

# KIC 003957477

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003957477-01	OBS	No	0.979046	131.728013	42625.6	2.911	3103.4	1337.5	0.95	5566	22.07	2395.15
003957477-02	OBS	No	0.979054	132.208911	8327.7	2.500	1914.7	-1.0	0.95	5566	8.62	2395.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003957477-01	OBS	FP	0.00	1	0	0	0	LPP_DV
003957477-02	OBS	FP	0.00	1	0	0	0	SAME_NTL_PERIOD—CENT_NOFITS

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

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

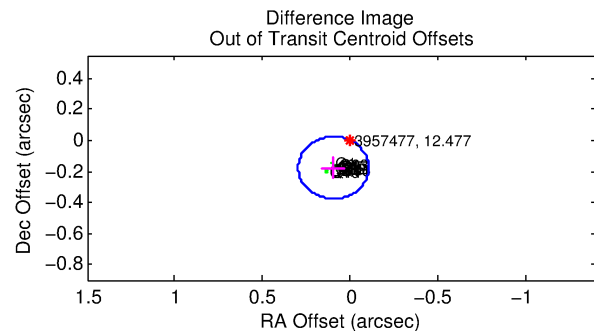
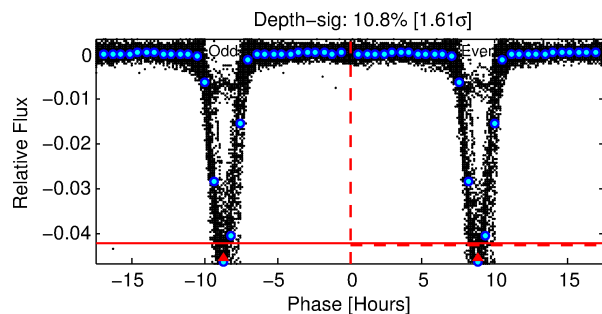
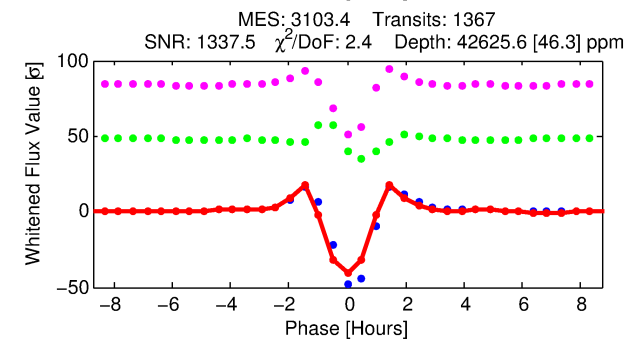
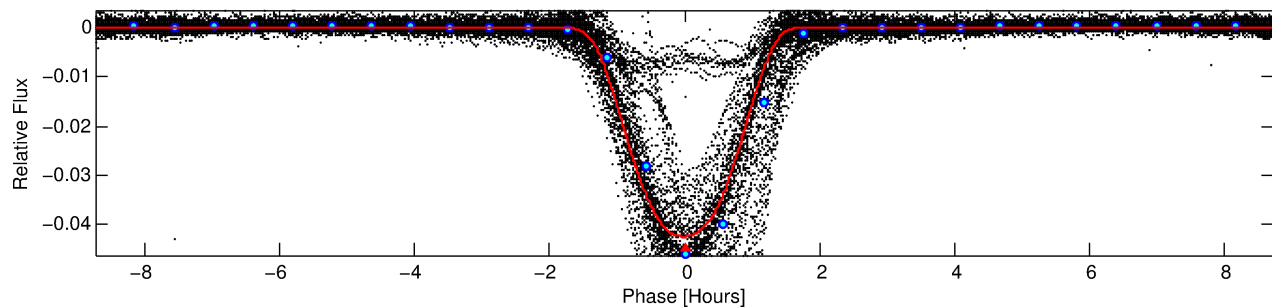
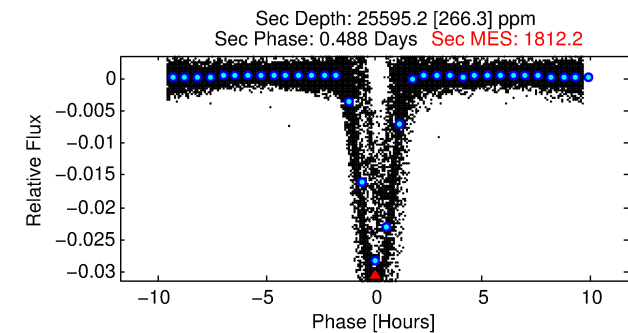
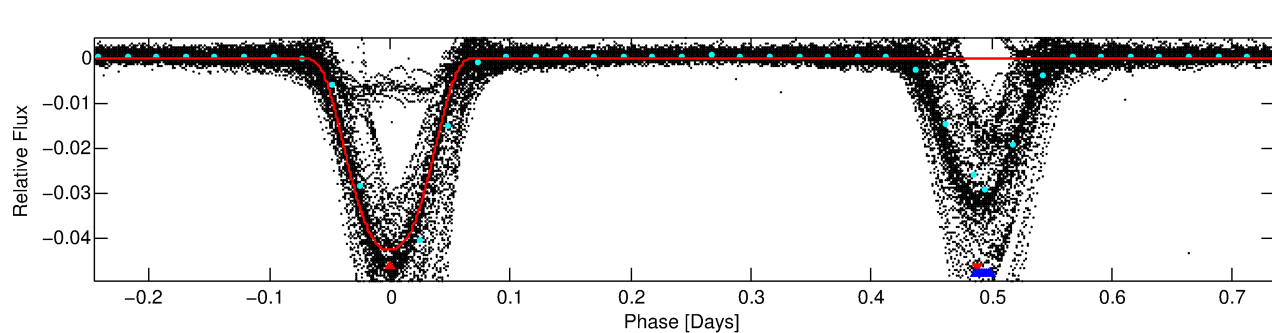
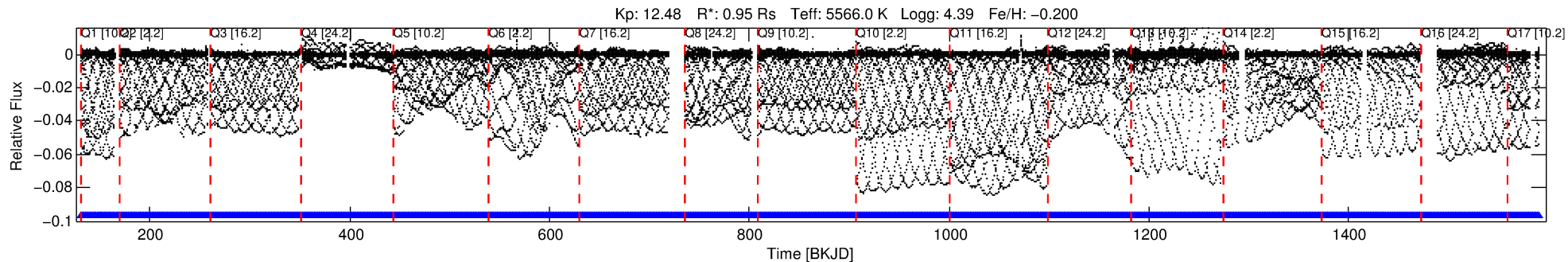
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003957477-01

No Significant Match Found

# DV One-Page Summary

KIC: 3957477 Candidate: 1 of 2 Period: 0.979 d



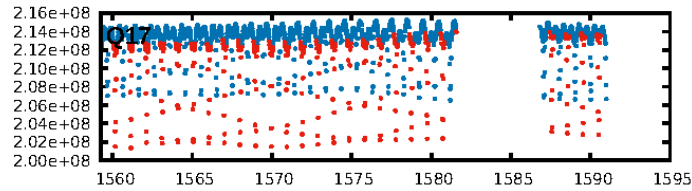
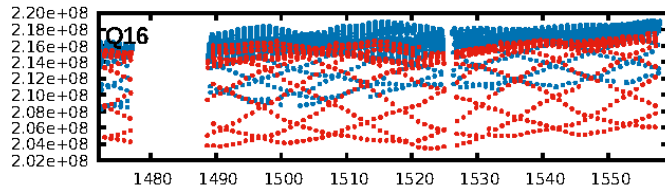
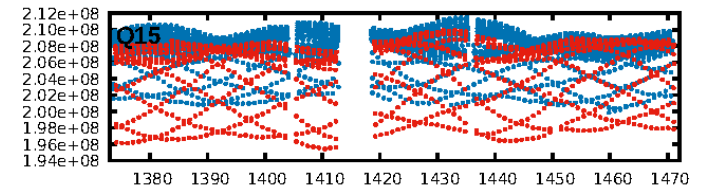
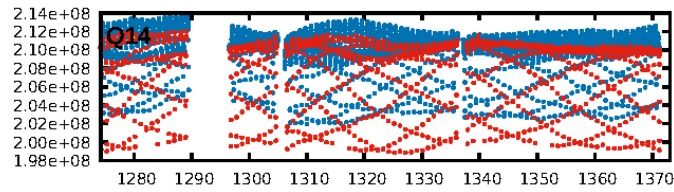
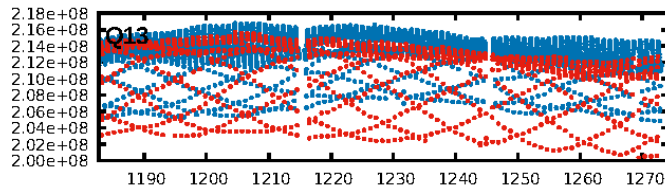
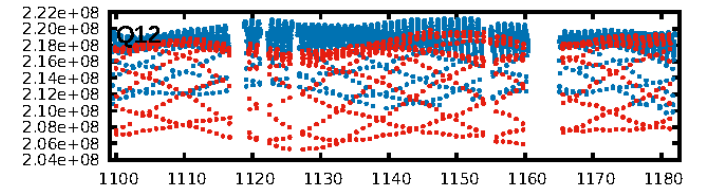
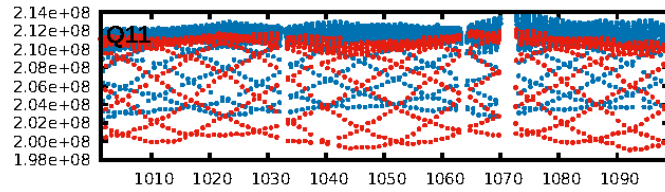
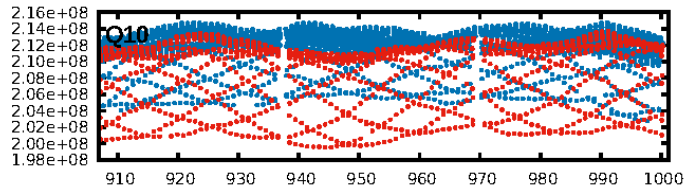
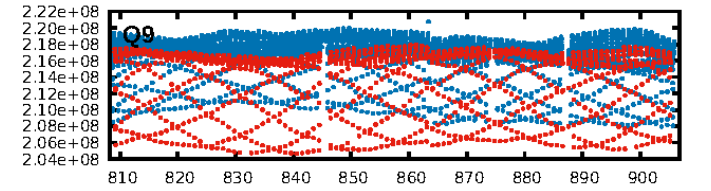
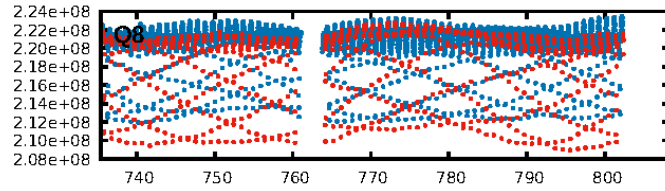
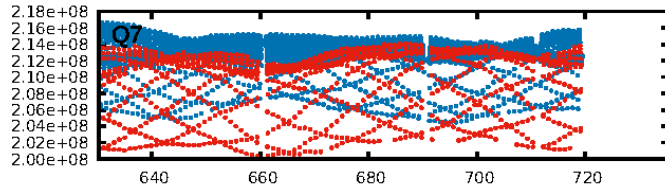
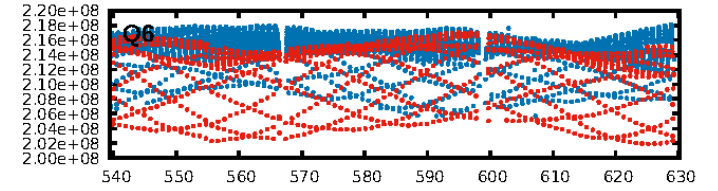
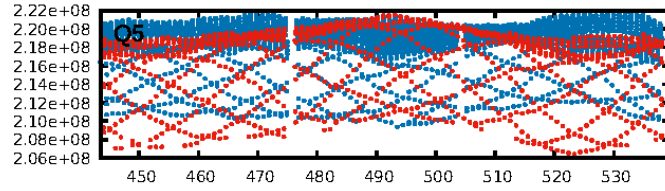
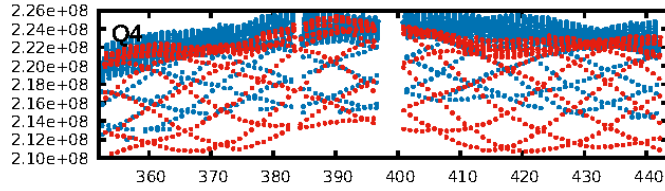
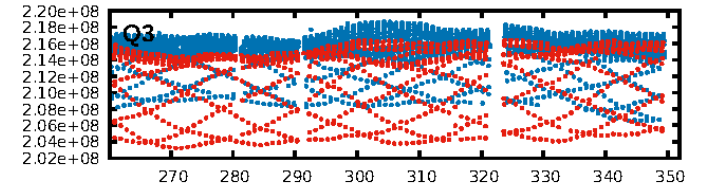
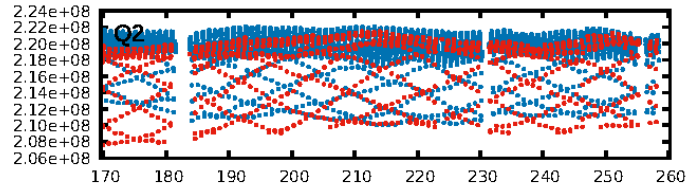
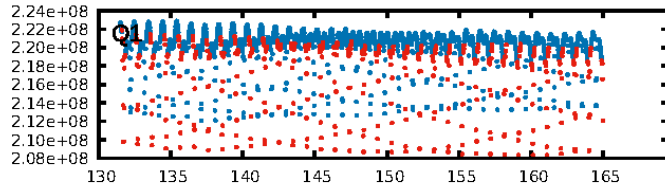
## DV Fit Results:

Period = 0.97905 [0.00000] d  
Epoch = 131.7280 [0.0000] BKJD  
Rp/R\* = 0.2117 [0.0001]  
a/R\* = 2.57 [0.00]  
b = 0.77 [0.00]  
Seff = 2395.15 [853.77]  
Teq = 1784 [159] K  
Rp = 22.07 [6.03] Re  
a = 0.0181 [0.0042] AU  
Ag = 9.47 [3.22] [2.63σ]  
Teffp = 4838 [130] K [14.87σ]

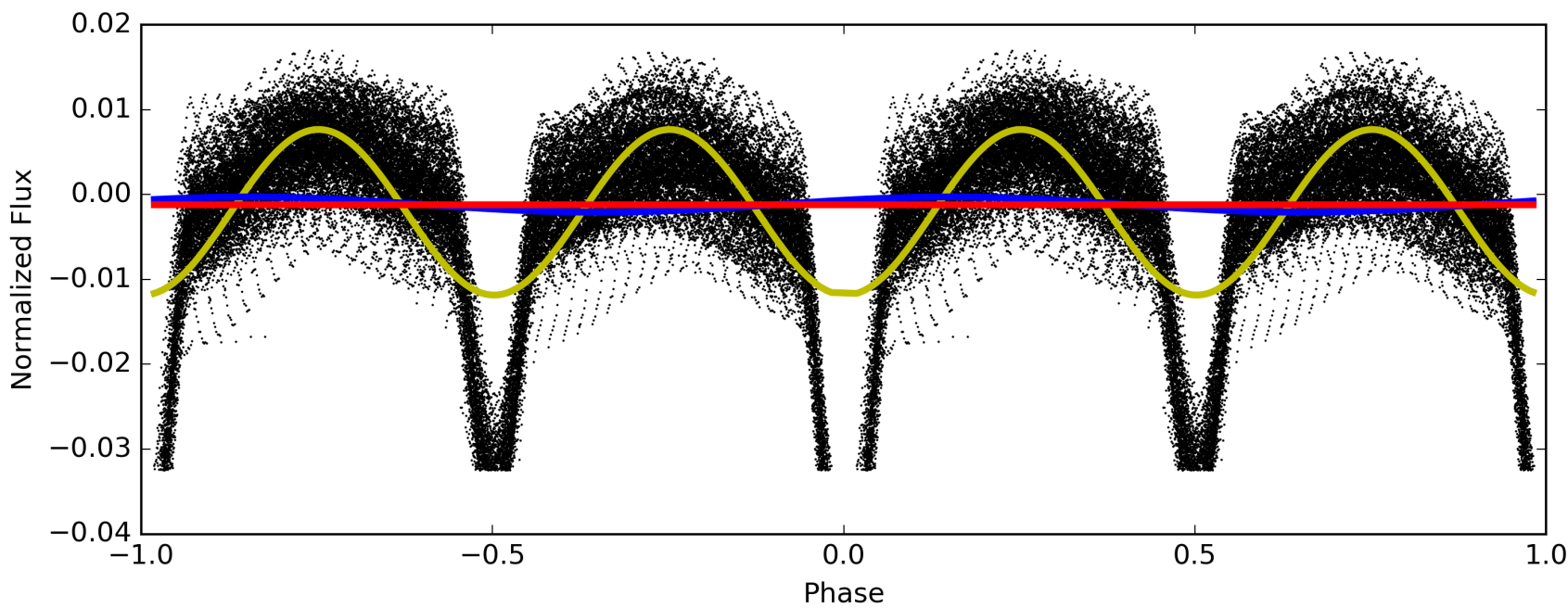
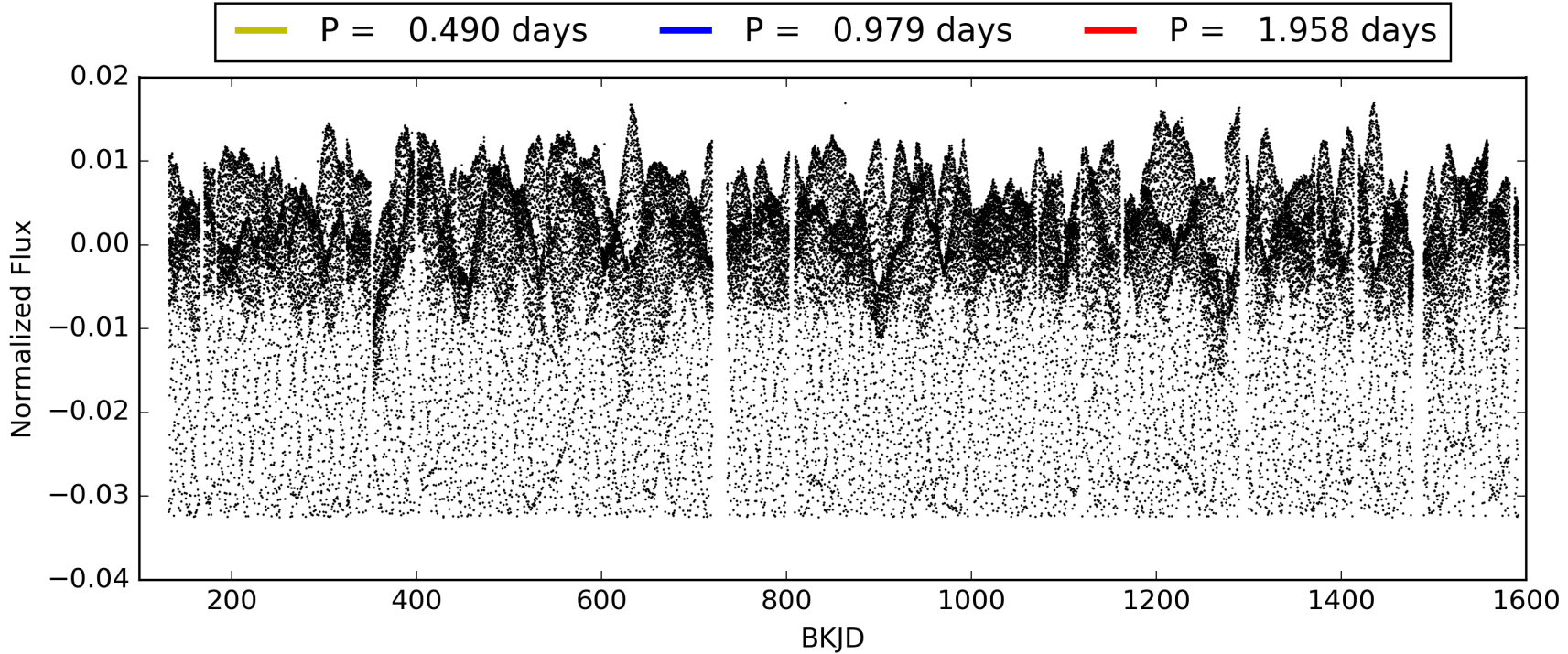
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1305/1305]  
GhostDiagnostic-chr: 1.476  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.201 arcsec [3.01σ]  
KicOffset-rm: 0.172 arcsec [2.50σ]  
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]

