Results of the IMO Video Meteor Network – December 2015

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Statistics of December looked even spottier than in the preceding month, but still we obtained another record-breaking result. 42 out of the 80 cameras observed in twenty or more observing nights, the two Italian cameras BMH2 and ROVER even in 31. But the observers were not only in southern Europe successful – also observers in Germany and Poland enjoyed favorable observing conditions. The Geminids provided their share to the overall outcome as well. Their maximum occurred in the European daytime hours of December 13, so that we enjoyed high rates both in the night before and thereafter. That was combined with a convenient lunar phase. At the Geminid peak, the moon was just three days old. Not all observers enjoyed clear skies in both nights, but when it cleared, the cameras recorded many hundred meteors. Number one of 2015 was HULUD1 of Erno Berko, which detected over 600 shooting stars on December 13/14. In the three nights of December 12-15 we recorded a total of 20,000 meteors.
With a total of more than 10,600 observing hours, we surpassed the previously best December outcome of 2013 by 10%. Over 60,000 meteors is an increase of more than a quarter. Detlef Koschny contributed particularly to this result, since all his intensified video cameras at the Canary Islands enjoyed perfect conditions and provided over 10,000 meteors in total.

Let's turn towards the most important shower of the month. As in the years before we had to select a higher zenith exponent of γ=1.7 to flatten the flux density profile of the Geminids. Figure 1 shows the profile of the whole shower with a temporal resolution of ≥30 min per measurement. It is obvious that the Geminid peak was not covered by us in this year.

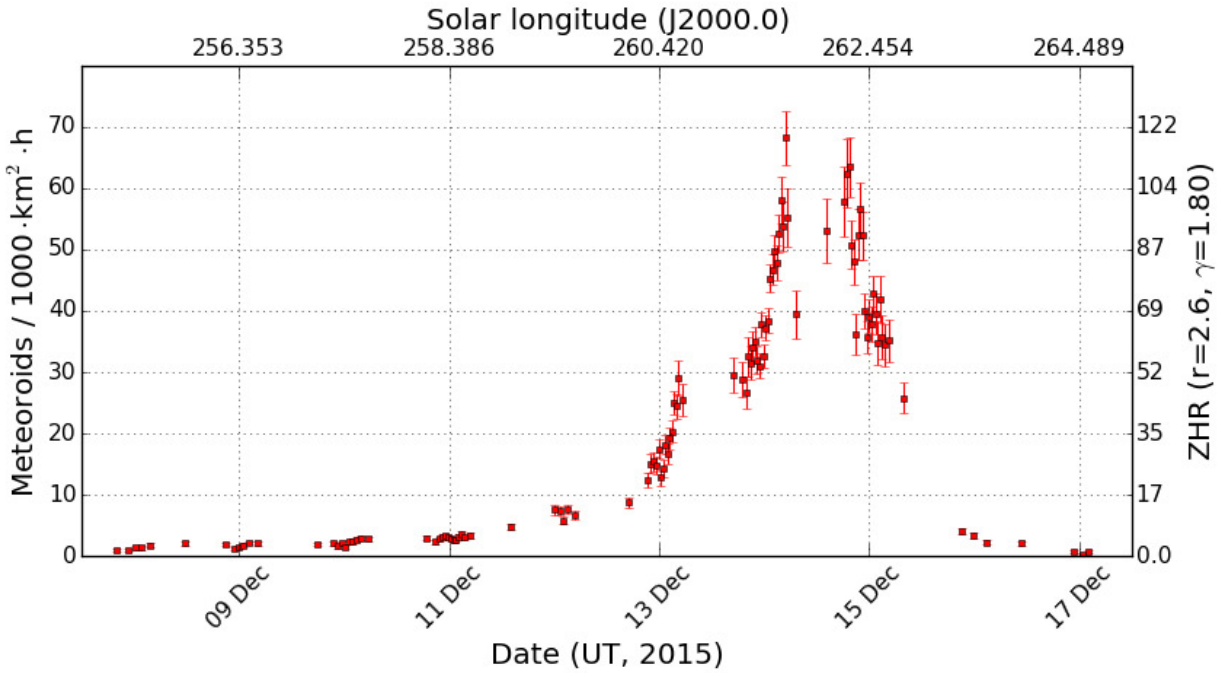

Figure 1: *Flux density profile of the Geminids 2015, derived from observations of the IMO video network.*

For the December 11-16 section, figure 2 presents a comparison of the last four years. We can see that the segments of the individual years fit quite well to each other. Only the transitions between the nights often do not agree very well, even when the zenith exponent is adapted. That hints on the fact that the dependency of the flux density from the radiant altitude is more complex than the zenith exponent model. In particular at the end of a night, rates are often overestimated.

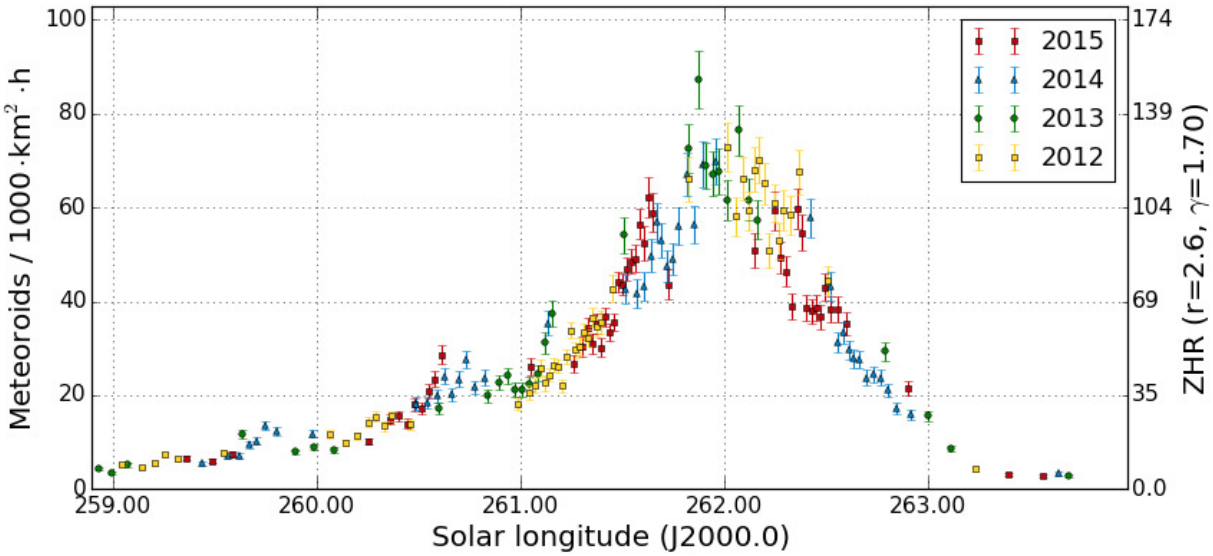

Figure 1: *Flux density profile of the Geminids 2012-2015, derived from observations of the IMO video network.*

Figure 3 presents the population index for the activity period of the Geminids. For sporadic meteors the values scatters between r=2.6 and 3.0. Until the night of December 12/13, the Geminids show virtually the same population index. Since their flux density is particularly low in the first few nights, the "sporadic dilution" is particularly strong there. With values near r=2.2, the Geminid population index is clearly smaller than the sporadic r-value in the three following nights.

