

Results of the IMO Video Meteor Network – February 2015

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2015/05/07

February is another winter month of the northern hemisphere that presents only occasionally nice observing conditions to the observers. That seems to be confirmed by a quick glimpse on the statistics, which shows bigger „holes“. However, that impression is misleading, since in particular at the middle of February there were also a number of nights where most cameras were in operation. There were three nights with more than 70 of the 83 cameras being active, and thus it was the by far best February result ever. For the first time we collected more than 10,000 hours of effective observing time, which is the third best total if we take into account that this month has 28 nights only. We marginally missed a total of 20,000 meteors, which is 20% more than in the previously best month of February 2012. Just as in 2012 till 2014, the average rate dropped to 2.0 meteors per hours which is close to the minimum that typically occurs in March.

There are no interesting meteor showers in February, only a minor shower sparked some discussions in this year. Chris Steyaert informed that Lucas Pellens and other observers of the RMOB radio network had experienced enhanced activity just before noon (UT) of February 5. The radiant was supposed to be high in the European skies by that time, but there was no optical confirmation from American observers.

In return Christoph Gerber reported, that he had noticed unusual activity from a radiant near gamma Lyrae in the publicly available data of the Canadian CMOR radar. In his subsequent search for confirmation he found at least one fireball recorded in the time of questions by the NASA network that fitted nicely to the radiant. Last but not least he found also a weak radiant in the IMO network video data. However, that was based on an old radiant list from 2009 and made of nine single-station meteors only, which should rather be interpreted as chance alignments.

Our two American video observers enjoyed (partly) clear skies in the night of February 5, 2015. The limiting magnitude of SALS3 from Carl Hergenrother was about 4 mags, but the radiant was located only about 10° above the horizon at the time in question. With 25° it was higher up in the sky for ORIE1 of Mike Otte, but that camera suffered from clouds between 10 and 11 UT. None of the 24 meteors recorded in total fitted to the given radiant. Based on the effective collection area we could estimate that the shower needed to be about four times as strong as the Antihelion source to be noticed by the two cameras.

Later Carl Johannink checked the CAMS Benelux dataset for possible “background activity” in the night before and thereafter, but found none. That is confirmed by our IMO video data. In the first decade of February, only about 10 meteors per night fit to the radiant, which yields a flux density of below one meteoroid per 1,000 km² and hour (figure 1). Since the alignment with the radiant was typically poor, also these are most probably just chance alignments.

So we are left with two interpretations: Either it was a short one-time outburst without a background component that was at best a little stronger than the Antihelion source, or it was made of faint meteors beyond the optical range.

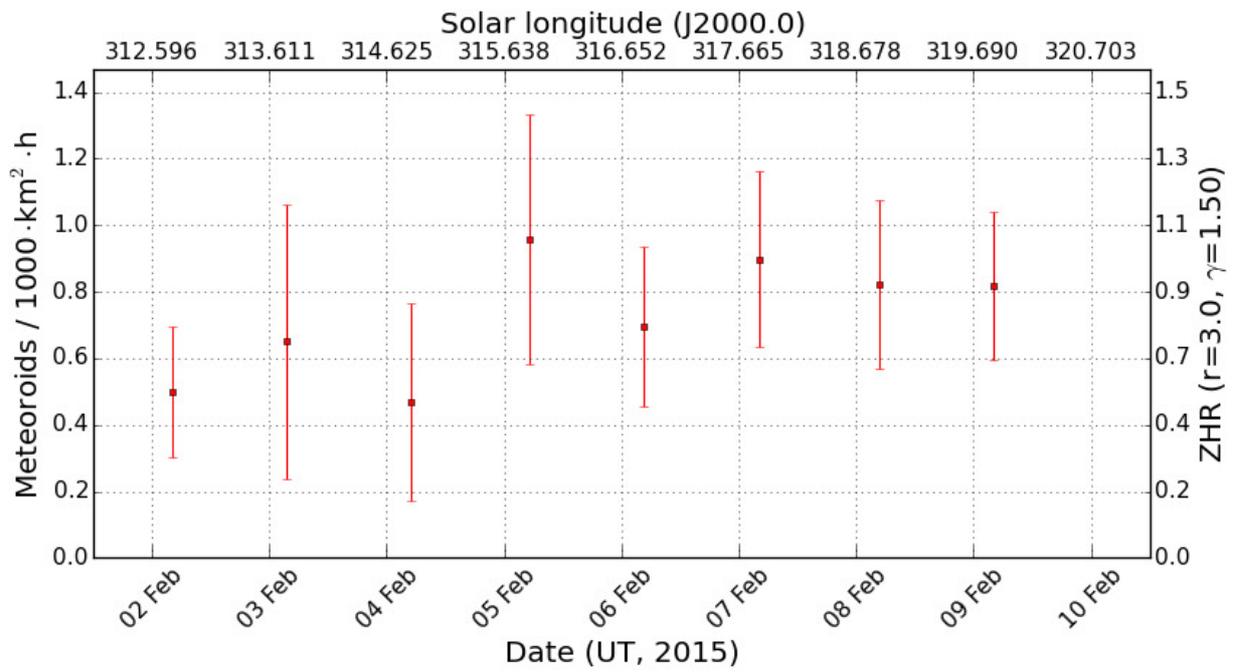


Figure 1: Flux density profile of meteors from a radiant near gamma Lyrae that was found in radar data just before noon (UT) of February 5.

