Results of the IMO Video Meteor Network – June 2015

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June presented exceptionally good observing conditions to the meteor observers. There were regional differences, though. In Germany, for example, the observers had to take breaks more frequently, whereas there were perfect observing conditions farther south. 56 of the 80 active cameras managed to observe in twenty or more observing nights, STG38 and JENNI in Italy even observed without any break. The last night of June was the most successful one with over 70 active video cameras.
The effective observing time in June accumulated to exactly 7,000 hours, slightly more than in the previous year. With 18,500, however, the total number of meteors was slightly lower than in 2014. According to the long-term statistics, June could close the gap to the other months in the first half year. For every month we store meanwhile over 100,000 single station meteors in the IMO video meteor database – only February still falls short by a mere 3,000 meteors.

The "Daytime Arietids campaign" initiated by Jürgen Rendtel remains a real challenge. It is well-known that this is one of the strongest radio meteor showers, but can it also cope with the major showers of visual observers like the Quadrantids, Perseids and Geminids? That shall be investigated with the help of optical observations. The observation of this shower is quite demanding, since the radiant lies just 30° away from the Sun and reaches only at broad twilight a sufficient altitude. The analysis of observations, however, is similarly complicated. Due to the low radiant altitude and limiting magnitude, there are automatically large correction factors. Minor systematic errors are significantly blown up under such circumstances.

Between June 5 and 11, 2015, we recorded 28 Daytime Arietids. They were quite evenly distributed over solar longitude, and also the average profile made of roughly 100 meteors from the last five years is relatively flat. The flux density is of the order of 10 meteoroids per 1,000 km^2 and hour. Given a population index of 3.0 and a zenith exponent of 1.0, a ZHR of the order of 5 is obtained. At a population index and zenith exponent of 2.0, however, the ZHR jumps to a staggering 250. So the fluctuation margin is by a factor of 50. That underlines perfectly, that the real challenge is not to observe these meteors but rather to obtain reliable information about the Daytime Arietid activity under such extreme circumstances.

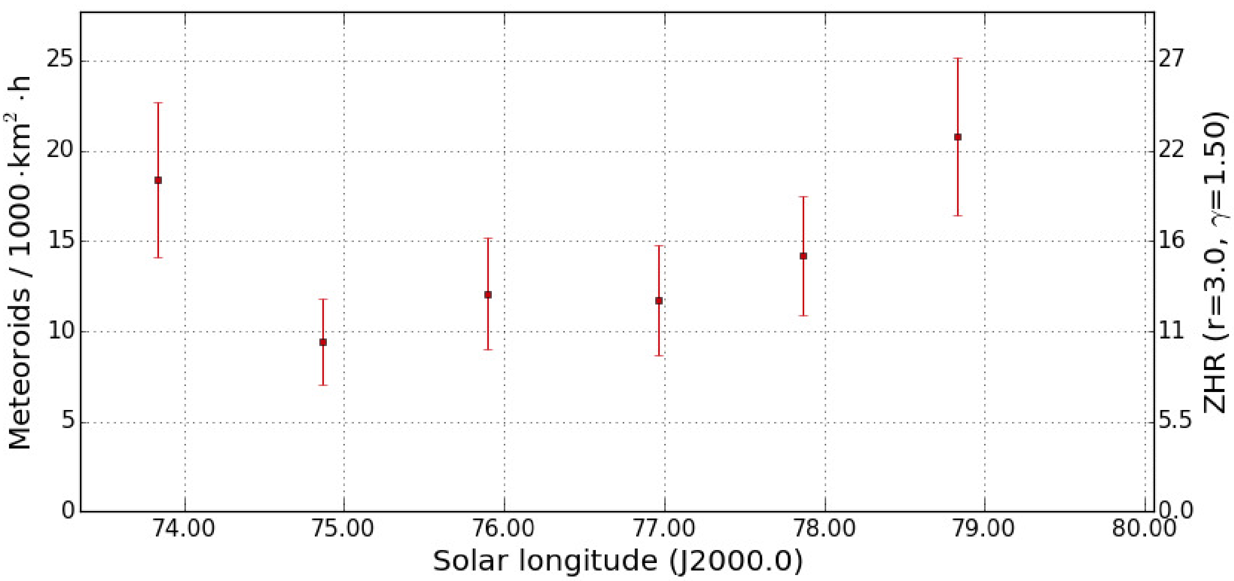

Figure 1: *Averaged flux density profile of the Daytime Arietids in the years 2011 to 2015.*

To get an impression from the real activity of the Daytime Arietids we did a comparison with the eta Aquariids. Also the radiant of that shower yields only at dawn a significant altitude in mid-northern latitudes, but thanks to better observing conditions in the south we have a more reliable picture from its zenithal hourly rate.

We analysed the time of peak activity of the eta Aquariids (May 3-8) and the above-mentioned activity interval of Daytime Arietids (June 5-11, 2015). We omitted intervals with limiting stellar magnitude of zero. For both showers we obtained a histogram, how many meteors were recorded at which radiant altitude. In parallel we calculated the observing time and average limiting magnitude of all cameras per radiant altitude interval.

Comparing the mean number of observed shower meteors per hour we get a first hint on the real activity of the Daytime Arietids. However, two additional effects have to be taken into consideration:

- In case of the Arietids, twilight has further progressed, which is reflected by decreasing limiting magnitudes. Indeed, the average stellar limiting magnitude reduces from an average 4.1 mag (0° radiant altitude) to 3.3 mag (10° radiant altitude), whereas it remains constant at 3.7 mag in case of the Aquariids.
- The Arietids are slower than the Aquariids. The loss in limiting magnitude by the meteor motion amount to 1.3 mag for the Arietids, but 1.5 mag for the Aquariids.

If these effects are accounted for with a population index of 3.0 (whereby the effect of the r-value is not so high this time, because the difference in limiting magnitude between both showers does not exceed 0.5 mag), we obtain figure 2. It becomes clear that at a similar radiant altitude we recorded more eta Aquariids per hour than Daytime Arietids.

