

# KIC 003661361

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003661361-01	OBS	No	0.724842	131.901705	8.7	4.621	10.6	3.5	13.40	6489	4.08	0.00
003661361-02	OBS	No	30.758819	141.757152	306.9	2.445	9.1	9.8	13.40	6489	27.41	3529.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003661361-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
003661361-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

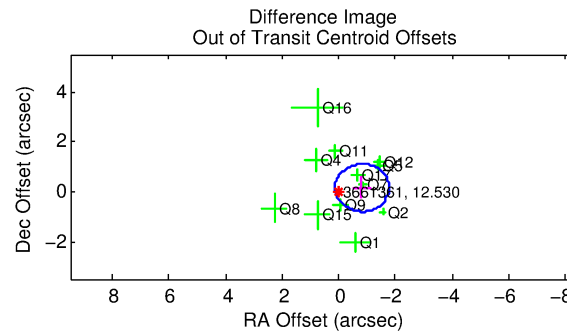
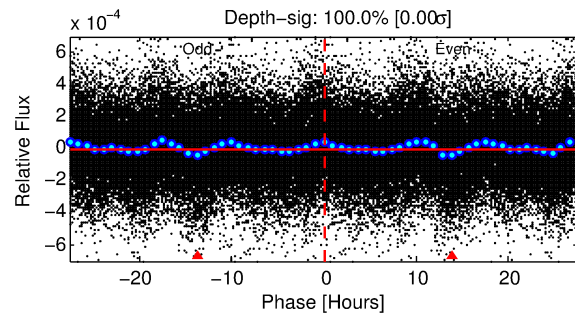
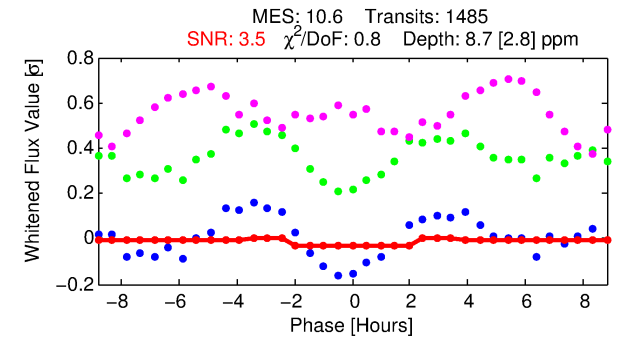
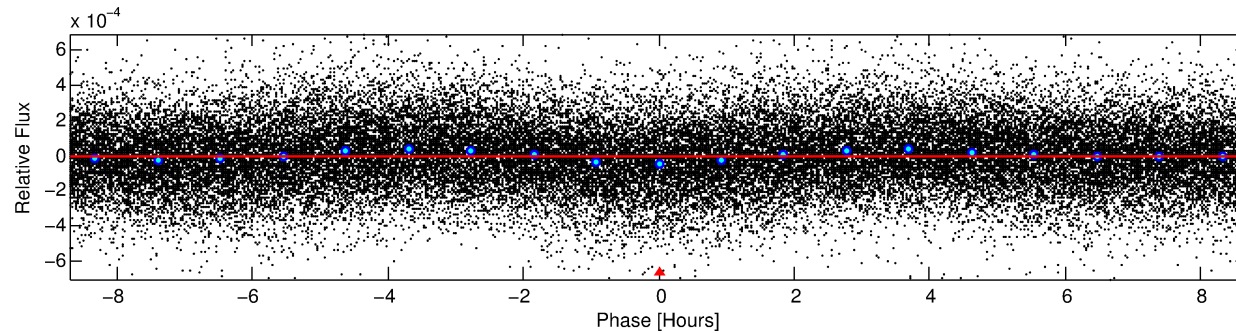
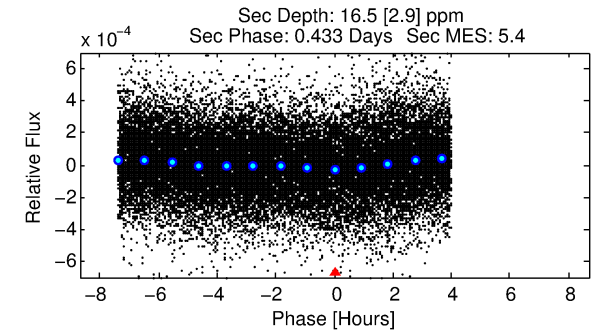
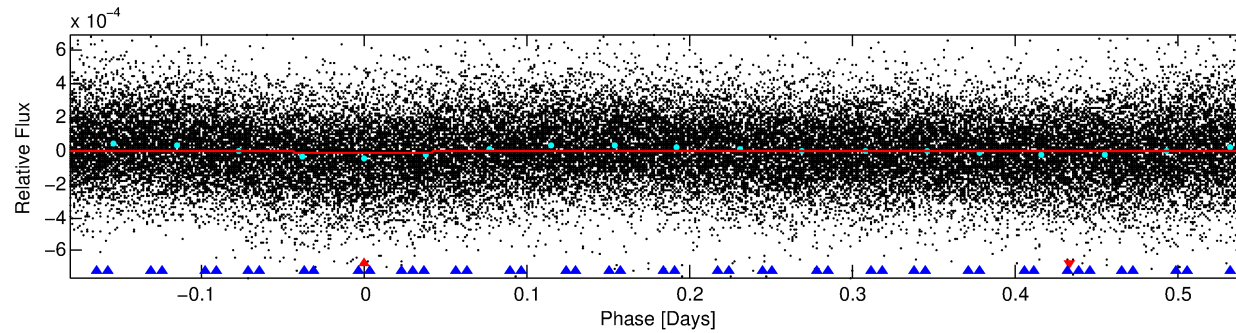
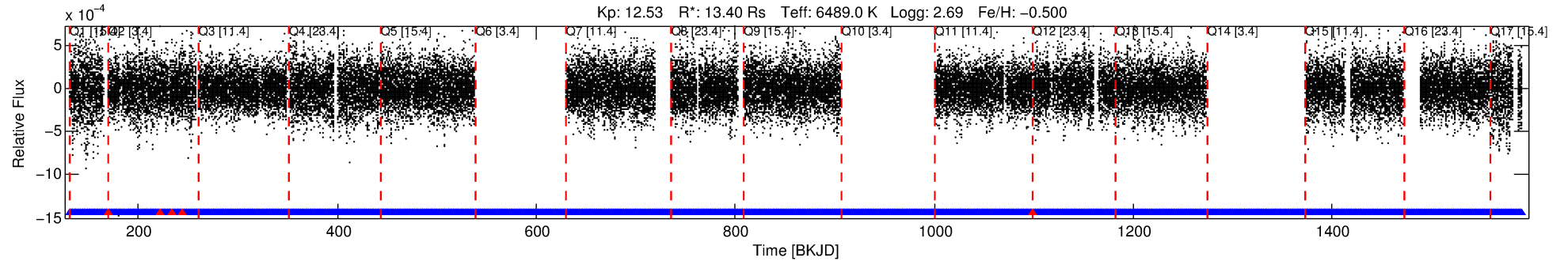
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003661361-01

No Significant Match Found

# DV One-Page Summary

KIC: 3661361 Candidate: 1 of 2 Period: 0.725 d



## DV Fit Results:

Period = 0.72484 [0.00003] d  
Epoch = 131.9017 [0.0082] BKJD  
Rp/R\* = 0.0028 [0.0019]  
a/R\* = 1.28 [1.83]  
b = 0.50 [5.62]  
Seff = N/A  
Teq = N/A  
Rp = 4.09 [3.43] Re  
a = N/A  
Ag = N/A  
Teffp = N/A

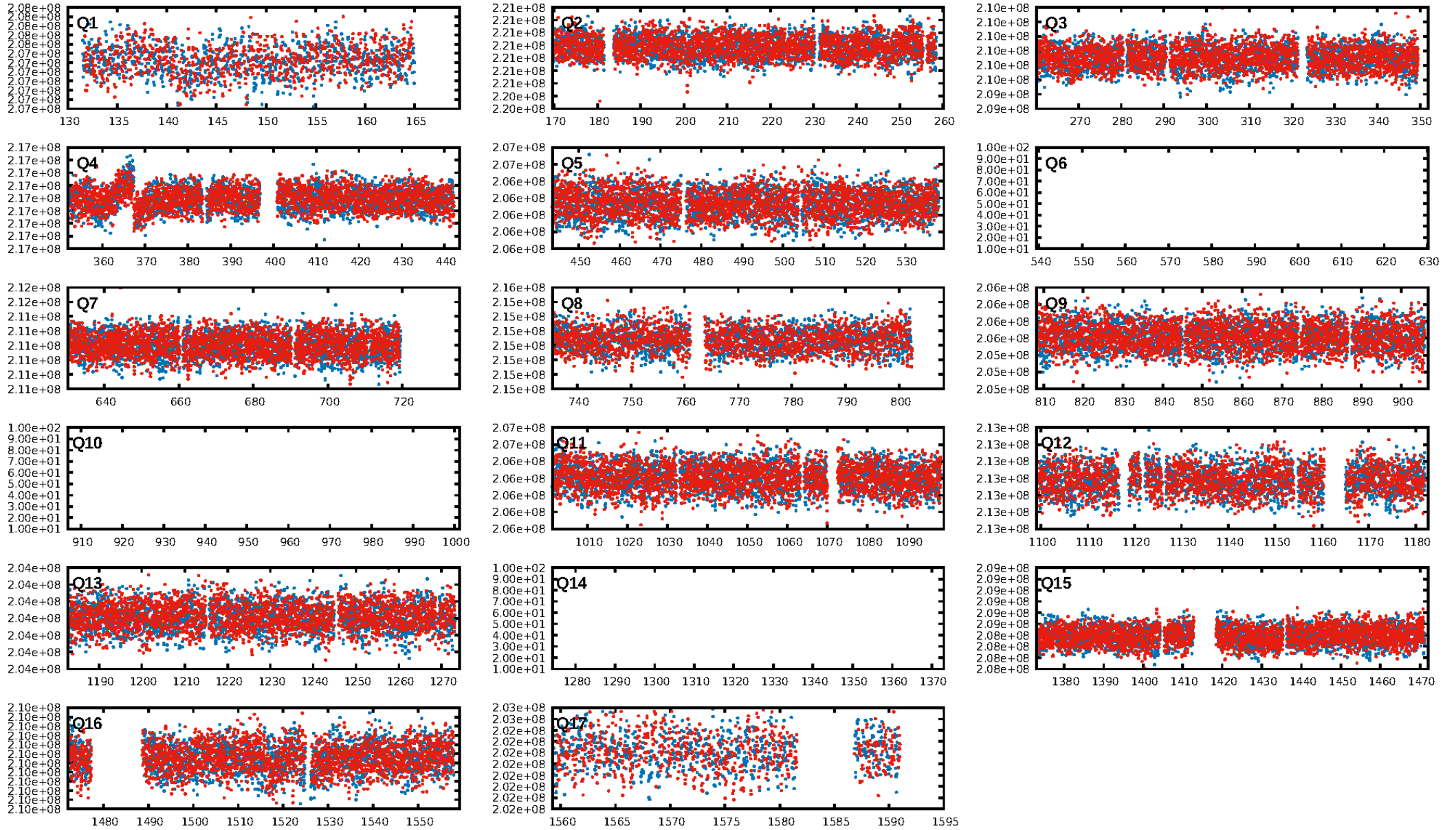
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [137.88σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.89e-14  
RollingBand-fgt: 1.00 [1397/1402]  
GhostDiagnostic-chr: 3.813  
Centroid-sig: 0.2%  
Centroid-so: 3.351 arcsec [1.78σ]  
OotOffset-rm: 0.836 arcsec [2.62σ]  
KicOffset-rm: 0.706 arcsec [1.96σ]  
OotOffset-st: 1/3/4/4 [12]  
KicOffset-st: 1/3/4/4 [12]  
DiffImageQuality-fgm: 0.92 [11/12]  
DiffImageOverlap-fno: 1.00 [14/14]

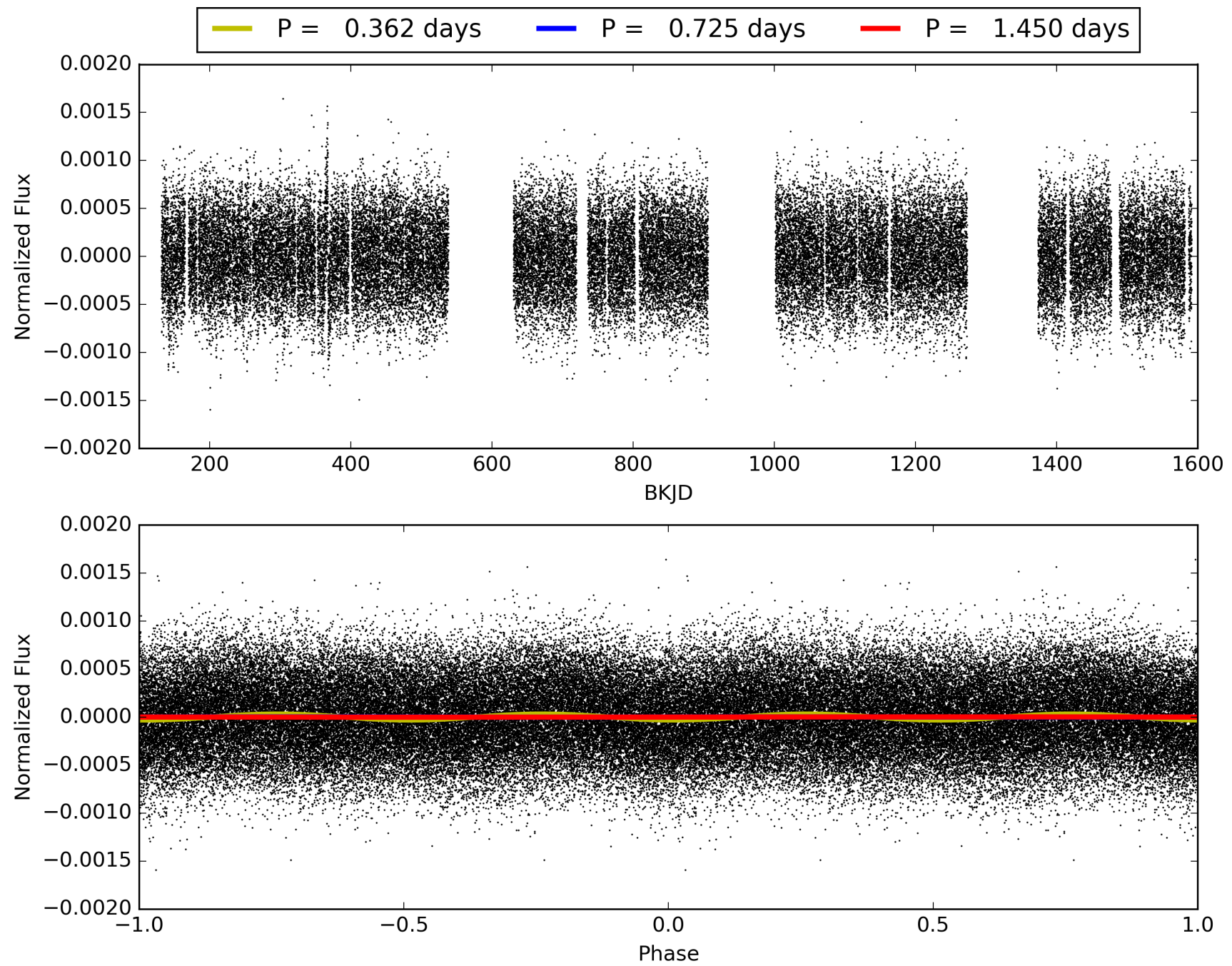
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 21:56:49 Z

