

# KIC 008509781

## Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	$R_{\star}$ ( $R_{\odot}$ )	$T_{\star}$ (K)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008509781-01	OBS	5529.01	70.335885	198.947237	24328.2	4.641	2822.7	2609.9	0.97	6081	25.86	10.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008509781-01	OBS	FP	0.00	0	1	0	0	MOD_ODDEVEN_ALT—DEEP_V_SHAPED

**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

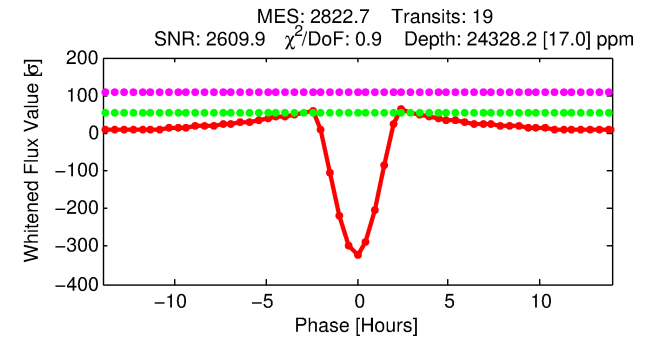
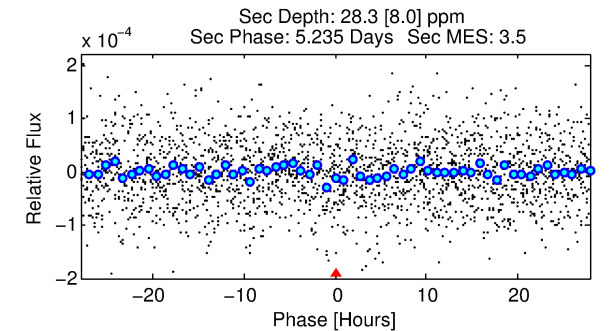
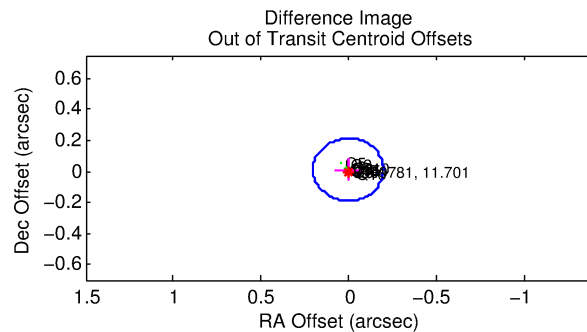
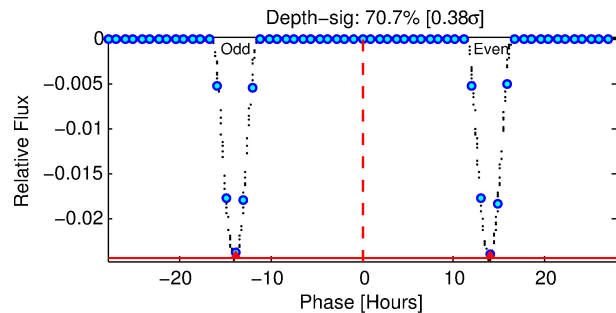
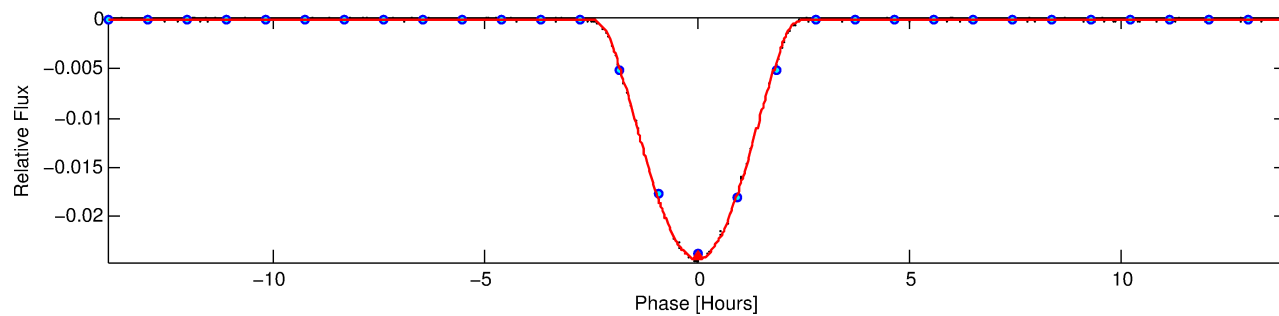
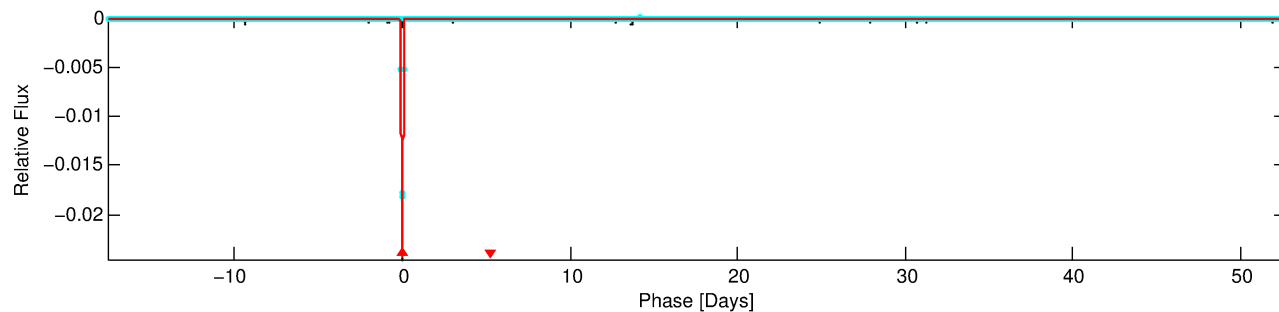
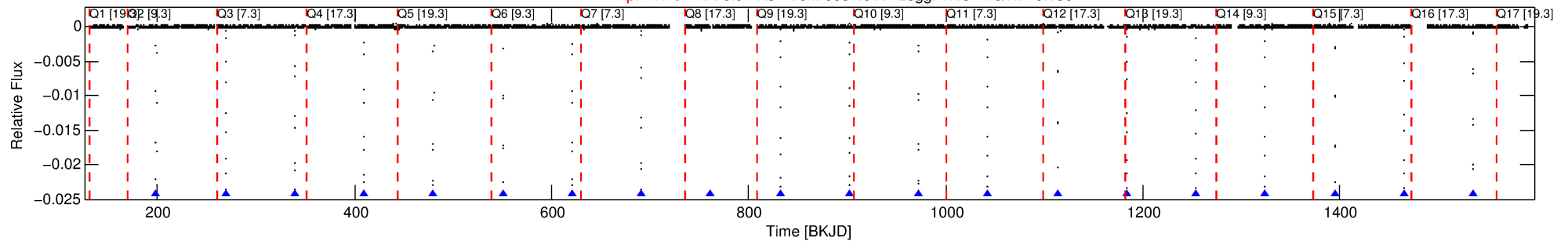
## Ephemeris Match Information For 008509781-01

No Significant Match Found

# DV One-Page Summary

KIC: 8509781 Candidate: 1 of 1 Period: 70.336 d  
KOI: K05529.01 Corr: 0.998

Kp: 11.70 R\*: 0.97 Rs Teff: 6081.0 K Logg: 4.48 Fe/H: -0.180



## DV Fit Results:

Period = 70.33589 [0.00000] d  
Epoch = 198.9472 [0.0000] BKJD  
Rp/R\* = 0.2453 [0.0053]  
a/R\* = 86.78 [0.17]  
b = 0.99 [0.01]  
Seff = 10.12 [3.03]  
Teq = 455 [34] K  
Rp = 25.86 [5.46] Re  
a = 0.3361 [0.0609] AU  
Ag = 2.63 [1.04] [1.58σ]  
Teff = 896 [71] K [5.62σ]

