

# KIC 012258330

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012258330-01	OBS	No	0.560562	131.936057	10.0	3.719	7.7	7.1	3.52	13203	1.20	870195.78
012258330-02	OBS	No	34.763995	140.622865	378.7	2.902	13.3	11.0	3.52	13203	8.32	3544.94
012258330-03	OBS	No	37.002616	150.599033	43.4	1.486	10.6	2.3	3.52	13203	2.45	3261.91
012258330-04	OBS	No	37.768097	151.711678	291.1	1.005	10.3	7.2	3.52	13203	6.26	3174.06
012258330-05	OBS	No	11.750989	140.282150	222.5	2.539	9.3	12.4	3.52	13203	9.35	15055.07
012258330-06	OBS	No	34.743135	139.521782	280.0	2.754	9.0	9.0	3.52	13203	6.68	3547.78

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258330-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
012258330-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

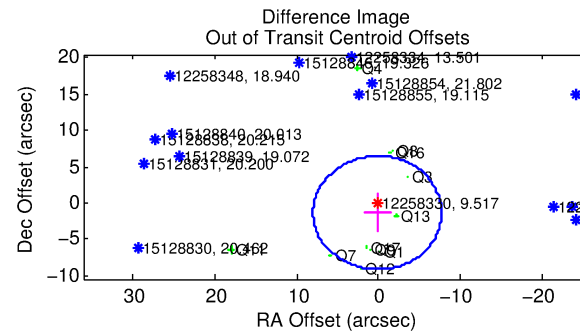
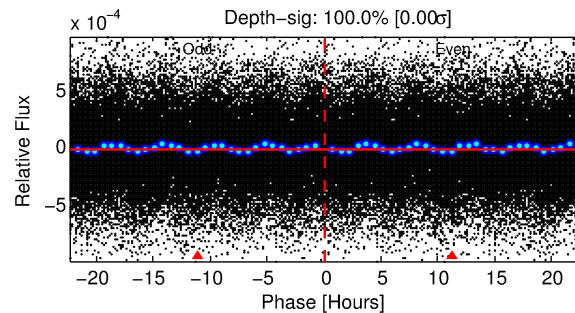
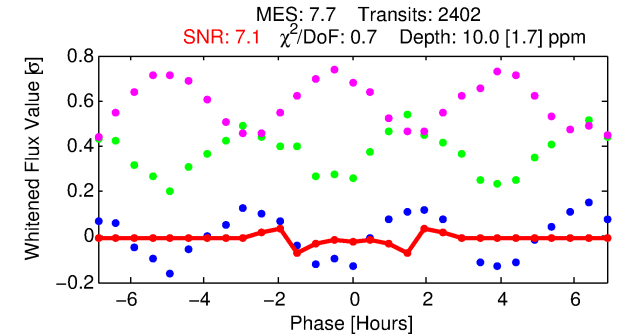
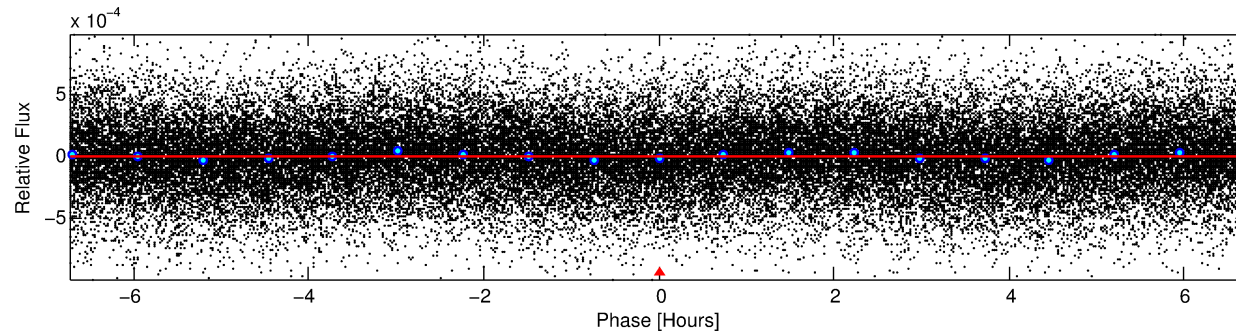
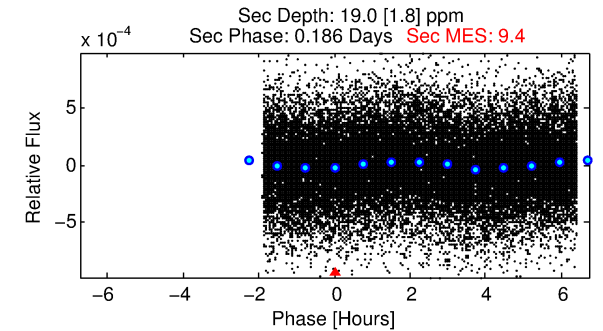
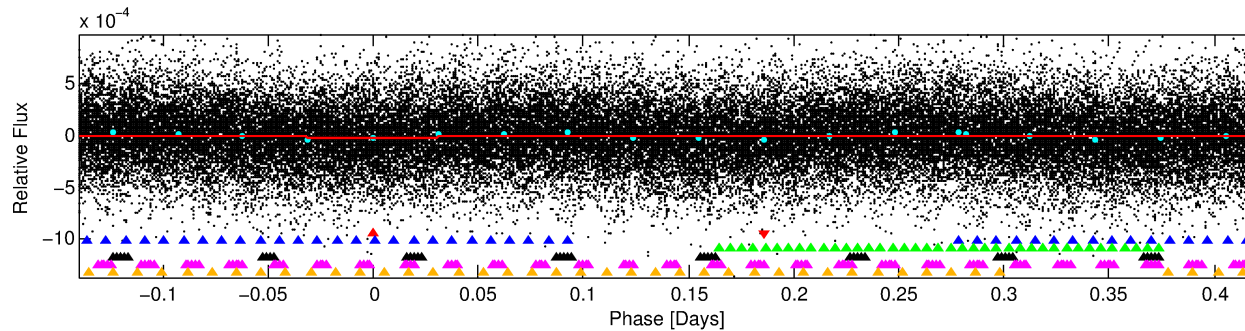
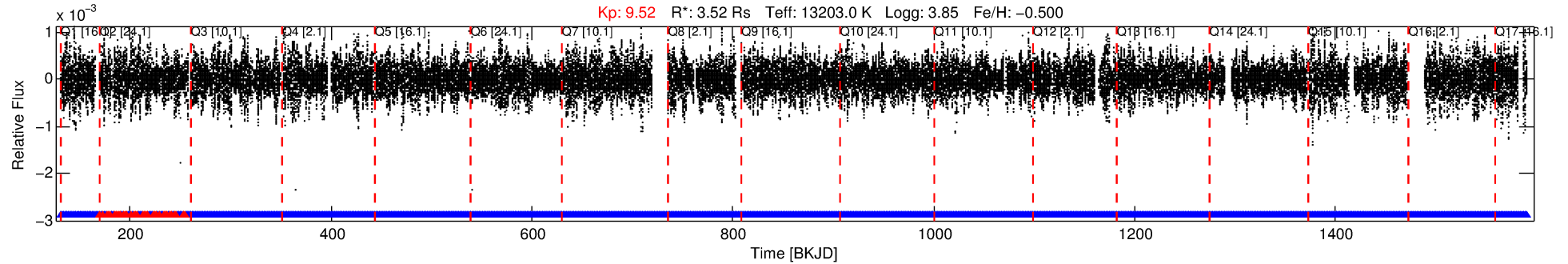
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012258330-01

No Significant Match Found

# DV One-Page Summary

KIC: 12258330 Candidate: 1 of 6 Period: 0.561 d



## DV Fit Results:

Period = 0.56056 [0.00001] d  
Epoch = 131.9361 [0.0013] BKJD  
 $R_p/R^* = 0.0031$  [0.0003]  
 $a/R^* = 1.17$  [0.17]  
 $b = 0.70$  [0.38]  
 $\text{Seff} = 870195.78$  [777404.02]  
 $T_{\text{eq}} = 7788$  [1739] K  
 $R_p = 1.20$  [0.53]  $R_e$   
 $a = 0.0197$  [0.0083] AU  
 $A_g = 2.82$  [2.01] [0.91σ]  
 $T_{\text{eff}} = 15607$  [2425] K [2.6σ]

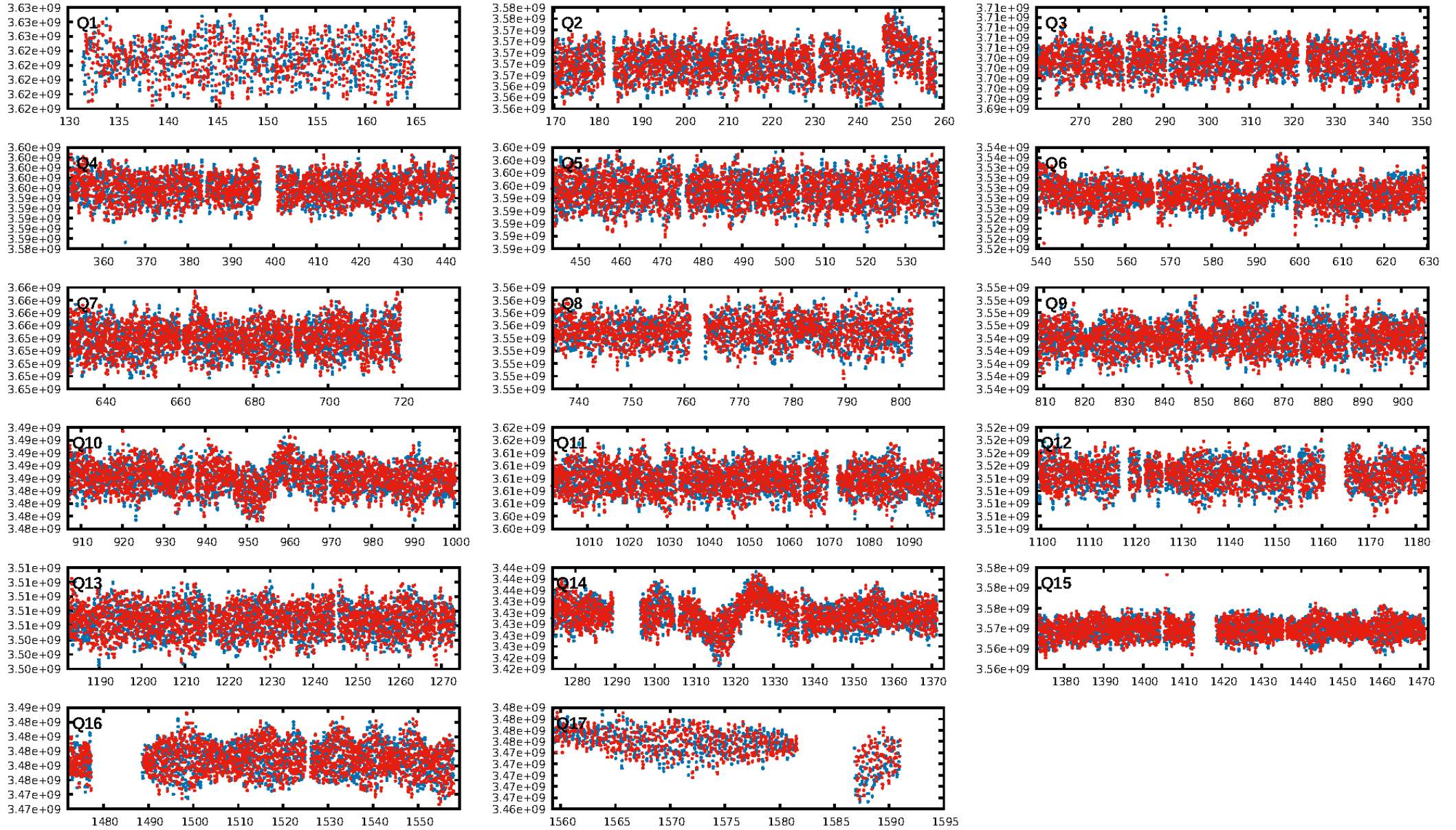
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [59.64σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 7.70e-13  
RollingBand-fgt: 0.98 [2254/2294]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 43.3%  
Centroid-so: 0.935 arcsec [0.76σ]  
OotOffset-rm: 1.375 arcsec [0.53σ]  
KicOffset-rm: 2.375 arcsec [0.98σ]  
OotOffset-st: 0/3/4/4 [11]  
KicOffset-st: 0/3/4/4 [11]  
DiffImageQuality-fgm: 0.00 [0/11]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:13:59 Z

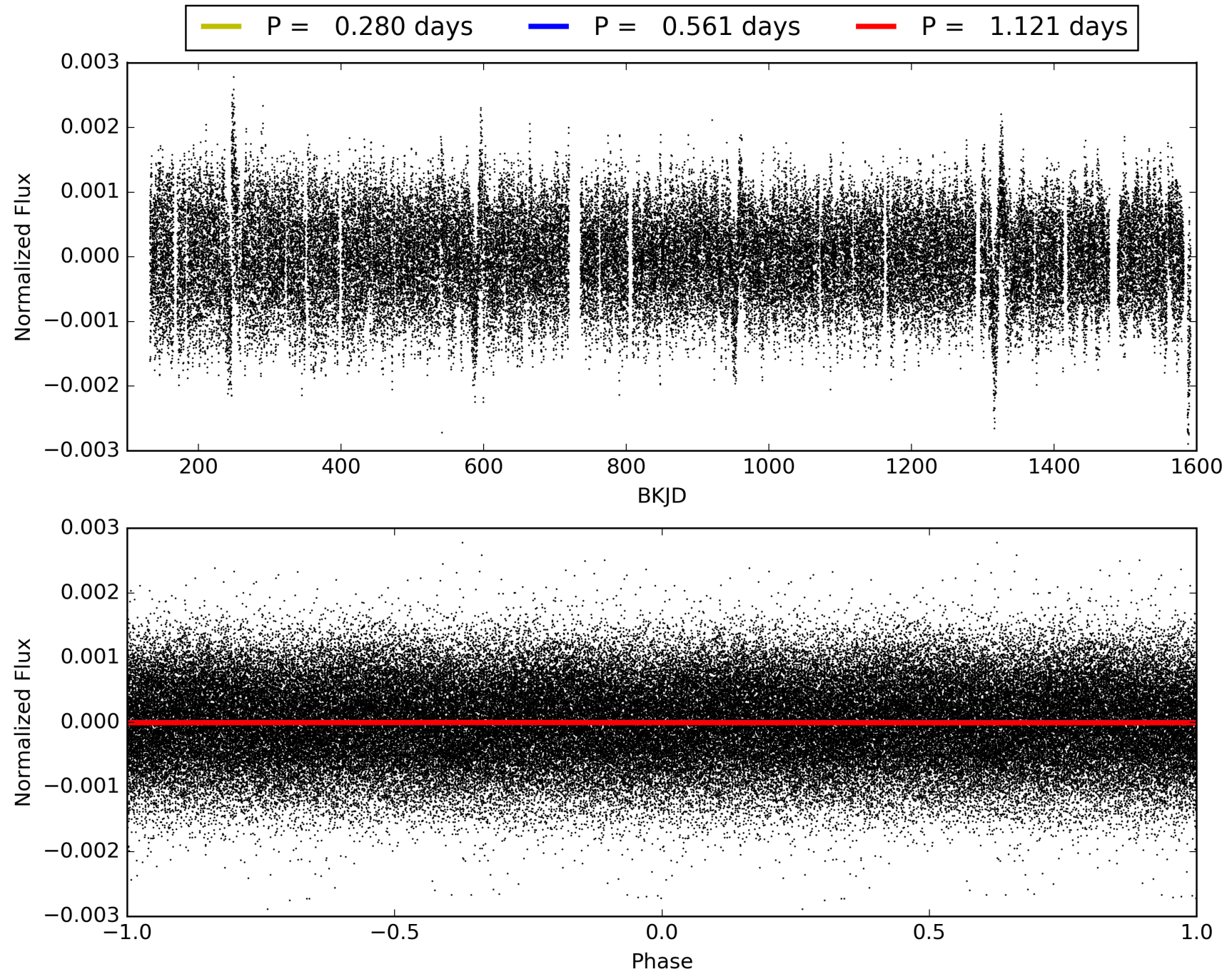
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 012258330-01, PDC Light Curves





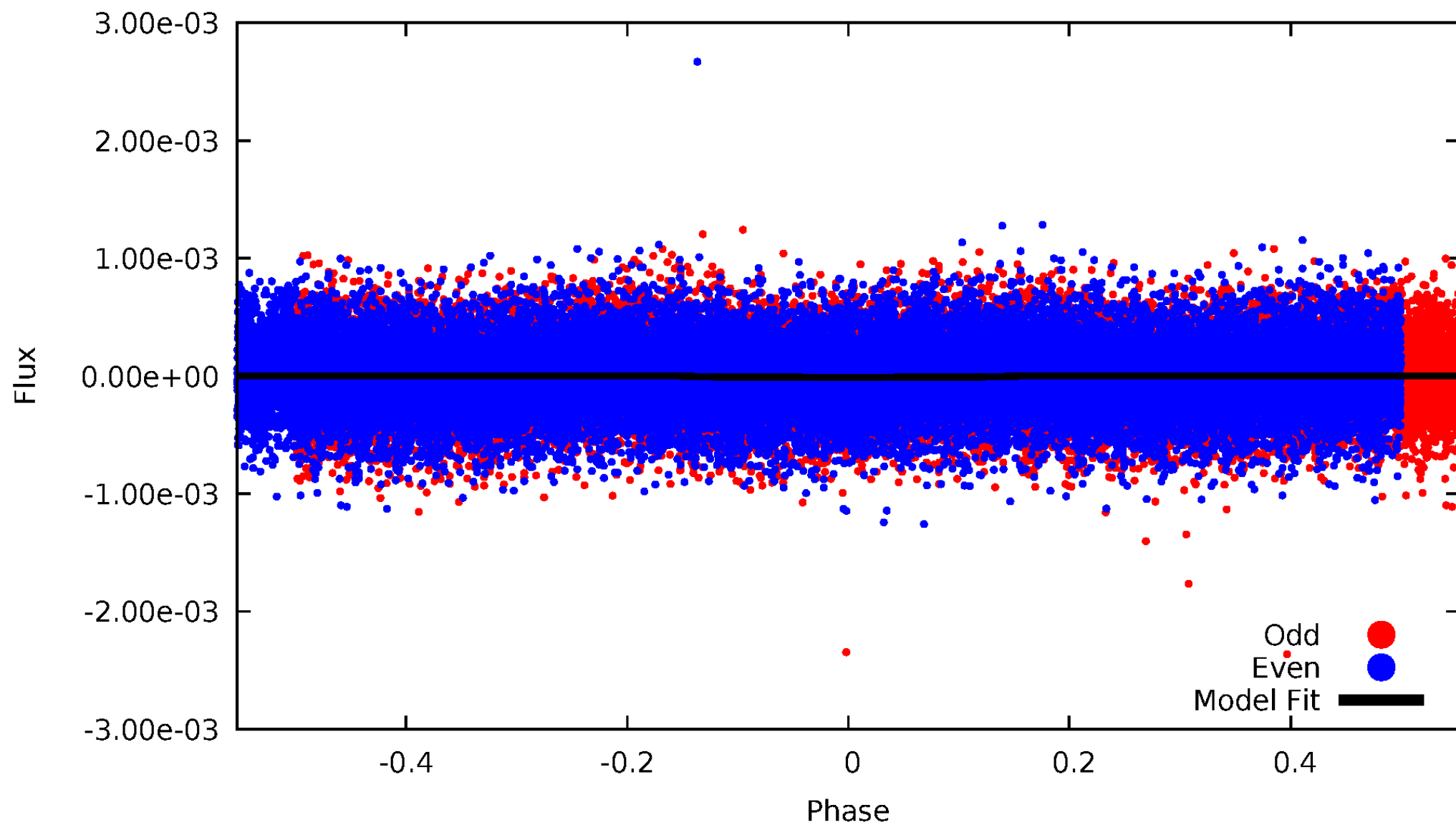
TCE 012258330-01





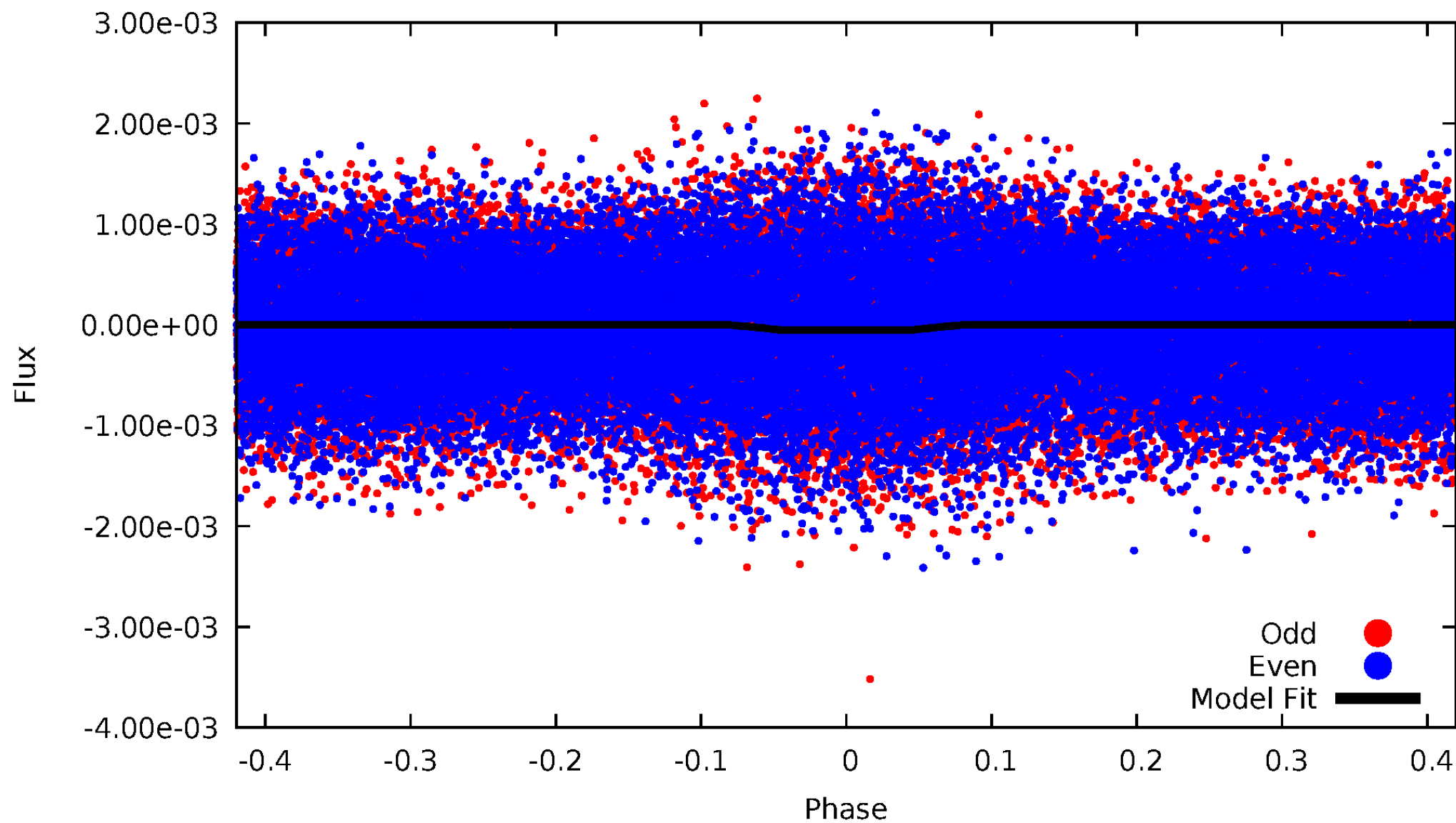
# DV Odd/Even

TCE 012258330-01



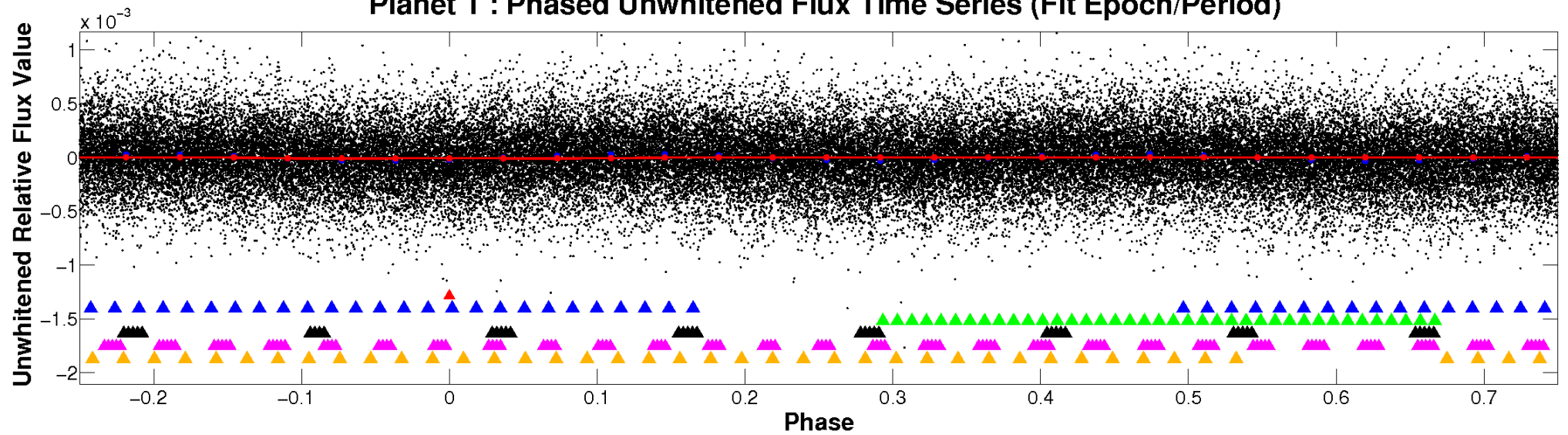
# ALT Odd/Even

TCE 012258330-01

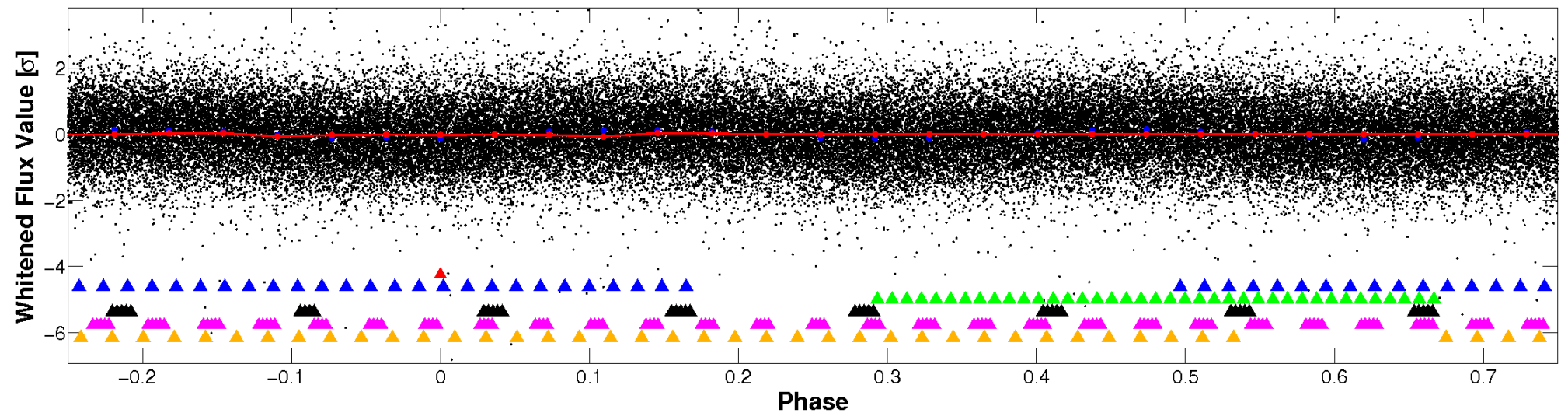


# Non-Whitened Vs. Whitened Light Curve

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



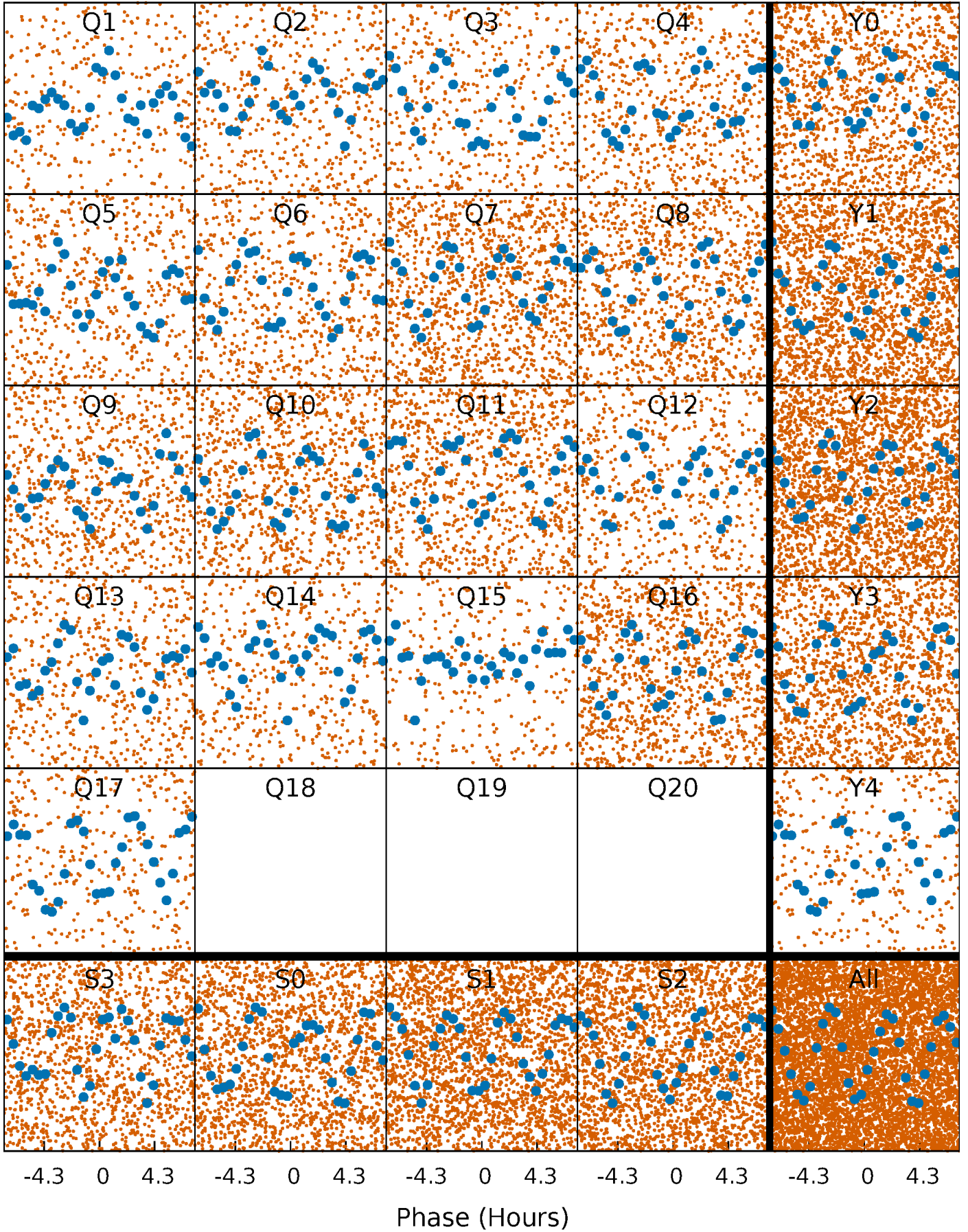
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





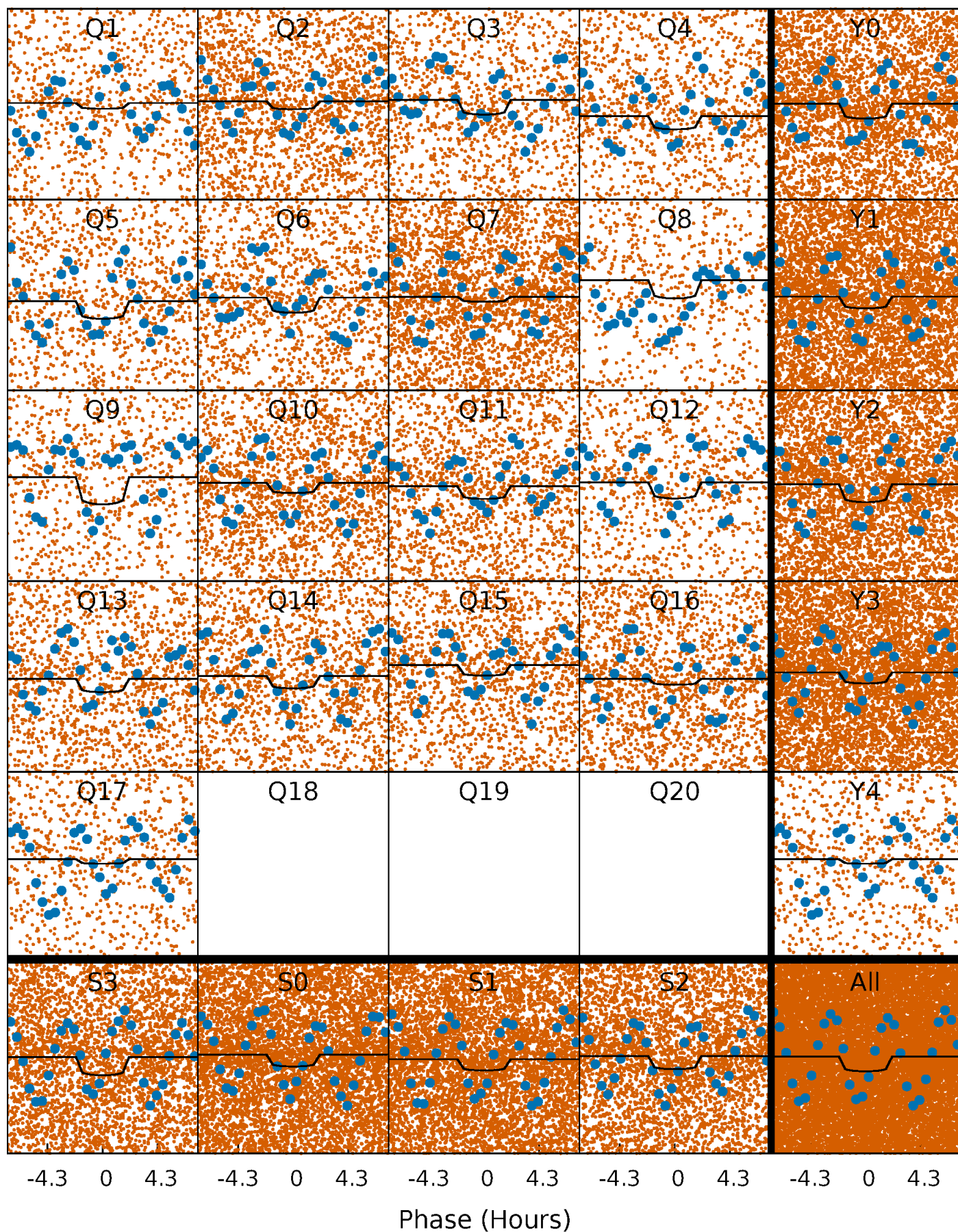
# PDC Quarter-Phased Transit Curves

TCE 012258330-01   P= 0.560562 Days    $T_0=131.936057$  (BKJD)



