

# KIC 007455624

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007455624-01	OBS	No	1.164131	132.492666	141.5	6.058	12.4	15.2	2.44	7212	2.93	21858.08
007455624-02	OBS	No	1.164144	131.900306	117.4	4.794	11.1	12.4	2.44	7212	2.76	21857.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007455624-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
007455624-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD

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

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

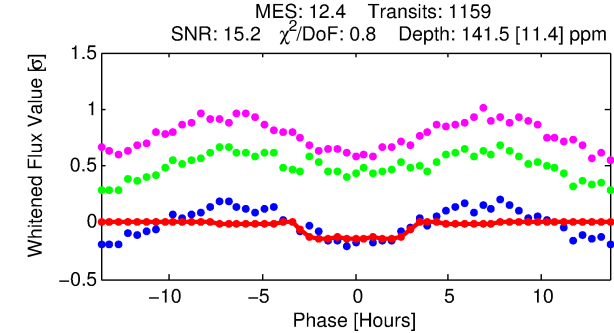
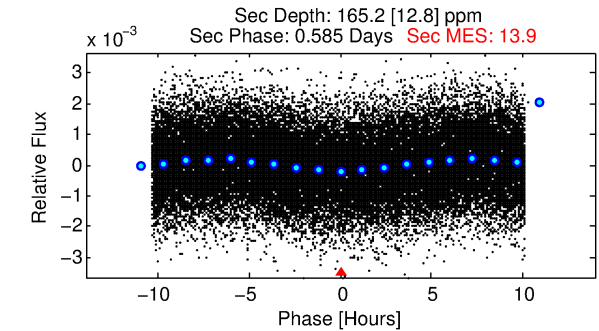
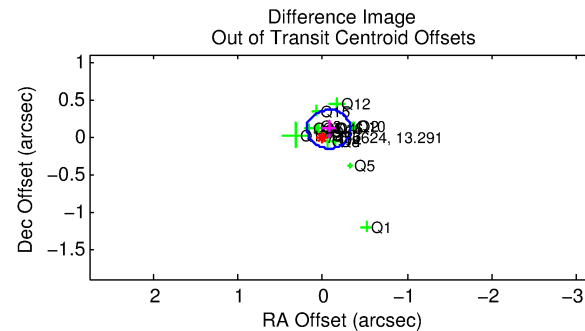
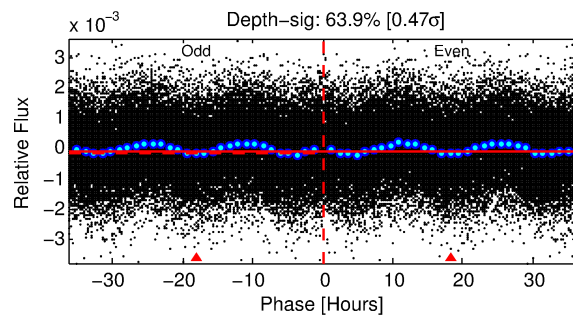
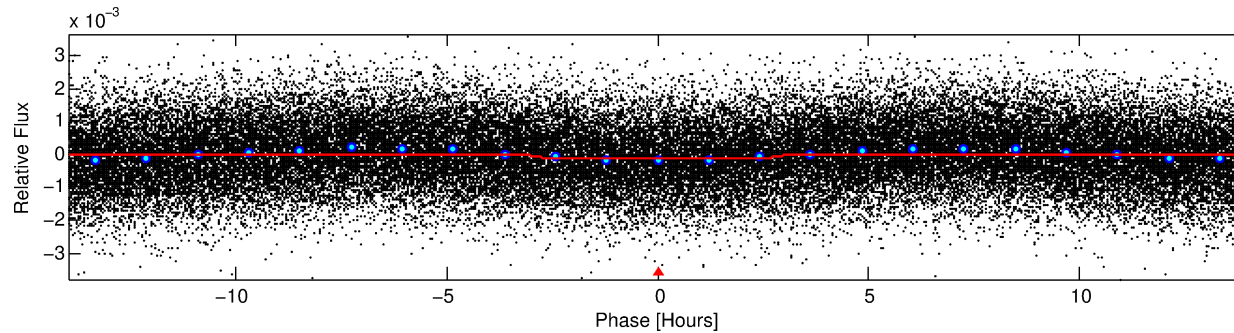
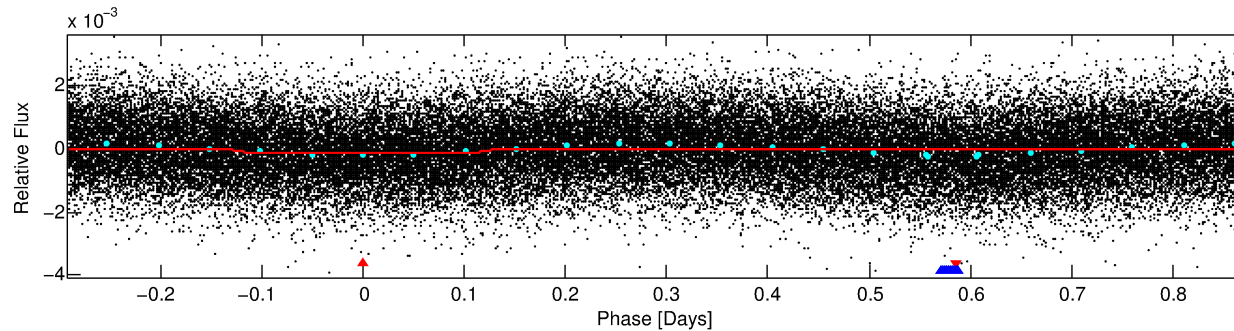
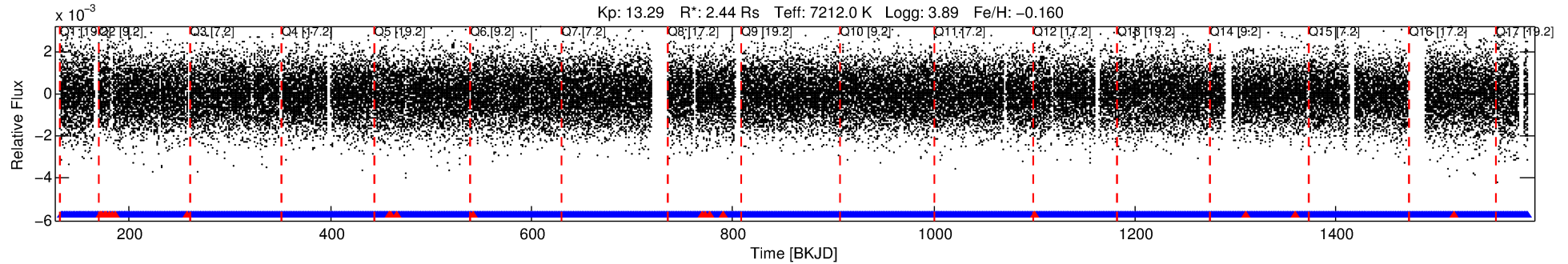
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007455624-01

No Significant Match Found

# DV One-Page Summary

KIC: 7455624 Candidate: 1 of 2 Period: 1.164 d



## DV Fit Results:

Period = 1.16413 [0.00001] d  
Epoch = 132.4927 [0.0039] BKJD  
Rp/R\* = 0.0110 [0.0117]  
a/R\* = 1.60 [5.77]  
b = 0.12 [47.14]  
Seff = 21858.08 [12428.40]  
Teq = 3100 [441] K  
Rp = 2.93 [3.30] Re  
a = 0.0257 [0.0088] AU  
Ag = 6.98 [15.33] [0.39 $\sigma$ ]  
Teffp = 7792 [4161] K [1.12 $\sigma$ ]

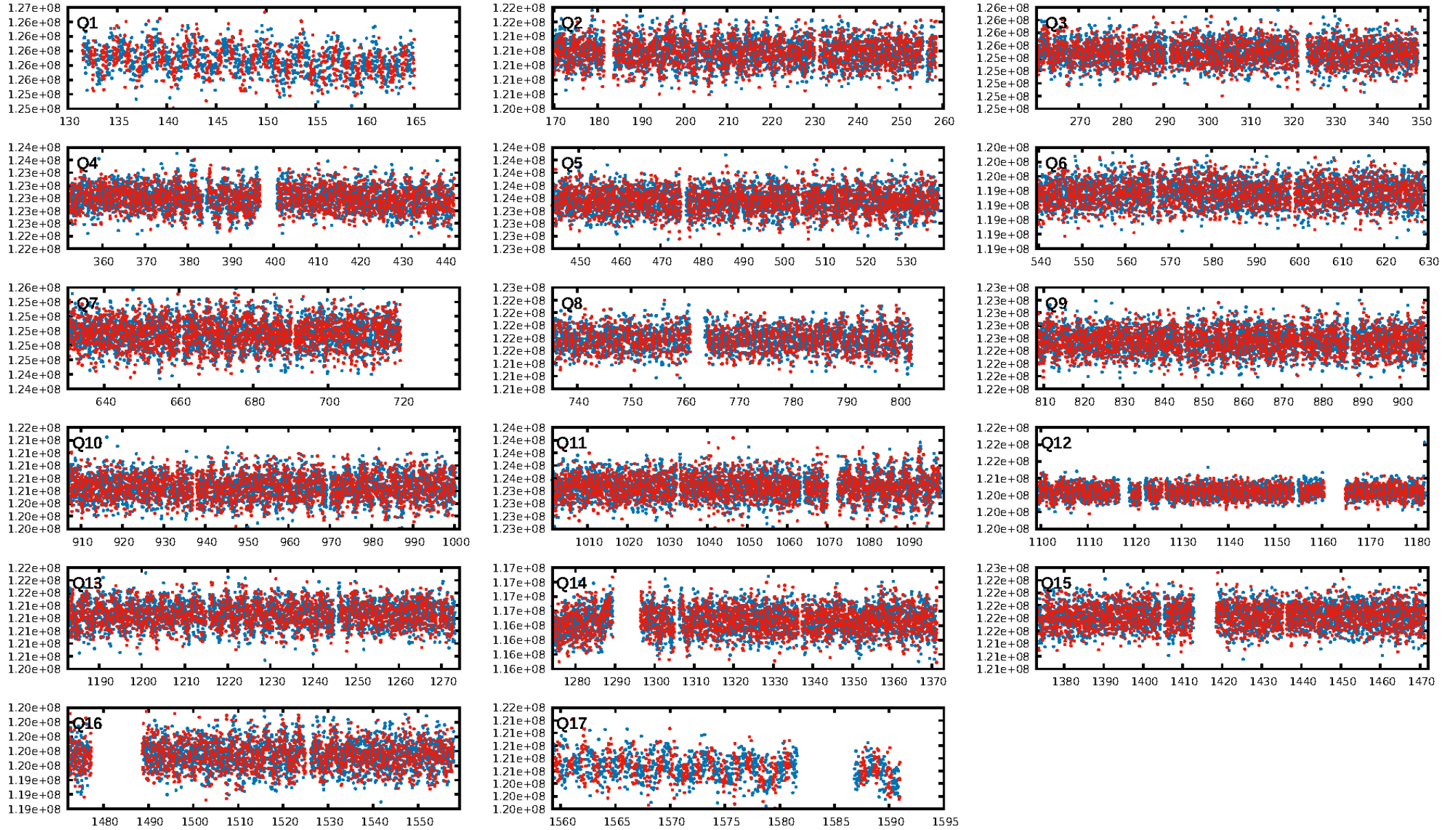
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00 $\sigma$ ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.98 [1088/1108]  
GhostDiagnostic-chr: 2.033  
Centroid-sig: 40.7%  
Centroid-so: 0.170 arcsec [1.44 $\sigma$ ]  
OotOffset-rm: 0.128 arcsec [1.49 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 0.040 arcsec [0.45 $\sigma$ ]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 21:45:03 Z

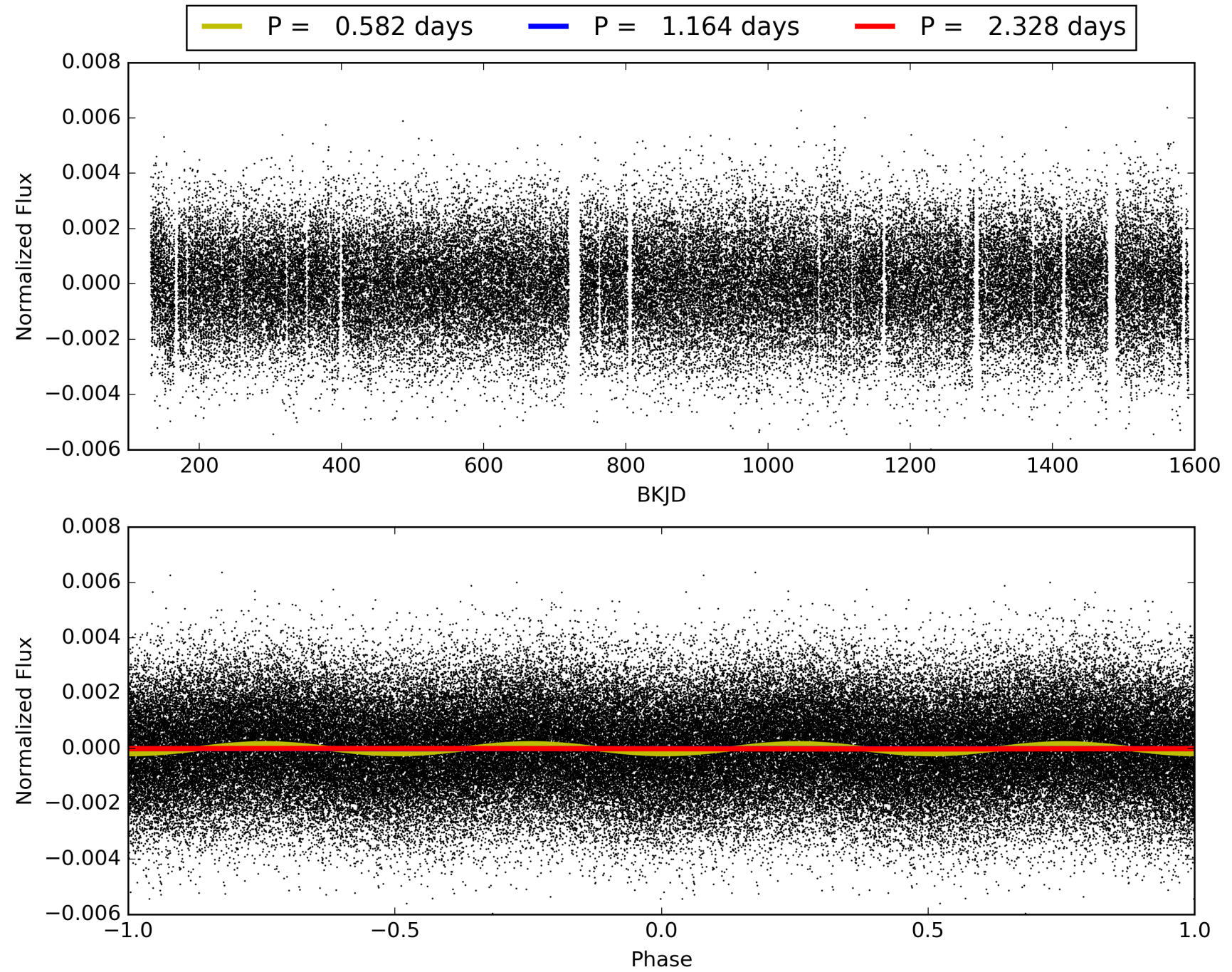
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007455624-01, PDC Light Curves



