# Optical identification of active galactic nuclei from the SRG/ART-XC all-sky X-ray survey

I. Zaznobin*, G. Uskov, S. Sazonov, R. Burenin,
M. Gilfanov, P. Medvedev, R. Sunyaev, R. Krivonos,
E. Filippova, A. Lutovinov, G. Khorunzhev, M. Eselevich

*zaznobin@cosmos.ru

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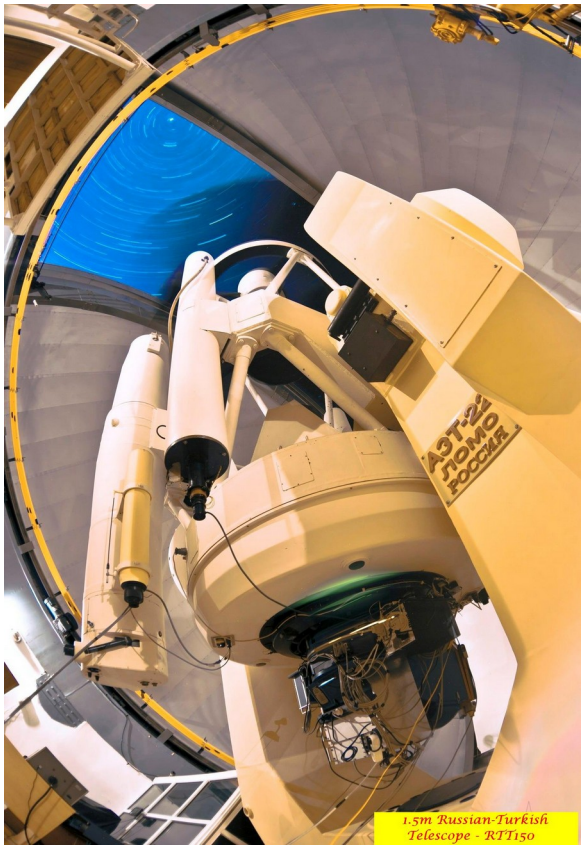
# Optical observations of AGN

