Results of the IMO Video Meteor Network – Second Quarter 2020

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Once more, over 80 video cameras were in operation in the second quarter of 2020. The weather was mostly favourable for the observers, as can be seen in figure 1. Only in mid-May and mid-June the number of cameras reduced substantially, and the absolute low was reached on June 4 with just 24 active cameras.

The output of April was over 11,000 hours of effective observing time, which was even higher than in record-breaking April 2015. In fact, since also the average number of meteors per hour was higher than usual, we could record 50% more meteors than in recent years – a total of 28,000 meteors.

There are less fluctuations in May, but still we recorded over 8,000 hours of observing time, which is a plus of 10% to the previously best output. Also here, the mean number of meteors per hours was above average, which resulted in record-breaking 20,000 meteors that month.

Last not least we collected 6,500 observing hours in June, which was slightly below the average of previous years. Hence, the total of 20,000 meteors was "only" the second-best yield of June.

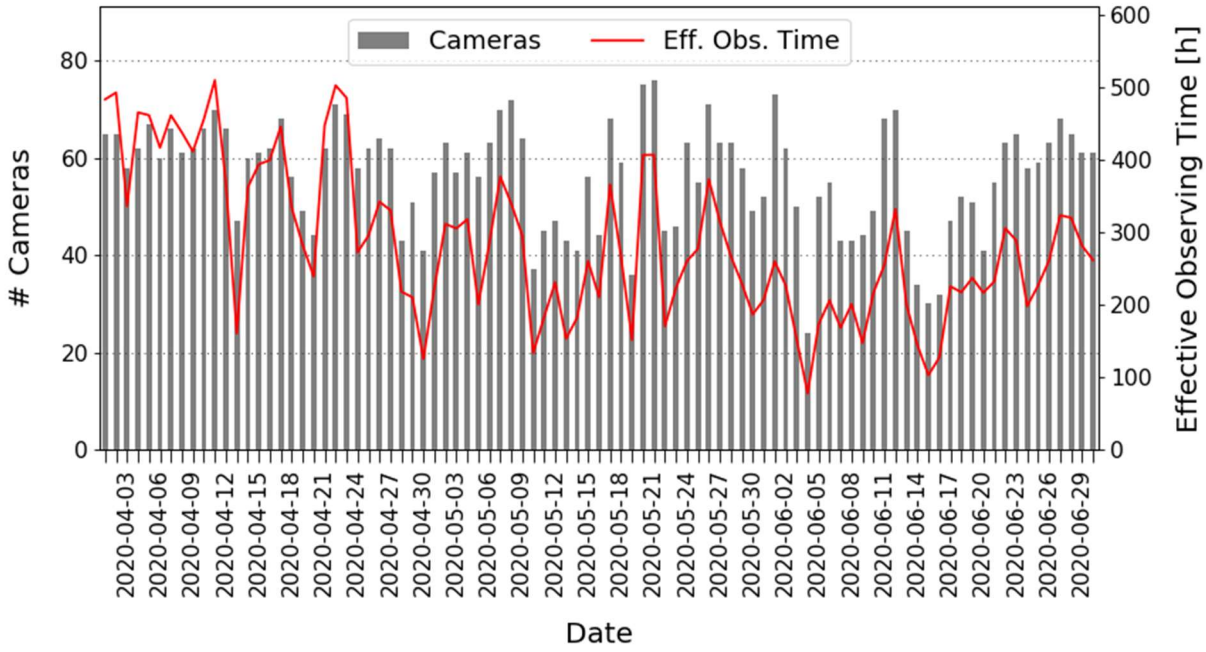

Figure 1: *Number of active cameras per night (grey bars) and effective observing time of these cameras (red line) in the second quarter of 2020.*

When looking at the absolute number of recorded meteors and the hourly average per day in the second quarter of 2020 (figure 2), in particular the Lyrids in April are eye-catching. It is also noticeable that starting from the second half of May, the hourly meteor rate was rising again, leaving the annual spring-time low behind. Due to the short nights that is not yet noticeable in meteor numbers, though.