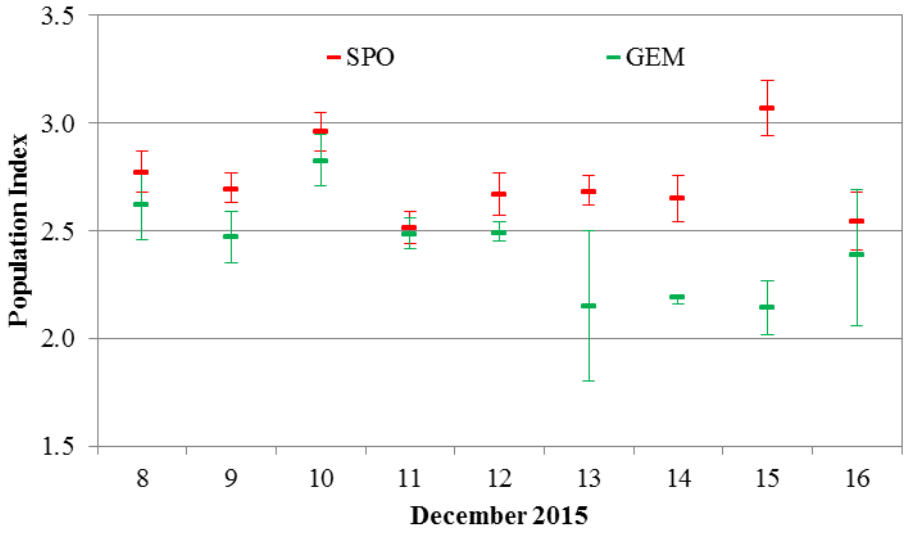

Figure 3: *Population index profile of the Geminids and sporadic meteors in December 2015.*

From time to time the Ursids provide nice surprises just before Christmas. In 2011 we observed a flux density of up to 15 meteoroids per 1,000 km^2 and hour near 270.4° solar longitude. The shower remained inconspicuous in 2012 and 2013 with peak flux densities of 5. In 2014 we observed an even stronger outburst with up to 25 meteoroids per 1,000 km^2 and hour near 270.8° solar longitude, when activity had already declined in the years before. This year the activity was slightly enhanced again with rates up to 10 just been the peaks of 2011 and 2014. Hence, the peak activity and time of the Ursids varies from year to year similar to the Quadrantids a few days later.

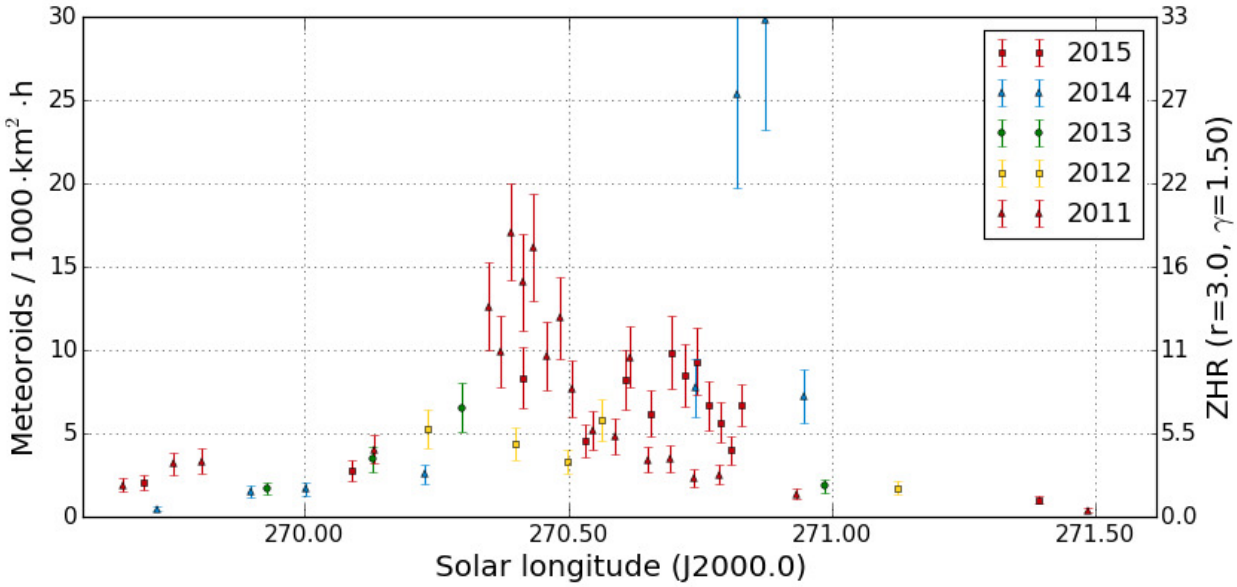

Figure 4: *Flux density profile of the Ursids 2011-2015, derived from observations of the IMO video network.*

Let's now make up a balance for 2015. The size of our camera network did not change, but thanks to the exceptional observing conditions we clearly outdid all the previous years. In the 17th year of the IMO network, 48 observers (2014: 48) from 14 countries (2014: 15) contributed with 92 meteor cameras (2014: 92) to the network. In the competition between the countries, Germany is ahead with 19 cameras, followed by Hungary (17), Italy (13), Slovenia and Portugal (both 12). Further cameras were operated in Poland (5), Spain (4), the Netherlands, USA and Czech Republic (all 2) as well as Belgium, Greece, Finland and Russia (all 1).

In 365 observing nights (2014: 365) and 121,853 hours of effective observing time (2014: 99,880) we recorded 480,362 meteors (2014: 367,036). Thus, the effective observing time increased by over 20% relative to the previous best result, the meteor count even by more than 30%. With 3.9 meteors per hour we obtained the same average as in the three years before.

Table 1 shows the monthly distribution of observations. In seven individual months and also in the monthly average of 2015 we collected more than 10,000 observing hours. So far we achieved this in four months only (2x 2014, 1x 2011 and 2012 each). Starting from August we recorded every month over 50,000 meteors, which before 2015 we managed only four times in August and two times in October. All the figures underline the superb observing conditions, but also the high quality and stability of the cameras in the IMO network.

Table 1: *Monthly distribution of video observations in the IMO Network 2015.*

Month	# Observing Nights	Eff. Observing Time [h]	# Meteors	Meteors / Hour
January	31	9,566.3	25,370	2.7
February	28	10,041.8	19,963	2.0
March	31	11,251.8	18,968	1.7
April	30	10,867.4	25,506	2.3
May	31	7,466.7	16,691	2.2
June	30	7,168.5	18,791	2.6
July	31	9,382.8	36,883	3.9
August	31	12,386.7	91,442	7.4
September	30	11,371.6	53,871	4.7
October	31	9,640.8	54,848	5.7
November	30	12,055.0	57,423	4.8
December	31	10,653,3	60,606	5.7
Total	***365***	***121,852.7***	***480,362***	***3.9***

Under these conditions it is no surprise that also the number of observers with 300 and more observing nights increased from seven in 2014 to ten in 2015. Detlef Koschny made it to the top – with 351 observing nights he outwent the old record by Antal Igaz from 2012 by five nights. Sirko Molau increased his own record by eleven nights and obtained with 342 exactly one more night than Rui Goncalves. There was only little shift in the next positions, but Rui Marques, Flavio Castellani, Carlos Saraiva and Jörg Strunk managed for the first time to observe in over 300 nights. Further 22 observers obtained over 200 and 12 over 100 observing nights.
Regarding the effective observing time, Rui Goncalves defended the top rank for the fourth time. Sirko Molau and he collected for the first time over 10,000 observing hours in a single year, and also the third rank remained with Carlos Saraiva.
Regarding the meteor counts there was also no change in the first three places. With a record-breaking 58,000 meteors, Sirko Molau remained on top of the list, followed by Detlef Koschny and Rui Goncalves. Eleven more observers contributed over 10,000 meteors to the final outcome.

Table 2 summarizes the details for all active observers of the IMO Video Meteor Network. The number of cameras and stations refers to the majority of 2015.