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

# TCE 003661361-01, PDC Light Curves



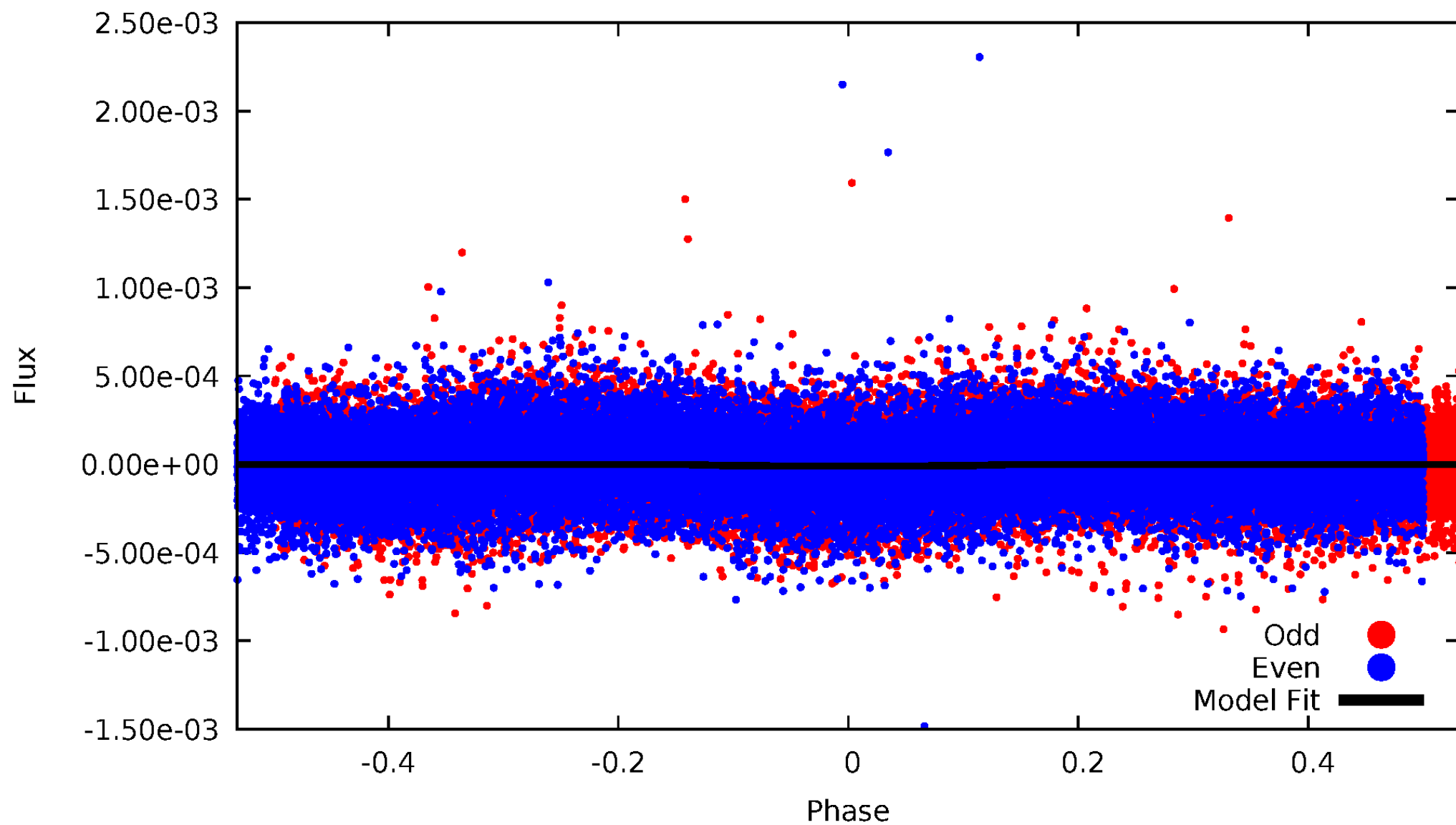
TCE 003661361-01





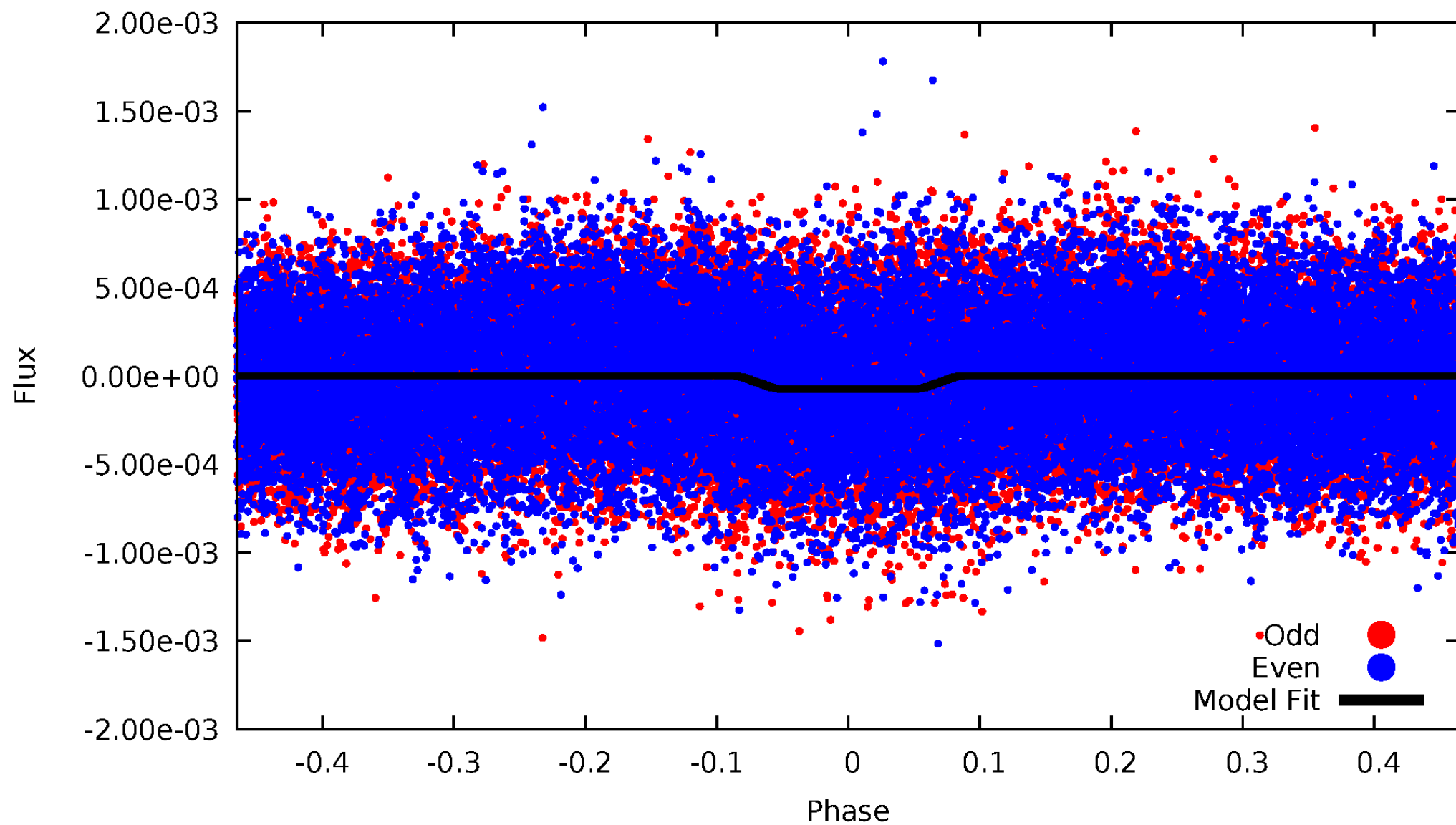
# DV Odd/Even

TCE 003661361-01

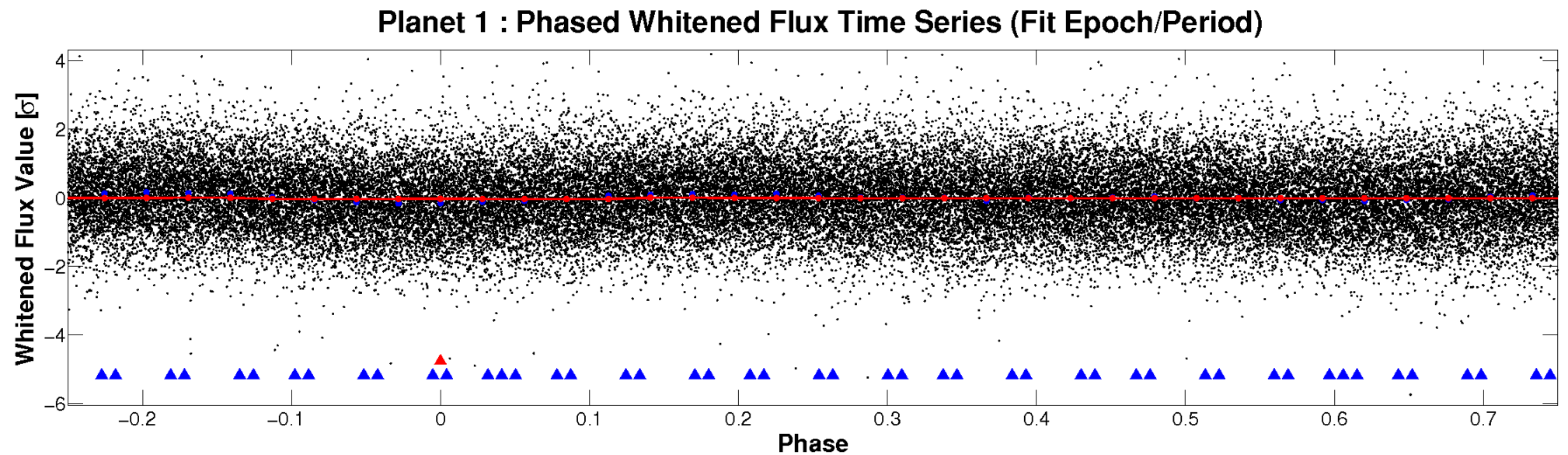
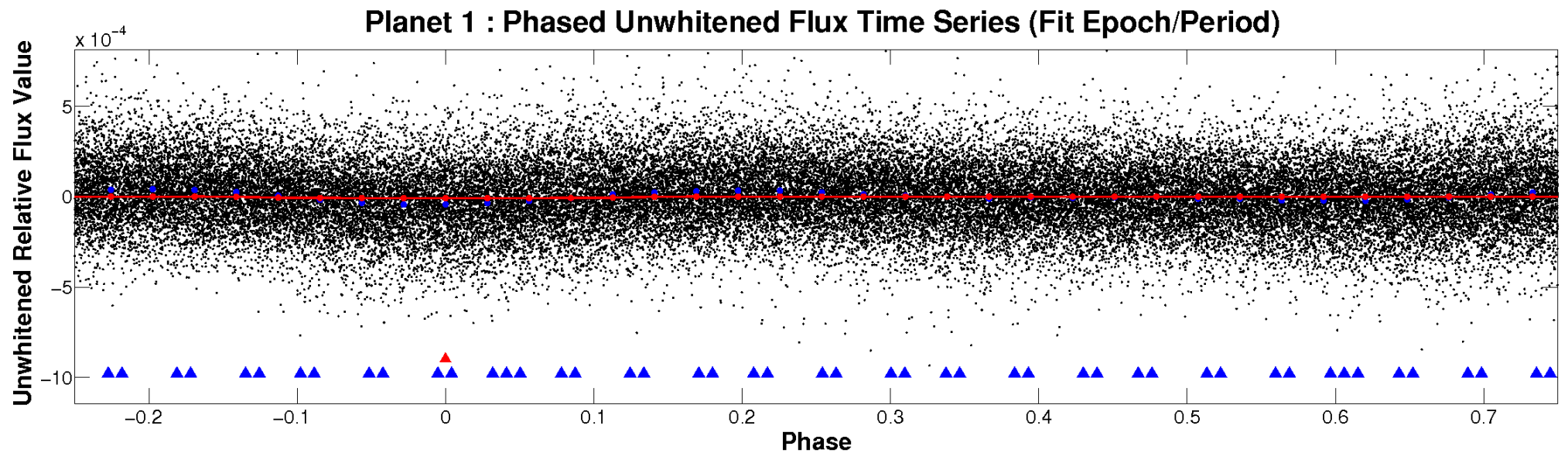


# ALT Odd/Even

TCE 003661361-01

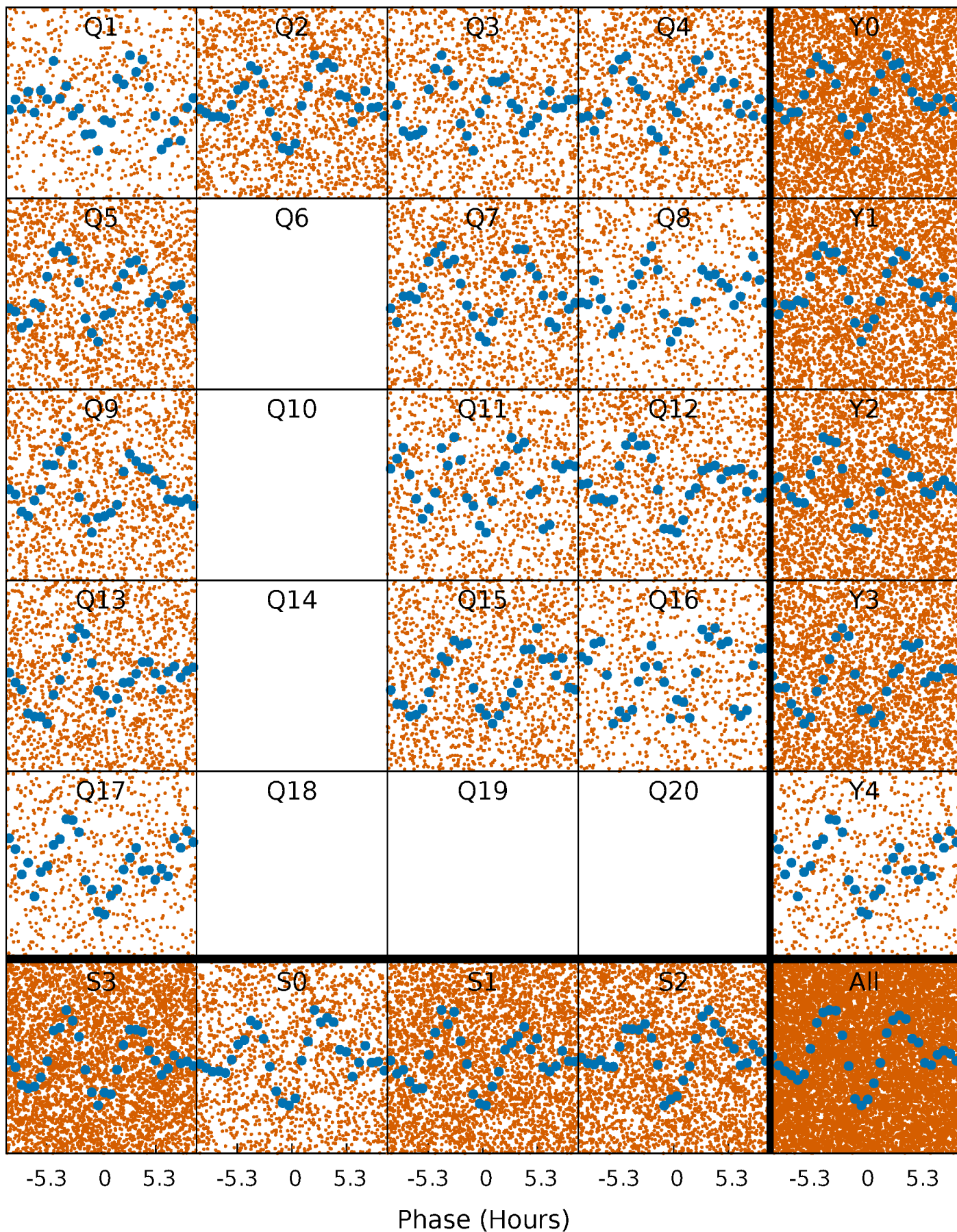


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

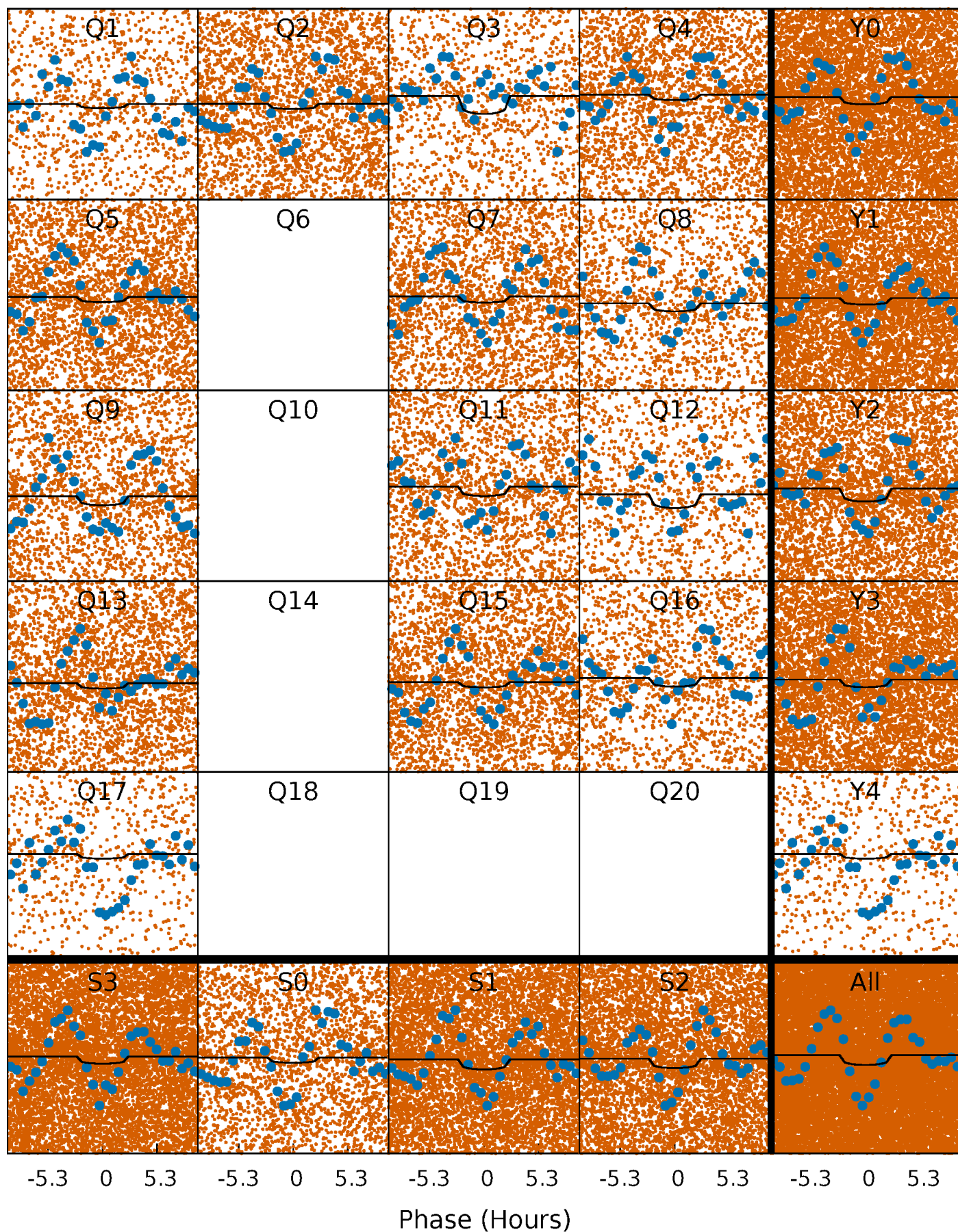
TCE 003661361-01 P= 0.724842 Days  $T_0=131.901704$  (BKJD)





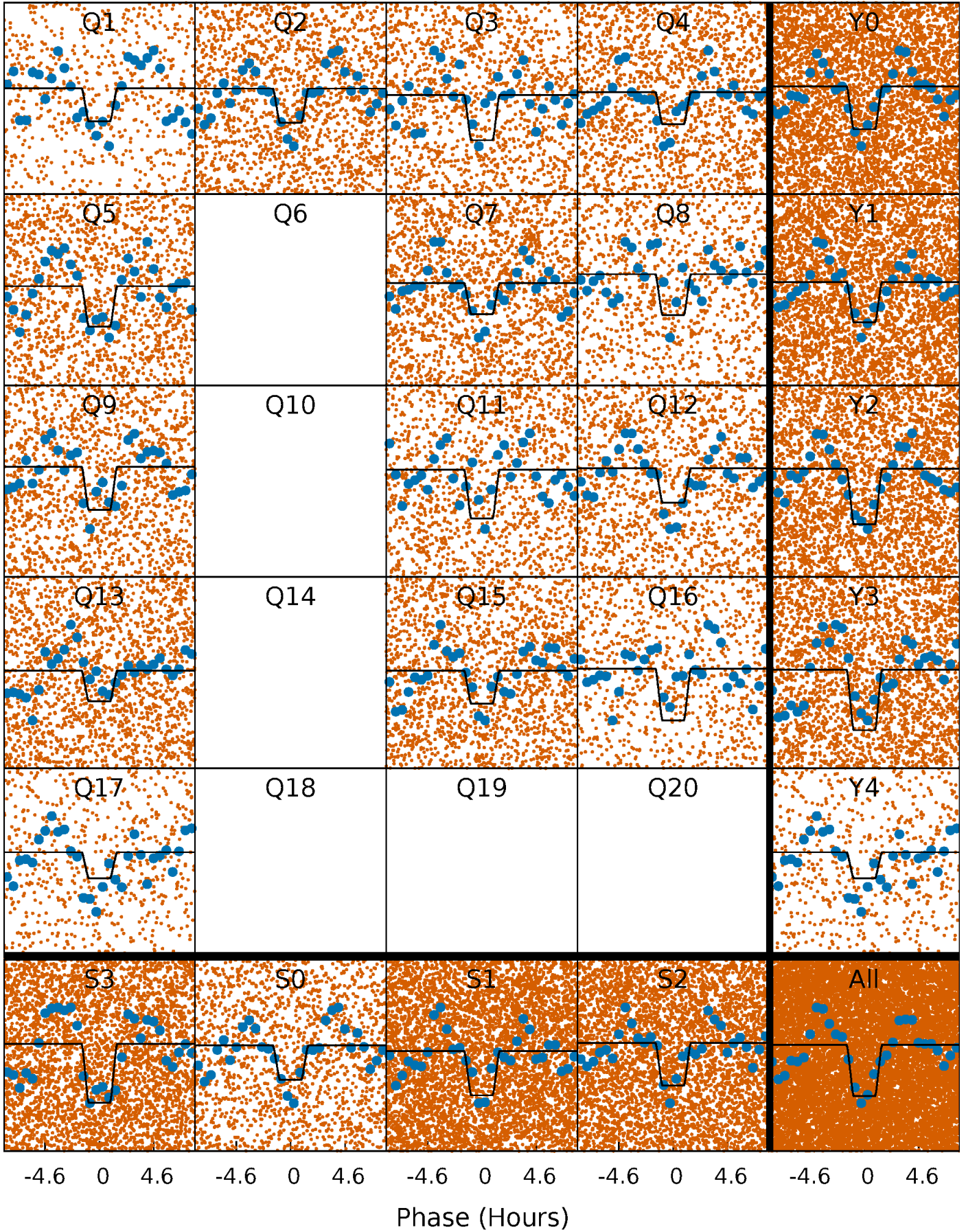
# DV Quarter-Phased Transit Curves

TCE 003661361-01 P= 0.724842 Days  $T_0=131.901704$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003661361-01 P= 0.724868 Days  $T_0=131.872671$  (BKJD)

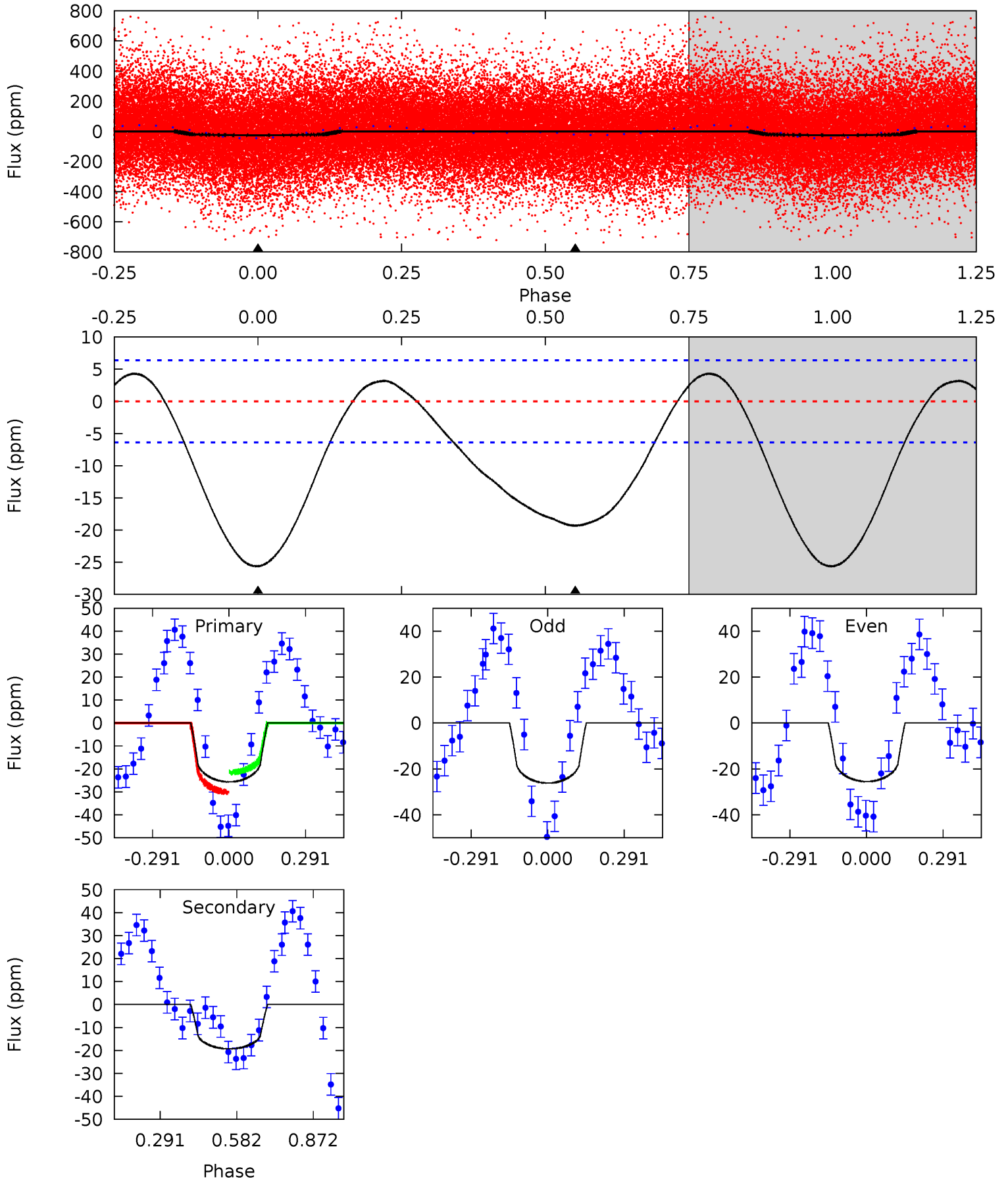




# DV Model-Shift Uniqueness Test

003661361-01, P = 0.724842 Days, E = 131.176862 Days

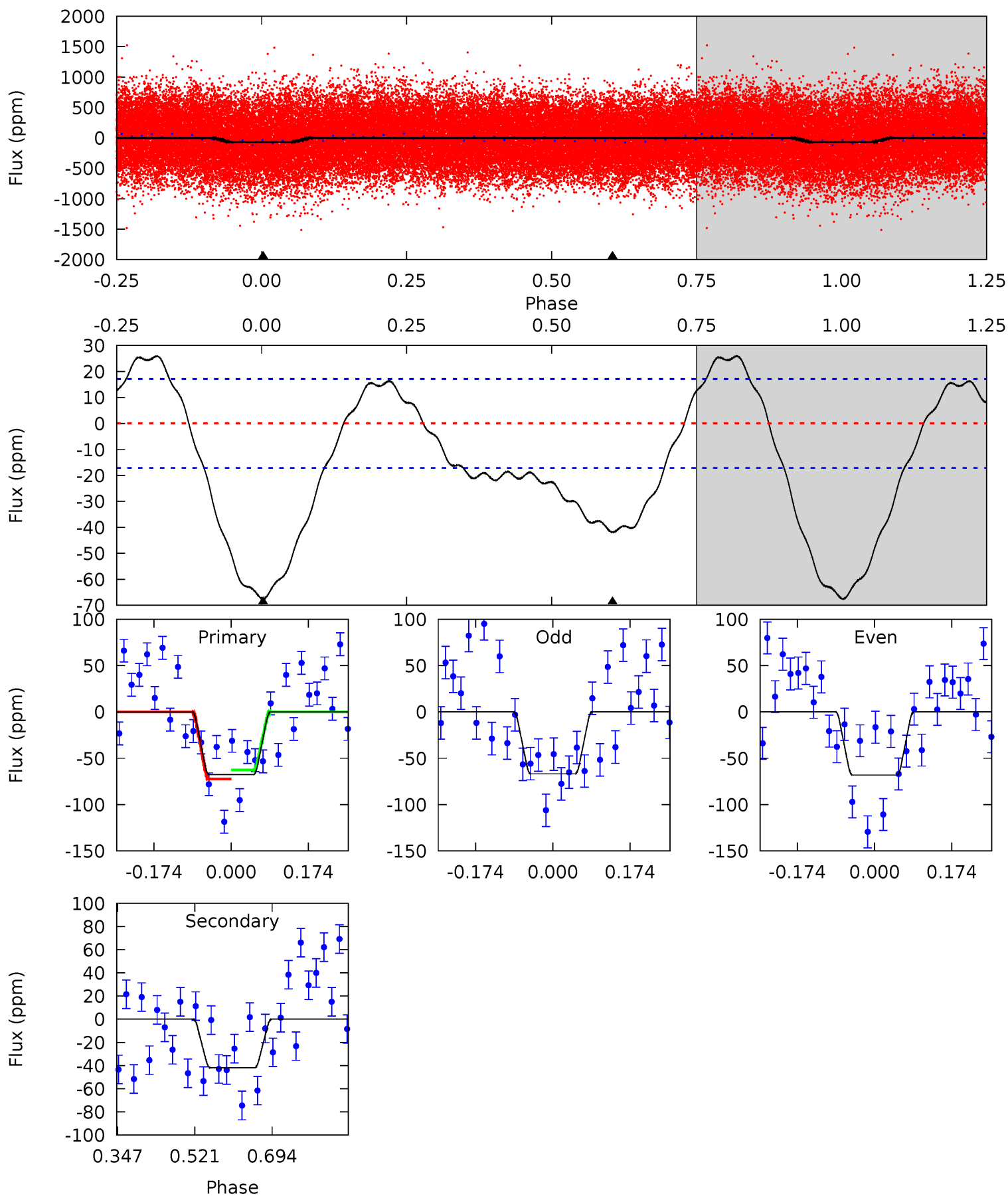
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.4	13.1	0	0	4.34	1.06	1.67	17.4	17.4	13.1	13.1	0.23	1.07	0.14	2.81



