Results of the IMO Video Meteor Network – October 2017

Sirko Molau, Abenstalstr. 13b, 84072 Seysdorf *2018/07/10*

After a mediocre September we enjoyed another record-breaking October in the IMO video network. The number of cameras was slowly growing, as the CILBO cameras went back to operation in late October, but also the weather was unusually pleasant. In particular southern Europe was hardly hampered by clouds at night, but also Slovenia was lucky this time. Germany and Poland, on the other hand, had to cope with longer breaks due to poor weather. Overall 58 of 79 cameras recorded meteors in 20 or more observing nights, BMH2 of Maurizio Carli observed in every night.

The effective observing time accumulated to over 12,800 hours and outraced even August 2017. The output was 15% higher than in the previously best October and the third best monthly result of the IMO network ever. We recorded over 66,000 meteors during that time, which is a plus of over 20% to the previously best October. The average of 5.2 meteors per hour matched to the result of the previous years, however.

October is always an interesting month thanks to the multitude of active meteor showers, some of which we will inspect more closely now.

The October Camelopardalids play a special role since their nature is still under discussion. They have a very small full width at half maximum (FWHM) and can thus be observed only every other year when the peak falls into the night time hours of the corresponding location. Some researcher state that the Camelopardalids are only occasionally active, whereas we believe in a shower that returns annually. The average profile of 2011-2016 shows a peak at 192.59°solar longitude (figure 1, green) with a peak flux density of about 7 meteoroids per 1,000 km^2 and hours and a FWHM of less than 0.2° solar longitude (<5 hours). The peak was expected to be well visible in Europe on October 5, 2017, near 21:30 UT. The Camelopardalids reached their peak indeed in the evening hours, but somewhat earlier and much stronger than anticipated (figure 1, red). At 19:20 UT (192.50° solar longitude) we could measure temporarily a flux density of almost 30 meteoroids per 1,000 km^2 and hour. The FWHM was only 0.015° solar longitude resp. 20 minutes.

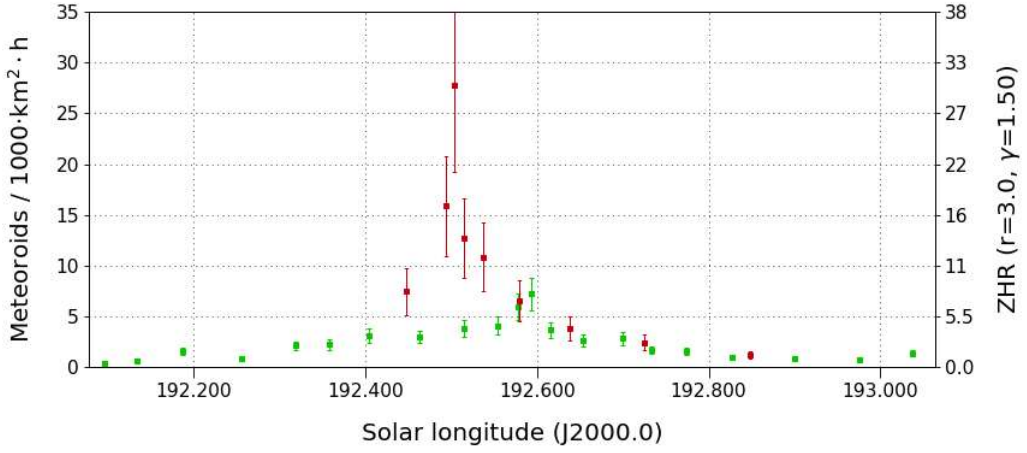

Figure 1: *Comparison of the flux density profile of the October Camelopardalids 2011-2016 (green) and 2017 (red), derived from video data of the IMO Network*

Because of the short duration, the activity profile relies on a small data set – in this case about 60 shower meteors that were recorded by the IMO network cameras in total. To make sure these are not false detection of a single camera or similar artifacts, we inspected the relevant data set manually. Indeed, there were about a dozen cameras in Germany, Italy, Hungary and Portugal

with clear skies in the first two evening hours that recorded clearly more October Camelopardalids than sporadic or other shower meteors. Thus, the activity peak was real and the equivalent ZHR (eZHR) reached almost 30 for a short period of time.

To determine the population index of the October Camelopardalids we had to combine the observations from 2011 till 2017. The data set of about 300 shower meteors yielded in total a population index of r=1.75 (figure 2). At the same time, the average sporadic population index was higher than 2.5, i.e. the Camelopardalids contain a large fraction of bright meteors.

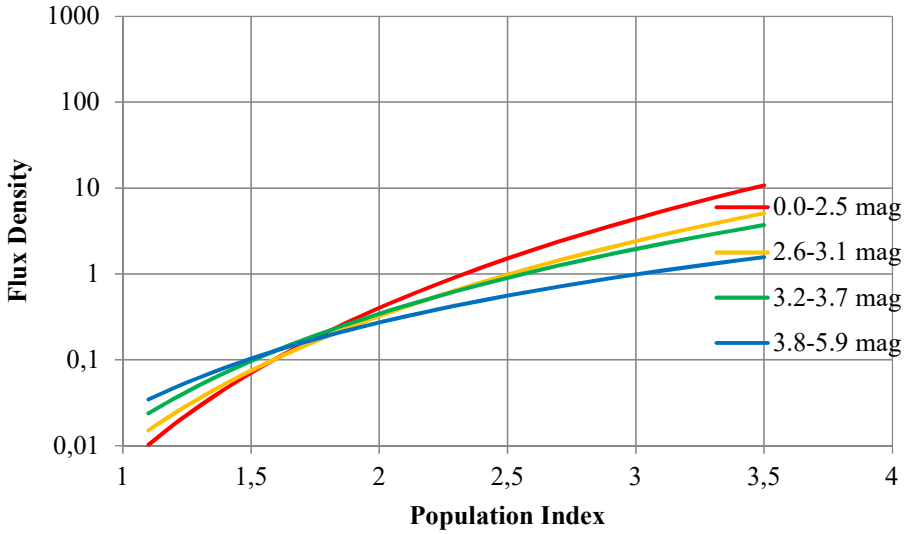

Figure 2: *Population index of the October Camelopardalids. The individual flux density profiles intersect exactly at one point with r=1.75.*

At the middle of October, we may observe the October Ursae Majorids. In the long-term activity profile, this shower peaks at 202.2° solar longitude (October 15, 2017, 15 UT) with a flux density of slightly more than four meteoroids per 1,000 km^2 and hour. The peak could not be observed this year, but we recorded about the same flux density of three in the night before and thereafter (figure 3). Since the peak of the October Ursae Majorids occurred just before new moon and we have seen systematically lower flux densities at this lunar phase, the lower activity level of 2017 seems not to be significant.

