

# KIC 002557335

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002557335-01	OBS	No	0.701112	132.196548	5.4	1.624	8.6	0.3	0.80	5569	0.18	2816.67
002557335-02	OBS	No	0.701277	131.843529	0.0	0.721	8.5	0.0	0.80	5569	0.01	2815.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002557335-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET
002557335-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_UNRESOLVED_OFFSET

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

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

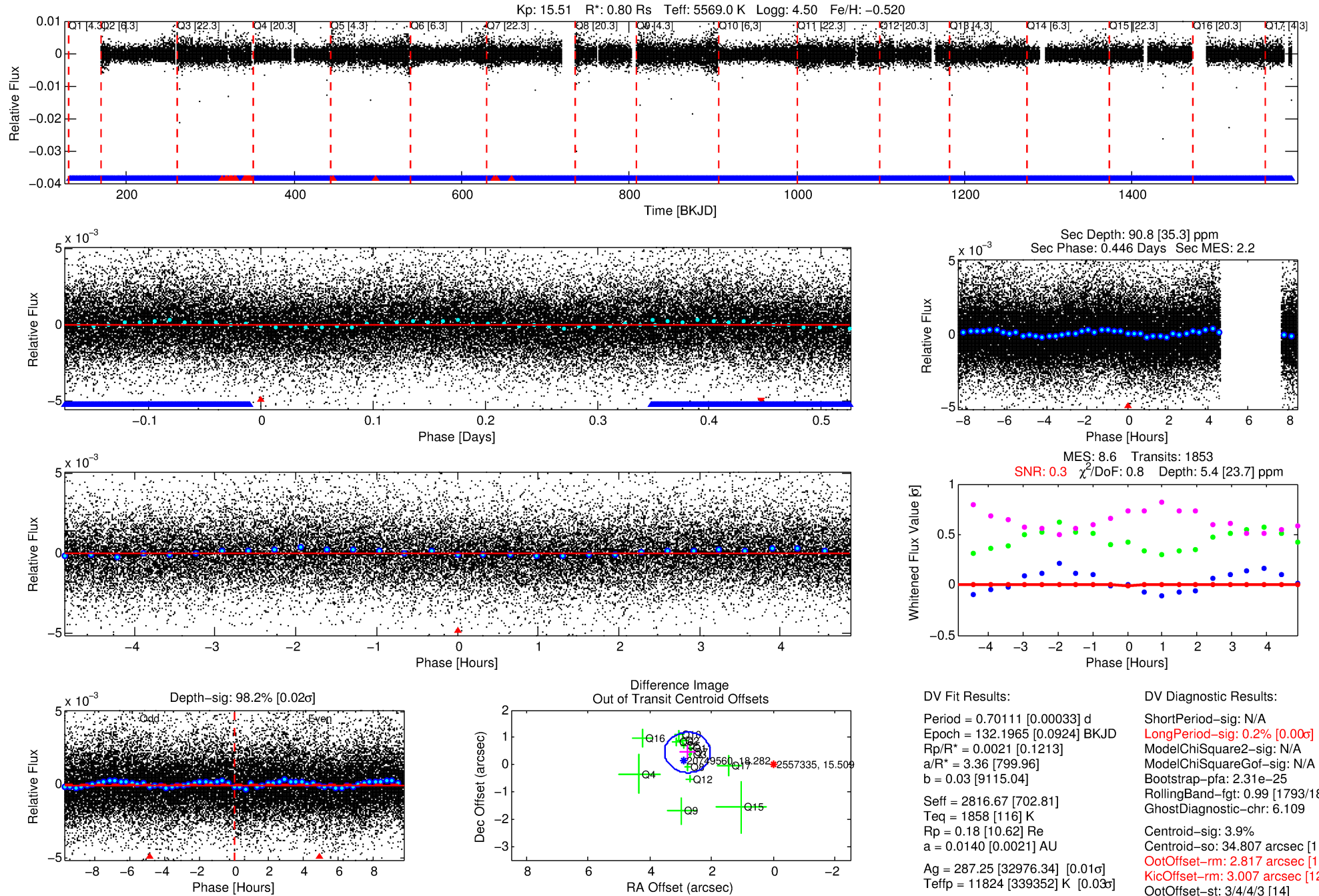
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002557335-01

No Significant Match Found

# DV One-Page Summary

KIC: 2557335 Candidate: 1 of 2 Period: 0.701 d



## DV Fit Results:

Period = 0.70111 [0.00033] d  
Epoch = 132.1965 [0.0924] BKJD  
Rp/R\* = 0.0021 [0.1213]  
a/R\* = 3.36 [799.96]  
b = 0.03 [9115.04]  
Seff = 2816.67 [702.81]  
Teq = 1858 [116] K  
Rp = 0.18 [10.62] Re  
a = 0.0140 [0.0021] AU  
Ag = 287.25 [32976.34] [0.01σ]  
Teffp = 11824 [339352] K [0.03σ]

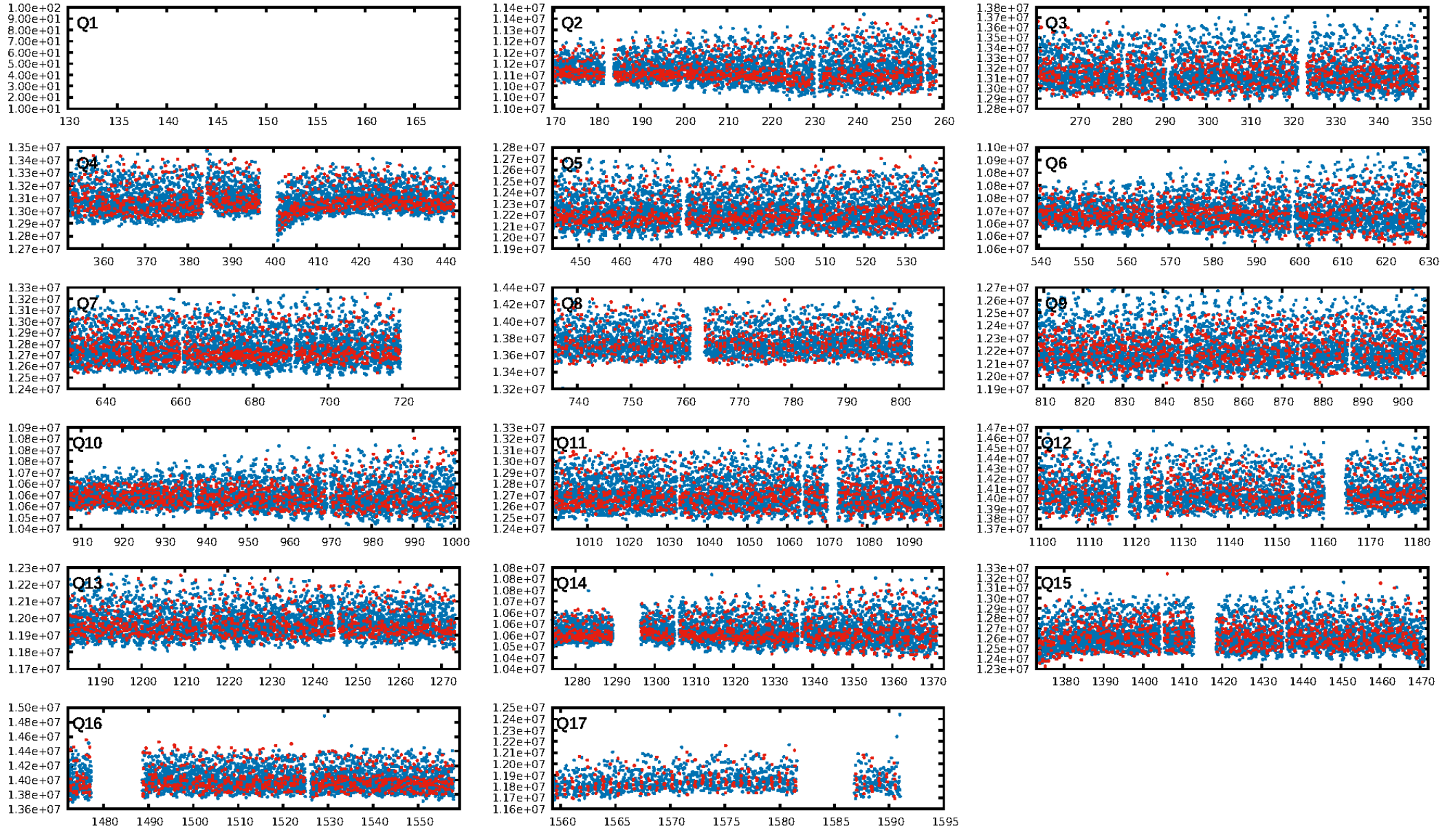
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.2% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.31e-25  
RollingBand-fgt: 0.99 [1793/1815]  
GhostDiagnostic-chr: 6.109  
Centroid-sig: 3.9%  
Centroid-so: 34.807 arcsec [1.46σ]  
OotOffset-rm: 2.817 arcsec [11.39σ]  
KicOffset-rm: 3.007 arcsec [12.71σ]  
OotOffset-st: 3/4/4/3 [14]  
KicOffset-st: 3/4/4/3 [14]  
DiffImageQuality-fgm: 0.57 [8/14]  
DiffImageOverlap-fno: 0.25 [4/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:07:03 Z

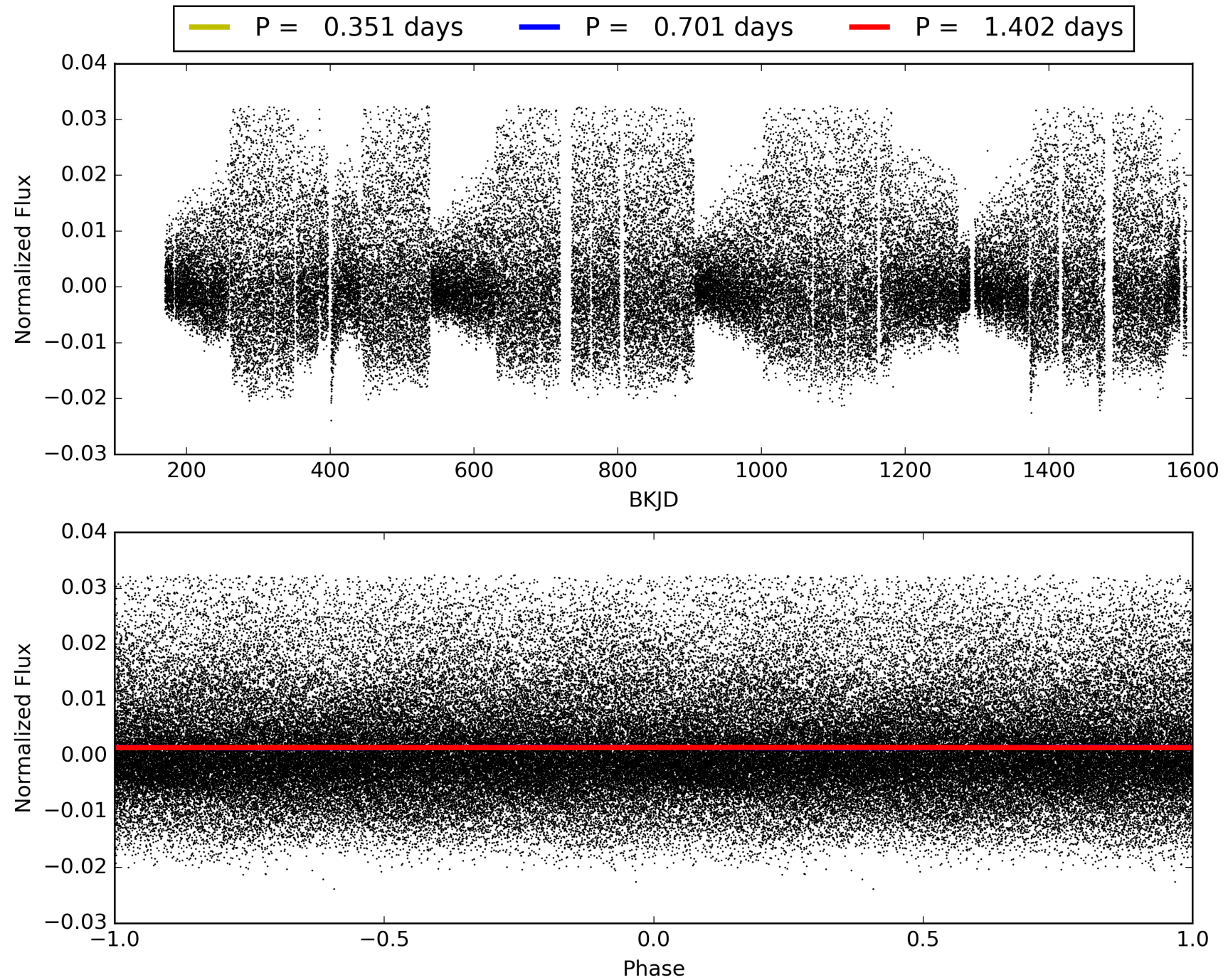
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 002557335-01, PDC Light Curves