# TCE 003957477-01, PDC Light Curves



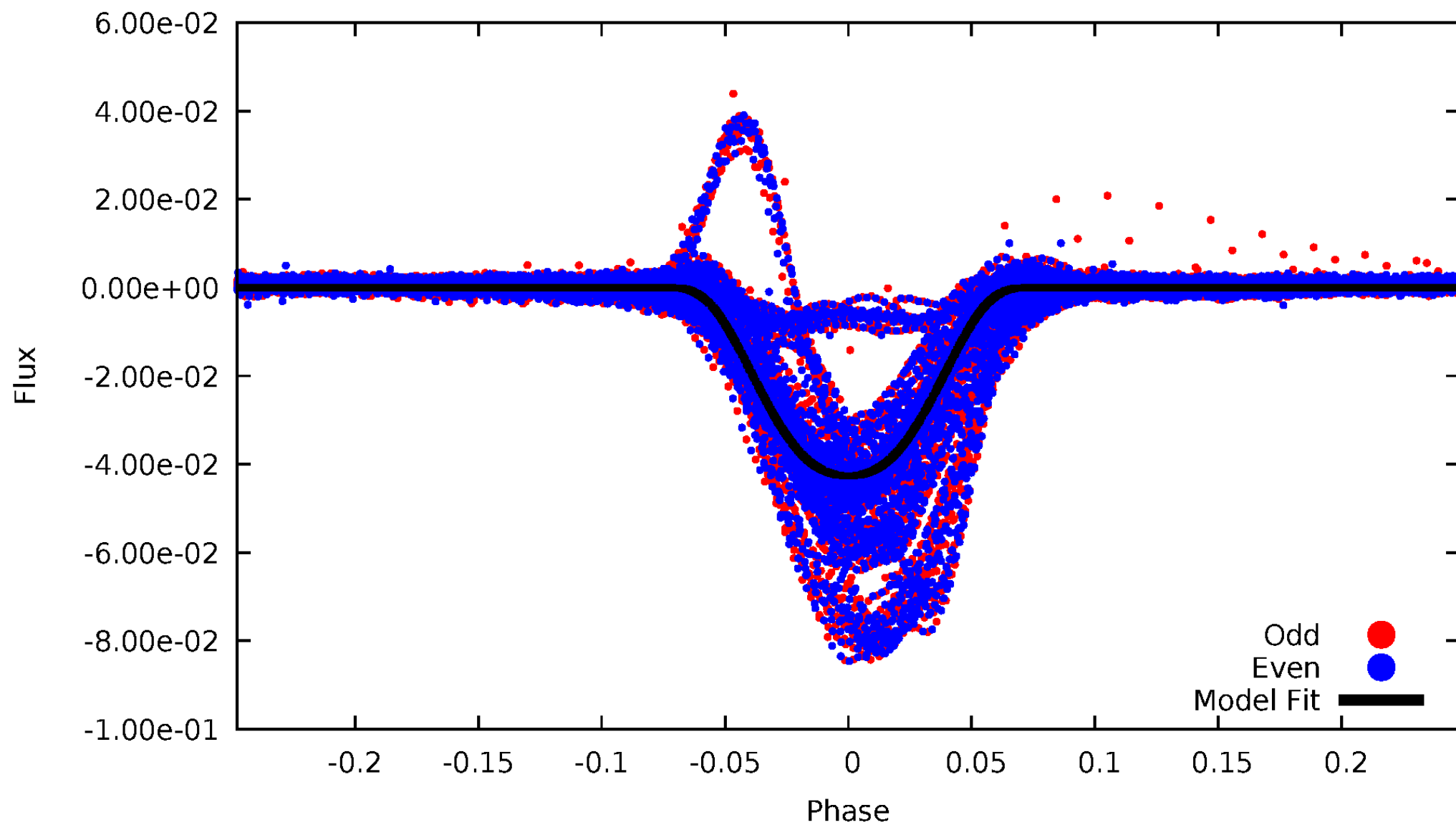
TCE 003957477-01





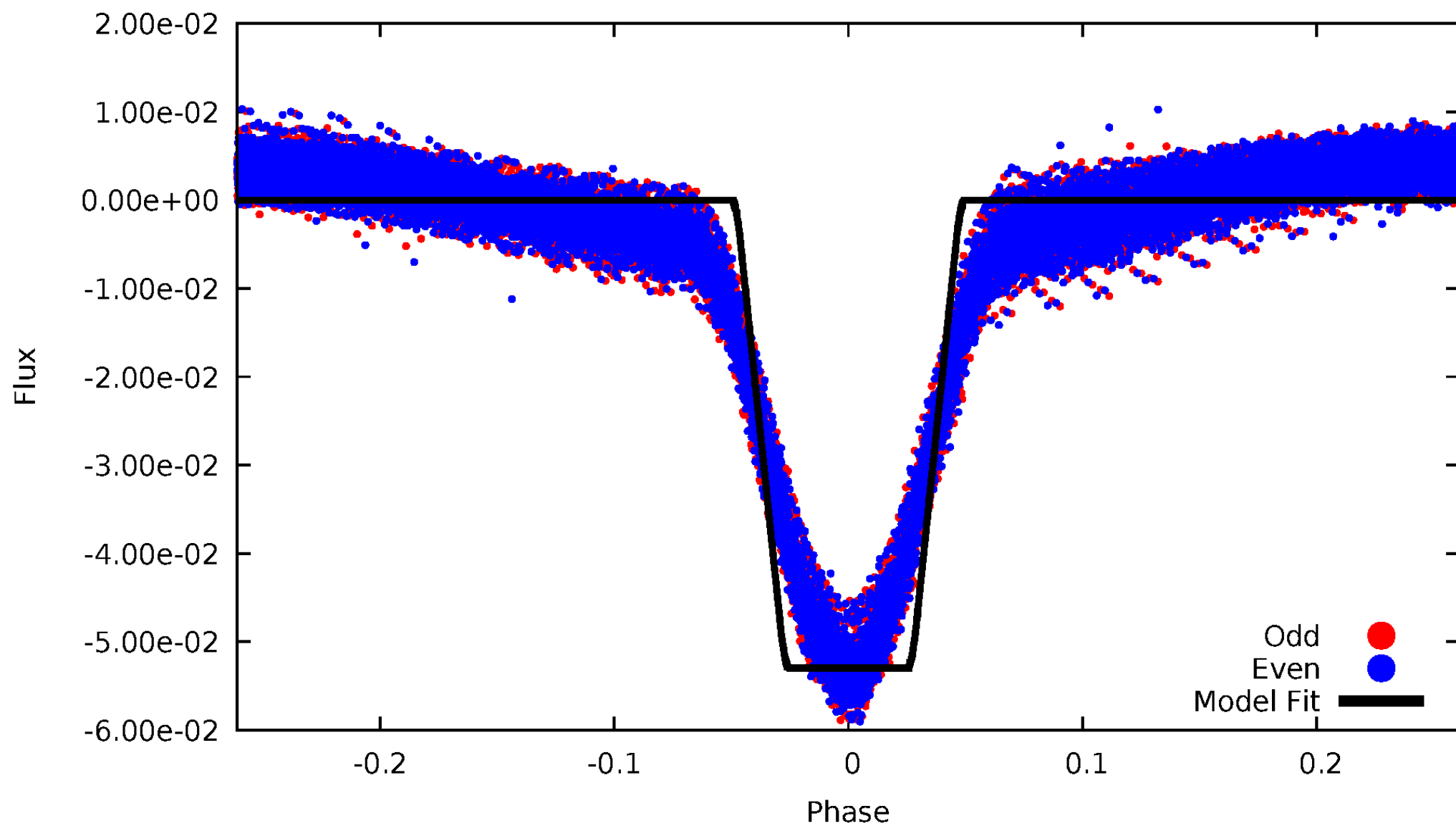
# DV Odd/Even

TCE 003957477-01



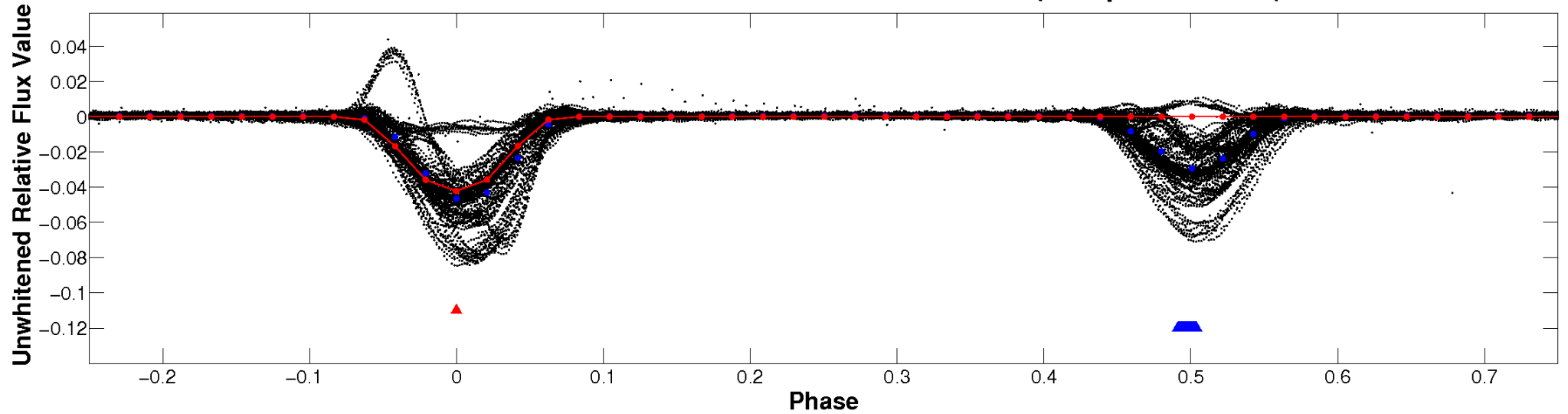
# ALT Odd/Even

TCE 003957477-01

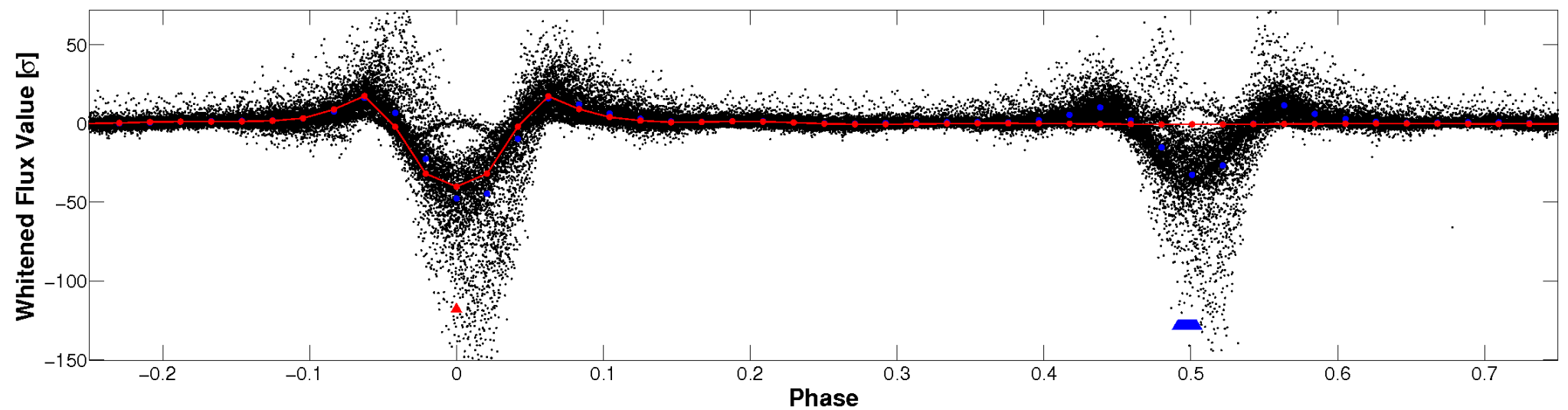


# Non-Whitened Vs. Whitened Light Curve

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

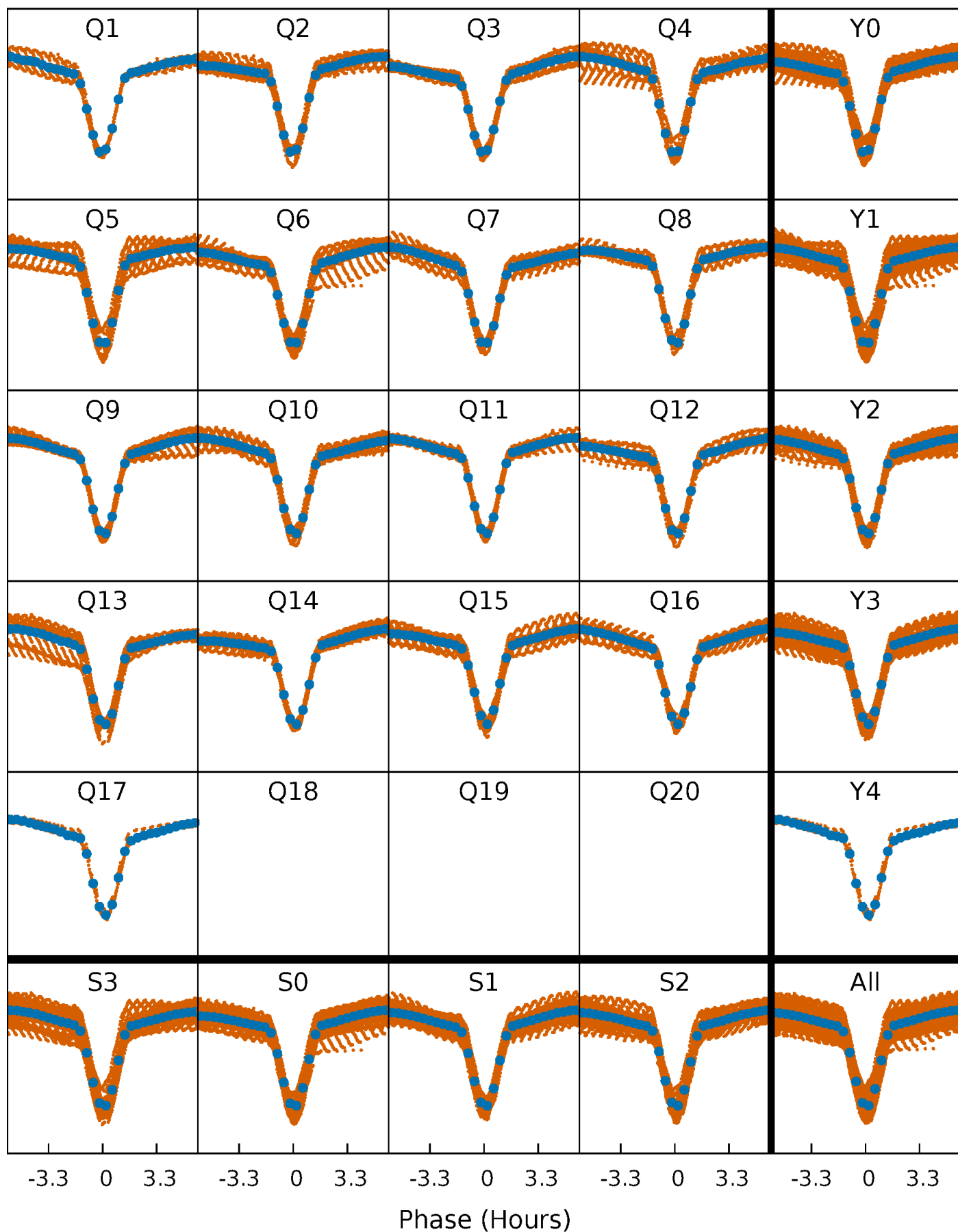


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

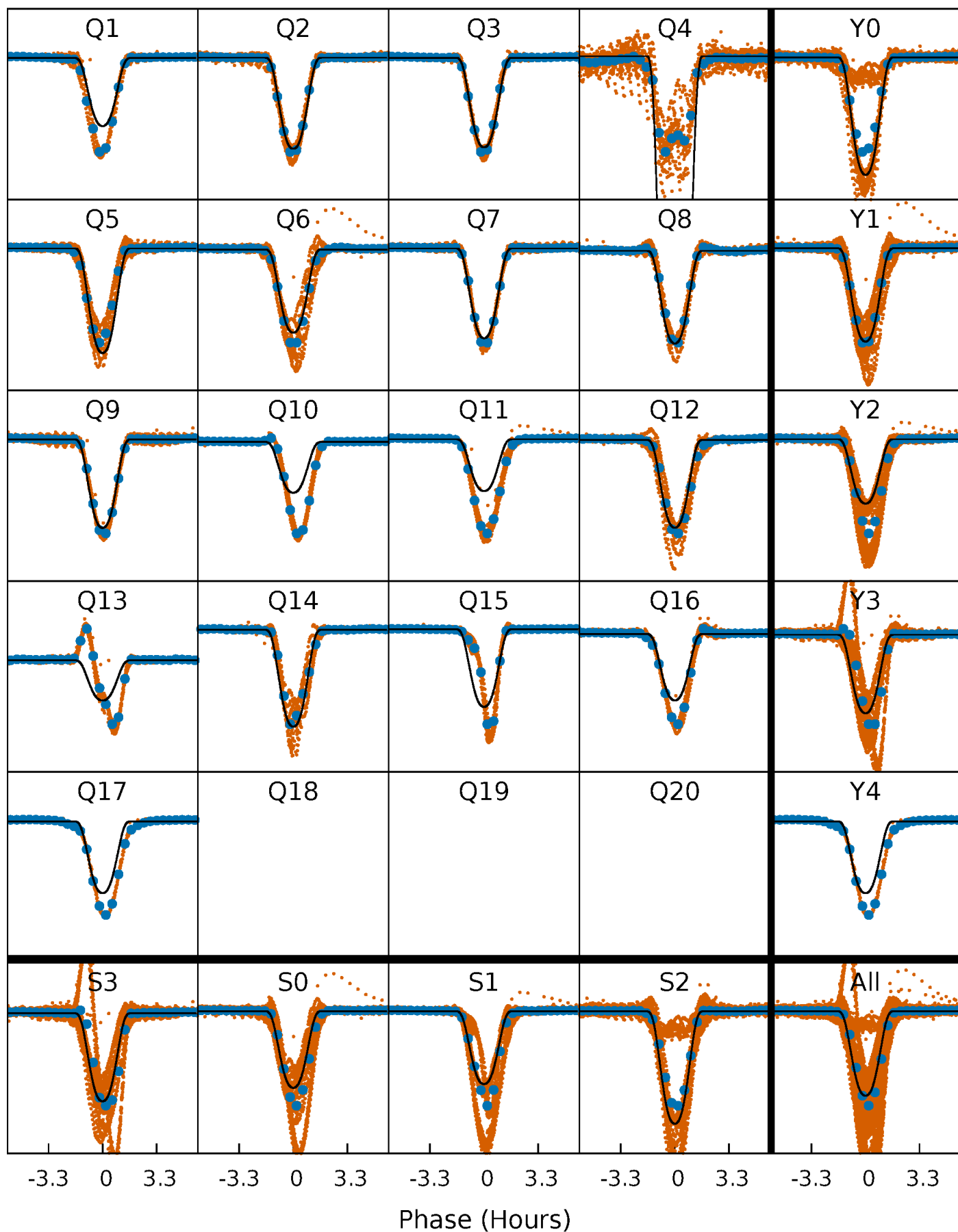
TCE 003957477-01   P= 0.979046 Days    $T_0=131.728013$  (BKJD)





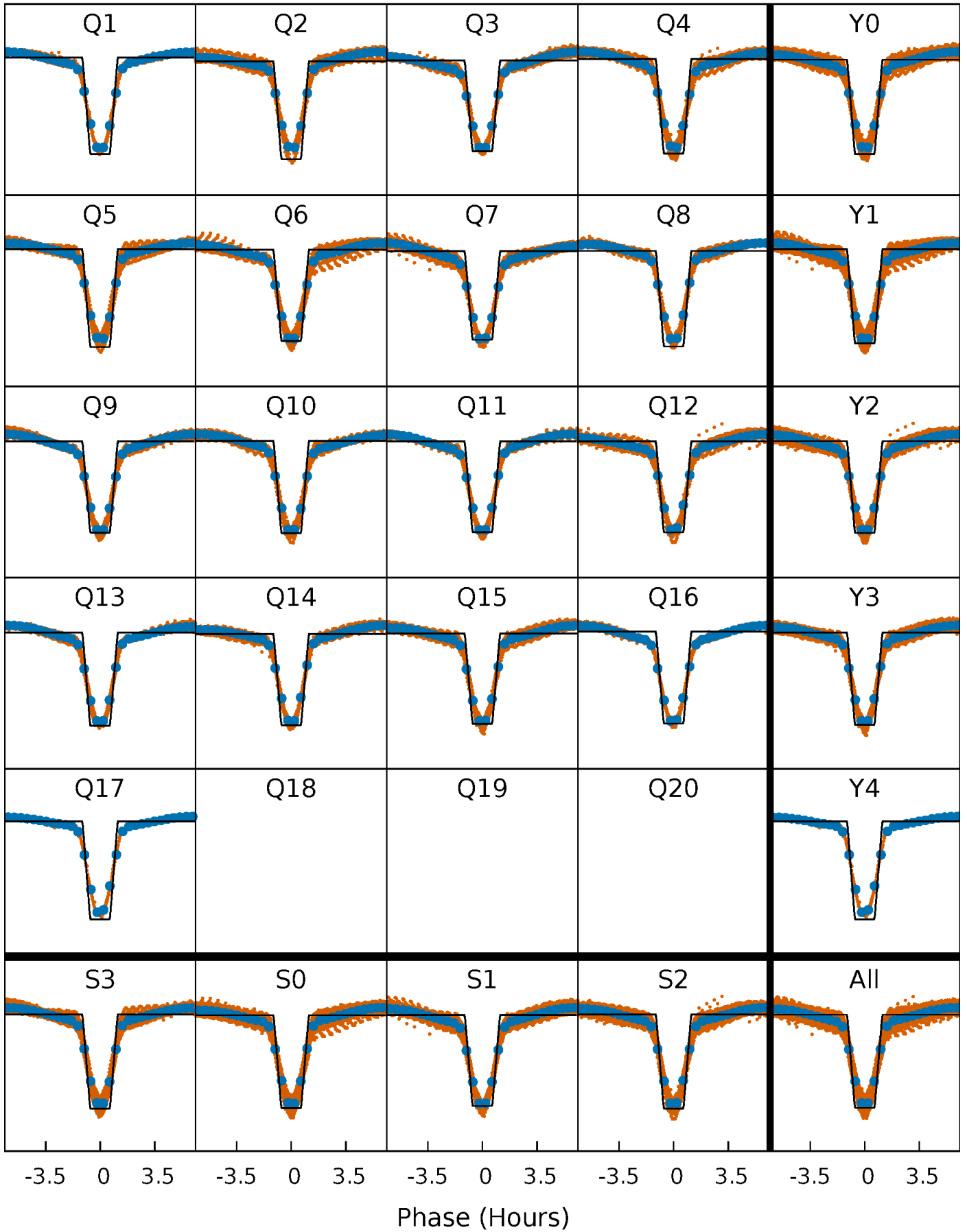
# DV Quarter-Phased Transit Curves

TCE 003957477-01 P= 0.979046 Days  $T_0=131.728013$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

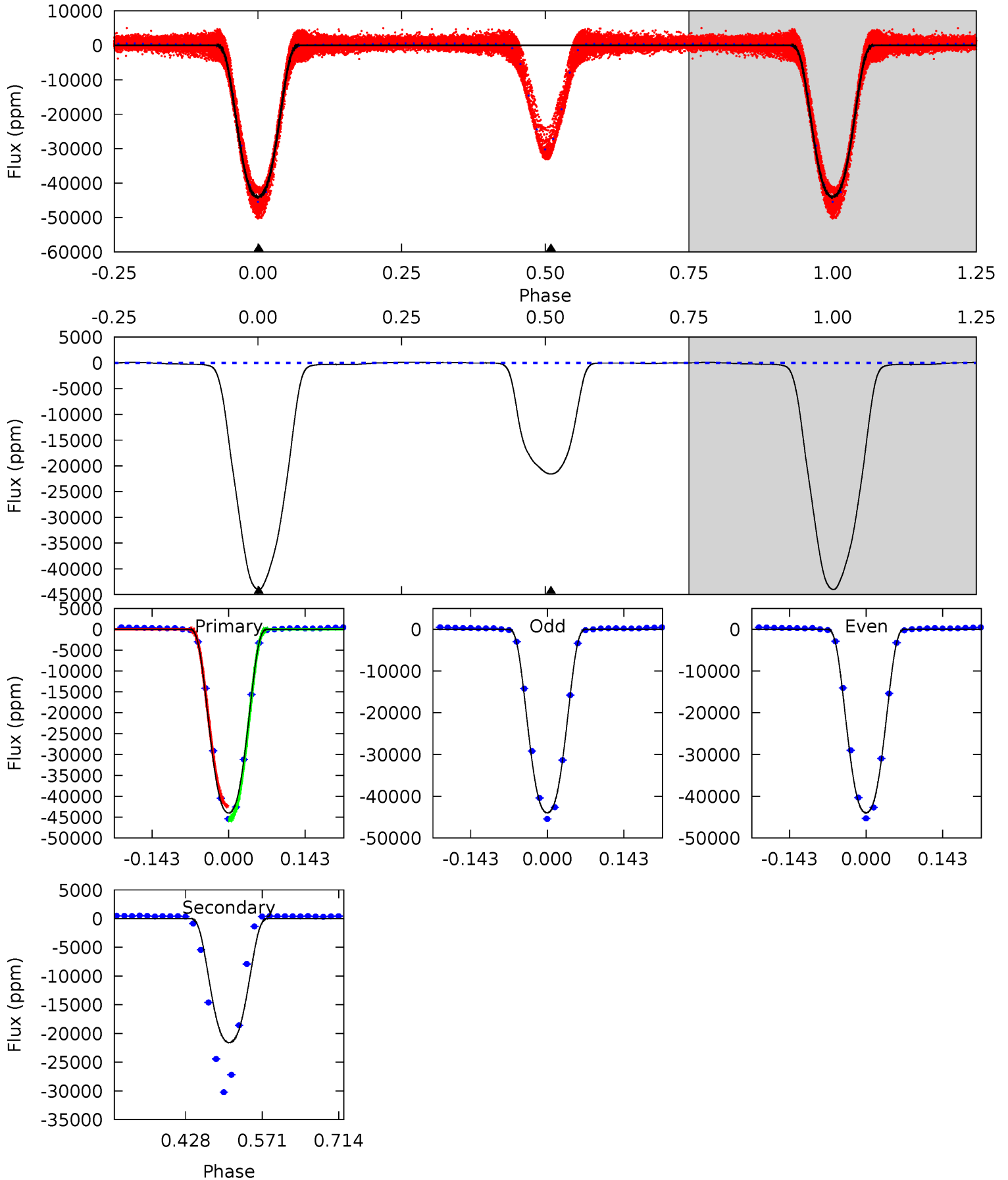
TCE 003957477-01 P= 0.979053 Days  $T_0=131.725062$  (BKJD)



# DV Model-Shift Uniqueness Test

003957477-01, P = 0.979046 Days, E = 130.748967 Days

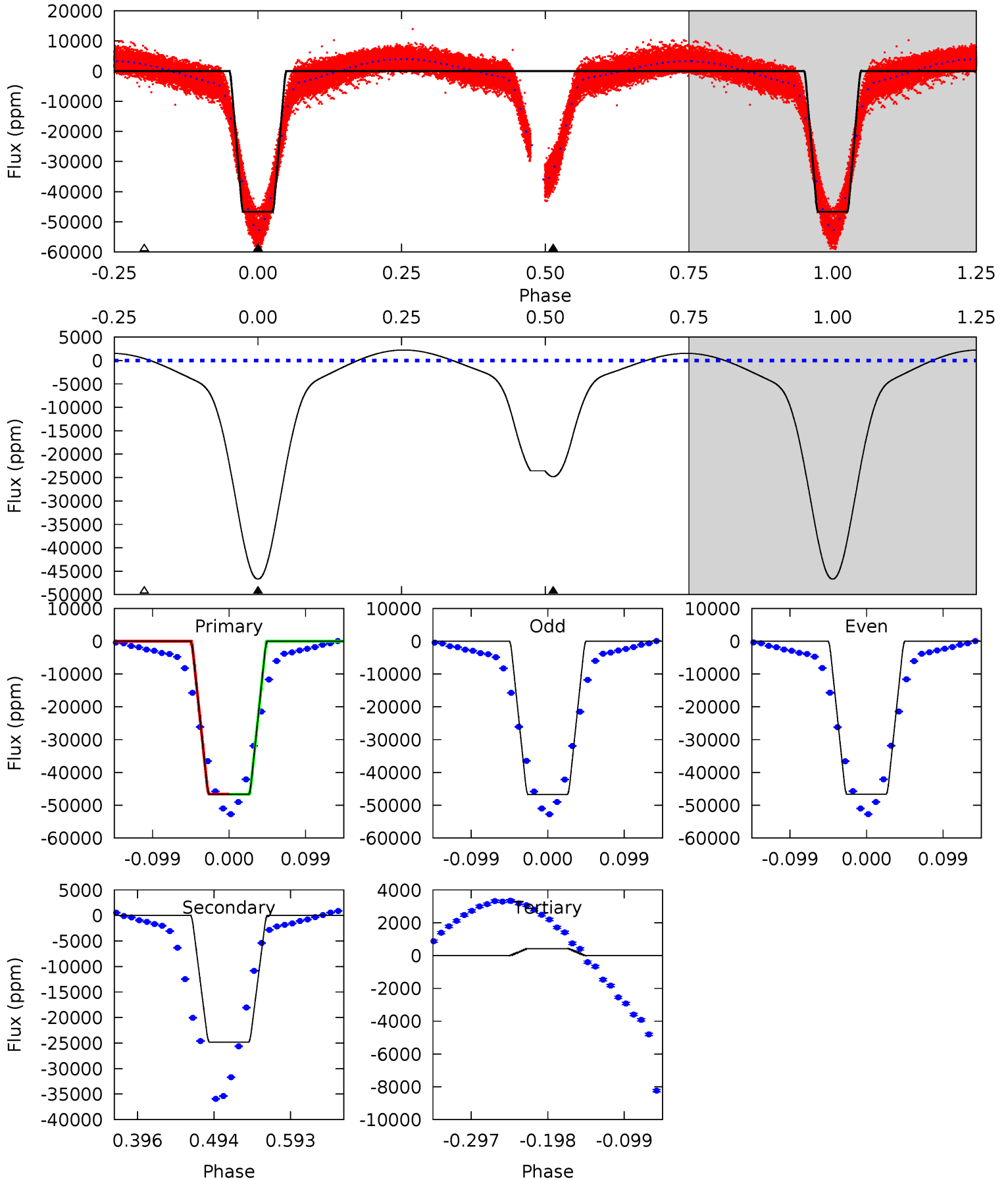
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3463	1699	0	0	4.49	1.47	9.21	3463	3463	1699	1699	0.02	1.04	0.00	0



