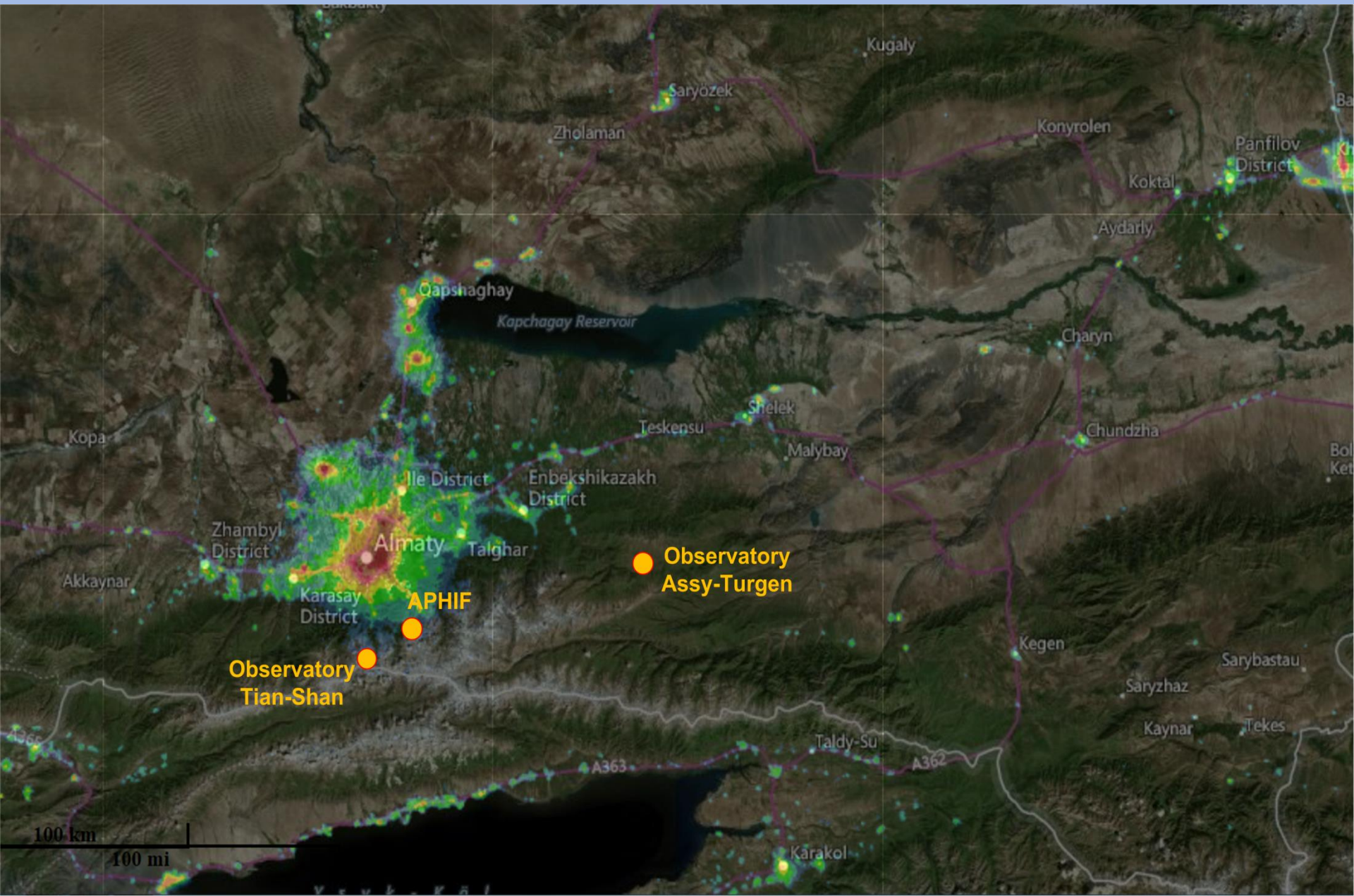
Practical use and capabilities of the AZT-20 telescope of Assy-Turgen observatory

Kim V.Yu [1,2]

1. Higher school of economics (Moscow, Russia) (postdoc)
2. Fesenkov astrophysical institute (Almaty, Kazakhstan)

Observatories APHI



Assy-Turgen Astronomical Observatory

1,5m telescope AZT-20

1,0m telescope Zeiss 1000

https://goo.gl/maps/C0nKW

2700 meters above sea level

Mounting of AZT-20 dome

Astroclimate of Assy-Turgen Plateau

- Median astronomical seeing observed during 1976-1981 was 0.64'' (minimum 0.20'')
- Clear night: 178 per year (1500 hours)
- Wind speed in clear nights is low: 1,7 m/sec
- Night median temperature: summer + 9.5^{o}C winter – 10.5^{o}C
- Horizon openness: 3,5^{o}

