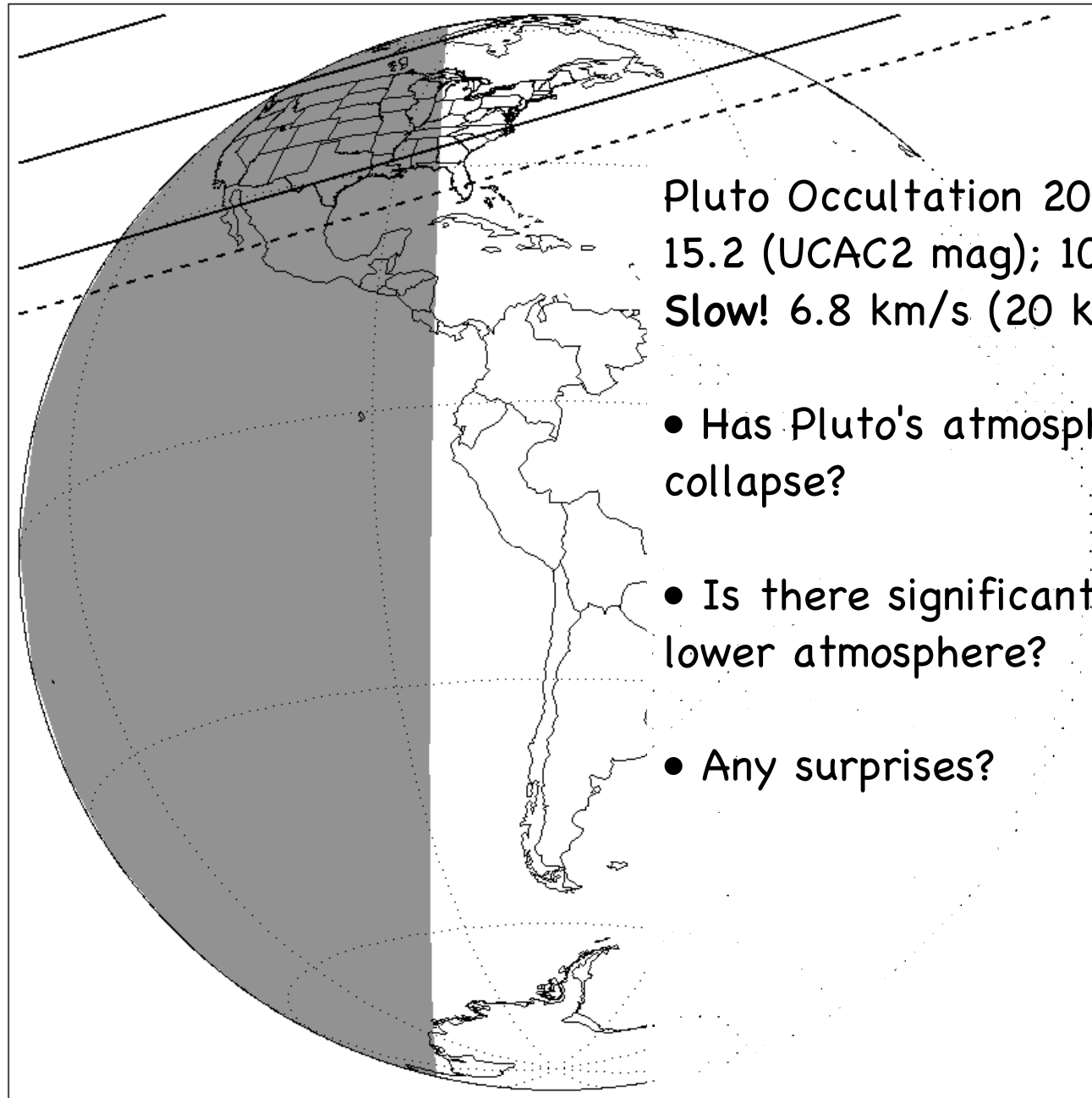


Visible and Near-IR Observations of the 2007 March 18 Occultation by Pluto

Leslie Young (SwRI)
Dick French (Wellesley College)
Marc Buie (Lowell Observatory)
and 34 others



Pluto Occultation 2007 Mar 18
15.2 (UCAC2 mag); 10.9 (K)
Slow! 6.8 km/s (20 km/s typical)

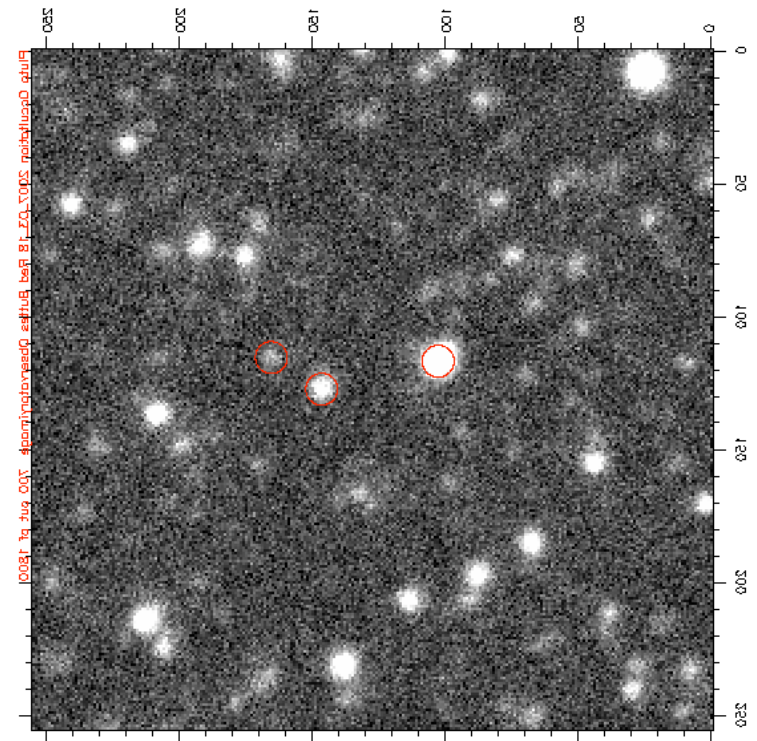
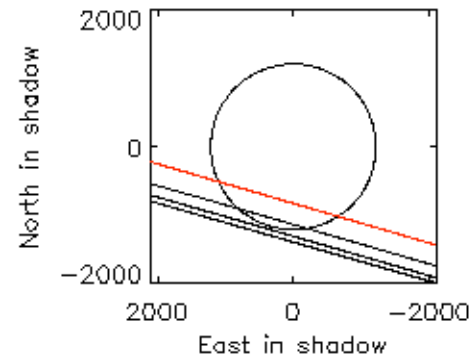
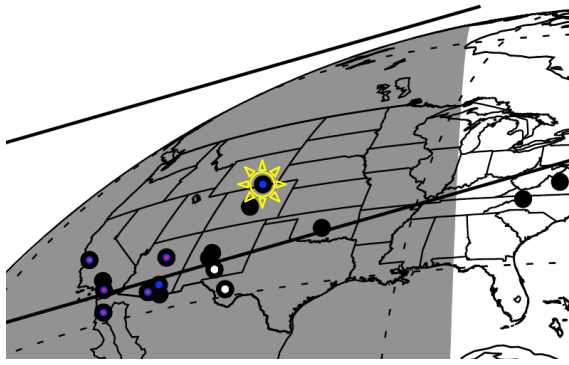
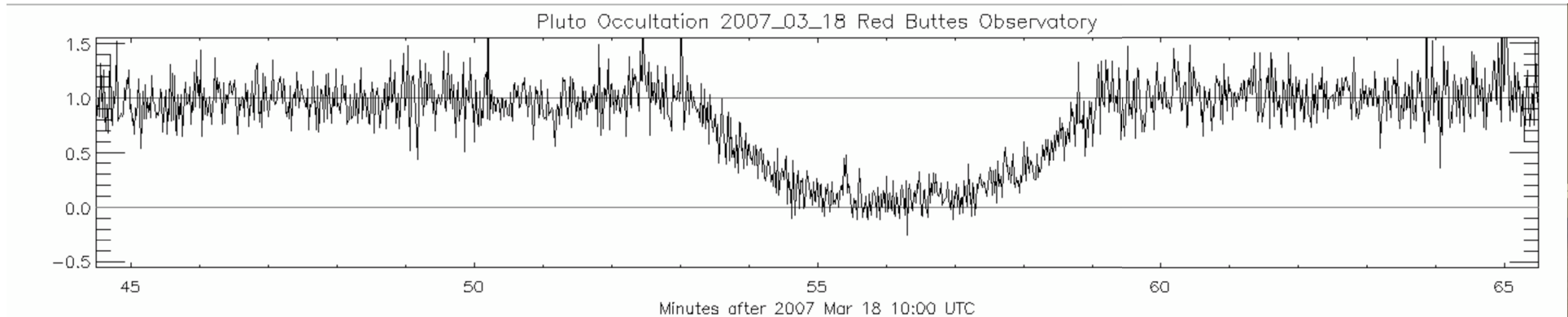
- Has Pluto's atmosphere begun its collapse?
- Is there significant haze in Pluto's lower atmosphere?
- Any surprises?