# DV Quarter-Phased Transit Curves

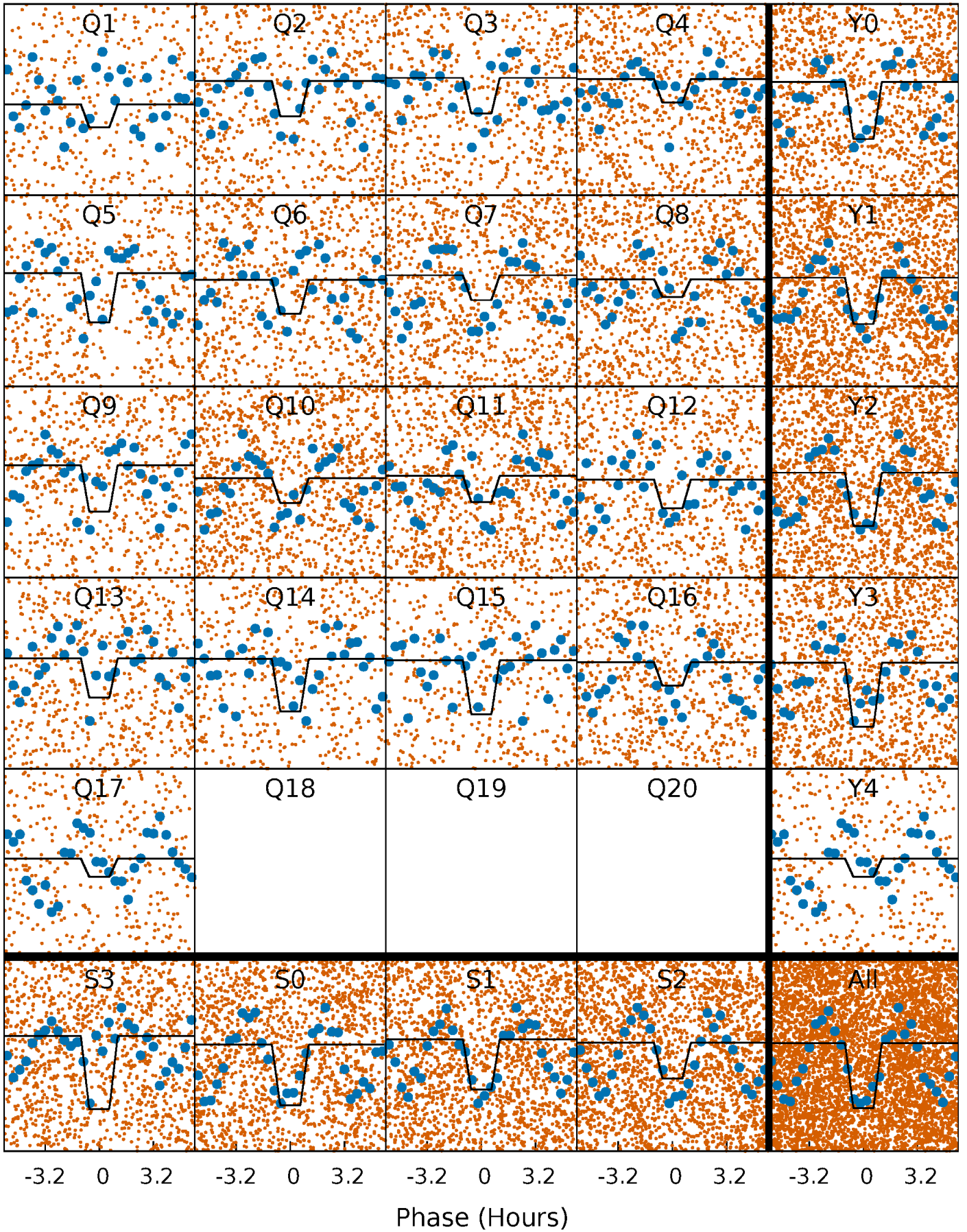
TCE 012258330-01 P= 0.560562 Days  $T_0=131.936057$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 012258330-01 P= 0.560548 Days  $T_0=131.936153$  (BKJD)

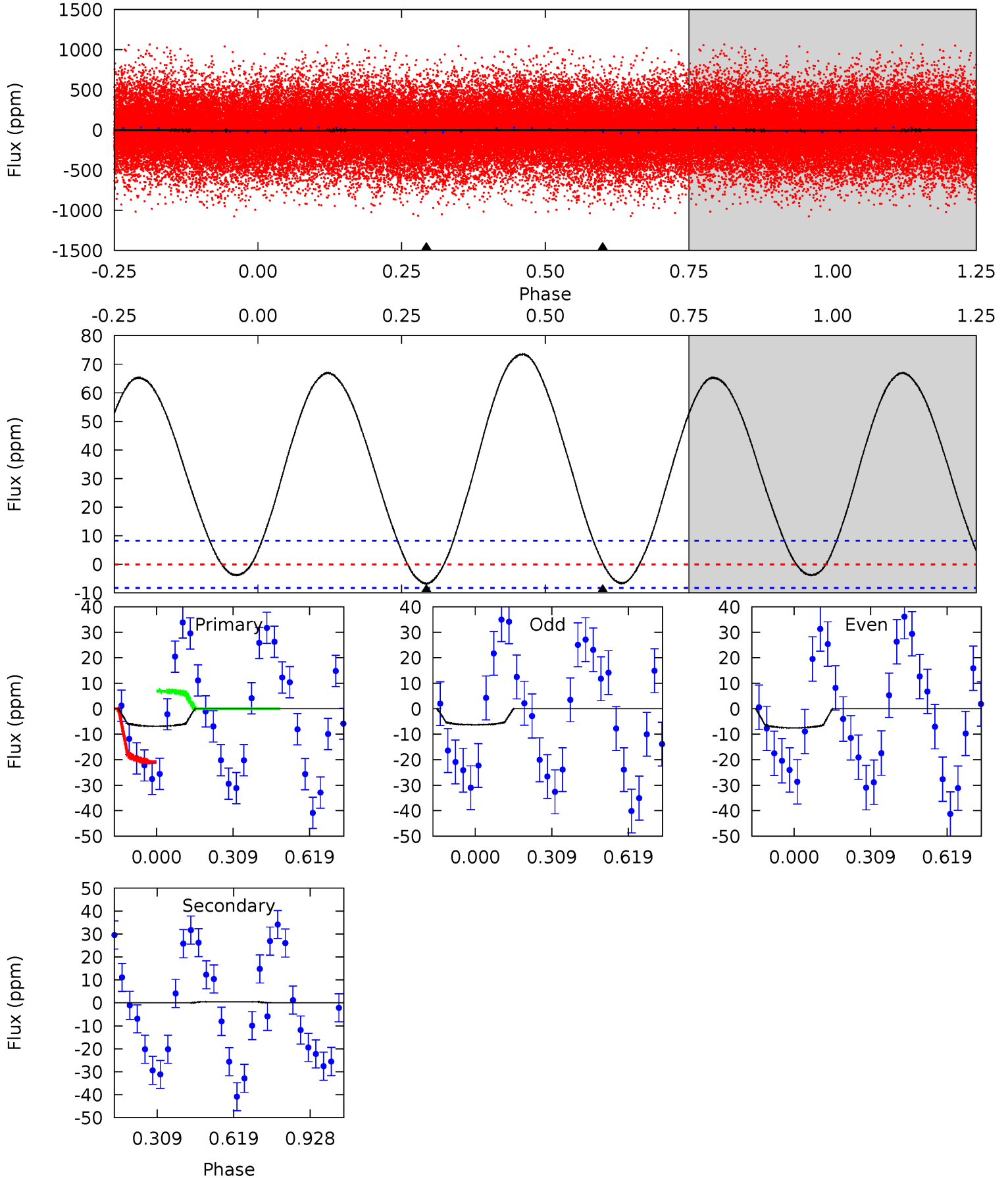




# DV Model-Shift Uniqueness Test

012258330-01, P = 0.560562 Days, E = 131.375495 Days

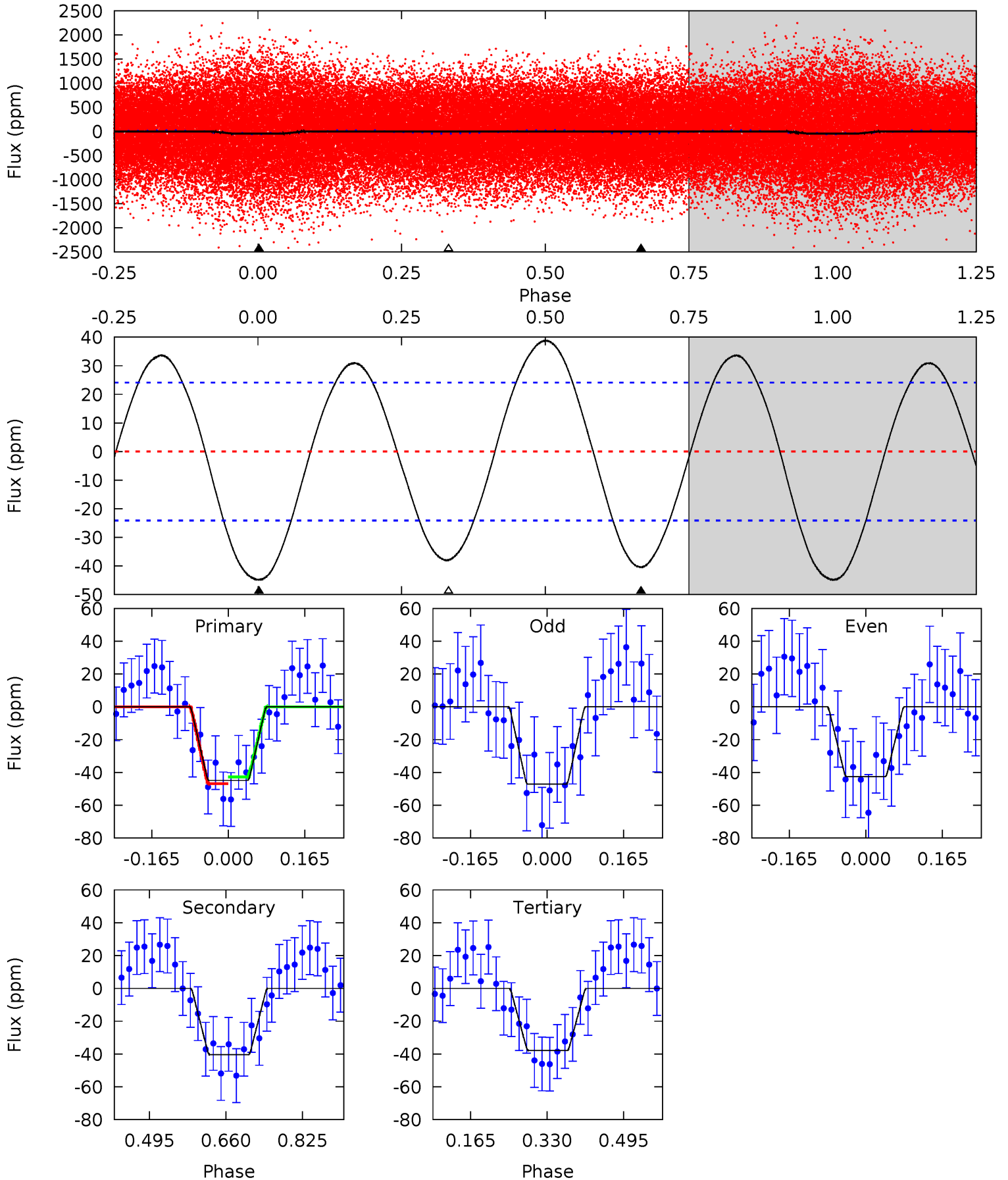
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.59	-0.24	0	0	4.32	1.02	3.42	3.59	3.59	-0.24	-0.24	0.32	2.48	0.91	3.64



# Alt Model-Shift Uniqueness Test

012258330-01, P = 0.560548 Days, E = 131.375605 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
8.28	7.47	7.00	0	4.46	1.39	4.83	1.28	8.28	0.46	7.47	0.40	1.29	0.46	0.31



### Stellar Parameters For KIC 012258330

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$13203^{+480}_{-1923}$	$3.855^{+0.400}_{-0.100}$	$-0.500^{+0.600}_{-0.050}$	$3.518^{+0.402}_{-1.508}$	$3.230^{+0.098}_{-0.880}$	$0.104^{+0.351}_{-0.032}$
	+4%/-15%	+10%/-3%	+120%/-10%	+11%/-43%	+3%/-27%	+336%/-31%
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 012258330-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$0 \pm 2$	$1.12^{+0.21}_{-0.25}$	$10208^{+1111}_{-1629}$	$-7461^{+2717}_{-1795}$	$-0.079^{+0.321}_{-0.352}$
Alt.	$-40 \pm 5$	$2.69^{+0.33}_{-0.68}$	$10216^{+1158}_{-1613}$	$10227^{+1242}_{-1246}$	$1.190^{+0.801}_{-0.267}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



## DV Centroid Data

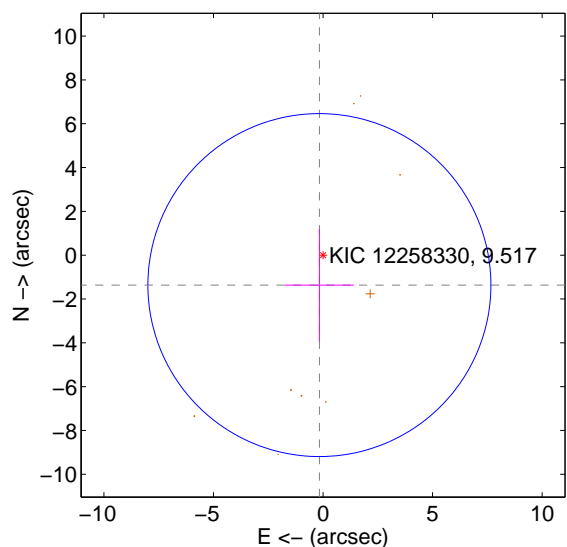
Supplemental centroid analysis for 012258330-01. **Kepler magnitude: 9.52.** Transit SNR 7.09

**There are 0 quarters with good PRF difference image offsets**

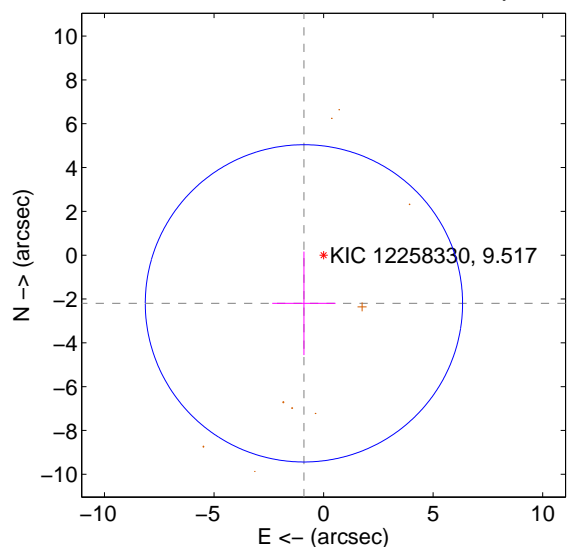
The direct PRF centroid is offset from the target star catalog position by about 0.67 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.375 \pm 2.609$	0.53	$0.166 \pm 1.573$	$-1.365 \pm 2.570$
PRF-fit source offset from KIC position	$2.375 \pm 2.413$	0.98	$0.897 \pm 1.446$	$-2.199 \pm 2.363$
photometric centroid source offset	$0.93 \pm 1.23$	0.76	$0.23 \pm 0.72$	$-0.91 \pm 1.25$

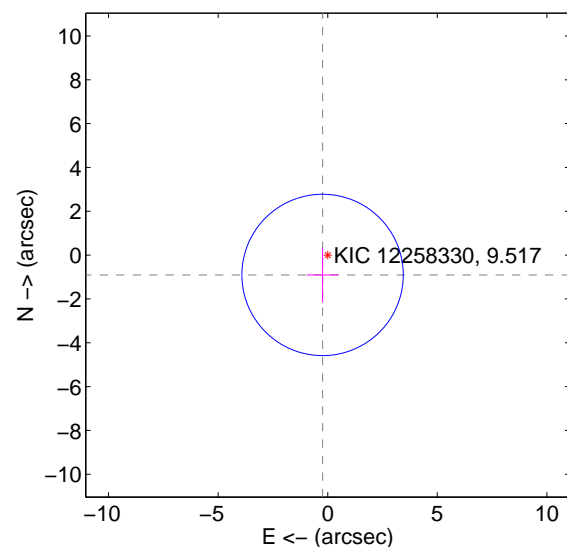
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

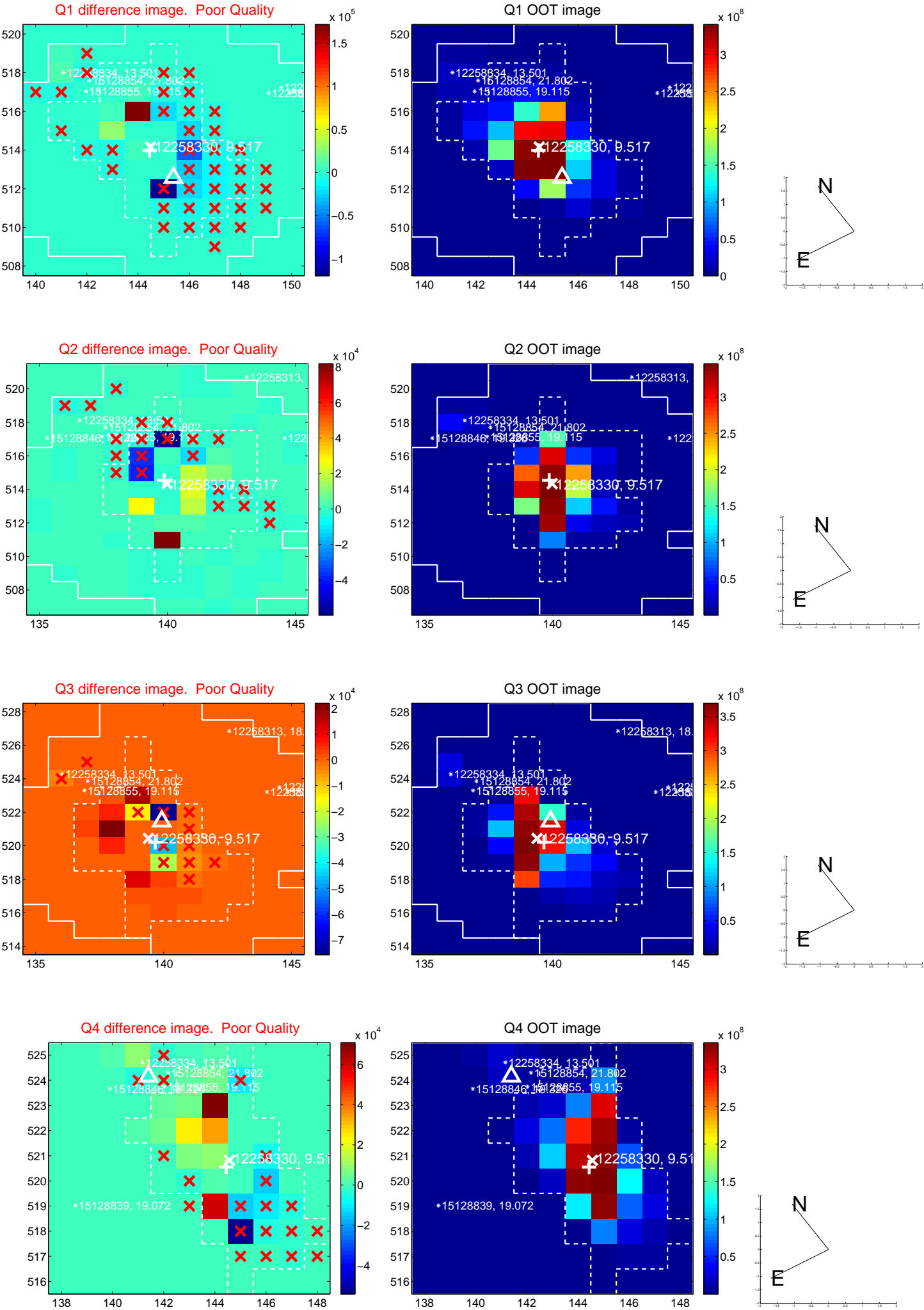


offset from photometric centroids

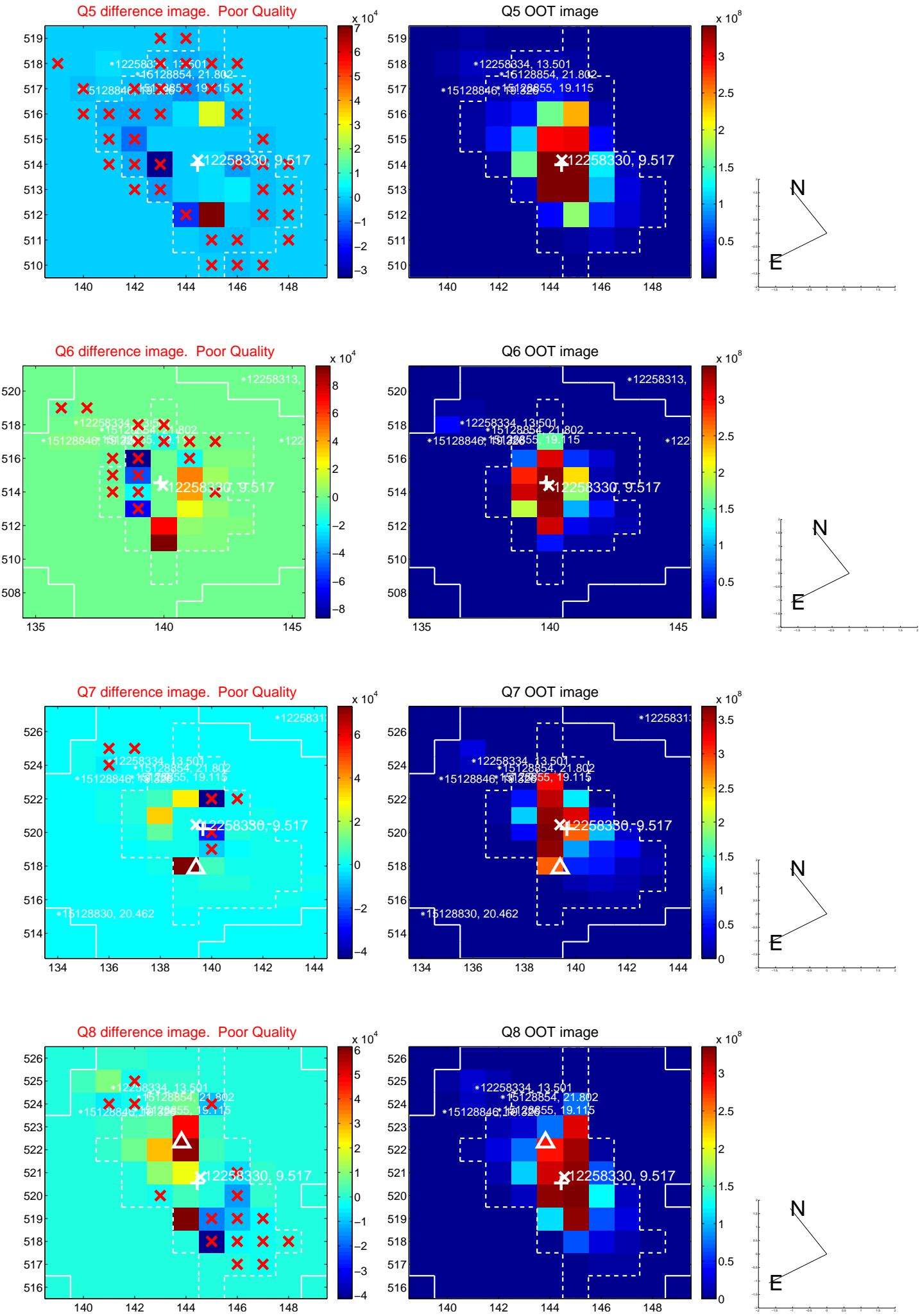


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

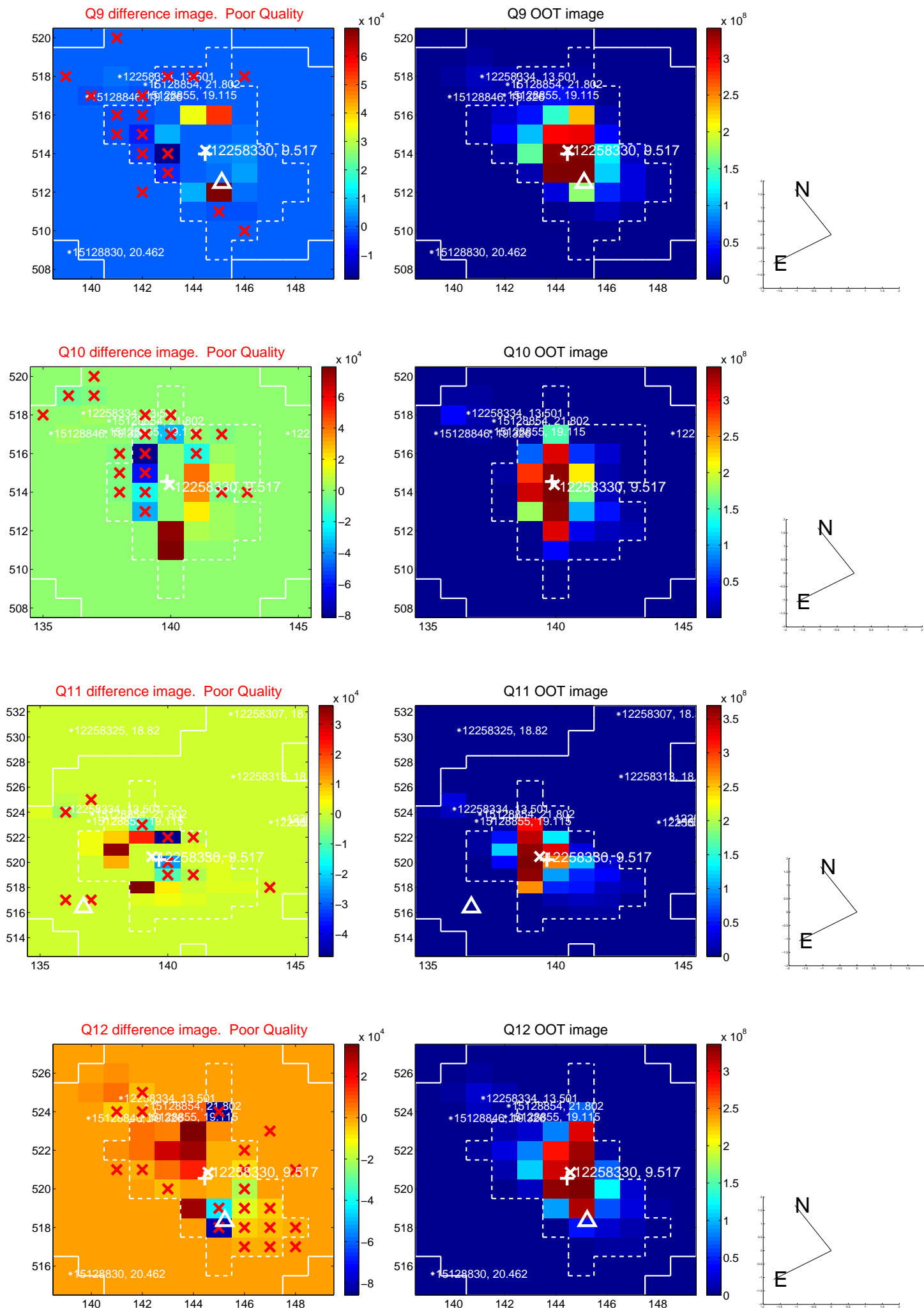


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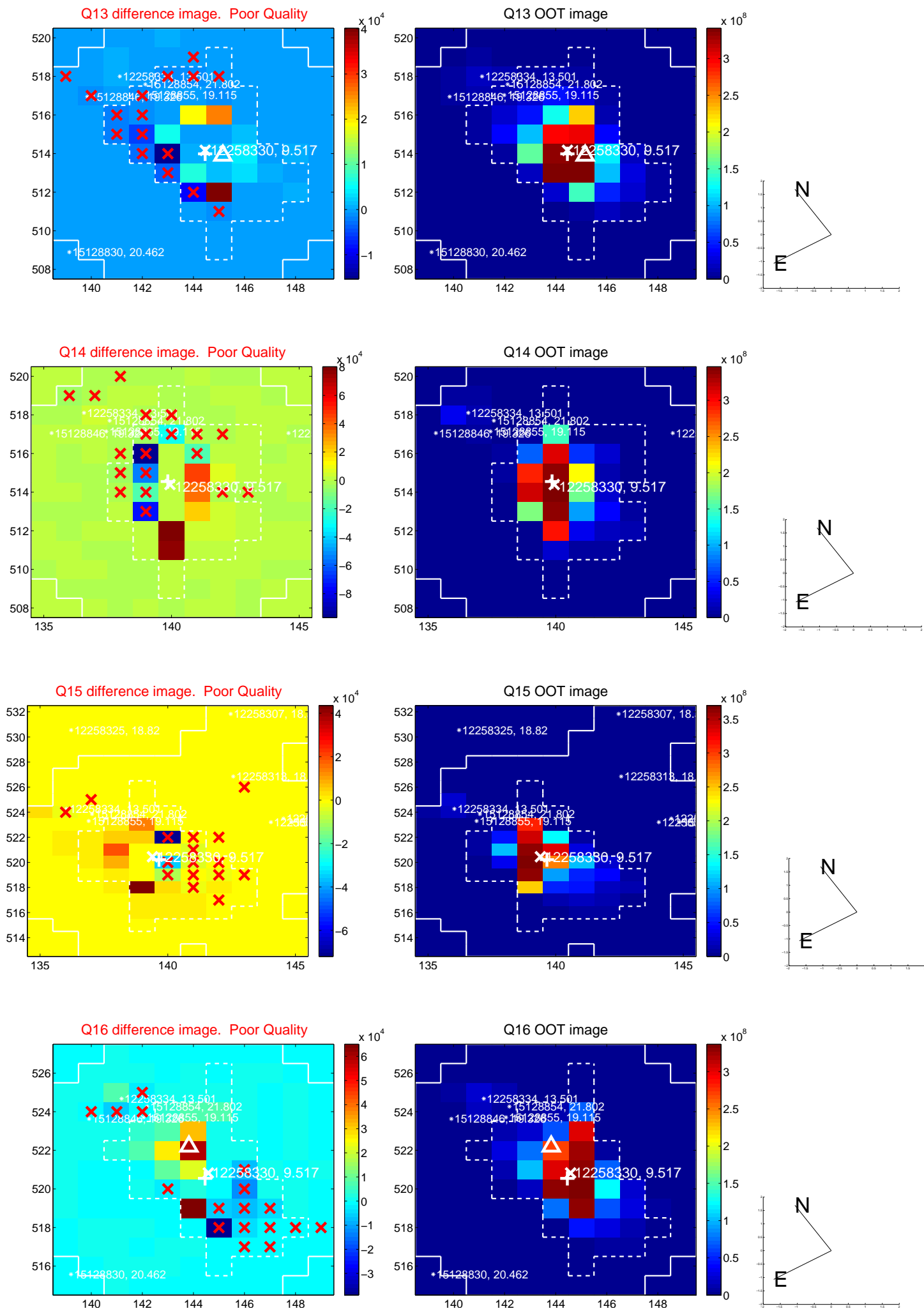




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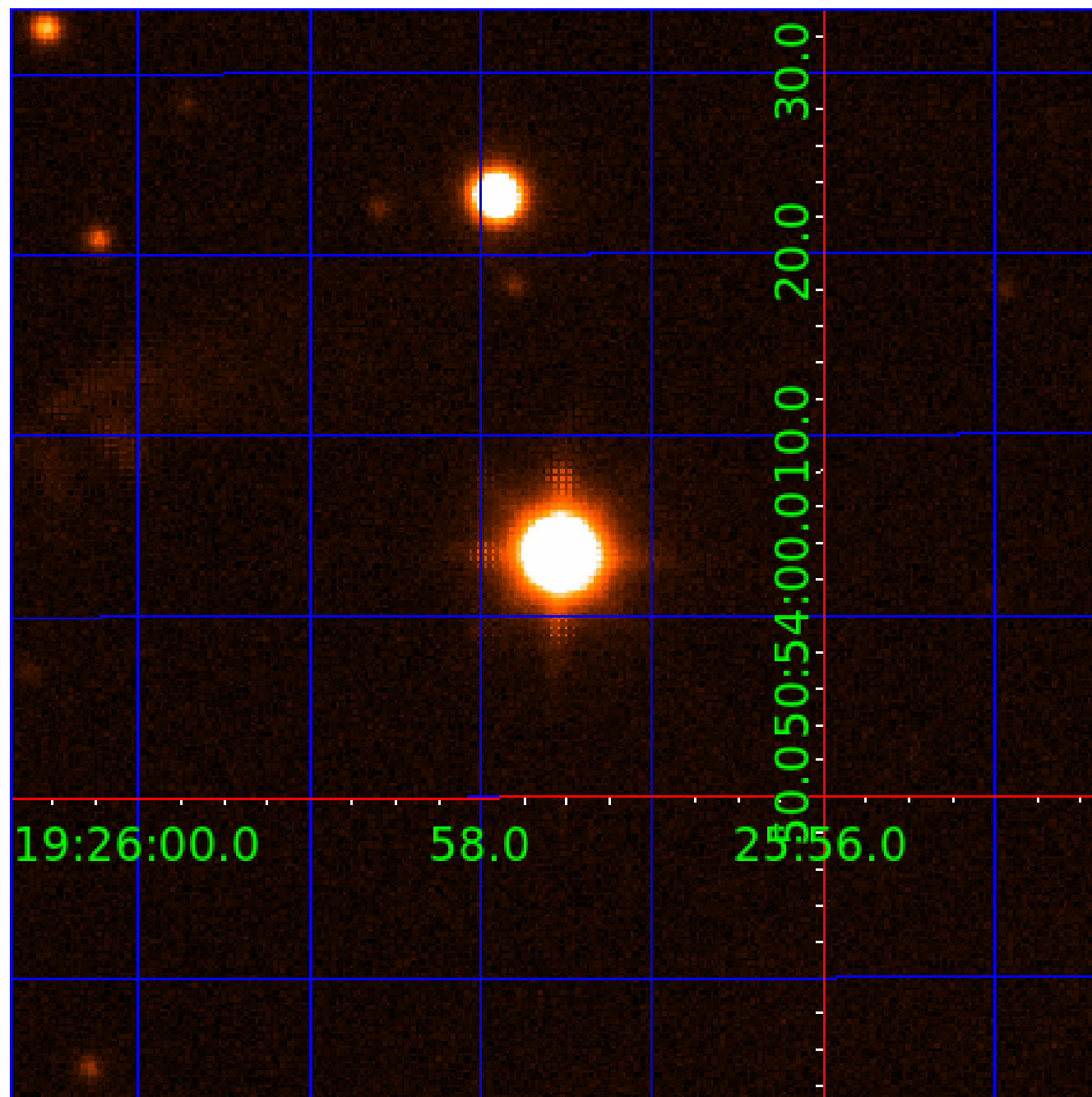
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UKIRT Image