- Minimal levels of sky brightness of V mag/arcsec^{2}:

V mag/arcsec^{2}:	Photometry system
22,18	B
21,34	V
20,42	R

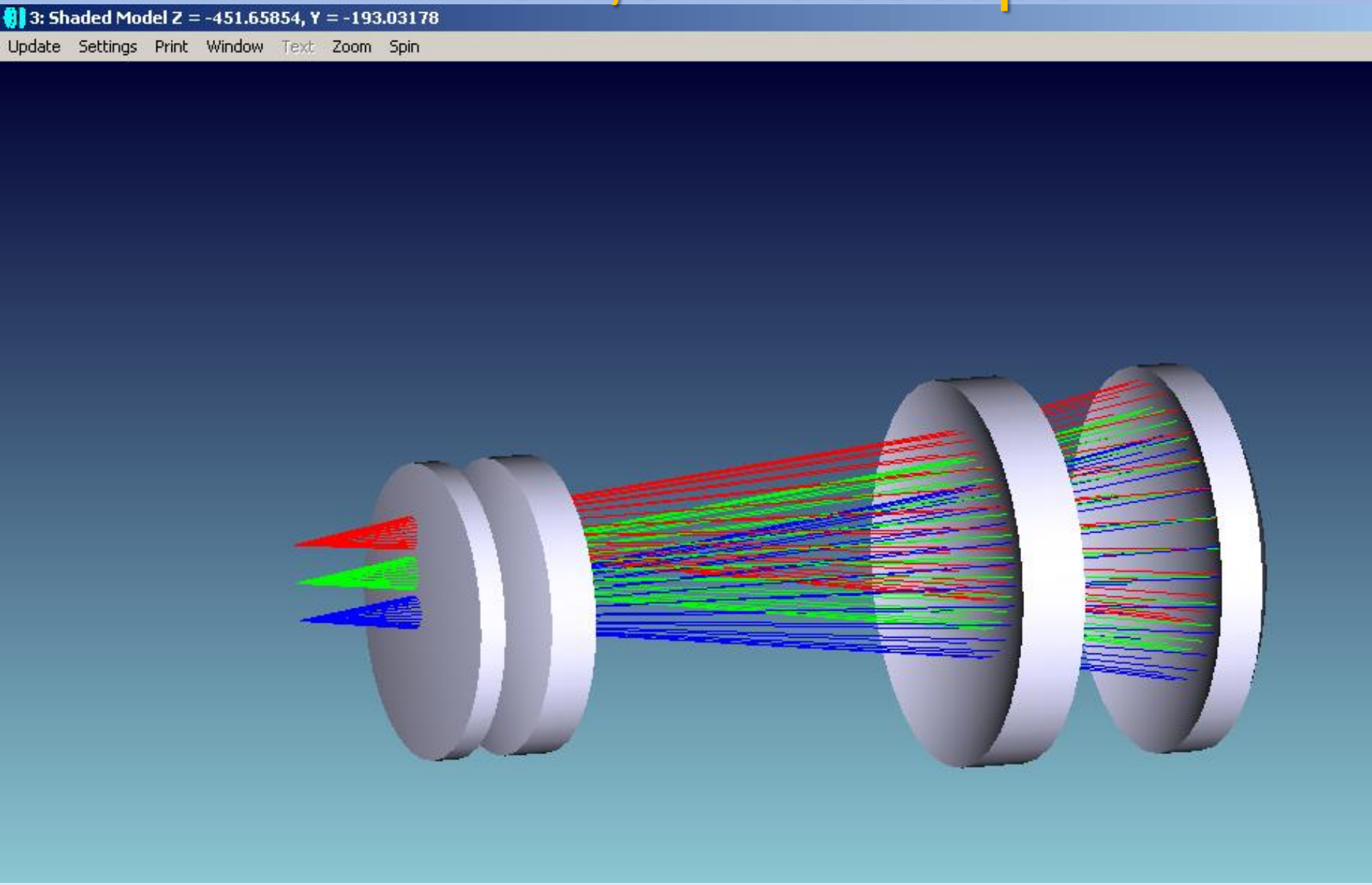
- UV atmospheric transmission

λnm	301	313,5	345	412
P	0,082	0,340	0,575	0,735

Data from the book " Astroclimate of High Altitude Plateau of Assy-Turgen" by T. B. Omarov, 1983, Fesenkov Astrophysical Institute

