Results of the IMO Video Meteor Network – December 2013

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December 2013 completed an eventful year. The month started promising and yielded good observing conditions to most observers in the first decade. An amazing 63 video cameras were active in the nights of December 2/3 and 3/4. Around December 10, however, the picture changed rapidly. We see large gaps in the observing statistics for the Geminids in Northern and Eastern Europe. Even worse became the situation in the second half of the month. Whereas observers in Germany experienced unusually good observing conditions and missed nearly no nights, we had a complete loss of observations from Slovenia, Hungary and Italy for several days.
Overall 80 video cameras were in operation, 33 of which were active in twenty and more nights. The effective observing time increased from 6,800 to almost 9,800 hours. The increase of the meteor count was less prominent, though, because we recorded fewer Geminids than 2012. The number increased from 40,000 to almost 48,000. At the end of the year, the race to catch up with the 2012 result had become thrilling again. Whether it was sufficient to surpass the outcome of the year before will be shown later.

In December, we saw a number of changes in the IMO network again. Whereas the camera ACR of Wolfgang Hinz died and forced him to take a longer break, we could welcome back Carl Hergenrother with SALSA3 after a break of almost two years. Rainer Arlt obtained a new Mintron camera, which is now dubbed LUDWIG2 and which is much more powerful that it's predecessor. Rui Goncalves introduced TEMPLAR5, another Mintron camera with 6 mm f/0.75 Panasonic lens, and Zoltan Zelko extended his equipment by HUVCSE04, which consists (similar to HUVCSE03) of a KPC-350BH video camera and a f/1.0 Tamron zoom lens (fixed at roughly 4 mm focal length). Meanwhile, every observer of the IMO network operates on average two video cameras.

Highlight of December were the Geminids. Whereas we recorded over 15,000 meteors in three nights of 2012 (December 12-15), it was "only" about 11,000 meteors in the same three nights of 2013. Main reason was the full moon, which illuminated the night sky, and the weather. Those few observers who enjoyed clear skies, recorded up to 600 meteors and more in a single night, whereas others missed the Geminids completely.
If the flux density profiles of the previous years are compared, we find a good agreement between 2012 and 2013 (figure 1), but significant deviation of the 2011 profile. Also the zenith exponent was "less cooperative" than for other showers. On the one hand we have observing interval in the evening hours of December 11/12 and 12/13 with higher rates than the following intervals, which hints on a zenith exponent below 1.5. On the other hand, the profile of the previous two years fit best to one another if the zenith exponent is around 1.7 to 1.8. Maybe this is linked to a „sub-optimal" default population index of 2.6.

Apropos population index: Of course, we determined this figure for the Geminids as well. In the night of December 13/14, the r-value was about 0.3 smaller than in the night before, which reflects the well-known fact that after the peak the Geminids are on average brighter than before. Still, with values below 2.0, the population index was again smaller than the r-values typically obtained from visual data. For this reason, we currently undertake a rigorous check of the full procedure. The results are still pending and will be presented in one of the upcoming monthly reports.

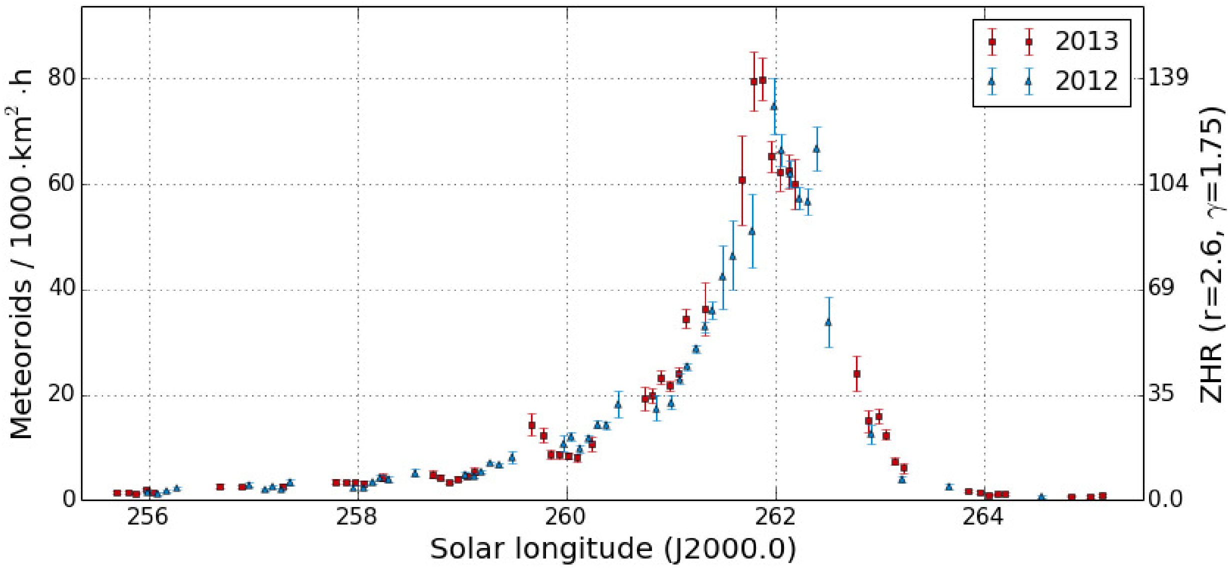

Figure 1: *Flux density profile of the Geminiden, obtained from data of the IMO Video Meteor Network in 2012 and 2013.*

Also the Ursids show a nice agreement of the flux density profiles from the last two years. (figure 2).

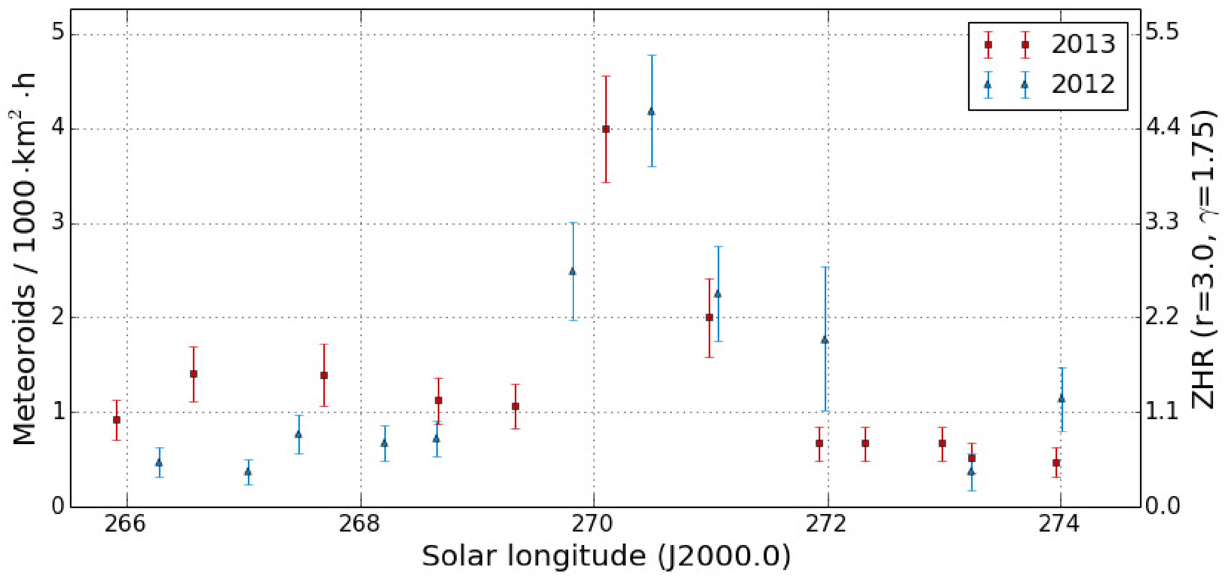

Figure 2: *Flux density profile of the Ursids, obtained from IMO Network data 2012 and 2013.*

