Results of the IMO Video Meteor Network – April 2011

Sirko Molau, Abenstalstr. 13b, 84072 Seysdorf *2011/06/14*

1. Observers

Code	Name	Place	Camera	FOV [°²]	St.LM [mag]	Eff.CA [km²]	Nights	Time [h]	Tot. CA [10³km²h]	Meteors
BENOR	Benitez-S.	Las Palmas/ES	TIMES4 (1.4/50)	2359	3.2	492	13	31.6	18.7	95
BERER	Berko	Ludanyhalaszi/HU	HULUD2 (0.75/6)	6500	3.8	2209	17	84.3	-	239
			HULUD3 (0.75/6)	4661	3.9	1052	8	28.3	42.9	76
BRIBE	Brinkmann	Herne/DE	HERMINE (0.8/6)	2374	4.2	1084	28	101.5	80.3	261
		Berg. Gladbach/DE	KLEMOI (0.8/6)	2386	5.4	2781	24	88.2	94.0	249
CASFL	Castellani	Monte Baldo/IT	BMH1 (0.8/6)	2350	-	-	22	77.6	-	220
			BMH2 (1.5/4.5)*	4243	-	-	26	81.1	-	199
CRIST	Crivello	Valbrevenna/IT	C3P8 (0.8/3.8)	5575	4.2	2525	21	134.5	134.9	259
			STG38 (0.8/3.8)	5593	4.3	2810	21	130.9	276.9	358
CSISZ	Csizmadia	Zalaegerszeg/HU	HUVCSE01 (0.95/5)	2439	3.0	249	23	50.1	16.7	124
CURMA	Currie	Grove/UK	MIC4 (0.8/6)	1471	5.2	3008	18	105.7	-	209
ELTMA	Eltri	Venezia/IT	MET38 (0.8/3.8)	5620	4.3	1778	19	134.2	-	234
GONRU	Goncalves	Tomar/PT	TEMPLAR1 (0.8/6)*	2188	5.3	2331	18	123.5	138.1	367
			TEMPLAR2 (0.8/6)*	2303	5.0	2397	18	100.1	143.9	242
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2 (0.8/8)	1471	6.0	3916	23	85.0		240
HERCA	Hergenrother	Tucson/US	SALSA3 (1.2/4)*	4332	4.0	1471	28	222.0	243.6	276
HINWO	Hinz	Brannenburg/DE	AKM2 (0.85/25)*	754	5.7	1306	25	131.4	152.5	300
IGAAN	Igaz	Baja/HU	HUBAJ (0.8/3.8)	5600	4.3	3338	20	47.6	60.1	139
		Hodmezovasar./HU	HUHOD (0.8/3.8)	5609	4.2	3031	22	65.4	-	163
		Budapest/HU	HUPOL (1.2/4)	3929	3.5	1144	22	54.8	82.2	152
JONKA	Jonas	Budapest/HU	HUSOR (0.95/4.0)	5262	3.9	1159	19	57.3	-	146
KACJA	Kac	Kostanjevec/SI	METKA (0.8/8)*	1381	4.0	2246	13	74.1		130
		Ljubljana/SI	ORION1 (0.8/8)	1420	5.3	2336	20	118.9	32.2	188
		Kamnik/SI	REZIKA (0.8/6)	2307	5.0	2293	19	124.3	65.1	458
			STEFKA (0.8/3.8)	5540	4.2	2882	23	138.2	-	318
KERST	Kerr	Glenlee/AU	GOCAM1 (0.8/3.8)	5238	4.2	2637	24	199.3	412.3	1344
KLAGR	Kladnik	Tacen/SI	TACKA (0.8/12)	715	5.4	796	15	73.6	41.7	304
KOSDE	Koschny	Noordwijkerh./NL	LIC4 (1.4/50)*	2027	-	-	20	89.0	269.7	148
LUNRO	Lunsford	Chula Vista/US	BOCAM (1.4/50)*	1860	5.1	1719	15	72.0	-	231
MOLSI	Molau	Seysdorf/DE	AVIS2 (1.4/50)*	1771	6.1	4182	23	158.8	383.0	1052
			MINCAM1 (0.8/8)	1477	4.9	1716	29	188.1	231.2	470
		Ketzür/DE	REMO1 (0.8/3.8)	5592	3.0	974	23	137.3	36.5	166
			REMO2 (0.8/3.8)	5635	4.3	2846	23	143.9	94.1	242
MORJO	Morvai	Fülöpszallas/HU	HUFUL (1.4/5)	2522	3.5	532	21	55.0	33.4	118
OTTMI	Otte	Pearl City/US	ORIE1 (1.4/5.7)	3837	-	-	3	9.1		33
PERZS	Perko	Becsehely/HU	HUBEC (0.8/3.8)*	5448	3.4	1500	22	88.6	162.1	269
ROTEC	Rothenberg	Berlin/DE	ARMEFA (0.8/6)	2369	4.8	1801	8	38.7	45.3	71
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON (0.8/3.8)	5537	3.0	846	26	64.6	-	159
SLAST	Slavec	Ljubljana/SI	KAYAK1 (1.8/28)	604	6.5	1849	21	81.1	-	222
STOEN	Stomeo	Scorze/IT	MIN38 (0.8/3.8)	5631	4.1	2407	23	135.7	-	444
			NOA38 (0.8/3.8)	5609	4.9	5800	23	137.7	159.8	344
			SCO38 (0.8/3.8)	5598	5.0	4416	24	150.3	-	455
STORO	Stork	Kunzak/CZ	KUN1 (1.4/50)*	1913	5.4	2778	3	21.5	67.1	243
		Ondrejov/CZ	OND1 (1.4/50)*	2195	5.8	4595	4	25.1	99.4	290
STRJO	Strunk	Herford/DE	MINCAM2 (0.8/6)	2357	4.7	1380	24	67.7	-	203
			MINCAM3 (0.8/12)	728	6.1	2271	22	83.8	133.7	217
			MINCAM5 (0.8/6)	2344	5.2	2535	25	114.3	-	395
TEPIS	Tepliczky	Budapest/HU	HUMOB (0.8/6)	2375	4.9	2258	21	80.3	-	264
TRIMI	Triglav	Velenje/SI	SRAKA (0.8/6)*	2222	-	-	13	34.4	61.3	85
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM (0.8/6)	2337	5.5	3574	18	62.7	-	145
Sum							30	4703.2		13556