2007 Mar 18 Pluto Occultation

Coauthor and lightcurve list

B	R	I	H	K	Location and observers
		1			Red Buttes Observatory, Robert R. Howell, Eric J. Hausel (Univ. of Wyoming)
				2	Lick Observatory, Scott Severson , Katie M. Morzinski (UC, Santa Cruz)
	3	4	5		Lowell Observatory, Marc Buie, Philip Massey, Robert Millis (Lowell)
		6		7	Palomar Observatory, Dick French (Wellesley), Phil Nicholson (Cornell), Keith Matthews (CIT), Kevin Shoemaker (Shoemaker Labs)
		X		X	Apache Point Observatory, Nancy Chanover, Jon Holtzman, Tanya Tavenner Chas Miller (NMSU), Jeff Regester (Greensboro Day School, Amanda Zangari (Wellesley), John Bally (CU)
		8			Mt Lemmon, Henry Roe (Lowell), Richard Hill (U Az)
		9			Table Mountain Observatory James Bauer, James Young, Bill Owen (JPL)
		10			WIYN, Cathy Olkin (SwRI), Steve Howell (WIYN)
	11		12	13	McMath-Pierce/KPVC (I,H,K) Don Jennings, Laddawan Miko (GSFC), Pedro Sada (U. de Monterrey), Claude Plymate (NSO), Llynn Haase (KPVC)
		14		15	San Pedro Martir, Leslie Young, Trina Ruhland (SwRI), Luis Salas, David Hiriart (U. Nacional Autónoma de México)
X		X			McDonald Observatory, Eliot Young (SwRI) Ted von Hippel, Don Winget, Karen Winget (U. Texas)

geometric solution (4 chords)



Red Buttes (0.6 m)

Robert R. Howell (Univ. of Wyoming),

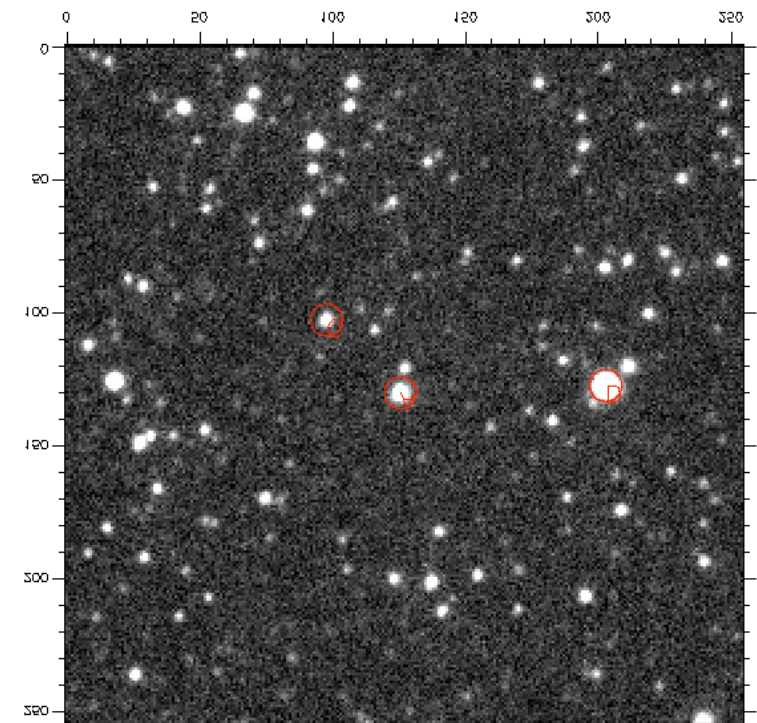
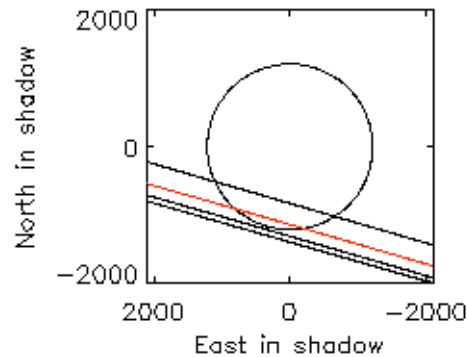
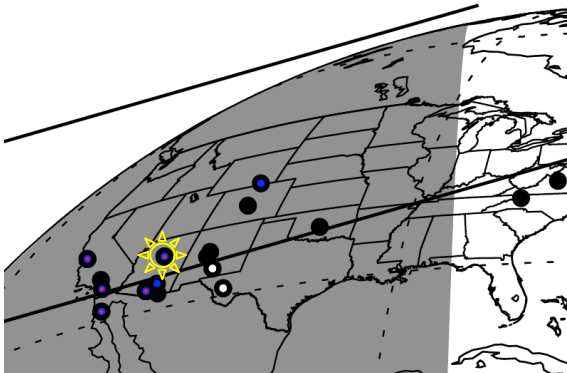
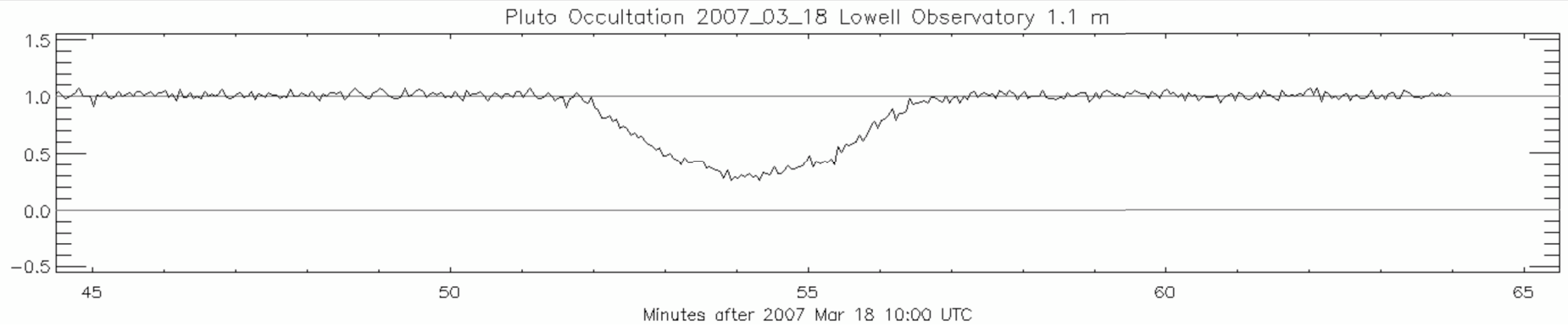
Eric J. Hausel (Univ. of Wyoming)

PHOT, I-filter, 1.0 s

1.1 arcsec/bin binned pix (2x2) , 4.7 arcmin FOV

Clear. Seeing 3-10 arcsec

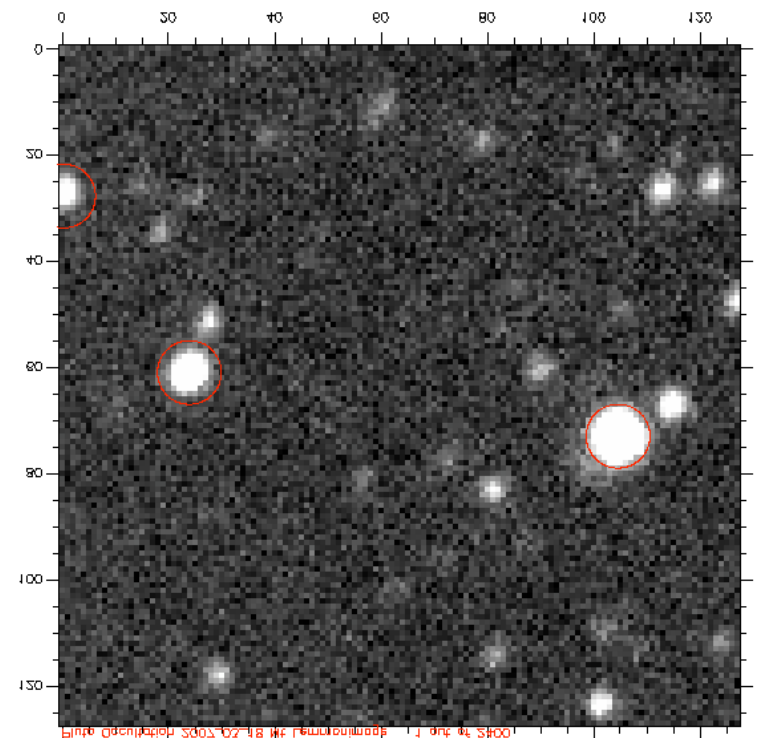
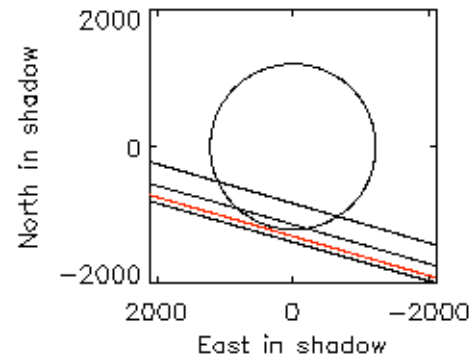
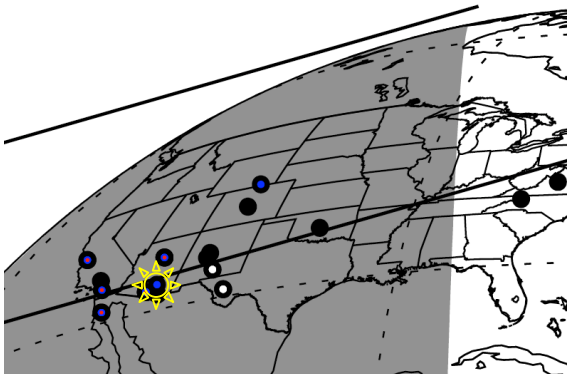
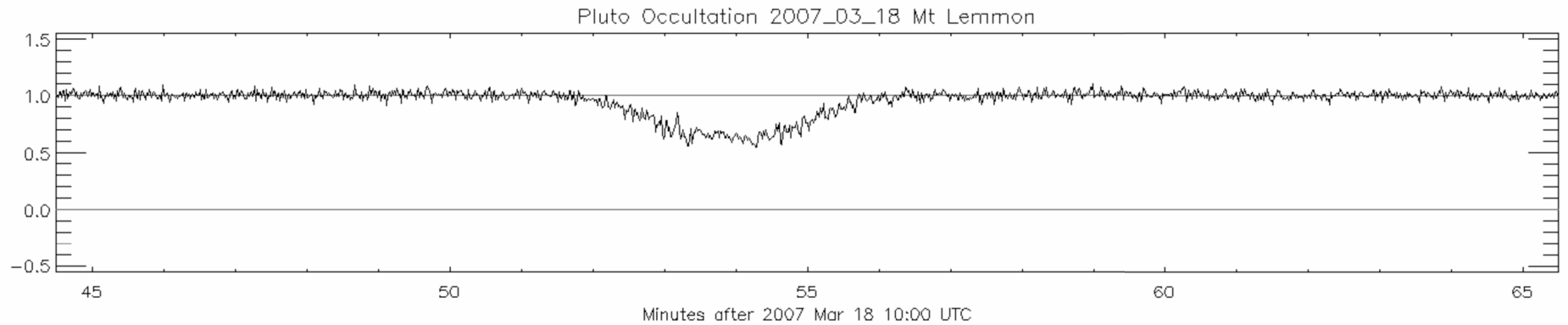
geometric solution (4 chords)



