Results of the IMO Video Meteor Network – August 2012

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Once again we obtained a monthly total that outperformed all previous records. This is because August 2012 presented two things: A high number of observers (40 observers with 74 camera systems) and perfect observing weather at almost all sites – even though there was a Perseid maximum without Moon interference on the agenda. 61 cameras, in other word almost every camera in automated operation, yielded twenty or more observing nights. 14 cameras even managed to obtain 30 or 31 nights. Stefano Crivello broke his own record with BILBO by observing 86 nights in a row without a break (from June 7 to August 29).

Rui Goncalves took TEMPLAR4 into operations, so he became the fifth observer with four or more cameras. Ulrich Sperberg, a „veteran of the first hour" (in fact, he was the second IMO network observer) reactivated his camera for the Perseids 2012.

And what is the result when there are some many cameras observing under perfect conditions? A record-breaking effective observing time, of course! For the second time after October 2011 we managed to obtain more than 10,000 observing hours, which is 250 more than in October and even 3,000 hour more than in August 2011. Whereas we recorded 53,000 and 59,000 meteors, respectively, in those months, it was more than 74,000 meteors in August 2012! The average of 7.2 meteors per hour matched almost perfectly to the values of 2011 (7.3) and 2010 (7.1).

Let's switch immediately to the Perseids. The overall activity profile (figure 1) obtained from over 30,000 Perseids shows the typical shape, and also the little "bumper" at 133° solar longitude (August 5) is there again. Looking at the Perseid maximum in detail, the same phenomenon as in 2011 can be seen: Instead of a smooth activity profile, there is a strong increase in flux density in every single night towards the local morning hours, which can be attributed to the zenith exponent. In this year we have chosen a different approach to determine the proper radiant altitude correction, which was presented in detail at the last IMC.

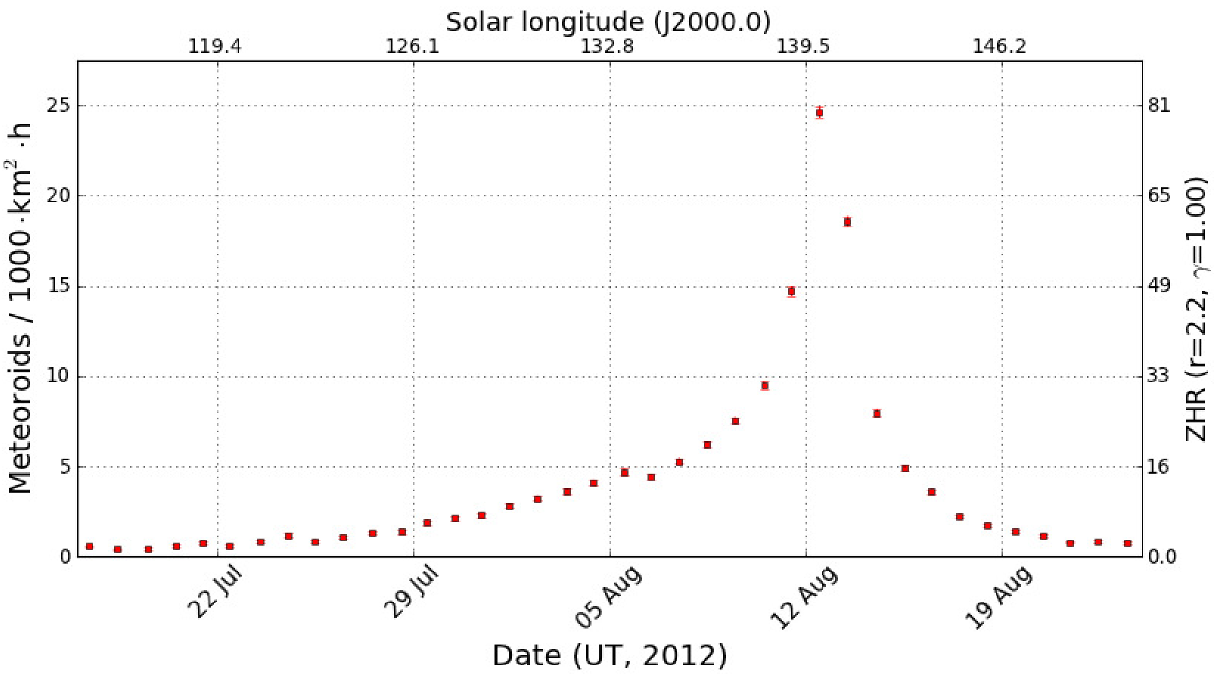

Figure 1: *Flux density profile of the Perseids in the full activity interval 2012.*

The flux density measurements, which are uploaded by the observers to the VMO server, contain the usual correction by the sine of the radiant altitude (i.e. with a zenith exponent of γ=1.0). During the analysis, this correction was at first reverted, and the observing intervals were grouped by radiant altitude. That is, the effective collection area and number of shower meteors were summed up in the interval 0 to 5°, 5 to 10°, etc. In the ideal case, when the flux density would have been constant all the time, this would have directly given us the dependency of the flux density from the radiant altitude. In practice, however, the Perseid flux density varies significantly in August. At the ascending activity branch, it is systematically higher at the end of the observing night with large radiant altitude than at the beginning. In addition, some nights with more observing time have a larger impact than others. our analysis showed, however, that both effects can be neglected. Conditions are reverted at the descending activity branch, and even if the nights are normalized to get the same weight each, nothing changes at the overall picture.

Next we can check, which function fits best to the determined dependency of the flux density from the radiant altitude. We found that the typical sine function with a zenith exponent fits very well to our data, whereby an exponent of γ=1.9 minimizes the mean squared error. Figure 2 shows the measurements (purple rectangles), the adapted correction function calculated with γ=1.9 (blue line) and the relative error between measurement and correction function (red line). The same procedure was applied to the 2011 Perseid data, which gave a best fit for a zenith exponent of γ=1.8.

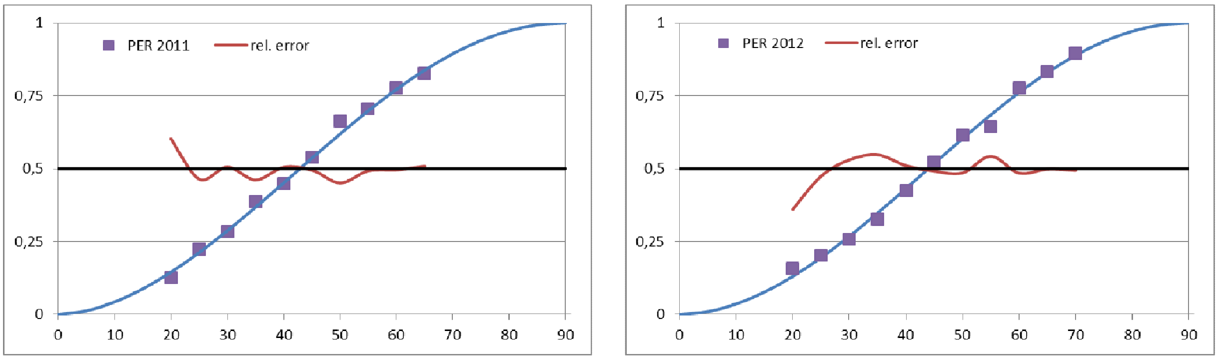

Figure 2: *Dependency of the flux density from the radiant altitude, determined from Perseid observations of 2011 and 2012. The blue line gives the best fitting correction function with a zenith exponent of γ=1.8 (2011) resp. 1.9 (2012). The red line represents the relative error.*

Figure 3 compares the uncorrected activity profile (γ=1.0) with the best profile (γ=1.9). The improvement is particularly obvious at the 2012 post-maximum Perseid nights.
Figure 4 is an overlay of the flux density profiles of 2011 and 2012 between 136 and 142° solar longitude. The data sets fit amazingly well to one another.