* active field of view smaller than video frame

2. Observing Times (h)

April	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
BENOR	0.7	-	2.3	0.7	-	-	-	4.0	-	2.7	1.8	2.2	3.1	-	-
BERER	8.7	1.2	8.2	-	5.4	-	0.6	1.2	7.9	5.8	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRIBE	3.2	0.7	0.7	2.8	-	3.7	6.8	5.7	6.5	5.1	1.5	7.1	1.6	1.8	2.5
	3.0	2.8	-	2.7	-	2.8	3.3	4.5	5.3	4.9	-	5.3	-	4.3	2.6
CASFL	5.0	5.6	2.8	5.0	1.7	6.3	4.9	3.5	3.2	4.1	-	4.2	2.6	-	2.3
	2.0	3.0	1.8	4.7	1.9	6.7	1.3	1.8	4.3	7.7	1.2	4.2	-	-	0.7
CRIST	9.5	1.8	-	5.4	7.1	9.2	6.3	5.3	-	9.0	8.3	7.0	-	2.2	-
	7.2	9.4	2.1	9.3	6.2	9.2	8.1	9.1	-	-	-	-	-	-	-

CSISZ	-	8.9	0.3	0.9	3.3	1.4	1.2	2.2	4.0	0.9	0.4	-	-	1.4	-
CURMA	9.2	4.0	9.1	-	-	8.8	4.8	8.7	-	8.2	8.3	3.1	-	-	-
ELTMA	8.7	8.6	8.6	-	6.9	5.2	7.5	6.8	4.8	9.1	8.6	-	6.7	-	-
GONRU	-	-	9.2	6.6	-	4.7	9.2	9.3	5.0	4.8	7.6	5.6	5.9	5.6	5.8
	-	-	9.2	9.6	-	2.6	5.0	7.2	2.8	5.4	9.2	4.3	7.4	3.5	6.4
GOVMI	4.6	7.0	5.1	-	-	2.1	5.6	-	4.5	6.8	1.2	-	0.4	2.2	1.2
HERCA	8.7	6.8	-	9.8	9.7	1.8	2.6	9.6	0.3	-	9.5	9.5	9.4	9.4	9.4
HINWO	7.6	8.8	2.8	-	0.2	5.6	1.9	5.0	7.9	-	6.8	-	-	1.1	4.7
IGAAN	-	-	-	-	5.0	0.6	0.2	3.8	1.8	1.0	0.2	-	2.5	0.4	-
	2.2	2.1	4.4	-	2.5	0.3	-	0.7	4.8	0.3	-	-	5.5	0.3	-
	1.0	0.3	3.1	-	3.6	0.5	0.8	2.6	6.7	3.2	0.5	-	0.6	1.8	-
JONKA	-	0.3	2.5	-	2.4	-	-	-	-	1.6	-	-	-	0.3	-
KACJA	5.0	9.5	5.9	-	-	2.6	2.1	3.2	8.6	-	1.0	-	-	-	-
	-	-	8.3	-	5.9	-	4.2	9.2	9.1	9.0	0.3	0.5	4.7	3.6	4.2
	4.3	9.4	9.4	-	9.3	6.2	2.4	8.5	7.3	4.5	-	-	-	-	2.8
	9.3	9.5	9.4	-	9.3	4.8	2.8	9.2	6.5	4.2	0.8	-	8.9	1.6	1.5
KERST	-	-	-	10.0	7.6	9.8	9.5	8.6	9.3	8.8	9.1	7.4	7.0	9.2	5.7
KLAGR	-	-	-	-	-	-	-	-	-	-	-	-	5.4	5.1	4.4
KOSDE	3.2	-	-	1.0	-	8.6	2.6	4.5	4.3	8.4	-	-	-	2.3	1.0
LUNRO	6.7	1.9	-	2.6	-	-	-	-	-	6.2	5.4	6.5	-	5.0	6.0
MOLSI	5.2	8.7	3.3	4.2	-	7.9	7.4	8.3	8.2	8.2	7.3	3.6	-	4.1	7.8
	5.9	9.3	4.2	1.3	-	3.7	7.1	8.9	8.9	8.4	8.8	7.0	0.8	5.0	6.1
	-	9.0	-	2.4	-	4.5	8.6	6.6	8.5	5.3	8.4	1.9	-	-	8.0
	-	9.0	-	1.4	-	8.7	8.5	6.8	8.5	8.4	7.3	0.6	-	-	7.9
MORJO	5.9	1.8	2.9	-	3.8	3.0	-	1.1	4.4	0.3	-	-	0.7	0.3	-
OTTMI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PERCZ	6.9	3.2	4.0	-	5.1	3.1	4.0	8.0	-	7.0	2.4	-	-	1.9	-
ROTEC	-	9.1	-	-	-	-	6.1	-	-	-	-	-	-	-	-
SCHHA	0.8	0.3	0.3	2.4	-	6.5	2.6	3.6	2.1	0.3	0.6	4.3	0.9	2.2	2.3
SLAST	3.7	5.8	3.7	-	7.1	2.8	0.5	5.8	3.3	7.7	0.7	-	3.6	1.0	0.8
STOEN	9.3	9.5	6.0	3.5	4.8	6.2	4.4	9.2	4.0	7.7	4.6	-	6.6	-	-
	9.6	9.5	7.2	1.0	4.8	4.8	4.7	9.2	4.7	7.7	1.8	-	5.7	-	7.6
	9.4	9.5	6.8	2.8	6.8	6.5	3.4	7.4	3.6	6.6	4.1	-	6.8	-	8.8
STORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STRJO	1.7	1.0	-	2.6	-	0.7	5.2	3.7	2.8	1.6	1.2	0.7	3.6	2.9	2.5
	1.2	2.0	-	2.4	-	3.6	4.1	3.0	4.3	2.9	2.2	-	3.5	2.3	7.5
	4.2	4.0	-	5.3	-	5.3	8.1	3.9	7.8	3.1	1.8	0.3	5.4	3.5	6.4
TEPIS	4.6	1.1	3.8	-	7.4	-	-	2.7	4.3	3.8	3.3	-	-	4.9	-
TRIMI	5.2	2.3	3.1	-	3.0	0.3	1.5	5.0	5.1	4.5	0.8	-	2.5	-	-
YRJIL	-	-	-	-	1.0	-	-	-	2.1	3.0	5.5	-	4.1	2.9	-
Sum	183.4	196.7	150.5	100.4	131.8	171.1	169.9	227.4	197.5	208.2	142.5	85.3	115.9	92.1	126.9

