Exoplanet transits, target for both professional and amateur astronomers

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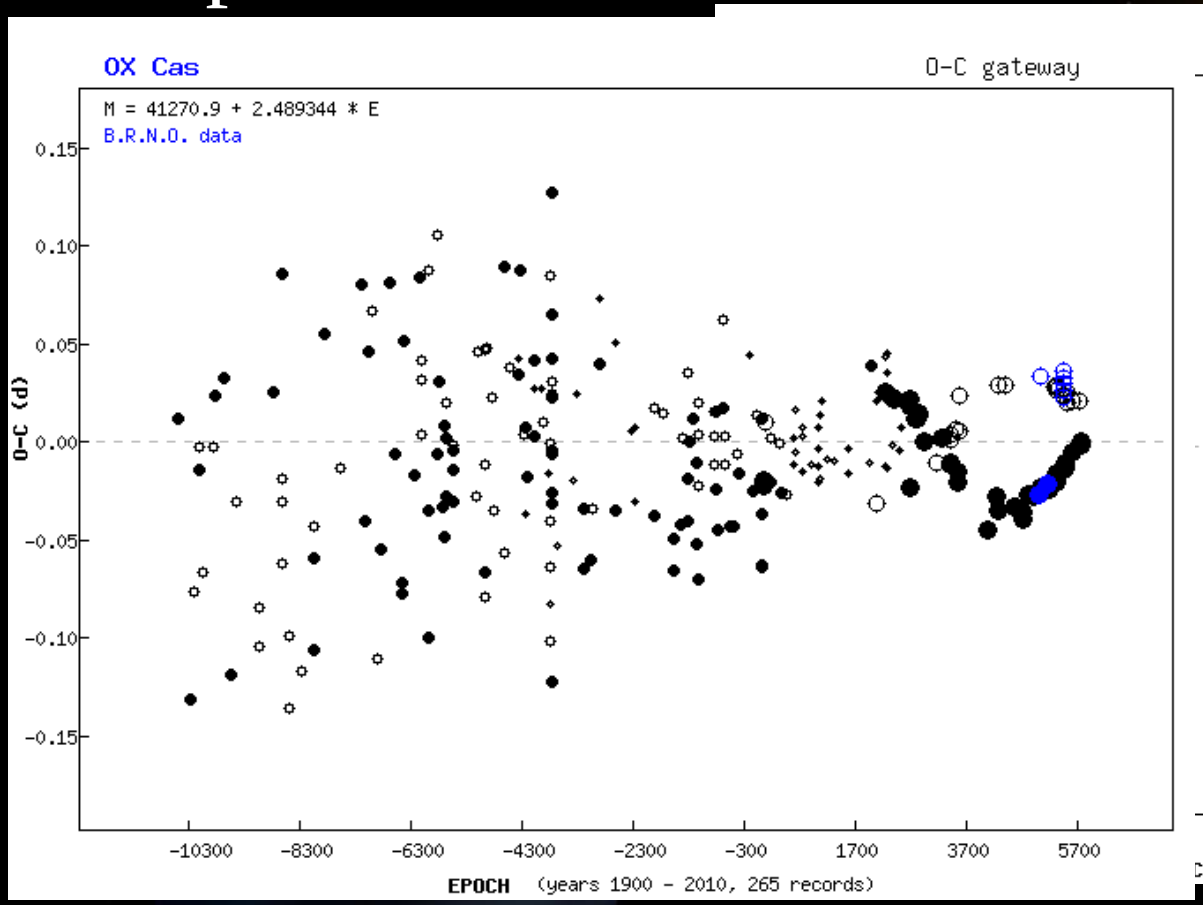