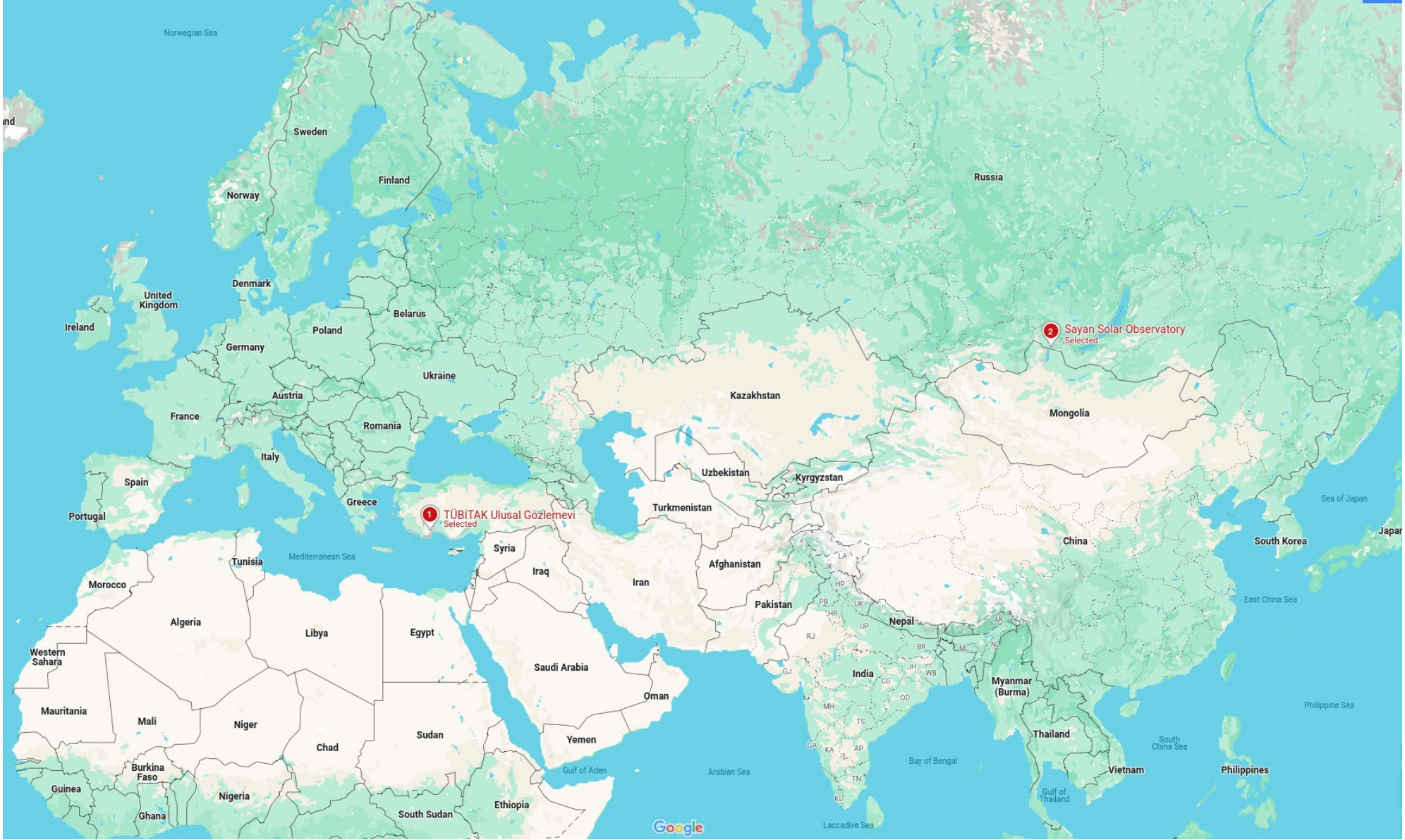

1.6-m AZT-33IK telescope of Sayan Solar Observatory of ISTP SB RAS



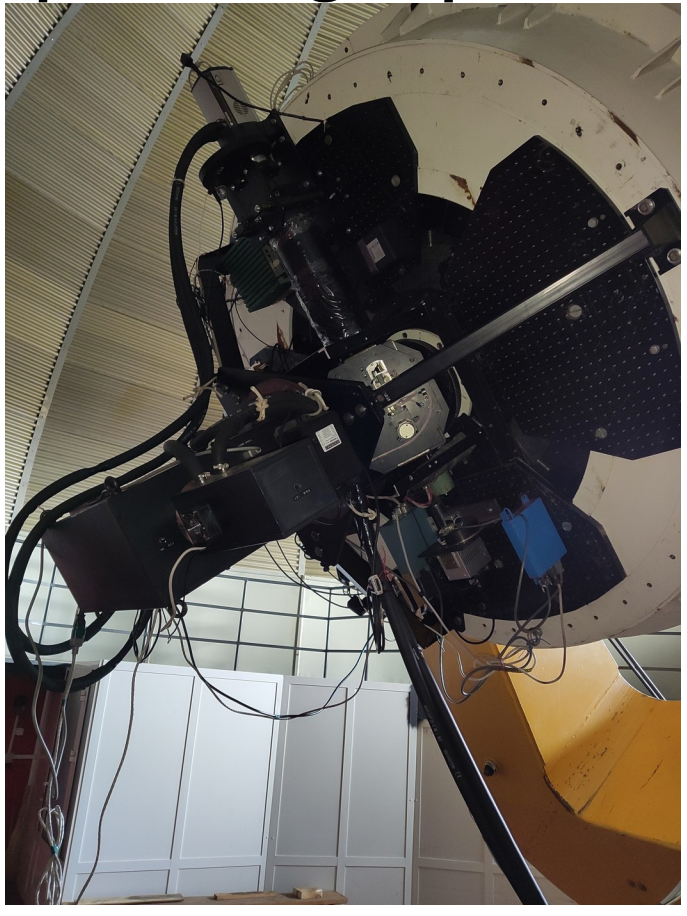

1.5 Russian-Turkish telescope of TÜBİTAK National Observatory (TUG)

Also used
SDSS
2dF
6dF

Brighter than $+20^m$ at northern sky $\delta > -30°$


Norwegian Sea
Sweden
Finland
Norway
Russia
Denmark
United Kingdom
Ireland
Belarus
Poland
Germany
Ukraine
Austria
France
Romania
Italy
Spain
Portugal
Greece
Kazakhstan
Mongolia
Uzbekistan
Kyrgyzstan
Turkmenistan
Sea of Japan
China
South Korea
Syria
Tunisia
Mediterranean Sea
Iraq
Iran
Afghanistan
Pakistan
Morocco
Algeria
Libya
Egypt
Nepal
India
Western Sahara
Saudi Arabia
Myanmar (Burma)
Oman
Mauritania
Mali
Niger
Chad
Sudan
Yemen
Thailand
Gulf of Aden
Arabian Sea
Bay of Bengal
Vietnam
Philippines
Burkina Faso
Guinea
Nigeria
Ethiopia
Ghana
South Sudan
Gulf of Thailand
Laccadive Sea
Philippine Sea
South China Sea
East China Sea
Google
1 TÜBİTAK Ulusal Gözlemevi
Selected
2 Sayan Solar Observatory
Selected

# ADAM low- and medium-resolution spectrograph for 1.6-m AZT-33IK telescope



- **A**fanasiev V. L.
- **D**odonov S. N.
- **A**mirkhanyan V. R.
- **M**oiseev A. V.

| Grism | Wavelength range, Å | Dispersion, Å $px^{-1}$ | Resolution |
|---|---|---|---|
| VPHG600G | 3590-7250 | 3.2-3.7 | 561-980 |
| VPHG600R | 6430-10030 | 3.2-3.6 | 1005-1319 |