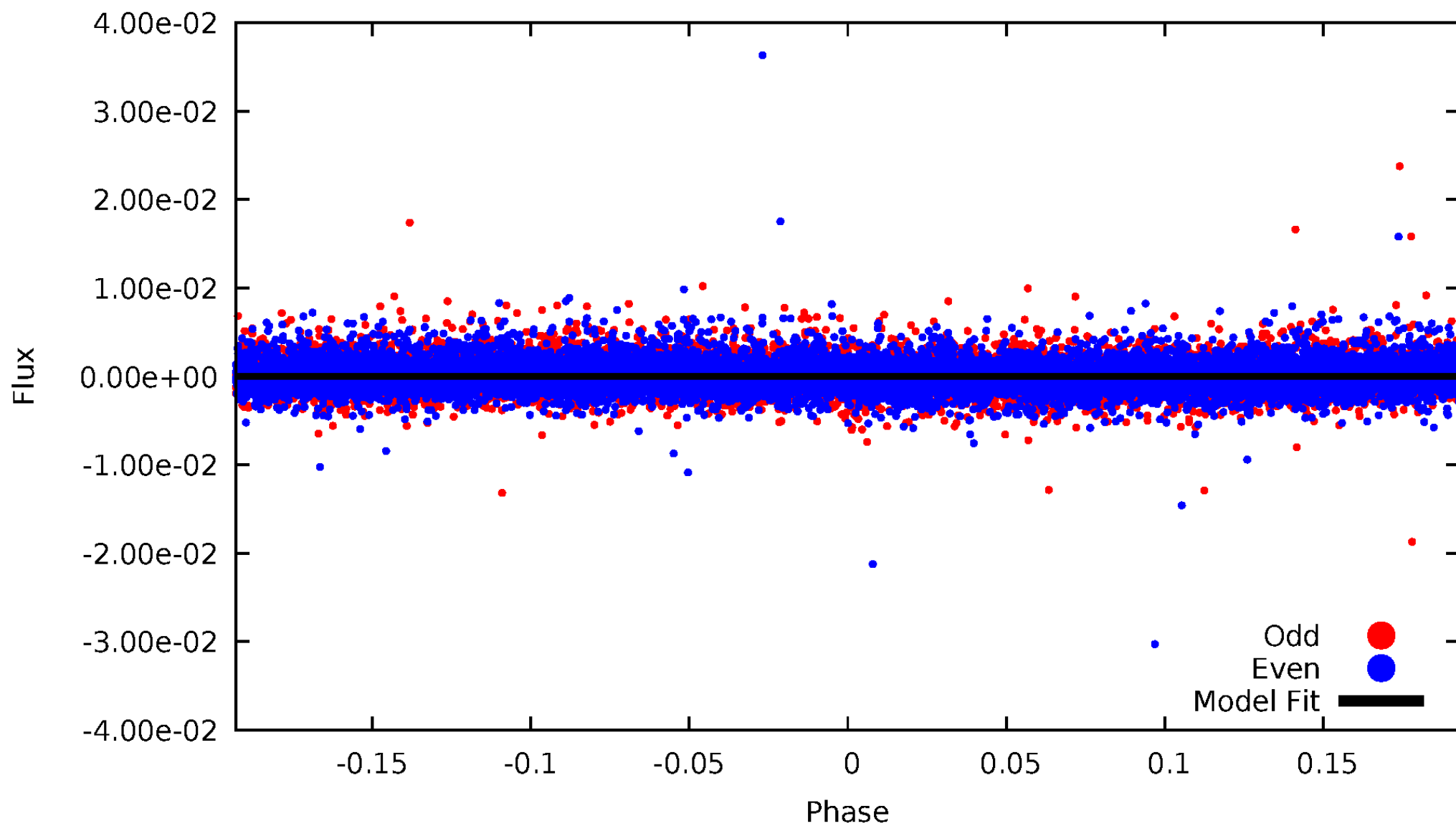


TCE 002557335-01



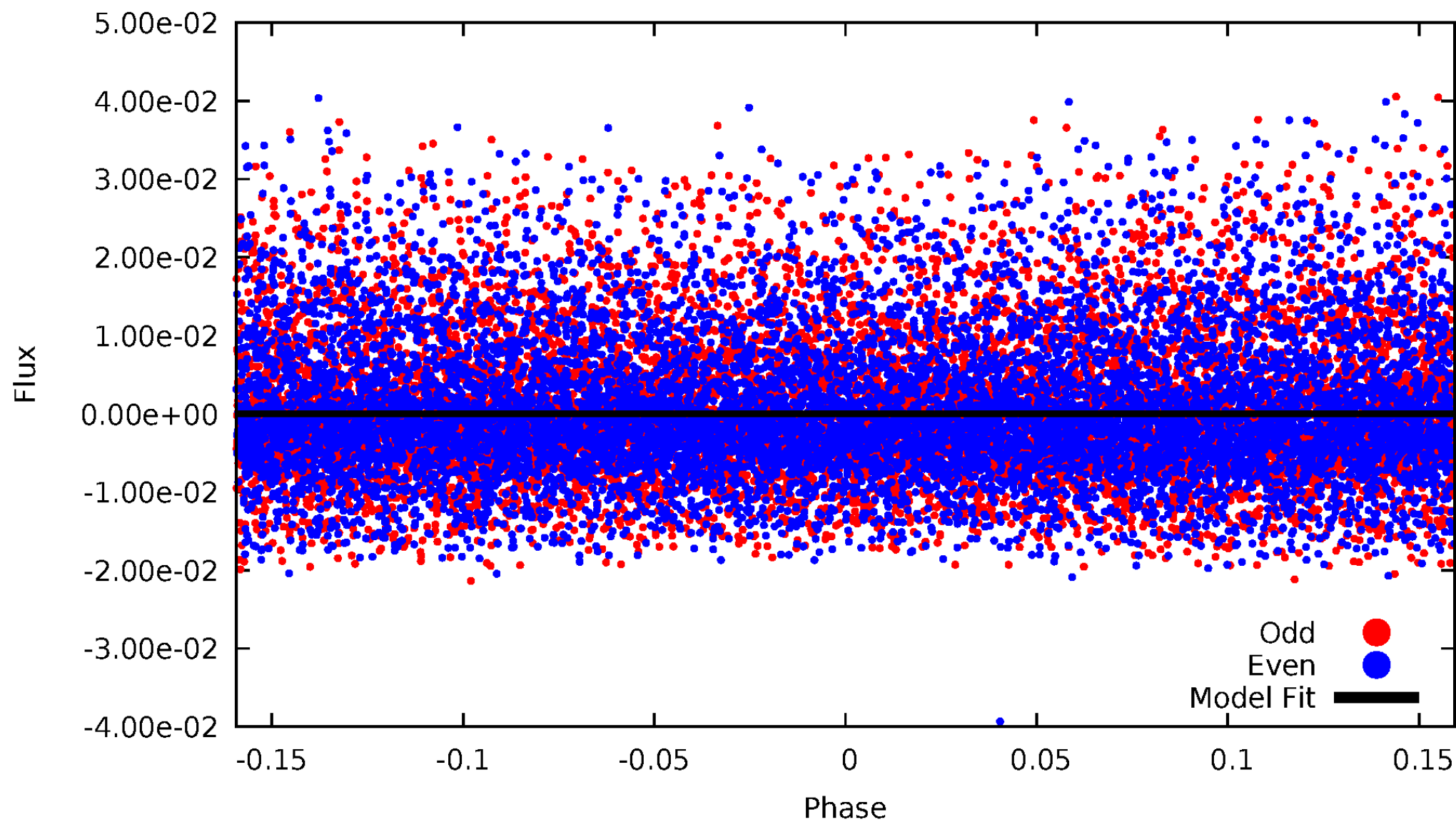
# DV Odd/Even

TCE 002557335-01



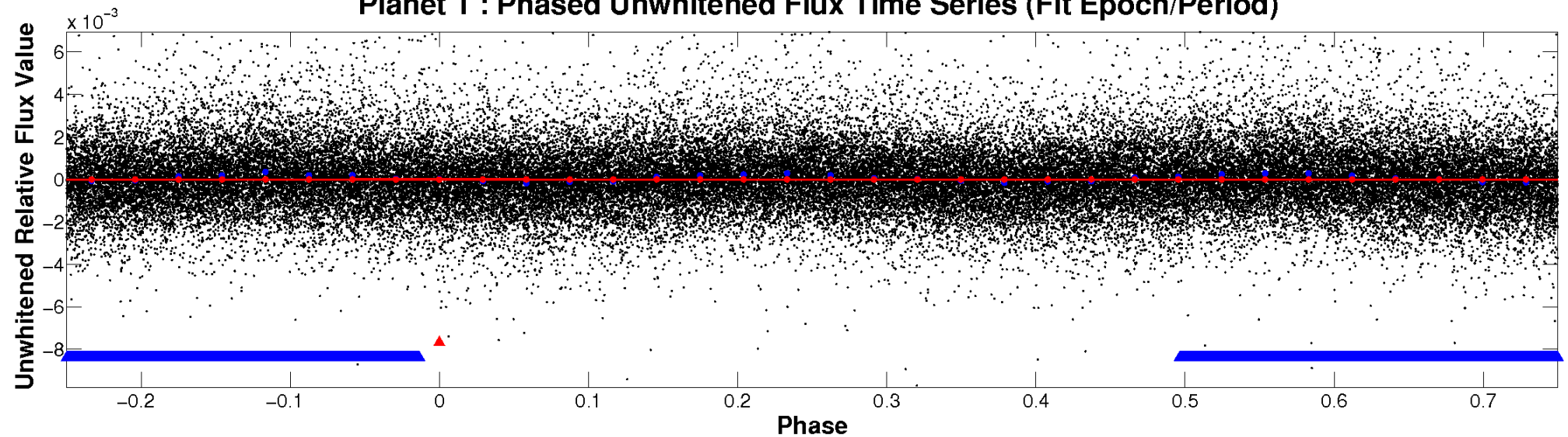
# ALT Odd/Even

TCE 002557335-01

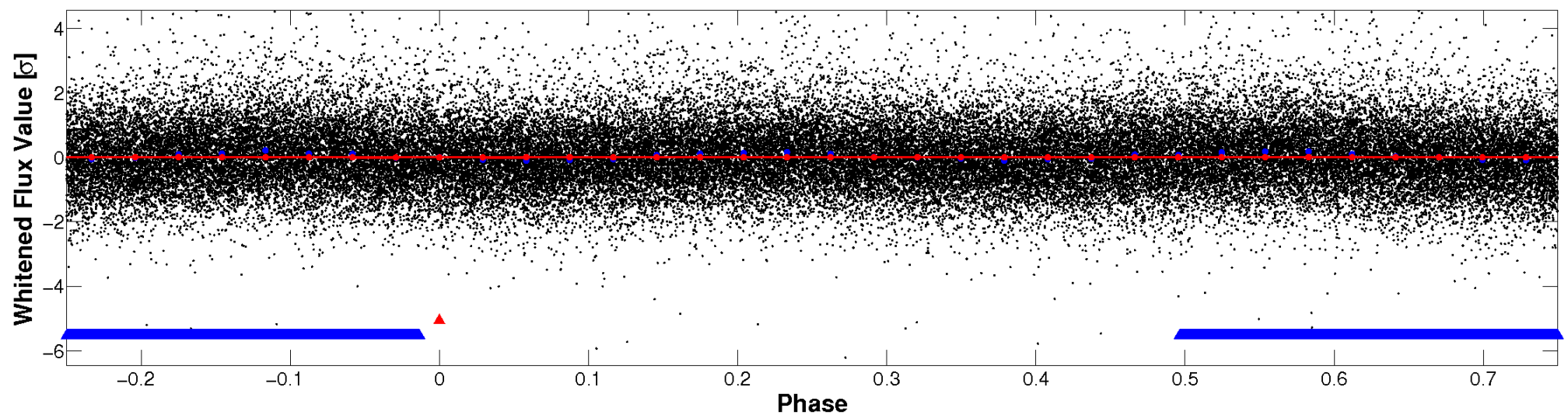


# Non-Whitened Vs. Whitened Light Curve

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



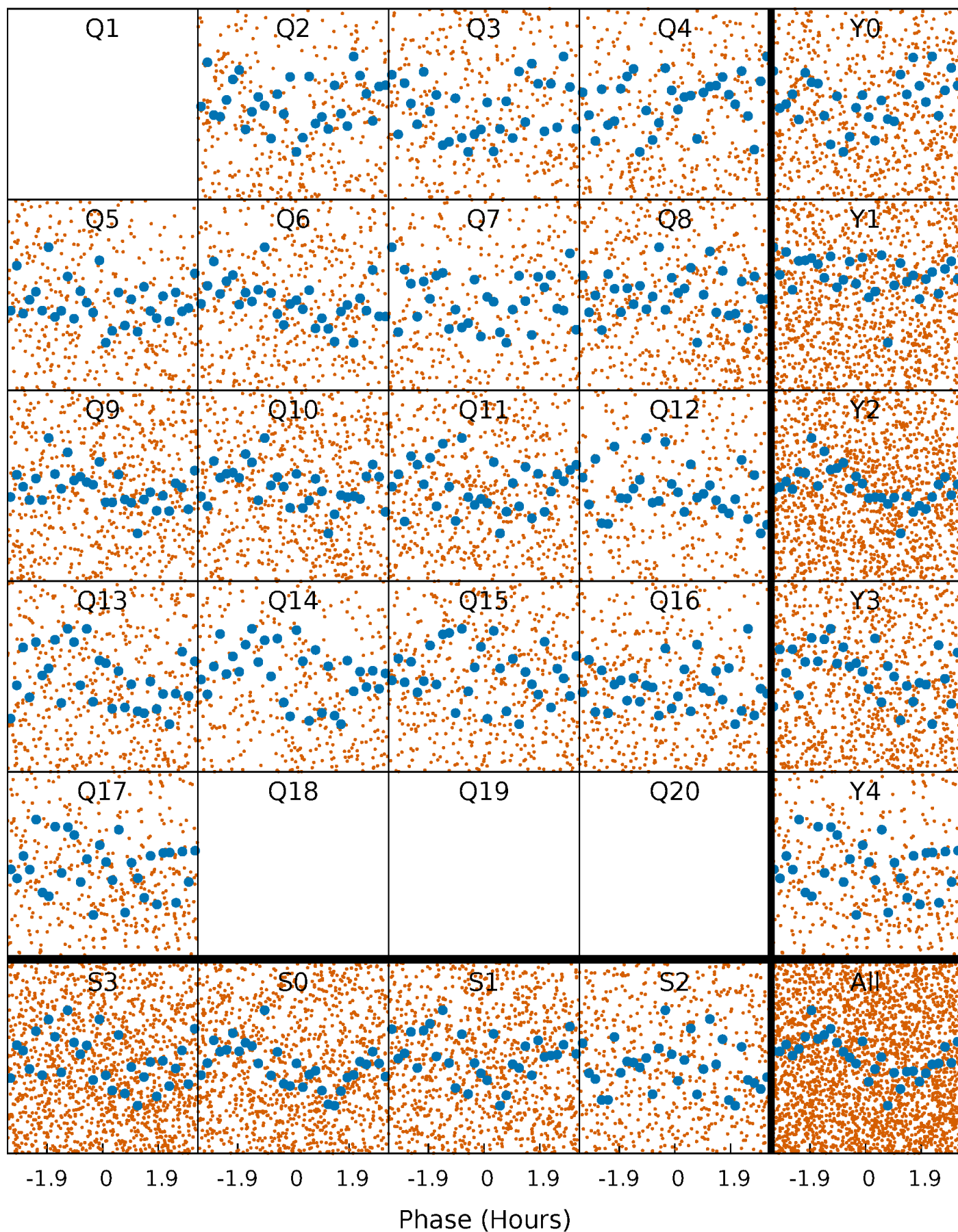
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

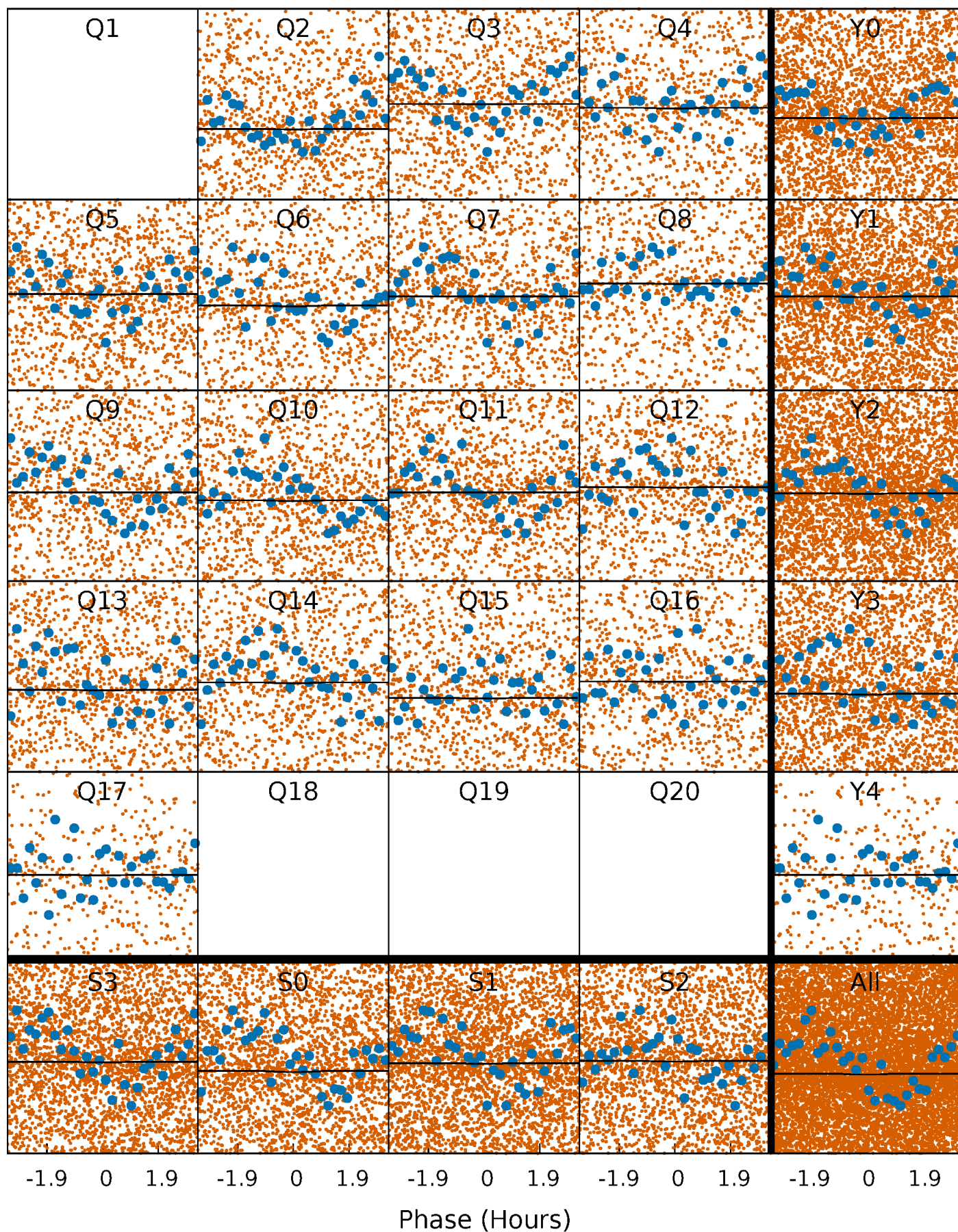
TCE 002557335-01 P= 0.701112 Days  $T_0=132.196548$  (BKJD)





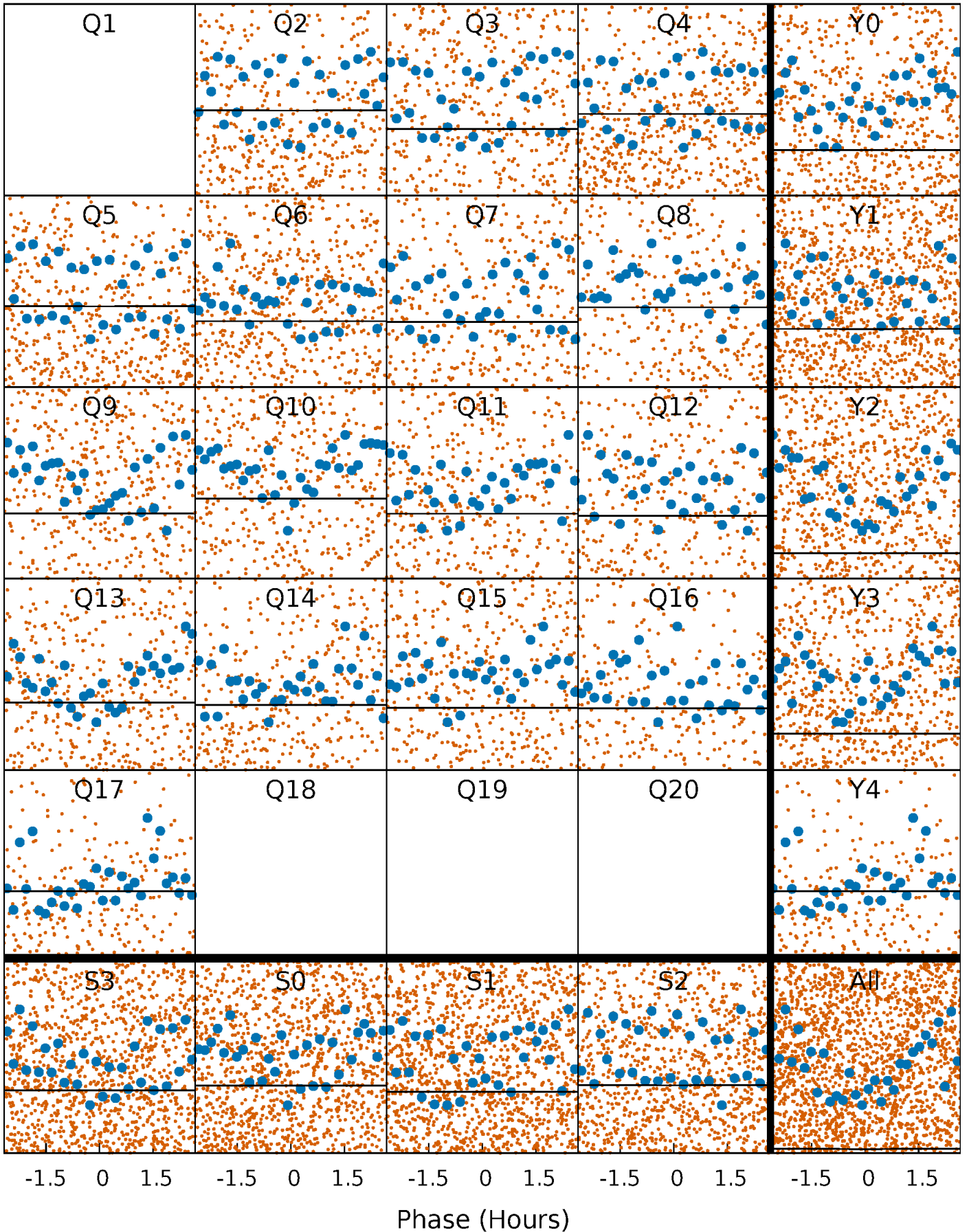
# DV Quarter-Phased Transit Curves

TCE 002557335-01 P= 0.701112 Days  $T_0=132.196548$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