1. Observers

Code	Name	Place	Camera	FOV [°]	St.LM [mag]	Eff.CA [km ²]	Nights	Time [h]	Meteors
ARLRA	Arlt	Ludwigsfelde/DE	LUDWIG2 (0.8/8)	1475	6.2	3779	23	169.2	643
BANPE	Bánfalvi	Zalaegerszeg/HU	HUVCS01 (0.95/5)	2423	3.4	361	8	24.3	62
BERER	Berkó	Ludanyhalaszi/HU	HULUD1 (0.8/3.8)	5542	4.8	3847	15	137.7	500
			HULUD3 (0.95/4)	4357	3.8	876	13	92.8	117
BOMMA	Bombardini	Faenza/IT	MARIO (1.2/4.0)	5794	3.3	739	16	92.8	177
BREMA	Breukers	Hengelo/NL	MBB3 (0.75/6)	2399	4.2	699	17	111.3	100
BRIBE	Klemt	Herne/DE	HERMINE (0.8/6)	2374	4.2	678	18	141.4	246
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2286	4.6	1080	18	95.3	184
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	5.0	1611	20	186.1	433
			BMH2 (1.5/4.5)*	4243	3.0	371	20	172.7	287
CRIST	Crivello	Valbrenna/IT	BILBO (0.8/3.8)	5458	4.2	1772	19	159.6	404
			C3P8 (0.8/3.8)	5455	4.2	1586	16	139.7	245
			STG38 (0.8/3.8)	5614	4.4	2007	19	173.1	670
CSISZ	Csizmadia	Baja/HU	HUVCS02 (0.95/5)	1606	3.8	390	11	32.7	80
DONJE	Donati	Faenza/IT	JENNI (1.2/4)	5886	3.9	1222	16	129.4	389
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5631	4.3	2151	13	107.2	160
FORKE	Förster	Carlsfeld/DE	AKM3 (0.75/6)	2375	5.1	2154	18	163.2	437
GONRU	Goncalves	Tomar/PT	TEMPLAR1 (0.8/6)	2179	5.3	1842	21	192.9	455
			TEMPLAR2 (0.8/6)	2080	5.0	1508	21	190.4	391
			TEMPLAR3 (0.8/8)	1438	4.3	571	21	176.2	189
			TEMPLAR4 (0.8/3.8)	4475	3.0	442	21	182.3	368
			TEMPLAR5 (0.75/6)	2312	5.0	2259	22	174.7	349
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1447	5.5	1841	16	117.1	191
			ORION3 (0.95/5)	2665	4.9	2069	11	81.0	60
			ORION4 (0.95/5)	2662	4.3	1043	13	71.8	56
HERCA	Hergenrother	Tucson/US	SALSA3 (0.8/3.8)	2336	4.1	544	26	255.8	383
HINWO	Hinz	Schwarzenberg/DE	HINWO1 (0.75/6)	2291	5.1	1819	16	147.5	404
IGAAN	Igaz	Debrecen/HU	HUDEB (0.8/3.8)	5522	3.2	620	17	160.4	156
		Hodmezovasar./HU	HUHOD (0.8/3.8)	5502	3.4	764	14	87.3	84
		Budapest/HU	HUPOL (1.2/4)	3790	3.3	475	12	116.3	31
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4)	2286	3.9	445	17	154.4	128
KACJA	Kac	Kamnik/SI	CVETKA (0.8/3.8)	4914	4.3	1842	11	63.5	174
		Kostanjevec/SI	METKA (0.8/12)*	715	6.4	640	1	1.6	4
		Ljubljana/SI	ORION1 (0.8/8)	1402	3.8	331	12	55.1	42
		Kamnik/SI	REZIKA (0.8/6)	2270	4.4	840	12	67.8	291
			STEFKA (0.8/3.8)	5471	2.8	379	10	59.6	143
KISSZ	Kiss	Sulysap/HU	HUSUL (0.95/5)*	4295	3.0	355	15	100.1	50
KOSDE	Koschny	Izana Obs./ES	ICC7 (0.85/25)*	714	5.9	1464	7	41.6	248
		La Palma / ES	ICC9 (0.85/25)*	683	6.7	2951	16	90.2	462
		Noordwijkerhout/NL	LIC4 (1.4/50)*	2027	6.0	4509	18	113.2	149
LOJTO	Łojek	Grabniak/PL	PAV57 (1.0/5)	1631	3.5	269	11	77.1	66
MACMA	Maciejewski	Chelm/PL	PAV35 (0.8/3.8)	5495	4.0	1584	9	73.5	124
			PAV36 (0.8/3.8)*	5668	4.0	1573	16	109.2	276
			PAV43 (0.75/4.5)*	3132	3.1	319	12	90.7	129
			PAV60 (0.75/4.5)	2250	3.1	281	13	103.4	243
MARGR	Maravelias	Lofoupoli/GR	LOOMECON (0.8/12)	738	6.3	2698	12	75.4	64
MARRU	Marques	Lisbon/PT	CAB1 (0.8/3.8)	5291	3.1	467	18	147.4	295
			RAN1 (1.4/4.5)	4405	4.0	1241	18	172.0	258
MASMI	Maslov	Novosibirsk/RU	NOWATEC (0.8/3.8)	5574	3.6	773	15	108.8	232
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1230	6.9	6152	11	67.0	343
			MINCAM1 (0.8/8)	1477	4.9	1084	17	99.7	260
		Ketzür/DE	REMO1 (0.8/8)	1467	6.5	5491	22	169.3	623
			REMO2 (0.8/8)	1478	6.4	4778	20	170.2	526
			REMO3 (0.8/8)	1420	5.6	1967	21	162.5	318
			REMO4 (0.8/8)	1478	6.5	5358	21	173.7	639
MORJO	Morvai	Fülöpszallas/HU	HUFUL (1.4/5)	2522	3.5	532	13	136.7	109
MOSFA	Moschini	Rovereto/IT	ROVER (1.4/4.5)	3896	4.2	1292	19	154.9	190
OCHPA	Ochner	Albiano/IT	ALBIANO (1.2/4.5)	2944	3.5	358	14	99.8	176
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	3.8	460	21	120.5	174
PERZS	Perkó	Becsehely/HU	HUBEC (0.8/3.8)*	5498	2.9	460	15	124.5	237
PUCRC	Pucer	Nova vas nad Dra./SI	MOBCAM1 (0.75/6)	2398	5.3	2976	17	129.5	199
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2366	4.5	911	17	153.3	152
SARAN	Saraiva	Carnaxide/PT	RO1 (0.75/6)	2362	3.7	381	18	163.8	212
			RO2 (0.75/6)	2381	3.8	459	19	164.2	258
			RO3 (0.8/12)	710	5.2	619	20	176.4	379
			SOFIA (0.8/12)	738	5.3	907	20	181.4	186
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	4900	3.0	409	20	130.3	293
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	563	6.2	1294	10	56.0	47
			KAYAK2 (0.8/12)	741	5.5	920	7	58.8	44
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5566	4.8	3270	19	139.1	393
			NOA38 (0.8/3.8)	5609	4.2	1911	20	141.2	359
			SCO38 (0.8/3.8)	5598	4.8	3306	19	148.8	435
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2354	5.4	2751	18	131.7	227
			MINCAM3 (0.8/6)	2338	5.5	3590	20	136.3	199
			MINCAM4 (1.0/2.6)	9791	2.7	552	18	109.5	134
			MINCAM5 (0.8/6)	2349	5.0	1896	18	137.3	211
			MINCAM6 (0.8/6)	2395	5.1	2178	21	144.7	202
TEPIS	Tepliczky	Agostyan/HU	HUAGO (0.75/4.5)	2427	4.4	1036	17	139.5	182
			HUMOB (0.8/6)	2388	4.8	1607	16	152.6	304
TRIMI	Triglav	Velenje/SI	SRAKA (0.8/6)*	2222	4.0	546	15	40.3	92
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM (0.8/6)	2337	5.5	3574	9	75.9	94
ZELZO	Zelko	Budapest/HU	HUVCS03 (1.0/4.5)	2224	4.4	933	10	35.8	79
			HUVCS04 (1.0/4.5)	1484	4.4	573	10	29.8	58
Sum							28	10041.8	19963

