Results of the IMO Video Meteor Network – August 2015

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If all good things come together in one month – many observers, perfect weather conditions, a major shower with new moon at peak – then the outcome will be record-breaking. That's what happened in August 2015.
Traditionally, the number of cameras peaks in August, because also occasional observers (which are meanwhile rare in the IMO network) activate their cameras for the Perseids. In this year, 86 video cameras were in operation plus one additional camera whose data are still missing.
The weather was perfect in the first half of the month. The statistics show only minor gaps – if so it was typically the failure of complete cameras as in case of MINCAM1 which was down because of an operator mistake. There were a few gaps at the middle of August, so that for example in Germany some observers missed the Perseid peak night. In the second half of the month the gaps shrunk again. In figures: 70 out of 86, i.e. 80% of the cameras managed to obtain twenty or more observing nights. Ten cameras even observed in thirty or more nights, five of these from Rui Goncalves, three from Maciej Maciejewski and two from Enrico Stomeo. In 16 nights 70 or more cameras were in operation, with peak activity on August 5 and 6 with 81 resp. 82 cameras.
New moon was on August 14, so that the Perseid peak was undisturbed by the moon. The output of the IMO network was accordingly rich. On August 12/13 alone we recorded almost 13,000 meteors, which is for the first time a five-digit count. Together with the nights before and thereafter it was almost 27,000 meteors. In August, 36 cameras recorded 1,000 or more meteors, six of these even more than 2,000. On top of the list was AVIS2 with almost 2,500 meteors, closely followed by SCO38, STG38 and JENNI. SCO38 and HULUD1 managed to capture over 400 meteors in a single night.
That yields a total of over 12,100 observing hours in August, which is not only by far the best August outcome, but the best month of the IMO network ever. A yield of almost 89.000 meteors is a plus of 15% compared to the now second best month of August 2012. That's how meteor observation makes fun!

As promised we will start the analysis with two showers which are active both in July and August. Figure 1 shows a detailed activity profile of the alpha Capricornids. The shower emerges from the sporadic background around July 20, reaches peak activity at the border between July and August and ceases around August 6. At maximum the Capricornids reach a flux density of about three meteoroids per 1,000 km^2 and hour.

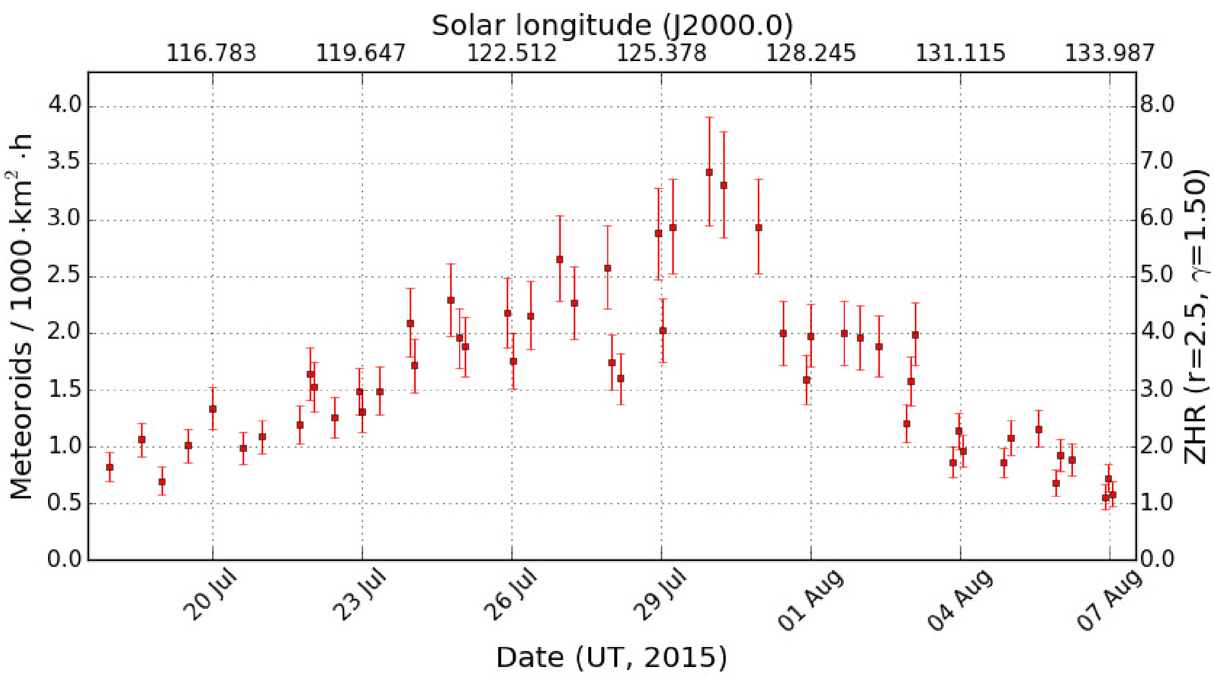

Figure 1: *Flux density profile of the alpha Capricornids 2015, derived from observations of the IMO video network.*

Figure 2 compares the flux density profile of the last four years. The 2015 peak is a shade stronger than the last peaks and the dip near 123° solar longitude is not visible, but otherwise the shower shows hardly any variation from one year to the next.

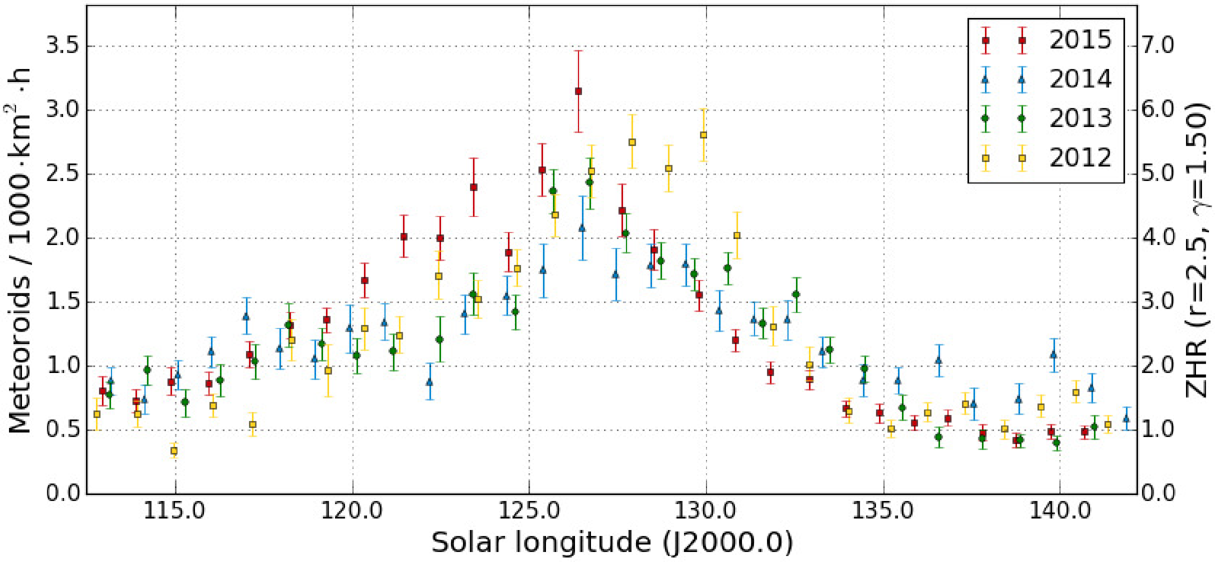

Figure 2: *Flux density profile of the alpha Capricornids 2012-2015, derived from observations of the IMO video network.*

The southern delta Aquariids start in the third decade of July. They reach their peak at the border of July and August as well and disappear around August 7 in the sporadic background. The profile of the southern delta Aquariids is almost symmetric and their peak is not sharp but rather oblate with a two-day maximum (figure 3). The flux density reaches peak values of 40 meteoroids per 1,000 km^2 and hour, which is more than ten times the flux density of the Capricornids.

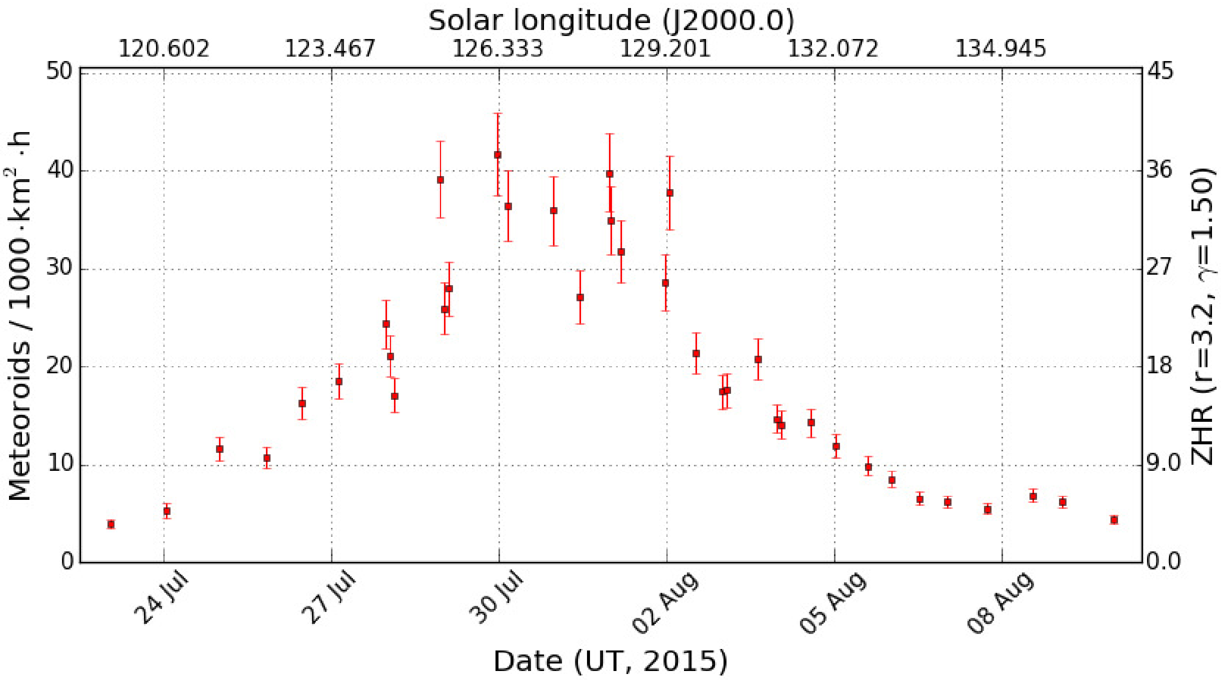

Figure 3: *Flux density profile of the southern delta Aquariids 2015, derived from observations of the IMO video network.*

Contrary to the alpha Capricornids, the activity of the southern delta Aquariids varies significantly from one year to the next. The activity seems to grow steadily since 2011, it has meanwhile tripled (figure 4)

