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Three years of *Galileo* dust data

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Abstract. From its launch in October 1989 until the end of 1992, the *Galileo* spacecraft traversed interplanetary space from Venus to the asteroid belt and successfully executed close flybys of Venus, the Earth, and the asteroid Gaspra. The dust instrument has been operating most of the time since it was switched on in December 1989. Except for short time intervals near Earth, data from the instrument were received via occasional (once per week to once per month) memory read outs containing 282–818 bytes of data. All events (impacts or noise events) were classified by an onboard program into 24 categories. Over the three-year time span, the dust detector recorded 469 "big" dust impacts. These were counted in 21 of the 24 event categories. The three remaining categories of very low amplitude events contain mostly noise events. The impact rate varied from 0.2 to 2 impacts per day depending on heliocentric distance and direction of spacecraft motion with respect to the interplanetary dust cloud. Because the average data transmission rate was very low, some data were not received on the ground. Complete data sets for 358 "big" impacts were received, but the other 111 "big" impacts were only counted. The observed impact rates are compared with a model of the meteoroid complex.

Introduction

The *Galileo* Dust Detector System (DDS) and the twin sensor on board *Ulysses* are highly sensitive multi-coincidence impact ionization detectors which have been described in detail by Grün *et al.* (1992c, d). In addition, data from the *Galileo* dust experiment have been published at various stages of the mission. Initial measurements and instrument performance are presented by Grün *et al.* (1992a, b) and Baguhl *et al.* (1992). Grün *et al.* (1994) discuss the possibility that some dust impacts may have originated from comet Shoemaker–Levy 9. Detection of interstellar dust by the *Galileo* dust instrument is described by Baguhl *et al.* (1994). Dust measurements during flybys of comets and asteroids are considered by Riemann and Grün (1992) and Hamilton and Burns (1992). Divine (1993) used the first year and a half of *Galileo* data as input to his interplanetary meteoroid model.

This is the second paper in a three paper set dedicated to presenting both raw and reduced dust impact data for analysis by researchers external to the *Galileo* and *Ulysses* Dust Teams. Paper I (Grün *et al.*, 1995b) gives details on the reduction process of *Galileo* and *Ulysses* dust data and Paper III (Grün *et al.*, 1995a) contains the first two years of *Ulysses* dust data. The current paper presents *Galileo* dust impact data from December 1989 to the end of 1992. The main data products are a table of the impact rates of all "big" impacts and a table of both raw and reduced data of all "big" impacts received on the ground. The information presented in these three papers is equivalent to data which we are submitting to the various data archiving centers (Planetary Data System, NSSDC, etc.).

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Mission and instrument operations

During its initial phase the *Galileo* mission explored the solar system between Venus (0.7 AU) and the asteroid

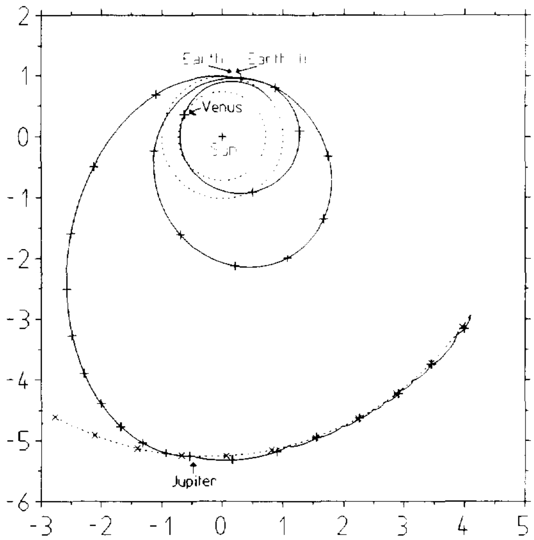

Fig. 1. Interplanetary trajectory of the *Galileo* spacecraft (solid) shown with the orbits of Venus, Earth and Jupiter (dashed). Planetary flybys are indicated and the tick marks correspond to 100 days of orbital motion

belt (2.3 AU); its orbit is shown in Fig. 1. Orbital elements, which match the actual *Galileo* interplanetary trajectory to an accuracy of 700,000 km, are provided in Table 1. After launch on October 18, 1989, *Galileo* flew to Venus which it passed on February 10, 1990. On December 8, 1990 *Galileo* swung by the Earth which sent it onto an orbit with an aphelion in the asteroid belt. After returning to Earth two years later, *Galileo* obtained enough energy to reach Jupiter in December 1995. The *Galileo* mission and spacecraft are described by Johnson *et al.* (1992) and D'Amario *et al.* (1992). The *Galileo* spacecraft is a dual-spinning spacecraft with its antenna pointed antiparallel to the spin vector. During most of the mission, the antenna pointed approximately towards the Sun; deviations from the Sun pointing are shown in Fig. 2. In 1991 and 1992, the spacecraft was repeatedly turned away from the Sun in efforts to cool, and thereby free, the spacecraft high gain antenna which failed to deploy in April 1991. Unfortunately, these attempts were unsuccessful.

The dust detector is mounted on the spinning section of the spacecraft and the sensor axis is offset by an angle of 55° with respect to the positive spin axis (opposite to the antenna direction). Because of the spacecraft spin and the 140° opening angle of the sensor, the dust detector is always able to sense particles that are within 15° of the positive spin axis. Over a complete rotation cycle, all angles within 125° of the spin axis are sampled. The rotation angle is defined as follows. First, project the dust detector axis onto a plane perpendicular to the spacecraft spin axis. The rotation angle (ROT) is measured in this plane with 0° defined as closest to ecliptic north. For both *Ulysses* and *Galileo*, 90° is close to the direction in which particles on prograde uninclined circular orbits move; with this pointing, the dust detectors are most sensitive to particles on retrograde orbits. During the initial portion of the mission there were rather long time periods when no sector (rotation angle) information was provided by the spacecraft to the instruments. Therefore, during these periods the direction of dust impacts could not be determined.

Table 1. Orbital elements of the *Galileo* trajectory from launch until the end of 1992 (1 AU = 149, 597, 871 km)

Orbital elements		Valid time range (error < 700,000 km)
Earth to Venus		
Epoch	1989 Nov. 9 16:30:56	
Perihelion	0.66769 AU	
Eccentricity	0.19775	1989–360 00:00
Inclination	4.3260	to
Long. of asc. node	24.70°	1990–041 00:00
Arg. of perihelion	184.80	
Mean anomaly	201.57°	
True anomaly	194.82	
Venus to Earth I		
Epoch	1990 Apr. 30 00:00:00	
Perihelion	0.69785 AU	
Eccentricity	0.29445	1990–041 00:00
Inclination	3.3818°	to
Long. of asc. node	75.89	1990–342 00:00
Arg. of perihelion	106.70°	
Mean anomaly	63.862	
True anomaly	97.819	
Earth I to Earth II		
Epoch	1991 Sep. 10 12:00:00	
Perihelion	0.90427 AU	
Eccentricity	0.43029	1990–342 00:00
Inclination	4.5473	to
Long. of asc. node	255.87	1992–344 00:00
Arg. of perihelion	223.14	
Mean anomaly	119.42	
True anomaly	151.68	
Post Earth II orbit		
Epoch	1992 Dec. 11 20:08:20	
Perihelion	0.98246 AU	
Eccentricity	0.68756	1992–344 00:00
Inclination	1.5228°	to
Long. of asc. node	255.91°	1992–365 00:00
Arg. of perihelion	186.49°	
Mean anomaly	359.73	
True anomaly	358.01°	

The *Galileo* spacecraft returns dust impact data in two ways. When the spacecraft is close enough to the Earth to support high data rates, data from the dust experiment are received nearly continuously at a rate of 24 bits per second as part of the Low Rate Science (LRS) telemetry. This LRS data were available during a four-day initial check-out period in December 1989 and during 2 two-month periods around both Earth flybys in December 1990 and December 1992. During the remainder of the time, data from the dust instrument were transmitted as instrument memory read-outs (MROs). The MROs returned event data which had accumulated over time in the instrument memory. The MROs were obtained during intervals of contact with the Deep Space Network (DNS), occurrences of which varied from once every few days to once per month. Initially, a MRO contained 14 instrument data frames (with each frame comprising the complete data set of an impact or noise event, consisting of 128 bits, plus ancillary and engineering data). In June 1990, the

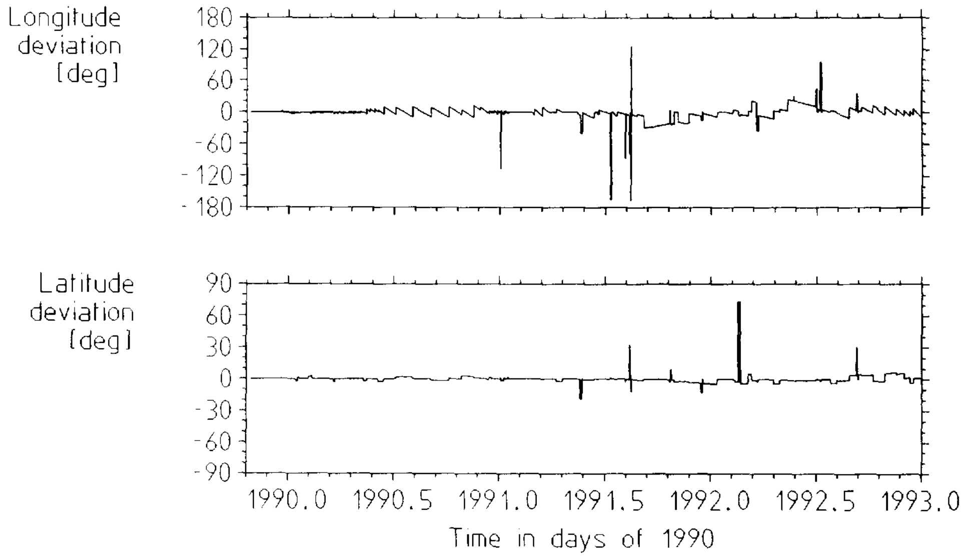

Fig. 2. Spacecraft attitude: deviation of the high gain antenna pointing (i.e. negative spin axis) from the Sun direction. The angles are given in a coordinate system referenced to the mean ecliptic and equinox of 1950.0

onboard program was changed to increase the size of a MRO from 14 to 40 instrument data frames.

Significant mission and dust instrument events are listed in Table 2. The dust instrument was switched on three weeks after launch, after which dust measurements and noise tests commenced. In initial noise tests, the dust instrument was set to its highest sensitivity state and the noise environment was characterized. During most of the remaining time, the instrument was kept in a state where approximately 10 clearly identifiable noise events occurred per day. During flybys of the Earth and Venus, however, noise rates were strongly enhanced (Baguhl *et al.*, 1992). Several anomalies on board the *Galileo* spacecraft caused the dust instrument to be unable to collect data for a total of 176 days.

The nominal channeltron high voltage (HV step 4 = 1250 V) could not be set because of unexpected noise which was also problematic for the *Ulysses* detector. It is assumed that the nearby radioactive thermal generators (RTGs) are responsible for this noise, although other reasons cannot be excluded. During ground tests (without RTGs) no such noise was observed.

Temporary noise sources with external causes include energetic particles from solar flares and from planetary radiation belts (Baguhl *et al.*, 1992, 1994). Figures 3a and b show the noise rate during each of the Earth flybys. High count rates (about 1 noise event per second) were encountered for about 30 min during the 1990 crossing of the radiation belts. As a consequence, during the second Earth encounter the sensitivity of the measurement channels was reduced by two steps for the 2 h around closest approach. Enhanced noise rates were recorded for more than 10 h around the 1992 closest approach and, despite the reduction in the sensitivity, significant noise was still recorded in the hour around closest approach. Examination of the data revealed that during both crossings of the Earth's radiation belts, noise events were recorded in low-amplitude event categories which normally contain only dust impacts.

With *Ulysses*, the time of an impact or noise event is recorded with a 2 s accuracy. *Galileo*, however, cannot always return such accurate timings because of its crippled antenna. During periods of low rate science transmission, the instrument time resolution was set to "short time" which is defined as 0.67 s. During periods of MRO transmission, however, the time resolution was changed to "long time" which was initially set to 1.1 h but redefined by the reprogramming in June 1990 to 4.3 h. The "long-time" mode is necessary when the interval between subsequent MROs is long (> 170 s; the memory location where the time is stored is an 8 bit word allowing the identification of only 256 unique times). The definition of long time was changed to the larger value in order to determine uniquely the time interval during which each impact occurred even if subsequent MROs are a month apart.

Impact events

All events, dust impacts and noise, are classified into one of 24 different categories (6 amplitude ranges and 4 event classes) and counted in 24 corresponding accumulators (Paper I). Most of the accumulators are relatively free from noise; except for extreme situations, such as radiation belt crossings, they count only real impacts. Only the low amplitude and class categories—AC01 (event class 0, amplitude range 1), AC11, and AC02—are strongly contaminated by noise. We call the dust particles detected in the noise-free accumulators "big" impacts. The search for an analysis of true "small" impacts in the noisy categories of *Galileo* events (cf. Baguhl *et al.* (1993) for *Ulysses* data) is forthcoming. The situation is more complicated than for *Ulysses* because many of the measurements in the noisy categories could not be transmitted to Earth before they were overwritten.

Table 3 displays the number of "big" dust impacts

Table 2. *Galileo* mission and dust detector (DDS) configurations, tests, and other events

Yr-DOY	Date	Time	Event
89-291	(18 Oct. 1989)		*Galileo* launch
89-361	(27 Dec. 1989)	19:18	DDS cover release
89-362	(28 Dec. 1989)	17:20	*Galileo* LRS start
89-362	(28 Dec. 1989)	17:20	DDS on, noise test and configuration: HV = 4, EVD = C, I, E, SSEN = 0, 0, 0, 0, short time
89-363	(29 Dec. 1989)	01:02	DDS noise test and configuration: HV = 2
89-363	(29 Dec. 1989)	19:32	DDS configuration: EVD = C, I
89-364	(30 Dec. 1989)	17:45	DDS configuration: EVD = I, E, SSEN = 0, 0, 1, 0, long time
89-365	(31 Dec. 1989)	00:05	DDS configuration: EVD = I
89-365	(31 Dec. 1989)	00:30	*Galileo* LRS end
90-009	(9 Jan. 1990)	00:20	DDS first MRO after LRS
90-041	(10 Feb. 1990)	05:59	*Galileo* Venus flyby
90-047	(16 Feb. 1990)	22:11	DDS configuration: SSEN = 1, 0, 1, 0
90-176	(25 June 1990)	14:45	DDS reprogramming
90-306	(5 Nov. 1990)	17:00	*Galileo* LRS start
90-312	(8 Nov. 1990)	17:30	DDS noise test and configuration: SSEN = 1, 0, 1, 1, short time
90-316	(12 Nov. 1990)	17:30	DDS noise test and configuration: EVD = I
90-318	(14 Nov. 1990)	17:30	DDS noise test
90-319	(15 Nov. 1990)	19:30	DDS noise test
90-342	(8 Dec. 1990)	20:34	*Galileo* first Earth flyby
90-346	(11 Dec. 1990)	17:30	DDS noise test
90-347	(12 Dec. 1990)	22:05	DDS configuration: EVD = C, I, SSEN = 0, 0, 1, 1
90-349	(14 Dec. 1990)	22:00	DDS configuration: long time
90-365	(31 Dec. 1990)	18:00	*Galileo* LRS end
91-121	(1 May 1991)	16:35	DDS last MRO before anomaly
91-123	(3 May 1991)	05:26	*Galileo* in safe mode and DDS memory corrupted
91-190	(9 July 1991)	19:50	DDS off
91-198	(17 July 1991)	17:00	DDS on and configuration: HV = 2, EVD = C, I, SSEN = 0, 0, 1, 1, long time
91-201	(20 July 1991)	02:09	*Galileo* in safe mode and DDS memory corrupted
91-217	(13 Aug. 1991)	09:45	DDS off
91-228	(16 Aug. 1991)	01:20	DDS on and configuration: HV = 2, EVD = C, I, SSEN = 0, 0, 1, 1, long time
91-302	(30 Oct. 1991)	22:37	*Galileo* Gaspra flyby
91-337	(3 Dec. 1991)	21:01	DDS last MRO before switch-off
91-340	(6 Dec. 1991)	22:30	DDS off, *Galileo* cold turn
91-350	(16 Dec. 1991)	22:00	DDS on and configuration: HV = 2, EVD = C, I, SSEN = 0, 0, 1, 1, long time
92-023	(23 Jan. 1992)	19:45	DDS last MRO before switch-off
92-028	(28 Jan. 1992)	22:30	DDS off, *Galileo* cold turn
92-065	(5 Mar. 1992)	07:50	DDS on and configuration: HV = 2, EVD = C, I, SSEN = 0, 0, 1, 1, long time
92-092	(2 Apr. 1992)	18:49	DDS last MRO before switch-off
92-097	(6 Apr. 1992)	23:00	DDS off, *Galileo* cold turn
92-107	(16 Apr. 1992)	18:05	DDS on and configuration: HV = 2, EVD = C, I, SSEN = 0, 0, 1, 1, long time
92-308	(3 Nov. 1992)	00:48	*Galileo* LRS start
92-310	(5 Nov. 1992)	07:04	DDS configuration: short time
92-328	(23 Nov. 1992)	17:00	DDS noise test
92-336	(1 Dec. 1992)	16:30	DDS noise test
92-338	(3 Dec. 1992)	16:00	DDS noise test
92-339	(4 Dec. 1992)	16:30	DDS noise test
92-343	(8 Dec. 1992)	14:09	DDS configuration, HV = 1, EVD = I, SSEN = 2, 0, 2, 2
92-343	(8 Dec. 1992)	15:09	*Galileo* second Earth flyby
92-343	(8 Dec. 1992)	16:09	DDS configuration, HV = 2, EVD = C, I, SSEN = 0, 0, 1, 1
92-349	(14 Dec. 1992)	11:00	DDS configuration: long time
92-354	(19 Dec. 1992)	02:39	*Galileo* LRS end