Table 2: *Distribution of video observation over the observers in 2015.*

Observer	Country	# Observing Nights	Eff, Observing Time [h]	# Meteors	Meteors / Hour	Cameras (Stations)
Detlef Koschny	Netherlands	351	5,495,0	46,642	8.5	4 (3)
Sirko Molau	Germany	342	10,059.2	57,765	5.7	7 (2)
Rui Goncalves	Portugal	341	11,010.4	35,553	3.2	5 (1)
Carl Hergenrother	USA	330	2,568.9	6,570	2.6	1 (1)
Stefano Crivello	Italy	322	5,549.8	26,387	4.8	3 (1)
Rui Marques	Portugal	322	3,923.1	12,166	3.1	2 (1)
Flavio Castellani	Italy	308	4,341.2	15,590	3.6	2 (1)
Enrico Stomeo	Italy	307	5,206.9	31,820	6.1	3 (1)
Carlos Saraiva	Portugal	306	8,119.3	19,882	2.4	4 (1)
Jörg Strunk	Germany	300	6,233.0	18,194	2.9	4 (1)
Rainer Arlt	Germany	294	1,526.4	9,387	6.1	1 (1)
Maciej Maciejewski	Poland	292	5,831.6	26,469	4.5	4 (1)
Bernd Klemt	Germany	288	2,763.1	8,455	3.1	2 (2)
Jenni Donati	Italy	280	1,932.5	10,492	5.4	1 (1)
Istvan Tepliczky	Hungary	278	3,263.7	10,565	3.2	2 (1)
Mario Bombardini	Italy	276	1,701.1	8,129	4.8	1 (1)
Fabio Moschini	Italy	276	793.1	3,652	4.6	1 (1)
Antal Igaz	Hungary	274	3,417.4	6,274	1.8	3 (3)
Hans Schremmer	Germany	274	1,252.7	4,631	3.7	1 (1)
Javor Kac	Slovenia	264	5,003.5	26,214	5.2	5 (3)
Karoly Jonas	Hungary	259	2,916.0	5,767	2.0	1 (1)
Stane Slavec	Slovenia	257	2,798.2	5,371	1.9	2 (1)
Mitja Govedic	Slovenia	253	3,466.7	10,671	3.1	3 (1)
Zsolt Perkó	Hungary	253	1,652.3	7,856	4.8	1 (1)
József Morvai	Hungary	245	1,640.8	2,801	1.7	1 (1)
Mike Otte	USA	245	1,367.2	2,770	2.0	1 (1)
Maurizio Eltri	Italy	238	1,498.6	6,466	4.3	1 (1)
Wolfgang Hinz	Germany	237	1,470.7	6,678	4.5	1 (1)
Grigoris Maravelias	Greece	232	1,624.1	4,344	2.7	1 (1)
Martin Breukers	Netherlands	222	1,211.0	2,862	2.4	1 (1)
Kevin Förster	Germany	221	1,298.2	5,861	4.5	1 (1)
Eckehard Rothenberg	Germany	208	1,250.4	2,744	2.2	1 (1)
Szilárd Csizmadia	Hungary	194	962.4	2,016	2.1	1 (1)
Mihaela Triglav	Slovenia	189	675.6	1,947	2.9	1 (1)
Alvaro Lopes	Portugal	184	423.0	1,596	3.8	1 (1)
Péter Bánfalvi	Hungary	166	303.2	2,013	6.6	1 (1)
Szabolcs Kiss	Hungary	161	888.7	1,070	1.2	1 (1)
Rok Pucer	Slovenia	157	980.2	2,117	2.2	1 (1)

Erno Berkó	Hungary	148	1,702.4	8,734	5.1	1 (1)
Paolo Ochner	Italy	137	684.7	1,851	2.7	1 (1)
Leo Scarpa	Italy	135	718.3	2,172	3.0	1 (1)
Ilkka Yrjölä	Finland	132	803.5	2,947	3.7	1 (1)
Mikhail Maslov	Russia	128	533.8	2,129	4.0	1 (1)
Tomasz Lojek	Poland	117	684.2	1,361	2.0	1 (1)
Zoltán Zelko	Hungary	43	239.8	419	1.7	2 (1)
Rafael Schmall	Hungary	11	30.9	75	2.4	1 (1)
Rosta Štork	Czech Rep.	5	32.9	883	26.8	2 (2)
Luc Bastiaens	Belgium	1	3.0	4	1.3	1 (1)

In 2014, two cameras obtained more than 300 observing nights and 280 nights were sufficient to make it into the TOP-10. In 2015, the bar was further raised, since there were already 7 cameras with 300 or more nights. SALSA3 of Carl Hergenrother in Tucson/USA is leading this list by far. It is followed by all cameras of Rui Goncalves, as well as three Italian and one German camera. If the threshold was left at 280 nights, the list would have to be extended by twelve more entries.

Two of the TOP-10 cameras recorded more than 10,000 meteors, further eight are missing in the list: ICC9 (16,233), ICC7 (13,638), AVIS2 (13,399), LIC1 (11,502), REMO1 (10,962), REZIKA (10,890), JENNI (10,492) and MIN38 (10,335).

Table 3: *The ten most successful video systems in 2015.*

Camera	Location	Observer	# Observing Nights	Eff. Observing Time [h]	# Meteors	Meteors / Hour
SALSA3	Tucson (US)	Carl Hergenrother	330	2,568.9	6,570	2.6
TEMPLAR1	Tomar (PT)	Rui Goncalves	315	2,306.4	9,055	3.9
TEMPLAR2	Tomar (PT)	Rui Goncalves	311	2,303.5	7,384	3.2
TEMPLAR4	Tomar (PT)	Rui Goncalves	310	2,200.3	7,815	3.6
TEMPLAR5	Tomar (PT)	Rui Goncalves	309	2,078.4	7,596	3.7
STG38	Valbrevenna (IT)	Stefano Crivello	303	2,033.1	12,675	6.2
BILBO	Valbrevenna (IT)	Stefano Crivello	301	1,913.8	8,296	4.3
TEMPLAR3	Tomar (PT)	Rui Goncalves	295	2,121.8	3,703	1.7
SCO38	Scorce (IT)	Enrico Stomeo	295	1,800.7	11,657	6.5
LUDWIG2	Ludwigsfelde (DE)	Rainer Arlt	294	1,526.4	9,387	6.1

In a few days' time, the complete data set of the IMO Video Meteor Network including the 2015 data will be available for download at the homepage of the IMO network http://www.imonet.org. Currently the database contains 2,614,295 meteors from 634,346 hours of effective observing time in 5,738 nights.

As always, we would like to thank the many observers, whose passion is a guarantor for the success of the IMO Network. Special thanks Stefano Crivello, Enrico Stomeo, Rui Goncalves, Carlos Saraiva, Maciej Maciejewski and Mikhail Maslov, who check together with Sirko Molau every month the consistency of the data set and ensure the high quality of the database. Even though it seems unlikely that we can obtain the same fantastic result in 2016 again, we keep our fingers crossed and wish clear skies to everyone.

