

# KIC 009229657

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009229657-01	OBS	2491.01	2.668306	131.689186	271.2	2.380	20.4	22.7	0.90	5806	1.76	582.45

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009229657-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT

**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 009229657-01

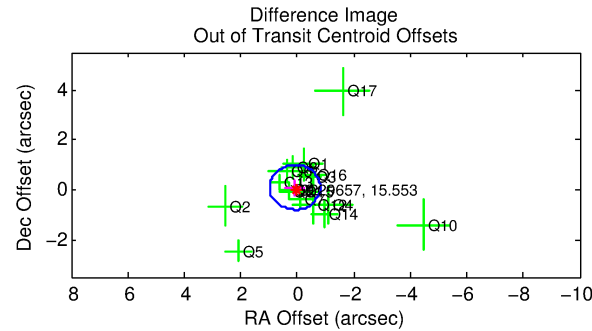
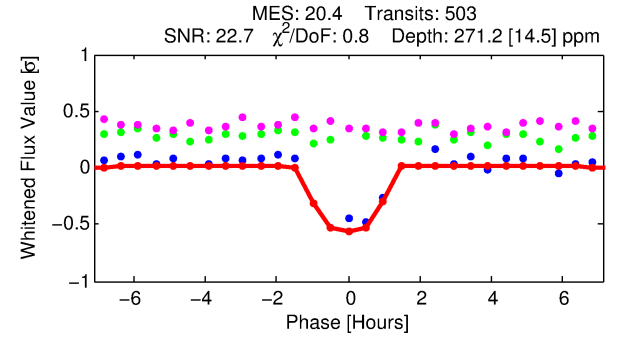
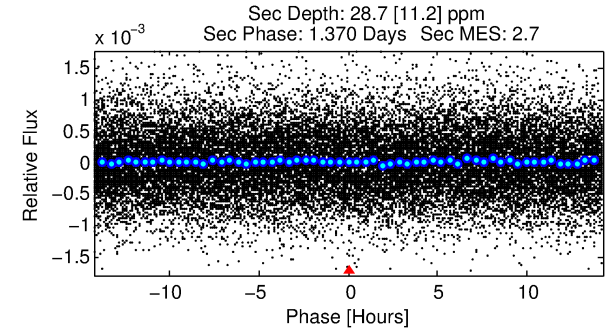
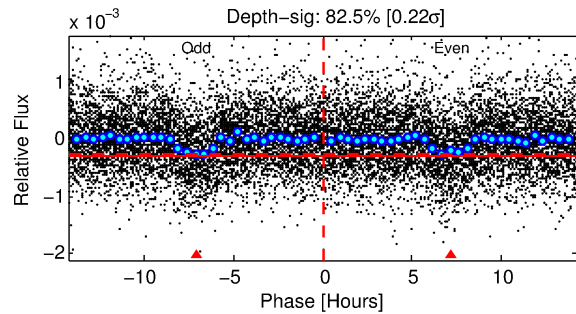
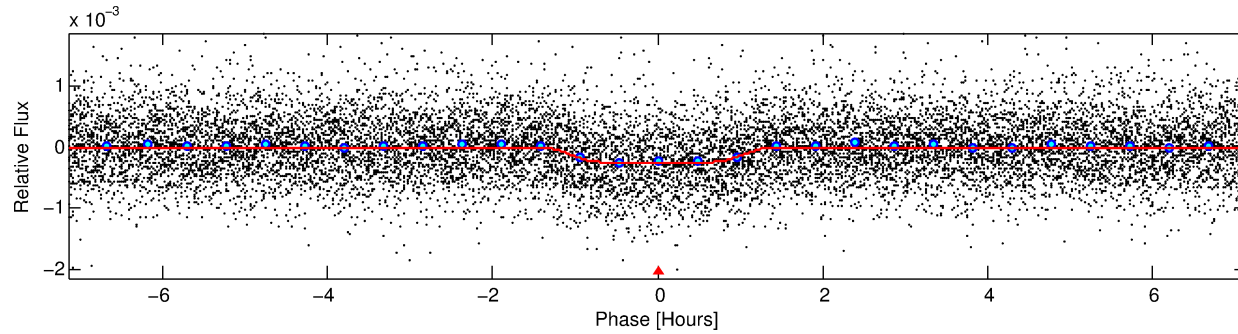
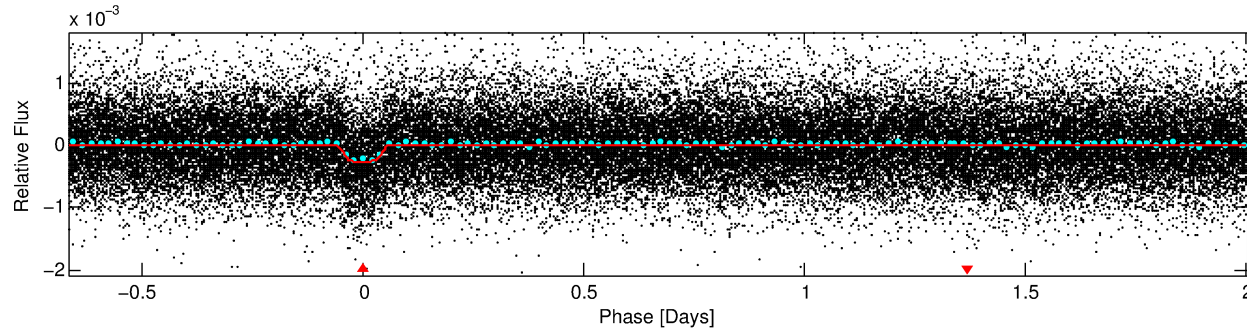
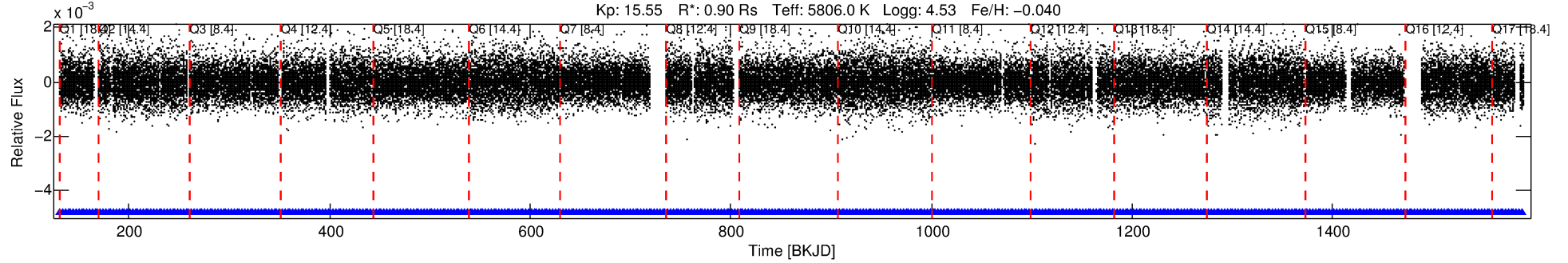
No Significant Match Found

# DV One-Page Summary

KIC: 9229657 Candidate: 1 of 1 Period: 2.668 d

KOI: K02491.01 Corr: 0.981

Kp: 15.55 R\*: 0.90 Rs Teff: 5806.0 K Logg: 4.53 Fe/H: -0.040



## DV Fit Results:

Period = 2.66831 [0.00001] d  
Epoch = 131.6892 [0.0017] BKJD  
Rp/R\* = 0.0180 [0.0048]  
a/R\* = 4.16 [4.96]  
b = 0.90 [0.27]  
Seff = 582.45 [196.10]  
Teq = 1253 [105] K  
Rp = 1.76 [0.65] Re  
a = 0.0376 [0.0081] AU  
Ag = 7.17 [5.21] [1.18σ]  
Teffp = 3169 [532] K [3.54σ]

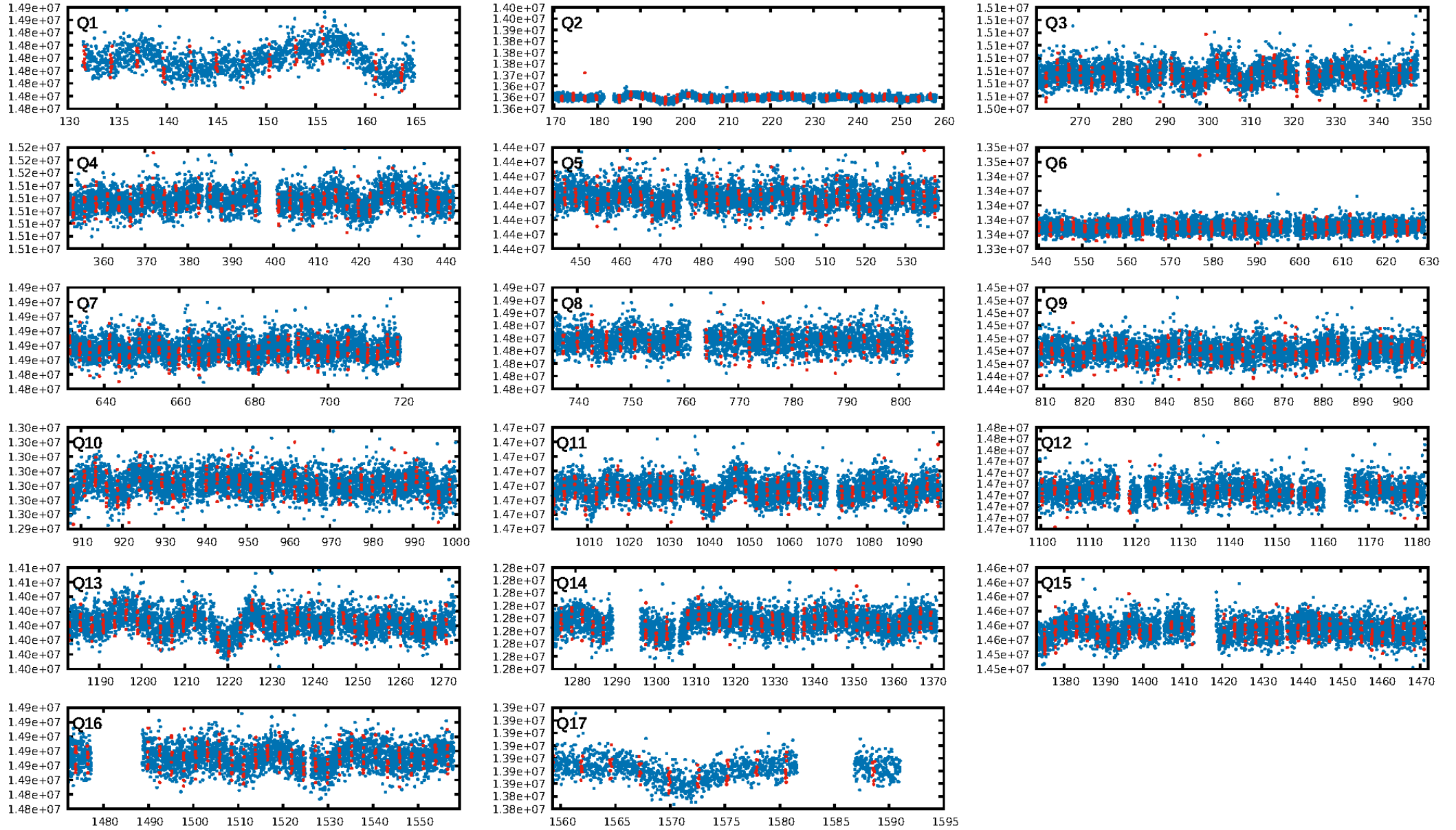
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.85e-92  
RollingBand-fgt: 1.00 [480/480]  
GhostDiagnostic-chr: 1.849  
Centroid-sig: 0.0%  
Centroid-so: 1.729 arcsec [2.78σ]  
OotOffset-rm: 0.122 arcsec [0.41σ]  
KicOffset-rm: 0.058 arcsec [0.15σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.82 [14/17]  
DiffImageOverlap-fno: 1.00 [17/17]