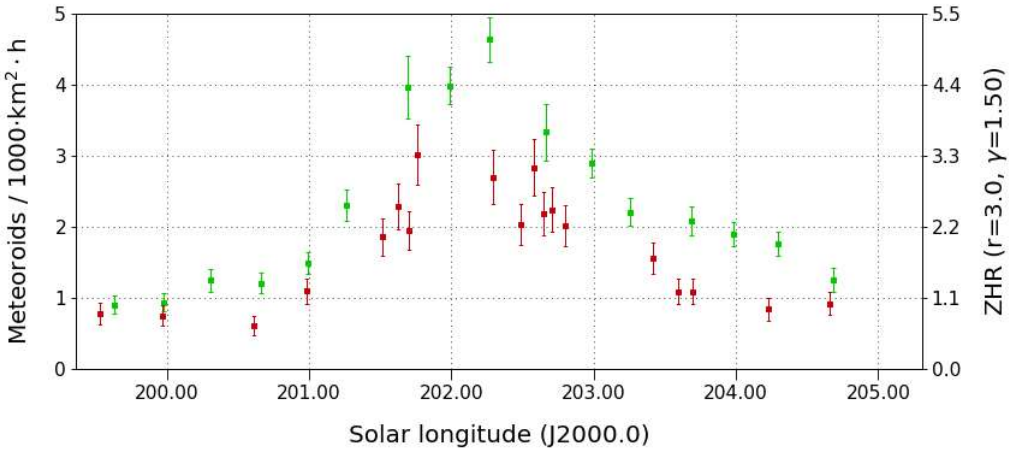

Figure 3: *Flux density profile of the October Ursae Majorids 2011-2016 (green) and 2017 (red), derived from video data of the IMO Network.*

The same is true for the Orionids which peaked a few days later. They were undisturbed by the moon and presented lower flux densities as well. Figure 4 shows that the activity profiles look nearly identical each year, but the absolute level of activity differs. In years with favorable lunar conditions (2014, 2017) the activity is virtually lower, and in years with full or waning moon as in 2013 virtually higher.

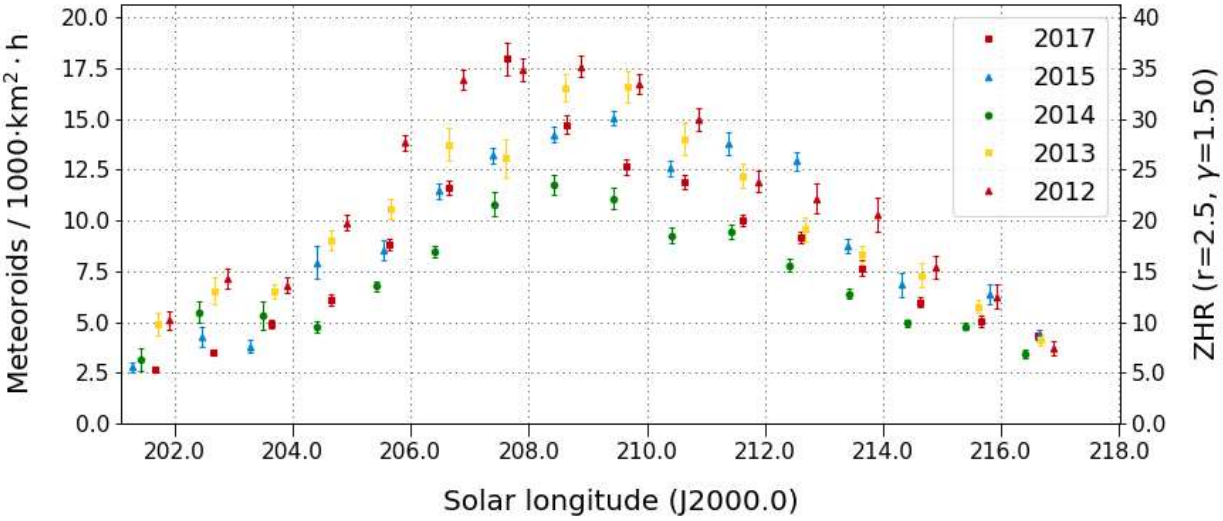

Figure 4: *Comparison of the Orionid flux density in individual years, derived from video data of the IMO Network.*

Orionid activity profiles can only be merged if the bin size is at least one degree in solar longitude such that each data point covers observations from every year. Figure 5 compares the activity profile of 2017 with the average profile of 2012 till 2016. In the ascending and the first half of the descending branch the flux density is somewhat lower than average and at the peak slightly higher.

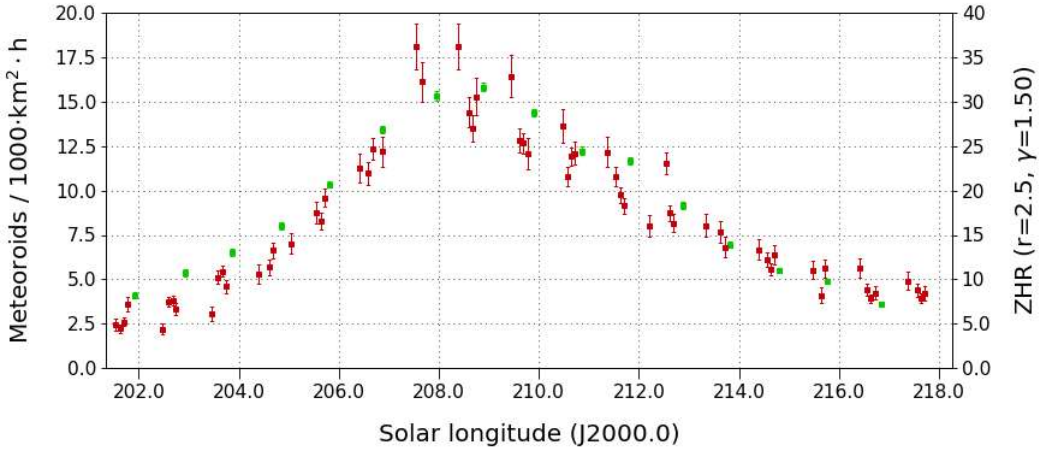

Figure 5: *Flux density profile of the Orionids 2012-2016 (green) and 2017 (red), derived from video data of the IMO Network.*

The Leonis Minorids reach their peak in the long-term average at the same time as the Orionids (208° solar longitude) und thus three days earlier than listed in the IMO Working List. This year

they showed a peak at both 208° and 210° solar longitude (figure 6), whereby there is some scatter.

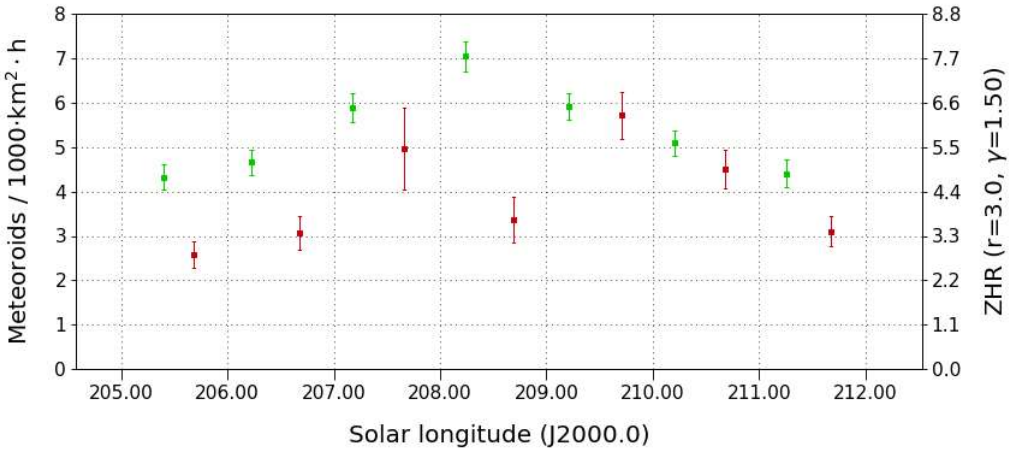

Figure 6: *Flux density profile of the Leonis Minorids 2011-2016 (green) and 2017 (red), derived from video data of the IMO Network.*

With respect to the population index, the October Ursae Majorids, Orionids and Leonis Minorids are quite similar (figure 7). Even though data from all years are averaged, the r-profiles show significant scatter that occurs synchronously at shower and sporadic meteors. These are systematic deviations with still unknown root cause. The population index of the October Ursae Majorids and Leonis Minorids is r=1.95, and of the Orionids r=2.15. The mean sporadic population index in r=2.45 in all three cases.

