

DETAILED LIGHT CURVE ANALYSIS WITH CoRoT

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OUTLINE

- Detrending method

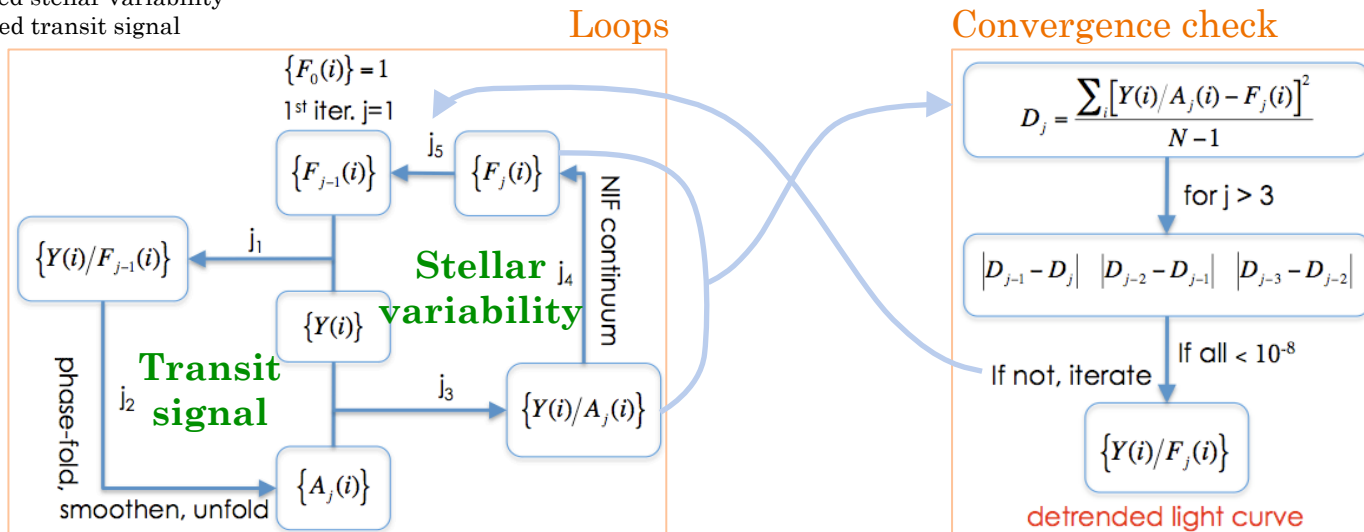
Impact of stellar variability on:

- Transit shape (i.e. planet parameters)
- Secondary eclipse detection
- Planet orbital phase detection

DETRENDING

- Pre-processing
- Stellar variability filtering with IRF
Iterative Reconstruction Filter,
Alapini & Aigrain 2009

NIF = non-linear iterative filter
Aigrain & Irwin 2004
Y = original signal
F = estimated stellar variability
A = estimated transit signal

