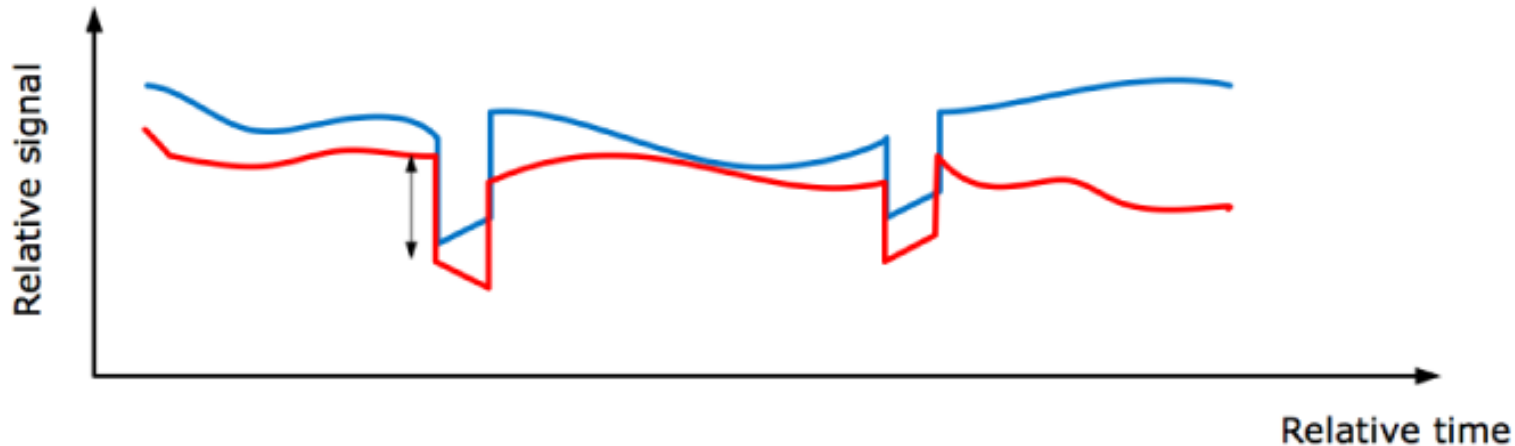


Calibrating EChO data



- Intrapixel, interpixel and jitter
- Evolution of detector within an observing visit
- Variation of the instrument response with time

Minimizing :

$$\text{OBS}(t) - \text{TRANSIT_MODEL}(\text{planet}) \otimes \text{INSTRUMENT_MOD}(t)$$

- Basis of orthogonal functions
- Independant component analysis
- Other

EChO requirement

Stability 10^{-4} over 10 hours

FINESSE study:

- 1 calibrator after any transit observation (1h)
- Every week, 1 calibrator for 8 hours

