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Three years of Ulysses dust data: 1993–1995

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Abstract

The Ulysses spacecraft is orbiting the Sun on a highly inclined ellipse ($i = 79°$). After its Jupiter flyby in 1992 at a heliocentric distance of 5.4 AU, the spacecraft reapproached the inner solar system, flew over the Sun's south polar region in September 1994, crossed the ecliptic plane at a distance of 1.3 AU in March 1995, and flew over the Sun's north polar region in July 1995. We report on dust impact data obtained with the dust detector onboard Ulysses between January 1993 and December 1995. We publish and analyse the complete data set of 509 recorded impacts of dust particles with masses between 10^{-16} g–10^{-7} g. Together with 968 dust impacts from launch until the end of 1992 published earlier (Grün et al., 1995c), information about 1477 particles detected with the Ulysses sensor between October 1990 and December 1995 is now available. The impact rate measured between 1993 and 1995 stayed relatively constant at about 0.4 impacts per day and varied by less than a factor of ten. Most of the impacts recorded outside about 3.5 AU are compatible with particles of interstellar origin. Two populations of interplanetary particles have been recognized: big micrometer-sized particles close to the ecliptic plane and small sub-micrometer-sized particles at high ecliptic latitudes. The observed impact rate is compared with a model for the flux of interstellar dust particles which gives relatively good agreement with the observed impact rate. No change in the instrument's noise characteristics or degradation of the channeltron could be revealed during the three-year period.

1. Introduction

The Ulysses mission is exploring the solar system between 1 and 5.4 AU from the Sun over a wide range of ecliptic latitudes ($-79°$–$+79°$). Ulysses carries a multi-coincidence impact ionization detector, which is nearly identical to the dust detector flown onboard the Galileo spacecraft. Detailed descriptions of the dust instruments onboard both spacecraft have been published by Grün et al. (1992a, b; 1995a). Early results on interplanetary dust obtained from both missions and dust measurements achieved by Ulysses in the environment of Jupiter have been reported (Grün et al., 1992c, d; Grün, 1994). Unexpected intermittent streams of dust particles originating from the Jovian system and interstellar particles sweeping through the solar system were discovered by Ulysses (Grün et al., 1993). A detailed analysis of the complete Ulysses dust data has led to the identification of 'small' impacts that had been previously considered potential noise events (Baguhl et al., 1993).

Data from the dust instruments onboard both spacecraft—Ulysses and Galileo—have been used in various ways: asteroids and comets have been investigated as dust sources (Riemann and Grün, 1992; Hamilton and Burns, 1992; Grün et al., 1994a; Mann et al., 1996a); conse-

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quences for the zodiacal light and other interplanetary meteoroid measurements have been considered (Mann et al., 1992; Mann and Grün, 1993; Mann et al., 1996b; Taylor et al., 1996); a detailed model of interplanetary meteoroid populations in the solar system has been developed (Divine, 1993; Divine et al., 1993; Grün and Staubach, 1996; Grün et al., 1997); the dust streams originating from the Jovian system have been analysed (Horányi et al., 1993a, b; Hamilton and Burns, 1993; Zook et al., 1996) and, finally, the properties of interstellar dust in the heliosphere have been investigated (Grün et al., 1994b; Baguhl et al., 1995a, b; 1996; Landgraf and Grün, 1998).

This is the fifth paper in a series dedicated to presenting both raw and reduced data obtained from the dust instruments onboard the Ulysses and Galileo spacecraft. Grün et al. (1995a; hereafter, Paper I) describe the reduction process of Ulysses and Galileo dust data. Papers II and III (Grün et al., 1995b, c) present the data sets from the initial three and two years of the Galileo and Ulysses missions, respectively. In the case of Ulysses the time period covered (Paper III) was October 1990–December 1992. In the current paper we extend the Ulysses data set from January 1993 until December 1995. In a companion paper (Krüger et al., 1998, Paper IV), we publish the Galileo data set for the same time period. The main data products are a table of the impact rate of all impacts determined from the particle accumulators and a table of both raw and reduced data of all dust impacts transmitted to Earth. The information presented in these papers is similar to data which we are submitting to the various data archiving centers (Planetary Data System, NSSDC, Ulysses Data Center, etc.). Electronic access to the data is also possible via the world wide web: http://galileo.mpi-hd.mpg.de.

This paper is organised similarly to Paper III. Section 2 gives a brief overview of the Ulysses mission and lists important mission events from 1993–95. A description of the Ulysses dust data set for this period is given in Section 3. Sections 4 and 5 analyse and discuss the new data set.

2. Mission and instrument operation

Ulysses was launched on 6 October 1990 and was brought onto a direct trajectory towards Jupiter. A swing-by maneuvre at Jupiter on 8 February 1992 deflected the spacecraft into an orbit that is inclined by 79° to the ecliptic plane (Fig. 1). In October 1994 Ulysses passed the Sun's south polar region, then crossed the ecliptic plane again, this time at a perihelion distance of 1.3 AU on 12 March 1995 and flew over the Sun's north polar region in August 1995. In April 1998 the spacecraft crossed the ecliptic plane at its aphelion at 5.4 AU. Approximate orbital elements for the Ulysses trajectory that include the whole out-of-ecliptic part of its orbit, are given in Paper III.

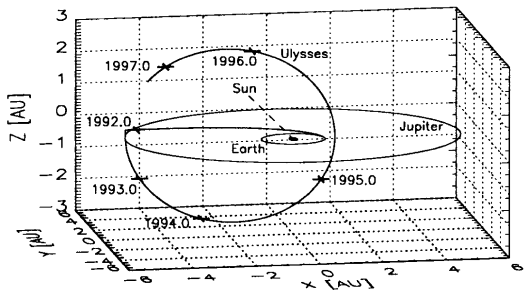

Fig. 1. Three-dimensional view of Ulysses' interplanetary trajectory from launch until the end of 1996 in ecliptic coordinates. The Sun is in the center. The orbits of Earth and Jupiter indicate the ecliptic plane. The initial trajectory of Ulysses was in the ecliptic plane. During Jupiter flyby in early 1992 Ulysses was brought into an orbit with 79° inclination that sent the spacecraft close to the ecliptic poles. Crosses mark the spacecraft position at the beginning of each year. Vernal equinox is to the right (positive x axis).

Ulysses is a spin-stabilized spacecraft with its spin axis pointing towards Earth. In Fig. 2 we show the deviation of the spin axis from the nominal Earth direction for the period 1993 to 1995 considered in this paper. Most of the time the axis pointing was within one degree of the Earth direction. This rather small deviation is negligible for the considerations in this paper. The Ulysses spacecraft and mission are explained in more detail by Wenzel et al. (1992). Details about the data transmission to Earth can also be found in Paper III.

The dust detector onboard Ulysses (GRU) has a 140° wide field of view. The instrument is mounted nearly at right angles (85°) to the antenna pointing direction (spacecraft spin axis). Therefore, the sensor is most sensitive to particles approaching from the plane perpendicular to the spacecraft–Earth direction. The

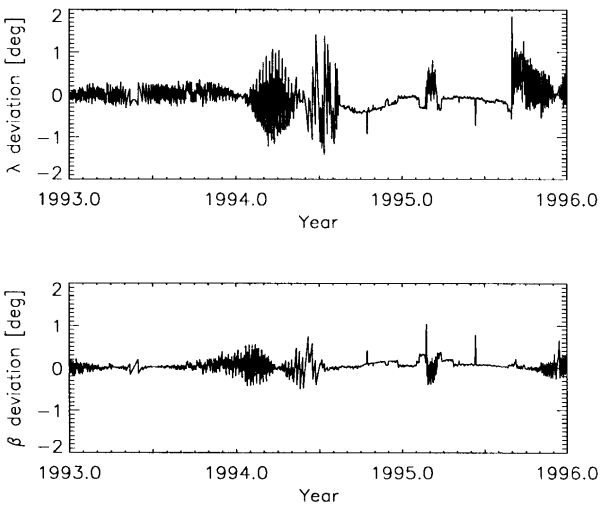

Fig. 2. Spacecraft attitude: deviation of the antenna pointing direction (i.e., negative spin axis) from the nominal Earth direction. The angles are given in ecliptic longitude (top) and latitude (bottom, equinox 1950.0).

rotation angle measures the sensor viewing direction at the time of a dust impact. During one spin revolution the rotation angle scans through a complete circle of 360°. The 0° rotation angle is defined to be the direction closest to ecliptic north. At high ecliptic latitudes, however, the sensor pointing at 0° rotation angle significantly deviates from the actual north direction. During the passages over the Sun's polar regions the sensor always scans through a plane tilted by about 30° from the ecliptic and all rotation angles lie close to the ecliptic plane (cf. Fig. 4 in Grün et al., 1997). A sketch of the viewing geometry can be found in Grün et al. (1993).

Table 1 lists significant mission and dust instrument events from 1993–95. Earlier events are only listed if especially significant. A comprehensive list of events from launch until the end of 1992 is given in Paper III. During the early phases of the mission the in-orbit noise characteristics of the instrument were investigated (Paper III). This led to a relatively noise-free configuration (hereafter called nominal configuration) for the instrument after 10 February 1992: channeltron voltage 1140 V (HV = 3); event definition status such that either the channeltron or the ion-collector channel can, independent of each other, start a measurement cycle (EVD = C, I); detection thresholds for ion-collector, channeltron and electron-channel set to the lowest levels and the detection threshold for the entrance grid set to the first digital step (SSEN = 0, 0, 0, 1). See Paper I for a description of these terms.

The operational configuration of the dust instrument was changed several times during noise tests: starting from the nominal configuration described above, all tests have been performed with the same instrument settings. During noise tests, the following changes of the instrument configuration were applied at one-hour intervals: (a) set the event definition status such that the channeltron, the ion collector and the electron-channel can initiate a measurement cycle (EVD = C, I, E); (b) set the thresholds for all channels to their lowest levels (SSEN = 0, 0, 0, 0); (c) reset the event definition status to its nominal configuration (EVD = C, I); (d) increase the channeltron high voltage by one digital step (HV = 4); (e) reset the channeltron high voltage and the detection thresholds to their nominal settings (HV = 3, SSEN = 0, 0, 0, 1). After step (e) the instrument is back in its nominal configuration. No detectable change in the noise behavior was revealed by the noise tests during the three years from 1993–95.

Spacecraft anomalies occurred five times between 1993 and 1995, and all scientific instruments onboard were switched off automatically for about one day during so-called DNELs (Disconnect all Non-Essential Loads). After each DNEL, the dust instrument was switched on again and was configured to its nominal operational mode.

The dust instrument has two heaters to allow for a relatively stable operating temperature within the sensor. By heating one of the two or both heaters, three different heating power levels can be achieved (400, 800 or 1200 mW). One or both heaters were switched on most of the time, except close to the Sun between 5 February and 12 June 1995 when both were switched off. The heaters remained switched on during the DNELs. Table 1 lists the total heating powers provided by the heaters. The temperature of the dust sensor was between −20°C–+15°C.

A timing error in the instrument electronics led to wrong spacecraft sector information for about 20% of the events in the data set published earlier (cf. Paper III, indicated by ROT = 999 in Table 4). The error was corrected by a reprogramming of the instrument on 30 April 1993.

After launch of Ulysses the sounder of the URAP instrument (Stone et al., 1992) emerged as a significant and unexpected noise source for the dust sensor. When the sounder was switched on after launch, sounder interference caused about 20% dead time (Paper III). With the sounder now usually being operated at a lower rate of about 2 min at 2 h intervals the dead time is reduced to about 2%. In a detailed investigation of the noise behavior of the Ulysses dust instrument Baguhl et al. (1993) showed that the noise rate measured during periods of sounder operation was correlated with the distance to, and the position of, the Sun with respect to the sensor-viewing direction: most noise events are triggered when the Sun shines directly into the sensor. On the other hand, when the spacecraft was at large heliocentric distances in 1993, the noise rate was extremely low, even during sounder operation periods.

In Fig. 3 we show the noise rate for the 1993–95 period. The upper panel shows the daily maxima, which are dominated by interference with the sounder. Since the sounder was operated for periods of only 2 min with quiet intervals of about 2 h, such high noise rates prevailed only during about 2% of the time, with the remaining 98% being free of sounder noise. In 1994 the maxima in the noise rate induced by the sounder began to increase significantly when Ulysses approached the inner solar system. The highest sounder noise rates occurred around perihelion passage in March 1995. From 12–22 July 1994 and 24 November–1 December 1994, the sounder was switched off and the noise level dropped to about 10 events per day. The noise during quiet times when the sounder was switched off is shown in the lower panel of Fig. 3. The average was about 20 events per day which shows that the dust instrument was not affected by dead time caused by random noise events during 98% of the time.

3. Impact events

Impact events are classified into four classes and six ion charge amplitude ranges which lead to 24 individual

Table 1
Ulysses mission and dust detector (GRU) configuration, tests and other events. Only selected events before 1993 are given. See Section 2 for details

Year–day	Date	Time	Event
90–279	06.10.90		Ulysses launch
91–154	03.06.91	18:13	GRU heater on: 1200 mW
92–041	10.02.92	17:00	GRU nominal configuration: HV = 3, EVD = C, I, SSEN = 0001
93–045	14.02.93	06:53	Ulysses DNEL #2
93–045	14.02.93	22:50	GRU on, nominal configuration
93–120	30.04.93	02:46	GRU new program (FN7 data) load
93–126	06.05.93	23:07	GRU start new program
93–196	15.07.93	02:00	GRU noise test
93–206	25.07.93	01:00	GRU HV = 4
93–211	30.07.93	06:03	GRU HV = 3
93–221	09.08.93	12:17	Ulysses DNEL #3
93–223	11.08.93	22:36	GRU on
93–224	12.08.93	07:43	GRU nominal configuration
93–231	19.08.93	01:59	GRU noise test
93–259	16.09.93	11:59	GRU noise test
93–287	14.10.93	18:59	GRU noise test
93–315	11.11.93	19:59	GRU noise test
93–331	27.11.93	23:41	Ulysses DNEL #4
93–332	28.11.93	15:21	GRU on
93–332	28.11.93	22:58	GRU nominal configuration
93–343	09.12.93	18:00	GRU noise test
94–006	06.01.94	16:00	GRU noise test
94–034	03.02.94	14:59	GRU noise test
94–062	03.03.94	07:00	GRU noise test
94–090	31.03.94	08:45	GRU noise test
94–118	28.04.94	07:30	GRU noise test
94–146	26.05.94	05:00	GRU noise test
94–174	22.06.94	06:00	GRU noise test
94–202	21.07.94	03:59	GRU noise test
94–230	18.08.94	02:59	GRU noise test
94–258	15.09.94	00:00	GRU noise test
94–276	03.10.94		Ulysses South polar pass (lat. -79°, 2.1 AU)
94–281	08.10.94	00:30	GRU heater: 800 mW
94–283	10.10.94	18:45	Ulysses DNEL #5
94–284	11.10.94	23:06	GRU on
94–285	12.10.94	04:17	GRU nominal configuration
94–286	13.10.94	19:59	GRU noise test
94–314	10.11.94	04:59	GRU noise test
94–341	08.12.94	23:59	GRU noise test
94–005	05.01.95	00:00	GRU noise test
95–003	02.02.95	01:59	GRU noise test
95–036	05.02.95	01:24	GRU heater off
95–071	12.03.95	12:01	Ulysses ecliptic plane crossing and perihelion (1.3 AU)
95–152	01.06.95	03:59	GRU noise test
95–163	12.06.95	03:31	GRU heater on: 400 mW
95–180	29.06.95	03:59	GRU noise test
95–208	27.07.95	04:00	GRU noise test
95–216	04.08.95	00:51	GRU heater: 800 mW
95–231	19.08.95		Ulysses North polar pass (lat. $+79^\circ$, 2.1 AU)
95–236	24.08.95	15:59	GRU noise test
95–264	21.09.95	18:59	GRU noise test
95–292	19.10.95	19:59	GRU noise test
95–300	27.10.95	16:23	GRU heater: 1200 mW
95–320	16.11.98	09:59	GRU noise test
95–344	10.12.95	15:55	Ulysses DNEL #6
95–344	10.12.95	21:28	GRU on
95–346	12.12.95	08:54	GRU nominal configuration
95–348	14.12.95	15:00	GRU noise test

Abbreviations used: DNEL: Disconnect non-essential loads (i.e., all scientific instruments); HV: channeltron high voltage step; EVD: event definition, ion- (I), channeltron- (C), or electron-channel (E); SSEN: detection thresholds, ICP, CCP, ECP and PCP.

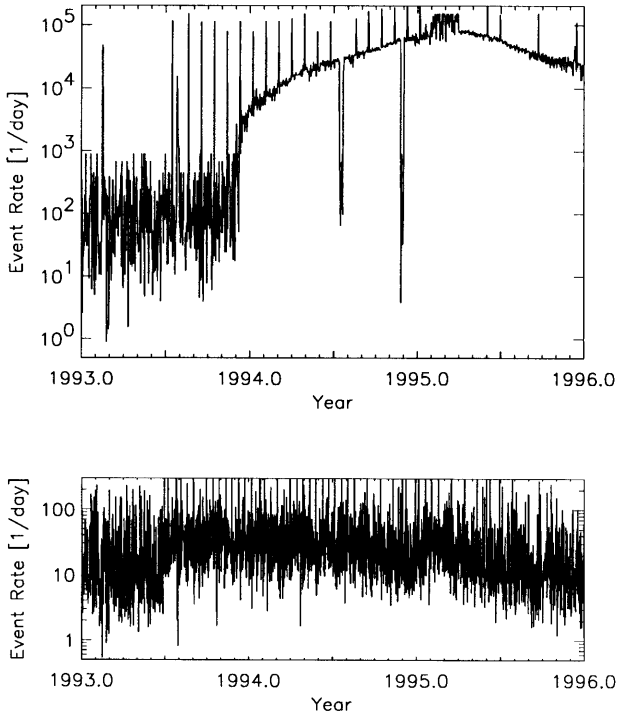

Fig. 3. Noise rate (class 0 events) detected with the dust instrument. Upper panel: Daily maxima in the noise rate (determined from the AC01 accumulator). The sounder was operated for only 2% of the total time, and the daily maxima are dominated by sounder noise. Sharp spikes are caused by periodic noise tests and short periods of reconfiguration after DNELs (cf. Table 1). From 12–22 Jul. 1994 and 24 Nov. to 1 Dec. 1994 the sounder was not operated, which reduced the maximum noise by several orders of magnitude. Lower panel: Noise rate detected during quiet intervals when the sounder was switched off, which was the case about 98% of the time (one-day average calculated from the number of AC01 events for which the complete information has been transmitted to Earth).

categories. In addition, the instrument has 24 accumulators with one accumulator belonging to one individual category. Class 3, our highest class, are real dust impacts and class 0 are noise events. Depending upon the noise of the charge measurements, classes 1 and 2 can be true dust impacts or noise events. This classification scheme for impact events has been described in Paper I and this scheme is still valid for the Ulysses dust instrument. In contrast to the Galileo dust instrument which had to be reprogrammed because of the low data transmission capabilities of the Galileo spacecraft, no such reprogramming was necessary for Ulysses. Most of the data processing for Ulysses is done on the ground.

Between 1 January 1993 and 31 December 1995 the complete data (sensor orientation, charge amplitudes, charge rise times, etc.) of 72,809 events including 509 dust impacts were transmitted to Earth. Table 2 lists the number of all dust impacts counted with the 24 accumulators of the dust instrument. 'AC*xy*' refers to class number '*x*' and amplitude range '*y*' (for a detailed description of the accumulator categories see Paper I). As discussed in the previous section, most noise events were recorded during the short time periods when either the sounder of the URAP instrument was operating (cf. Paper III) or the dust instrument was configured to its high sensitive state for noise tests, or both. During these periods many events were only counted by one of the 24 accumulators because their full information was overwritten before the data could be transmitted to Earth (see bottom of Table 2). Since the dust impact rate was low during times surrounding these periods, it is expected that only a few true dust impacts were lost.

Two particles in AC32 and AC33 (days 93–154, 21:01 h and 93–319, 15:31 h), respectively, were detected in a gap of several hours when no data could be transmitted to Earth, and their full information had to be taken from the instrument memory (FN7, cf. Grün et al., 1992a). Before and after these gaps the sounder was operated for about 2 min at 2 h intervals and we assume that it was operated with the same frequency in the gap. Due to these long quiet intervals between sounder operation it is rather unlikely that the two events occurred when the sounder was active. Even in such a case these are still very likely true dust impacts because the sounder noise usually affects only the lowest ion amplitude range (AR1).

All 509 dust impacts detected between 1993 and 1995 for which the complete information exists are listed in Table 3. Dust particles are identified by their sequence number and their impact time (first two columns). The event category—class (CLN) and amplitude range (AR)—are given in the third and fourth columns. Raw data as transmitted to Earth are shown in the next columns: sector value (SEC) which is the spacecraft spin orientation at the time of impact, impact charge numbers (IA, EA, CA) and rise times (IT, ET), time difference and coincidence of electron and ion signals (EIT, EIC), coincidence of ion and channeltron signal (IIC), charge reading at the entrance grid (PA) and time (PET) between this signal and the impact. Then the instrument configuration is given: event definition (EVD), charge sensing thresholds (ICP, ECP, CCP, PCP) and channeltron high voltage step (HV). Compare Paper I for further explanation of the instrument parameters.