Abbreviations used to describe the instrument configuration: LRS, data transmission in Low Rate Science format; MRO, DDS memory read-out; HV, channeltron high voltage step; EVD, event definition, ion- (I), channeltron- (C), or electron-channel (E); SSEN, detection thresholds ICP, CCP, ECP, and PCP; short time, time resolution 2/3 s; long time, time resolution 1 h before 90-176, 4 h after 90-176.

recorded in intervals of seven days or longer, depending on the occurrence of MROs. When the frequency of MROs was higher or when no impact was recorded, MROs are lumped together. The instrument was shut down five times, sometimes intentionally to protect it from direct solar radiation during Sun-pointing periods and at other times when the data were corrupted unintentionally by spacecraft anomalies. These breaks are indicated as solid lines in Table 3. The largest gap appears between days 91–121 and 91–228: the instrument was switched off and on twice, but no useful data were recorded over the entire three and a half months. During the initial three

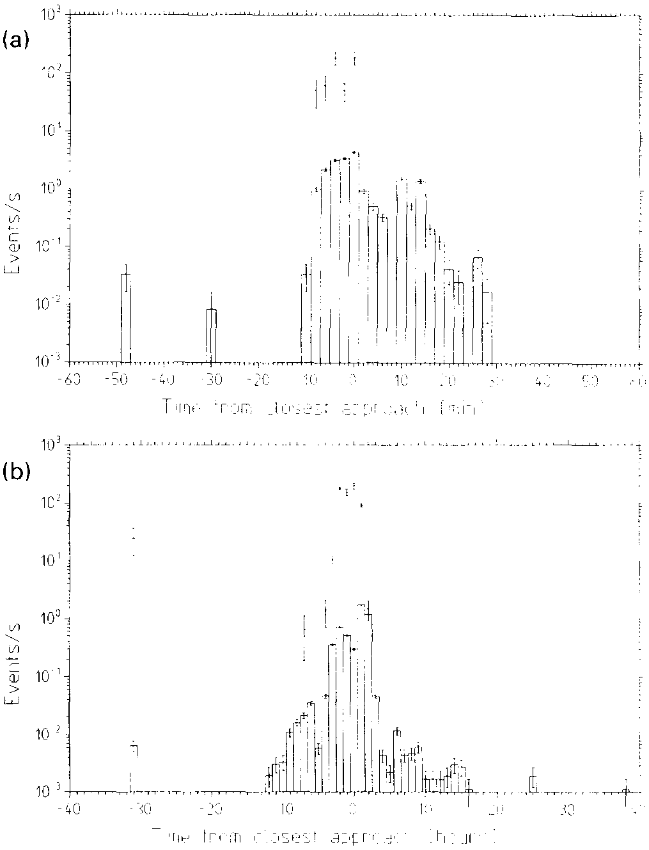

Fig. 3. Noise count rates during Earth flybys. Event counters (bars) saturate at about 20 events per second while the special noise counters saturate at about 200 events. (a) *Galileo* had its first close approach with the Earth on December 8, 1990 at 20.34 hours UT. Instrument threshold (ICP) was set to step one. The event counts were averaged over 2 min. (b) The second Earth flyby occurred on December 8, 1992, 15.09 hours. For 2 h around closest approach, the sensitivity threshold (ICP) was increased from step 0 to step 2

years of the *Galileo* mission, the instrument detected 469 "big" dust impacts. Since both the dust impact and noise rates were low during most of this period it is expected that, when the instrument was on, no "big" dust impacts were missed.

Radiation belts provide a noisy environment for the instrument. During the two Earth flybys, 528 clearly identified noise events were logged in normally noise-free categories. Here we give the accumulator name followed by the numbers of noise events detected during the 1990 and 1992 Earth encounters: AC21 (191/139), AC12 (74/66), AC22 (39/2), AC03 (0/10), AC13 (0/4), and AC23 (0/1). These events are not included in Table 3. The noise rate as a function of time during the two Earth flybys is given in Figs 3a and b. During several hours around Earth closest approaches, and in a much reduced manner during the Venus flyby, the increased noise rate caused significant dead-time.

Figure 4 shows the impact rate of dust particles recorded by the *Galileo* dust detector up until the end of 1992. At the same heliocentric distance, the impact rates were lower by about a factor ten when the spacecraft moved towards the Sun compared to the rates measured when it moved away from the Sun. This effect is due to

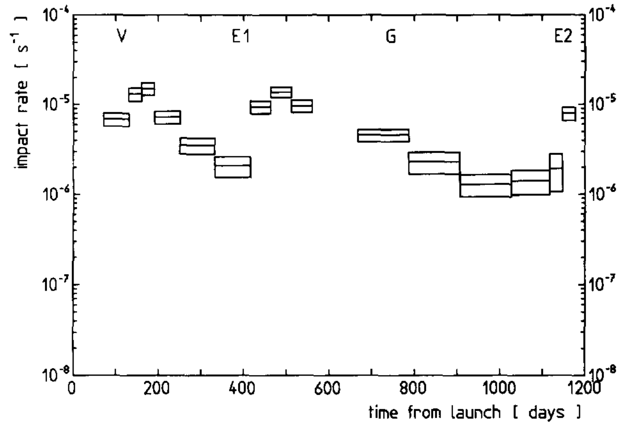

Fig. 4. Impact rates as a function of time are shown for "big" impacts. The thick bars give the average fluxes in the indicated intervals. The boxes indicate the 1-sigma error. Flybys of Venus (V), Earth (E1 and E2) and Gaspra (G) are indicated

the fact that the dust detector looks away from the Sun; when *Galileo* has a positive radial velocity, the instrument's field of view includes the ram direction. After both Earth flybys, the impact rate increased by about an order of magnitude for a similar reason. Each flyby increased *Galileo*'s radial velocity, thereby making the instrument more sensitive to dust on low eccentricity orbits. Finally, during the Gaspra flyby no enhancement above the average impact rate (0.3 per day) was observed in agreement with the prediction of Hamilton and Burns (1992).

With the help of the elaborate memory storage concept of the dust instrument, complete data for 358 impacts were received on the ground. In the original memory setup, only "class 3" events were stored in a safe portion of the memory that would not be overwritten by lower-class events. Because of the long time between subsequent MROs, however, about 50% of the data for impacts in other classes were being overwritten before they could be transmitted to ground. The problem was remedied in June 1990 when the instrument was reprogrammed with a new data storage and transmission scheme. The improvement allows us to store and subsequently transmit several events of all categories in a single MRO. In addition, the content of a MRO was increased by about a factor 3—with this scheme complete data of 95% of all recorded "big" impacts were received on the ground after June 1990.

A list of the 358 "big" impacts for which complete information exists is displayed in Table 4. Dust particles are identified by their sequence number and their impact time. The event category—class (CLN) and amplitude range (AR)—is also given. Raw data as received on ground are displayed next: sector value (SEC) at 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), and charge reading at the entrance grid (PA) as well as time (PET) between this signal and the impact. This is followed by instrument status information such as event definition (EVD), charge sensing thresholds (ICP, ECP, CCP, PCP) and channeltron high voltage step (HV, see Paper I for further explanations).

Orbital information follows next: heliocentric distance

Table 3. Overview of accumulated big impacts during the first three years of the *Galileo* mission. Switch-on of the instrument is indicated by horizontal lines. The heliocentric distances r, the lengths of the time intervals Δt (days) from the previous date, and the corresponding numbers of impacts are given for each of 21 accumulators. The accumulators are arranged in order of six increasing signal amplitudes (AR), with four event classes for each amplitude (CLN = 0, 1, 2, 3); e.g. AC31 means counter for AR = 1 and CLN = 3. The three accumulators that usually contain noise events are marked by "*". The totals of counted impacts, of impacts with complete data, and of all events (noise plus impact events) for the entire period are given as well

Date	Time	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
89-362	17:20	0.877	0.0																								
90-009	00:19	0.836	11.3	*	*	-	1	*	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	1	-	-
90-040	07:35	0.722	31.3	*	*	-	4	*	5	-	-	-	3	-	2	-	1	-	1	-	-	1	-	-	-	-	-
90-052	00:19	0.700	11.7	*	*	3	-	*	2	-	1	-	3	-	1	-	-	-	-	-	2	-	-	-	-	1	-
90-062	00:19	0.701	10.0	*	*	-	1	*	3	-	8	-	1	-	7	-	1	-	2	-	1	-	-	-	-	-	-
90-088	21:38	0.782	26.9	*	*	-	4	*	7	1	4	-	5	-	5	-	-	-	5	-	3	-	1	-	1	-	1
90-096	18:55	0.819	7.9	*	*	-	1	*	5	-	2	-	3	-	4	-	1	-	-	-	1	-	1	-	-	-	-
90-103	23:25	0.856	7.2	*	*	-	1	*	5	-	-	-	2	-	3	-	-	-	2	-	1	-	-	-	-	-	-
90-110	18:20	0.892	6.8	*	*	-	-	*	3	-	2	-	1	-	2	-	1	-	1	-	1	-	-	-	-	-	-
90-118	00:58	0.931	7.3	*	*	-	1	*	-	-	2	-	1	-	1	-	1	-	1	-	2	-	-	-	-	-	-
90-128	05:00	0.984	10.2	*	*	-	1	*	3	-	3	-	3	-	3	-	-	-	-	-	-	-	-	-	-	-	-
90-138	19:24	1.036	10.6	*	*	-	-	*	2	-	3	-	1	-	-	-	1	-	-	-	-	-	1	-	-	-	-
90-145	19:28	1.069	7.0	*	*	-	1	*	-	-	1	-	2	-	2	-	-	-	-	-	-	-	1	-	-	-	-
90-152	19:24	1.100	7.0	*	*	-	-	*	3	-	-	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
90-159	07:54	1.126	6.5	*	*	-	-	*	2	-	-	-	-	-	1	-	-	-	2	-	-	-	-	-	-	-	-
90-172	16:38	1.175	13.4	*	*	-	1	*	1	-	3	-	1	-	1	-	-	-	-	-	-	-	-	-	1	-	-
90-179	19:36	1.197	7.1	*	*	1	-	*	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
90-186	23:29	1.217	7.2	*	*	-	2	*	1	-	-	-	-	-	1	-	-	-	-	-	1	-	-	-	-	-	-
90-193	19:39	1.233	6.8	*	*	-	-	*	-	-	2	-	-	-	3	-	1	-	-	-	1	-	-	-	-	-	-
90-200	23:39	1.248	7.2	*	*	-	-	*	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
90-215	23:36	1.269	15.0	*	*	-	-	*	2	-	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-
90-232	17:49	1.279	16.8	*	*	-	-	*	1	-	1	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-
90-239	19:49	1.279	7.1	*	*	-	-	*	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90-247	17:59	1.276	7.9	*	*	-	1	*	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90-260	19:29	1.263	13.1	*	*	-	-	*	2	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
90-268	02:10	1.252	7.3	*	*	-	-	*	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90-274	20:29	1.239	6.8	*	*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1	-	-
90-281	18:59	1.223	6.9	*	*	-	-	*	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
90-291	21:14	1.196	10.1	*	*	-	1	*	-	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
90-299	17:29	1.171	7.8	*	*	-	-	*	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90-312	16:49	1.124	13.0	*	*	-	-	*	1	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90-342	00:16	0.989	29.3	*	*	-	1	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90-350	00:02	0.956	8.0	*	*	-	2	*	2	-	1	-	-	-	-	-	-	-	1	-	-	-	1	-	-	-	-
90-357	13:51	0.931	7.6	*	*	-	3	*	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90-365	17:06	0.913	8.1	*	*	-	1	*	1	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-

Table 3. (*Continued*)

Date	Time	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
91-007	18:43	0.906	7.1	*	*	-	-	*	2	-	1	-	-	-	3	-	1	-	-	-	-	-	-	-	1	-	-
91-014	18:09	0.906	7.0	*	*	-	-	*	-	-	-	-	4	-	1	-	-	-	-	-	-	-	-	-	-	-	-
91-021	19:09	0.913	7.0	*	*	-	2	*	1	-	1	-	-	-	1	-	-	-	-	-	-	-	-	-	1	-	-
91-028	17:25	0.928	6.9	*	*	-	2	*	1	-	1	-	1	-	-	-	-	-	1	-	1	-	-	-	1	-	-
91-035	17:24	0.949	7.0	*	*	-	1	*	-	-	2	-	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91-044	17:19	0.985	9.0	*	*	-	2	*	1	-	1	-	1	-	1	-	-	-	2	-	1	-	-	-	1	-	-
91-053	16:44	1.029	9.0	*	*	-	-	*	6	-	1	-	2	-	2	-	1	-	2	-	1	-	-	-	-	-	-
91-065	18:29	1.096	12.1	*	*	-	1	*	4	-	-	-	2	-	2	-	-	-	1	-	1	-	-	-	-	-	-
91-074	18:09	1.151	9.0	*	*	-	1	*	2	-	-	-	2	-	1	-	1	-	5	-	-	-	1	-	-	-	-
91-084	18:40	1.215	10.0	*	*	-	3	*	-	-	2	-	1	-	1	-	-	-	1	-	-	-	-	-	1	-	-
91-121	16:39	1.453	36.9	*	*	-	3	*	5	-	1	-	1	-	12	-	2	-	6	-	2	-	1	-	-	-	-
91-228	01:20	1.995	106.4																								
91-253	14:14	2.082	25.5	*	*	-	2	*	-	-	2	-	1	-	4	-	-	-	-	-	-	-	-	-	-	-	1
91-280	15:03	2.156	27.0	*	*	-	2	*	2	-	2	-	1	-	8	-	-	-	-	-	-	-	-	-	-	-	-
91-296	21:37	2.192	16.3	*	*	-	-	*	1	-	2	-	1	-	-	-	-	-	1	-	-	-	-	-	-	-	-
91-303	04:57	2.204	6.3	*	*	-	-	*	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91-316	00:02	2.225	12.8	*	*	-	-	*	1	-	2	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-
91-328	20:32	2.242	12.9	*	*	-	1	*	1	-	2	-	-	-	1	-	-	-	1	-	-	-	-	-	-	-	-
91-337	21:02	2.252	9.0	*	*	-	-	*	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
91-350	20:00	2.262	13.0																								
91-364	21:11	2.269	14.0	*	*	-	-	*	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92-013	19:31	2.270	13.9	*	*	-	1	*	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92-065	07:50	2.234	51.5																								
92-073	16:32	2.222	8.4	*	*	-	1	*	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92-092	19:50	2.188	19.1	*	*	-	2	*	1	-	1	-	-	-	-	-	-	-	2	-	-	-	-	-	-	-	-
92-107	18:05	2.155	14.9																								
92-114	21:59	2.137	7.2	*	*	-	-	*	-	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92-135	12:59	2.078	20.6	*	*	-	-	*	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92-155	18:50	2.010	20.2	*	*	-	-	*	-	-	-	-	1	-	-	-	-	-	2	-	-	-	-	-	-	-	-
92-177	19:14	1.923	22.0	*	*	-	-	*	1	-	-	-	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-
92-192	18:18	1.857	15.0	*	*	-	-	*	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92-215	20:04	1.744	23.1	*	*	-	-	*	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92-239	23:10	1.612	24.1	*	*	-	1	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
92-261	22:39	1.480	22.0	*	*	-	-	*	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	-	-	-	-
92-315	00:48	1.140	53.1	*	*	-	1	*	-	-	1	-	1	-	2	-	-	-	-	-	-	-	-	-	2	-	-
92-329	01:01	1.058	14.0	*	*	-	-	*	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1
92-343	15:10	0.984	14.6	*	*	-	-	*	1	-	-	-	-	-	1	-	1	-	2	-	-	-	-	-	1	-	-
92-353	00:00	0.984	9.4	*	*	-	-	*	1	1	-	-	-	-	-	-	1	-	1	-	-	-	-	-	-	-	1
92-363	16:09	1.007	10.7	*	*	-	2	*	1	-	1	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Impacts (counted)				*	*	4	55	*	92	2	73	0	53	0	83	0	14	0	46	0	21	1	8	0	12	1	4
Impacts (complete data)				*	*	0	49	*	49	0	71	0	26	0	76	0	11	0	43	0	9	0	8	0	12	1	3
All events (complete data)				3225	958	33	49	86	88	17	71	5	29	1	76	0	11	0	43	0	9	0	8	0	12	1	3

