Results of the IMO Video Meteor Network – August 2017

Sirko Molau, Abenstalstr. 13b, 84072 Seysdorf *2018/05/03*

With regards to the effective observing time, we could achieve another record in August 2017. Once more we enjoyed unusually perfect weather – 75 (!) out of 78 cameras managed to observe in twenty or more observing nights and 17 cameras even in every night – and the number of meteor cameras was increasing. Stefano Crivello started to operate ARCI, another Mintron camera with 3.8mm f/0.8 c-mount lens. The camera TACKA, which was active in 2012 for the last time, was taken over and resurrected by Jure Zakrajšek. It consists of a Mintron camera as well, equipped with a 12 mm f/0.8 c-mount lens. Even with these we are still 10 cameras short of the all-time high, but the output of more than 12,700 hours of effective observing time is better than in the previous years and in the long-term statistics August 2017 ranks third. With 6.2 meteors per hour, the average meteor count was well below the average of the previous years, however. For this reason, we recorded "only" 78,000 meteors or 20% less than in August 2016. We cannot derive a general trend from this, since there were cameras which recorded more and others which recorded less meteors. One important factor was the outage of all CILBO cameras on the Canary Islands, which alone recorded over 11,000 meteors in August 2016.

The analysis of the data took longer than usual because we did not have access to the flux viewer anymore. For this reason, we ordered a server in the AWS cloud, and Vladimir Nikolić from the Petnica team newly installed and adapted the software such that we have the same functionality as before. Access is now given under the URL meteorflux.org. On the new server, we can load and ingest data ourselves, which makes us faster and more flexible in the future. Time permitting, Vladimir may also implement step-by-step new functions in the weeks and months to come.

Let's now have a look at the meteor showers with peak at the July-August border. Figure 1 compares the average flux density profile of the alpha Capricornids in the years 2011-2016 (green) with the profile of 2017 (red). Whereas the descending activity branch matches perfectly, we see a smaller activity in the ascending branch of 2017. The maximum occurs at 126° solar longitude in the averaged profile. In 2017, the rates were at a constantly high level between 125° and 129° solar longitude (July 27 till August 1).

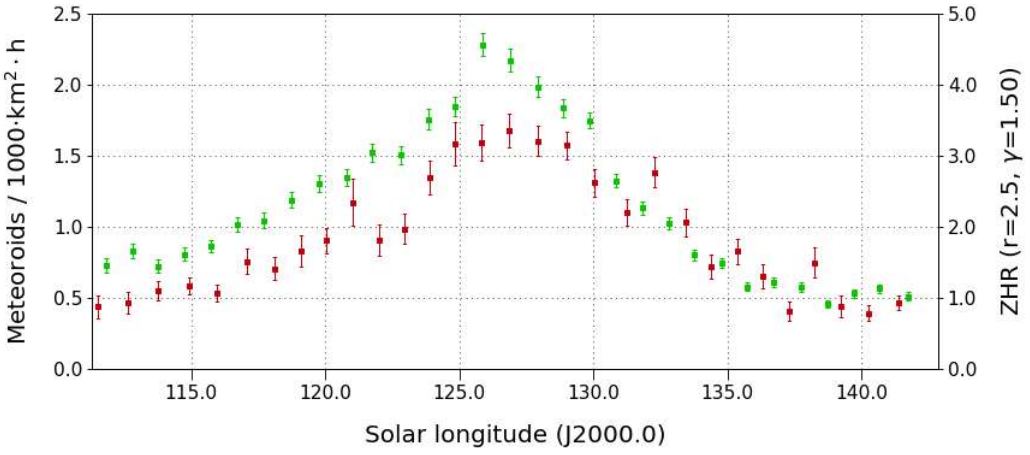

Figure 1: *Flux density profile of the alpha Capricornids 2011-2016 (green) and 2017 (red), derived from video data of the IMO Network.*

Figure 2 presents the average r-profile of the years 2011 till 2017. Whereas the Capricornid population index differs only marginally from the sporadic meteors until 124° and after 133° solar longitude (r=2.5), it is about 0.3 smaller in the time in-between (r=2.2). That is also the population index at the activity peak.

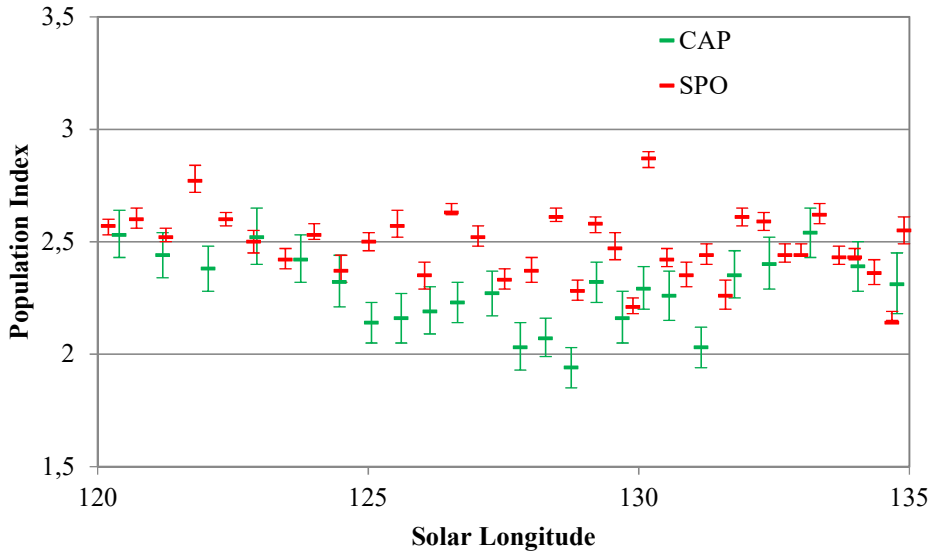

Figure 2: *Comparison of the population index profile of the alpha Capricornids (green) and sporadic meteors (red) in the years 2011-2017.*

Figure 3 compares the average activity profile of the Southern delta Aquariids in the years 2011-2016 (green) and 2017 (red). The peak time of 126° to 127° solar longitude (July 29/30) was in 2017 identical to the long-term average. The scatter of data in the averaged profile is somewhat larger than in the case of the Capricornids, and peak activity in 2017 is also a bit smaller than on average. This time it cannot be attributed to the lunar phase because there was new moon on July 23. Possibly we see here a side effect of the outage of the CILBO cameras which are not only particularly powerful, but also well positioned for the observation of these southern meteor showers.

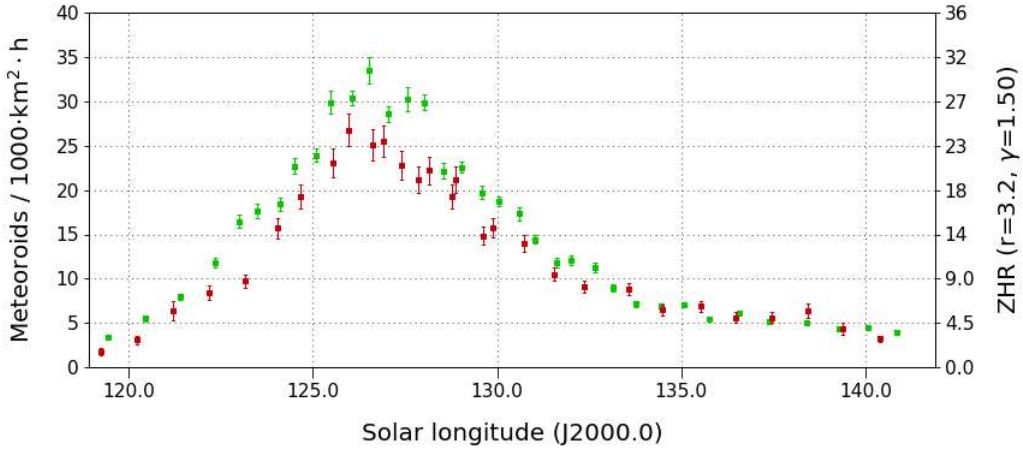

Figure 3: *Flux density profile of the Southern delta Aquariids 2011-2016 (green) and 2017 (red), derived from video data of the IMO Network.*

With r=2.15, the population index of the Southern delta Aquariids (figure 4) is over the full activity interval smaller than of the sporadic meteors and comparable to the alpha Capricornids. Note that the flux density is in the analysed observing interval larger than the peak value of the Capricornids. The “sporadic dilution” at the begin and end of the interval is thus significantly smaller.