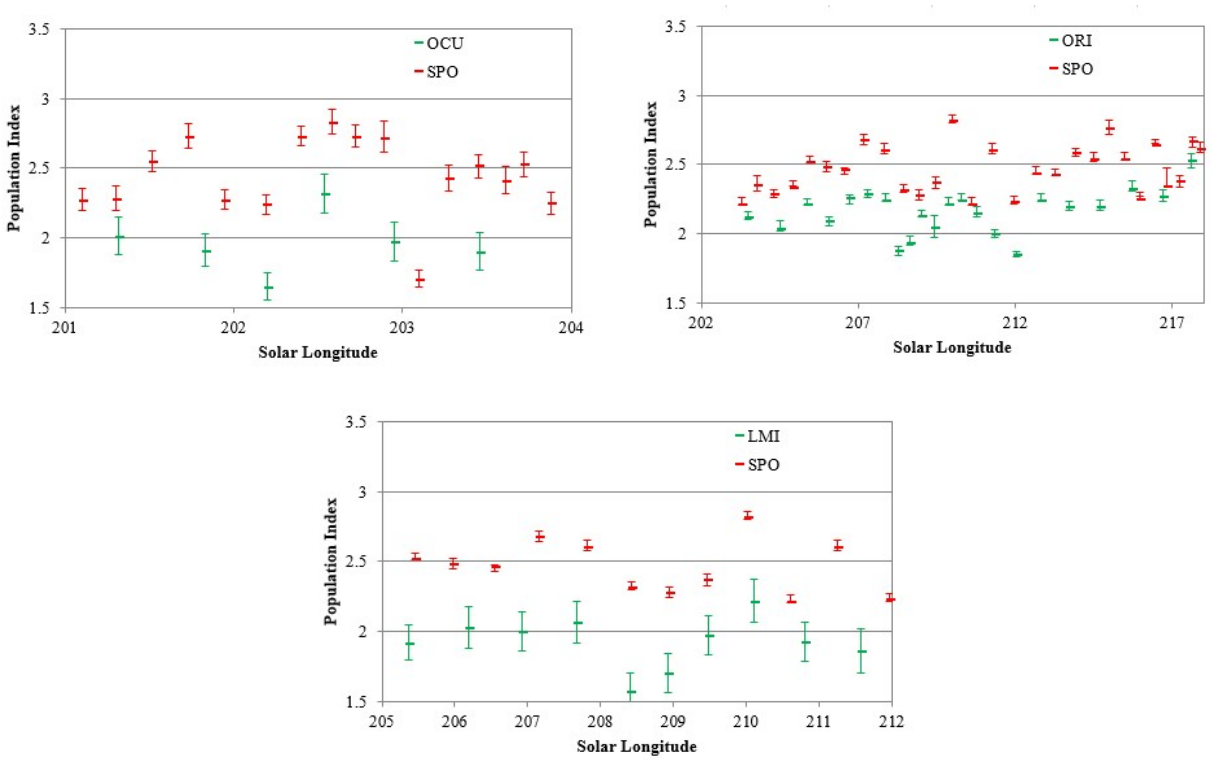

Figure 7: *Mean population index profile of the October Ursae Majorids (up left), Orionids (up right) and Leonis Minorids (down), derived from data of 2011-2017. The r-value of the meteor shower is depicted in green, of the sporadic meteors in red.*

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	25	133.7	930
BERER	Berkó	Ludanyhalaszi/HU	HULUD1 (0.8/3.8)	5542	4.8	3847	16	140.0	759
BOMMA	Bombardini	Faenza/IT	MARIO (1.2/4.0)	5794	3.3	739	28	243.1	1590
BREMA	Breukers	Hengelo/NL	MBB3 (0.75/6)	2399	4.2	699	21	90.4	315
BRIBE	Klemt	Herne/DE	HERMINE (0.8/6)	2374	4.2	678	20	117.2	478
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2286	4.6	1080	22	117.4	497
CARMA	Carli	Monte Baldo/IT	BMH2 (1.5/4.5)*	4243	3.0	371	31	297.0	2871
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	5.0	1611	28	281.4	1304
CINFR	Cineglosso	Faenza/IT	JENNI (1.2/4)	5886	3.9	1222	27	152.8	1772
CRIST	Crivello	Valbrevenna/IT	ARCI (0.8/3.8)	5566	4.6	2575	29	236.2	1428
			BILBO (0.8/3.8)	5458	4.2	1772	29	238.2	1882
			C3P8 (0.8/3.8)	5455	4.2	1586	28	221.0	1164
			STG38 (0.8/3.8)	5614	4.4	2007	30	249.0	2512
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5631	4.3	2151	19	141.1	647
FORKE	Förster	Carlsfeld/DE	AKM3 (0.75/6)	2375	5.1	2154	12	75.5	645
GONRU	Goncalves	Foz do Arelho/PT	FARELHO1 (0.75/4.5)	2286	3.0	208	20	156.6	179
		Tomar/PT	TEMPLAR1 (0.8/6)	2179	5.3	1842	28	259.7	1596
			TEMPLAR2 (0.8/6)	2080	5.0	1508	27	264.0	1311
			TEMPLAR3 (0.8/8)	1438	4.3	571	26	240.6	551
			TEMPLAR4 (0.8/3.8)	4475	3.0	442	26	249.2	1259
			TEMPLAR5 (0.75/6)	2312	5.0	2259	26	225.2	1176
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1447	5.5	1841	29	218.8	958
			ORION4 (0.95/5)	2662	4.3	1043	14	91.6	196
HERCA	Hergenrother	Tucson/US	SALSA3 (0.8/3.8)	2336	4.1	544	30	286.0	1277
HINWO	Hinz	Schwarzenberg/DE	HINWO1 (0.75/6)	2291	5.1	1819	16	104.0	587
IGAAN	Igaz	Hodmezovasar./HU	HUHOD (0.8/3.8)	5502	3.4	764	15	69.0	156
		Budapest/HU	HUPOL (1.2/4)	3790	3.3	475	21	159.1	166
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4)	2286	3.9	445	26	180.8	501
			HUSOR2 (0.95/3.5)	2465	3.9	715	26	216.3	495
KACJA	Kac	Kamnik/SI	CVETKA (0.8/3.8)	4914	4.3	1842	26	193.7	1336
		Kostanjevec/SI	METKA (0.8/12)*	715	6.4	640	27	253.0	1280
		Ljubljana/SI	ORION1 (0.8/8)	1399	3.8	268	25	216.0	1289
		Kamnik/SI	REZIKA (0.8/6)	2270	4.4	840	25	209.7	2280
			STEFKA (0.8/3.8)	5471	2.8	379	22	178.1	931
KOSDE	Koschny	Izana Obs./ES	ICC7 (0.85/25)*	714	5.9	1464	7	57.9	367
		La Palma / ES	ICC9 (0.85/25)*	683	6.7	2951	4	29.5	638
		Izana Obs./ES	LIC1(2.8/50)*	2255	6.2	5670	6	48.2	470
LOPAL	Lopes	Lisboa/PT	NASO1 (0.75/6)	2377	3.8	506	16	124.4	225
MACMA	Maciejewski	Chelm/PL	PAV35 (0.8/3.8)	5495	4.0	1584	13	53.0	235
			PAV36 (0.8/3.8)*	5668	4.0	1573	14	90.3	416
			PAV43 (0.75/4.5)*	3132	3.1	319	14	5.6	28
			PAV60 (0.75/4.5)	2250	3.1	281	14	92.9	435
MARRU	Marques	Lisbon/PT	CAB1 (0.75/6)	2362	4.8	1517	29	260.8	1441
			RAN1 (1.4/4.5)	4405	4.0	1241	26	227.4	1021
MASMI	Maslov	Novosimbirsk/RU	NOWATEC (0.8/3.8)	5574	3.6	773	17	113.3	553
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1230	6.9	6152	26	183.8	1814
			ESCIMO2 (0.85/25)	155	8.1	3415	13	107.3	283
			MINCAM1 (0.8/8)	1477	4.9	1084	16	113.2	604
		Ketzür/DE	REMO1 (0.8/8)	1467	6.5	5491	22	123.4	883
			REMO2 (0.8/8)	1478	6.4	4778	23	141.9	1113
			REMO3 (0.8/8)	1420	5.6	1967	24	158.8	942
			REMO4 (0.8/8)	1478	6.5	5358	26	158.5	1301
MOSFA	Moschini	Rovereto/IT	ROVER (1.4/4.5)	3896	4.2	1292	27	228.5	685
OCHPA	Ochner	Albiano/IT	ALBIANO (1.2/4.5)	2944	3.5	358	19	138.4	606
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	3.8	460	20	132.1	305
PERZS	Perkó	Becsehely/HU	HUBEC (0.8/3.8)*	5498	2.9	460	28	237.8	1641
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2366	4.5	911	21	134.5	437
SARAN	Saraiva	Carnaxide/PT	RO1 (0.75/6)	2362	3.7	381	29	198.7	526
			RO2 (0.75/6)	2381	3.8	459	28	220.4	817
			RO3 (0.8/12)	710	5.2	619	28	239.6	1022
			RO4 (1.0/8)	1582	4.2	549	28	175.3	360
			SOFIA (0.8/12)	738	5.3	907	29	209.2	583
SCALE	Scarpa	Alberoni/IT	LEO (1.2/4.5)*	4152	4.5	2052	24	144.6	230
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	4900	3.0	409	23	119.9	463
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	563	6.2	1294	26	151.6	1054
			KAYAK2 (0.8/12)	741	5.5	920	25	210.9	288
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5566	4.8	3270	26	155.1	1242
			NOA38 (0.8/3.8)	5609	4.2	1911	28	170.1	1018
			SCO38 (0.8/3.8)	5598	4.8	3306	27	173.7	1148
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2354	5.4	2751	24	117.2	869
			MINCAM3 (0.8/6)	2338	5.5	3590	20	98.1	436
			MINCAM4 (0.8/6)	2306	5.0	1412	22	109.9	247
			MINCAM5 (0.8/6)	2349	5.0	1896	21	105.6	511
			MINCAM6 (0.8/6)	2395	5.1	2178	18	95.3	429
TEPIS	Tepliczky	Agostyan/HU	HUAGO (0.75/4.5)	2427	4.4	1036	19	149.3	516
			HUMOB (0.8/6)	2388	4.8	1607	24	177.3	762
WEGWA	Wegrzyk	Nieznaszyn/PL	PAV78 (0.8/6)	2286	4.0	778	23	90.0	375
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM (0.8/6)	2337	5.5	3574	15	68.9	280
ZAKJU	Zakrajšek	Petkovec/SI	TACKA (0.8/12)	714	5.3	783	27	200.2	534
Sum							31	12847.8	66471