1. Observers

Code	Name	Place	Camera	FOV [^{o2}]	St.LM [mag]	Eff.CA [km^2]	Nights	Time [h]	Meteors
ARLRA	Arlt	Ludwigsfelde/DE	LUDWIG2 (0.8/8)	1475	6.2	3779	26	165.9	1394
BANPE	Bánfalvi	Zalaegerszeg/HU	HUVCSE01 (0.95/5)	2423	3.4	361	12	26.1	251
BERER	Berkó	Ludanyhalaszi/HU	HULUD1 (0.8/3.8)	5542	4.8	3847	8	59.1	892
BOMMA	Bombardini	Faenza/IT	MARIO (1.2/4.0)	5794	3.3	739	21	127.5	890
BREMA	Breukers	Hengelo/NL	MBB3 (0.75/6)	2399	4.2	699	21	114.8	328
BRIBE	Klemt	Herne/DE	HERMINE (0.8/6)	2374	4.2	678	23	154.7	519
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2286	4.6	1080	21	159.0	507
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	5.0	1611	30	357.5	2008
			BMH2 (1.5/4.5)*	4243	3.0	371	31	331.2	1677
CRIST	Crivello	Valbrevenna/IT	BILBO (0.8/3.8)	5458	4.2	1772	19	104.2	676
			C3P8 (0.8/3.8)	5455	4.2	1586	16	100.1	405
			STG38 (0.8/3.8)	5614	4.4	2007	20	127.2	1086
DONJE	Donati	Faenza/IT	JENNI (1.2/4)	5886	3.9	1222	19	117.0	895
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5631	4.3	2151	12	120.1	1116
FORKE	Förster	Carlsfeld/DE	AKM3 (0.75/6)	2375	5.1	2154	22	158.4	861
GONRU	Goncalves	Tomar/PT	TEMPLAR1 (0.8/6)	2179	5.3	1842	25	178.2	723
			TEMPLAR2 (0.8/6)	2080	5.0	1508	24	176.8	620
			TEMPLAR3 (0.8/8)	1438	4.3	571	22	145.6	280
			TEMPLAR4 (0.8/3.8)	4475	3.0	442	24	155.4	615
			TEMPLAR5 (0.75/6)	2312	5.0	2259	24	143.8	571
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1447	5.5	1841	18	142.9	514
			ORION3 (0.95/5)	2665	4.9	2069	18	75.3	140
			ORION4 (0.95/5)	2662	4.3	1043	20	128.5	256
HERCA	Hergenrother	Tucson/US	SALSA3 (0.8/3.8)	2336	4.1	544	29	270.6	864
HINWO	Hinz	Schwarzenberg/DE	HINWO1 (0.75/6)	2291	5.1	1819	27	243.6	1255
IGAAN	Igaz	Debrecen/HU	HUDEB (0.8/3.8)	5522	3.2	620	7	58.0	177
		Hodmezovasar./HU	HUHOD (0.8/3.8)	5502	3.4	764	6	32.8	86
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4)	2286	3.9	445	13	64.3	258
			HUSOR2 (0.95/3.5)	2465	3.9	715	11	61.7	262
KACJA	Kac	Kamnik/SI	CVETKA (0.8/3.8)	4914	4.3	1842	21	145.0	1055
		Kostanjevec/SI	METKA (0.8/12)*	715	6.4	640	1	5.3	17
		Ljubljana/SI	ORION1 (0.8/8)	1402	3.8	331	15	72.7	141
		Kamnik/SI	REZIKA (0.8/6)	2270	4.4	840	21	177.9	1995
			STEFKA (0.8/3.8)	5471	2.8	379	19	137.6	872
KOSDE	Koschny	Izana Obs./ES	ICC7 (0.85/25)*	714	5.9	1464	26	189.4	1973
		La Palma / ES	ICC9 (0.85/25)*	683	6.7	2951	24	192.3	2959
		Izana Obs./ES	LIC1(2.8/50)*	2255	6.2	5670	17	128.6	2011
		La Palma / ES	LIC2 (3.2(50)*	2199	6.5	7512	18	166.3	3041
		Noordwijkerhout/NL	LIC4 (1.4/50)*	2027	6.0	4509	14	61.8	126
LOJTO	Łojek	Grabniak/PL	PAV57 (1.0/5)	1631	3.5	269	11	77.7	278
LOPAL	Lopes	Lisboa/PT	NASO1 (0.75/6)	2377	3.8	506	9	58.4	51
MACMA	Maciejewski	Chelm/PL	PAV35 (0.8/3.8)	5495	4.0	1584	25	137.3	811
			PAV36 (0.8/3.8)*	5668	4.0	1573	25	156.8	748
			PAV43 (0.75/4.5)*	3132	3.1	319	24	162.8	524
			PAV60 (0.75/4.5)	2250	3.1	281	27	171.7	823
MARGR	Maravelias	Lofoupoli/GR	LOOMECON (0.8/12)	738	6.3	2698	18	48.0	473
MARRU	Marques	Lisbon/PT	CAB1 (0.8/3.8)	5291	3.1	467	16	122.7	474
			RAN1 (1.4/4.5)	4405	4.0	1241	18	123.4	454
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1230	6.9	6152	28	210.2	1789
			ESCIMO2 (0.85/25)	155	8.1	3415	21	206.6	256
			MINCAM1 (0.8/8)	1477	4.9	1084	24	188.2	1232
		Ketzür/DE	REMO1 (0.8/8)	1467	6.5	5491	25	171.7	1290
			REMO2 (0.8/8)	1478	6.4	4778	25	178.3	1459
			REMO3 (0.8/8)	1420	5.6	1967	20	133.5	647
			REMO4 (0.8/8)	1478	6.5	5358	22	122.6	720
MORJO	Morvai	Fülöpszallas/HU	HUFUL (1.4/5)	2522	3.5	532	10	72.2	137
MOSFA	Moschini	Rovereto/IT	ROVER (1.4/4.5)	3896	4.2	1292	31	95.9	897
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	3.8	460	17	106.8	197
PERZS	Perkó	Becsehely/HU	HUBEC (0.8/3.8)*	5498	2.9	460	18	125.5	1100
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2366	4.5	911	17	133.7	347
SARAN	Saraiva	Carnaxide/PT	RO1 (0.75/6)	2362	3.7	381	20	126.6	313
			RO2 (0.75/6)	2381	3.8	459	18	132.7	356
			RO3 (0.8/12)	710	5.2	619	18	144.1	397
			SOFIA (0.8/12)	738	5.3	907	17	131.6	273
SCALE	Scarpa	Alberoni/IT	LEO (1.2/4.5)*	4152	4.5	2052	15	110.7	466
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	4900	3.0	409	23	118.8	468
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	563	6.2	1294	16	108.1	327
			KAYAK2 (0.8/12)	741	5.5	920	14	115.6	211
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5566	4.8	3270	20	152.2	1421
			NOA38 (0.8/3.8)	5609	4.2	1911	19	157.4	1684
			SCO38 (0.8/3.8)	5598	4.8	3306	21	164.4	1701
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2354	5.4	2751	23	152.1	718
			MINCAM3 (0.8/6)	2338	5.5	3590	25	147.4	496
			MINCAM4 (1.0/2.6)	9791	2.7	552	20	49.7	128
			MINCAM5 (0.8/6)	2349	5.0	1896	23	148.9	490
			MINCAM6 (0.8/6)	2395	5.1	2178	20	136.3	370
TEPIS	Tepliczky	Agostyan/HU	HUAGO (0.75/4.5)	2427	4.4	1036	15	116.4	566
			HUMOB (0.8/6)	2388	4.8	1607	11	93.9	676
TRIMI	Triglav	Velenje/SI	SRAKA (0.8/6)*	2222	4.0	546	5	52.8	82
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM (0.8/6)	2337	5.5	3574	16	112.3	440
Sum							31	10653.3	60606