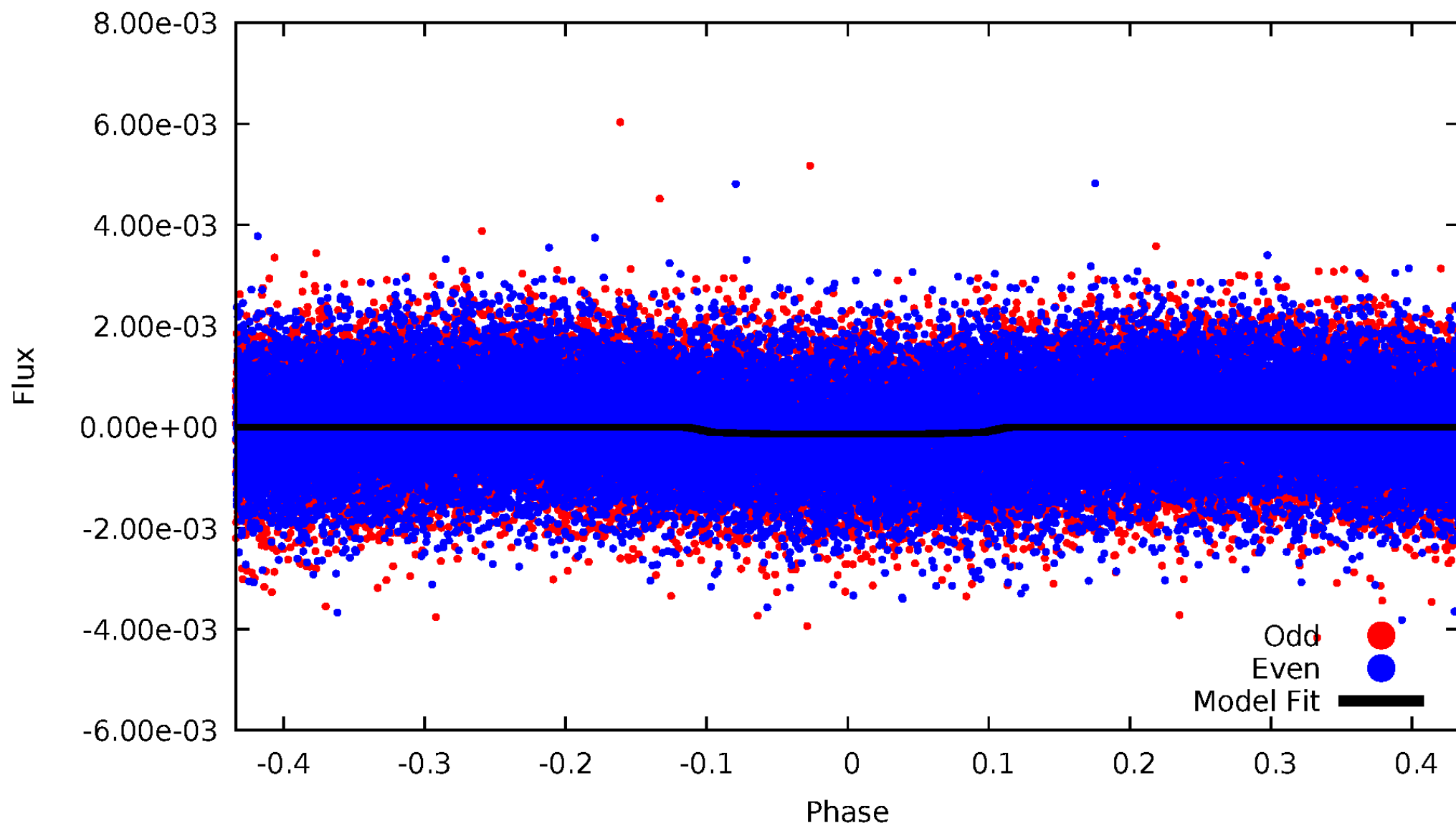


# TCE 007455624-01



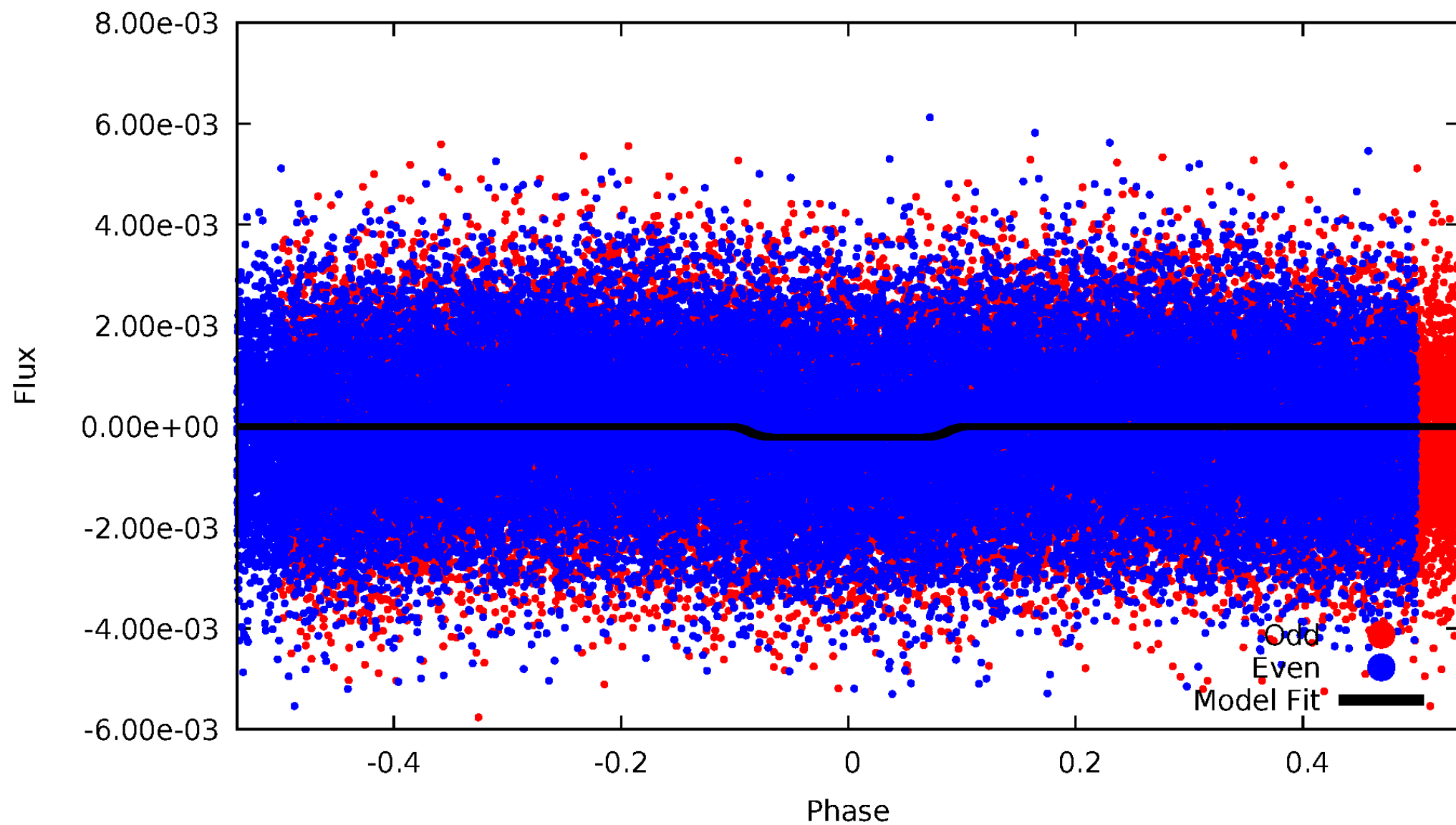
# DV Odd/Even

TCE 007455624-01



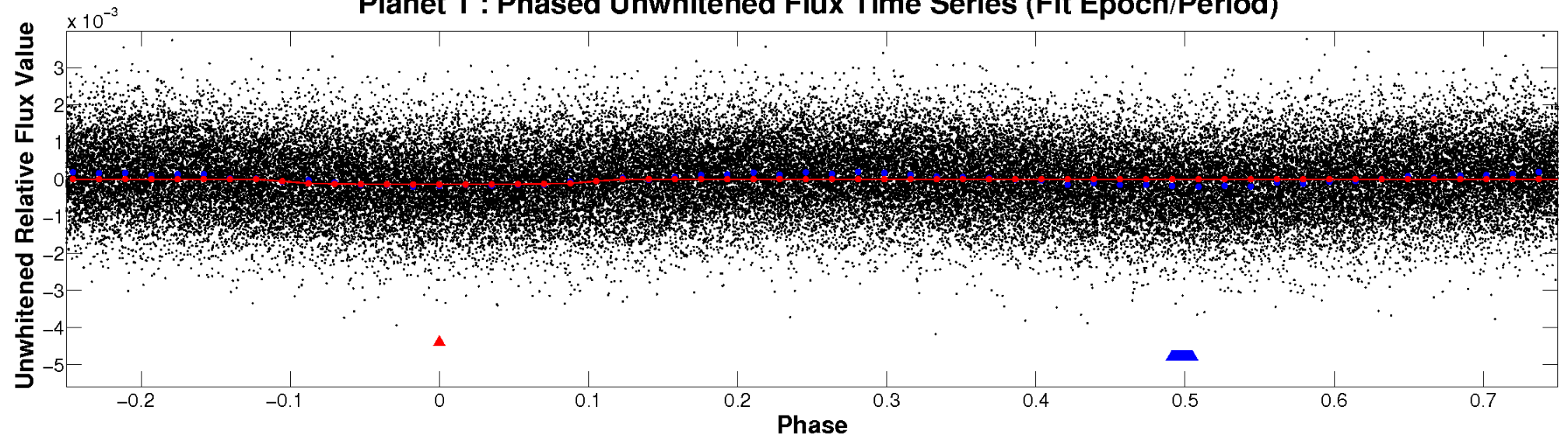
# ALT Odd/Even

TCE 007455624-01

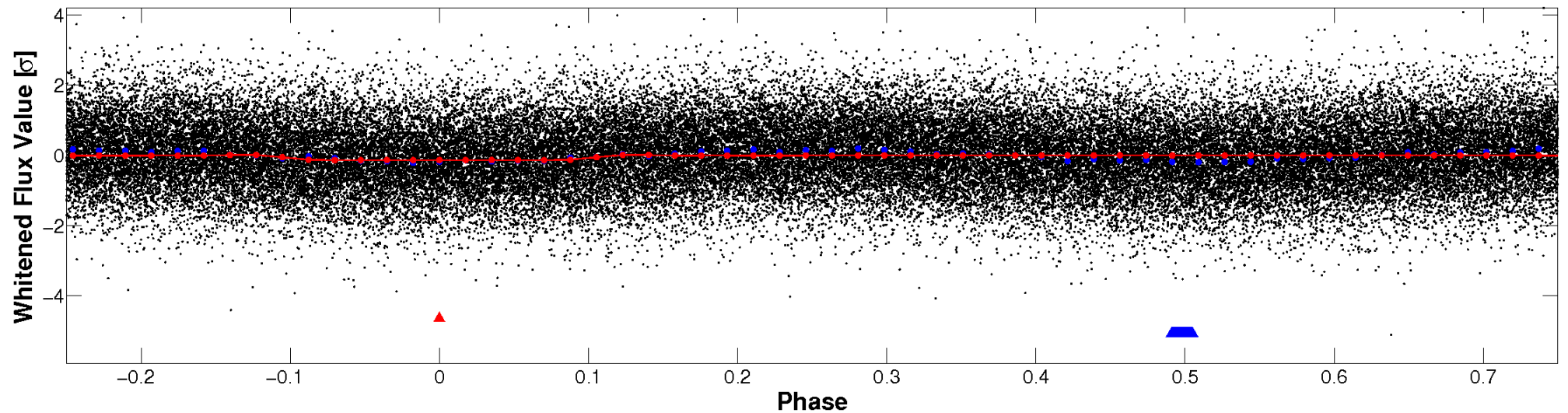


# Non-Whitened Vs. Whitened Light Curve

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



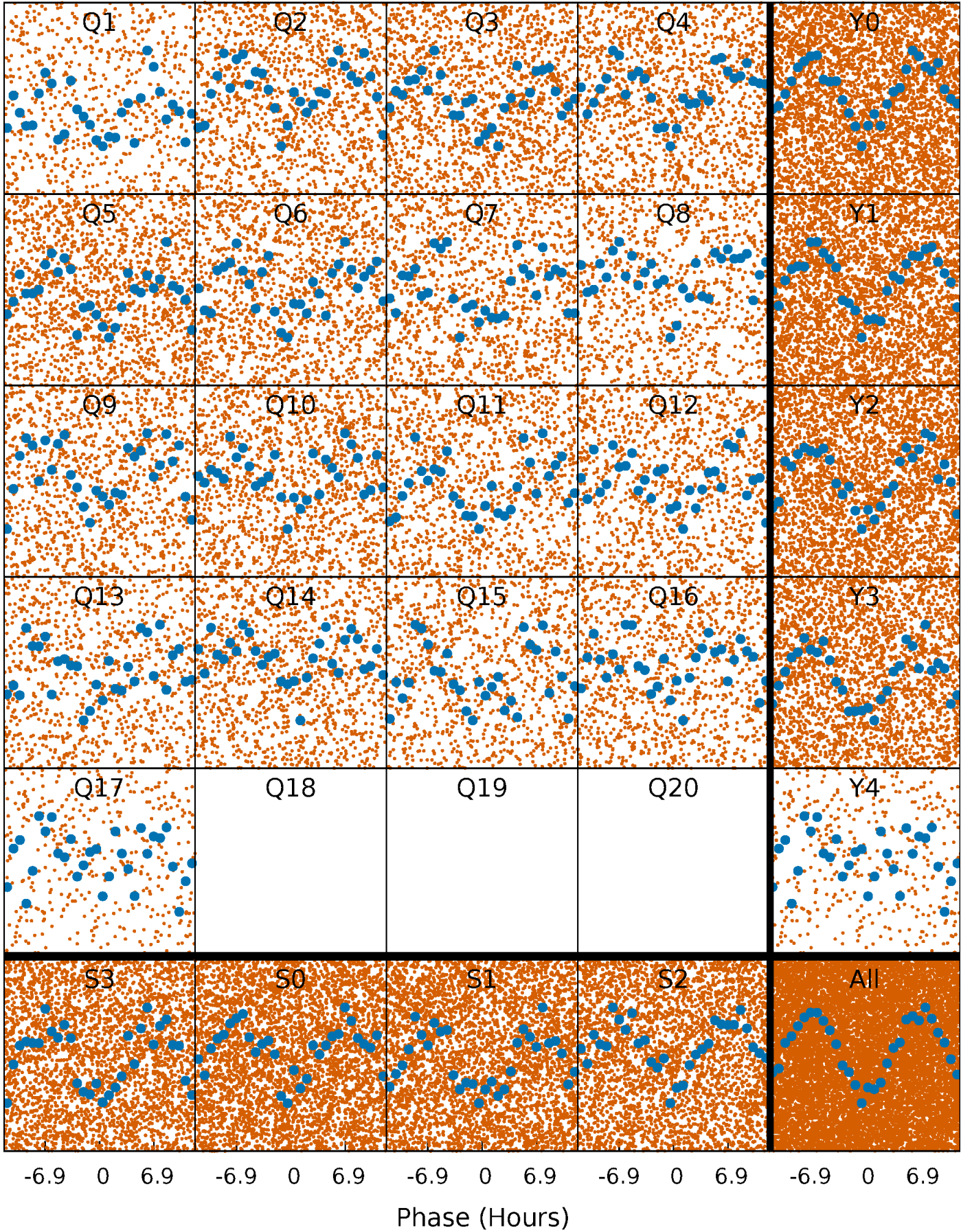
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

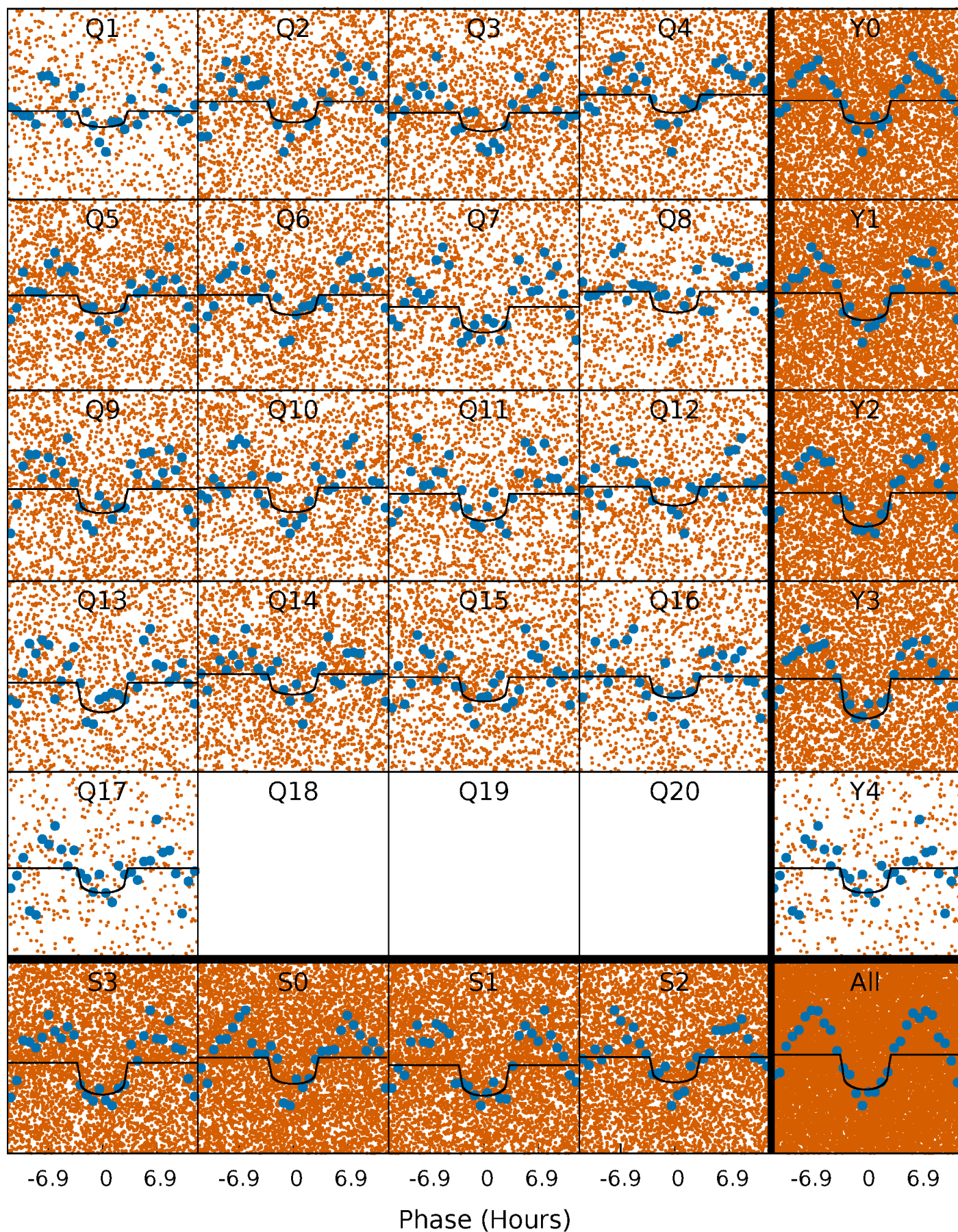
TCE 007455624-01 P= 1.164131 Days  $T_0=132.492666$  (BKJD)





# DV Quarter-Phased Transit Curves

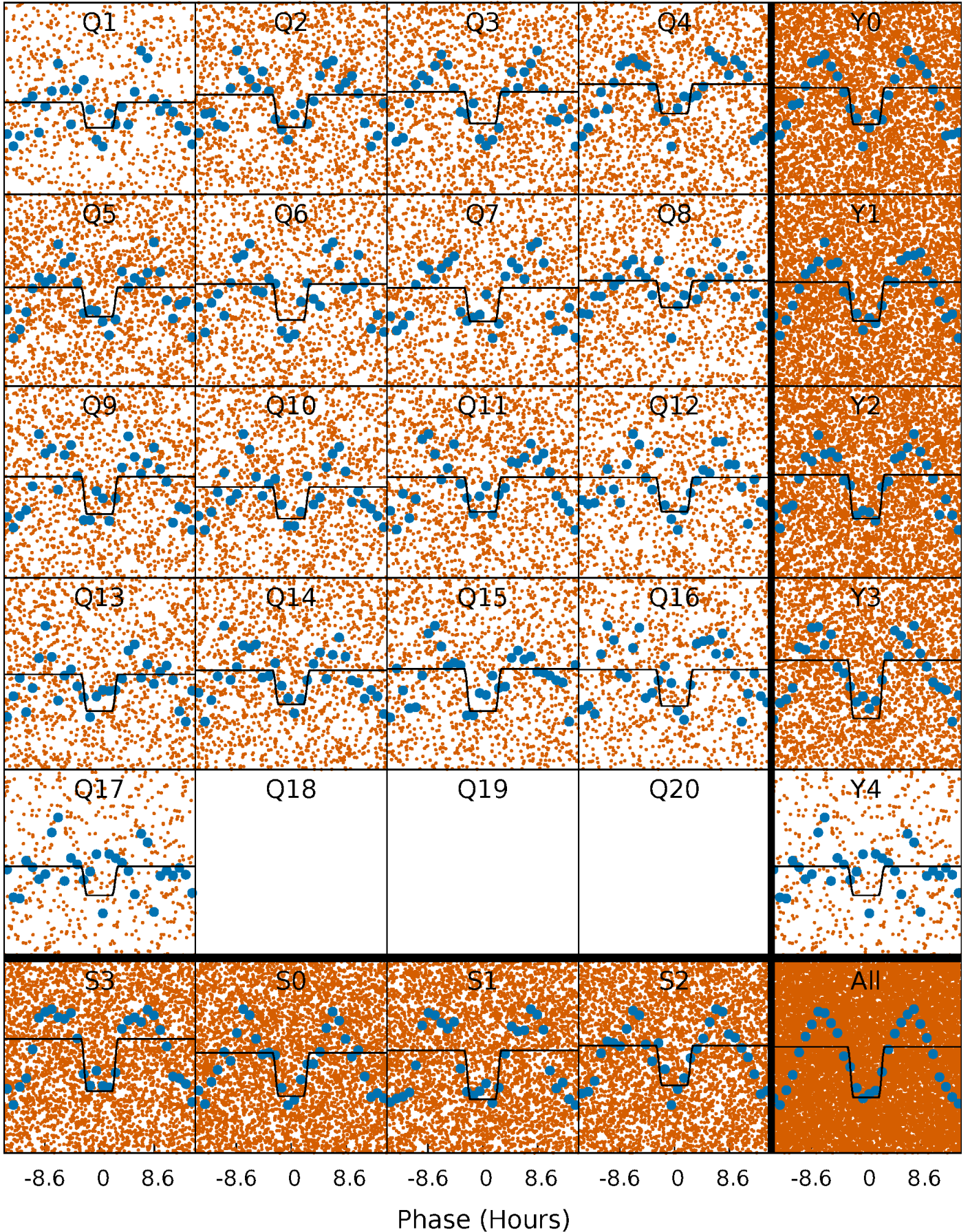
TCE 007455624-01 P= 1.164131 Days  $T_0=132.492666$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

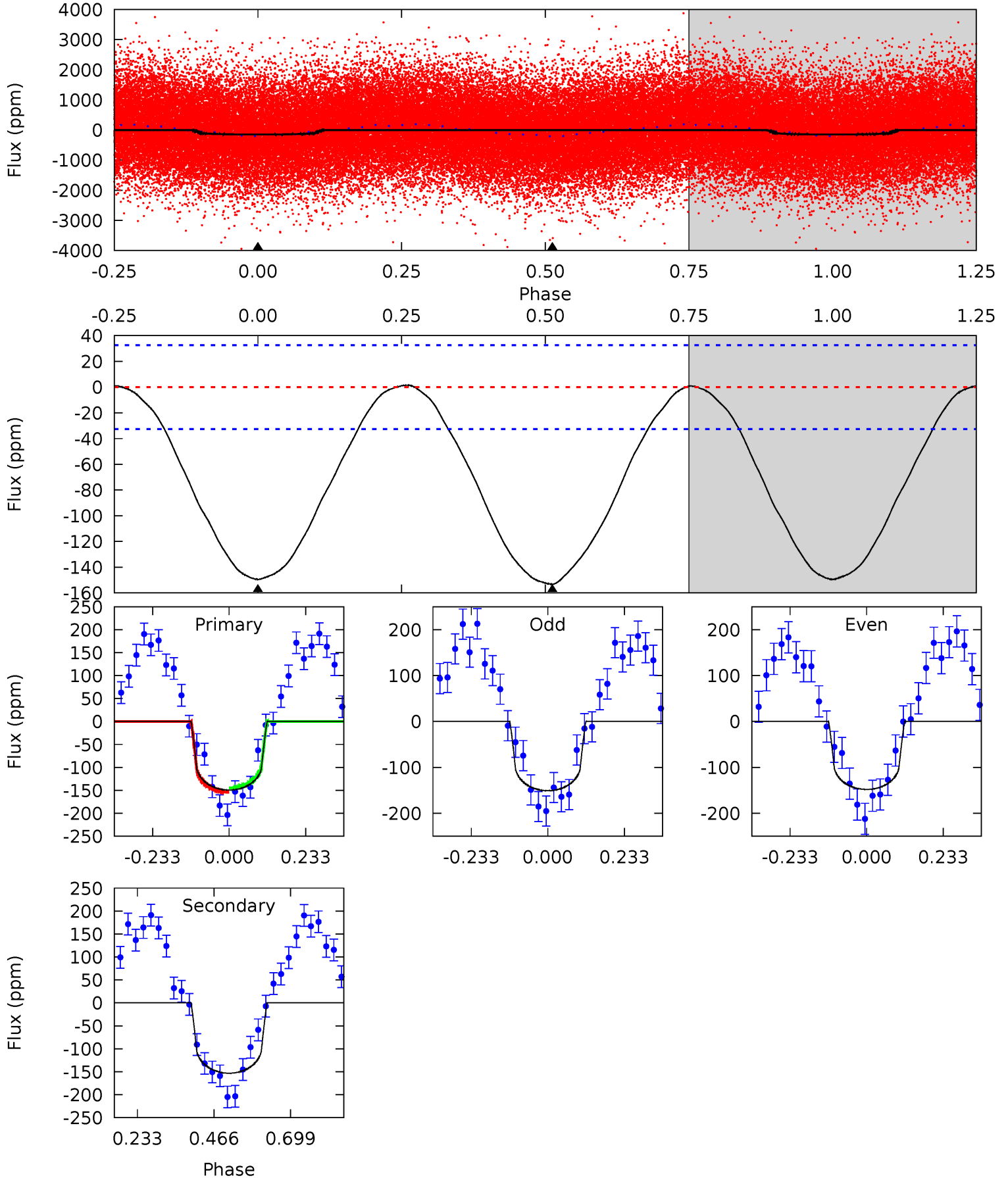
TCE 007455624-01 P= 1.164142 Days  $T_0=132.491380$  (BKJD)



# DV Model-Shift Uniqueness Test

007455624-01, P = 1.164131 Days, E = 131.328535 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
20.1	20.6	0	0	4.38	1.19	0.19	20.1	20.1	20.6	20.6	0.18	1.00	0.01	0.63