Let's finally come to the traditional end-of-year review. In the first few months of 2013 the weather was so poor that at some times we did not even obtain half of the 2012 output. With the exception of April, the monthly totals of every single month in the first half of 2013 decreased, so that we had amassed a deficite of almost 40,000 meteors by the end of June. In the second half of 2013, the situation improved. Now we could record at least as many meteors as in 2012, and in most months even a few thousand more. Still, it was not sufficient to reach the results of 2012.

49 observers (2012: 46) from 16 countries (2012: 15) operated a total of 88 video cameras (2012: 80) in the IMO network. There were no changes in the global ranking: Germany is still leading with 18 cameras, closely followed by Hungary (17), and followed by Italy (12) and Slovenia (11). 8 cameras were operated in Portugal, and 3 cameras in Poland, Spain, Belgium and the Czech Republic. Two cameras were active in the USA, and single cameras in Australia, the Netherlands, Greece, Finland, France and Russia.

In 365 observing nights (2012: 366) and 86,632 hours of effective observing time (2012: 93,563), we recorded a total of 350,002 meteors (2012: 353,627). The hourly average increased slightly from 3.8 to 4.0 meteors per hours. Even though the network further expanced, we saw a small reduction in observing time (-7%), whereas the meteor counts remained almost the same (-1%). Overall, the output of 2013 has been by far the second best in the history of the IMO network.

Table 1 presents the distribution of observations over the months.

Tabelle 1: *Monthly distribution of video observations in the IMO Network 2013.*

Month	# Observing Nights	Eff. Observing Time [h]	# Meteors	Meteors / Hour
January	31	4,922.1	13,474	2.7
February	28	5,012.8	10,492	2.1
March	31	6,002.3	12,134	2.0
April	30	7,137,1	14,311	2.0
May	31	5,124.0	12,654	2.5
June	30	5,686.9	16,250	2.9
July	31	8,061.9	35,829	4.4
August	31	9,878.2	75,405	7.6
September	30	8,490.8	37,458	4.4
October	31	9,462.6	44,010	4.7
November	30	7,100.3	30,419	4.3
December	31	9,753.3	47,566	4.9
Gesamt	***365***	***86,632.3***	***350,002***	***4.0***

In 2012 there were four observers that managed to obtain more than 300 observing nights, in 2013 the number increased to five. Thanks to perfect observing conditions, Detlef Koschny took over the lead with his two image-intensified cameras on Teneriffe and La Palma. Together with a third camera in the Netherlands he obtained 339 observing nights. Antal Igaz ranked second with 318 nights, followed by Sirko Molau with 317, Rui Goncalves with 313 and Stefano Crivello with 308 nights. There were 18 observers with over 200 nights, and another 11 with more than 100 nights.
With respect to the effective observing time, Rui Goncalves could clearly increase his yield from 2012 and defend the pool position with over 8,100 hours. He was followed by Sirko Molau with nearly 7,000 and Carlos Saraiva with almost 5,600 observing hours.
The ranking with respect to the number of meteors changed in 2013. Enrico Stomeo, who had dominated this table for the last three years, ranked in 2013 “only” third with 27,000 meteors, closely followed by Rui Goncalves. The undisputed leader of 2013 was Detlef Koschny with well above 41,000 meteors, followed by Sirko Molau with almost 36,000 meteors. So for every image intensified cameras on the Canaries you have to come up with two or three powerful Mintron cameras at a good central European location. Lets see whether someone can catch up with Detlef in 2014.

In the long-term statistics of the IMO Network, three more observers got “supersonic” by collecting more than 1,000 observing nights: Mitja Govedic, Hans Schremmer and Maurizio Eltri. Stefano Crivello and Javor Kac are observers number three and four who contributed overall more than 100,000 meteors to the IMO Video Meteore Database.

Table 2 lists all active observers of the IMO Network in 2013, whereby the number of cameras and stations refers to the majority of the year.

Table 2: Distribution of video observation over the observers in 2013.

Observer	Country	# Observing Nights	Eff. Observing Time [h]	# Meteors	Meteors / Hour	Cameras (Stations)
Detlef Koschny	Netherlands	339	4,949.9	41,536	8.4	3 (3)
Antal Igaz	Hungary	318	4,543.7	10,660	2.3	4 (3)
Sirko Molau	Germany	317	6,950,8	35,596	5.1	5 (2)
Rui Goncalves	Portugal	313	8,129.3	27,003	3.3	3 (1)
Stefano Crivello	Italy	308	5,304.1	24,126	4.5	3 (1)
Enrico Stomeo	Italy	284	4,382.8	27,179	6.2	3 (1)
Carlos Saraiva	Portugal	271	5,596.3	13,279	2.4	3 (1)
József Morvai	Hungary	260	1,532.0	3,387	2.2	1 (1)
Bernd Brinkmann	Germany	260	2,059.3	6,286	3.1	2 (2)
Hans Schremmer	Germany	255	1,226.7	4,291	3.5	1 (1)
Jörg Strunk	Germany	245	3,499.4	13,116	3.7	4 (1)
Mike Otte	USA	245	1,317.4	5,173	3.9	1 (1)
Mitja Govedic	Slovenia	244	3,150.0	10,069	3.2	3 (1)
Maciej Maciejewski	Poland	241	3,530.2	9,765	2.8	3 (1)
Istvan Tepliczky	Hungary	238	1,768.0	7,130	4.0	1 (1)
Szabolcs Kiss	Hungary	230	1,187.6	1,269	1.1	1 (1)
Karoly Jonas	Hungary	228	1,391.1	2,959	2.1	1 (1)
Grigoris Maravelias	Greece	226	1,392.4	4,309	3.1	1 (1)
Zsolt Perkó	Hungary	225	1,285.1	7,220	5.6	1 (1)
Flavio Castellani	Italy	223	2,120.0	7,613	3.6	2 (1)
Mario Bombardini	Italy	221	1,102.3	7,886	7.2	1 (1)
Martin Breukers	Netherlands	212	1,807.7	4,123	2.4	2 (1)
Rok Pucer	Slovenia	205	1,161.1	4,822	4.2	1 (1)
Javor Kac	Slovenia	192	3,406.3	16,371	4.8	5 (3)
Erno Berkó	Hungary	188	3,322.5	13,350	4.0	3 (1)
Mihaela Triglav	Slovenia	184	591.0	2,983	5.0	1 (1)
Maurizio Eltri	Italy	171	1,009.9	4,996	4.9	1 (1)
Leo Scarpa	Italy	154	782.5	2,838	3.6	1 (1)
Péter Bánfalvi	Hungary	154	766.2	1,905	2.5	1 (1)
Ilkka Yrjölä	Finland	152	815.1	3,207	3.9	1 (1)
Szofia Biro	Hungary	150	806.9	1,952	2.4	1 (1)
Eckehard Rothenberg	Germany	145	772.2	1,749	2.3	1 (1)
Stane Slavec	Slovenia	136	639.7	1,406	2.2	1 (1)
Jenni Donati	Italy	111	809.1	6,304	7.8	1 (1)
Mikhail Maslov	Russia	93	374.2	2,713	7.3	1 (1)
Paolo Ochner	Italy	89	263.5	1,211	4.6	1 (1)
Steve Kerr	Australia	81	343.3	1,740	5.1	1 (1)
Francisco Ocaña González	Spain	77	558.2	473	0.8	1 (1)
Wolfgang Hinz	Germany	72	380.6	2,478	6.5	1 (1)
Rainer Arlt	Germany	66	468.4	790	1.5	1 (1)
Zoltán Zelko	Hungary	51	287.4	726	2.6	1 (1)
Arnaud Leroy	France	48	201.3	143	0.7	1 (1)
Karl-Heinz Gansel	Germany	40	178.7	197	1.1	1 (1)
Luc Bastiaens	Belgium	39	186.3	159	0.9	1 (1)
Szilárd Csizmadia	Hungary	19	35.6	100	2.8	1 (1)
Tomasz Lojek	Poland	14	71.4	179	2.5	1 (1)
Rosta Štork	Czech Rep.	13	101.4	3,070	30.3	2 (2)
Carl Hergenrother	USA	7	70.4	151	2.1	1 (1)
Jakub Koukal	Czech Rep.	1	3.0	14	4.7	1 (1)