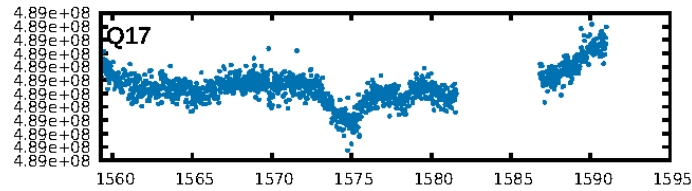
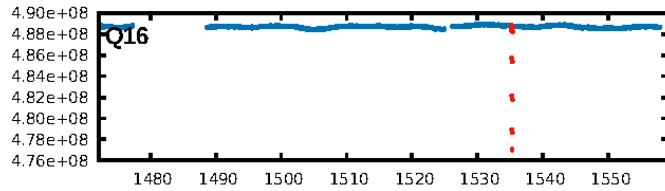
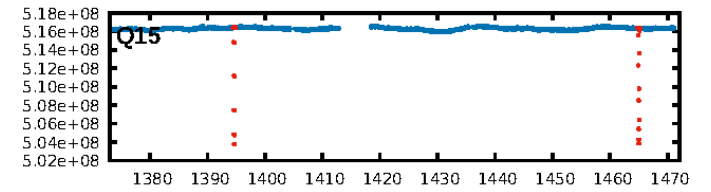
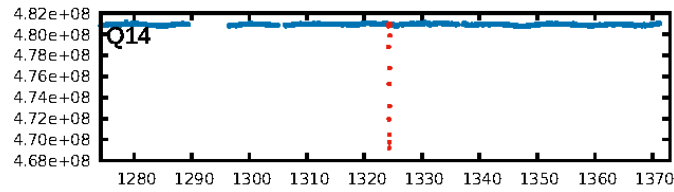
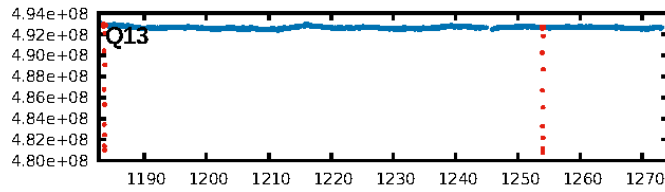
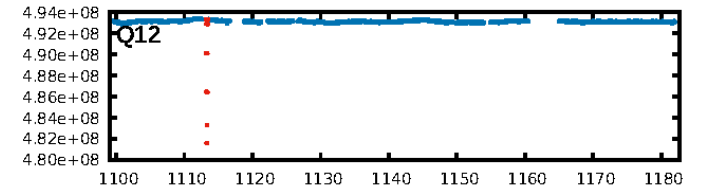
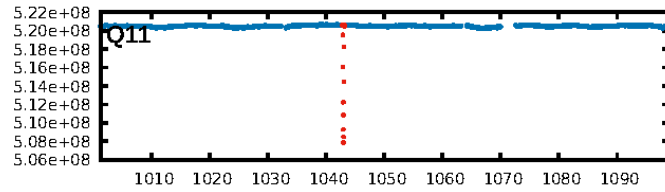
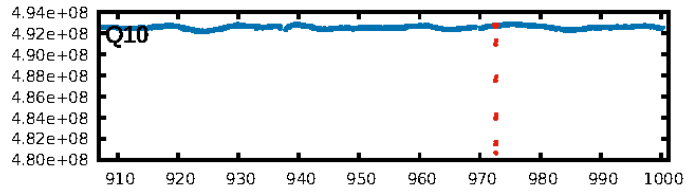
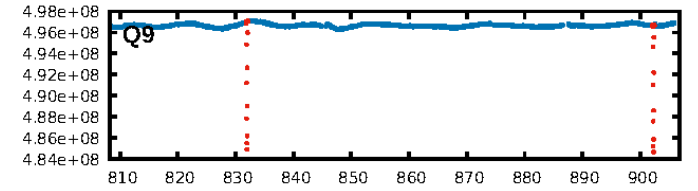
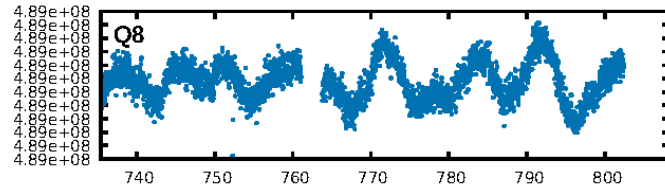
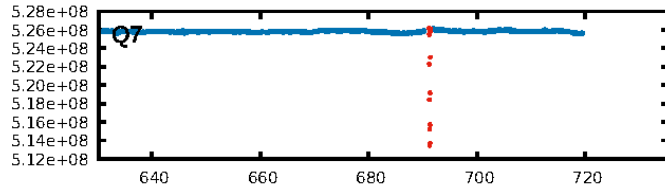
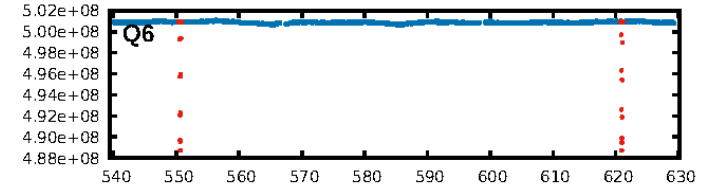
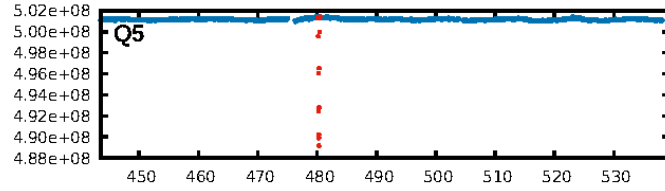
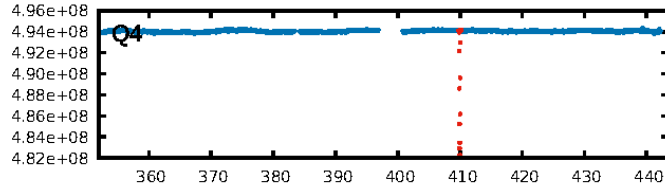
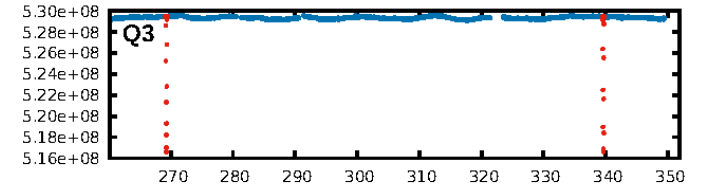
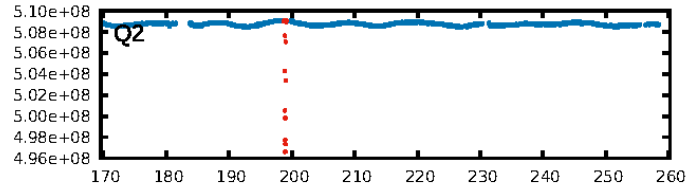
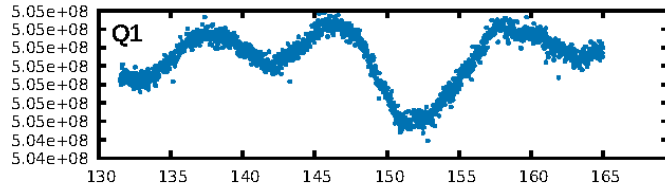
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 25.6%  
ModelChiSquareGof-sig: 96.9%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [19/19]  
GhostDiagnostic-chr: 9.284  
Centroid-sig: 0.0%  
Centroid-so: 0.136 arcsec [40.53σ]  
OotOffset-rm: 0.014 arcsec [0.20σ]  
KicOffset-rm: 0.116 arcsec [1.63σ]  
OotOffset-st: 4/3/2/3 [12]  
KicOffset-st: 4/3/2/3 [12]  
DiffImageQuality-fgm: 1.00 [12/12]  
DiffImageOverlap-fno: 1.00 [12/12]

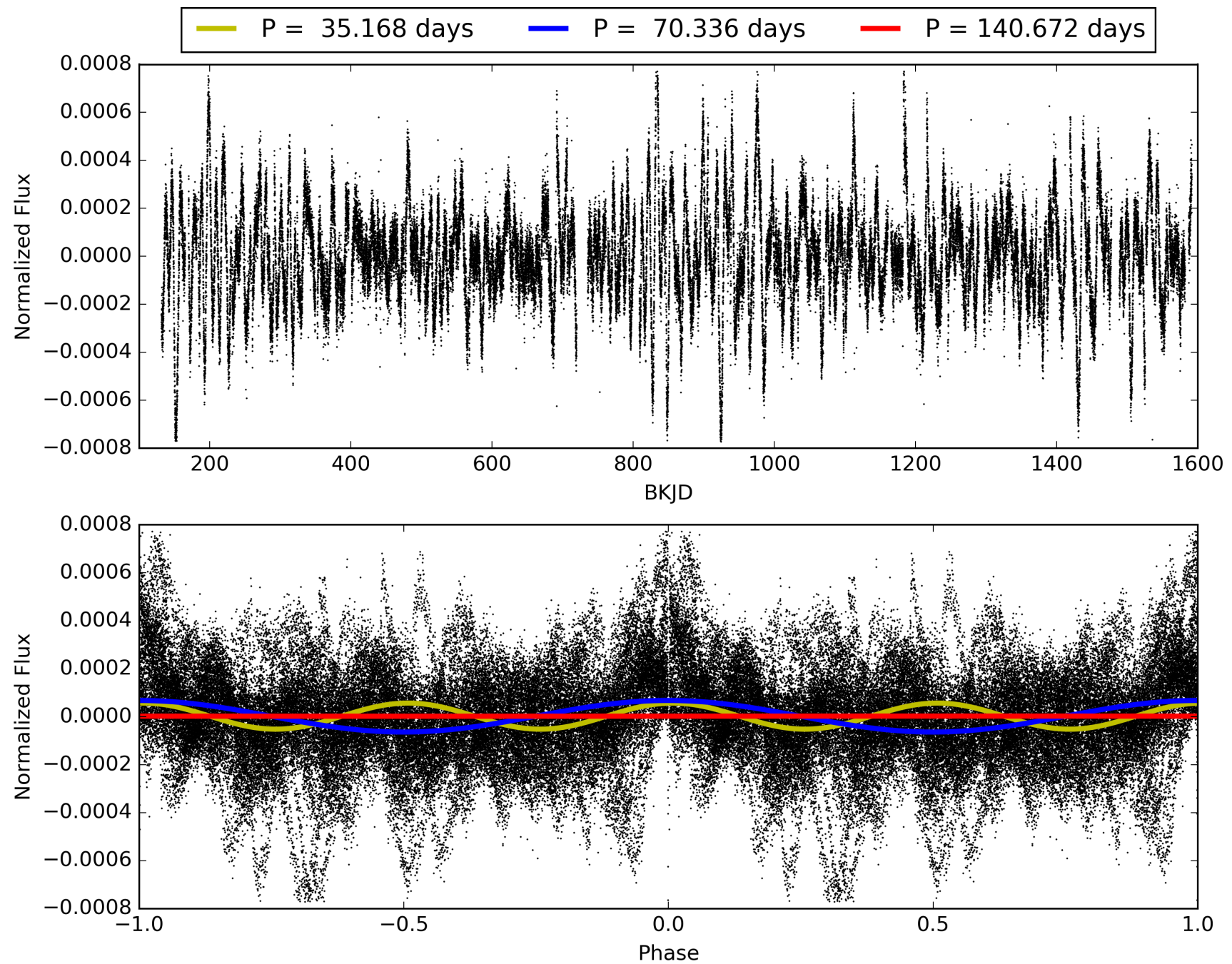
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:02:18 Z

This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008509781-01, PDC Light Curves