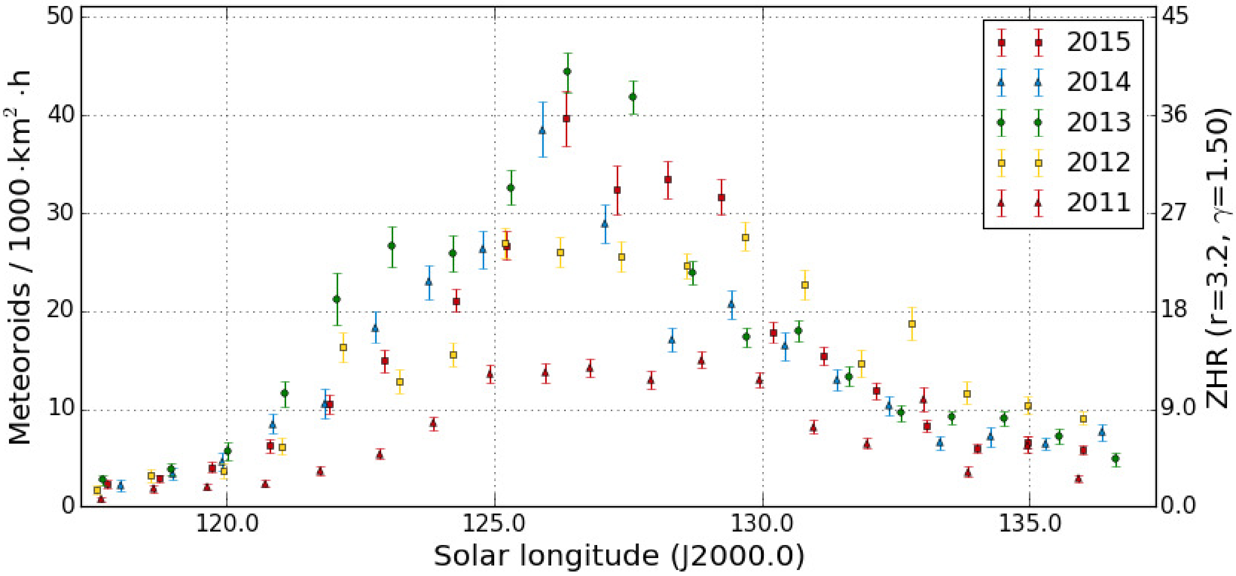

Figure 4: *Flux density profile of the southern delta Aquariids 2011-2015, derived from observations of the IMO video network.*

The activity interval of the Perseids starts already in mid-July, but we will focus first on the time of maximum (figure 5). It can be easily seen that the activity rises steadily in the European nighttime hours of August 12/13 and reaches the peak at dawn. In the following night, the rate is decreasing again.

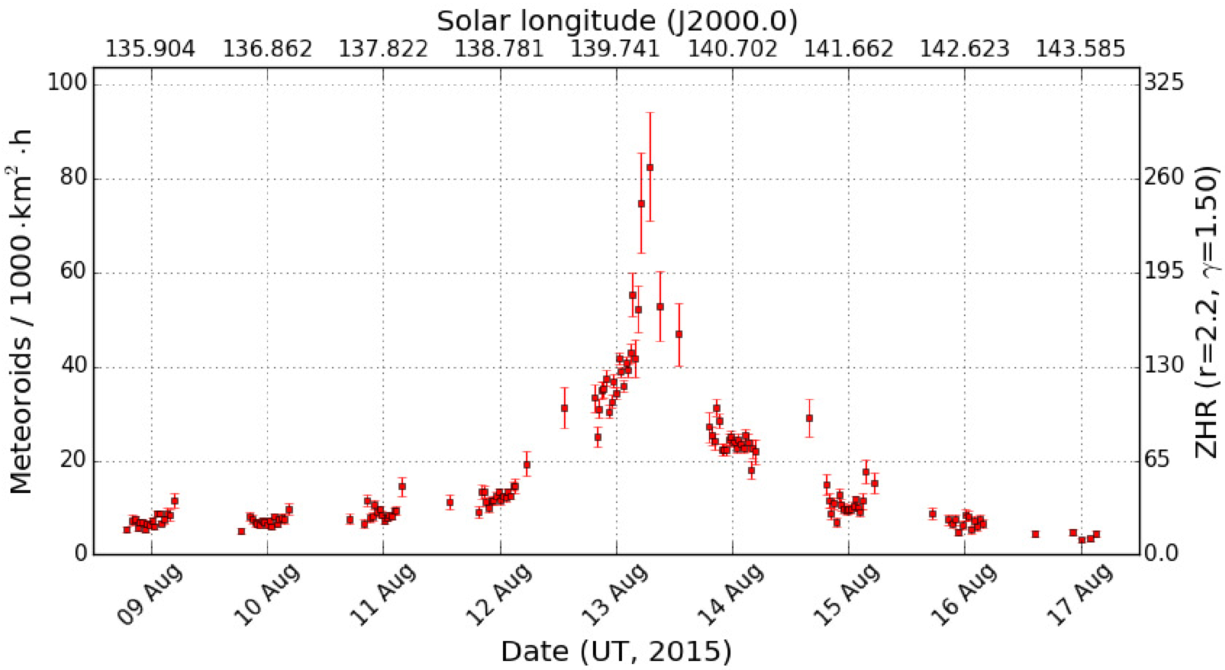

Figure 5: *Flux density profile close the peak of the Perseids 2015, derived from observations of the IMO video network.*

Figure 6 zooms directly into the maximum night with a high resolution of ten minutes per bin, which reveals an interesting feature in the morning hours. The flux density is growing steadily with only small fluctuations. However, before the maximum disappears in morning twilight, we have a short-term peak at 3:45 UT (139.89° solar longitude) with rates almost twice as high.

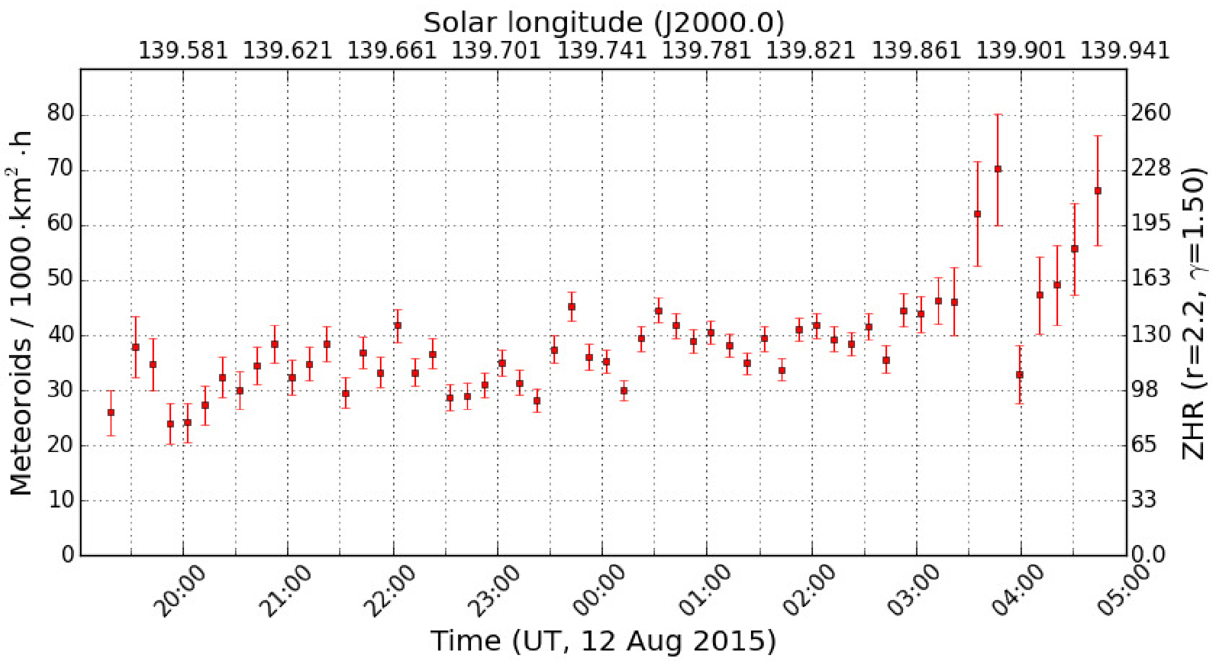

Figure 6: *High resolution flux density profile of the Perseid maximum night August 12/13, 2015, derived from observations of the IMO video network.*

Rainer Arlt provided a high-resolution ZHR profile from visual Perseid observations in IMO for comparison, which only uses observations with 10 min intervals or less. Indeed this profile shows the same phenomenon (figure 7). Taken for themselves, both outliers would probably be considered as measurement errors, but together they give a strong hint that this must have been a real feature. Visual data from Europe and northern America yield a continuous visual profile that does not end at European dawn hours as in case of our video data.

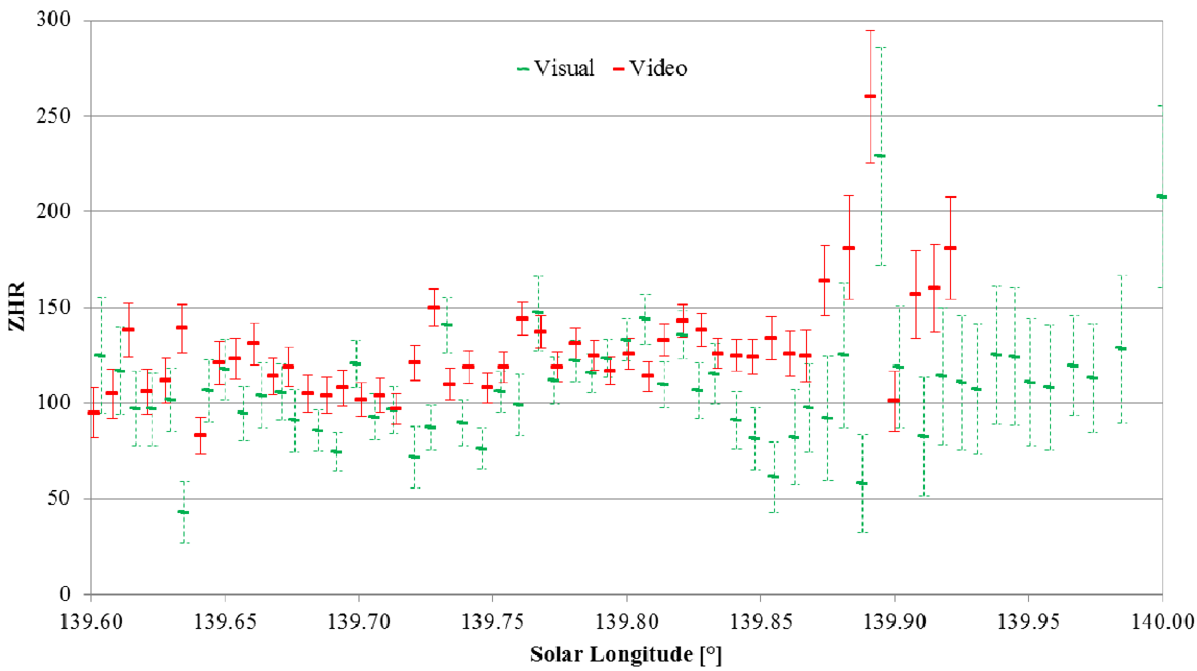

Figure 7: *Activity profile of the Perseid peak, derived from visual and video observations of IMO on August 12/13, 2015.*

Finally, a comparison of the full Perseid activity from the last five years shows hardly any difference in the profiles. Only at solar longitude 136 to 137° there seem to be two different regimes of the snap off point.