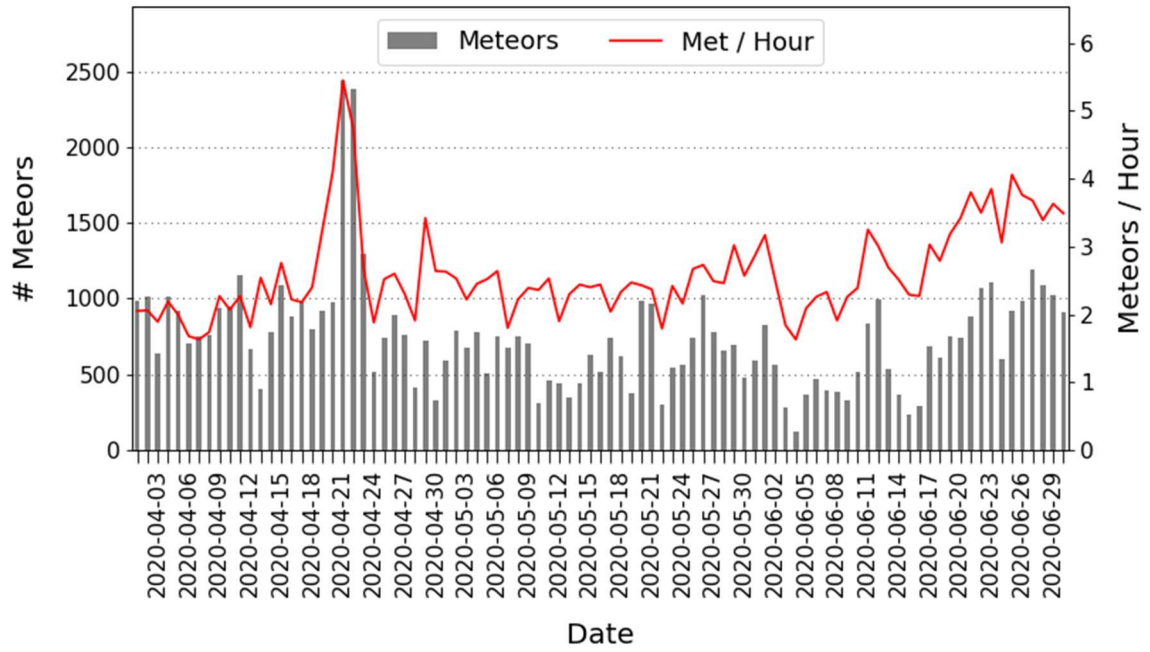

Figure 2: *Number of recorded meteors per night (grey bars) and average number of meteors per hours (red line) in the second quarter of 2020.*

The activity profile of the Lyrids 2020 shows a remarkable increase in flux density toward dawn of April 22. In that night alone, the flux density jumped from roughly one meteoroid per 1,000 km^2 and hour to almost four. Since the rate had declined already in the next night, the peak must have fallen somewhere into the European daytime hours. However, when we compare the activity profile with the long-term average from 2011 to 2019, we see that we just reached the peak at dawn, and that the increase in activity was just a few hours late (figure 3).