In the statistics of the most successful video camera (table 3) we have once more a photo finish between TEMPLAR3 and SCO38. They are followed by the image-intensified camera ICC7 at Teneriffe. Her twin-camera ICC9 at La Palma started operation in February, which is why it did not made it into the TOP-10, even thought it was the camera that recorded most meteors in 2013 (19,411).

Table 3: *The ten most successful video systems in 2013.*

Camera	Location	Observer	# Observing Nights	Eff. Observing Time [h]	# Meteors	Meteors / Hour
TEMPLAR3	Tomar (PT)	Rui Goncalves	292	2,135.4	5,830	2.7
STG38	Valbrevenna (IT)	Stefano Crivello	292	1,860.2	9,751	5.2
ICC7	Teneriffe (ES)	Detlef Koschny	290	2,350.6	18,837	8.0
BILBO	Valbrevenna (IT)	Stefano Crivello	288	1,766.5	8,267	4.7
C3P8	Scorce (IT)	Stefano Crivello	283	1,677.4	6,108	3.6
MIN38	Scorce (IT)	Enrico Stomeo	272	1,455.4	9,517	6.5
REMO2	Ketzür (DE)	Sirko Molau	268	1,488.3	7,249	4.8
REMO1	Ketzür (DE)	Sirko Molau	267	1,474.1	10,121	6.9
SCO38	Scorce (IT)	Enrico Stomeo	266	1,508.8	9,994	6.6
TEMPLAR2	Tomar (PT)	Rui Goncalves	261	2,047.9	6,912	3.4

The complete data set of 2013 is ready for download at the IMO Network Homepage http://www.imonet.org.

As always, we would like to thank the many observers, whose passion is a guarantor for the success of the IMO Network. Special thanks to Stefano Crivello, Enrico Stomeo, Rui Goncalves and Antal Igaz, who check together with Sirko Molau every month the consistency of the data set and ensure the high quality of the database.