Lowell Observatory 2007-03-18 Lowell 1.1 m - 11:11:55.000

Lowell (1.1 m)
 Philip Massey, Marc Buie (Lowell)
 PHOT, I-filter, 3.0 s
 0.62 arcsec/bin pixel (2x2), 2.7 arcmin FOV
 Mostly clear, 1.9 arcsec FWHM

geometric solution (4 chords)



Mt Lemmon (1.5 m).

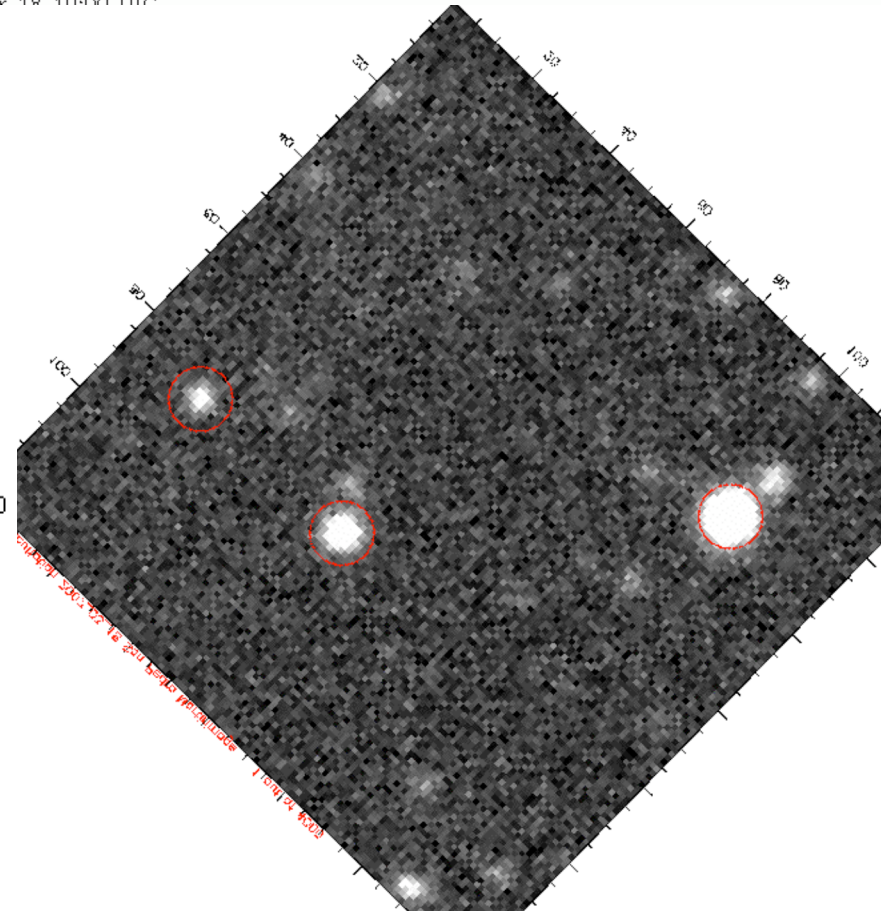
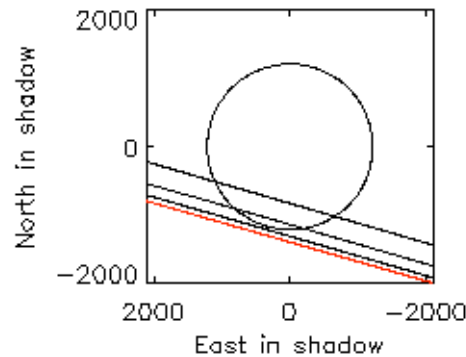
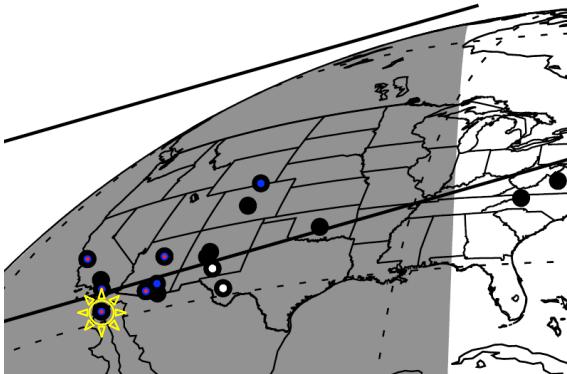
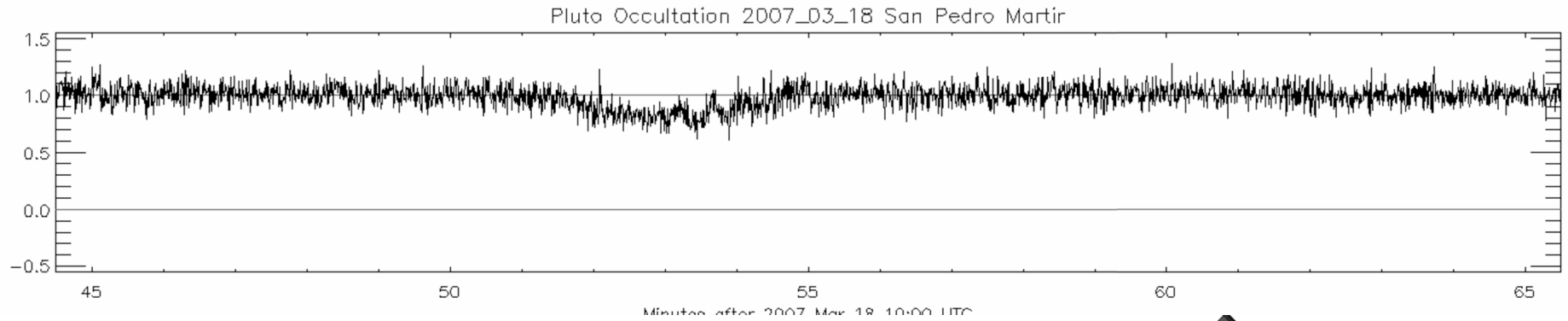
Henry Roe (Lowell), Rick Hill (U of A)

PHOT, I-filter, 1.0 s

0.61 arcsec/bin pixel (4x4), 1.3 arcmin FOV

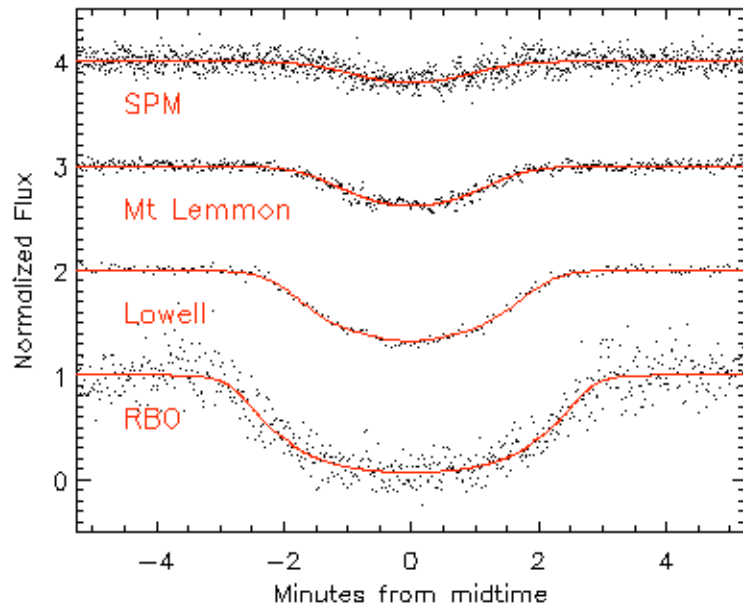
Clear, 1.8 arcsec FWHM

geometric solution (4 chords)