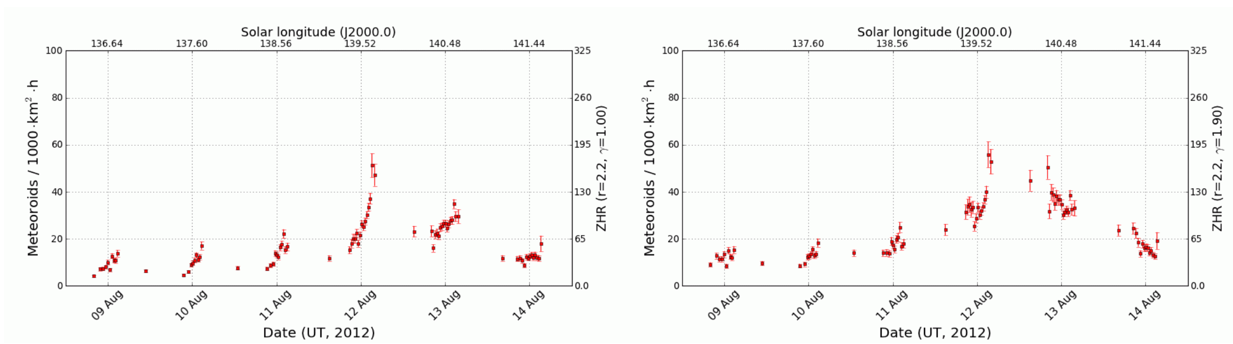

Figure 3: *Detailed flux density profile of the Perseid maximum 2012 with a zenith exponent of γ=1.0 (left) resp. 1.9 (right).*

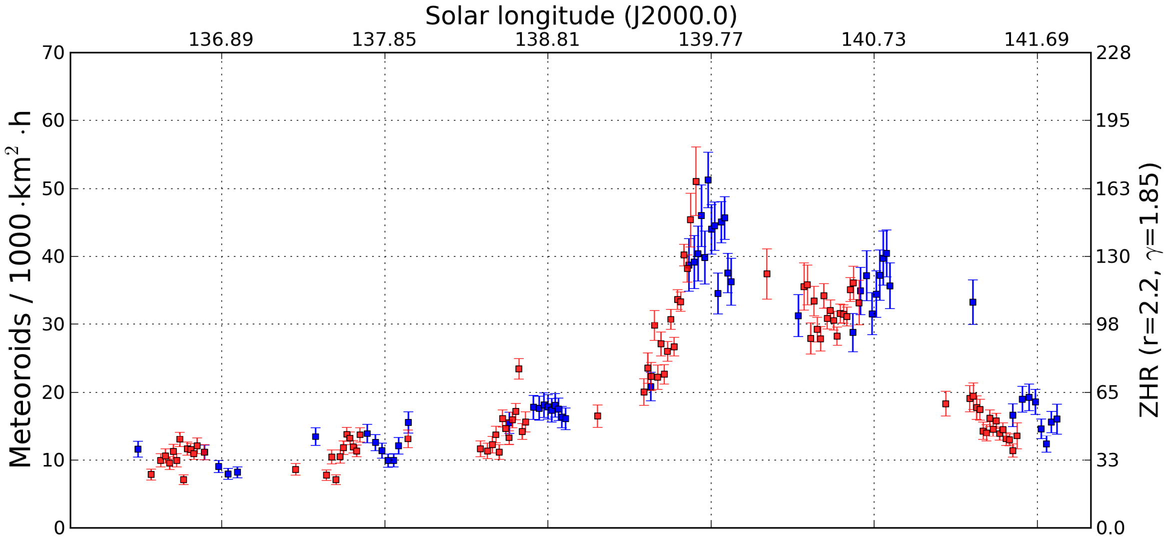

Figure 4: *Flux density profile of the Perseid maximum 2011 (blue) and 2012 (red), calculated with a zenith exponent of 1.85.*

Of course, the Perseids are not the only meteor shower of August. In the following we will discuss once more further showers, which have been found in our recent comprehensive meteor shower analysis in spring 2012.

The established shower of the kappa-Cygnids (12 KCG) shows a weakly developed profile with a maximum on August 18 (in this year, the flux density was virtually constant between August 3 and 20). With 2,900 members, this shower can be detected between 132 and 156° solar longitude. In the past we noticed already, that the radiant drift of the kappa Cygnids is not uniform. That was confirm by our new analysis. Whereas both declination and meteor shower velocity show a constant development, we can split the right ascension in two intervals: Up to a solar longitude of about 142° the radiants drifts by an average of +1.0° per day, thereafter by -1.7° per day. Table 1 shows the parameter set for the full activity interval as well as for both subsections.

Table 1: *Parameters of the kappa Cygnids from the MDC Working List and the analysis of the IMO network in 2012. Both the mean values for the overall activity intervall, and the detailed values for the two subsection until 142 and starting from 143° solar longitude are given.*

Source	Solar Longitude		Right Ascension		Deklination		Vinf	
	Mean [°]	Interval [°]	Mean [°]	Drift [°]	Mean [°]	Drift [°]	Mean [km/s]	Drift [km/s]
MDC	145	-	278.2	+0.3	+54.0	+0.1	24.1	-
IMO 2012	145	132-156	272.6	-0.9	+57.6	+0.8	22.7	+0.08
	137	132-142	280.3	+1.0	+50.1	+0.6	22.0	+0.19
	150	143-156	267.3	-1.7	+61.6	+0.5	23.1	0.00

The southern iota Aquariids (3 SIA), which are also listed as established shower by the MDC, cannot be detected with certainty in our long-term data. There are a few radiants between August 3 and 8, which look somehow similar to the MDC values, but they show strong variations from one day to the next, and the mean radiant is about 8° north of the expected position.

The northern iota Aquariids (33 NIA) are in a little more comfortable position. This shower can be identified between 140 and 144° solar longitude. The meteor shower parameters derived from 850 meteors are given in table 2.

Table 2: *Parameters of the northern iota Aquariids from the MDC Working List and the analysis of the IMO network in 2012.*

Source	**Solar Longitude**		**Right Ascension**		**Deklination**		**Vinf**	
	Mean [°]	**Interval** [°]	**Mean** [°]	**Drift** [°]	**Mean** [°]	**Drift** [°]	**Mean** **[km/s]**	**Drift** **[km/s]**
MDC	148	-	328	-	-4.7	-	29.8	-
IMO 2012	142	140-144	334.0	+0.4	-8.3	-0.5	29.4	-

The Aurigids, which are also among the established meteor showers, can first be observed on August 26 at 159° solar longitude. The shower parameters in table 3 were obtained from 1,700 meteors. The radiant position shows virtually no scatter in the full activity interval, only the velocity varies a little. The agreement with the MDC values is excellent.