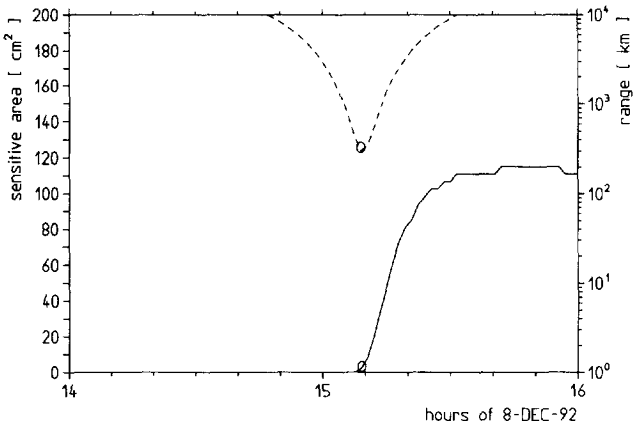

Fig. 5. Details of the second Earth flyby as a function of time. The distance from *Galileo* to Earth is given (dashed line) as is the area of the dust detector capable of detecting particles on circular prograde orbits about the Earth (solid line). A single dust particle was detected almost exactly at closest approach (open circles)

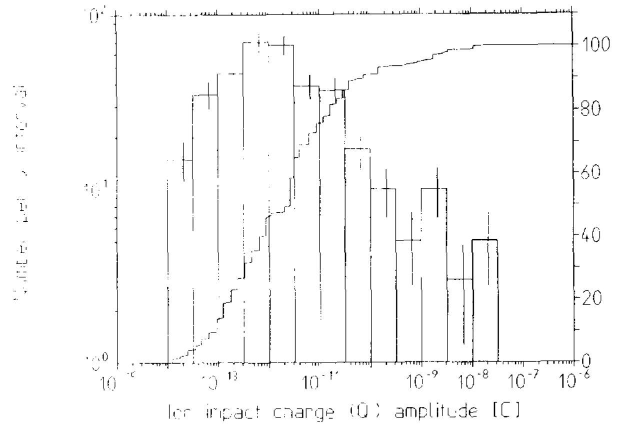

Fig. 6. Amplitude distribution of the impact charge Q_I. Bars indicate numbers of impacts per charge interval, while the solid line shows the cumulative distribution. This curve is significantly flatter than a similar one for *Ulysses* (Paper III, Fig. 4), implying that *Galileo* is sensing larger particles

(R in AU), ecliptic longitude and latitude (LON, LAT) and the distance to the Earth (R_E in AU). This is followed by the rotation angle (ROT), as defined above. Whenever this value is indeterminate (SEC = 0), ROT is arbitrarily set to 999. This occurs 71 times. Ecliptic longitude and latitude (S_LON, S_LAT) of the positive sensor axis pointing are displayed next. (When ROT is not valid, then S_LON and S_LAT cannot be used.) Mean impact speed (v) and speed error factor (VEF) as well as mean particle mass (m) and mass error factor (MEF) are presented last. We suggested that whenever VEF > 6, both speed and mass values should be discarded. This occurs for 21 impacts.

No intrinsic dust charge values are given because the noise rate was very high (Paper I). Furthermore, the signal amplitudes on the induced charge grid were similar for both noise and impact events. Therefore, reliable dust charge values are difficult to obtain and require careful study of the noise environment with the whole data set. This work is forthcoming.

During the second Earth flyby an impact of a "big" dust particle (No. 350) was recorded. This particle was detected at *Galileo*'s perigee 300 km above the Earth. It had a mass of 3×10^{-12} g and an impact speed of 33 km s^{-1}, which is compatible with a debris particle in a bound orbit about the Earth. No other debris particle was detected during this flyby. Figure 5 shows the sensitivity of the *Galileo* dust detector with respect to dust particles in prograde circular orbits around the Earth. Such particles are strongly concentrated at low altitudes and were nearly impossible to detect during the inbound trajectory of *Galileo*. No dust particles were detected during the previous flybys of Earth and Venus.

Analysis

In this section we will discuss various characteristics of the data set presented above. First we discuss the amplitude distribution of the impact charge. Then the in-flight channeltron amplification is determined. The derived mass and speed values are analyzed and finally the *Galileo* impact rates are compared with Divine's (1993) meteoroid model.

Because of its relative insensitivity to noise, the positive impact charge Q_I is the most important impact parameter determined by the *Galileo* dust detector. Figure 6 shows the distribution of the impact charge (Q_I) measured until the end of 1992. Impact charges are observed over the entire six orders of magnitude that the instrument is capable of measuring. About 2% of all impacts are close to the saturation limit and may constitute lower limits of the actual impact charges. Above about 10^{-12} C, the impact charge distribution closely follows a power law with index about $-1/3$ which is flatter than the $-1/2$ power law obeyed by *Ulysses* impacts (Paper III). This is a real effect which implies that, on average, *Galileo* is sensing larger particles than *Ulysses*. The number of impacts inducing charges below 10^{-12} C are reduced in Fig. 6; thus the low Q_I impacts are not complete. The same is true when one looks at the charge distribution of *Ulysses* "big" impacts (Paper III, Fig. 4).

Both *Galileo* and *Ulysses* instruments showed high noise levels for the channeltron detector, even at low channeltron amplifications. To improve the noise behavior, we used a lower high voltage value (and hence amplification) than originally planned. In this paragraph, we determine the in-flight channeltron amplification. A measure of the amplification is the ratio of the channeltron charge Q_C over the ion charge Q_I. This ratio is displayed in Fig. 7 as a function of the ion charge Q_I at high voltage step HV = 2 (1020 V). The sensitivity threshold and the saturation limit of the channeltron charge are given as solid diagonal lines. The mean charge ratio Q_C/Q_I (i.e. the channeltron amplification determined for $10^{-12}\ \mathrm{C} \leqslant Q_I \leqslant 10^{-10}$ C) at this high voltage is $A \sim 1.6$.

Masses and speeds of all "big" impacts recorded until the end of 1992 are displayed in Fig. 8. Speeds have been found over the entire calibration range from 2 to 70 km s^{-1} and the masses vary over 10 orders of magnitude from 10^{-16} to 10^{-6} g. The mean errors are a factor 2 for the speed and a factor 10 for the mass. The clustering of the speed values are due to the discrete steps in the rise time

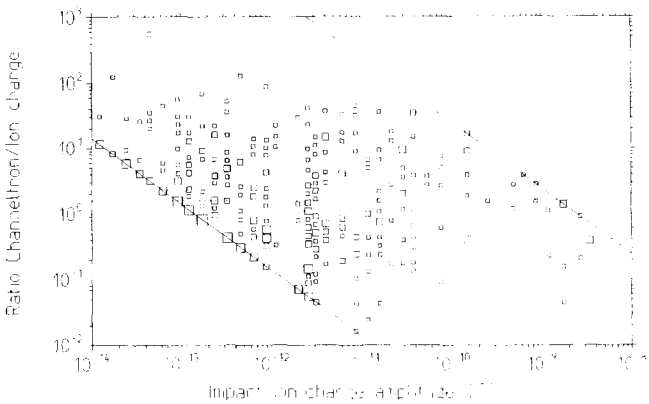

Fig. 7. Channeltron amplification factor $A = Q_C/Q_I$ as a function of impact charge Q_I for channeltron high voltage step 2 (1020 V). The area of the squares indicates the number of events included at each point

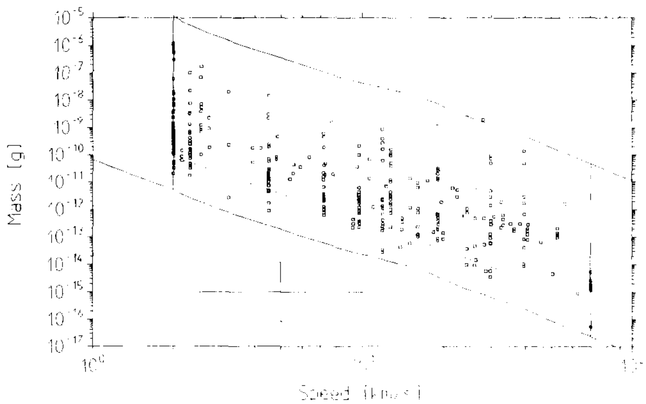

Fig. 8. Masses and impact speeds of all "big" impacts recorded by *Galileo*. The upper and lower solid lines indicate the threshold and saturation limits of the detector. The central dotted line is the effective mass threshold dividing "big" from "small" impacts for the *Ulysses* data. Applying the *Ulysses* result to the *Galileo* data set implies that the number of "big" impacts below this line should equal the number of "small" impacts above it (see Paper III)

measurement, but this quantization effect is much smaller than the uncertainty in the speed measurement. The large number of very low impact speeds (below 3 km s^{-1}) needs further study. The number of "big" impacts is incomplete in a band of width a factor one hundred in mass above the sensitivity threshold. Many of the "big" impacts (46%), however, occur in this band. Furthermore, the "small" impacts have yet to be recovered from the *Galileo* data. The effective mass thresholds for "big" impacts has been estimated for the more complete *Ulysses* data set (shown as the dotted line in Fig. 8). If we adopt the *Ulysses* results (cf. Paper III, Fig. 7), then the number of unseen "small" impacts above the dotted line should equal the number of detected "big" impacts below it. It should be remarked that this threshold for "big" impacts is rigorously valid only for the dust population (mass and speed distributions) recorded by the *Ulysses* dust detector. Therefore, by applying this threshold to the *Galileo* data it is assumed that the mass and speed distributions of the dust particles recorded by *Galileo* and *Ulysses* do not significantly differ. At masses $> 10^{-12}$ g, all "big" particles

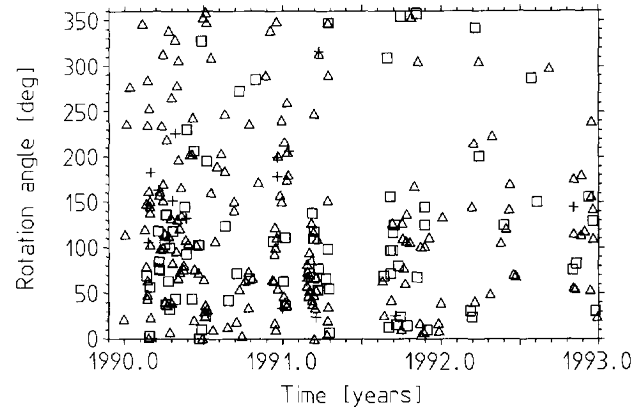

Fig. 9. Rotation angle vs time for two different mass ranges. Gaps in the data coverage show up as empty vertical bands. For some time periods no rotation angle information was available; these data are not shown. Symbols denote different mass–speed combinations. Squares and triangles are particles with masses $> 2.5 \times 10^{-14}$ g while impacts denoted by plus signs are smaller. Squares are fast particles with speeds > 15 km s^{-1}, whereas particles denoted by triangles are slower

except the slowest (< 6 km s^{-1}) can be detected. Particles with smaller masses will not be completely recorded because those with slower speeds fall below the detection threshold.

Directions of the recorded "big" impacts are shown in Fig. 9: the rotation angles at the time of impact are shown as functions of time. Meteoroids moving parallel to the ecliptic plane should have rotation angles around 90° and 270 (see the discussion of the rotation angle above). Beside some gaps in the data, there are times when rotation angles are uniformly distributed and other times when they cluster in a limited rotation angle interval. Uniform distribution of rotation angles can occur when dust particles arrive at the spacecraft isotropically (at least in the spin plane), when dust particles arrive from close to the spin axis, and for other more complicated distributions. For most of the times, rotation angles cluster around 90°. This effect is most obvious during the second half of 1991 and the beginning of 1992. Modeling the impact directions as a consequence of the orbital distribution of interplanetary dust particles is in preparation.

Figure 4 shows the observed impact rate variations with time. During inbound (towards the Sun) portions of the interplanetary trajectory the dust detector pointed to the hemisphere opposite to the spacecraft motion; thus impact velocities were reduced and the observed impact rate is correspondingly low. In contrast, during the outbound portions of the *Galileo* trajectory the sensor points towards the hemisphere which includes the spacecraft ram direction and hence the observed impact flux is high. The general decrease of the dust flux with heliocentric distance is due to the decrease of the interplanetary dust population with increasing distance from the Sun. This flux variation is quantitatively modeled by Divine's (1993) "Five populations of interplanetary meteoroids" model which is based on a variety of interplanetary dust observations including *Galileo* data from the first year (until the end of 1991). It is interesting to compare the impact rates observed by *Galileo* (Fig. 4) for the three-year period with