April	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
BENOR	2.4	-	-	-	-	-	4.3	1.5	3.5	-	2.4	-	-	-	-
BERER	-	-	-	3.9	6.5	8.3	8.1	8.1	-	-	5.0	1.8	0.6	3.0	-
	-	-	-	1.8	6.5	8.2	8.1	-	0.3	-	0.3	-	0.4	2.7	-
BRIBE	0.9	5.0	4.8	4.8	2.6	4.4	5.3	7.9	3.4	4.5	2.0	-	0.6	1.3	4.3
	-	4.4	3.5	4.5	6.2	3.1	3.3	5.0	2.6	3.4	1.5	-	0.7	2.0	6.5
CASFL	-	2.3	4.5	-	-	3.8	2.2	4.8	1.0	2.5	-	2.5	-	2.8	-
	-	2.8	3.8	1.3	8.0	5.4	2.8	1.8	2.1	1.7	0.3	3.5	-	1.8	4.5
CRIST	1.3	8.6	8.5	8.5	8.4	5.5	-	-	6.4	5.4	2.9	-	-	-	7.9
	1.4	8.6	8.5	8.5	8.4	8.4	-	-	4.8	6.2	3.6	0.7	2.8	2.6	5.8
CSISZ	1.3	0.3	0.9	3.1	5.0	3.9	6.1	0.5	1.1	-	0.7	-	-	0.7	1.6
CURMA	-	-	7.8	1.2	5.3	3.8	7.0	-	3.9	5.0	-	5.5	-	-	2.0
ELTMA	-	-	7.9	6.5	6.5	8.3	8.4	6.0	-	3.6	-	-	-	5.5	-
GONRU	8.2	5.2	-	-	-	-	-	-	8.6	8.6	8.4	5.2	-	-	-
	5.3	4.0	-	-	-	-	-	-	4.5	5.3	6.8	1.6	-	-	-
GOVMI	3.3	4.8	1.3	6.8	5.7	8.2	8.1	0.7	1.5	-	1.3	1.1	-	-	1.5
HERCA	9.3	9.3	9.3	9.2	9.2	9.2	9.1	9.1	4.7	9.0	8.7	9.0	3.0	8.9	8.5
HINWO	5.8	7.8	7.7	7.7	7.6	7.5	7.5	2.1	4.8	2.9	2.3	4.6	-	4.6	6.1
IGAAN	6.2	2.1	1.4	0.9	3.3	-	8.3	4.8	1.2	-	1.3	0.2	-	2.4	-
	4.0	-	0.9	3.3	7.0	4.3	8.3	7.3	-	-	2.3	0.2	1.8	1.9	1.0
	1.4	0.3	0.8	3.0	5.6	5.2	8.2	5.0	0.3	-	-	-	-	0.3	-
JONKA	1.4	3.8	1.3	2.9	3.4	8.3	8.1	8.2	0.7	-	4.6	1.5	1.0	4.2	0.8
KACJA	-	-	2.9	8.4	8.5	8.4	8.0	-	-	-	-	-	-	-	-
	-	8.7	8.6	8.5	8.5	8.3	8.4	5.8	2.0	-	-	-	-	-	1.1