Table 2: *Parameters of the Aurigids from the MDC Working List and the analysis of the IMO network in 2012.*

Source	**Solar Longitude**		**Right Ascension**		**Deklination**		**Vinf**	
	Mean [°]	**Interval** [°]	**Mean** [°]	**Drift** [°]	**Mean** [°]	**Drift** [°]	**Mean** **[km/s]**	**Drift** **[km/s]**
MDC	158	-	89.8	+1.0	+38.7	-0.2	66.6	-
IMO 2012	159	153-166	91.8	+1.00	+39.0	-0.01	67.7	-0.15

That was about it with the known meteor showers in August. Further showers from the MDC working list the beta Cassiopeiids (177 BCA) or mu Perseids (435 MPR) have been detected as well, but their identification remains questionable. And that the Orionids can be traced back until end of August (!) will be discussed in detail at some later analysis.

Last but not least, table 4 presents a few candidates for new meteor showers again.
The first shower is active from August 8 until the end of the month and can be regarded as a safe detection. The presented parameters were obtained from over 4,500 meteors and the scatter is in the full activity interval very small. In the whole second half of August, this shower is the second or third strongest source in the sky, even stronger than the kappa Cygnids. For this reason, the shower was immediately reported to MDC, where it got the preliminary designation theta Piscids (508 TPI).
1,350 meteors were assigned to a second candidate, which is active between August 22 and September 1. Maybe the activity interval extends even three to four more days, but in the given interval the scatter is lowest. The shower shows a weak activity profile with maximum at 155° solar longitude. As the radiant is close to the north celestial pole, larger variations in right ascension are quite normal.
The third candidate is less prominent. The parameters given in table 4 are based on 500 meteors. The suspected shower is active in the last few days of August and shows an acceptable scatter in the parameters.
Finally also the last candidate is quite safe, as it represents the strongest source in the sky in early September. Almost 2,000 meteors can be assigned to that fast shower candidate. Its weak activity profile shows a peak in early September at 160° solar longitude.

Table 4: *Parameters of four possibly new showers from the analysis of the IMO network in 2012. The first one got the preliminary MDC designation theta Piscids.*

Source	**Solar Longitude**		**Right Ascension**		**Deklination**		**Vinf**	
	Mean [°]	**Interval** [°]	**Mean** [°]	**Drift** [°]	**Mean** [°]	**Drift** [°]	**Mean** **[km/s]**	**Drift** **[km/s]**
IMO 2012	147	135-158	352.0	+0.78	+4.1	+0.36	40.6	-0.16
	155	149-158	0.6	+0.3	+77.5	-0.0	42.4	-
	155	153-157	106.5	+1.8	+40.0	-0.3	55.6	-
	160	153-166	70.4	0.0	+41.5	+0.4	70.0	-

1. Observers

Code	Name	Place	Camera	FOV [$^o{}^2$]	St.LM [mag]	Eff.CA [km^2]	Nights	Time [h]	Meteors
ARLRA	Arlt	Ludwigsfelde/DE	LUDWIG1 (0.8/8)	1488	4.8	726	7	47.0	89
BERER	Berko	Ludanyhalaszi/HU	HULUD1 (0.95/3)	2256	4.8	1540	30	205.6	2892
			HULUD2 (0.75/6)	4860	3.9	1103	30	184.6	1012
			HULUD3 (0.75/6)	4661	3.9	1052	28	167.7	877
BIRSZ	Biro	Agostyan/HU	HUAGO (0.75/4.5)	2427	4.4	1036	29	195.0	1233
BOMMA	Bombardini	Faenza/IT	MARIO (1.2/4.0)	5794	3.3	739	29	212.4	1730
BREMA	Breukers	Hengelo/NL	MBB3 (0.75/6)	2399	4.2	699	27	119.0	715
			MBB4 (0.8/8)	1470	5.1	1208	25	116.6	605
BRIBE	Brinkmann	Herne/DE	HERMINE (0.8/6)	2374	4.2	678	27	121.2	795
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2286	4.6	1080	28	123.3	1029
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	5.0	1611	23	140.9	675
			BMH2 (1.5/4.5)*	4243	3.0	371	28	139.5	645
CRIST	Crivello	Valbrevenna/IT	BILBO (0.8/3.8)	5458	4.2	1772	30	207.8	1930
			C3P8 (0.8/3.8)	5455	4.2	1586	31	195.3	1426
			STG38 (0.8/3.8)	5614	4.4	2007	27	195.7	2650
CSISZ	Csizmadia	Zalaegerszeg/HU	HUVCSE01 (0.95/5)	2423	3.4	361	20	63.7	349
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5631	4.3	2151	27	198.7	1518
GONRU	Goncalves	Tomar/PT	TEMPLAR1 (0.8/6)	2179	5.3	1842	29	224.1	1427
			TEMPLAR2 (0.8/6)	2080	5.0	1508	30	226.4	1191
			TEMPLAR3 (0.8/8)	1438	4.3	571	30	209.6	983
			TEMPLAR4 (0.8/3.8)	4475	3.0	442	4	32.2	108
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1447	5.5	1841	30	194.3	1440
			ORION3 (0.95/5)	2665	4.9	2069	30	181.8	937
			ORION4 (0.95/5)	2662	4.3	1043	29	183.7	1006
HINWO	Hinz	Brannenburg/DE	ACR (2.0/35)*	557	7.4	4954	9	27.4	268
IGAAN	Igaz	Baja/HU	HUBAJ (0.8/3.8)	5552	2.8	403	27	178.3	1146
		Debrecen/HU	HUDEB (0.8/3.8)	5522	3.2	620	30	201.6	1316
		Hodmezovasar./HU	HUHOD (0.8/3.8)	5502	3.4	764	29	204.2	1276
		Sopron/HU	HUSOP (0.8/6)	2031	3.8	460	29	164.5	1637
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4)	2286	3.9	445	29	200.6	911
KACJA	Kac	Kamnik/SI	CVETKA (0.8/3.8)	4914	4.3	1842	23	141.2	1501
		Kostanjevec/SI	METKA (0.8/8)*	1372	4.0	361	11	75.7	199
		Ljubljana/SI	ORION1 (0.8/8)	1402	3.8	331	29	172.8	852
		Kamnik/SI	REZIKA (0.8/6)	2270	4.4	840	20	128.3	1550
			STEFKA (0.8/3.8)	5471	2.8	379	19	121.0	1060
KERST	Kerr	Glenlee/AU	GOCAM1 (0.8/3.8)	5189	4.6	2550	20	162.7	788
KOSDE	Koschny	Izana Obs./ES	ICC7 (0.85/25)*	714	5.9	1464	10	51.5	405
		Noordwijkerhout/NL	LIC4 (1.4/50)*	2027	6.0	4509	16	61.4	624
LERAR	Leroy	Gretz/FR	SAPHIRA (1.2/6)	3260	3.4	301	16	52.6	216
MACMA	Maciejewski	Chelm/PL	PAV35 (1.2/4)	4383	2.5	253	26	129.3	404
			PAV36 (1.2/4)*	5732	2.2	227	26	143.6	858
			PAV43 (0.95/3.75)*	2544	2.7	176	25	138.7	391
MARGR	Maravelias	Lofoupoli/GR	LOOMECON (0.8/12)	738	6.3	2698	26	158.3	1076
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1776	6.1	3817	10	40.7	1246
			MINCAM1 (0.8/8)	1477	4.9	1084	27	142.7	949
		Ketzür/DE	REMO1 (0.8/8)	1467	6.0	3139	25	128.2	1912
			REMO2 (0.8/8)	1475	5.6	1965	25	126.0	900
MORJO	Morvai	Fülöpszallas/HU	HUFUL (1.4/5)	2522	3.5	532	24	140.8	854
OCAFR	Ocana Gonzales	Madrid/ES	FOGCAM (1.4/7)	1890	3.9	109	26	182.8	341
OCHPA	Ochner	Albiano/IT	ALBIANO (1.2/4.5)	2944	3.5	358	27	61.4	407
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	3.8	460	26	125.1	741
PERZS	Perko	Becsehely/HU	HUBEC (0.8/3.8)*	5498	2.9	460	30	197.8	2090
PUCRC	Pucer	Nova vas nad Dra./SI	MOBCAM1 (0.75/6)	2398	5.3	2976	23	146.8	1328
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2366	4.5	911	23	118.1	306
SARAN	Saraiva	Carnaxide/PT	RO1 (0.75/6)	2362	3.7	381	30	202.3	687
			RO2 (0.75/6)	2381	3.8	459	29	190.4	818
			SOFIA (0.8/12)	738	5.3	907	29	194.3	593
SCALE	Scarpa	Alberoni/IT	LEO (1.2/4.5)*	4152	4.5	2052	27	172.4	987
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	4900	3.0	409	28	113.2	876
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	563	6.2	1294	23	113.0	406
SPEUL	Sperberg	Salzwedel/DE	ADAM (0.8/6)	2292	-	-	8	47.6	320
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5566	4.8	3270	30	202.4	2336
			NOA38 (0.8/3.8)	5609	4.2	1911	30	215.0	1988
			SCO38 (0.8/3.8)	5598	4.8	3306	30	213.2	2308
STORO	Stork	Kunzak/CZ	KUN1 (1.4/50)*	1913	5.4	2778	5	31.9	1327
		Ondrejov/CZ	OND1 (1.4/50)*	2195	5.8	4595	6	35.5	1672
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2362	4.6	1152	24	98.7	445
			MINCAM3 (0.8/12)	728	5.7	975	24	90.5	415
			MINCAM4 (1.0/2.6)	9791	2.7	552	22	90.8	420
			MINCAM5 (0.8/6)	2349	5.0	1896	29	115.2	772
TEPIS	Tepliczky	Budapest/HU	HUMOB (0.8/6)	2388	4.8	1607	29	199.2	1713
TRIMI	Triglav	Velenje/SI	SRAKA (0.8/6)*	2222	4.0	546	25	152.1	772
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM (0.8/6)	2337	5.5	3574	21	58.1	431
ZELZO	Zelko	Budapest/HU	HUVCSE02 (0.95/5)	1606	3.8	390	4	15.3	102
Sum							31	10361.3	74202