Table 4. Raw data: No., impact time, CLN, AR, SEC, IA, EA, CA, IT, ET, EIT, EIC, IIC, PA, PET, EVD, ICP, ECP, CCP, PCP, HV; and evaluated data: R, LON, LAT, R_E, 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	R_E	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
1	89-365 10:08	3	2	49	10	11	4	12	1	13	0	1	13	1	5	0	1	0	0	2	0.86721	96.2	4.1	0.14169	21	125	53	4.5	1.9	$7.5 \cdot 10^{-12}$	10.5
2	90-002 11:45	1	6	239	56	49	27	10	15	0	1	1	31	10	5	0	1	0	0	2	0.85992	98.7	4.1	0.14624	114	147	-16	4.5	1.9	$1.5 \cdot 10^{-08}$	10.5
3	90-005 14:10	3	1	152	2	3	1	15	15	14	0	1	7	31	5	0	1	0	0	2	0.84877	102.4	4.2	0.15373	236	51	-23	11.8	11.8	$3.4 \cdot 10^{-14}$	5858.3
4	90-012 09:01	3	3	123	19	1	1	10	15	8	0	1	9	3	5	0	1	0	0	2	0.82366	111.0	4.3	0.17362	277	53	8	4.5	1.9	$4.9 \cdot 10^{-12}$	10.5
5	90-017 12:55	3	1	0	7	20	5	4	4	15	0	1	17	1	5	0	1	0	0	2	0.80415	117.9	4.3	0.19276	999	999	999	70.0	1.9	$1.2 \cdot 10^{-15}$	10.5
6	90-019 09:07	3	4	0	24	30	9	4	2	5	0	1	46	0	5	0	1	0	0	2	0.79716	120.4	4.3	0.20055	999	999	999	52.6	1.6	$2.1 \cdot 10^{-13}$	6.0
7	90-021 08:34	3	3	0	18	7	9	15	3	15	0	1	7	2	5	0	1	0	0	2	0.78966	123.2	4.3	0.20951	999	999	999	11.8	11.8	$6.9 \cdot 10^{-13}$	5858.3
8	90-022 21:14	3	1	0	3	11	2	10	5	15	0	1	9	1	5	0	1	0	0	2	0.78388	125.4	4.2	0.21687	999	999	999	9.7	1.9	$2.3 \cdot 10^{-13}$	10.5
9	90-023 12:20	3	1	0	7	21	9	13	2	15	0	1	24	1	5	0	1	0	0	2	0.78151	126.3	4.2	0.22001	999	999	999	2.3	1.9	$1.7 \cdot 10^{-10}$	10.5
10	90-031 22:11	3	1	0	7	29	1	4	14	15	1	1	31	1	5	0	1	0	0	2	0.75047	139.0	3.9	0.26860	999	999	999	70.0	1.9	$5.3 \cdot 10^{-15}$	10.5
11	90-032 20:50	1	4	0	27	22	22	14	9	0	1	1	1	30	5	0	1	0	0	2	0.74711	140.5	3.9	0.27484	999	999	999	2.0	1.9	$6.4 \cdot 10^{-09}$	10.5
12	90-041 03:14	1	5	74	49	49	30	15	15	0	1	1	60	12	5	0	1	0	0	2	0.71923	154.1	3.3	0.33636	346	132	58	11.8	11.8	$2.7 \cdot 10^{-10}$	5858.3
13	90-047 17:49	2	6	235	56	55	31	12	10	5	0	1	31	0	5	0	1	0	0	2	0.70525	166.3	3.4	0.39864	120	216	-21	2.0	1.9	$7.8 \cdot 10^{-07}$	10.5
14	90-051 18:53	3	2	8	9	23	2	15	12	15	0	1	27	3	5	1	1	0	0	2	0.70048	174.0	3.3	0.43903	79	231	11	2.0	1.9	$5.9 \cdot 10^{-10}$	10.5
15	90-051 23:12	3	3	215	22	11	13	13	6	15	0	1	14	3	5	1	1	0	0	2	0.70034	174.4	3.3	0.44086	148	211	-40	2.0	1.9	$7.3 \cdot 10^{-10}$	10.5
16	90-052 06:45	3	4	15	28	30	17	8	1	5	0	1	58	0	5	1	1	0	0	2	0.70010	175.0	3.3	0.44407	69	230	19	26.1	2.4	$5.5 \cdot 10^{-12}$	23.7
17	90-053 09:43	3	3	118	22	49	8	15	15	14	0	1	31	3	5	1	1	0	0	2	0.69938	177.1	3.3	0.45557	284	121	13	2.0	1.9	$1.7 \cdot 10^{-08}$	10.5
18	90-053 10:47	3	2	218	11	14	5	4	8	15	0	1	28	8	5	1	1	0	0	2	0.69935	177.2	3.3	0.45603	143	214	-38	50.7	1.6	$4.7 \cdot 10^{-15}$	6.0
19	90-053 12:57	3	2	33	11	20	7	15	4	15	0	1	18	1	5	1	1	0	0	2	0.69931	177.4	3.3	0.45696	44	222	39	2.0	1.9	$4.8 \cdot 10^{-10}$	10.5
20	90-053 16:11	3	2	153	12	3	5	15	14	12	0	1	17	31	5	1	1	0	0	2	0.69924	177.6	3.3	0.45834	235	128	-25	2.0	1.9	$5.5 \cdot 10^{-11}$	10.5
21	90-054 07:17	3	4	30	25	31	25	7	3	5	0	1	47	0	5	1	1	0	0	2	0.69896	178.9	3.3	0.46483	48	228	36	12.7	1.9	$5.2 \cdot 10^{-11}$	10.5
22	90-054 15:55	1	4	19	30	49	28	10	5	0	1	1	23	10	5	1	1	0	0	2	0.69884	179.5	3.3	0.46855	63	232	24	4.5	1.9	$3.2 \cdot 10^{-09}$	10.5
23	90-056 02:25	3	1	245	7	4	1	7	12	14	0	1	54	31	5	1	1	0	0	2	0.69857	182.3	3.2	0.48347	105	237	-10	29.8	1.9	$3.8 \cdot 10^{-15}$	10.5
24	90-057 05:23	3	3	64	21	26	11	12	9	15	0	1	31	1	5	1	1	0	0	2	0.69862	184.5	3.2	0.49520	0	183	58	6.4	3.1	$8.2 \cdot 10^{-11}$	58.7
25	90-057 07:32	3	3	205	20	30	9	12	8	15	0	1	30	1	5	1	1	0	0	2	0.69863	184.6	3.2	0.49614	162	206	-47	2.0	1.9	$7.4 \cdot 10^{-09}$	10.5
26	90-057 16:10	3	2	140	8	8	9	11	2	15	0	1	9	3	5	1	1	0	0	2	0.69870	185.3	3.2	0.49991	253	130	-11	7.2	1.9	$7.5 \cdot 10^{-13}$	10.5
27	90-059 09:09	3	3	62	20	24	11	5	6	6	0	1	45	0	5	1	1	0	0	2	0.69934	188.6	3.1	0.51783	3	192	58	33.1	1.6	$2.9 \cdot 10^{-13}$	6.0
28	90-059 14:33	3	3	24	20	24	14	5	6	6	0	1	43	0	5	1	1	0	0	2	0.69946	189.0	3.1	0.52020	56	238	29	33.1	1.6	$2.9 \cdot 10^{-13}$	6.0
29	90-060 02:25	3	2	247	10	8	13	13	6	15	0	1	6	2	5	1	1	0	0	2	0.69977	190.0	3.1	0.52540	103	245	-8	2.3	1.9	$4.8 \cdot 10^{-11}$	10.5
30	90-060 03:29	3	2	217	12	22	1	13	4	14	0	1	31	0	5	1	1	0	0	2	0.69980	190.1	3.1	0.52587	145	229	-39	2.3	1.9	$4.3 \cdot 10^{-10}$	10.5
31	90-060 05:39	3	3	222	21	2	17	12	15	9	0	1	12	2	5	1	1	0	0	2	0.69986	190.3	3.1	0.52682	138	233	-34	2.0	1.9	$1.4 \cdot 10^{-10}$	10.5
32	90-060 13:12	3	3	213	19	22	12	9	12	7	0	1	33	0	5	1	1	0	0	2	0.70008	190.9	3.1	0.53013	150	224	-42	4.8	1.6	$8.1 \cdot 10^{-11}$	6.0
33	90-061 03:13	3	2	190	12	20	22	1	12	15	0	1	21	2	5	1	1	0	0	2	0.70054	192.0	3.0	0.53629	183	187	-51	70.0	1.9	$2.7 \cdot 10^{-15}$	10.5
34	90-061 22:38	3	2	48	8	9	3	13	14	7	0	1	33	0	5	1	1	0	0	2	0.70128	193.5	3.0	0.54481	23	225	52	2.3	1.9	$4.1 \cdot 10^{-11}$	10.5
35	90-078 11:31	3	1	204	5	8	1	8	9	10	0	1	1	31	5	1	1	0	0	2	0.73945	223.7	1.8	0.71390	163	242	-49	24.4	1.6	$1.0 \cdot 10^{-14}$	6.0
36	90-078 15:50	3	4	236	27	49	22	5	15	5	0	1	33	31	5	1	1	0	0	2	0.74008	224.0	1.8	0.71563	118	272	-21	29.8	1.9	$5.1 \cdot 10^{-12}$	10.5
37	90-080 18:32	3	3	4	23	28	28	4	4	6	0	1	47	0	5	1	1	0	0	2	0.74775	227.6	1.6	0.73569	84	284	5	52.6	1.6	$1.4 \cdot 10^{-13}$	6.0
38	90-081 03:09	3	4	9	28	49	21	6	15	5	0	1	47	0	5	1	1	0	0	2	0.74911	228.2	1.6	0.73905	77	284	11	19.0	1.9	$3.2 \cdot 10^{-11}$	10.5
39	90-082 05:02	3	5	10	49	52	27	15	5	5	0	1	31	0	5	1	1	0	0	2	0.75326	230.0	1.5	0.74906	76	284	12	56.0	2.0	$1.6 \cdot 10^{-12}$	12.5
40	90-082 11:31	1	6	208	56	57	31	13	4	0	1	1	31	5	5	1	1	0	0	2	0.75432	230.4	1.5	0.75154	158	257	-47	2.0	1.9	$1.2 \cdot 10^{-06}$	10.5
41	90-083 13:24	3	2	205	10	8	7	11	3	14	0	1	20	3	5	1	1	0	0	2	0.75862	232.2	1.4	0.76138	162	256	-49	7.2	1.9	$1.0 \cdot 10^{-12}$	10.5
42	90-084 00:11	3	2	250	13	5	4	12	3	15	0	1	11	3	5	1	1	0	0	2	0.76045	232.9	1.3	0.76543	98	287	-5	4.5	1.9	$4.5 \cdot 10^{-12}$	10.5
43	90-086 11:30	3	3	153	18	4	1	15	15	11	0	1	21	2	5	1	1	0	0	2	0.77084	236.9	1.1	0.78730	235	188	-26	11.8	11.8	$4.2 \cdot 10^{-13}$	5858.3
44	90-089 18:14	3	2	199	9	20	1	10	12	15	0	1	31	2	5	1	1	0	0	2	0.78543	241.9	0.8	0.81509	170	257	-52	9.7	1.9	$1.8 \cdot 10^{-12}$	10.5
45	90-089 21:28	3	1	249	5	7	1	13	15	12	0	1	2	23	5	1	1	0	0	2	0.78605	242.2	0.8	0.81621	100	298	-7	2.3	1.6	$1.8 \cdot 10^{-11}$	6.0
46	90-089 22:33	3	2	97	13	11	1	14	8	15	0	1	18	1	5	1	1	0	0	2	0.78626	242.2	0.8	0.81658	314	197	35	2.0	1.9	$2.4 \cdot 10^{-10}$	10.5
47	90-090 09:20	1	4	212	26	21	22	7	15	0	1	1	27	31	5	1	1	0	0	2	0.78833	242.9	0.8	0.82026	152	277	-45	12.7	1.9	$1.3 \cdot 10^{-11}$	10.5
48	90-093 12:50	3	5	238	49	53	29	15	11	5	0	1	63	0	5	1	1	0	0	2	0.80319	247.5	0.5	0.84528	115	300	-19	7.7	2.0	$1.6 \cdot 10^{-09}$	12.5
49	90-094 01:46	3	3	246	21	26	6	5	5	6	0	1	46	0	5	1	1	0	0	2	0.80580	248.3	0.4	0.84943	104	302	-10	40.9	1.6	$2.0 \cdot 10^{-13}$	6.0
50	90-094 14:43	3	3	35	19	6	7	12	3	15	0	1	34	31	5	1	1	0	0	2	0.80842	249.1	0.4	0.85355	41	291	39	2.0	1.9	$2.1 \cdot 10^{-10}$	10.5

Table 4. (*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	R_E	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
51	90-096 01:13	3	3	223	21	26	25	5	7	6	0	1	46	0	5	1	1	0	0	2	0.81550	251.1	0.3	0.86430	136	297	-35	30.5	1.6	$5.8 \cdot 10^{-13}$	6.0
52	90-096 12:01	3	3	37	20	24	8	5	5	6	0	1	44	0	5	1	1	0	0	2	0.81773	251.8	0.2	0.86761	38	294	40	40.9	1.6	$1.2 \cdot 10^{-13}$	6.0
53	90-097 18:12	3	3	164	19	20	1	11	2	12	0	1	28	1	5	1	1	0	0	2	0.82403	253.5	0.1	0.87669	219	210	-38	2.3	1.9	$7.3 \cdot 10^{-10}$	10.5
54	90-098 09:18	3	3	223	21	27	20	4	6	6	0	1	47	0	5	1	1	0	0	2	0.82721	254.4	0.1	0.88115	136	297	-35	38.1	1.6	$3.1 \cdot 10^{-13}$	6.0
55	90-099 05:48	3	3	38	19	19	4	15	6	15	0	1	20	1	5	1	1	0	0	2	0.83154	255.5	0.0	0.88712	37	296	41	2.0	1.9	$1.1 \cdot 10^{-09}$	10.5
56	90-102 01:45	3	1	79	6	22	1	12	5	15	0	1	19	1	5	1	1	0	0	2	0.84610	259.3	-0.2	0.90610	339	231	50	4.5	1.9	$1.6 \cdot 10^{-11}$	10.5
57	90-102 13:37	3	4	19	25	49	17	6	5	5	0	1	47	0	5	1	1	0	0	2	0.84867	260.0	-0.2	0.90930	63	311	21	19.0	1.9	$2.1 \cdot 10^{-11}$	10.5
58	90-102 23:19	3	4	240	29	49	25	9	15	5	0	1	25	0	5	1	1	0	0	2	0.85077	260.5	-0.3	0.91188	113	312	-17	7.2	1.9	$6.0 \cdot 10^{-10}$	10.5
59	90-104 10:54	3	2	249	12	14	1	6	11	15	0	1	29	2	5	1	1	0	0	2	0.85853	262.4	-0.4	0.92114	100	318	-7	28.3	1.6	$5.2 \cdot 10^{-14}$	6.0
60	90-105 02:00	3	4	41	25	31	17	6	3	5	0	1	47	0	5	1	1	0	0	2	0.86183	263.2	-0.4	0.92497	32	300	43	19.0	1.9	$1.5 \cdot 10^{-11}$	10.5
61	90-106 11:26	3	3	59	19	7	2	12	4	15	0	1	20	2	5	1	1	0	0	2	0.86917	264.9	-0.5	0.93324	7	273	54	2.0	1.9	$2.5 \cdot 10^{-10}$	10.5
62	90-108 11:58	1	4	226	27	20	27	10	9	0	1	1	29	18	5	1	1	0	0	2	0.87988	267.4	-0.7	0.94473	132	314	-33	4.5	1.9	$2.4 \cdot 10^{-10}$	10.5
63	90-109 12:47	3	3	36	20	8	11	14	5	15	0	1	10	3	5	1	1	0	0	2	0.88537	268.6	-0.7	0.95037	39	309	39	2.0	1.9	$3.2 \cdot 10^{-10}$	10.5
64	90-109 19:15	3	2	131	11	10	1	15	5	14	0	1	29	3	5	1	1	0	0	2	0.88681	268.9	-0.8	0.95181	266	216	-3	2.0	1.9	$1.4 \cdot 10^{-10}$	10.5
65	90-112 08:44	3	4	236	25	29	24	7	6	6	0	1	47	0	5	1	1	0	0	2	0.90045	271.9	-0.9	0.96498	118	322	-22	21.6	1.6	$6.4 \cdot 10^{-12}$	6.0
66	90-112 13:02	3	1	212	7	13	3	3	7	15	0	1	13	1	5	1	1	0	0	2	0.90141	272.2	-0.9	0.96587	152	305	-46	62.6	1.6	$9.0 \cdot 10^{-16}$	6.0
67	90-112 13:02	3	3	5	22	14	12	11	6	14	0	1	20	1	5	1	1	0	0	2	0.90141	272.2	-0.9	0.96587	83	325	5	2.3	1.9	$6.5 \cdot 10^{-10}$	10.5
68	90-116 06:33	3	2	86	14	22	5	12	5	14	0	1	33	23	5	1	1	0	0	2	0.92127	276.4	-1.2	0.98319	329	240	44	4.5	1.9	$5.8 \cdot 10^{-11}$	10.5
69	90-117 10:36	3	2	159	10	4	2	7	13	14	0	1	4	0	5	1	1	0	0	2	0.92748	277.6	-1.3	0.98820	226	232	-34	29.8	1.9	$6.1 \cdot 10^{-15}$	10.5
70	90-118 20:02	3	2	33	13	20	1	8	5	8	0	1	40	0	5	1	1	0	0	2	0.93486	279.1	-1.3	0.99391	44	322	35	19.0	1.9	$5.1 \cdot 10^{-13}$	10.5
71	90-120 00:04	3	3	252	19	22	11	15	13	15	0	1	20	2	5	1	1	0	0	2	0.94104	280.4	-1.4	0.99848	96	333	-4	2.5	1.6	$7.1 \cdot 10^{-10}$	6.0
72	90-121 04:07	3	2	122	12	29	1	13	13	15	0	1	31	3	5	1	1	0	0	2	0.94720	281.6	-1.5	1.00286	278	228	6	2.3	1.9	$1.4 \cdot 10^{-09}$	10.5
73	90-123 04:39	3	3	227	19	4	4	8	15	9	0	1	29	3	5	1	1	0	0	2	0.95781	283.7	-1.6	1.00997	131	330	-32	9.7	1.9	$7.5 \cdot 10^{-13}$	10.5
74	90-125 04:06	3	3	102	19	23	11	14	11	15	0	1	31	3	5	1	1	0	0	2	0.96811	285.7	-1.7	1.01637	307	239	28	3.9	1.6	$1.8 \cdot 10^{-10}$	6.0
75	90-125 11:39	3	1	17	7	5	1	12	2	14	0	1	21	3	5	1	1	0	0	2	0.96974	286.0	-1.7	1.01734	66	339	18	4.5	1.9	$1.7 \cdot 10^{-12}$	10.5
76	90-125 15:58	3	2	180	9	7	1	10	7	15	0	1	12	2	5	1	1	0	0	2	0.97067	286.2	-1.7	1.01789	197	263	-52	9.7	1.9	$3.3 \cdot 10^{-13}$	10.5
77	90-128 04:22	1	3	234	23	11	1	14	0	7	0	1	19	1	5	1	1	0	0	2	0.98364	288.6	-1.8	1.02507	121	338	-25	2.0	1.9	$8.7 \cdot 10^{-10}$	10.5
78	90-129 09:29	3	2	12	15	22	19	10	10	7	0	1	43	0	5	1	1	0	0	2	0.98983	289.8	-1.9	1.02822	73	343	13	9.7	1.9	$6.3 \cdot 10^{-12}$	10.5
79	90-131 05:42	1	4	202	26	28	27	14	13	0	1	1	27	16	5	1	1	0	0	2	0.99916	291.6	-2.0	1.03262	166	310	-53	2.5	1.6	$5.6 \cdot 10^{-09}$	6.0
80	90-132 18:22	3	2	224	11	7	1	9	8	15	0	1	31	6	5	1	1	0	0	2	1.00682	293.0	-2.0	1.03592	135	339	-37	12.7	1.9	$2.4 \cdot 10^{-13}$	10.5
81	90-137 12:42	3	5	10	49	56	22	15	3	5	0	1	31	0	5	1	1	0	0	2	1.03025	297.3	-2.2	1.04416	76	355	10	11.8	11.8	$8.7 \cdot 10^{-10}$	5858.3
82	90-138 04:52	3	2	7	15	22	18	9	10	8	0	1	42	0	5	1	1	0	0	2	1.03351	297.9	-2.3	1.04509	80	355	7	12.7	1.9	$3.3 \cdot 10^{-12}$	10.5
83	90-140 11:53	3	3	217	20	13	7	5	1	11	0	1	26	1	5	1	1	0	0	2	1.04445	299.9	-2.4	1.04778	145	342	-43	29.8	1.9	$9.7 \cdot 10^{-14}$	10.5
84	90-141 20:14	3	5	243	55	54	27	13	4	5	0	1	26	0	5	1	1	0	0	2	1.05080	301.0	-2.4	1.04904	108	0	-15	2.0	1.9	$5.4 \cdot 10^{-07}$	10.5
85	90-143 13:13	3	3	254	20	24	17	5	8	7	0	1	45	0	5	1	1	0	0	2	1.05874	302.4	-2.5	1.05030	93	1	-3	28.1	1.6	$4.8 \cdot 10^{-13}$	6.0
86	90-143 16:27	3	1	226	6	5	1	7	3	15	0	1	5	3	5	1	1	0	0	2	1.05936	302.6	-2.5	1.05038	132	354	-34	29.8	1.9	$3.7 \cdot 10^{-15}$	10.5
87	90-143 18:37	3	2	156	8	19	1	8	5	15	0	1	14	1	5	1	1	0	0	2	1.05978	302.6	-2.5	1.05044	231	257	-32	19.0	1.9	$1.9 \cdot 10^{-13}$	10.5
88	90-147 17:31	3	4	246	29	26	26	12	1	11	0	1	31	1	5	1	1	0	0	2	1.07769	305.9	-2.6	1.05184	104	1	-12	2.0	1.9	$1.7 \cdot 10^{-08}$	10.5
89	90-151 14:16	3	4	176	24	11	22	14	1	13	0	1	25	1	5	1	1	0	0	2	1.09457	308.9	-2.7	1.05137	203	282	-51	2.0	1.9	$1.0 \cdot 10^{-09}$	10.5
90	90-155 23:58	3	4	33	24	26	11	6	8	6	0	1	49	0	5	1	1	0	0	2	1.11302	312.3	-2.8	1.04869	44	358	32	22.4	1.6	$2.9 \cdot 10^{-12}$	6.0
91	90-157 05:05	3	3	176	18	15	1	15	8	11	0	1	21	1	5	1	1	0	0	2	1.11796	313.2	-2.9	1.04757	203	284	-53	11.8	11.8	$2.4 \cdot 10^{-12}$	5858.3
92	90-158 08:03	3	4	147	26	30	28	12	13	9	0	1	11	2	5	1	1	0	0	2	1.12246	314.1	-2.9	1.04638	243	262	-24	2.5	1.6	$7.3 \cdot 10^{-09}$	6.0
93	90-161 21:15	3	2	173	9	15	1	10	5	15	0	1	15	0	5	1	1	0	0	2	1.13631	316.7	-3.0	1.04169	207	280	-51	26.1	2.4	$4.7 \cdot 10^{-14}$	23.7
94	90-161 23:25	3	2	50	14	20	14	10	12	8	0	1	38	0	5	1	1	0	0	2	1.13666	316.8	-3.0	1.04155	20	339	45	5.6	1.6	$2.1 \cdot 10^{-11}$	6.0
95	90-163 04:32	3	1	10	7	11	13	10	11	10	0	1	1	31	5	1	1	0	0	2	1.14125	317.6	-3.0	1.03962	76	9	8	14.0	1.6	$1.9 \cdot 10^{-13}$	6.0
96	90-166 08:02	3	3	247	20	22	14	6	14	8	0	1	40	0	5	1	1	0	0	2	1.15284	319.9	-3.0	1.03387	103	24	-11	7.8	2.1	$1.9 \cdot 10^{-11}$	14.5
97	90-172 01:00	3	2	13	10	14	12	10	11	10	0	1	37	0	5	1	1	0	0	2	1.17263	323.8	-3.1	1.02078	72	22	13	14.0	1.6	$4.9 \cdot 10^{-13}$	6.0
98	90-172 04:14	1	6	247	60	49	31	4	15	4	1	1	30	0	5	1	1	0	0	2	1.17308	323.9	-3.1	1.02043	103	24	-11	39.6	1.9	$4.9 \cdot 10^{-11}$	10.5
99	90-174 10:10	3	2	64	12	20	2	8	6	9	0	1	39	0	5	1	1	0	0	2	1.18041	325.4	-3.2	1.01434	0	329	52	19.0	1.9	$4.3 \cdot 10^{-13}$	10.5
100	90-177 15:16	3	3	87	21	26	9	5	6	6	0	1	45	0	5	1	1	0	0	2	1.19047	327.6	-3.2	1.00477	328	293	41	33.1	1.6	$4.5 \cdot 10^{-13}$	6.0
101	90-179 23:21	3	3	57	19	22	11	5	5	8	0	1	41	0	5	1	1	0	0	2	1.19745	329.1	-3.2	0.99721	10	342	51	40.9	1.6	$8.0 \cdot 10^{-14}$	6.0
102	90-181 18:29	3	1	69	6	10	4	12	9	15	0	1	21	4	5	1	1	0	0	2	1.20263	330.3	-3.3	0.99105	353	320	51	11.9	2.3	$2.0 \cdot 10^{-13}$	21.5
103	90-181 18:30	3	1	64	5	7	8	8	12	9	0	1	38	13	5	1	1	0	0	2	1.20263	330.3	-3.3	0.99105	0	329	52	15.0	1.6	$5.8 \cdot 10^{-14}$	6.0
104	90-184 02:35	1	5	18	50	52	28	15	14	0	1	1	30	5	5	1	1	0	0	2	1.20913	331.8	-3.3	0.98262	65	20	19	2.5	1.6	$7.0 \cdot 10^{-08}$	6.0
105	90-185 13:06	1	2	43	9	13	1	13	15	0	1	1	47	31	5	1	1	0	0	2	1.21298	332.7	-3.3	0.97719	30	3	43	2.3	1.6	$9.3 \cdot 10^{-11}$	6.0

