

# KIC 009832727

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009832727-01	OBS	No	1.377261	131.843066	44.7	7.904	11.2	11.7	2.13	7914	1.64	18327.55
009832727-02	OBS	No	5.641379	135.833896	463.0	43.098	12.0	18.7	2.13	7914	6.38	2796.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009832727-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
009832727-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT

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

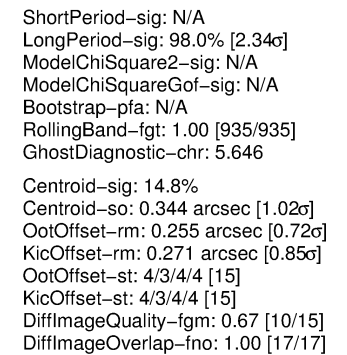
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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.

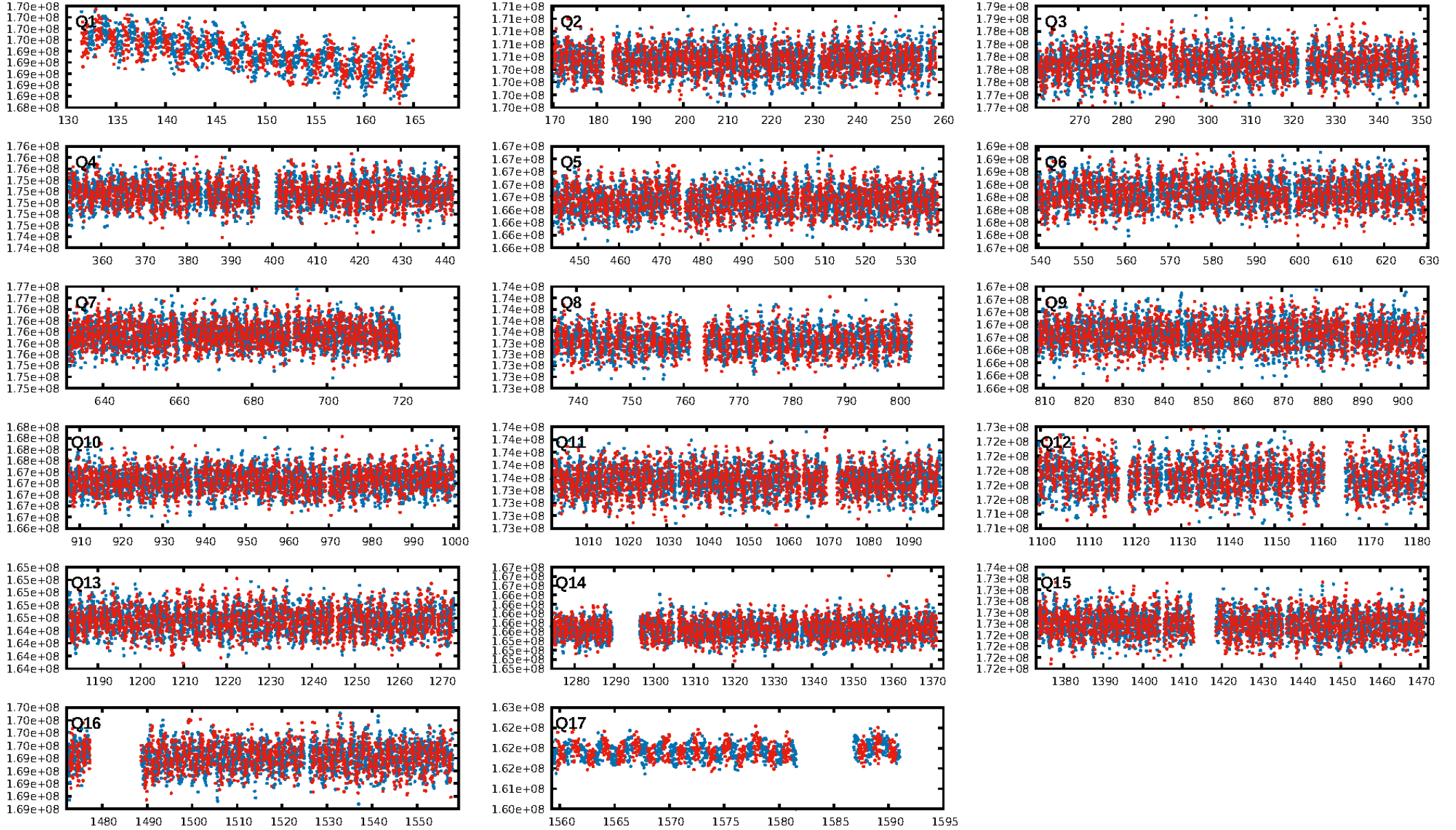
## Ephemeris Match Information For 009832727-01