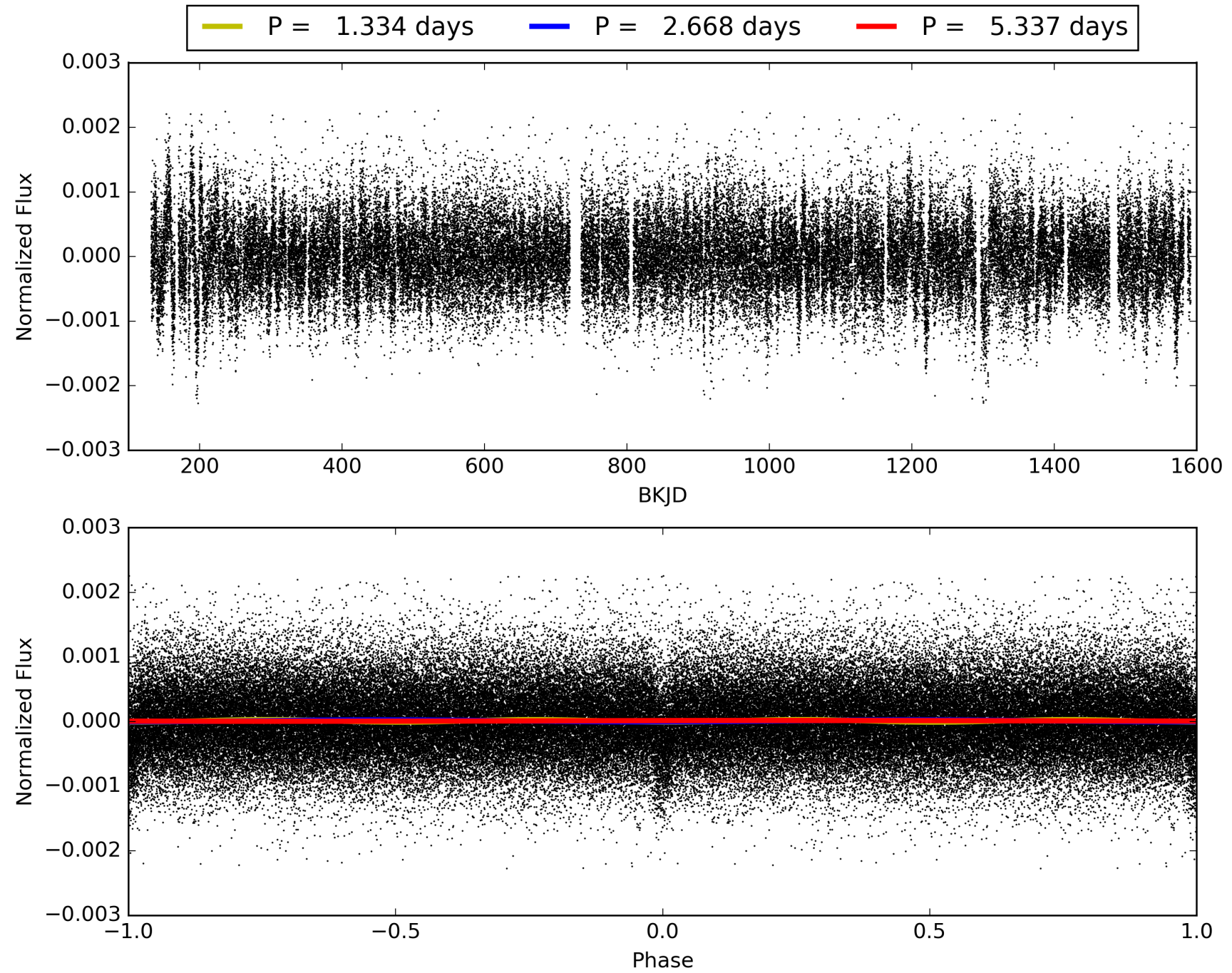
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:52:26 Z