* 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	-	-	-	-	-	-	-	-	-	-	6.3	6.8	-	-	-
BERER	6.8	6.8	6.0	6.3	6.8	7.0	6.2	6.4	7.3	6.4	0.9	7.2	7.3	7.6	7.8
	6.9	6.9	4.8	5.9	6.8	7.0	7.2	1.8	7.3	5.3	0.8	7.4	7.7	7.8	6.7
	6.9	6.9	5.3	5.6	6.8	7.0	7.3	4.6	7.4	3.4	-	7.4	7.7	7.8	7.9
BIRSZ	6.9	6.9	2.9	4.5	7.1	5.4	7.2	7.3	7.3	7.3	5.7	7.5	7.3	7.6	7.7
BOMMA	7.8	7.9	7.9	7.9	-	7.8	8.0	8.0	7.4	7.4	7.5	7.9	4.7	7.5	8.1
BREMA	-	6.3	1.2	5.1	0.2	5.8	4.5	0.8	6.8	6.0	6.4	7.1	1.5	0.5	0.4
	-	6.2	1.5	5.1	0.8	5.9	6.3	1.6	6.7	5.8	6.1	7.1	0.7	0.8	-
BRIBE	2.2	6.5	3.5	4.6	-	3.5	0.2	0.3	6.8	7.1	7.1	7.2	-	1.3	0.5
	0.8	5.8	3.5	1.9	-	2.3	4.6	3.2	6.4	7.0	7.1	7.0	1.6	0.2	0.4
CASFL	5.1	6.5	6.5	4.4	5.6	5.1	-	7.2	4.4	8.3	6.6	2.5	8.5	7.1	-
	6.5	1.7	5.5	2.3	5.5	5.0	6.9	6.4	2.1	6.6	5.8	1.9	5.9	4.2	8.2
CRIST	4.6	7.4	5.8	7.5	5.8	7.5	7.7	7.7	7.8	7.7	7.8	7.0	7.4	8.0	7.6
	6.0	4.1	7.5	7.0	3.1	4.0	7.7	7.7	7.8	7.8	7.9	7.0	6.9	8.0	4.1
	-	-	-	7.5	7.1	7.5	7.7	7.6	7.8	7.8	7.9	6.9	7.2	8.0	7.7
CSISZ	4.7	4.2	-	-	-	-	-	-	-	-	-	5.9	2.4	0.9	1.7
ELTMA	6.7	7.5	7.7	6.4	3.6	7.2	7.9	7.9	3.6	6.8	4.2	3.2	8.1	8.1	8.3
GONRU	7.6	7.6	7.9	5.4	7.9	8.2	8.2	8.2	6.4	8.0	5.0	7.5	5.1	-	8.6
	7.4	7.4	7.9	4.8	8.0	8.2	8.2	8.2	6.6	7.9	5.6	7.3	5.1	-	8.7
	6.6	7.9	8.0	4.4	8.1	7.7	8.2	8.2	6.7	6.3	3.1	7.2	4.5	-	8.7
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GOVMI	7.1	7.1	4.5	7.2	7.3	3.8	5.6	5.3	7.5	2.6	7.3	7.0	4.8	6.1	7.8
	7.1	7.0	3.8	7.2	7.3	4.0	4.5	4.7	7.2	1.4	7.3	6.5	3.2	5.1	7.8
	7.1	7.1	3.9	3.4	6.9	4.5	5.3	5.0	3.8	1.9	7.4	7.0	4.4	5.3	7.9
HINWO	1.1	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IGAAN	-	-	-	-	5.5	6.4	7.5	5.5	1.9	7.2	7.8	7.8	6.8	7.9	7.7
	2.9	7.0	5.7	6.9	-	6.9	7.4	7.2	7.3	5.6	1.3	7.7	7.5	6.0	7.8
	6.0	7.3	6.3	4.7	7.5	7.5	7.6	7.6	4.5	2.6	7.1	7.4	7.5	7.5	7.6
	6.7	6.3	5.5	1.3	7.1	2.2	3.0	6.3	4.9	-	7.6	7.6	7.8	7.7	7.4
JONKA	6.7	6.8	6.5	5.7	7.0	7.4	7.4	7.4	6.5	7.5	2.8	4.2	6.9	7.9	7.9
KACJA	7.2	7.6	2.0	6.4	7.3	6.5	4.3	4.9	7.5	-	2.5	6.6	-	-	-
	-	-	-	-	-	3.8	-	-	-	-	-	4.8	-	-	8.1
	7.3	6.6	6.7	5.9	1.7	2.5	4.4	5.2	7.1	3.7	5.9	6.6	3.7	7.1	3.6
	7.4	7.1	2.3	7.2	-	-	3.7	5.1	7.6	-	2.6	6.5	-	-	-
	7.4	7.1	2.7	6.7	-	-	-	4.2	7.8	-	2.0	6.3	-	-	-
KERST	-	-	-	-	-	-	-	-	-	-	7.4	4.5	10.6	7.9	8.5
KOSDE	-	-	1.5	-	-	-	-	-	-	-	-	-	-	-	-
	-	3.4	3.5	2.8	0.3	-	-	3.9	6.1	5.3	6.2	6.2	-	-	-
LERAR	-	-	-	-	-	-	-	-	-	6.7	6.7	6.4	5.2	1.3	3.6
MACMA	3.2	3.0	1.2	5.9	3.2	6.1	7.0	7.1	-	1.8	3.1	-	-	-	0.4
	6.1	6.6	2.0	6.7	3.5	6.1	7.0	7.0	0.9	2.5	5.4	-	-	-	0.6
	6.4	5.5	3.1	6.5	3.9	5.8	7.1	7.2	1.0	2.0	5.1	-	-	-	0.8
MARGR	0.4	3.9	6.7	-	-	4.8	7.8	4.0	2.9	-	7.0	7.8	8.1	7.5	5.6
MOLSI	3.9	-	-	-	-	-	-	-	3.1	-	4.9	5.8	5.0	-	3.7
	6.5	-	1.2	0.9	4.3	4.6	3.8	7.2	5.6	7.1	7.6	7.6	7.7	6.3	2.8
	6.0	3.4	2.5	4.5	5.5	4.0	3.6	3.3	6.2	1.7	6.9	7.0	7.1	7.0	6.8
	6.0	2.4	2.9	4.1	4.4	4.6	2.8	3.5	6.6	2.4	6.9	7.0	7.1	7.1	7.1
MORJO	7.1	7.2	3.3	2.6	3.8	5.0	6.0	4.3	6.8	6.6	5.0	6.1	6.9	7.0	7.3
OCAFR	7.9	7.9	8.0	8.0	8.0	5.5	8.0	8.1	8.3	3.6	6.9	4.6	8.4	6.4	6.3
OCHPA	2.0	1.5	0.8	-	1.0	1.8	4.0	2.2	2.4	4.4	3.0	3.3	-	0.3	1.7
OTTMI	7.7	-	6.6	2.7	4.4	4.8	2.4	0.2	-	5.3	4.5	-	5.2	1.3	2.1
PERZS	7.2	5.7	4.4	7.3	7.3	7.4	5.6	6.6	6.9	4.2	7.8	7.4	3.7	6.6	5.6
PUCRC	6.8	6.4	-	7.1	5.2	7.6	7.6	-	-	5.7	7.1	4.8	4.4	6.8	5.6
ROTEC	4.1	2.4	-	-	-	1.8	-	3.7	-	2.8	6.9	7.0	7.1	7.2	-
SARAN	3.9	7.7	7.8	2.7	8.2	8.3	8.3	8.4	4.1	6.2	4.6	7.0	2.8	-	8.7
	4.2	8.1	8.2	2.3	8.2	8.3	8.3	8.2	4.0	5.4	4.3	7.2	2.9	-	8.7
	3.5	7.5	7.9	3.6	7.9	8.3	8.3	8.4	3.1	5.9	4.4	7.6	2.9	-	8.7
SCALE	5.7	5.6	7.3	6.6	3.3	7.5	7.5	7.6	2.9	-	-	5.1	6.5	7.5	6.6
SCHHA	1.6	6.3	1.4	-	1.2	5.2	4.8	3.0	6.9	7.1	7.2	7.3	2.4	0.3	-
SLAST	-	-	-	2.9	3.8	4.7	5.1	3.9	6.3	4.5	-	5.8	2.5	-	5.1
SPEUL	-	-	-	-	-	-	-	-	-	-	6.7	6.5	6.6	6.7	-
STOEN	6.1	6.7	7.6	6.1	5.3	7.8	7.8	7.9	4.3	7.1	4.0	4.2	7.1	7.7	7.5
	7.5	7.6	7.8	7.2	6.7	7.8	7.8	7.9	4.4	7.7	3.5	3.8	7.2	8.3	8.4
	7.3	7.2	7.8	7.5	6.1	7.9	7.8	8.0	4.7	7.6	4.3	4.1	7.3	7.4	8.3
STORO	-	-	-	-	-	-	-	6.2	-	-	6.5	-	6.8	5.9	6.5
	-	-	-	-	-	-	-	3.4	-	-	4.7	6.8	6.6	6.9	7.1
STRJO	-	1.3	4.4	1.7	-	-	-	2.0	4.7	3.5	6.4	6.4	6.5	2.5	-
	-	3.1	4.9	1.8	-	0.4	4.5	1.5	5.1	4.4	6.4	6.1	6.3	2.5	0.2
	0.4	4.7	2.0	1.4	-	-	-	0.9	4.6	3.5	6.4	6.5	6.5	3.2	-
	-	1.5	3.4	2.7	-	2.2	2.7	2.4	5.2	4.8	6.3	6.5	6.6	3.4	0.2
TEPIS	6.7	6.8	4.5	4.8	7.1	6.0	7.2	7.3	7.3	7.3	5.3	7.5	7.4	7.6	6.4
TRIMI	7.3	4.1	1.6	6.5	7.3	6.2	4.2	4.3	7.4	6.5	7.3	5.7	6.7	4.1	6.9
YRJIL	2.6	2.8	-	-	2.7	-	-	1.0	3.0	1.2	3.1	4.4	4.4	4.4	2.8
ZELZO	-	2.0	5.9	-	4.1	-	-	-	3.3	-	-	-	-	-	-
Sum	305.6	333.8	273.5	276.1	267.5	318.1	331.7	332.1	328.3	300.2	363.2	409.0	344.7	297.1	337.3