# Alt Model-Shift Uniqueness Test

003661361-01, P = 0.724868 Days, E = 131.147803 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
17.5	10.9	0	0	4.45	1.36	4.45	17.5	17.5	10.9	10.9	0.17	1.33	0.28	1.27





### Stellar Parameters For KIC 003661361

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6489^{+394}_{-1579}$	$2.694^{+0.264}_{-0.176}$	$-0.500^{+0.350}_{-0.200}$	$13.402^{+2.770}_{-6.464}$	$3.239^{+0.221}_{-1.991}$	$0.002^{+0.005}_{-0.001}$
	+6%/-24%	+10%/-7%	+70%/-40%	+21%/-48%	+7%/-61%	+239%/-41%
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 003661361-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-19 \pm 1$	$4.15^{+2.99}_{-2.37}$	$9267^{+1216}_{-2177}$	$3495^{+9229}_{-10328}$	$0.319^{+1.367}_{-0.207}$
Alt.	$-42 \pm 4$	$12.39^{+3.95}_{-3.64}$	$9198^{+1248}_{-2168}$	$-6818^{+2128}_{-1422}$	$0.078^{+0.066}_{-0.032}$

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

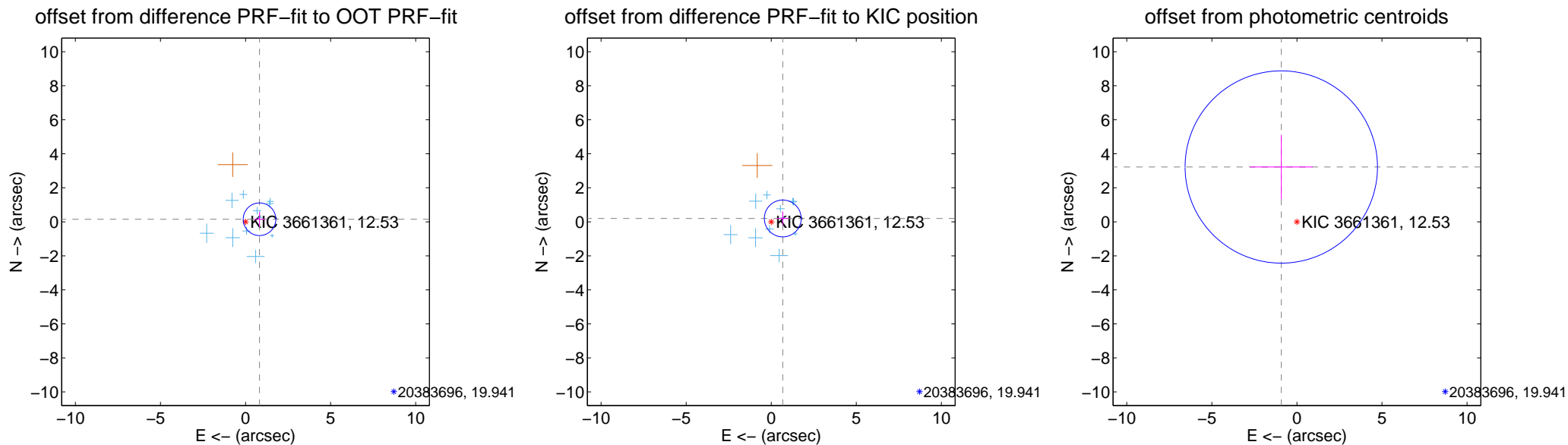
## DV Centroid Data

Supplemental centroid analysis for 003661361-01. Kepler magnitude: 12.53. Transit SNR 3.48

There are 11 quarters with good PRF difference image offsets

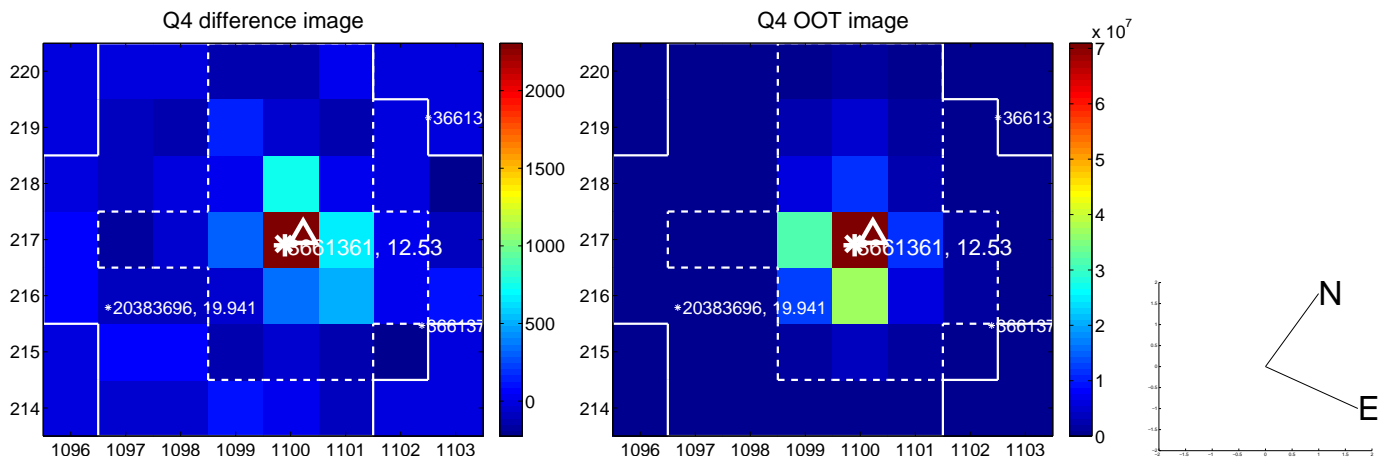
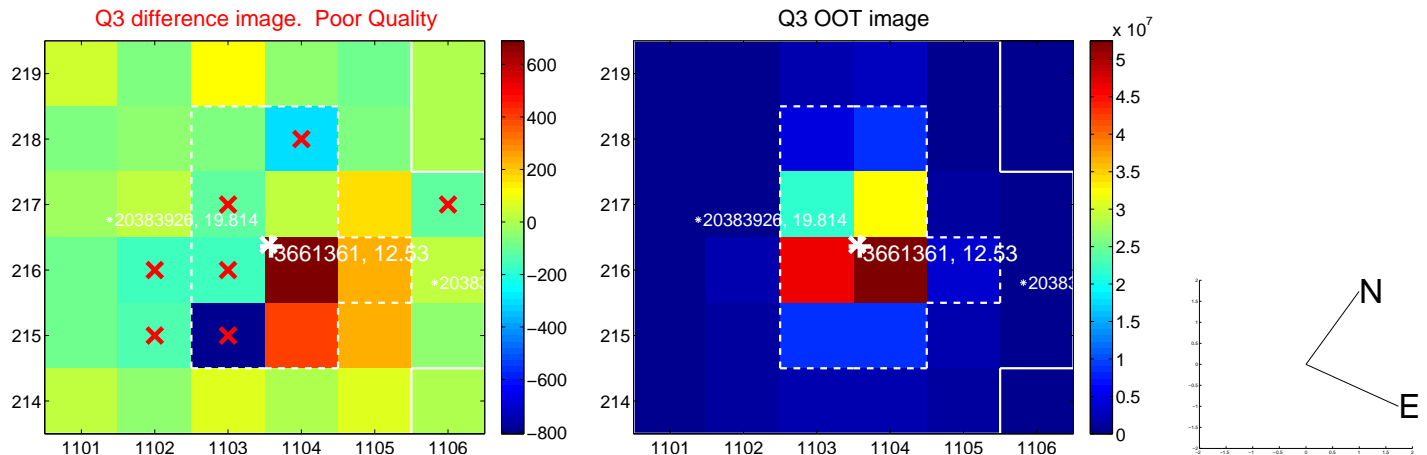
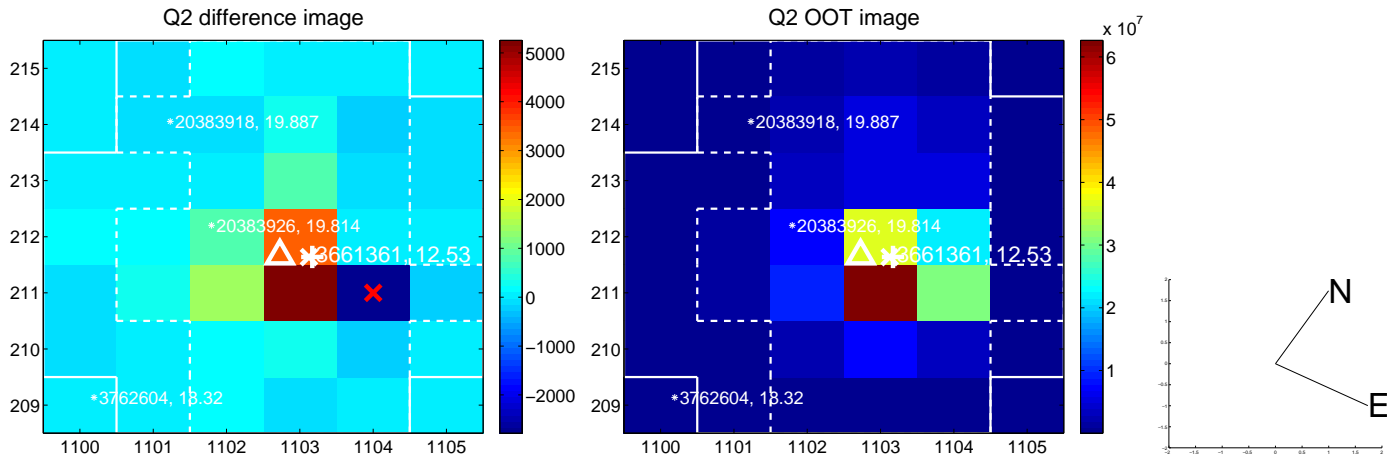
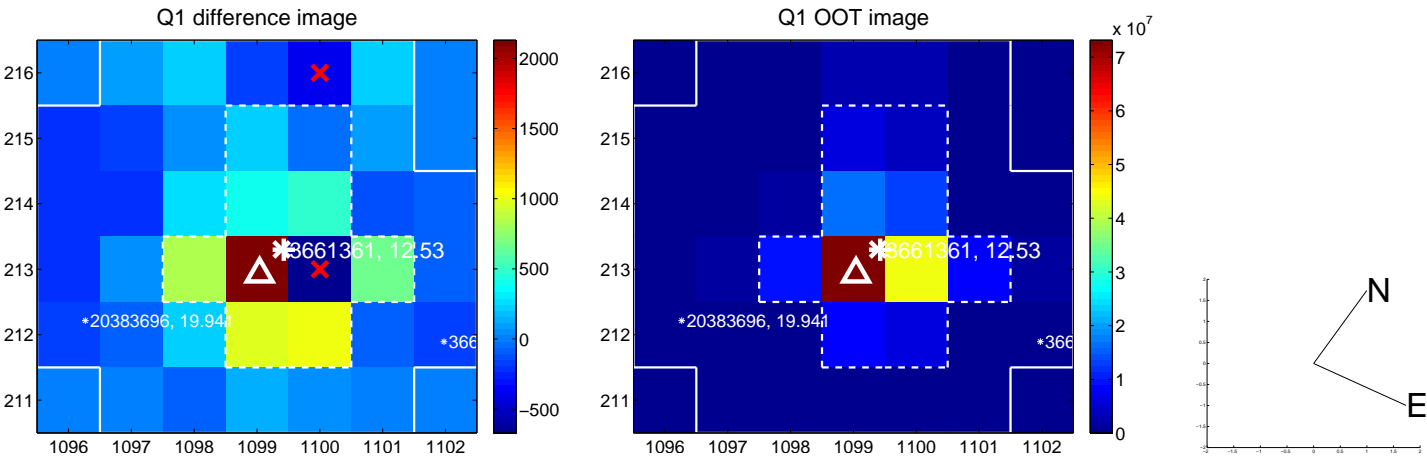
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.836 \pm 0.319$	2.62	$-0.822 \pm 0.316$	$0.152 \pm 0.415$
PRF-fit source offset from KIC position	$0.706 \pm 0.361$	1.96	$-0.678 \pm 0.341$	$0.197 \pm 0.398$
photometric centroid source offset	$3.35 \pm 1.88$	1.78	$0.92 \pm 1.84$	$3.22 \pm 1.89$

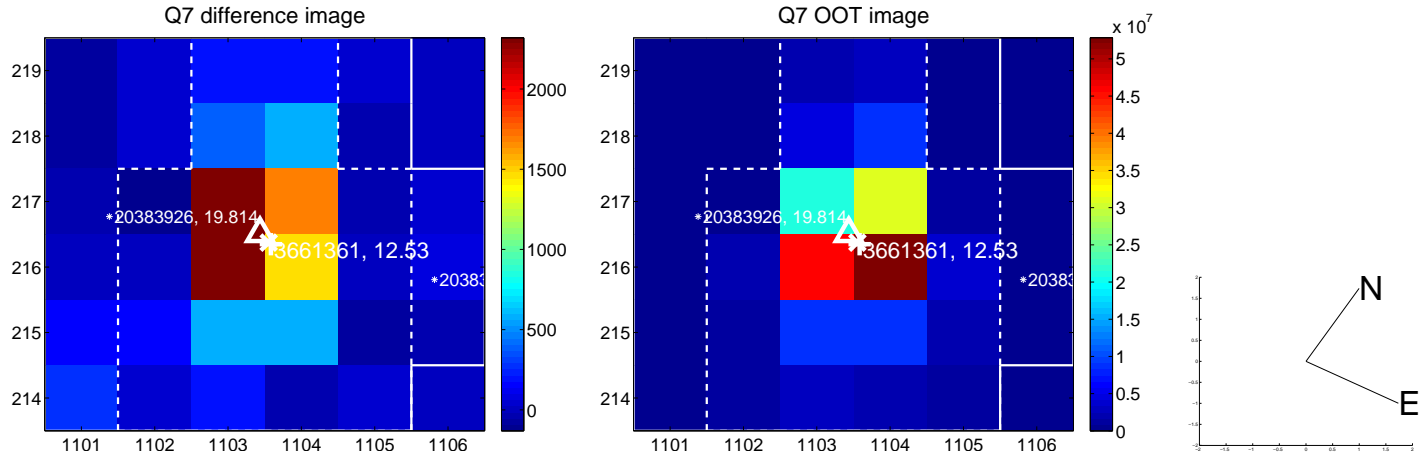
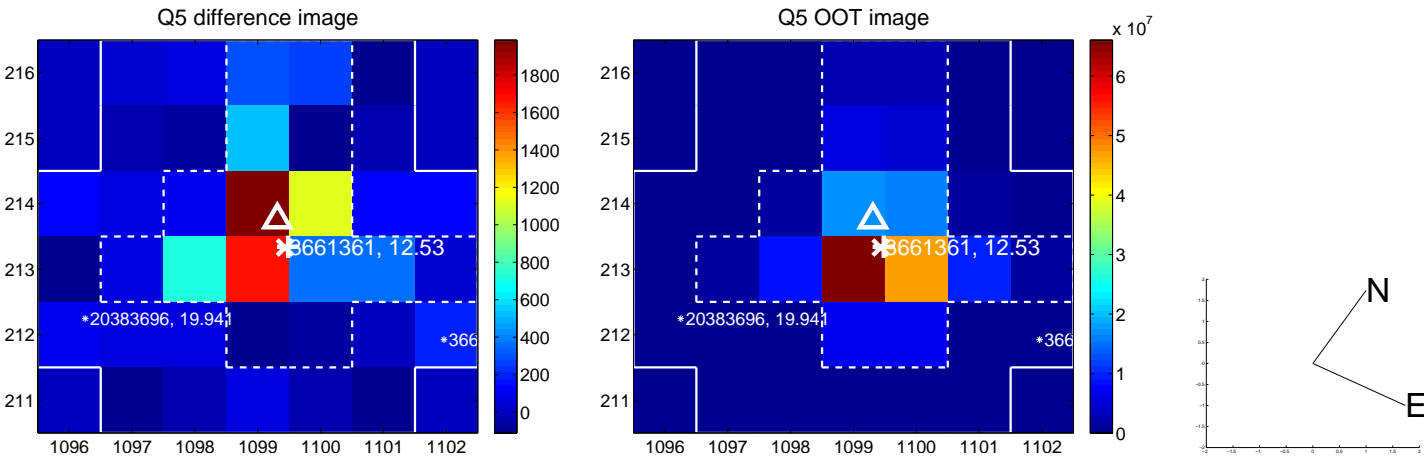