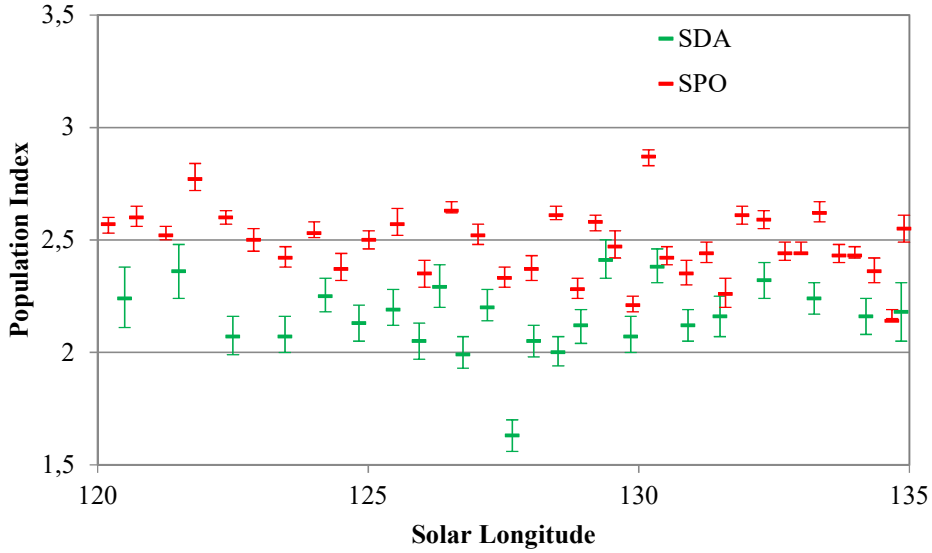

Figure 4: *Comparison of the population index profile of the Southern delta Aquariids (green) and sporadic meteors (red) in the years 2011-2017.*

In the end we shall have a look at the Perseids, which were severely hampered by the moon in mid-August 2017. Figure 5 compares the high-resolution activity profile of the years 2011 till 2015 (2016 was omitted, because that year was shaped by individual dust trails) close to the peak (green) with the flux density of 2017 (red). We see that the rates in 2017 were in general relatively small, which is confirmed by visual observations of IMO that hardly delivered a ZHR beyond 80. However, the graph shows clearly that we simply missed the peak in Europe. In the night of August 11/12, the flux density was on the rise, and in the following night it declined already. Interestingly, the rate in the post-maximum night even somewhat grew from dusk till dawn when using the typical zenith exponent of γ=1.5. Only with a value of γ=1.8 it matched well to the long-term profile. That confirms the result of the first zenith exponent analysis in 2012, which delivered the same result for the Perseids

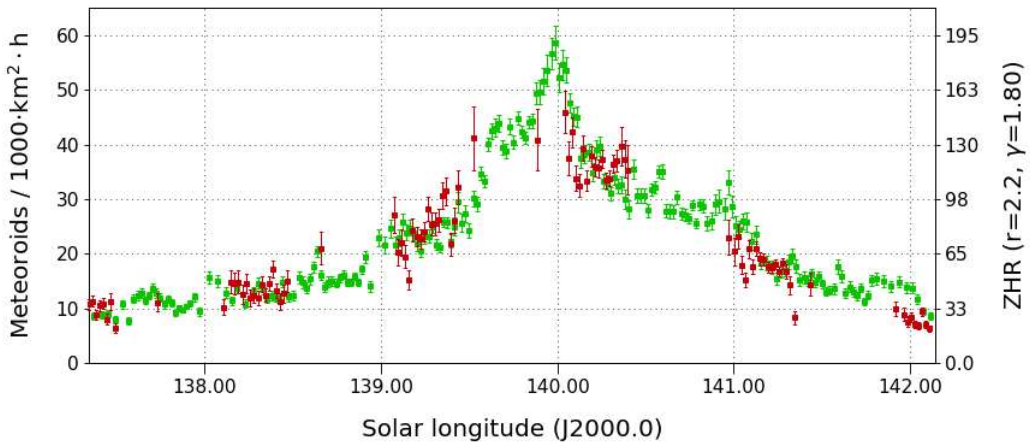

Figure 5: *Flux density profile around the Perseid maximum 2011-2015 (green) and 2017 (red), derived from video data of the IMO Network. The plot was obtained with a zenith exponent of γ=1.8*

Thanks to the high meteor count we can compute a population index profile for the year 2017 alone. In the complete analysed interval between 130° and 145° solar longitude (August 2-17), the population index of the Perseids is with r=1.8 clearly smaller than that of the sporadic meteors (r=2.4). In fact, the population index sometimes reaches values as low as r=1.5.

However, if we only look at the post-maximum night between 140.2° and 140.36° solar longitude, we obtain an almost constant value of r=1.75 ±0.03.

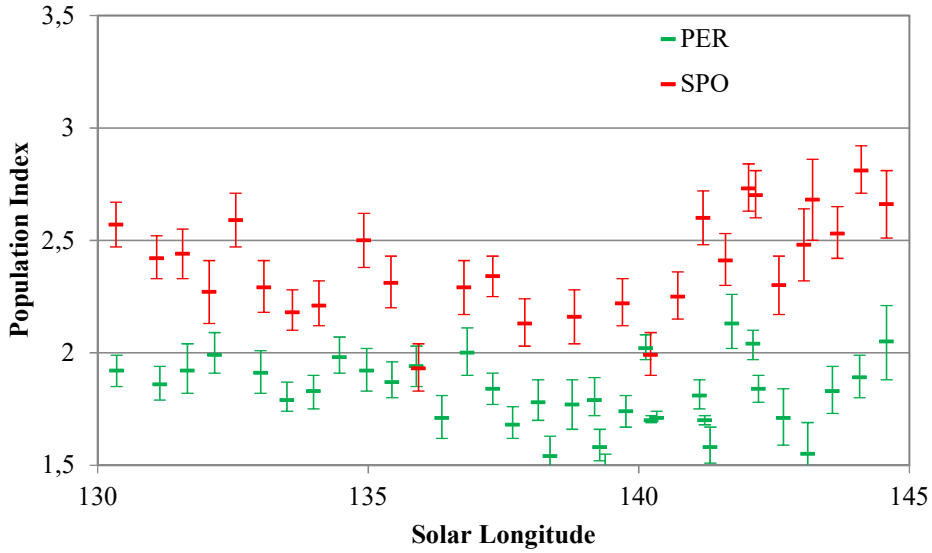

Figure 6: *Comparison of the population index profile of the Perseids (green) and sporadic meteors (red) in 2017.*

