

# KIC 010527135

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010527135-01	OBS	2622.01	0.657368	132.118239	139.7	1.085	13.7	17.5	0.85	5430	1.08	2743.29
010527135-02	OBS	No	0.657376	131.780577	152.9	0.975	13.9	18.7	0.85	5430	1.28	2743.24

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010527135-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
010527135-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

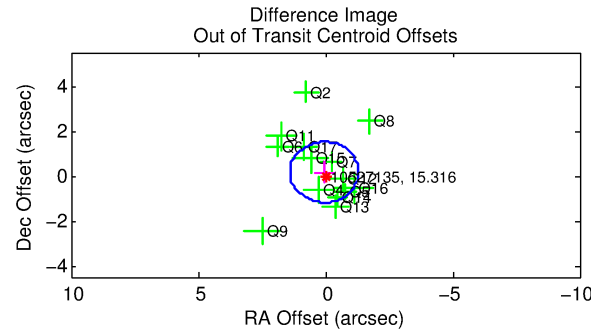
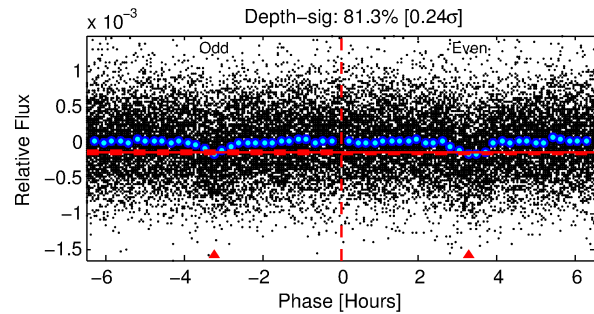
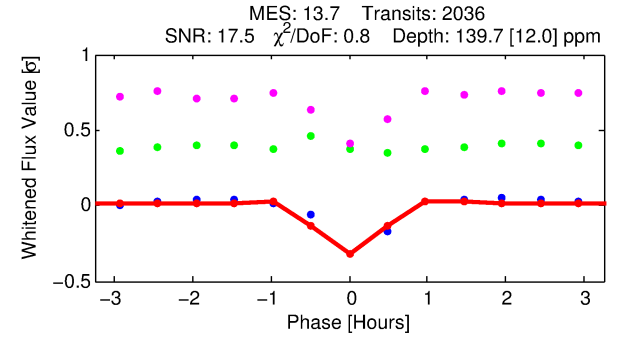
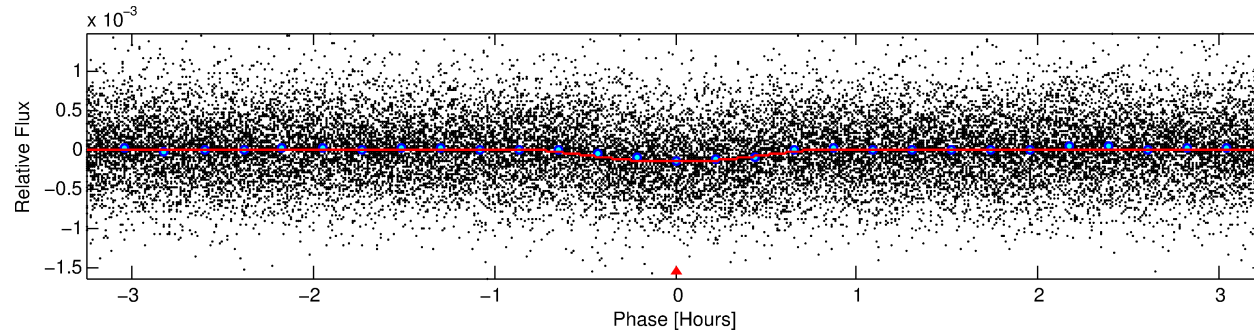
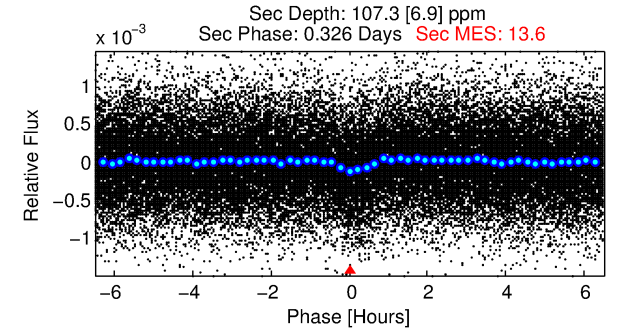
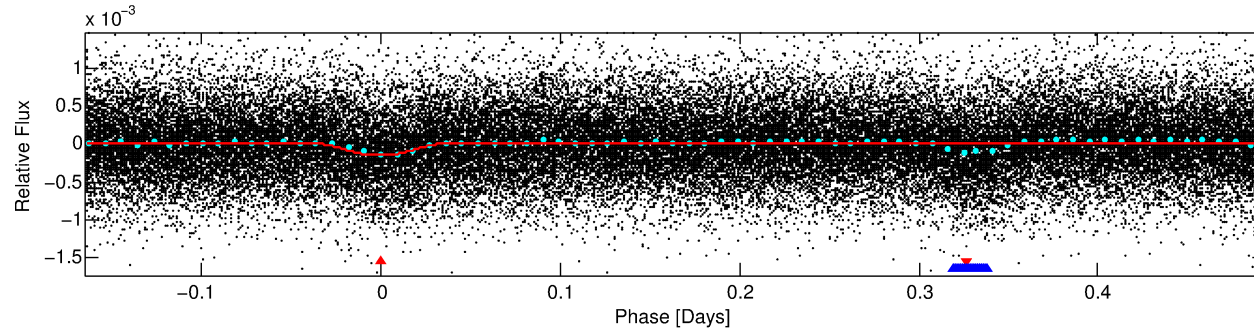
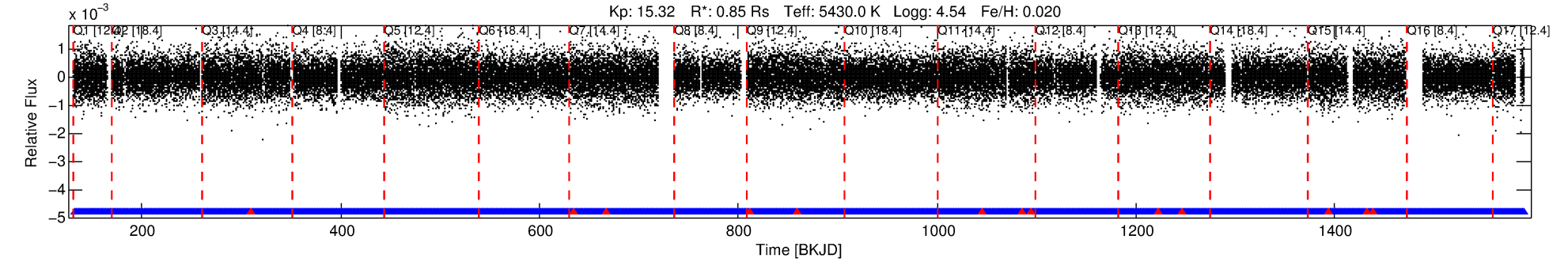
## Ephemeris Match Information For 010527135-01

No Significant Match Found

# DV One-Page Summary

KIC: 10527135 Candidate: 1 of 2 Period: 0.657 d

KOI: K02622 Corr: No Ephemeris Match



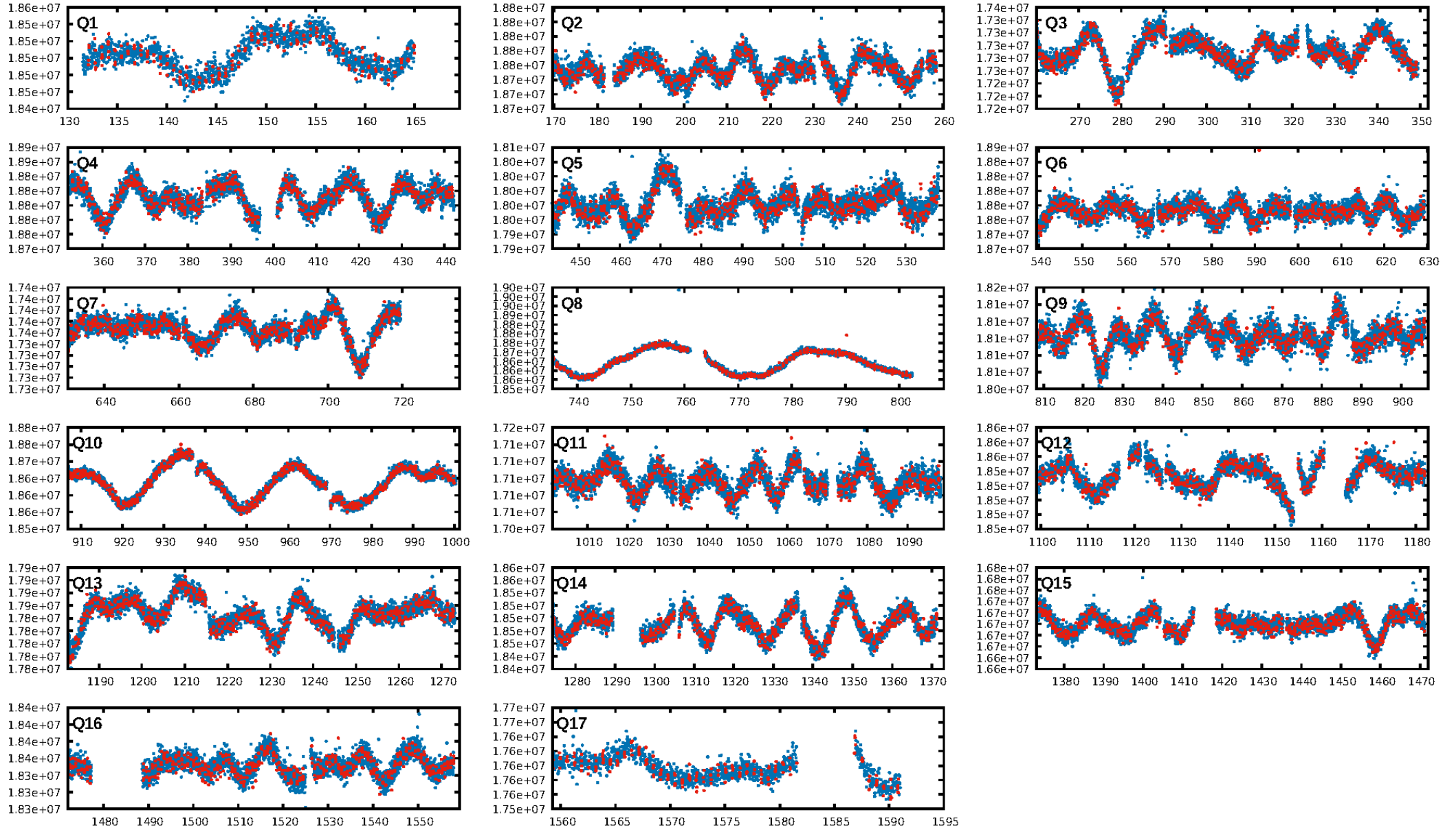
## DV Fit Results:

Period = 0.65737 [0.00001] d  
Epoch = 132.1182 [0.0010] BKJD  
Rp/R\* = 0.0117 [0.0040]  
a/R\* = 3.47 [4.34]  
b = 0.70 [1.00]  
Seff = 2743.29 [802.07]  
Teff = 1845 [135] K  
Rp = 1.08 [0.44] Re  
a = 0.0143 [0.0026] AU  
Ag = 10.33 [7.68] [1.21σ]  
**Teffp = 5115 [905] K [3.57σ]**

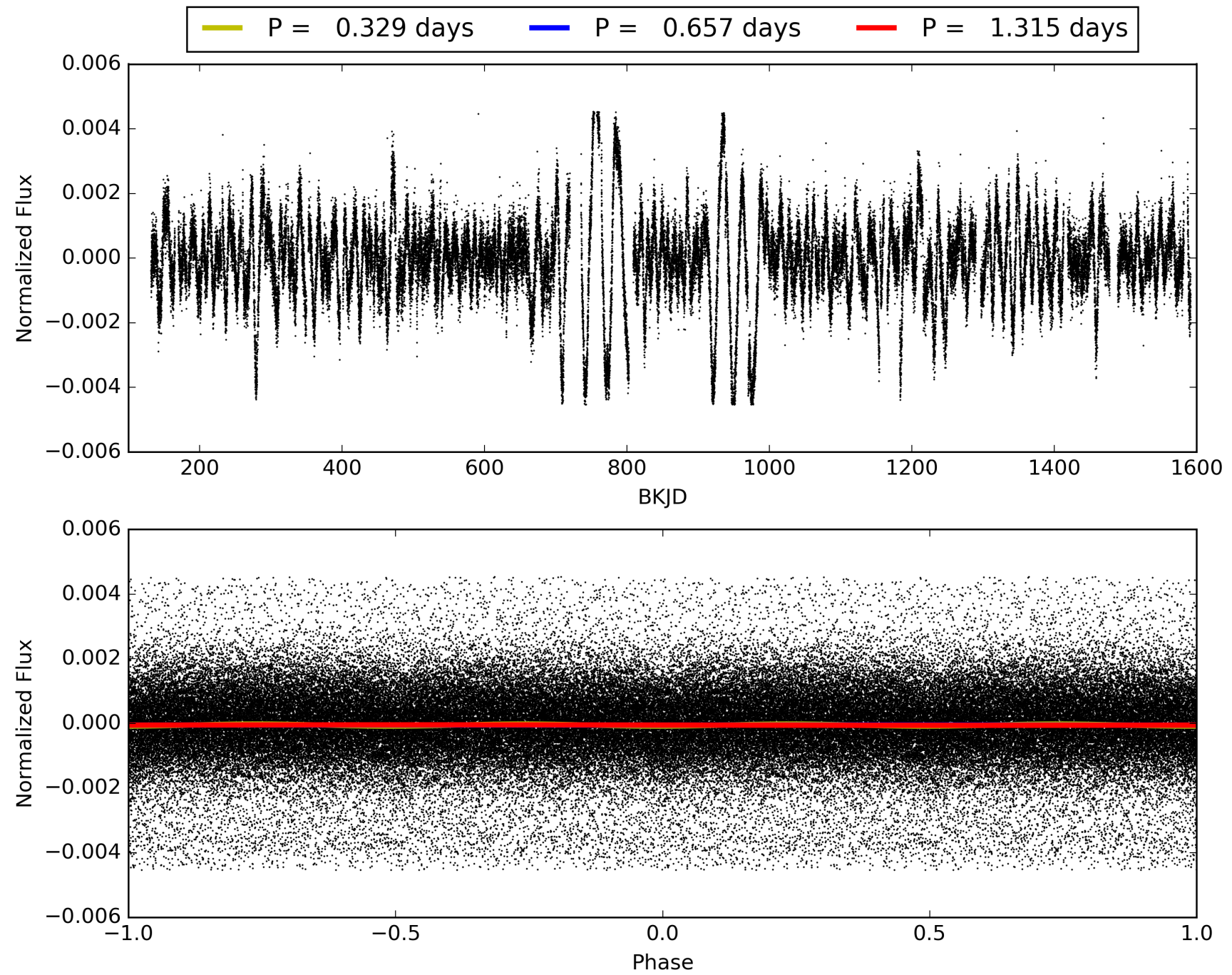
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.35e-46  
RollingBand-fgt: 0.99 [1930/1943]  
GhostDiagnostic-chr: 1.805  
Centroid-sig: 24.8%  
Centroid-so: 0.450 arcsec [0.62σ]  
OotOffset-rm: 0.170 arcsec [0.38σ]  
KicOffset-rm: 0.016 arcsec [0.04σ]  
OotOffset-st: 3/3/4/4 [14]  
KicOffset-st: 3/3/4/4 [14]  
DiffImageQuality-fgm: 0.79 [11/14]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 010527135-01, PDC Light Curves