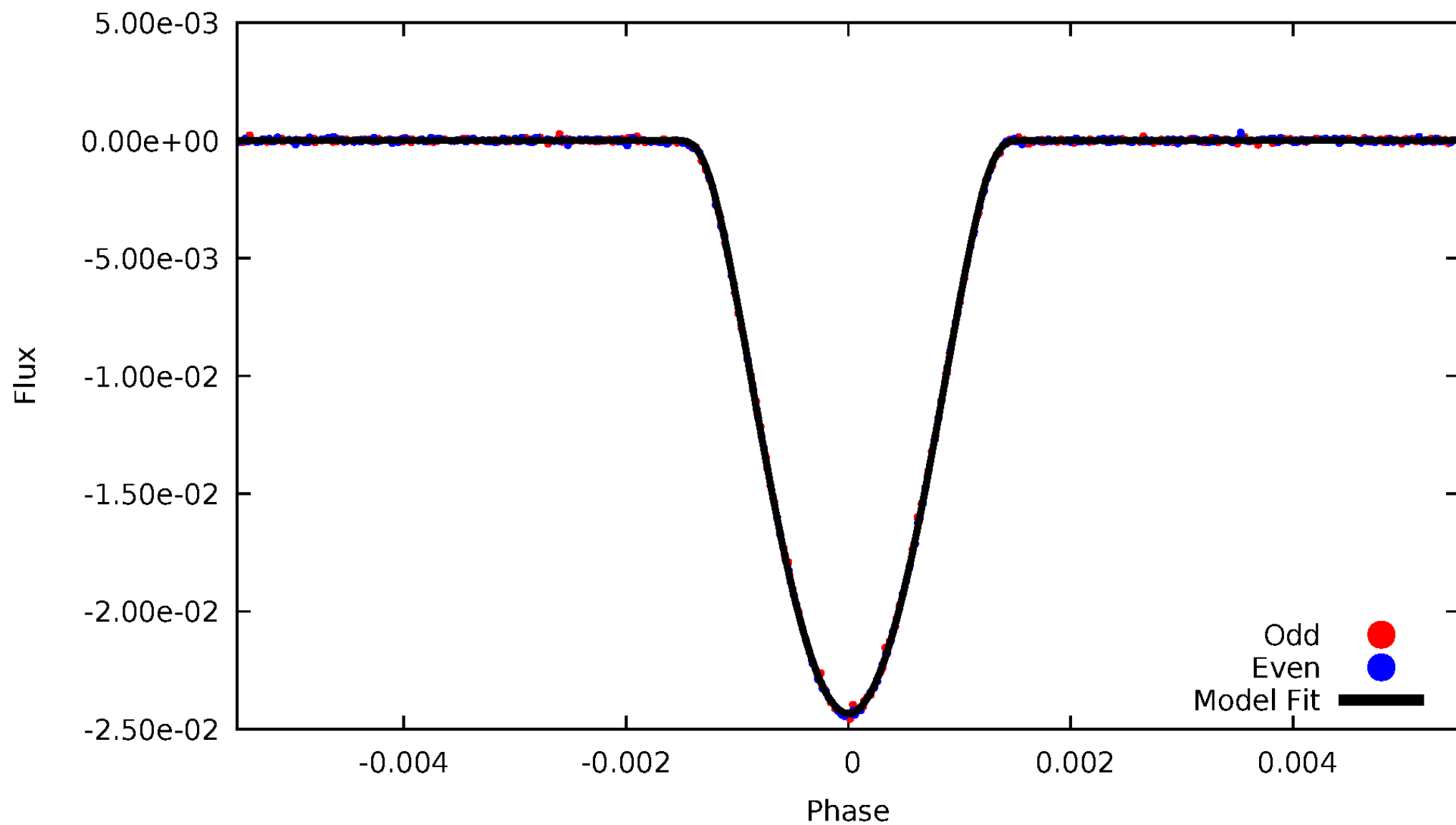


TCE 008509781-01



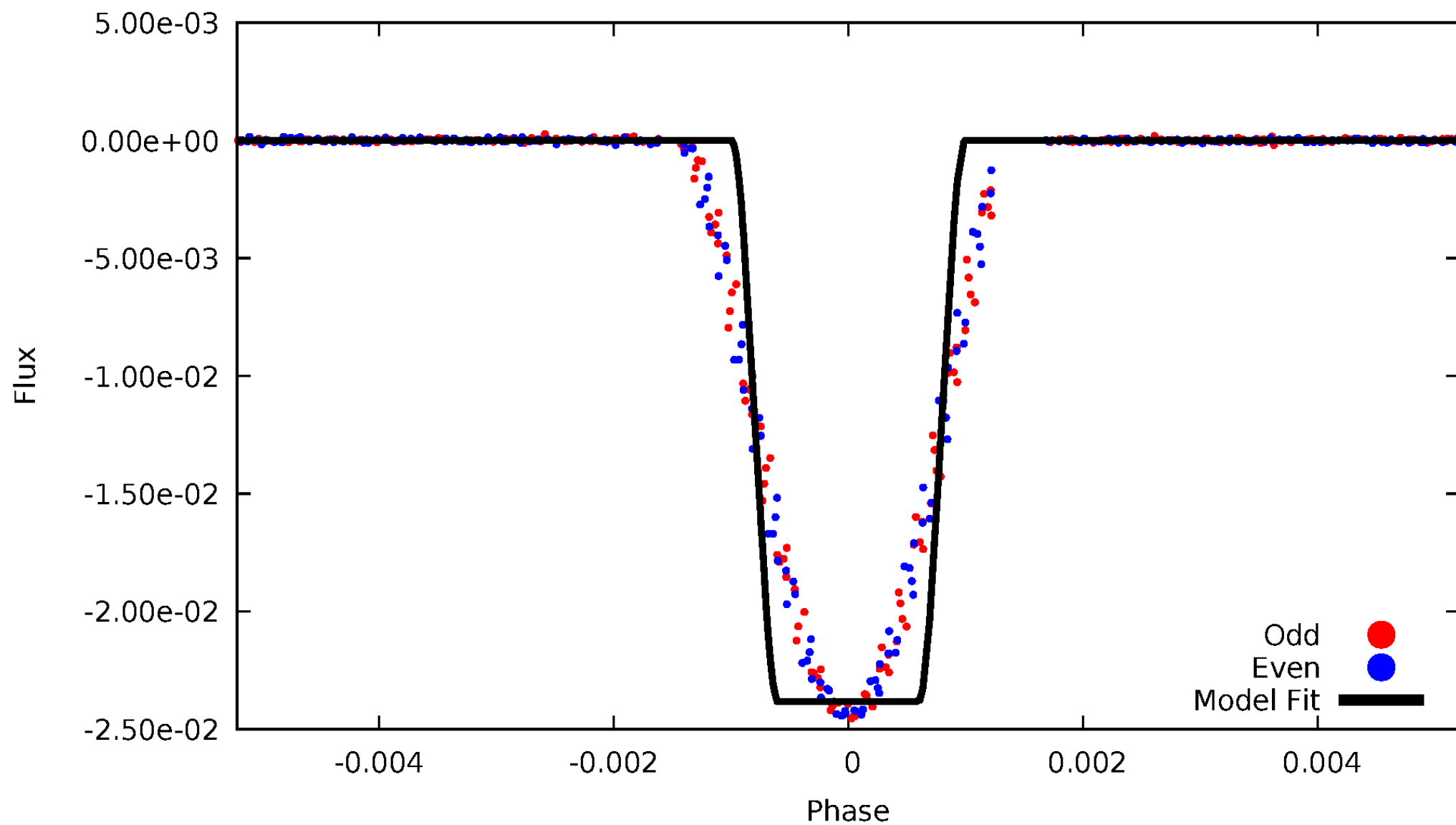
# DV Odd/Even

TCE 008509781-01



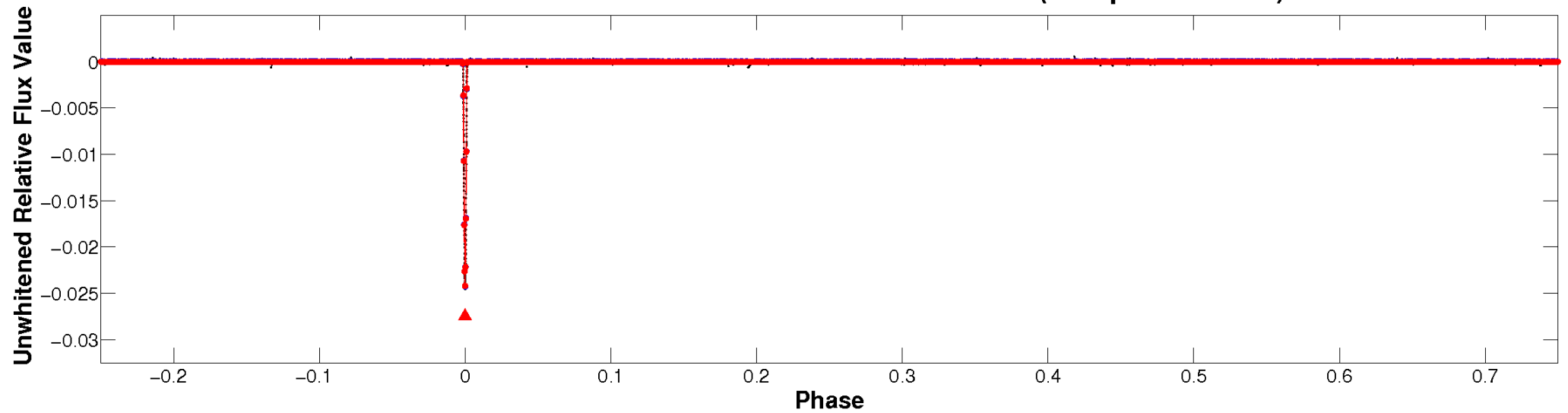
# ALT Odd/Even

TCE 008509781-01

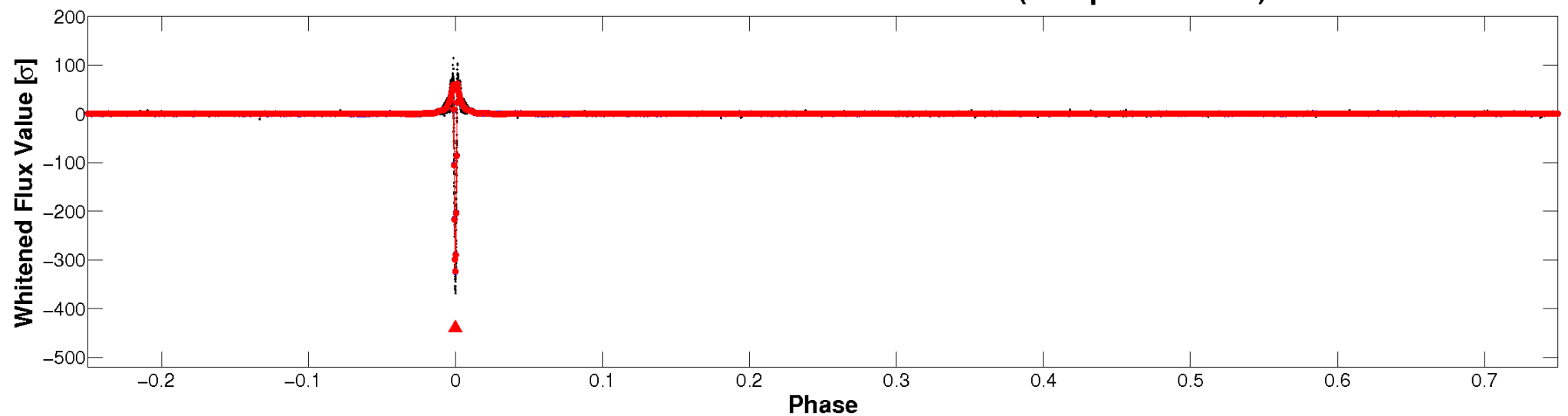


# Non-Whitened Vs. Whitened Light Curve

**Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

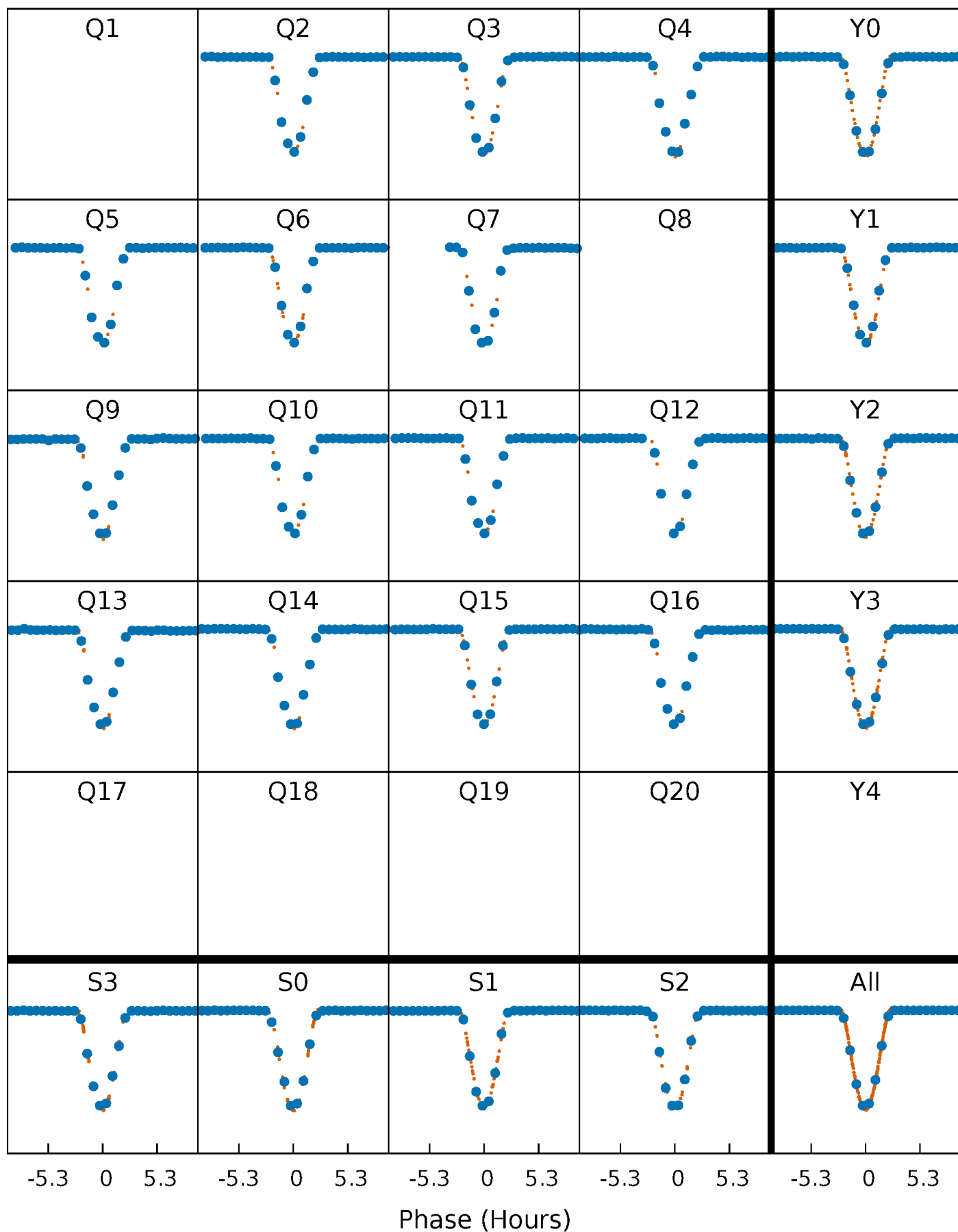