1. Observers

Code	Name	Place	Camera	FOV [^{o2}]	Slim [mag]	Eff.CA [km^2]	Nights	Time [h]	Meteors
ARLRA	Arlt	Ludwigsfelde/DE	LUDWIG2 (0.8/8)	1475	6.2	3779	29	122.4	946
BERER	Berkó	Ludanyhalaszi/HU	HULUD1 (0.8/3.8)	5542	4.8	3847	24	166.7	1724
BOMMA	Bombardini	Faenza/IT	MARIO (1.2/4.0)	5794	3.3	739	31	228.1	2153
BREMA	Breukers	Hengelo/NL	MBB3 (0.75/6)	2399	4.2	699	28	138.9	611
BRIBE	Klemt	Herne/DE	HERMINE (0.8/6)	2374	4.2	678	26	126.3	646
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2286	4.6	1080	26	122.2	593
CARMA	Carli	Monte Baldo/IT	BMH2 (1.5/4.5)*	4243	3.0	371	31	203.5	2181
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	5.0	1611	31	201.4	1101
CINFR	Cineglosso	Faenza/IT	JENNI (1.2/4)	5886	3.9	1222	31	206.5	1134
CRIST	Crivello	Valbrevenna/IT	ARCI (0.8/3.8)	5566	4.6	2575	21	150.4	1195
			BILBO (0.8/3.8)	5458	4.2	1772	31	215.4	1923
			C3P8 (0.8/3.8)	5455	4.2	1586	31	185.4	1305
			STG38 (0.8/3.8)	5614	4.4	2007	31	224.1	2440
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5631	4.3	2151	31	198.7	1491
FORKE	Förster	Carlsfeld/DE	AKM3 (0.75/6)	2375	5.1	2154	22	129.8	912
GONRU	Goncalves	Foz do Arelho/PT	FARELHO1 (0.75/4.5)	2286	3.0	208	6	24.6	28
		Tomar/PT	TEMPLAR1 (0.8/6)	2179	5.3	1842	31	224.1	1445
			TEMPLAR2 (0.8/6)	2080	5.0	1508	31	229.2	1224
			TEMPLAR3 (0.8/8)	1438	4.3	571	31	215.3	591
			TEMPLAR4 (0.8/3.8)	4475	3.0	442	31	222.6	1587
			TEMPLAR5 (0.75/6)	2312	5.0	2259	31	208.3	1229
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1447	5.5	1841	28	176.1	890
			ORION4 (0.95/5)	2662	4.3	1043	27	168.5	681
HERCA	Hergenrother	Tucson/US	SALSA3 (0.8/3.8)	2336	4.1	544	25	150.2	414
HINWO	Hinz	Schwarzenberg/DE	HINWO1 (0.75/6)	2291	5.1	1819	27	139.2	812
IGAAN	Igaz	Hodmezovasar./HU	HUHOD (0.8/3.8)	5502	3.4	764	29	155.2	669
		Budapest/HU	HUPOL (1.2/4)	3790	3.3	475	28	166.0	302
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4)	2286	3.9	445	28	177.1	686
			HUSOR2 (0.95/3.5)	2465	3.9	715	27	190.6	758
KACJA	Kac	Kamnik/SI	CVETKA (0.8/3.8)	4914	4.3	1842	24	135.4	1236
		Kostanjevec/SI	METKA (0.8/12)*	715	6.4	640	29	181.8	873
		Ljubljana/SI	ORION1 (0.8/8)	1399	3.8	268	29	177.5	1364
		Kamnik/SI	REZIKA (0.8/6)	2270	4.4	840	23	135.0	1484
			STEFKA (0.8/3.8)	5471	2.8	379	24	133.9	977
LOJTO	Łojek	Grabniak/PL	PAV57 (1.0/5)	1631	3.5	269	17	97.4	809
LOPAL	Lopes	Lisboa/PT	NASO1 (0.75/6)	2377	3.8	506	24	183.9	633
MACMA	Maciejewski	Chelm/PL	PAV35 (0.8/3.8)	5495	4.0	1584	29	149.9	1088
			PAV36 (0.8/3.8)*	5668	4.0	1573	30	179.4	1812
			PAV43 (0.75/4.5)*	3132	3.1	319	29	167.7	817
			PAV60 (0.75/4.5)	2250	3.1	281	29	174.7	1105
MARRU	Marques	Lisbon/PT	CAB1 (0.75/6)	2362	4.8	1517	31	240.8	1500
			RAN1 (1.4/4.5)	4405	4.0	1241	27	193.7	1216
MASMI	Maslov	Novosimbirsk/RU	NOWATEC (0.8/3.8)	5574	3.6	773	24	111.5	820
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1230	6.9	6152	29	147.4	1682
			ESCIMO2 (0.85/25)	155	8.1	3415	26	72.6	351
			MINCAM1 (0.8/8)	1477	4.9	1084	27	144.8	989
		Ketzür/DE	REMO1 (0.8/8)	1467	6.5	5491	28	119.0	954
			REMO2 (0.8/8)	1478	6.4	4778	28	135.0	1059
			REMO3 (0.8/8)	1420	5.6	1967	29	154.9	1131
			REMO4 (0.8/8)	1478	6.5	5358	29	152.3	1371
MORJO	Morvai	Fülöpszallas/HU	HUFUL (1.4/5)	2522	3.5	532	30	191.6	707
MOSFA	Moschini	Rovereto/IT	ROVER (1.4/4.5)	3896	4.2	1292	30	196.2	832
OCHPA	Ochner	Albiano/IT	ALBIANO (1.2/4.5)	2944	3.5	358	19	126.1	533
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	3.8	460	29	146.8	404
PERZS	Perkó	Becsehely/HU	HUBEC (0.8/3.8)*	5498	2.9	460	29	192.2	1350
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2366	4.5	911	24	114.9	423
SARAN	Saraiva	Carnaxide/PT	RO1 (0.75/6)	2362	3.7	381	28	215.8	748
			RO2 (0.75/6)	2381	3.8	459	29	231.6	1187
			RO3 (0.8/12)	710	5.2	619	30	231.3	1183
			RO4 (1.0/8)	1582	4.2	549	30	209.2	613
			SOFIA (0.8/12)	738	5.3	907	28	173.0	715
SCALE	Scarpa	Alberoni/IT	LEO (1.2/4.5)*	4152	4.5	2052	27	170.6	456
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	4900	3.0	409	27	120.2	692
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	563	6.2	1294	26	144.6	837
			KAYAK2 (0.8/12)	741	5.5	920	29	190.8	418
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5566	4.8	3270	31	204.7	2197
			NOA38 (0.8/3.8)	5609	4.2	1911	31	205.9	2204
			SCO38 (0.8/3.8)	5598	4.8	3306	31	206.7	2131
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2354	5.4	2751	28	143.7	1035
			MINCAM3 (0.8/6)	2338	5.5	3590	28	132.2	705
			MINCAM4 (0.8/6)	2306	5.0	1412	26	112.3	349
			MINCAM5 (0.8/6)	2349	5.0	1896	28	130.0	569
			MINCAM6 (0.8/6)	2395	5.1	2178	28	127.2	694
TEPIS	Tepliczky	Agostyan/HU	HUAGO (0.75/4.5)	2427	4.4	1036	26	173.7	668
			HUMOB (0.8/6)	2388	4.8	1607	26	167.8	923
WEGWA	Wegrzyk	Nieznaszyn/PL	PAV78 (0.8/6)	2286	4.0	778	27	101.0	495
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM (0.8/6)	2337	5.5	3574	8	23.2	83
ZAKJU	Zakrajšek	Petkovec/SI	TACKA (0.8/12)	714	5.3	783	22	112.9	411
Sum							31	12751.6	78504