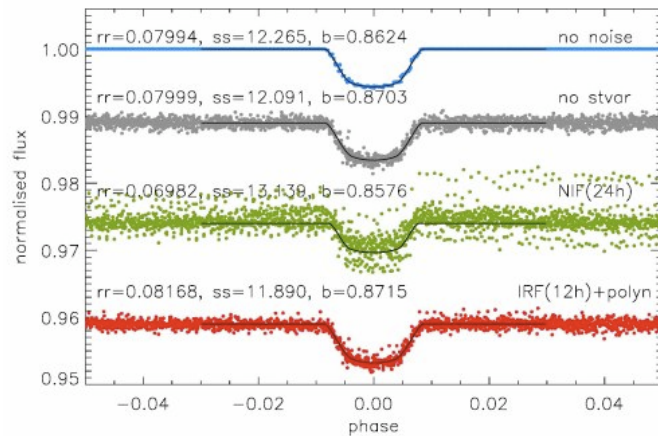
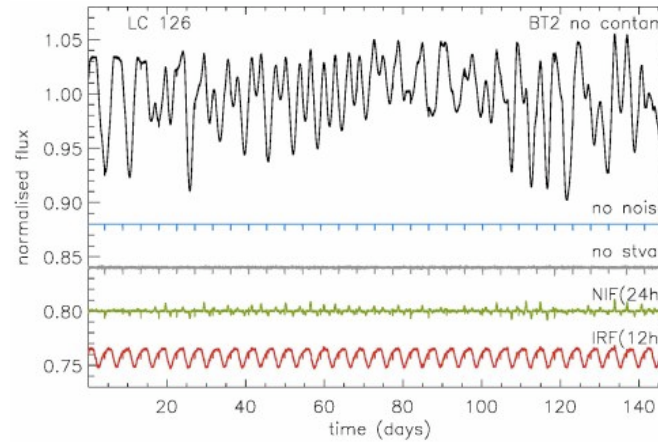
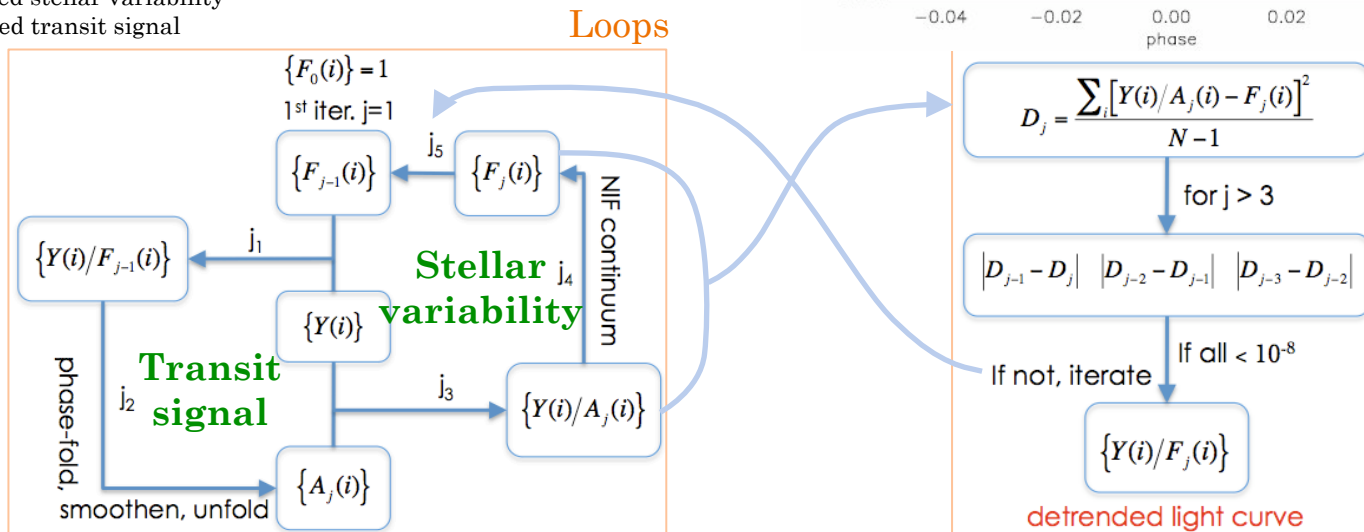