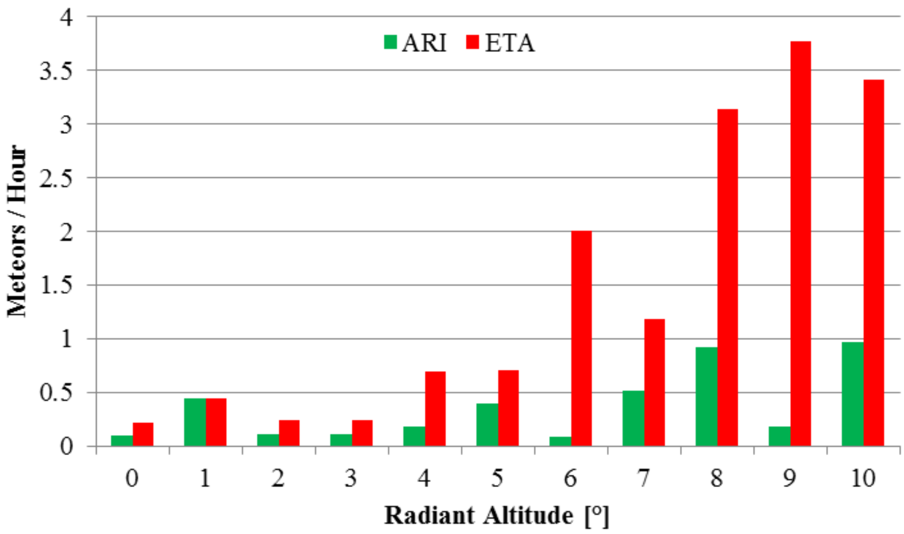

Figure 2: *Average number of Daytime Arietids and eta Aquariids per hour at a given radiant altitude, normalized for the same limiting magnitude and angular meteor velocity.*

Due to the low meteor counts, there is significant scatter in these values. For this reason we depicted cumulative averages in figure 3, i.e. not the average activity at a fixed radiant altitude x but in the interval 0 to x°. From this we can conclude that the activity of Daytime Arietids is only about a quarter of the eta Aquariid activity. That's not a precise measure of flux density or ZHR, but at least an estimate that is independent of the radiant altitude. We can conclude that the Daytime Arietids are less spectacular in the optical than in the radar domain. Their population index must be higher than those of the well-known major showers in the optical domain.

Finally we want to give an illustrative example, that meteor shower assignment in case of single-station video or visual observation is erroneous, since it lacks spatial information from the meteor trail. That's not a remarkably new finding, but sometimes still educative.

When analyzing the Daytime Arietids I recognized, that my own camera REMO2 in Ketzür/Germany had recorded one of these rare shower members on June 8 at 00:57:42 UT (figure 4, left). The train ended left of Atair and the backward prolongation missed the radiant by only 0.3°. That's a supposedly safe shower assignment, even though the apparent velocity was with 19 °/s about 4°/s higher than expected.

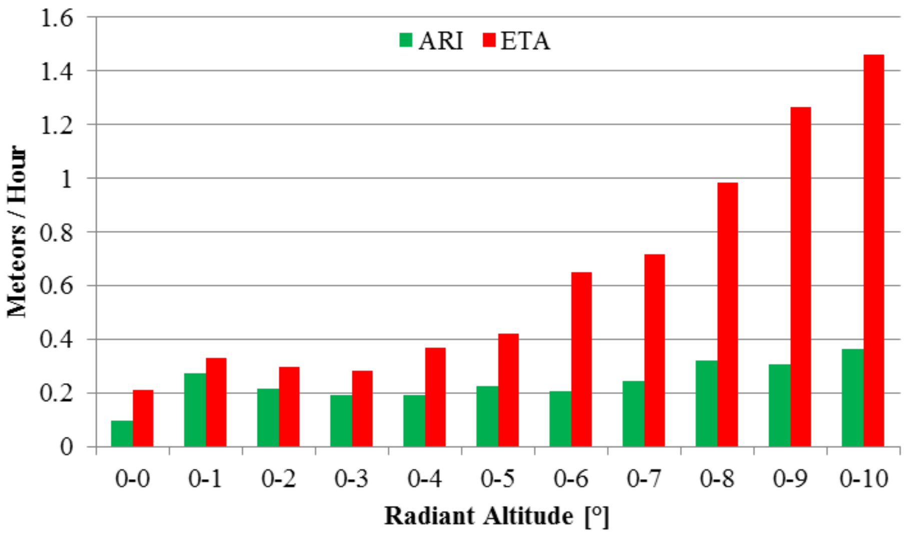

Figure 3: *Same like figure 2, but with cumulative increasing radiant altitude.*

Fortunately it was just REMO2, because the camera LUDWIG2 of Rainer Arlt covered the same atmospheric volume at his observing site Ludwigsfelde, which is about 50 km away. Indeed also this camera had recorded a similar meteor at exactly the same second (figure 4, right), which crossed the right wing of the eagle. It all seems to argue that both cameras recorded the same meteor, but LUDWIG2 flagged its meteor as sporadic.

An evil thought is immediately thrilling through the programmer: Is there a bug in the software? So you start to frantically check the observation and verify the code. The average meteor trail is correctly determined as can be shown by a manual verification. So it must be the velocity determination, which shows indeed some discrepancies that cannot be sorted out on short notice. The analysis is postponed until the next evening, but overnight you realize what a catastrophic impact that would have on all analyses provided so far. Fortunately there is all clear signal at the next evening, because the error was made during the verification. The value obtained by MetRec fits perfectly.

Then you realize that the radiant distance of the REMO2 meteor is slightly below 90° and of the LUDWIG2 meteor slightly above 90°. Is there a problem with meteor shower assignment beyond 90° radiant distance? Again your thoughts pivot around which severe implication this would have until the all clear signal lights up once more. If the accepted errors in meteor shower assignment are increased, also the meteor of LUDWIG2 is recognized as Daytime Arietid. The radiant miss distance is almost 8° and with 24°/s the angular velocity is even 6°/s higher than expected. Final clarification comes from a quick and dirty hack that computes the intersection point of the backward prolongation of two meteors. The radiant position is obtained as α=0.43h and δ=27°. The velocity has to be increased to v_{inf}=70 km/s. Voila! Now both meteors are matching perfectly to the radiant.

So the true radiant is about 30° away from the Daytime Arietids! It was pure chance that the backward prolongation of my meteor matched exactly to the radiant of ARI. Only the recording of a second camera revealed the true origin of the meteor.

In the end the programmer is left with the warm feeling, that about 15 years earlier he had sufficiently tested and created quite reliable source code (at least in this respect).

Figure 4: *Bright meteor in the morning of June 8, 2015, recorded by REMO2 (left) in Ketzür/Germany and by LUDWIG2 (right) at about 50 km distance in Ludwigsfelde.*