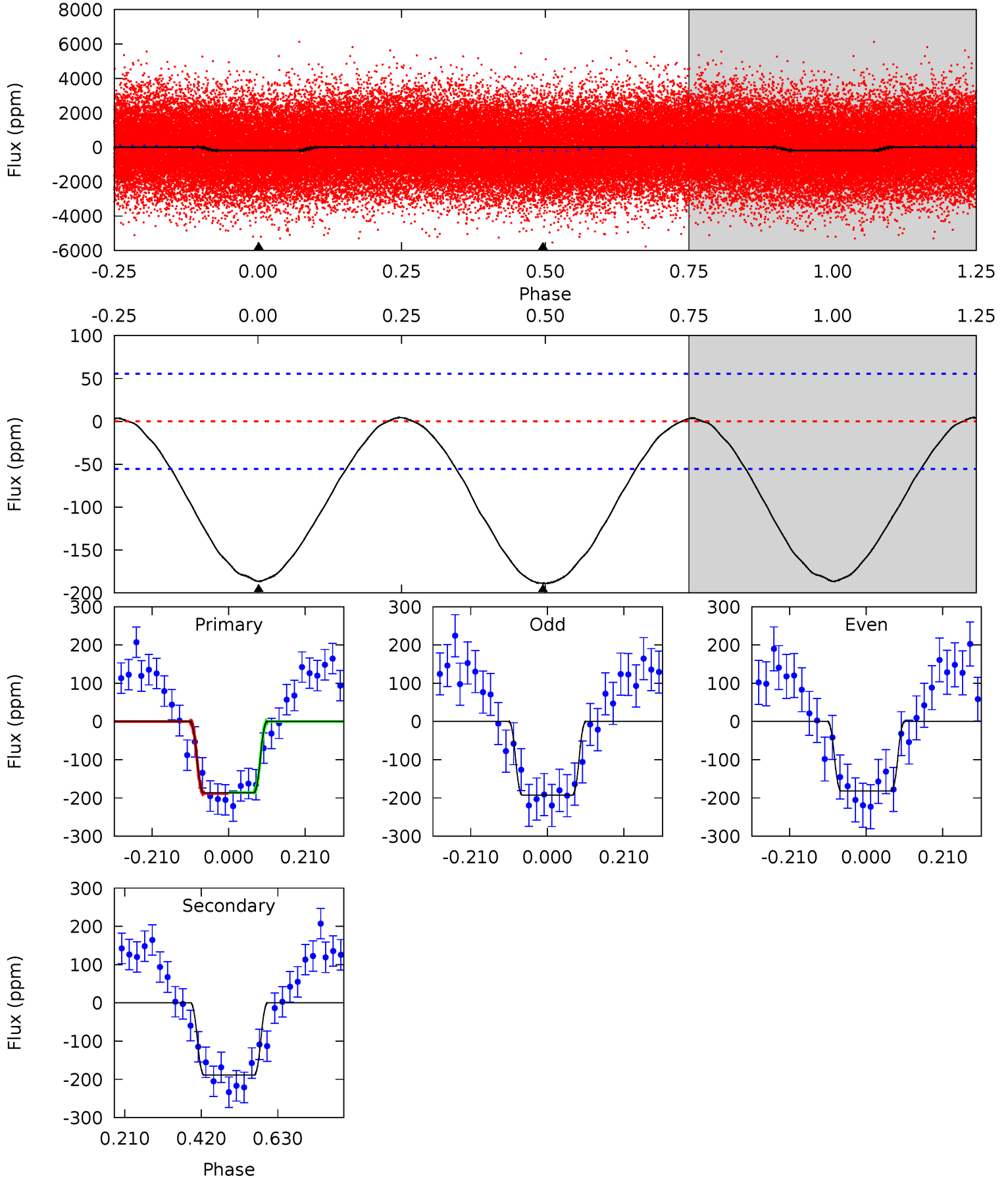




# Alt Model-Shift Uniqueness Test

007455624-01, P = 1.164142 Days, E = 131.327238 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
14.8	15.0	0	0	4.41	1.25	0.32	14.8	14.8	15.0	15.0	0.44	0.98	0.02	0.10



### Stellar Parameters For KIC 007455624

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7212^{+230}_{-316}$	$3.886^{+0.315}_{-0.135}$	$-0.160^{+0.250}_{-0.350}$	$2.442^{+0.518}_{-0.888}$	$1.670^{+0.168}_{-0.392}$	$0.162^{+0.392}_{-0.067}$
	+3%/-4%	+8%/-3%	+156%/-219%	+21%/-36%	+10%/-23%	+243%/-42%
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 007455624-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-153 \pm 7$	$3.39^{+2.75}_{-1.96}$	$4274^{+329}_{-418}$	$6749^{+5518}_{-1847}$	$4.707^{+22.344}_{-3.248}$
Alt.	$-189 \pm 13$	$4.05^{+2.89}_{-2.35}$	$4246^{+343}_{-407}$	$6367^{+5574}_{-1494}$	$4.026^{+19.913}_{-2.618}$

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

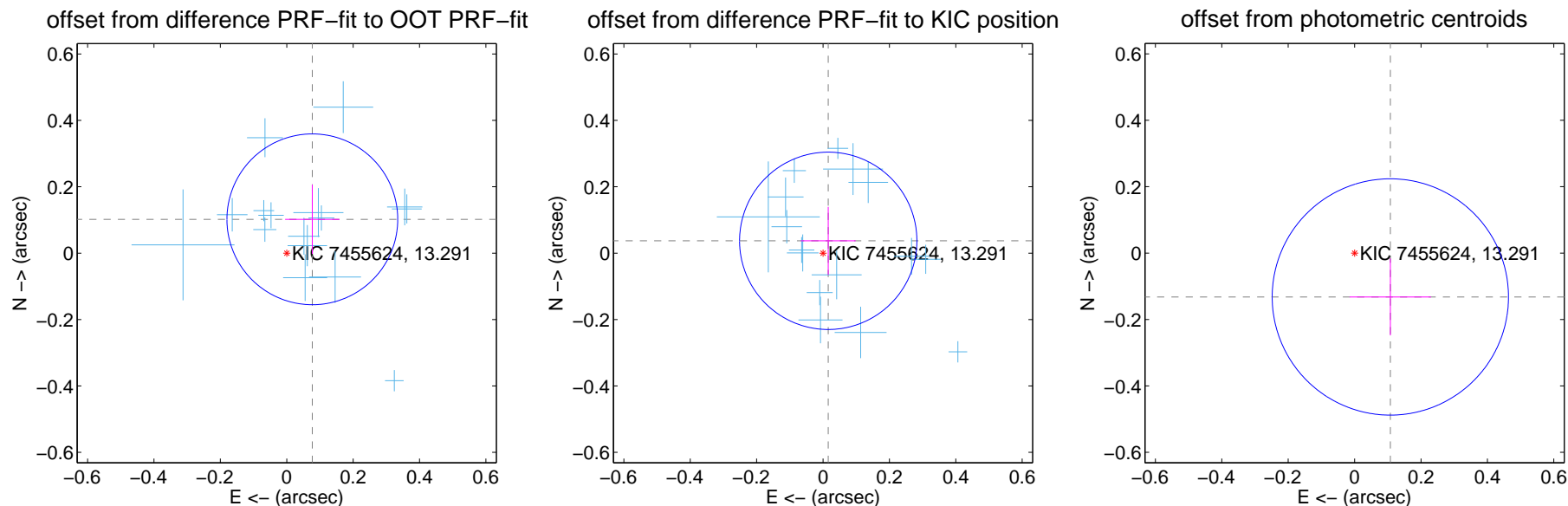
## DV Centroid Data

Supplemental centroid analysis for 007455624-01. Kepler magnitude: 13.29. Transit SNR 15.20

There are 17 quarters with good PRF difference image offsets

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

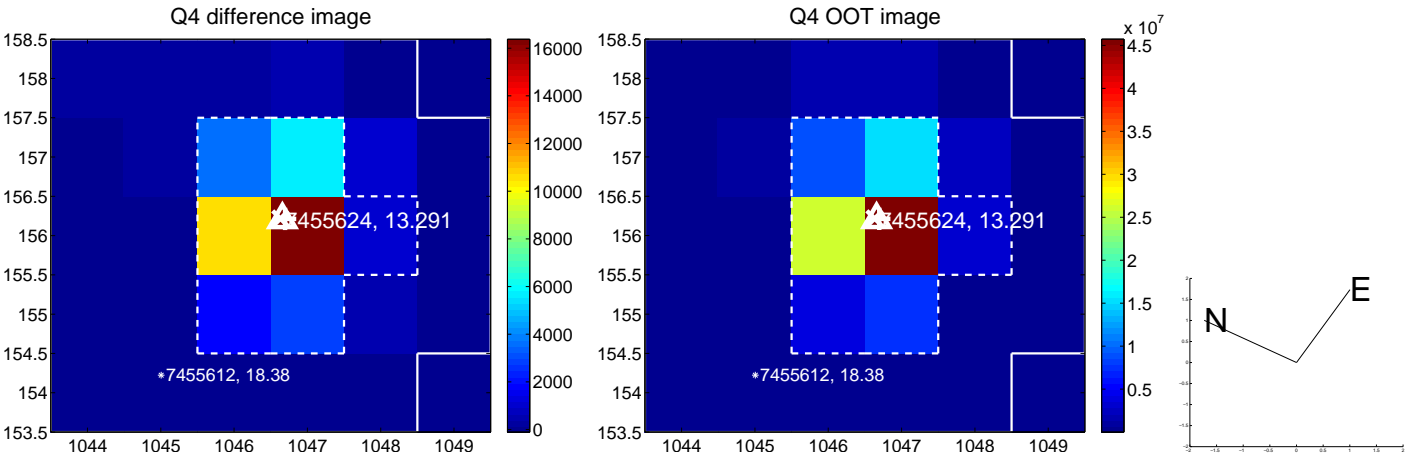
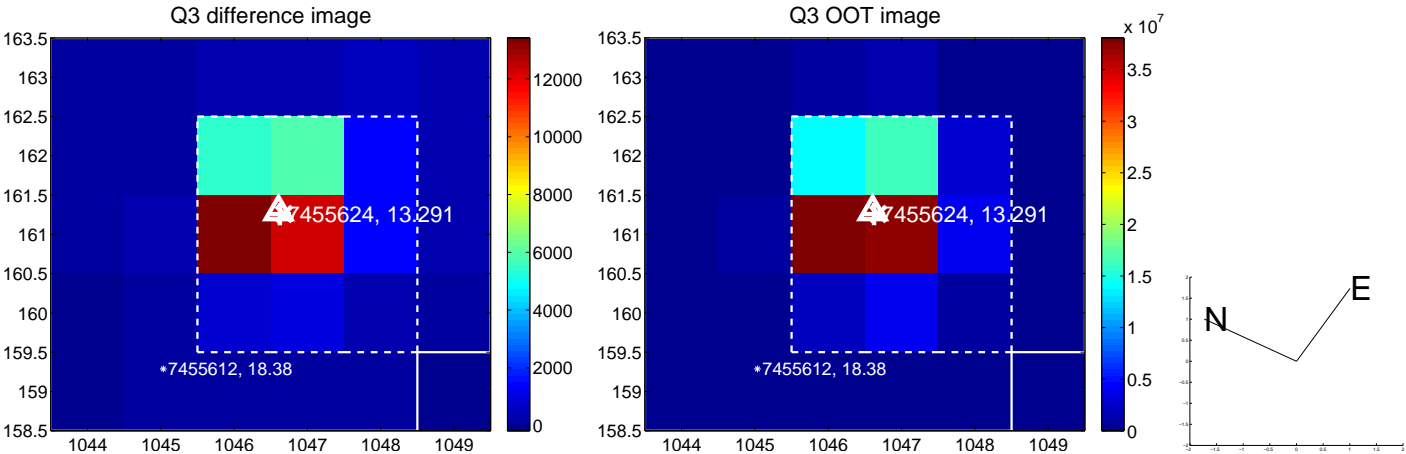
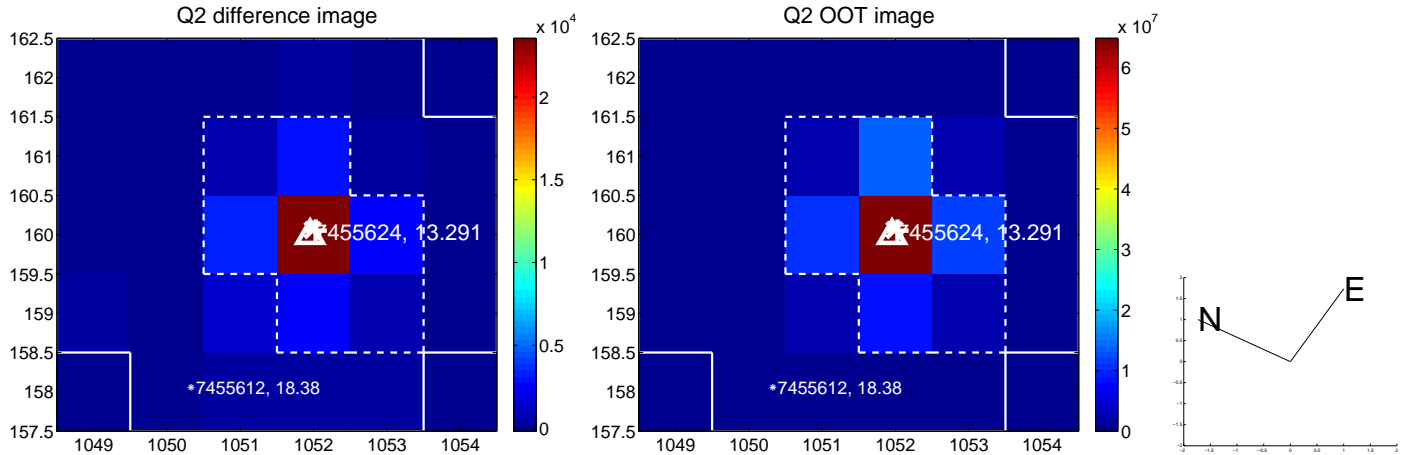
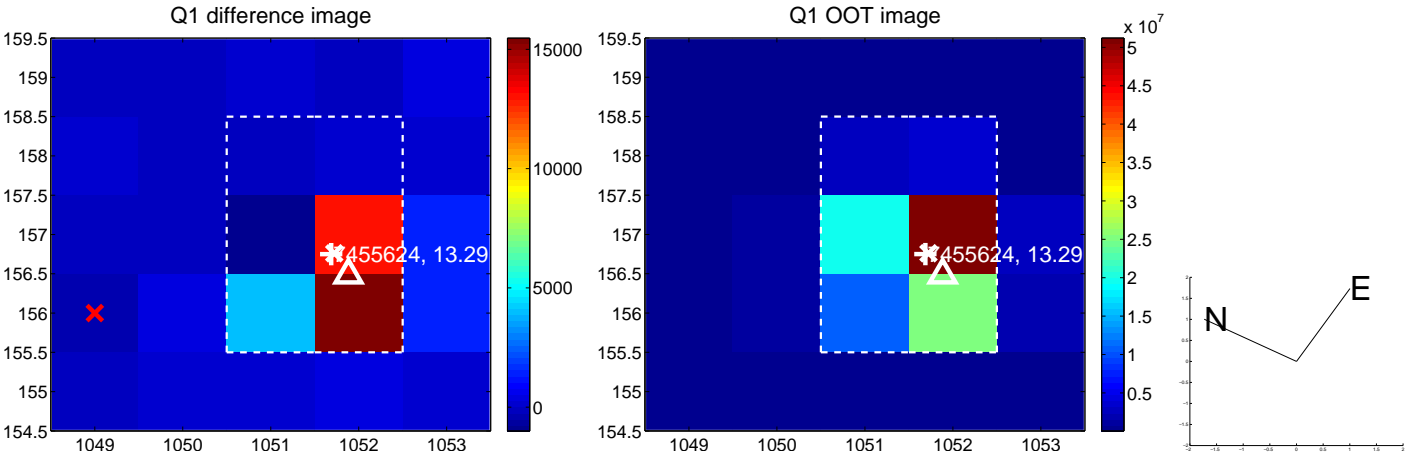
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.128 \pm 0.086$	1.49	$-0.077 \pm 0.082$	$0.102 \pm 0.104$
PRF-fit source offset from KIC position	$0.040 \pm 0.089$	0.45	$-0.016 \pm 0.083$	$0.037 \pm 0.102$
photometric centroid source offset	$0.17 \pm 0.12$	1.44	$-0.11 \pm 0.12$	$-0.13 \pm 0.12$



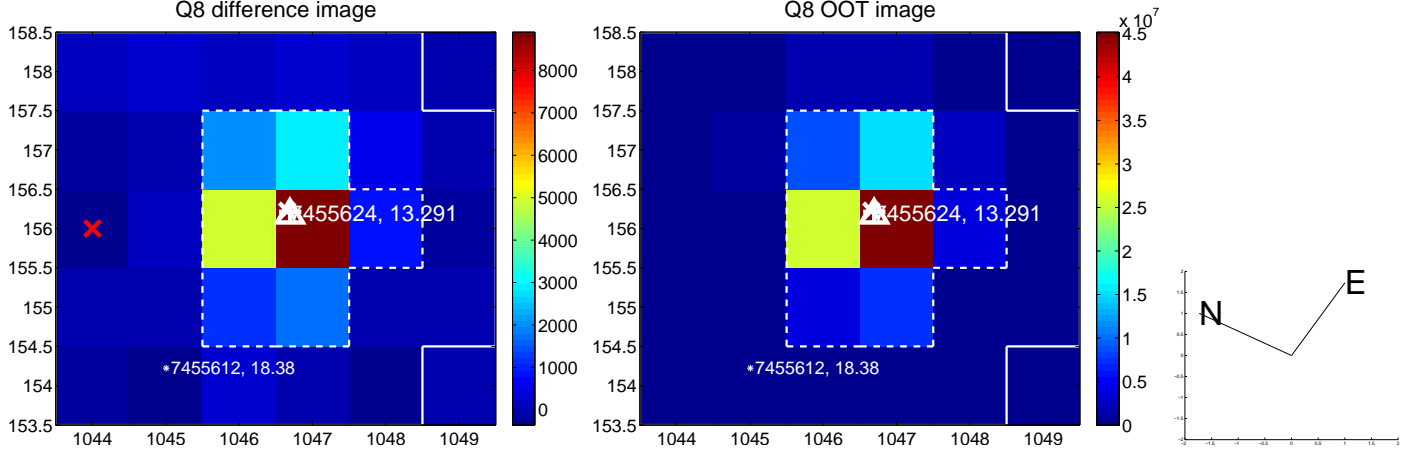
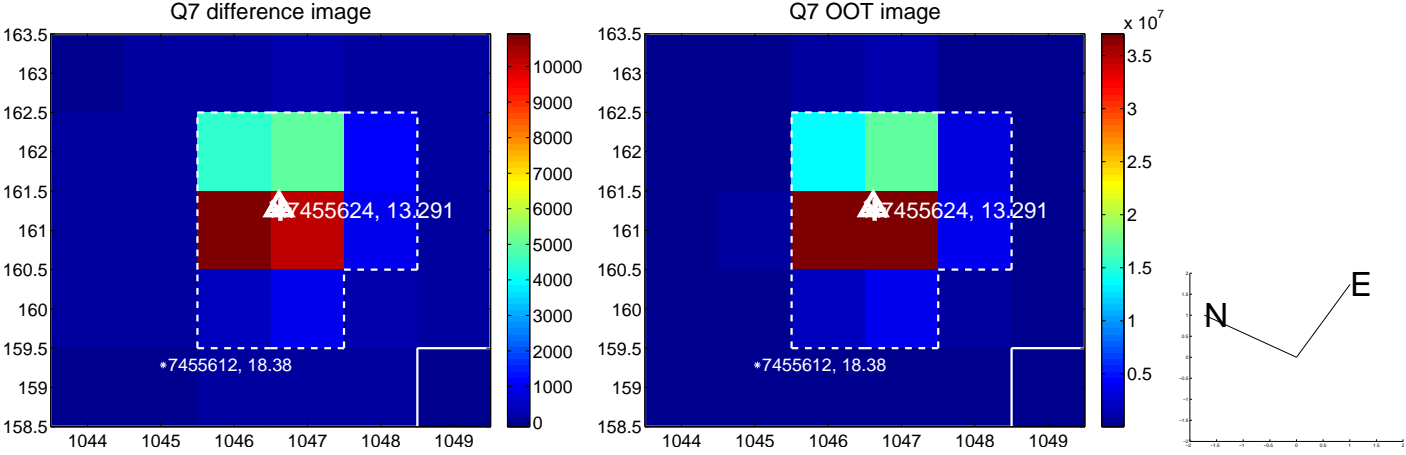
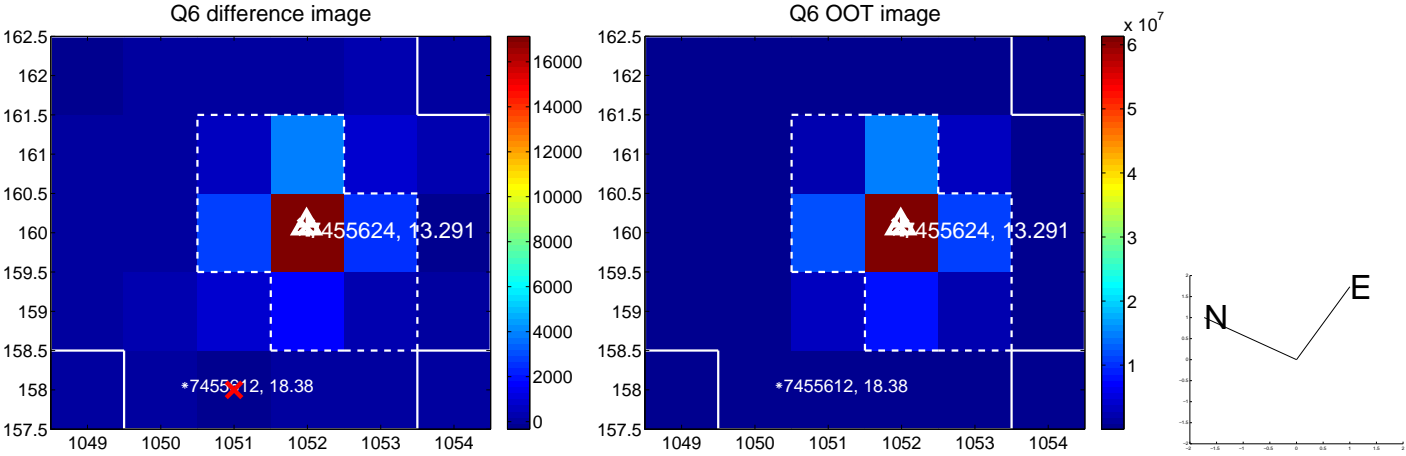
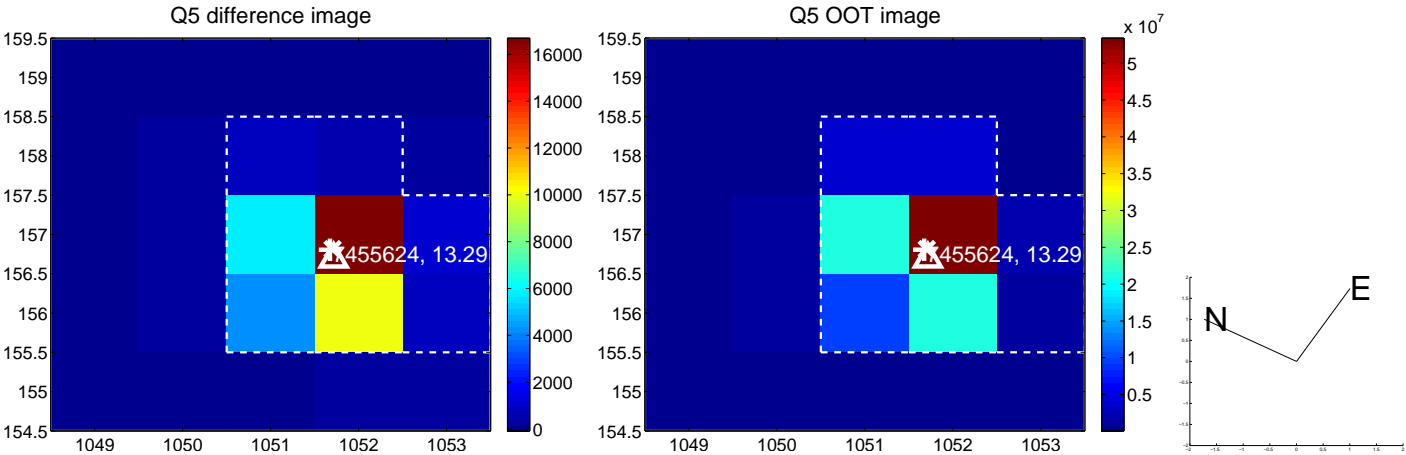
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