DETRENDING

- Pre-processing
- Stellar variability filtering with IRF

Iterative Reconstruction Filter,
Alapini & Aigrain 2009

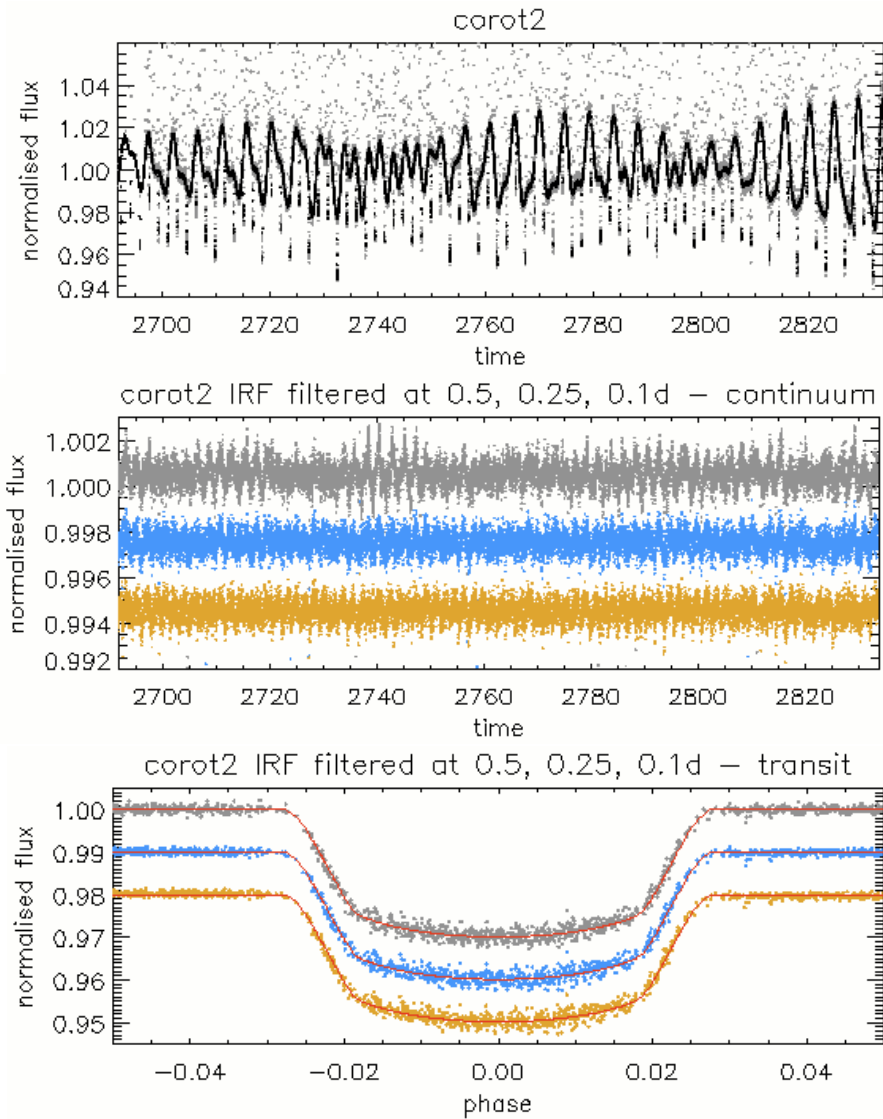
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TRANSIT

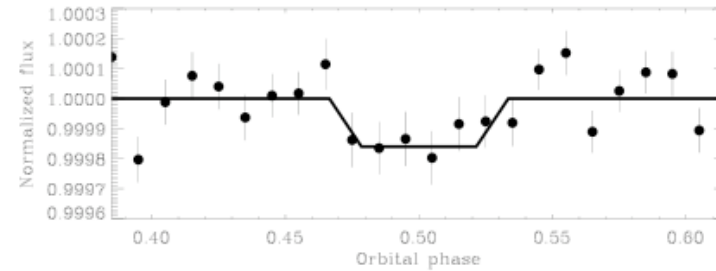
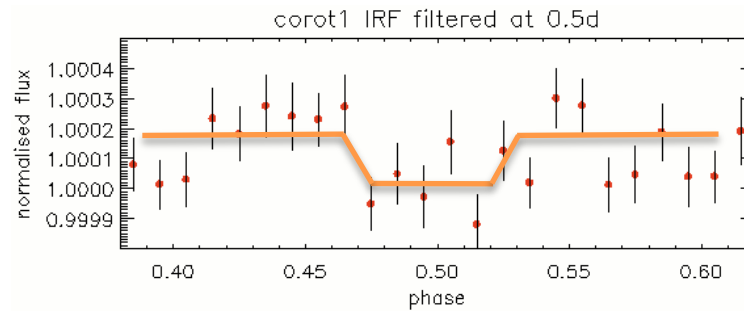
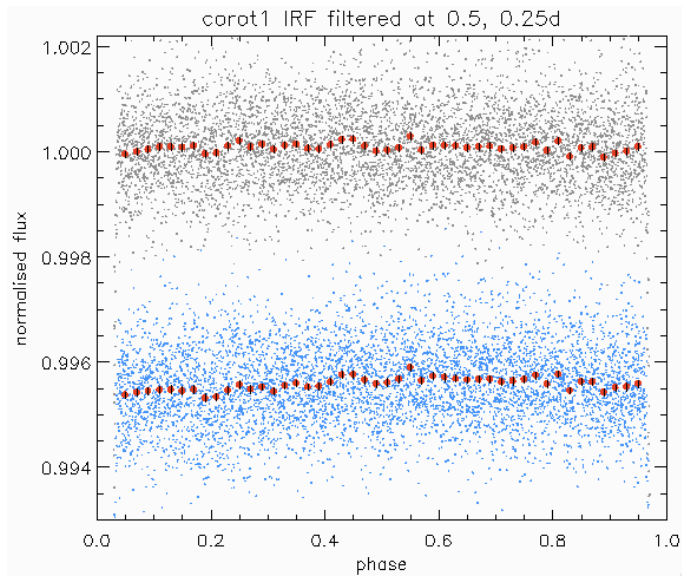
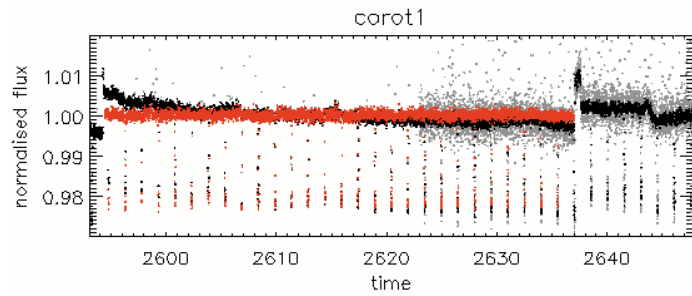
Difference in planet parameters within error bars

