



# GATITO

a small photometric telescope for TIGRE

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- Photometric calibration: not possible now:
  - spend time in photometric stars
  - “aperture” (3”) too small
  - not photometric nights
- Differential photometry with a small telescope and large FOV



# Requirements

- Will not be an independent instrument!
- Telescope not very large and not very small
- Large FOV
- Large detector
- Derotator + Focuser + Filter wheel
- Large backfocus distance
- Telescope cover
- Linux

- Highly variable objects (SN, Novae,...)
- Determination of EW in T Tauri stars
- Search for photospheric analogs of short periods chromospheric cycles
- Comparison of chromospheric and photometric rotation periods
- Transients in FOV

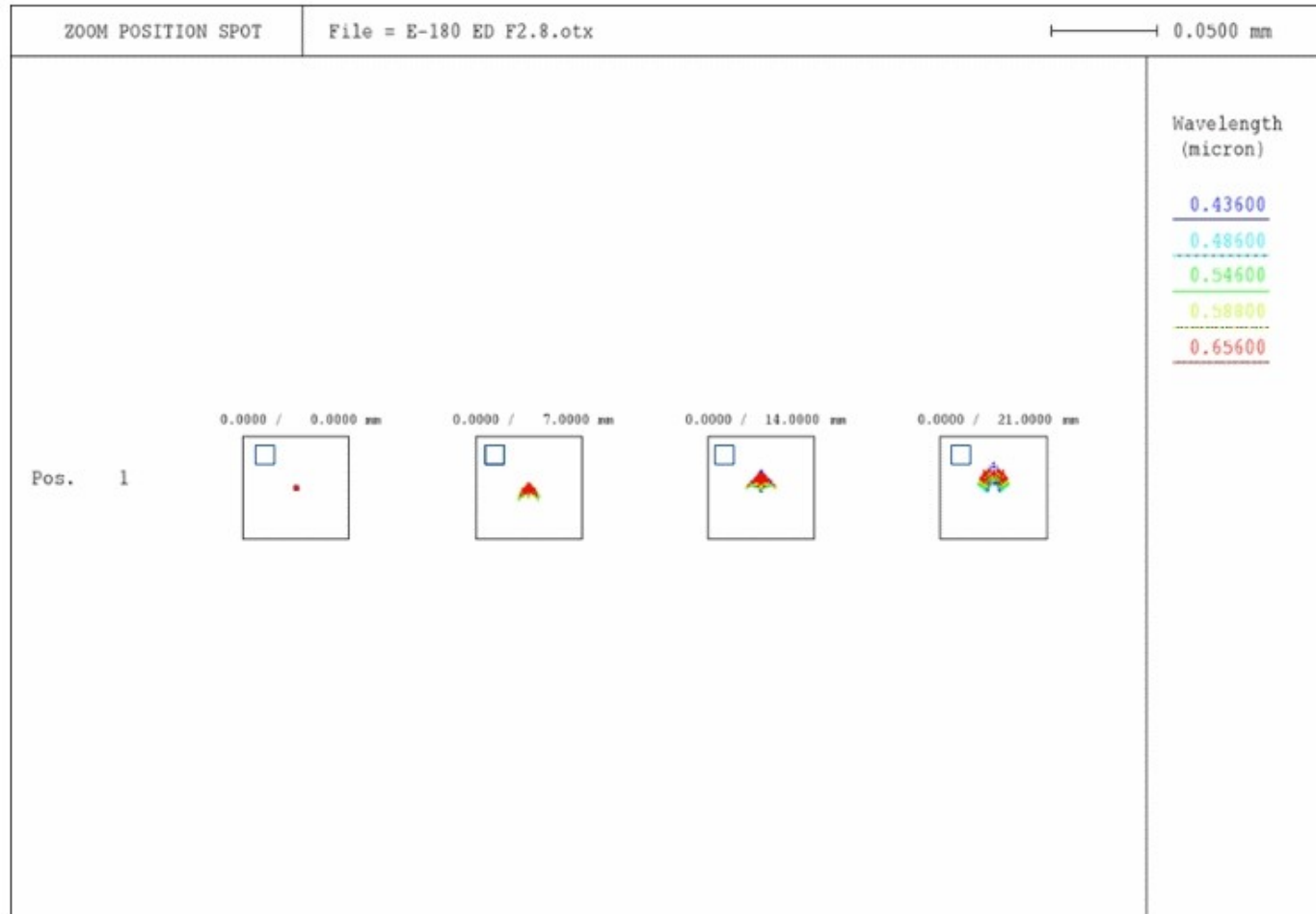


# Telescope



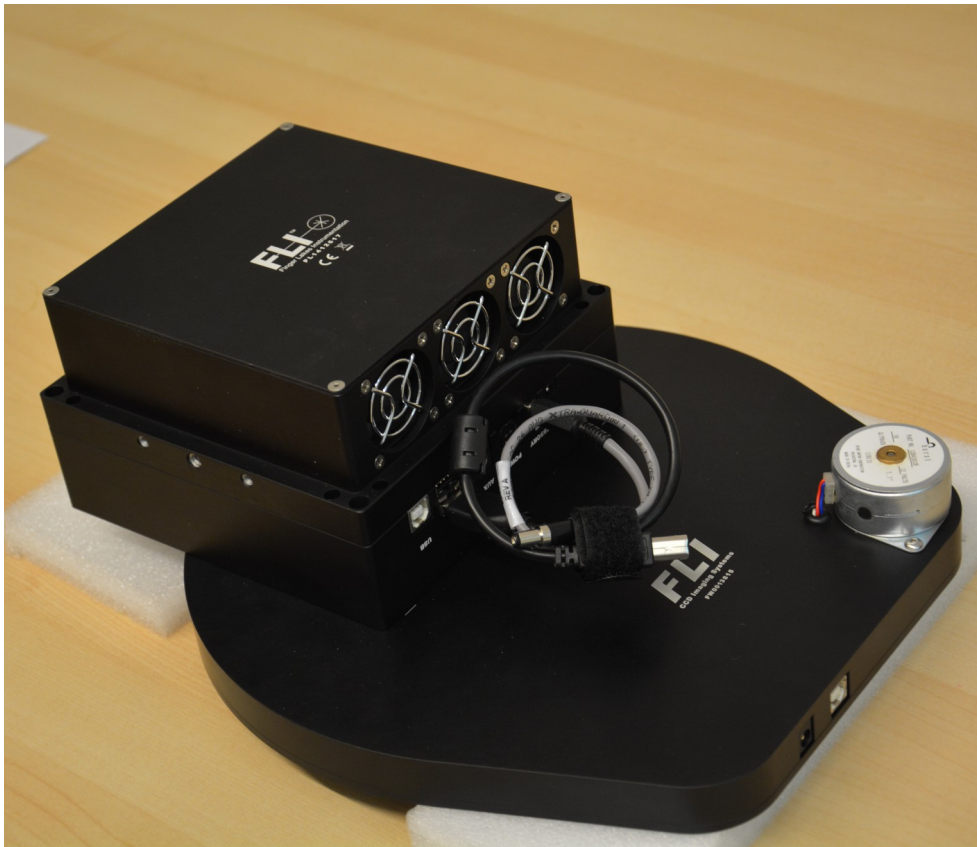
- Takahashi ε-180ED
- Effective aperture 180mm
- Focal length 500mm f/2.8
- FOV: Ø44mm (60% vignetting)
- FOV: Ø 5°

# Telescope



Credit: Takahashi Europe

# CCD + FW



- FLI PL 16803
- Kodak KAF-16803
- Front-illuminated
- 4096x4096 (9 $\mu$ m)
- 36.9x36.9mm
- Cooling  $\Delta T = 55^{\circ}\text{C}$
- Max. QE  $\sim 60\%$  at 550nm