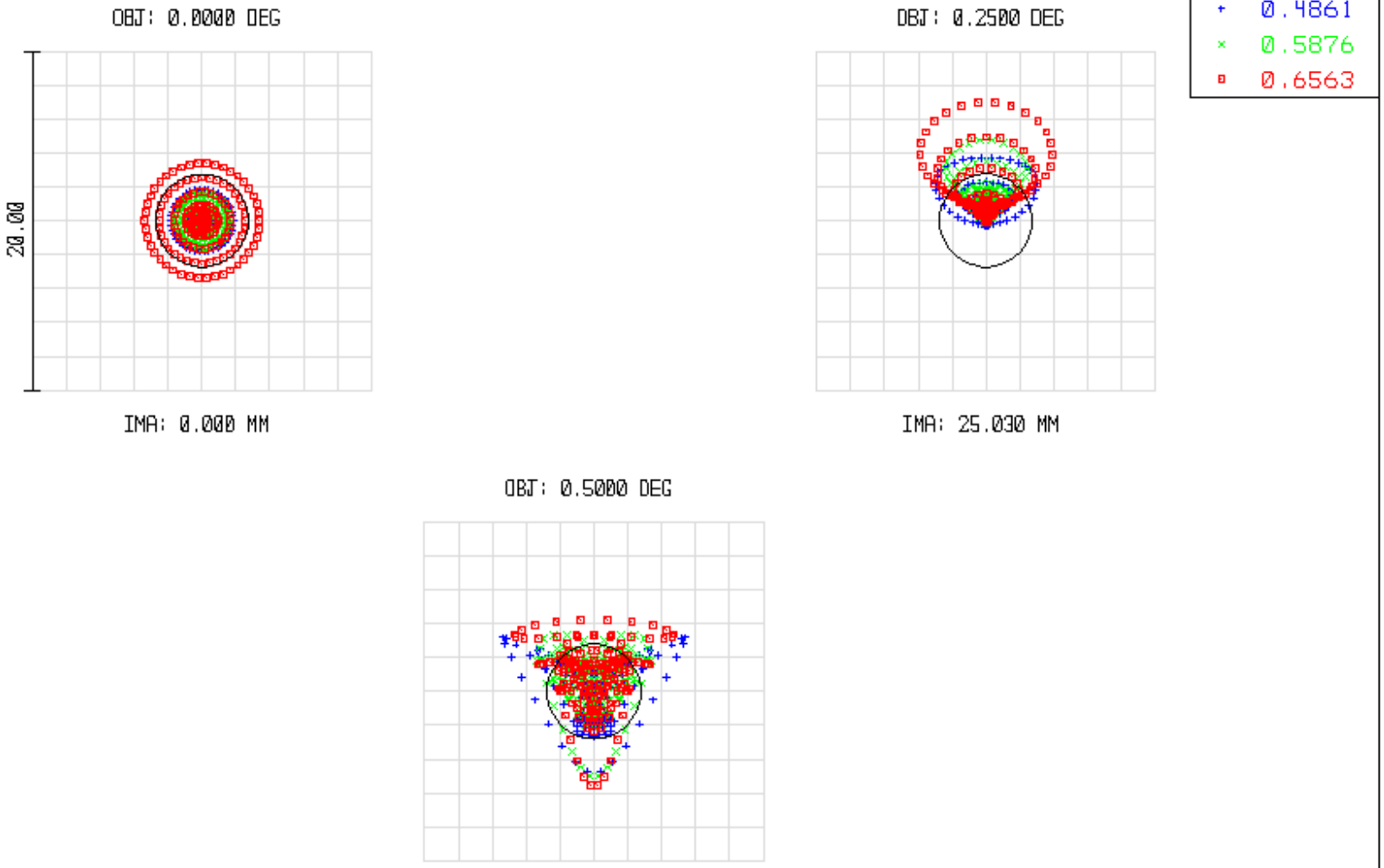
AZT-20 1,5m telescope

AZT-20 1,5m telescope



2: Spot Diagram

Update Settings Print Window Text Zoom



SPOT DIAGRAM

WED OCT 18 2017 UNITS ARE μm. AIRY RADIUS : 2.736 μm

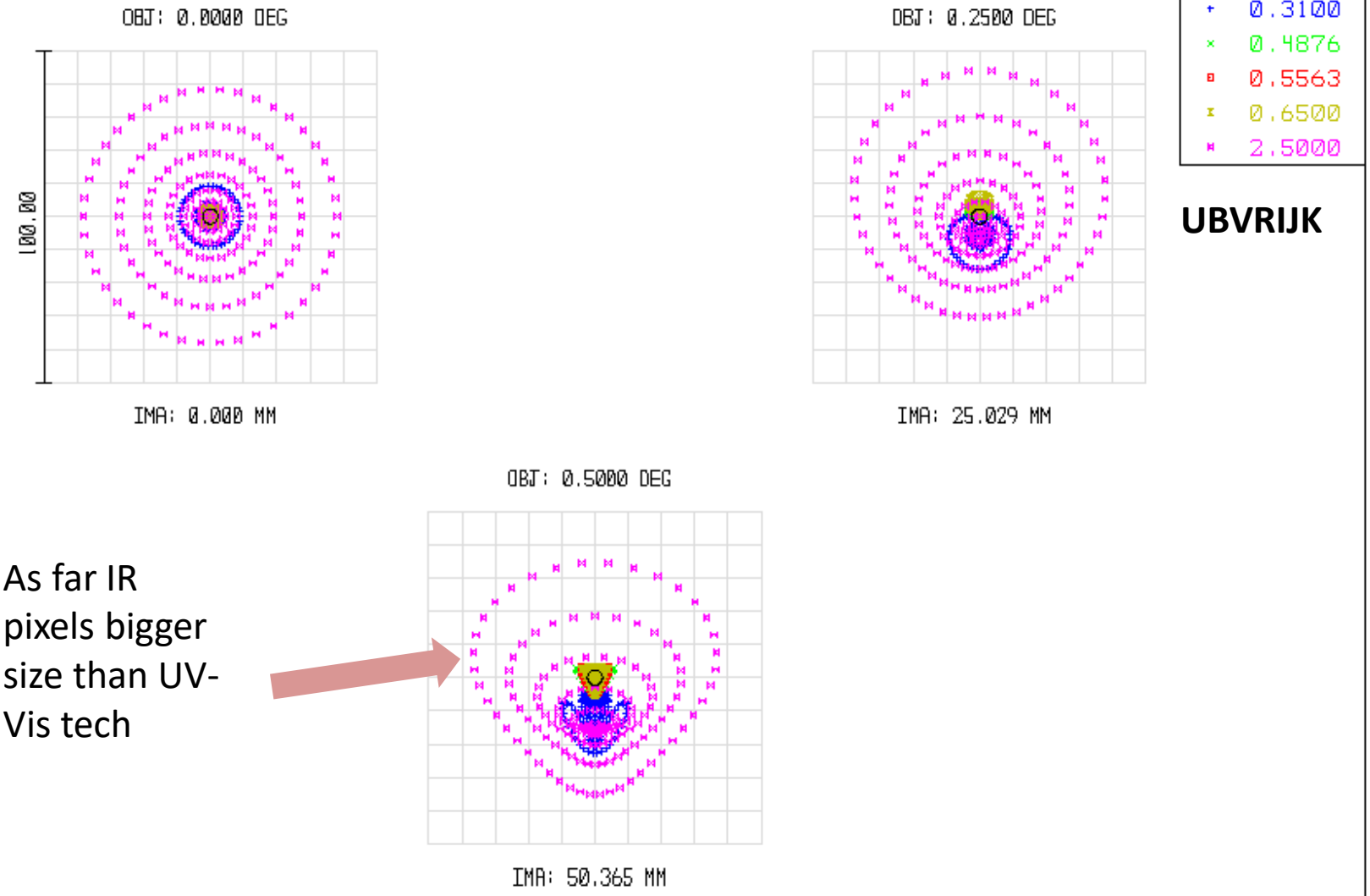
FIELD	:	1	2	3
RMS RADIUS	:	1.539	2.164	2.507