August	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	-	-	7.1	7.5	-	-	-	7.4	-	-	-	-	5.1	6.8	-	-
BERER	7.9	7.2	6.4	7.9	7.9	6.6	6.1	8.2	8.3	7.8	-	8.4	8.4	8.6	6.4	2.7
	6.4	5.9	4.3	8.0	8.0	4.5	5.0	7.2	7.4	7.3	-	8.4	8.6	8.6	4.4	0.3
	4.6	6.8	4.3	7.2	4.3	3.7	3.9	5.0	5.0	3.8	-	7.2	6.4	8.6	4.9	-
BIRSZ	2.6	7.7	7.6	7.9	7.4	8.0	2.1	6.4	8.2	7.1	-	8.4	8.5	8.5	6.0	-
BOMMA	6.7	8.3	8.3	8.3	8.3	8.4	8.4	8.4	8.4	5.1	6.5	8.6	8.6	-	2.3	2.0
BREMA	-	7.4	6.5	6.4	4.9	4.8	7.6	2.5	-	3.4	3.2	4.0	6.9	-	1.7	7.1
	0.9	7.4	7.2	5.5	4.8	4.7	7.6	-	-	3.4	3.2	3.4	6.8	-	-	7.1
BRIBE	2.0	7.6	7.6	6.3	5.2	3.7	6.6	2.5	1.7	6.2	6.4	4.9	6.7	3.0	-	-
	5.4	7.3	7.4	5.2	4.3	3.9	7.6	-	1.9	6.0	5.7	6.7	6.7	1.9	1.5	-
CASFL	-	-	6.7	8.0	3.4	7.6	1.3	-	8.4	1.8	9.2	8.1	8.6	-	-	-
	6.1	6.2	6.4	4.0	3.7	7.8	1.2	3.0	6.3	-	7.7	5.5	4.9	2.2	-	-
CRIST	8.1	8.2	8.2	8.3	7.2	7.0	8.4	5.6	8.5	0.7	8.7	8.6	8.6	4.1	-	0.3
	8.1	8.2	8.2	8.3	8.3	3.4	5.5	4.8	5.9	1.9	8.7	8.7	8.8	5.0	0.9	4.0
	8.1	8.2	8.2	8.3	6.9	7.9	8.4	5.9	8.6	-	8.7	8.7	8.8	5.9	1.2	1.2
CSISZ	0.2	3.5	4.0	4.5	4.2	1.1	1.9	4.4	5.3	2.0	-	3.0	4.1	2.8	2.9	-
ELTMA	8.5	8.3	8.5	8.6	8.6	8.6	8.3	8.4	8.8	-	-	7.0	9.0	8.9	-	-
GONRU	8.6	8.5	8.2	8.7	8.7	8.3	5.8	8.7	-	8.5	6.5	7.1	8.6	8.5	9.0	8.8
	8.6	8.6	8.8	8.7	8.7	8.6	6.1	8.7	0.4	8.8	6.3	7.3	8.9	8.5	9.1	9.0
	8.8	8.7	6.9	8.9	4.6	6.3	4.8	8.8	0.6	9.0	7.5	6.2	6.6	8.0	9.1	9.2
	-	-	-	-	-	-	-	-	-	-	-	-	7.1	6.9	9.1	9.1
GOVMI	1.1	7.6	7.5	8.1	8.1	8.2	8.2	8.3	8.4	8.4	0.7	8.4	7.5	8.5	4.3	-
	0.3	7.6	7.0	8.1	8.1	8.2	6.8	8.4	8.4	8.4	0.2	7.3	6.1	8.5	4.3	-
	0.5	7.9	7.2	8.1	8.1	8.2	8.3	8.5	8.5	8.5	-	8.5	7.5	8.6	4.4	-
HINWO	-	-	-	5.0	1.0	6.3	2.9	2.4	0.4	-	-	8.0	-	0.3	-	-
IGAAN	4.0	7.6	8.2	8.2	8.2	8.1	6.4	8.4	8.4	8.5	1.6	8.6	8.6	4.5	6.1	0.9
	6.8	5.8	7.9	8.1	8.2	5.3	8.1	6.3	8.4	8.4	2.6	8.5	8.5	7.2	7.3	7.0
	7.6	7.2	7.8	7.8	7.9	7.9	6.6	8.0	8.1	8.2	-	7.3	8.3	8.0	4.8	-
	3.4	7.5	7.6	7.9	7.8	7.7	0.9	3.6	6.8	4.5	1.9	8.1	5.1	8.3	2.0	-
JONKA	4.2	6.9	8.0	8.0	8.2	8.3	5.8	8.4	8.5	7.6	-	8.7	8.3	6.7	4.4	-
KACJA	-	-	-	8.2	8.5	8.2	1.3	8.4	8.1	8.3	2.2	8.9	7.5	7.8	1.0	-
	-	7.8	8.3	8.4	8.4	7.6	-	-	5.6	-	-	7.6	-	5.3	-	-
	2.7	8.1	8.1	8.2	8.3	3.0	6.2	8.5	8.4	8.1	2.8	8.7	5.3	8.4	-	-
	-	-	-	8.3	8.4	8.5	1.3	8.6	7.8	8.4	3.5	8.9	6.2	8.9	-	-
	-	-	-	8.3	8.4	8.4	0.7	8.6	7.9	8.2	1.7	8.7	6.8	9.1	-	-
KERST	9.2	9.1	10.5	-	10.4	7.8	8.0	8.4	4.4	6.7	6.1	8.9	10.2	10.3	10.3	3.5
KOSDE	-	-	7.0	9.1	2.6	2.4	1.0	-	-	6.8	6.1	-	-	-	9.3	5.7
