

# KIC 006523440

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006523440-01	OBS	No	1.218340	131.850669	29.1	4.462	11.8	11.6	1.93	6824	1.06	10697.44
006523440-02	OBS	No	1.218286	132.828007	46.7	14.619	11.3	8.5	1.93	6824	1.59	10698.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006523440-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
006523440-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS

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

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

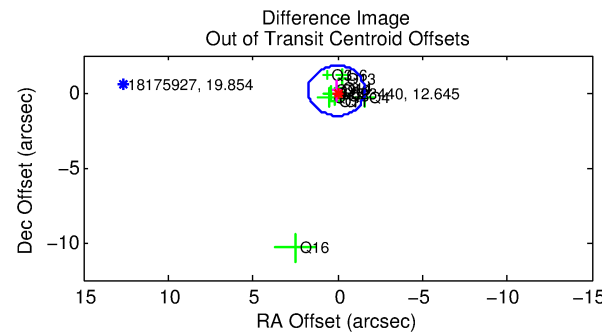
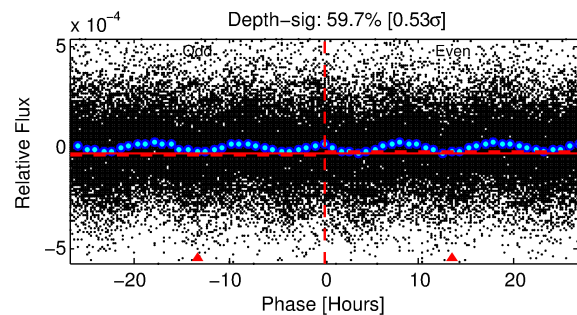
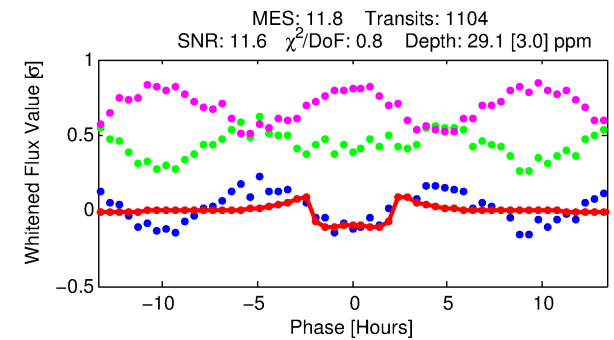
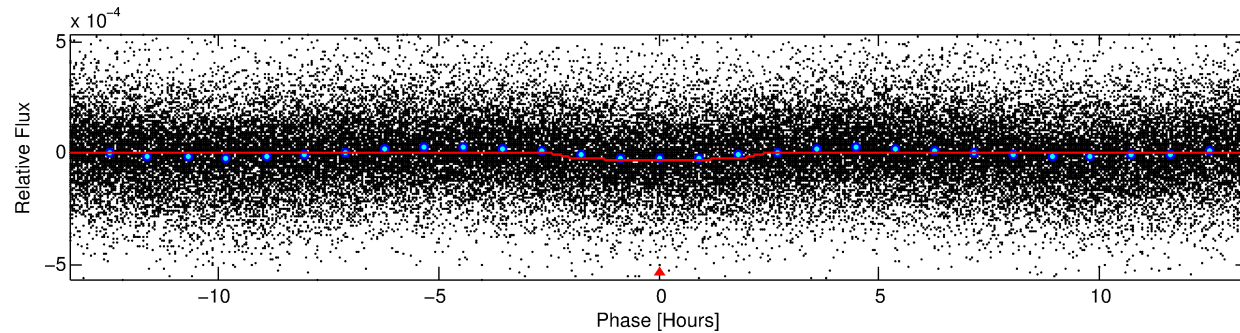
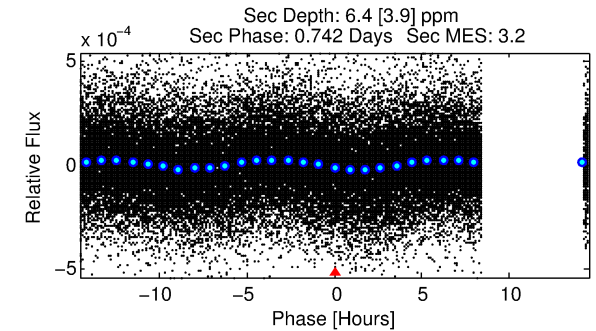
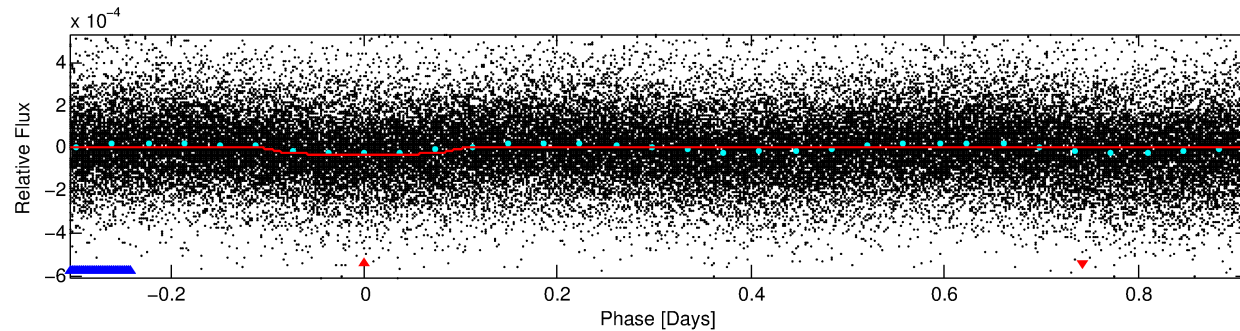
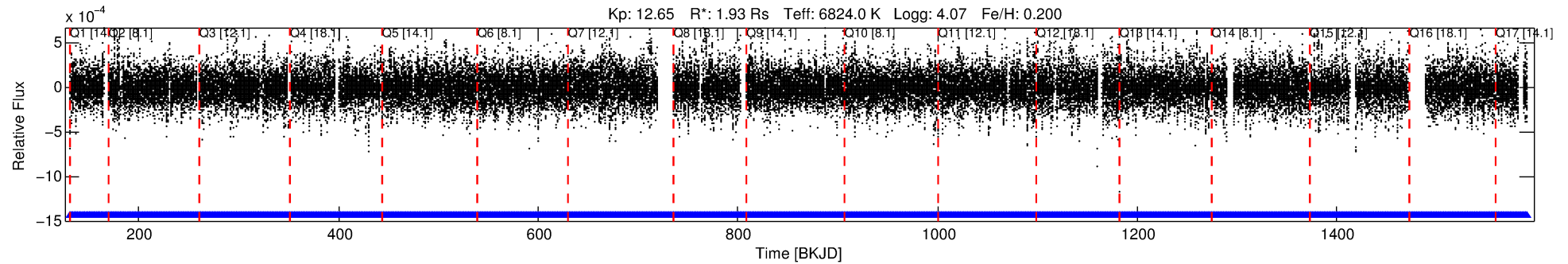
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006523440-01

No Significant Match Found

# DV One-Page Summary

KIC: 6523440 Candidate: 1 of 2 Period: 1.218 d



## DV Fit Results:

Period = 1.21834 [0.00001] d  
Epoch = 131.8507 [0.0022] BKJD  
Rp/R\* = 0.0051 [0.0003]  
a/R\* = 2.04 [0.15]  
b = 0.40 [0.21]  
Seff = 10697.44 [3289.07]  
Teq = 2593 [199] K  
Rp = 1.06 [0.25] Re  
a = 0.0260 [0.0049] AU  
Ag = 2.08 [1.41] [0.77σ]  
Teffp = 4817 [770] K [2.80σ]

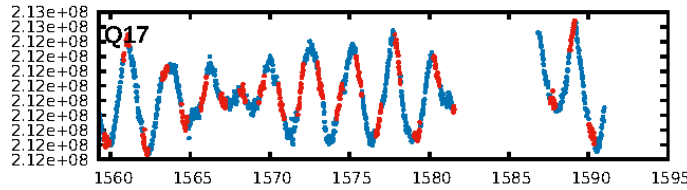
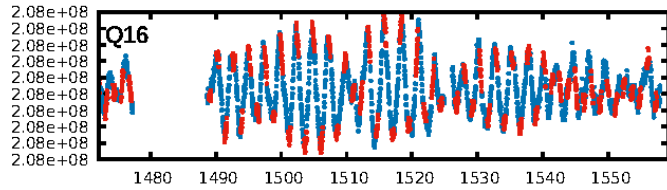
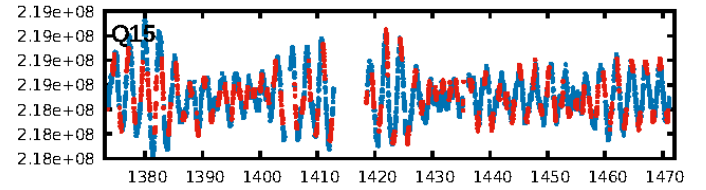
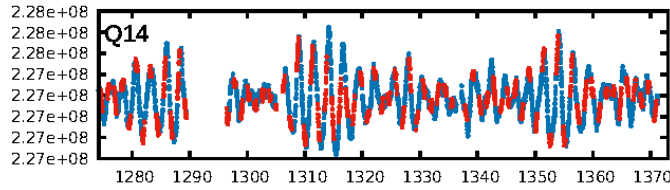
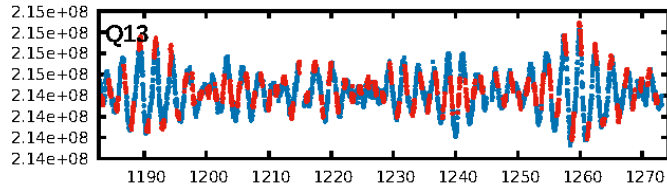
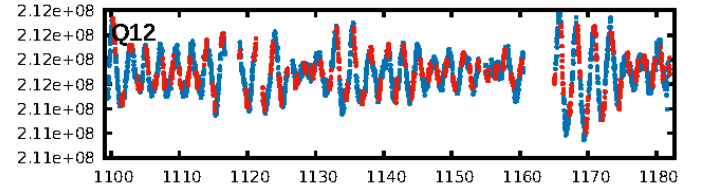
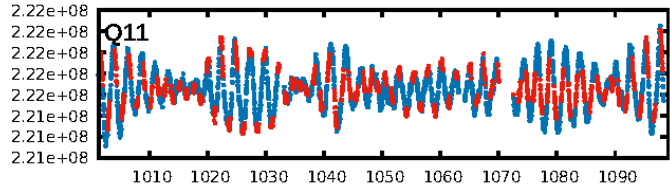
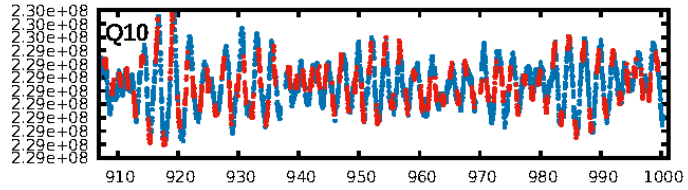
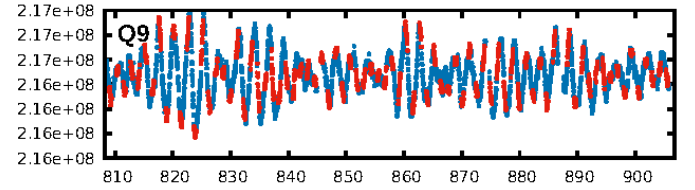
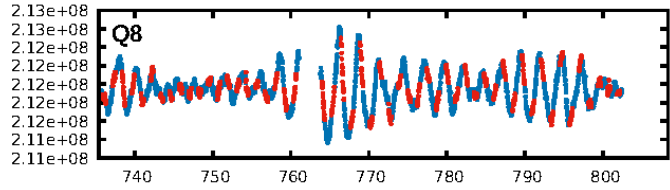
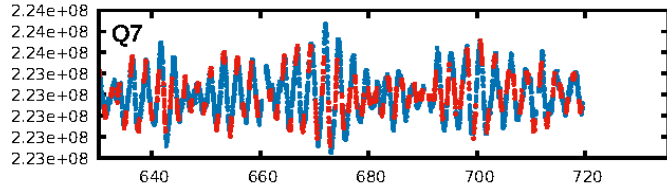
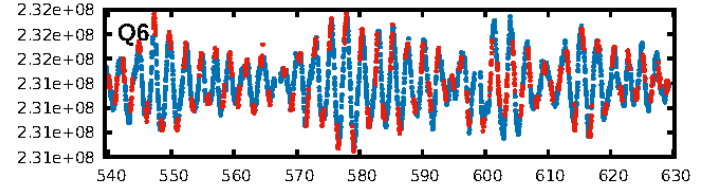
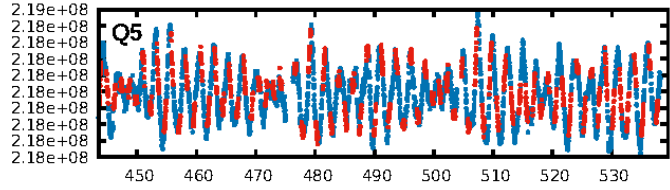
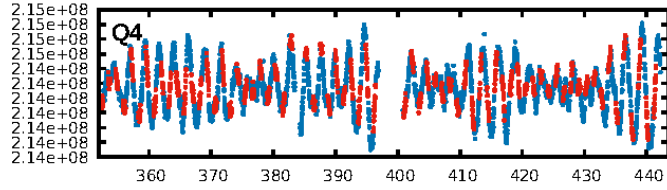
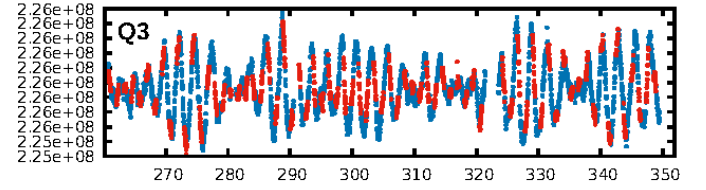
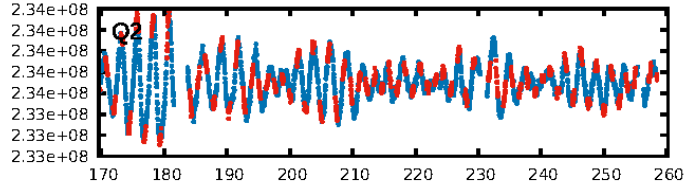
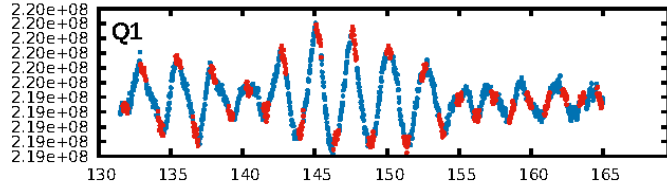
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1054/1054]  
GhostDiagnostic-chr: 2.063  
Centroid-sig: 2.6%  
Centroid-so: 0.603 arcsec [1.47σ]  
OotOffset-rm: 0.154 arcsec [0.28σ]  
OotOffset-st: 3/4/3/3 [13]  
KicOffset-rm: 0.151 arcsec [0.22σ]  
KicOffset-st: 3/4/3/3 [13]  
DiffImageQuality-fgm: 0.85 [11/13]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:18:19 Z

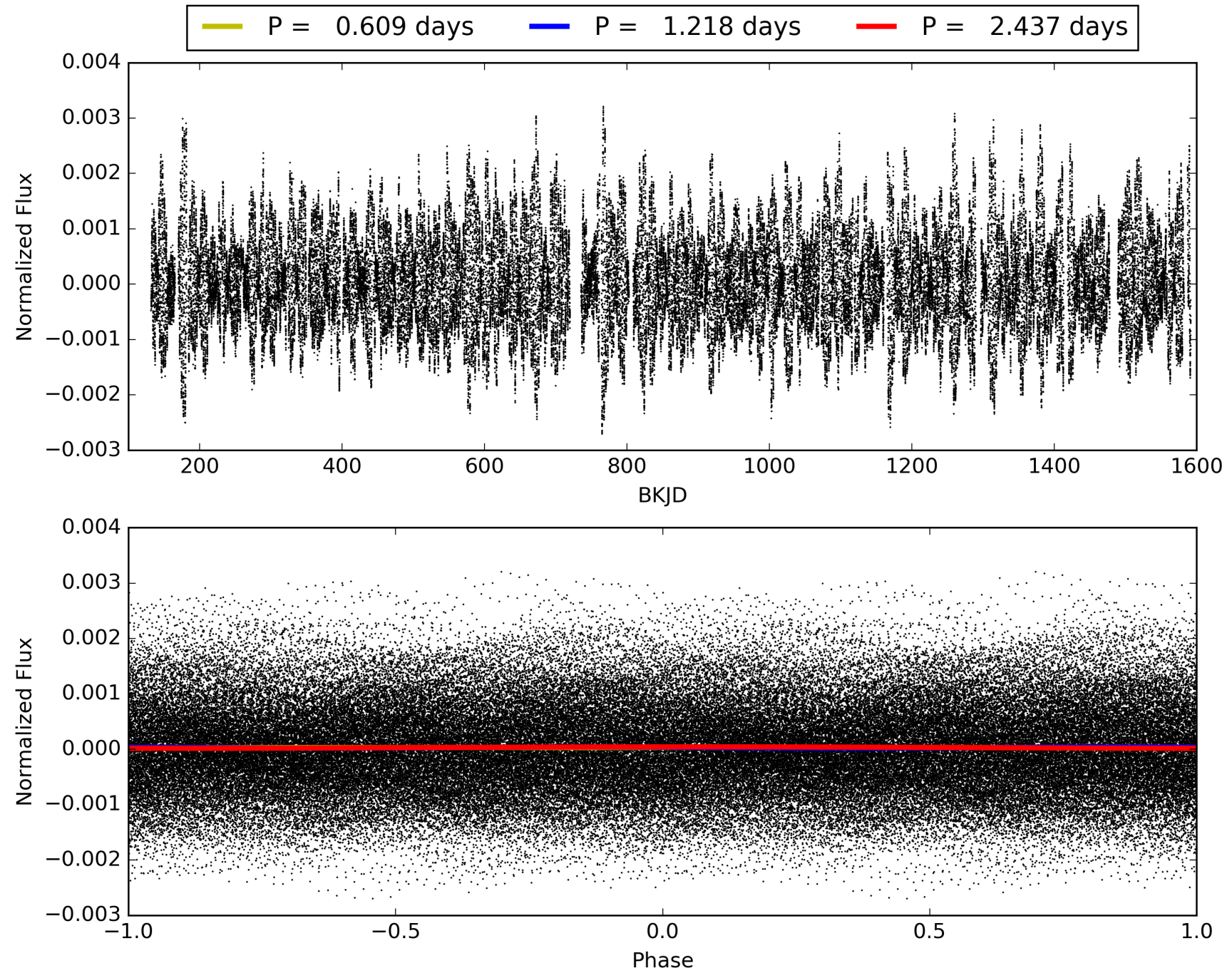
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