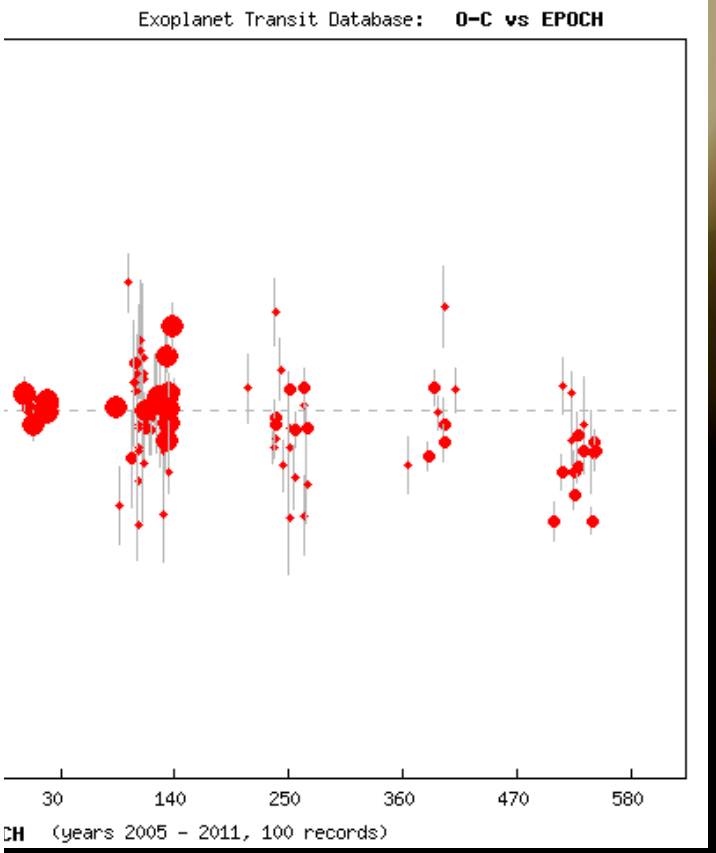
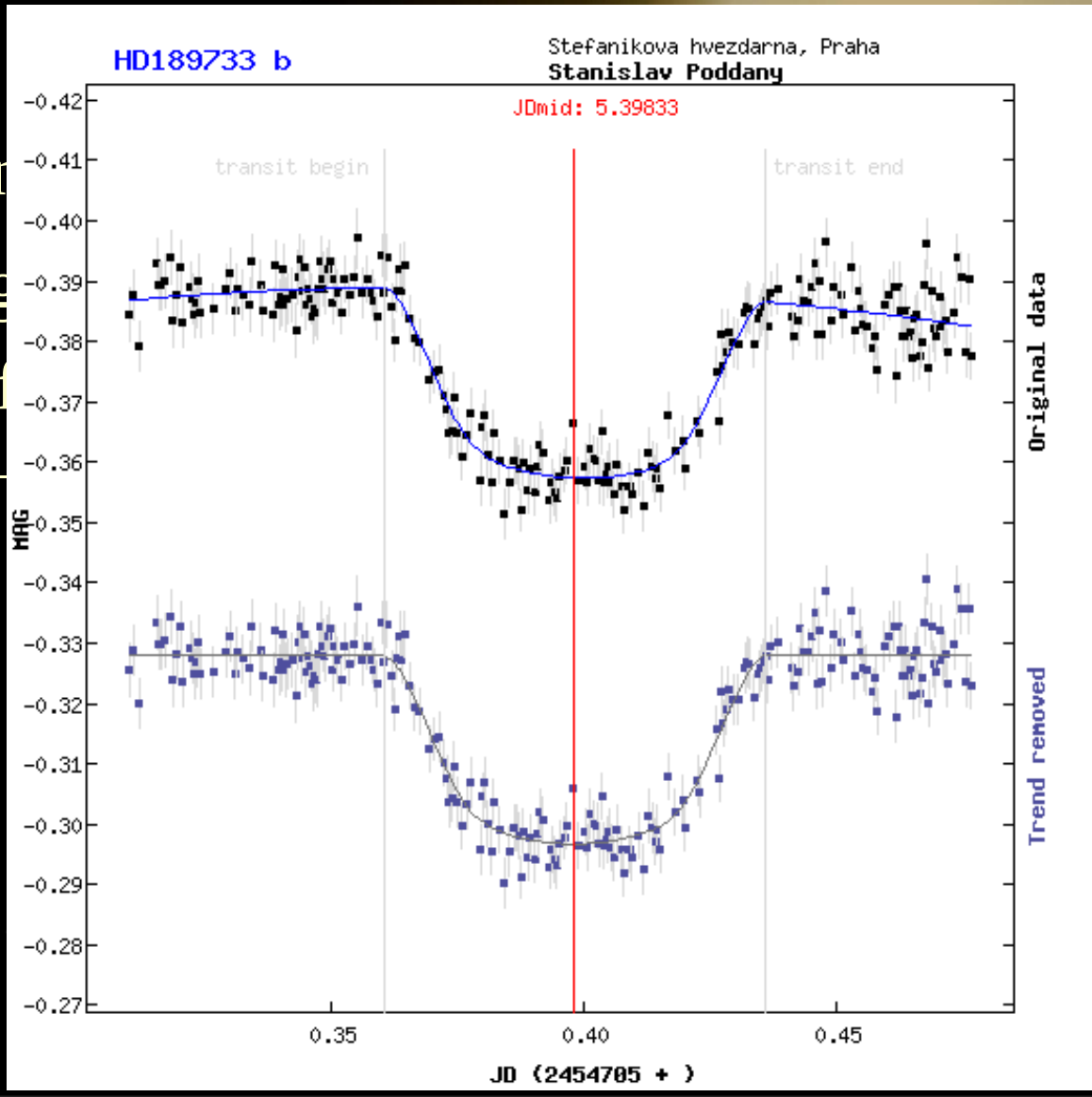
Exoplanet transits – a new field for amateurs (2/5)