1. Observers

Code	Name	Place	Camera	FOV [°²]	St.LM [mag]	Eff.CA [km²]	Nights	Time [h]	Meteors
ARLRA	Arlt	Ludwigsfelde/DE	LUDWIG2 (0.8/8)	1475	6.2	3779	20	59.1	286
BANPE	Bánfalvi	Zalaegerszeg/HU	HUVCSE01 (0.95/5)	2423	3.4	361	16	13.1	87
BERER	Berkó	Ludanyhalaszi/HU	HULUD1 (0.8/3.8)	5542	4.8	3847	6	25.8	112
			HULUD3 (0.95/4)	4357	3.8	876	5	24.6	38
BOMMA	Bombardini	Faenza/IT	MARIO (1.2/4.0)	5794	3.3	739	29	126.4	401
BREMA	Breukers	Hengelo/NL	MBB3 (0.75/6)	2399	4.2	699	17	61.9	157
BRIBE	Klemt	Herne/DE	HERMINE (0.8/6)	2374	4.2	678	18	64.9	186
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2286	4.6	1080	22	67.3	146
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	5.0	1611	25	117.6	248
			BMH2 (1.5/4.5)*	4243	3.0	371	25	92.5	147
CRIST	Crivello	Valbrevenna/IT	BILBO (0.8/3.8)	5458	4.2	1772	28	137.4	294
			C3P8 (0.8/3.8)	5455	4.2	1586	24	113.7	234
			STG38 (0.8/3.8)	5614	4.4	2007	30	151.1	629
DONJE	Donati	Faenza/IT	JENNI (1.2/4)	5886	3.9	1222	30	167.1	637
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5631	4.3	2151	23	85.0	214
FORKE	Förster	Carlsfeld/DE	AKM3 (0.75/6)	2375	5.1	2154	18	57.4	161
GONRU	Goncalves	Tomar/PT	TEMPLAR1 (0.8/6)	2179	5.3	1842	26	168.8	535
			TEMPLAR2 (0.8/6)	2080	5.0	1508	26	171.3	382
			TEMPLAR3 (0.8/8)	1438	4.3	571	25	150.3	149
			TEMPLAR4 (0.8/3.8)	4475	3.0	442	27	164.9	374
			TEMPLAR5 (0.75/6)	2312	5.0	2259	24	149.8	333
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1447	5.5	1841	18	74.2	209
HERCA	Hergenrother	Tucson/US	SALSA3 (0.8/3.8)	2336	4.1	544	27	175.3	320
HINWO	Hinz	Schwarzenberg/DE	HINWO1 (0.75/6)	2291	5.1	1819	19	67.6	178
IGAAN	Igaz	Debrecen/HU	HUDEB (0.8/3.8)	5522	3.2	620	23	104.4	112
		Hodmezovasar./HU	HUHOD (0.8/3.8)	5502	3.4	764	19	67.1	89
		Budapest/HU	HUPOL (1.2/4)	3790	3.3	475	18	37.7	49
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4)	2286	3.9	445	21	80.4	109
			HUSOR2 (0.95/3.5)	2465	3.9	715	21	96.8	103
KACJA	Kac	Kamnik/SI	CVETKA (0.8/3.8)	4914	4.3	1842	22	88.2	317
		Kostanjevec/SI	METKA (0.8/12)*	715	6.4	640	3	16.2	22
		Ljubljana/SI	ORION1 (0.8/8)	1402	3.8	331	20	82.3	95
		Kamnik/SI	REZIKA (0.8/6)	2270	4.4	840	22	89.9	381
			STEFKA (0.8/3.8)	5471	2.8	379	21	80.7	188
KISSZ	Kiss	Sulysap/HU	HUSUL (0.95/5)*	4295	3.0	355	22	90.0	68
KOSDE	Koschny	Izana Obs./ES	ICC7 (0.85/25)*	714	5.9	1464	24	119.8	664
		La Palma / ES	ICC9 (0.85/25)*	683	6.7	2951	27	152.9	1145
		Noordwijkerhout/NL	LIC4 (1.4/50)*	2027	6.0	4509	22	14.8	87
LOJTO	Łojek	Grabniak/PL	PAV57 (1.0/5)	1631	3.5	269	9	31.5	30
MACMA	Maciejewski	Chelm/PL	PAV35 (0.8/3.8)	5495	4.0	1584	24	85.6	367
			PAV36 (0.8/3.8)*	5668	4.0	1573	24	89.4	259
			PAV43 (0.75/4.5)*	3132	3.1	319	22	85.8	181
			PAV60 (0.75/4.5)	2250	3.1	281	25	94.6	329
MARGR	Maravelias	Lofoupoli/GR	LOOMECON (0.8/12)	738	6.3	2698	22	150.7	325
MARRU	Marques	Lisbon/PT	CAB1 (0.8/3.8)	5291	3.1	467	23	146.8	262
			RAN1 (1.4/4.5)	4405	4.0	1241	25	148.2	235
MASMI	Maslov	Novosimbirsk/RU	NOWATEC (0.8/3.8)	5574	3.6	773	21	25.9	80
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1230	6.9	6152	20	69.3	351
			ESCIMO2 (0.85/25)	155	8.1	3415	19	59.4	142
			MINCAM1 (0.8/8)	1477	4.9	1084	17	53.8	210
		Ketzür/DE	REMO1 (0.8/8)	1467	6.5	5491	19	67.1	331
			REMO2 (0.8/8)	1478	6.4	4778	19	64.7	262
			REMO3 (0.8/8)	1420	5.6	1967	17	55.0	117
			REMO4 (0.8/8)	1478	6.5	5358	17	64.7	340
MOSFA	Moschini	Rovereto/IT	ROVER (1.4/4.5)	3896	4.2	1292	24	19.8	130
OCHPA	Ochner	Albiano/IT	ALBIANO (1.2/4.5)	2944	3.5	358	20	57.4	98
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	3.8	460	22	90.0	131
PERZS	Perkó	Becsehely/HU	HUBEC (0.8/3.8)*	5498	2.9	460	27	128.1	336
PUCRC	Pucer	Nova vas nad Dra./SI	MOBCAM1 (0.75/6)	2398	5.3	2976	21	90.1	168
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2366	4.5	911	8	26.9	62
SARAN	Saraiva	Carnaxide/PT	RO1 (0.75/6)	2362	3.7	381	21	121.7	214
			RO2 (0.75/6)	2381	3.8	459	24	146.9	302
			RO3 (0.8/12)	710	5.2	619	22	131.2	344
			SOFIA (0.8/12)	738	5.3	907	24	99.0	166
SCALE	Scarpa	Alberoni/IT	LEO (1.2/4.5)*	4152	4.5	2052	19	67.3	103
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	4900	3.0	409	21	65.5	159
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	563	6.2	1294	25	111.9	222
			KAYAK2 (0.8/12)	741	5.5	920	22	110.4	89
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5566	4.8	3270	23	73.8	325
			NOA38 (0.8/3.8)	5609	4.2	1911	27	100.3	311
			SCO38 (0.8/3.8)	5598	4.8	3306	27	97.6	366
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2354	5.4	2751	16	65.0	180
			MINCAM3 (0.8/6)	2338	5.5	3590	20	63.3	158
			MINCAM4 (1.0/2.6)	9791	2.7	552	20	62.2	104
			MINCAM5 (0.8/6)	2349	5.0	1896	16	62.6	139
			MINCAM6 (0.8/6)	2395	5.1	2178	18	63.5	126
TEPIS	Tepliczky	Agostyan/HU	HUAGO (0.75/4.5)	2427	4.4	1036	25	114.9	122
			HUMOB (0.8/6)	2388	4.8	1607	25	75.4	276
TRIMI	Triglav	Velenje/SI	SRAKA (0.8/6)*	2222	4.0	546	23	50.5	143
ZELZO	Zelko	Budapest/HU	HUVCSE03 (1.0/4.5)	2224	4.4	933	2	4.3	9
Sum							30	7000.4	18490

