

# Results of the IMO Video Meteor Network – June 2010

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2010/07/29

## 1. Observers

Code	Name	Place	Camera	FOV	LM	Nights	Time	Meteors
BENOR	Benitez-S.	Las Palmas	TIMES4 (1.4/50)	Ø 20°	3 mag	17	28.2	81
BRIBE	Brinkmann	Herne	HERMINE (0.8/6)	Ø 55°	3 mag	24	84.2	216
CASFL	Castellani	Monte Baldo	BMH2 (0.8/6)	Ø 55°	3 mag	20	32.5	95
CRIST	Crivello	Valbrenna	C3P8 (0.8/3.8)	Ø 80°	3 mag	21	73.4	244
			STG38 (0.8/3.8)	Ø 80°	3 mag	24	67.1	189
ELTMA	Eltri	Venezia	MET38 (0.8/3.8)	Ø 80°	3 mag	13	39.5	87
GONRU	Goncalves	Tomar	TEMPLAR1 (0.8/6)	Ø 55°	3 mag	13	62.5	207
			TEMPLAR2 (0.8/6)	Ø 55°	3 mag	20	55.8	146
GOVMI	Govedic	Sredisce ob Dravi	ORION2 (0.8/8)	Ø 42°	4 mag	18	71.4	209
HERCA	Hergenrother	Tucson	SALSA2 (1.2/4)	Ø 80°	3 mag	28	102.0	250
HINWO	Hinz	Brannenburg	AKM2 (0.85/25)	Ø 32°	6 mag	7	26.1	55
JOBKL	Jobse	Oostkapelle	BETSY2 (1.2/85)	Ø 25°	7 mag	14	40.6	259
KACJA	Kac	Kostanjevec	METKA (0.8/8)	Ø 42°	4 mag	9	18.2	44
		Ljubljana	ORION1 (0.8/8)	Ø 42°	4 mag	21	47.4	139
		Kamnik	REZIKA (0.8/6)	Ø 55°	3 mag	9	41.3	193
			STEFKA (0.8/3.8)	Ø 80°	3 mag	11	40.1	126
KERST	Kerr	Glenlee	GOCAM1 (0.8/3.8)	Ø 80°	3 mag	23	178.4	1352
MOLSI	Molau	Seysdorf	AVIS2 (1.4/50)	Ø 60°	6 mag	14	42.6	231
			MINCAM1 (0.8/8)	Ø 42°	4 mag	20	65.9	203
MORJO	Morvai	Fülöpszallas	HUFUL (0.8/3.8)	Ø 80°	3 mag	7	19.3	44
OCHPA	Ochner	Albiano	ALBIANO (1.2/4.5)	Ø 68°	3 mag	18	48.2	89
OTMI	Otte	Pearl City	ORIE1 (1.4/16)	Ø 20°	4 mag	17	45.7	124
ROTEC	Rothenberg	Berlin	ARMEFA (0.8/6)	Ø 55°	3 mag	23	66.9	185
SCHHA	Schremmer	Niederkrüchten	DORAEMON (0.8/3.8)	Ø 80°	3 mag	22	39.0	91
SLAST	Slavec	Ljubljana	KAYAK1 (1.8/28)	Ø 50°	4 mag	16	48.5	86
STOEN	Stomeo	Scorze	MIN38 (0.8/3.8)	Ø 80°	3 mag	17	73.9	257
			NOA38 (0.8/3.8)	Ø 80°	3 mag	19	81.8	279
			SCO38 (0.8/3.8)	Ø 80°	3 mag	17	71.8	265
STORO	Stork	Ondrejov	OND1 (1.4/50)	Ø 55°	6 mag	2	6.1	84
STRJO	Strunk	Herford	MINCAM2 (0.8/6)	Ø 55°	3 mag	20	35.9	93
			MINCAM3 (0.8/8)	Ø 42°	4 mag	18	45.4	133
			MINCAM5 (0.8/6)	Ø 55°	3 mag	19	44.1	171
Sum						30	1743.8	6227