Observational technics (3/5)

- Optics
  - Apertures 3 cm ar
  - A dew cap as long
  - Small focal ratio f
    light polluted sites -



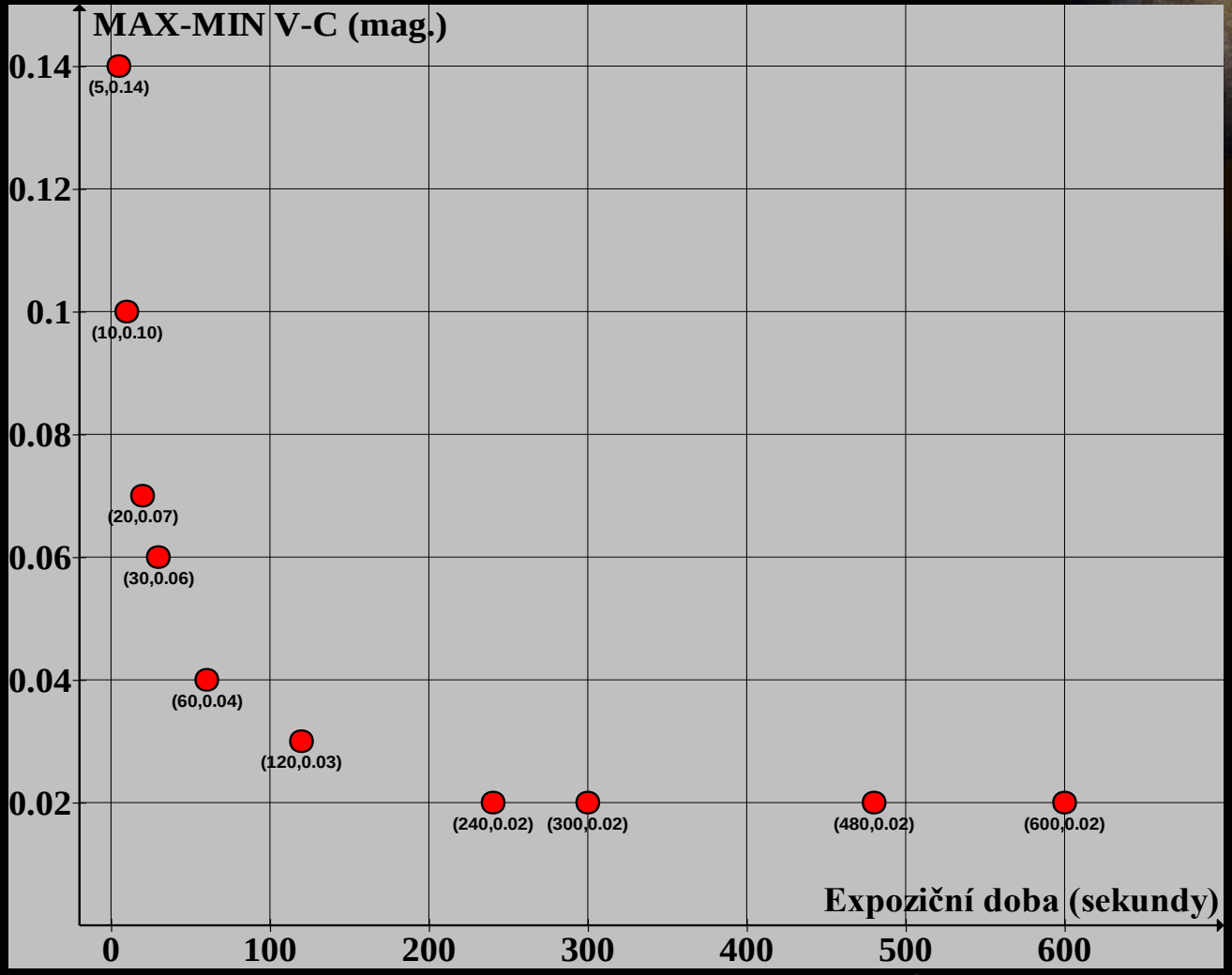
Example of photometric data obtained with f/11 0.4 m telescope from center of Prague – capital city of Czech republic (strong light pollution)

Increasing photometry precision (4/5)

