

Lunar Occultation of HIP 36603, 2021 Feb 23

A Double Star Discovery?

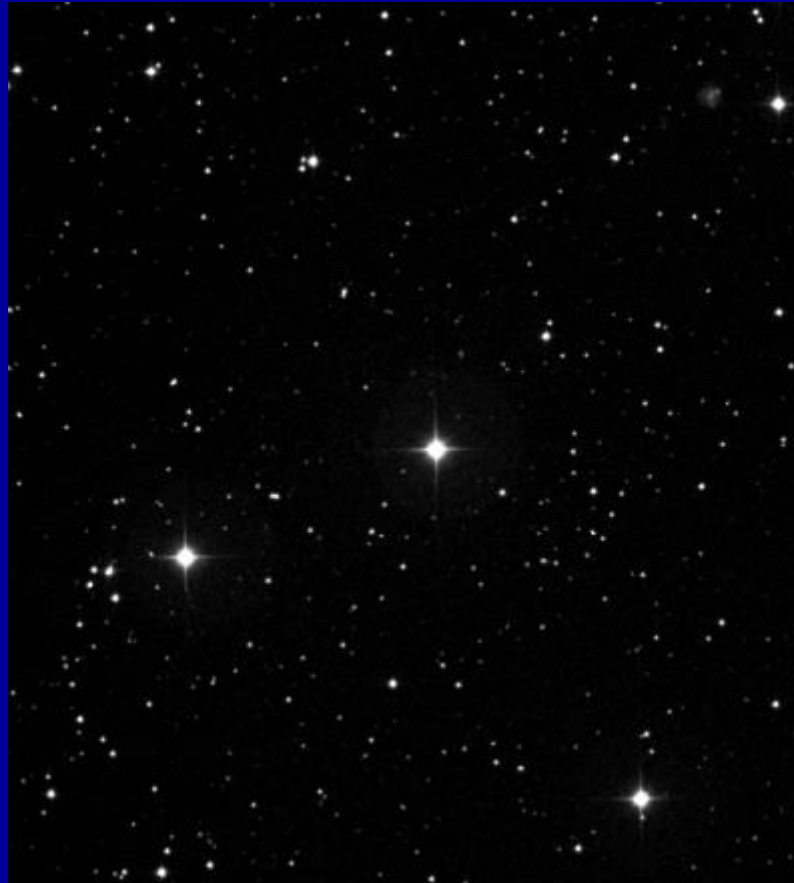


Image:
Aladin
DDS2 blue
Fov: 16.8'

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Lunar occultation predictions : Occult v.4.12.10

with Prediction ... Set Output filter Mag limit adjustment... show Recording Timer

1. Site location: Site name: WAO, Apert(cm): 50, Use Site files

2. Star cat.: XZ, XZ < mag 9, XZ < mag 7, XZ < mag 4, ZC

3. Objects: Stars, Planets, Asteroids, Grazes only, Doubles only

4. Set UT dates: Year: 2021, Month: Feb, Day: 23, Starting at: -6 hrs, 0 hrs, +6 hrs, +12hrs

5. Events for Site: Occultations, Grazes, Short Output, Apply Filter

6. Events anywhere

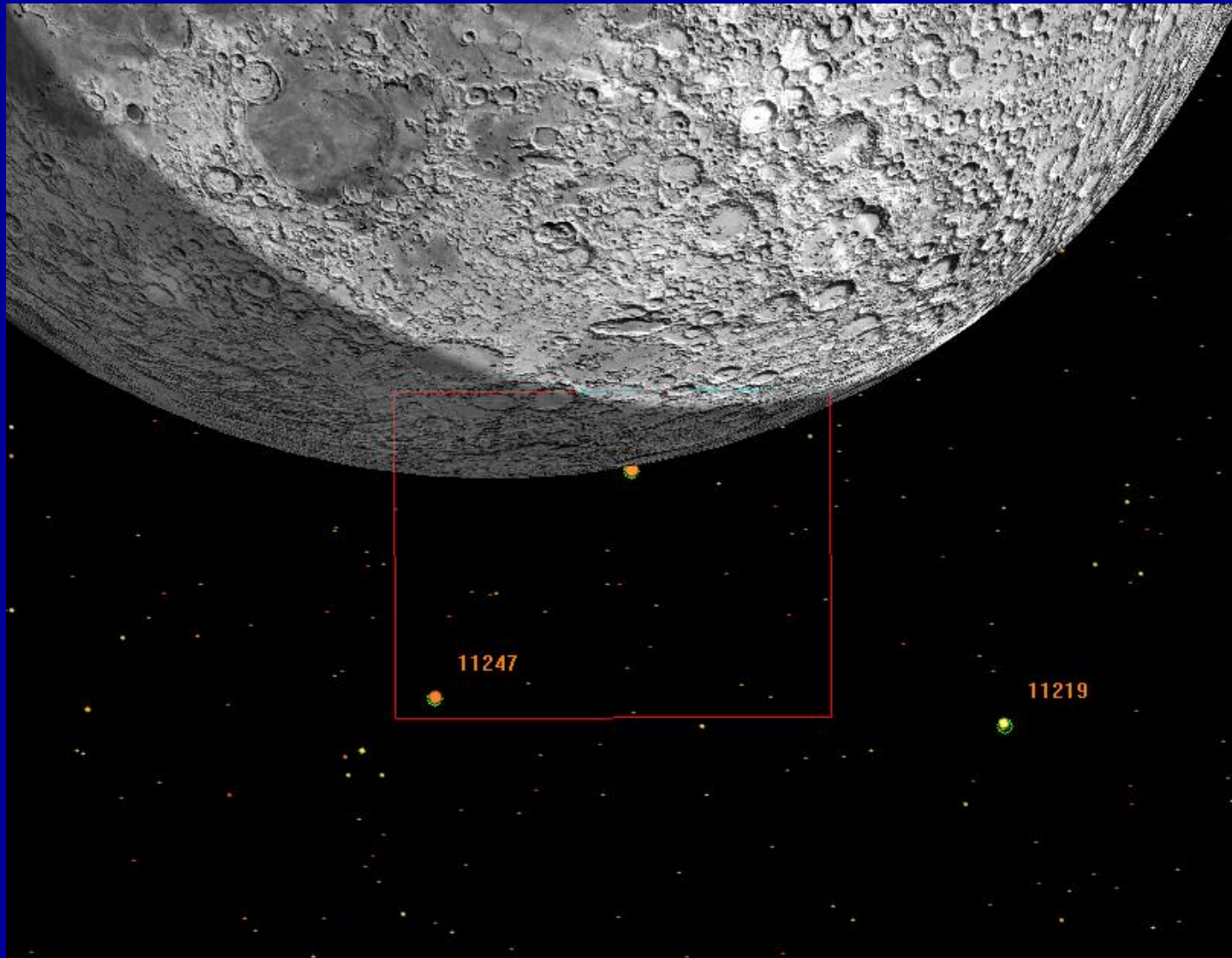
Right-click on prediction for further options