* 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	1.3	-	4.0	3.9	4.2	5.2	5.4	0.3	-	0.3	1.3	3.8	4.1	6.0	0.8
BERER	6.9	6.8	5.5	2.1	6.9	-	6.7	6.2	6.2	5.8	5.8	-	7.4	-	7.6
BOMMA	6.6	7.0	7.8	7.7	7.8	6.7	7.7	2.3	6.2	6.9	5.1	8.3	7.6	8.4	8.4
BREMA	3.5	-	4.6	6.0	5.0	5.3	3.4	4.9	3.7	-	0.2	5.9	4.4	6.6	2.0
BRIBE	3.7	-	2.0	2.1	4.1	6.7	5.6	4.3	0.7	-	-	-	7.2	5.9	0.5
	4.5	-	1.0	3.0	1.4	6.2	4.0	2.9	-	-	-	-	7.0	6.7	0.2
CARMA	7.1	7.7	7.7	7.7	5.6	7.9	7.8	2.3	6.0	3.3	2.4	8.3	7.0	8.3	7.2
CASFL	7.6	7.7	7.7	7.8	5.7	7.8	7.8	3.2	6.3	1.8	2.2	8.2	6.7	8.3	6.7
CRIST	7.1	7.8	7.8	7.8	7.9	6.9	7.9	2.8	6.3	6.9	4.6	8.4	8.1	8.5	8.4
	-	-	-	-	-	-	-	-	-	-	3.5	7.9	8.0	8.0	7.0
	6.7	7.3	7.4	7.5	7.4	6.2	7.0	3.5	7.8	4.3	3.2	7.9	8.0	8.0	7.2
	6.3	7.4	2.8	7.5	6.5	7.4	5.1	1.8	4.1	4.2	3.1	7.9	8.0	8.0	7.2
DONJE	7.3	7.3	7.4	7.5	7.5	6.8	7.4	2.5	7.4	5.4	4.8	7.9	8.0	8.0	7.6
ELTMA	5.1	4.9	6.6	7.3	6.9	5.7	4.7	3.9	5.0	6.1	6.3	8.2	7.3	7.5	8.0
FORKE	-	3.9	4.9	6.8	0.3	6.9	6.9	-	-	-	-	-	5.5	7.2	2.6
GONRU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8.1	8.1	8.1	3.1	8.2	5.0	7.6	8.2	8.3	7.6	8.4	8.0	8.1	7.4	7.9
	8.2	8.2	8.2	3.2	8.3	6.1	7.1	8.4	8.4	7.7	8.6	7.6	8.3	7.9	8.0
	8.0	8.0	8.1	3.4	8.2	3.4	7.2	8.4	8.4	8.3	8.3	4.6	8.5	7.5	8.7
	8.2	8.2	8.2	3.0	8.3	5.5	7.2	8.4	8.4	7.9	8.5	6.1	8.5	7.6	8.1
	7.9	7.9	8.0	3.4	8.2	3.3	6.4	7.3	6.8	8.2	8.3	3.5	8.2	6.7	8.4
GOVMI	7.1	0.7	-	2.1	4.6	-	4.3	7.3	7.4	3.1	6.8	0.8	7.7	6.1	7.9
	6.8	1.0	5.3	-	5.4	-	4.6	7.2	7.3	3.9	7.2	-	7.5	7.6	7.6
HERCA	0.2	4.7	2.1	3.3	7.3	6.8	9.1	8.7	9.1	0.7	0.2	4.1	2.6	9.3	6.3
HINWO	-	4.0	5.1	6.8	2.5	6.7	7.0	0.5	-	-	0.2	1.7	6.4	7.5	3.7
IGAAN	6.9	6.2	-	2.5	2.8	0.2	5.1	7.1	7.1	6.3	7.1	-	5.8	7.2	7.2
	6.5	5.7	6.0	0.2	5.9	-	4.6	6.4	5.6	3.8	1.9	0.6	6.5	6.9	6.9
JONKA	7.0	5.7	6.2	0.5	3.4	-	5.1	7.2	5.6	5.1	3.3	-	7.7	7.8	6.7
	7.1	6.2	4.2	-	6.1	-	3.1	7.5	6.8	6.0	4.3	-	7.8	7.9	7.9
KACJA	7.0	1.6	7.0	7.2	3.3	-	-	7.4	2.1	2.4	5.4	7.8	-	-	-
	6.6	1.9	6.8	3.1	2.9	-	2.7	4.1	4.1	0.7	4.4	4.1	7.8	8.0	8.0
	5.0	3.1	7.5	5.2	5.9	-	1.1	7.6	6.3	1.2	6.2	5.2	7.8	7.3	8.1
	6.6	1.6	6.9	7.5	2.7	-	-	6.6	2.5	2.4	5.0	8.0	-	-	-
	6.8	1.8	6.2	7.6	3.0	-	-	7.5	2.6	2.4	5.4	7.9	-	-	-
LOJTO	4.2	-	-	3.1	6.5	-	6.8	6.7	5.7	-	4.6	-	7.6	7.4	6.1
LOPAL	-	-	7.3	-	7.9	6.3	-	-	8.0	7.6	8.1	8.3	8.2	8.1	8.6
MACMA	6.3	3.8	2.8	0.6	6.0	0.5	4.5	6.9	4.6	6.1	7.1	4.4	3.6	7.4	7.4
	6.6	4.9	3.4	1.8	6.5	1.3	6.7	7.1	7.0	7.2	7.1	6.0	3.6	7.6	7.6
	6.5	5.0	3.0	1.6	6.6	0.9	6.2	7.0	6.5	6.8	7.0	3.6	3.3	7.3	7.4
	6.5	4.7	3.1	1.6	6.7	0.8	6.6	7.0	7.0	6.9	7.2	5.1	3.4	7.4	7.4
MARRU	8.0	8.1	8.1	7.2	8.3	8.1	5.7	8.4	8.5	8.5	8.5	6.6	8.6	8.6	8.7
	7.5	5.3	6.4	-	8.0	7.1	3.1	5.4	8.4	8.6	8.6	8.7	8.5	7.5	8.7
MASMI	4.8	4.9	5.0	2.1	-	-	-	5.4	0.5	5.7	-	-	3.0	5.5	6.1
MOLSI	1.2	6.2	4.0	2.4	2.2	4.1	6.5	0.2	3.5	-	1.1	4.2	6.7	7.0	0.4
	-	6.6	2.4	0.7	0.3	2.0	3.8	-	1.0	-	0.1	1.9	3.3	5.5	-
	0.7	6.6	4.5	1.7	0.6	3.7	7.1	-	3.1	-	0.3	3.7	6.9	7.5	-
	2.7	-	3.0	3.9	4.0	5.4	5.6	0.7	2.4	0.3	-	3.8	5.1	5.6	2.5
	3.5	-	3.0	3.5	3.6	5.6	5.5	-	2.1	0.4	-	4.0	5.2	6.4	2.6
	4.1	-	4.6	5.0	4.7	6.6	6.6	1.3	2.7	0.4	-	4.9	6.5	6.8	2.8
	4.0	-	4.3	3.9	4.3	6.5	6.6	1.3	2.7	-	0.3	5.1	5.8	7.0	2.8
MORJO	7.1	6.2	7.4	4.6	7.2	-	4.7	7.4	6.3	7.5	6.8	0.4	6.6	7.8	7.6
MOSFA	5.6	7.6	6.8	7.7	7.8	7.9	7.8	1.1	6.0	1.6	2.2	8.2	6.2	8.3	7.9
OCHPA	-	6.5	-	7.0	4.8	7.8	5.2	-	-	-	-	6.1	3.3	8.3	6.9
OTTMI	2.8	1.9	8.0	-	1.6	8.1	8.1	2.5	3.2	8.3	8.3	3.0	7.7	7.8	0.8
PERZS	7.1	1.7	5.0	3.6	3.7	-	4.3	6.5	6.5	3.4	6.5	-	7.9	7.2	7.8
ROTEC	-	-	3.1	3.3	2.9	6.3	6.2	-	-	-	-	2.5	2.9	6.9	0.7
SARAN	8.4	8.4	8.7	2.9	8.8	3.8	3.6	7.4	7.9	8.0	9.0	9.0	8.6	9.0	9.2
	8.5	7.8	8.4	2.4	8.5	7.2	5.8	8.6	8.7	8.5	8.5	8.8	8.8	8.8	8.9
	8.3	8.3	8.2	3.0	8.3	6.3	4.9	8.4	8.4	8.5	8.1	8.2	8.6	8.5	8.8
	8.1	5.4	8.2	0.6	8.2	6.3	5.6	8.6	8.5	5.8	8.5	8.7	8.6	6.9	8.9
	8.2	4.7	6.4	1.8	5.0	-	2.4	7.0	8.4	5.0	7.9	8.9	8.7	6.4	9.0
SCALE	5.3	5.6	7.5	7.6	7.6	5.7	5.5	4.6	5.2	-	-	-	5.0	8.1	8.1
SCHHA	3.6	-	3.6	2.5	5.7	6.9	1.9	3.6	-	-	0.2	0.3	7.2	6.1	3.0
SLAST	5.5	1.9	5.3	6.2	2.9	-	-	4.4	2.2	3.3	5.3	7.2	5.9	7.1	6.5
	5.7	2.5	6.3	6.3	7.3	-	2.5	7.7	7.2	6.2	5.8	7.9	7.7	8.0	7.1
STOEN	5.7	5.9	7.8	7.7	7.8	6.1	7.5	5.8	5.8	5.3	5.6	8.1	5.0	8.3	8.2
	5.9	6.3	7.6	7.6	7.8	5.9	7.9	6.4	6.1	6.6	6.2	8.2	5.6	8.3	8.2
	5.7	6.4	5.2	7.7	7.4	6.4	7.9	6.7	7.0	7.1	5.5	8.2	3.0	8.1	8.1
STRJO	4.6	-	3.1	3.1	4.0	6.6	5.9	3.3	3.1	-	-	2.2	7.0	4.8	1.0
	4.5	-	3.1	2.5	4.4	6.4	6.0	3.0	3.0	-	-	2.4	6.4	4.5	0.7
	4.0	-	3.9	4.0	4.5	6.1	6.5	1.3	3.4	-	-	2.0	6.2	3.3	-
	4.9	-	2.1	3.6	2.6	6.4	4.8	2.2	2.7	-	-	1.1	5.0	4.0	0.6
	4.3	-	3.8	3.5	4.6	6.6	6.0	3.6	2.0	-	-	3.0	6.0	4.1	0.4
TEPIS	6.8	6.5	5.2	-	4.5	-	7.2	7.3	7.3	-	-	4.5	3.1	5.3	7.0
	6.9	6.8	5.9	-	4.6	-	-	1.3	7.3	3.3	-	5.4	7.5	5.7	6.9
WEGWA	4.4	3.2	4.9	2.2	3.0	0.7	6.7	4.1	2.6	-	0.2	5.7	1.5	5.5	4.5
YRJIL	-	-	-	-	-	-	-	-	-	-	-	-	2.4	-	3.5
ZAKJU	-	-	-	-	-	-	5.3	6.8	6.2	3.3	6.4	8.1	6.5	6.0	6.2
Sum	396.2	312.1	391.5	287.3	395.9	299.1	391.1	353.7	375.2	272.9	303.0	361.1	471.7	513.8	428.4