## 2. Observing Times (h)

June	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
BENOR	-	-	-	-	2.3	1.4	1.4	1.5	1.8	-	-	-	0.3	4.2	-
BRIBE	2.7	4.0	4.4	5.4	2.0	0.3	0.7	-	-	-	1.4	4.0	2.6	4.0	4.0
CASFL	-	1.2	0.3	4.5	1.3	1.5	0.3	-	0.3	1.2	0.7	-	0.3	-	-
CRIST	1.0	4.1	1.1	2.1	2.5	-	-	4.0	2.0	4.0	-	-	-	-	-
	0.5	2.5	3.0	3.0	-	3.5	-	3.0	0.5	3.0	-	1.0	1.5	-	-
ELTMA	-	-	-	2.1	-	4.2	-	3.1	3.6	-	3.9	-	-	3.9	-
GONRU	-	6.6	3.9	6.2	-	4.0	2.9	-	-	-	-	5.6	5.3	6.0	-
	-	-	-	-	-	-	3.1	-	0.9	1.4	-	4.1	3.1	4.6	3.6
GOVMI	-	-	-	-	4.3	5.7	3.9	6.5	5.1	-	4.5	2.6	2.1	3.8	-
HERCA	2.3	5.8	4.0	7.9	3.8	3.1	-	2.3	2.8	5.5	3.3	4.0	3.7	4.0	3.1
HINWO	-	-	-	5.0	4.5	-	-	-	-	2.3	4.6	-	-	-	-
JOBKL	-	4.3	4.3	2.9	-	-	-	-	-	-	-	4.0	-	-	-
KACJA	-	-	-	-	3.4	0.3	-	2.6	3.6	0.7	2.0	0.3	-	0.3	-
	1.1	-	-	4.1	2.6	4.4	3.5	2.0	1.1	1.5	1.3	0.9	0.3	2.9	-
	-	-	-	-	-	-	6.1	5.1	4.8	3.3	-	-	-	5.1	-
	-	-	-	-	-	3.2	3.3	3.3	3.4	-	-	-	-	5.2	-
KERST	11.5	6.7	-	11.7	10.9	10.7	9.4	10.2	10.8	-	-	4.7	1.2	-	9.9
MOLSI	-	-	-	-	-	-	3.2	1.9	2.4	2.8	2.5	-	-	4.1	-
	-	-	-	4.4	5.7	-	3.4	0.6	2.6	5.6	3.4	-	-	4.2	-
MORJO	-	-	-	-	-	-	-	-	-	-	-	-	-	2.4	-
OCHPA	-	-	3.2	2.4	1.2	2.0	-	2.0	1.0	4.0	2.9	0.4	-	-	-

OTTMI	3.7	-	2.6	1.5	-	-	4.4	-	-	3.1	-	2.3	-	2.7	-
ROTEC	-	-	4.7	4.7	4.5	2.1	2.4	3.0	1.7	4.5	3.0	-	2.4	0.3	4.3
SCHHA	0.3	1.1	3.3	3.1	1.8	-	-	0.3	-	-	-	1.0	1.3	2.1	1.6
SLAST	1.7	-	-	4.5	3.6	-	3.0	-	5.3	-	-	1.2	2.7	4.4	-
STOEN	-	-	-	3.1	4.8	5.9	-	3.0	5.1	6.3	5.3	-	-	4.2	-
	-	-	-	2.0	4.1	6.0	-	6.0	5.0	5.0	6.3	4.2	6.3	4.2	-
	1.0	-	-	4.1	6.1	5.9	-	5.0	4.9	5.2	6.3	4.2	-	-	-
STORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STRJO	0.5	3.4	3.1	2.9	0.6	-	-	-	-	-	-	2.3	0.7	0.7	2.7
	-	-	2.6	4.0	1.1	-	1.0	-	-	-	-	1.8	-	1.1	2.6
	0.5	4.1	2.3	2.9	1.5	-	0.8	-	-	-	-	1.3	-	1.6	2.5
Sum	26.8	43.8	42.8	94.5	72.6	64.2	52.8	65.4	68.7	59.4	51.4	49.9	33.8	76.0	34.3