## TCE 006523440-01, PDC Light Curves



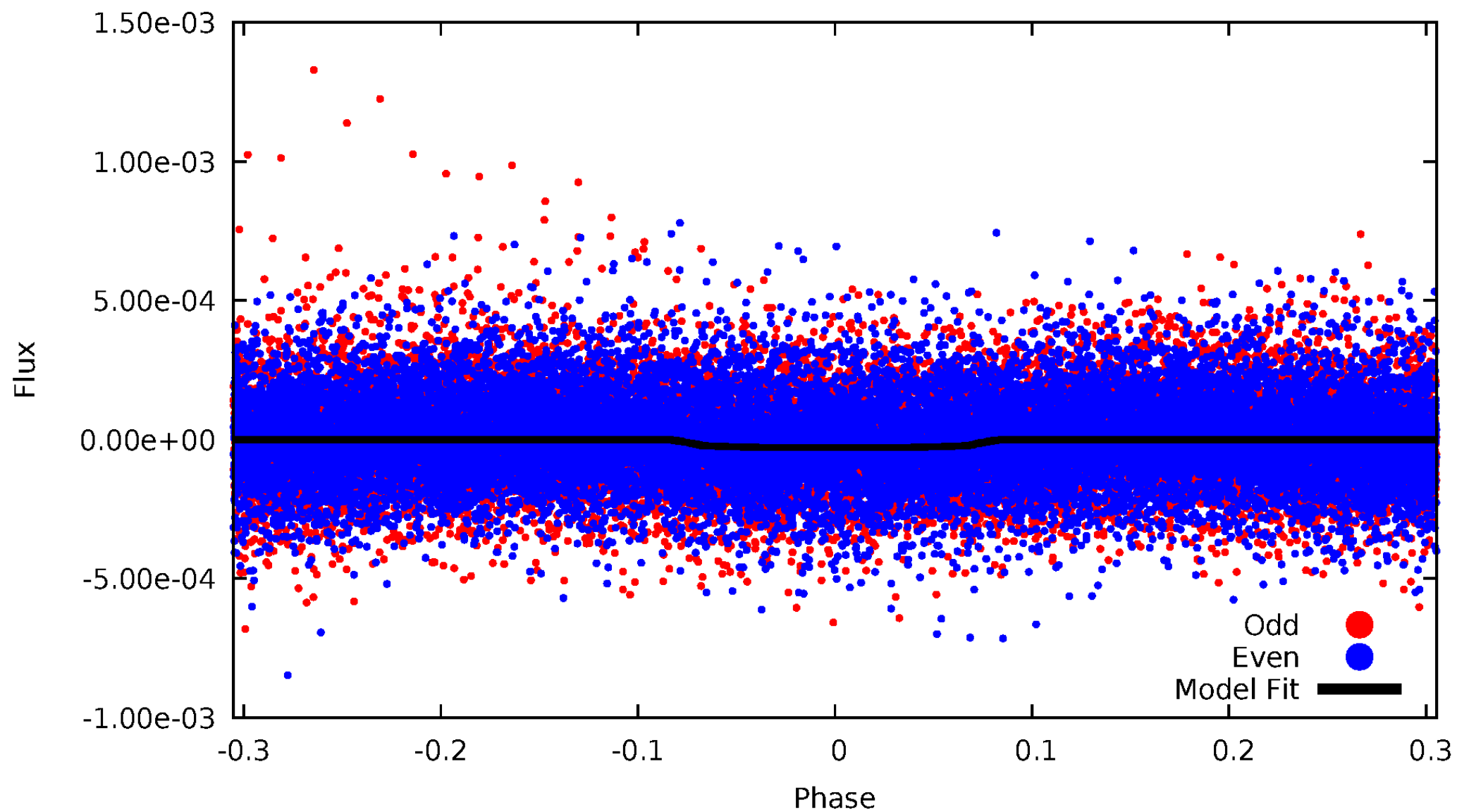


TCE 006523440-01



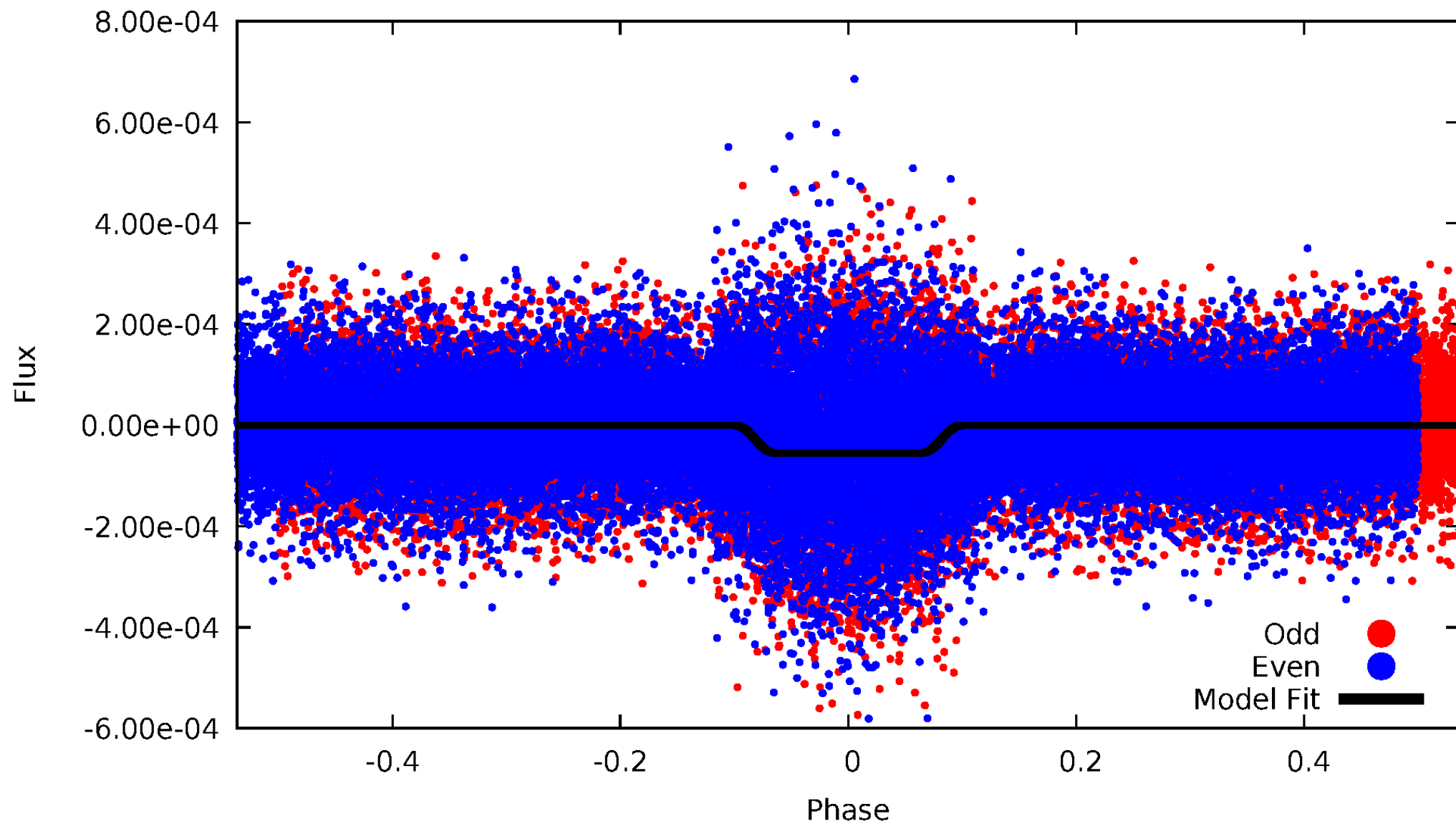
# DV Odd/Even

TCE 006523440-01



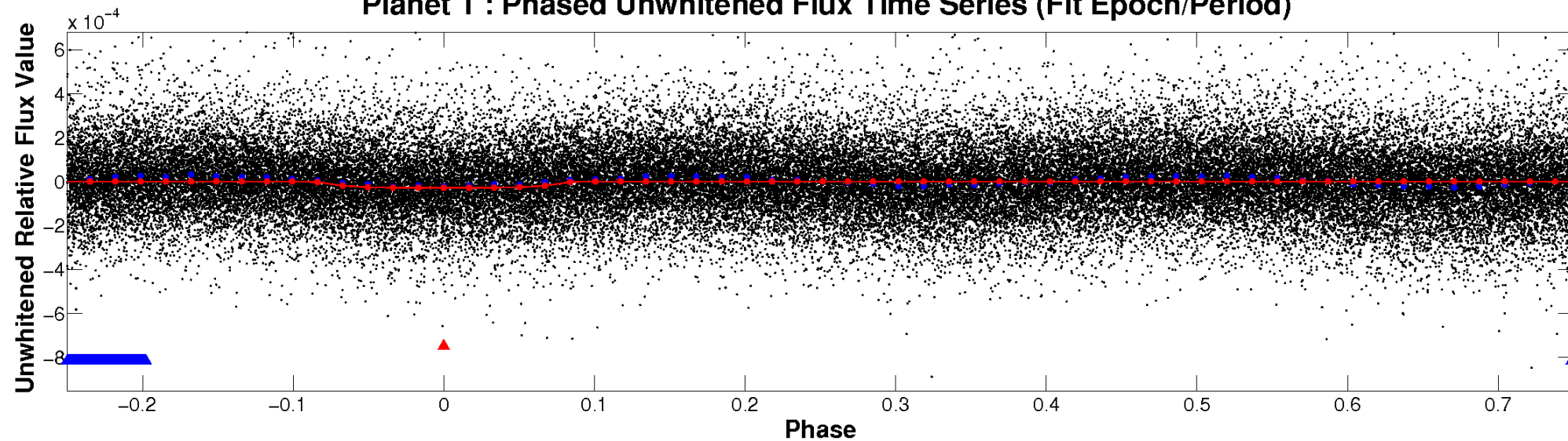
# ALT Odd/Even

TCE 006523440-01

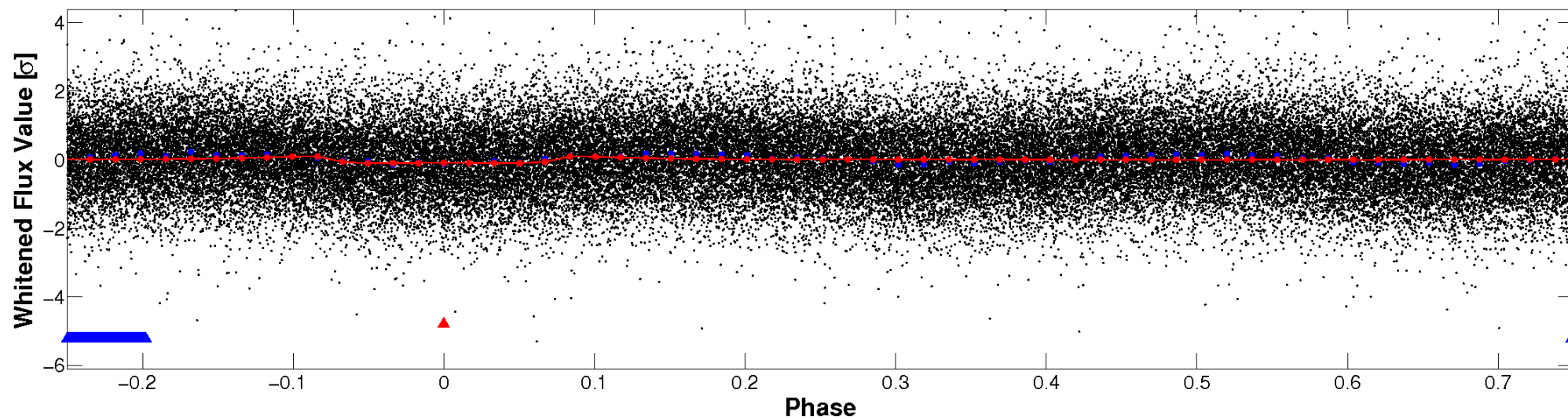


# Non-Whitened Vs. Whitened Light Curve

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



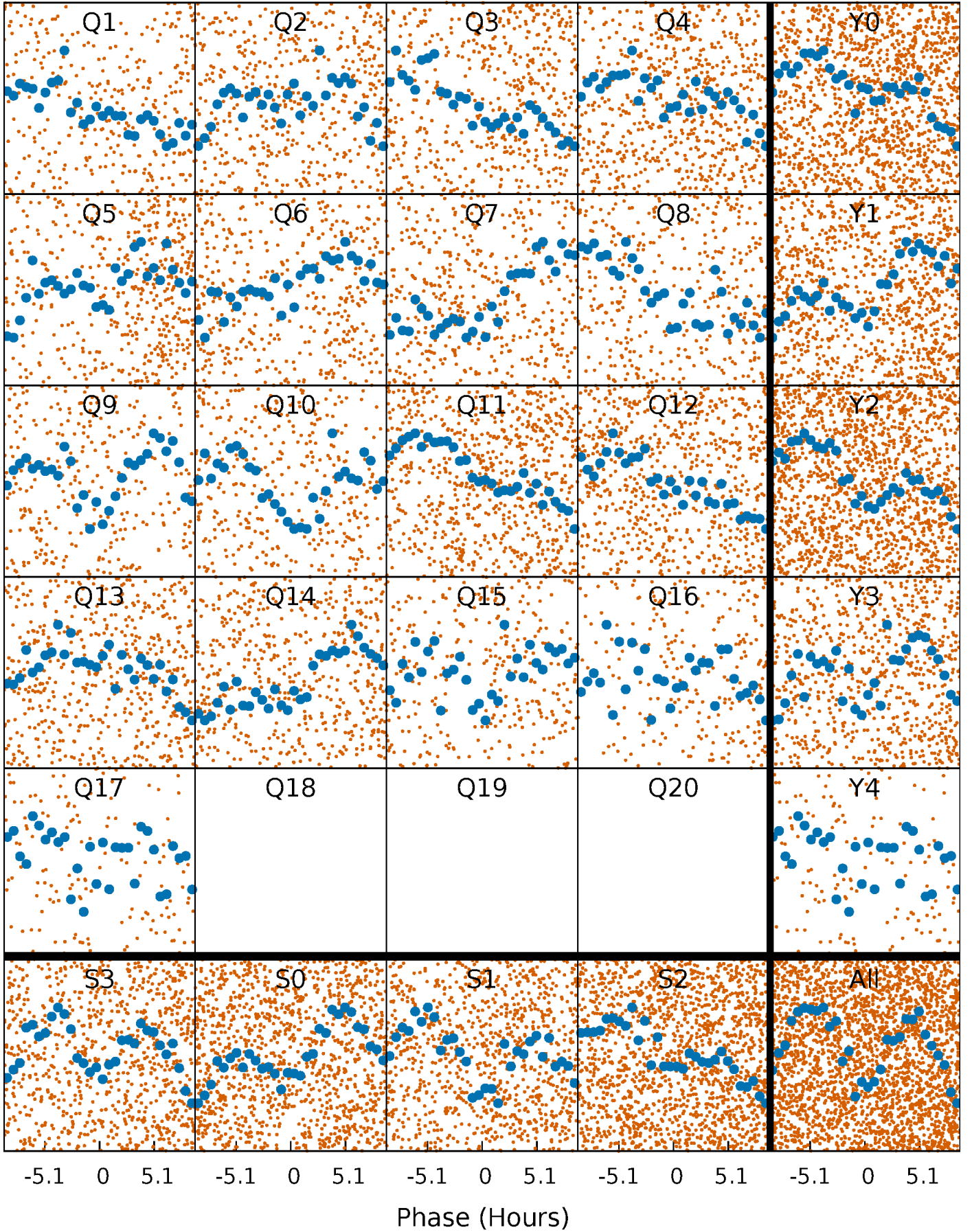
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

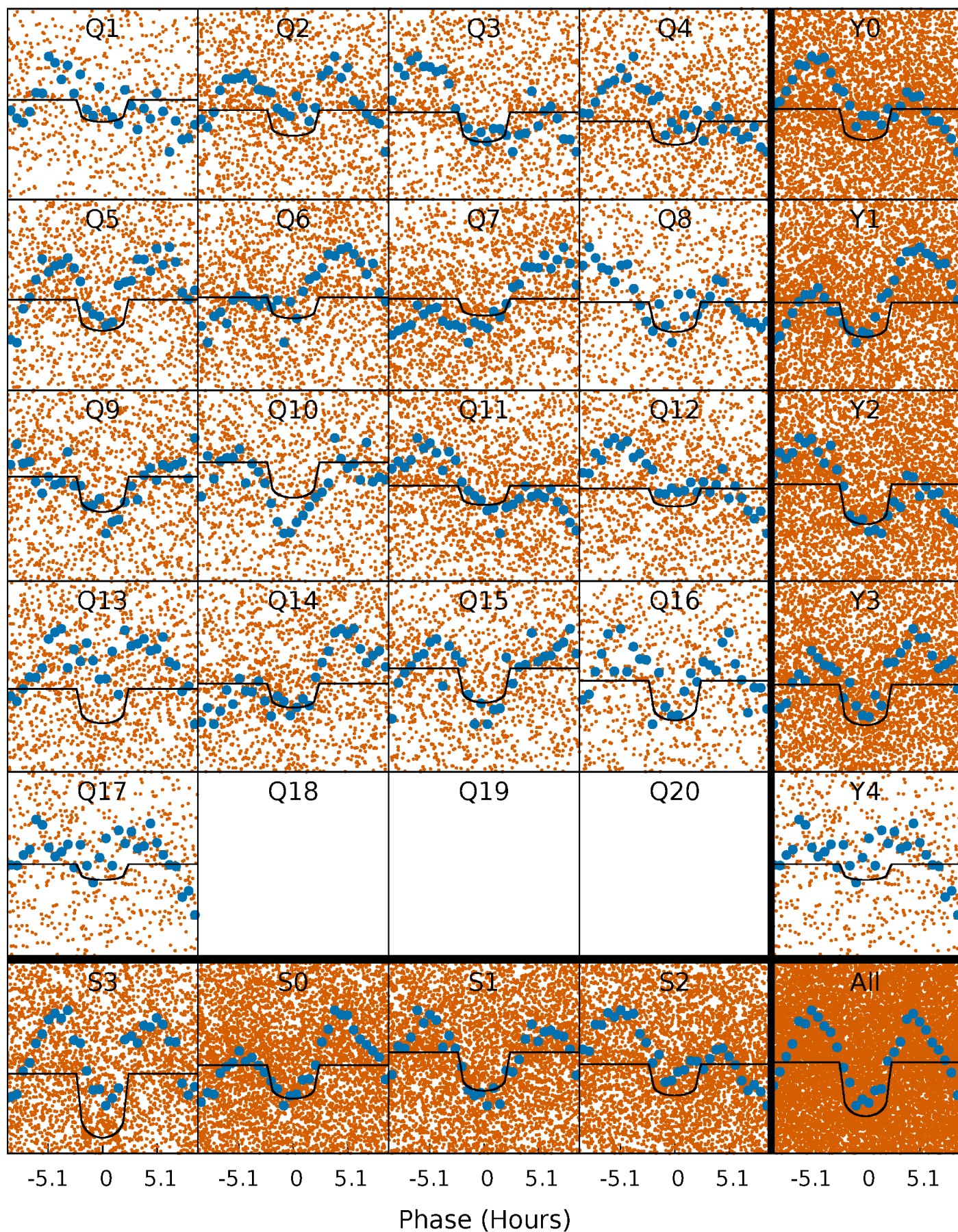
TCE 006523440-01 P= 1.218340 Days  $T_0=131.850669$  (BKJD)





# DV Quarter-Phased Transit Curves

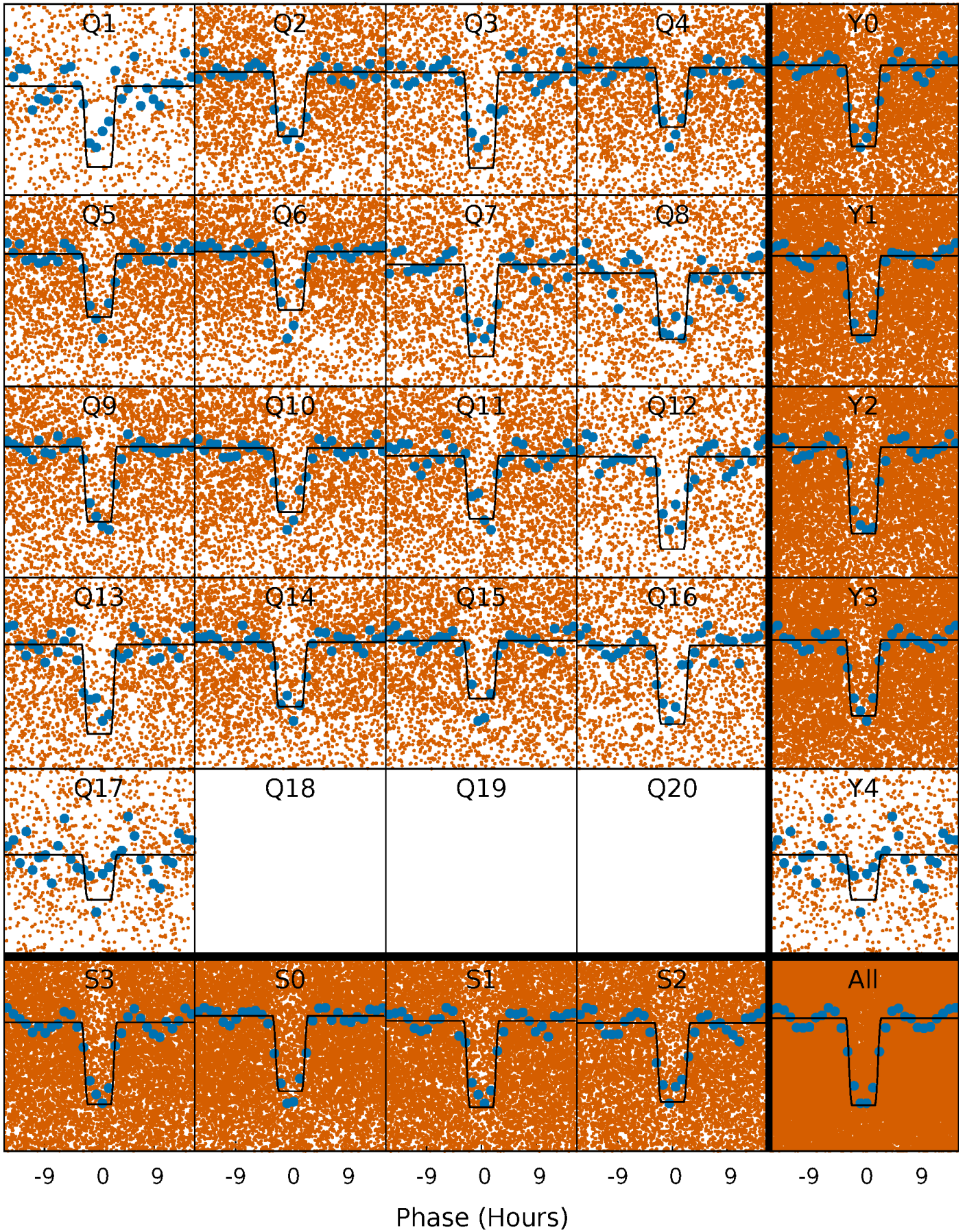
TCE 006523440-01 P= 1.218340 Days  $T_0=131.850669$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

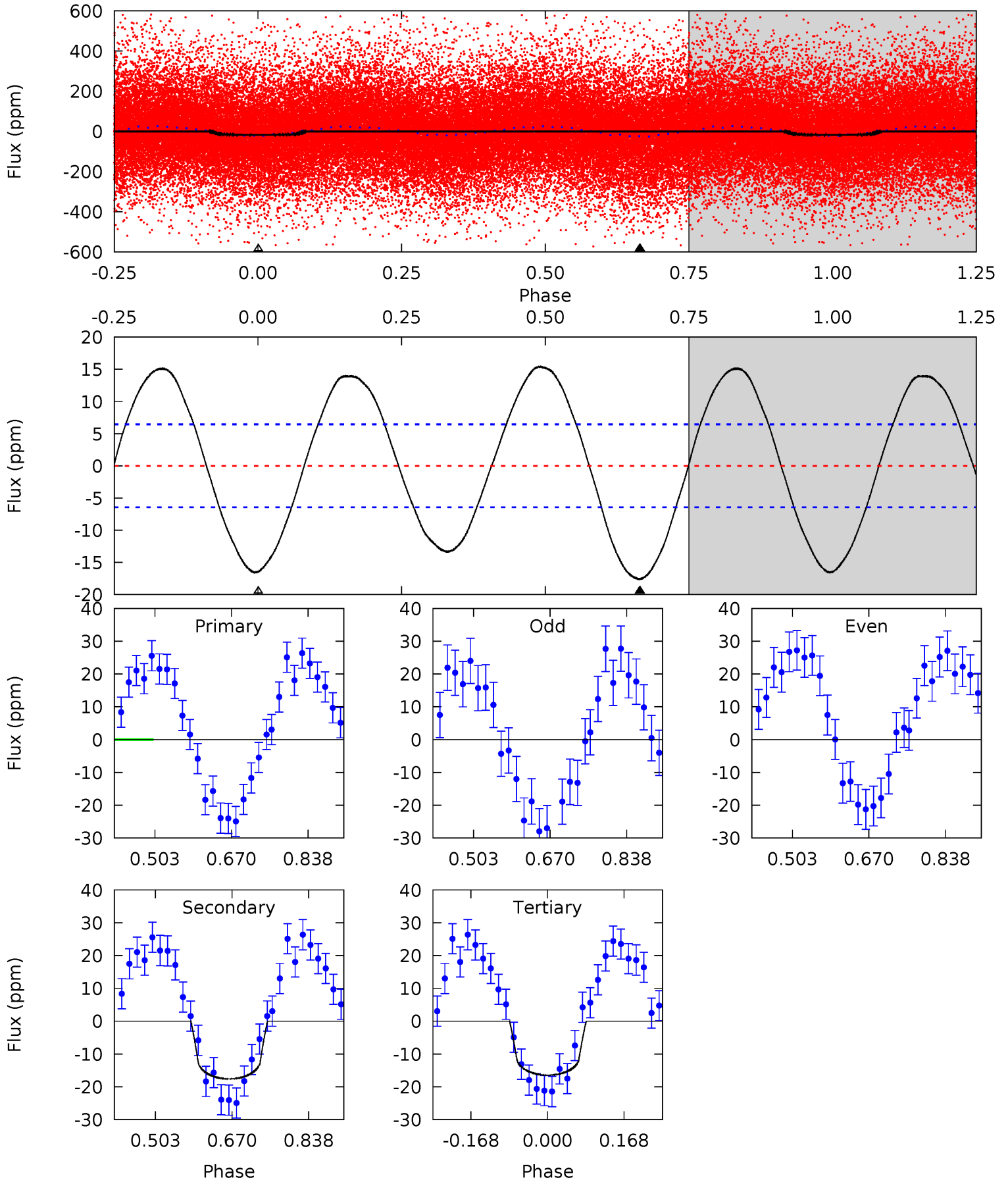
TCE 006523440-01 P= 1.218339 Days  $T_0=131.842011$  (BKJD)