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

# TCE 009229657-01, PDC Light Curves

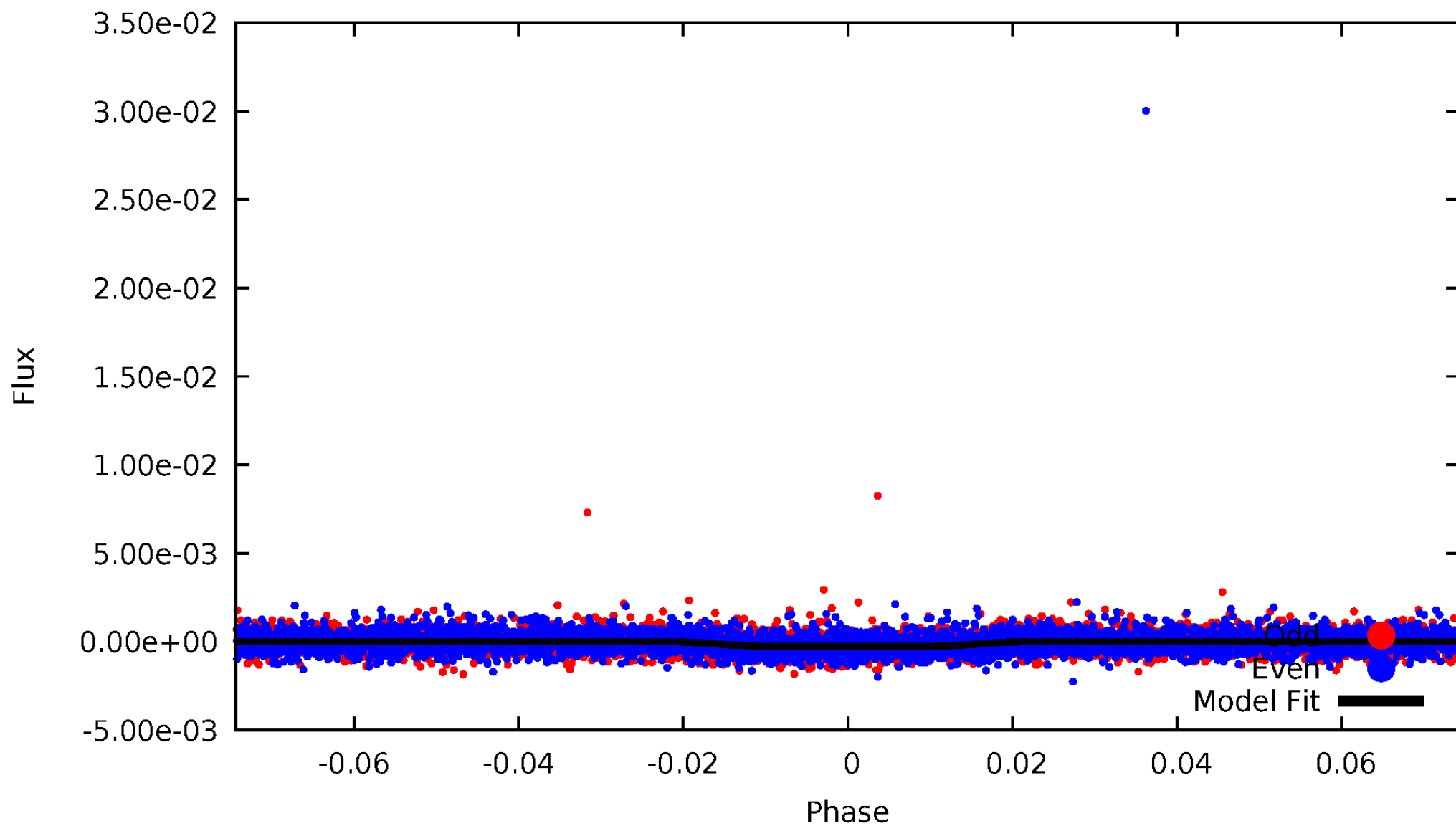


TCE 009229657-01



# DV Odd/Even

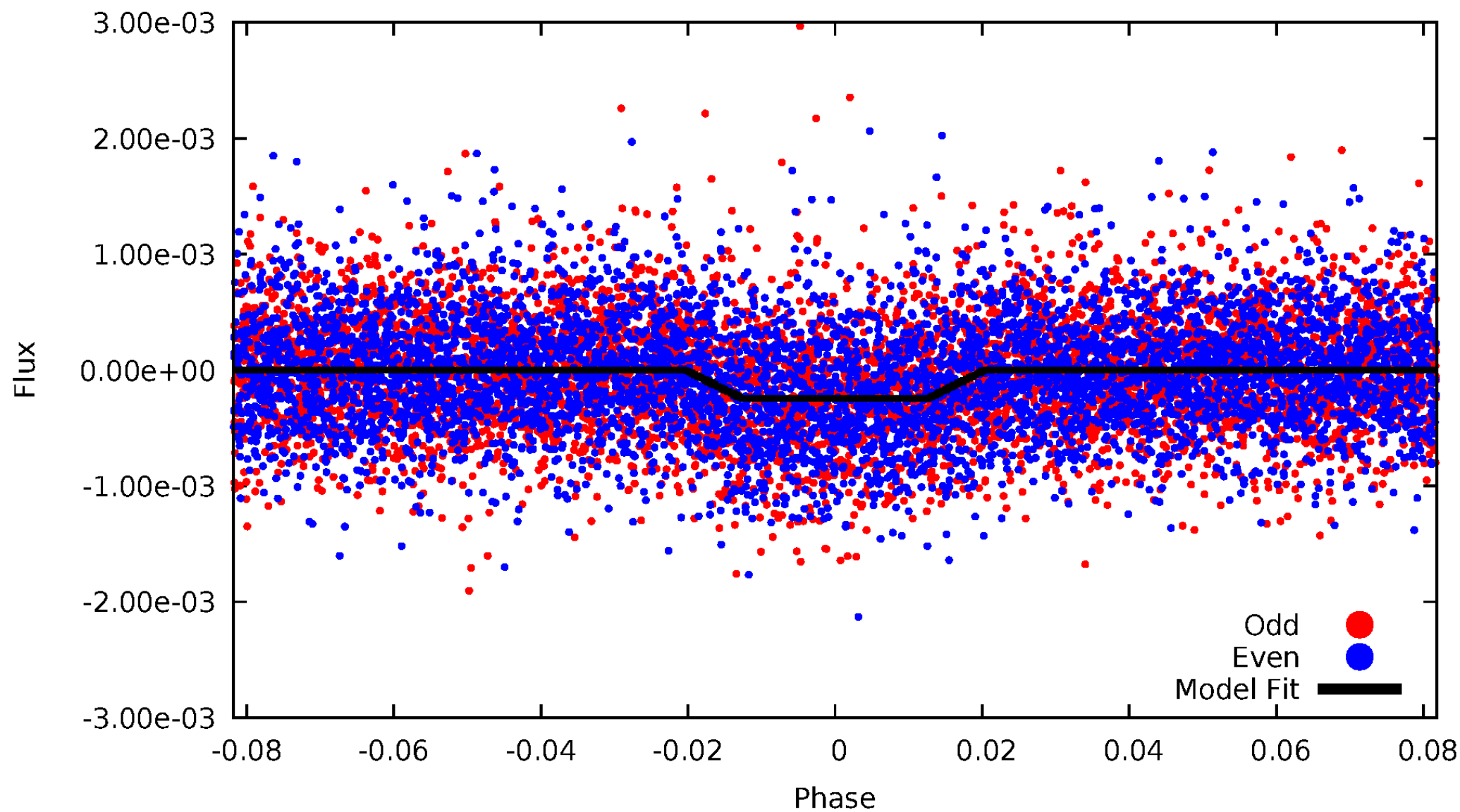
TCE 009229657-01





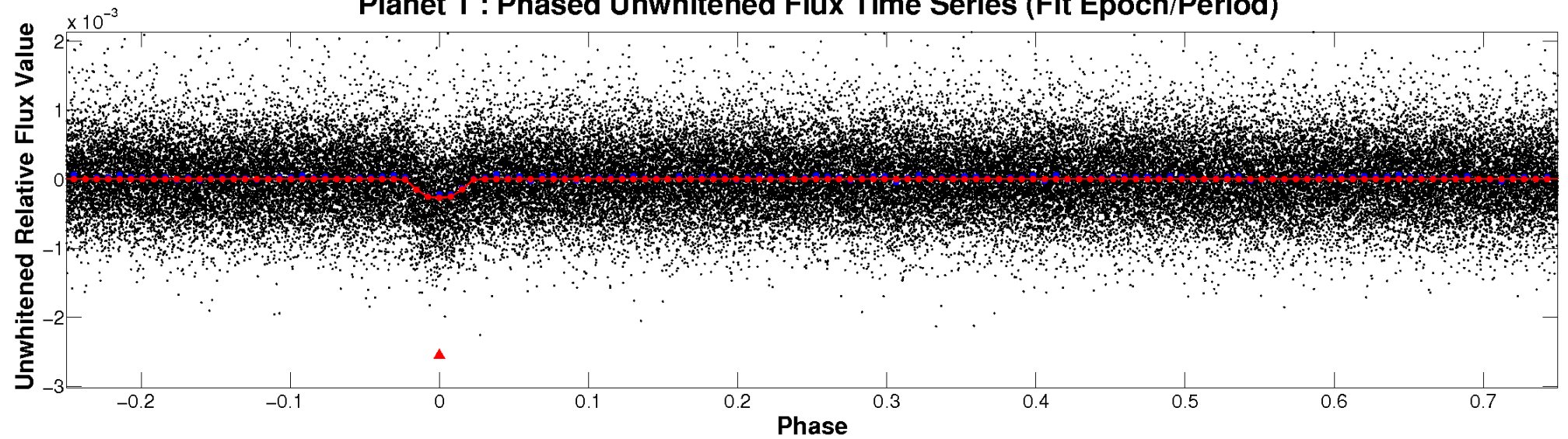
# ALT Odd/Even

TCE 009229657-01

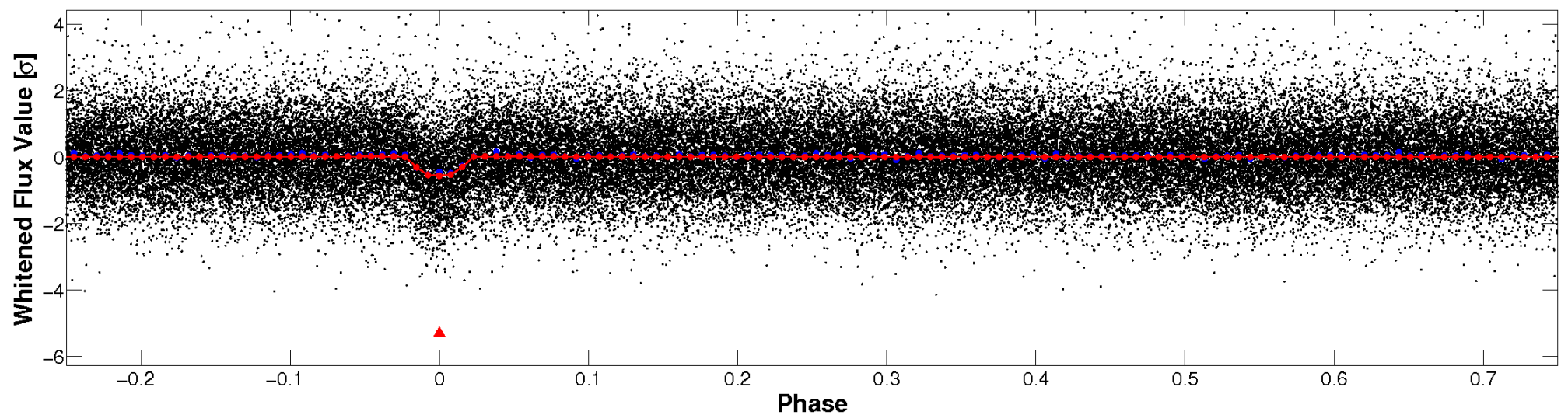


# Non-Whitened Vs. Whitened Light Curve

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

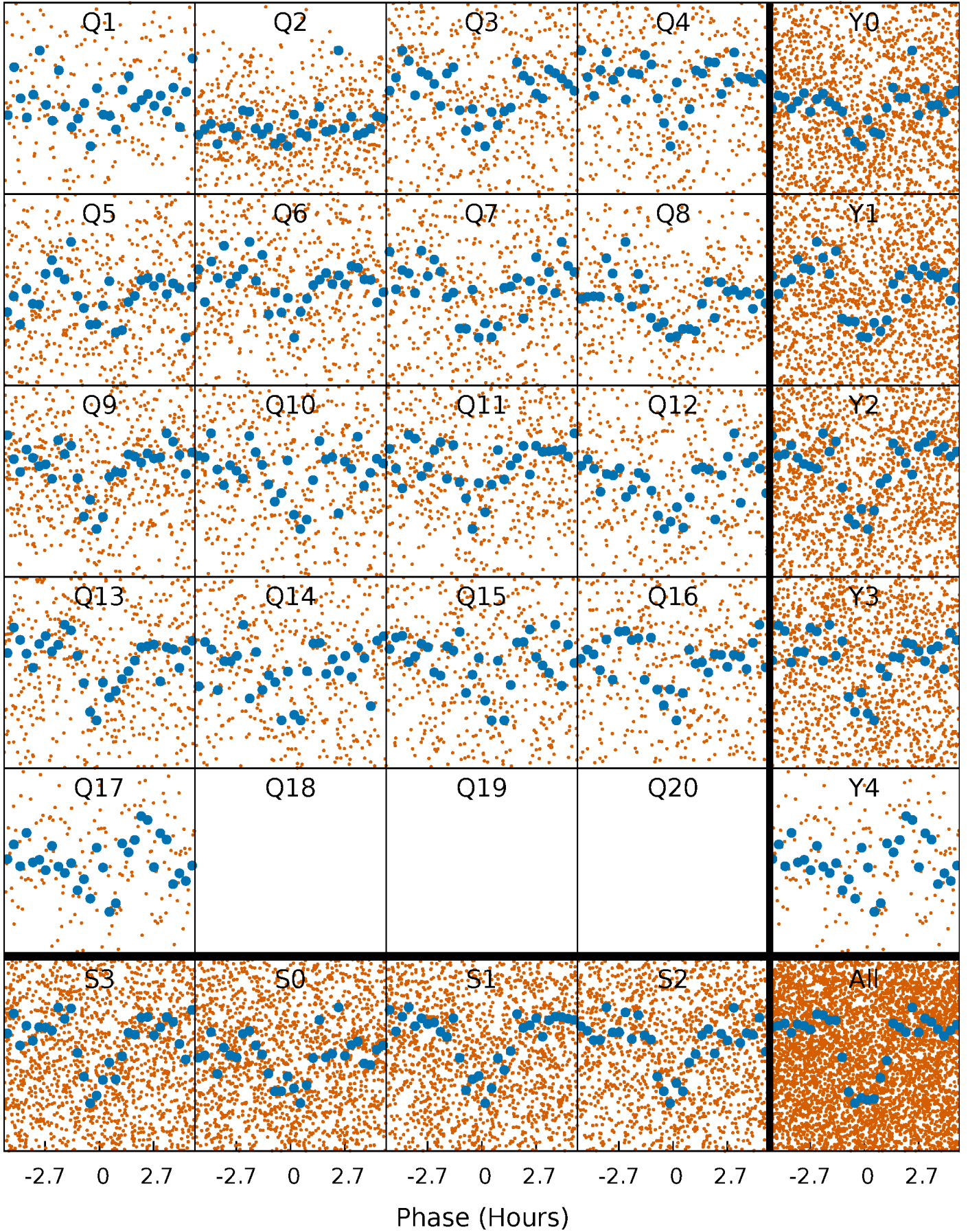


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

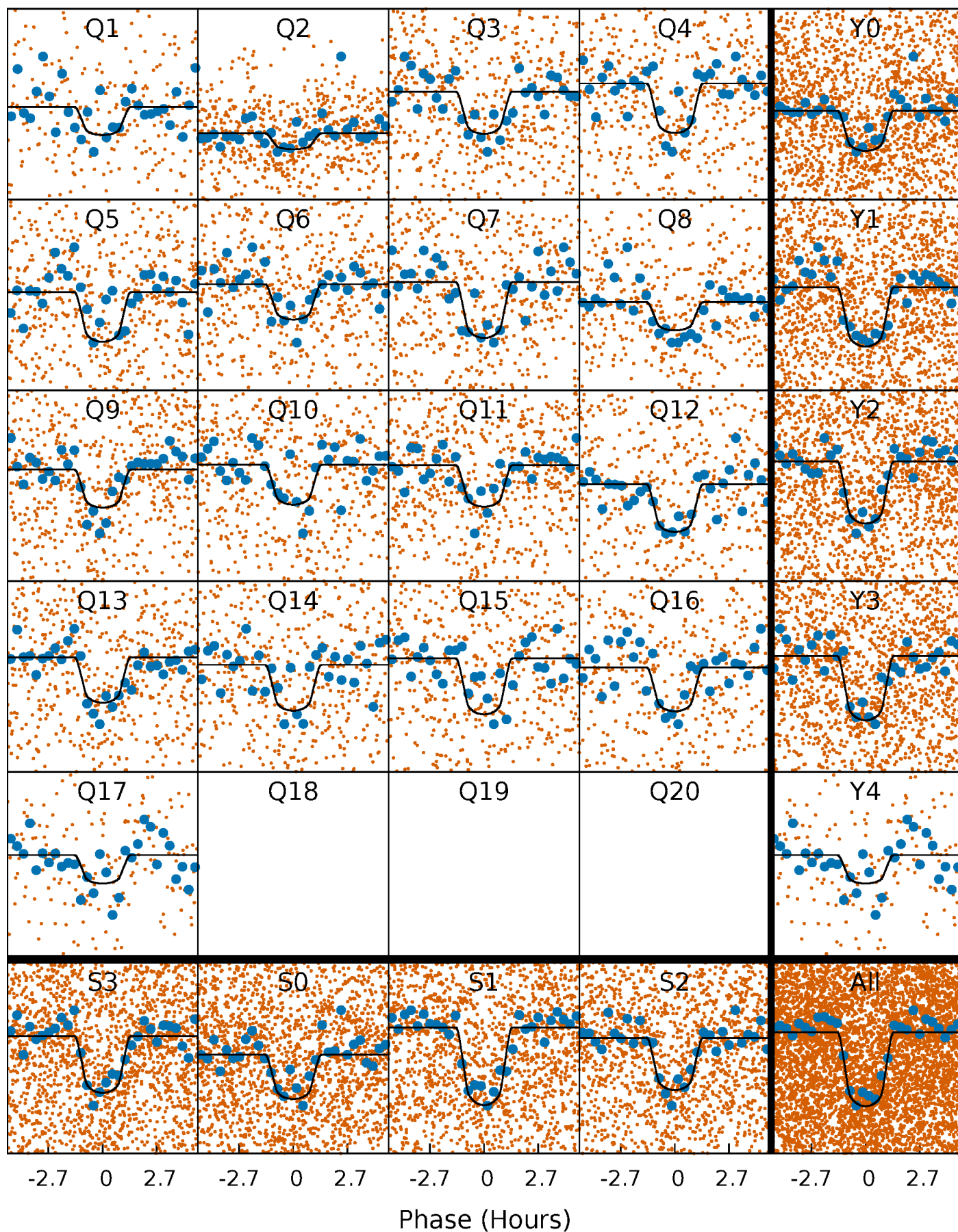
TCE 009229657-01 P= 2.668306 Days  $T_0=131.689186$  (BKJD)