GEO RADIUS	:	3.373	7.004	6.220

SCALE BAR : 20 REFERENCE : CHIEF RAY

AZT20_WYNNE_310817_INTANE.ZMX
CONFIGURATION 1 OF 1

2: Spot Diagram

Update Settings Print Window Text Zoom



SPOT DIAGRAM

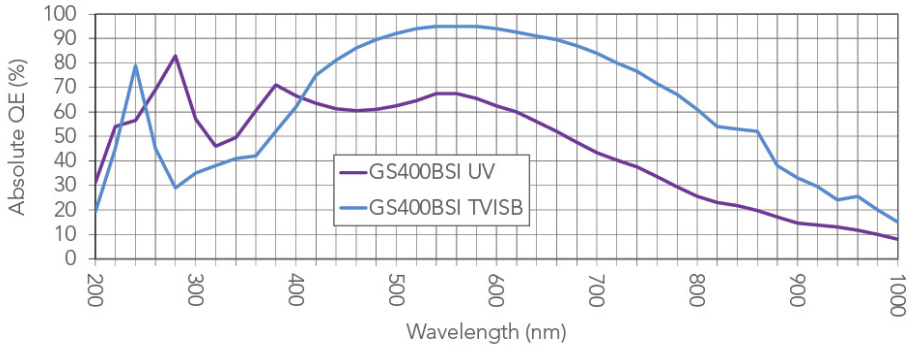
WED OCT 18 2017 UNITS ARE μm. AIRY RADIUS : 2.27 μm