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

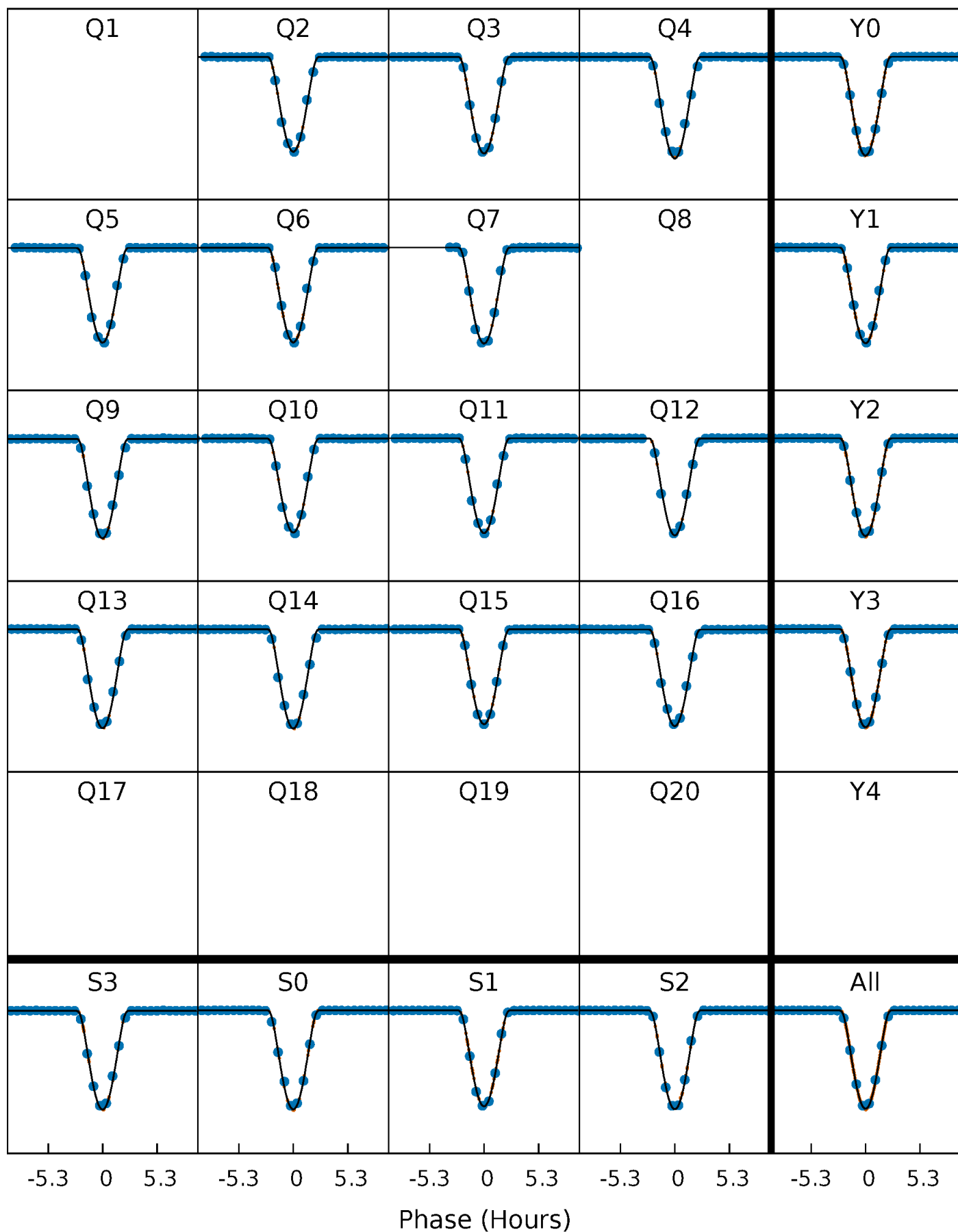
TCE 008509781-01 P= 70.335885 Days  $T_0=198.947237$  (BKJD)





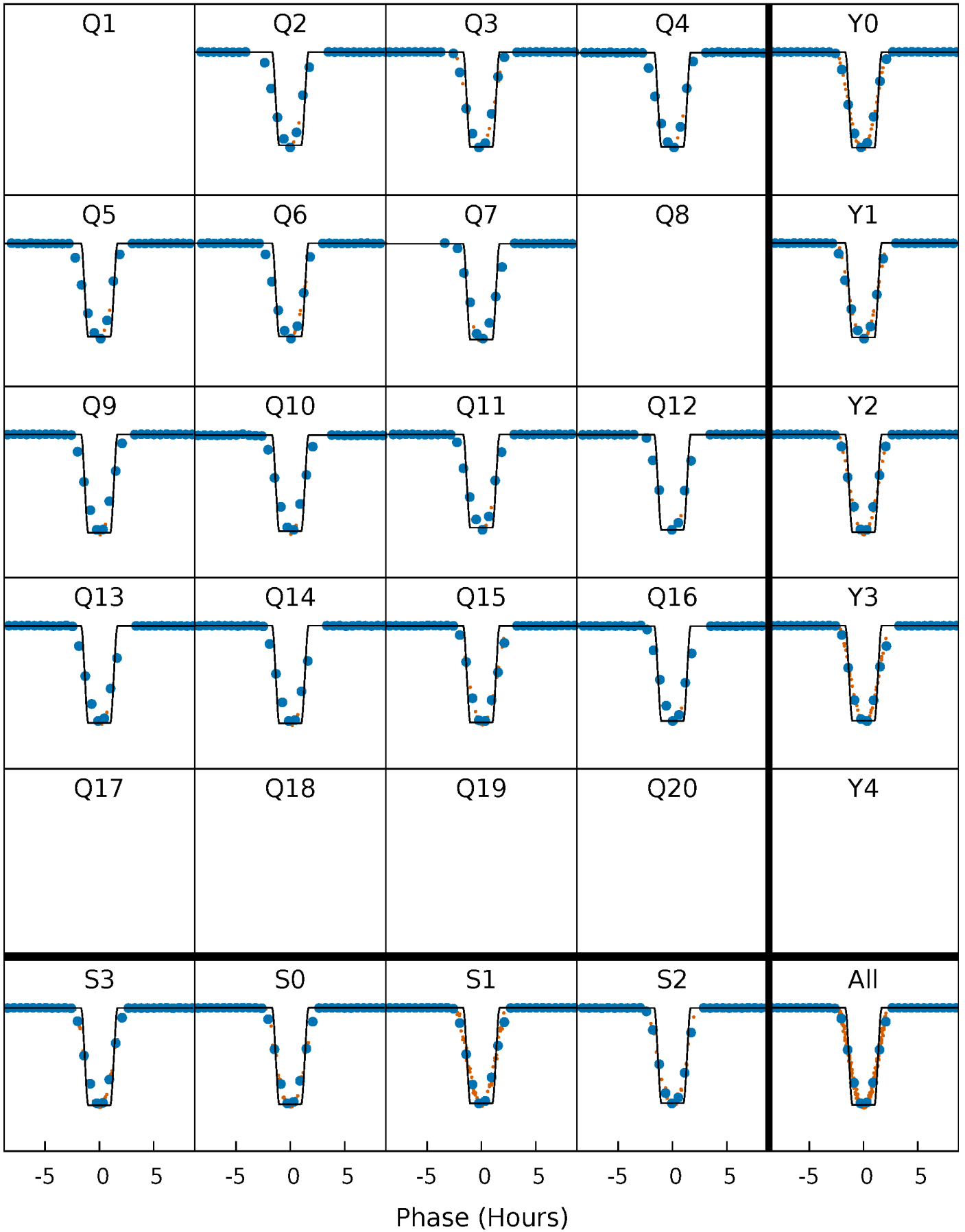
# DV Quarter-Phased Transit Curves

TCE 008509781-01 P= 70.335885 Days  $T_0=198.947237$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