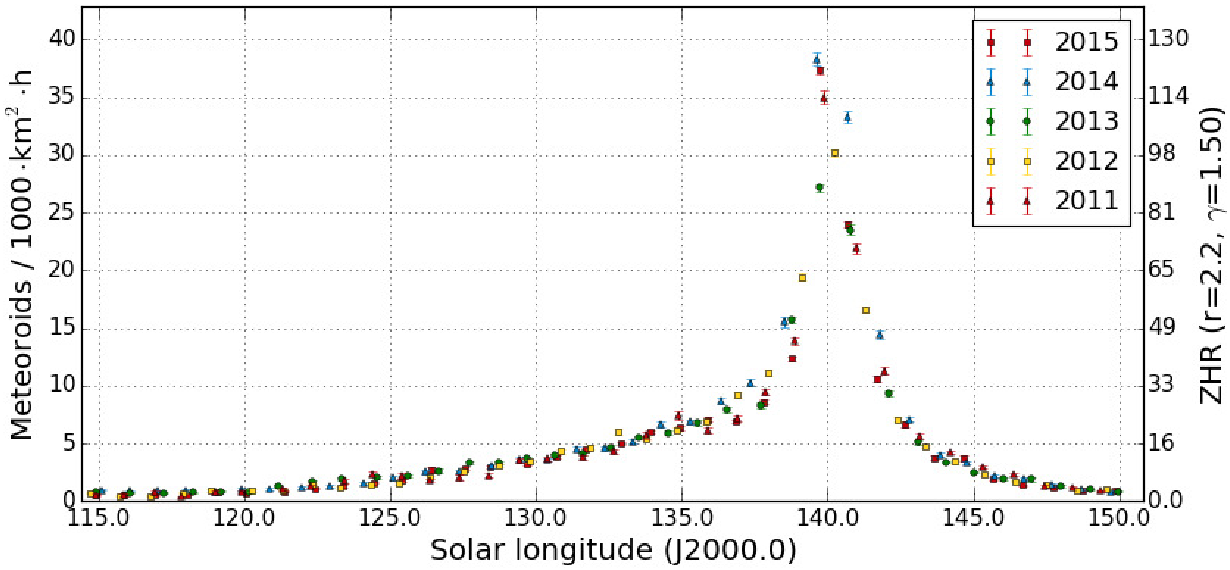

Figure 8: *Flux density profile of the Perseids 2011-2015, derived from observations of the IMO video network.*

Last but not least we confirmed, that the kappa Cygnids of 2015 are back at the normal level, after they showed significantly enhanced rates in 2014 (figure 9).

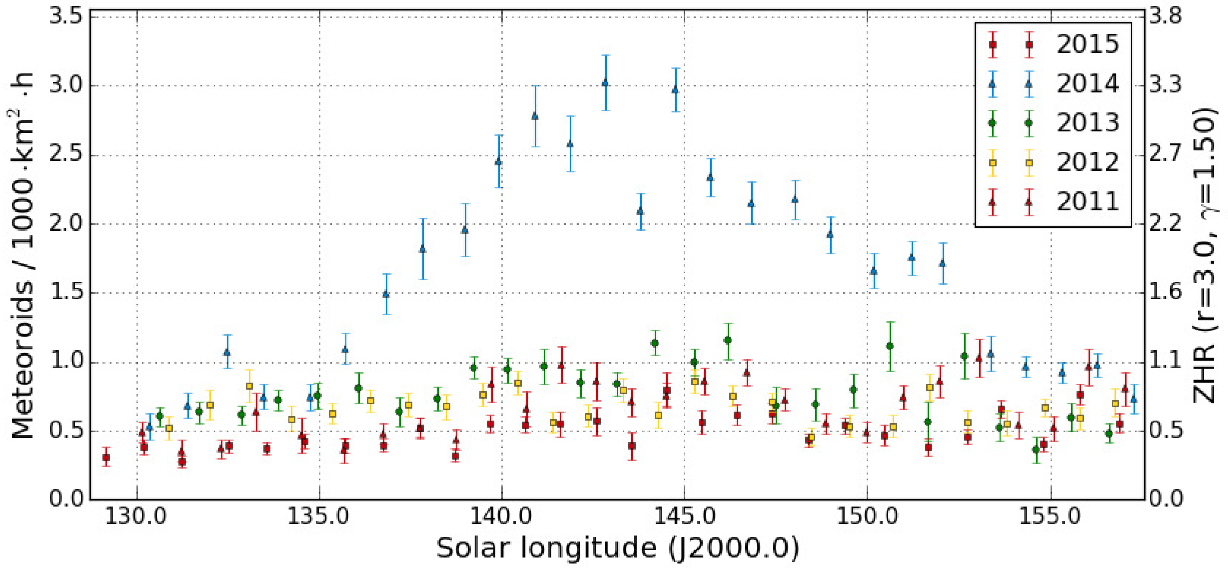

Figure 9: *Flux density profile of the kappa Cygnids 2011-2015, derived from observations of the IMO video network.*

Before we take a detailed look at the population index of the three important showers, we will have another look at the sporadic meteors first. In the July report we showed, that the scatter in r-values can be reduced significantly by introducing camera-specific perceptions coefficients. That is confirmed by the August data: Figure 10 shows left the uncorrected sporadic r-profile in July and August. The scatter is smaller in August because of the larger number of active cameras, but once more there is a severe outlier on August 16/17. At the right side we see the corrected r-profile for comparison. The outlier is still there (in that particular night we had hardly any cameras with consistently clear skies), but damped. The day-to-day variations have become smaller and long-term variations correlated to the lunar phase become more prominent.

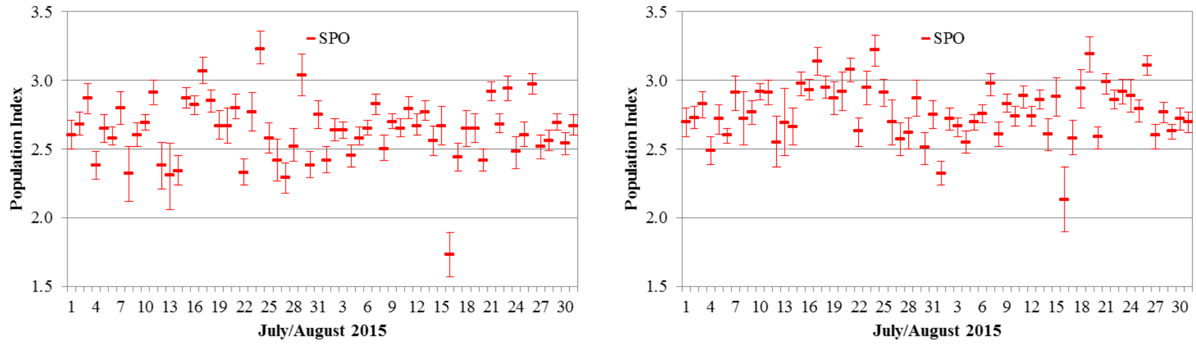

Figure 10: *Sporadic population index in July/August 2015. Left the original, right the perception coefficient corrected profile.*

With a help of a low-pass filter (sliding 5-day-average excluding the outlier) we can identify long-term variations (figure 11, left). If these variations are removed we receive the final sporadic r-profile with variations between 2.5 and 3.0 (figure 11, right).

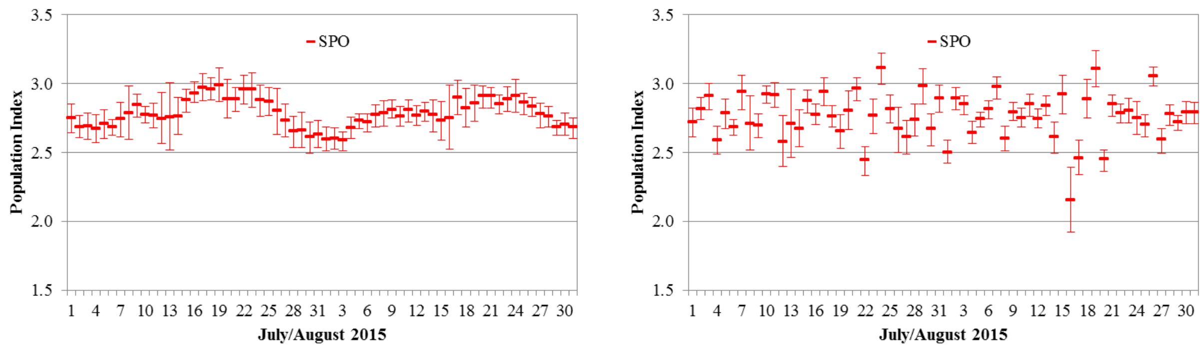

Figure 11: *With a low-pass filter smoothed sporadic population index (left) and final sporadic r-profile in July/August 2015, corrected for the perception coefficient and long-term variations.*

Let's now calculate the population index profiles for the individual showers. On the left side you see the uncorrected profile, on the right side the profile that is corrected for the perception coefficient and long-term variations. In case of the alpha Capricornids (figure 12) we have the smallest number of meteors, which results in larger variations. From the begin of activity until the peak, the r-values are smaller than the sporadic values. At peak time the population index is about 2.3, which fits nicely to the value of r=2.5 given in the IMO meteor shower list. Right after the peak, there is hardly any difference to the sporadic population index.

