

Prepointing and time analysis

Das Beispiel der Sternbedeckung von
(130) Elektra vom 21 April 2018

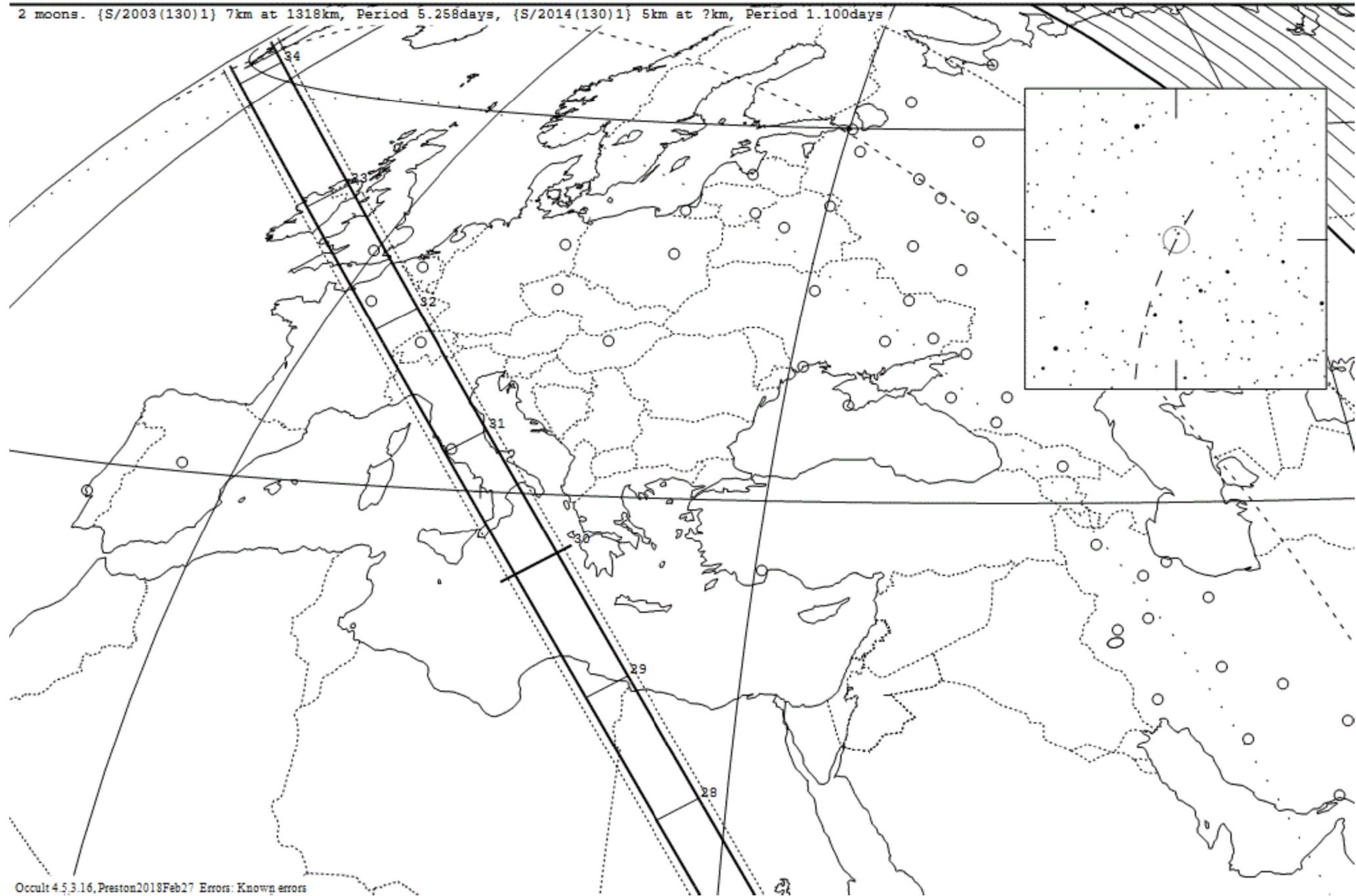
130 Elektra occults TYC 0408-00029-1 on 2018 Apr 21 from 0h 12m to 0h 34m UT

Star:
 Mv = 11.6
 RA = 17 17 50.3040 (J2000)
 Dec = 5 20 25.010
 [of Date: 17 18 44, 5 19 17]
 Prediction of 2018 Feb 27.0

Max Duration = 20.5 secs
 Mag Drop = 1.6 (0.0r)
 Sun : Dist = 128 deg
 Moon: Dist = 149 deg
 : illum = 29 %
 E 0.016"x 0.010" in PA 77

Asteroid: (in DAMIT, ISAM)
 Mag = 12.9
 Dia = 199km, 0.096"
 Parallax = 3.087"
 Hourly dRA == -0.520s
 dDec = 15.00"

