

Centre for Research in Astronomy,  
Astrophysics and Geophysics  
ALGIERS Observatory



# New Observations of asteroidal occultations in Algeria

Presented by :

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# Outline

- Presentation of the CRAAG (Algiers Observatory) – History, structure etc.
- History of stellar occultation by asteroids in Algeria
- First Algerian Stellar Occultation by Asteroids Network
- Results obtained by the campaign observations of July and August 2017
- Near Futur prospects
- Summary

# Presentation of the Algiers Observatory



The Centre for Research in Astronomy Astrophysics and Geophysics (**CRAAG**) comes from the creation of the Algiers Observatory in 1890 and after from the Institute of Meteorology and Physics of the Globe in Algiers (**IMPGA**) in 1931. The name of **L'Observatoire d'Alger** remained long after the independence of Algeria in 1962 until 1980.

In 1980, the Algerian ministry of high study and research created the National Center for Astronomy, Astrophysics and Geophysics (**CNAAG**) and in 1985, they change the establishment of the status of research centers in Algeria, **CRAAG** was created.

And here is some works that the Algiers observatory participate in the scientific community :

Participation in the international program of the chart of Sky (**Carte du ciel**) - 1909-1925.

Discovery of 64 asteroids including **858 El Djezair** on May 26th 1916 and **859 Bouzareah** on October 2nd 1916 by the french astronomer Frederick Sy. The first asteroid has the arabic name of the city of Algiers and the second has the arabic name of the village where the observatory located them.

Determination of time, enrichment of the fundamental catalog, etc...

The centre (CRAAG) has 3 departments :

- Seismology
- Geophysics
- Astronomy and Astrophysics

The department of Astronomy and Astrophysics has two divisions :

- Solar physics and Spaceweather
- Stellar physics and high energy astronomy

Each division has 4 groups :

The 4 groups of the division of solar physics :

- Solar physics
- Heliosismology
- Space weather
- Solar high angular resolution

The 4 groups of the division of stellar physics and high energy astronomy :

- Stellar physics
- Variable stars
- High energy astronomy
- Signal processing applied to Astronomy

**And we are creating a project to study planetology and small bodies**

# History of stellar occultation by asteroids in Algeria

**Mostefaoui Toufik**, professor of physics in Bejaia University and **Daiffallah Khalil**, astronomy researcher in CRAAG interested by observing stellar occultation by asteroids from 1996.

They contacted **European Asteroidal Occultation Network (EAON)** and received constantly bulletin letters about occultations that paths pass by algerian territory.

Unfortunately, they don't observe any positive occultation because the low probability of observation based on the accuracy of the astrometrical position of the star and the precision of the path on the geographic map were not accurate in this moment.

History and list of Algerians who observed positive or negative occultations on the website Euraster occultation.

**Daiffallah Khalil** was the first, then **Chabou Charaf**, **Demardji Yacine** and **BABA AISSA Djounaï**.

2001/02/19 | 4063 | Euforbo | TYC 1964-01250-1

O- | Rui Goncalves | 23:30:00 | 23:40:00 | M245 | VIS | PT | W 08 23 06.3 | N 39 31 18.2 | 90 | W |  
dmin=1.11" N +/- 0.33" at 23:38:54 +/- 7s from 20 CCD images. |;  
O- | Francois Colas | 23:32:04 | 23:40:02 | M1050 | CCD | FR | E 00 08 32.2 | N 42 56 10.8 | 2880 | WS |  
0.363s cycle (0.20s exposure + 0.163s lapse).  
dmin=1.05" NNE +/- 0.13" at 23:37:55 +/- 25s from 17 CCD images.  
Data processing : J. Lecacheux. |;  
O- | Henk Bulder | 23:27:00 | 23:44:00 | M305 | VIS | NL | E 06 52 44.0 | N 52 56 18.1 | 8 | W | ;  
O- | Oernulf Midtskogen | 23:29:00 | 23:39:00 | M320 | VIS | NO | E 10 17 13 | N 59 49 12 | 287 | | ;

2001/02/17 | 119 | Althaea | HIP 79124

O- | Andrew Elliott | 04:42:00 | 05:02:00 | M254 | VID | UK | W 00 56 44.4 | N 51 25 10.7 | 72 | W | ;  
O- | Oscar Canales | 04:43:58 | 04:55:32 | M120 | VIS | ES | W 00 54 50.3 | N 41 39 15.1 | 230 | | ;  
O- | Jean Lecacheux | 04:46:47 | 04:55:33 | M1050 | CCD | FR | E 00 08 32.2 | N 42 56 10.8 | 2880 | WS |  
0.74s cycle (0.25s exposure + 0.49s lapse).  
dmin=0.057" S +/- 0.009" at 04:50:42.5 +/- 2s from 168 CCD images. |;  
O- | Khalil Daifallah | 04:34:12 | 05:13:22 | M115 | VIS | DZ | E 03 03 42 | N 36 13 44 | 250 | | ;  
Original report mention 2001/02/26 for the date : miskey ? |;

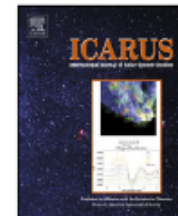
2001/02/16 | 31 | Euphrosyne | TYC 2856-01185-1

O- | Regis Neel | | | M310 | VIS | FR | E 05 14 19 | N 45 25 57 | 460 | | ;  
O- | Oernulf Midtskogen | 20:41:00 | 20:49:00 | M320 | VIS | NO | E 10 17 13 | N 59 49 12 | 287 | | ;

2001/02/16 | 174 | Phaedra | PPM 126482

O- | Jean Lecacheux | 04:55:44 | 05:12:06 | M1050 | CCD | FR | E 00 08 32.2 | N 42 56 10.8 | 2880 | WS |  
0.65s cycle (0.30s exposure + 0.35s lapse).  
dmin=0.425" S +/- 0.035" at 05:03:48 +/- 15s from 27 CCD images. |;

O+	J. Clerigo			M406	VID	PT	W	09 01 58.8	N 39 45 00	30	
64.3	01:54:37.0		01:55:41.3	NTP							
O+	R. Nunes/P. Coelho			M254	CCD	PT	W	08 55	N 38 30	40	
56.5	01:54:36.5		01:55:33								
15 frames/s.;											
O+	H. Denzau et al			M254	VID	PT	W	08 37 33.2	N 37 08 28.7	64	
42.2	01:54:45.5		01:55:27.7	RAD							
O+	Ewen-Smith et al			M200	VID	PT	W	08 36 01.8	N 37 11 24.6	65	
42.9	01:54:44.8		01:55:27.7	RAD++							
O+	C. Reis			M254	WEB	PT	W	08 34 58	N 39 10 50	10	
56.3	01:54:37.7		01:55:34.0								
O+	C. Marciano			M203	VIS	PT	W	08 28 33	N 38 21 38.9	25	
53	01:54:41		01:55:34								
O+	Rui Goncalves			M250	VID	PT	W	08 23 01.5	N 39 31 22.6	90	
61	01:54:36.4		01:55:37.4	RAD++							
O+	C. Oliveira			M254	VID	PT	W	08 06 11.0	N 38 11 01.8	50	
50.8	01:54:40.0		01:55:30.8	RAD							
O-	R. Dusser			L60	VIS	MA	W	06 58 08.6	N 33 55 07.4	6	
O-	J.L. Ortiz	01:50:08	02:02:37	M400	VID	ES	W	03 23 05	N 37 10 54		
M400/M250 with VID.;											
O-	K. Daiffallah	01:47:00	02:19:00	M114	VIS	DZ	W	03 20 00	N 36 45 00	200	
O+	A.J. Elliot			M254	VID	UK	W	02 01 50.5	N 50 35 52.9	140	
73	01:54:29.1		01:55:42.1	RAD							
O+	P. Dupouy et al			M320	CCD	FR	W	01 03 45.7	N 43 43 34	53	
			01:55:34.70	RAD							
D missed. Observation with M. Lavayssiere.;											
O+	O. Canales			M120	VIS	ES	W	01 02 30.5	N 41 37 29.4	330	
51.11	01:54:27.6		01:55:18.71	RAD++							
O+	T. Platt			M250		UK	W	00 47 19.5	N 51 25 26	73	
71	01:54:30		01:55:41	RAD							



## Titania's radius and an upper limit on its atmosphere from the September 8, 2001 stellar occultation

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# Occultation of PPM 239128 by Titania (III) on 2001 Sep 08 at 2h 1.9m UT

## Star (2000):

Mag = 7.5  
RA = 21 38 13.964  
Dec = -14 54 35.91

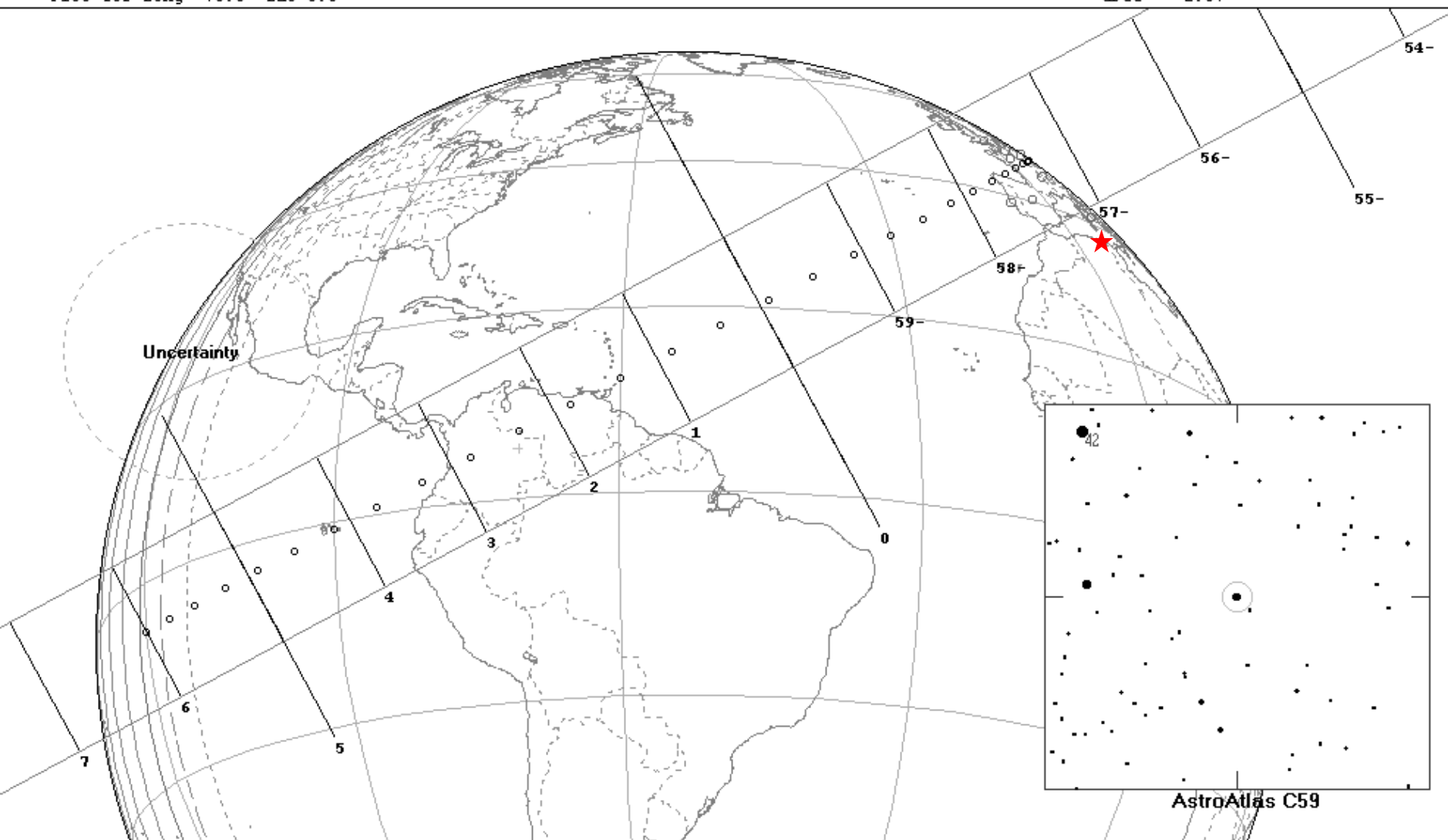
Max Duration = 75.9 secs

Mag Drop = 6.4  
Sun : Dist = 156 deg  
Moon: Dist = 81 deg  
illum = 77%

## Asteroid:

Mag = 13.9  
Dia = 1578km, 0.114"  
Parallax = .462"  
Hourly dRA = -.329s  
dDec = -2.57"

Plot for Long -70.0 Lat 5.0



ESOP XXXVI, Freiberg (Germany),  
September 2017

## 2002/03/24 | 76 | Freia | TYC 1367-02101-1

O- | Rene Bourtembourg | 20:41:00 | 20:43:00 | M254 | VIS | BE | E 05 06 25 | N 50 17 40 | 280 | W | ;  
 O- | W. Thuillot et al | 20:41:40 | 21:10:00 | M800 | VID | FR | E 05 42 45 | N 43 55 46 | 650 | | ;  
 Observation with J.E. Arlot. | ;  
 O- | Henk Bulder | 20:39:45 | 20:46:00 | M305 | VIS | NL | E 06 52 44.0 | N 52 56 18.1 | 8 | W | ;  
 O- | Simone Bolzoni | 20:40:00 | 20:46:00 | M200 | VIS | IT | E 08 08 17 | N 45 40 19 | 1300 | | ;  
 O- | Sandor Szabo | 20:40:00 | 20:52:30 | M340 | VIS | HU | E 16 33 19 | N 47 41 07 | 245 | | ;  
 Cloud interruption 20:41:30/45:48. | ;