# DV Model-Shift Uniqueness Test

006523440-01, P = 1.218340 Days, E = 130.632329 Days

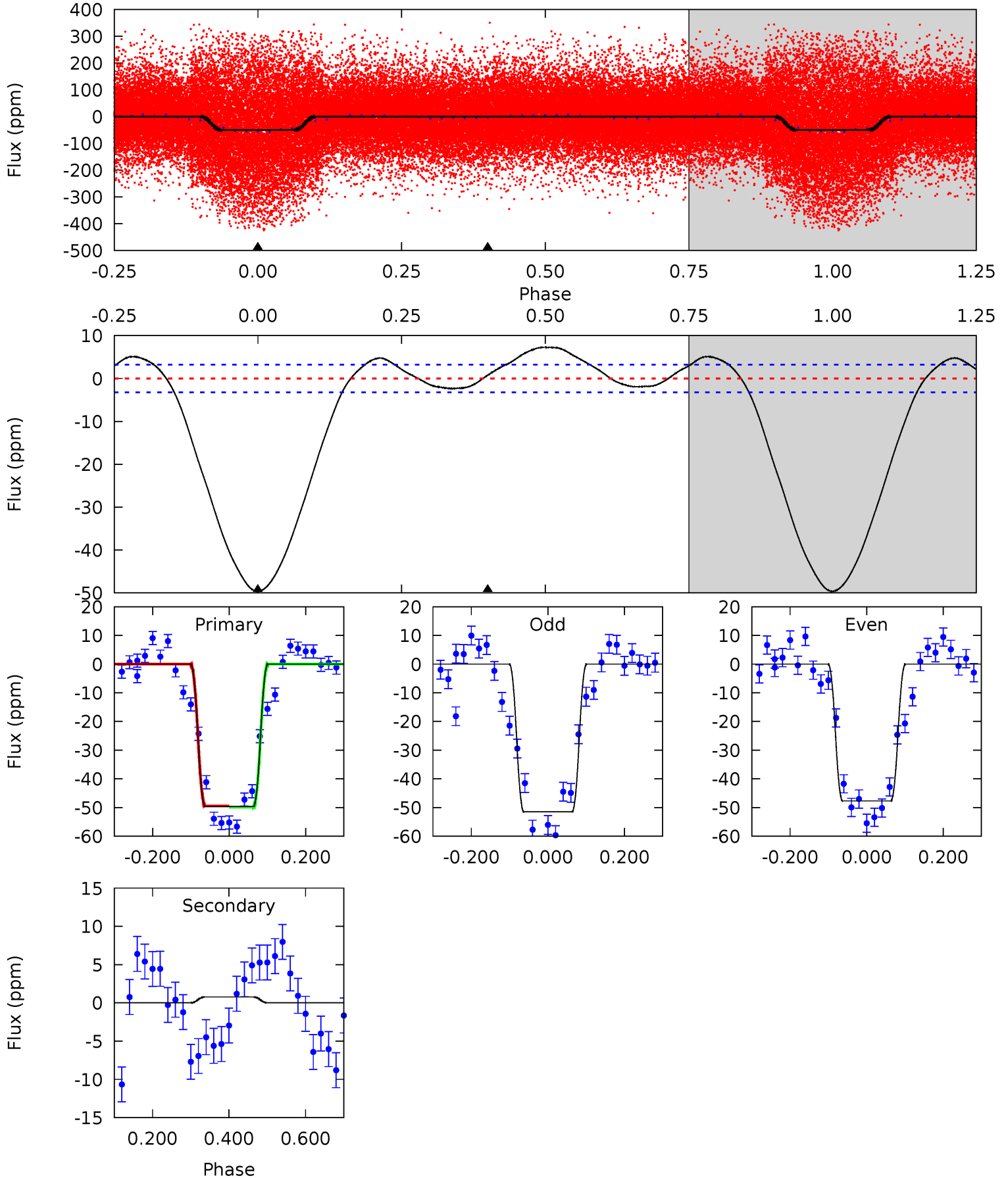
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	12.2	11.4	0	4.46	1.38	7.26	0.79	12.2	0.80	12.2	1.56	0.87	0.47	0.65



# Alt Model-Shift Uniqueness Test

006523440-01, P = 1.218339 Days, E = 130.623672 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
67.9	-1.06	0	0	4.42	1.28	3.44	67.9	67.9	-1.06	-1.06	2.60	0.98	0.13	0.29





### Stellar Parameters For KIC 006523440

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6824^{+162}_{-255}$	$4.065^{+0.145}_{-0.145}$	$0.200^{+0.200}_{-0.300}$	$1.927^{+0.435}_{-0.435}$	$1.571^{+0.142}_{-0.244}$	$0.309^{+0.253}_{-0.119}$
	+2%/-4%	+4%/-4%	+100%/-150%	+23%/-23%	+9%/-16%	+82%/-38%
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 006523440-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-18 \pm 1$	$1.06^{+0.15}_{-0.13}$	$3613^{+237}_{-229}$	$6072^{+300}_{-270}$	$5.686^{+1.710}_{-1.248}$
Alt.	$1 \pm 1$	$1.54^{+0.22}_{-0.19}$	$3608^{+225}_{-236}$	$-3638^{+204}_{-185}$	$-0.117^{+0.101}_{-0.118}$

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

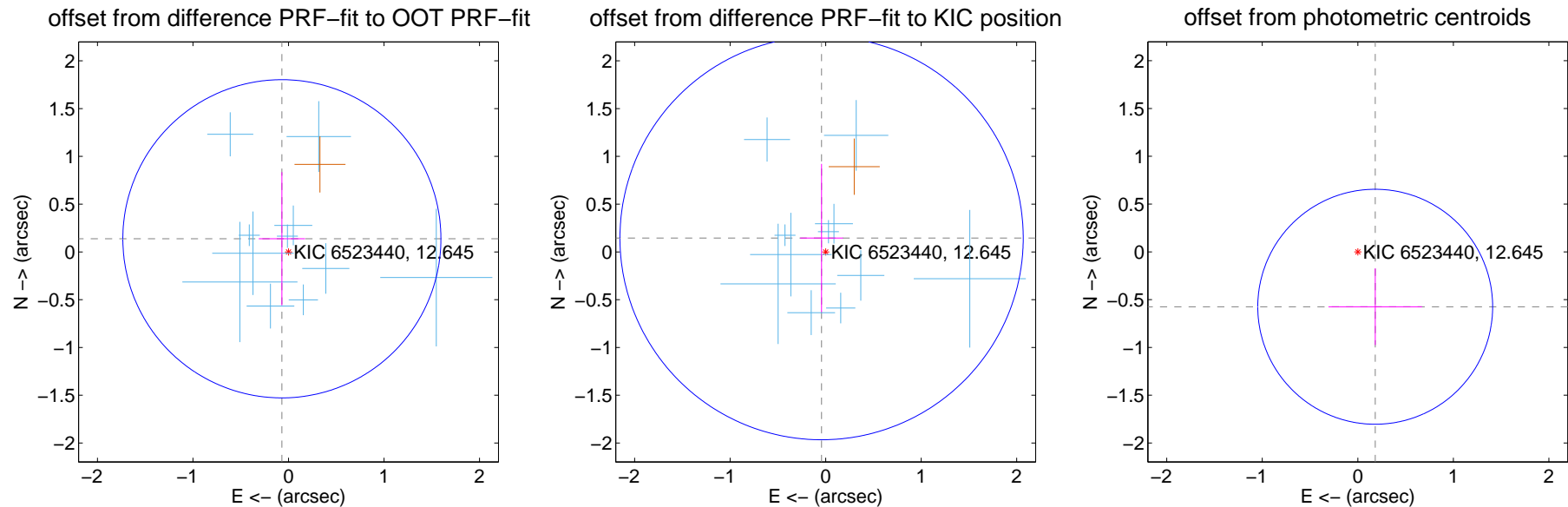
## DV Centroid Data

Supplemental centroid analysis for 006523440-01. Kepler magnitude: 12.64. Transit SNR 11.59

There are 11 quarters with good PRF difference image offsets

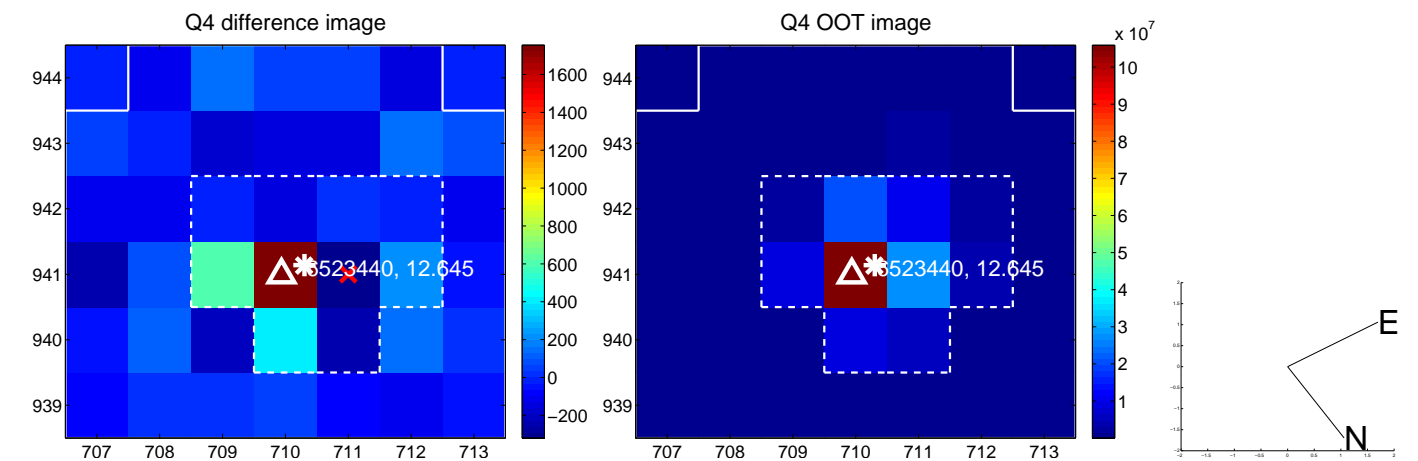
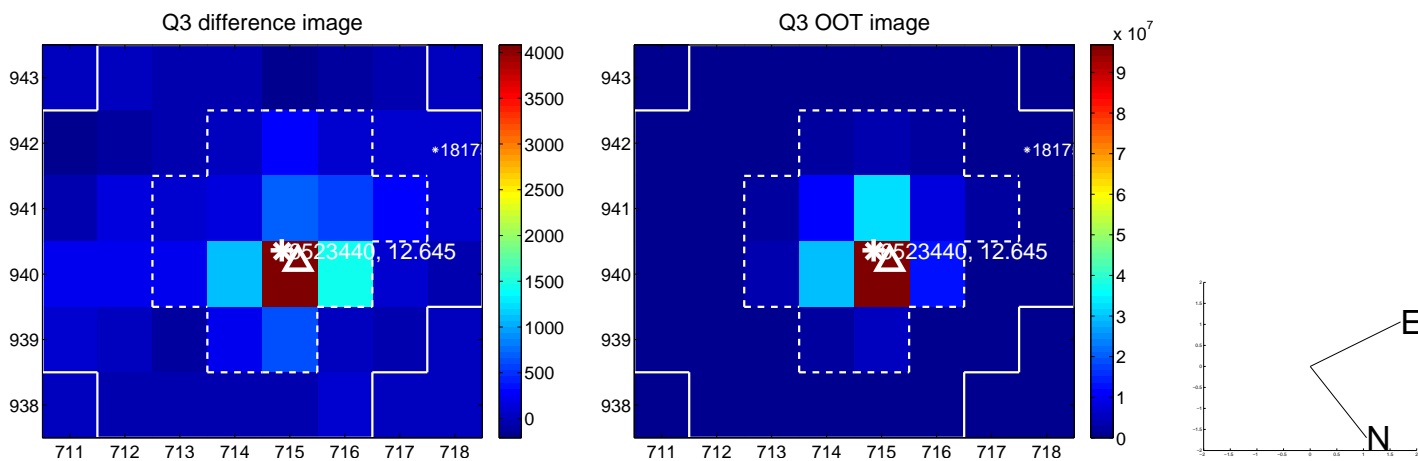
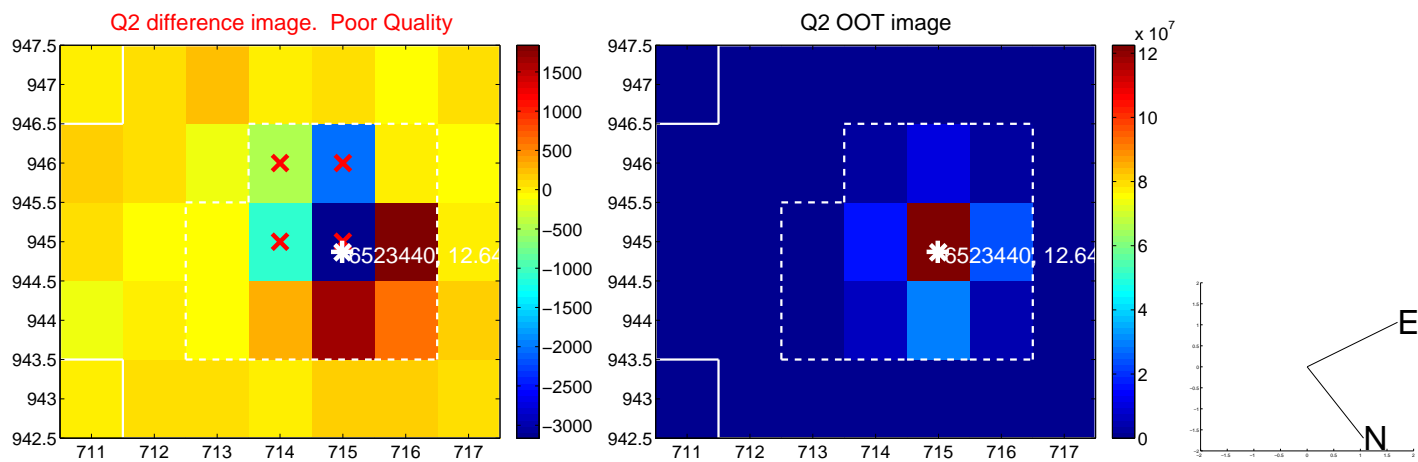
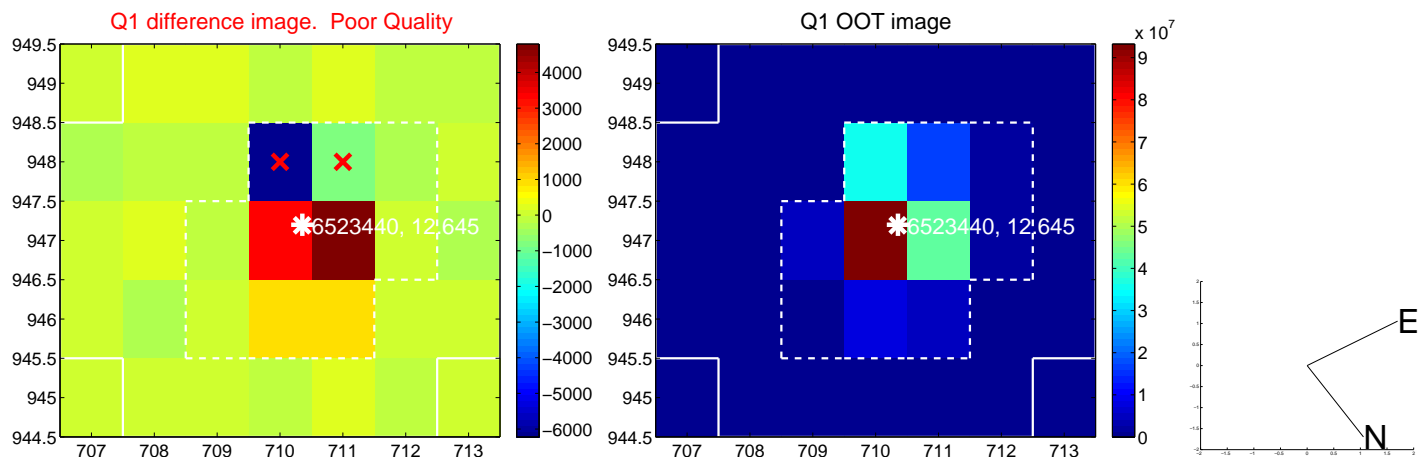
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.154 \pm 0.555$	0.28	$0.069 \pm 0.242$	$0.137 \pm 0.697$
PRF-fit source offset from KIC position	$0.151 \pm 0.704$	0.22	$0.043 \pm 0.224$	$0.145 \pm 0.776$
photometric centroid source offset	$0.60 \pm 0.41$	1.47	$-0.18 \pm 0.49$	$-0.57 \pm 0.40$