* active field of view smaller than video frame

2. Observing Times (h)

June	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	-	3.8	4.0	4.0	4.2	1.5	3.7	2.4	-	4.2	1.6	4.0	3.4	1.5	3.9
BANPE	-	0.5	0.4	-	0.6	0.8	1.0	-	0.5	1.0	0.6	-	1.2	-	-
BERER	-	-	-	-	4.6	5.1	4.4	-	-	-	-	-	-	-	-
	-	-	-	-	4.6	5.3	4.4	-	-	-	-	-	-	-	-
BOMMA	6.3	5.6	4.8	5.7	6.8	4.8	4.7	3.9	1.0	5.2	4.6	0.7	1.9	6.3	6.7
BREMA	-	-	4.0	4.8	-	4.7	1.1	4.4	4.6	4.5	4.5	2.7	0.3	-	4.4
BRIBE	0.6	-	1.4	5.0	-	4.8	4.9	4.9	3.9	3.4	4.8	1.8	4.7	-	4.7
	2.5	2.4	3.6	5.0	-	4.9	4.8	3.1	2.5	2.8	4.7	1.2	4.6	4.4	-
CASFL	3.0	6.5	-	6.5	4.1	4.7	-	6.6	5.2	6.4	6.0	2.1	3.1	-	6.1
	1.5	6.2	-	6.2	3.7	3.1	-	4.8	4.9	6.1	5.2	-	1.1	0.4	5.2
CRIST	3.1	6.4	6.1	6.4	6.3	5.2	3.4	1.8	5.9	6.2	6.0	-	6.1	1.5	4.4
	3.8	1.1	6.4	6.4	6.4	4.7	3.4	0.3	5.5	6.3	5.7	-	3.3	-	-
	6.2	6.4	6.2	6.4	6.3	6.1	3.6	2.0	6.3	6.2	6.0	0.9	5.7	2.2	3.7
DINJE	6.8	6.8	6.7	6.6	6.8	6.8	6.7	6.7	6.7	6.7	6.5	1.5	6.0	6.3	6.8
ELTMA	0.7	0.9	2.4	-	3.7	4.5	2.6	6.3	4.1	6.3	5.5	-	1.8	5.3	5.9
FORKE	2.9	5.3	1.2	5.3	5.2	2.0	-	-	-	4.4	-	4.5	3.1	-	4.7
GONRU	7.2	7.1	7.2	7.1	7.3	7.2	-	-	5.9	-	7.2	7.2	-	6.9	4.5
	7.3	7.3	7.5	7.2	7.2	7.4	-	-	5.6	-	7.3	7.3	-	7.2	4.0
	7.1	6.5	6.8	5.5	5.0	7.1	-	0.3	7.0	-	6.6	6.6	-	5.6	2.8
	7.4	6.9	7.4	6.7	7.3	7.3	-	-	4.9	-	6.9	7.2	0.6	6.3	3.4
	5.5	5.7	6.5	3.4	3.3	7.4	-	-	7.1	-	7.0	7.1	-	7.1	3.4
GOVMI	-	-	-	-	-	4.9	5.9	5.7	5.0	5.4	4.5	5.8	5.7	5.2	-
HERCA	7.6	7.9	8.5	8.2	0.5	3.2	8.5	-	-	5.4	8.4	8.4	8.2	8.4	8.4
HINWO	3.9	5.4	3.3	5.3	5.3	3.1	4.9	-	-	2.9	0.4	4.9	2.7	-	5.0
IGAAN	4.4	4.1	4.3	5.4	5.4	5.3	5.3	4.9	5.4	5.4	5.1	5.6	3.9	-	-
	1.7	5.9	4.6	6.0	2.9	2.6	5.3	0.8	3.4	5.6	2.5	2.9	-	-	-
	1.4	5.8	0.6	0.7	-	1.8	1.4	-	-	-	1.8	1.3	0.9	-	1.2
JONKA	5.8	6.1	5.8	3.2	6.0	5.7	4.6	0.4	-	0.9	1.7	5.8	5.4	-	1.3
	6.1	6.1	6.1	5.4	6.0	0.3	6.0	3.5	-	3.7	5.9	5.8	5.8	-	5.3
KACJA	5.7	5.4	3.5	5.7	2.5	5.9	5.8	5.9	2.3	4.8	5.6	5.3	2.5	-	-
	-	-	-	-	-	4.6	-	-	-	-	-	5.9	5.7	-	-
	4.3	5.9	-	5.3	3.2	-	5.9	6.0	2.5	5.0	5.6	4.2	3.8	-	-
	5.7	5.8	3.7	4.8	2.1	6.0	5.9	6.2	2.3	4.7	6.0	4.8	2.5	-	-
	5.2	5.4	2.3	5.0	2.5	5.7	6.0	6.2	2.4	4.4	5.9	4.8	2.7	-	-
KISSZ	6.1	4.3	-	4.2	6.1	-	5.8	4.1	1.0	4.9	5.8	5.9	5.9	0.4	3.9
KOSDE	7.9	2.2	3.0	3.3	1.7	2.4	7.9	7.4	7.8	3.7	7.5	4.2	2.9	5.0	7.9
	4.8	4.8	5.3	4.3	-	3.7	5.0	5.5	6.0	7.0	8.0	8.1	0.2	8.0	1.4
	-	0.2	0.2	0.8	0.2	1.0	0.8	0.8	0.6	1.2	1.0	0.5	-	-	1.6
LOJTO	-	4.6	1.3	-	-	4.5	-	-	-	-	-	-	3.3	4.2	-
