

# Experience with high-speed video recording on a small telescope

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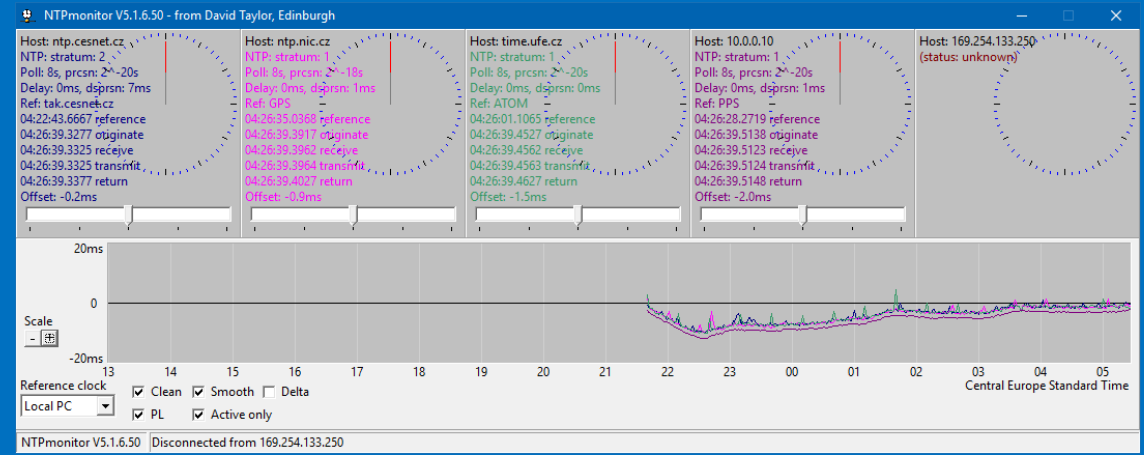


During last four years I have recorded about 60 total occultations with frame rates 100/fps or higher with two different digital cameras (QHY5L-II-M and ASI174MM) mounted on a 20cm telescope.  
Both are **digital cameras** – no time inserter !

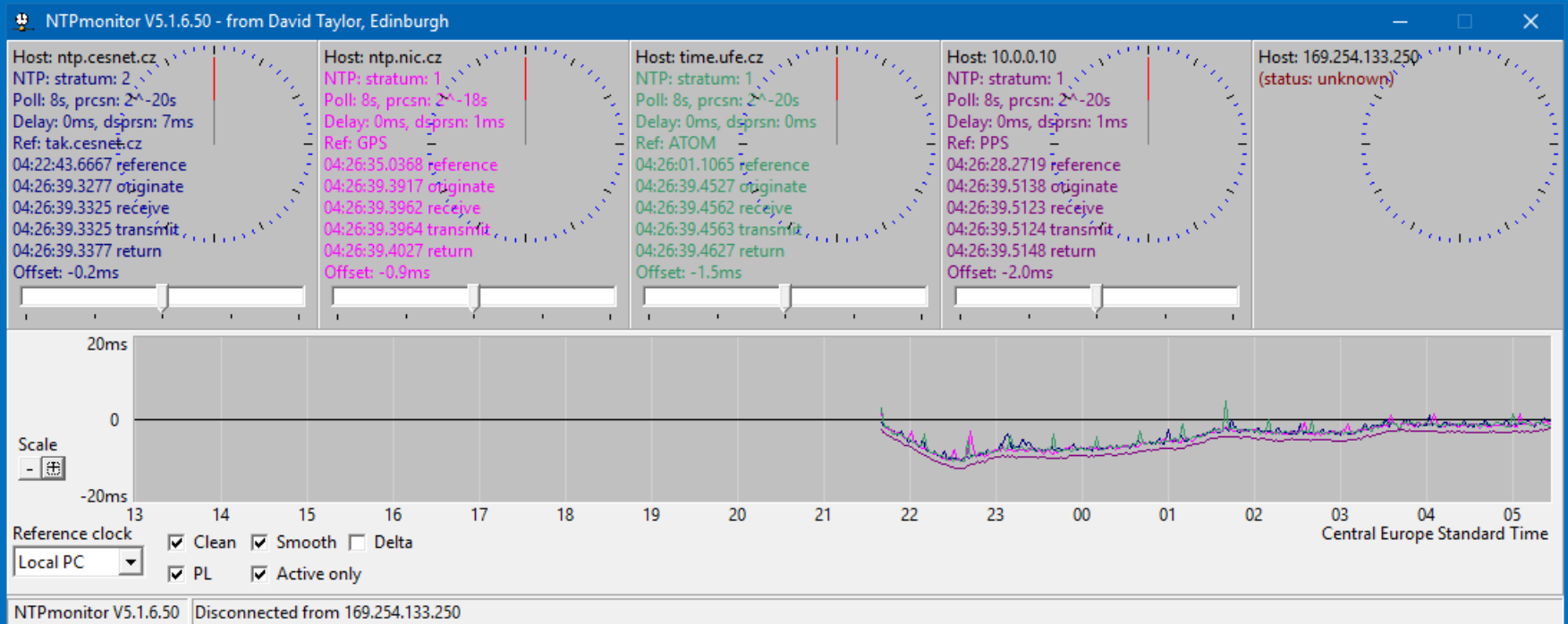
Capture SW (EZplanetary/FireCapture) inserts/records time info based on internal time running on the computer.