No Significant Match Found

## KIC: 9832727    Candidate: 1 of 2    Period: 1.377 d

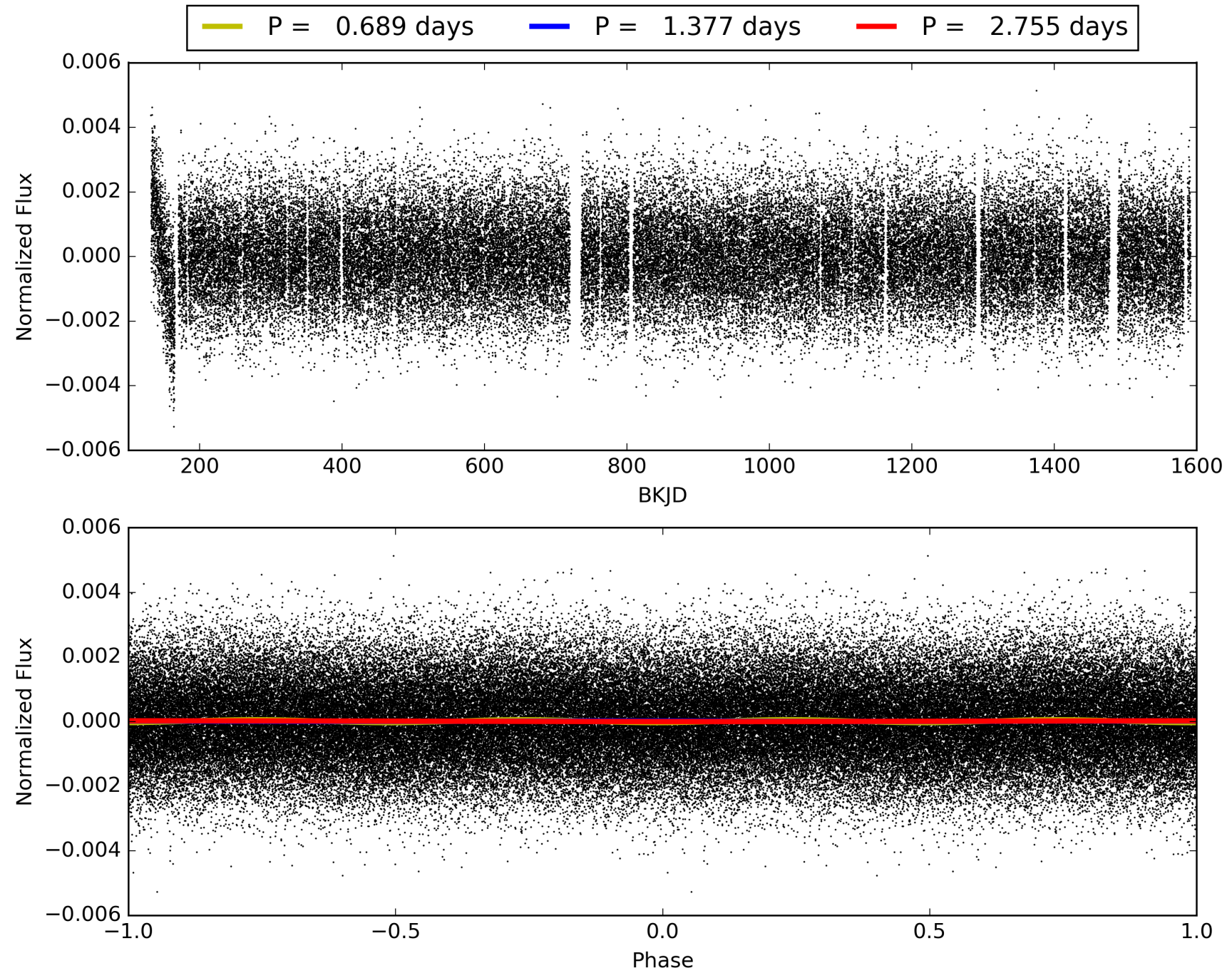


# TCE 009832727-01, PDC Light Curves



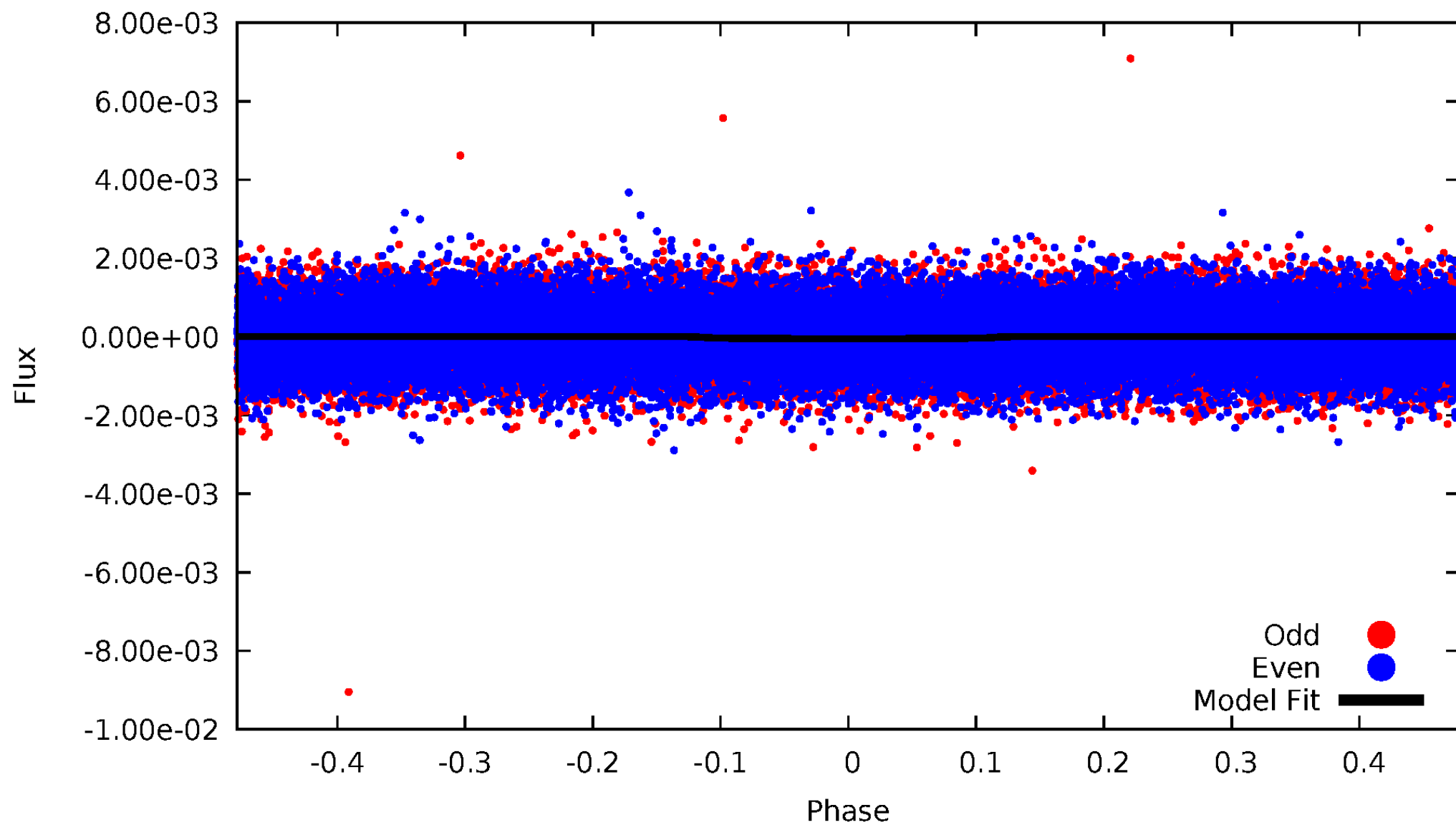


TCE 009832727-01



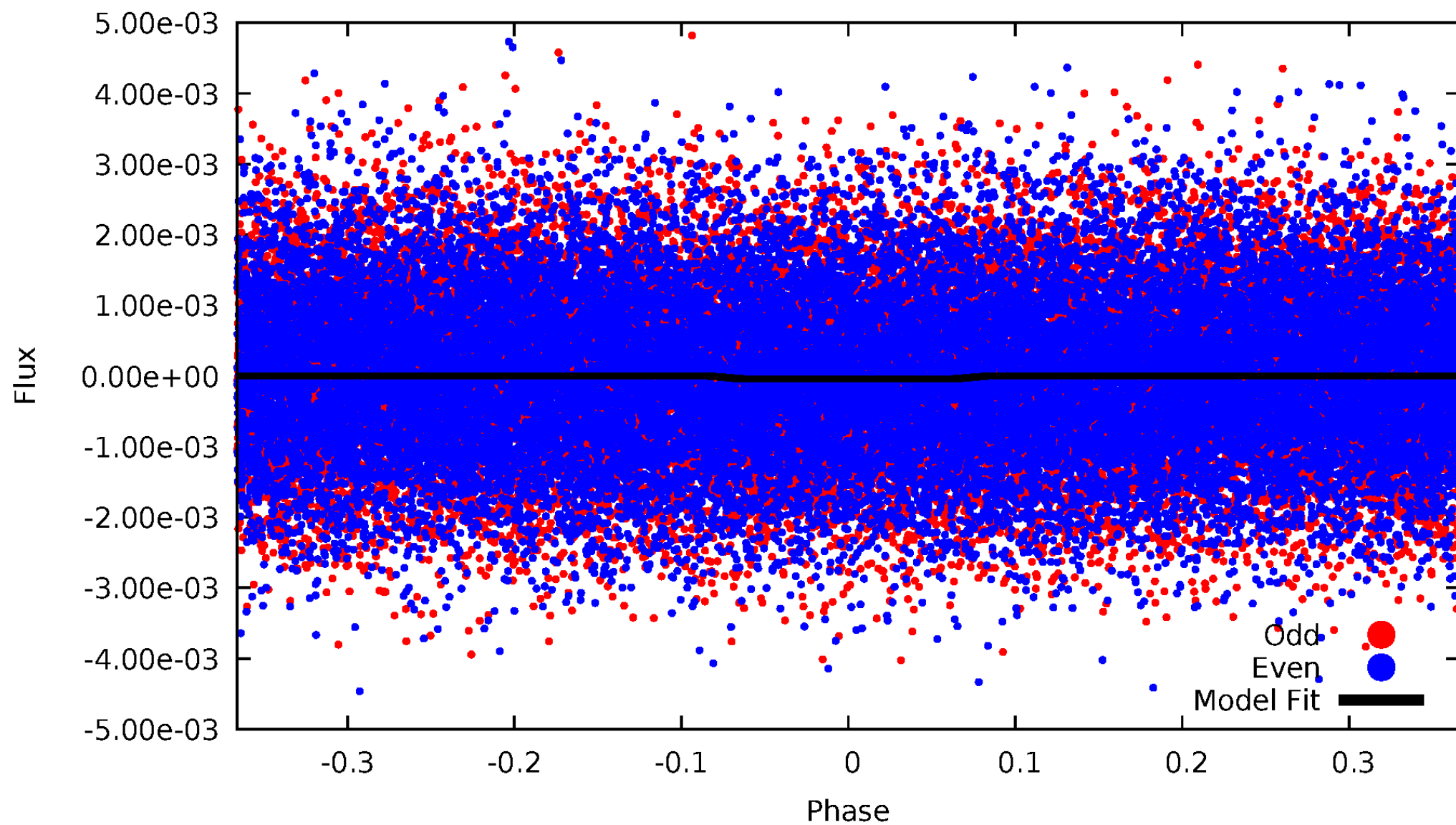
# DV Odd/Even

TCE 009832727-01



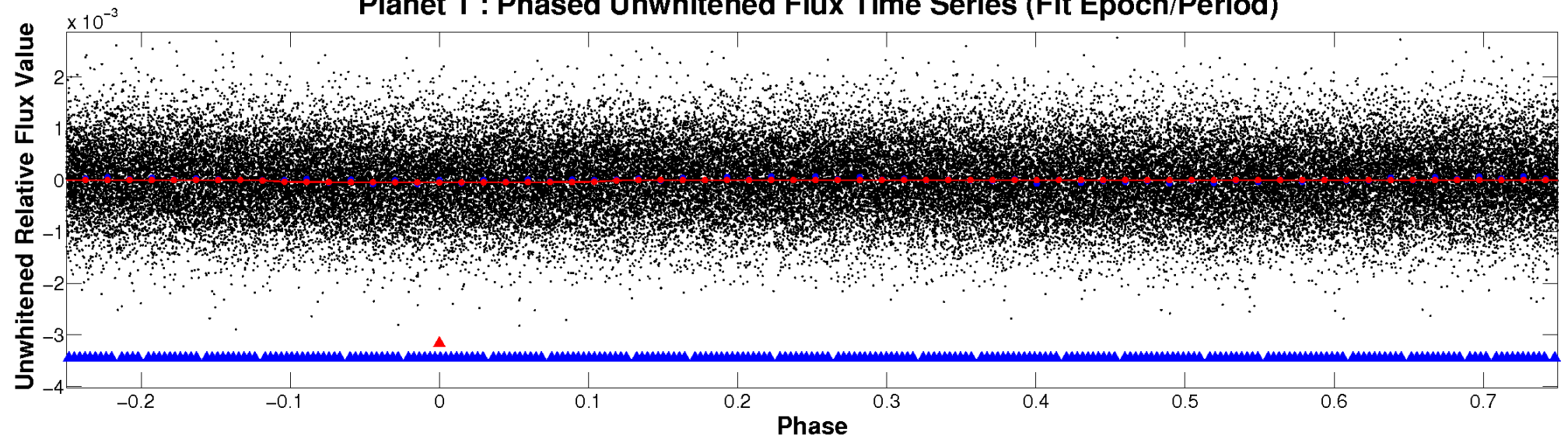
# ALT Odd/Even

TCE 009832727-01

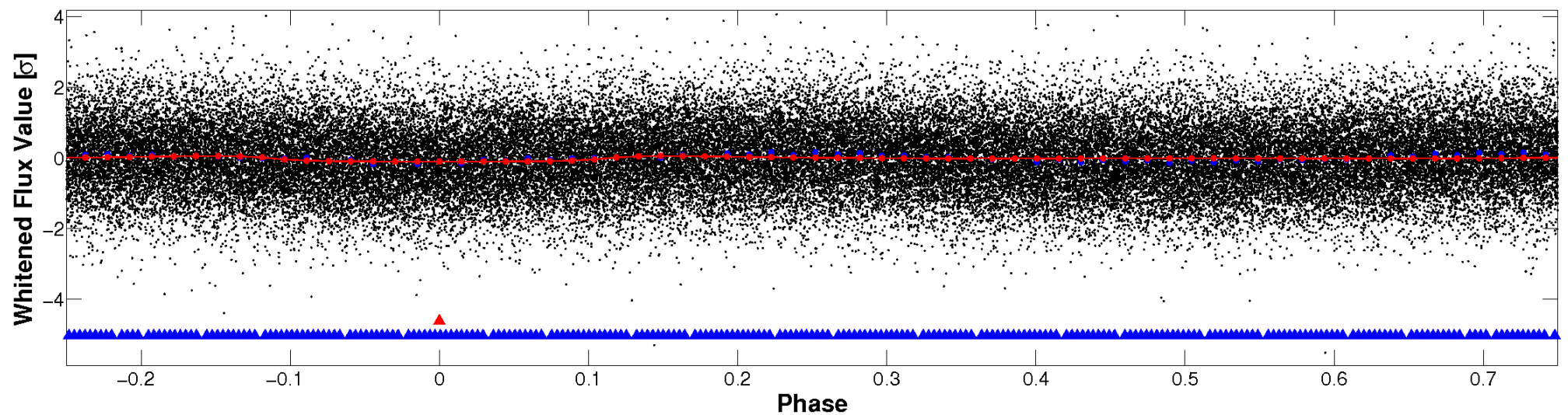


# Non-Whitened Vs. Whitened Light Curve

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



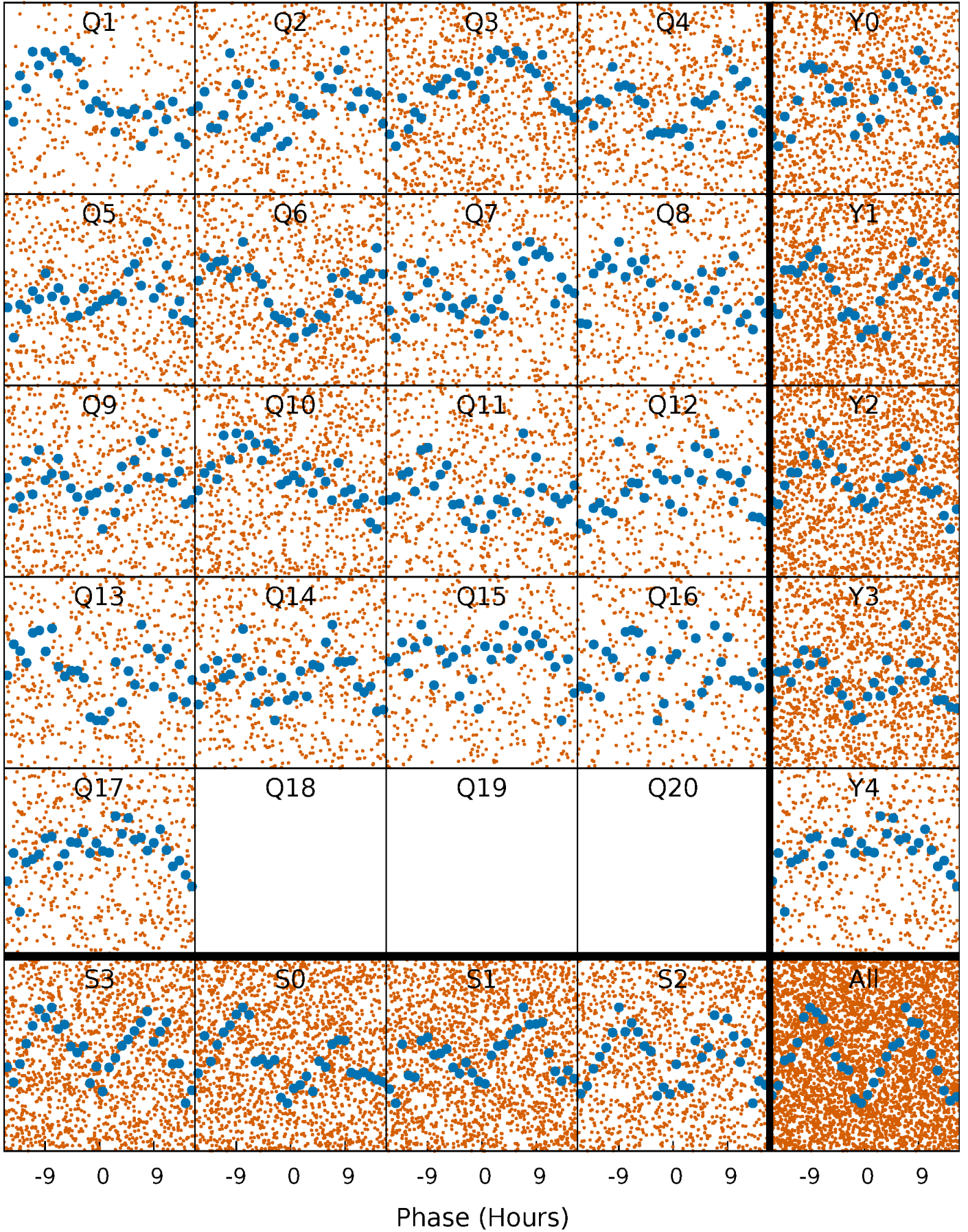
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





# PDC Quarter-Phased Transit Curves

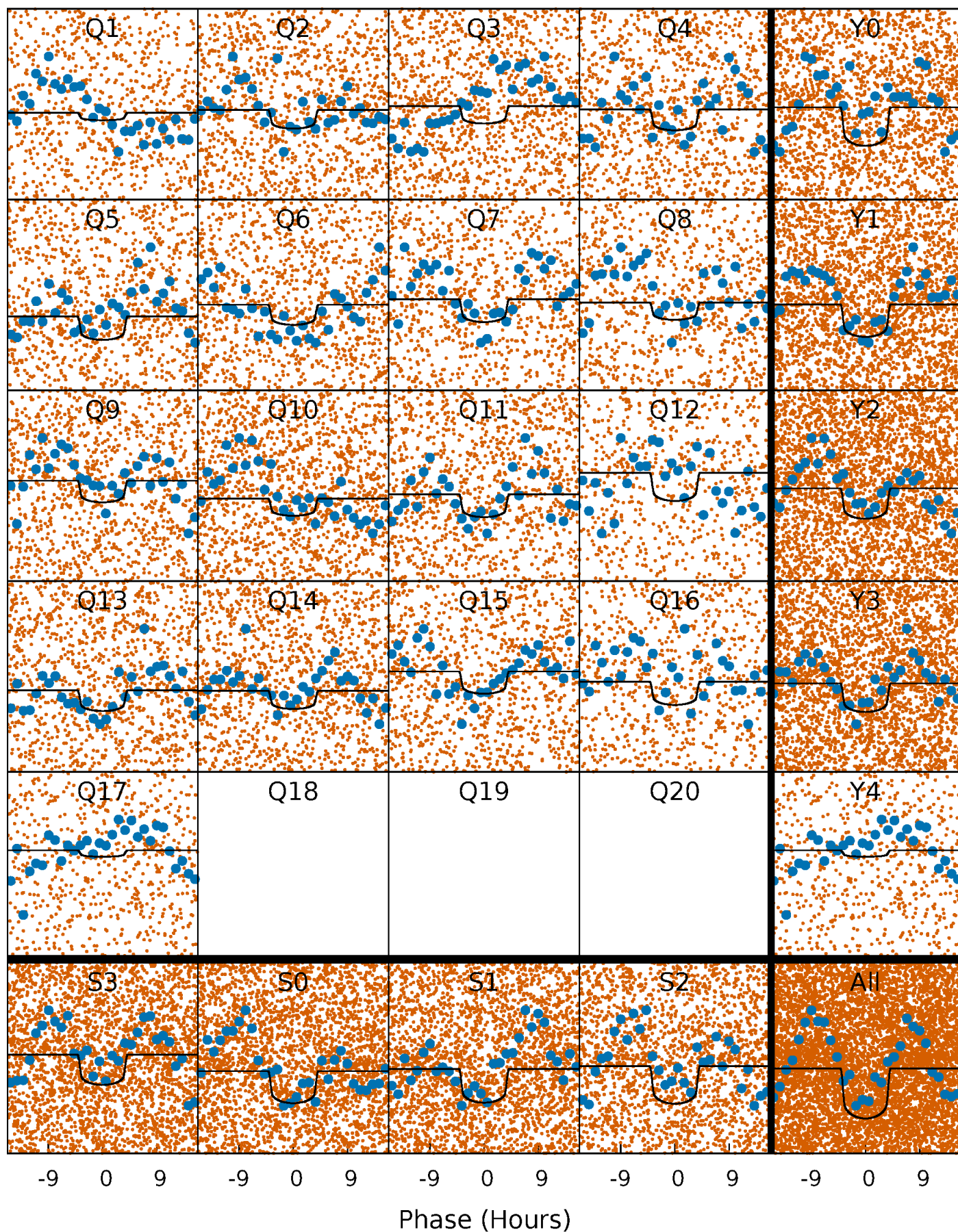
TCE 009832727-01 P= 1.377261 Days  $T_0=131.843066$  (BKJD)





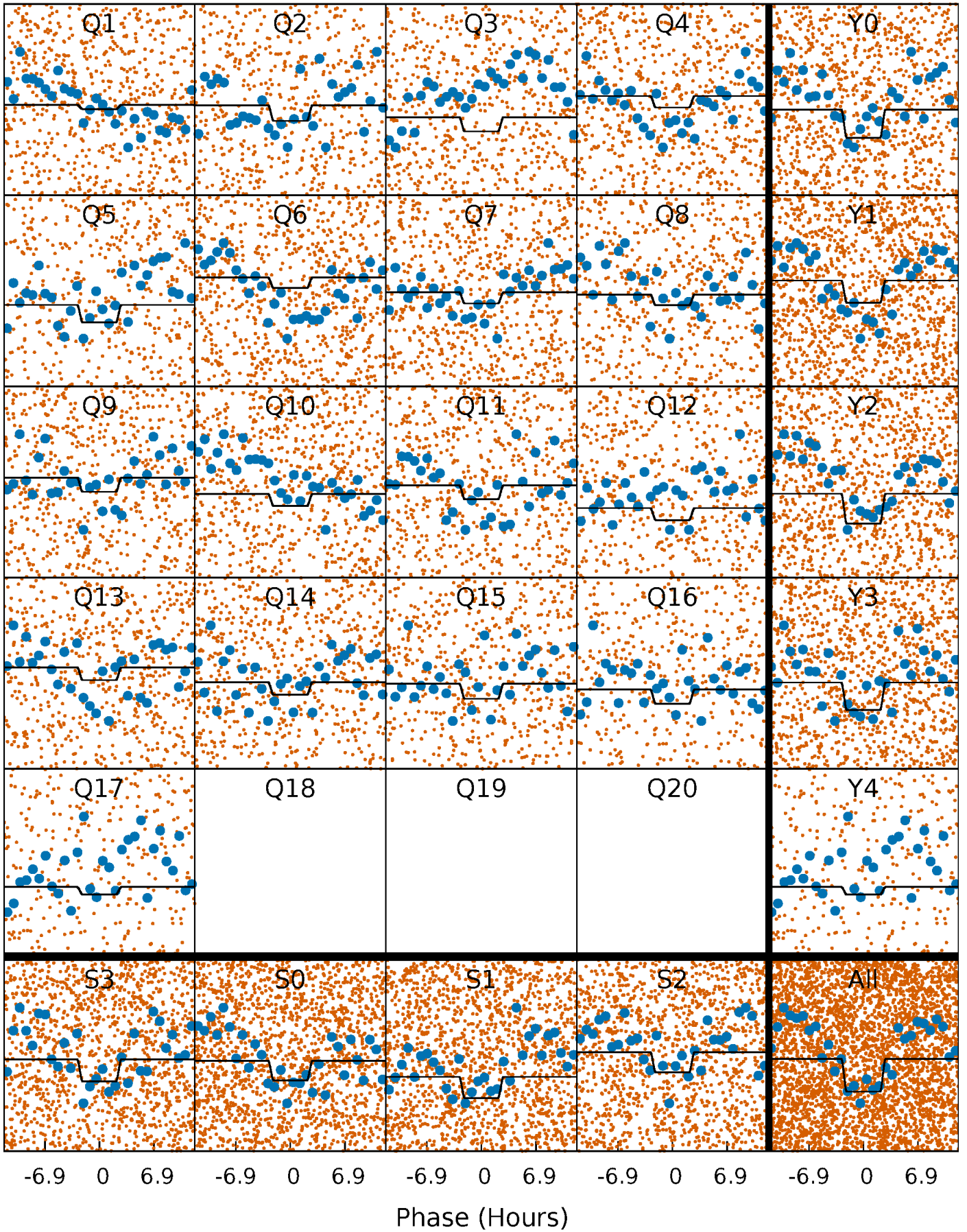
# DV Quarter-Phased Transit Curves

TCE 009832727-01 P= 1.377261 Days  $T_0=131.843066$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

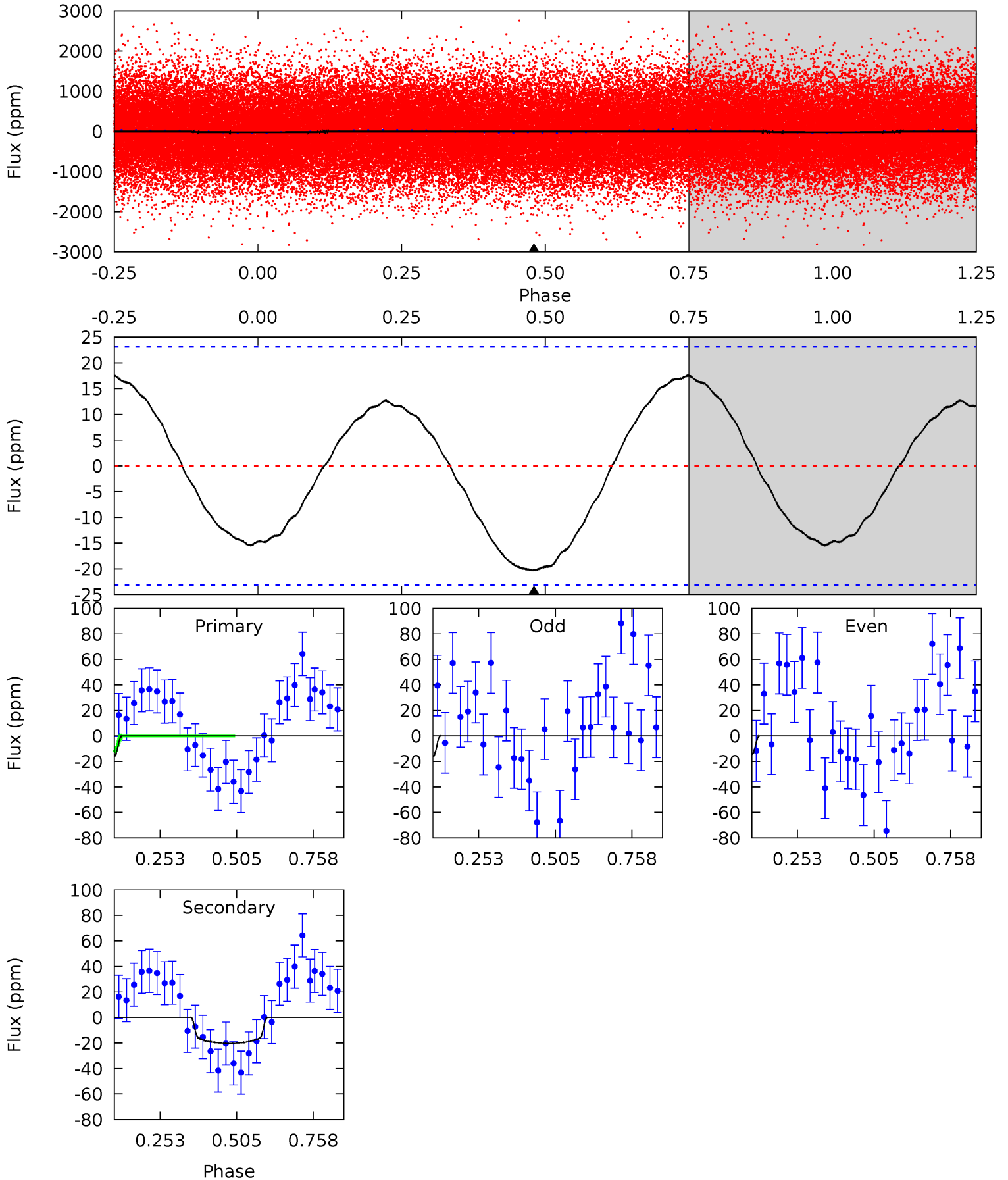
TCE 009832727-01 P= 1.377218 Days  $T_0=131.863977$  (BKJD)