Declination



# KIC 012258330

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012258330-01	OBS	No	0.560562	131.936057	10.0	3.719	7.7	7.1	3.52	13203	1.20	870195.78
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258330-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
012258330-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

**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.

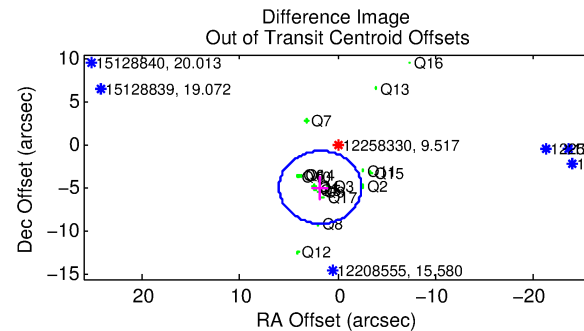
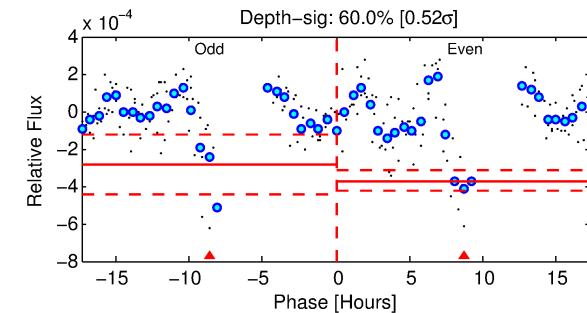
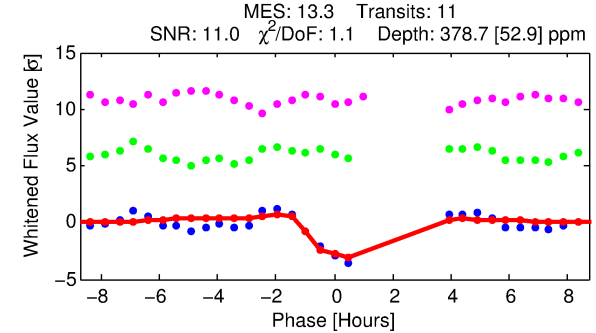
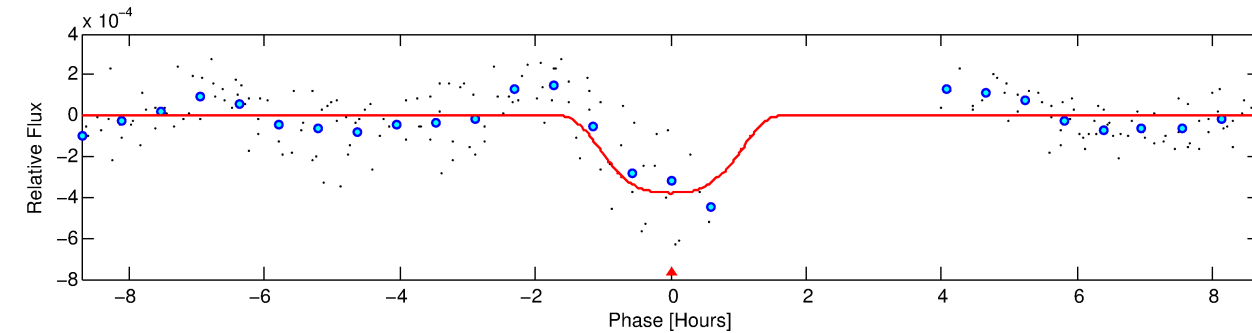
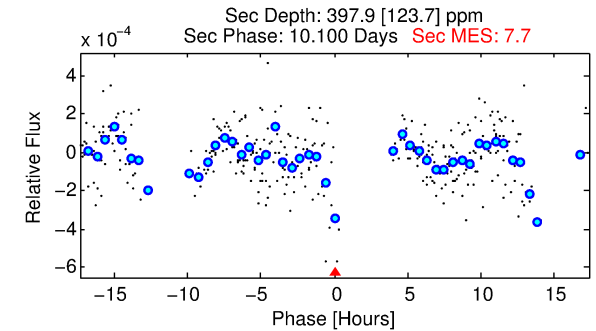
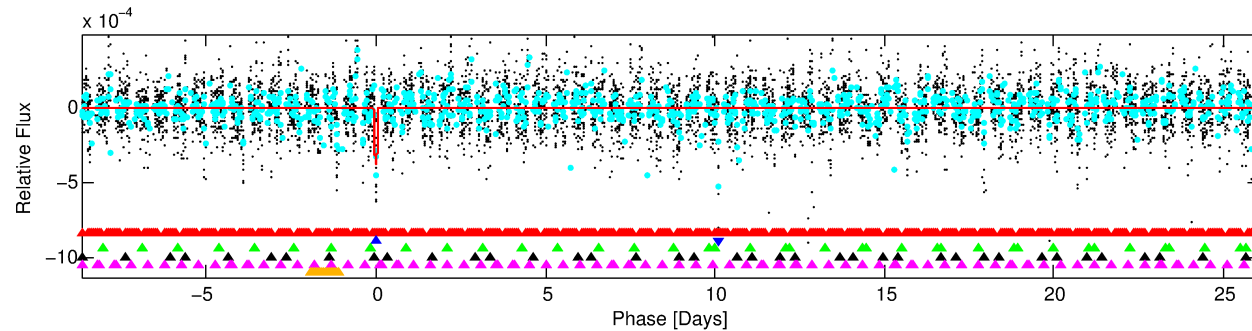
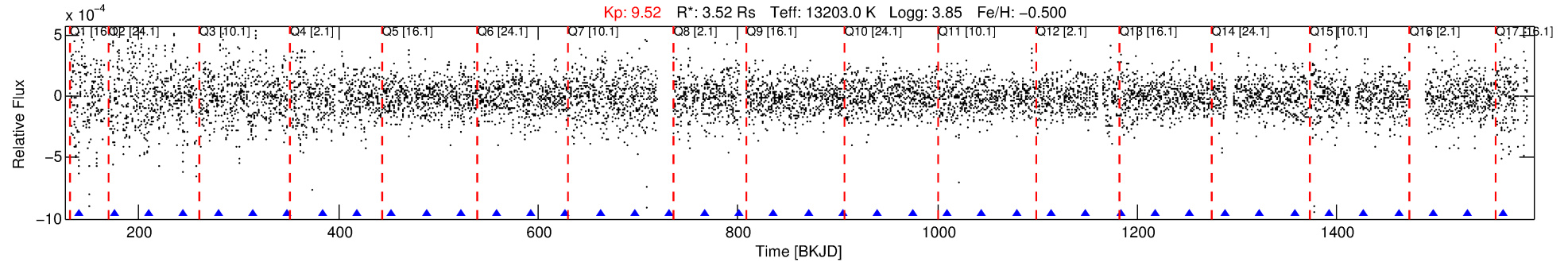
Ephemeris Match Information For 012258330-02

No Significant Match Found



# DV One-Page Summary

KIC: 12258330 Candidate: 2 of 6 Period: 34.764 d



## DV Fit Results:

Period = 34.76399 [0.00109] d  
Epoch = 140.6229 [0.0083] BKJD  
 $R_p/R^* = 0.0217$  [0.0018]  
 $a/R^* = 27.40$  [6.08]  
 $b = 0.98$  [0.01]  
 $\text{Seff} = 3544.94$  [3166.93]  
 $T_{\text{eq}} = 1968$  [439] K  
 $R_p = 8.32$  [3.63]  $R_e$   
 $a = 0.3083$  [0.1293] AU  
 $A_g = 300.37$  [229.08] [1.31σ]  
 **$T_{\text{eff}} = 12664$  [2153] K [4.87σ]**

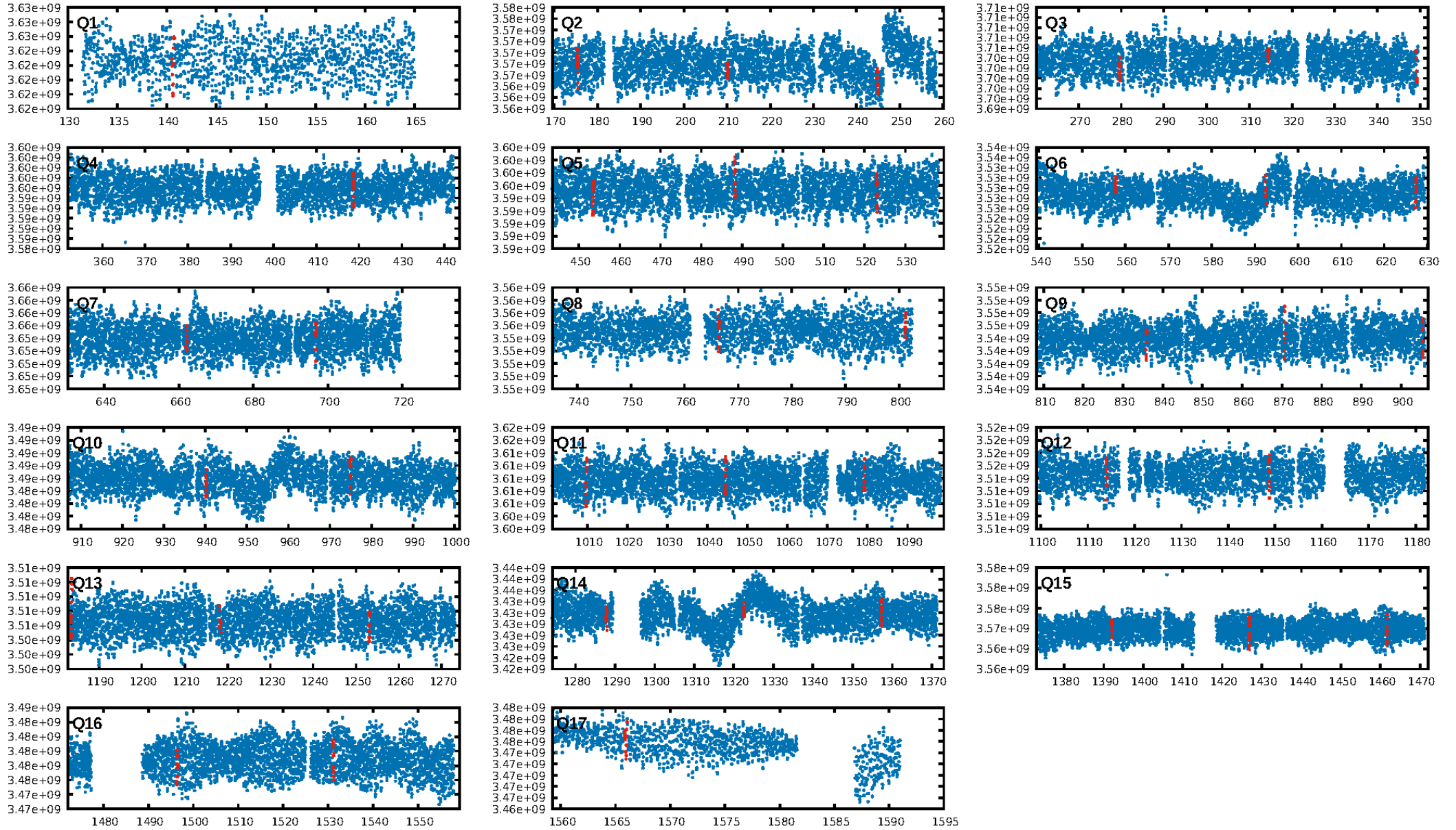
## DV Diagnostic Results:

ShortPeriod-sig: 10.0% [0.13σ]  
LongPeriod-sig: 100.0% [16.48σ]  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.35e-23  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 8.9%  
Centroid-so: 0.582 arcsec [1.65σ]  
**OotOffset-rm: 5.214 arcsec [3.72σ]**  
**KicOffset-rm: 6.004 arcsec [4.93σ]**  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
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DiffImageOverlap-fno: 0.00 [0/17]

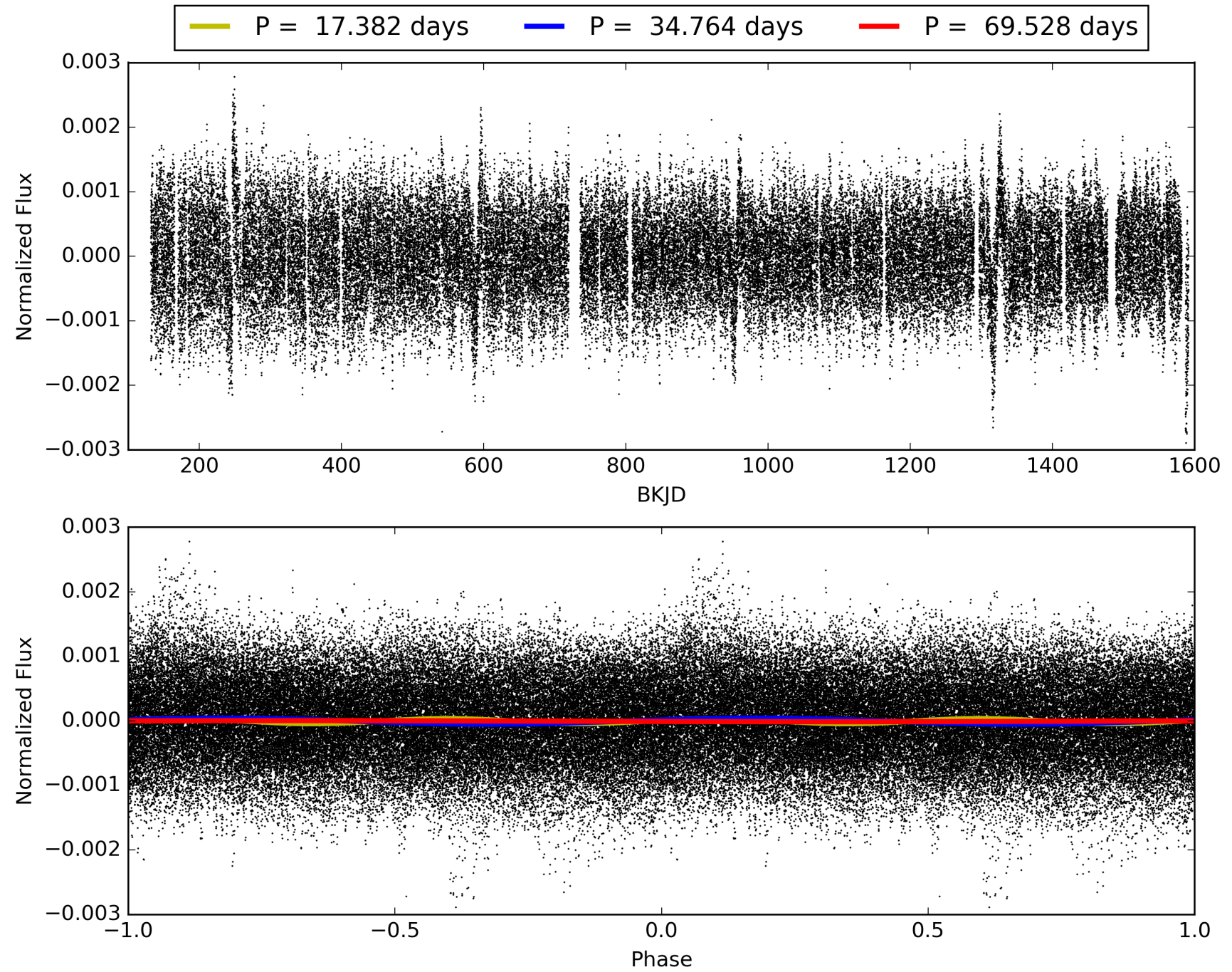
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 012258330-02, PDC Light Curves

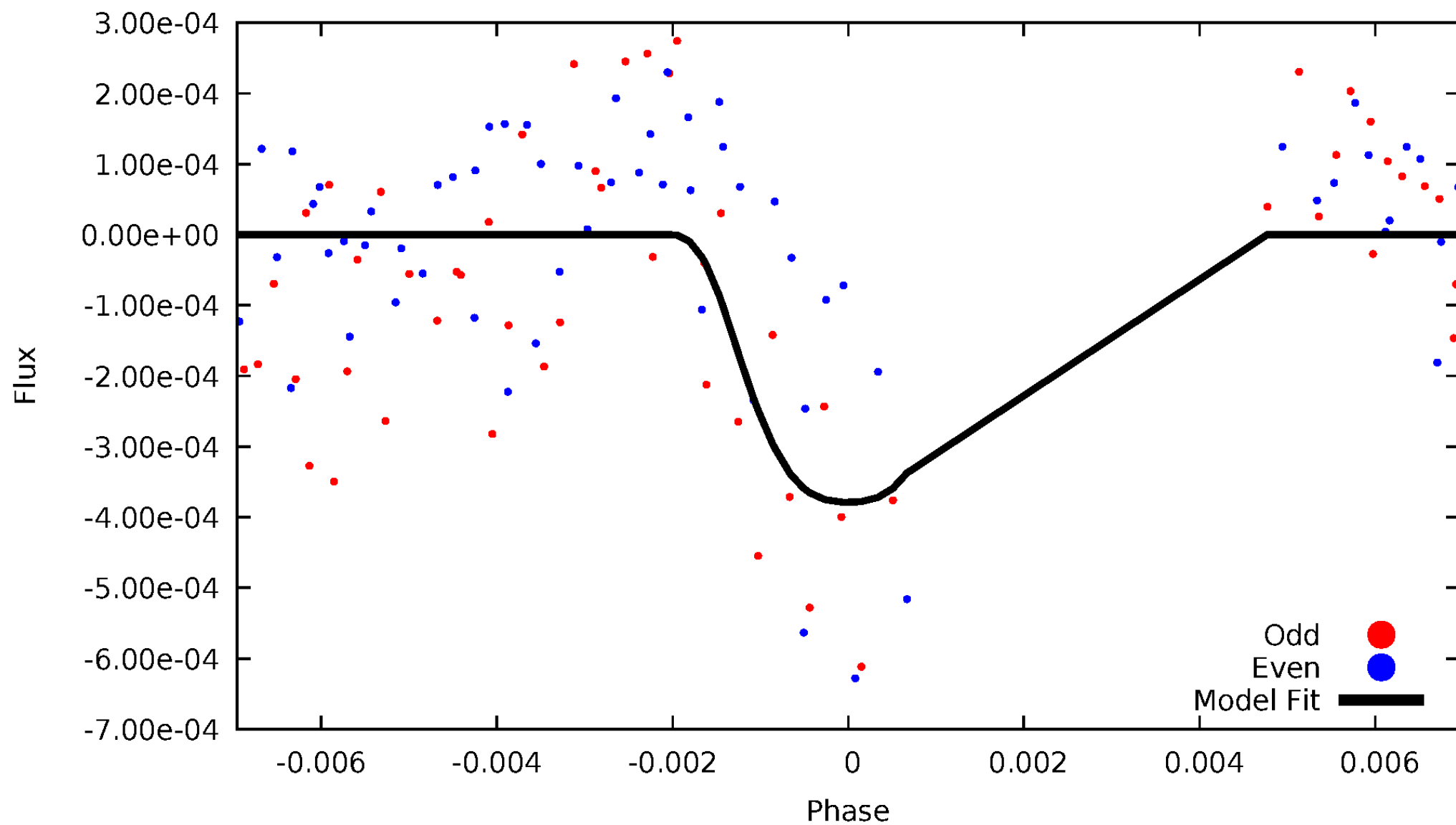


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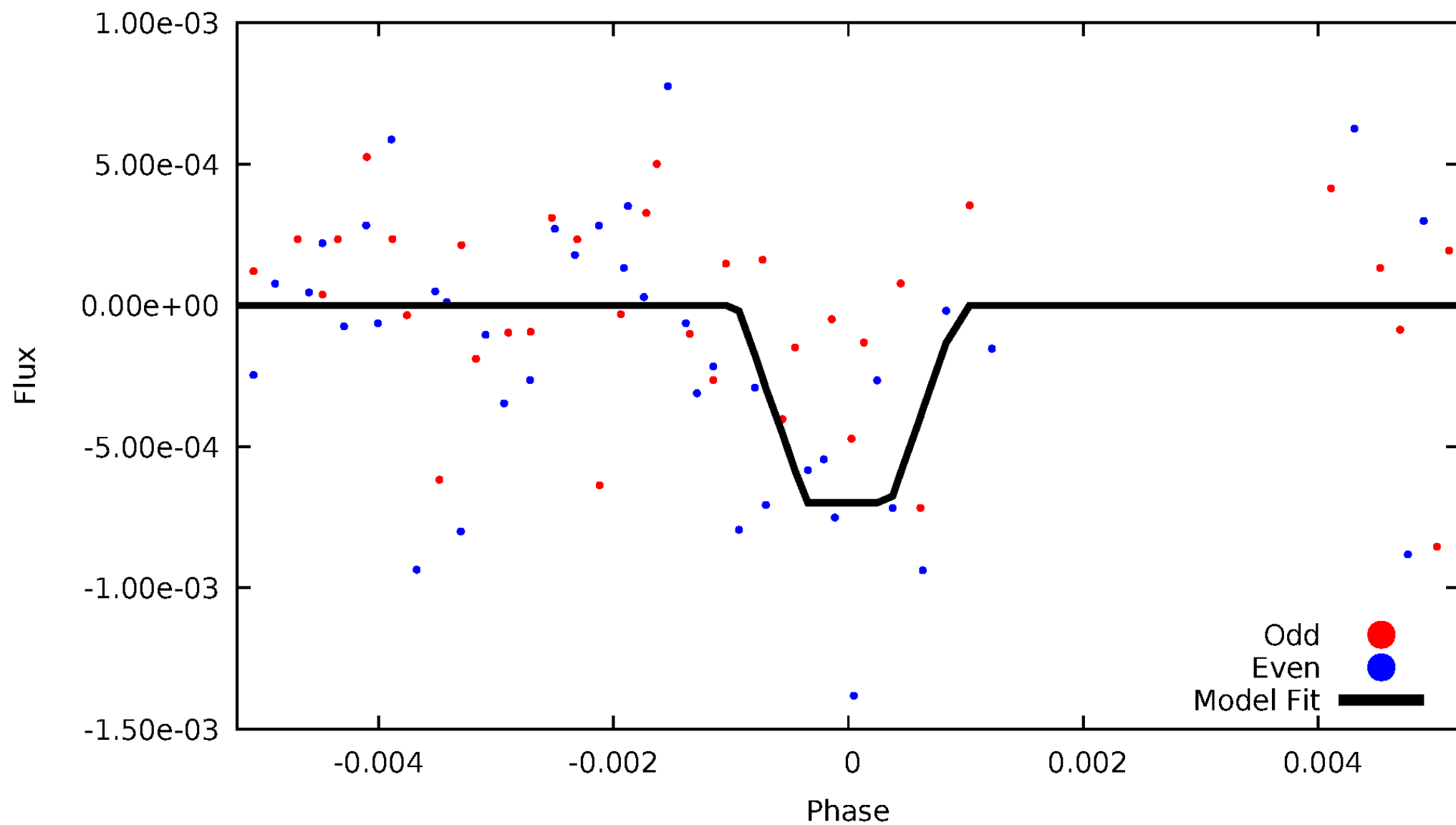
# DV Odd/Even

TCE 012258330-02



# ALT Odd/Even

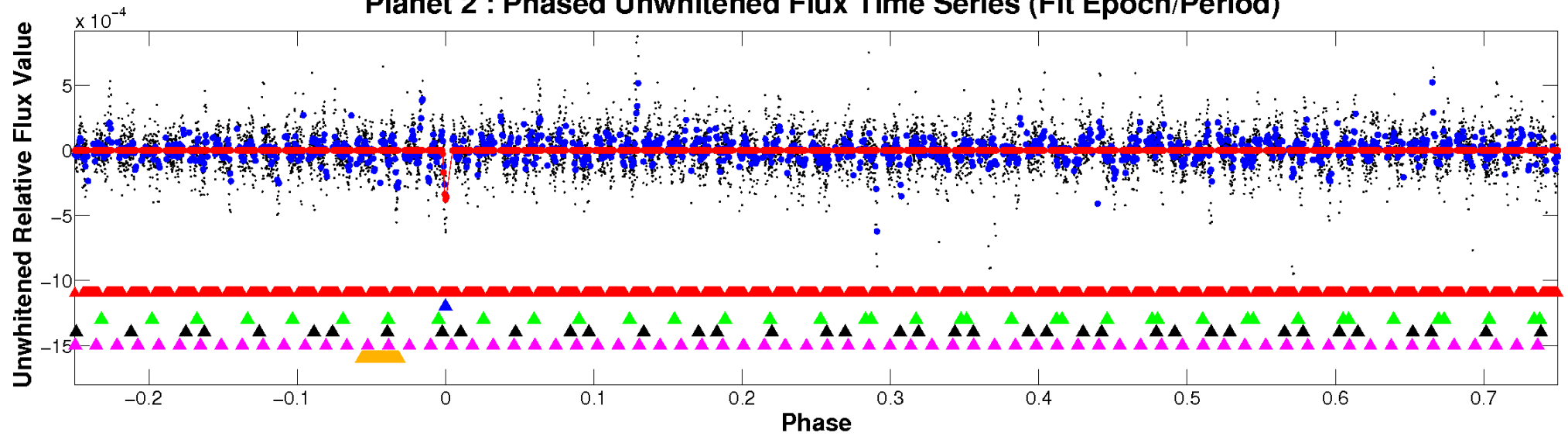
TCE 012258330-02



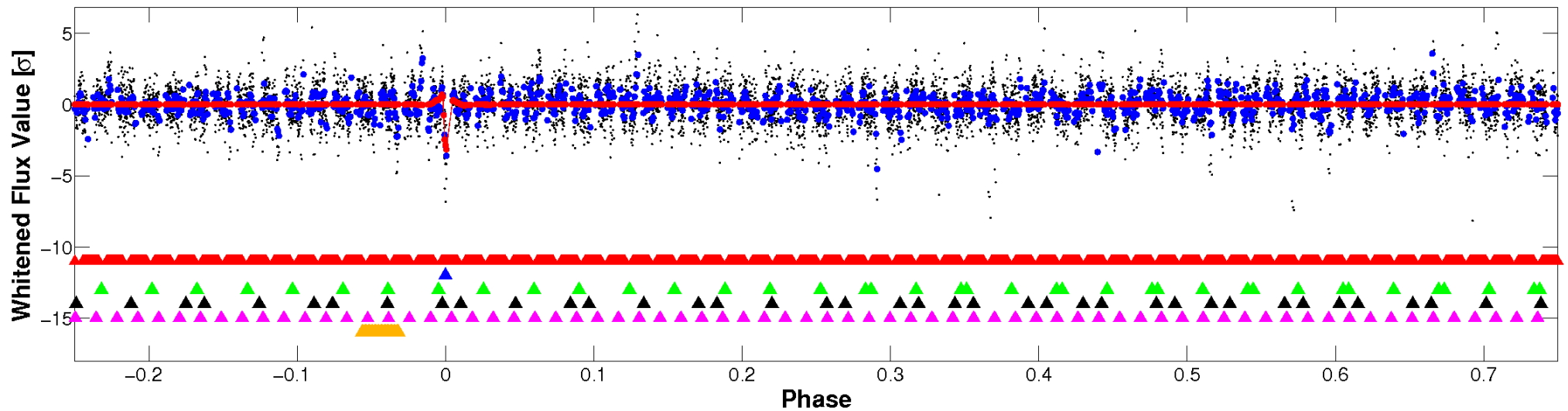


# Non-Whitened Vs. Whitened Light Curve

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

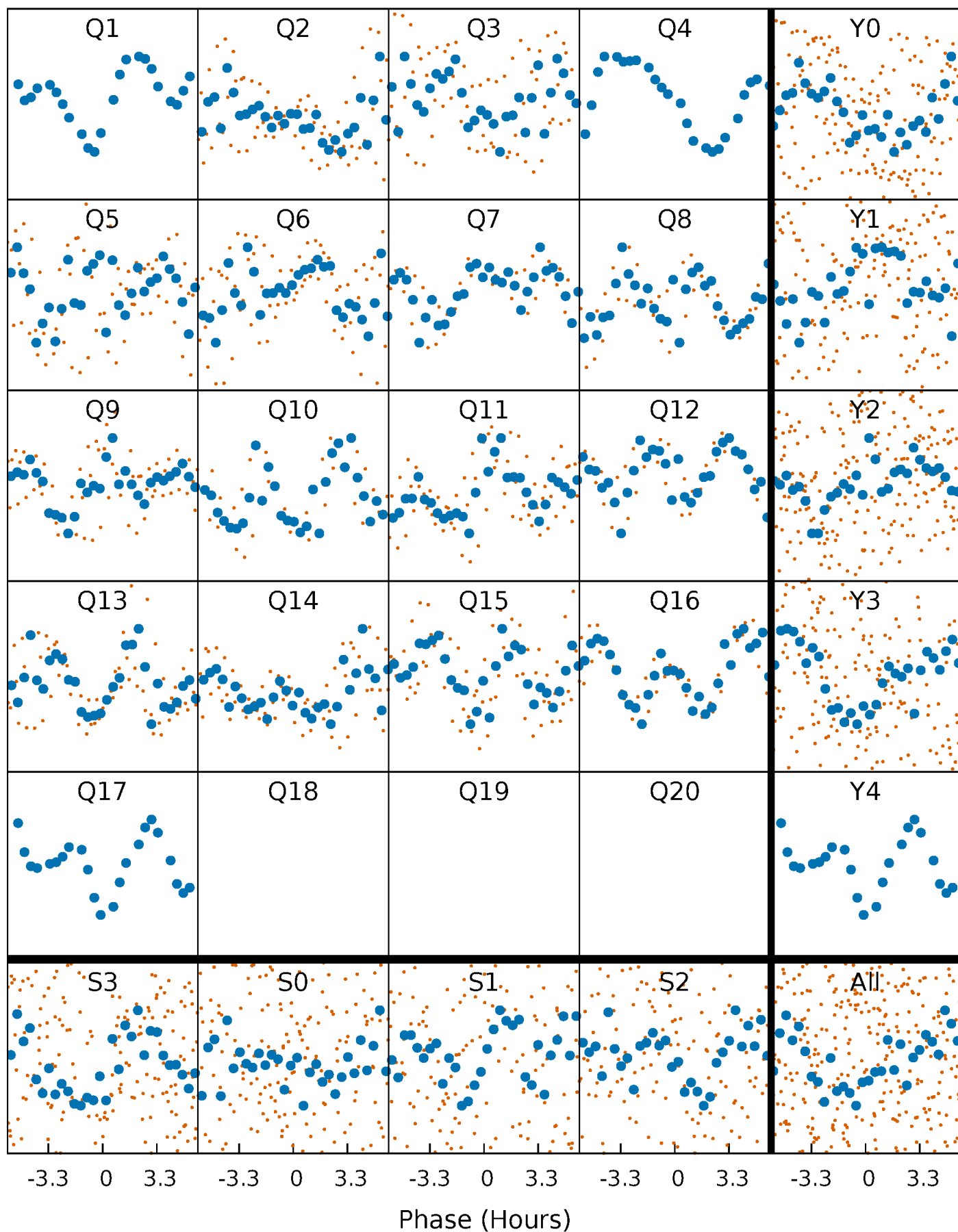


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



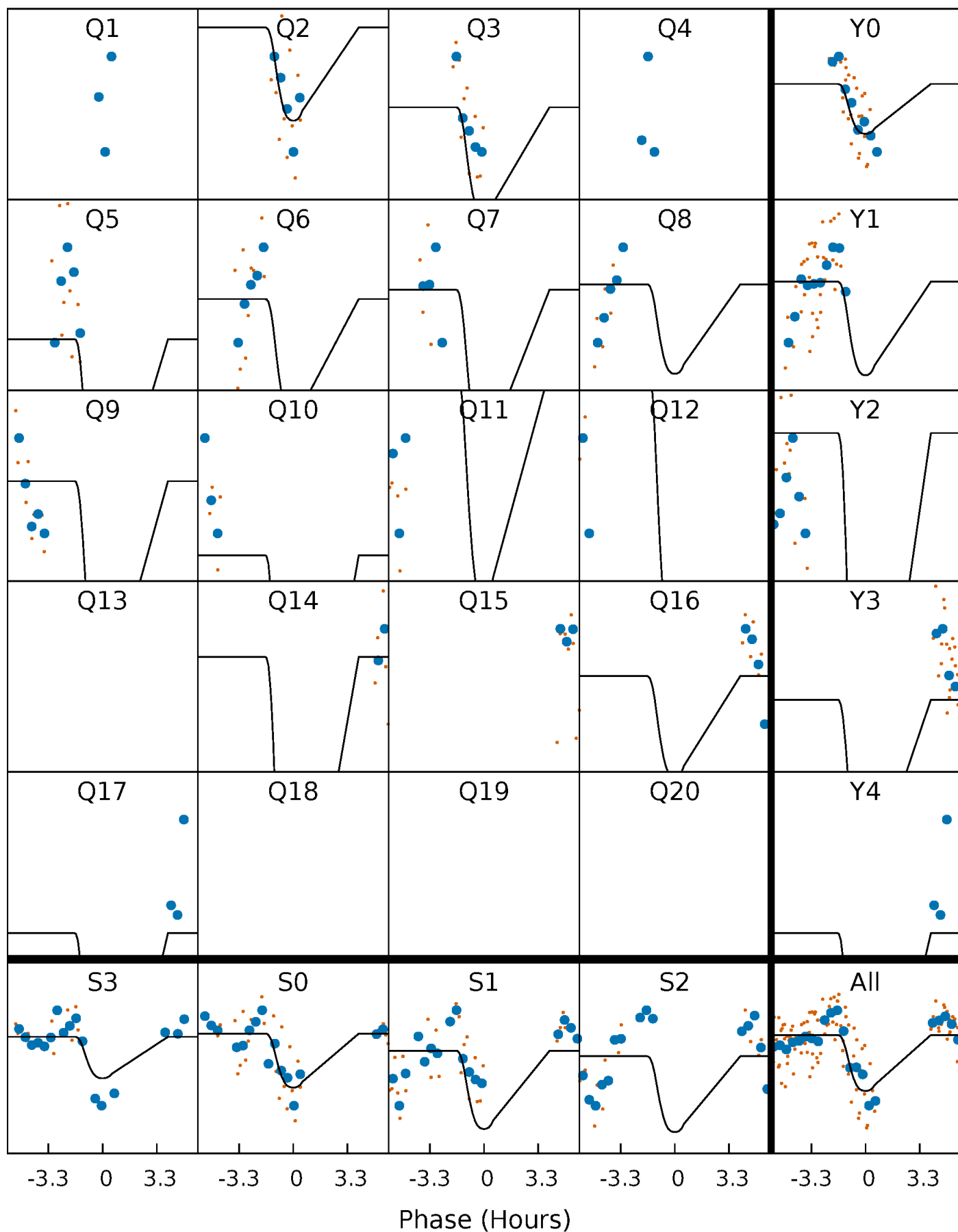
# PDC Quarter-Phased Transit Curves

TCE 012258330-02   P= 34.763995 Days    $T_0=140.622865$  (BKJD)