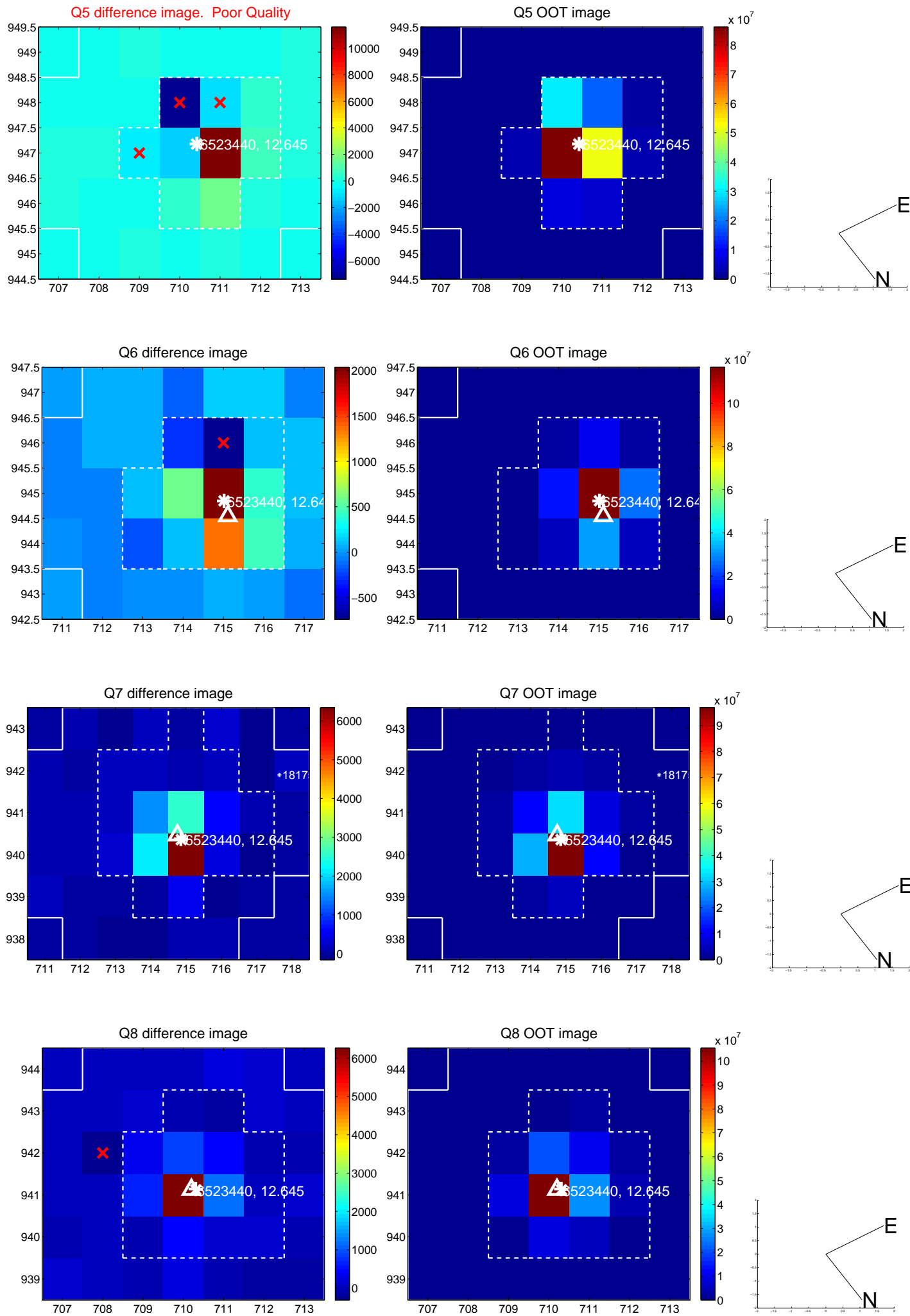


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

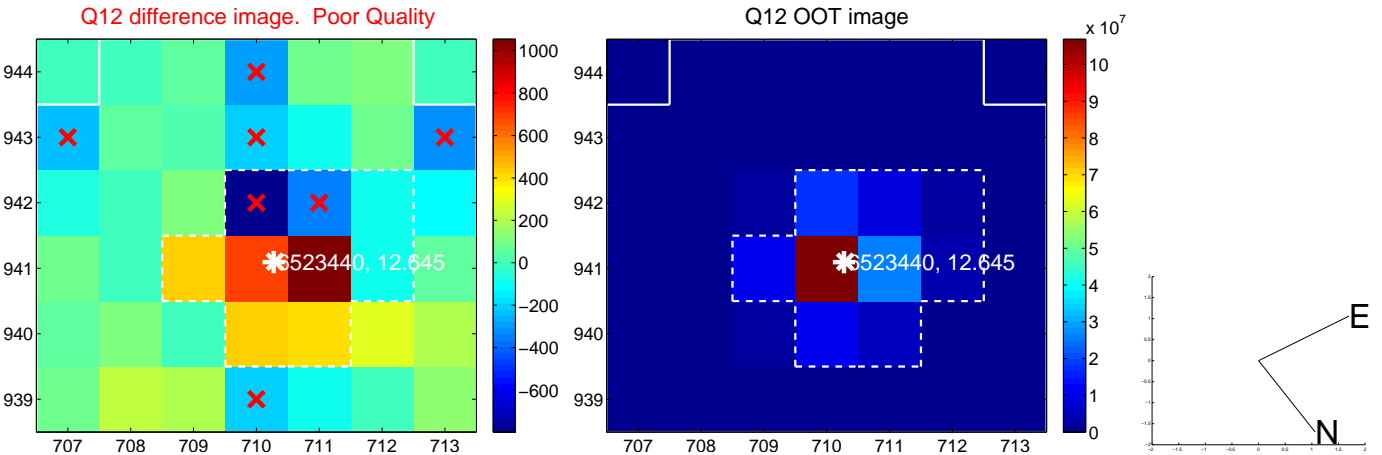
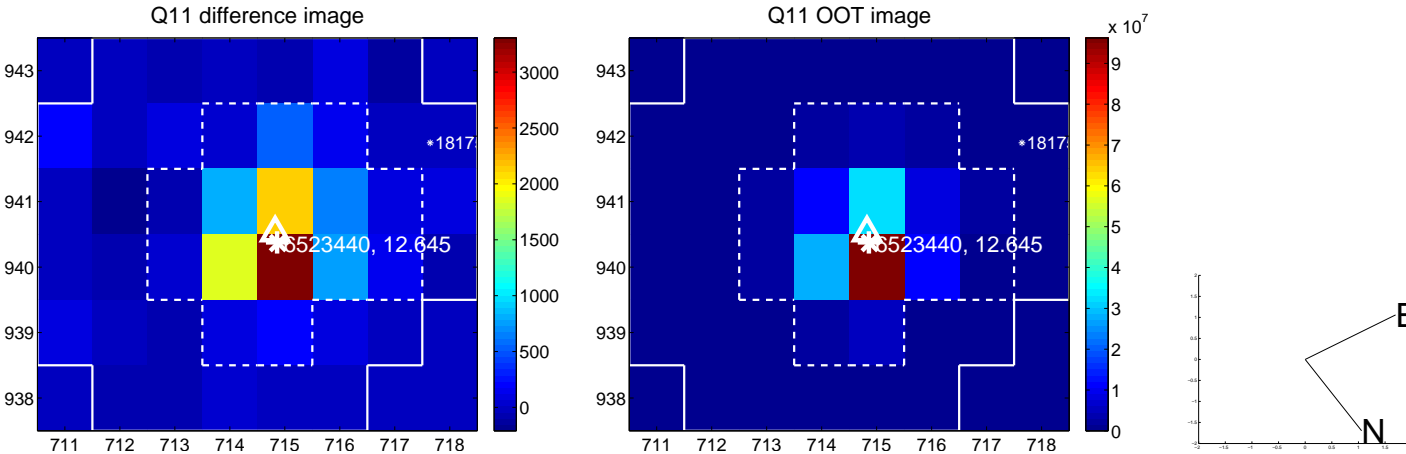
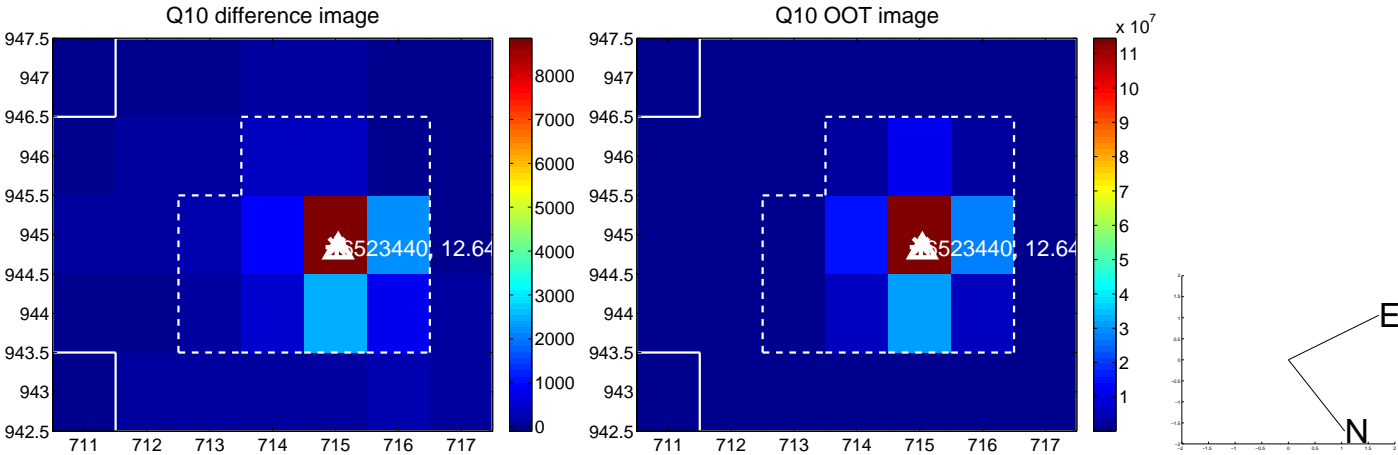
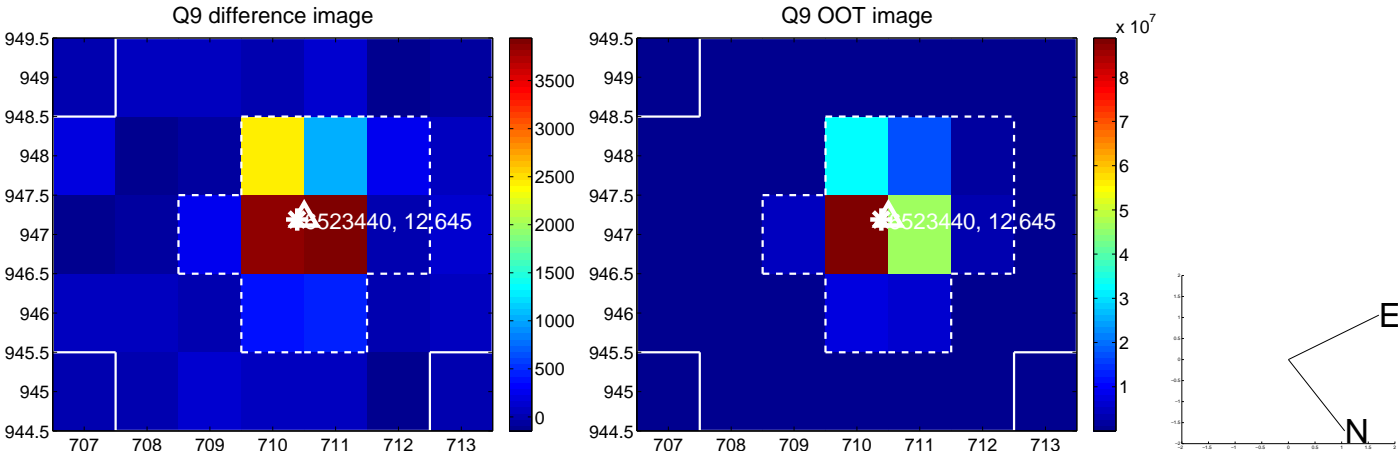


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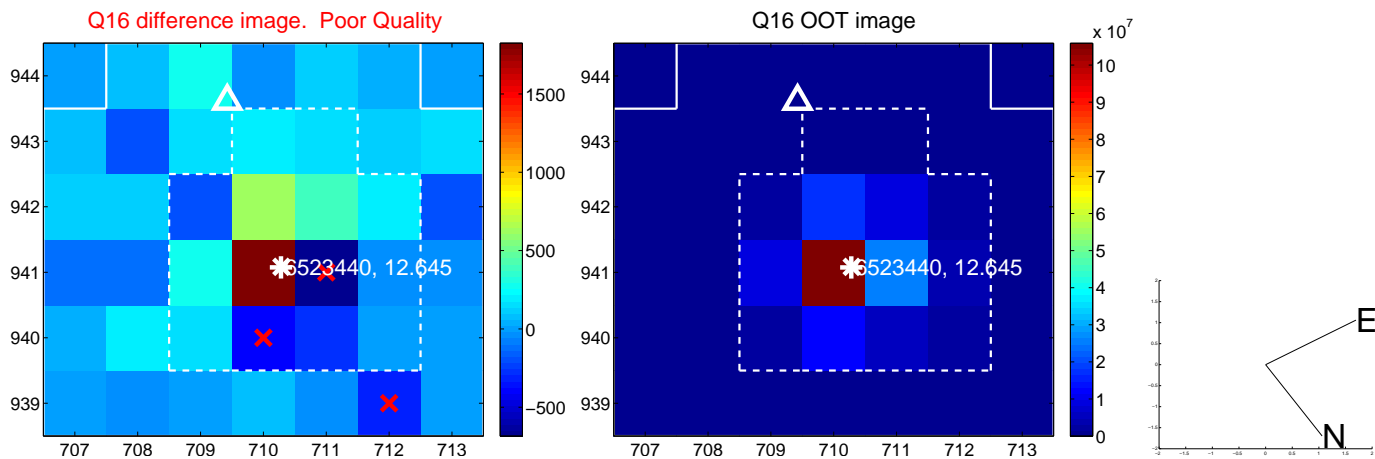
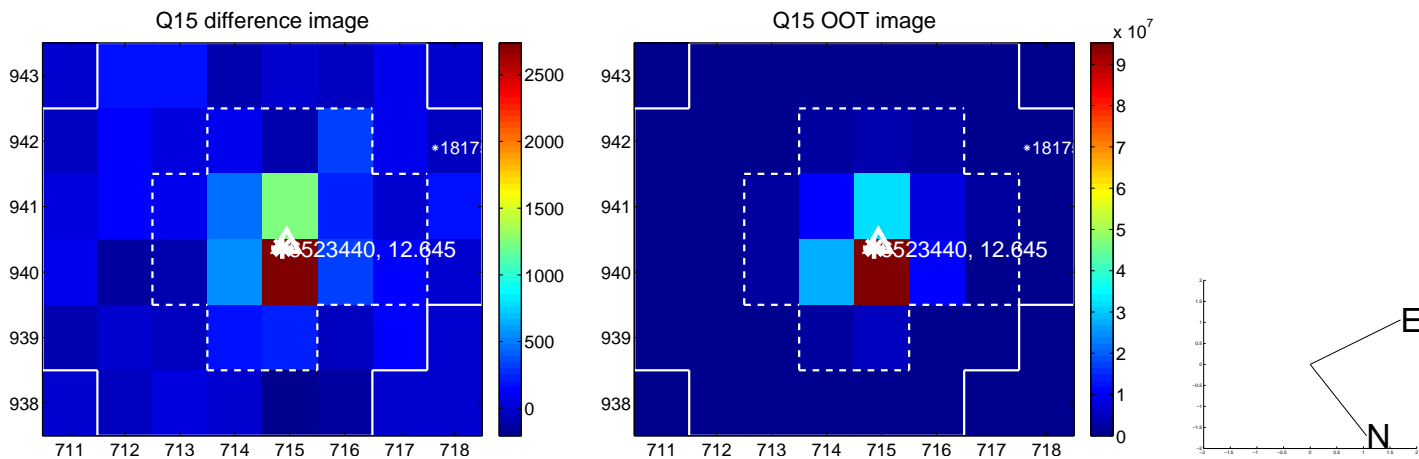
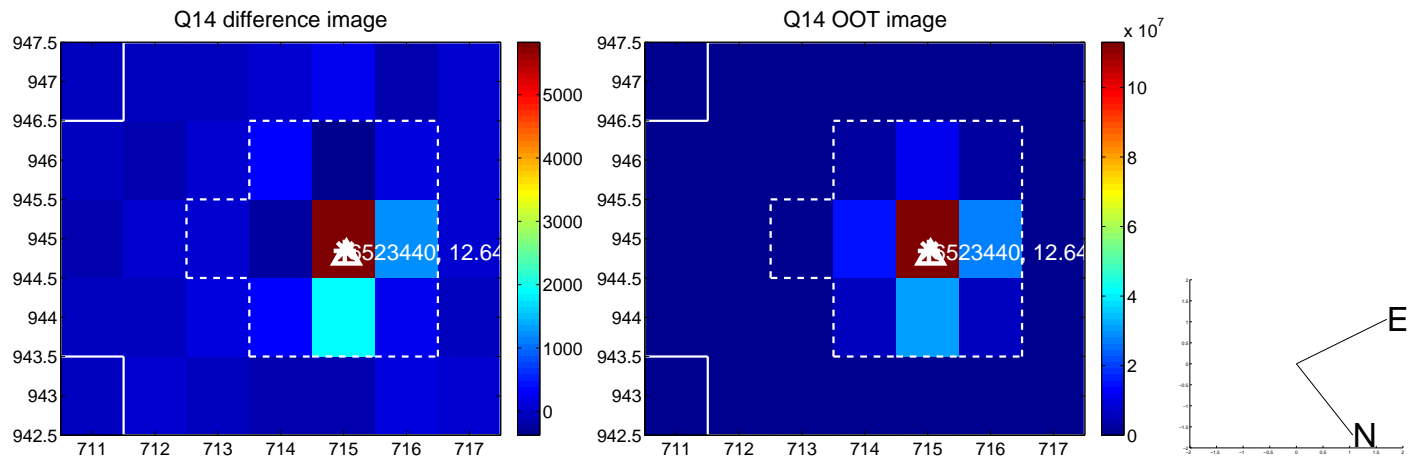
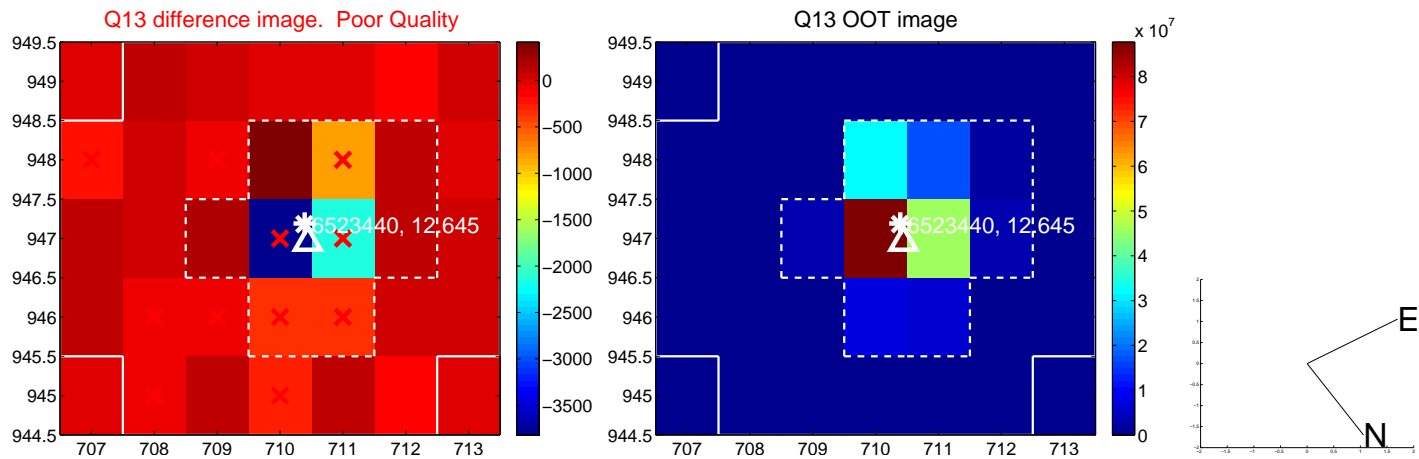




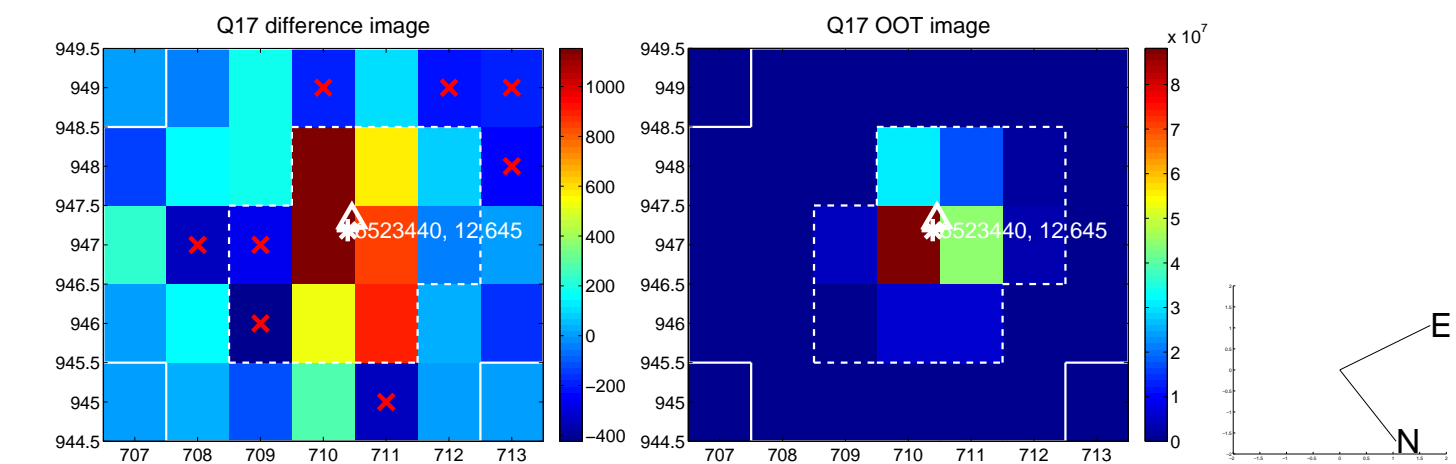
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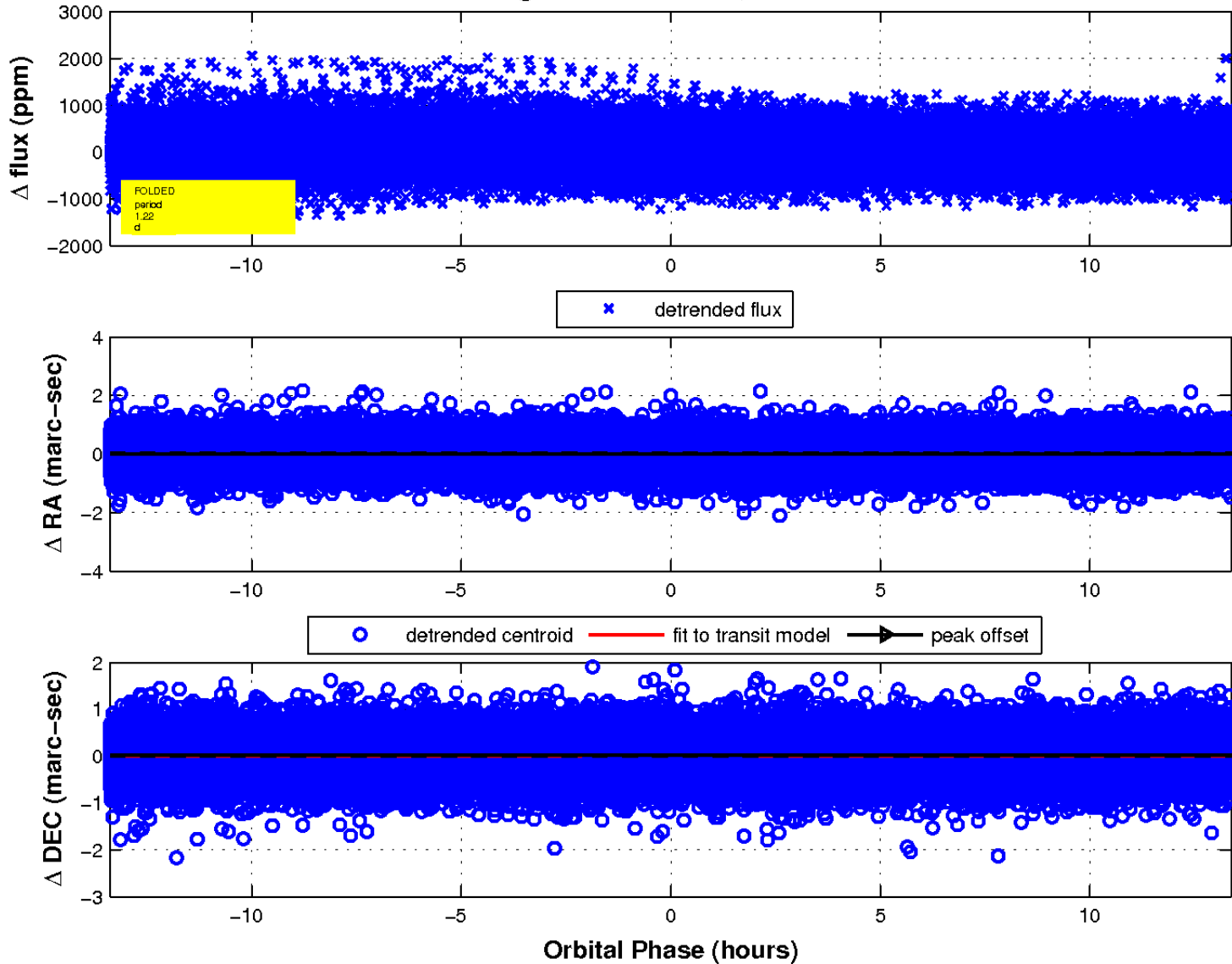
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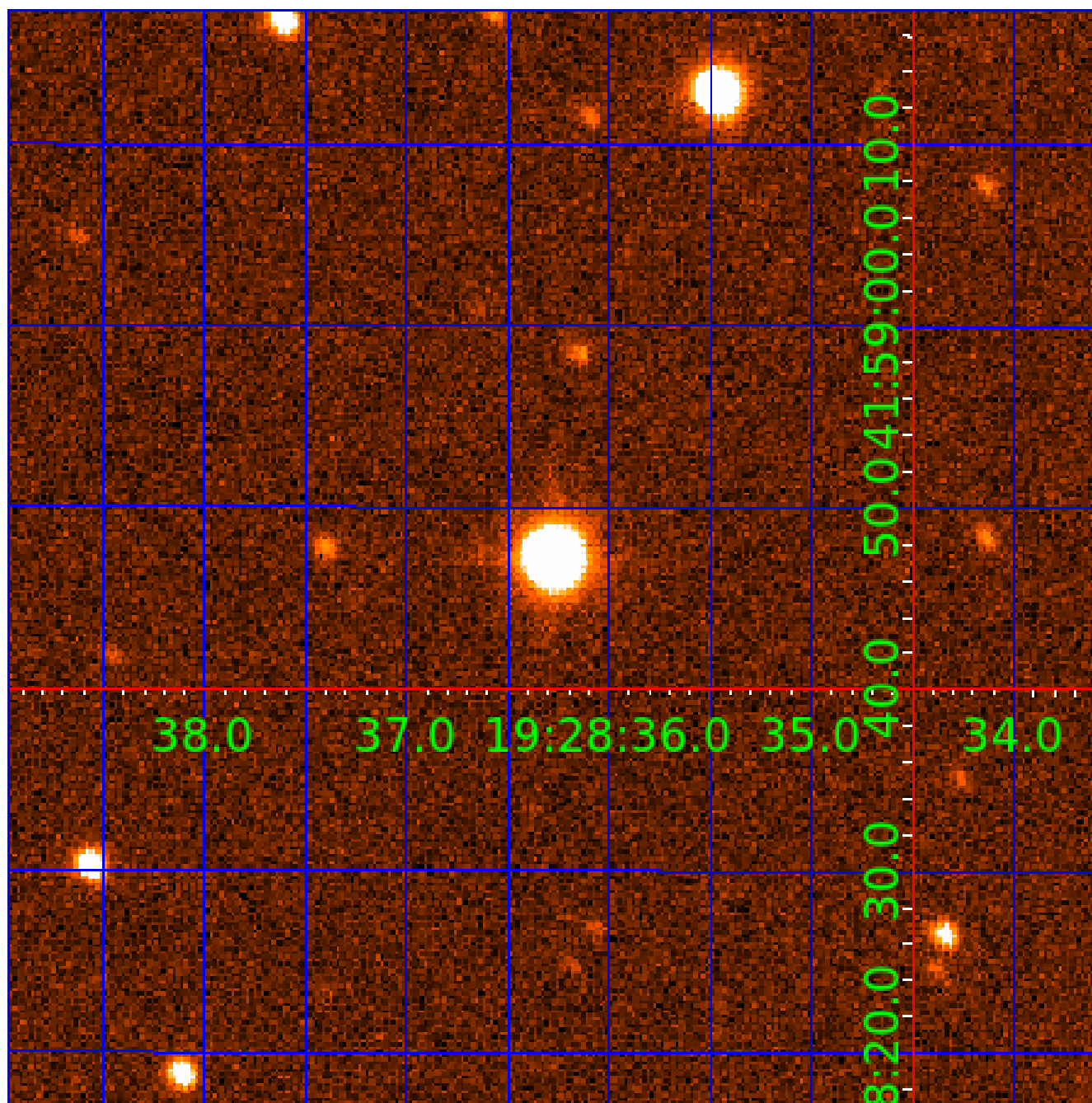


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 006523440

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006523440-01	OBS	No	1.218340	131.850669	29.1	4.462	11.8	11.6	1.93	6824	1.06	10697.44
006523440-02	OBS	No	1.218286	132.828007	46.7	14.619	11.3	8.5	1.93	6824	1.59	10698.08