## 2002/03/14 | 79 | Eurynome | TYC 1334-00068-1

O- | Carles Schnabel | 20:13:30 | 20:34:05 | M210 | VID | ES | E 01 52 25.7 | N 41 29 41.5 | 180 | | ;  
 Cloud interruption 20:24:00/44. | ;  
 O- | Wilari Pallares | 20:05:00 | 20:37:00 | M280 | VIS | ES | E 01 55 36 | N 41 31 21 | 160 | | ;  
 O- | Moulley Chabou | 20:10:00 | 20:40:00 | M65 | VIS | DZ | E 02 47 00 | N 36 40 00 | 120 | | ;

## 2002/03/10 | 8739 | 1997 BE3 | TYC 1919-00436-1

O- | Patrick Degrelle | 22:53:24 | 23:28:03 | M153 | VIS | FR | E 02 35 06.8 | N 50 27 11.1 | 116 | W | ;

## 2002/03/09 | 1107 | Lictoria | TYC 1898-00944-1

path map, chords, observer list  
 asteroid measurement: at least 94 km

O- | Rui Goncalves | | | M254 | CCD | PT | W 08 23 01.5 | N 39 31 22.6 | 90 | | ;  
 dmin=0.22" N +/- 0.03" at 18:59:04 +/- 7s from 19 CCD images. | ;  
 O- | Jean Montanne | 19:00:00 | 19:04:00 | M203 | CCD | FR | W 00 38 58 | N 44 49 24 | 12 | | ;  
 O- | Paul Pinel | 18:55:00 | 19:10:00 | M200 | VIS | FR | E 00 34 17 | N 46 48 37 | 106 | | ;  
 O- | Wolfgang Vollmann | 19:04:55 | 19:09:20 | L130 | VIS | AT | E 15 52 54 | N 47 41 48 | 585 | | ;  
 O- | Michael Gruenanger | 19:00:00 | 19:10:00 | M200 | VIS | AT | E 16 20 42 | N 48 14 06 | 230 | | ;  
 O- | Sandor Szabo | 19:01:10 | 19:10:00 | M340 | VIS | HU | E 16 33 19.2 | N 47 41 07.6 | 245 | | ;  
 O- | Jan Masiar | 19:03:00 | 19:09:00 | L200 | VIS | SK | E 18 46 00.9 | N 49 18 28.8 | 430 | | ;

2002/03/25 | 1819 | Laputa | HIP 43834

path map, chords, observer list

asteroid measurement: at least 41 km

O-	Manuel Iglesias	23:55:00	00:15:00	L60	VIS	ES	W	03 57 59.1	N 38 57 54	630		;
O-	Emmanuel Brochard	23:59:00	00:06:00	M203	VIS	FR	W	00 38 58	N 45 53 26	30		
Geo Clarke 1880.  ;												
O-	Hazel McGee	23:59:00	00:10:00	M305	VIS	UK	W	00 30 28.0	N 51 15 57.5	57		;
O-	Philippe Henarejos	23:45:00	00:10:00	M205	VIS	FR	W	00 26 11	N 49 11 19	0		;
O-	Jean Lecacheux	23:50:06	00:12:48	M1050	CCD	FR	E	00 08 32.2	N 42 56 10.8	2880	WS	
0.205s cycle (0.040s exposure + 0.165s lapse time).  ;												
O-	Francois Colas	23:55:00	00:10:00	B50	VIS	FR	E	00 10 05	N 43 03 22	610	WS	;
O-	Pierre Laques	23:55:00	00:10:00	B80	VIS	FR	E	00 10 05	N 43 03 22	610		;
O+	Paul Pinel	00:00:00	00:05:00	M200	VIS	FR	E	00 34 17	N 46 48 37	106		
7.4	00:02:48.9	0.2	00:02:56.3	0.2	PHONE			;				
O-	Alex Roca	23:52:00	00:10:00	M200	VIS	ES	E	01 02 35	N 42 14 49	1001		;
O-	Carles Schnabel	23:50:00	00:11:00	M210	VIS	ES	E	01 52 25.7	N 41 29 41.5	180		;
O-	Xavier Jordà	23:45:00	00:15:00	M200	VIS	ES	E	02 00 05	N 41 40 20	910		;
O-	Alain Klotz	23:58:50	00:05:10	M200	CCD	FR	E	02 02 11.2	N 43 48 34.7	148		;
O-	Ricard Casas	23:55:00	00:05:00	L160	VIS	ES	E	02 05 29	N 41 33 04	225		
Visual on TV monitor. Cloudy but star visible.  ;												
O-	Quim Ribalta	23:50:00	00:10:00	M356	VIS	ES	E	02 06 12	N 41 32 53	195		;
O-	Patrick Degrelle	23:53:18	00:18:53	M153	VIS	FR	E	02 35 06.8	N 50 27 11.1	116	W	;
O-	Moulley Chabou	23:50:00	00:10:00	M65	VIS	DZ	E	02 47 00	N 36 40 00	120		;
O-	Eric Frappa	00:00:00	00:05:00	B100	VIS	FR	E	04 28 58.3	N 45 23 23.4	1044	WS	;
O-	Etienne Simian					FR	E	04 19 00	N 43 38 00			
Not sure to be on the target star.  ;												
O-	Bernard Bayle				WEB	FR	E	05 06 00	N 43 36 00			;
O-	Christophe Marlot	23:55:00	00:10:00	M150	VIS	FR	E	05 08 00	N 45 13 00			;
O-	Christophe Marlot	23:55:00	00:10:00	L80	VID	FR	E	05 08 00	N 45 13 00			;
O-	F.R. Van Loo	00:04:00	00:25:00	M250	VIS	BE	E	05 30 16	N 51 00 00	80		;
O-	W. Thuillot et al	23:43:00	00:20:00	M800	VID	FR	E	05 42 45	N 43 55 46	650		
Observation with J.E. Arlot.  ;												
O-	K.E. Wolters	23:55:00	00:20:00	M127	VIS	NL	E	05 59 11	N 51 59 21	14		;
O-	Patrick Chevalley				WEB	CH	E	06 09 00	N 46 13 00			;
O-	Monique De Kock	00:00:00	00:10:00	M200	VIS	NL	E	06 15 41	N 51 54 16	20		;

light curve (R. Behrend)

11.7	21:06:22.7	0.4	21:06:34.4	0.4	RAD												
0+	Florent Losse		21:04:04	21:10:44	M200	CCD	FR	W	00	12	11		N 44 33 32		20		
12.78	21:06:24.07		21:06:36.85		RAD												
Dubious data due to tracking problem.;																	
0?	Eric Barbotin		21:03:00	21:10:00	M225	VIS	FR	E	00	02	11.2		N 45 41 57.8		62		
3.1	21:06:01.3		21:06:04.4		PHONE	0.7	0.3	A									
Not sure of the event.;																	
0-	Audrey Cazenave		21:03:00	21:10:00	M318	VIS	FR	E	00	02	11.2		N 45 41 57.8		62		
0+	J. Caquel et al		21:00:00	21:12:00	M300	VIS	FR	E	00	03	31.8		N 43 08 40.4		488		
1.5	21:03:31.0		21:03:32.5		RAD												
Observation with G. Vaudescal.;																	
0-	Michel Boutet		20:50:00	21:13:00	M400	VIS	FR	E	01	13	40		N 43 16 28		310		
0-	Jacques Sanchez		20:50:00	21:13:00	M250	VIS	FR	E	01	13	40		N 43 16 28		310		
0-	Emmanuel Pelegrin		21:00:00	21:20:20	M410	VIS	FR	E	02	20	30		N 43 42 30		550		
0+	J.M. Lopez et al		21:05:50	21:06:30	M400	CCD	FR	E	03	30	13		N 44 02 22		1300		
8.7	21:06:17.1		21:06:25.8		RAD												
Observation with A.M. Jacquey.;																	
0-	Raymond Poncy		21:06:00	21:07:40	M254	CCD	FR	E	03	56	29		N 43 38 49		45		
0+	Eric Frappa		20:58:07	21:12:06	M203	VID	FR	E	04	26	42.5		N 45 18 19.8		1248	WS	
14.18	21:06:02.59	0.08	21:06:16.77	0.08	GPS++												
0+	Maylis Lavayssiere		21:03:46	21:08:15	M150	VIS	FR	E	04	26	43.1		N 45 18 19.7		1249	WS	
	21:06:03.1	0.5			GPS++	0.75			A								
R not timed.;																	
0-	Jean-Francois Coliac		21:02:00	21:12:00	M120	CCD	FR	E	05	27	21.2		N 43 18 41.1				
0+	Gerard Faure		21:02:10	21:08:15	M203	VIS	FR	E	05	35	58.9		N 44 59 30.1		1170		
13.30	21:06:01.70		21:06:15.00		RAD	0.6	0.4	A									
0-	Francois Colas		21:00:30	21:16:00	L180	VIS	FR	E	05	42	52.4		N 43 55 56.8		640	WS	
0-	A. Klotz/Y. Damerdji		21:06:05	21:06:31	M800	CCD	FR	E	05	42	52.4		N 43 55 56.8		640		
0-	Philippe Bernascolle		21:05:38	21:07:15	M280	VIS	FR	E	05	52	28		N 43 24 39		335		
0-	Matthieu Conjat		21:03:00	21:08:00	M200	VIS	FR	E	06	52	00		N 43 39 00		300		
0-	E. Frappa/A. Klotz		21:05:28	21:08:51	M250	CCD	FR	E	06	55	25.1		N 43 45 07.3		1270	WS	
Technical interruption 21:06:57.7/07:20.5.;																	
0-	Pierre Dubreuil		21:04:00	21:08:30	M200	CCD	FR	E	07	14	41		N 43 46 33		500		
0+	Simone Bolzoni		21:03:00	21:09:00	M200	VIS	IT	E	08	51	07		N 45 36 18		230		
14.5	21:05:46.0	0.5	21:06:00.5	1.5	RAD	0.5	0.5	A									
0+	Andrea Manna		20:52:00	21:08:00	M300	VIS	CH	E	08	56	00		N 46 11 00		230		
13.6	21:05:46		21:05:59.6		PHONE												
0+	Stefano Sposetti		21:01:54	21:11:04	M400	CCD	CH	E	09	01	30		N 46 13 54		260		
14.0	21:05:41.5	1	21:05:55.5	1	NTP												
0-	Roberto Di Luca		20:58:00	21:08:00	M250	VID	IT	E	11	07	44.3		N 44 24 34.0		230		

2006/11/12 | 154 | Bertha | TYC 2361-00836-1

potential stations W, E (O. Kloes)

path map, chords raw data, chords best fit, observer list

asteroid measurement: 183.6 km +/- 2.0 x 152.8 km +/- 4.3, PA -82.2 deg +/- 1.6

O-	Rui Goncalves	21:00:00	21:04:00	M250	VID	PT	W	08 23 06.3	N 39 31 18.2	90	W	;
O-	Jose Ripero	20:48:00	21:05:00	M343	VIS	ES	W	03 34 50	N 40 38 34	647		;
O+	Michel Boutet	20:56:00	21:05:00	M250	VIS	FR	E	01 17 20.2	N 43 30 06.7	178	W	
10.61	21:01:04.10	0.10	21:01:14.71	0.06	PHONE			0.56	0.34	A	;	
O+	Raymond Poncy	21:00:45	21:02:15	M254	CCD	FR	E	03 56 29	N 43 38 49	45		
10.8	21:00:51.8	0.5	21:01:02.6	0.5	RAD							;
O+	Yassine Damerdji	21:00:43	21:01:09	M800	CCD	FR	E	05 42 52.4	N 43 55 56.8	640		
10.86	21:00:45.62	0.2	21:00:56.48	0.2	RAD							;
O+	E. Frappa/A. Klotz	21:00:11	21:03:18	M250	CCD	FR	E	06 55 25.1	N 43 45 07.3	1270	WS	
7.62	21:00:43.84	0.50	21:00:51.46	0.50	NTP++							
Technical interruption 21:01:40.9/47.6. Remote observation using TAROT North robotic telescope.  ;												
O-	Andrea Manna	20:57:55	21:05:00	M300	VIS	CH	E	08 56 00	N 46 11 00	230		;
O+	C. Frisoni/G. Busi	20:56:00	21:04:00	M400	VID	IT	E	11 09 13.1	N 44 21 28.5	651	W	
7.20	21:00:26.20	0.04	21:00:33.40	0.04	RAD++							;
O+	D. Dall'Occo et al	20:55:00	21:02:00	M250	VIS	IT	E	11 18 11	N 44 34 04	27	W	
9	21:00:25	0.50	21:00:34	0.50	GPS							
Observation with A. Santagada.  ;												
O+	L. Barbieri et al	20:55:00	21:03:00	M300	VID	IT	E	11 31 11.4	N 44 31 36.6	25	W	
9.00	21:00:23.24	0.32	21:00:32.24	0.32	RAD++							
Observation with E. Pierantoni.  ;												
O-	I. Mhitarov et al	20:58:00	21:00:00	M254	WEB	RU	E	39 11 09.2	N 45 05 09.1	36	WS	
Observation with V. Onoprienko.  ;												