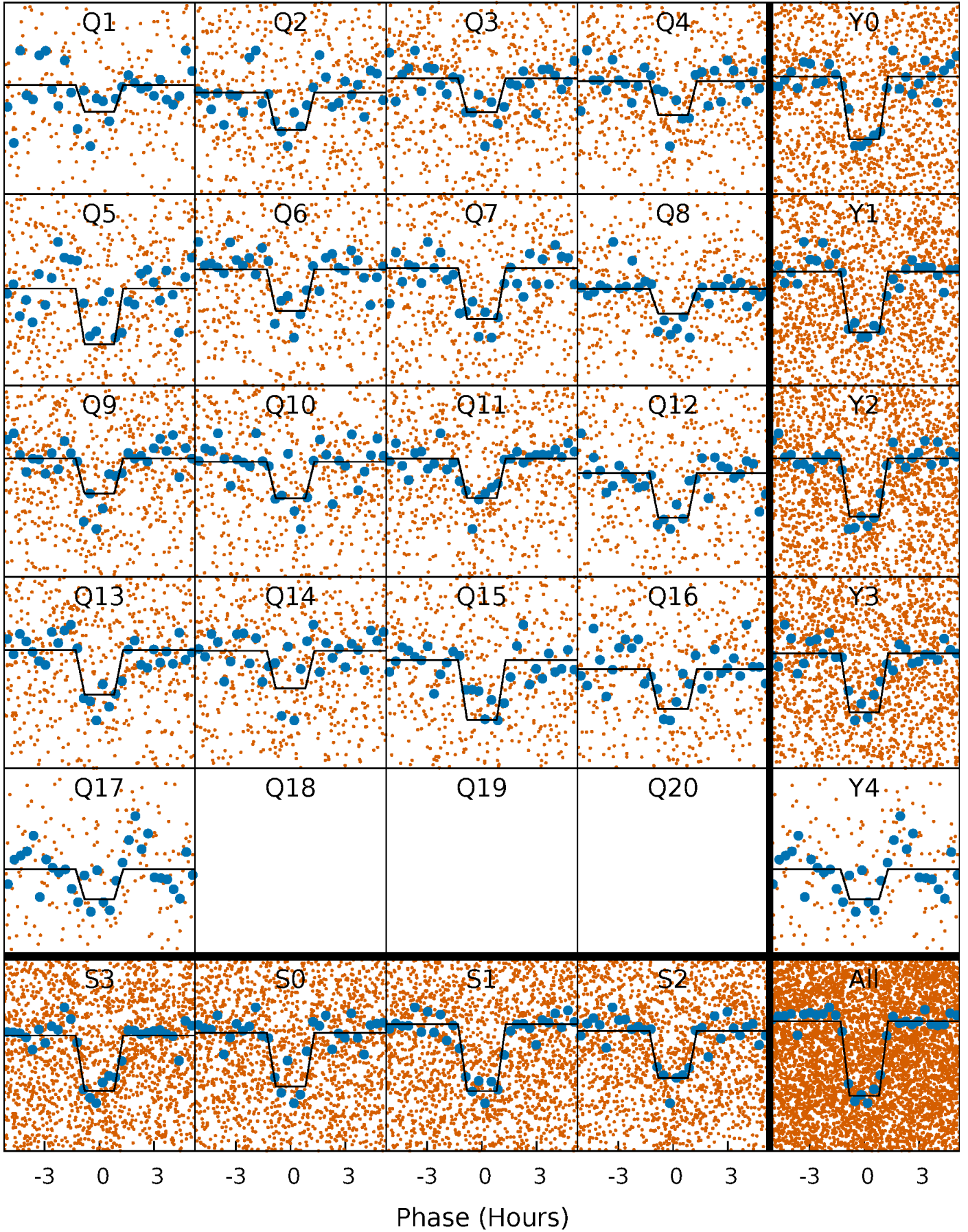
# DV Quarter-Phased Transit Curves

TCE 009229657-01 P= 2.668306 Days  $T_0=131.689186$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

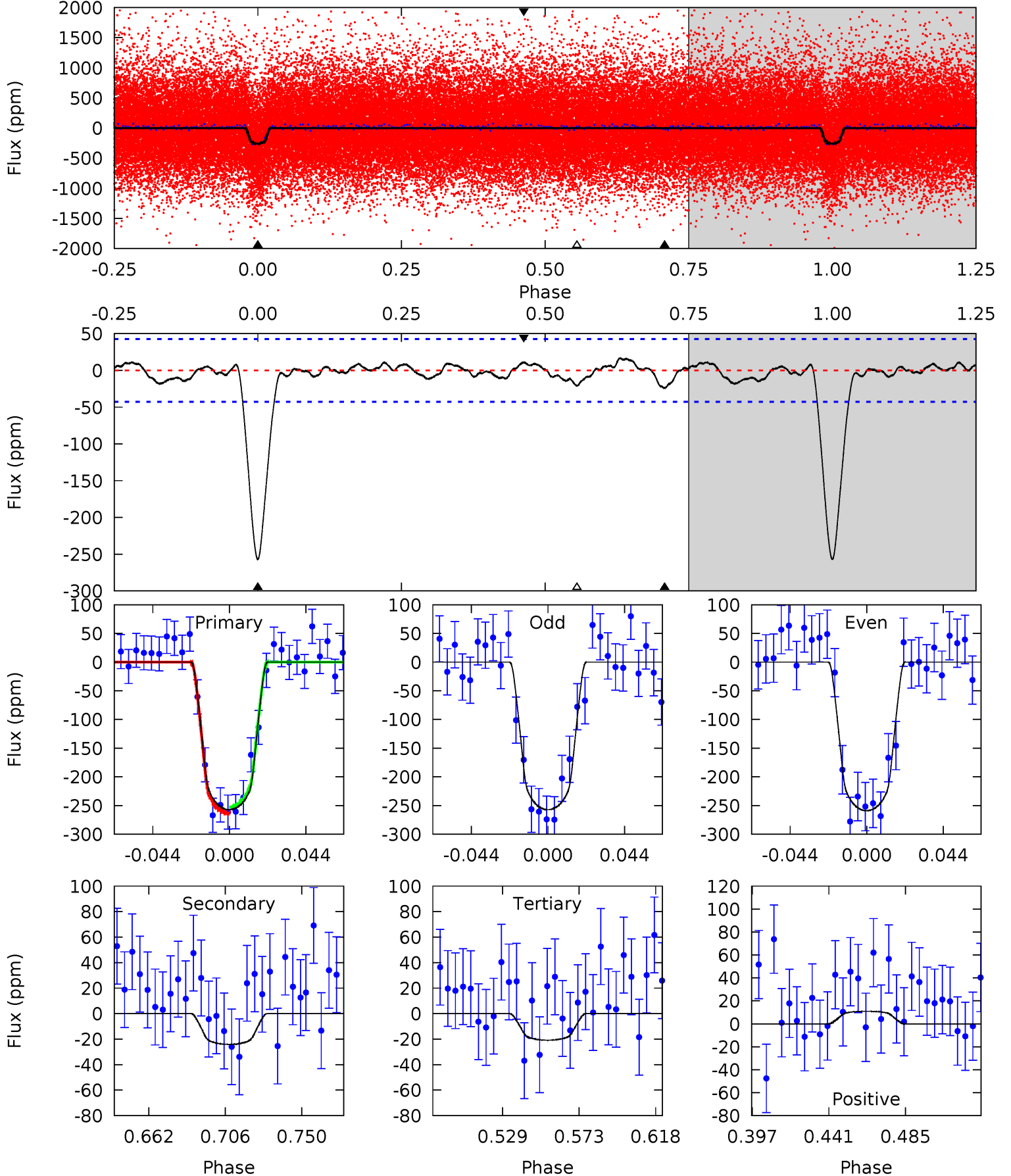
TCE 009229657-01 P= 2.668328 Days  $T_0=131.683863$  (BKJD)



# DV Model-Shift Uniqueness Test

009229657-01, P = 2.668306 Days, E = 129.020880 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
28.5	2.68	2.31	1.21	4.73	2.01	0.88	26.2	27.3	0.36	1.46	0.09	0.98	0.06	0.60

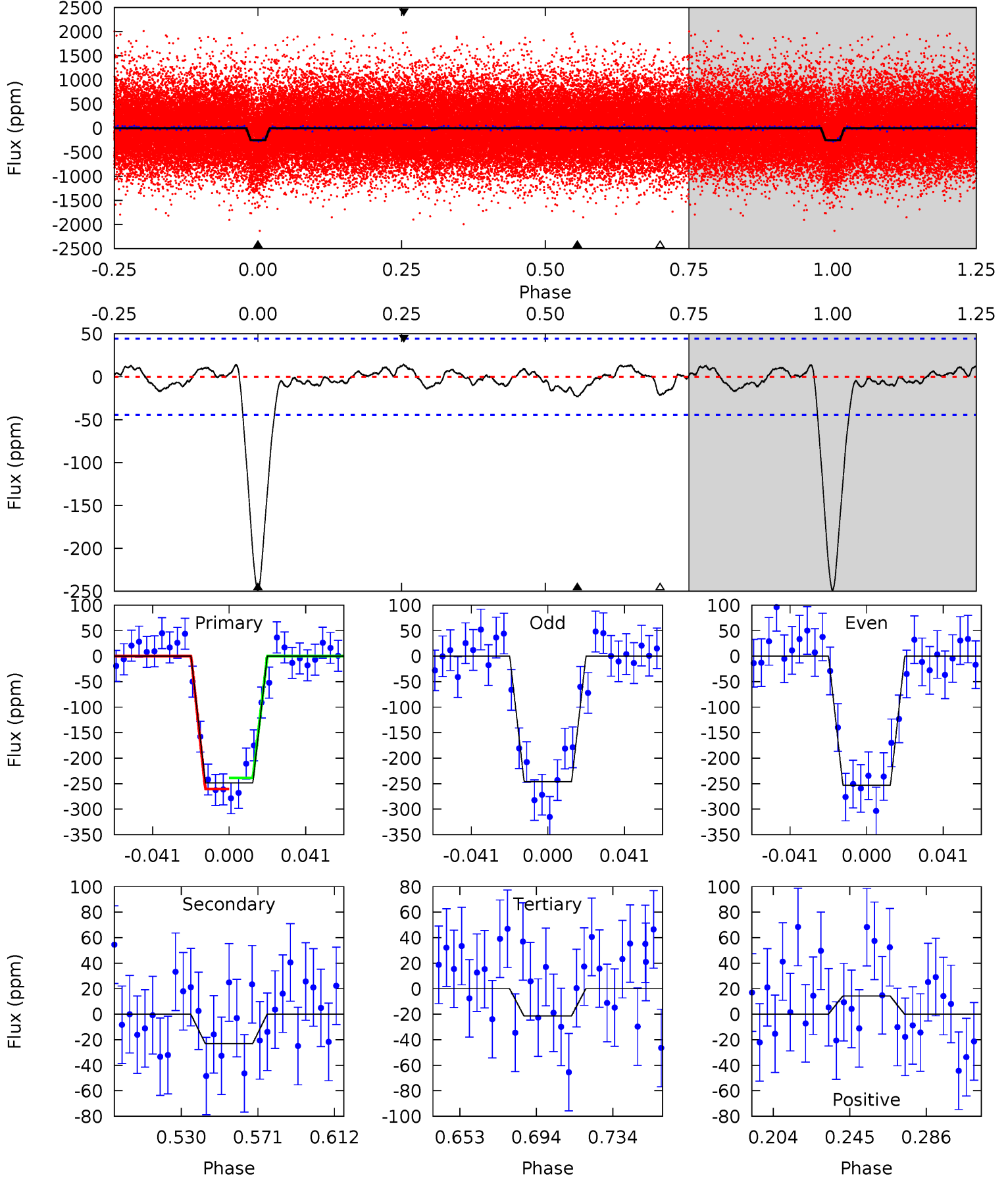




# Alt Model-Shift Uniqueness Test

009229657-01, P = 2.668328 Days, E = 129.015535 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
26.6	2.46	2.29	1.52	4.75	2.05	0.84	24.3	25.1	0.17	0.94	0.37	1.00	0.05	1.17