The next four columns in Table 3 give information about Ulysses' orbit: heliocentric distance (*R*), ecliptic longitude and latitude (LON, LAT) and distance from Jupiter (D_{Jup}). The next column gives the rotation angle (ROT) as described in Section 2. Whenever this value is unknown, ROT is arbitrarily set to 999. This occurs 14 times. Then follows the pointing direction of the dust instrument at the time of particle impact in ecliptic longitude and latitude (S_{LON}, S_{LAT}). When ROT is not valid S_{LON} and S_{LAT} are useless and are also set to 999. Mean impact velocity (*V*) and velocity error factor (*VEF*, i.e., multiply or divide stated velocity by *VEF* to obtain upper or lower limits) as well as mean particle mass (*M*) and

Table 2
Overview of dust impacts accumulated with the Ulysses dust detector between 1 January 1993 and 31 December 1995. Switch-on of the instrument is indicated by horizontal lines. The heliocentric distance R, the lengths of the time interval Δt (days) from the previous table entry, and the corresponding numbers of impacts are given for the 24 accumulators. The accumulators are arranged with increasing signal amplitude ranges (AR), with four event classes for each amplitude range (CLN = 0, 1, 2, 3); e.g., AC31 means counter for AR = 1 and CLN = 3. The Δt in the first line (93–001) is the time interval counted from the last entry in Table 3 in Paper III. The totals of counted impacts*, of impacts with complete data, and of all events (noise plus impact events) for the entire period are also given

Date	Time (h)	R (AU)	Δt (d)	AC 01*	AC 11*	AC 21	AC 31	AC 02*	AC 12	AC 22	AC 32	AC 03	AC 13	AC 23	AC 33	AC 04	AC 14	AC 24	AC 34	AC 05	AC 15	AC 25	AC 35	AC 06	AC 16	AC 26	AC 36
93–001	02:08	5.065	2.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–008	09:24	5.049	7.3	—	1	—	—	—	—	—	2	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—
93–016	02:51	5.028	7.7	1	—	—	—	1	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–023	03:00	5.011	7.0	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–030	07:15	5.001	7.2	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–044	18:50	4.967	14.5	1	1	—	1	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–045	14:53	4.952	0.8																								
93–053	02:13	4.931	7.5	—	—	—	—	1	—	—	2	—	1	—	2	—	—	—	—	—	—	—	—	—	—	—	—
93–060	06:07	4.929	7.2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–068	05:29	4.888	8.0	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–076	01:48	4.889	7.8	1	—	—	—	1	—	—	2	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–083	03:48	4.870	7.1	1	—	—	—	—	—	—	2	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–090	04:04	4.852	7.0	—	1	—	—	1	—	—	3	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–098	02:25	4.796	7.9	1	—	—	—	—	2	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–105	04:50	4.810	7.1	1	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–113	00:08	4.788	7.8	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–120	00:37	4.768	7.0	1	—	—	—	—	—	—	2	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
93–127	01:10	4.747	7.0	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–134	04:48	4.726	7.2	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–142	00:32	4.702	7.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–149	01:25	4.680	7.0	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–156	02:37	4.597	7.1	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–164	01:55	4.633	8.0		2	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–171	02:42	4.540	7.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–179	01:33	4.583	8.0	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–187	11:29	4.476	8.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–195	01:06	4.529	7.6	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–202	01:49	4.505	7.0	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–210	00:09	4.476	7.9	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–217	00:11	4.451	7.0	—	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–224	06:14	4.424	7.3	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–225	06:29	4.421	1.0																								
93–233	01:23	4.392	7.8	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–241	03:55	4.361	8.1	1	—	—	—	—	—	1	1	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—
93–249	02:41	4.210	7.9	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–257	01:23	4.299	7.9	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–265	10:20	4.266	8.4	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–273	01:04	4.235	7.6	2	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–281	01:15	4.202	8.0	—	—	—	—	—	1	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–288	02:55	4.021	7.1	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–296	06:11	4.138	8.1	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
93–304	00:43	4.105	7.8	—	—	—	—	—	—	—	1	—	—	—	2	—	—	—	1	—	—	—	—	—	—	—	—
93–312	02:43	3.898	8.1	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–320	03:49	4.034	8.0	2	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–331	17:21	3.792	11.6	4	—	—	—	—	1	—	1	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—

continued

Table 2—*continued*

Date	*Time* (h)	*R* (AU)	Δ*t* (d)	AC 01*	AC 11*	AC 21	AC 31	AC 02*	AC 12	AC 22	AC 32	AC 03	AC 13	AC 23	AC 33	AC 04	AC 14	AC 24	AC 34	AC 05	AC 15	AC 25	AC 35	AC 06	AC 16	AC 26	AC 36
93–332	17:22	3.786	1.0																								
93–340	01:29	3.943	7.3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
93–348	00:46	3.906	8.0	1	—	—	—	1	—	—	—	—	—	—	2	—	—	—	1	—	—	—	—	—	—	—	—
93–356	00:16	3.868	8.0	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
93–363	00:49	3.834	7.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–006	01:02	3.795	8.0	1	1	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—
94–014	01:59	3.755	8.0	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
95–022	00:58	3.715	8.0	3	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
94–030	00:15	3.674	8.0	2	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–037	02:40	3.614	7.1	—	—	—	—	—	—	—	—	—	—	—	3	—	—	—	—	—	—	—	—	—	—	—	—
94–045	00:18	3.596	7.9	1	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–052	00:41	3.559	7.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–060	01:07	3.516	8.0	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–068	00:22	3.473	8.0	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–075	00:42	3.434	7.0	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–083	00:55	3.389	8.0	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–090	01:14	3.350	7.0	4	—	—	1	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–098	01:19	3.304	8.0	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–106	00:45	3.257	8.0	2	—	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–113	00:46	3.216	7.0	2	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
94–124	00:05	3.150	11.0	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—
94–131	00:15	3.108	7.0	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–138	01:26	3.065	7.0	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–146	00:26	3.016	8.0	—	—	—	—	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–154	00:44	2.966	8.0	—	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—
94–162	00:27	2.915	8.0	2	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–169	23:56	2.728	8.0	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–177	00:04	2.818	7.0	1	—	—	—	—	1	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–184	00:12	2.773	7.0	4	—	—	1	1	—	—	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
94–192	00:11	2.720	8.0	3	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–199	02:39	2.506	7.1	1	—	—	—	1	2	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–207	00:07	2.619	7.9	3	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–214	00:09	2.572	7.0	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–221	00:43	2.524	7.0	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–229	00:55	2.469	8.0	3	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—
94–237	00:24	2.413	8.0	2	—	—	1	1	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–245	00:24	2.357	8.0	3	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–253	00:24	2.301	8.0	—	—	—	—	—	1	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—
94–261	00:02	2.245	8.0	1	—	—	1	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–268	00:30	2.195	7.0	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–276	00:00	1.895	8.0	1	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	1
94–283	15:14	2.084	7.6	4	—	—	—	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–285	23:58	1.816	2.4																								
94–293	00:02	2.018	7.0	1	1	—	1	—	—	—	—	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—
94–301	00:16	1.962	8.0	1	—	—	—	—	—	—	2	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–309	00:01	1.906	8.0	5	—	—	—	—	2	—	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—
94–317	00:02	1.851	8.0	5	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
94–324	00:36	1.804	7.0	2	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
94–331	06:16	1.755	7.2	1	—	—	—	1	1	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
94–339	01:47	1.705	7.8	1	—	—	—	—	1	—	1	—	—	—	1	—	—	1	—	—	—	—	—	—	—	—	—

continued

Table 2—*continued*

Date	*Time* (h)	*R* (AU)	Δ*t* (d)	AC 01*	AC 11*	AC 21	AC 31	AC 02*	AC 12	AC 22	AC 32	AC 03	AC 13	AC 23	AC 33	AC 04	AC 14	AC 24	AC 34	AC 05	AC 15	AC 25	AC 35	AC 06	AC 16	AC 26	AC 36
94–347	00:10	1.655	7.9	3	—	—	—	1	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—
94–354	00:44	1.613	7.0	1	—	—	—	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—
94–362	00:00	1.314	8.0	1	—	—	—	1	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—
95–004	01:17	1.529	7.1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–012	00:02	1.488	7.9	1	—	—	—	—	1	—	—	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—
95–019	23:57	1.442	8.0	3	—	—	—	1	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—
95–027	00:04	1.423	7.0	5	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	1
95–034	23:59	1.382	8.0	5	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–042	01:28	1.375	7.1	3	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–050	01:03	1.357	8.0	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
95–058	00:57	1.346	8.0	5	—	—	—	1	—	—	1	1	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—
95–066	00:01	1.340	8.0	7	1	—	1	—	—	—	—	—	—	—	1	—	2	—	—	—	1	—	—	—	—	—	—
95–073	00:41	1.340	7.0	11	—	—	—	2	—	—	—		1	—	1	—	—	—	1	—	—	1	1	—	—	—	—
95–080	01:36	1.346	7.0	7	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	1	—	—
95–088	00:29	1.358	8.0	6	—	—	—	3	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	2
95–095	00:30	1.373	7.0	9	—	1	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	1	1	—	—	—	—
95–103	00:08	1.395	8.0	8	—	—	—	—	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	1	—	—
95–111	00:00	1.476	8.0	4	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–119	00:15	1.456	8.0	3	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–127	00:30	1.493	8.0	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–135	00:11	1.534	8.0	2	1	—	1	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—
95–142	00:35	1.572	7.0	5	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–150	00:51	1.619	8.0	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–158	01:05	1.667	8.0	2	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
95–166	01:25	1.718	8.0	1	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–174	01:40	1.770	8.0	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–182	01:15	1.824	8.0	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–189	01:43	1.872	7.0	—	—	—	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–197	01:05	1.927	8.0	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–204	01:51	1.976	7.0	3	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
95–212	00:07	2.032	7.9	2	1	—	—	1	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–219	00:07	2.082	7.0	1	—	—	—	3	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–226	01:16	2.131	7.0	2	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–233	01:42	2.181	7.0	4	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–240	23:59	2.450	7.9	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–248	00:49	2.287	7.0	2	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—
95–255	01:18	2.336	7.0	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–262	01:50	2.385	7.0	1	—	—	—	—	—	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—	—	—
95–270	00:19	2.441	7.9	3	—	—	—	—	—	—	1	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–277	00:19	2.489	7.0	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–284	01:14	2.538	7.0	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–292	00:08	2.592	8.0	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–299	00:27	2.640	7.0	2	—	—	—	1	—	—	—	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—
95–306	01:38	2.687	7.0	3	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–313	01:38	2.733	7.0	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–320	03:37	2.780	7.1	3	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
95–328	01:21	2.831	7.9	1	—	—	—	2	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–335	02:38	3.146	7.1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–344	13:11	2.937	9.4	1	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
95–345	00:05	2.941	0.5																								

continued

Table 2—*continued*

Date	*Time* (h)	*R* (AU)	Δt (d)	AC 01*	AC 11*	AC 21	AC 31	AC 02*	AC 12	AC 22	AC 32	AC 03	AC 13	AC 23	AC 33	AC 04	AC 14	AC 24	AC 34	AC 05	AC 15	AC 25	AC 35	AC 06	AC 16	AC 26	AC 36
95–352	01:00	2.985	7.0	1	—	—	—	—	—	—	—	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—
95–360	01:15	3.035	8.0	1	—	—	—	1	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Impacts (counted)				235*	17*	1	18	40*	30	5	47	3	9	6	63	0	4	3	12	0	3	2	5	0	3	0	4
Impacts (complete data)				235	17	1	18	40	30	5	47	2	9	6	63	0	4	3	12	0	3	2	5	0	3	0	4
All events (complete data)				68176	3676	1	18	738	30	5	47	3	9	6	63	1	4	3	12	0	3	2	5	0	3	0	4

* Entries for AC01, AC11 and AC02 are the number of impacts with complete data. Due to the noise contamination of these three categories the number of impacts cannot be determined from the accumulators. The method to separate dust impacts from noise events in these three categories has been given by Baguhl et al. (1993).

mass error factor (*MEF*) are given in the last columns. For $VEF > 6$, both velocity and mass values should be discarded. This occurs for 48 impacts. No intrinsic dust charge values are given (see Svestka et al., 1996 for a detailed analysis).

4. Analysis

The positive impact charge measured on the ion collector, Q_I, is the most important impact parameter determined by the dust instrument because of its relative insensitivity to noise. In Fig. 4 we show the distribution of Q_I for all dust particles detected between 1993–95. Ion impact charges have been detected over the entire range of six orders of magnitude in impact charge that can be measured by the dust instrument. About 1% of all impacts are close to the saturation limit of $Q_I \sim 10^{-8}$ C and may thus constitute lower limits of the actual impact charges. The impact charge distribution is reminiscent of three individual particle populations: small particles with impact charges $Q_I < 10^{-13}$ C (AR1), intermediate particles with 10^{-13} C $\leqslant Q_I \leqslant 3\times10^{-11}$ C (AR2 and AR3) and big particles with $Q_I > 3\times10^{-11}$ C (AR4 to AR6). The intermediate particles are mostly of interstellar origin and the big particles are interplanetary particles detected close to the ecliptic plane (Grün et al., 1997; see also Section 5). The small particles occur mostly over the Sun's polar regions and are attributed to a population of interplanetary β-meteoroids at high ecliptic latitudes (Baguhl et al., 1995b; Hamilton et al., 1996).

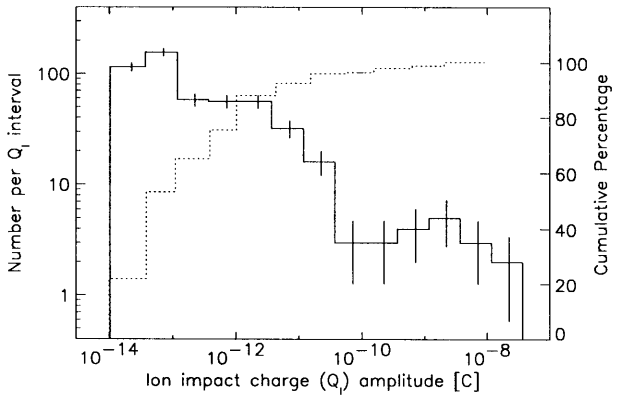

Fig. 4. Distribution of the impact charge amplitude Q_I for all particles detected between 1993–95. The solid line indicates the number of impacts per charge interval, and the dotted line shows the cumulative percentage. Vertical bars indicate the $\sqrt{n}$ statistical error.

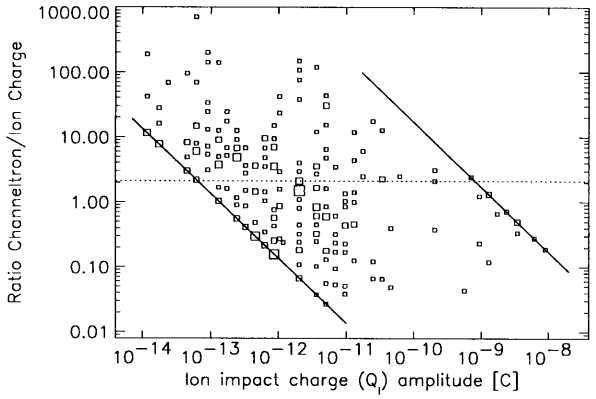

Fig. 5. Channeltron amplification factor $A = Q_C/Q_I$ as a function of impact charge Q_I for all particles detected between 1993–95. The solid lines denote the sensitivity threshold (lower left) and the saturation limit (upper right) of the channeltron. Squares indicate dust particle impacts. The area of each square is proportional to the number of events included (the scaling of the squares differs from that used in Paper III). The dotted horizontal line shows the mean value of the channeltron amplification $A = 2.1$ for ion impact charges 10^{-12} C $< Q_I < 10^{-11}$ C.

The ratio of the channeltron charge Q_C and the ion collector charge Q_I is a measure of the channeltron amplification A. The channeltron amplification is an important parameter for dust impact identification (Paper I). In Fig. 5 we show the charge ratio Q_C/Q_I as a function of Q_I for the nominal high voltage of 1140 V (HV = 3). The mean amplification determined from particles with 10^{-12} C $\leqslant Q_I \leqslant 10^{-11}$ C is $A \simeq 2.1$. This is very close to the value obtained in Paper III for the first two years of the

mission ($A \simeq 2.2$). Therefore, the channeltron does not show any detectable aging during the more than five years of the Ulysses mission.

Figure 6 shows the masses and velocities of all dust particles detected between 1993–95. As in the earlier period (1990–92; Paper III), velocities occur over the entire calibrated range from 2–70 km/s. The masses vary over 10 orders of magnitude from 10^{-6} g–10^{-16} g. The mean errors are a factor of 2 for the velocity and a factor of 10 for the mass. The clustering of the velocity values is due to discrete steps in the rise time measurement but this quantization is much smaller than the velocity uncertainty. For many particles in the lowest two amplitude ranges (AR1 and AR2) the velocity had to be computed from the ion charge signal alone which leads to the striping in the lower mass range in Fig. 6 (most prominent above 10 km s^{-1}). In the higher amplitude ranges the velocity could normally be calculated from both the target and the ion charge signal, resulting in a more continuous distribution in the mass-velocity plane. Impact velocities below about 3 km/s should be treated with caution because anomalous impacts onto the sensor grids or structures other than the target generally lead to prolonged rise times and hence to unnaturally low impact velocities.

5. Discussion

Most of the time from January 1993–December 1995, Ulysses was at high ecliptic latitudes far away from the ecliptic plane. The dust impact rate detected by the Ulysses dust sensor in this period is displayed in Fig. 7. The highest overall impact rate was detected around the ecliptic plane crossing which occurred on 12 March 1995 (at 1.3 AU from the Sun). The maximum impact rate of particles in the three highest ion amplitude ranges (AR4 to AR6) coincides with the highest overall impact rate (upper panel of Fig. 7). These impacts are attributed to interplanetary particles on low inclination orbits (Grün et al., 1997). These are the impacts with $Q_I > 10^{-10}$ C shown in Fig. 4. The impact rate of particles in the lowest amplitude range (AR1) increased gradually since mid 1993, reached its maximum at the ecliptic plane crossing in March 1995 and decreased later. Although the impact rate reached its maximum during a short time around the ecliptic plane crossing, the majority of these small particles has been detected during the much longer time interval when Ulysses was at high ecliptic latitudes. They are attributed to a population of small interplanetary particles on escape trajectories from the solar system (Baguhl et al., 1995; Hamilton et al., 1996).

The impact rate of particles in the intermediate ion amplitude ranges AR2 and AR3 was relatively constant during the 1993–95 period. It dominated the overall impact rate until early 1994, i.e., outside about 3.5 AU

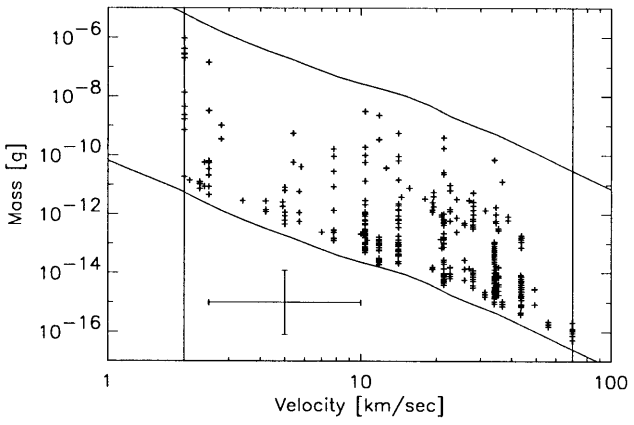

Fig. 6. Masses and impact velocities of all impacts recorded with the Ulysses sensor between 1993–95. The lower and upper solid lines indicate the threshold and the saturation limit of the detector, respectively, and the vertical lines indicate the calibrated velocity range. A sample error bar is shown that indicates a factor of 2 uncertainty for the velocity and a factor of 10 for the mass determination.

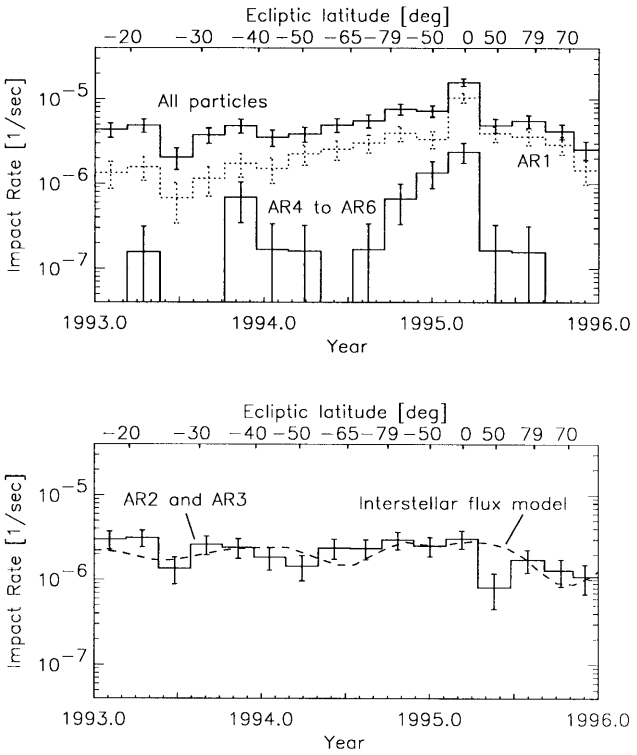

Fig. 7. Impact rate of dust particles detected with the Ulysses dust sensor as a function of time with the ecliptic latitude of the spacecraft indicated at the top. Upper panel: the upper solid line shows the total impact rate, the dotted line the impact rate of small particles (AR1) and the lower solid line the rate of big particles (AR4–AR6). Note that a rate of about 1.8×10^{-7} impacts per second is caused by a single dust impact in the averaging interval of about 70 days. Lower panel: intermediate particles (AR2 and AR3, solid line). A model for the rate of interstellar particles assuming a constant flux is superimposed as a dashed line.

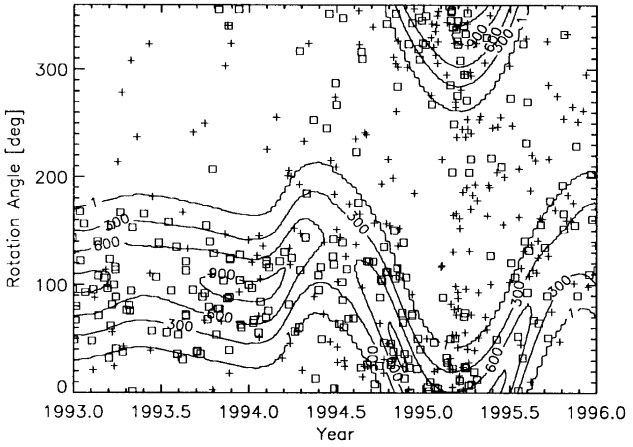

Fig. 8. Rotation angle vs time for all particles detected between 1993–95 for which complete information is available. Plus signs indicate particles with impact charge $Q_I < 8 \times 10^{-14}$ C, squares those with $Q_I \geqslant 8 \times 10^{-14}$ C. The contour lines show the sensitive area of the dust sensor for particles approaching from the interstellar upstream direction (levels of 1, 300, 600 and 900 cm^2 detector area are shown). Most of the larger Q_I particles came from directions consistent with the interstellar upstream direction. The biggest particles in the highest amplitude ranges which are of interplanetary origin are not shown separately here because only very few of them were detected (cf. Table 2) and they cannot be separated from interstellar particles by directional arguments. passage over the Sun's south polar region occurred in October 1994, ecliptic plane crossing in March 1995, and passage over the Sun's north polar region in August 1995.

from the Sun. Impacts in these ion amplitude ranges are mostly due to interstellar particles (see also Fig. 8 and Grün et al., 1993; Baguhl et al., 1995). Figure 7 also shows the expected impact rate of interstellar particles assuming that they approach from the direction of interstellar helium (Witte et al., 1996) and that they move on straight trajectories with a relative velocity of 26 km s^{-1} through the solar system. This assumption means dynamically that radiation pressure cancels gravity for these particles ($\beta = 1$) and that their Larmor radii are large compared with the dimension of the solar system. Both assumptions are reasonable for particles with masses between 10^{-13}–10^{-12} g which is the dominant size range measured for interstellar particles (e.g., Grün et al., 1997). The dust particle flux is independent of heliocentric distance in this simple model, which gives relatively good agreement with the observed impact rate. The variation predicted by the model is caused by changes in the instrument's viewing direction with respect to the approach direction of the particles and changes in the relative velocity between the spacecraft and the particles. After the ecliptic plane crossing the rate of interstellar particles expected from the model is significantly higher than the one observed. A detailed dynamical model (Landgraf, 1998) for the motion of interstellar particles in the interplanetary magnetic field gives better agreement with the observed impact rate, especially after 1996.

The sensor orientation at the time of a particle impact (rotation angle) is shown in Fig. 8. The detector's sensitive area for particles approaching from the interstellar direction is superimposed. The bigger particles (squares, impact charge $Q_I \geqslant 8 \times 10^{-14}$ C) are clearly concentrated towards the interstellar direction. They have been detected with a relatively constant rate during the whole three-year period (Fig. 7). Only a few small particles (crosses, impact charges $Q_I \leqslant 8 \times 10^{-14}$ C) have been detected and they cluster above the Sun's polar regions. The particles with the highest ion amplitude ranges (AR4–AR6) are not distinguished in this diagram because they cannot be separated from interstellar particles by directional arguments. They have to be distinguished by other means (e.g., mass and velocity). Furthermore, their total number is so small that they constitute only a small 'contamination' of the interstellar particles in Fig. 8. In the ecliptic plane at 1.3 AU, however, interplanetary particle flux dominates over interstellar flux by a factor of about 3 (in number).

