

# KIC 004841314

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004841314-01	OBS	No	2.160461	132.697631	24.8	2.959	8.7	3.5	2.35	6894	1.84	8145.85
004841314-02	OBS	No	2.160728	133.406446	6.9	21.070	9.1	2.3	2.35	6894	0.68	8144.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004841314-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
004841314-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

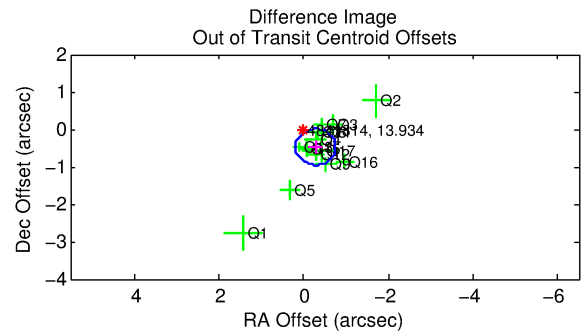
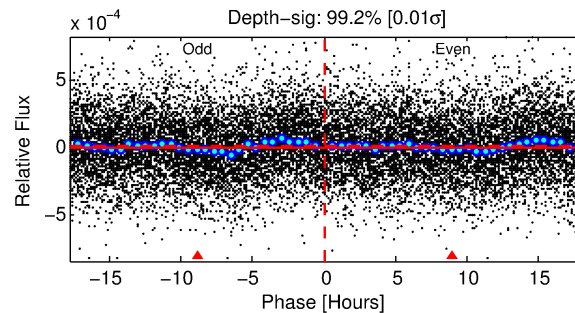
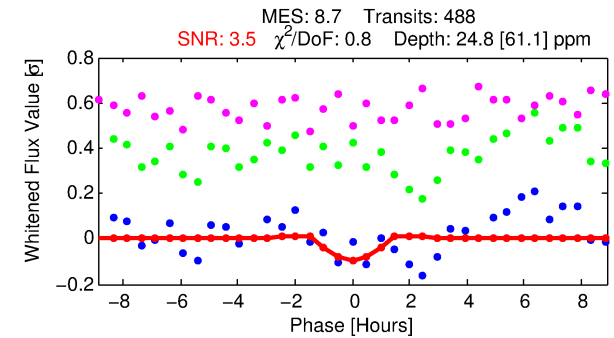
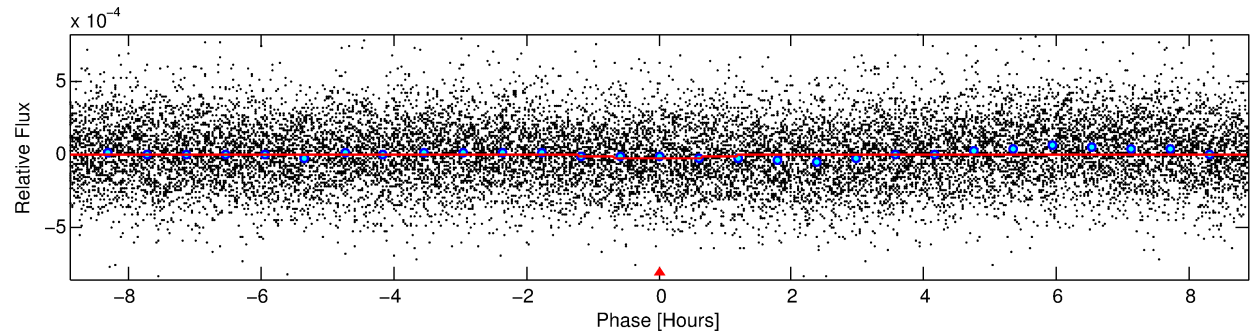
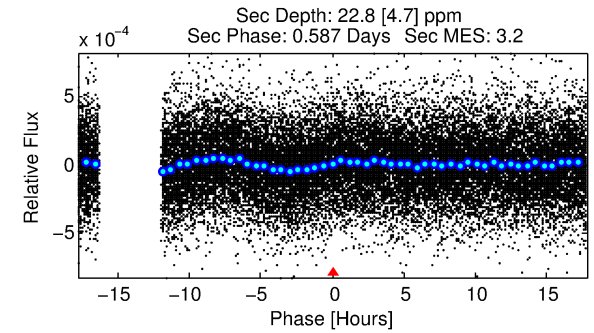
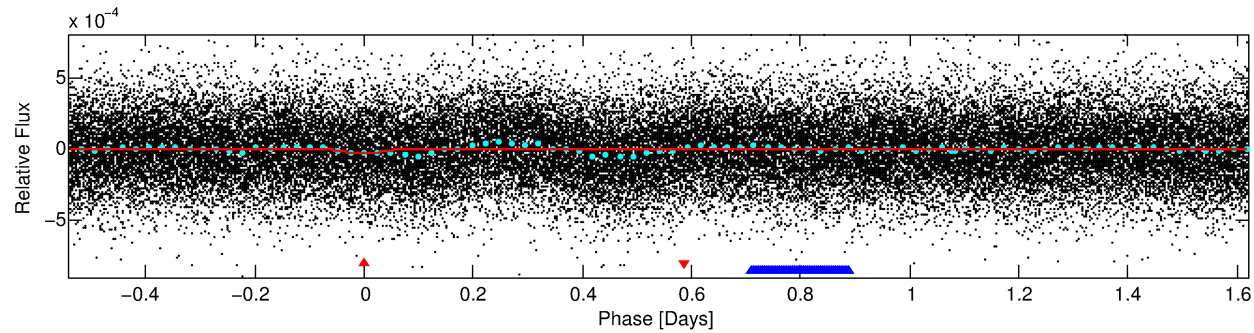
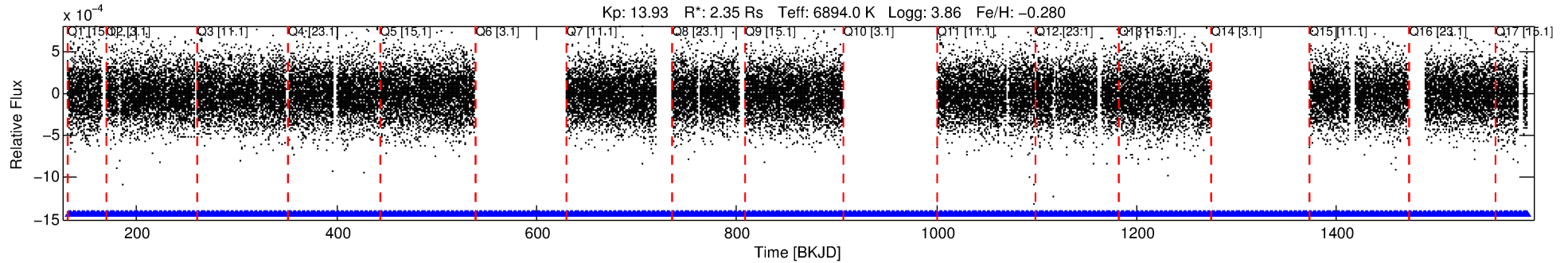
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004841314-01

No Significant Match Found

# DV One-Page Summary

KIC: 4841314 Candidate: 1 of 2 Period: 2.160 d



## DV Fit Results:

Period = 2.16046 [0.00005] d  
Epoch = 132.6976 [0.0117] BKJD  
Rp/R\* = 0.0072 [0.0158]  
a/R\* = 1.30 [0.65]  
b = 1.00 [0.04]  
Seff = 8145.85 [5584.92]  
Teff = 2422 [415] K  
Rp = 1.84 [4.12] Re  
a = 0.0370 [0.0153] AU  
Ag = 5.08 [22.65] [0.18σ]  
Teffp = 5623 [6203] K [0.51σ]

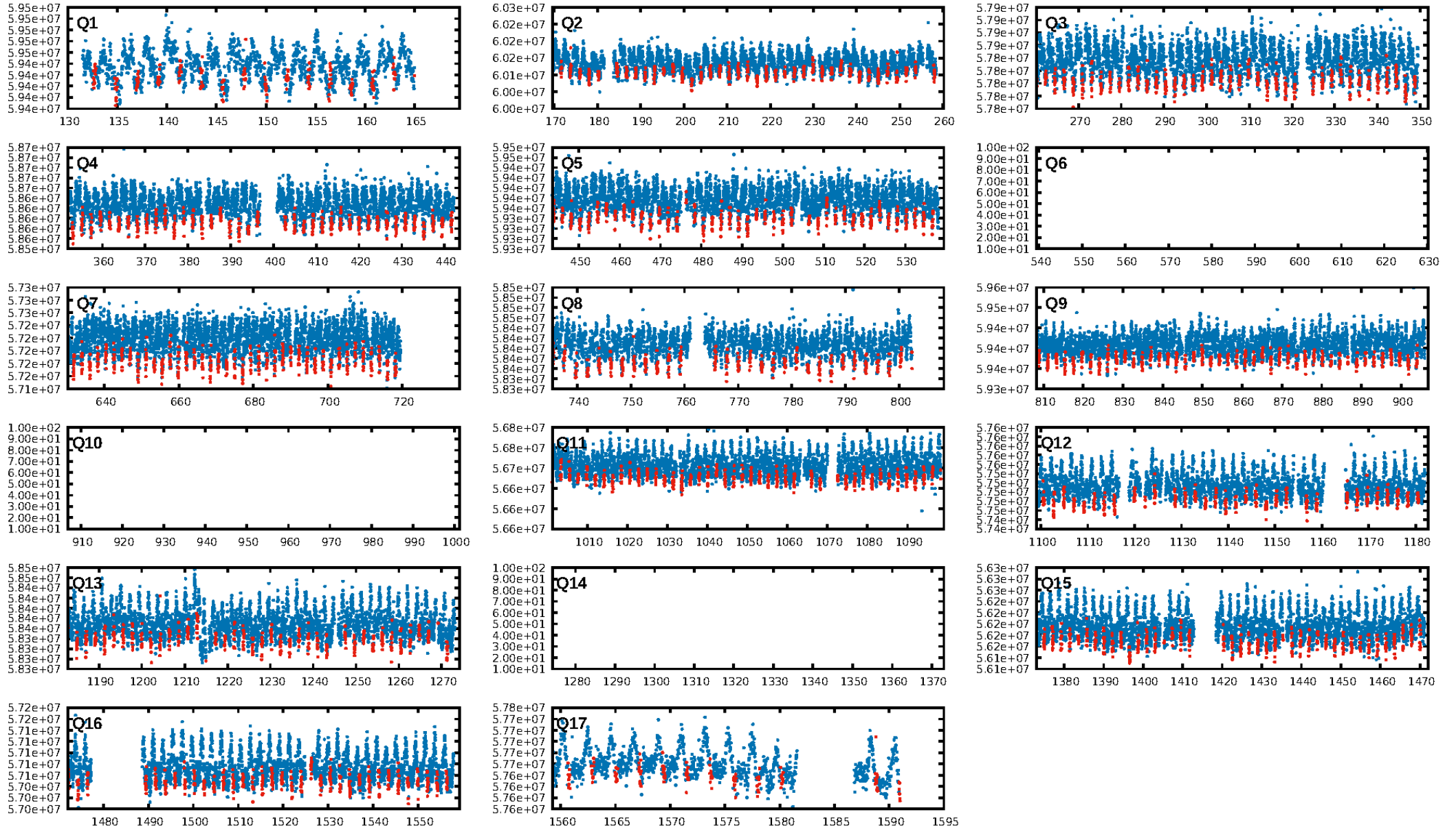
## DV Diagnostic Results:

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 [461/461]  
GhostDiagnostic-chr: 0.5817  
Centroid-sig: 0.0%  
Centroid-so: 14.171 arcsec [4.82σ]  
OotOffset-rm: 0.552 arcsec [3.46σ]  
KicOffset-rm: 0.104 arcsec [0.39σ]  
OotOffset-st: 1/4/4/5 [14]  
KicOffset-st: 1/4/4/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 0.71 [10/14]

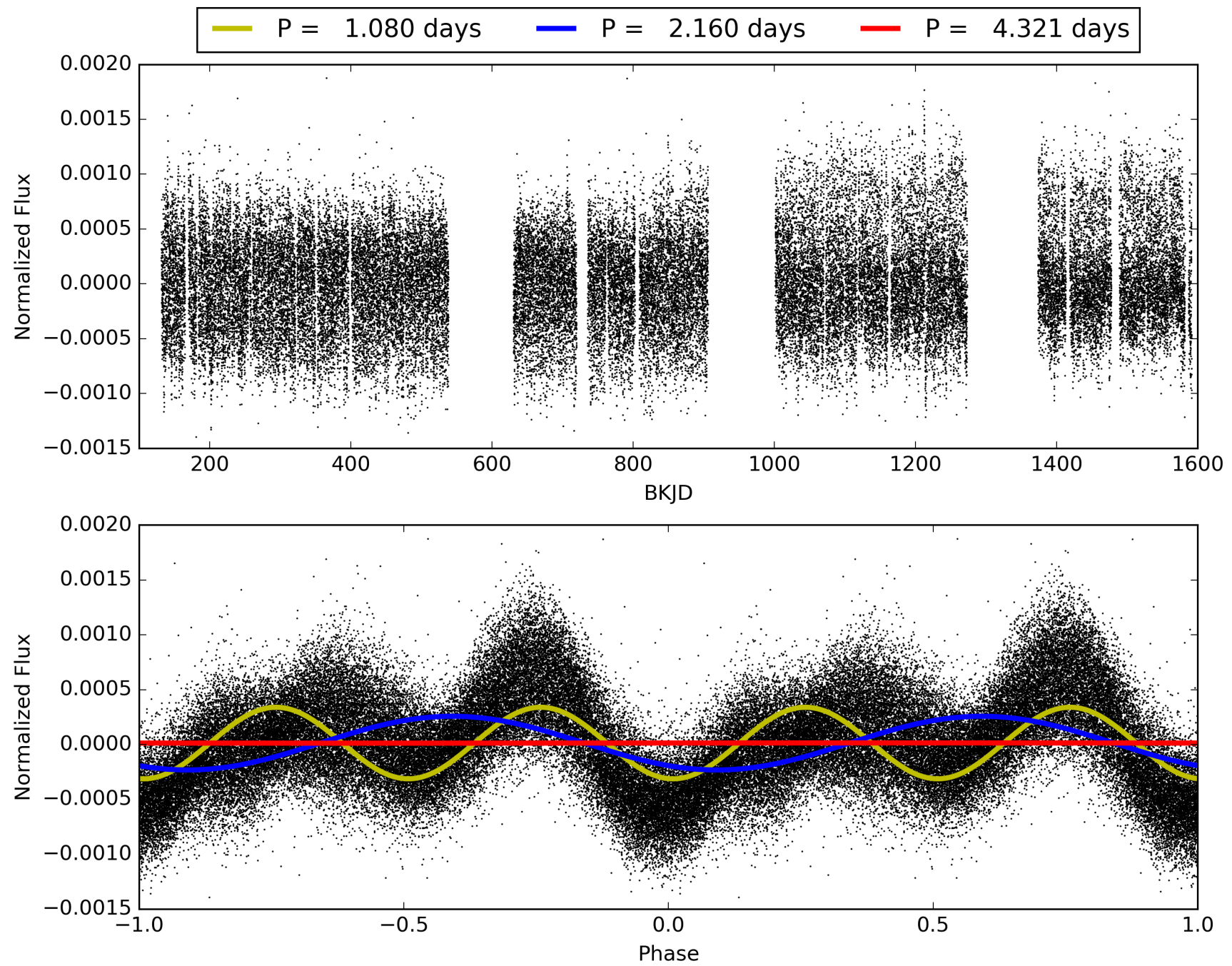
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:56:55 Z