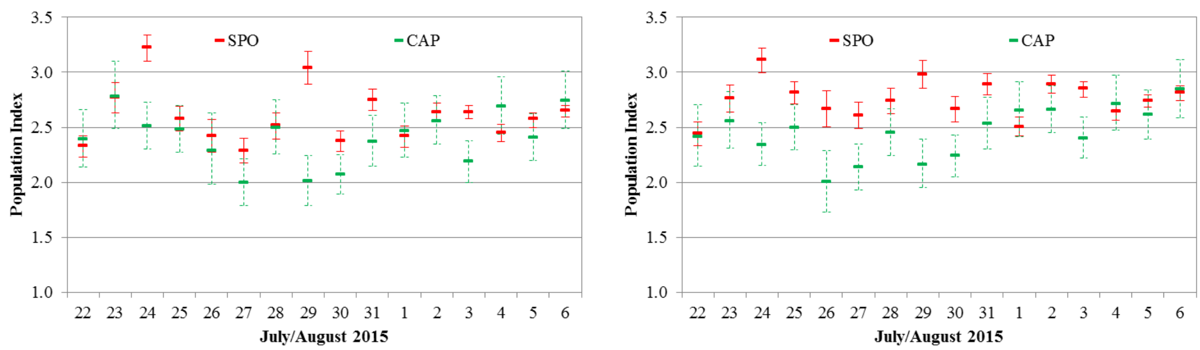

Figure 12: *Population index of the alpha Capricornids and sporadic meteors in July/August 2015, derived from IMO video observations. Left the original profiles, right the profiles corrected for the perception coefficient and long-term variations.*

In case of the southern delta Aquariids (figure 13) the scatter is smaller, since there are more shower meteors. Towards the begin and end of the activity interval, the r-values agree with the sporadic values. This comes as no surprise, since at these times the sporadic dilution is strongest, i.e. there are many chance alignments of sporadic meteors with the shower radiant. The closer we come to the peak, the smaller is the population index. At the turn of month r-values of 2.1 are obtained, which deviates strongly from r=3.2 given in the IMO meteor shower list.

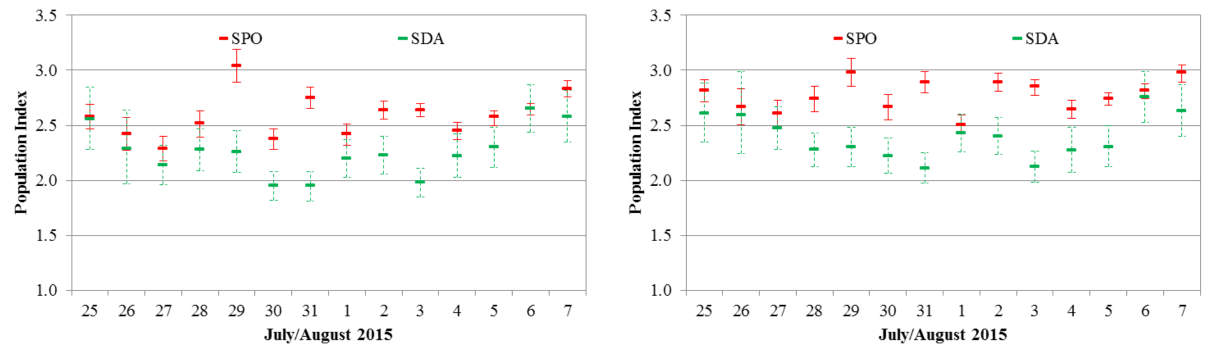

Figure 13: *Population index of the southern delta Aquariids and sporadic meteors in July/August 2015, derived from IMO video observations. Left the original profiles, right the profiles corrected for the perception coefficient and long-term variations.*

In case of the Perseids we have the same effect in the last few days of July, that the population index is slowly shrinking and deviating from the sporadic values (figure 14). At the same time, the error bars are reducing thanks to the increasing meteor counts. In the first half of August we see only small variations of the population index, at peak it varies between 2.1 and 2.2. Towards the end of the activity interval, the deviation from the sporadic r values persists amazingly. It seems that the Perseids keep their large percentage of bright meteors and dominate the sporadic background until the end of their activity interval.

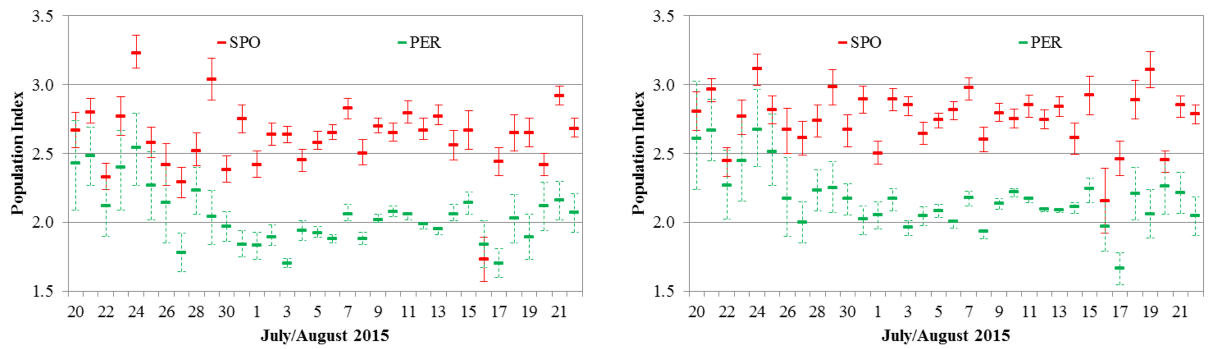

Figure 14: *Population index of the Perseids and sporadic meteors in July/August 2015, derived from IMO video observations. Left the original profiles, right the profiles corrected for the perception coefficient and long-term variations.*

Since there is a sufficiently large data set available for the Perseid peak, we finally calculated a high-resolution population index profile for August 12/13 and 13/14. The step size was 0.02° in solar longitude resp. 30 minutes. For comparison, Kristina Veljkovic calculated a high resolution r-profile from visual observations in IMO, based on the average distance between the meteor brightness and the limiting magnitude. Both the visual and video r-values scatter around 2.0 on August 12/13 (figure 15, left), whereby the video population index is on average 0.1 larger than the visual. In the following night (figure 15, right) the visual r-values start at 1.9 and slowly reduce to 1.8 at the end of night. Video observations start at 2.2 in this night, but decrease continuously towards the same end value. Hence, the measurements agree basically with one another.
A more detailed analysis will be presented in a dedicated WGN paper.

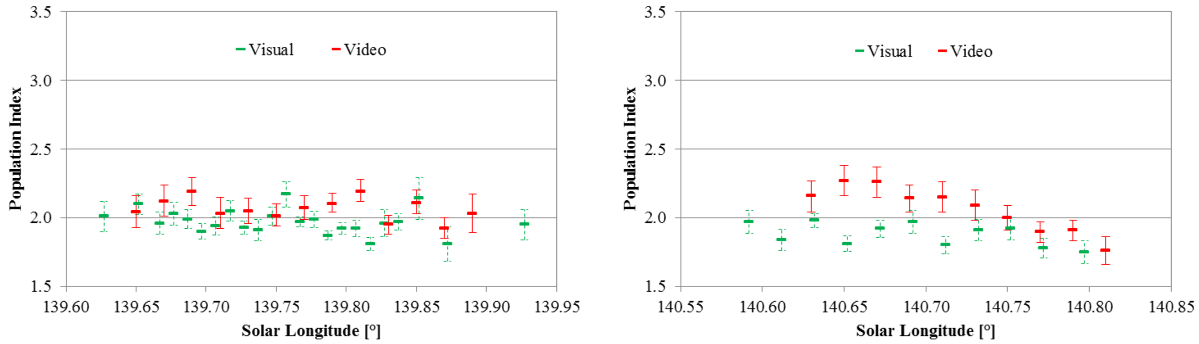

Figure 15: *r-value profile of the Perseid peak, derived from visual and video observations of IMO on August 12/13 (left) and August 13/14, 2015 (right).*

