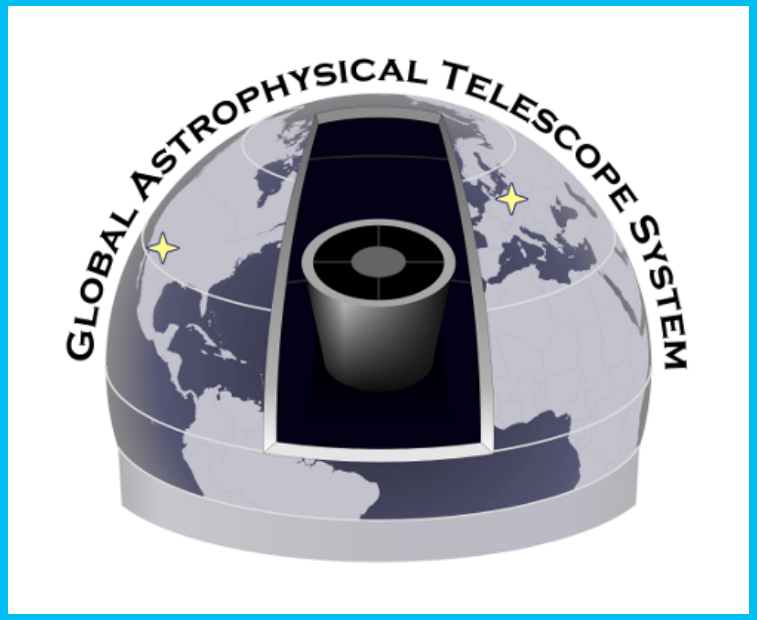
PST2 – Poznań telescope in Arizona

Tadeusz Michałowski

Astronomical Observatory
Adam Mickiewicz University
Poznań, Poland

8th OPTICON Gaia Science Alerts Workshop
Warsaw, Poland, 6-8 December 2017

Small telescopes – wide spectrum of possibilities



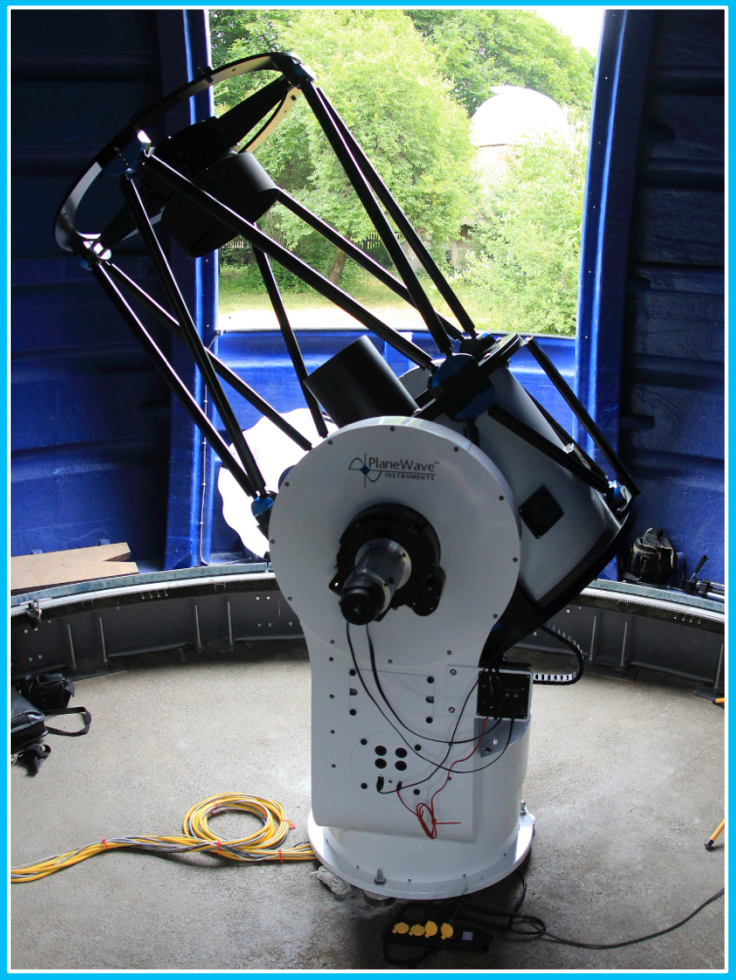
Krzysztof Kamiński, Wojciech Dimitrow,
Magda Polińska, Monika Kamińska, Wojciech Borczyk

Astronomical Observatory
Adam Mickiewicz University, Poznań, Poland

GATS

Global Astrophysical Telescope System = PST1 + PST2

Poznań Spectroscopic Telescope 2

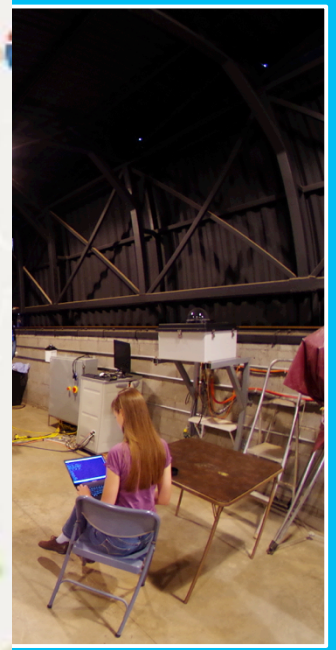


0.7m, dual Nasmyth

fiber-fed, echelle, R~40000
CCD: Andor iKon-L

Global Astrophysical Telescope System

Astronomical Observatory of Adam Mickiewicz University



Winer Observatory, AZ

Global Astrophysical Telescope System

Astronomical Observatory of Adam Mickiewicz University

Remote control and robotic observations

DB: 0 | 2 [s] auto-refresh | auto: OFF | status: 1 | commands | last: (-1) | current: (-1) | next: (0) power_up | edit