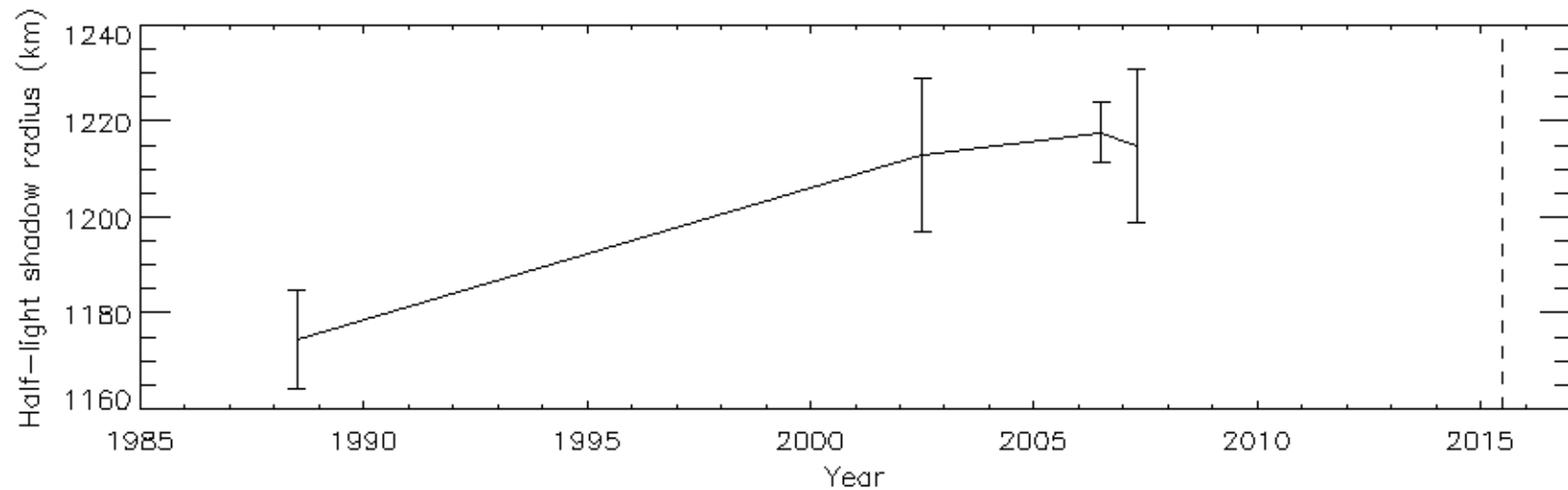


San Pedro Martir (1.5 m).
Leslie Young (SwRI),
David Hiriart (Instituto de Astronomía)
PHOT, I-Filter, 0.5 s
0.68 arcsec/bin pixel (4x4), 1.5 arcmin FOV
Clear, 2-3 arcsec FWHM

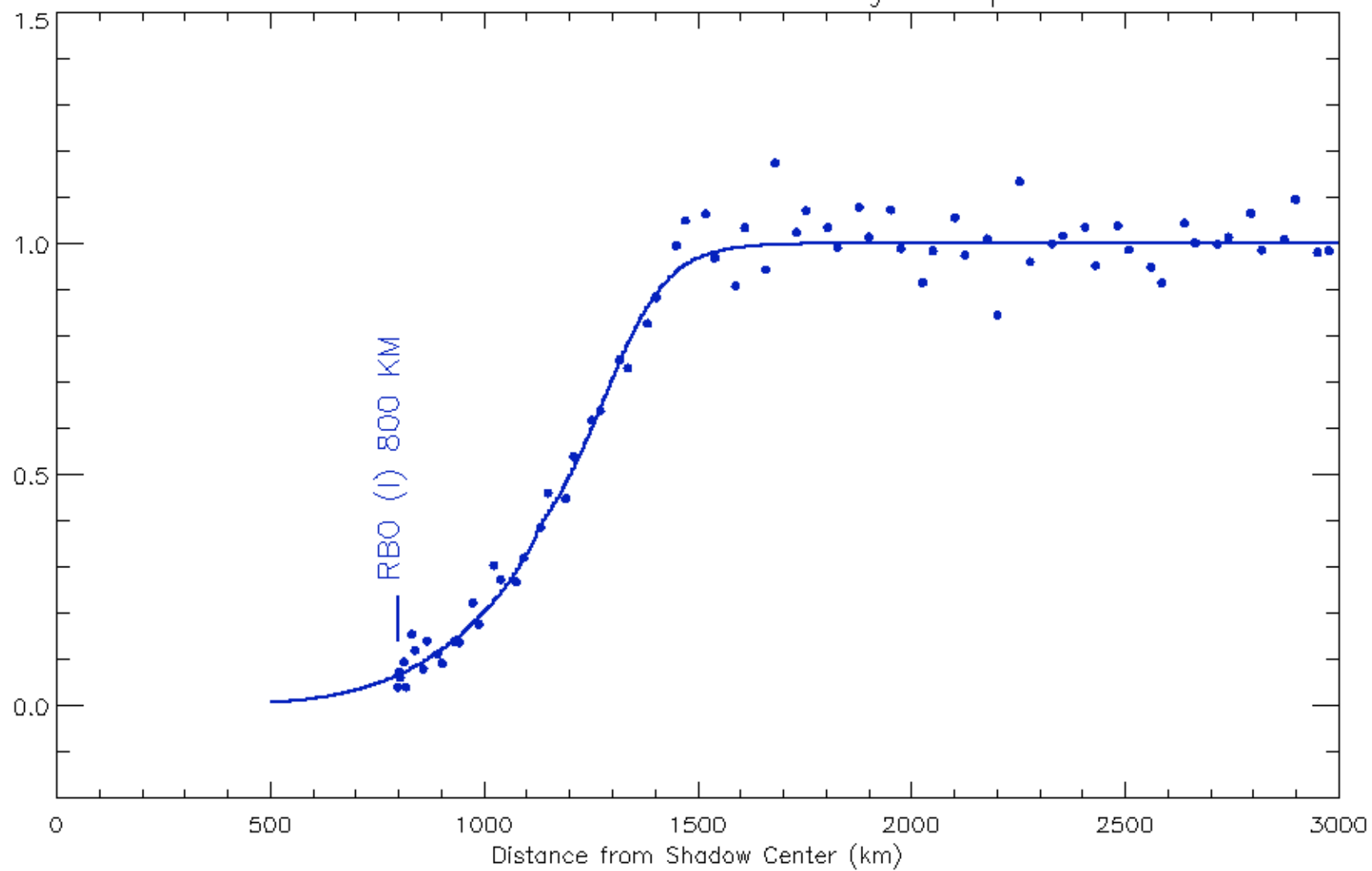
geometric solution preliminary results



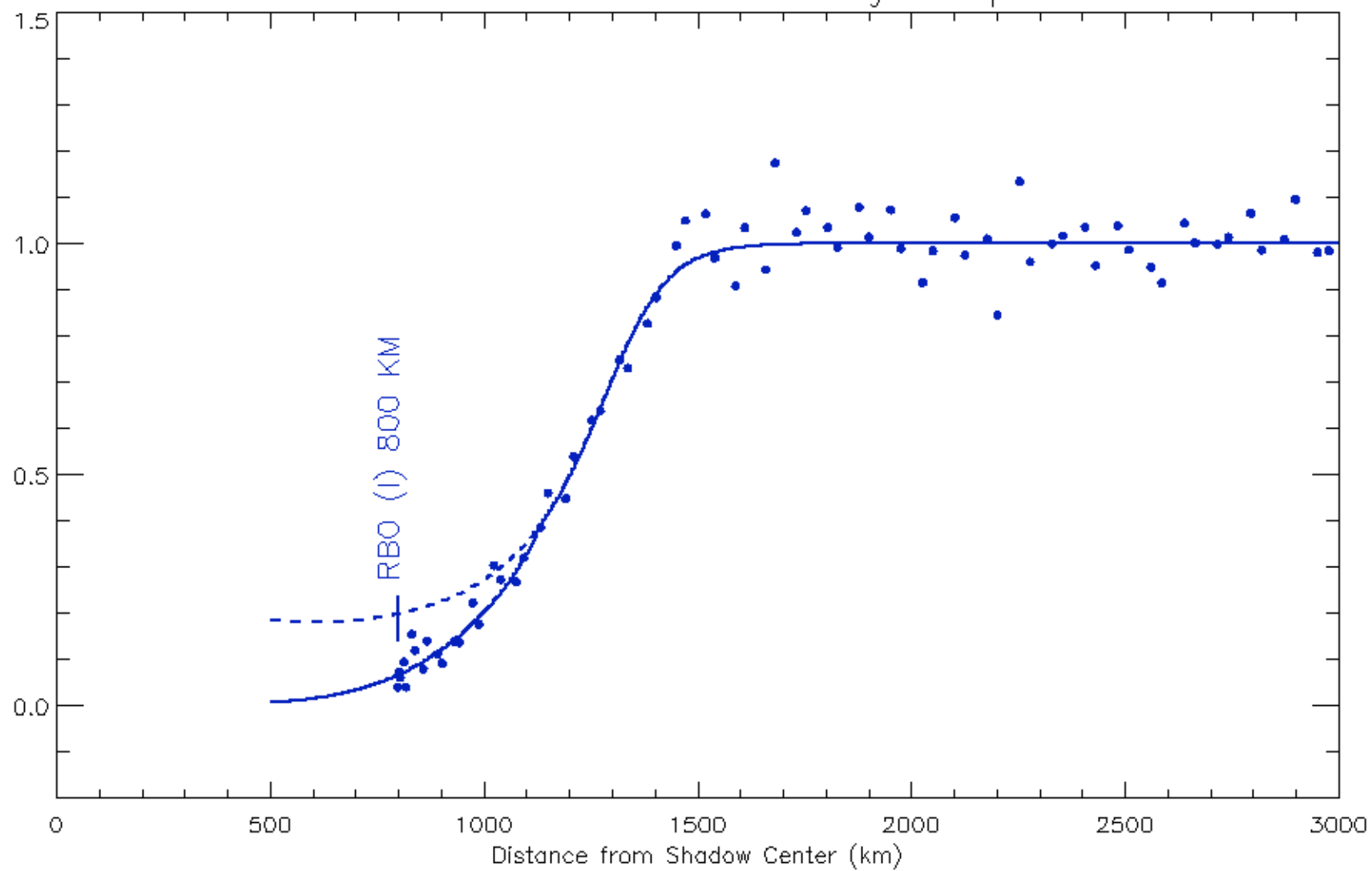
Year	Half-light radius (km)
1988	1175 $\pm$ 10
2002	1213 $\pm$ 16
2006	1218 $\pm$ 6
2007	1215 $\pm$ 16