Occultation prediction for WAO
E. Longitude 8 21 50.0, Latitude 50 8 17.0, Alt. 256m; Telescope dia 50cm; dMag 0.0

day	Time	P	Star	Sp	Mag	Mag	%	Elon	Sun	Moon	CA	PA	VA	AA
y	m d h m s		No	D	v	r	V	ill	Alt	Alt	Az	o	o	o
21	Feb 23 17 20 30.8	d	79419	K0	8.6	8.2	85+	135	-4	44	105	76N	87	130 77
21	Feb 23 17 33 5	m	79406	A0	8.6	8.7	85+	135	-6	45	108	12S	179	221 169
Distance of 79406 to Terminator = 18.2"; to 3km sunlit peak = 4.8"														
21	Feb 23 17 48 42.5	d	79430	G5	8.7	8.2	85+	135	-9	48	111	42N	53	94 43
21	Feb 23 19 25 13.5	D	79470	K0	7.6	7.1	86+	136		60	142	26S	165	191 155
21	Feb 23 19 52 43	m	79477	K2	7.8	7.2	86+	136		62	154	7S	185	203 175
Distance of 79477 to Terminator = 6.0"; to 3km sunlit peak = 0.0"														
21	Feb 23 20 26 18.3	d	79505	M1	8.8	7.9	86+	136		64	170	73S	119	126 109
21	Feb 23 20 54 48.9	D	79523w	M5	7.7	6.8s	86+	136		64	184	63N	75	72 64
79523 is double: AB 7.8 11.1 92" 180.0, dT = -68sec														
79523 = NSV 17512, 7.69 to 7.78, Hp														
21	Feb 23 21 19 48.7	D	79524	F5	8.0	7.7	86+	136		63	197	34S	158	146 147
21	Feb 23 22 22 23.4	D	79549	K0	8.4	7.7	86+	137		58	224	47S	145	116 134
21	Feb 23 22 55 16.5	D	79561	G5	8.3	7.8	86+	137		54	235	44S	148	113 137
21	Feb 23 23 18 17.9	d	79574	K0	8.8	8.2	87+	137		51	241	43S	149	111 139
21	Feb 23 23 38 58.3	D	1157	A2	6.2	6.2	87+	137		48	247	15N	27	347 16
21	Feb 23 23 46 42	Gr	1157	A2	6.2	6.2	87+	137		46	**	GRAZE: CA	0.6N;	Dist. 67km in az.
Distance of 1157 to Terminator = 1.6"; to 3km sunlit peak = 0.0"														
21	Feb 24 0 58 47.7	D	79620	A3	8.1	8.0	87+	138		36	265	27N	40	355 29
21	Feb 24 1 29 59.7	d	79644	A0	8.6	8.6	87+	138		31	270	71N	83	39 72
21	Feb 24 2 44 0.9	d	79679	B9	7.7	7.7	87+	138		20	283	82S	111	68 100
21	Feb 24 3 8 1.9	d	79688	K0	7.5	7.0	88+	139		16	287	61N	74	32 63

