Serbian-Bulgarian mini-network telescopes and Gaia-FUN-TO during 2017

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Introduction

- Astrometrically, photometrically and spectroscopically surveying the full sky. Sept.2016, the Gaia DR1 appeared. The ESA space astrometry mission or Gaia satellite (at December 2013).
- In astrometry and photometry until V=20 mag (~1 billon sources) and to 16 mag in spectroscopy (~150 million objects). Gaia celestial reference frame - Gaia CRF in the future (QSOs based one).
- About 3000 Gaia Alerts (by the Gaia Science Alerts group) during 3 years (until October 2017). "Serbian-Bulgarian mini-network telescopes" was established at 2013, and ~45 objects were observed.

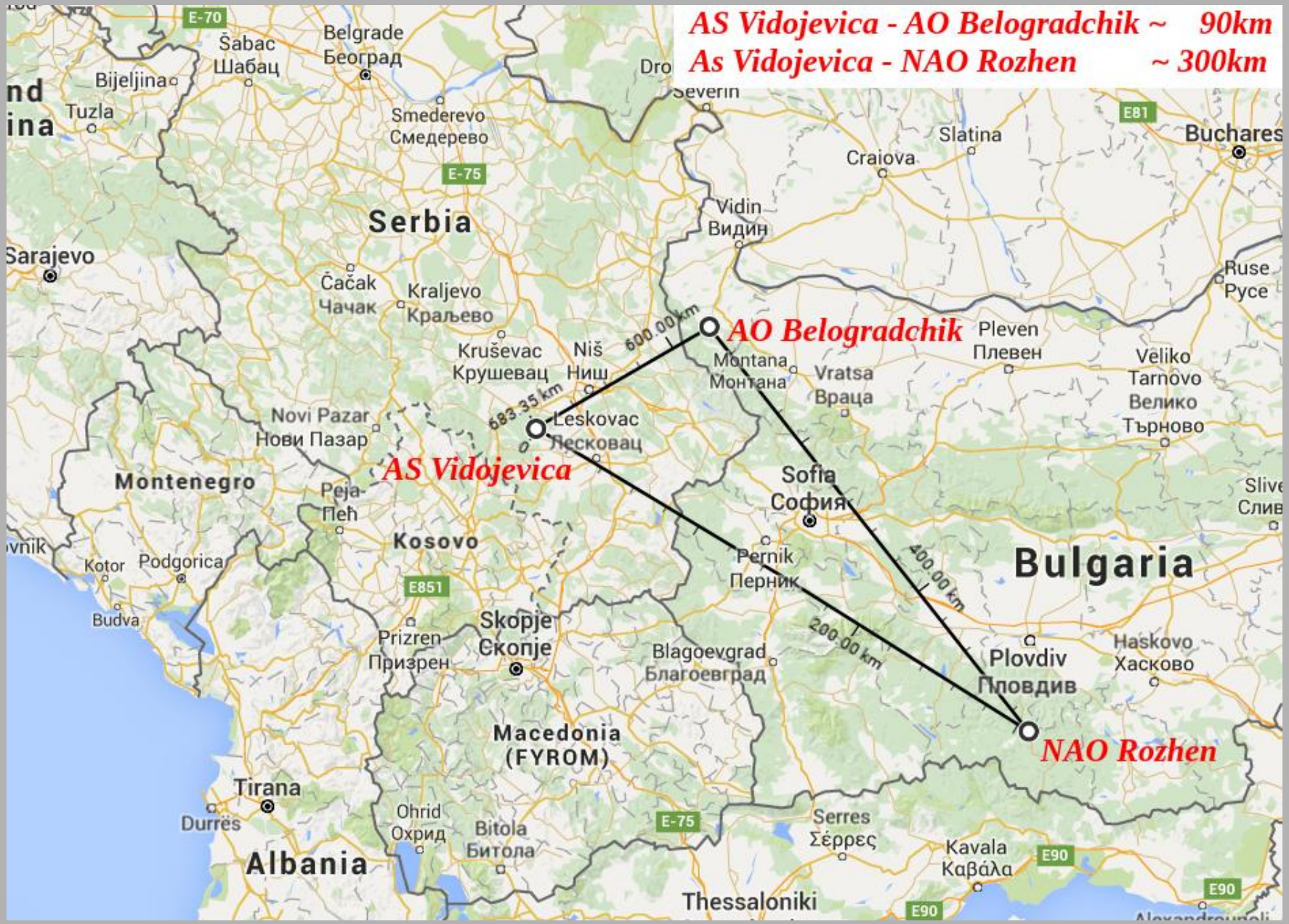
Mini-network (3 sites, now 6 telescopes):

- 60cm and 1.4m tel. of Astronomical Station Vidojevica - ASV of Astronomical Observatory in Belgrade - AOB (Serbia),
- 2m, 60cm and 50/70cm Schmidt-camera at Rozhen Obs., National Astronomical Observatory (NAO) of Bulgarian Academy of Sciences (BAS),
- 60cm Belogradchik AO (Bulgaria).