Device name	Status	Current comm	Comm res	_error	_log	_out	_params	_in_auto	_in_manual
Planewave CDK700	4		none	more...	more...	more...	more...	more...	more...
Andor iKon-L CCD	4		0	more...	more...	more...	more...	more...	more...
Andor iXon EMCCD	4		none	more...	more...	more...	more...	more...	more...
SBIG ST-7 (abox)	4		none	more...	more...	more...	more...	more...	more...
SBIG ST-7 (expo)	4		0	more...	more...	more...	more...	more...	more...
SBIG ST-7 (guider)	4		none	more...	more...	more...	more...	more...	more...
Shelyak calibration lamps	0		0	more...	more...	more...	more...	more...	more...
FLI filter wheel	0		none	more...	more...	more...	more...	more...	more...
ScopeDome	none	none	none	more...	more...	more...	more...	more...	more...
Thermometer	0			more...	more...	more...	more...		
Oasis chiller	7			more...	more...	more...	more...		
Barometer	0			more...	more...	more...	more...		
Thermostat	0			more...	more...	more...	more...		
APC UPS	0			more...	more...	more...	more...		
Weather station	none			more...	more...	more...	more...		

Planewave CDK700	RA_{J2000} = 0.000000	Dec_{J2000} = 0.000000	tracking OFF	**focuser:** 0	**rotator:** 0.000°	**m3:** 0
Andor iKon-L	T_{CCD}: -6.6°C	t_{exp}: 1.00s	**max signal:** 21157 ADU		T_{oasis}: 19.60°C	Eff_{oasis}: -100
Andor iXon EMCCD	T_{CCD}: 0.0°C	t_{exp}: 1.00s		AG_{corr}: (,)	$fiber_{RA,Dec}$: (,)	**filter:** L
SBIG ST-7 (abox)	T_{CCD}: 0.0°C	t_{exp}: 0.20s		AG_{corr}: (,)	$fiber_{x,y}$: (0.000, 0.000)	
SBIG ST-7 (expo)	T_{CCD}: 0.0°C	t_{exp}: 0.20s	**total signal:** ADU/pix			
SBIG ST-7 (guider)	T_{CCD}: 0.0°C	t_{exp}: 0.20s	**total signal:** 0.0 ADU/pix	AG_{corr}: (,)	$fiber_{RA,Dec}$: (,)	**filters** OFF
Thermo & Baro	T_{now}: 28.01°C	$power_0$: 0.3550		**press:** 1004.40 hPa		
Lab-El	T_1: 28.62°C	T_2: 27.97°C	T_3: 28.7°C	**press:** 1004.7 hPa	**humidity:** 40.6%	
Other	UPS power: AC	**Shelyak:** M F				
last file saved	ikon	/home/gats/obs/i0000000506stability_test_flat.fits		ixon		
	abox			guider		
	expo					