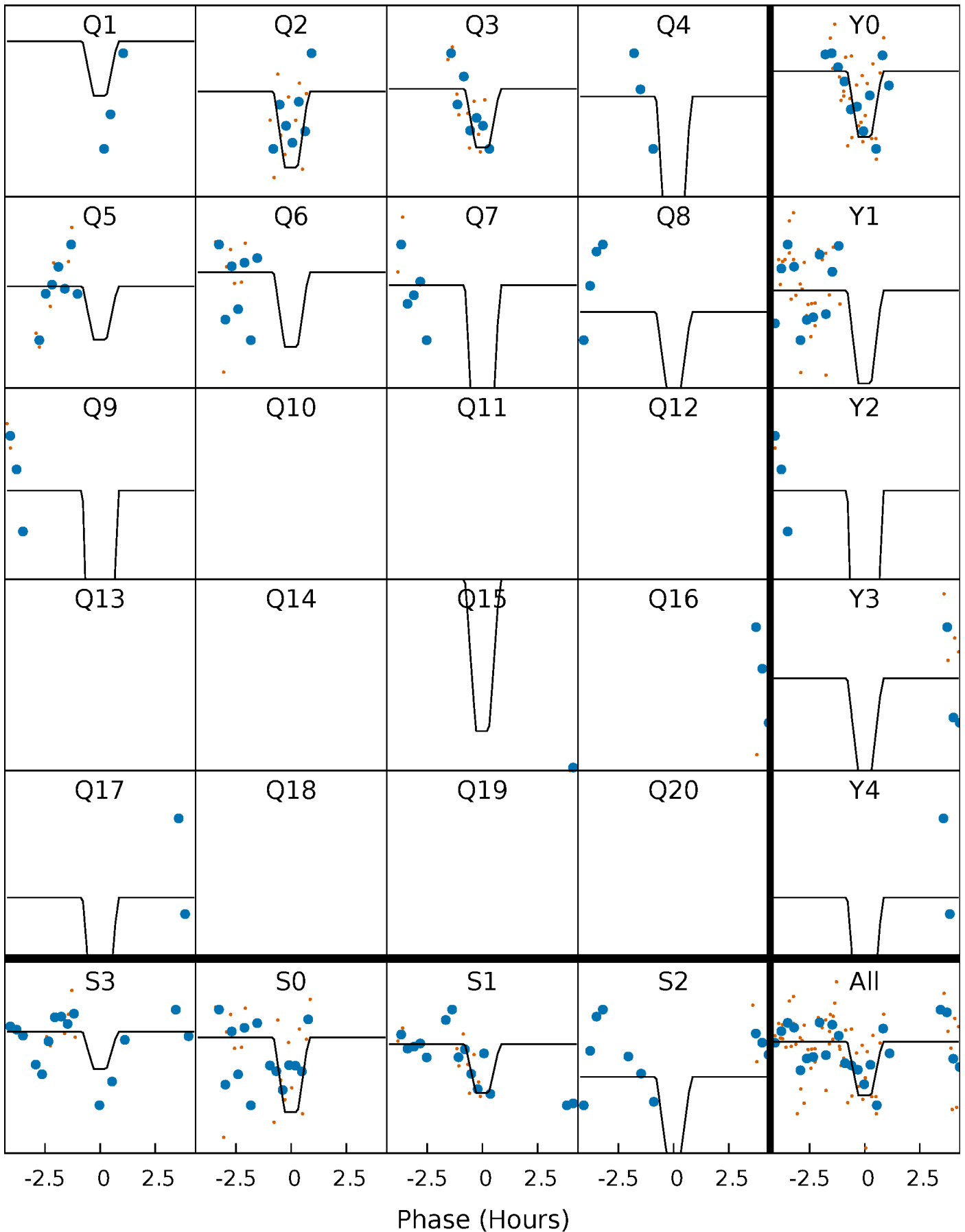
# DV Quarter-Phased Transit Curves

TCE 012258330-02   P= 34.763995 Days    $T_0=140.622865$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 012258330-02   P= 34.765025 Days    $T_0=140.603563$  (BKJD)

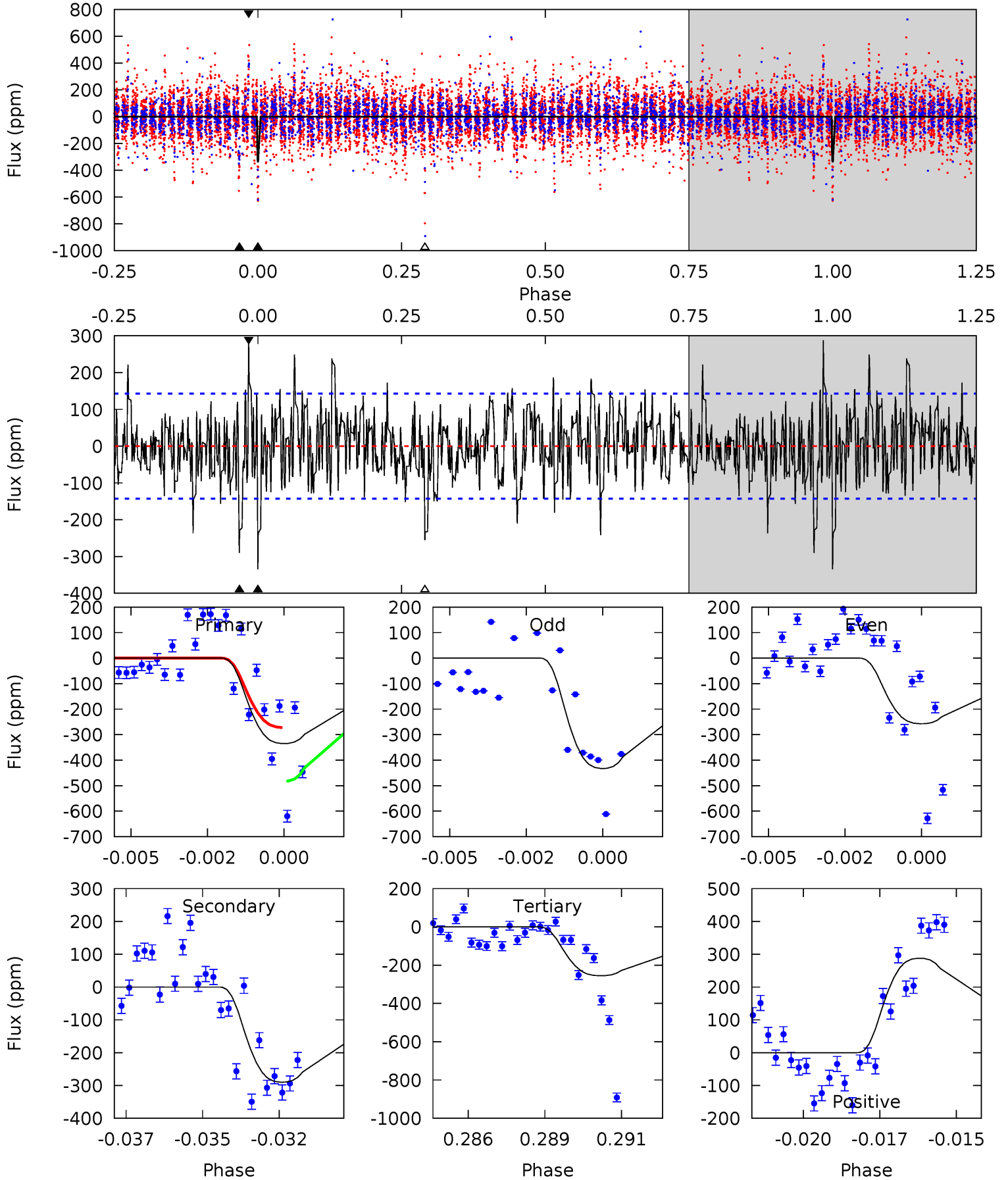




# DV Model-Shift Uniqueness Test

012258330-02, P = 34.763995 Days, E = 105.858870 Days

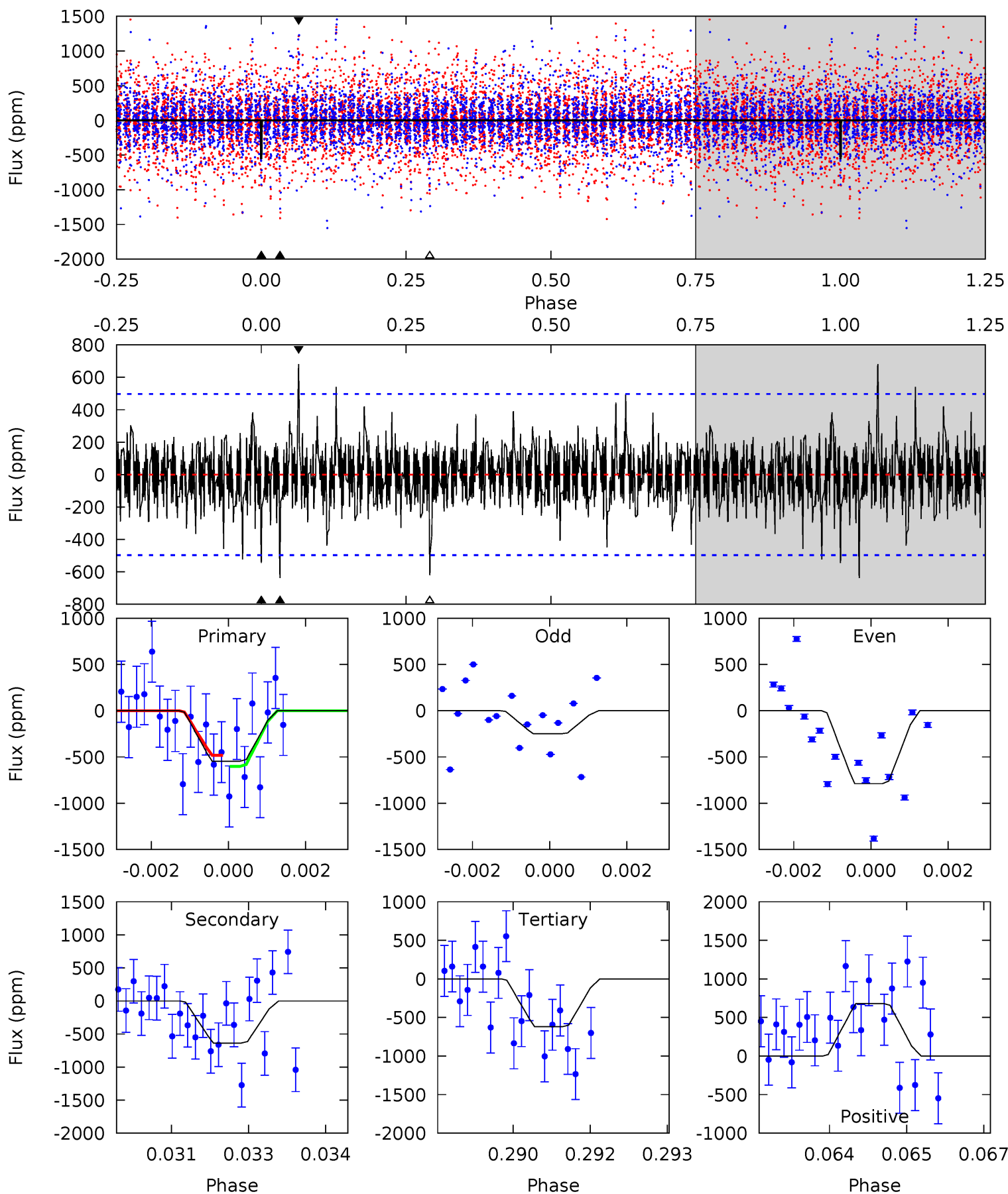
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.4	10.7	9.46	10.7	5.29	3.02	2.43	2.95	1.75	1.29	0.08	3.28	1.07	0.46	2.81



# Alt Model-Shift Uniqueness Test

012258330-02, P = 34.765025 Days, E = 105.838538 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
5.89	6.86	6.68	7.34	5.36	3.15	1.44	-0.80	-1.45	0.18	-0.48	2.78	0.92	0.52	0.66



### Stellar Parameters For KIC 012258330

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$13203^{+480}_{-1923}$	$3.855^{+0.400}_{-0.100}$	$-0.500^{+0.600}_{-0.050}$	$3.518^{+0.402}_{-1.508}$	$3.230^{+0.098}_{-0.880}$	$0.104^{+0.351}_{-0.032}$
	+4%/-15%	+10%/-3%	+120%/-10%	+11%/-43%	+3%/-27%	+336%/-31%
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 012258330-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-290 \pm 27$	$7.75^{+1.26}_{-1.66}$	$2575^{+290}_{-368}$	$10476^{+1166}_{-1064}$	$246^{+142}_{-66}$
Alt.	$-636 \pm 93$	$9.72^{+1.40}_{-2.12}$	$2602^{+276}_{-423}$	$12213^{+1506}_{-1604}$	$346^{+193}_{-90}$

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

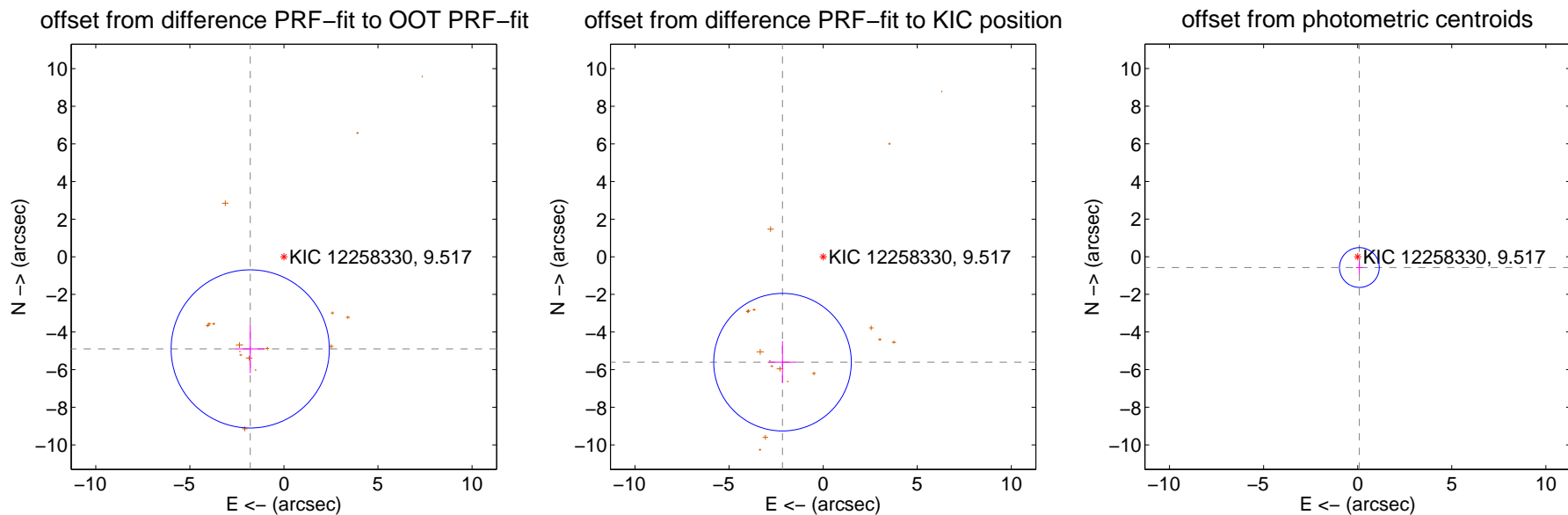
## DV Centroid Data

Supplemental centroid analysis for 012258330-02. **Kepler magnitude: 9.52.** Transit SNR 11.03

**There are 0 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 0.72 arcsec

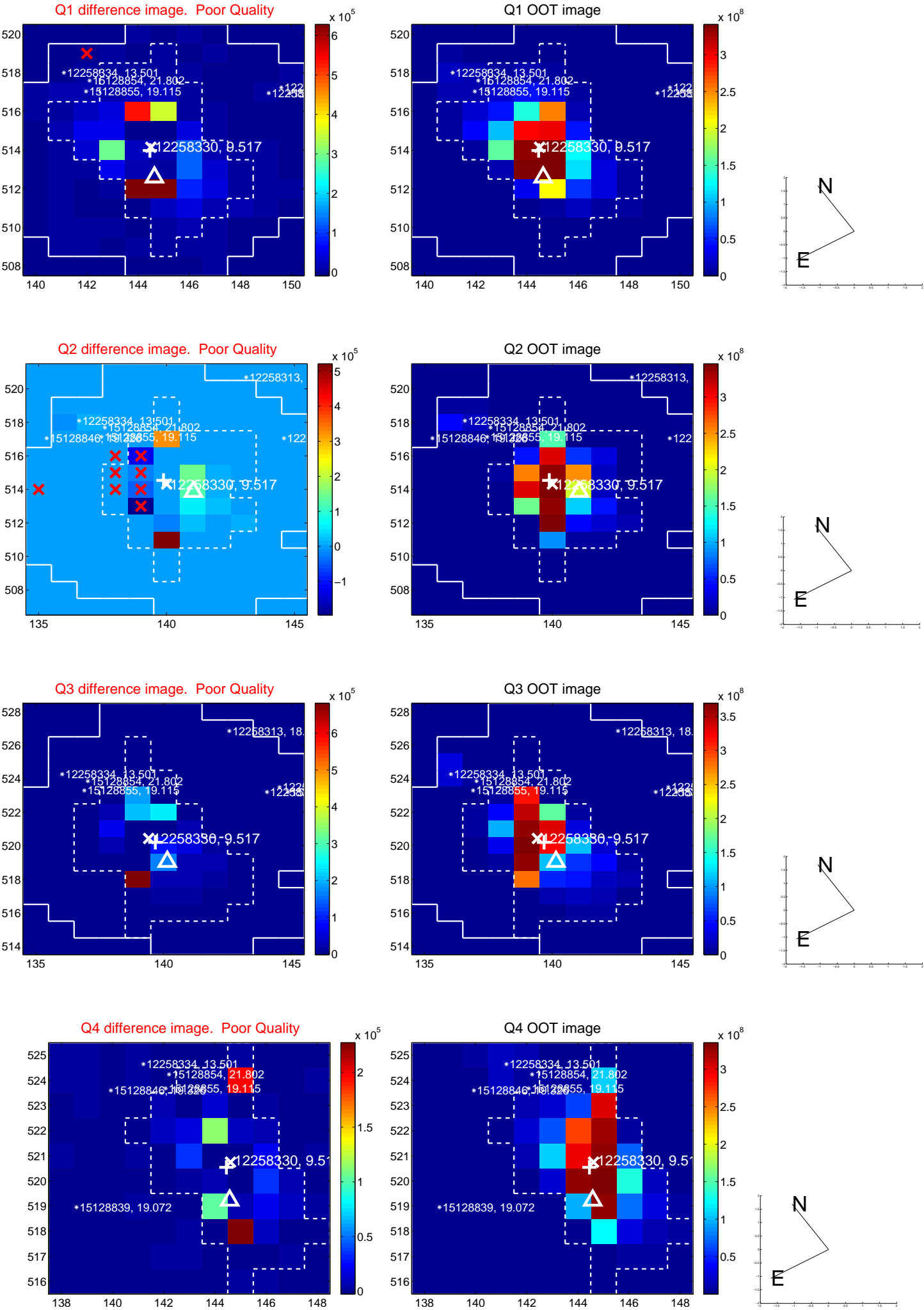
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>5.214 \pm 1.401</math></b>	<b>3.72</b>	$1.791 \pm 0.779$	$-4.897 \pm 1.291$
PRF-fit source offset from KIC position	<b><math>6.004 \pm 1.218</math></b>	<b>4.93</b>	$2.161 \pm 0.746$	$-5.601 \pm 1.117$
photometric centroid source offset	$0.58 \pm 0.35$	1.65	$-0.09 \pm 0.18$	$-0.57 \pm 0.36$



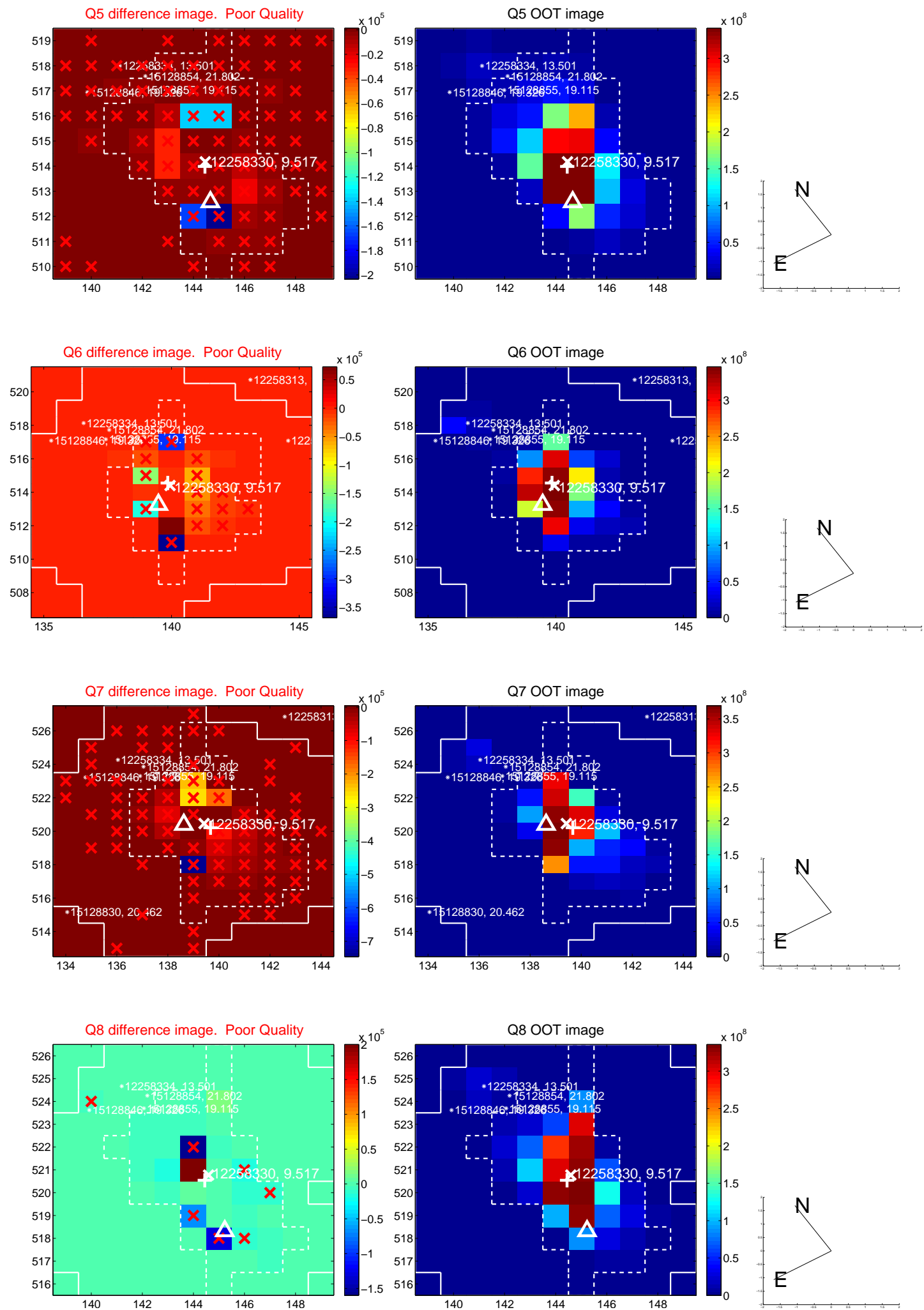
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



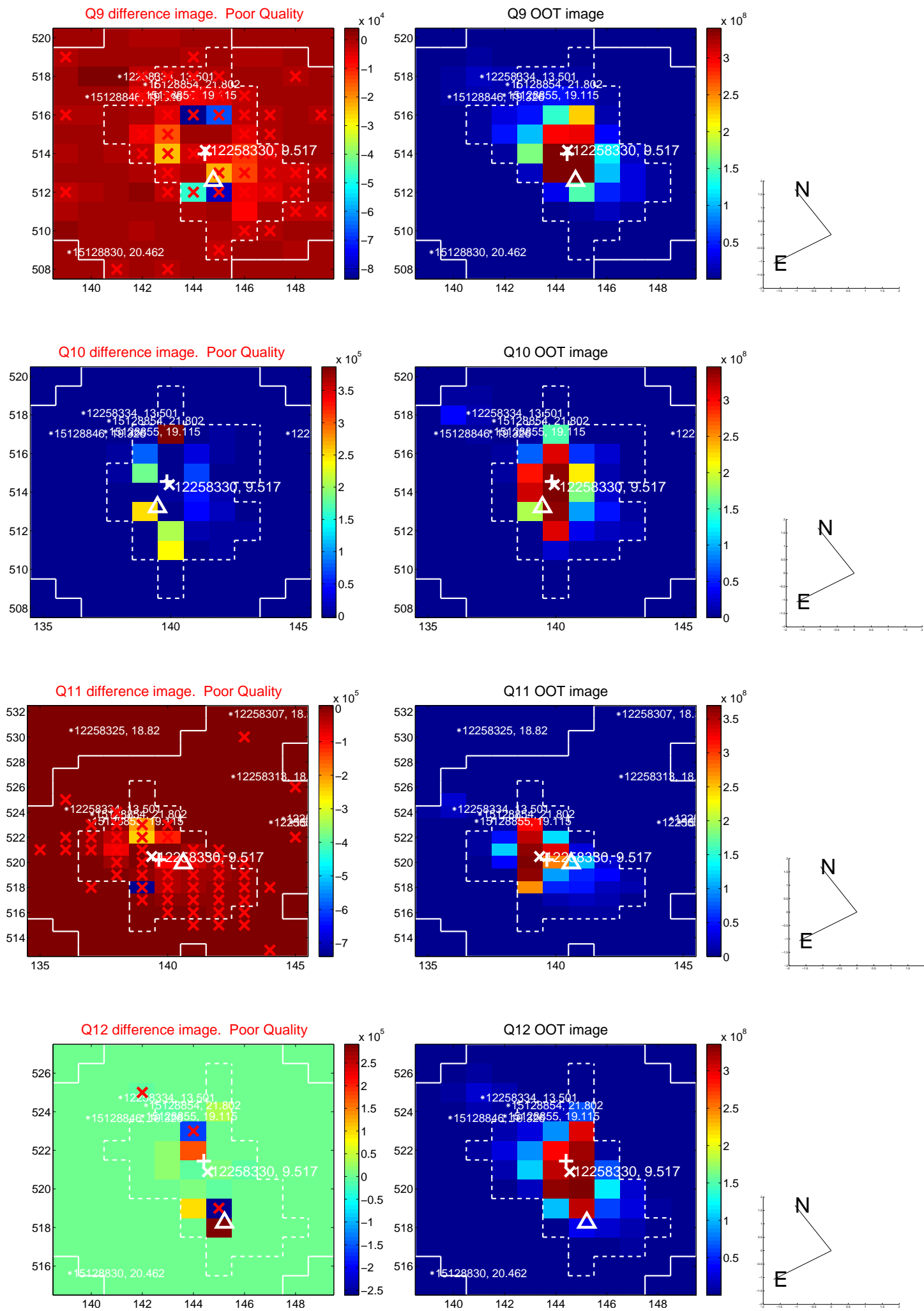
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



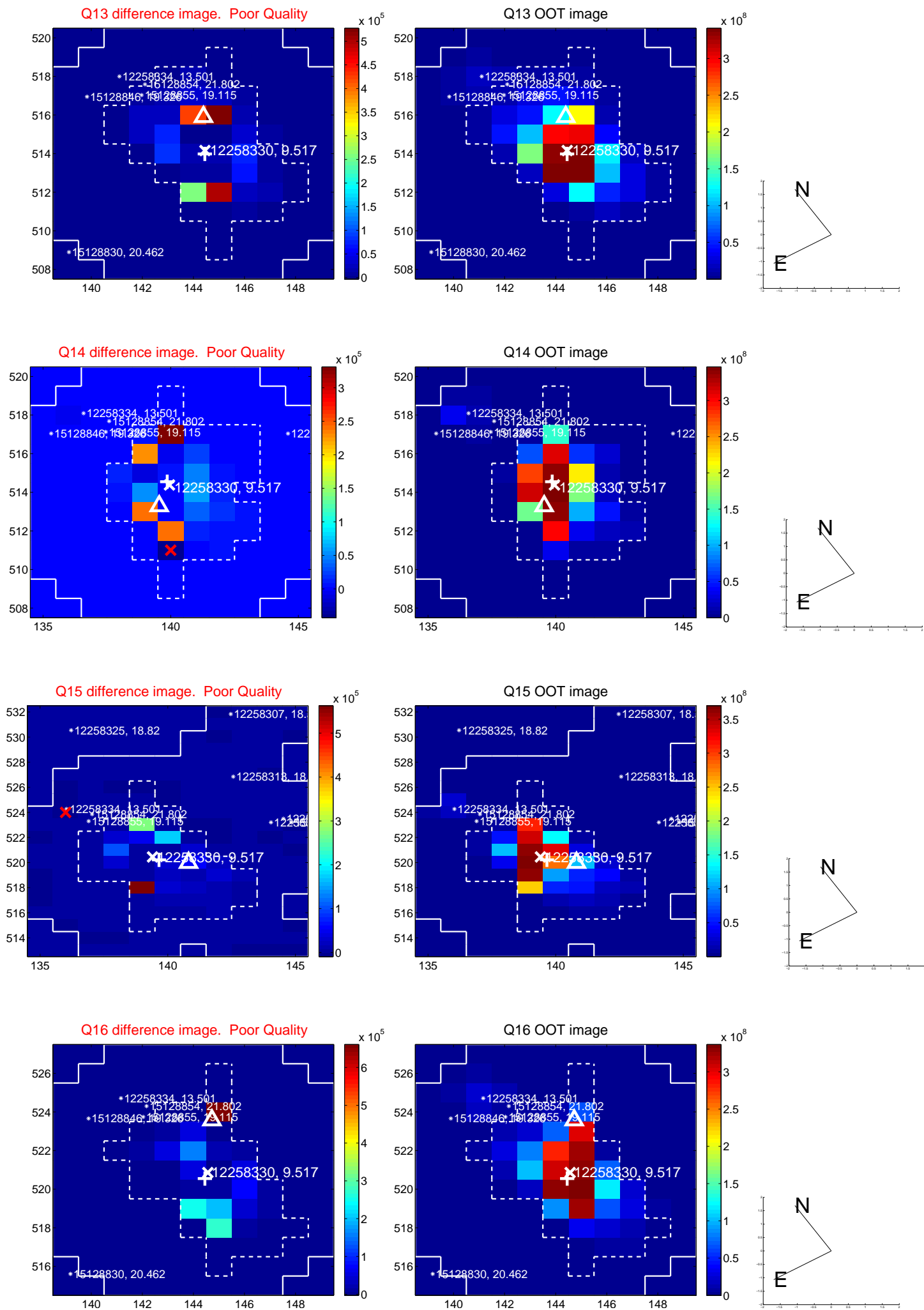
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



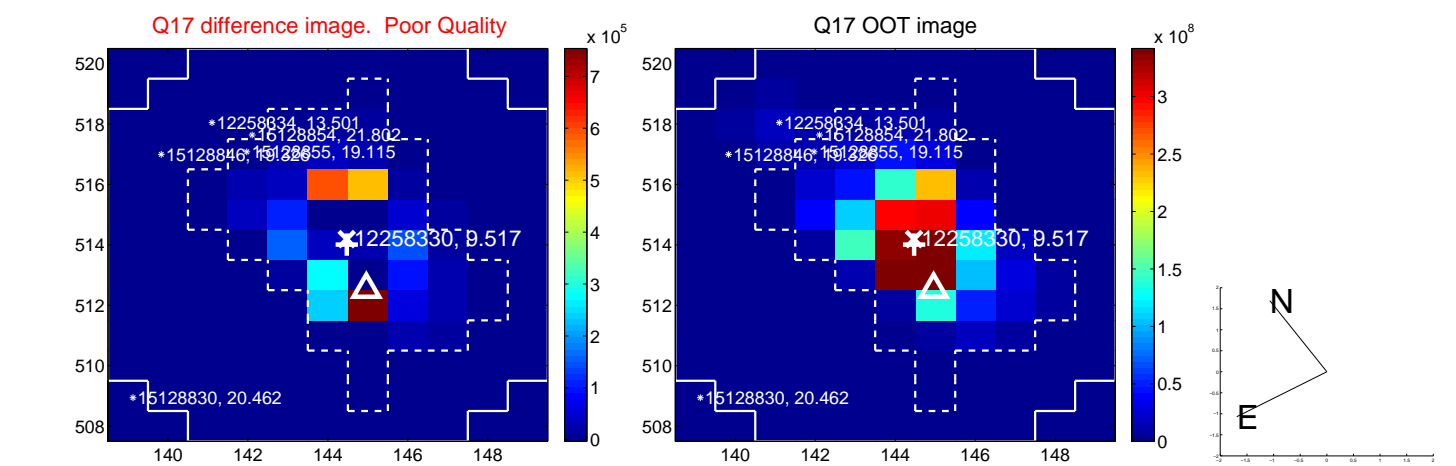
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