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

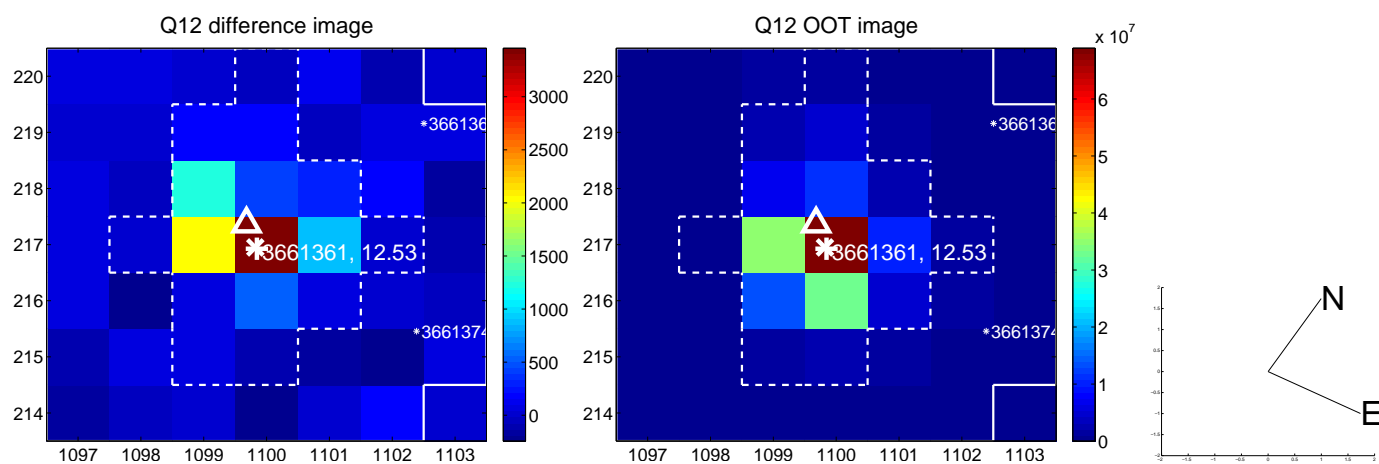
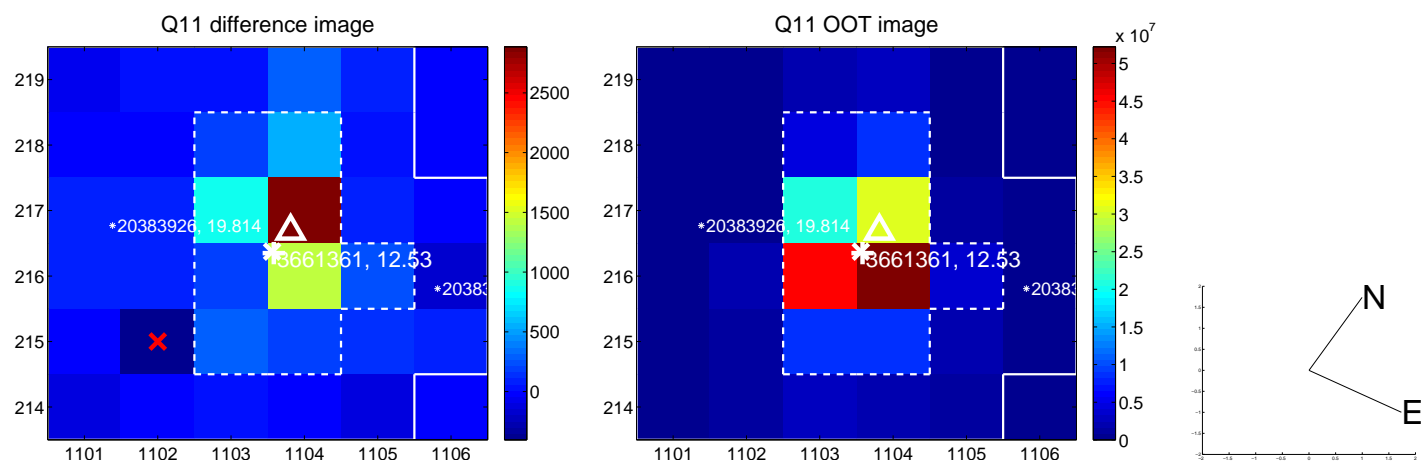
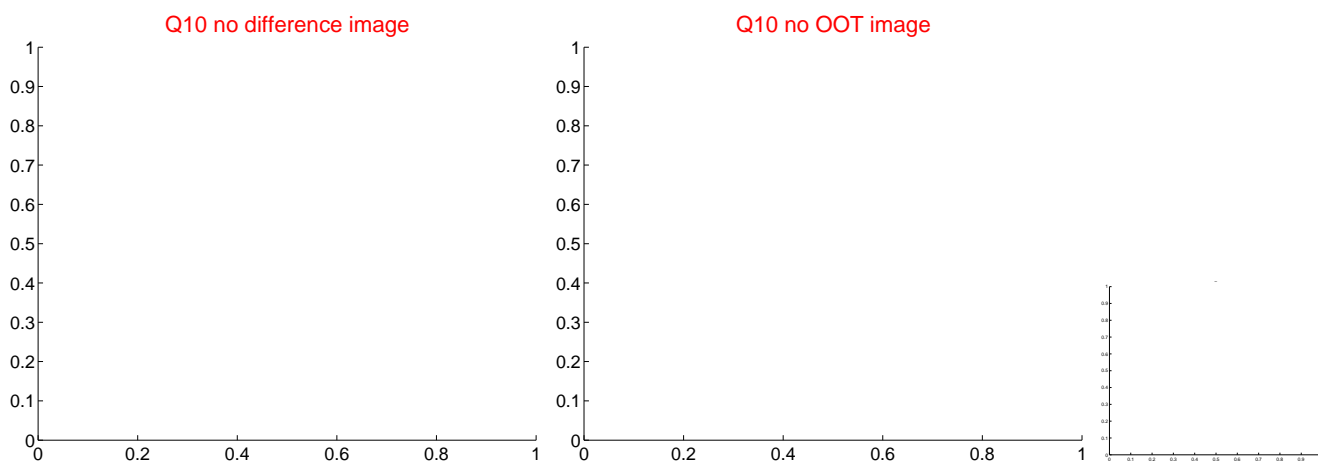
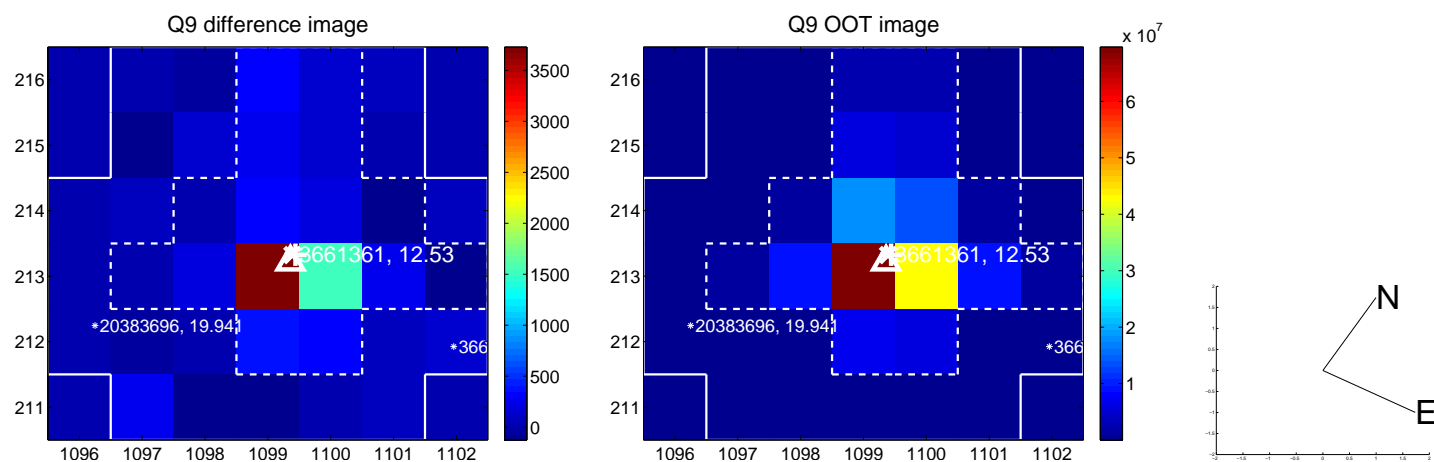


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

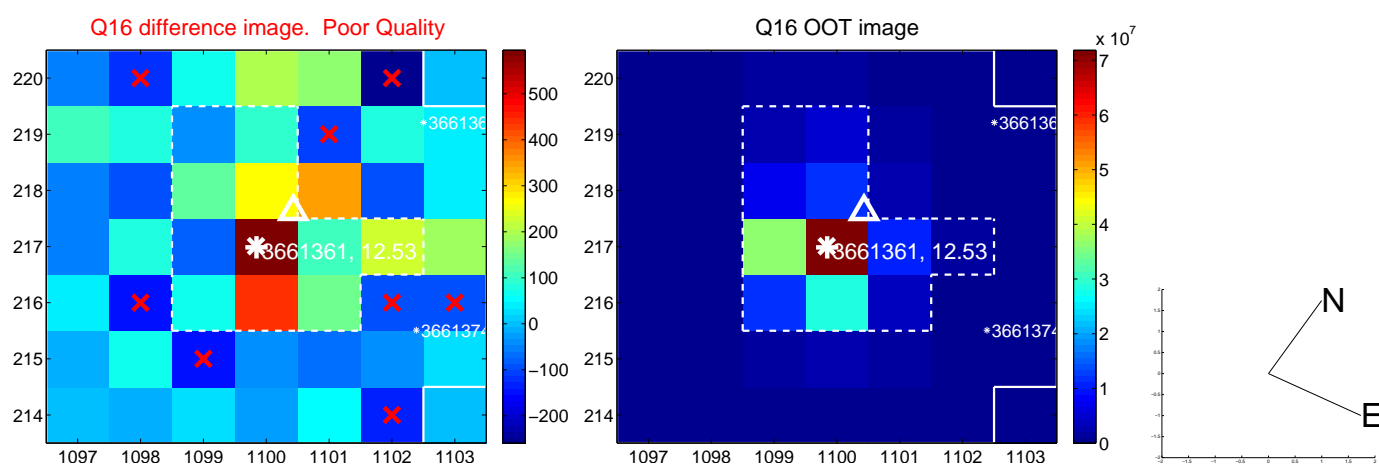
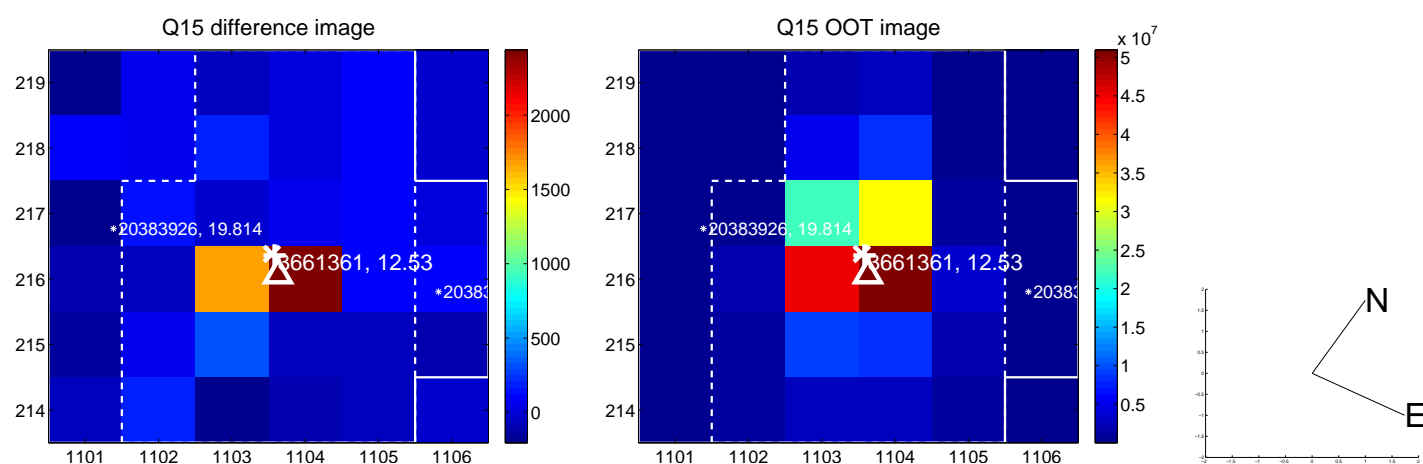
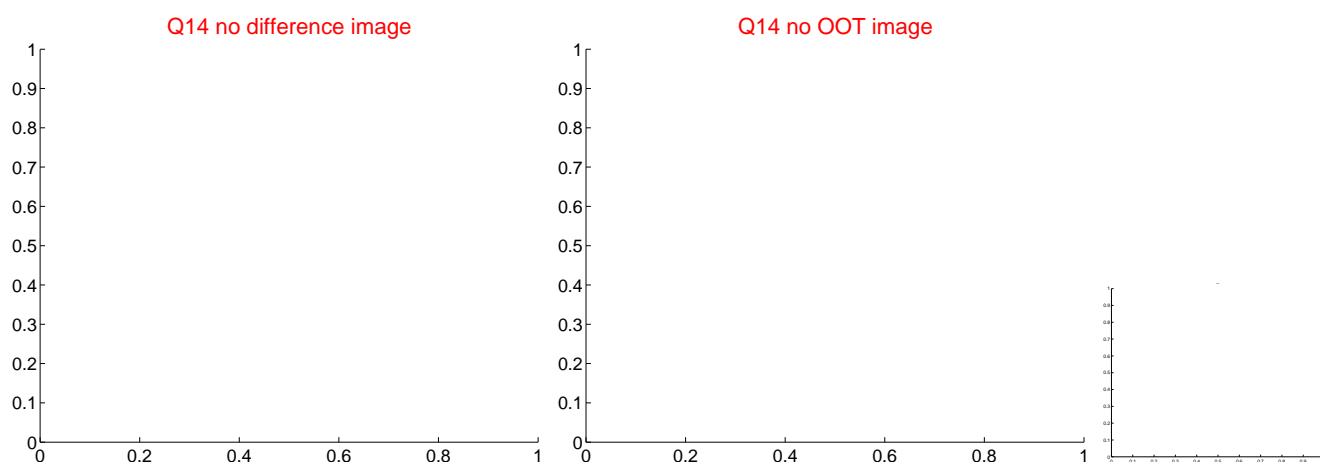
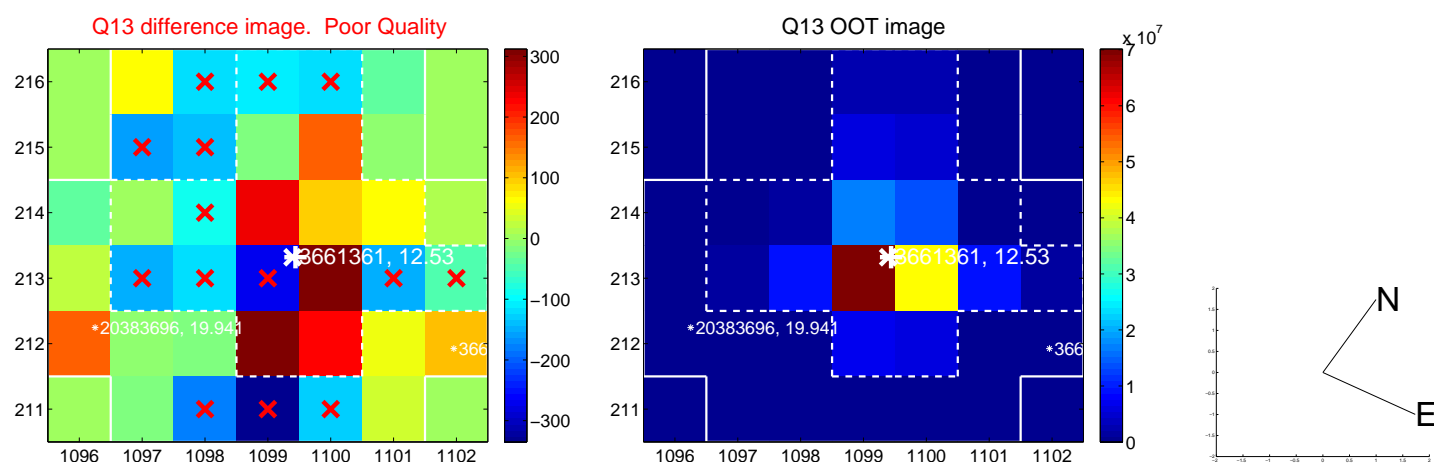




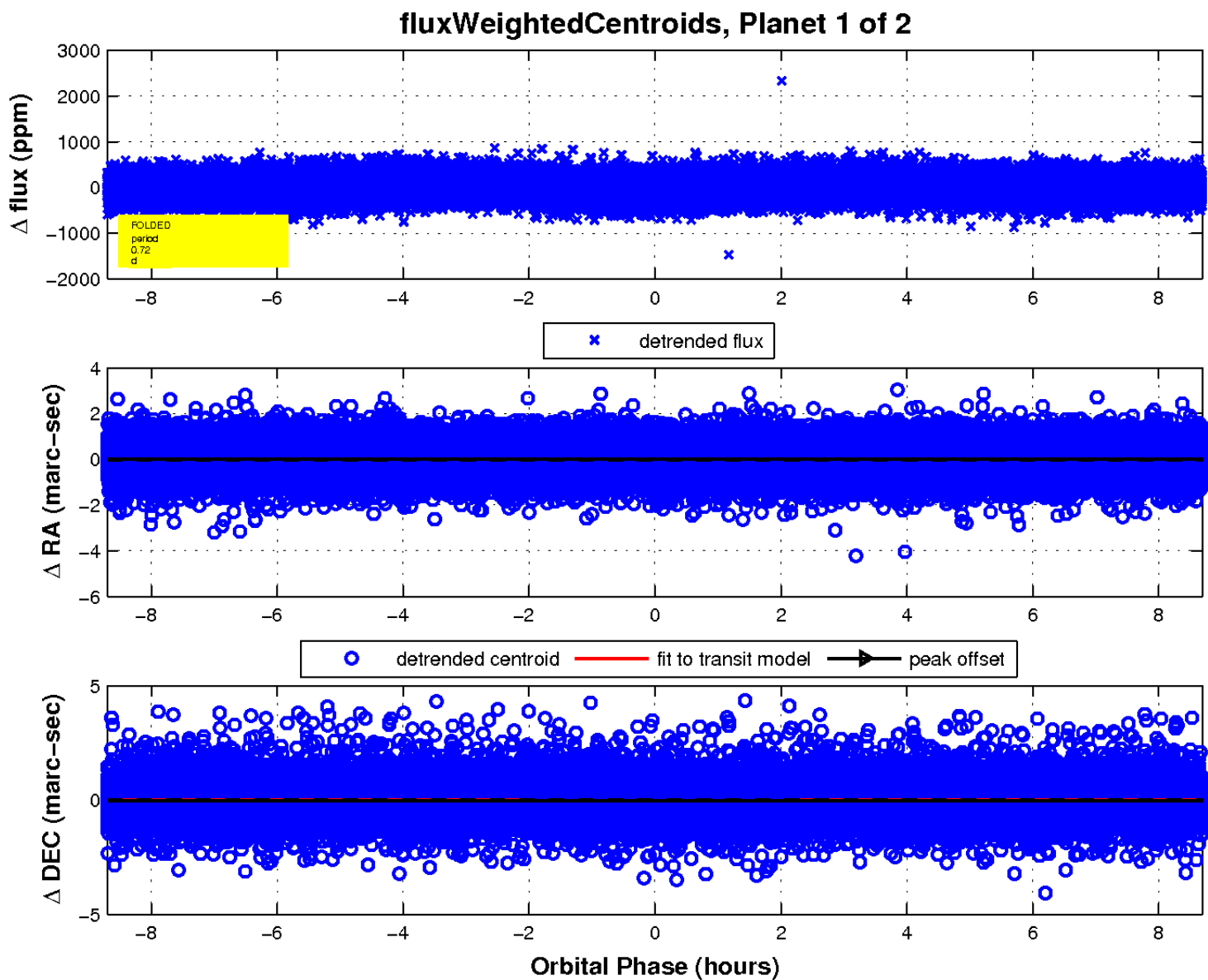
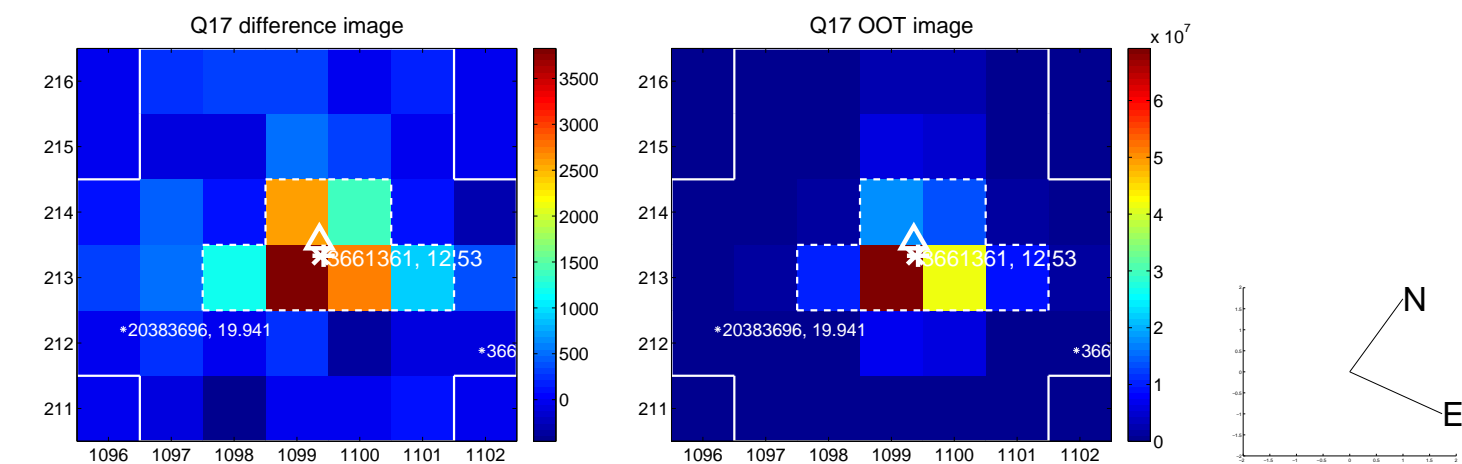
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