AUTO

STOP WORK

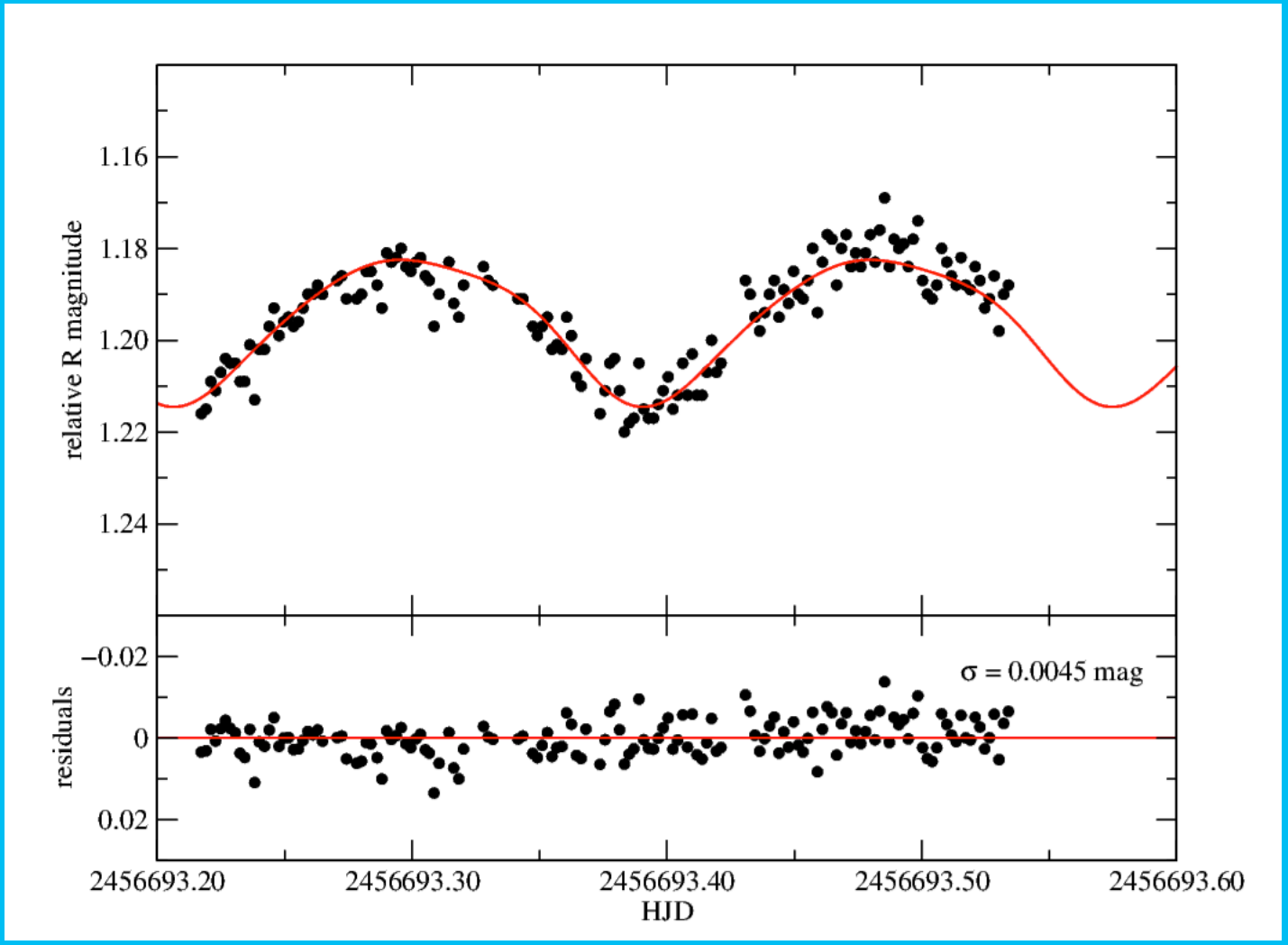
POWER OFF

CLOSE ROOF

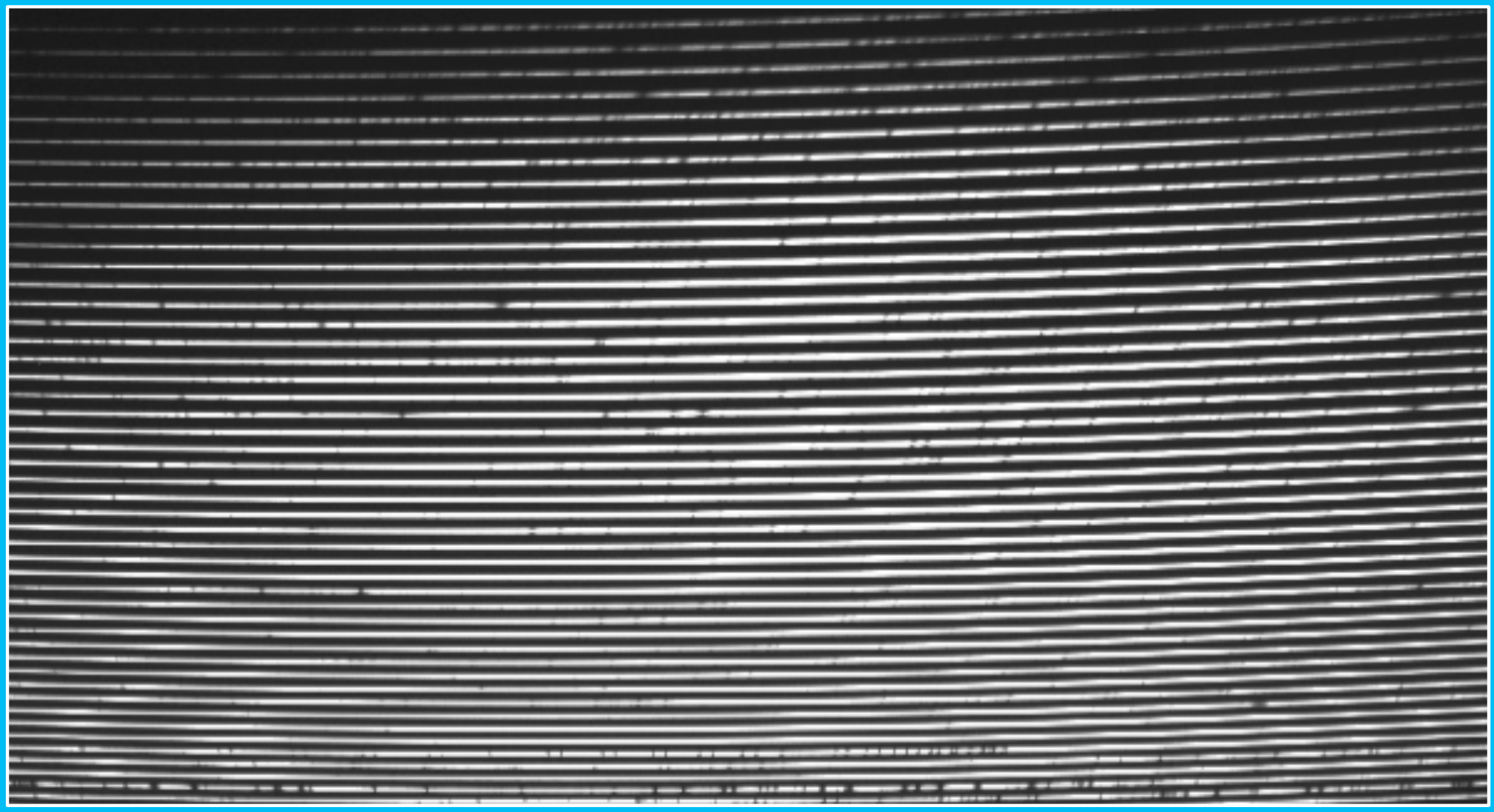
Spectroscopy and photometry of the bright stars