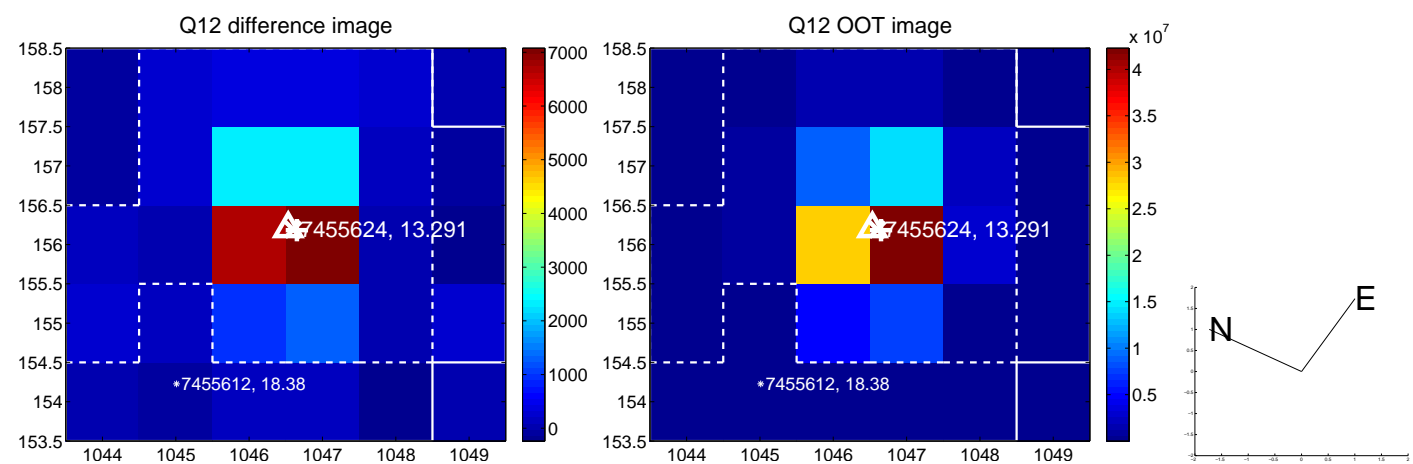
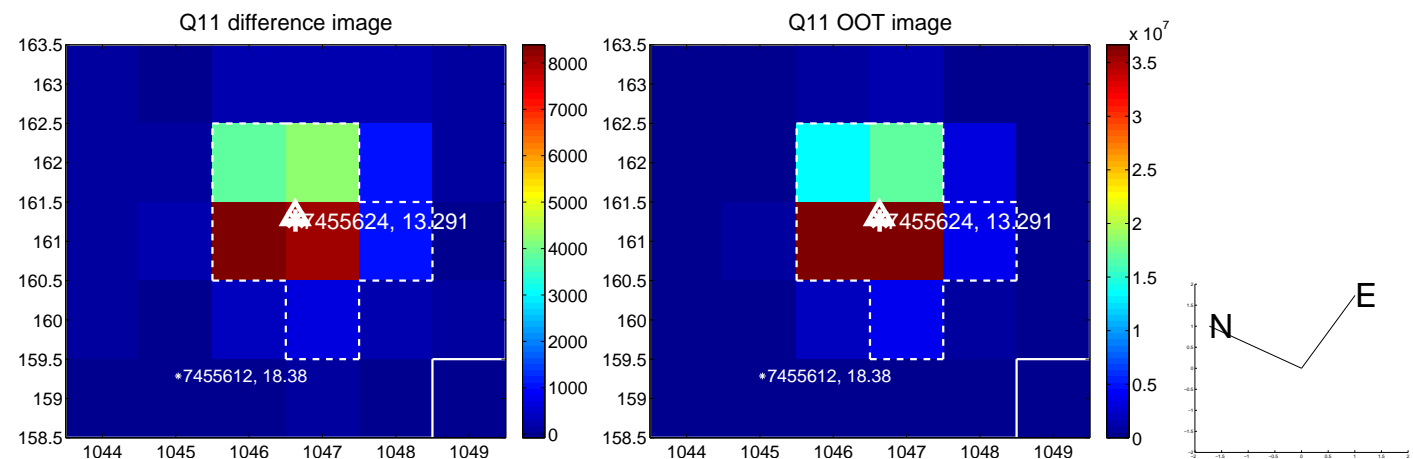
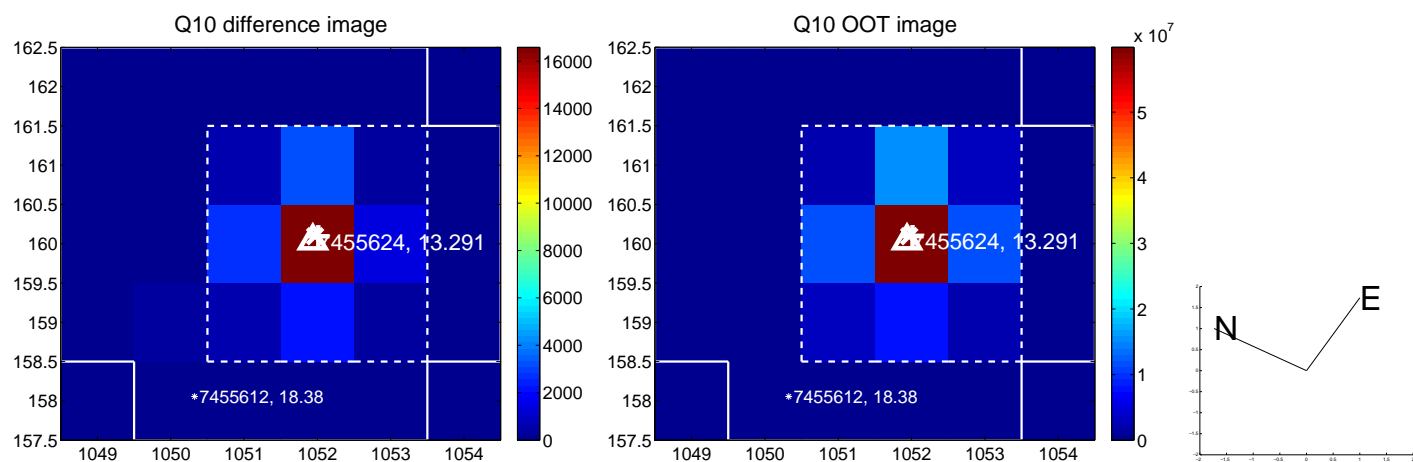
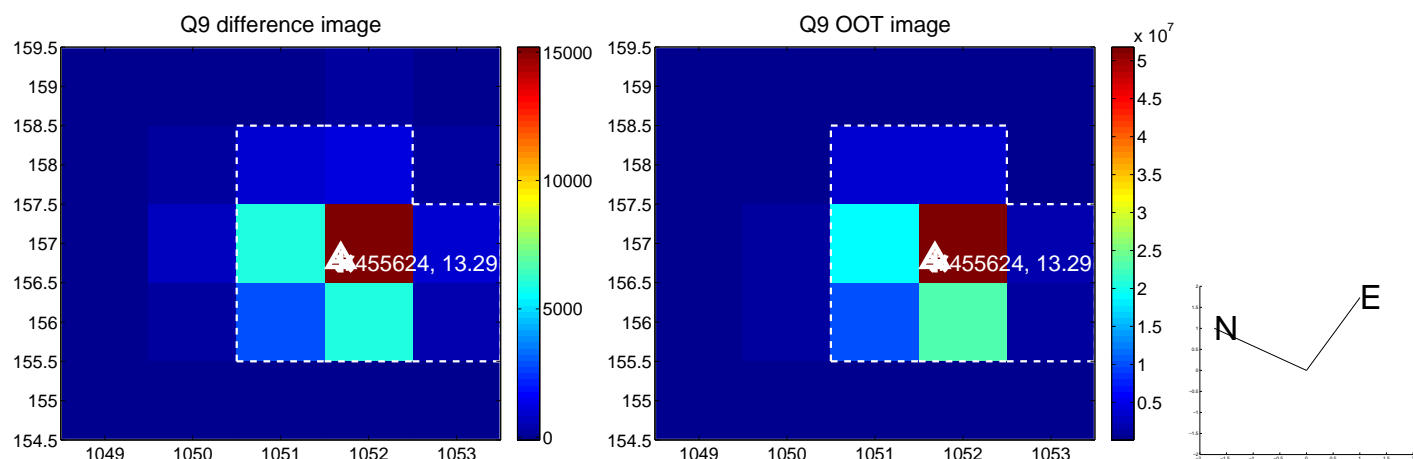
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

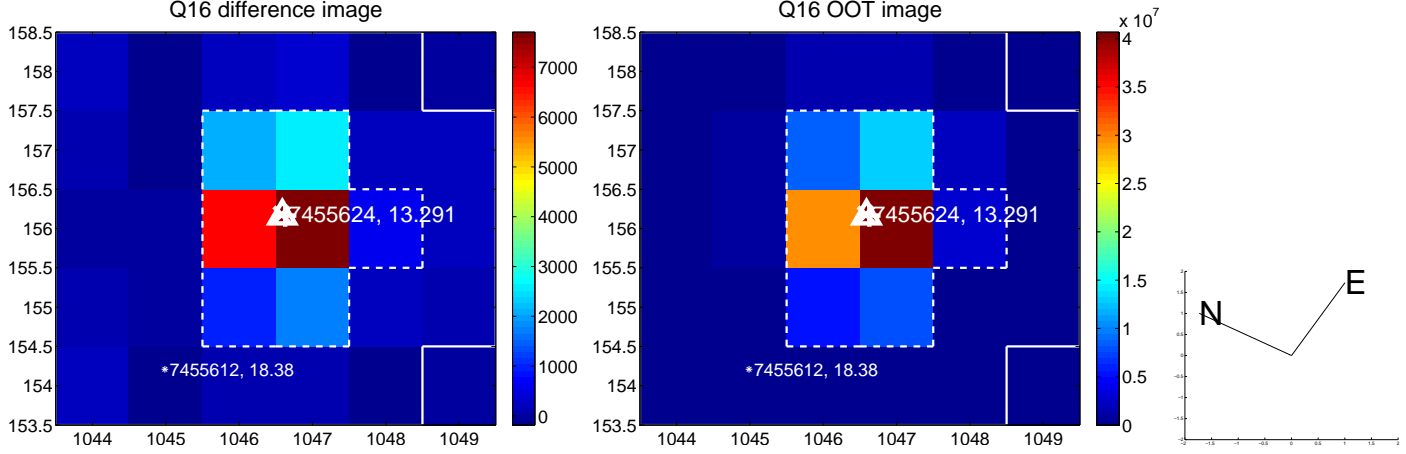
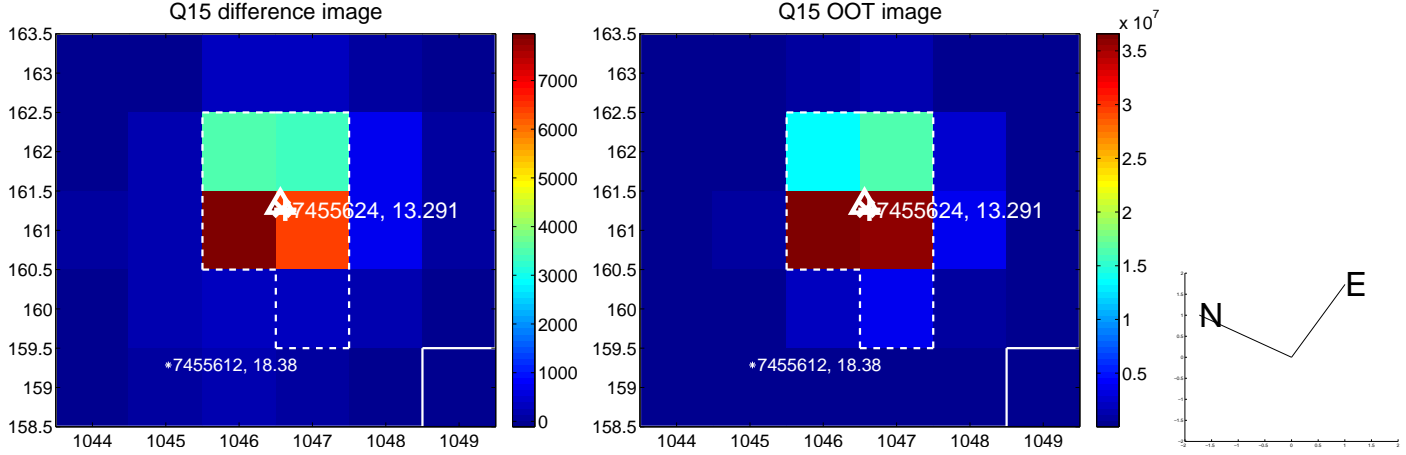
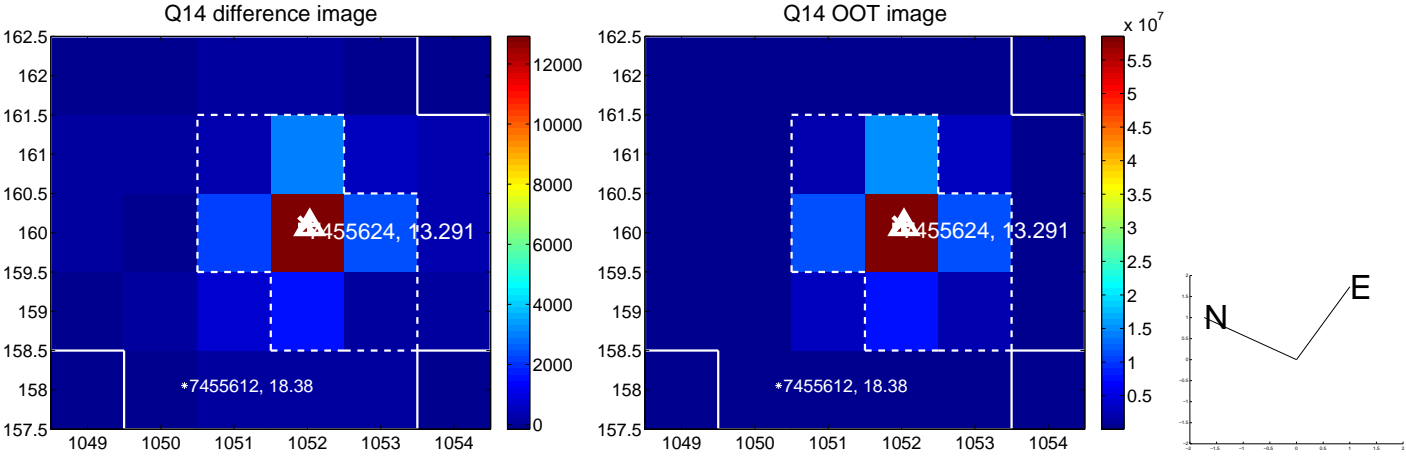
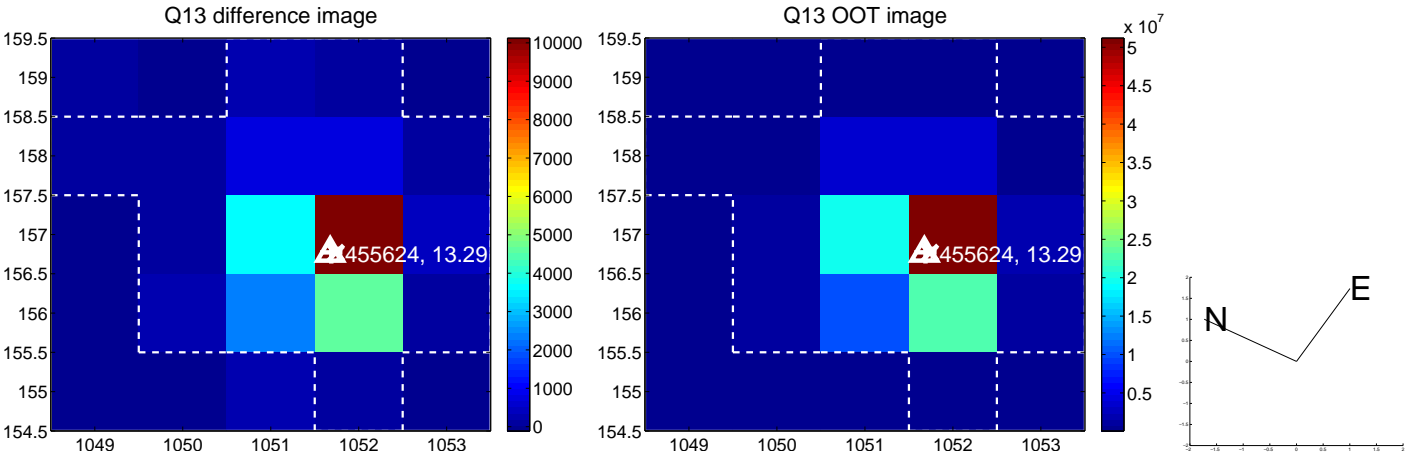


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

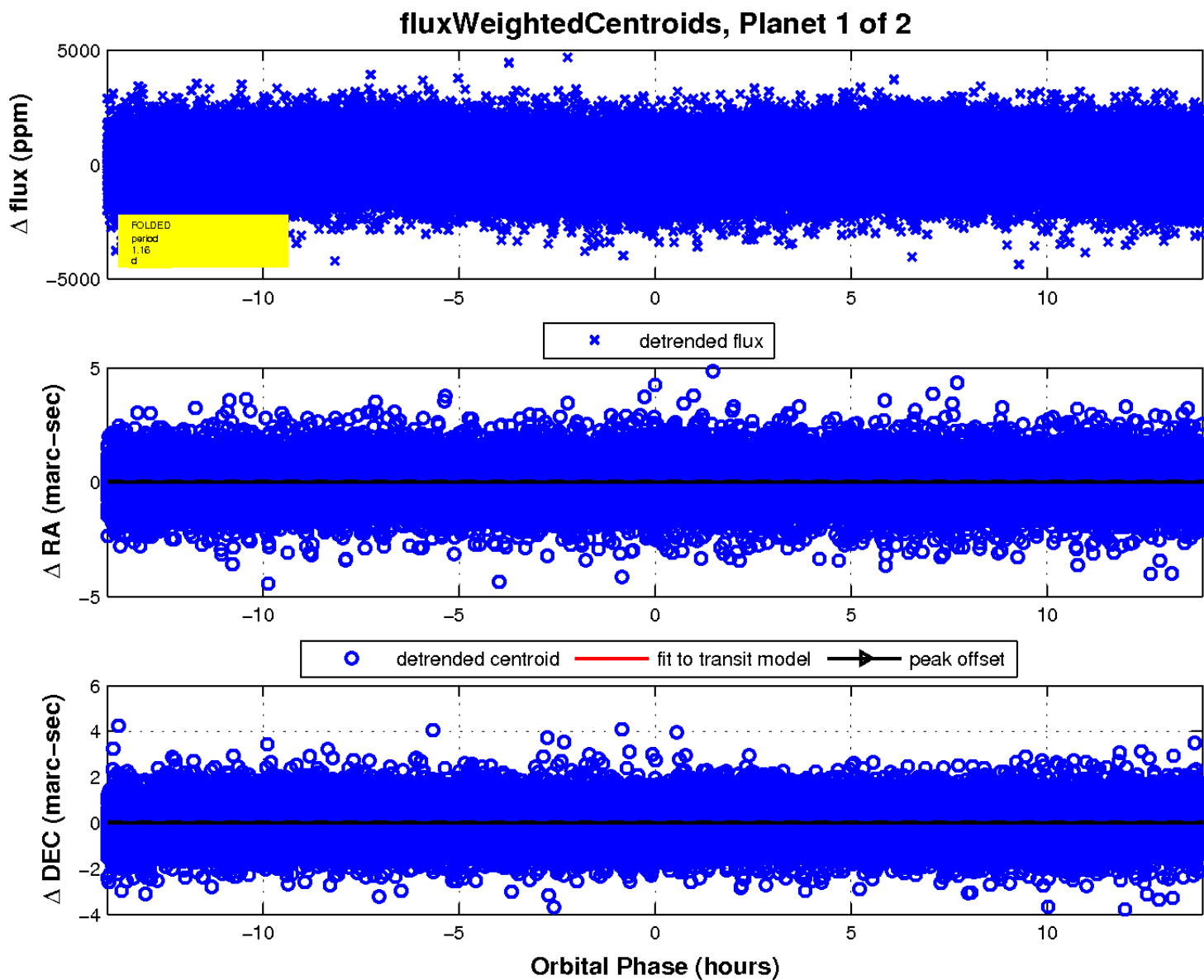
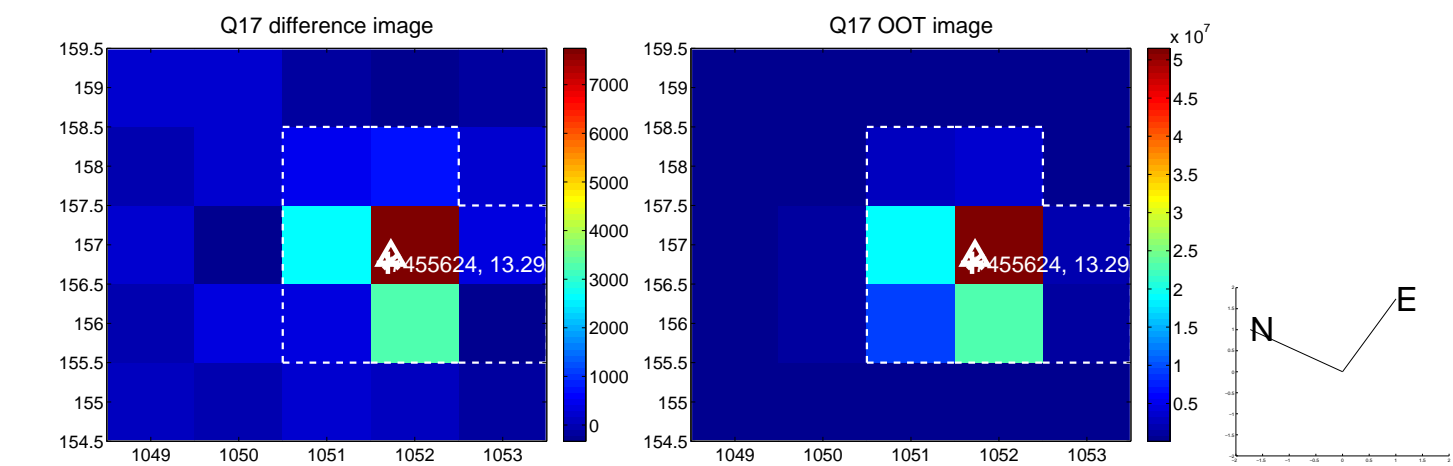