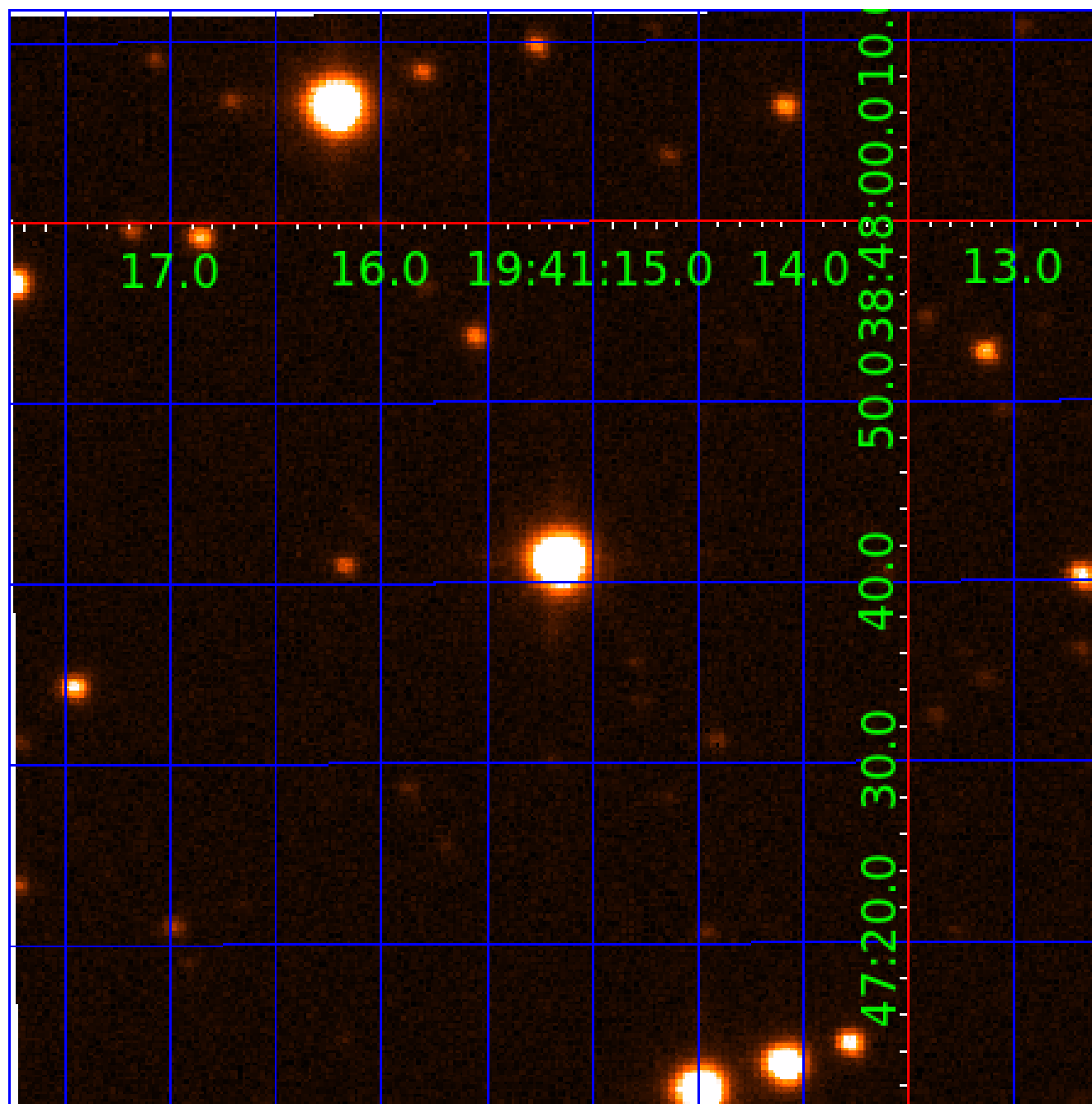


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 003661361

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003661361-01	OBS	No	0.724842	131.901705	8.7	4.621	10.6	3.5	13.40	6489	4.08	0.00
003661361-02	OBS	No	30.758819	141.757152	306.9	2.445	9.1	9.8	13.40	6489	27.41	3529.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003661361-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
003661361-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

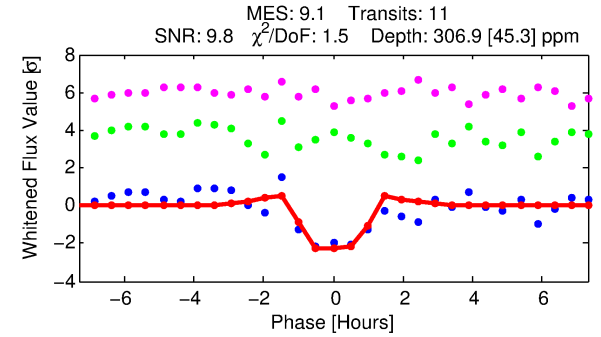
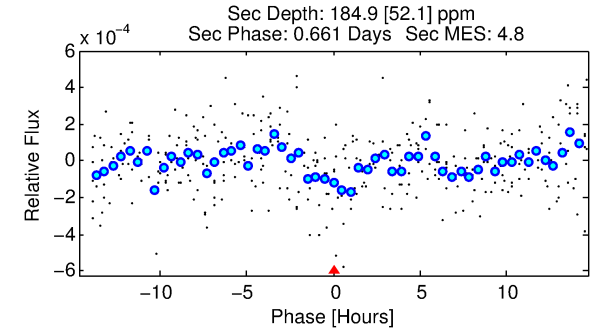
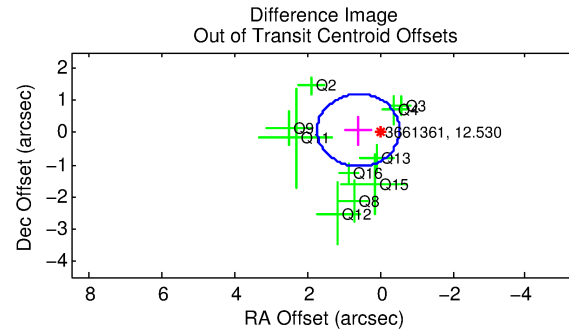
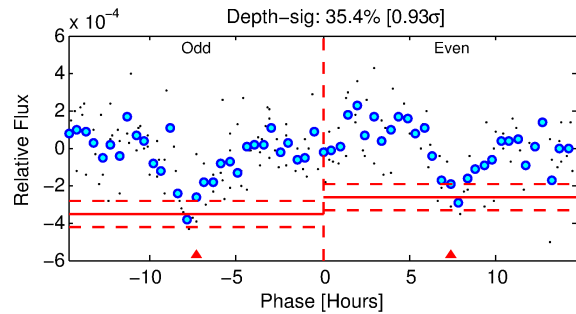
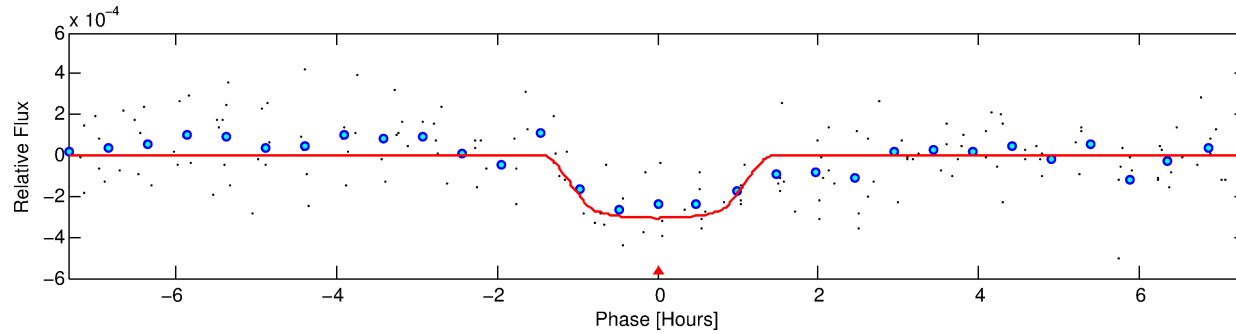
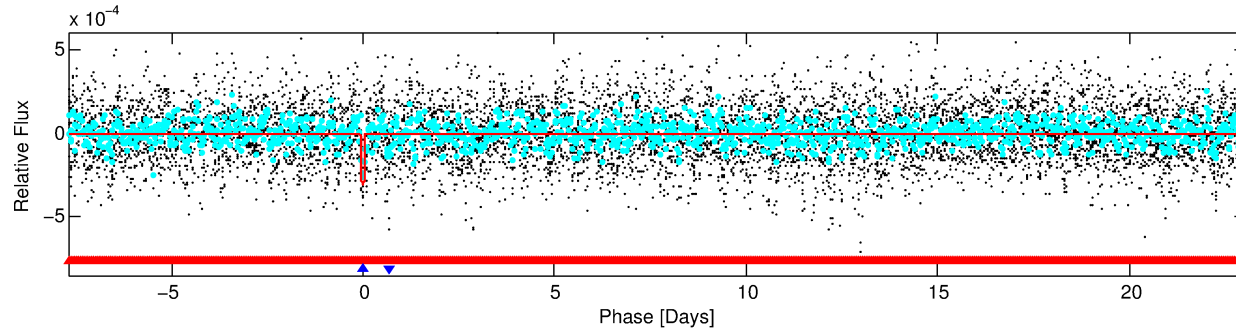
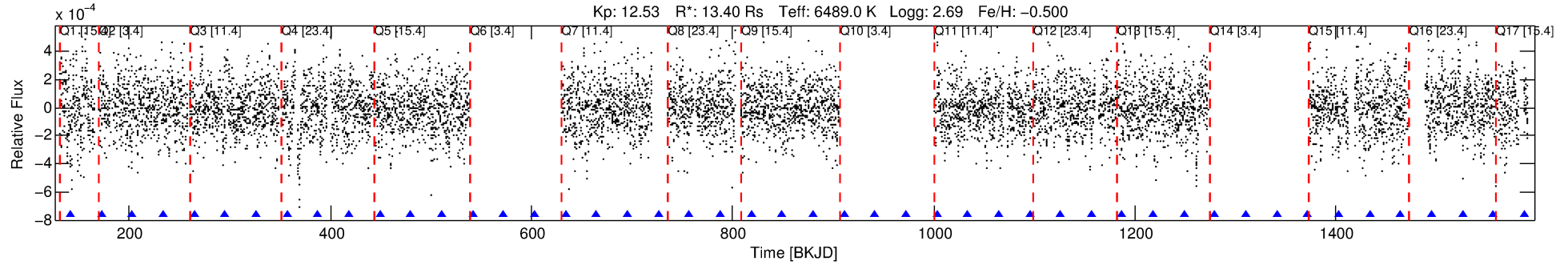
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003661361-02

No Significant Match Found

# DV One-Page Summary

KIC: 3661361 Candidate: 2 of 2 Period: 30.759 d



## DV Fit Results:

Period = 30.75882 [0.00020] d  
Epoch = 141.7572 [0.0046] BKJD  
Rp/R\* = 0.0187 [0.0090]  
a/R\* = 45.89 [125.57]  
b = 0.90 [0.59]  
Seff = 3529.87 [3890.89]  
Teq = 1965 [542] K  
Rp = 27.41 [18.64] Re  
a = 0.2843 [0.1081] AU  
Ag = 10.95 [12.32] [0.81 $\sigma$ ]  
Teffp = 5527 [1928] K [1.78 $\sigma$ ]

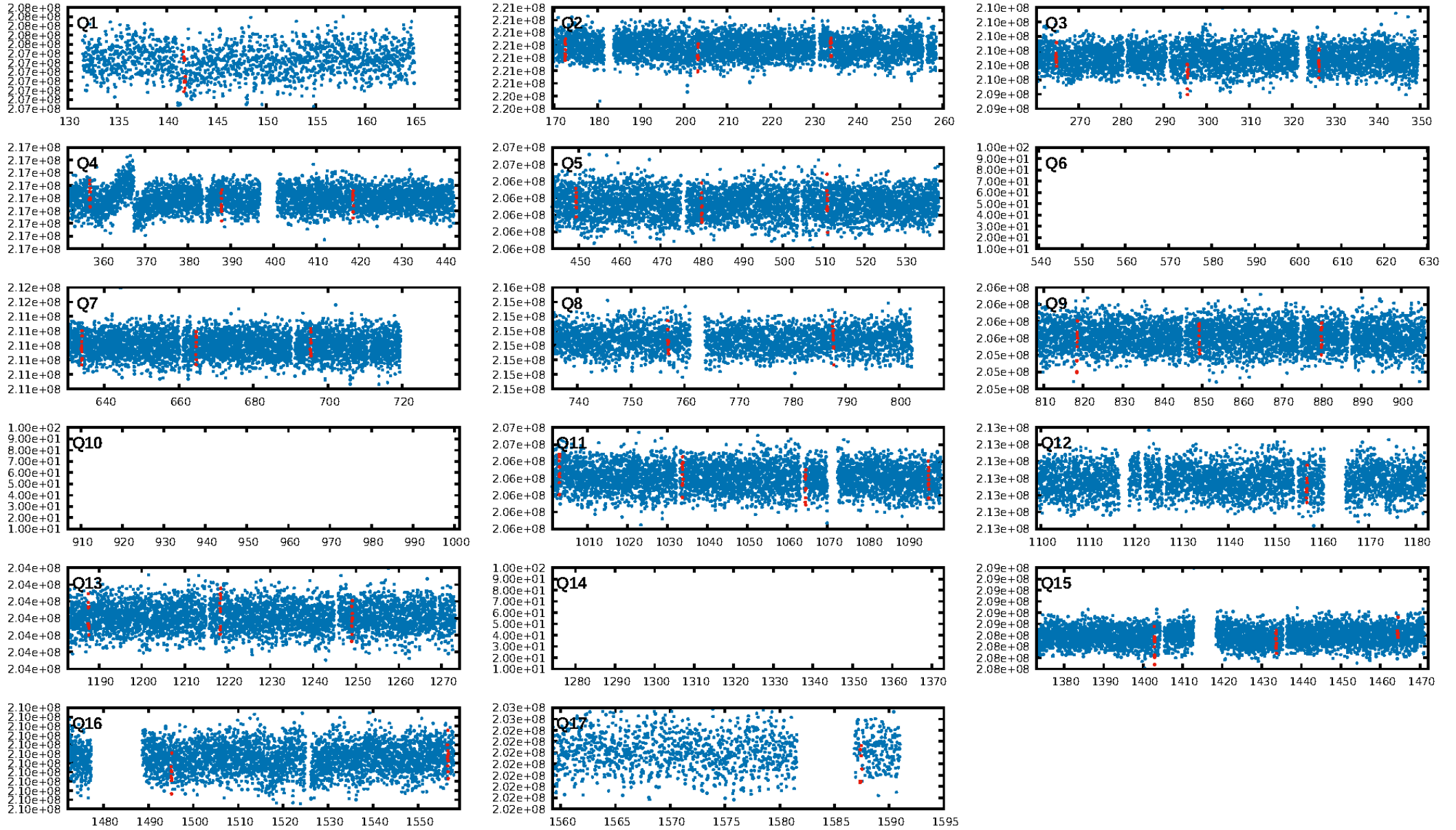
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [137.88 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 7.1%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 9.08e-09**  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: 1.567  
Centroid-sig: 0.0%  
Centroid-so: 1.519 arcsec [3.04 $\sigma$ ]  
OotOffset-rm: 0.599 arcsec [1.59 $\sigma$ ]  
OotOffset-st: 1/3/4/2 [10]  
KicOffset-rm: 0.721 arcsec [1.92 $\sigma$ ]  
KicOffset-st: 1/3/4/2 [10]  
DiffImageQuality-fgm: 1.00 [10/10]  
DiffImageOverlap-fno: 0.00 [0/13]

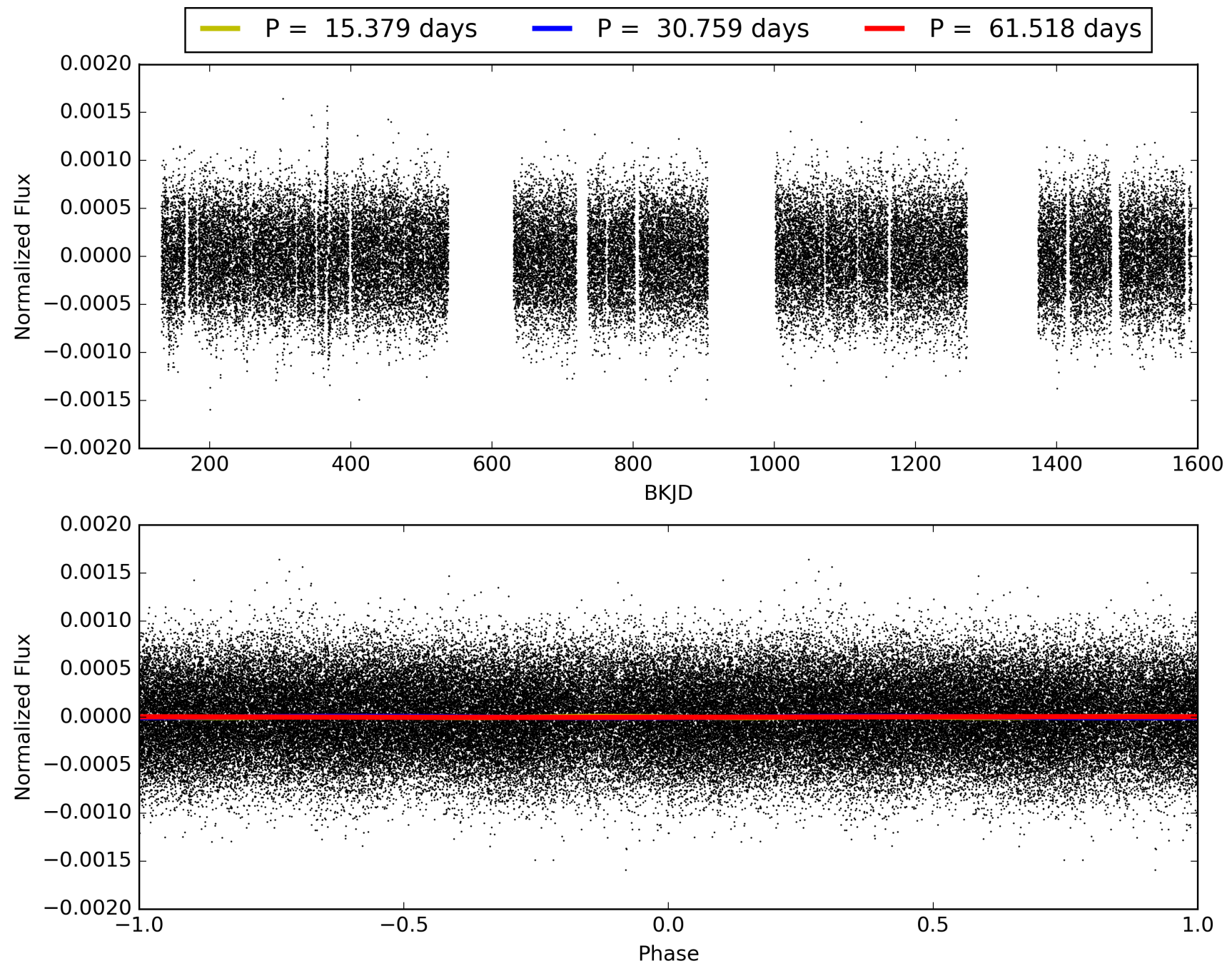
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 21:57:02 Z