Computer time is maintained by Meinberg NTP server software  
<https://www.meinbergglobal.com/english/sw/ntp.htm>

Monitored with David Taylor's nice **NTPmonitor** – thus StF Internet needed !  
<http://www.satsignal.eu/software/net.htm#NTPmonitor>  
Detailed offset logs



Last – but not least – as a time source is used Raspberry Pi running as local NTP server connected with a cable directly to the recording PC.  
No Internet basically needed.



# Can we utilise higher time resolution ?

Better event timing ?

Better component separation ?

Closer doubles ?

Better diffraction curve fit ?

Faint components ?

Mag limits ?

Grazes ?

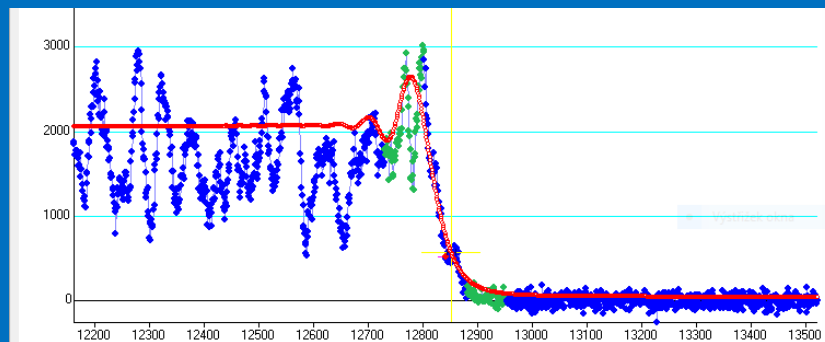
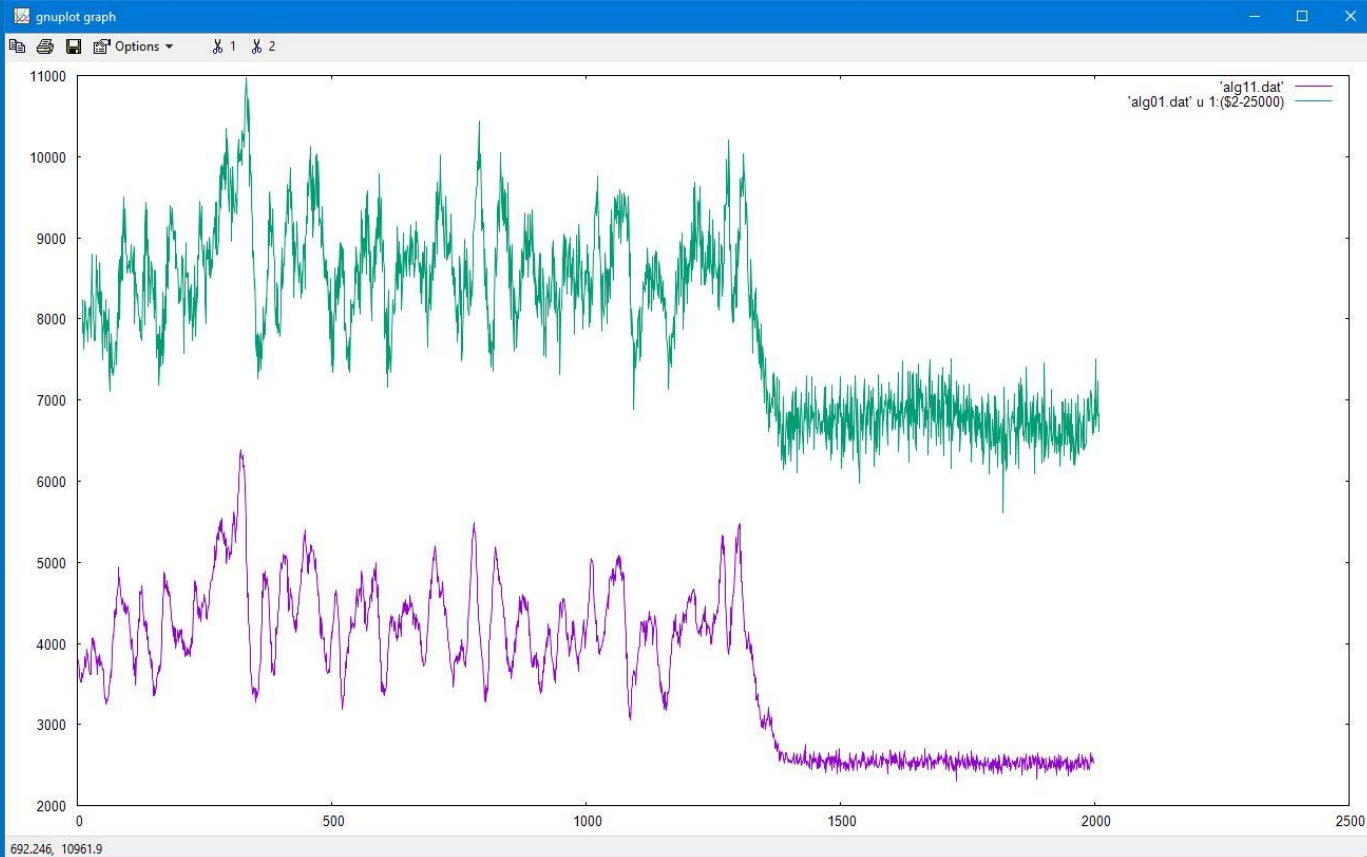
74 Vir = SAO 139390 = HIP 66006 = XZ 19454 (4.7 mag V)