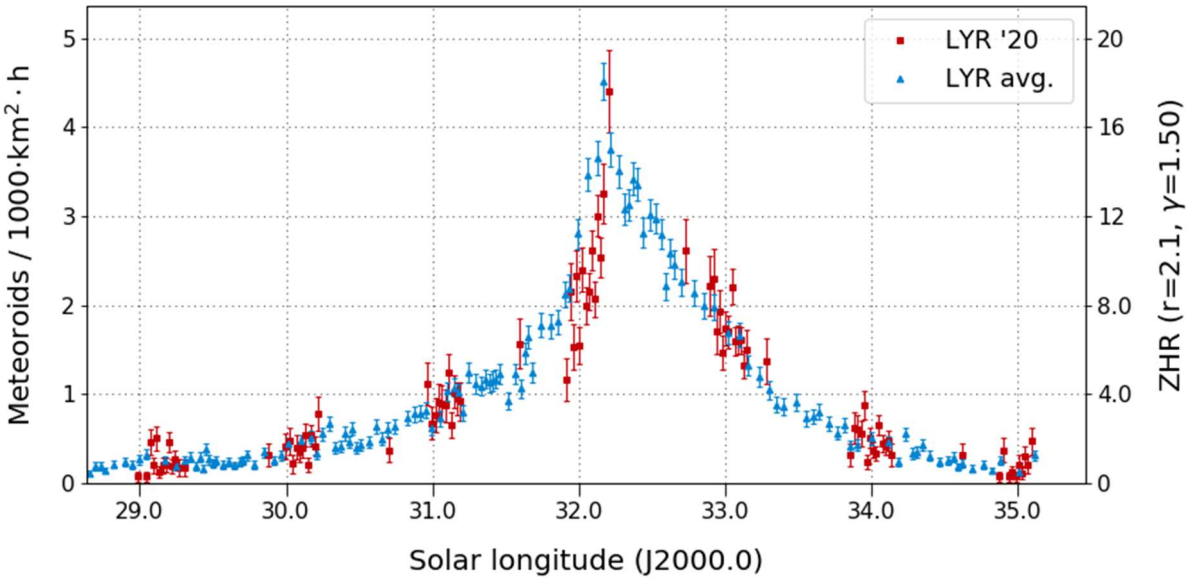

Figure 3: *Activity profile of the Lyrids in 2020 (red) and in the average of the years 2011 to 2019 (blue), derived from data of the IMO Video Meteor Network.*

Fun fact: We are missing the peak time of 32.17° solar longitude almost every year in Europe (figure 4). Either it occurs just at the begin of the observing interval when the radiant is rising (2015, 2019) or at the interval end (2012, 2016 and 2020), or completely outside the European observing window (all other years). There is no year, where this solar longitude is well observable from central Europe.

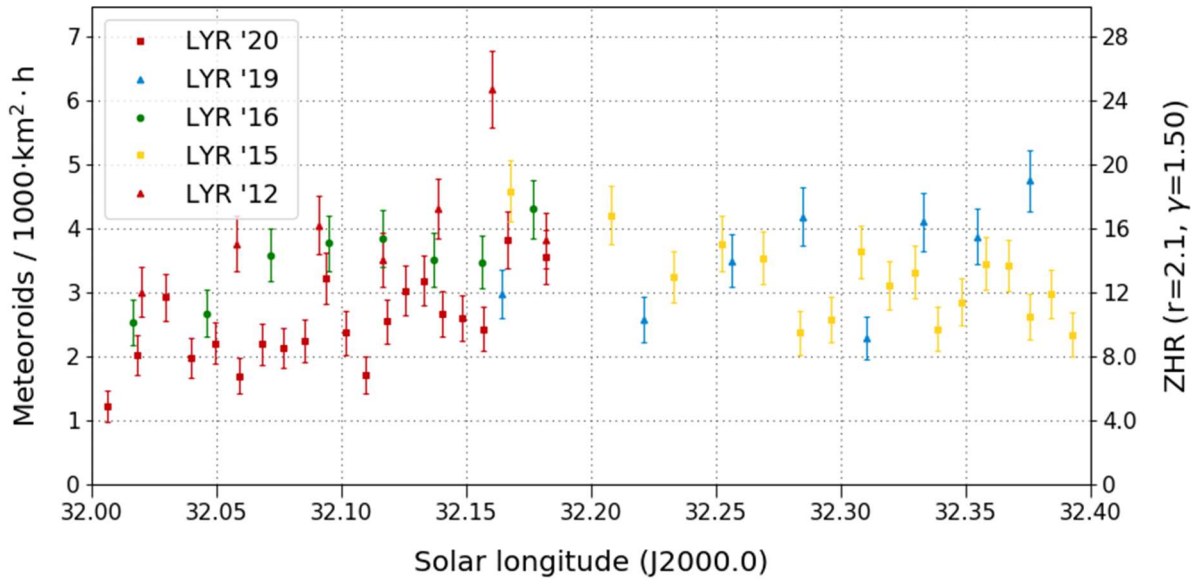

Figure 4: *Time of Lyrid peak activity near 32.17° solar longitude in those years where it fell into the European nighttime hours.*

The flux density profile of the eta Aquariids matches to a large extend to the long-term average as well (figure 5). Eye-catching is the deep dip in activity on Mai 7/8 (solar longitude 48°), which cannot be attributed to poor weather or insufficient data. In fact, when comparing the profile with the long-term average, it is not this value which is particularly low, but the following night (solar longitude 49°) with particularly high activity. Also here we cannot blame poor weather or other negative circumstances for this outlier.