	-	8.6	8.6	8.5	8.4	8.3	8.3	5.9	0.6	-	-	-	-	-	3.0
	-	8.7	8.6	7.8	8.5	8.4	8.4	5.7	1.8	0.3	-	-	-	-	2.2
KERST	6.7	-	-	8.1	-	8.7	8.5	5.3	10.6	8.9	9.8	4.9	8.6	8.2	9.0
KLAGR	1.2	5.6	6.1	7.6	8.3	8.1	7.9	6.8	2.6	-	1.0	0.5	-	-	3.0
KOSDE	6.7	7.6	-	0.5	5.5	2.2	-	7.3	7.2	7.2	0.7	-	-	1.2	7.0
LUNRO	9.0	1.4	-	-	-	-	-	-	1.5	-	0.9	6.4	6.6	-	5.9
MOLSI	7.8	7.7	7.6	7.6	7.5	7.4	7.3	7.3	7.2	7.2	-	-	-	-	-
	4.6	8.3	8.3	8.3	8.2	8.1	8.1	5.8	7.9	7.9	0.5	7.0	4.5	7.6	7.6
	-	7.7	7.7	7.7	7.7	7.6	7.5	7.3	7.4	0.3	-	0.8	4.6	0.9	6.9
	-	7.7	7.7	7.7	7.7	7.6	7.5	7.4	7.3	1.6	-	0.3	4.8	2.6	6.9
MORJO	1.5	2.8	2.2	0.4	4.9	5.7	7.0	2.5	1.1	-	2.4	-	-	-	0.3
OTTMI	-	-	-	-	4.9	-	-	-	-	-	-	-	-	2.1	2.1
PERCZ	4.0	3.2	4.7	4.6	7.2	5.1	8.3	0.4	-	-	2.2	0.3	-	1.0	2.0
ROTEC	-	2.0	2.5	6.1	-	-	-	-	-	-	0.3	-	-	5.7	6.9
SCHHA	0.3	-	3.4	4.3	1.4	0.9	7.1	3.2	-	2.6	0.6	-	3.4	4.4	3.8
SLAST	-	1.2	2.7	1.5	6.6	5.4	8.0	6.3	-	-	-	-	-	-	2.9
STOEN	-	3.7	5.7	7.2	8.6	7.9	5.5	4.3	4.5	6.0	-	1.0	-	5.5	-
	-	7.5	6.9	6.1	8.6	8.3	5.9	3.2	-	6.2	-	1.7	-	5.0	-
	-	7.2	8.5	7.9	8.5	8.5	6.6	4.3	4.3	7.2	-	0.8	-	4.0	-
STORO	-	-	-	-	6.5	7.6	7.4	-	-	-	-	-	-	-	-
	-	-	-	3.6	6.8	7.3	7.4	-	-	-	-	-	-	-	-
STRJO	-	0.6	3.5	2.5	2.7	3.4	5.3	6.1	3.7	3.9	-	-	-	1.2	4.6
	-	3.3	4.9	4.7	4.2	2.9	7.1	6.0	-	2.8	-	-	-	3.4	5.5
	0.3	4.6	2.8	6.1	2.5	4.2	7.1	5.6	7.0	3.8	-	-	-	4.7	6.5
TEPIS	-	1.5	4.3	5.9	5.2	6.8	6.4	6.7	-	-	3.0	0.3	0.9	2.3	1.1
TRIMI	-	-	-	-	-	-	-	-	-	-	0.8	0.3	-	-	-
YRJIL	3.1	1.0	5.9	5.8	-	0.8	5.3	2.8	5.1	3.5	-	3.3	3.3	-	4.2
Sum	97.4	179.9	197.0	225.3	262.6	263.7	287.5	188.8	137.2	127.5	76.6	65.0	47.6	104.5	143.0

3. Results (Meteors)

April	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
BENOR	2	-	8	2	-	-	-	9	-	8	6	6	6	-	-
BERER	24	4	32	-	20	-	2	4	29	12	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
BRIBE	8	2	3	9	-	10	19	11	13	10	3	16	5	6	6
	9	7	-	8	-	10	7	10	11	12	-	19	-	12	8
CASFL	14	17	9	11	5	20	14	11	9	15	-	8	9	-	5
	5	7	6	10	4	13	5	7	12	11	2	10	-	-	2
CRIST	20	1	-	10	16	19	10	8	-	16	10	15	-	5	-
	32	17	12	17	12	22	16	29	-	-	-	-	-	-	-
CSISZ	-	6	1	2	9	2	3	9	7	4	2	-	-	3	-
CURMA	9	3	24	-	-	14	16	18	-	10	18	9	-	-	-
ELTMA	11	14	14	-	12	11	7	13	9	10	4	-	17	-	-
GONRU	-	-	26	20	-	11	23	12	17	15	27	24	18	20	23
	-	-	16	9	-	5	19	7	12	8	26	13	14	12	20
GOVMI	13	16	10	-	-	6	15	-	11	17	4	-	1	9	1
HERCA	12	14	-	13	12	5	5	13	1	-	13	11	7	5	11
HINWO	19	26	4	-	1	12	3	11	20	-	10	-	-	4	23
IGAAN	-	-	-	-	10	1	1	10	4	4	1	-	3	2	-
	6	5	11	-	8	1	-	2	10	1	-	-	8	1	-
	3	1	9	-	7	2	2	6	15	10	1	-	3	2	-
JONKA	-	1	10	-	4	-	-	-	-	4	-	-	-	2	-
KACJA	9	18	6	-	-	3	3	9	10	-	1	-	-	-	-
	-	-	10	-	16	-	6	13	9	15	1	2	10	6	9
	17	37	25	-	36	4	4	28	29	24	-	-	-	-	7
	13	15	10	-	10	5	2	17	23	11	1	-	15	4	3
KARJO	-	1	10	-	4	-	-	-	-	4	-	-	-	2	-
KERST	-	-	-	75	36	69	55	60	65	54	60	50	49	41	26
KLAGR	-	-	-	-	-	-	-	-	-	-	-	-	20	18	11
KOSDE	8	-	-	4	-	14	10	14	12	14	-	-	-	4	3
LUNRO	23	8	-	12	-	-	-	-	-	27	15	20	-	11	16
MOLSI	37	64	7	15	-	41	41	63	75	53	35	37	-	25	21
	8	19	2	4	-	8	12	16	17	22	14	23	2	15	17
	-	7	-	2	-	4	11	6	12	3	6	2	-	-	7
	-	10	-	2	-	3	21	6	13	6	4	1	-	-	10