And the 1.31m (3.6m?) ARIES (Aryabhatta Research Institute of observational sciencES, India) tel.

- Johnson UBV and Cousins RI filters.

ASV, Belogradchik and Rozhen



The instruments:

1) 60 cm Cassegrain (long.=21.5º, lat.=43.1º, h=1136m), CCD Apogee Alta U42, ASV (Serbia),
2) 1.4m (21.6, 43.1, 1143m), CCD Apogee Alta U42, ASV(Serbia),
3) 2m Ritchey-Chrétien (24.7º, 41.7º, 1730m),
CCD VersArray 1300B, Rozhen Obs. (Bulgaria),
4) 60cm Cassegrain (24.7º, 41.7º, 1759m),
CCD FLI PL09000, Rozhen Obs. (Bulgaria),
5) 50/70cm Schmidt-camera (24.7º, 41.7º, 1759m),
CCD FLI PL16803, Rozhen Obs. (Bulgaria),
6) 60cm Cassegrain (22.7º, 43.6º, 650m),
CCD FLI PL09000, Belogradchik (Bulgaria).

The 1.4m ASV (Serbia), since mid-2016

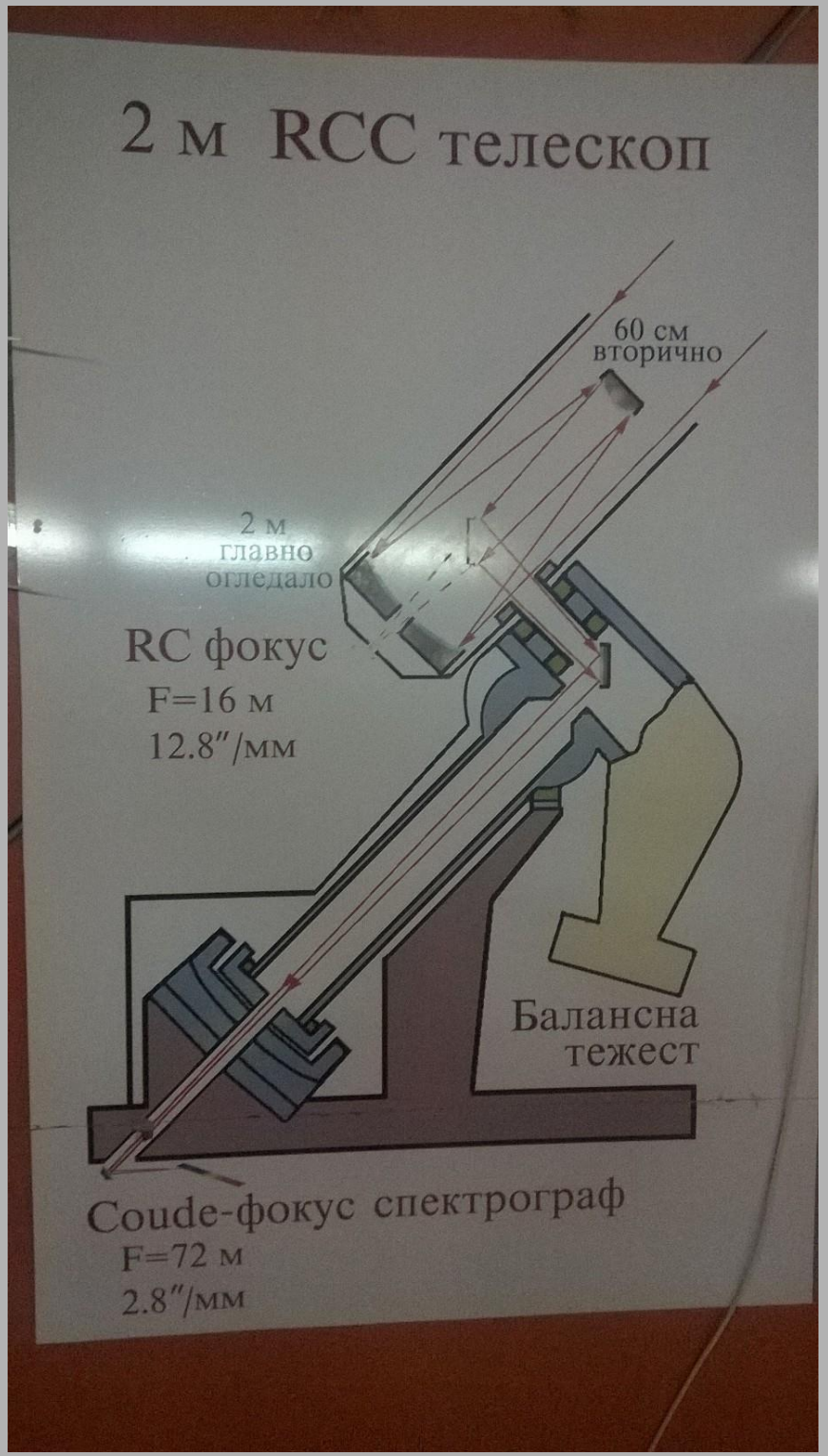
BELISSIMA project, Ritchey-Chrétien, Nasmyth