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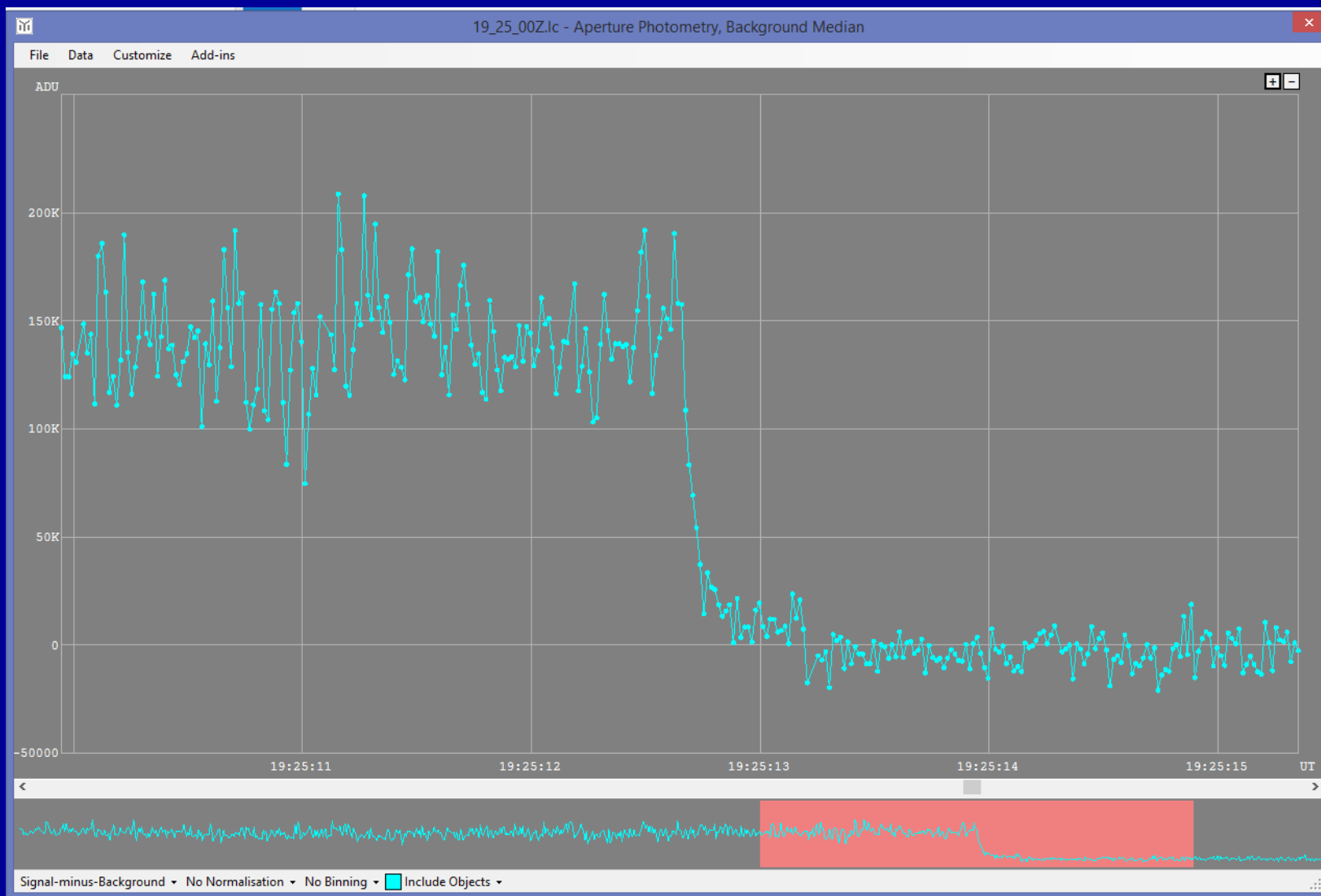


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Basic data :

HD 59600 -- Star

Other object types: * (HD,AG,...), IR (IRAS,2MASS)

ICRS coord. (*ep=J2000*) : 07 31 39.1955602757 +23 59 59.391570131 (Optical) [0.0372 0.0346 90] A 2018yCat.1345....0G

FK4 coord. (*ep=B1950 eq=1950*) : 07 28 37.9549578262 +24 06 23.409561831 [0.0372 0.0346 90]

Gal coord. (*ep=J2000*) : 195.1051447499938 +19.1110589847310 [0.0372 0.0346 90]

Proper motions *mas/yr* : -10.963 0.711 [0.081 0.092 90] A 2018yCat.1345....0G

Radial velocity / Redshift / *cz* : V(km/s) 37.55 [0.32] / z(~) 0.000125 [0.000001] / cz 37.55 [0.32]
A 2005A&A...430..165F

Parallax (*mas*) : 4.6491 [0.0437] A 2018yCat.1345....0G

Spectral type : K0 E 1993yCat.3135....0C

Fluxes (7) :

U	9.570	[0.010]	C	1987A&AS...68..211O
B	8.690	[0.007]	C	1987A&AS...68..211O
V	7.640	[0.009]	C	1987A&AS...68..211O
G	7.3521	[0.0003]	C	2018yCat.1345....0G
J	5.802	[0.026]	C	2003yCat.2246....0C
H	5.309	[0.016]	C	2003yCat.2246....0C
K	5.174	[0.018]	C	2003yCat.2246....0C

Identifiers (19) :

An access of full data is available using the icon Vizier near the identifier of the catalogue

HD 59600 	GSC 01910-00345 	N30 1686	TIC 94748585
AG+24 846 	HIC 36603 	PMC 90-93 2748	TYC 1910-345-1 
AGKR 6758	HIP 36603 	PEM 97620 	YZ 24 2989
BD+24 1683 	IRAS 07286+2406 	SAO 79470 	Gaia DR2 866852497734061056 
GC 10063	2MASS J07313918+2359593 	SKY# 13787	

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List of occultation residuals : Occult v.4.12.10

with Residuals... Sort... Graze organiser functions Archive functions Help

Right-click on line to plot individual events Plot graze events against profile

File name : Okloes_2021_02_23_Double.dat
 Reduction date : Mittwoch, 28. Juli 2021
 Ephemeris : DE440 (1550/2650), DE438 (1550/2650)
 Limb basis : LRO Lunar Orbiter Laser Altimeter [LOLA]
 O-C basis : limb correction applied

Telescopes:

#	Aperture cm	Longitude ° ' "	Latitude ° ' "	Alt m
A	25	+ 8 21 50.4	+50 8 17.4	256

ref	Tel	Observer	Star No.	y	m	d	h	m	s	PhGrMrCeDb	O-C mas	O-C sec	limb "	PA °	l °	b °	AA °	P °	D °	scale
001	A	O. Kloes	S 79470	2021	2	23	19	25	12.72	DD G 1 B	-10	0.15	1.46	164.78	-5.93	-3.29	154.49	154.83	-5.26	1.006
002	A	O. Kloes	S 79470	2021	2	23	19	25	14.02	DD G 1 F	-116	1.46	1.40	164.80	-5.93	-3.29	154.52	154.86	-5.26	1.006
003	A	O. Kloes	S 79505	2021	2	23	20	26	18.20	DD G 1	-46	0.13	-1.82	119.02	-6.09	-3.33	108.58	108.69	-6.57	1.007
004	A	O. Kloes	S 79523	2021	2	23	20	54	48.87	DD G 1	-24	0.07	-0.02	74.67	-6.17	-3.34	64.16	64.16	-3.84	1.007
005	A	O. Kloes	S 79524	2021	2	23	21	19	48.46	DD G 1	-24	0.10	1.29	157.71	-6.24	-3.34	147.14	147.50	-5.93	1.008
006	A	O. Kloes	S 79549	2021	2	23	22	22	23.29	DD G 1	-50	0.16	0.56	144.92	-6.39	-3.35	134.19	134.49	-6.66	1.007
007	A	O. Kloes	S 79561	2021	2	23	22	55	16.37	DD G 1	-34	0.11	-0.01	148.19	-6.47	-3.35	137.38	137.71	-6.58	1.007
008	A	O. Kloes	S 79574	2021	2	23	23	18	17.72	DD G 1	-29	0.09	0.18	149.30	-6.52	-3.34	138.43	138.76	-6.56	1.007
009	A	O. Kloes	R 1157	2021	2	23	23	38	58.98	DD G 1	-6	0.07	0.41	27.38	-6.56	-3.34	16.45	16.76	1.60	1.006

Star positions not from Gaia or Hipparcos2 have a '\$' after the O-C

Mean residual of 7 events involving single stars: -30 mas ±14 mas
 Mean clock correction from 6 event times: -0.11 secs ±0.03 secs

Mean residuals are exclusive of:
 events after 1900 with a residual > ±0.5"
 Bright limb events, events that are not 'Certain', and Start, End and Miss events
 events involving Planets or Asteroids

Mean clock correction additionally limited to events with a radial motion >0.15"/sec

Explanation of columns 'PhGrMrCeDb'

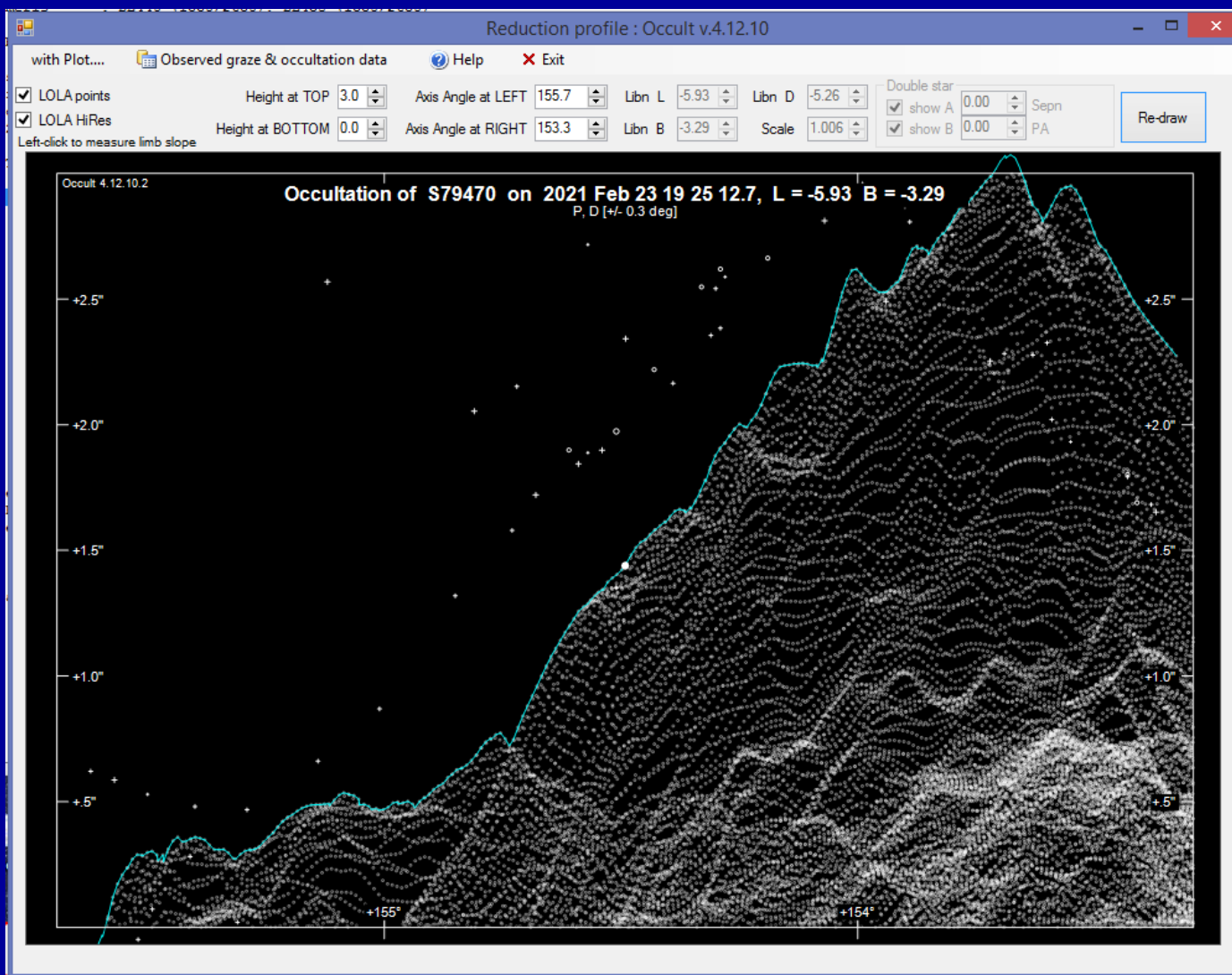
Ph - Phase of the event.
 1st character D = disappear, R = reappear, B = blink, F = flash.
 plus for grazes, M = Miss, S = Start, E = End
 2nd character D = dark limb, B = bright limb, U = in umbra of lunar eclipse