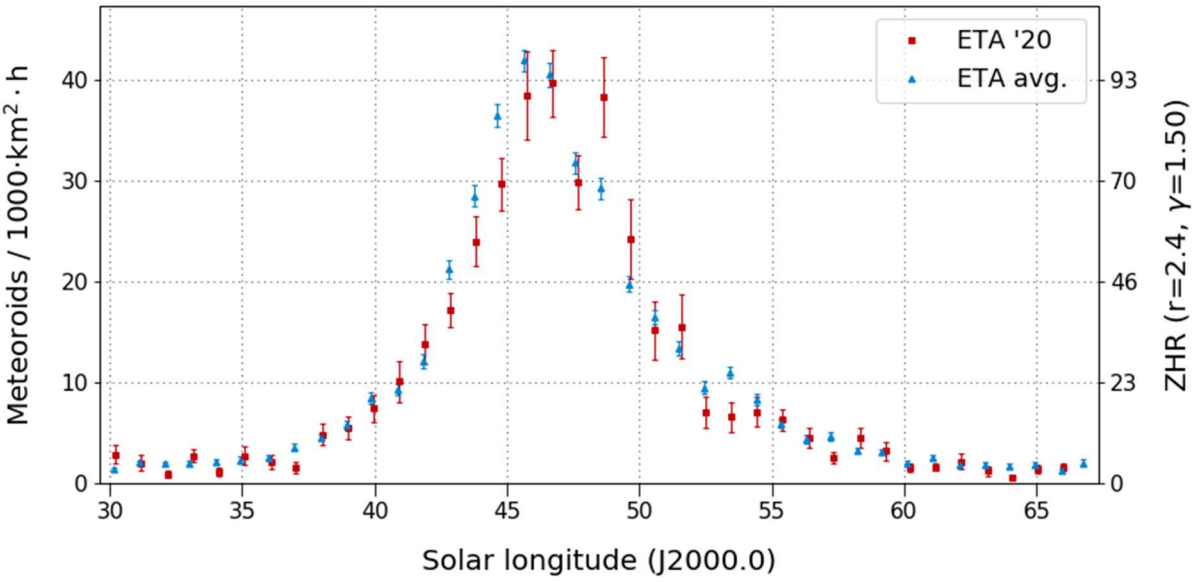

Figure 5: *Activity profile of the eta Aquariids in 2020 (red) and in the average of the years 2011 to 2019 (blue), derived from data of the IMO Video Meteor Network.*

In the whole interval with flux densities beyond ten meteoroids per 1,000 km^2 and hour, the population index was of the order of r=2.25 (figure 6).