Streams of tiny dust particles originating from the Jovian system have been first detected with Ulysses and later with Galileo out to 2 AU from Jupiter (Grün et al., 1993, 1996). During the time period from 1993–95 considered here, Ulysses was more than 2.5 AU away from Jupiter which makes a significant contribution of Jovian dust stream particles in the present data set very unlikely. Analysis of the particles' trajectories and their interaction with the interplanetary magnetic field (Zook et al., 1996) showed that the velocities are about 300 km/s and the particles are about 10 nm in size. These values are far beyond the calibrated range of the dust sensors given above and, in principle, one cannot exclude that the data set presented in this paper contains at least a fraction of particles for which the masses and velocities inferred from our calibration are wrong. Recent analyses of the interplanetary (Grün and Staubach, 1997) and interstellar populations (Landgraf, 1998), however, are consistent with the calibrated velocities and masses of the particles in the new 1993–95 data set. Given the present knowledge about the particles' dynamics, the velocities and masses stated in Papers II and III for the stream particles are not correct. Future investigations will address possible contributions of particles beyond the calibrated range of the dust instruments in the complete Ulysses and Galileo data sets, not only close to Jupiter where the dust streams have been detected.

Acknowledgements

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Table 3
Raw data: No., impact time, CLN, AR, SEC, IA, EA, CA, IT, ET, EIT, EIC, ICC, PA, PET, EVD, ICP, ECP, CCP, PCP, HV and evaluated data: R, LON, LAT, D_{Jup}, rotation angle (ROT), instr. pointing (S_{LON}, S_{LAT}), speed (V), speed error factor (VEF), mass (M) and mass error factor (MEF)

No.	IMP. DATE	CLN	AR	SEC	IA	EA	CA	IT	ET	EIT	EIC	IIC	PA	PET	EVD	ICP	ECP	CCP	PCP	HV	R	LON	LAT	D_{Jup}	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
969	93–001 08:03	1	1	108	7	4	10	9	13	0	1	1	0	0	1	0	0	0	1	3	5.06620	160.6	−15.6	5295.9	49	253	41	14.1	1.9	$5.4\cdot10^{-14}$	10.5
970	93–003 09:06	3	3	108	20	25	11	6	6	6	0	1	43	0	1	0	0	0	1	3	5.06177	160.6	−15.8	5327.6	999	999	999	28.0	1.6	$5.9\cdot10^{-13}$	6.0
971	93–004 10:56	3	2	120	12	20	6	7	6	6	0	1	38	0	1	0	0	0	1	3	5.05968	160.6	−15.8	5342.5	67	259	23	34.1	1.9	$5.2\cdot10^{-14}$	10.5
972	93–005 05:55	3	2	129	10	15	11	6	7	6	0	1	36	0	1	0	0	0	1	3	5.05811	160.6	−15.9	5353.6	80	263	11	43.5	1.9	$8.5\cdot10^{-15}$	10.5
973	93–005 13:43	3	3	249	19	22	11	7	7	6	0	1	41	0	1	0	0	0	1	3	5.05732	160.6	−15.9	5359.2	999	999	999	21.0	1.6	$8.2\cdot10^{-13}$	6.0
974	93–008 15:36	3	2	60	8	13	9	9	9	9	0	1	0	0	1	0	0	0	1	3	5.05073	160.7	−16.1	5405.6	999	999	999	21.0	1.6	$7.2\cdot10^{-14}$	6.0
975	93–012 20:05	0	2	189	9	2	0	9	15	15	1	0	39	30	1	0	0	0	1	3	5.04191	160.7	−16.3	5466.8	168	322	−63	14.1	1.9	$5.8\cdot10^{-14}$	10.5
976	93–012 23:34	0	1	129	7	5	0	7	15	15	1	0	0	0	1	0	0	0	1	3	5.04165	160.7	−16.3	5468.6	999	999	999	34.1	1.9	$2.7\cdot10^{-15}$	10.5
977	93–014 02:40	3	2	157	11	19	5	8	6	8	0	1	37	0	1	0	0	0	1	3	5.03922	160.7	−16.4	5485.3	122	277	−27	21.4	1.9	$1.7\cdot10^{-13}$	10.5
978	93–018 08:39	0	1	15	4	3	0	11	15	15	1	0	9	30	1	0	0	0	1	3	5.02999	160.8	−16.6	5548.0	999	999	999	7.8	1.9	$1.3\cdot10^{-13}$	10.5
979	93–021 13:52	1	2	177	15	20	7	10	5	0	1	1	36	0	1	0	0	0	1	3	5.02285	160.8	−16.8	5595.8	156	304	−55	24.1	2.0	$2.5\cdot10^{-13}$	11.5
980	93–024 09:11	3	2	130	11	14	1	8	11	11	0	1	0	0	1	0	0	0	1	3	5.01647	160.8	−16.9	5638.1	93	265	0	20.8	1.6	$1.4\cdot10^{-13}$	6.0
981	93–026 14:10	3	3	243	19	23	27	6	6	6	0	1	42	0	1	0	0	0	1	3	5.01172	160.9	−17.1	5669.2	999	999	999	28.0	1.6	$3.3\cdot10^{-13}$	6.0
982	93–035 02:33	3	2	243	12	19	6	7	6	6	0	1	38	0	1	0	0	0	1	3	4.99242	161.0	−17.5	5793.4	999	999	999	34.1	1.9	$3.9\cdot10^{-14}$	10.5
983	93–038 01:40	1	1	87	7	2	11	9	15	0	1	1	0	0	1	0	0	0	1	3	4.98549	161.0	−17.7	5837.0	48	244	41	14.1	1.9	$4.2\cdot10^{-14}$	10.5
984	93–040 18:36	0	1	65	1	2	0	15	15	15	1	0	37	30	1	0	0	0	1	3	4.97908	161.0	−17.9	5876.9	21	220	64	11.8	11.8	$2.3\cdot10^{-14}$	5858.3
985	93–041 12:09	1	2	118	9	15	7	8	0	0	1	1	7	24	1	0	0	0	1	3	4.97732	161.0	−17.9	5887.7	95	263	−2	21.4	1.9	$9.9\cdot10^{-14}$	10.5
986	93–044 06:24	3	1	110	6	10	7	8	9	8	0	1	0	0	1	0	0	0	1	3	4.97085	161.1	−18.1	5927.5	88	260	4	25.9	1.6	$1.4\cdot10^{-14}$	6.0
987	93–047 00:51	1	3	113	21	15	25	5	0	5	0	1	45	0	1	0	0	0	1	3	4.96433	161.1	−18.2	5967.2	999	999	999	34.1	1.9	$1.1\cdot10^{-13}$	10.5
988	93–049 13:05	0	2	140	9	14	0	7	8	7	0	0	35	0	1	0	0	0	1	3	4.95836	161.1	−18.4	6003.2	140	285	−41	35.4	1.6	$1.6\cdot10^{-14}$	6.0
989	93–051 08:32	3	2	113	12	20	9	7	7	7	0	1	1	0	1	0	0	0	1	3	4.95415	161.2	−18.5	6028.4	108	266	−14	34.1	1.9	$5.2\cdot10^{-14}$	10.5
990	93–052 03:08	3	3	82	19	24	7	6	7	6	0	1	43	0	1	0	0	0	1	3	4.95204	161.2	−18.5	6041.0	71	251	19	25.9	1.6	$5.0\cdot10^{-13}$	6.0
991	93–052 08:57	3	2	198	14	21	1	8	6	6	0	1	40	0	1	0	0	0	1	3	4.95174	161.2	−18.5	6042.7	999	999	999	21.4	1.9	$4.2\cdot10^{-13}$	10.5
992	93–053 02:21	3	3	186	19	23	11	7	8	6	0	1	41	0	1	0	0	0	1	3	4.94992	161.2	−18.6	6053.5	999	999	999	19.3	1.6	$1.4\cdot10^{-12}$	6.0
993	93–063 13:11	0	1	85	7	7	0	9	15	0	1	0	0	0	1	0	0	0	1	3	4.92411	161.3	−19.2	6203.5	106	262	−12	14.1	1.9	$9.2\cdot10^{-14}$	10.5
994	93–066 23:27	0	1	82	1	6	0	15	7	11	0	0	12	24	1	0	0	0	1	3	4.91565	161.4	−19.4	6251.5	114	265	−19	56.0	2.0	$1.5\cdot10^{-16}$	12.5
995	93–070 08:31	0	2	210	11	20	0	7	5	6	0	0	39	0	1	0	0	0	1	3	4.90711	161.4	−19.6	6299.3	999	999	999	34.1	1.9	$4.4\cdot10^{-14}$	10.5
996	93–070 16:19	3	2	62	12	20	1	7	6	6	0	1	38	0	1	0	0	0	1	3	4.90616	161.4	−19.6	6304.6	96	256	−3	34.1	1.9	$5.2\cdot10^{-14}$	10.5
997	93–071 06:43	0	1	63	4	5	0	14	6	11	0	0	54	1	1	0	0	0	1	3	4.90457	161.4	−19.6	6313.4	98	257	−4	2.0	1.9	$1.9\cdot10^{-11}$	10.5
998	93–073 19:21	3	3	13	22	29	6	9	3	5	0	1	47	0	1	0	0	0	1	3	4.89818	161.4	−19.8	6348.7	32	221	53	7.8	1.9	$9.1\cdot10^{-11}$	10.5
999	93–074 22:26	3	2	75	10	19	8	9	6	7	0	1	36	0	1	0	0	0	1	3	4.89529	161.5	−19.8	6364.5	124	268	−27	14.1	1.9	$6.7\cdot10^{-13}$	10.5
1000	93–077 08:18	3	2	28	11	19	1	7	6	8	0	1	37	0	1	0	0	0	1	3	4.88915	161.5	−20.0	6398.0	62	240	28	34.1	1.9	$3.3\cdot10^{-14}$	10.5
1001	93–078 00:18	3	2	94	14	24	1	8	5	6	0	1	44	0	1	0	0	0	1	3	4.88721	161.5	−20.0	6408.5	155	294	−51	21.4	1.9	$6.7\cdot10^{-13}$	10.5
1002	93–079 18:50	3	3	39	22	27	10	6	5	6	0	1	46	0	1	0	0	0	1	3	4.88266	161.5	−20.1	6433.0	81	248	10	34.6	1.6	$5.9\cdot10^{-13}$	6.0
1003	93–080 08:50	0	1	21	5	15	0	7	0	0	1	0	36	30	1	0	0	0	1	3	4.88135	161.5	−20.2	6440.1	56	236	33	34.1	1.9	$9.9\cdot10^{-15}$	10.5
1004	93–083 14:50	3	2	48	11	15	3	8	9	8	0	1	35	0	1	0	0	0	1	3	4.87283	161.6	−20.4	6485.5	100	254	−6	21.4	1.9	$1.4\cdot10^{-13}$	10.5
1005	93–084 18:01	1	1	250	5	15	2	10	0	0	1	1	12	24	1	0	0	0	1	3	4.86953	161.6	−20.4	6503.0	24	209	59	10.4	1.9	$4.8\cdot10^{-13}$	10.5
1006	93–086 14:07	3	3	57	20	26	8	5	5	6	0	1	46	0	1	0	0	0	1	3	4.86490	161.6	−20.5	6527.4	116	262	−20	43.7	1.6	$1.4\cdot10^{-13}$	6.0
1007	93–086 21:34	3	2	55	12	20	9	7	5	6	0	1	37	0	1	0	0	0	1	3	4.86390	161.6	−20.5	6532.6	114	260	−18	34.1	1.9	$5.2\cdot10^{-14}$	10.5
1008	93–087 21:41	3	2	36	10	19	8	7	6	6	0	1	37	0	1	0	0	0	1	3	4.86124	161.6	−20.6	6546.6	89	249	3	34.1	1.9	$2.9\cdot10^{-14}$	10.5
1009	93–088 00:36	0	2	2	11	15	0	8	0	6	0	0	38	0	1	0	0	0	1	3	4.86091	161.6	−20.6	6548.3	41	224	46	21.4	1.9	$1.4\cdot10^{-13}$	10.5
1010	93–091 13:36	0	1	122	2	3	0	15	5	12	0	0	11	24	1	0	0	0	1	3	4.85154	161.7	−20.8	6597.0	214	26	−45	11.8	11.8	$3.2\cdot10^{-14}$	5858.3
1011	93–095 16:13	3	2	9	10	19	8	9	7	7	0	1	36	0	1	0	0	0	1	3	4.84039	161.7	−21.1	6654.1	999	999	999	14.1	1.9	$6.7\cdot10^{-13}$	10.5
1012	93–096 09:35	1	2	158	10	11	2	11	13	0	1	1	43	12	1	0	0	0	1	3	4.83835	161.7	−21.1	6664.4	999	999	999	7.8	1.9	$1.4\cdot10^{-12}$	10.5
1013	93–097 01:22	1	2	85	10	7	1	10	15	0	1	1	37	31	1	0	0	0	1	3	4.83664	161.8	−21.2	6673.1	167	308	−56	10.4	1.9	$3.1\cdot10^{-13}$	10.5
1014	93–100 02:20	0	1	163	3	6	0	9	10	9	0	0	2	24	1	0	0	0	1	3	4.82843	161.8	−21.3	6714.4	279	61	10	19.3	1.6	$1.3\cdot10^{-14}$	6.0
1015	93–102 05:13	1	2	246	8	5	6	10	15	15	1	1	35	31	1	0	0	0	1	3	4.82257	161.8	−21.5	6743.6	38	219	49	10.4	1.9	$1.6\cdot10^{-13}$	10.5
1016	93–104 10:41	1	1	249	6	6	12	8	14	0	1	1	0	0	1	0	0	0	1	3	4.81633	161.8	−21.6	6774.5	43	223	44	21.4	1.9	$1.4\cdot10^{-14}$	10.5
1017	93–110 03:31	3	2	14	14	21	1	7	5	6	0	1	41	0	1	0	0	0	1	3	4.80023	161.9	−22.0	6853.1	76	240	14	34.1	1.9	$8.3\cdot10^{-14}$	10.5
1018	93–112 11:11	1	1	7	7	7	6	9	15	15	1	1	0	0	1	0	0	0	1	3	4.79386	162.0	−22.1	6883.7	999	999	999	14.1	1.9	$9.2\cdot10^{-14}$	10.5
1019	93–115 12:43	3	2	15	13	21	7	7	5	6	0	1	39	0	1	0	0	0	1	3	4.78496	162.0	−22.3	6926.1	81	241	10	34.1	1.9	$7.1\cdot10^{-14}$	10.5
1020	93–117 17:30	3	2	11	14	22	11	8	8	6	0	1	41	0	1	0	0	0	1	3	4.77887	162.0	−22.4	6954.9	76	239	15	21.4	1.9	$5.0\cdot10^{-13}$	10.5
1021	93–118 07:41	0	1	175	6	4	0	7	15	15	1	0	33	31	1	0	0	0	1	3	4.77707	162.0	−22.5	6963.4	308	72	36	34.1	1.9	$1.9\cdot10^{-15}$	10.5
1022	93–119 12:55	3	4	23	27	49	28	8	7	5	0	1	47	0	1	0	0	0	1	3	4.77347	162.1	−22.5	6980.2	94	246	−1	10.4	1.9	$1.9\cdot10^{-10}$	10.5
1023	93–122 04:32	0	1	64	7	9	0	10	15	0	1	0	55	31	1	0	0	0	1	3	4.76586	162.1	−22.7	7015.6	153	284	−49	4.9	1.7	$2.6\cdot10^{-12}$	7.7
1024	93–122 07:37	2	2	212	12	20	1	7	5	6	0	1	39	0	1	0	0	0	1	3	4.76550	162.1	−22.7	7017.3	1	153	70	34.1	1.9	$5.2\cdot10^{-14}$	10.5
1025	93–131 12:23	3	1	121	2	5	1	9	9	10	0	1	0	0	1	0	0	0	1	3	4.73830	162.2	−23.3	7141.2	237	39	−26	31.3	2.0	$1.6\cdot10^{-15}$	12.5
1026	93–145 21:41	1	2	66	10	6	9	10	15	0	1	1	0	0	1	0	0	0	1	3	4.69480	162.4	−24.2	7331.4	165	301	−56	10.4	1.9	$2.6\cdot10^{-13}$	10.5
1027	93–154 21:05	3	3	135	19	25	10	8	5	6	0	1	45	0	1	0	0	0	1	3	4.66679	162.6	−24.8	7448.9	267	53	0	24.1	2.0	$7.5\cdot10^{-13}$	11.5
1028	93–155 20:43	0	1	175	1	3	0	15	15	12	0	0	3	24	1	0	0	0	1	3	4.66404	162.6	−24.8	7460.3	323	82	50	11.8	11.8	$2.6\cdot10^{-14}$	5858.3
1029	93–158 20:55	1	1	23	2	0	5	15	0	0	0	1	0	0	1	0	0	0	1	3	4.65455	162.6	−25.0	7499.1	110	253	−15	11.8	11.8	$5.8\cdot10^{-14}$	5858.3
1030	93–160 04:10	1	1	228	1	2	1	15	15	0	1	1	10	31	1	0	0	0	1	3	4.65019	162.7	−25.1	7516.9	39	219	48	11.8	11.8	$2.3\cdot10^{-14}$	5858.3