August	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	6.2	2.6	1.1	6.4	3.4	6.1	6.4	6.6	5.4	6.3	4.3	6.8	6.9	7.0	4.8	1.5
BERER	7.3	7.3	7.5	-	6.7	7.7	-	8.2	7.3	8.4	7.8	-	-	8.1	8.5	8.0
BOMMA	7.7	8.5	8.5	5.7	8.6	8.7	8.7	8.8	6.6	8.9	8.8	9.1	6.6	9.0	9.1	0.3
BREMA	6.6	5.9	4.3	1.4	6.2	5.0	7.4	1.8	7.3	6.3	5.5	8.2	8.1	4.0	-	5.4
BRIBE	5.5	5.8	6.3	3.8	4.7	7.0	7.9	1.7	5.1	0.9	4.0	8.2	8.3	6.8	-	7.5
	6.2	4.0	6.0	4.2	1.6	7.9	7.8	3.4	7.1	1.0	6.6	8.2	8.4	8.2	0.2	4.5
CARMA	6.1	8.4	1.9	6.4	8.4	7.1	7.1	8.8	6.7	8.9	7.4	2.7	6.8	9.1	9.1	2.3
CASFL	6.3	8.4	1.6	6.1	8.4	6.7	7.1	8.9	6.6	8.9	8.5	2.0	6.6	9.1	9.2	1.5
CRIST	8.5	8.4	8.6	7.1	8.8	8.7	8.8	8.9	7.2	8.9	2.8	3.2	2.1	3.4	3.6	0.3
	6.1	8.2	5.3	6.2	8.3	8.4	8.4	8.4	8.4	8.2	8.5	8.7	6.0	8.8	5.3	2.8
	6.0	8.2	4.9	6.2	8.3	8.4	8.4	8.5	8.2	8.2	8.6	8.7	5.3	8.8	6.0	3.3
	4.1	8.2	3.2	1.4	8.3	8.4	8.5	8.2	6.7	7.4	8.7	8.6	5.2	8.8	2.2	0.2
DONJE	7.2	8.2	6.1	6.8	8.3	8.4	8.4	8.5	8.5	8.4	8.7	8.7	6.0	8.8	6.3	4.0
ELTMA	8.0	8.4	6.2	0.9	6.5	8.0	8.4	7.9	8.9	8.1	5.5	4.9	6.4	8.7	8.2	0.2
FORKE	6.9	5.3	-	6.0	3.0	7.9	6.7	8.0	6.6	-	5.9	7.8	8.2	8.4	4.1	-
GONRU	-	-	-	-	-	-	0.7	-	3.9	-	4.6	-	1.5	-	5.2	8.7
	6.5	8.7	8.8	8.7	8.7	8.7	3.9	3.0	8.1	5.2	8.9	9.1	2.5	5.1	6.9	9.2
	6.5	8.8	8.8	8.9	8.9	9.0	6.1	3.1	7.8	4.8	9.0	9.2	2.8	5.1	6.9	9.3
	6.5	8.7	8.8	8.7	8.7	8.8	3.7	2.8	7.4	3.4	8.4	9.0	1.1	4.4	6.6	9.3
	6.0	8.8	8.9	8.9	8.9	9.0	5.0	2.6	7.6	3.8	8.8	9.0	2.2	4.8	6.8	9.4
	6.8	8.5	8.5	8.6	8.6	8.8	5.0	2.7	6.9	3.5	7.3	9.1	1.2	4.7	6.5	9.1
GOVMI	7.1	8.0	7.9	-	8.1	8.1	5.7	8.3	8.4	8.3	6.9	2.1	6.4	7.6	8.7	8.6
	6.9	6.5	6.6	-	7.9	8.0	4.8	7.6	8.2	7.8	1.6	4.8	6.7	5.0	7.3	7.4
HERCA	3.4	-	-	-	-	-	-	5.6	5.9	9.2	8.7	8.2	8.0	7.7	9.4	9.6
HINWO	4.4	3.6	0.3	7.8	3.5	7.9	7.5	8.0	5.9	3.8	6.0	7.7	8.4	8.5	3.8	-
IGAAN	7.3	7.3	6.3	4.3	6.0	2.9	5.3	5.4	6.1	5.7	6.2	0.9	4.6	1.8	7.3	6.3
	6.8	6.1	7.1	-	7.5	7.2	5.0	8.1	7.2	7.7	6.6	-	6.1	7.4	8.0	7.7
JONKA	7.8	7.0	8.0	-	7.9	8.1	3.2	8.3	8.0	8.3	6.3	0.3	6.4	8.6	8.7	8.9
	7.8	8.1	8.1	-	8.2	8.3	6.3	8.4	8.5	8.5	7.6	1.8	7.6	8.8	8.8	8.9
KACJA	0.5	1.3	3.8	-	7.9	8.4	7.7	8.6	8.4	8.1	3.3	-	5.7	8.8	8.8	2.9
	4.7	8.1	8.1	-	8.6	8.5	8.4	8.5	8.6	8.6	8.2	4.7	5.8	8.9	8.9	8.0
	4.6	7.5	7.9	-	8.5	6.7	7.0	8.2	8.7	4.7	4.6	4.3	5.0	9.0	9.0	4.3
	-	1.3	3.9	-	8.1	8.5	7.9	8.6	8.1	8.7	3.5	-	6.0	8.9	8.9	2.8
	0.6	0.2	3.9	-	8.1	8.5	7.8	8.7	8.3	8.6	3.0	-	4.5	8.8	9.0	2.7
LOJTO	6.9	-	6.8	-	-	-	-	-	2.7	-	0.8	6.0	-	7.8	7.7	-
LOPAL	8.6	8.7	8.6	8.3	8.4	8.2	8.2	-	-	4.7	6.3	3.2	6.2	7.7	9.2	9.2
MACMA	7.2	5.9	6.1	-	-	7.7	1.1	4.4	7.8	6.5	1.7	5.8	2.3	7.6	7.6	6.2
	7.7	7.7	7.8	0.2	-	8.1	2.6	6.5	8.1	8.1	4.0	6.4	3.0	8.2	8.3	8.3
	7.6	7.5	6.3	-	-	8.0	3.0	5.0	8.0	6.9	3.3	6.3	2.9	8.1	8.1	8.0