<http://www.euraster.net/results/2006/index.html>

O-	Jan-Maarten Winkel	21:45:00	21:48:00	M310	VID	NL	E	06	15	36.9	N	51	54	13.6	66	W	;
O-	Guido Wortmann	21:44:31	21:48:34	M500	VID	DE	E	13	28	30.8	N	52	29	12.5	41	WS	;
O-	Wolfgang Rothe	21:45:01	21:49:15	M200	VID	DE	E	13	28	57.6	N	52	28	10.0	37	WS	;
O-	Karel Halir	21:44:30	21:47:00	M508	VID	CZ	E	13	36	09.3	N	49	45	06.3	402	WS	;
O-	Tomas Janik	21:45:22	21:46:46	M203	VIS	CZ	E	14	02	26.0	N	50	40	59.8	379	W	;
O-	Peter Lindner	21:45:37	21:49:30	M305	VID	DE	E	14	16	45.1	N	51	26	57.3	118	W	;
O-	Vaclav Priban	21:41:08	21:50:50	M300	VID	CZ	E	14	28	35.8	N	50	08	27.0	325	WS	;
O-	Gerhard Dangl	21:43:48	21:46:12	M254	VID	AT	E	15	14	08.2	N	48	47	13.4	599	WW	;
O-	Marcin Filipek	21:42:00	21:48:00	M400	VIS	PL	E	19	44	55.6	N	50	12	43.5	430	WS	;

2012/10/11 | 775 | Lumiere | TYC 2421-00831-1

O-	Stefano Sposetti	04:04:18	04:10:48	M400	VID	CH	E	09	01	26.5	N	46	13	53.2	260	W	;
----	------------------	----------	----------	------	-----	----	---	----	----	------	---	----	----	------	-----	---	---

2012/10/10 | 1867 | Deiphobus | FK6 3851

O+	D. Baba Aissa et al			M125	VIS	DZ	E	03	01	56	N	36	47	49	340	WS	
	6.3	00:25:29.6	00:25:35.9					0.4	0.4	A							

Time source from website. Standard PE applied. Observation with F. Demri.;

O-	Charaf Chabou			M76	VIS	DZ	E	05	24	39	N	36	12	13	1125	WS	
	1																

Rough estimation, no absolute timing.;

O-	E. Frappa/A. Klotz	00:24:34	00:27:49	M250	CCD	FR	E	06	55	25.1	N	43	45	07.3	1270	WS	

Technical interruption 00:26:03.7/18.7.;

2012/10/09 | 58721 | 1998 DX14 | TYC 0008-00564-1

O-	E. Frappa/A. Klotz	22:52:28	22:55:43	M250	CCD	FR	E	06	55	25.1	N	43	45	07.3	1270	WS	

Technical interruption 22:53:58.0/54:13.2.;

2012/10/09 | 18 | Melpomene | 2UCAC 24683410

O-	E. Frappa/A. Klotz	20:46:40	20:49:55	M250	CCD	FR	E	06	55	25.1	N	43	45	07.3	1270	WS	

Technical interruption 20:48:10.0/25.2.;

<http://www.euraster.net/results/2012/index.html>

2012/10/08 | 792 | Metcalfia | 2UCAC 35211969

asteroid measurement: at least 44 km

2016/09/04 | 218 | Bianca | TYC 0683-00937-1

O- | Alberto Ossola | 01:59:00 | 02:01:40 | M230 | VID | CH | E 08 55 10.5 | N 45 59 50.6 | 350 | WS |;  
O- | Andrea Manna | 01:59:36 | 02:03:13 | M200 | VID | CH | E 08 55 13.8 | N 46 10 35.5 | 240 | WS |;

2016/09/04 | 693 | Zerbinetta | TYC 2418-01278-1

P+ | prediction | 01:26:52 | 01:26:52 | | | | E 03 00 00 | N 36 07 23 | 0 | WS |;  
O+ | Djounai Baba Aissa | | | M279 | VIS | DZ | E 03 01 56.8 | N 36 47 52.0 | 329 | WS |  
1.70 | 01:26:52.56 | | 01:26:54.26 | | NTP | 0.44 | 0.44 | A |;  
O- | Peter Delincak | 01:25:00 | 01:30:00 | M100 | CCD | SK | E 18 42 09.5 | N 49 24 15.2 | 680 | WS |;

2016/09/04 | 438 | Zeuxo | 4UC434-001147

O- | Alex Pratt | 00:06:19 | 00:11:05 | M279 | VID | UK | W 01 36 28.0 | N 53 50 15.4 | 114 | WS |;

2016/09/03 | 182 | Elsa | 2UCAC 38968044

O- | Peter Delincak | 02:32:00 | 02:36:00 | M400 | CCD | SK | E 18 42 09.5 | N 49 24 15.2 | 680 | WS |;

2016/09/03 | 212 | Medea | 1UT570-152238

O- | Peter Delincak | 02:16:00 | 02:21:00 | M400 | CCD | SK | E 18 42 09.5 | N 49 24 15.2 | 680 | WS |;

<http://www.euraster.net/results/2016/index.html>

2016/11/01 | 2753 | Duncan | 4UC584-042033

O- | Alex Pratt | 22:57:58 | 22:59:08 | M279 | VID | UK | W 01 36 28.0 | N 53 50 15.4 | 114 | WS |;

2016/11/01 | 50285 | 2000 CB25 | 4UC620-017736

O- | C. Perello/A. Selva | 22:16:42 | 22:22:03 | M500 | VID | ES | E 02 05 24.6 | N 41 33 00.2 | 224 | WS |;

2016/11/01 | 193 | Ambrosia | TVC 2907-00867-1

O- | D. Baba Aissa et al | 19:30:00 | 19:36:00 | M279 | VIS | DZ | E 03 01 56.1 | N 36 47 52.2 | 329 | WS |  
Observation with Z. Grigahcene. |;

2016/11/01 | 202421 | 2005 UQ513 | 4UC610-002000

Transneptunian object

O- | Alex Pratt | 18:50:24 | 19:02:22 | M279 | VID | UK | W 01 36 28.0 | N 53 50 15.4 | 114 | WS |  
1.28s integration. Difficult observation. |;

O- | R. Iglesias et al | 18:17:01 | 19:10:09 | M400 | CCD | ES | W 01 00 59 | N 40 02 29 | 1945 | WS |  
5s integration. No report sent. Observation with S. Rodriguez. |;

O- | F. Colas/E. Meza | 18:35:00 | 19:05:00 | M1050 | CCD | FR | E 00 08 32.3 | N 42 56 10.9 | 2870 | WS |  
0.5s integration. No report sent. |;

O- | Fabrizio Ciabattari | 18:52:09 | 18:56:55 | M500 | CCD | IT | E 10 30 53.7 | N 43 59 43.0 | 750 | WS |  
3.8s cycle (3s exposure + 0.8s lapse time). |;

<http://www.euraster.net/results/2016/index.html>

# Positive observations of a stellar occultation by an asteroid in Algeria since 2012

First positive observation of a stellar occultation by an asteroid in CRAAG observed by **BABA AISSA Djounaï**.

**CHABOU MOULAY Charaf**, professor of geology and planetology at Setif University, also observed it in Setif.

It was the occultation of the star **FK6 3851 (HIP 141201)** from Pegasus constellation by the asteroid **1867 Deiphobus** on **October 10<sup>th</sup>, 2012**.

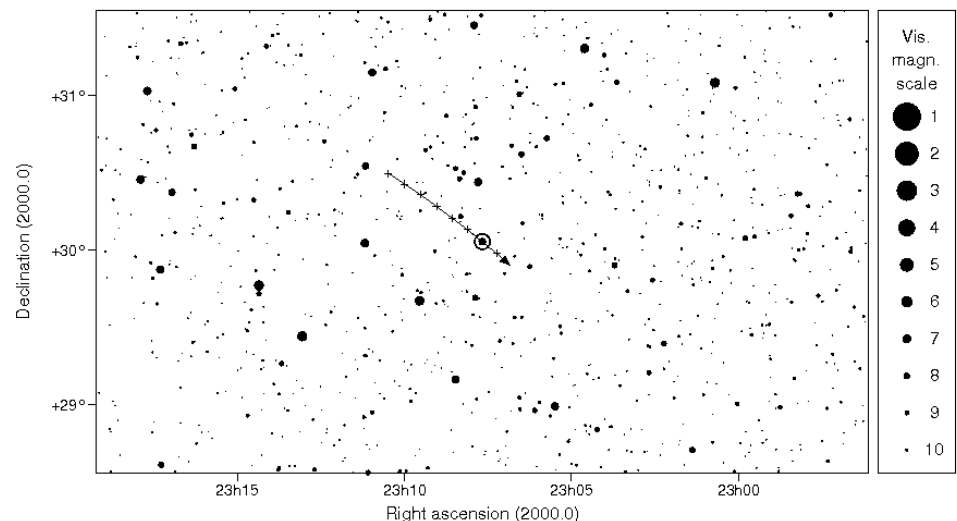
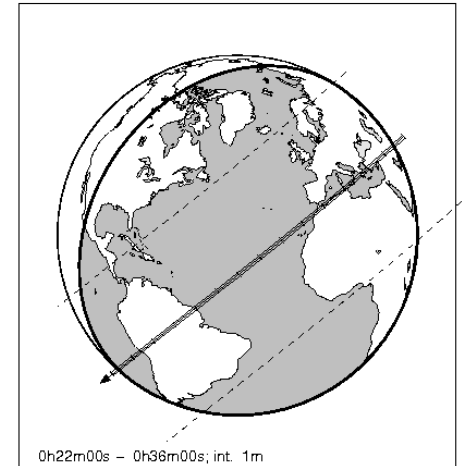
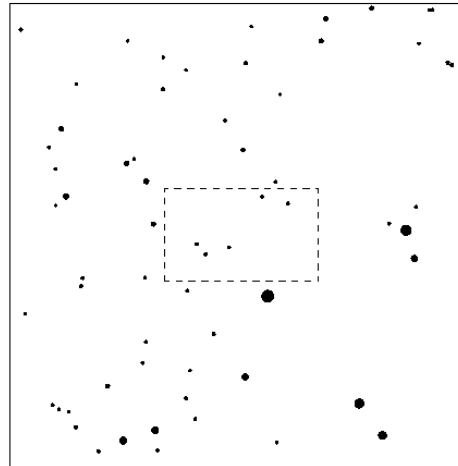
We used visual method to observe it by MEADE Maksutov 127 mm.

ESOP XXXVI, Freiberg (Germany),  
September 2017

## 1867 Deiphobus & FK6 3851

2012 oct 10 0<sup>h</sup>29.1<sup>m</sup> U.T.

<b>Planet:</b>	a = 5.13, e = 0.04	<b>Star:</b>	Source cat. FK6
V. mag. = 15.47	Diam. = 131.0 km = 0.04"	$\alpha = 23^{\text{h}}07^{\text{m}}40.163^{\text{s}}$	$\delta = +30^{\circ}03'15.02''$
$\mu = 18.42''/\text{h}$	$\pi = 2.07''$ Ref. = MPO158360	V. mag. = 7.58	Ph. mag. =
$\Delta m = 7.9$	Max. dur. = 8.3s	Sun : 144°	Moon : 122°, 33%