MORJO	12	5	5	-	7	8	-	4	11	1	-	-	2	1	-
OTTMI	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PERCZ	14	9	8	-	10	7	9	22	-	17	9	-	-	8	-
ROTEC	-	10	-	-	-	-	13	-	-	-	-	-	-	-	-
SCHHA	3	1	1	9	-	14	7	9	5	1	1	9	2	5	10
SLAST	6	14	9	-	23	4	2	21	19	19	1	-	7	2	3
STOEN	22	19	16	12	22	17	15	29	10	36	11	-	24	-	-
	15	15	14	3	13	12	13	17	14	29	5	-	14	-	17
	17	24	11	7	20	16	5	20	9	27	8	-	24	-	39
STORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STRJO	4	4	-	9	-	2	13	8	7	5	3	2	7	14	5
	3	4	-	5	-	8	11	6	8	6	6	-	13	6	21
	8	9	-	30	-	12	25	20	28	6	4	1	18	15	16
TEPIS	14	3	12	-	14	-	-	11	14	11	8	-	-	10	-
TRIMI	10	7	7	-	13	1	2	13	11	7	1	-	9	-	-
YRJIL	-	-	-	-	4	-	-	-	6	8	10	-	7	11	-
Sum	430	443	338	300	344	416	447	602	587	569	331	278	314	279	340

April	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
BENOR	7	-	-	-	-	-	23	4	8	-	6	-	-	-	-
BERER	-	-	-	6	15	22	36	16	-	-	7	2	2	6	-
	-	-	-	5	15	16	31	-	1	-	1	-	1	6	-
BRIBE	1	11	10	16	7	11	14	20	9	10	6	-	2	4	19
	-	10	10	14	14	7	8	22	10	10	3	-	2	9	17
CASFL	-	7	10	-	-	15	4	11	3	6	-	8	-	9	-
	-	7	9	4	18	14	8	6	5	7	1	8	-	5	13
CRIST	1	13	18	13	20	19	-	-	16	7	4	-	-	-	18
	2	22	23	28	29	27	-	-	17	11	12	2	5	7	16
CSISZ	2	1	3	5	13	9	28	2	2	-	2	-	-	3	6
CURMA	-	-	14	3	10	4	28	-	8	9	-	9	-	-	3
ELTMA	-	-	14	8	22	17	16	11	-	13	-	-	-	11	-
GONRU	15	9	-	-	-	-	-	-	35	26	26	20	-	-	-
	10	10	-	-	-	-	-	-	20	14	18	9	-	-	-
GOVMI	7	11	3	19	18	29	34	2	6	-	4	1	-	-	3
HERCA	11	7	6	6	15	12	15	17	13	4	11	10	9	10	8
HINWO	9	10	8	21	14	12	23	4	7	10	5	10	-	23	11
IGAAN	16	9	5	3	12	-	34	14	4	-	1	1	-	4	-
	10	-	1	6	13	8	37	21	-	-	5	1	3	3	2
	3	1	3	6	16	17	35	8	1	-	-	-	-	1	-
JONKA	11	9	3	6	13	23	26	12	2	-	8	2	1	7	2
KACJA	-	-	2	10	6	19	34	-	-	-	-	-	-	-	-
	-	5	4	9	18	18	25	7	3	-	-	-	-	-	2
	-	18	20	19	24	32	74	36	3	-	-	-	-	-	21
	-	13	11	19	23	18	71	26	1	1	-	-	-	-	6
KERST	44	-	-	60	-	45	64	52	72	74	58	24	64	75	72
KLAGR	8	20	14	23	35	46	62	33	2	-	2	1	-	-	9
KOSDE	5	2	-	1	6	4	-	13	6	11	2	-	-	3	12
LUNRO	22	7	-	-	-	-	-	-	2	-	2	34	16	-	16
MOLSI	39	24	33	50	55	70	123	37	30	77	-	-	-	-	-
	12	28	23	30	15	34	60	25	8	19	3	2	4	18	10
	-	1	2	8	10	13	31	14	6	1	-	1	4	1	14
	-	4	7	9	14	23	42	16	16	4	-	2	5	3	21
MORJO	3	6	6	1	11	8	13	6	2	-	5	-	-	-	1
OTTMI	-	-	-	-	14	-	-	-	-	-	-	-	-	3	16
PERCZ	15	9	14	10	17	22	54	1	-	-	7	1	-	3	3
ROTEC	-	4	4	8	-	-	-	-	-	-	1	-	-	5	26
SCHHA	1	-	6	12	3	3	16	10	-	6	2	-	3	11	9
SLAST	-	4	6	5	13	13	19	25	-	-	-	-	-	-	7
STOEN	-	15	19	20	31	30	24	20	9	21	-	3	-	19	-
	-	13	15	17	27	18	24	14	-	19	-	3	-	13	-
	-	26	15	20	37	36	27	15	8	25	-	1	-	18	-
STORO	-	-	-	-	48	70	125	-	-	-	-	-	-	-	-
	-	-	-	11	37	66	176	-	-	-	-	-	-	-	-
STRJO	-	2	8	9	9	8	18	21	11	10	-	-	-	3	21
	-	7	10	12	10	10	33	15	-	5	-	-	-	6	12
	1	12	15	20	6	12	40	22	22	14	-	-	-	15	24

TEPIS	-	4	9	9	33	22	47	24	-	-	8	2	2	3	4
TRIMI	-	-	-	-	-	-	-	-	-	-	3	1	-	-	-
YRJIL	4	5	11	11	-	1	25	7	7	8	-	7	5	-	8
Sum	259	366	394	572	766	903	1627	609	375	422	213	165	128	307	432

Incredible: March 2011 was already a month with unusually good weather conditions, but it was still beaten by April! The month which is generally renowned for rapidly changing conditions presented perfect skies to the observers. As in March the more northern observers were slightly favored. 32 out of 50 cameras managed to record meteors in twenty or more nights, and seven of them even in twenty-five or more nights. April 2010 broke already the record with respect to meteor number and effective observing time, but this year both values increased by another 50%. With respect to the effective observing time, April 2011 is the second best month ever in the long-term statistics of the IMO network!