* 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	3.5	-	10.3	10.6	11.2	0.9	1.3	11.0	11.0	9.0	5.0	2.6	12.7	-	-
BANPE	-	-	-	-	-	-	-	-	-	4.8	1.0	-	7.4	2.2	-
BERER	-	3.3	-	-	-	-	-	-	-	-	-	9.5	13.5	2.1	2.9
BOMMA	7.1	8.4	2.2	-	-	1.4	-	11.5	1.9	1.4	6.0	4.8	0.3	12.6	3.3
BREMA	0.3	3.6	2.2	-	9.4	-	9.7	5.8	10.2	-	9.8	-	1.3	2.5	-
BRIBE	-	3.5	4.9	12.3	9.2	-	9.4	1.2	13.8	4.8	7.8	-	-	6.2	0.7
	-	5.2	5.6	11.8	9.5	-	10.4	1.4	13.8	8.7	4.9	0.7	-	6.4	2.5
CASFL	5.8	13.3	13.4	8.7	13.4	13.3	9.9	13.5	11.7	13.3	13.5	13.6	13.0	13.6	8.0
	11.1	4.2	13.2	4.8	13.3	12.9	6.6	13.4	11.1	12.9	11.5	13.5	12.1	13.5	4.7
CRIST	5.3	-	0.2	-	-	0.6	0.7	8.9	13.2	13.2	4.0	2.9	-	3.1	-
	2.2	-	-	-	-	0.8	-	7.0	11.0	13.2	0.6	2.7	-	2.0	-
	5.9	-	0.3	-	-	0.4	0.6	9.1	13.2	13.2	5.1	3.3	-	3.0	-
DONJE	10.1	8.7	2.5	-	-	1.0	-	11.9	2.2	1.7	5.2	4.9	0.5	13.2	3.0
ELTMA	-	-	-	-	4.0	-	-	-	4.4	13.4	-	11.8	6.6	12.0	11.9
FORKE	-	-	10.5	4.8	6.4	3.5	13.4	10.2	8.3	12.1	-	-	5.0	-	7.6
GONRU	-	12.0	10.2	11.5	11.9	2.7	4.0	10.2	5.5	12.2	6.4	10.0	0.2	5.0	12.6
	-	12.0	9.4	11.5	11.5	2.3	3.7	9.6	5.5	12.3	5.8	10.1	-	5.2	12.8
	0.6	11.1	8.9	10.6	12.7	-	1.7	9.1	-	12.9	4.9	5.7	-	0.7	12.4
	-	11.7	9.8	10.7	10.9	-	3.5	9.2	4.3	12.3	5.0	8.2	-	4.9	12.6
	0.4	10.9	9.3	8.9	12.6	1.1	1.5	8.5	3.8	12.8	5.3	6.4	-	1.0	12.6
GOVMI	0.9	9.3	6.4	-	-	-	-	-	1.1	11.5	6.7	-	6.2	-	-
	-	8.3	1.8	-	-	-	-	-	0.7	2.7	2.8	-	1.6	2.8	-
	0.9	9.1	3.5	-	-	-	-	-	1.2	8.6	3.6	-	4.2	2.7	-
HERCA	11.6	9.2	6.9	11.7	11.2	12.0	9.5	11.9	11.9	10.3	11.6	-	7.6	12.1	6.8
HINWO	-	4.1	13.1	12.2	12.2	7.3	13.3	11.8	11.2	12.5	-	2.9	7.3	7.1	7.6
IGAAN	6.4	-	-	-	-	-	-	-	-	-	-	-	-	10.7	-
	-	5.5	-	-	-	-	-	-	-	-	6.2	-	-	-	-
JONKA	2.8	11.2	-	1.0	-	-	-	-	0.3	2.7	3.1	2.2	8.3	-	0.2
	3.6	10.7	1.2	0.8	-	-	-	-	-	2.8	-	2.6	8.4	-	-
KACJA	-	10.0	-	5.8	4.4	11.9	10.3	-	-	2.5	-	8.5	13.2	0.3	9.4
	-	-	-	-	5.3	-	-	-	-	-	-	-	-	-	-
	1.1	6.0	-	5.4	-	4.4	7.1	-	-	3.8	-	0.3	7.1	-	3.5
	-	13.2	-	8.2	5.9	12.9	13.0	-	-	8.4	-	8.9	13.3	-	10.3
	-	11.6	-	5.1	3.9	12.8	-	-	-	1.3	-	8.5	13.3	-	8.1
KOSDE	-	9.9	11.2	5.9	-	-	2.2	4.5	4.3	10.7	11.5	11.4	10.1	9.1	2.4
	1.3	7.5	7.6	4.1	-	-	-	-	7.1	11.4	11.4	11.4	11.2	11.4	11.3
	1.8	10.0	10.3	6.4	-	0.7	2.4	4.7	4.7	11.0	12.0	11.0	8.0	8.7	1.2
	-	-	-	-	-	-	-	-	-	-	11.5	11.5	11.3	10.3	8.8
	-	-	-	-	-	-	9.7	6.2	10.9	-	6.9	-	0.1	1.0	-
LOJTO	-	-	-	-	-	-	3.5	-	-	13.3	-	-	-	6.6	-
LOPAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10.4
MACMA	6.6	0.3	1.4	0.9	6.0	10.5	9.4	-	-	12.1	1.9	0.6	1.6	6.9	-
	7.3	0.4	2.5	3.3	7.1	10.2	8.4	-	-	13.7	2.6	-	1.0	6.7	-
	8.0	0.2	1.9	-	8.6	11.0	8.3	-	0.2	13.9	2.7	0.6	1.0	6.6	-
	9.2	0.2	2.7	3.4	9.1	10.5	8.2	-	0.4	13.8	2.7	0.5	1.4	6.6	-
MARGR	-	5.5	-	1.4	4.7	1.5	2.9	0.3	-	0.2	-	-	8.8	7.5	1.1
MARRU	9.8	12.6	10.7	12.1	-	4.9	4.3	9.5	4.3	12.7	7.5	9.3	-	1.6	1.6
	-	7.0	9.3	8.7	10.7	-	-	8.1	-	6.9	-	1.9	-	7.0	12.2
MOLSI	0.4	0.3	12.1	-	11.7	10.3	12.9	0.2	7.3	0.6	4.9	13.0	1.2	5.9	11.8
	-	-	13.1	-	13.3	10.0	13.4	-	10.4	-	3.2	13.4	-	6.2	11.8
	-	-	11.9	-	13.0	9.4	12.8	-	9.7	-	3.7	13.0	0.3	5.5	8.5
	3.2	-	11.6	8.1	11.1	0.7	1.4	10.3	13.4	7.6	5.9	2.8	13.9	-	-
	3.5	-	11.8	8.4	11.8	-	2.2	10.4	13.7	8.3	6.6	2.7	13.9	-	0.2
	3.3	-	12.5	8.6	10.3	-	1.4	10.5	14.1	4.0	6.0	2.7	-	-	-
	3.4	-	-	8.6	11.5	1.5	1.9	10.4	-	7.5	6.3	2.7	-	-	-
MORJO	0.3	10.2	4.7	-	-	-	-	-	-	-	6.3	-	3.3	-	-
MOSFA	3.3	4.7	4.9	0.7	2.1	4.0	1.1	2.5	5.1	6.1	2.7	8.2	9.8	11.5	0.2
OTTMI	-	1.8	3.5	6.5	8.2	12.9	0.9	8.0	9.3	12.6	-	-	-	2.5	-
PERZS	0.3	13.3	7.7	2.1	-	-	-	-	-	8.5	-	-	13.3	4.7	-
ROTEC	3.2	-	8.6	7.4	9.4	-	-	11.9	13.0	7.9	4.9	-	13.9	-	-
SARAN	0.2	10.1	10.7	11.6	11.7	-	-	10.3	-	9.1	0.4	3.9	-	5.4	11.9
	-	10.6	6.7	10.6	11.8	-	-	11.0	-	8.7	0.5	3.2	-	4.7	10.7
	-	11.0	10.1	11.2	11.7	-	-	10.4	-	8.9	0.4	3.4	-	4.9	12.2
	-	11.0	11.0	11.0	12.0	-	-	9.0	-	7.8	-	4.5	-	3.9	12.3
SCALE	-	4.8	-	-	3.2	-	-	-	3.3	11.6	0.2	12.4	6.2	12.3	8.1
SCHHA	0.5	1.4	-	7.9	-	-	7.4	3.9	13.6	2.0	5.8	-	1.0	8.2	-
SLAST	-	8.7	-	8.3	-	7.3	9.2	-	-	1.2	-	-	10.1	-	5.0
	-	6.6	-	9.0	-	6.8	9.7	-	-	5.8	-	-	9.4	-	5.7
STOEN	6.9	5.8	-	-	2.9	-	-	3.1	3.6	13.4	7.5	13.1	11.2	9.0	8.9
	7.8	5.4	-	-	3.0	-	-	3.4	3.8	13.5	8.2	12.8	11.1	13.6	7.1
	7.0	5.8	-	-	3.0	-	-	3.5	3.7	13.7	9.3	13.5	7.9	13.6	7.3
STRJO	-	0.9	6.2	9.3	9.4	-	13.0	4.4	12.1	6.7	6.4	-	10.2	-	3.5
	-	0.3	4.8	7.5	9.4	-	11.2	3.9	13.9	6.1	5.3	0.2	8.4	1.0	2.3
	-	0.2	0.2	0.6	2.3	-	5.0	3.1	12.3	-	1.4	-	0.8	2.0	0.3
	-	0.9	5.0	8.1	8.8	-	11.4	0.4	14.0	6.7	5.8	-	9.4	3.4	3.7
	-	0.8	5.3	7.3	8.7	-	12.4	-	13.8	6.1	6.2	-	7.4	-	1.9
TEPIS	-	5.5	12.7	-	-	-	-	-	-	-	-	-	10.6	3.8	-
	0.2	7.2	11.7	-	8.4	-	-	-	-	10.1	7.8	6.1	11.9	3.9	-
TRIMI	-	-	-	-	-	-	11.5	-	-	-	-	-	-	-	-
YRJIL	-	3.4	5.4	-	-	-	14.8	-	5.5	-	4.0	1.2	-	11.0	7.9
Sum	167.1	400.4	395.6	355.4	433.8	214.4	342.5	339.1	398.8	565.5	326.2	335.6	402.8	371.9	343.8