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

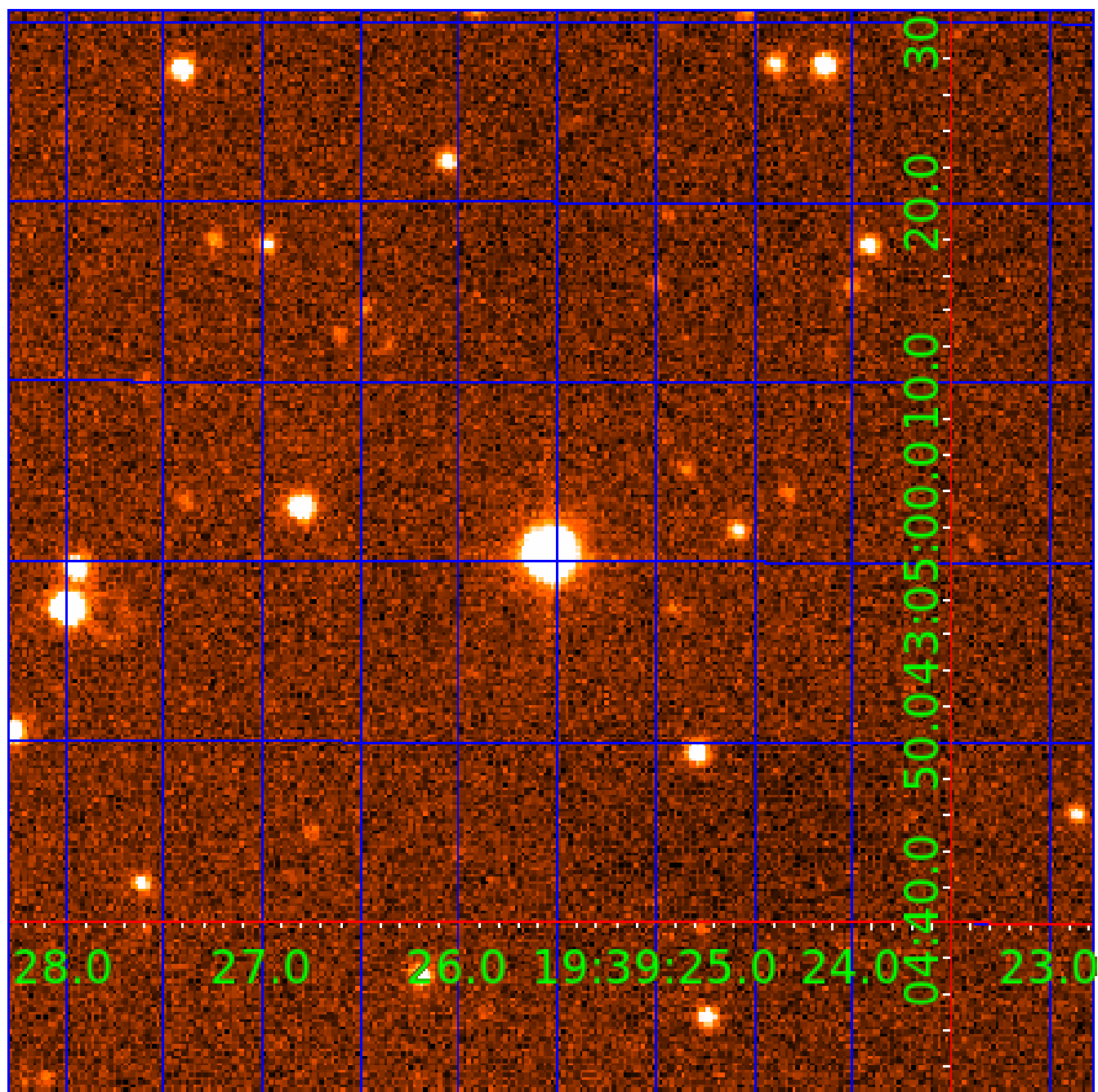


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007455624

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007455624-01	OBS	No	1.164131	132.492666	141.5	6.058	12.4	15.2	2.44	7212	2.93	21858.08
007455624-02	OBS	No	1.164144	131.900306	117.4	4.794	11.1	12.4	2.44	7212	2.76	21857.76

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007455624-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
007455624-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD

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

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

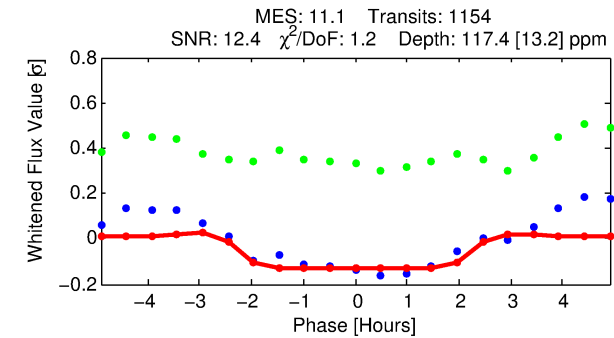
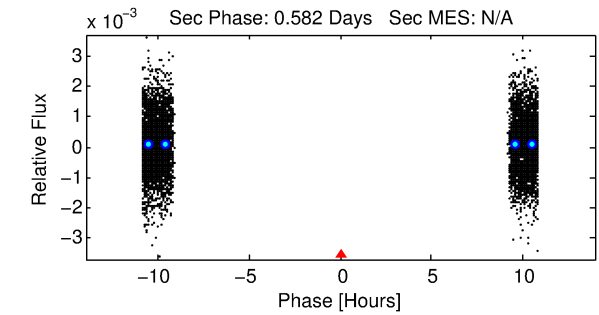
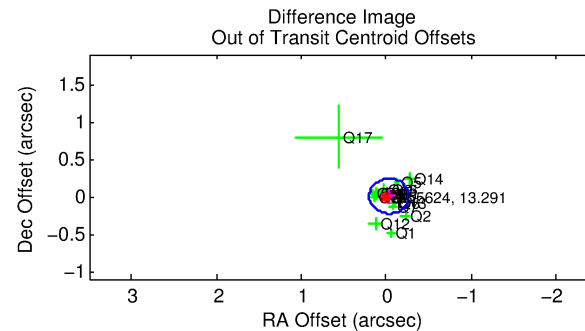
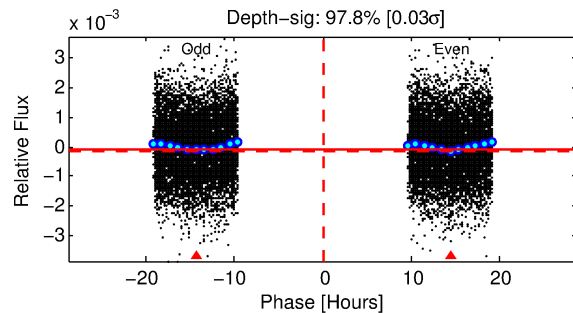
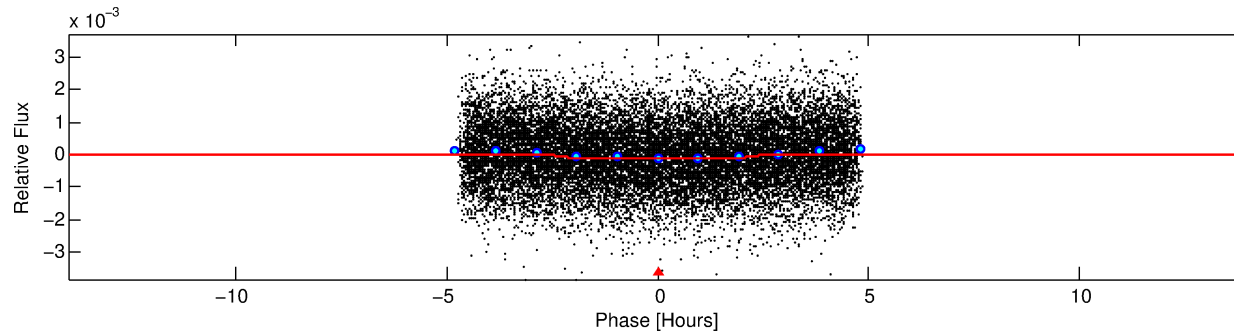
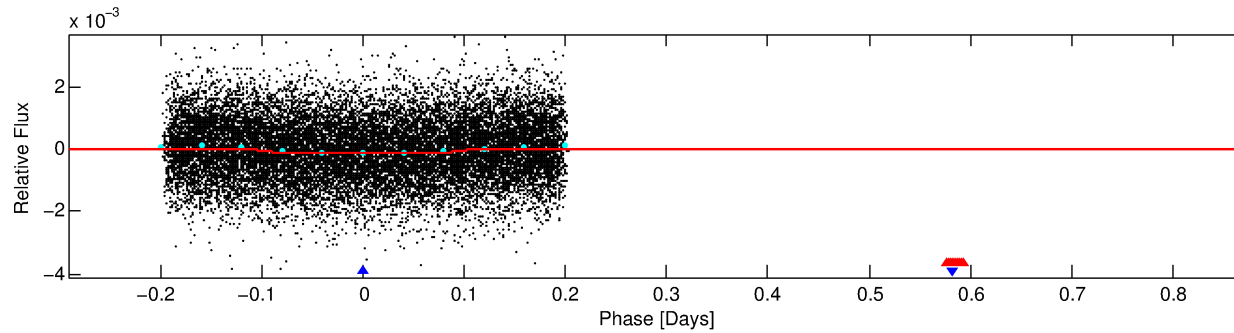
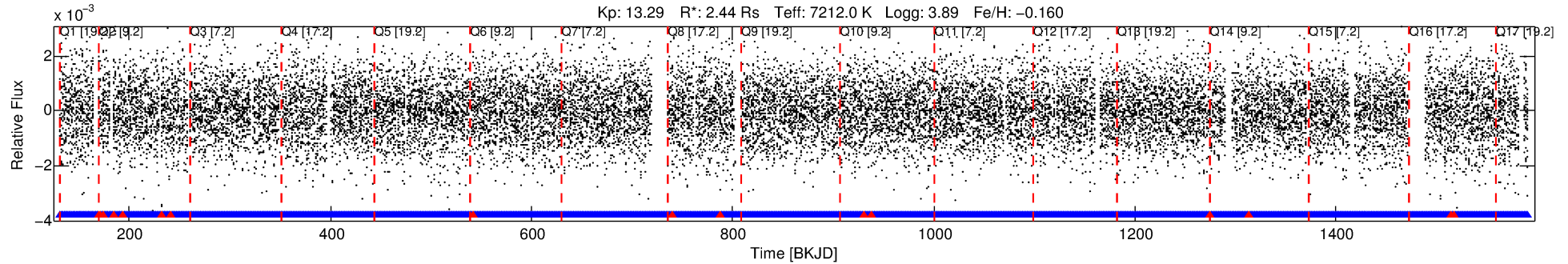
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007455624-02

No Significant Match Found

# DV One-Page Summary

KIC: 7455624 Candidate: 2 of 2 Period: 1.164 d



## DV Fit Results:

Period = 1.16414 [0.00001] d  
Epoch = 131.9003 [0.0048] BKJD  
Rp/R\* = 0.0104 [0.0090]  
a/R\* = 1.73 [5.65]  
b = 0.56 [6.03]  
Seff = 21857.76 [12428.22]  
Teq = 3100 [441] K  
Rp = 2.76 [2.59] Re  
a = 0.0257 [0.0088] AU

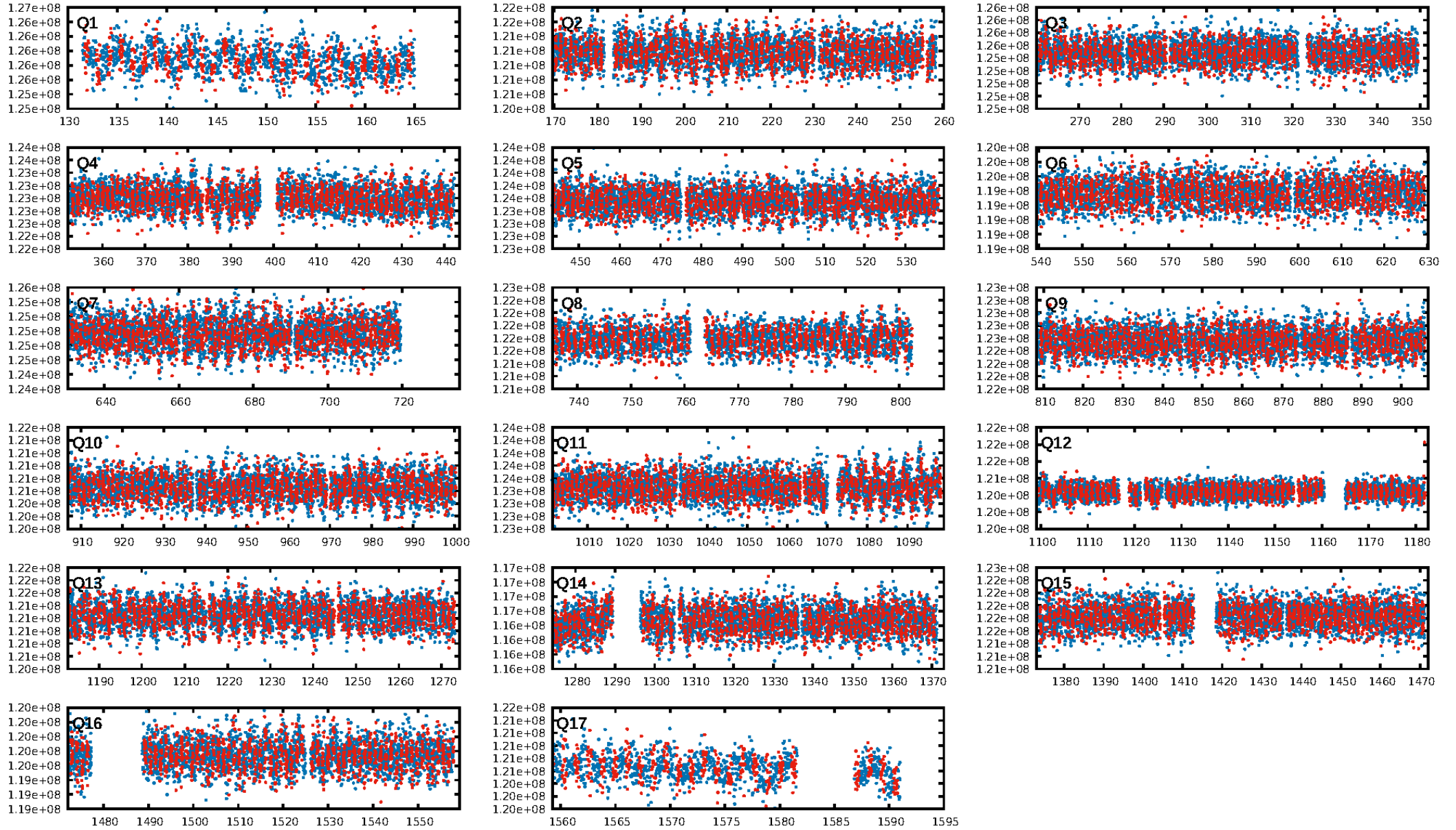
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.98 [1084/1101]  
GhostDiagnostic-chr: 1.819  
Centroid-sig: 45.9%  
Centroid-so: 0.162 arcsec [0.99σ]  
OotOffset-rm: 0.036 arcsec [0.46σ]  
KicOffset-rm: 0.081 arcsec [0.81σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 21:45:16 Z

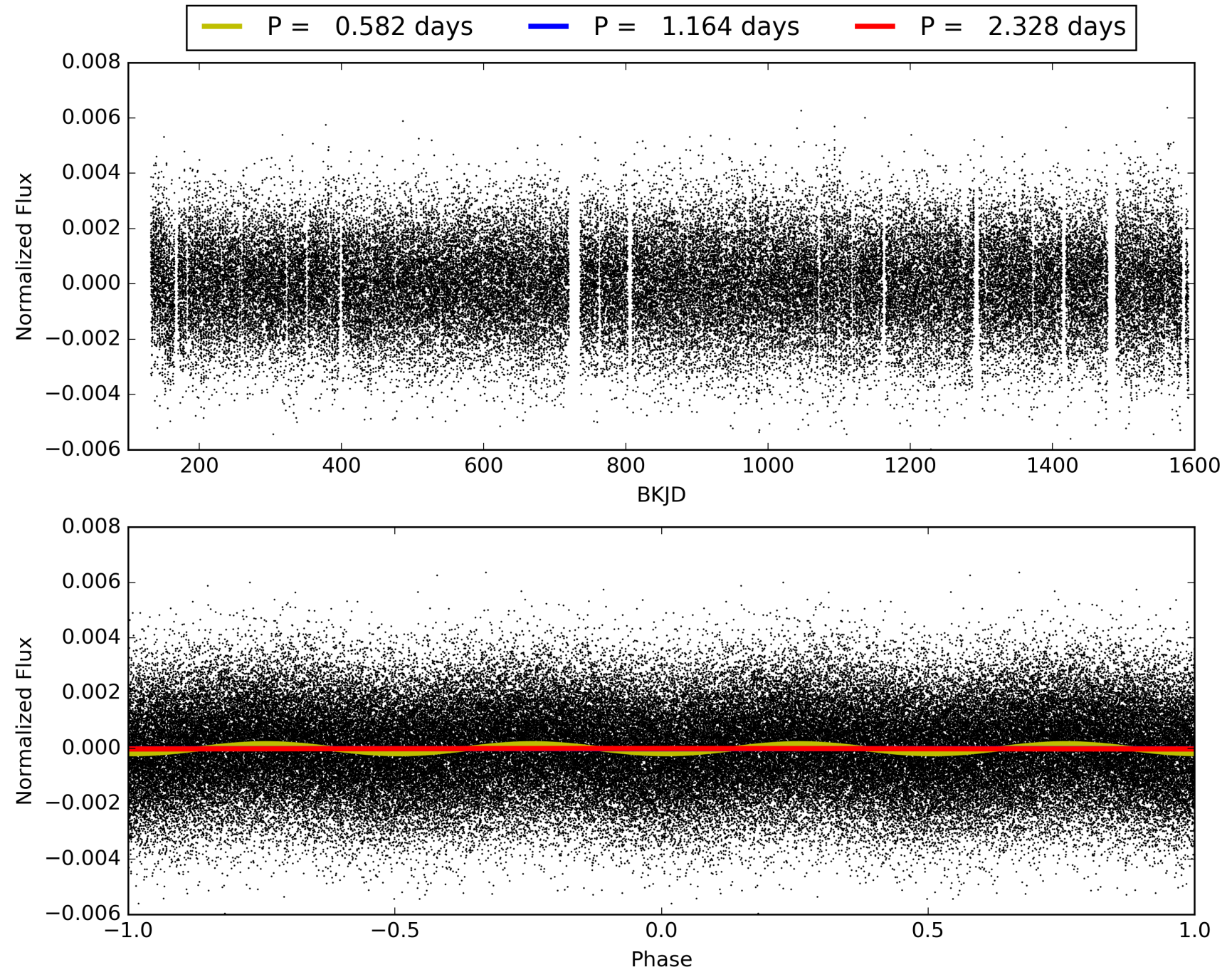
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007455624-02, PDC Light Curves