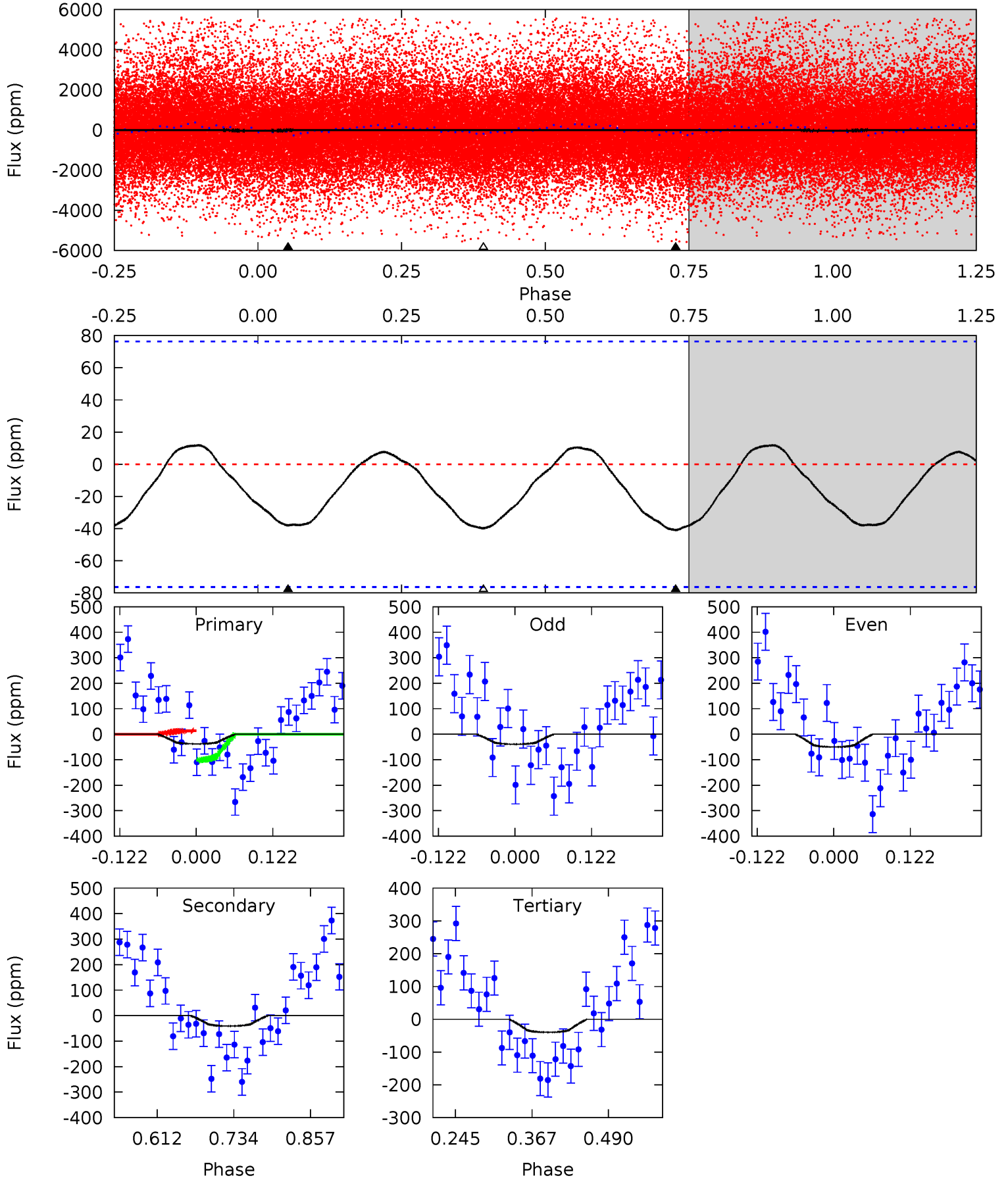
TCE 002557335-01 P= 0.701162 Days  $T_0=132.193096$  (BKJD)



# DV Model-Shift Uniqueness Test

002557335-01, P = 0.701112 Days, E = 132.196548 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
2.25	2.42	2.36	0	4.52	1.54	1.03	-0.11	2.25	0.06	2.42	0.34	0.16	0.22	2.64

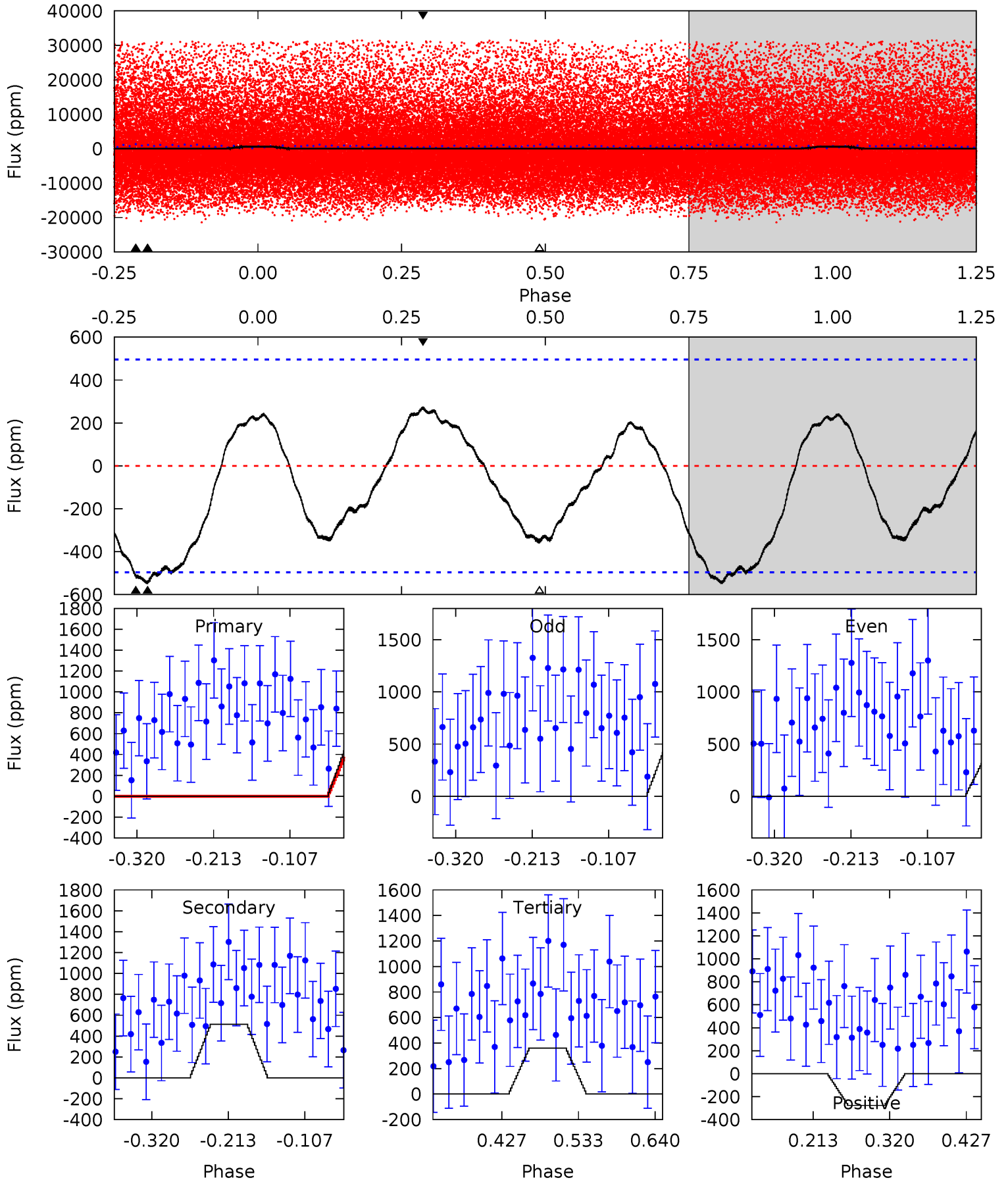




# Alt Model-Shift Uniqueness Test

002557335-01, P = 0.701162 Days, E = 132.193096 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
5.05	4.72	3.31	2.54	4.55	1.61	1.78	1.74	2.51	1.40	2.18	0.62	1.38	0.33	0.08





### Stellar Parameters For KIC 002557335

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5569^{+166}_{-166}$	$4.504^{+0.099}_{-0.121}$	$-0.520^{+0.300}_{-0.300}$	$0.802^{+0.140}_{-0.102}$	$0.749^{+0.109}_{-0.047}$	$2.042^{+0.880}_{-0.721}$
	+3%/-3%	+2%/-3%	+58%/-58%	+17%/-13%	+15%/-6%	+43%/-35%
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 002557335-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-41 \pm 17$	$6.98^{+7.88}_{-4.75}$	$2602^{+136}_{-125}$	$-2699^{+5818}_{-157}$	$0.083^{+0.777}_{-0.067}$
Alt.	$-514 \pm 109$	$7.18^{+8.04}_{-4.99}$	$2600^{+125}_{-123}$	$3251^{+1973}_{-5616}$	$1.094^{+10.403}_{-0.861}$

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

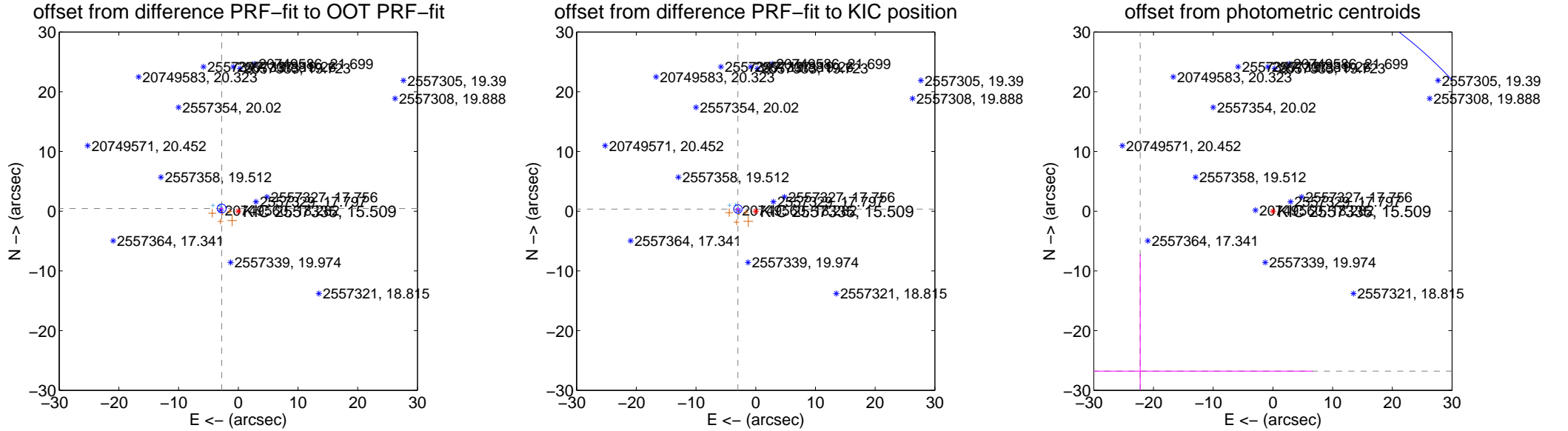
## DV Centroid Data

Supplemental centroid analysis for 002557335-01. Kepler magnitude: 15.51. Transit SNR 0.30

There are 8 quarters with good PRF difference image offsets

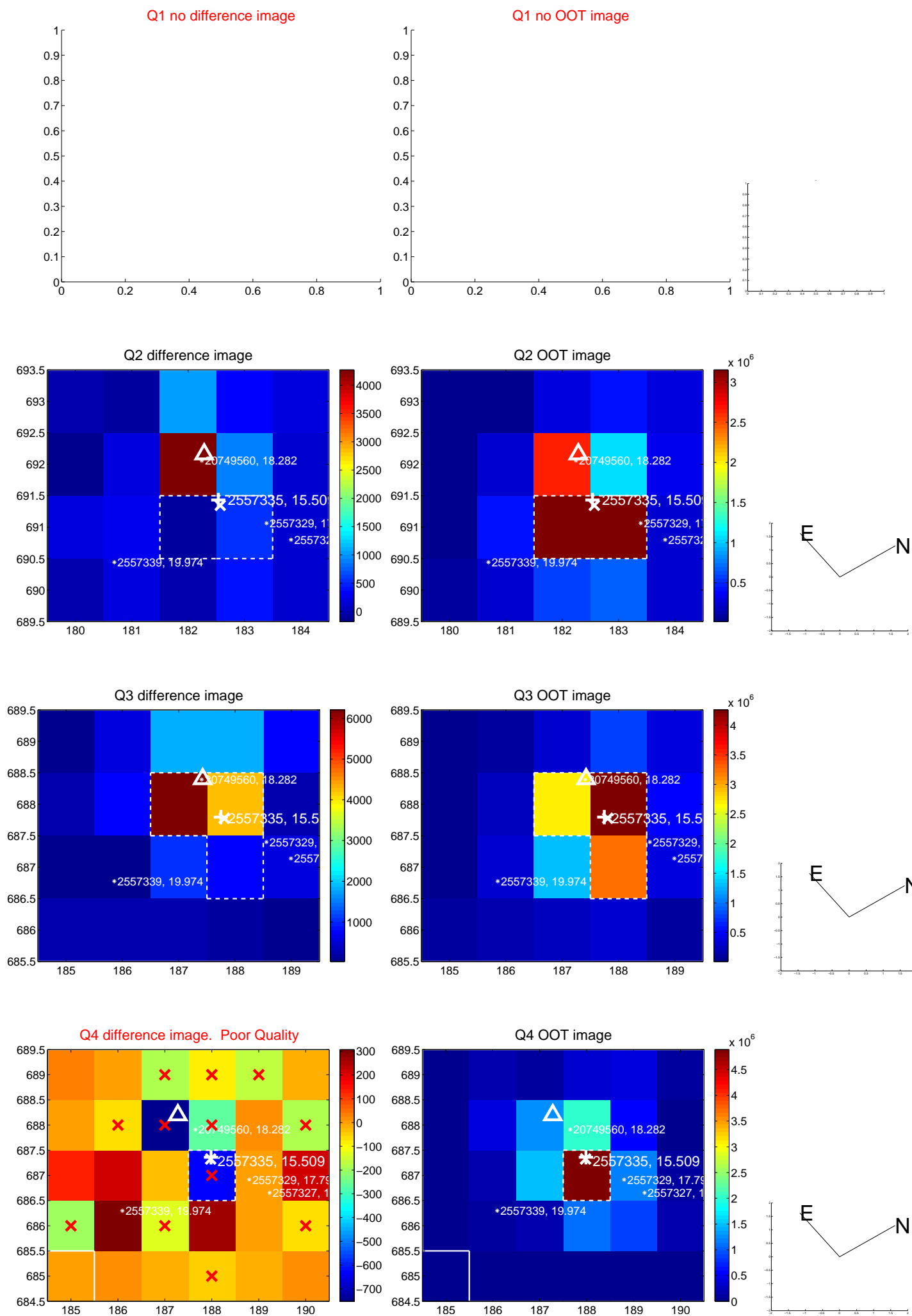
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.817 \pm 0.247$	11.39	$2.781 \pm 0.235$	$0.445 \pm 0.248$
PRF-fit source offset from KIC position	$3.007 \pm 0.237$	12.71	$2.986 \pm 0.225$	$0.352 \pm 0.255$
photometric centroid source offset	$34.81 \pm 23.81$	1.46	$22.22 \pm 28.90$	$-26.79 \pm 19.56$