1031	93–162 17:15	3	3	240	21	26	12	5	5	5	0	1	45	0	1	0	0	0	1	3	4.64221	162.7	−25.3	7549.2	57	230	32	43.7	1.6	$1.6\cdot10^{-13}$	6.0
1032	93–163 15:09	0	1	72	3	6	0	14	15	0	1	0	17	30	1	0	0	0	1	3	4.63900	162.7	−25.4	7562.0	181	333	−60	2.1	1.6	$1.4\cdot10^{-11}$	6.0
1033	93–171 19:01	3	3	17	19	23	6	6	7	6	0	1	42	0	1	0	0	0	1	3	4.61268	162.8	−25.9	7666.0	107	252	−12	25.9	1.6	$4.3\cdot10^{-13}$	6.0
1034	93–176 22:59	3	2	38	14	21	11	8	6	6	0	1	40	0	1	0	0	0	1	3	4.59583	162.9	−26.2	7731.1	139	271	−40	21.4	1.9	$4.2\cdot10^{-13}$	10.5
1035	93–193 10:41	3	2	229	15	22	7	7	7	6	0	1	40	0	1	0	0	0	1	3	4.54024	163.2	−27.4	7937.8	56	233	33	34.1	1.9	$1.1\cdot10^{-13}$	10.5
1036	93–197 08:49	1	2	44	14	7	13	10	15	0	1	1	38	31	1	0	0	0	1	3	4.52689	163.3	−27.6	7985.7	158	294	−53	10.4	1.9	$5.8\cdot10^{-13}$	10.5
1037	93–203 00:22	3	3	252	19	23	9	6	6	6	0	1	43	0	1	0	0	0	1	3	4.50686	163.3	−28.0	8056.3	94	251	−1	28.0	1.6	$3.3\cdot10^{-13}$	6.0
1038	93–213 20:04	3	3	18	20	25	7	5	6	6	0	1	44	0	1	0	0	0	1	3	4.46874	163.5	−28.8	8186.9	135	274	−36	35.4	1.6	$2.8\cdot10^{-13}$	6.0
1039	93–215 18:32	1	2	203	14	21	6	7	15	0	1	1	23	31	1	0	0	0	1	3	4.46155	163.6	−28.9	8211.0	36	223	51	34.1	1.9	$8.3\cdot10^{-14}$	10.5
1040	93–217 16:28	0	1	199	4	8	0	8	8	8	0	0	3	24	1	0	0	0	1	3	4.45478	163.6	−29.0	8233.5	33	221	53	28.0	1.6	$5.2\cdot10^{-15}$	6.0
1041	93–217 16:49	3	3	214	20	26	10	5	5	5	0	1	46	0	1	0	0	0	1	3	4.45478	163.6	−29.0	8233.5	54	236	35	43.7	1.6	$1.4\cdot10^{-13}$	6.0
1042	93–227 01:34	0	1	31	6	6	0	12	15	0	1	0	15	30	1	0	0	0	1	3	4.42053	163.8	−29.7	8345.2	167	314	−57	5.0	1.9	$1.2\cdot10^{-12}$	10.5
1043	93–227 08:50	3	2	190	10	19	3	8	5	7	0	1	39	0	1	0	0	0	1	3	4.41961	163.8	−29.7	8348.2	31	221	55	21.4	1.9	$1.5\cdot10^{-13}$	10.5
1044	93–233 08:37	3	3	241	19	24	11	5	5	5	0	1	43	0	1	0	0	0	1	3	4.39732	163.9	−30.2	8418.9	113	266	−17	43.7	1.6	$7.3\cdot10^{-14}$	6.0
1045	93–233 13:27	2	2	247	14	21	5	8	6	6	0	1	40	0	1	0	0	0	1	3	4.39639	163.9	−30.2	8421.8	121	270	−25	21.4	1.9	$4.2\cdot10^{-13}$	10.5
1046	93–233 14:05	3	2	212	14	21	11	7	6	6	0	1	40	0	1	0	0	0	1	3	4.39639	163.9	−30.2	8421.8	72	248	18	34.1	1.9	$8.3\cdot10^{-14}$	10.5
1047	93–233 20:04	3	3	211	19	23	11	7	7	6	0	1	42	0	1	0	0	0	1	3	4.39545	163.9	−30.2	8424.7	71	247	19	21.0	1.6	$9.6\cdot10^{-13}$	6.0
1048	93–237 12:44	0	1	252	4	3	0	8	15	15	1	0	20	30	1	0	0	0	1	3	4.38136	164.0	−30.5	8468.6	133	278	−34	21.4	1.9	$6.1\cdot10^{-15}$	10.5
1049	93–248 02:48	3	1	213	7	11	18	7	8	7	0	1	0	0	1	0	0	0	1	3	4.34132	164.2	−31.3	8589.9	95	260	−1	35.4	1.6	$6.9\cdot10^{-15}$	6.0
1050	93–248 14:18	0	1	61	4	7	0	7	7	8	0	0	7	24	1	0	0	0	1	3	4.33939	164.2	−31.3	8595.7	241	56	−22	43.7	1.6	$8.4\cdot10^{-16}$	6.0
1051	93–256 08:54	0	2	160	10	23	0	10	4	8	0	0	44	0	1	0	0	0	1	3	4.30924	164.3	−31.9	8684.0	38	232	48	10.4	1.9	$2.9\cdot10^{-12}$	10.5
1052	93–258 00:01	1	2	158	8	1	8	9	13	0	1	1	6	24	1	0	0	0	1	3	4.30237	164.4	−32.0	8703.7	38	233	48	14.1	1.9	$4.2\cdot10^{-14}$	10.5
1053	93–263 21:54	3	2	150	8	12	5	8	9	8	0	1	0	0	1	0	0	0	1	3	4.27911	164.5	−32.5	8769.7	36	232	49	25.9	1.6	$2.7\cdot10^{-14}$	6.0
1054	93–267 18:55	3	2	185	13	20	6	9	12	8	0	1	38	0	1	0	0	0	1	3	4.26362	164.6	−32.8	8812.9	89	262	3	14.1	1.9	$1.4\cdot10^{-12}$	10.5
1055	93–272 08:20	0	1	40	5	8	0	8	8	8	0	0	0	0	1	0	0	0	1	3	4.24547	164.7	−33.1	8862.7	250	65	−14	28.0	1.6	$6.2\cdot10^{-15}$	6.0
1056	93–272 12:41	0	1	166	2	3	0	15	15	0	1	0	42	30	1	0	0	0	1	3	4.24446	164.7	−33.1	8865.5	67	253	23	11.8	11.8	$3.2\cdot10^{-14}$	5858.3
1057	93–272 18:08	3	2	184	13	20	11	9	12	9	0	1	38	0	1	0	0	0	1	3	4.24345	164.7	−33.1	8868.2	92	265	0	14.1	1.9	$1.4\cdot10^{-12}$	10.5
1058	93–275 13:58	1	2	225	14	10	5	7	15	0	1	1	60	31	1	0	0	0	1	3	4.23227	164.7	−33.4	8898.5	155	309	−48	34.1	1.9	$2.1\cdot10^{-14}$	10.5
1059	93–278 13:17	2	2	162	14	22	4	8	4	6	0	1	40	0	1	0	0	0	1	3	4.22000	164.8	−33.6	8931.3	68	255	22	21.4	1.9	$5.0\cdot10^{-13}$	10.5
1060	93–281 01:19	3	3	167	19	25	23	6	6	6	0	1	44	0	1	0	0	0	1	3	4.20972	164.9	−33.6	8958.5	79	261	12	28.0	1.6	$4.4\cdot10^{-13}$	6.0
1061	93–283 02:02	0	2	209	8	5	0	7	15	0	1	0	57	30	1	0	0	0	1	3	4.20147	164.9	−34.0	8980.2	140	296	−38	34.1	1.9	$3.3\cdot10^{-15}$	10.5
1062	93–286 09:31	0	1	186	6	5	0	10	15	0	1	0	38	31	1	0	0	0	1	3	4.18745	165.0	−34.2	9016.6	110	277	−13	10.4	1.9	$1.1\cdot10^{-13}$	10.5
1063	93–289 02:17	3	5	254	49	49	28	15	5	6	0	1	63	0	1	0	0	0	1	3	4.17649	165.0	−34.4	9044.8	207	35	−46	11.8	11.8	$3.4\cdot10^{-10}$	5858.3
1064	93–289 15:05	1	1	109	6	1	1	10	15	0	1	1	10	31	1	0	0	0	1	3	4.17387	165.1	−34.5	9051.5	3	180	66	10.4	1.9	$6.0\cdot10^{-14}$	10.5
1065	93–291 06:05	1	2	198	8	2	2	10	15	0	1	1	38	31	1	0	0	0	1	3	4.16705	165.1	−34.6	9068.8	129	290	−30	10.4	1.9	$1.0\cdot10^{-13}$	10.5
1066	93–296 21:08	3	3	140	20	25	10	5	6	6	0	1	44	0	1	0	0	0	1	3	4.14326	165.2	−35.1	9128.5	54	250	34	35.4	1.6	$2.8\cdot10^{-13}$	6.0
1067	93–299 20:05	3	4	156	24	30	18	6	4	5	0	1	47	0	1	0	0	0	1	3	4.13100	165.3	−35.3	9158.8	78	264	13	38.7	1.6	$8.4\cdot10^{-13}$	6.0
1068	93–301 02:49	3	2	98	12	20	2	7	6	6	0	1	38	0	1	0	0	0	1	3	4.12565	165.3	−35.4	9171.9	355	165	64	34.1	1.9	$5.2\cdot10^{-14}$	10.5
1069	93–303 11:39	3	3	155	19	22	1	7	6	6	0	1	42	0	1	0	0	0	1	3	4.11544	165.4	−35.6	9196.8	78	264	13	22.7	1.6	$5.8\cdot10^{-13}$	6.0
1070	93–306 21:56	0	1	145	2	1	0	15	15	0	1	0	8	31	1	0	0	0	1	3	4.10032	165.5	−35.9	9233.2	66	259	23	11.8	11.8	$2.4\cdot10^{-14}$	5858.3
1071	93–311 21:54	3	3	170	23	29	17	6	5	5	0	1	47	0	1	0	0	0	1	3	4.07853	165.6	−36.3	9284.7	104	280	−8	34.6	1.6	$9.8\cdot10^{-13}$	6.0
1072	93–314 14:57	0	1	55	4	3	0	6	14	0	1	0	27	31	1	0	0	0	1	3	4.06701	165.7	−36.5	9311.6	303	103	30	43.5	1.9	$4.4\cdot10^{-16}$	10.5
1073	93–315 01:15	0	1	200	4	8	0	8	8	8	0	0	5	31	1	0	0	0	1	3	4.06481	165.7	−36.6	9316.7	147	312	−40	28.0	1.6	$5.2\cdot10^{-15}$	6.0
1074	93–319 15:34	3	2	142	14	22	1	7	5	6	0	1	42	0	1	0	0	0	1	3	4.04434	165.8	−37.0	9363.7	67	261	22	34.1	1.9	$9.7\cdot10^{-14}$	10.5
1075	93–319 17:36	3	2	156	14	22	14	7	6	6	0	1	41	0	1	0	0	0	1	3	4.04434	165.8	−37.0	9363.7	87	272	5	34.1	1.9	$9.7\cdot10^{-14}$	10.5
1076	93–320 03:49	0	1	79	2	6	0	15	7	9	0	0	8	31	1	0	0	0	1	3	4.04212	165.8	−37.0	9368.8	341	144	56	56.0	2.0	$1.8\cdot10^{-16}$	12.5
1077	93–321 11:24	3	2	79	8	13	1	7	7	6	0	1	0	0	1	0	0	0	1	3	4.03656	165.8	−37.1	9381.4	340	143	56	43.7	1.6	$4.7\cdot10^{-15}$	6.0
1078	93–323 09:14	0	1	120	7	2	0	8	15	0	1	0	0	0	1	0	0	0	1	3	4.02762	165.9	−37.3	9401.5	39	241	43	21.4	1.9	$9.1\cdot10^{-15}$	15.0
1079	93–323 18:53	1	2	155	9	3	12	9	15	0	1	1	0	0	1	0	0	0	1	3	4.02594	165.9	−37.3	9405.2	88	274	4	14.1	1.9	$6.6\cdot10^{-14}$	10.5
1080	93–324 03:31	0	1	105	5	3	0	12	15	0	1	0	41	30	1	0	0	0	1	3	4.02426	165.9	−37.4	9409.0	18	215	57	5.0	1.9	$6.1\cdot10^{-13}$	10.5
1081	93–325 08:32	3	3	179	19	24	2	5	5	6	0	1	44	0	1	0	0	0	1	3	4.01921	165.9	−37.5	9420.3	123	296	−23	43.7	1.6	$7.3\cdot10^{-14}$	6.0
1082	93–325 19:17	1	4	180	28	31	18	7	5	3	1	1	47	0	1	0	0	0	1	3	4.01697	166.0	−37.5	9425.2	125	297	−24	28.1	1.6	$5.4\cdot10^{-12}$	6.0
1083	93–326 15:21	0	1	66	5	1	0	7	15	0	1	0	0	0	1	0	0	0	1	3	4.01303	166.0	−37.6	9434.0	324	124	46	34.1	1.9	$1.1\cdot10^{-15}$	10.5
1084	93–343 03:13	0	2	83	8	13	0	7	7	6	0	0	35	0	1	0	0	0	1	3	3.93755	166.4	−39.0	9595.7	356	176	57	43.7	1.6	$4.7\cdot10^{-15}$	6.0
1085	93–344 14:09	0	1	151	1	11	0	15	9	15	1	0	9	31	1	0	0	0	1	3	3.93115	166.5	−39.2	9608.9	93	281	0	11.8	11.8	$1.0\cdot10^{-13}$	5858.3
1086	93–345 15:17	3	4	176	24	29	25	9	9	6	0	1	47	0	1	0	0	0	1	3	3.92591	166.5	−39.3	9619.7	128	304	−24	12.6	1.6	$3.7\cdot10^{-11}$	6.0
1087	93–345 18:07	3	3	159	22	29	12	9	5	5	0	1	47	0	1	0	0	0	1	3	3.92533	166.5	−39.3	9620.9	104	287	−7	7.8	1.9	$9.1\cdot10^{-11}$	10.5
1088	93–347 07:50	3	3	129	20	25	28	5	5	5	0	1	43	0	1	0	0	0	1	3	3.91831	166.6	−39.4	9635.2	63	261	24	43.7	1.6	$1.1\cdot10^{-13}$	6.0
1089	93–349 02:45	3	3	126	21	27	11	5	5	6	0	1	46	0	1	0	0	0	1	3	3.91011	166.6	−39.6	9651.9	60	259	26	43.7	1.6	$1.9\cdot10^{-13}$	6.0
1090	93–363 14:05	1	1	178	6	2	4	11	15	0	1	1	37	31	1	0	0	0	1	3	3.84108	167.1	−40.9	9787.6	141	320	−30	7.8	1.9	$1.5\cdot10^{-13}$	10.5
1091	93–364 16:19	3	3	147	19	23	26	6	6	6	0	1	42	0	1	0	0	0	1	3	3.83564	167.1	−41.0	9797.9	100	287	−3	28.0	1.6	$3.3\cdot10^{-13}$	6.0
1092	94–005 20:40	3	3	143	23	29	14	7	5	5	0	1	47	0	1	0	0	0	1	3	3.80587	167.3	−41.6	9853.7	97	286	0	28.1	1.6	$1.9\cdot10^{-12}$	6.0
1093	94–005 20:55	0	1	160	1	10	0	15	9	15	1	0	43	26	1	0	0	0	1	3	3.80587	167.3	−41.6	9853.7	121	303	−16	11.8	11.8	$8.6\cdot10^{-14}$	5858.3
1094	94–008 16:32	3	2	119	14	22	13	9	9	6	0	1	40	0	1	0	0	0	1	3	3.79177	167.4	−41.9	9879.6	64	262	21	14.1	1.9	$2.3\cdot10^{-12}$	10.5
1095	94–010 03:52	3	3	120	19	23	11	6	7	6	0	1	41	0	1	0	0	0	1	3	3.78439	167.5	−42.1	9893.1	67	264	19	25.9	1.6	$4.3\cdot10^{-13}$	6.0
1096	94–016 19:49	0	1	158	6	3	0	8	14	0	1	0	0	0	1	0	0	0	1	3	3.75154	167.7	−42.7	9951.9	127	310	−19	21.4	1.9	$8.5\cdot10^{-15}$	10.5
1097	94–019 18:56	0	1	117	5	10	0	7	8	7	0	0	4	24	1	0	0	0	1	3	3.73654	167.8	−43.0	9978.2	71	266	16	35.4	1.6	$4.1\cdot10^{-15}$	6.0
1098	94–019 20:49	3	4	106	27	31	23	7	6	5	0	1	47	0	1	0	0	0	1	3	3.73654	167.8	−43.0	9978.2	56	253	26	22.7	1.6	$9.8\cdot10^{-12}$	6.0

continued

Table 3—*continued*

No.	IMP. DATE	CLN	AR	SEC	IA	EA	CA	IT	ET	EIT	EIC	IIC	PA	PET	EVD	ICP	ECP	CCP	PCP	HV	R	LON	LAT	D_{Jup}	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
1099	94–020 14:01	3	1	170	6	9	5	7	8	7	0	1	0	0	1	0	0	0	1	3	3.73278	167.8	−43.1	9984.8	145	327	−27	35.4	1.6	$4.1\cdot10^{-15}$	6.0
1100	94–021 10:20	0	1	100	2	1	0	12	15	0	1	0	17	31	1	0	0	0	1	3	3.72838	167.9	−43.2	9992.4	51	249	28	11.8	11.8	$2.4\cdot10^{-14}$	5858.3
1101	94–023 13:27	0	1	139	1	10	0	15	9	15	1	0	43	22	1	0	0	0	1	3	3.71767	167.9	−43.4	10010.8	106	292	−5	11.8	11.8	$8.6\cdot10^{-14}$	5858.3
1102	94–024 06:21	3	2	124	15	22	19	7	6	6	0	1	41	0	1	0	0	0	1	3	3.71388	168.0	−43.5	10017.3	84	276	8	34.1	1.9	$1.1\cdot10^{-13}$	10.5
1103	94–029 00:21	0	1	155	4	8	0	8	7	8	0	0	0	0	1	0	0	0	1	3	3.68977	168.1	−43.9	10058.1	136	318	−21	34.6	1.6	$2.7\cdot10^{-15}$	6.0
1104	94–035 11:15	3	3	102	20	25	11	6	6	5	0	1	44	0	1	0	0	0	1	3	3.65708	168.4	−44.6	10112.1	70	261	16	28.0	1.6	$5.9\cdot10^{-13}$	6.0
1105	94–036 00:01	3	3	137	22	24	19	11	12	10	0	1	47	0	1	0	0	0	1	3	3.65386	168.4	−44.7	10117.3	119	302	−11	2.8	1.6	$1.0\cdot10^{-09}$	6.0
1106	94–036 04:45	3	3	139	19	24	1	5	5	6	0	1	44	0	1	0	0	0	1	3	3.65321	168.4	−44.7	10118.4	122	304	−13	43.7	1.6	$7.3\cdot10^{-14}$	6.0
1107	94–037 05:32	0	1	213	2	6	0	9	9	10	0	0	0	0	1	0	0	0	1	3	3.64804	168.4	−44.8	10126.7	226	54	−19	31.3	2.0	$1.9\cdot10^{-15}$	12.5
1108	94–040 03:11	3	3	103	20	25	9	5	5	6	0	1	45	0	1	0	0	0	1	3	3.63248	168.6	−45.1	10151.7	76	265	12	43.7	1.6	$1.1\cdot10^{-13}$	6.0
1109	94–041 22:30	1	2	128	12	10	1	8	15	15	1	1	10	31	1	0	0	0	1	3	3.62337	168.7	−45.3	10166.2	116	298	−9	21.4	1.9	$7.6\cdot10^{-14}$	10.5
1110	94–057 03:32	0	1	212	4	8	0	7	8	8	0	0	0	0	1	0	0	0	1	3	3.54275	169.3	−46.9	10289.3	256	73	−2	35.4	1.6	$2.4\cdot10^{-15}$	6.0
1111	94–064 04:07	3	3	108	20	25	17	7	8	6	0	1	44	0	1	0	0	0	1	3	3.50502	169.7	−47.7	10344.0	122	295	−9	19.3	1.6	$2.5\cdot10^{-12}$	6.0
1112	94–069 17:45	0	1	39	4	8	0	8	8	8	0	0	0	0	1	0	0	0	1	3	3.47505	169.9	−48.3	10386.2	32	208	28	28.0	1.6	$5.2\cdot10^{-15}$	6.0
1113	94–073 23:07	3	3	100	23	29	12	6	4	5	0	1	47	0	1	0	0	0	1	3	3.45170	170.2	−48.8	10418.3	130	296	−11	38.7	1.6	$6.2\cdot10^{-13}$	6.0
1114	94–080 10:04	0	1	141	3	6	0	8	8	8	0	0	0	0	1	0	0	0	1	3	3.41566	170.5	−49.6	10466.7	201	4	−18	28.0	1.6	$3.1\cdot10^{-15}$	6.0
1115	94–083 03:03	0	1	144	1	13	0	15	15	15	1	0	42	31	1	0	0	0	1	3	3.40029	170.7	−49.9	10486.8	206	9	−17	11.8	11.8	$1.4\cdot10^{-13}$	5858.3
1116	94–083 13:58	1	3	52	19	21	12	11	14	0	1	1	12	31	1	0	0	0	1	3	3.39819	170.7	−50.0	10489.5	82	244	8	2.8	1.6	$3.5\cdot10^{-10}$	6.0
1117	94–083 23:02	3	1	89	5	9	12	7	7	7	0	1	0	0	1	0	0	0	1	3	3.39609	170.7	−50.0	10492.3	134	292	−11	43.7	1.6	$1.4\cdot10^{-15}$	6.0
1118	94–085 18:43	0	1	26	6	11	0	8	7	7	0	0	0	0	1	0	0	0	1	3	3.38556	170.8	−50.2	10505.9	46	209	22	34.6	1.6	$6.2\cdot10^{-15}$	6.0
1119	94–085 18:46	0	1	78	4	5	0	9	15	0	1	0	42	31	1	0	0	0	1	3	3.38556	170.8	−50.2	10505.9	119	278	−6	14.1	1.9	$3.8\cdot10^{-14}$	10.5
1120	94–087 16:23	0	1	132	4	8	0	8	8	8	0	0	0	0	1	0	0	0	1	3	3.37499	170.9	−50.5	10519.4	201	358	−18	28.0	1.6	$5.2\cdot10^{-15}$	6.0
1121	94–088 19:11	1	2	78	14	10	17	10	15	0	1	1	38	31	1	0	0	0	1	3	3.36863	171.0	−50.6	10527.5	125	281	−8	10.4	1.9	$10.0\cdot10^{-13}$	10.5
1122	94–093 21:33	0	1	93	4	8	0	8	8	8	0	0	7	31	1	0	0	0	1	3	3.33953	171.3	−51.2	10563.8	152	305	−16	28.0	1.6	$5.2\cdot10^{-15}$	6.0
1123	94–095 19:27	1	3	21	20	12	15	7	15	0	1	1	44	31	1	0	0	0	1	3	3.32882	171.4	−51.5	10577.0	57	213	18	14.1	1.9	$1.4\cdot10^{-12}$	10.5
1124	94–102 19:30	0	1	13	3	3	0	13	15	0	1	0	13	30	1	0	0	0	1	3	3.28854	171.9	−52.3	10625.4	57	209	18	2.5	1.9	$4.6\cdot10^{-12}$	10.5
1125	94–105 01:02	3	3	13	21	27	3	7	5	6	0	1	46	0	1	0	0	0	1	3	3.27550	172.0	−52.6	10640.7	61	211	17	28.1	1.6	$9.7\cdot10^{-13}$	6.0
1126	94–105 03:19	0	1	107	3	7	0	9	8	9	0	0	0	0	1	0	0	0	1	3	3.27477	172.0	−52.6	10641.5	193	340	−19	22.7	1.6	$7.8\cdot10^{-15}$	6.0
1127	94–105 14:57	0	2	195	8	3	0	7	15	0	1	0	13	25	1	0	0	0	1	3	3.27259	172.1	−52.7	10644.0	317	98	23	34.1	1.9	$2.4\cdot10^{-15}$	10.5
1128	94–106 22:57	2	3	50	21	27	25	7	5	5	0	1	47	0	1	0	0	0	1	3	3.26459	172.2	−52.9	10653.3	113	259	−4	28.1	1.6	$9.7\cdot10^{-13}$	6.0
1129	94–107 16:25	0	1	74	3	1	0	8	15	0	1	0	14	31	1	0	0	0	1	3	3.26002	172.2	−53.0	10658.3	147	292	−16	21.4	1.9	$3.9\cdot10^{-15}$	10.5
1130	94–111 12:06	0	1	234	2	6	0	9	9	10	0	0	0	0	1	0	0	0	1	3	3.23754	172.5	−53.5	10684.2	21	167	30	31.3	2.0	$1.9\cdot10^{-15}$	12.5
1131	94–114 13:38	0	1	128	4	6	0	9	15	0	1	0	42	31	1	0	0	0	1	3	3.21989	172.7	−53.9	10703.9	233	17	−10	5.7	2.1	$5.5\cdot10^{-13}$	15.7
1132	94–118 01:22	1	3	61	19	22	11	8	13	0	1	1	11	31	1	0	0	0	1	3	3.19918	173.0	−54.3	10726.6	144	284	−16	5.8	1.6	$4.1\cdot10^{-11}$	6.0
1133	94–120 10:01	3	5	88	54	52	30	13	5	5	0	1	3	0	1	0	0	0	1	3	3.18506	173.2	−54.6	10741.9	185	326	−21	2.0	1.9	$4.2\cdot10^{-07}$	10.5
1134	94–124 00:09	0	1	184	6	11	0	7	7	7	0	0	7	31	1	0	0	0	1	3	3.16341	173.5	−55.1	10765.0	324	98	27	43.7	1.6	$2.3\cdot10^{-15}$	6.0
1135	94–134 19:59	3	3	126	20	25	1	7	6	6	0	1	46	0	1	0	0	0	1	3	3.09847	174.4	−56.6	10831.4	253	31	−3	22.7	1.6	$1.2\cdot10^{-12}$	6.0
1136	94–136 02:05	0	1	9	6	4	0	9	15	0	1	0	17	30	1	0	0	0	1	3	3.09085	174.5	−56.8	10838.9	89	230	5	14.1	1.9	$4.5\cdot10^{-14}$	10.5
1137	94–139 05:49	0	2	210	9	14	0	8	7	7	0	0	36	0	1	0	0	0	1	3	3.07173	174.8	−57.2	10857.6	13	154	34	34.6	1.6	$1.7\cdot10^{-14}$	6.0
1138	94–144 14:15	0	2	18	13	21	0	7	6	6	0	0	40	0	1	0	0	0	1	3	3.03863	175.4	−58.0	10889.2	109	246	−4	34.1	1.9	$7.1\cdot10^{-14}$	10.5
1139	94–145 10:38	1	2	8	9	5	8	10	15	0	1	1	43	31	1	0	0	0	1	3	3.03322	175.5	−58.1	10894.3	95	235	2	10.4	1.9	$1.8\cdot10^{-13}$	10.5
1140	94–149 19:51	3	3	20	21	27	1	7	5	6	0	1	47	0	1	0	0	0	1	3	3.00603	176.0	−58.8	10919.4	116	253	−8	28.1	1.6	$9.7\cdot10^{-13}$	6.0
1141	94–151 19:17	3	3	228	19	24	4	6	6	6	0	1	43	0	1	0	0	0	1	3	2.99355	176.2	−59.1	10930.7	50	195	24	28.0	1.6	$3.8\cdot10^{-13}$	6.0
1142	94–155 19:42	0	1	243	3	7	0	9	8	8	0	0	0	0	1	0	0	0	1	3	2.96847	176.7	−59.7	10953.0	73	216	13	22.7	1.6	$7.8\cdot10^{-15}$	6.0
1143	94–157 08:49	0	1	34	3	6	0	13	15	0	1	0	21	30	1	0	0	0	1	3	2.95902	176.8	−59.9	10961.3	140	275	−18	2.4	1.6	$8.8\cdot10^{-12}$	6.0
1144	94–161 23:58	2	2	106	13	22	1	8	5	6	0	1	41	0	1	0	0	0	1	3	2.92977	177.4	−60.6	10986.4	245	26	−8	21.4	1.9	$4.2\cdot10^{-13}$	10.5
1145	94–166 14:38	0	2	180	11	20	0	8	5	6	0	0	39	0	1	0	0	0	1	3	2.90032	178.1	−61.4	11011.1	352	129	37	21.4	1.9	$2.2\cdot10^{-13}$	10.5
1146	94–169 13:31	0	1	217	3	6	0	11	15	15	1	0	6	30	1	0	0	0	1	3	2.88111	178.5	−61.8	11026.8	47	196	26	4.2	1.6	$1.2\cdot10^{-12}$	6.0
1147	94–170 15:59	0	1	80	5	9	0	7	7	7	0	0	0	0	1	0	0	0	1	3	2.87389	178.7	−62.0	11032.6	215	359	−21	43.7	1.6	$1.4\cdot10^{-15}$	6.0
1148	94–175 03:30	3	3	14	19	23	5	6	6	6	0	1	43	0	1	0	0	0	1	3	2.84488	179.4	−62.7	11055.6	126	267	−14	28.0	1.6	$3.3\cdot10^{-13}$	6.0
1149	94–176 09:34	1	2	25	13	1	1	5	14	15	1	1	40	16	1	0	0	0	1	3	2.83679	179.6	−62.9	11061.9	142	283	−21	70.0	1.9	$2.1\cdot10^{-16}$	10.5
1150	94–177 05:28	2	3	8	23	30	10	8	5	5	0	1	47	0	1	0	0	0	1	3	2.83193	179.7	−63.1	11065.7	119	261	−10	10.4	1.9	$5.8\cdot10^{-11}$	10.5
1151	94–178 07:10	0	1	54	4	4	0	7	15	12	0	0	5	24	1	0	0	0	1	3	2.82463	179.9	−63.3	11071.3	184	328	−28	34.1	1.9	$1.4\cdot10^{-15}$	10.5
1152	94–178 15:19	3	2	182	8	13	18	6	7	6	0	1	0	0	1	0	0	0	1	3	2.82219	179.9	−63.3	11073.1	4	149	39	49.4	1.6	$2.8\cdot10^{-15}$	6.0
1153	94–179 11:06	0	1	118	4	8	0	7	8	8	0	0	4	24	1	0	0	0	1	3	2.81732	180.1	−63.4	11076.9	274	54	7	35.4	1.6	$2.4\cdot10^{-15}$	6.0
1154	94–180 01:46	0	2	127	10	19	0	7	5	6	0	0	37	0	1	0	0	0	1	3	2.81325	180.2	−63.5	11080.0	287	65	14	34.1	1.9	$2.9\cdot10^{-14}$	10.5
1155	94–181 11:02	0	1	71	1	4	0	15	9	11	0	0	0	0	1	0	0	0	1	3	2.80429	180.4	−63.8	11086.7	209	356	−24	11.8	11.8	$3.0\cdot10^{-14}$	5858.3
1156	94–182 09:04	3	1	112	7	12	5	7	7	6	0	1	7	31	1	0	0	0	1	3	2.79776	180.6	−63.9	11091.6	267	49	3	43.7	1.6	$3.3\cdot10^{-15}$	6.0
1157	94–183 06:06	0	1	29	3	6	0	14	15	0	1	0	43	31	1	0	0	0	1	3	2.79205	180.8	−64.1	11095.9	151	292	−24	2.1	1.6	$1.4\cdot10^{-11}$	6.0
1158	94–184 14:18	0	1	250	2	5	0	15	9	10	0	0	0	0	1	0	0	0	1	3	2.78386	181.0	−64.3	11101.9	103	248	−2	31.3	2.0	$1.6\cdot10^{-15}$	12.5
1159	94–184 15:06	1	1	207	6	5	7	11	15	0	1	1	44	30	1	0	0	0	1	3	2.78305	181.0	−64.3	11102.5	42	195	29	7.8	1.9	$2.4\cdot10^{-13}$	10.5
1160	94–185 02:03	0	1	197	3	7	0	8	8	8	0	0	14	24	1	0	0	0	1	3	2.78059	181.1	−64.4	11104.3	28	180	34	28.0	1.6	$3.7\cdot10^{-15}$	6.0
1161	94–188 17:00	1	2	221	11	10	8	11	15	15	1	1	20	31	1	0	0	0	1	3	2.75677	181.8	−65.0	11121.6	64	215	19	7.8	1.9	$1.3\cdot10^{-12}$	10.5
1162	94–190 02:55	0	1	21	4	8	0	8	8	8	0	0	0	0	1	0	0	0	1	3	2.74771	182.1	−65.2	11128.1	144	287	−22	28.0	1.6	$5.2\cdot10^{-15}$	6.0
1163	94–194 13:53	3	3	245	23	29	5	6	4	5	0	1	47	0	1	0	0	0	1	3	2.71793	183.0	−66.0	11149.0	102	253	−2	38.7	1.6	$6.2\cdot10^{-13}$	6.0
1164	94–195 03:00	0	1	15	7	8	0	10	15	0	1	0	4	31	1	0	0	0	1	3	2.71378	183.2	−66.1	11153.8	139	285	−20	10.4	1.9	$2.3\cdot10^{-13}$	10.5

