Gaia-FUN-TO and the observations of Gaia Alerts objects using Serbian-Bulgarian mini-network telescopes

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Introduction

❖ The ESA space astrometry mission Gaia (December 2013).

❖ 1 000 000 stars and 500 000 QSOs, Gaia celestial reference frame (QSOs based one, Gaia CRF), extragalactic radio sources (ERS) in optical domain, morphology and photometry of targets.

❖ The follow-up network for the Gaia photometric alerts.
Mini-network (5 telescopes):

❖ 60cm ASV (Astronomical Station Vidojevica, AOB, Serbia),

❖ 2m Rozhen (NAO BAS, Bulgaria), 60cm Rozhen, 50/70cm Schmidh (Rozhen),

❖ 60cm Belogradchik AO (Bulgaria).

❖ Johnson UBV and Cousins RI filters.
The instruments:

1) 60 cm Cassegrain (long.=21.5°, lat.=43.1°, h=1150m),
   CCD Apogee Alta U42, ASV (Serbia),

2) 2m Ritchey-Chrétien (24.7°, 41.7°, 1730m),
   CCD VersArray 1300B, Rozhen Observatory (Bulgaria),

3) 60cm Cassegrain (24.7°, 41.7°, 1759m),
   CCD FLI PL09000, Rozhen Observatory (Bulgaria),

4) 50/70cm Schmidt-camera (24.7°, 41.7°, 1759m),
   CCD FLI PL16803, Rozhen Observatory (Bulgaria),

5) 60cm Cassegrain (22.7°, 43.6°, 650m),
   CCD FLI PL09000, Belogradchik (Bulgaria).
60cm ASV (Serbia), since mid 2011
Optical observations of targets for Gaia Alerts

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′.

2) The RC (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′.
3) The 60cm Rozhen (F=7.5m) tel. The CCD FLI PL09000: 3056x3056, 12x12μm, 0.″33/pixel, 16.8x16.8′.

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′.
Gaia14aae (GaiaVerif14acp), R-filter, Oct. 21st 2014, ASV

Observed objects (17)

❖ 60cm ASV:
   Gaia14aae(1), Gaia15 aai(1), Gaia15aaj(1), Gaia15aal(1),
   Gaia15aba(1), Gaia15ace(1), Gaia15abn(1), Gaia15ael(1),
   Gaia15aek(1), Gaia15aea(1), Gaia15adu(1), Gaia15afd(5),
   Gaia15afq(4), Gaia15aft(3), Gaia15afc(1), Gaia15aff(4),
   Gaia15aer(1).

❖ 60cm Belogradchik:
   Gaia14aae(1), Gaia15afd(2).

❖ 2m Rozhen (FoReRo2):
   Gaia15aff(1).

❖ 50/70cm Schmidt-camera (Rozhen):
   Gaia15aff(1).
Conclusions

❖ The observations of Gaia-FUN-TO in optical domain (with BVRI filters) by using mentioned telescopes and good CCD detectors; the seeing=1.˝0 to 3.˝5 (~1.˝2 for 60cm ASV).
❖ These telescopes are useful for the photometric observations of Gaia Alerts objects: 17 ones at the ASV (Serbia), 3 ones at the Rozhen and Belogradchik (Bulgaria).
❖ With calibration (dark, bias, flat, hot/dead pixels, etc.) and stacking of data, it is possible to catch ~20mag target by using 2m Rozhen tel. and until ~19mag with other mentioned instruments. The exp.time until ~5min.
❖ Bellissima project, 1.4m telescope at ASV site (2016?).
Thank you!