1. Observers

Code	Name	Place	Camera	FOV [°²]	St.LM [mag]	Eff.CA [km²]	Nights	Time [h]	Meteors
ARLRA	Arlt	Ludwigsfelde/DE	LUDWIG1 (0.8/8)	1488	4.8	726	1	8.3	8
			LUDWIG2 (0.8/8)	1534	5.8	2467	14	96.2	354
BANPE	Bánfalvi	Zalaegerszeg/HU	HUVCSE01 (0.95/5)	2423	3.4	361	10	61.2	187
BERER	Berkó	Ludanyhalaszi/HU	HULUD1 (0.8/3.8)	5542	4.8	3847	15	110.0	779
			HULUD3 (0.95/4)	4357	3.8	876	12	107.6	179
BOMMA	Bombardini	Faenza/IT	MARIO (1.2/4.0)	5794	3.3	739	23	186.7	1647
BREMA	Breukers	Hengelo/NL	MBB3 (0.75/6)	2399	4.2	699	7	40.0	73
			MBB4 (0.8/8)	1470	5.1	1208	13	79.1	158
BRIBE	Klemt	Herne/DE	HERMINE (0.8/6)	2374	4.2	678	13	62.7	127
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2286	4.6	1080	21	113.2	425
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	5.0	1611	21	135.9	1315
			BMH2 (1.5/4.5)*	4243	3.0	371	4	45.5	148
CRIST	Crivello	Valbrevenna/IT	BILBO (0.8/3.8)	5458	4.2	1772	19	174.3	1500
			C3P8 (0.8/3.8)	5455	4.2	1586	21	201.0	1042
			STG38 (0.8/3.8)	5614	4.4	2007	21	178.2	1598
DONJE	Donati	Faenza/IT	JENNI (1.2/4)	5886	3.9	1222	23	229.3	1895
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5631	4.3	2151	20	188.6	783
GANKA	Gansel	Dingden/DE	DARO01 (1.4/3.6)	7141	3.1	652	8	33.1	62
GONRU	Goncalves	Tomar/PT	TEMPLAR1 (0.8/6)	2179	5.3	1842	15	172.1	825
			TEMPLAR2 (0.8/6)	2080	5.0	1508	16	175.6	762
			TEMPLAR3 (0.8/8)	1438	4.3	571	22	227.0	853
			TEMPLAR4 (0.8/3.8)	4475	3.0	442	16	166.1	655
			TEMPLAR5 (0.75/6)	2312	5.0	2259	10	91.9	292
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1447	5.5	1841	19	124.8	475
			ORION3 (0.95/5)	2665	4.9	2069	15	100.3	208
			ORION4 (0.95/5)	2662	4.3	1043	17	121.0	282
HERCA	Hergenrother	Tucson/US	SALSA3 (1.2/4)*	2198	4.6	894	7	70.4	151
HINWO	Hinz	Schwarzenberg/DE	ACR (2.0/35)*	557	7.3	5002	5	46.3	432
IGAAN	Igaz	Baja/HU	HUBAJ (0.8/3.8)	5552	2.8	403	16	86.5	388
		Debrecen/HU	HUDEB (0.8/3.8)	5522	3.2	620	17	142.3	412
		Hodmezovasar./HU	HUHOD (0.8/3.8)	5502	3.4	764	18	104.1	363
		Budapest/HU	HUPOL (1.2/4)	3790	3.3	475	13	86.6	103
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4)	2286	3.9	445	17	127.3	282
KACJA	Kac	Kamnik/SI	CVETKA (0.8/3.8)	4914	4.3	1842	10	66.7	336
		Kostanjevec/SI	METKA (0.8/12)*	715	6.4	640	7	59.5	273
		Ljubljana/SI	ORION1 (0.8/8)	1402	3.8	331	13	55.6	84
		Kamnik/SI	REZIKA (0.8/6)	2270	4.4	840	6	31.1	130
			STEFKA (0.8/3.8)	5471	2.8	379	10	79.8	330
KISSZ	Kiss	Sulysap/HU	HUSUL (0.95/5)*	4295	3.0	355	13	85.7	104
KOSDE	Koschny	Izana Obs./ES	ICC7 (0.85/25)*	714	5.9	1464	24	187.2	1642
		La Palma / ES	ICC9 (0.85/25)*	683	6.7	2951	25	138.0	1270
		Noordwijkerhout/NL	LIC4 (1.4/50)*	2027	6.0	4509	15	85.6	251
LOJTO	Łojek	Grabniak/PL	PAV57 (1.0/5)	1631	3.5	269	6	33.5	96
MACMA	Maciejewski	Chelm/PL	PAV35 (0.8/3.8)	5495	4.0	1584	22	160.4	739
			PAV36 (0.8/3.8)*	5668	4.0	1573	23	182.5	831
			PAV43 (0.75/4.5)*	3132	3.1	319	17	135.2	246
			PAV60 (0.75/4.5)	2250	3.1	281	21	118.5	347
MARGR	Maravelias	Lofoupoli/GR	LOOMECON (0.8/12)	738	6.3	2698	17	102.7	269
MASMI	Maslov	Novosimbirsk/RU	NOWATEC (0.8/3.8)	5574	3.6	773	17	88.8	705
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1230	6.9	6152	26	151.0	996
			MINCAM1 (0.8/8)	1477	4.9	1084	23	140.4	424
		Ketzür/DE	REMO1 (0.8/8)	1467	6.5	5491	22	173.7	1072
			REMO2 (0.8/8)	1478	6.4	4778	22	160.8	731
			REMO3 (0.8/8)	1420	5.6	1967	22	156.0	244
			REMO4 (0.8/8)	1478	6.5	5358	21	164.6	906
MORJO	Morvai	Fülöpszallas/HU	HUFUL (1.4/5)	2522	3.5	532	22	145.3	305
OCHPA	Ochner	Albiano/IT	ALBIANO (1.2/4.5)	2944	3.5	358	15	98.8	483
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	3.8	460	16	97.3	440
PERZS	Perkó	Becsehely/HU	HUBEC (0.8/3.8)*	5498	2.9	460	20	161.8	1052
PUCRC	Pucer	Nova vas nad Dra./SI	MOBCAM1 (0.75/6)	2398	5.3	2976	16	118.7	736
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2366	4.5	911	12	79.1	145
SARAN	Saraiva	Carnaxide/PT	RO1 (0.75/6)	2362	3.7	381	20	210.1	679
			RO2 (0.75/6)	2381	3.8	459	22	221.3	828
			SOFIA (0.8/12)	738	5.3	907	21	223.1	610
SCALE	Scarpa	Alberoni/IT	LEO (1.2/4.5)*	4152	4.5	2052	21	171.6	485
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	4900	3.0	409	24	133.6	783
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	563	6.2	1294	14	104.6	207
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5566	4.8	3270	23	204.6	1494
			NOA38 (0.8/3.8)	5609	4.2	1911	22	198.7	1191
			SCO38 (0.8/3.8)	5598	4.8	3306	23	216.4	1625
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2354	5.4	2751	23	118.3	1029
			MINCAM3 (0.8/6)	2338	5.5	3590	22	121.0	891
			MINCAM4 (1.0/2.6)	9791	2.7	552	21	100.3	662
			MINCAM5 (0.8/6)	2349	5.0	1896	22	118.9	957
TEPIS	Tepliczky	Agostyan/HU	HUAGO (0.75/4.5)	2427	4.4	1036	18	112.6	268
		Budapest/HU	HUMOB (0.8/6)	2388	4.8	1607	12	99.0	344
TRIMI	Triglav	Velenje/SI	SRAKA (0.8/6)*	2222	4.0	546	19	124.4	733
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM (0.8/6)	2337	5.5	3574	8	50.9	563
ZELZO	Zelko	Budapest/HU	HUVCSE03 (1.0/4.5)	2224	4.4	933	6	36.2	140
			HUVCSE04 (1.0/4.5)	1484	4.4	573	5	36.2	127
Sum							31	9753.3	47566