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

# TCE 003661361-02, PDC Light Curves



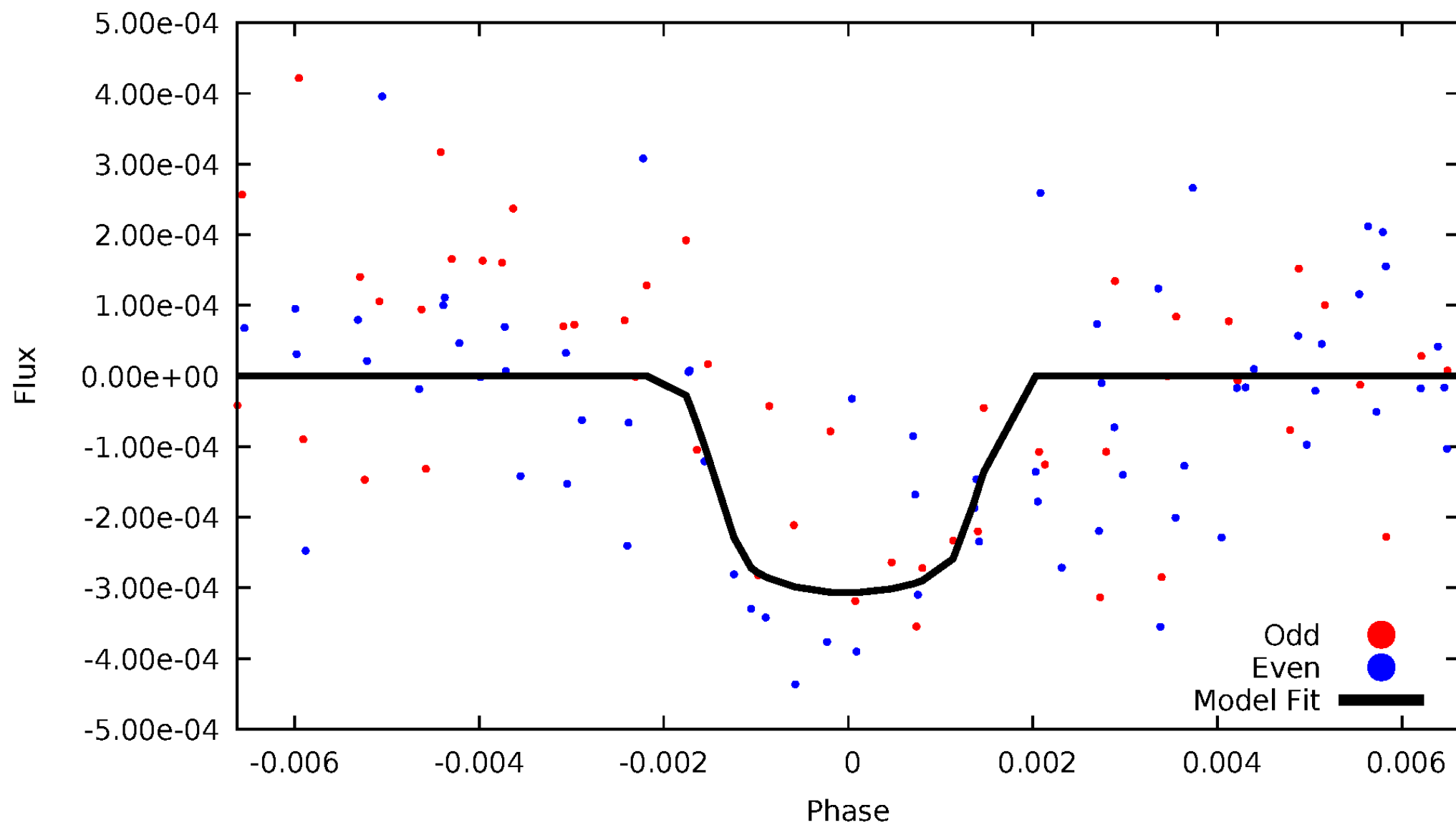
TCE 003661361-02





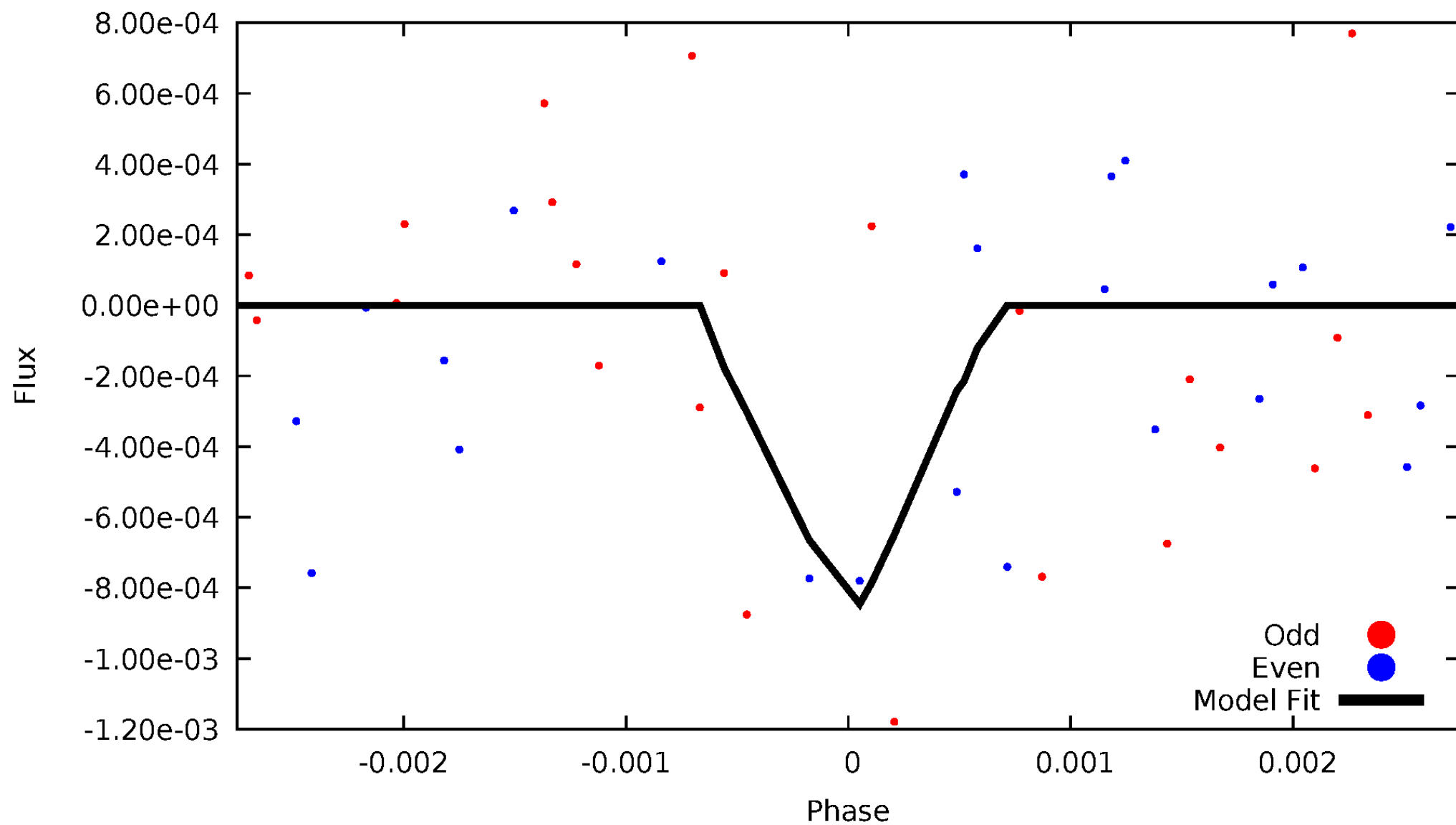
# DV Odd/Even

TCE 003661361-02



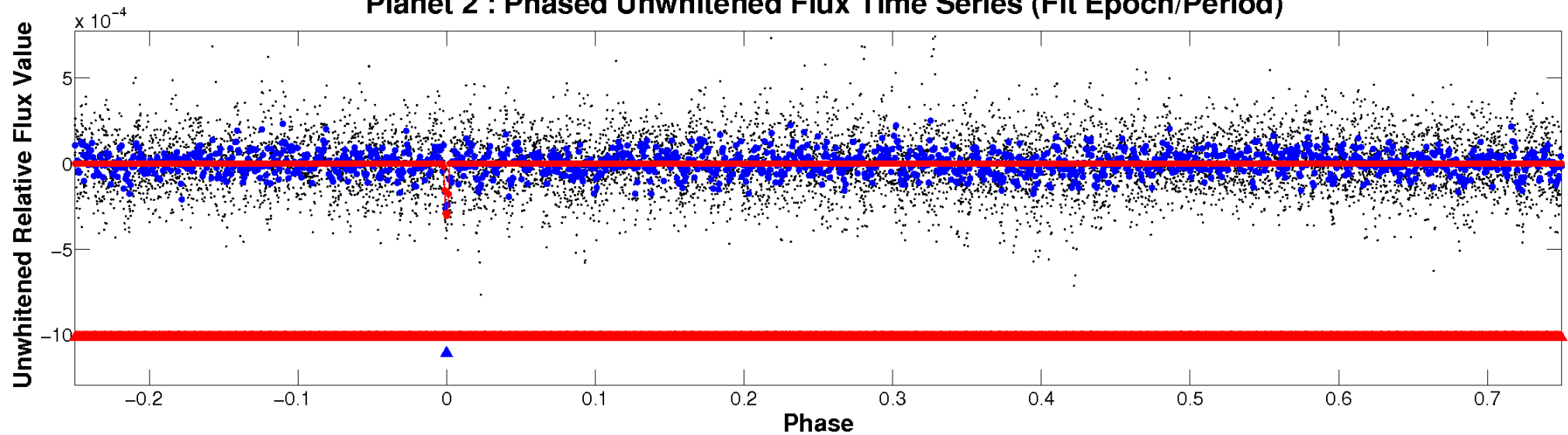
# ALT Odd/Even

TCE 003661361-02

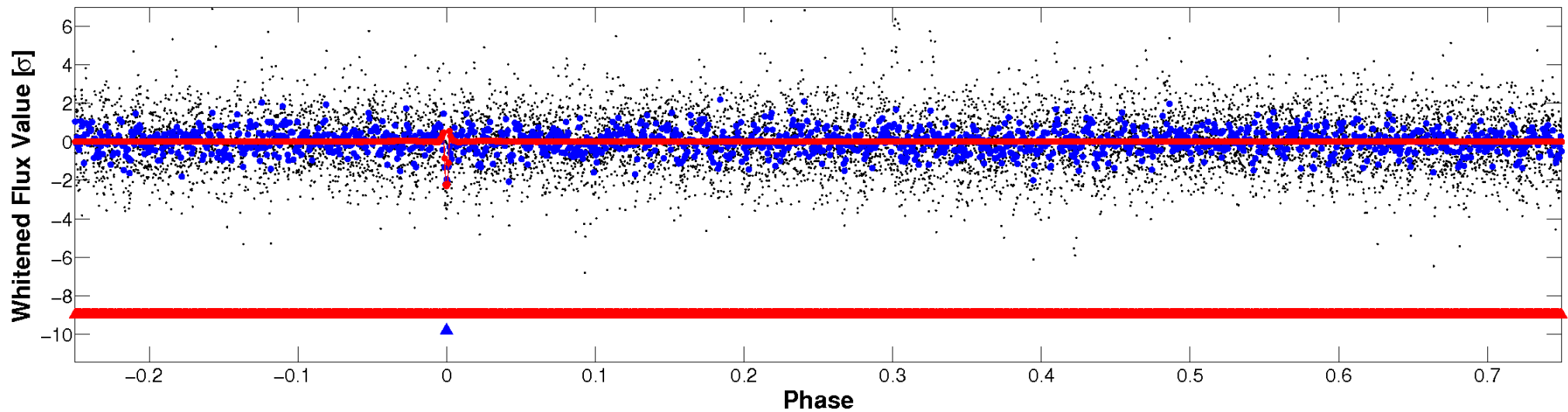


# Non-Whitened Vs. Whitened Light Curve

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

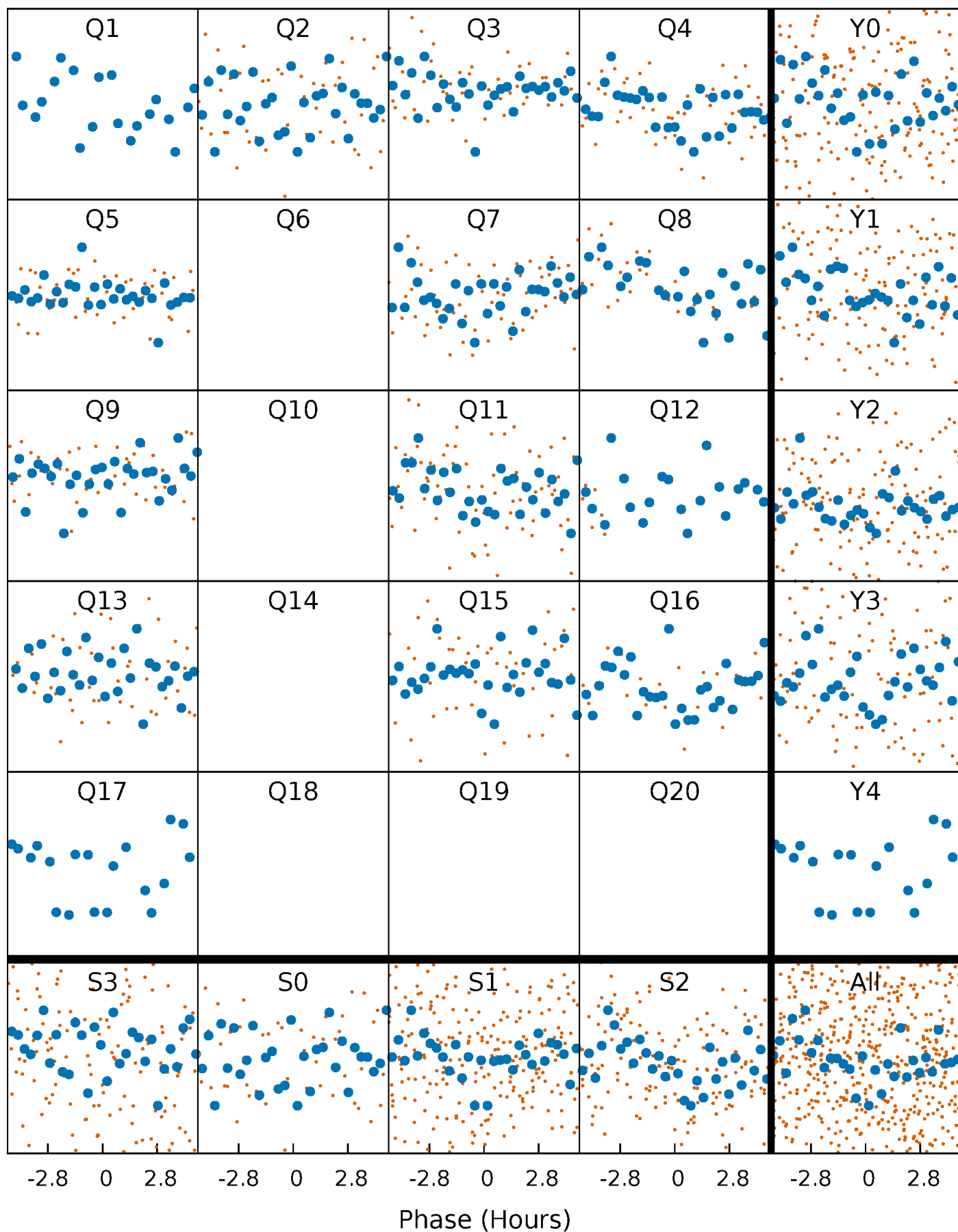


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



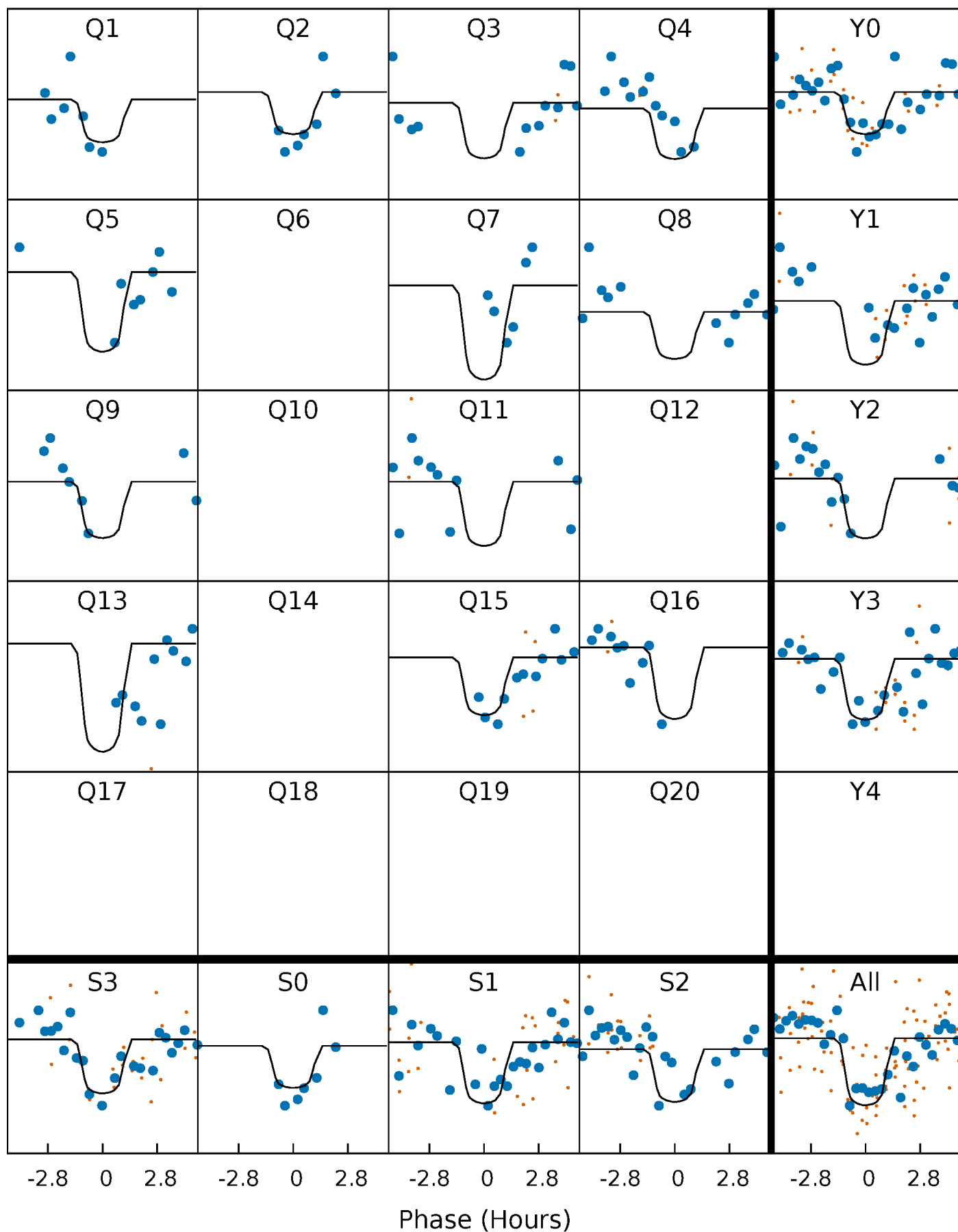
# PDC Quarter-Phased Transit Curves

TCE 003661361-02   P= 30.758819 Days    $T_0=141.757152$  (BKJD)



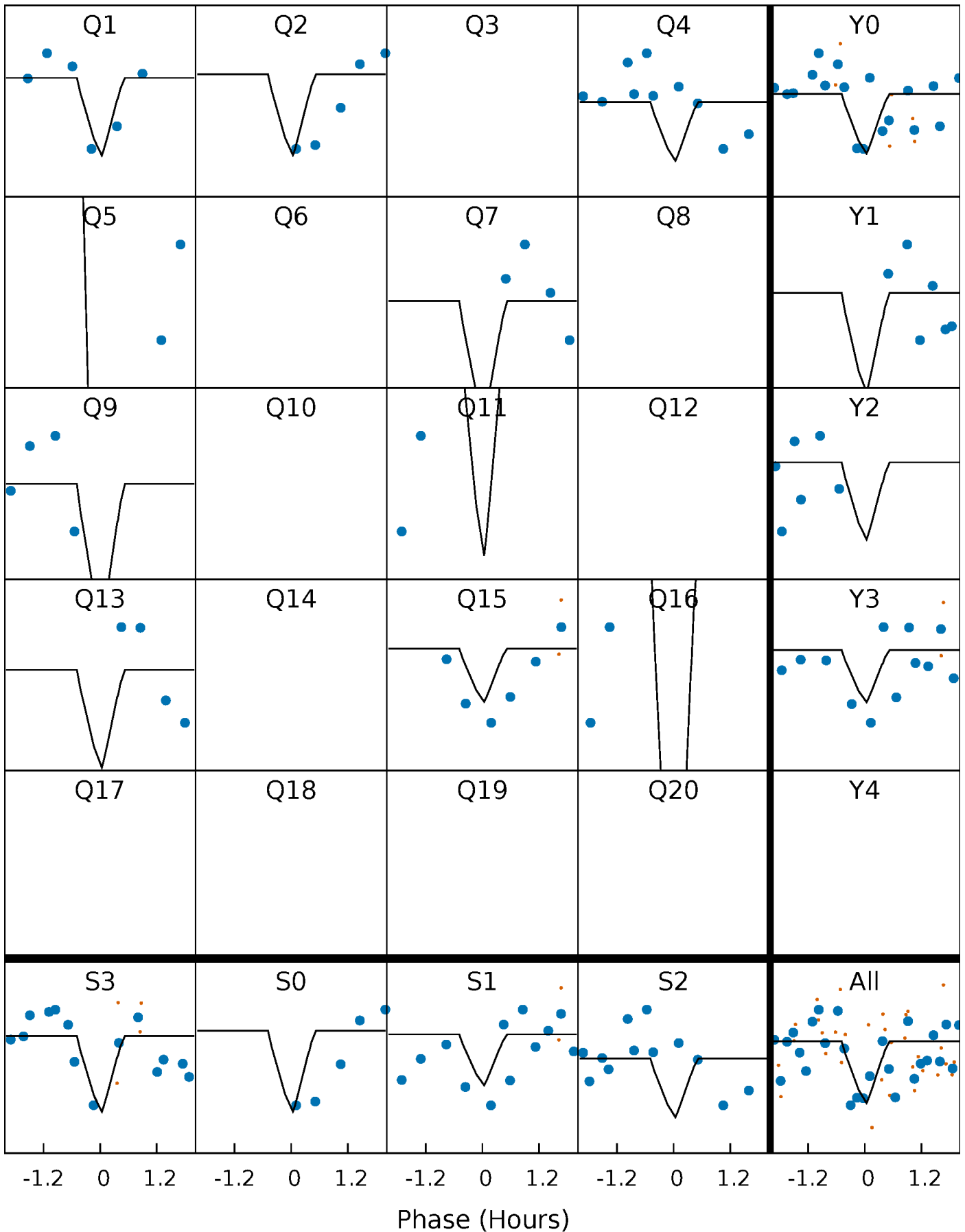
# DV Quarter-Phased Transit Curves

TCE 003661361-02   P= 30.758819 Days    $T_0=141.757152$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003661361-02     $P = 30.760256$  Days     $T_0 = 141.714587$  (BKJD)