	7.5	7.6	7.6	-	-	7.9	2.6	6.3	8.0	8.0	3.9	6.6	3.0	8.1	8.2	8.0
MARRU	3.8	8.8	8.8	8.9	8.9	8.9	9.0	9.0	9.0	6.4	5.0	7.8	0.9	7.4	9.2	9.1
	8.8	8.7	8.9	8.9	8.8	-	7.9	2.5	9.0	1.6	6.3	4.7	-	-	7.0	8.8
MASMI	4.3	2.2	-	6.0	1.7	2.5	-	6.9	5.4	5.1	7.0	7.1	7.1	3.6	7.2	2.4
MOLSI	7.1	7.2	2.1	6.2	5.6	7.5	7.5	7.6	7.5	5.5	7.4	6.4	8.0	8.0	4.1	-
	2.6	2.7	0.6	1.7	1.5	1.5	2.0	5.6	4.5	3.4	4.4	0.7	5.8	7.5	0.5	-
	7.2	7.4	1.9	5.2	5.8	8.0	8.0	8.1	6.7	4.8	8.0	5.7	8.4	8.5	4.7	-
	5.1	1.3	3.2	6.1	3.4	6.2	6.4	6.3	-	6.3	2.7	6.5	6.7	6.7	4.1	3.0
	6.4	1.9	4.3	6.9	4.2	7.1	7.2	7.2	3.4	7.4	2.7	7.4	7.6	7.6	4.3	4.0
	6.6	2.3	4.7	7.5	5.0	7.5	7.8	7.8	3.7	8.0	3.0	8.0	8.2	8.3	4.9	4.6
	6.6	2.3	4.8	7.4	4.8	7.7	7.8	7.8	3.2	8.0	2.9	8.0	8.2	8.3	4.7	5.2
MORJO	7.6	7.5	7.9	3.3	7.8	7.8	5.0	7.9	7.9	7.9	7.8	1.2	7.5	4.2	4.6	8.1
MOSFA	8.0	8.4	0.3	6.6	8.6	6.8	7.6	8.8	5.8	8.9	5.2	2.6	7.7	9.1	9.1	-
OCHPA	5.6	7.7	-	5.4	8.6	-	-	8.4	-	4.9	-	4.1	8.3	9.0	8.2	-
OTTMI	3.8	4.7	8.7	1.7	-	8.8	8.7	8.1	2.6	0.4	0.6	7.2	4.6	2.1	3.5	9.2
PERZS	7.9	8.0	8.1	0.2	8.3	8.3	7.2	8.4	8.5	8.5	8.4	4.0	8.7	8.8	8.8	8.9
ROTEC	6.0	2.4	0.8	7.2	2.7	6.7	7.5	7.8	3.4	6.9	2.2	4.9	8.0	8.1	5.5	-
SARAN	9.2	9.2	9.3	9.3	9.2	5.1	9.3	5.0	9.5	1.2	-	-	8.0	9.2	9.6	-
	8.8	9.0	8.9	8.9	8.9	-	9.0	5.7	9.3	-	6.7	3.9	7.1	8.9	9.0	9.3
	8.8	8.8	8.9	9.0	8.9	-	8.7	5.3	9.1	2.5	6.2	3.9	8.8	8.9	9.4	9.3
	8.0	8.7	8.9	8.5	8.5	-	7.5	2.7	8.5	0.3	6.2	3.0	4.7	8.8	8.7	9.3
	9.1	9.1	9.0	3.8	4.3	5.0	3.1	-	9.0	1.4	2.8	3.3	6.8	8.3	8.2	-
SCALE	8.2	8.3	4.4	0.2	1.8	7.1	8.2	8.6	8.1	8.7	4.7	4.1	5.8	7.6	9.0	-
SCHHA	7.2	3.1	7.2	4.4	1.5	5.5	7.7	1.7	4.9	0.9	2.5	8.3	8.0	7.6	-	5.1
SLAST	4.9	6.1	7.0	-	6.4	7.9	3.3	7.9	6.9	7.9	6.8	-	-	5.0	6.8	4.0
	4.9	7.5	7.6	-	8.0	8.0	7.2	8.0	8.0	5.0	7.7	4.3	4.7	8.3	7.0	6.4
STOEN	8.1	8.5	5.2	0.6	6.4	7.3	8.6	8.7	7.5	8.9	4.9	5.5	6.6	9.1	7.5	0.7
	8.2	8.5	5.7	0.7	6.5	7.0	8.1	8.6	6.7	8.7	3.3	5.4	5.8	8.7	8.6	0.8
	7.8	8.5	5.8	1.7	7.5	7.5	8.2	8.8	7.3	8.7	4.3	4.9	6.4	9.1	9.0	0.8
STRJO	4.8	4.4	5.4	6.8	7.6	6.4	7.8	4.7	5.5	3.2	5.5	8.1	8.1	6.7	1.5	8.5
	3.5	4.6	4.7	6.3	7.3	5.9	7.7	2.8	3.2	2.1	5.0	8.0	8.0	6.6	1.3	8.3
	2.3	1.6	0.5	0.8	7.0	6.2	7.5	1.0	2.0	2.6	6.3	7.8	8.1	6.3	-	7.1
	5.0	4.5	4.3	7.0	5.1	6.3	7.7	4.3	5.1	4.0	5.7	8.0	8.1	6.7	1.9	6.3
	3.4	4.1	4.7	5.9	6.9	5.1	7.8	2.7	2.7	2.2	4.1	7.5	7.3	5.8	0.9	8.2
TEPIS	7.5	7.8	3.6	-	8.0	8.1	4.1	8.2	7.3	8.3	8.2	3.6	8.5	8.6	8.6	8.6
	7.6	7.5	7.5	-	7.7	7.8	4.2	7.8	6.9	7.9	7.7	0.4	7.9	8.0	8.6	8.7
WEGWA	-	1.8	4.2	-	2.0	3.1	2.2	6.8	1.1	0.3	3.4	5.0	7.2	6.2	8.5	-
YRJIL	1.0	-	-	-	3.6	2.5	-	-	3.3	-	-	2.2	4.7	-	-	-
ZAKJU	0.5	3.9	5.4	-	4.6	3.7	5.8	7.4	-	6.9	3.3	-	0.9	5.9	6.1	3.7
Sum	464.6	470.7	423.7	296.1	465.4	500.5	471.8	480.2	495.7	437.4	420.0	393.8	448.0	555.9	491.8	383.0