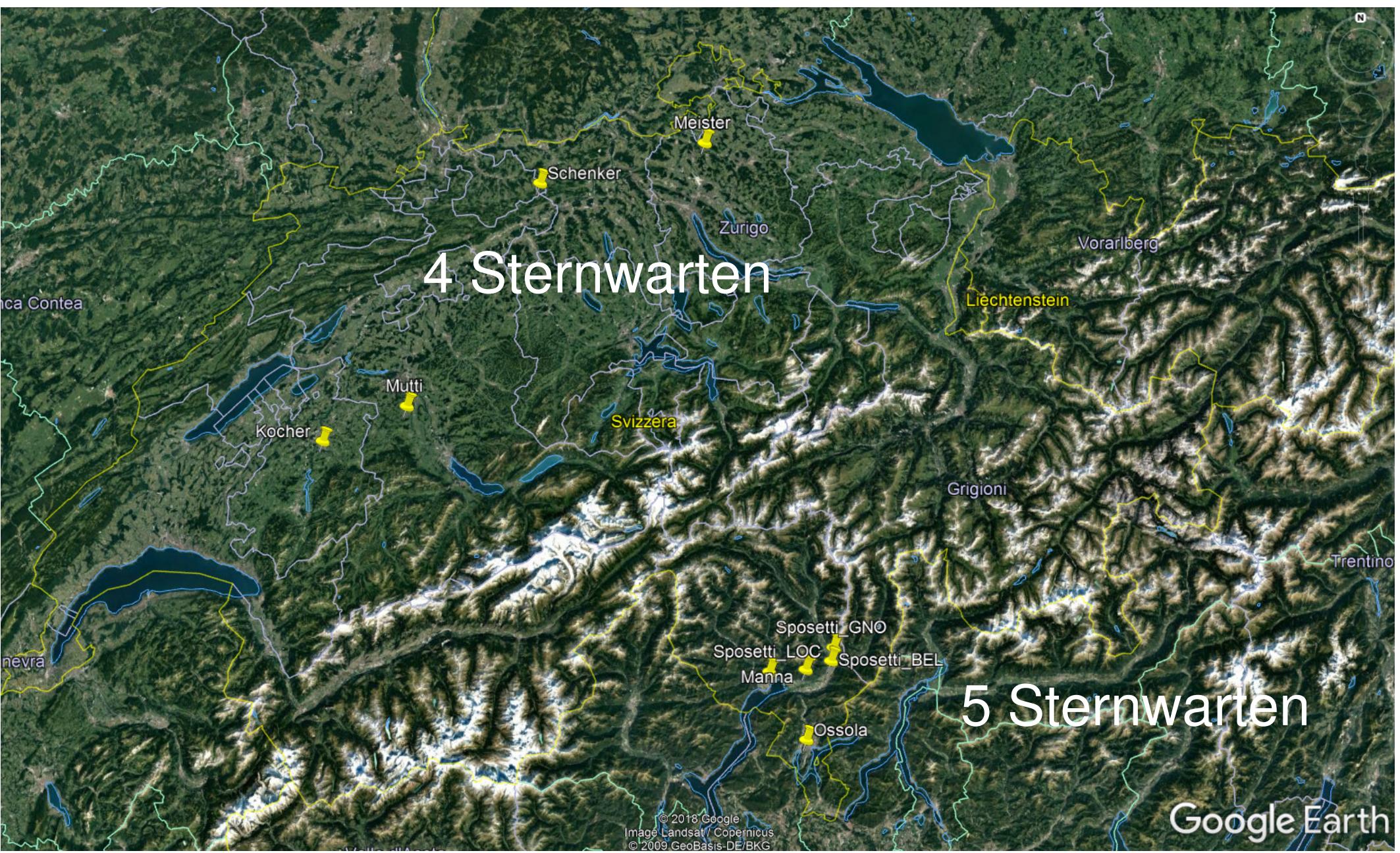
2 moons. {S/2003(130)1} 7km at 1318km, Period 5.258days, {S/2014(130)1} 5km at ?km, Period 1.100days