# Alt Model-Shift Uniqueness Test

003957477-01, P = 0.979053 Days, E = 130.746009 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
1222	650.1	-11.0	0	4.57	1.65	49.4	1233	1222	661.1	650.1	0.83	1.00	0.05	1.26



### Stellar Parameters For KIC 003957477

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5566^{+149}_{-149}$	$4.394^{+0.153}_{-0.187}$	$-0.200^{+0.300}_{-0.300}$	$0.955^{+0.261}_{-0.161}$	$0.824^{+0.122}_{-0.061}$	$1.333^{+0.947}_{-0.640}$
	+3%/-3%	+3%/-4%	+150%/-150%	+27%/-17%	+15%/-7%	+71%/-48%
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 003957477-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-21585 \pm 13$	$22.04^{+3.52}_{-1.94}$	$2493^{+173}_{-139}$	$4736^{+102}_{-117}$	$8.173^{+1.773}_{-1.848}$
Alt.	$-24825 \pm 38$	$24.24^{+3.59}_{-2.43}$	$2513^{+160}_{-152}$	$4713^{+112}_{-116}$	$7.911^{+1.580}_{-1.865}$

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

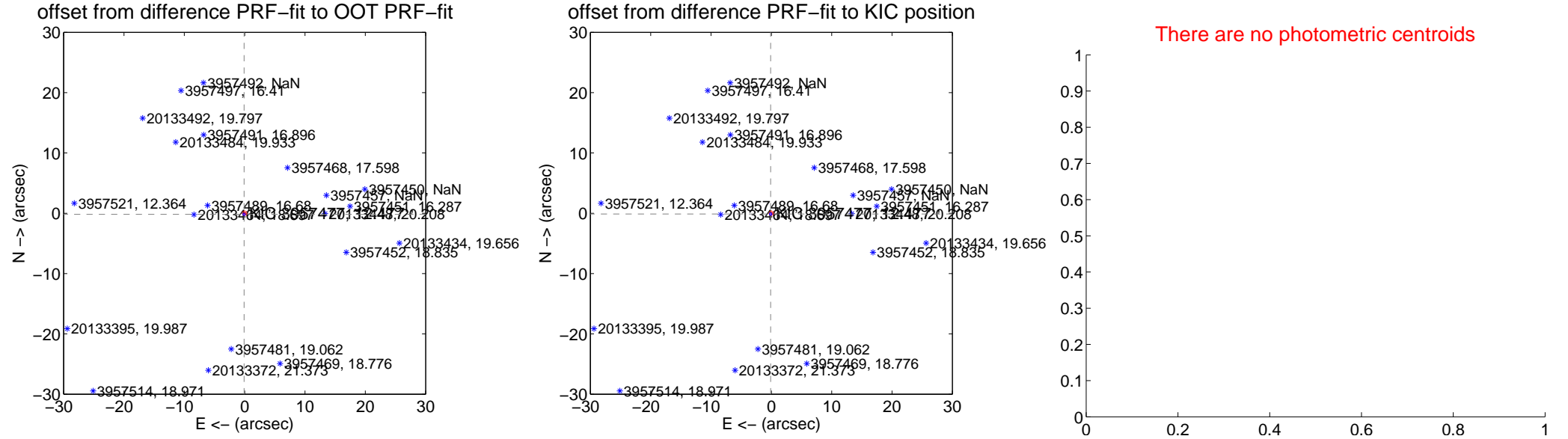
## DV Centroid Data

Supplemental centroid analysis for 003957477-01. Kepler magnitude: 12.48. Transit SNR 1337.51