Table 4. (*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	R_E	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
106	90-187 21:10	1	5	47	54	55	31	15	15	0	1	1	31	8	5	1	1	0	0	2	1.21902	334.2	-3.3	0.96800	24	11	47	2.0	1.9	$5.5 \cdot 10^{-07}$	10.5
107	90-187 21:10	3	3	38	19	21	14	8	13	9	0	1	38	0	5	1	1	0	0	2	1.21902	334.2	-3.3	0.96800	37	21	40	5.6	1.6	$4.3 \cdot 10^{-11}$	6.0
108	90-187 21:10	1	4	65	30	49	26	12	15	0	1	1	22	7	5	1	1	0	0	2	1.21902	334.2	-3.3	0.96800	359	339	53	2.0	1.9	$6.1 \cdot 10^{-08}$	10.5
109	90-189 12:00	3	3	73	22	24	8	12	8	15	0	1	27	2	5	1	1	0	0	2	1.22304	335.2	-3.3	0.96138	347	325	51	7.3	3.9	$4.7 \cdot 10^{-11}$	128.4
110	90-189 12:00	3	2	46	13	19	5	9	9	10	0	1	36	0	5	1	1	0	0	2	1.22304	335.2	-3.3	0.96138	25	12	46	16.0	1.6	$8.0 \cdot 10^{-13}$	6.0
111	90-191 02:50	3	2	181	10	25	4	8	3	15	0	1	20	0	5	1	1	0	0	2	1.22692	336.2	-3.3	0.95453	195	320	-53	19.0	1.9	$7.3 \cdot 10^{-13}$	10.5
112	90-191 20:05	3	3	41	18	10	11	12	6	15	0	1	14	1	5	1	1	0	0	2	1.22860	336.7	-3.3	0.95142	32	18	42	11.8	11.8	$1.1 \cdot 10^{-12}$	5858.3
113	90-200 19:47	3	3	100	19	24	17	15	15	11	0	1	36	15	5	1	1	0	0	2	1.24733	342.2	-3.4	0.90914	309	295	30	2.5	1.6	$1.0 \cdot 10^{-09}$	6.0
114	90-201 08:44	1	2	206	14	14	12	12	15	0	1	1	54	31	5	1	1	0	0	2	1.24832	342.5	-3.4	0.90641	160	8	-51	4.5	1.9	$2.4 \cdot 10^{-11}$	10.5
115	90-205 16:16	3	2	57	12	12	11	13	5	15	0	1	22	1	5	1	1	0	0	2	1.25568	345.1	-3.4	0.88385	10	355	52	2.3	1.9	$1.3 \cdot 10^{-10}$	10.5
116	90-210 08:26	1	5	244	53	55	31	15	13	0	1	1	31	4	5	1	1	0	0	2	1.26255	347.9	-3.4	0.85805	107	35	-14	2.5	1.6	$1.7 \cdot 10^{-07}$	6.0
117	90-214 20:17	1	2	185	11	22	9	14	11	0	1	1	6	30	5	1	1	0	0	2	1.26807	350.5	-3.4	0.83203	190	327	-55	2.0	1.9	$6.8 \cdot 10^{-10}$	10.5
118	90-224 13:15	3	5	175	49	51	31	15	15	8	0	1	47	11	5	1	1	0	0	2	1.27632	356.1	-3.3	0.77216	204	328	-50	3.2	2.0	$2.1 \cdot 10^{-08}$	12.5
119	90-232 11:04	3	2	189	8	20	1	9	6	15	0	1	25	3	5	1	1	0	0	2	1.27934	0.6	-3.3	0.72015	184	354	-57	12.7	1.9	$7.8 \cdot 10^{-13}$	10.5
120	90-232 15:23	1	2	144	13	21	13	14	15	0	1	1	47	31	5	1	1	0	0	2	1.27937	0.8	-3.3	0.71893	248	307	-19	2.0	1.9	$8.1 \cdot 10^{-10}$	10.5
121	90-233 04:19	1	2	232	15	20	17	10	6	4	1	1	2	7	5	1	1	0	0	2	1.27945	1.1	-3.3	0.71530	124	51	-28	18.9	1.6	$6.9 \cdot 10^{-13}$	6.0
122	90-240 00:15	3	1	55	4	4	1	12	4	10	0	1	8	0	5	1	1	0	0	2	1.27912	5.0	-3.2	0.66842	13	16	50	4.5	1.9	$9.1 \cdot 10^{-13}$	10.5
123	90-240 13:12	3	2	34	8	10	9	10	10	10	0	1	33	0	5	1	1	0	0	2	1.27898	5.3	-3.2	0.66466	42	42	35	16.0	1.6	$1.2 \cdot 10^{-13}$	6.0
124	90-254 13:42	1	2	220	11	10	13	12	14	0	1	1	12	19	5	1	1	0	0	2	1.27012	13.4	-3.0	0.56491	141	62	-41	4.5	1.9	$7.6 \cdot 10^{-12}$	10.5
125	90-254 22:19	3	3	213	19	50	9	9	15	15	0	1	31	2	5	1	1	0	0	2	1.26976	13.6	-3.0	0.56231	150	55	-48	7.2	1.9	$1.9 \cdot 10^{-10}$	10.5
126	90-260 07:45	3	2	51	14	3	4	10	15	10	0	1	22	2	5	1	1	0	0	2	1.26347	16.7	-2.9	0.52321	18	39	47	9.7	1.9	$3.8 \cdot 10^{-13}$	10.5
127	90-260 16:22	1	2	13	14	0	1	7	0	0	0	1	6	31	5	1	1	0	0	2	1.26299	16.9	-2.9	0.52060	72	70	12	29.8	1.9	$1.3 \cdot 10^{-13}$	10.5
128	90-266 01:48	1	3	126	20	21	15	4	11	0	1	1	47	29	5	1	1	0	0	2	1.25506	20.1	-2.8	0.48142	273	322	0	39.6	1.9	$8.5 \cdot 10^{-14}$	10.5
129	90-266 10:25	1	2	26	8	12	6	15	15	0	1	0	1	31	5	1	1	0	0	2	1.25447	20.3	-2.8	0.47881	53	65	26	2.1	1.6	$9.0 \cdot 10^{-11}$	6.0
130	90-272 08:47	1	6	62	57	29	31	11	0	7	0	1	31	0	5	1	1	0	0	2	1.24386	23.9	-2.7	0.43592	3	21	50	2.3	1.9	$1.0 \cdot 10^{-07}$	10.5
131	90-280 02:18	3	3	19	18	14	1	15	10	15	0	1	20	4	5	1	1	0	0	2	1.22727	28.6	-2.5	0.38070	63	88	20	11.8	11.8	$2.2 \cdot 10^{-12}$	5858.3
132	90-286 13:36	3	2	40	15	22	4	14	5	15	0	1	28	1	5	1	1	0	0	2	1.21098	32.7	-2.3	0.33532	34	74	41	2.0	1.9	$1.3 \cdot 10^{-09}$	10.5
133	90-288 00:07	3	3	12	19	7	1	10	7	15	0	1	20	3	5	1	1	0	0	2	1.20707	33.6	-2.3	0.32536	73	90	13	4.5	1.9	$1.3 \cdot 10^{-11}$	10.5
134	90-288 21:41	3	1	152	7	19	7	11	15	15	0	1	14	2	5	1	1	0	0	2	1.20457	34.2	-2.3	0.31917	236	346	-27	7.2	1.9	$2.5 \cdot 10^{-12}$	10.5
135	90-289 14:56	3	2	17	13	29	5	7	12	11	0	1	31	2	5	1	1	0	0	2	1.20255	34.7	-2.2	0.31424	66	88	18	29.8	1.9	$4.0 \cdot 10^{-13}$	10.5
136	90-296 23:49	1	2	17	9	0	1	14	0	0	0	1	43	0	5	1	1	0	0	2	1.18024	39.5	-2.0	0.26458	66	88	18	2.0	1.9	$2.0 \cdot 10^{-10}$	10.5
137	90-303 06:49	1	3	117	20	14	3	6	15	0	1	1	47	31	5	1	1	0	0	2	1.15905	43.8	-1.8	0.22374	285	352	13	19.0	1.9	$6.4 \cdot 10^{-13}$	10.5
138	90-309 16:59	1	2	198	9	11	1	14	15	0	1	1	17	19	5	1	1	0	0	2	1.13542	48.4	-1.6	0.18362	172	58	-52	2.1	1.6	$9.1 \cdot 10^{-11}$	6.0
139	90-326 18:20	3	3	114	19	29	9	11	6	15	0	1	31	1	5	1	1	0	1	2	1.06351	61.6	-0.8	0.08496	290	16	16	2.3	1.9	$3.2 \cdot 10^{-09}$	10.5
140	90-336 22:53	3	1	79	7	8	1	15	5	15	0	1	6	1	5	1	1	0	1	2	1.01490	70.4	-0.3	0.03077	339	48	50	2.0	1.9	$5.5 \cdot 10^{-11}$	10.5
141	90-343 03:52	1	2	18	13	14	1	15	15	0	1	1	47	31	5	1	1	0	1	2	0.98352	76.3	0.0	0.00166	65	128	21	2.0	1.9	$3.9 \cdot 10^{-10}$	10.5
142	90-343 05:48	3	1	244	7	20	1	8	6	15	0	1	28	2	5	1	1	0	1	2	0.98316	76.4	0.0	0.00209	107	130	-13	19.0	1.9	$1.9 \cdot 10^{-13}$	10.5
143	90-345 13:49	1	2	19	14	15	12	12	0	6	0	1	12	31	5	1	1	0	1	2	0.97308	79.1	-0.3	0.01421	63	130	21	4.5	1.9	$2.7 \cdot 10^{-11}$	10.5
144	90-346 14:17	3	2	254	10	5	4	11	7	15	0	1	9	3	5	1	1	0	1	2	0.96887	80.3	-0.4	0.01949	93	133	-2	7.2	1.9	$6.2 \cdot 10^{-13}$	10.5
145	90-348 11:14	3	4	233	28	49	29	11	15	7	0	1	47	0	1	0	1	0	1	2	0.96142	82.6	-0.5	0.02921	122	134	-24	2.3	1.9	$2.3 \cdot 10^{-08}$	10.5
146	90-348 12:08	3	1	52	4	21	7	13	5	15	0	1	17	1	1	0	1	0	1	2	0.96127	82.6	-0.5	0.02940	17	107	52	2.3	1.9	$1.0 \cdot 10^{-10}$	10.5
147	90-349 01:38	3	5	249	54	55	30	13	9	5	0	1	60	0	1	0	1	0	1	2	0.95911	83.3	-0.6	0.03232	100	139	-7	2.0	1.9	$5.5 \cdot 10^{-07}$	10.5
148	90-350 19:10	3	2	57	12	14	4	12	10	15	0	1	17	2	1	0	1	0	1	2	0.95270	85.4	-0.8	0.04132	10	98	55	10.9	2.1	$1.2 \cdot 10^{-12}$	14.2
149	90-351 06:31	1	2	72	8	10	12	15	15	0	1	1	61	30	1	0	1	0	1	2	0.95100	86.0	-0.8	0.04379	349	68	54	2.1	1.6	$6.5 \cdot 10^{-11}$	6.0
150	90-352 09:30	3	2	241	13	8	1	15	2	10	0	1	18	1	1	0	1	0	1	2	0.94709	87.4	-0.9	0.04965	111	142	-17	2.0	1.9	$1.5 \cdot 10^{-10}$	10.5
151	90-353 15:34	3	1	193	5	8	9	5	12	15	0	1	4	0	1	0	1	0	1	2	0.94290	88.9	-1.0	0.05620	179	91	-55	28.7	2.1	$5.8 \cdot 10^{-15}$	14.5
152	90-354 01:49	3	1	178	6	24	1	5	11	15	0	1	26	3	1	0	1	0	1	2	0.94152	89.5	-1.1	0.05844	200	62	-50	70.0	1.9	$2.0 \cdot 10^{-15}$	10.5
153	90-354 14:09	1	2	25	8	6	1	10	5	0	1	1	47	19	1	0	1	0	1	2	0.93988	90.1	-1.1	0.06113	55	140	27	9.7	1.9	$2.3 \cdot 10^{-13}$	10.5
154	90-355 14:41	3	1	177	1	14	1	14	4	15	0	1	14	0	1	0	1	0	1	2	0.93674	91.4	-1.2	0.06650	201	63	-50	11.8	11.8	$1.7 \cdot 10^{-13}$	5858.3
155	90-360 15:46	1	2	208	10	21	7	13	15	0	1	1	47	31	1	0	1	0	1	2	0.92321	98.0	-1.7	0.09316	158	125	-50	2.3	1.9	$2.7 \cdot 10^{-10}$	10.5
156	90-362 20:27	3	4	149	26	29	18	13	5	15	0	1	30	1	1	0	1	0	1	2	0.91842	100.9	-1.9	0.10485	240	51	-24	10.6	7.7	$7.1 \cdot 10^{-11}$	1303.9
157	90-364 03:09	1	6	213	56	49	23	10	6	0	1	1	28	10	1	0	1	0	1	2	0.91594	102.6	-2.0	0.11168	150	138	-46	4.5	1.9	$1.5 \cdot 10^{-08}$	10.5
158	90-364 15:23	3	1	40	1	5	1	15	1	13	0	1	10	3	1	0	1	0	1	2	0.91502	103.2	-2.1	0.11440	34	140	41	70.0	2.0	$5.6 \cdot 10^{-17}$	12.5
159	91-002 23:52	3	3	19	19	49	8	5	15	10	0	1	31	1	1	0	1	0	1	2	0.90993	107.7	-2.4	0.13234	63	157	20	29.8	1.9	$1.5 \cdot 10^{-12}$	10.5
160	91-003 08:30	1	4	31	30	49	29	15	15	0	1	1	46	19	1	0	1	0	1	2	0.90948	108.2	-2.4	0.13427	46	150	33	2.0	1.9	$6.1 \cdot 10^{-08}$	10.5