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

# TCE 004841314-01, PDC Light Curves



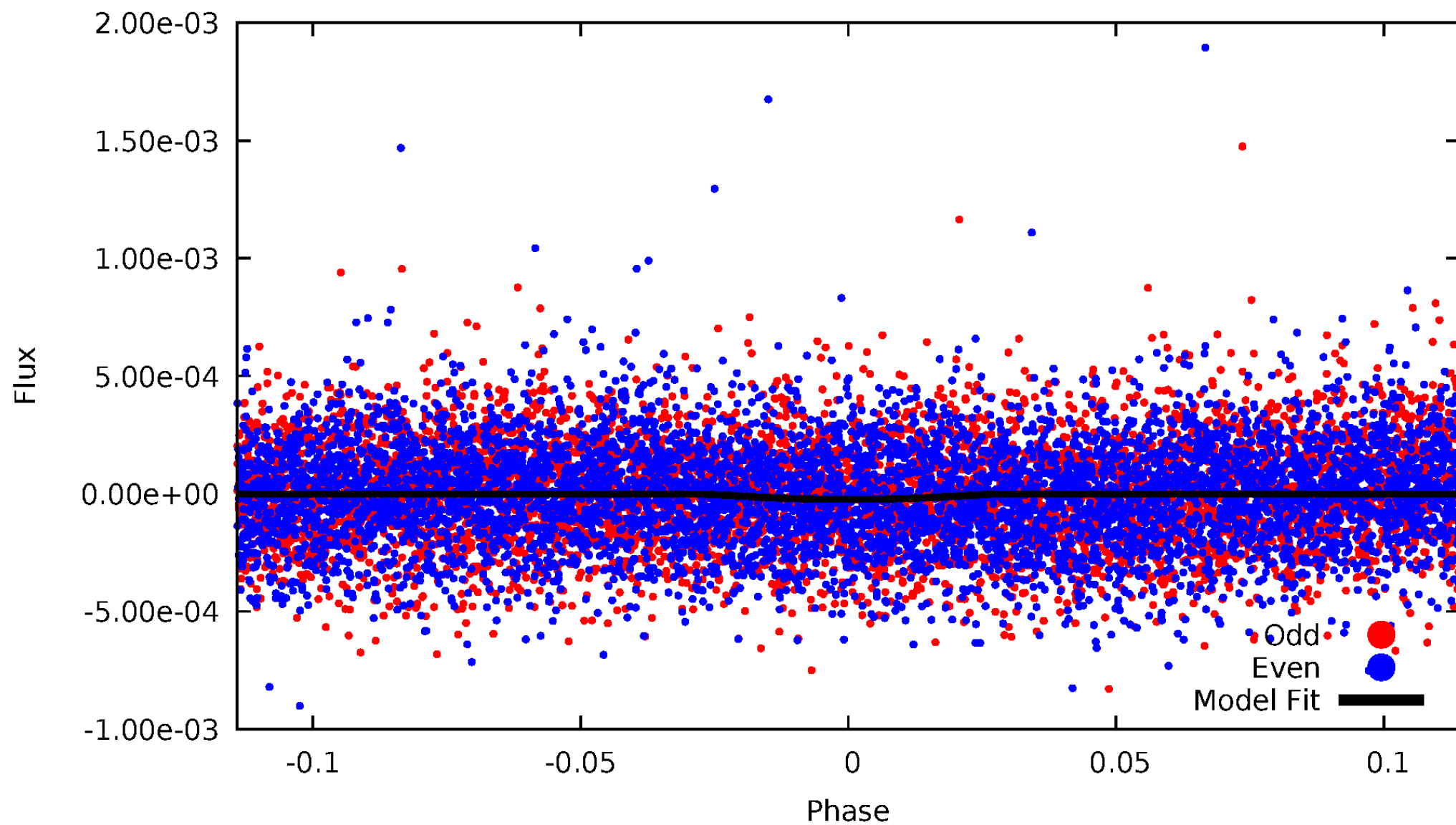
TCE 004841314-01





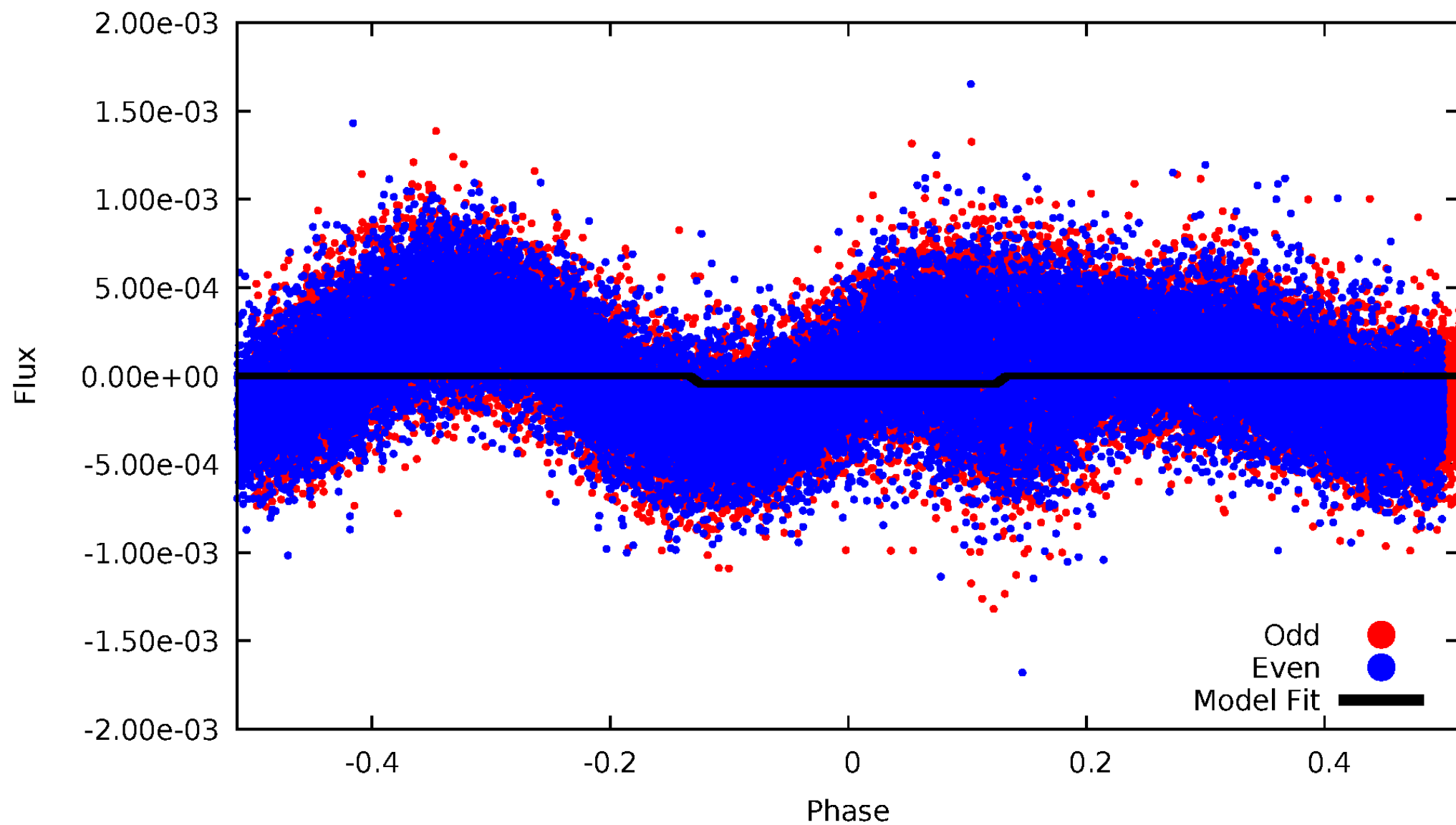
# DV Odd/Even

TCE 004841314-01

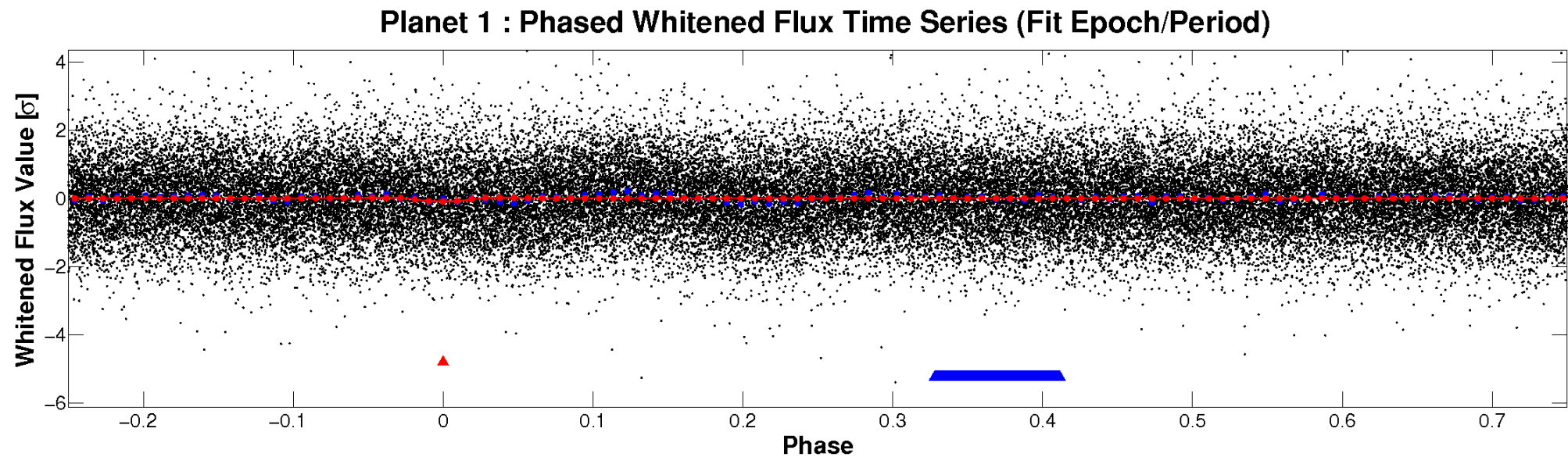
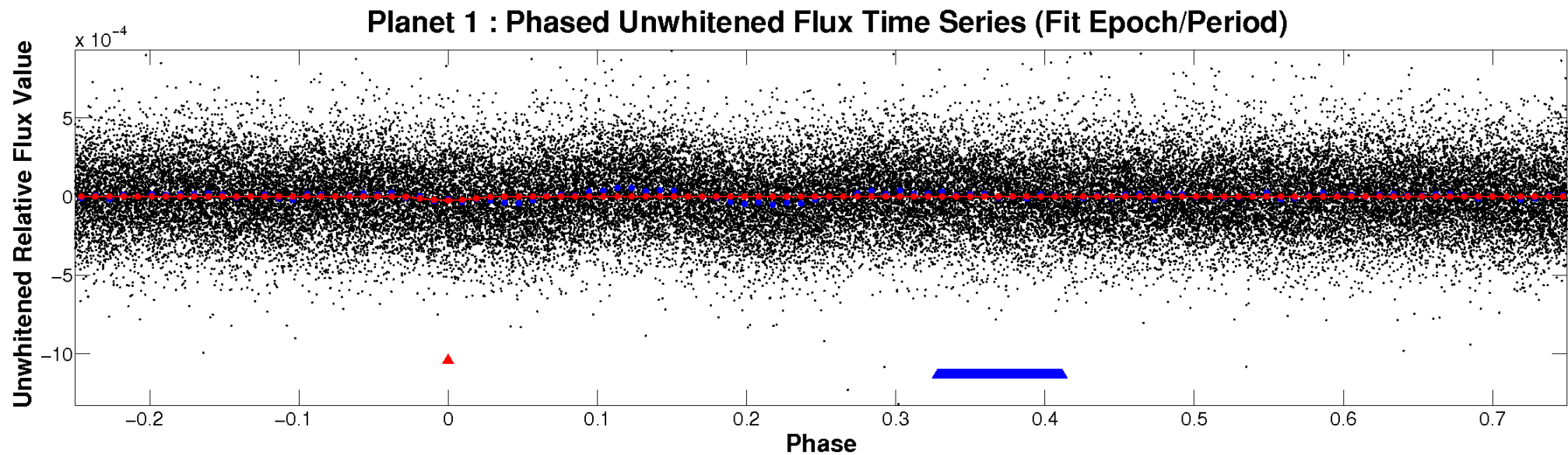


# ALT Odd/Even

TCE 004841314-01

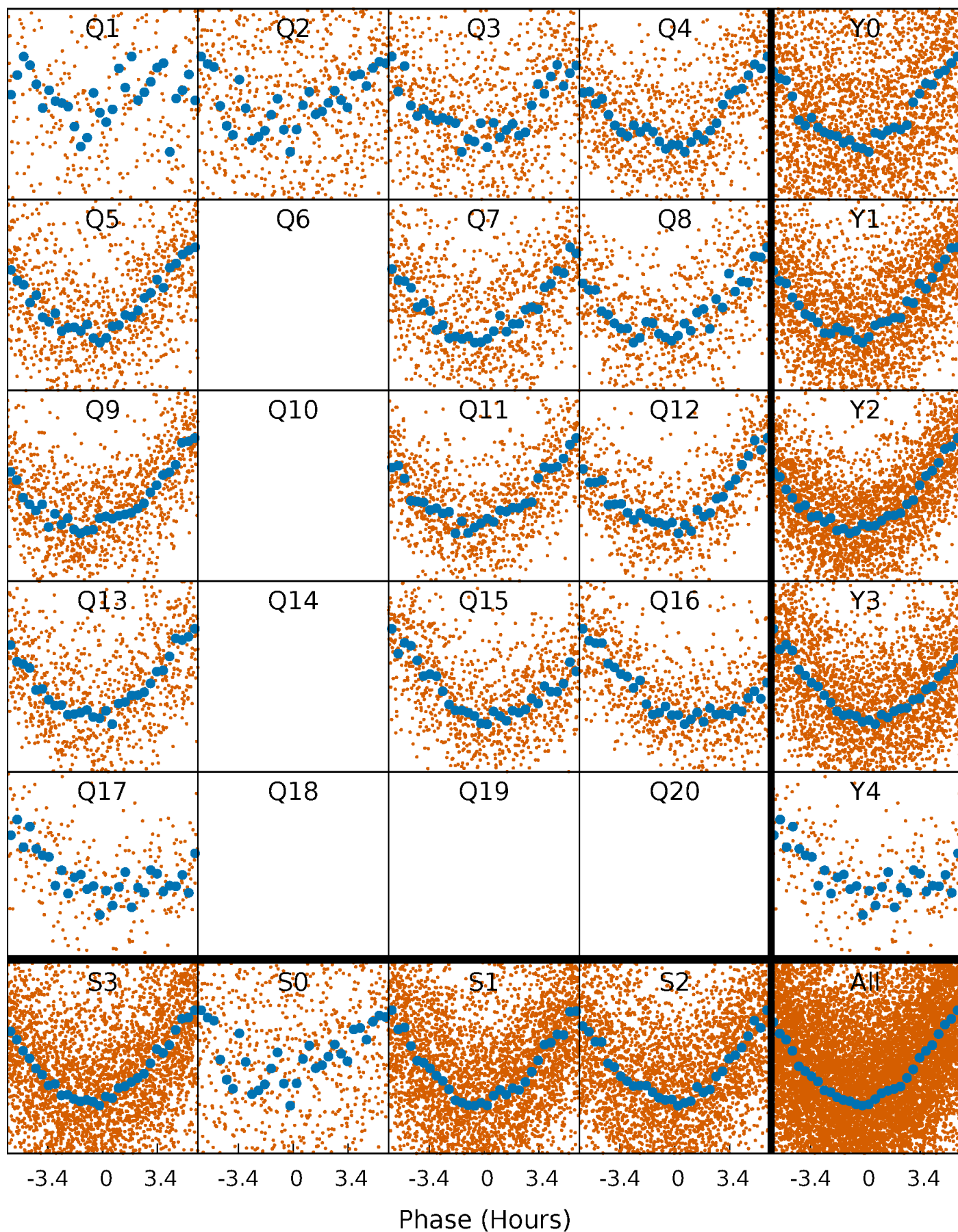


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

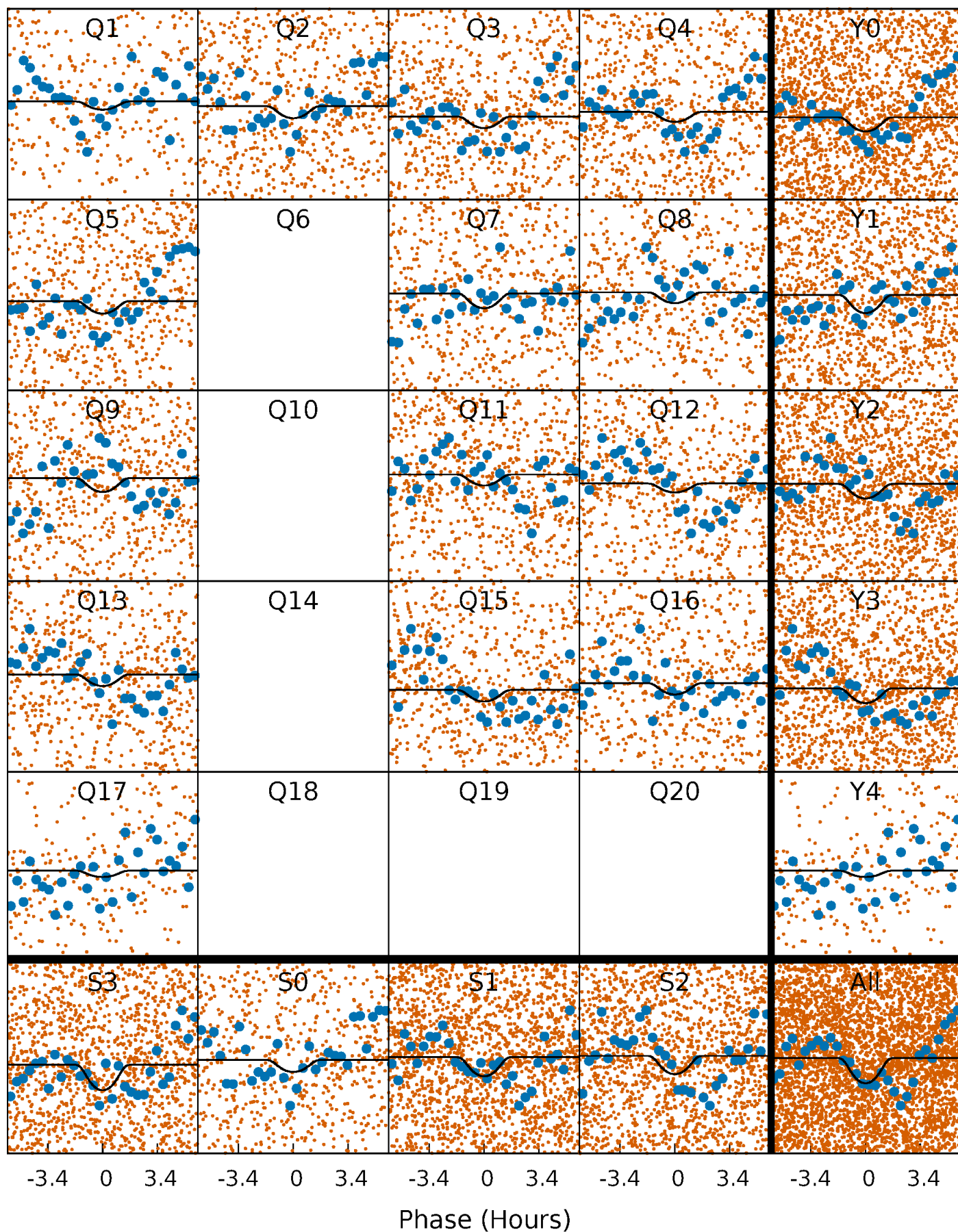
TCE 004841314-01 P= 2.160461 Days  $T_0=132.697631$  (BKJD)





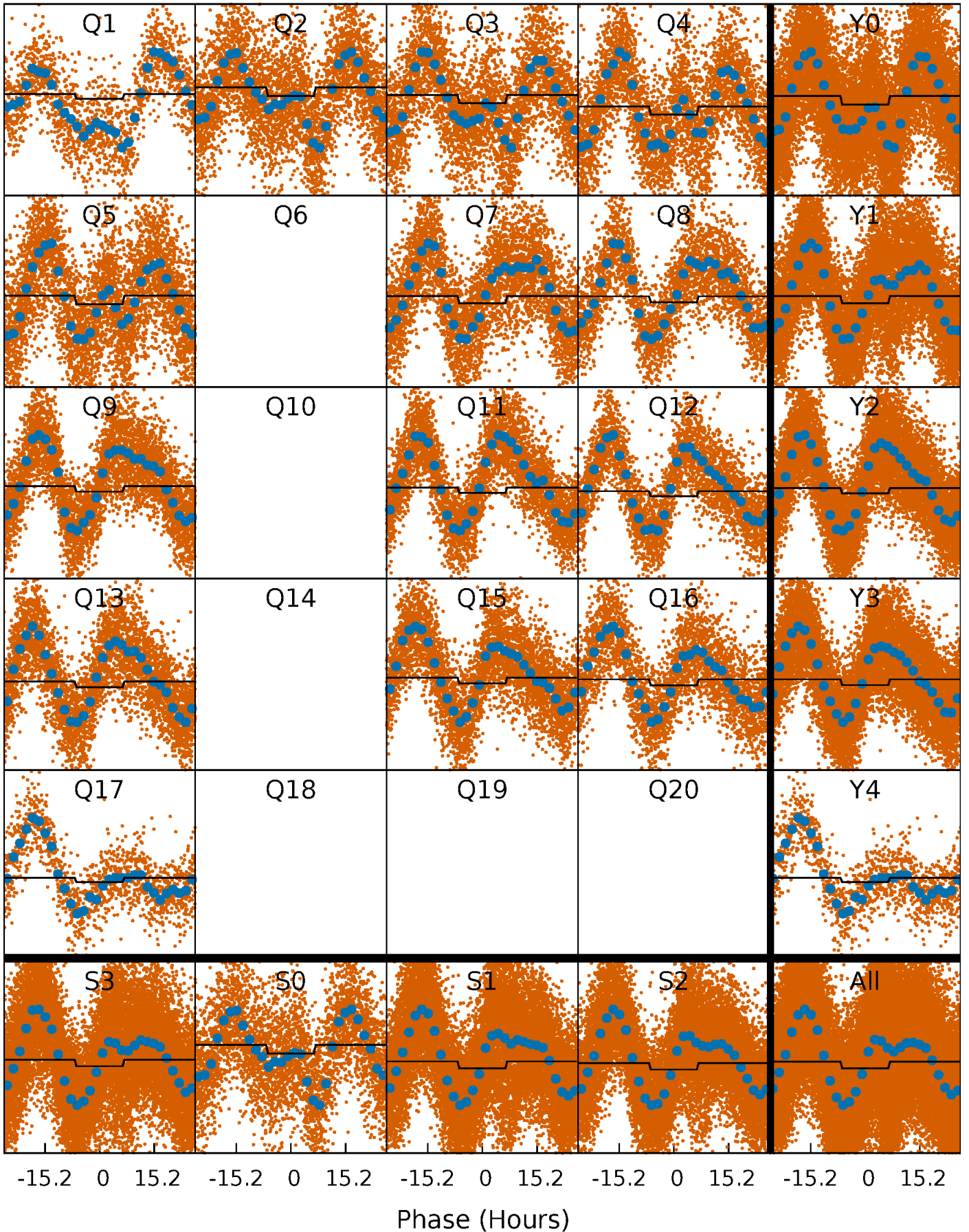
# DV Quarter-Phased Transit Curves

TCE 004841314-01 P= 2.160461 Days  $T_0=132.697631$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