1. Observers

Code	Name	Place	Camera	FOV [°^{2}]	St.LM [mag]	Eff.CA [km^2]	Nights	Time [h]	Meteors
ARLRA	Arlt	Ludwigsfelde/DE	LUDWIG2 (0.8/8)	1475	6.2	3779	27	135.6	1215
BANPE	Bánfalvi	Zalaegerszeg/HU	HUVCSE01 (0.95/5)	2423	3.4	361	19	40.0	324
BERER	Berkó	Ludanyhalaszi/HU	HULUD1 (0.8/3.8)	5542	4.8	3847	18	116.1	1896
			HULUD3 (0.95/4)	4357	3.8	876	18	115.5	604
BOMMA	Bombardini	Faenza/IT	MARIO (1.2/4.0)	5794	3.3	739	27	194.2	1831
BREMA	Breukers	Hengelo/NL	MBB3 (0.75/6)	2399	4.2	699	20	98.4	551
BRIBE	Klemt	Herne/DE	HERMINE (0.8/6)	2374	4.2	678	24	108.7	651
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2286	4.6	1080	25	115.3	727
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	5.0	1611	29	172.0	1162
			BMH2 (1.5/4.5)*	4243	3.0	371	28	156.8	971
CRIST	Crivello	Valbrevenna/IT	BILBO (0.8/3.8)	5458	4.2	1772	28	194.2	1601
			C3P8 (0.8/3.8)	5455	4.2	1586	28	170.6	1198
			STG38 (0.8/3.8)	5614	4.4	2007	28	193.0	2348
CSISZ	Csizmadia	Baja/HU	HUVCSE02 (0.95/5)	1606	3.8	390	14	96.7	256
DONJE	Donati	Faenza/IT	JENNI (1.2/4)	5886	3.9	1222	28	207.1	2301
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5631	4.3	2151	28	155.7	1353
FORKE	Förster	Carlsfeld/DE	AKM3 (0.75/6)	2375	5.1	2154	21	122.7	1181
GONRU	Goncalves	Tomar/PT	TEMPLAR1 (0.8/6)	2179	5.3	1842	31	215.3	1563
			TEMPLAR2 (0.8/6)	2080	5.0	1508	31	218.8	1337
			TEMPLAR3 (0.8/8)	1438	4.3	571	30	206.3	685
			TEMPLAR4 (0.8/3.8)	4475	3.0	442	31	216.0	1756
			TEMPLAR5 (0.75/6)	2312	5.0	2259	31	199.0	1490
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1447	5.5	1841	23	146.8	1137
			ORION3 (0.95/5)	2665	4.9	2069	27	160.4	954
			ORION4 (0.95/5)	2662	4.3	1043	29	170.1	970
HERCA	Hergenrother	Tucson/US	SALSA3 (0.8/3.8)	2336	4.1	544	28	167.0	737
HINWO	Hinz	Schwarzenberg/DE	HINWO1 (0.75/6)	2291	5.1	1819	26	142.5	1224
IGAAN	Igaz	Debrecen/HU	HUDEB (0.8/3.8)	5522	3.2	620	25	150.7	855
		Hodmezovasar./HU	HUHOD (0.8/3.8)	5502	3.4	764	16	86.9	707
		Budapest/HU	HUPOL (1.2/4)	3790	3.3	475	6	37.1	92
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4)	2286	3.9	445	26	160.6	663
			HUSOR2 (0.95/3.5)	2465	3.9	715	26	165.9	621
KACJA	Kac	Kamnik/SI	CVETKA (0.8/3.8)	4914	4.3	1842	17	121.8	1659
		Kostanjevec/SI	METKA (0.8/12)*	715	6.4	640	6	43.3	149
		Ljubljana/SI	ORION1 (0.8/8)	1402	3.8	331	10	59.8	133
		Kamnik/SI	REZIKA (0.8/6)	2270	4.4	840	17	122.5	1550
			STEFKA (0.8/3.8)	5471	2.8	379	17	124.7	1368
KISSZ	Kiss	Sulysap/HU	HUSUL (0.95/5)*	4295	3.0	355	20	123.5	495
KOSDE	Koschny	Izana Obs./ES	ICC7 (0.85/25)*	714	5.9	1464	28	194.7	1870
		La Palma / ES	ICC9 (0.85/25)*	683	6.7	2951	25	155.3	1579
		Noordwijkerhout/NL	LIC4 (1.4/50)*	2027	6.0	4509	19	77.1	491
LOJTO	Łojek	Grabniak/PL	PAV57 (1.0/5)	1631	3.5	269	20	110.9	506
LOPAL	Lopes	Lisboa/PT	NASO1 (0.75/6)	2377	3.8	506	27	134.8	459
MACMA	Maciejewski	Chelm/PL	PAV35 (0.8/3.8)	5495	4.0	1584	31	184.7	1754
			PAV36 (0.8/3.8)*	5668	4.0	1573	31	184.1	2027
			PAV43 (0.75/4.5)*	3132	3.1	319	29	183.6	1128
			PAV60 (0.75/4.5)	2250	3.1	281	31	190.7	1813
MARGR	Maravelias	Lofoupoli/GR	LOOMECON (0.8/12)	738	6.3	2698	24	184.5	645
MARRU	Marques	Lisbon/PT	CAB1 (0.8/3.8)	5291	3.1	467	29	198.3	1672
			RAN1 (1.4/4.5)	4405	4.0	1241	28	167.7	949
MASMI	Maslov	Novosimbirsk/RU	NOWATEC (0.8/3.8)	5574	3.6	773	18	83.7	588
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1230	6.9	6152	27	162.8	2446
			ESCIMO2 (0.85/25)	155	8.1	3415	25	155.4	618
			MINCAM1 (0.8/8)	1477	4.9	1084	7	49.2	323
		Ketzür/DE	REMO1 (0.8/8)	1467	6.5	5491	26	144.7	1789
			REMO2 (0.8/8)	1478	6.4	4778	27	143.7	1122
			REMO3 (0.8/8)	1420	5.6	1967	26	136.5	1018
			REMO4 (0.8/8)	1478	6.5	5358	27	152.4	1474
MORJO	Morvai	Fülöpszallas/HU	HUFUL (1.4/5)	2522	3.5	532	24	137.7	569
MOSFA	Moschini	Rovereto/IT	ROVER (1.4/4.5)	3896	4.2	1292	24	57.5	532
OCHPA	Ochner	Albiano/IT	ALBIANO (1.2/4.5)	2944	3.5	358	12	48.3	488
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	3.8	460	26	146.4	543
PERZS	Perkó	Becsehely/HU	HUBEC (0.8/3.8)*	5498	2.9	460	26	169.8	1828
PUCRC	Pucer	Nova vas nad Dra./SI	MOBCAM1 (0.75/6)	2398	5.3	2976	22	141.5	707
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2366	4.5	911	27	146.5	520
SARAN	Saraiva	Carnaxide/PT	RO1 (0.75/6)	2362	3.7	381	27	175.3	596
			RO2 (0.75/6)	2381	3.8	459	26	176.4	828
			RO3 (0.8/12)	710	5.2	619	28	195.9	849
			SOFIA (0.8/12)	738	5.3	907	25	165.2	612
SCALE	Scarpa	Alberoni/IT	LEO (1.2/4.5)*	4152	4.5	2052	28	142.5	627
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	4900	3.0	409	27	106.0	915
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	563	6.2	1294	26	147.8	643
			KAYAK2 (0.8/12)	741	5.5	920	25	155.8	338
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5566	4.8	3270	29	153.7	2042
			NOA38 (0.8/3.8)	5609	4.2	1911	30	167.9	1991
			SCO38 (0.8/3.8)	5598	4.8	3306	30	170.1	2379
STORO	Stork	Ondrejov/CZ	OND1 (1.4/50)*	2195	5.8	4595	2	12.8	664
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2354	5.4	2751	25	116.2	702
			MINCAM3 (0.8/6)	2338	5.5	3590	26	101.8	717
			MINCAM4 (1.0/2.6)	9791	2.7	552	23	86.7	301
			MINCAM5 (0.8/6)	2349	5.0	1896	27	104.4	584
			MINCAM6 (0.8/6)	2395	5.1	2178	26	107.1	569
TEPIS	Tepliczky	Agostyan/HU	HUAGO (0.75/4.5)	2427	4.4	1036	28	184.7	829
			HUMOB (0.8/6)	2388	4.8	1607	29	180.1	1363
TRIMI	Triglav	Velenje/SI	SRAKA (0.8/6)*	2222	4.0	546	26	135.1	662
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM (0.8/6)	2337	5.5	3574	23	101.4	704
Summe							31	12161.0	88688