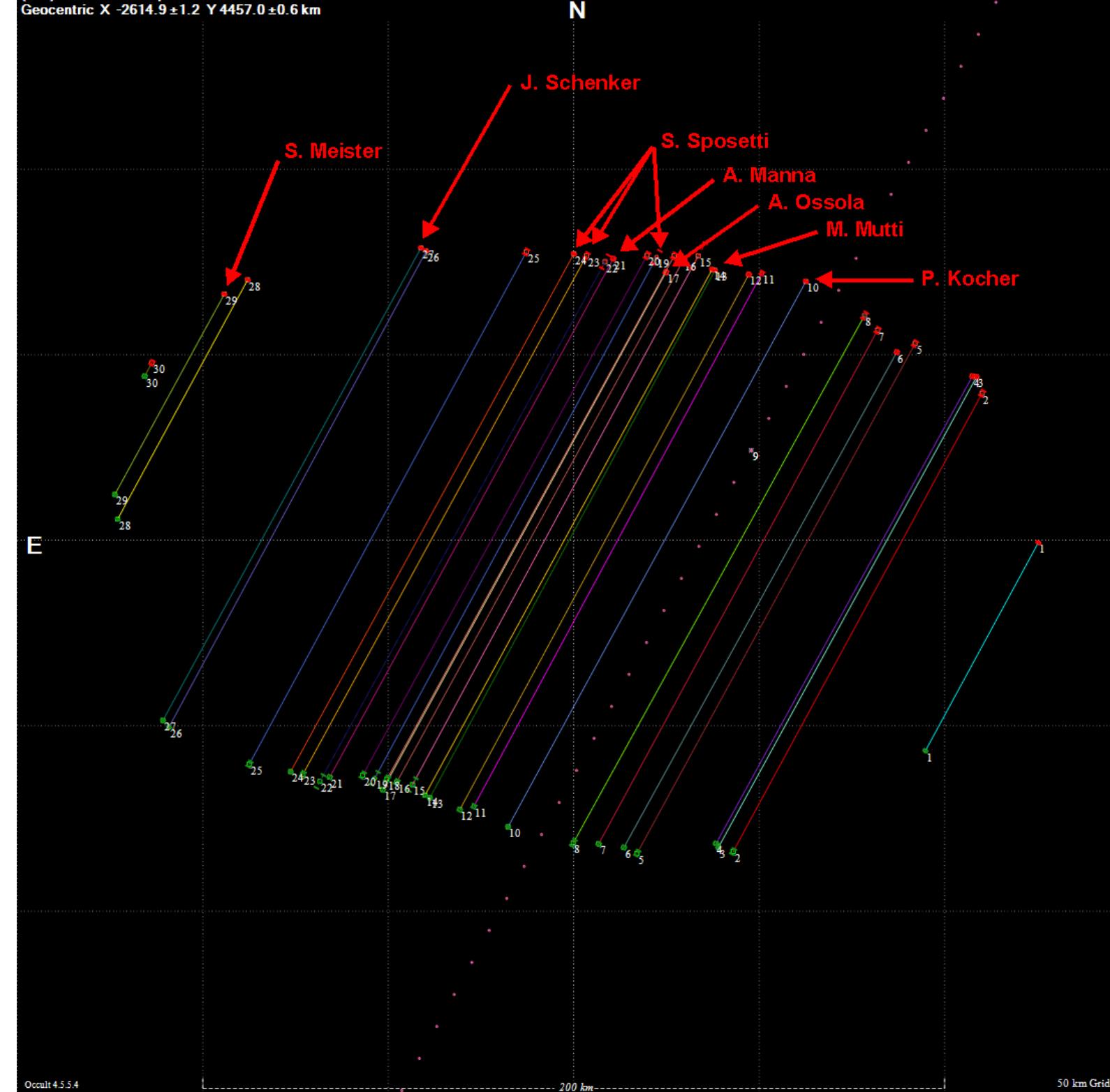


Auf *occultations.ch*

April 21, 2018: Great success for SOTAS members: At 00:31 UT, the shadow of (130) Elektra, a 180 km asteroid, crossed Europe with center line directly along Switzerland. After good preparation works (workshop) and thanks to brilliant weather conditions along the whole path, totally 9 (nine!) SOTAS stations recorded the disappearance and reappearance of the light of a 11.6 mag star. Eric Frappa (Euraster) aranged the chords and simulated the suitable model of the asteroid. Well done guys!



(130) Elektra 2018 Apr 21 261.5 ± 2.9 x 159.0 ± 1.2 km, PA $84.6^\circ \pm 0.8^\circ$
Geocentric X -2614.9 ± 1.2 Y 4457.0 ± 0.6 km



Find best fit

Center X	-1.0	<input checked="" type="checkbox"/>	0.0			
Center Y	2.8	<input checked="" type="checkbox"/>	0.0			
Major axis (km)	261.5	<input checked="" type="checkbox"/>	0.0			
Minor axis (km)	159.0	<input checked="" type="checkbox"/>	0.0			
Orientation	84.6	<input checked="" type="checkbox"/>	0.0			
a/b=1.64 dM=0.54						
Motion 8.63km/s, Y						
Double star or double asteroid						
Sepn (masec)	0.0	<input type="checkbox"/>	0.0			
PA of 2nd	0.0	<input type="checkbox"/>	0.0			
Show:	<input checked="" type="radio"/> Both	<input type="radio"/> Primary	<input type="radio"/> Secondary			
A =	10.0	<input type="button"/>	B = 10.0	<input type="button"/>	PA = 0.0	<input type="button"/>