June	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
BENOR	-	1.8	1.3	1.3	2.0	1.2	2.3	-	2.9	-	-	0.9	1.2	-	0.4
BRIBE	5.8	5.8	-	-	-	3.8	2.5	4.8	1.8	4.4	4.0	4.3	3.2	4.8	3.5
CASFL	1.9	3.0	2.8	-	-	2.7	0.7	4.1	0.8	-	0.3	1.3	-	-	3.3
CRIST	0.6	3.7	1.0	-	-	3.1	5.5	6.3	5.2	5.2	6.2	5.2	5.0	1.6	4.0
	1.3	2.0	3.5	-	0.5	1.0	4.1	4.8	5.2	2.4	5.2	5.2	3.2	3.0	4.2
ELTMA	-	-	-	-	-	-	-	3.0	3.8	3.0	3.0	4.0	0.9	-	1.0
GONRU	-	-	-	-	-	-	-	-	-	-	0.5	4.3	5.8	5.8	5.6
	2.3	3.8	-	2.4	4.5	4.3	4.0	0.6	1.9	1.6	-	1.6	1.4	1.8	4.8
GOVMI	-	2.2	-	-	-	-	-	6.0	3.7	0.5	2.9	6.1	3.1	4.5	3.9
HERCA	3.1	5.0	3.5	4.1	3.5	4.0	4.5	4.8	2.2	0.8	-	3.7	3.5	3.4	0.3
HINWO	-	-	-	-	-	-	-	4.8	-	-	-	-	-	1.7	3.2
JOBKL	3.3	3.3	-	-	-	3.2	1.7	3.2	2.1	1.2	1.8	2.0	3.3	-	-
KACJA	-	-	-	-	-	-	-	5.0	-	-	-	-	-	-	-
	-	-	-	-	-	0.8	-	4.9	2.2	0.3	0.6	3.6	3.6	2.9	2.8
	-	-	-	-	-	-	-	5.9	-	-	-	4.3	4.9	1.8	-
	-	-	-	-	-	0.6	-	4.7	-	-	-	3.7	6.0	2.7	4.0
KERST	8.2	7.5	-	2.6	7.2	9.2	1.9	7.0	-	7.9	8.6	9.2	2.9	8.5	-
MOLSI	-	-	-	-	-	-	2.2	0.5	4.8	-	4.6	4.6	4.4	1.0	3.6
	-	3.2	1.5	-	-	1.2	3.3	0.7	5.4	1.0	3.9	5.5	5.4	0.3	4.6
MORJO	1.9	-	1.0	-	-	-	-	-	1.5	-	-	-	3.7	6.0	2.8
OCHPA	-	1.0	-	-	-	5.9	5.0	6.9	-	-	2.0	2.0	3.0	2.3	1.0
OTTMI	2.8	5.1	1.3	-	1.8	1.9	3.8	0.2	3.6	3.1	-	-	-	-	1.8
ROTEC	-	2.8	-	0.3	1.2	3.1	4.3	4.3	3.3	-	-	0.5	4.4	1.5	3.6
SCHHA	1.5	1.3	0.6	-	-	2.5	2.8	2.3	-	3.5	1.8	3.5	1.6	0.3	1.4
SLAST	-	-	-	-	-	-	-	3.3	2.6	1.3	1.5	4.5	3.9	1.0	4.0
STOEN	6.2	4.7	-	-	-	-	-	6.2	4.1	5.9	3.1	2.9	-	1.0	2.1
	6.2	4.8	-	-	-	-	-	5.2	3.1	3.6	3.2	3.1	-	0.3	3.2
	4.9	-	-	-	-	-	-	6.2	2.0	4.9	4.2	3.2	-	1.0	2.7
STORO	-	-	-	-	-	-	-	-	2.4	-	-	3.7	-	-	-
STRJO	2.0	2.2	-	-	1.3	1.6	1.0	3.9	1.0	1.6	2.5	0.9	1.0	-	-
	3.8	3.3	-	-	-	2.4	3.0	4.0	-	3.6	2.1	3.6	2.6	1.5	1.3
	3.6	3.9	-	-	-	3.0	1.2	3.5	0.6	1.9	3.6	2.8	2.5	-	-
Sum	59.4	70.4	16.5	10.7	22.0	55.5	53.8	117.1	66.2	57.7	65.6	100.2	80.5	58.7	73.1