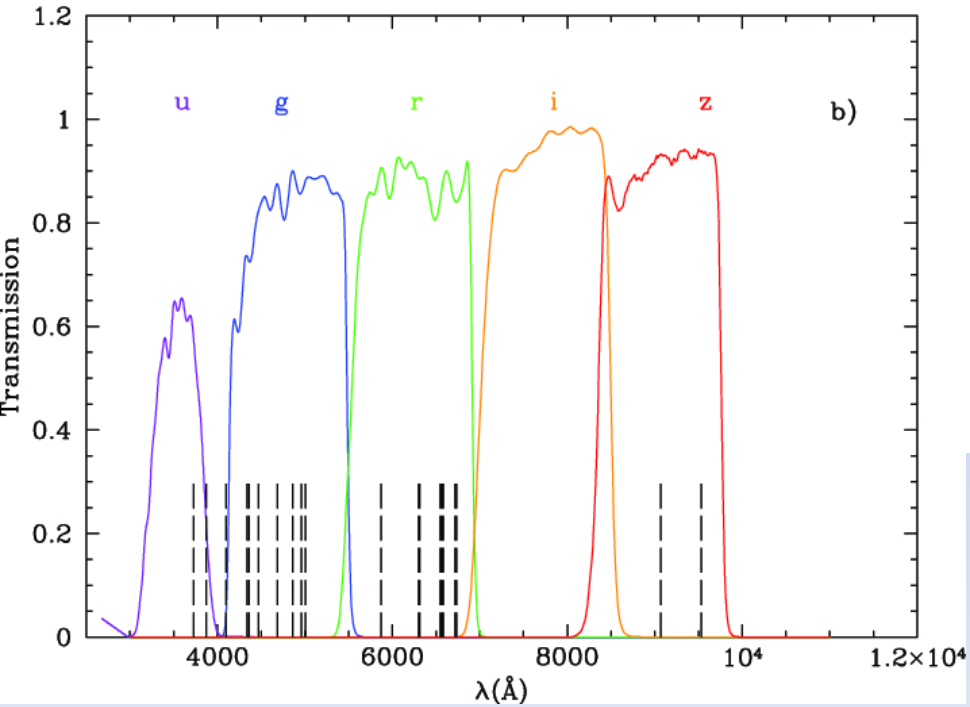
FIELD	1	2	3
RMS RADIUS	11.394	11.474	12.113
GEO RADIUS	38.172	43.811	38.137

SCALE BAR : 100 REFERENCE : CHIEF RAY

AZT20_WYNNE_310817_INTANE.ZMX
CONFIGURATION 1 OF 1

Equipment for photometry





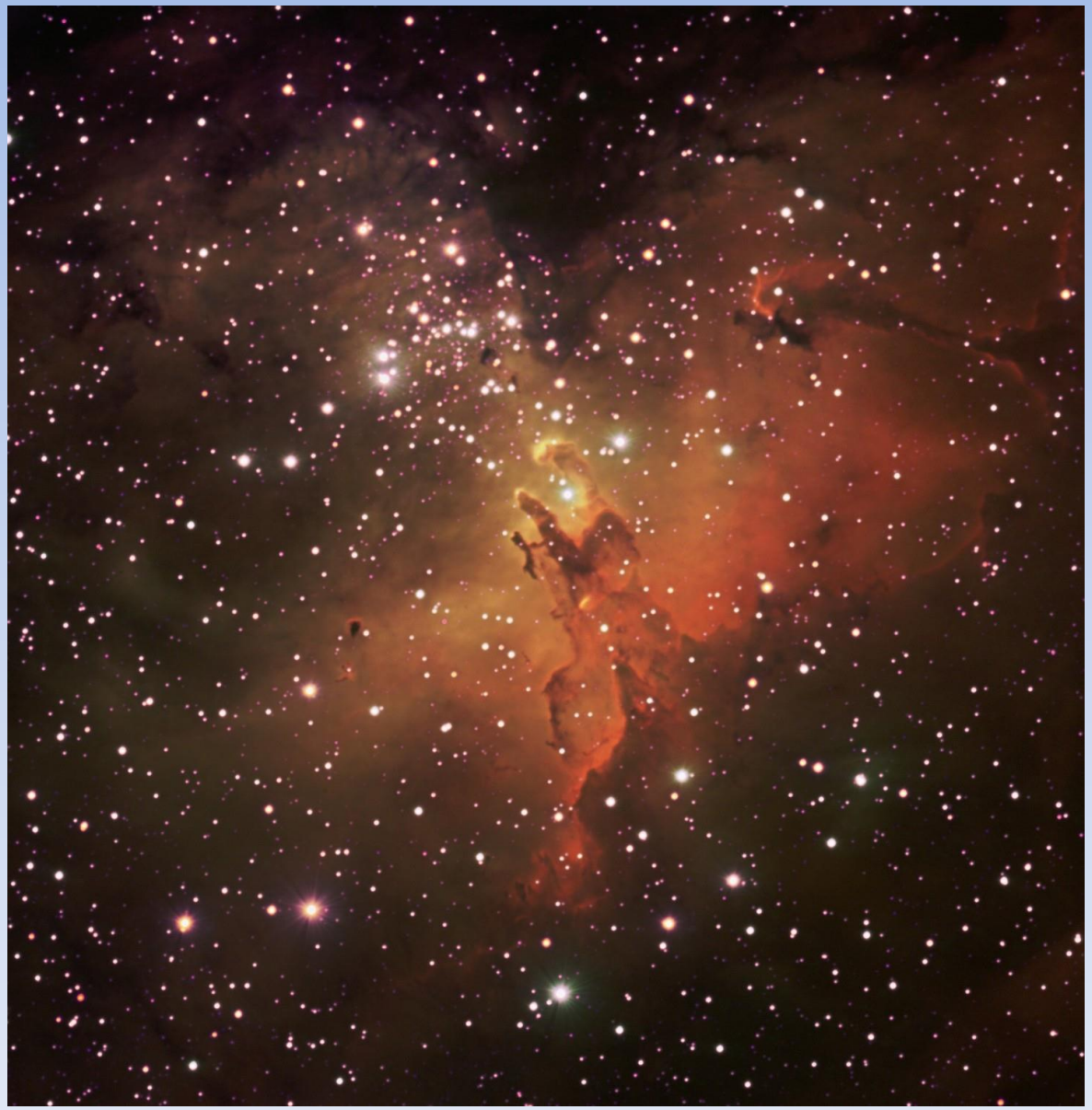
CMOS back illuminated camera
Kepler KL400