MACMA	2.5	5.2	1.3	5.1	5.1	5.0	5.0	3.4	4.5	0.6	4.9	4.5	4.9	4.8	-
	3.7	5.1	2.2	5.2	5.2	5.1	5.0	1.2	3.3	0.8	5.0	4.2	4.8	4.8	-
	4.2	5.1	2.2	5.2	4.9	5.1	4.9	-	4.5	2.7	-	4.0	4.6	4.6	-
	4.6	5.2	2.2	5.1	5.1	5.0	5.0	2.3	4.3	1.4	4.9	4.1	4.9	4.6	-
MARGR	-	-	-	0.7	7.7	-	-	6.6	7.9	7.9	7.2	7.9	7.9	7.9	7.9
MARRU	6.5	7.2	-	7.2	7.2	6.9	3.0	-	7.1	-	5.2	-	-	6.4	6.7
	5.7	5.9	7.3	7.1	7.4	0.5	-	-	7.4	-	6.0	3.1	0.7	5.4	6.5
MASMI	-	-	-	-	-	-	0.5	1.4	-	0.8	1.1	1.8	1.8	-	1.0
MOLSI	-	4.9	4.8	4.8	4.8	-	4.1	-	-	-	4.6	2.6	1.9	-	1.2
	-	5.5	5.4	5.5	5.5	-	0.2	-	-	-	0.6	1.0	0.2	-	-
	-	-	4.6	5.2	5.2	-	0.6	-	-	-	4.9	1.0	-	-	0.2
	3.2	2.8	4.1	4.3	4.2	3.8	4.3	4.3	-	4.2	2.1	4.1	3.9	-	4.0
	1.8	2.7	3.8	4.3	4.2	3.9	4.4	4.4	-	4.3	2.2	4.3	4.2	-	4.1
	2.6	3.1	4.6	-	1.7	3.7	4.1	4.5	-	4.5	2.4	4.4	4.1	-	4.1
	-	2.6	4.2	4.6	4.4	3.8	4.5	4.5	-	4.5	2.7	4.3	4.0	-	4.3
MOSFA	0.3	0.3	0.5	0.7	0.7	0.5	-	1.3	1.2	1.8	1.4	-	-	-	0.5
OCHPA	-	2.8	2.1	6.1	-	5.8	-	3.5	2.8	5.5	-	1.0	0.4	-	-
OTTMI	7.1	6.2	-	5.0	6.8	4.1	5.0	5.0	6.4	3.9	-	-	-	-	-
PERZS	5.3	4.2	2.6	4.9	6.2	6.2	6.2	5.0	6.1	6.1	6.1	6.1	5.9	3.7	0.6
PUCRC	3.7	6.1	3.6	5.6	6.1	6.2	6.2	6.2	1.1	6.0	6.2	1.5	-	-	-
ROTEC	-	-	-	-	-	-	-	-	-	4.2	-	4.1	3.2	-	4.1
SARAN	7.7	3.2	-	3.8	4.6	-	-	-	7.4	-	5.4	-	-	4.4	7.5
	7.8	7.8	6.5	7.2	7.6	-	-	-	7.7	-	5.7	-	0.9	3.5	7.3
	7.6	7.5	6.3	7.2	7.4	-	-	-	7.4	-	5.8	-	-	4.2	7.4
	5.5	4.7	2.2	5.3	4.3	-	-	-	2.6	-	6.0	-	0.8	4.3	7.3
SCALE	-	4.6	3.1	4.8	4.8	4.3	1.1	5.0	-	5.6	5.4	-	1.4	-	-
SCHHA	0.4	-	3.3	4.5	0.4	2.5	4.1	4.4	3.9	1.7	4.8	4.3	4.6	-	3.4
SLAST	6.0	6.2	3.8	5.4	3.3	6.0	6.2	6.1	3.3	5.8	6.0	4.3	5.8	0.9	-
	6.4	6.4	4.2	5.3	4.6	6.3	6.3	6.2	3.7	6.0	6.2	3.5	5.7	0.7	-
STOEN	-	-	-	-	-	4.6	0.5	6.1	3.1	6.3	1.6	0.3	1.6	2.7	3.4
	1.3	6.6	4.2	5.5	5.9	5.0	0.6	6.3	3.1	6.3	3.7	0.2	-	2.2	3.4
	1.6	6.5	4.4	4.9	6.0	5.6	0.5	6.2	2.7	6.4	-	1.0	2.2	2.3	3.3
STRJO	-	-	3.7	4.0	1.5	4.7	4.6	4.7	4.6	2.4	4.6	4.2	4.5	-	4.5
	1.3	-	4.0	3.9	1.5	4.5	3.8	4.0	4.4	2.6	4.4	2.9	1.8	-	4.0
	0.5	-	4.0	4.0	-	4.7	4.7	4.7	4.6	2.4	4.6	3.3	4.5	-	4.4
	0.3	-	3.7	3.9	-	4.5	4.4	4.6	4.6	2.5	4.5	4.3	4.3	-	4.5
	-	-	4.1	3.9	-	4.5	4.5	4.4	4.5	2.5	4.4	2.9	4.4	-	4.5
TEPIS	5.8	5.8	5.5	5.7	5.7	5.6	5.6	-	1.6	5.5	5.5	5.5	5.5	0.6	4.4
	5.8	5.8	4.1	5.7	5.7	5.6	5.6	-	0.9	5.0	5.2	1.9	5.5	0.2	1.1
TRIMI	1.9	0.2	-	1.2	2.0	3.9	3.1	4.5	1.7	1.2	1.9	4.9	2.4	0.5	-
ZELZO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum	253.6	305.5	257.7	338.6	295.5	304.0	252.3	225.7	248.7	256.1	325.6	246.5	222.3	160.9	226.2