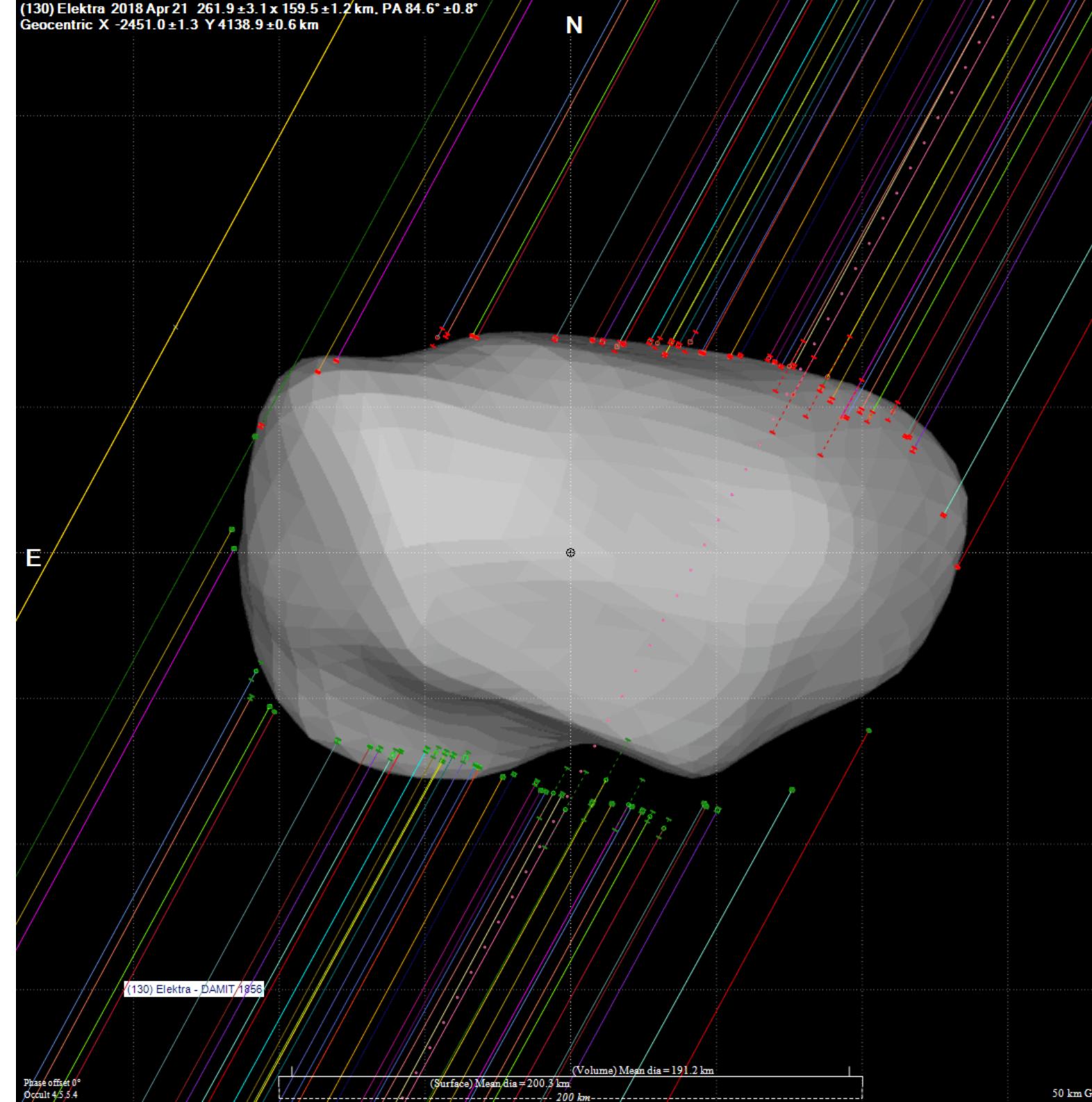
Circular Include Miss events

Plot scale: Quality of the fit: Excellent
Opacity:

1	Olivier Dechambre, FR
2	A. Leroy/G. Canaud, FR
3	Pietro Baruffetti, IT
4	Michele Bigi, IT
5	Francois Meyer, FR
6	G Isopi/F Mallia/F Maio, I
7	Eric Vauthrin, FR
8	Alfonso Noschese, IT
9 (P)	Prediction
10	Peter Kocher, CH
11	Peter Tickner, UK
12	John Talbot, UK
13	Tim Haymes, UK
14	Martin Mutti, CH
15	Adrian Jones, UK
16	L Leonelli/D Alboresi/L Ba
17	Alberto Ossola, CH
18	Roberto Di Luca, IT
19	Malcolm Jennings, UK
20	Stefano Sposetti, CH
21	Andrea Manna, CH
22	S Orlandi/C Frisoni, IT
23	Stefano Sposetti, CH
24	Stefano Sposetti, CH
25	Philip Denyer, UK
26	Simon Kidd, UK
27	Jonas Schenker, CH
28	Frederic Vachier, FR
29	Stefan Meister, CH
30	Roland Boninsegna, BE

(130) Elektra 2018 Apr21 261.9 \pm 3.1 x 159.5 \pm 1.2 km, PA 84.6 \pm 0.8°

Geocentric X -2451.0 \pm 1.3 Y 4138.9 \pm 0.6 km



Find best fit

Center X	132.0	<input checked="" type="checkbox"/>	0.0
Center Y	-76.1	<input checked="" type="checkbox"/>	0.0
Major axis (km)	261.9	<input checked="" type="checkbox"/>	0.0
Minor axis (km)	159.5	<input checked="" type="checkbox"/>	0.0
Orientation	84.6	<input checked="" type="checkbox"/>	0.0
a/b=	1.64		
dM=	0.54		
Motion	8.63km/s, Y		