Tasks for photometric observations on AZT-20

- 1. Optical afterglow of gamma-ray bursts
  - (published more than 30 telegrams in GCN Circular). Collaboration with SRI RAS
  2. Wolf-Rayet stars
  3. AGNs
  4. etc. (asteroids, satellites)

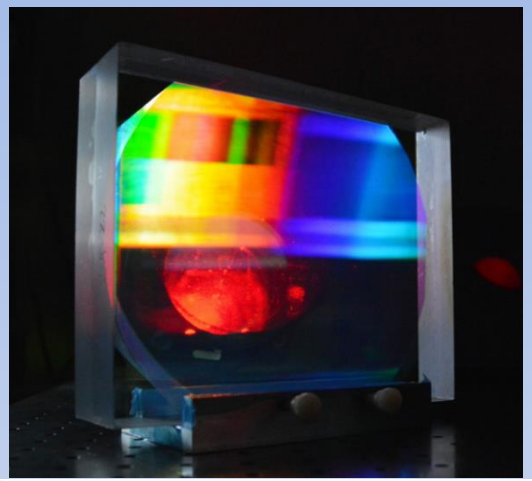
M100 Galaxy

Eagle Nebula



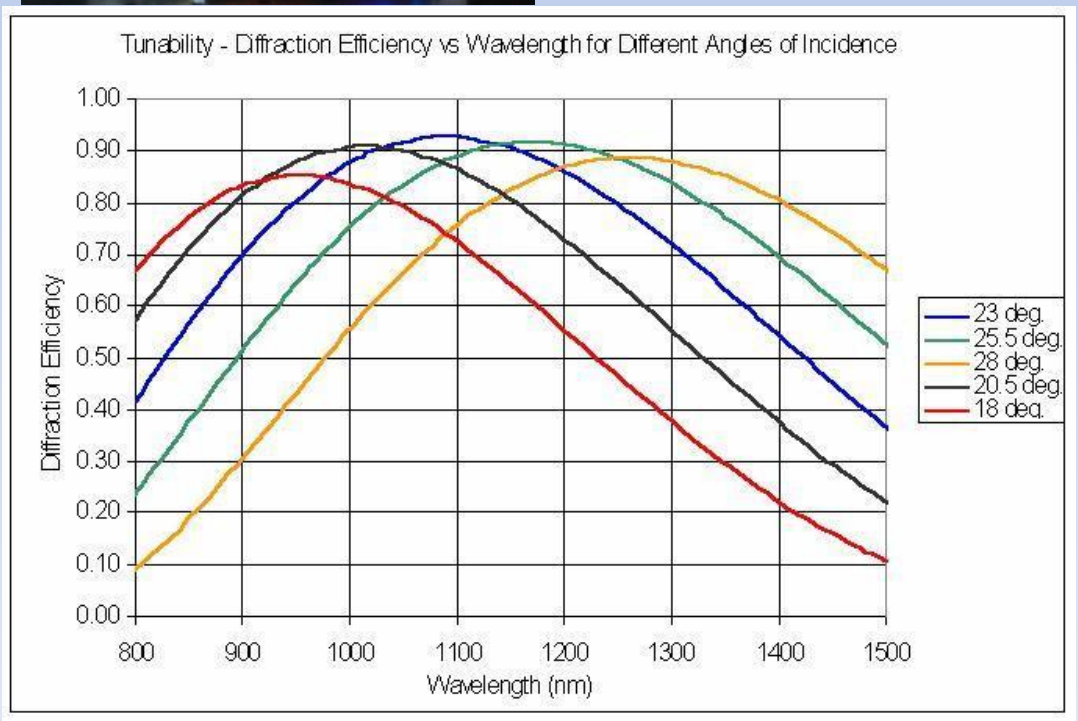
‘Hidden’ galaxy

Slit Spectrograph for AZT-20 telescope



Volume Phase Holographic (VPH) Gratings

Wasatch Photonics



Excellent 1st order diffraction efficiency

Broad operational bandwidth with angle tuning