### Stellar Parameters For KIC 009229657

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5806^{+157}_{-192}$	$4.528^{+0.042}_{-0.168}$	$-0.040^{+0.250}_{-0.300}$	$0.899^{+0.231}_{-0.077}$	$0.996^{+0.104}_{-0.127}$	$1.928^{+0.438}_{-0.891}$
	+3%/-3%	+1%/-4%	+625%/-750%	+26%/-9%	+10%/-13%	+23%/-46%
Source	PHO1	KIC0	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 009229657-01 / KOI 2491.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-24 \pm 9$	$1.82^{+0.58}_{-0.50}$	$1784^{+99}_{-83}$	$3456^{+467}_{-379}$	$5.298^{+5.698}_{-2.804}$
Alt.	$-23 \pm 9$	$1.66^{+0.56}_{-0.52}$	$1775^{+106}_{-78}$	$3515^{+564}_{-370}$	$6.032^{+7.998}_{-3.171}$

$T_{max}$  = 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  $A_{obs} \gg 1.0$

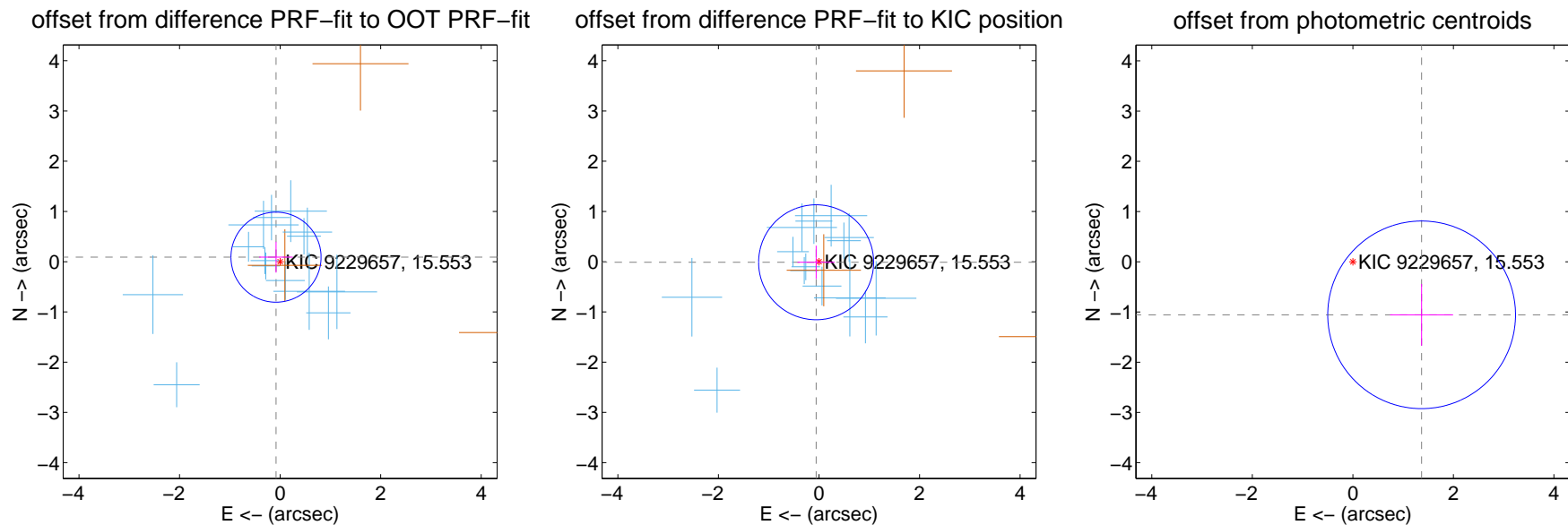
## DV Centroid Data

Supplemental centroid analysis for 009229657-01. Kepler magnitude: 15.55. Transit SNR 22.68

There are 14 quarters with good PRF difference image offsets

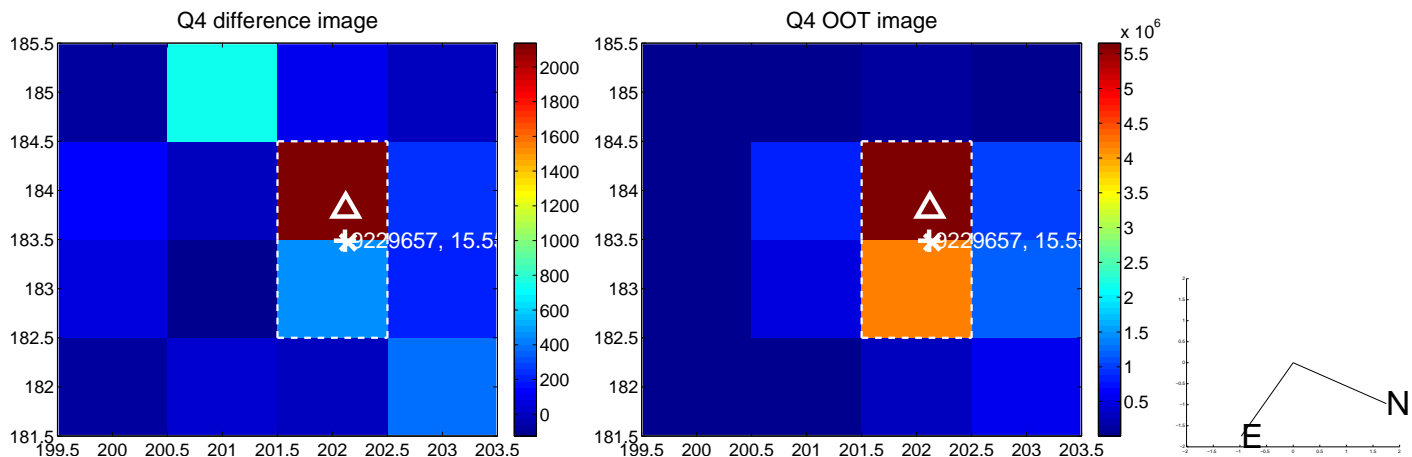
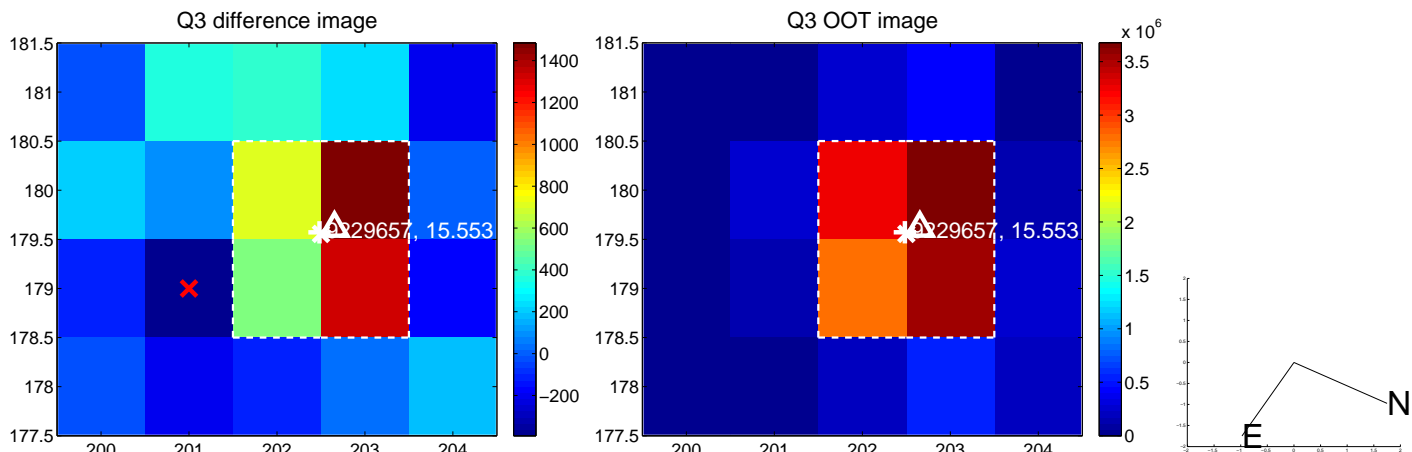
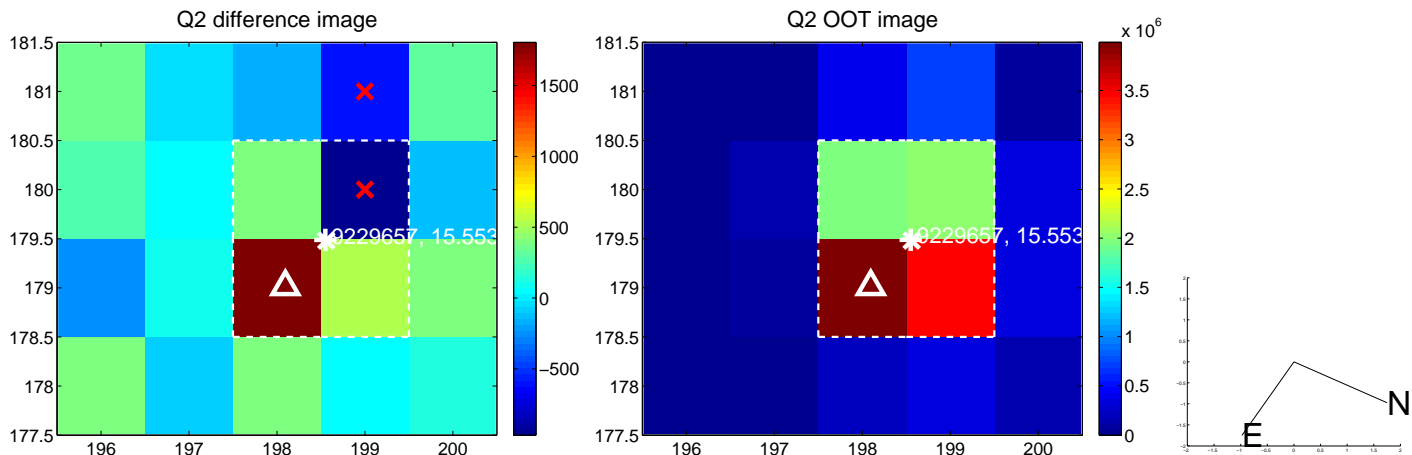
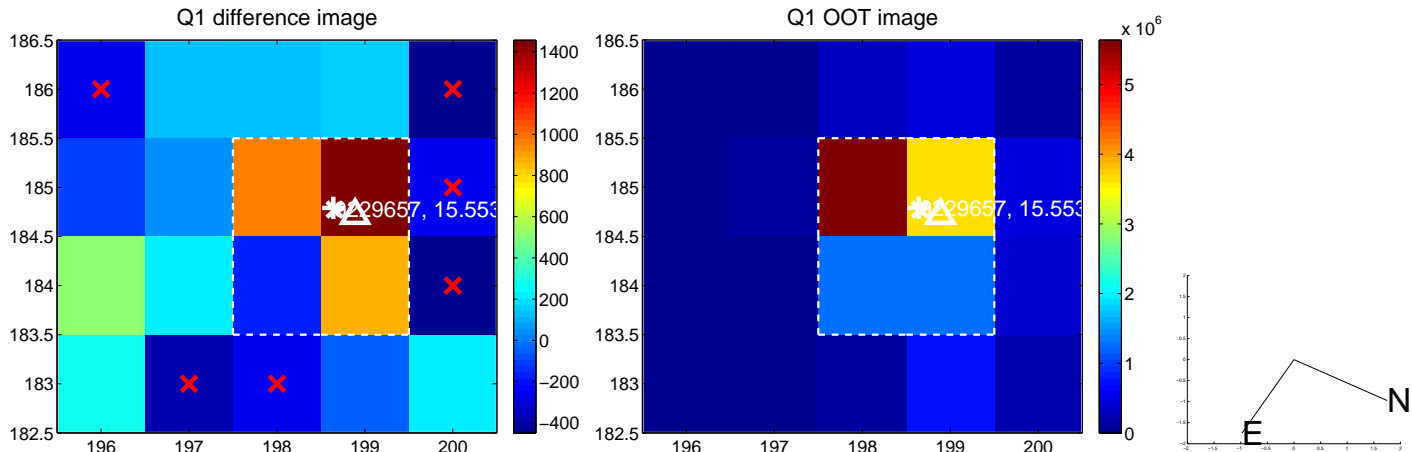
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.122 \pm 0.299$	0.41	$0.082 \pm 0.333$	$0.090 \pm 0.308$
PRF-fit source offset from KIC position	$0.058 \pm 0.381$	0.15	$0.057 \pm 0.370$	$-0.011 \pm 0.331$
photometric centroid source offset	$1.73 \pm 0.62$	2.78	$-1.37 \pm 0.63$	$-1.06 \pm 0.61$