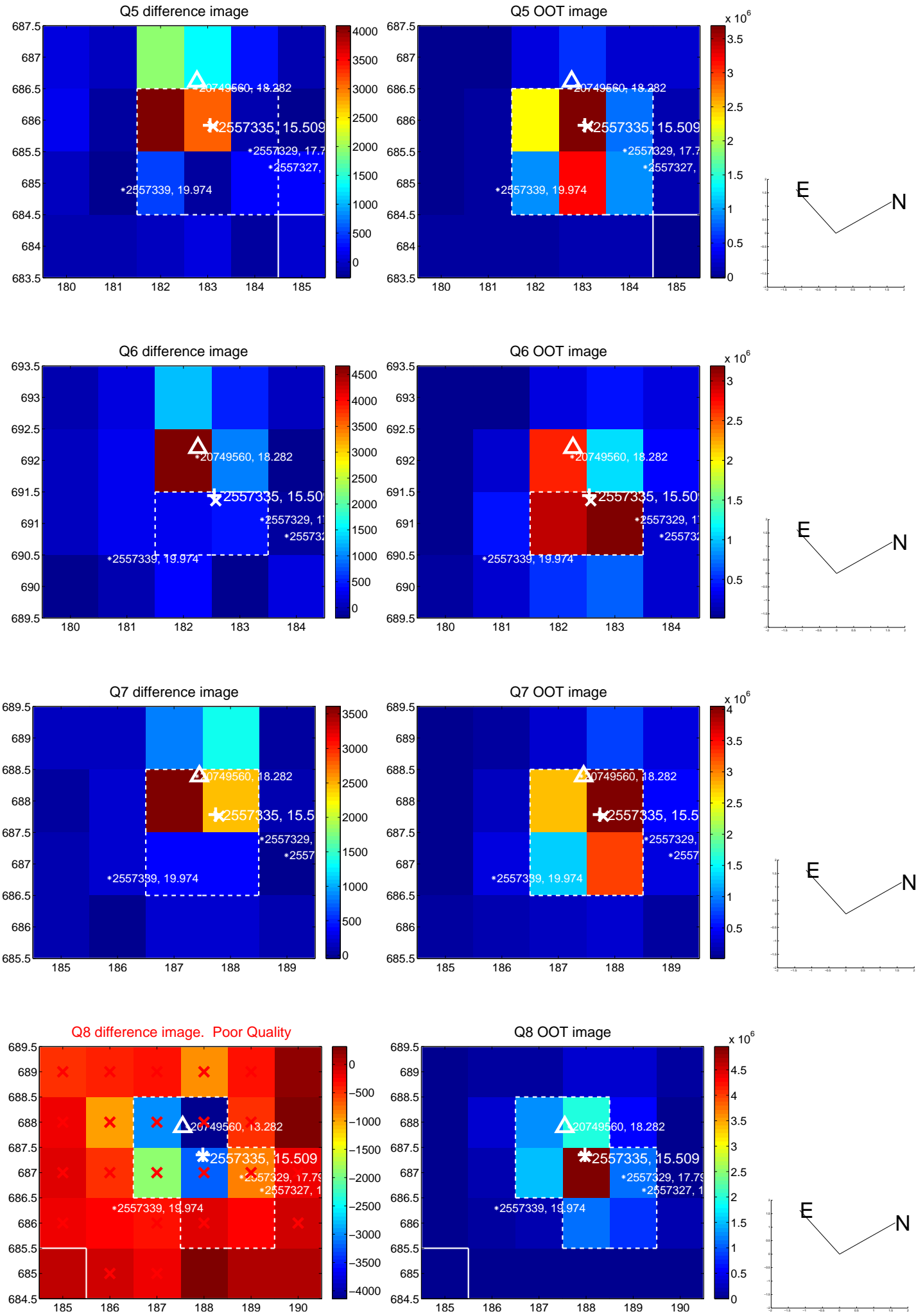


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

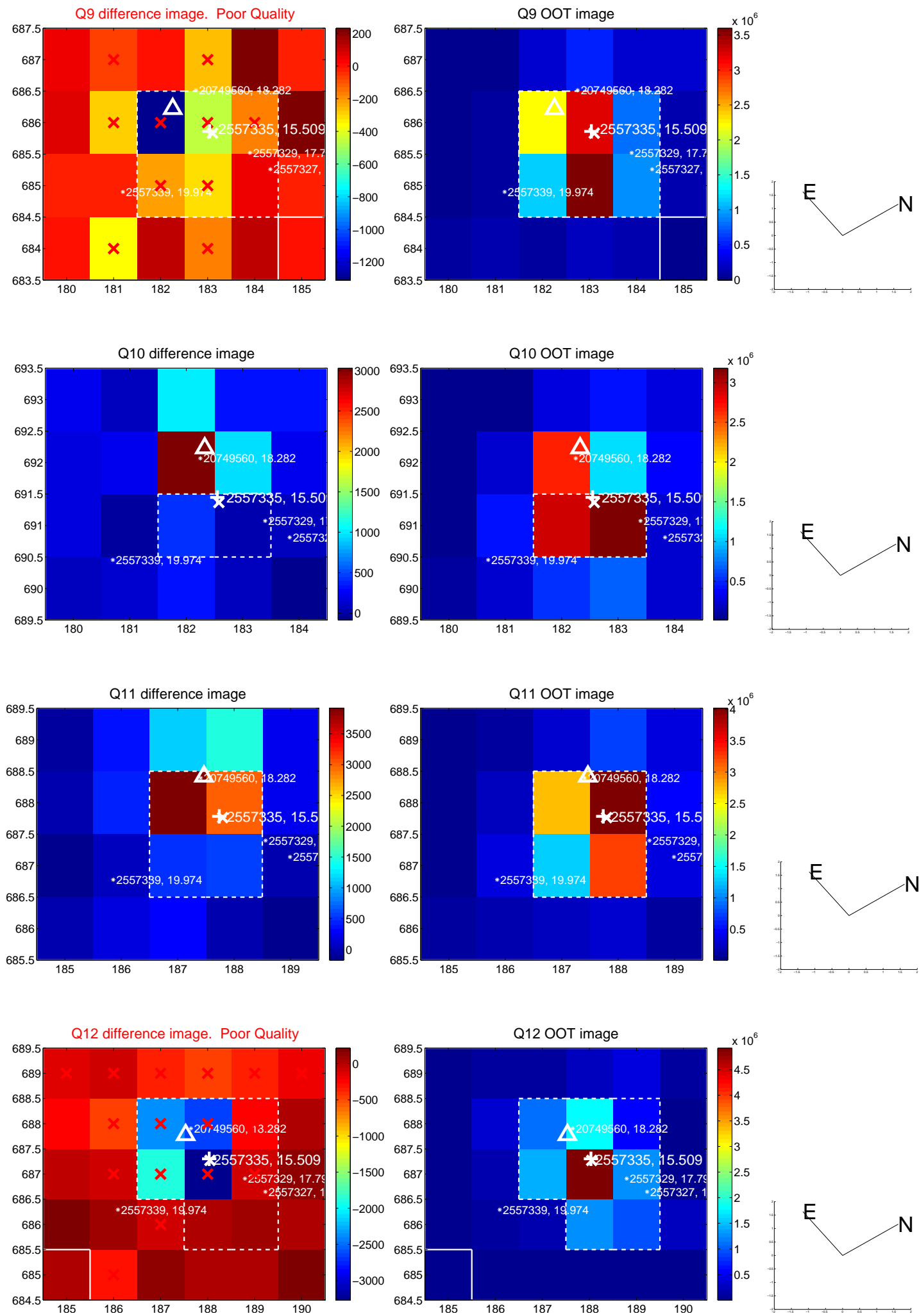


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

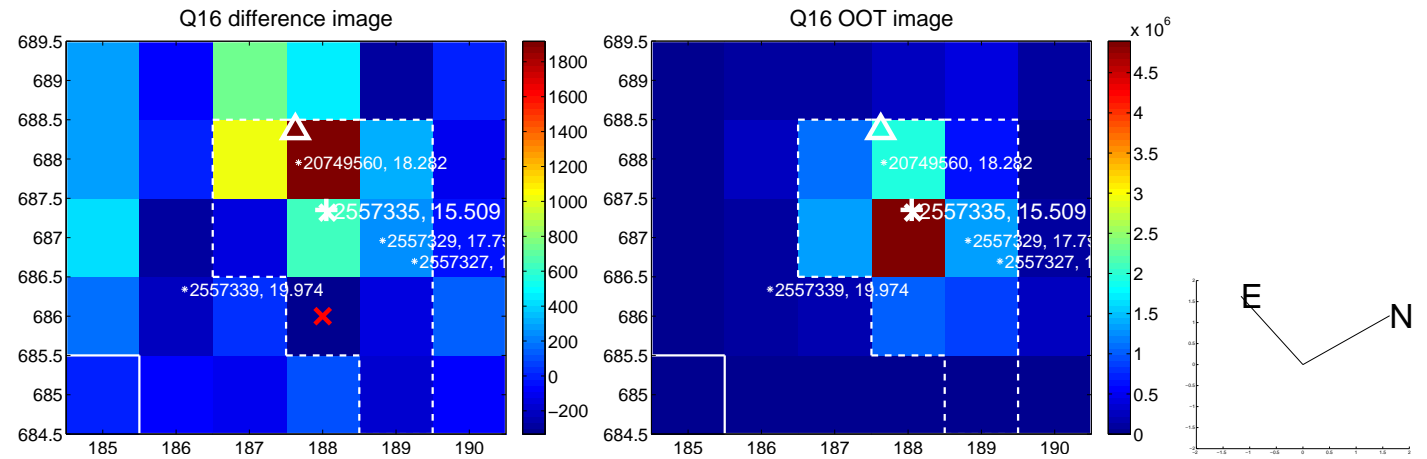
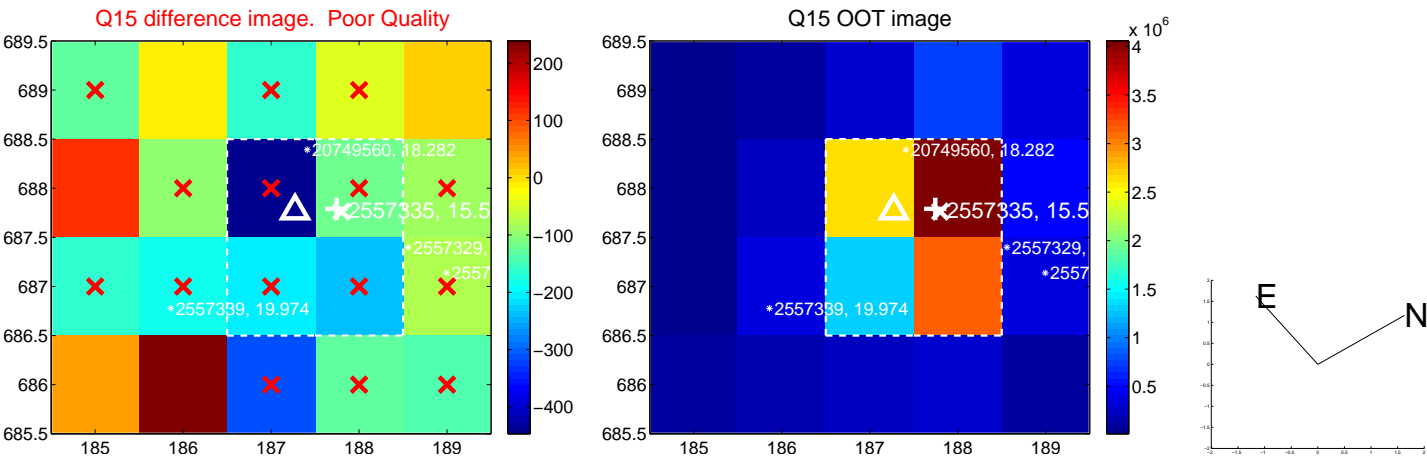
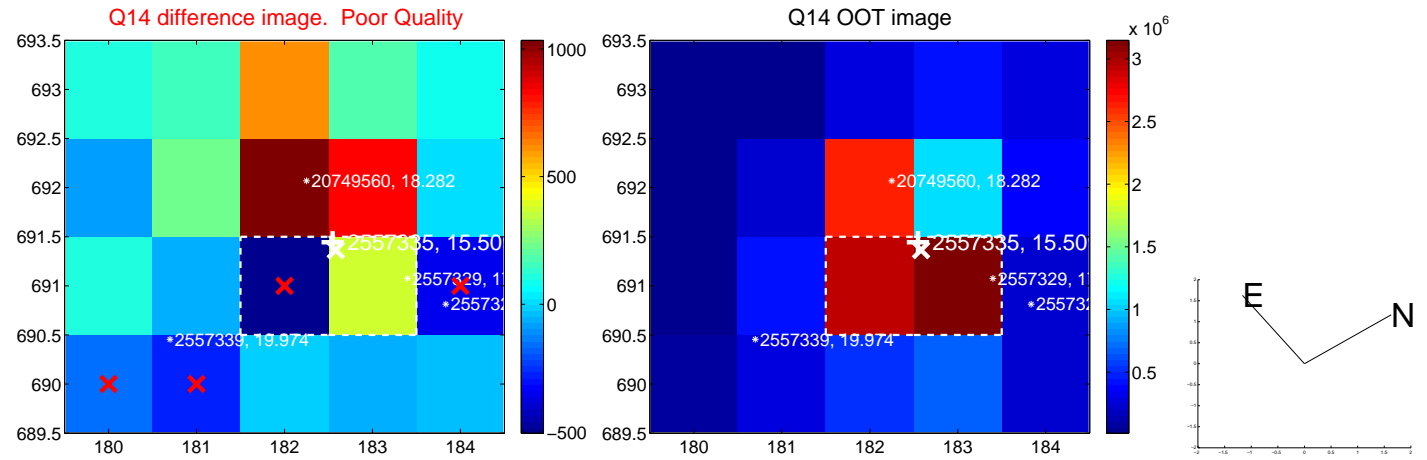
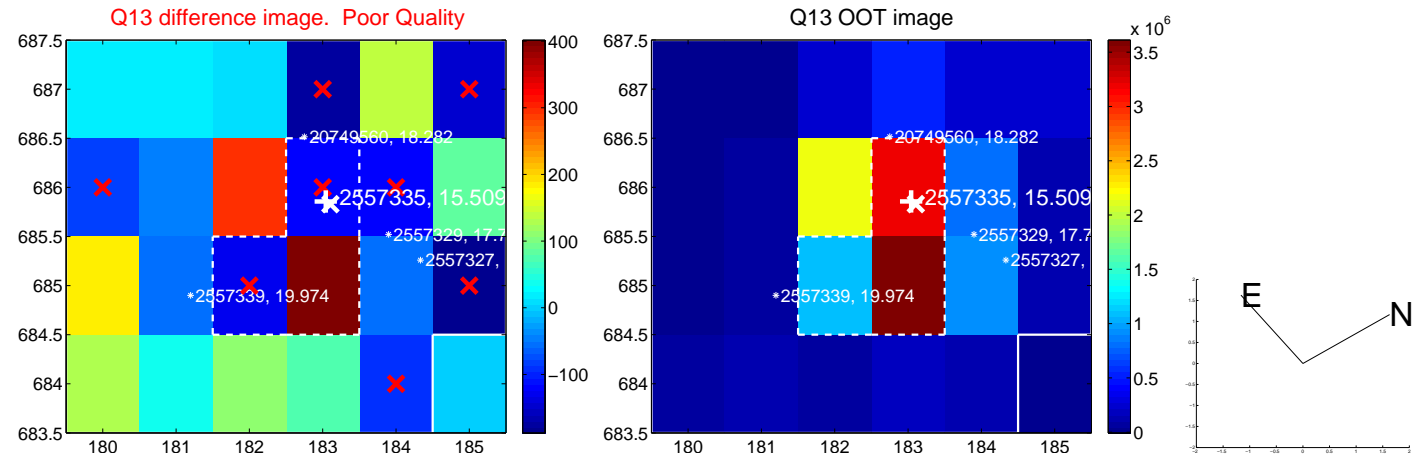




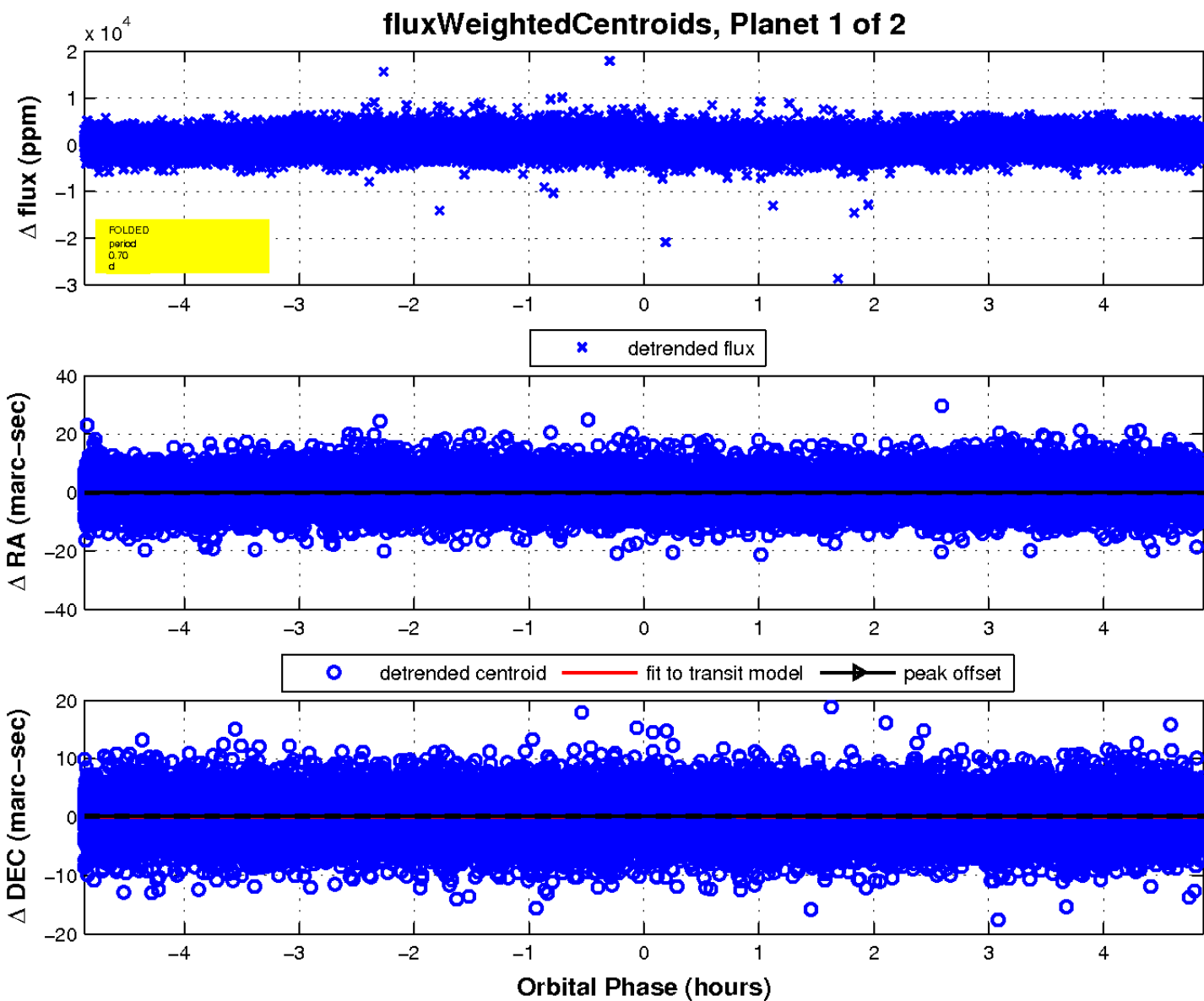
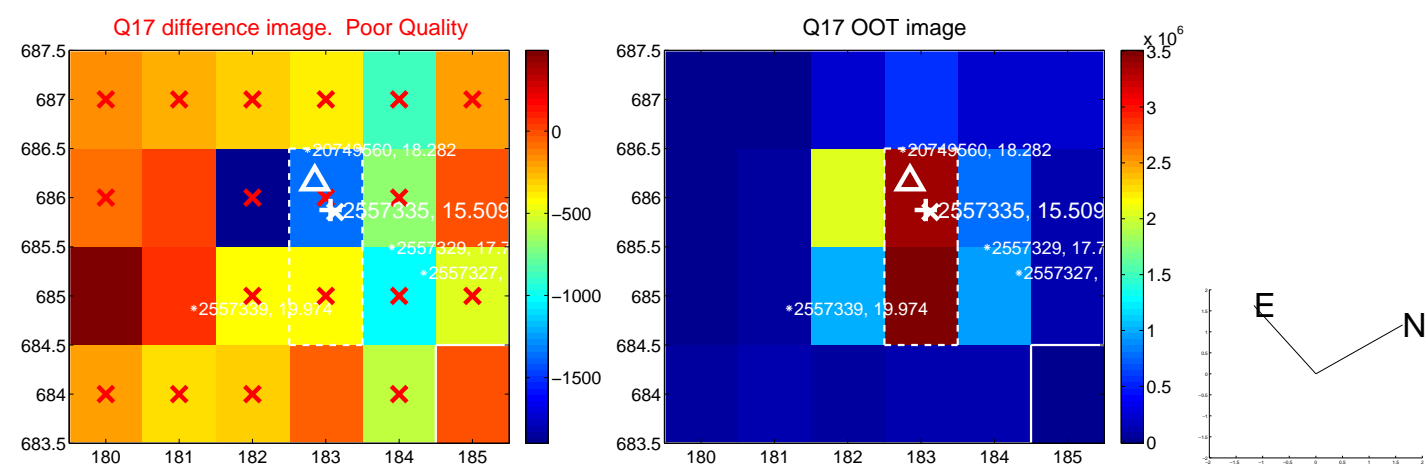
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

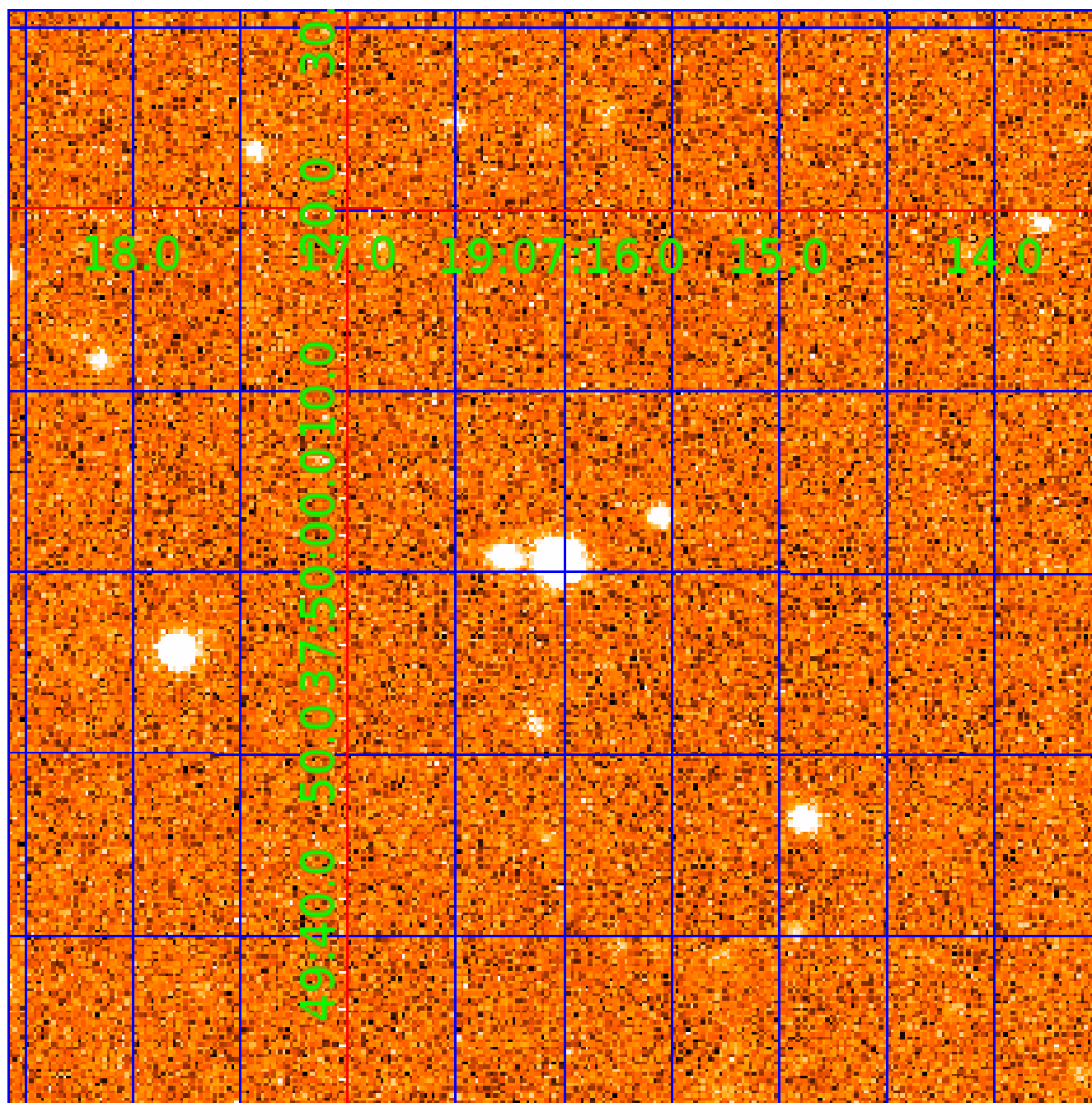


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 002557335

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
002557335-01	OBS	No	0.701112	132.196548	5.4	1.624	8.6	0.3	0.80	5569	0.18	2816.67
002557335-02	OBS	No	0.701277	131.843529	0.0	0.721	8.5	0.0	0.80	5569	0.01	2815.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002557335-01	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_UNRESOLVED_OFFSET
002557335-02	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_UNRESOLVED_OFFSET