IRF allows filtering of stellar variability to lower timescales

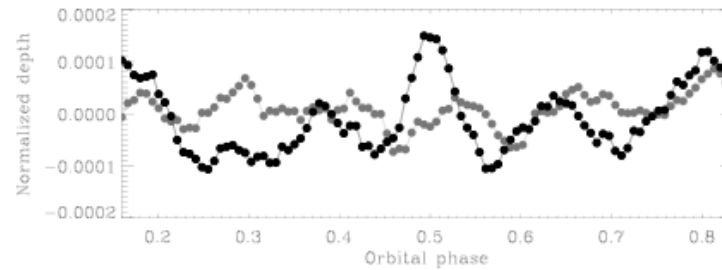
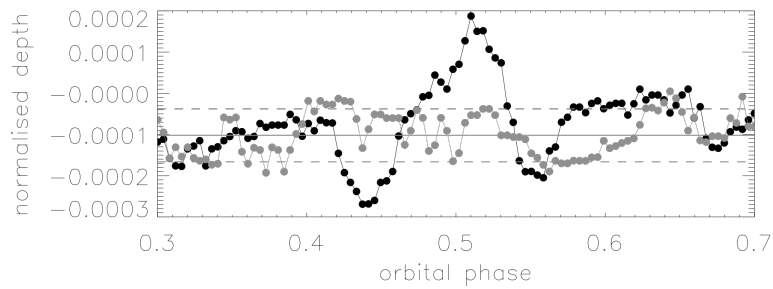


	Alonso et al 08	IRF 0.50	IRF 0.25	IRF 0.10
	value			
T0	2454237.53562 ± 0.00014	2454237.53536	2454237.53541	2454237.53551
R _p /R _s	0.16670 ± 0.0006	0.16326	0.16327	0.16311
a/R _s	6.700 ± 0.03	6.286	6.263	6.263
incl [°]	87.84 ± 0.10	86.13	86.07	86.06

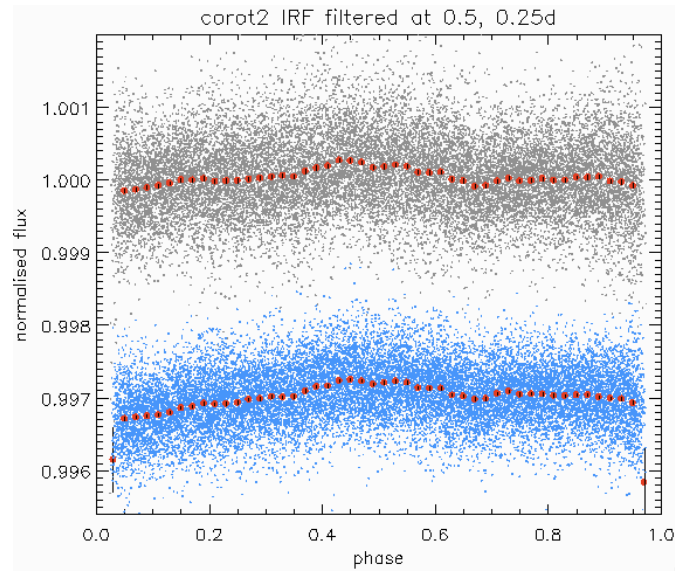
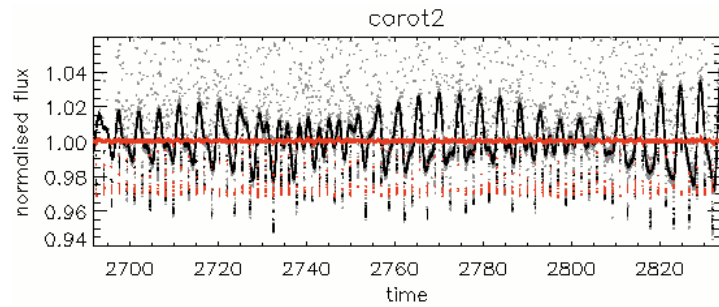
SECONDARY ECLIPSE