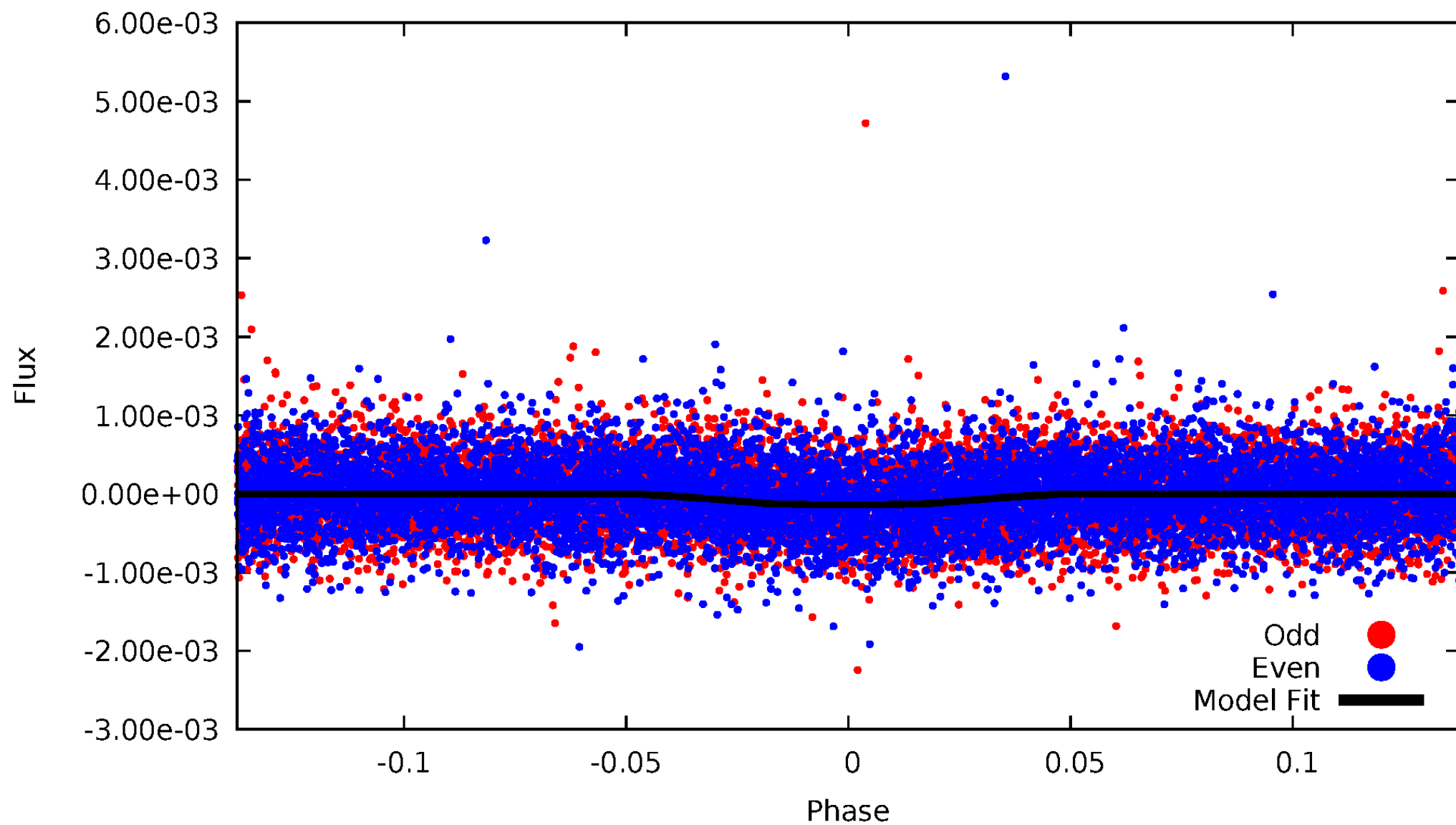


TCE 010527135-01



# DV Odd/Even

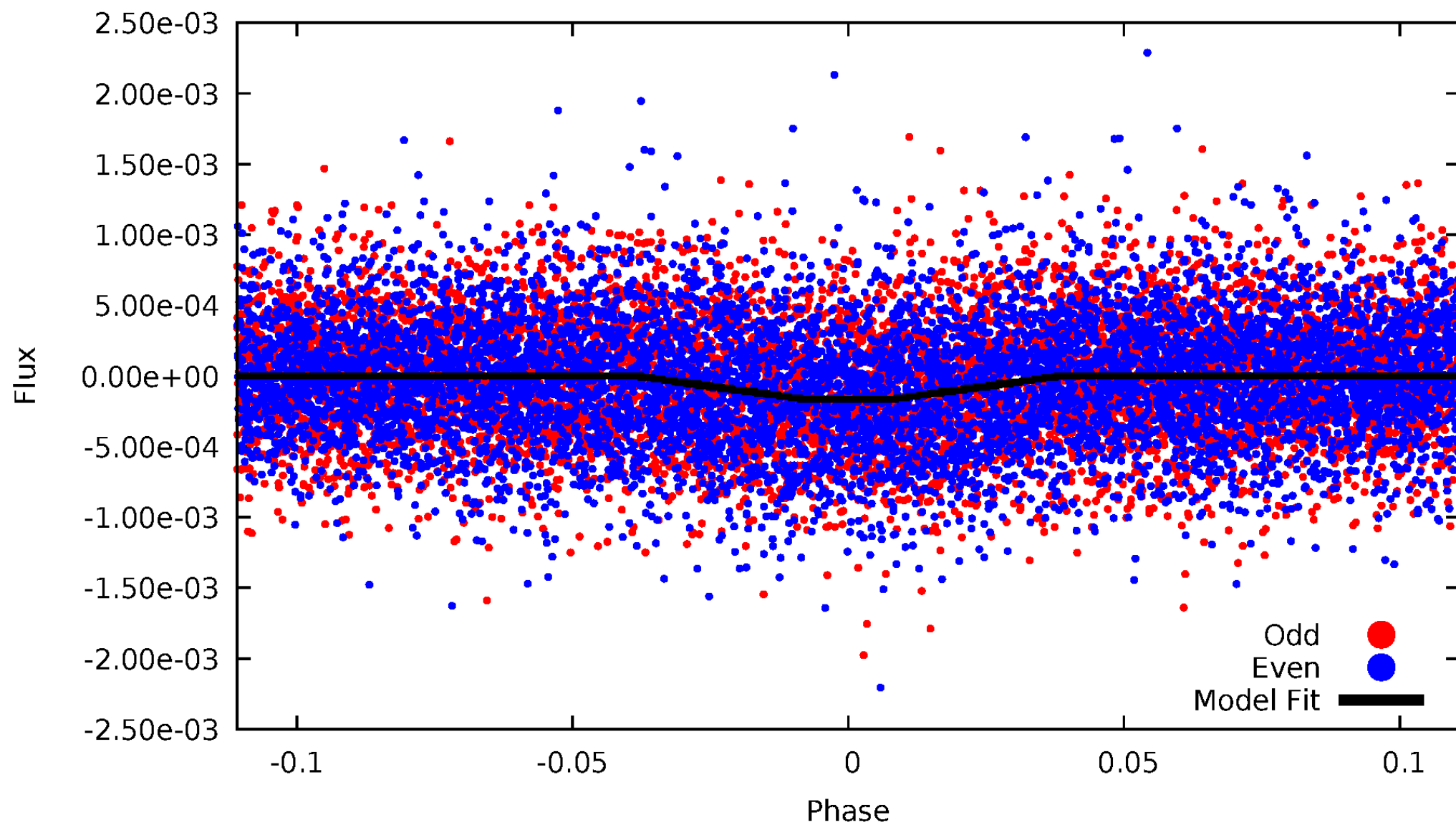
TCE 010527135-01



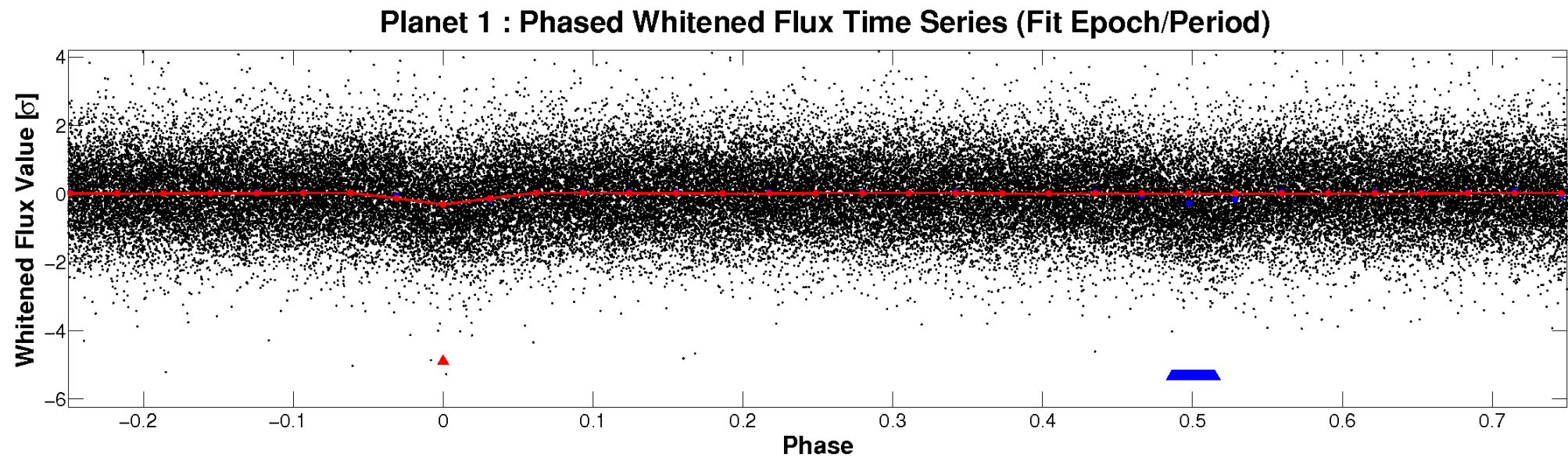
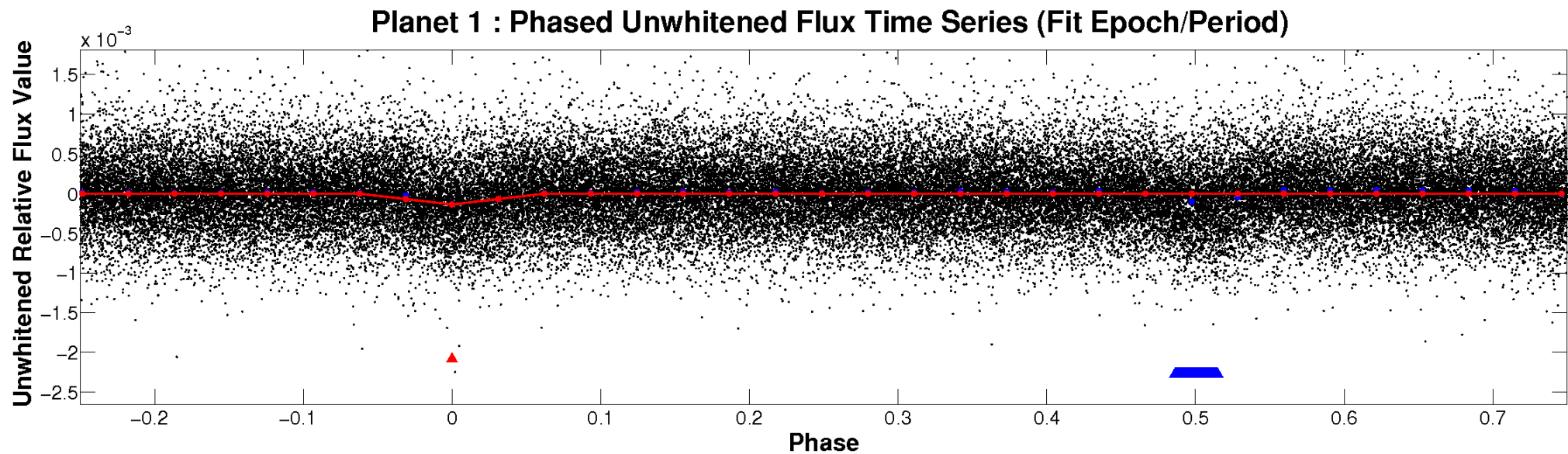


# ALT Odd/Even

TCE 010527135-01

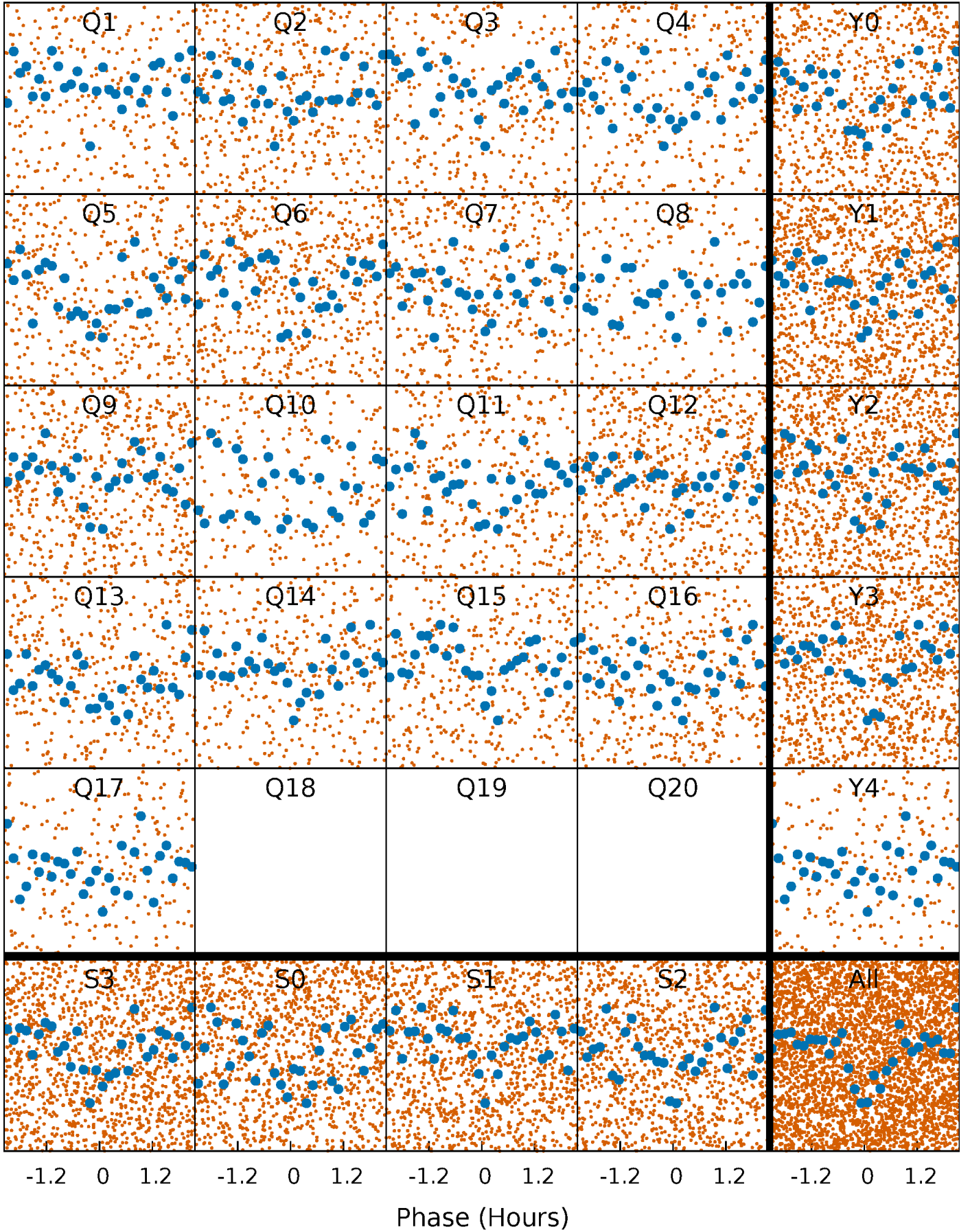


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

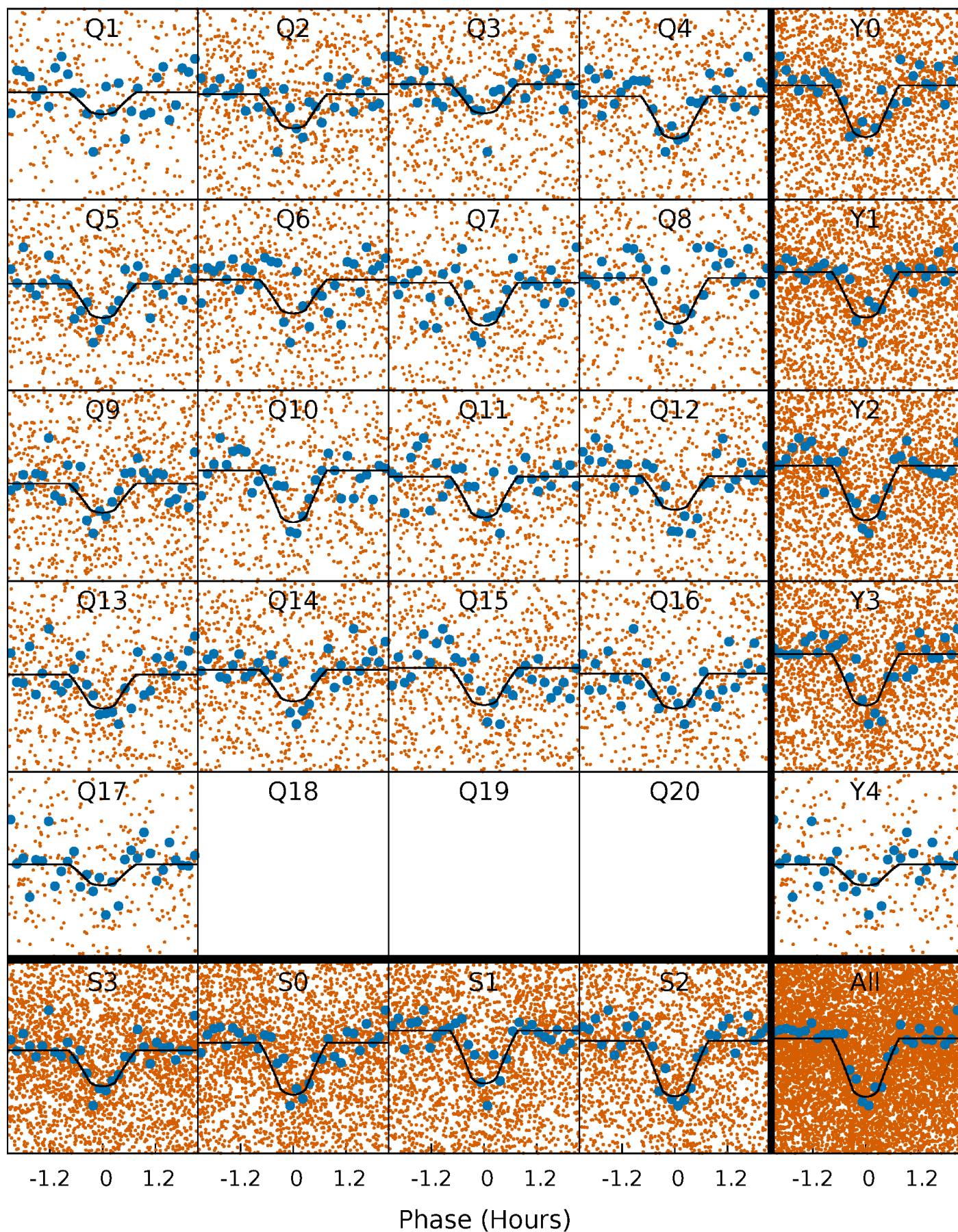
TCE 010527135-01 P= 0.657368 Days  $T_0=132.118239$  (BKJD)





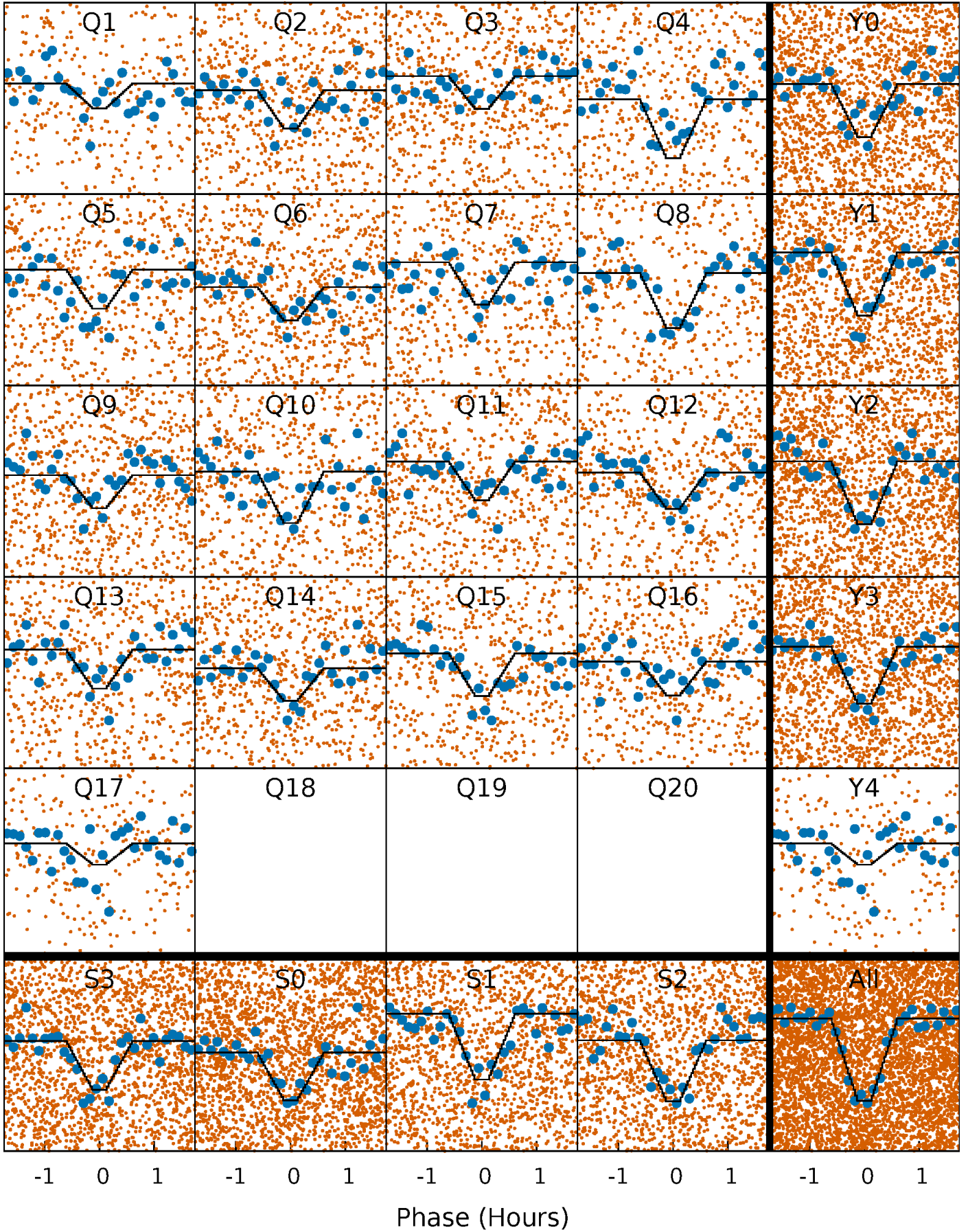
# DV Quarter-Phased Transit Curves

TCE 010527135-01   P= 0.657368 Days    $T_0=132.118239$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

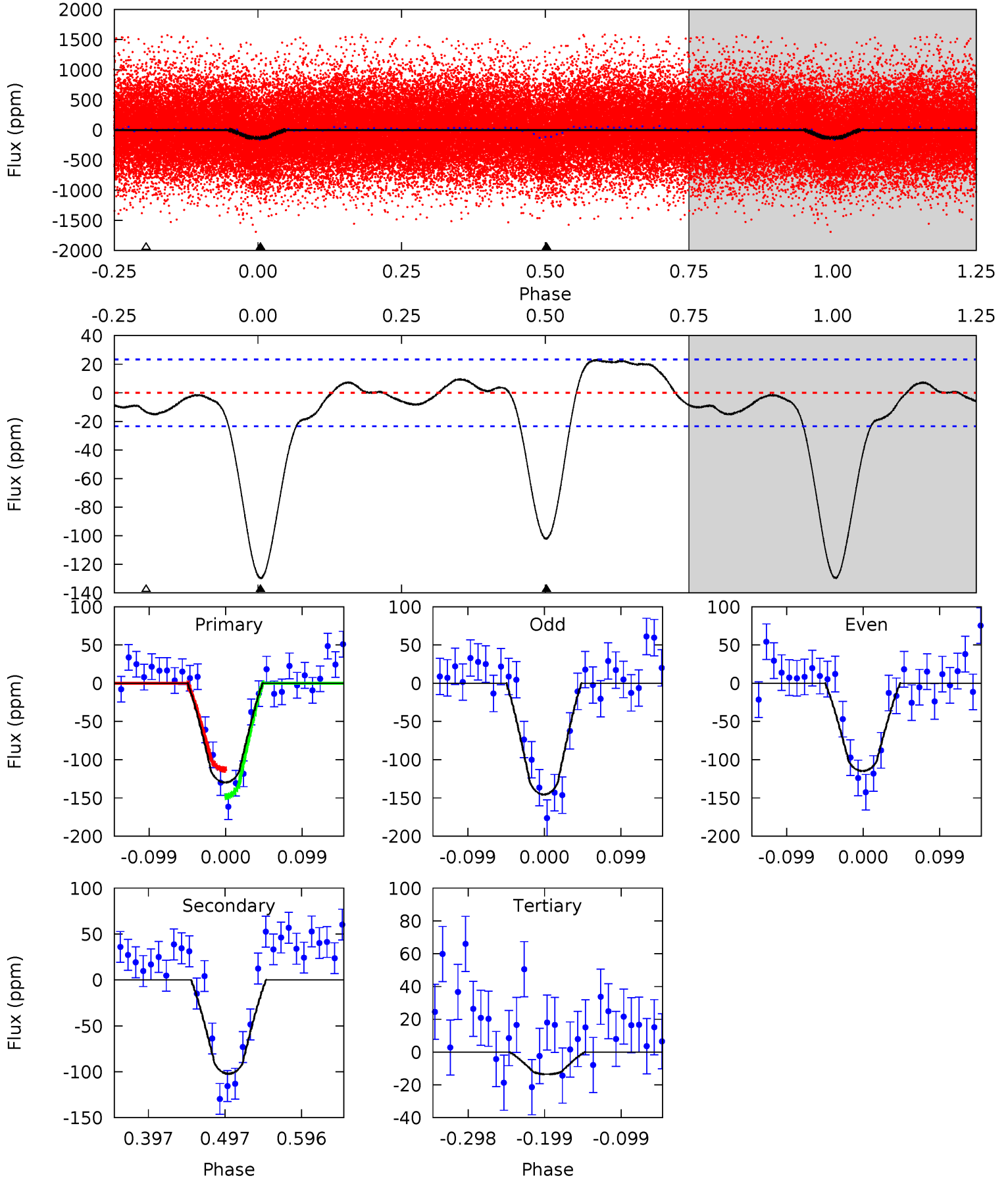
TCE 010527135-01 P= 0.657372 Days  $T_0=132.116549$  (BKJD)



# DV Model-Shift Uniqueness Test

010527135-01, P = 0.657368 Days, E = 131.460871 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
25.4	20.0	2.65	0	4.57	1.65	2.06	22.7	25.4	17.3	20.0	3.02	0.92	0.15	3.47

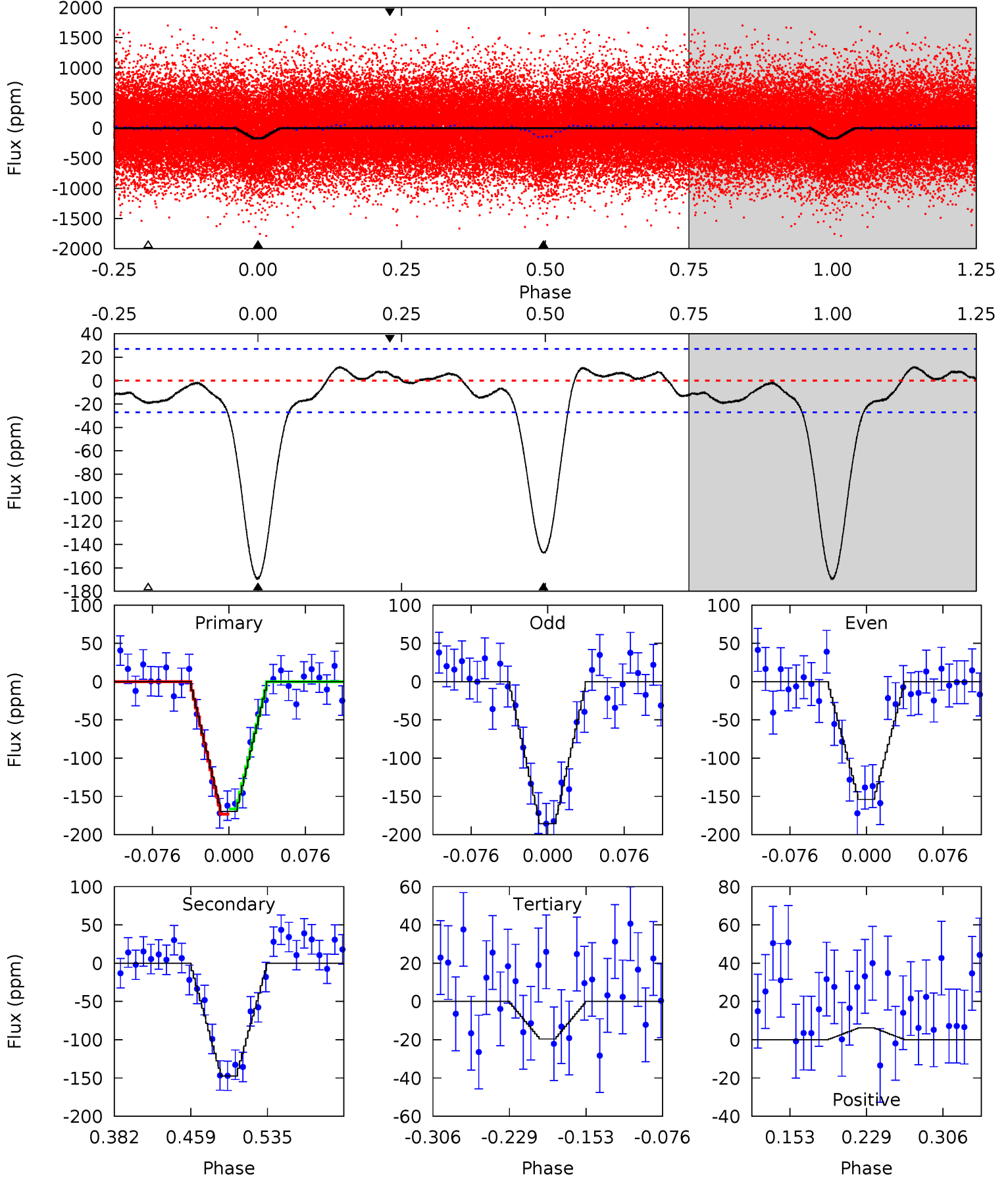




# Alt Model-Shift Uniqueness Test

010527135-01, P = 0.657372 Days, E = 131.459177 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
29.0	25.2	3.35	1.06	4.62	1.77	1.46	25.7	27.9	21.8	24.1	2.71	0.94	0.07	0.58