June	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ARLRA	3.9	-	-	-	-	-	-	3.8	3.3	1.9	-	0.3	-	1.4	2.3
BANPE	-	1.1	0.2	-	-	-	-	-	-	0.8	0.7	-	1.4	1.5	0.8
BERER	-	-	-	-	-	-	-	-	-	-	4.9	-	-	1.5	5.3
	-	-	-	-	-	-	-	-	-	-	5.0	-	-	-	5.3
BOMMA	-	1.9	4.3	0.8	3.3	4.7	5.4	0.3	3.8	6.7	6.7	3.0	6.6	3.3	6.6
BREMA	4.4	-	-	-	-	-	0.5	-	3.6	-	-	4.4	-	4.5	4.5
BRIBE	4.4	-	0.5	-	-	1.3	-	-	-	-	-	4.7	-	4.4	4.7
	4.7	-	1.0	-	-	0.4	0.5	-	4.4	0.5	-	0.2	-	4.5	4.6
CASFL	-	2.6	1.9	1.9	4.6	4.6	-	1.9	6.2	6.1	6.0	5.9	3.9	5.8	5.9
	-	1.4	1.5	1.3	2.6	2.5	-	0.9	5.5	5.0	5.2	5.6	2.9	4.4	5.3
CRIST	3.4	5.9	6.0	4.5	3.2	4.0	-	3.1	6.2	6.2	5.9	6.2	6.0	3.1	4.9
	-	5.9	3.5	2.8	-	2.4	-	2.8	6.2	6.2	6.2	6.2	6.2	5.8	6.2
	4.3	5.9	6.1	5.0	3.0	5.0	1.1	3.4	6.2	6.2	6.2	6.2	6.2	5.9	6.2
DINJE	1.0	3.7	5.3	1.3	6.2	6.6	6.6	0.7	6.5	6.6	6.6	3.7	6.5	4.9	6.5
ELTMA	-	-	2.6	-	4.8	2.5	-	-	6.3	1.0	3.8	3.3	1.4	3.4	5.9
FORKE	2.1	-	-	-	-	-	-	0.3	4.5	4.0	0.6	0.4	-	2.0	4.9
GONRU	7.1	7.2	7.2	7.1	7.0	6.7	2.9	7.2	7.2	6.1	7.1	7.1	7.1	5.6	1.4
	7.3	7.3	7.3	7.3	7.2	6.8	3.1	7.3	7.3	6.2	7.1	7.3	7.2	5.8	1.5
	7.0	7.0	6.9	6.9	6.9	5.6	-	7.0	7.0	5.1	6.3	7.2	6.0	4.5	-
	7.3	7.3	7.3	7.3	7.3	5.3	2.1	7.1	7.2	6.0	7.1	7.3	6.9	5.6	1.5
	7.3	7.3	7.3	7.3	7.2	5.8	-	7.3	7.2	5.2	6.4	7.3	6.2	4.5	-
GOVMI	-	2.0	0.7	-	-	1.2	-	-	4.9	1.3	3.2	-	5.6	5.5	1.7
HERCA	7.7	8.0	8.3	8.4	8.3	8.4	8.4	6.1	7.0	3.2	3.6	0.2	1.0	5.1	-
HINWO	2.9	-	-	-	-	0.7	-	-	4.9	4.2	0.6	-	-	2.3	4.9
IGAAN	0.4	4.3	2.3	-	5.2	5.5	5.3	-	-	0.2	5.6	-	5.6	-	5.5
	-	-	-	-	4.7	3.6	2.5	-	-	-	6.0	-	1.6	1.3	3.2
	-	0.3	5.4	2.2	4.5	1.2	-	-	-	-	1.8	-	-	3.0	2.4
JONKA	-	-	4.7	0.2	1.8	5.2	1.5	-	-	-	5.8	-	-	5.8	2.7
	-	2.4	5.2	-	3.6	5.5	-	-	-	0.6	5.8	-	-	5.5	2.2
KACJA	-	2.1	2.9	1.1	-	3.3	-	-	5.6	2.3	2.1	-	3.1	-	4.8
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	1.5	2.5	-	-	5.7	-	-	5.7	2.7	2.5	-	2.4	2.0	5.6
	-	1.4	3.0	1.3	-	3.6	-	-	6.2	1.9	3.9	-	3.3	-	4.8
	-	1.2	-	1.1	-	3.5	-	-	5.9	2.1	0.8	-	2.8	-	4.8
KISSZ	-	3.9	0.7	0.3	2.9	5.9	3.0	-	-	-	5.3	-	-	4.3	5.3
KOSDE	5.0	5.6	4.5	4.4	1.7	3.3	-	-	-	4.9	7.8	7.8	-	-	-
	2.3	2.8	-	-	8.2	8.2	8.2	6.1	3.2	7.8	8.2	7.7	6.7	6.2	5.2
	0.5	0.5	-	-	-	0.2	0.2	-	0.7	0.2	-	1.0	0.2	0.6	1.8
LOJTO	-	3.9	-	-	-	4.1	-	2.8	-	2.8	-	-	-	-	-
MACMA	4.8	4.8	0.3	-	4.8	4.8	-	0.7	0.4	0.4	4.7	-	-	-	3.1
	4.3	5.0	-	-	4.3	4.9	2.1	2.2	0.7	1.1	4.3	-	-	-	4.9
	4.9	5.0	-	-	3.9	4.8	1.1	2.1	-	0.8	4.6	-	1.8	-	4.8
	4.6	4.8	-	-	4.6	4.8	2.0	2.1	1.1	1.1	4.4	-	1.5	-	4.9
MARGR	7.9	7.9	7.0	7.8	7.8	7.8	3.0	-	7.8	7.4	6.5	2.7	7.5	-	-
MARRU	7.1	6.4	7.0	7.1	-	3.7	7.0	-	7.1	7.1	7.1	7.1	7.1	7.1	2.5
	7.0	6.3	6.4	7.0	6.0	-	-	6.7	7.0	7.1	7.2	7.4	6.9	6.8	3.4
MASMI	0.9	1.6	1.2	1.6	0.2	1.5	0.7	1.6	0.2	1.6	-	1.6	1.7	1.4	1.7
MOLSI	3.3	4.5	0.7	-	-	-	-	1.8	4.5	4.5	1.7	4.3	1.1	4.6	4.6
	0.2	3.0	-	-	-	0.1	-	0.5	5.0	4.4	5.2	4.1	2.5	5.2	5.3
	0.8	5.1	-	-	-	0.3	-	0.2	5.0	5.0	-	4.4	1.6	4.9	4.8
	4.1	-	-	-	0.8	-	-	4.0	2.2	-	-	-	-	2.8	3.9
	4.0	-	0.4	-	-	-	-	4.2	2.1	-	-	-	-	1.7	3.7
	-	-	-	-	-	0.2	-	4.2	1.7	-	-	-	-	1.0	4.1
	3.9	-	-	-	-	-	-	4.2	1.9	-	-	-	-	2.2	4.1
MOSFA	-	0.8	0.2	0.3	0.2	0.2	-	0.5	1.2	2.5	0.9	1.8	1.0	0.8	0.2
OCHPA	-	1.1	-	0.5	1.3	-	-	0.4	2.4	3.0	3.4	3.9	3.3	6.1	2.0
OTTMI	-	1.4	5.0	6.3	0.7	4.0	2.5	5.4	-	2.2	2.2	5.6	1.9	1.7	1.6
PERZS	-	6.0	3.5	2.6	5.5	3.8	3.8	-	5.0	3.2	4.4	-	6.0	5.7	3.4
PUCRC	-	-	-	-	4.4	-	2.2	-	5.2	4.1	3.6	0.8	1.1	4.4	5.8
ROTEC	4.1	-	0.2	-	-	-	-	4.1	-	-	-	-	-	-	2.9
SARAN	7.6	7.4	7.5	5.1	4.2	0.8	-	6.1	7.4	7.6	7.2	7.0	7.5	-	2.3
	7.5	7.4	7.6	7.3	3.3	-	1.2	5.6	7.2	7.6	7.3	6.8	7.5	5.3	3.3
	7.2	7.2	3.1	-	5.0	2.6	-	6.9	6.9	7.4	7.1	2.9	7.3	2.3	4.5
	7.5	4.3	4.4	1.8	1.8	0.4	-	5.9	7.3	7.3	7.0	2.7	3.1	2.2	0.3
SCALE	-	1.6	2.6	-	3.9	2.7	-	-	-	1.8	5.7	4.0	0.5	-	4.4
SCHHA	4.8	-	-	-	-	1.7	1.0	-	0.4	2.8	-	3.3	-	4.3	4.9
SLAST	-	4.8	3.8	0.9	4.2	6.1	-	-	5.1	3.9	-	1.3	3.4	3.4	5.9
	-	4.3	-	-	4.5	6.1	-	-	5.6	3.7	-	-	4.9	3.7	6.1
STOEN	-	3.0	2.1	0.2	5.2	1.4	0.7	-	6.4	3.2	5.1	4.7	0.9	4.5	6.2
	-	3.1	3.8	0.3	5.0	1.4	0.8	-	6.5	3.2	5.6	4.7	0.5	4.8	6.3
	-	2.2	2.9	0.2	4.8	1.5	0.8	-	6.5	3.3	5.6	4.2	0.7	5.0	6.3
STRJO	4.5	-	-	-	-	-	-	-	-	-	-	4.5	-	3.5	4.5
	4.3	-	-	-	-	2.0	-	-	-	1.4	-	4.5	0.2	3.7	4.1
	4.3	-	-	-	-	0.6	-	-	0.8	0.8	-	3.0	0.2	2.5	3.6
	4.3	-	-	-	-	-	-	-	-	-	-	4.1	-	3.7	4.4
	4.3	-	-	-	-	1.8	-	-	1.4	0.6	-	3.4	-	3.0	4.4
TEPIS	-	5.5	4.4	4.7	5.4	4.0	-	-	-	4.1	5.5	2.3	4.1	5.5	1.1
	-	2.7	1.2	0.8	1.9	0.8	-	-	1.0	1.9	2.4	0.6	2.1	1.9	-
TRIMI	-	1.9	0.3	-	1.0	2.2	-	-	3.6	3.1	1.9	-	3.4	2.1	1.6
ZELZO	-	-	-	-	-	2.0	-	-	-	-	-	-	-	2.3	-
Sum	201.2	223.5	184.7	127.0	198.9	212.3	80.2	137.5	269.3	233.2	275.4	210.7	198.1	244.1	285.1