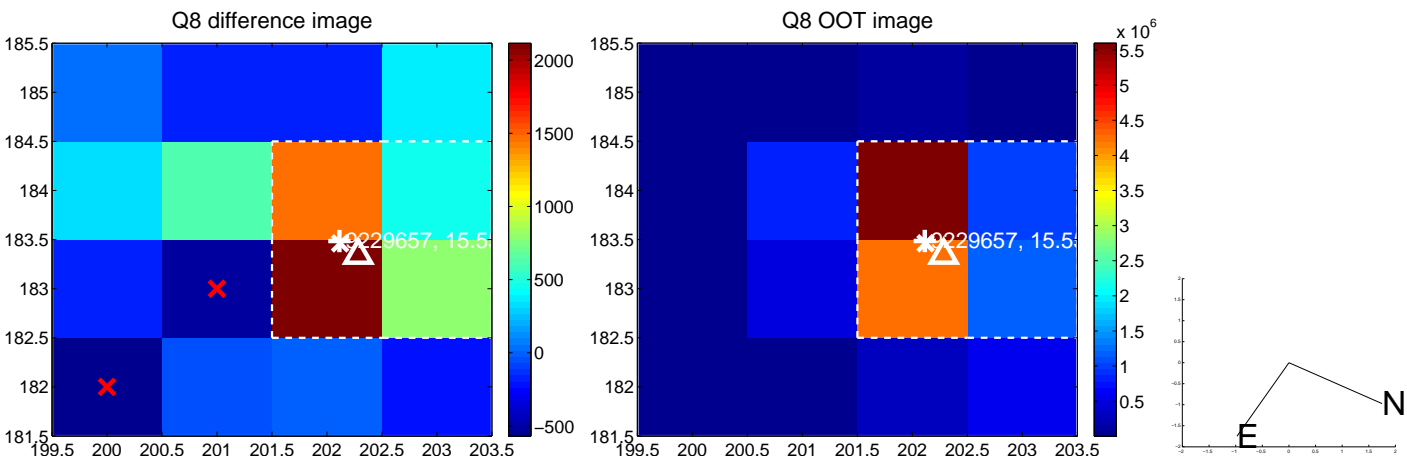
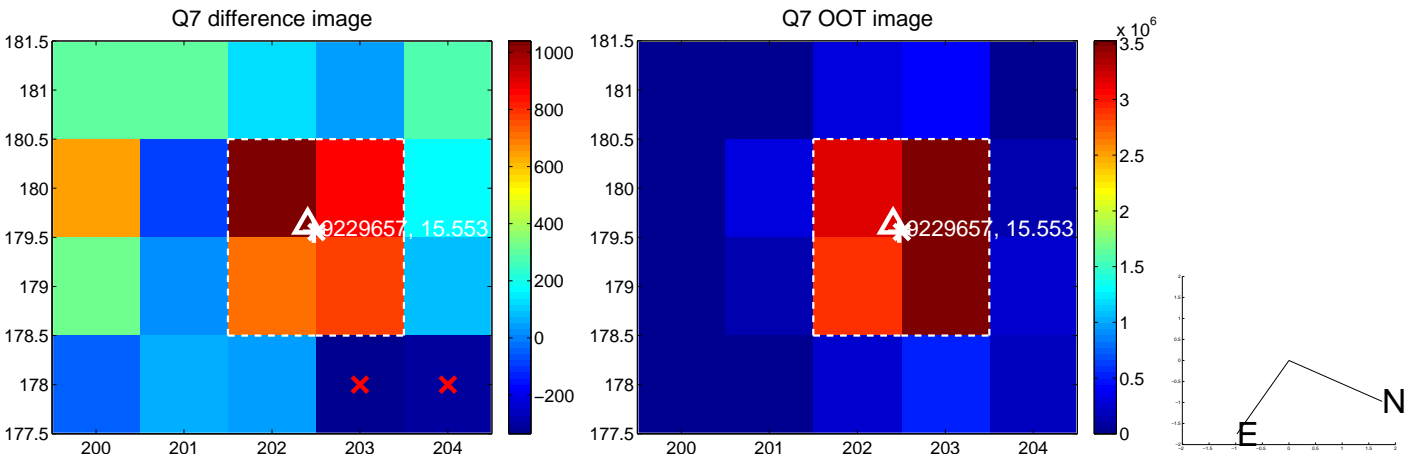
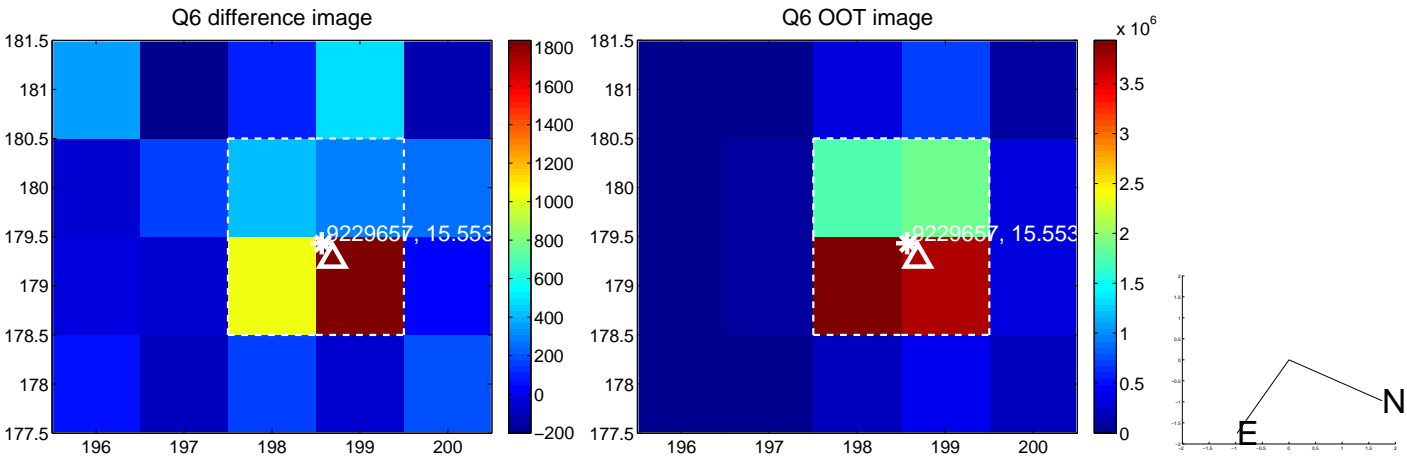
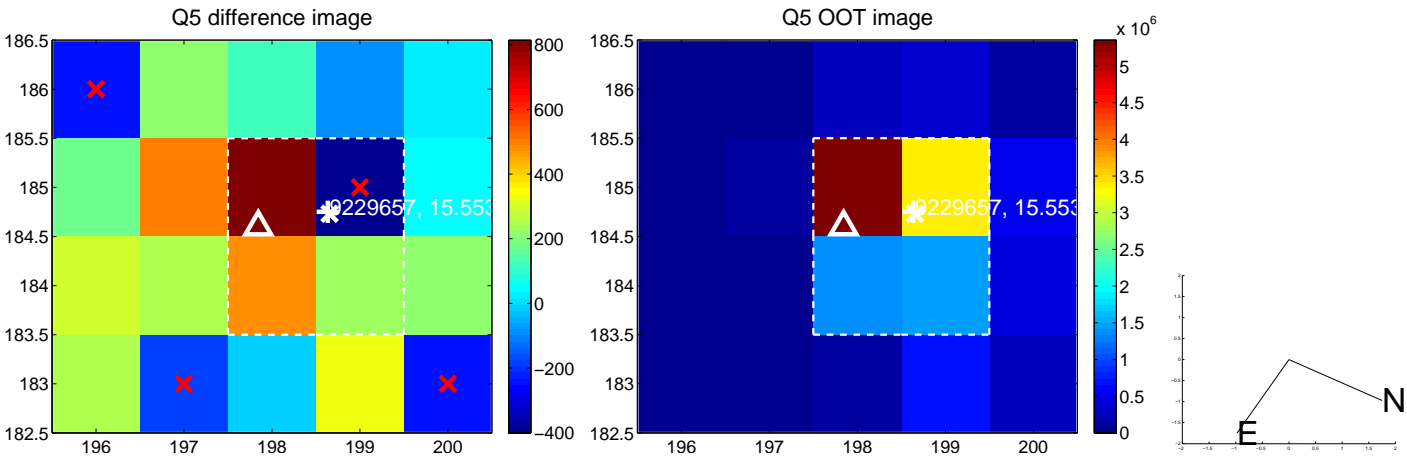


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: 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.