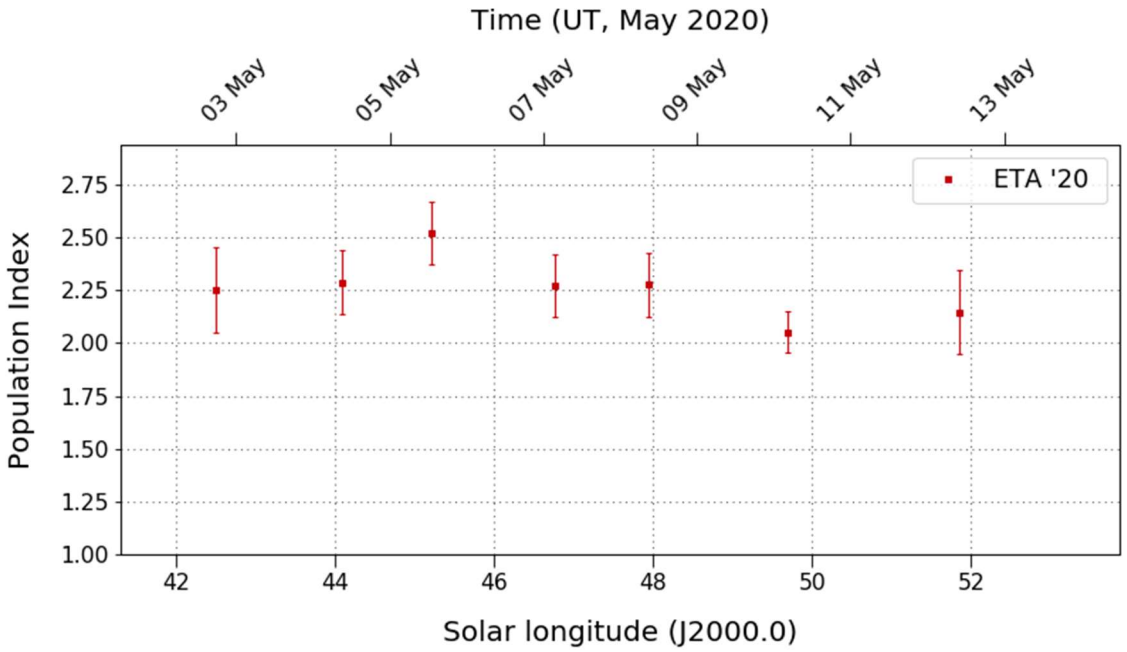

Figure 6: *Population index of the eta Aquariids during the shower peak in 2020, derived from data of the IMO Video Meteor Network.*

Peak activity of the eta Lyrids was observed few days later at 50° solar longitude (figure 7). The maximum occurred in the European daytime of May 10. In total, we recorded well over 250 members of this shower during the activity period.

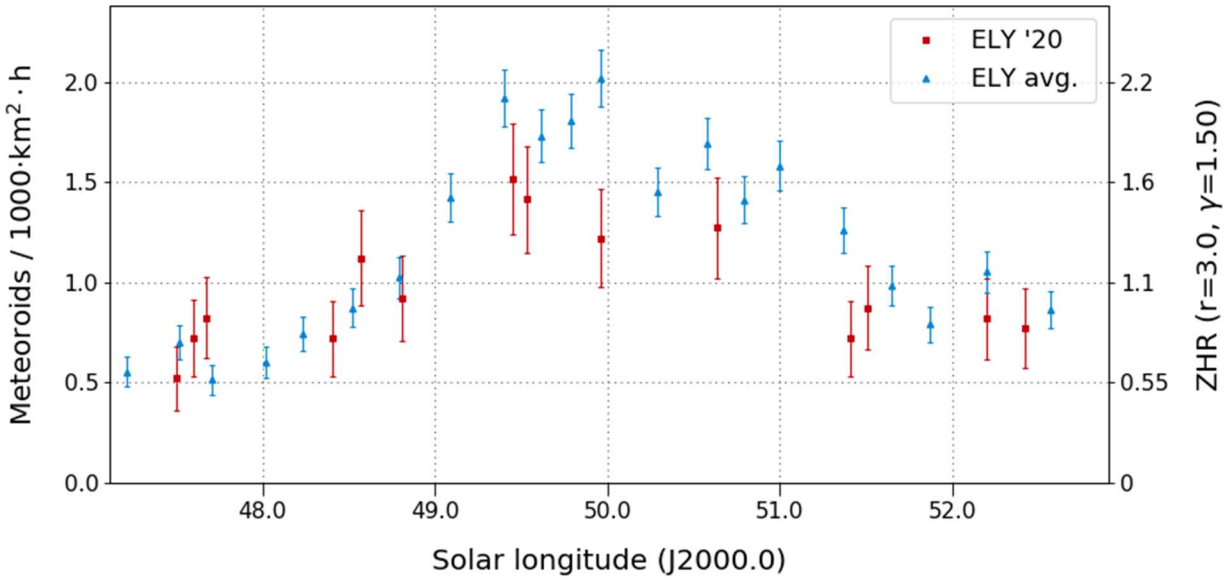

Figure 7: *Activity profile of the eta Lyrids in 2020 (red) and in the average of the years 2011 to 2019 (blue), derived from data of the IMO Video Meteor Network.*