3. Results (Meteors)

August	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	5	-	29	35	39	54	38	2	-	1	13	68	59	86	5
BERER	85	81	42	9	66	-	94	58	100	76	111	-	214	-	130
BOMMA	48	51	82	75	57	56	89	14	36	112	62	339	216	112	86
BREMA	7	-	26	36	38	16	12	24	20	-	2	77	50	48	9
BRIBE	8	-	18	17	28	60	34	23	4	-	-	-	83	60	2
	17	-	5	17	9	57	19	11	-	-	-	-	95	52	1
CARMA	70	94	99	102	75	108	97	12	102	36	16	343	89	112	70
CASFL	44	48	55	62	34	48	46	9	47	25	9	182	69	47	33
CRIST	27	24	40	37	50	31	43	5	13	47	27	151	138	66	53
	-	-	-	-	-	-	-	-	-	-	96	282	148	113	59
	48	61	65	65	67	40	46	24	86	24	100	355	186	124	61
	42	57	25	56	36	44	48	9	33	16	72	250	131	87	52
DONJE	64	83	85	86	93	54	93	11	100	29	110	337	203	127	81
ELTMA	20	33	51	51	49	61	40	20	19	42	93	291	154	75	62
FORKE	-	33	44	61	1	73	72	-	-	-	-	-	90	93	10
GONRU	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	62	67	72	9	69	29	47	56	69	89	117	88	73	35	45
	59	68	58	12	69	24	28	50	54	79	98	83	74	38	61
	22	22	33	9	26	4	22	35	37	43	68	38	32	13	28
	70	98	72	12	64	19	35	82	97	111	177	103	123	41	74
	69	63	86	11	58	9	55	61	44	80	94	48	41	23	72
GOVMI	42	7	-	18	18	-	18	31	36	21	88	6	117	32	55
	31	4	13	-	14	-	16	24	32	18	90	-	125	46	48
HERCA	1	10	2	14	22	25	29	24	47	2	1	20	8	41	25
HINWO	-	25	33	52	11	54	52	2	-	-	1	29	96	92	22
IGAAN	22	16	-	17	19	1	47	40	28	36	57	-	56	54	31
	18	10	9	1	9	-	12	21	10	12	13	4	41	25	22
JONKA	27	27	20	1	27	-	39	35	27	35	39	-	74	56	36
	36	35	11	-	24	-	34	33	31	46	42	-	96	64	42
KACJA	60	26	61	73	28	-	-	91	13	16	97	291	-	-	-
	31	17	42	17	17	-	7	14	12	2	31	24	80	54	57
	28	30	70	63	50	-	10	69	37	4	96	111	153	83	77
	75	23	97	87	34	-	-	70	8	14	85	284	-	-	-
	28	15	63	62	25	-	-	67	8	20	94	265	-	-	-
LOJTO	35	-	-	23	39	-	55	65	25	-	57	-	90	98	71
LOPAL	-	-	18	-	45	16	-	-	31	30	71	108	58	26	34
MACMA	50	42	23	4	61	3	34	70	27	65	130	45	57	98	64
	73	37	35	16	78	7	76	128	75	101	182	98	89	150	100
	25	32	20	9	41	4	40	72	50	51	98	26	38	15	46
	30	27	23	12	66	5	44	75	42	68	113	41	48	71	53
MARRU	85	58	77	43	59	45	67	63	71	80	109	55	68	70	54
	49	25	23	-	60	26	17	28	68	72	128	190	87	23	87
MASMI	31	41	48	16	-	-	-	55	5	87	-	-	49	77	56
MOLSI	7	98	26	11	8	26	56	1	48	-	8	73	132	130	1
	-	18	13	4	1	18	26	-	6	-	1	18	30	40	-
	5	69	27	8	3	40	53	-	26	-	2	58	114	90	-
	15	-	17	46	42	52	66	5	21	2	-	85	83	67	19
	25	-	14	42	25	72	25	-	12	3	-	72	76	99	16
	25	-	31	46	27	62	75	2	25	1	-	87	80	85	12
	31	-	36	46	44	88	64	5	22	-	2	113	111	90	18
MORJO	34	21	27	10	25	-	31	35	19	44	55	3	70	51	45
MOSFA	22	23	36	36	37	35	40	3	32	12	11	185	71	42	18
OCHPA	-	46	-	31	12	39	35	-	-	-	-	112	15	40	23
OTTMI	3	4	22	-	2	23	25	3	12	61	51	31	20	16	2
PERZS	71	11	51	38	41	-	28	32	27	36	139	-	152	78	83
ROTEC	-	-	8	10	4	50	7	-	-	-	-	42	15	63	4
SARAN	24	25	28	4	45	3	11	17	35	37	81	100	60	26	31
	59	33	52	3	58	17	47	43	61	56	78	158	91	38	49
	54	59	52	3	56	17	37	51	48	53	68	90	66	24	55
	26	15	23	3	29	8	14	21	31	24	66	99	51	15	26
	48	17	34	2	28	-	15	22	34	28	65	105	47	22	37
SCALE	10	22	15	19	22	27	24	16	14	-	-	-	71	37	23
SCHHA	12	-	17	11	60	56	13	20	-	-	1	2	136	75	24
SLAST	27	12	23	30	13	-	-	17	5	26	48	85	40	54	47
	7	3	12	13	8	-	6	22	10	13	31	70	27	28	13
STOEN	36	60	92	81	87	101	74	37	36	60	102	397	50	121	85
	36	69	84	75	81	86	84	66	54	87	129	440	80	104	55
	44	75	52	56	69	90	88	68	59	88	117	420	29	109	68
STRJO	39	-	18	37	38	57	28	8	13	-	-	33	144	51	3
	29	-	8	33	31	42	35	18	14	-	-	37	106	29	3
	15	-	8	14	9	34	26	4	15	-	-	18	32	19	-
	33	-	5	26	15	42	14	8	12	-	-	9	49	18	1
	23	-	21	21	31	39	41	29	14	-	-	38	120	24	2
TEPIS	32	36	16	-	12	-	41	34	45	-	-	58	33	41	38
	46	51	19	-	22	-	-	10	57	26	-	67	116	55	50
WEGWA	14	16	26	20	10	4	39	35	14	-	1	62	11	50	30
YRJIL	-	-	-	-	-	-	-	-	-	-	-	-	28	-	21
ZAKJU	-	-	-	-	-	-	36	27	22	12	39	78	49	19	19
Sum	2396	2173	2588	2069	2670	2101	2759	2242	2387	2259	3982	7877	6103	4377	2895

