Video Photometry in Tangra 3

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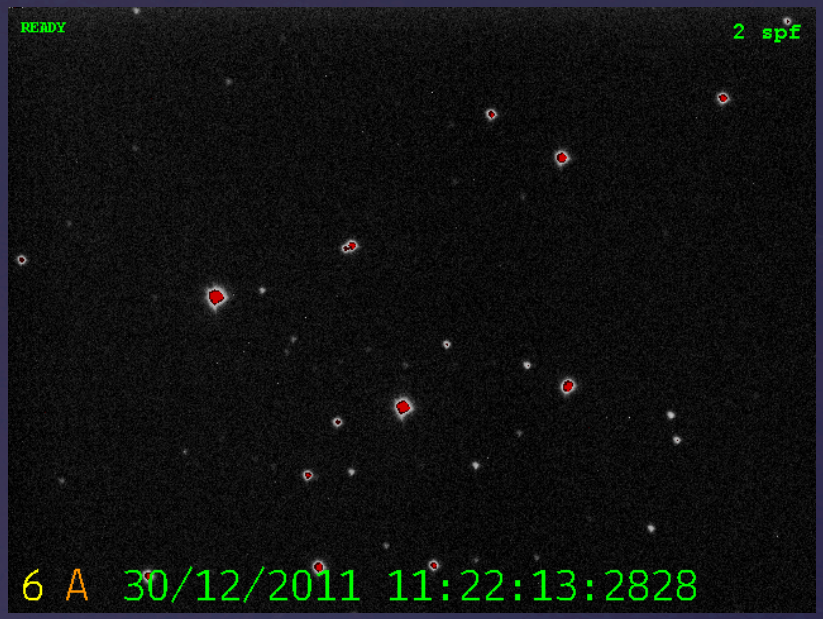
Lucky Star Kick-Off Meeting, Paris, 18-22 Apr 2016

- Project Managed on GitHub
- Open Source for Contributors and Researchers
- Cross-Platform on Windows, Linux and Mac OSX (Using C++ and the Mono Framework)

Tangra is Open Source & Cross Platform

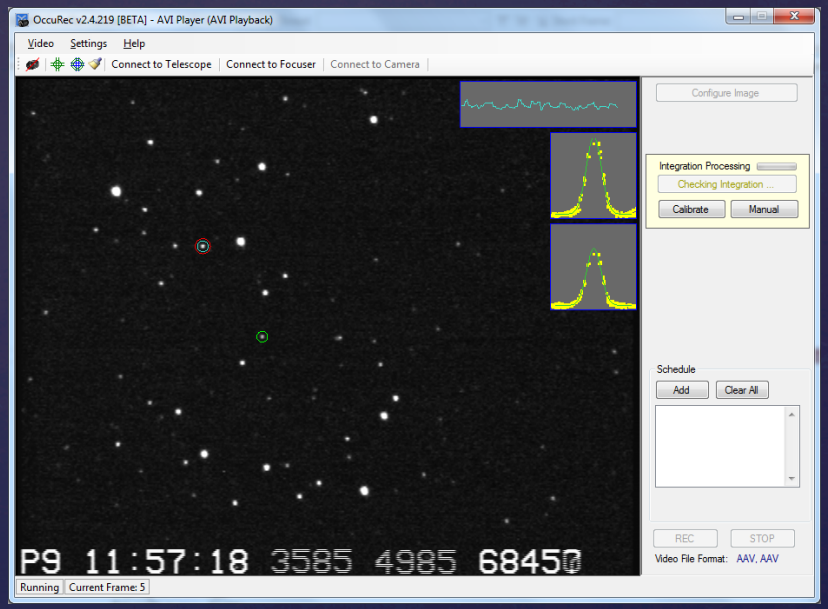
- ADV

Astronomical Digital Video



- AAV

Astronomical Analogue Video with OccuRec



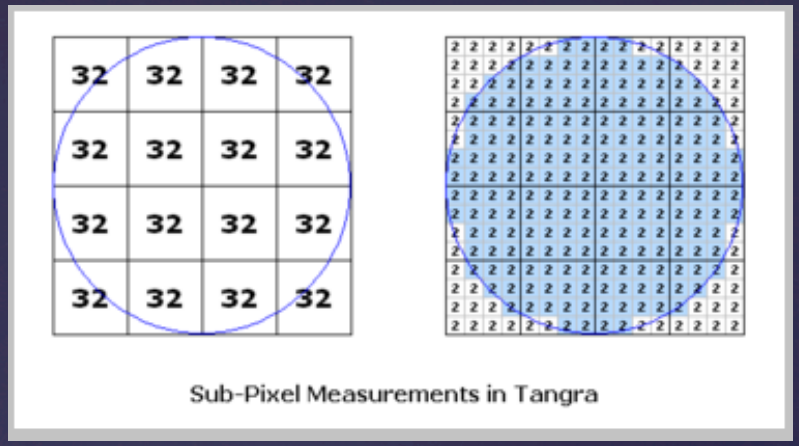
- FITS

Opens a FITS file sequence as a ‘video’