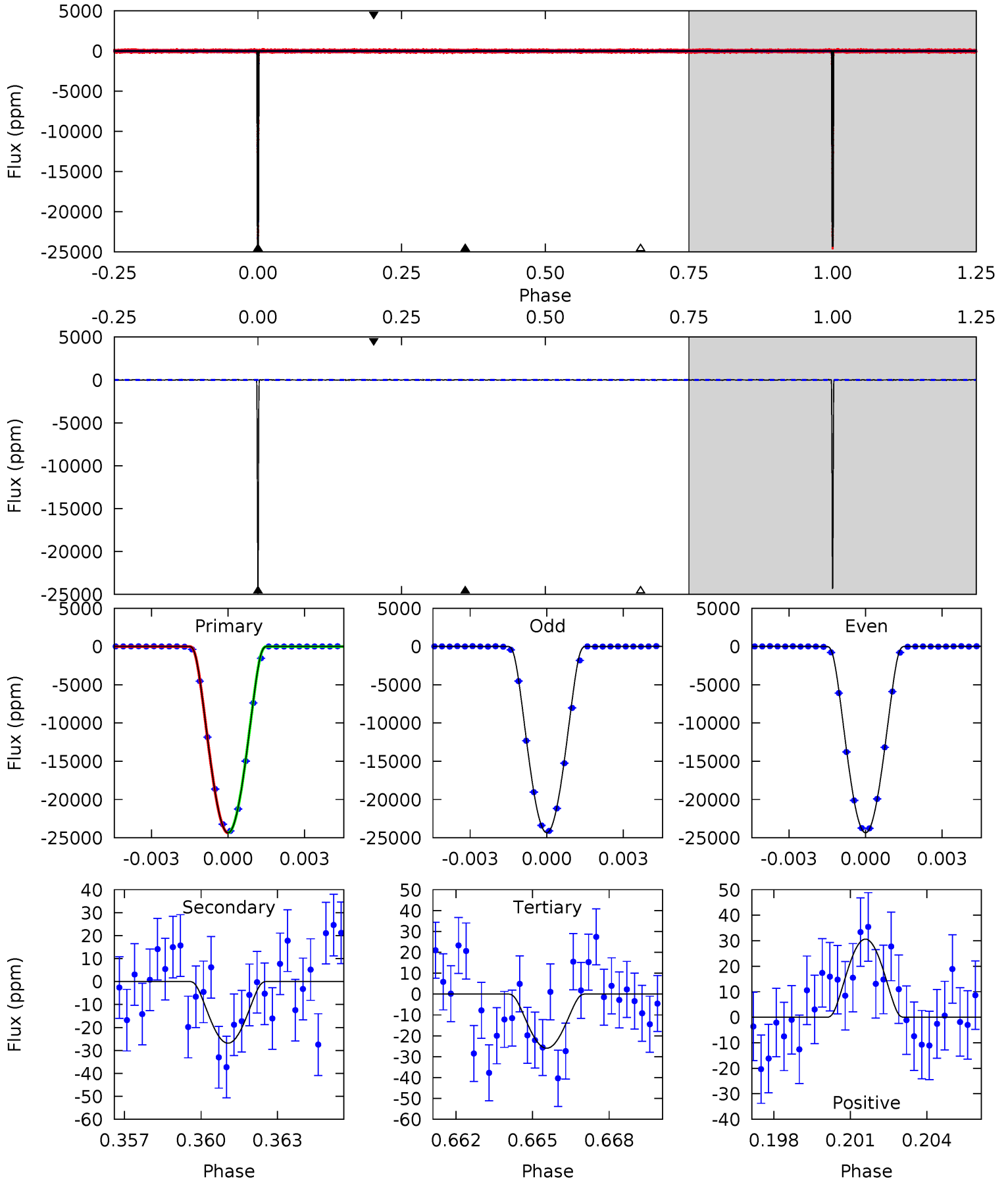
TCE 008509781-01 P= 70.335348 Days  $T_0=198.952211$  (BKJD)



# DV Model-Shift Uniqueness Test

008509781-01, P = 70.335885 Days, E = 128.611352 Days

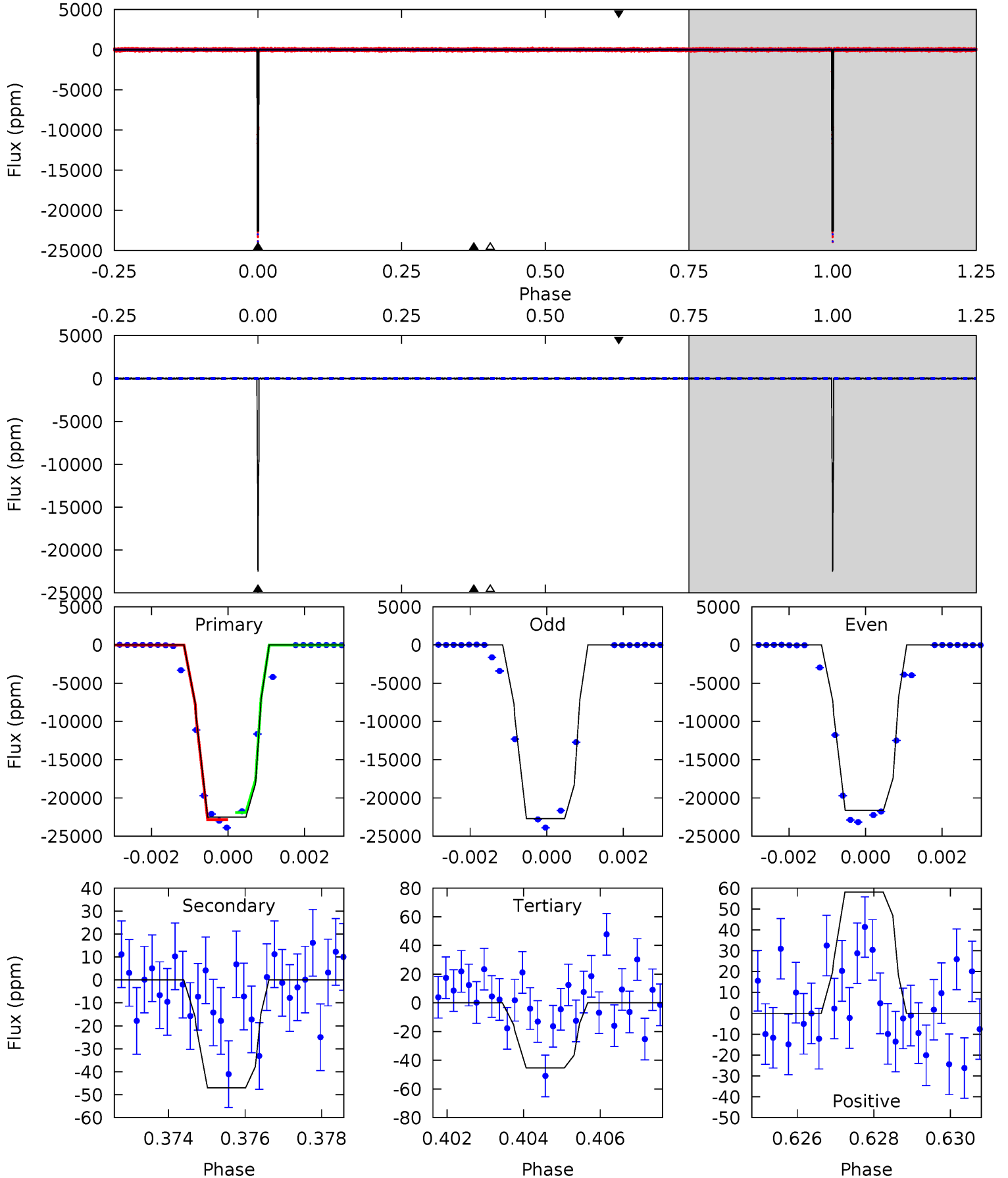
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5691	6.28	6.07	7.16	5.25	2.97	1.89	5685	5684	0.21	-0.88	1.48	1.00	0.00	1.83



# Alt Model-Shift Uniqueness Test

008509781-01, P = 70.335348 Days, E = 128.616863 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1902	3.97	3.83	4.91	5.33	3.09	1.11	1898	1897	0.14	-0.94	48.0	1.00	0.00	39.5



### Stellar Parameters For KIC 008509781

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6081^{+145}_{-199}$	$4.478^{+0.050}_{-0.150}$	$-0.180^{+0.250}_{-0.350}$	$0.966^{+0.203}_{-0.094}$	$1.022^{+0.117}_{-0.130}$	$1.598^{+0.420}_{-0.669}$
	+2%/-3%	+1%/-3%	+139%/-194%	+21%/-10%	+11%/-13%	+26%/-42%
Source	PHO1	FLK73	KIC0	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 008509781-01 / KOI 5529.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-27 \pm 4$	$26.46^{+3.03}_{-2.05}$	$643^{+35}_{-26}$	$1876^{+43}_{-45}$	$2.308^{+0.572}_{-0.529}$
Alt.	$-47 \pm 12$	$16.68^{+1.87}_{-1.37}$	$644^{+32}_{-27}$	$2213^{+66}_{-81}$	$10^{+3}_{-3}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming A=0.3)

$A_{obs}$  = Observed Albedo (Assuming T=0)