# DV Model-Shift Uniqueness Test

009832727-01, P = 1.377261 Days, E = 130.465805 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
3.82	3.82	0	0	4.37	1.14	2.08	3.82	3.82	3.82	3.82	0.20	1.01	0.46	0.73

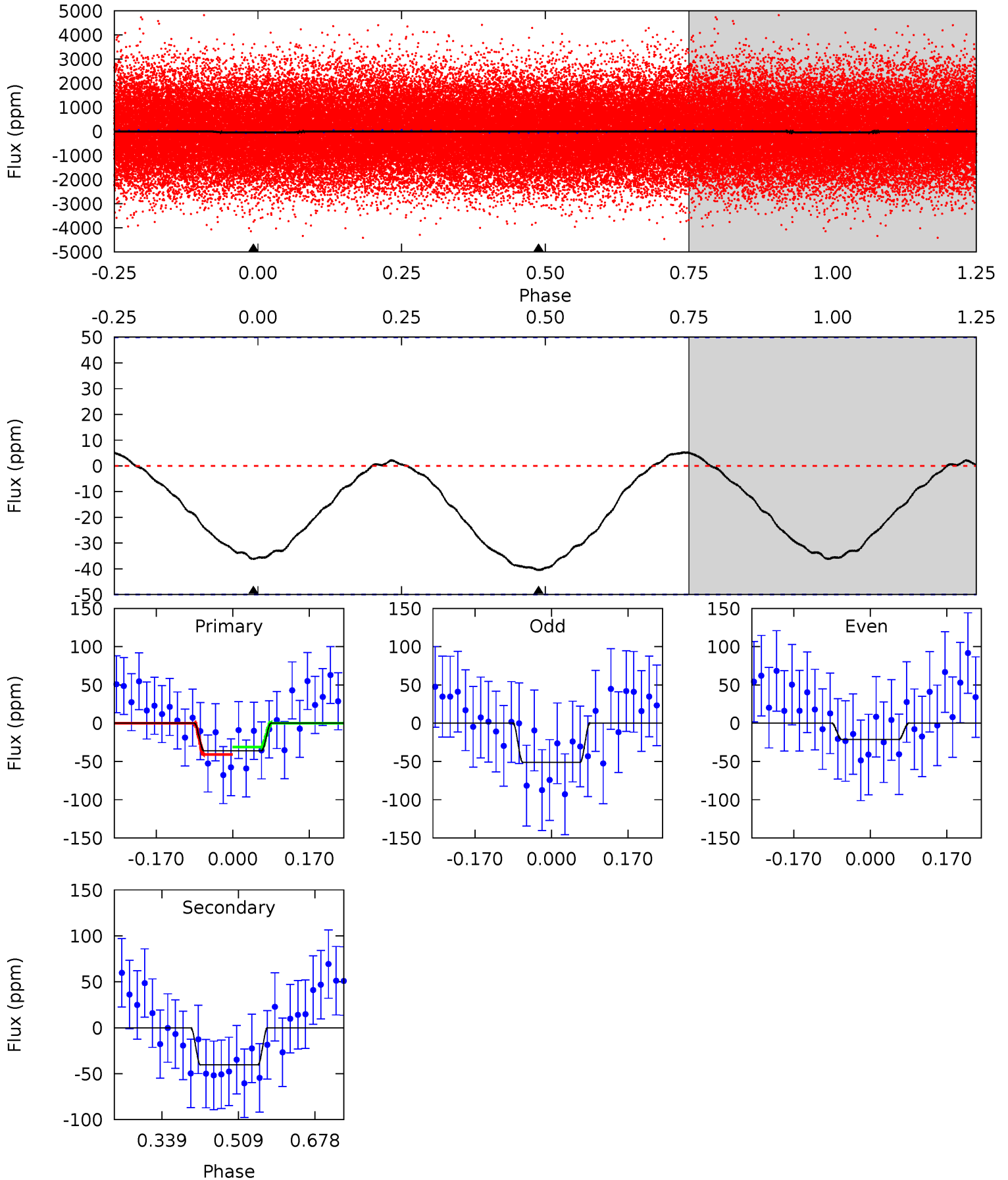




# Alt Model-Shift Uniqueness Test

009832727-01, P = 1.377218 Days, E = 130.486759 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
3.22	3.61	0	0	4.45	1.37	0.32	3.22	3.22	3.61	3.61	1.33	0.31	0.11	0.43





### Stellar Parameters For KIC 009832727

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7914^{+219}_{-329}$	$4.037^{+0.170}_{-0.139}$	$-0.040^{+0.200}_{-0.350}$	$2.128^{+0.456}_{-0.557}$	$1.799^{+0.144}_{-0.313}$	$0.263^{+0.245}_{-0.108}$
	+3%/-4%	+4%/-3%	+500%/-875%	+21%/-26%	+8%/-17%	+93%/-41%
Source	KIC0	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 009832727-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-20 \pm 5$	$1.64^{+0.88}_{-0.72}$	$4132^{+275}_{-298}$	$5905^{+2478}_{-1139}$	$3.441^{+8.327}_{-2.007}$
Alt.	$-40 \pm 11$	$1.43^{+0.85}_{-0.75}$	$4125^{+285}_{-261}$	$7818^{+5477}_{-1846}$	$9.576^{+29.056}_{-6.080}$

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

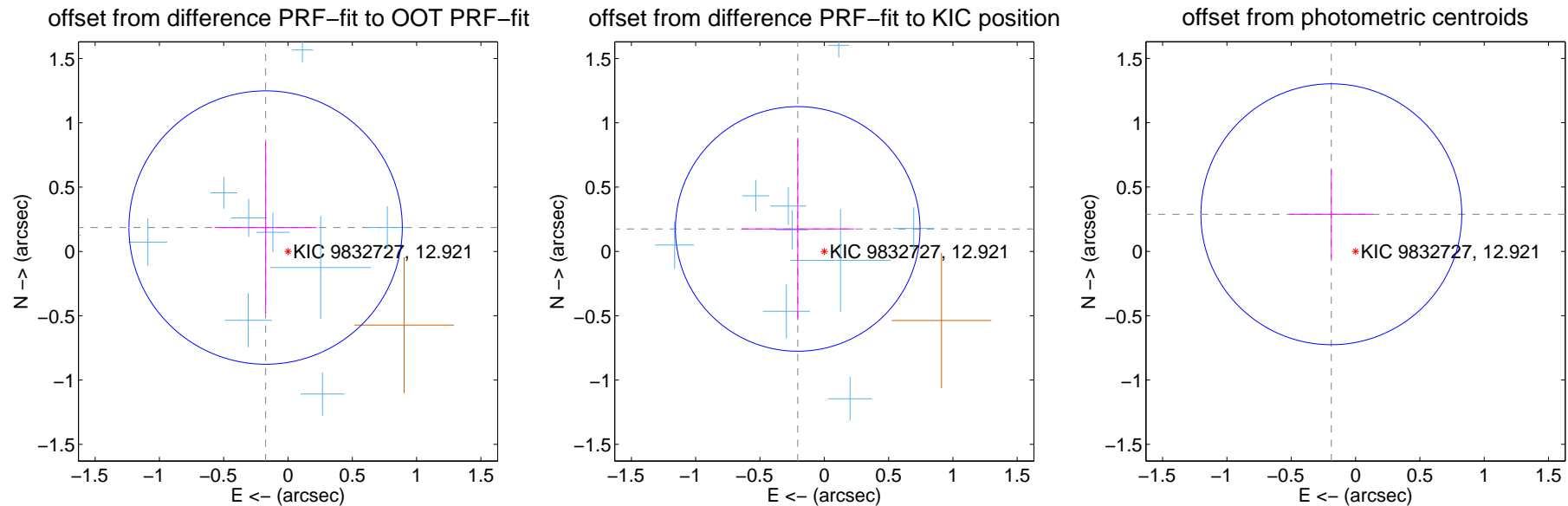
## DV Centroid Data

Supplemental centroid analysis for 009832727-01. Kepler magnitude: 12.92. Transit SNR 11.66

There are 10 quarters with good PRF difference image offsets

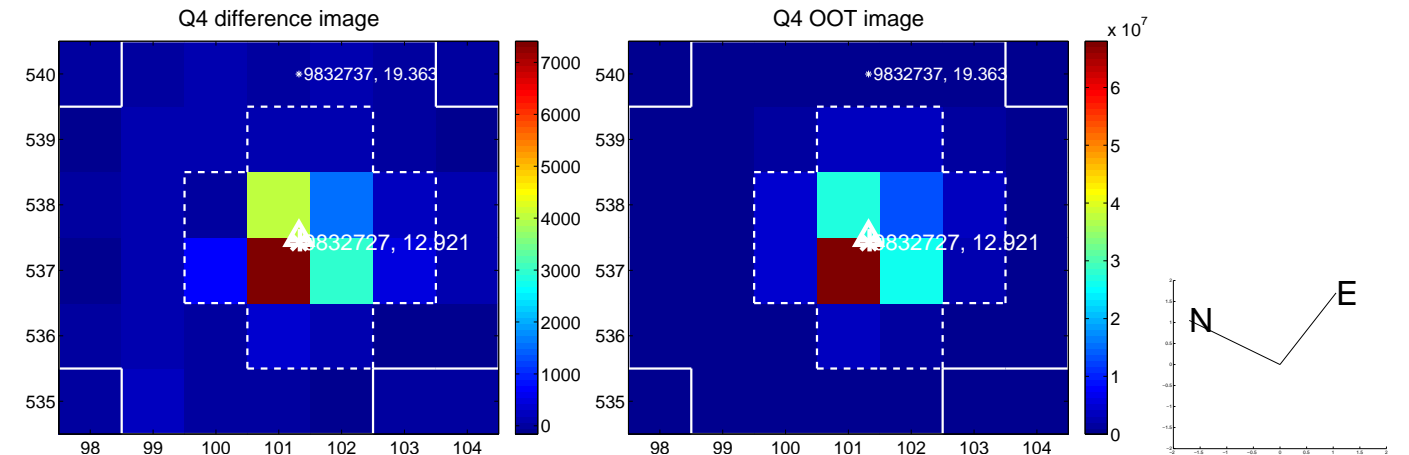
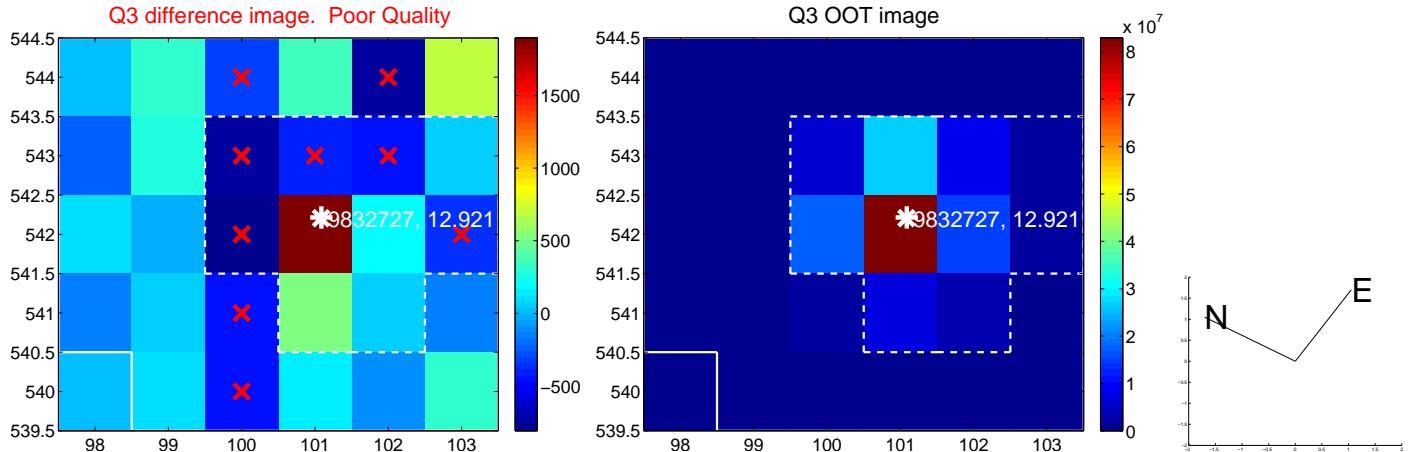
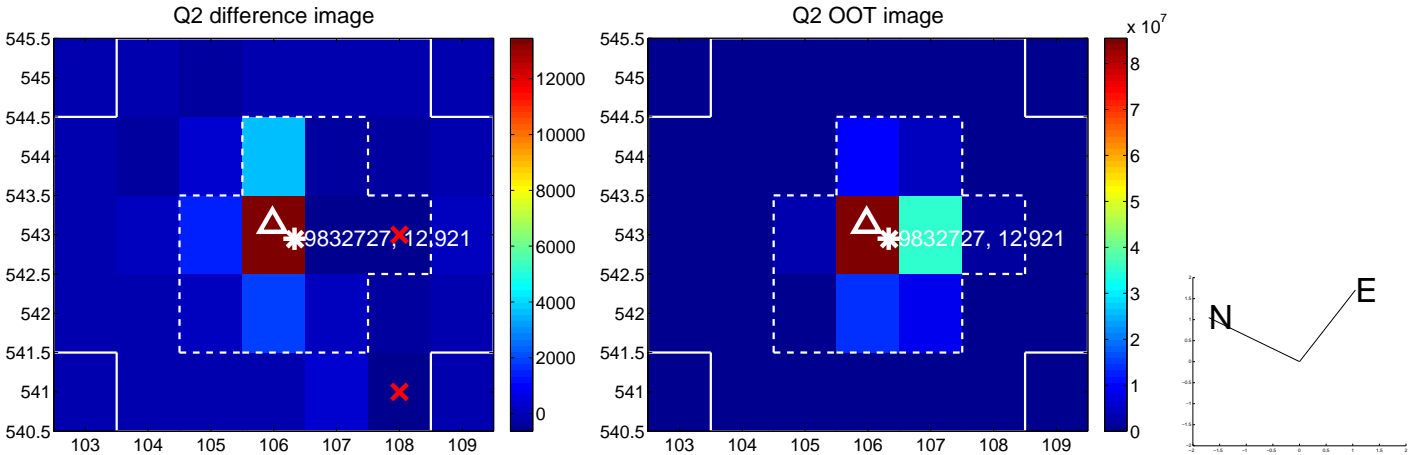
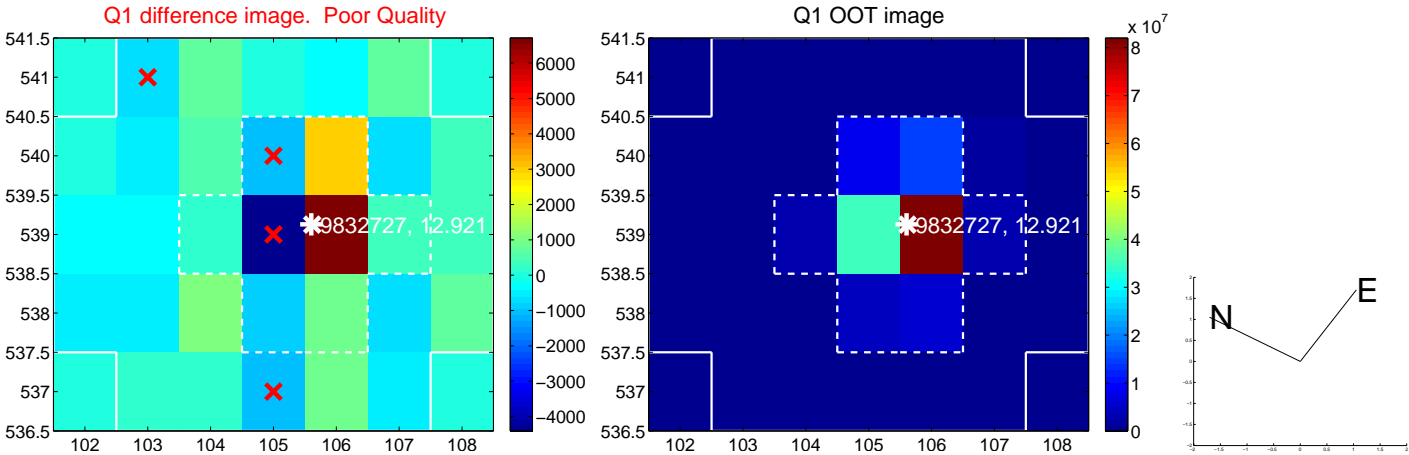
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.255 \pm 0.354$	0.72	$0.174 \pm 0.397$	$0.186 \pm 0.666$
PRF-fit source offset from KIC position	$0.271 \pm 0.317$	0.85	$0.207 \pm 0.437$	$0.175 \pm 0.709$
photometric centroid source offset	$0.34 \pm 0.34$	1.02	$0.19 \pm 0.33$	$0.29 \pm 0.34$