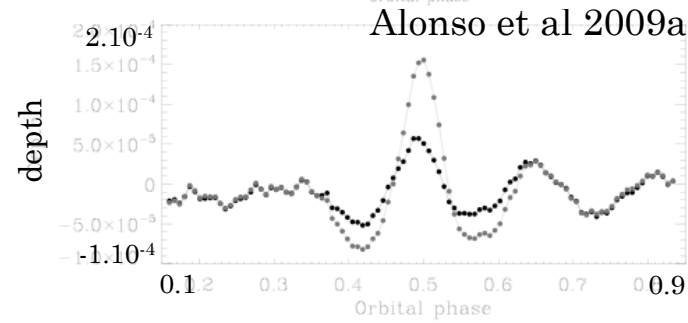
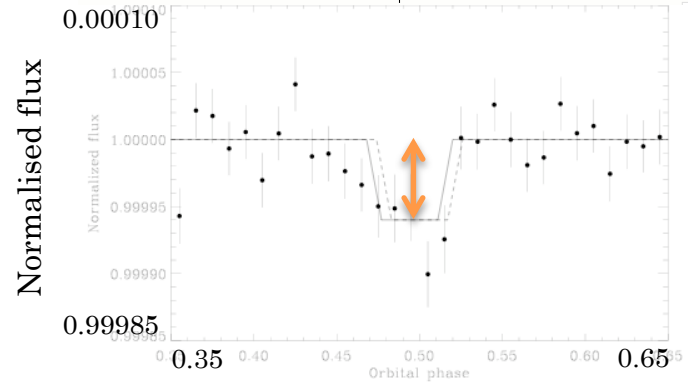
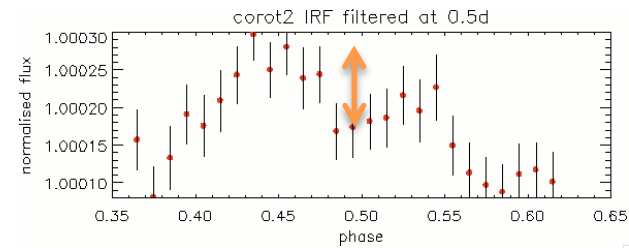
Alonso et al 2009b