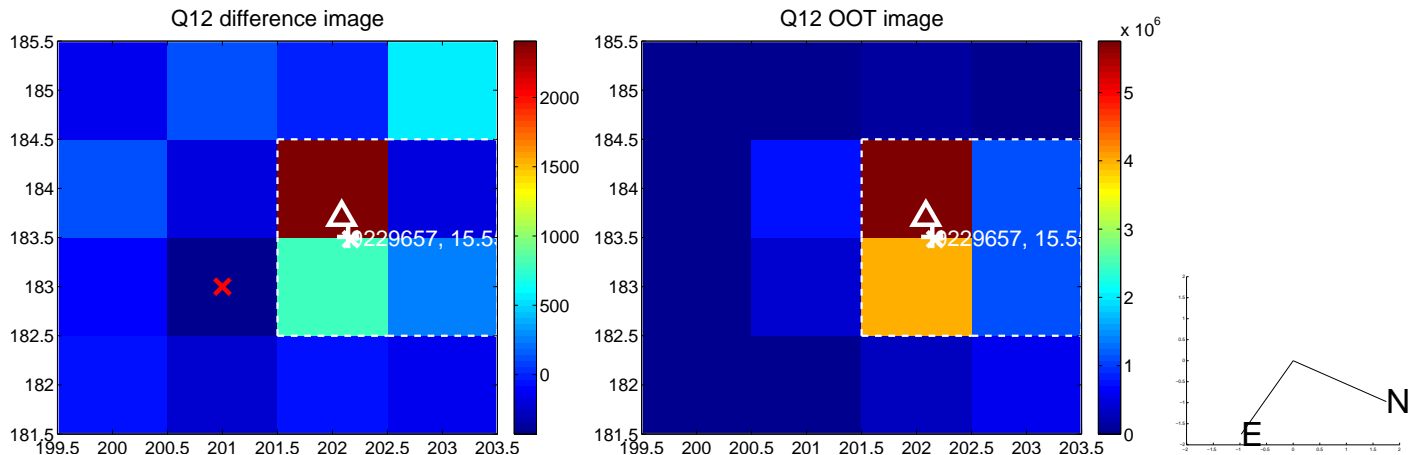
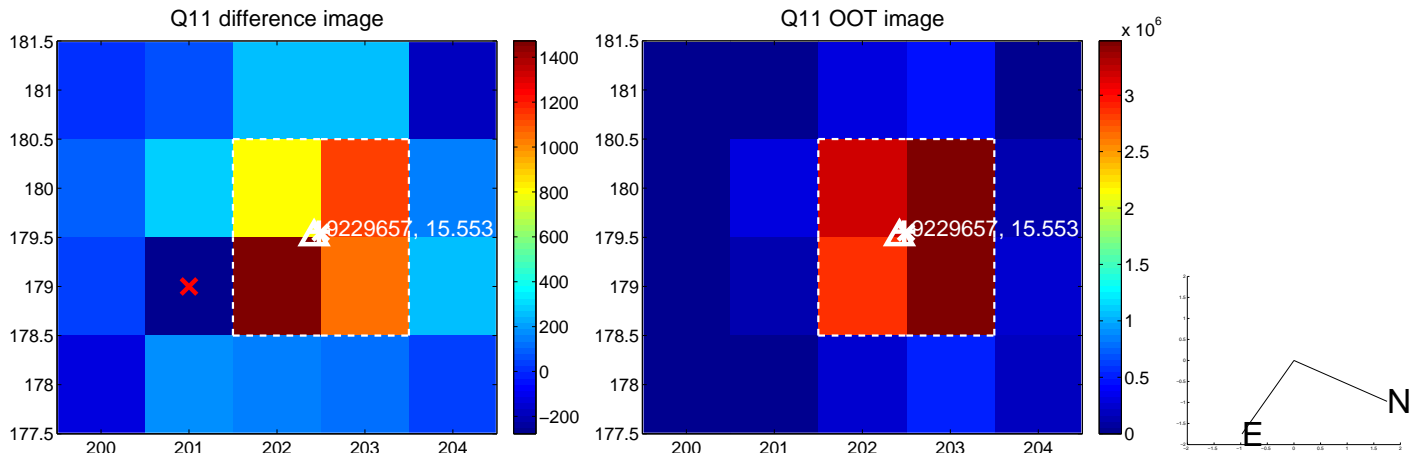
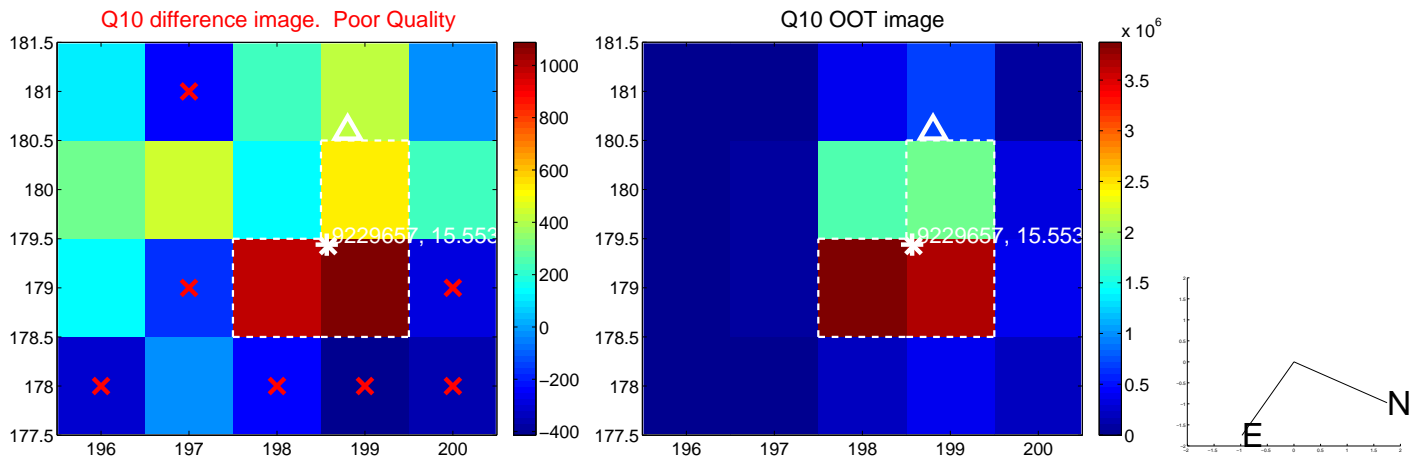
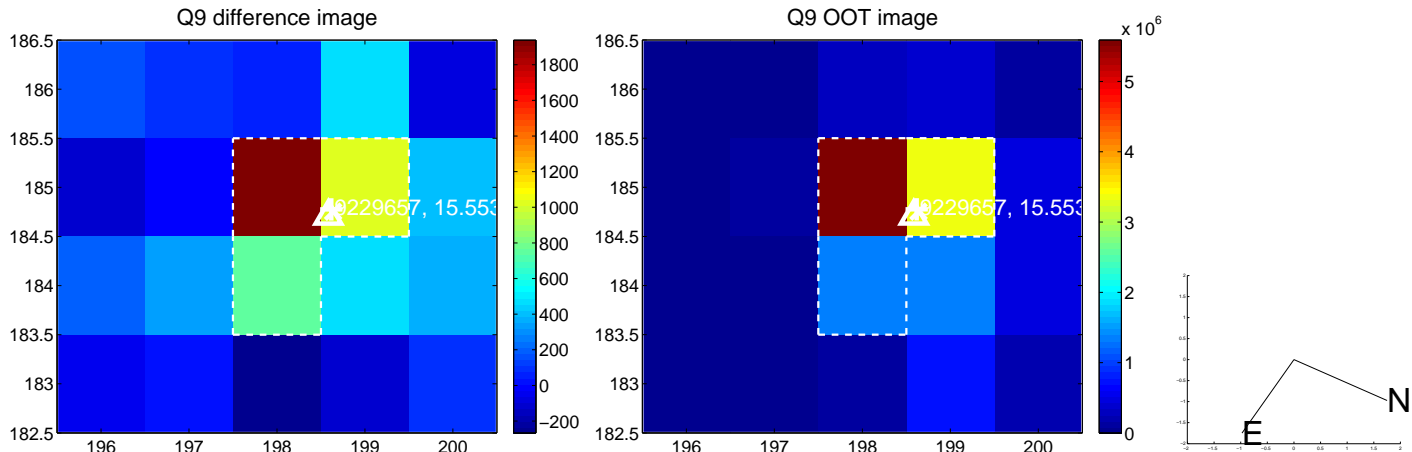