There were no other relevant showers in the second quarter, which is why we finish this report with a look at the Anthelion source in the first half of 2020. It is obvious that the activity remained low until end of March, and then nearly increased by a factor of three in late April / early May. In the second quarter of 2020 the error bars are getting bigger, because we have less night time in Summer.
By the way, we applied the moon phase correction in figure 8, to reduce systematic errors in this month-long activity plot.

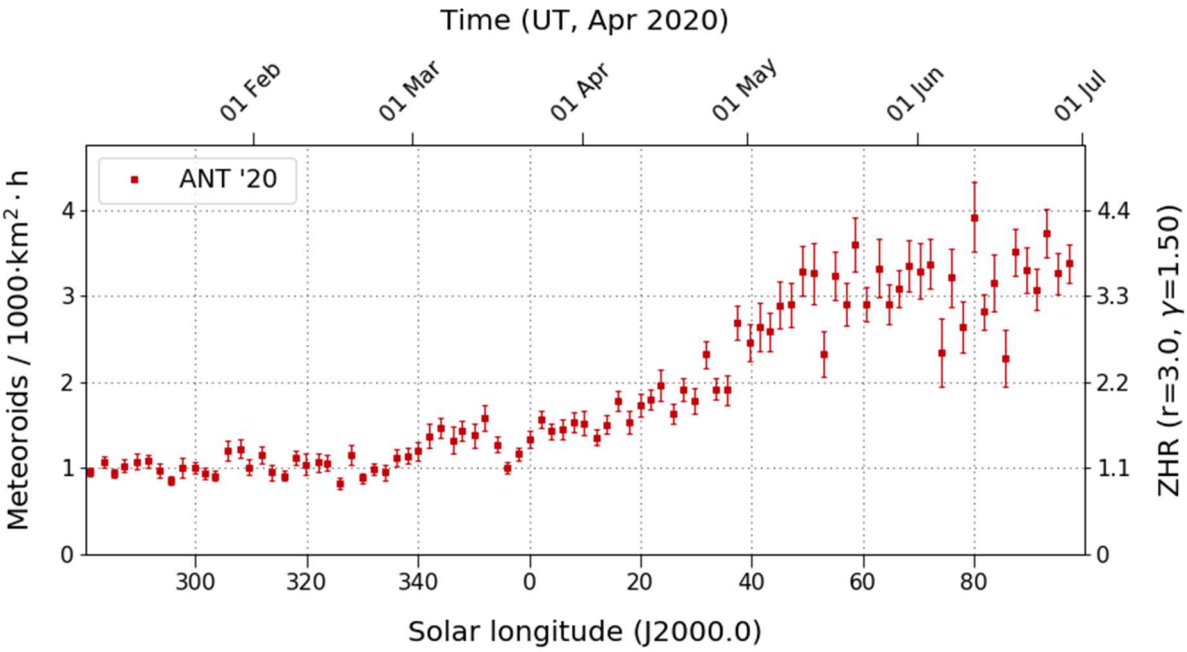

Figure 8: *Activity profile of the Anthelion source in the first half of 2020, derived from data of the IMO Video Meteor Network.*