Double star or double asteroid

Sepn (masec) 0.0 0.0

PA of 2nd 0.0 0.0

Show: Both Primary Secondary

A= 10.0 B= 10.0 PA= 0.0

Circular Include Miss events

Plot scale Quality of the fit Excellent

RMS fit 0.0 \pm 4.0 km

Opacity

1 (M)	Matthieu Conjat, FR
2	Olivier Dechambre, FR
3	Claudio Costa, IT
4	A. Leroy/G. Canaud, FR
5	Pietro Baruffetti, IT
6	Michele Bigi, IT
7	M Bachini/G. Succi/E. Dal Ca
8	Alessandro Marchini, IT
9	Francois Meyer, FR
10	G Isopi/F. Mallia/F. Maio, I
11	Roberto Bacci, IT
12	Eric Vauthrin, FR
13	Alfonso Noschese, IT
14	M. Mannucci/N. Montigiani, I
15	P. Bacci/M. Maestripieri/M. D
16 (P)	Prediction
17	Peter Birtwhistle, UK
18	Ettore Marmo, IT
19	Luca Rizzuti, IT
20	Peter Kocher, CH
21	Gianni Galli, IT
22	Peter Tickner, UK
23	John Taitbot, UK
24	Tim Haymes, UK
25	Martin Mutti, CH
26	Adrian Jones, UK
27	L. Leonelli/D. Alboresi/L. Ba
28	Alberto Ossola, CH
29	Roberto Di Luca, IT
30	Malcolm Jennings, UK
31	Stefano Sposetti, CH
32	Andrea Manna, CH
33	S. Orlandi/C. Frisoni, IT
34	Stefano Sposetti, CH
35	Stefano Sposetti, CH
36	Philip Denyer, UK
37	Simon Kidd, UK
38	Jonas Schenker, CH
39	Mike Collins, UK
40	Philippe Morel, FR
41	Frederic Vachier, FR
42	Stefan Meister, CH
43	Roland Boninsegna, BE
44 (M)	Rene Bourtembourg, BE
45 (M)	Robert Greimel, AT
46 (M)	Michal Rottenborn, CZ
47 (M)	Karel Halir, CZ
48 (M)	Jiri Kubanek, CZ

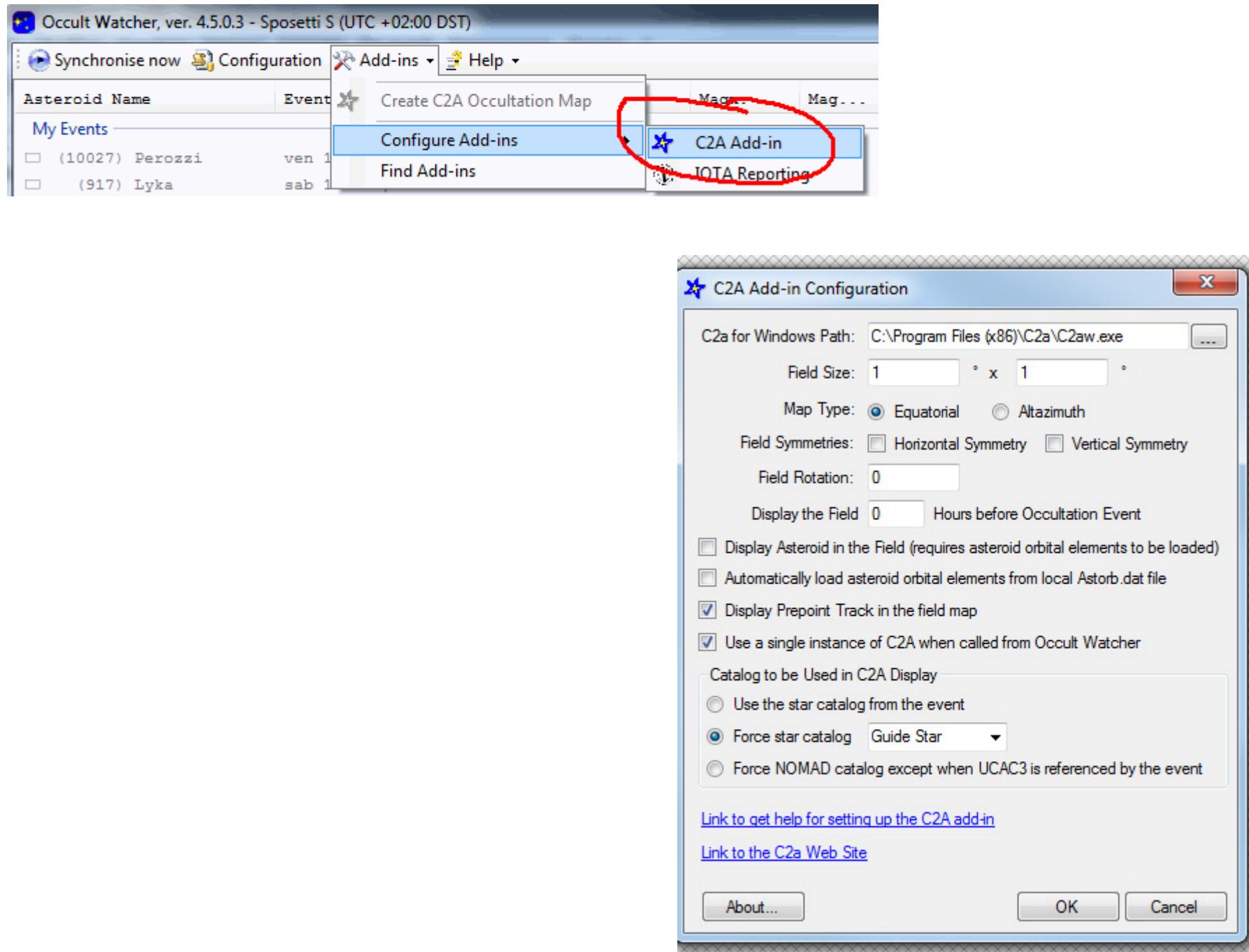
Part 1 - Prepointing

Software nötig:
-Occultwatcher
-C2A

Download sites:

<http://www.occultwatcher.net/>

<http://www.astrosurf.com/c2a/english/index.htm>



Part 2 – Zeitanalyse: Manuelles einfaches Vorgehen

Software nötig:

- Virtualdub
- Tangra3

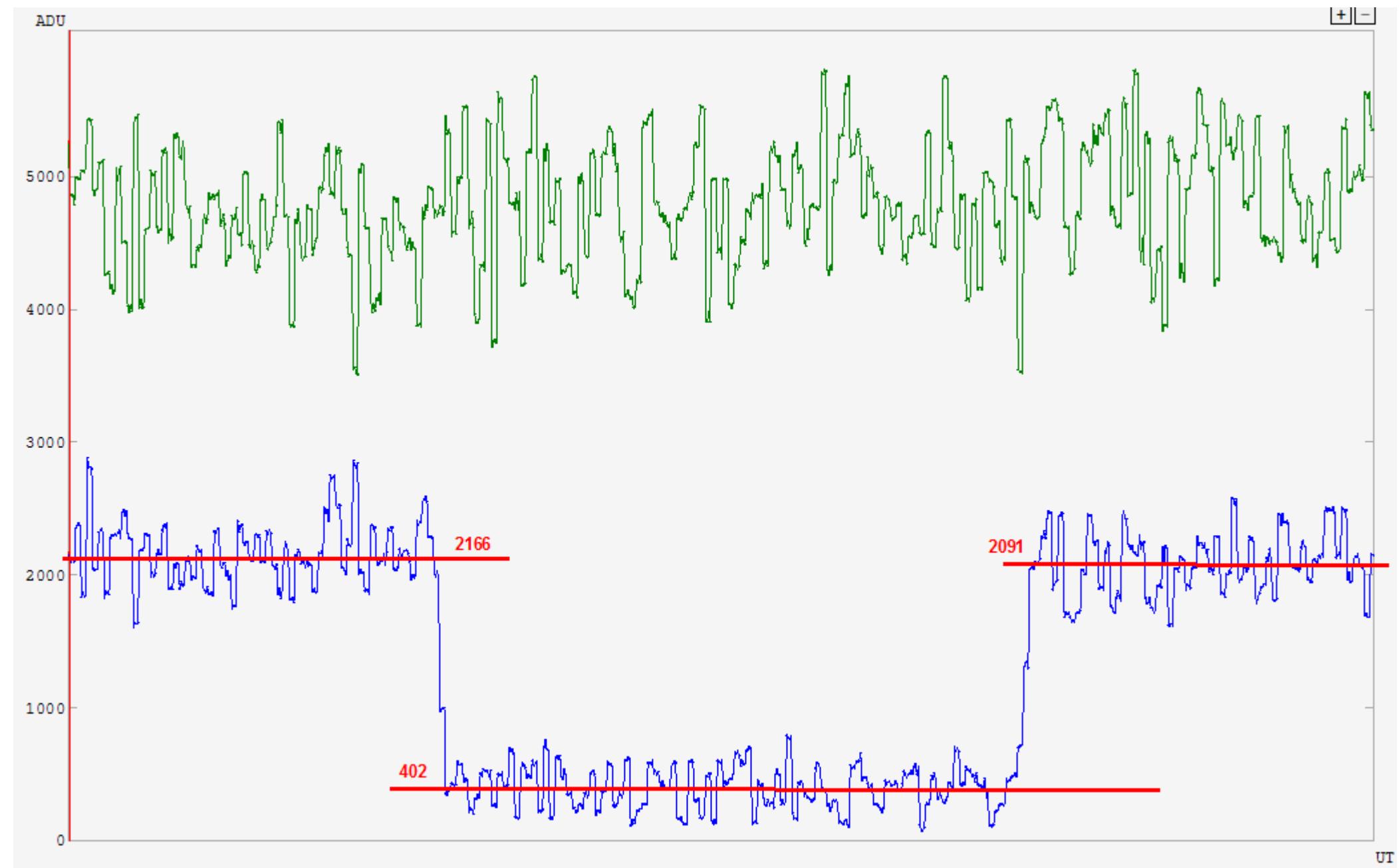
Download sites:

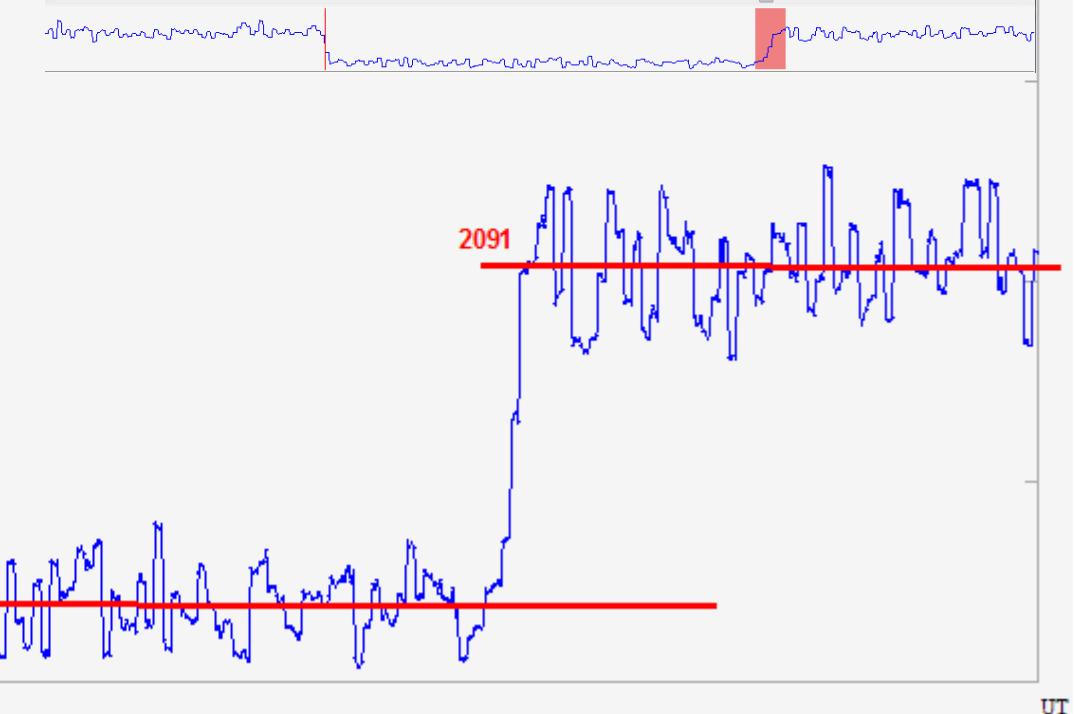
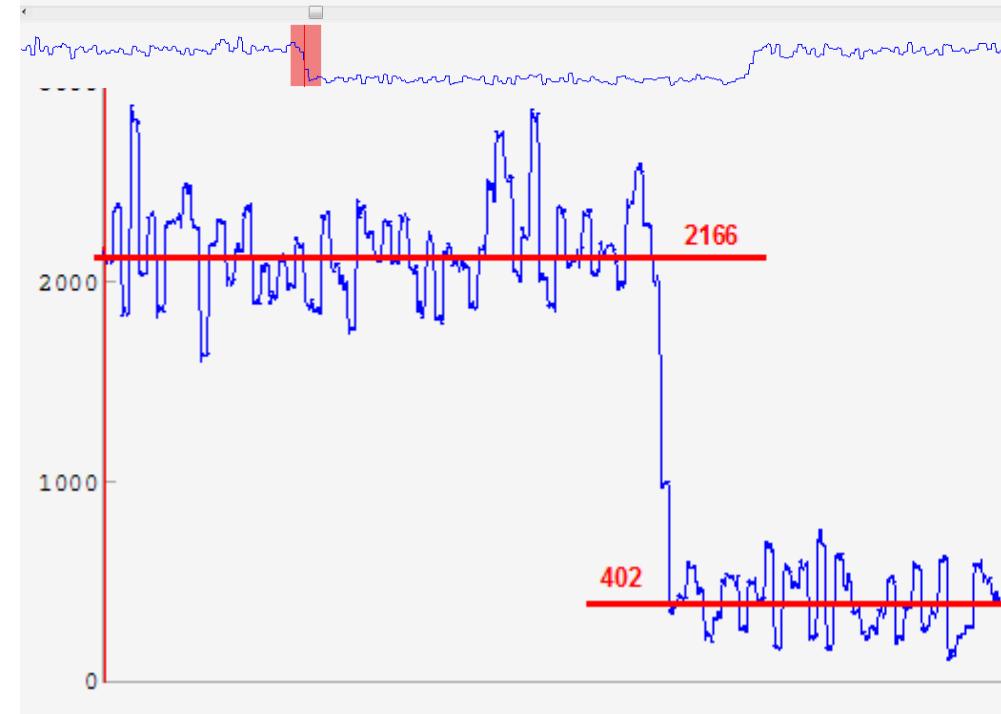
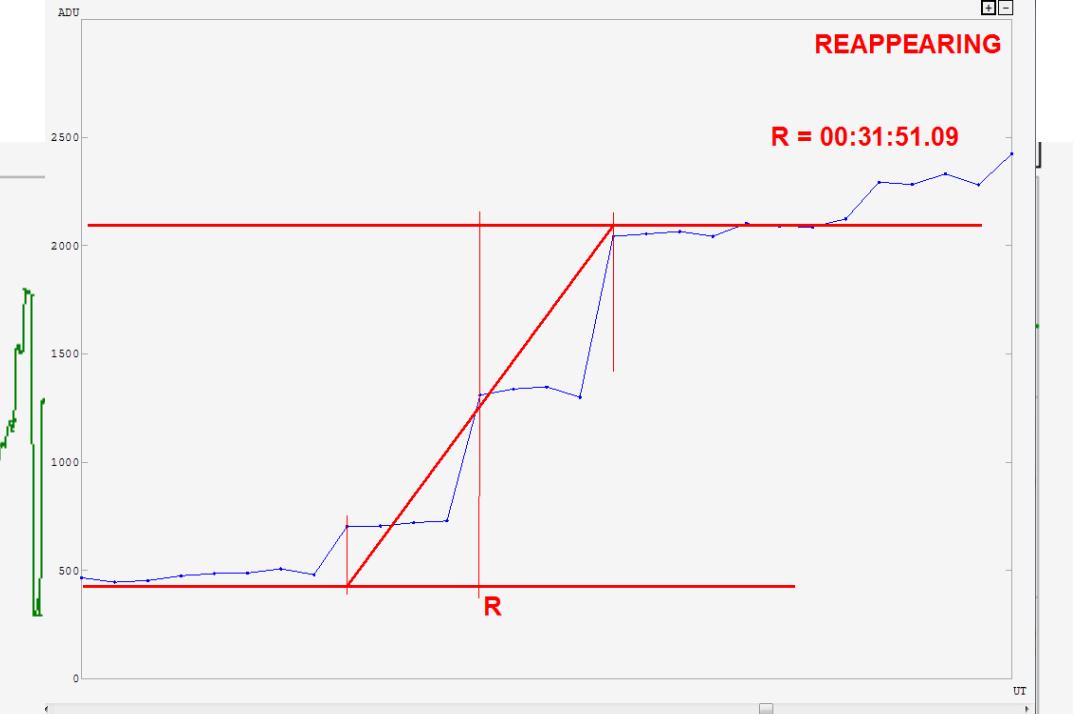
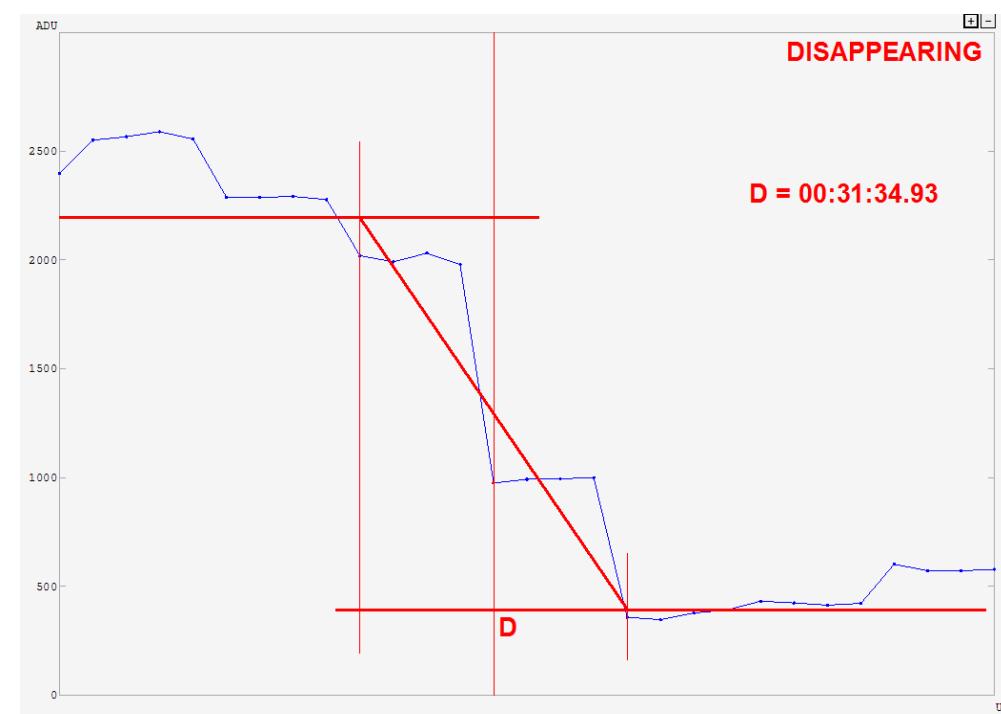
<http://www.virtualdub.org/>