Ernö Berko started to operate a third camera dubbed HULUD3, and once more we could win a new observer in Slovenia. Gregor Kladnik is now operating the camera TACKA in Tacen, with Javor Kac giving him initial support. TACKA consists of a Mintron camera with a long-focal 12mm Computar lens.

As reported in the previous month, a new version of MetRec was released in late March, which allows to calculate flux densities for meteor showers. All observers of the IMO network were asked to upgrade to the new software version still before the Lyrids to do a first large-scale test with this shower. Of course, the switch was not immediately successful for all cameras, but most observers upgraded to the new release soon. In the end we obtained suitable flux density data from 36 cameras in April.
On time for the Lyrid maximum, Geert Barentsen provided a first version of his online flux analysis tool. Similar to the well-known visual quick-look analysis at the IMO homepage, the flux density is determined over all available data sets and presented in graphical form. As some observers uploaded their post-processed video observations already at the next day, we could present a first Lyrid activity profile within less than 24 hours.
Two weeks later, Geert improved the software to the version which is currently available at http://vmo.imo.net/flx/. Contrary to the visual quick-look analysis, the interval length of each data point is not fixed. The raw data have a resolution of one minute in time. So the user has the option to adjust the temporal resolution by two parameters (minimum interval length and minimum meteor number per interval) interactively. In addition there is the option to choose the start and end date and the meteor shower, whereby all showers recognized by MetRec (i.e. essentially the IMO working list) can be chosen. The data set can also be restricted to one camera, which helps to find errors. Even though version 0.2 of the flux analysis tool is only preliminary and there are still many proposals for improvements, the tool is already well suited for meteor shower analyses, in particular since the data set was sufficiently large thanks to the weather conditions.

Now we come to the question: How does the flux density profile from video data compare to results of visual observers of IMO? Figure 1 compares both profiles, using the time interval from April 9 to 30 (which was defined by the visual observations and goes well beyond the activity interval of the Lyrids) and a minimum interval length of approximately one hour. The video profile is based on 1213 Lyrids obtained by 35 cameras, the visual profile on 897 Lyrides from roughly twice as many observers.

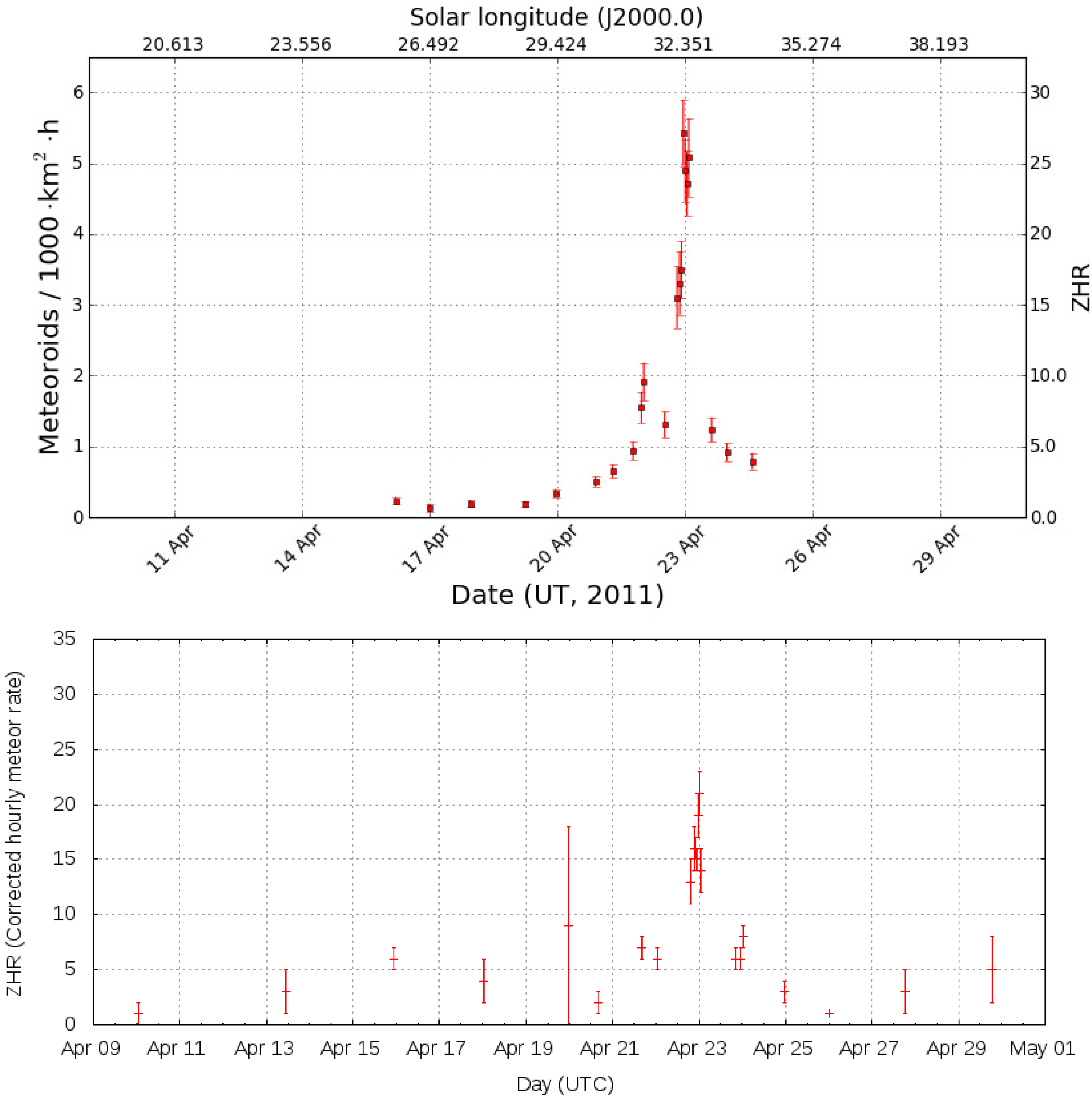

Figure 1: *Comparison of the online Lyrid flux density profile of the IMO network (upper graph) with the IMO quick-look analysis of visual observations (lower graph).*

First of all it's amazing how well the video profile looks like. It is immediately clear that the standard deviation of video data away from the peak is much smaller than in the visual profile. That's not a big surprise, as most visual observers are only active near the maximum, whereas the distribution of video data depends only on the weather conditions.