* active field of view smaller than video frame

2. Observing Times (h)

October	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	7.6	-	6.4	-	2.7	5.4	-	9.4	2.6	0.2	1.5	6.7	4.6	9.5	9.6
BERER	10.6	7.7	-	-	-	10.9	6.5	-	8.2	-	-	7.1	10.7	10.7	10.4
BOMMA	-	10.2	-	4.4	8.2	5.8	6.6	10.5	4.9	11.2	11.2	11.4	11.3	11.4	11.4
BREMA	-	1.7	-	-	2.3	0.3	-	9.7	-	-	-	3.9	3.5	7.6	11.3
BRIBE	-	1.2	2.0	-	3.1	-	-	8.2	-	-	-	3.8	6.1	11.5	11.3
	1.8	-	2.9	-	4.6	0.7	-	2.2	-	-	0.9	6.5	5.9	11.3	11.3
CARMA	2.7	1.8	9.0	7.5	8.7	11.2	2.5	11.3	9.7	9.2	8.8	11.5	11.5	11.6	11.6
CASFL	2.8	-	8.3	7.2	7.8	11.1	2.3	11.2	9.4	8.1	7.8	11.4	11.5	11.5	11.6
CRIST	-	6.2	-	3.1	5.4	2.8	3.5	7.3	2.3	9.4	7.2	7.4	7.4	7.6	9.1
	0.2	3.3	0.5	-	0.7	9.4	3.4	10.8	3.7	9.6	-	11.1	9.3	10.5	11.3
	0.2	-	0.2	-	1.7	10.6	3.0	10.9	3.7	10.9	0.3	11.1	10.0	11.2	11.3
	0.3	3.3	-	-	0.6	10.8	3.5	10.9	3.9	10.8	0.2	3.9	10.6	11.2	11.3
DONJE	0.2	3.7	0.6	-	1.9	10.4	3.2	10.9	5.7	11.0	0.6	11.1	9.3	11.2	11.3
ELTMA	-	4.0	-	-	-	7.7	3.6	9.8	9.2	10.7	5.7	3.1	3.1	-	9.7
FORKE	-	-	0.7	-	-	-	-	-	-	-	3.1	5.1	1.5	7.1	11.4
GONRU	10.4	-	-	-	10.5	-	10.4	-	1.2	-	8.0	1.1	-	-	-
	10.6	10.6	9.1	1.9	10.6	10.6	10.8	7.2	10.6	10.9	9.3	6.6	10.1	3.3	8.6
	10.7	10.8	9.2	-	11.0	11.0	11.0	10.1	11.0	11.1	10.4	6.6	9.8	3.1	7.8
	10.7	9.9	8.4	-	10.7	10.8	10.8	3.0	10.9	10.9	6.7	6.1	9.6	-	4.1
	10.8	10.8	9.1	-	10.8	10.7	10.9	10.0	-	11.0	8.8	6.5	10.1	3.3	6.8
	10.5	9.9	8.3	-	9.4	6.6	10.5	3.6	7.9	10.1	8.0	6.1	-	1.1	6.7
GOVMI	7.4	10.3	0.4	1.1	2.4	9.5	7.8	7.0	-	4.5	11.1	11.1	11.2	11.0	11.1
	8.8	9.2	-	-	0.8	4.7	2.8	6.5	-	3.7	9.9	7.9	10.2	-	5.2
HERCA	10.6	10.7	10.5	10.7	1.8	10.0	10.7	8.0	10.9	11.1	10.6	2.7	5.3	-	10.4
HINWO	7.2	-	-	-	-	-	-	1.5	-	-	5.8	6.7	6.4	11.5	11.5
IGAAN	6.0	7.4	1.3	1.7	0.3	3.4	3.4	6.1	4.5	1.8	7.5	5.1	7.2	7.2	6.1
	7.9	8.1	5.5	-	-	10.0	5.7	-	-	-	9.9	6.3	9.7	10.3	10.5
JONKA	7.2	10.5	4.9	0.3	0.7	6.9	5.3	1.9	1.4	-	10.2	5.1	9.8	11.3	11.3
	8.2	10.4	5.3	2.9	1.7	10.9	6.4	6.9	3.0	-	11.2	7.9	10.2	11.4	11.3
KACJA	10.2	7.4	1.9	-	-	1.1	6.9	2.6	-	0.7	8.3	9.6	8.3	9.6	10.2
	9.6	8.2	3.6	-	-	8.6	6.0	9.1	-	4.8	11.1	10.2	10.9	11.4	11.4
	10.6	6.6	-	-	-	6.9	7.7	9.0	-	5.2	11.0	7.2	8.8	7.0	7.8
	9.6	6.8	2.1	-	-	6.2	5.8	2.1	-	-	11.1	10.9	9.1	10.2	11.4
	-	-	-	-	-	-	5.6	3.2	-	0.7	11.0	10.9	9.0	9.6	8.5
KOSDE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LOPAL	-	10.2	10.2	10.1	10.1	9.6	8.8	9.9	9.0	8.6	8.0	5.5	-	1.6	1.7
MACMA	4.9	1.1	-	-	4.4	-	4.8	1.0	3.0	1.3	-	3.6	1.8	-	1.2
	10.7	7.7	-	-	0.8	-	10.1	5.1	4.9	4.1	-	4.2	2.8	-	4.2
	0.4	0.4	-	-	0.4	-	0.4	0.4	0.4	0.4	-	0.4	0.4	-	0.4
	10.6	8.2	-	-	0.8	-	10.1	5.3	5.0	4.6	-	4.2	3.0	-	5.6
MARRU	9.7	9.7	9.7	9.7	10.3	10.8	10.7	9.4	9.9	8.9	6.8	7.3	6.7	1.2	10.0
	8.2	10.2	9.6	10.5	9.7	9.5	10.0	10.8	10.8	10.8	8.2	-	0.8	2.1	2.0
MASMI	0.2	8.0	2.4	4.2	-	-	7.4	10.6	-	0.7	-	10.7	10.7	10.8	1.5
MOLSI	9.7	-	9.4	-	4.0	-	-	0.3	1.3	3.6	10.3	10.6	10.8	10.8	10.9
	10.5	-	10.5	-	-	-	-	-	-	1.0	9.8	5.8	-	11.0	8.0
	9.0	-	9.5	-	-	-	-	-	-	-	-	-	-	-	-
	7.7	-	6.1	-	-	5.5	-	9.3	-	-	1.4	6.9	-	9.3	9.3
	8.6	-	5.2	-	-	5.1	-	10.0	0.8	-	1.6	9.5	2.5	10.8	10.9
	9.6	-	7.4	-	-	5.9	0.2	11.1	-	-	1.8	10.1	2.9	11.4	11.6
	9.2	-	7.2	-	-	6.1	-	11.0	1.2	0.3	1.7	10.4	2.8	11.4	11.5
MOSFA	-	-	5.8	3.1	4.0	11.1	1.3	11.1	9.7	3.9	0.2	10.7	11.5	11.5	11.6
OCHPA	-	-	-	-	-	-	-	-	2.1	2.8	-	9.8	9.2	7.9	8.2
OTTMI	4.9	10.8	3.0	6.0	-	-	7.9	11.1	4.9	-	-	-	-	-	2.7
PERZS	10.2	9.3	5.0	-	1.3	4.7	8.0	4.8	-	1.6	10.9	11.0	11.1	11.3	11.4
ROTEC	7.9	-	3.6	-	0.6	5.8	-	11.0	1.8	-	2.0	6.8	4.0	10.7	11.3
SARAN	6.4	9.2	8.5	7.2	7.3	6.6	7.2	7.9	9.0	10.1	8.7	3.1	1.1	4.5	1.9
	10.8	10.8	9.8	10.9	10.9	10.8	10.8	-	10.3	10.9	5.3	3.2	1.1	2.3	1.3
	10.5	10.5	9.5	10.6	10.6	8.0	10.6	-	10.0	10.6	8.3	4.0	-	4.4	3.2
	9.7	9.5	9.3	9.5	9.5	7.0	8.2	-	4.7	3.4	3.5	2.6	-	0.7	0.3
	8.7	8.9	9.6	9.5	10.5	7.5	10.9	11.0	10.9	9.8	8.5	3.0	0.7	3.9	1.3
SCALE	2.7	3.9	-	-	0.2	9.7	4.1	10.9	9.6	8.8	9.5	5.1	6.1	-	7.6
SCHHA	-	-	1.7	-	7.0	-	0.2	0.2	-	4.8	2.5	7.4	7.3	11.3	10.4
SLAST	8.6	1.4	0.3	-	-	-	3.2	3.8	0.7	2.0	6.3	5.2	8.5	6.7	7.1
	10.0	7.1	-	-	-	6.1	7.8	9.5	1.6	6.6	10.8	9.5	9.2	7.0	7.7
STOEN	0.6	3.3	2.6	0.8	0.3	10.3	3.5	10.5	9.6	6.6	-	6.1	2.5	3.5	6.3
	0.3	3.5	1.8	0.7	-	9.8	3.3	10.0	9.0	9.6	0.6	6.6	2.6	8.2	9.4
	-	3.9	4.4	0.9	0.2	10.2	3.0	10.6	7.5	9.8	0.3	7.1	2.6	9.3	10.6
STRJO	2.6	0.9	3.1	-	3.1	0.5	-	7.2	-	-	0.9	8.6	5.2	11.4	11.5
	2.2	0.8	3.6	-	0.9	-	-	8.4	-	-	0.7	6.2	4.4	11.4	11.5
	3.0	-	4.5	-	0.3	0.2	-	8.0	-	0.3	0.2	7.8	5.3	11.5	11.6
	2.0	0.7	3.4	-	0.8	-	-	6.0	-	-	0.7	7.9	4.6	11.3	11.3
	-	-	-	-	-	-	-	7.9	-	0.2	0.8	6.6	4.4	11.4	11.4
TEPIS	10.5	8.6	7.3	-	2.8	6.0	8.1	2.6	2.1	1.2	11.1	7.8	11.2	11.2	11.3
	10.5	8.7	7.1	-	-	6.6	6.9	2.1	1.5	0.9	10.8	7.9	11.1	11.2	8.2
WEGWA	9.7	-	3.5	-	2.0	-	-	8.5	3.3	0.5	0.9	3.0	-	1.2	6.5
YRJIL	-	-	-	4.9	1.1	2.1	-	-	-	-	4.0	-	3.9	-	3.5
ZAKJU	8.8	6.8	-	0.3	-	9.4	7.5	8.3	-	3.4	0.9	2.0	2.2	5.7	10.4
Sum	443.0	364.8	304.8	139.7	232.3	409.9	351.6	486.5	279.3	329.7	385.2	497.9	447.0	535.1	622.9