Table 1: *Observational statistics for second quarter of 2020.*

Code	Name	Place	Camera	April			May			June		
				Nights	Time [h]	Meteors	Nights	Time [h]	Meteors	Nights	Time [h]	Meteors
ARLRA	Arlt	Ludwigsfelde/DE	LUDWIG2	27	149.2	555	29	102.9	348	21	56.6	272
BIATO	Bianchi	Mt. San Lorenzo/IT	OMSL1	26	109.1	247	26	105.0	211	26	77.2	299
BOMMA	Bombardini	Faenza/IT	MARIO	26	206.5	561	29	131.7	375	29	146.0	584
BRIBE	Klemt	Herne/DE	HERMINE	30	190.3	353	26	133.6	268	22	55.6	155
		Berg. Gladbach/DE	KLEMOI	22	153.4	310	23	120.1	232	17	57.2	156
CARMA	Carli	Monte Baldo/IT	BMH2	21	183.7	620	18	83.6	233	19	92.2	384
CASFL	Castellani	Monte Baldo/IT	BMH1	21	181.7	723	19	85.0	330	19	92.8	456
CINFR	Cineglosso	Faenza/IT	JENNI	26	209.9	603	29	147.5	373	29	153.2	513
CRIST	Crivello	Valbrevenna/IT	ARCI	25	159.3	354	24	110.5	231	25	95.3	238
			BILBO	24	176.6	336	24	106.7	266	24	109.6	354
			C3P8	22	165.9	215	20	102.2	179	22	68.9	173
			STG38	26	198.9	597	25	137.9	416	23	116.6	522
ELTMA	Eltri	Venezia/IT	MET38	23	158.5	327	18	74.3	152	10	47.6	138
FORKE	Förster	Carlsfeld/DE	AKM3	26	177.8	512	21	96.0	231	19	57.9	252
GONRU	Goncalves	Tomar/PT	TEMPLAR1	25	139.0	305	26	170.0	332	29	155.2	457
			TEMPLAR2	26	122.5	181	28	168.5	303	29	154.2	348
			TEMPLAR3	18	100.8	63	25	151.9	84	23	121.0	97
			TEMPLAR4	25	93.0	178	28	151.3	287	26	140.0	279
			TEMPLAR5	22	107.9	161	25	139.4	244	23	117.1	225
GOVMI	Govedic	Sredisce ob Dr./SI	ORION2	16	123.4	325	21	94.1	210	21	91.0	311
			ORION3	16	106.7	102	17	78.5	76	17	73.1	85
			ORION4	17	66.3	120	17	33.3	52	18	68.8	92
HINWO	Hinz	Schwarzenberg/DE	HINWO1	29	199.6	527	25	107.5	263	19	63.7	207
IGAAN	Igaz	Hodmezovasar./HU	HUHOD	12	52.1	63	18	54.0	74	18	69.0	74
JONKA	Jonas	Budapest/HU	HUSOR	26	197.0	188	19	81.0	96	19	68.4	95
			HUSOR2	27	190.1	207	19	79.6	95	18	71.9	117
KACJA	Kac	Kamnik/SI	CVETKA	12	94.2	276	17	83.0	212	15	69.5	255
			METKA	25	66.3	155	19	29.2	72	20	39.1	85
			MOBCAM1	12	100.1	221	19	97.1	270	15	62.3	223
			REZIKA	11	87.3	339	17	85.1	336	16	73.3	374
		Ljubljana/SI	STEFKA	12	91.8	171	16	81.8	172	16	67.5	154
KNOAN	Knöfel	Berlin/DE	ARMEFA	25	155.6	251	26	105.4	174	16	56.4	117
KOSDE	Koschny	La Palma / ES	ICC7	13	35.2	64	17	70.6	112	21	120.0	180
			ICC9	15	106.5	503	29	198.6	1060	26	161.7	977
			LIC1	13	45.2	79	16	82.4	108	21	125.7	190
			LIC2	17	120.2	515	29	205.3	1043	25	172.2	1150
KWIMA	Kwinta	Krakow/PL	PAV06	24	148.4	112	18	67.2	74	11	27.3	47
			PAV07	26	161.9	144	18	70.4	75	9	17.6	14
			PAV79	26	171.9	247	18	75.6	109	12	34.4	59