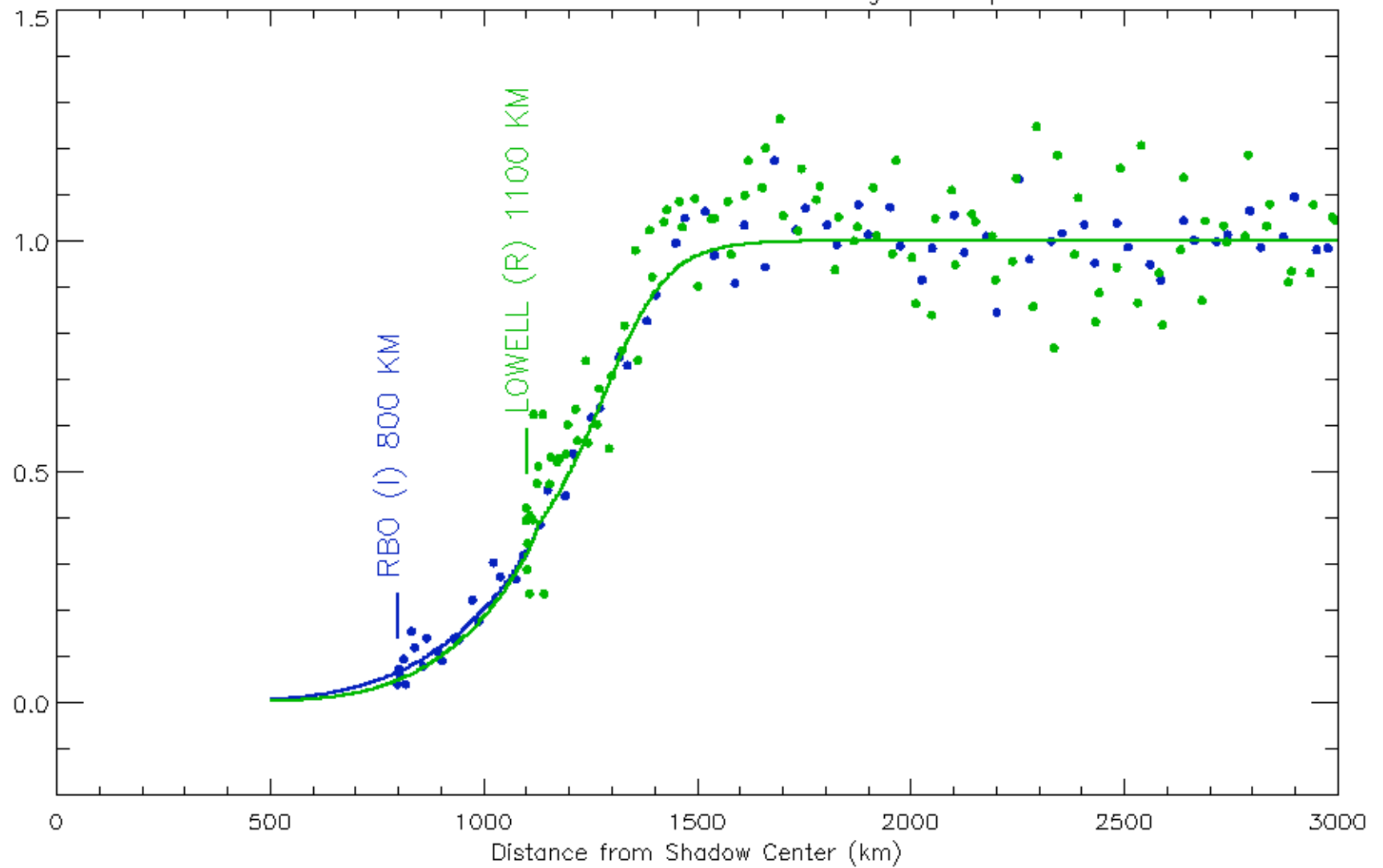
Pluto Occultation 2007_03_18 Wavelength Comparison



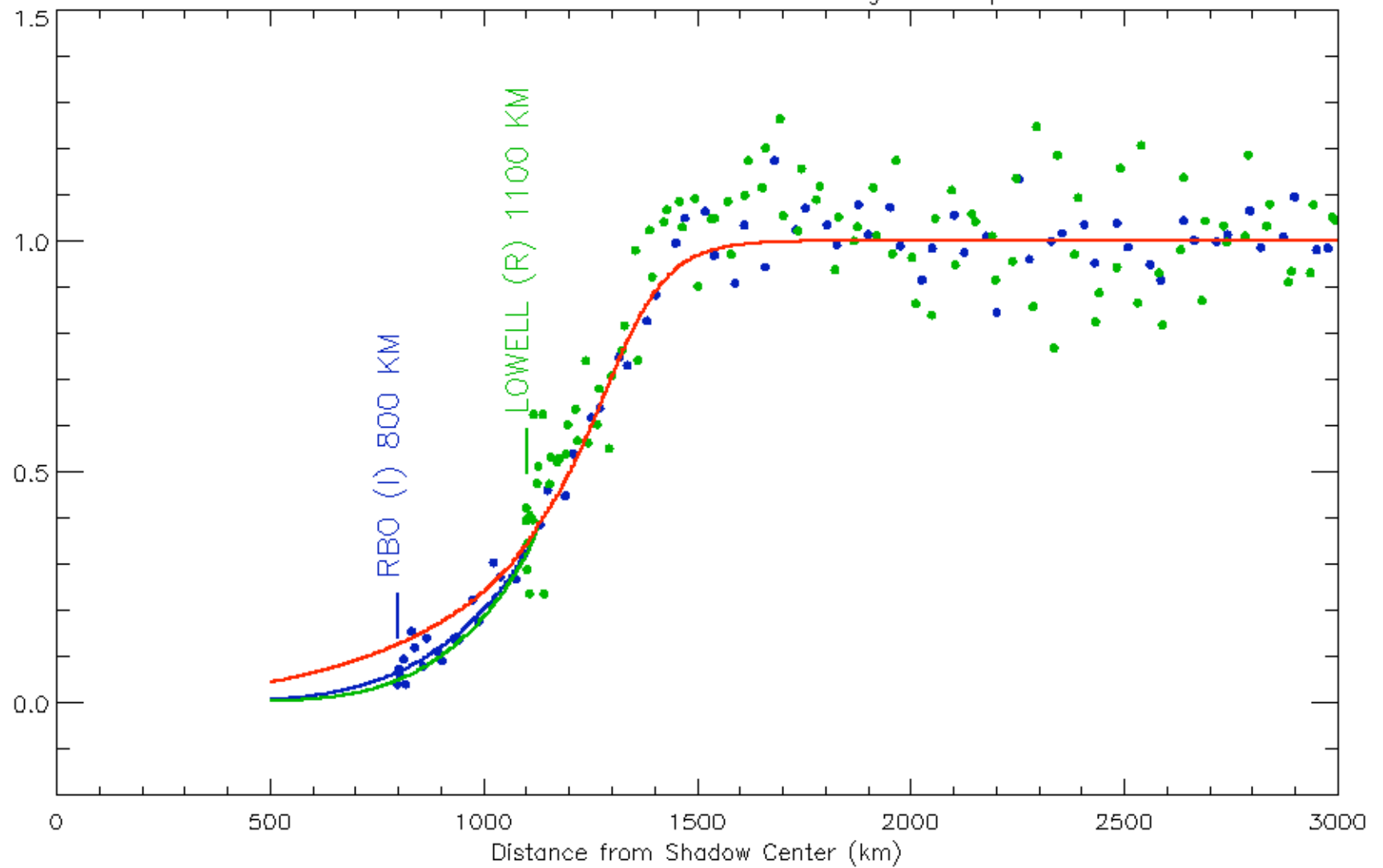
Pluto Occultation 2007_03_18 Wavelength Comparison