December	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	1.7	2.9	7.1	12.5	-	6.5	0.9	9.5	1.3	0.6	5.8	-	8.3	6.3	12.8	0.6
BANPE	-	-	-	-	-	-	2.5	1.0	0.1	3.1	1.1	-	0.5	-	1.9	0.5
BERER	-	-	-	-	-	-	-	-	-	-	-	-	-	0.8	13.6	13.4
BOMMA	13.2	12.8	11.7	13.4	2.5	2.0	-	-	0.6	-	-	-	-	6.9	-	3.5
BREMA	-	1.6	-	2.9	1.3	-	-	9.9	2.7	-	2.7	4.4	9.1	10.0	5.5	9.9
BRIBE	-	-	0.7	10.4	-	-	0.4	12.7	2.4	3.4	10.6	5.1	13.0	9.1	3.6	9.5
	-	-	3.3	11.7	-	-	-	8.4	-	-	10.3	11.9	10.6	8.6	3.8	9.5
CASFL	6.0	13.6	13.7	13.6	13.2	8.1	12.8	11.4	13.6	13.5	13.6	13.7	13.3	13.6	-	5.8
	4.4	13.4	12.3	13.4	13.2	10.9	12.8	10.7	13.5	13.4	13.4	13.4	8.6	13.4	0.2	5.4
CRIST	12.0	-	0.2	7.6	1.8	0.4	-	-	-	1.6	12.0	-	-	-	8.4	8.1
	10.3	-	-	2.6	1.9	-	-	-	-	6.5	9.6	9.1	-	-	13.0	7.6
	12.0	-	1.1	7.7	2.7	0.4	-	-	-	5.4	13.0	10.9	-	-	10.4	9.5
DONJE	12.6	13.3	11.7	-	-	2.1	-	-	2.1	-	-	-	-	6.5	-	3.8
ELTMA	8.6	12.4	11.3	10.7	-	-	-	-	-	-	-	-	-	-	13.0	-
FORKE	-	3.3	6.5	8.9	6.5	-	5.3	2.9	2.0	1.5	13.5	8.5	4.2	-	13.5	-
GONRU	10.7	3.5	10.8	-	6.2	4.7	-	-	0.3	6.6	6.9	0.8	3.9	9.4	-	-
	9.9	3.0	11.3	-	5.6	4.9	-	-	0.4	8.3	8.8	0.8	3.7	8.4	-	-
	7.9	-	11.2	-	12.9	4.0	-	-	0.3	5.7	5.3	-	-	5.9	0.7	0.4
	8.3	1.1	10.5	-	5.9	4.9	-	1.0	0.3	6.3	1.8	0.6	3.4	8.2	-	-
	8.5	-	10.8	0.3	12.5	2.4	-	-	0.2	3.9	4.2	-	1.7	4.2	-	-
GOVMI	-	-	2.1	5.6	-	-	12.8	11.2	12.8	12.6	11.2	4.7	8.8	-	12.5	6.5
	-	1.5	0.8	3.2	-	-	5.5	6.9	3.1	8.2	5.3	1.2	-	-	12.5	6.4
	-	3.3	1.0	5.5	-	-	10.4	9.7	7.8	12.8	9.1	7.5	8.9	-	12.4	6.3
HERCA	11.7	11.7	11.7	11.3	4.3	9.0	6.4	-	0.3	1.3	2.9	11.1	9.9	11.4	11.9	11.4
HINWO	-	2.9	7.5	13.8	5.5	2.2	11.5	12.8	2.3	4.0	13.4	6.6	13.6	11.1	13.8	-
IGAAN	-	-	-	-	-	-	3.7	1.1	-	-	-	-	-	9.1	13.5	13.5
	-	-	-	-	-	-	3.4	-	-	-	-	-	-	4.3	6.7	6.7
JONKA	-	-	-	-	-	-	-	1.0	-	-	-	-	-	4.8	13.6	13.1
	1.0	-	-	-	-	-	-	-	-	-	-	-	-	4.4	13.7	12.5
KACJA	2.0	-	-	6.0	4.2	-	9.2	5.9	-	9.0	-	9.7	11.5	3.2	2.5	5.5
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	3.1	7.7	11.9	-	-	2.5	-	0.4	8.4	-
	6.8	-	-	6.4	8.0	-	10.1	9.1	0.2	7.2	-	13.8	11.9	2.1	2.6	5.6
	3.7	-	-	4.1	4.3	-	8.0	5.9	-	10.1	-	13.3	12.2	3.4	2.3	5.7
KOSDE	11.1	11.5	11.1	0.1	4.7	3.7	3.0	2.5	1.8	-	6.8	7.7	9.9	10.9	-	11.4
	11.4	11.4	10.4	6.4	8.9	-	6.9	5.9	5.3	-	-	5.5	5.8	5.8	6.4	6.5
	11.7	12.0	12.0	-	-	-	-	-	-	-	-	-	-	-	-	-
	11.5	11.5	-	6.4	8.9	2.4	6.9	5.9	8.9	8.8	-	9.4	10.7	11.4	-	10.2
	-	2.1	0.4	-	-	1.9	-	3.2	1.5	-	-	-	2.1	8.0	-	7.8
LOJTO	-	-	-	0.8	12.3	-	0.1	2.9	-	5.2	-	-	-	7.2	13.3	12.6
LOPAL	5.0	-	10.4	0.6	13.0	3.9	-	-	3.1	2.2	-	-	9.8	-	-	-
MACMA	1.1	-	-	8.8	12.7	3.6	3.3	10.3	10.8	1.8	-	1.6	0.9	2.6	12.2	9.4
	0.9	-	0.5	9.6	14.0	2.9	3.9	9.8	9.7	6.4	-	3.2	0.2	4.8	13.9	13.8
	-	-	-	10.0	14.1	3.0	4.0	10.6	13.6	7.5	-	3.6	1.0	4.8	13.8	13.8
	0.7	-	1.1	11.8	14.0	3.0	3.9	10.5	13.7	7.3	-	3.3	0.9	4.9	14.0	13.9
MARGR	-	-	-	-	-	1.4	3.5	1.9	2.8	0.6	-	1.4	-	2.0	-	0.5
MARRU	7.0	-	8.1	-	6.7	-	-	-	-	-	-	-	-	-	-	-
	4.5	-	9.0	-	11.5	8.3	-	-	3.7	1.6	5.3	-	4.8	2.9	-	-
MOLSI	-	8.9	10.8	6.6	1.1	8.9	13.1	3.5	9.1	12.1	13.1	13.1	12.6	3.8	0.9	-
	-	9.8	11.4	7.3	-	8.1	11.4	3.6	9.1	11.0	12.1	12.0	11.9	4.1	-	-
	-	8.7	9.7	5.1	0.4	7.8	9.2	3.1	7.6	9.7	11.0	11.9	11.7	3.4	1.1	-
	-	3.6	5.5	13.7	-	4.8	1.6	13.1	0.9	0.8	4.9	-	12.0	5.0	13.5	2.3
	-	4.2	6.0	13.8	0.4	6.0	1.9	12.0	-	1.1	5.5	-	12.7	5.1	13.4	2.7
	-	-	6.0	0.3	0.9	5.6	2.4	13.1	1.8	-	-	-	14.1	-	13.9	2.0
	-	4.1	5.6	14.1	1.1	5.3	2.0	7.6	0.9	-	5.9	0.3	14.0	5.2	-	2.7
MORJO	-	-	-	-	-	-	12.2	3.9	-	-	-	-	-	4.3	13.6	13.4
MOSFA	1.9	3.1	2.5	3.4	1.4	1.1	1.5	1.0	1.7	2.9	1.5	2.5	2.2	1.1	0.2	1.0
OTTMI	-	9.6	11.4	10.4	-	-	-	1.0	-	-	0.2	-	-	-	2.1	5.9
PERZS	-	-	4.3	-	-	2.5	8.8	2.5	2.6	7.5	8.6	11.8	8.3	-	13.5	5.2
ROTEC	-	-	5.1	13.6	-	3.4	0.8	9.1	0.9	-	-	-	-	6.8	13.8	-
SARAN	5.9	-	8.2	-	9.7	4.1	0.2	-	3.7	2.7	4.2	-	-	2.6	-	-
	4.5	-	10.4	-	12.9	7.0	0.2	-	6.3	5.2	7.7	-	-	-	-	-
	6.4	-	10.2	-	12.6	7.9	-	-	6.0	5.7	7.7	-	-	3.4	-	-
	4.7	-	9.8	-	12.9	7.6	-	-	6.3	3.5	2.5	-	-	1.8	-	-
SCALE	7.2	10.1	13.0	5.0	0.2	-	-	-	-	-	-	-	-	-	13.1	-
SCHHA	-	-	1.8	2.2	0.6	0.5	0.2	10.9	0.9	3.1	7.0	9.8	9.3	11.8	-	9.0
SLAST	3.0	-	-	-	-	-	13.3	9.7	12.6	5.6	-	6.7	-	1.0	2.4	4.0
	-	-	-	-	-	-	13.4	6.9	12.9	7.0	-	8.0	9.1	-	5.3	-
STOEN	6.1	13.3	12.4	9.0	-	1.4	-	3.3	-	-	-	-	-	7.4	7.8	6.1
	6.5	13.4	12.0	10.6	-	-	-	2.1	-	-	-	-	-	7.2	9.5	6.4
	6.4	13.5	13.4	11.0	-	1.9	-	4.4	1.1	-	-	-	-	7.5	8.7	8.2
STRJO	-	2.3	1.6	6.7	-	0.9	-	10.3	0.8	-	4.4	1.2	13.3	5.9	10.2	12.4
	-	0.6	1.9	5.9	-	1.9	-	12.4	0.4	-	6.6	1.1	13.8	6.0	10.1	12.4
	-	-	0.3	0.7	-	-	-	3.1	-	-	0.5	0.2	5.3	0.8	1.4	9.2
	-	-	2.9	6.5	-	2.2	-	10.5	0.4	-	5.8	1.3	13.2	5.5	10.5	12.5
	-	-	1.5	3.6	-	0.8	-	13.3	-	-	6.1	0.4	13.0	5.6	9.9	12.2
TEPIS	1.7	-	-	-	3.1	4.7	10.4	10.1	-	9.3	8.2	6.6	-	2.9	13.4	13.4
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13.4	13.2
TRIMI	-	-	-	-	-	-	-	-	-	-	12.3	12.8	10.2	-	6.0	-
YRJIL	9.1	-	-	-	-	-	2.5	-	2.4	2.8	9.6	9.3	9.9	13.5	-	-
Sum	279.6	254.0	398.0	375.6	290.6	191.0	259.4	372.8	241.5	276.4	332.0	294.3	399.8	352.5	508.1	434.8