- Aperture and PSF Photometry
- Variety of Background Models (Mean, Median, Mode, PSF)
- Theory based on DAOPHOT (Stetson, P. 1986) and CCDCAP (Mighell, P. 1998)
- Supports Darks and Flats
- Undergone Extensive Accuracy Testing

Verified and Powerful Photometry

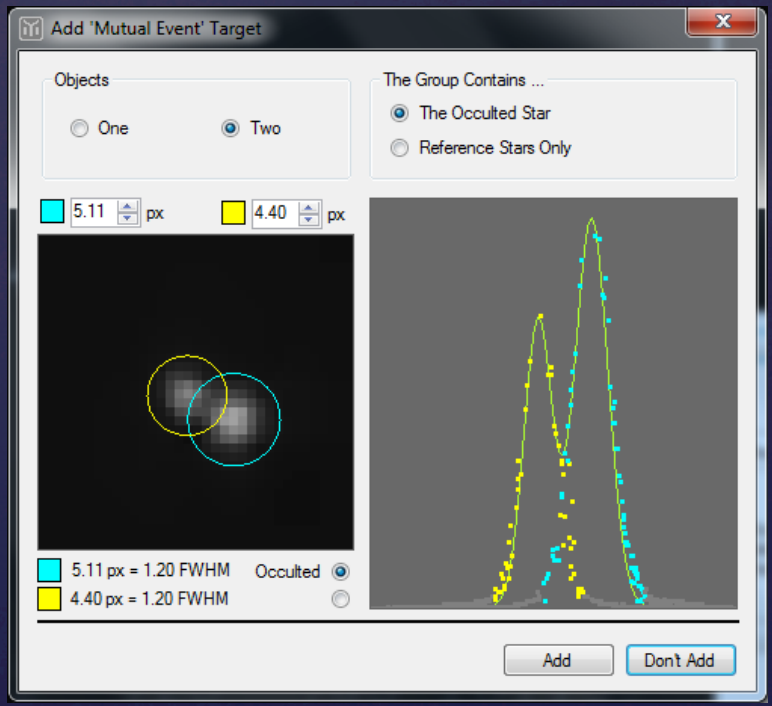
- Sub-Pixel Aperture Measurements

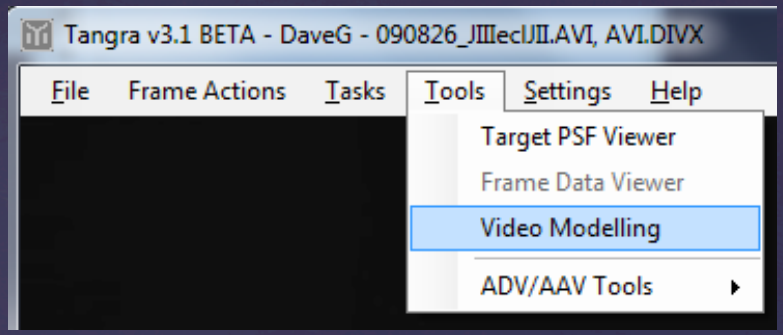


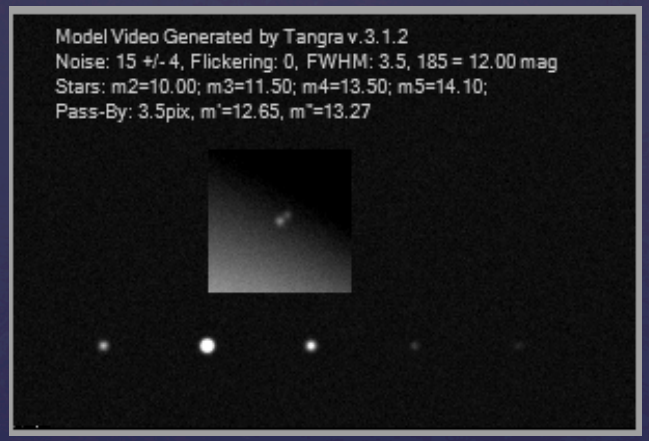
Sub-Pixel Measurements in Tangra

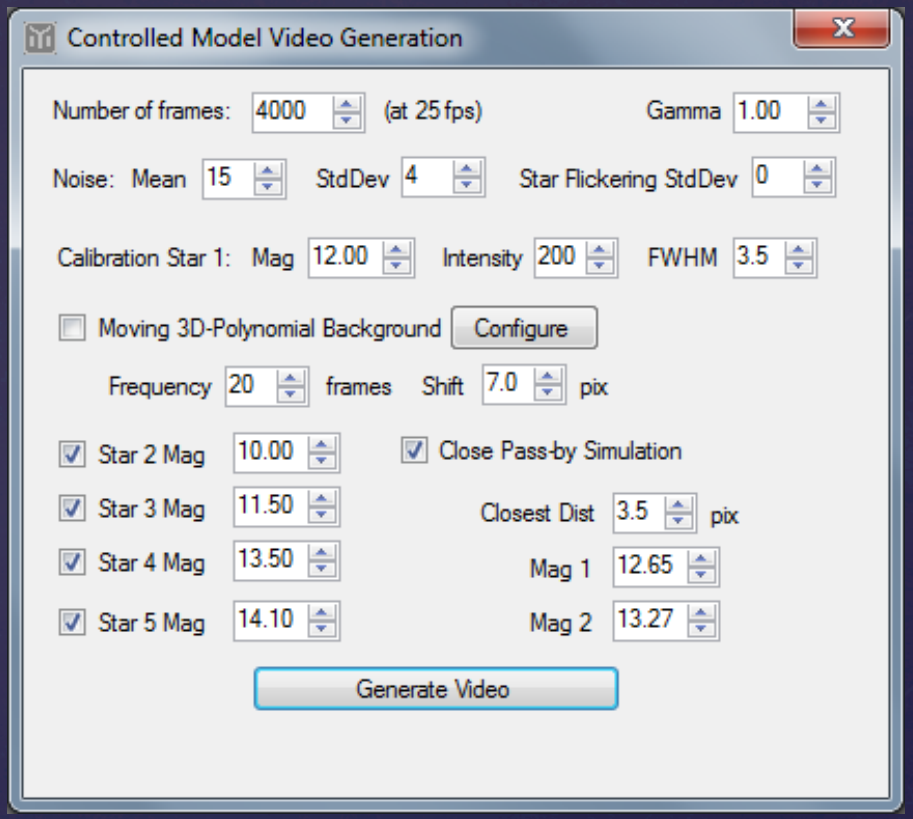
- PSF – Non-linear least square fitting and linear fitting to average model

- PSF fitting of overlapping model (application in Mutual Events)



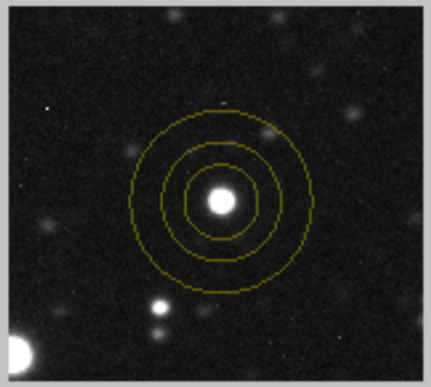