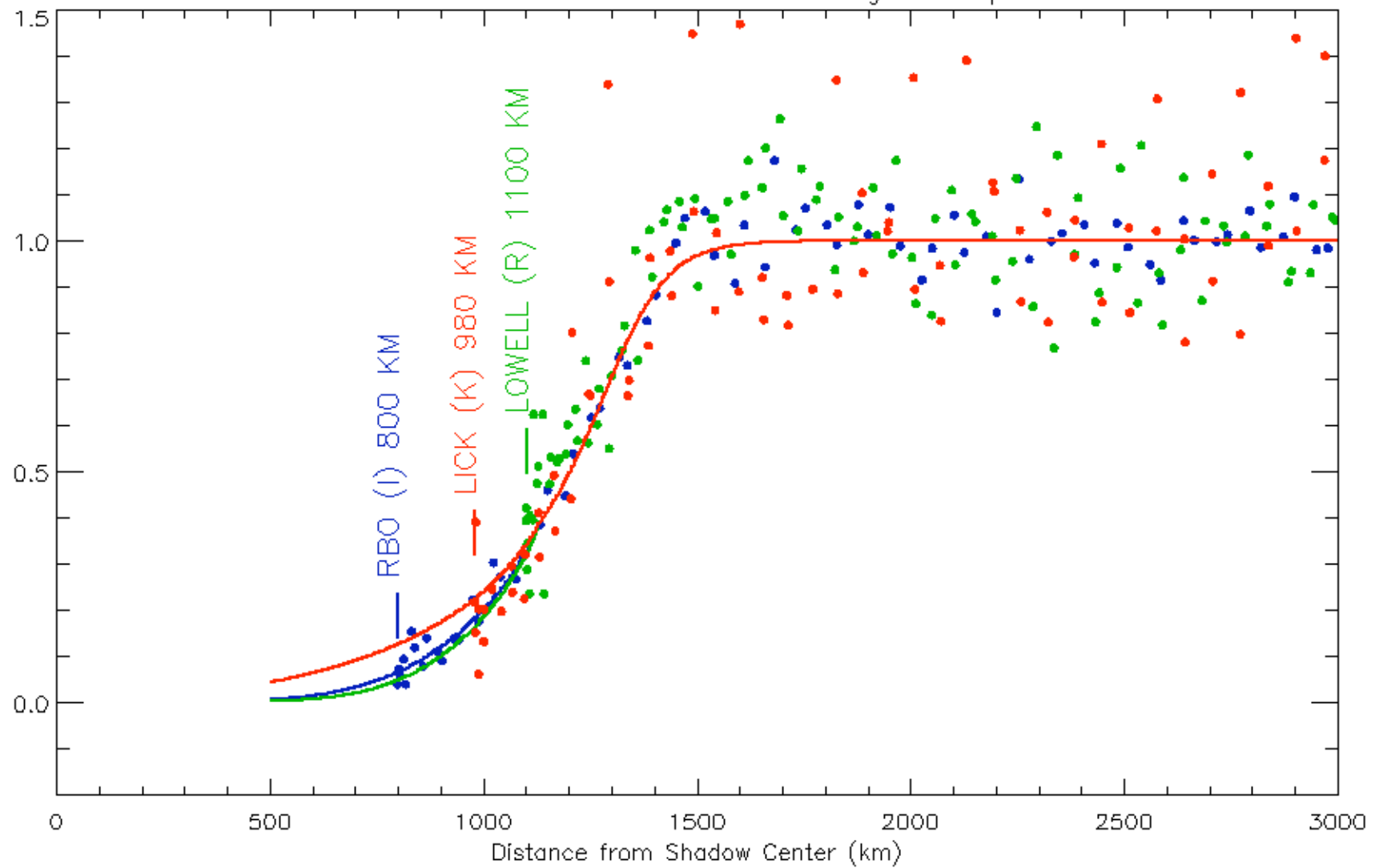
Pluto Occultation 2007_03_18 Wavelength Comparison



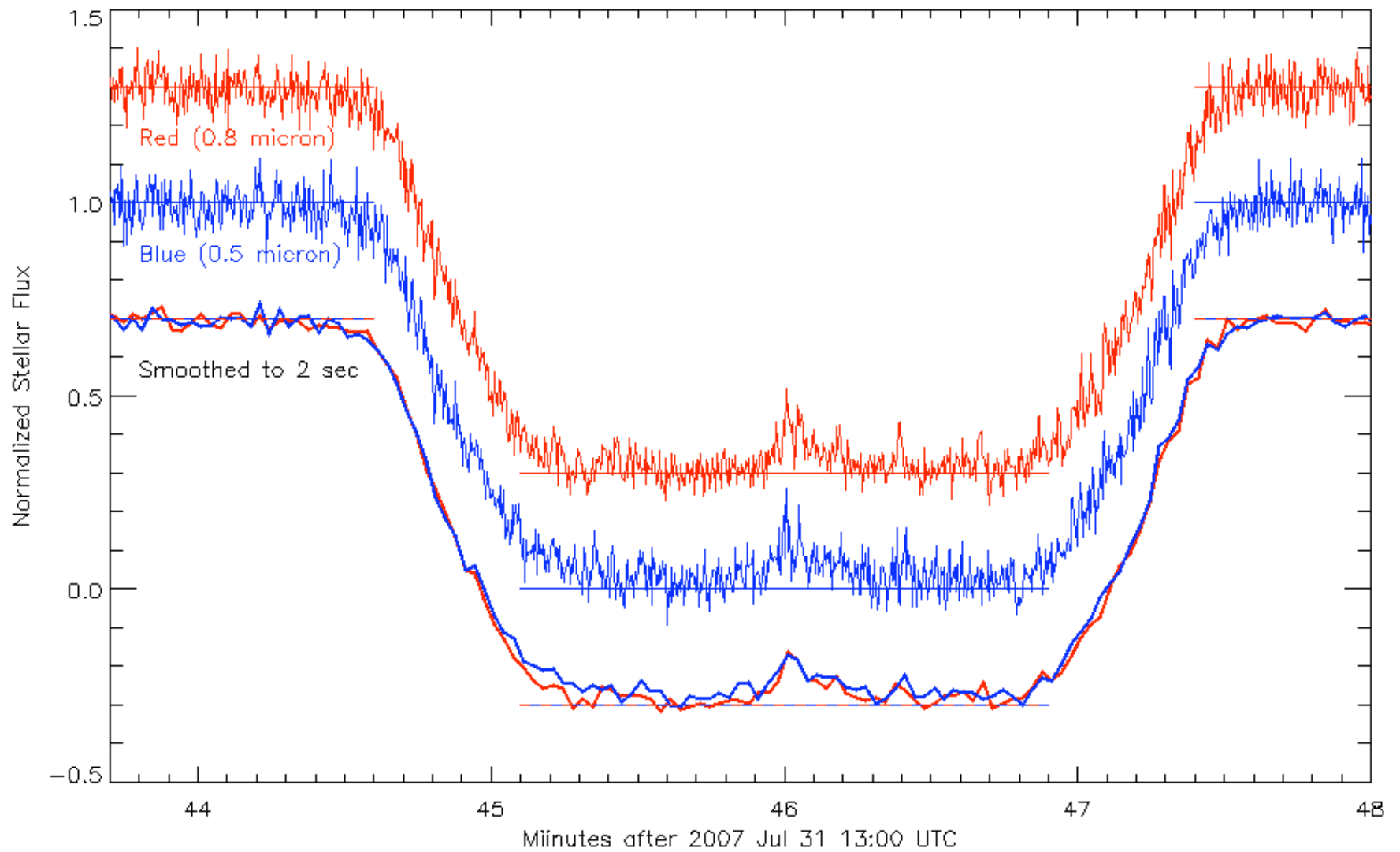
Pluto Occultation 2007_03_18 Wavelength Comparison



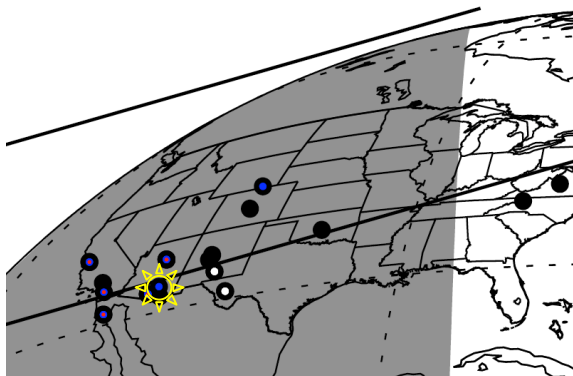
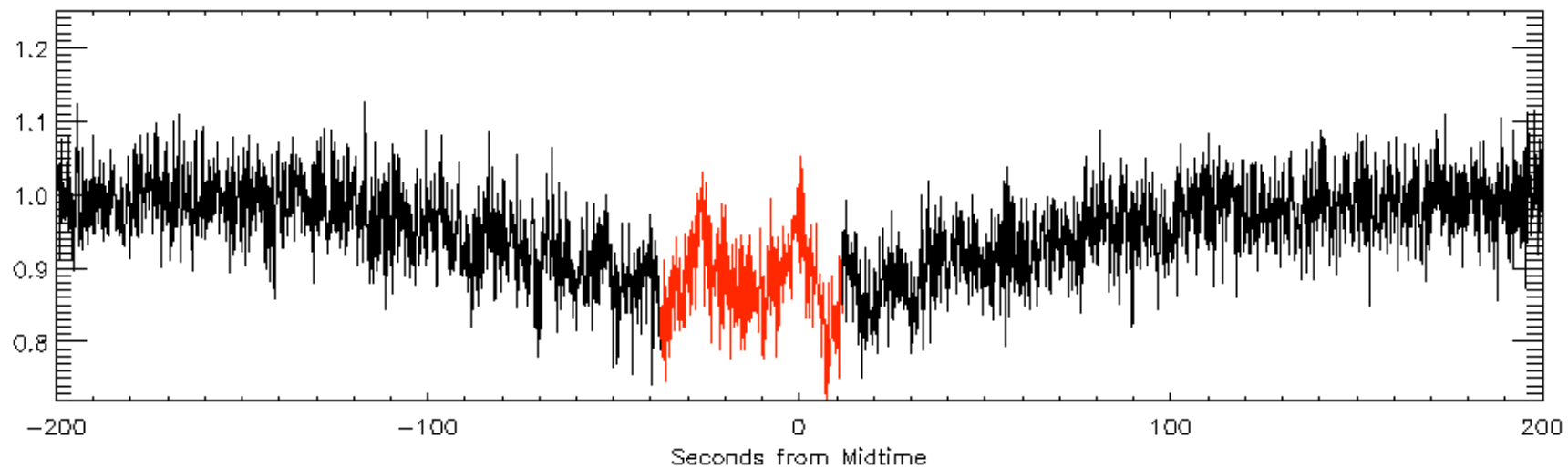
Pluto Occultation 2007_03_18 Wavelength Comparison