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006523440-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
006523440-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS

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

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

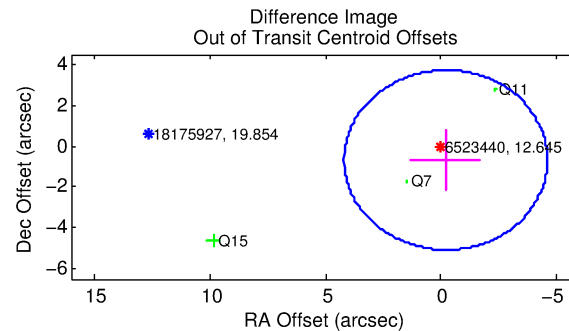
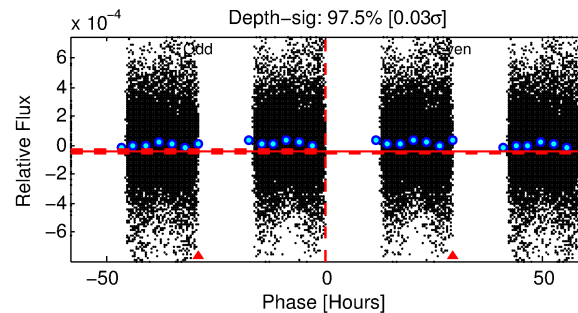
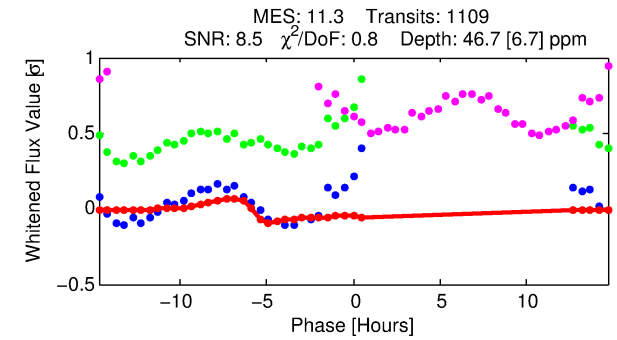
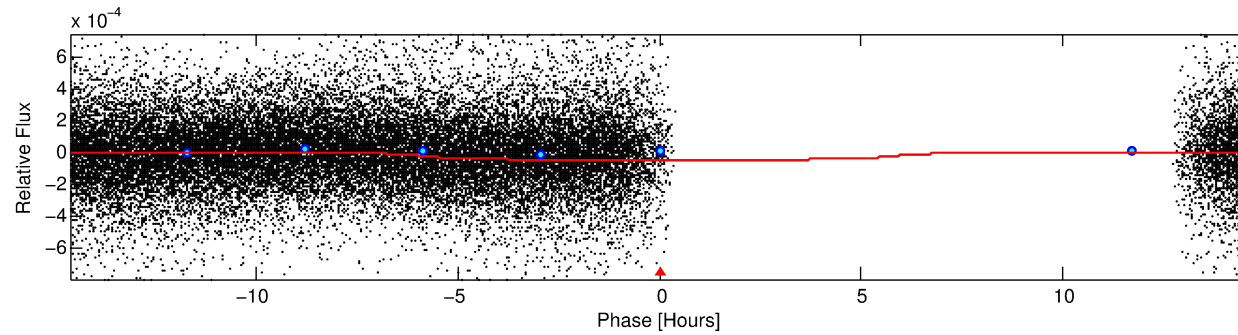
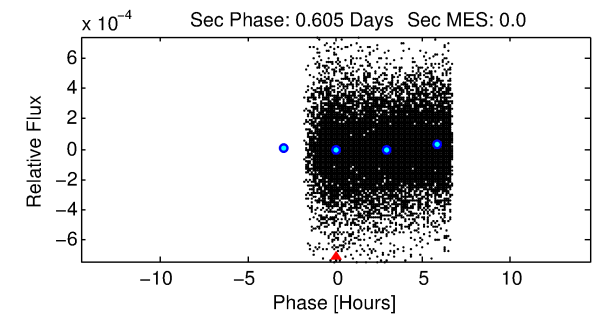
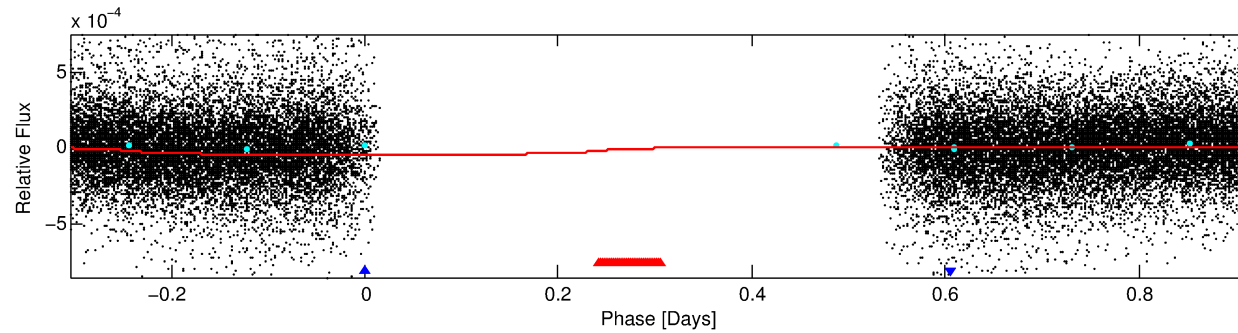
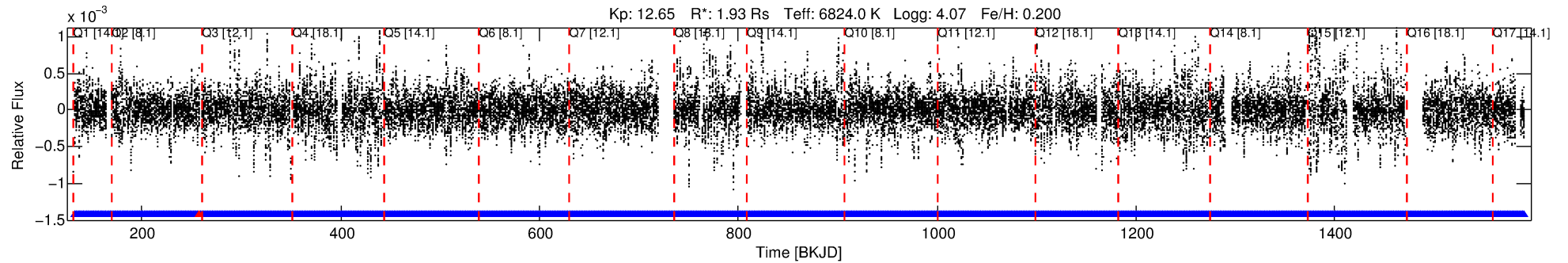
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006523440-02

No Significant Match Found

# DV One-Page Summary

KIC: 6523440 Candidate: 2 of 2 Period: 1.218 d



## DV Fit Results:

Period = 1.21829 [0.00002] d  
Epoch = 132.8280 [0.0235] BKJD  
Rp/R\* = 0.0076 [0.0005]  
a/R\* = 1.00 [0.00]  
b = 0.94 [0.04]  
Seff = 10698.08 [3289.26]  
Teff = 2593 [199] K  
Rp = 1.59 [0.38] Re  
a = 0.0260 [0.0049] AU  
Ag = N/A  
Teffp = N/A

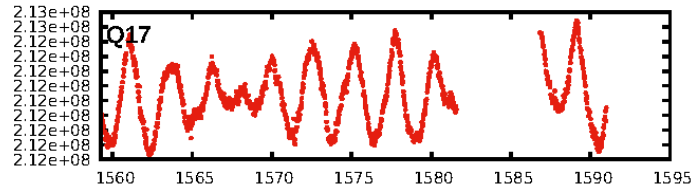
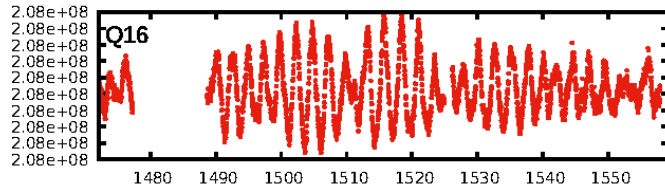
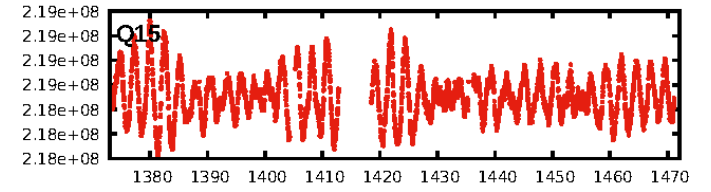
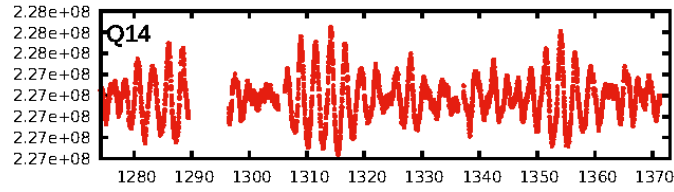
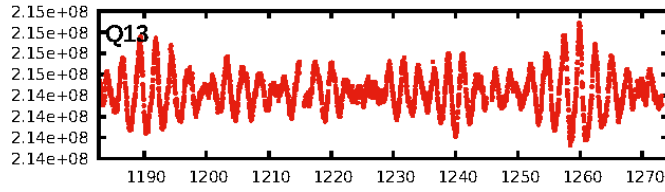
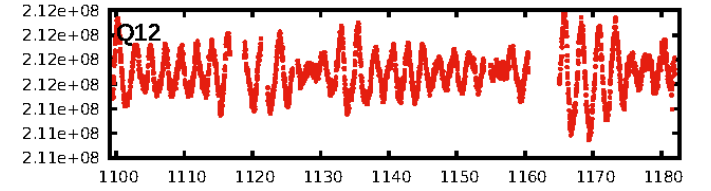
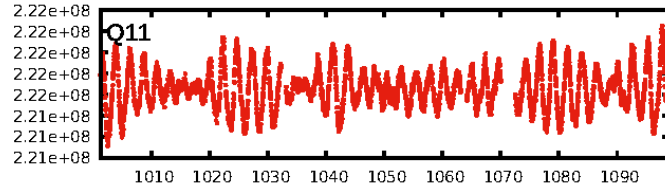
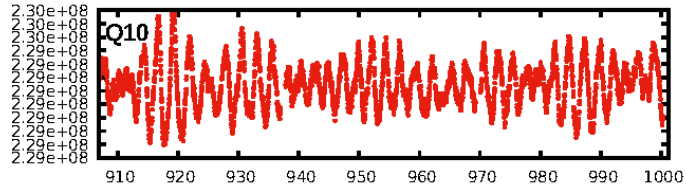
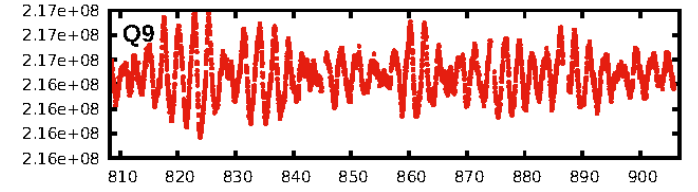
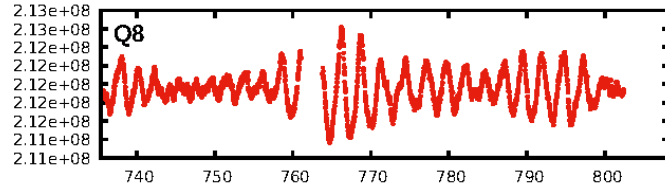
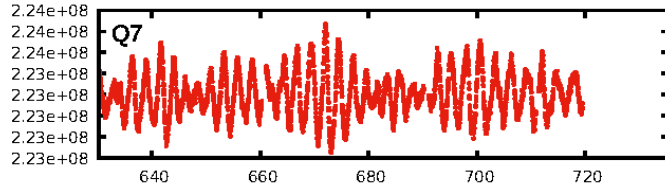
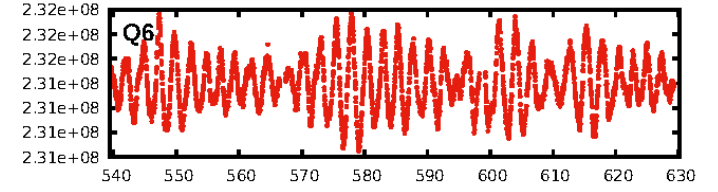
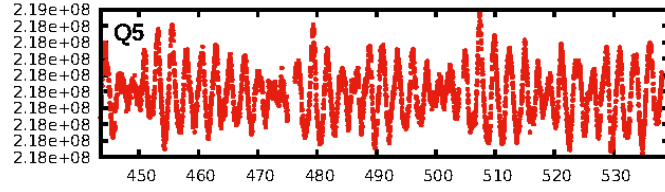
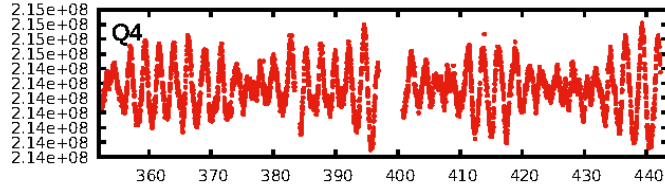
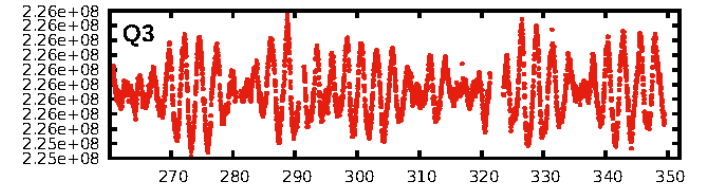
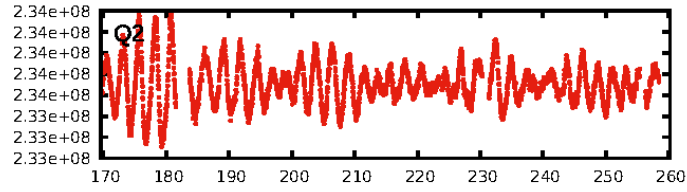
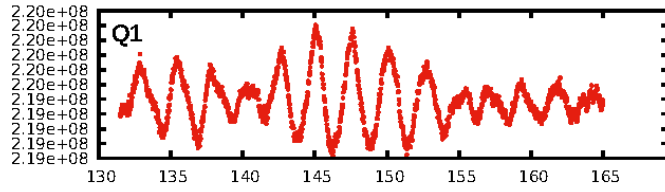
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1057/1058]  
GhostDiagnostic-chr: 0.808  
Centroid-sig: 0.3%  
Centroid-so: 0.296 arcsec [1.79σ]  
OotOffset-rm: 0.706 arcsec [0.48σ]  
KicOffset-rm: 0.790 arcsec [0.54σ]  
OotOffset-st: 0/3/0/0 [3]  
KicOffset-st: 0/3/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.00 [0/17]

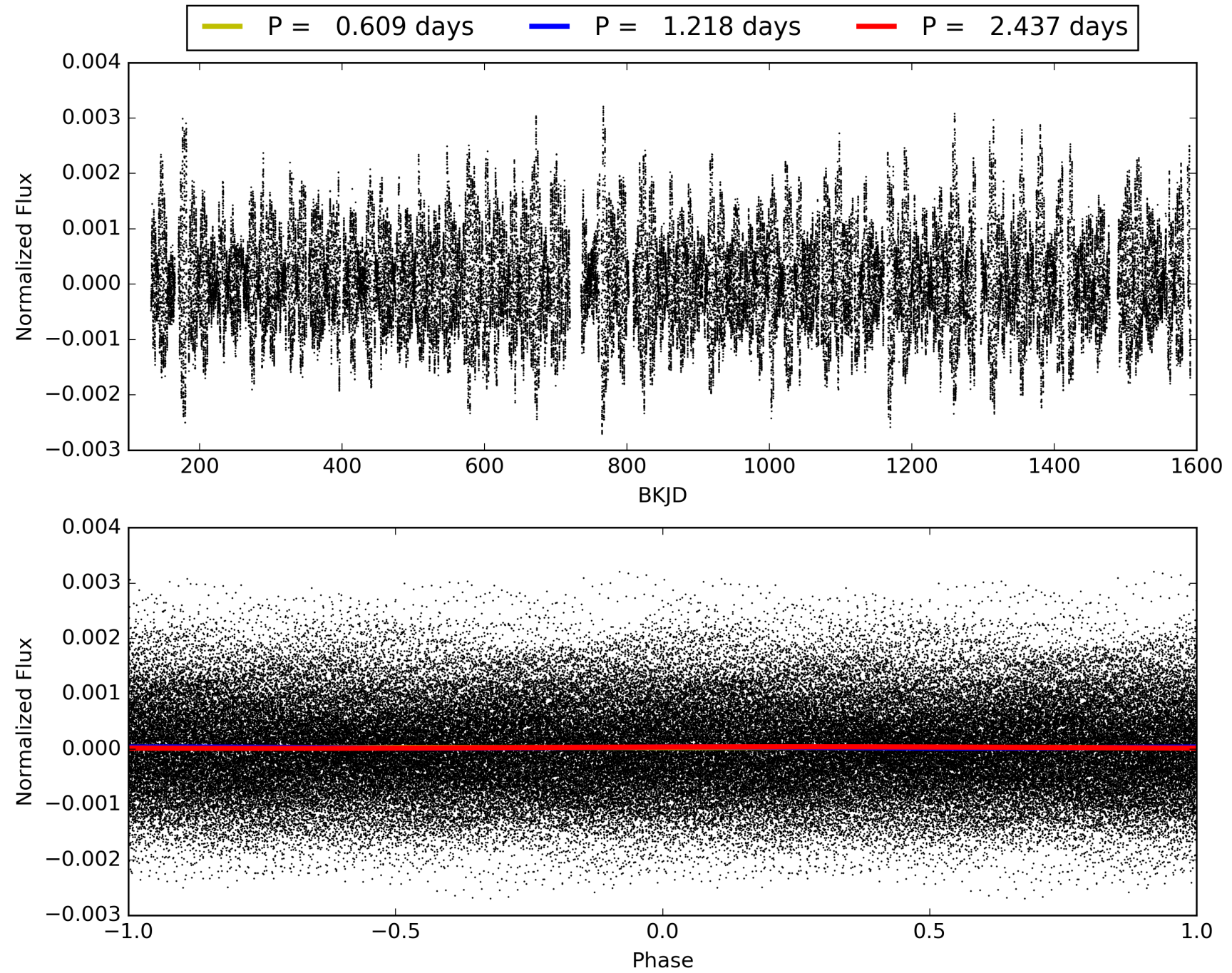
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:18:36 Z