* active field of view smaller than video frame

2. Observing Times (h)

August	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	4.6	5.1	5.4	-	5.8	5.8	5.7	5.8	6.1	5.9	6.0	2.3	6.2	1.8	2.7
BANPE	0.3	1.4	3.4	2.8	2.4	3.2	2.5	3.6	-	-	-	-	-	-	0.2
BERER	6.0	4.1	6.8	6.4	6.8	5.8	6.9	7.0	7.3	7.3	7.5	7.6	3.9	7.6	5.4
	6.0	2.9	6.9	6.6	6.8	5.8	7.1	7.2	7.4	7.4	7.5	7.6	4.0	7.8	5.2
BOMMA	-	7.3	7.6	6.6	7.6	7.7	7.7	8.0	7.4	1.9	8.0	8.1	8.1	-	-
BREMA	6.2	6.3	5.4	6.3	6.5	4.8	0.4	6.7	1.1	4.3	-	7.0	3.4	-	-
BRIBE	6.1	6.4	6.3	6.2	6.6	4.7	-	3.4	3.0	2.0	2.6	6.8	2.2	2.6	-
	5.7	6.3	6.3	5.5	6.6	5.3	2.4	4.0	3.3	-	1.6	7.1	1.7	4.0	-
CASFL	0.6	7.6	7.6	6.1	7.7	7.7	1.0	6.6	7.3	7.7	8.0	8.1	7.6	4.5	-
	0.5	7.3	7.4	6.2	7.5	5.1	0.2	5.4	6.6	7.7	7.8	7.9	7.4	2.9	-
CRIST	0.7	7.4	6.8	7.2	7.1	7.5	7.5	7.4	-	-	7.8	7.8	7.2	5.3	5.6
	1.1	7.4	7.4	7.5	7.4	7.6	7.6	5.3	-	1.5	7.8	7.9	6.5	1.9	2.6
	1.8	7.4	7.4	7.5	7.0	7.6	7.6	7.6	-	-	7.8	7.6	7.2	5.1	4.9
CSISZ	4.1	-	-	7.4	7.6	7.9	8.0	7.5	-	-	-	-	-	-	-
DONJE	-	7.3	7.6	7.4	7.7	7.7	7.8	8.1	7.8	1.9	8.2	8.3	8.4	3.7	-
ELTMA	-	7.1	7.8	6.4	7.6	7.4	6.9	7.8	8.0	8.1	7.9	8.2	8.3	2.5	0.3
FORKE	-	6.2	6.4	2.4	6.7	6.6	6.7	2.7	7.0	5.8	6.8	7.3	6.4	1.7	3.2
GONRU	7.9	7.9	8.1	8.1	8.2	8.2	8.0	8.3	8.4	5.1	3.8	8.2	8.5	3.1	6.2
	8.1	8.2	8.2	8.2	8.3	8.3	8.1	8.4	8.5	5.4	4.1	8.4	8.7	3.1	6.3
	7.9	8.0	8.0	8.3	8.3	8.3	7.8	8.3	8.5	3.2	3.7	8.6	8.3	1.9	6.5
	8.1	8.2	8.2	8.2	8.3	8.3	7.9	8.4	8.5	5.4	4.0	8.3	8.7	3.0	5.9
	8.0	8.0	8.2	8.2	7.1	8.3	7.5	8.2	8.4	3.7	3.5	8.6	8.5	2.5	6.1
GOVMI	-	-	-	-	-	7.3	6.0	7.4	7.5	7.5	7.2	7.6	7.5	7.6	2.2
	0.3	1.8	7.1	6.4	7.3	7.3	7.1	7.4	7.5	7.5	7.0	7.6	7.5	7.5	2.6
	0.7	1.7	7.1	6.3	7.3	7.3	7.3	7.4	7.5	7.5	7.1	7.6	7.5	7.3	2.4
HERCA	4.4	0.7	7.3	8.7	7.6	0.8	6.8	-	9.2	0.7	8.7	4.4	8.5	-	7.9
HINWO	-	6.6	6.7	2.1	6.8	6.7	6.9	3.1	6.5	7.2	6.7	7.2	7.1	2.1	4.2
IGAAN	6.6	0.5	5.3	3.3	7.0	7.0	7.3	7.0	6.8	7.5	7.7	7.7	7.8	7.5	7.5
	4.8	-	-	4.1	7.1	7.3	6.1	6.0	6.3	4.3	7.3	7.7	7.2	7.1	5.8
	-	-	-	-	3.7	6.7	6.2	6.7	6.5	7.3	-	-	-	-	-
JONKA	3.5	-	6.9	5.3	7.1	4.1	7.5	6.5	6.9	7.6	7.7	5.9	7.8	7.8	3.9
	4.6	-	7.2	7.3	7.3	6.8	7.4	7.5	7.4	7.6	7.7	7.6	5.8	7.8	2.4
KACJA	-	-	7.1	1.9	7.3	7.5	7.5	6.8	7.7	6.4	-	7.8	7.8	7.0	-
	-	-	-	-	-	7.0	7.2	-	-	-	7.3	7.5	7.5	6.8	-
	-	-	3.2	2.2	4.7	-	-	-	-	-	-	-	-	-	-
	-	-	7.4	2.4	7.4	7.6	7.6	7.0	7.8	6.1	-	8.0	7.9	6.7	-
	-	-	7.4	2.0	7.5	7.7	7.6	7.1	7.7	6.5	-	8.0	7.9	7.1	-
KISSZ	-	-	7.3	7.0	7.4	7.4	7.4	7.3	7.9	7.7	7.8	7.1	7.5	7.9	2.9
KOSDE	8.4	8.5	7.9	6.7	5.2	8.6	2.8	4.7	1.5	-	3.1	-	-	8.7	8.8
	4.3	3.8	3.3	4.1	4.5	5.5	3.4	-	-	-	1.3	-	-	9.1	9.1
	5.5	5.6	1.4	3.6	5.8	5.9	3.3	6.1	-	5.8	0.2	6.4	-	2.2	-
LOJTO	4.8	-	-	6.1	5.5	6.4	6.2	6.6	-	-	6.6	6.7	6.4	6.7	4.5
LOPAL	2.4	1.1	3.7	3.1	2.6	7.0	3.8	8.1	-	4.1	3.4	5.4	8.7	3.5	7.3
MACMA	6.3	5.3	3.1	3.2	1.9	6.5	6.8	6.9	7.0	7.1	6.9	7.2	6.7	7.3	7.4
	6.4	5.3	2.0	4.3	1.6	6.4	6.7	6.9	6.8	6.2	6.6	6.9	7.0	7.2	7.2
	5.9	5.9	2.8	5.9	3.8	6.6	6.8	6.9	6.6	6.5	6.6	-	7.2	7.2	7.3
	6.3	5.3	2.5	5.3	3.2	6.4	6.8	6.9	5.5	6.5	6.7	7.1	7.1	7.2	7.4
MARGR	5.9	6.5	8.2	8.2	8.2	8.2	8.2	8.2	8.1	8.2	8.1	8.2	7.8	5.7	8.2
MARRU	7.8	7.9	7.9	7.9	7.9	8.0	5.5	8.0	6.4	6.1	7.7	8.0	8.1	7.2	7.4
	7.8	7.5	6.3	7.7	7.6	8.0	3.5	7.5	7.6	6.7	4.3	5.1	7.1	6.3	5.5
MASMI	4.1	4.8	-	4.7	5.0	5.0	-	5.0	1.5	5.2	2.0	-	-	4.8	-
MOLSI	-	6.2	6.2	6.0	6.4	6.4	6.5	6.5	6.5	6.7	6.8	6.8	6.9	-	-
	-	6.7	6.8	6.3	6.9	7.0	7.0	7.1	7.2	7.2	7.3	7.4	7.3	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	5.3	5.8	6.0	-	6.0	6.3	5.0	5.4	5.8	6.7	6.4	2.0	6.7	2.1	5.3
	4.7	5.7	5.9	0.4	6.3	6.3	5.4	5.5	5.8	6.7	6.8	2.3	6.8	2.6	5.3
	6.2	6.1	3.9	0.6	3.4	4.6	5.4	3.6	4.2	6.8	6.8	2.1	5.1	2.3	5.8
	6.0	6.1	6.2	1.0	6.4	6.5	5.5	6.1	5.8	6.8	6.8	2.5	6.7	2.8	5.0
MORJO	4.6	-	7.1	6.9	7.0	7.3	6.8	7.4	6.3	7.4	4.4	2.8	4.9	4.6	0.4
MOSFA	0.2	2.5	2.0	2.3	2.1	1.2	-	2.9	4.0	4.6	4.9	6.7	6.1	1.8	-
OCHPA	-	4.5	-	-	3.8	-	-	-	1.5	-	5.2	6.4	6.5	-	-
OTTMI	3.9	5.7	7.6	7.3	6.7	5.9	7.6	-	5.3	7.1	7.0	6.0	4.4	6.4	5.3
PERZS	1.0	2.8	-	7.0	7.4	7.3	7.3	7.6	7.7	7.5	7.7	7.8	7.9	7.8	1.9
PUCRC	-	7.4	7.3	5.1	7.5	7.4	-	-	7.6	7.3	6.6	7.7	7.7	4.2	-
ROTEC	4.5	5.4	6.0	-	6.3	6.4	5.8	4.9	6.6	6.1	5.6	0.7	6.9	1.4	6.5
SARAN	6.7	6.2	6.8	7.7	8.4	7.5	5.9	8.5	8.6	3.0	5.6	7.1	8.9	6.4	7.6
	8.4	7.6	6.6	7.5	8.5	8.1	5.8	8.3	8.4	3.5	4.1	6.7	8.6	4.9	5.9
	8.2	7.5	7.7	7.5	8.2	7.7	6.8	8.1	8.3	3.5	5.2	7.5	8.5	5.4	7.2
	8.0	6.8	7.4	7.8	8.5	8.1	2.7	8.5	8.5	-	3.6	7.2	8.4	6.2	7.1
SCALE	-	6.6	4.6	4.7	4.9	6.9	3.0	7.0	7.6	5.6	7.6	7.7	7.8	0.9	0.4
SCHHA	5.8	5.1	5.5	4.6	6.6	3.8	0.2	4.3	2.8	4.7	1.1	6.9	1.4	5.6	-
SLAST	-	1.3	6.3	2.2	6.6	6.7	6.7	6.5	6.7	5.7	6.8	6.3	6.0	5.7	1.3
	-	2.3	7.1	2.3	7.2	7.2	7.2	7.2	7.3	6.1	7.3	7.4	7.2	5.1	0.8
STOEN	-	7.6	7.3	6.0	7.6	7.7	4.2	7.5	8.0	7.3	8.1	8.2	8.1	2.8	1.0
	0.2	7.7	7.0	6.0	7.7	7.7	2.9	7.2	7.8	7.4	7.9	8.1	8.2	3.1	0.6
	-	7.7	7.3	5.7	7.8	7.8	3.1	7.7	8.0	7.0	8.1	8.1	8.1	2.8	0.7
STORO	-	-	-	-	-	-	-	-	-	-	-	6.0	6.8	-	-
STRJO	5.1	6.2	6.3	5.0	6.4	6.3	-	6.3	3.7	-	0.9	6.6	4.0	0.4	-
	5.3	6.1	6.1	5.5	6.0	6.3	1.6	6.5	3.0	-	0.8	6.0	4.1	-	0.4
	3.2	6.2	6.4	0.6	5.0	5.0	1.2	6.4	2.6	-	-	5.9	3.9	-	0.5
	1.8	6.0	3.2	2.5	4.3	6.0	2.0	4.2	3.6	-	1.0	6.6	4.1	-	0.6
	4.8	6.1	6.2	5.5	5.8	5.9	2.0	6.3	3.8	-	0.6	5.8	3.3	0.3	-
TEPIS	3.8	1.7	6.9	7.0	7.1	7.1	6.8	7.0	7.1	7.3	7.4	6.8	7.5	7.6	2.2
	3.5	2.4	6.7	7.0	7.1	7.1	7.2	7.2	7.3	7.4	7.4	6.2	7.5	7.6	1.3
TRIMI	-	1.0	7.4	1.8	6.0	7.6	7.6	7.7	6.4	7.8	7.8	7.8	7.9	6.5	4.0
YRJIL	-	-	2.0	2.0	-	3.2	-	-	3.6	4.0	1.5	3.7	4.4	4.6	4.5
Sum	285.7	383.6	466.1	411.1	519.8	542.9	434.2	504.1	466.2	399.3	435.2	518.2	521.2	350.2	264.6