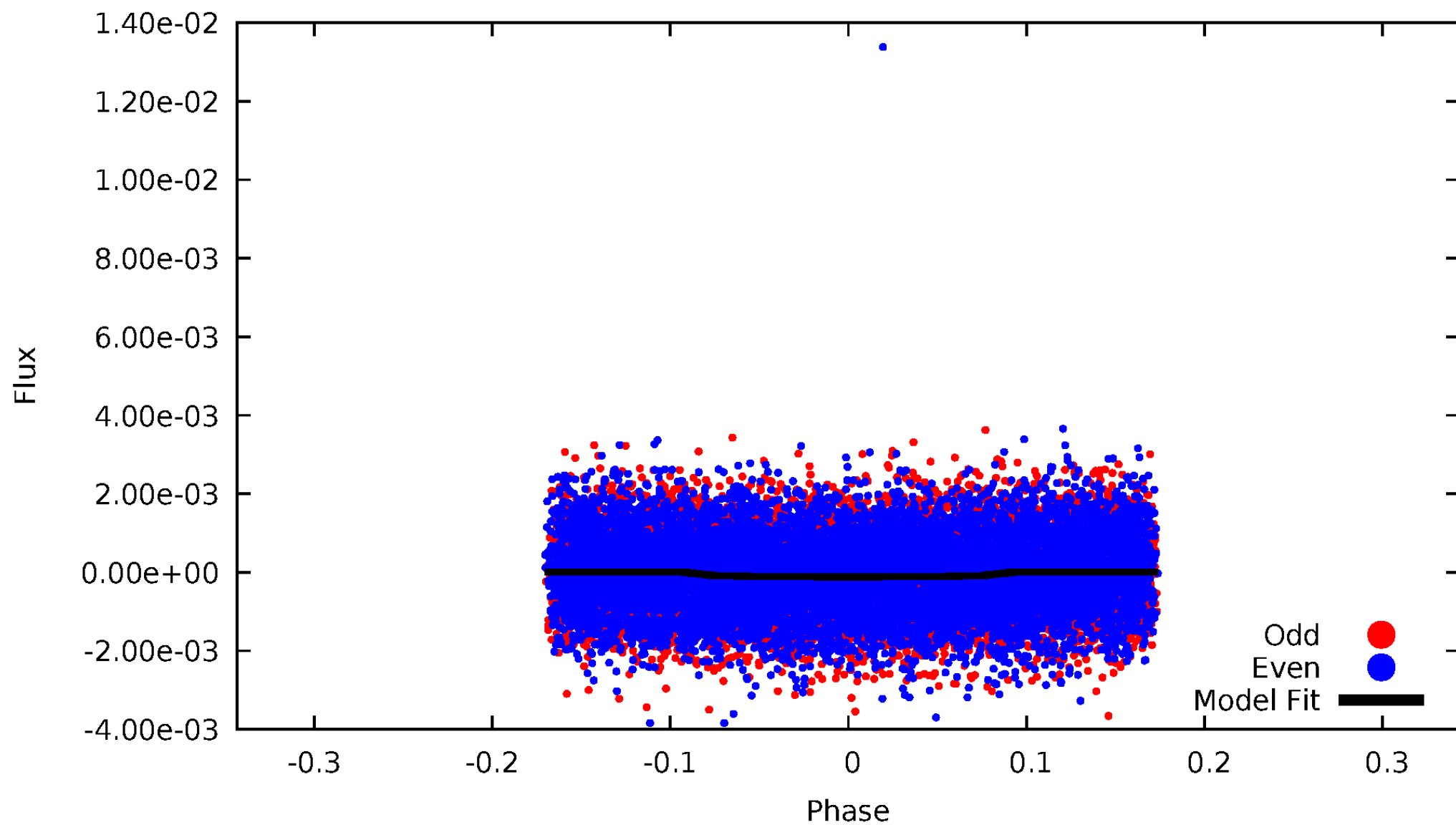


# TCE 007455624-02



DV Odd/Even

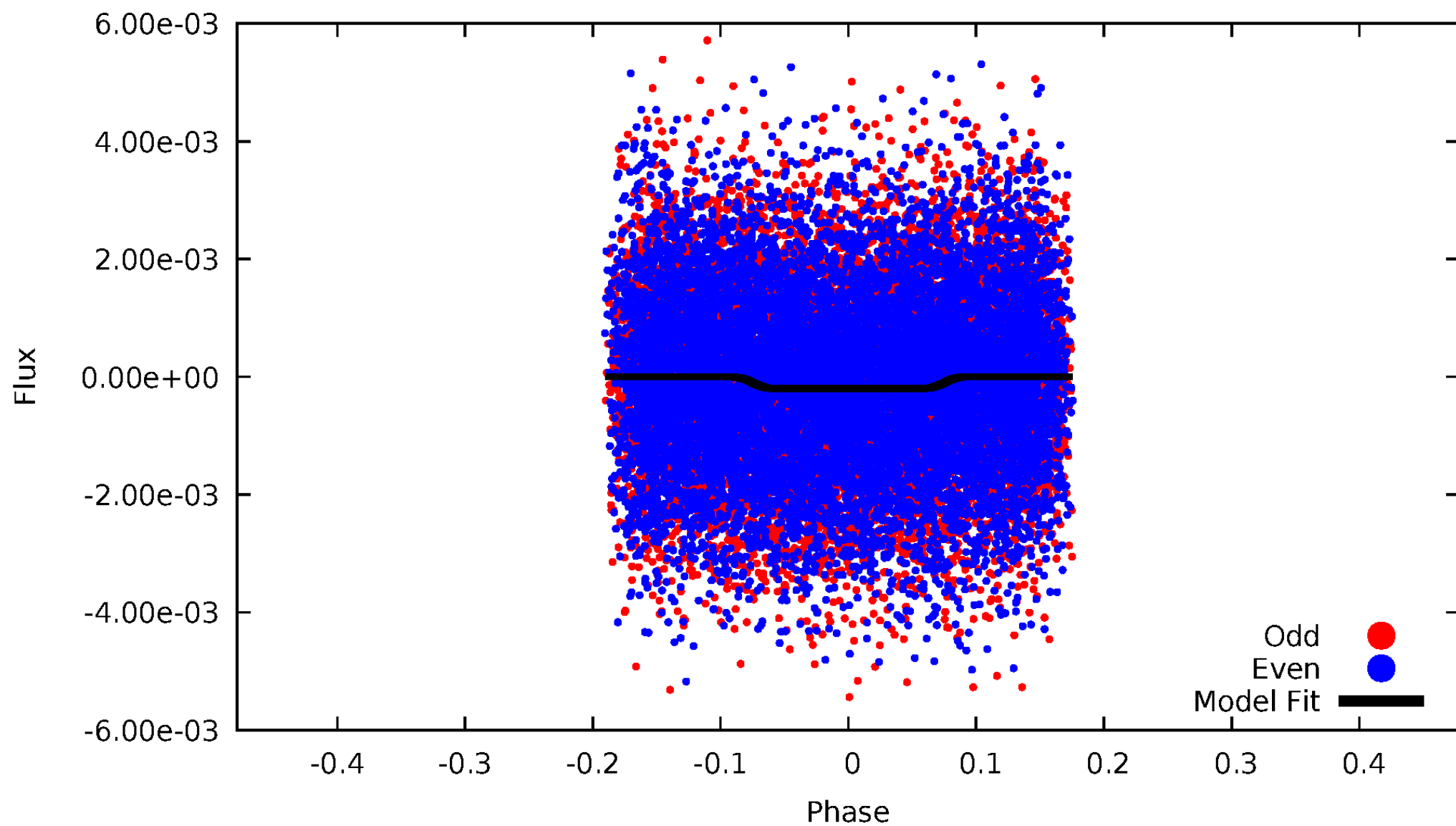
TCE 007455624-02





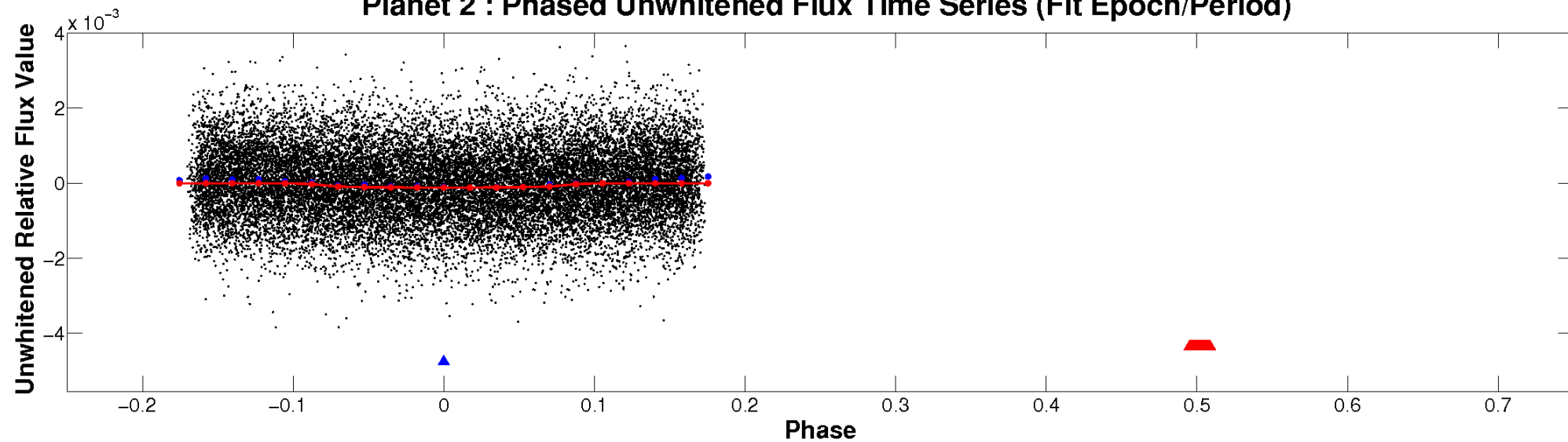
# ALT Odd/Even

TCE 007455624-02

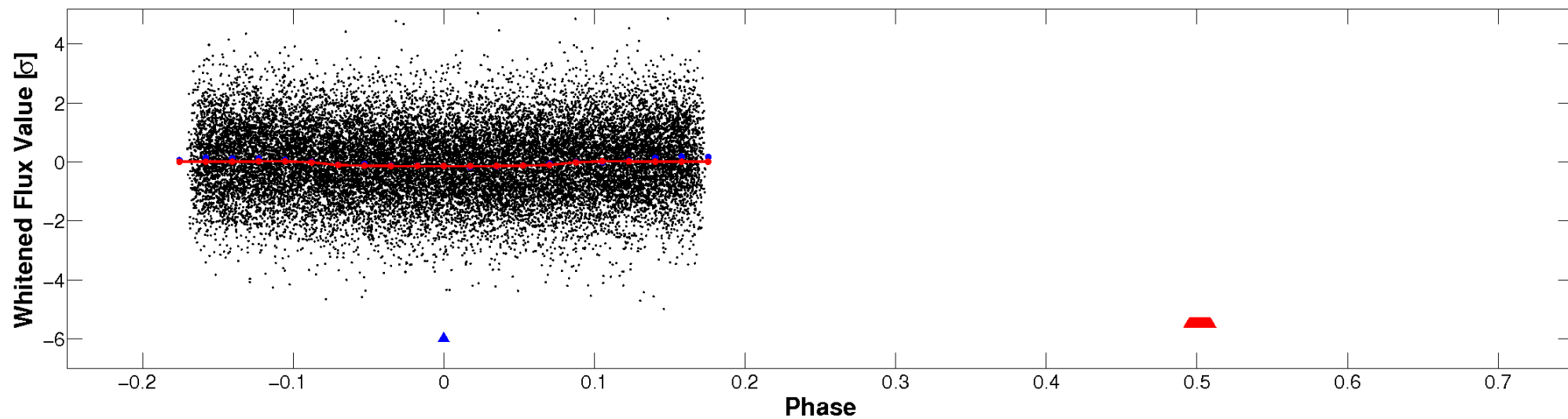


# Non-Whitened Vs. Whitened Light Curve

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

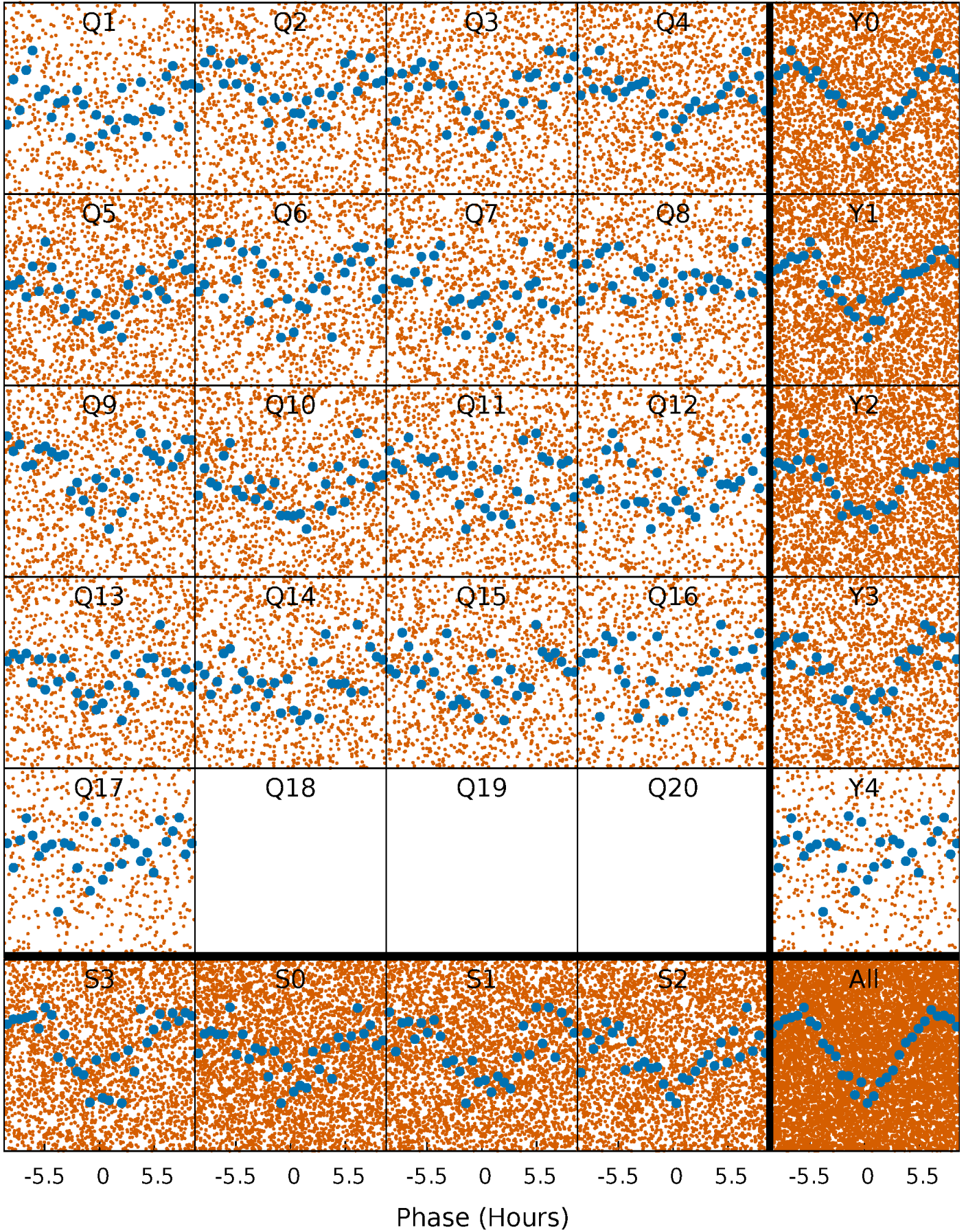


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



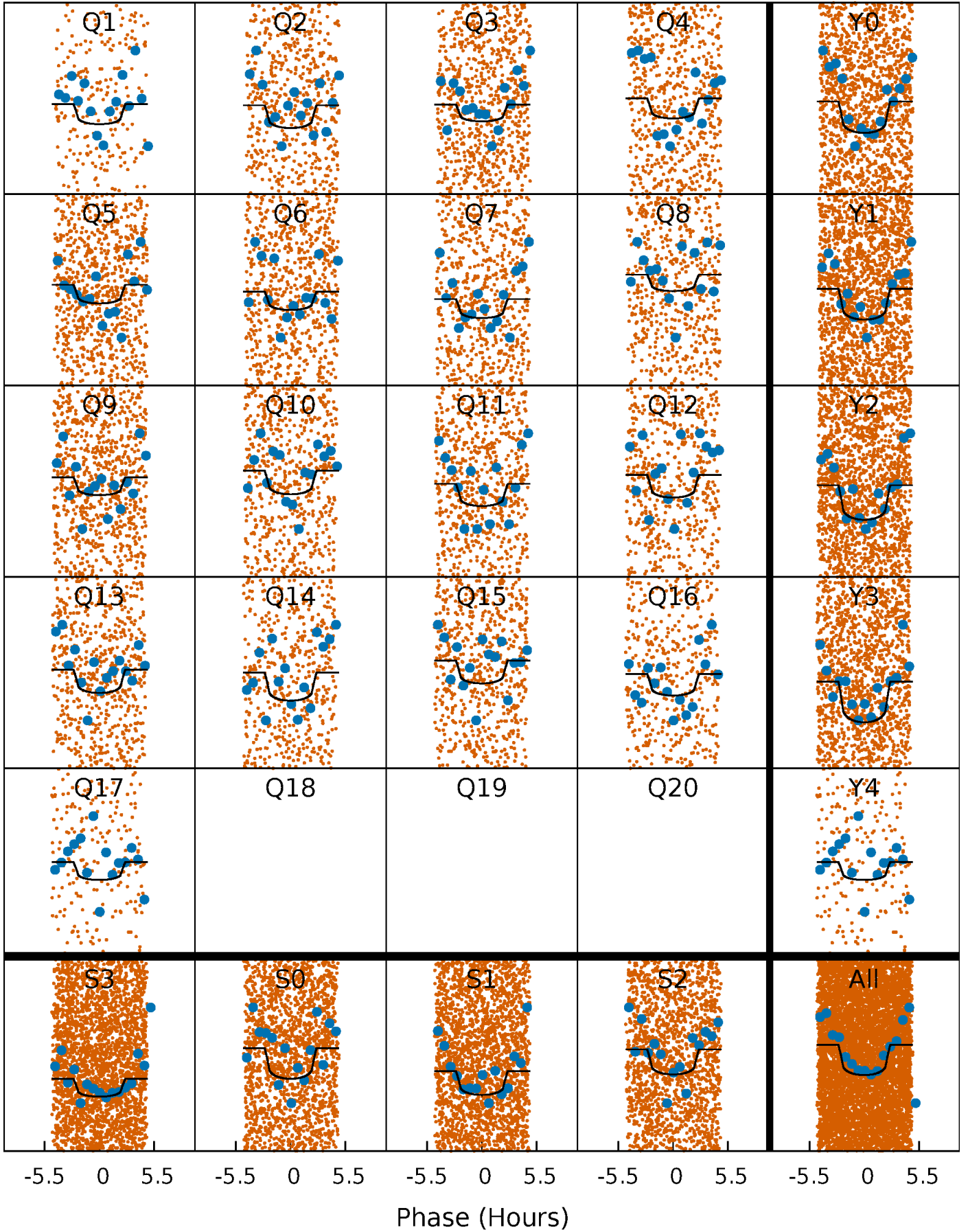
# PDC Quarter-Phased Transit Curves

TCE 007455624-02 P= 1.164144 Days  $T_0=131.900306$  (BKJD)



# DV Quarter-Phased Transit Curves

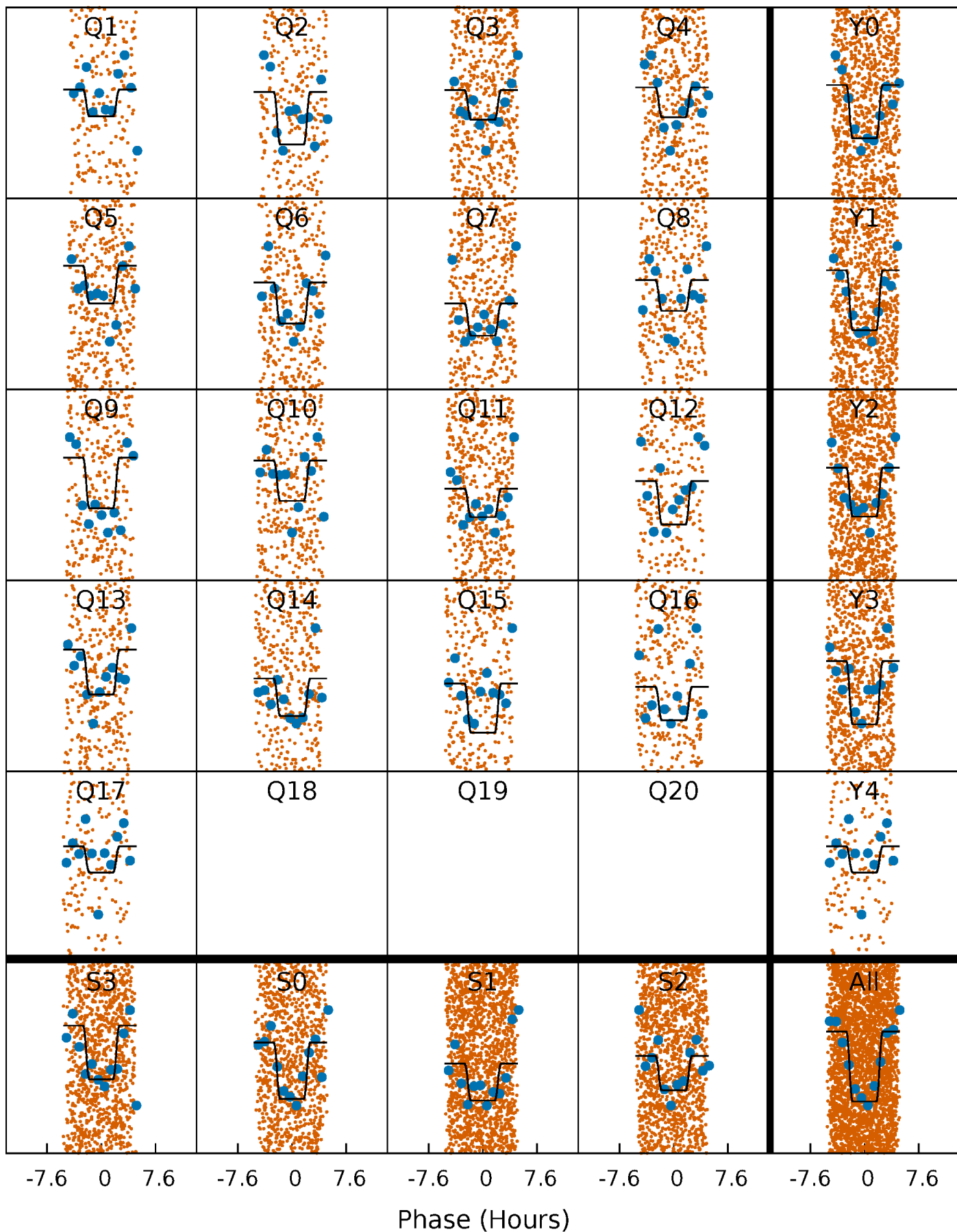
TCE 007455624-02     $P = 1.164144$  Days     $T_0 = 131.900306$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007455624-02   P= 1.164165 Days    $T_0=131.896877$  (BKJD)