SECONDARY ECLIPSE

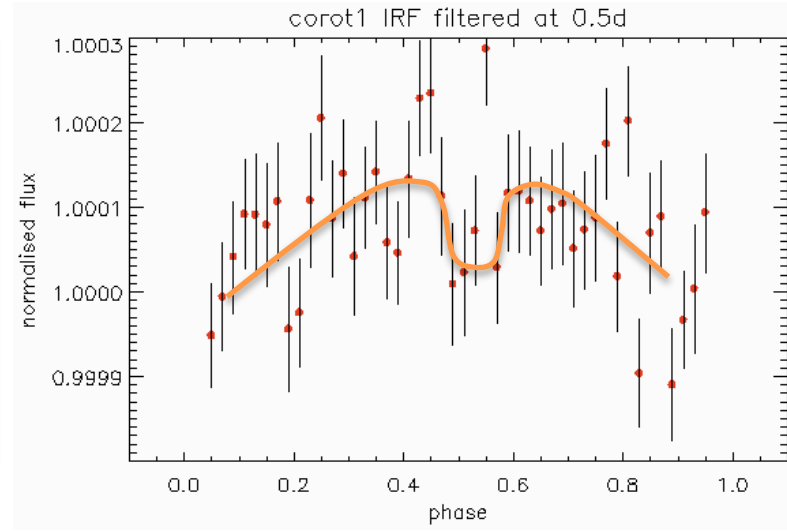
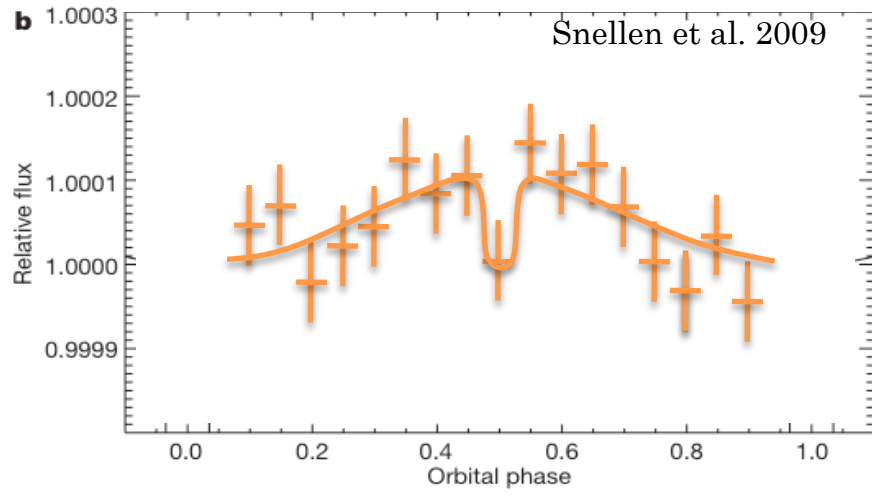