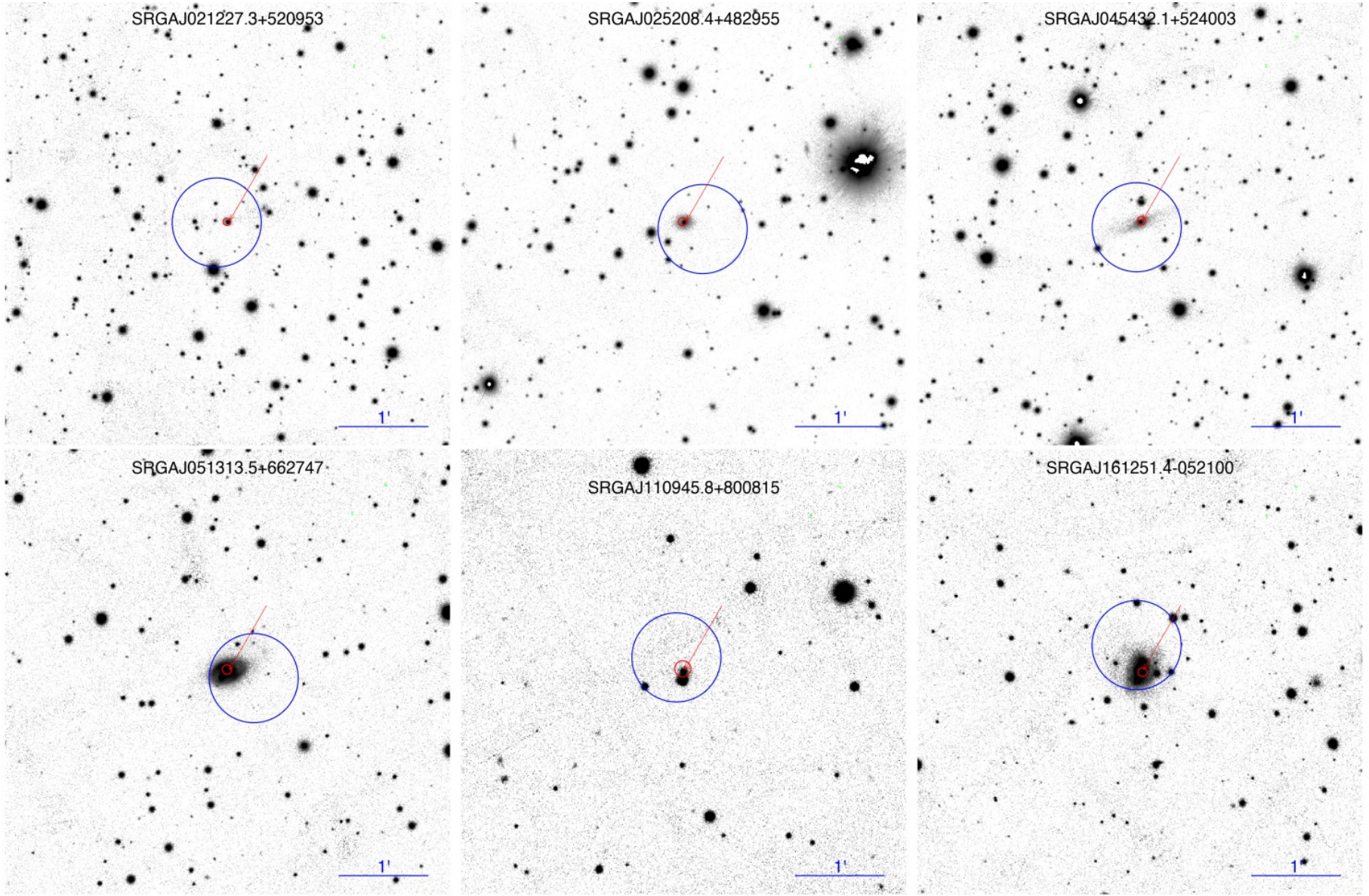
*For $z \geq 0.10$

Afanasiev, et al. 2015

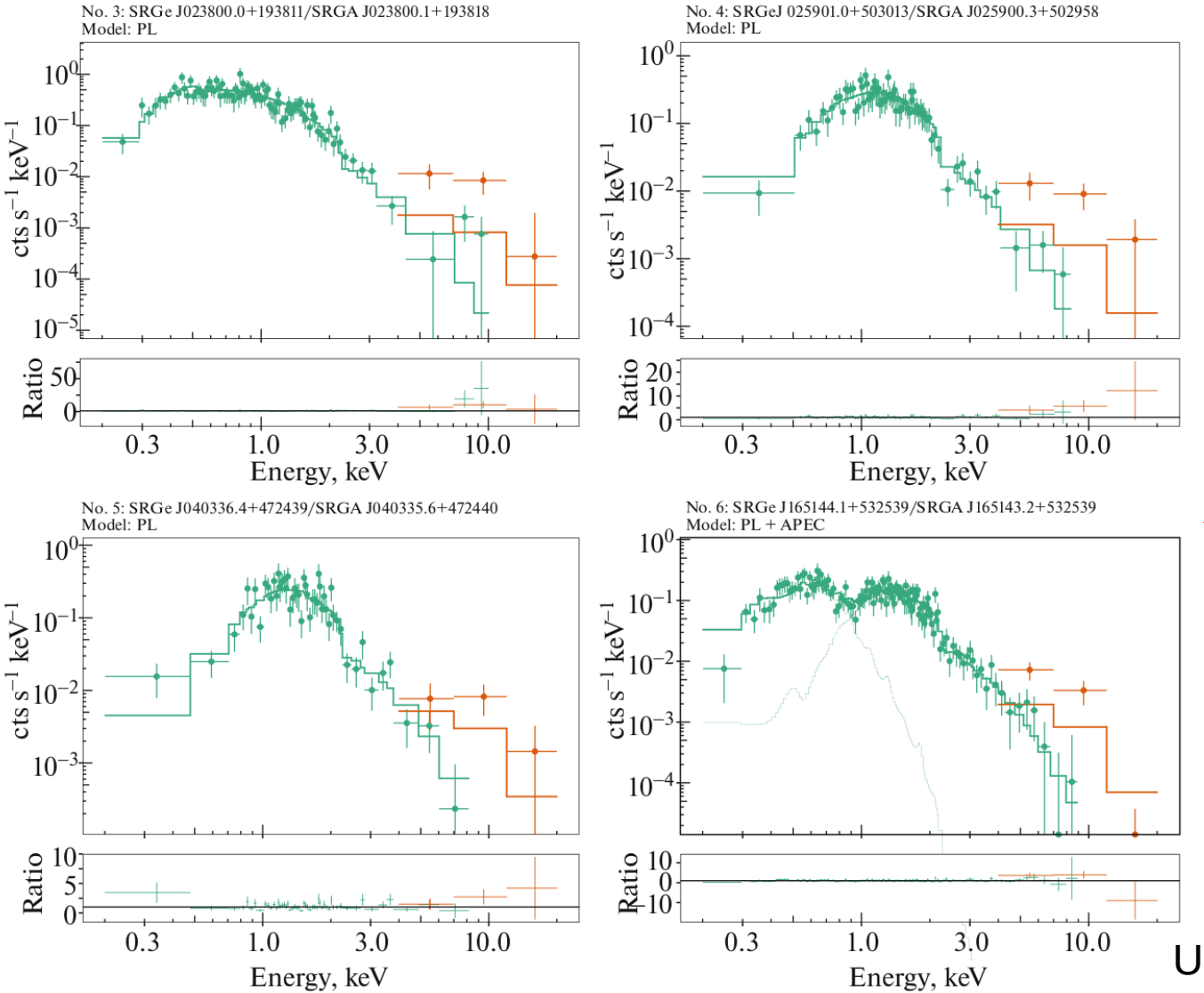
# Low and medium resolution imaging spectrometer TFOSC (TUBITAK Faint Object Spectrograph and Camera)

| Grism | Wavelength range, Å | Dispersion, Å $px^{-1}$ | Resolution |
|---|---|---|---|
| №7 | 3900-6800 | 4.1 | 1300 |
| №8 | 5850-8270 | 3.0 | 2300 |
| №15 | 3230-9120 | 12.0 | 500 |

http://hea.iki.rssi.ru/rtt150/ru/index.php?page=tfosc

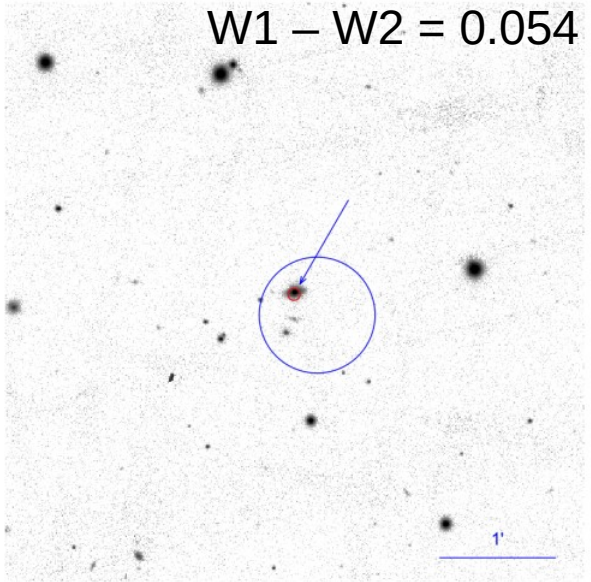

SRGAJ021227.3+520953
1'
SRGAJ025208.4+482955
1'
SRGAJ045432.1+524003
1'
SRGAJ051313.5+662747
1'
SRGAJ110945.8+800815
1'
SRGAJ161251.4-052100
1'