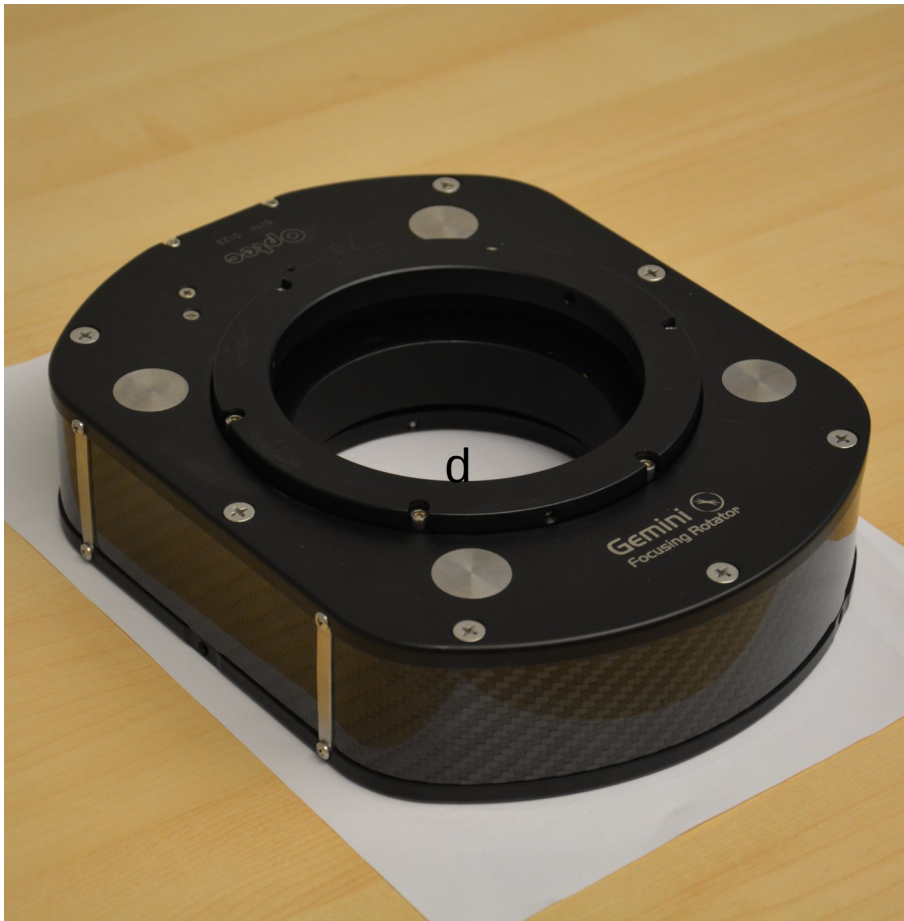


# CCD + FW



- Filter wheel
- FLI CFW5-7
- 7 positions
- 50mm square
- Johnson-Cousins  
B,V,Rc,Ic

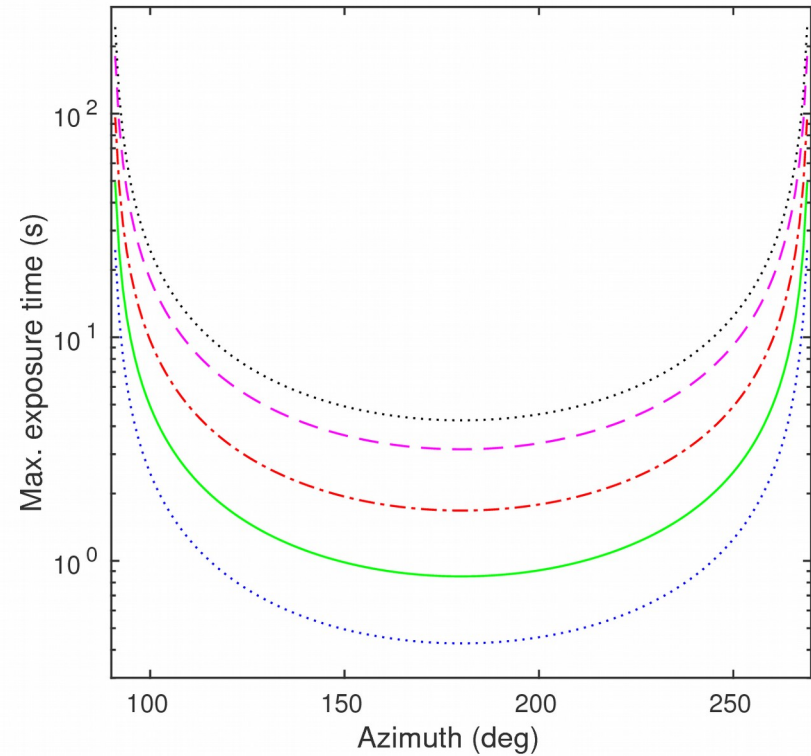
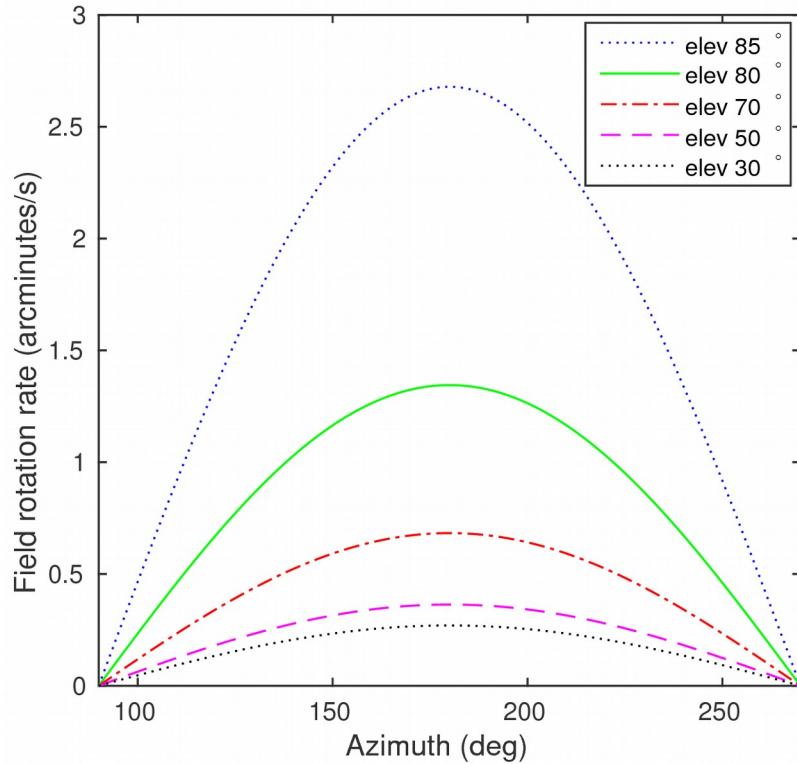
# Derotator