	-	4.6	-	-	-	3.4	1.0	-	-	-	7.3	0.4	6.1	-	-	0.9
LERAR	3.2	4.4	5.7	1.7	1.5	1.6	3.2	0.2	0.9	-	-	0.3	-	-	-	-
MACMA	7.4	5.0	4.9	7.9	3.3	8.0	5.0	3.4	3.0	6.8	-	6.2	8.6	8.0	6.8	3.0
	7.1	5.1	5.0	7.6	4.3	7.9	5.0	-	2.6	7.5	-	7.9	8.5	8.7	8.4	3.6
	7.3	5.4	4.2	7.9	3.0	8.0	4.7	-	-	5.3	-	8.4	8.8	7.5	8.5	5.3
MARGR	5.9	7.0	-	3.6	7.4	7.4	7.7	7.8	7.9	8.5	7.6	6.7	-	4.4	6.0	3.9
MOLSI	3.1	-	1.4	2.6	-	-	-	-	-	-	-	7.2	-	-	-	-
	6.8	7.9	8.0	8.0	1.8	5.1	5.9	4.9	-	1.4	3.3	8.6	3.0	4.8	-	-
	5.9	7.4	7.4	7.4	3.7	3.4	5.1	7.0	2.3	3.1	-	-	-	-	-	-
	6.6	7.4	7.4	7.5	1.3	2.9	5.3	6.9	3.3	2.5	-	-	-	-	-	-
MORJO	5.7	5.6	7.3	6.8	6.3	5.6	4.7	6.9	6.9	-	-	-	-	-	-	-
OCAFR	8.6	8.6	-	3.1	4.2	-	8.3	8.9	-	8.9	9.1	7.6	2.9	-	6.7	-
OCHPA	2.9	3.2	2.2	2.2	1.5	1.1	6.4	1.5	2.4	-	2.7	2.7	3.2	0.7	-	0.3
OTTMI	4.6	3.8	2.1	4.2	7.6	7.7	2.0	8.3	6.8	-	-	8.7	4.9	7.7	8.1	1.4
PERZS	1.9	7.4	8.0	8.2	8.4	8.3	8.3	8.4	8.5	8.6	0.2	8.7	8.5	7.2	3.5	-
PUCRC	7.6	7.9	-	-	-	7.3	7.4	8.1	8.1	-	-	6.3	8.1	8.5	0.3	2.1
ROTEC	4.0	7.4	7.5	7.4	4.1	3.2	6.7	7.8	-	1.6	3.7	8.1	7.3	5.7	-	0.6
SARAN	8.2	8.6	3.0	8.8	8.9	8.9	7.9	7.7	0.7	9.1	6.0	5.6	8.5	6.8	7.7	7.2
	8.1	7.2	2.8	8.8	8.8	-	7.0	7.9	0.4	8.9	4.8	5.1	8.1	6.1	9.0	9.1
	7.8	8.0	2.6	8.4	8.8	8.9	7.6	7.6	-	9.1	5.3	3.4	6.3	5.6	7.9	9.0
SCALE	7.5	7.2	7.9	7.9	8.3	8.3	5.7	6.2	7.6	2.3	5.9	5.8	7.8	4.3	-	-
SCHHA	-	7.7	7.7	5.4	4.6	2.9	7.8	0.9	3.2	1.6	3.9	2.9	5.4	0.5	1.6	2.4
SLAST	2.4	7.1	6.3	-	7.7	7.2	4.0	7.3	7.0	7.7	1.5	7.1	1.6	1.5	-	-
SPEUL	5.6	6.9	6.9	1.7	-	-	-	-	-	-	-	-	-	-	-	-
STOEN	8.0	6.3	8.5	8.5	8.7	8.2	7.6	6.9	7.4	2.9	9.0	9.0	8.3	5.7	-	0.2
	8.1	6.4	8.5	8.6	8.7	8.2	7.7	7.3	8.3	3.4	9.0	9.0	9.1	7.7	-	1.4
	7.8	6.3	8.5	8.6	8.7	8.1	7.3	6.9	7.9	3.2	9.0	9.0	9.1	7.9	-	1.6
STORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STRJO	2.3	6.7	6.7	4.6	1.1	2.4	6.0	3.3	-	7.1	2.7	6.8	6.8	1.3	1.5	-
	1.3	4.5	6.7	2.1	1.3	1.2	6.2	3.4	-	6.8	2.7	7.1	-	-	-	-
	2.7	6.8	6.7	4.0	4.7	-	6.1	3.5	-	6.5	2.6	6.7	-	0.4	-	-
	2.7	6.8	7.0	4.7	4.9	2.1	6.0	3.5	1.2	6.7	3.3	7.4	6.4	1.9	1.6	1.1
TEPIS	3.3	7.7	7.9	8.0	8.0	8.1	2.5	7.1	8.3	7.6	-	8.4	8.5	8.6	6.0	-
TRIMI	3.6	6.4	7.0	7.3	8.4	5.2	3.6	8.2	8.6	7.7	-	-	-	-	-	-
YRJIL	4.8	-	-	-	5.3	-	-	0.2	4.7	2.7	0.4	1.1	-	3.9	0.8	1.8
ZELZO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum	314.2	425.8	411.7	449.8	405.3	389.6	358.8	378.7	319.8	339.3	217.7	437.5	408.4	342.6	211.1	132.8