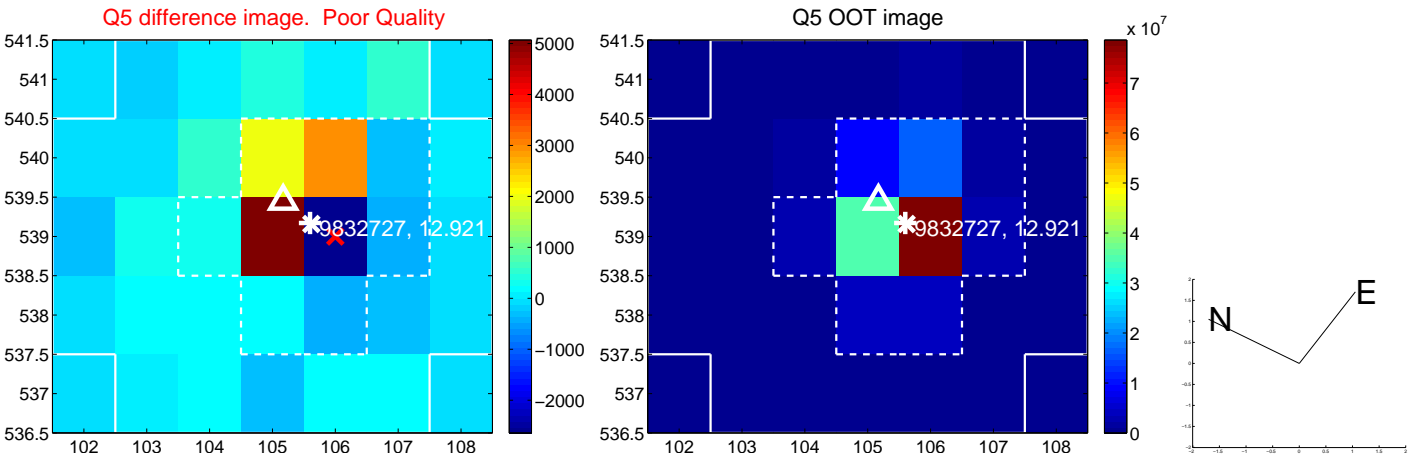


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

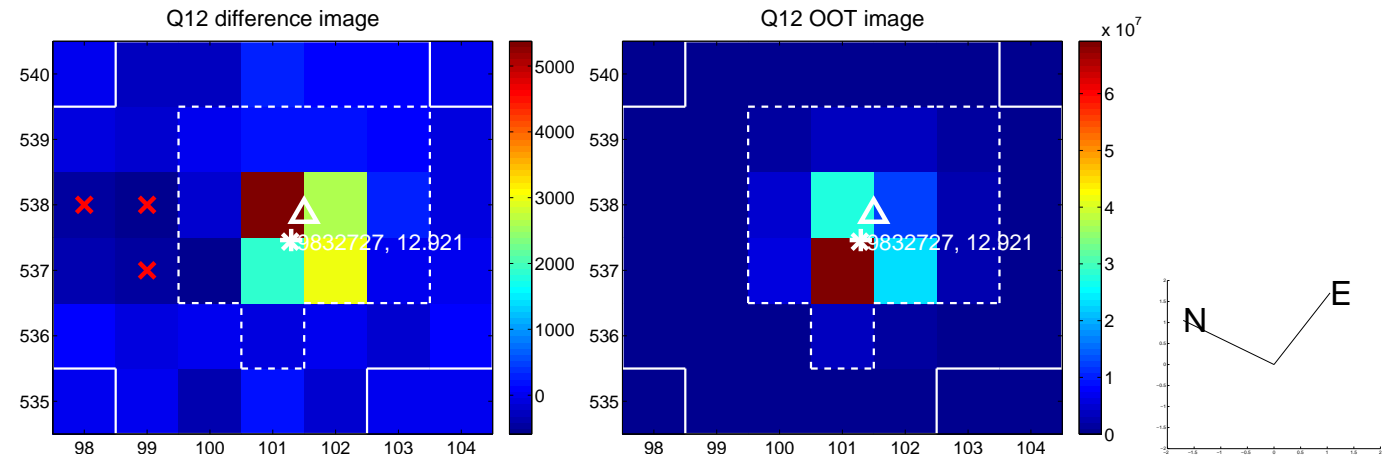
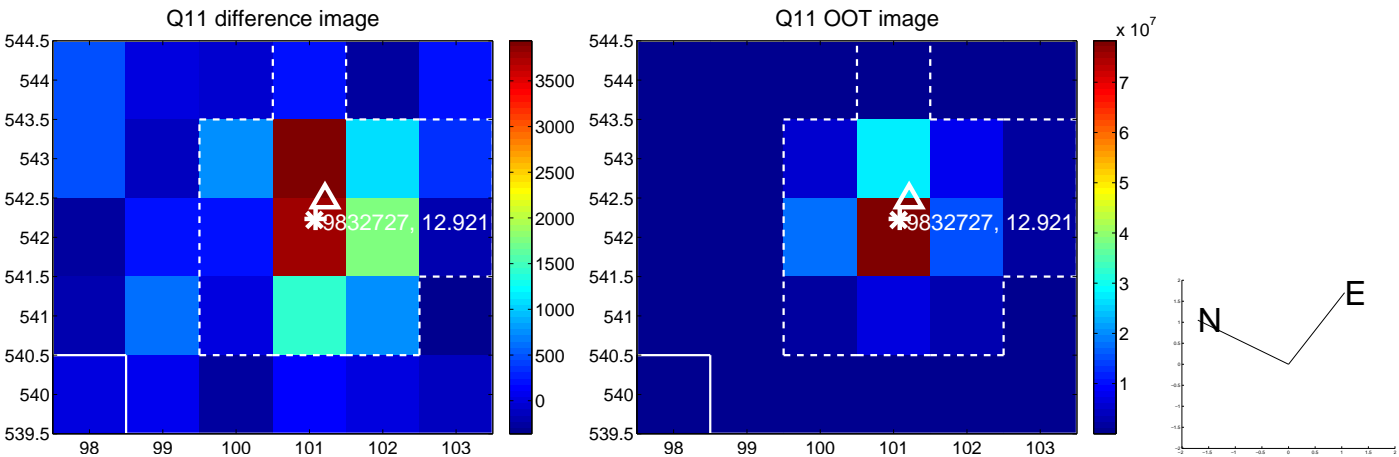
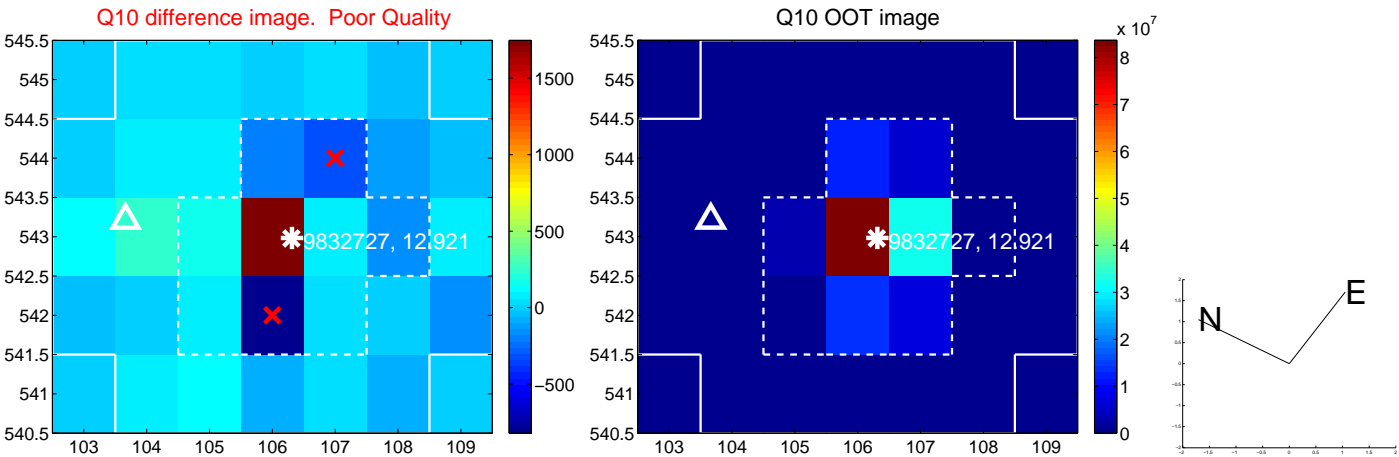
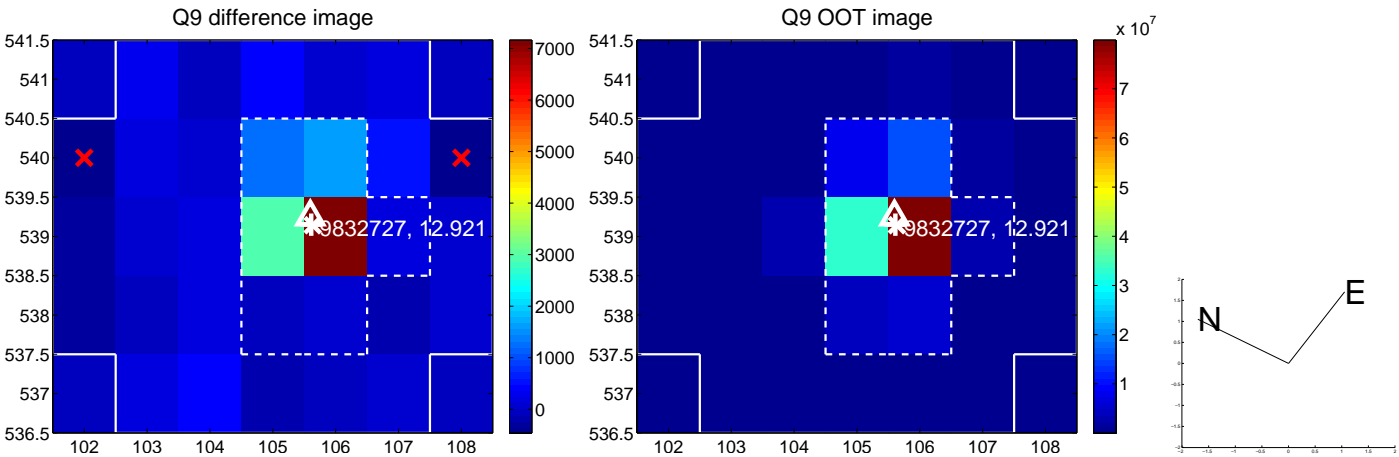


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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

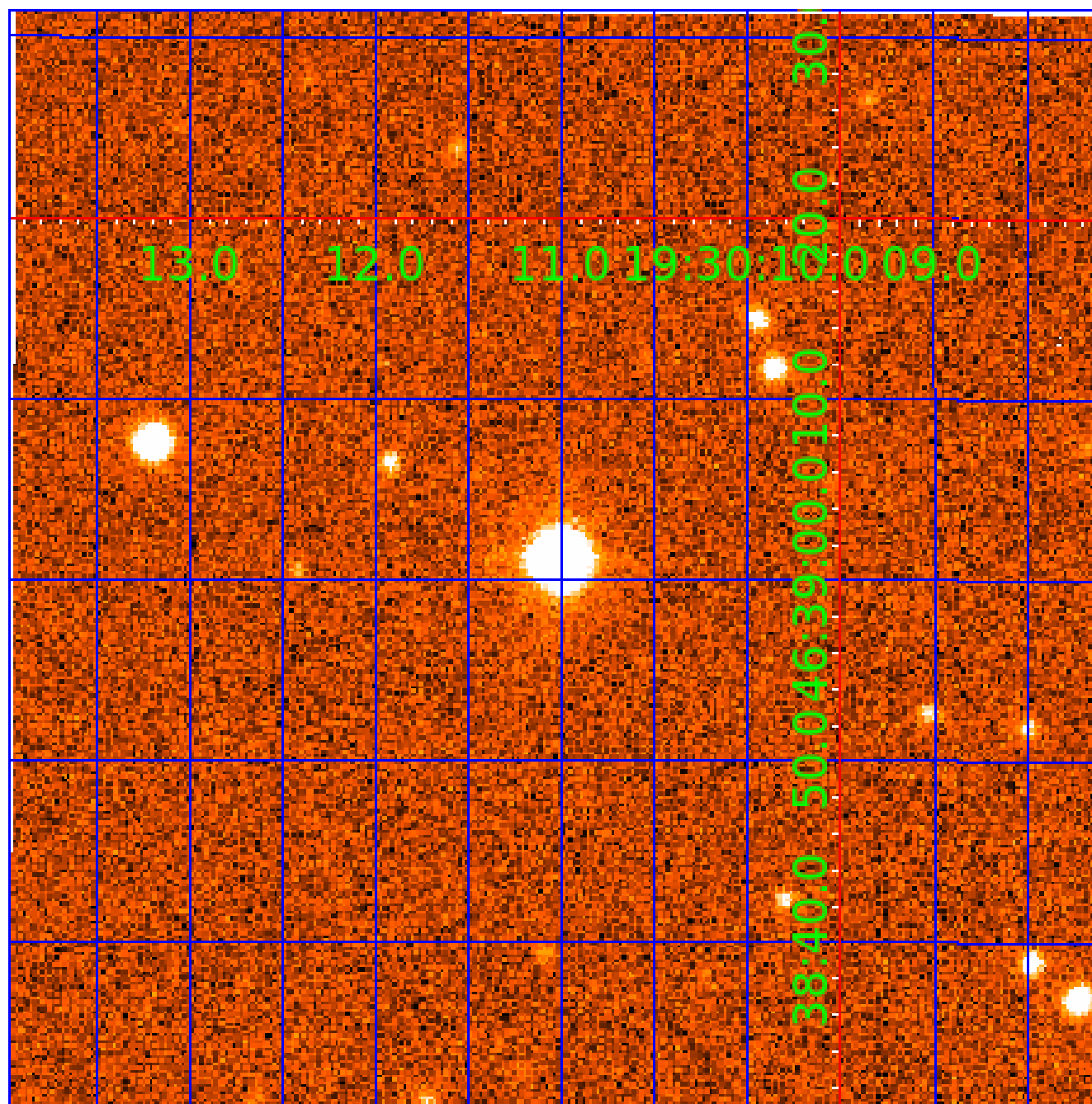






UKIRT Image

Declination





# KIC 009832727

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009832727-01	OBS	No	1.377261	131.843066	44.7	7.904	11.2	11.7	2.13	7914	1.64	18327.55
009832727-02	OBS	No	5.641379	135.833896	463.0	43.098	12.0	18.7	2.13	7914	6.38	2796.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009832727-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
009832727-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT

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

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

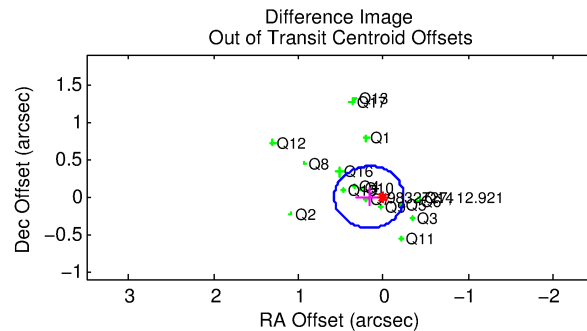
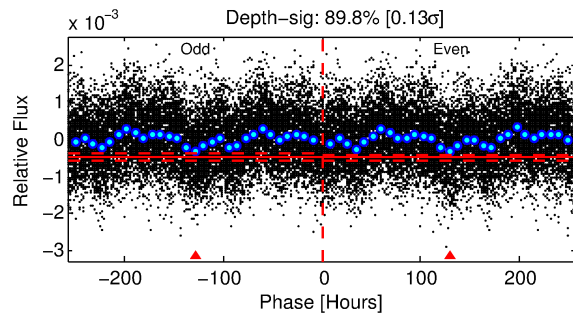
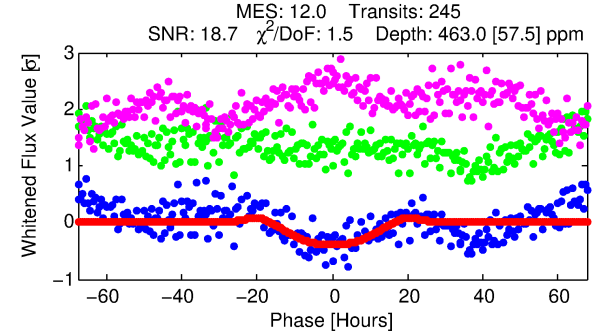
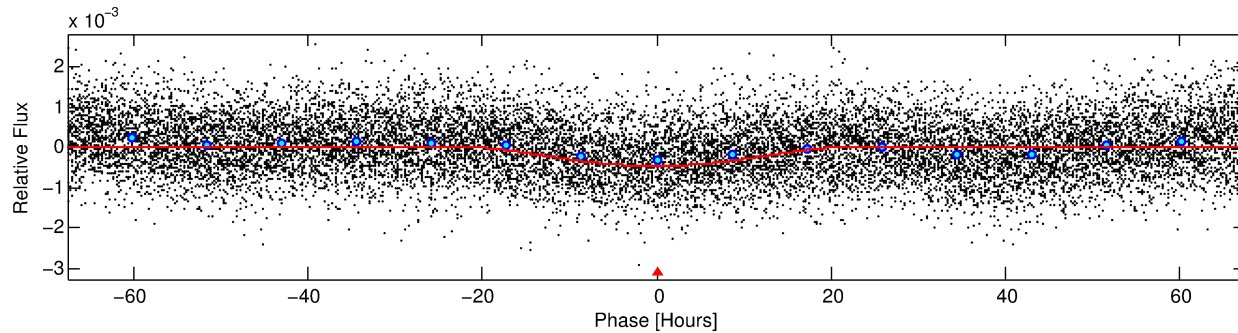
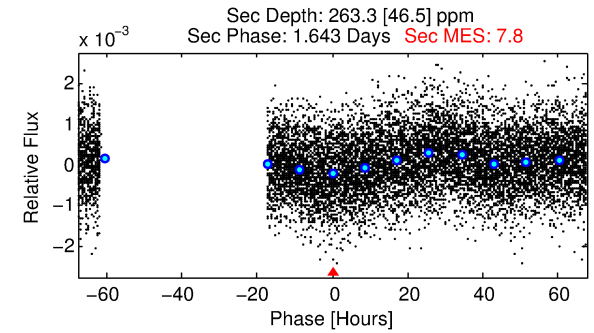
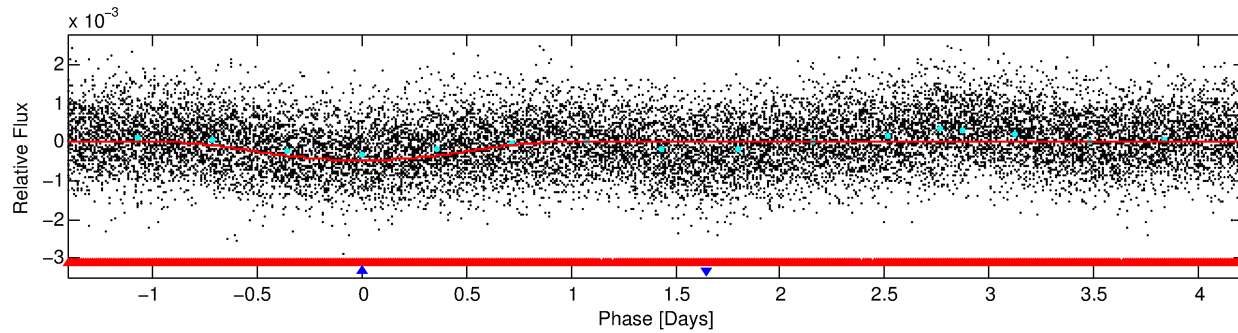
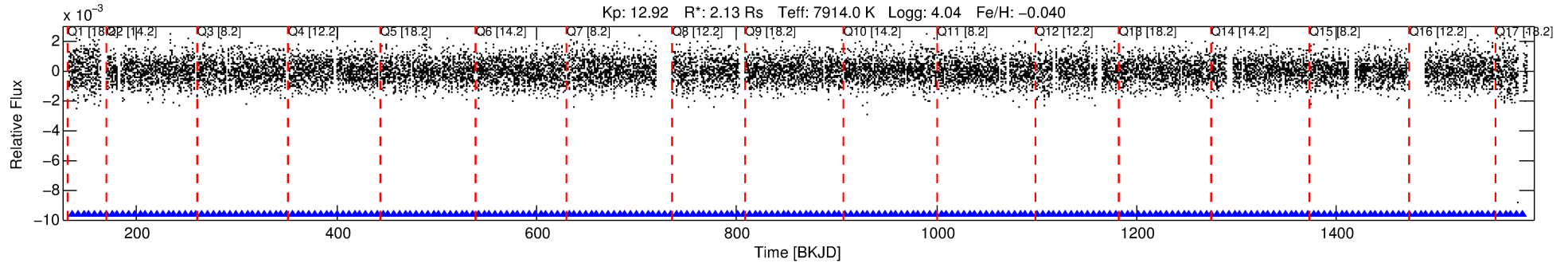
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009832727-02