Occultation prediction for SZ192 Barrandov

E. Longitude 14 22 18.5, Latitude 50 1 54.4, Alt. 352m; Telescope dia 20cm; dMag 2.0

day	Time	P	Star	Sp	Mag	Mag	%	Elon	Sun	Moon	CA	PA	VA	AA	Libration	A	B	RV	Cct	durn	R.A. (J2000)	Dec	Mdist	SV										
y	m	d	h	m	s	No	D	v	r	V	ill	Alt	Alt	Az	o	o	o	L	B	m/o	m/o	"/s	o	sec	h	m	s	o	m	s	Mm	m/s		
17	Jun	4	22	38	13	D	1941	M3	4.7	3.8s	82+	129		22	228	168	189	160	166	+5.0	-4.6	-0.2	-5.1	.093	-76.5	.06	13	31	57.9	- 6	15	21	398.1	770.7
R1941 = 74 Virginis = NSV 6297 = SAO 139390 = HIP 66006 = XZ 19454, 4.68, range 0.07, V																																		
179.9 m/s																																		

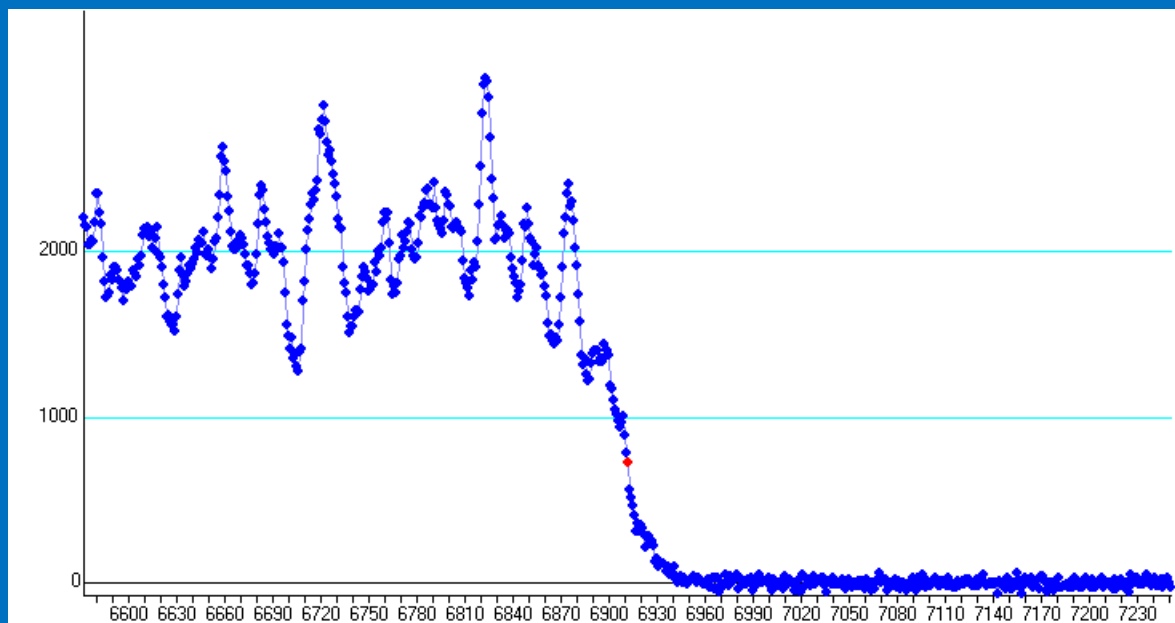


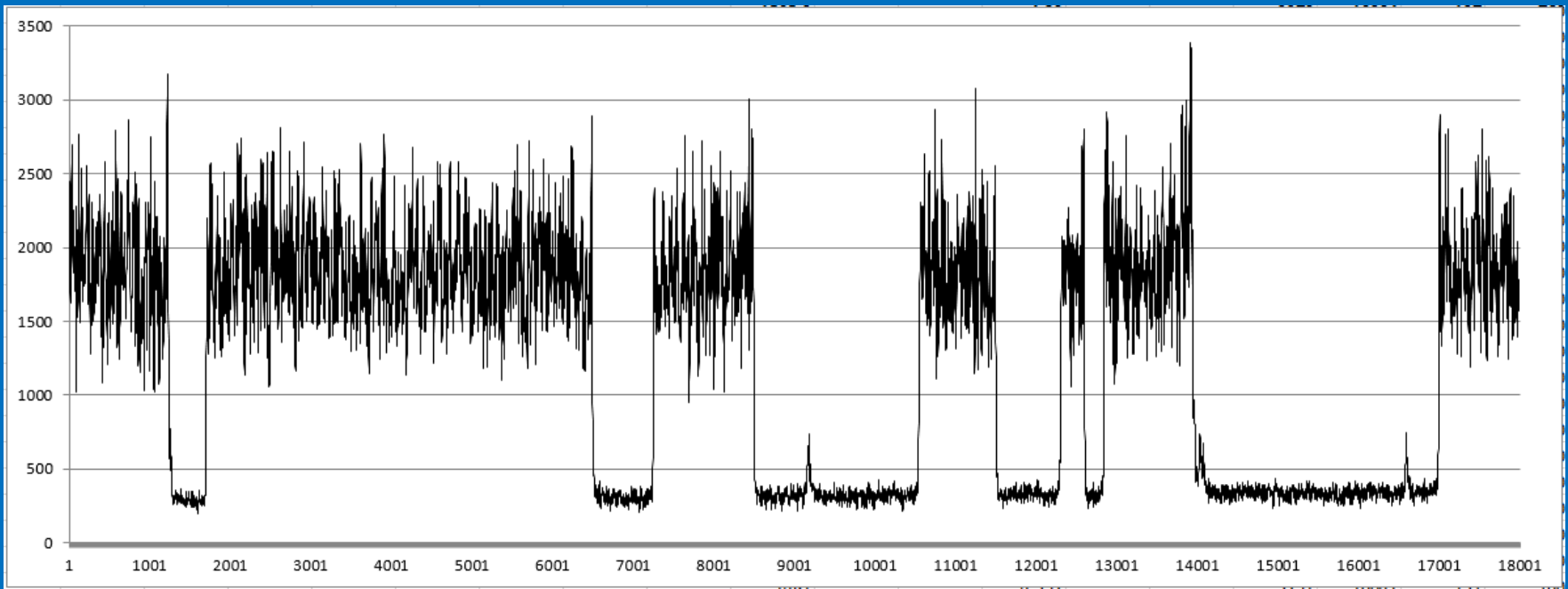


Occultation prediction for Ondrejov CD, AsU, CZ

E. Longitude 14 46 53.2, Latitude 49 54 33.0, Alt. 530m; Telescope dia 20cm; dMag 2.0