3. Results (Meteors)

August	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	-	-	-	-	-	-	-	-	-	-	23	28	-	-	-
BERER	71	60	44	33	67	79	169	139	158	138	11	399	259	174	134
	45	34	21	20	31	51	53	11	34	45	1	121	77	69	34
	23	21	17	19	30	36	53	36	50	40	-	123	75	51	48
BIRSZ	35	36	13	16	36	23	48	57	69	85	133	154	65	67	49
BOMMA	69	70	72	70	-	76	85	84	91	113	198	168	30	52	51
BREMA	-	28	4	29	3	33	10	3	55	67	122	135	6	5	2
	-	15	4	29	3	27	29	5	53	48	111	86	6	2	-
BRIBE	10	40	20	22	-	23	1	1	51	74	156	139	-	9	1
	7	36	30	16	-	21	45	14	63	105	174	161	17	1	1
CASFL	25	21	35	27	30	33	-	39	16	62	85	15	28	22	-
	18	6	20	13	18	28	49	35	16	51	80	11	30	17	21
CRIST	25	36	15	45	33	61	109	99	112	135	282	159	79	93	57
	34	23	47	49	14	37	81	79	81	122	195	155	50	62	9
	-	-	-	99	61	71	119	129	133	169	313	207	100	130	85
CSISZ	38	27	-	-	-	-	-	-	-	-	-	61	21	7	12
ELTMA	61	48	49	41	14	76	83	87	70	113	61	46	87	81	49
GONRU	59	46	57	27	68	65	35	72	36	55	60	117	39	-	61
	50	46	47	23	43	67	59	74	28	42	54	97	29	-	49
	35	55	42	8	52	47	36	46	23	31	52	129	23	-	37
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
GOVMI	55	64	28	66	58	37	36	36	68	11	186	135	56	48	76
	45	44	23	42	34	31	20	21	46	6	171	94	26	27	33
	50	39	19	25	43	30	30	33	11	13	162	109	42	23	37
HINWO	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IGAAN	-	-	-	-	22	47	63	49	23	100	159	174	65	68	47
	22	37	38	49	-	32	70	57	61	92	37	206	84	61	46
	31	33	33	28	34	44	60	58	40	28	161	171	95	74	69
	98	59	5	10	74	9	22	87	54	-	9	289	181	104	127
JONKA	32	27	27	16	20	48	37	60	38	84	26	54	59	53	55
KACJA	111	95	11	100	89	53	39	67	102	-	17	256	-	-	-
	-	-	-	-	-	10	-	-	-	-	-	13	-	-	15
	52	35	29	34	3	4	19	42	69	25	46	133	28	51	10
	91	50	6	80	-	-	32	61	161	-	31	260	-	-	-
	99	81	11	67	-	-	-	69	124	-	17	229	-	-	-
KERST	-	-	-	-	-	-	-	-	-	-	77	21	61	40	56
KOSDE	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-
	-	15	15	15	3	-	-	43	70	67	153	147	-	-	-
LERAR	-	-	-	-	-	-	-	-	-	26	60	34	19	8	11
MACMA	9	1	6	22	10	22	45	58	-	6	40	-	-	-	1
	27	22	13	58	24	36	70	100	3	14	116	-	-	-	1
	26	8	8	18	16	5	33	43	2	3	60	-	-	-	2
MARGR	1	9	43	-	-	33	46	37	36	-	130	114	92	69	34
MOLSI	30	-	-	-	-	-	-	-	59	-	299	356	242	-	43
	33	-	2	2	16	46	26	57	41	48	159	158	67	24	4
	94	18	7	46	30	69	32	65	124	22	274	239	150	146	103
	35	9	7	15	15	37	19	23	85	16	141	134	77	50	39
MORJO	29	32	17	20	33	51	45	35	58	70	70	96	57	42	42
OCAFR	15	12	23	12	11	7	3	14	16	15	36	35	30	15	12
OCHPA	15	10	5	-	7	14	27	20	21	29	26	28	-	2	12
OTTMI	32	-	28	26	44	50	17	1	-	71	51	-	59	9	17
PERZS	46	29	21	39	36	58	39	57	118	50	395	267	50	82	76
PUCRC	53	33	24	33	27	38	58	-	-	68	220	132	39	80	50
ROTEC	18	8	-	-	-	8	-	17	-	13	61	46	19	10	-
SARAN	22	33	22	10	22	51	39	40	9	33	66	59	8	-	37
	22	44	48	11	49	46	49	51	7	36	84	85	7	-	38
	17	27	33	6	27	39	35	36	3	23	62	67	11	-	35
SCALE	48	38	41	43	14	49	78	63	40	-	-	69	61	49	27
SCHHA	7	38	5	-	14	39	46	15	65	78	198	153	16	1	-
SLAST	-	-	-	9	10	23	21	14	40	10	-	60	7	-	23
SPEUL	-	-	-	-	-	-	-	-	-	-	94	90	58	31	-
STOEN	74	48	61	60	37	115	119	142	72	200	47	80	114	120	72
	72	51	62	74	48	100	116	105	85	157	58	93	82	85	64
	93	79	74	90	54	94	113	129	102	184	78	110	132	90	78
STORO	-	-	-	-	-	-	-	169	-	-	392	-	316	238	212
	-	-	-	-	-	-	-	115	-	-	358	355	311	301	232
STRJO	-	2	11	4	-	-	-	13	30	20	83	98	42	11	-
	-	11	18	4	-	1	18	8	20	12	91	52	28	12	1
	1	7	4	4	-	-	-	3	29	10	120	98	46	9	-
	-	7	13	5	-	4	12	14	47	42	148	150	78	12	1
TEPIS	57	45	27	16	69	51	85	90	75	148	138	211	88	85	64
TRIMI	29	20	4	35	29	24	21	31	48	55	70	61	27	26	44
YRJIL	16	22	-	-	21	-	-	4	19	4	51	72	52	41	18
ZELZO	-	13	24	-	28	-	-	-	37	-	-	-	-	-	-
Sum	2216	1903	1441	1780	1574	2309	2704	3262	3297	3384	7639	8404	4103	3039	2664