- **Tips for high photometry precision**
  - Effect of exposure time
  - S/N ratio and defocusing
  - Star field must be fixed in CCD frame (autoguiding)
  - Multi comparison stars differential photometry
  - Paralel observing with more telescopes
  - Multi aperture – shutter light curves

Increasing photometry precision (4/5)

- Effect of exposure time



Seeing contribution to photometry noise

- short exposures = large scatter

- longer exposures = small scatter

Increasing photometry precision (4/5)

- S/N ratio and defocusing

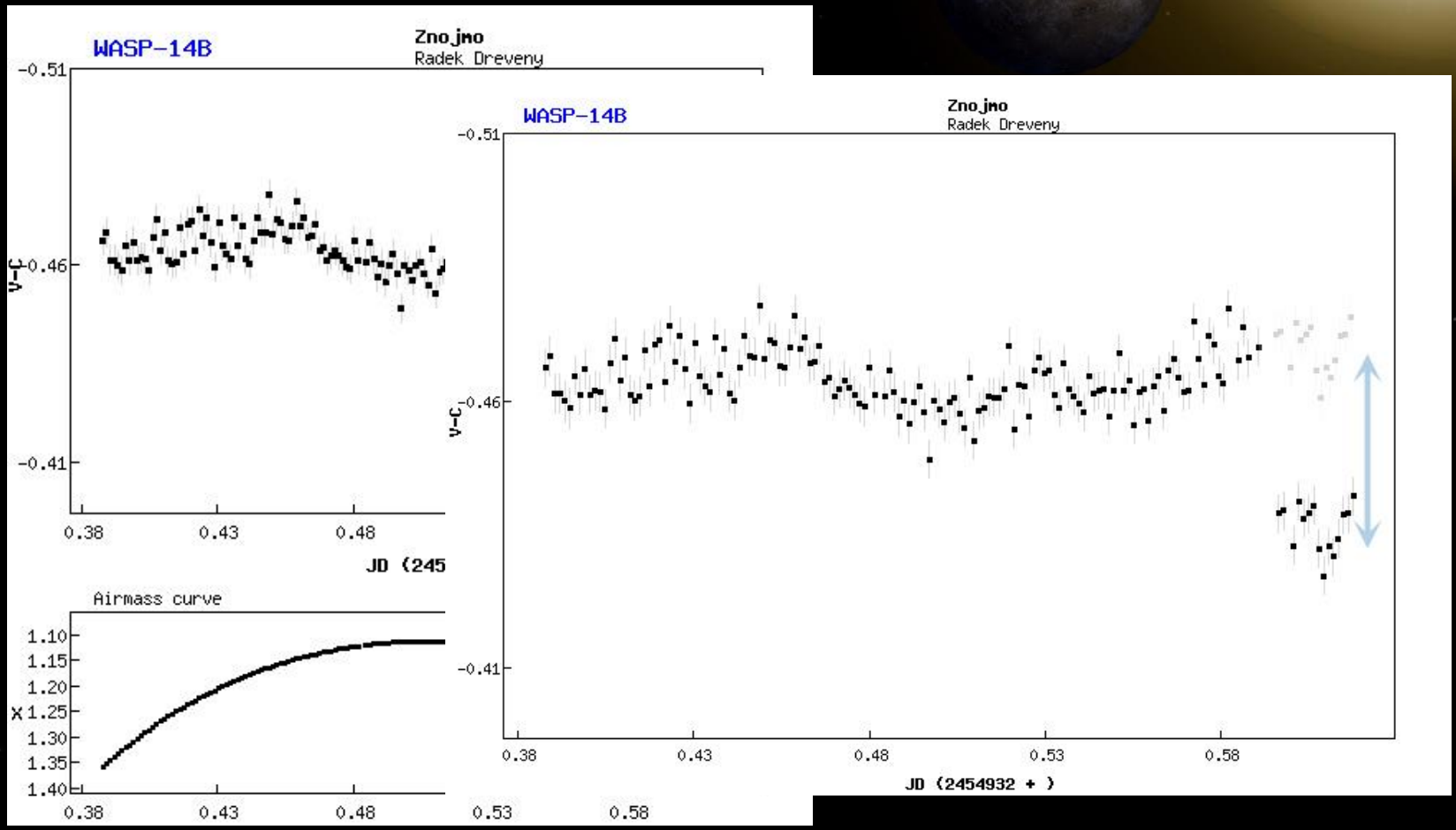
$$\sigma \approx 1.0857 \frac{N}{S}$$

$$S_{\text{aperture}} = \sum_{n=0}^{n_{\text{aperture}}} p(s) \ [\text{ADU}]$$

$$N = \sqrt{\frac{S_{\text{star}}}{G} + n_{\text{aperture}} \cdot \sigma_{\text{sky}}^2 + \frac{\sigma_{\text{sky}}^2}{n_{\text{annulus}}} n_{\text{aperture}}^2}$$