* active field of view smaller than video frame

2. Observing Times (h)

February	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	5.0	1.9	-	1.6	7.6	8.2	2.1	5.2	-	-	-	4.4	10.7	10.7	6.2
BANPE	-	-	-	-	-	-	3.1	1.5	-	-	-	-	4.4	-	3.9
BERER	-	3.9	-	-	11.2	10.4	4.9	11.2	-	-	0.5	9.2	11.8	9.9	11.3
	-	3.6	-	-	10.5	9.4	-	7.7	-	-	-	7.6	7.4	7.3	7.3
BOMMA	4.6	3.7	-	-	-	-	11.8	5.1	7.4	4.5	6.4	1.7	-	-	-
BREMA	-	0.5	2.8	5.5	9.1	9.9	-	2.5	-	-	2.2	11.3	0.2	8.5	11.7
BRIBE	-	-	6.0	8.0	10.5	12.7	-	-	-	-	7.8	12.1	9.5	7.7	12.0
	-	-	4.1	3.6	5.4	12.3	-	1.7	-	-	2.3	10.4	8.9	11.0	11.4
CASFL	12.7	12.5	1.3	-	-	-	12.3	12.4	11.8	12.3	12.2	-	-	-	5.6
	12.6	12.1	1.1	-	-	-	12.0	12.3	12.2	12.1	12.1	-	-	-	2.9
CRIST	11.4	0.7	-	-	-	-	10.6	11.3	12.0	12.0	11.9	11.9	-	-	-
	12.3	-	-	-	-	-	8.0	11.2	12.0	7.0	11.9	9.4	-	-	-
	12.3	5.1	-	-	-	-	12.1	12.1	12.0	12.0	11.9	11.9	-	-	-
CSISZ	-	0.3	0.3	-	-	-	-	-	-	-	-	2.3	3.0	-	5.5
DINJE	9.2	3.5	-	-	-	-	11.7	6.3	12.2	12.1	11.9	2.1	-	-	-
ELTMA	4.9	3.6	-	-	-	-	10.7	7.1	11.7	11.7	9.6	-	-	-	-
FORKE	-	-	-	-	4.0	3.1	-	4.7	-	-	11.5	12.1	12.0	11.9	8.8
GONRU	3.0	4.7	6.2	11.9	11.4	11.7	11.7	11.9	11.7	-	-	6.4	-	-	-
	2.9	4.4	5.7	12.1	10.8	11.8	11.8	12.0	10.8	-	-	6.4	-	-	-
	2.1	3.8	7.0	12.0	9.8	11.6	11.3	11.8	11.7	-	4.9	6.0	-	0.9	-
	2.8	3.4	4.5	11.9	11.2	11.8	11.7	12.0	11.9	-	-	5.8	-	-	-
	1.0	1.9	5.6	12.1	7.6	11.3	11.8	12.0	9.8	-	4.9	6.0	-	-	-
GOVMI	-	3.3	-	-	-	-	10.4	8.4	-	3.0	-	9.3	9.3	5.5	3.5
	-	3.7	-	-	-	-	10.0	7.7	-	2.1	-	8.0	7.6	5.5	-
	-	2.6	-	-	-	-	8.8	6.4	-	1.5	-	-	7.6	4.9	3.1
HERCA	-	10.8	2.5	11.9	11.8	11.2	12.0	11.6	12.0	11.9	11.7	11.0	10.5	11.1	-
HINWO	-	-	-	-	1.7	-	-	5.2	-	-	-	12.3	12.1	12.0	8.2
IGAAN	5.0	7.5	-	1.5	8.0	7.2	8.9	11.8	-	-	10.3	12.2	12.1	12.1	12.0
	-	5.1	1.9	-	-	-	7.0	-	-	-	7.2	7.1	7.7	7.3	7.5
	-	6.9	-	3.8	9.9	-	-	-	-	4.0	-	12.2	12.1	12.1	11.6
JONKA	-	12.0	-	1.5	8.3	-	8.1	10.6	2.7	-	-	12.2	12.1	12.1	11.8
KACJA	-	0.3	-	-	-	-	9.1	-	5.1	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	0.1	-	-	-	-	8.7	0.2	4.2	2.8	-	-	-	-	-
	-	2.5	-	-	-	-	9.4	-	4.7	-	1.3	-	-	-	-
	-	0.5	-	-	-	-	8.9	-	4.2	-	-	-	-	-	-
KISSZ	-	1.6	-	-	8.8	0.2	8.1	0.3	1.5	-	-	12.0	12.2	12.2	1.0
KOSDE	-	-	-	-	-	-	-	-	-	-	-	-	-	11.0	6.6
	5.4	4.0	4.9	-	-	1.8	-	-	-	6.5	2.7	-	9.5	4.7	4.9
	2.7	4.9	7.3	7.1	7.4	10.9	3.9	5.2	-	-	-	1.4	-	5.9	8.9
LOJTO	8.3	-	0.8	1.5	-	4.8	-	5.1	-	-	-	-	12.1	11.3	-