Optical observations of Gaia Alerts, Gaia-FUN-TO

Schmidt-camera 50/70cm

1) The ASV (D/F=0.6/6m) tel. The CCD Apogee Alta U42: 2048x2048 pixels, pixel size is 13.5x13.5 μm, scale is 0.″465/pixel, FoV=15.8x15.8′, + SBIG ST10 XME & Apogee Alta E47.

2) The R.C. (D/F=2/16m) tel. of Rozhen National Astronomical Observatory (NAO) of Bulgarian Academy of Sciences (BAS). The CCD VersArray 1300B: 1340x1300, 20x20μm, 0.″261/px, 5.6x5.6′.


2 м RCC телескоп
60 см
вторично
2 м
главно
огледало
RC фокус
F=16 м
12.8″/мм
Балансна
тежест
Coude-фокус спектрограф
F=72 м
2.8″/мм

Dome, 2 m Rozhen

3) The 60cm Rozhen (F=7.5m) tel.
The CCD FLI PL09000: 3056x3056, 12x12µm, 0.″33/pixel, 16.8x16.8‘; under reconstruction.
4) The 50/70cm Schmidt (F=1.72m), Rozhen.
The CCD FLI PL16803: 4096x4096, 9x9µm, 1.″08/pixel, 73.7x73.7' .
5) The 60cm Belogradchik (F=7.5m) tel.
The CCD FLI PL09000: 3056x3056, 12x12µm, 0.″335/pixel, 16.8x16.8'.
6) The 1.4m ASV (F=11.42m) tel. since mid-2016. The CCD Apogee Alta U42: 2048x2048, 13.5x13.5 µm, 0.″243/pixel, 8.3x8.3’, since mid-2016., new Andor iKon-L 936 (2048x2048 pixels, 13.5x13.5µm).

1.31m ARIES (Manora Peak, Nainital, India)