No Significant Match Found

# DV One-Page Summary

KIC: 9832727 Candidate: 2 of 2 Period: 5.641 d



## DV Fit Results:

Period = 5.64138 [0.00037] d  
Epoch = 135.8339 [0.0542] BKJD  
Rp/R\* = 0.0275 [0.0060]  
a/R\* = 1.05 [0.00]  
b = 0.98 [0.01]  
Seff = 2796.49 [993.45]  
Teq = 1854 [165] K  
Rp = 6.38 [2.17] Re  
a = 0.0754 [0.0164] AU  
Ag = 20.28 [11.45] [1.68σ]  
Teffp = 6084 [757] K [5.46σ]

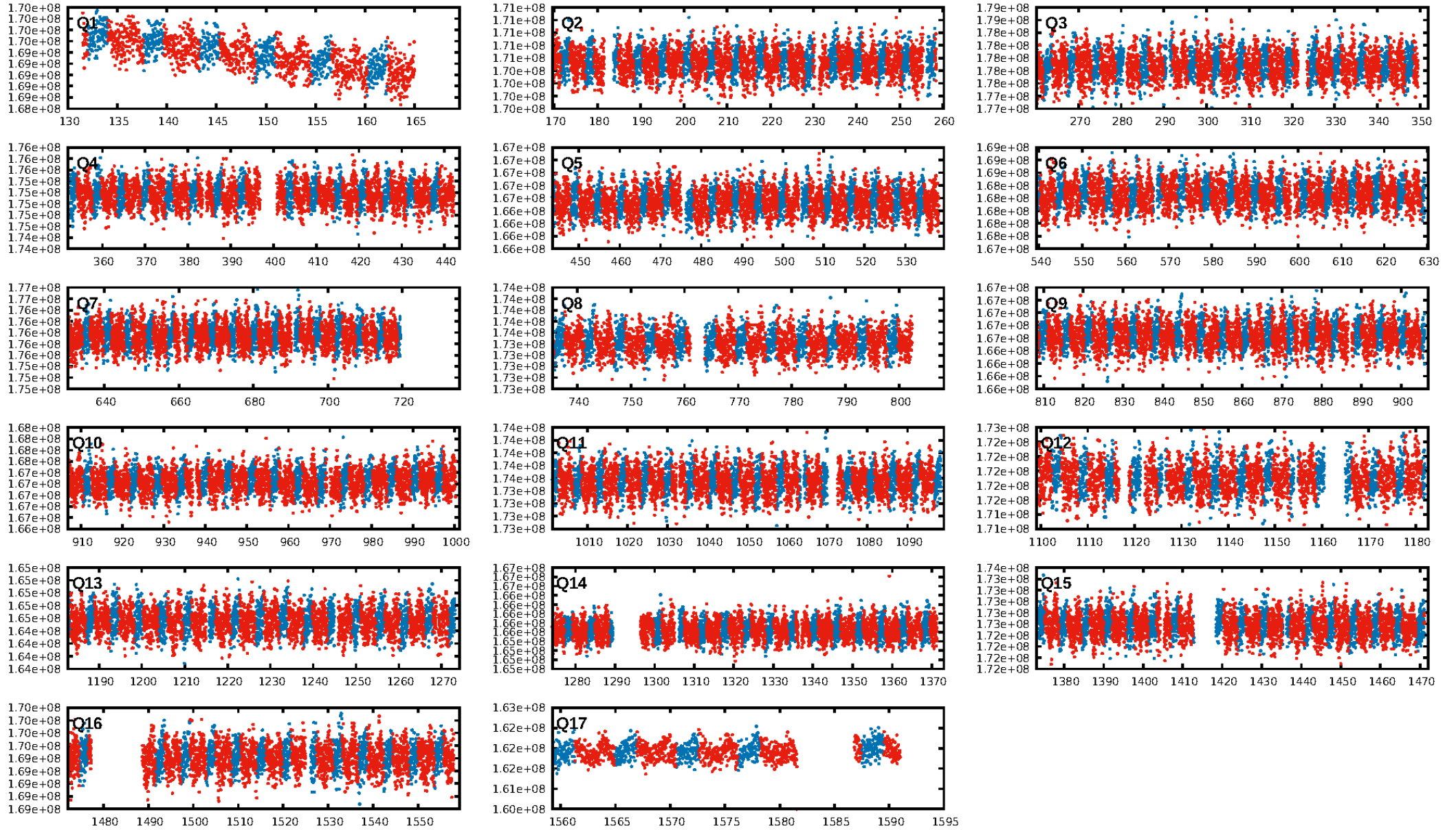
## DV Diagnostic Results:

ShortPeriod-sig: 98.0% [2.34σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [234/234]  
GhostDiagnostic-chr: 1.489  
Centroid-sig: 4.2%  
Centroid-so: 0.074 arcsec [1.49σ]  
OotOffset-rm: 0.165 arcsec [1.20σ]  
KicOffset-rm: 0.218 arcsec [1.52σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

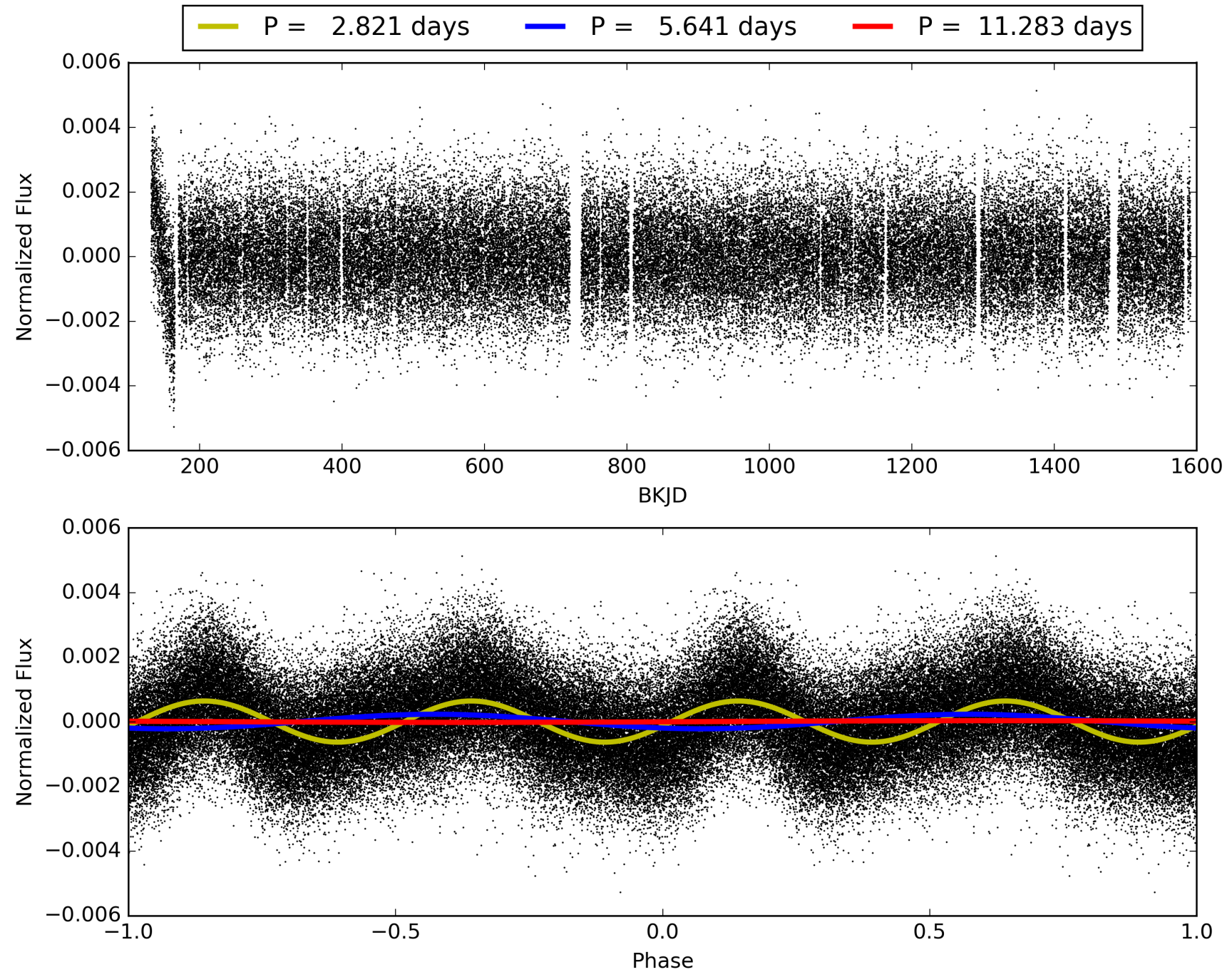
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 10:30:54 Z