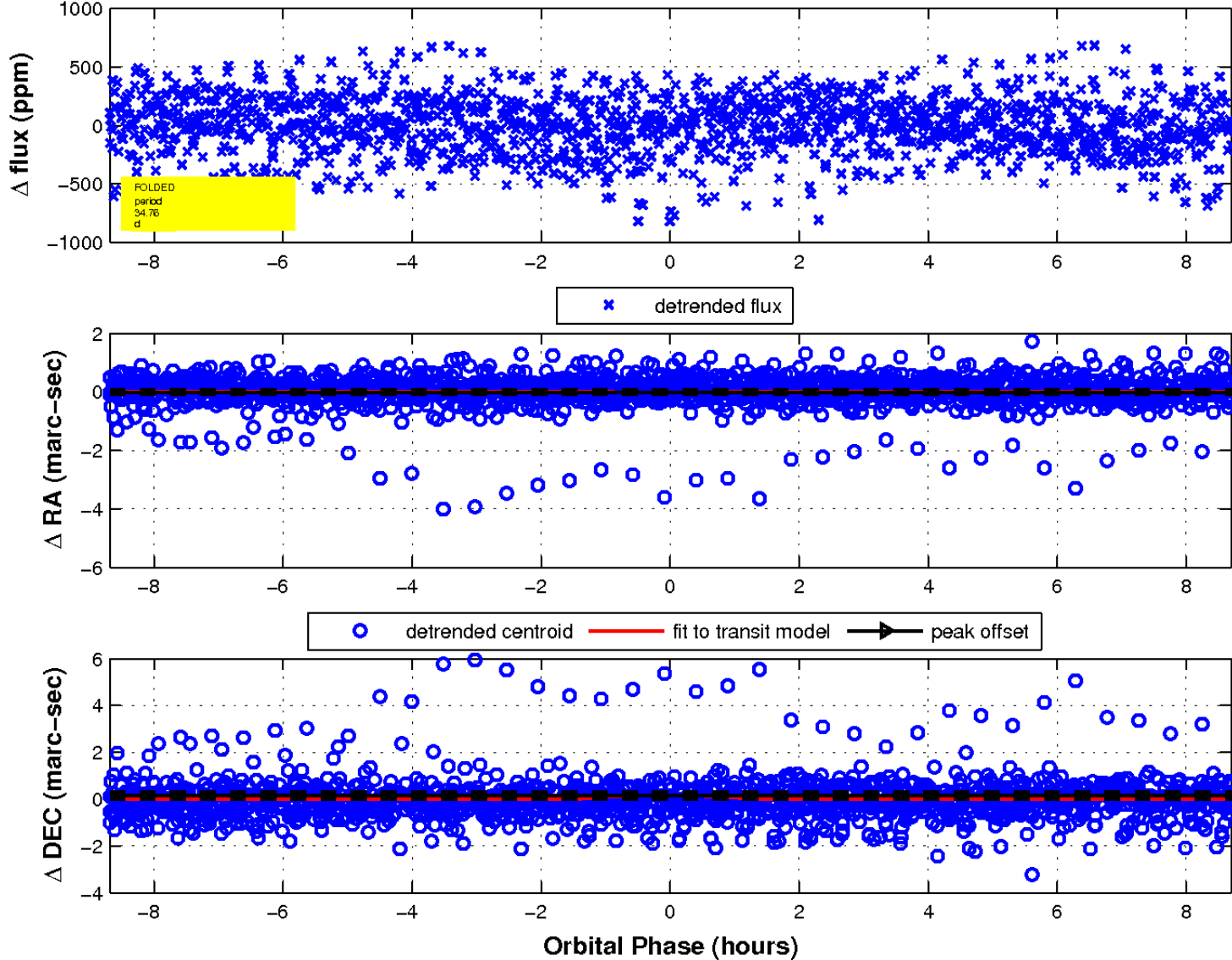
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



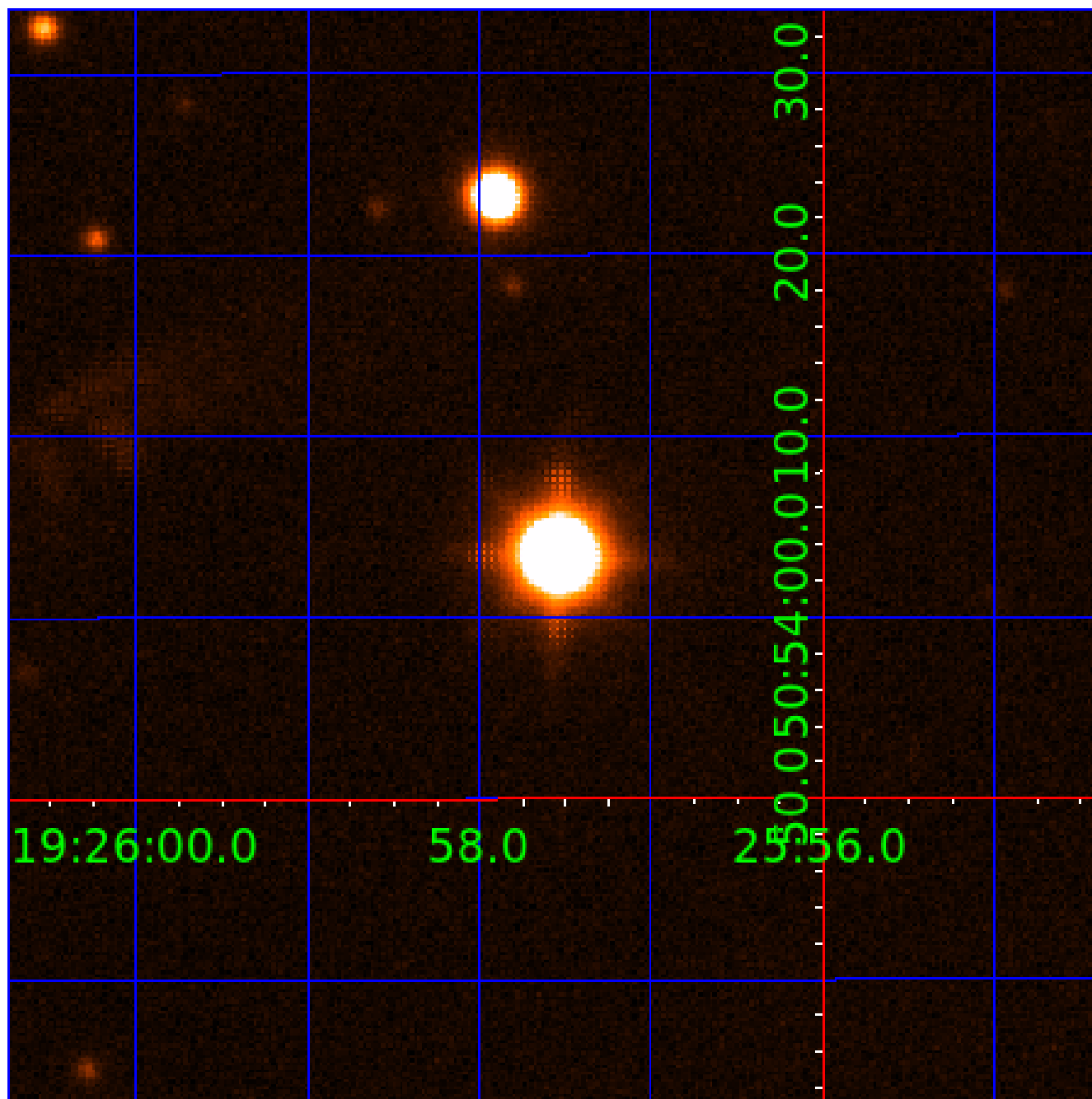
fluxWeightedCentroids, Planet 2 of 6





UKIRT Image

Declination



# KIC 012258330

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012258330-01	OBS	No	0.560562	131.936057	10.0	3.719	7.7	7.1	3.52	13203	1.20	870195.78
012258330-02	OBS	No	34.763995	140.622865	378.7	2.902	13.3	11.0	3.52	13203	8.32	3544.94
012258330-03	OBS	No	37.002616	150.599033	43.4	1.486	10.6	2.3	3.52	13203	2.45	3261.91
012258330-04	OBS	No	37.768097	151.711678	291.1	1.005	10.3	7.2	3.52	13203	6.26	3174.06
012258330-05	OBS	No	11.750989	140.282150	222.5	2.539	9.3	12.4	3.52	13203	9.35	15055.07
012258330-06	OBS	No	34.743135	139.521782	280.0	2.754	9.0	9.0	3.52	13203	6.68	3547.78

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258330-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
012258330-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

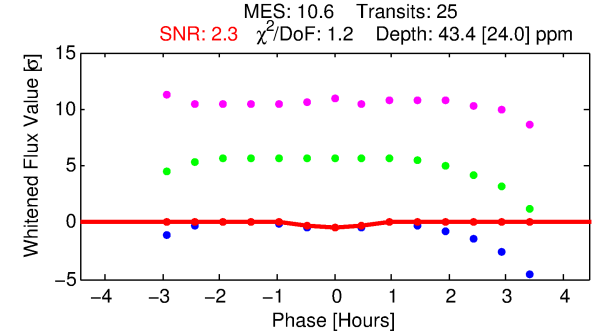
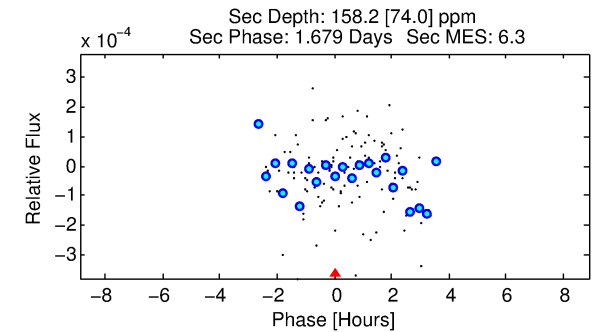
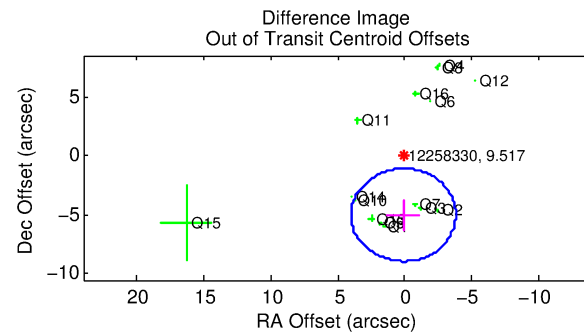
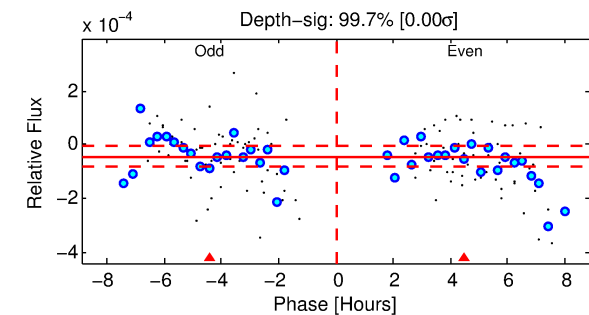
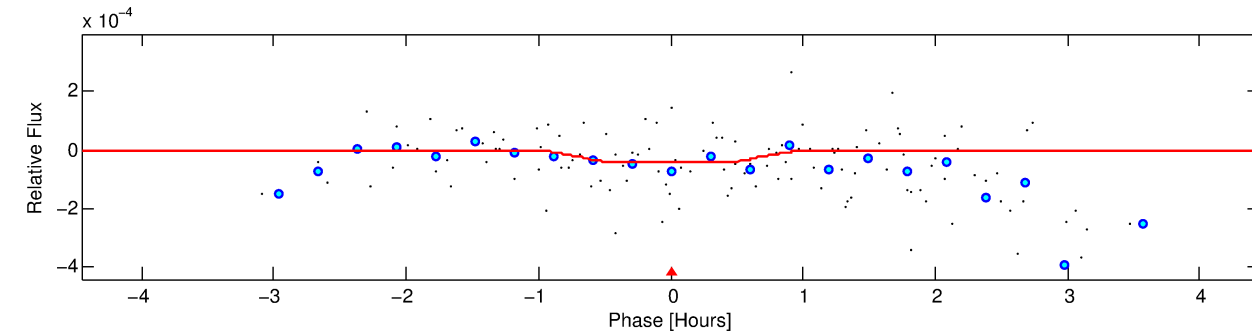
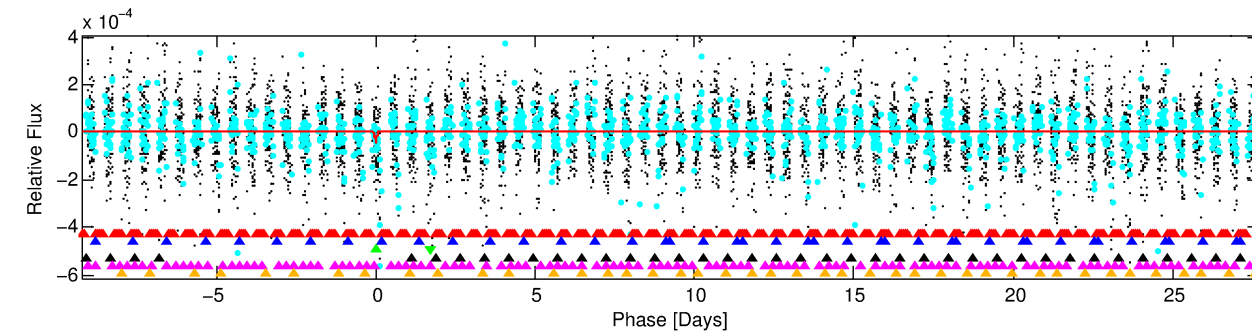
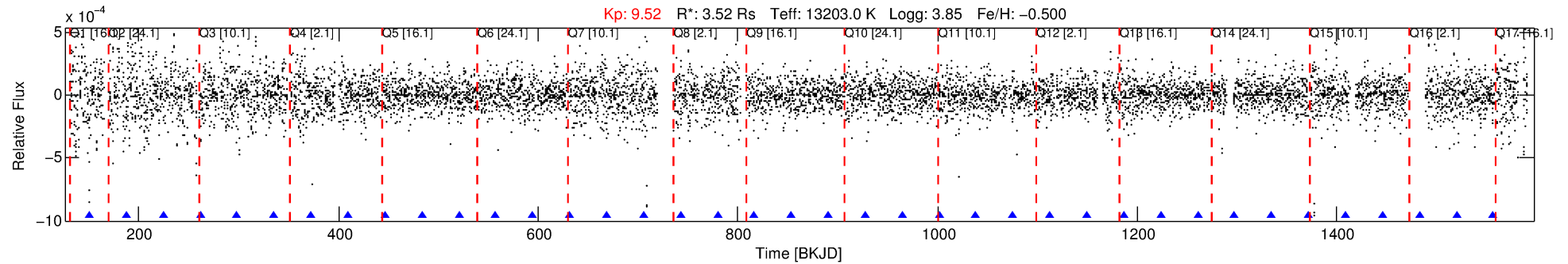
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 012258330-03

No Significant Match Found

# DV One-Page Summary

KIC: 12258330 Candidate: 3 of 6 Period: 37.003 d



## DV Fit Results:

Period = 37.00262 [0.00118] d  
Epoch = 150.5990 [0.0275] BKJD  
Rp/R\* = 0.0064 [0.0050]  
a/R\* = 167.13 [1093.92]  
b = 0.49 [10.10]  
Seff = 3261.91 [2914.08]  
Teq = 1927 [430] K  
Rp = 2.45 [2.20] Re  
a = 0.3214 [0.1348] AU  
Ag = 1499.38 [2673.53] [0.56σ]  
Teffp = 18540 [8108] K [2.05σ]

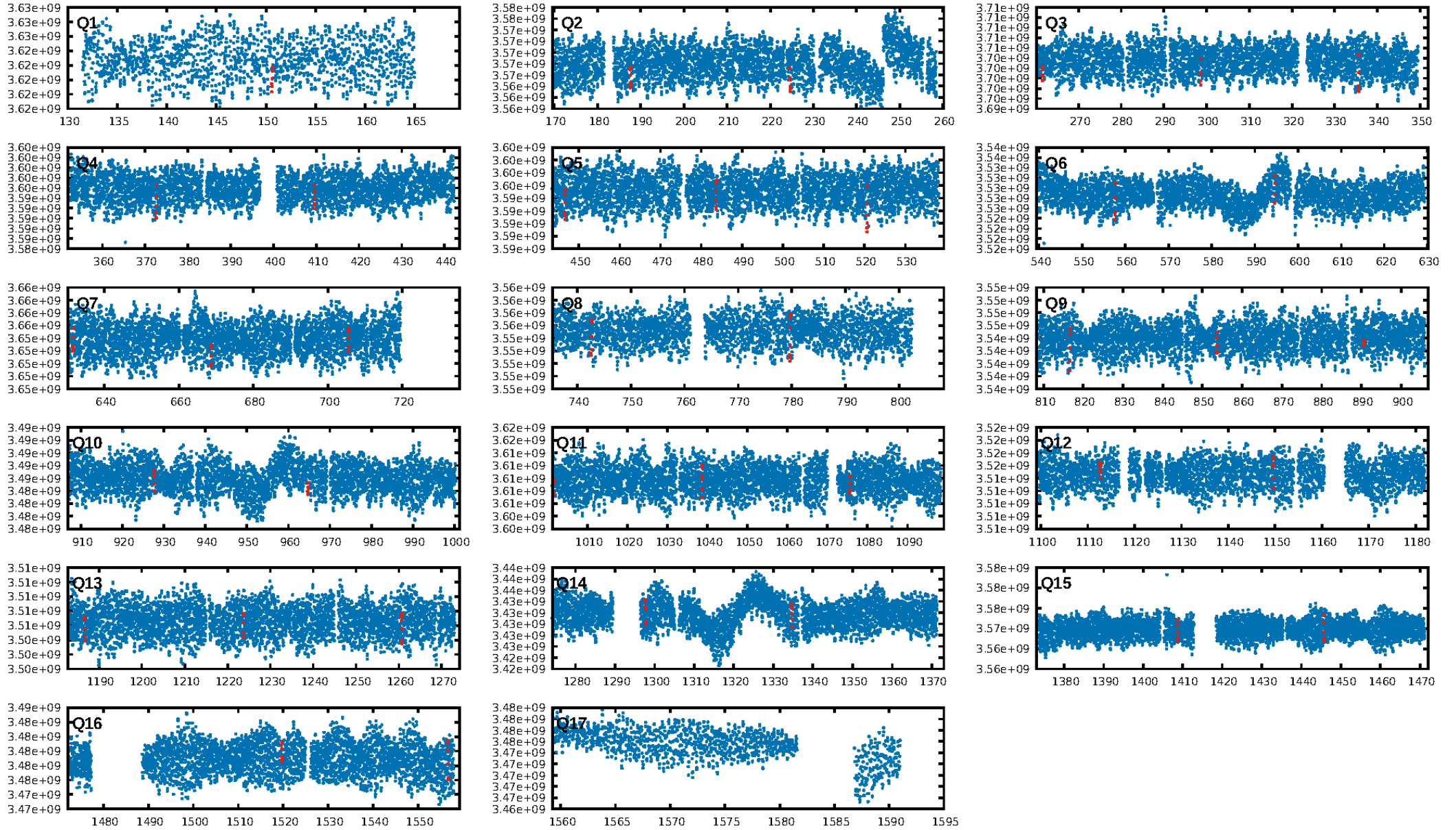
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [16.48σ]  
LongPeriod-sig: 100.0% [10.24σ]  
ModelChiSquare2-sig: 5.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.15e-16  
RollingBand-fgt: 1.00 [25/25]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 19.0%  
Centroid-so: 2.949 arcsec [1.05σ]  
OotOffset-rm: 5.007 arcsec [3.84σ]  
KicOffset-rm: 5.489 arcsec [3.67σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.00 [0/16]  
DiffImageOverlap-fno: 0.00 [0/16]

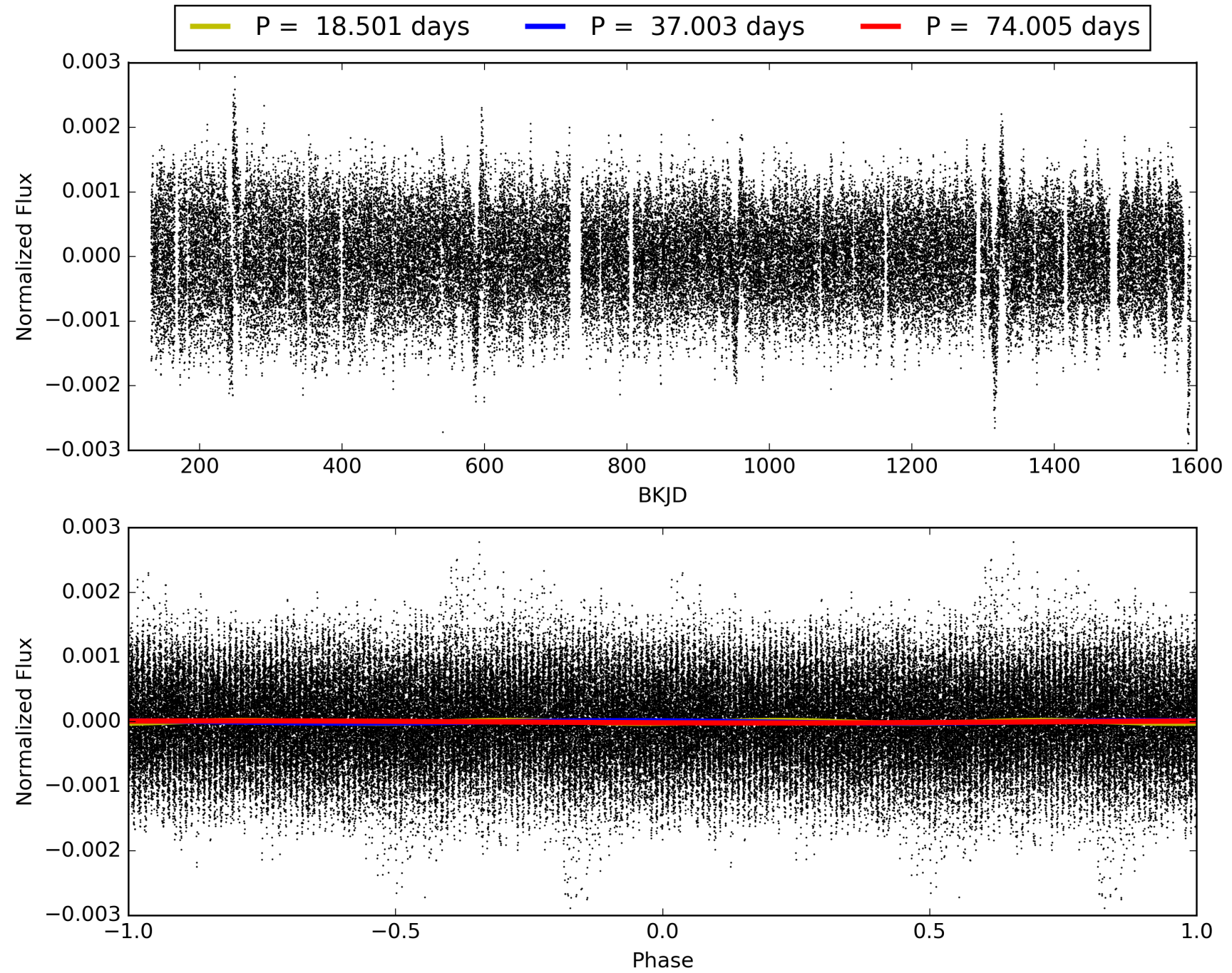
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:14:14 Z