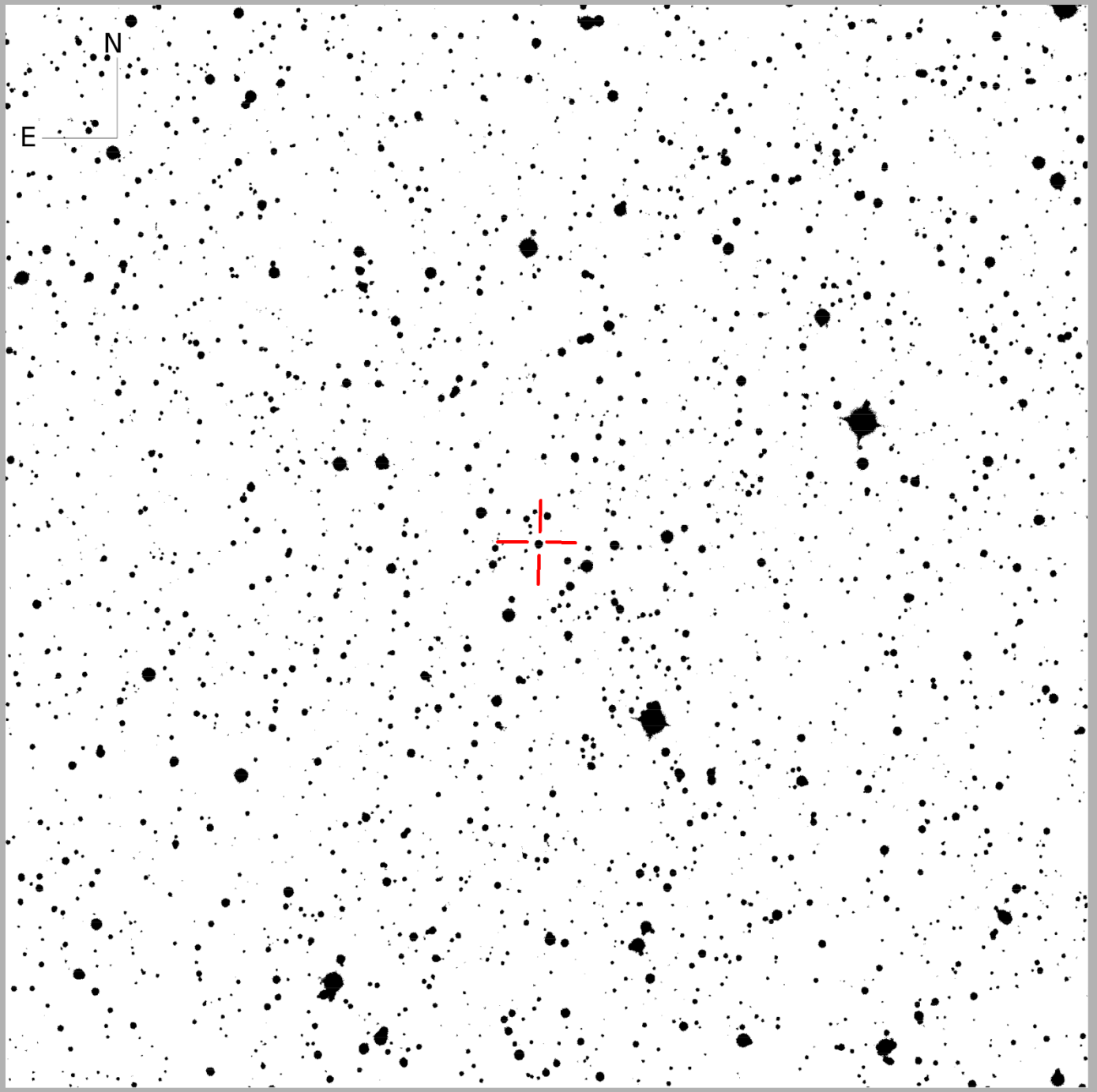
ARIES - **A**ryabhatta **R**esearch **I**nstitute of observational scienc**ES**

R.C. Cassegrain (long.=79.6ºE, lat.=29.35ºN, h=2420m), central Himalayan region.

CCD: 2048x2048 pixels, pixel size is 13.5x13.5 μm, scale is 0.″541/pixel, FoV=18.5x18.5′, 21-25Nov.2016 (Gaya16aye, 6 times).

3.6m(?) R.C. f/9 (79.7ºE, 29.35ºN, 2450m), Alt-Azimuth.

Gaia16aye(23), R-filter(Exp.=40s), June19th2017, 1.4m ASV.



Observed objects (15) during 2017 (until Oct.):

- **1.4m ASV (5 objects)**: Gaia16aye(11 times), Gaia17arv(1), Gaia17asa(1), Gaia17asc(1), Gaia17aru(1).
- **60cm ASV (9)**: Gaia16aye(8), Gaia17bsu(1), Gaia17bsp(1), Gaia17bsr(1), Gaia17bts(4), Gaia17bxh(1), Gaia17chf(1), Gaia17cgo(1), Gaia17che(1) .
- **60cm Belogradchik (1)**: Gaia17ade(2).
- **2m Rozhen - FoReRo2 (1):** Gaia16aye(4).
- **50/70cm Schmidt-camera (5):** Gaia17asc(1), Gaia17arv(1), Gaia17asa(1), Gaia17chf(1), Gaia17bts(1).
- **60cm Rozhen** : - (under reconstruction).

Conclusions

- The Gaia-FUN-TO (15 objects in 2017, 45 ones 2014-2017) using 6 telescopes, and BVRI filters; the seeing=1.″0 to 3.″5 (mean~1.″2 at ASV site, it could be 0.″7 at Rozhen and ASV).
- During 2017 (until October) there are: ~230 points using 60cm ASV tel., ~180 ones with 1.4m ASV (Serbia), ~10 at 2m Rozhen, 60 at Schmidt-camera (Rozhen), and ~20 at 60cm Belogradchik (Bulgaria); sum ~ 500 (1650), 60cm Rozhen: - .
- It is possible to observe the objects until V~20mag by using 2m Rozhen or 1.4m ASV (Exp.time. ~5min), or until V~19mag with smaller instruments.
- The 1.4m tel. at ASV site from mid-2016 via Belissima project. New Andor i Kon-L 936, new EMCCD Andor iXon 897 for lucky imaging.

Thank you!