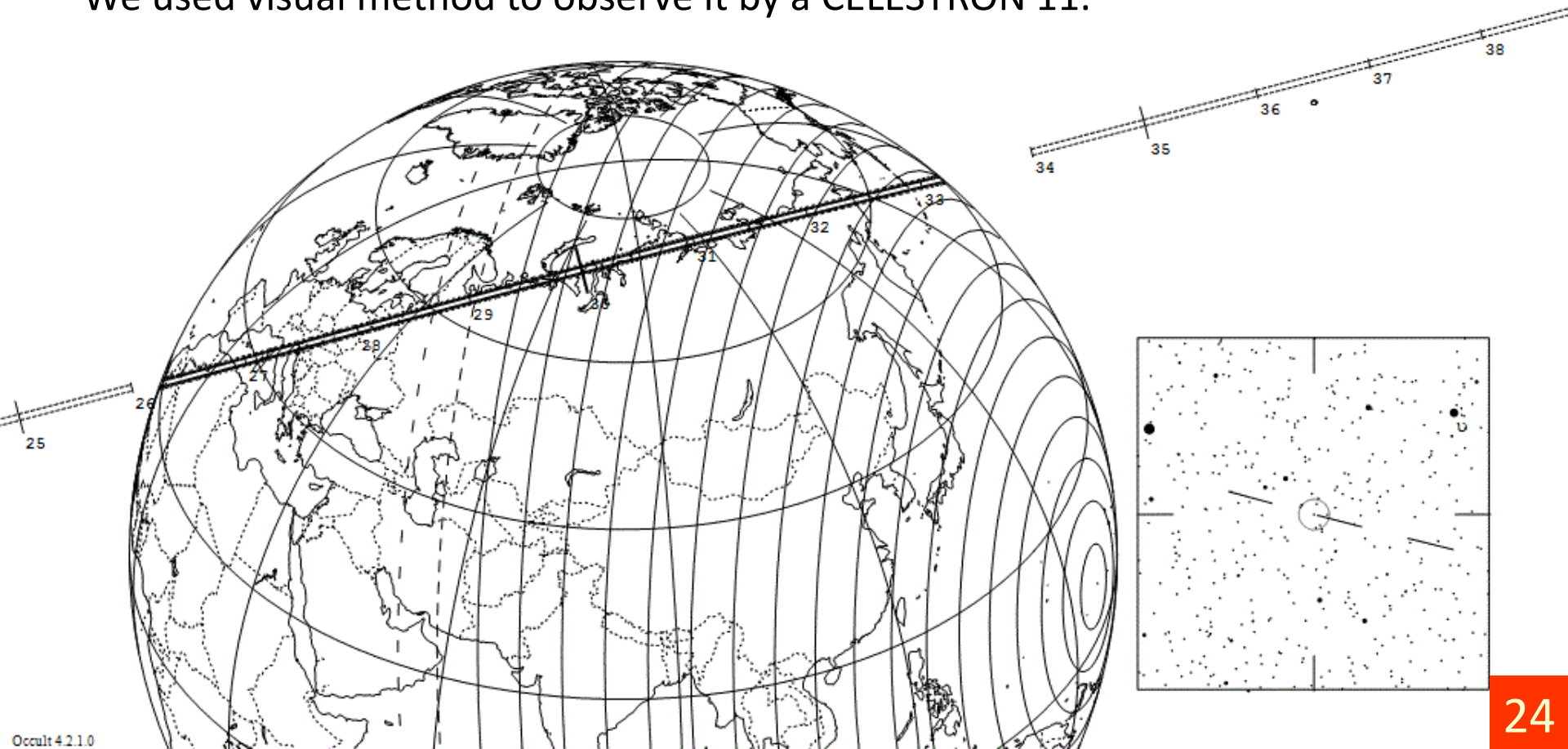


693 Zerbinetta occults TYC 2418-01278-1 on 2016 Sep 4 from 1h 26m to 1h 33m UT		
Star:	Max Duration = 3.2 secs	Asteroid:
Mv = 11.0	Mag Drop = 4.4	Mag = 15.4
RA = 5 55 1.7774 (J2000)	Sun : Dist = 73 deg	Dia = 80km, 0.035"
Dec = 36 44 0.386	Moon: Dist = 102 deg	Parallax = 2.786"
[of Date: 5 56 9, 36 43 54]	: illum = 7 %	Hourly dRA = 3.167s
Prediction of 2016 Aug 25.0	E 0.016"x 0.012" in PA 89	dDec = 9.96"

The second positive observation of a stellar occultation by an asteroid was also in Algiers Observatory (CRAAG).

**It was the occultation of the star TYC 2418-01278-1 from Auriga constellation by the asteroid 693 Zerbinetta on September 04<sup>th</sup>, 2016.**

We used visual method to observe it by a CELESTRON 11.



Since the first positive experience, I began to list all asteroid occultation passing by the Algerian territory from 2012 until now.

I use :

- The website of **Drek C. Breit** to obtain informations:  
<http://www.poyntsource.com/New/Global.htm>
- The website of **Steve Preston** :  
<http://www.asteroidoccultation.com/>
- The software online **Occult Watcher**.
- The database of **SIMBAD** and **ALADIN** for the recognition and identification of the occulted stars.
- Several software to a local orientation as C2A, The Sky Version 6, etc.
- **Tangra** and **Limovie** to plot the light curves.

# Results obtained by the campaign observations of July and August 2017

Now, the instruments that I have at my disposal to observe occultation are :

1 – Instruments that I can be moved throughout Algiers

- Telescope Celestron 8 with CGEM mount.
- Telescope Celestron 11 with CGEM mount.

2 – Fixed Instruments at Algiers Observatory

- Lunette guide apochromatique 200 mm F/D 9
- Richtey-Chretien Telescope 810 mm F=6400 mm from the italian society Dub Optika.





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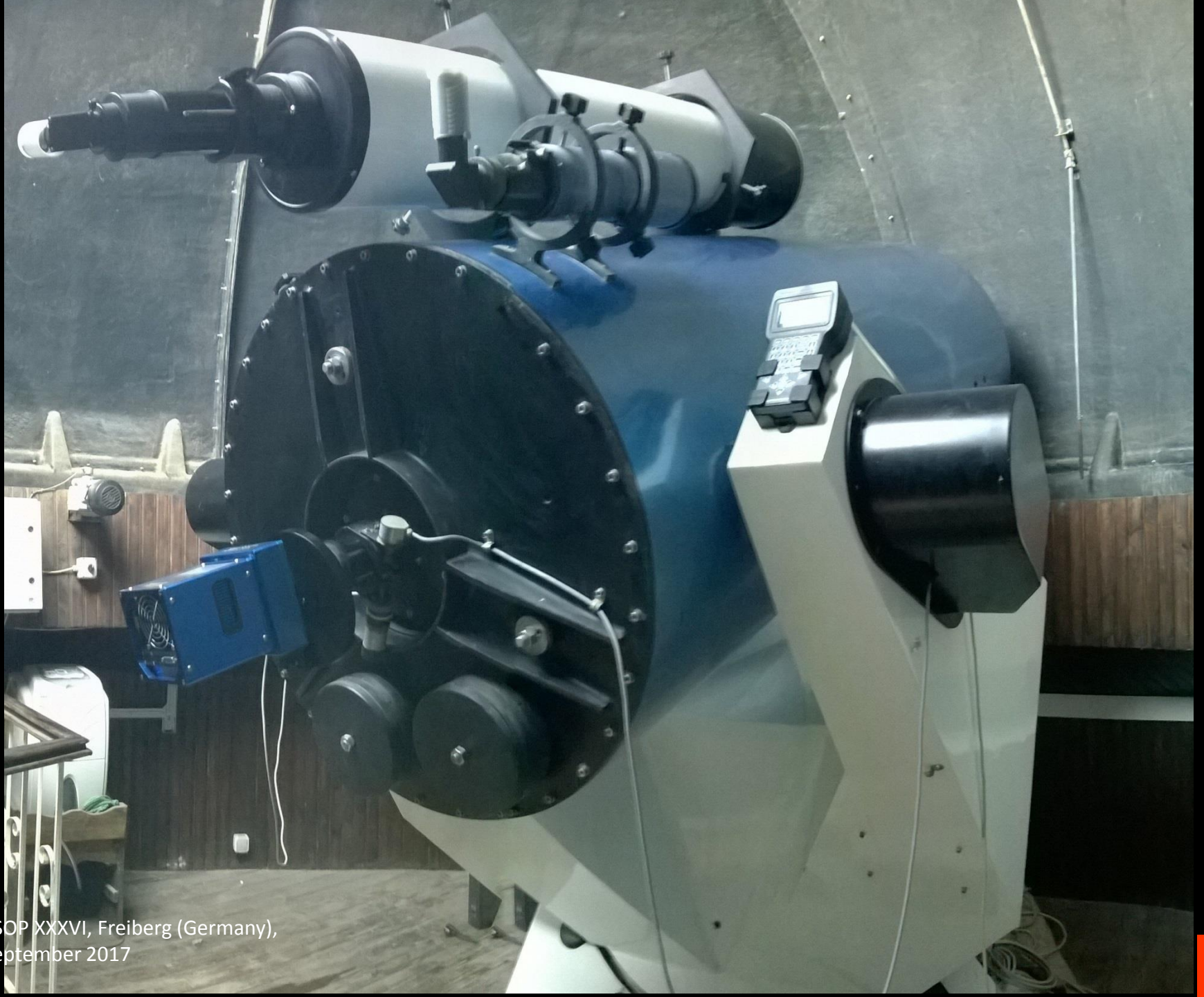
The 5 meters dome of the  
Richtey-Chretien Telescope in  
Algiers Observatory (CRAAG)

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September 2017





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September 2017



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September 2017





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September 2017

we acquired recently a kit for observing occultation from Shelyak instruments



The kit contains, the video camera Watec 910HX/RC (CCIR/PAL), a video time Inserter IOTA VTI version 2 and a Grabber.

34513 2000 SQ178 occults TYC 7394-01360-1 on 2017 Jul 16 from 23h 22m to 23h 29m UT

Star:

Mv = 10.9 Mp = 10.9 Mr = 10.9

RA = 18 34 26.3618 (J2000)

Dec = -31 20 42.149

[of Date: 18 35 35, -31 19 41]

Prediction of 2017 Jun 30.0

Max Duration = 0.7 secs

Mag Drop = 7.6 (7.2r)

Sun : Dist = 161 deg

Moon: Dist = 108 deg

: illum = 48 %

E 0.060"x 0.060" in PA 90

Asteroid:

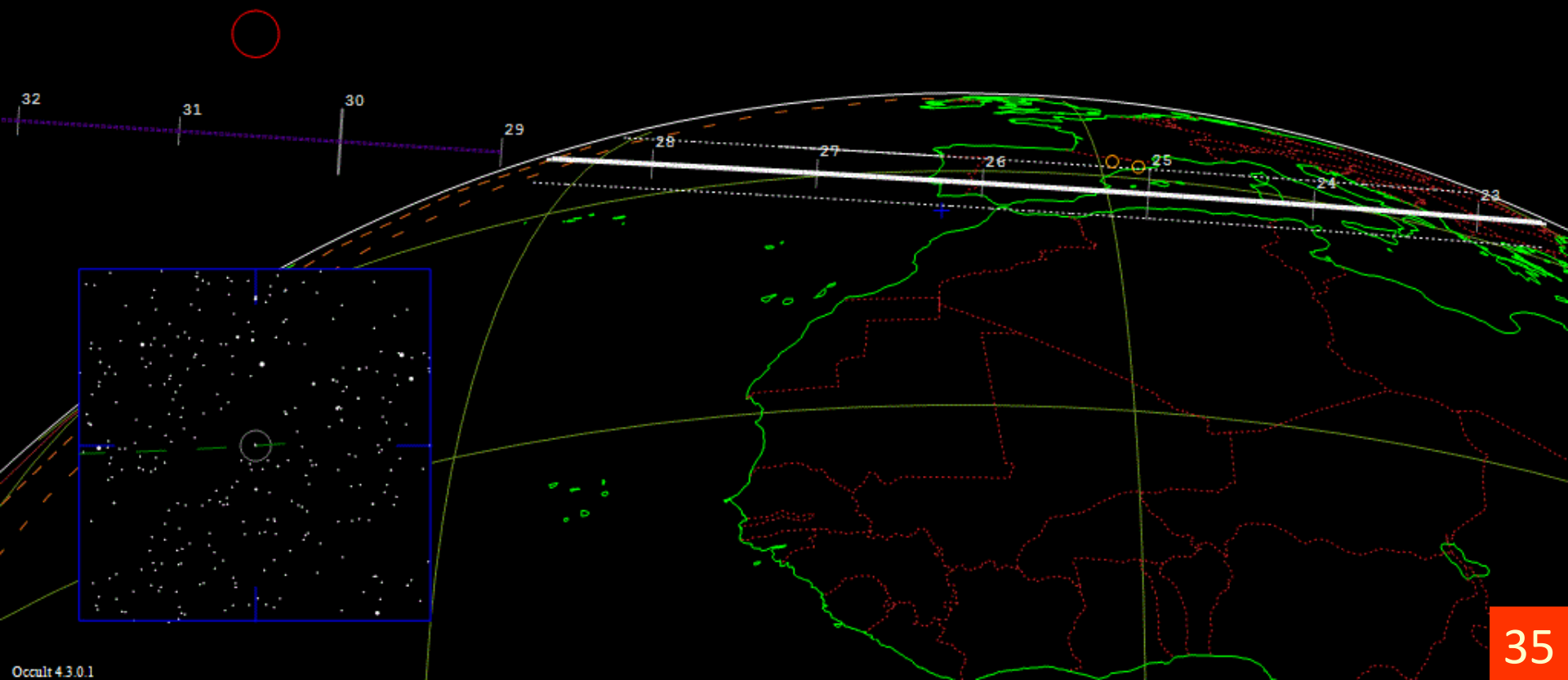
Mag = 18.5

Dia = 9km, 0.005"

Parallax = 3.640"

Hourly dRA = -1.944s

dDec = 1.62"