Table 4. (*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	R_E	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
161	91-004 10:23	1	2	166	8	6	1	15	7	0	1	1	5	23	1	0	1	0	1	2	0.90826	109.7	-2.5	0.14004	217	67	-43	2.0	1.9	$4.6\cdot10^{-11}$	10.5
162	91-005 12:16	3	3	36	19	20	4	14	4	13	0	1	31	0	1	0	1	0	1	2	0.90722	111.2	-2.6	0.14581	39	151	36	2.0	1.9	$1.3\cdot10^{-09}$	10.5
163	91-006 05:32	3	2	241	14	20	8	10	8	7	0	1	40	0	1	0	1	0	1	2	0.90662	112.1	-2.7	0.14965	111	164	-19	16.0	1.6	$1.1\cdot10^{-12}$	6.0
164	91-006 14:09	1	2	38	14	6	3	8	13	0	1	1	8	31	1	0	1	0	1	2	0.90635	112.6	-2.7	0.15156	37	149	38	19.0	1.9	$9.2\cdot10^{-14}$	10.5
165	91-010 00:07	3	3	38	18	11	1	15	6	14	0	1	18	1	1	0	1	0	1	2	0.90479	117.3	-3.0	0.16970	37	156	40	11.8	11.8	$1.3\cdot10^{-12}$	5858.3
166	91-010 13:04	1	3	196	21	22	18	15	14	0	1	1	14	22	1	0	1	0	1	2	0.90471	118.0	-3.1	0.17255	174	126	-55	2.0	1.9	$2.4\cdot10^{-09}$	10.5
167	91-011 02:00	1	3	135	19	25	24	11	14	0	1	1	63	27	1	0	1	0	1	2	0.90468	118.8	-3.1	0.17538	260	66	-9	2.7	1.6	$9.0\cdot10^{-10}$	6.0
168	91-012 03:53	1	3	174	22	21	19	11	13	0	1	1	58	31	1	0	1	0	1	2	0.90474	120.3	-3.2	0.18104	205	87	-49	2.3	1.9	$1.4\cdot10^{-09}$	10.5
169	91-013 14:24	1	3	192	19	20	22	9	15	0	1	1	38	0	1	0	1	0	1	2	0.90511	122.2	-3.3	0.18855	180	121	-57	7.2	1.9	$1.6\cdot10^{-11}$	10.5
170	91-015 18:10	3	1	173	4	22	1	6	5	15	0	1	17	1	1	0	1	0	1	2	0.90627	125.2	-3.4	0.19969	207	92	-47	39.6	1.9	$1.1\cdot10^{-14}$	10.5
171	91-017 13:19	3	3	0	20	14	10	12	8	14	0	1	29	1	1	0	1	0	1	2	0.90778	127.6	-3.6	0.20887	999	999	999	2.0	1.9	$8.6\cdot10^{-10}$	10.5
172	91-018 10:53	3	1	0	1	3	1	12	15	15	0	1	44	0	1	0	1	0	1	2	0.90872	128.8	-3.6	0.21341	999	999	999	11.8	11.8	$2.8\cdot10^{-14}$	5858.3
173	91-019 04:08	3	2	0	9	14	9	15	15	13	0	1	9	0	1	0	1	0	1	2	0.90956	129.8	-3.7	0.21701	999	999	999	2.1	1.6	$1.5\cdot10^{-10}$	6.0
174	91-019 17:05	1	6	0	58	12	30	8	0	0	1	1	31	8	1	0	1	0	1	2	0.91024	130.6	-3.7	0.21971	999	999	999	9.7	1.9	$1.0\cdot10^{-10}$	10.5
175	91-020 14:39	1	2	0	11	21	11	15	7	0	1	1	47	20	1	0	1	0	1	2	0.91148	131.8	-3.8	0.22417	999	999	999	2.0	1.9	$5.8\cdot10^{-10}$	10.5
176	91-022 22:44	1	2	0	11	13	1	13	15	0	1	1	1	15	1	0	1	0	1	2	0.91525	134.9	-3.9	0.23559	999	999	999	2.3	1.6	$1.3\cdot10^{-10}$	6.0
177	91-023 11:41	3	2	0	13	31	5	12	3	15	0	1	58	3	1	0	1	0	1	2	0.91623	135.6	-3.9	0.23818	999	999	999	4.5	1.9	$2.0\cdot10^{-10}$	10.5
178	91-024 00:37	1	5	0	49	50	31	9	15	0	1	1	22	7	1	0	1	0	1	2	0.91726	136.4	-4.0	0.24076	999	999	999	11.8	11.8	$3.8\cdot10^{-10}$	5858.3
179	91-024 04:56	3	4	0	25	31	13	8	3	5	0	1	47	0	1	0	1	0	1	2	0.91761	136.6	-4.0	0.24162	999	999	999	9.7	1.9	$9.7\cdot10^{-11}$	10.5
180	91-026 08:42	1	3	0	19	21	12	12	8	0	1	1	63	25	1	0	1	0	1	2	0.92219	139.5	-4.1	0.25177	999	999	999	7.3	3.9	$1.8\cdot10^{-11}$	128.4
181	91-027 10:35	3	1	0	3	13	1	10	6	8	0	1	13	1	1	0	1	0	1	2	0.92472	140.9	-4.1	0.25674	999	999	999	9.7	1.9	$3.2\cdot10^{-13}$	10.5
182	91-027 14:54	3	1	0	1	28	4	5	11	15	0	1	29	2	1	0	1	0	1	2	0.92516	141.1	-4.1	0.25756	999	999	999	11.8	11.8	$1.1\cdot10^{-12}$	5858.3
183	91-028 16:47	1	6	0	59	12	31	4	0	1	1	1	31	1	1	0	1	0	1	2	0.92788	142.5	-4.2	0.26244	999	999	999	39.6	1.9	$1.7\cdot10^{-12}$	10.5
184	91-032 11:23	3	1	0	6	3	1	14	15	15	0	1	7	2	1	0	1	0	1	2	0.93864	147.4	-4.3	0.27892	999	999	999	2.0	1.9	$2.0\cdot10^{-11}$	10.5
185	91-033 08:57	3	2	0	11	4	1	14	15	9	0	1	18	2	1	0	1	0	1	2	0.94147	148.5	-4.3	0.28269	999	999	999	2.0	1.9	$5.3\cdot10^{-11}$	10.5
186	91-033 08:57	1	3	0	19	21	7	8	12	0	1	1	26	31	1	0	1	0	1	2	0.94147	148.5	-4.3	0.28269	999	999	999	5.6	1.6	$4.3\cdot10^{-11}$	6.0
187	91-034 06:31	1	3	0	21	24	22	14	14	0	1	1	58	12	1	0	1	0	1	2	0.94440	149.7	-4.4	0.28640	999	999	999	2.5	1.6	$1.3\cdot10^{-09}$	6.0
188	91-035 08:24	3	2	0	14	49	6	13	15	14	0	1	56	2	1	0	1	0	1	2	0.94805	151.0	-4.4	0.29077	999	999	999	2.3	1.9	$3.6\cdot10^{-09}$	10.5
189	91-036 01:40	3	4	0	25	27	6	8	7	6	0	1	58	0	1	0	1	0	1	2	0.95056	151.9	-4.4	0.29363	999	999	999	17.4	1.6	$1.1\cdot10^{-11}$	6.0
190	91-036 14:36	1	2	0	11	12	9	12	15	0	1	1	47	31	1	0	1	0	1	2	0.95249	152.6	-4.4	0.29574	999	999	999	4.5	1.9	$1.0\cdot10^{-11}$	10.5
191	91-038 09:45	3	1	0	7	26	3	14	12	15	0	1	27	2	1	0	1	0	1	2	0.95914	154.8	-4.5	0.30262	999	999	999	2.0	1.9	$7.1\cdot10^{-10}$	10.5
192	91-038 18:22	3	3	0	19	22	4	8	5	6	0	1	42	0	1	0	1	0	1	2	0.96052	155.3	-4.5	0.30396	999	999	999	23.3	2.0	$5.9\cdot10^{-13}$	13.5
193	91-040 00:34	1	3	0	23	22	12	15	10	0	1	1	5	31	1	0	1	0	1	2	0.96544	156.8	-4.5	0.30857	999	999	999	2.0	1.9	$3.5\cdot10^{-09}$	10.5
194	91-040 04:53	3	4	0	27	49	27	7	15	5	0	1	47	0	1	0	1	0	1	2	0.96616	157.0	-4.5	0.30922	999	999	999	12.7	1.9	$1.0\cdot10^{-10}$	10.5
195	91-040 04:53	3	1	0	3	29	1	9	10	15	0	1	31	1	1	0	1	0	1	2	0.96616	157.0	-4.5	0.30922	999	999	999	12.7	1.9	$1.5\cdot10^{-12}$	10.5
196	91-040 09:12	1	5	0	49	50	30	10	15	0	1	1	18	8	1	0	1	0	1	2	0.96688	157.2	-4.5	0.30986	999	999	999	11.8	11.8	$3.8\cdot10^{-10}$	5858.3
197	91-040 13:31	3	2	0	14	22	5	9	3	13	0	1	25	1	1	0	1	0	1	2	0.96761	157.4	-4.5	0.31050	999	999	999	12.7	1.9	$3.0\cdot10^{-12}$	10.5
198	91-040 22:09	1	6	0	58	50	30	5	13	0	1	1	30	17	1	0	1	0	1	2	0.96907	157.9	-4.5	0.31178	999	999	999	29.8	1.9	$7.7\cdot10^{-11}$	10.5
199	91-047 00:49	3	4	0	28	49	18	10	15	13	0	1	31	0	1	0	1	0	1	2	0.99587	165.0	-4.5	0.33166	999	999	999	4.5	1.9	$2.2\cdot10^{-09}$	10.5
200	91-047 09:27	1	4	0	27	27	27	11	9	0	1	1	22	10	1	0	1	0	1	2	0.99755	165.4	-4.5	0.33272	999	999	999	2.3	1.9	$8.1\cdot10^{-09}$	10.5
201	91-047 13:46	3	2	0	10	5	6	11	5	15	0	1	4	2	1	0	1	0	1	2	0.99840	165.6	-4.5	0.33325	999	999	999	7.2	1.9	$6.2\cdot10^{-13}$	10.5
202	91-047 18:05	1	5	0	49	30	22	15	14	0	1	1	31	13	1	0	1	0	1	2	0.99925	165.8	-4.5	0.33378	999	999	999	11.8	11.8	$1.6\cdot10^{-10}$	5858.3
203	91-048 15:39	1	2	0	13	14	14	12	15	0	1	1	59	31	1	0	1	0	1	2	1.00354	166.8	-4.5	0.33635	999	999	999	4.5	1.9	$2.0\cdot10^{-11}$	10.5
204	91-048 19:58	1	2	0	11	21	8	13	11	0	1	1	47	31	1	0	1	0	1	2	1.00441	167.0	-4.5	0.33686	999	999	999	2.3	1.9	$3.1\cdot10^{-10}$	10.5
205	91-048 19:58	1	3	0	22	15	26	15	2	0	1	1	28	24	1	0	1	0	1	2	1.00441	167.0	-4.5	0.33686	999	999	999	2.0	1.9	$1.3\cdot10^{-09}$	10.5
206	91-049 17:32	3	4	0	28	49	30	11	15	8	0	1	47	0	1	0	1	0	1	2	1.00879	168.0	-4.5	0.33935	999	999	999	2.3	1.9	$2.3\cdot10^{-08}$	10.5
207	91-050 10:47	1	2	0	8	21	10	15	12	0	1	1	42	31	1	0	1	0	1	2	1.01234	168.8	-4.5	0.34129	999	999	999	2.0	1.9	$3.5\cdot10^{-10}$	10.5
208	91-050 15:06	1	2	0	9	0	4	10	0	0	0	1	0	0	1	0	1	0	1	2	1.01323	169.0	-4.5	0.34177	999	999	999	9.7	1.9	$9.1\cdot10^{-13}$	10.5
209	91-051 08:22	1	3	0	23	27	27	11	13	0	1	1	10	7	1	0	1	0	1	2	1.01683	169.8	-4.5	0.34365	999	999	999	2.7	1.6	$2.3\cdot10^{-09}$	6.0
210	91-051 12:40	3	3	0	23	29	7	7	2	6	0	1	47	0	1	0	1	0	1	2	1.01774	170.0	-4.5	0.34411	999	999	999	29.8	2.0	$1.5\cdot10^{-12}$	12.1
211	91-053 03:29	1	2	0	8	4	5	15	15	0	1	1	11	31	1	0	1	0	1	2	1.02600	171.7	-4.5	0.34814	999	999	999	2.0	1.9	$3.3\cdot10^{-11}$	10.5
212	91-053 03:30	1	2	0	12	11	1	12	15	0	1	1	47	31	1	0	1	0	1	2	1.02601	171.7	-4.5	0.34814	999	999	999	4.5	1.9	$1.0\cdot10^{-11}$	10.5
213	91-053 16:27	3	3	0	21	8	11	3	15	6	0	1	61	0	1	0	1	0	1	2	1.02880	172.3	-4.5	0.34944	999	999	999	70.0	1.9	$1.7\cdot10^{-15}$	10.5
214	91-053 20:45	1	3	0	19	12	7	9	15	0	1	1	27	27	1	0	1	0	1	2	1.02974	172.5	-4.5	0.34986	999	999	999	7.2	1.9	$6.6\cdot10^{-12}$	10.5
215	91-056 17:47	3	1	19	3	22	1	6	11	15	0	1	26	4	1	0	1	0	1	2	1.04505	175.5	-4.5	0.35627	63	226	19	39.6	1.9	$8.9\cdot10^{-16}$	10.5