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

# TCE 012258330-03, PDC Light Curves

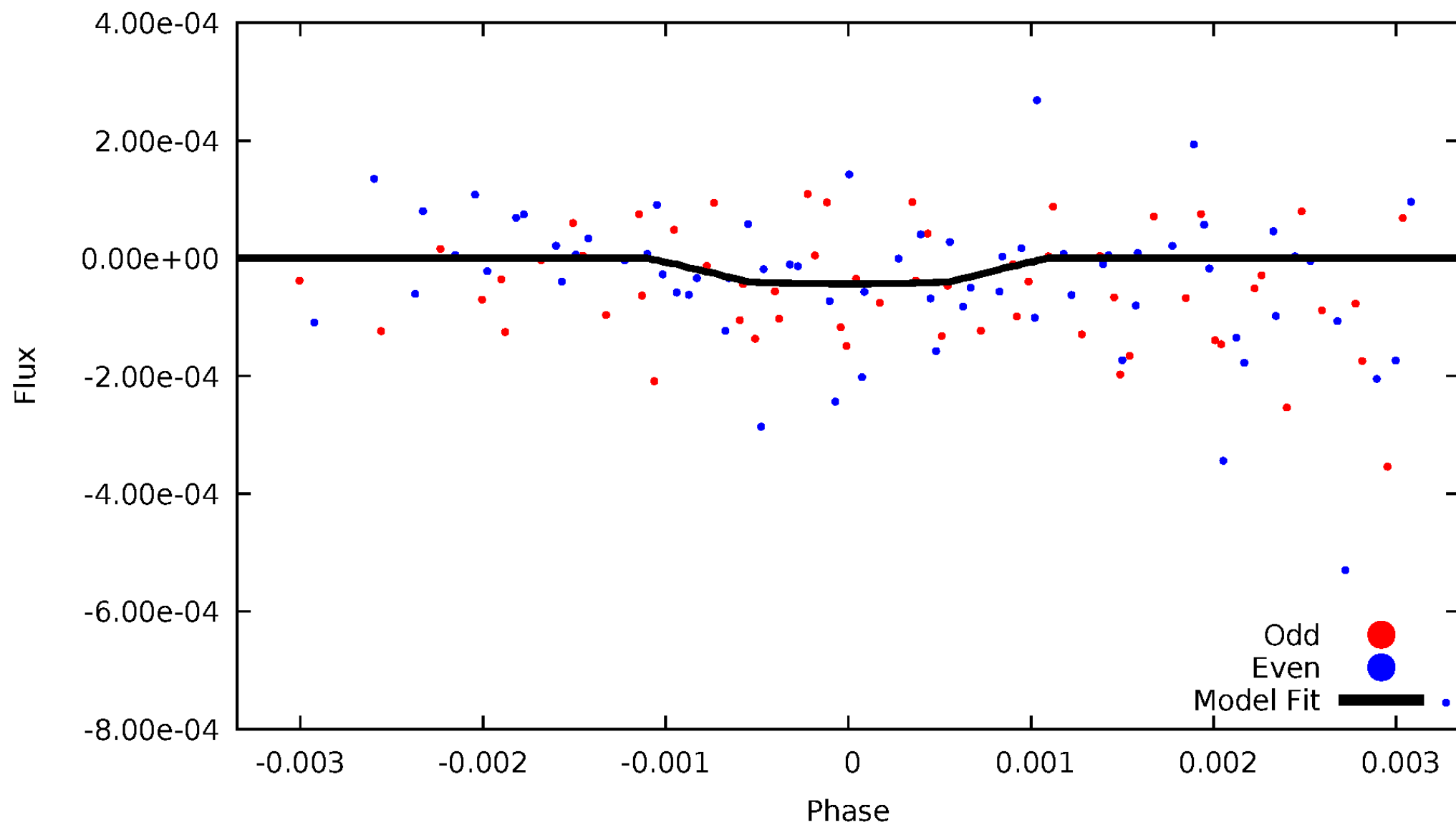


TCE 012258330-03



# DV Odd/Even

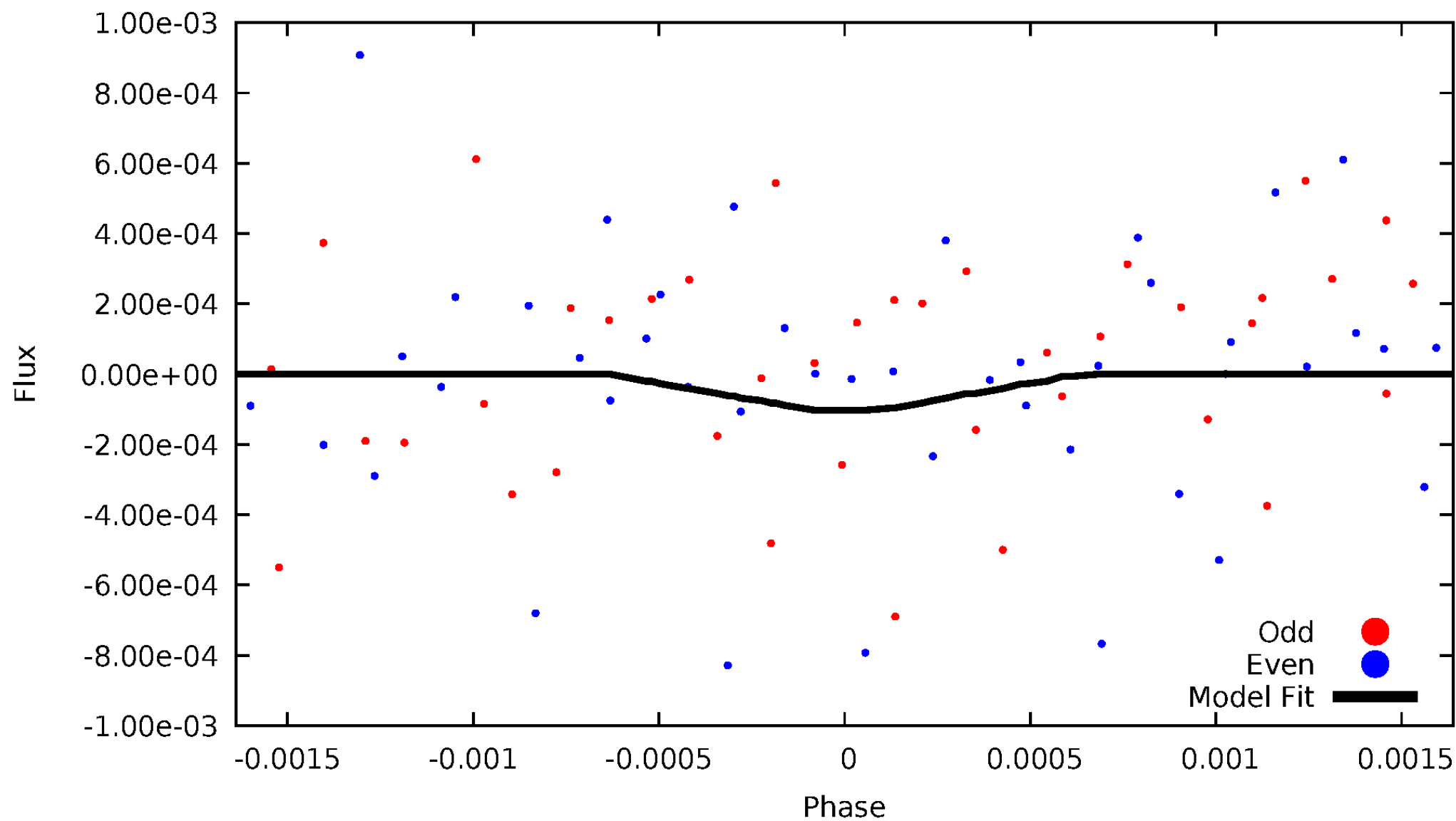
TCE 012258330-03





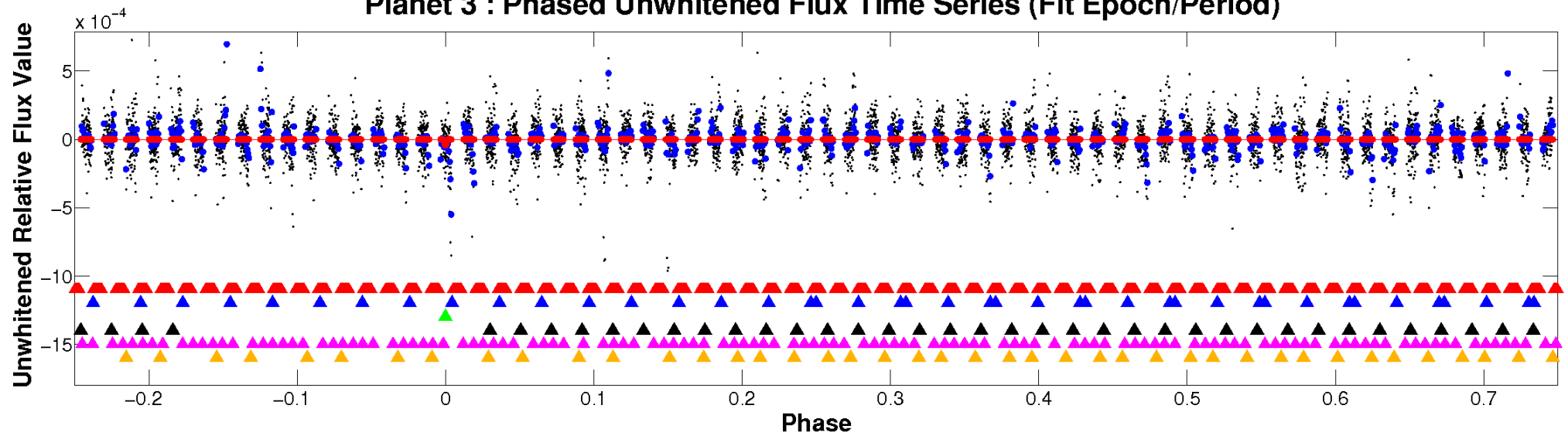
# ALT Odd/Even

TCE 012258330-03

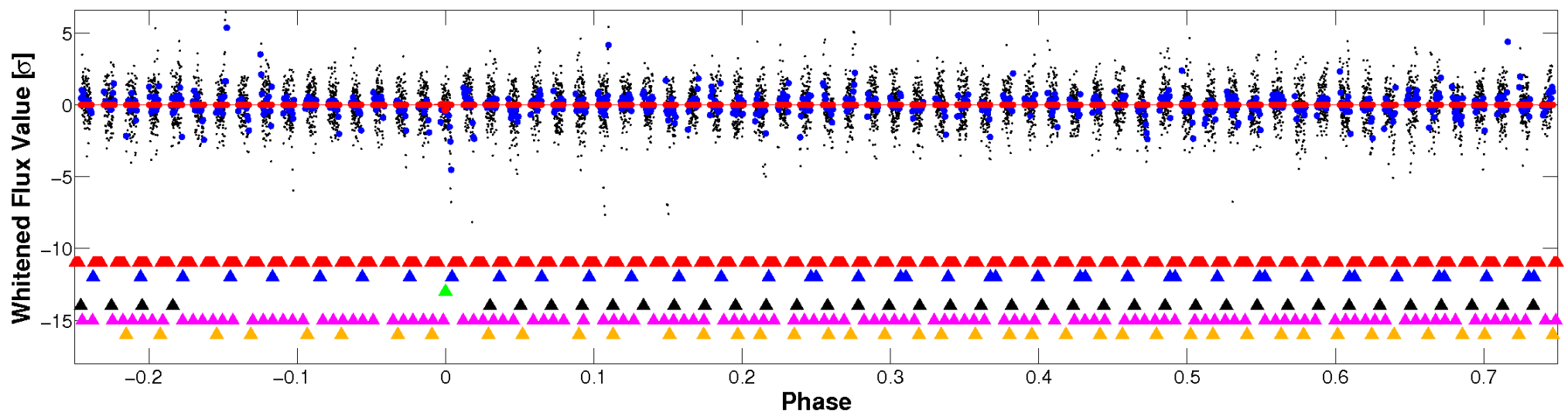


# Non-Whitened Vs. Whitened Light Curve

**Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)**

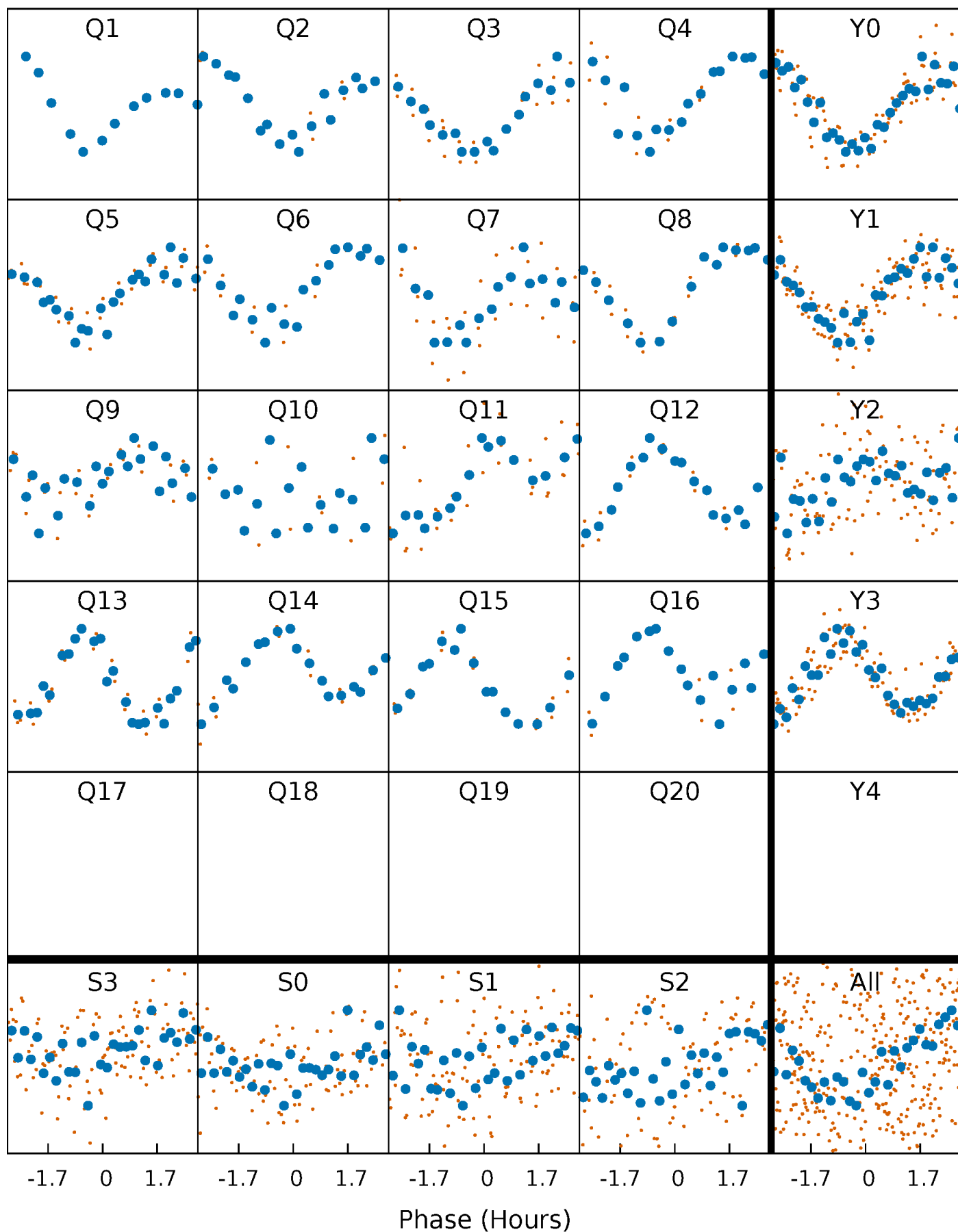


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



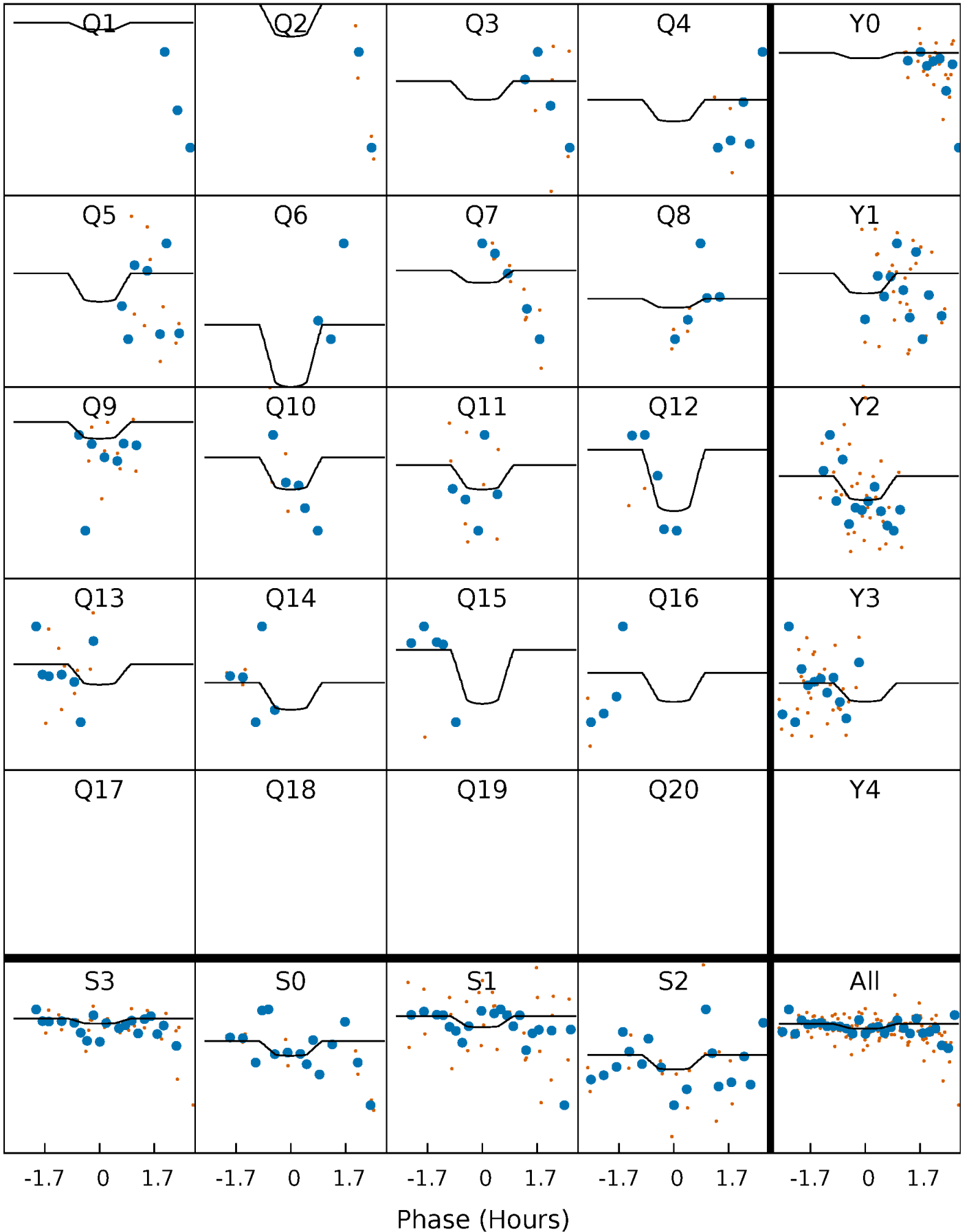
# PDC Quarter-Phased Transit Curves

TCE 012258330-03   P= 37.002616 Days    $T_0=150.599033$  (BKJD)



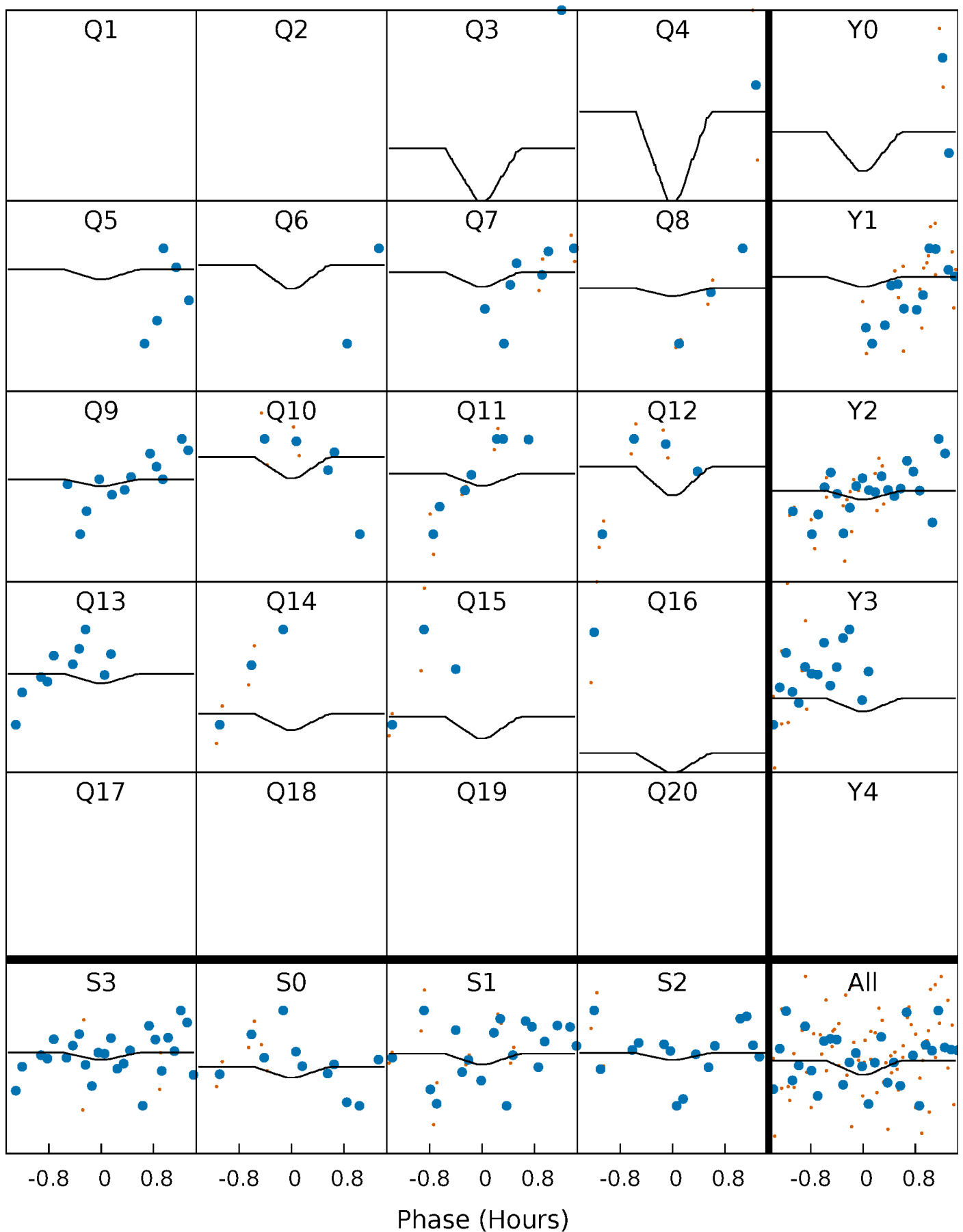
# DV Quarter-Phased Transit Curves

TCE 012258330-03   P= 37.002616 Days    $T_0=150.599033$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

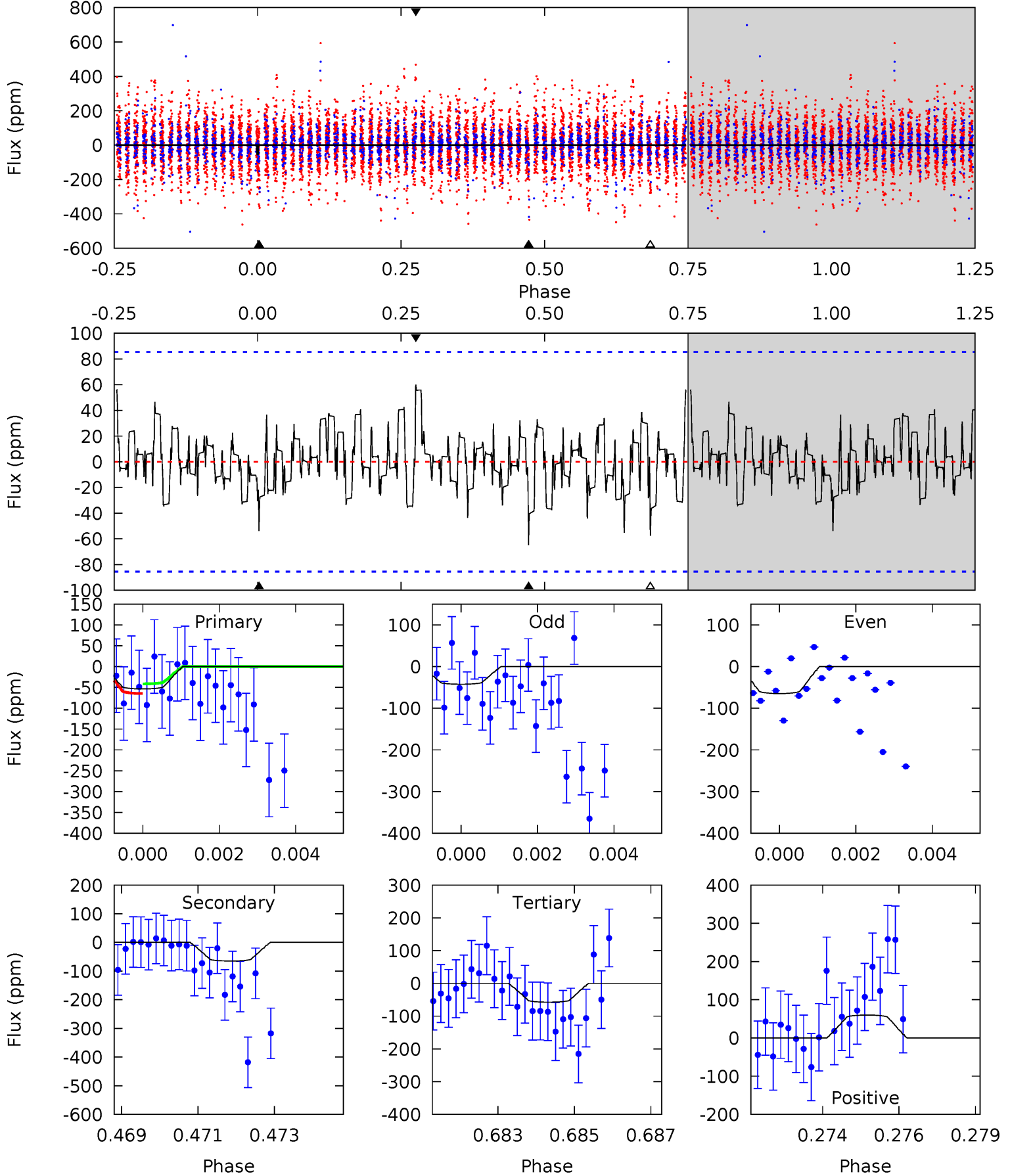
TCE 012258330-03 P= 37.001966 Days  $T_0=150.604698$  (BKJD)



# DV Model-Shift Uniqueness Test

012258330-03,  $P = 37.002616$  Days,  $E = 113.596417$  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
3.34	4.04	3.57	3.74	5.32	3.08	1.02	-0.23	-0.40	0.46	0.30	0.70	1.00	0.48	0.73

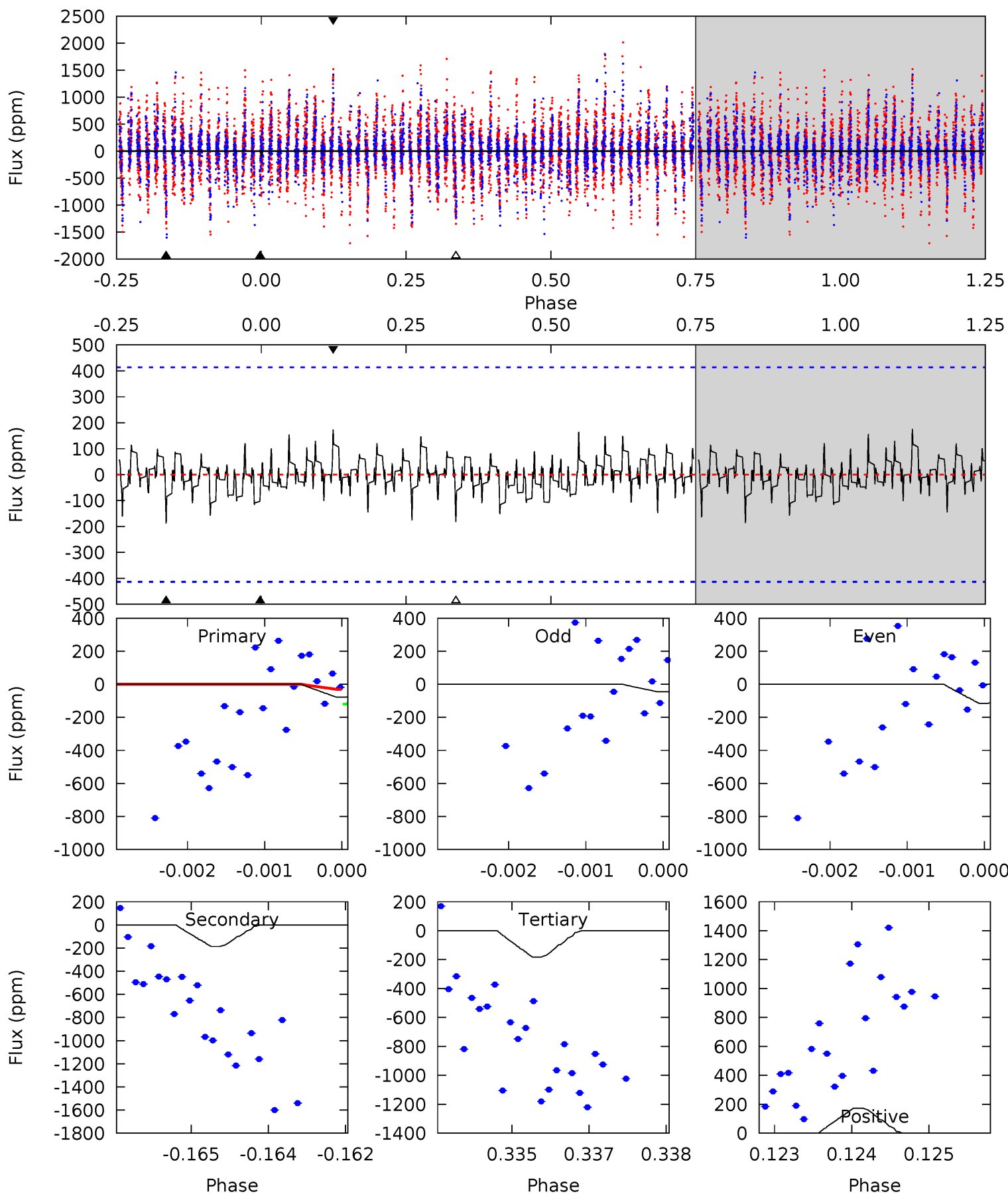




# Alt Model-Shift Uniqueness Test

012258330-03, P = 37.001966 Days, E = 113.602732 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
1.03	2.44	2.38	2.27	5.42	3.24	0.65	-1.36	-1.24	0.05	0.17	0.46	-9.64	0.48	0.59



### Stellar Parameters For KIC 012258330

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$13203^{+480}_{-1923}$	$3.855^{+0.400}_{-0.100}$	$-0.500^{+0.600}_{-0.050}$	$3.518^{+0.402}_{-1.508}$	$3.230^{+0.098}_{-0.880}$	$0.104^{+0.351}_{-0.032}$
	+4%/-15%	+10%/-3%	+120%/-10%	+11%/-43%	+3%/-27%	+336%/-31%
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 012258330-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-65 \pm 16$	$2.49^{+1.80}_{-1.49}$	$2524^{+271}_{-376}$	$13649^{+24982}_{-4794}$	$561^{+3059}_{-372}$
Alt.	$-186 \pm 76$	$3.58^{+2.00}_{-1.80}$	$2545^{+274}_{-397}$	$16083^{+17437}_{-5559}$	$763^{+2413}_{-502}$

$T_{max}$  = 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

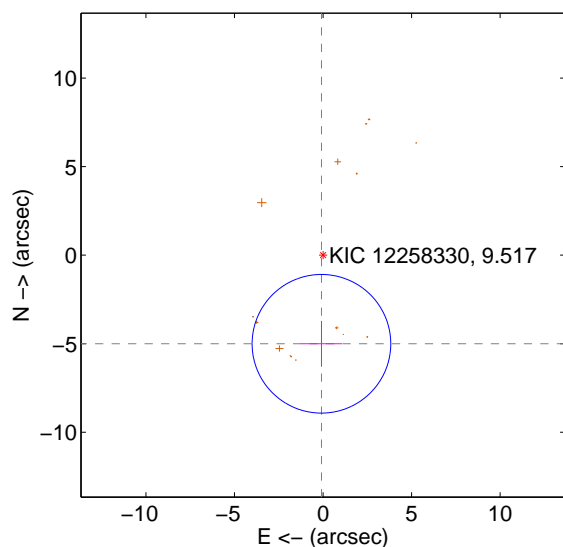
Supplemental centroid analysis for 012258330-03. **Kepler magnitude: 9.52.** Transit SNR 2.32

**There are 0 quarters with good PRF difference image offsets**

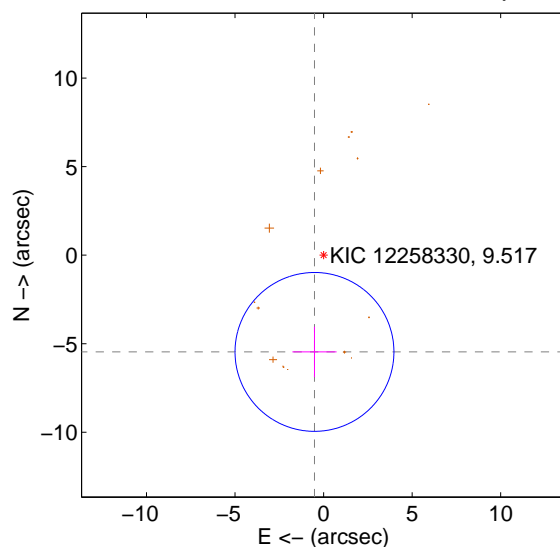
The direct PRF centroid is offset from the target star catalog position by about 1.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>5.007 \pm 1.305</math></b>	<b>3.84</b>	$0.090 \pm 1.160$	$-5.006 \pm 1.296$
PRF-fit source offset from KIC position	<b><math>5.489 \pm 1.496</math></b>	<b>3.67</b>	$0.515 \pm 1.249$	$-5.465 \pm 1.426$
photometric centroid source offset	$2.95 \pm 2.81$	1.05	$-1.54 \pm 1.68$	$-2.52 \pm 3.13$

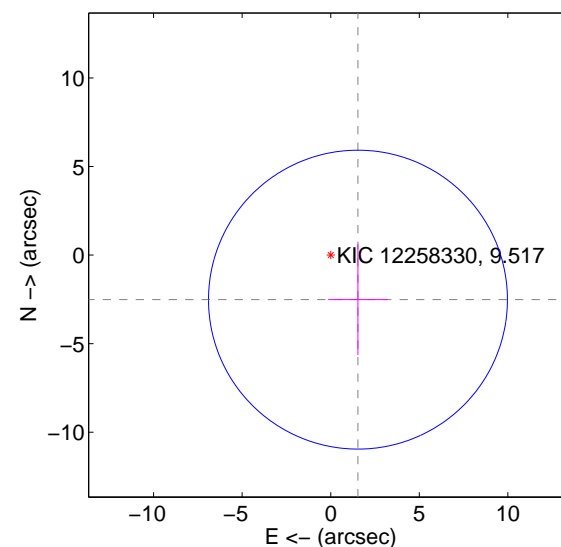
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

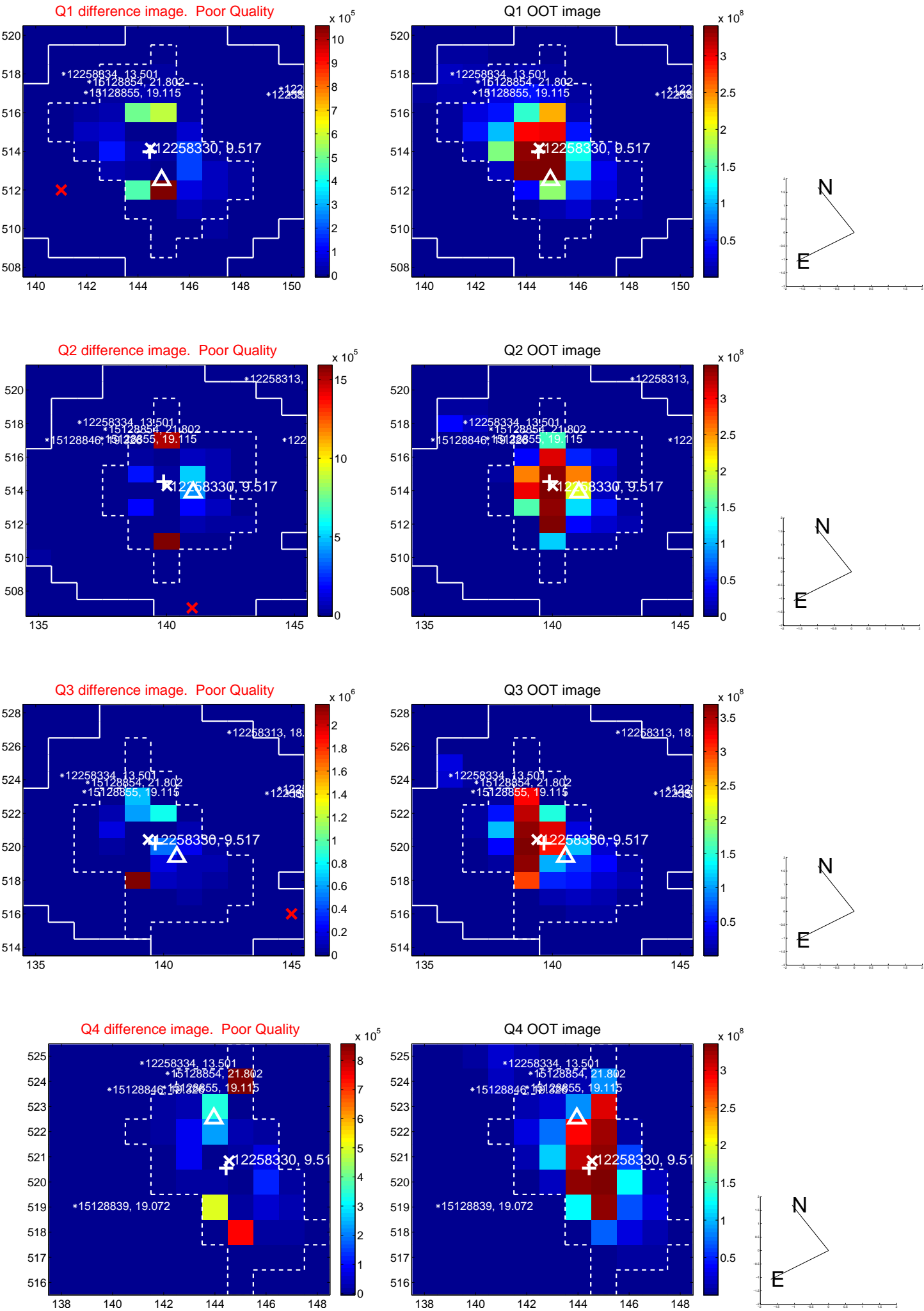


offset from photometric centroids

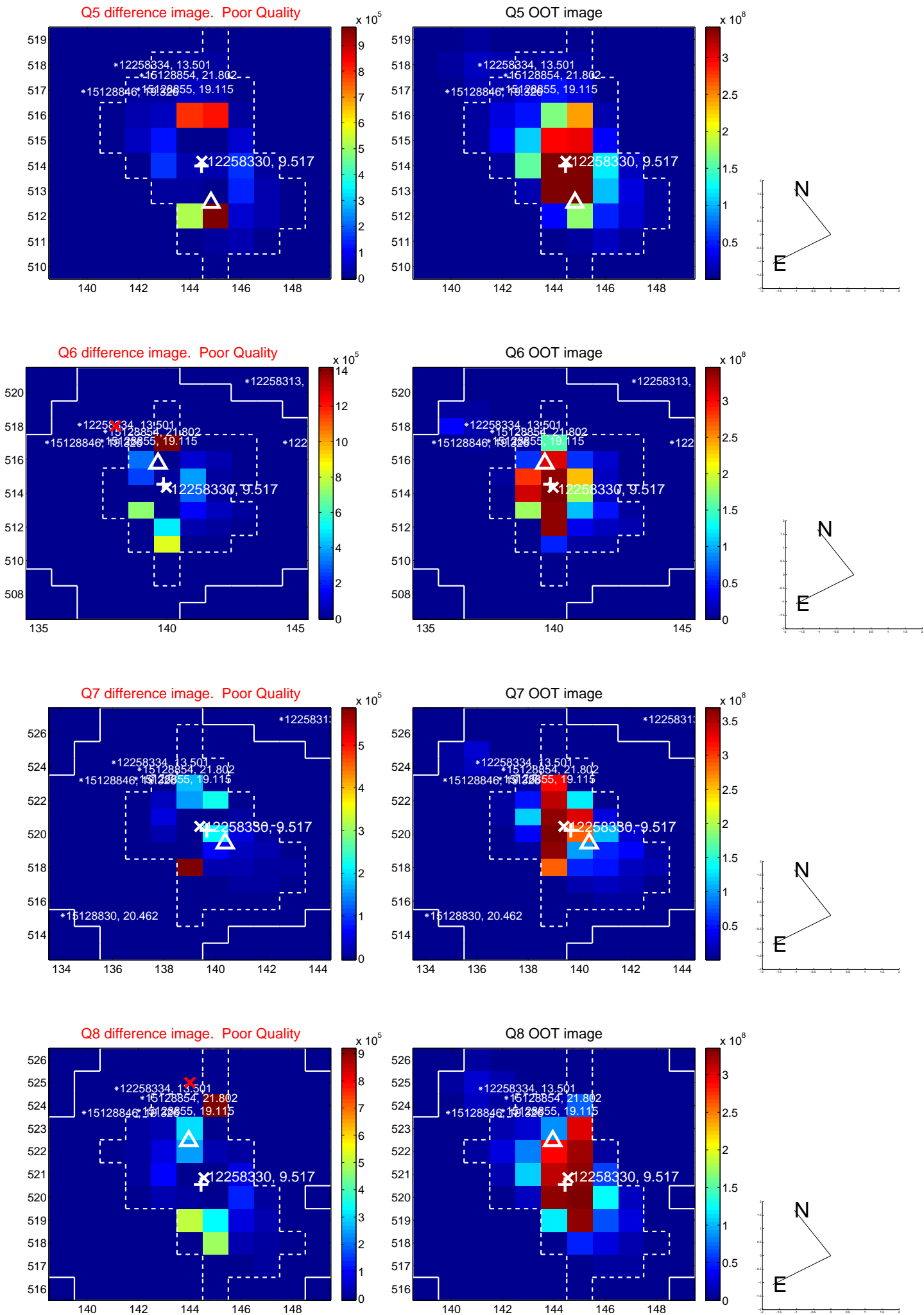


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

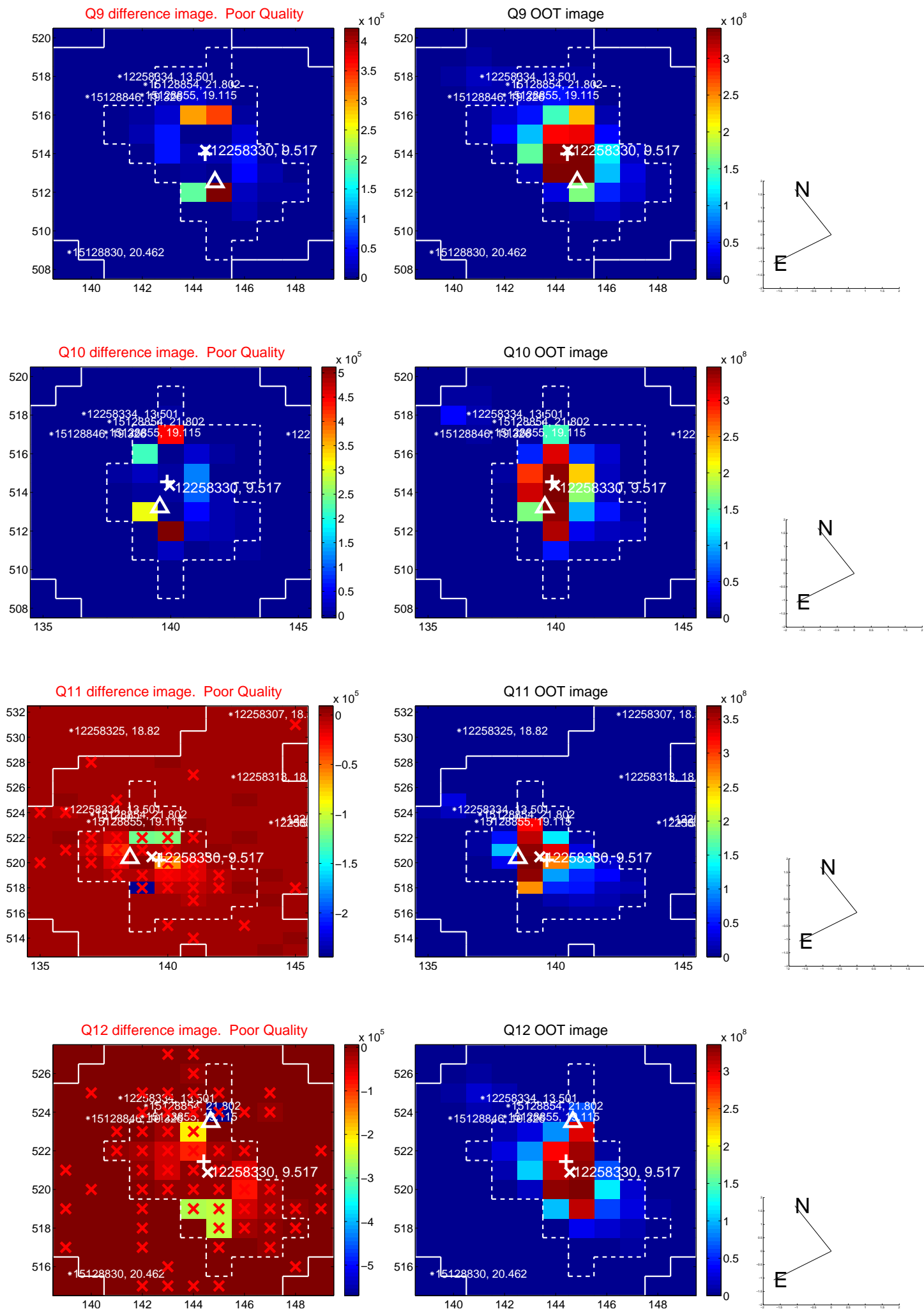
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