* active field of view smaller than video frame

2. Observing Times (h)

December	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	-	-	-	-	-	8.3	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.1
BANPE	5.5	9.5	9.5	7.8	0.2	10.9	-	3.8	-	-	-	-	-	-	-
BERER	9.5	11.7	11.7	8.9	-	11.1	2.2	-	12.8	7.3	2.1	-	-	-	-
	12.7	11.5	11.7	7.0	-	9.7	1.9	-	13.2	7.5	0.9	-	-	-	-
BOMMA	-	12.2	13.3	13.2	13.2	11.4	-	-	-	8.7	-	5.7	13.4	2.9	11.4
BREMA	1.8	13.9	1.2	8.6	7.0	3.6	3.9	-	-	-	-	-	-	-	-
	2.9	10.7	-	9.3	8.4	4.1	1.0	-	-	8.0	-	-	-	-	-
BRIBE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	12.4	7.9	-	1.6	0.7	-	-	-	5.4	-	7.5	3.0	5.2	10.5
CASFL	3.2	6.3	6.3	6.1	6.4	-	7.0	1.7	4.6	7.6	8.5	11.1	11.6	8.2	6.9
	7.8	12.3	12.7	12.7	-	-	-	-	-	-	-	-	-	-	-
CRIST	2.8	-	-	13.1	0.2	11.5	9.7	4.5	1.9	-	13.2	13.2	11.7	5.9	13.2
	3.0	13.0	13.1	6.6	-	10.8	4.1	3.6	1.5	13.2	11.1	13.2	10.3	6.7	13.2
	3.7	13.0	13.1	10.5	-	11.6	9.6	5.2	2.9	11.9	13.2	13.2	11.4	5.5	13.2
DINJE	-	12.8	13.3	13.2	13.3	13.4	12.8	12.5	8.5	12.0	-	8.2	13.5	2.7	13.3
ELTMA	4.1	12.1	13.3	13.3	11.4	13.3	13.3	6.8	7.9	11.9	-	-	-	2.2	12.8
GANKA	-	-	-	-	-	-	-	-	-	-	-	-	3.0	-	-
GONRU	12.8	12.8	12.7	12.9	12.8	12.1	9.4	12.9	12.8	10.4	-	-	-	9.6	8.6
	12.8	8.8	12.8	12.9	12.8	12.2	8.9	13.0	13.0	9.6	-	-	-	12.6	12.7
	12.8	12.7	12.7	12.7	12.8	12.8	12.9	12.9	12.9	5.8	1.3	-	4.5	12.9	12.6
	12.8	12.8	12.8	12.9	12.8	12.2	8.7	13.0	13.0	4.9	-	-	-	11.1	11.5
	-	-	-	-	-	-	-	-	-	-	-	-	-	6.7	9.8
GOVMI	10.1	12.9	12.6	12.8	3.0	12.5	3.1	7.1	-	-	1.5	8.9	-	-	-
	10.0	12.5	11.9	10.1	3.5	12.0	2.0	5.5	-	-	1.0	4.5	-	-	-
	9.9	13.0	12.6	12.9	-	11.8	2.0	6.6	-	-	1.9	8.7	-	-	-
HERCA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HINWO	-	10.8	9.8	-	-	-	-	-	-	4.7	8.4	12.6	-	-	-
IGAAN	-	-	-	3.8	-	5.2	1.5	5.0	4.0	11.3	11.8	13.1	-	-	0.2
	13.4	13.4	8.6	-	-	12.9	9.8	-	7.1	12.1	5.3	-	-	-	-
	8.6	7.2	-	8.2	-	8.4	1.0	1.3	3.3	8.5	7.3	2.5	-	-	-
	12.4	10.8	12.5	2.5	-	7.2	2.0	2.4	6.5	10.7	-	-	-	-	-
JONKA	13.1	12.9	12.7	3.8	1.6	10.1	5.2	2.0	7.2	9.5	-	-	-	0.3	-
KACJA	-	13.0	13.0	13.3	2.1	3.3	9.8	2.4	5.7	2.2	-	1.9	-	-	-
	12.1	7.5	10.5	8.3	4.9	-	7.6	-	-	-	-	-	-	-	-
	12.3	7.6	5.9	0.3	1.2	4.1	8.9	-	5.4	-	4.1	2.4	-	-	-
	-	-	-	-	1.1	10.1	10.1	2.1	5.9	-	-	1.8	-	-	-
	-	12.9	13.1	13.3	8.8	8.8	10.3	2.8	5.3	2.5	-	2.0	-	-	-
KISSZ	12.4	10.8	12.5	2.5	-	6.9	2.0	2.4	6.5	10.7	-	-	-	-	-
KOSDE	0.5	6.5	11.6	11.0	9.8	11.3	6.1	2.4	2.3	-	-	-	4.8	1.2	-
	1.5	1.8	4.5	11.0	-	5.5	6.8	-	-	-	-	2.0	3.8	1.1	5.4
	-	-	-	7.1	2.4	1.3	-	3.0	4.8	11.1	-	5.8	-	-	-
LOJTO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MACMA	1.3	13.4	12.0	4.0	-	0.6	3.6	3.8	-	0.8	-	-	-	-	-
	3.6	13.7	12.0	3.9	-	0.4	3.1	3.6	0.2	1.3	-	-	-	-	-
	4.6	12.9	2.5	-	-	-	-	3.3	0.6	-	-	-	-	-	-
	3.2	8.6	2.8	1.5	-	-	2.6	1.9	0.3	-	-	-	-	-	-
MARGR	8.8	5.9	-	-	5.0	10.2	-	6.9	12.0	1.3	-	-	-	8.4	-
MASMI	-	1.3	-	0.4	1.3	-	-	-	13.8	10.8	10.8	3.6	-	7.3	-
MOLSI	1.5	12.8	8.5	-	2.0	1.0	1.2	2.4	-	-	-	-	2.3	2.4	13.0
	-	13.4	8.9	-	1.4	0.7	-	0.5	-	-	-	-	1.6	3.6	12.9
	10.3	-	5.2	10.2	3.5	12.1	-	-	0.2	-	-	1.7	-	6.1	13.8
	10.4	-	5.6	10.2	3.2	12.5	-	-	-	-	-	1.6	-	6.0	13.8
	10.2	-	2.9	9.9	3.0	11.5	-	-	-	-	-	0.9	-	6.1	14.1
	11.1	-	5.8	10.3	3.3	12.5	-	-	-	-	-	1.7	-	6.1	14.1
MORJO	13.4	6.8	13.4	5.8	3.1	12.2	4.1	5.5	8.0	10.6	4.7	3.2	-	0.5	-
OCHPA	7.2	-	-	-	-	-	-	7.2	8.6	8.0	-	-	8.3	6.4	12.9
OTTMI	5.4	-	-	-	7.4	7.6	-	0.2	7.5	-	7.5	6.6	-	2.7	-
PERZS	9.3	13.3	13.4	13.3	3.7	13.3	0.9	8.7	-	1.9	2.9	12.8	-	-	-
PUCRC	-	5.5	10.2	10.2	1.6	10.3	7.9	-	9.1	10.3	10.3	10.0	0.8	3.1	10.2
ROTEC	9.3	0.2	4.2	7.4	-	-	-	-	-	-	-	0.2	-	3.7	6.1
SARAN	12.8	12.8	12.8	12.8	12.7	12.9	12.9	12.9	11.7	3.8	-	-	6.2	10.5	9.0
	12.6	12.7	12.7	12.6	12.7	12.7	12.7	12.7	12.7	3.3	-	-	6.8	12.6	12.4
	12.6	12.6	12.7	12.7	12.6	12.7	12.7	12.7	12.7	2.8	-	-	6.2	12.8	12.5
SCALE	2.2	10.6	13.1	13.1	10.6	11.6	12.7	4.8	3.5	13.2	0.2	-	-	1.1	11.7
SCHHA	0.3	11.4	6.8	1.9	5.0	3.0	0.5	4.0	7.1	10.4	-	13.8	8.1	4.0	8.9
SLAST	12.8	12.7	11.7	7.7	9.4	9.8	12.1	1.8	5.4	2.2	4.9	3.2	-	-	-
STOEN	6.4	12.2	13.4	13.4	10.9	13.5	12.6	5.4	8.2	12.1	10.7	-	-	3.1	10.6
	6.5	12.3	13.5	-	11.4	13.6	12.5	5.8	7.0	13.5	13.4	-	-	2.6	11.7
	6.7	11.8	13.5	13.3	11.5	13.5	12.3	5.1	8.0	8.9	13.4	-	-	2.9	12.6
STRJO	0.3	13.5	5.1	9.4	5.5	3.7	-	-	-	-	-	13.6	11.7	1.8	7.3
	-	13.3	5.1	9.3	3.9	3.2	-	-	-	-	-	12.9	11.8	3.5	8.8
	-	12.4	3.4	9.3	3.9	2.8	-	-	-	0.2	-	13.6	11.8	0.7	7.9
	0.2	13.3	5.1	9.6	4.3	3.6	-	-	-	-	-	13.0	11.9	2.7	8.4
TEPIS	8.9	13.3	13.3	1.6	-	5.3	1.3	0.8	2.4	11.8	-	-	-	-	-
	4.5	13.1	13.1	5.3	-	8.2	-	-	1.7	11.8	-	-	-	-	-
TRIMI	12.4	11.1	11.5	12.3	7.2	12.4	7.2	2.9	3.3	-	-	12.4	5.5	-	5.6
YRJIL	6.8	1.5	11.9	8.5	-	-	-	-	3.3	-	-	2.0	14.9	2.0	-
ZELZO	11.2	6.2	9.0	-	0.2	-	-	-	6.1	3.5	-	-	-	-	-
	10.2	6.5	9.1	-	-	-	-	-	6.5	3.9	-	-	-	-	-
Sum	461.5	673.2	634.1	542.5	311.6	548.5	326.5	247.8	328.9	353.9	170.4	265.1	198.9	217.5	402.7