August	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	1.4	-	-	0.6	6.6	6.7	6.5	5.2	0.3	6.3	7.0	-	6.9	6.3	7.1	5.5
BANPE	-	-	0.8	-	-	1.3	0.2	2.3	2.0	-	-	1.8	3.2	3.2	2.3	3.1
BERER	2.6	-	-	-	-	-	-	-	-	-	-	-	-	-	8.5	8.6
	2.0	-	-	-	-	-	-	-	-	-	-	-	-	-	8.6	8.7
BOMMA	5.1	8.5	-	2.9	5.7	8.6	8.6	2.3	5.3	8.6	8.9	9.0	9.0	7.5	9.0	9.2
BREMA	-	-	0.2	6.8	7.6	7.7	7.7	-	1.3	-	-	-	7.3	1.4	-	-
BRIBE	-	-	5.7	2.3	7.7	7.8	7.7	0.7	-	0.8	-	0.7	8.3	5.3	2.8	-
	-	-	4.7	2.0	7.6	7.8	7.8	1.2	1.3	1.9	0.6	-	8.2	5.5	6.9	-
CASFL	1.8	2.5	0.2	4.5	0.4	7.4	3.6	-	0.6	8.8	8.9	9.0	8.9	9.0	9.1	9.2
	0.2	1.5	-	4.9	0.6	6.3	1.7	-	0.4	8.6	8.7	8.8	8.7	8.7	8.8	9.0
CRIST	8.1	5.1	6.6	8.3	7.9	7.0	3.9	-	1.8	8.4	8.7	8.7	8.7	8.2	8.8	8.7
	8.1	1.0	3.3	8.3	6.8	5.6	1.1	-	-	8.6	8.6	8.7	8.6	4.6	8.9	8.9
	8.1	5.1	6.6	8.3	7.7	7.0	4.5	-	1.2	5.7	8.6	8.6	8.6	8.8	8.8	8.9
CSISZ	-	-	-	-	-	-	-	-	3.5	1.9	8.9	9.1	9.1	4.3	8.4	9.0
DONJE	5.4	8.6	-	4.4	6.3	8.6	8.7	4.2	6.0	8.8	9.1	9.0	9.0	9.0	9.0	9.1
ELTMA	0.2	4.2	-	2.7	-	8.4	2.9	1.0	2.8	2.1	8.4	8.1	4.3	3.7	7.1	5.5
FORKE	-	-	-	-	-	7.9	7.7	-	-	7.8	8.2	2.5	-	7.8	4.9	-
GONRU	2.0	4.7	8.8	8.8	8.8	4.3	6.1	6.1	9.0	9.0	8.2	9.0	9.1	6.8	2.1	4.5
	2.0	5.0	8.8	8.9	8.9	4.0	6.4	6.4	9.1	9.1	8.4	9.2	9.3	6.5	1.8	4.7
	-	3.5	8.7	8.7	8.7	4.1	6.8	6.3	8.9	9.0	6.8	5.6	9.0	6.8	3.7	4.1
	1.2	4.6	8.8	8.9	8.9	3.7	6.2	5.7	9.0	9.1	8.1	9.0	9.2	7.3	2.6	4.3
	2.0	3.6	8.8	8.8	6.5	4.1	5.8	6.7	9.1	9.1	7.0	3.8	8.9	4.4	2.1	3.5
GOVMI	-	-	0.8	-	1.4	6.9	4.3	8.3	4.9	0.9	8.5	8.5	8.6	8.5	8.6	8.8
	-	-	-	-	0.7	5.0	4.0	6.7	5.0	0.9	8.5	8.5	8.1	6.4	6.5	8.2
	-	0.2	0.6	-	1.3	6.5	4.3	8.3	4.9	0.6	8.5	8.5	8.6	8.4	8.6	8.8
HERCA	3.6	5.8	9.5	8.9	9.6	9.3	8.4	5.3	0.3	-	4.7	4.1	3.2	9.8	5.2	3.6
HINWO	2.5	-	-	-	2.2	7.5	8.0	1.3	-	8.2	8.1	3.5	0.4	8.1	7.2	5.6
IGAAN	-	-	-	1.3	-	-	-	8.2	8.2	1.0	8.2	6.8	2.7	8.2	5.7	3.9
	-	0.6	4.5	0.7	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JONKA	-	-	0.2	-	2.6	-	2.0	8.2	4.1	3.1	8.6	8.6	8.2	8.8	8.8	8.9
	-	-	1.0	-	2.8	-	3.2	8.4	2.4	2.0	8.5	8.6	8.7	8.5	8.5	8.9
KACJA	-	-	-	-	-	-	-	-	-	-	8.5	7.4	8.5	5.7	7.8	9.1
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	4.5	-	-	6.8	8.5	6.6	6.0	8.7	8.6
	-	-	-	-	-	-	-	-	-	-	8.7	7.6	8.5	7.2	6.7	7.9
	-	-	-	-	-	-	-	-	-	-	8.7	7.7	8.7	7.4	6.8	8.9
KISSZ	-	-	-	-	0.2	0.3	-	8.3	4.5	4.3	4.6	8.7	-	-	-	-
KOSDE	8.9	8.9	8.9	4.3	4.1	6.1	9.0	9.1	9.1	8.3	9.1	9.2	9.0	9.0	6.1	0.7
	9.2	9.2	9.2	9.3	4.1	9.3	9.4	9.4	2.5	8.4	7.4	6.5	-	4.3	4.6	4.1
	-	-	-	6.9	1.4	-	7.2	1.6	-	1.3	-	1.6	5.3	-	-	-
LOJTO	1.7	7.0	7.2	7.3	-	-	-	-	1.6	-	7.4	-	-	2.1	3.6	6.5
LOPAL	-	-	-	2.8	8.9	4.2	4.6	1.0	9.3	8.5	7.2	4.6	9.4	4.1	2.3	3.7
MACMA	4.1	7.2	7.6	7.7	7.8	1.9	5.9	6.0	8.0	1.9	8.1	8.1	0.9	8.2	3.4	8.3
	3.9	7.0	7.7	7.7	7.9	0.7	4.9	6.1	8.0	1.9	7.8	8.4	1.0	8.4	6.9	8.3
	4.8	7.3	7.6	7.6	7.7	-	4.8	5.6	8.0	1.7	8.2	8.3	1.5	8.3	7.7	8.5
	4.8	7.3	7.6	7.7	7.8	0.7	5.9	5.6	8.0	1.9	8.2	8.2	1.8	8.4	8.1	8.5
MARGR	8.1	8.2	8.0	8.2	-	-	-	-	-	-	8.8	8.1	7.1	5.9	6.2	-
MARRU	4.5	5.8	8.2	8.2	-	8.3	3.8	-	6.7	8.4	6.9	6.4	7.5	2.7	3.8	5.3
	-	6.9	8.0	7.8	7.5	2.8	5.0	0.6	6.6	8.6	1.1	3.1	8.4	2.8	-	-
MASMI	-	5.7	5.7	6.5	-	-	-	-	-	5.8	-	5.5	-	1.2	3.9	7.3
MOLSI	0.9	3.9	5.7	2.8	1.2	7.4	7.5	1.3	-	7.7	7.8	7.8	6.8	8.0	8.0	8.1
	0.4	0.3	1.4	0.7	-	7.9	8.0	-	-	8.2	8.2	8.3	2.7	8.4	8.5	8.2
	-	-	-	-	-	-	-	-	-	7.8	7.9	7.7	3.8	7.3	7.3	7.4
	0.7	-	-	0.5	7.4	5.3	7.1	6.1	-	6.6	7.8	-	7.5	7.5	7.0	6.4
	-	-	-	0.5	7.5	5.4	7.3	6.0	0.4	6.8	7.8	-	6.9	6.2	5.6	6.8
	-	-	-	-	4.1	5.4	7.4	6.4	0.5	6.9	7.9	-	8.2	8.2	7.8	6.8
	0.2	-	-	0.7	7.6	5.5	7.3	6.1	-	6.9	8.0	-	7.9	8.1	6.4	7.5
MORJO	-	-	-	0.6	-	-	-	3.9	0.6	4.8	7.6	8.4	8.6	7.6	8.9	8.8
MOSFA	-	0.7	-	0.6	2.4	0.6	-	-	-	2.1	2.1	1.7	1.4	1.3	1.7	1.6
OCHPA	-	-	-	-	-	2.6	-	-	-	-	2.5	1.5	-	3.6	5.0	5.2
OTTMI	7.1	2.1	-	2.1	6.1	8.6	1.7	7.1	3.8	6.4	7.9	-	-	-	2.1	5.2
PERZS	-	-	2.5	-	6.3	7.8	4.0	8.3	5.7	-	8.7	8.6	6.4	6.8	7.9	8.1
PUCRC	-	0.2	4.4	-	-	3.2	7.9	3.8	-	6.7	7.9	7.9	7.9	7.9	7.9	-
ROTEC	0.6	-	2.4	7.3	7.4	7.6	6.2	4.8	-	7.1	7.9	-	7.5	5.7	5.7	3.2
SARAN	-	6.6	7.8	9.1	8.4	4.8	4.6	-	8.8	6.3	4.5	-	-	2.7	2.1	4.7
	-	6.1	8.0	9.0	8.5	4.7	3.2	-	8.6	-	5.2	-	9.5	4.8	-	5.9
	-	6.5	7.6	8.9	8.6	5.0	4.1	-	8.4	6.4	5.9	3.8	9.3	6.3	-	7.8
	-	7.5	7.9	9.1	8.3	4.1	4.8	-	8.6	5.9	2.3	-	-	2.0	-	5.9
SCALE	0.2	3.3	-	2.6	-	8.0	3.3	0.2	2.7	1.6	8.6	8.6	8.4	4.3	8.7	6.7
SCHHA	-	-	5.8	4.2	5.2	7.7	7.5	0.8	-	2.0	0.2	2.4	7.7	1.9	1.7	0.5
SLAST	-	1.9	4.5	-	1.4	4.7	8.3	5.3	-	-	6.3	8.3	7.8	7.9	8.3	8.3
	-	-	4.8	-	2.1	5.0	8.3	5.6	-	-	8.4	8.4	7.9	6.8	8.4	8.4
STOEN	0.3	4.6	0.5	2.6	0.4	8.6	3.3	0.3	3.7	4.6	8.8	8.4	6.3	5.0	-	4.9
	0.5	4.6	0.2	3.8	0.6	8.6	3.6	-	3.2	5.5	8.9	8.9	8.9	6.6	8.9	5.6
	0.3	4.0	0.2	3.9	1.1	8.7	2.3	0.5	3.4	5.7	9.0	9.0	8.9	8.3	9.1	5.8
STORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STRJO	-	-	3.2	6.4	7.6	7.5	7.7	1.5	4.3	0.2	1.6	-	7.5	6.2	3.0	2.3
	-	-	1.0	4.0	7.4	7.6	7.5	1.6	2.7	0.8	1.5	-	4.5	2.2	1.7	1.6
	-	-	0.7	4.2	6.2	5.5	7.6	0.8	1.5	-	-	-	7.6	4.5	0.3	0.9
	-	-	3.3	5.2	7.5	7.6	7.6	1.6	4.8	0.8	1.9	0.1	7.8	7.2	2.0	1.1
	-	-	2.2	4.3	7.5	6.3	7.1	1.3	2.3	0.5	1.5	0.4	8.1	7.5	-	1.7
TEPIS	-	-	0.3	-	8.0	7.4	6.9	8.2	6.0	3.8	8.3	8.4	8.4	8.5	8.6	8.6
	0.4	-	0.9	-	6.9	6.2	6.8	7.8	5.3	4.3	8.3	8.4	8.5	8.5	6.3	8.6
TRIMI	-	2.6	-	-	1.8	3.4	6.4	5.2	0.5	-	4.7	5.2	5.6	4.7	3.4	4.3
YRJIL	3.9	4.5	5.0	5.2	5.4	-	-	5.1	5.4	5.8	2.3	-	5.7	6.5	6.7	6.4
Sum	121.8	204.4	254.6	301.3	337.6	376.5	373.9	260.2	264.9	333.5	512.4	427.8	501.0	482.5	446.0	460.2