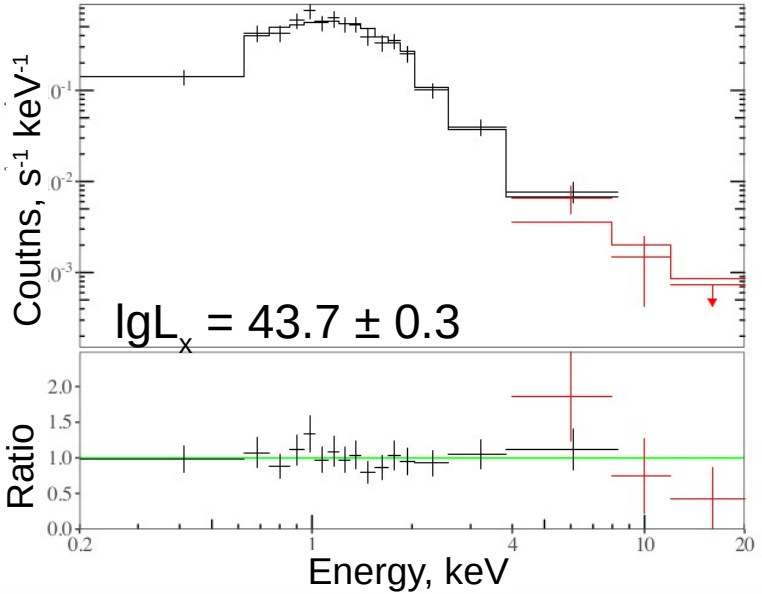
# Model: tbabs ∗ (ztbabs ∗ cflux ∗ zpowerlaw + apec)