Gr - G if the event is during a graze

Mr - Method of timing and recording. Main types are:
 G = video with time insertion, V = video with other time linking
 S = visual using a stopwatch, T = visual using a tape recorder, E = eye/ear

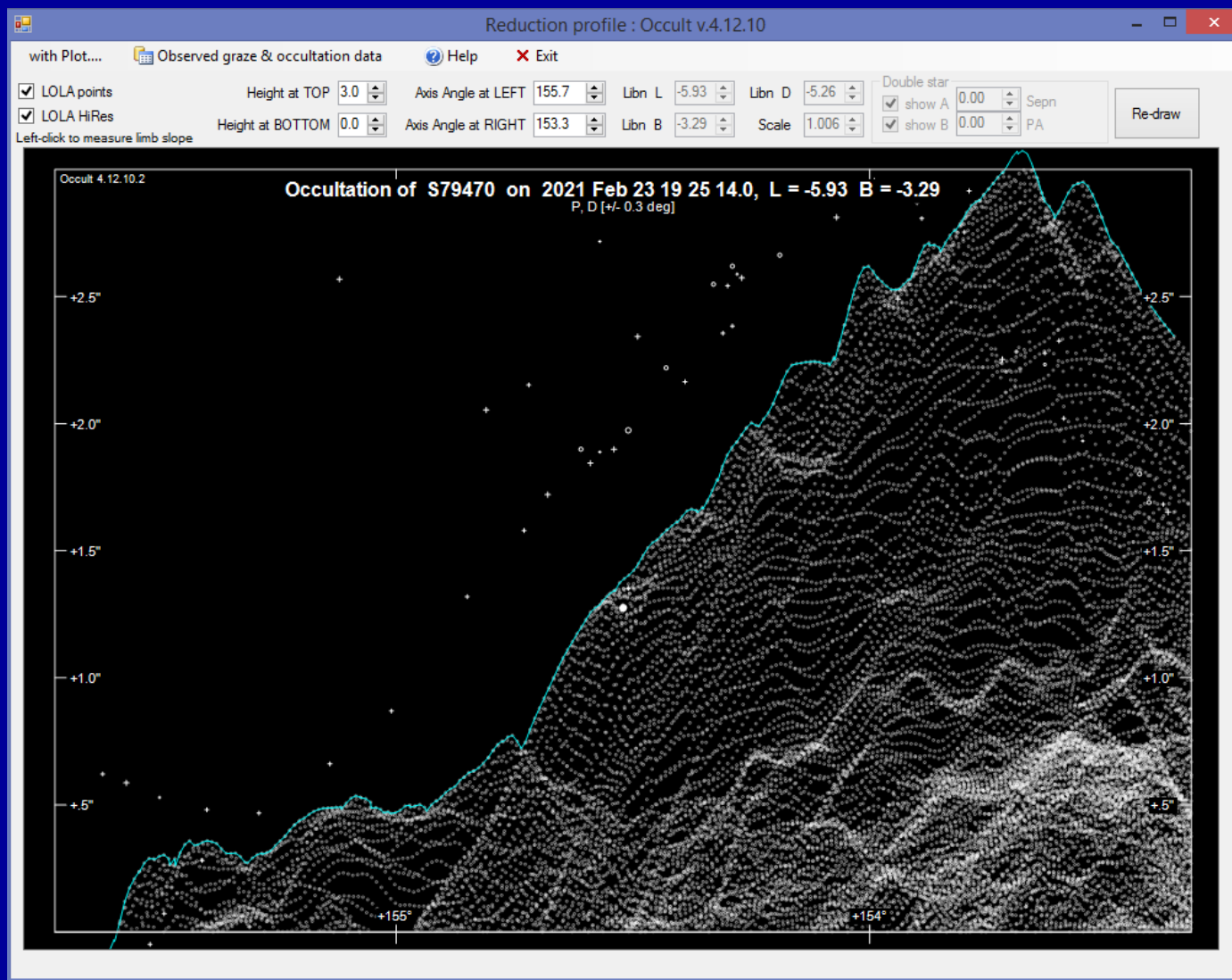