Table 4. (*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	R_E	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
216	91-056 22:06	3	3	23	23	26	25	10	9	6	0	1	45	0	1	0	1	0	1	2	1.04603	175.7	-4.5	0.35665	58	223	23	9.5	1.7	$3.6\cdot10^{-11}$	7.6
217	91-057 23:59	1	3	6	19	21	14	9	15	0	1	1	60	31	1	0	1	0	1	2	1.05192	176.8	-4.5	0.35885	82	229	5	4.8	1.6	$6.9\cdot10^{-11}$	6.0
218	91-058 12:55	1	2	12	8	9	6	13	14	0	1	1	37	14	1	0	1	0	1	2	1.05490	177.3	-4.5	0.35992	73	227	11	2.3	1.9	$4.1\cdot10^{-11}$	10.5
219	91-058 17:14	1	5	16	52	14	29	15	0	8	0	1	30	0	1	0	1	0	1	2	1.05589	177.5	-4.5	0.36026	68	226	16	2.0	1.9	$1.1\cdot10^{-08}$	10.5
220	91-059 23:26	1	2	31	14	1	5	15	0	0	1	1	45	2	1	0	1	0	1	2	1.06291	178.8	-4.4	0.36263	46	219	31	2.0	1.9	$5.5\cdot10^{-11}$	10.5
221	91-060 08:04	3	4	0	24	30	17	9	2	5	0	1	47	0	1	0	1	0	1	2	1.06493	179.1	-4.4	0.36328	999	999	999	22.4	3.1	$5.3\cdot10^{-12}$	52.8
222	91-061 22:53	1	2	253	11	14	17	13	15	0	1	1	47	31	1	0	1	0	1	2	1.07412	180.7	-4.4	0.36607	94	240	-5	2.3	1.6	$1.5\cdot10^{-10}$	6.0
223	91-062 20:28	1	2	27	12	10	8	10	10	0	1	1	36	6	1	0	1	0	1	2	1.07929	181.6	-4.4	0.36754	52	231	27	9.7	1.9	$8.6\cdot10^{-13}$	10.5
224	91-063 05:05	3	3	13	21	25	9	5	5	6	0	1	46	0	1	0	1	0	1	2	1.08137	181.9	-4.4	0.36810	72	237	12	40.9	1.6	$1.7\cdot10^{-13}$	6.0
225	91-067 04:00	3	5	3	52	53	30	14	4	5	0	1	60	0	1	0	1	0	1	2	1.10462	185.6	-4.3	0.37366	86	240	1	2.0	1.9	$3.0\cdot10^{-07}$	10.5
226	91-067 08:19	1	3	230	18	21	22	15	12	0	1	1	47	31	1	0	1	0	1	2	1.10570	185.8	-4.3	0.37389	127	235	-31	3.2	2.0	$2.2\cdot10^{-10}$	12.5
227	91-068 10:12	3	1	34	4	18	1	15	15	15	0	1	54	13	1	0	1	0	1	2	1.11217	186.8	-4.2	0.37519	42	226	34	2.0	1.9	$1.2\cdot10^{-10}$	10.5
228	91-069 16:24	3	4	222	26	30	12	6	5	5	0	1	58	0	1	0	1	0	1	2	1.11977	187.9	-4.2	0.37661	138	231	-39	32.6	1.6	$2.0\cdot10^{-12}$	6.0
229	91-069 16:24	1	4	37	24	14	17	7	15	0	1	1	24	31	1	0	1	0	1	2	1.11977	187.9	-4.2	0.37661	38	224	37	12.7	1.9	$4.4\cdot10^{-12}$	10.5
230	91-072 04:47	1	2	237	10	9	12	11	13	0	1	1	0	0	1	0	1	0	1	2	1.13515	190.2	-4.1	0.37914	117	238	-23	7.2	1.9	$1.2\cdot10^{-12}$	10.5
231	91-072 04:47	3	4	242	30	49	14	4	4	5	0	1	61	0	1	0	1	0	1	2	1.13515	190.2	-4.1	0.37914	110	239	-18	39.6	1.9	$2.9\cdot10^{-12}$	10.5
232	91-072 09:06	3	4	0	30	49	21	7	15	5	0	1	60	0	1	0	1	0	1	2	1.13625	190.3	-4.1	0.37931	999	999	999	12.7	1.9	$1.6\cdot10^{-10}$	10.5
233	91-072 13:25	3	4	30	26	30	24	14	1	7	0	1	53	0	1	0	1	0	1	2	1.13736	190.5	-4.1	0.37947	48	229	30	11.8	9.5	$6.2\cdot10^{-11}$	2690.1
234	91-073 06:41	1	2	16	11	9	1	8	15	0	1	1	47	31	1	0	1	0	1	2	1.14180	191.1	-4.1	0.38012	68	236	16	19.0	1.9	$9.2\cdot10^{-14}$	10.5
235	91-073 06:41	3	4	144	28	28	13	15	4	7	0	1	31	1	1	0	1	0	1	2	1.14180	191.1	-4.1	0.38012	248	130	-20	2.0	1.9	$2.0\cdot10^{-08}$	10.5
236	91-073 19:37	1	3	236	19	11	1	5	15	0	1	1	26	31	1	0	1	0	1	2	1.14514	191.6	-4.1	0.38058	118	238	-24	29.8	1.9	$6.4\cdot10^{-14}$	10.5
237	91-074 08:34	3	3	64	21	24	11	13	5	13	0	1	31	0	1	0	1	0	1	2	1.14849	192.0	-4.1	0.38103	0	184	51	10.6	7.7	$1.4\cdot10^{-11}$	1303.9
238	91-075 06:08	1	3	40	19	21	18	10	11	0	1	1	28	29	1	0	1	0	1	2	1.15409	192.8	-4.1	0.38175	34	238	40	5.9	1.6	$3.6\cdot10^{-11}$	6.0
239	91-077 22:50	3	2	26	13	14	3	9	6	13	0	1	24	2	1	0	1	0	1	2	1.17102	195.0	-4.0	0.38370	53	249	27	12.7	1.9	$1.0\cdot10^{-12}$	10.5
240	91-077 22:50	3	4	16	28	49	25	7	15	5	0	1	47	0	1	0	1	0	1	2	1.17102	195.0	-4.0	0.38370	68	254	16	12.7	1.9	$1.1\cdot10^{-10}$	10.5
241	91-078 11:47	3	1	47	5	9	19	10	5	14	0	1	14	3	1	0	1	0	1	2	1.17443	195.5	-4.0	0.38405	24	229	45	26.1	2.4	$9.6\cdot10^{-15}$	23.7
242	91-080 06:55	3	2	242	9	13	1	10	11	8	0	1	0	0	1	0	1	0	1	2	1.18582	196.9	-3.9	0.38519	110	256	-17	14.0	1.6	$3.6\cdot10^{-13}$	6.0
243	91-082 02:04	3	3	26	19	23	10	6	5	6	0	1	43	0	1	0	1	0	1	2	1.19728	198.3	-3.8	0.38624	53	249	27	32.6	1.6	$2.3\cdot10^{-13}$	6.0
244	91-083 16:54	1	6	9	59	57	31	4	14	0	1	1	31	15	1	0	1	0	1	2	1.20765	199.6	-3.8	0.38715	77	255	8	39.6	1.9	$1.4\cdot10^{-10}$	10.5
245	91-083 21:12	3	1	95	4	24	2	1	11	15	0	1	21	2	1	0	1	0	1	2	1.20880	199.7	-3.8	0.38725	316	159	34	70.0	1.9	$1.5\cdot10^{-16}$	10.5
246	91-084 14:28	3	1	97	3	6	1	11	10	15	0	1	12	3	1	0	1	0	1	2	1.21342	200.3	-3.8	0.38765	314	157	32	13.8	1.6	$4.4\cdot10^{-14}$	6.0
247	91-097 00:08	1	2	0	14	10	9	10	15	0	1	1	19	31	1	0	1	0	1	2	1.29381	209.1	-3.3	0.39590	999	999	999	9.7	1.9	$1.2\cdot10^{-12}$	10.5
248	91-098 02:01	1	3	0	20	14	4	4	9	0	1	1	53	6	1	0	1	0	1	2	1.30082	209.9	-3.3	0.39693	999	999	999	39.6	1.9	$4.1\cdot10^{-14}$	10.5
249	91-101 03:21	3	3	17	20	26	21	6	7	5	0	1	45	0	1	0	1	0	1	2	1.32070	211.9	-3.2	0.40036	66	268	16	24.4	1.6	$1.1\cdot10^{-12}$	6.0
250	91-103 20:04	1	2	61	12	10	7	11	15	0	1	1	47	31	1	0	1	0	1	2	1.33820	213.6	-3.1	0.40411	4	222	49	7.2	1.9	$2.0\cdot10^{-12}$	10.5
251	91-104 17:38	3	4	73	27	27	13	7	10	5	0	1	57	0	1	0	1	0	1	2	1.34403	214.1	-3.0	0.40554	347	201	48	12.7	1.9	$4.0\cdot10^{-11}$	10.5
252	91-104 17:38	3	3	250	21	26	22	8	8	6	0	1	44	0	1	0	1	0	1	2	1.34403	214.1	-3.0	0.40554	98	272	-9	16.0	1.6	$6.6\cdot10^{-12}$	6.0
253	91-105 10:54	1	5	212	55	55	30	13	12	0	1	1	31	3	1	0	1	0	1	2	1.34869	214.6	-3.0	0.40674	152	254	-50	2.0	1.9	$6.4\cdot10^{-07}$	10.5
254	91-105 10:54	3	4	50	25	21	20	12	2	13	0	1	31	1	1	0	1	0	1	2	1.34869	214.6	-3.0	0.40674	20	240	46	2.0	1.9	$4.0\cdot10^{-09}$	10.5
255	91-105 15:13	3	4	114	28	49	30	8	15	5	0	1	47	0	1	0	1	0	1	2	1.34985	214.7	-3.0	0.40706	290	164	13	9.7	1.9	$2.2\cdot10^{-10}$	10.5
256	91-105 19:31	3	4	39	25	3	19	10	15	7	0	1	8	1	1	0	1	0	1	2	1.35102	214.8	-3.0	0.40737	35	253	38	4.5	1.9	$1.7\cdot10^{-11}$	10.5
257	91-105 23:50	3	4	73	24	31	23	6	3	5	0	1	47	0	1	0	1	0	1	2	1.35218	214.9	-3.0	0.40769	347	201	48	19.0	1.9	$1.3\cdot10^{-11}$	10.5
258	91-108 07:55	3	3	25	22	28	23	9	7	5	0	1	47	0	1	0	1	0	1	2	1.36729	216.3	-2.9	0.41222	55	264	25	15.0	1.7	$1.4\cdot10^{-11}$	7.1
259	91-109 05:29	3	3	59	23	27	10	4	4	5	0	1	47	0	1	0	1	0	1	2	1.37309	216.9	-2.9	0.41417	7	225	49	52.6	1.6	$1.2\cdot10^{-13}$	6.0
260	91-109 18:26	3	3	0	21	26	10	5	5	5	0	1	46	0	1	0	1	0	1	2	1.37656	217.2	-2.8	0.41539	999	999	999	40.9	1.6	$2.0\cdot10^{-13}$	6.0
261	91-110 16:00	3	5	0	49	49	22	6	15	5	0	1	60	0	1	0	1	0	1	2	1.38235	217.7	-2.8	0.41751	999	999	999	11.8	11.8	$2.7\cdot10^{-10}$	5858.3
262	91-112 02:31	3	1	0	1	19	1	15	15	15	0	1	18	2	1	0	1	0	1	2	1.39159	218.5	-2.8	0.42117	999	999	999	11.8	11.8	$2.5\cdot10^{-13}$	5858.3
263	91-112 19:46	1	2	0	10	21	9	12	11	0	1	1	6	31	1	0	1	0	1	2	1.39620	219.0	-2.7	0.42312	999	999	999	4.5	1.9	$2.6\cdot10^{-11}$	10.5
264	91-113 13:02	3	2	0	14	19	17	11	7	5	0	1	0	0	1	0	1	0	1	2	1.40081	219.4	-2.7	0.42515	999	999	999	15.0	1.7	$1.2\cdot10^{-12}$	7.1
265	91-113 17:21	3	3	0	19	23	4	7	4	6	0	1	44	0	1	0	1	0	1	2	1.40196	219.5	-2.7	0.42568	999	999	999	29.8	2.0	$3.0\cdot10^{-13}$	12.1
266	91-117 07:37	1	2	0	11	21	9	12	15	0	1	1	47	31	1	0	1	0	1	2	1.42489	221.5	-2.6	0.43722	999	999	999	4.5	1.9	$3.0\cdot10^{-11}$	10.5
267	91-118 00:53	3	4	0	25	27	18	15	15	11	0	1	22	3	1	0	1	0	1	2	1.42946	221.9	-2.5	0.43980	999	999	999	2.5	1.6	$4.1\cdot10^{-09}$	6.0
268	91-119 20:01	3	3	0	20	24	13	5	5	5	0	1	45	0	1	0	1	0	1	2	1.44084	222.9	-2.5	0.44664	999	999	999	40.9	1.6	$1.2\cdot10^{-13}$	6.0
269	91-120 08:58	1	4	0	25	21	17	7	14	0	1	1	25	31	1	0	1	0	1	2	1.44424	223.1	-2.5	0.44881	999	999	999	12.7	1.9	$1.1\cdot10^{-11}$	10.5
270	91-228 14:02	3	3	0	23	31	12	4	4	7	0	1	31	0	1	0	1	0	1	2	1.99695	264.0	0.6	1.70607	999	999	999	39.6	1.9	$6.9\cdot10^{-13}$	10.5