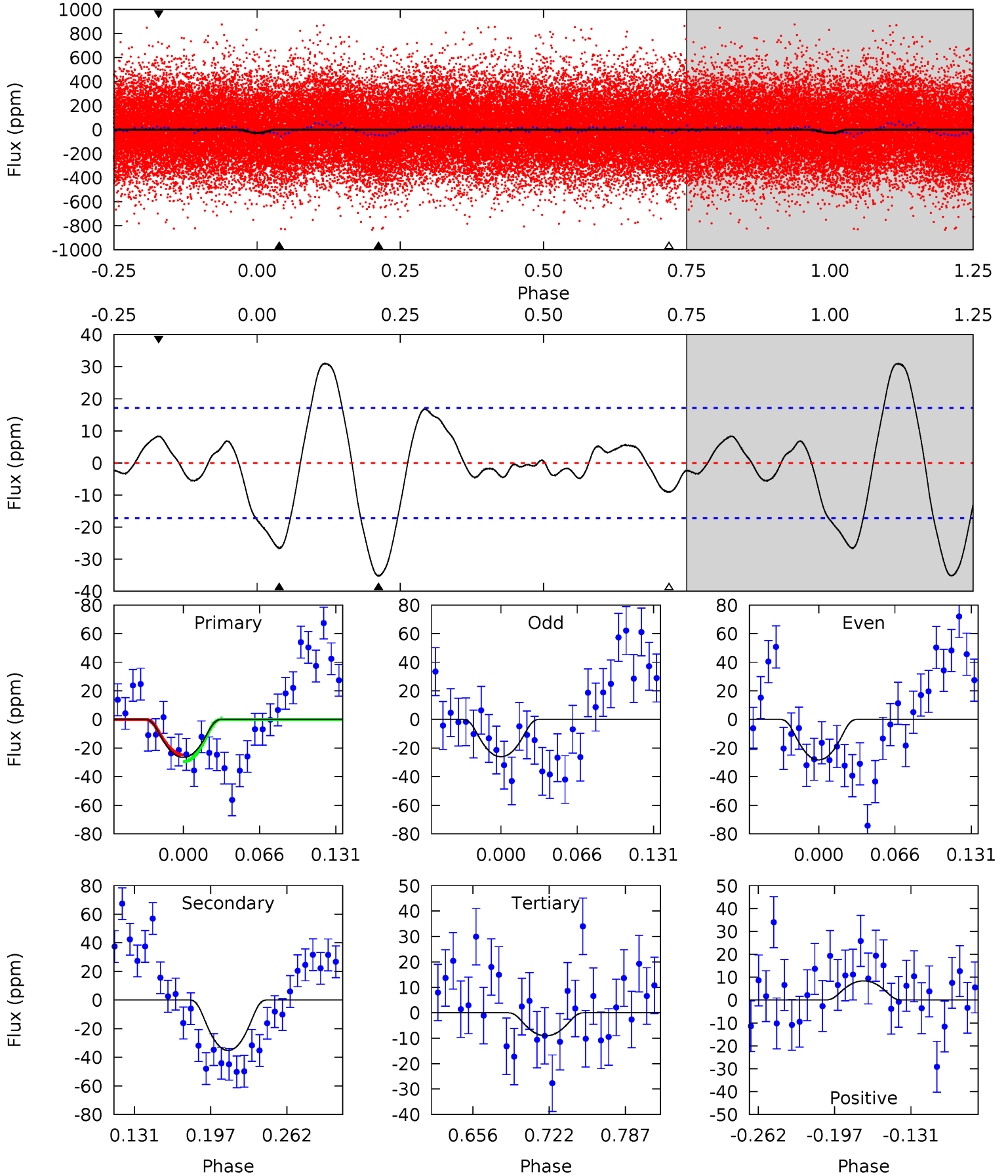
TCE 004841314-01 P= 2.160628 Days  $T_0=132.812289$  (BKJD)



# DV Model-Shift Uniqueness Test

004841314-01, P = 2.160461 Days, E = 130.537170 Days

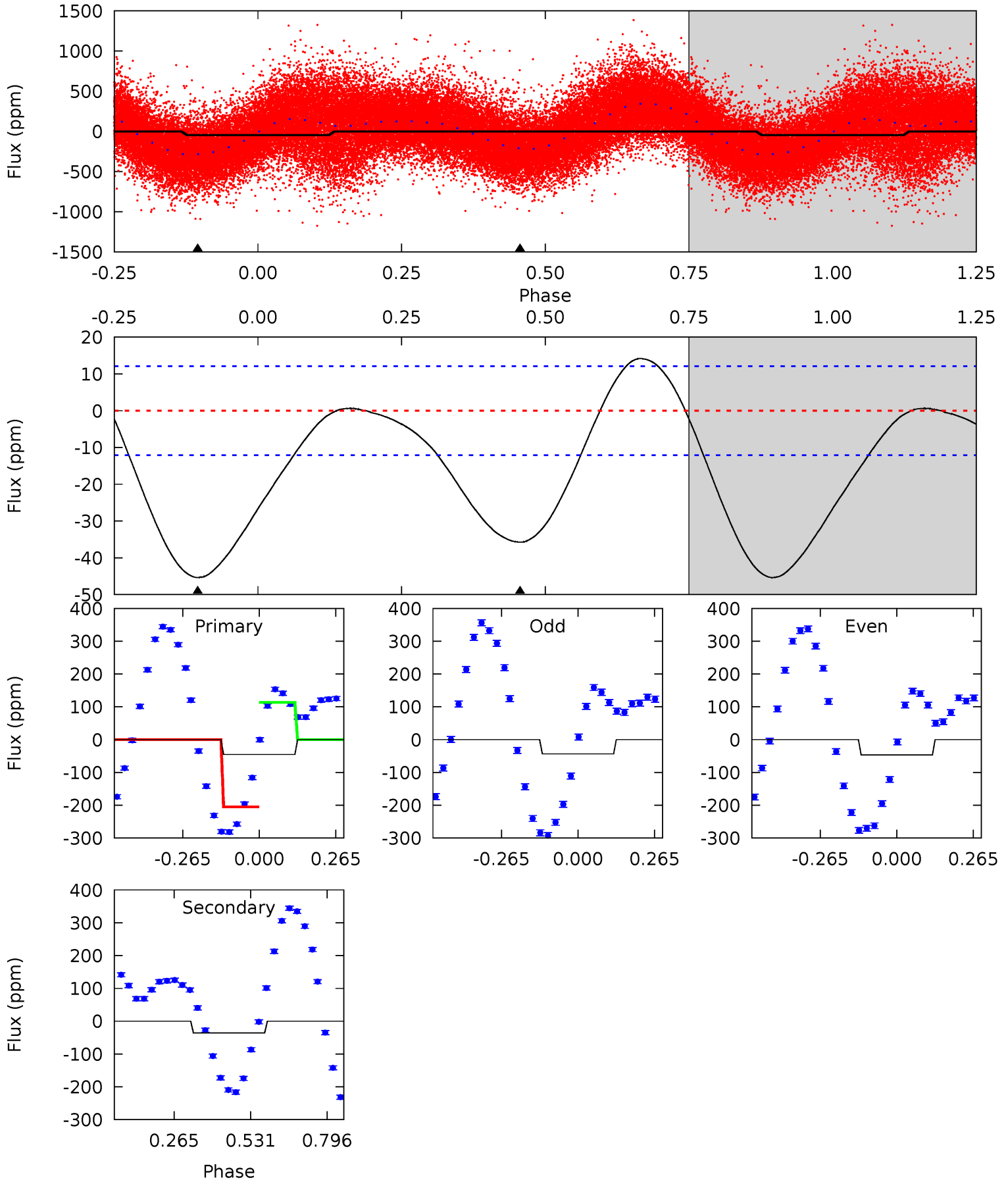
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.20	9.54	2.46	2.27	4.65	1.84	2.27	4.75	4.93	7.08	7.27	0.30	1.12	0.47	0.64



# Alt Model-Shift Uniqueness Test

004841314-01, P = 2.160628 Days, E = 130.651661 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
16.3	12.9	0	0	4.36	1.11	0.26	16.3	16.3	12.9	12.9	0.59	1.23	0.24	17.8





### Stellar Parameters For KIC 004841314

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6894^{+217}_{-299}$	$3.857^{+0.390}_{-0.130}$	$-0.280^{+0.300}_{-0.300}$	$2.346^{+0.541}_{-1.005}$	$1.442^{+0.205}_{-0.308}$	$0.157^{+0.512}_{-0.059}$
	+3%/-4%	+10%/-3%	+107%/-107%	+23%/-43%	+14%/-21%	+326%/-38%
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 004841314-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-35 \pm 4$	$3.21^{+3.47}_{-2.24}$	$3282^{+279}_{-356}$	$4464^{+3494}_{-1242}$	$2.503^{+22.979}_{-1.933}$
Alt.	$-36 \pm 3$	$3.07^{+3.27}_{-2.19}$	$3291^{+262}_{-316}$	$4649^{+4286}_{-1335}$	$2.857^{+30.559}_{-2.209}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature  
 $T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )  
 $A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

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

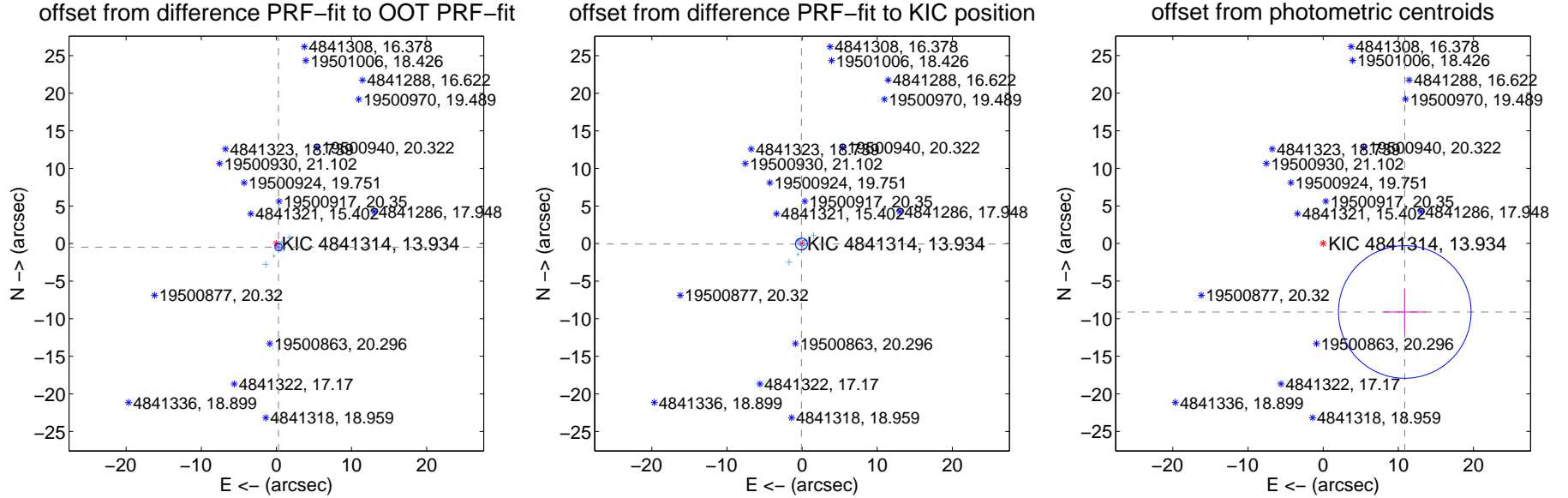
## DV Centroid Data

Supplemental centroid analysis for 004841314-01. Kepler magnitude: 13.93. Transit SNR 3.46

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.44 arcsec

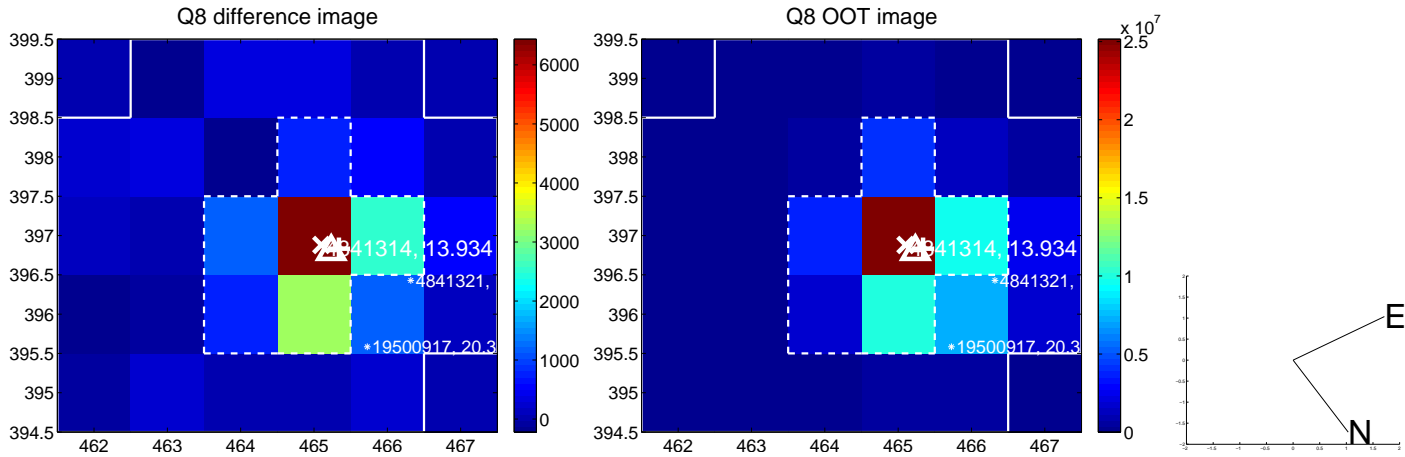
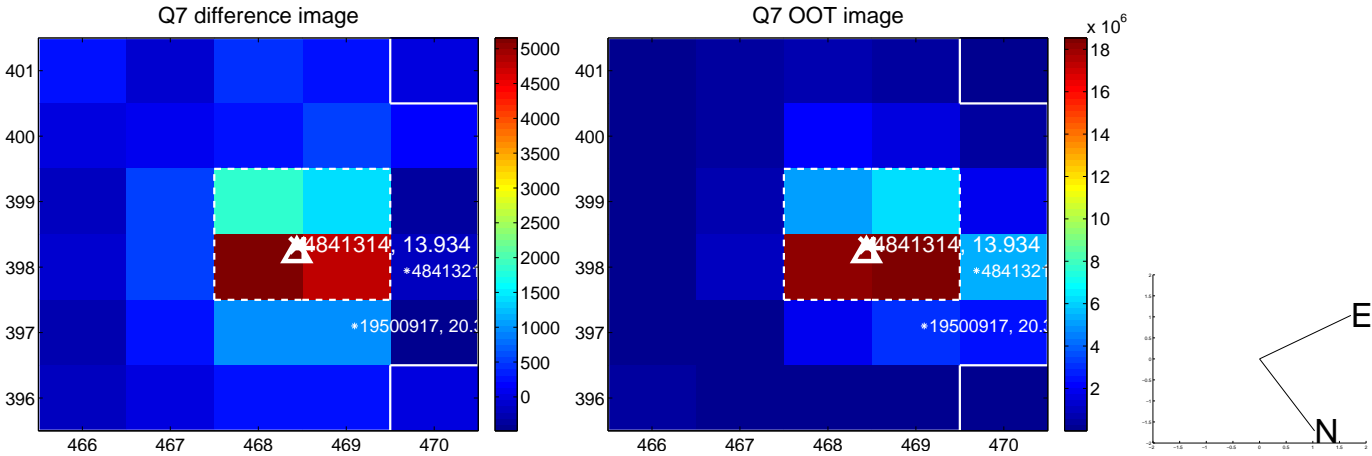
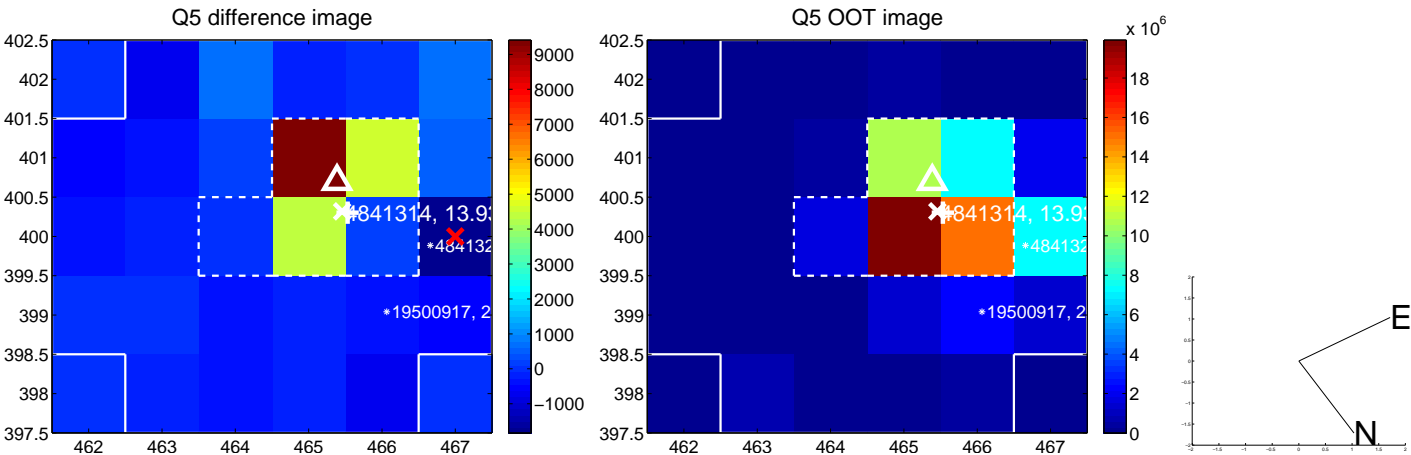
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.552 \pm 0.159$	3.46	$-0.281 \pm 0.157$	$-0.475 \pm 0.160$
PRF-fit source offset from KIC position	$0.104 \pm 0.263$	0.39	$0.084 \pm 0.197$	$-0.061 \pm 0.221$
photometric centroid source offset	$14.17 \pm 2.94$	4.82	$-10.86 \pm 2.84$	$-9.10 \pm 3.08$



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.