MACMA	-	-	-	-	-	-	-	-	-	-	-	10.8	12.2	11.8	-
	4.8	-	4.1	12.6	-	2.6	-	1.6	-	-	-	10.9	8.7	7.4	-
	-	-	-	-	-	-	-	2.6	-	-	-	2.9	12.3	11.9	-
	11.5	-	-	-	-	-	-	2.6	-	-	-	10.9	12.2	11.9	-
MARGR	5.4	5.6	6.5	-	-	-	5.5	-	-	-	-	-	-	2.0	7.7
MARRU	1.4	-	1.8	11.2	-	1.7	-	6.5	6.0	-	9.9	8.5	-	-	-
	-	-	-	11.9	9.7	8.5	10.3	11.8	5.6	-	10.5	10.2	-	-	-
MASMI	7.8	9.9	8.9	10.6	2.6	2.9	-	7.8	-	3.7	0.4	4.0	-	-	11.7
MOLSI	-	-	-	-	-	-	1.3	3.0	-	-	-	-	-	-	-
	0.4	7.7	6.8	2.8	4.7	9.1	5.3	1.8	-	-	-	-	-	-	2.9
	6.1	1.7	-	-	12.3	6.0	4.4	3.2	0.2	-	-	-	12.0	11.9	7.1
	4.6	1.2	-	-	10.5	5.5	4.8	3.4	-	-	-	-	12.1	12.0	6.6
	7.0	3.6	-	1.5	12.8	6.1	6.2	3.3	-	-	-	-	12.3	12.2	7.5
	5.7	-	-	1.6	12.8	6.2	5.7	3.1	-	-	-	-	12.3	12.2	6.9
MORJO	-	9.6	-	-	-	-	9.6	8.8	-	-	-	12.2	12.0	12.1	12.0
MOSFA	10.5	8.2	1.6	-	-	-	6.7	12.5	12.4	12.4	12.3	-	-	-	4.7
OCHPA	7.0	6.5	2.9	-	-	-	-	8.6	8.3	8.6	8.5	-	-	-	-
OTTMI	-	2.2	-	10.2	5.5	9.4	1.4	-	10.4	-	3.5	7.8	3.1	7.0	4.8
PERZS	-	5.7	-	-	-	-	10.4	11.4	-	2.0	-	11.2	12.1	-	9.3
PUCRC	5.3	7.9	5.0	-	-	-	10.3	12.2	6.8	4.3	11.7	2.6	-	0.8	7.1
ROTEC	-	-	-	-	7.2	6.5	-	5.4	-	-	-	6.4	12.1	12.0	5.1
SARAN	-	-	-	8.7	7.2	7.6	10.2	11.8	7.7	-	8.2	10.2	-	-	-
	2.6	-	-	12.0	10.3	10.1	10.6	11.8	6.0	-	7.4	10.0	-	-	-
	4.1	1.1	-	11.7	11.0	9.9	10.7	11.5	7.6	-	8.5	10.2	-	-	-
	4.0	0.9	-	11.8	11.1	9.9	11.1	11.8	6.5	-	9.6	10.5	-	-	-
SCHHA	1.7	-	5.4	8.2	7.4	12.3	0.9	0.9	-	-	12.1	12.0	6.1	5.1	10.6
SLAST	-	-	-	-	-	-	9.7	5.8	3.0	0.7	1.5	-	-	-	-
	-	-	-	-	-	-	9.6	5.8	8.5	4.3	-	-	-	-	-
STOEN	10.1	1.7	1.8	-	-	-	10.6	10.9	12.3	12.3	12.2	3.3	-	-	4.1
	9.3	2.2	1.5	-	-	-	10.8	11.0	12.4	12.4	12.2	3.1	-	-	4.5
	11.1	4.1	2.2	-	-	-	10.9	10.9	12.4	12.3	12.2	2.9	-	-	5.1
STRJO	1.0	-	-	3.3	8.4	11.8	0.7	-	-	-	10.4	8.3	12.0	12.2	12.2
	1.2	-	2.0	3.0	8.5	11.4	0.6	-	-	-	10.5	8.4	8.2	11.9	11.9
	0.9	-	1.7	-	9.5	12.6	1.0	-	-	-	5.0	-	11.8	5.5	7.7
	1.1	-	-	2.7	10.6	12.5	1.2	-	-	-	10.3	8.2	10.9	12.1	12.0
	1.1	-	1.8	3.7	11.5	12.4	1.0	-	-	-	10.3	8.1	12.0	12.2	12.2
TEPIS	-	3.4	-	1.8	8.2	5.2	-	9.3	-	4.1	2.6	12.0	11.9	11.9	11.8
	-	-	-	9.9	10.3	5.6	6.8	11.6	-	6.0	3.7	11.9	11.8	11.8	11.8
TRIMI	1.3	5.4	0.4	-	-	-	4.8	4.1	0.9	0.5	-	-	-	3.3	-
YRJIL	-	-	-	-	-	4.0	6.4	6.6	-	12.2	4.0	10.0	-	8.4	12.2
ZELZO	-	-	-	-	4.1	-	1.0	5.0	-	-	-	-	3.4	4.2	6.5
	-	-	-	-	-	-	1.3	2.7	-	-	-	-	2.6	3.6	6.3
Sum	245.2	224.0	116.4	245.2	361.2	350.1	472.7	485.6	308.6	211.3	352.7	462.2	416.9	423.0	388.0