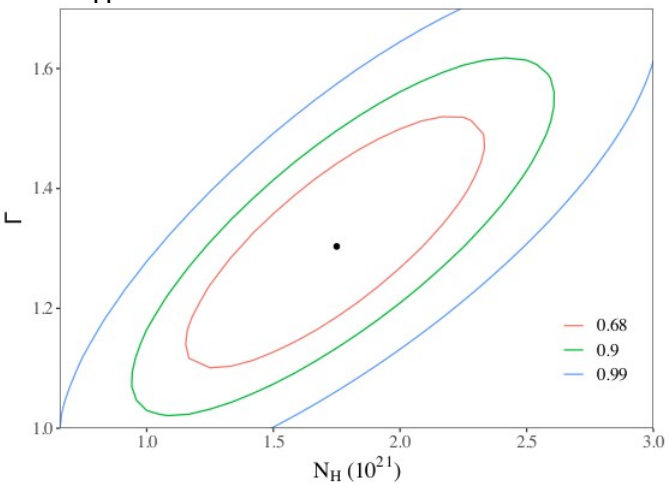


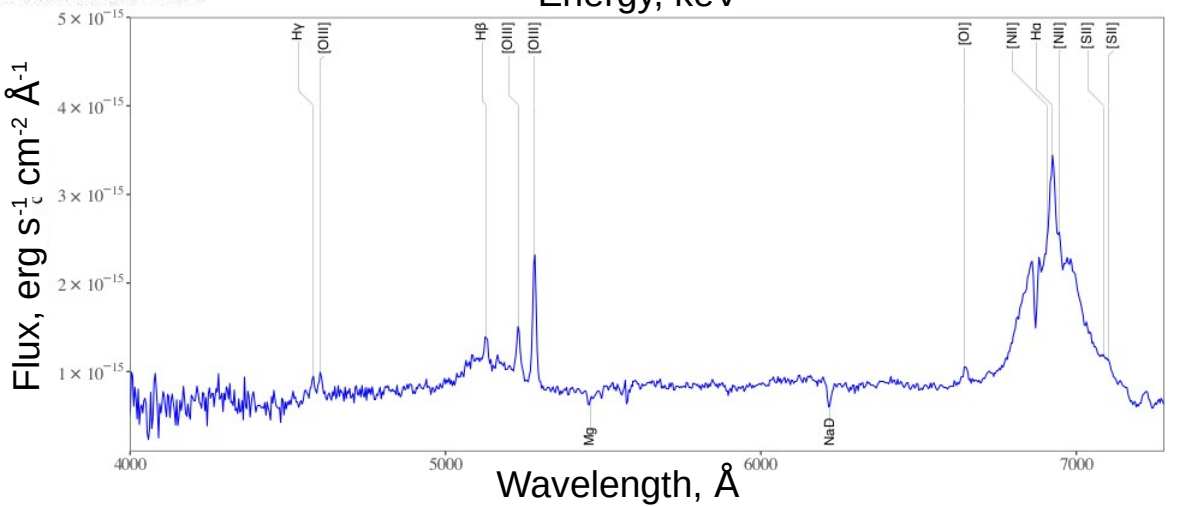

eROSITA
ART-XC

Uskov et al. 2024



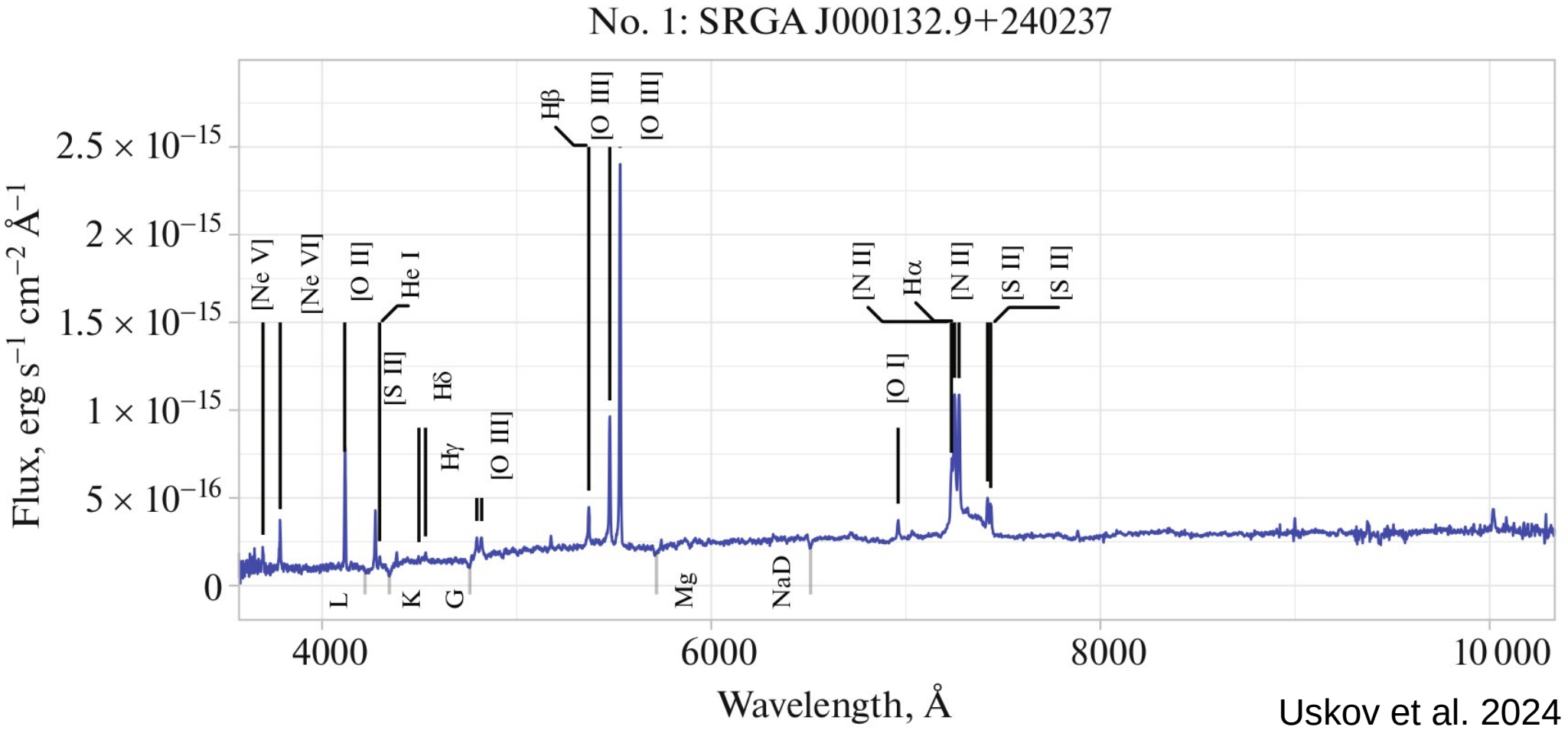

$Z_{spec}$ = 0.0550

FWHM(Hα) = (93±2) $10^2$ km/s

lg(OIII/Hβ) = 0.74±0.06
lg(NII/Hα) = −1.07±0.22