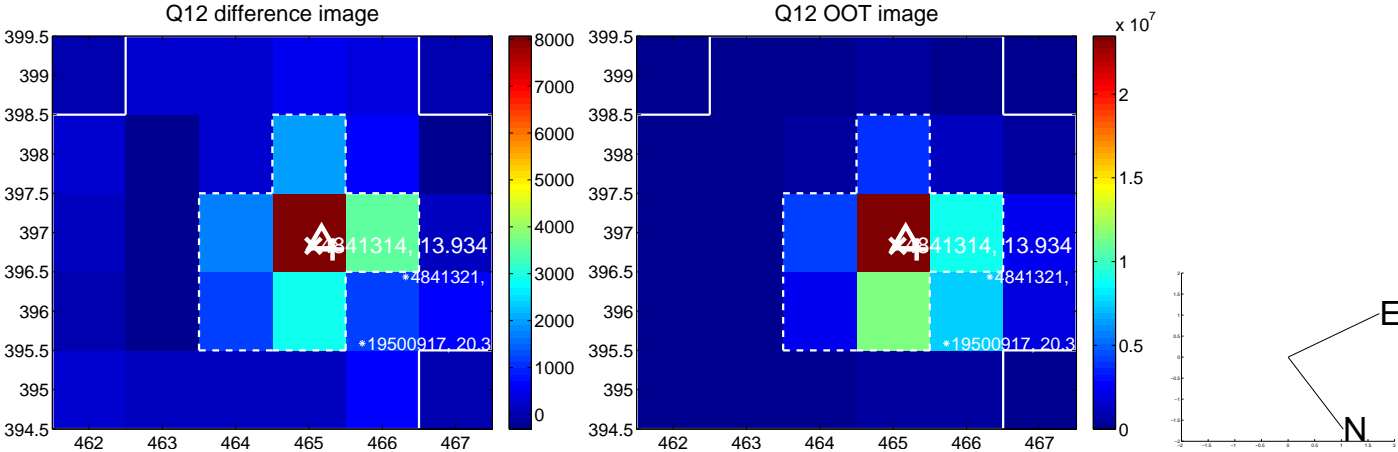
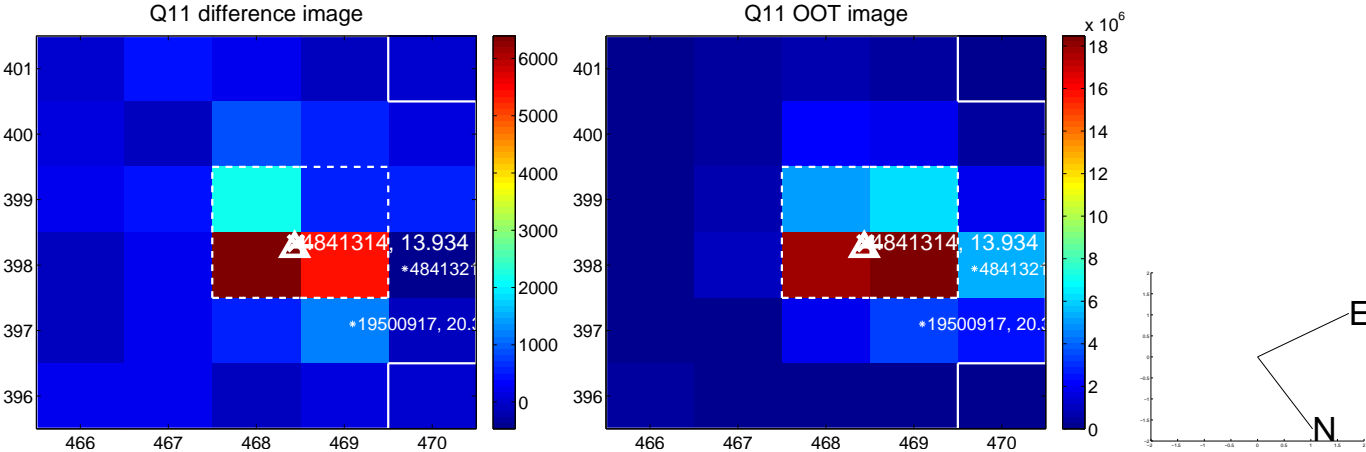
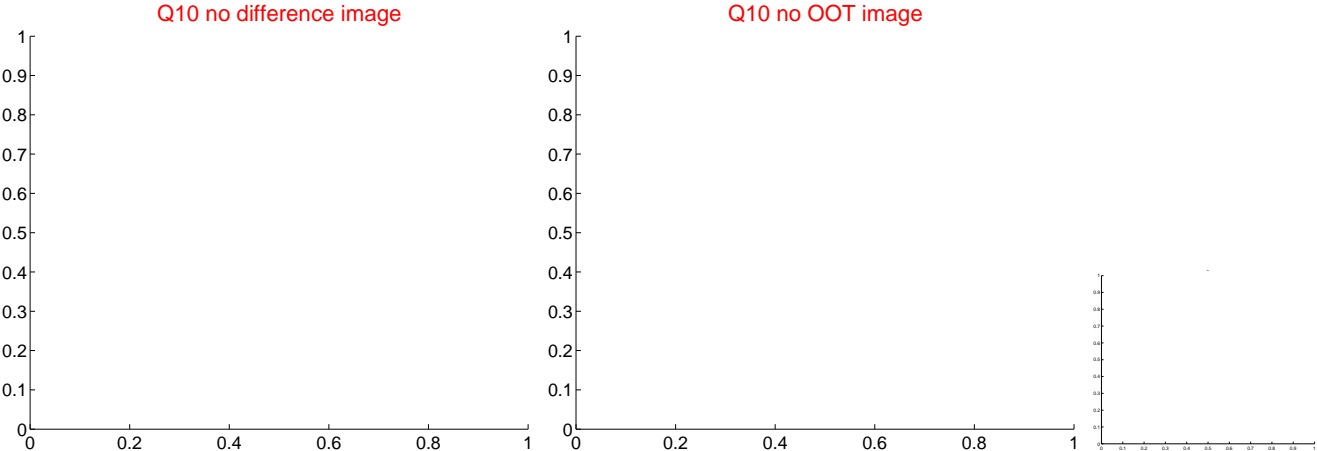
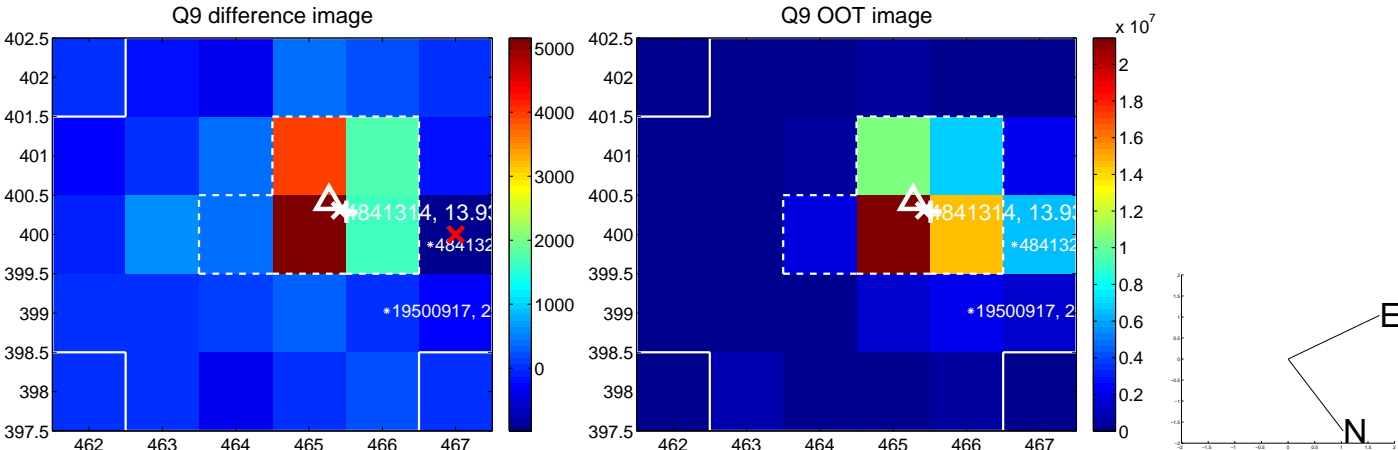


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

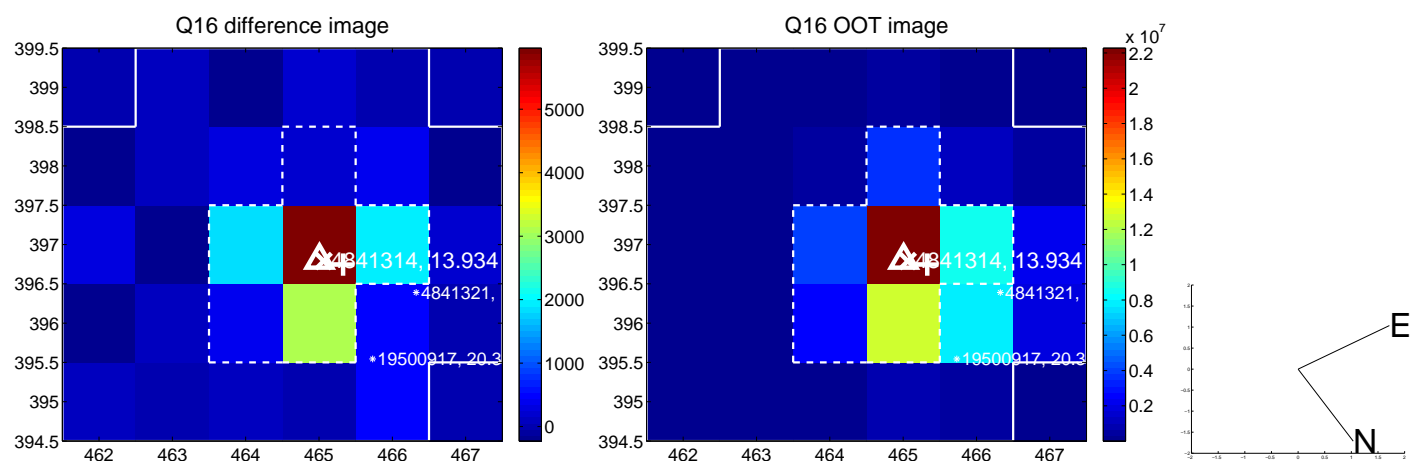
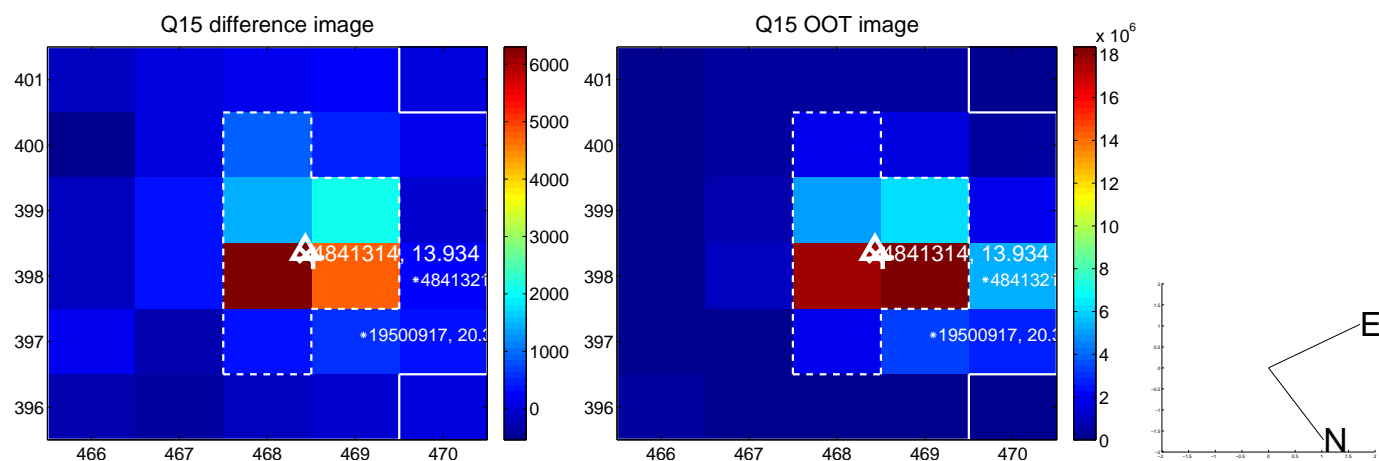
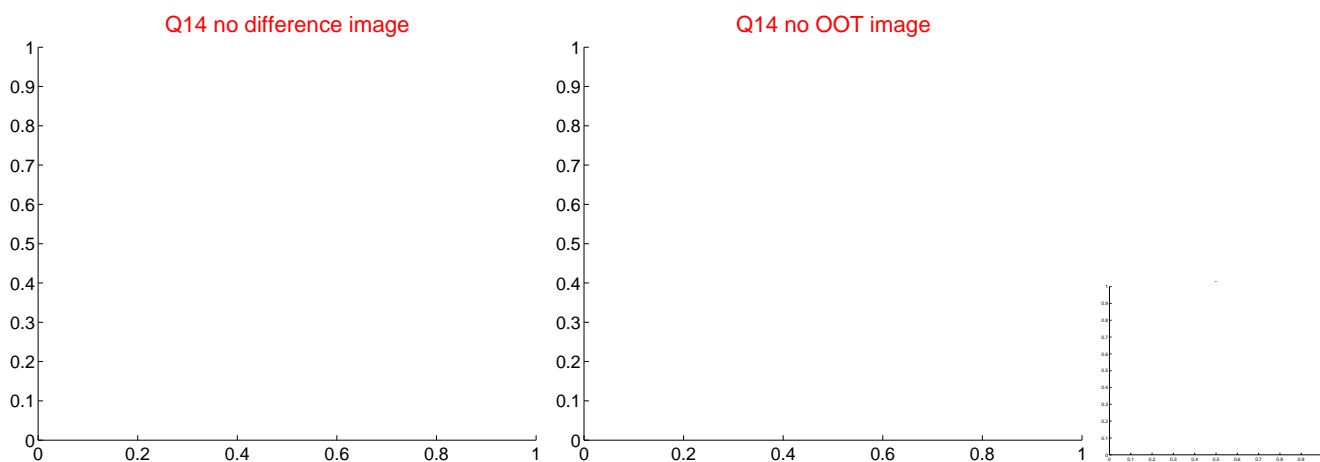
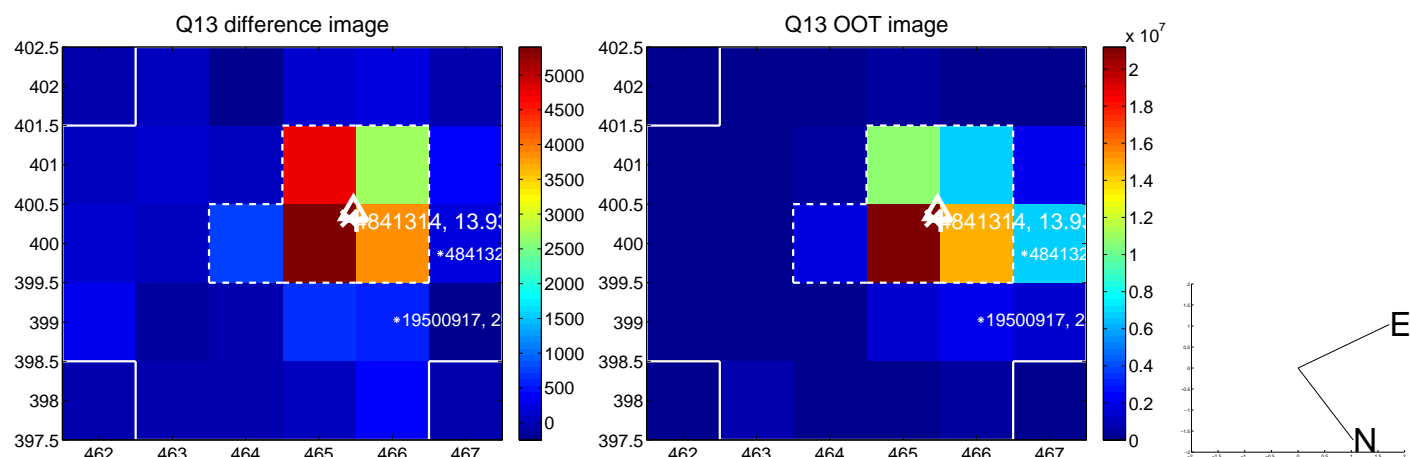




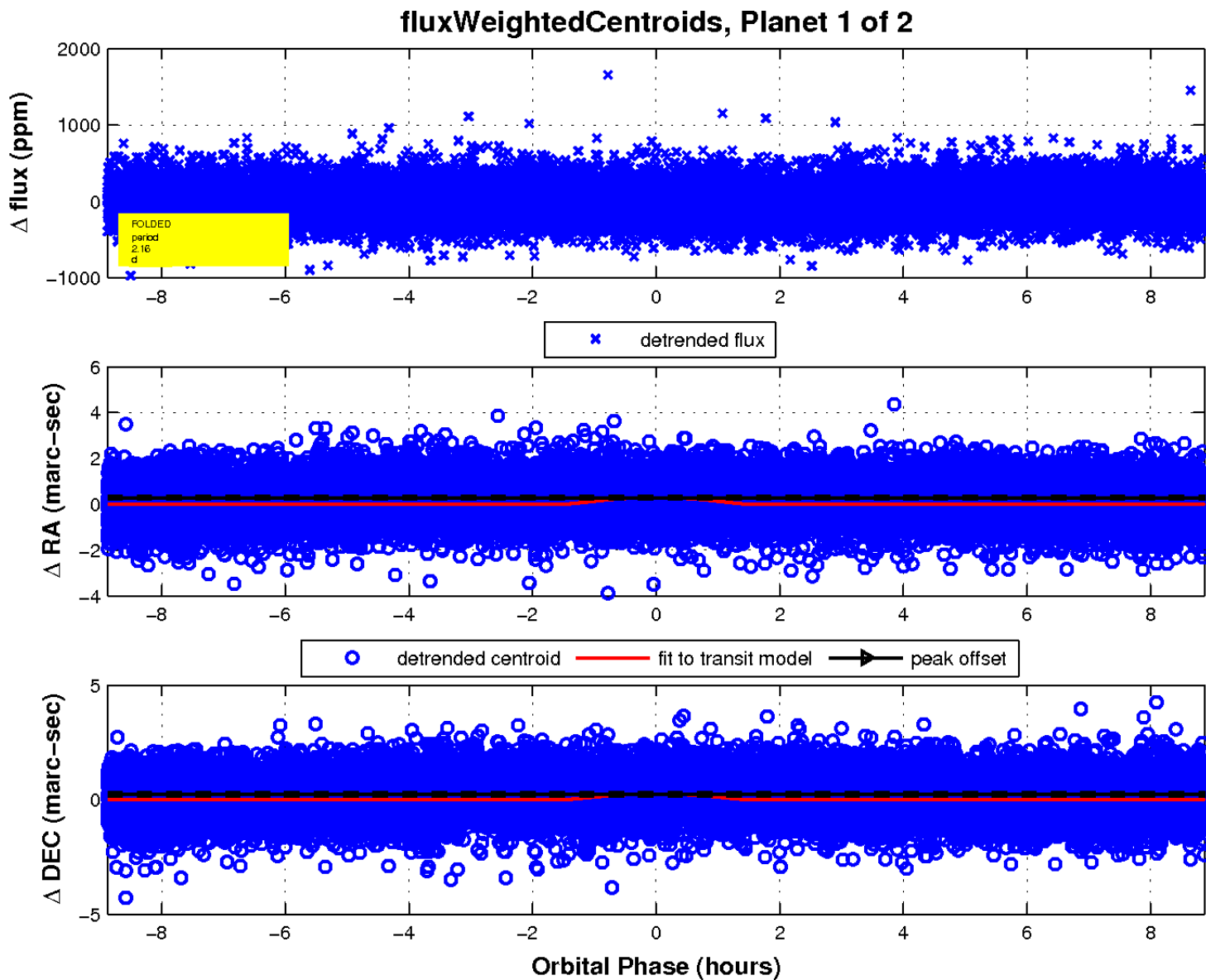
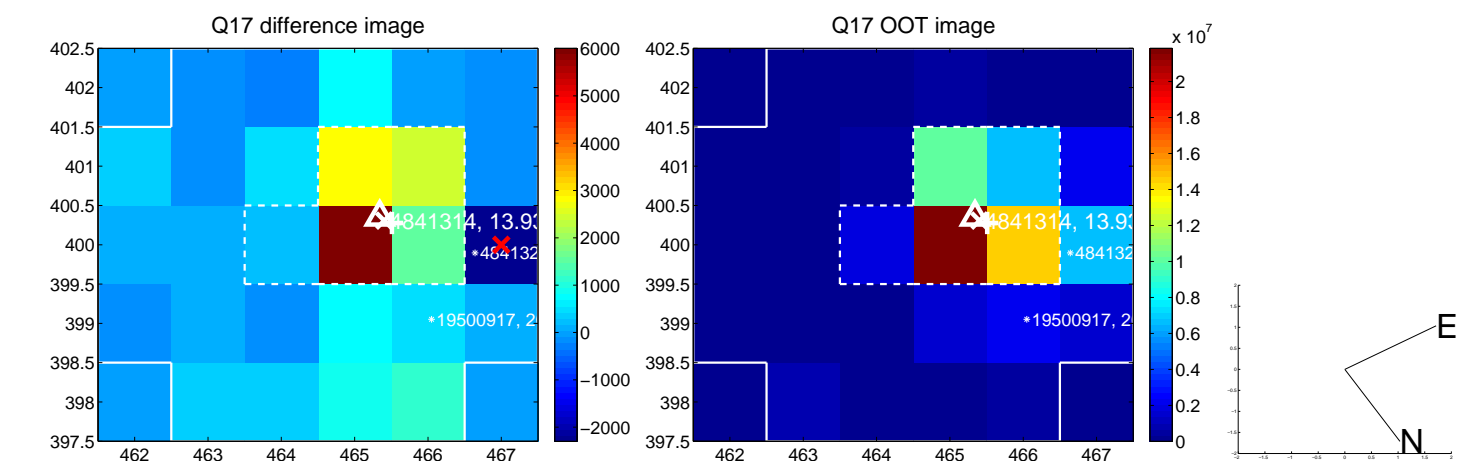
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