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

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

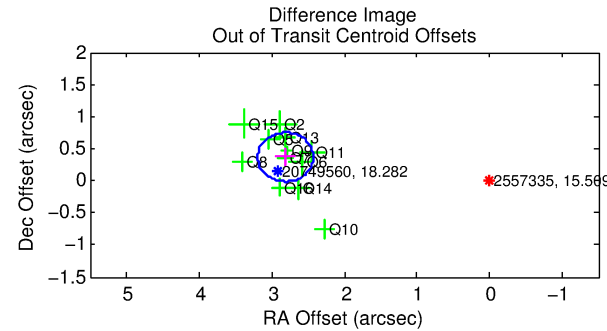
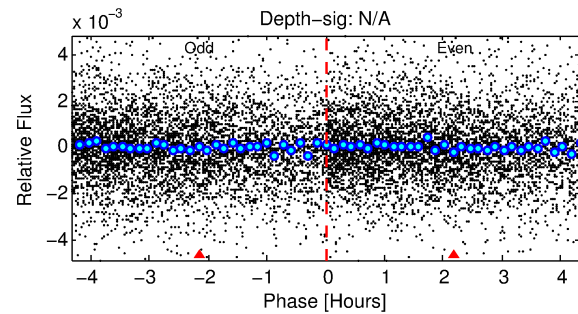
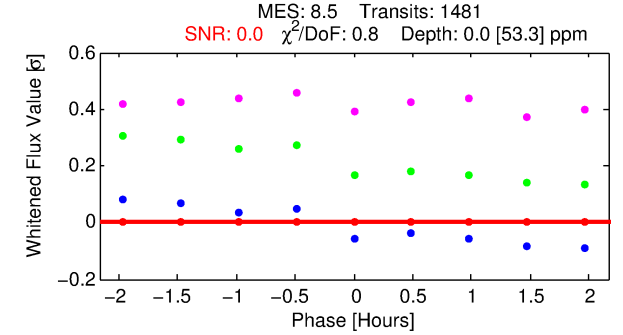
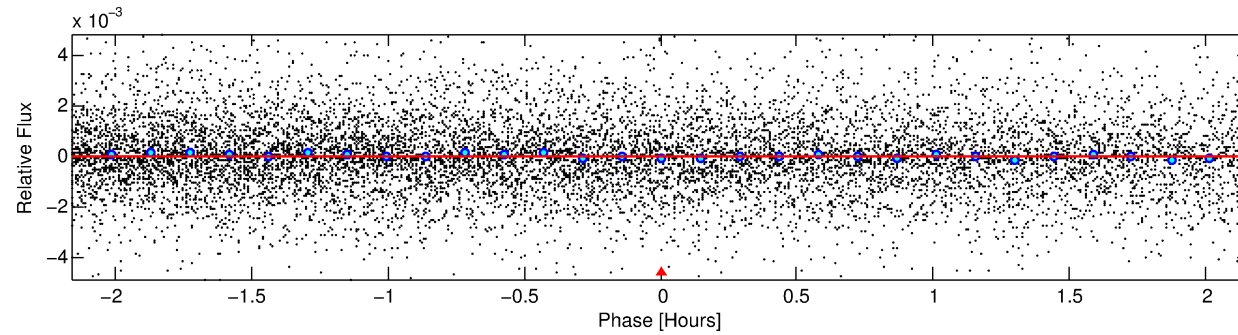
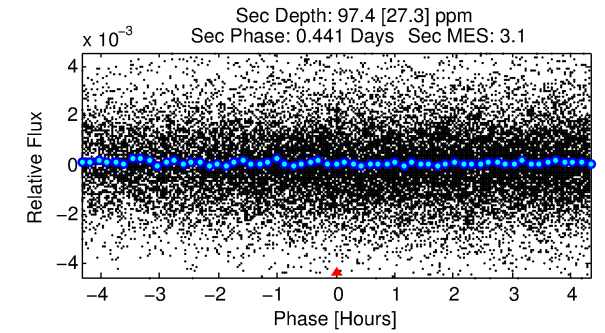
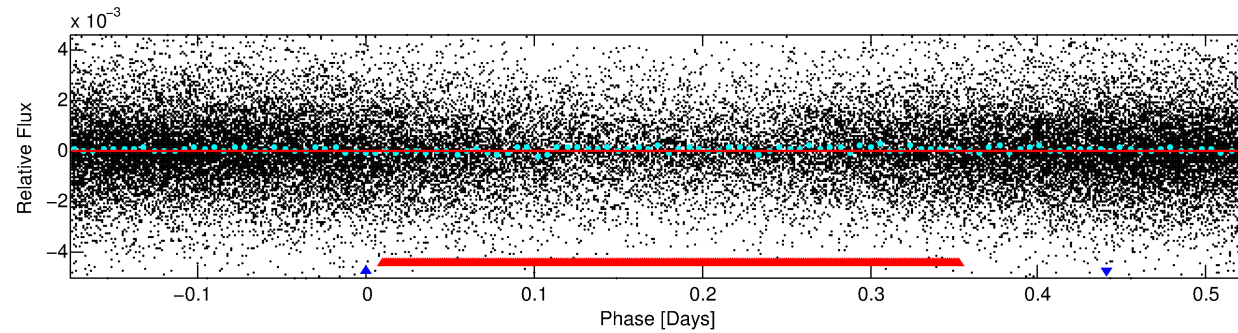
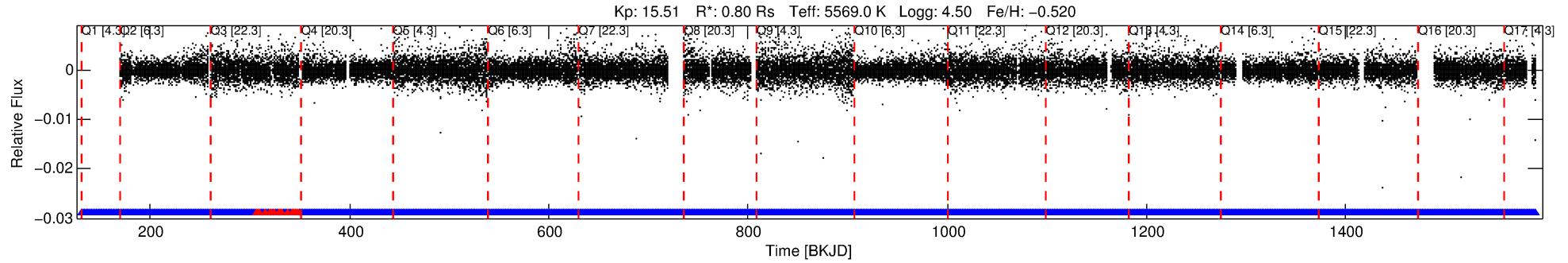
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 002557335-02

No Significant Match Found

# DV One-Page Summary

KIC: 2557335 Candidate: 2 of 2 Period: 0.701 d



## DV Fit Results:

Period = 0.70128 [0.22714] d  
Epoch = 131.8435 [29.0792] BKJD  
Rp/R\* = 0.0002 [0.2029]  
a/R\* = 4.04 [1588.38]  
b = 0.85 [165.39]  
Seff = 2815.79 [1404.39]  
Teff = 1857 [232] K  
Rp = 0.01 [17.76] Re  
a = 0.0140 [0.0037] AU  
Ag = 60506.07 [162790980.31] [0.00σ]  
Teffp = 45042 [30299720] K [0.00σ]

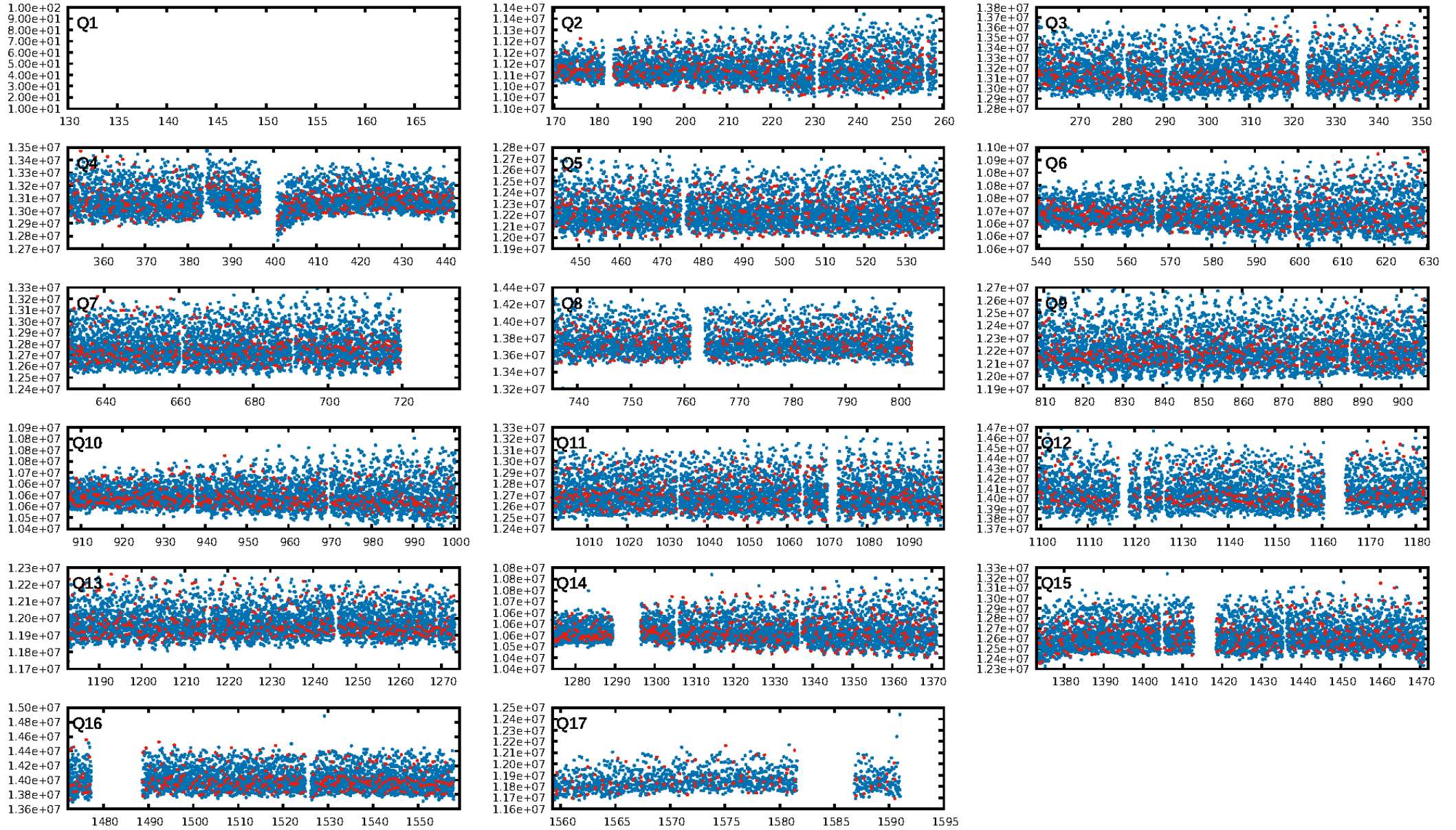
## DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.28e-25  
RollingBand-fgt: 0.99 [1460/1481]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 2.835 arcsec [22.29σ]  
KicOffset-rm: 3.062 arcsec [26.54σ]  
OotOffset-st: 4/3/2/3 [12]  
KicOffset-st: 4/3/2/3 [12]  
DiffImageQuality-fgm: 0.42 [5/12]  
DiffImageOverlap-fno: 0.31 [5/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 04:07:13 Z

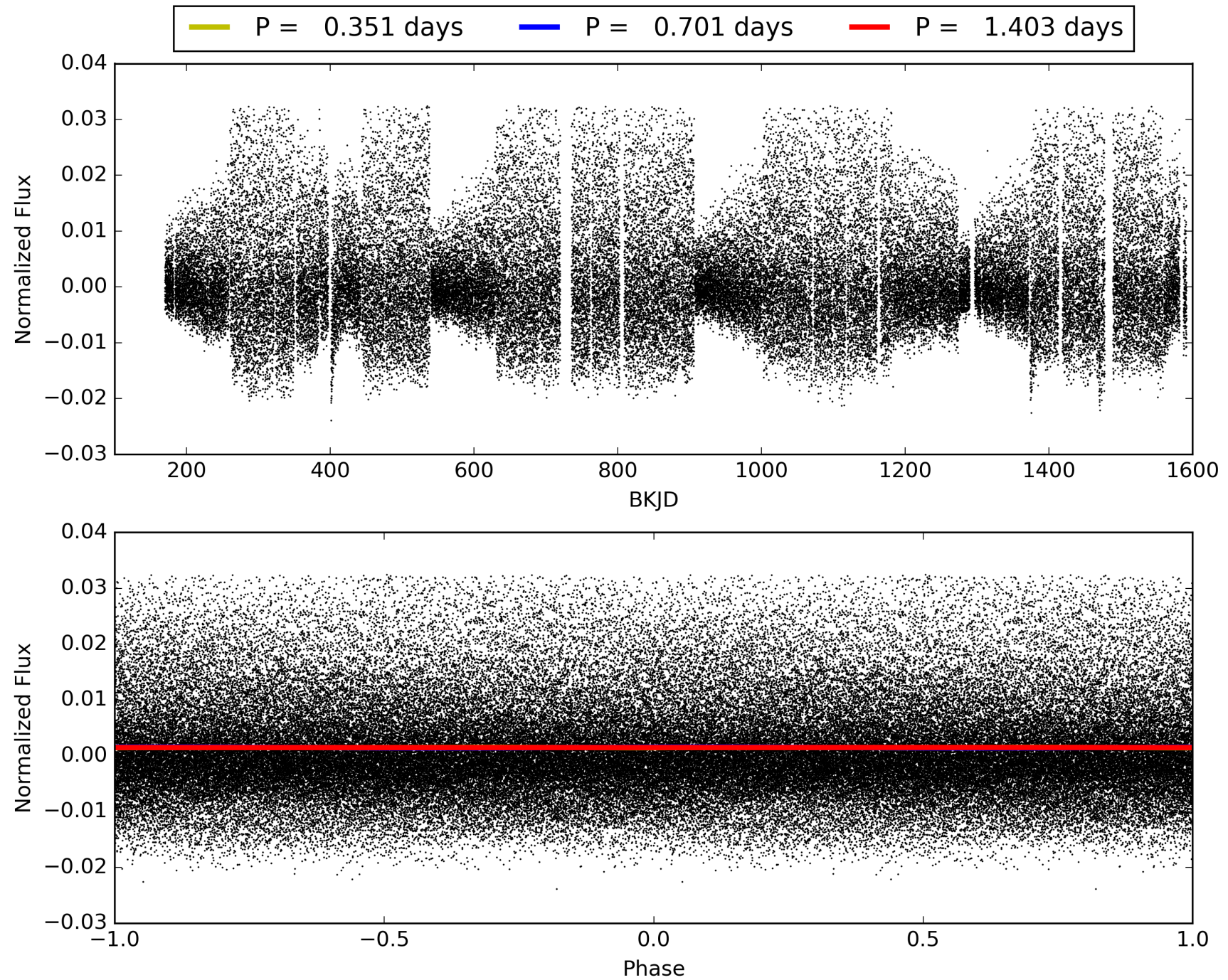
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 002557335-02, PDC Light Curves