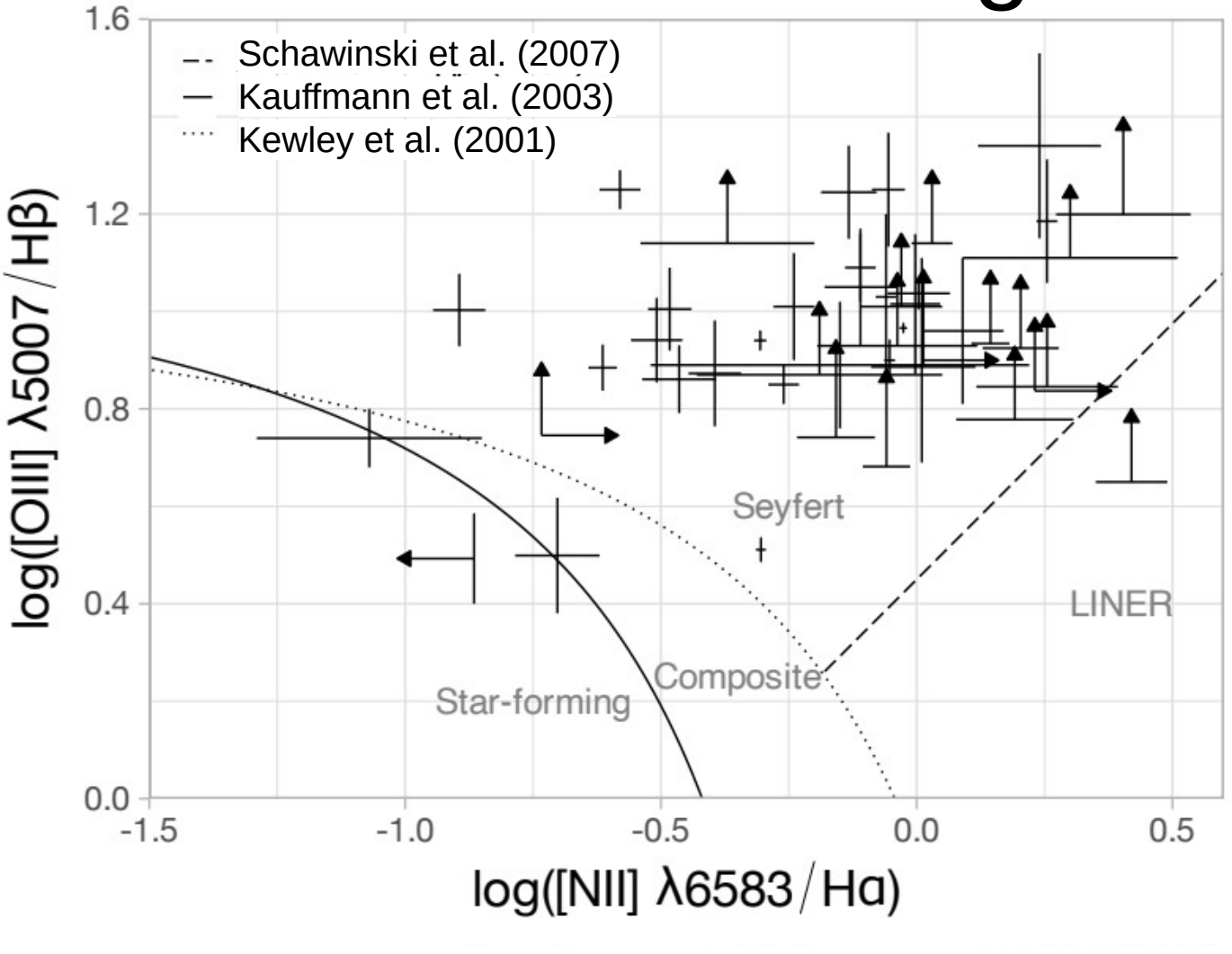
Uskov et al. 2022

# Shifted Halpha broad line




Uskov et al. 2024

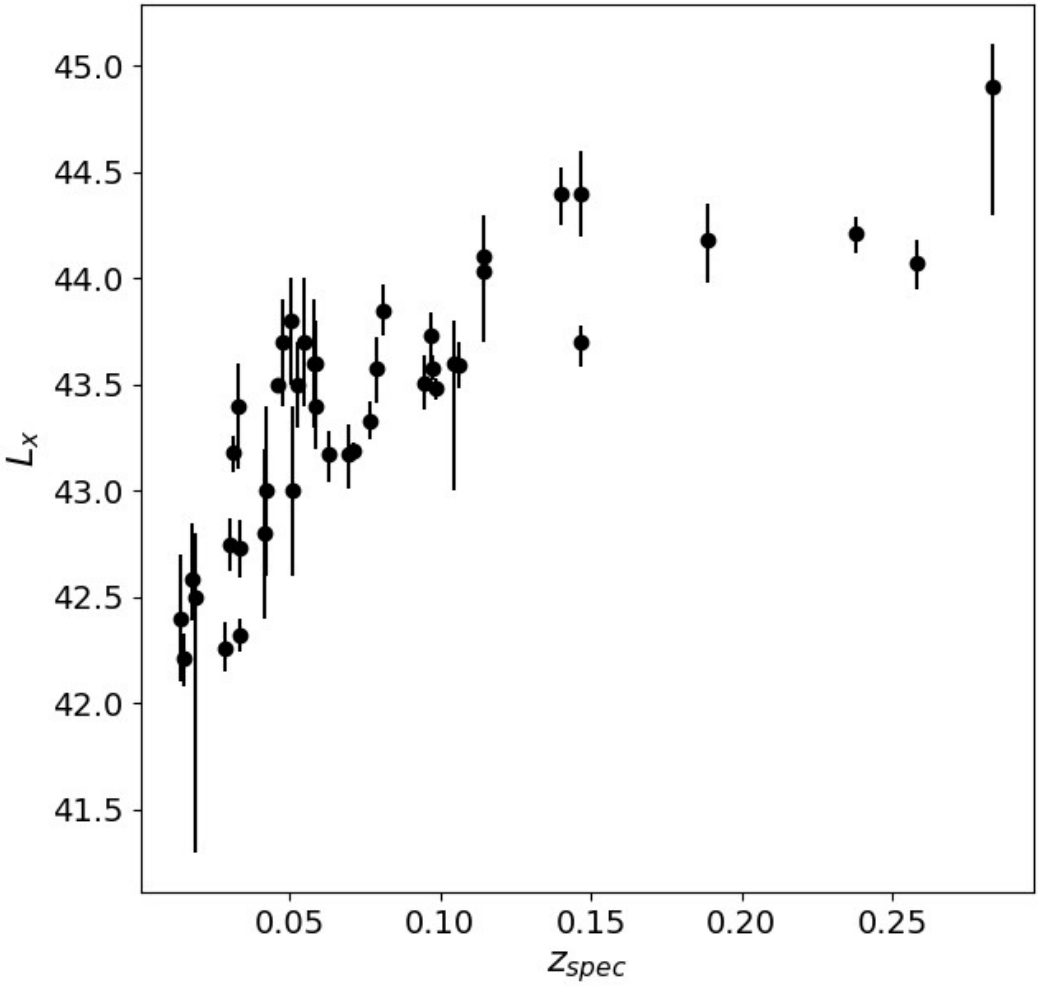
# BPT-diagram




| | |
|---|---|
| 19 | Sy1 |
| 2 | NLSy1 |
| 2 | Sy1.8 |
| 8 | Sy1.9 |
| 19 | Sy2 |
| **50** | total |