### Stellar Parameters For KIC 010527135

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5430^{+177}_{-160}$	$4.535^{+0.048}_{-0.143}$	$0.020^{+0.250}_{-0.300}$	$0.847^{+0.181}_{-0.077}$	$0.896^{+0.081}_{-0.090}$	$2.076^{+0.427}_{-0.850}$
	+3%/-3%	+1%/-3%	+1250%/-1500%	+21%/-9%	+9%/-10%	+21%/-41%
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 010527135-01 / KOI 2622.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-102 \pm 5$	$1.12^{+0.42}_{-0.39}$	$2615^{+147}_{-111}$	$5051^{+1089}_{-641}$	$9.210^{+11.548}_{-4.445}$
Alt.	$-147 \pm 6$	$1.20^{+0.40}_{-0.39}$	$2621^{+144}_{-115}$	$5303^{+1053}_{-589}$	$11^{+13}_{-5}$

$T_{max}$  = 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

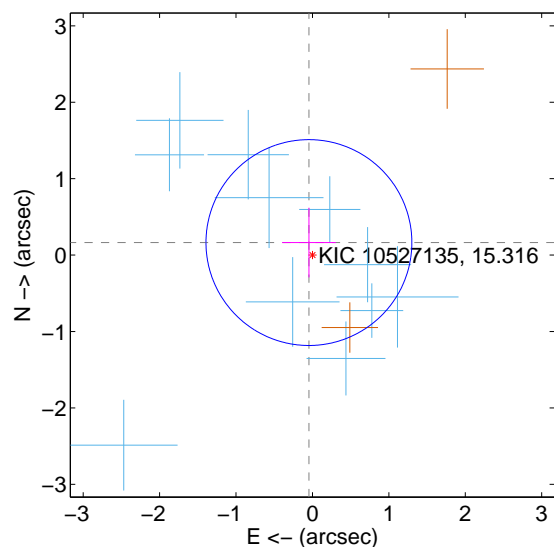
Supplemental centroid analysis for 010527135-01. Kepler magnitude: 15.32. Transit SNR 17.51

There are 11 quarters with good PRF difference image offsets

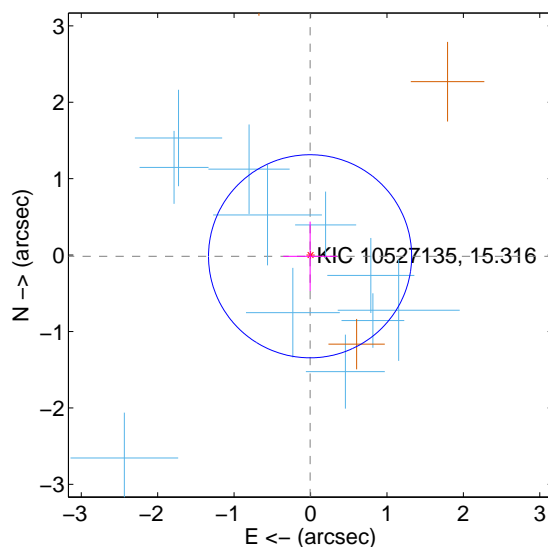
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.170 \pm 0.449$	0.38	$0.046 \pm 0.351$	$0.164 \pm 0.456$
PRF-fit source offset from KIC position	$0.016 \pm 0.443$	0.04	$0.006 \pm 0.352$	$-0.015 \pm 0.454$
photometric centroid source offset	$0.45 \pm 0.73$	0.62	$0.33 \pm 0.76$	$0.30 \pm 0.68$

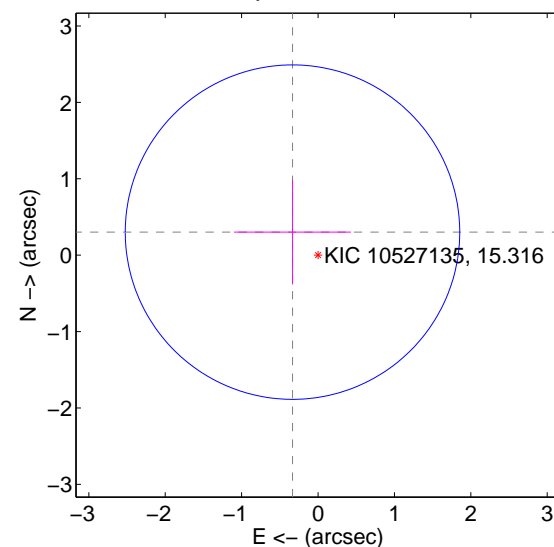
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

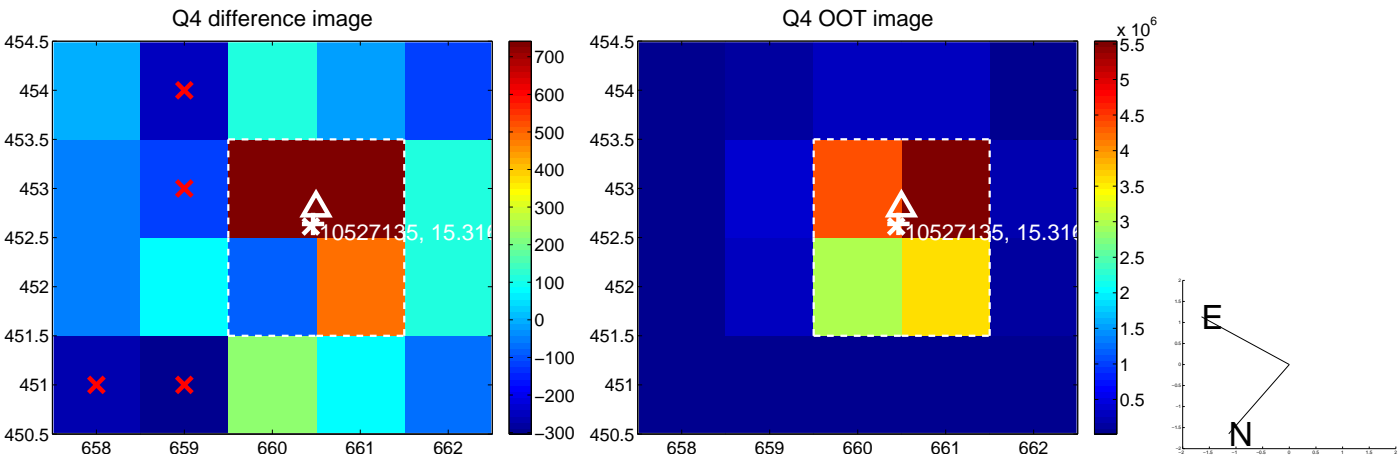
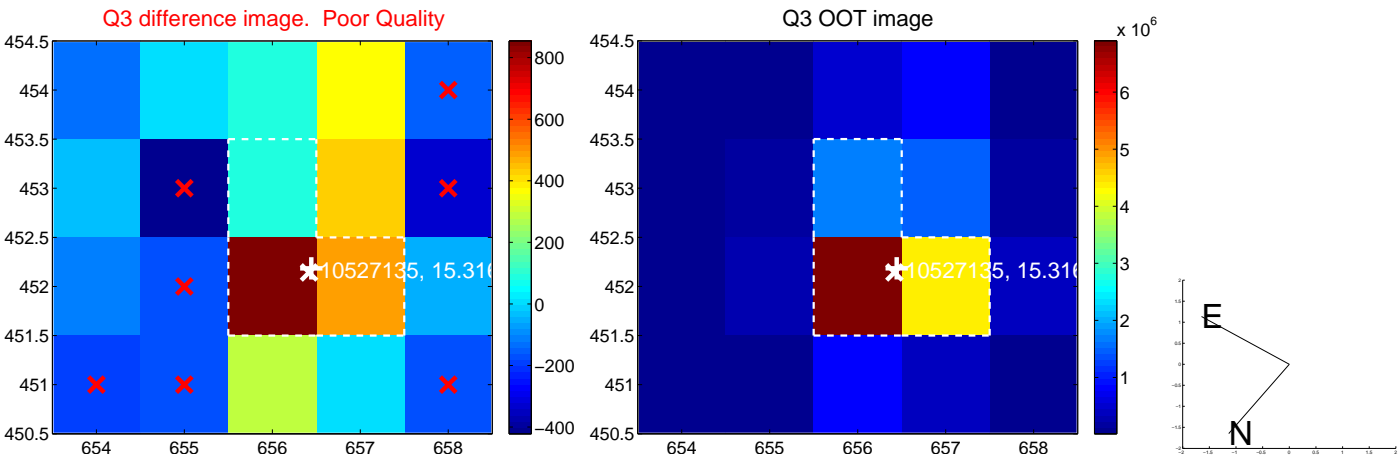
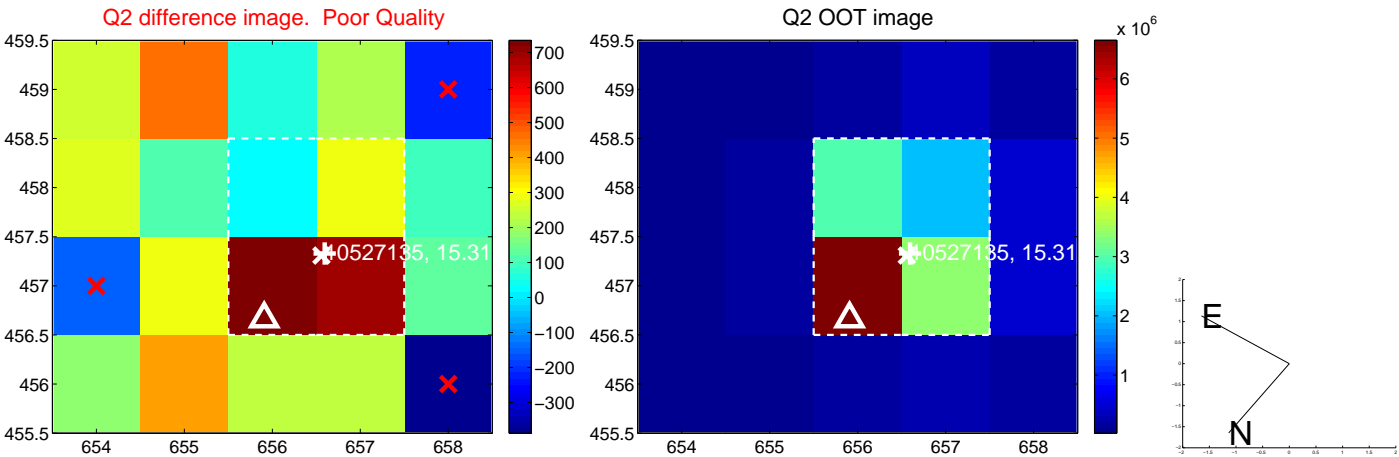
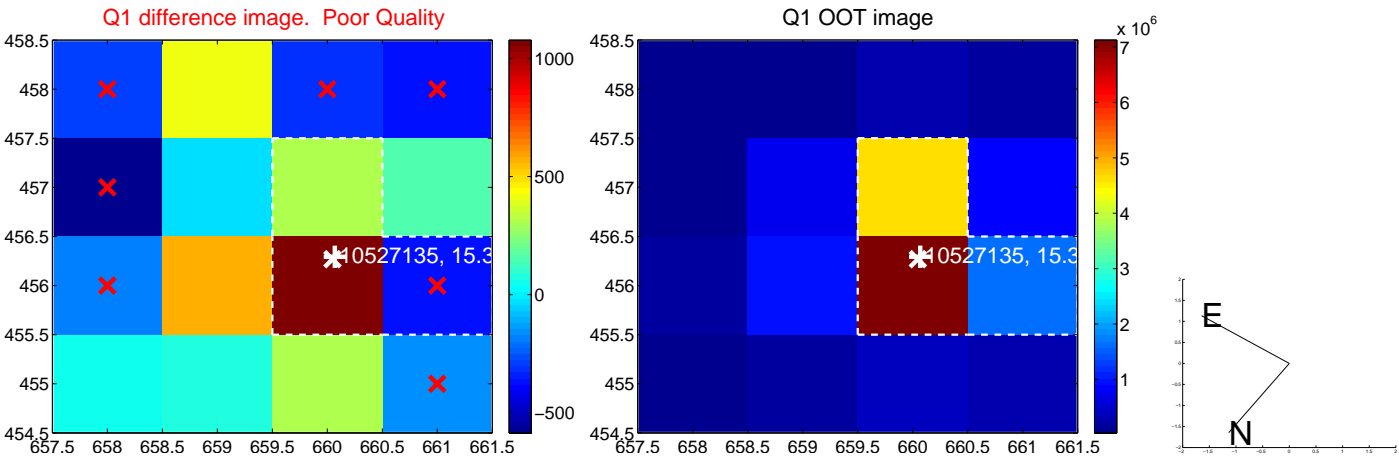


offset from photometric centroids

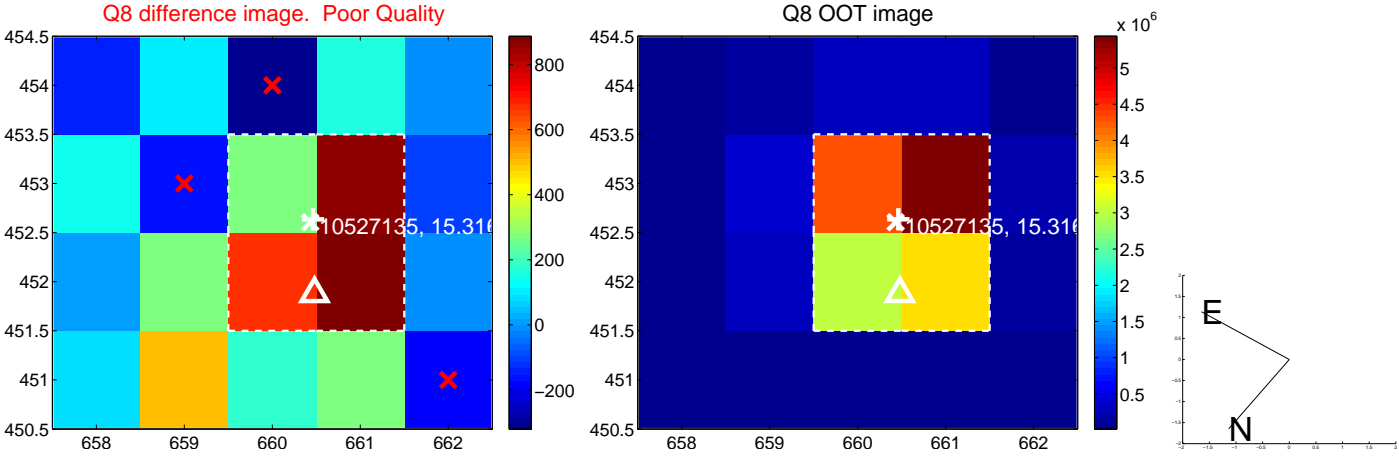
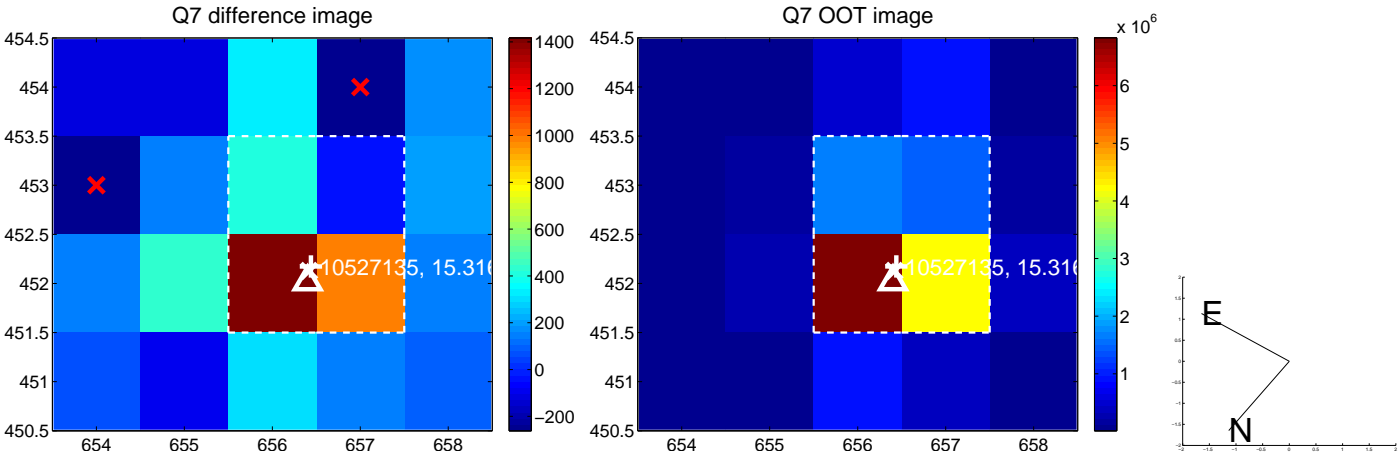
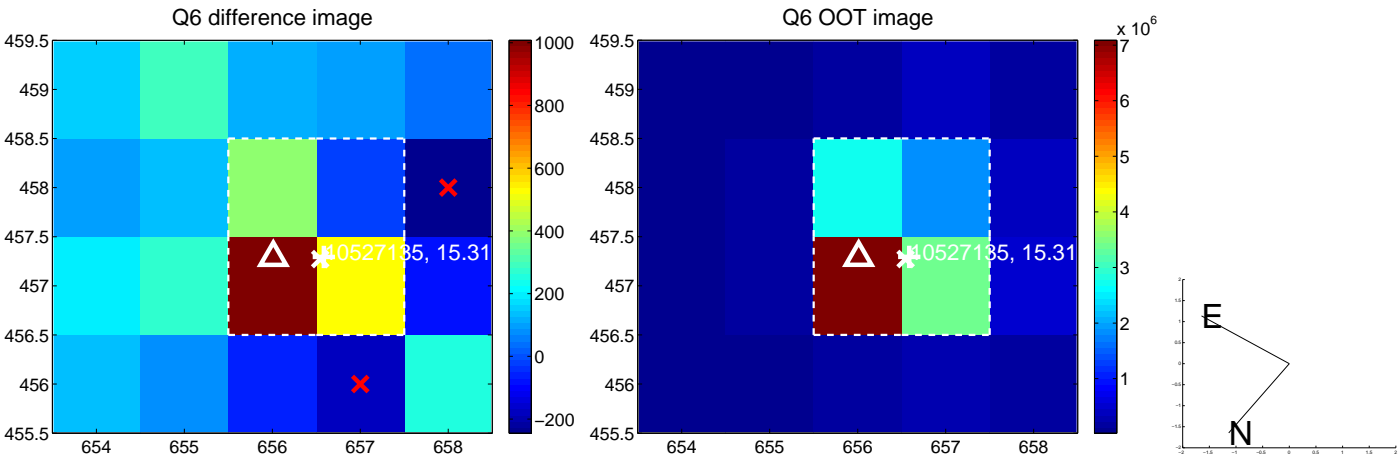
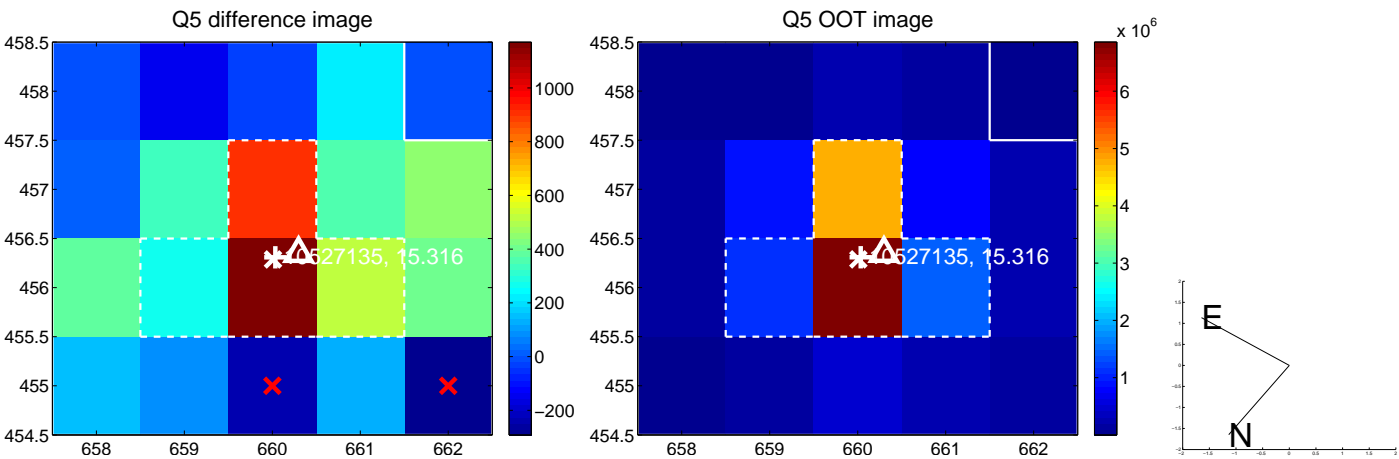