3. Results (Meteors)

December	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	11	-	39	99	79	2	5	81	148	37	104	11	386	-	-
BANPE	-	-	-	-	-	-	-	-	-	40	6	-	116	18	-
BERER	-	19	-	-	-	-	-	-	-	-	-	72	619	6	9
BOMMA	32	31	5	-	-	8	-	57	10	10	22	36	2	368	18
BREMA	1	13	2	-	34	-	26	24	34	-	55	-	5	17	-
BRIBE	-	12	7	36	40	-	43	2	79	6	54	-	-	63	1
	-	15	6	47	53	-	53	3	66	13	30	3	-	60	1
CASFL	43	76	75	9	65	60	19	63	80	76	70	149	251	257	26
	54	11	59	14	54	55	8	54	52	51	58	144	235	287	12
CRIST	45	-	1	-	-	2	6	31	111	117	10	51	-	46	-
	15	-	-	-	-	6	-	22	52	78	3	28	-	23	-
	57	-	2	-	-	4	8	63	153	165	26	59	-	54	-
DONJE	39	24	6	-	-	10	-	79	20	17	20	42	3	384	18
ELTMA	-	-	-	-	3	-	-	-	25	78	-	140	175	408	42
FORKE	-	-	52	14	39	6	79	47	66	56	-	-	107	-	71
GONRU	-	81	35	50	46	1	9	30	4	87	31	110	1	38	59
	-	52	22	43	32	1	5	26	3	94	20	91	-	59	36
	2	29	8	22	25	-	4	12	-	51	15	21	-	3	24
	-	73	38	58	31	-	10	22	2	81	16	91	-	55	37
	3	43	18	38	53	1	1	21	3	89	32	70	-	9	41
GOVMI	6	32	12	-	-	-	-	-	5	91	17	-	128	-	-
	-	8	5	-	-	-	-	-	3	8	3	-	9	12	-
	1	13	4	-	-	-	-	-	3	34	2	-	50	11	-
HERCA	30	40	27	31	23	31	4	34	37	31	30	-	35	194	26
HINWO	-	38	66	81	47	27	71	57	70	53	-	14	151	120	41
IGAAN	8	-	-	-	-	-	-	-	-	-	-	-	-	100	-
	-	13	-	-	-	-	-	-	-	-	26	-	-	-	-
JONKA	6	17	-	2	-	-	-	-	2	2	1	9	155	-	1
	7	22	5	1	-	-	-	-	-	1	-	9	153	-	-
KACJA	-	45	-	21	8	60	57	-	-	2	-	135	462	2	21
	-	-	-	-	17	-	-	-	-	-	-	-	-	-	-
	2	1	-	1	-	11	9	-	-	2	-	2	59	-	2
	-	109	-	44	49	159	176	-	-	60	-	255	422	-	75
	-	38	-	16	10	66	-	-	-	2	-	167	336	-	27
KOSDE	-	93	85	34	-	-	17	53	40	126	166	205	297	142	6
	4	26	33	3	-	-	-	-	75	214	235	330	427	246	59
	32	114	96	44	-	6	26	69	47	177	183	273	345	176	13
	-	-	-	-	-	-	-	-	-	-	315	444	538	336	72
	-	-	-	-	-	-	11	21	17	-	27	-	2	9	-
LOJTO	-	-	-	-	-	-	1	-	-	34	-	-	-	21	-
LOPAL	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
MACMA	38	1	4	1	26	38	36	-	-	113	8	5	18	129	-
	27	3	6	2	15	40	26	-	-	116	2	-	8	172	-
	33	1	3	-	13	27	11	-	1	84	3	1	8	102	-
	46	1	9	2	23	44	23	-	2	125	2	2	15	113	-
MARGR	-	45	-	12	38	10	20	2	-	1	-	-	155	76	7
MARRU	36	55	34	32	-	8	7	19	5	70	19	99	-	47	4
	-	39	35	36	17	-	-	30	-	28	-	4	-	93	28
MOLSI	3	2	114	-	177	88	177	1	34	3	32	349	18	67	49
	-	-	12	-	25	18	29	-	6	-	2	48	-	9	4
	-	-	48	-	91	57	140	-	30	-	25	265	2	63	25
	9	-	29	60	74	1	2	83	141	30	85	5	363	-	-
	17	-	40	71	91	-	6	81	158	32	118	6	396	-	1
	12	-	26	53	56	-	3	69	114	8	70	4	-	-	-
	8	-	-	62	89	4	17	71	-	19	102	5	-	-	-
MORJO	1	17	5	-	-	-	-	-	-	-	9	-	38	-	-
MOSFA	23	34	30	4	12	25	5	17	40	41	22	63	152	225	1
OTTMI	-	4	14	11	11	23	2	19	17	27	-	-	-	11	-
PERZS	1	115	32	2	-	-	-	-	-	122	-	-	397	57	-
ROTEC	4	-	8	16	20	-	-	21	38	13	26	-	116	-	-
SARAN	1	27	22	29	23	-	-	25	-	27	3	13	-	50	22
	-	36	23	45	33	-	-	23	-	28	3	25	-	33	14
	-	50	27	38	34	-	-	29	-	37	1	13	-	30	38
	-	37	26	21	25	-	-	26	-	18	-	13	-	25	12
SCALE	-	1	-	-	1	-	-	-	10	29	1	65	60	204	14
SCHHA	2	2	-	25	-	-	37	33	80	5	41	-	12	71	-
SLAST	-	27	-	9	-	43	27	-	-	1	-	-	123	-	4
	-	6	-	6	-	20	16	-	-	7	-	-	78	-	2
STOEN	37	11	-	-	3	-	-	3	43	133	46	192	289	270	52
	34	11	-	-	5	-	-	5	46	120	44	211	302	513	28
	45	11	-	-	2	-	-	5	33	131	60	226	310	430	30
STRJO	-	3	13	44	64	-	89	12	112	19	46	-	67	-	8
	-	1	10	32	43	-	65	4	64	9	32	1	36	6	5
	-	1	1	4	16	-	10	2	21	-	9	-	5	19	2
	-	4	6	24	36	-	43	1	79	6	32	-	48	34	10
	-	3	3	25	44	-	46	-	56	2	45	-	32	-	3
TEPIS	-	26	30	-	-	-	-	-	-	-	-	-	242	77	-
	1	27	39	-	19	-	-	-	-	85	14	52	300	67	-
TRIMI	-	-	-	-	-	-	39	-	-	-	-	-	-	-	-
YRJIL	-	13	11	-	-	-	67	-	51	-	3	2	-	144	14
Sum	776	1702	1368	1374	1834	962	1591	1452	2388	3472	2482	4630	9059	6661	1126