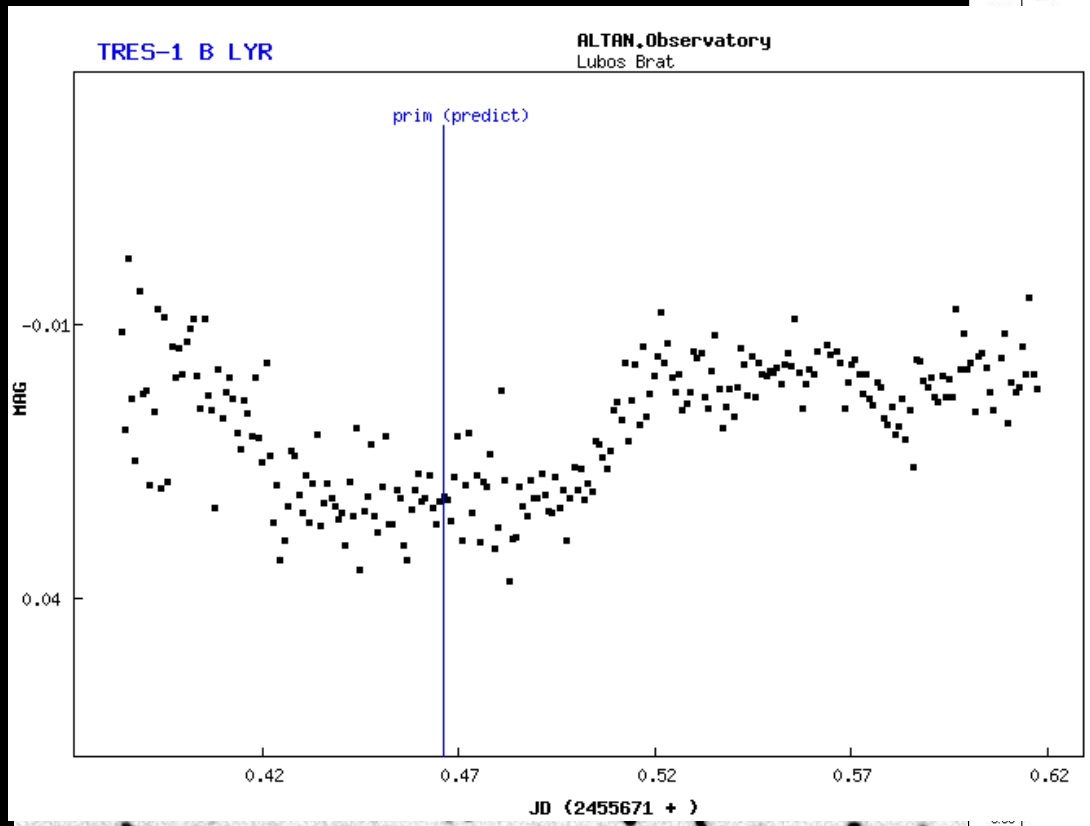
Increasing photometry precision (4/5)