1165	94–195 09:05	0	2	163	10	5	0	7	15	0	1	0	36	30	1	0	0	0	1	3	2.71212	183.2	−66.1	11153.0	347	134	39	34.1	1.9	$4.5\cdot10^{-15}$	10.5
1166	94–195 13:34	1	2	233	10	8	10	9	15	15	1	1	0	0	1	0	0	0	1	3	2.71129	183.3	−66.2	11153.5	86	239	6	14.1	1.9	$1.8\cdot10^{-13}$	10.5
1167	94–198 10:17	1	2	214	8	8	8	10	15	0	1	1	1	31	1	0	0	0	1	3	2.69216	183.9	−66.7	11166.5	60	217	21	10.4	1.9	$2.7\cdot10^{-13}$	10.5
1168	94–199 10:06	0	1	192	5	9	0	9	8	8	0	0	0	0	1	0	0	0	1	3	2.68548	184.2	−66.8	11171.0	30	186	34	22.7	1.6	$1.5\cdot10^{-14}$	6.0
1169	94–200 15:37	0	1	187	2	6	0	15	7	10	0	0	0	0	1	0	0	0	1	3	2.67713	184.5	−67.1	11176.6	25	183	36	56.0	2.0	$1.8\cdot10^{-16}$	12.5
1170	94–201 23:45	0	1	3	4	4	0	10	15	0	1	0	47	31	1	0	0	0	1	3	2.66876	184.8	−67.3	11182.1	126	276	−14	10.4	1.9	$6.7\cdot10^{-14}$	10.5
1171	94–204 06:15	3	3	250	21	27	7	7	5	6	0	1	46	0	1	0	0	0	1	3	2.65284	185.4	−67.7	11192.5	115	265	−8	28.1	1.6	$9.7\cdot10^{-13}$	6.0
1172	94–207 17:11	1	2	216	10	5	8	10	15	0	1	1	44	31	1	0	0	0	1	3	2.63012	186.4	−68.3	11207.0	69	229	16	10.4	1.9	$2.2\cdot10^{-13}$	10.5
1173	94–209 12:31	3	1	35	2	6	1	8	9	9	0	1	0	0	1	0	0	0	1	3	2.61747	186.9	−68.6	11214.9	175	328	−28	31.3	2.0	$1.9\cdot10^{-15}$	12.5
1174	94–218 14:32	1	2	212	13	11	13	10	15	15	1	1	6	31	1	0	0	0	1	3	2.55634	189.9	−70.3	11251.9	69	235	16	10.4	1.9	$1.0\cdot10^{-12}$	10.5
1175	94–222 13:18	0	1	73	3	7	0	9	8	10	0	0	0	0	1	0	0	0	1	3	2.52898	191.4	−71.0	11267.7	235	39	−13	22.7	1.6	$7.8\cdot10^{-15}$	6.0
1176	94–223 15:28	0	1	3	5	9	0	7	7	6	0	0	3	31	1	0	0	0	1	3	2.52126	191.9	−71.2	11272.1	137	295	−19	43.7	1.6	$1.4\cdot10^{-15}$	6.0
1177	94–224 04:15	0	1	64	7	12	0	8	7	7	0	0	35	0	1	0	0	0	1	3	2.51783	192.1	−71.3	11274.1	223	28	−19	34.6	1.6	$8.8\cdot10^{-15}$	6.0
1178	94–228 05:41	3	5	29	55	49	25	13	6	5	0	1	61	0	1	0	0	0	1	3	2.49031	193.9	−72.1	11289.3	176	339	−28	2.0	1.9	$2.7\cdot10^{-07}$	10.5
1179	94–228 16:49	1	1	156	1	5	0	15	2	7	1	0	47	31	1	0	0	0	1	3	2.48687	194.1	−72.1	11291.2	354	157	39	70.0	2.0	$5.2\cdot10^{-17}$	12.5
1180	94–230 05:18	3	1	133	1	8	1	15	13	15	0	1	47	31	1	0	0	0	0	4	2.47651	194.8	−72.4	11296.8	323	121	31	11.8	11.8	$6.1\cdot10^{-14}$	5858.3
1181	94–231 08:34	0	1	21	5	8	0	8	8	8	0	0	0	0	1	0	0	0	1	3	2.46874	195.4	−72.6	11301.0	166	330	−27	28.0	1.6	$6.2\cdot10^{-15}$	6.0
1182	94–234 04:14	1	2	175	9	11	11	13	15	0	1	1	45	31	1	0	0	0	1	3	2.44884	196.9	−73.2	11311.6	23	197	36	2.4	1.6	$5.8\cdot10^{-11}$	6.0
1183	94–234 10:36	3	2	127	8	12	5	7	7	6	0	1	4	25	1	0	0	0	1	3	2.44711	197.0	−73.2	11312.5	316	116	28	43.7	1.6	$4.0\cdot10^{-15}$	6.0
1184	94–236 03:34	0	2	122	8	13	0	7	7	7	0	0	36	0	1	0	0	0	1	3	2.43497	198.0	−73.5	11318.8	310	111	25	43.7	1.6	$4.7\cdot10^{-15}$	6.0
1185	94–236 08:32	0	1	227	4	2	0	12	10	0	1	0	4	23	1	0	0	0	1	3	2.43410	198.0	−73.5	11319.2	97	268	0	5.0	1.9	$4.6\cdot10^{-13}$	10.5
1186	94–237 14:05	0	1	168	2	6	0	9	9	10	0	0	4	25	1	0	0	0	1	3	2.42542	198.8	−73.8	11323.7	15	188	37	31.3	2.0	$1.9\cdot10^{-15}$	12.5
1187	94–241 02:58	0	1	174	4	8	0	7	8	8	0	0	0	0	1	0	0	0	1	3	2.40105	200.9	−74.4	11336.0	25	202	35	35.4	1.6	$2.4\cdot10^{-15}$	6.0
1188	94–241 08:38	3	1	72	5	9	4	7	7	7	0	1	0	0	1	0	0	0	1	3	2.39931	201.1	−74.4	11336.9	241	55	−10	43.7	1.6	$1.4\cdot10^{-15}$	6.0
1189	94–244 22:16	0	1	70	5	9	0	7	8	7	0	0	0	0	1	0	0	0	1	3	2.37400	203.6	−75.1	11349.3	240	56	−11	35.4	1.6	$3.5\cdot10^{-15}$	6.0
1190	94–246 12:01	1	2	242	15	7	21	10	11	15	1	1	39	17	1	0	0	0	1	3	2.36264	204.8	−75.4	11354.8	122	296	−11	10.4	1.9	$6.4\cdot10^{-13}$	10.5
1191	94–247 01:02	3	3	174	19	25	4	8	6	6	0	1	44	0	1	0	0	0	1	3	2.35914	205.2	−75.5	11356.5	26	209	34	19.5	1.6	$1.8\cdot10^{-12}$	6.0
1192	94–250 08:00	3	3	241	22	28	4	7	5	5	0	1	47	0	1	0	0	0	1	3	2.33636	207.9	−76.0	11367.2	121	299	−11	28.1	1.6	$1.4\cdot10^{-12}$	6.0
1193	94–255 02:26	0	1	172	2	9	0	9	15	0	1	0	45	31	1	0	0	0	1	3	2.30298	212.2	−76.8	11382.5	25	214	34	11.8	11.8	$8.8\cdot10^{-14}$	5858.3
1194	94–258 02:26	3	1	139	1	7	1	15	4	15	0	1	47	31	1	0	0	0	0	4	2.28186	215.3	−77.2	11391.9	339	160	35	70.0	2.0	$7.5\cdot10^{-17}$	12.5
1195	94–258 22:05	3	3	240	23	29	4	7	4	5	0	1	47	0	1	0	0	0	1	3	2.27569	216.2	−77.3	11394.6	122	306	−11	31.4	1.8	$1.3\cdot10^{-12}$	9.5
1196	94–261 16:34	0	1	9	6	10	0	7	7	7	0	0	0	0	1	0	0	0	1	3	2.25629	219.4	−77.7	11403.0	157	343	−24	43.7	1.6	$2.0\cdot10^{-15}$	6.0
1197	94–263 08:45	3	2	159	14	22	1	7	7	6	0	1	42	0	1	0	0	0	1	3	2.24482	221.3	−77.9	11407.9	8	200	37	34.1	1.9	$9.7\cdot10^{-14}$	10.5
1198	94–272 05:54	3	2	171	8	19	5	8	2	15	0	1	5	25	1	0	0	0	1	3	2.18206	233.6	−78.8	11433.5	25	229	33	21.4	1.9	$1.1\cdot10^{-13}$	10.5
1199	94–273 11:01	0	1	199	2	9	0	15	8	13	1	0	47	26	1	0	0	0	1	3	2.17321	235.5	−78.9	11437.0	64	270	17	11.8	11.8	$8.8\cdot10^{-14}$	5858.3
1200	94–273 20:07	1	3	216	19	12	13	8	15	15	1	1	38	30	1	0	0	0	1	3	2.17056	236.1	−78.9	11438.1	88	292	5	10.4	1.9	$2.1\cdot10^{-12}$	10.5
1201	94–275 22:23	3	6	228	56	56	30	14	14	5	0	1	31	0	1	0	0	0	1	3	2.15551	239.4	−79.0	11443.9	105	308	−2	2.0	1.9	$9.5\cdot10^{-07}$	10.5
1202	94–276 18:57	0	1	35	4	8	0	8	7	8	0	0	4	25	1	0	0	0	1	3	2.14932	240.9	−79.1	11446.3	194	39	−25	34.6	1.6	$2.7\cdot10^{-15}$	6.0
1203	94–278 06:01	0	2	227	11	11	0	9	15	15	1	0	58	30	1	0	0	0	1	3	2.13870	243.3	−79.1	11450.3	103	309	−2	14.1	1.9	$3.5\cdot10^{-13}$	10.5
1204	94–281 16:51	0	1	167	3	6	0	9	8	9	0	0	0	0	1	0	0	0	1	3	2.11480	249.0	−79.1	11459.2	18	231	35	22.7	1.6	$6.6\cdot10^{-15}$	6.0
1205	94–282 00:48	0	1	250	7	11	0	7	8	6	0	0	4	26	1	0	0	0	1	3	2.11214	249.7	−79.1	11460.2	135	342	−16	35.4	1.6	$6.9\cdot10^{-15}$	6.0
1206	94–282 10:11	0	1	176	6	10	0	8	8	7	0	0	0	0	1	0	0	0	1	3	2.10949	250.3	−79.1	11461.2	31	247	31	28.0	1.6	$1.0\cdot10^{-14}$	6.0
1207	94–282 10:47	3	3	187	23	29	12	8	5	6	0	1	47	0	1	0	0	0	1	3	2.10949	250.3	−79.1	11461.2	46	263	26	24.1	2.0	$3.2\cdot10^{-12}$	11.5
1208	94–286 10:57	0	2	234	9	19	0	7	6	7	0	0	38	0	1	0	0	0	1	3	2.08119	257.2	−79.0	11471.4	112	326	−6	34.1	1.9	$2.4\cdot10^{-14}$	10.5
1209	94–286 21:03	1	1	10	5	1	1	9	15	0	1	1	1	26	0	0	0	0	0	3	2.07765	258.1	−78.9	11472.7	157	9	−23	14.1	1.9	$2.5\cdot10^{-14}$	10.5
1210	94–287 02:51	3	3	142	20	26	4	7	6	5	0	1	46	0	1	0	0	0	1	3	2.07677	258.3	−78.9	11473.0	342	193	35	22.7	1.6	$1.5\cdot10^{-12}$	6.0
1211	94–289 09:58	3	4	235	27	49	23	7	6	5	0	1	47	0	1	0	0	0	1	3	2.05998	262.3	−78.8	11478.9	112	330	−6	14.1	1.9	$9.0\cdot10^{-11}$	10.5
1212	94–290 14:44	3	1	53	1	6	10	15	9	11	0	1	0	0	1	0	0	0	1	3	2.05204	264.2	−78.7	11481.7	216	78	−19	31.3	2.0	$1.5\cdot10^{-15}$	12.5
1213	94–291 21:18	0	1	188	3	6	0	8	8	9	0	0	0	0	1	0	0	0	1	3	2.04233	266.5	−78.5	11485.0	46	274	26	28.0	1.6	$3.1\cdot10^{-15}$	6.0
1214	94–293 23:11	0	1	10	6	10	0	7	7	7	0	0	0	0	1	0	0	0	1	3	2.02823	269.8	−78.3	11489.8	155	16	−23	43.7	1.6	$2.0\cdot10^{-15}$	6.0
1215	94–296 10:59	3	2	189	12	12	1	6	5	6	0	1	63	0	1	0	0	0	1	3	2.01062	273.7	−77.9	11495.8	46	279	26	43.5	1.9	$7.6\cdot10^{-15}$	10.5
1216	94–296 17:22	3	3	175	20	26	8	7	6	6	0	1	45	0	1	0	0	0	1	3	2.00886	274.1	−77.9	11496.3	26	258	33	22.7	1.6	$1.5\cdot10^{-12}$	6.0
1217	94–298 03:50	3	2	177	12	21	1	7	6	6	0	1	40	0	1	0	0	0	1	3	1.99832	276.3	−77.6	11499.8	28	263	33	34.1	1.9	$6.0\cdot10^{-14}$	10.5
1218	94–301 00:16	0	1	43	3	7	0	8	8	8	0	0	0	0	1	0	0	0	1	3	1.97814	280.5	−77.1	11506.4	199	74	−25	28.0	1.6	$3.7\cdot10^{-15}$	6.0
1219	94–301 11:16	0	1	123	4	7	0	8	9	7	0	0	0	0	1	0	0	0	1	3	1.97551	281.0	−77.0	11507.2	311	177	25	25.9	1.6	$5.7\cdot10^{-15}$	6.0
1220	94–301 19:56	2	3	185	21	26	14	9	7	6	0	1	46	0	1	0	0	0	1	3	1.97288	281.5	−77.0	11508.1	38	279	30	15.6	1.6	$7.8\cdot10^{-12}$	6.0
1221	94–303 15:55	3	2	9	13	21	2	7	6	6	0	1	40	0	1	0	0	0	1	3	1.95976	284.0	−76.6	11512.3	150	23	−22	34.1	1.9	$7.1\cdot10^{-14}$	10.5
1222	94–305 21:18	1	2	153	13	12	13	10	15	0	1	1	36	30	1	0	0	0	1	3	1.94404	286.9	−76.0	11517.2	352	229	38	10.4	1.9	$1.2\cdot10^{-12}$	10.5
1223	94–306 02:32	1	2	234	11	11	10	12	15	15	1	1	11	30	1	0	0	0	1	3	1.94317	287.1	−76.0	11517.5	106	345	−3	5.0	1.9	$6.4\cdot10^{-12}$	10.5
1224	94–306 08:20	0	1	120	2	2	0	15	15	15	1	0	0	0	1	0	0	0	1	3	1.94143	287.4	−75.9	11518.0	305	177	23	11.8	11.8	$2.8\cdot10^{-14}$	5858.3
1225	94–307 15:37	0	1	89	5	9	0	8	7	8	0	0	0	0	1	0	0	0	1	3	1.93185	289.0	−75.6	11521.0	261	141	0	34.6	1.6	$3.8\cdot10^{-15}$	6.0
1226	94–308 01:45	0	1	184	1	8	0	15	11	13	0	0	47	31	1	0	0	0	1	3	1.92924	289.5	−75.5	11521.8	35	283	32	11.8	11.8	$6.1\cdot10^{-14}$	5858.3
1227	94–310 04:04	1	2	106	8	8	1	9	15	15	1	1	1	30	1	0	0	0	1	3	1.91448	291.9	−75.0	11526.4	284	163	12	14.1	1.9	$1.3\cdot10^{-13}$	10.5
1228	94–310 04:06	0	1	242	7	12	0	8	7	6	0	0	5	26	1	0	0	0	1	3	1.91448	291.9	−75.0	11526.4	116	358	−9	34.6	1.6	$8.8\cdot10^{-15}$	6.0
1229	94–310 14:46	0	1	136	1	1	0	15	12	15	1	0	0	0	1	0	0	0	1	3	1.91187	292.3	−74.9	11527.2	326	204	33	11.8	11.8	$1.9\cdot10^{-14}$	5858.3
1230	94–310 21:03	0	1	119	5	10	0	8	7	9	0	0	0	0	1	0	0	0	1	3	1.90928	292.7	−74.8	11527.9	302	180	22	34.6	1.6	$4.5\cdot10^{-15}$	6.0
1231	94–311 12:10	0	1	1	6	11	0	7	7	7	0	0	0	0	1	0	0	0	1	3	1.90495	293.4	−74.6	11529.3	136	19	−18	43.7	1.6	$2.3\cdot10^{-15}$	6.0
1232	94–314 12:12	0	1	13	6	9	0	7	8	7	0	0	0	0	1	0	0	0	1	3	1.88422	296.4	−73.7	11535.5	152	38	−25	35.4	1.6	$4.1\cdot10^{-15}$	6.0
1233	94–315 16:03	3	2	238	14	22	2	8	8	8	0	1	42	0	1	0	0	0	1	3	1.87648	297.5	−73.4	11537.8	108	359	−5	21.4	1.9	$5.0\cdot10^{-13}$	10.5
1234	94–320 14:24	3	4	215	26	29	11	7	6	6	0	1	47	0	1	0	0	0	1	3	1.84311	301.8	−71.8	11547.5	74	337	14	22.7	1.6	$6.4\cdot10^{-12}$	6.0