- Optec Gemini Focusing Rotator
- Focus travel 12.7mm
- Focus resol. 0.11 $\mu$ m
- Rotator resol. 600 steps/degree
- 1.5 deg/sec
- Handles 10kg payload

# Field rotation

$$D\eta/dt \text{ (rad/h)} = -0.262 \cos(\text{lat}) * \cos(\text{az}) * \sin(\text{elev})$$

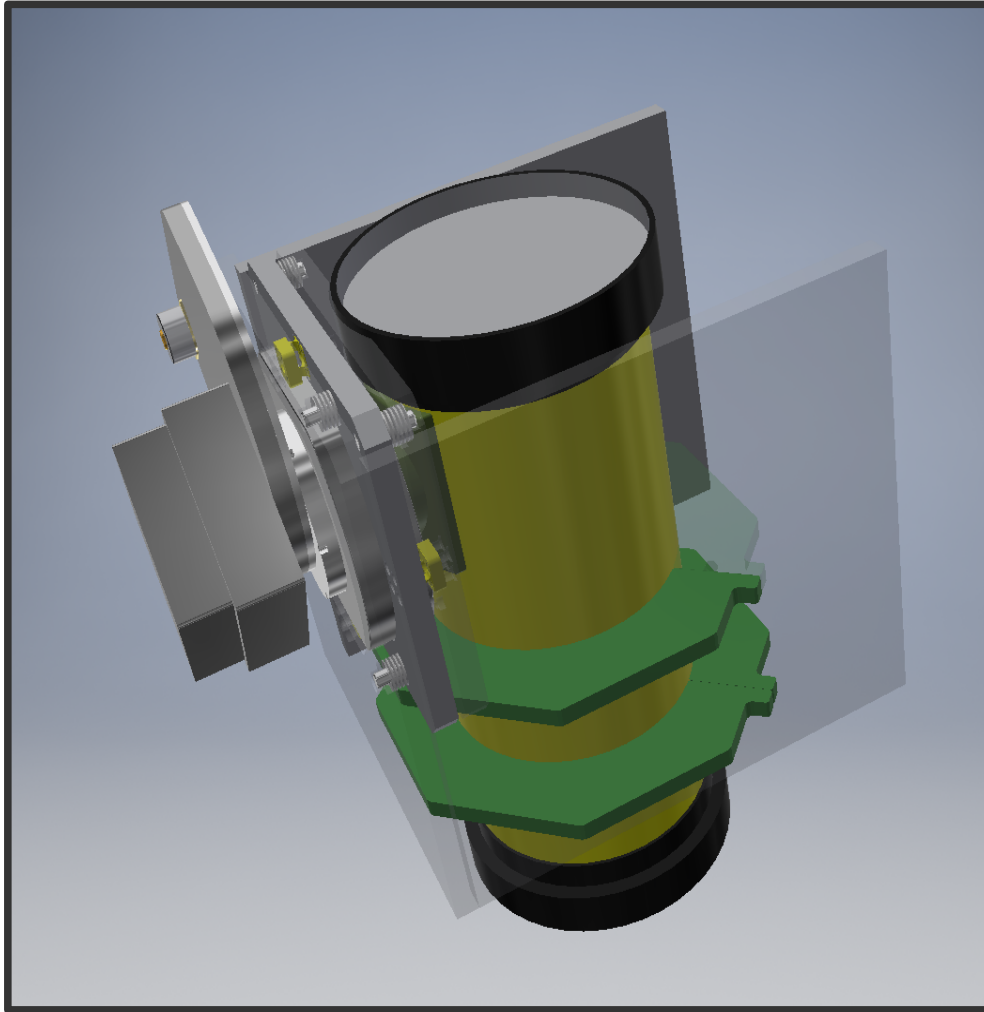


# FF Generator



- Aurora Flatfield panel
- Ø315mm illuminated surface
- Electroluminescent foil
- Better uniform illumination
- Better spectrum
- Integrated as cover