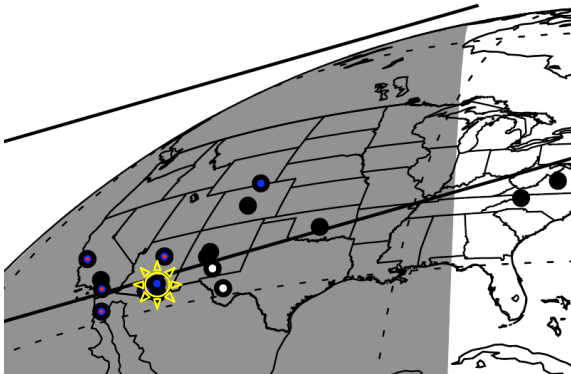
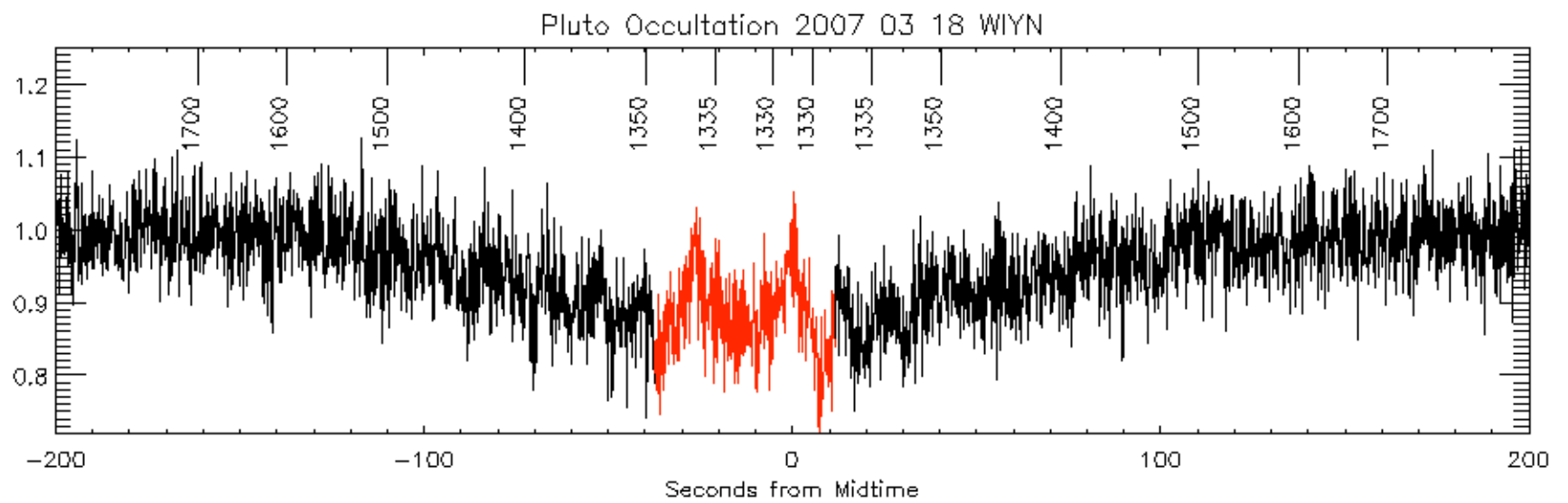


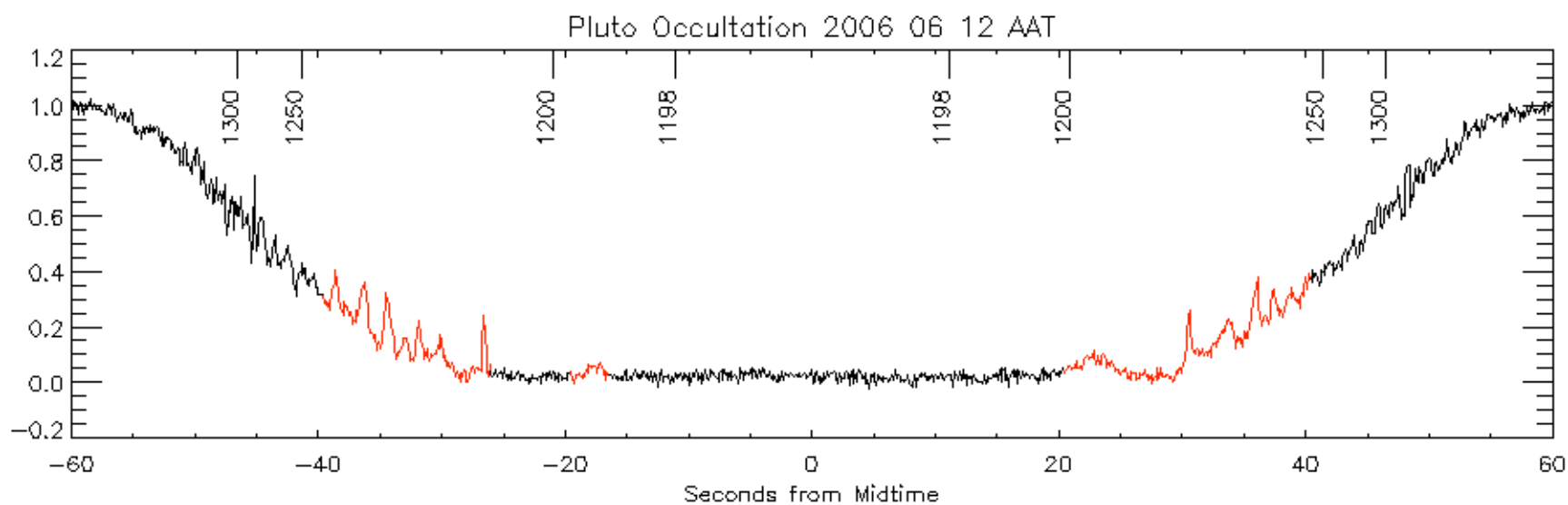
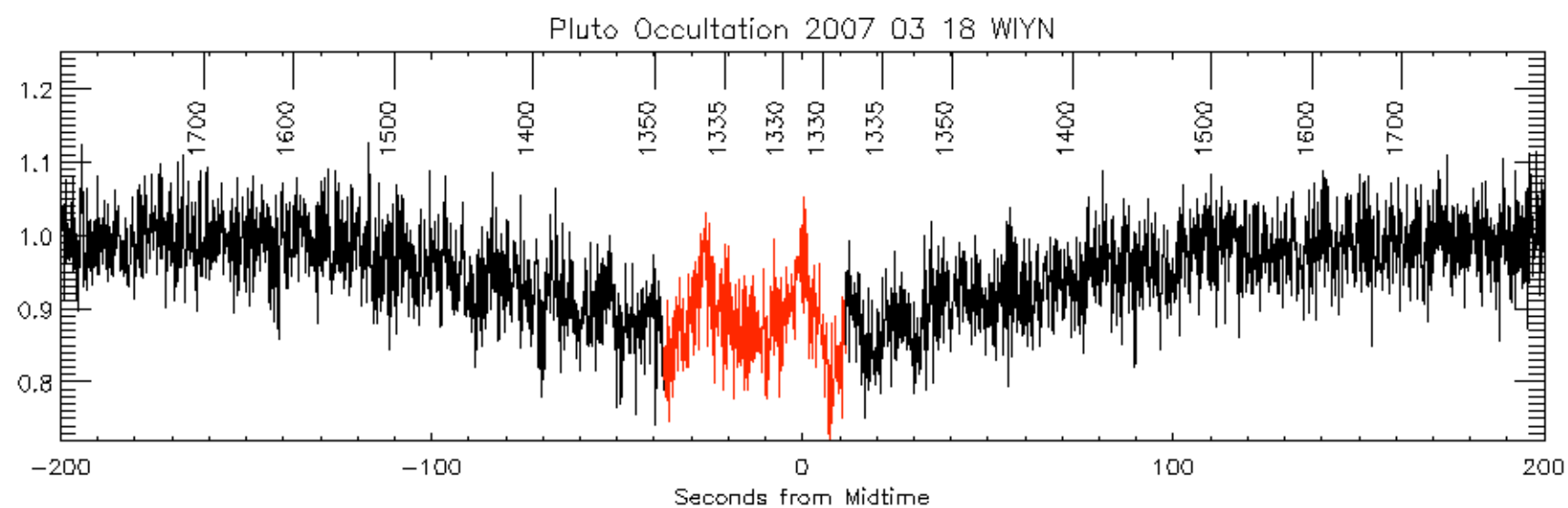
Pluto Occultation 2007 Jul 31 Mt John