3. Results (Meteors)

June	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	-	11	22	22	28	3	15	8	-	23	2	22	12	7	28
BANPE	-	3	3	-	4	5	7	-	3	6	4	-	8	-	-
BERER	-	-	-	-	20	21	14	-	-	-	-	-	-	-	-
	-	-	-	-	8	5	6	-	-	-	-	-	-	-	-
BOMMA	18	18	11	9	28	12	14	11	1	20	8	1	5	15	29
BREMA	-	-	6	8	-	12	7	3	12	14	15	4	1	-	14
BRIBE	2	-	4	14	-	14	10	12	10	3	16	4	15	-	22
	3	1	7	13	-	6	5	4	5	6	20	1	16	8	-
CASFL	11	14	-	17	9	5	-	20	12	15	10	3	3	-	11
	2	8	-	8	1	6	-	8	5	5	7	-	2	1	7
CRIST	6	4	6	15	11	9	1	4	12	11	10	-	12	6	14
	8	3	10	13	20	7	1	2	12	10	18	-	8	-	-
	25	33	17	29	26	15	1	7	33	26	34	1	16	5	11
DINJE	24	29	24	14	28	30	22	14	28	25	19	2	13	23	36
ELTMA	2	3	5	-	8	9	9	9	10	7	7	-	3	11	9
FORKE	4	9	4	16	15	2	-	-	-	12	-	4	9	-	19
GONRU	19	21	12	21	6	11	-	-	24	-	29	15	-	16	7
	14	23	12	8	6	13	-	-	16	-	16	11	-	14	5
	10	4	5	4	4	4	-	2	3	-	9	6	-	5	4
	11	14	11	18	5	9	-	-	10	-	13	9	1	12	4
	9	3	7	3	2	6	-	-	15	-	17	11	-	8	2
GOVMI	-	-	-	-	-	15	17	15	5	15	8	9	10	12	-
HERCA	17	14	16	14	1	4	13	-	-	7	9	12	20	21	17
HINWO	6	17	10	13	15	1	6	-	-	7	1	4	9	-	22
IGAAN	5	5	5	3	2	3	9	2	7	8	3	3	4	-	-
	2	8	5	3	7	3	3	4	4	3	2	6	-	-	-
	4	2	1	2	-	3	1	-	-	-	4	2	1	-	1
JONKA	6	8	1	3	5	8	8	2	-	3	2	10	4	-	3
	1	2	6	4	7	1	4	1	-	6	4	6	14	-	10
KACJA	15	17	5	17	13	19	25	25	8	14	11	10	14	-	-
	-	-	-	-	-	9	-	-	-	-	-	7	6	-	-
	5	1	-	6	3	-	8	6	4	1	2	3	7	-	-
	8	14	5	12	9	14	27	34	14	11	25	9	14	-	-
	12	11	5	10	8	10	11	9	3	5	7	10	6	-	-
KISSZ	6	5	-	1	2	-	5	1	2	2	2	4	3	1	4
KOSDE	45	8	10	8	9	16	33	37	51	11	31	28	17	32	42
	51	24	35	8	-	14	20	30	27	49	76	50	1	67	3
	-	1	1	6	1	7	5	5	4	8	7	3	-	-	9
LOJTO	-	2	1	-	-	7	-	-	-	-	-	-	2	4	-
MACMA	13	17	5	28	34	21	7	5	6	5	30	9	19	33	-
	7	11	11	11	13	17	9	1	8	1	15	11	20	18	-
	9	11	3	9	9	12	6	-	11	6	-	9	8	12	-
	13	10	12	16	24	21	12	2	13	4	14	13	24	18	-
MARGR	-	-	-	1	3	-	-	4	20	25	19	16	20	21	19
MARRU	12	8	-	3	6	3	1	-	9	-	11	-	-	9	8
	5	9	2	7	5	1	-	-	4	-	8	3	1	8	12
MASMI	-	-	-	-	-	-	1	2	-	1	1	4	4	-	1
MOLSI	-	23	11	30	29	-	2	-	-	-	19	6	7	-	6
	-	10	15	9	16	-	1	-	-	-	4	1	1	-	-
	-	-	10	13	29	-	4	-	-	-	5	4	-	-	1
	5	11	11	27	21	5	30	21	-	21	4	33	23	-	24
	3	5	15	18	19	10	22	21	-	20	4	22	13	-	25
	2	10	9	-	3	5	12	10	-	12	7	21	12	-	2
	-	7	21	30	21	8	20	32	-	30	12	20	13	-	18
MOSFA	2	2	3	4	4	3	-	8	8	14	11	-	-	-	3
OCHPA	-	1	5	2	-	5	-	10	6	11	-	1	2	-	-
OTTMI	6	6	-	5	5	1	6	1	6	2	-	-	-	-	-
PERZS	8	4	6	2	22	14	16	7	11	16	14	15	19	9	3
PUCRC	8	9	6	11	15	11	11	15	1	11	9	1	-	-	-
ROTEC	-	-	-	-	-	-	-	-	-	8	-	10	7	-	8
SARAN	6	10	-	10	3	-	-	-	5	-	6	-	-	6	22
	7	16	2	9	9	-	-	-	12	-	10	-	4	8	17
	13	15	7	5	8	-	-	-	12	-	11	-	-	16	26
	4	3	6	2	5	-	-	-	8	-	5	-	2	2	9
SCALE	-	5	4	8	7	3	3	5	-	6	2	-	1	-	-
SCHHA	1	-	5	6	2	5	9	6	9	4	16	5	10	-	8
SLAST	3	8	4	9	7	11	15	12	5	12	19	5	9	2	-
	5	4	2	4	2	3	7	3	5	6	9	1	3	1	-
STOEN	-	-	-	-	-	12	3	20	20	24	3	2	2	13	9
	1	8	9	16	13	5	1	23	14	15	10	1	-	5	8
	5	12	13	11	15	15	1	24	15	16	-	7	5	13	4
STRJO	-	-	4	16	1	14	13	12	17	6	17	3	15	-	10
	4	-	3	8	3	13	12	7	7	6	10	5	5	-	11
	1	-	7	3	-	8	4	7	4	1	8	1	14	-	6
	1	-	8	12	-	12	11	4	9	5	7	6	20	-	8
	-	-	9	9	-	8	5	6	7	5	8	1	11	-	10
TEPIS	5	5	5	4	5	6	5	-	1	1	3	5	3	1	2
	8	14	8	14	16	11	10	-	9	9	8	13	16	1	9
TRIMI	7	1	-	5	7	9	6	9	5	6	4	12	12	3	-
ZELZO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sum	515	595	513	719	692	610	572	552	607	642	791	536	581	467	622