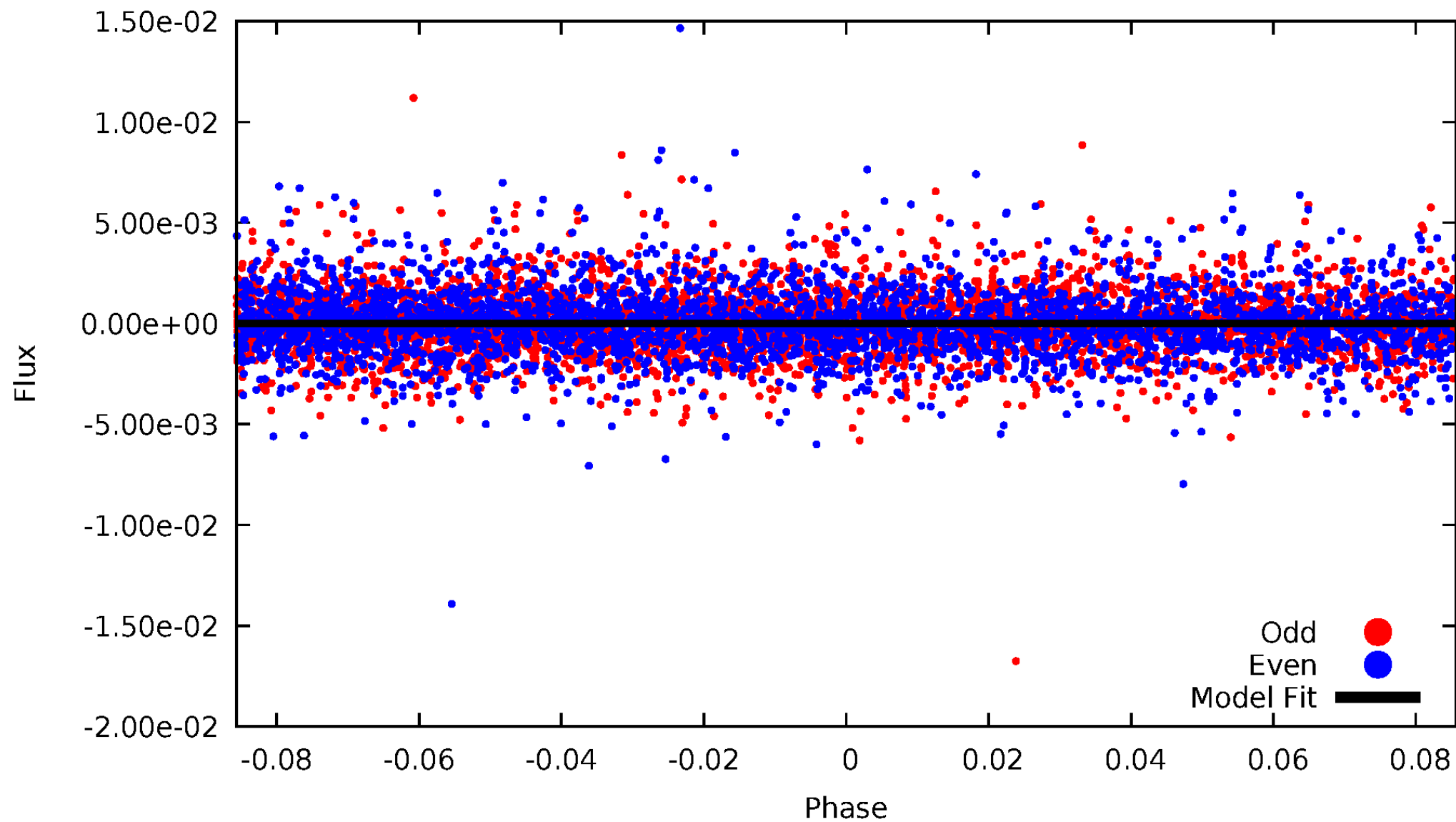
TCE 002557335-02





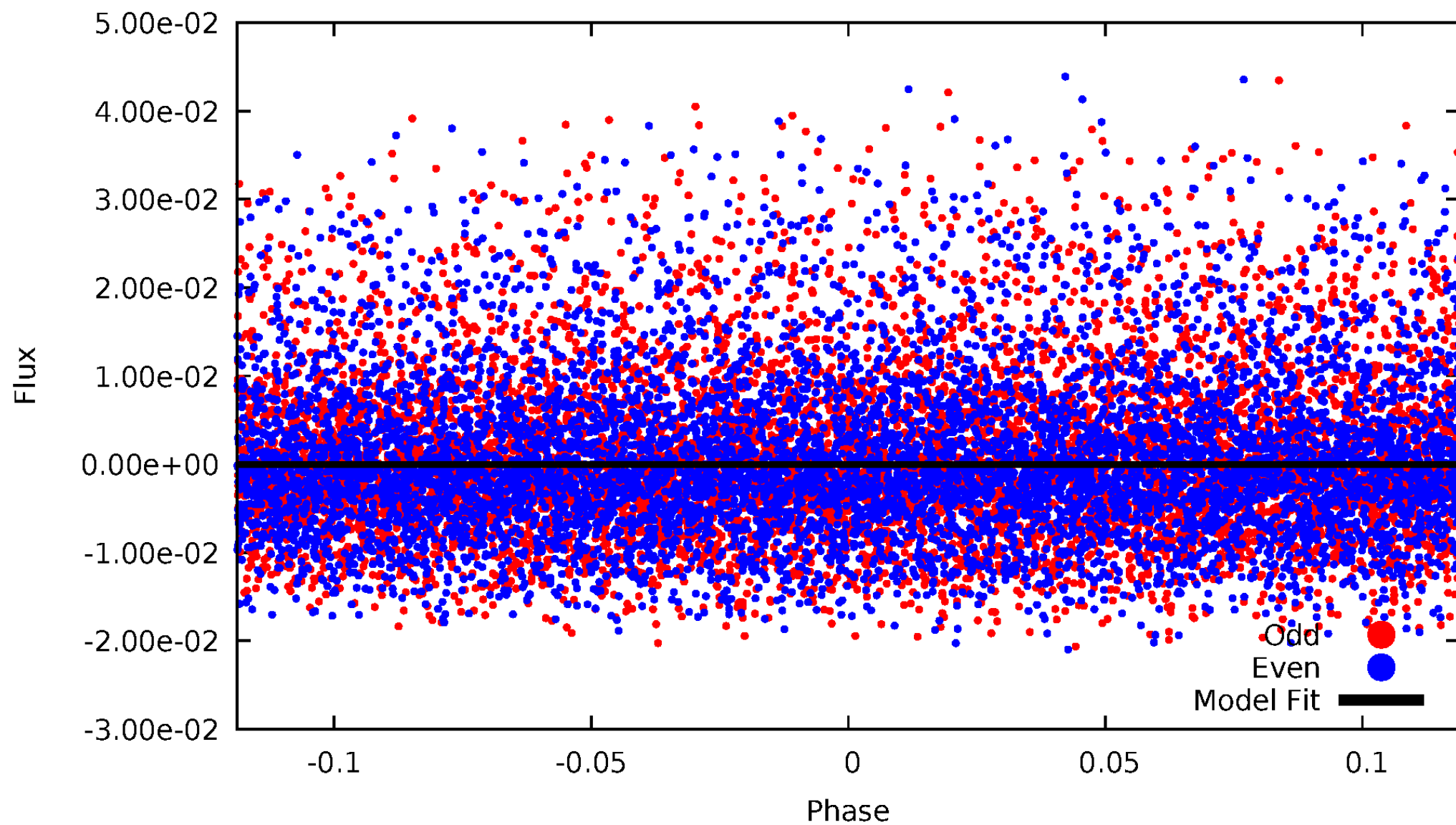
DV Odd/Even

TCE 002557335-02



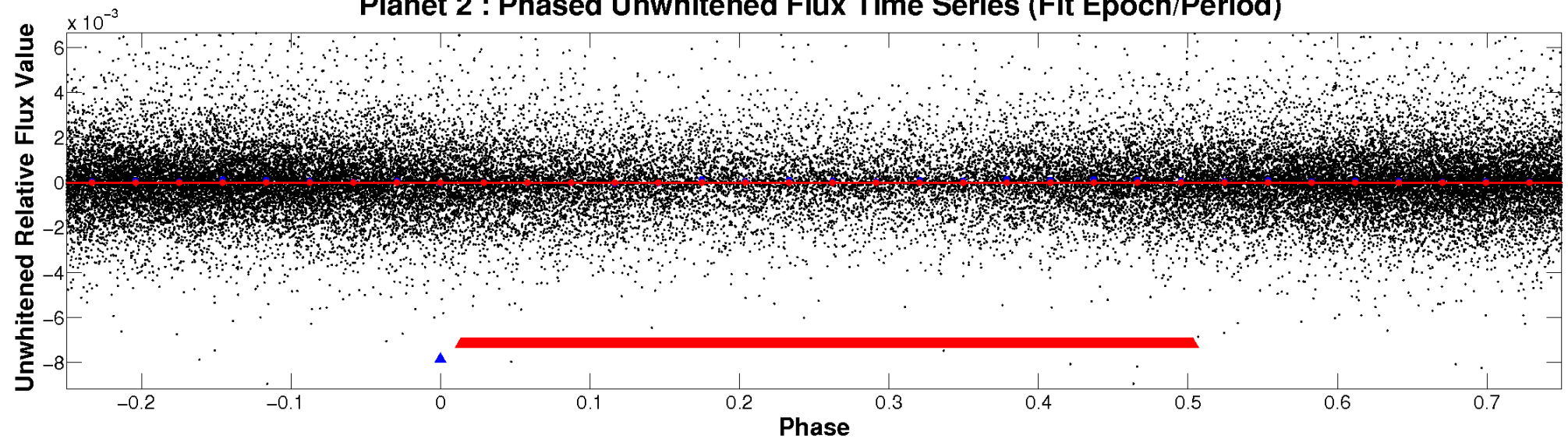
# ALT Odd/Even

TCE 002557335-02

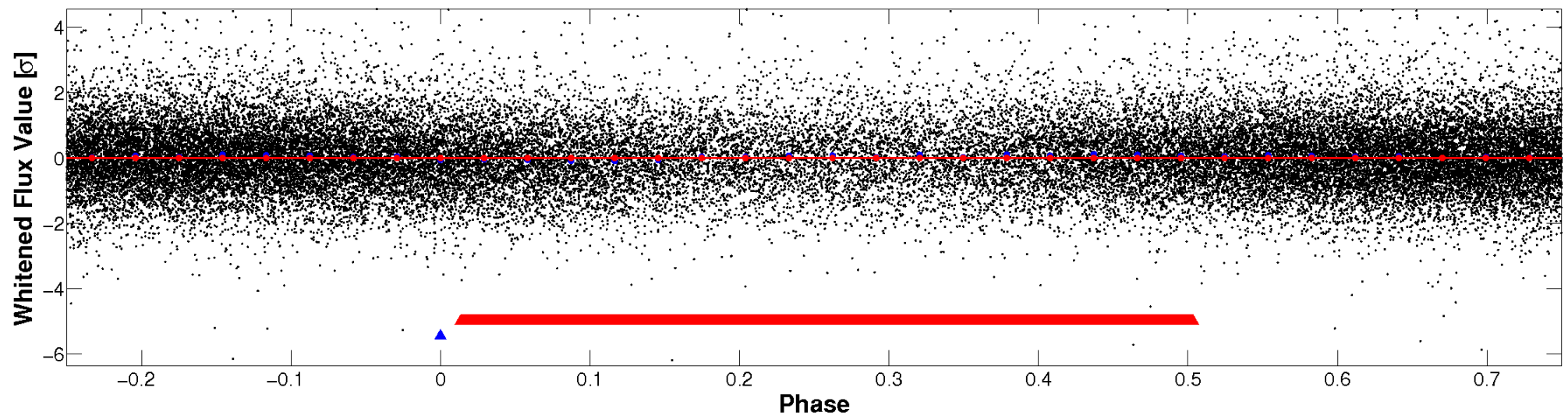


# Non-Whitened Vs. Whitened Light Curve

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

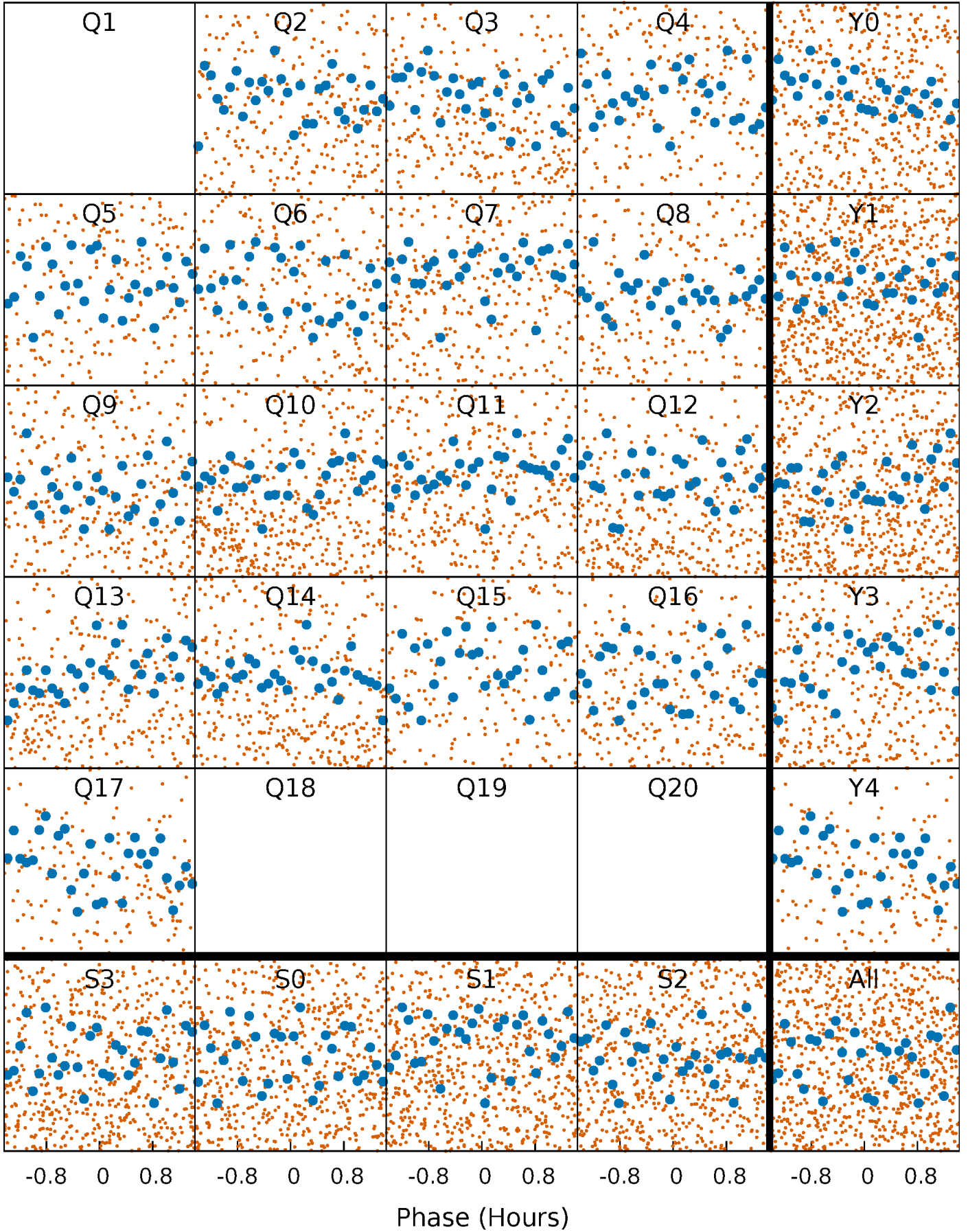


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



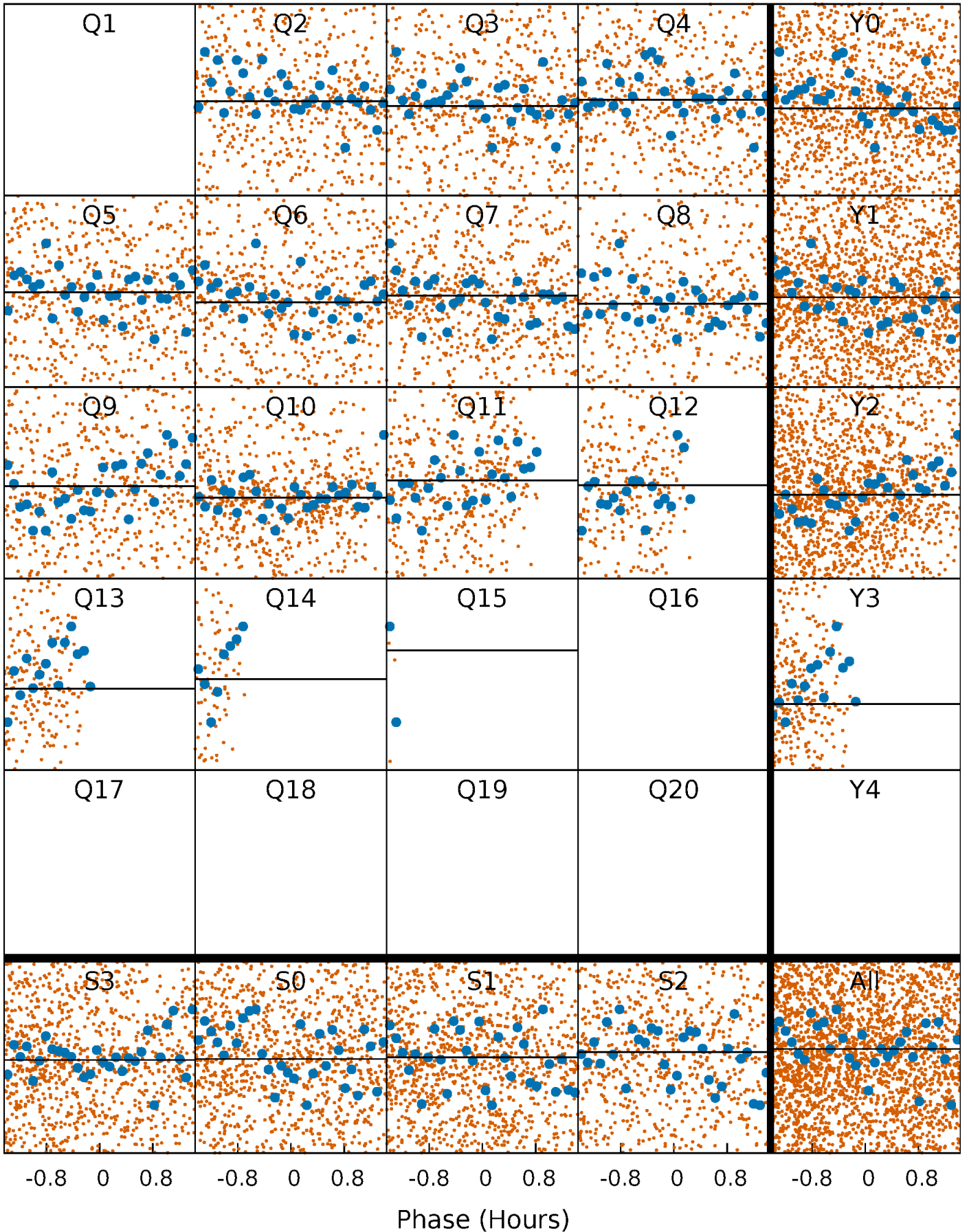
# PDC Quarter-Phased Transit Curves

TCE 002557335-02     $P = 0.701277$  Days     $T_0 = 131.843529$  (BKJD)