Let's now have a detailed look at the activity peak. For figure 2, and interval of 30 hours before and after midnight of April 22/23 was chosen, and the minimum interval length was reduced to 30 minutes. It becomes clear that the flux density increased significantly between 20:00 UT and 24:00 UT on April 22. The peak is reached shortly before midnight. Thereafter, the activity stays almost constant until the end of the European observing window at 4:00 UT Note that the shape of the profile changes with slightly adapted parameters, so the existing data set is pushed to the limits.

In the visual data, the peak occurs slightly before midnight of April 22/23 as well. The scatter is smaller than in the video data, but so is the time interval covered by visual observations.

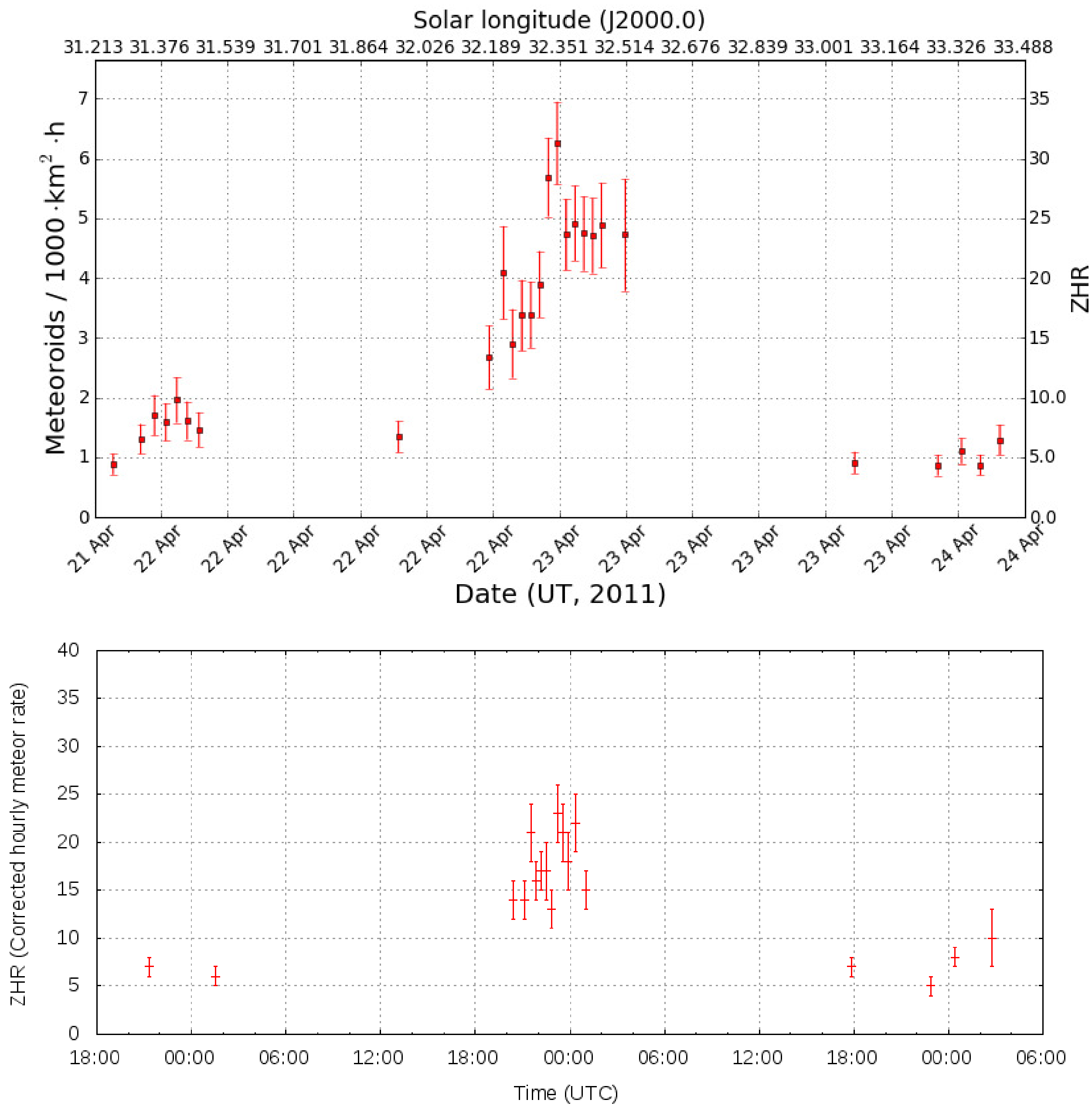

Figure 2: *Detailed flux density profile from the maximum of the Lyrids obtained from video data of the IMO network (upper graph) and the IMO quick look analysis of visual observations (lower graph).*

Beside the qualitative analysis, let's now have a look at quantitative aspects. The primary result of the video observations are flux densities measured in meteoroids per thousand square kilometers effective collection area and hour, that are capable of producing meteors brighter than 6.5 mag. In addition, Geert used an equation from an old WGN paper by R. Koschak and J. Rendtel to determine flux densities from visual ZHRs. He used the formula the other way round to transform the flux densities into ZHR (right y-axis in figure 1 and 2) for better comparison of the results with visual observations. By applying the formula directly without any adaptation or correction, we yield a peak ZHR of 27 in the lower resolution video profile (figure 1), which compares to 21 in the visual profile. It's amazing how well these values fit given that the formula has to cope with the unknown human field of view, reduced detection probability away from the center of fov, and the impact of meteor motion. In addition, the perception coefficient is hardly known for individual observers, but it has a significant impact on the flux density. On the other hand, these factors are either constant or they can be accurately calculated for video observations. It seems almost too good to be true that the relative error is only 25% under these conditions.