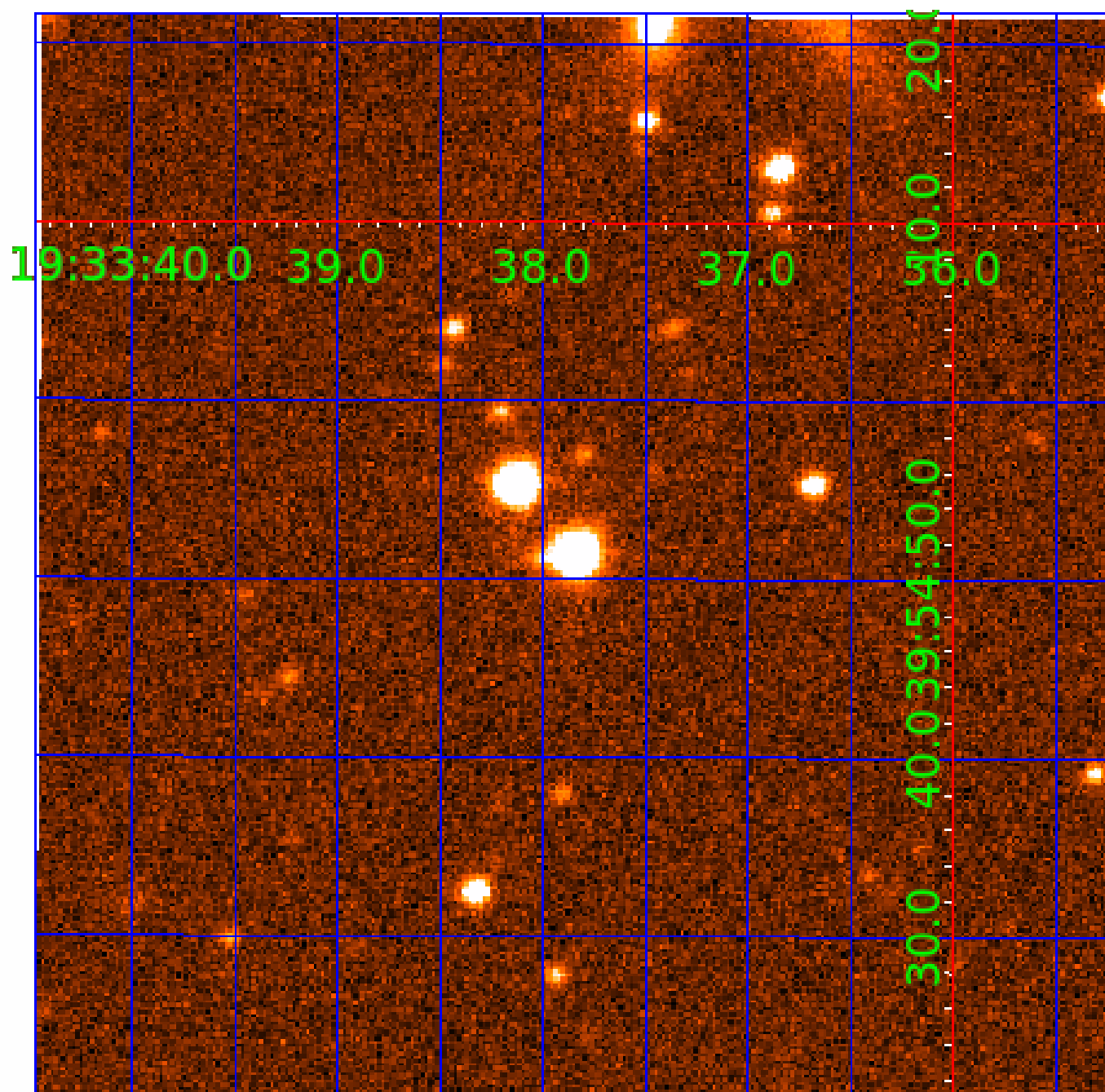


white  $\times$ : KIC target position; +: OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 004841314

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
004841314-01	OBS	No	2.160461	132.697631	24.8	2.959	8.7	3.5	2.35	6894	1.84	8145.85
004841314-02	OBS	No	2.160728	133.406446	6.9	21.070	9.1	2.3	2.35	6894	0.68	8144.50

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004841314-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
004841314-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_DIFFS

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

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

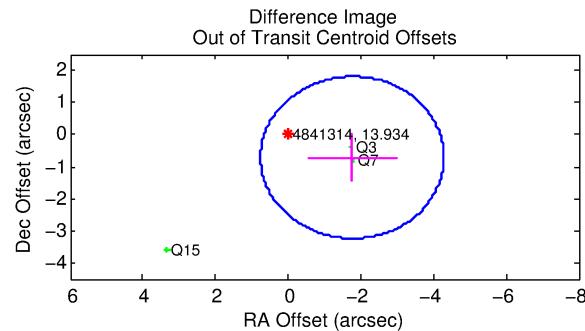
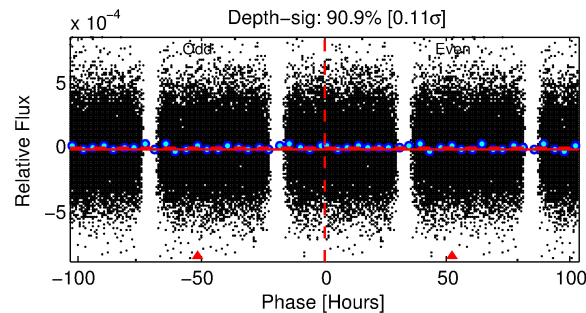
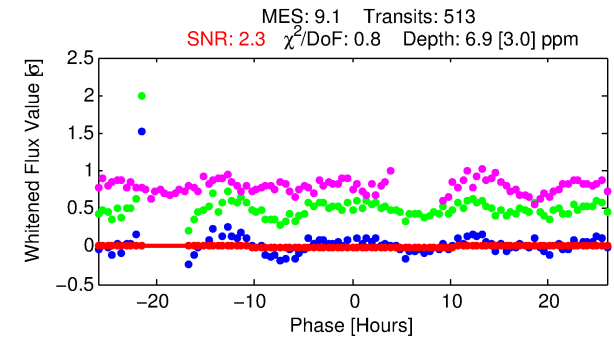
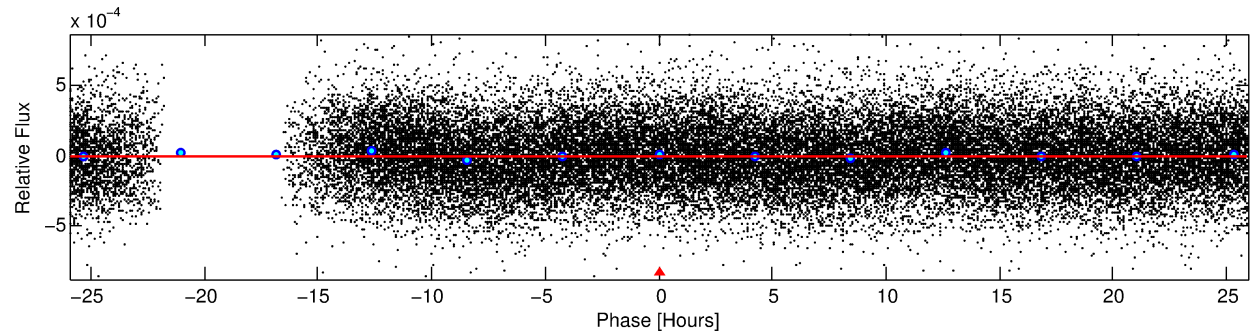
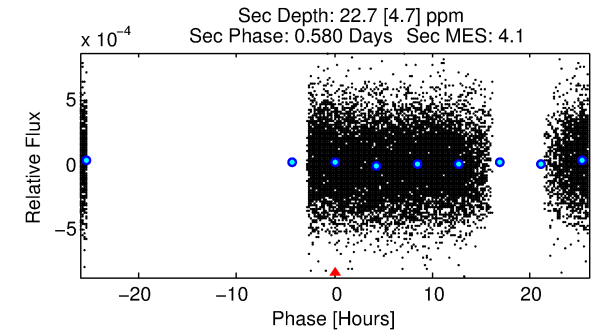
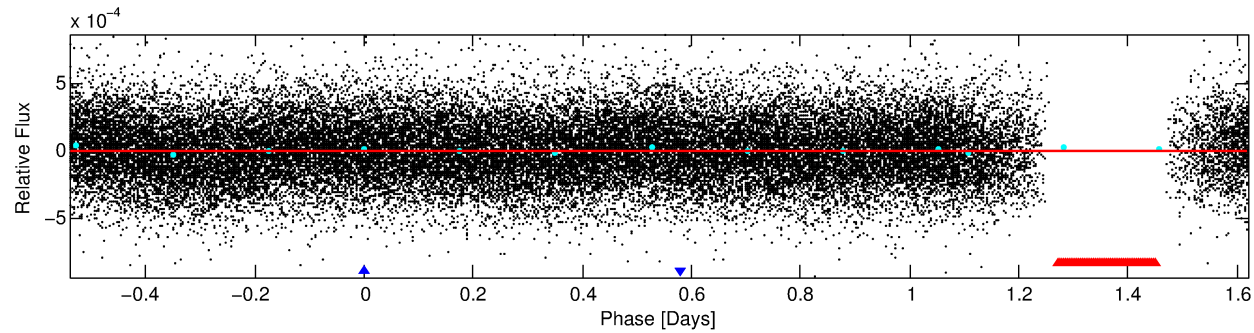
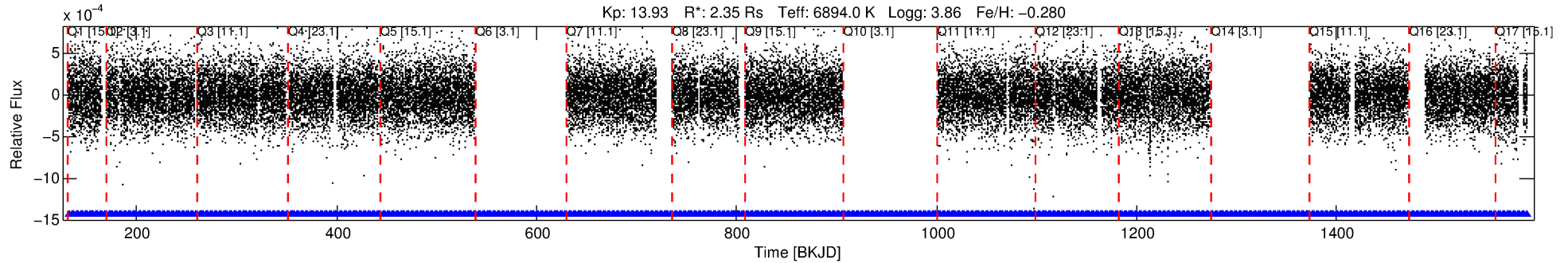
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 004841314-02

No Significant Match Found

# DV One-Page Summary

KIC: 4841314 Candidate: 2 of 2 Period: 2.161 d



## DV Fit Results:

Period = 2.16073 [0.00018] d  
Epoch = 133.4064 [0.0444] BKJD  
Rp/R\* = 0.0027 [0.0047]  
a/R\* = 1.02 [0.41]  
b = 0.80 [4.88]  
Seff = 8144.50 [5584.00]  
Teq = 2422 [415] K  
Rp = 0.68 [1.25] Re  
a = 0.0370 [0.0153] AU  
Ag = 37.02 [134.61] [0.27σ]  
Teffp = 9238 [8267] K [0.82σ]

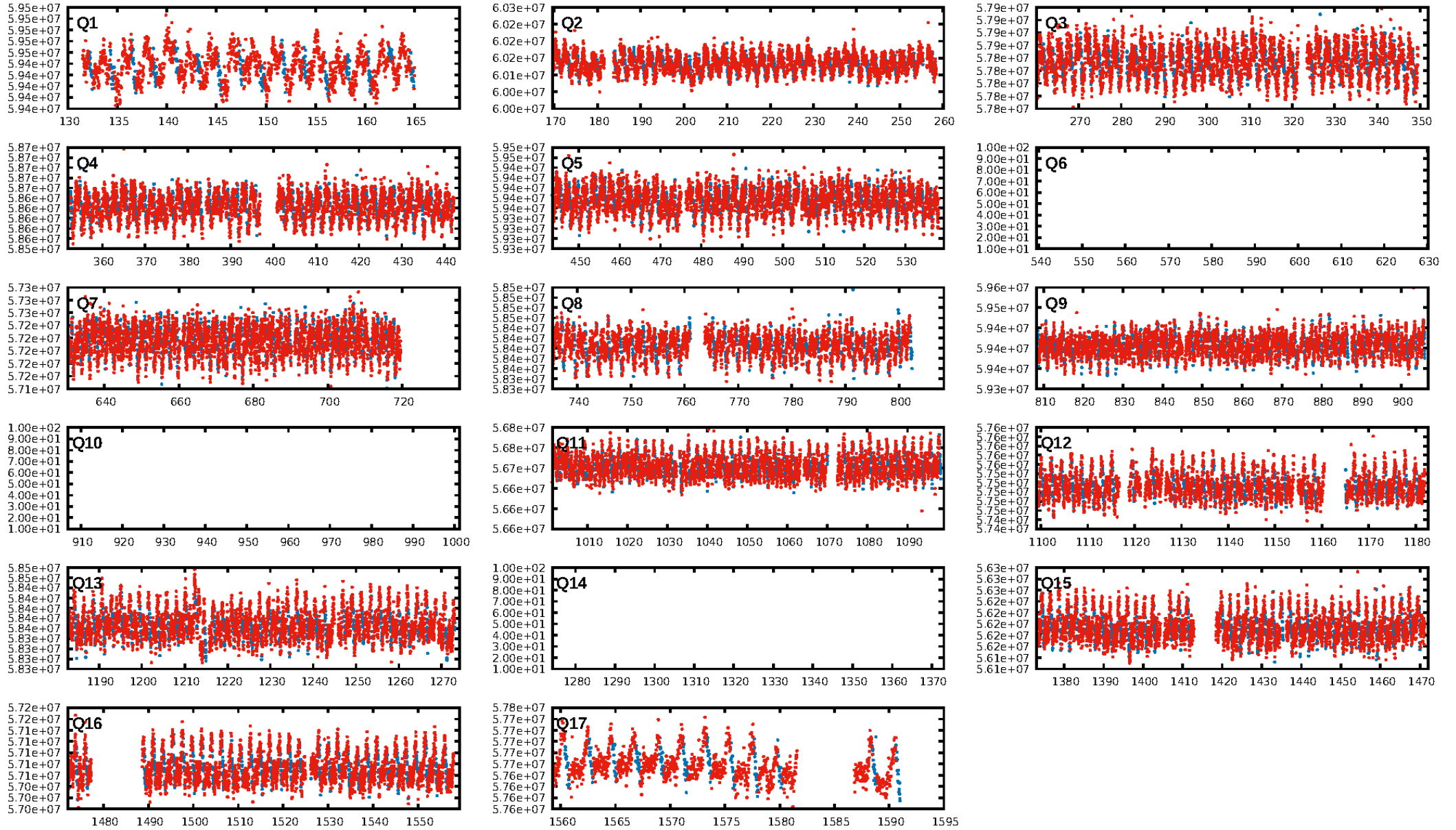
## DV Diagnostic Results:

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 [484/484]  
GhostDiagnostic-chr: 0.4169  
Centroid-sig: 0.0%  
Centroid-so: 16.110 arcsec [4.68σ]  
OotOffset-rm: 1.899 arcsec [2.26σ]  
KicOffset-rm: 1.665 arcsec [1.52σ]  
OotOffset-st: 0/3/0/0 [3]  
KicOffset-st: 0/3/0/0 [3]  
DiffImageQuality-fgm: 0.00 [0/3]  
DiffImageOverlap-fno: 0.00 [0/14]

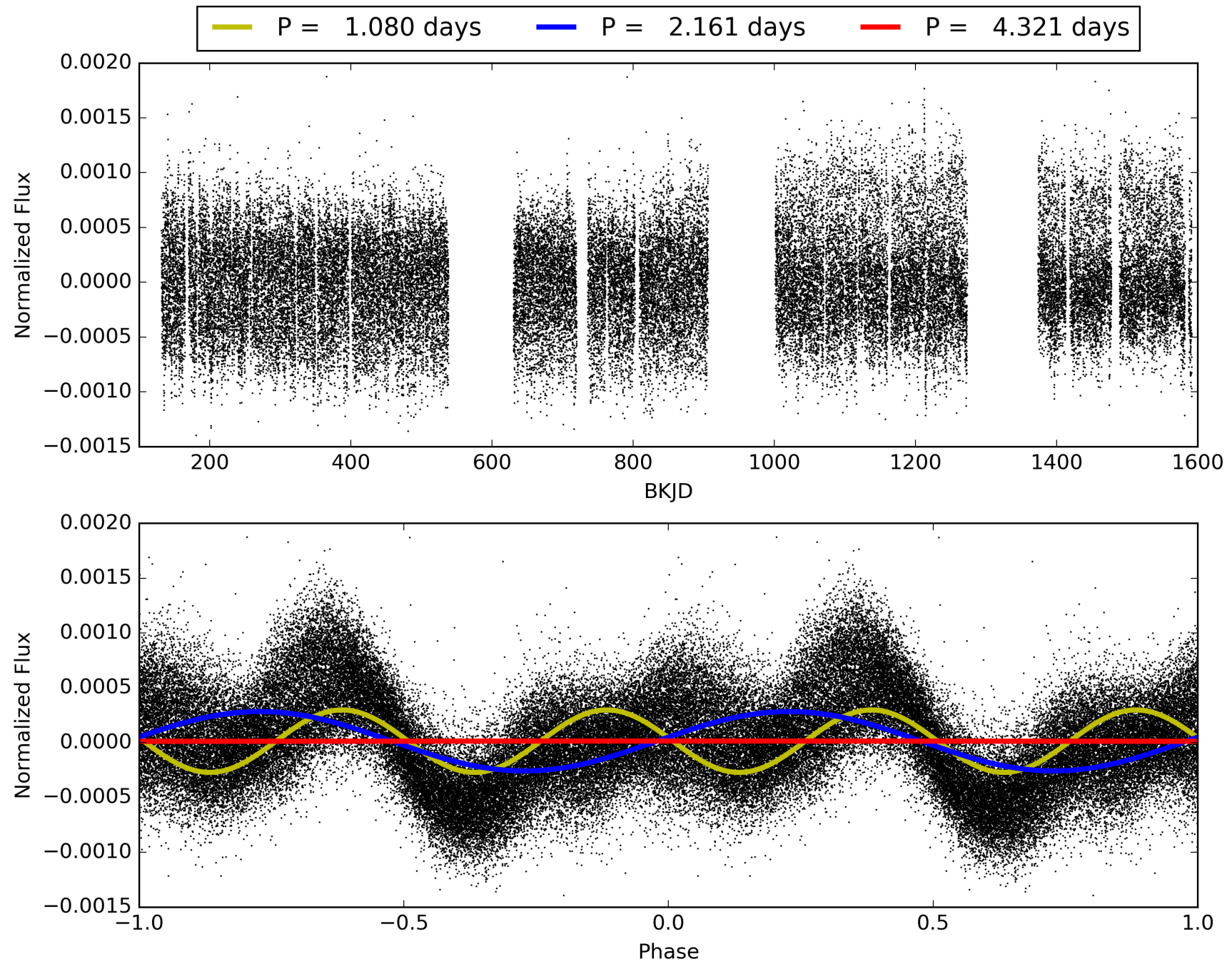
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 08:57:08 Z