### 3. Results (Meteors)

June	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
BENOR	-	-	-	-	7	3	5	5	7	-	-	-	1	10	-
BRIBE	9	15	12	13	4	1	2	-	-	-	1	15	5	9	11
CASFL	-	1	1	9	2	4	1	-	1	3	2	-	1	-	-
CRIST	2	8	4	9	6	-	-	13	4	7	-	-	-	-	-
	1	5	8	6	-	6	-	8	1	10	-	3	3	-	-
ELTMA	-	-	-	6	-	9	-	7	9	-	7	-	-	9	-
GONRU	-	14	15	19	-	13	7	-	-	-	-	25	12	25	-
	-	-	-	-	-	-	6	-	2	2	-	13	10	14	14
GOVMI	-	-	-	-	13	16	14	19	27	-	14	5	4	8	-
HERCA	4	7	8	11	12	10	-	6	7	13	7	16	8	8	7
HINWO	-	-	-	15	13	-	-	-	-	5	8	-	-	-	-
JOBKL	-	20	32	20	-	-	-	-	-	-	-	29	-	-	-
KACJA	-	-	-	-	9	1	-	5	9	1	7	2	-	1	-
	6	-	-	10	7	9	10	8	5	5	3	3	1	7	-
	-	-	-	-	-	-	21	25	20	14	-	-	-	23	-

	-	-	-	-	-	8	12	15	10	-	-	-	-	12	-
KERST	106	45	-	108	92	94	83	74	89	-	-	16	3	-	96
MOLSI	-	-	-	-	-	-	17	10	8	21	11	-	-	20	-
	-	-	-	17	28	-	11	2	4	16	8	-	-	6	-
MORJO	-	-	-	-	-	-	-	-	-	-	-	-	-	7	-
OCHPA	-	-	3	8	1	2	-	2	1	10	5	1	-	-	-
OTTMI	9	-	6	2	-	-	10	-	-	17	-	2	-	6	-
ROTEC	-	-	12	15	18	6	6	6	6	11	9	-	5	1	14
SCHHA	1	2	6	6	4	-	-	1	-	-	-	2	4	4	4
SLAST	5	-	-	5	5	-	8	-	8	-	-	5	5	8	-
STOEN	-	-	-	5	21	25	-	11	14	23	17	-	-	7	-
	-	-	-	3	15	15	-	12	14	21	17	12	29	12	-
	2	-	-	4	21	23	-	18	22	20	26	13	-	-	-
STORO	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
STRJO	2	7	7	7	2	-	-	-	-	-	-	5	4	1	6
	-	-	5	17	2	-	2	-	-	-	-	5	-	4	8
	1	14	15	14	3	-	3	-	-	-	-	4	-	8	9
Sum	148	138	134	329	285	245	218	247	268	199	142	176	95	210	169