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

# TCE 009832727-02, PDC Light Curves



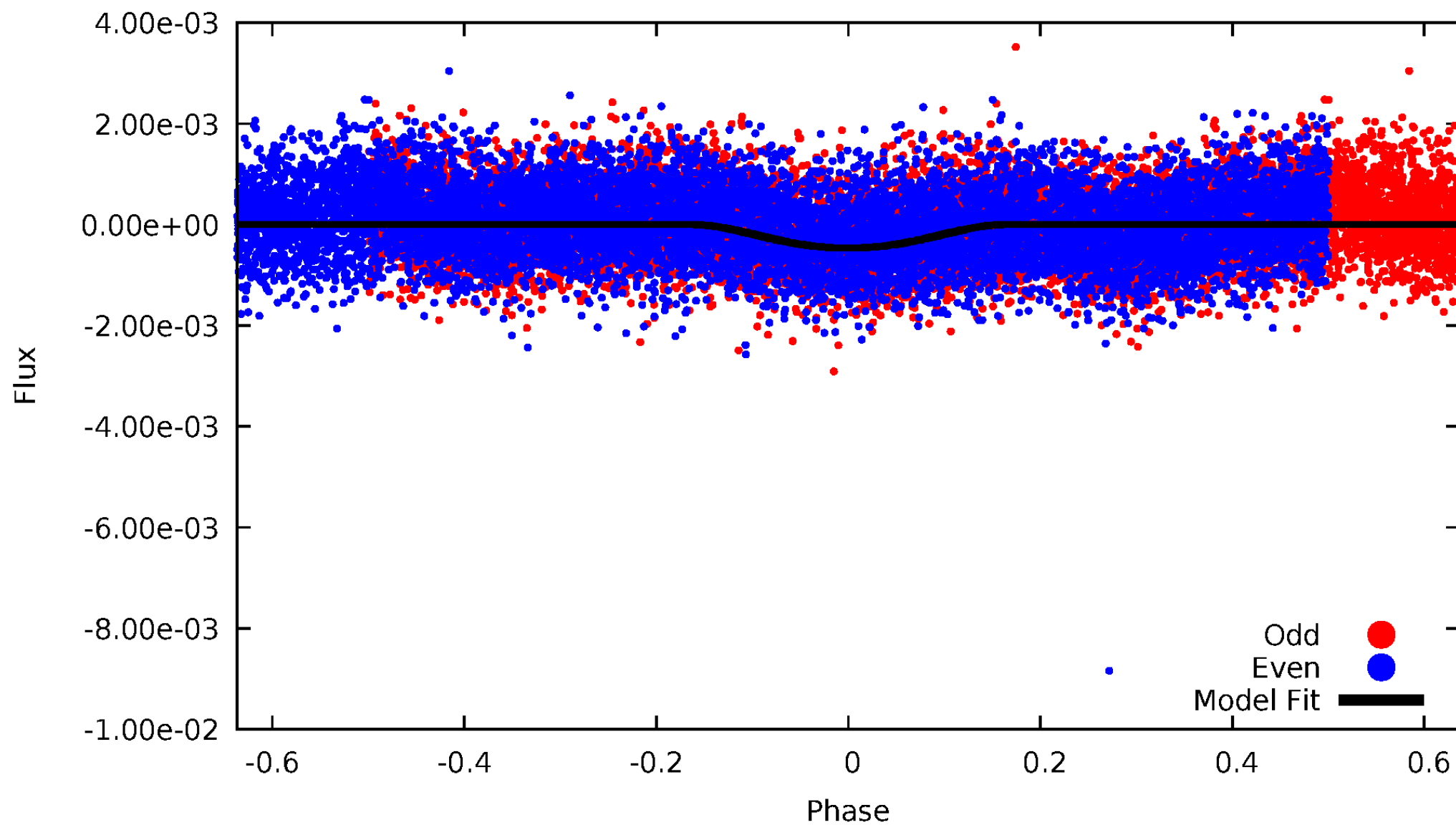
TCE 009832727-02





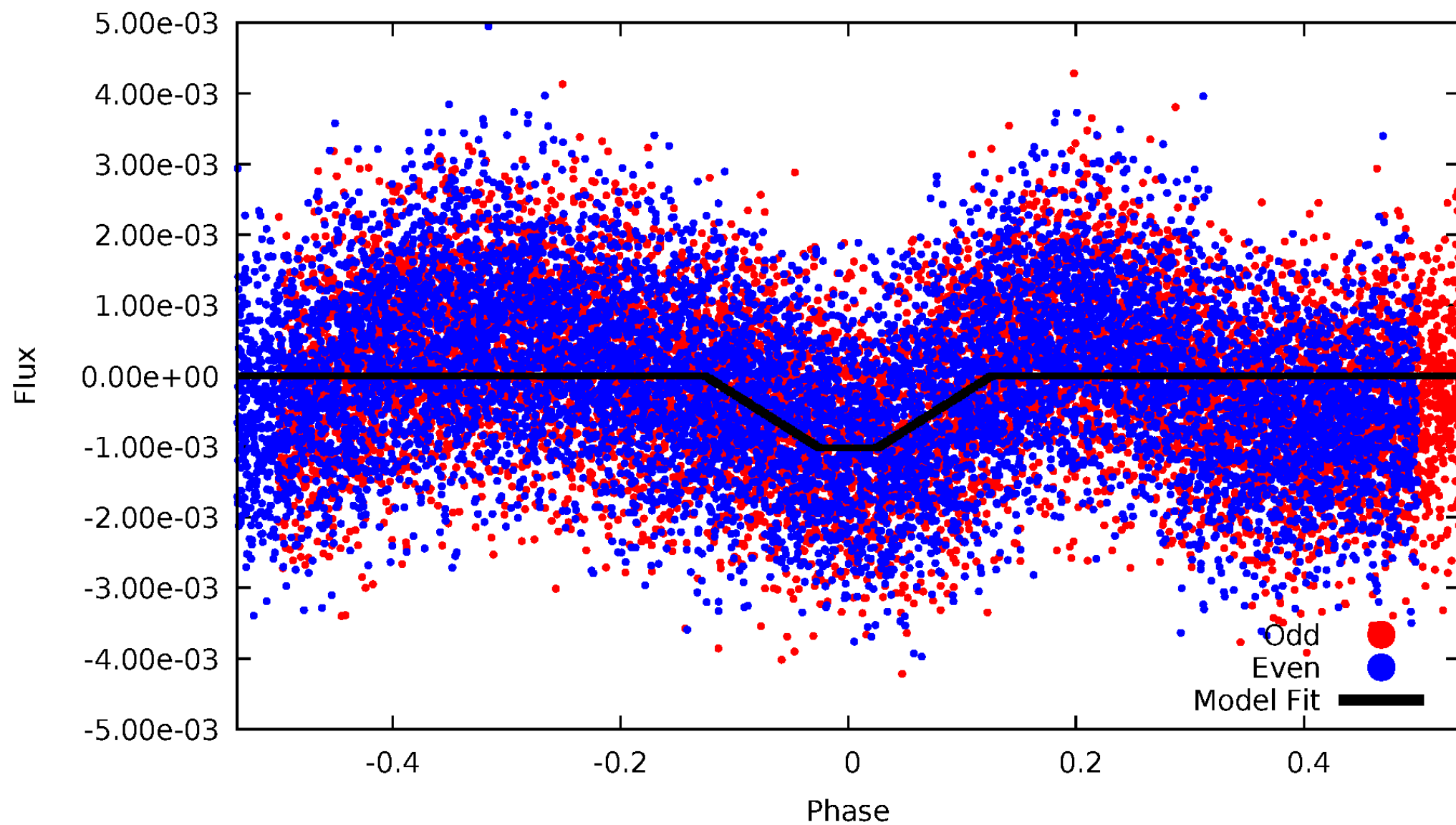
DV Odd/Even

TCE 009832727-02



# ALT Odd/Even

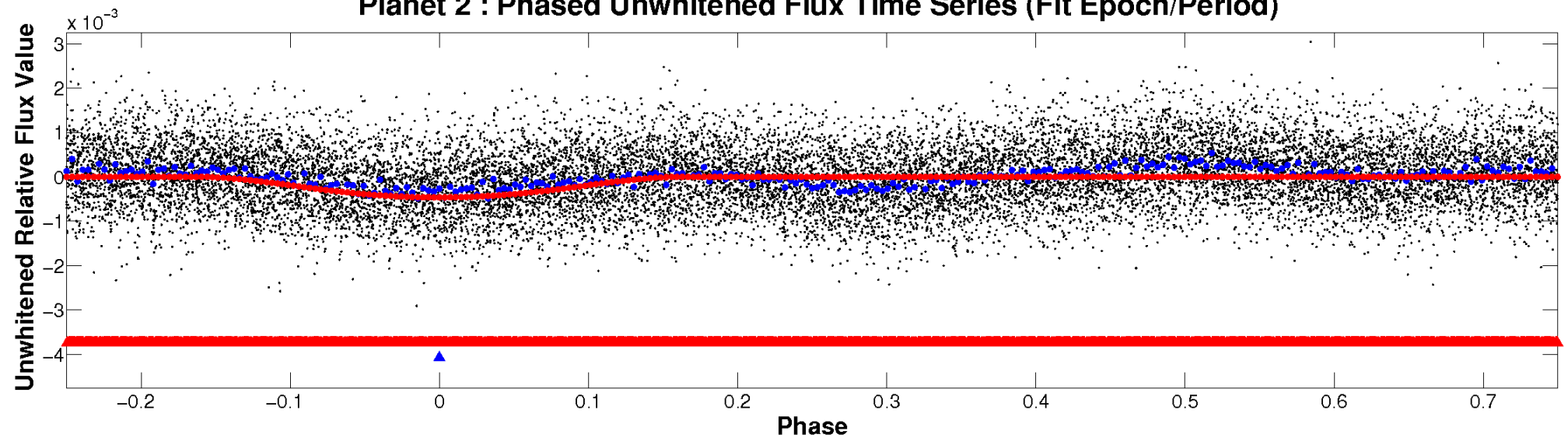
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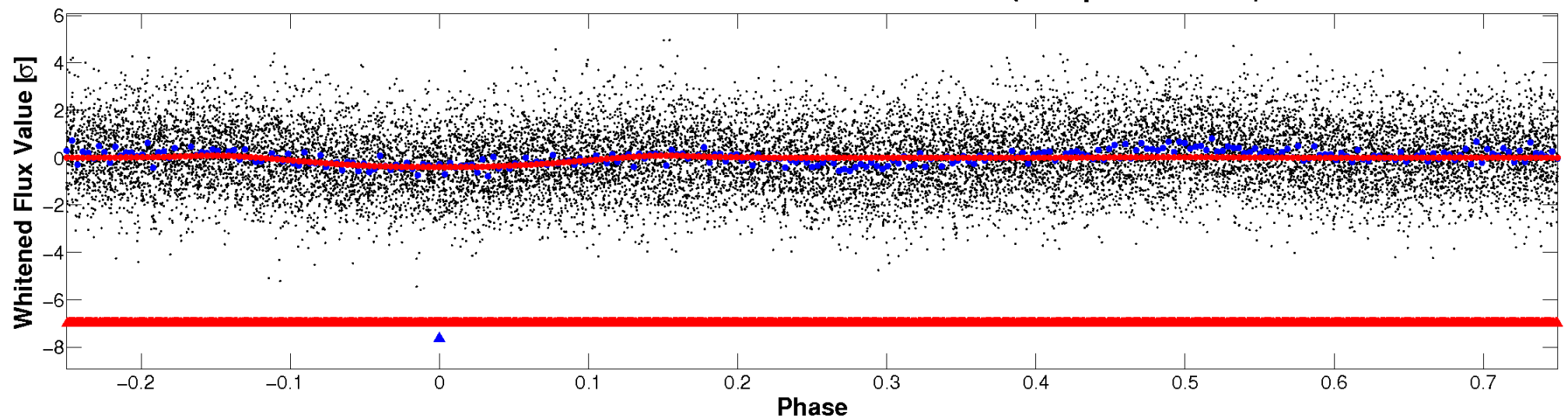


# Non-Whitened Vs. Whitened Light Curve

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

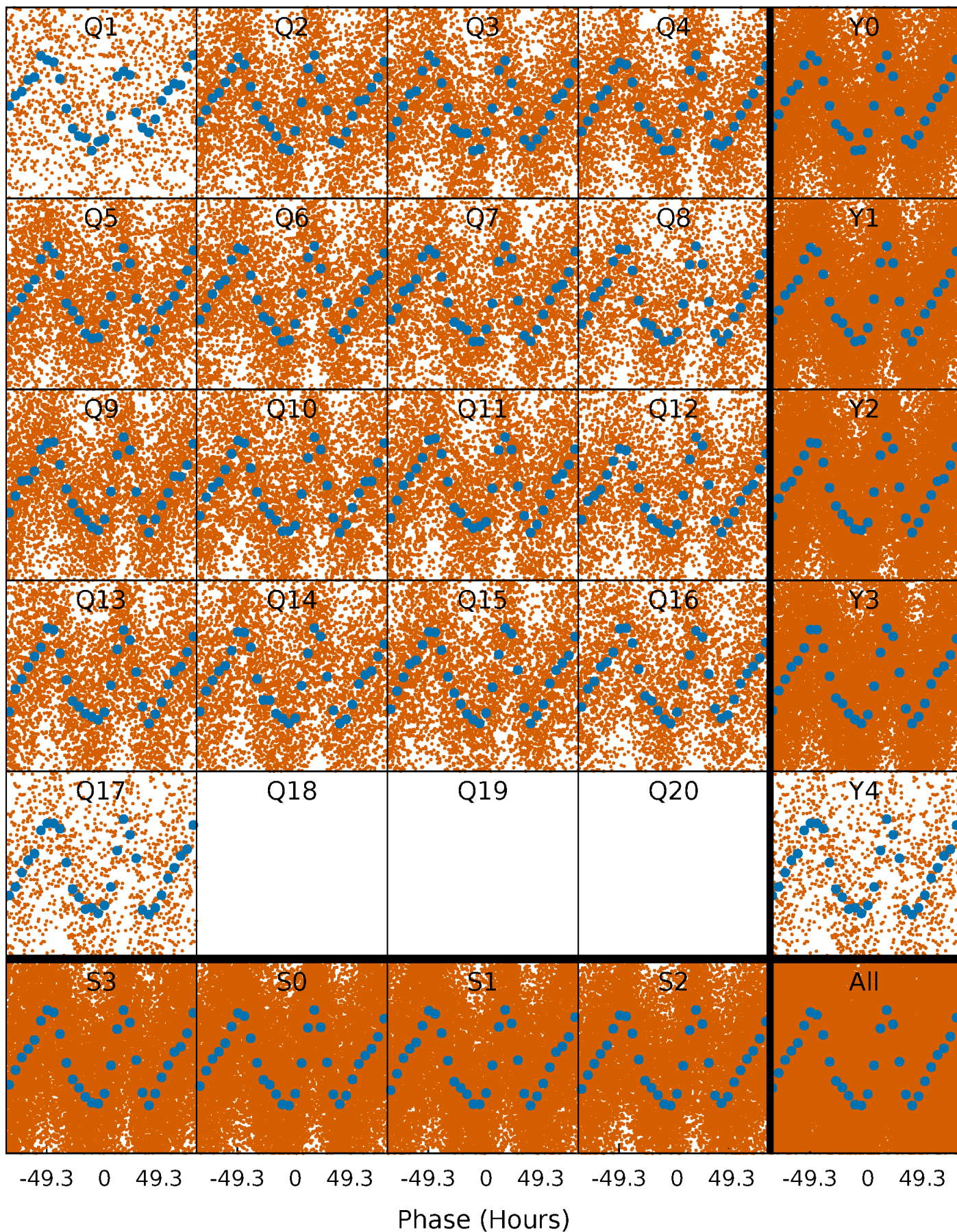


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

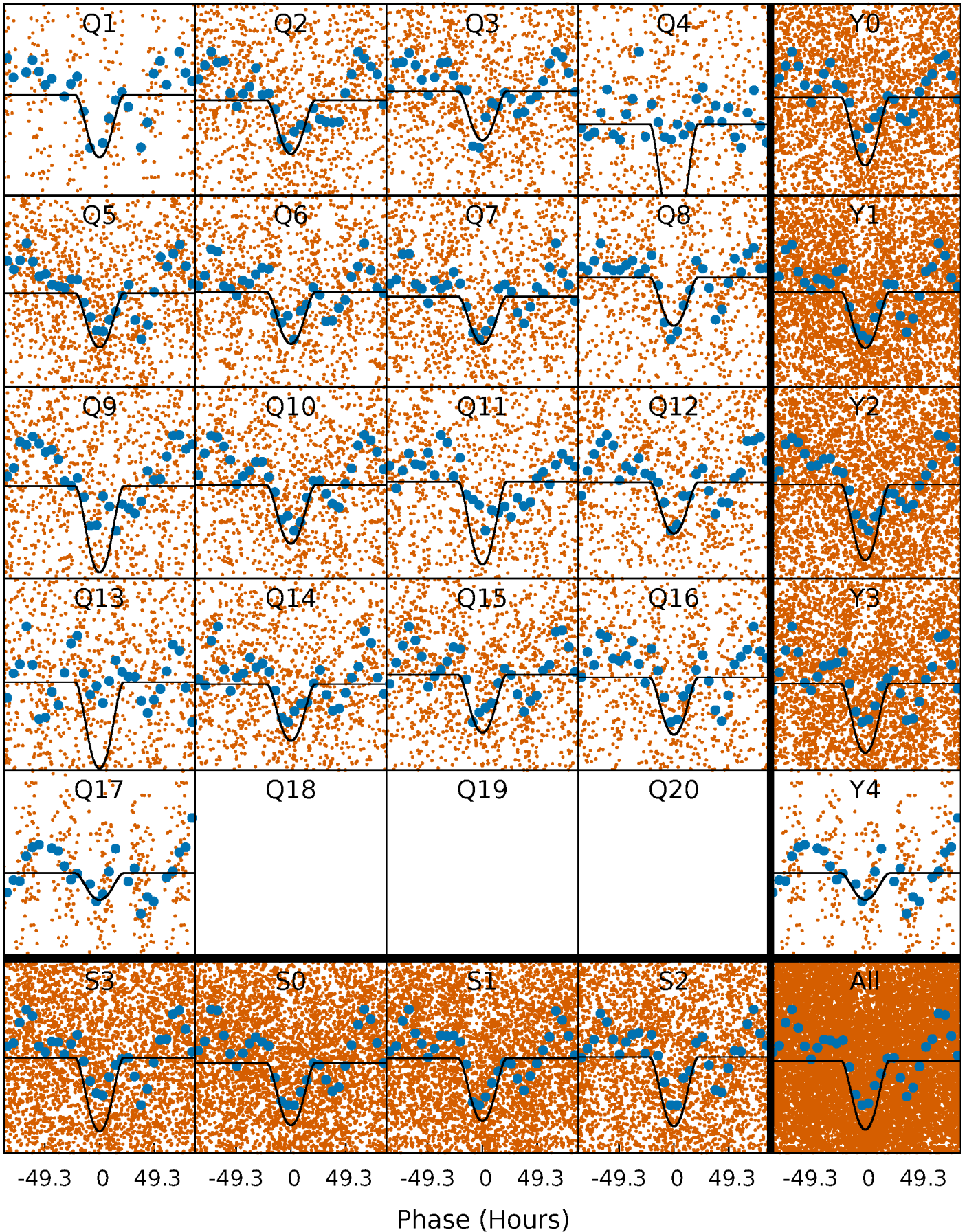
TCE 009832727-02   P= 5.641379 Days    $T_0=135.833896$  (BKJD)





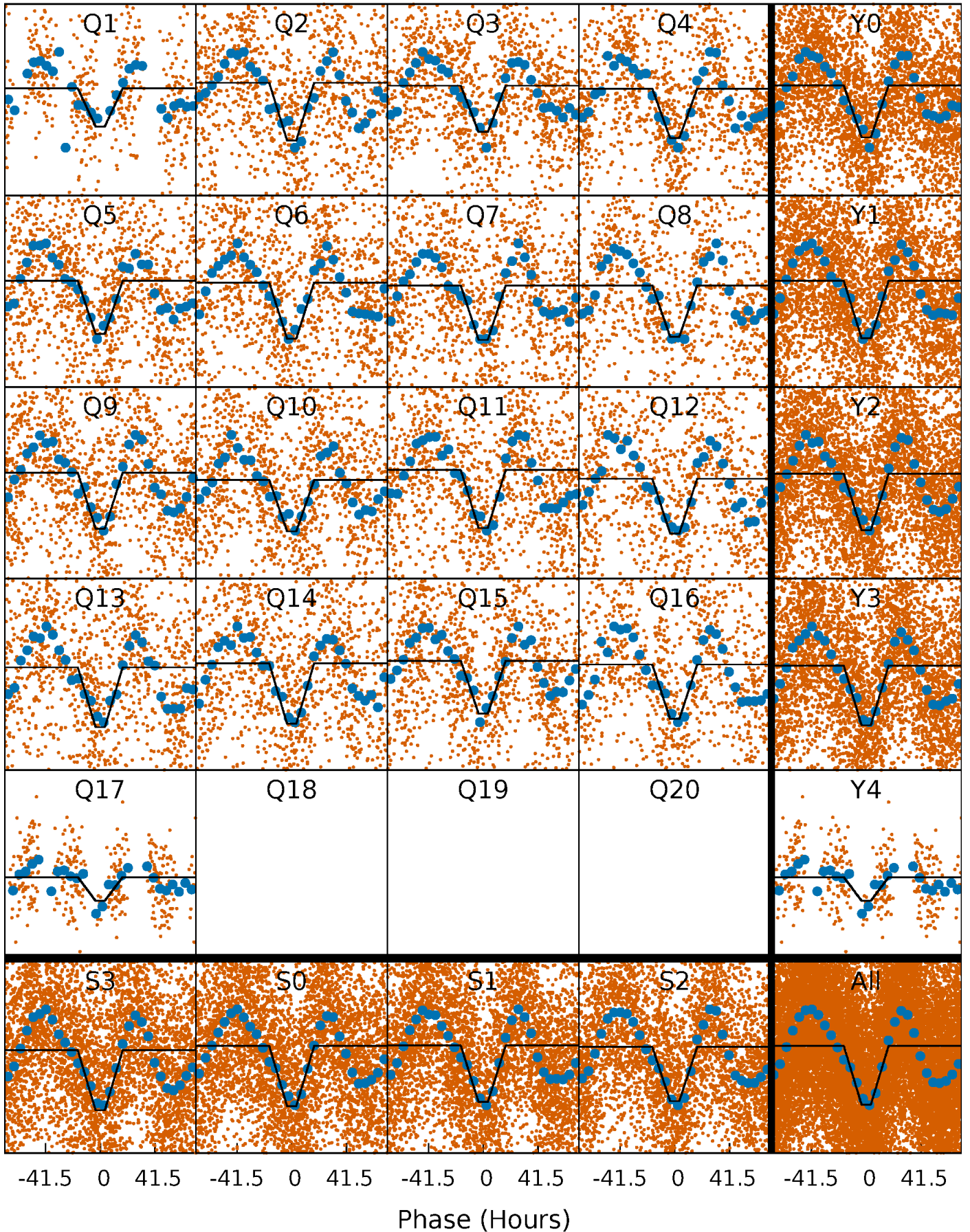
# DV Quarter-Phased Transit Curves

TCE 009832727-02   P= 5.641379 Days    $T_0=135.833896$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009832727-02   P= 5.641538 Days    $T_0=135.459484$  (BKJD)