<http://www.hristopavlov.net/Tangra3/>

Prediction:

- Occultwatcher, IOTA feed
- Rank: 100
- Probability: about 85 %
- Combined magnitude: 11.3 mag
- Star magnitude: 11.4 mag
- Asteroid magnitude: 12.9 mag
- Lightdrop: 1.6 - 2.0 mag
- Max duration: 20.5 s
- Event time: 00:31:37 UT
- Error in time: 3 s
- Moon distance: below horizon
- Moon illumination: -
- Sky position of the target: elevation = 40 deg, azimuth = 133 deg





STARTSEITE

[Table WAT-910 \(CCIR\)](#)
[Table WAT-910 \(EIA\)](#)

Video timing diagrams for all types of WAT-910 cameras

WAT-910HX and WAT-910BD (CCIR)					
Mode	Integration time [s]	Correction time [s]		Tolerance value [s]	
		Evaluation in fields (0.020s)	Evaluation in frames (0.040s)	Evaluation in fields (0.020s)	Evaluation in frames (0.040s)
1/50s	0.020	-0.020	-0.020	±0.010	±0.020
x2	0.040	-0.030	-0.040	±0.020	±0.020
x4	0.080	-0.050	-0.060	±0.040	±0.040
x8	0.160	-0.090	-0.100	±0.080	±0.080
x16	0.320	-0.170	-0.180	±0.160	±0.160
x32	0.640	-0.330	-0.340	±0.320	±0.320
x64	1.280	-0.650	-0.660	±0.640	±0.640
x128	2.560	-1.290	-1.300	±1.280	±1.280
x256	5.080	-2.550	-2.560	±2.540	±2.540

Note: In the mode x256 the WAT-910 camera integrates only 254 fields or 127 frames

D = 00:31:34.93

R = 00:31:51.09

“Dangl correction”: - 0.100 s

D = 00:31:34.83 ± 0.08 s

R = 00:31:50.99 ± 0.08 s

Duration = 16.16 s ± 0.16 s

Lightdrop:

$$\Delta m = -2.5 \log (I_1/I_2)$$

$$\begin{aligned}\Delta m &= -2.5 \log (400 / 2100) \\ &= 1.8 \text{ mag}\end{aligned}$$