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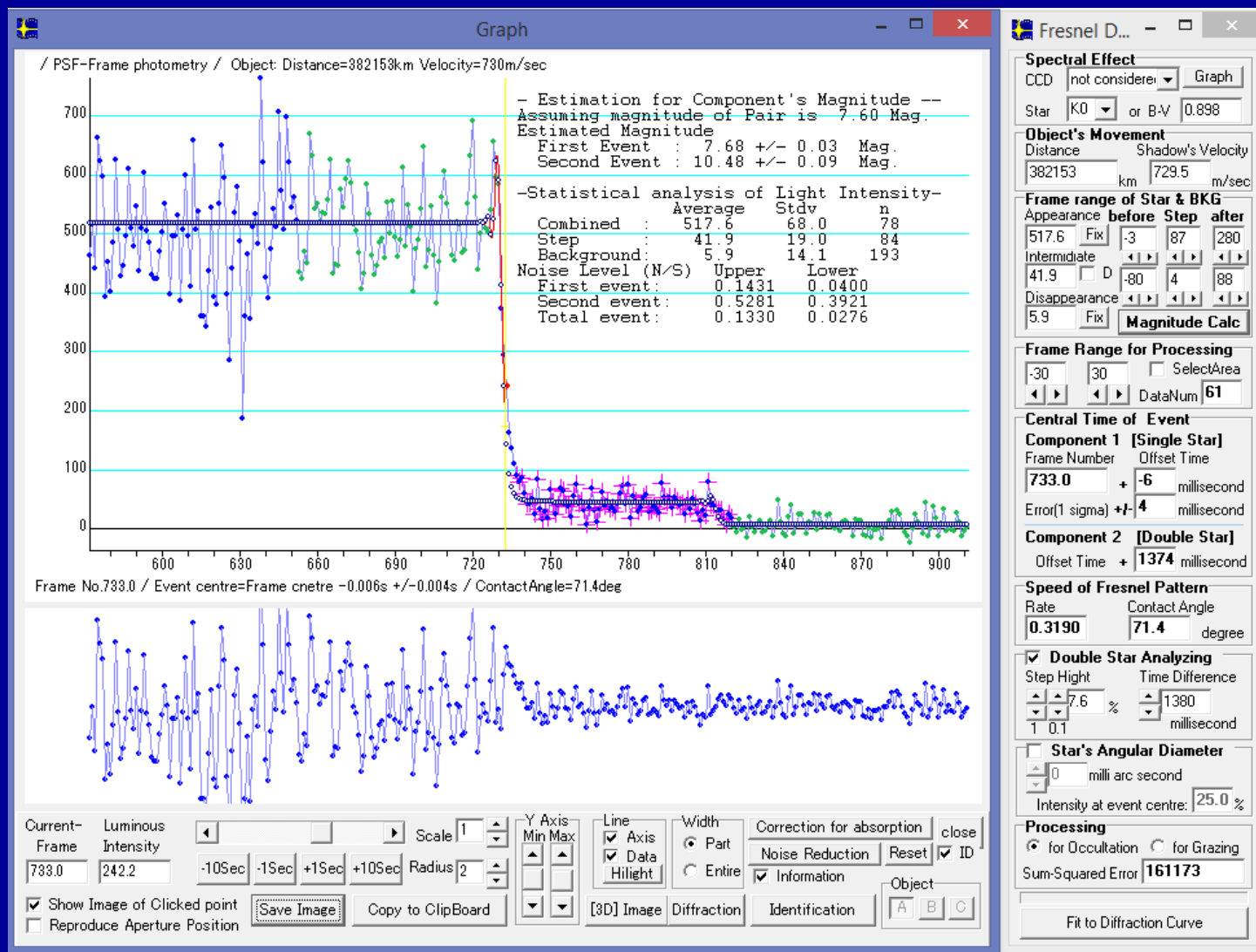
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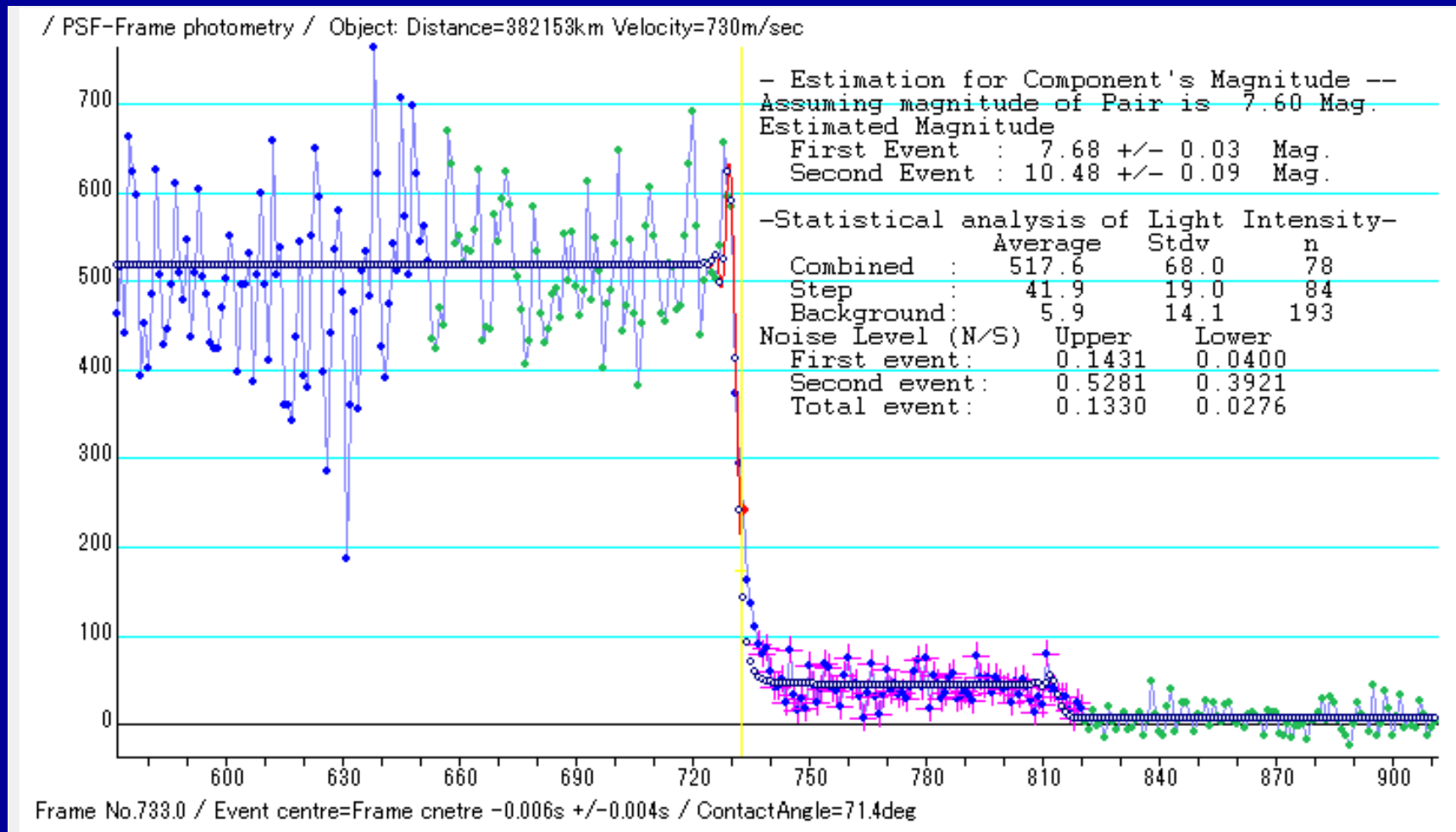
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with Report...
Help
Exit