and ~10 new AGN

# X-ray properties (eROSITA + ART-XC)



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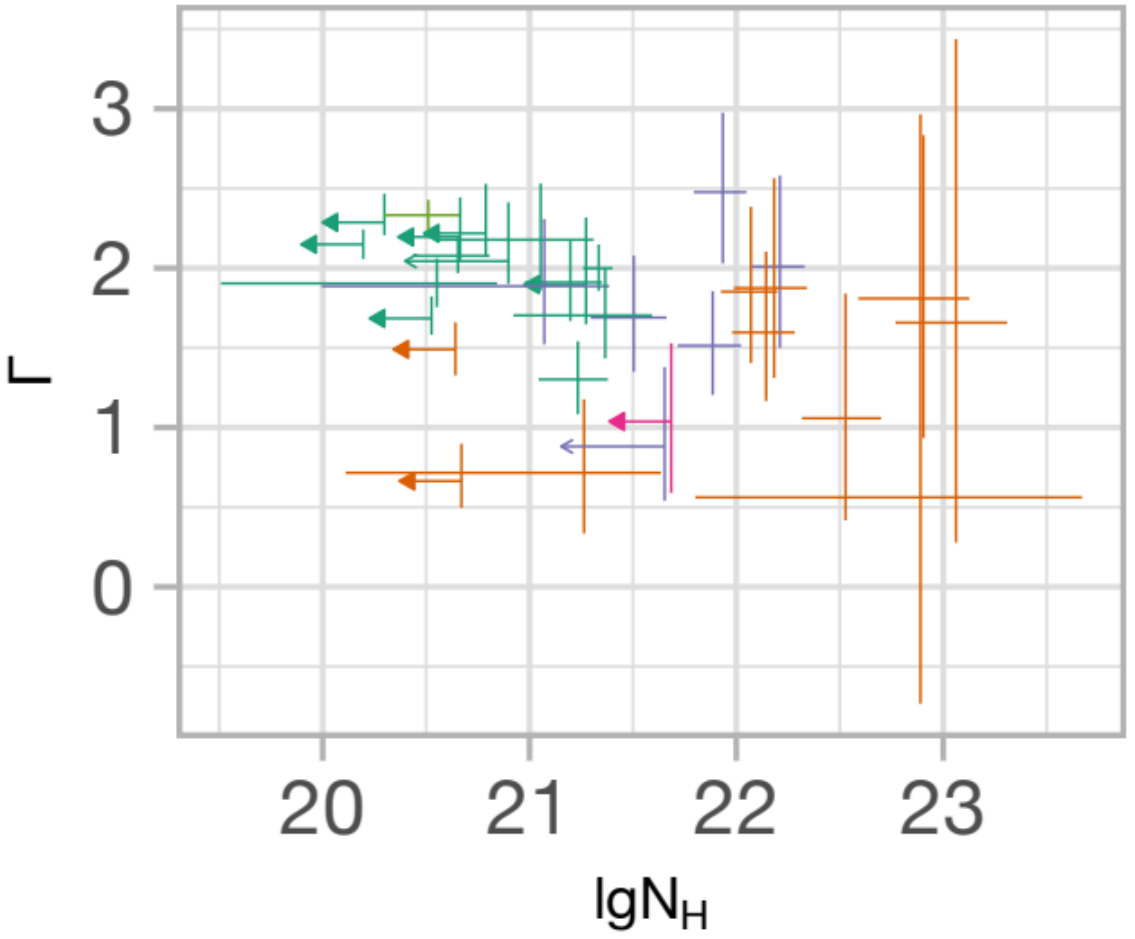
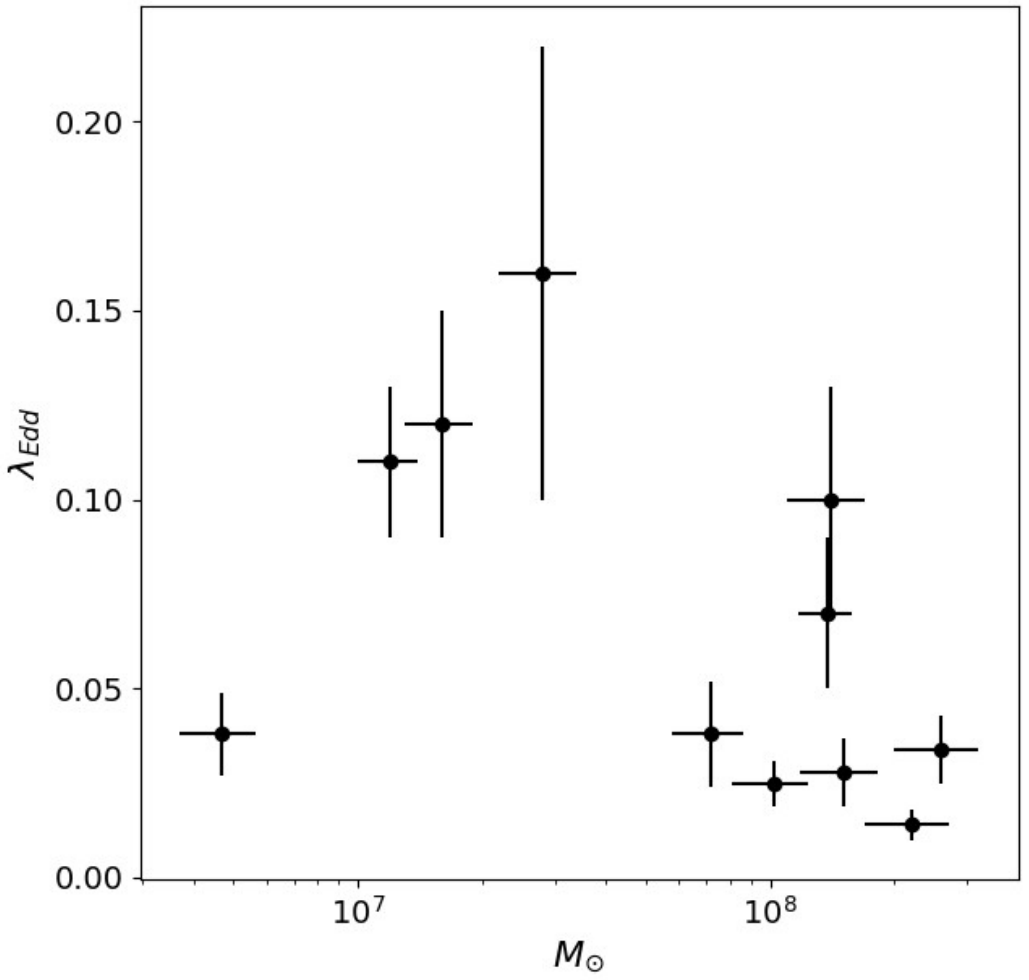
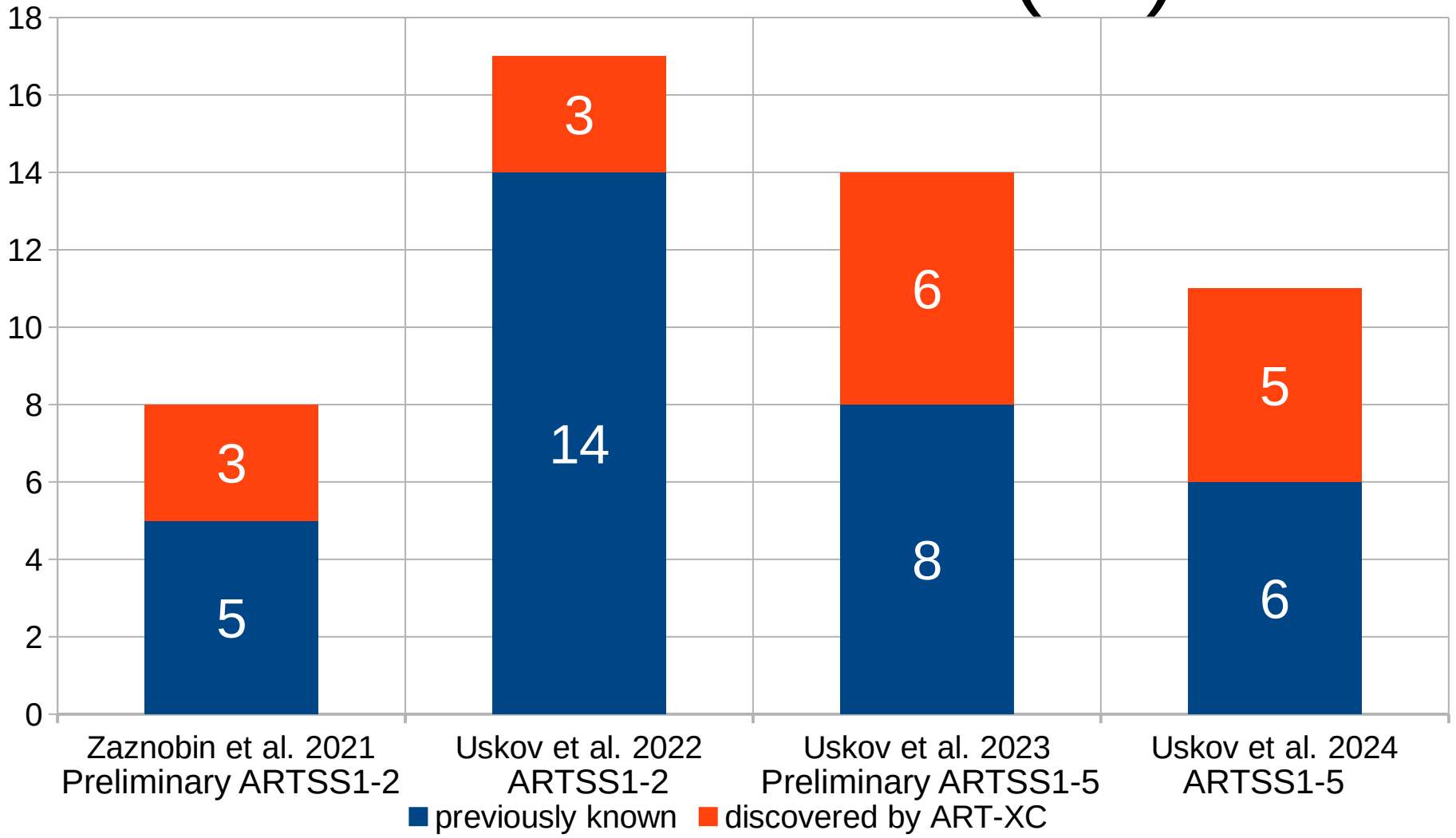