COMPLEX

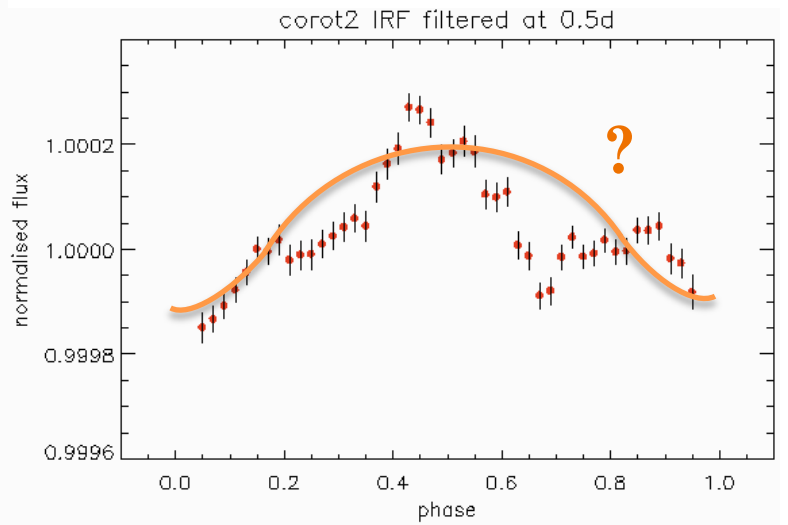
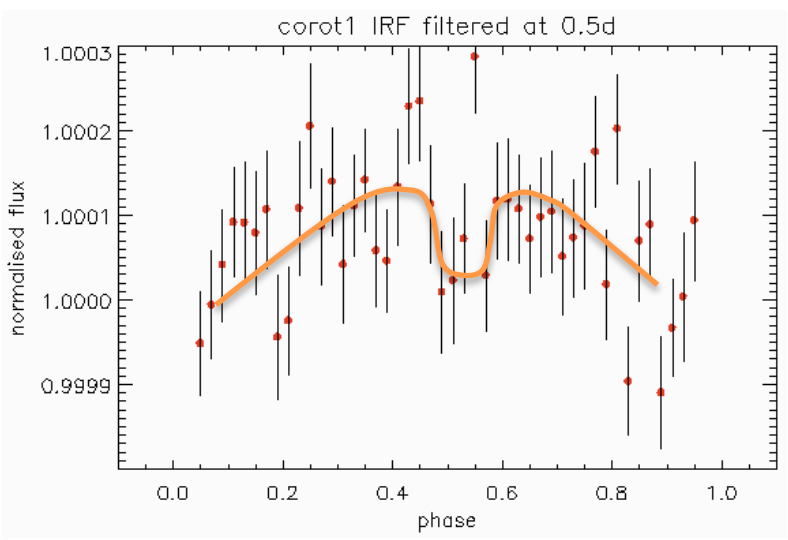
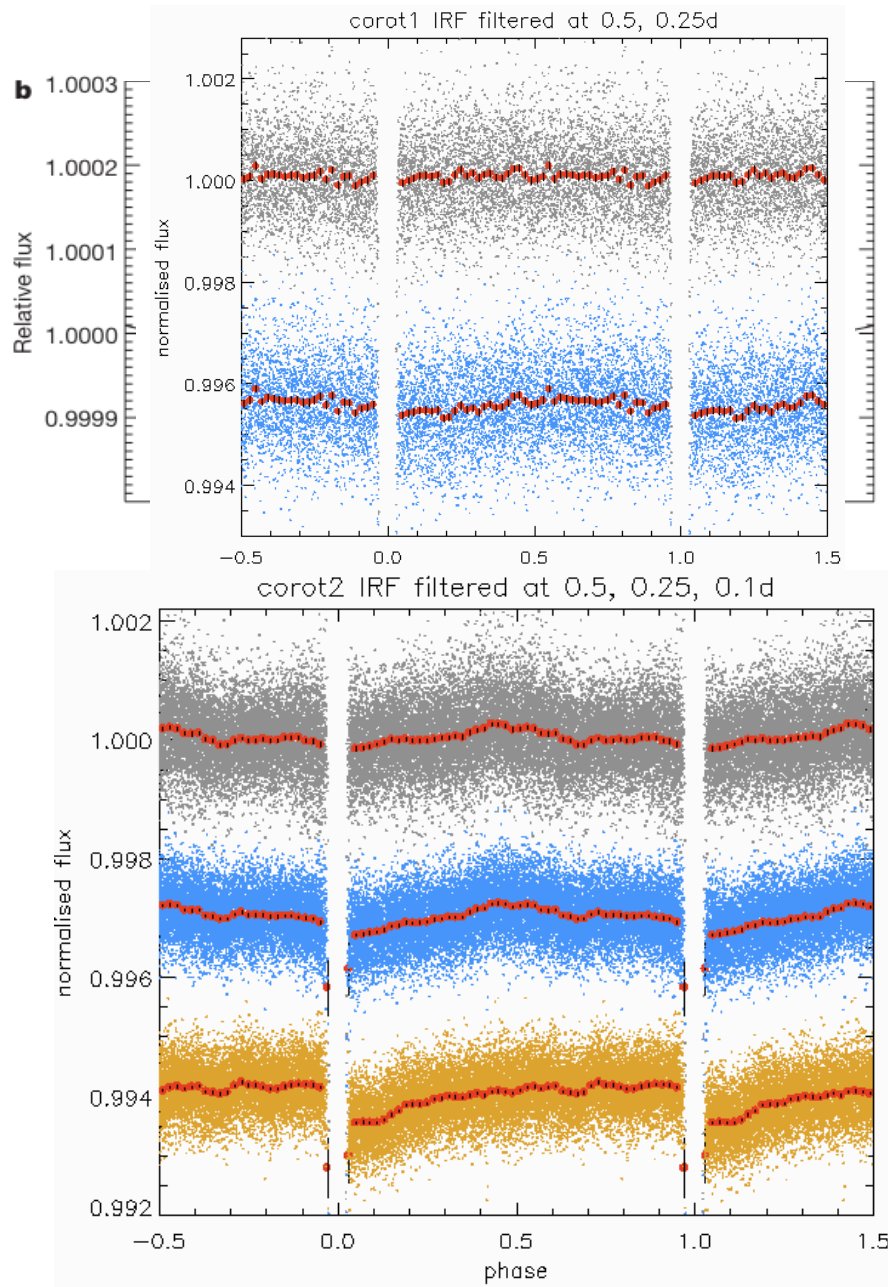


Alonso et al 2009a

ORBITAL PHASES



ORBITAL PHASES



COMPLEX



SUMMARY

- Filtering stellar variability can affect determination of planet parameters
 - not noticeable in CoRoT giant planets & CoRoT-7
 - for small planets around active fast rotator, watch this space
- Stellar variability affects significance of secondary eclipse and orbital phase detection
- Detrending is an art: done just right → detection

**robust
secondary eclipse
& orbital phase
detection**