December	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	9.9	2.8	3.4	4.1	11.5	0.4	-	5.1	-	2.3	1.0	9.2	-	10.8	12.9	13.7
BANPE	-	-	-	-	-	2.4	-	-	5.8	-	-	-	5.8	-	-	-
BERER	-	-	-	-	-	-	-	-	12.7	1.2	-	11.3	4.9	0.7	1.9	-
	-	-	-	-	-	-	-	-	12.1	-	-	10.9	8.5	-	-	-
BOMMA	13.0	11.2	11.5	4.4	-	0.3	-	-	3.0	0.4	9.4	11.6	3.6	0.8	4.1	8.0
BREMA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	9.7	6.7	-	1.2	12.8	2.5	1.8
BRIBE	5.4	2.6	3.3	5.5	9.2	2.0	2.9	3.4	-	5.2	5.8	-	-	13.7	2.3	1.4
	7.5	4.3	2.7	6.5	10.6	-	0.5	0.7	-	5.4	5.9	-	0.6	12.8	-	1.5
CASFL	7.0	5.6	-	-	-	-	-	-	-	-	4.4	4.8	-	5.0	6.3	7.3
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRIST	13.2	9.7	-	-	-	-	-	-	-	-	4.0	11.4	-	13.1	12.0	10.0
	13.2	12.6	-	-	-	-	-	-	-	-	6.5	11.2	-	12.7	11.8	9.6
	10.9	11.0	-	-	-	-	-	-	-	-	0.7	0.9	-	3.0	3.7	10.0
DINJE	11.7	11.2	10.7	6.0	-	2.0	-	-	-	-	10.8	12.6	-	1.5	4.8	8.5
ELTMA	9.6	10.2	4.4	-	-	-	-	-	-	-	9.2	13.4	2.4	-	4.0	13.0
GANKA	-	1.4	4.2	1.6	7.1	-	-	-	-	4.5	3.3	-	-	8.0	-	-
GONRU	-	-	-	-	12.9	9.8	-	-	-	-	-	-	-	9.6	-	-
	-	-	-	-	13.0	9.6	0.9	-	-	-	-	-	-	10.0	-	-
	-	-	-	12.6	12.9	12.8	-	-	0.2	7.0	-	5.0	12.3	11.9	-	-
	-	-	-	-	10.1	10.0	0.2	-	-	-	-	-	-	7.3	-	-
	-	-	-	12.8	12.9	12.2	1.0	-	-	6.7	-	5.2	12.9	11.7	-	-
GOVMI	-	-	-	2.5	1.7	2.4	2.0	5.8	9.9	0.3	-	7.2	8.5	-	-	-
	-	-	-	0.2	-	-	3.4	-	6.9	-	-	7.6	9.2	-	-	-
	-	-	-	3.8	-	5.1	3.3	5.5	9.3	0.5	-	6.2	7.9	-	-	-
HERCA	-	-	-	-	-	-	-	-	-	3.7	8.9	12.2	12.1	9.0	12.2	12.3
HINWO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IGAAN	-	-	-	-	-	0.4	2.3	3.4	11.0	5.2	-	8.1	-	0.2	-	-
	-	-	-	-	2.6	-	0.6	3.9	13.7	8.5	-	8.5	13.6	4.4	3.9	-
	-	-	-	-	-	-	-	5.0	8.1	7.8	2.5	4.4	8.0	4.0	-	8.0
	-	-	-	-	3.8	-	-	-	-	3.6	0.2	12.0	-	-	-	-
JONKA	-	-	-	-	3.8	-	-	-	13.7	8.3	-	12.2	6.7	-	4.2	-
KACJA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	8.6	-	-	-	-	-	-	-	-
	-	-	-	0.6	-	-	-	1.2	-	-	-	1.6	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KISSZ	-	-	-	-	3.6	-	-	-	-	3.6	0.2	11.6	-	-	-	-
KOSDE	5.8	7.7	8.5	7.3	8.3	-	7.3	-	11.7	11.7	11.7	6.9	-	9.4	11.7	11.7
	-	1.5	3.0	4.9	4.6	5.4	4.8	5.8	7.0	7.8	9.0	2.9	6.8	10.8	9.5	10.8
	-	-	-	6.4	-	-	7.3	-	-	9.3	4.9	-	6.9	10.9	2.3	2.1
LOJTO	-	-	-	-	-	11.5	3.1	5.7	7.0	1.2	-	-	-	-	5.0	-
MACMA	7.9	4.3	1.2	7.7	3.4	13.4	9.7	12.4	12.1	12.2	-	11.1	14.1	1.3	10.1	-
	11.4	5.5	9.1	10.5	3.7	14.0	11.0	11.4	13.7	11.7	-	12.3	14.1	2.5	9.8	-
	7.3	9.9	9.1	11.1	3.2	14.0	8.6	12.7	14.1	6.6	-	4.3	10.4	-	-	-
	8.0	3.0	1.4	6.1	0.2	6.4	9.8	11.0	13.5	8.9	0.8	10.3	13.5	-	4.7	-
MARGR	-	-	-	3.6	-	4.2	7.1	4.4	-	11.7	6.4	-	-	2.0	2.2	2.6
MASMI	0.2	0.4	3.1	-	0.3	-	-	13.2	13.9	3.9	-	0.2	-	-	-	4.3
MOLSI	11.5	7.6	3.0	4.3	4.8	7.0	3.6	13.1	5.8	7.3	0.6	13.1	2.3	12.7	6.6	0.6
	12.6	6.0	2.6	4.6	3.6	6.5	2.3	13.8	4.4	5.5	0.4	13.6	2.5	12.8	6.2	-
	11.2	3.1	7.3	5.6	12.9	-	4.7	7.3	-	14.1	1.1	6.8	-	12.3	10.5	13.7
	11.6	1.3	6.9	4.6	11.9	-	5.1	6.9	-	2.7	1.1	6.8	1.5	13.2	10.6	13.3
	14.0	1.9	9.8	3.4	13.2	-	4.6	5.9	-	2.2	1.1	5.6	1.2	12.0	9.5	13.0
	13.5	-	7.3	4.0	11.6	-	5.3	7.5	-	2.9	1.3	7.7	2.0	13.4	10.1	13.1
MORJO	-	-	-	-	3.1	4.4	-	-	13.5	9.4	0.6	10.6	-	2.4	5.6	4.4
OCHPA	13.6	10.2	8.5	-	-	-	-	-	-	-	2.6	1.1	-	0.2	0.3	3.7
OTTMI	-	8.3	6.7	-	-	-	-	0.6	-	7.1	6.1	8.4	5.0	10.2	-	-
PERZS	-	-	-	4.4	2.3	1.7	11.9	11.0	13.1	5.0	-	7.5	11.4	-	-	-
PUCRC	-	10.3	7.6	1.3	-	-	-	-	-	-	-	-	-	-	-	-
ROTEC	10.7	-	-	-	-	-	2.3	-	-	-	-	-	-	9.3	12.4	13.3
SARAN	-	6.5	-	9.9	10.3	11.8	-	-	-	6.0	-	-	12.0	9.8	-	-
	1.2	8.2	-	10.5	11.6	12.0	1.2	-	-	6.3	-	-	11.1	10.0	-	-
	0.9	9.7	-	10.9	12.8	12.0	-	-	-	6.7	-	-	12.1	9.7	-	-
SCALE	11.7	5.5	8.6	-	-	-	-	-	-	-	10.0	9.2	-	0.3	5.3	12.6
SCHHA	2.1	-	-	8.8	7.8	-	4.7	-	-	7.1	9.2	-	0.5	4.9	1.0	2.3
SLAST	-	-	-	7.9	-	-	-	-	-	-	-	3.0	-	-	-	-
STOEN	9.5	8.8	6.8	-	0.2	-	-	-	-	-	10.5	12.2	1.4	2.3	9.7	10.7
	10.7	10.9	8.8	-	0.2	-	-	-	-	-	7.7	11.8	1.5	1.9	10.5	10.9
	13.2	13.1	8.8	-	0.4	-	-	-	-	-	10.2	11.9	1.9	2.3	10.2	10.9
STRJO	6.5	1.5	3.7	5.0	7.4	3.7	0.5	0.7	-	5.1	4.2	-	-	5.9	0.8	1.4
	7.7	1.7	3.7	7.9	7.4	3.1	0.8	0.5	-	6.1	3.7	-	-	4.7	0.5	1.4
	2.0	0.9	2.3	6.2	6.8	-	0.9	0.4	-	4.8	3.8	-	-	5.6	-	0.6
	7.0	-	3.6	6.6	5.7	3.8	0.7	0.4	-	6.0	4.0	-	-	5.4	1.2	2.4
TEPIS	0.2	-	-	-	3.9	-	-	11.7	13.5	4.7	-	8.2	11.1	0.1	0.5	-
	-	-	-	-	3.7	-	-	8.4	13.4	5.4	-	-	10.4	-	-	-
TRIMI	8.8	-	0.5	4.0	-	-	1.3	2.6	-	-	-	1.0	2.4	-	-	-
YRJIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZELZO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum	322.2	230.4	182.1	228.1	281.0	204.3	135.7	210.0	263.1	283.3	190.5	385.6	274.3	361.3	253.4	264.9