June	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
ARLRA	19	-	-	-	-	-	-	26	12	4	-	1	-	1	20
BANPE	-	9	1	-	-	-	-	-	-	5	4	-	11	9	5
BERER	-	-	-	-	-	-	-	-	-	-	29	-	-	2	26
	-	-	-	-	-	-	-	-	-	-	8	-	-	-	11
BOMMA	-	3	8	2	12	10	11	1	12	33	21	18	27	13	30
BREMA	12	-	-	-	-	-	1	-	6	-	-	9	-	11	22
BRIBE	9	-	1	-	-	5	-	-	-	-	-	16	-	10	19
	8	-	1	-	-	1	1	-	7	2	-	1	-	12	18
CASFL	-	7	2	2	8	4	-	5	19	14	10	21	5	9	12
	-	2	4	2	2	3	-	2	13	15	11	15	5	5	8
CRIST	7	13	19	5	7	7	-	10	23	19	15	19	17	3	9
	-	9	13	2	-	8	-	8	16	17	13	11	10	8	7
	16	34	28	13	9	9	4	21	48	34	29	40	28	12	25
DINJE	4	11	21	5	24	32	10	1	41	26	22	24	36	20	29
ELTMA	-	-	6	-	16	4	-	-	20	4	11	23	8	11	19
FORKE	12	-	-	-	-	-	-	1	16	7	2	2	-	5	22
GONRU	28	33	29	23	23	16	5	27	32	23	39	35	21	11	9
	24	24	23	15	19	7	5	26	13	14	24	26	14	8	2
	6	5	12	8	4	5	-	8	10	5	6	8	4	8	-
	20	16	19	22	19	11	2	19	25	12	32	32	16	8	4
	25	19	21	9	27	6	-	33	24	11	27	22	22	4	-
GOVMI	-	17	4	-	-	9	-	-	17	3	6	-	20	24	3
HERCA	14	5	16	19	13	22	15	7	9	3	11	1	4	16	-
HINWO	15	-	-	-	-	2	-	-	21	11	1	-	-	2	15
IGAAN	2	7	1	-	7	8	4	-	-	1	7	-	13	-	3
	-	-	-	-	6	4	4	-	-	-	9	-	4	5	7
	-	1	4	4	4	2	-	-	-	-	5	-	-	5	3
JONKA	-	-	8	1	4	8	3	-	-	-	11	-	-	7	4
	-	3	7	-	4	6	-	-	-	1	6	-	-	7	3
KACJA	-	14	2	1	-	12	-	-	28	11	2	-	25	-	29
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	4	2	-	-	6	-	-	11	7	2	-	5	5	7
	-	12	4	1	-	28	-	-	45	18	14	-	35	-	28
	-	5	-	2	-	5	-	-	22	9	2	-	14	-	22
KISSZ	-	4	1	2	3	4	4	-	-	-	6	-	-	4	2
KOSDE	40	30	29	20	7	15	-	-	-	22	60	63	-	-	-
	12	6	-	-	78	64	72	36	15	61	71	98	71	50	56
	3	4	-	-	-	1	1	-	4	2	-	6	1	5	3
LOJTO	-	2	-	-	-	6	-	4	-	2	-	-	-	-	-
MACMA	13	23	2	-	11	27	-	7	4	4	20	-	-	-	24
	11	15	-	-	10	18	3	8	1	6	16	-	-	-	18
	15	9	-	-	6	15	1	4	-	2	9	-	2	-	13
	19	18	-	-	16	25	3	5	2	2	16	-	1	-	26
MARGR	25	14	14	25	19	17	6	-	15	18	5	5	14	-	-
MARRU	14	12	5	8	-	1	13	-	19	23	19	26	27	22	3
	11	10	11	11	10	-	-	11	21	16	11	20	13	18	7
MASMI	4	3	3	5	1	2	1	6	1	6	-	9	7	8	10
MOLSI	14	24	1	-	-	-	-	7	60	29	3	28	3	18	31
	1	5	-	-	-	1	-	3	33	9	2	9	2	6	14
	6	12	-	-	-	2	-	1	41	26	-	10	4	21	21
	26	-	-	-	1	-	-	27	4	-	-	-	-	4	33
	19	-	1	-	-	-	-	19	1	-	-	-	-	3	22
	-	-	-	-	-	1	-	5	2	-	-	-	-	2	2
	28	-	-	-	-	-	-	32	4	-	-	-	-	10	34
MOSFA	-	5	1	2	1	1	-	5	7	16	5	13	6	5	1
OCHPA	-	3	-	4	2	-	-	2	2	10	4	10	5	11	2
OTTMI	-	2	10	9	4	8	13	8	-	8	8	9	2	8	4
PERZS	-	23	11	6	27	5	9	-	12	8	16	-	27	19	7
PUCRC	-	-	-	-	7	-	4	-	8	9	5	1	4	7	15
ROTEC	15	-	1	-	-	-	-	4	-	-	-	-	-	-	9
SARAN	13	8	12	15	4	2	-	11	19	12	20	18	10	-	2
	15	13	8	6	6	-	2	15	20	19	25	31	21	22	5
	30	23	16	-	6	1	-	24	13	24	31	20	19	17	7
	9	6	13	7	4	1	-	10	14	14	10	10	13	8	1
SCALE	-	4	5	-	7	2	-	-	-	7	10	9	3	-	12
SCHHA	14	-	-	-	-	4	2	-	1	4	-	10	-	19	19
SLAST	-	15	8	1	13	16	-	-	7	6	-	1	13	7	14
	-	5	-	-	2	5	-	-	3	1	-	-	4	7	7
STOEN	-	14	9	1	31	4	3	-	36	23	12	41	6	18	19
	-	13	9	2	17	3	3	-	39	15	16	24	4	19	18
	-	11	9	1	27	3	4	-	38	19	22	30	5	21	20
STRJO	10	-	-	-	-	-	-	-	-	-	-	15	-	8	19
	12	-	-	-	-	5	-	-	-	2	-	17	1	8	19
	6	-	-	-	-	4	-	-	2	1	-	6	2	5	14
	10	-	-	-	-	-	-	-	-	-	-	6	-	3	17
	11	-	-	-	-	1	-	-	2	2	-	7	-	8	16
TEPIS	-	3	5	9	10	2	-	-	-	4	11	1	11	14	1
	-	18	7	5	13	7	-	-	9	15	21	4	15	16	-
TRIMI	-	6	2	-	5	7	-	-	11	7	5	-	6	4	4
ZELZO	-	-	-	-	-	3	-	-	-	-	-	-	-	6	-
Sum	627	616	449	275	556	523	209	449	960	763	838	881	666	672	992