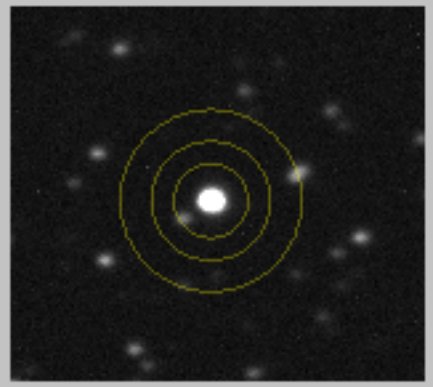


Testing with Modelled Videos

Check Star					
Frame No	143	153	175	189	222
Tangra	11.907	11.907	11.908	11.900	11.901
MaximDL	11.905	11.910	11.907	11.898	11.899
Difference	0.002	0.003	0.001	0.002	0.002



Variable Star					
Frame No	143	153	175	189	222
Tangra	11.972	11.948	11.895	11.845	11.748
MaximDL	11.965	11.940	11.888	11.841	11.743
Difference	0.007	0.008	0.007	0.004	0.005



- Tested with Variable Star Images
- Bias + Dark + Flat Corrected
- Agreement within 0.002 mags and 0.006 mags (contaminated background)

Testing against MaximDL

Demo – Processing FITS sequence

Questions?

http://www.hristopavlov.net/Tangra3