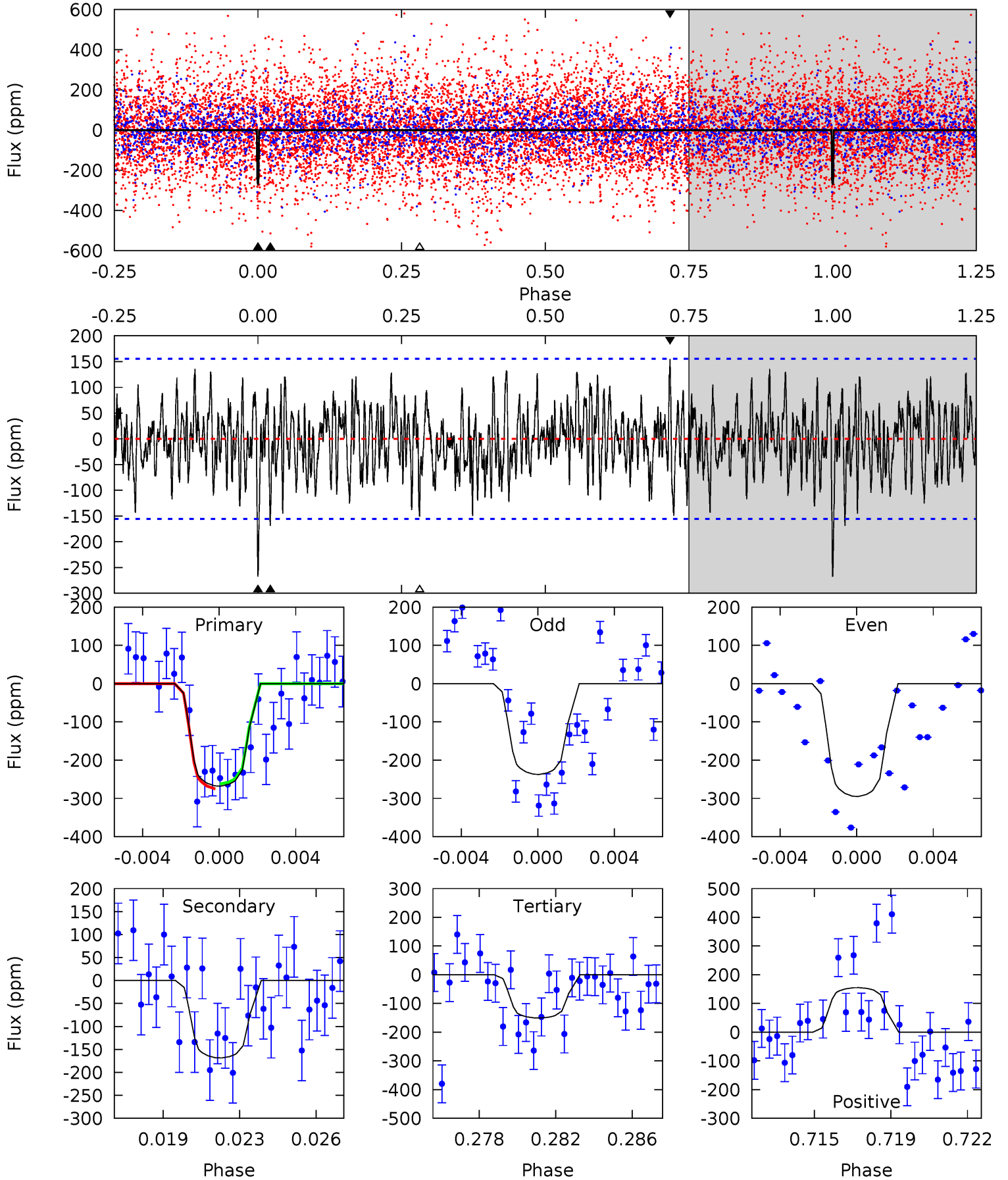




# DV Model-Shift Uniqueness Test

003661361-02,  $P = 30.758819$  Days,  $E = 110.998333$  Days

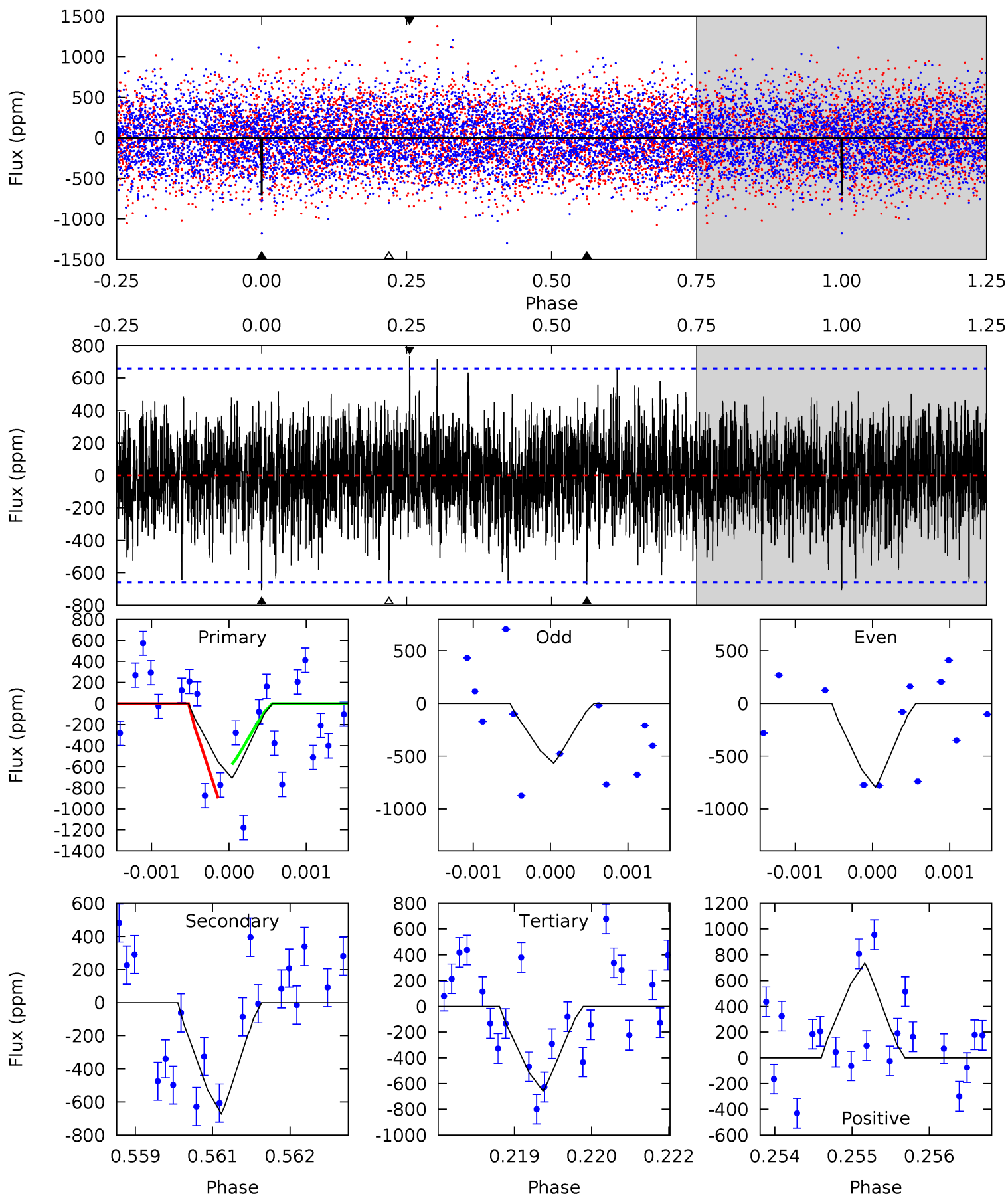
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.98	5.65	5.05	5.20	5.21	2.90	1.76	3.92	3.78	0.60	0.46	0.95	0.88	0.37	0.22



# Alt Model-Shift Uniqueness Test

003661361-02, P = 30.760256 Days, E = 110.954331 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
5.82	5.53	5.41	6.05	5.41	3.22	1.62	0.41	-0.23	0.11	-0.52	0.92	0.78	0.51	1.15



### Stellar Parameters For KIC 003661361

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6489^{+394}_{-1579}$	$2.694^{+0.264}_{-0.176}$	$-0.500^{+0.350}_{-0.200}$	$13.402^{+2.770}_{-6.464}$	$3.239^{+0.221}_{-1.991}$	$0.002^{+0.005}_{-0.001}$
	+6%/-24%	+10%/-7%	+70%/-40%	+21%/-48%	+7%/-61%	+239%/-41%
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 003661361-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-169 \pm 30$	$26.40^{+14.75}_{-12.88}$	$2624^{+356}_{-672}$	$5022^{+1769}_{-1038}$	$10^{+25}_{-6}$
Alt.	$-672 \pm 122$	$41.96^{+16.73}_{-14.61}$	$2627^{+365}_{-608}$	$5647^{+1452}_{-1162}$	$16^{+21}_{-8}$

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

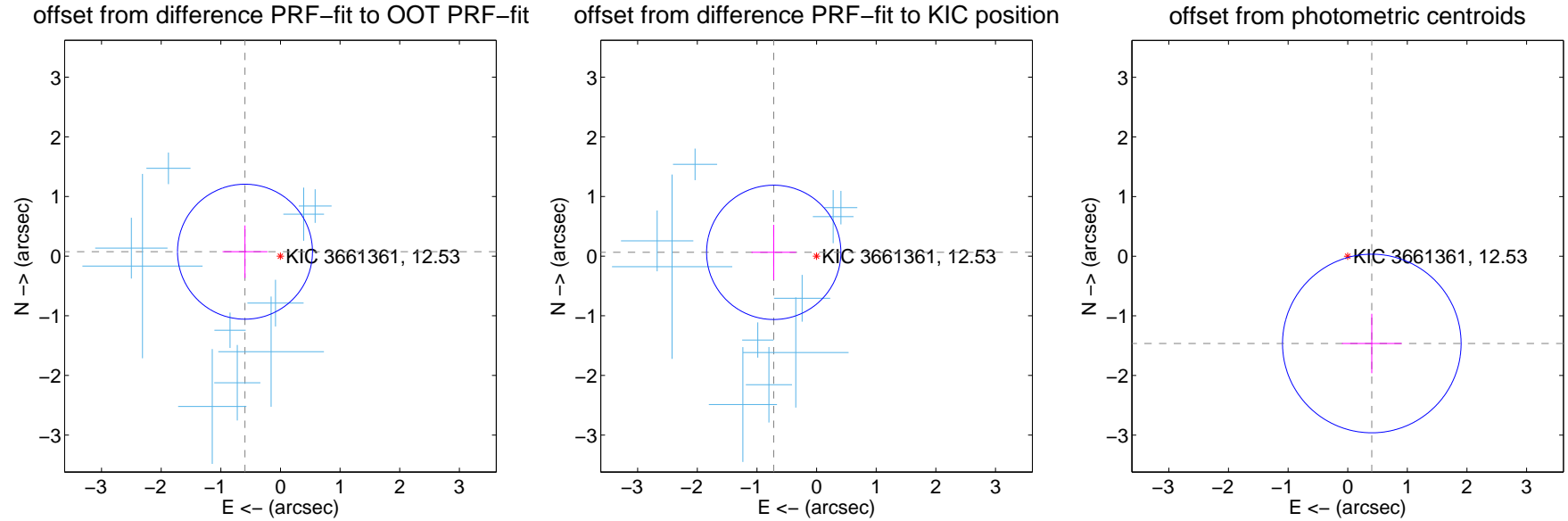
## DV Centroid Data

Supplemental centroid analysis for 003661361-02. Kepler magnitude: 12.53. Transit SNR 9.77

There are 10 quarters with good PRF difference image offsets

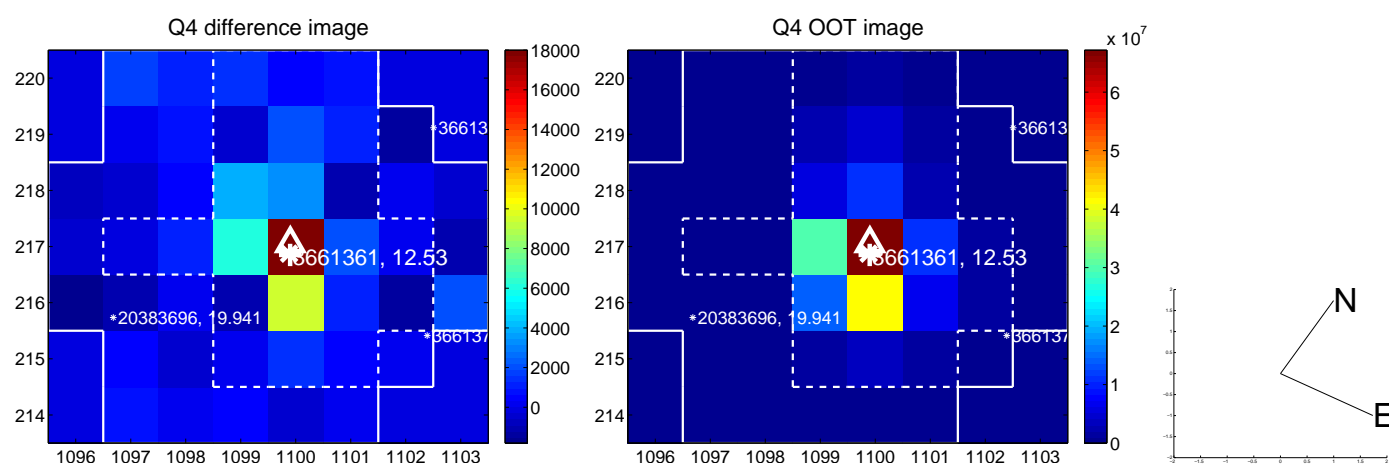
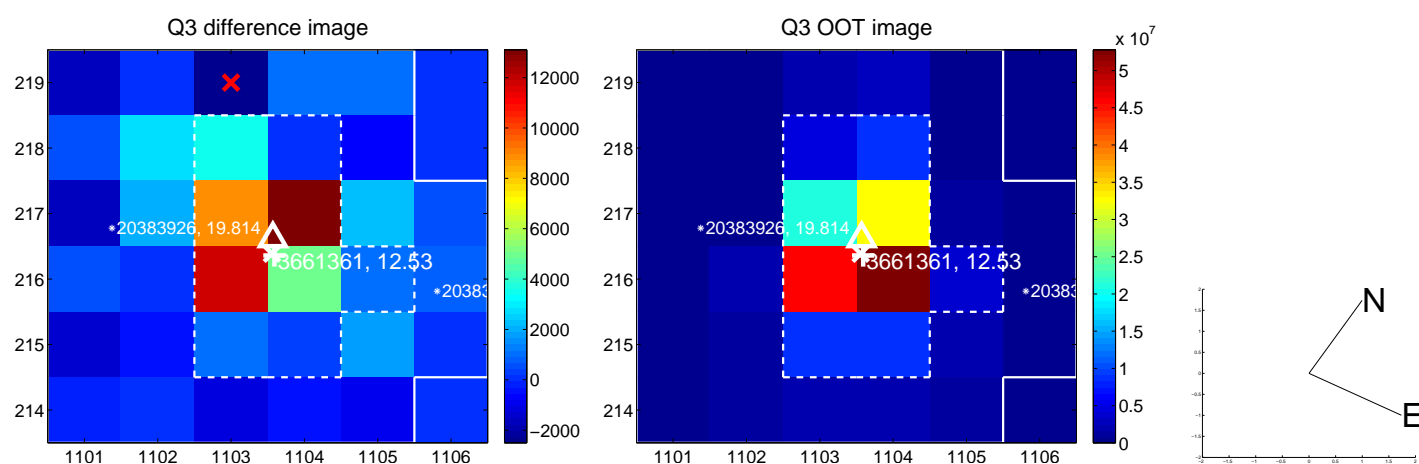
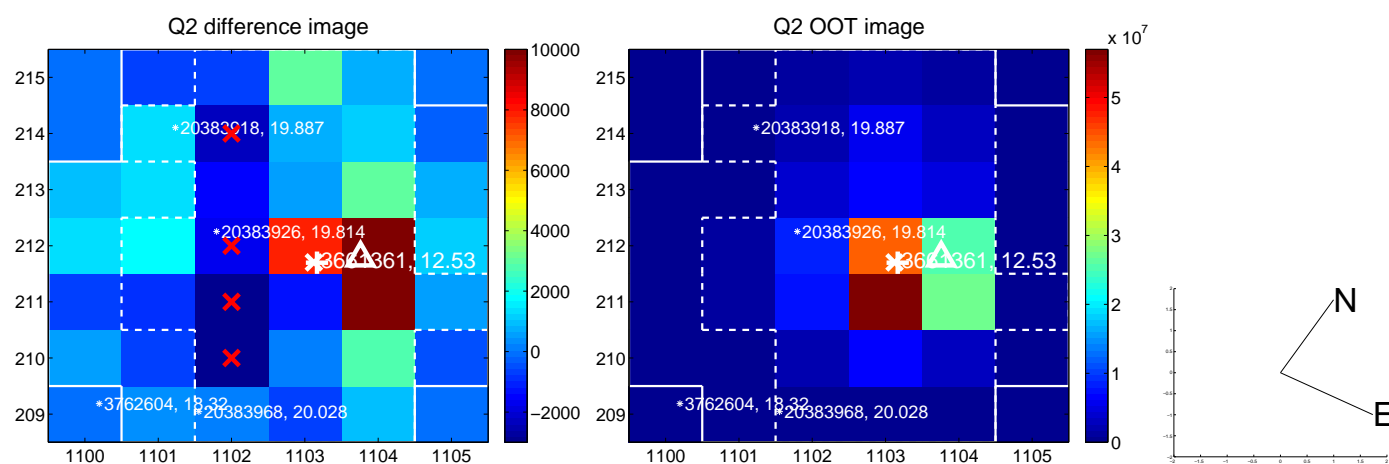
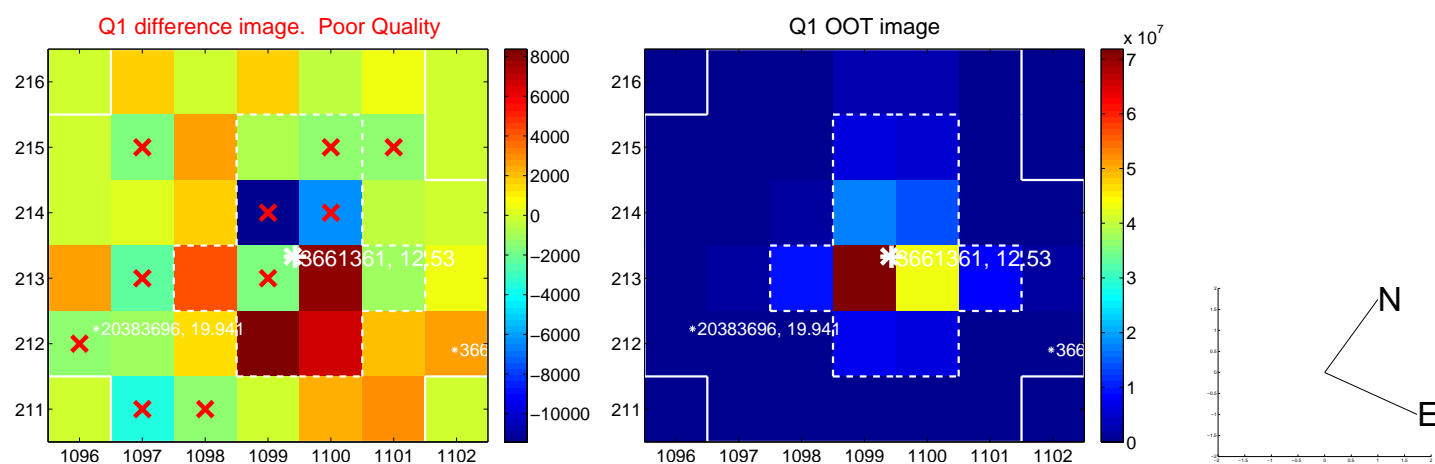
The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.599 \pm 0.377$	1.59	$0.595 \pm 0.376$	$0.074 \pm 0.442$
PRF-fit source offset from KIC position	$0.721 \pm 0.375$	1.92	$0.718 \pm 0.375$	$0.063 \pm 0.461$
photometric centroid source offset	$1.52 \pm 0.50$	3.04	$-0.40 \pm 0.50$	$-1.46 \pm 0.50$

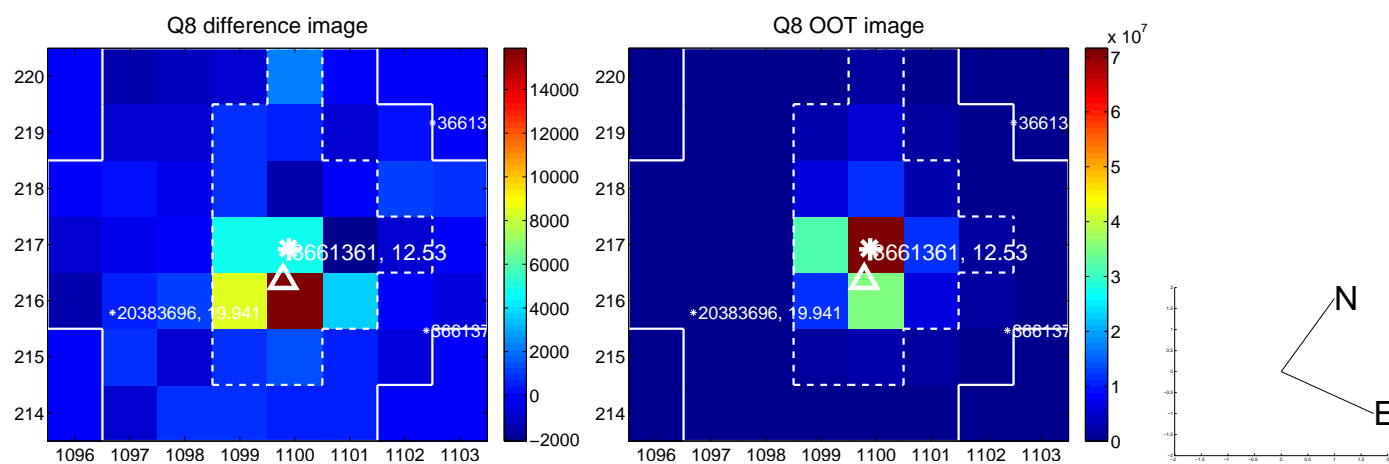
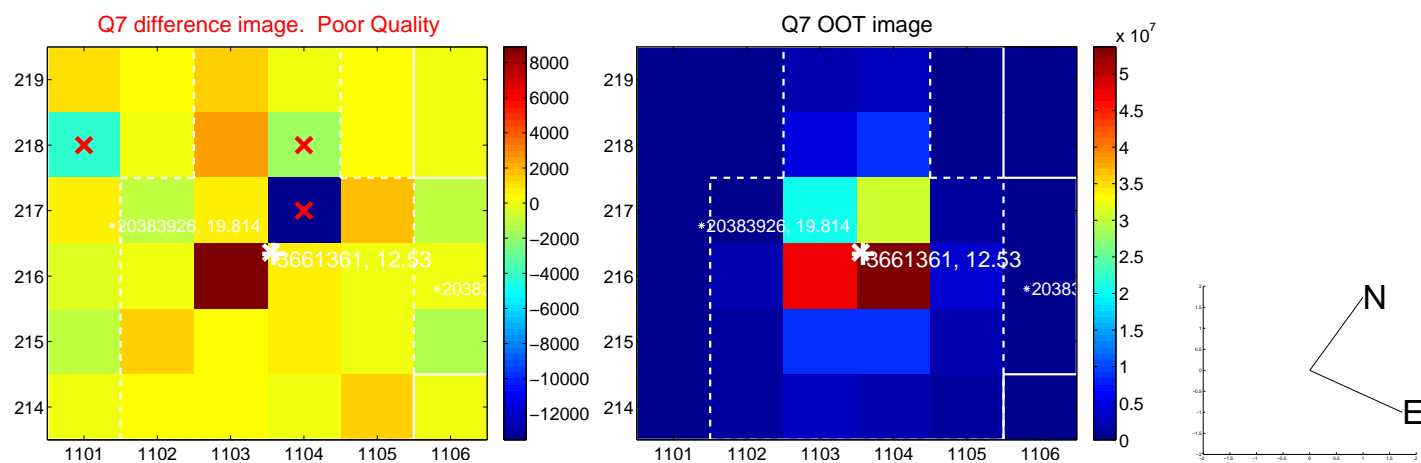
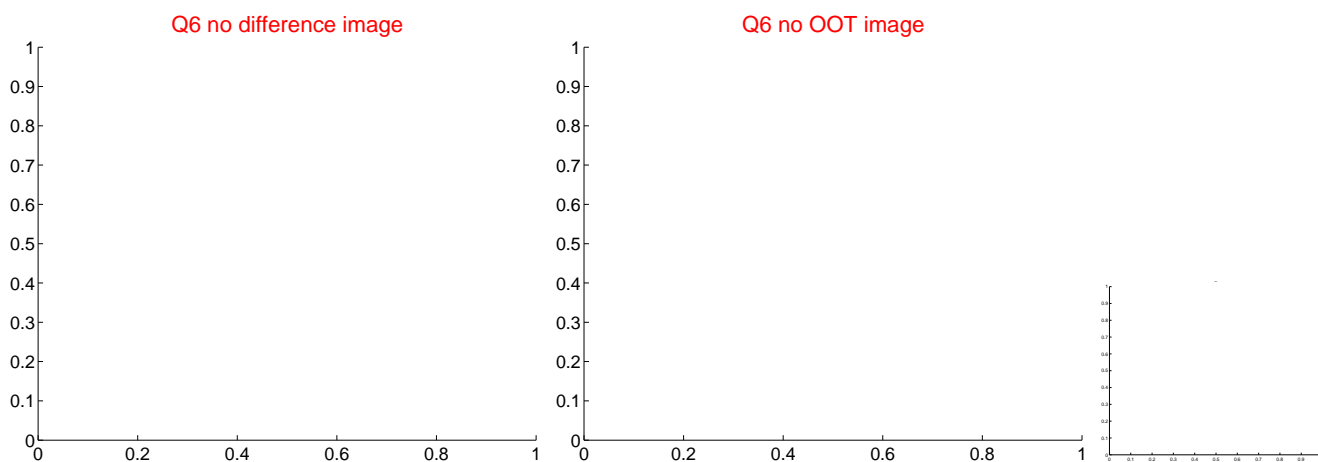
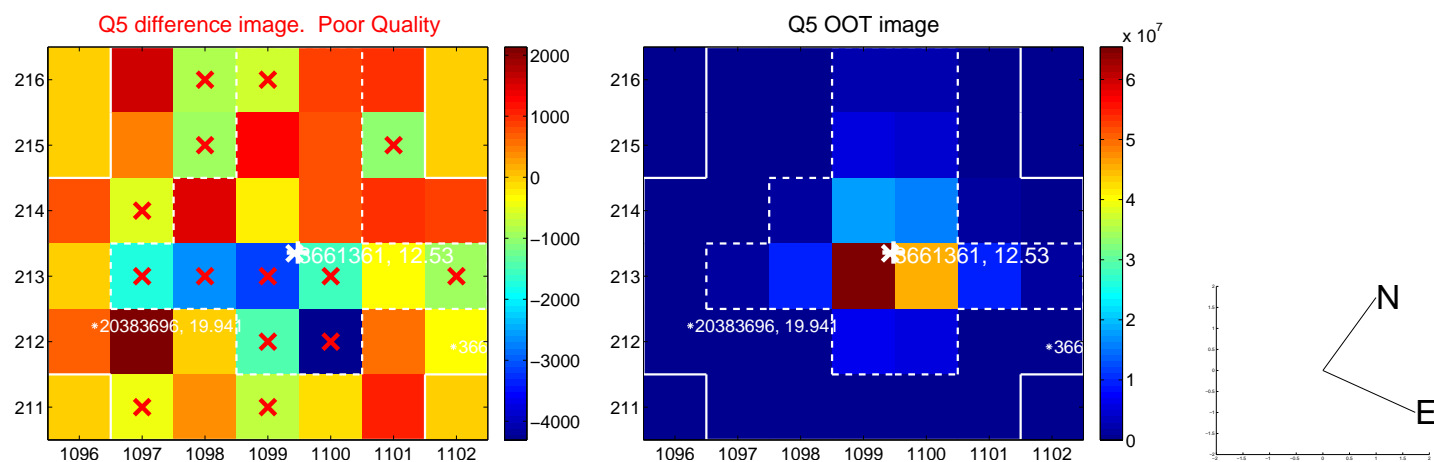