2021 Feb 23 at 19h 25m

S79470 D D

Star Mag

P.A. A.A.

C.A. %all

I b

Scale Alt

RV CCT

T (bright) secs

T (faint) - T (bright) secs

T (faint) secs = 14.020

- - No step event

/ PSF-Frame photometry / Object: Distance=382153km Velocity=730m/sec

- Estimation for Component's Magnitude --
Assuming magnitude of Pair is 7.60 Mag.
Estimated Magnitude
First Event : 7.68 +/- 0.03 Mag.
Second Event : 10.48 +/- 0.09 Mag.

-Statistical analysis of Light Intensity-

	Average	Stdev	n
Combined :	517.6	68.0	78
Step :	41.9	19.0	84
Background:	5.9	14.1	193

Noise Level (N/S) Upper Lower

First event: 0.1431 0.0400

Second event: 0.5281 0.3921

Total event: 0.1330 0.0276

Email message

Dear Martin,

yesterday evening I recorded this lunar occultation with a QHY174M-GPS at a frame rate of 60 fps with a 10" LX200 Classic. I recorded FITS frames with 16 Bit (real 12 bit) with timestamps for every single frame. The frames were converted to an AVI video with Sini software to make the video readable in Limovie.

I want to thank Alex Pratt (BAA, IOTA/ES) for his help with the analysis in Limovie.

Regards,

Oliver Klös
IOTA/ES

Report will be emailed to:

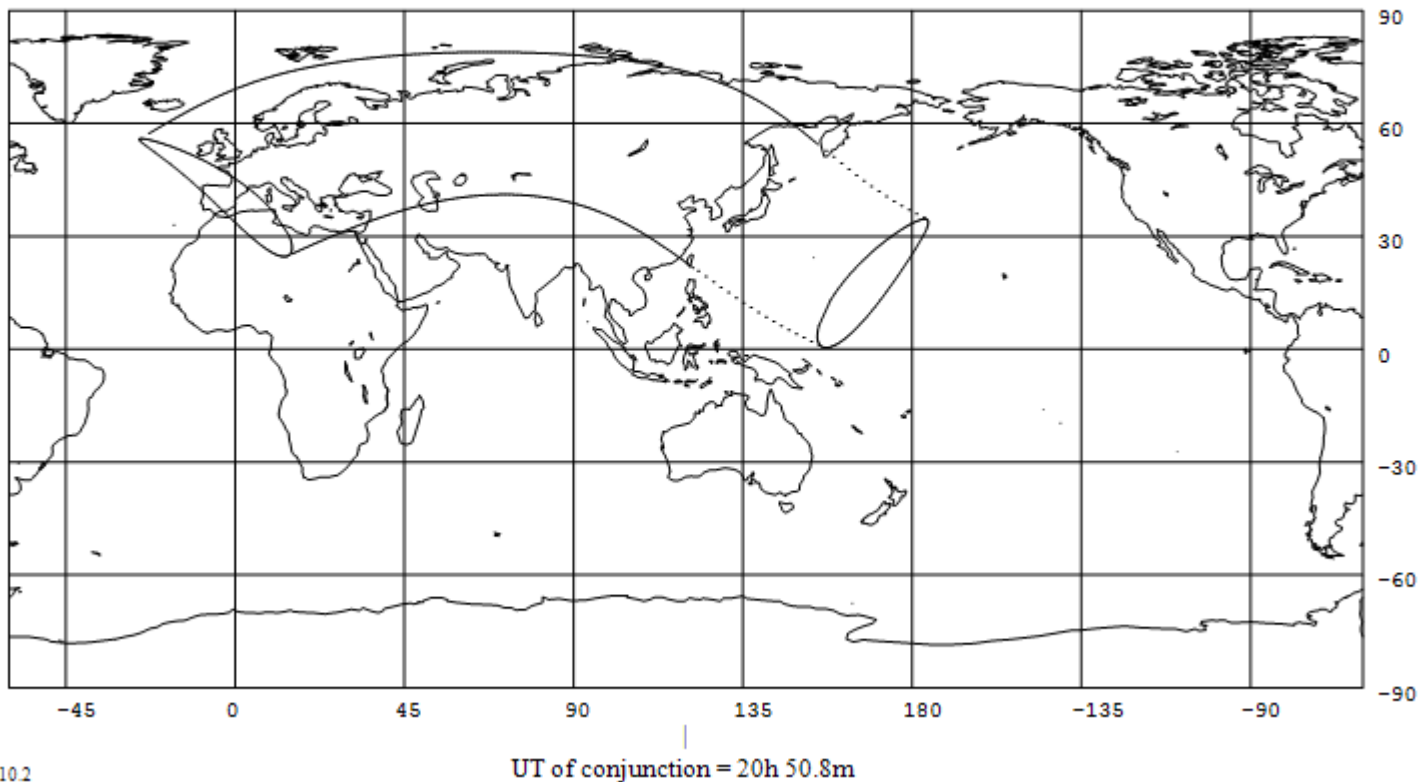
cc Email addresses. Separate with a semicolon (;)