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

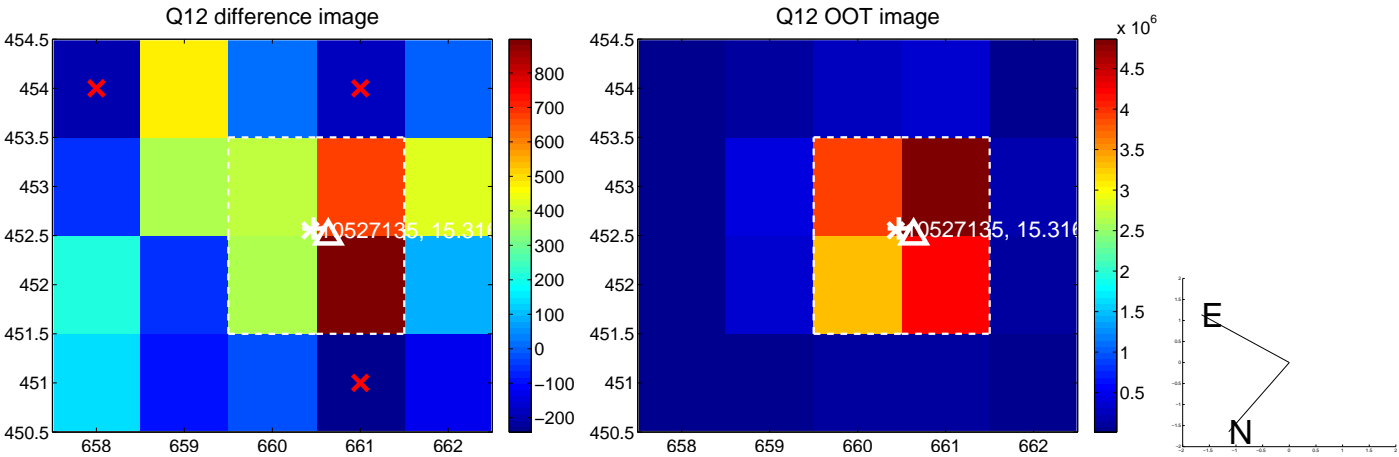
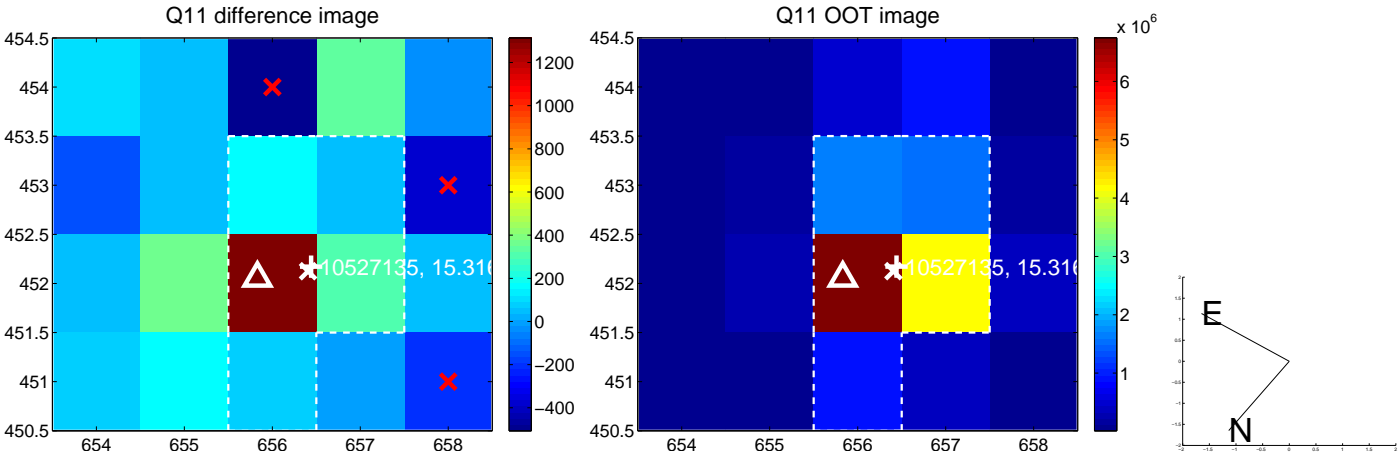
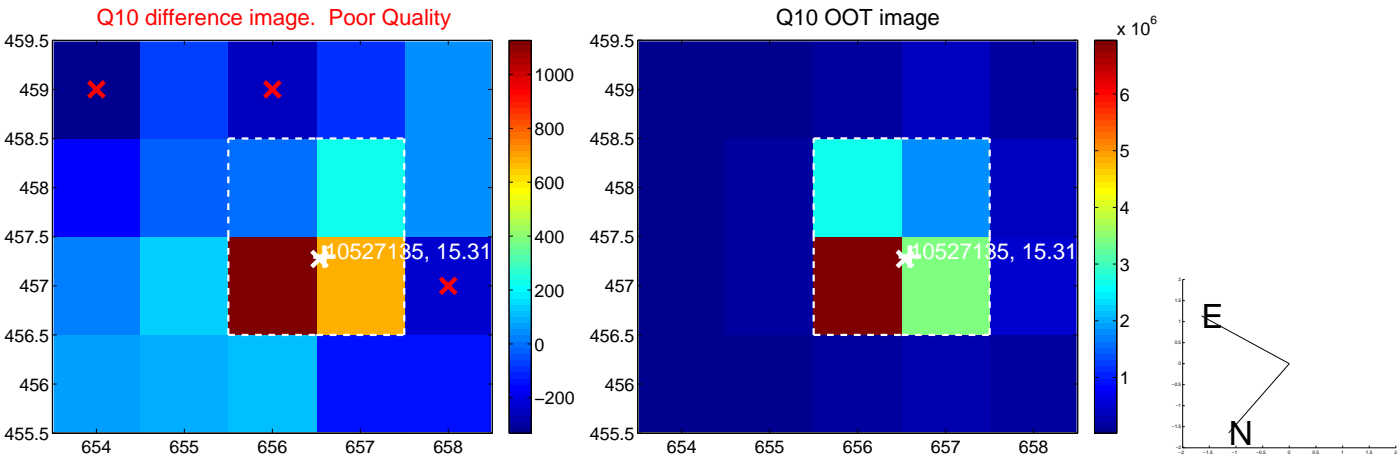
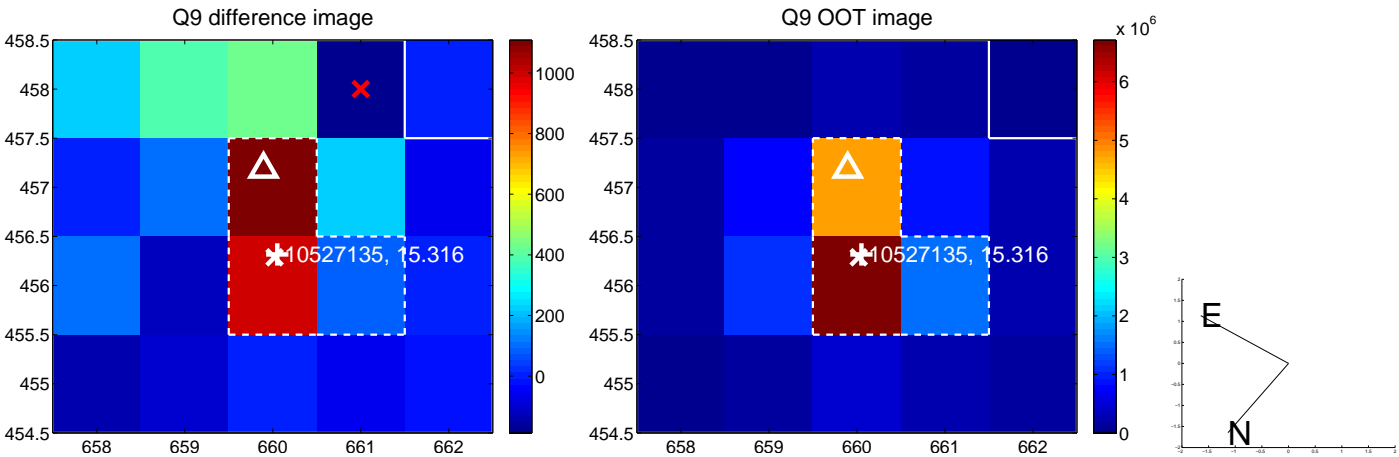


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

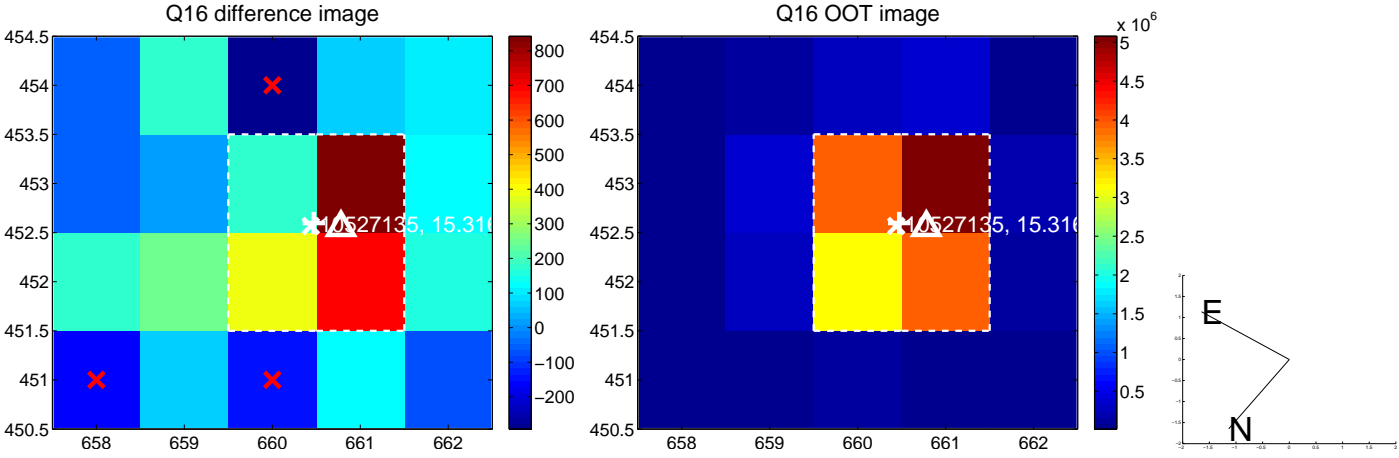
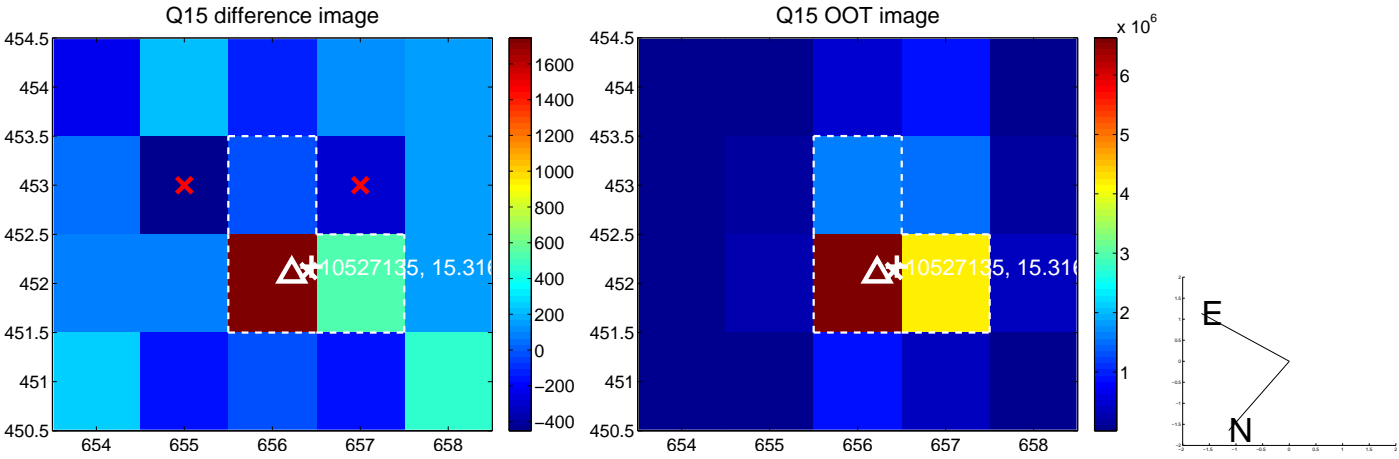
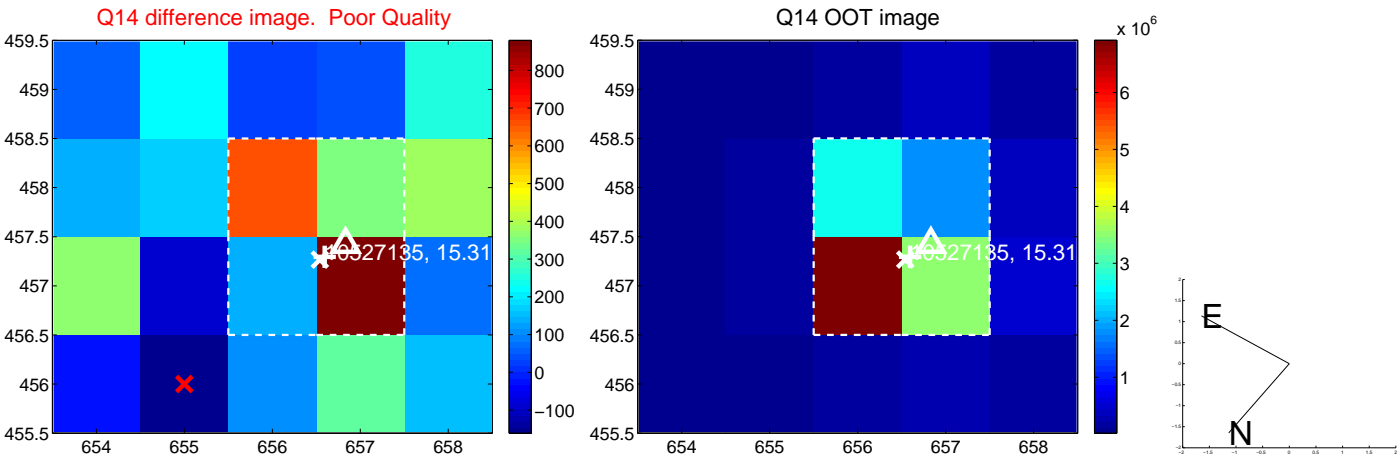
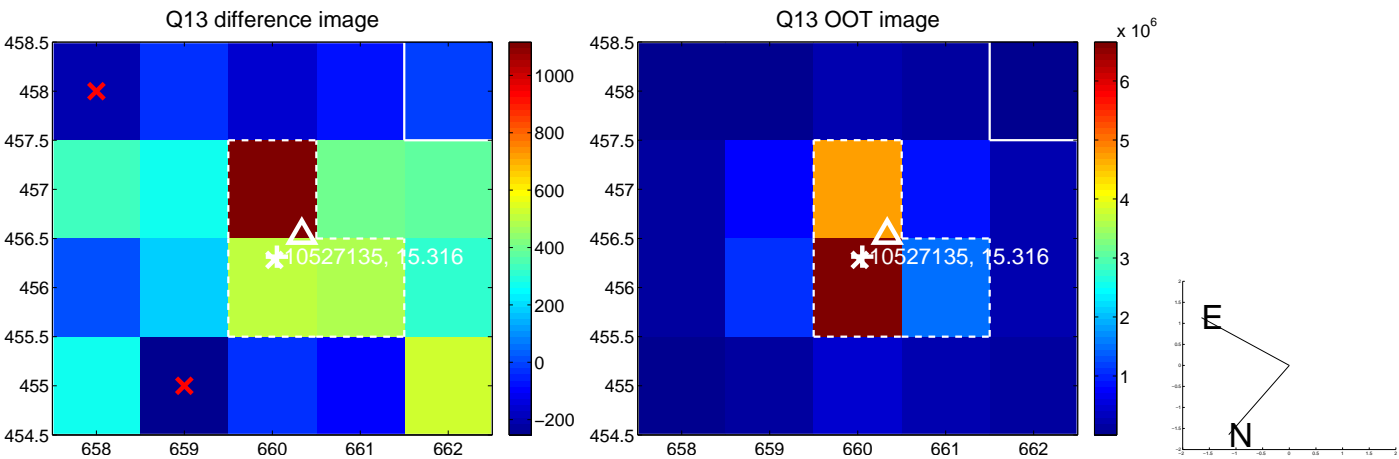




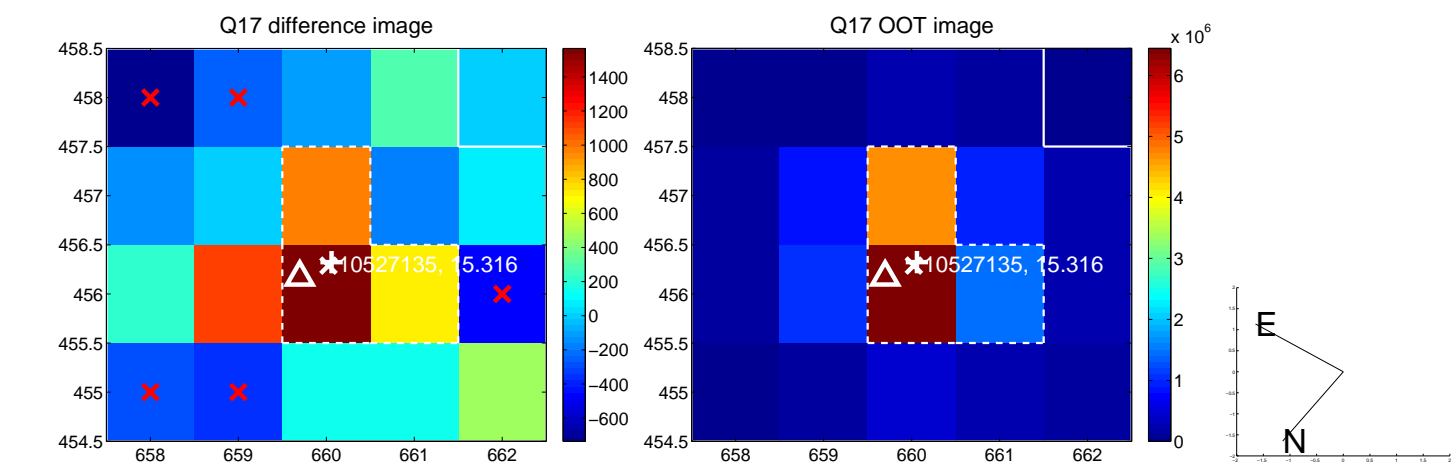
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



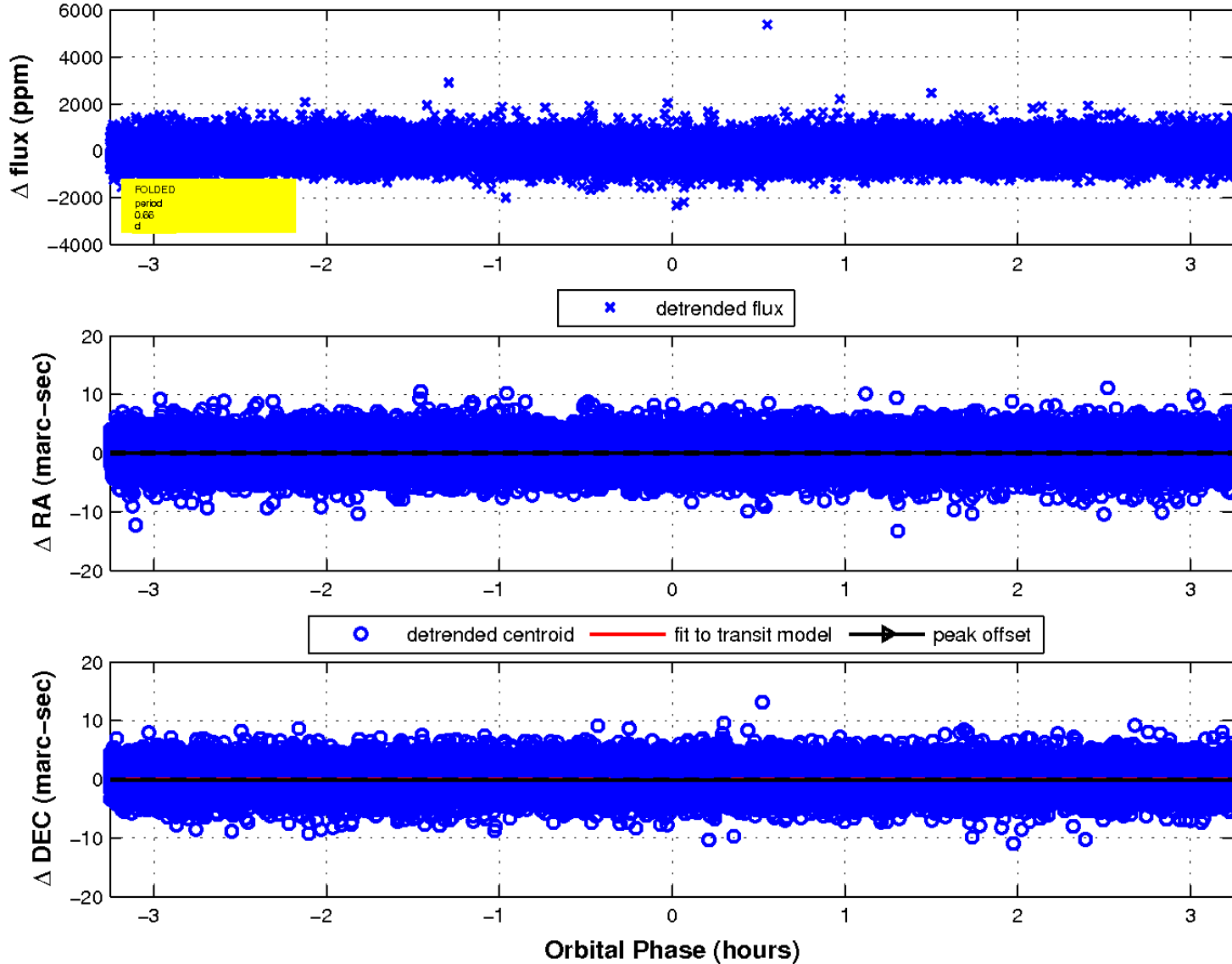
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