February	16	17	18	19	20	21	22	23	24	25	26	27	28
ARLRA	10.8	-	9.6	10.4	6.7	9.7	10.3	5.5	10.1	10.3	10.6	1.9	9.7
BANPE	3.3	-	-	3.5	1.4	-	-	-	-	-	3.2	-	-
BERER	11.5	11.2	10.2	10.5	10.0	-	-	-	-	-	-	-	-
	7.4	8.3	6.9	6.1	3.3	-	-	-	-	-	-	-	-
BOMMA	-	3.4	9.2	6.6	6.1	-	-	0.3	-	-	0.5	10.4	11.1
BREMA	7.7	9.7	-	-	-	7.7	-	5.9	6.4	-	-	-	9.7
BRIBE	7.8	-	9.8	3.7	-	2.2	1.8	9.3	8.0	-	-	10.9	1.6
	-	-	7.2	4.4	-	0.8	-	5.5	4.1	0.2	-	1.5	0.5
CASFL	10.7	12.0	11.9	11.9	6.8	-	11.7	4.1	0.7	3.2	-	9.3	10.7
	10.7	11.8	11.7	11.7	3.4	-	11.3	3.5	0.3	1.6	-	7.2	10.1
CRIST	-	11.7	11.6	11.6	1.3	0.2	10.4	5.5	1.1	-	9.5	4.1	10.8
	-	11.7	11.6	5.3	0.6	-	11.4	0.9	-	-	9.4	6.0	11.0
	-	11.7	11.6	11.6	2.1	-	10.4	6.6	1.1	0.5	9.7	7.4	11.0
CSISZ	2.0	5.6	5.4	5.0	1.9	1.4	-	-	-	-	-	-	-
DINJE	-	7.2	11.8	11.7	8.5	-	-	0.7	-	-	1.0	9.4	10.1
ELTMA	2.8	10.8	11.8	11.6	-	-	-	-	-	-	-	2.0	8.9
FORKE	11.7	-	11.7	11.6	11.4	-	11.4	-	7.1	11.3	11.2	2.4	5.3
GONRU	10.8	11.6	10.1	11.0	-	11.4	-	10.0	11.1	7.4	5.1	6.8	7.0
	10.5	11.8	10.2	10.3	-	11.6	-	10.4	11.2	8.0	4.5	6.3	6.9
	9.4	11.6	8.8	9.4	-	11.3	-	8.4	9.8	6.6	-	8.0	-
	10.1	11.8	9.4	10.6	-	11.6	-	9.3	10.9	6.6	2.1	6.5	6.4
	9.7	11.7	9.4	10.0	-	11.5	0.8	8.9	10.0	6.2	-	6.7	5.8
GOVMI	11.8	-	11.7	11.8	10.1	2.7	-	-	-	-	9.7	4.7	1.9
	11.5	-	11.7	5.5	7.7	-	-	-	-	-	-	-	-
	11.2	-	8.7	11.3	4.8	-	-	-	-	0.2	-	-	0.7
HERCA	8.8	9.8	7.7	10.6	9.4	8.2	7.3	4.7	8.0	10.6	10.7	11.4	8.6
HINWO	11.8	-	11.3	11.9	11.8	-	11.6	-	7.5	11.3	11.2	1.3	6.3
IGAAN	8.7	11.9	11.4	-	11.3	8.5	-	-	-	-	-	-	-
	-	7.1	7.7	7.2	6.9	3.5	-	4.1	-	-	-	-	-
	10.2	11.1	11.1	11.3	-	-	-	-	-	-	-	-	-
JONKA	11.5	11.9	11.9	10.3	9.6	7.6	-	-	-	-	-	-	0.2
KACJA	10.3	2.5	11.6	9.8	8.9	-	-	-	-	1.2	0.8	3.9	-
	-	-	-	-	-	1.6	-	-	-	-	-	-	-
	4.8	-	11.4	5.0	7.0	-	-	-	-	-	3.9	3.0	4.0
	10.4	2.4	11.8	10.5	8.7	-	-	-	-	1.2	1.2	3.7	-
	10.5	2.2	11.7	10.6	7.9	-	-	-	-	-	0.2	2.9	-
KISSZ	1.3	12.0	10.7	11.8	-	6.4	-	-	-	-	-	-	-
KOSDE	7.6	2.5	-	-	-	3.4	6.8	3.7	-	-	-	-	-
	4.8	10.1	-	3.3	6.2	1.1	10.2	10.1	-	-	-	-	-
	-	9.5	10.7	-	-	-	-	4.9	9.9	0.6	1.2	10.8	-
LOJTO	11.9	11.8	-	-	-	6.9	-	2.6	-	-	-	-	-
MACMA	3.9	8.2	-	-	11.9	8.2	4.6	1.9	-	-	-	-	-