October	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	9.6	9.0	9.4	9.5	4.4	0.1	2.2	4.4	-	3.5	-	-	0.4	9.4	4.9	0.7
BERER	10.2	10.0	5.5	4.1	4.7	-	-	-	11.8	-	-	10.9	-	-	-	-
BOMMA	11.4	11.4	5.6	-	0.6	4.6	0.6	10.7	12.0	12.1	11.5	9.2	2.3	8.5	11.8	12.3
BREMA	6.9	3.4	5.1	4.8	3.3	7.4	-	1.8	-	1.7	1.4	0.4	0.5	10.3	3.1	-
BRIBE	9.7	9.4	10.9	5.3	2.1	8.9	-	1.3	-	3.2	0.2	1.9	-	11.6	5.5	-
	11.4	11.5	11.7	3.2	2.1	9.3	-	-	-	0.9	0.6	2.1	0.2	10.9	5.4	-
CARMA	11.7	11.7	11.7	11.8	10.6	3.1	7.0	12.1	12.0	12.1	11.2	12.3	4.7	12.0	12.0	12.4
CASFL	11.6	11.8	11.8	11.8	10.7	-	7.2	11.9	12.0	12.0	10.7	12.1	-	11.7	11.8	12.3
CRIST	8.0	7.7	1.9	-	1.0	1.4	-	8.8	8.8	6.6	7.9	2.5	1.2	3.1	7.7	7.5
	10.7	11.4	10.9	8.5	4.0	0.8	11.6	11.7	11.7	11.2	6.9	11.8	5.4	11.8	12.0	12.0
	11.3	11.4	11.4	11.5	4.5	0.3	11.6	11.7	11.7	11.4	7.0	11.8	4.2	9.4	11.9	12.0
	11.3	11.4	10.7	11.5	1.6	-	11.3	11.6	11.7	11.4	0.4	11.8	1.8	9.2	12.0	12.0
DONJE	11.3	11.4	11.4	11.5	4.5	0.3	11.6	11.7	11.7	11.6	7.2	11.8	6.0	11.9	12.0	12.0
ELTMA	5.2	-	-	-	-	-	-	11.8	11.8	11.8	9.6	9.8	-	2.7	1.1	10.7
FORKE	11.5	11.6	11.7	9.2	2.4	-	-	-	-	-	-	-	-	-	-	0.2
GONRU	3.1	2.4	-	-	0.3	10.8	10.9	10.8	10.7	7.9	10.8	10.8	11.2	6.3	11.3	7.7
	0.2	-	1.7	-	-	11.5	11.5	11.4	11.5	11.5	11.6	11.4	11.6	11.8	11.8	11.4
	0.2	-	1.2	-	-	11.6	11.7	11.7	11.7	11.4	11.8	11.6	11.9	11.9	12.0	11.7
	1.1	-	-	-	0.3	11.5	11.4	10.0	11.5	11.5	11.7	11.8	11.8	11.8	11.8	11.8
	0.2	-	0.6	-	-	11.6	11.6	11.7	11.7	11.4	11.8	11.6	11.9	11.9	12.0	11.6
	1.4	0.2	-	-	-	11.4	11.3	10.0	11.4	11.4	11.5	11.5	11.6	11.7	11.7	11.4
GOVMI	11.2	7.2	11.3	8.5	10.1	8.6	-	2.9	11.5	8.6	1.6	7.2	1.5	9.1	3.1	10.5
	7.7	5.8	-	8.4	-	-	-	-	-	-	-	-	-	-	-	-
HERCA	11.4	10.8	8.0	9.1	9.6	11.3	9.2	11.5	11.3	11.2	10.1	10.0	10.3	11.6	11.4	5.2
HINWO	11.6	11.5	11.5	9.5	5.5	-	0.9	-	-	-	1.2	-	-	0.5	1.2	-
IGAAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	8.3	7.8	-	-	8.2	4.2	-	1.4	8.4	7.0	-	8.3	-	8.5	8.6	4.5
JONKA	11.4	8.6	10.6	7.6	9.6	5.1	-	-	11.9	6.2	-	5.5	-	8.4	5.7	3.4
	11.6	11.6	10.7	7.6	9.9	7.5	-	-	11.9	9.2	-	7.4	-	10.6	6.2	4.4
KACJA	11.0	8.7	10.8	11.6	9.6	2.4	-	-	11.9	11.3	3.9	8.0	4.0	4.1	12.0	7.6
	11.4	11.0	11.6	11.6	11.2	10.1	-	7.9	11.9	11.8	5.5	12.0	2.4	10.6	12.1	7.0
	9.2	8.7	11.7	9.1	11.4	6.0	-	-	8.9	12.1	7.4	11.8	3.8	9.0	12.2	6.9
	11.4	11.4	10.8	11.6	11.0	3.1	-	-	11.9	11.7	4.8	8.0	4.2	4.1	12.1	8.3
	11.2	9.1	10.9	11.8	10.6	2.5	-	-	12.0	11.2	3.9	7.7	4.5	4.2	12.1	7.9
KOSDE	-	-	-	-	-	-	-	-	-	10.8	4.6	5.9	3.8	10.9	10.9	11.0
	-	-	-	-	-	-	-	-	-	9.8	-	-	-	9.4	3.1	7.2
	-	-	-	-	-	-	-	-	-	11.1	4.9	6.2	3.6	11.3	11.1	-
LOPAL	2.2	-	-	-	-	8.3	10.6	-	-	-	-	-	-	-	-	-
MACMA	10.7	10.2	5.0	-	-	-	-	-	-	-	-	-	-	-	-	-