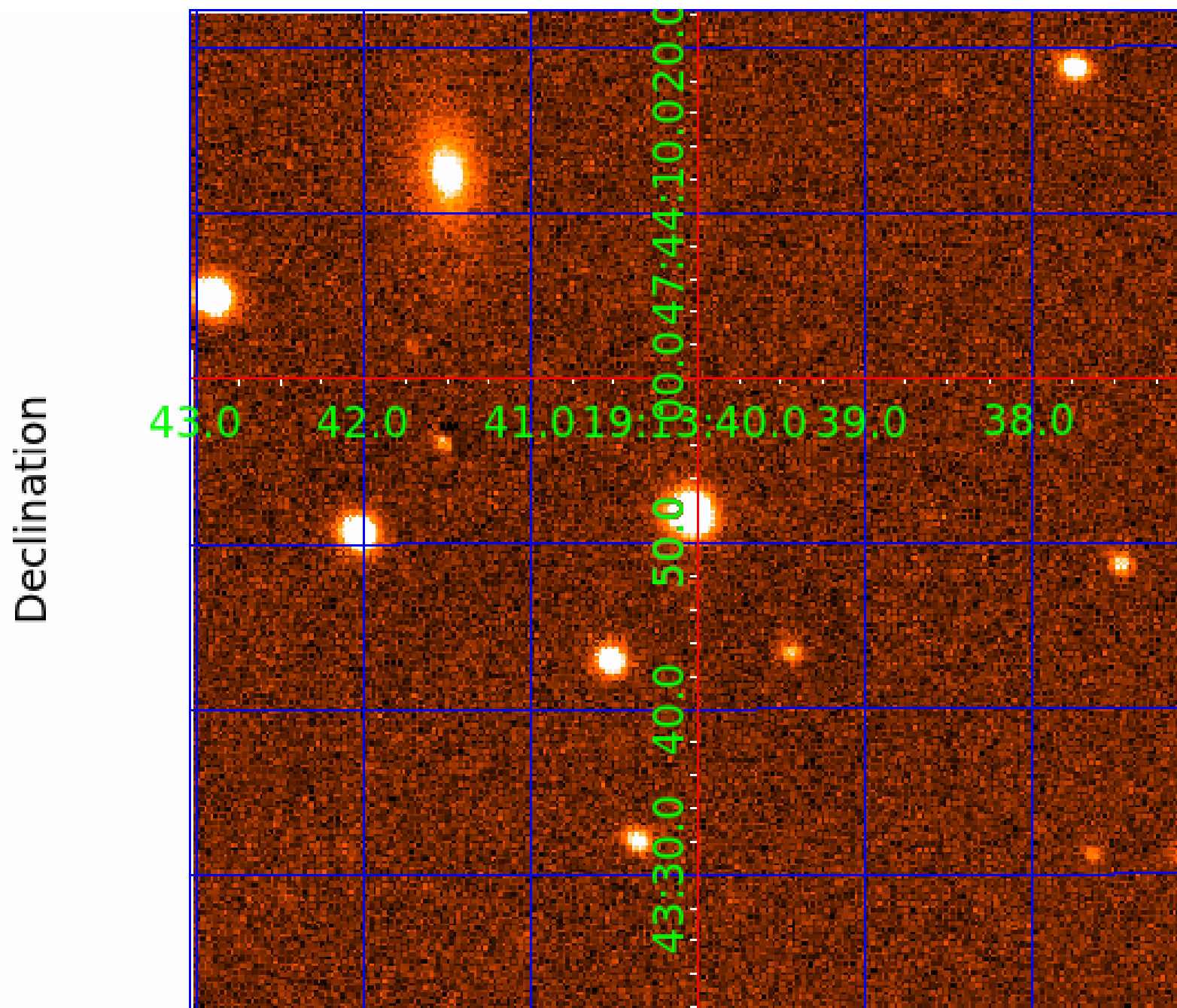
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 2



UKIRT Image





# KIC 010527135

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010527135-01	OBS	2622.01	0.657368	132.118239	139.7	1.085	13.7	17.5	0.85	5430	1.08	2743.29
010527135-02	OBS	No	0.657376	131.780577	152.9	0.975	13.9	18.7	0.85	5430	1.28	2743.24

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010527135-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
010527135-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

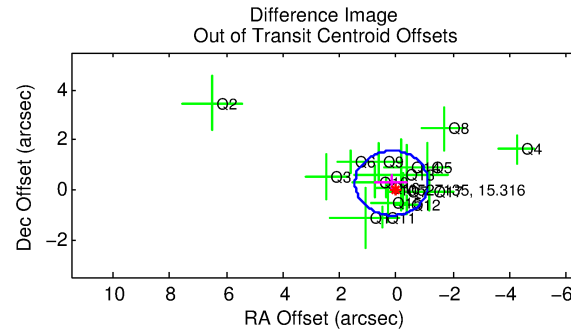
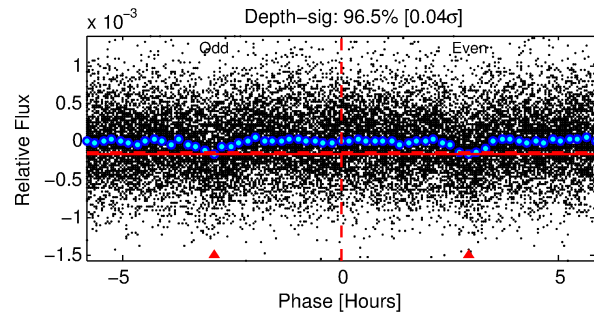
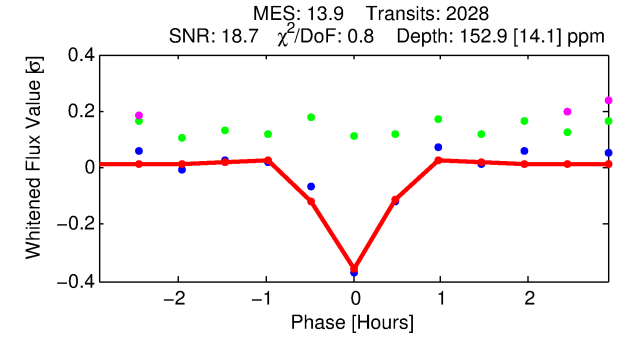
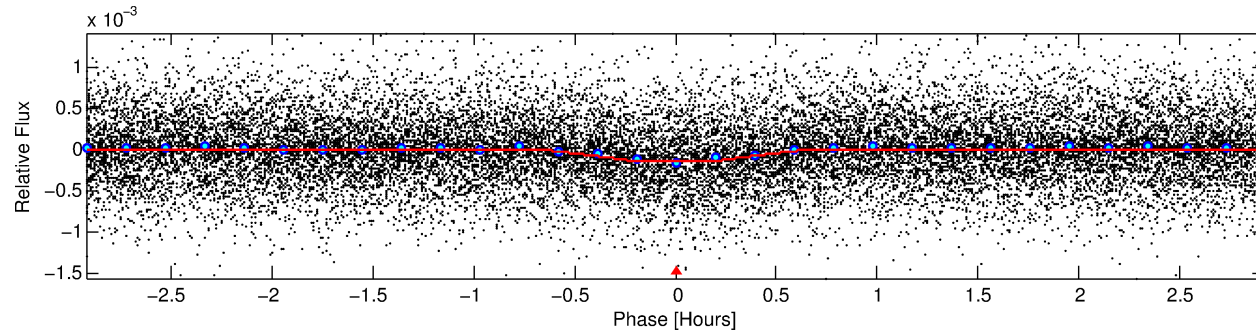
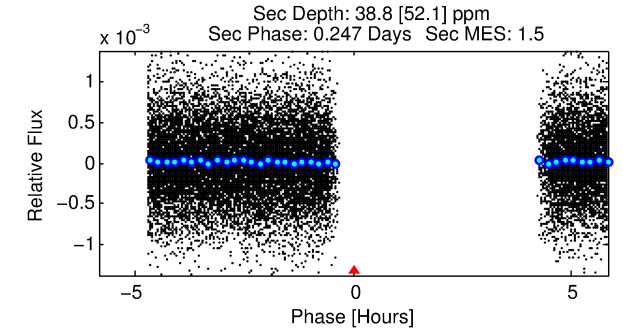
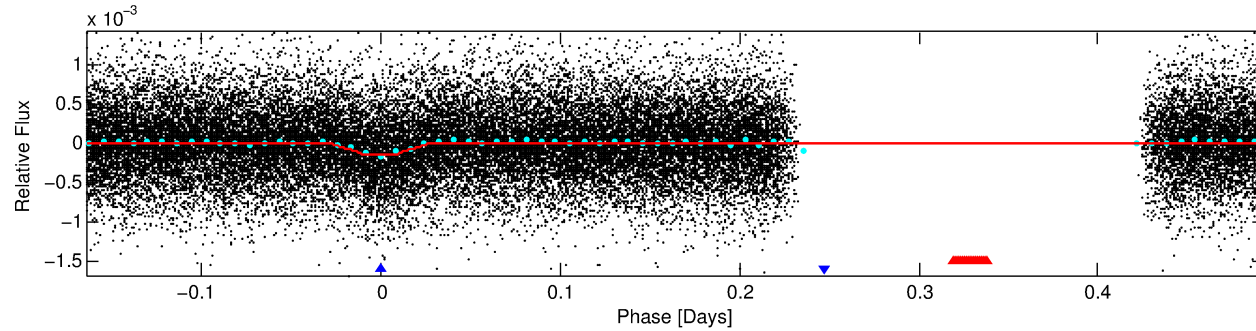
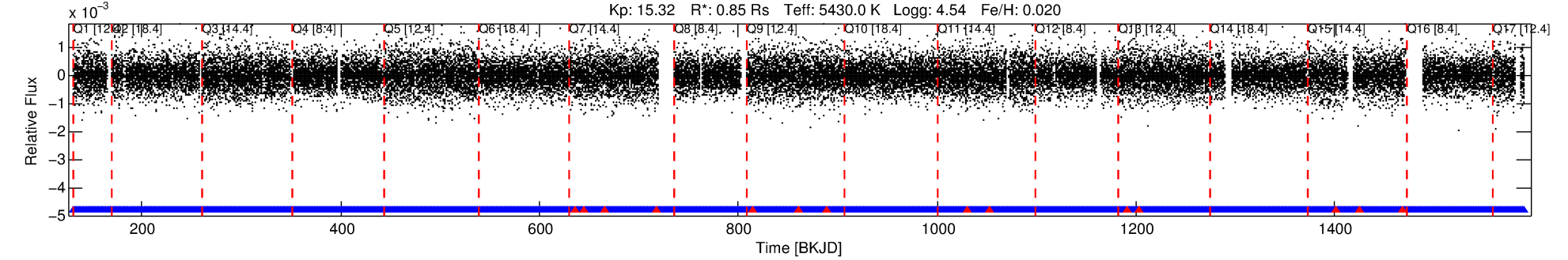
## Ephemeris Match Information For 010527135-02

No Significant Match Found

# DV One-Page Summary

KIC: 10527135 Candidate: 2 of 2 Period: 0.657 d

KOI: K02622 Corr: No Ephemeris Match



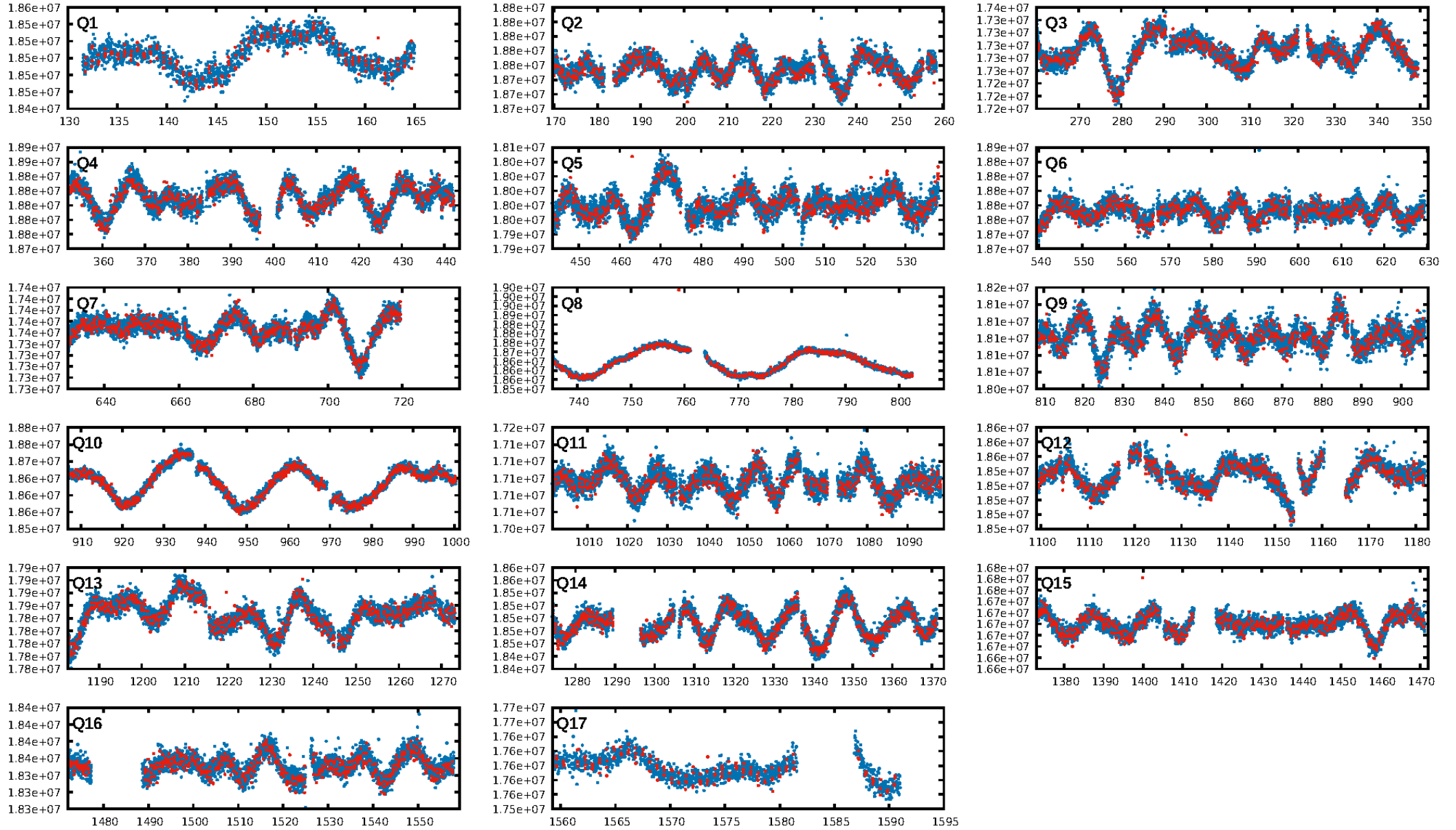
## DV Fit Results:

Period = 0.65738 [0.00001] d  
Epoch = 131.7806 [0.0009] BKJD  
Rp/R\* = 0.0138 [0.0079]  
a/R\* = 2.56 [5.41]  
b = 0.90 [0.53]  
Seff = 2743.24 [802.05]  
Teq = 1845 [135] K  
Rp = 1.28 [0.78] Re  
a = 0.0143 [0.0026] AU  
Ag = 2.67 [4.76] [0.35σ]  
Teffp = 3648 [1611] K [1.12σ]

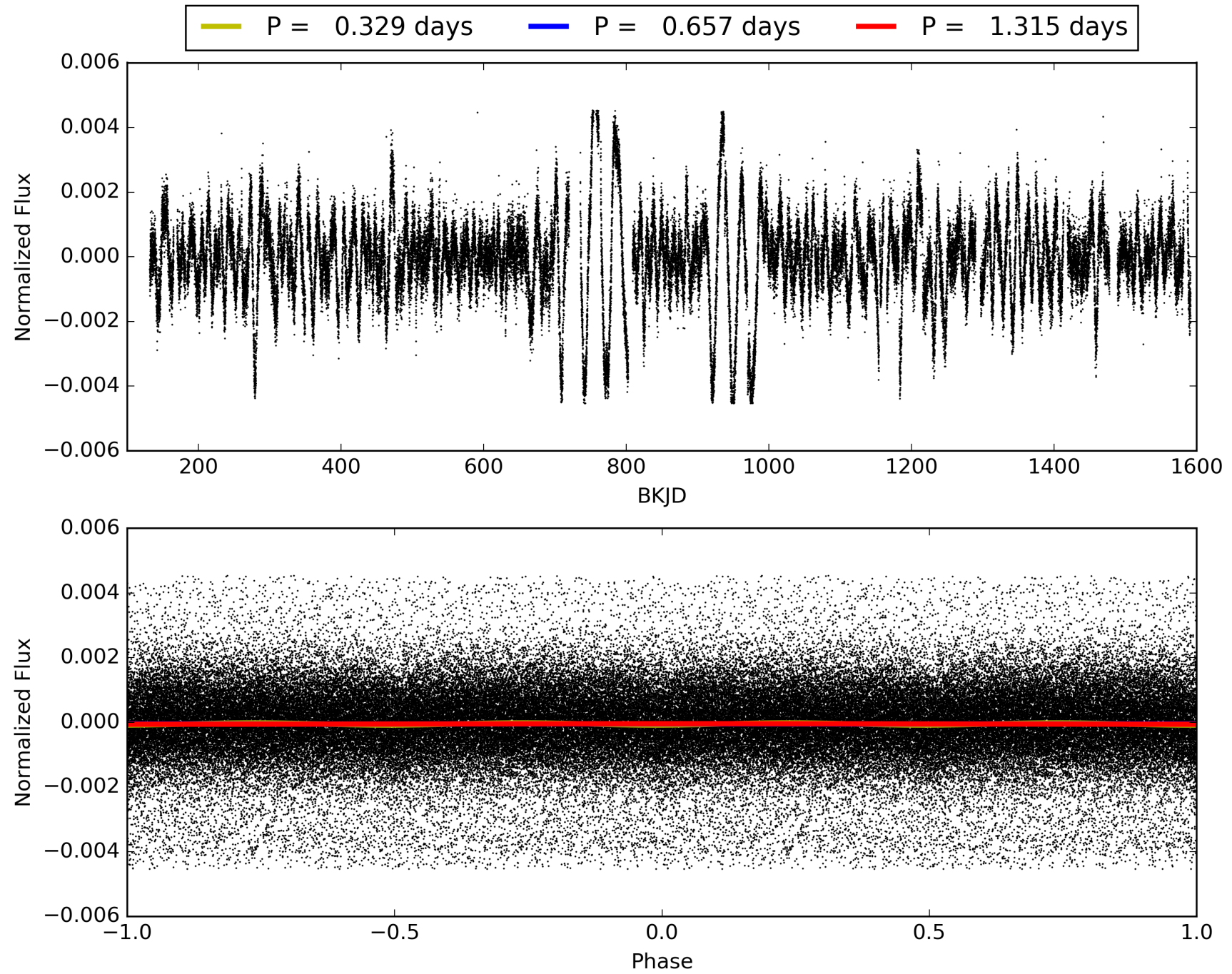
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.44e-48  
RollingBand-fgt: 0.99 [1923/1938]  
GhostDiagnostic-chr: 7.303  
Centroid-sig: 3.3%  
Centroid-so: 1.074 arcsec [1.46σ]  
OotOffset-rm: 0.304 arcsec [0.70σ]  
KicOffset-rm: 0.158 arcsec [0.29σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.82 [14/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 010527135-02, PDC Light Curves