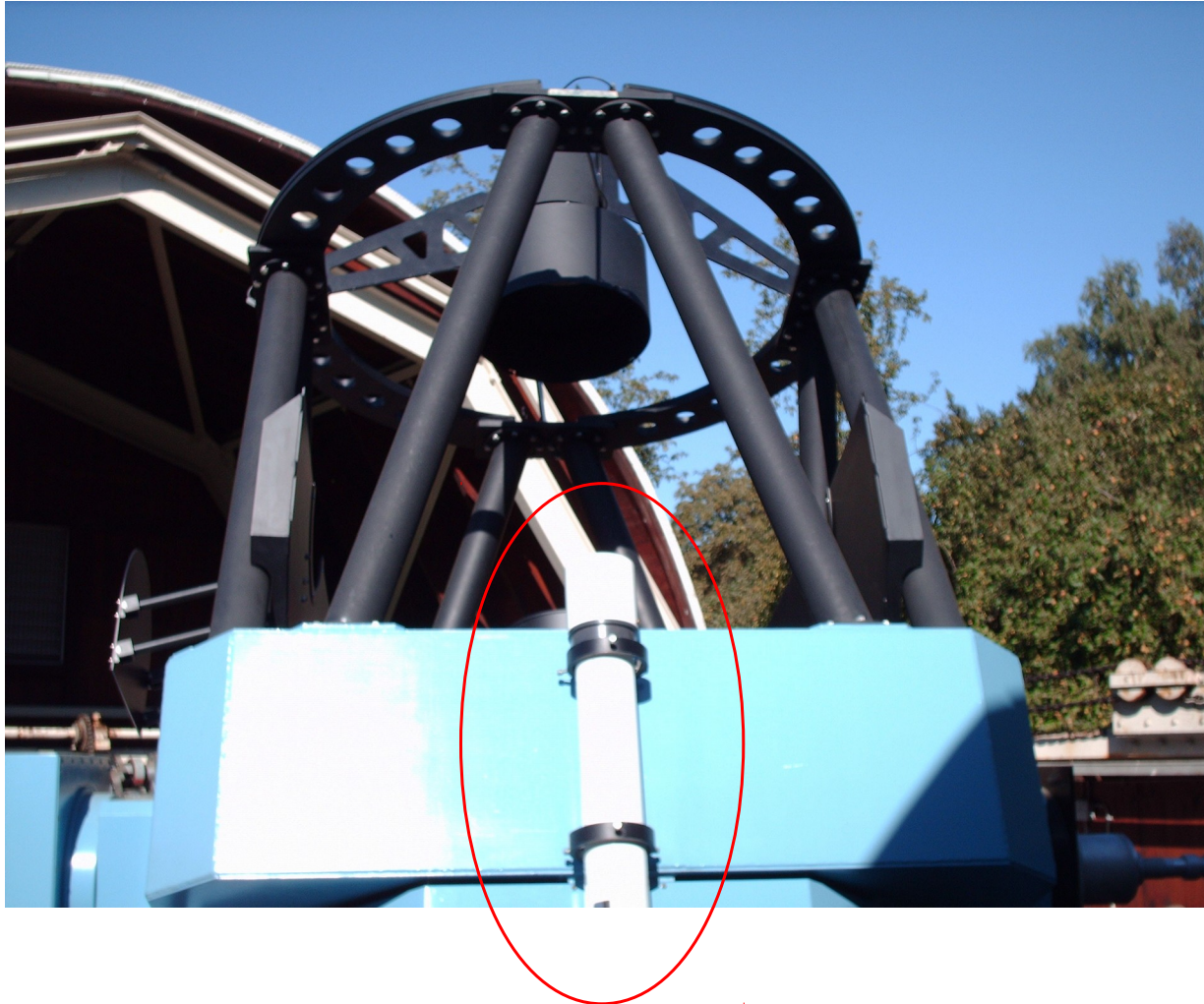
# Mount



- Telescope + instrument fixed to mount
- Correction lens in derotator
- Angle to instrument can be adjusted
- Angle of mount to telescope can be adjusted
- + Cover-FF Lamp

Credit: Arnis Levits

# Where?



# Time plan

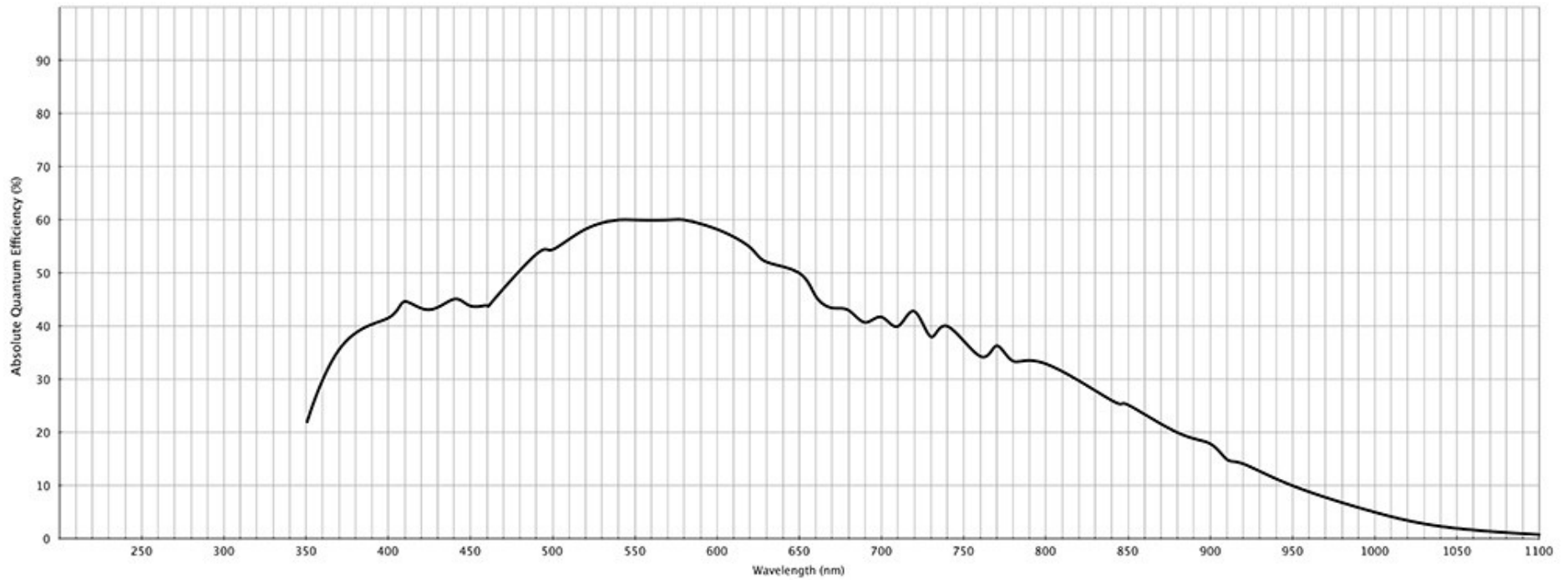
Task	
Finish design of mount and construction derotator-FW-CCD Adapter	2 months
Construction of the mount	4 months
Test and characterization of CCD + derotator	3 months
Integration of the parts (when mount is finished)	1 month
Characterization of FF Generator	2 weeks
Software implementation	4 months
Test on the sky in Hamburg	2 months
Packaging and Transport to Guanajuato	2 months
Reduction pipeline	6 months
Total time until ready for transport	11 months



END



# CCD QE



Credit: Finger Lakes Instruments

# Tigre Filters Transmission