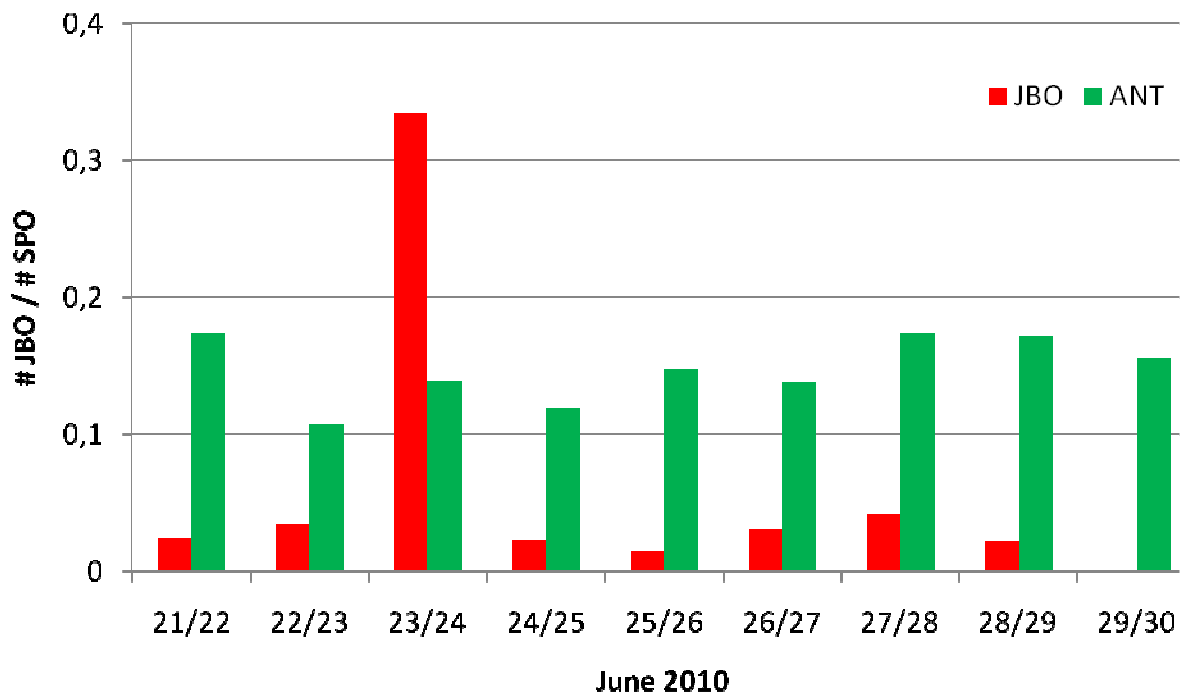
June	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
BENOR	-	5	3	4	7	3	4	-	7	-	-	3	4	-	3
BRIBE	9	19	-	-	-	10	7	13	3	12	13	9	7	12	5
CASFL	3	13	8	-	-	10	2	23	3	-	1	1	-	-	6
CRIST	4	14	5	-	-	19	19	16	16	22	18	20	14	4	20
	3	6	8	-	1	2	13	20	13	4	19	16	11	6	16
ELTMA	-	-	-	-	-	-	-	5	7	9	5	10	1	-	3
GONRU	-	-	-	-	-	-	-	-	-	-	2	16	23	20	16
	6	8	-	4	12	12	11	1	5	2	-	3	5	3	13
GOVMI	-	7	-	-	-	-	-	22	6	3	7	18	5	13	8
HERCA	7	10	8	16	13	14	12	15	4	2	-	8	9	7	1
HINWO	-	-	-	-	-	-	-	6	-	-	-	-	-	3	5
JOBKL	25	19	-	-	-	23	7	26	11	3	10	13	21	-	-
KACJA	-	-	-	-	-	-	-	9	-	-	-	-	-	-	-
	-	-	-	-	-	3	-	17	10	1	1	10	8	7	8
	-	-	-	-	-	-	-	44	-	-	-	21	18	7	-
	-	-	-	-	-	1	-	15	-	-	-	12	17	16	8
KERST	62	34	-	20	66	96	5	29	-	79	36	55	13	51	-
MOLSI	-	-	-	-	-	-	24	1	25	-	12	27	31	3	21
	-	9	4	-	-	2	11	2	16	2	13	17	26	1	8
MORJO	3	-	2	-	-	-	-	-	3	-	-	-	8	16	5
OCHPA	-	1	-	-	-	15	13	13	-	-	2	3	4	3	2
OTTMI	8	10	4	-	4	4	12	1	15	10	-	-	-	-	4
ROTEC	-	10	-	2	5	10	11	15	4	-	-	1	11	2	5
SCHHA	4	5	2	-	-	7	5	10	-	5	4	8	4	1	2
SLAST	-	-	-	-	-	-	-	7	5	1	1	4	10	3	6
STOEN	36	22	-	-	-	-	-	38	5	14	5	6	-	1	7
	34	28	-	-	-	-	-	30	5	11	7	7	-	1	6
	30	-	-	-	-	-	-	29	4	22	10	10	-	2	9
STORO	-	-	-	-	-	-	-	-	30	-	-	54	-	-	-
STRJO	6	9	-	-	2	4	3	9	3	6	6	2	2	-	-
	10	8	-	-	-	5	6	13	-	13	7	15	8	3	2
	18	16	-	-	-	8	5	16	2	8	7	9	11	-	-
Sum	268	253	44	46	110	248	170	445	202	229	186	378	271	185	189