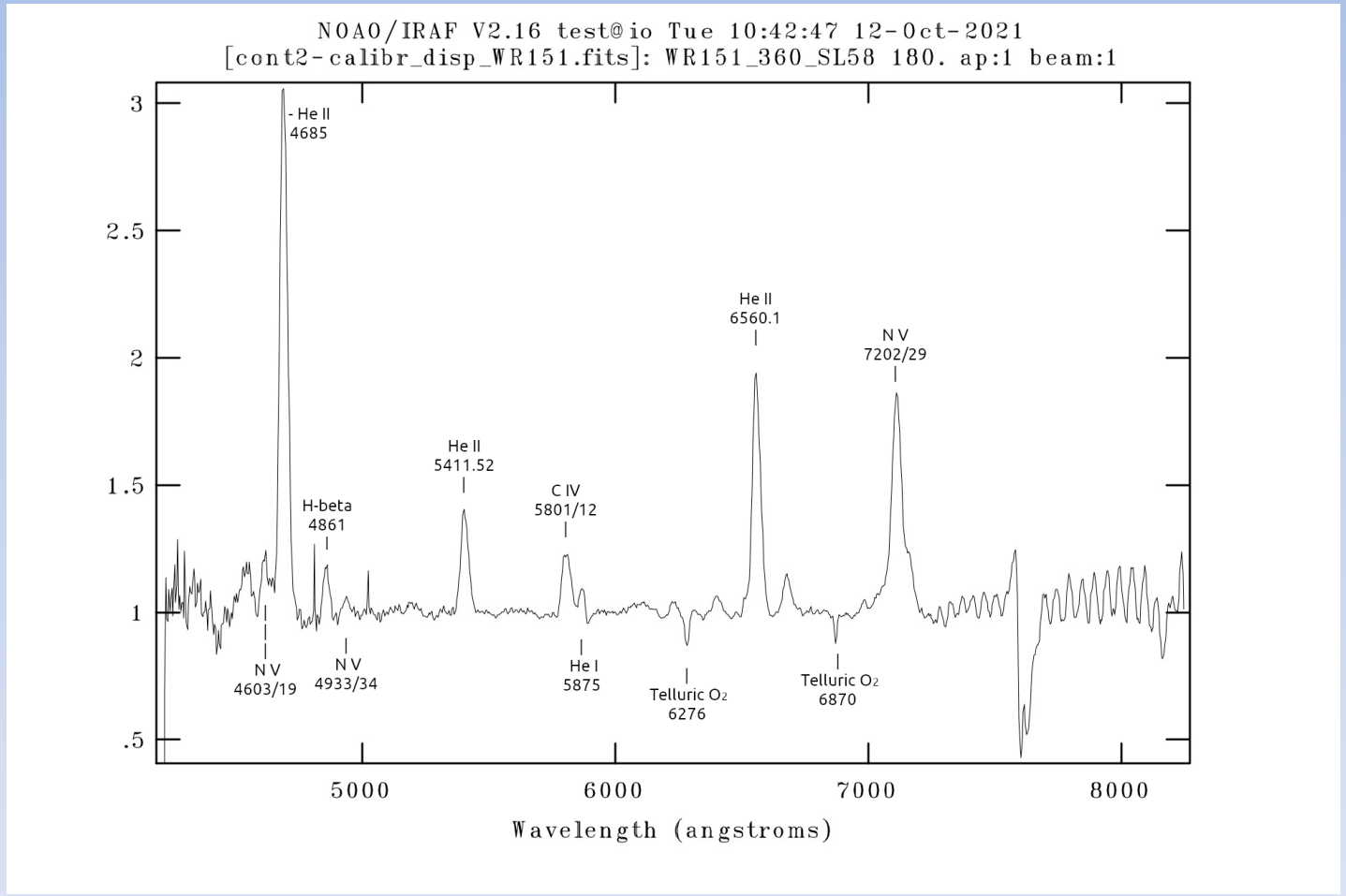
Customizable in wavelength (350-2500 nm)

Gratings (360 and 2400 lines/mm)

Disp. (4 Å/pix and 0.4 Å/pix)

EmCCD camera Andor (~ 21 mag)

WR 151 spectrum received on VPH (360) grating



Tasks for spectroscopic observations on AZT-20

- 1. Wolf-Rayet stars
- 2. Gaseous nebulae
- 3. Variable stars (B[e], Ae/Be Herbig's stars, etc)

Further perspectives for AZT-20

- 1. Installation of additional VPH-grating (1700 lines/mm) for Ha-region
- 2. Total automation of AZT-20 for observing process.