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

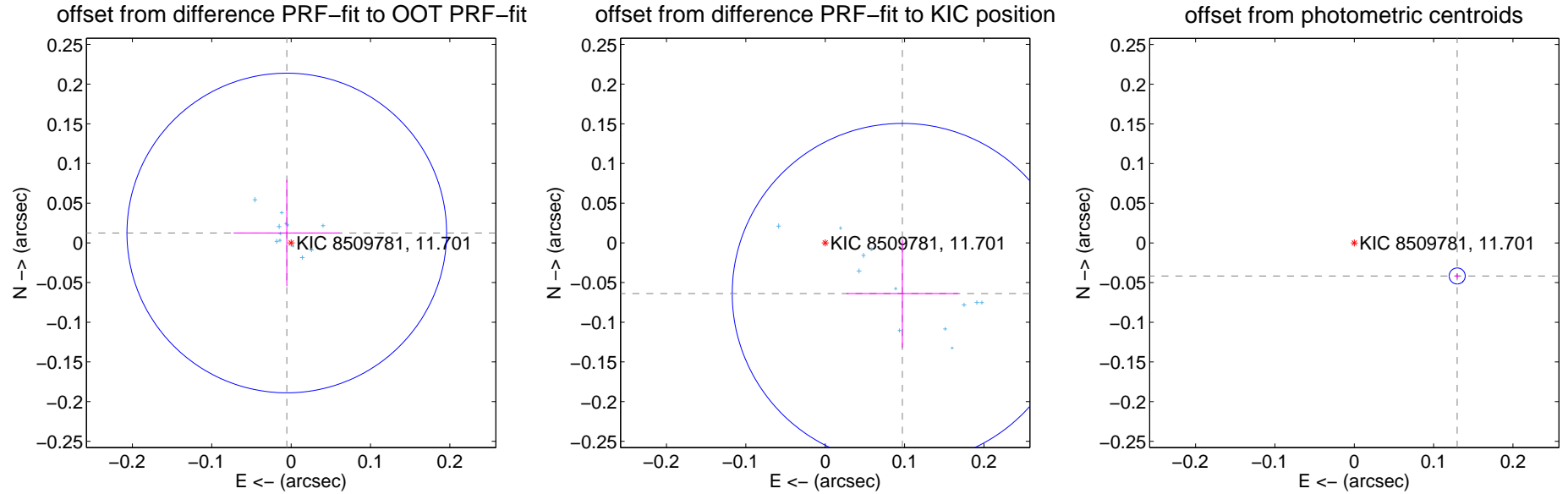
## DV Centroid Data

Supplemental centroid analysis for 008509781-01. **Kepler magnitude: 11.70.** Transit SNR 2609.85

There are 12 quarters with good PRF difference image offsets

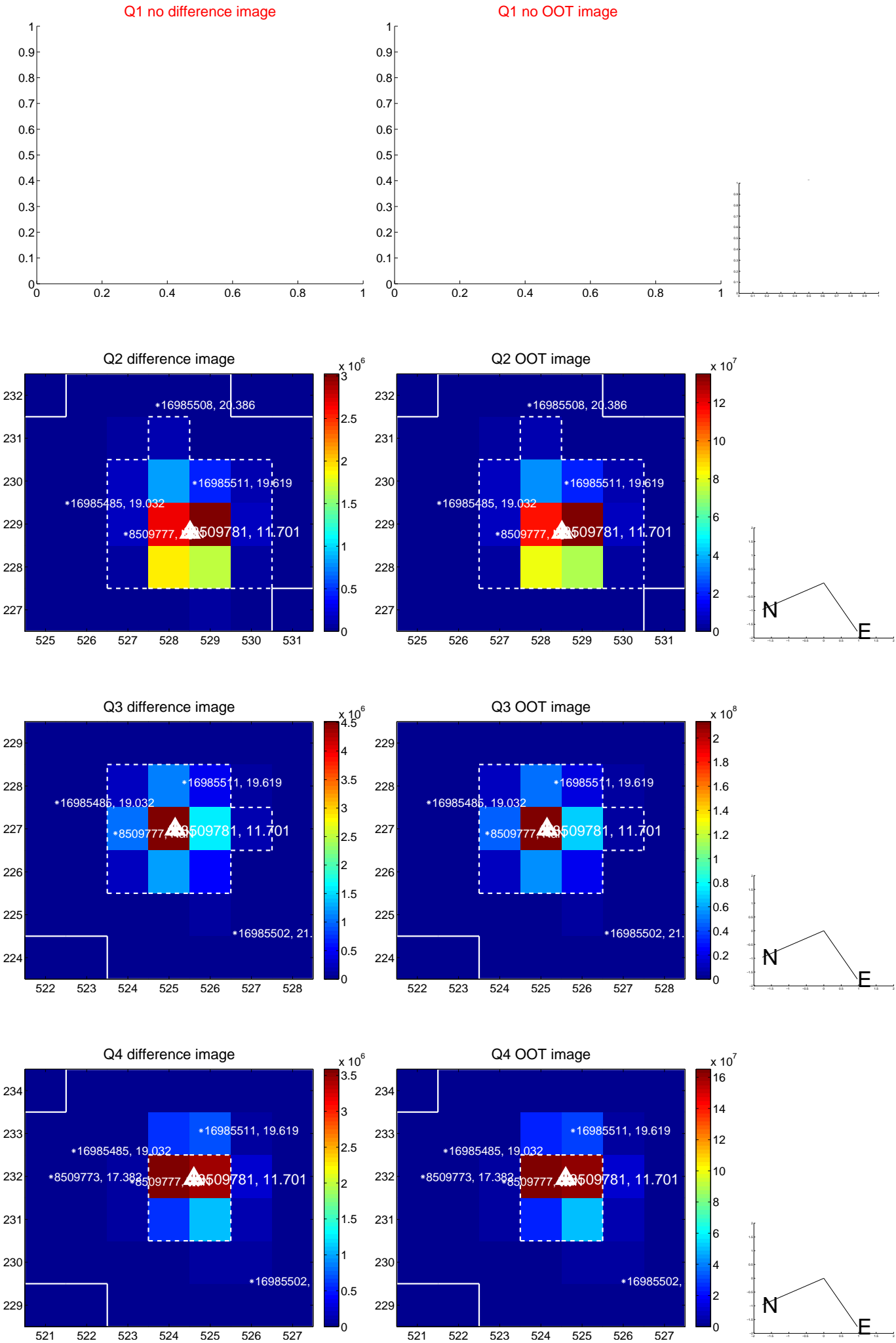
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.014 \pm 0.067$	0.20	$0.005 \pm 0.067$	$0.012 \pm 0.067$
PRF-fit source offset from KIC position	$0.116 \pm 0.071$	1.63	$-0.097 \pm 0.070$	$-0.064 \pm 0.068$
photometric centroid source offset	<b><math>0.14 \pm 0.00</math></b>	<b>40.53</b>	$-0.13 \pm 0.00$	$-0.04 \pm 0.00$

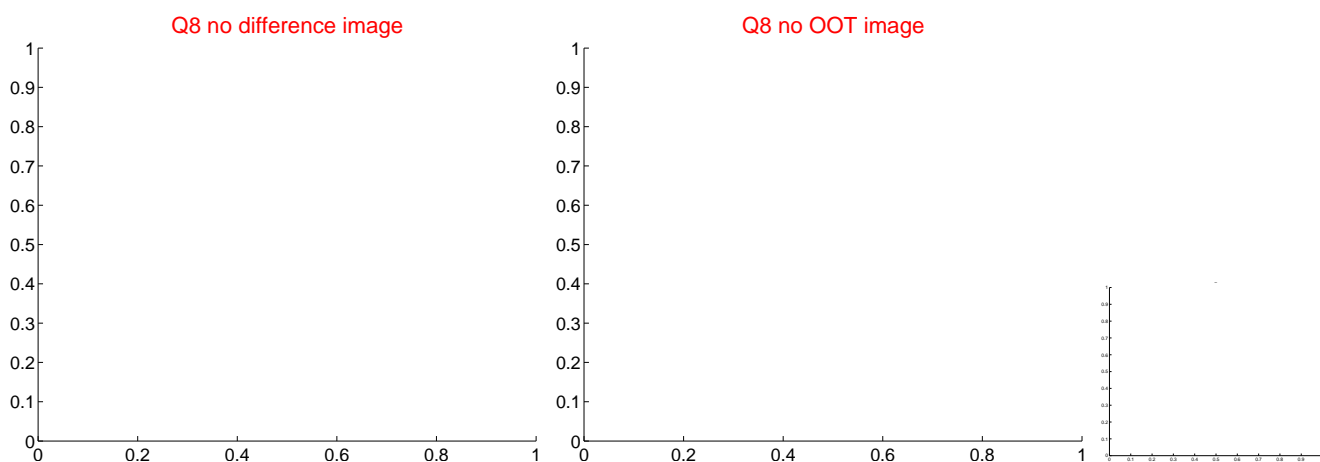
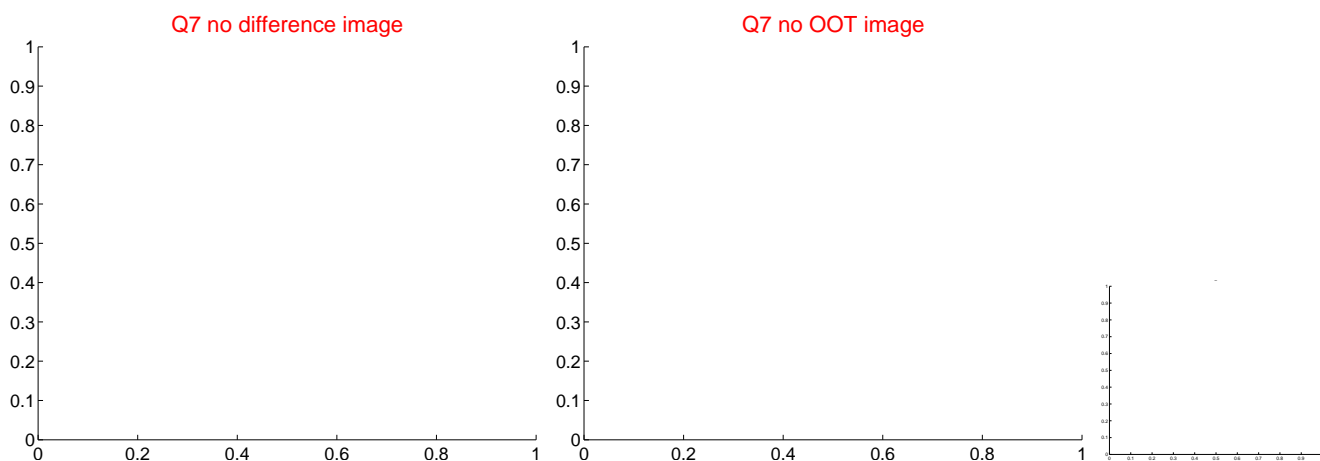
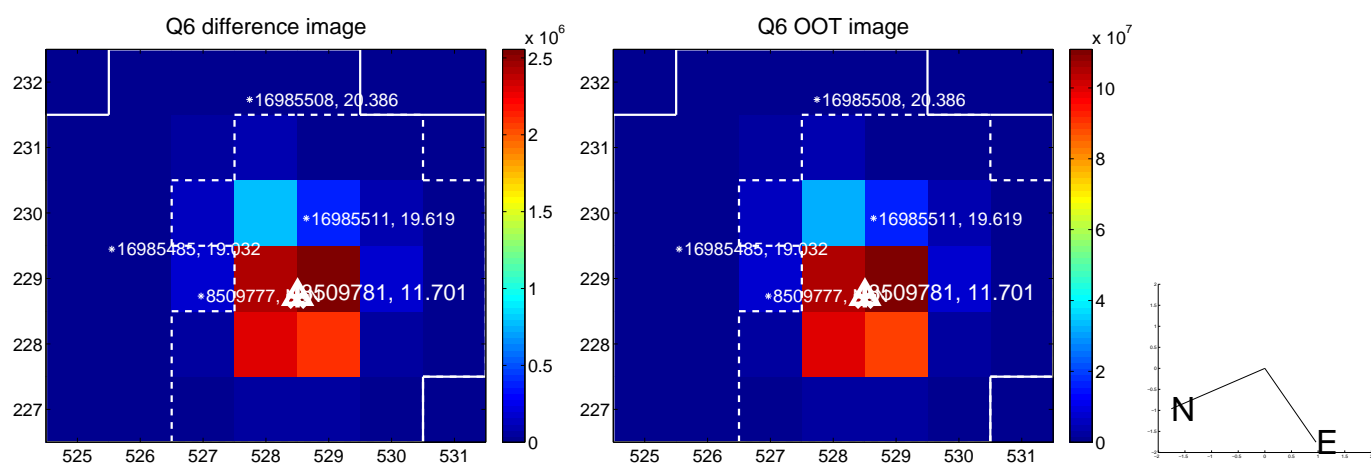
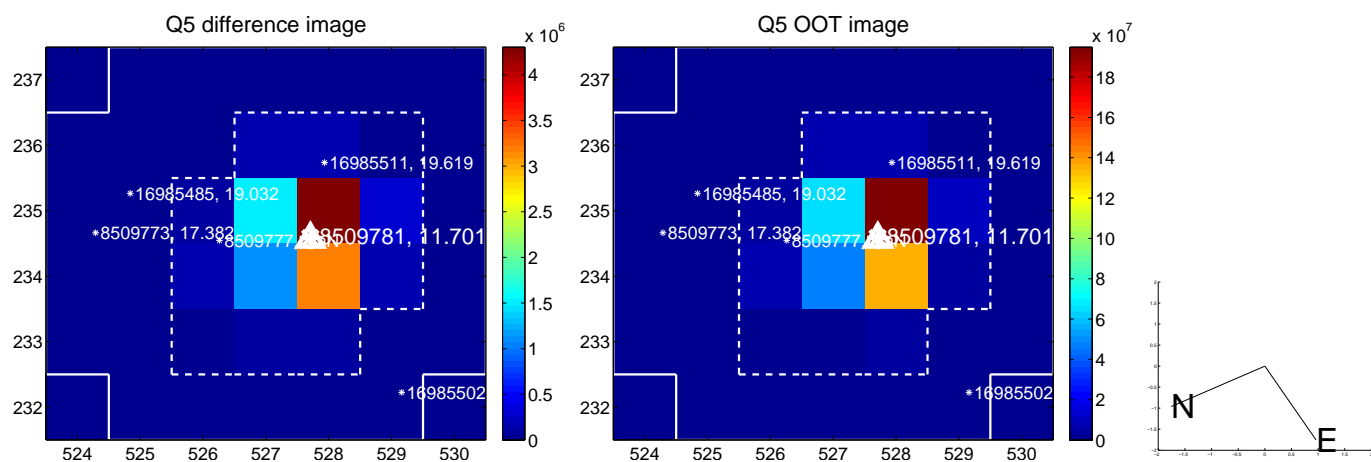