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

# TCE 004841314-02, PDC Light Curves



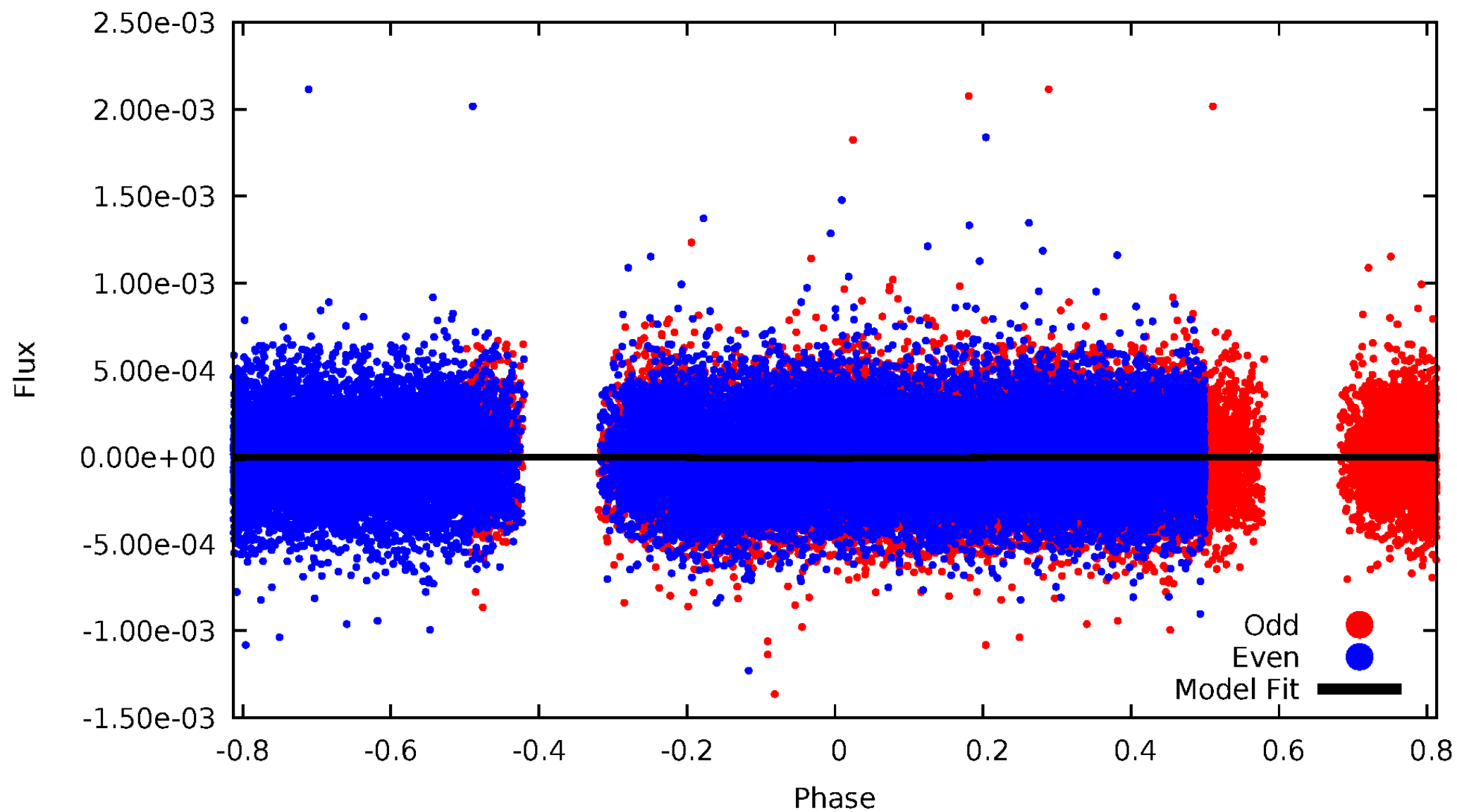
TCE 004841314-02





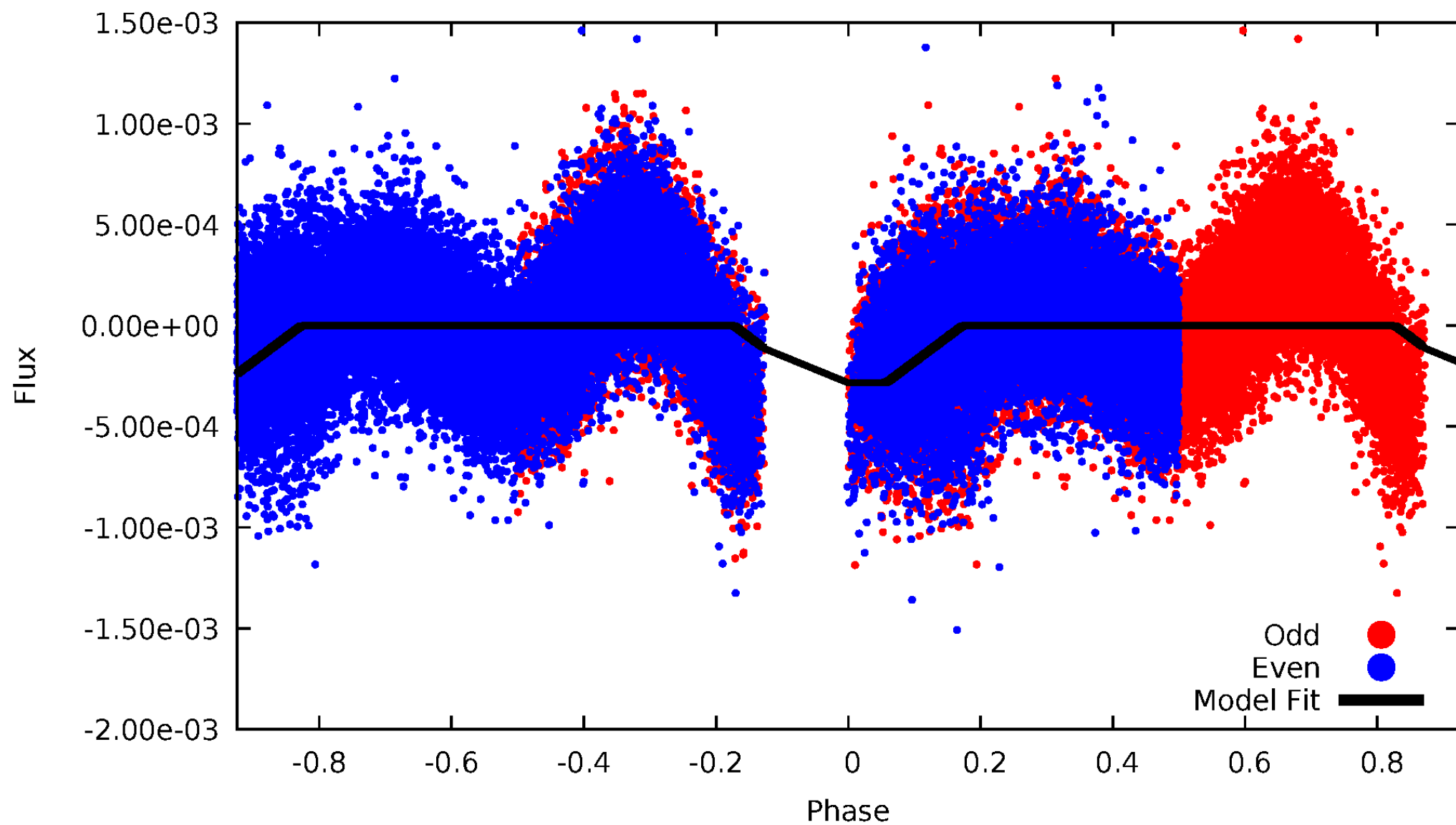
DV Odd/Even

TCE 004841314-02



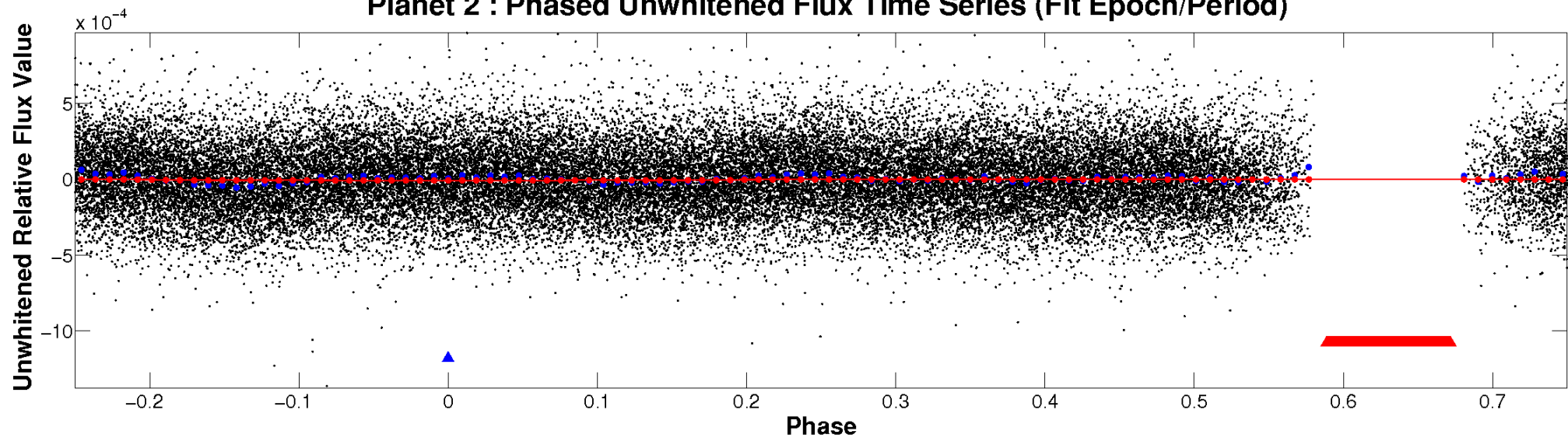
# ALT Odd/Even

TCE 004841314-02

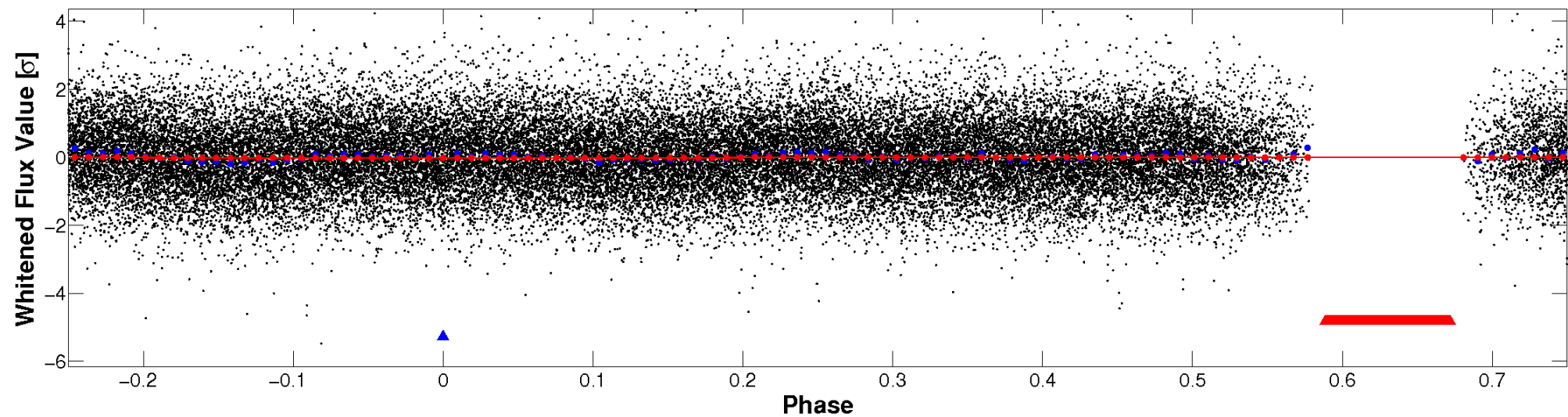


# Non-Whitened Vs. Whitened Light Curve

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

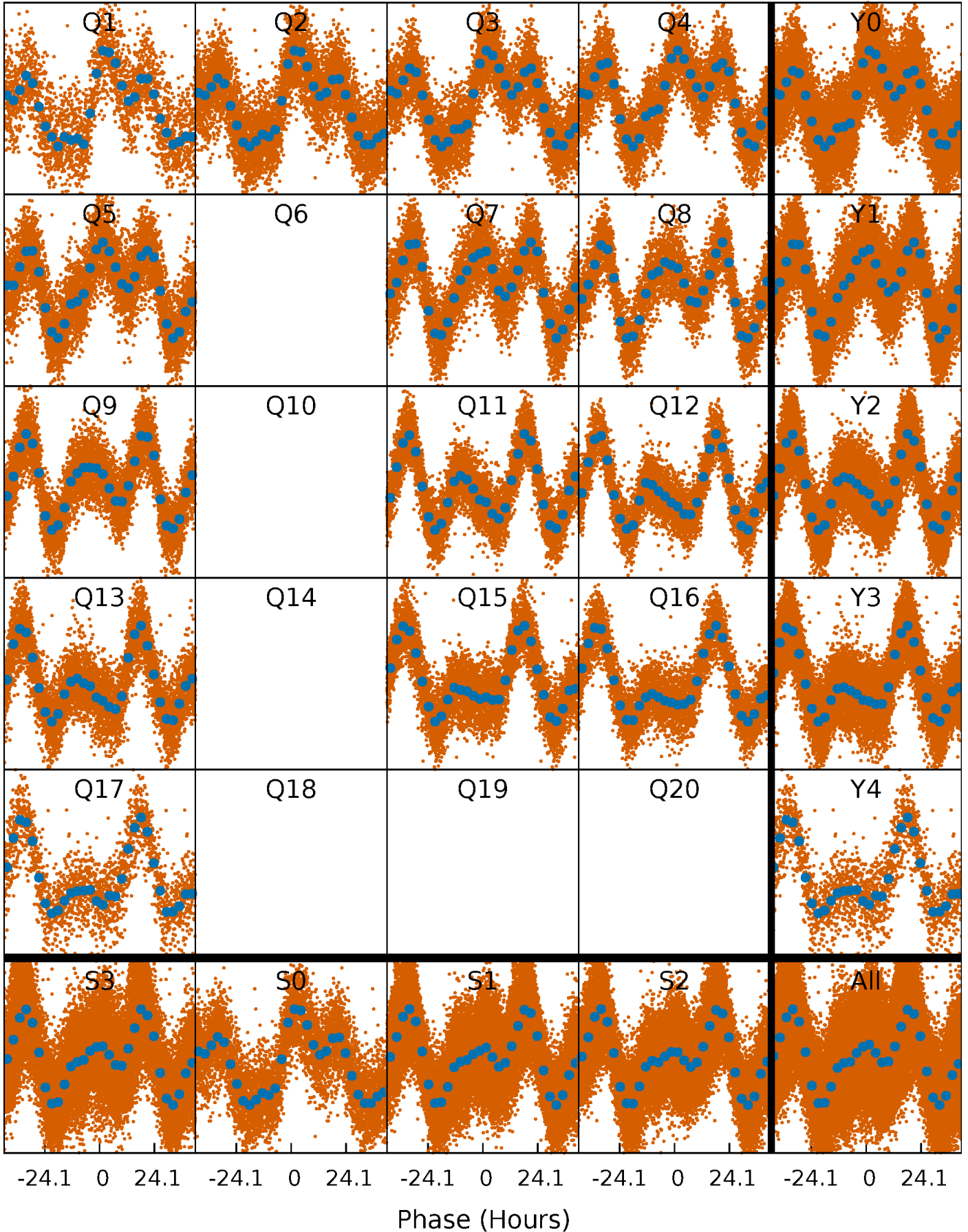


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

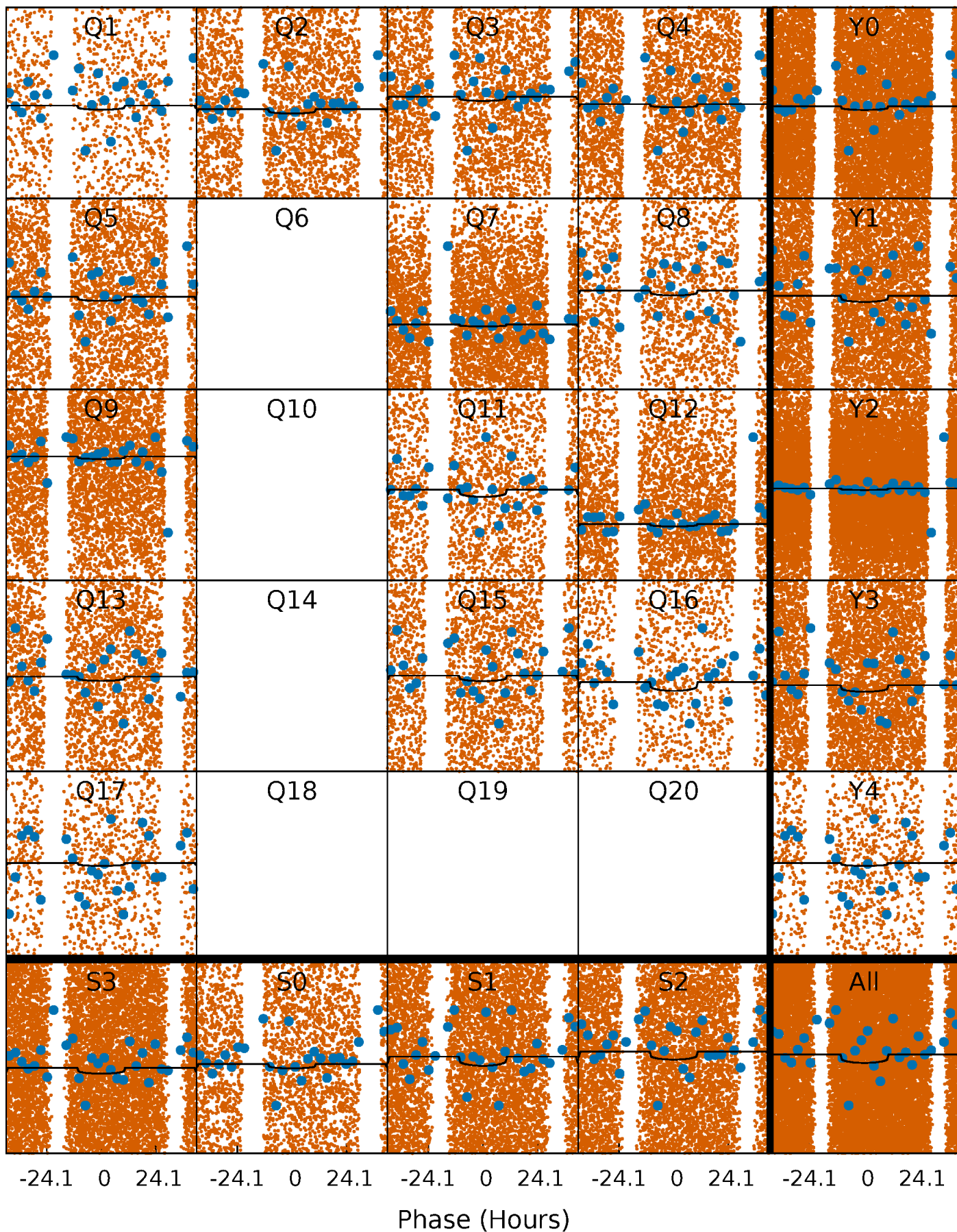
TCE 004841314-02   P= 2.160728 Days    $T_0=133.406445$  (BKJD)





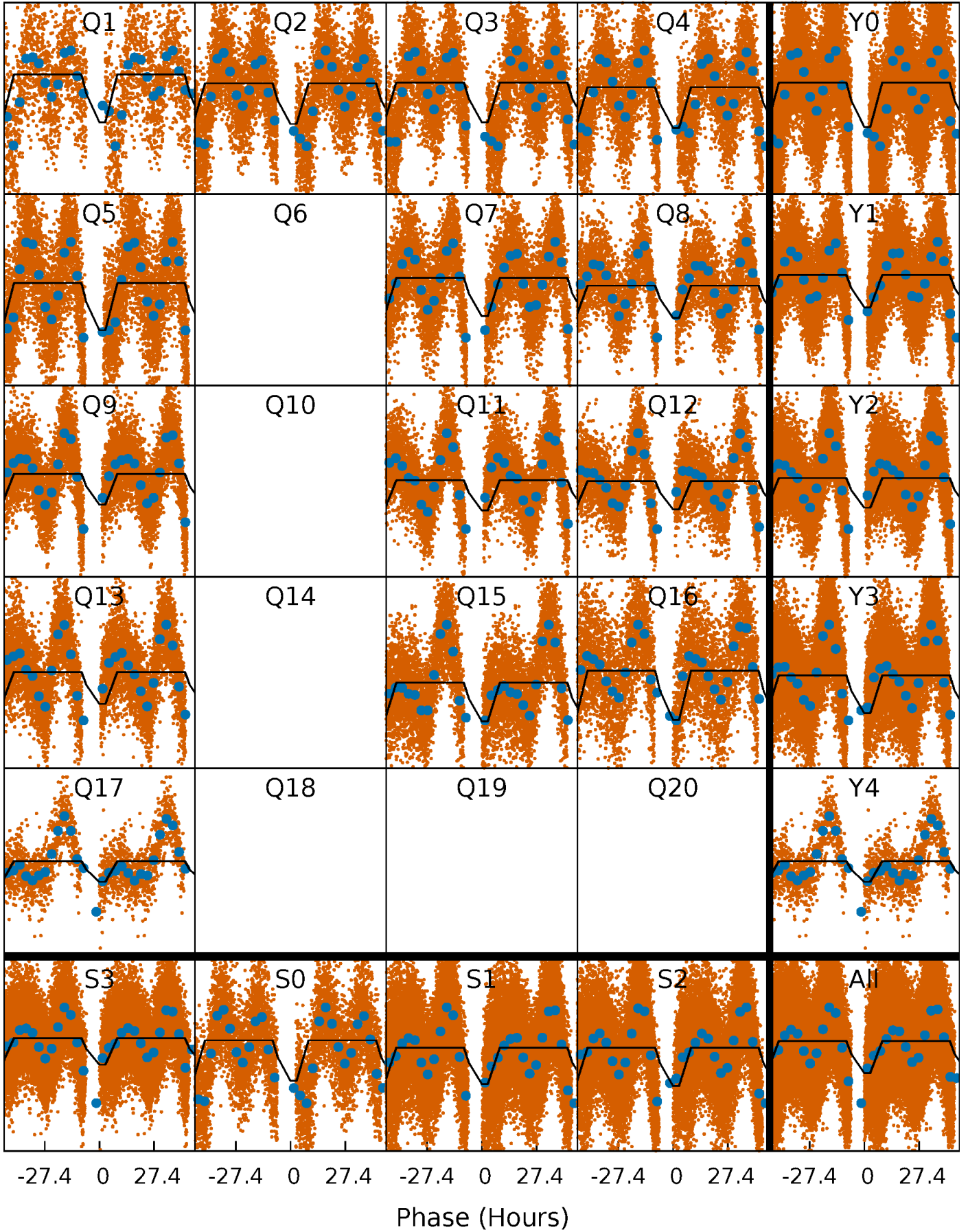
# DV Quarter-Phased Transit Curves

TCE 004841314-02 P= 2.160728 Days  $T_0=133.406445$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 004841314-02 P= 2.160649 Days  $T_0=132.771784$  (BKJD)