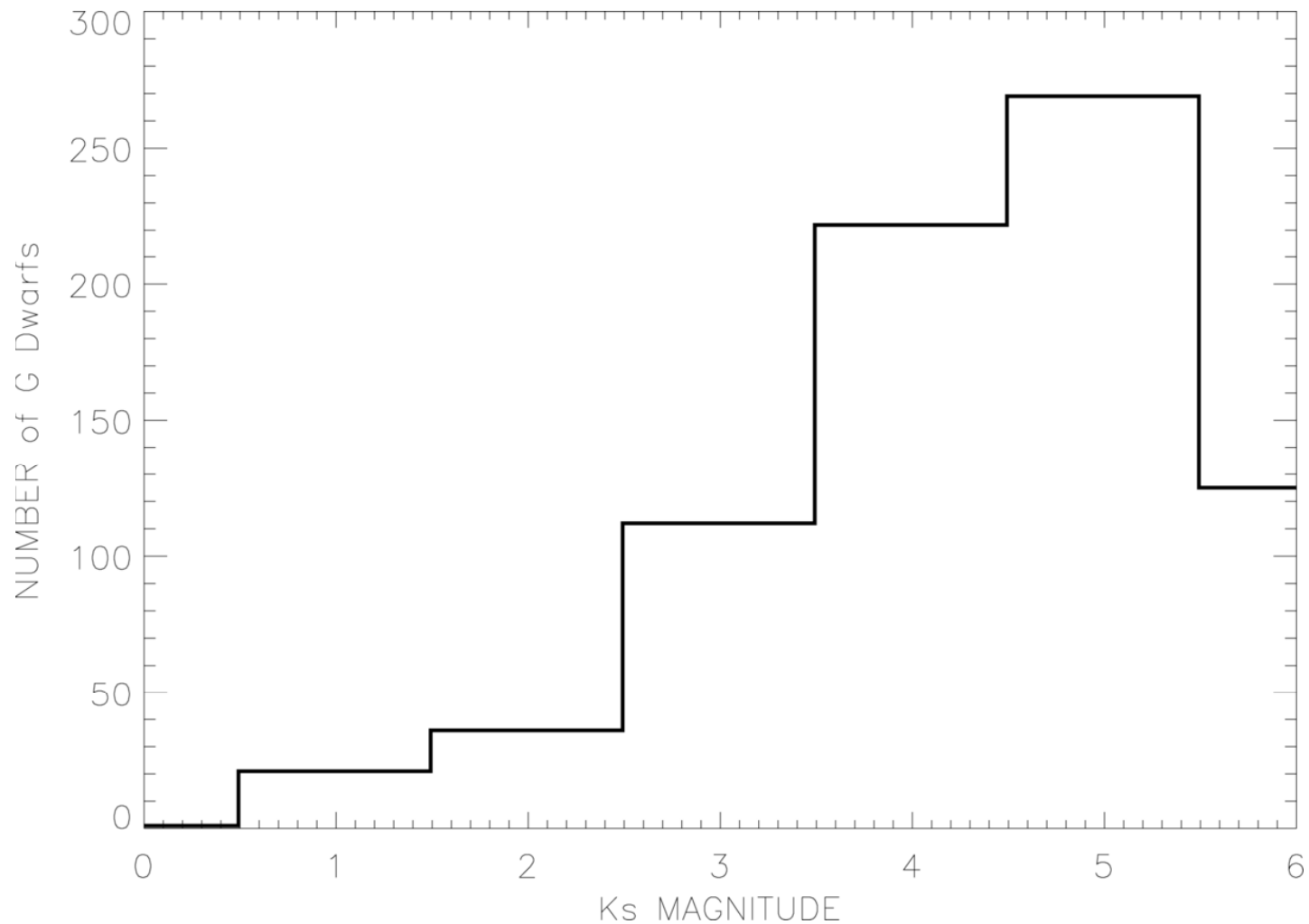
EChO (a proposition):