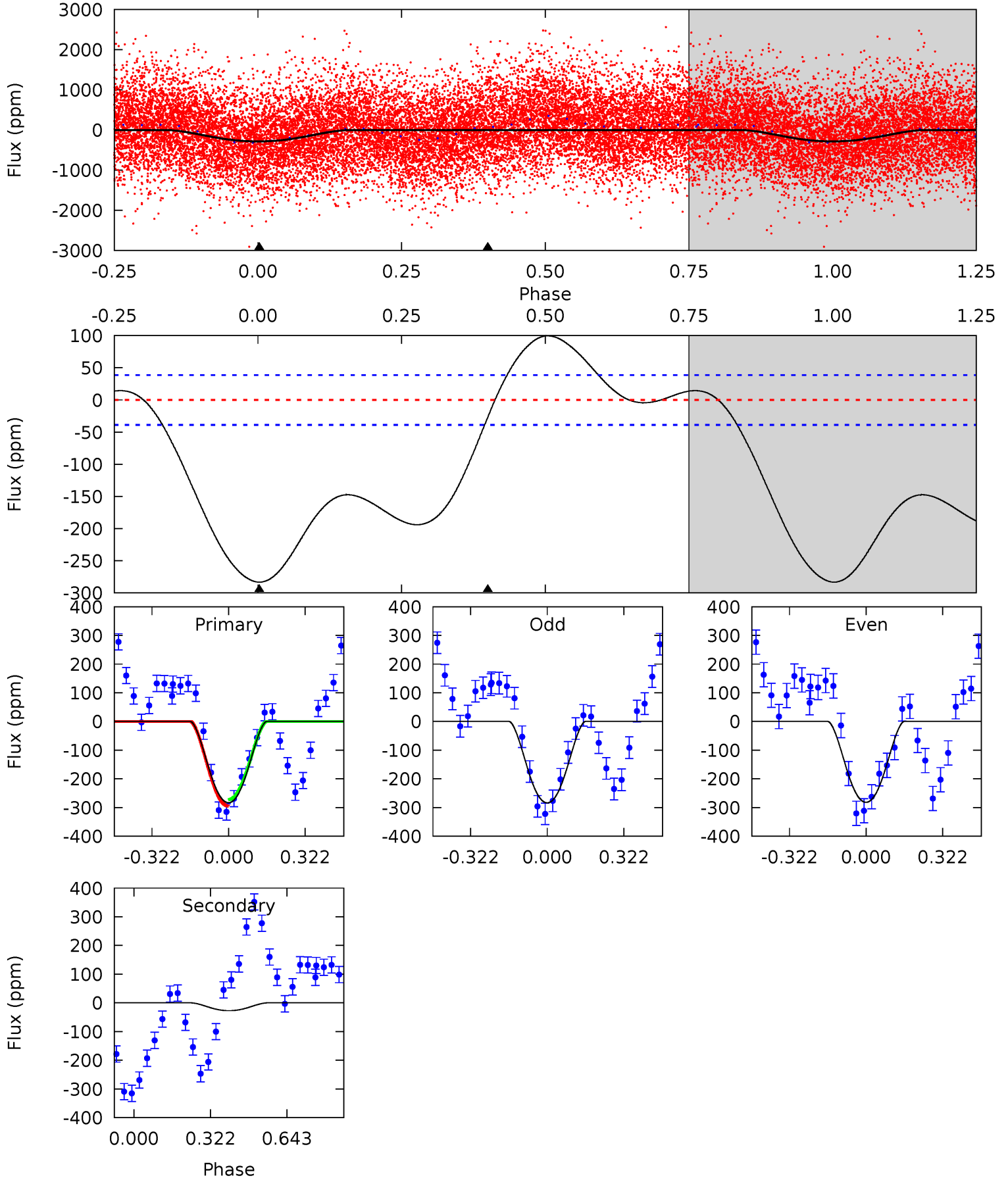




# DV Model-Shift Uniqueness Test

009832727-02, P = 5.641379 Days, E = 130.192517 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
31.6	3.03	0	0	4.31	0.99	0.70	31.6	31.6	3.03	3.03	0.11	0.98	0.26	1.20

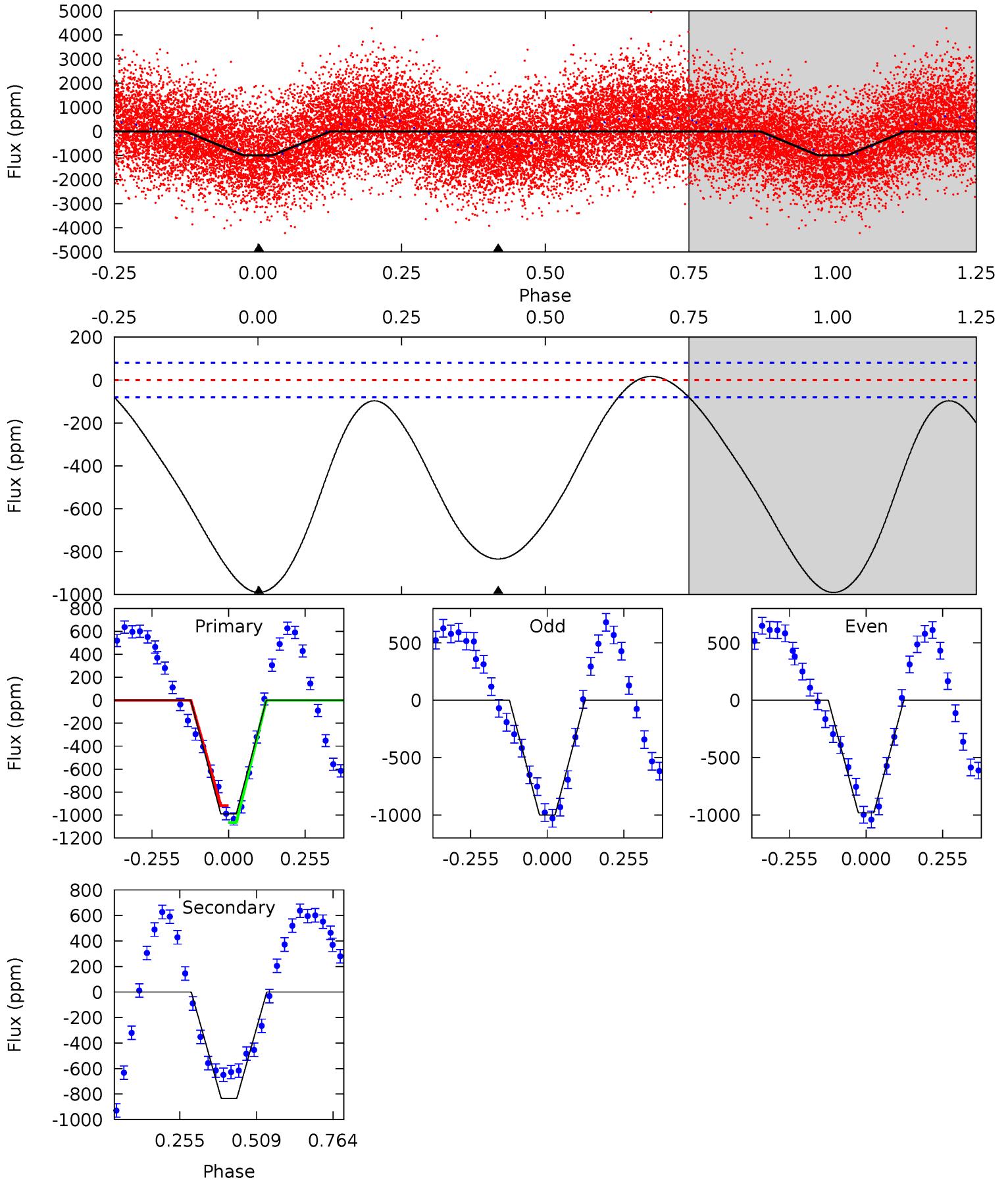




# Alt Model-Shift Uniqueness Test

009832727-02, P = 5.641538 Days, E = 129.817946 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
53.6	45.2	0	0	4.36	1.14	2.04	53.6	53.6	45.2	45.2	0.53	0.96	0.02	4.34



### Stellar Parameters For KIC 009832727

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7914^{+219}_{-329}$	$4.037^{+0.170}_{-0.139}$	$-0.040^{+0.200}_{-0.350}$	$2.128^{+0.456}_{-0.557}$	$1.799^{+0.144}_{-0.313}$	$0.263^{+0.245}_{-0.108}$
	+3%/-4%	+4%/-3%	+500%/-875%	+21%/-26%	+8%/-17%	+93%/-41%
Source	KIC0	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 009832727-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-27 \pm 9$	$6.31^{+1.70}_{-1.43}$	$2583^{+163}_{-180}$	$3625^{+418}_{-378}$	$2.056^{+1.615}_{-0.951}$
Alt.	$-834 \pm 18$	$7.19^{+1.81}_{-1.67}$	$2580^{+160}_{-176}$	$7410^{+1113}_{-727}$	$50^{+33}_{-18}$

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

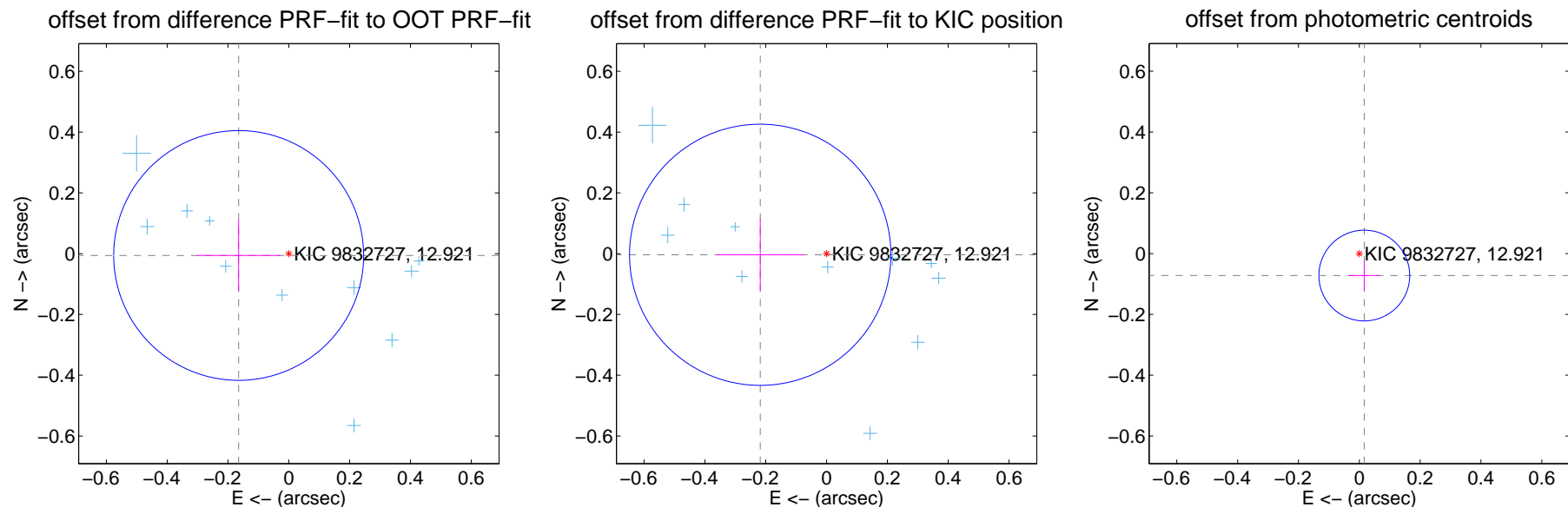
## DV Centroid Data

Supplemental centroid analysis for 009832727-02. Kepler magnitude: 12.92. Transit SNR 18.73

There are 17 quarters with good PRF difference image offsets

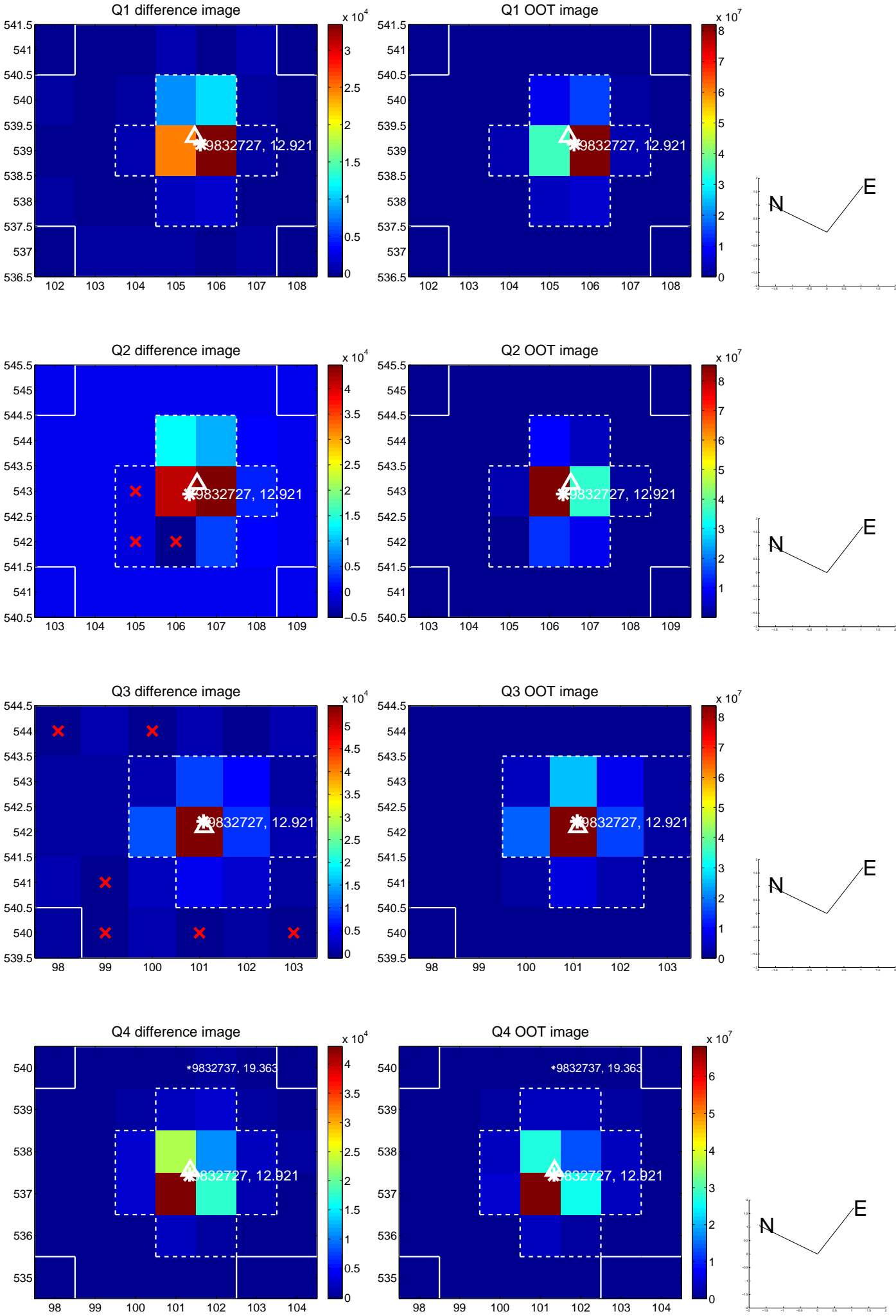
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.165 \pm 0.137$	1.20	$0.165 \pm 0.137$	$-0.006 \pm 0.118$
PRF-fit source offset from KIC position	$0.218 \pm 0.143$	1.52	$0.218 \pm 0.143$	$-0.004 \pm 0.118$
photometric centroid source offset	$0.07 \pm 0.05$	1.49	$-0.02 \pm 0.05$	$-0.07 \pm 0.05$