August	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	-	-	8	7	-	-	-	9	-	-	-	-	3	11	-	-
BERER	63	65	77	92	73	69	31	72	62	40	-	99	75	79	51	9
	19	18	30	41	38	23	14	26	23	24	-	36	24	25	23	1
	20	20	21	28	17	10	9	18	15	13	-	23	25	20	16	-
BIRSZ	7	41	38	26	29	32	1	12	28	12	-	40	28	28	25	-
BOMMA	34	52	41	47	36	41	32	34	42	11	35	46	36	-	9	5
BREMA	-	34	30	17	12	16	28	3	-	7	7	10	21	-	4	24
	2	27	28	14	13	16	22	-	-	10	13	9	14	-	-	19
BRIBE	4	52	43	14	7	5	30	4	6	28	17	13	23	2	-	-
	20	60	49	21	5	7	42	-	12	31	28	26	30	6	1	-
CASFL	-	-	22	27	18	24	3	-	33	8	41	32	29	-	-	-
	26	28	17	20	11	19	3	9	21	-	24	25	23	6	-	-
CRIST	60	57	56	61	28	28	30	33	40	2	66	51	51	25	-	2
	38	48	36	36	21	8	23	20	13	5	29	42	30	21	2	16
	103	110	93	82	42	52	76	55	73	-	98	93	87	60	7	3
CSISZ	1	27	20	23	22	2	6	10	12	7	-	9	19	11	14	-
ELTMA	60	68	48	47	44	43	25	23	41	-	-	61	56	36	-	-
GONRU	61	55	43	61	26	41	37	44	-	59	20	33	38	40	36	36
	50	55	26	37	8	35	26	37	1	45	21	21	36	22	36	27
	30	35	18	40	8	13	16	27	1	42	17	20	15	29	26	30
	-	-	-	-	-	-	-	-	-	-	-	-	27	20	25	36
GOVMI	4	37	31	56	53	29	27	38	50	42	2	47	24	29	11	-
	2	24	10	26	30	18	13	16	26	29	1	40	12	23	4	-
	1	34	22	37	34	26	22	21	29	30	-	43	25	9	7	-
HINWO	-	-	-	91	1	29	23	34	2	-	-	83	-	1	-	-
IGAAN	7	27	29	25	38	21	17	22	23	11	6	31	39	14	17	2
	34	23	41	35	37	18	18	38	26	22	1	29	28	31	24	19
	25	26	38	34	39	26	16	27	17	22	-	18	21	5	3	-
	39	52	8	78	41	35	1	29	24	34	14	67	25	53	9	-
JONKA	11	23	25	25	23	18	13	20	26	12	-	26	21	17	15	-
KACJA	-	-	-	95	71	34	5	54	51	49	5	75	68	50	4	-
	-	5	12	16	18	7	-	-	34	-	-	47	-	22	-	-
	5	33	23	28	28	1	11	19	23	22	8	32	16	23	-	-
	-	-	-	125	90	72	9	88	65	54	45	94	72	64	-	-
	-	-	-	62	50	35	1	32	33	32	9	45	37	27	-	-
KERST	76	52	79	-	50	25	28	30	7	26	22	35	21	36	37	9
KOSDE	-	-	79	68	23	23	9	-	-	66	50	-	-	-	46	33
	-	23	-	-	-	22	4	-	-	-	20	2	22	-	-	3
LERAR	7	9	13	5	3	7	7	1	5	-	-	1	-	-	-	-
MACMA	20	13	6	17	2	15	3	10	2	21	-	19	19	16	10	11
	44	20	20	48	11	31	14	-	4	22	-	41	41	38	32	8
	20	13	7	26	5	15	2	-	-	13	-	16	16	15	12	7
MARGR	41	37	-	16	42	31	32	43	35	48	48	23	-	16	13	7
MOLSI	20	-	21	27	-	-	-	-	-	-	-	149	-	-	-	-
	17	37	45	45	2	10	13	12	-	5	14	42	16	8	-	-
	46	68	108	85	22	28	57	64	5	10	-	-	-	-	-	-
	21	20	47	33	5	13	22	30	3	4	-	-	-	-	-	-
MORJO	15	19	22	20	20	12	12	16	21	-	-	-	-	-	-	-
OCAFR	12	10	-	5	9	-	12	10	-	9	5	8	3	-	2	-
OCHPA	24	23	15	14	11	8	3	11	15	-	21	18	21	5	-	2
OTTMI	42	29	18	34	32	31	3	19	20	-	-	39	20	26	19	4
PERZS	3	57	60	93	76	48	54	47	59	43	1	70	57	52	7	-
PUCRC	70	96	-	-	-	45	42	39	42	-	-	47	58	26	1	7
ROTEC	10	8	8	17	9	4	9	11	-	1	3	6	7	12	-	1
SARAN	26	23	2	16	14	28	16	16	3	20	6	8	18	14	11	15
	33	24	5	27	11	-	14	21	1	21	7	8	25	10	17	17
	25	14	2	18	5	16	13	15	-	8	1	4	10	12	17	12
SCALE	45	47	30	33	21	26	14	17	39	5	27	21	28	14	-	-
SCHHA	-	27	35	7	3	4	21	4	6	12	31	11	21	3	4	12
SLAST	6	17	25	-	28	17	11	10	11	14	10	14	13	13	-	-
SPEUL	17	9	17	4	-	-	-	-	-	-	-	-	-	-	-	-
STOEN	113	91	91	92	68	70	39	38	70	11	89	101	71	30	-	1
	92	75	61	67	33	44	21	37	52	13	79	79	59	21	-	3
	78	84	82	61	35	47	20	37	62	16	74	82	90	32	-	8
STORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STRJO	3	19	24	6	2	2	13	5	-	19	7	19	10	1	1	-
	1	29	22	9	3	1	25	7	-	19	5	18	-	-	-	-
	2	16	23	6	5	-	10	4	-	14	1	7	-	1	-	-
	6	42	38	8	10	2	29	5	2	30	10	30	12	3	5	7
TEPIS	8	52	44	53	43	34	12	18	28	19	-	48	36	35	34	-
TRIMI	17	31	35	26	40	17	16	21	21	24	-	-	-	-	-	-
YRJIL	20	-	-	-	24	-	-	1	17	8	2	5	-	26	6	2
ZELZO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum	1706	2270	2067	2460	1678	1529	1230	1473	1382	1224	1040	2337	1772	1274	643	398