December	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	6	3	55	102	-	17	9	71	3	3	2	-	39	20	60	2
BANPE	-	-	-	-	-	-	17	6	1	20	8	-	3	-	13	3
BERER	-	-	-	-	-	-	-	-	-	-	-	-	-	1	78	88
BOMMA	63	65	46	80	1	10	-	-	1	-	-	-	-	10	-	15
BREMA	-	1	-	3	2	-	-	22	7	-	2	12	14	31	1	22
BRIBE	-	-	1	11	-	-	1	30	3	7	10	11	38	40	7	17
	-	-	6	11	-	-	-	25	-	-	13	16	22	34	7	23
CASFL	31	62	51	67	51	29	64	18	39	51	42	52	51	45	-	36
	24	51	41	46	42	29	41	24	39	29	30	29	38	43	1	22
CRIST	87	-	1	66	2	4	-	-	-	11	39	-	-	-	19	27
	40	-	-	12	1	-	-	-	-	28	23	27	-	-	24	23
	130	-	3	91	8	3	-	-	-	30	62	82	-	-	29	57
DONJE	68	64	41	-	-	13	-	-	10	-	-	-	-	13	-	24
ELTMA	44	63	44	57	-	-	-	-	-	-	-	-	-	-	37	-
FORKE	-	9	34	83	6	-	45	22	17	4	30	17	5	-	52	-
GONRU	31	2	38	-	11	6	-	-	2	3	14	1	12	21	-	-
	20	5	28	-	8	7	-	-	3	17	19	1	11	17	-	-
	8	-	14	-	18	1	-	-	1	6	8	-	-	4	3	1
	17	1	29	-	4	6	-	1	1	6	9	1	6	20	-	-
	16	-	35	1	67	1	-	-	1	11	11	-	1	5	-	-
GOVMI	-	-	3	12	-	-	46	29	26	27	10	8	14	-	42	6
	-	2	4	4	-	-	17	10	4	8	1	3	-	-	31	8
	-	1	2	4	-	-	20	12	13	15	9	17	8	-	32	5
HERCA	47	29	36	21	15	33	5	-	1	2	10	23	16	20	22	11
HINWO	-	17	36	60	10	3	51	40	5	10	36	12	55	32	52	-
IGAAN	-	-	-	-	-	-	12	1	-	-	-	-	-	8	28	20
	-	-	-	-	-	-	2	-	-	-	-	-	-	8	19	18
JONKA	-	-	-	-	-	-	-	1	-	-	-	-	-	17	31	14
	1	-	-	-	-	-	-	-	-	-	-	-	-	13	33	17
KACJA	1	-	-	9	22	-	26	8	-	42	-	51	60	9	5	9
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	2	5	22	-	-	1	-	1	21	-
	25	-	-	30	98	-	100	102	1	91	-	73	108	5	7	6
	2	-	-	5	14	-	29	7	-	37	-	49	53	8	2	4
KOSDE	77	97	92	1	53	41	13	10	9	-	29	53	74	79	-	81
	120	175	166	78	160	-	138	99	100	-	-	74	69	47	37	44
	92	177	141	-	-	-	-	-	-	-	-	-	-	-	-	-
	147	192	-	50	124	50	126	61	72	70	-	73	126	120	-	125
	-	6	2	-	-	3	-	4	4	-	-	-	3	9	-	8
LOJTO	-	-	-	1	63	-	1	1	-	10	-	-	-	21	64	61
LOPAL	3	-	5	1	13	1	-	-	3	1	-	-	13	-	-	-
MACMA	2	-	-	40	78	23	7	58	35	9	-	2	3	9	66	62
	3	-	1	27	92	19	8	34	47	6	-	4	1	2	45	42
	-	-	-	21	51	11	7	32	32	7	-	1	5	6	33	31
	3	-	2	35	84	26	13	52	62	15	-	6	6	5	53	54
MARGR	-	-	-	-	-	9	33	12	20	4	-	9	-	16	-	4
MARRU	13	-	23	-	3	-	-	-	-	-	-	-	-	-	-	-
	9	-	22	-	38	14	-	-	11	5	16	-	23	6	-	-
MOLSI	-	131	61	9	1	32	107	30	45	59	62	50	72	15	1	-
	-	12	1	2	-	3	14	7	8	16	15	7	14	4	-	-
	-	73	33	5	1	15	78	21	53	43	59	50	41	13	1	-
	-	4	12	89	-	22	10	65	7	3	11	-	91	9	82	3
	-	4	30	103	1	25	27	77	-	5	4	-	67	14	80	5
	-	-	14	1	1	13	11	59	4	-	-	-	66	-	60	3
	-	5	27	113	2	28	32	51	2	-	6	1	64	6	-	6
MORJO	-	-	-	-	-	-	13	10	-	-	-	-	-	10	23	11
MOSFA	15	22	16	29	9	7	10	10	11	18	10	17	14	8	1	6
OTTMI	-	9	23	15	-	-	-	4	-	-	1	-	-	-	3	3
PERZS	-	-	36	-	-	16	92	10	5	47	40	45	16	-	62	5
ROTEC	-	-	12	32	-	3	3	14	1	-	-	-	-	1	19	-
SARAN	5	-	11	-	26	6	1	-	7	5	7	-	-	3	-	-
	4	-	21	-	31	1	1	-	17	4	14	-	-	-	-	-
	7	-	16	-	35	14	-	-	12	3	12	-	-	1	-	-
	3	-	13	-	25	4	-	-	9	7	5	-	-	4	-	-
SCALE	12	19	20	7	1	-	-	-	-	-	-	-	-	-	22	-
SCHHA	-	-	4	4	3	1	1	25	6	16	5	17	27	32	-	19
SLAST	1	-	-	-	-	-	39	7	22	4	-	7	-	1	7	5
	-	-	-	-	-	-	20	10	18	3	-	7	11	-	7	-
STOEN	34	74	65	51	-	2	-	25	-	-	-	-	-	33	28	30
	35	71	58	61	-	-	-	18	-	-	-	-	-	46	42	34
	25	79	64	64	-	6	-	36	2	-	-	-	-	62	40	40
STRJO	-	3	2	21	-	3	-	61	6	-	2	10	38	19	22	54
	-	1	3	17	-	5	-	48	1	-	9	1	38	15	8	42
	-	-	2	4	-	-	-	5	-	-	3	1	7	5	4	7
	-	-	6	8	-	3	-	46	4	-	4	8	23	15	9	41
	-	-	2	4	-	1	-	25	-	-	7	1	24	6	10	31
TEPIS	1	-	-	-	8	19	32	18	-	20	9	17	-	8	30	29
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	38	34
TRIMI	-	-	-	-	-	-	-	-	-	-	11	12	15	-	5	-
YRJIL	20	-	-	-	-	-	3	-	9	3	26	22	27	25	-	-
Sum	1292	1529	1554	1668	1283	588	1327	1479	844	841	755	981	1532	1100	1558	1398