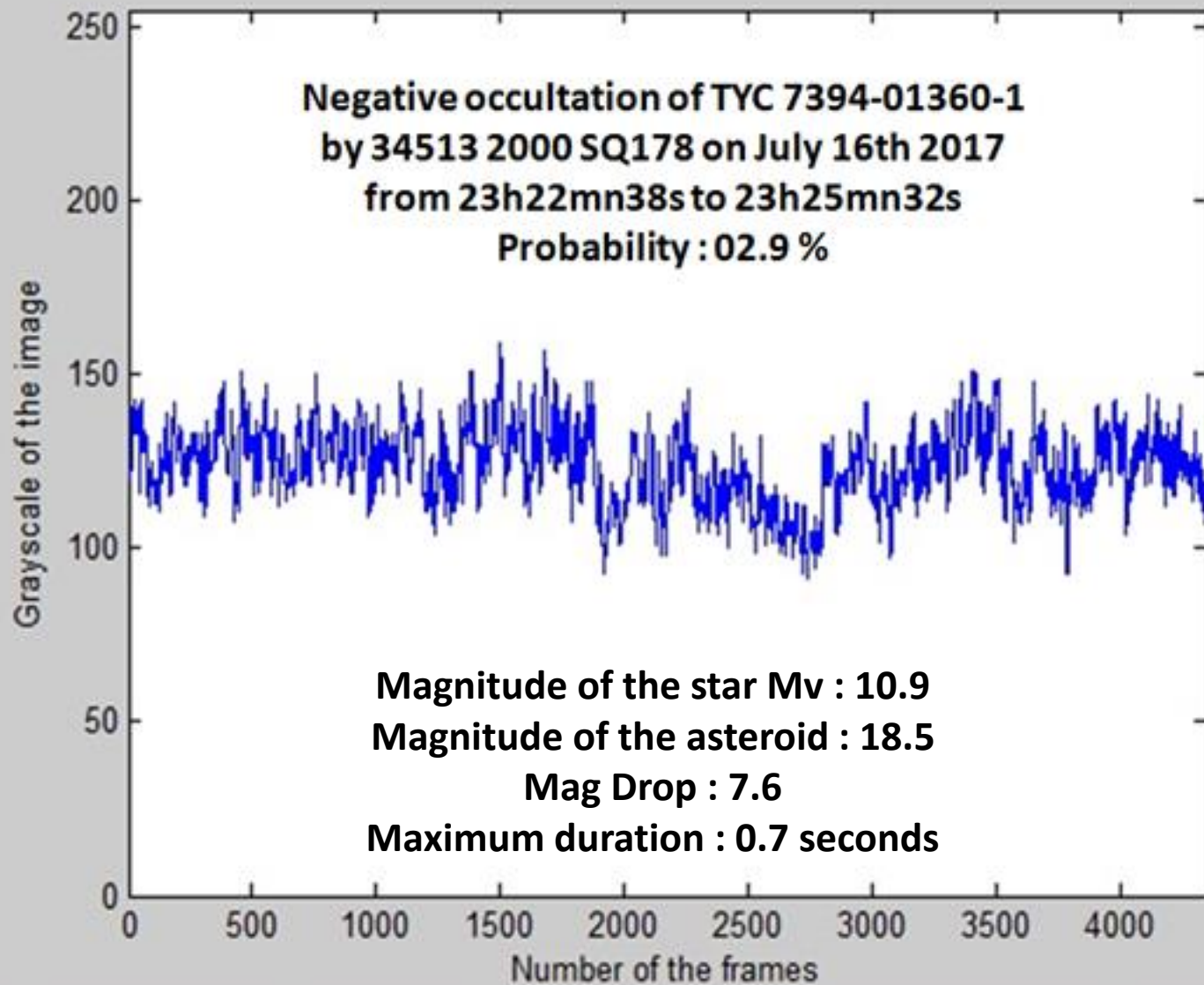


Satellites: 9 HDOP: 0.9  
UTC: 23:00:22 2017-07-16  
Latitude: 3647.8726 N  
Longitude: 00301.9351 E  
Altitude: 350.8 M MSL  
WGS84 separation: 47.0 M

CPU clock 999920 Hz  
Adj clock 1000000 Hz  
vSync 19996 CPU us  
External PAL Fullscreen  
Almanac 23h 2017-07-16



P8 23:24:04 7058 6858 371584



47074 1998 XV95 occults TYC 5719-00069-1 on 2017 Jul 29 from 22h 47m to 23h 0m UT

Star:

Mv = 11.1 Mp = 11.1 Mr = 11.1

RA = 19 6 27.4755 (J2000)

Dec = -13 38 30.693

[of Date: 19 7 28, -13 36 40]

Prediction of 2017 Jul 29.0

Max Duration = 0.9 secs

Mag Drop = 7.4 (7.0r)

Sun : Dist = 158 deg

Moon: Dist = 77 deg

: illum = 43 %

E 0.050"x 0.050" in PA 90

Asteroid:

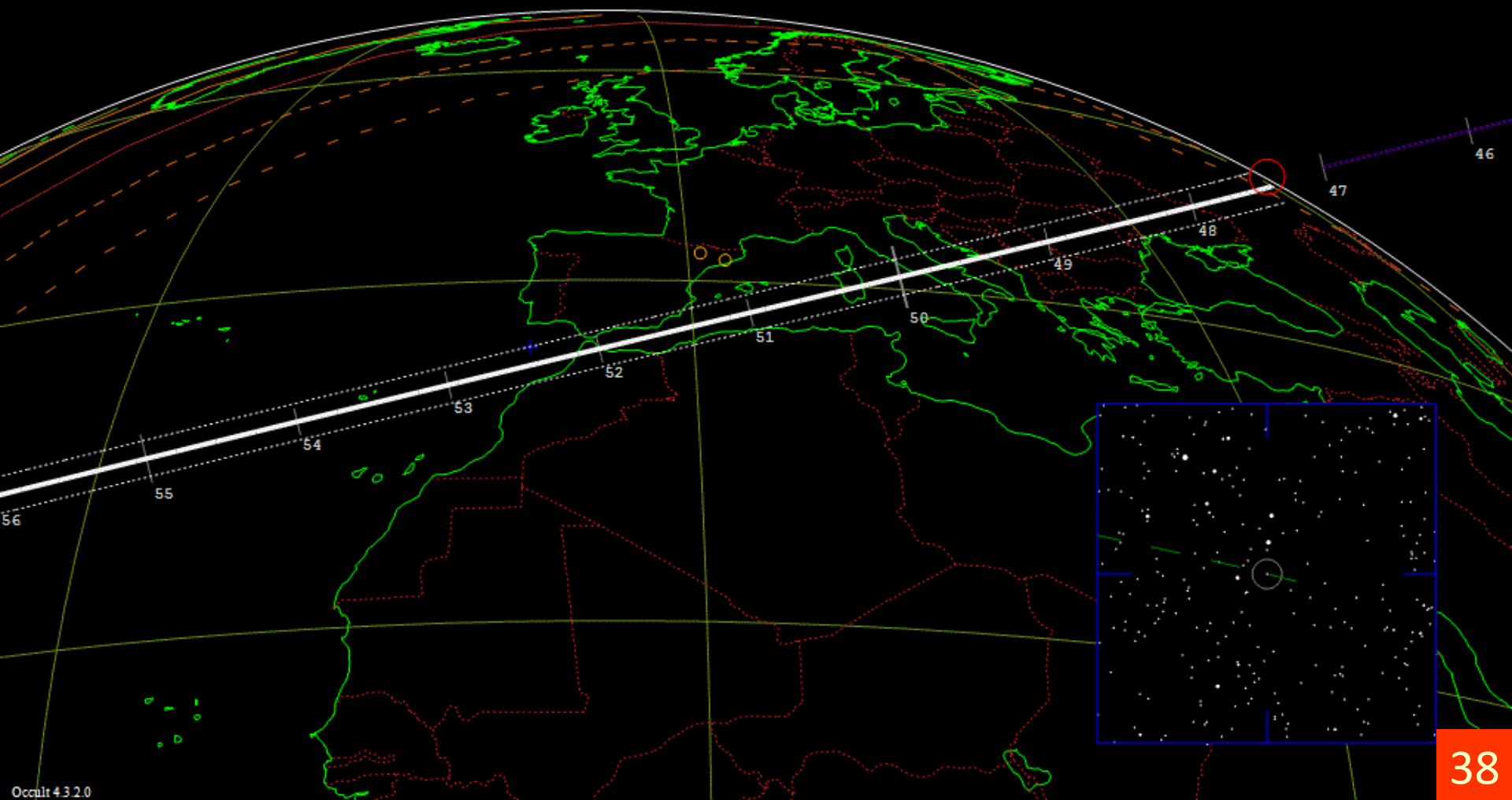
Mag =18.5

Dia = 10km, 0.006"

Parallax = 3.879"

Hourly dRA =-1.715s

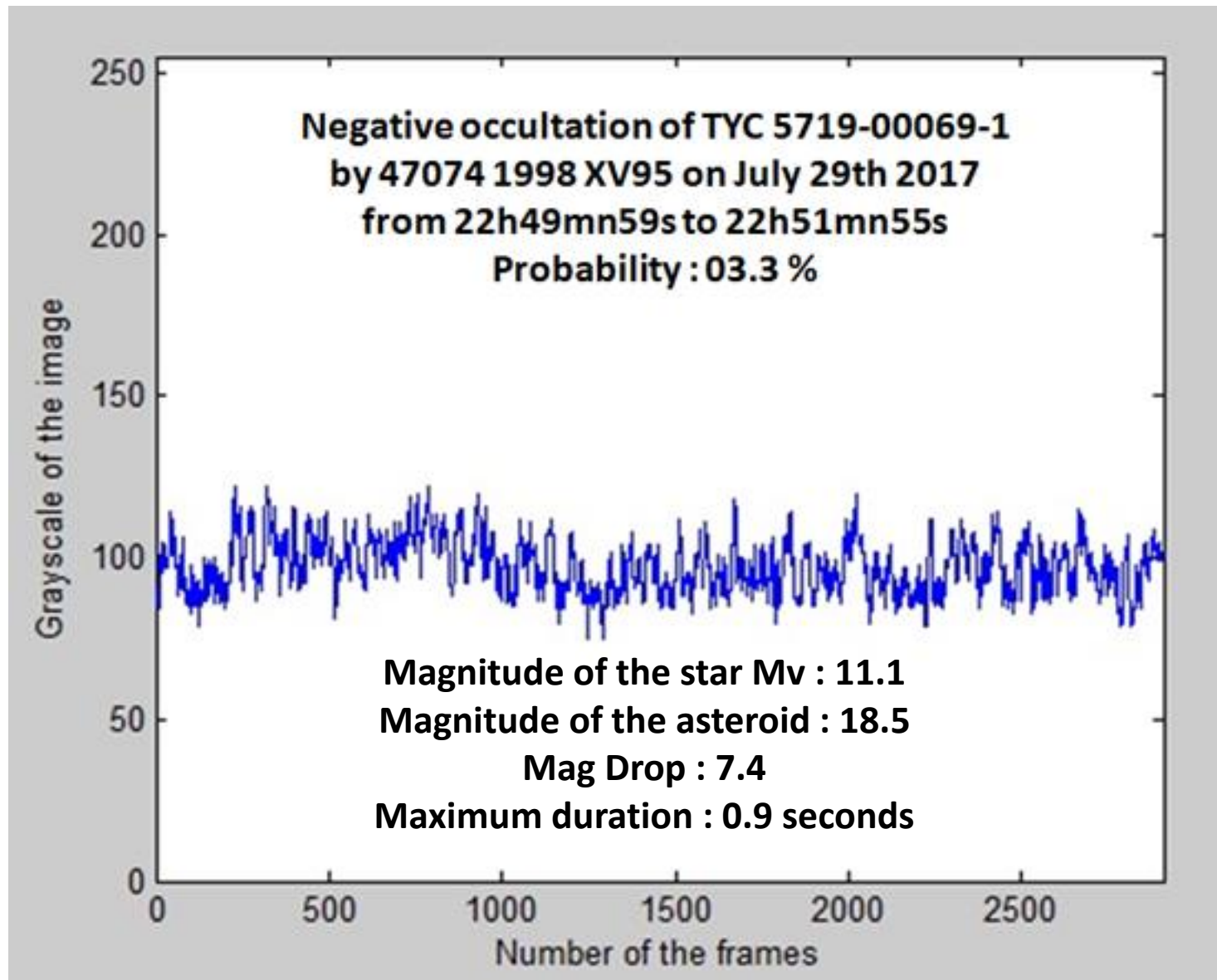
dDec = -6.22"



Satellites: 8 ADOP: 1.1  
UTC: 22:05:44 2017-07-29  
Latitude: 3647.8737 N  
Longitude: 00301.9398 E  
Altitude: 340.9 M MSL  
WGS84 separation: 47.0 M

CPU clock 999916 Hz  
Adj clock 999996 Hz  
vSync 20000 CPU us  
External PAL Fullscreen  
Almanac 22h 2017-07-29