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

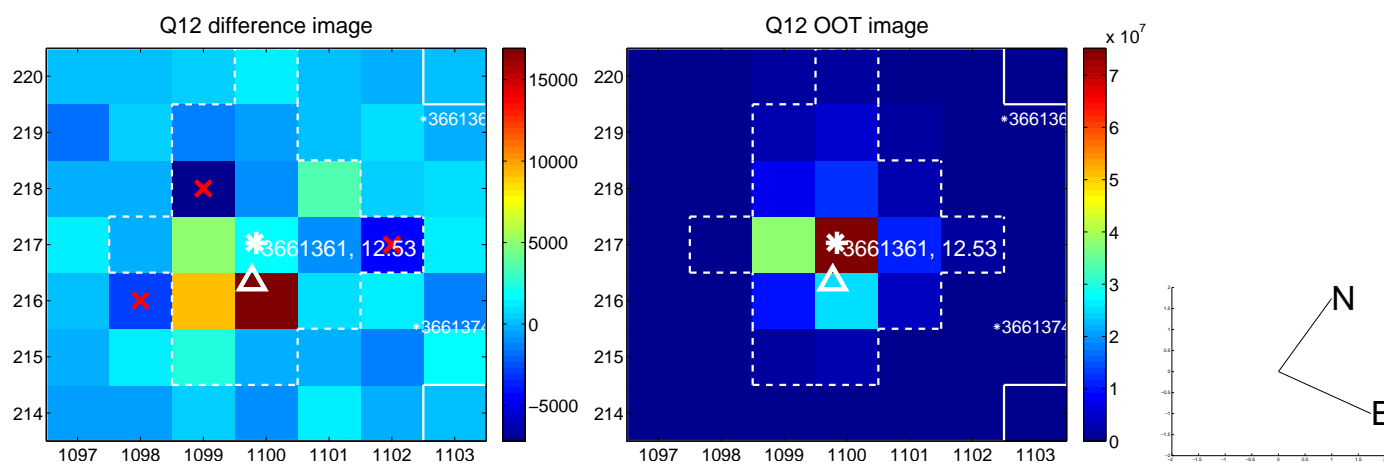
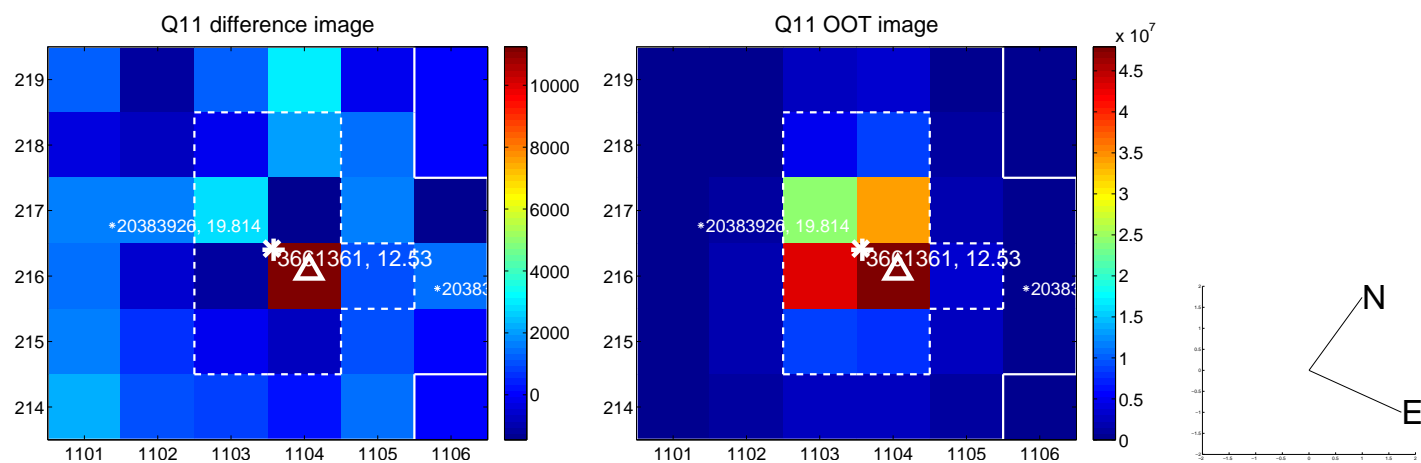
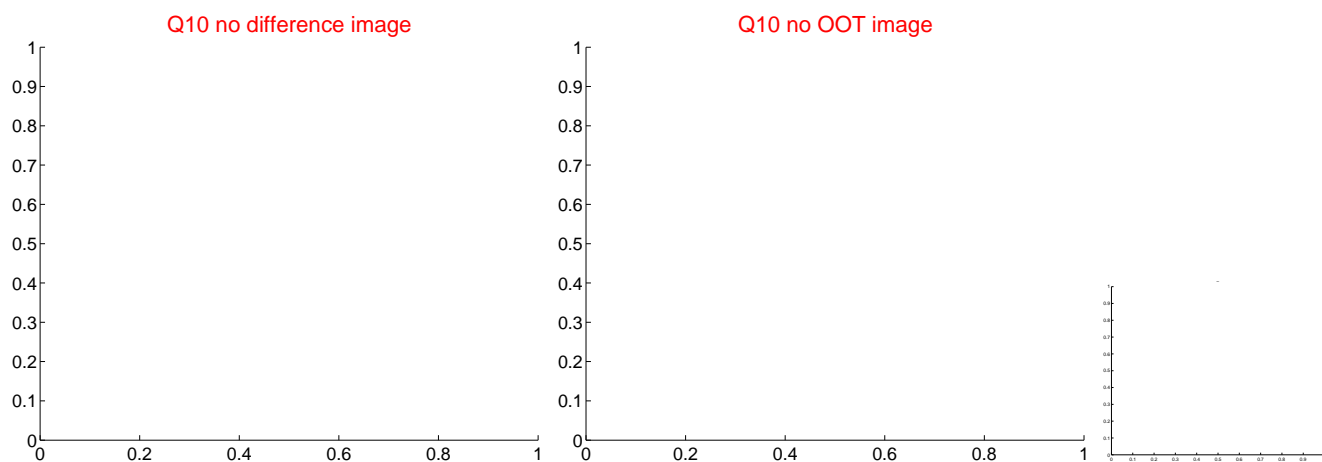
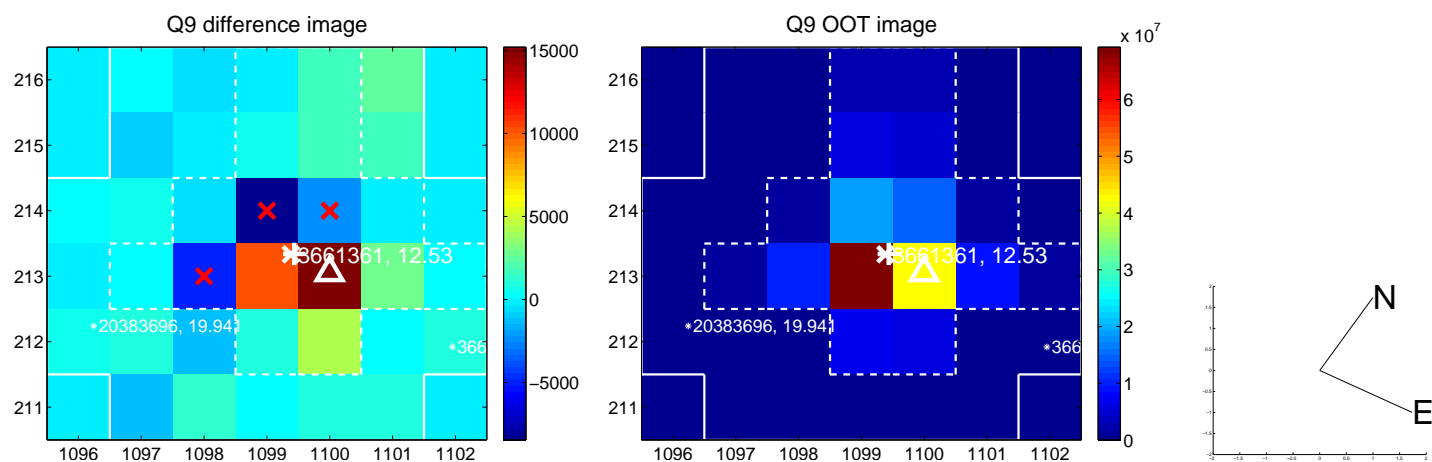


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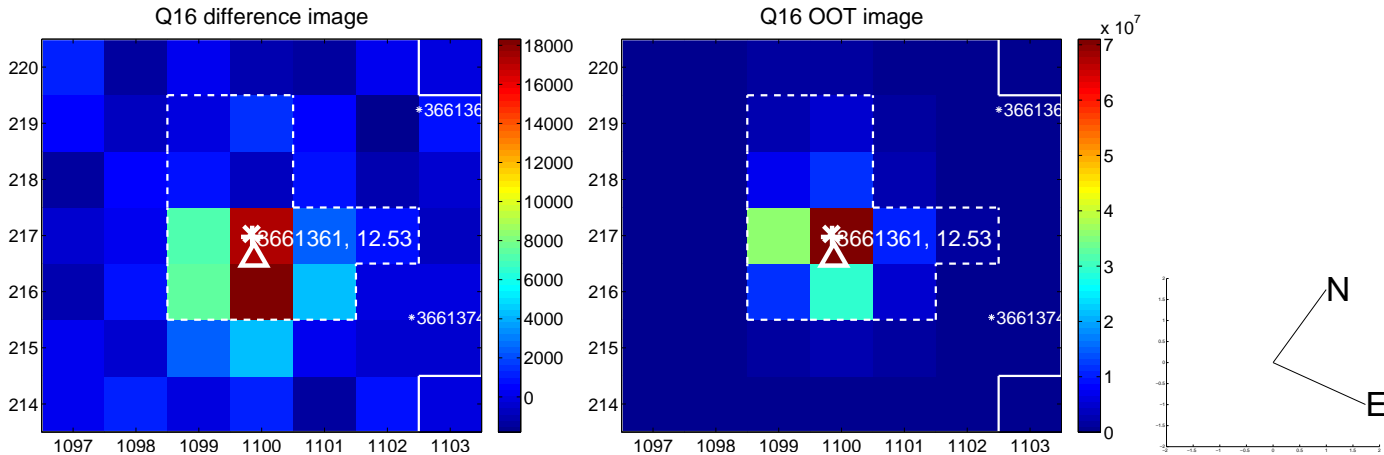
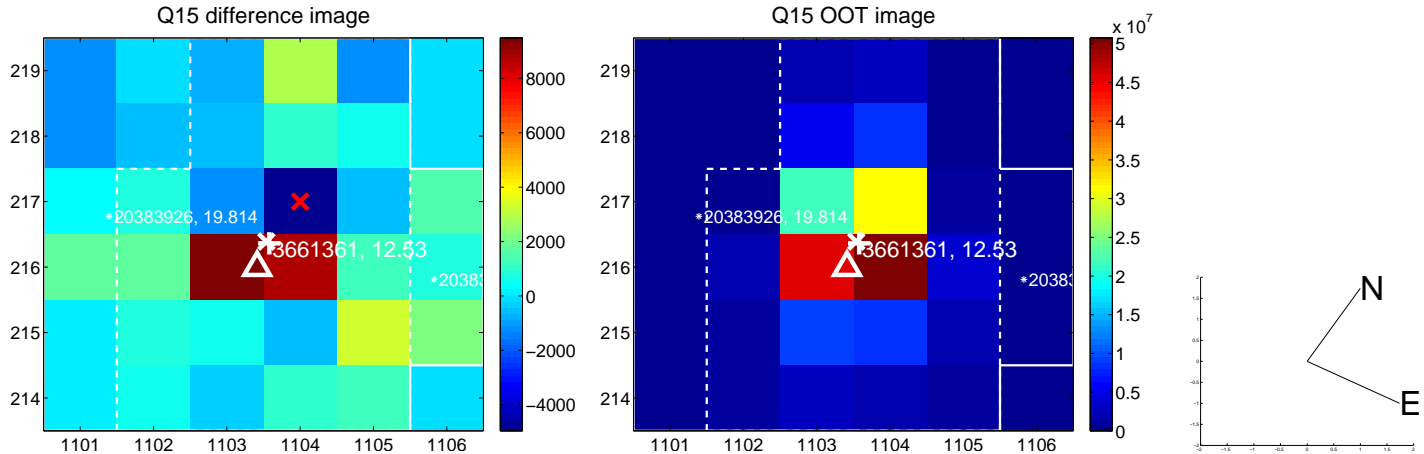
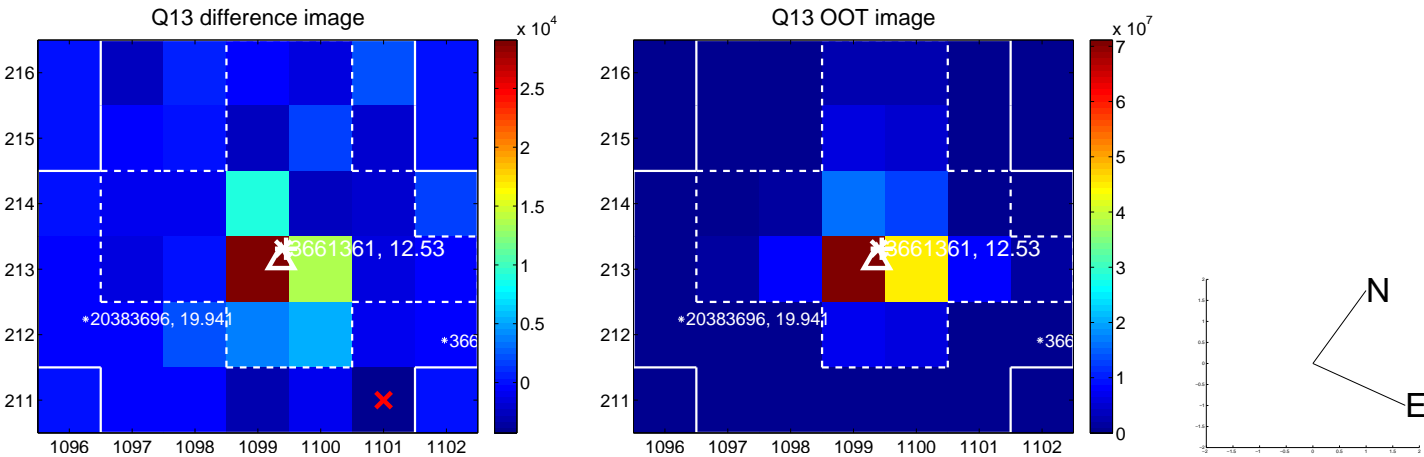




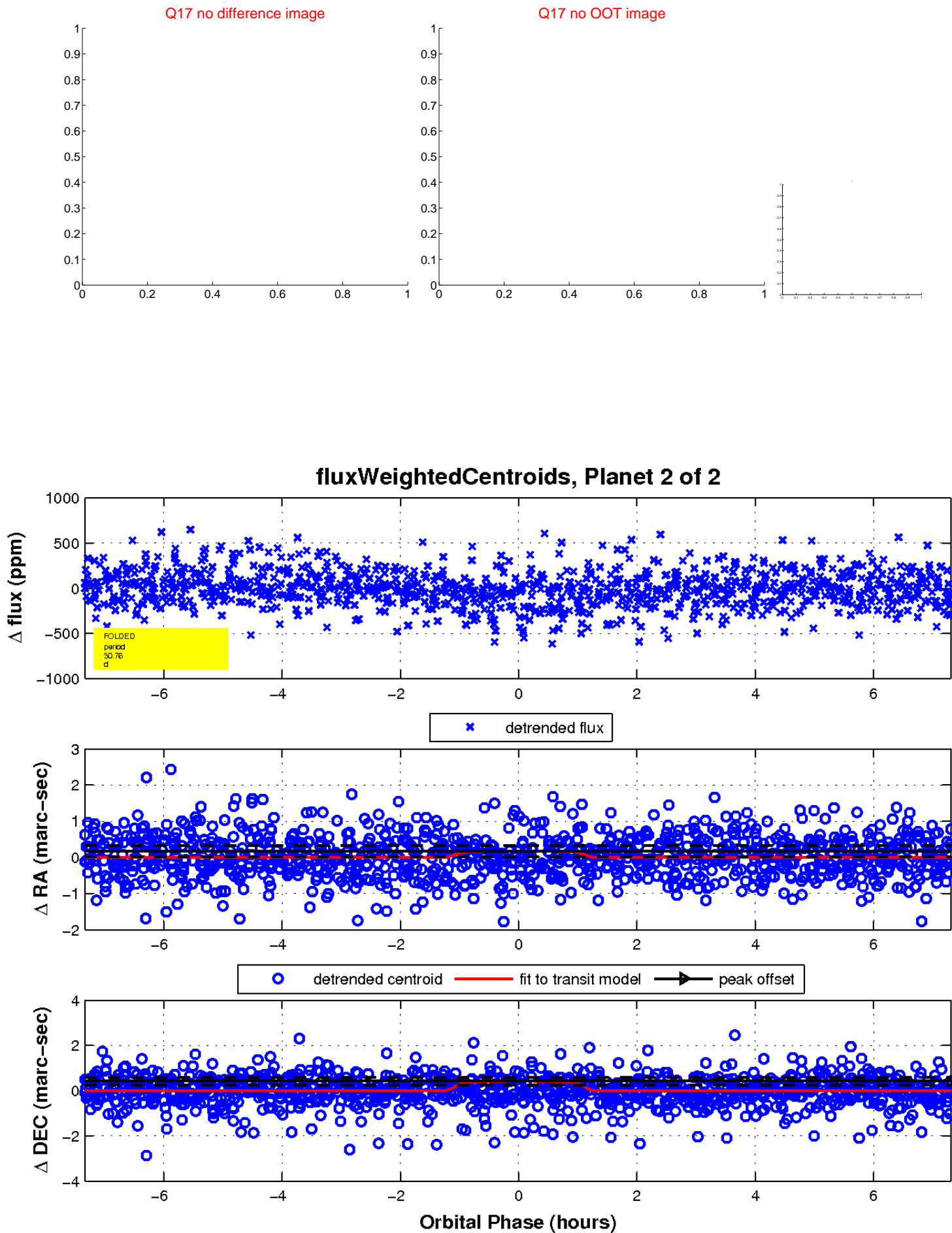
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UKIRT Image

Declination