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

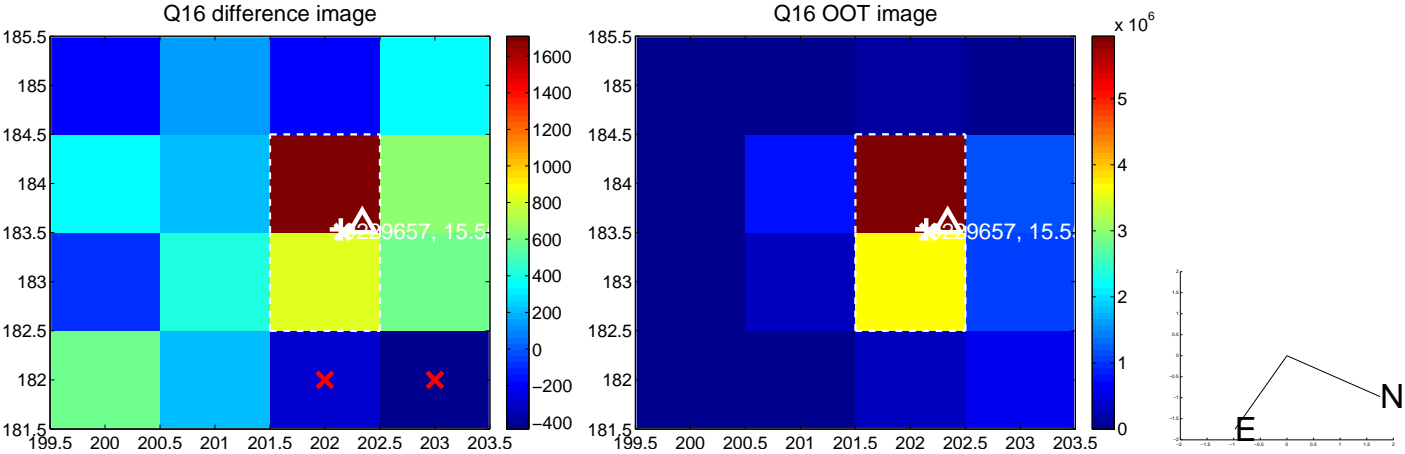
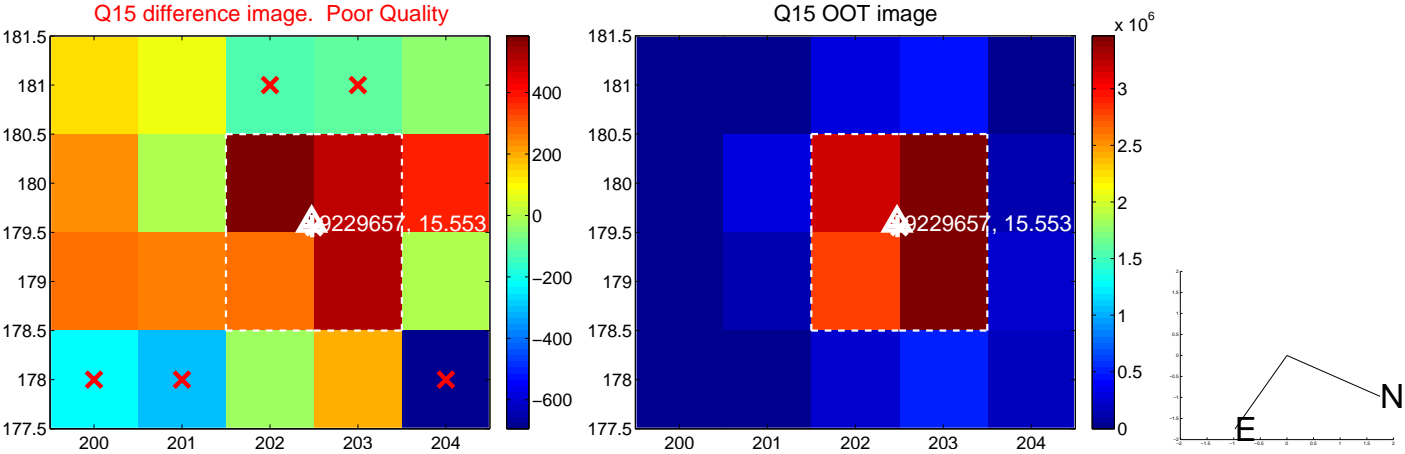
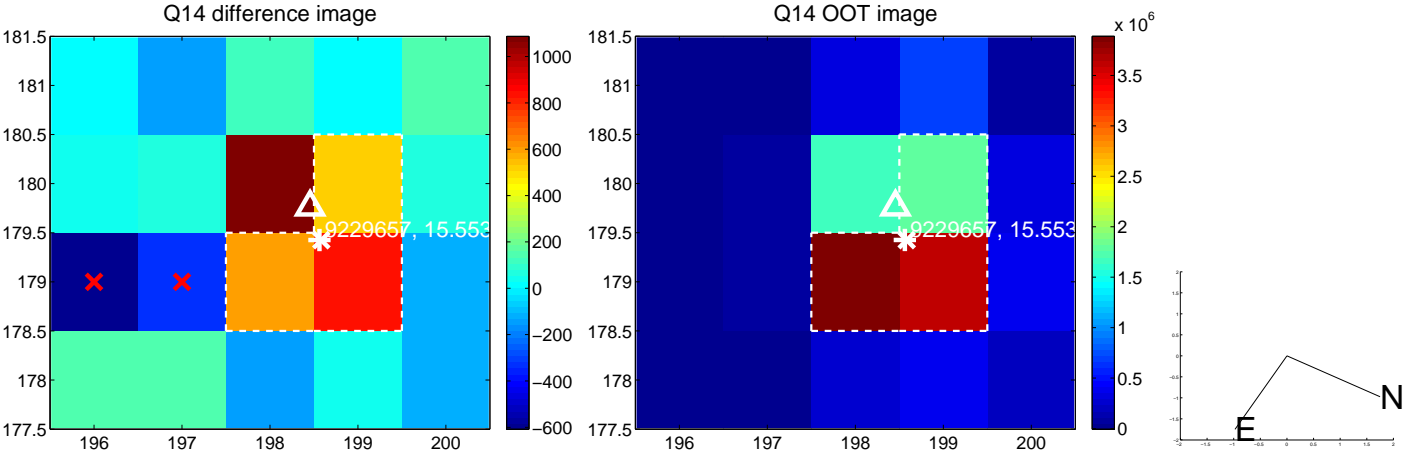
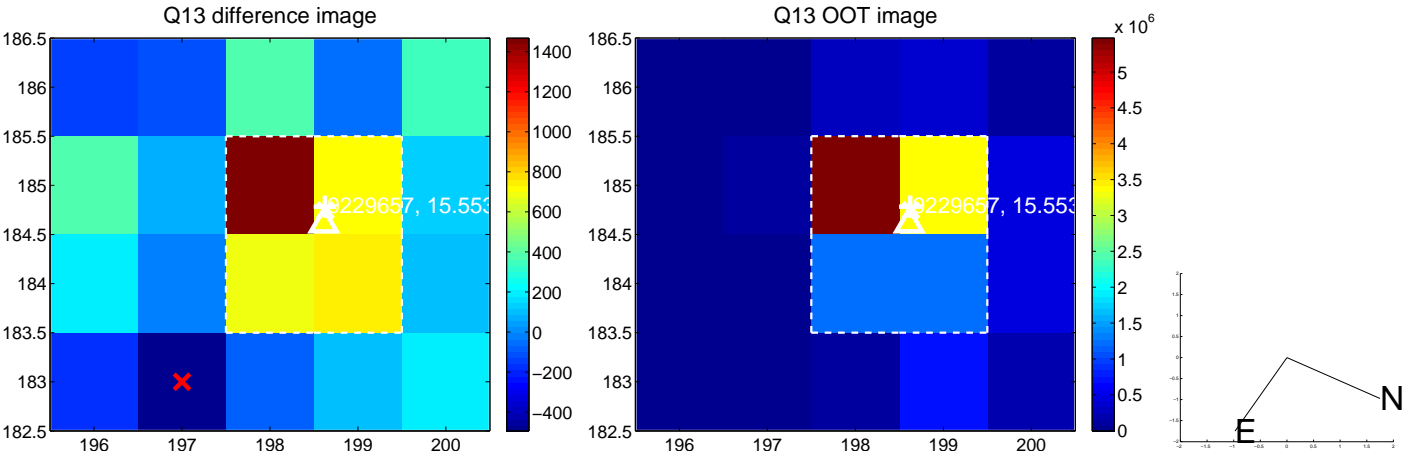




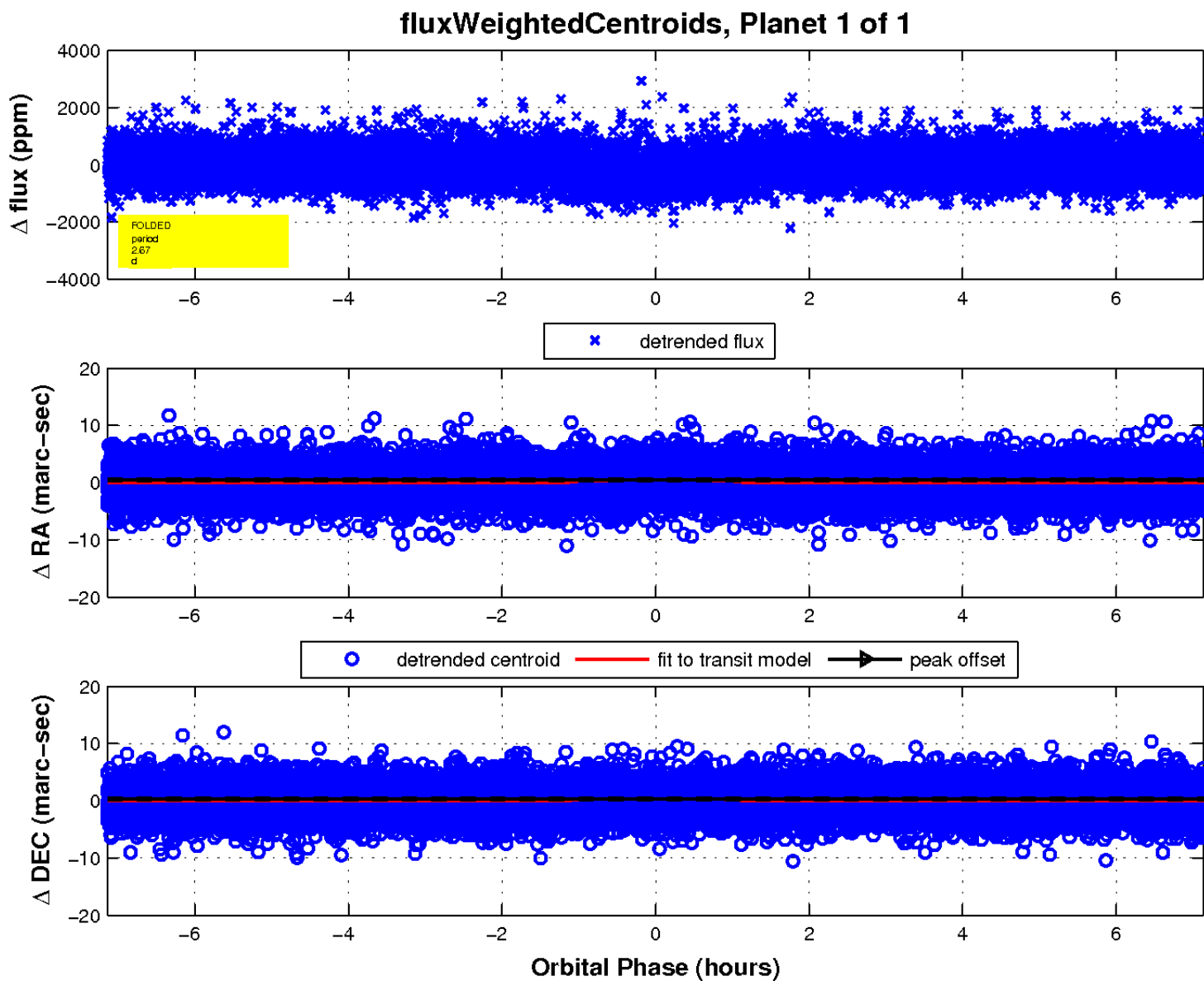
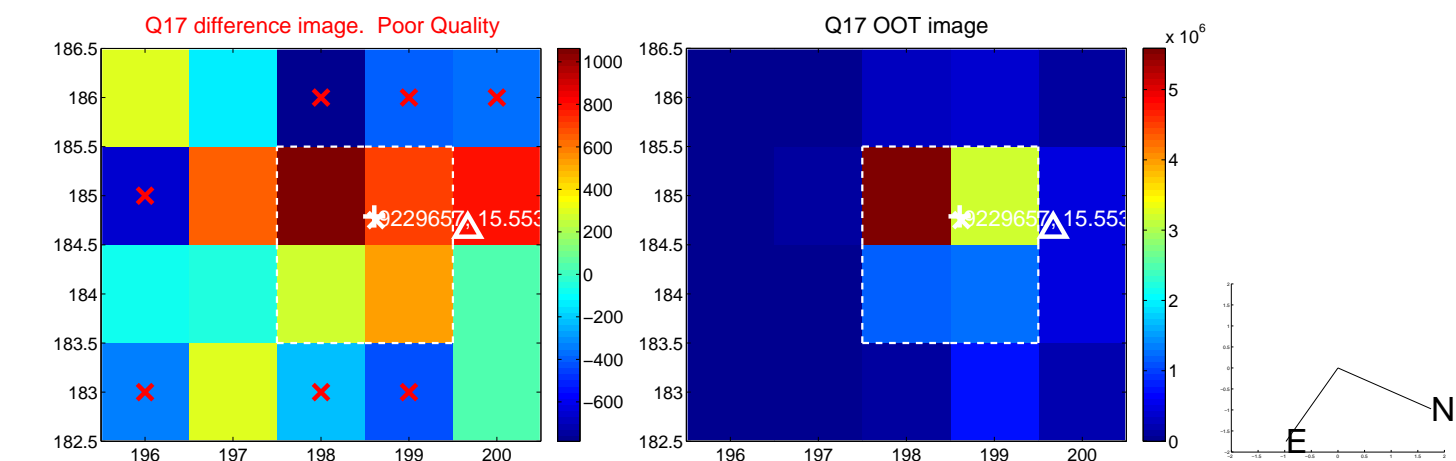
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