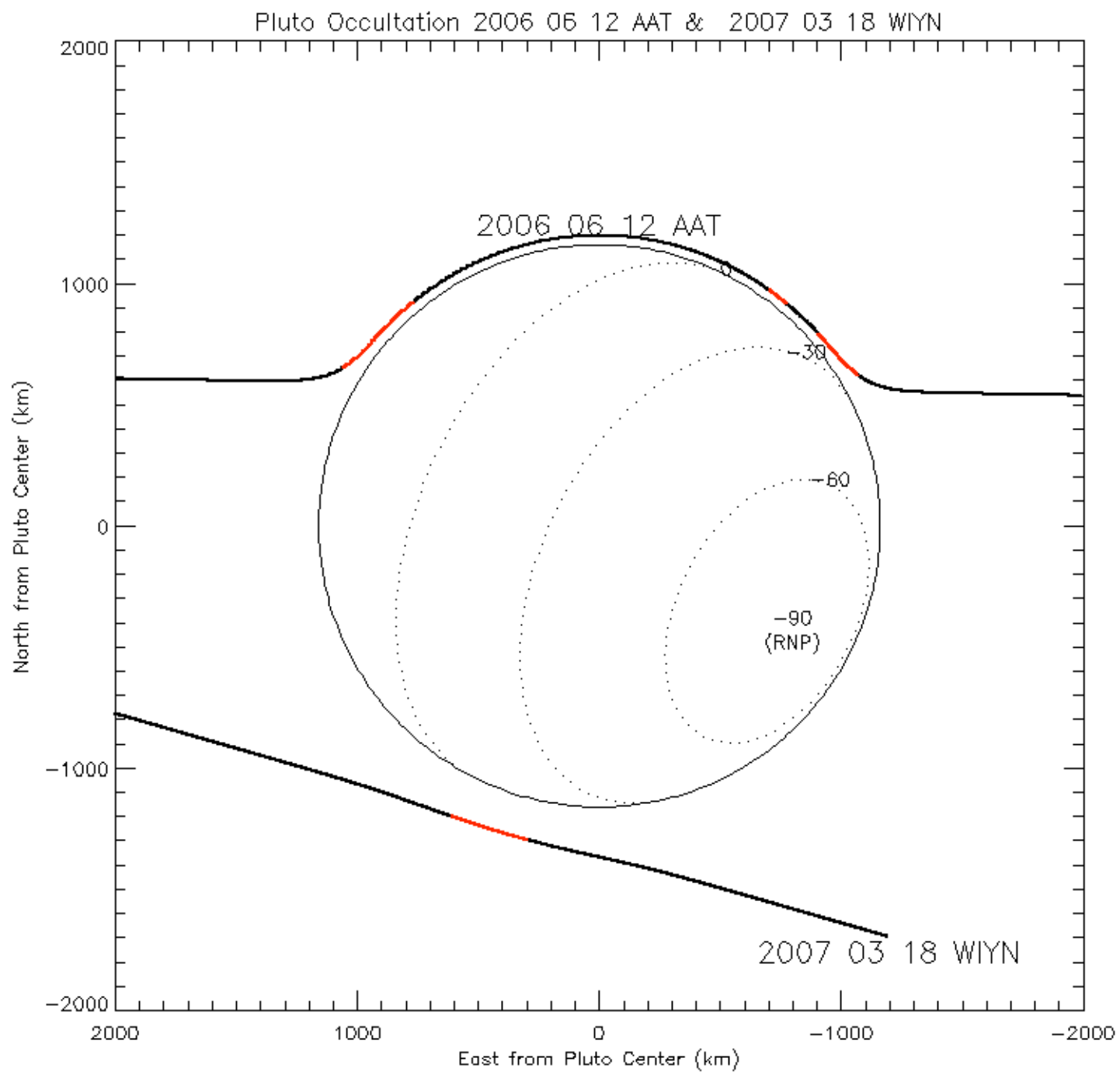


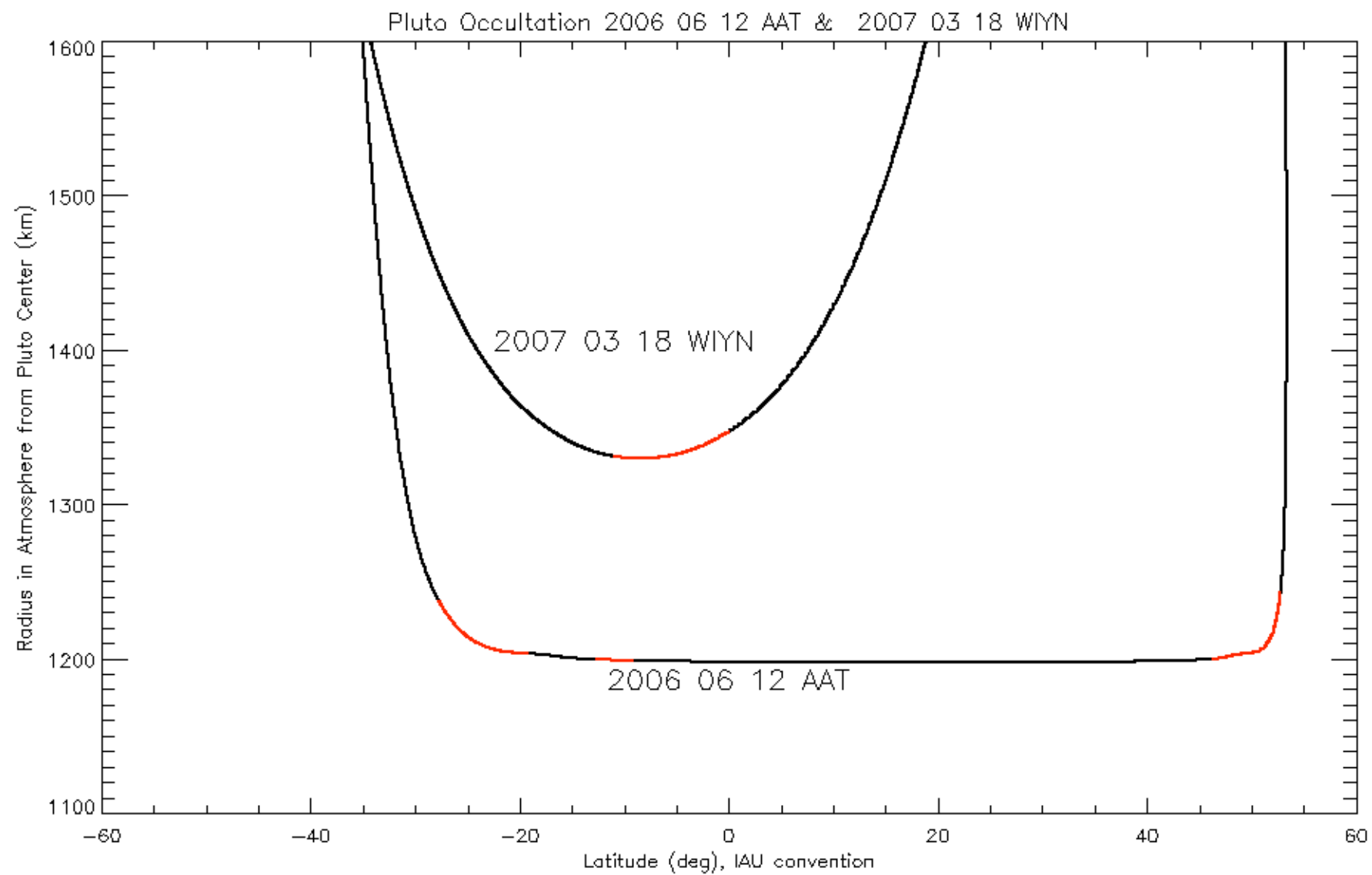
Pluto Occultation 2007 03 18 WIYN

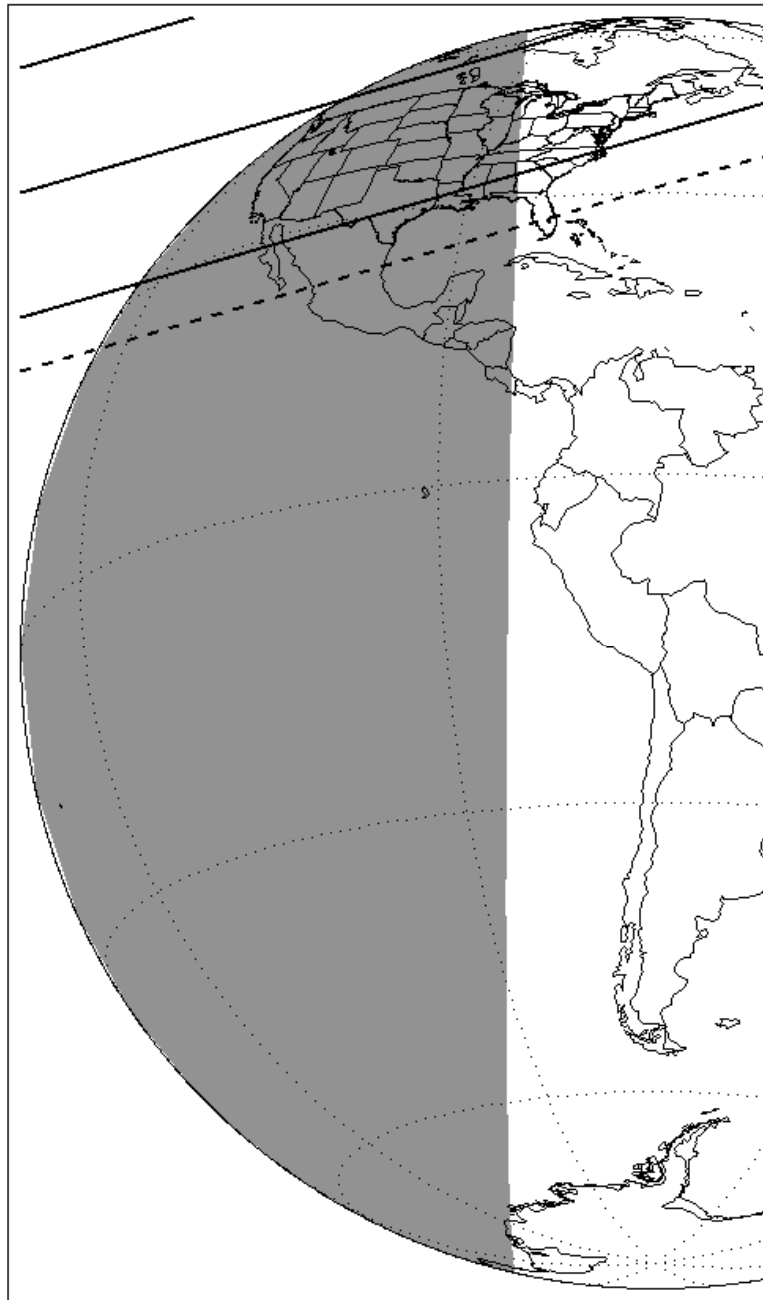












Conclusions

- Has Pluto's atmosphere begun its collapse?

No significant change since 2002. The July 31 event will provide tighter constraints.

- Is there significant haze in Pluto's lower atmosphere?

Preliminary analysis of the March event favors a clear lower atmosphere, with tighter limits expected from July 31 event.

- Any surprises?

High-altitude spikes, which may be related to dynamics at mid-latitudes in the summer hemisphere.