LOJTO	Łojek	Grabniak/PL	PAV57	12	86.6	159	3	5.5	42	-	-	-
MACMA	Maciejewski	Chelm/PL	PAV35	26	146.1	174	21	70.0	99	18	43.5	73
			PAV36	27	169.6	248	22	85.1	157	19	61.7	126
			PAV43	25	174.3	290	21	92.0	139	15	49.5	93
			PAV60	29	176.5	341	23	86.8	192	19	59.8	141
MARRU	Marques	Lisbon/PT	CAB1	-	-	-	11	77.4	29	21	133.9	182
			RAN1	18	94.7	124	20	120.1	150	27	122.8	208
MISST	Missiaggia	Nove/IT	TOALDO	10	65.6	288	15	72.3	272	16	67.7	349
MOLSI	Molau	Seysdorf/DE	AVIS2	28	190.7	796	24	93.7	369	20	67.8	341
			DIMCAM2	28	185.4	1430	24	95.6	614	16	52.6	510
			ESCIMO3	28	200.9	859	23	111.6	386	19	75.9	326
		Ketzür/DE	REMO1	27	147.4	847	28	103.1	503	23	71.6	518
			REMO2	26	154.1	587	26	100.3	315	17	50.4	191
			REMO3	27	179.1	554	28	126.4	343	21	72.1	250
			REMO4	27	174.3	649	28	117.5	373	23	79.1	337
MORJO	Morvai	Fülöpszallas/HU	HUFUL	29	222.8	197	17	85.4	77	17	85.4	83
MOSFA	Moschini	Rovereto/IT	ROVER	26	190.5	224	16	82.8	88	10	56.7	84
NAGHE	Nagy	Budapest/HU	HUKON	22	74.0	290	10	39.2	74	9	27.6	67
		Piszkestetö/HU	HUPIS	29	184.9	389	26	104.6	195	25	88.6	198
OTTMI	Otte	Pearl City/US	ORIE1	12	9.8	36	14	16.7	70	26	18.2	119
PERZS	Perkó	Becsehely/HU	HUBEC	26	178.0	392	15	63.6	120	23	96.6	323
SARAN	Saraiva	Carnaxide/PT	RO1	23	137.3	163	29	203.1	227	28	190.5	311
			RO2	22	108.7	239	27	145.8	238	28	146.2	267
			RO3	24	115.4	237	28	177.8	348	29	190.6	486
			RO4	24	134.9	172	27	151.9	188	27	183.1	274
SCALE	Scarpa	Alberoni/IT	LEO	24	15.1	70	13	35.7	37	18	30.6	70
SCHHA	Schremmer	Niederkrüchten/DE	DORAEMON	27	184.0	364	28	129.8	258	17	34.6	88
SLAST	Slavec	Ljubljana/SI	KAYAK1	24	152.2	283	15	77.5	146	19	74.4	218
			KAYAK2	23	165.9	110	16	89.4	95	17	78.3	76
STOEN	Stomeo	Scorze/IT	MIN38	29	164.6	599	28	90.2	346	23	80.4	421
			NOA38	28	196.2	530	24	103.7	306	24	99.4	385
			SCO38	29	199.3	643	27	105.7	349	23	89.5	399
STRJO	Strunk	Herford/DE	BEMCE	28	174.2	1054	27	124.2	691	21	70.8	426
			BEMCE2	27	173.1	786	26	121.9	503	20	70.5	344
			MINCAM2	1	0.1	1	18	68.7	60	16	49.7	34
			MINCAM3	25	148.3	259	27	123.5	251	20	71.4	164
			MINCAM5	21	128.1	328	27	117.3	244	17	58.8	158
			WAMECA	3	17.2	14	-	-	-	-	-	-
TEPIS	Tepliczky	Agostyan/HU	HUMOB	25	177.6	327	17	91.1	179	20	87.6	250
WEGWA	Wegrzyk	Nieznaszyn/PL	PAV78	-	-	-	25	84.9	113	13	18.1	40
YRJIL	Yrjölä	Kuusankoski/FI	FINEXCAM	25	91.1	163	7	12.0	29	-	-	-
ZAKJU	Zakrajšek	Petkovec/SI	PETKA	24	170.4	568	23	100.1	306	16	61.5	276
			ROVKA	-	-	-	15	68.2	103	15	70.0	153
			TACKA	25	188.0	230	8	45.6	47	-	-	-
Sum				30	11150.8	27824	31	8115.6	19449	30	6584.6	20067