3. Results (Meteors)

August	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	32	39	65	-	67	76	69	26	68	65	83	28	134	29	22
BANPE	2	10	29	22	19	27	19	41	-	-	-	-	-	-	2
BERER	43	19	97	72	95	81	123	92	156	99	217	437	75	131	28
	13	3	34	18	27	26	35	35	46	33	75	132	33	46	17
BOMMA	-	62	63	37	84	85	81	74	57	17	113	322	170	-	-
BREMA	39	23	22	12	28	22	2	53	3	16	-	158	36	-	-
BRIBE	30	28	45	35	46	30	-	24	22	16	13	114	18	29	-
	34	33	44	25	56	31	8	18	12	-	11	167	8	60	-
CASFL	7	43	52	38	59	35	1	51	52	54	91	193	90	28	-
	5	44	41	23	43	21	1	40	27	74	83	191	90	27	-
CRIST	4	40	45	62	63	107	86	68	-	-	157	183	180	74	43
	6	55	52	60	45	69	68	39	-	5	104	195	92	16	25
	9	87	82	108	72	115	136	103	-	-	185	279	221	91	43
CSISZ	8	-	-	20	27	21	32	38	-	-	-	-	-	-	-
DONJE	-	80	102	44	103	92	108	121	58	20	132	352	222	32	-
ELTMA	-	38	61	48	67	63	46	48	68	72	110	299	177	21	2
FORKE	-	61	54	13	48	66	62	12	75	89	77	214	126	3	18
GONRU	54	59	70	67	62	87	51	70	75	31	24	148	132	12	49
	51	37	58	63	59	66	39	68	55	28	16	179	146	15	46
	21	27	42	28	21	43	17	31	19	6	12	100	88	3	29
	64	50	88	95	97	82	56	88	73	31	29	267	232	7	57
	55	33	42	65	56	74	33	80	68	10	15	274	209	4	74
GOVMI	-	-	-	-	-	54	38	68	66	64	99	198	142	65	5
	1	8	36	17	45	38	39	36	62	52	71	198	143	36	9
	1	4	26	20	45	43	35	43	54	61	95	186	130	43	8
HERCA	27	5	39	48	22	2	23	-	43	3	43	40	124	-	45
HINWO	-	65	44	17	56	61	49	33	50	93	75	179	95	11	27
IGAAN	24	4	16	14	30	36	39	52	21	60	73	161	121	47	25
	19	-	-	23	32	48	25	35	37	41	72	197	75	67	20
	-	-	-	-	10	16	9	13	21	23	-	-	-	-	-
JONKA	13	-	31	19	23	31	31	25	22	54	66	74	64	56	10
	10	-	30	24	29	21	34	39	21	29	59	96	46	46	3
KACJA	-	-	72	8	82	75	79	99	129	80	-	399	249	47	-
	-	-	-	-	-	18	17	-	-	-	20	53	27	14	-
	-	-	3	2	13	-	-	-	-	-	-	-	-	-	-
	-	-	53	4	65	92	113	87	116	85	-	317	225	40	-
	-	-	60	6	67	74	72	73	104	89	-	334	222	37	-
KISSZ	-	-	21	13	23	25	23	28	27	36	60	89	60	38	8
KOSDE	133	109	113	50	42	102	14	41	20	-	24	-	-	91	92
	47	33	13	27	44	42	8	-	-	-	3	-	-	103	108
	26	34	4	12	42	44	9	50	-	39	1	148	-	6	-
LOJTO	9	-	-	25	20	23	29	22	-	-	55	106	70	49	7
LOPAL	18	8	39	25	3	13	10	25	-	3	9	47	79	33	28
MACMA	70	28	9	8	9	70	69	85	78	68	90	206	178	114	97
	78	50	16	20	13	84	82	115	83	64	87	291	192	138	88
	57	33	9	17	9	55	49	82	48	52	55	-	162	89	56
	78	41	13	22	14	73	73	101	60	63	75	198	169	103	90
MARGR	9	15	25	30	30	22	32	24	34	28	30	86	43	14	45
MARRU	68	49	72	77	85	94	18	56	54	47	78	275	201	80	74
	42	23	40	56	56	64	14	56	40	35	18	77	106	49	47
MASMI	5	49	-	27	42	49	-	52	12	79	15	-	-	72	-
MOLSI	-	68	93	76	122	112	127	85	133	124	175	267	186	-	-
	-	33	28	23	29	38	37	20	33	33	33	75	24	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	41	72	82	-	100	102	42	34	91	93	92	24	193	24	22
	16	34	49	1	53	74	54	20	80	56	63	22	120	16	24
	45	48	32	2	13	36	50	7	46	83	80	17	61	16	16
	34	86	76	9	77	91	49	27	80	92	88	13	159	38	30
MORJO	11	-	33	21	21	37	20	27	27	34	52	78	54	30	2
MOSFA	1	16	12	17	16	12	-	24	40	38	59	121	73	11	-
OCHPA	-	38	-	-	30	-	-	-	12	-	47	141	87	-	-
OTTMI	12	22	24	23	21	16	22	-	24	47	74	63	17	14	18
PERZS	6	16	-	35	52	74	89	105	122	89	161	399	239	102	9
PUCRC	-	36	32	21	31	29	-	-	45	46	44	150	92	15	-
ROTEC	9	24	33	-	28	44	20	16	47	31	31	2	75	3	28
SARAN	19	20	29	32	29	25	12	28	31	5	17	81	65	23	30
	46	32	41	46	48	46	24	45	34	8	20	62	125	23	28
	41	34	34	58	45	47	14	31	35	7	20	72	90	15	40
	20	11	30	42	41	36	5	34	20	-	8	71	83	29	32
SCALE	-	18	17	18	19	31	8	24	27	46	32	162	71	8	2
SCHHA	47	36	48	30	63	21	1	47	17	35	2	217	8	58	-
SLAST	-	2	18	5	33	25	29	28	44	25	61	91	79	17	1
	-	3	11	1	10	20	12	12	30	9	28	48	36	9	1
STOEN	-	69	79	72	96	95	28	90	143	124	164	374	282	28	9
	1	96	74	58	83	87	9	61	138	140	166	379	258	31	2
	-	104	96	73	100	114	17	87	134	173	179	445	296	35	3
STORO	-	-	-	-	-	-	-	-	-	-	-	367	297	-	-
STRJO	13	21	36	19	61	49	-	48	18	-	5	139	39	1	-
	43	42	42	40	53	50	7	74	17	-	4	81	39	-	2
	21	23	18	3	21	18	5	27	6	-	-	64	32	-	3
	14	26	29	26	38	36	8	61	10	-	2	97	30	-	1
	25	26	54	19	41	38	7	60	4	-	4	107	31	1	-
TEPIS	11	2	32	28	28	24	29	29	41	48	79	124	89	58	3
	15	5	60	56	55	41	59	44	63	66	111	155	122	80	4
TRIMI	-	3	27	9	22	28	39	30	33	43	41	138	74	21	10
YRJIL	-	-	13	16	-	18	-	-	32	29	10	82	104	60	33
Sum	1703	2495	3254	2445	3674	4202	2929	3785	3793	3438	4772	12915	9032	2882	1700

August	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	4	-	-	1	67	66	54	28	1	33	51	-	37	37	11	22
BANPE	-	-	6	-	-	9	1	15	13	-	-	16	24	23	19	27
BERER	6	-	-	-	-	-	-	-	-	-	-	-	-	-	65	60
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	13	14
BOMMA	55	94	-	21	30	44	67	12	29	45	54	47	38	41	48	41
BREMA	-	-	1	19	33	31	31	-	3	-	-	-	17	2	-	-
BRIBE	-	-	26	4	35	33	30	3	-	3	-	2	41	18	6	-
	-	-	21	3	32	37	35	6	3	11	1	-	35	15	21	-
CASFL	6	17	1	12	1	32	16	-	4	37	45	33	32	41	55	36
	1	8	-	9	3	29	11	-	2	28	22	32	17	30	30	39
CRIST	96	24	19	56	43	45	4	-	5	38	24	36	34	23	21	21
	61	7	17	52	21	18	6	-	-	39	21	26	32	14	31	22
	74	33	40	112	71	65	22	-	13	29	66	74	55	48	57	58
CSISZ	-	-	-	-	-	-	-	-	8	2	10	20	18	12	18	22
DONJE	56	112	-	44	32	62	79	13	56	71	66	55	60	41	43	45
ELTMA	1	31	-	21	-	41	6	3	7	14	30	32	12	13	14	8
FORKE	-	-	-	-	-	49	39	-	-	50	46	11	-	39	29	-
GONRU	5	12	61	54	53	13	38	36	56	52	49	58	47	25	1	12
	4	15	43	44	33	5	34	22	49	36	34	23	41	15	4	9
	-	6	27	20	25	3	13	11	24	23	12	4	22	3	3	2
	4	17	52	54	53	6	32	24	41	49	29	18	38	10	6	7
	2	9	36	58	50	11	22	24	50	31	35	6	40	16	2	6
GOVMI	-	-	2	-	7	21	11	38	13	4	32	50	46	39	33	42
	-	-	-	-	3	18	4	11	13	5	27	18	17	14	9	24
	-	1	2	-	4	14	10	13	6	1	15	21	28	20	15	26
HERCA	7	12	26	34	33	21	27	14	1	-	11	18	8	38	17	6
HINWO	13	-	-	-	20	46	50	1	-	59	50	11	1	43	37	38
IGAAN	-	-	-	4	-	-	-	16	24	5	14	12	9	18	22	8
	-	3	12	1	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
JONKA	-	-	2	-	8	-	5	19	5	6	6	15	27	16	17	18
	-	-	1	-	9	-	7	16	2	1	12	21	19	16	15	15
KACJA	-	-	-	-	-	-	-	-	-	-	62	52	77	53	42	54
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	12	-	-	9	22	20	9	18	25
	-	-	-	-	-	-	-	-	-	-	92	60	65	69	26	41
	-	-	-	-	-	-	-	-	-	-	41	44	43	31	33	38
KISSZ	-	-	-	-	1	2	-	14	4	3	3	17	-	-	-	-
KOSDE	77	95	87	31	47	37	91	80	96	96	111	80	37	15	57	2
	107	89	107	78	28	91	108	108	10	99	97	88	-	52	45	44
	-	-	-	31	1	-	28	1	-	3	-	5	7	-	-	-
LOJTO	4	18	20	16	-	-	-	-	12	-	11	-	-	3	1	6
LOPAL	-	-	-	20	24	2	7	2	24	6	10	1	12	7	2	2
MACMA	14	54	65	69	55	3	15	26	63	22	54	36	4	53	10	32
	13	64	61	64	45	4	22	36	58	13	53	43	8	53	40	49
	12	31	48	38	27	-	6	14	27	7	34	24	6	27	20	34
	26	48	61	77	48	3	15	27	58	13	61	47	7	56	41	52
MARGR	27	37	25	26	-	-	-	-	-	-	20	12	15	7	9	-
MARRU	22	24	32	50	-	34	15	-	37	40	26	22	26	6	2	8
	-	32	36	20	29	4	15	4	27	19	2	2	21	15	-	-
MASMI	-	41	18	30	-	-	-	-	-	32	-	27	-	2	9	27
MOLSI	5	25	49	37	3	117	147	3	-	123	117	72	44	35	45	56
	5	2	9	5	-	18	30	-	-	22	23	21	16	24	19	18
	-	-	-	-	-	-	-	-	-	64	81	47	32	34	38	27
	4	-	-	4	106	86	97	60	-	43	93	-	89	106	39	50
	-	-	-	1	75	75	64	38	1	36	53	-	30	29	10	28
	-	-	-	-	8	55	54	53	1	42	52	-	61	45	44	51
	1	-	-	1	67	80	70	44	-	33	60	-	52	44	32	41
MORJO	-	-	-	4	-	-	-	11	3	6	11	20	20	14	15	18
MOSFA	-	4	-	6	1	3	-	-	-	15	13	11	9	9	10	11
OCHPA	-	-	-	-	-	20	-	-	-	-	17	9	-	27	24	36
OTTMI	22	5	-	7	17	18	1	18	12	17	12	-	-	-	2	15
PERZS	-	-	6	-	49	28	13	47	21	-	31	42	44	13	7	29
PUCRC	-	1	2	-	-	19	18	7	-	13	29	17	23	17	20	-
ROTEC	2	-	1	15	17	22	16	10	-	16	17	-	5	1	1	6
SARAN	-	17	30	14	21	3	16	-	24	4	8	-	-	9	1	3
	-	17	26	29	24	3	9	-	41	-	8	-	28	11	-	4
	-	24	25	39	22	6	16	-	47	12	10	2	33	15	-	15
	-	15	28	24	20	3	15	-	27	4	3	-	-	7	-	4
SCALE	1	17	-	6	-	21	10	1	5	6	21	16	5	10	16	9
SCHHA	-	-	43	34	34	35	40	3	-	9	1	17	38	14	14	3
SLAST	-	3	9	-	1	18	39	18	-	-	24	17	16	12	16	12
	-	-	2	-	1	8	8	6	-	-	11	12	19	17	15	9
STOEN	3	47	3	11	4	81	17	2	21	28	57	40	24	36	-	15
	3	40	1	24	5	67	20	-	22	26	56	41	14	27	43	19
	2	56	1	20	16	97	10	3	25	39	65	46	25	37	58	23
STORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STRJO	-	-	7	6	51	45	60	3	21	3	4	-	30	15	4	4
	-	-	2	10	45	66	33	1	10	3	5	-	30	9	4	5
	-	-	3	2	8	10	12	1	2	-	-	-	12	7	2	1
	-	-	3	8	42	40	45	3	13	1	4	1	25	19	1	1
	-	-	3	8	31	33	25	1	7	2	4	1	20	15	-	2
TEPIS	-	-	1	-	20	20	14	19	7	7	8	22	24	19	16	27
	2	-	1	-	32	40	27	39	21	14	43	48	48	36	32	44
TRIMI	-	15	-	-	4	10	23	14	3	-	18	13	14	12	9	9
YRJIL	23	27	27	25	28	-	-	24	29	25	4	-	18	31	23	23
Sum	774	1249	1237	1513	1723	2046	1925	1078	1207	1638	2411	1756	1991	1884	1577	1660