S/N~150 in 5min for 3 mag
390-900nm, R~40000

Beta Cep

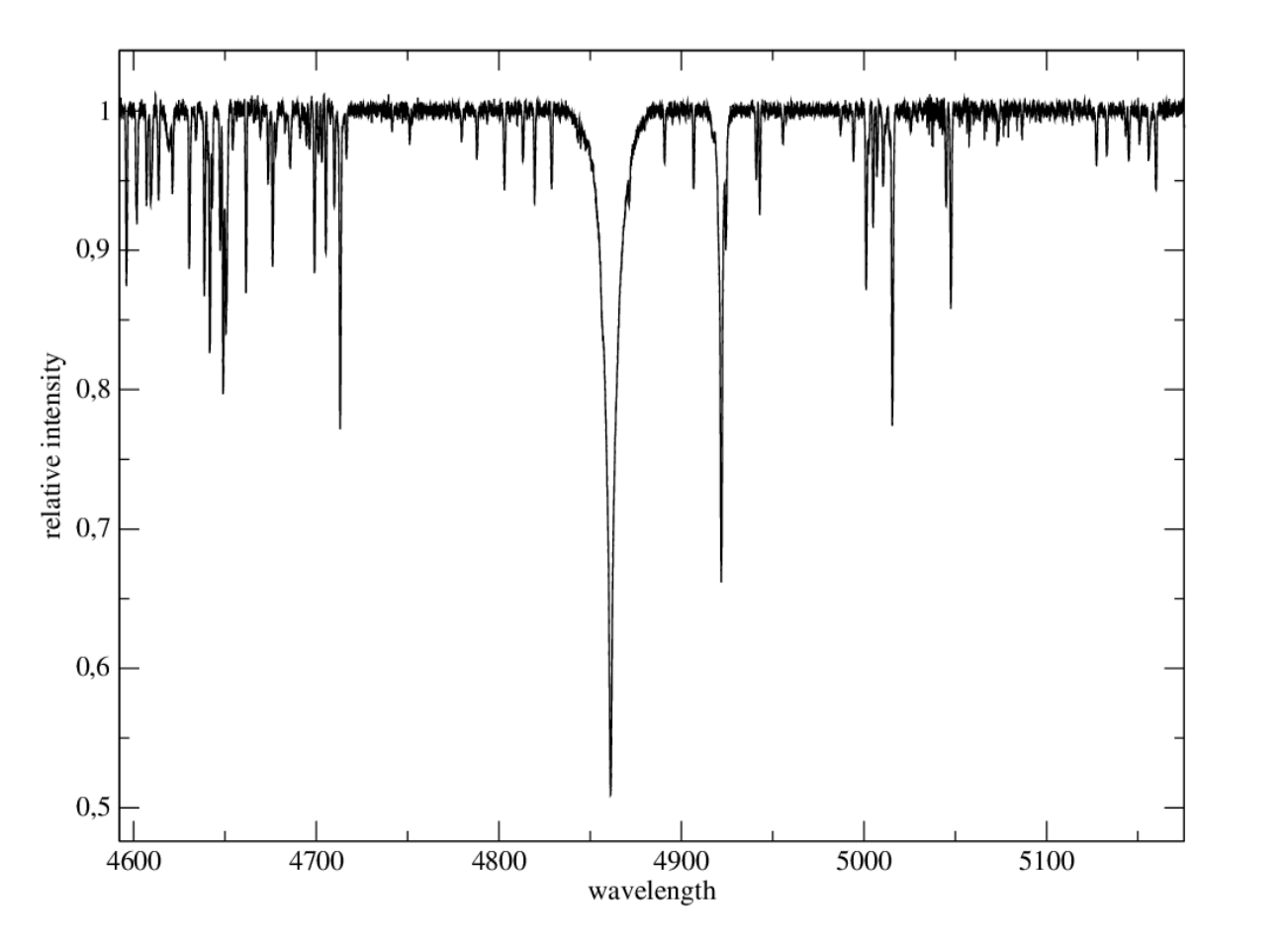

relative R magnitude
1.16
1.18
1.20
1.22
1.24
residuals
−0.02
0
0.02
σ = 0.0045 mag
2456693.20
2456693.30
2456693.40
2456693.50
2456693.60
HJD