- 1 calibrator (1h) every ~ 36 hours
- 1 calibrator (10h) every ~ 10 days

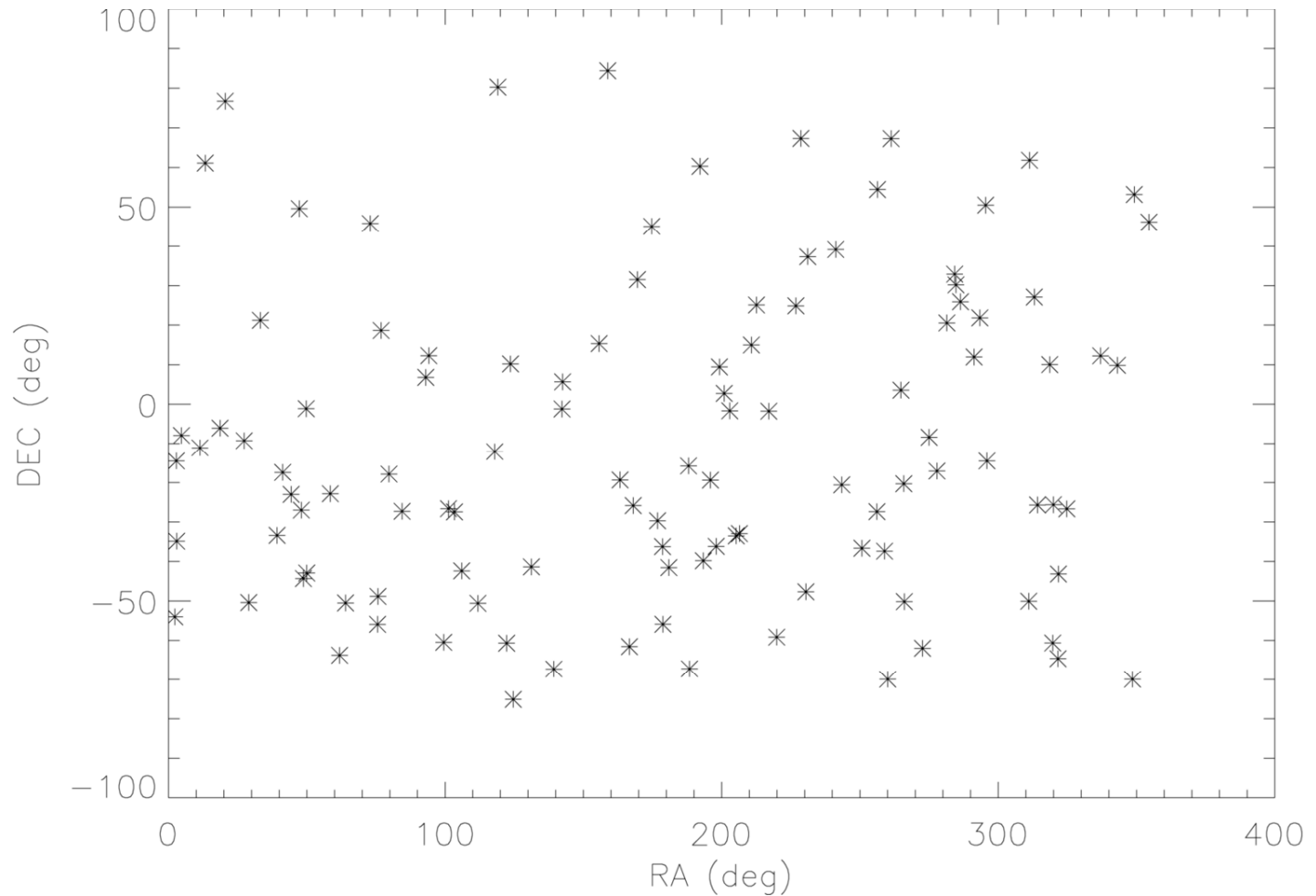
Getting standard candles stable at few 10^{-5}

- G stars are the best candles you can dream of.
- Using Kepler, Ciardi et al. 2012
 - G dwarf stars are the more stable
 - Variability floor 10^{-5} over 30 days for 70 % of G dwarfs