There are 17 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

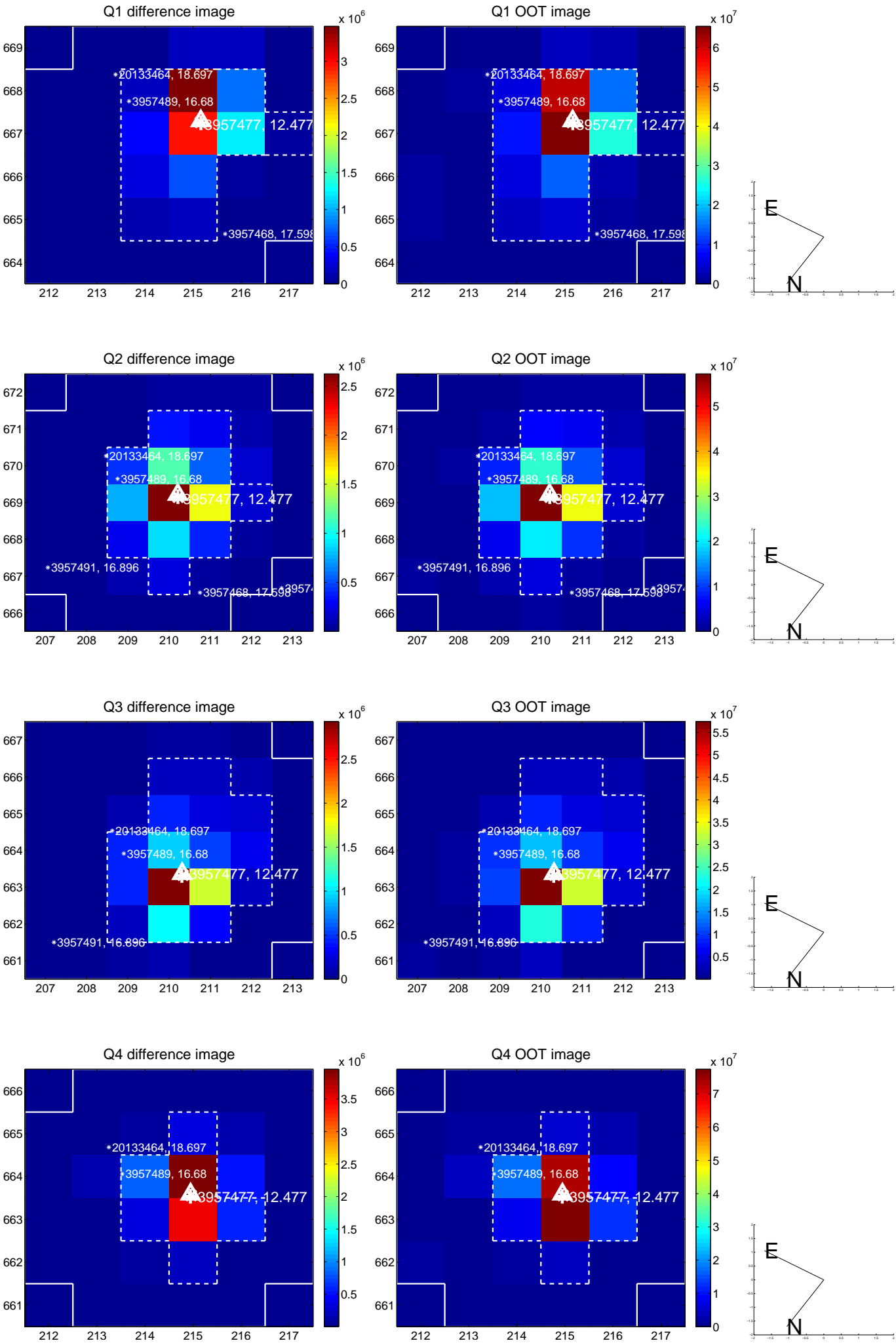
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>0.201 <math>\pm</math> 0.067</b>	<b>3.01</b>	0.097 $\pm$ 0.067	-0.176 $\pm$ 0.067
PRF-fit source offset from KIC position	0.172 $\pm$ 0.069	2.50	0.118 $\pm$ 0.068	-0.125 $\pm$ 0.068
photometric centroid source offset	—	—	—	—



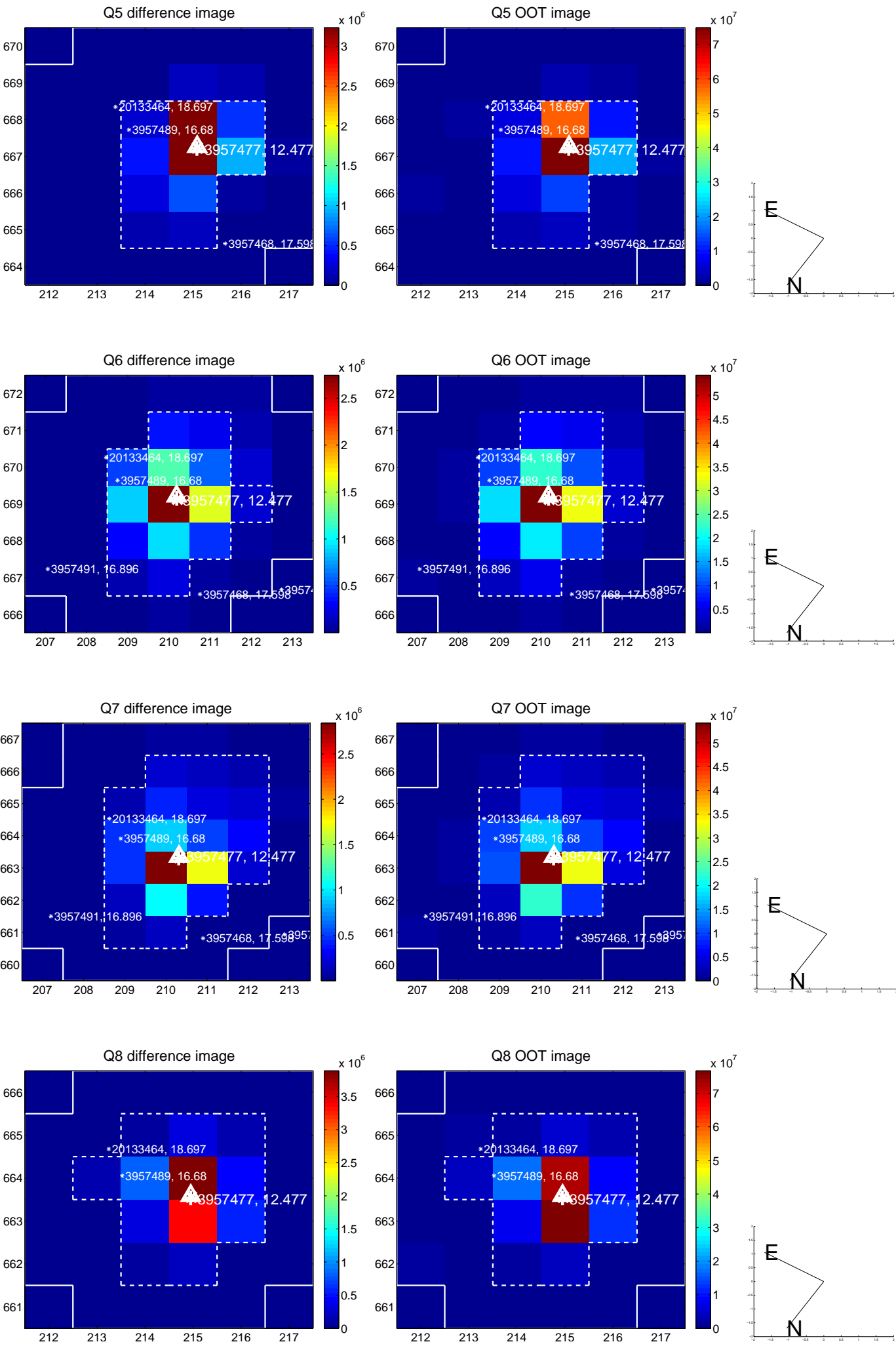
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



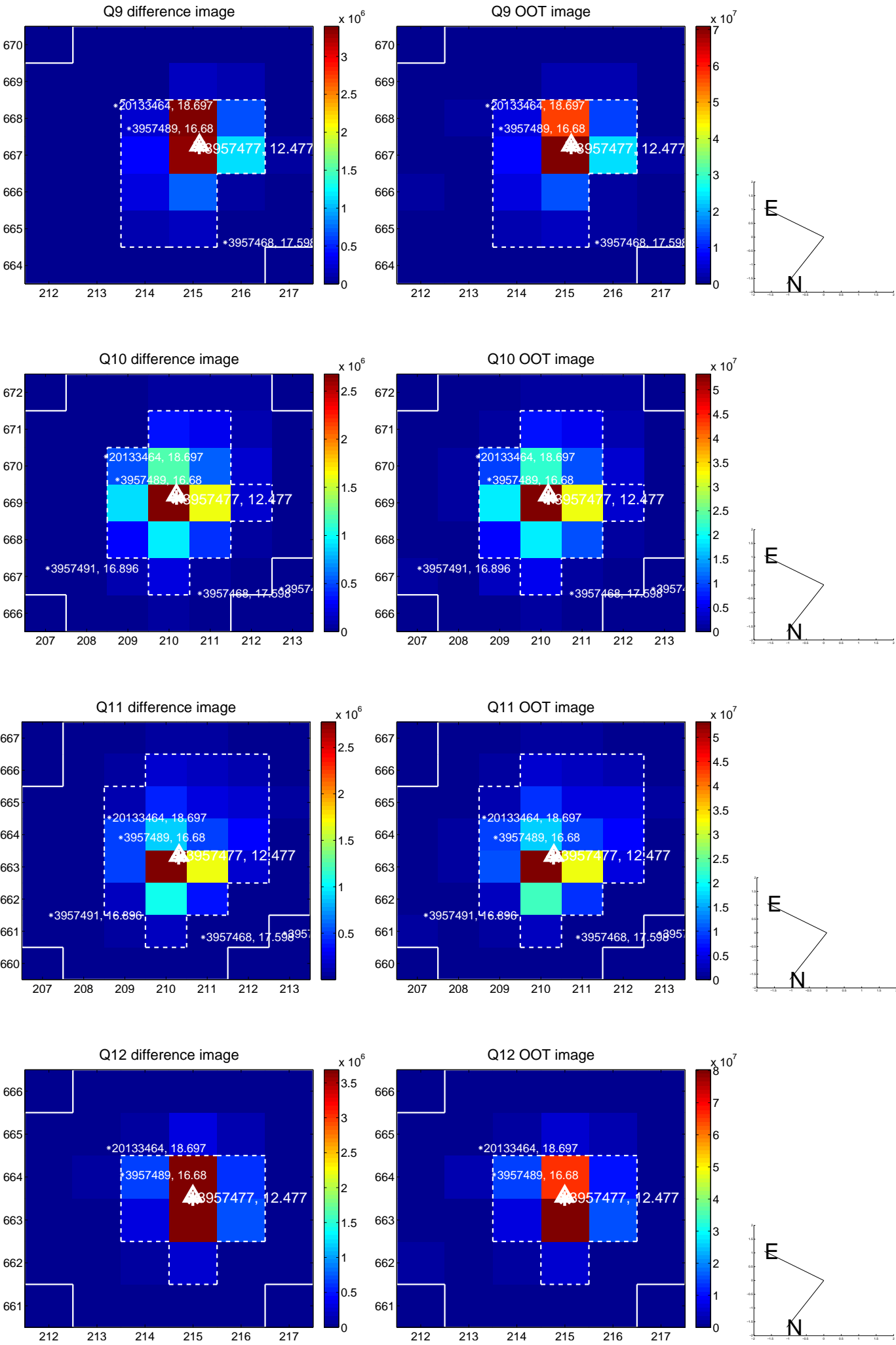
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



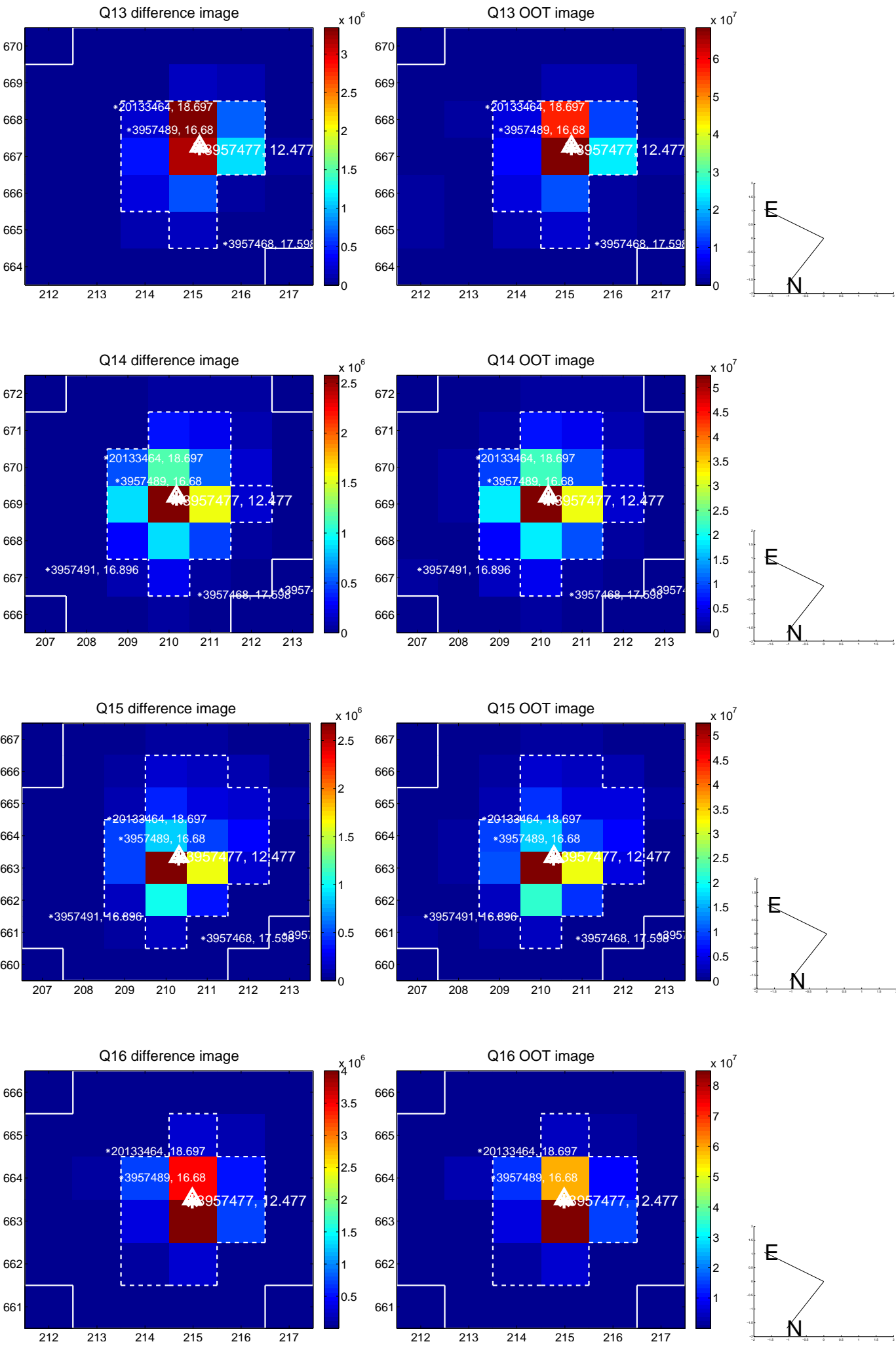
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



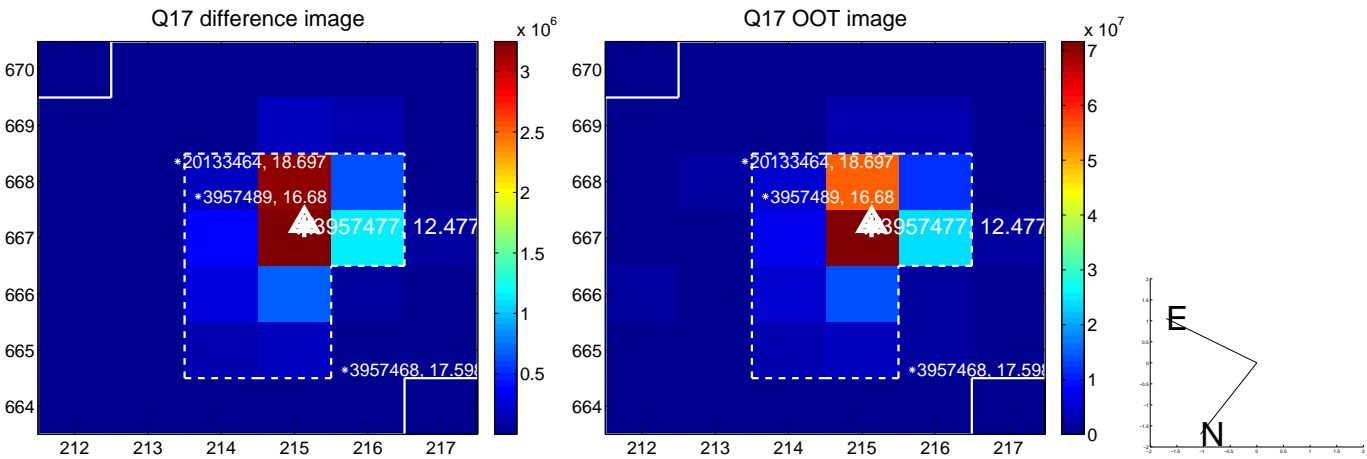
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