Automatic spectra reduction



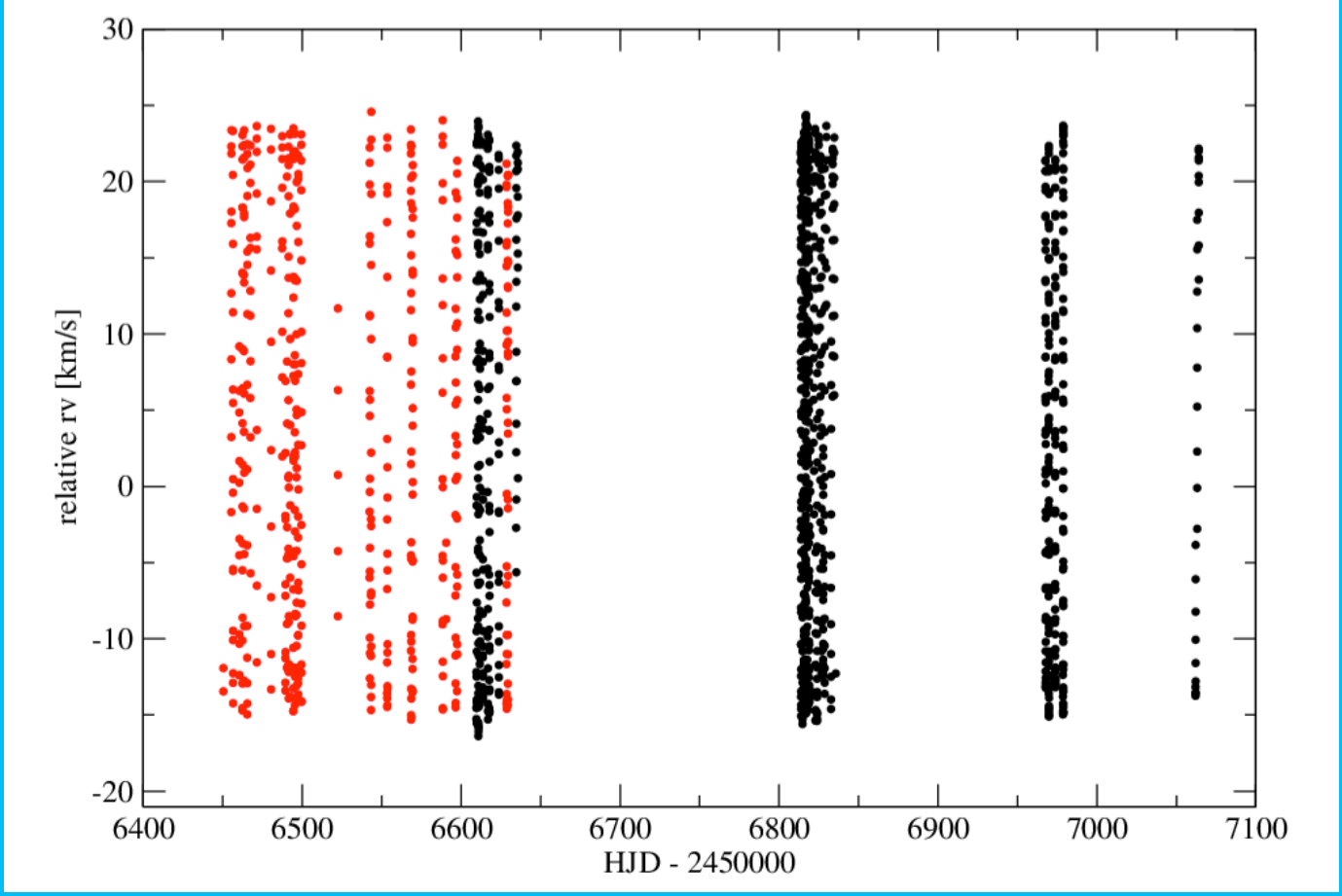
Echelle spectrum

Beta Cep



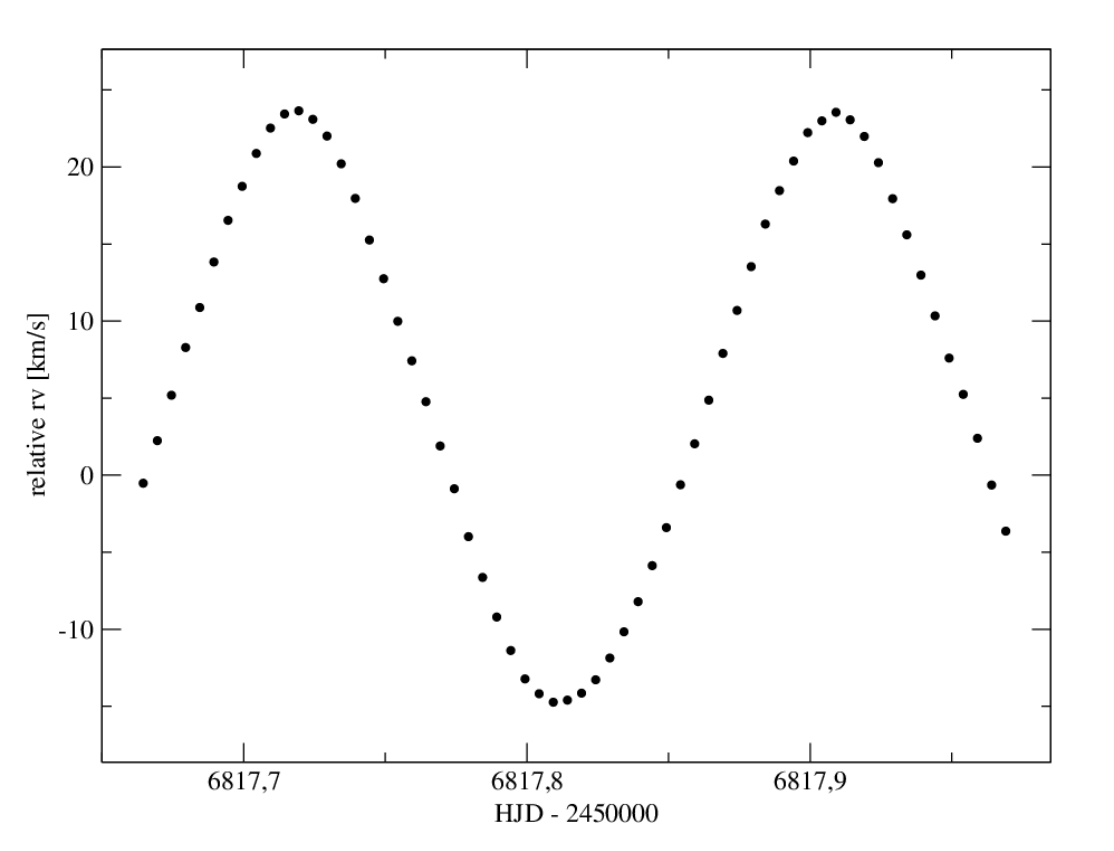
Mean Beta Cep spectrum (S/N~170 → 450)