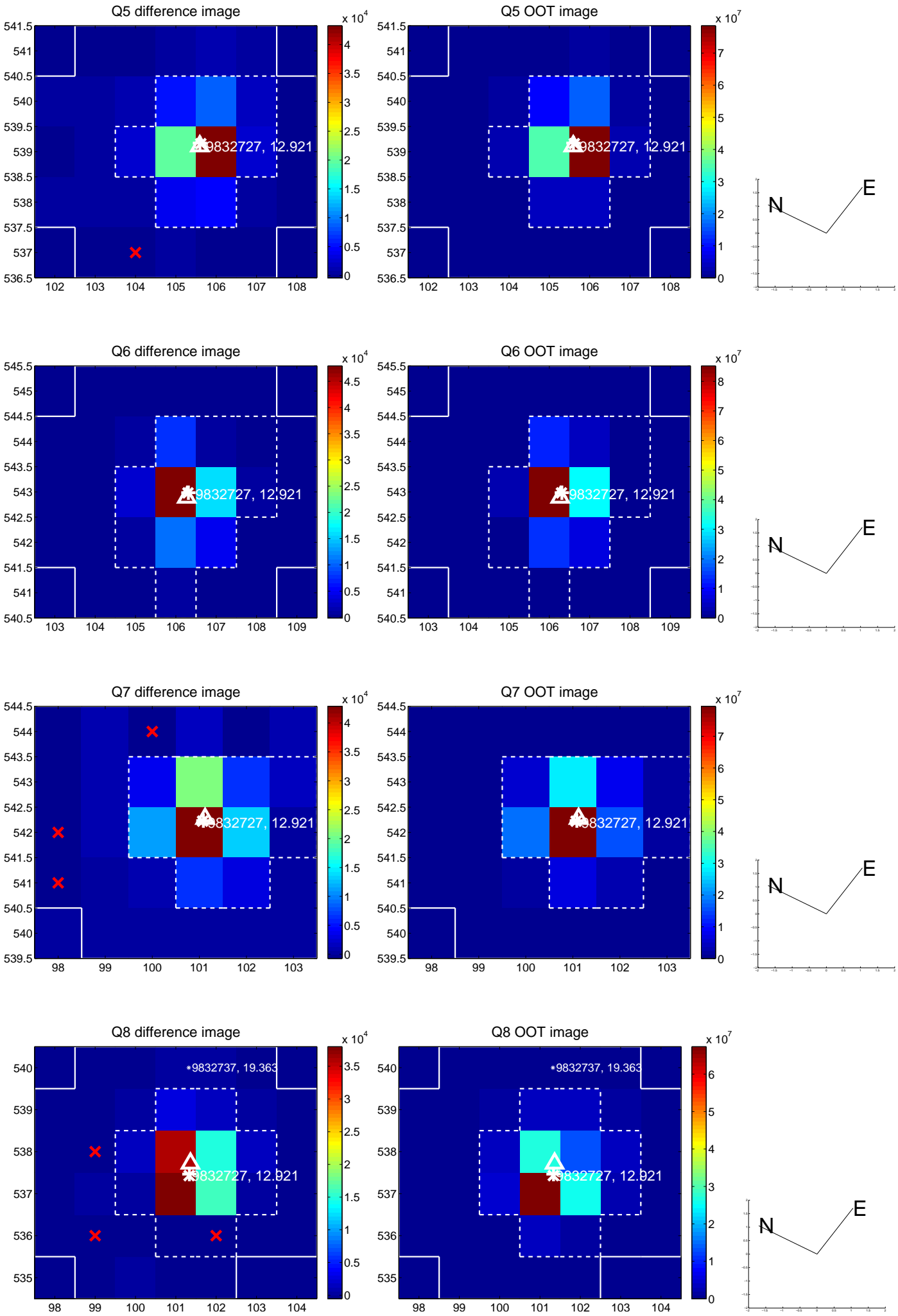


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

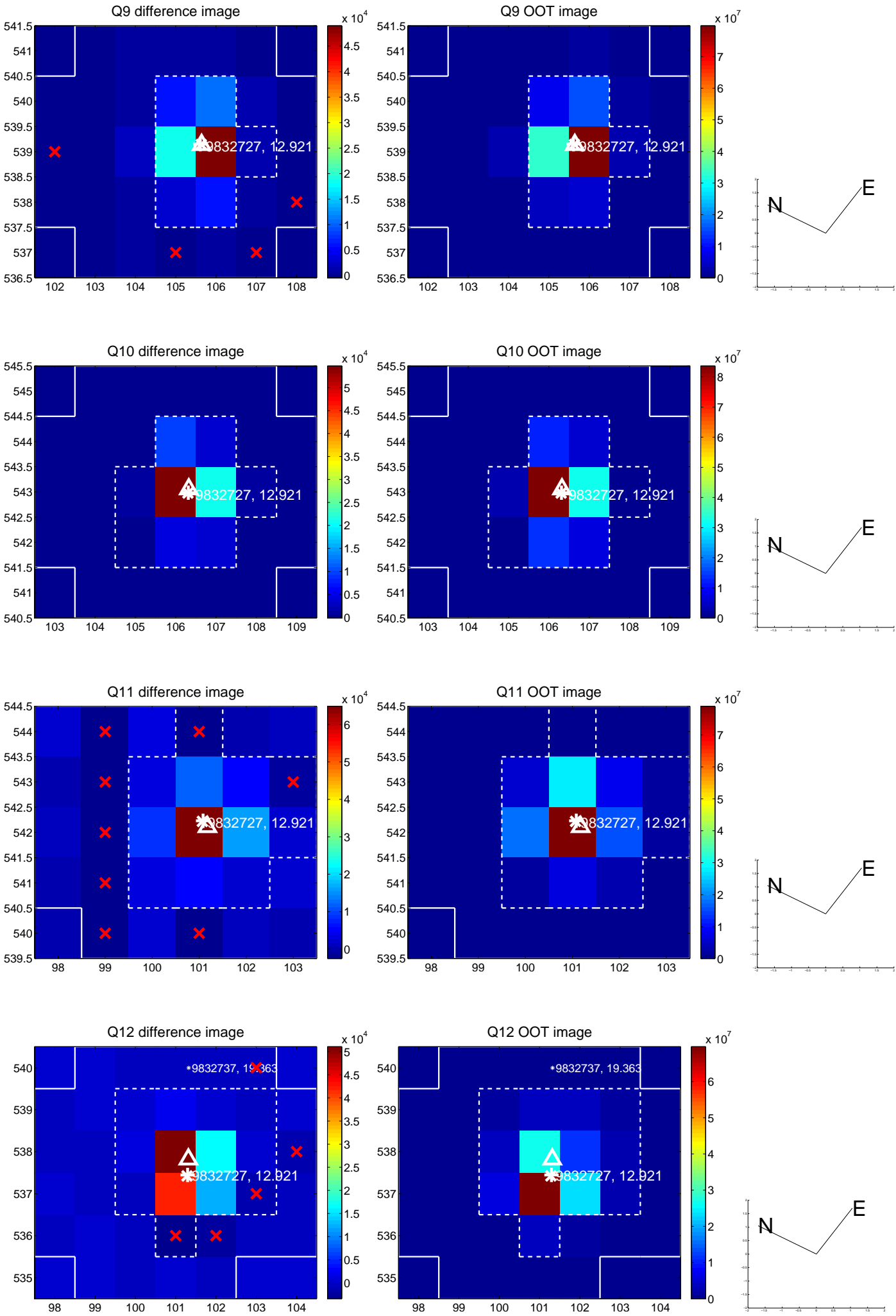


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

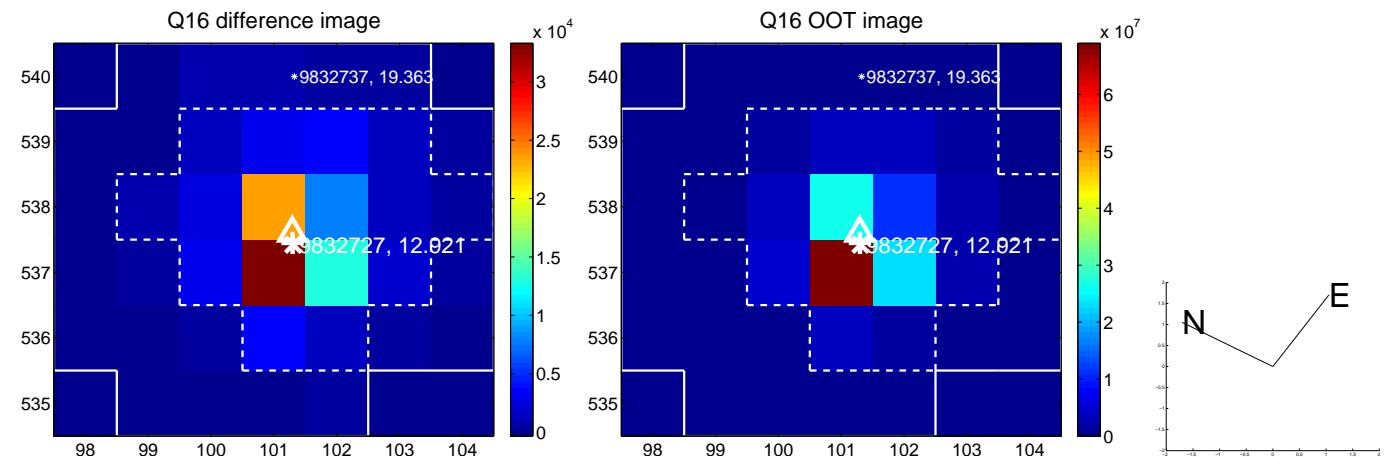
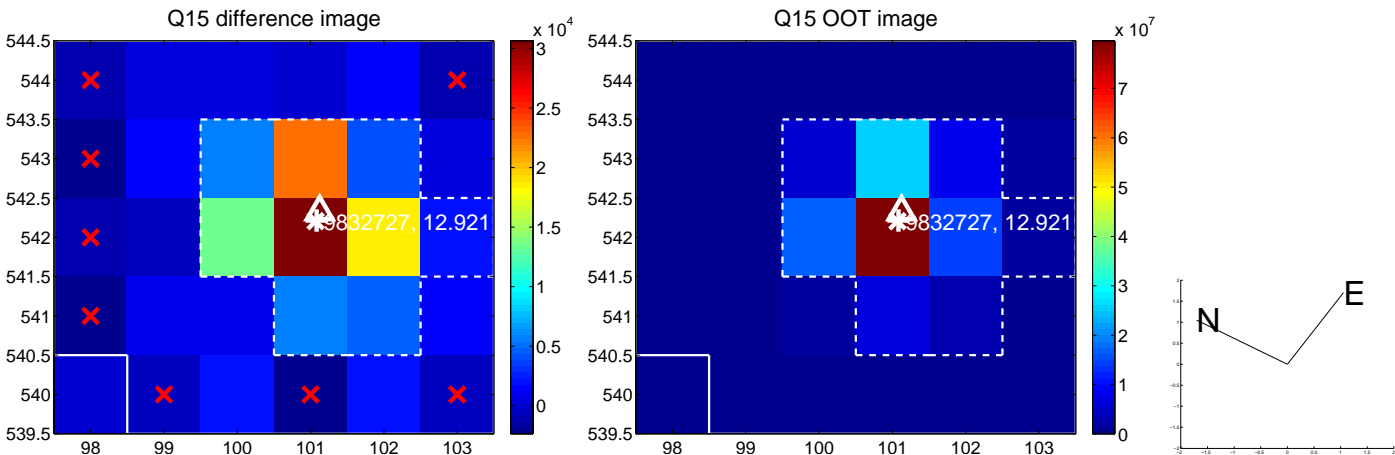
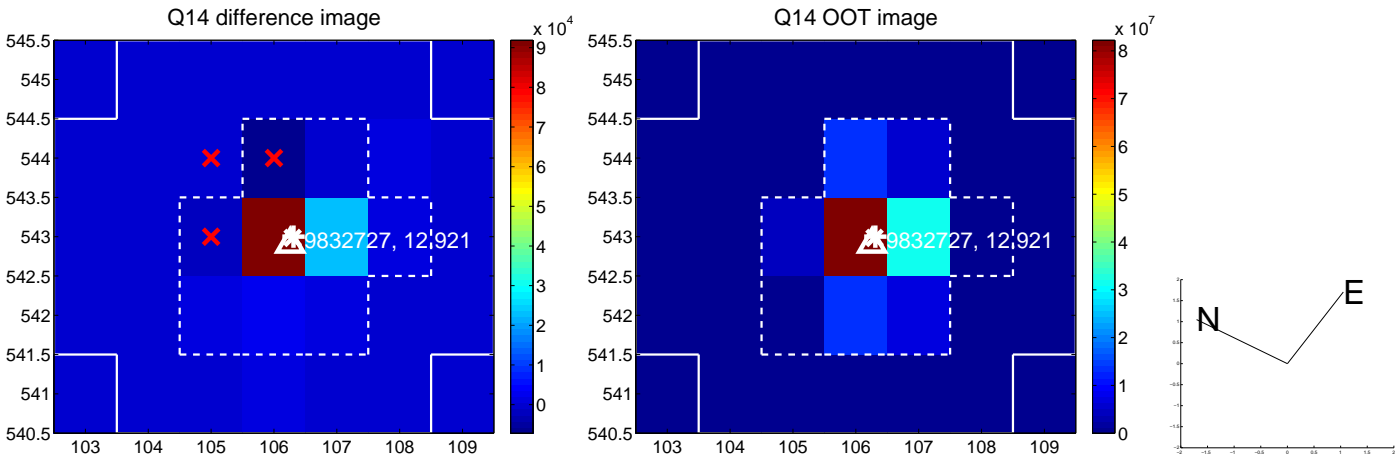
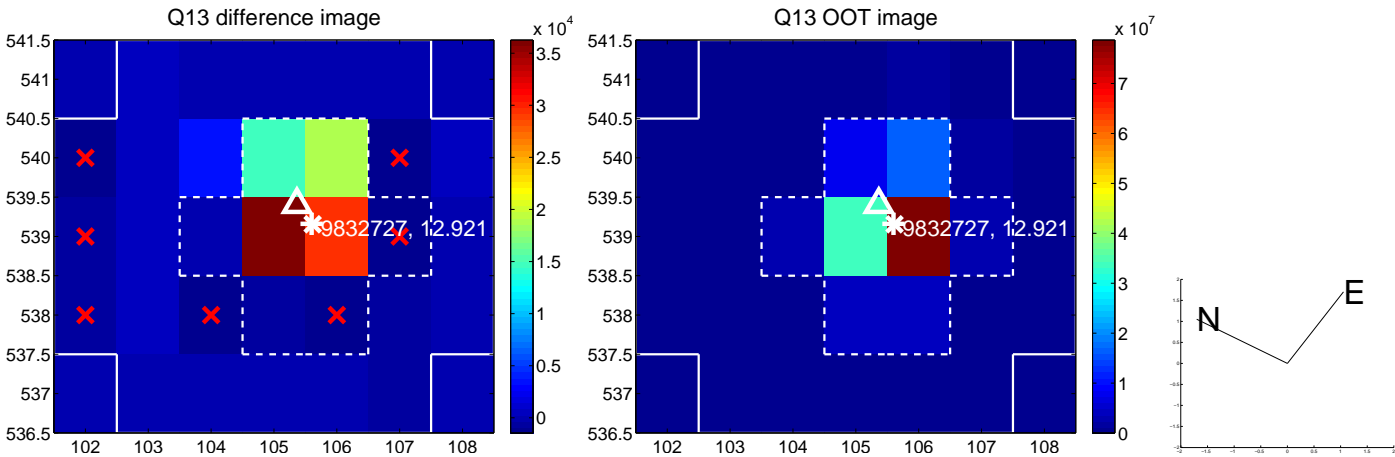




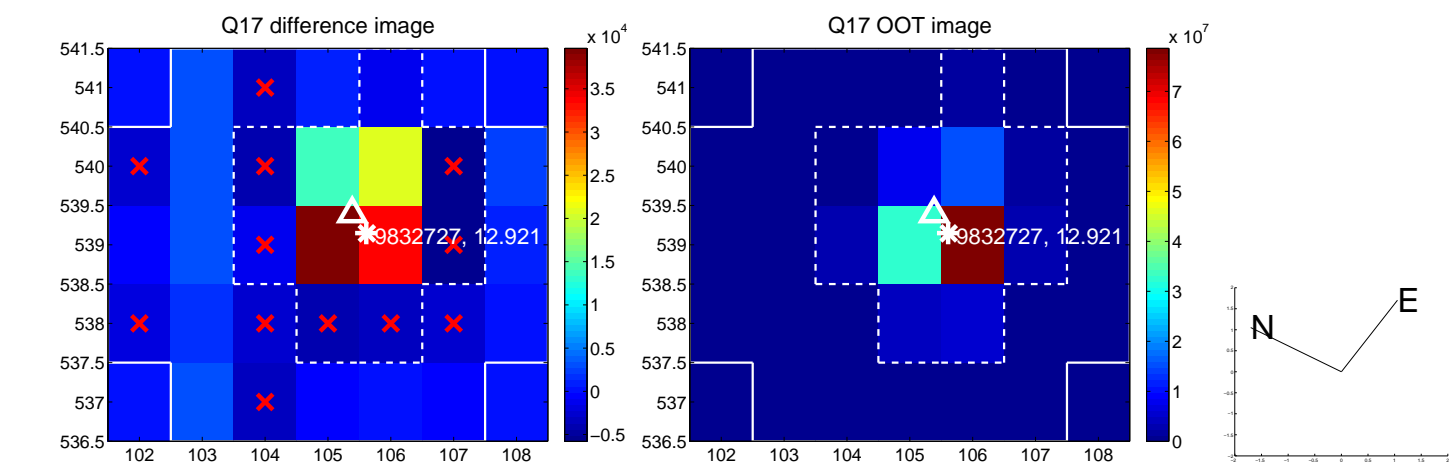
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



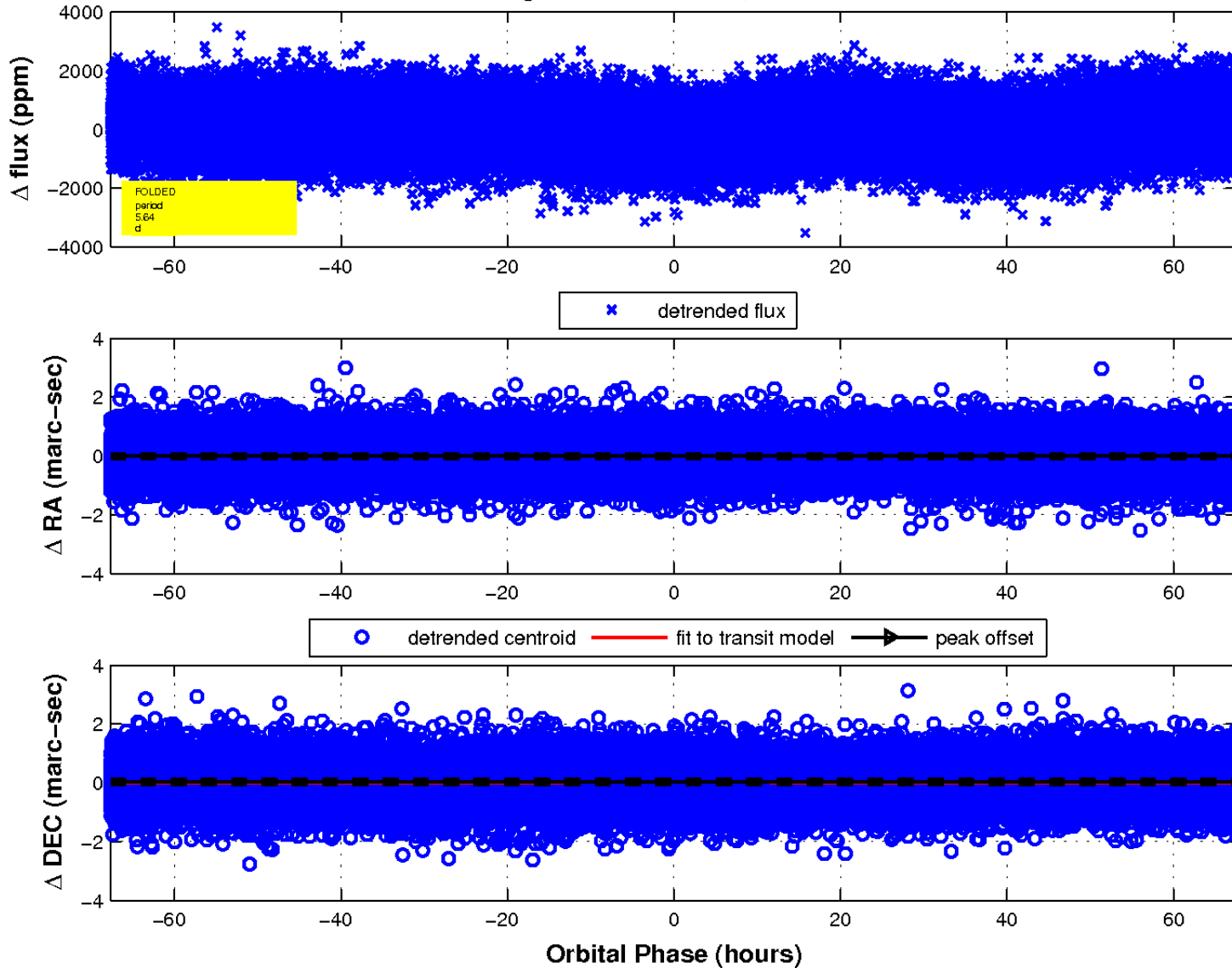
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