continued

Table 3—*continued*

No.	IMP. DATE	CLN	AR	SEC	IA	EA	CA	IT	ET	EIT	EIC	IIC	PA	PET	EVD	ICP	ECP	CCP	PCP	HV	R	LON	LAT	D_{Jup}	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
1235	94–321 18:01	0	1	180	5	5	0	8	15	15	1	0	40	30	1	0	0	0	1	3	1.83460	302.8	−71.4	11550.0	24	290	38	21.4	1.9	$9.8\cdot10^{-15}$	10.5
1236	94–322 02:29	0	1	209	7	3	0	12	15	15	1	0	43	30	1	0	0	0	1	3	1.83290	303.0	−71.3	11550.5	65	332	19	5.0	1.9	$8.7\cdot10^{-13}$	10.5
1237	94–323 09:22	3	1	6	7	12	3	7	7	6	0	1	0	0	1	0	0	0	1	3	1.82358	304.1	−70.8	11553.1	139	35	−22	43.7	1.6	$3.3\cdot10^{-15}$	6.0
1238	94–325 02:32	0	2	189	8	8	0	7	15	15	1	0	39	30	1	0	0	0	1	3	1.81260	305.3	−70.2	11556.3	36	308	35	34.1	1.9	$5.7\cdot10^{-15}$	10.5
1239	94–325 16:09	3	4	173	24	30	9	8	4	5	0	1	47	0	1	0	0	0	1	3	1.80839	305.7	−70.0	11557.5	13	281	42	27.0	2.3	$3.0\cdot10^{-12}$	19.8
1240	94–328 13:29	1	2	240	10	8	1	9	15	15	1	1	47	30	1	0	0	0	1	3	1.78910	307.7	−68.9	11562.9	107	13	−6	14.1	1.9	$1.8\cdot10^{-13}$	10.5
1241	94–330 09:47	0	1	123	5	4	0	7	15	15	1	0	36	30	1	0	0	0	1	3	1.77661	308.9	−68.2	11566.4	302	201	24	34.1	1.9	$1.6\cdot10^{-15}$	10.5
1242	94–332 21:54	3	3	187	21	27	11	6	5	6	0	1	46	0	1	0	0	0	1	3	1.76005	310.4	−67.2	11570.9	31	313	39	34.6	1.6	$5.0\cdot10^{-13}$	6.0
1243	94–333 12:38	1	2	139	13	11	10	9	15	15	1	1	38	30	1	0	0	0	1	3	1.75593	310.7	−66.9	11572.1	324	225	37	14.1	1.9	$4.9\cdot10^{-13}$	10.5
1244	94–334 02:01	0	1	167	5	4	0	7	15	15	1	0	36	30	1	0	0	0	1	3	1.75264	311.0	−66.7	11573.0	3	277	47	34.1	1.9	$1.6\cdot10^{-15}$	10.5
1245	94–335 16:57	2	4	182	29	49	25	6	6	5	0	1	47	0	1	0	0	0	1	3	1.74199	311.9	−66.0	11575.9	23	307	43	21.4	1.9	$2.7\cdot10^{-11}$	10.5
1246	94–338 00:39	3	2	166	14	23	1	7	6	6	0	1	42	0	1	0	0	0	1	3	1.72654	313.2	−65.0	11580.1	0	277	48	34.1	1.9	$1.1\cdot10^{-13}$	10.5
1247	94–340 19:37	0	2	154	15	23	0	8	6	6	0	0	42	0	1	0	0	0	1	3	1.70881	314.5	−63.8	11585.0	343	254	47	21.4	1.9	$6.4\cdot10^{-13}$	10.5
1248	94–341 04:20	1	3	218	19	9	10	7	15	15	1	1	40	30	1	0	0	0	1	3	1.70640	314.7	−63.6	11585.6	73	1	15	14.1	1.9	$6.2\cdot10^{-13}$	10.5
1249	94–341 11:44	0	1	231	3	3	0	10	15	15	1	0	39	30	1	0	0	0	1	3	1.70481	314.8	−63.5	11586.0	91	14	3	10.4	1.9	$5.0\cdot10^{-14}$	10.5
1250	94–341 12:14	3	3	217	20	26	13	6	6	5	0	1	45	0	1	0	0	0	1	3	1.70401	314.9	−63.4	11586.3	71	0	17	28.0	1.6	$7.0\cdot10^{-13}$	6.0
1251	94–344 16:44	0	1	164	4	2	0	8	15	15	1	0	0	0	1	0	0	0	1	3	1.68416	316.3	−62.0	11591.6	356	278	51	21.4	1.9	$5.4\cdot10^{-15}$	10.5
1252	94–345 17:15	0	1	42	3	7	0	7	8	8	0	0	0	0	1	0	0	0	1	3	1.67787	316.7	−61.5	11593.4	185	111	−40	35.4	1.6	$1.8\cdot10^{-15}$	6.0
1253	94–351 23:53	0	1	183	7	12	0	7	7	7	0	0	6	31	1	0	0	0	1	3	1.63924	319.2	−58.5	11603.9	22	325	49	43.7	1.6	$3.3\cdot10^{-15}$	6.0
1254	94–353 10:33	0	2	203	10	5	0	6	15	15	1	0	55	30	1	0	0	0	1	3	1.63016	319.8	−57.8	11606.3	50	357	33	43.5	1.9	$1.6\cdot10^{-15}$	10.5
1255	94–353 17:53	1	6	138	58	52	31	5	5	4	1	1	28	0	1	0	0	0	1	3	1.62865	319.8	−57.6	11606.8	319	234	39	34.1	1.9	$7.0\cdot10^{-11}$	10.5
1256	94–354 04:36	0	1	159	7	7	0	8	15	15	1	0	42	30	1	0	0	0	1	3	1.62565	320.0	−57.4	11607.6	348	272	54	21.4	1.9	$2.0\cdot10^{-14}$	10.5
1257	94–356 08:47	2	4	131	28	49	10	6	5	5	0	1	47	0	1	0	0	0	1	3	1.61298	320.8	−56.3	11611.1	309	226	33	21.4	1.9	$2.3\cdot10^{-11}$	10.5
1258	94–358 17:46	3	4	196	24	31	17	9	5	5	0	1	47	0	1	0	0	0	1	3	1.59902	321.6	−55.0	11615.0	40	355	41	7.8	1.9	$1.6\cdot10^{-10}$	10.5
1259	94–361 00:02	0	2	157	9	14	0	7	7	7	0	0	37	0	1	0	0	0	1	3	1.58529	322.3	−53.7	11618.8	345	271	56	43.7	1.6	$6.4\cdot10^{-15}$	6.0
1260	94–363 00:40	0	2	142	8	13	0	7	7	7	0	0	35	0	1	0	0	0	1	3	1.57390	322.9	−52.6	11622.1	324	243	45	43.7	1.6	$4.7\cdot10^{-15}$	6.0
1261	95–004 03:58	1	2	141	13	11	12	10	9	15	1	1	36	3	1	0	0	0	1	3	1.54015	324.6	−49.2	11631.9	323	244	46	10.4	1.9	$1.0\cdot10^{-12}$	10.5
1262	95–004 13:56	2	3	160	19	23	12	6	7	5	0	1	43	0	1	0	0	0	1	3	1.53814	324.7	−48.9	11632.5	350	282	61	25.9	1.6	$4.3\cdot10^{-13}$	6.0
1263	95–007 05:04	0	1	203	2	10	0	9	15	15	1	0	47	31	1	0	0	0	1	3	1.52428	325.4	−47.4	11636.7	50	18	36	11.8	11.8	$1.1\cdot10^{-13}$	5858.3
1264	95–009 11:27	3	4	171	25	31	24	6	5	5	0	1	47	0	1	0	0	0	1	3	1.51268	326.0	−46.0	11640.3	6	321	65	34.6	1.6	$1.7\cdot10^{-12}$	6.0
1265	95–012 03:31	3	4	168	25	49	21	7	5	5	0	1	47	0	1	0	0	0	1	3	1.49887	326.7	−44.3	11644.8	1	313	67	14.1	1.9	$6.5\cdot10^{-11}$	10.5
1266	95–014 12:22	2	4	174	24	30	22	7	5	5	0	1	47	0	1	0	0	0	1	3	1.48730	327.2	−42.9	11648.6	10	336	66	28.1	1.6	$2.6\cdot10^{-12}$	6.0
1267	95–015 14:43	0	1	145	1	5	0	15	8	12	0	0	6	3	1	0	0	0	1	3	1.48252	327.4	−42.2	11650.2	329	253	54	36.7	2.0	$7.4\cdot10^{-16}$	12.5
1268	95–016 15:32	0	1	107	2	7	0	10	9	13	1	0	47	26	1	0	0	0	1	3	1.47722	327.7	−41.5	11652.0	276	221	8	31.3	2.0	$2.3\cdot10^{-15}$	12.5
1269	95–017 10:28	0	2	101	11	8	0	10	15	15	1	0	45	30	1	0	0	0	1	3	1.47373	327.9	−41.0	11653.2	268	218	0	10.4	1.9	$4.3\cdot10^{-13}$	10.5
1270	95–017 11:03	0	1	154	3	6	0	8	7	9	0	0	0	0	1	0	0	0	1	3	1.47373	327.9	−41.0	11653.2	342	271	63	34.6	1.6	$1.6\cdot10^{-15}$	6.0
1271	95–020 19:30	0	1	138	5	9	0	8	7	8	0	0	6	27	1	0	0	0	1	3	1.45847	328.6	−38.8	11658.8	320	245	47	34.6	1.6	$3.8\cdot10^{-15}$	6.0
1272	95–022 17:59	3	6	199	57	49	31	11	5	5	0	1	28	0	1	0	0	0	1	3	1.45031	329.0	−37.6	11661.8	47	32	42	2.5	1.9	$1.4\cdot10^{-07}$	10.5
1273	95–03 07:13	0	1	180	3	10	0	9	15	15	1	0	19	30	1	0	0	0	1	3	1.44764	329.1	−37.2	11662.9	20	7	64	14.1	1.9	$8.0\cdot10^{-14}$	10.5
1274	95–024 09:03	0	1	148	1	10	0	15	15	0	1	0	47	31	1	0	0	0	1	3	1.44290	329.3	−36.4	11664.7	335	260	60	11.8	11.8	$8.6\cdot10^{-14}$	5858.3
1275	95–025 08:51	0	1	132	4	2	0	8	15	15	1	0	0	0	1	0	0	0	1	3	1.43928	329.5	−35.8	11666.2	313	241	42	21.4	1.9	$5.4\cdot10^{-15}$	10.5
1276	95–025 09:48	3	3	169	21	27	11	6	5	6	0	1	46	0	1	0	0	0	1	3	1.43877	329.5	−35.7	11666.4	5	335	72	34.6	1.6	$5.0\cdot10^{-13}$	6.0
1277	95–026 05:38	0	1	152	6	2	0	8	15	15	1	0	36	30	1	0	0	0	1	3	1.43571	329.7	−35.2	11667.7	341	268	66	21.4	1.9	$7.5\cdot10^{-15}$	10.5
1278	95–028 07:12	0	1	158	2	8	0	15	15	15	1	0	47	31	1	0	0	0	1	3	1.42727	330.1	−33.8	11671.2	350	287	72	2.3	2.0	$1.3\cdot10^{-11}$	12.5
1279	95–029 04:29	0	1	126	3	1	0	8	15	15	1	0	9	27	1	0	0	0	1	3	1.42389	330.3	−33.2	11672.7	306	239	35	21.4	1.9	$3.9\cdot10^{-15}$	10.5
1280	95–029 19:54	0	1	180	5	10	0	7	7	8	0	0	6	31	1	0	0	0	1	3	1.42152	330.4	−32.7	11673.8	22	19	64	43.7	1.6	$1.7\cdot10^{-15}$	6.0
1281	95–030 02:28	0	1	140	1	10	0	15	15	15	1	0	47	31	1	0	0	0	1	3	1.42057	330.4	−32.6	11674.2	326	250	54	11.8	11.8	$8.6\cdot10^{-14}$	5858.3
1282	95–030 12:48	0	1	160	1	6	0	15	8	11	0	0	0	0	1	0	0	0	1	3	1.41870	330.5	−32.2	11675.1	354	299	74	36.7	2.0	$8.9\cdot10^{-16}$	12.5
1283	95–030 17:40	2	2	167	15	22	3	8	6	6	0	1	41	0	1	0	0	0	1	3	1.41823	330.6	−32.1	11675.3	4	337	75	21.4	1.9	$5.4\cdot10^{-13}$	10.5
1284	95–037 06:21	0	1	245	4	12	0	8	15	15	1	0	47	31	1	0	0	0	1	3	1.39531	331.8	−27.4	11686.8	117	68	−23	21.4	1.9	$2.8\cdot10^{-14}$	10.5
1285	95–038 21:39	0	1	60	1	2	0	15	15	15	1	0	11	30	1	0	0	0	1	3	1.39023	332.1	−26.2	11689.7	216	208	−48	11.8	11.8	$2.3\cdot10^{-14}$	5858.3
1286	95–038 23:24	0	1	246	1	8	0	15	15	13	0	0	7	27	1	0	0	0	1	3	1.39023	332.1	−26.2	11689.7	118	69	−24	11.8	11.8	$6.1\cdot10^{-14}$	5858.3
1287	95–040 23:50	3	2	224	14	21	1	11	2	10	0	1	25	0	1	0	0	0	1	3	1.38427	332.4	−24.7	11693.4	88	61	3	7.8	1.9	$8.7\cdot10^{-12}$	10.5
1288	95–048 09:56	0	1	108	2	6	0	15	8	11	0	0	10	27	1	0	0	0	1	3	1.36502	333.7	−19.1	11707.4	295	241	26	36.7	2.0	$1.1\cdot10^{-15}$	12.5
1289	95–048 19:22	1	5	178	49	49	29	15	3	15	1	1	21	7	1	0	0	0	1	3	1.36419	333.7	−18.8	11708.2	33	53	57	11.8	11.8	$3.4\cdot10^{-10}$	5858.3
1290	95–049 04:31	0	1	144	4	4	0	7	15	0	1	0	39	30	1	0	0	0	1	3	1.36337	333.8	−18.6	11708.9	344	261	73	34.1	1.9	$1.4\cdot10^{-15}$	10.5
1291	95–050 02:44	0	3	174	19	11	0	7	15	0	1	0	20	30	1	0	0	0	1	3	1.36151	333.9	−17.9	11710.6	28	52	62	14.1	1.9	$8.8\cdot10^{-13}$	10.5
1292	95–052 05:48	0	1	170	4	6	0	12	15	0	1	0	26	30	1	0	0	0	1	3	1.35729	334.3	−16.3	11714.8	27	55	63	3.4	1.6	$2.8\cdot10^{-12}$	6.0
1293	95–054 02:07	0	1	148	7	10	0	10	6	14	0	0	19	1	1	0	0	0	1	3	1.35391	334.6	−14.8	11718.6	359	319	85	27.0	2.3	$1.4\cdot10^{-14}$	19.8
1294	95–055 14:55	0	1	164	4	10	0	6	7	0	1	0	47	31	1	0	0	0	1	3	1.35145	334.8	−13.7	11721.7	32	61	58	49.4	1.6	$8.6\cdot10^{-16}$	6.0
1295	95–055 21:43	1	4	89	26	29	28	11	10	0	1	1	47	6	1	0	0	0	1	3	1.35087	334.9	−13.4	11722.4	286	242	16	5.4	1.8	$5.5\cdot10^{-10}$	8.5
1296	95–056 05:27	0	1	158	4	10	0	6	15	0	1	0	47	31	1	0	0	0	1	3	1.35049	334.9	−13.2	11723.0	22	59	68	10.0	5.4	$2.1\cdot10^{-13}$	377.1
1297	95–056 08:51	3	3	132	20	25	17	8	7	6	0	1	44	0	1	0	0	0	1	3	1.35030	334.9	−13.1	11723.2	345	256	75	18.0	1.6	$3.3\cdot10^{-12}$	6.0
1298	95–056 22:25	3	2	170	14	21	2	9	3	8	0	1	25	0	1	0	0	0	1	3	1.34939	335.0	−12.6	11724.5	50	67	40	14.1	1.9	$1.9\cdot10^{-12}$	10.5
1299	95–057 09:23	0	1	157	4	12	0	10	15	15	1	0	20	29	1	0	0	0	1	3	1.34868	335.1	−12.2	11725.6	32	64	58	10.4	1.9	$2.7\cdot10^{-13}$	10.5
1300	95–057 20:24	0	2	130	8	2	0	7	15	0	1	0	47	30	1	0	0	0	1	3	1.34816	335.2	−11.9	11726.3	354	262	83	34.1	1.9	$2.1\cdot10^{-15}$	10.5

1301	95–058 08:10	0	1	193	2	10	0	11	15	0	1	0	47	31	1	0	0	0	1	3	1.34750	335.2	−11.5	11727.4	82	70	8	11.8	11.8	$1.1 \cdot 10^{-13}$	5858.3
1302	95–058 19:21	1	5	124	53	49	31	13	15	3	1	1	18	1	1	0	0	0	1	3	1.34686	335.3	−11.1	11728.5	355	259	85	2.0	1.9	$2.0 \cdot 10^{-07}$	10.5
1303	95–060 06:24	0	1	15	7	8	0	13	7	11	1	0	47	23	1	0	0	0	1	3	1.34508	335.5	−10.0	11731.7	204	223	−62	2.5	1.9	$2.1 \cdot 10^{-11}$	10.5
1304	95–060 21:52	1	4	106	26	27	9	14	0	6	0	1	31	0	1	0	0	0	1	3	1.34441	335.6	−9.5	11733.0	339	248	69	2.0	1.9	$1.3 \cdot 10^{-08}$	10.5
1305	95–060 23:27	1	1	159	5	5	4	13	15	0	1	1	42	30	1	0	0	0	1	3	1.34441	335.6	−9.5	11733.0	54	71	36	2.5	1.9	$8.6 \cdot 10^{-12}$	10.5
1306	95–061 09:39	0	1	135	3	14	0	6	15	0	1	0	47	31	1	0	0	0	1	3	1.34389	335.7	−9.1	11734.1	22	69	68	43.5	1.9	$2.4 \cdot 10^{-15}$	10.5
1307	95–061 14:19	0	1	123	4	12	0	10	12	15	1	0	19	31	1	0	0	0	1	3	1.34377	335.7	−9.0	11734.4	5	67	85	10.4	1.9	$2.7 \cdot 10^{-13}$	10.5
1308	95–061 16:53	3	3	135	22	20	8	13	1	10	0	1	25	0	1	0	0	0	1	3	1.34365	335.8	−8.9	11734.7	23	69	68	2.0	1.9	$2.3 \cdot 10^{-09}$	10.5
1309	95–062 06:35	0	1	210	1	9	0	15	14	15	1	0	47	31	1	0	0	0	1	3	1.34306	335.9	−8.4	11736.0	131	79	−39	11.8	11.8	$7.3 \cdot 10^{-14}$	5858.3
1310	95–063 05:53	3	1	230	5	21	1	12	8	15	0	1	19	0	1	0	0	0	1	3	1.34229	336.0	−7.7	11738.0	164	99	−71	5.0	1.9	$8.2 \cdot 10^{-12}$	10.5
1311	95–063 18:36	1	4	32	24	22	13	12	9	0	1	1	1	21	1	0	0	0	1	3	1.34179	336.1	−7.2	11739.4	249	242	−19	2.0	1.9	$4.3 \cdot 10^{-09}$	10.5
1312	95–064 12:39	0	1	82	5	19	0	13	9	13	1	0	24	27	1	0	0	0	1	3	1.34124	336.2	−6.6	11741.1	325	246	55	2.5	1.9	$5.5 \cdot 10^{-11}$	10.5
1313	95–064 14:52	0	1	162	3	10	0	9	15	0	1	0	47	31	1	0	0	0	1	3	1.34124	336.2	−6.6	11741.1	77	73	13	14.1	1.9	$8.0 \cdot 10^{-14}$	10.5
1314	95–066 16:34	0	2	133	10	8	0	13	15	15	1	0	47	30	1	0	0	0	1	3	1.33999	336.5	−4.9	11745.9	51	76	39	2.5	1.9	$3.4 \cdot 10^{-11}$	10.5
1315	95–066 17:51	0	1	33	4	11	0	7	15	0	1	0	63	31	1	0	0	0	1	3	1.33999	336.5	−4.9	11745.9	270	246	0	34.1	1.9	$4.7 \cdot 10^{-15}$	10.5
1316	95–067 03:53	0	1	27	2	7	0	15	6	11	1	0	47	22	1	0	0	0	1	3	1.33976	336.6	−4.5	11747.1	265	246	−4	70.0	2.0	$9.1 \cdot 10^{-17}$	12.5
1317	95–067 17:04	0	1	162	3	11	0	10	15	0	1	0	47	31	1	0	0	0	1	3	1.33956	336.7	−4.2	11748.2	99	77	−7	10.4	1.9	$2.0 \cdot 10^{-13}$	10.5
1318	95–068 07:38	1	3	72	20	20	21	13	3	0	1	1	63	9	1	0	0	0	1	3	1.33934	336.8	−3.7	11749.7	337	244	67	2.0	1.9	$1.7 \cdot 10^{-09}$	10.5
1319	95–068 19:12	0	1	209	1	1	0	15	5	12	0	0	10	31	1	0	0	0	1	3	1.33919	336.9	−3.3	11750.9	166	97	−74	11.8	11.8	$1.9 \cdot 10^{-14}$	5858.3
1320	95–068 20:04	0	1	129	4	11	0	9	15	15	1	0	59	30	1	0	0	0	1	3	1.33919	336.9	−3.3	11750.9	54	77	36	14.1	1.9	$1.1 \cdot 10^{-13}$	10.5
1321	95–069 00:14	0	1	141	5	1	0	6	0	13	0	0	6	27	1	0	0	0	1	3	1.33912	336.9	−3.1	11751.5	72	77	18	43.5	1.9	$3.9 \cdot 10^{-16}$	10.5
1322	95–069 18:34	0	1	254	3	8	0	0	2	13	0	0	6	31	1	0	0	0	1	3	1.33897	337.0	−2.5	11753.2	237	245	−32	70.0	2.0	$1.3 \cdot 10^{-16}$	12.5
1323	95–070 13:16	0	1	66	1	3	0	15	4	12	0	0	3	27	1	0	0	0	1	3	1.33886	337.1	−1.9	11755.0	339	242	69	11.8	11.8	$2.6 \cdot 10^{-14}$	5858.3
1324	95–070 23:35	3	4	24	27	17	10	9	15	15	0	1	10	0	1	0	0	0	1	3	1.33883	337.2	−1.6	11755.9	276	248	6	7.8	1.9	$2.8 \cdot 10^{-11}$	10.5
1325	95–071 00:14	2	5	59	49	52	23	15	6	5	0	1	47	0	1	0	0	0	1	3	1.33883	337.2	−1.5	11756.2	326	245	56	36.7	2.0	$1.3 \cdot 10^{-11}$	12.5
1326	95–071 14:58	3	3	70	19	23	25	11	10	8	0	1	41	0	1	0	0	0	1	3	1.33882	337.3	−1.1	11757.5	345	237	75	5.4	1.8	$5.8 \cdot 10^{-11}$	8.5
1327	95–071 20:17	0	2	53	10	12	0	15	14	0	1	0	28	31	1	0	0	0	1	3	1.33882	337.3	−0.9	11758.1	323	246	53	2.5	1.6	$6.4 \cdot 10^{-11}$	6.0
1328	95–071 23:49	3	5	68	54	52	26	13	6	5	0	1	47	0	1	0	0	0	1	3	1.33882	337.3	−0.8	11.758.4	345	237	75	2.0	1.9	$4.2 \cdot 10^{-07}$	10.5
1329	95–072 10:52	0	1	142	4	12	0	8	15	15	1	0	55	31	1	0	0	0	1	3	1.33885	337.4	−0.4	11759.6	93	78	−2	21.4	1.9	$2.8 \cdot 10^{-14}$	10.5
1330	95–072 12:37	0	1	105	4	6	0	11	15	0	1	0	43	30	1	0	0	0	1	3	1.33887	337.4	−0.3	11759.9	42	80	48	4.2	1.6	$1.4 \cdot 10^{-12}$	6.0
1331	95–072 17:53	0	1	142	3	12	0	10	15	0	1	0	47	31	1	0	0	0	1	3	1.33888	337.4	−0.2	11760.2	88	79	2	10.4	1.9	$2.3 \cdot 10^{-13}$	10.5
1332	95–073 03:18	0	1	133	1	2	0	15	1	0	1	0	8	12	1	0	0	0	1	3	1.33895	337.5	0.2	11761.4	78	79	12	11.8	11.8	$2.3 \cdot 10^{-14}$	5858.3
1333	95–075 00:55	0	1	81	1	14	0	15	13	0	1	0	18	30	1	0	0	0	1	3	1.33943	337.8	1.7	11766.1	10	78	11.8	11.8	11.8	$1.6 \cdot 10^{-13}$	5858.3
1334	95–075 11:38	0	1	188	2	10	0	11	10	0	1	0	20	30	1	0	0	0	1	3	1.33957	337.9	2.0	11767.1	161	87	−70	11.8	11.8	$1.1 \cdot 10^{-13}$	5858.3
1335	95–075 15:04	0	1	84	3	11	0	10	15	15	1	0	19	31	1	0	0	0	1	3	1.33967	337.9	2.2	11767.7	16	97	73	10.4	1.9	$2.0 \cdot 10^{-13}$	10.5
1336	95–076 03:22	0	1	82	1	1	0	15	15	0	1	0	0	0	1	0	0	0	1	3	1.33988	338.0	2.6	11769.0	14	100	74	11.8	11.8	$1.9 \cdot 10^{-14}$	5858.3
1337	95–076 16:29	2	3	34	19	22	11	7	8	6	0	1	41	0	1	0	0	0	1	3	1.34013	338.1	3.0	11700.3	308	248	38	19.3	1.6	$1.2 \cdot 10^{-12}$	6.0
1338	95–076 18:34	0	1	179	5	10	0	8	7	7	0	0	0	0	1	0	0	0	1	3	1.34019	338.1	3.1	11770.6	152	83	−61	34.6	1.6	$4.5 \cdot 10^{-15}$	6.0
1339	95–077 00:05	1	6	78	59	31	31	6	4	0	1	1	28	2	1	0	0	0	1	3	1.34032	338.1	3.3	11771.3	11	107	77	21.4	1.9	$1.7 \cdot 10^{-10}$	10.5
1340	95–078 09:18	0	1	12	2	8	0	9	6	10	0	0	0	0	1	0	0	0	1	3	1.34117	338.3	4.3	11774.9	281	251	11	70.0	2.0	$1.1 \cdot 10^{-16}$	12.5
1341	95–081 05:51	0	1	239	6	10	0	7	7	7	0	0	0	0	1	0	0	0	1	3	1.34342	338.7	6.5	11782.2	244	254	−25	43.7	1.6	$2.0 \cdot 10^{-15}$	6.0
1342	95–082 19:04	0	1	195	2	11	0	15	15	15	1	0	15	30	1	0	0	0	1	3	1.34510	339.0	7.8	11786.7	186	251	−83	11.8	11.8	$1.2 \cdot 10^{-13}$	5858.3
1343	95–083 09:05	0	1	80	2	7	0	15	15	0	1	0	62	31	1	0	0	0	1	3	1.34582	339.1	8.3	11788.4	24	101	64	2.3	2.0	$1.1 \cdot 10^{-11}$	12.5
1344	95–083 13:38	0	2	63	10	14	0	9	15	0	1	0	63	30	1	0	0	0	1	3	1.34596	339.1	8.4	11788.8	0	167	80	5.7	2.1	$6.0 \cdot 10^{-12}$	15.7
1345	95–083 22:41	0	1	63	4	8	0	14	7	0	1	0	47	23	1	0	0	0	1	3	1.34642	339.2	8.7	11789.8	2	157	80	10.6	7.7	$1.3 \cdot 10^{-13}$	1303.9
1346	95–084 04:15	3	6	47	58	53	31	6	5	5	0	1	29	0	1	0	0	0	1	3	1.34672	339.2	8.9	11790.5	341	233	68	21.4	1.9	$4.0 \cdot 10^{-10}$	10.5
1347	95–084 15:03	0	1	16	6	5	0	7	13	0	1	0	27	30	1	0	0	0	1	3	1.34736	339.3	9.2	11791.9	296	252	25	34.1	1.9	$2.3 \cdot 10^{-15}$	10.5
1348	95–085 10:40	0	2	112	9	27	0	8	8	14	0	0	28	0	1	0	0	0	1	3	1.34836	339.4	9.8	11794.1	71	87	19	21.4	1.9	$5.0 \cdot 10^{-13}$	10.5
1349	95–085 16:08	0	2	15	12	9	0	13	15	15	1	0	10	30	1	0	0	0	1	3	1.34870	339.4	10.0	11794.8	295	252	24	2.5	1.9	$5.6 \cdot 10^{-11}$	10.5
1350	95–087 02:40	3	6	78	58	51	30	8	6	5	0	1	27	0	1	0	0	0	1	3	1.35071	339.6	11.1	11798.7	24	105	63	10.4	1.9	$3.1 \cdot 10^{-09}$	10.5
1351	95–087 14:28	0	1	100	4	1	0	9	15	8	0	0	11	31	1	0	0	0	1	3	1.35148	339.7	11.5	11800.2	56	92	33	14.1	1.9	$2.1 \cdot 10^{-14}$	10.5
1352	95–087 19:18	3	3	113	23	49	9	8	6	15	0	1	31	0	1	0	0	0	1	3	1.35188	339.8	11.7	11800.9	74	88	15	10.4	1.9	$10.0 \cdot 10^{-11}$	10.5
1353	95–088 02:27	3	3	41	21	27	26	8	6	6	0	1	46	0	1	0	0	0	1	3	1.35228	339.8	11.9	11801.7	333	238	61	19.5	1.6	$4.0 \cdot 10^{-12}$	6.0
1354	95–088 07:29	0	1	229	1	6	0	15	8	13	0	0	1	27	1	0	0	0	1	3	1.35269	339.8	12.1	11802.4	237	260	−32	36.7	2.0	$8.9 \cdot 10^{-16}$	12.5
1355	95–089 03:14	2	5	76	52	51	19	14	7	5	0	1	26	0	1	0	0	0	1	3	1.35416	340.0	12.7	11805.0	23	110	64	2.0	1.9	$2.9 \cdot 10^{-07}$	10.5
1356	95–089 08:17	0	1	128	4	11	0	8	15	0	1	0	47	31	1	0	0	0	1	3	1.35437	340.0	12.8	11805.4	96	86	−6	21.4	1.9	$2.4 \cdot 10^{-14}$	10.5
1357	95–090 18:30	3	5	252	55	49	31	7	11	5	0	1	63	0	1	0	0	0	1	3	1.35709	340.2	14.0	11809.9	272	258	1	14.1	1.9	$5.6 \cdot 10^{-10}$	10.5
1358	95–090 23:42	0	1	194	6	10	0	7	7	6	0	0	0	0	1	0	0	0	1	3	1.35732	340.2	14.1	11810.3	190	280	−78	43.7	1.6	$2.0 \cdot 10^{-15}$	6.0
1359	95–091 17:32	0	1	46	4	10	0	9	15	15	1	0	46	30	1	0	0	0	1	3	1.35876	340.4	14.7	11812.6	342	226	68	5.7	2.1	$1.1 \cdot 10^{-12}$	15.7
1360	95–091 18:43	0	1	239	3	8	0	8	7	8	0	0	0	0	1	0	0	0	1	3	1.35901	340.4	14.8	11813.0	254	261	−16	34.6	1.6	$2.3 \cdot 10^{-15}$	6.0
1361	95–091 21:42	0	1	53	7	5	0	8	15	15	1	0	37	30	1	0	0	0	1	3	1.35926	340.4	14.9	11813.4	352	203	74	21.4	1.9	$1.4 \cdot 10^{-14}$	10.5
1362	95–092 08:13	0	1	55	3	6	0	9	10	13	0	0	6	27	1	0	0	0	1	3	1.36001	340.5	15.1	11814.5	355	192	75	19.3	1.6	$1.3 \cdot 10^{-14}$	6.0
1363	95–092 10:22	0	1	87	4	1	0	7	15	15	1	0	6	31	1	0	0	0	1	3	1.36026	340.5	15.2	11814.9	41	101	47	34.1	1.9	$8.9 \cdot 10^{-16}$	10.5
1364	95–092 22:50	0	1	31	2	1	0	10	15	15	1	0	9	27	1	0	0	0	1	3	1.36129	340.6	15.6	11816.5	322	245	50	11.8	11.8	$2.4 \cdot 10^{-14}$	5858.3
1365	95–092 22:59	2	1	232	6	10	4	7	7	6	0	1	7	27	1	0	0	0	1	3	1.36129	340.6	15.6	11816.5	245	263	−25	43.7	1.6	$2.0 \cdot 10^{-15}$	6.0
1366	95–095 11:51	0	1	77	6	1	0	8	0	0	1	0	59	1	1	0	0	0	1	3	1.36676	341.0	17.5	11824.4	28	113	58	21.4	1.9	$6.3 \cdot 10^{-15}$	10.5
1367	95–095 16:41	3	3	62	21	27	20	5	5	6	0	1	47	0	1	0	0	0	1	3	1.36734	341.0	17.7	11825.2	7	151	73	43.7	1.6	$1.9 \cdot 10^{-13}$	6.0
1368	95–096 01:27	0	1	202	7	12	0	7	7	6	0	0	35	0	1	0	0	0	1	3	1.36821	341.1	18.0	11826.4	204	277	−64	43.7	1.6	$3.3 \cdot 10^{-15}$	6.0
1369	95–096 20:22	0	1	150	1	9	0	15	15	15	1	0	47	31	1	0	0	0	1	3	1.37001	341.2	18.6	11828.9	131	83	−40	11.8	11.8	$7.3 \cdot 10^{-14}$	5858.3
1370	95–097 21:17	0	1	12	3	3	0	8	15	15	1	0	5	31	1	0	0	0	1	3	1.37280	341.4	19.4	11832.6	298	255	26	21.4	1.9	$5.3 \cdot 10^{-15}$	10.5