Beta Cep



(1479 spectra)

Beta Cep



Radial velocities from cross corellation

Photometry of asteroids

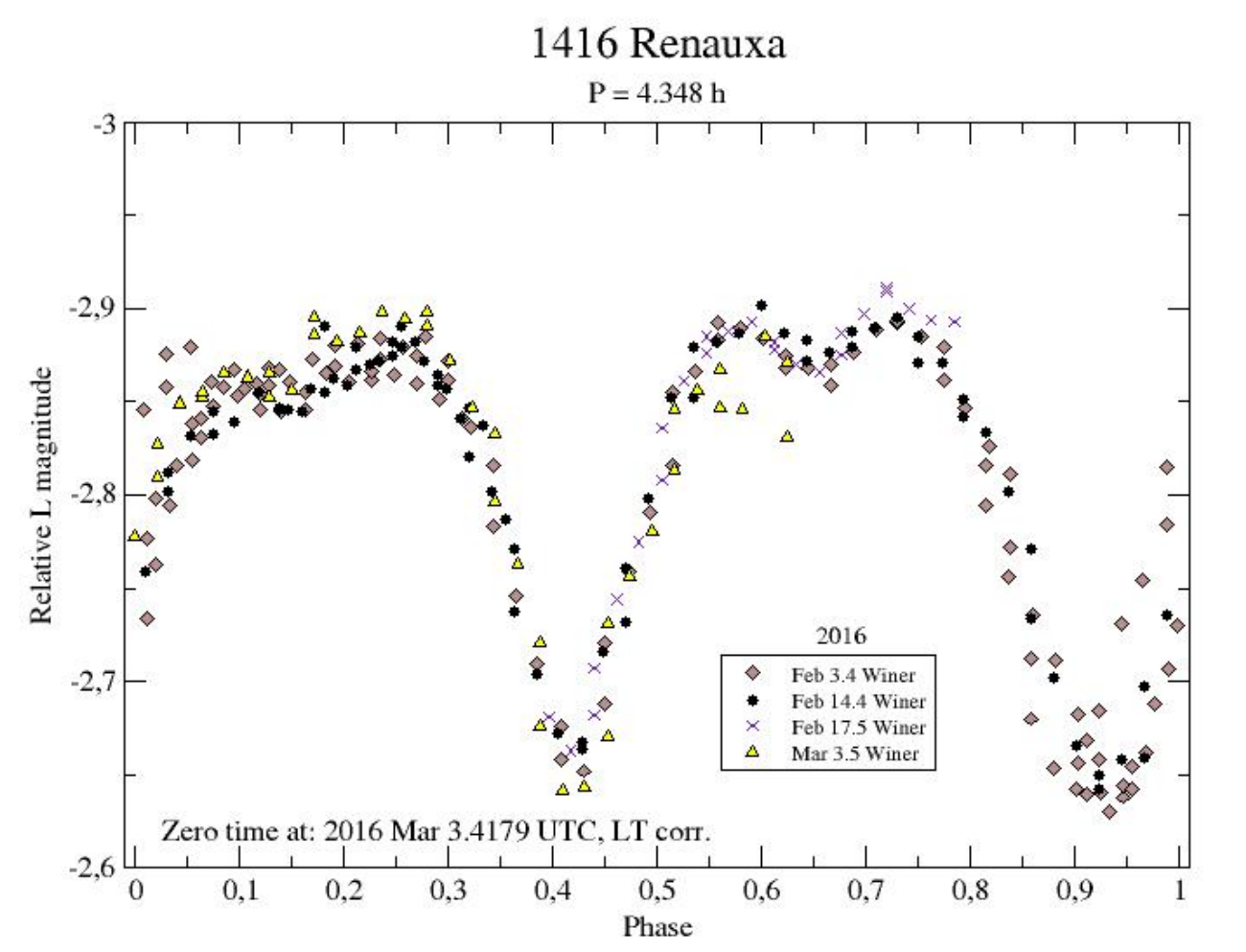
Field: 10’ x 10’