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

# TCE 006523440-02, PDC Light Curves



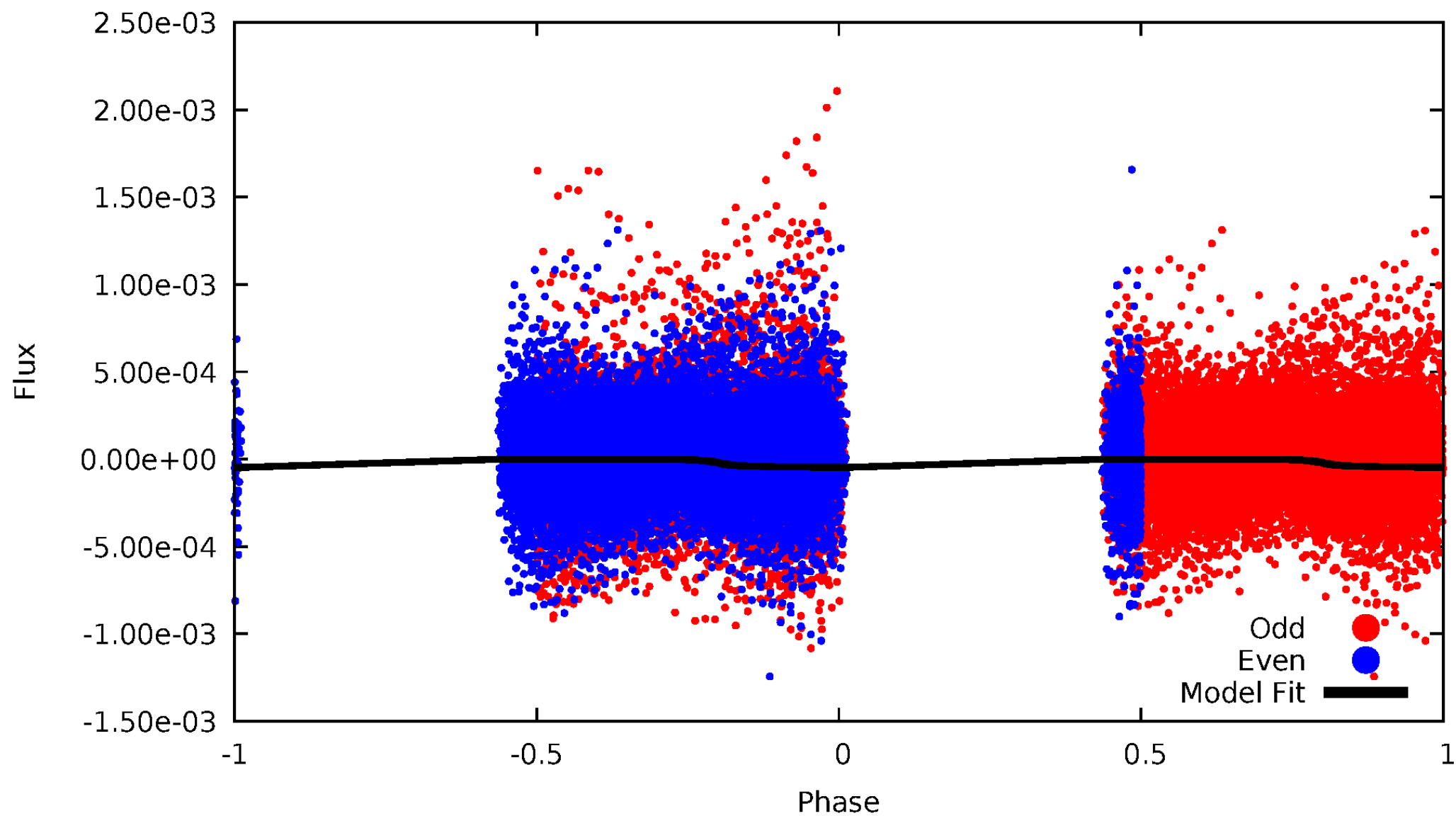
TCE 006523440-02





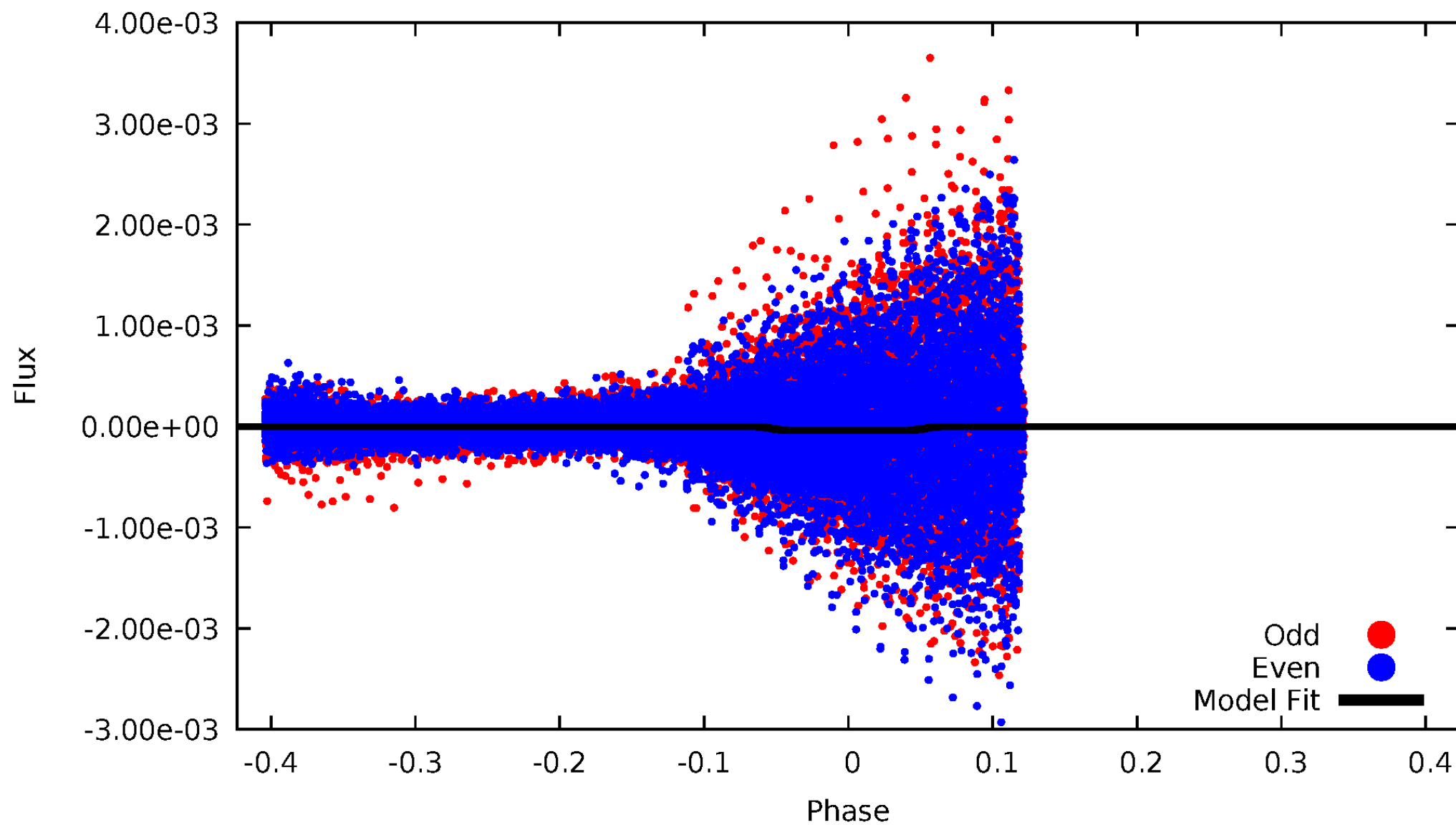
# DV Odd/Even

TCE 006523440-02



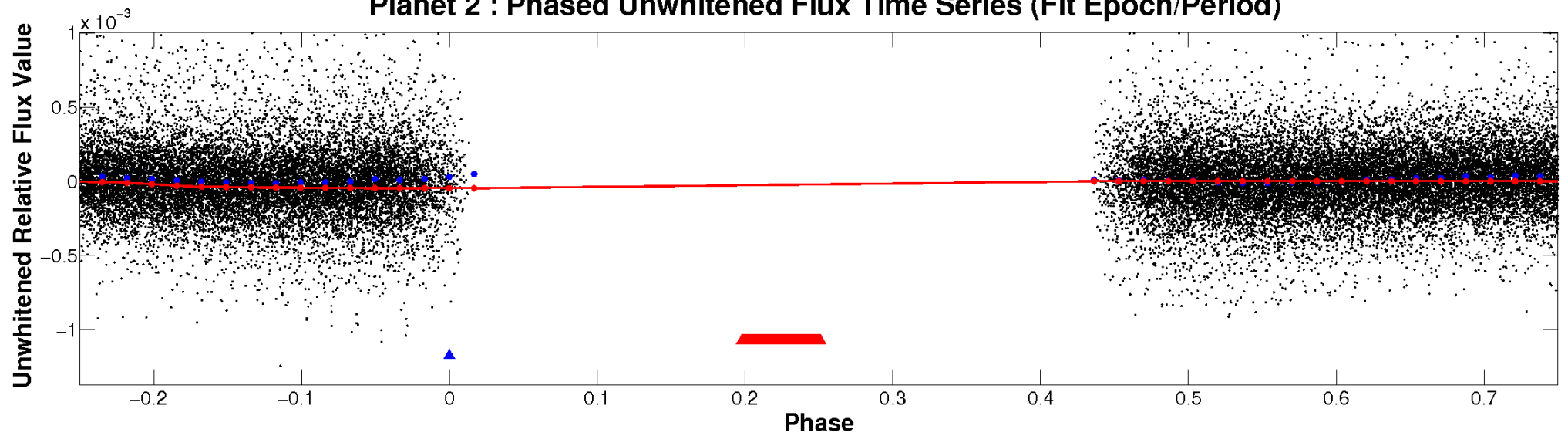
# ALT Odd/Even

TCE 006523440-02

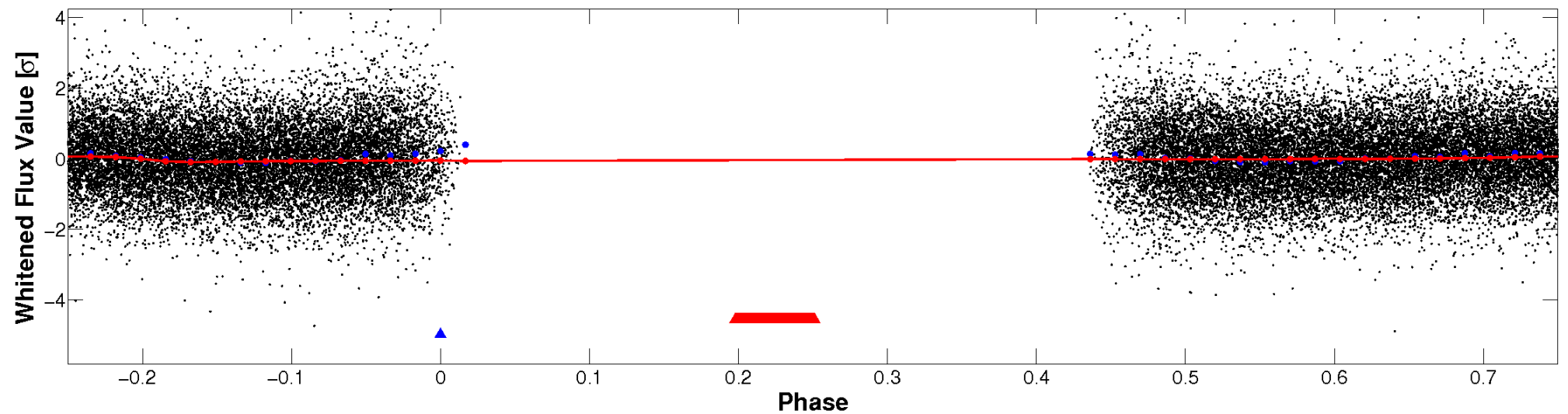


# Non-Whitened Vs. Whitened Light Curve

## Planet 2 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

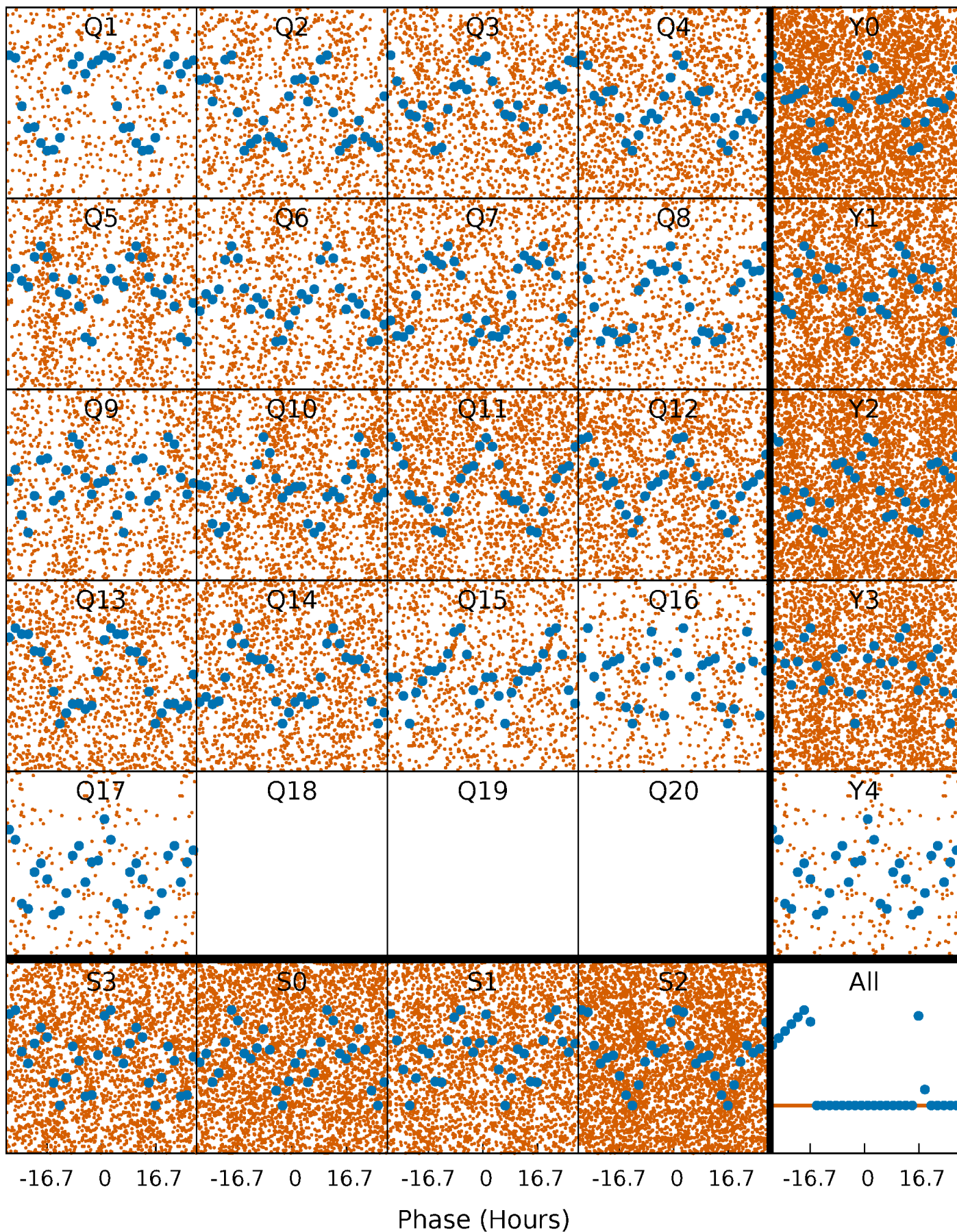


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

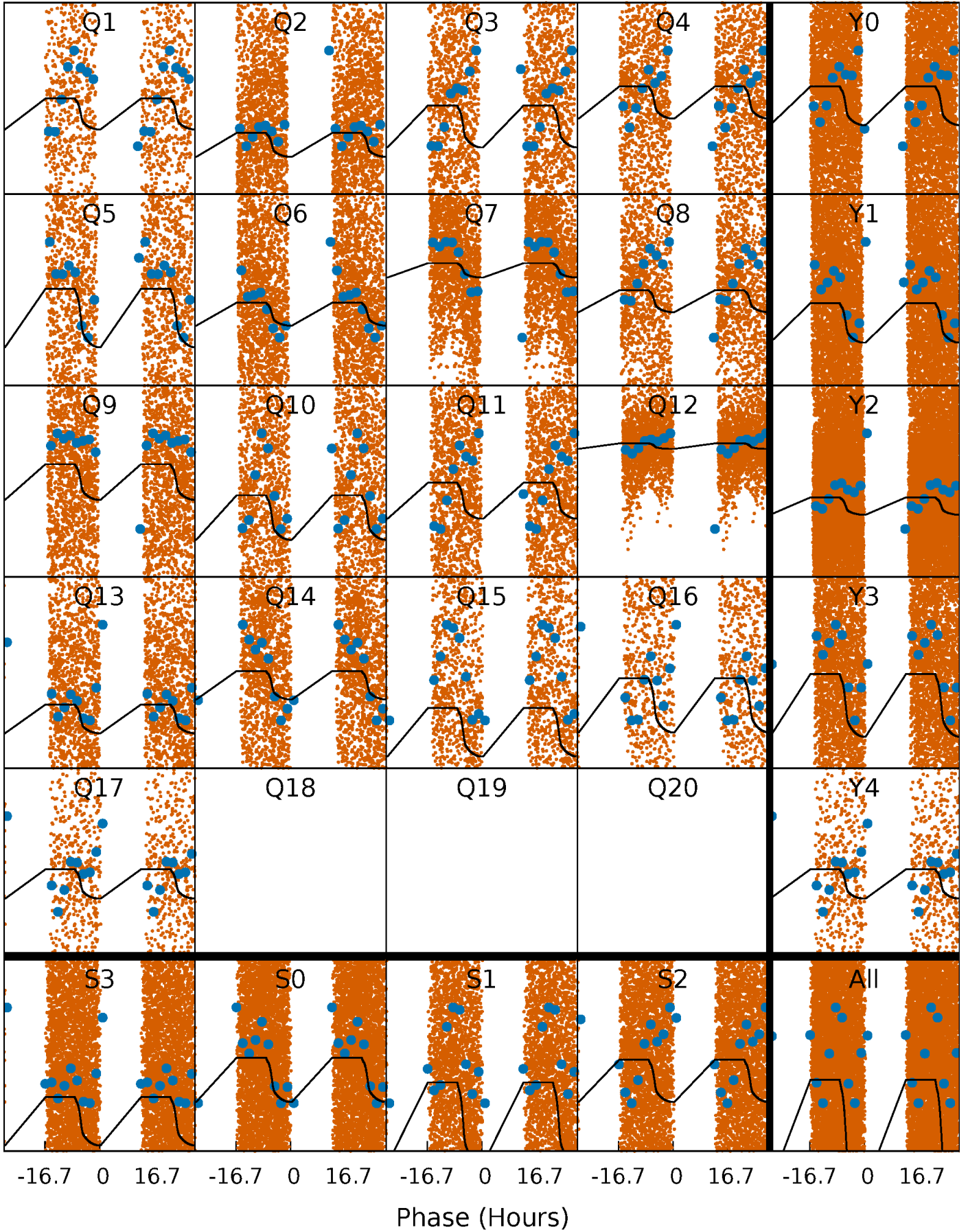
TCE 006523440-02 P= 1.218286 Days  $T_0=132.828007$  (BKJD)





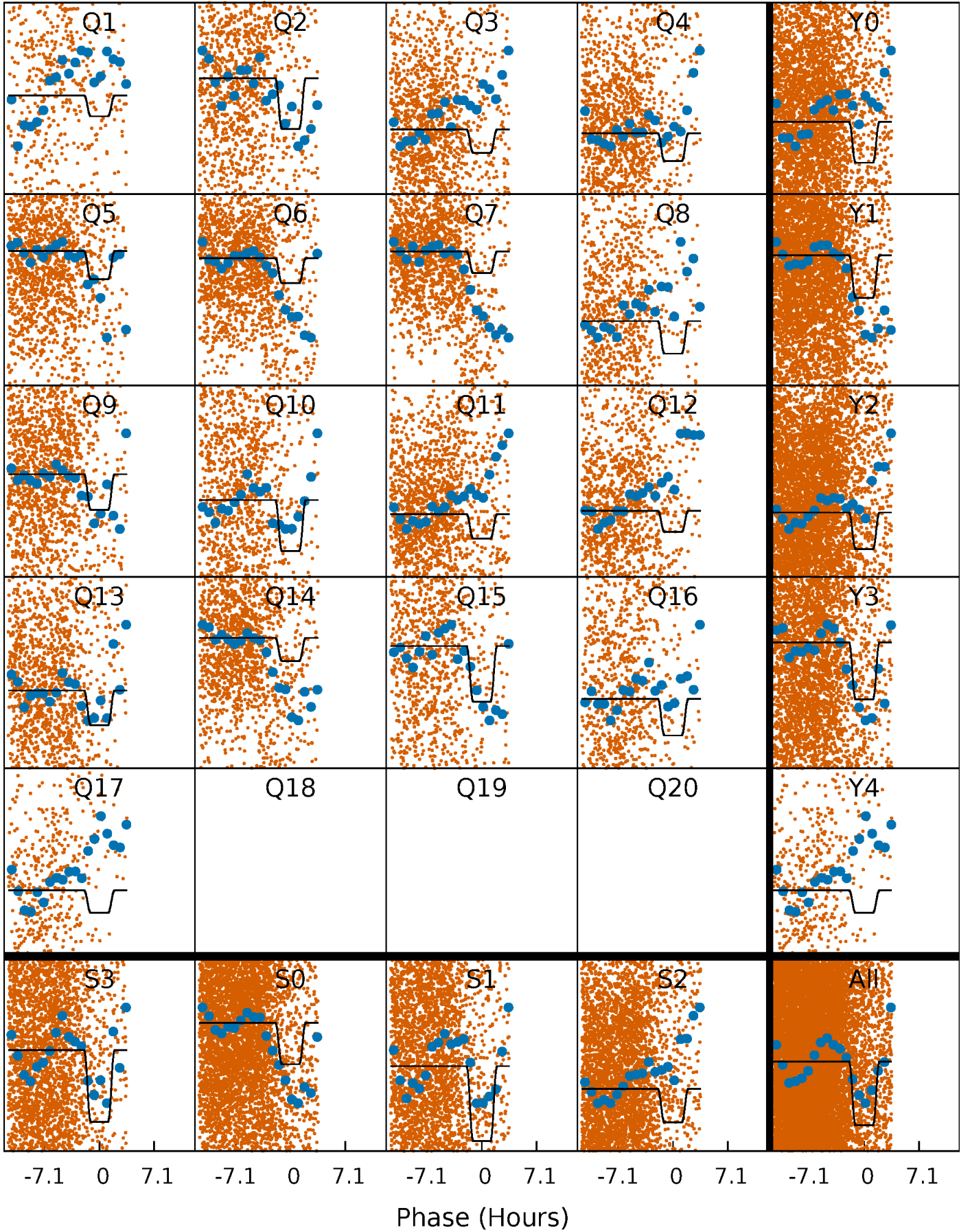
# DV Quarter-Phased Transit Curves

TCE 006523440-02   P= 1.218286 Days    $T_0=132.828007$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006523440-02 P= 1.218339 Days  $T_0=132.632410$  (BKJD)

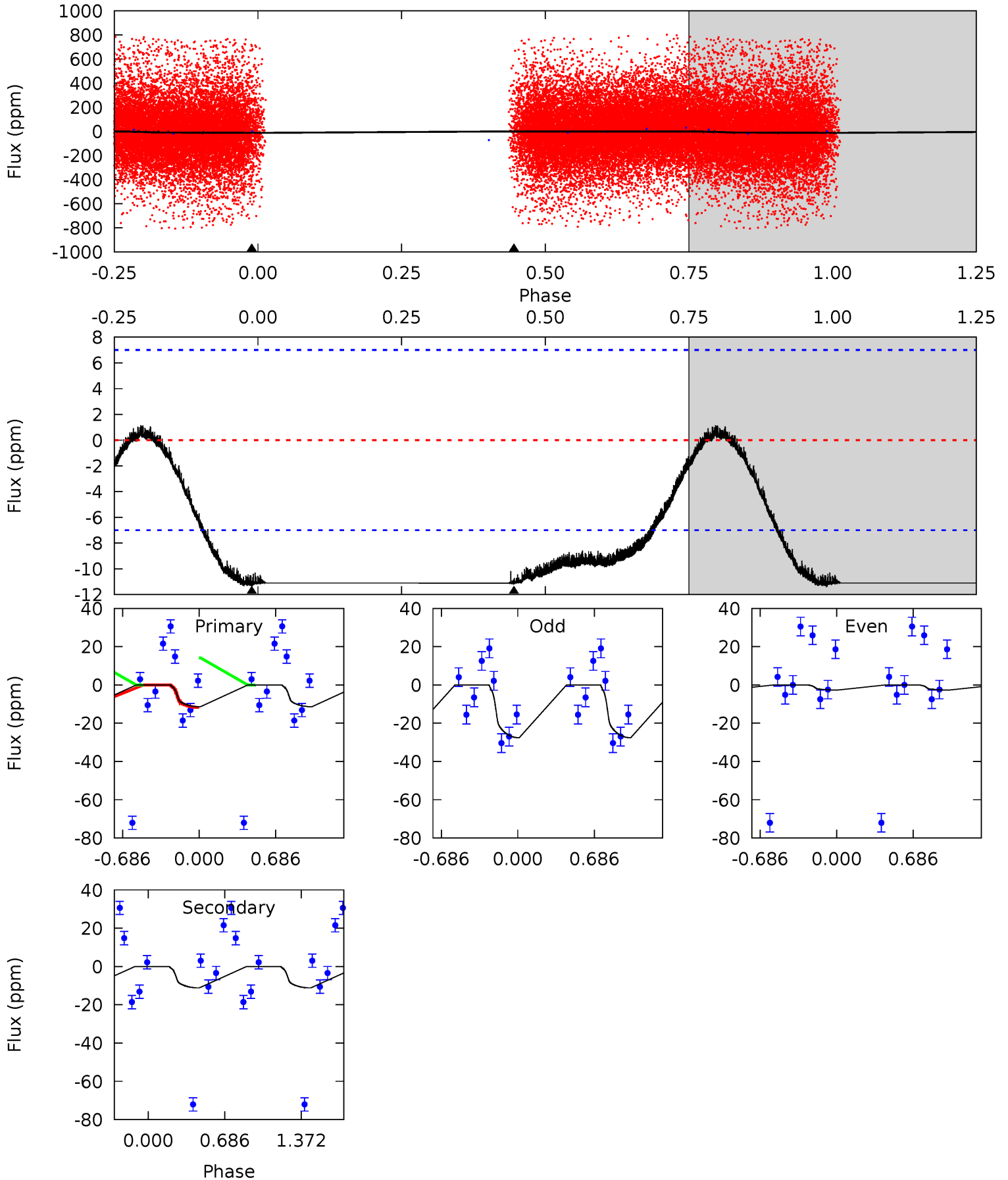




# DV Model-Shift Uniqueness Test

006523440-02, P = 1.218286 Days, E = 130.391435 Days

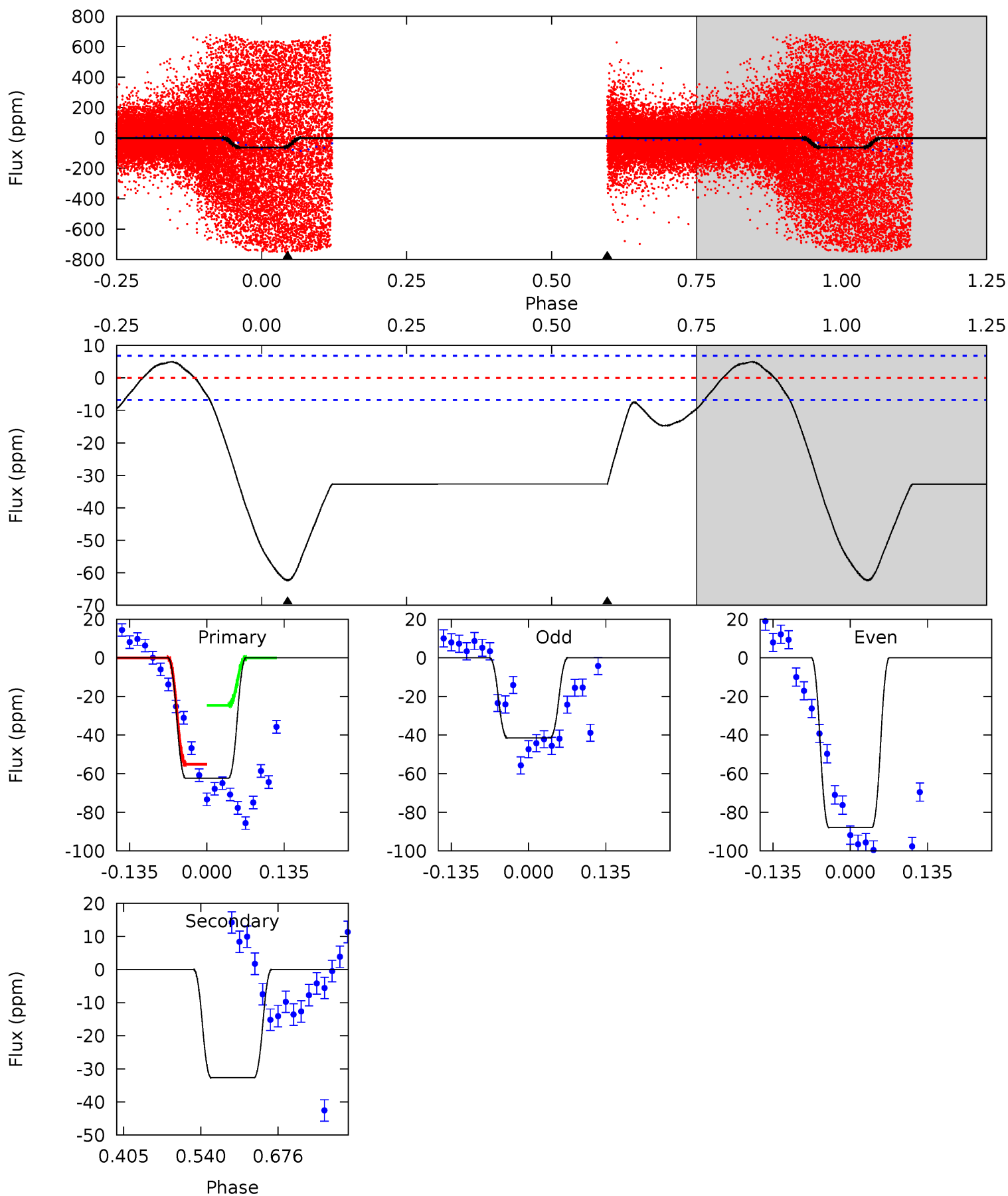
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.73	6.60	0	0	4.14	0.40	0.37	6.73	6.73	6.60	6.60	7.12	-0.17	0.09	0.11