continued

Table 3—*continued*

No.	IMP. DATE	CLN	AR	SEC	IA	EA	CA	IT	ET	EIT	EIC	IIC	PA	PET	EVD	ICP	ECP	CCP	PCP	HV	R	LON	LAT	D_{Jup}	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
1371	95–099 06:06	0	1	9	3	7	0	9	8	10	0	0	0	0	1	0	0	0	1	3	1.37635	341.6	20.4	11837.2	294	257	22	22.7	1.6	$7.8\cdot10^{-15}$	6.0
1372	95–099 06:23	3	3	210	18	49	3	11	15	15	0	1	31	1	1	0	0	0	1	3	1.37635	341.6	20.4	11837.2	217	276	−52	2.5	1.9	$3.2\cdot10^{-09}$	10.5
1373	95–099 11:12	0	1	177	2	7	0	9	7	10	0	0	0	0	1	0	0	0	1	3	1.37668	341.6	20.5	11837.6	170	51	−77	56.0	2.0	$2.2\cdot10^{-16}$	12.5
1374	95–099 18:48	0	1	227	3	6	0	8	15	15	1	0	7	30	1	0	0	0	1	3	1.37769	341.7	20.8	11838.9	241	269	−29	7.0	2.9	$2.4\cdot10^{-13}$	46.7
1375	95–100 21:48	0	1	107	2	10	0	15	15	15	1	0	47	31	1	0	0	0	1	3	1.38077	341.9	21.7	11842.7	72	98	16	11.8	11.8	$1.1\cdot10^{-13}$	5858.3
1376	95–101 09:22	1	6	61	60	49	31	4	3	15	1	1	31	3	1	0	0	0	1	3	1.38217	341.9	22.0	11844.4	8	155	70	11.8	11.8	$2.3\cdot10^{-09}$	5858.3
1377	95–103 13:33	0	1	185	4	2	0	7	15	15	1	0	0	0	1	0	0	0	1	3	1.38838	342.3	23.6	11851.9	183	342	−79	34.1	1.9	$1.1\cdot10^{-15}$	10.5
1378	95–107 02:46	1	2	68	9	3	3	9	13	15	1	1	0	0	1	0	0	0	1	3	1.39943	342.9	26.1	11864.6	19	138	61	14.1	1.9	$6.6\cdot10^{-14}$	10.5
1379	95–108 04:50	0	1	82	4	10	0	10	15	15	1	0	47	31	1	0	0	0	1	3	1.40319	343.1	26.9	11868.8	39	118	45	4.9	1.7	$1.8\cdot10^{-12}$	7.7
1380	95–108 13:16	0	1	191	1	6	0	15	7	12	0	0	3	31	1	0	0	0	1	3	1.40447	343.1	27.2	11870.2	193	315	−72	56.0	2.0	$1.5\cdot10^{-16}$	12.5
1381	95–110 19:24	0	1	28	5	4	0	10	15	15	1	0	10	30	1	0	0	0	1	3	1.41236	343.5	28.8	11878.8	324	244	48	10.4	1.9	$7.9\cdot10^{-14}$	10.5
1382	95–112 20:30	0	3	62	18	19	0	14	4	14	0	0	31	0	1	0	0	0	1	3	1.41970	343.9	30.2	11886.6	12	158	63	2.0	1.9	$7.2\cdot10^{-10}$	10.5
1383	95–113 06:23	1	1	180	6	6	21	0	0	4	1	1	47	0	1	0	0	0	1	3	1.42158	344.0	30.6	11888.6	178	13	−74	11.8	11.8	$9.7\cdot10^{-14}$	5858.3
1384	95–116 02:16	0	1	119	4	11	0	10	15	15	1	0	47	31	1	0	0	0	1	3	1.43227	344.5	32.5	11899.7	93	101	−4	10.4	1.9	$2.3\cdot10^{-13}$	10.5
1385	95–116 11:46	0	1	89	1	14	0	15	12	15	1	0	63	30	1	0	0	0	1	3	1.43377	344.6	32.7	11901.2	51	119	34	11.8	11.8	$1.6\cdot10^{-13}$	5858.3
1386	95–116 22:41	0	1	233	6	7	0	7	6	10	1	0	11	20	1	0	0	0	1	3	1.43578	344.7	33.1	11903.3	254	279	−16	34.1	1.9	$3.2\cdot10^{-15}$	10.5
1387	95–119 14:50	3	1	235	1	6	5	15	7	10	0	1	0	0	1	0	0	0	1	3	1.44665	345.2	34.8	11914.4	257	280	−13	56.0	2.0	$1.5\cdot10^{-16}$	12.5
1388	95–128 11:48	3	1	13	6	10	4	7	7	8	0	1	0	0	1	0	0	0	1	3	1.48678	347.0	40.6	11954.2	306	261	29	43.7	1.6	$2.0\cdot10^{-15}$	6.0
1389	95–130 18:54	1	1	101	6	21	1	10	15	15	1	1	56	31	1	0	0	0	1	3	1.49834	347.5	42.1	11965.6	70	121	14	10.4	1.9	$1.1\cdot10^{-12}$	10.5
1390	95–132 10:27	3	4	29	24	30	13	6	4	5	0	1	47	0	1	0	0	0	1	3	1.50644	347.8	43.1	11973.5	329	243	45	38.7	1.6	$8.4\cdot10^{-13}$	6.0
1391	95–133 22:21	0	1	92	5	5	0	10	15	15	1	0	43	30	1	0	0	0	1	3	1.51404	348.2	44.0	11980.9	58	131	24	10.4	1.9	$9.3\cdot10^{-14}$	10.5
1392	95–134 08:37	0	1	167	1	4	0	15	10	10	0	0	0	0	1	0	0	0	1	3	1.51596	348.3	44.3	11982.8	164	53	−59	11.8	11.8	$3.0\cdot10^{-14}$	5858.3
1393	95–136 21:13	0	1	187	1	9	0	15	14	15	1	0	47	31	1	0	0	0	1	3	1.52961	348.9	45.8	11996.2	192	355	−59	11.8	11.8	$7.3\cdot10^{-14}$	5858.3
1394	95–139 08:14	0	1	185	6	6	0	7	15	15	1	0	0	0	1	0	0	0	1	3	1.54226	349.5	47.2	12008.6	190	2	−59	34.1	1.9	$2.7\cdot10^{-15}$	10.5
1395	95–139 11:09	0	1	43	4	6	0	9	10	9	0	0	0	0	1	0	0	0	1	3	1.54293	349.5	47.3	12009.2	350	218	50	19.3	1.6	$1.5\cdot10^{-14}$	6.0
1396	95–141 03:32	0	1	140	7	12	0	8	7	7	0	0	7	26	1	0	0	0	1	3	1.55244	349.9	48.3	12018.6	127	95	−32	34.6	1.6	$8.8\cdot10^{-15}$	6.0
1397	95–141 09:49	0	1	121	3	7	0	8	8	9	0	0	9	26	1	0	0	0	1	3	1.55381	350.0	48.5	12019.9	100	112	−10	28.0	1.6	$3.7\cdot10^{-15}$	6.0
1398	95–142 18:17	0	2	204	10	7	0	7	15	15	1	0	39	30	1	0	0	0	1	3	1.56140	350.4	49.3	12027.4	217	328	−43	34.1	1.9	$6.4\cdot10^{-15}$	10.5
1399	95–144 22:04	0	1	224	5	9	0	8	8	8	0	0	2	26	1	0	0	0	1	3	1.57329	350.9	50.5	12039.1	246	308	−21	28.0	1.6	$7.4\cdot10^{-15}$	6.0
1400	95–154 09:51	3	3	83	21	27	7	8	6	6	0	1	47	0	1	0	0	0	1	3	1.62876	353.7	55.5	12094.6	50	158	25	19.5	1.6	$4.0\cdot10^{-12}$	6.0
1401	95–154 15:30	0	1	193	5	9	0	8	7	8	0	0	2	26	1	0	0	0	1	3	1.63026	353.8	55.7	12096.1	204	358	−46	34.6	1.6	$3.8\cdot10^{-15}$	6.0
1402	95–156 01:53	0	1	223	3	2	0	8	15	15	1	0	3	27	1	0	0	0	1	3	1.63858	354.3	56.4	12104.6	247	319	−19	21.4	1.9	$4.6\cdot10^{-15}$	10.5
1403	95–162 03:26	0	1	228	5	6	0	11	15	15	1	0	43	30	1	0	0	0	1	3	1.67641	356.4	59.4	12143.5	256	318	−13	7.8	1.9	$2.4\cdot10^{-13}$	10.5
1404	95–164 03:19	3	2	195	11	19	7	7	7	6	0	1	38	0	1	0	0	0	1	3	1.68901	357.02	60.3	12156.7	209	3	−40	34.1	1.9	$3.3\cdot10^{-14}$	10.5
1405	95–167 22:23	0	1	156	1	8	0	15	15	15	1	0	47	31	1	0	0	0	1	3	1.71293	358.7	62.0	12181.9	156	81	−41	11.8	11.8	$6.1\cdot10^{-14}$	5858.3
1406	95–170 09:59	0	1	187	3	2	0	8	15	15	1	0	2	31	1	0	0	0	1	3	1.72908	359.8	63.2	12199.2	200	23	−41	21.4	1.9	$4.6\cdot10^{-15}$	10.5
1407	95–181 01:05	0	1	2	6	11	0	7	7	7	0	0	0	0	1	0	0	0	1	3	1.79926	5.2	67.5	12276.4	303	302	15	43.7	1.6	$2.3\cdot10^{-15}$	6.0
1408	95–181 21:10	0	1	115	3	6	0	9	8	9	0	0	0	0	1	0	0	0	1	3	1.80514	5.7	67.9	12283.0	103	146	−10	22.7	1.6	$6.6\cdot10^{-15}$	6.0
1409	95–183 00:17	0	2	236	9	13	0	7	7	6	0	0	2	27	1	0	0	0	1	3	1.81271	6.4	68.3	12291.6	273	329	−1	43.7	1.6	$5.4\cdot10^{-15}$	6.0
1410	95–184 13:36	3	1	127	7	12	17	7	8	6	0	1	2	26	1	0	0	0	1	3	1.82285	7.3	68.9	12303.2	121	133	−20	35.4	1.6	$8.1\cdot10^{-15}$	6.0
1411	95–186 14:57	3	1	217	2	5	3	15	8	10	0	1	2	26	1	0	0	0	1	3	1.83642	8.6	69.6	12318.8	248	355	−15	36.7	2.0	$9.0\cdot10^{-16}$	12.5
1412	95–192 23:17	3	2	115	10	14	9	7	7	6	0	1	36	0	1	0	0	0	1	3	1.88004	13.2	71.8	12369.9	107	155	−12	43.7	1.6	$7.5\cdot10^{-15}$	6.0
1413	95–199 11:31	3	3	74	19	23	12	8	9	6	0	1	40	0	1	0	0	0	1	3	1.92501	18.8	73.8	12424.2	52	211	14	14.5	1.6	$3.8\cdot10^{-12}$	6.0
1414	95–200 06:05	0	1	38	7	5	0	7	15	0	1	0	43	30	1	0	0	0	1	3	1.93109	19.7	74.0	12431.6	2	264	26	34.1	1.9	$2.7\cdot10^{-15}$	10.5
1415	95–201 10:29	0	1	184	5	4	0	9	15	0	1	0	46	30	1	0	0	0	1	3	1.93893	20.8	74.3	12441.3	208	55	−30	14.1	1.9	$3.8\cdot10^{-14}$	10.5
1416	95–201 11:50	0	1	152	3	8	0	9	8	10	0	0	7	31	1	0	0	0	1	3	1.93893	20.8	74.3	12441.3	163	109	−33	22.7	1.6	$9.4\cdot10^{-15}$	6.0
1417	95–204 22:17	0	1	67	6	2	0	7	15	0	1	0	3	26	1	0	0	0	1	3	1.96337	24.4	75.3	12471.8	45	226	16	34.1	1.9	$1.5\cdot10^{-15}$	10.5
1418	95–206 07:19	1	1	117	2	1	1	15	15	15	1	1	4	17	1	0	0	0	1	3	1.97300	25.9	75.6	12483.9	116	164	−16	11.8	11.8	$2.4\cdot10^{-14}$	5858.3
1419	95–209 11:13	1	3	57	21	21	6	6	9	15	1	1	47	4	1	0	0	0	1	3	1.99492	29.6	76.3	12511.9	32	244	20	21.4	1.9	$1.0\cdot10^{-12}$	10.5
1420	95–209 23:26	0	2	8	8	12	0	7	7	6	0	0	0	0	1	0	0	0	1	3	1.99843	30.2	76.4	12516.4	324	318	18	43.7	1.6	$4.0\cdot10^{-15}$	6.0
1421	95–211 09:05	0	1	127	4	2	0	8	15	0	1	0	0	0	1	0	0	0	1	3	2.00898	32.1	76.7	12530.1	132	155	−22	21.4	1.9	$5.4\cdot10^{-15}$	10.5
1422	95–213 04:07	0	2	133	12	11	0	10	15	0	1	0	8	30	1	0	0	0	1	3	2.02042	34.3	77.1	12544.9	141	148	−26	10.4	1.9	$8.6\cdot10^{-13}$	10.5
1423	95–215 23:45	0	2	197	8	9	0	7	15	15	1	0	1	30	1	0	0	0	1	3	2.04069	38.2	77.6	12571.6	231	49	−21	34.1	1.9	$6.8\cdot10^{-15}$	10.5
1424	95–216 00:51	0	1	10	1	2	0	15	12	15	1	0	0	0	1	0	0	0	1	3	2.04157	38.4	77.6	12572.8	329	320	19	11.8	11.8	$2.3\cdot10^{-14}$	5858.3
1425	95–218 16:24	0	2	224	8	12	0	8	7	7	0	0	0	0	1	0	0	0	1	3	2.06010	42.2	78.0	12597.5	270	17	−3	34.6	1.6	$1.1\cdot10^{-14}$	6.0
1426	95–218 19:50	3	2	98	15	22	9	8	7	6	0	1	41	0	1	0	0	0	1	3	2.06099	42.4	78.0	12598.7	93	200	−5	21.4	1.9	$5.4\cdot10^{-13}$	10.5
1427	95–222 06:58	0	2	125	10	14	0	7	7	7	0	0	37	0	1	0	0	0	1	3	2.08573	47.7	78.5	12632.1	132	168	−22	43.7	1.6	$7.5\cdot10^{-15}$	6.0
1428	95–223 04:56	0	1	108	4	9	0	7	7	8	0	0	0	0	1	0	0	0	1	3	2.09192	49.1	78.6	12640.6	108	191	−12	43.7	1.6	$1.2\cdot10^{-15}$	6.0
1429	95–225 02:52	0	1	164	6	10	0	7	7	7	0	0	0	0	1	0	0	0	1	3	2.10519	52.1	78.7	12658.8	187	109	−32	43.7	1.6	$2.0\cdot10^{-15}$	6.0
1430	95–226 07:22	0	1	38	4	9	0	8	7	8	0	0	0	0	1	0	0	0	1	3	2.11404	54.1	78.8	12671.1	10	287	23	34.6	1.6	$3.2\cdot10^{-15}$	6.0
1431	95–227 00:57	0	1	128	1	7	0	15	7	11	1	0	63	24	1	0	0	0	1	3	2.11935	55.4	78.9	12678.4	137	168	−24	56.0	2.0	$1.8\cdot10^{-16}$	12.5
1432	95–228 04:20	0	1	187	2	6	0	15	8	10	0	0	0	0	1	0	0	0	1	3	2.12731	57.2	79.0	12689.6	220	75	−25	36.7	2.0	$1.1\cdot10^{-15}$	12.5
1433	95–230 09:52	0	1	111	2	6	0	15	8	10	0	0	0	0	1	0	0	0	1	3	2.14324	60.9	79.1	12712.0	114	194	−14	36.7	2.0	$1.1\cdot10^{-15}$	12.5
1434	95–232 01:05	0	2	78	12	12	0	8	7	0	1	0	46	3	1	0	0	0	1	3	2.15475	63.6	79.1	12728.3	67	237	6	21.4	1.9	$1.1\cdot10^{-13}$	10.5
1435	95–235 12:40	0	1	183	6	11	0	7	7	7	0	0	0	0	1	0	0	0	1	3	2.17953	69.3	79.1	12763.9	215	88	−27	43.7	1.6	$2.3\cdot10^{-15}$	6.0