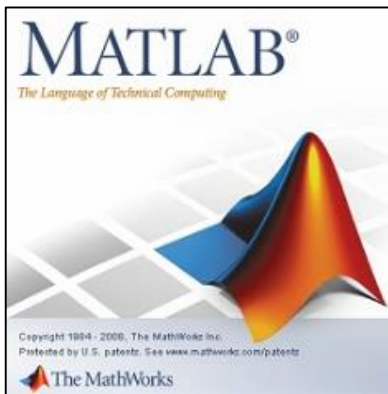




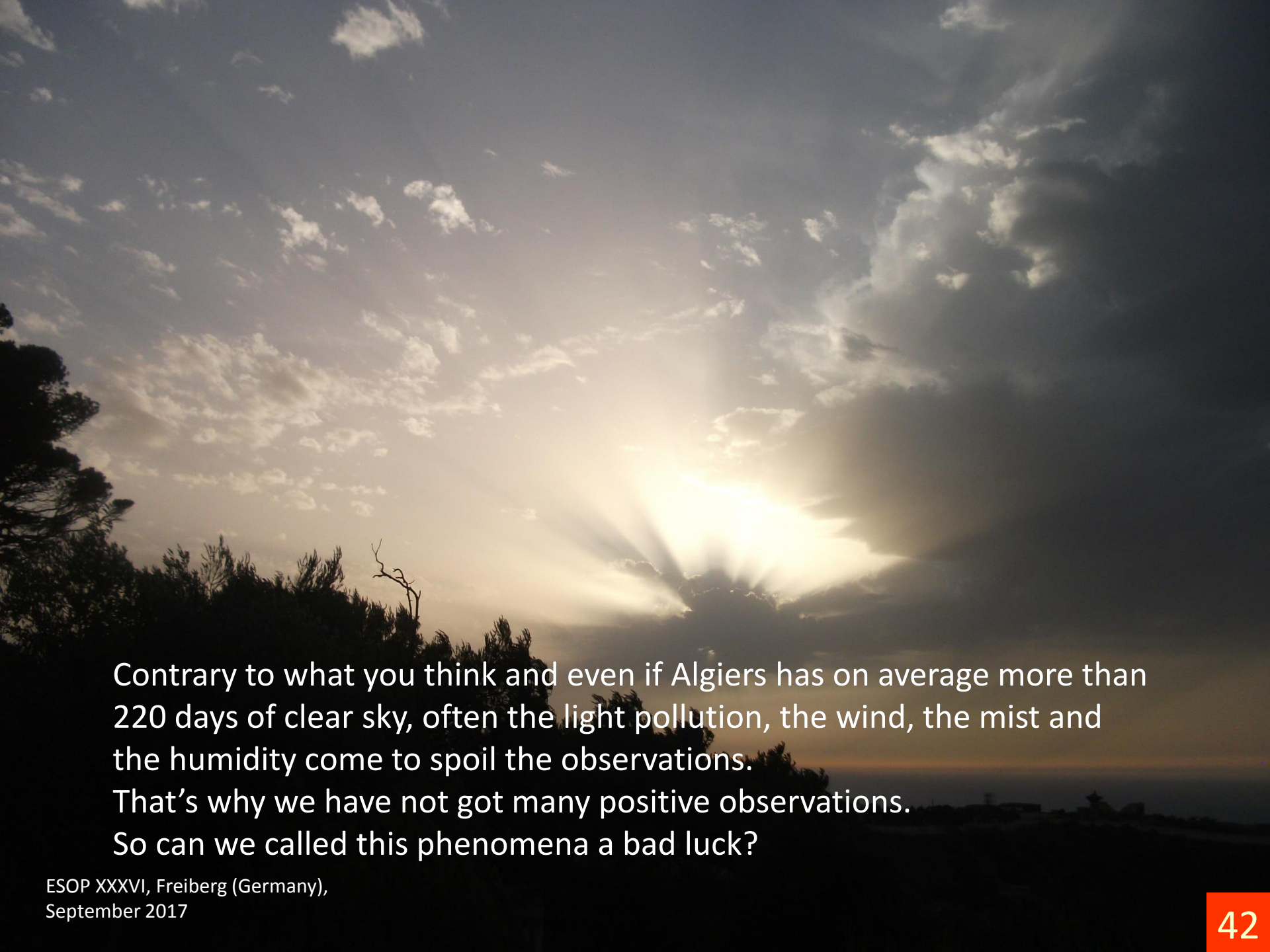


I took an AVI format video of more than 2 minutes from the CCD video camera WATEC 910 HX/RC (CCIR/PAL).

I used Planetary Imaging PreProcessor (PIPP) software to transform the AVI video to FITS images.



After processing, I had more than 4000 frames. I used Matlab language to process and plot the curve of the star light.



Contrary to what you think and even if Algiers has on average more than 220 days of clear sky, often the light pollution, the wind, the mist and the humidity come to spoil the observations.  
That's why we have not got many positive observations.  
So can we called this phenomena a bad luck?

# First Algerian of Asteroidal Occultations Network December 2016



وزارة الشباب والرياضة  
Ministère de la Jeunesse et des Sports  
Ministry of Youth and Sports



الجمعية الجزائرية للشباب هواة علم الفلك  
Association Algérienne des Jeunes Astronomes Amateurs  
Algerian Association of Youth Amateur Astronomers

بالتعاون مع  
en collaboration avec  
in collaboration with

مركز البحث في علم الفلك و الفيزياء الفلكية و الجيوفيزياء  
Centre de Recherche en Astronomie, Astrophysique et Géophysique  
Center for Research in Astronomy, Astrophysics and Geophysics

التريص الوطني الأول في رصد الإحتجابات الكويكبية  
First national training course in asteroidal occultations  
Premier stage national sur les occultations astéroïdes



10-8 ديسمبر 2016 - مركز تجمع وتحضير المواهب والنخب الرياضية بالسويدانية ، الجزائر  
8-10 Decembre 2016, CRPTES - Souidania, Alger  
8-10 December 2016, CRPTES - Souidania, Algiers

متعاملنا : وزارة الشباب والرياضة  
Notre Partenaire : le Ministère de la Jeunesse et des Sports





ESOP XXXVI, Freiberg (Germany),  
September 2017





ESOP XXXVI, Freiberg (Germany),  
September 2017

# 861 Aida occults HIP 36411 on 2016 Dec 15 from 23h 58m to 24h 15m UT

Star:

Mv = 6.7 Mp = 8.0 Mr = 6.0

RA = 7 29 30.7615 (J2000)

Dec = 19 37 59.392

[of Date: 7 30 31, 19 35 39]

Prediction of 2016 Nov 1.0

Max Duration = 5.5 secs

Mag Drop = 8.2 (8.5r)

Sun : Dist = 153 deg

Moon: Dist = 2 deg

: illum = 94 %

E 0.024"x 0.013" in PA 89

Asteroid:

Mag =14.9

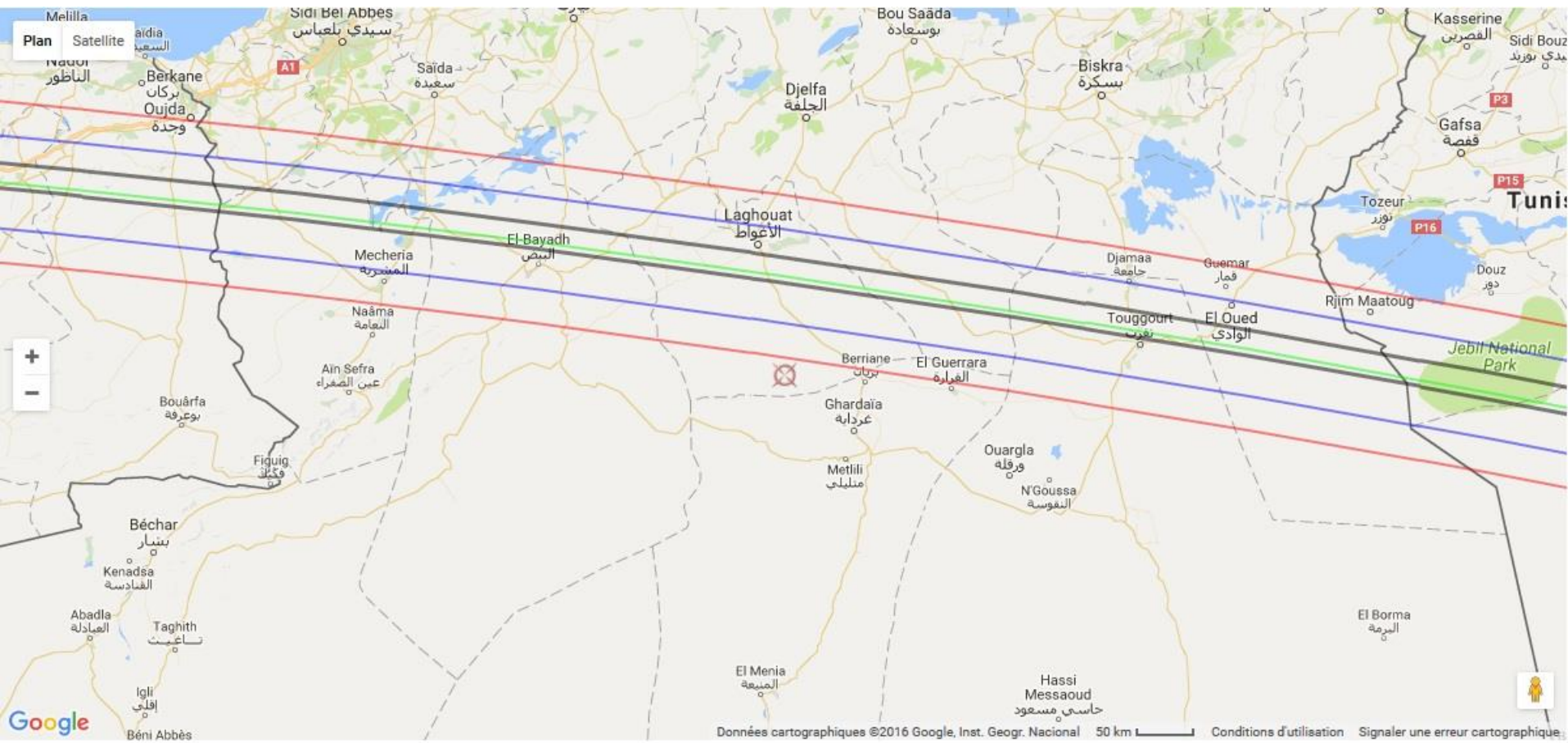
Dia = 67km, 0.037"

Parallax = 3.495"

Hourly dRA =-1.637s

dDec = 6.89"





# 444 Gyptis occults TYC 0033-00648-1 on 2016 Dec 17 from 17h 17m to 18h 5m UT

Star:

Mv = 10.0 Mp = 10.6 Mr = 9.7

RA = 1 54 8.8279 (J2000)

Dec = 3 38 9.968

[of Date: 1 55 2, 3 43 3]

Prediction of 2016 Sep 19.0

Max Duration = 55.5 secs

Mag Drop = 2.2 (2.1r)

Sun : Dist = 121 deg

Moon: Dist = 108 deg

: illum = 82 %

E 0.021"x 0.010" in PA 81

Asteroid:

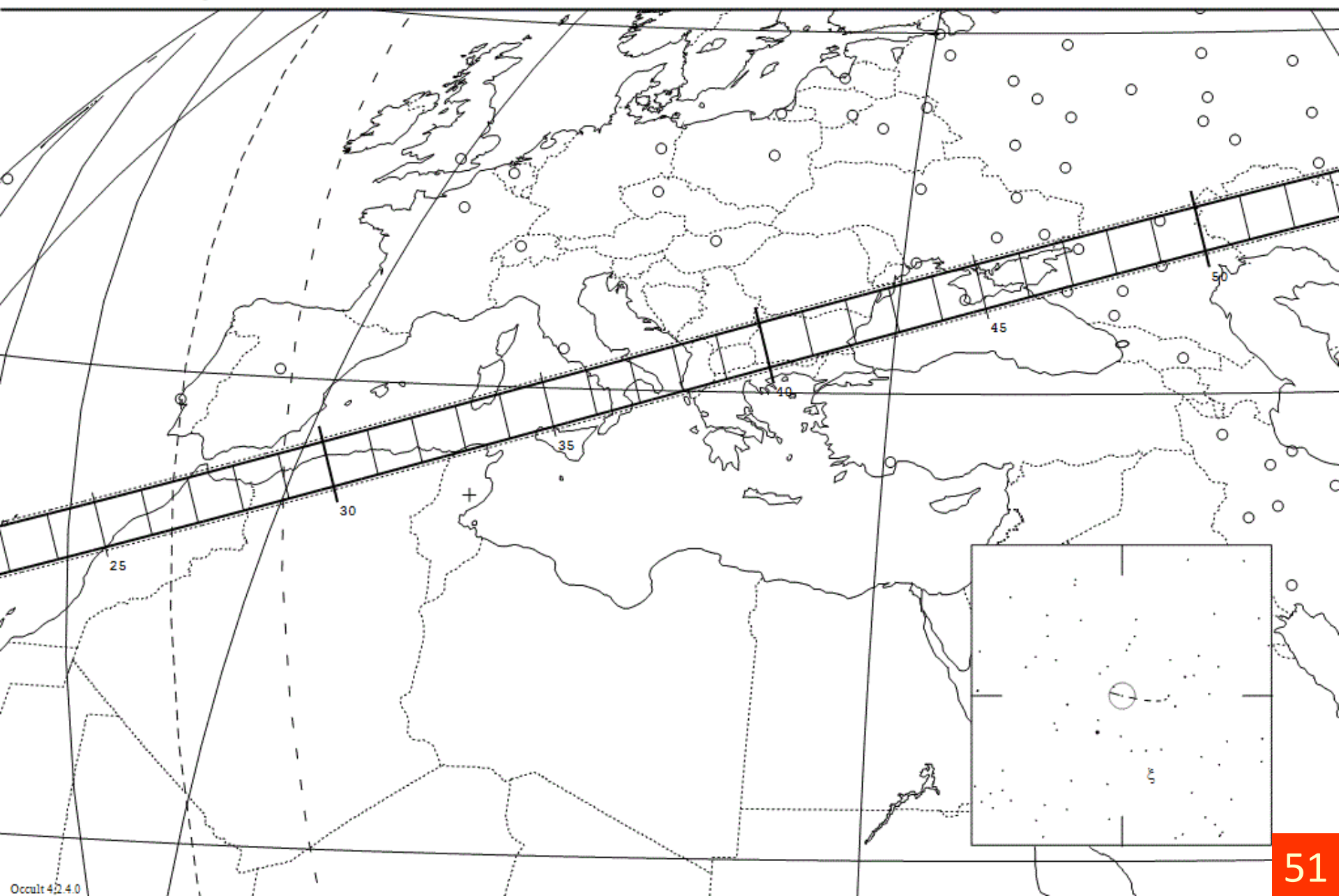
Mag = 12.0

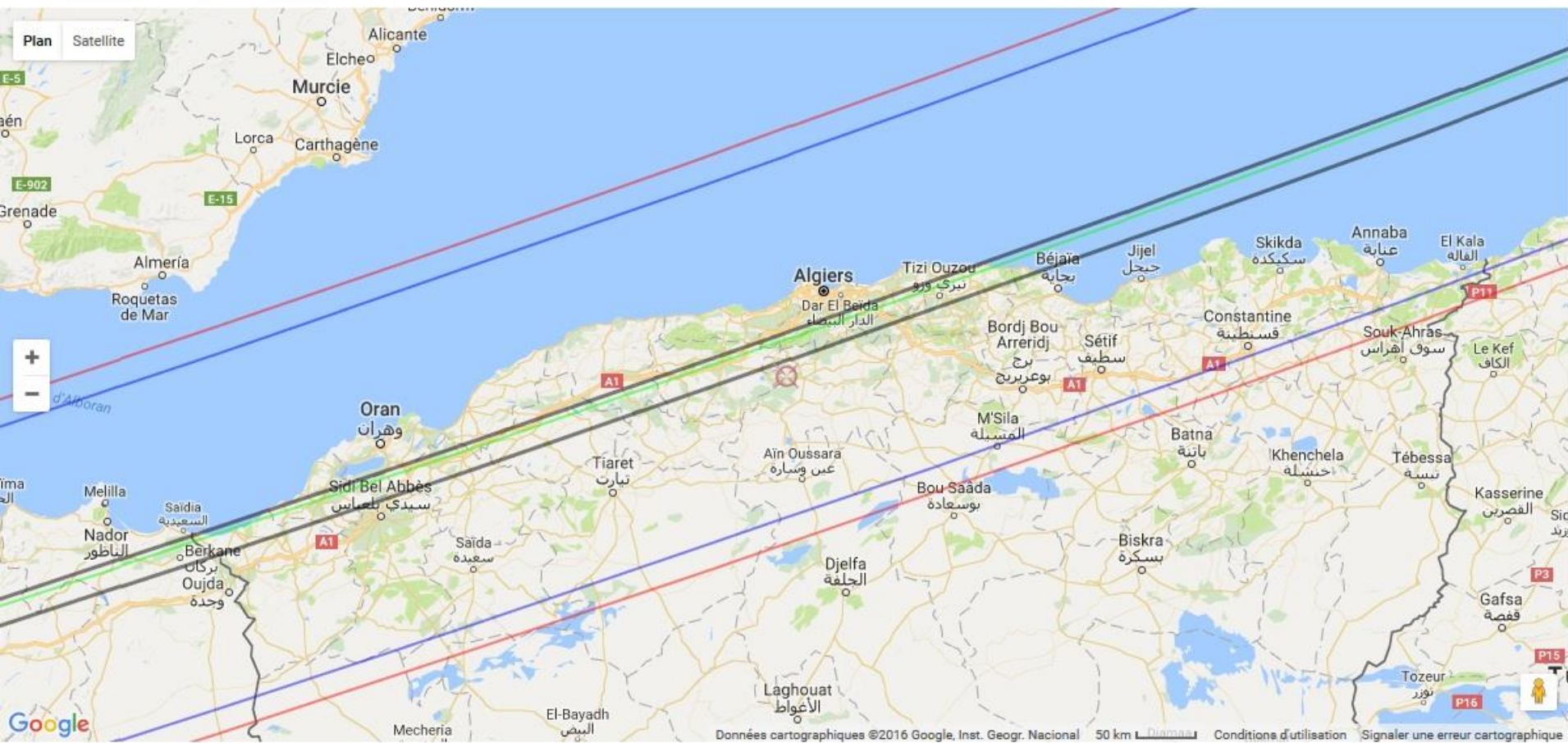
Dia = 193km, 0.149"

Parallax = 4.910"

Hourly dRA = 0.627s

dDec = 2.29"







Centre de Recherche en Astronomie, Astrophysique et Géophysique  
مركز البحث في علم الفلك والفيزياء الفلكية وفيزياء الأرض

Observation régionale de l'occultation stellaire  
de l'étoile HIP 104172 par l'astéroïde 5247 Krylov  
à Tichy (Béjaïa) le Dimanche 06 Août 2017 à 22h05mn



الرصد الجهوي للاختجاب النجمي HIP104172  
من طرف الكويكب 5247 كريلوف بتيشي (ولاية بجاية)  
يوم الأحد 06 أوت 2017 على الساعة 22:05

**Organismes amateurs participants**

Association Sirius d'Astronomie de Béjaïa  
Association Aster des astronomes amateurs de Kherrata – Béjaïa  
Association Scientifique M'cheddalah – Bouira  
Club Horizon Djurdjura d'Astronomie – Tizi-Ouzou  
Club Al-Birâni d'Astronomie – Alger  
Ligue des activités scientifiques et techniques de jeunes de Sétif  
Club d'Astronomie Tandra – Sétif  
Centre des loisirs scientifiques de Borj Bou Arreridj  
Association Al-Battani d'Astronomie – Oran

**الجمعيات و الهيئات الهواة المشاركة**

جمعية سيروس لعلم الفلك - بجاية  
جمعية أسطر لشباب هواة علم الفلك بخراطة - بجاية  
الجمعية العلمية لمشكلة - البويرة  
نادي أفق جرجرة لعلم الفلك - عزري وزو  
نادي البيروني لعلم الفلك - الجزائر  
رابطة النشاطات العلمية و التقنية للشباب - سطيف  
النادي الفلكي طنجة - سطيف  
مركز الشبيبة العلمية - برج بوعريريج  
جمعية البتاني لعلم الفلك - وهران

Regional Observation of the  
occultation star HIP 104172 by the  
asteroid 5247 Krylov in Tichy  
(Bejaia) – Sunday, August 06th  
2017 at 21h05mn UT

ESOP XXXVI, Freiberg (Germany),  
September 2017

# 5247 Krylov occults HIP 104172 on 2017 Aug 6 from 20h 48m to 21h 12m UT

Star:

Mv = 6.1

RA = 21 6 23.5376 (J2000)

Dec = 26 55 27.364

[of Date: 21 7 11, 26 59 51]

Prediction of 2017 Jun 28.0

Max Duration = 0.9 secs

Mag Drop = 9.2

Sun : Dist = 137 deg

Moon: Dist = 45 deg

: illum = 99 %

E 0.084"x 0.038" in PA 79

Asteroid:

Mag =15.3

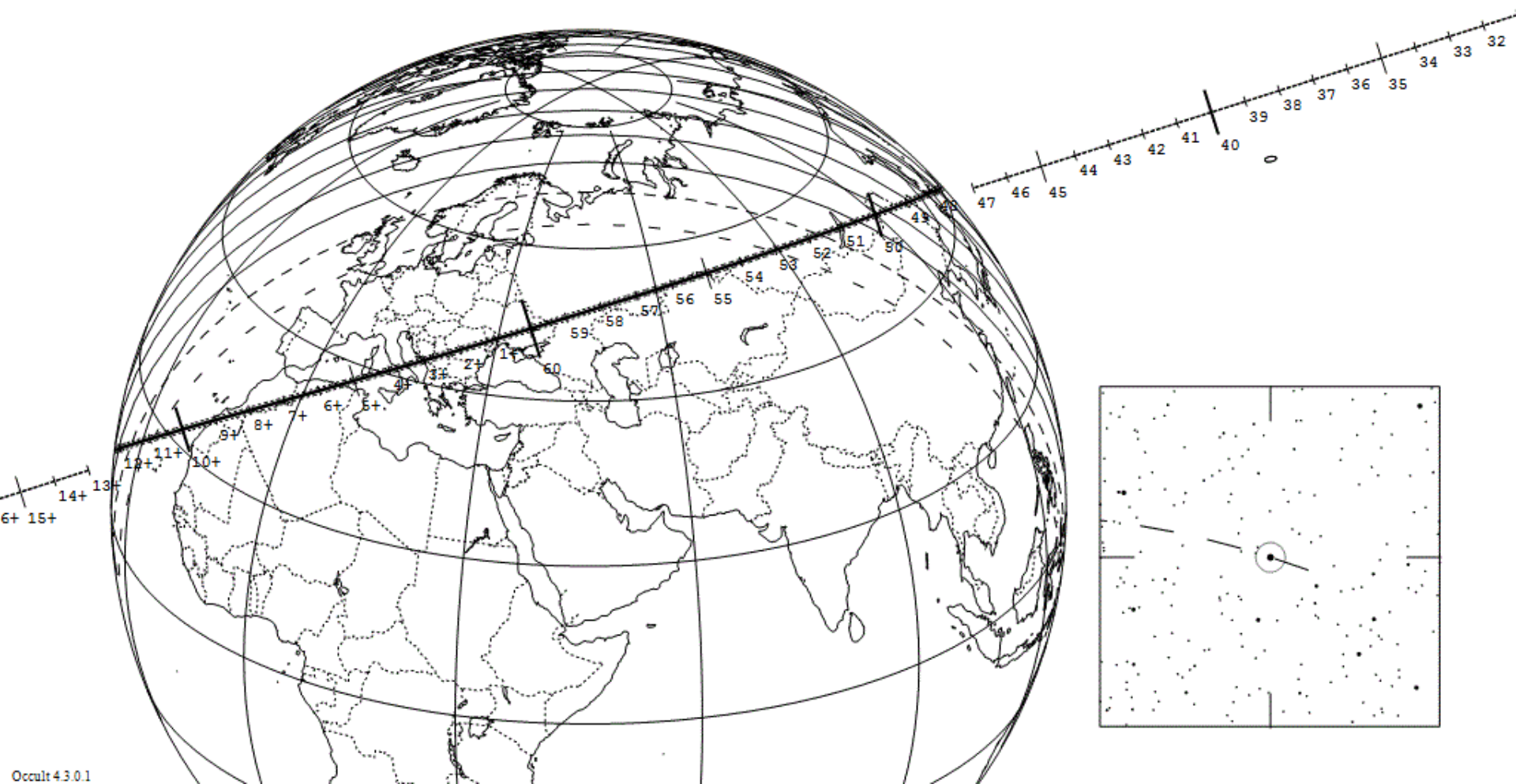
Dia = 8km,

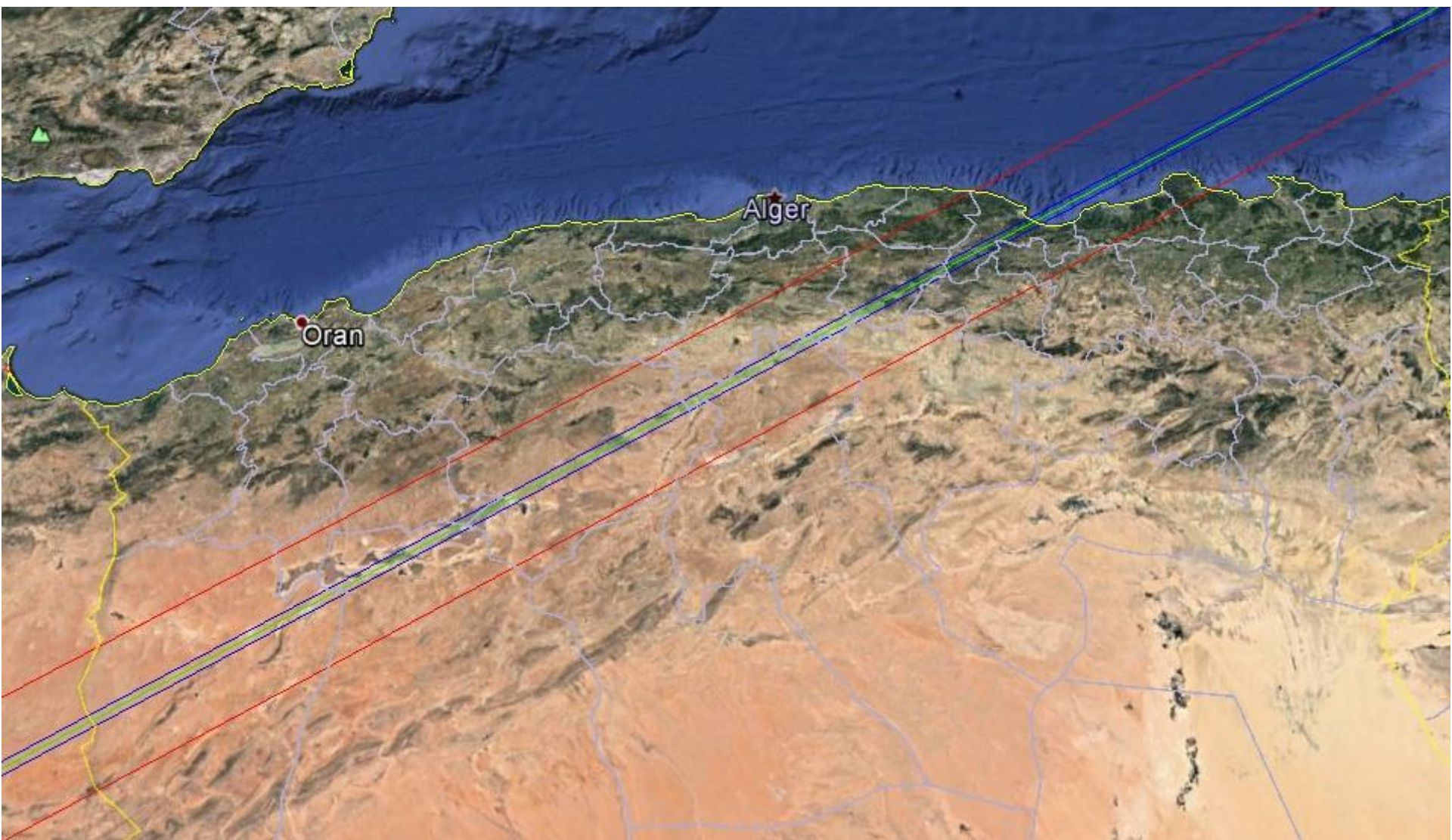
0.009"