# Alt Model-Shift Uniqueness Test

006523440-02, P = 1.218339 Days, E = 131.414071 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
41.2	21.6	0	0	4.50	1.49	3.43	41.2	41.2	21.6	21.6	14.6	0.34	0.07	2.19



### Stellar Parameters For KIC 006523440

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6824^{+162}_{-255}$	$4.065^{+0.145}_{-0.145}$	$0.200^{+0.200}_{-0.300}$	$1.927^{+0.435}_{-0.435}$	$1.571^{+0.142}_{-0.244}$	$0.309^{+0.253}_{-0.119}$
	+2%/-4%	+4%/-4%	+100%/-150%	+23%/-23%	+9%/-16%	+82%/-38%
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 006523440-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-11 \pm 2$	$1.60^{+0.23}_{-0.22}$	$3627^{+230}_{-237}$	$4450^{+257}_{-250}$	$1.576^{+0.584}_{-0.415}$
Alt.	$-33 \pm 2$	$1.33^{+0.20}_{-0.18}$	$3627^{+208}_{-243}$	$6338^{+396}_{-335}$	$6.684^{+2.153}_{-1.556}$

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

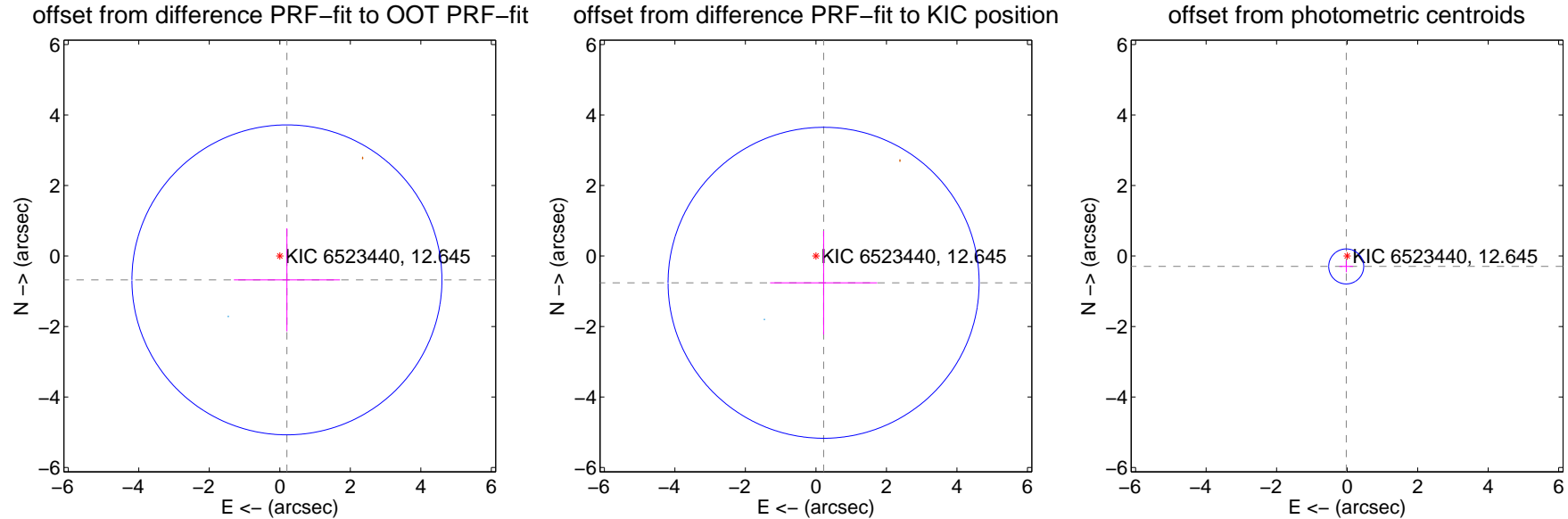
## DV Centroid Data

Supplemental centroid analysis for 006523440-02. Kepler magnitude: 12.64. Transit SNR 8.49

There are 1 quarters with good PRF difference image offsets

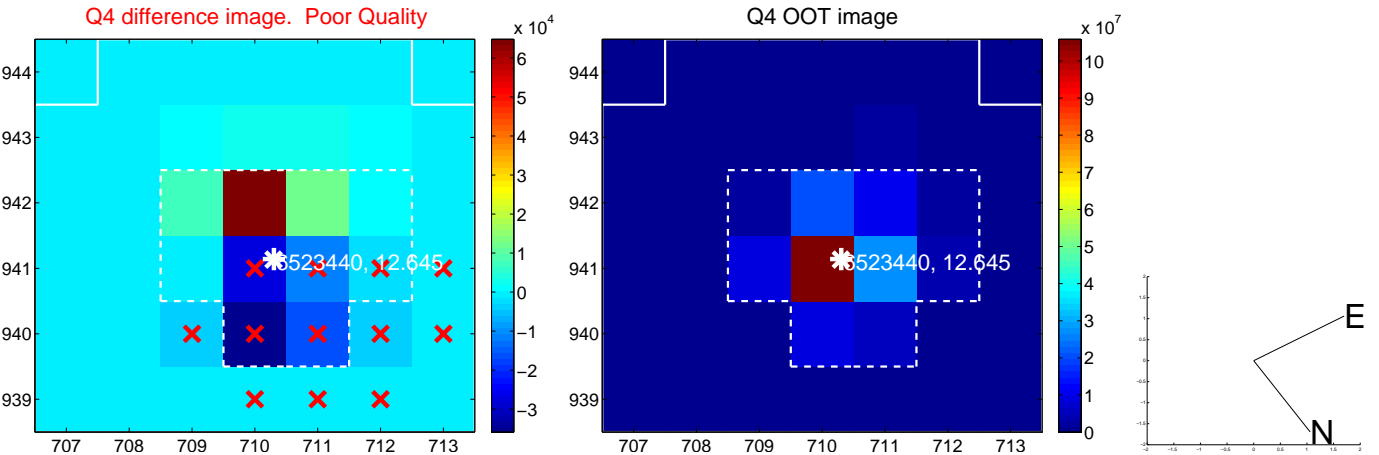
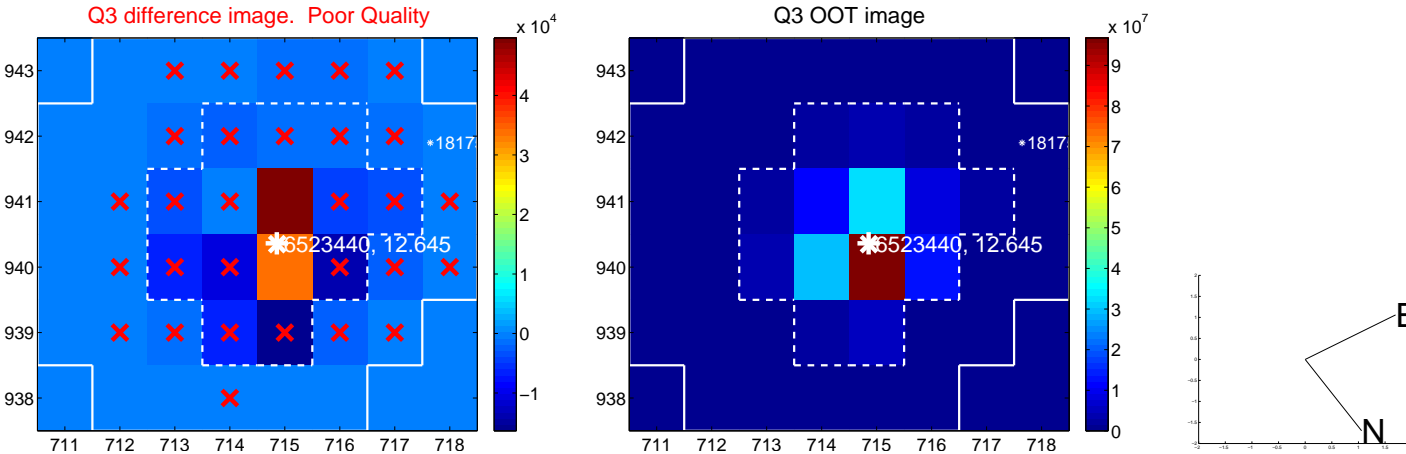
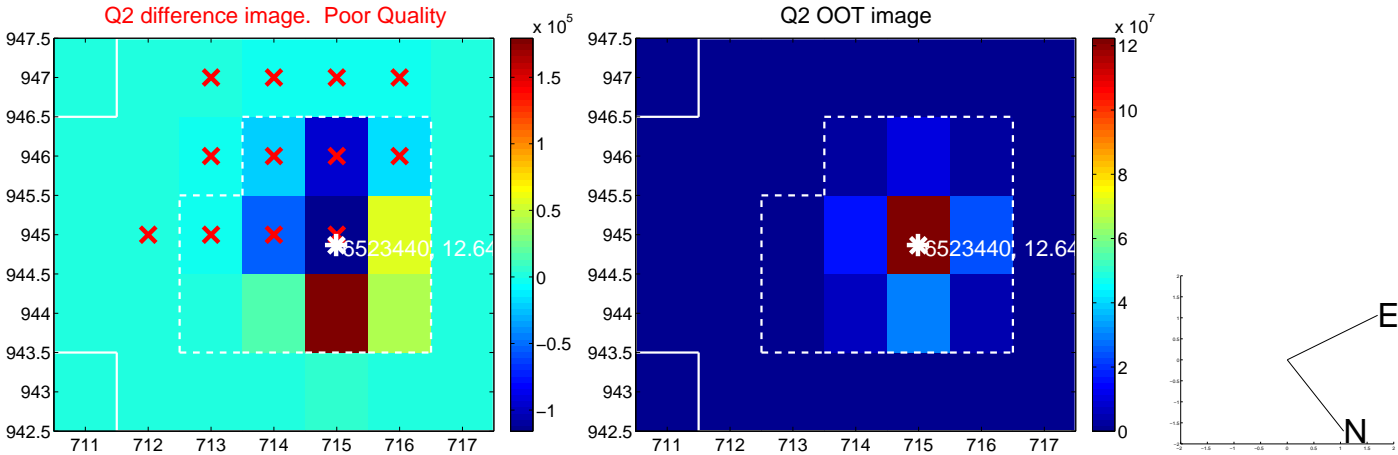
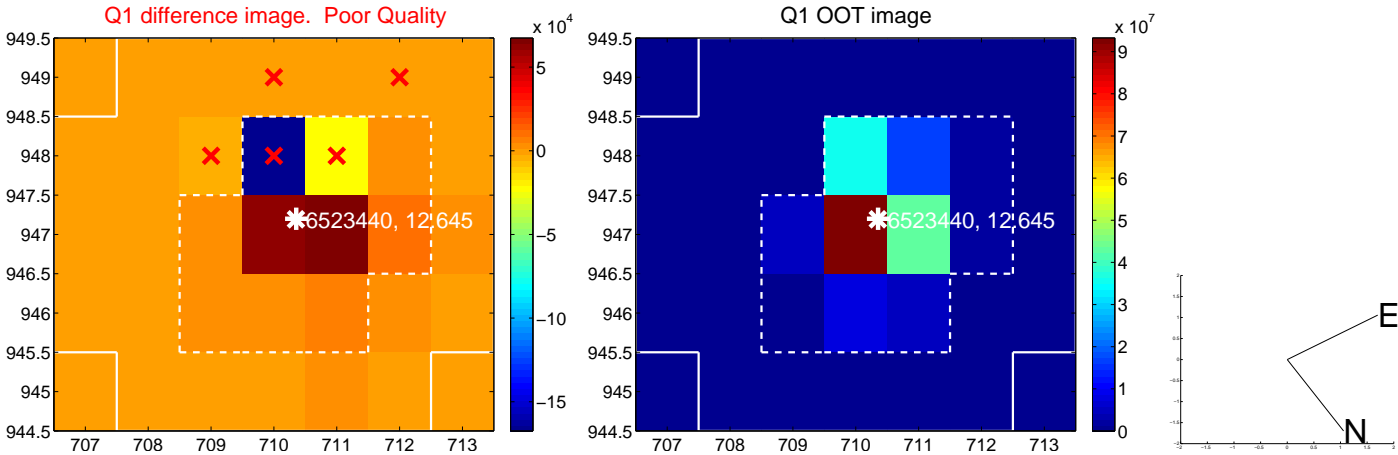
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.706 \pm 1.466$	0.48	$-0.202 \pm 1.505$	$-0.676 \pm 1.462$
PRF-fit source offset from KIC position	$0.790 \pm 1.470$	0.54	$-0.218 \pm 1.517$	$-0.759 \pm 1.467$
photometric centroid source offset	$0.30 \pm 0.17$	1.79	$0.03 \pm 0.19$	$-0.30 \pm 0.17$

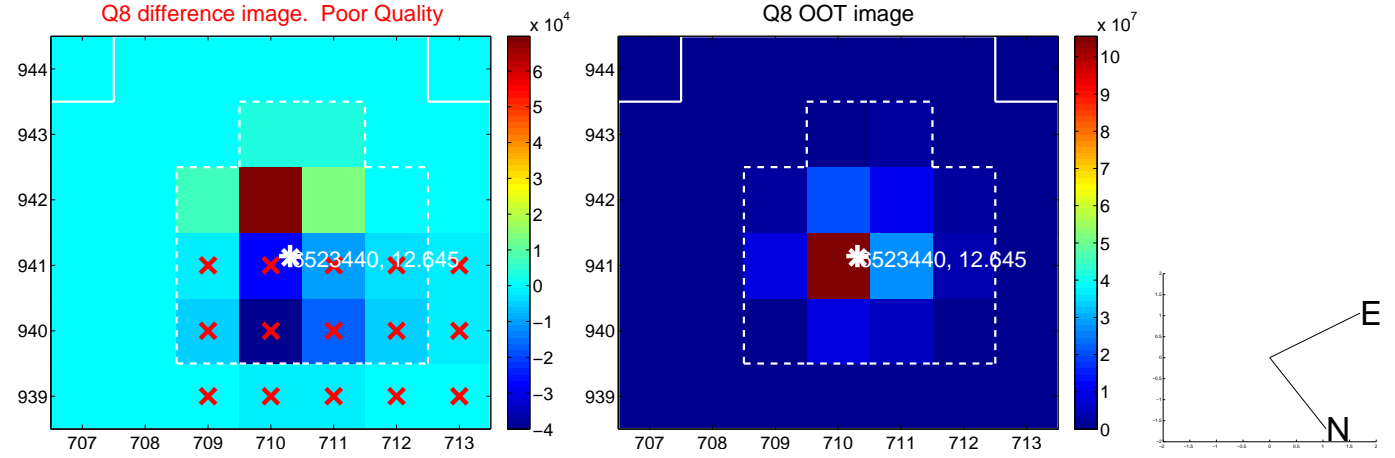
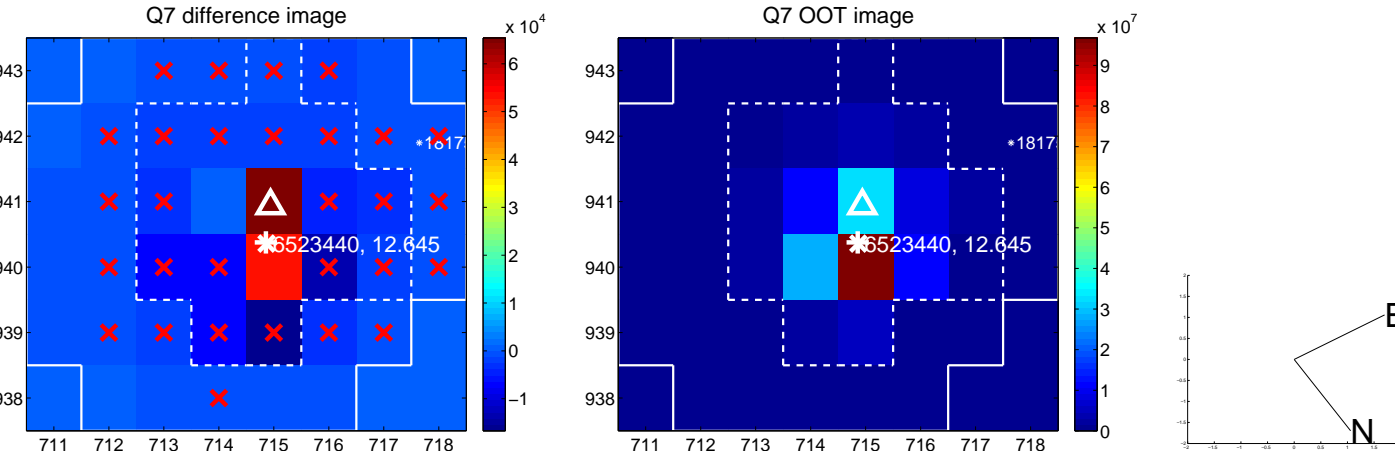
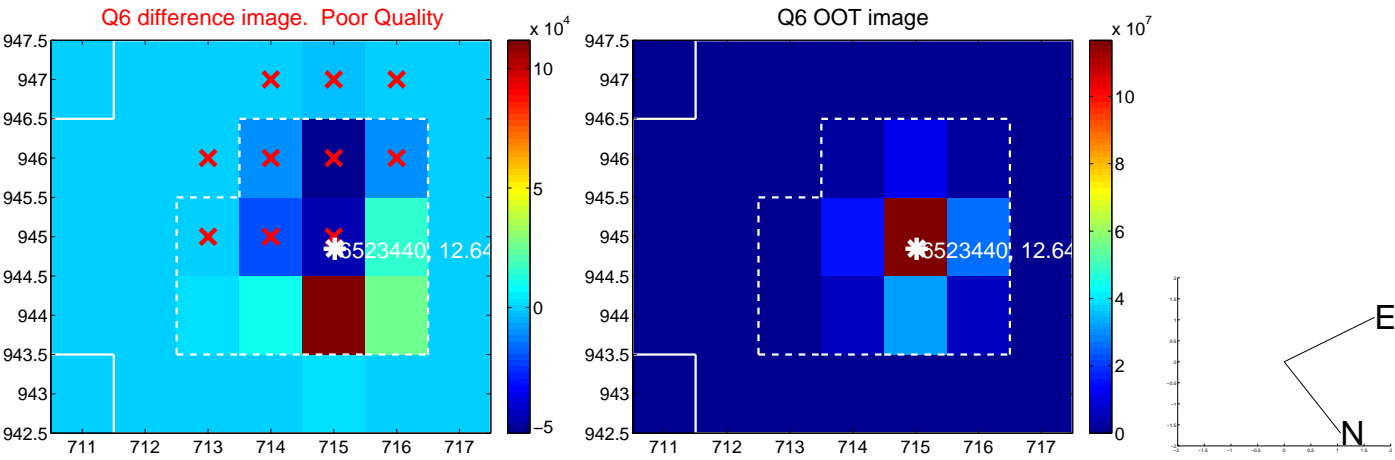
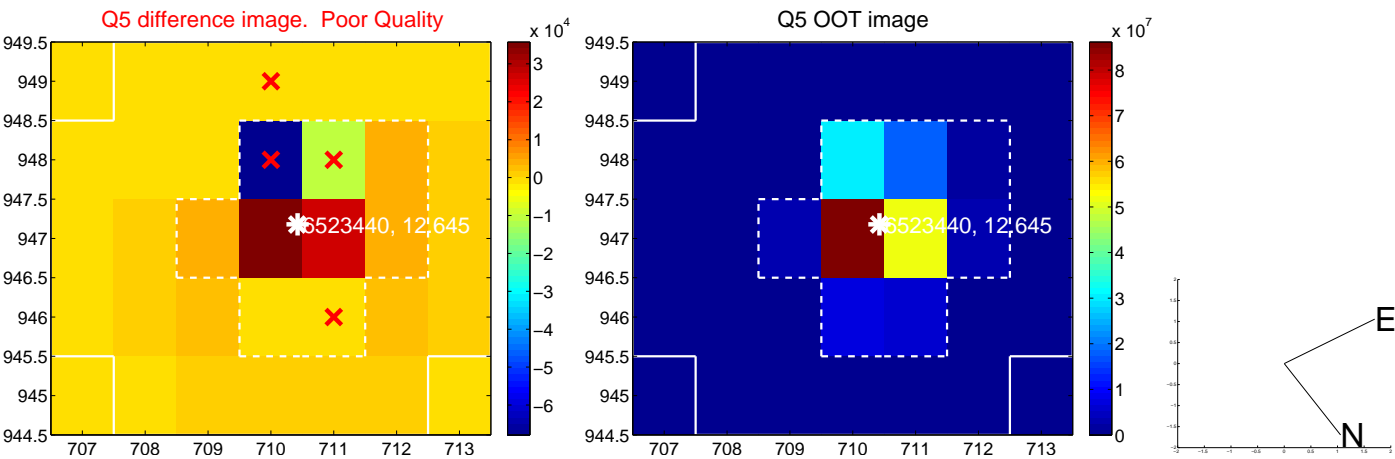