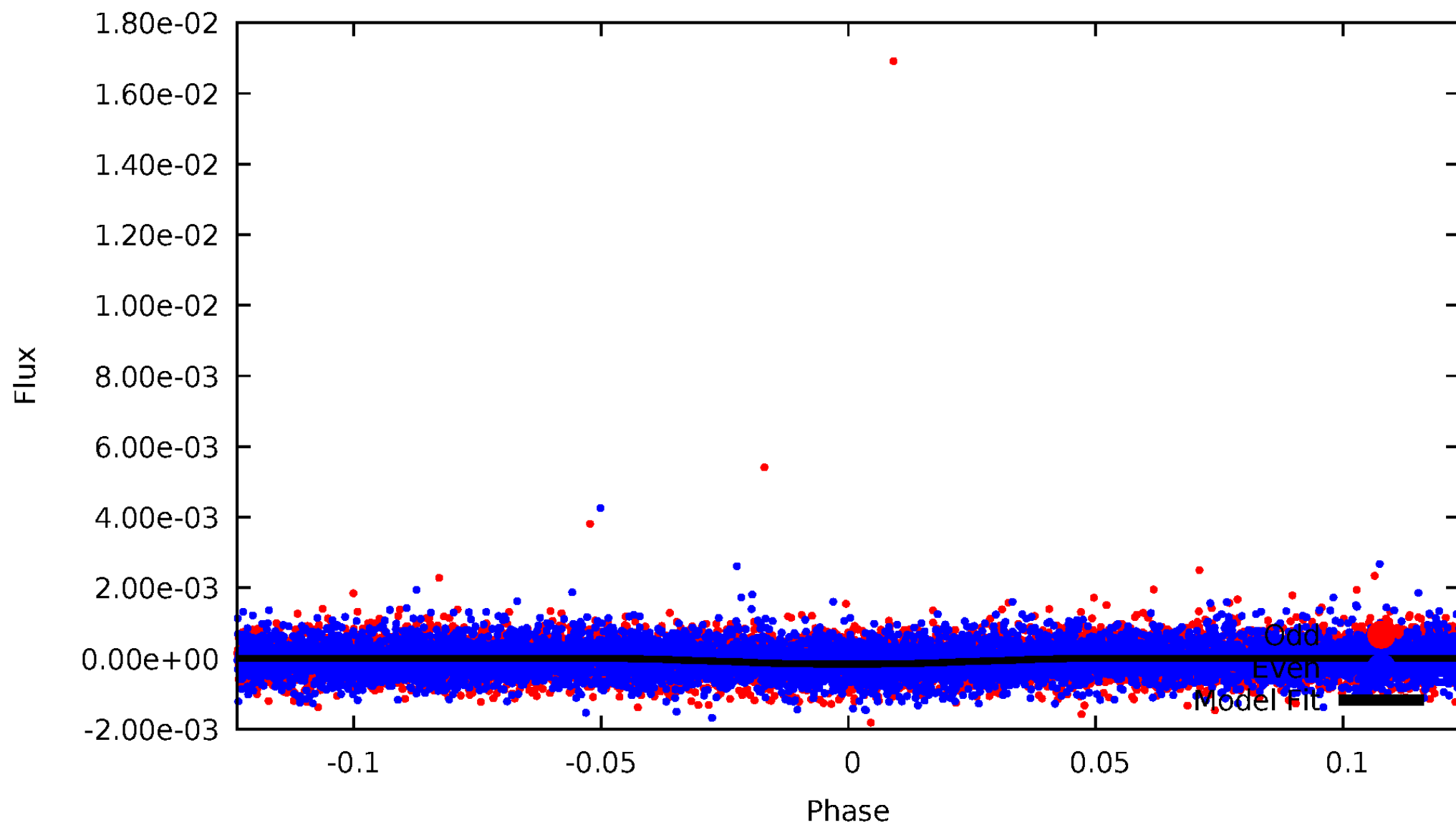


# TCE 010527135-02



# DV Odd/Even

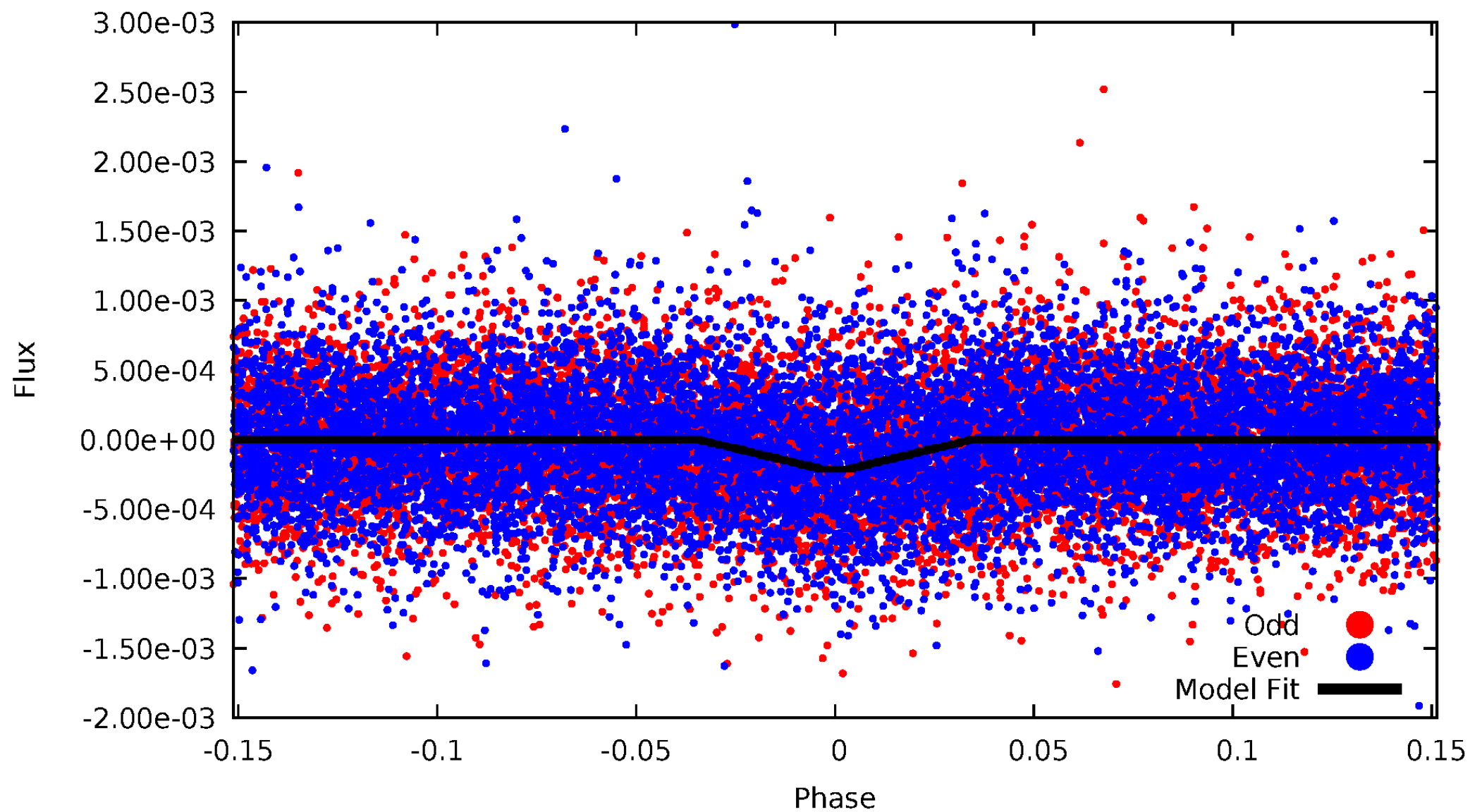
TCE 010527135-02





# ALT Odd/Even

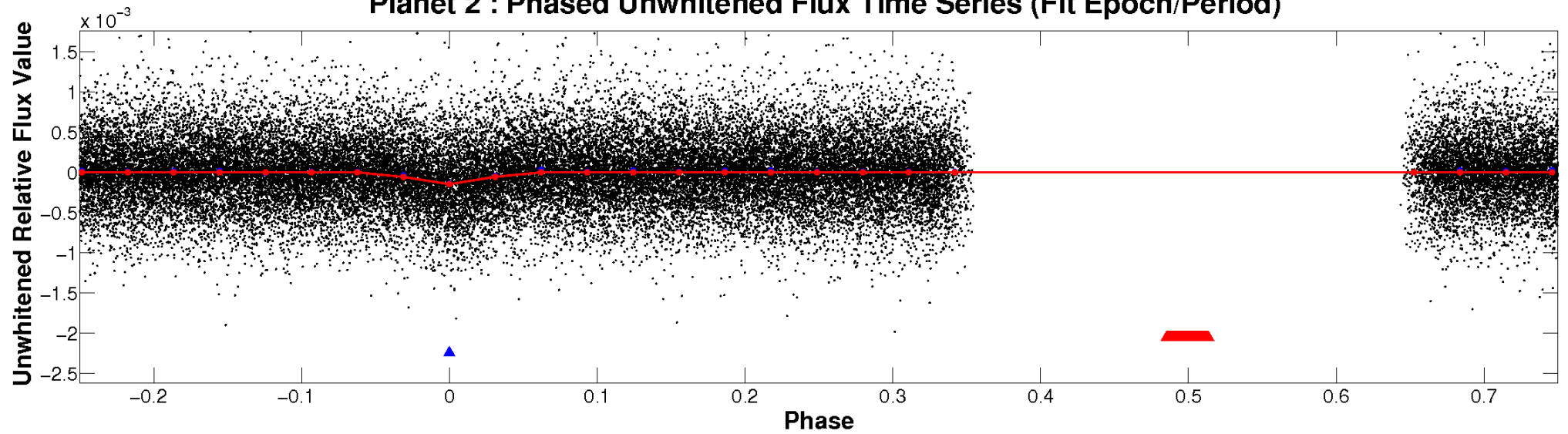
TCE 010527135-02



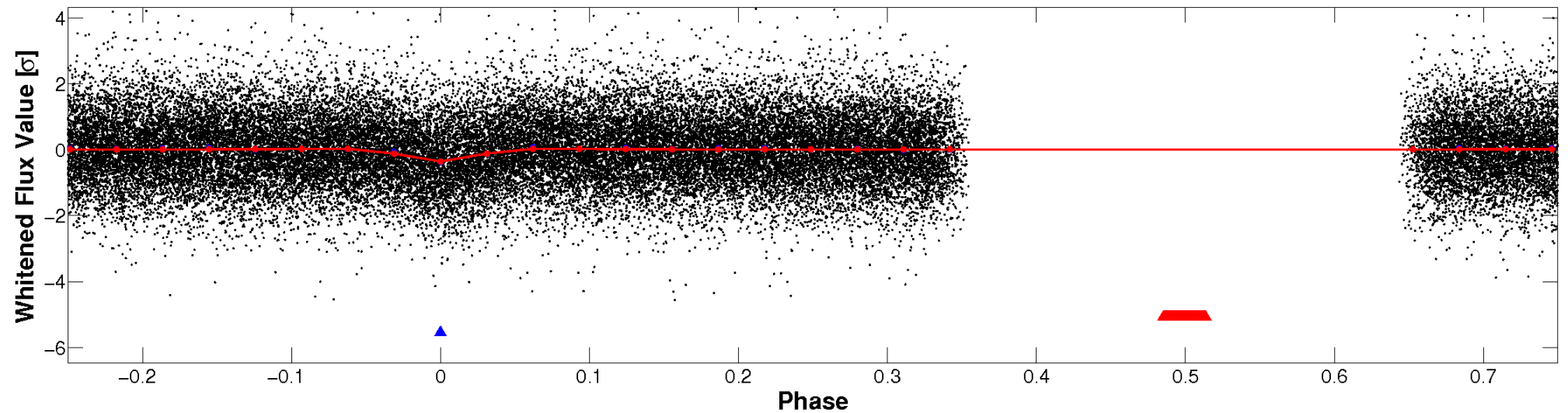


# Non-Whitened Vs. Whitened Light Curve

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

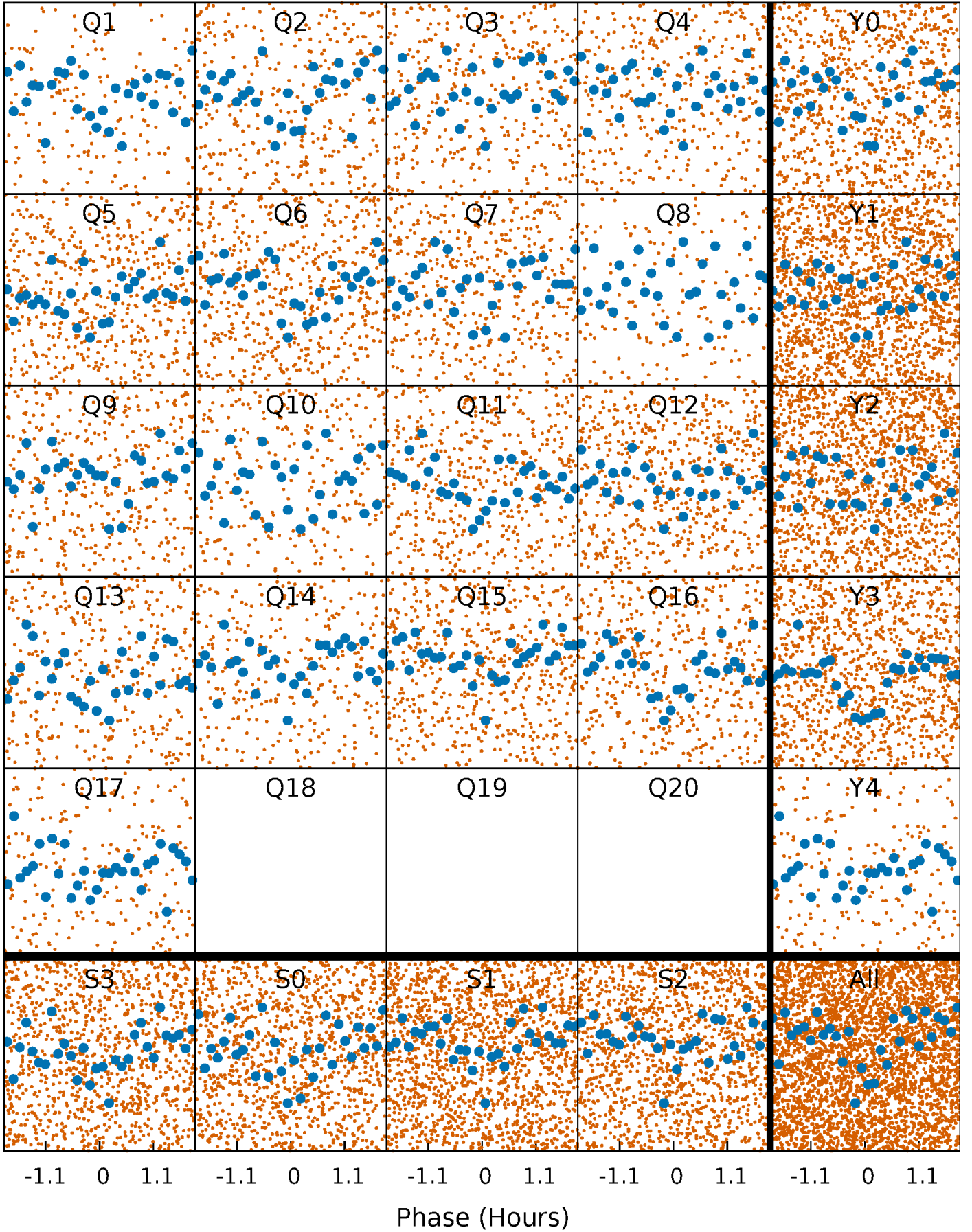


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



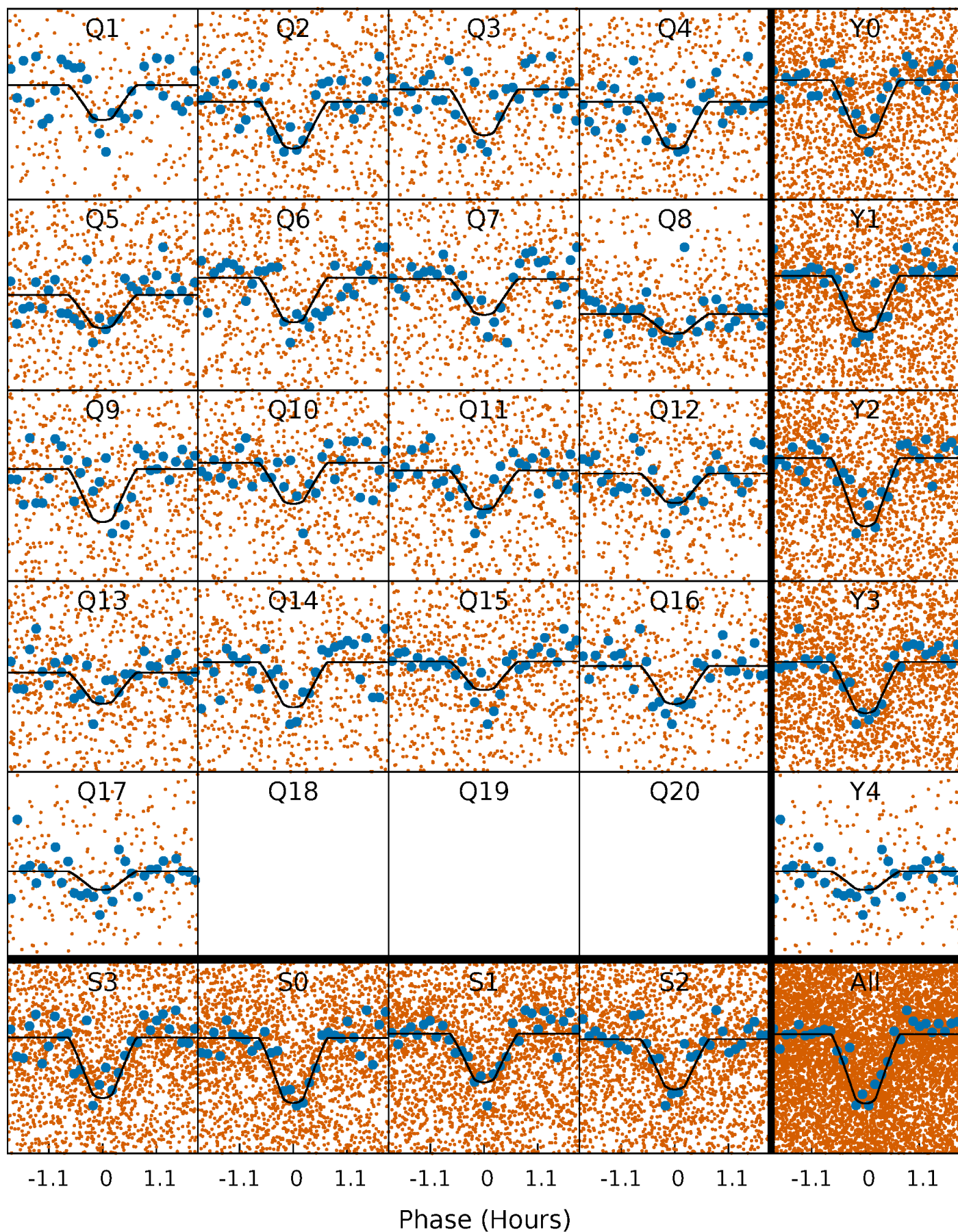
# PDC Quarter-Phased Transit Curves

TCE 010527135-02   P= 0.657376 Days    $T_0=131.780577$  (BKJD)



# DV Quarter-Phased Transit Curves

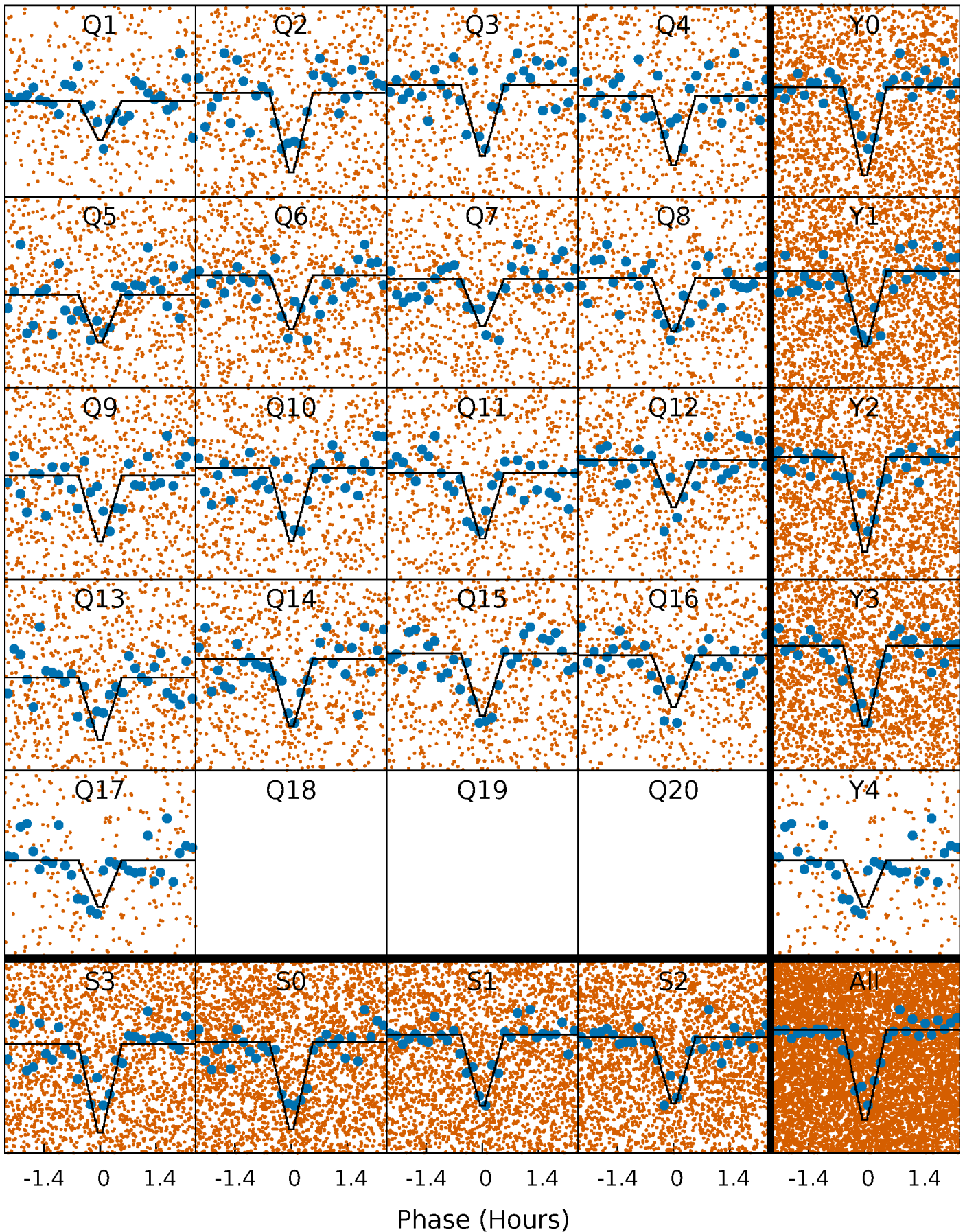
TCE 010527135-02   P= 0.657376 Days    $T_0=131.780577$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

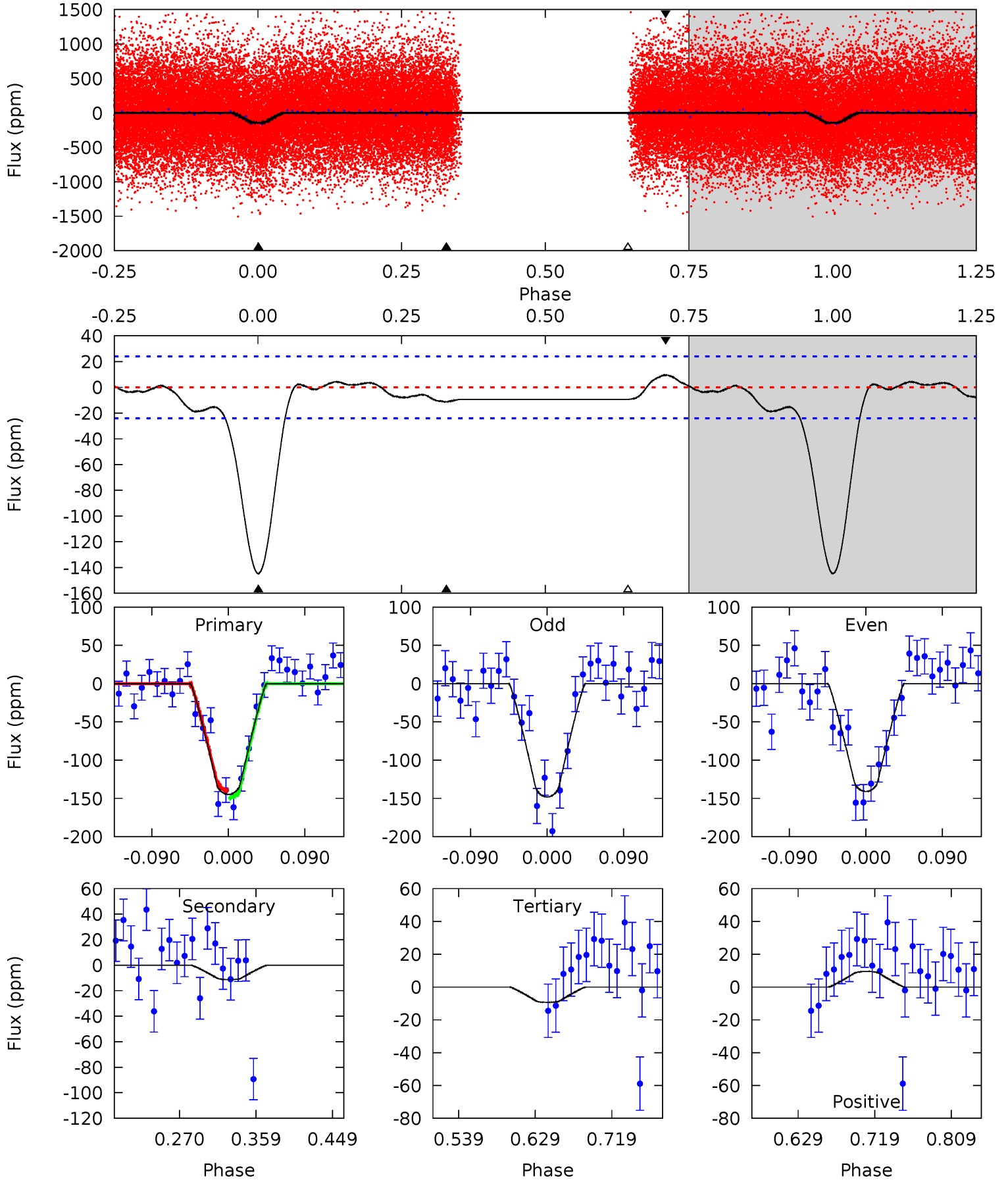
TCE 010527135-02 P= 0.657377 Days  $T_0=131.779948$  (BKJD)