International collaboration in Assy-Turgen

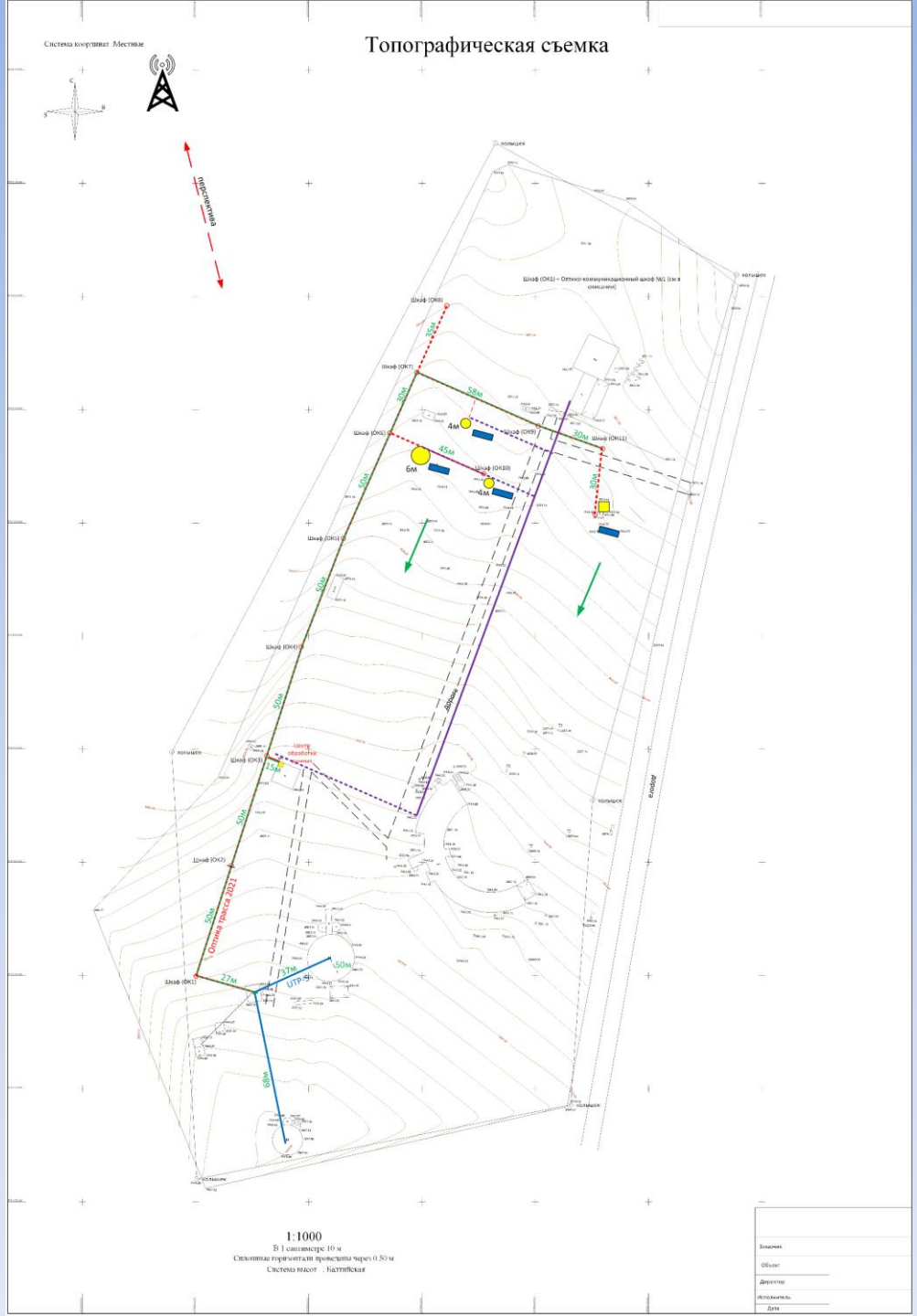

STIRLING


2021-4-2 13:33


2021-3-31 11:53


2021-3-31 11:53

Топографическая съемка



1:1000

В 1 сантиметре 10 м

Сплошные горизонтали проведены через 0.50 м

Система высот : Балтийская

Заказчик	
Объект	
Директор	
Исполнитель	
Дата	

Thank you for attention