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

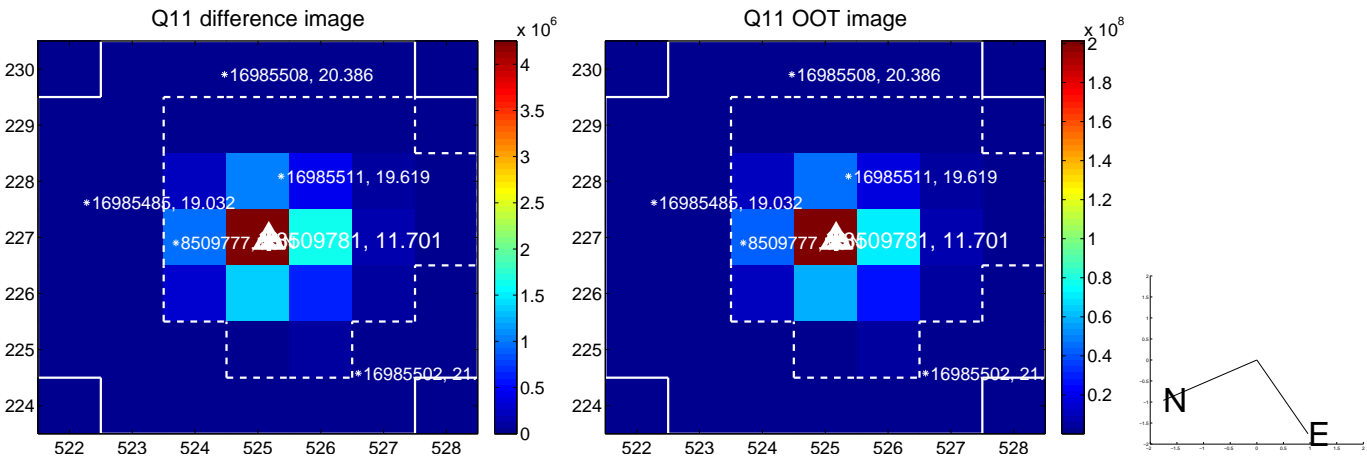
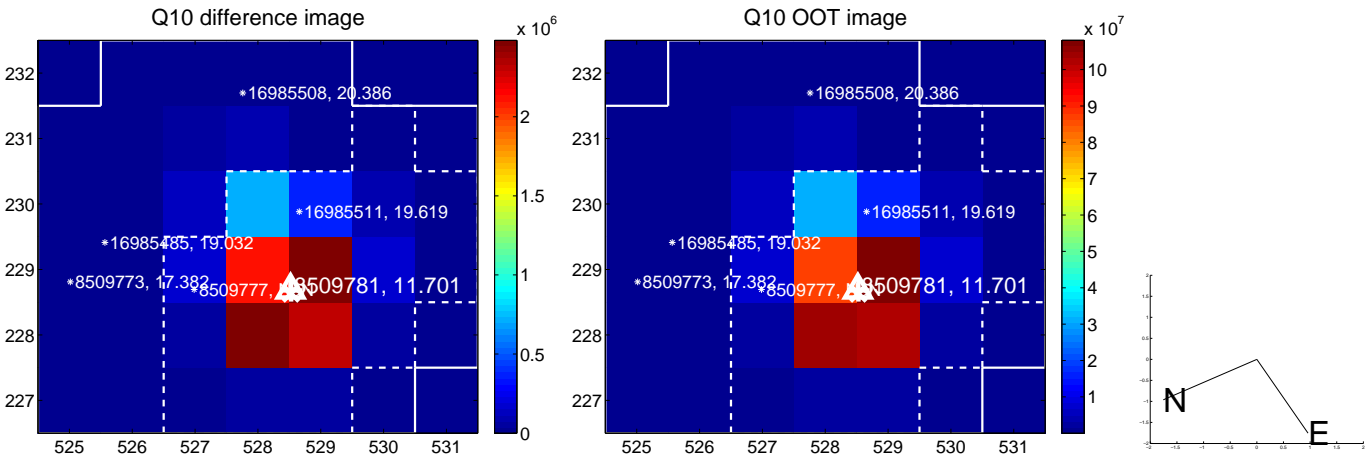
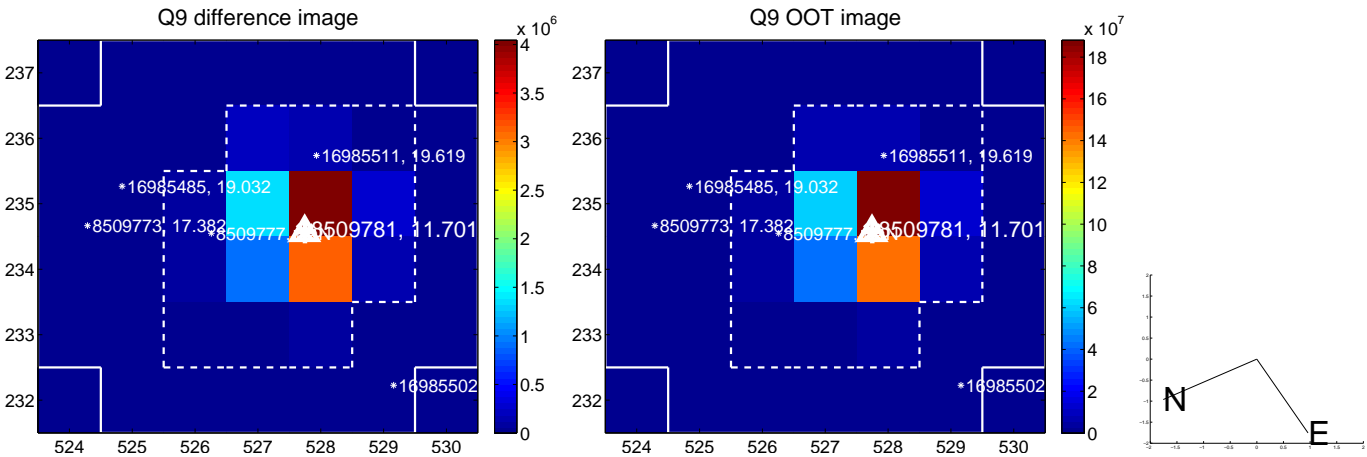