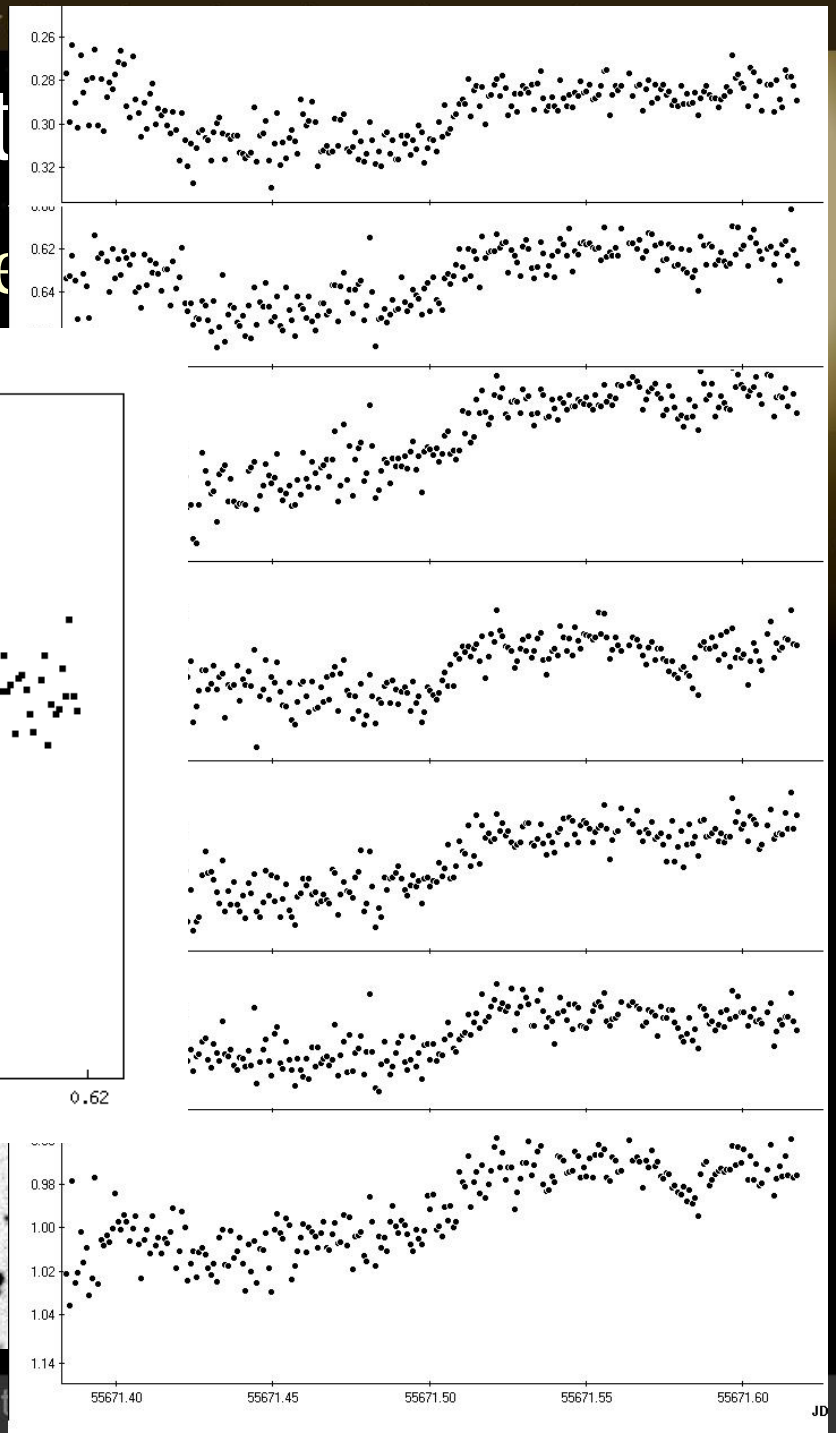
- Star field must be fixed in CCD frame (autoguiding, meridian flip)