3. Results (Meteors)

December	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	-	-	-	-	-	8	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	55
BANPE	11	49	40	16	1	40	-	10	-	-	-	-	-	-	-
BERER	91	82	127	37	-	83	5	-	182	46	13	-	-	-	-
	26	23	25	13	-	18	5	-	31	13	2	-	-	-	-
BOMMA	-	85	109	94	92	63	-	-	-	42	-	72	610	13	84
BREMA	5	22	1	22	9	5	9	-	-	-	-	-	-	-	-
	7	20	-	29	19	3	4	-	-	18	-	-	-	-	-
BRIBE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	43	27	-	6	4	-	-	-	9	-	159	15	13	23
CASFL	22	30	54	41	44	-	56	10	35	60	95	201	288	81	49
	25	31	48	44	-	-	-	-	-	-	-	-	-	-	-
CRIST	3	-	-	84	1	112	54	18	12	-	170	361	296	63	67
	3	81	65	13	-	48	14	20	8	93	81	183	164	59	51
	6	107	106	31	-	70	54	17	13	141	164	344	247	28	71
DINJE	-	78	104	111	116	66	42	45	33	52	-	87	657	13	68
ELTMA	15	45	87	44	47	54	83	22	36	69	-	-	-	18	47
GANKA	-	-	-	-	-	-	-	-	-	-	-	-	11	-	-
GONRU	76	80	88	66	87	70	21	59	98	33	-	-	-	44	32
	70	64	82	68	75	66	15	44	67	20	-	-	-	71	56
	43	56	62	48	54	59	56	41	61	8	3	-	112	51	38
	65	50	62	51	65	62	16	40	75	6	-	-	-	64	34
	-	-	-	-	-	-	-	-	-	-	-	-	-	48	45
GOVMI	41	64	62	32	3	76	24	17	-	-	3	48	-	-	-
	23	33	24	15	4	34	8	6	-	-	1	25	-	-	-
	16	39	29	22	-	38	11	9	-	-	2	58	-	-	-
HERCA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HINWO	-	48	44	-	-	-	-	-	-	40	118	182	-	-	-
IGAAN	-	-	-	11	-	34	1	7	16	42	94	117	-	-	1
	28	57	10	-	-	48	23	-	40	64	26	-	-	-	-
	37	34	-	14	-	36	1	2	15	50	56	21	-	-	-
	12	14	13	6	-	7	1	3	20	14	-	-	-	-	-
JONKA	30	41	26	16	2	18	16	7	40	24	-	-	-	1	-
KACJA	-	102	57	73	3	14	59	4	16	5	-	3	-	-	-
	74	39	58	46	15	-	34	-	-	-	-	-	-	-	-
	29	17	8	1	1	3	8	-	8	-	2	1	-	-	-
	-	-	-	-	2	65	28	8	24	-	-	3	-	-	-
	-	77	35	64	50	28	51	2	14	7	-	2	-	-	-
KISSZ	13	14	13	6	-	7	1	3	20	14	-	-	-	-	-
KOSDE	4	79	94	126	71	116	82	17	25	-	-	-	185	1	-
	19	3	40	133	-	83	75	-	-	-	-	10	244	9	81
	-	-	-	26	6	2	-	6	17	74	-	30	-	-	-
LOJTO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MACMA	8	110	67	3	-	1	25	2	-	1	-	-	-	-	-
	22	122	67	3	-	1	19	4	1	1	-	-	-	-	-
	13	78	17	-	-	-	-	3	2	-	-	-	-	-	-
	4	17	25	2	-	-	11	3	2	-	-	-	-	-	-
MARGR	31	1	-	-	21	33	-	18	48	9	-	-	-	45	-
MASMI	-	8	-	2	21	-	-	-	94	61	140	80	-	116	-
MOLSI	9	146	34	-	20	2	3	9	-	-	-	-	40	14	101
	-	41	10	-	4	1	-	1	-	-	-	-	22	31	90
	139	-	21	121	18	119	-	-	1	-	-	8	-	89	120
	91	-	21	78	11	73	-	-	-	-	-	6	-	71	71
	29	-	2	19	5	22	-	-	-	-	-	4	-	32	23
	138	-	20	99	19	101	-	-	-	-	-	12	-	60	69
MORJO	38	7	26	20	2	29	8	13	34	31	6	19	-	5	-
OCHPA	31	-	-	-	-	-	-	16	27	48	-	-	211	19	39
OTTMI	21	-	-	-	25	36	-	1	38	-	45	96	-	16	-
PERZS	51	123	86	88	4	132	5	30	-	7	10	329	-	-	-
PUCRC	-	51	63	56	13	61	36	-	46	90	77	114	11	20	30
ROTEC	21	1	3	18	-	-	-	-	-	-	-	1	-	15	14
SARAN	30	41	37	49	37	42	35	33	39	20	-	-	106	38	29
	63	44	43	35	56	56	52	44	49	16	-	-	133	49	35
	23	24	26	41	44	35	42	34	25	13	-	-	114	49	14
SCALE	10	34	60	39	23	47	55	5	7	58	1	-	-	8	27
SCHHA	1	26	18	5	19	11	2	17	27	41	-	246	183	17	28
SLAST	41	33	19	11	22	25	29	1	3	3	8	3	-	-	-
STOEN	22	73	126	95	89	93	98	20	43	113	157	-	-	37	81
	41	75	118	-	60	98	106	19	26	109	136	-	-	26	48
	47	81	104	109	79	118	105	10	32	136	190	-	-	43	91
STRJO	2	39	5	48	23	14	-	-	-	-	-	277	385	17	49
	-	29	7	43	13	9	-	-	-	-	-	218	373	26	51
	-	21	4	24	8	10	-	-	-	1	-	141	338	10	35
	1	38	4	42	16	8	-	-	-	-	-	277	385	23	64
TEPIS	26	33	41	2	-	13	1	2	18	29	-	-	-	-	-
	32	55	60	7	-	24	-	-	16	49	-	-	-	-	-
TRIMI	30	31	19	29	31	57	26	2	12	-	-	192	182	-	38
YRJIL	44	2	75	24	-	-	-	-	10	-	-	40	362	6	-
ZELZO	31	32	31	-	1	-	-	-	30	15	-	-	-	-	-
	25	29	23	-	-	-	-	-	29	21	-	-	-	-	-
Sum	1909	3052	2882	2515	1457	2711	1515	704	1565	1816	1600	3970	5674	1459	1949