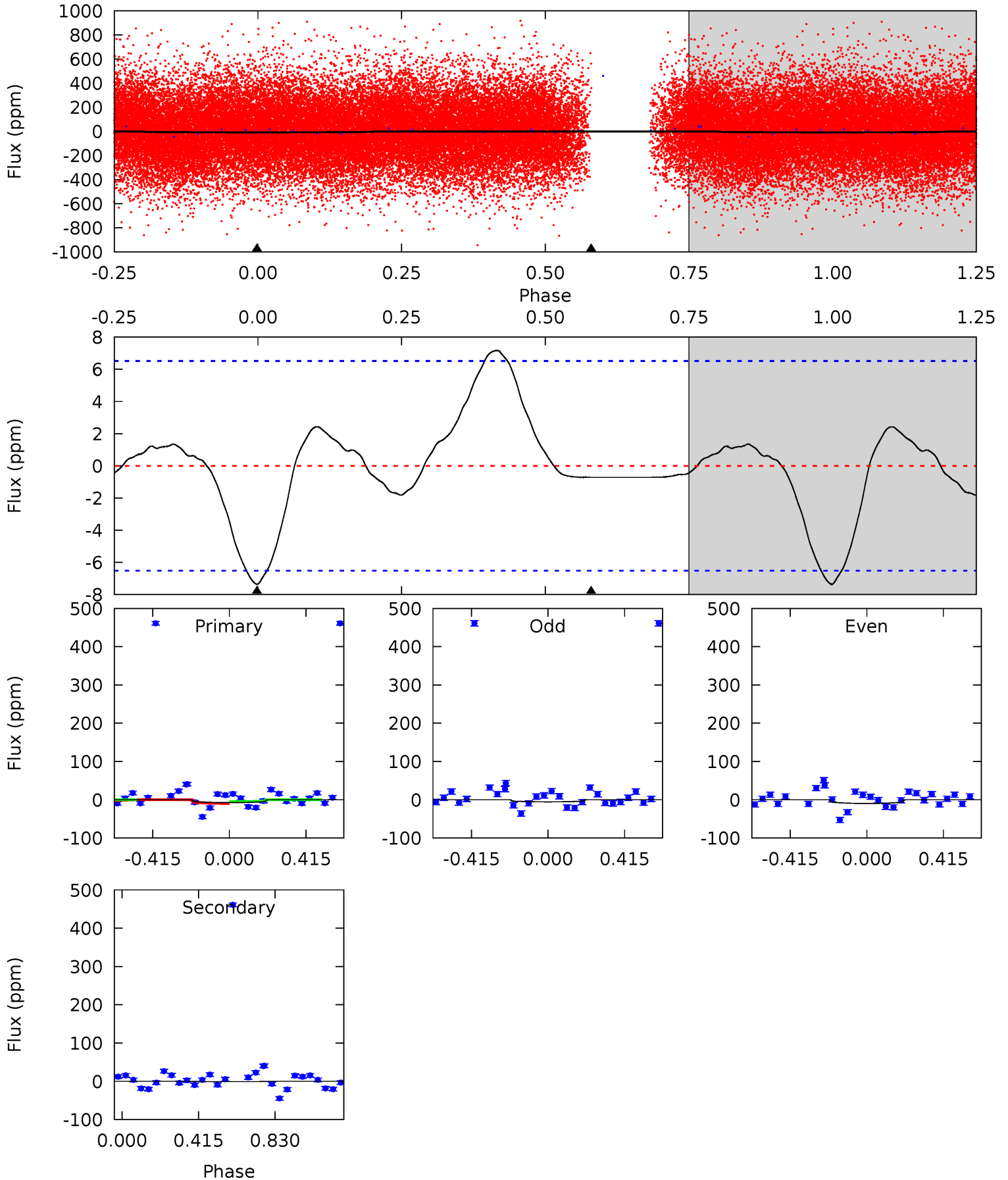




# DV Model-Shift Uniqueness Test

004841314-02, P = 2.160728 Days, E = 131.245717 Days

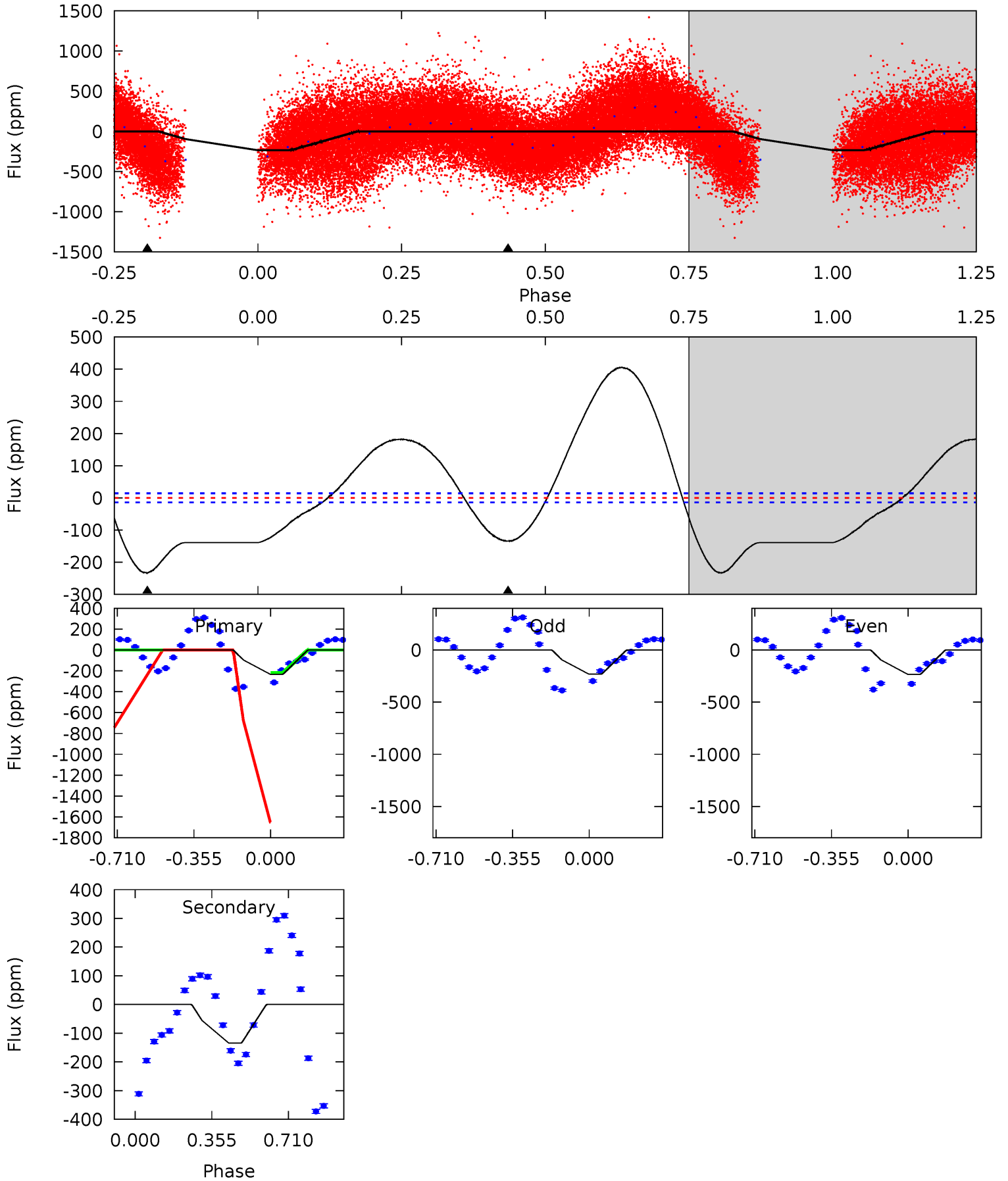
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.81	0.47	0	0	4.26	0.82	0.84	4.81	4.81	0.47	0.47	1.38	1.01	0.49	1.50



# Alt Model-Shift Uniqueness Test

004841314-02, P = 2.160649 Days, E = 130.611135 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
71.1	41.0	0	0	4.29	0.92	11.0	71.1	71.1	41.0	41.0	0.24	1.41	0.64	125.9



### Stellar Parameters For KIC 004841314

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6894^{+217}_{-299}$	$3.857^{+0.390}_{-0.130}$	$-0.280^{+0.300}_{-0.300}$	$2.346^{+0.541}_{-1.005}$	$1.442^{+0.205}_{-0.308}$	$0.157^{+0.512}_{-0.059}$
	+3%/-4%	+10%/-3%	+107%/-107%	+23%/-43%	+14%/-21%	+326%/-38%
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 004841314-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-1\pm 2$	$1.00^{+1.04}_{-0.67}$	$3313^{+277}_{-389}$	$1912^{+3151}_{-5794}$	$0.304^{+3.682}_{-0.928}$
Alt.	$-134\pm 3$	$3.95^{+1.50}_{-1.32}$	$3298^{+250}_{-310}$	$5649^{+1195}_{-680}$	$6.476^{+7.674}_{-3.060}$

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

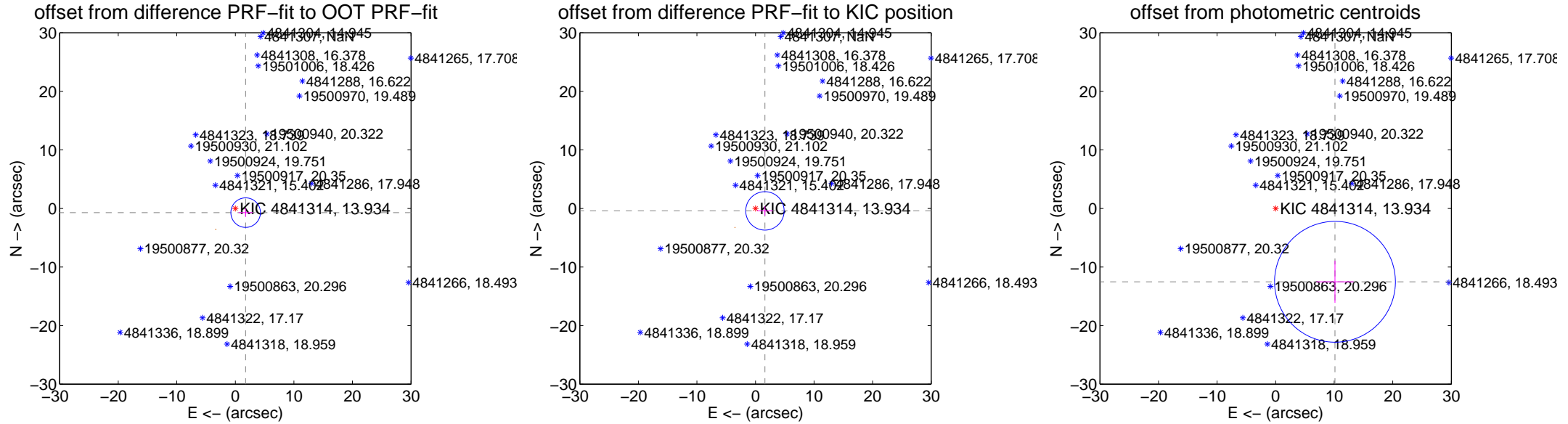
# DV Centroid Data

Supplemental centroid analysis for 004841314-02. Kepler magnitude: 13.93. Transit SNR 2.31

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.37 arcsec

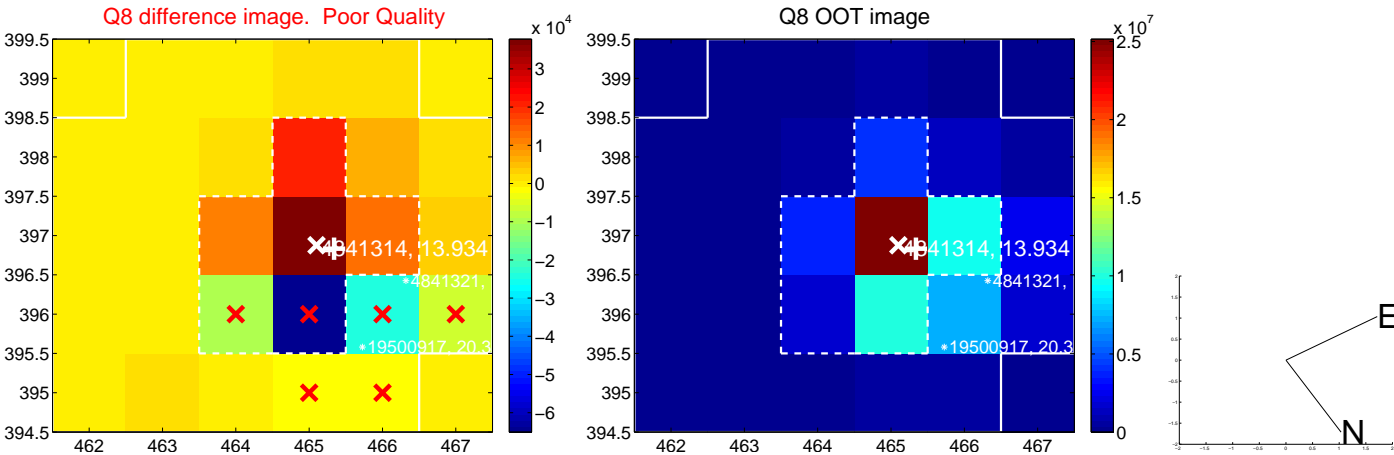
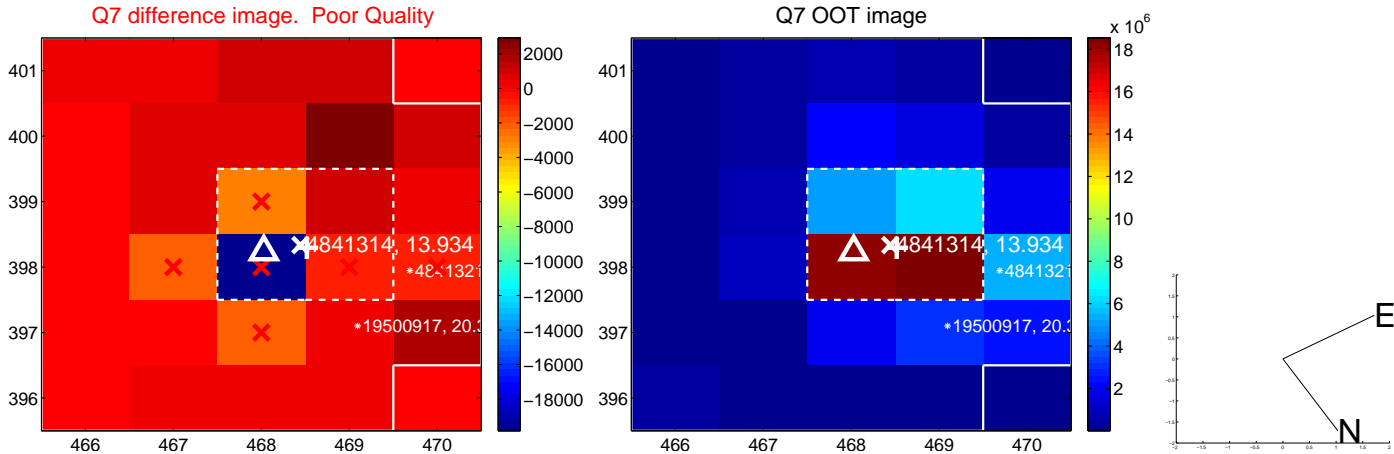
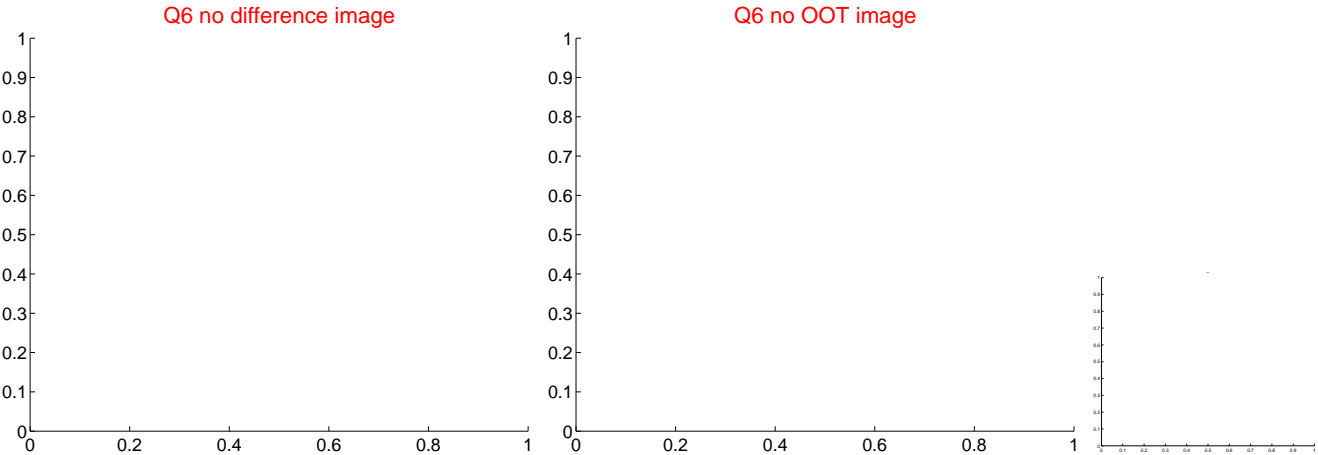
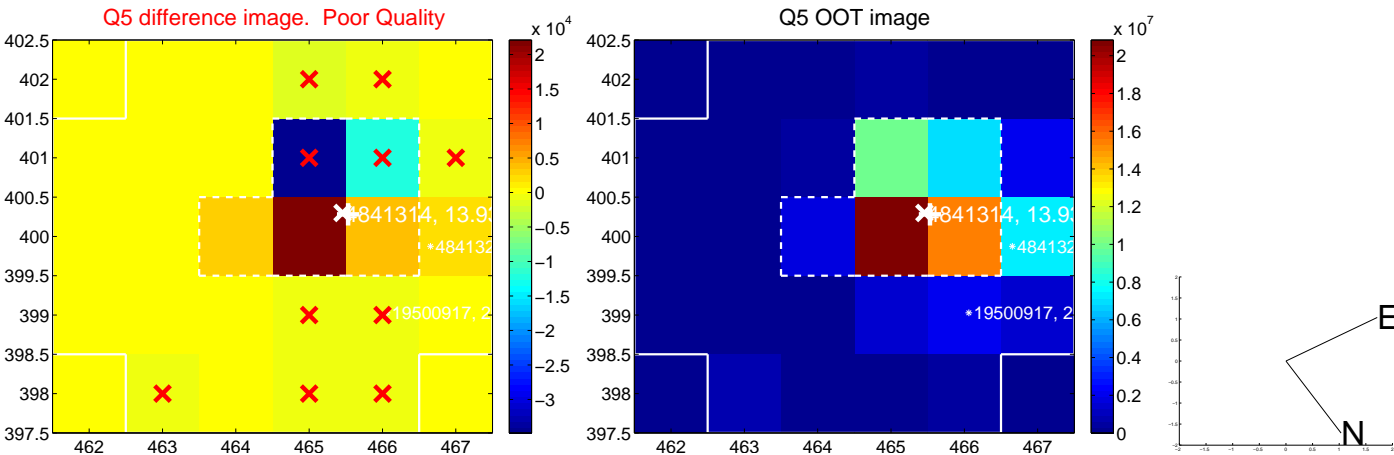
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.899 \pm 0.841$	2.26	$-1.760 \pm 1.200$	$-0.714 \pm 0.733$
PRF-fit source offset from KIC position	$1.665 \pm 1.093$	1.52	$-1.612 \pm 1.332$	$-0.419 \pm 0.788$
photometric centroid source offset	$16.11 \pm 3.44$	4.68	$-10.13 \pm 3.18$	$-12.52 \pm 3.60$



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.