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value

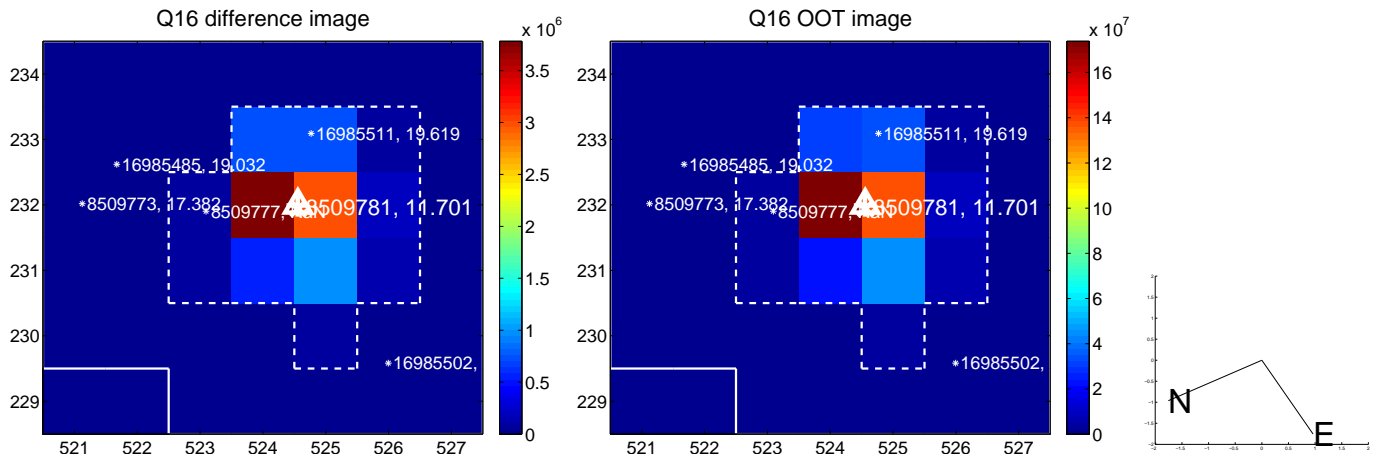
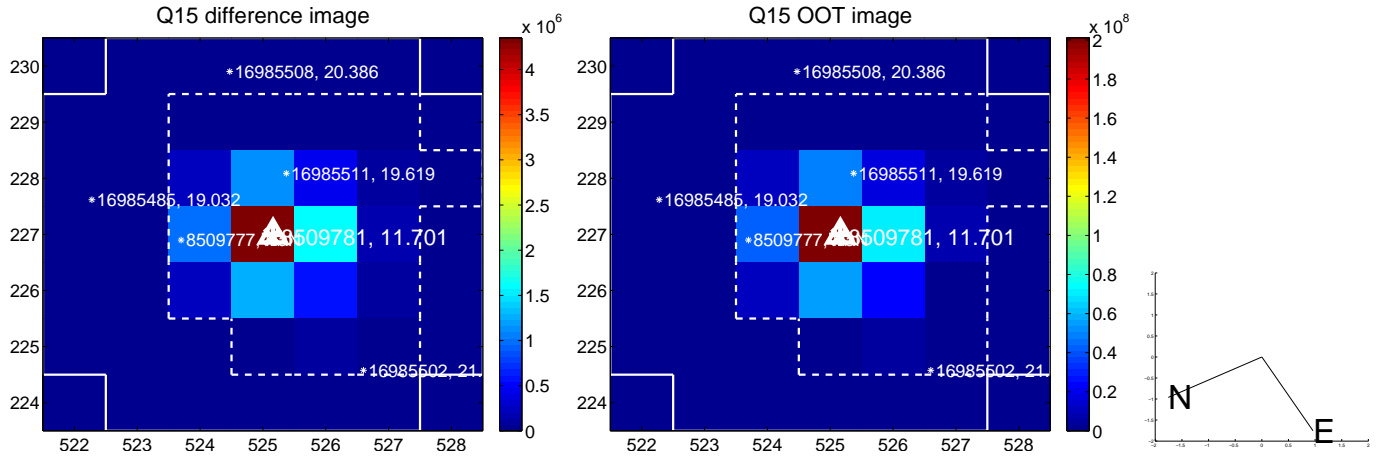
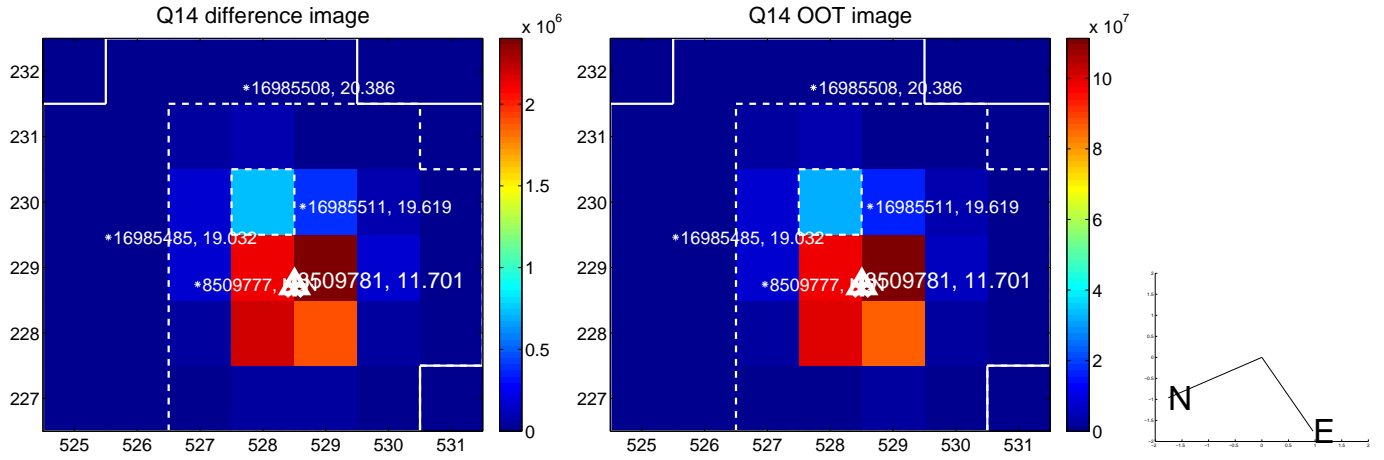
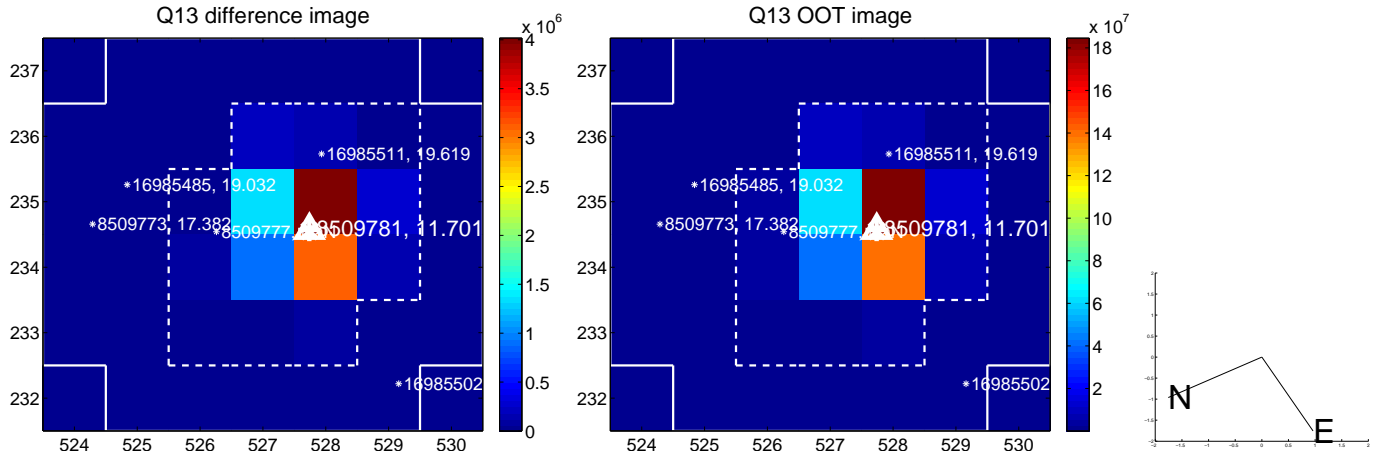




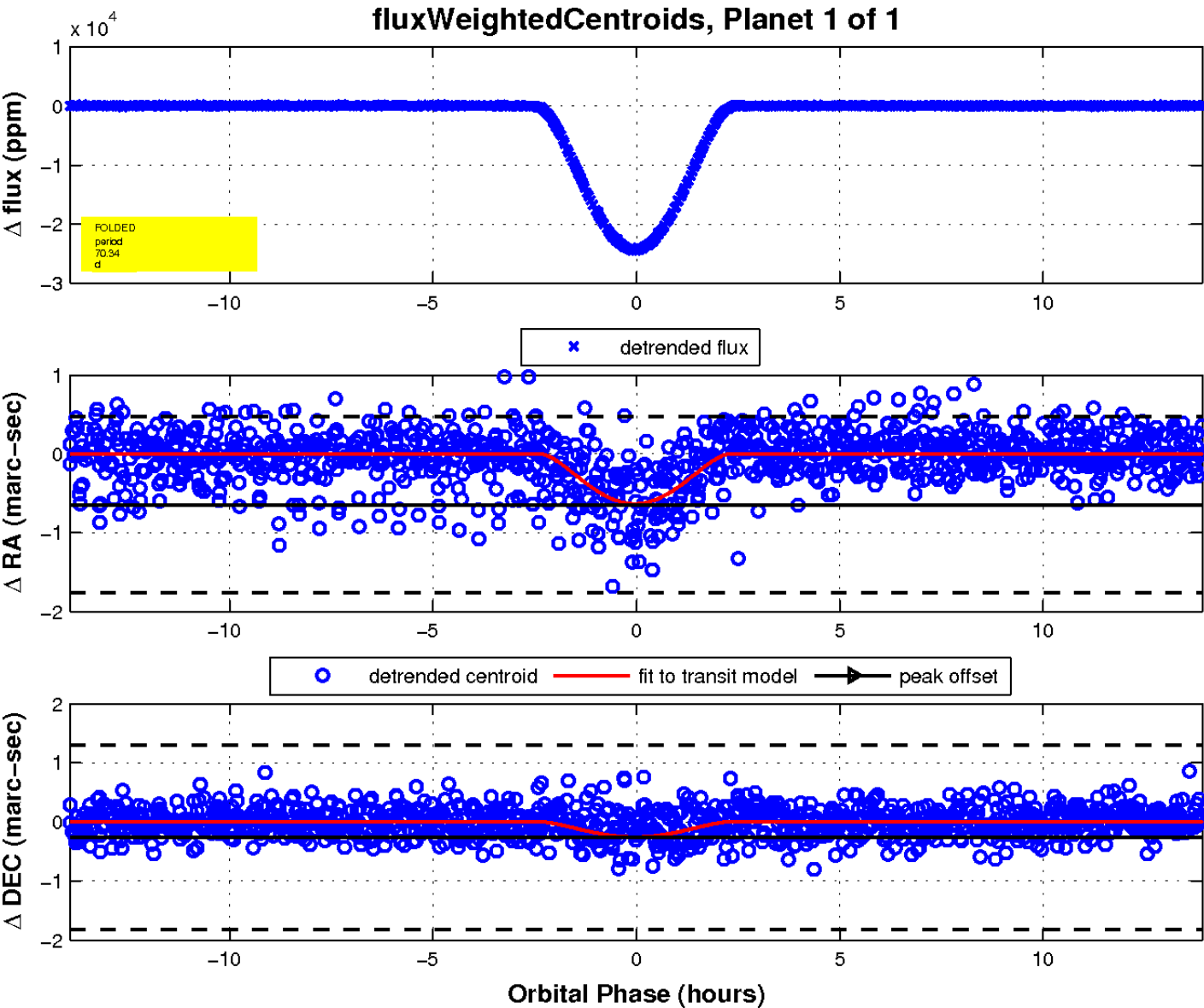
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UKIRT Image