December	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	47	4	8	16	45	1	-	12	-	3	2	13	-	56	48	44
BANPE	-	-	-	-	-	4	-	-	9	-	-	-	7	-	-	-
BERER	-	-	-	-	-	-	-	-	63	1	-	31	10	2	6	-
	-	-	-	-	-	-	-	-	17	-	-	4	2	-	-	-
BOMMA	71	70	47	15	-	2	-	-	5	2	35	53	8	5	29	41
BREMA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	11	9	-	2	25	8	3
BRIBE	9	8	4	14	10	2	9	5	-	13	16	-	-	24	8	5
	15	8	6	5	17	-	1	1	-	11	23	-	2	36	-	1
CASFL	52	42	-	-	-	-	-	-	-	-	25	27	-	23	37	43
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
CRIST	66	29	-	-	-	-	-	-	-	-	39	32	-	53	12	28
	37	30	-	-	-	-	-	-	-	-	20	19	-	28	15	10
	70	48	-	-	-	-	-	-	-	-	4	5	-	21	28	23
DINJE	73	71	58	21	-	6	-	-	-	-	36	57	-	9	27	65
ELTMA	42	30	18	-	-	-	-	-	-	-	19	35	3	-	23	46
GANKA	-	8	5	5	11	-	-	-	-	4	2	-	-	16	-	-
GONRU	-	-	-	-	35	25	-	-	-	-	-	-	-	11	-	-
	-	-	-	-	27	27	1	-	-	-	-	-	-	9	-	-
	-	-	-	28	22	36	-	-	1	17	-	17	26	14	-	-
	-	-	-	-	22	38	1	-	-	-	-	-	-	4	-	-
	-	-	-	41	27	45	1	-	-	12	-	27	30	16	-	-
GOVMI	-	-	-	2	1	4	5	24	30	1	-	19	19	-	-	-
	-	-	-	1	-	-	4	-	8	-	-	16	6	-	-	-
	-	-	-	3	-	5	4	17	11	1	-	9	8	-	-	-
HERCA	-	-	-	-	-	-	-	-	-	3	34	26	21	10	34	23
HINWO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IGAAN	-	-	-	-	-	1	8	6	30	11	-	8	-	1	-	-
	-	-	-	-	4	-	1	8	37	14	-	25	21	4	2	-
	-	-	-	-	-	-	-	9	28	14	3	9	19	1	-	14
	-	-	-	-	4	-	-	-	-	2	1	6	-	-	-	-
JONKA	-	-	-	-	7	-	-	-	24	6	-	16	6	-	2	-
KACJA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	7	-	-	-	-	-	-	-	-
	-	-	-	1	-	-	-	3	-	-	-	2	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
KISSZ	-	-	-	-	4	-	-	-	-	2	1	6	-	-	-	-
KOSDE	24	44	50	74	83	-	58	-	97	87	84	53	-	66	53	69
	-	5	7	39	18	21	25	26	40	37	68	20	63	86	35	83
	-	-	-	6	-	-	17	-	-	11	11	-	4	35	4	2
LOJTO	-	-	-	-	-	26	4	20	25	8	-	-	-	-	13	-
MACMA	57	29	6	27	1	63	36	64	66	37	-	45	63	4	24	-
	48	17	8	39	2	74	39	76	101	43	-	62	62	4	16	-
	5	12	7	9	1	22	11	23	24	3	-	1	15	-	-	-
	38	14	8	18	1	10	22	33	50	14	1	24	36	-	14	-
MARGR	-	-	-	1	-	12	8	2	-	23	7	-	-	4	2	4
MASMI	1	3	25	-	3	-	-	53	67	24	-	1	-	-	-	6
MOLSI	52	15	2	11	11	39	16	137	8	19	6	130	1	154	14	3
	51	7	4	9	2	20	2	41	3	5	2	33	2	36	7	-
	79	7	23	21	91	-	24	12	-	6	1	12	-	58	42	60
	61	1	14	7	41	-	24	11	-	3	2	7	1	64	31	42
	15	2	14	3	16	-	9	1	-	2	1	2	1	16	15	11
	44	-	14	12	80	-	33	12	-	6	2	12	2	63	53	55
MORJO	-	-	-	-	3	4	-	-	27	9	2	10	-	3	3	6
OCHPA	33	17	22	-	-	-	-	-	-	-	4	4	-	1	2	9
OTTMI	-	35	17	-	-	-	-	2	-	13	15	38	8	34	-	-
PERZS	-	-	-	13	1	1	17	34	44	5	-	44	28	-	-	-
PUCRC	-	38	27	3	-	-	-	-	-	-	-	-	-	-	-	-
ROTEC	18	-	-	-	-	-	1	-	-	-	-	-	-	20	15	18
SARAN	-	16	-	26	17	38	-	-	-	15	-	-	21	10	-	-
	1	24	-	32	19	28	5	-	-	12	-	-	22	10	-	-
	1	24	-	19	8	32	-	-	-	13	-	-	26	3	-	-
SCALE	29	13	10	-	-	-	-	-	-	-	2	14	-	2	15	26
SCHHA	6	-	-	15	9	-	15	-	-	7	27	-	3	40	4	16
SLAST	-	-	-	2	-	-	-	-	-	-	-	7	-	-	-	-
STOEN	65	50	44	-	1	-	-	-	-	-	48	68	3	23	81	64
	52	26	25	-	1	-	-	-	-	-	38	51	3	17	61	55
	77	51	54	-	2	-	-	-	-	-	42	66	4	31	81	72
STRJO	11	10	10	11	14	6	3	3	-	10	41	-	-	46	3	2
	14	2	5	18	10	3	2	2	-	4	29	-	-	29	3	1
	4	4	4	9	4	-	4	2	-	4	14	-	-	19	-	2
	12	-	9	6	9	2	1	1	-	4	25	-	-	24	3	3
TEPIS	1	-	-	-	4	-	-	30	37	2	-	9	18	1	1	-
	-	-	-	-	13	-	-	21	39	3	-	-	25	-	-	-
TRIMI	31	-	3	9	-	-	9	7	-	-	-	3	22	-	-	-
YRJIL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
ZELZO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum	1312	814	558	591	701	597	420	705	891	557	741	1178	623	1271	874	955