CCD: Andor iXon

Exp. Time: 4-5 min

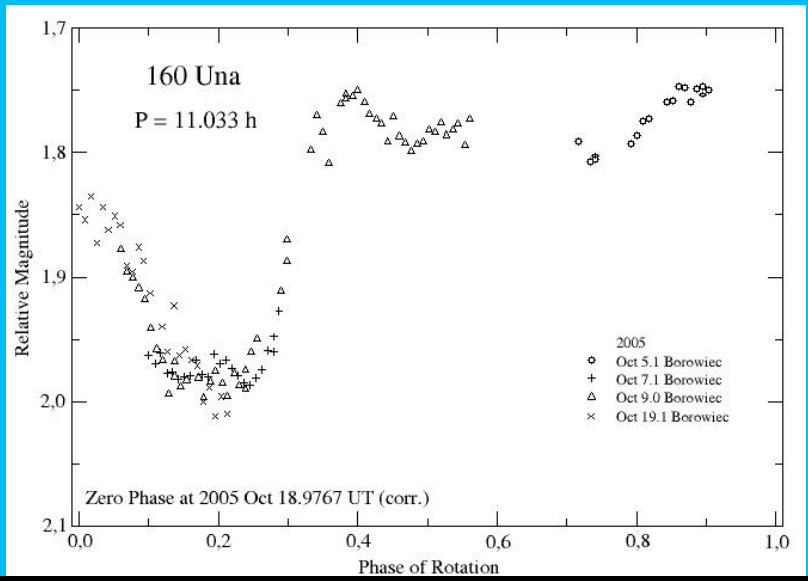
14 – 15 mag (S/N ~ 100)