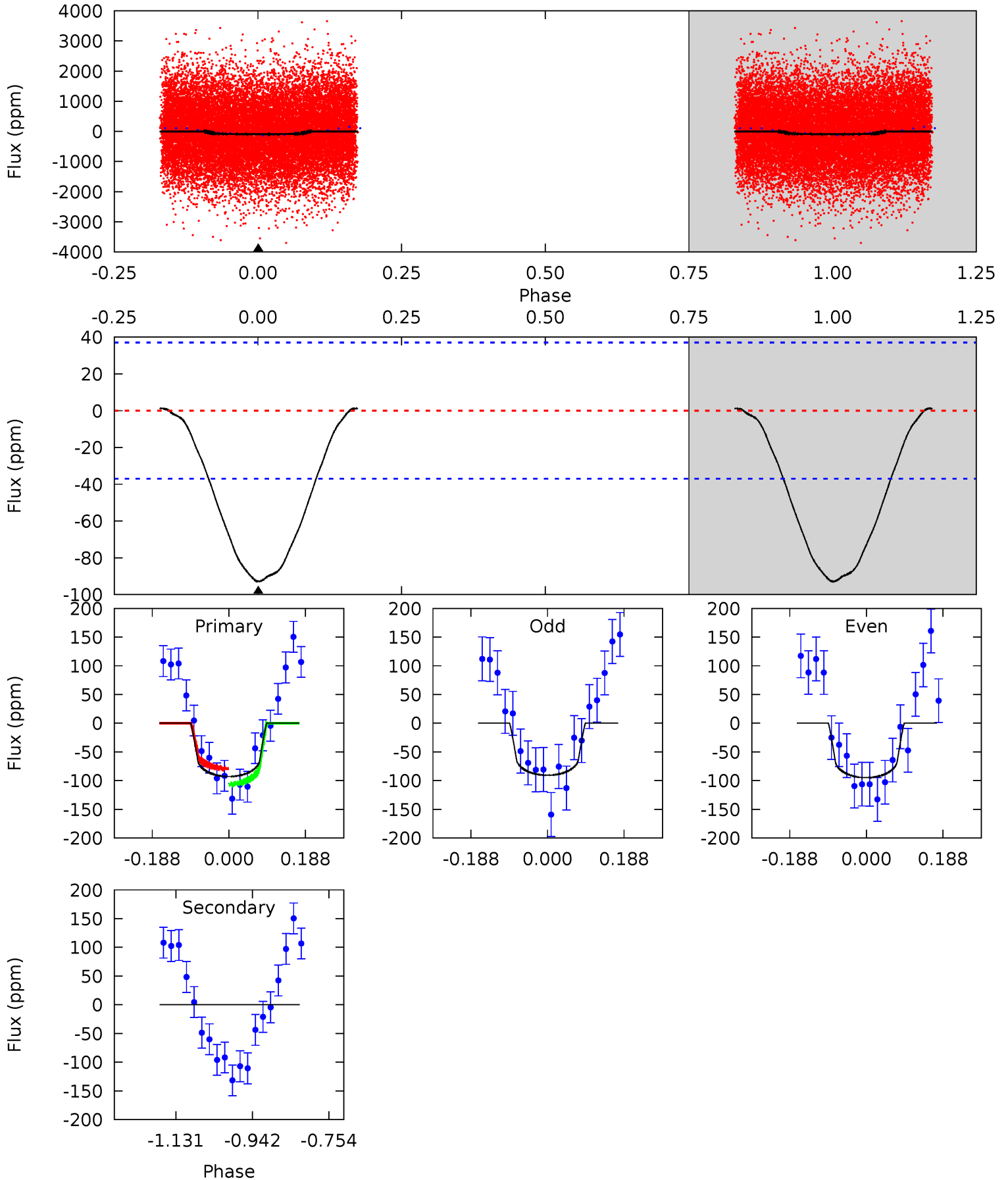




# DV Model-Shift Uniqueness Test

007455624-02, P = 1.164144 Days, E = 130.736162 Days

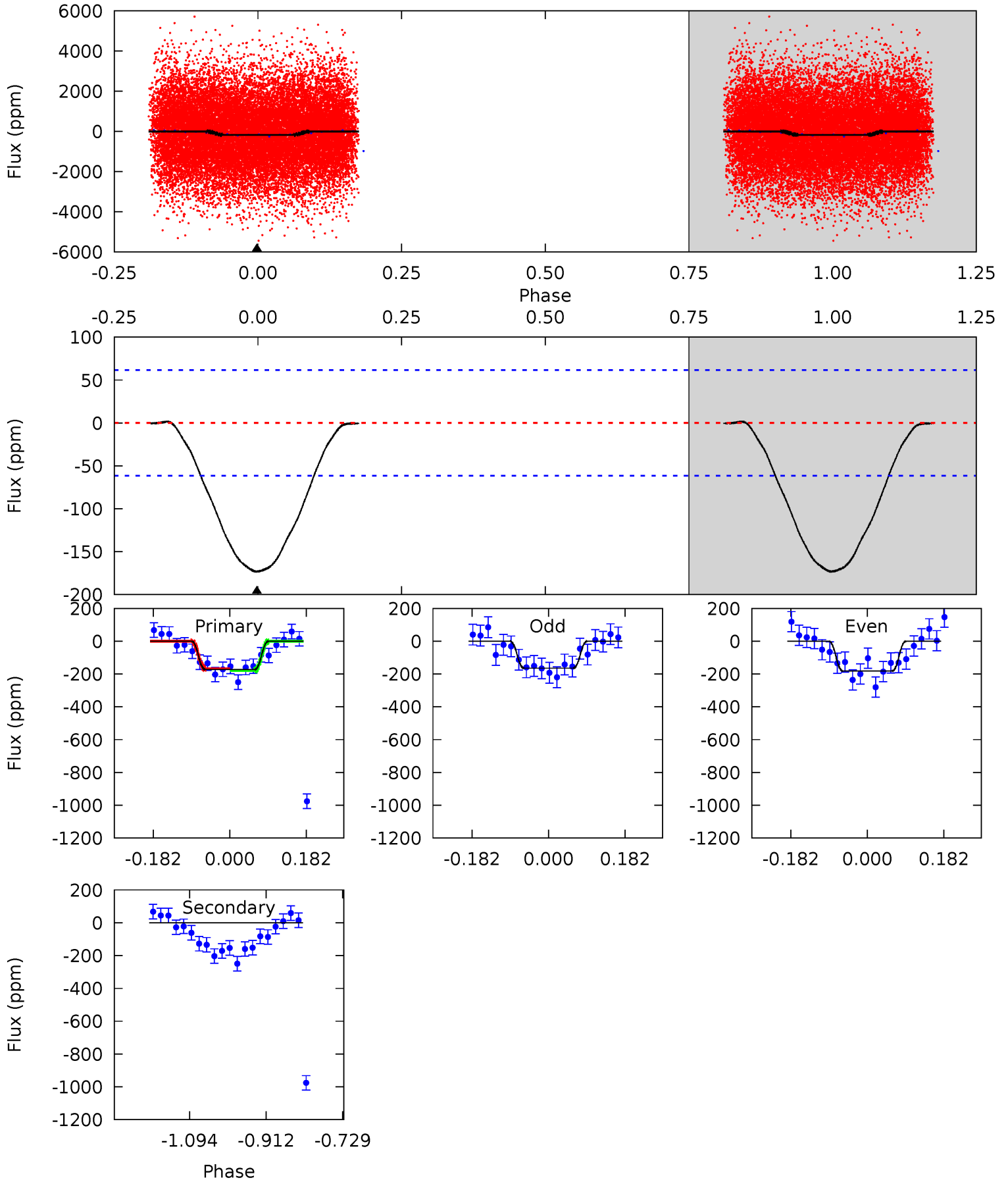
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.1	0	0	0	4.43	1.32	0.15	11.1	11.1	0	0	0.25	1.17	0.01	1.63



# Alt Model-Shift Uniqueness Test

007455624-02, P = 1.164165 Days, E = 130.732712 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
12.5	0	0	0	4.44	1.33	0.08	12.5	12.5	0	0	0.64	0.96	0.01	0.33



### Stellar Parameters For KIC 007455624

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7212^{+230}_{-316}$	$3.886^{+0.315}_{-0.135}$	$-0.160^{+0.250}_{-0.350}$	$2.442^{+0.518}_{-0.888}$	$1.670^{+0.168}_{-0.392}$	$0.162^{+0.392}_{-0.067}$
	+3%/-4%	+8%/-3%	+156%/-219%	+21%/-36%	+10%/-23%	+243%/-42%
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 007455624-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 8$	$2.87^{+2.15}_{-1.74}$	$4263^{+324}_{-420}$	$-3836^{+7430}_{-818}$	$0.000^{+0.526}_{-0.632}$
Alt.	$0 \pm 14$	$3.75^{+2.49}_{-2.21}$	$4255^{+311}_{-393}$	$-3872^{+7239}_{-779}$	$-0.014^{+0.453}_{-0.627}$

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

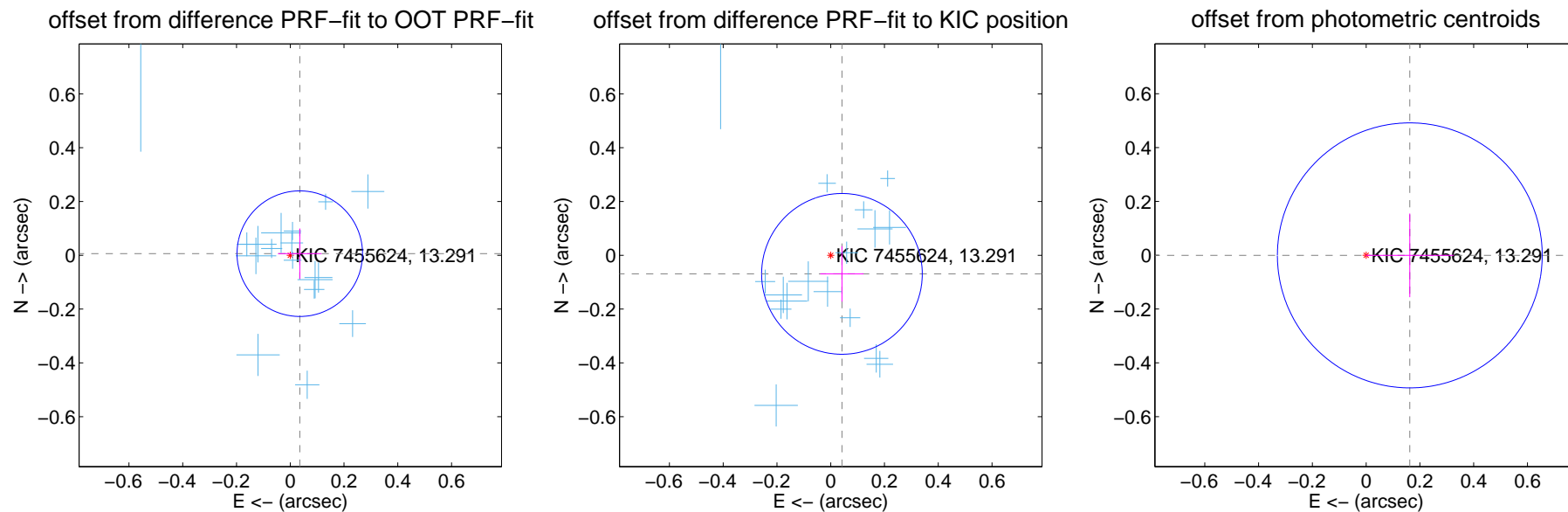
## DV Centroid Data

Supplemental centroid analysis for 007455624-02. Kepler magnitude: 13.29. Transit SNR 12.42

There are 17 quarters with good PRF difference image offsets

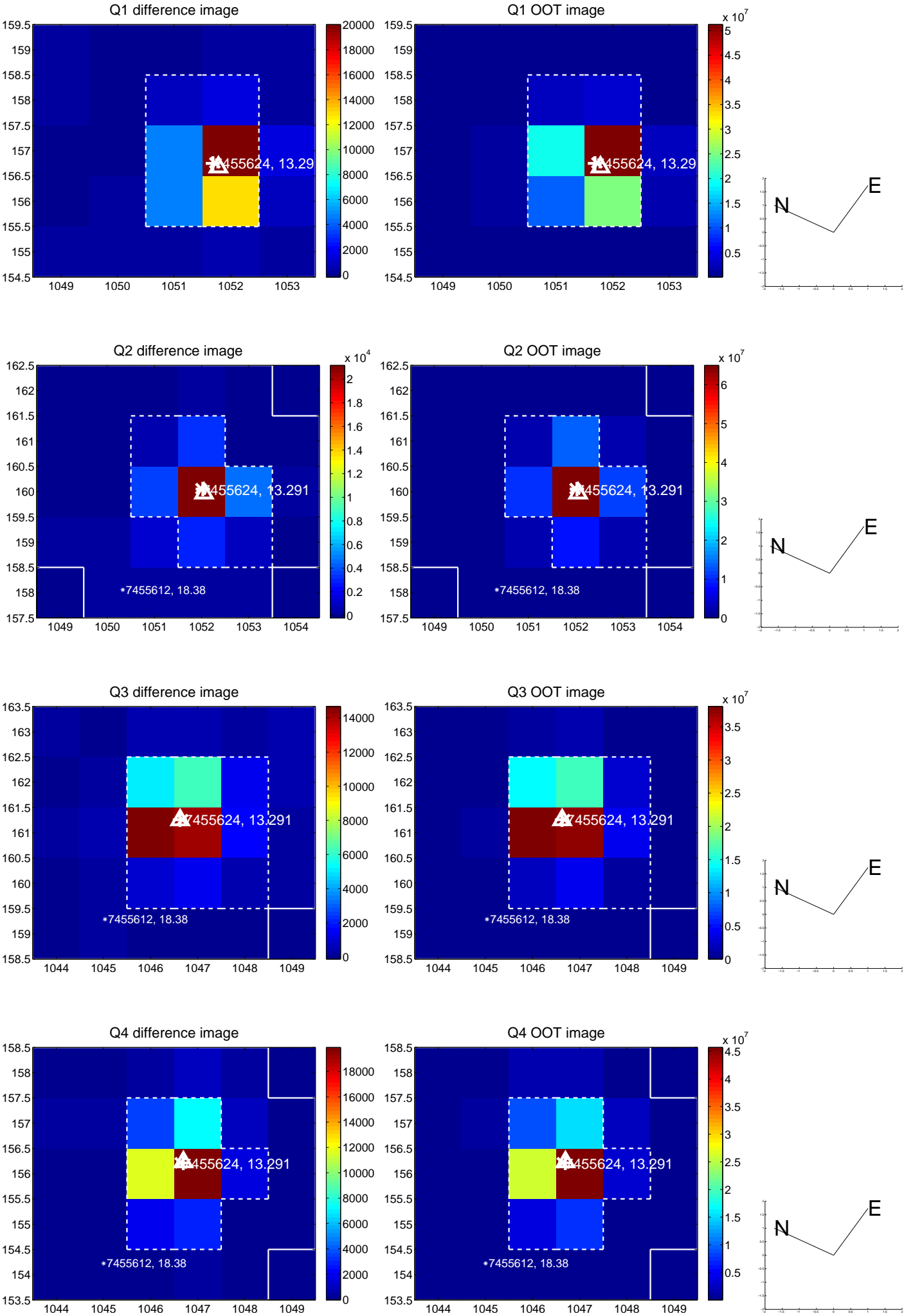
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.036 \pm 0.078$	0.46	$-0.035 \pm 0.081$	$0.006 \pm 0.093$
PRF-fit source offset from KIC position	$0.081 \pm 0.100$	0.81	$-0.042 \pm 0.081$	$-0.069 \pm 0.103$
photometric centroid source offset	$0.16 \pm 0.16$	0.99	$-0.16 \pm 0.16$	$-0.00 \pm 0.16$



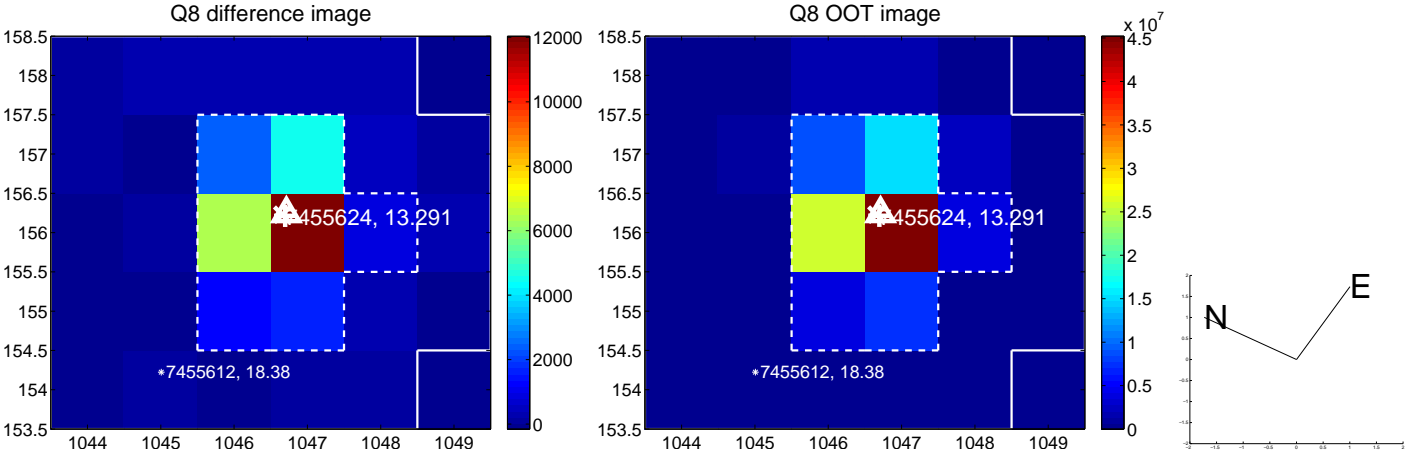
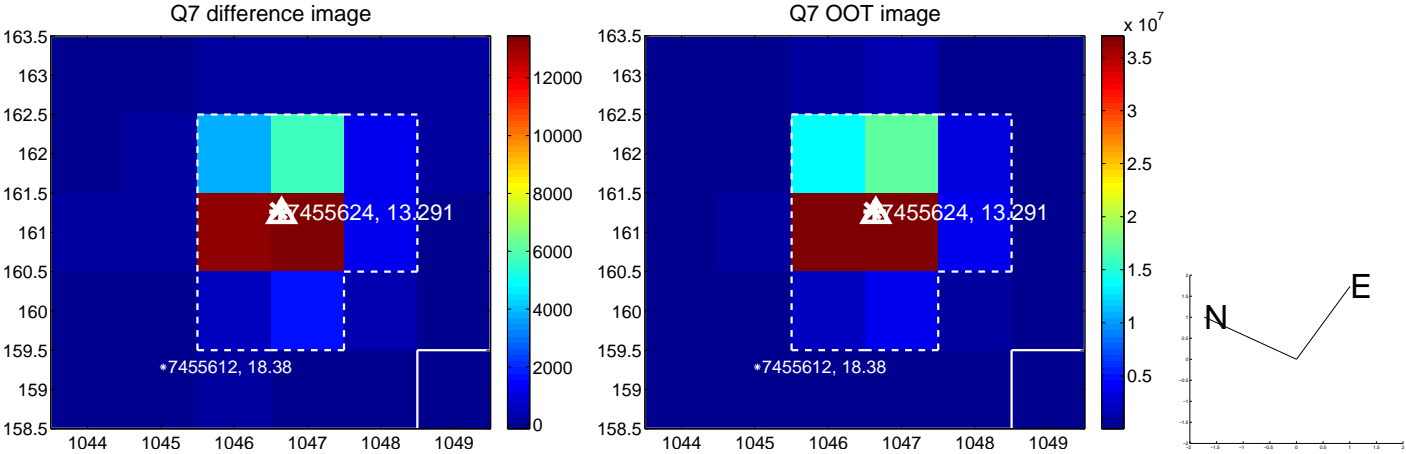
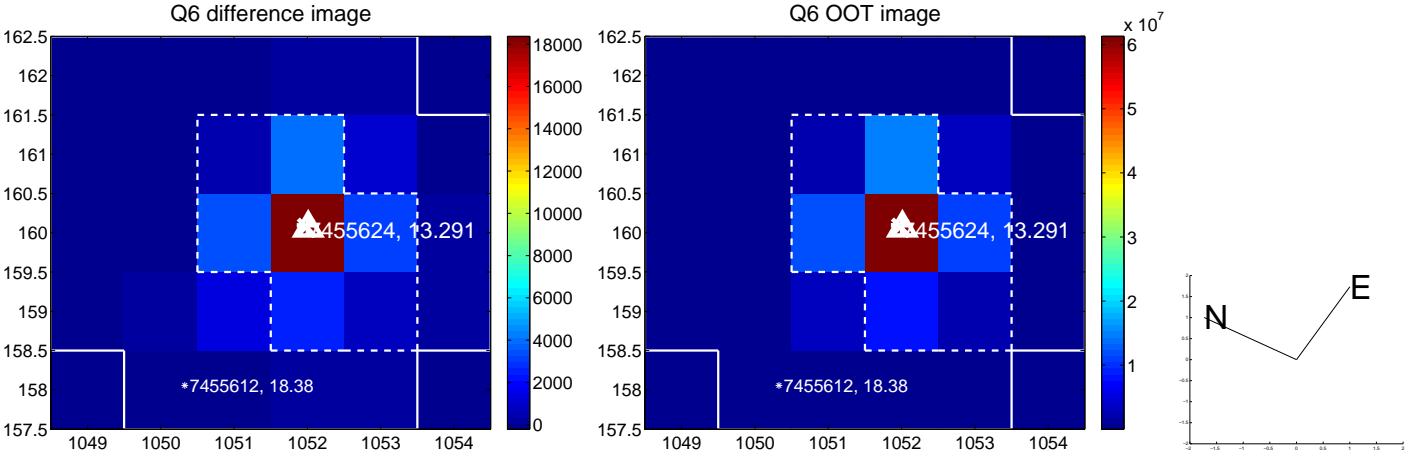
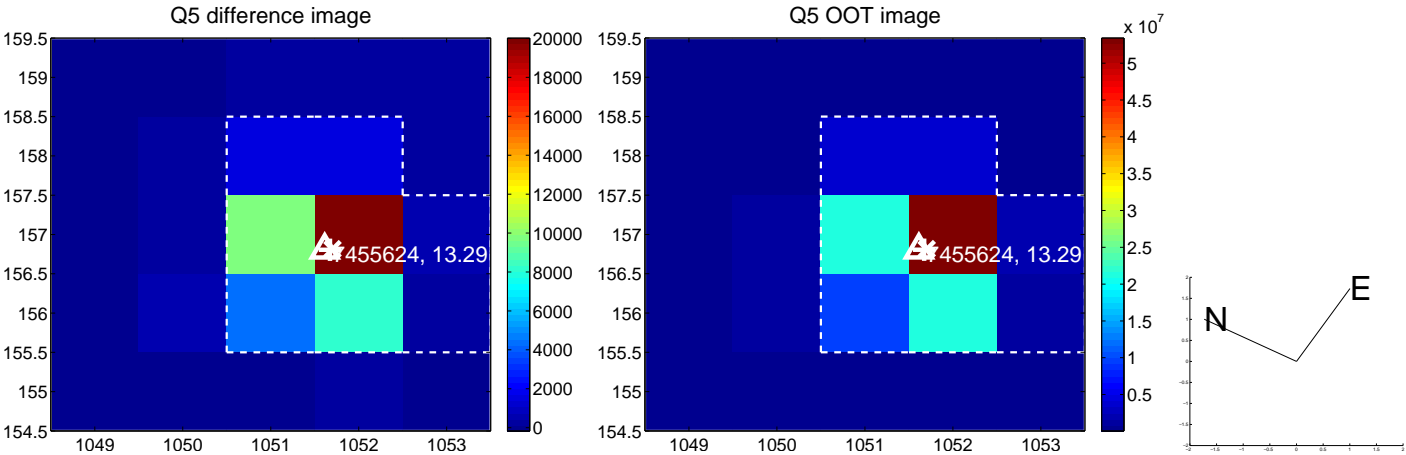
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