# DV Quarter-Phased Transit Curves

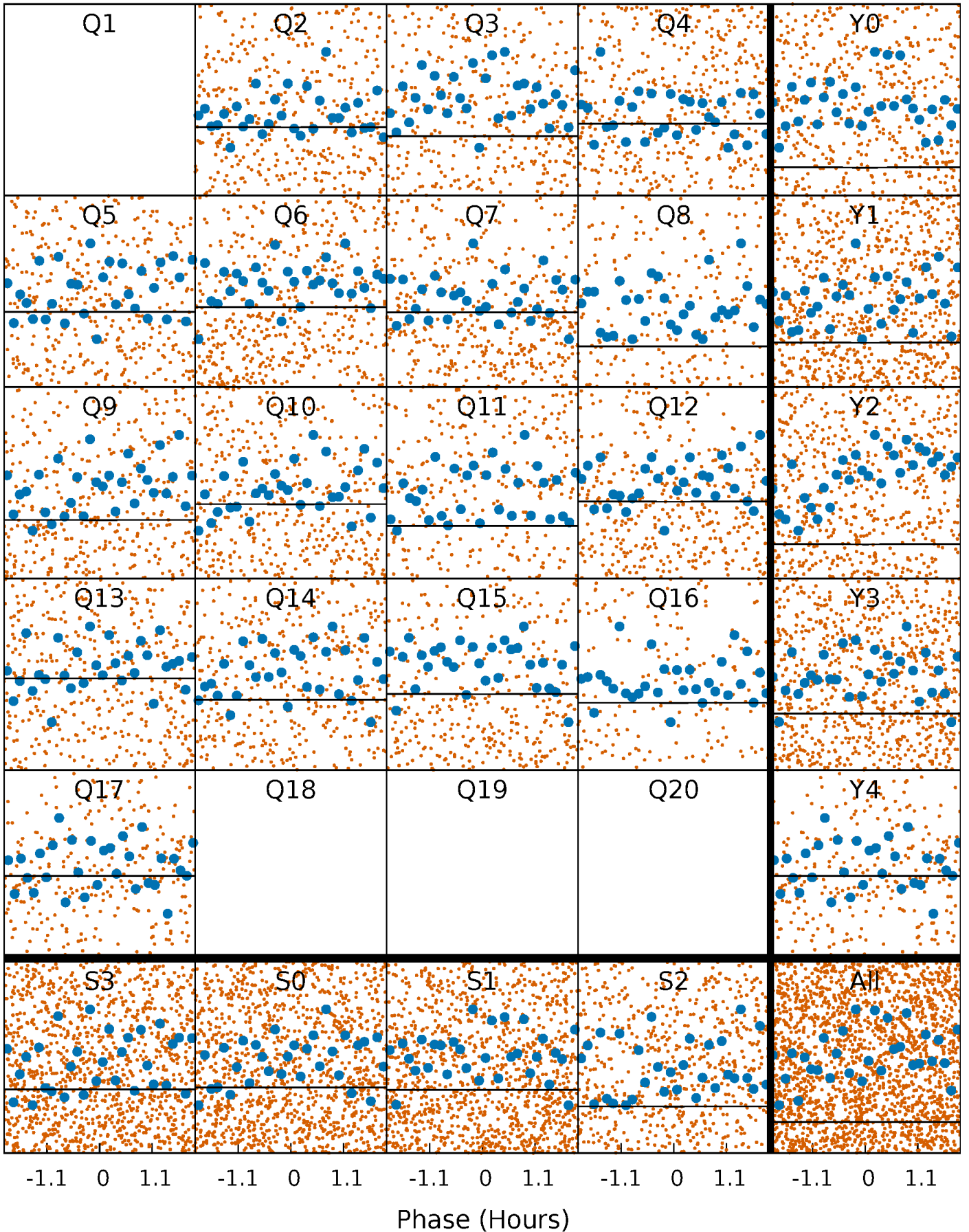
TCE 002557335-02   P= 0.701277 Days    $T_0=131.843529$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 002557335-02   P= 0.701162 Days    $T_0=131.811310$  (BKJD)

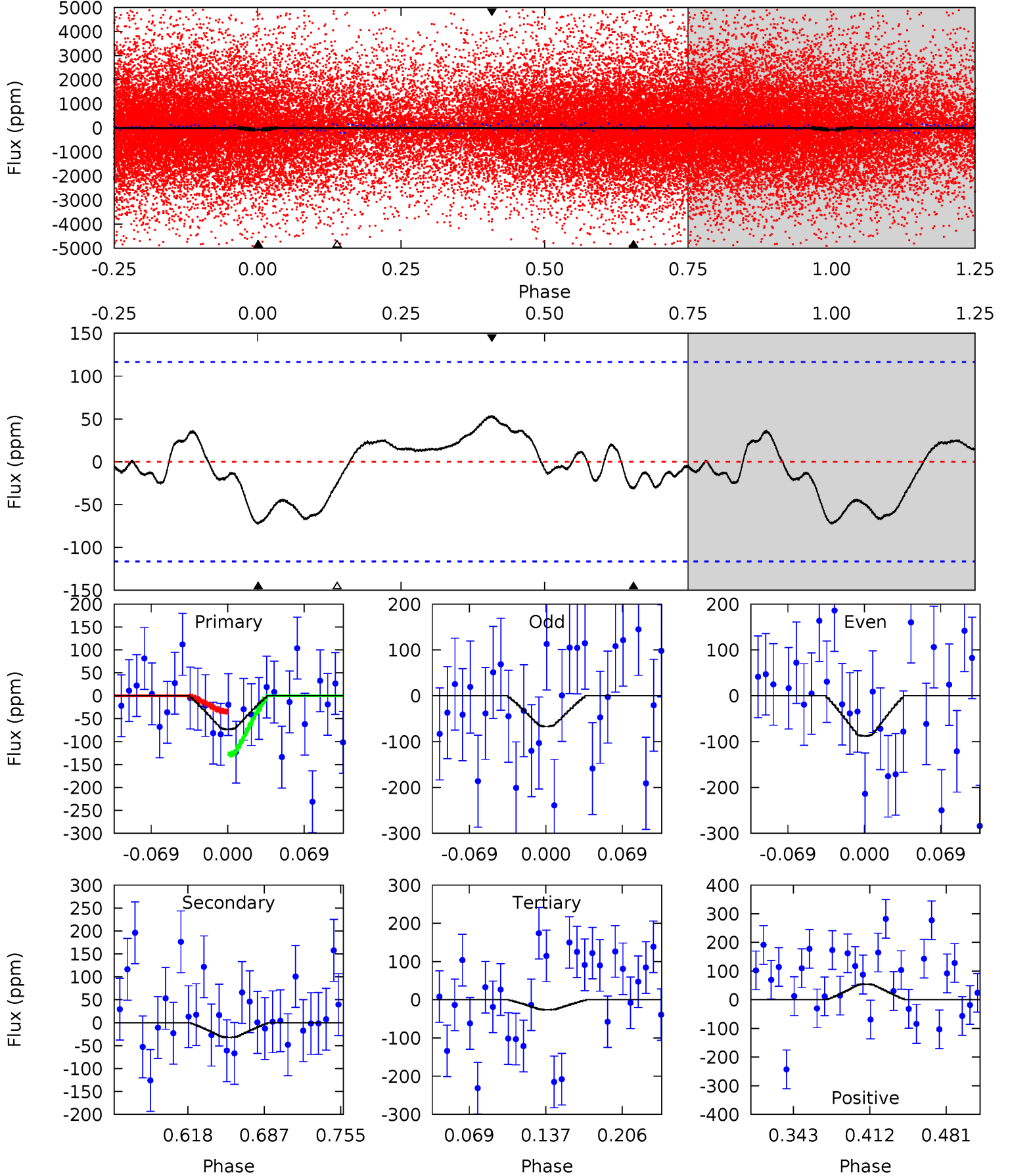




# DV Model-Shift Uniqueness Test

002557335-02, P = 0.701277 Days, E = 131.843529 Days

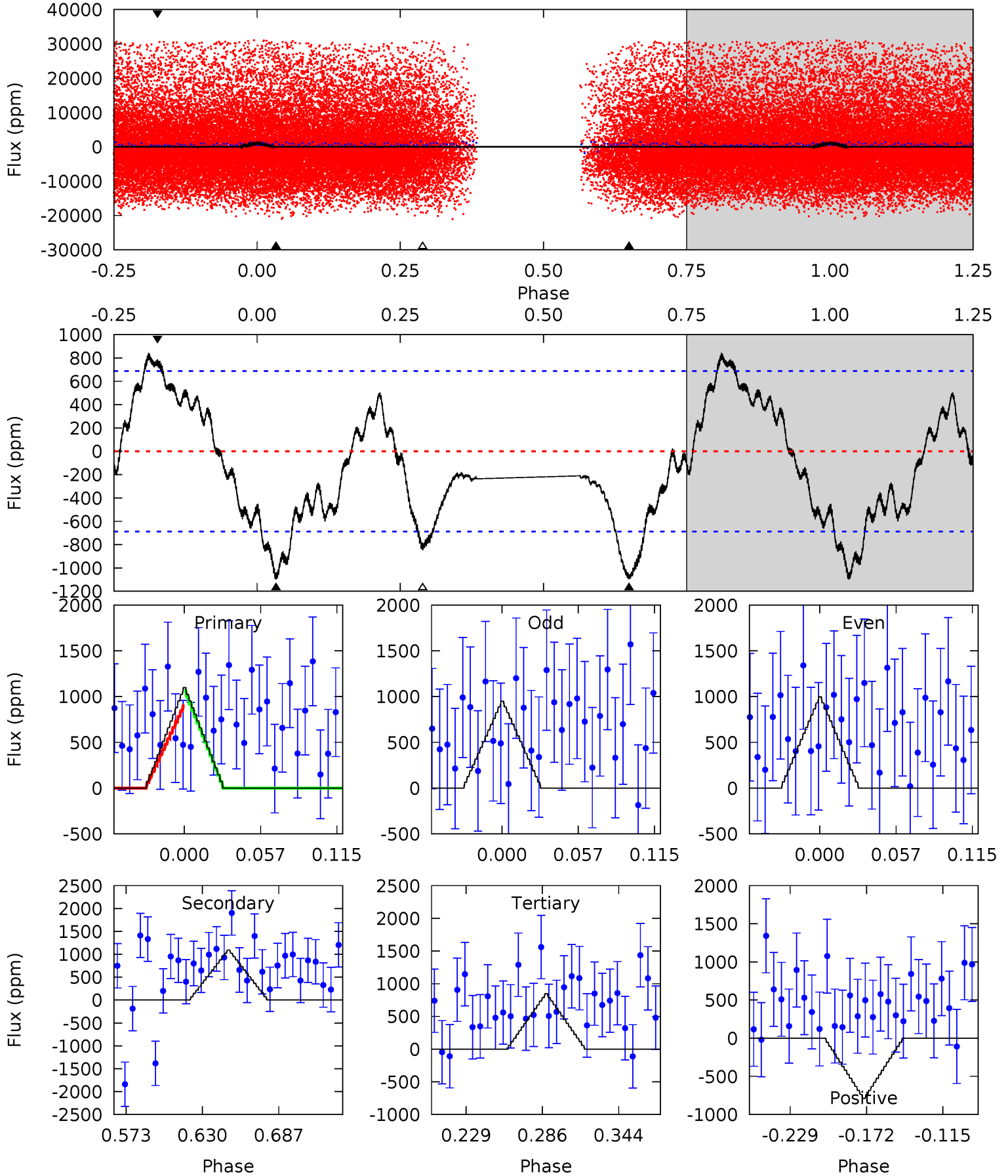
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.91	1.27	1.04	2.17	4.64	1.82	1.01	1.87	0.75	0.23	-0.90	0.42	0.29	0.43	1.90



# Alt Model-Shift Uniqueness Test

002557335-02, P = 0.701162 Days, E = 131.811310 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.46	7.44	5.75	5.37	4.68	1.90	2.79	1.71	2.09	1.69	2.08	0.16	-6.37	0.44	0.55



### Stellar Parameters For KIC 002557335

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5569^{+166}_{-166}$	$4.504^{+0.099}_{-0.121}$	$-0.520^{+0.300}_{-0.300}$	$0.802^{+0.140}_{-0.102}$	$0.749^{+0.109}_{-0.047}$	$2.042^{+0.880}_{-0.721}$
	+3%/-3%	+2%/-3%	+58%/-58%	+17%/-13%	+15%/-6%	+43%/-35%
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 002557335-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-32 \pm 25$	$11.72^{+13.12}_{-8.43}$	$2621^{+370}_{-281}$	$-2771^{+572}_{-265}$	$0.019^{+0.237}_{-0.018}$
Alt.	$-1095 \pm 147$	$12.62^{+14.34}_{-8.83}$	$2616^{+373}_{-258}$	$3014^{+1903}_{-5685}$	$0.736^{+8.566}_{-0.591}$

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

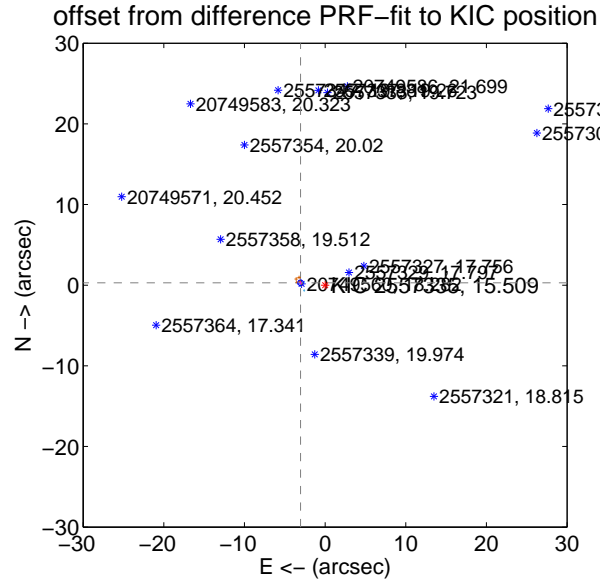
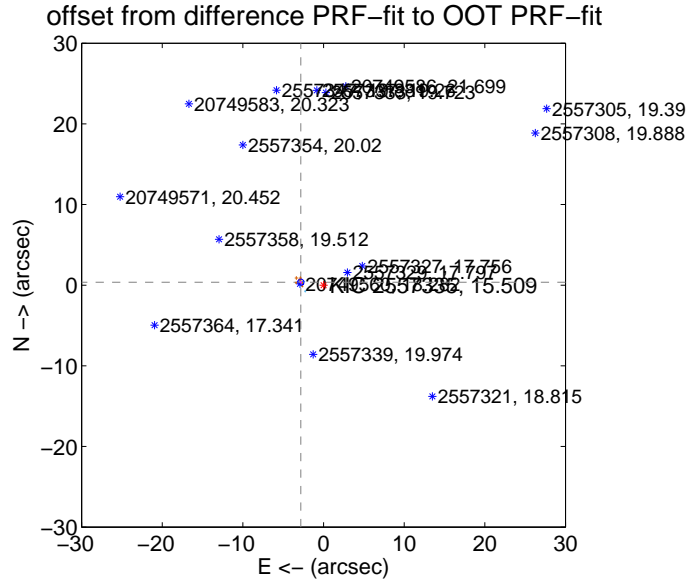
## DV Centroid Data

Supplemental centroid analysis for 002557335-02. Kepler magnitude: 15.51. Transit SNR 0.00

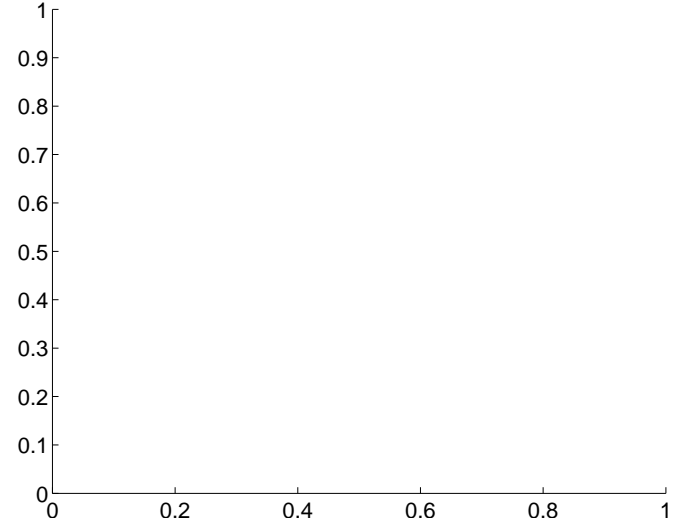
There are 5 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>2.835 <math>\pm</math> 0.127</b>	<b>22.29</b>	2.812 $\pm$ 0.119	0.367 $\pm$ 0.141
PRF-fit source offset from KIC position	<b>3.062 <math>\pm</math> 0.115</b>	<b>26.54</b>	3.048 $\pm$ 0.108	0.290 $\pm$ 0.144
photometric centroid source offset	—	—	—	—