Table 4. (*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	R_E	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
271	91-231 02:26	3	2	19	13	20	9	10	8	8	0	1	37	0	1	0	1	0	1	2	2.00627	264.7	0.7	1.74447	63	312	22	9.7	1.9	$3.4 \cdot 10^{-12}$	10.5
272	91-234 12:24	3	6	15	57	58	29	6	4	5	0	1	28	0	1	0	1	0	1	2	2.01866	265.6	0.8	1.79654	69	313	17	19.0	1.9	$1.4 \cdot 10^{-09}$	10.5
273	91-235 01:20	3	1	46	3	22	1	11	3	15	0	1	18	0	1	0	1	0	1	2	2.02058	265.8	0.8	1.80475	25	291	48	7.2	1.9	$2.2 \cdot 10^{-12}$	10.5
274	91-242 01:35	3	3	100	22	27	19	4	4	5	0	1	47	0	1	0	1	0	1	2	2.04495	267.6	0.9	1.91125	309	215	31	52.6	1.6	$9.8 \cdot 10^{-14}$	6.0
275	91-246 00:30	3	3	55	20	24	17	6	7	6	0	1	45	0	1	0	1	0	1	2	2.05813	268.7	1.0	1.97098	13	280	53	24.4	1.6	$7.9 \cdot 10^{-13}$	6.0
276	91-248 21:31	3	3	251	22	27	12	5	5	6	0	1	47	0	1	0	1	0	1	2	2.06746	269.5	1.1	2.01420	97	318	-5	40.9	1.6	$2.9 \cdot 10^{-13}$	6.0
277	91-249 06:09	1	3	209	20	7	7	6	13	0	1	1	42	12	1	0	1	0	1	2	2.06862	269.5	1.1	2.01959	156	293	-48	19.0	1.9	$2.1 \cdot 10^{-13}$	10.5
278	91-250 03:43	3	2	13	9	13	12	9	11	9	0	1	0	0	1	0	1	0	1	2	2.07148	269.8	1.1	2.03304	72	294	16	16.0	1.6	$2.4 \cdot 10^{-13}$	6.0
279	91-251 01:18	3	1	34	5	8	7	11	12	9	0	1	0	0	1	0	1	0	1	2	2.07432	270.0	1.1	2.04648	42	285	38	9.2	1.6	$2.2 \cdot 10^{-13}$	6.0
280	91-253 18:00	3	3	230	22	8	11	14	3	14	0	1	15	2	1	0	1	0	1	2	2.08272	270.7	1.2	2.08659	127	290	-27	2.0	1.9	$4.5 \cdot 10^{-10}$	10.5
281	91-254 15:34	3	2	251	14	21	23	8	5	6	0	1	40	0	1	0	1	0	1	2	2.08548	270.9	1.2	2.09991	97	297	-4	19.0	1.9	$7.2 \cdot 10^{-13}$	10.5
282	91-255 00:12	3	3	237	22	27	13	5	6	5	0	1	47	0	1	0	1	0	1	2	2.08658	271.0	1.2	2.10523	117	293	-20	33.1	1.6	$6.6 \cdot 10^{-13}$	6.0
283	91-258 18:48	3	3	231	19	23	2	8	4	6	0	1	43	0	1	0	1	0	1	2	2.09791	272.0	1.3	2.16075	125	293	-26	26.1	2.4	$4.8 \cdot 10^{-13}$	23.7
284	91-260 13:56	3	1	46	6	11	11	8	8	6	0	1	0	0	1	0	1	0	1	2	2.10317	272.5	1.3	2.18697	25	276	49	26.4	1.6	$1.5 \cdot 10^{-14}$	6.0
285	91-264 04:13	3	3	53	21	25	10	4	7	6	0	1	46	0	1	0	1	0	1	2	2.11345	273.4	1.4	2.23895	15	267	53	35.2	1.6	$3.1 \cdot 10^{-13}$	6.0
286	91-267 22:49	3	3	7	20	24	20	6	9	7	0	1	44	0	1	0	1	0	1	2	2.12388	274.3	1.4	2.29282	80	303	9	19.6	1.6	$1.9 \cdot 10^{-12}$	6.0
287	91-271 21:43	3	3	47	20	23	9	5	4	6	0	1	44	0	1	0	1	0	1	2	2.13442	275.3	1.5	2.34841	24	280	50	45.7	1.6	$6.5 \cdot 10^{-14}$	6.0
288	91-272 06:21	3	3	68	20	23	6	6	4	6	0	1	44	0	1	0	1	0	1	2	2.13536	275.4	1.5	2.35342	354	242	56	36.5	1.6	$1.7 \cdot 10^{-13}$	6.0
289	91-274 23:04	3	2	57	14	22	1	9	9	7	0	1	42	0	1	0	1	0	1	2	2.14229	276.0	1.6	2.39073	10	264	55	12.7	1.9	$3.0 \cdot 10^{-12}$	10.5
290	91-275 16:19	1	2	0	11	14	18	15	14	0	1	1	9	23	1	0	1	0	1	2	2.14411	276.2	1.6	2.40060	999	999	999	2.5	1.6	$1.0 \cdot 10^{-10}$	6.0
291	91-276 05:16	3	1	230	7	11	11	10	11	8	0	1	0	0	1	0	1	0	1	2	2.14547	276.3	1.6	2.40799	127	300	-27	14.0	1.6	$1.9 \cdot 10^{-13}$	6.0
292	91-277 07:09	1	2	242	13	15	3	9	15	0	1	1	59	31	1	0	1	0	1	2	2.14815	276.6	1.6	2.42269	110	305	-14	5.4	2.0	$1.3 \cdot 10^{-11}$	12.2
293	91-280 08:29	3	3	9	20	23	19	7	10	7	0	1	42	0	1	0	1	0	1	2	2.15560	277.3	1.7	2.46391	77	308	11	12.2	1.6	$7.2 \cdot 10^{-12}$	6.0
294	91-283 09:50	1	3	21	23	12	23	9	0	4	1	1	21	1	1	0	1	0	1	2	2.16281	278.1	1.7	2.50445	60	306	25	7.2	1.9	$1.2 \cdot 10^{-11}$	10.5
295	91-285 00:39	3	2	244	14	21	3	9	5	6	0	1	41	0	1	0	1	0	1	2	2.16653	278.4	1.7	2.52562	107	308	-12	12.7	1.9	$2.5 \cdot 10^{-12}$	10.5
296	91-286 15:29	1	2	223	13	12	8	12	15	0	1	1	59	31	1	0	1	0	1	2	2.17019	278.8	1.8	2.54658	136	300	-34	4.5	1.9	$1.5 \cdot 10^{-11}$	10.5
297	91-288 10:37	3	4	54	27	49	20	6	15	5	0	1	47	0	1	0	1	0	1	2	2.17417	279.3	1.8	2.56960	14	275	54	19.0	1.9	$2.8 \cdot 10^{-11}$	10.5
298	91-293 15:44	3	2	245	12	19	11	10	7	7	0	1	37	0	1	0	1	0	1	2	2.18526	280.5	1.9	2.63482	105	312	-11	9.7	1.9	$2.4 \cdot 10^{-12}$	10.5
299	91-296 21:23	3	2	69	14	19	4	15	11	9	0	1	36	0	1	0	1	0	1	2	2.19180	281.2	2.0	2.67407	353	244	65	3.9	1.6	$5.3 \cdot 10^{-11}$	6.0
300	91-303 17:19	3	2	201	13	20	15	10	8	9	0	1	39	0	1	0	1	0	1	2	2.20473	282.8	2.1	2.75370	167	301	-53	9.7	1.9	$3.4 \cdot 10^{-12}$	10.5
301	91-309 07:03	3	2	66	8	13	7	8	9	6	0	1	36	0	1	0	1	0	1	2	2.21441	284.1	2.2	2.81516	357	262	55	24.4	1.6	$3.8 \cdot 10^{-14}$	6.0
302	91-310 13:15	3	3	16	20	24	1	6	4	6	0	1	45	0	1	0	1	0	1	2	2.21649	284.4	2.2	2.82858	68	319	18	36.5	1.6	$2.0 \cdot 10^{-13}$	6.0
303	91-312 08:23	1	2	103	8	9	5	13	13	0	1	1	44	19	1	0	1	0	1	2	2.21939	284.8	2.2	2.84744	305	216	28	2.3	1.9	$4.1 \cdot 10^{-11}$	10.5
304	91-317 17:49	3	2	52	13	20	9	9	5	6	0	1	39	0	1	0	1	0	1	2	2.22761	286.0	2.3	2.90180	17	288	52	12.7	1.9	$1.8 \cdot 10^{-12}$	10.5
305	91-318 11:04	1	2	248	9	7	17	10	12	0	1	1	0	0	1	0	1	0	1	2	2.22865	286.2	2.3	2.90879	101	320	-8	9.7	1.9	$3.3 \cdot 10^{-13}$	10.5
306	91-320 01:54	3	4	61	27	49	17	7	15	5	0	1	47	0	1	0	1	0	1	2	2.23094	286.5	2.3	2.92429	4	272	55	12.7	1.9	$1.0 \cdot 10^{-10}$	10.5
307	91-326 13:12	3	2	59	14	29	5	11	6	15	0	1	29	3	1	0	1	0	1	2	2.23946	288.0	2.4	2.98309	7	277	54	7.2	1.9	$4.1 \cdot 10^{-11}$	10.5
308	91-327 10:46	3	1	248	2	6	10	13	14	6	0	1	0	0	1	0	1	0	1	2	2.24056	288.2	2.4	2.99085	101	340	-9	3.2	2.0	$2.7 \cdot 10^{-12}$	12.5
309	91-328 12:39	3	3	231	22	27	24	8	8	5	0	1	47	0	1	0	1	0	1	2	2.24186	288.4	2.5	3.00003	125	335	-28	16.0	1.6	$9.5 \cdot 10^{-12}$	6.0
310	91-328 21:17	3	2	217	9	13	9	9	10	8	0	1	0	0	1	0	1	0	1	2	2.24228	288.5	2.5	3.00305	145	326	-42	18.3	1.6	$1.5 \cdot 10^{-13}$	6.0
311	91-333 22:05	3	2	57	9	13	8	9	10	8	0	1	0	0	1	0	1	0	1	2	2.24789	289.6	2.5	3.04367	10	299	53	18.3	1.6	$1.5 \cdot 10^{-13}$	6.0
312	91-337 20:59	3	2	241	10	9	2	15	12	15	0	1	12	3	1	0	1	0	1	2	2.25186	290.5	2.6	3.07324	111	339	-17	2.0	1.9	$1.0 \cdot 10^{-10}$	10.5
313	91-360 12:34	3	2	52	11	19	10	10	10	9	0	1	37	0	1	0	1	0	1	2	2.26712	295.5	2.9	3.20016	17	312	50	9.7	1.9	$2.0 \cdot 10^{-12}$	10.5
314	91-361 14:27	3	3	58	19	23	13	14	15	13	0	1	15	3	1	0	1	0	1	2	2.26753	295.7	2.9	3.20435	8	302	53	2.5	1.6	$8.4 \cdot 10^{-10}$	6.0
315	91-365 04:44	1	2	36	11	12	5	11	15	0	1	1	20	31	1	0	1	0	1	2	2.26869	296.5	3.0	3.21705	39	332	38	7.2	1.9	$2.3 \cdot 10^{-12}$	10.5
316	92-004 03:38	3	1	225	6	9	3	11	12	6	0	1	0	0	1	0	1	0	1	2	2.26959	297.3	3.0	3.22876	134	337	-34	9.2	1.6	$3.1 \cdot 10^{-13}$	6.0
317	92-068 07:46	3	2	42	10	14	3	9	9	8	0	1	37	0	1	0	1	0	1	2	2.23022	311.5	3.8	3.08810	31	354	51	19.9	1.6	$1.4 \cdot 10^{-13}$	6.0
318	92-072 15:18	1	2	217	8	13	2	13	15	0	1	1	47	31	1	0	1	0	1	2	2.22391	312.4	3.8	3.05738	145	10	-39	2.3	1.6	$7.8 \cdot 10^{-11}$	6.0
319	92-072 23:56	3	1	47	7	11	3	10	10	9	0	1	0	0	1	0	1	0	1	2	2.22336	312.5	3.8	3.05471	24	4	51	16.0	1.6	$1.3 \cdot 10^{-13}$	6.0
320	92-076 01:16	1	2	167	14	22	10	15	6	0	1	1	47	16	1	0	1	0	1	2	2.21858	313.2	3.8	3.03136	215	294	-39	2.0	1.9	$1.1 \cdot 10^{-09}$	10.5
321	92-078 17:59	3	1	35	7	10	10	11	12	9	0	1	0	0	1	0	1	0	1	2	2.21416	313.8	3.9	3.00979	41	17	41	9.2	1.6	$4.4 \cdot 10^{-13}$	6.0
322	92-078 22:17	3	1	77	7	10	1	10	10	8	0	1	0	0	1	0	1	0	1	2	2.21386	313.9	3.9	3.00832	342	306	54	16.0	1.6	$1.1 \cdot 10^{-13}$	6.0
323	92-083 14:27	3	4	0	24	22	3	14	2	12	0	1	19	0	1	0	1	0	1	2	2.20576	314.9	3.9	2.96873	999	999	999	2.0	1.9	$4.1 \cdot 10^{-09}$	10.5
324	92-087 17:41	3	4	103	25	31	14	7	3	5	0	1	47	0	1	0	1	0	1	2	2.19813	315.9	3.9	2.93152	305	257	31	12.7	1.9	$5.2 \cdot 10^{-11}$	10.5
325	92-088 15:15	3	2	177	8	13	3	9	9	8	0	1	35	0	1	0	1	0	1	2	2.19641	316.1	3.9	2.92317	201	283	-45	19.9	1.6	$8.7 \cdot 10^{-14}$	6.0

Table 4. (*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	R_E	ROT	S_{LON}	S_{LAT}	V	VEF	M	MEF
326	92-114 12:29	1	3	29	19	12	3	8	15	0	1	1	25	31	1	0	1	0	1	2	2.13824	322.3	4.2	2.64574	49	11	32	9.7	1.9	$2.8 \cdot 10^{-12}$	10.5
327	92-118 02:45	1	2	161	12	13	1	11	12	2	1	1	41	9	1	0	1	0	1	2	2.12881	323.2	4.2	2.60220	224	279	-35	7.2	1.9	$3.3 \cdot 10^{-12}$	10.5
328	92-119 08:57	1	2	0	14	10	4	15	7	0	1	1	5	31	1	0	1	0	1	2	2.12543	323.5	4.2	2.58670	999	999	999	2.0	1.9	$2.4 \cdot 10^{-10}$	10.5
329	92-138 23:11	3	4	245	28	1	14	13	15	12	0	1	5	3	1	0	1	0	1	2	2.06757	328.5	4.3	2.33026	105	44	-10	2.0	1.9	$3.6 \cdot 10^{-10}$	10.5
330	92-146 08:04	1	3	231	20	10	1	5	0	7	0	1	30	0	1	0	1	0	1	2	2.04324	330.5	4.4	2.22769	125	39	-25	29.8	1.9	$6.0 \cdot 10^{-14}$	10.5
331	92-151 04:33	3	4	234	25	12	29	10	10	15	0	1	11	1	1	0	1	0	1	2	2.02644	331.8	4.4	2.15866	121	40	-22	4.5	1.9	$7.2 \cdot 10^{-11}$	10.5
332	92-158 22:03	1	3	219	21	23	22	11	11	0	1	1	14	7	1	0	1	0	1	2	1.99843	333.9	4.4	2.04673	142	30	-37	4.2	1.6	$1.8 \cdot 10^{-10}$	6.0
333	92-159 15:19	3	3	199	22	23	19	12	14	6	0	1	21	0	1	0	1	0	1	2	1.99574	334.1	4.5	2.03621	170	3	-50	2.0	1.9	$3.5 \cdot 10^{-09}$	10.5
334	92-168 19:20	1	2	14	8	8	1	13	15	0	1	1	45	14	1	0	1	0	1	2	1.96032	336.8	4.5	1.90098	70	45	18	2.3	1.9	$3.5 \cdot 10^{-11}$	10.5
335	92-174 00:26	1	3	15	23	14	4	15	15	0	1	1	8	31	1	0	1	0	1	2	1.93920	338.3	4.5	1.82332	69	44	19	2.0	1.9	$1.4 \cdot 10^{-09}$	10.5
336	92-180 03:07	3	2	0	14	19	15	13	15	8	0	1	36	8	1	0	1	0	1	2	1.91353	340.2	4.5	1.73181	999	999	999	2.7	1.6	$1.9 \cdot 10^{-10}$	6.0
337	92-209 10:18	3	2	116	11	19	1	8	8	6	0	1	37	0	1	0	1	0	1	2	1.77697	349.8	4.5	1.29623	287	298	14	19.0	1.9	$3.0 \cdot 10^{-13}$	10.5
338	92-223 15:07	3	1	213	5	14	1	8	9	15	0	1	12	1	1	0	1	0	1	2	1.70286	355.1	4.5	1.09352	150	24	-42	19.0	1.9	$7.7 \cdot 10^{-14}$	10.5
339	92-250 22:51	3	4	108	27	49	25	7	15	5	0	1	47	0	1	0	1	0	1	2	1.54678	6.7	4.3	0.73584	298	316	28	12.7	1.9	$1.0 \cdot 10^{-10}$	10.5
340	92-306 03:17	1	6	10	59	61	31	5	8	0	1	1	31	4	1	0	1	0	1	2	1.19618	40.2	2.7	0.21280	76	103	16	28.1	1.6	$1.9 \cdot 10^{-09}$	6.0
341	92-308 00:49	3	4	24	25	27	12	13	10	15	0	1	30	0	1	0	1	0	1	2	1.18414	41.7	2.6	0.20008	56	101	32	4.9	2.1	$4.5 \cdot 10^{-10}$	14.3
342	92-308 01:05	3	3	195	19	22	8	13	12	15	0	1	26	4	1	0	1	0	1	2	1.18407	41.7	2.6	0.20001	176	52	-46	2.5	1.6	$7.1 \cdot 10^{-10}$	6.0
343	92-308 01:06	3	1	217	3	25	6	1	9	15	0	1	30	2	1	0	1	0	1	2	1.18406	41.7	2.6	0.20000	145	83	-34	70.0	1.9	$1.5 \cdot 10^{-15}$	10.5
344	92-308 06:26	3	2	238	9	10	1	14	4	15	0	1	8	1	1	0	1	0	1	2	1.18265	41.8	2.6	0.19853	115	98	-14	2.0	1.9	$1.1 \cdot 10^{-10}$	10.5
345	92-311 10:18	3	3	25	20	9	9	14	1	14	0	1	31	1	1	0	1	0	1	2	1.16277	44.4	2.4	0.17807	55	101	33	2.0	1.9	$3.8 \cdot 10^{-10}$	10.5
346	92-314 06:12	1	6	5	59	29	29	5	0	4	1	1	31	0	1	0	1	0	1	2	1.14518	46.8	2.2	0.16040	83	103	11	29.8	1.9	$5.2 \cdot 10^{-11}$	10.5
347	92-325 00:00	3	6	239	56	56	31	12	10	5	0	1	31	0	1	0	1	0	1	2	1.08091	56.5	1.5	0.09797	114	111	-14	2.0	1.9	$9.5 \cdot 10^{-07}$	10.5
348	92-325 17:31	3	3	192	23	6	10	13	3	14	0	1	15	3	1	0	1	0	1	2	1.07673	57.2	1.5	0.09395	180	60	-47	2.0	1.9	$3.9 \cdot 10^{-10}$	10.5
349	92-333 10:40	3	4	236	28	28	19	14	12	15	0	1	31	1	1	0	1	0	1	2	1.03437	65.0	0.9	0.05272	118	110	-18	2.0	1.9	$2.0 \cdot 10^{-08}$	10.5
350	92-343 15:09	1	6	209	56	15	30	5	0	4	1	1	6	31	5	2	2	0	2	2	0.98486	76.2	0.0	0.00004	156	100	-46	29.8	1.9	$3.0 \cdot 10^{-12}$	10.5
351	92-346 23:21	3	4	26	27	49	24	9	15	5	0	1	47	0	1	0	1	0	1	2	0.98266	80.6	-0.1	0.01729	53	128	27	7.2	1.9	$4.4 \cdot 10^{-10}$	10.5
352	92-349 04:52	1	4	150	24	15	13	9	0	6	0	1	10	1	1	0	1	0	1	2	0.98254	83.5	-0.2	0.02870	239	29	-26	7.2	1.9	$2.2 \cdot 10^{-11}$	10.5
353	92-349 16:29	1	2	209	14	14	4	13	0	12	0	1	13	0	1	0	1	0	1	2	0.98265	84.2	-0.2	0.03118	156	113	-51	2.3	1.9	$2.5 \cdot 10^{-10}$	10.5
354	92-352 16:37	3	6	228	58	52	30	5	14	15	0	1	31	0	1	0	1	0	1	2	0.98444	88.1	-0.3	0.04644	129	141	-30	29.8	1.9	$9.2 \cdot 10^{-11}$	10.5
355	92-353 09:53	1	2	242	13	11	8	14	15	0	1	1	45	31	1	0	1	0	1	2	0.98515	89.0	-0.3	0.05008	110	147	-15	2.0	1.9	$2.4 \cdot 10^{-10}$	10.5
356	92-353 09:53	1	3	219	19	15	19	8	0	7	0	1	40	0	1	0	1	0	1	2	0.98515	89.0	-0.3	0.05008	142	135	-39	9.7	1.9	$4.4 \cdot 10^{-12}$	10.5
357	92-358 14:59	3	2	42	8	25	1	8	10	15	0	1	26	1	1	0	1	0	1	2	0.99348	95.8	-0.5	0.07611	31	130	45	19.0	1.9	$5.2 \cdot 10^{-13}$	10.5
358	92-363 15:47	3	1	47	2	19	1	15	15	15	0	1	18	3	1	0	1	0	1	2	1.00667	102.2	-0.7	0.10068	24	124	49	11.8	11.8	$2.9 \cdot 10^{-13}$	5858.3

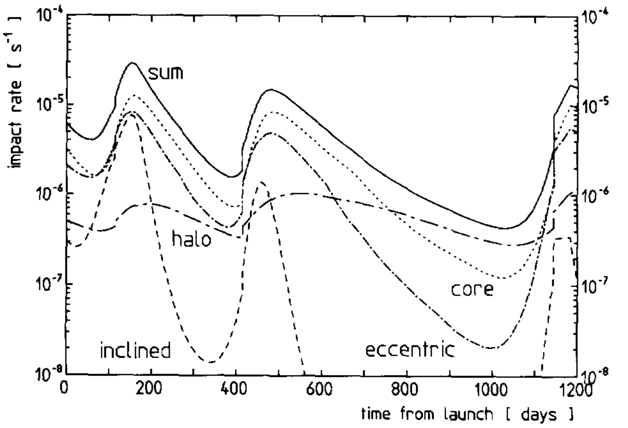

Fig. 10. Divine's (1993) model of the *Galileo* "big" impact rate (cf. Fig. 4). Contributions to the impact rate from five different dust populations are shown separately as well as summed together. The model calculations take into account the orbit of *Galileo* as well as the detector geometry and sensitivity

the model values (Fig. 10). The model values shown are adjusted for the new effective mass threshold for "big" impacts. This threshold is about a factor 10 below the value used by Divine in his original modeling. For most of the mission, the impact rates are matched by the core population which has been defined to represent the majority of interplanetary dust data including zodiacal light observations. At this stage, only impact rates are modeled by the Divine model. However, we are upgrading the model to include impact directions and impact speeds as well.

Besides comparing the dust observations with theoretical models, future data analysis activities will include identification of "small" impact events in the *Galileo* data set (cf. Baguhl *et al.*, 1993), dead-time and measuring-time analysis of *Galileo* data, and finally, an analysis of measurements by the primary dust charge channel.

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