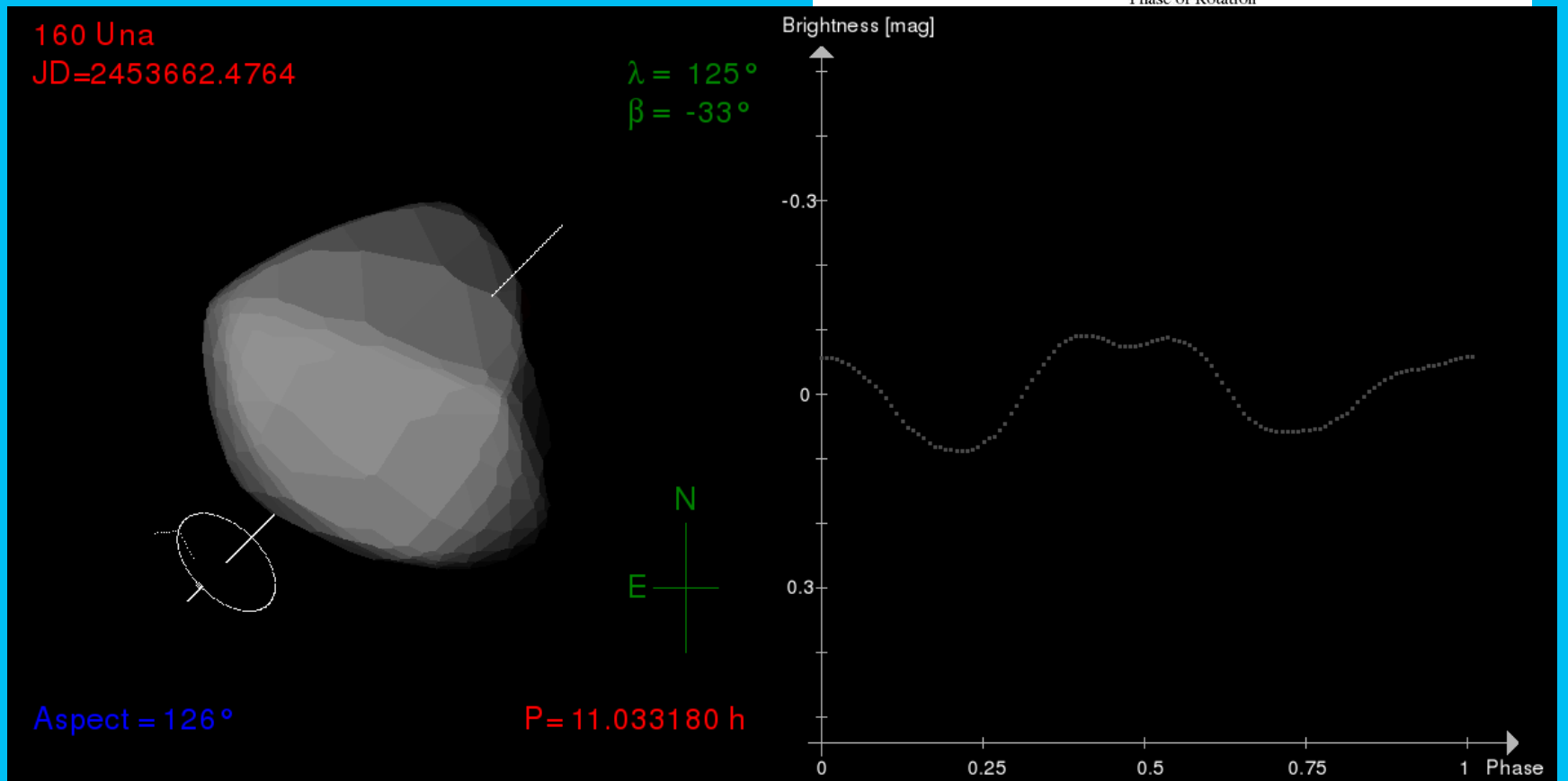
Photometry of Main Belt Asteroids



160 Una

18 Oct 2005



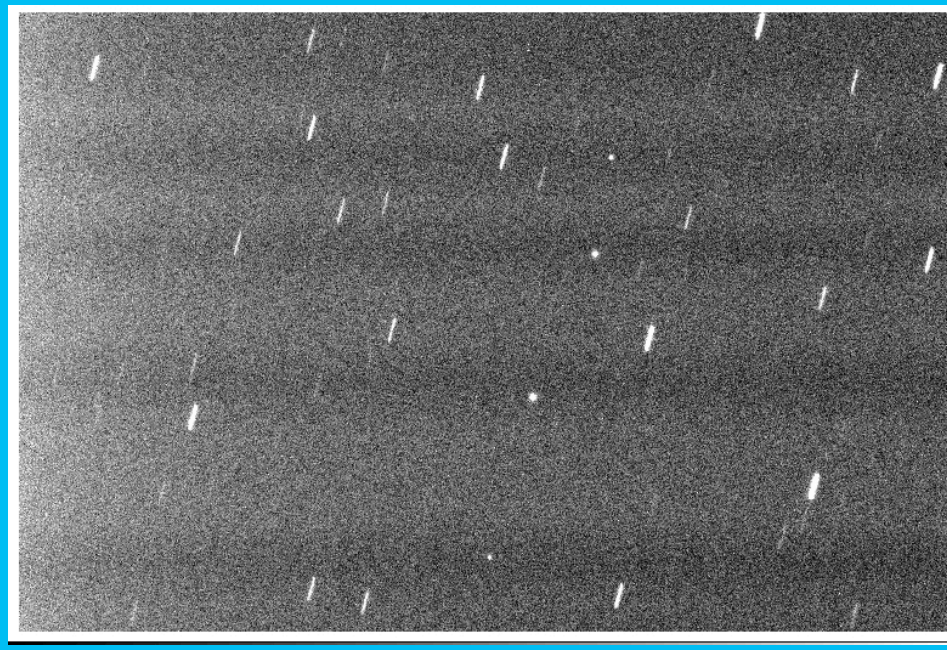


Astrometry of the Earth satellites and space debris

Exp. Time: 0.05 – 10 s

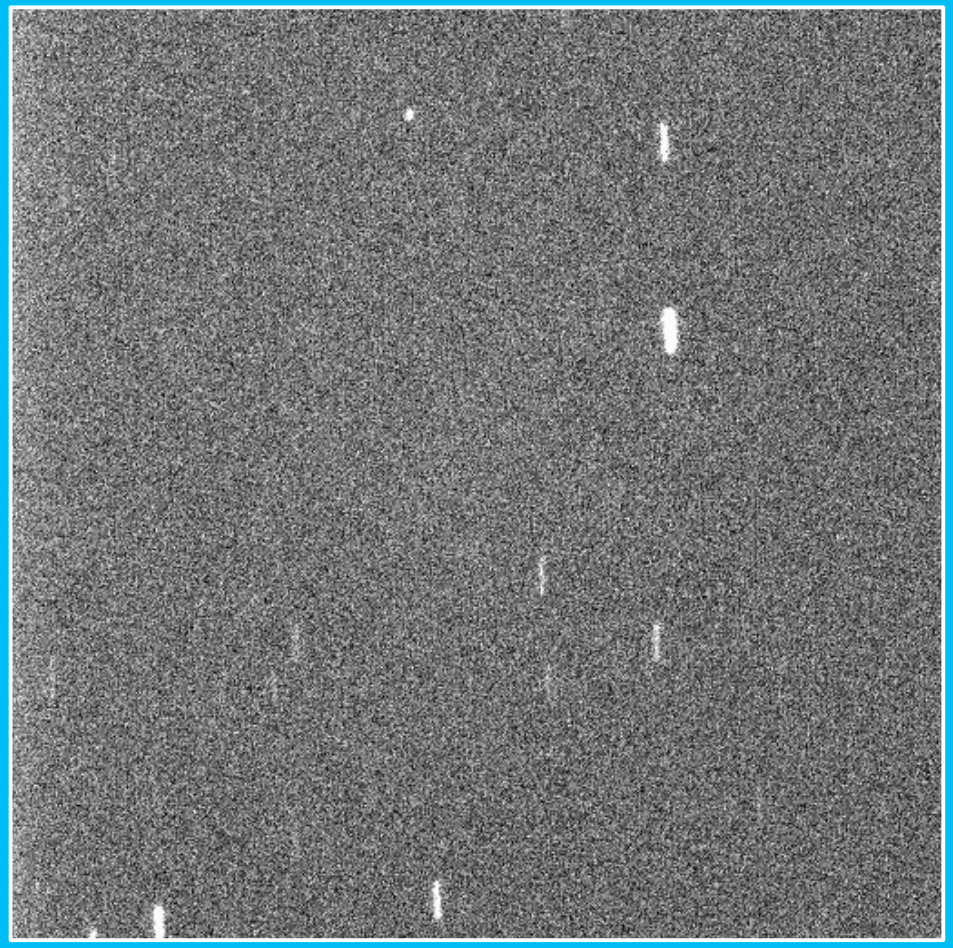
Geostationary satellites

(star-tracking)



(satellite-tracking)

Earth satellites



Lageos
distance: ~9000km
size: 0.6m
proper motion: 200"/s
brightness: ~13mag
exposure: 0.1s

PST2 telescope observing
24 LEO satellites in 10 minutes!