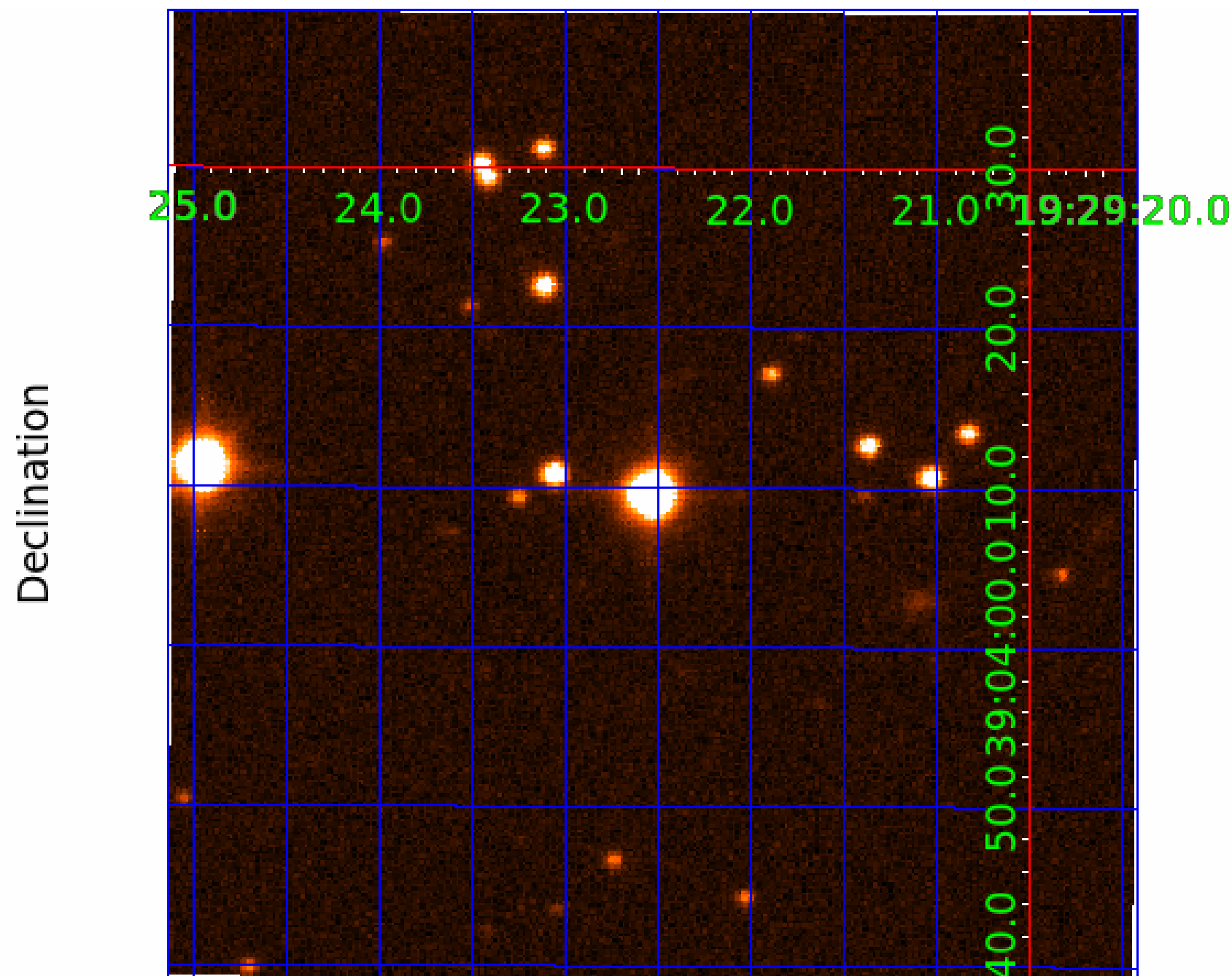


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image





# KIC 003957477

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003957477-01	OBS	No	0.979046	131.728013	42625.6	2.911	3103.4	1337.5	0.95	5566	22.07	2395.15
003957477-02	OBS	No	0.979054	132.208911	8327.7	2.500	1914.7	-1.0	0.95	5566	8.62	2395.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003957477-01	OBS	FP	0.00	1	0	0	0	LPP_DV
003957477-02	OBS	FP	0.00	1	0	0	0	SAME_NTL_PERIOD—CENT_NOFITS

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

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

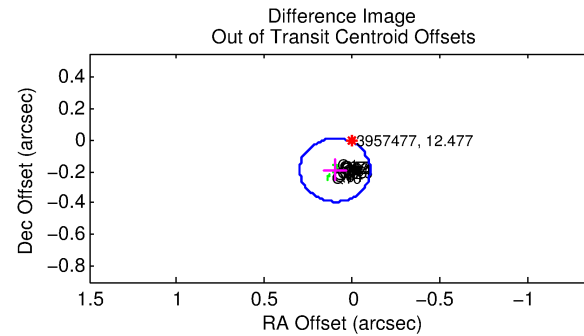
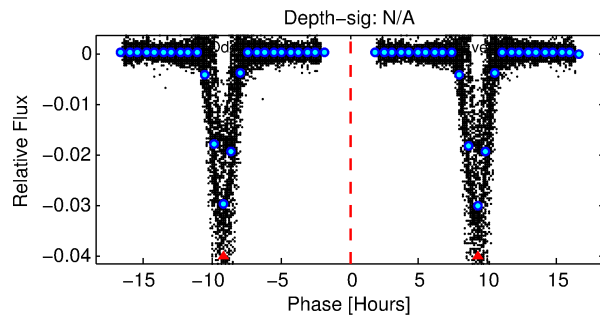
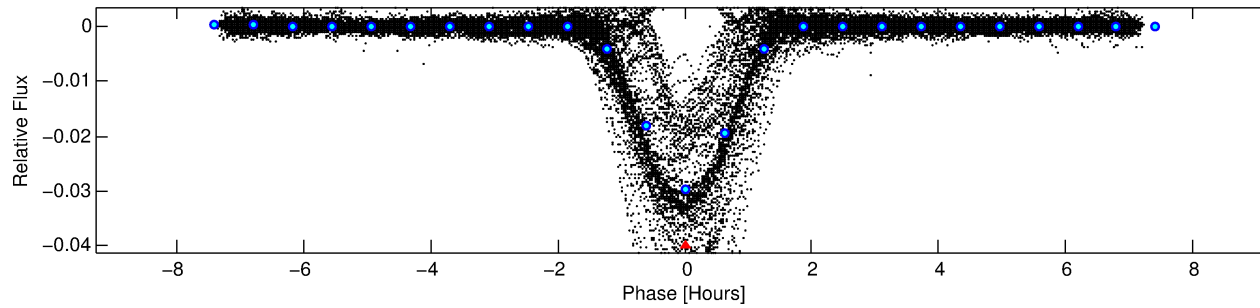
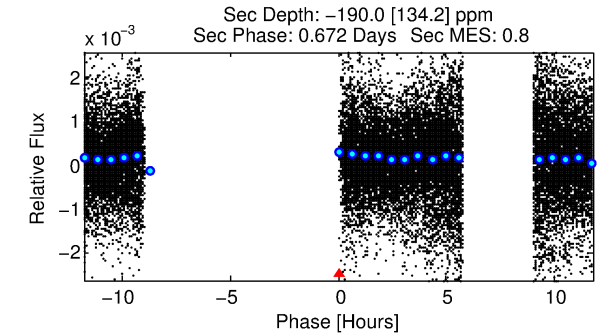
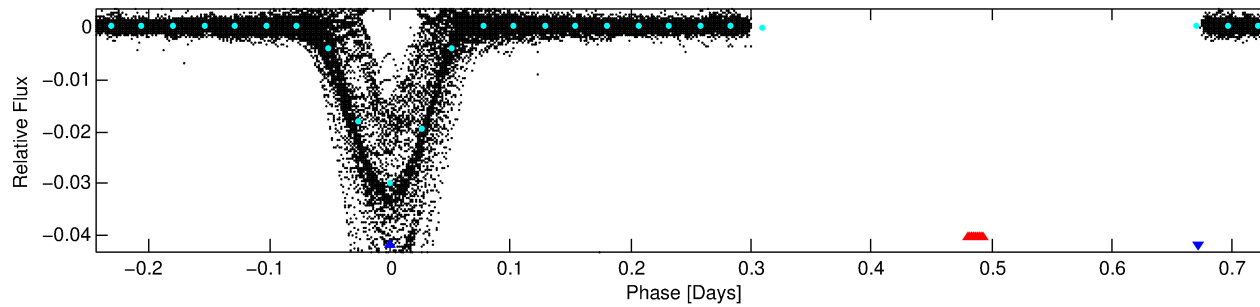
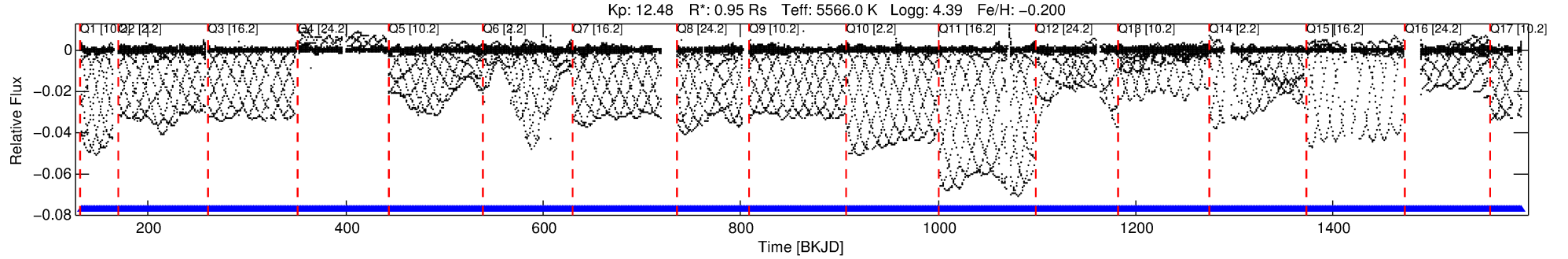
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 003957477-02

No Significant Match Found

# DV One-Page Summary

KIC: 3957477 Candidate: 2 of 2 Period: 0.979 d



## TPS TCE Results:

Period = 0.97905 d  
Epoch = 132.2089 BKJD

DV fit results are unavailable

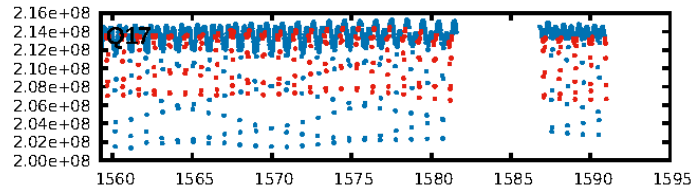
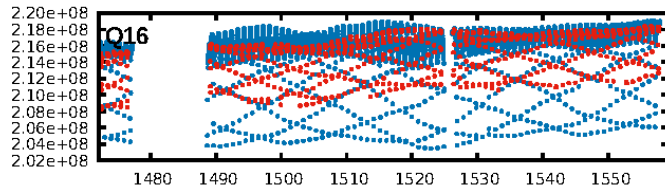
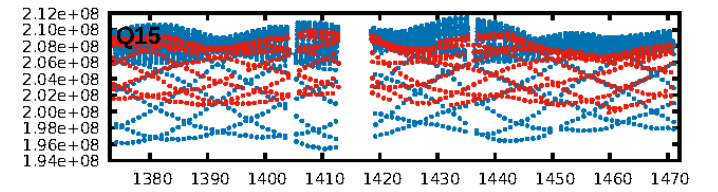
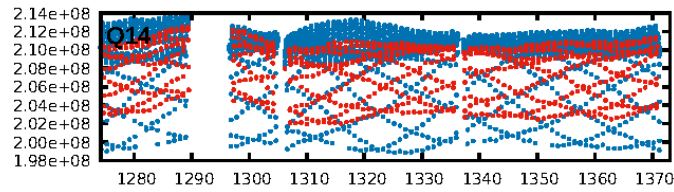
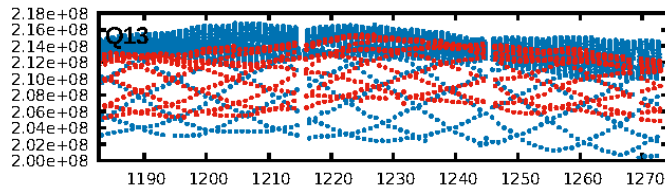
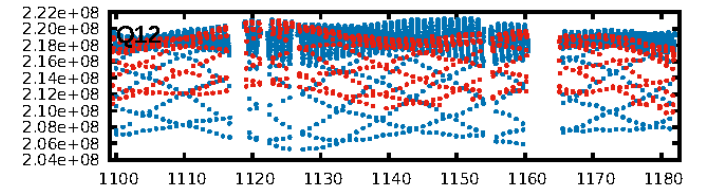
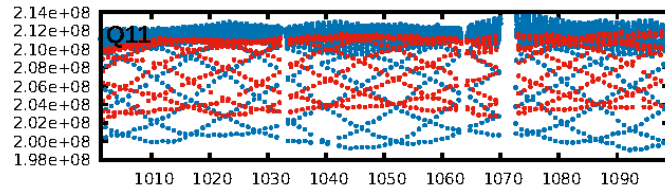
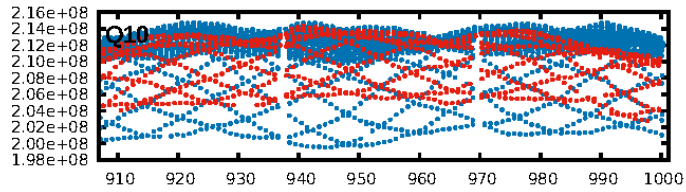
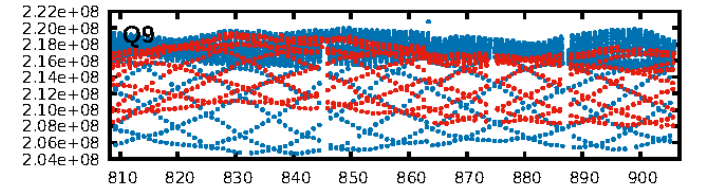
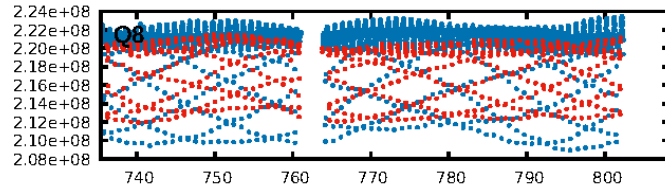
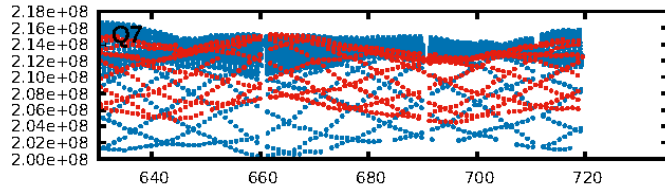
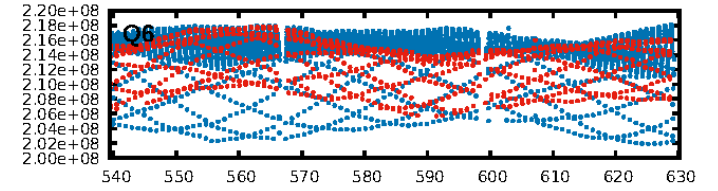
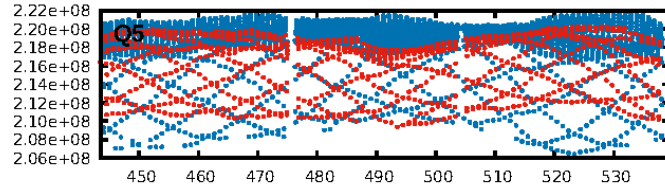
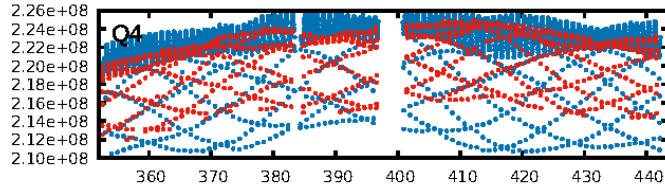
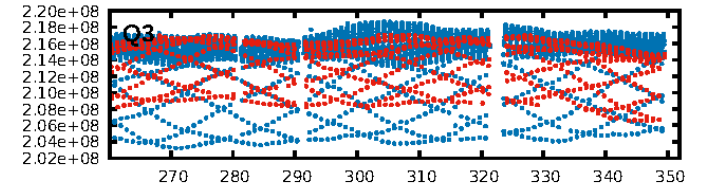
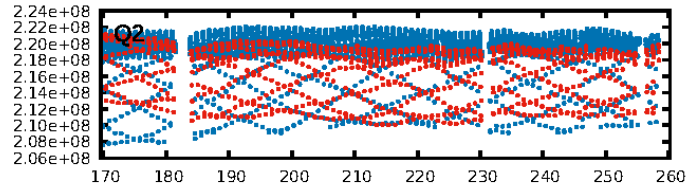
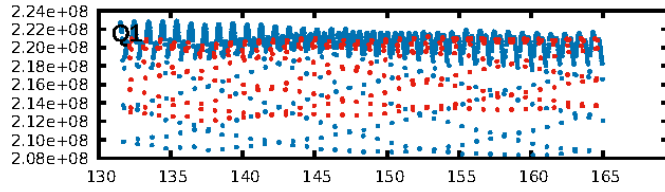
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1310/1310]  
GhostDiagnostic-chr: 1.814  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.213 arcsec [3.18σ]  
KicOffset-rm: 0.181 arcsec [2.62σ]  
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]

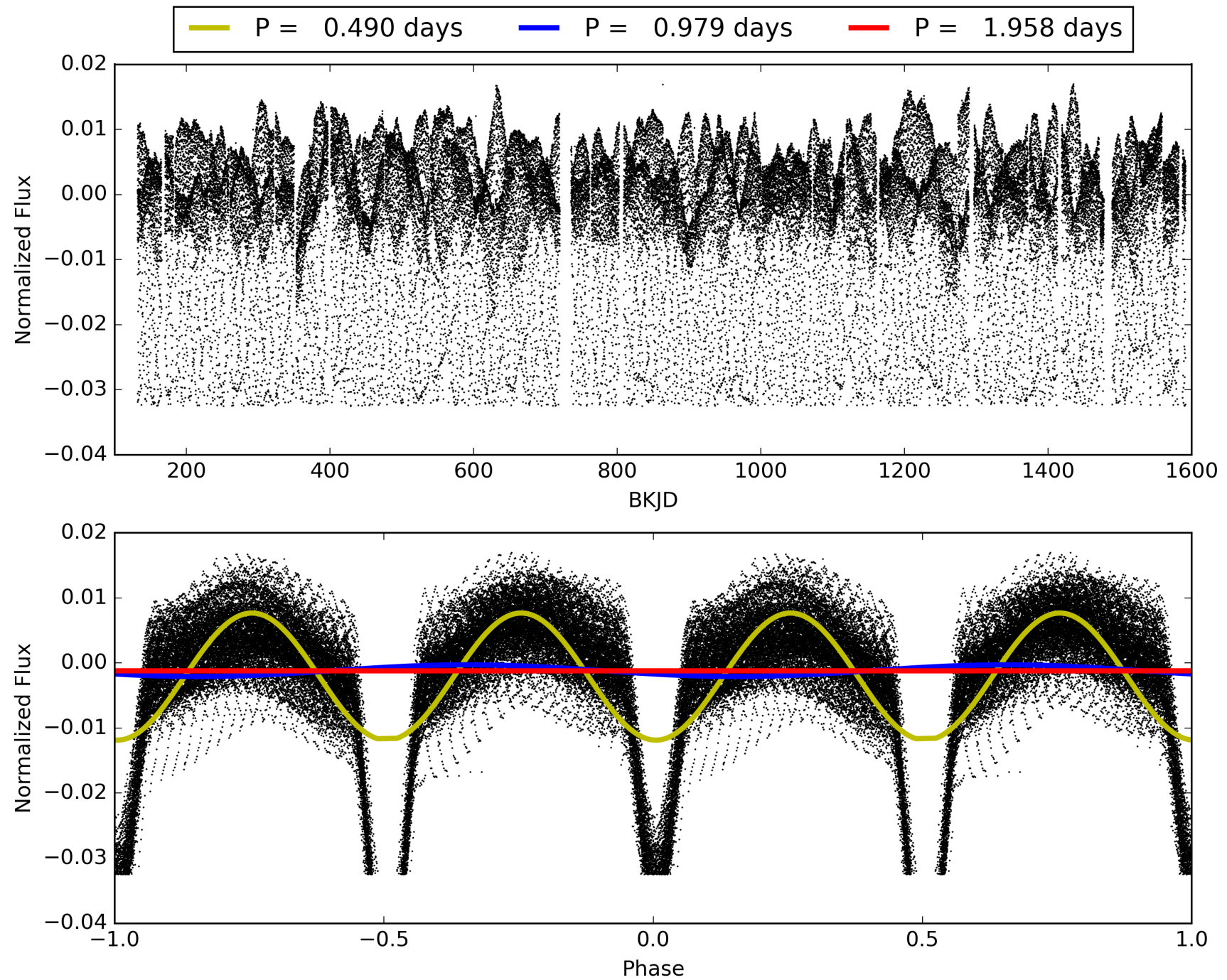
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 09:31:34 Z