	12.2	10.1	1.9	-	12.0	9.0	5.0	2.8	-	-	-	-	3.5
	12.1	12.0	3.0	-	11.9	10.0	5.6	4.2	-	-	-	-	2.2
	12.1	12.0	0.3	-	11.9	9.6	2.6	3.7	-	-	-	-	2.1
MARGR	-	-	-	-	0.5	-	-	-	9.1	11.2	8.8	5.0	8.1
MARRU	10.0	11.6	11.4	9.9	-	11.4	-	10.7	11.2	10.8	-	7.7	5.7
	8.7	11.5	9.3	9.3	-	11.0	-	10.1	10.5	11.1	-	3.5	8.5
MASMI	11.2	-	11.2	-	6.0	-	10.1	-	-	-	-	-	-
MOLSI	-	-	-	5.7	11.1	3.8	10.4	0.9	2.7	10.8	10.8	-	6.5
	-	-	-	4.8	11.3	-	10.0	1.1	3.2	10.8	11.2	-	5.8
	11.5	-	6.3	11.6	1.3	9.6	10.3	7.9	11.3	11.4	11.4	1.6	10.2
	11.9	-	9.6	11.8	3.0	9.9	10.5	8.0	11.3	11.4	11.4	-	10.7
	12.1	-	7.6	7.5	-	10.7	9.9	8.1	11.5	10.6	2.5	1.5	8.0
	12.1	-	9.3	11.9	0.6	9.9	9.6	7.9	11.2	11.6	11.4	1.8	9.9
MORJO	11.4	11.9	8.0	11.8	9.9	7.4	-	-	-	-	-	-	-
MOSFA	11.5	12.1	12.0	11.7	-	-	11.8	1.0	-	2.4	0.2	5.2	5.7
OCHPA	8.2	8.5	8.5	8.4	-	-	9.6	-	-	2.8	-	3.4	-
OTMI	0.4	0.9	7.0	7.1	-	3.2	8.0	7.2	9.5	-	8.5	3.4	-
PERZS	12.0	5.9	7.3	11.8	10.9	6.3	-	-	-	-	7.3	-	0.9
PUCRC	11.8	11.7	11.5	11.6	8.6	0.3	-	-	-	-	-	-	-
ROTEC	11.8	-	7.4	11.7	-	8.6	11.1	5.0	10.3	11.4	11.4	-	9.9
SARAN	9.4	11.5	10.0	9.7	-	11.4	-	8.8	10.9	9.5	-	4.4	6.6
	8.3	11.3	9.9	9.5	-	11.4	-	7.1	8.1	7.2	-	4.0	6.6
	10.3	11.1	9.8	10.1	-	11.1	-	9.2	8.0	8.3	-	4.4	7.8
	9.8	11.5	9.4	9.5	-	11.4	-	8.6	11.0	10.6	-	5.3	7.1
SCHHA	3.5	6.0	8.5	1.1	-	2.2	-	8.8	7.1	-	-	10.4	-
SLAST	-	-	11.8	11.1	8.2	-	-	-	-	-	-	1.1	3.1
	-	-	11.8	11.7	7.1	-	-	-	-	-	-	-	-
STOEN	8.3	11.9	11.9	11.4	2.3	-	2.7	-	-	-	1.8	1.3	8.2
	8.8	12.1	11.8	11.7	2.8	-	2.7	-	-	0.2	1.8	2.1	7.8
	9.0	12.1	12.0	11.8	3.5	-	2.8	-	-	-	1.9	2.6	9.0
STRJO	11.0	-	12.0	-	-	-	3.5	7.7	5.2	0.4	-	8.4	3.2
	11.0	-	11.7	5.8	-	1.4	2.0	7.6	4.5	-	-	10.4	4.3
	10.0	-	11.7	5.8	-	-	3.8	7.4	1.2	0.6	-	9.8	3.5
	11.0	-	11.9	5.9	-	-	-	8.1	5.5	-	0.2	9.4	3.7
	11.0	-	11.8	5.8	-	1.6	3.4	7.3	3.9	-	0.2	9.4	4.0
TEPIS	11.8	11.7	-	11.6	8.6	9.1	-	-	-	-	-	-	4.5
	11.8	11.7	-	11.2	6.8	9.9	-	-	-	-	-	-	-
TRIMI	2.8	-	3.3	6.8	1.9	1.3	-	-	-	-	2.1	1.4	-
YRJIL	12.1	-	-	-	-	-	-	-	-	-	-	-	-
ZELZO	3.4	5.0	1.9	1.3	-	-	-	-	-	-	-	-	-
	2.0	4.7	3.5	2.8	0.3	-	-	-	-	-	-	-	-
Sum	634.2	515.4	667.3	620.6	326.2	329.0	265.4	286.0	284.5	240.1	208.6	275.7	325.7