day	Time	P	Star	Sp	Mag	Mag	%	Elon	Sun	Moon	CA	PA	VA	AA	Libration	A	B	RV	Cot	durn	R.A. (J2000)	Dec	Mdist	SV										
y	m	d	h	m	s	No	D	v	r	V	ill	Alt	Alt	Az	o	o	o	o	L	B	m/o	m/o	"/s	o	sec	h	m	s	o	m	s	Mm	m/s	
18	Feb	23	17	2	5.9	D		692SK5	0.9*	0.1v	54+	95	-5	57	171	54S	117	123	124	-4.3	+6.7	+1.9	-1.0	.319	-41.9	.09	4	35	55.2	16	30	33	366.6	762.3
R692 = Aldebaran = alpha Tauri																																		
18	Feb	23	17	59	40.5	R		692SK5	0.9*	0.1v	54+	95		56	196	-43S	215	204	222	-4.5	+6.6	+1.3	+2.0	.318	-138.1	.09	4	35	55.2	16	30	33	366.5	759.4
R692 = Aldebaran = alpha Tauri																																		





R 1449 M0 6.5 mag V  
200fps -> 20 fps



Future – PTP ( $10^{-5}$  -  $10^{-6}$  s) instead of NTP ( $10^{-3}$  s) on Windows machines  
[https://en.wikipedia.org/wiki/Precision\\_Time\\_Protocol](https://en.wikipedia.org/wiki/Precision_Time_Protocol)

Existing >15 years

Very effective

IEEE 1581 norm

Should be implemented in Windows 10 v1809