# DV Model-Shift Uniqueness Test

010527135-02, P = 0.657376 Days, E = 131.123201 Days

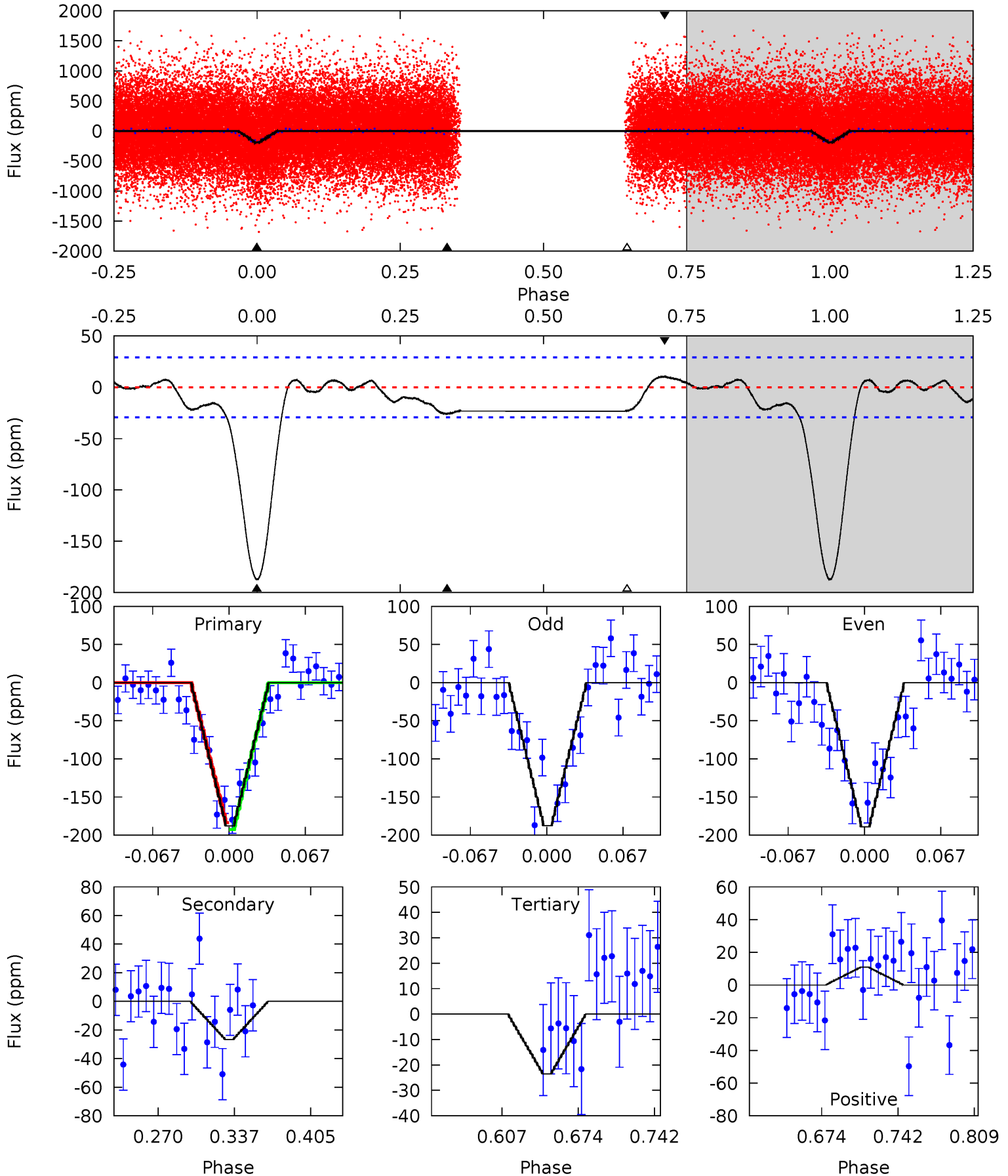
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.6	2.17	1.78	1.81	4.59	1.70	1.29	25.8	25.8	0.39	0.35	0.68	0.93	0.06	0.95



# Alt Model-Shift Uniqueness Test

010527135-02, P = 0.657377 Days, E = 131.122571 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
29.9	4.25	3.75	1.73	4.65	1.83	1.43	26.1	28.2	0.50	2.51	0.12	0.96	0.05	0.71





### Stellar Parameters For KIC 010527135

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5430^{+177}_{-160}$	$4.535^{+0.048}_{-0.143}$	$0.020^{+0.250}_{-0.300}$	$0.847^{+0.181}_{-0.077}$	$0.896^{+0.081}_{-0.090}$	$2.076^{+0.427}_{-0.850}$
	+3%/-3%	+1%/-3%	+1250%/-1500%	+21%/-9%	+9%/-10%	+21%/-41%
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 010527135-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-11 \pm 5$	$1.39^{+0.71}_{-0.73}$	$2628^{+135}_{-123}$	$2913^{+1107}_{-5378}$	$0.645^{+2.468}_{-0.433}$
Alt.	$-27 \pm 6$	$1.43^{+0.71}_{-0.67}$	$2616^{+149}_{-108}$	$3458^{+1025}_{-582}$	$1.403^{+3.344}_{-0.790}$

$T_{max}$  = 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

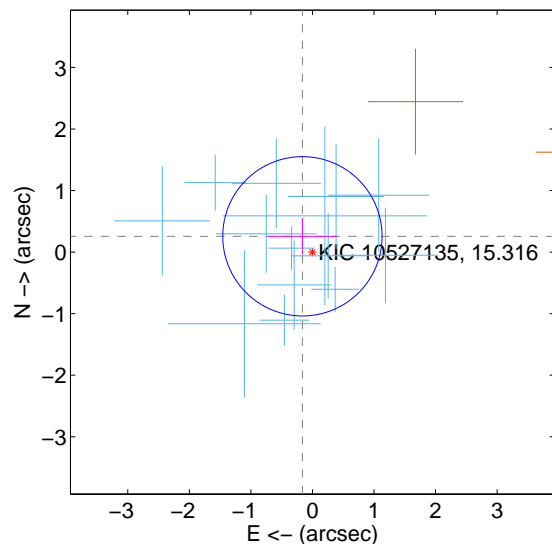
Supplemental centroid analysis for 010527135-02. Kepler magnitude: 15.32. Transit SNR 18.67

There are 14 quarters with good PRF difference image offsets

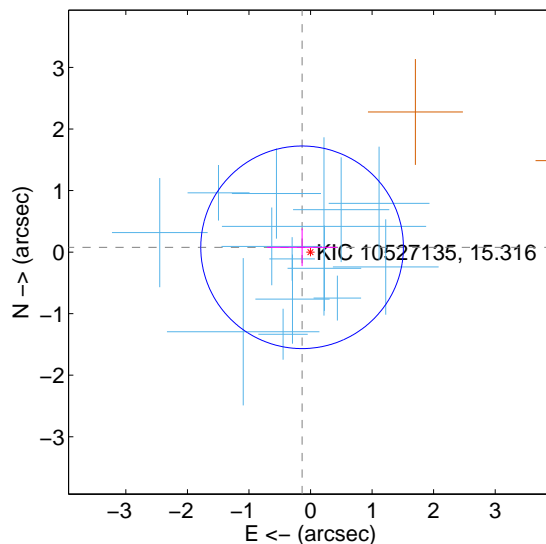
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.304 \pm 0.431$	0.70	$0.163 \pm 0.556$	$0.257 \pm 0.296$
PRF-fit source offset from KIC position	$0.158 \pm 0.549$	0.29	$0.137 \pm 0.571$	$0.078 \pm 0.307$
photometric centroid source offset	$1.07 \pm 0.73$	1.46	$0.95 \pm 0.75$	$0.50 \pm 0.67$

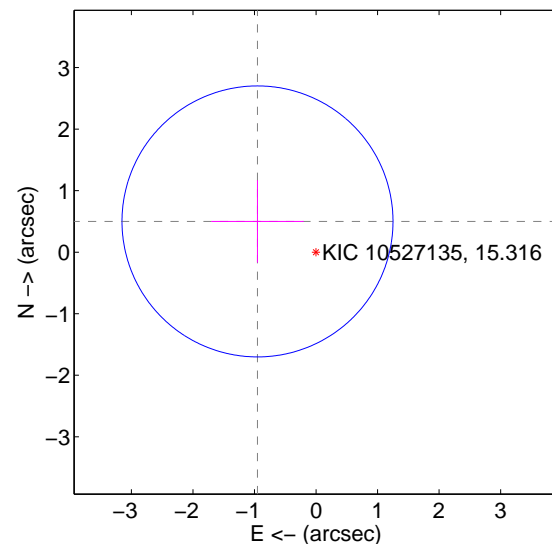
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

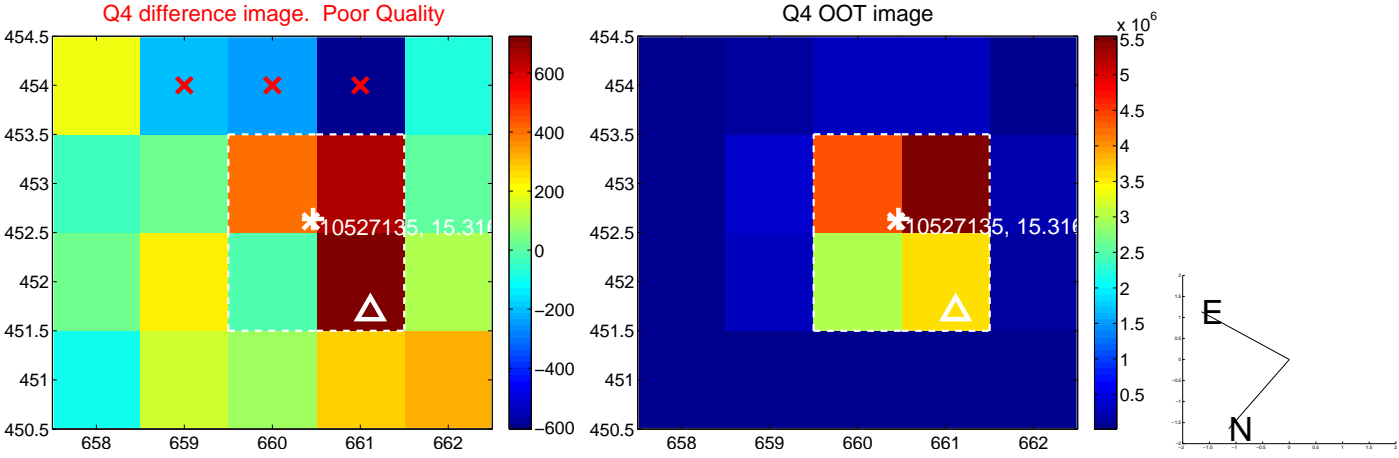
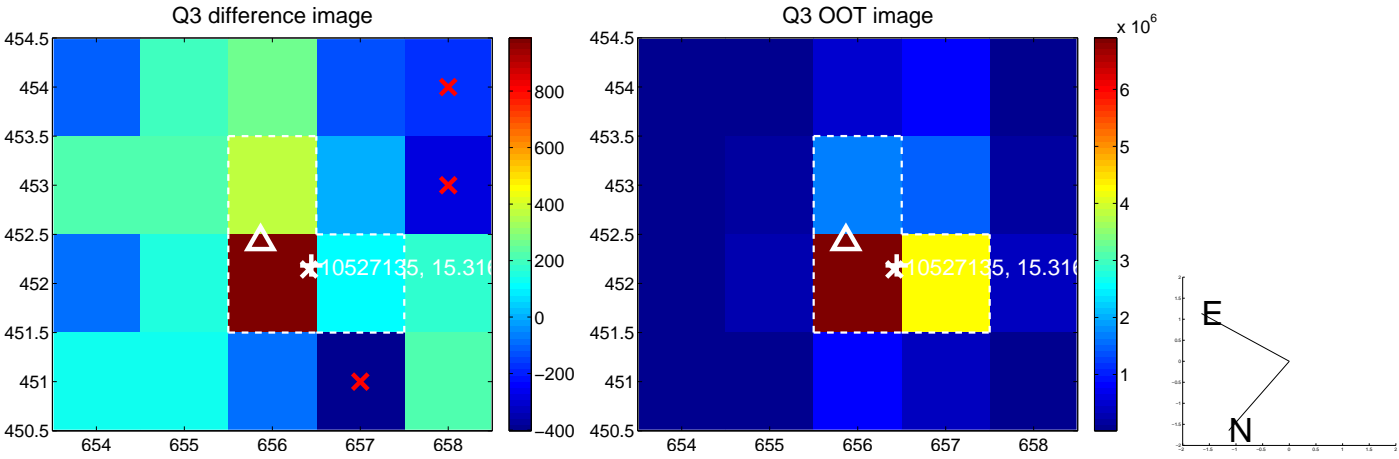
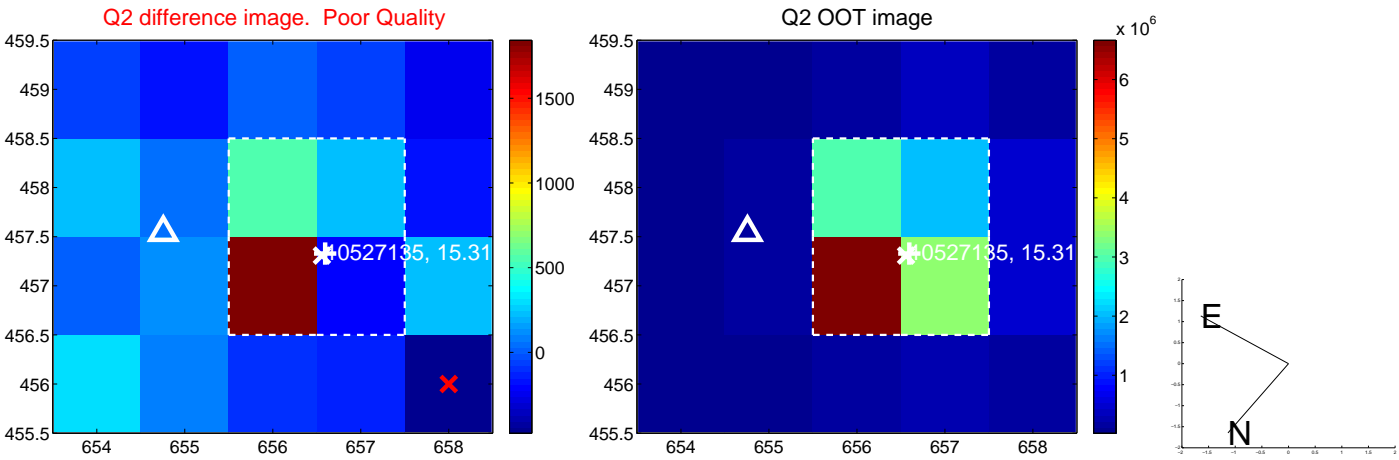
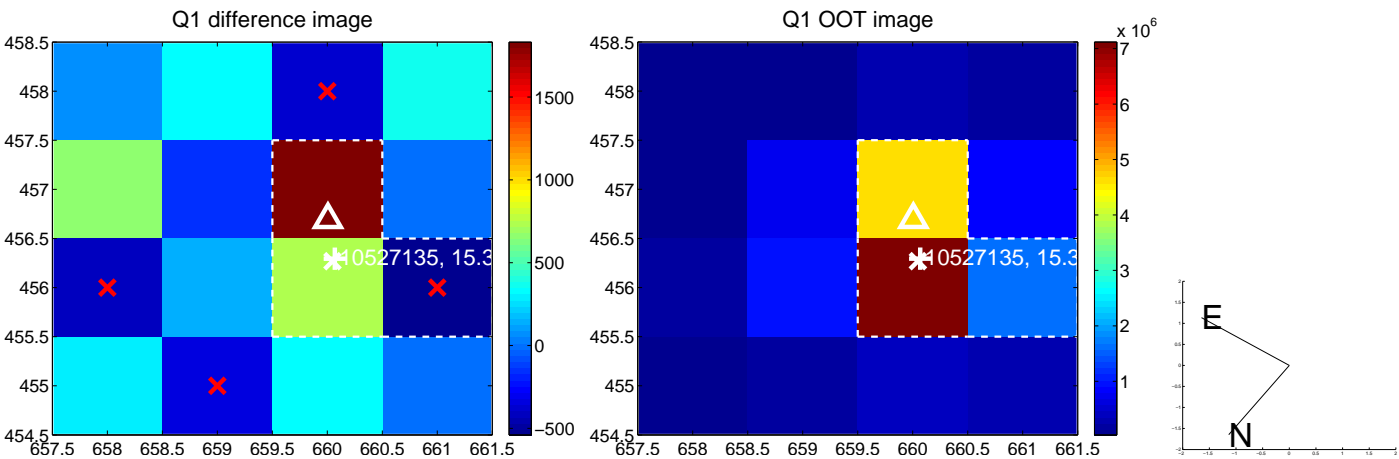


offset from photometric centroids

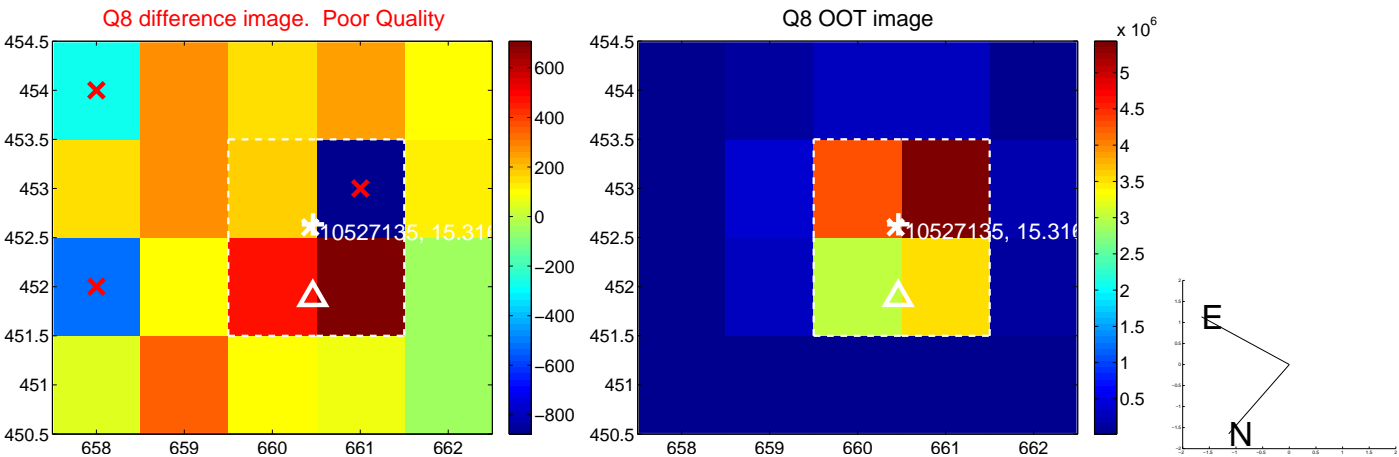
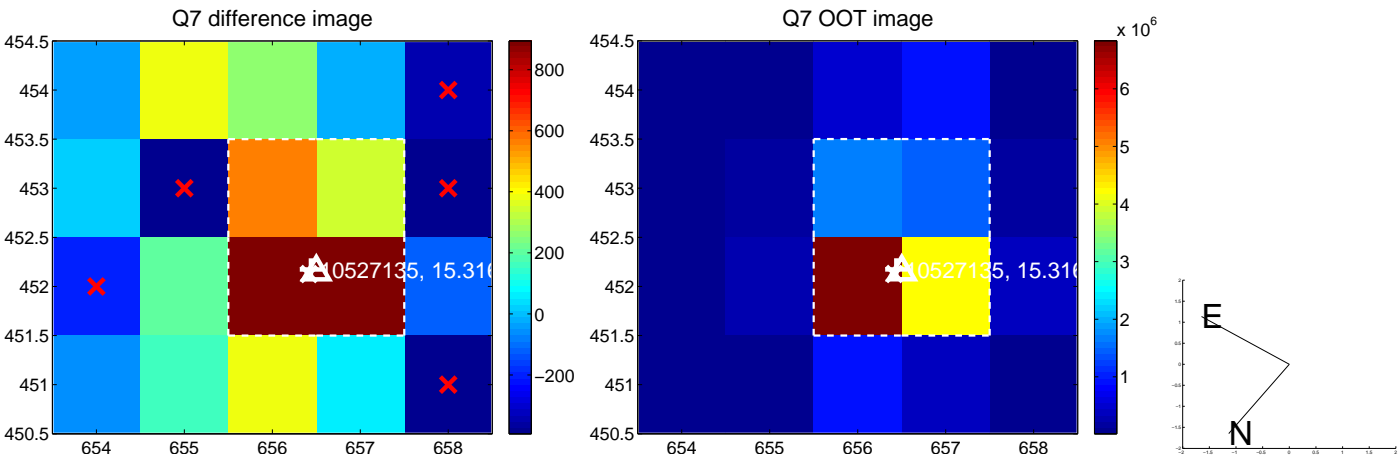
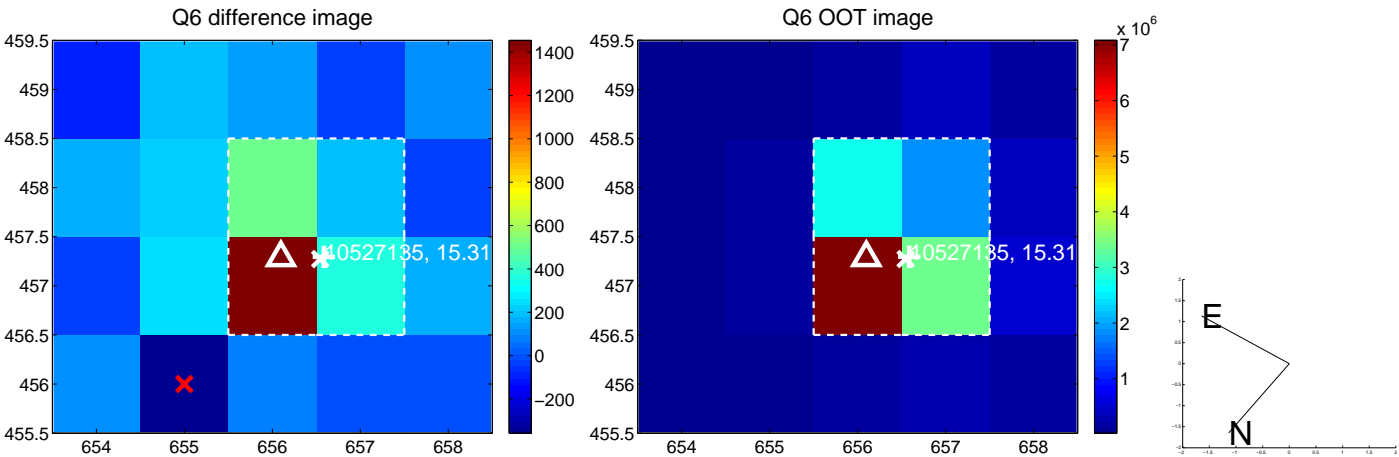
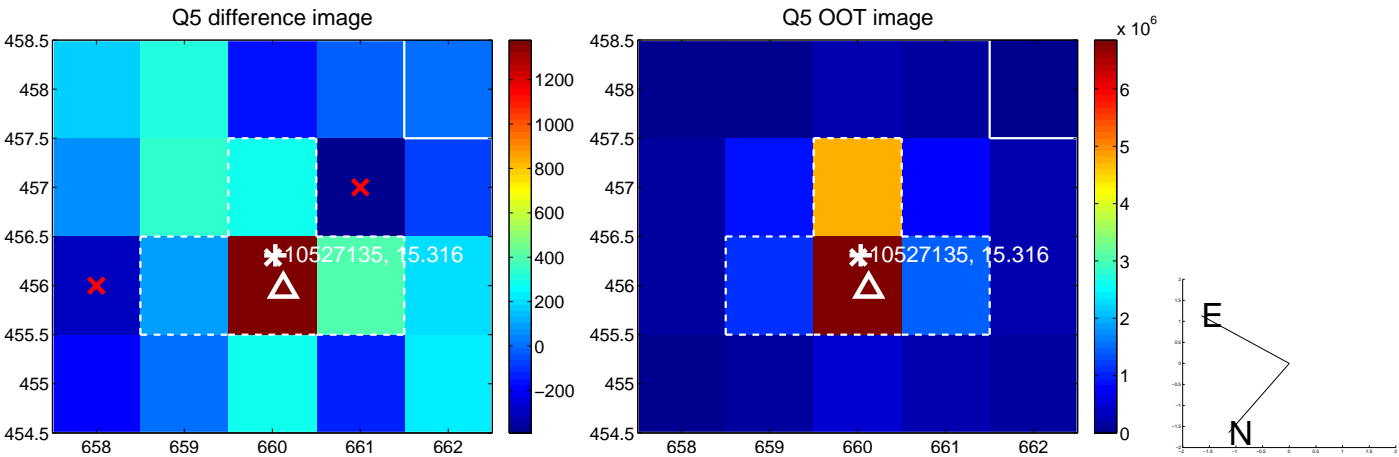