	11.6	11.8	10.6	1.7	-	-	-	-	-	-	-	-	-	-	-	-
	0.4	0.4	0.4	0.4	-	-	-	-	-	-	-	-	-	-	-	-
	11.6	11.6	10.4	1.9	-	-	-	-	-	-	-	-	-	-	-	-
MARRU	-	0.4	0.2	-	3.3	11.4	11.1	11.4	11.5	10.4	11.7	11.8	11.7	11.7	11.7	11.7
	3.6	-	-	-	-	11.3	11.4	6.8	11.5	7.4	11.6	11.4	11.6	11.7	11.6	4.3
MASMI	10.8	6.2	-	3.1	5.5	-	-	-	-	-	-	-	-	-	9.2	11.3
MOLSI	10.9	11.0	7.9	11.1	2.7	2.9	2.4	2.2	6.4	7.9	8.3	4.0	-	10.4	11.3	2.7
	11.4	-	-	8.2	-	-	-	-	-	-	-	4.0	-	10.8	11.7	4.6
	11.4	11.4	7.5	11.5	3.9	3.5	-	1.3	4.6	7.9	6.4	3.0	-	10.7	10.1	1.5
	9.4	7.8	9.2	6.9	3.0	-	2.0	1.5	-	6.8	2.3	2.6	0.9	9.4	4.9	1.2
	10.9	10.8	10.7	8.6	3.6	-	2.6	1.5	-	6.4	2.6	2.7	0.7	10.5	5.3	-
	11.6	11.4	11.4	9.3	4.4	-	2.4	1.9	-	8.5	3.1	3.3	1.0	11.4	6.0	1.1
	11.6	10.9	11.3	9.2	4.4	0.4	2.7	1.7	-	7.8	2.9	3.4	1.1	11.6	5.8	0.9
MOSFA	11.6	11.5	7.4	3.6	-	-	6.5	12.0	12.1	11.0	9.9	12.2	3.6	7.0	12.2	12.4
OCHPA	8.1	6.1	7.0	-	-	-	6.5	6.9	7.6	8.0	7.2	11.7	8.2	6.5	5.3	9.3
OTTMI	11.4	11.5	11.6	11.6	6.7	3.0	0.2	-	7.7	11.9	1.3	-	3.6	0.3	-	-
PERZS	11.4	11.3	11.6	11.6	11.2	8.1	-	4.5	11.9	11.7	6.6	10.6	2.8	9.2	4.6	10.1
ROTEC	11.3	10.9	11.4	9.5	2.2	-	0.9	4.2	-	5.3	-	1.8	-	11.5	-	-
SARAN	3.9	0.7	1.5	-	0.8	11.9	8.9	11.8	11.9	6.1	5.8	-	8.5	12.0	9.1	7.1
	3.1	0.5	1.2	-	-	11.5	11.5	11.8	11.7	6.7	6.6	11.7	11.8	11.8	2.6	8.7
	3.8	1.1	1.2	-	0.2	11.4	11.5	11.4	11.4	7.7	11.6	11.6	11.7	11.8	11.8	10.6
	1.9	0.2	1.0	-	0.3	10.8	11.2	10.3	10.4	4.9	8.5	6.7	7.0	9.9	8.6	5.7
	4.1	0.9	1.2	-	0.2	11.7	8.9	11.8	11.6	5.8	3.9	-	9.4	10.2	10.1	4.7
SCALE	2.2	0.2	-	1.2	-	-	2.3	11.5	11.9	11.6	5.9	9.5	-	1.1	1.1	7.9
SCHHA	9.2	8.0	6.3	3.9	6.8	8.0	1.8	0.6	-	5.4	0.8	3.8	-	10.3	2.2	-
SLAST	9.8	1.5	-	11.0	7.1	2.9	-	5.0	10.5	9.6	3.0	0.6	7.2	8.5	11.7	9.4
	10.1	9.1	-	10.9	10.5	-	-	5.5	10.8	10.1	6.7	0.6	8.3	11.2	12.2	12.0
STOEN	9.7	-	-	-	0.4	-	3.5	11.4	11.9	11.9	10.2	10.7	2.5	3.2	2.0	11.2
	10.1	0.6	-	7.9	1.0	-	2.1	10.1	11.9	12.0	10.1	11.7	3.2	1.3	1.4	11.3
	11.0	1.0	-	7.5	-	-	3.0	11.2	9.3	11.8	7.6	11.2	3.5	2.6	1.9	11.7
STRJO	11.6	7.2	11.7	7.3	1.8	9.5	0.3	2.5	-	3.7	0.2	-	0.6	2.5	3.3	-
	11.3	3.3	11.7	6.7	1.3	9.2	-	1.7	-	1.3	-	-	0.3	1.2	-	-
	11.5	7.4	11.7	7.4	1.1	9.3	-	2.2	-	1.9	0.2	-	-	1.0	3.5	-
	11.4	6.9	11.6	7.2	1.0	8.5	0.2	2.4	-	2.6	-	-	-	1.9	3.2	-
	11.2	4.0	11.7	6.8	1.1	8.9	-	1.7	-	1.6	0.2	-	-	2.0	3.4	-
TEPIS	11.4	11.4	11.5	11.5	1.7	-	-	-	-	-	-	-	-	-	-	-
	11.4	11.4	11.5	5.7	-	10.4	-	1.1	11.8	9.9	0.7	2.8	-	7.1	-	-
WEGWA	4.4	10.0	5.8	5.9	6.2	3.0	-	1.0	1.6	1.2	-	0.7	-	4.9	6.0	0.2
YRJIL	10.5	-	3.9	5.3	5.1	4.6	4.3	5.3	6.0	-	-	-	-	-	-	4.4
ZAKJU	11.3	5.8	11.4	11.6	7.8	1.9	-	4.7	11.8	11.8	5.0	11.1	10.9	10.7	12.1	6.6
Sum	652.2	504.3	489.6	435.1	269.1	347.8	270.4	389.7	523.1	555.2	352.6	450.3	264.9	558.1	519.5	436.2