June was another highlight for most observers of the IMO network. If we forget about a short rainy period right before midsummer, most observers enjoyed perfect conditions through all of June. 12 cameras recorded meteors in twenty and more nights, and even though the data from five cameras are still missing at this point, we managed to obtain another all-time high for June with more than 1,700 hours of effective observing time and 6,000 meteors. Among the months with least observations, June could join up. In soccer we would say, that the relegation spots are held by February (24,558 meteors), May (24,395 meteors) and June (24,362 meteors). When the currently missing data are added, June will probably pass the other two months. Once more, that

is in particular thanks to Steve Kerr, who took full advantage of the high meteor activity and long nights in the southern hemisphere.

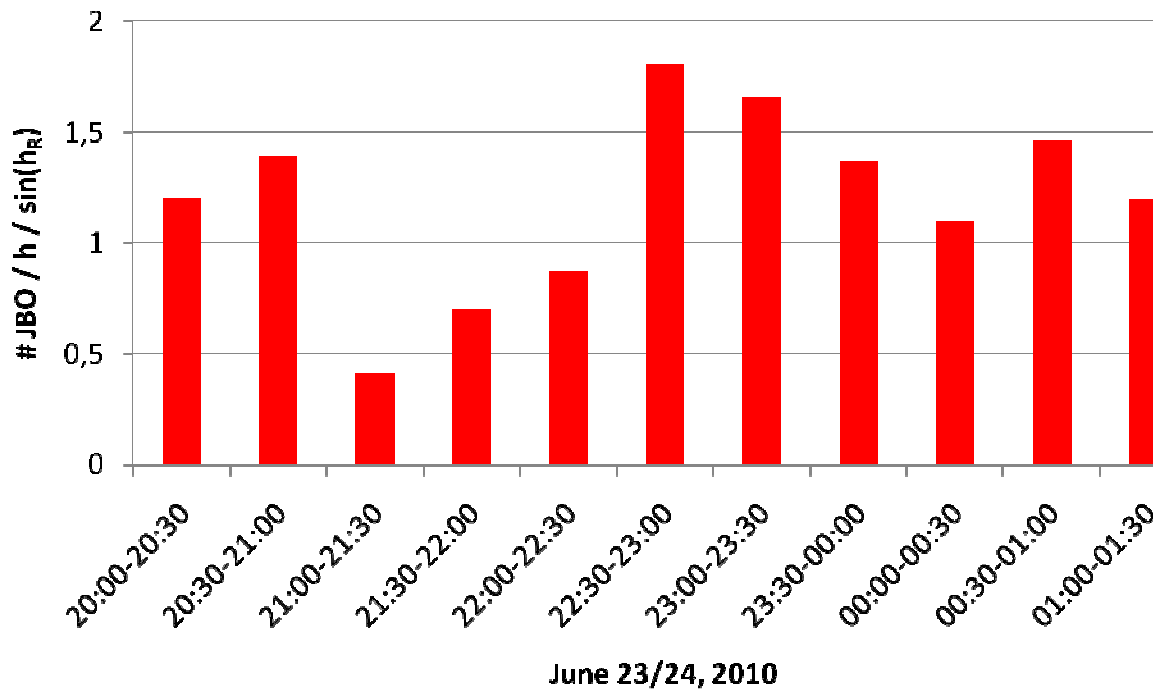
On June 24, Javor Kac reported enhanced June Bootid activity to the IMO News mailing list, which Slovenian observers had noted during a comet observing session between 0 and 1 UT. Also his own camera ORION1 had recorded more JBO than SPO this night. He alarmed other observers to give this shower special attention, but there were no further positive reports. Some visual observers even noted that they had observed nothing special on June 23/24. So was that just a false alarm?