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

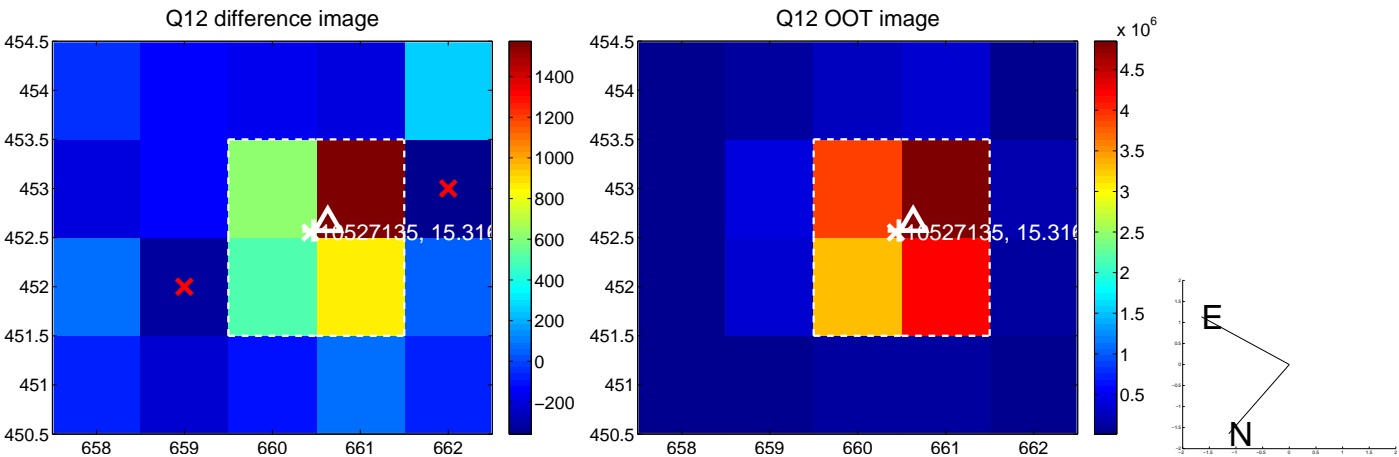
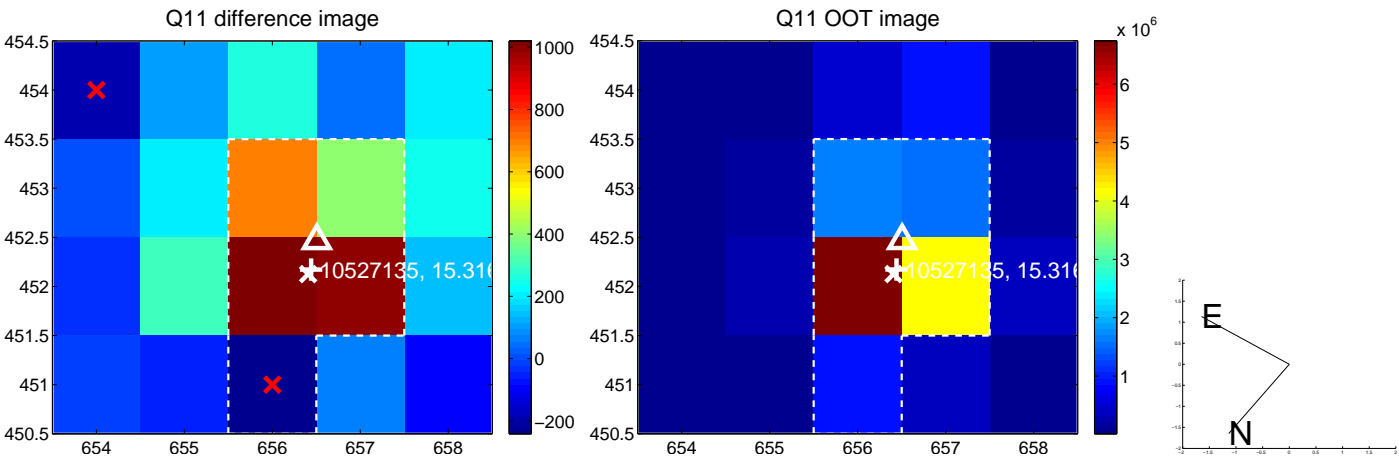
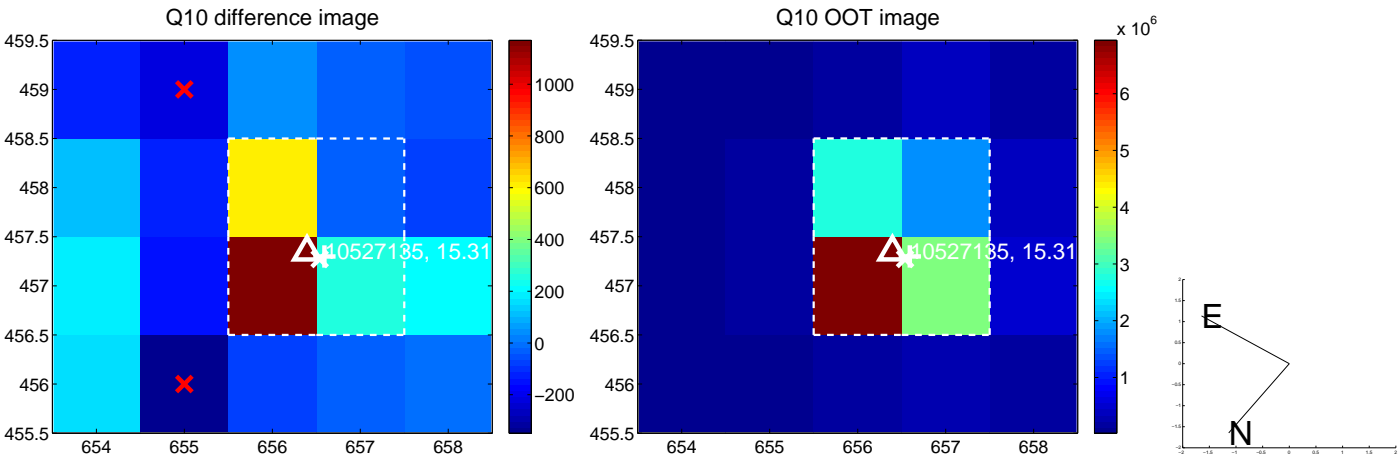
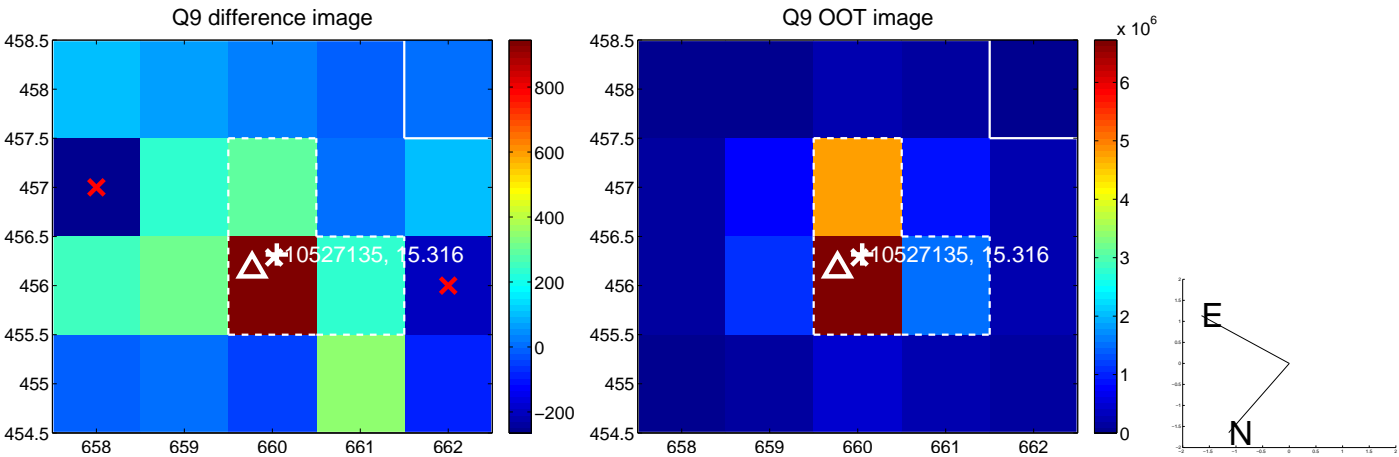
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



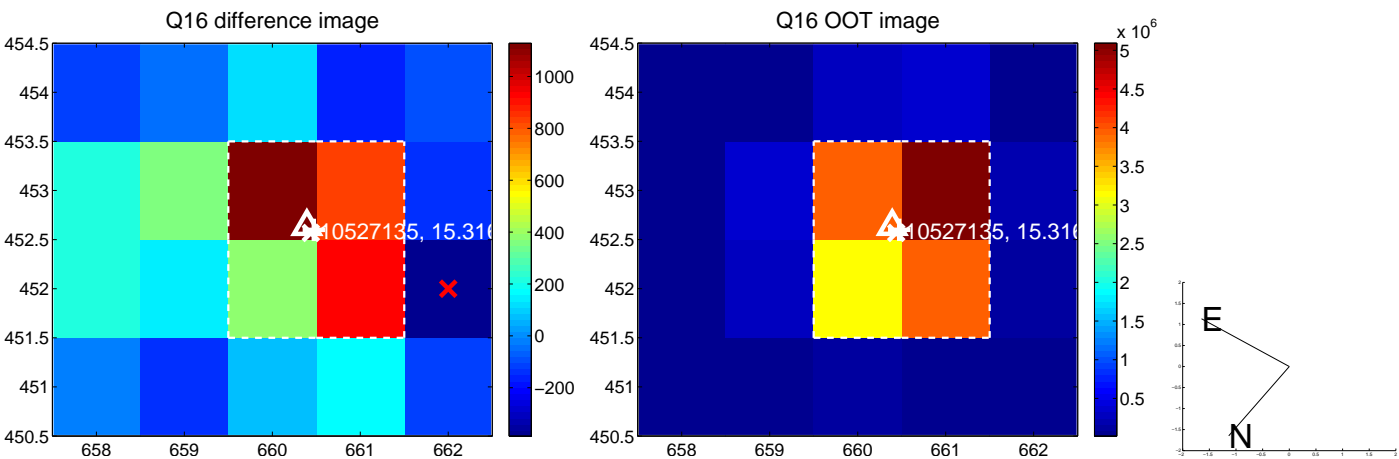
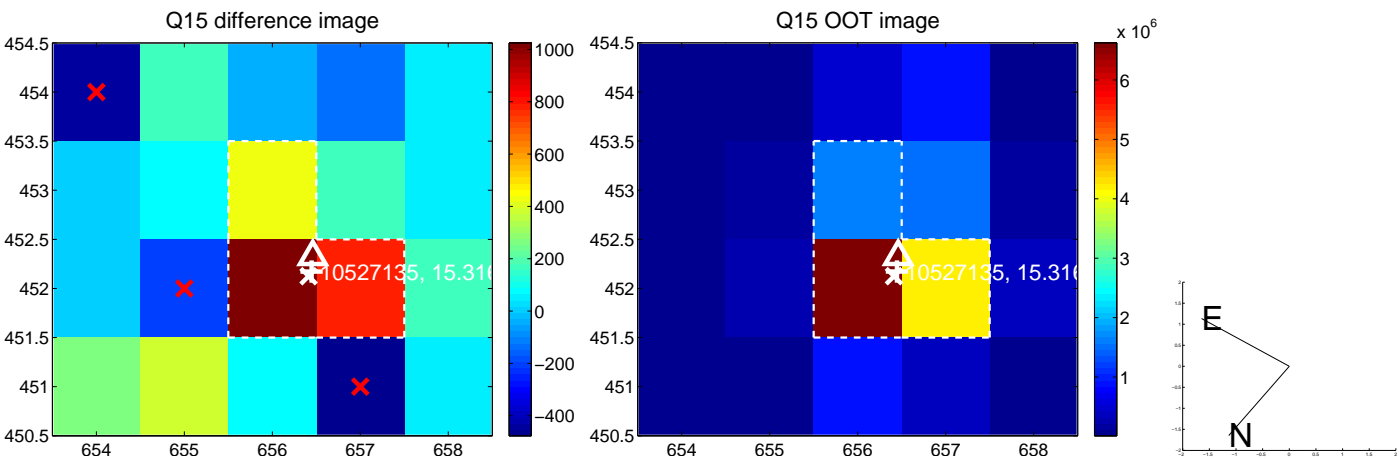
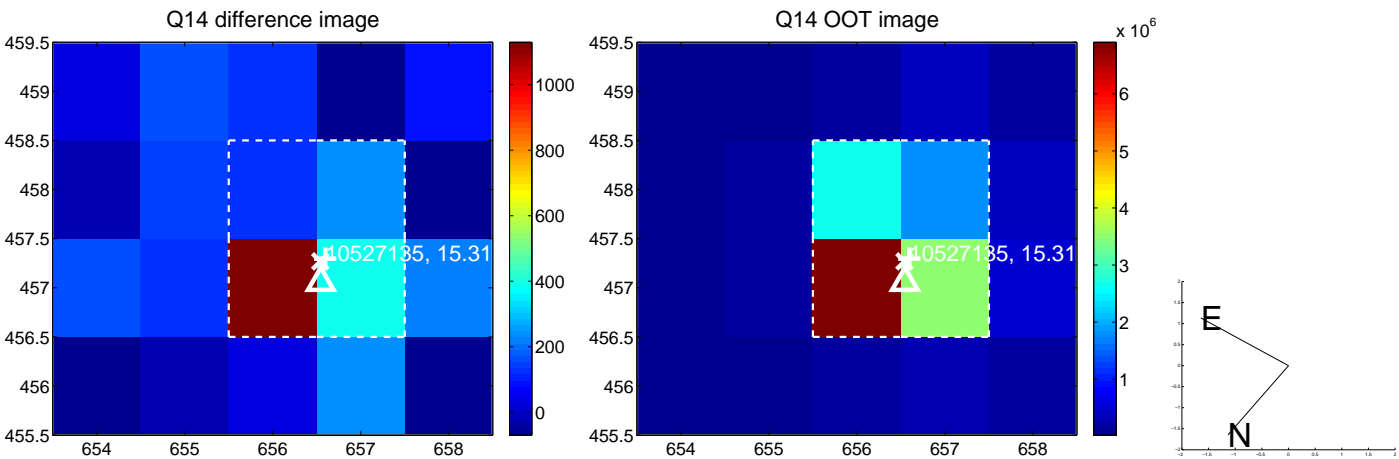
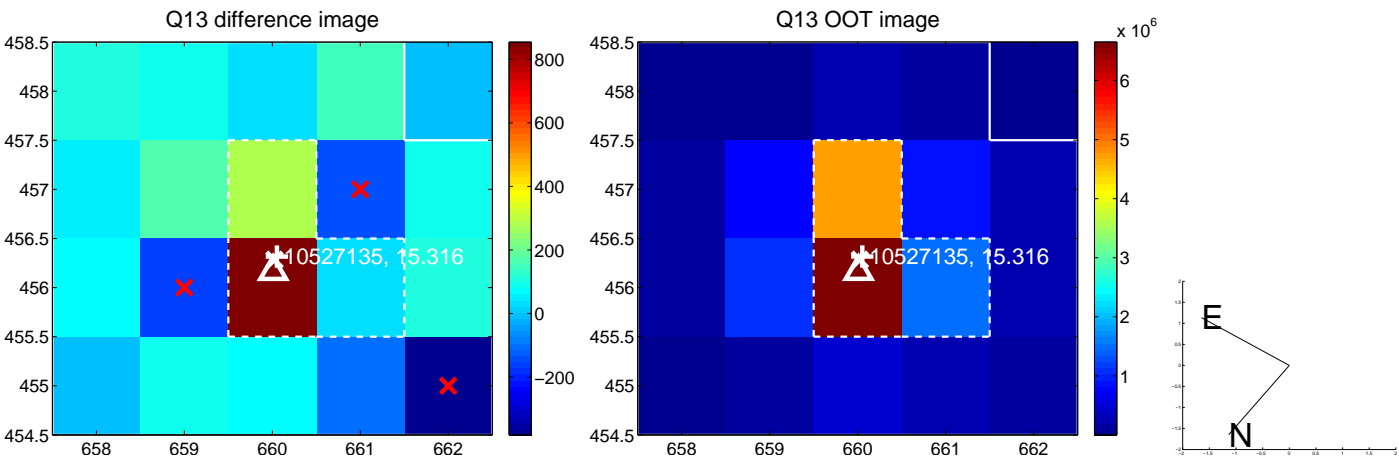
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

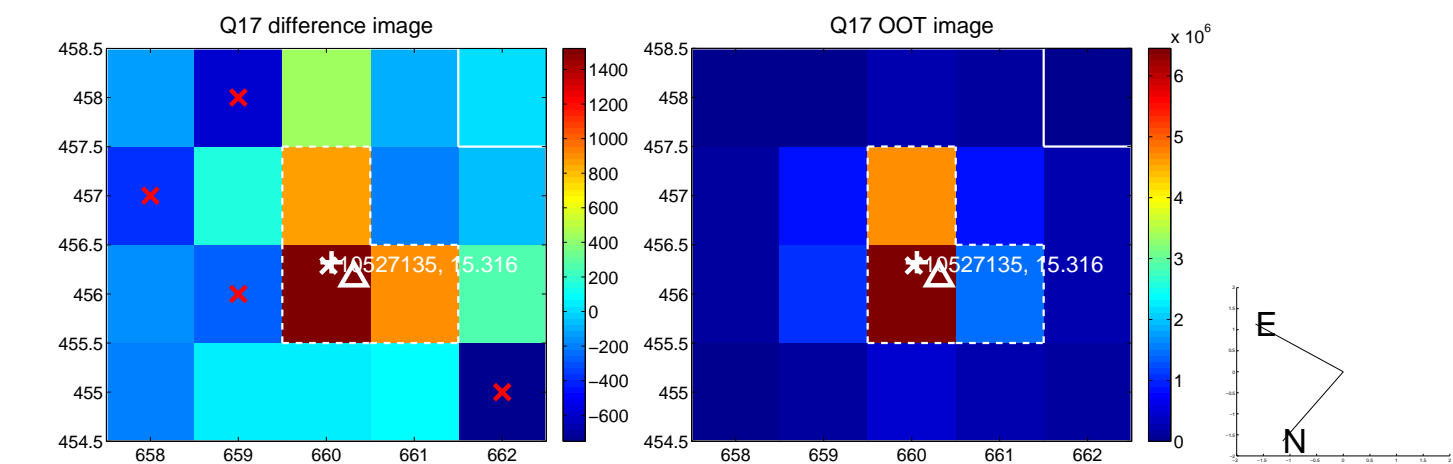


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

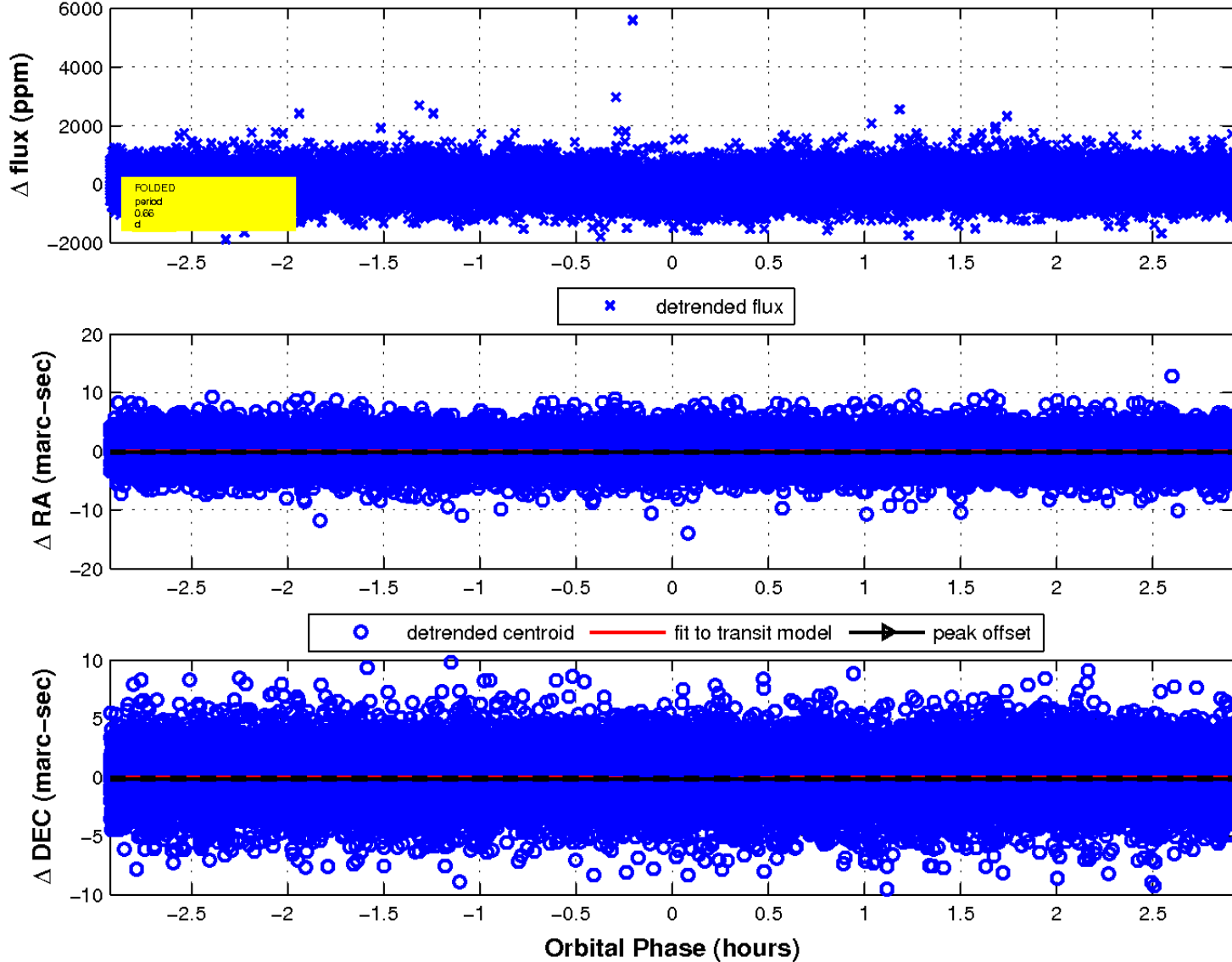




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