1436	95–238 09:48	0	1	109	2	6	0	15	8	10	0	0	0	0	1	0	0	0	1	3	2.19988	73.8	79.1	12793.5	111	205	−13	36.7	2.0	$1.1 \cdot 10^{-15}$	12.5
1437	95–240 19:35	0	1	130	2	5	0	9	15	15	1	0	40	30	1	0	0	0	1	3	2.21668	77.5	79.0	12818.2	141	178	−26	2.3	2.0	$7.4 \cdot 10^{-12}$	12.5
1438	95–241 10:59	0	1	119	1	5	0	15	8	8	0	0	38	2	1	0	0	0	1	3	2.22110	78.4	78.9	12824.8	125	194	−20	36.7	2.0	$7.4 \cdot 10^{-16}$	12.5
1439	95–243 06:12	1	1	76	7	5	8	11	15	0	1	1	13	30	1	0	0	0	1	3	2.23435	81.2	78.8	12844.5	65	252	7	7.8	1.9	$2.9 \cdot 10^{-13}$	10.5
1440	95–245 19:13	0	1	145	6	11	0	8	8	7	0	0	0	0	1	0	0	0	1	3	2.25201	84.7	78.6	12871.0	162	160	−31	28.0	1.6	$1.2 \cdot 10^{-14}$	6.0
1441	95–246 22:43	1	5	141	55	49	31	14	6	0	1	1	27	2	1	0	0	0	1	3	2.25995	86.3	78.5	12883.1	156	169	−30	2.0	1.9	$2.7 \cdot 10^{-07}$	10.5
1442	95–250 09:51	0	1	145	5	10	0	8	8	8	0	0	5	26	1	0	0	0	1	3	2.28462	90.8	78.2	12920.8	161	165	−31	28.0	1.6	$8.8 \cdot 10^{-15}$	6.0
1443	95–255 12:36	2	3	127	19	23	14	8	9	7	0	1	40	0	1	0	0	0	1	3	2.32069	96.8	77.6	12977.0	135	198	−24	14.5	1.6	$3.8 \cdot 10^{-12}$	6.0
1444	95–260 08:15	0	1	8	4	2	0	8	15	0	1	0	0	0	1	0	0	0	1	3	2.35401	101.7	76.9	13029.9	326	6	19	21.4	1.9	$5.4 \cdot 10^{-15}$	10.5
1445	95–260 18:57	3	3	96	22	28	9	8	6	5	0	1	47	0	1	0	0	0	1	3	2.35751	102.1	76.9	13035.5	90	243	−3	19.5	1.6	$5.6 \cdot 10^{-12}$	6.0
1446	95–262 23:29	1	3	69	23	21	15	8	14	15	1	1	46	31	1	0	0	0	1	3	2.37238	104.1	76.5	13059.5	51	280	13	10.4	1.9	$1.3 \cdot 10^{-11}$	10.5
1447	95–262 23:37	0	1	123	5	10	0	8	7	8	0	0	0	0	1	0	0	0	1	3	2.37238	104.1	76.5	13059.5	127	212	−21	34.6	1.6	$4.5 \cdot 10^{-15}$	6.0
1448	95–263 01:51	0	1	236	6	11	0	7	7	7	0	0	0	0	1	0	0	0	1	3	2.37325	104.2	76.5	13061.0	286	47	3	43.7	1.6	$2.3 \cdot 10^{-15}$	6.0
1449	95–264 04:11	0	1	187	4	9	0	8	8	9	0	0	4	26	1	0	0	0	1	3	2.38112	105.2	76.4	13073.7	217	111	−27	28.0	1.6	$6.2 \cdot 10^{-15}$	6.0
1450	95–266 19:06	3	2	160	15	22	11	7	6	6	0	1	42	0	1	0	0	0	1	3	2.39944	107.4	75.9	13103.7	178	156	−33	34.1	1.9	$1.1 \cdot 10^{-13}$	10.5
1451	95–270 05:58	0	1	88	6	11	0	8	7	7	0	0	0	0	1	0	0	0	1	3	2.42293	110.0	75.4	13142.6	75	262	3	34.6	1.6	$6.2 \cdot 10^{-15}$	6.0
1452	95–277 14:49	0	1	157	6	1	0	6	15	0	1	0	43	9	1	0	0	0	1	3	2.47405	114.8	74.2	13229.1	169	173	−33	43.5	1.9	$4.5 \cdot 10^{-16}$	10.5
1453	95–281 14:28	0	1	234	3	3	0	10	15	0	1	0	36	30	1	0	0	0	1	3	2.50163	117.1	73.5	13276.7	276	66	−1	10.4	1.9	$5.0 \cdot 10^{-14}$	10.5
1454	95–287 14:01	0	1	74	4	7	0	8	9	8	0	0	7	31	1	0	0	0	1	3	2.54280	120.1	72.4	13349.0	48	297	15	25.9	1.6	$5.7 \cdot 10^{-15}$	6.0
1455	95–292 20:18	0	2	179	8	7	0	7	15	0	1	0	47	31	0	0	0	0	1	3	2.57861	122.4	71.5	13413.3	192	155	−32	34.1	1.9	$4.7 \cdot 10^{-15}$	10.5
1456	95–295 06:19	0	1	224	4	8	0	8	8	9	0	0	4	31	1	0	0	0	1	3	2.59559	123.4	71.1	13444.1	254	91	−11	28.0	1.6	$5.2 \cdot 10^{-15}$	6.0
1457	95–295 07:50	3	3	161	21	28	19	7	5	5	0	1	47	0	1	0	0	0	1	3	2.59559	123.4	71.1	13444.1	166	186	−32	14.1	1.9	$1.5 \cdot 10^{-11}$	10.5
1458	95–295 15:49	3	3	151	20	26	11	5	6	5	0	1	45	0	1	0	0	0	1	3	2.59813	123.5	71.0	13448.8	152	203	−29	35.4	1.6	$3.3 \cdot 10^{-13}$	6.0
1459	95–296 04:38	0	1	24	7	11	0	7	7	7	0	0	0	0	1	0	0	0	1	3	2.60152	123.7	70.9	13455.0	333	20	21	43.7	1.6	$2.9 \cdot 10^{-15}$	6.0
1460	95–301 04:17	0	1	159	2	2	0	15	1	0	1	0	47	12	1	0	0	0	1	3	2.63531	125.5	70.1	13517.3	160	196	−31	11.8	11.8	$2.8 \cdot 10^{-14}$	5858.3
1461	95–302 21:28	0	1	27	1	3	0	15	15	12	0	0	4	25	1	0	0	0	1	3	2.64709	126.1	69.8	13539.3	333	22	20	11.8	11.8	$2.6 \cdot 10^{-14}$	5858.3
1462	95–304 07:23	0	1	177	3	11	0	9	6	14	0	0	43	1	1	0	0	0	1	3	2.65632	126.5	69.5	13556.7	183	169	−33	14.1	1.9	$9.5 \cdot 10^{-14}$	10.5
1463	95–310 09:16	0	1	163	6	11	0	7	7	7	0	0	10	31	1	0	0	0	1	3	2.69728	128.3	68.5	13634.5	159	200	−30	43.7	1.6	$2.3 \cdot 10^{-15}$	6.0
1464	95–313 18:47	0	1	240	4	8	0	8	8	8	0	0	0	0	1	0	0	0	1	3	2.71972	129.2	67.9	13677.8	265	89	−6	28.0	1.6	$5.2 \cdot 10^{-15}$	6.0
1465	95–315 18:29	0	1	177	5	1	0	8	15	15	1	0	0	0	1	0	0	0	1	3	2.73297	129.8	67.6	13703.6	176	182	−32	21.4	1.9	$5.4 \cdot 10^{-15}$	10.5
1466	95–317 08:05	0	1	125	5	3	0	11	15	0	1	0	44	30	1	0	0	0	1	3	2.74289	130.1	67.3	13723.0	101	260	−9	7.8	1.9	$1.5 \cdot 10^{-13}$	10.5
1467	95–318 22:12	3	3	164	20	25	13	5	6	6	0	1	43	0	1	0	0	0	1	3	2.75361	130.5	67.0	13744.0	155	207	−29	35.4	1.6	$2.8 \cdot 10^{-13}$	6.0
1468	95–322 00:37	0	2	218	9	19	0	7	5	6	0	0	37	0	1	0	0	0	1	3	2.77416	131.2	66.5	13784.7	229	125	−21	34.1	1.9	$2.4 \cdot 10^{-14}$	10.5
1469	95–325 03:34	0	1	236	3	4	0	10	15	15	1	0	35	31	1	0	0	0	1	3	2.79463	131.9	66.0	13825.6	252	104	−12	10.4	1.9	$5.7 \cdot 10^{-14}$	10.5
1470	95–325 04:08	0	2	121	8	13	0	7	7	7	0	0	36	0	1	0	0	0	1	3	2.79463	131.9	66.0	13825.6	90	272	−3	43.7	1.6	$4.7 \cdot 10^{-15}$	6.0
1471	95–336 13:32	3	1	249	3	7	9	7	7	8	0	1	0	0	1	0	0	0	1	3	2.86840	134.1	64.2	13976.2	262	96	−7	43.7	1.6	$7.2 \cdot 10^{-16}$	6.0
1472	95–342 11:21	0	1	21	6	8	0	11	15	0	1	0	19	31	1	0	0	0	1	3	2.90605	135.1	63.3	14055.0	295	66	6	4.2	1.6	$2.8 \cdot 10^{-12}$	6.0
1473	95–347 05:06	0	1	139	5	3	0	10	15	0	1	0	40	31	1	0	0	0	1	3	2.93625	135.8	62.5	14119.1	98	266	−7	10.4	1.9	$6.9 \cdot 10^{-14}$	10.5
1474	95–349 04:45	3	3	150	21	27	23	5	5	5	0	1	47	0	1	0	0	0	1	3	2.94891	136.1	62.2	14146.2	110	255	−11	43.7	1.6	$1.9 \cdot 10^{-13}$	6.0
1475	95–353 13:46	0	1	219	7	14	0	7	6	9	0	0	29	0	1	0	0	0	1	3	2.97646	136.7	61.6	14205.8	202	155	−25	34.1	1.9	$1.3 \cdot 10^{-14}$	10.5
1476	95–355 15:17	0	2	190	9	9	0	7	15	0	1	0	60	31	1	0	0	0	1	3	2.98978	137.0	61.2	14234.8	161	202	−25	34.1	1.9	$7.8 \cdot 10^{-15}$	10.5
1477	95–362 01:08	0	1	179	5	4	0	9	15	0	1	0	44	30	1	0	0	0	1	3	3.02949	137.8	60.3	14322.3	137	225	−19	14.1	1.9	$3.8 \cdot 10^{-14}$	10.5

References

Baguhl, M., Grün, E., Linkert, D., Linkert, G., Siddique, N., 1993. Identification of 'small' dust impacts in the Ulysses dust detector data. Planet. Space Sci. 41, 1085–1098.

Baguhl, M., Grün, E., Hamilton, D.P., Linkert, G., Riemann, R., Staubach, P., Zook, H., 1995a. The flux of interstellar dust observed by Ulysses and Galileo. Space Sci. Rev. 72, 471–476.

Baguhl, M., Hamilton, D.P., Grün, E., Dermott, S., Fechtig, H., Hanner, M.S., Kissel, J., Lindblad, B.-A., Linkert, D., Linkert, G., Mann, I., McDonnell, J.A.M., Morfill, G.E., Polanskey, C., Riemann, R., Schwehm, G., Staubach, P., Zook, H., 1995b. Dust measurements at high ecliptic latitudes. Science 268, 1016–1019.

Baguhl, M., Grün, E., Landgraf, M., 1996. In situ measurements of interstellar dust with the Ulysses and Galileo spaceprobes. Space Sci Rev. 78, 165–172.

Divine, N., 1993. Five populations of interplanetary meteoroids. J. Geophys. Res. 98, 17,029–17,048.

Divine, N., Grün, E., Staubach, P., 1993. Modelling the meteoroid distributions in interplanetary space and near Earth. In: Flury, W. (Ed.). Proceedings of the First European Conference on Space Debris. Darmstadt, ESA SD-01, pp. 245–250.

Grün, E., 1994. Dust measurements in the outer solar system. In: Melani, A., Di Martino, M., Cellino, A. (Eds.). Asteroids, Comets, Meteors 1993. Kluwer Acad. Publ., pp. 367–380.

Grün, E., Fechtig, H., Hanner, M.S., Kissel, J., Lindblad, B.-A., Linkert, D., Linkert, G., Morfill, G.E., Zook, H.A., 1992a. The Galileo dust detector. Space Sci. Rev. 60, 317–340.

Grün, E., Fechtig, H., Giese, R.H., Kissel, J., Linkert, D., Maas, D., McDonnell, J.A.M., Morfill, G.E., Schwehm, G., Zook, H.A., 1992b. The Ulysses dust experiment. Astron. Astrophys. Suppl. Ser. 92, 411–423.

Grün, E., Baguhl, M., Fechtig, H., Hanner, M.S., Kissel, J., Lindblad, B.-A., Linkert, D., Linkert, G., Mann, I., McDonnell, J.A.M., Morfill, G.E., Polanskey, C., Riemann, R., Schwehm, G., Siddique, N., Zook, H.A., 1992c. Galileo and Ulysses dust measurements: From Venus to Jupiter. Geophys. Res. Letters 19, 1311–1314.

Grün, E., Zook, H.A., Baguhl, M., Fechtig, H., Hanner, M.S., Kissel, J., Lindblad, B.-A., Linkert, D., Linkert, G., Mann, I., McDonnell, J.A.M., Morfill, G.E., Polanskey, C., Riemann, R., Schwehm, G., Siddique, N., 1992d. Ulysses dust measurements near Jupiter. Science 257, 1550–1552.

Grün, E., Zook, H.A., Baguhl, M., Balogh, A., Bame, S.J., Fechtig, H., Forsyth, R., Hanner, M.S., Horanyi, M., Kissel, J., Lindblad, B.-A., Linkert, D., Linkert, G., Mann, I., McDonnell, J.A.M., Morfill, G.E., Phillips, J.L., Polanskey, C., Schwehm, G., Siddique, N., Staubach, P., Svestka, J., Taylor, A., 1993. Discovery of jovian dust streams and interstellar grains by the Ulysses spacecraft. Nature 362, 428–430.

Grün, E., Hamilton, D.P., Baguhl, M., Riemann, R., Horanyi, M., Polanskey, C., 1994a. Dust streams from comet Shoemaker-Levy 9? Geophys. Res. Lett. 21, 1035–1038.

Grün, E., Gustafson, B., Mann, I., Baguhl, M., Morfill, G.E., Staubach, P., Taylor, A., Zook, H.A., 1994b. Interstellar dust in the heliosphere. Astron. Astrophys. 286, 915–924.

Grün, E., Baguhl, M., Fechtig, H., Hamilton, D.P., Kissel, J., Linkert, D., Linkert, G., Riemann, R., 1995a (Paper I). Reduction of Galileo and Ulysses dust data. Planet. Space Sci. 43, 941–951.

Grün, E., Baguhl, M., Divine, N., Fechtig, H., Hamilton, D.P., Hanner, M.S., Kissel, J., Lindblad, B.-A., Linkert, D., Linkert, G., Mann, I., McDonnell, J.A.M., Morfill, G.E., Polanskey, C., Riemann, R., Schwehm, G., Siddique, N., Staubach, P., Zook, H.A., 1995b (Paper II). Three years of Galileo dust data. Planet. Space Sci. 43, 953–969.

Grün, E., Baguhl, M., Divine, N., Fechtig, H., Hamilton, D.P., Hanner, M.S., Kissel, J., Lindblad, B.-A., Linkert, D., Linkert, G., Mann, I., McDonnell, J.A.M., Morfill, G.E., Polanskey, C., Riemann, R., Schwehm, G., Siddique, N., Staubach, P., Zook, H.A., 1995c (Paper III). Two years of Ulysses dust data. Planet. Space Sci. 43, 971–999.

Grün, E., Staubach, P., 1996. Dynamic populations of dust in interplanetary space. In: Gustafson, B.A., Hanner, M.S. (Eds.). Physics, Chemistry and Dynamics of Interplanetary Dust. ASP Conference Series, vol. 104, pp. 3–14.

Grün, E., Baguhl, M., Hamilton, D.P., Riemann, R., Zook, H.A., Dermott, S., Fechtig, H., Gustafson, B.A., Hanner, M.S., Horányi, M., Khurana, K.K., Kissel, J., Kivelson, M., Lindblad, B.-A., Linkert, D., Linkert, G., Mann, I., McDonnell, J.A.M., Morfill, G.E., Polanskey, C., Schwehm, G., Srama, R., 1996. Constraints from Galileo observations on the origin of jovian dust streams. Nature 381, 395–398.

Grün, E., Staubach, P., Baguhl, M., Hamilton, D.P., Zook, H.A., Dermott, S., Gustafson, B.A., Fechtig, H., Kissel, J., Linkert, D., Linkert, G., Srama, R., Hanner, M.S., Polanskey, C., Horanyi, M., Lindblad, B.-A., Mann, I., McDonnell, J.A.M., Morfill, G.E., Schwehm, G., 1997. South-north and radial traverses through the zodiacal cloud. Icarus 129, 270–288.

Hamilton, D.P., Burns, J.A., 1992. Orbital stability zones about asteroids II. The destabilizing effects of eccentric orbits and of solar radiation. Icarus 96, 43–64.

Hamilton, D.P., Burns, J.A., 1993. Ejection of dust from Jupiter's gossamer ring. Nature 364, 695–699.

Hamilton, D.P., Grün, E., Baguhl, M., 1996. electromagnetic escape of dust from the Solar System. In: Gustafson, B.A., Hanner, M.S. (Eds.). Physics, Chemistry and Dynamics of Interplanetary Dust. ASP Conference Series, vol. 104, pp. 31–34.

Horanyi, M., Grün, E., Morfill, G.E., 1993a. Mechanism for the acceleration and ejection of dust grains from Jupiter's magnetosphere. Nature 363, 144–146.

Horanyi, M., Grün, E., Morfill, G.E., 1993b. The dusty ballerina skirt of Jupiter. J. Geophys. Res. 98, 21,245–21,251.

Krüger, H., Grün, E., Hamilton, D.P., Baguhl, M., Dermott, S., Fechtig, H., Gustafson, B.A., Hanner, M.S., Horányi, M., Kissel, J., Lindblad, B.-A., Linkert, D., Linkert, G., Mann, I., McDonnell, J.A.M., Morfill, G.E., Polanskey, C., Riemann, R., Schwehm, G., Srama, R., Zook, H.A., 1998 (Paper IV). Three years of Galileo dust data II: 1993 to 1995. Planet. Space. Sci.

Landgraf, M. 1998. Modellierung der Dynamik und Interpretation der In-Situ-Messung interstellaren Staubs in der lokalen Umgebung des Sonnensystems. Ph.D. thesis, University of Heidelberg.

Landgraf, M., Grün, E., 1998. In situ measurements of interstellar dust. In: Breitschwerdt, D., Freyberg, M.J., Trümper, J. (Eds.). Proceedings of the IAU Colloquium No. 166 on the Local Bubble and Beyond. Lecture Notes in Physics, vol. 506. Springer, Heidelberg, pp. 381–384.

Mann, I., Grün, E., Baguhl, M., Fechtig, H., Hanner, M.S., Kissel, J., Lindblad, B.-A., Linkert, D., McDonnell, J.A.M., Morfill, G.E., Polanskey, C., Riemann, R., Schwehm, G., Siddique, N., Zook, H.A., 1992. Measurements with the Ulysses and Galileo dust detectors close to the ecliptic. In: Proceedings of the 30th Liege international astrophysical colloquium 'Observations and physical properties of small solar system bodies', June 1992, Univ. de Liege, Institut d'Astrophysique, pp. 13–17.

Mann, I., Grün, E., 1993.

Mann, I., Grün, E., 1995. Dust particles beyond the asteroid belt—a study based on recent results of the Ulysses dust experiment. Planet. Space Sci. 43, 827–832.

Mann, I., Grün, E., Wilk, M., 1996a. The contribution of asteroid dust to the interplanetary dust cloud: The impact of Ulysses results on the understanding of dust production in the asteroid belt and the formation of the IRAS dust bands. Icarus 120, 399–407.

Mann, I., Wilk, M., Grün, E., 1996b. Analysis of Ulysses dust measurements within the asteroid belt. In: Gustafson, B.A., Hanner, M.S. (Eds.). Physics, Chemistry and Dynamics of Interplanetary Dust. ASP Conference Series, vol. 104, pp. 19–22.

Riemann, R., Grün, E., 1992. Meteor streams, asteroids and comets near the orbits of Galileo and Ulysses. In: McDonnell, J.A.M. (Ed.). Proceeding of the workshop on Hypervelocity Impacts in Space. University of Kent at Canterbury, pp. 120–125.

Stone, R.G., Bougeret, J.L., Caldwell, J., Canu, P., de Conchy, Y., Cornilleau-Wehrlin, N., Desch, M.D., Fainberg, J., Goetz, K., Goldstein, M.L., Harvey, C.C., Hoang, S., Howard, R., Kaiser, M.L., Kellogg, P., Klein, B., Knoll, R., Lecacheux, A., Langyel-Frey, D., MacDowall, R.J., Manning, R., Meetre, C.A., Meyeer, A., Monge, N., Monson, S., Nicol, G., Reiner, M.J., Steinbert, J.L., Torres, E., de Villedary, C., Wouters, F., Zarka, P., 1992. The unified radio and plasma wave investigation. Astron. Astrophys. Suppl. Ser. 92, 291–316.

Svestka, J., Auer, S., Baguhl, M., Grün, E., 1996. Measurements of dust electric charges by the Ulysses and Galileo dust detectors. In: Gustafson, B.A., Hanner, M.S., (Eds.). Physics, Chemistry and Dynamics of Interplanetary Dust. ASP Conference Series, vol. 104, pp. 31–34.

Taylor, A.D., McDonnell, J.A.M., Grün, E., 1996. Taurid complex meteoroids detected near aphelion with Ulysses. Adv. Space Res. 17 (12) 171–175.

Wenzel, K.P., Marsden, R.G., Page, D.E., Smith, E.J., 1992. The Ulysses mission. Astron. Astrophys. Suppl. Ser. 92, 207–219.

Witte, M., Banaszkiewicz, H., Rosenbauer, H., 1996. Recent results on the parameters of interstellar helium from the Ulysses/GAS experiment. Space Sci. Rev. 78, No. 1/2, 289–296.

Zook, H.A., Grün, E., Baguhl, M., Hamilton, D.P., Linkert, G., Liou, J.-C., Forsyth, R., Phillips, J.L., 1996. Solar wind magnetic field bending of jovian dust trajectories. Science 274, 1501–1503.