3. Results (Meteors)

October	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	44	-	29	-	9	23	-	61	9	2	20	33	10	74	127
BERER	58	35	-	-	-	79	31	-	34	-	-	35	42	52	33
BOMMA	-	38	-	10	52	38	33	66	18	79	65	63	56	58	83
BREMA	-	17	-	-	5	1	-	23	-	-	-	13	18	30	43
BRIBE	-	6	5	-	4	-	-	28	-	-	-	6	34	79	51
	1	-	4	-	10	1	-	2	-	-	4	16	43	67	46
CARMA	21	3	87	39	70	108	6	114	78	38	22	103	133	152	140
CASFL	13	-	34	20	31	43	2	41	30	19	14	43	55	62	61
CRIST	-	73	-	22	66	29	28	76	19	64	71	74	75	81	116
	1	9	3	-	1	26	4	33	9	44	-	36	57	79	89
	1	-	1	-	9	51	2	43	9	71	2	68	71	108	104
	2	11	-	-	5	50	5	39	11	38	2	12	52	48	71
DONJE	1	15	6	-	20	78	7	64	26	78	5	76	105	106	151
ELTMA	-	7	-	-	-	32	9	26	43	32	6	3	3	-	47
FORKE	-	-	4	-	-	-	-	-	-	-	27	8	15	78	116
GONRU	13	-	-	-	13	-	9	-	2	-	6	1	-	-	-
	67	63	38	3	30	36	55	22	34	52	45	32	47	7	15
	52	61	31	-	31	40	41	19	26	28	38	13	19	4	11
	25	13	10	-	14	13	13	2	8	15	9	9	15	-	6
	44	50	28	-	37	28	38	14	-	39	39	15	26	7	8
	49	34	27	-	29	12	28	2	11	23	28	12	-	1	10
GOVMI	25	17	1	1	6	27	18	18	-	13	37	32	36	61	39
	16	14	-	-	1	9	12	5	-	13	27	22	11	-	18
HERCA	22	24	16	20	3	19	18	34	41	45	50	16	43	-	50
HINWO	32	-	-	-	-	-	-	3	-	-	21	10	33	78	82
IGAAN	15	17	7	6	1	6	15	7	6	1	17	10	18	16	14
	9	6	8	-	-	14	3	-	-	-	1	5	3	8	11
JONKA	16	16	19	2	3	19	6	7	3	-	22	16	13	28	24
	11	8	16	1	5	15	8	11	4	-	30	21	13	20	36
KACJA	55	23	9	-	-	5	31	12	-	2	34	45	60	49	48
	19	17	20	-	-	30	16	23	-	23	65	32	38	74	71
	41	23	-	-	-	20	43	41	-	26	64	24	45	31	38
	57	16	16	-	-	32	29	6	-	-	96	62	95	112	143
	-	-	-	-	-	-	33	6	-	1	28	19	34	30	26
KOSDE	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
LOPAL	-	15	16	11	10	19	15	9	11	13	20	4	-	8	1
MACMA	26	3	-	-	1	-	28	7	15	3	-	14	13	-	6
	45	7	-	-	5	-	39	28	32	9	-	18	27	-	17
	2	2	-	-	2	-	2	2	2	2	-	2	2	-	2
	51	17	-	-	2	-	47	36	39	14	-	16	27	-	17
MARRU	45	51	47	30	35	33	39	22	24	25	35	19	12	2	27
	26	30	46	40	47	17	19	29	19	33	18	-	4	7	3
MASMI	1	39	1	11	-	-	21	40	-	2	-	63	66	53	2
MOLSI	40	-	60	-	19	-	-	1	2	8	129	102	173	159	178
	14	-	18	-	-	-	-	-	-	2	7	2	-	4	47
	10	-	34	-	-	-	-	-	-	-	-	-	-	-	-
	50	-	21	-	-	37	-	100	-	-	7	37	-	71	105
	47	-	12	-	-	25	-	77	1	-	26	43	2	80	152
	51	-	16	-	-	30	1	90	-	-	17	31	3	49	116
	54	-	26	-	-	44	-	94	2	2	26	76	3	104	155
MOSFA	-	-	8	9	8	22	1	31	14	2	1	13	25	28	37
OCHPA	-	-	-	-	-	-	-	-	19	1	-	18	19	42	24
OTTMI	3	20	1	11	-	-	17	23	3	-	-	-	-	-	20
PERZS	49	29	24	-	4	36	22	22	-	3	66	73	76	77	84
ROTEC	32	-	4	-	1	12	-	35	1	-	15	23	8	25	50
SARAN	22	25	14	20	16	10	13	11	12	10	13	3	2	13	2
	35	44	39	29	33	27	26	-	14	16	26	2	1	14	1
	34	50	50	29	32	27	17	-	22	15	33	5	-	8	3
	16	13	12	12	18	10	12	-	5	6	10	6	-	4	1
	18	24	18	21	17	11	12	14	9	15	12	5	2	4	2
SCALE	3	2	-	-	1	8	2	18	10	7	9	2	3	-	8
SCHHA	-	-	2	-	22	-	1	1	-	12	8	27	47	56	43
SLAST	31	5	2	-	-	-	15	10	5	10	27	25	36	43	31
	9	5	-	-	-	7	7	5	1	5	18	7	12	3	9
STOEN	3	11	15	4	2	58	12	60	56	21	-	7	8	2	24
	2	8	11	6	-	51	6	55	37	21	1	9	1	46	57
	-	7	13	6	3	63	10	69	46	18	1	14	2	49	75
STRJO	11	2	9	-	6	1	-	35	-	-	4	43	39	135	122
	4	1	2	-	1	-	-	29	-	-	1	13	19	57	74
	3	-	4	-	3	1	-	12	-	2	1	11	16	34	24
	1	1	7	-	2	-	-	15	-	-	1	14	24	73	90
	-	-	-	-	-	-	-	29	-	1	1	17	21	64	64
TEPIS	31	16	23	-	9	17	17	7	2	1	30	21	20	50	56
	42	21	35	-	-	29	22	6	4	3	47	25	30	46	47
WEGWA	33	-	12	-	9	-	-	30	12	2	4	14	-	7	51
YRJIL	-	-	-	16	1	5	-	-	-	-	9	-	6	-	14
ZAKJU	15	9	-	1	-	14	11	15	-	12	1	6	17	13	32
Sum	1569	1073	1021	380	764	1498	977	1915	840	1042	1519	1815	2084	3030	3801