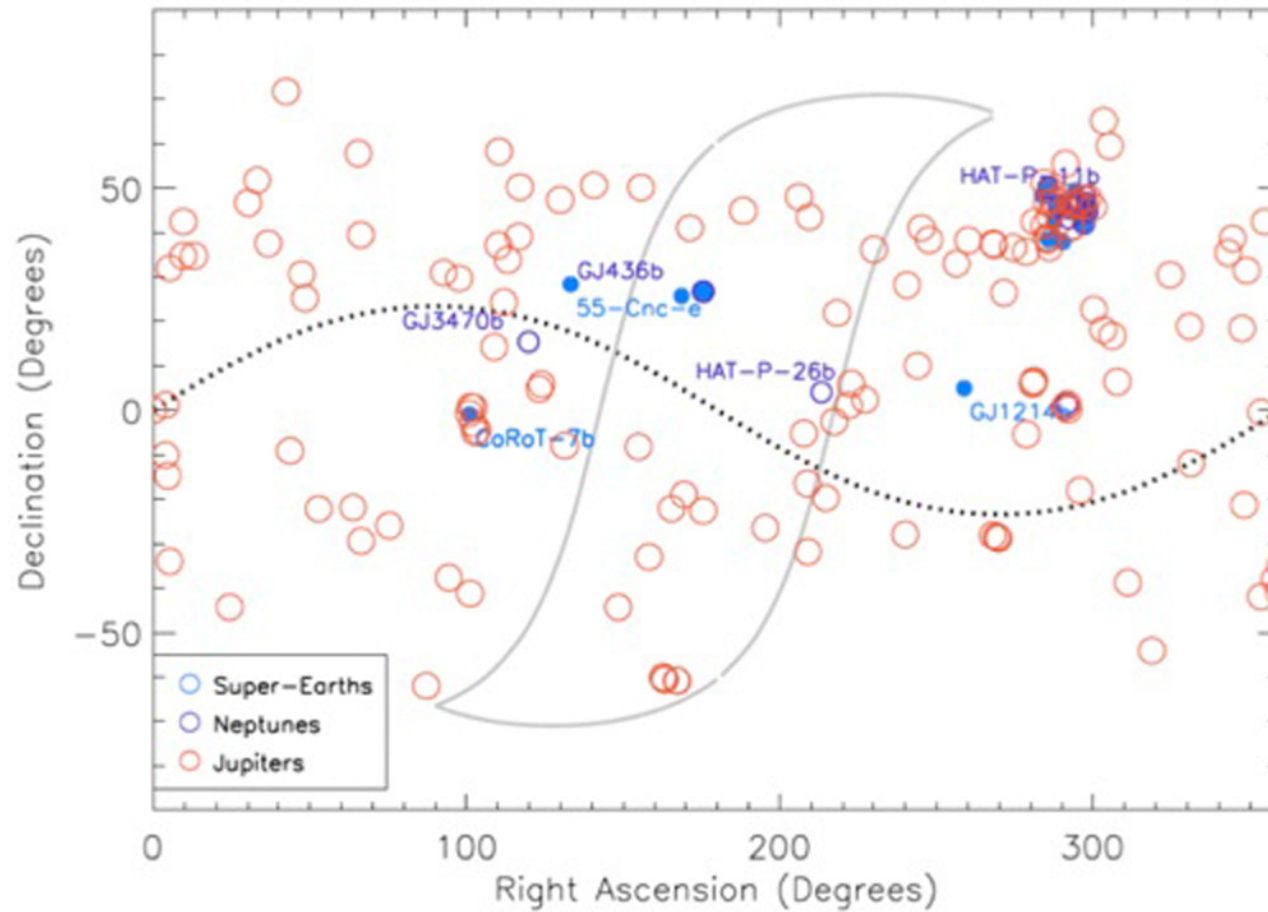
Histogram of bright G stars in Ks



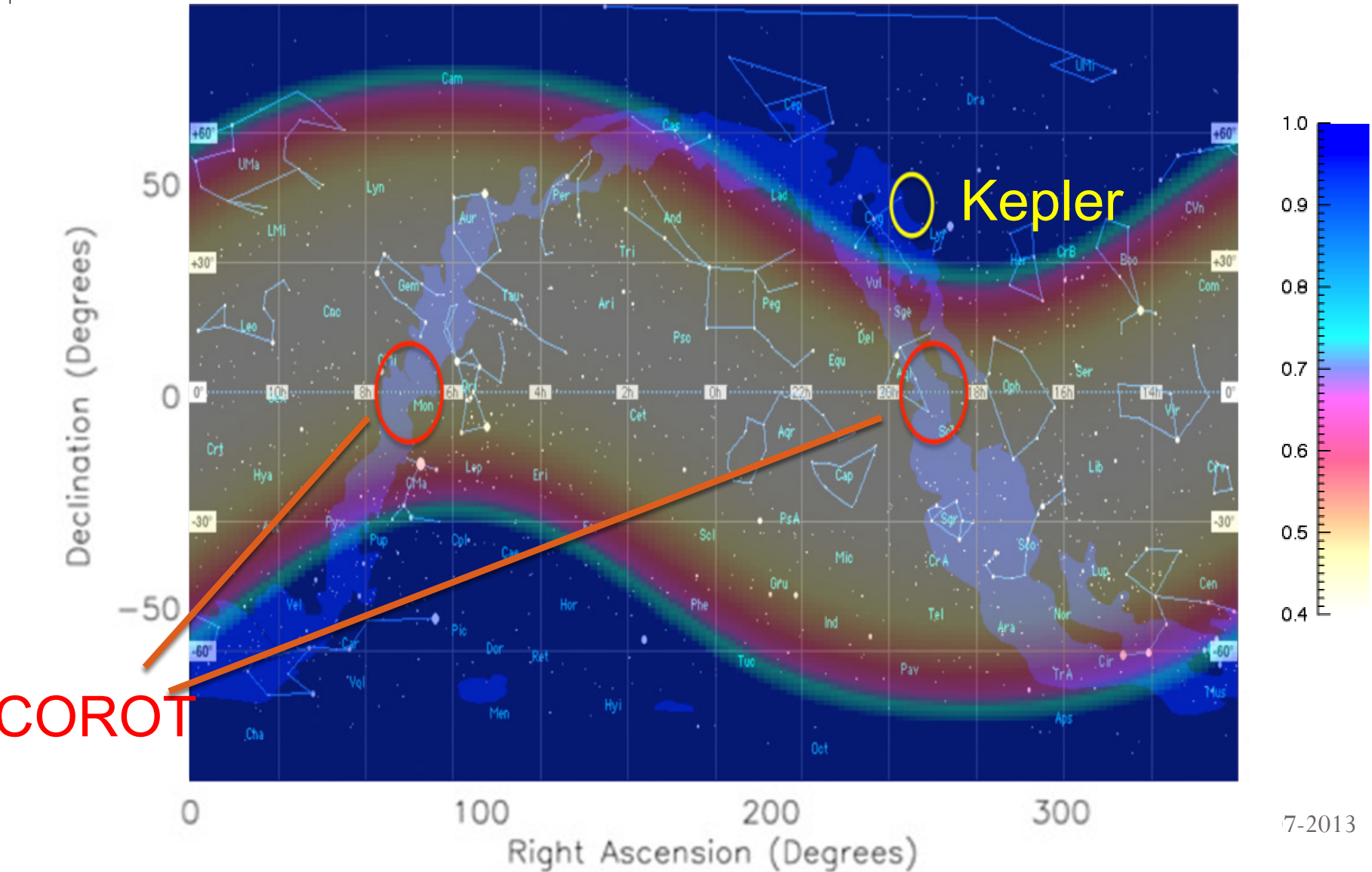
Distribution of bright G stars on the sky



Visibility of known transiting extrasolar planets



EChO visibility



Remarks from scheduling exercise

Constraint from scheduling exercise :

- 1 hour observation every ~ 30 hours is fairly easy to schedule
- 10 hours every 10 days is a constraint on schedule
- 8 hours is easier to schedule than 10 hours

- On year 1, calibrations are more important but harder to schedule.

Concluding remarks

Constraining your instrument model:

- Using few bright stable G dwarf stars in continuous viewing zone
 - Stability information from TESS
 - Dedicated survey by Cheops to find best calibrators
 - Spectropolarimetry + Ca HK lines survey to monitor activity
- How long and how often ?
 - Conservative on year 1 to learn the instrument.
 - (1 hour calib every ~ 36 hours, 10 hours calib every ~ 10 days)