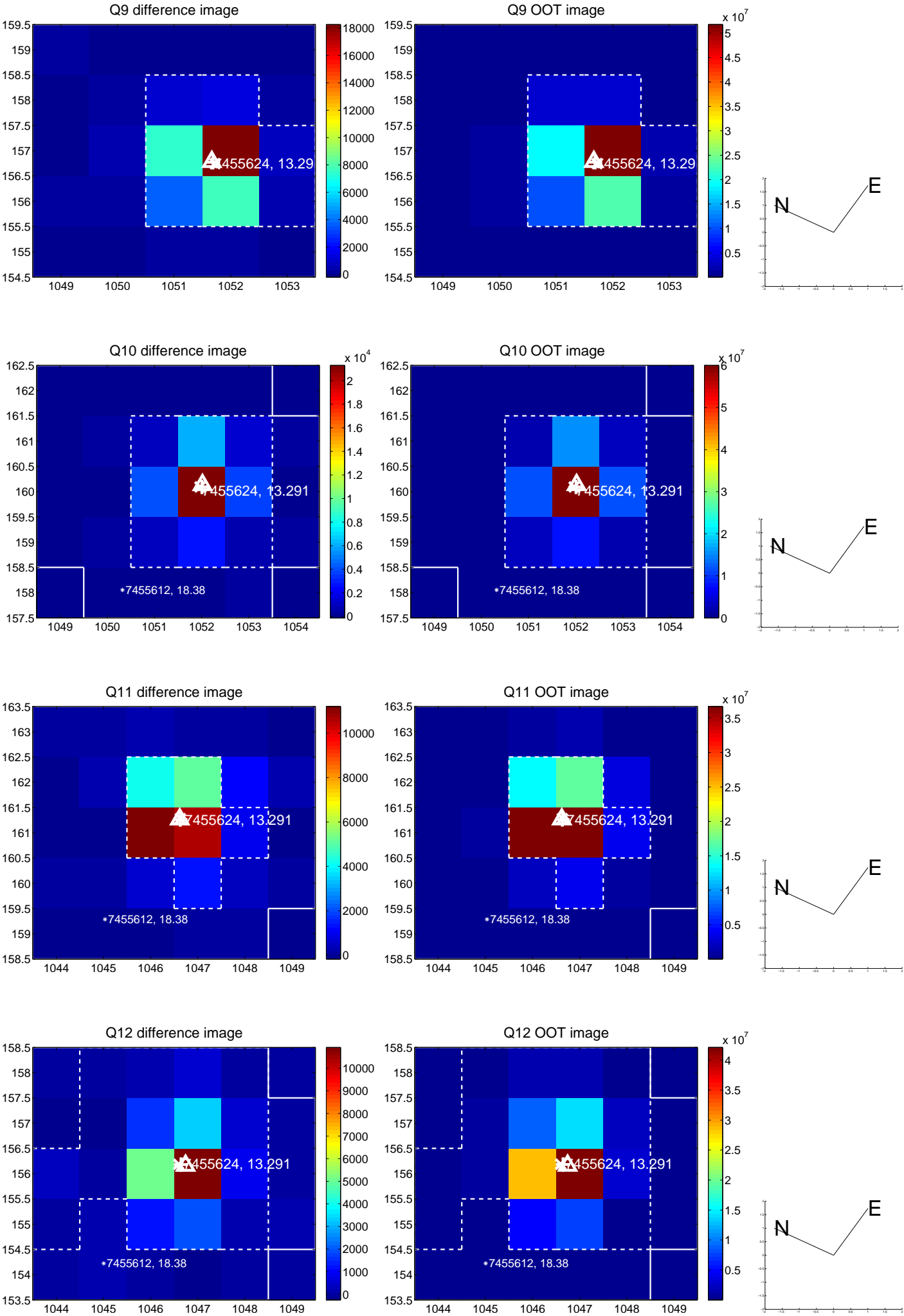




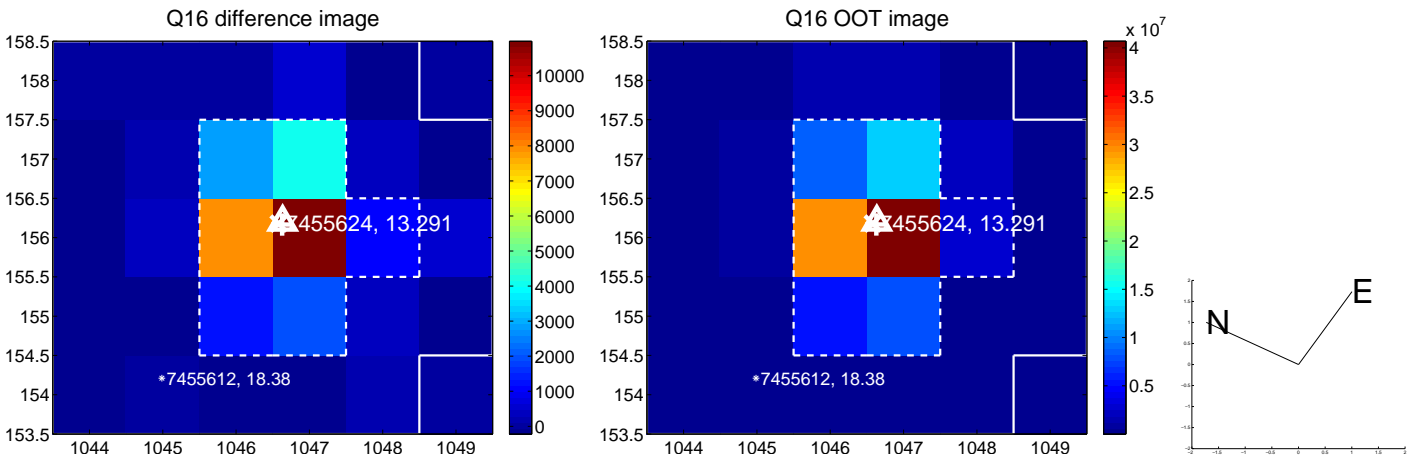
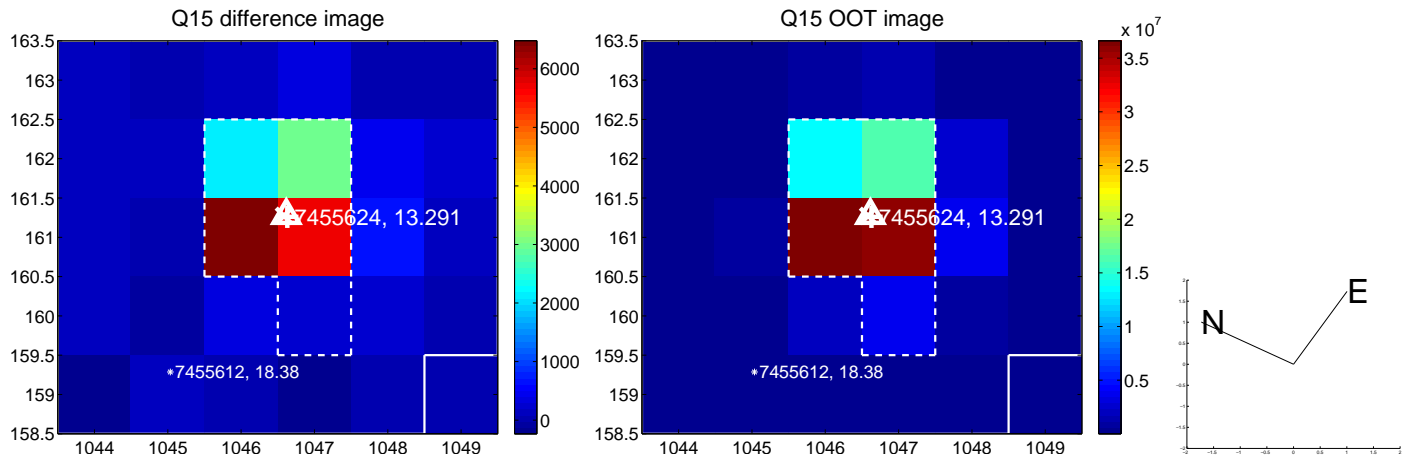
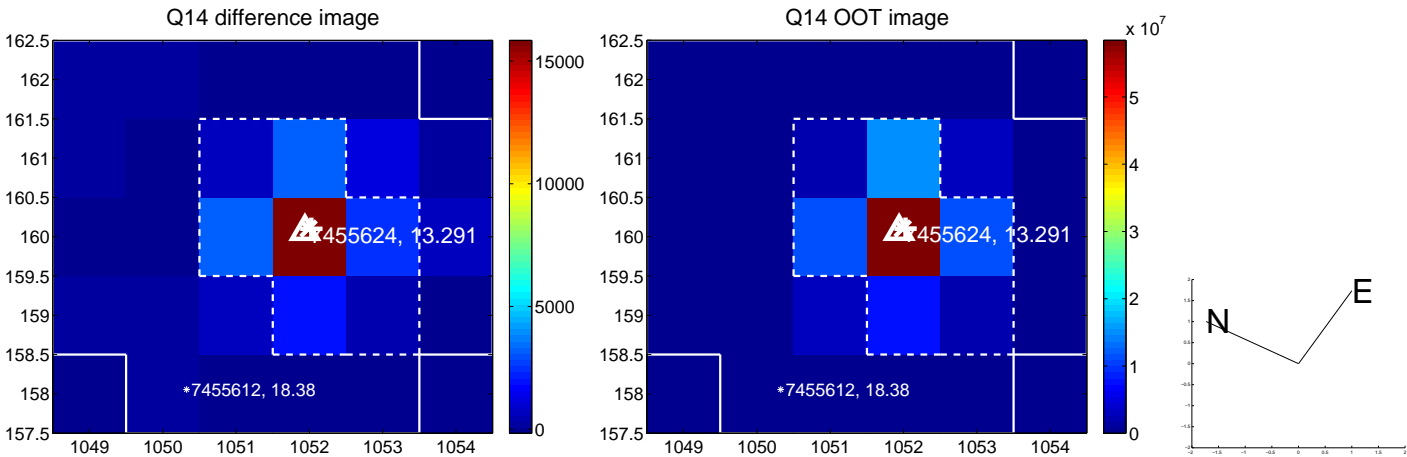
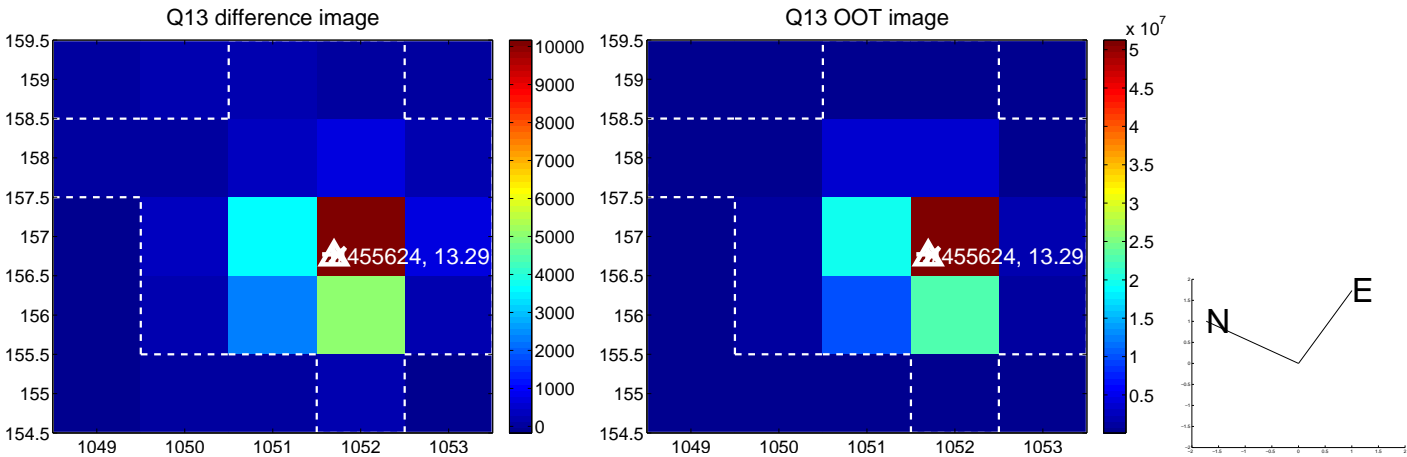
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



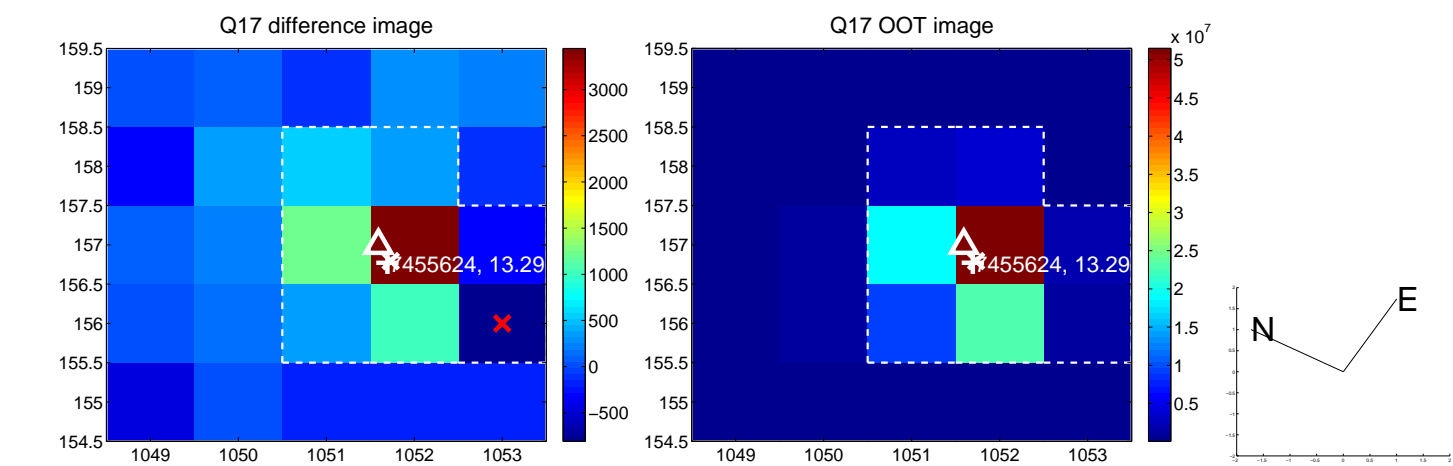
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



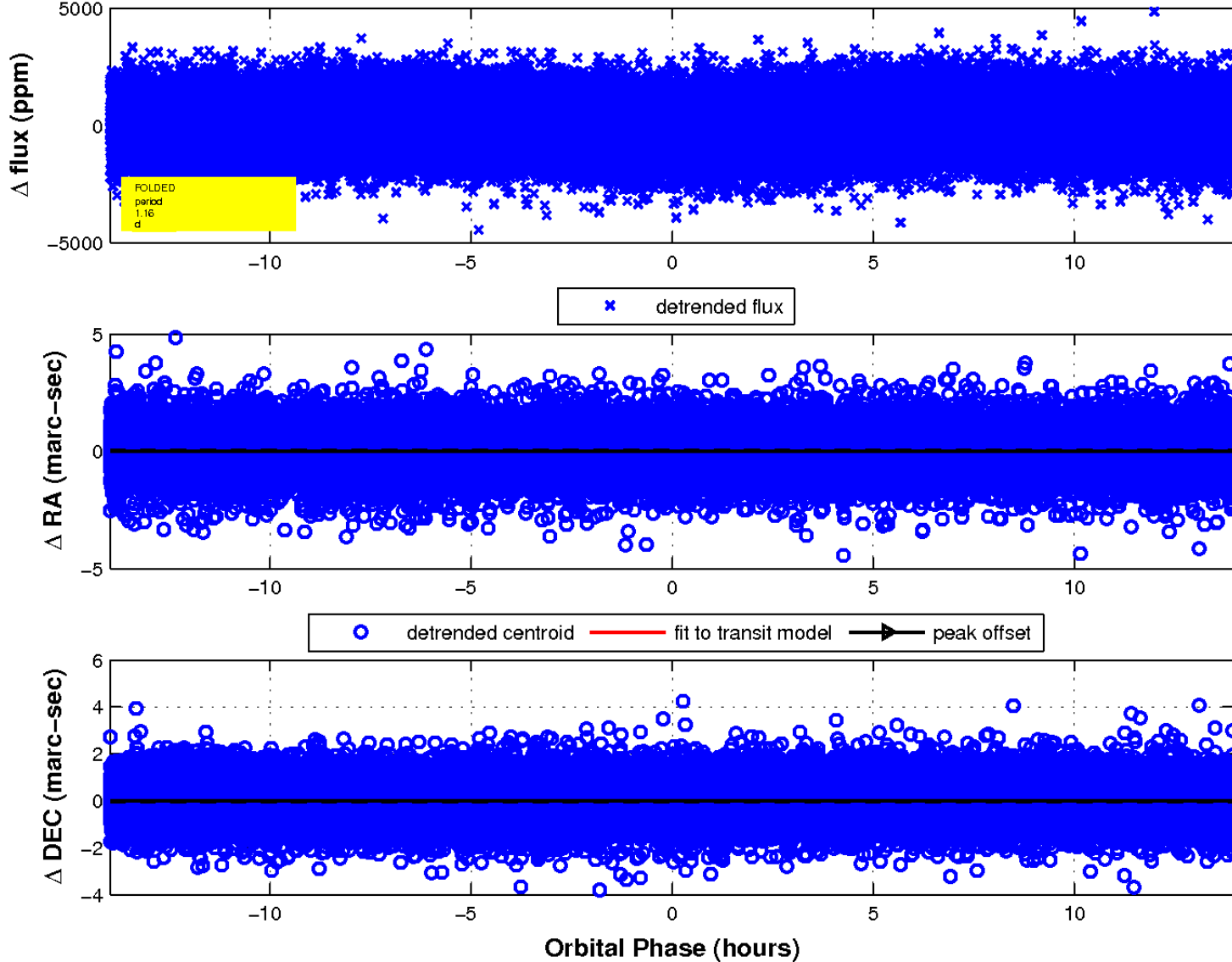
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