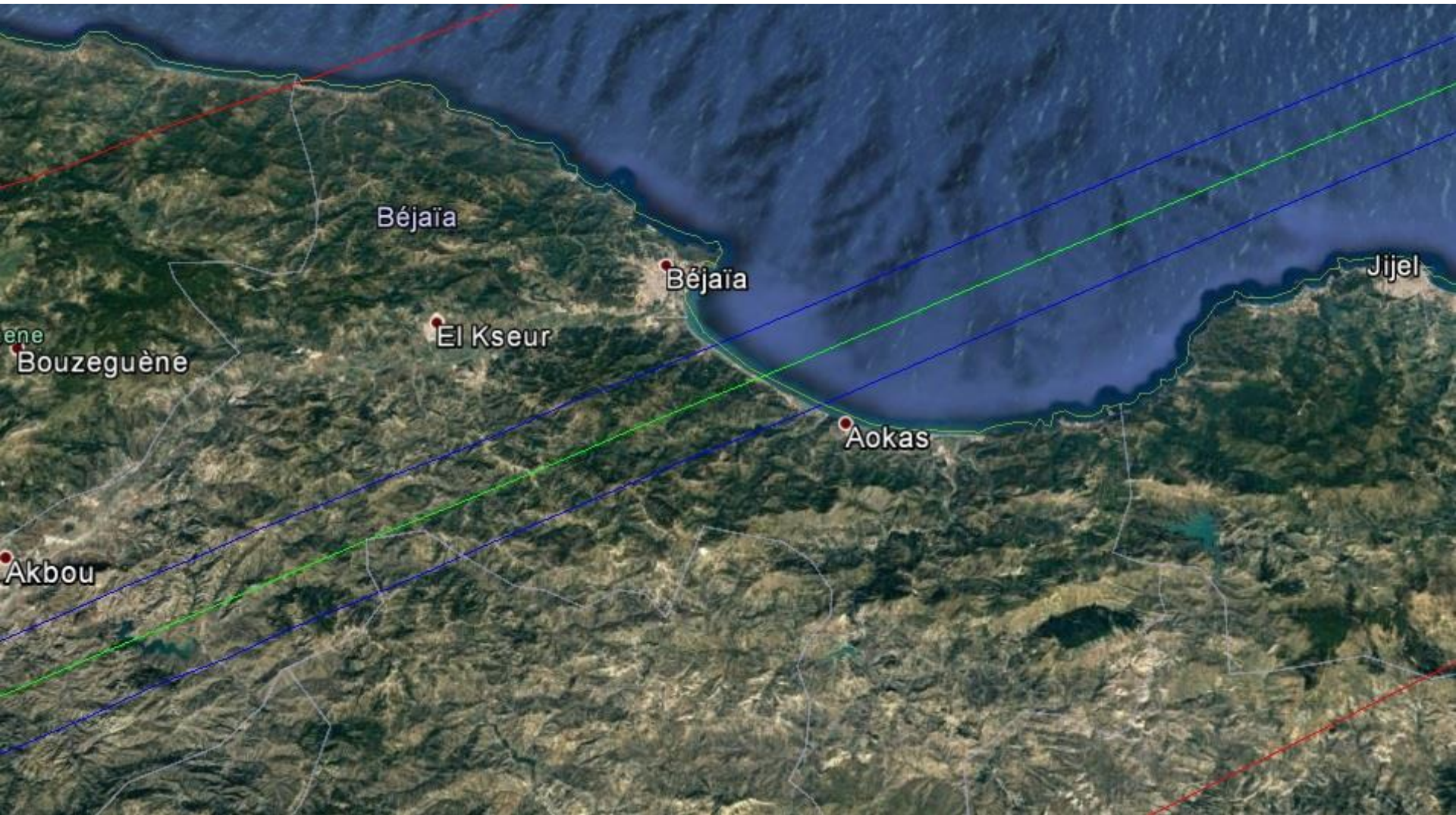
Parallax = 6.946"

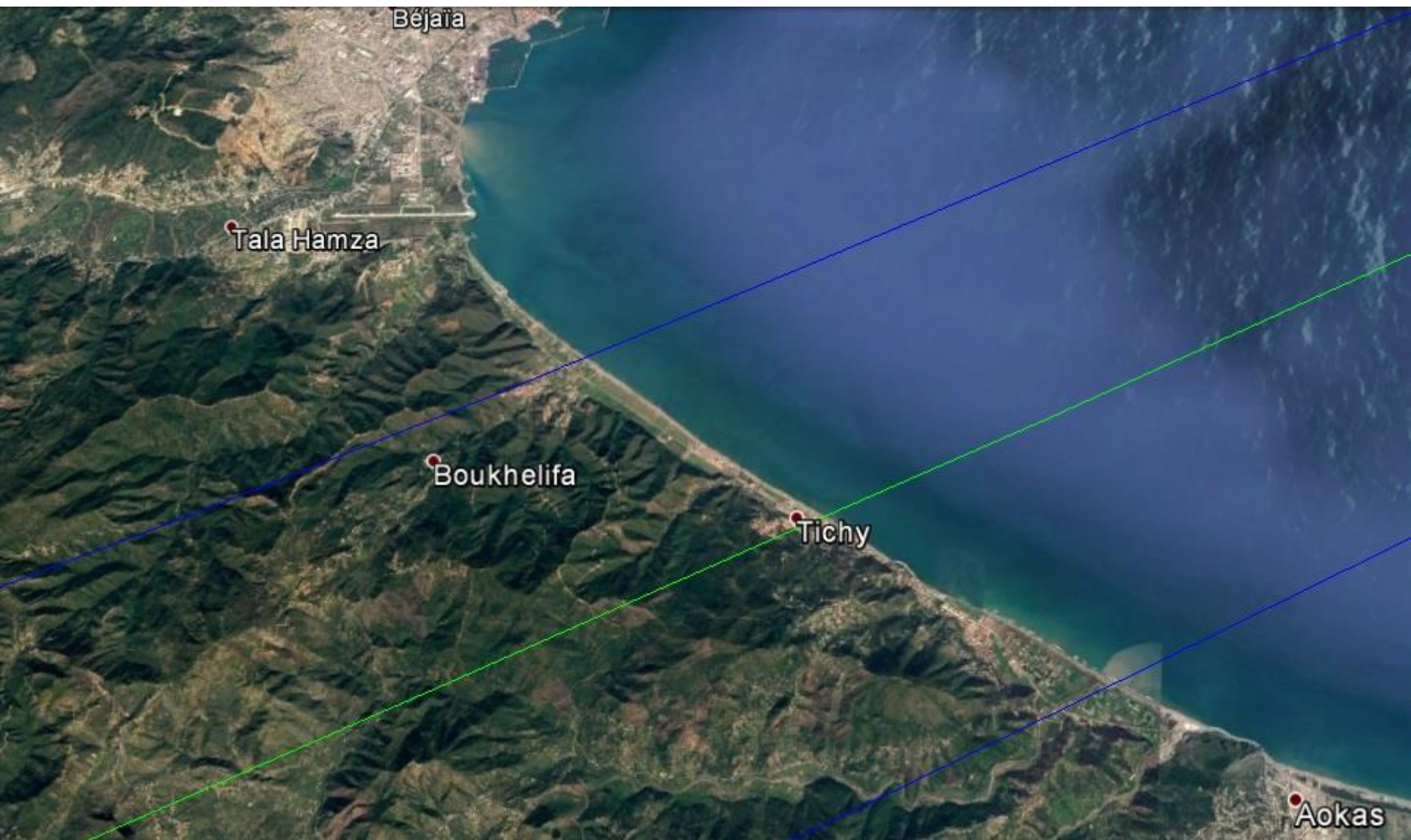
Hourly dRA =-2.220s

dDec = -9.49"









12 telescopes divided by 6 teams throughout the central band of the occultation.  
Each team composed by 2 or 3 persons.













ESOP XXXVI, Freiberg (Germany),  
September 2017





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September 2017





I am preparing the second meeting and a national training course for the stellar occultations by asteroids on 14th November 2017.  
More than 20 associations and club will participate with more 50 personnes using more than 20 instruments for observing the occultation of the star TYC 0186-01629-1 from Canis Minor constellation by 392 Wilhelmina.

Deuxième Rencontre nationale  
sur les occultations astéroïdales  
10 -14 novembre 2017 à Ghardaïa

CRAAG

الملتقى الوطني الثاني لرصد  
الاعتجابات الكويكبية  
14-10 نوفمبر 2017 بغرداية

# 392 Wilhelmina occults TYC 0186-01629-1 on 2017 Nov 14 from 3h 57m to 4h 23m UT

Star:

Mv = 9.8  
RA = 7 33 28.8933 (J2000)  
Dec = 4 45 15.548  
[of Date: 7 34 26, 4 42 52]  
Prediction of 2017 Jul 4.0

Max Duration = 8.5 secs

Mag Drop = 4.8

Sun : Dist = 116 deg

Moon: Dist = 70 deg

: illum = 18 %

E 0.019"x 0.011" in PA 82

Asteroid:

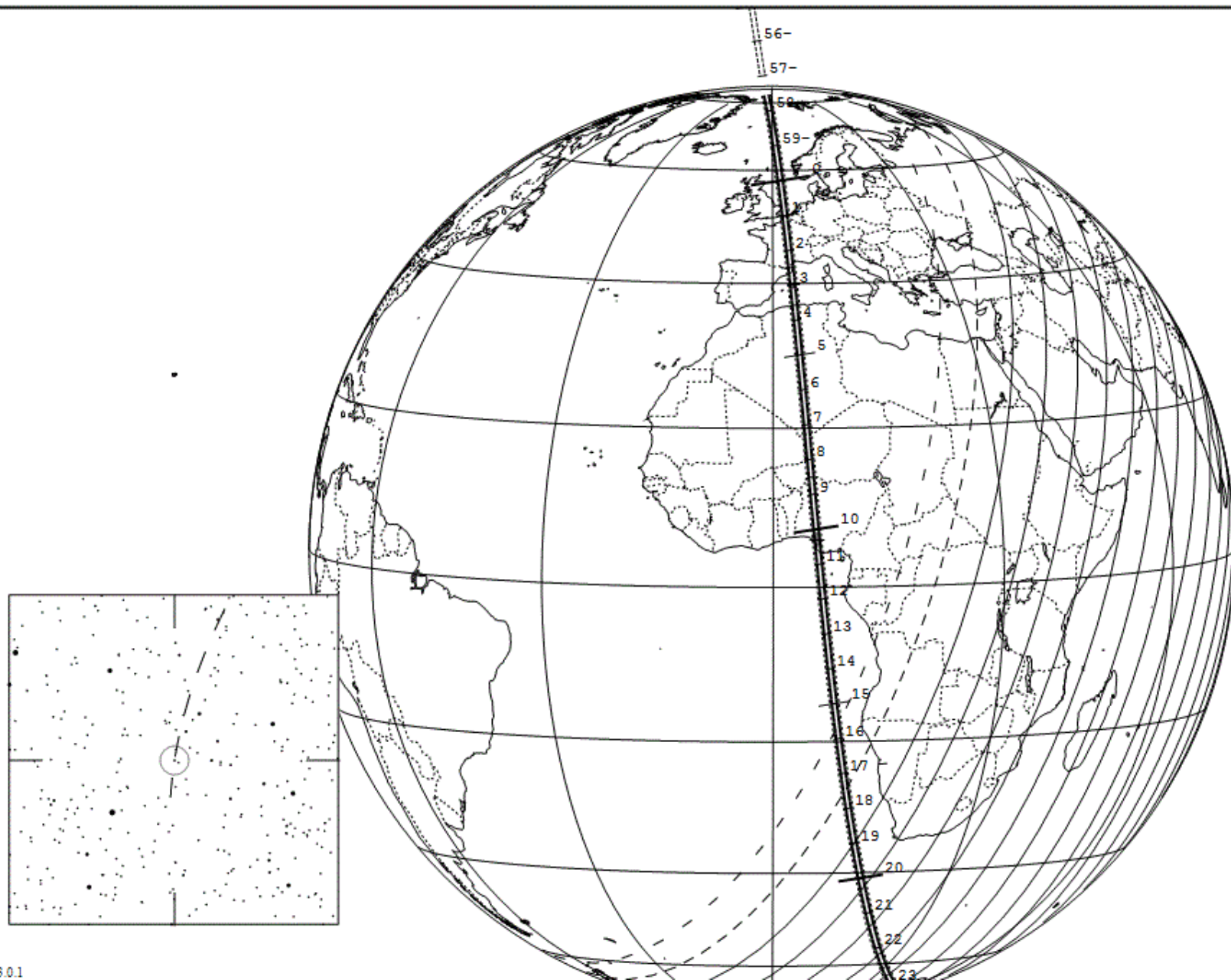
Mag =14.6

Dia = 69km, 0.045"

Parallax = 4.146"

Hourly dRA = 0.195s

dDec =-18.72"



# Summary

We are interesting by stellar occultation by asteroids with low probability  
Observation as NEA (Near-Earth Asteroids) and TNO (TransNeptunian Objects).

We create an Algerian Amateurs Astronomers Network to observe stellar  
occultations by asteroids.

We wish to create a relationship with other partners around the world and  
especially from IOTA in order to develop this research in Algeria.



ESOP XXXVI, Freiberg (Germany),  
September 2017

**Thank you for  
your attention!**