3. Results (Meteors)

February	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
ARLRA	15	5	-	12	15	14	9	13	-	-	-	10	55	57	12
BANPE	-	-	-	-	-	-	10	6	-	-	-	-	10	-	6
BERER	-	6	-	-	49	38	9	41	-	-	1	42	56	37	68
	-	1	-	-	12	15	-	7	-	-	-	11	12	11	13
BOMMA	6	9	-	-	-	-	29	13	10	7	8	2	-	-	-
BREMA	-	1	4	2	4	11	-	1	-	-	1	11	1	16	8
BRIBE	-	-	12	14	22	28	-	-	-	-	12	28	12	20	22
	-	-	13	7	10	24	-	2	-	-	2	13	13	24	24
CASFL	32	19	9	-	-	-	24	39	23	41	34	-	-	-	7
	31	12	4	-	-	-	11	17	14	29	29	-	-	-	8
CRIST	30	2	-	-	-	-	34	19	32	33	33	37	-	-	-
	26	-	-	-	-	-	18	19	22	17	31	11	-	-	-
	58	7	-	-	-	-	56	48	55	47	68	45	-	-	-
CSISZ	-	2	2	-	-	-	-	-	-	-	-	6	7	-	10
DINJE	37	13	-	-	-	-	36	33	52	40	18	2	-	-	-
ELTMA	14	10	-	-	-	-	20	13	20	13	9	-	-	-	-
FORKE	-	-	-	-	3	16	-	6	-	-	33	41	41	33	30
GONRU	4	5	12	34	31	26	40	40	26	-	-	6	-	-	-
	4	7	12	26	19	29	22	30	13	-	-	3	-	-	-
	1	1	16	20	11	14	11	23	6	-	3	1	-	1	-
	1	6	10	27	33	27	23	28	25	-	-	5	-	-	-
	3	4	18	25	22	16	16	23	12	-	14	6	-	-	-
GOVMI	-	2	-	-	-	-	7	13	-	9	-	14	8	14	2
	-	4	-	-	-	-	6	11	-	1	-	5	6	3	-
	-	4	-	-	-	-	5	7	-	2	-	-	2	7	1
HERCA	-	10	1	14	18	19	18	17	24	23	21	19	12	10	-
HINWO	-	-	-	-	9	-	-	12	-	-	-	41	36	37	26
IGAAN	3	6	-	4	8	7	4	21	-	-	9	9	12	15	11
	-	7	2	-	-	-	4	-	-	-	9	4	12	7	7
	-	6	-	1	3	-	-	-	-	3	-	5	2	2	3
JONKA	-	5	-	1	6	-	1	13	3	-	-	9	15	17	17
KACJA	-	2	-	-	-	-	16	-	39	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	1	-	-	-	-	4	1	7	5	-	-	-	-	-
	-	5	-	-	-	-	27	-	34	-	4	-	-	-	-
	-	1	-	-	-	-	18	-	27	-	-	-	-	-	-
KISSZ	-	1	-	-	5	1	2	1	2	-	-	3	6	8	3
KOSDE	-	-	-	-	-	-	-	-	-	-	-	-	-	53	42
	60	27	50	-	-	10	-	-	-	26	2	-	54	12	19
	5	5	9	8	9	17	6	5	-	-	-	5	-	8	5
LOJTO	8	-	1	1	-	1	-	6	-	-	-	-	9	13	-
MACMA	-	-	-	-	-	-	-	-	-	-	-	15	13	13	-
	14	-	3	26	-	11	-	3	-	-	-	31	23	26	-
	-	-	-	-	-	-	-	1	-	-	-	8	29	14	-
	9	-	-	-	-	-	-	4	-	-	-	22	41	25	-
MARGR	4	3	7	-	-	-	4	-	-	-	-	-	-	3	4
MARRU	2	-	7	33	-	3	-	28	8	-	18	10	-	-	-
	-	-	-	24	16	19	12	14	3	-	20	19	-	-	-
MASMI	27	29	24	23	1	5	-	9	-	2	2	14	-	-	22
MOLSI	-	-	-	-	-	-	6	6	-	-	-	-	-	-	-
	1	27	9	1	23	14	8	1	-	-	-	-	-	-	1
	21	2	-	-	51	12	23	10	1	-	-	-	56	44	11
	14	5	-	-	32	7	13	9	-	-	-	-	43	52	8
	12	6	-	1	22	10	17	3	-	-	-	-	38	29	6
	17	-	-	1	48	14	19	11	-	-	-	-	69	48	15
MORJO	-	6	-	-	-	-	6	7	-	-	-	7	15	20	10
MOSFA	16	6	5	-	-	-	10	23	9	16	17	-	-	-	5
OCHPA	21	10	8	-	-	-	-	21	9	20	17	-	-	-	-
OTTMI	-	2	-	16	6	13	1	-	23	-	4	8	1	8	12
PERZS	-	12	-	-	-	-	9	17	-	5	-	18	39	-	16
PUCRC	6	3	10	-	-	-	6	25	17	13	23	3	-	2	18
ROTEC	-	-	-	-	4	1	-	12	-	-	-	3	19	15	1
SARAN	-	-	-	18	12	14	8	8	3	-	13	12	-	-	-
	1	-	-	21	21	24	13	19	7	-	16	16	-	-	-
	1	1	-	27	29	27	31	32	9	-	19	19	-	-	-
	4	1	-	17	12	15	11	7	4	-	11	8	-	-	-
SCHHA	2	-	19	22	22	24	2	1	-	-	40	37	4	5	21
SLAST	-	-	-	-	-	-	5	1	5	3	1	-	-	-	-
	-	-	-	-	-	-	4	4	9	6	-	-	-	-	-
STOEN	25	8	14	-	-	-	27	29	30	36	30	5	-	-	27
	23	3	7	-	-	-	25	43	29	37	28	5	-	-	17
	36	7	14	-	-	-	32	43	38	54	30	2	-	-	20
STRJO	7	-	-	3	13	19	2	-	-	-	22	23	17	23	11
	4	-	5	4	6	17	1	-	-	-	25	9	5	30	8
	1	-	1	-	5	21	3	-	-	-	3	-	13	25	5
	3	-	-	2	15	27	5	-	-	-	18	24	5	27	18
	2	-	1	3	14	21	1	-	-	-	21	24	11	21	16
TEPIS	-	8	-	3	10	11	-	10	-	6	1	18	26	17	14
	-	-	-	6	25	23	4	22	-	16	3	29	32	22	33
TRIMI	5	8	3	-	-	-	9	4	4	2	-	-	-	6	-
YRJIL	-	-	-	-	-	2	5	3	-	17	3	9	-	15	19
ZELZO	-	-	-	-	5	-	1	13	-	-	-	-	10	9	12
	-	-	-	-	-	-	1	6	-	-	-	-	6	8	11
Sum	616	343	312	447	681	667	810	977	654	529	726	792	896	912	705