October	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
ARLRA	88	29	64	94	29	1	17	32	-	24	-	-	2	89	19	1
BERER	32	31	21	7	7	-	-	-	139	-	-	123	-	-	-	-
BOMMA	77	92	11	-	4	19	2	174	136	108	90	28	9	29	65	87
BREMA	5	6	16	7	12	53	-	1	-	4	6	2	3	38	12	-
BRIBE	33	16	38	11	12	68	-	1	-	3	1	8	-	62	12	-
	24	61	70	3	12	52	-	-	-	4	1	3	1	63	9	-
CARMA	147	124	143	142	93	3	124	204	110	123	63	129	9	85	113	145
CASFL	75	62	70	71	68	-	63	85	54	52	31	62	-	41	45	57
CRIST	102	121	15	-	8	13	-	173	128	91	85	20	8	23	84	107
	91	91	57	81	7	3	132	120	98	80	24	80	24	42	50	57
	109	123	105	129	5	1	139	151	131	96	18	86	27	62	81	79
	72	57	47	70	4	-	120	115	83	66	1	61	13	30	41	38
DONJE	131	136	129	138	12	3	192	194	161	143	39	131	40	103	111	111
ELTMA	6	-	-	-	-	-	-	133	77	69	21	52	-	19	3	59
FORKE	55	85	126	96	34	-	-	-	-	-	-	-	-	-	-	1
GONRU	6	4	-	-	1	20	18	19	13	3	15	8	14	2	11	1
	4	-	1	-	-	127	123	120	107	71	99	71	85	93	85	64
	1	-	3	-	-	104	106	96	100	67	60	73	71	94	70	52
	2	-	-	-	1	47	54	37	44	38	28	31	38	28	30	21
	4	-	1	-	-	109	104	90	103	54	61	73	78	93	66	50
	9	1	-	-	-	100	118	95	102	73	63	72	84	65	89	39
GOVMI	83	17	92	32	27	34	-	35	94	54	3	39	1	57	12	47
	28	6	-	14	-	-	-	-	-	-	-	-	-	-	-	-
HERCA	45	52	30	34	51	80	77	91	73	47	75	55	56	44	47	19
HINWO	57	53	94	73	42	-	2	-	-	-	1	-	-	3	3	-
IGAAN	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	4	-	-	9	3	-	2	9	11	-	10	-	19	18	6
JONKA	25	18	42	12	27	12	-	-	53	22	-	29	-	28	19	20
	33	15	20	17	17	9	-	-	53	25	-	29	-	40	22	16
KACJA	53	24	137	144	30	17	-	-	125	84	6	100	13	64	117	49
	81	27	92	100	24	42	-	60	71	69	14	91	7	72	78	24
	73	22	102	110	51	11	-	-	93	97	32	89	9	72	106	26
	157	85	164	210	55	32	-	-	192	194	14	161	21	88	166	77
	65	20	97	110	26	7	-	-	100	49	7	79	16	49	91	38
KOSDE	-	-	-	-	-	-	-	-	-	71	67	31	32	86	70	10
	-	-	-	-	-	-	-	-	-	256	-	-	-	225	28	129
	-	-	-	-	-	-	-	-	-	116	97	44	56	83	74	-
LOPAL	2	-	-	-	-	31	40	-	-	-	-	-	-	-	-	-
MACMA	52	41	26	-	-	-	-	-	-	-	-	-	-	-	-	-
	62	78	47	2	-	-	-	-	-	-	-	-	-	-	-	-
	2	2	2	2	-	-	-	-	-	-	-	-	-	-	-	-
	59	56	52	2	-	-	-	-	-	-	-	-	-	-	-	-
MARRU	-	1	1	-	40	106	123	129	110	44	81	85	86	77	81	31
	17	-	-	-	-	97	132	81	77	20	42	39	57	55	57	9
MASMI	49	33	-	5	46	-	-	-	-	-	-	-	-	-	28	93
MOLSI	186	100	66	140	22	7	6	15	31	47	21	18	-	108	169	7
	44	-	-	34	-	-	-	-	-	-	-	4	-	43	61	3
	95	45	38	88	10	6	-	7	14	34	8	15	-	76	117	7
	73	12	80	53	22	-	21	5	-	52	8	9	6	81	29	4
	104	17	124	110	16	-	61	3	-	42	23	3	8	112	25	-
	75	21	107	89	25	-	29	5	-	44	11	5	7	82	32	6
	95	28	126	97	33	1	53	5	-	59	22	7	11	148	29	1
MOSFA	37	33	8	8	-	-	59	94	41	47	21	44	4	26	33	31
OCHPA	31	25	25	-	-	-	48	46	40	45	10	53	28	42	33	57
OTTMI	21	33	26	36	20	2	1	-	10	29	1	-	27	1	-	-
PERZS	90	48	88	102	85	68	-	79	114	94	27	84	12	62	43	80
ROTEC	34	12	37	43	9	-	10	17	-	16	-	1	-	52	-	-
SARAN	12	4	4	-	4	58	51	40	51	8	2	-	25	33	35	13
	13	4	3	-	-	59	68	69	58	9	49	39	60	46	11	22
	21	5	4	-	1	89	108	79	70	26	50	43	55	68	50	28
	8	1	4	-	2	22	32	21	29	4	17	24	25	20	19	7
	13	3	2	-	1	55	61	69	57	9	4	-	37	34	39	15
SCALE	1	1	-	3	-	-	12	44	16	24	9	13	-	6	3	25
SCHHA	21	17	31	10	66	35	7	1	-	6	5	11	-	31	3	-
SLAST	77	10	-	115	32	22	-	95	103	105	20	5	22	57	93	58
	23	7	-	21	7	-	-	27	22	12	8	2	5	21	27	18
STOEN	73	-	-	-	3	-	56	289	144	142	43	84	6	13	14	92
	57	1	-	8	3	-	38	157	133	114	33	69	7	7	9	71
	75	2	-	20	-	-	51	173	114	118	35	69	8	8	11	88
STRJO	69	8	107	34	9	173	1	12	-	7	2	-	5	19	16	-
	32	5	54	22	6	97	-	5	-	3	-	-	2	9	-	-
	30	3	25	9	2	44	-	6	-	2	2	-	-	6	7	-
	40	11	80	15	4	91	1	9	-	3	-	-	-	15	14	-
	44	4	56	18	6	81	-	4	-	2	1	-	-	12	4	-
TEPIS	51	40	71	52	2	-	-	-	-	-	-	-	-	-	-	-
	49	32	71	11	-	46	-	8	70	47	3	9	-	59	-	-
WEGWA	34	53	16	5	13	5	-	10	1	9	-	2	-	19	33	1
YRJIL	39	-	15	20	15	20	61	31	17	-	-	-	-	-	-	11
ZAKJU	29	15	35	43	11	2	-	42	38	37	11	37	14	19	42	13
Sum	3719	2193	3218	2922	1183	2187	2521	3705	3809	3524	1591	2644	1234	3458	3014	2221