Uskov, et al.
2022,2023,2024

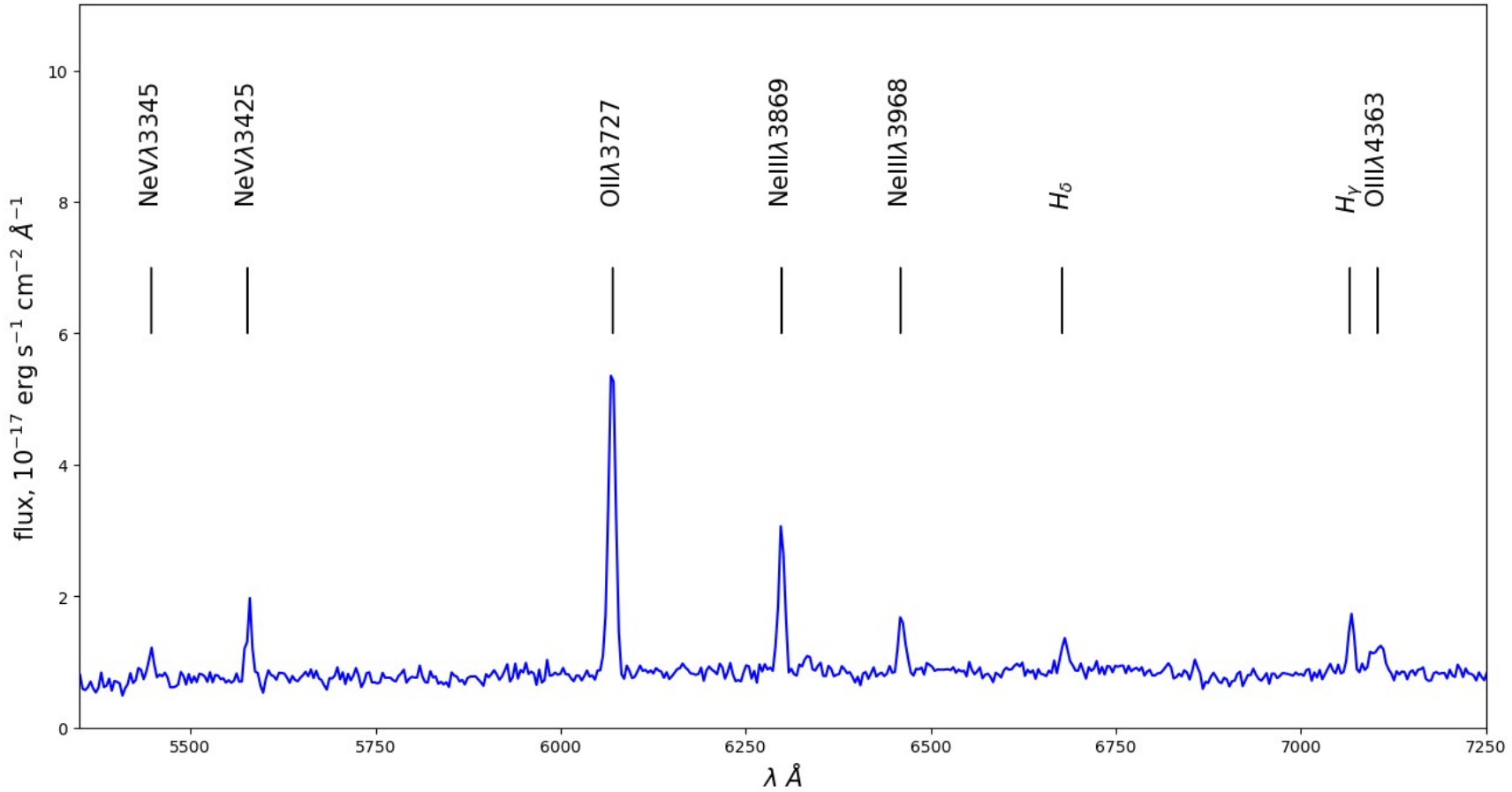
# SMBH masses (Sy1) and the Eddington ratio



# Published sources (50)



# New AGN at z=0.628 with $L_x \sim 10^{46}$ erg $s^{-1}$



# Results

- ~60 AGNs were identified using optical observations on AZT-33IK, RTT-150 and archival data from 2dF, 6dF, SDSS
- All of them turned out to be nearby Seyfert galaxies at $z < 0.3$
- We measured: column density of hydrogen on the line of sight, X-ray luminosity, optical type, redshift and SMBH mass (last for Sy1)
- Identifying new AGNs from the SRG/ART-XC survey can be effectively solved using 1.5-m class optical telescopes.
- 4 papers were published (Zaznobin et al. 2021, Uskov et al. 2022, 2023, 2024)
- Optical follow-up work to identification/classification AGN from ARTSS1-5 survey is underway