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

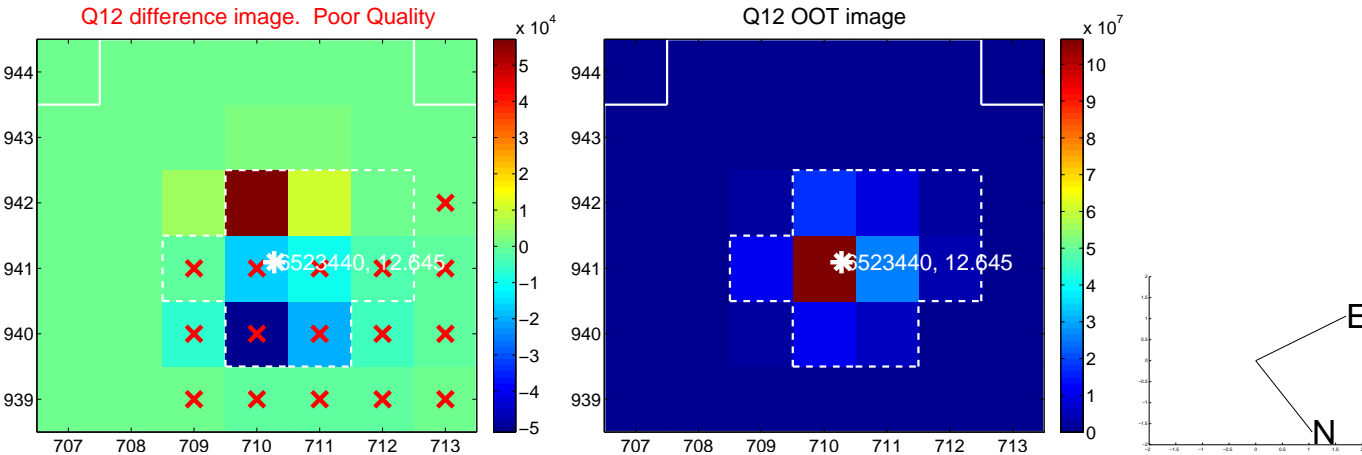
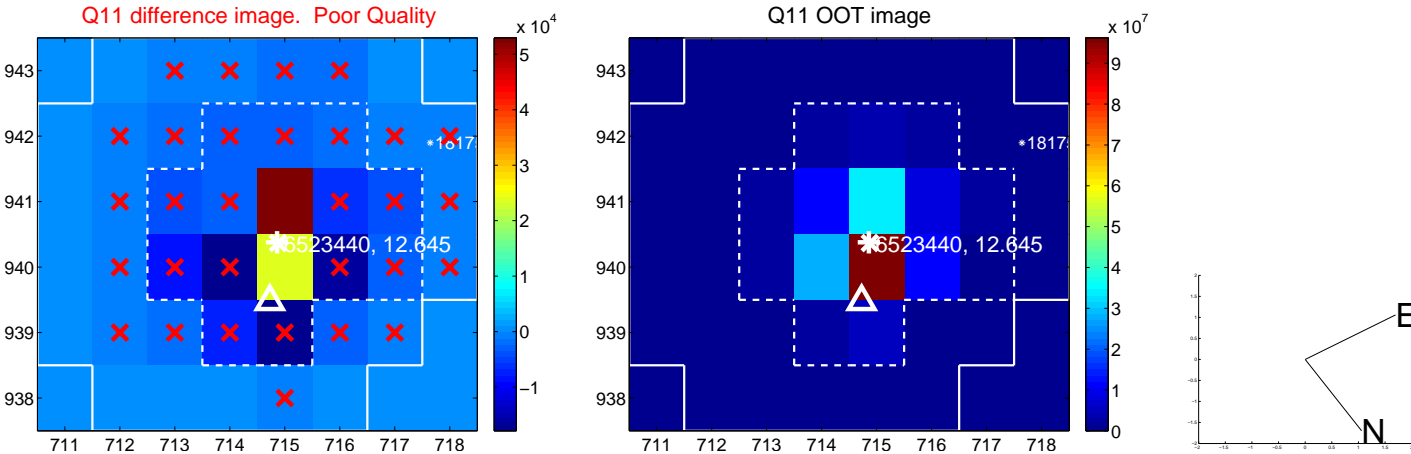
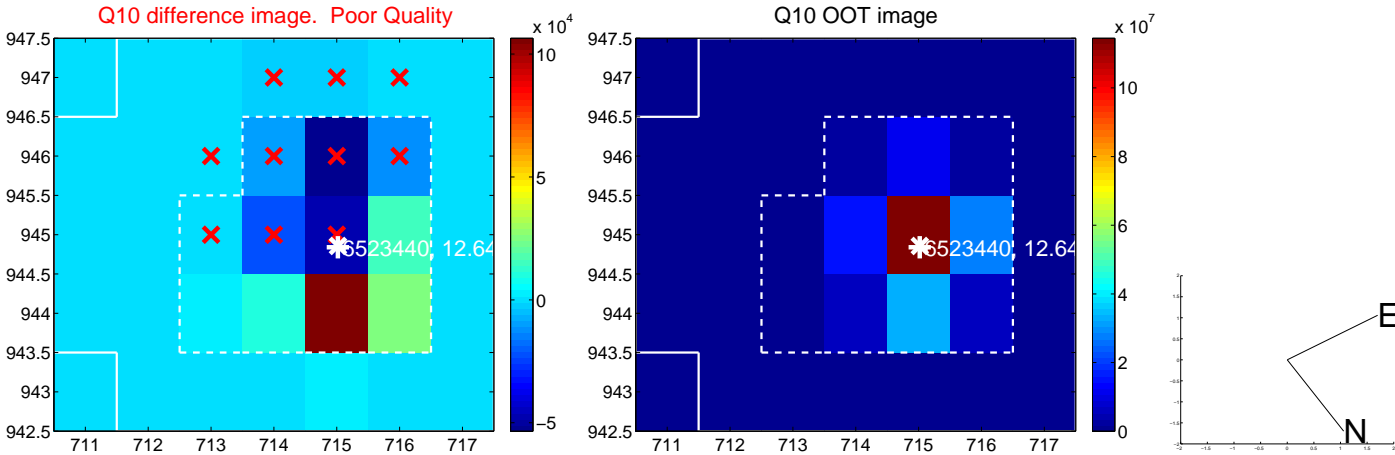
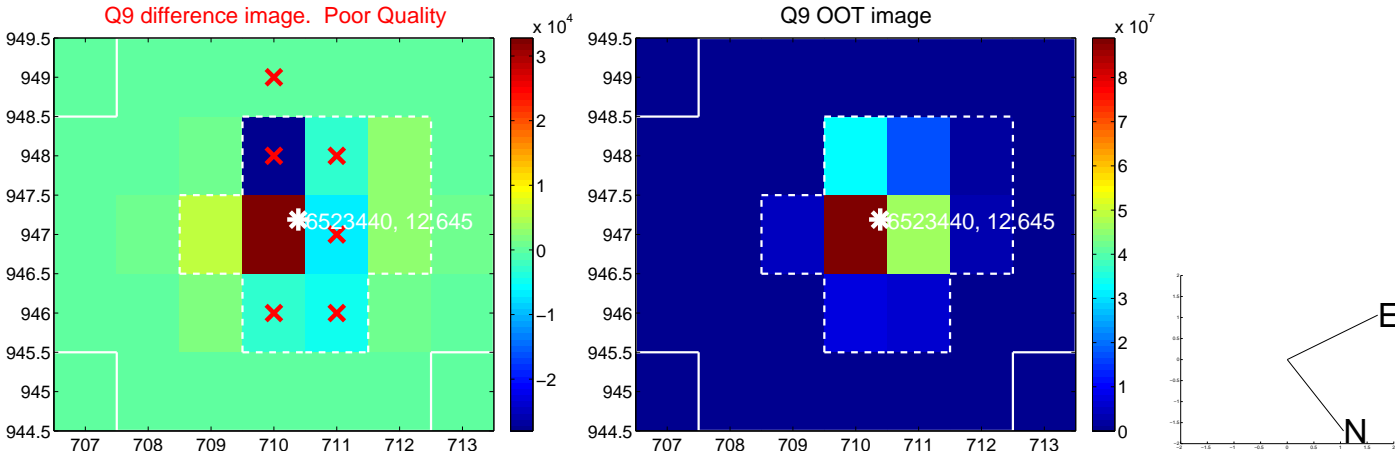


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

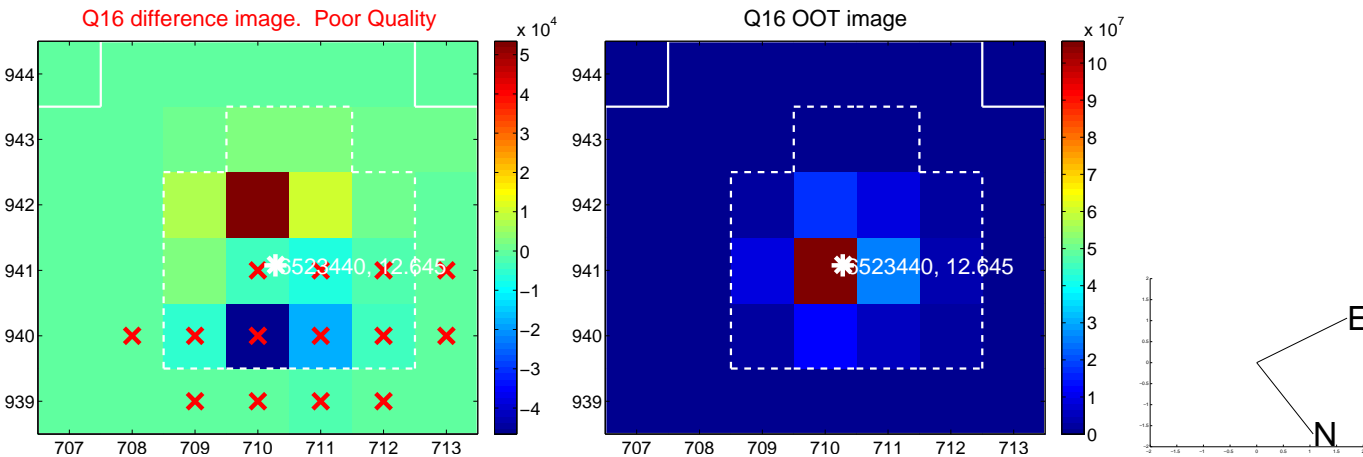
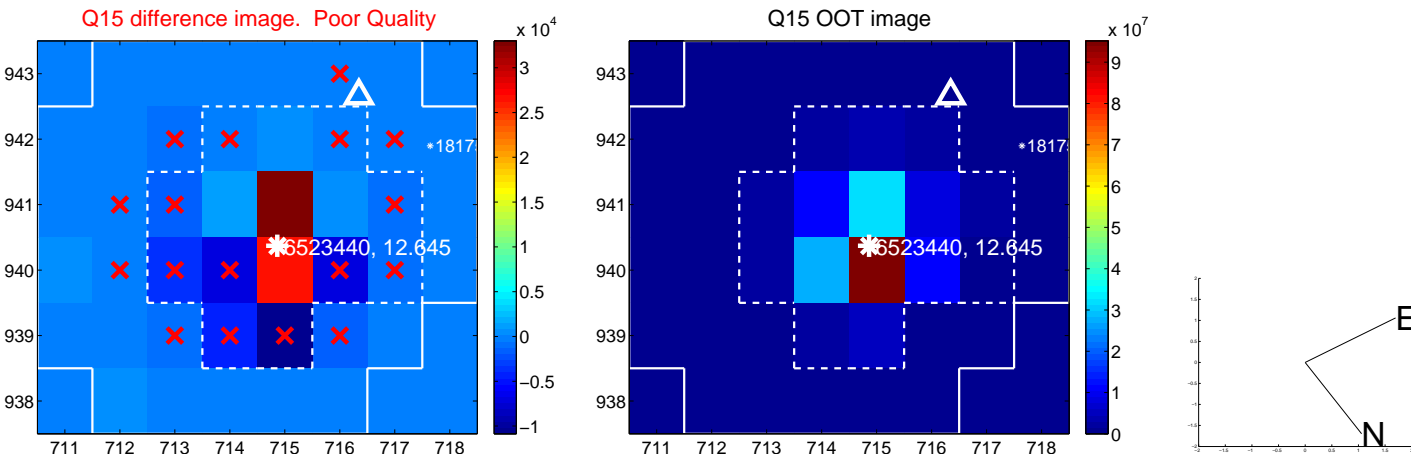
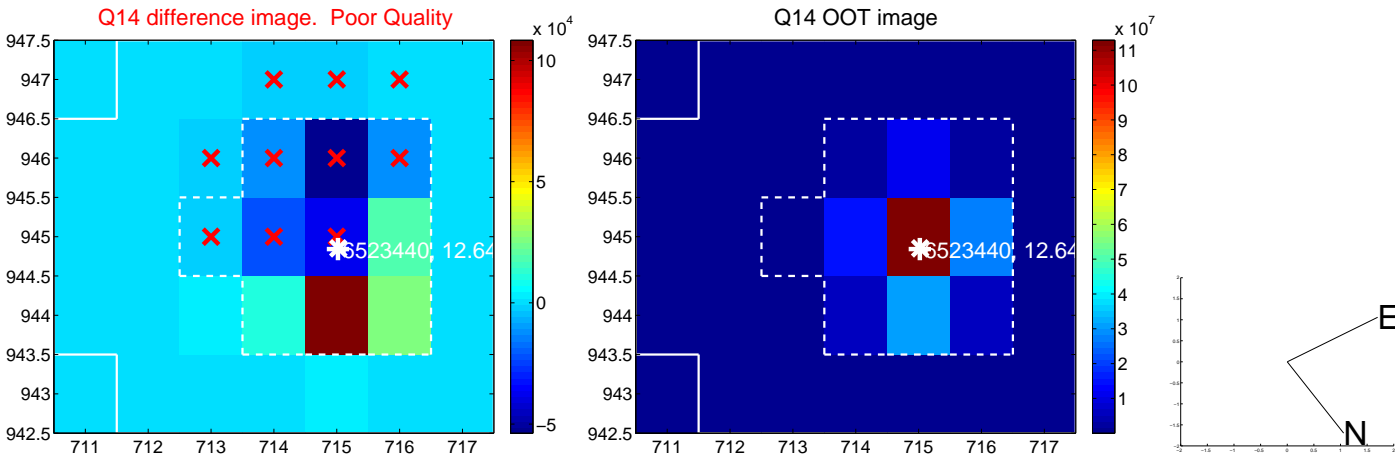
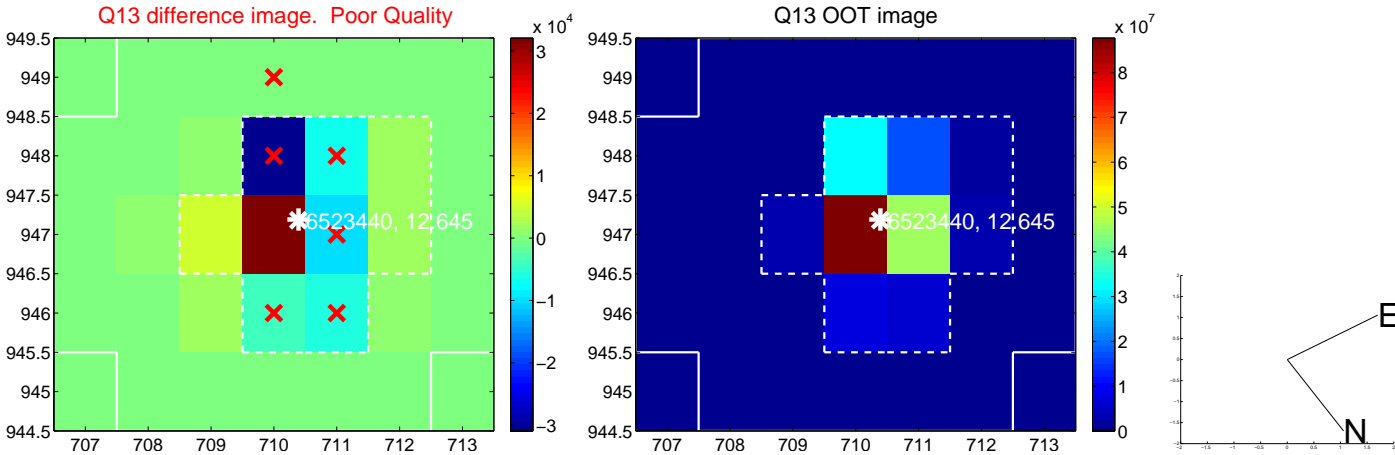




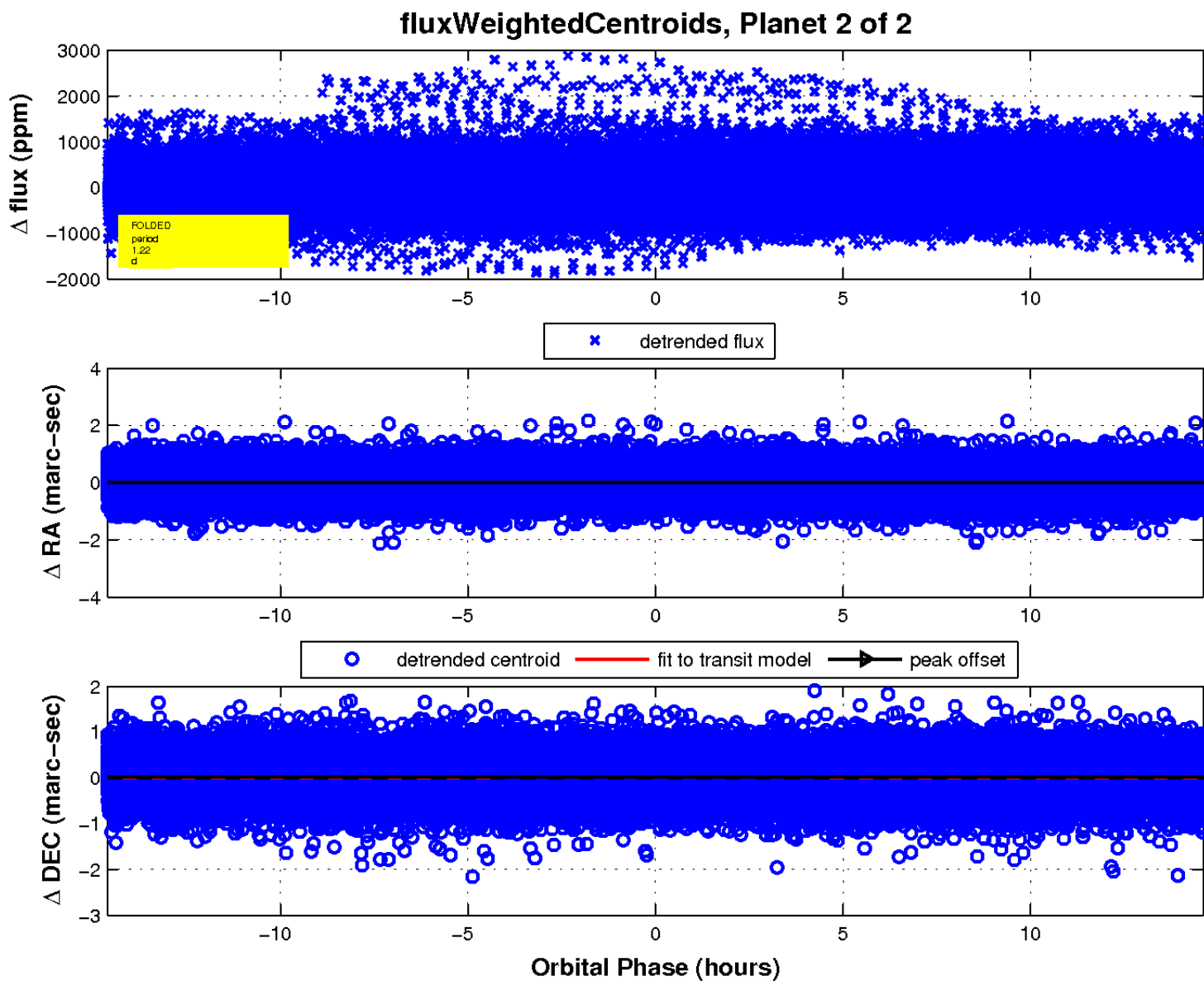
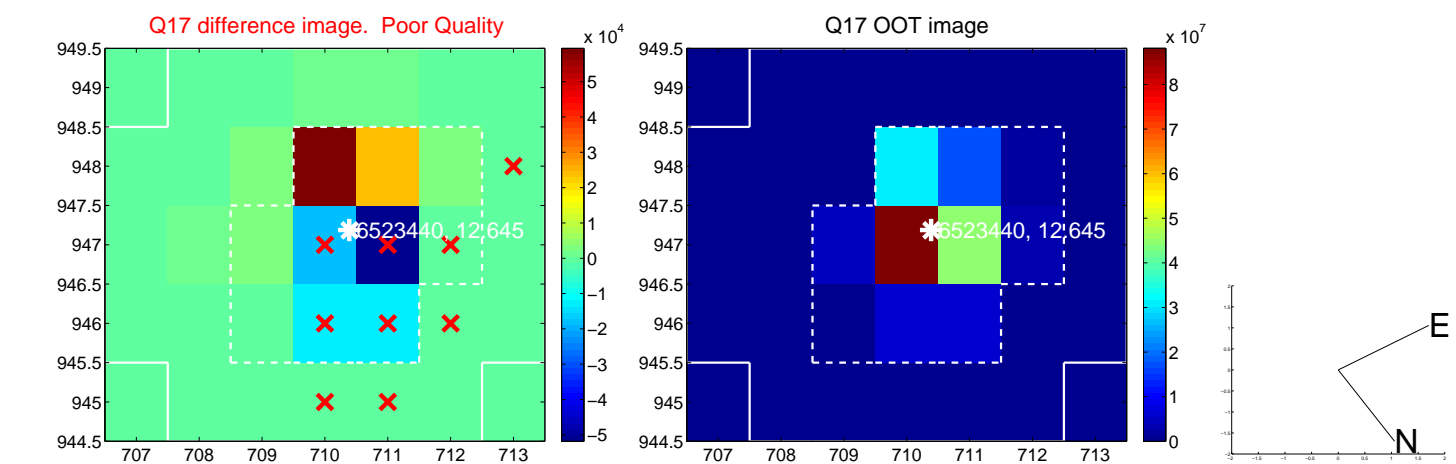
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



UKIRT Image

Declination