August	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	33	15	5	68	20	32	37	44	16	22	21	45	71	65	17	1
BERER	79	45	85	-	30	43	-	57	44	54	32	-	-	61	70	58
BOMMA	44	62	51	26	71	60	63	45	33	57	36	44	37	53	34	2
BREMA	32	23	8	2	18	13	31	3	18	10	17	26	28	5	-	12
BRIBE	36	29	37	14	15	22	26	2	6	1	8	45	29	20	-	19
	36	15	34	21	4	36	37	4	13	1	11	33	34	26	1	4
CARMA	57	83	8	59	83	48	47	70	38	54	41	2	35	69	54	8
CASFL	24	30	4	28	44	27	25	36	14	29	26	2	13	20	19	2
CRIST	27	25	31	9	29	33	24	35	25	32	19	26	16	28	21	2
	37	55	15	18	40	53	54	40	32	27	35	26	28	20	13	4
	47	67	8	20	62	62	51	54	33	27	44	27	29	19	14	7
	17	27	6	9	36	55	30	40	16	21	36	20	13	16	4	1
DONJE	60	81	24	36	86	88	66	89	71	46	79	55	31	39	23	10
ELTMA	44	48	24	7	24	28	47	42	24	24	11	13	21	45	27	1
FORKE	49	31	-	39	8	37	34	36	26	-	24	31	59	54	7	-
GONRU	-	-	-	-	-	-	1	-	5	-	2	-	4	-	5	11
	37	53	48	61	37	45	6	12	24	12	44	44	1	13	25	56
	26	35	31	50	33	24	21	4	16	6	26	30	3	5	24	35
	6	22	14	12	17	11	5	3	18	2	12	11	1	3	9	13
	25	46	51	51	36	26	12	5	26	3	31	29	3	9	20	36
	19	51	39	47	41	31	14	8	31	5	21	46	3	10	17	32
GOVMI	21	39	41	-	25	23	19	35	21	39	12	10	18	33	47	18
	19	23	22	-	13	11	3	17	18	16	2	9	14	17	20	16
HERCA	4	-	-	-	-	-	-	8	18	23	14	14	12	23	9	18
HINWO	18	13	1	41	12	28	32	28	18	8	27	26	37	47	7	-
IGAAN	23	21	18	12	13	12	18	18	13	20	15	3	15	6	18	20
	12	1	12	-	6	6	2	7	5	8	5	-	3	10	13	5
JONKA	31	22	31	-	14	14	11	20	12	14	12	2	14	11	18	17
	31	17	30	-	14	15	18	24	11	13	6	4	12	30	21	18
KACJA	1	4	25	-	54	49	48	61	41	49	6	-	20	58	56	8
	19	33	46	-	42	28	42	49	33	36	25	17	12	39	33	14
	17	52	42	-	37	29	43	61	48	20	9	17	9	46	44	9
	-	5	33	-	79	62	65	89	58	72	9	-	59	92	78	6
	2	1	11	-	39	24	36	46	46	40	5	-	10	40	27	3
LOJTO	46	-	57	-	-	-	-	-	8	-	4	30	-	62	44	-
LOPAL	22	18	12	23	16	14	15	-	-	1	13	11	9	19	12	11
MACMA	47	29	31	-	-	39	6	15	15	17	9	18	3	25	34	27
	67	44	59	1	-	63	8	34	42	31	20	32	10	52	64	40
	36	22	20	-	-	28	4	11	20	12	5	17	9	23	21	22
	48	23	37	-	-	42	7	25	30	27	13	18	10	43	35	29
MARRU	21	59	42	45	31	32	33	35	47	9	9	25	2	25	41	40
	41	40	42	25	20	-	20	4	26	4	19	19	-	-	14	59
MASMI	31	10	-	42	6	7	-	28	25	24	38	30	35	15	57	7
MOLSI	103	68	20	62	33	75	107	107	70	57	69	40	97	123	26	-
	15	17	5	12	9	10	13	19	12	7	14	2	17	22	2	-
	49	39	9	26	21	31	46	47	46	18	31	7	56	58	10	-
	35	10	5	59	21	32	39	33	-	26	8	35	54	62	5	10
	45	7	10	70	28	38	43	51	3	46	14	63	66	84	2	8
	49	13	7	79	27	36	47	53	3	25	5	50	73	81	12	13
	49	10	7	82	40	41	65	73	3	47	11	60	103	80	10	20
MORJO	30	17	28	1	15	16	5	23	12	18	20	2	24	4	7	15
MOSFA	17	17	1	14	31	18	13	23	8	19	12	5	15	25	11	-
OCHPA	27	30	-	6	22	-	-	29	-	11	-	4	19	21	11	-
OTTMI	14	13	7	5	-	13	15	14	2	2	4	7	12	5	10	6
PERZS	50	35	62	1	24	25	23	47	41	34	34	17	32	59	43	36
ROTEC	24	7	1	16	12	18	11	26	3	20	4	6	45	23	4	-
SARAN	36	30	27	26	17	4	14	5	20	1	-	-	15	17	9	-
	49	41	31	25	22	-	16	14	25	-	15	4	19	25	29	29
	52	50	40	46	29	-	27	7	28	2	15	6	32	27	46	43
	17	15	17	10	12	-	9	3	14	1	4	4	14	12	13	17
	29	32	30	18	12	4	9	-	15	1	11	5	10	18	17	-
SCALE	20	28	8	1	4	18	9	11	9	12	2	4	12	15	3	-
SCHHA	37	11	46	17	3	19	29	5	4	2	4	21	32	23	-	12
SLAST	17	41	38	-	30	30	25	54	21	36	12	-	-	41	46	19
	8	13	14	-	10	10	5	22	10	12	4	11	4	18	7	7
STOEN	101	84	22	1	59	69	76	77	43	45	25	21	62	60	29	4
	88	79	39	9	65	52	56	56	34	46	16	13	33	53	31	4
	85	70	32	11	58	58	58	71	28	44	21	10	50	59	39	5
STRJO	30	32	43	52	45	15	73	11	12	4	15	72	60	41	5	56
	16	16	23	26	38	9	56	3	9	2	8	34	36	14	1	29
	12	8	2	3	15	10	18	3	3	3	10	23	15	13	-	17
	22	18	24	18	26	14	46	7	2	4	8	45	48	22	4	29
	22	18	29	13	24	11	44	5	6	1	5	38	24	22	1	28
TEPIS	22	20	12	-	16	14	7	24	12	26	13	4	25	30	33	24
	36	19	43	-	25	19	9	19	22	34	20	3	34	46	42	33
WEGWA	-	8	9	-	4	10	7	18	3	2	6	21	26	21	28	-
YRJIL	1	-	-	-	5	3	-	-	10	-	-	3	12	-	-	-
ZAKJU	1	11	13	-	7	10	8	16	-	18	2	-	3	6	7	8
Sum	2500	2246	1839	1475	1964	2032	2089	2220	1617	1542	1295	1497	1951	2526	1660	1173