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

# TCE 003957477-02, PDC Light Curves

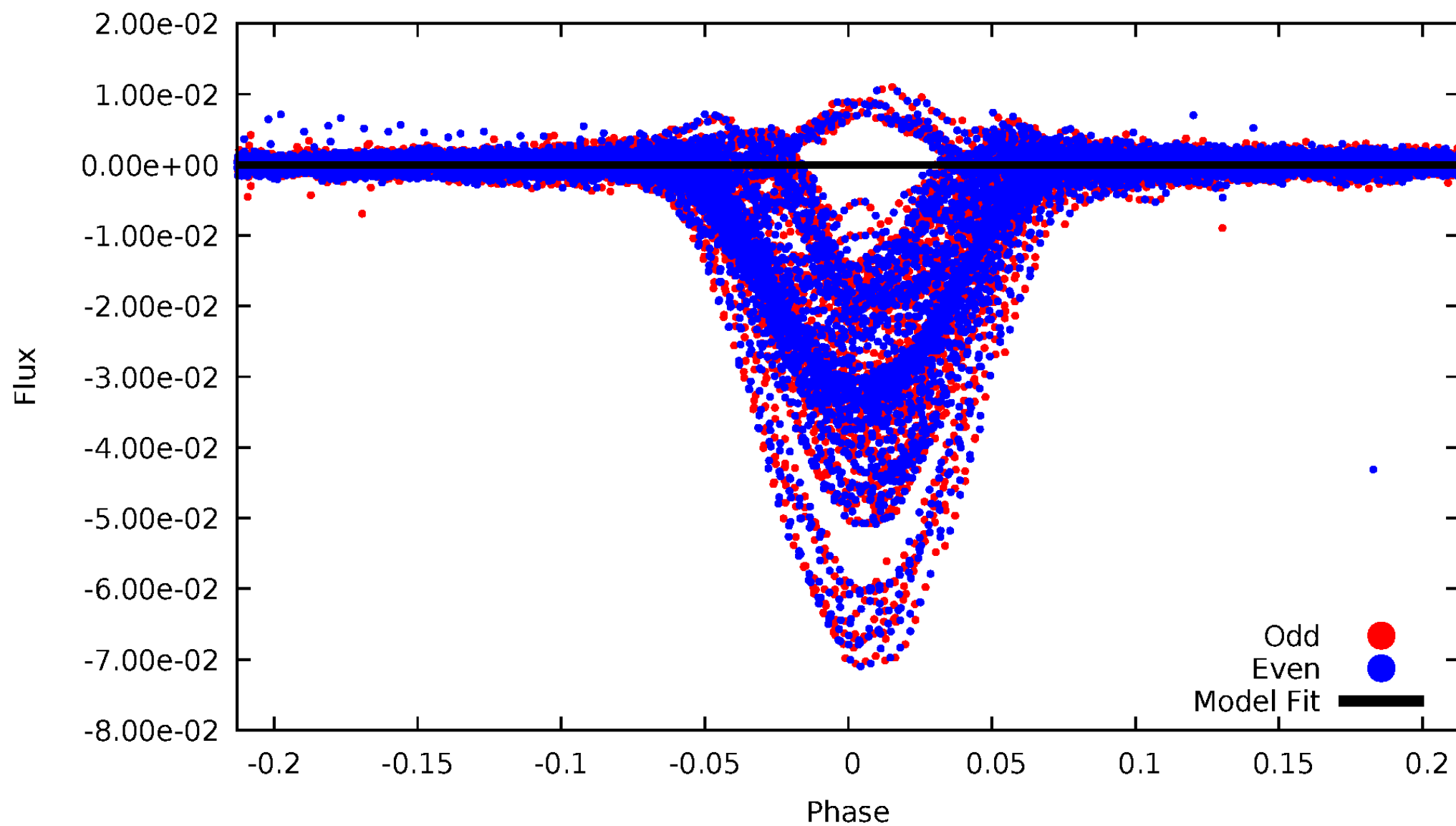


TCE 003957477-02



# DV Odd/Even

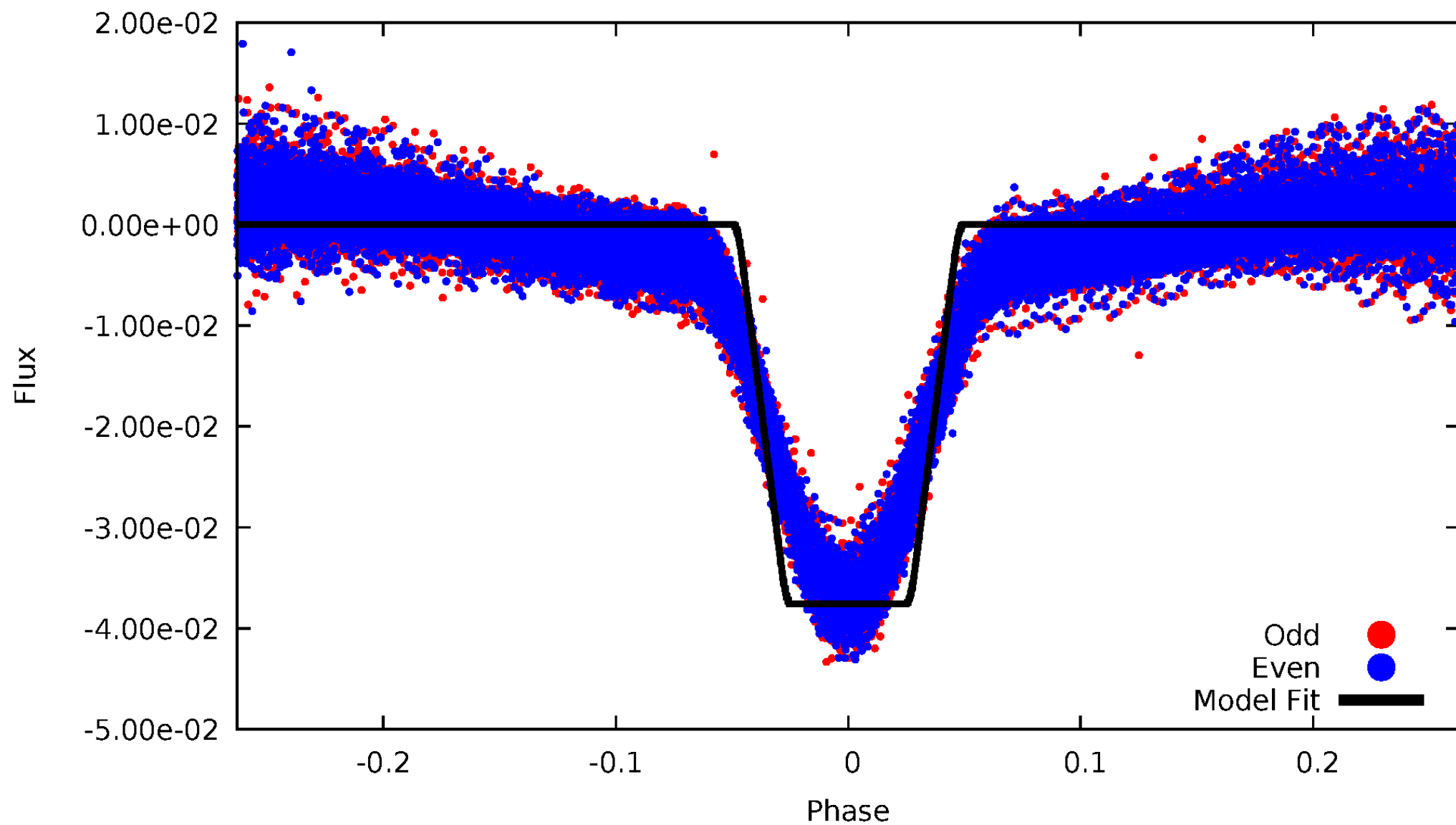
TCE 003957477-02





# ALT Odd/Even

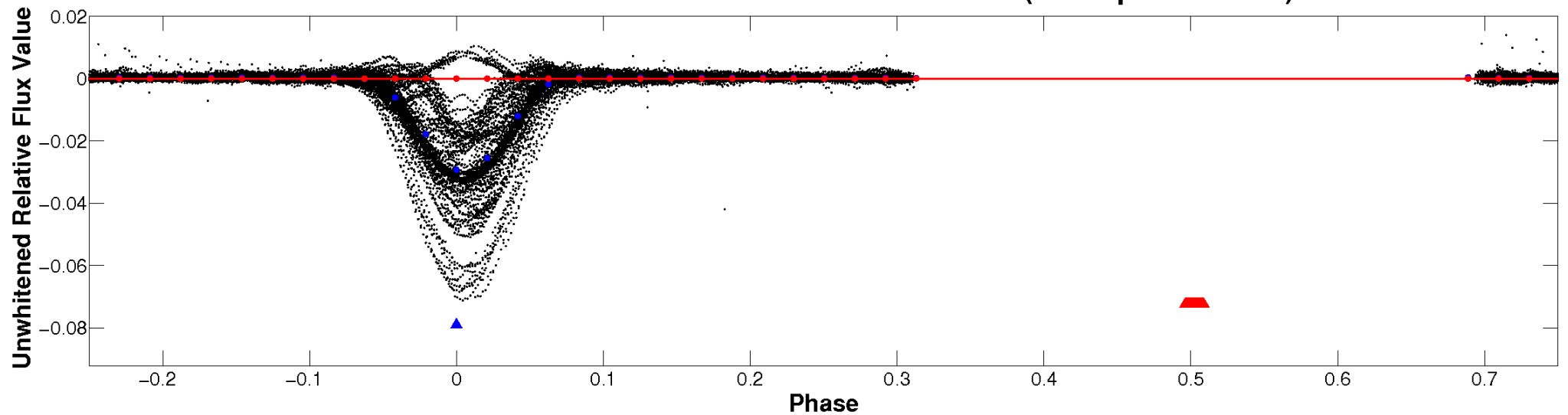
TCE 003957477-02





# Non-Whitened Vs. Whitened Light Curve

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

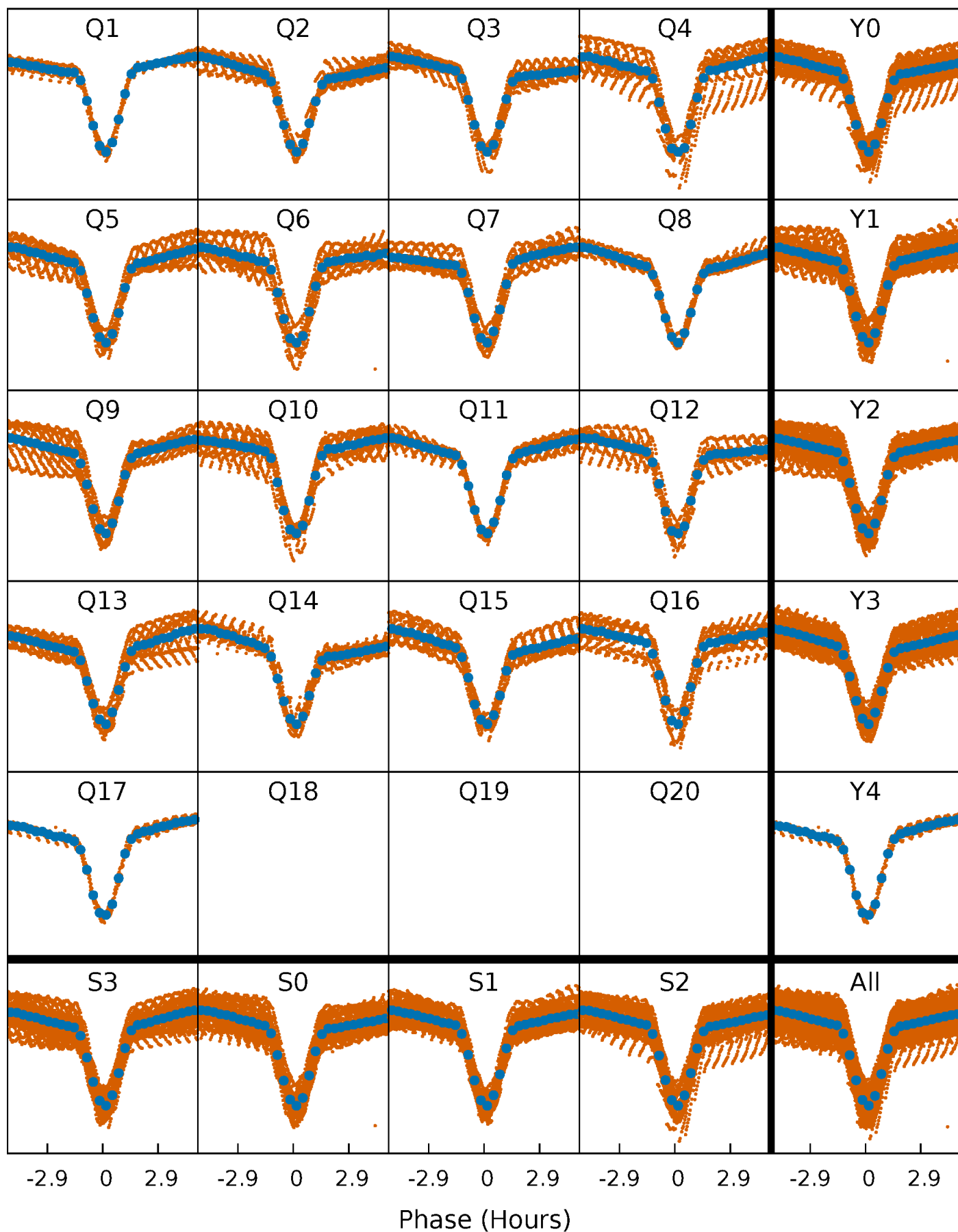


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



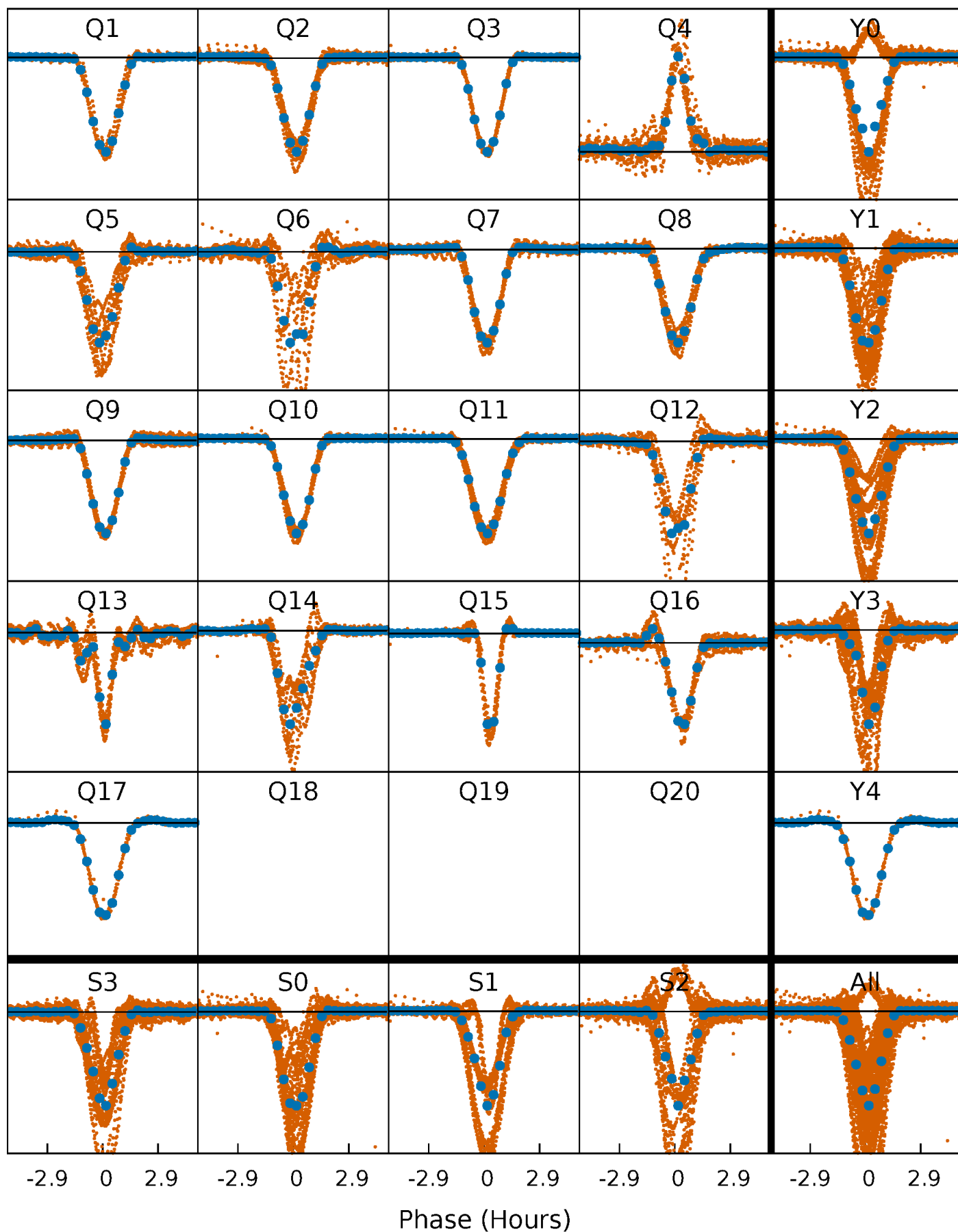
# PDC Quarter-Phased Transit Curves

TCE 003957477-02     $P = 0.979054$  Days     $T_0 = 132.208911$  (BKJD)