To answer this question, the video data between June 21/22 and 29/30 were analysed in detail. At first, we calculated the ratio between the number of June Bootids and Sporadics over all cameras for each night. The result, which is based on a total of 1889 SPO and 141 JBO, is given in Figure 1. The observation of Javor is clearly confirmed: Whereas the June Bootids were virtually absent all of the time, we recorded over a hundred shower meteors on June 23/24 alone, which is about 1/3 of the sporadic count of that night. The ratio of Anthelion to sporadic meteors is plotted for comparison. As expected, the Anthelion rate was almost constant in that time interval. Whereas the regular June Bootid maximum was predicted for June 27, we observed an early outburst of this shower similar to 2004. Only the ZHR stayed probably below 10 this time.



**Figure 1:** Activity profile of the June Bootids in the third decade of June 2010 (red). The enhanced JBO rate of June 23/24 is clearly visible. For comparison, the activity profile of the Anthelion source is given as well (green).

Next we analysed, whether the activity on June 23/24 was constant, or whether there were strong variations as suggested by some observers. Fortunately just that night was the best June night ever (for the first time we collected more than 100 hours effective observing time), so that we could analyze the number of June Bootids in half hour intervals and correct the counts for the radiant altitude. The resulting profile is given in figure 2. There might be a dip in activity between 21:00 and 22:30 UT, but overall the JBO activity was clearly enhanced all night long.



**Figure 2:** JBO activity on June 23/24. Here, the average hourly number of June Bootids, corrected by the radiant altitude, is given.

Finally, we derived the radiant position of the June Bootids from the observation of that single night. With  $\alpha=224^\circ$ ,  $\delta=48^\circ$  and  $v_{\text{inf}}=17\text{km/s}$  we received figures that match almost perfectly to the values given in the IMO shower calendar. Reports from observers, who noted the radiant about 10 degrees farther south in previous years, could not be confirmed for 2010.

Away from the JBO and ANT, there are just two other showers in June. Both, the delta Piscids (410 DPI) and f-Ophiuchids (412 FOP) were detected in our shower analysis last year, which is why we wanted to check if they were traceable in 2010, too. We extended the shower list by these showers and recomputed the meteor shower assignment for all observations starting from June 19. Between June 19 and 26, a total of 48 meteors were assigned to the delta Piscids. The activity was such low that they did not stand out of the sporadic background. Only on June 21/22 we recorded a slightly larger number of 16 delta Piscids. With only 31 meteors fitting to the radiant, the f-Ophiuchids remained below the detection threshold all the time between June 26 and 30.