Let's investigate which effects impact the determined flux density of video data in which way:

- The limiting magnitude for stars is determined from an averaged background image. That shows much more stars than an individual video frame, which are the basis for meteor detection. So the limiting magnitude may be too optimistic, which will reduce the effective collection area and increase the flux density. On the other hand, the human eyes has an "integrating function". In the video stream we see many more objects than in a single video frame. The set of stars which is used by MetRec to determine the limiting magnitude, matches quite well to those stars that the human observer recognizes in the video stream. In addition, the meteor detection in MetRec is not based on single frames either. A meteor is only reported if it can be detected in several consecutive video frames. Thus, the software detects also meteors which stand out hardly from the background noise in single frames.
- Currently the algorithm supposes (contrary to the visual analysis) that the detection probability for meteor is 100% down to the determined limiting magnitude, which will hardly be the case. In reality, more meteors are visible than detected by the software, which also means that the flux density is currently under- rather than overestimated.

In total, the deviation between visual and video data will be larger than 25%. But even if they differ in the end by a factor of two or three, I still regard this as a wonderful proof, that both the algorithm to compute flux densities from video data as well as the formula to calculate flux densities from visual ZHR work reasonably well.

Let's have a look at the Antihelion source in April. It shows a nearly constant flux density of 1.5 to 2 meteoroids per hour and thousand square kilometers effective collection area.

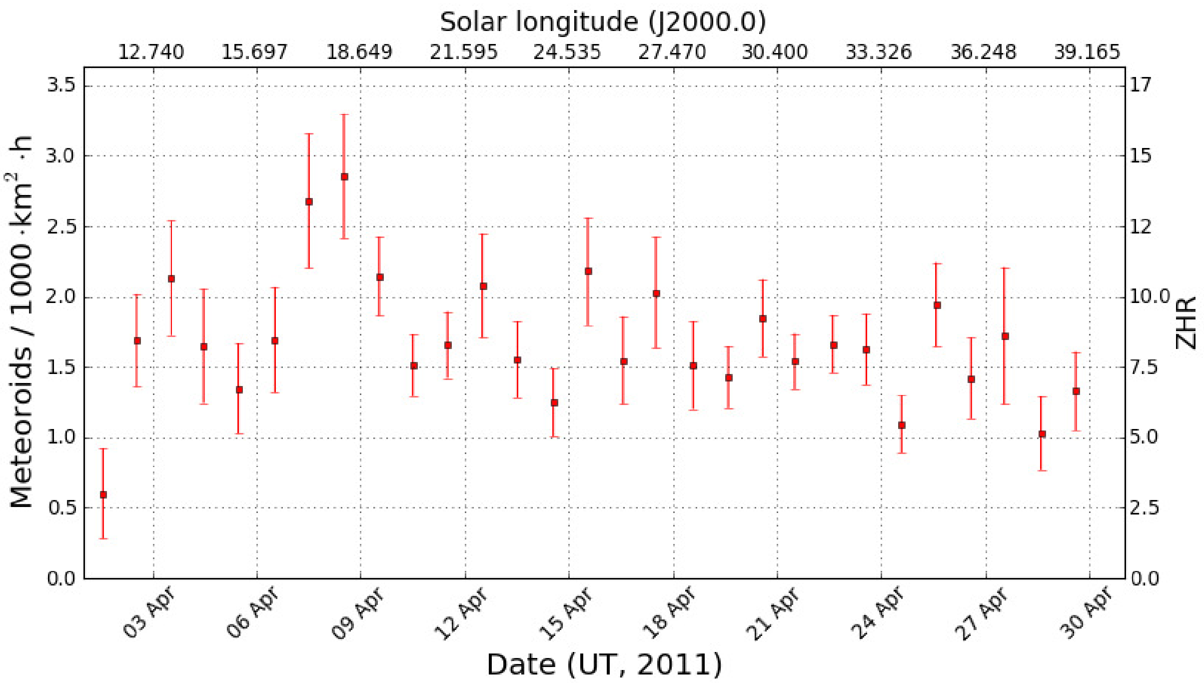

Figure 3: *Flux density profile of the Antihelion source in April 2011.*

In the end we shall discuss the question: Will visual observations become useless now that also flux densities can be obtained from video data? So let's have a look at the strengths of each observing technique.

Video data are objective in their meteor shower assignment and yield suitable data not only for the peaks of major showers. The size of the data set depends only from the weather conditions. Once the child diseases are cured, they will also yield more accurate absolute flux densities than visual observations. The boundary conditions (field of view, observing direction, detection probability in the field of view, dependency of the limiting meteor magnitude form the angular velocity) and their impact on the flux density measures can be calculated much more accurately.

Visual observations from the peak times of major showers are available from round the globe and yield a better geographic and temporal coverage. The limiting magnitude of visual observers is closer to 6.5 mag which minimizes the influence of the population index. Also meteor magnitudes are (currently) more precisely estimated by visual observers. Last but not least, we are using standardized visual observing techniques and analysis methods for some decades now, which makes visual observations mandatory for long-term analyses.

In view of this, both techniques can verify and calibrate each other. Video observations will cover minor shower and the ascending and descending branches of major showers more accurately than visual observations, as was shown in case of the Lyrids. Visual observations, on the other hand, may cover the peak times of major showers with only little gaps.