[a BCC copy will be sent to your Email Inbox]

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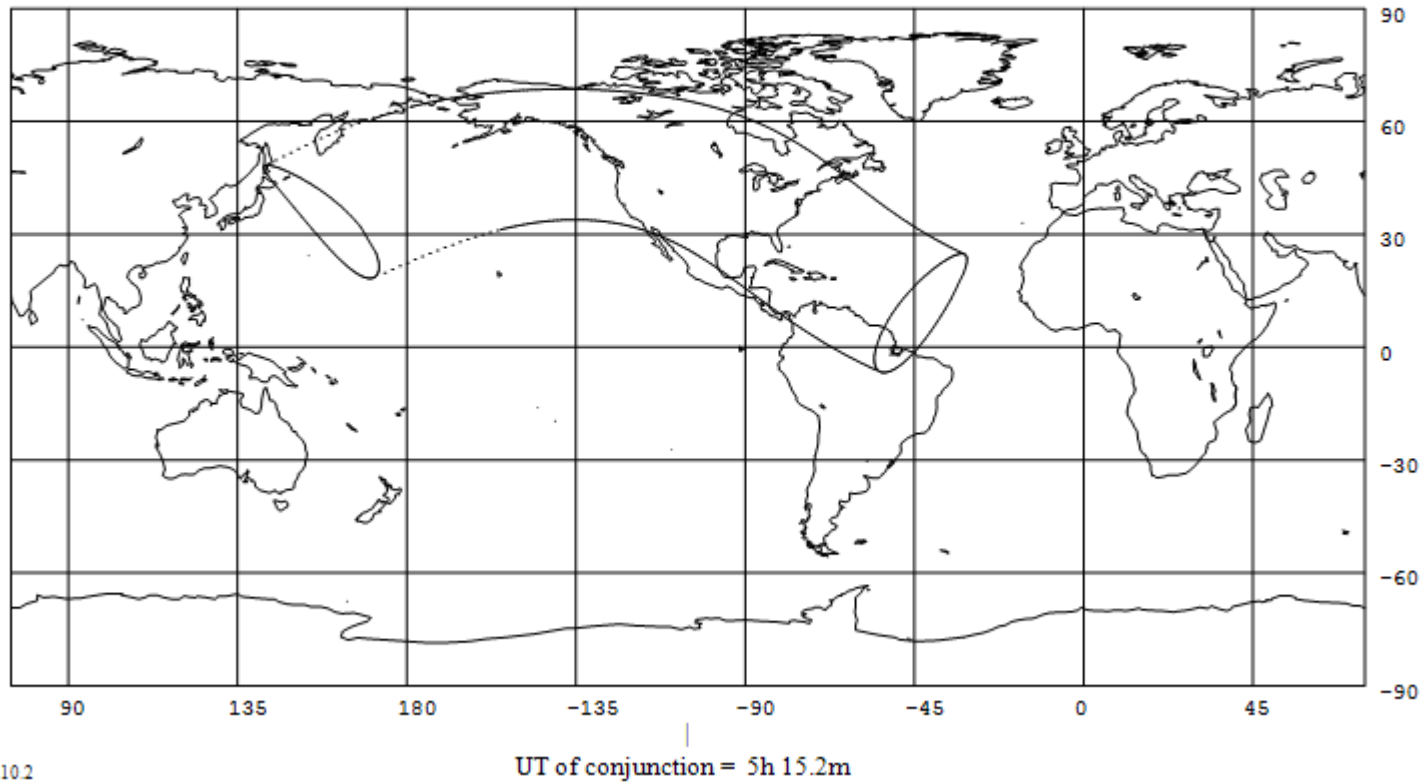
Occultation of 79470 K0, Magnitude 7.6, on 2026 Nov 27



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Occultation of 79470 K0, Magnitude 7.6, on 2027 Feb 18



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Conclusion:

- The eye is still a good detector.
- Record lunar occultations with > 8 bit

What's next?

- Article in *Journal of Double Star Observations* (JDSO)
- Waiting for a confirmation

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Thanks to

Alex Pratt (BAA, IOTA/ES)
for his help with the analysis with Limovie

and to

Jan Manek, Martin Unwin & the worldwide coordinators
for still collecting lunar occultation observations