

The UrbObsBel Project: Instruments and Detectors

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Abstract

Urban Observatory of Belgrade (UrbObsBel) is a project hosted by Astronomical Observatory of Belgrade. Our main aim is to study, applying well-tested astronomical techniques, light pollution and dynamical processes of the Serbian capital, Belgrade. Our observations will provide valuable information on energy usage distribution that has a high impact on the environment and ecosystems. We have already mounted and we are also planning to mount several observational instruments covering spectral range from visible (400 nm) to infrared (13 micron), and use both broadband and hyperspectral imaging systems in our synoptic study. Apart from study of the urban dynamics we intend to use several instruments aimed at the study of sky brightness and various sources of sky pollution such as street lights. This would be achieved mounting identical instruments at Astronomical Observatory of Belgrade (AOB) and at our Astronomical Station at Vidojevica (ASV). Until now we have acquired the following equipment: Web and file server, TESS-W photometer, Unihedron Sky Quality Meter, Hyperspectral Imaging (HSI) devices, FLIR and AllSky Camera.

FLIR camera

- FLIR A700, IR resolution (IFOV): 640×480 pixels, Field of view (FOV): $14^\circ \times 10^\circ$, Thermal sensitivity (NETD): <25 mK, 24° f/1.0 @ $+30^\circ\text{C}$
- It was purchased but not installed yet!



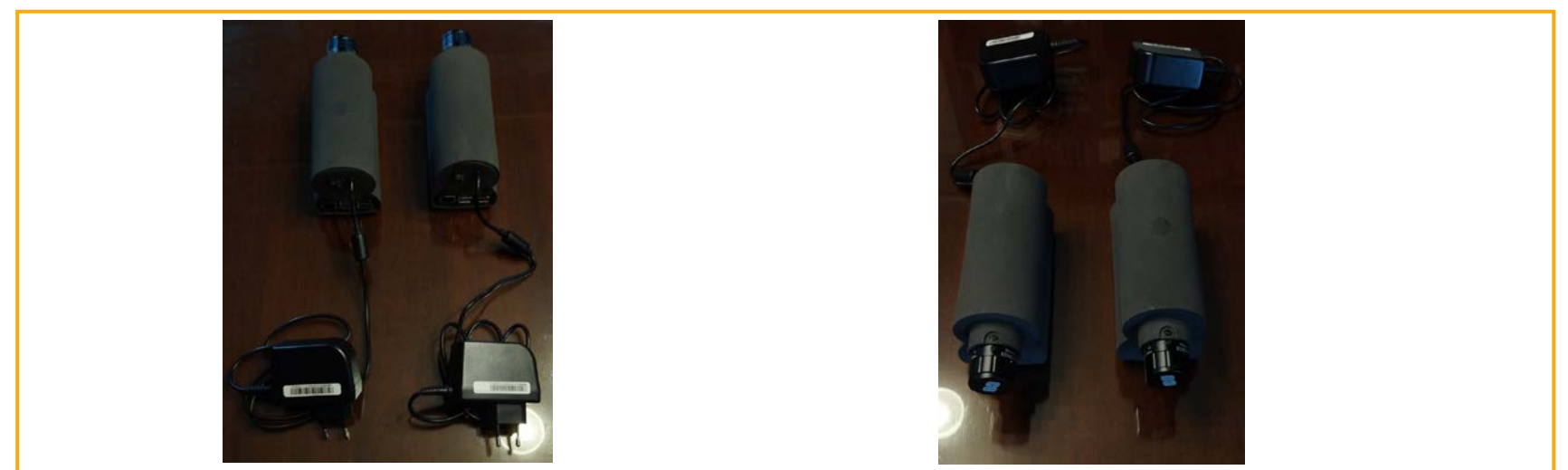
All Sky Camera

- Alcor OMEA 3C, Resolution: 3100×2100 pixels, Field of view (FOV): $180^\circ \times 180^\circ$, Pixel scale: 5.4 arcmin/pixel
- It was purchased but not installed yet!



HSI devices

- Visual and Near-Infrared (VNIR) Hyperspectral Imaging (HSI) devices
- It was purchased but not installed yet!



Unihedron Sky Quality Meter

- SQM-LE measures the brightness of the night sky in magnitudes per square arcsecond, HWHM of the angular sensitivity is $\sim 42^\circ$
- It was installed at Astronomical Station Vidojevica only



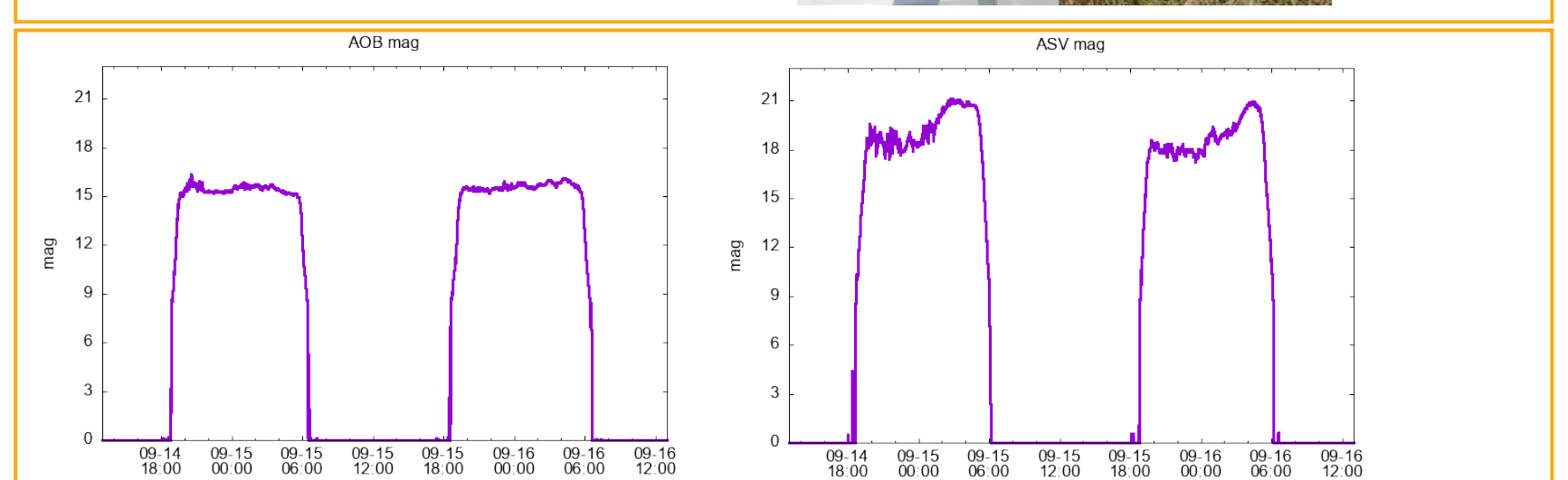
TESS-W photometer

- Further validity testing is required to confirm if the method works in clinical samples
- It was installed at Astronomical Observatory Belgrade (AOB) and Astronomical Station Vidojevica (ASV)



Comparing measurements

- We can compare TESS-W measurements at both stations during several nights: $\text{mag}_{\text{AOB}} = 16.35$ and $\text{mag}_{\text{ASV}} = 21.16$



On ASV we can see fainter objects up to 4.5 mag than on AOB

References

1. <http://urbobsbel.aob.rs>

2. <http://vidojevica.aob.rs>