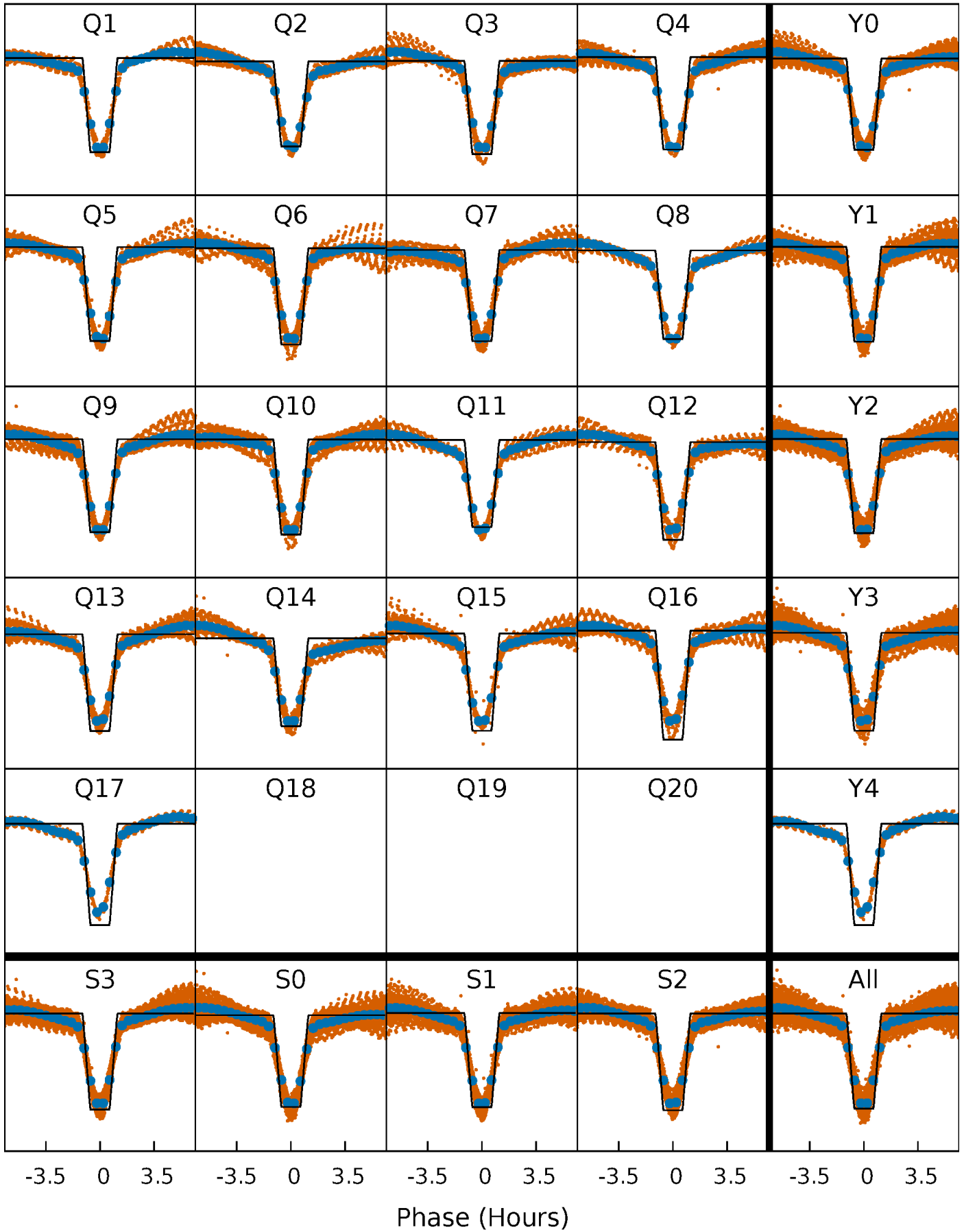
# DV Quarter-Phased Transit Curves

TCE 003957477-02   P= 0.979054 Days    $T_0=132.208911$  (BKJD)



## Alt. Detrend Quarter-Phased Transit Curves

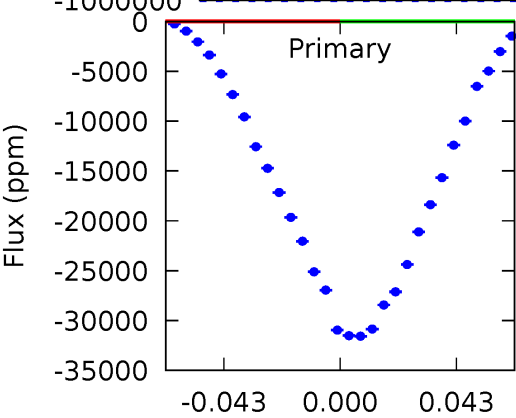
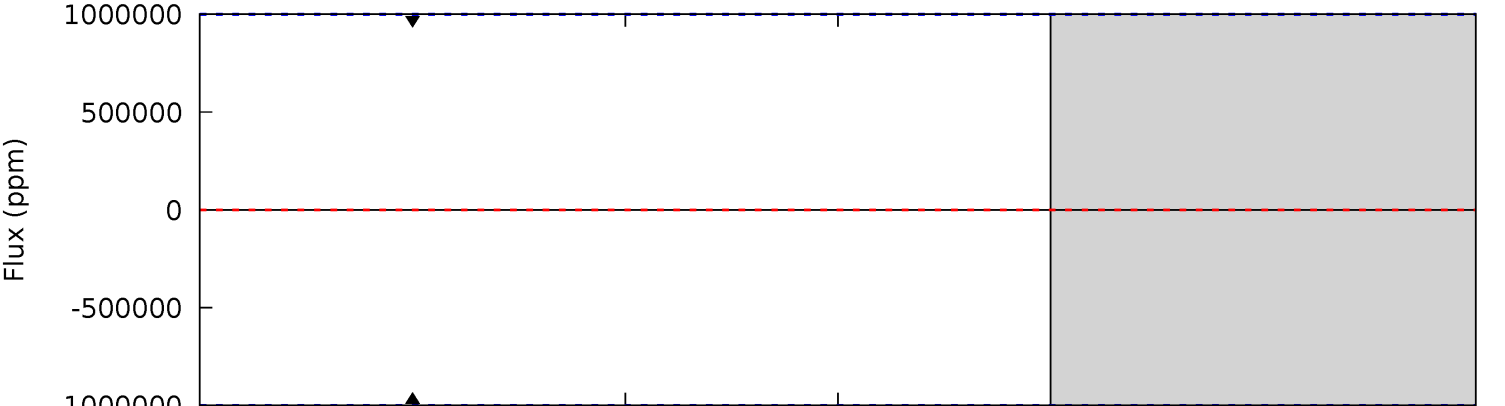
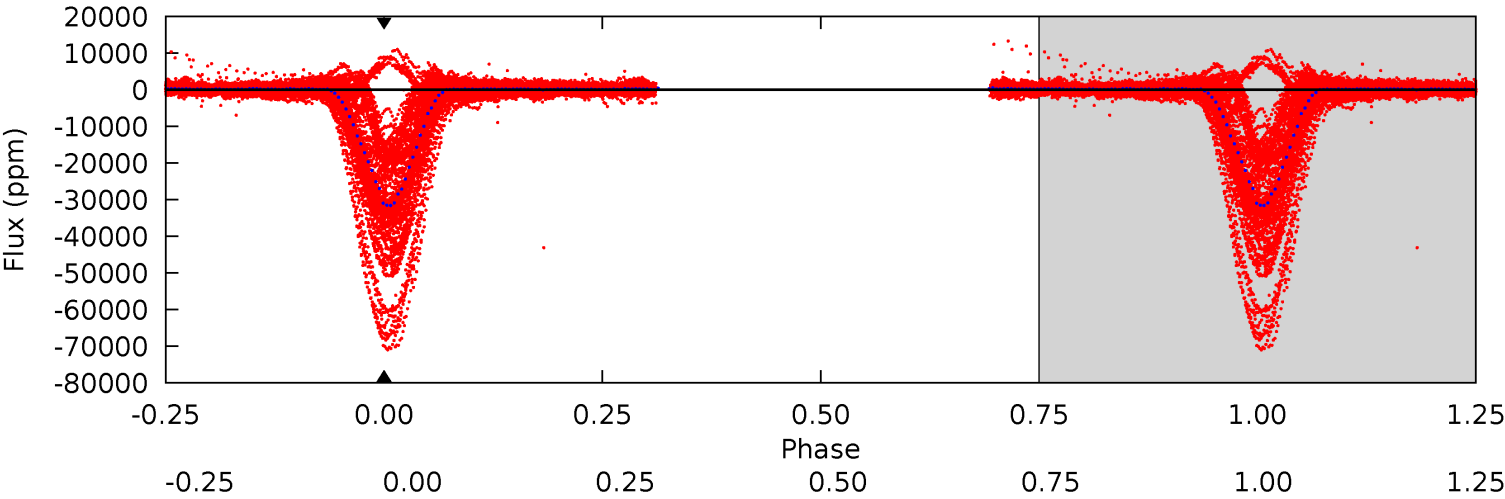
TCE 003957477-02     $P = 0.979054$  Days     $T_0 = 132.213990$  (BKJD)



# DV Model-Shift Uniqueness Test

003957477-02, P = 0.979054 Days, E = 131.229857 Days

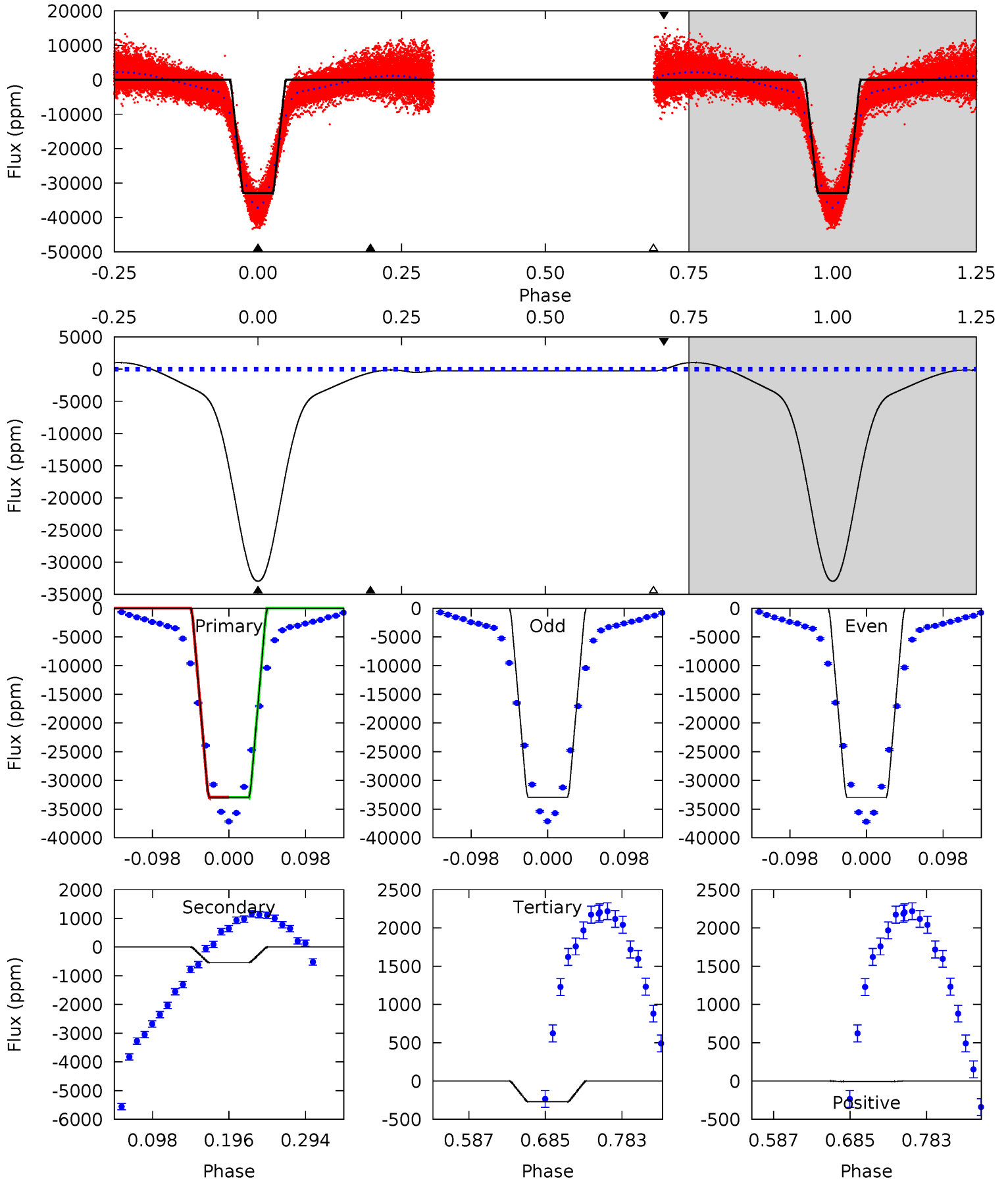
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

003957477-02, P = 0.979054 Days, E = 131.234936 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
810.1	13.3	6.65	-0.17	4.57	1.66	33.9	803.4	810.2	6.64	13.5	0.55	1.00	0.03	0.21



### Stellar Parameters For KIC 003957477

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$5566^{+149}_{-149}$	$4.394^{+0.153}_{-0.187}$	$-0.200^{+0.300}_{-0.300}$	$0.955^{+0.261}_{-0.161}$	$0.824^{+0.122}_{-0.061}$	$1.333^{+0.947}_{-0.640}$
	+3%/-3%	+3%/-4%	+150%/-150%	+27%/-17%	+15%/-7%	+71%/-48%
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 003957477-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$12.03^{+10.38}_{-7.80}$	$2508^{+193}_{-152}$	$-4056^{+16609}_{-7083}$	$-2.347^{+209.016}_{-161.807}$
Alt.	$-540 \pm 41$	$20.80^{+10.50}_{-9.63}$	$2508^{+173}_{-143}$	$-2328^{+5265}_{-343}$	$0.222^{+0.574}_{-0.121}$

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



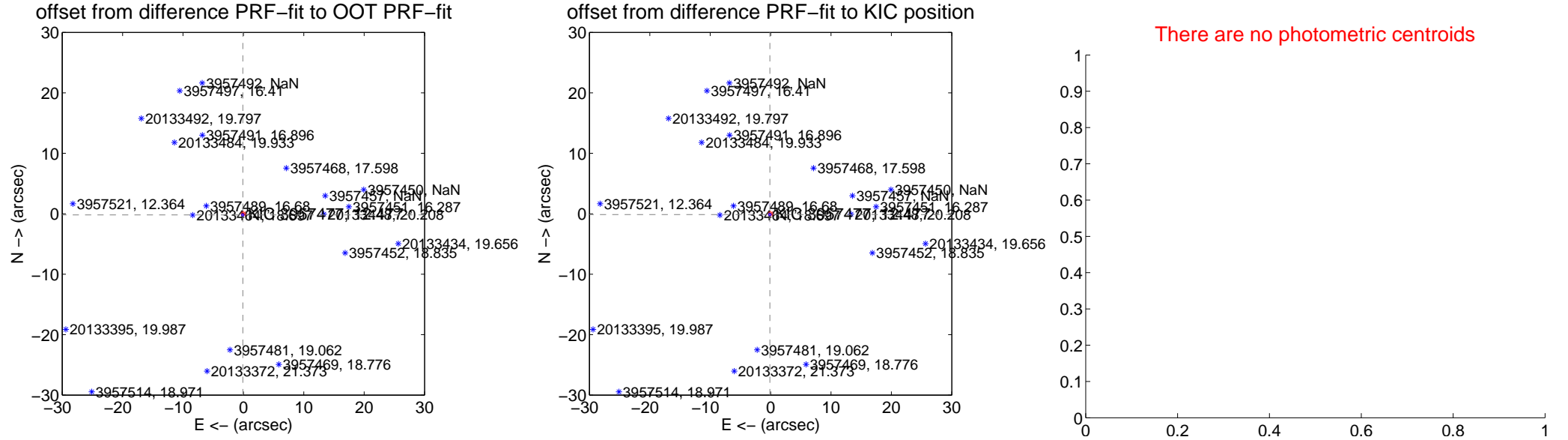
## DV Centroid Data

Supplemental centroid analysis for 003957477-02. Kepler magnitude: 12.48. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

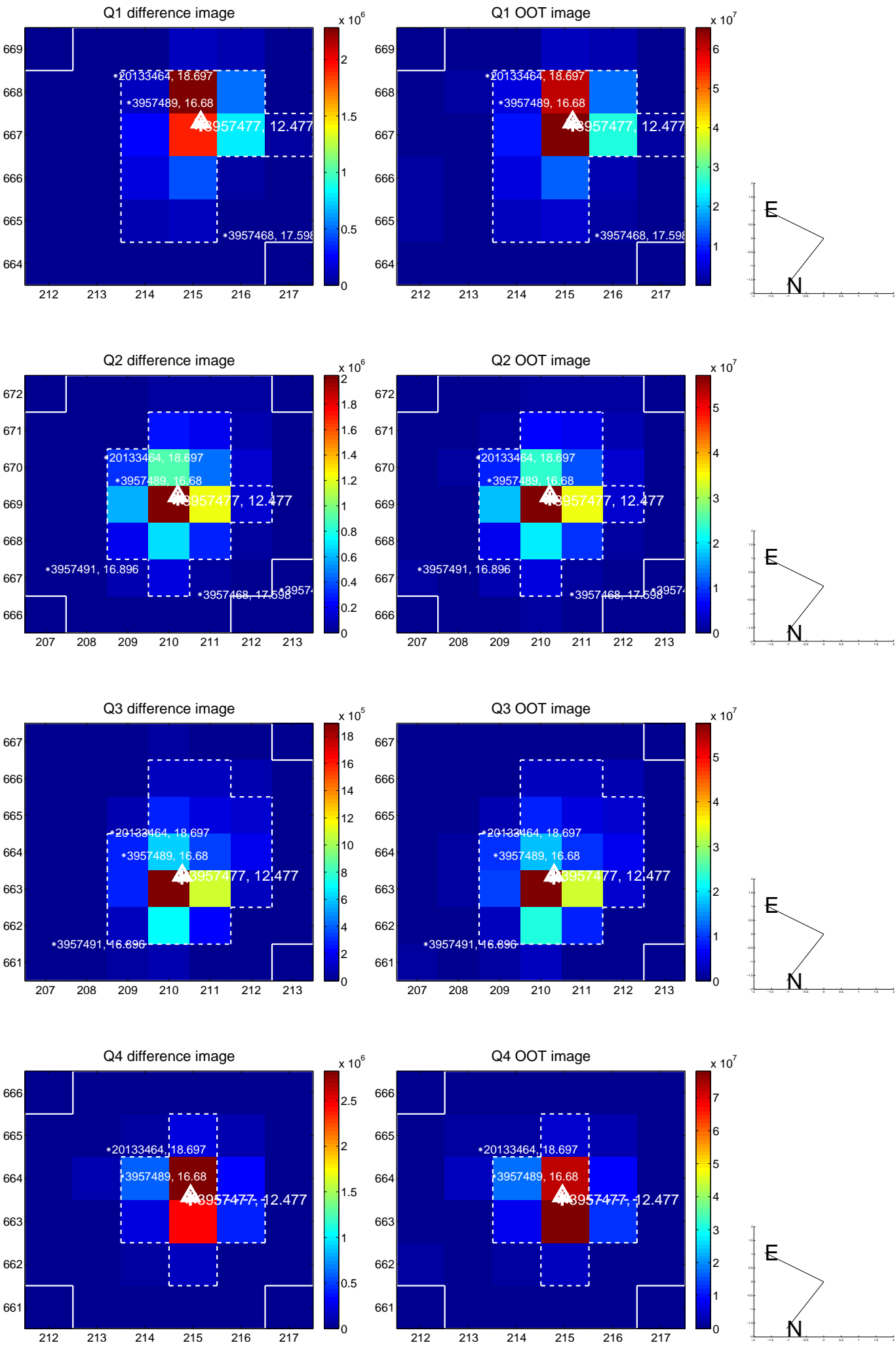
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>0.213 <math>\pm</math> 0.067</b>	<b>3.18</b>	0.099 $\pm$ 0.067	-0.189 $\pm$ 0.067
PRF-fit source offset from KIC position	0.181 $\pm$ 0.069	2.62	0.118 $\pm$ 0.068	-0.137 $\pm$ 0.068
photometric centroid source offset	—	—	—	—