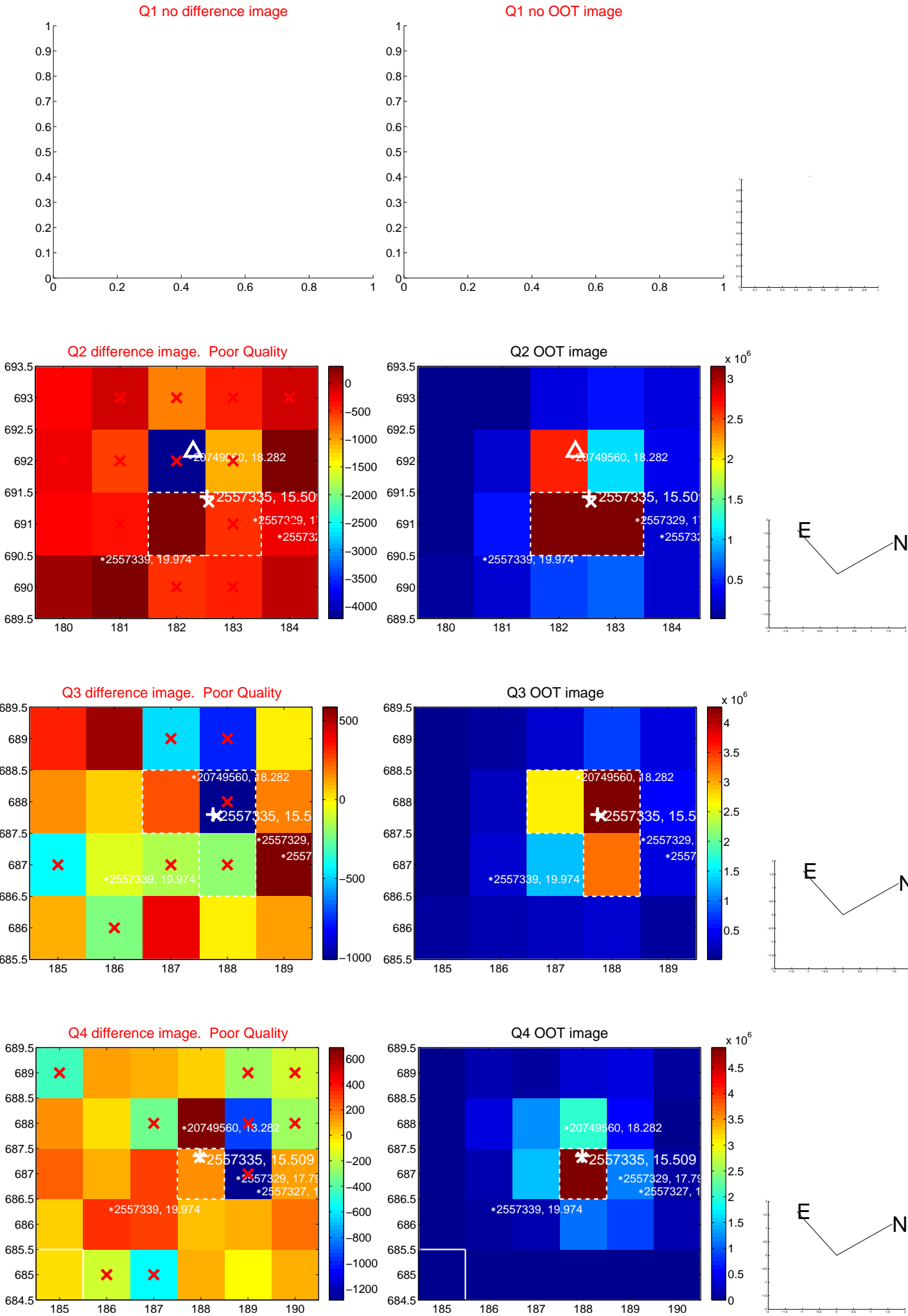


There are no photometric centroids

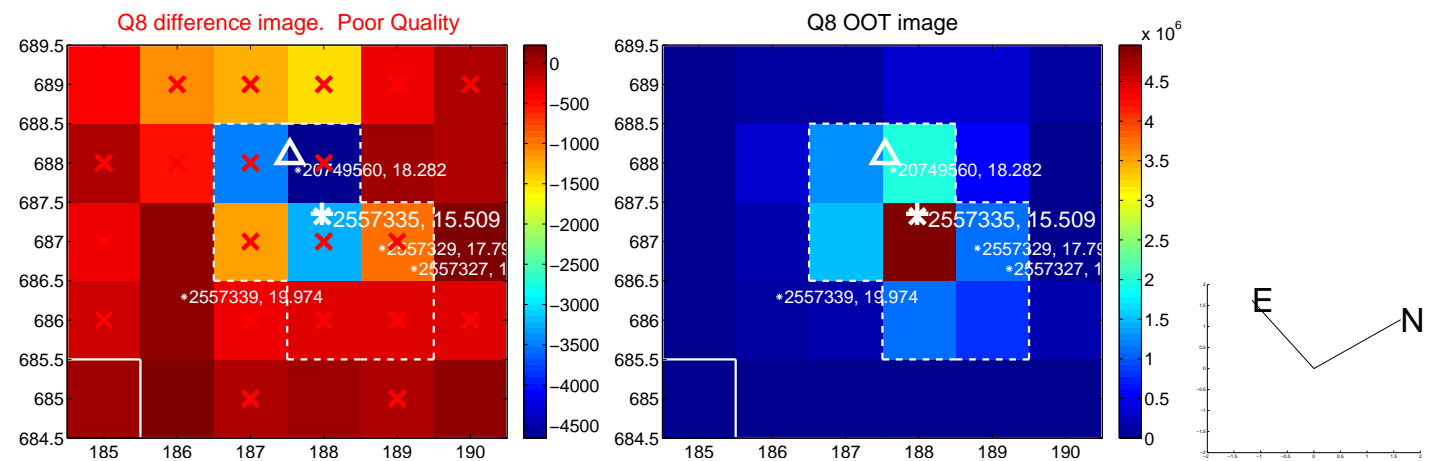
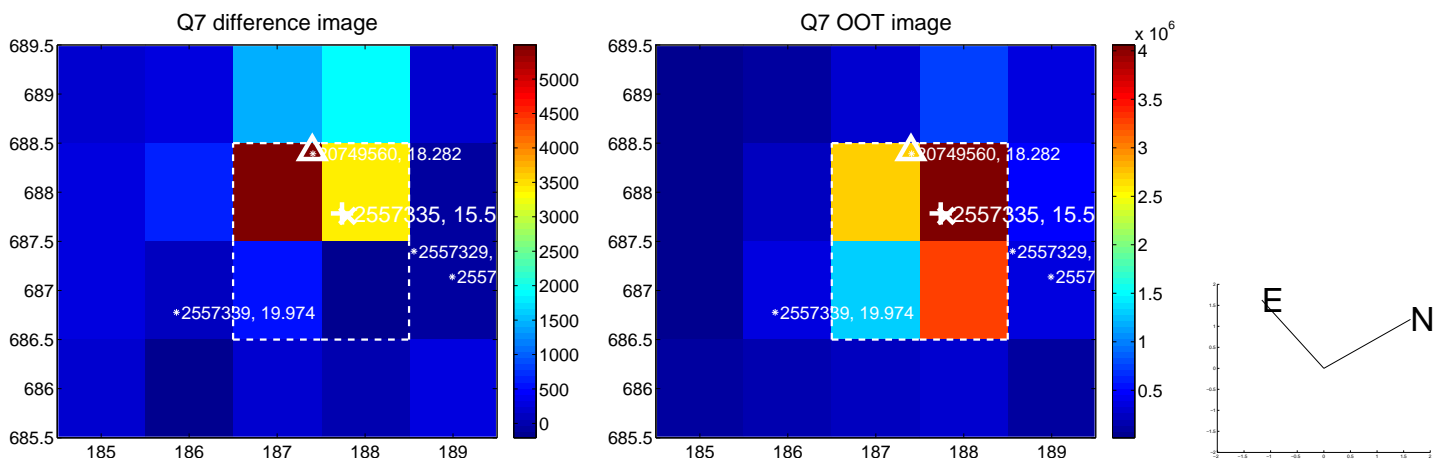
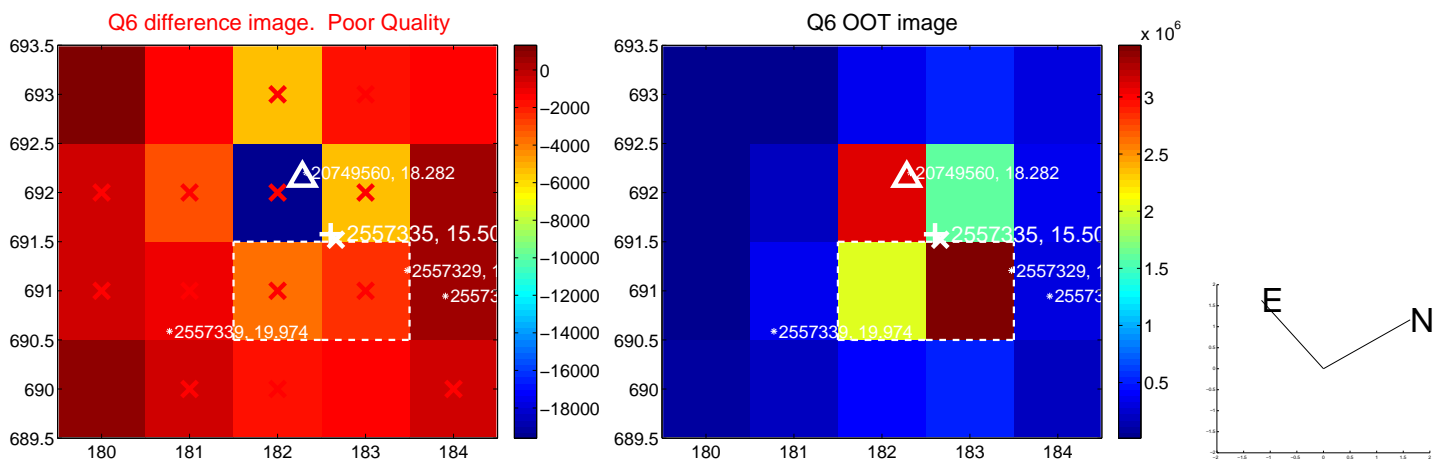
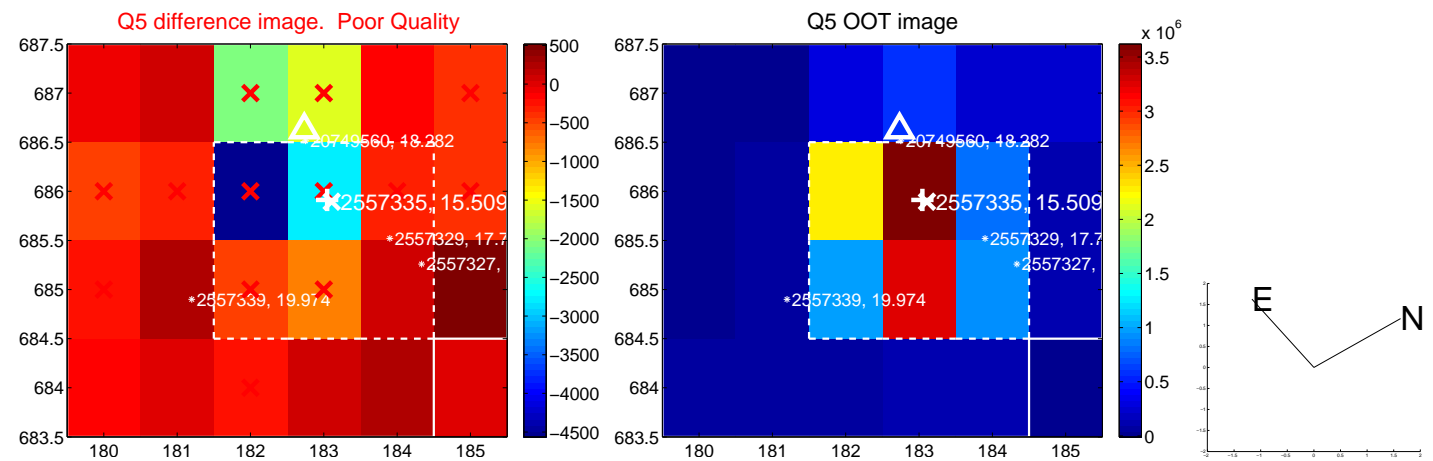


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

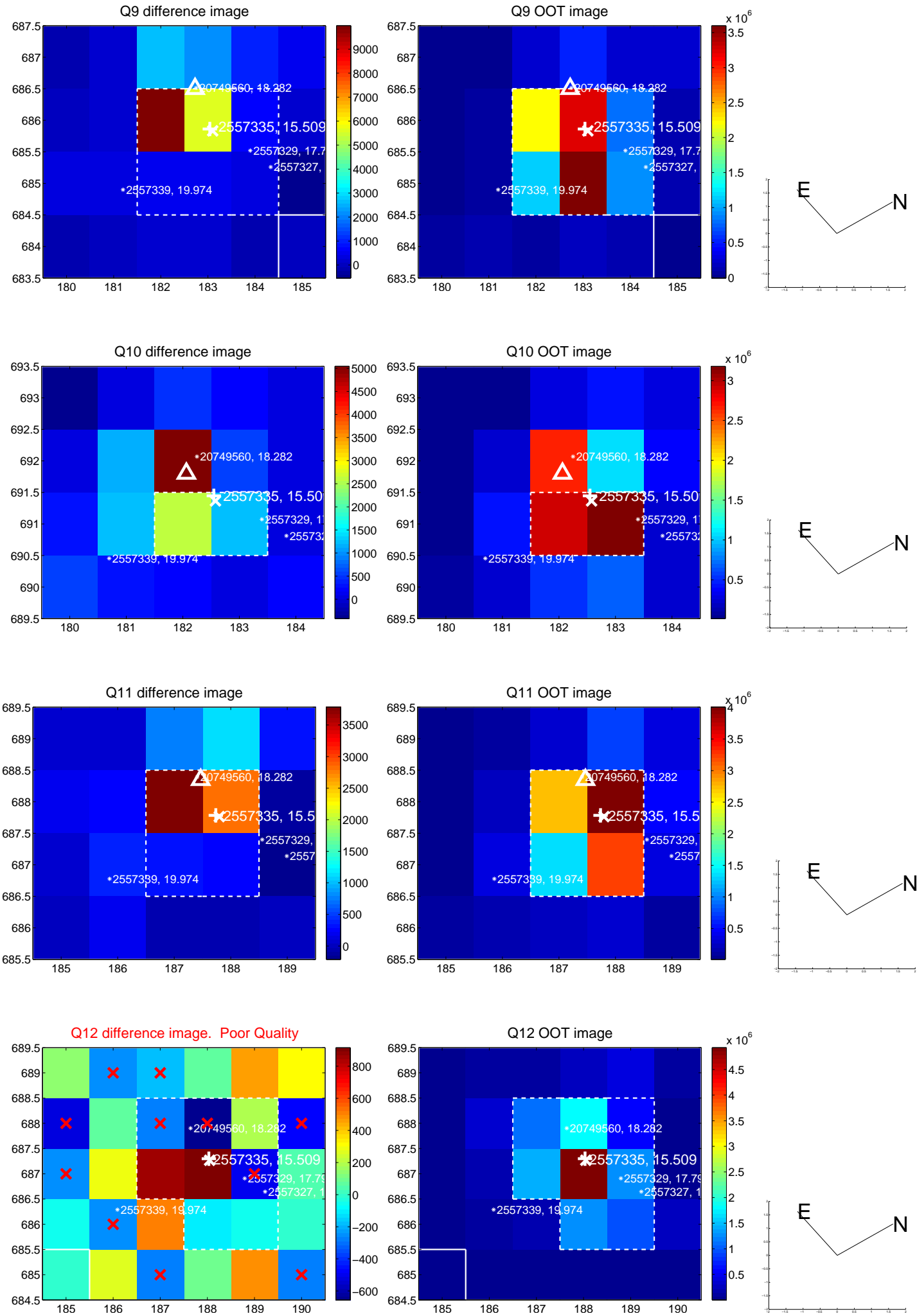


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

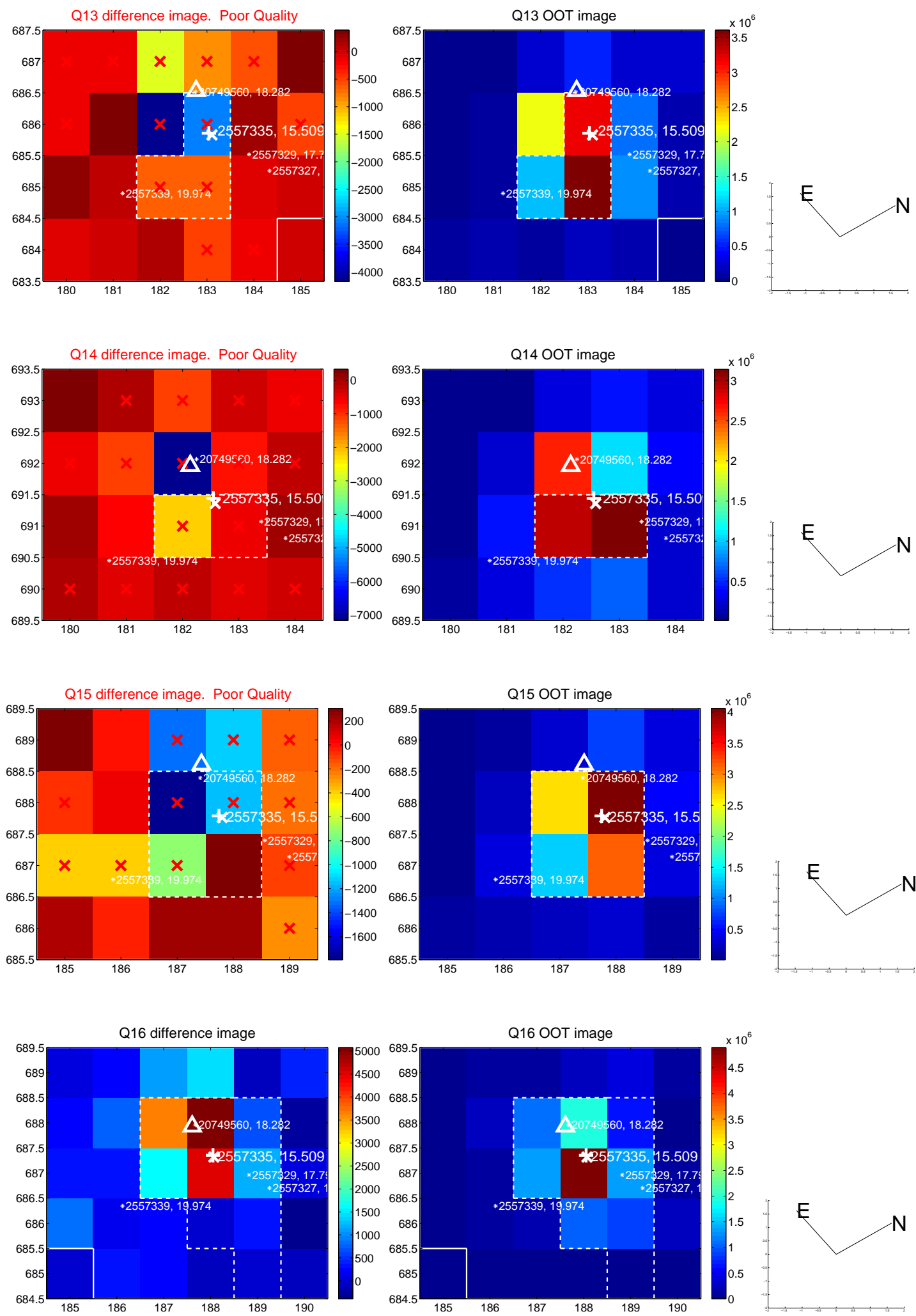




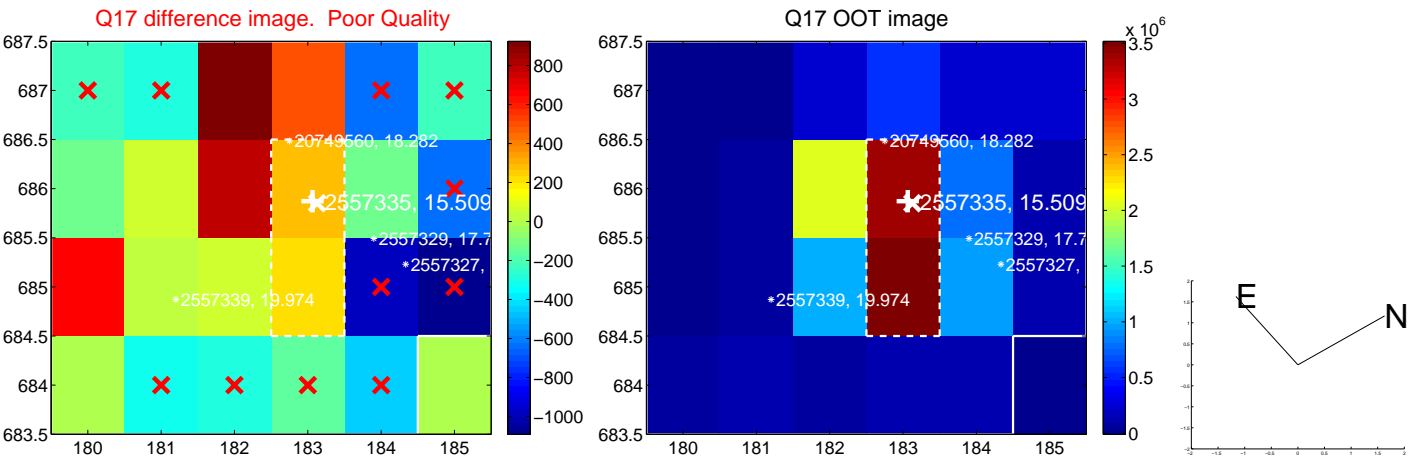
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.



folded centroid time series figure for this object.

UKIRT Image

Declination