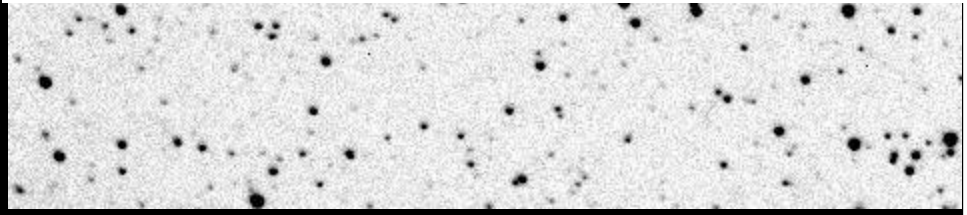


Increasing photomet

- Multi comparison stars diffe

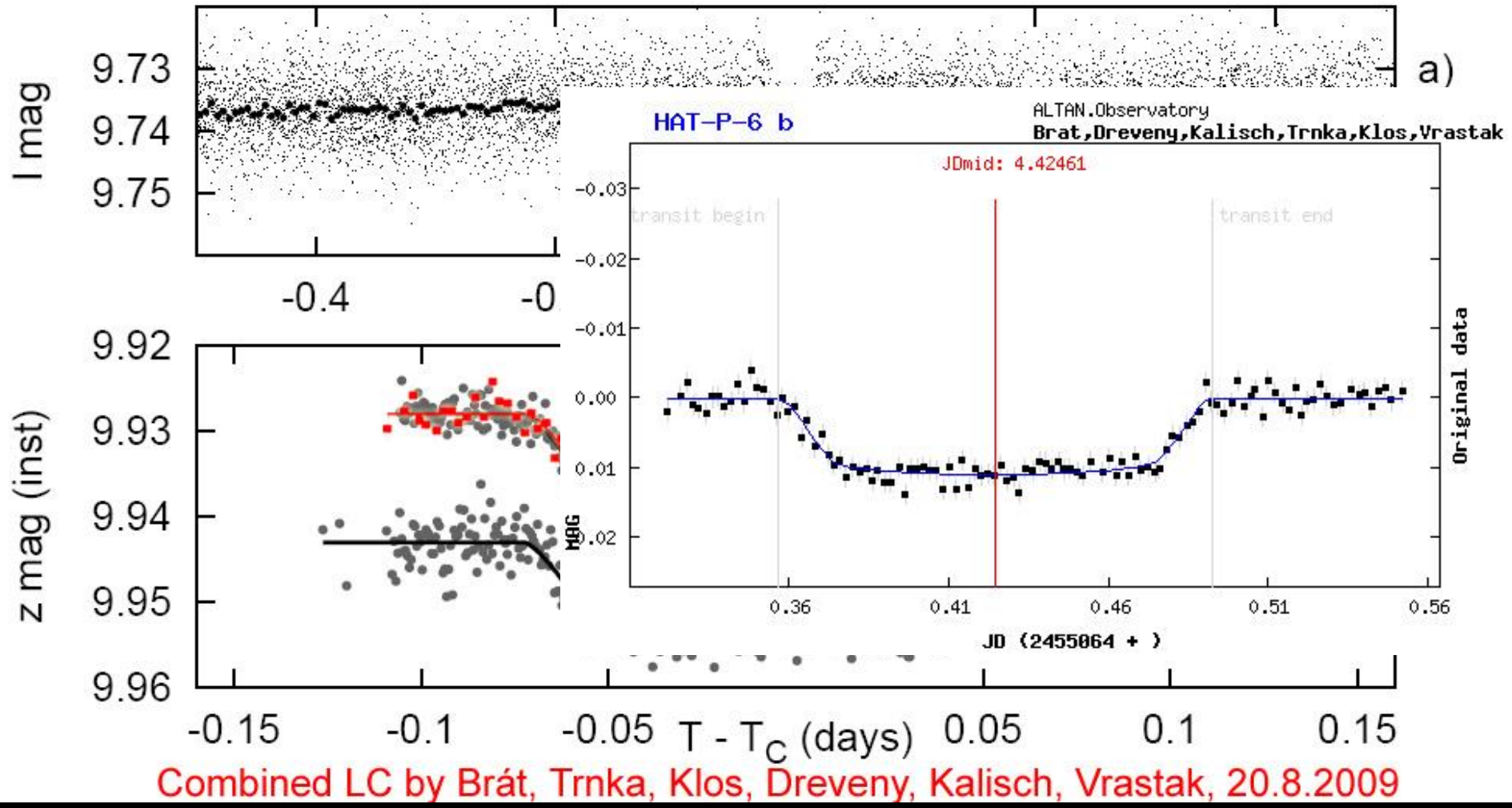






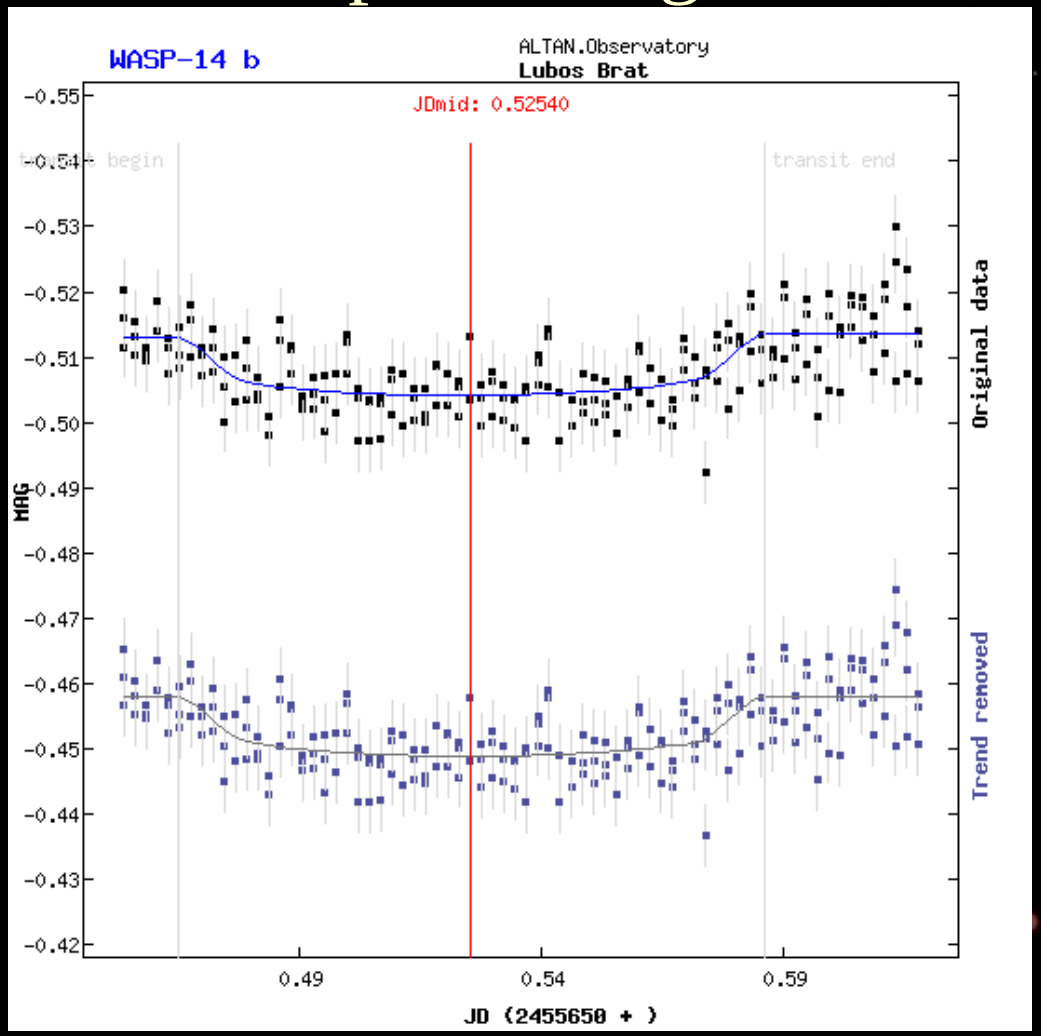
Increasing photometry precision (4/5)