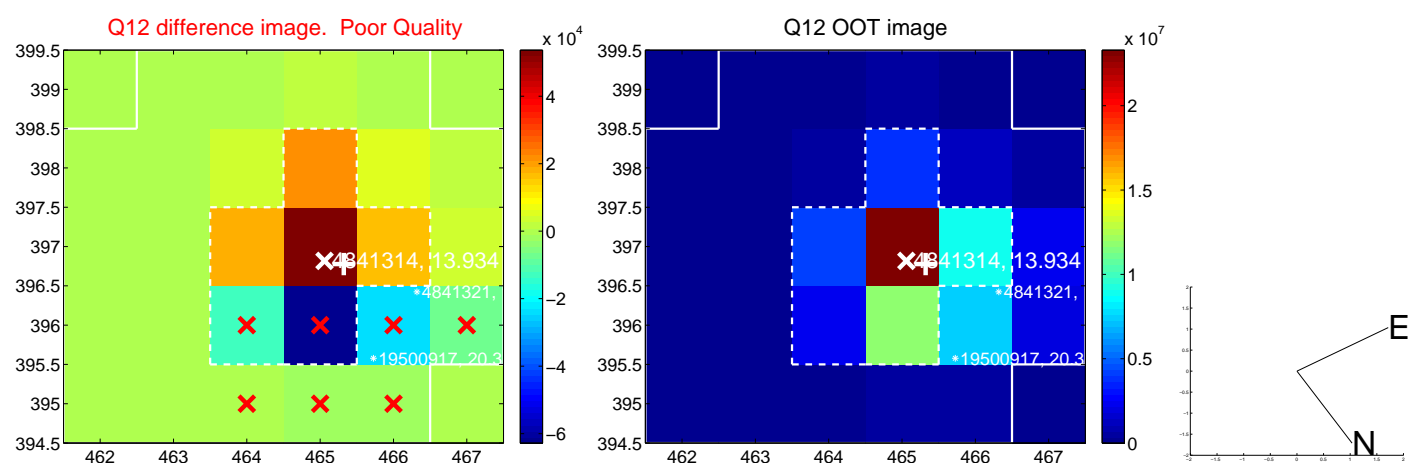
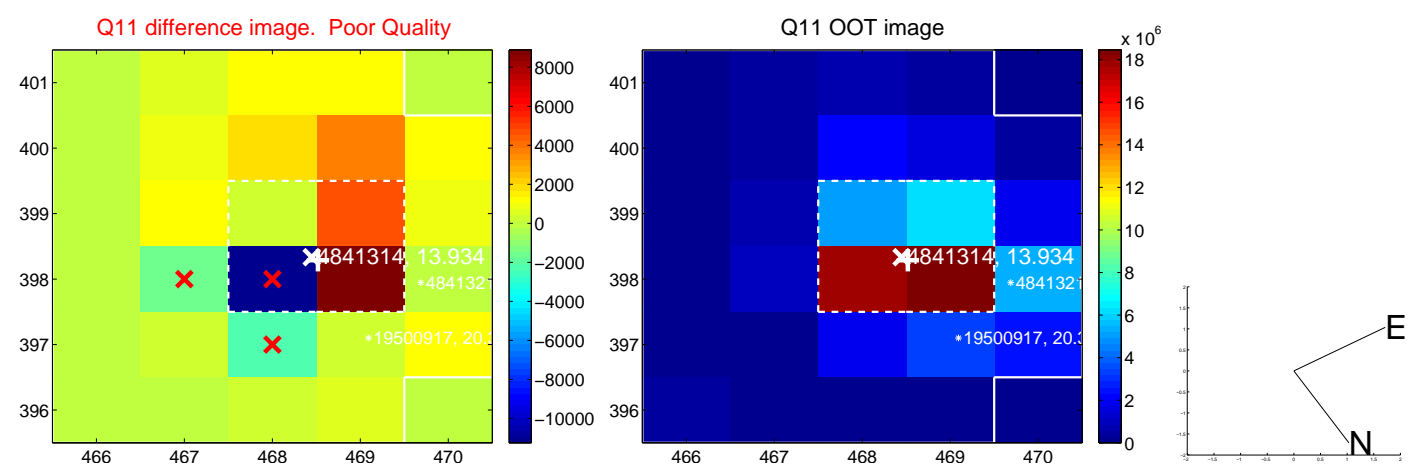
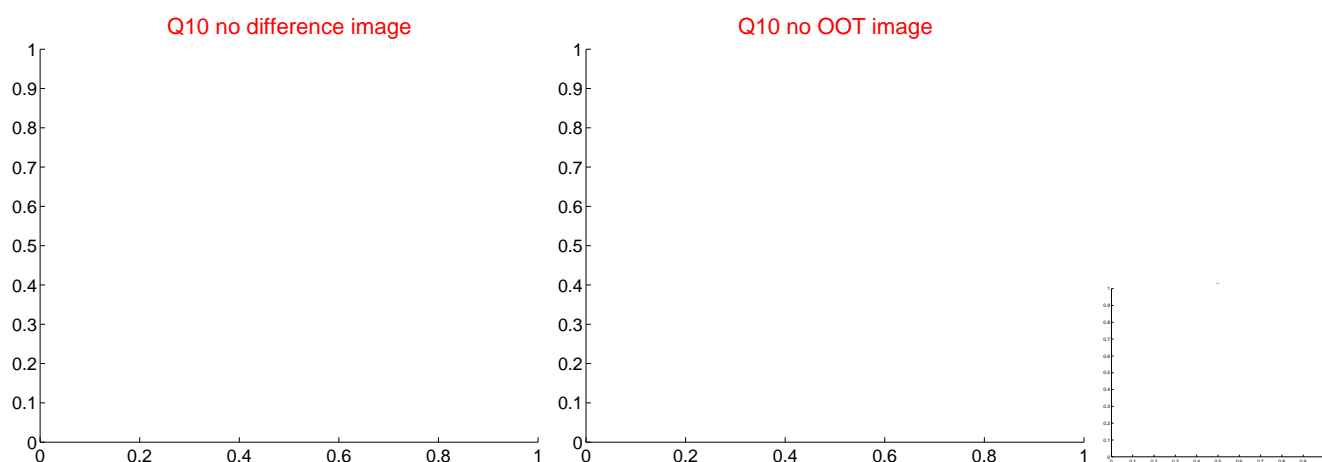
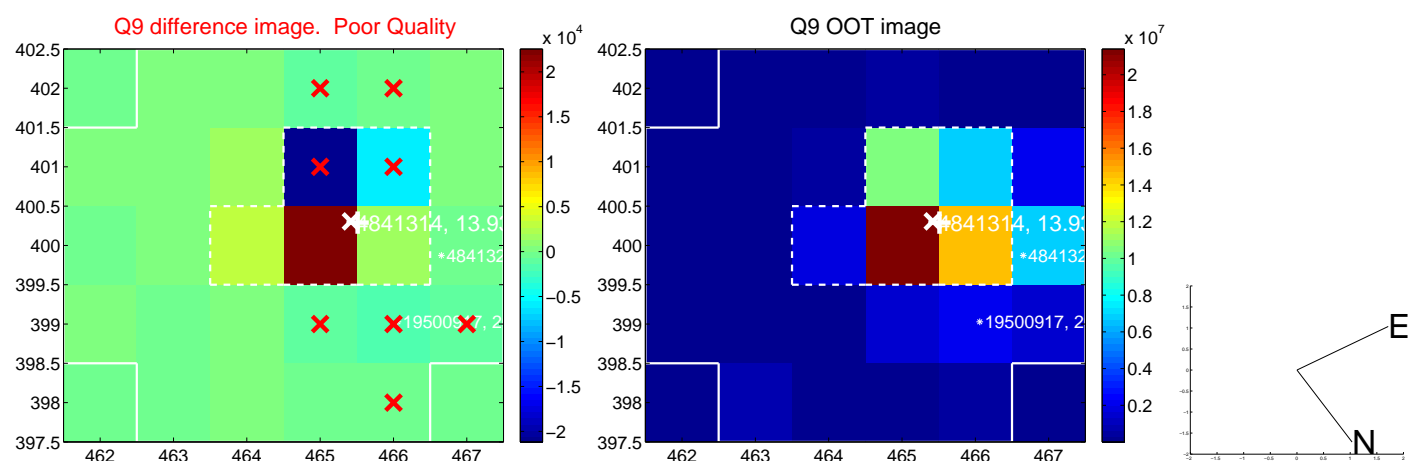


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

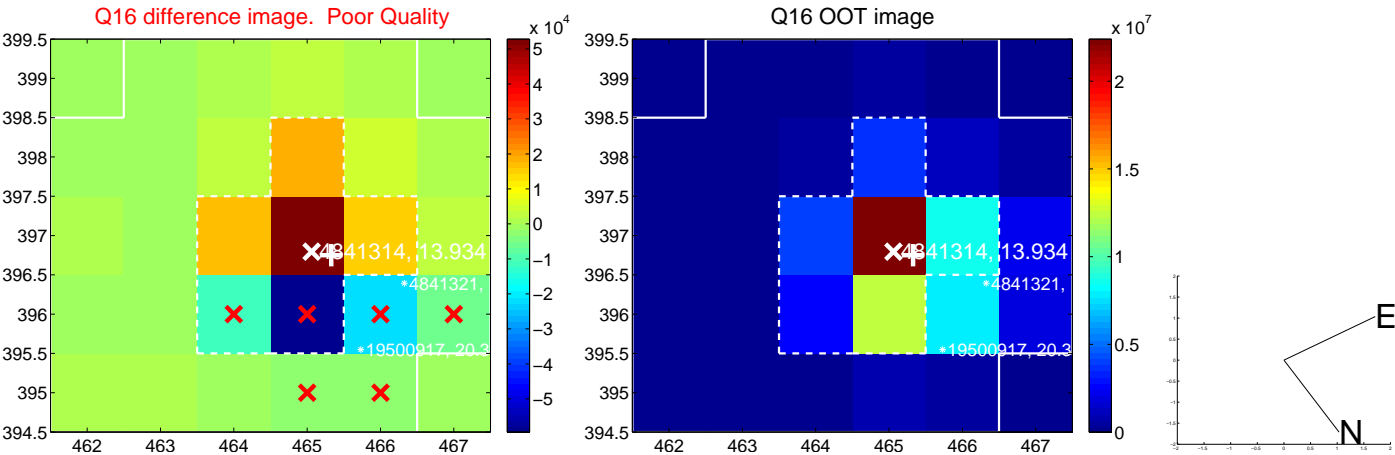
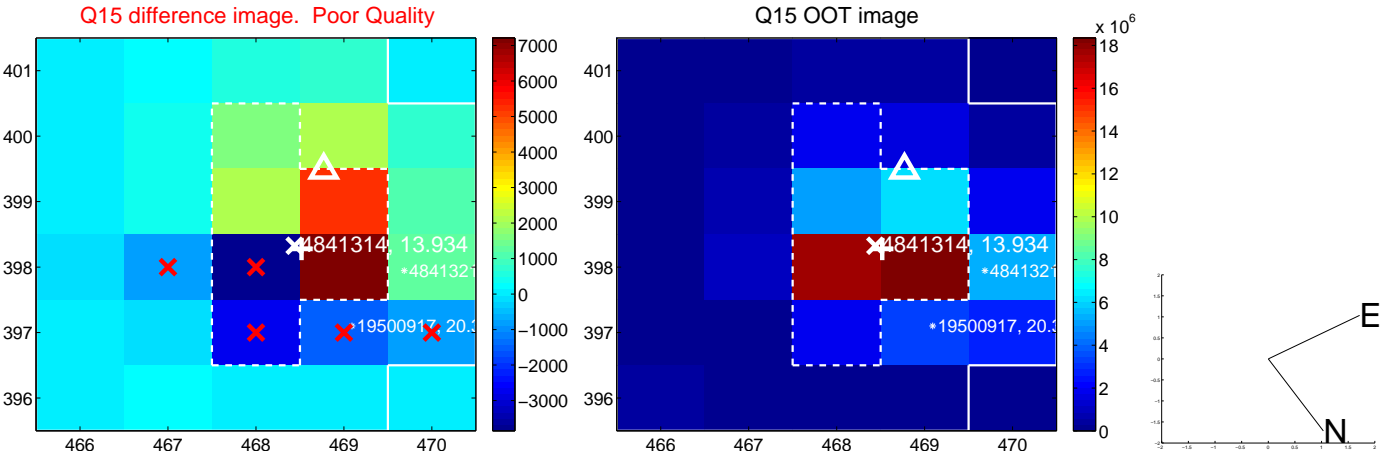
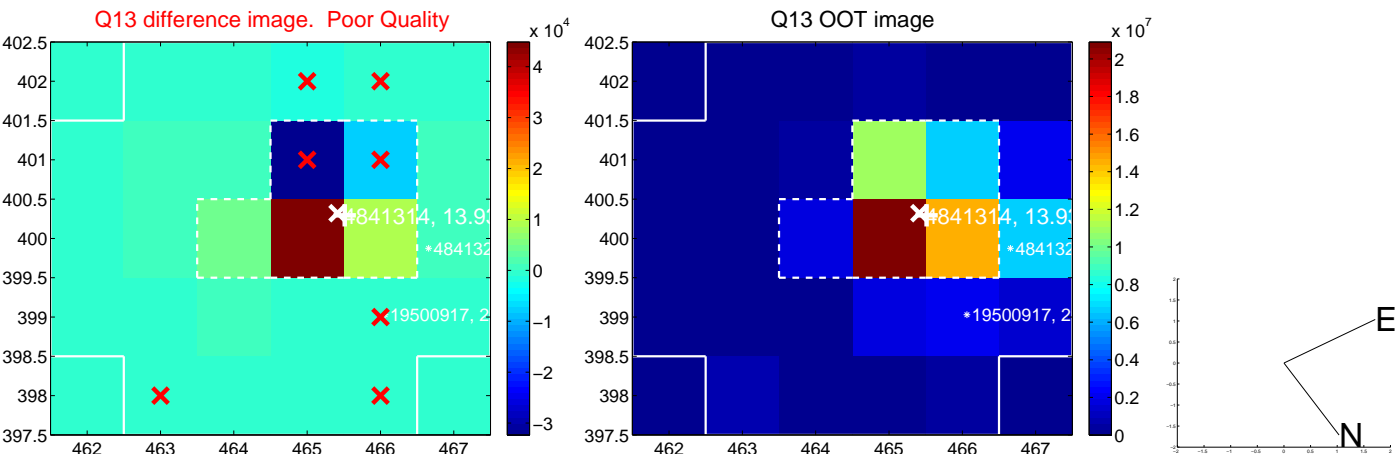




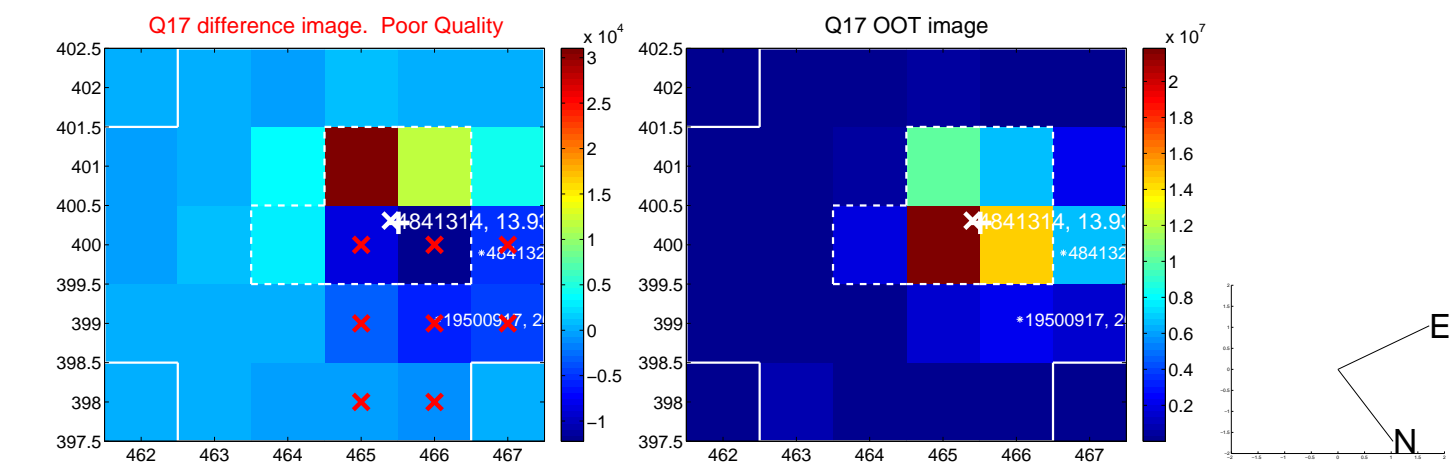
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



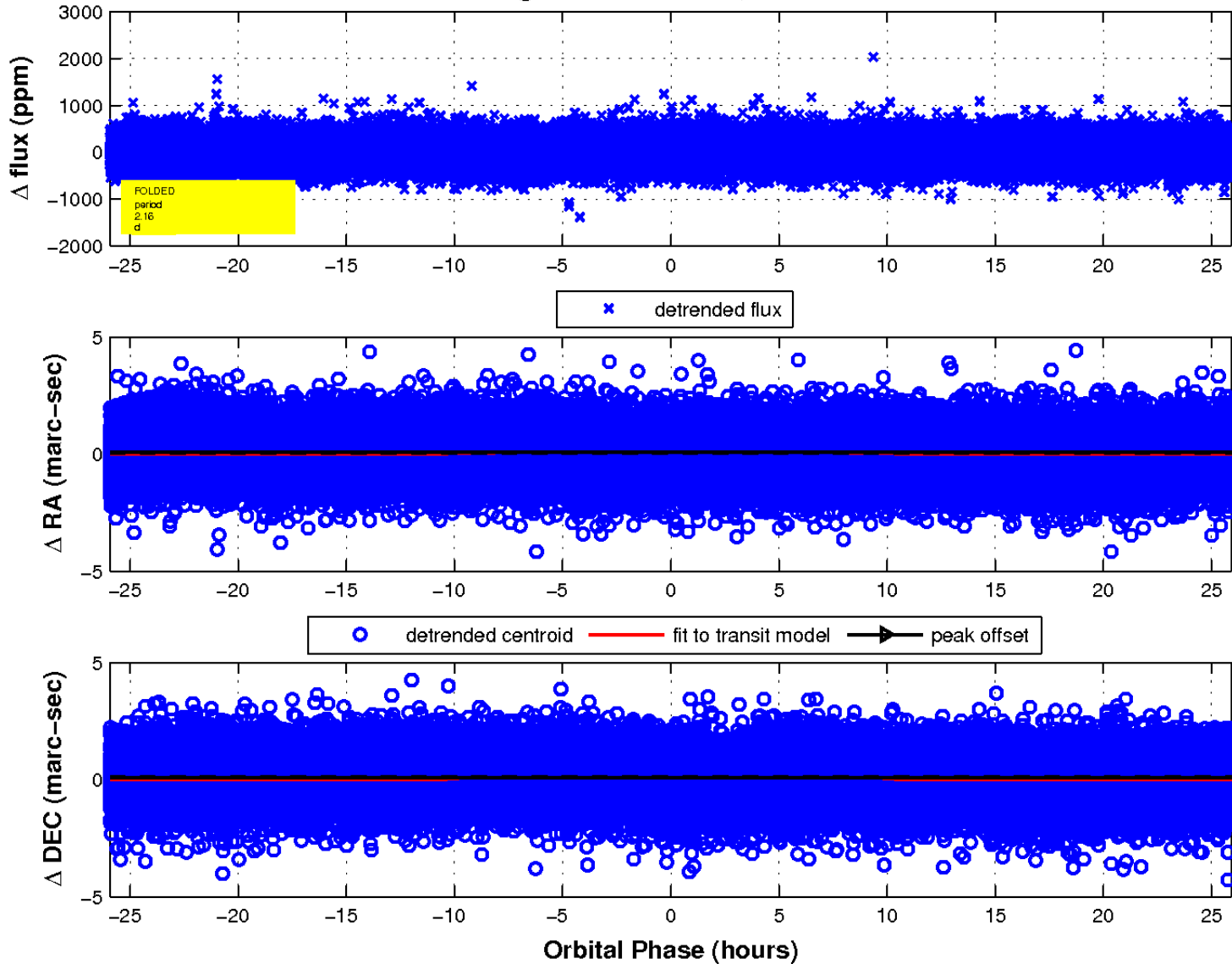
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