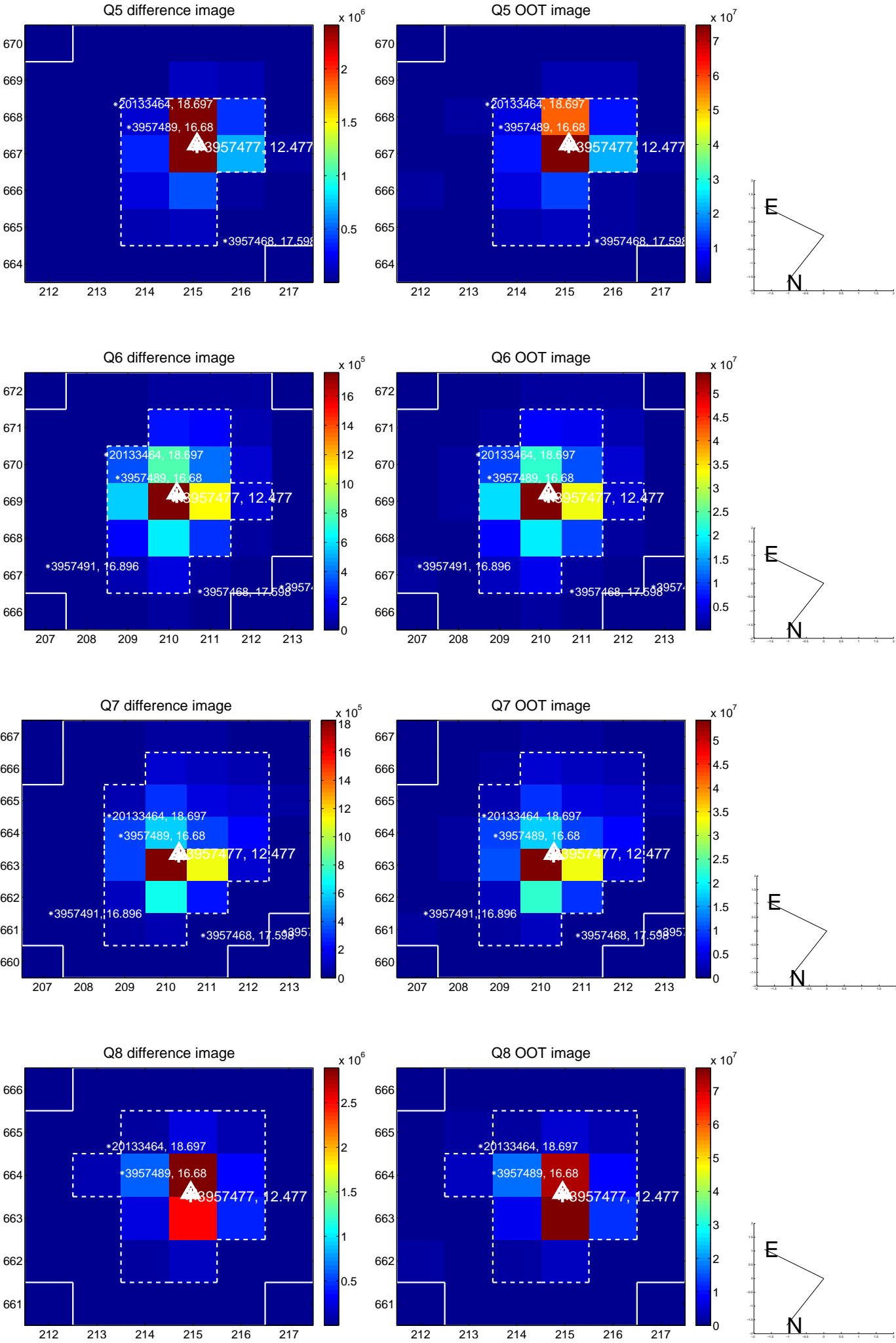


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

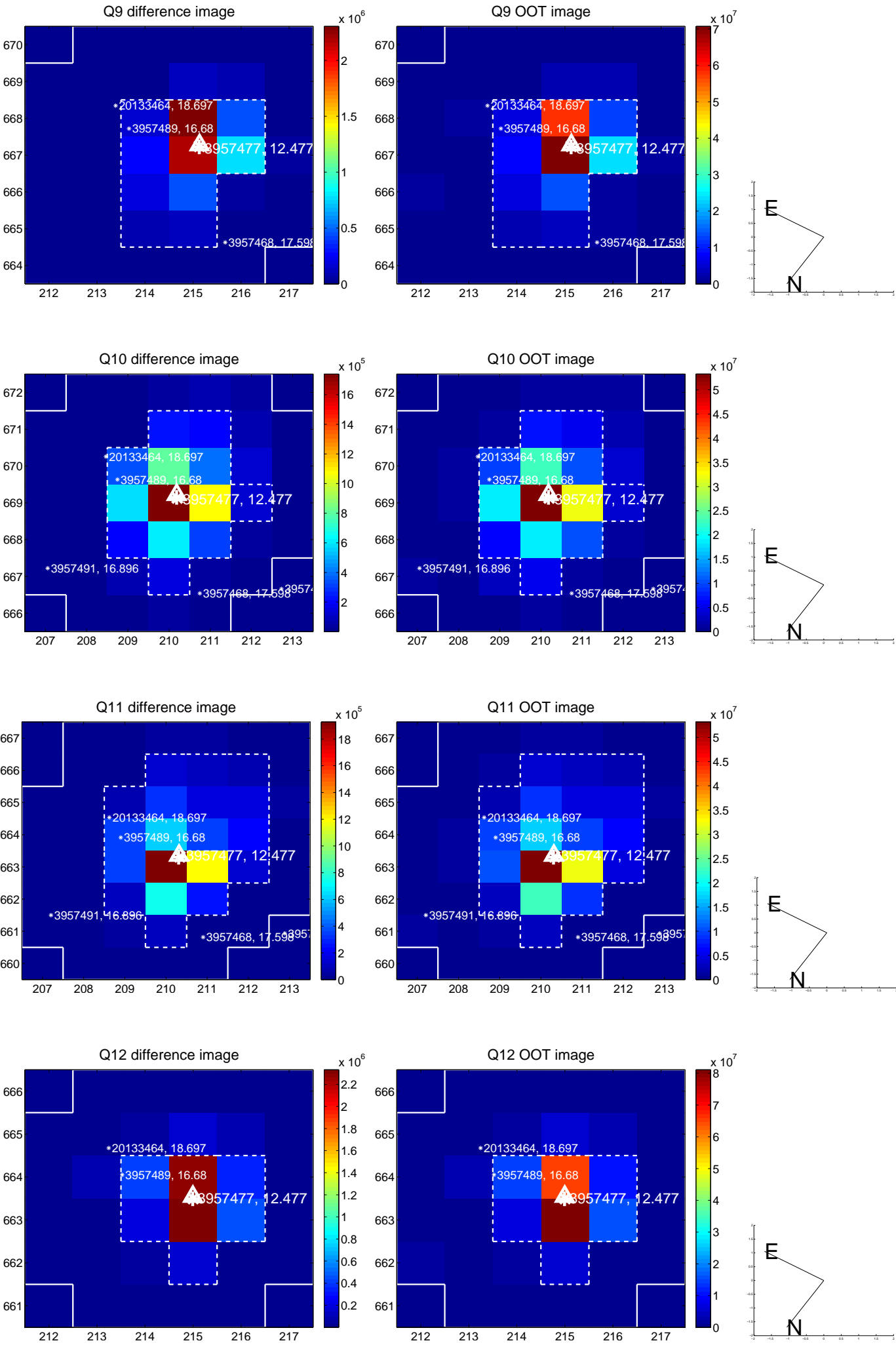
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



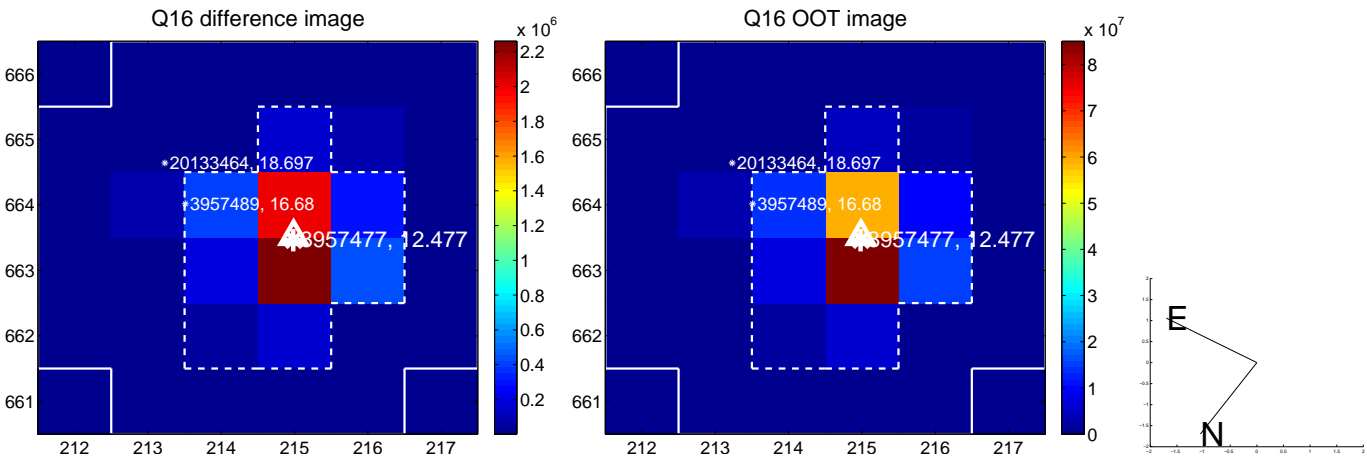
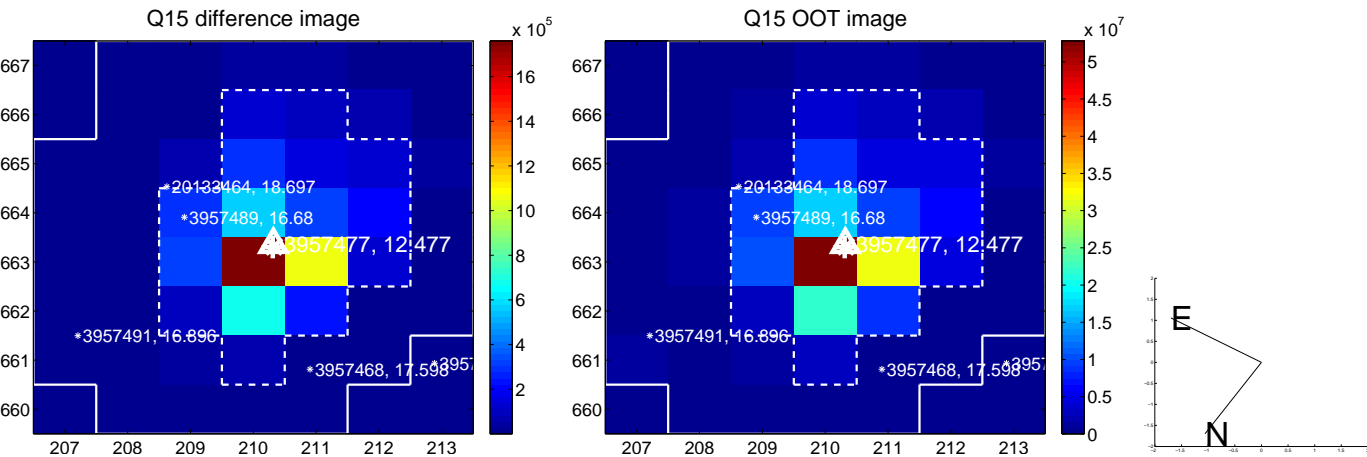
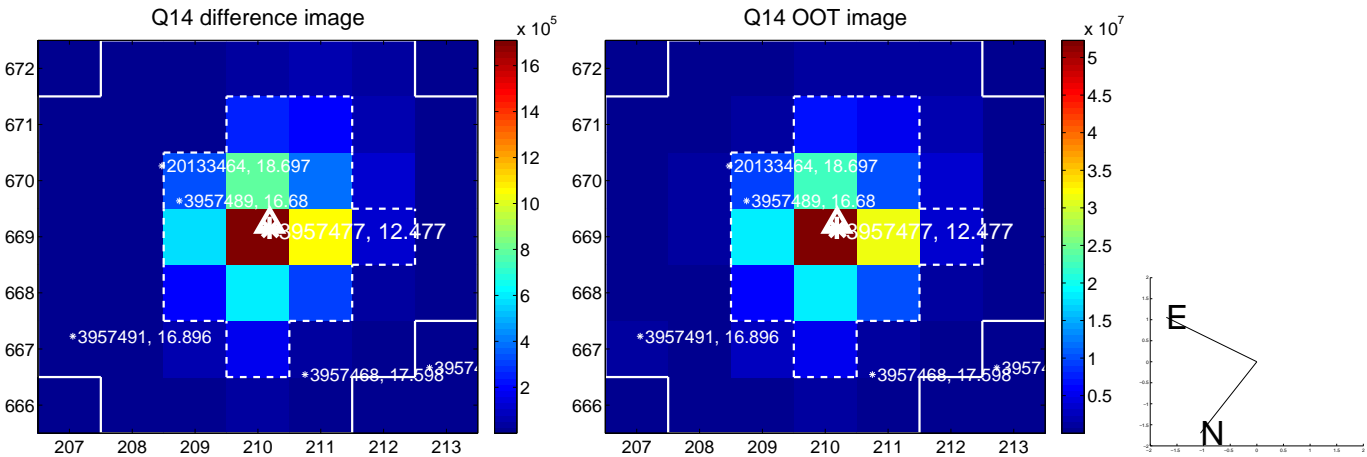
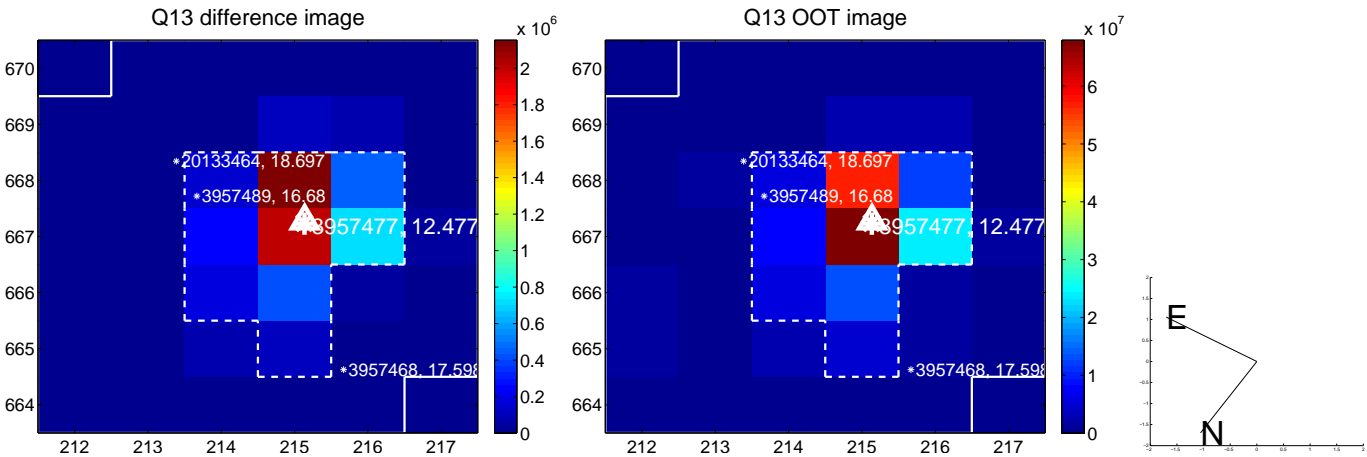
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



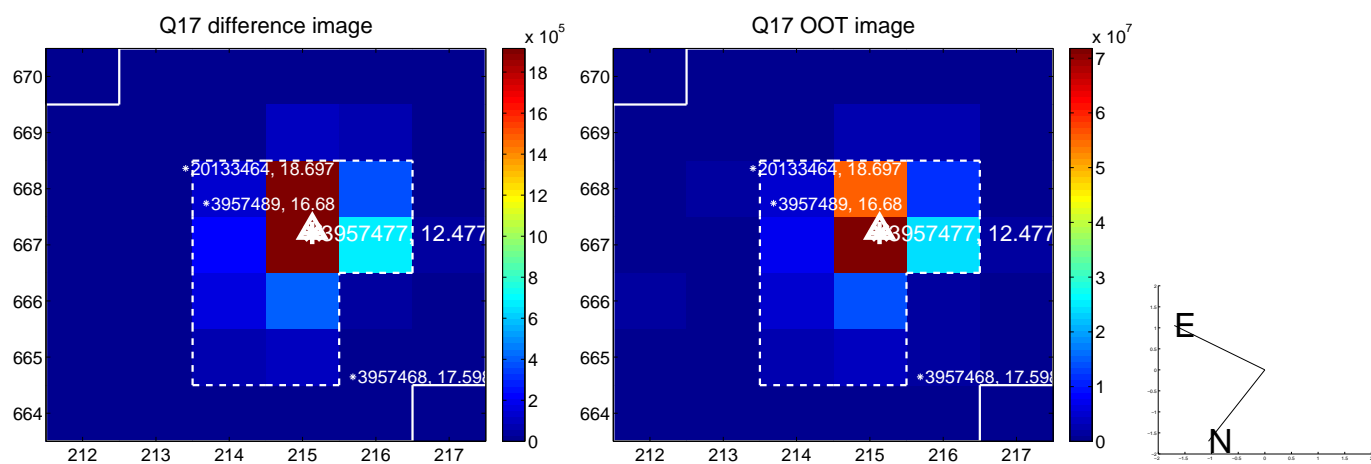
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



folded centroid time series figure for this object.



UKIRT Image