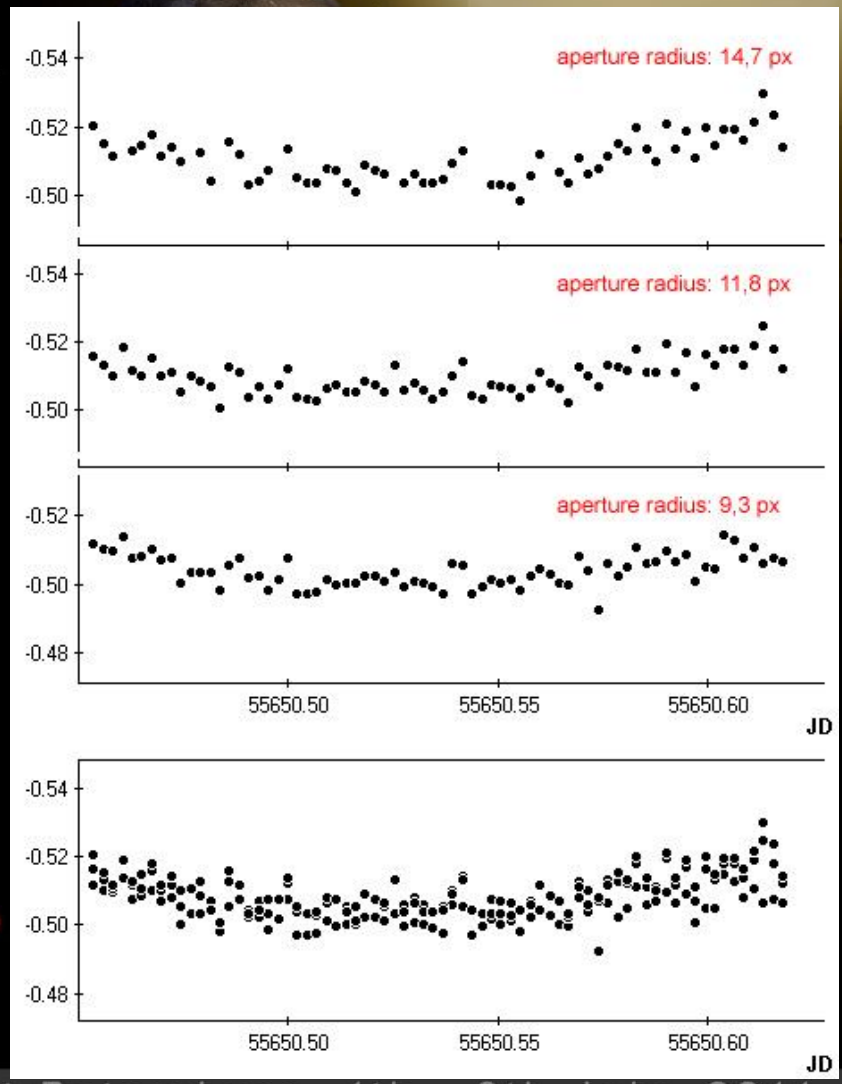
- Paralel observing with more telescopes



Increasing photometry precision (4/5)

- Multi aperture light curves






Thank you for your attention !