February	16	17	18	19	20	21	22	23	24	25	26	27	28
ARLRA	58	-	21	62	29	25	45	22	37	39	63	1	24
BANPE	13	-	-	7	1	-	-	-	-	-	9	-	-
BERER	39	50	28	18	18	-	-	-	-	-	-	-	-
	16	7	5	6	1	-	-	-	-	-	-	-	-
BOMMA	-	7	27	8	16	-	-	2	-	-	2	11	20
BREMA	3	6	-	-	-	2	-	3	9	-	-	17	-
BRIBE	6	-	14	2	-	1	1	15	11	-	-	25	1
	-	-	10	4	-	2	-	18	6	1	-	10	1
CASFL	20	42	28	26	3	-	38	5	1	7	-	18	17
	12	15	19	17	8	-	27	4	2	1	-	13	14
CRIST	-	28	35	33	2	1	24	6	4	-	17	14	20
	-	14	25	8	1	-	22	1	-	-	13	8	9
	-	49	56	41	9	-	38	12	3	1	24	22	31
CSISZ	7	14	16	11	3	2	-	-	-	-	-	-	-
DINJE	-	20	30	32	23	-	-	4	-	-	4	20	25
ELTMA	5	15	16	10	-	-	-	-	-	-	-	2	13
FORKE	39	-	32	28	31	-	26	-	10	38	21	1	8
GONRU	34	30	20	22	-	40	-	21	28	14	7	6	9
	33	35	27	15	-	37	-	18	31	8	4	10	8
	17	15	12	5	-	10	-	3	11	4	-	4	-
	26	37	15	17	-	27	-	12	20	7	2	9	11
	31	32	27	14	-	31	2	14	21	2	-	6	10
GOVMI	20	-	34	33	11	3	-	-	-	-	16	4	1
	5	-	8	6	5	-	-	-	-	-	-	-	-
	5	-	4	14	3	-	-	-	-	1	-	-	1
HERCA	12	10	26	16	7	16	4	12	16	21	13	15	9
HINWO	25	-	36	28	27	-	36	-	14	32	33	1	11
IGAAN	4	24	8	-	9	2	-	-	-	-	-	-	-
	-	11	5	7	5	3	-	1	-	-	-	-	-
	1	2	2	1	-	-	-	-	-	-	-	-	-
JONKA	6	14	4	8	7	1	-	-	-	-	-	-	1
KACJA	42	1	26	19	14	-	-	-	-	2	1	12	-
	-	-	-	-	-	4	-	-	-	-	-	-	-
	1	-	5	1	3	-	-	-	-	-	2	9	3
	69	5	49	54	21	-	-	-	-	3	3	17	-
	33	3	19	20	13	-	-	-	-	-	1	8	-
KISSZ	2	7	1	7	-	1	-	-	-	-	-	-	-
KOSDE	47	12	-	-	-	31	46	17	-	-	-	-	-
	16	58	-	29	13	2	48	36	-	-	-	-	-
	-	12	13	-	-	-	-	6	24	1	2	9	-
LOJTO	13	8	-	-	-	5	-	1	-	-	-	-	-
MACMA	29	19	-	-	17	7	7	4	-	-	-	-	-
	43	38	5	-	27	14	7	3	-	-	-	-	2
	25	19	3	-	7	13	5	2	-	-	-	-	3
	31	42	1	-	28	21	9	5	-	-	-	-	5
MARGR	-	-	-	-	1	-	-	-	12	7	4	8	7
MARRU	34	17	24	13	-	27	-	13	31	11	-	8	8
	12	17	16	10	-	18	-	12	18	17	-	3	8
MASMI	15	-	16	-	20	-	23	-	-	-	-	-	-
MOLSI	-	-	-	19	97	6	27	6	16	56	83	-	21
	-	-	-	15	53	-	17	3	11	27	32	-	17
	36	-	16	46	2	25	32	37	34	58	69	2	35
	49	-	15	49	1	19	25	31	32	52	54	-	16
	33	-	8	19	-	13	13	29	16	25	5	3	10
	53	-	16	66	3	29	27	40	41	48	49	5	20
MORJO	8	12	2	10	4	2	-	-	-	-	-	-	-
MOSFA	19	10	8	13	-	-	15	1	-	6	1	7	3
OCHPA	9	19	5	14	-	-	18	-	-	3	-	2	-
OTTMI	3	5	17	8	-	4	13	5	12	-	10	3	-
PERZS	31	14	26	24	4	4	-	-	-	-	17	-	1
PUCRC	21	22	13	11	4	2	-	-	-	-	-	-	-
ROTEC	13	-	3	9	-	7	14	4	10	8	21	-	8
SARAN	13	21	24	10	-	21	-	8	12	2	-	2	11
	18	22	13	15	-	19	-	12	15	2	-	2	2
	25	38	13	12	-	31	-	12	25	9	-	5	14
	13	14	18	8	-	7	-	7	9	10	-	5	5
SCHHA	7	8	17	1	-	2	-	20	16	-	-	23	-
SLAST	-	-	12	10	8	-	-	-	-	-	-	1	1
	-	-	8	9	4	-	-	-	-	-	-	-	-
STOEN	29	35	27	11	7	-	18	-	-	-	7	6	22
	27	29	23	9	1	-	23	-	-	1	7	10	12
	18	28	26	17	7	-	19	-	-	-	11	6	27
STRJO	16	-	23	-	-	-	4	15	6	2	-	17	4
	15	-	15	4	-	1	1	15	11	-	-	19	4
	14	-	8	1	-	-	1	18	3	1	-	9	2
	10	-	18	2	-	-	-	11	5	-	1	17	3
	12	-	11	3	-	1	2	16	4	-	1	14	3
TEPIS	12	14	-	14	6	6	-	-	-	-	-	-	6
	22	22	-	21	8	16	-	-	-	-	-	-	-
TRIMI	12	-	11	16	3	2	-	-	-	-	4	3	-
YRJIL	21	-	-	-	-	-	-	-	-	-	-	-	-
ZELZO	6	12	7	4	-	-	-	-	-	-	-	-	-
	4	9	5	7	1	-	-	-	-	-	-	-	-
Sum	1418	1069	1176	1129	596	563	677	562	587	527	613	452	527