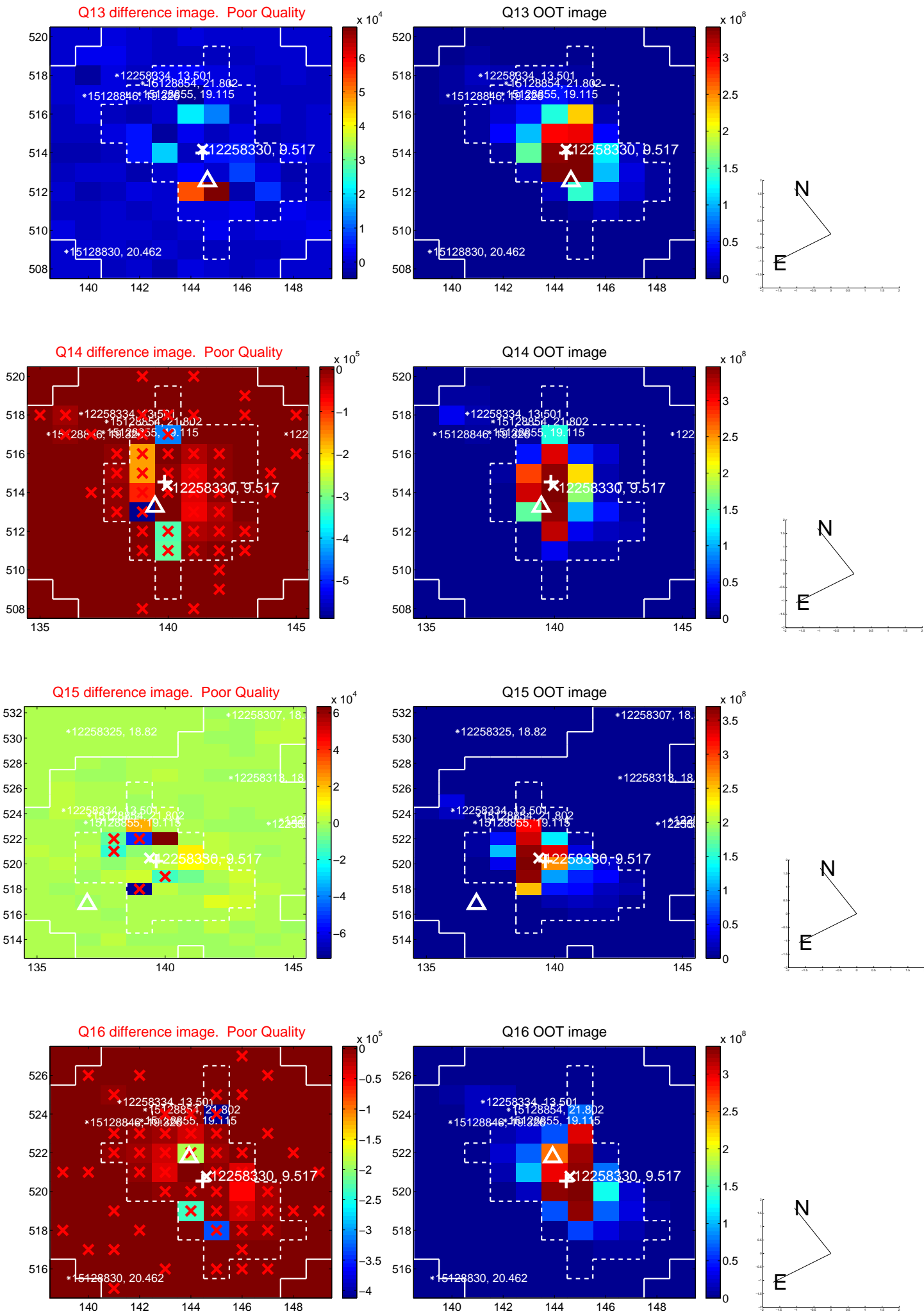


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

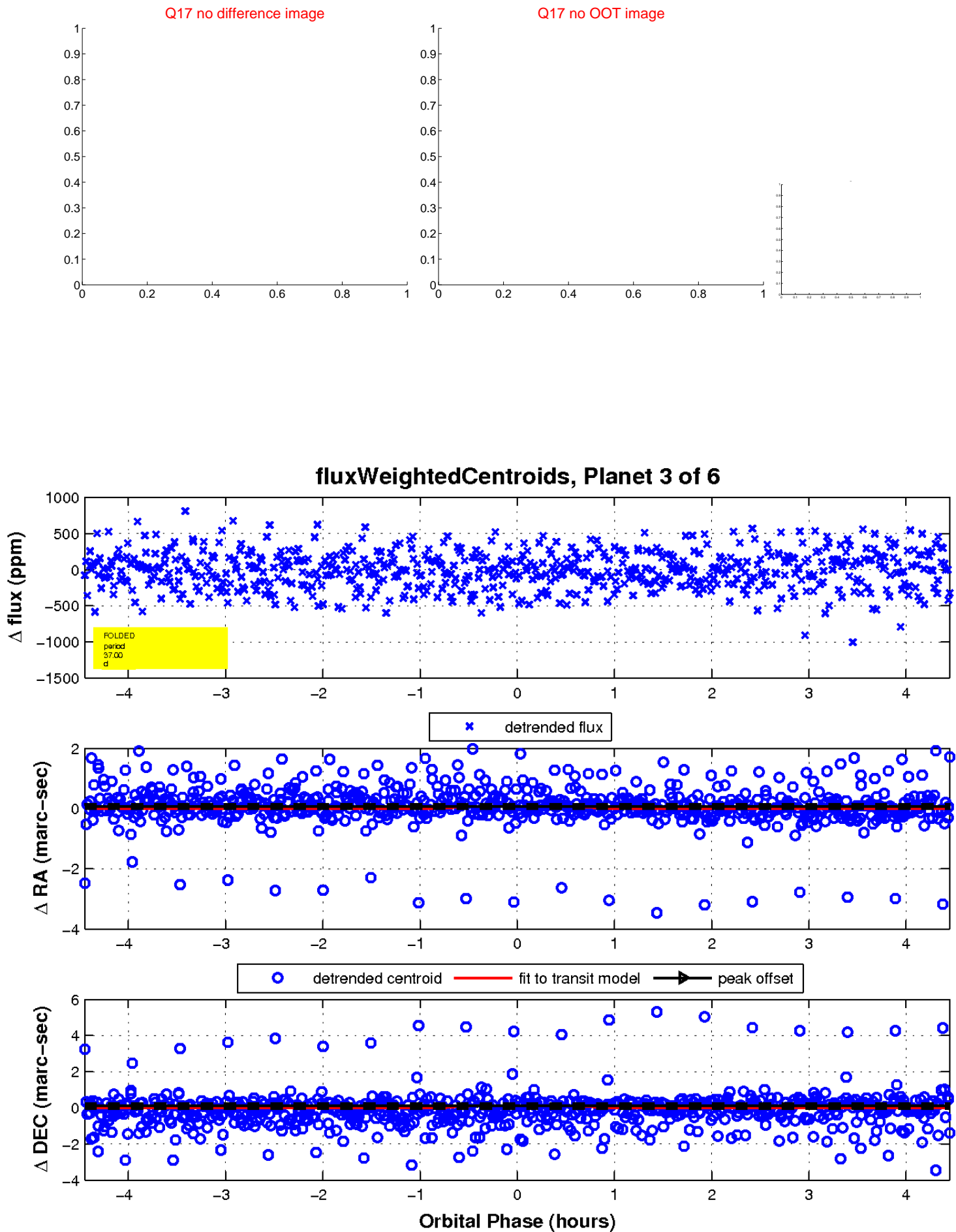




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

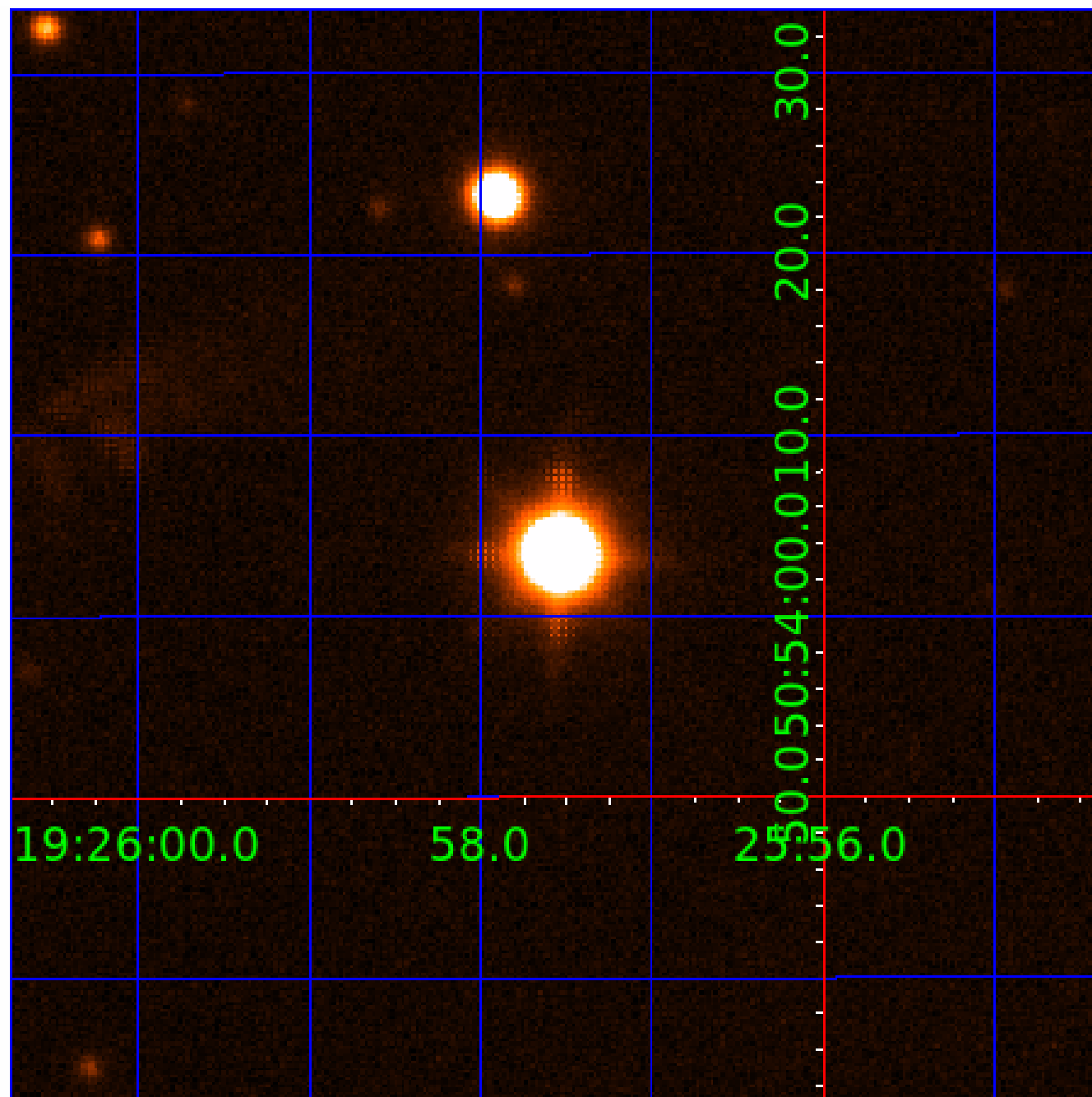


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 012258330

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012258330-01	OBS	No	0.560562	131.936057	10.0	3.719	7.7	7.1	3.52	13203	1.20	870195.78
012258330-02	OBS	No	34.763995	140.622865	378.7	2.902	13.3	11.0	3.52	13203	8.32	3544.94
012258330-03	OBS	No	37.002616	150.599033	43.4	1.486	10.6	2.3	3.52	13203	2.45	3261.91
012258330-04	OBS	No	37.768097	151.711678	291.1	1.005	10.3	7.2	3.52	13203	6.26	3174.06
012258330-05	OBS	No	11.750989	140.282150	222.5	2.539	9.3	12.4	3.52	13203	9.35	15055.07
012258330-06	OBS	No	34.743135	139.521782	280.0	2.754	9.0	9.0	3.52	13203	6.68	3547.78

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258330-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
012258330-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

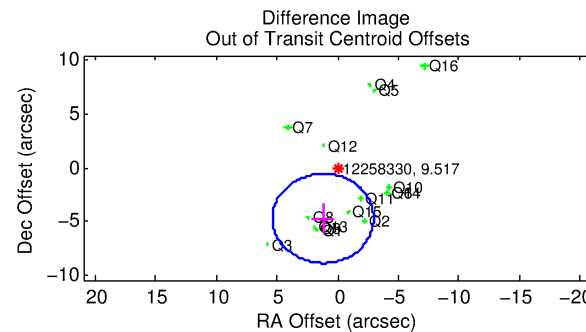
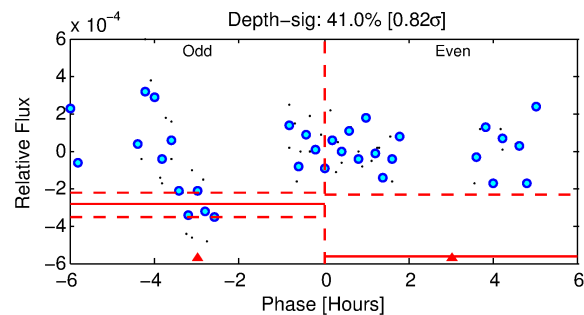
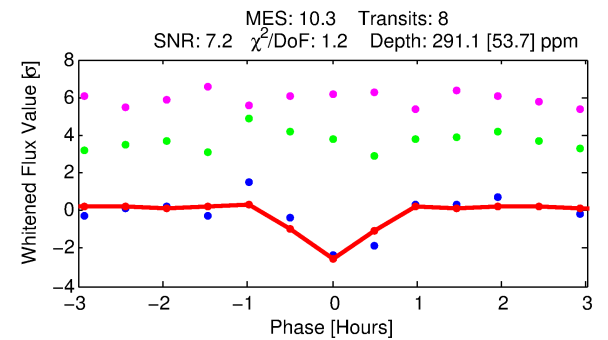
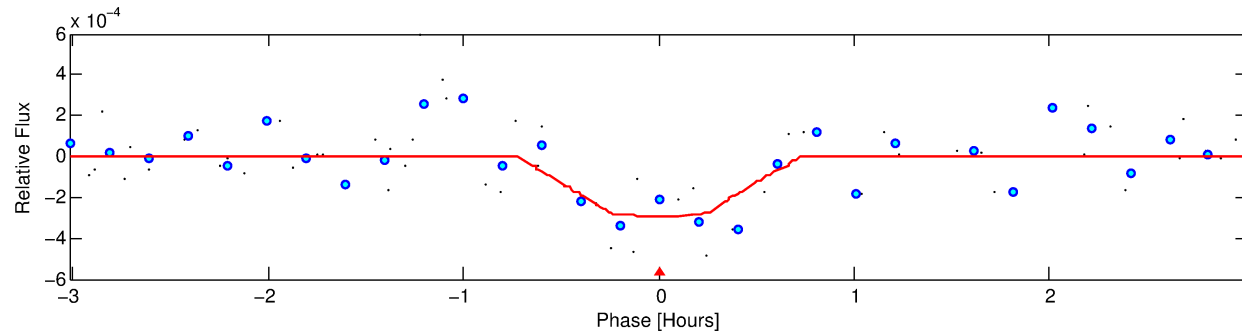
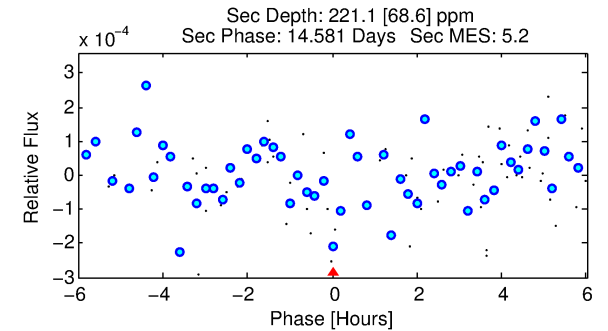
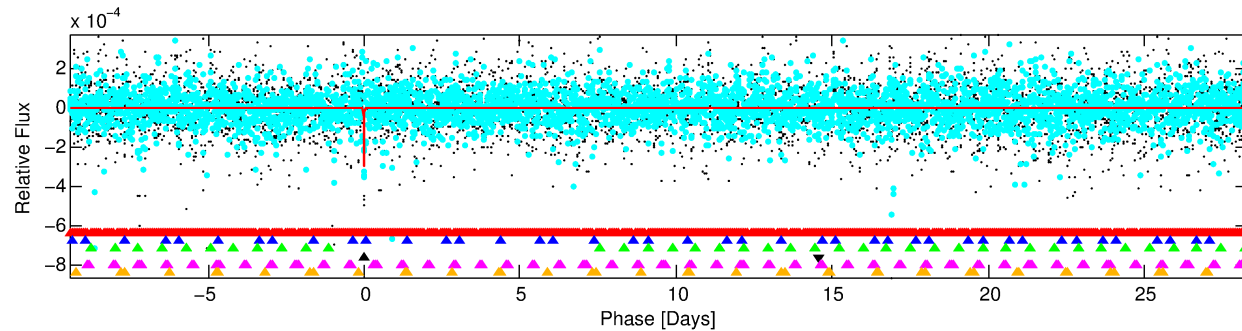
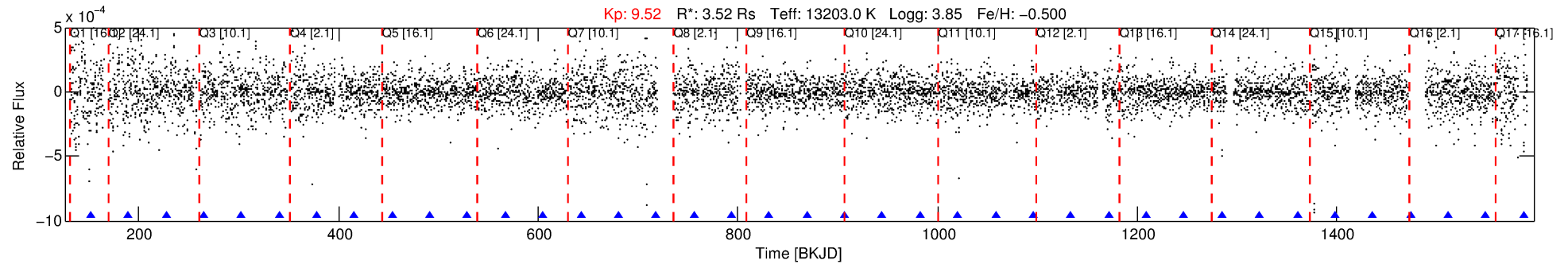
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012258330-04

No Significant Match Found

# DV One-Page Summary

KIC: 12258330 Candidate: 4 of 6 Period: 37.768 d



## DV Fit Results:

Period = 37.76810 [0.00040] d  
Epoch = 151.7117 [0.0076] BKJD  
Rp/R\* = 0.0163 [0.0147]  
a/R\* = 291.04 [2309.09]  
b = 0.07 [116.47]  
Seff = 3174.06 [2835.60]  
Teff = 1914 [427] K  
Rp = 6.26 [6.23] Re  
a = 0.3258 [0.1367] AU  
Ag = 329.20 [640.24] [0.51σ]  
Teffp = 12605 [6031] K [1.7σ]

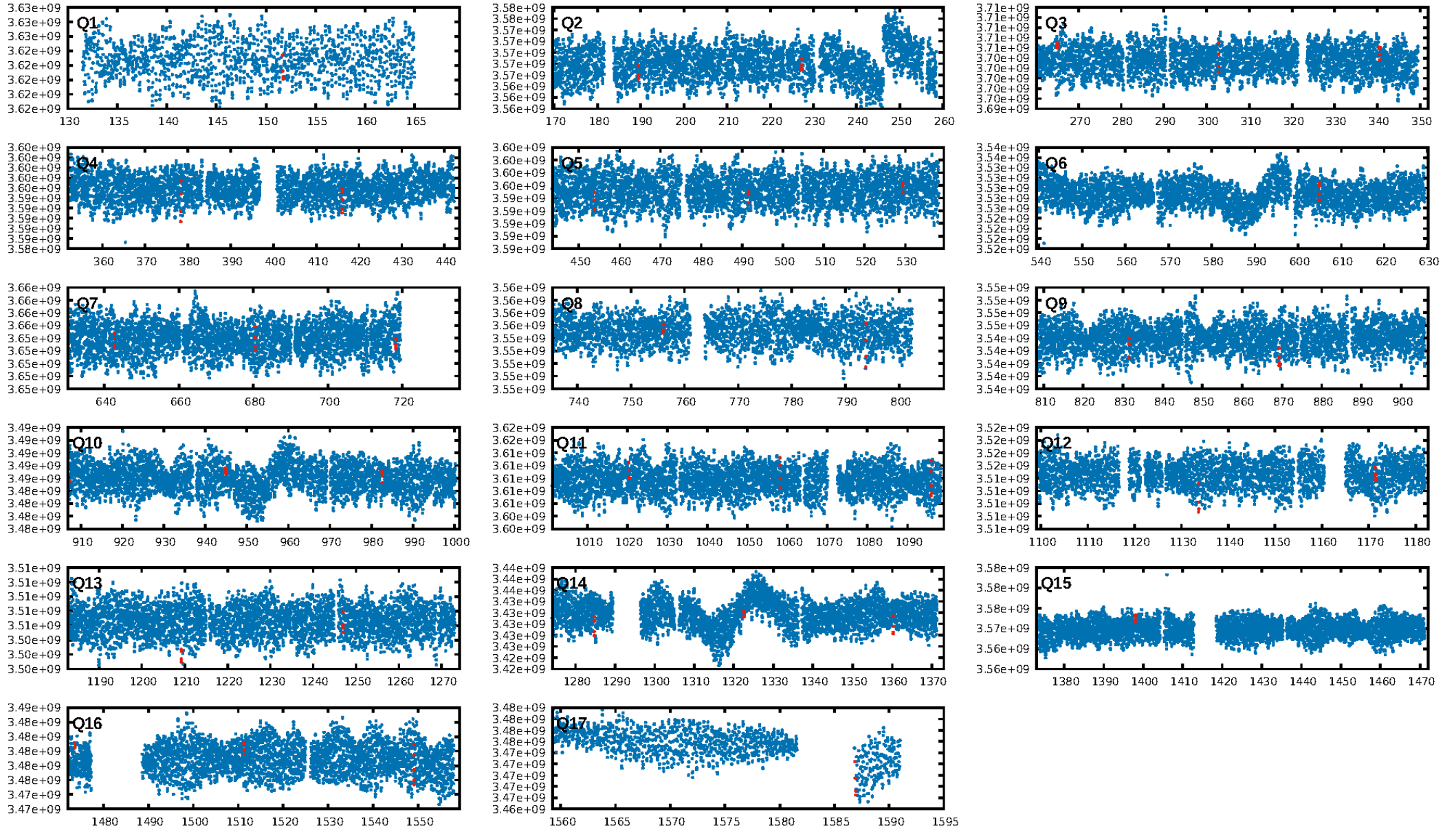
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.24σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 33.3%  
ModelChiSquareGof-sig: 85.1%  
Bootstrap-pfa: 1.01e-13  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 9.2%  
Centroid-so: 0.749 arcsec [1.52σ]  
OotOffset-rm: 4.906 arcsec [3.52σ]  
KicOffset-rm: 5.617 arcsec [4.16σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.00 [0/16]  
DiffImageOverlap-fno: 0.00 [0/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:14:17 Z

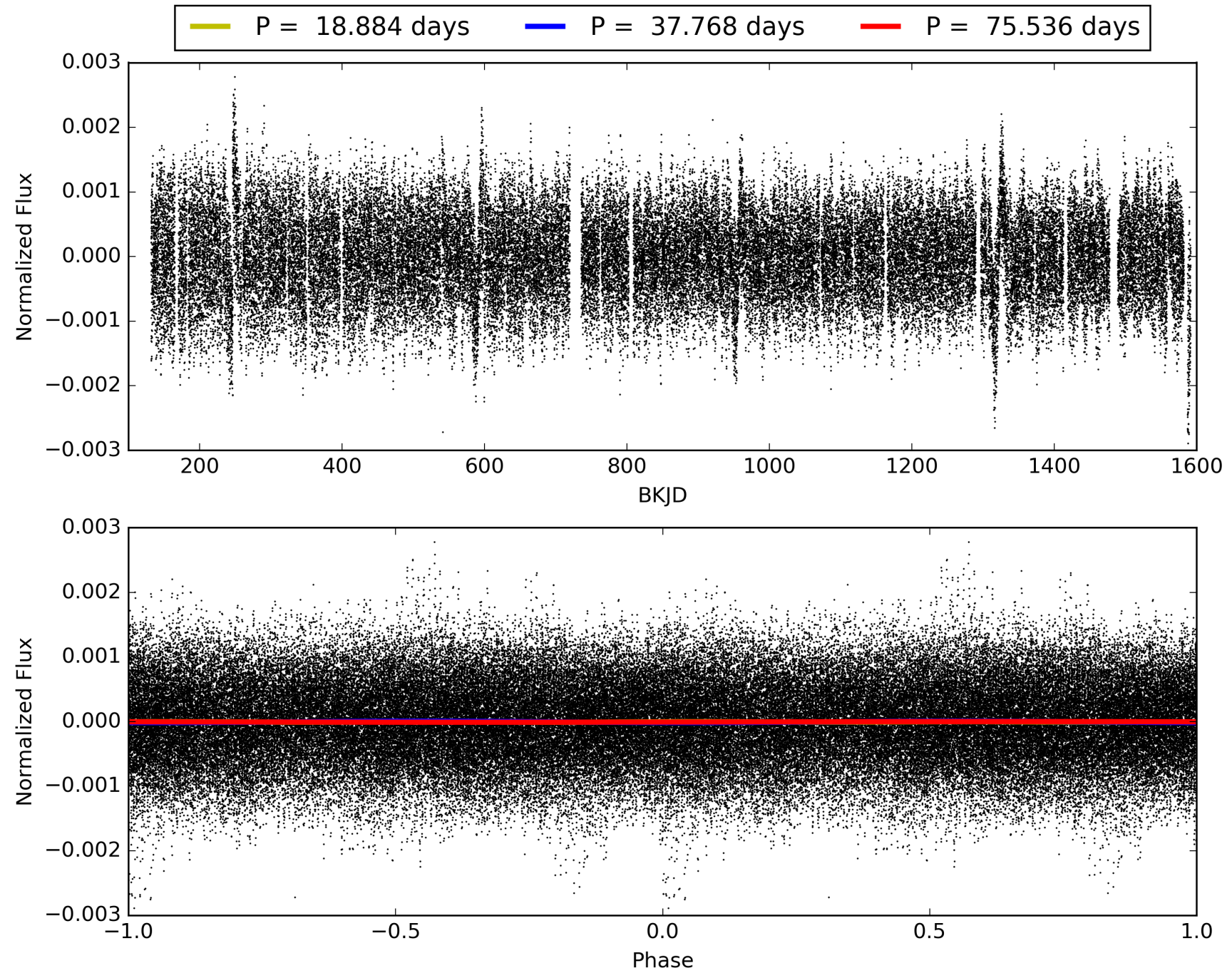
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 012258330-04, PDC Light Curves



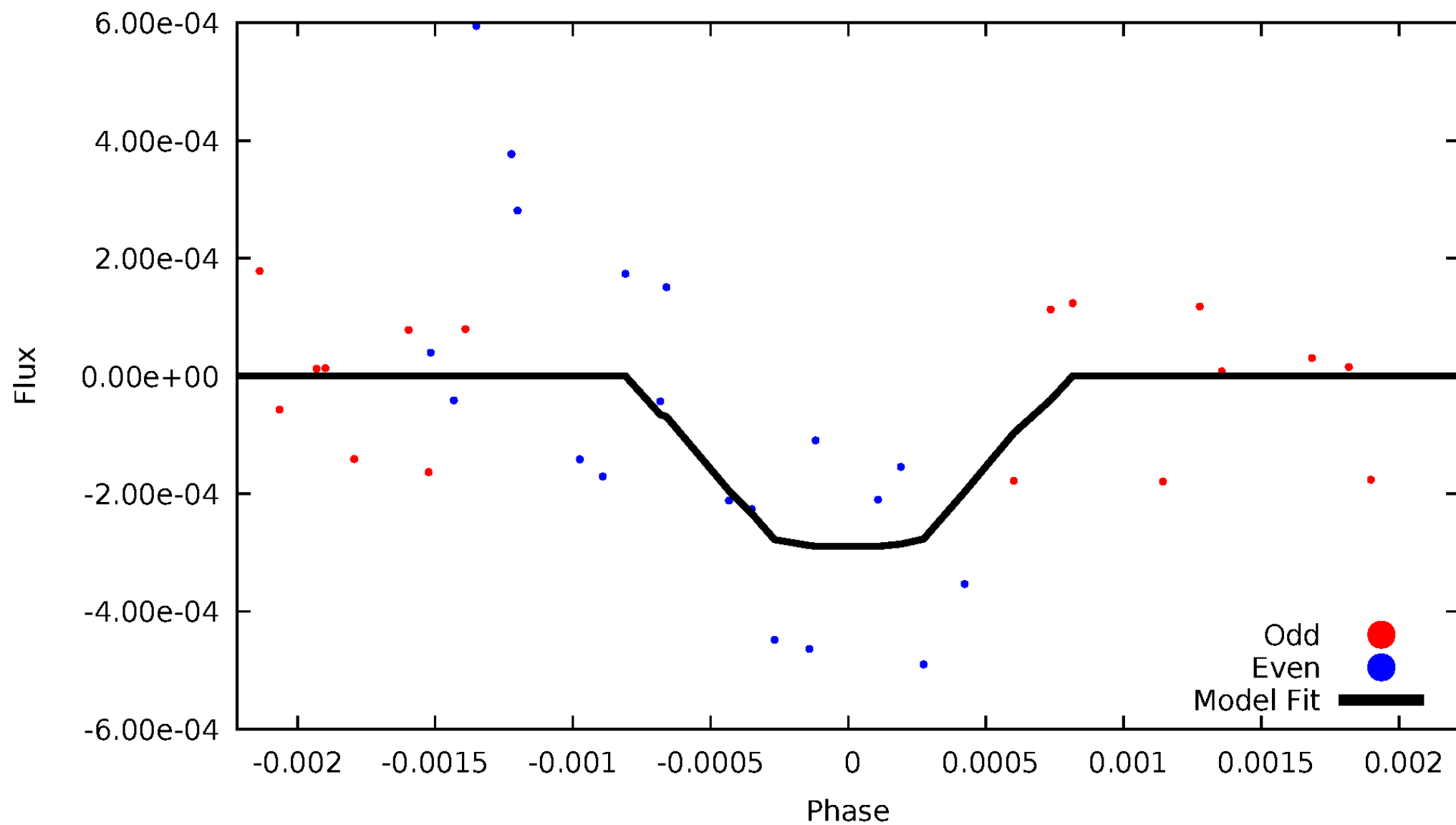


TCE 012258330-04



# DV Odd/Even

TCE 012258330-04



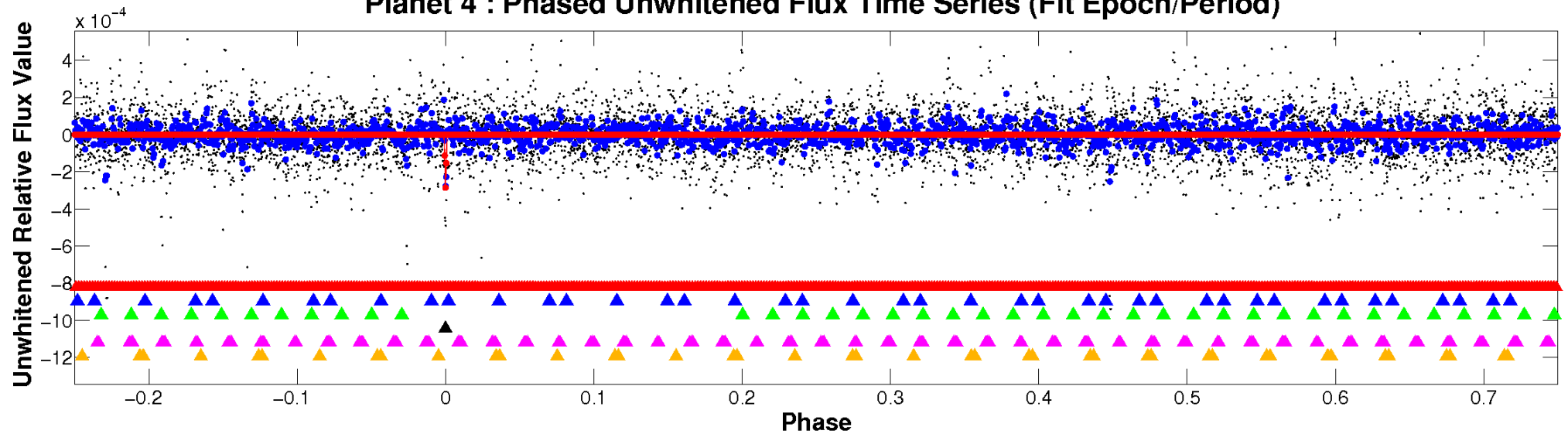


ALT Odd/Even

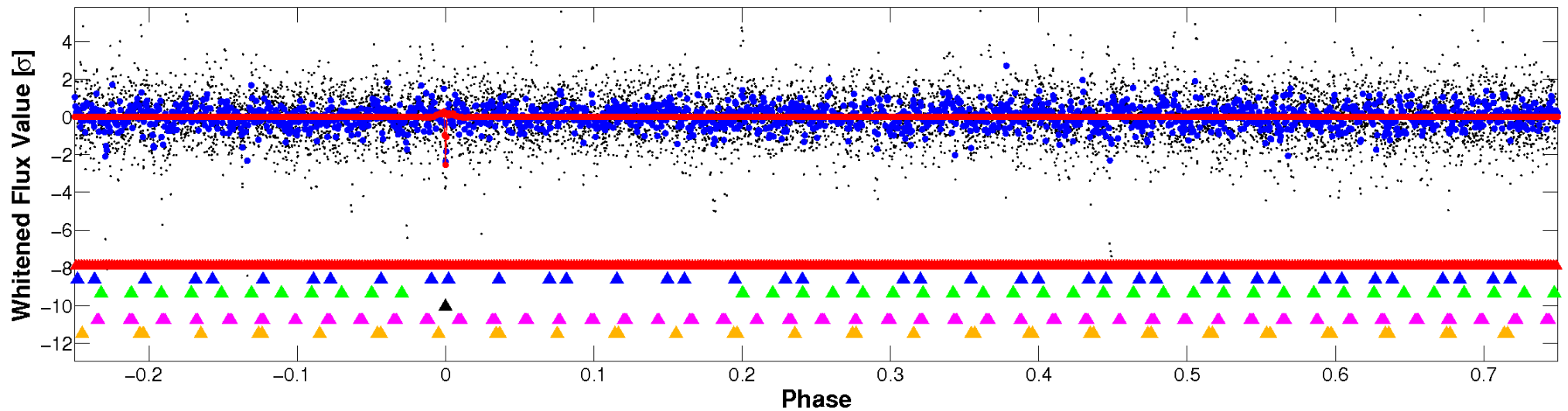
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

## Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

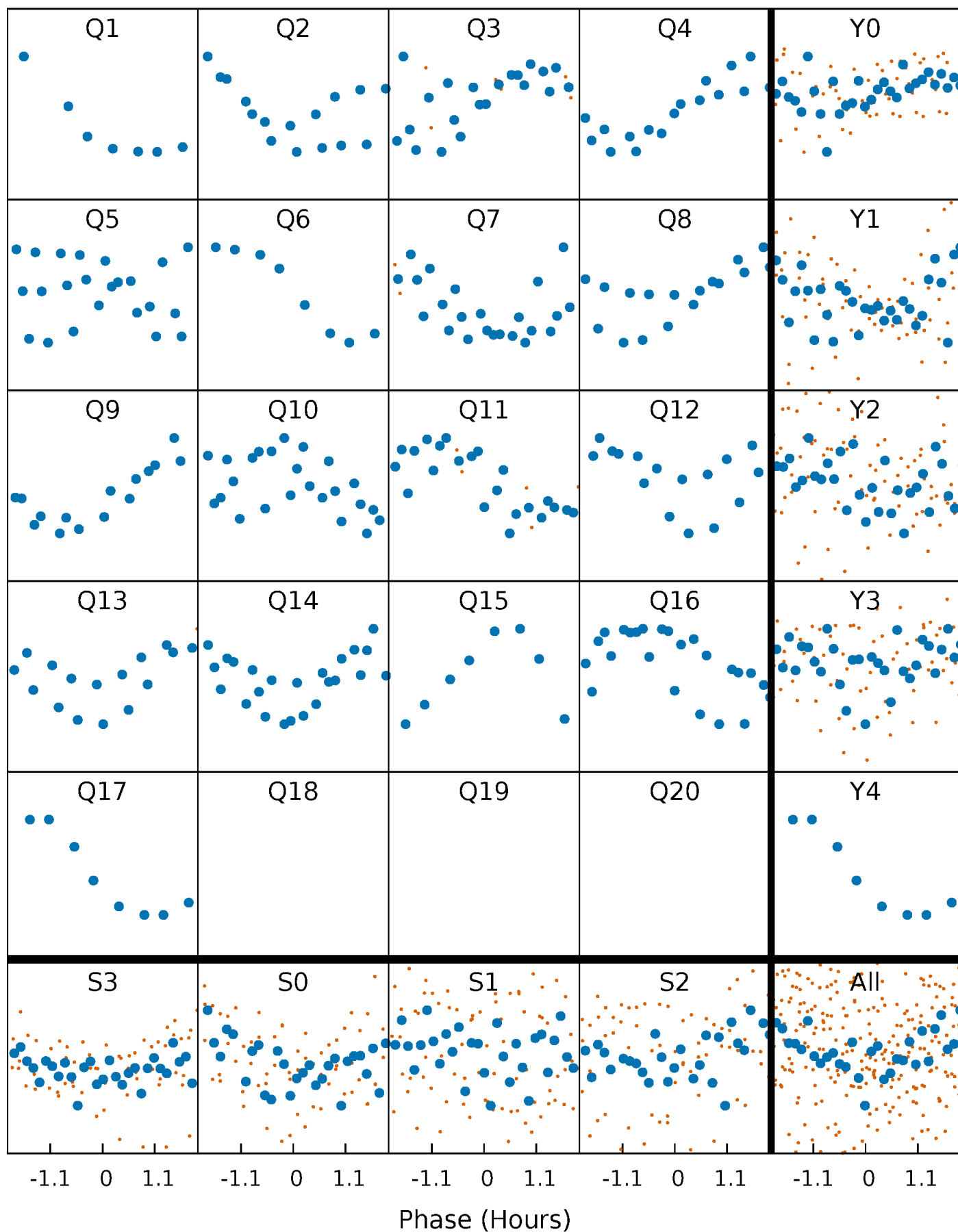


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



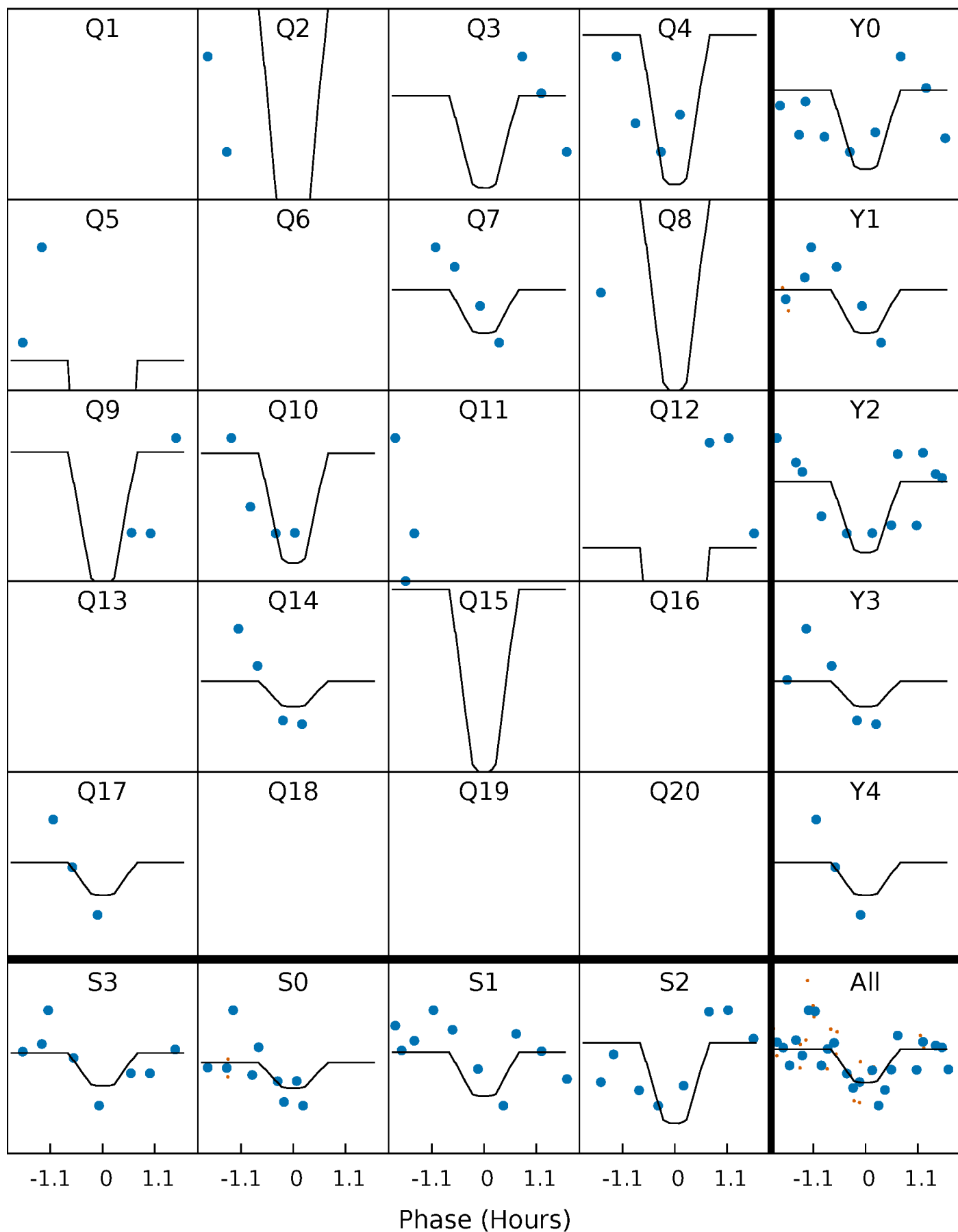
# PDC Quarter-Phased Transit Curves

TCE 012258330-04   P= 37.768097 Days    $T_0=151.711678$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 012258330-04 P= 37.768097 Days  $T_0=151.711678$  (BKJD)



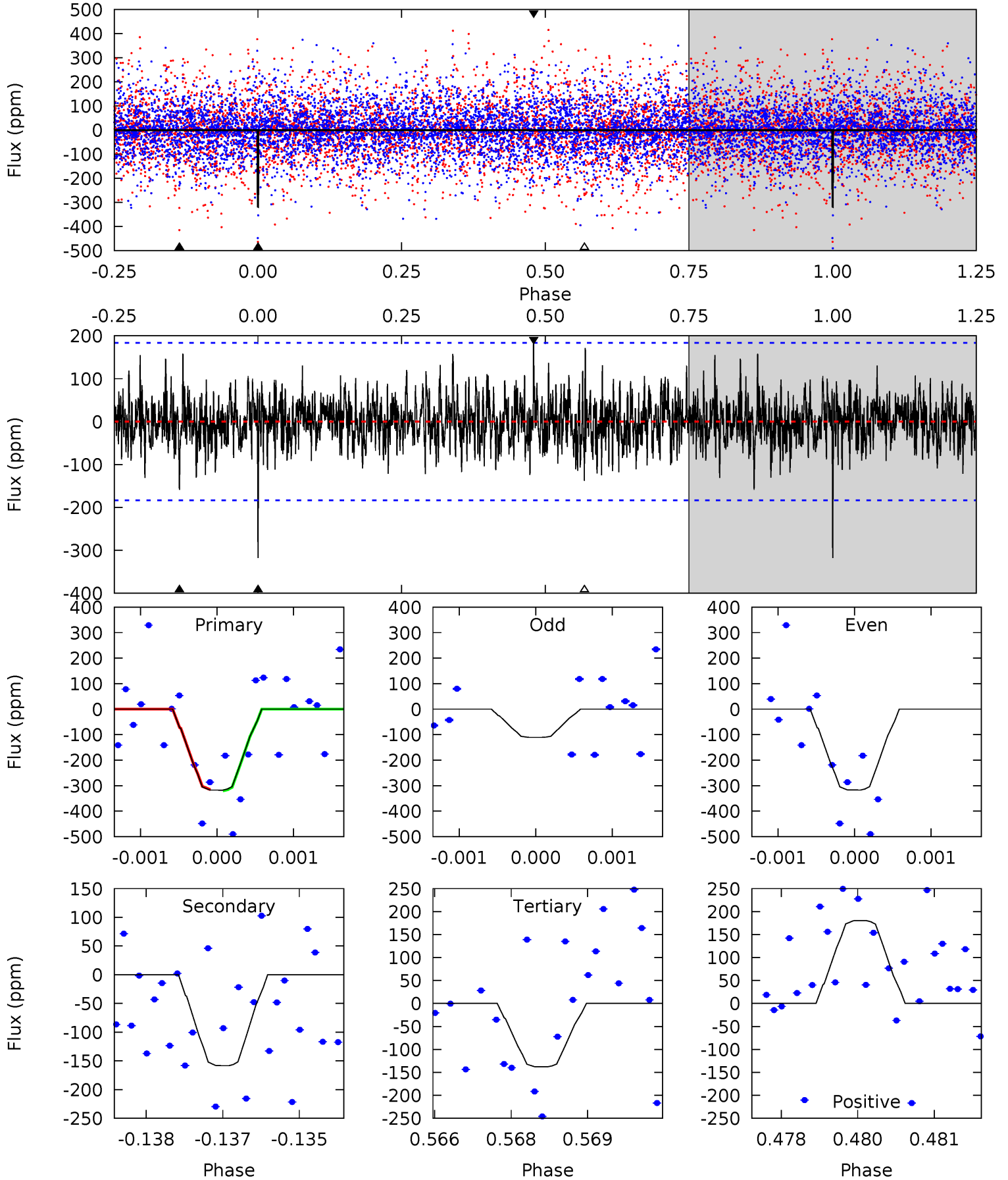


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

012258330-04, P = 37.768097 Days, E = 113.943581 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
9.34	4.66	4.05	5.30	5.39	3.20	1.33	5.28	4.04	0.61	-0.64	1.84	1.32	0.36	0.08



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 012258330

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$13203^{+480}_{-1923}$	$3.855^{+0.400}_{-0.100}$	$-0.500^{+0.600}_{-0.050}$	$3.518^{+0.402}_{-1.508}$	$3.230^{+0.098}_{-0.880}$	$0.104^{+0.351}_{-0.032}$
	+4%/-15%	+10%/-3%	+120%/-10%	+11%/-43%	+3%/-27%	+336%/-31%
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 012258330-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-158 \pm 34$	$6.42^{+5.29}_{-3.71}$	$2540^{+248}_{-407}$	$9386^{+9497}_{-2882}$	$210^{+971}_{-147}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{max}$  = 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

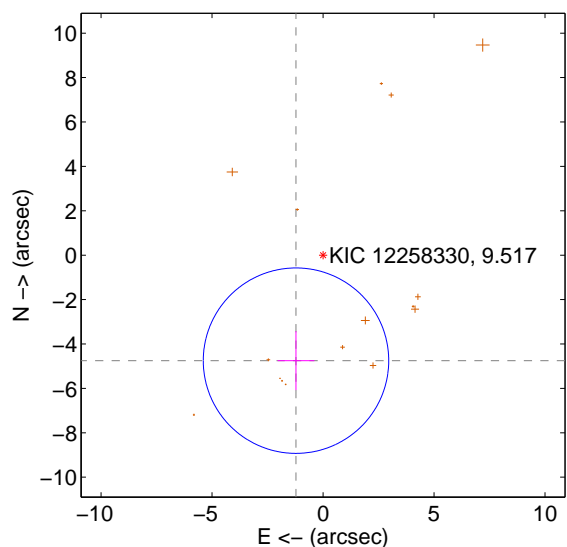
Supplemental centroid analysis for 012258330-04. **Kepler magnitude: 9.52.** Transit SNR 7.23

**There are 0 quarters with good PRF difference image offsets**

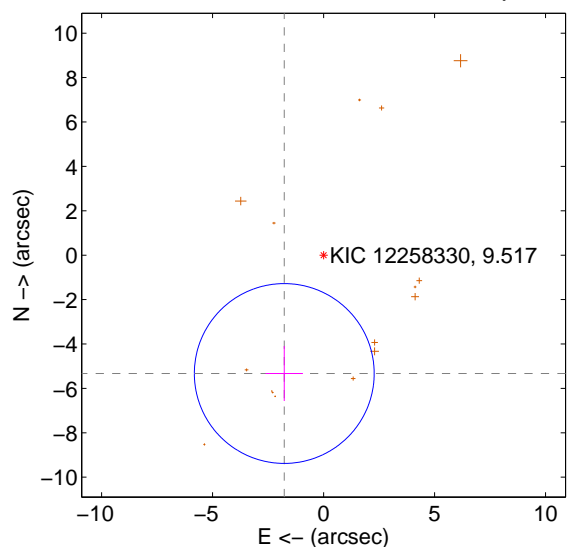
The direct PRF centroid is offset from the target star catalog position by about 1.24 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.906 \pm 1.392</math></b>	<b>3.52</b>	$1.218 \pm 0.827$	$-4.752 \pm 1.329$
PRF-fit source offset from KIC position	<b><math>5.617 \pm 1.350</math></b>	<b>4.16</b>	$1.771 \pm 0.842$	$-5.331 \pm 1.239$
photometric centroid source offset	$0.75 \pm 0.49$	1.52	$-0.04 \pm 0.28$	$-0.75 \pm 0.49$

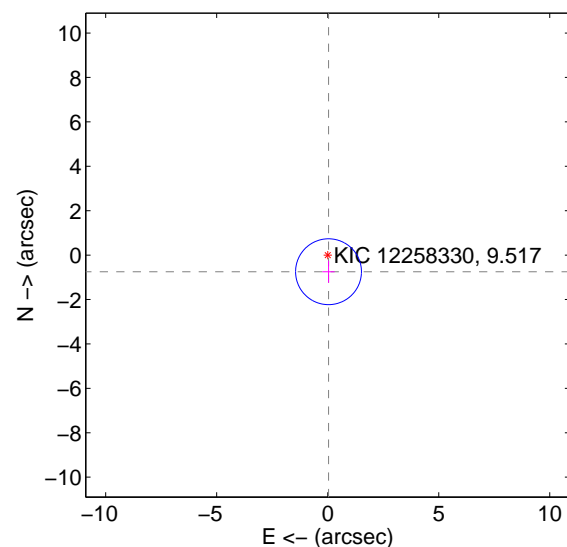
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

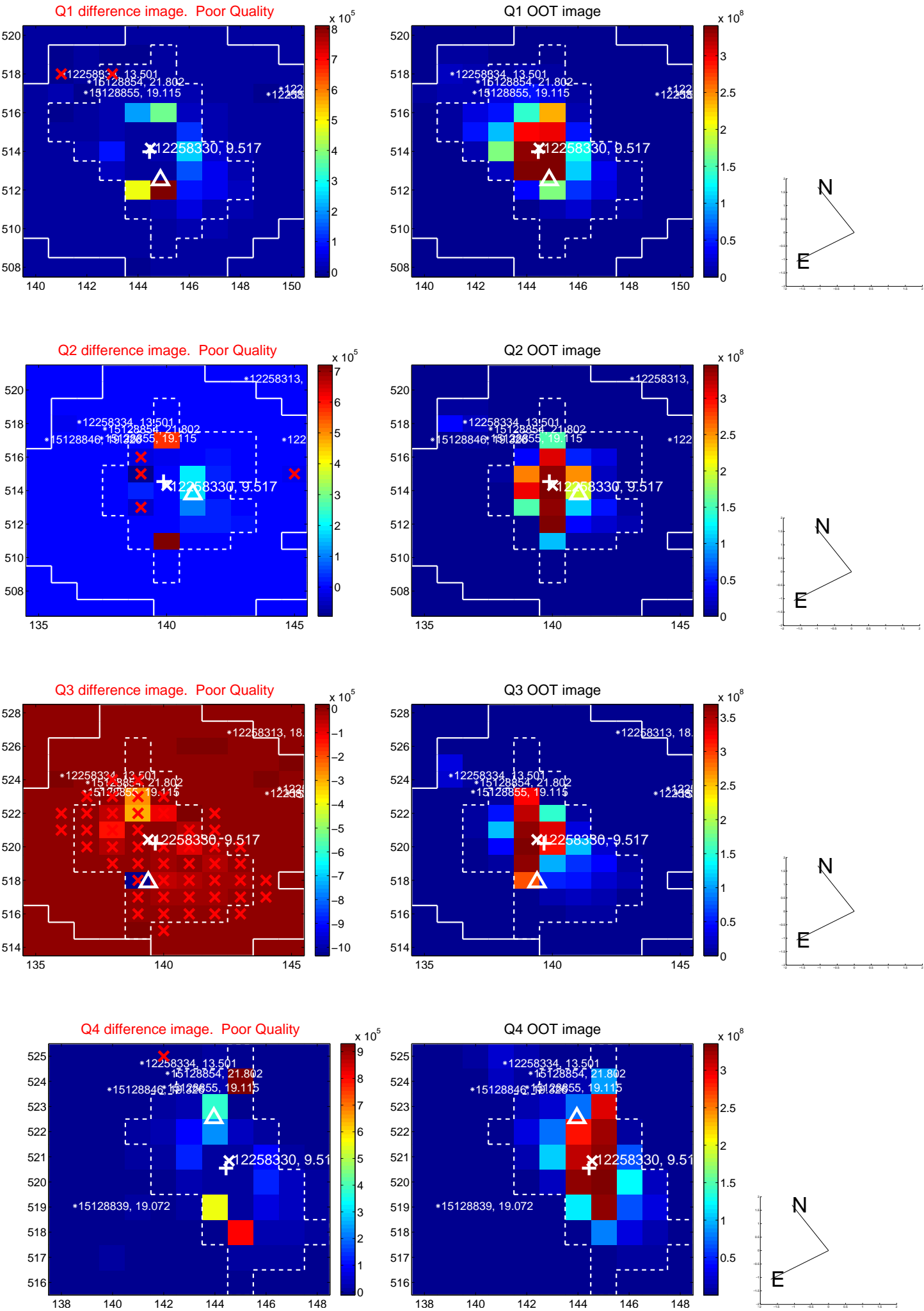


offset from photometric centroids

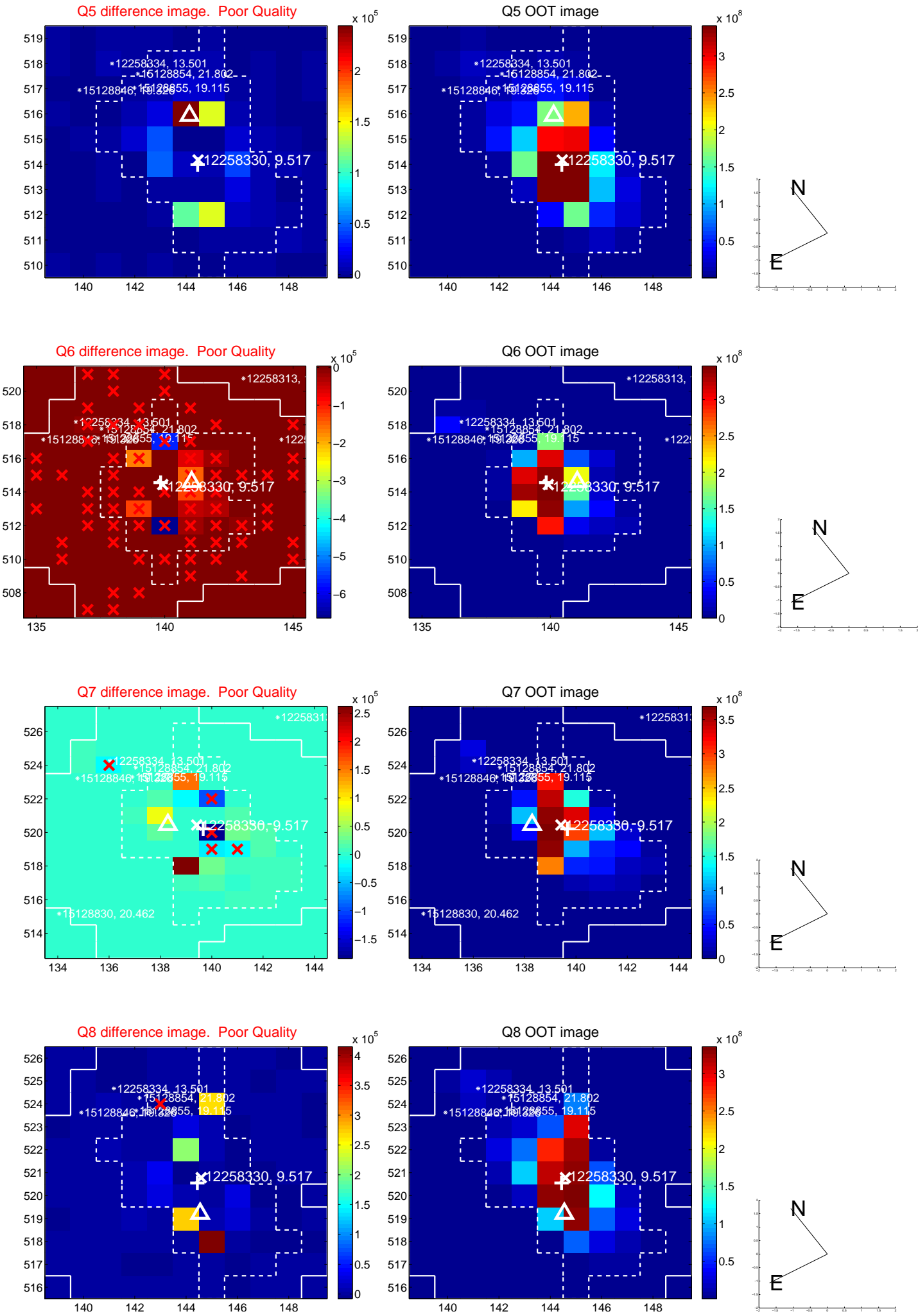


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

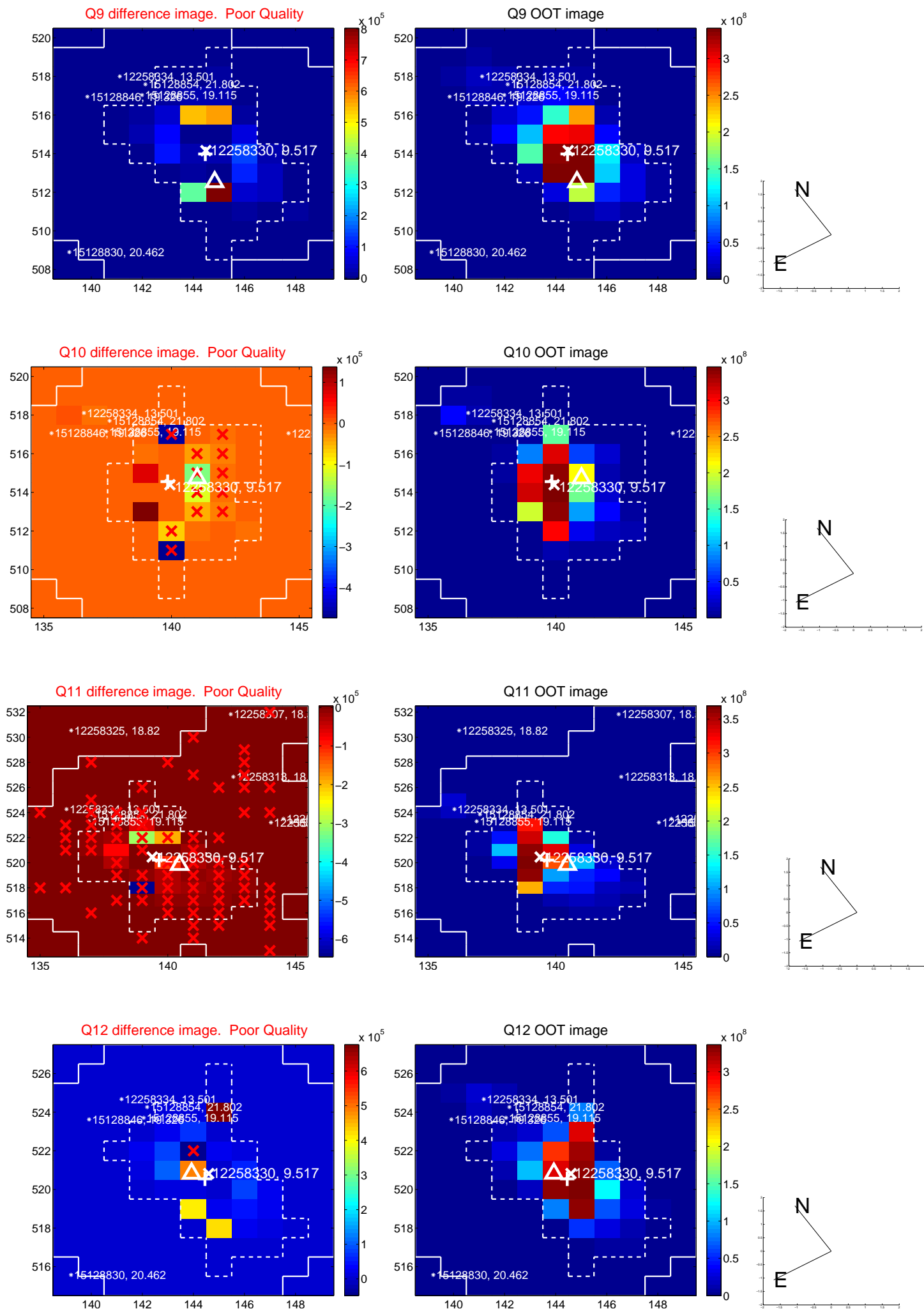


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

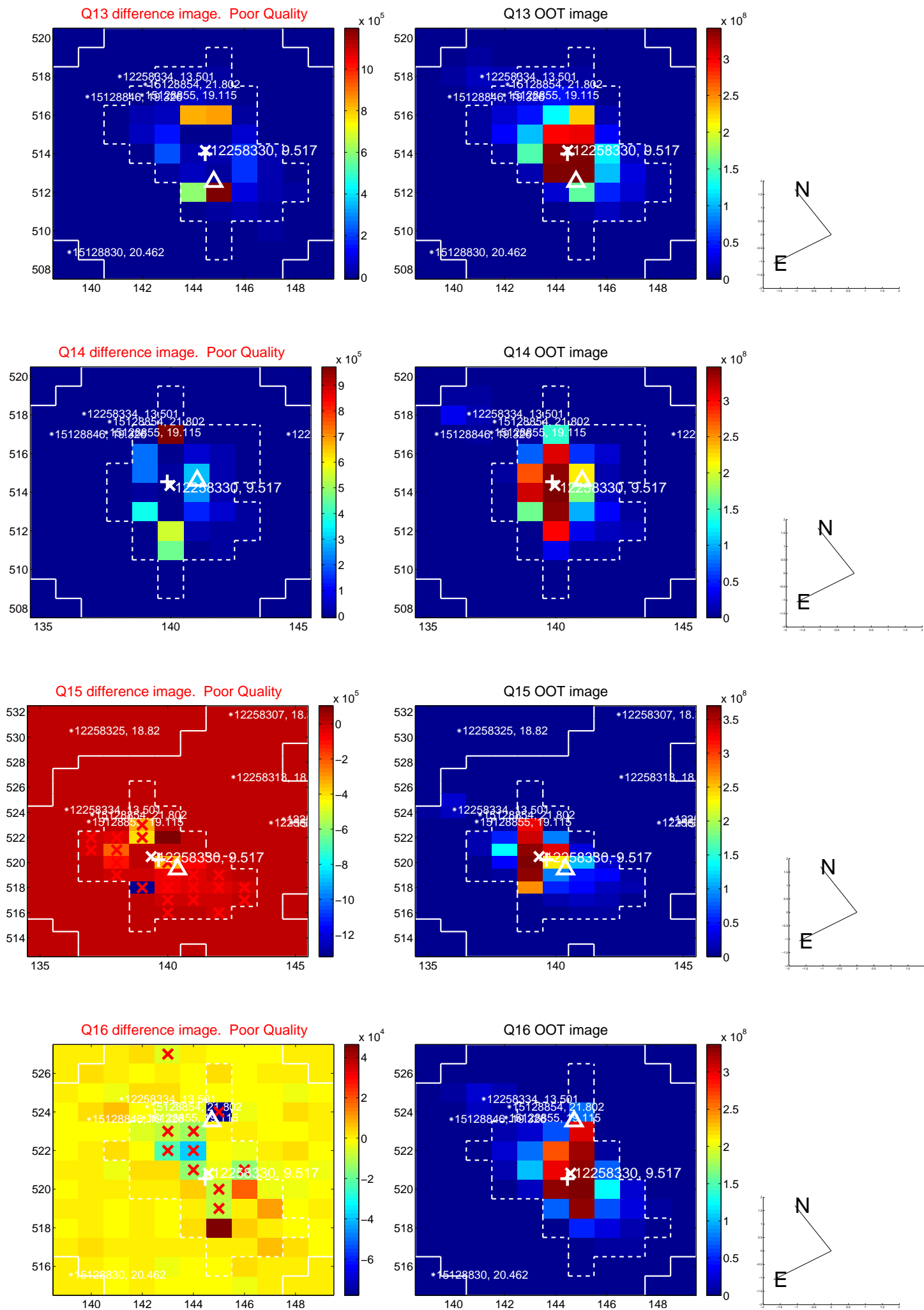




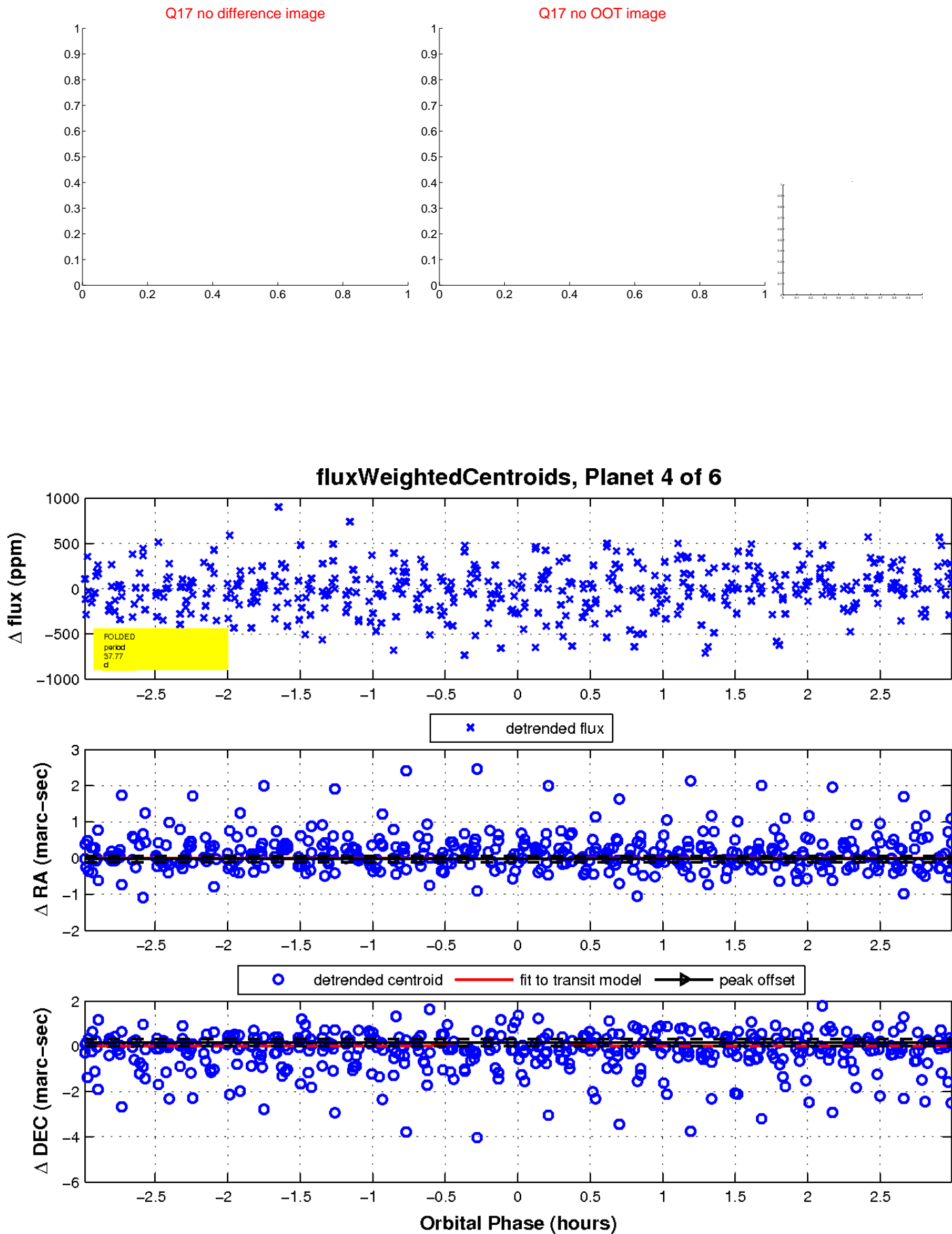
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

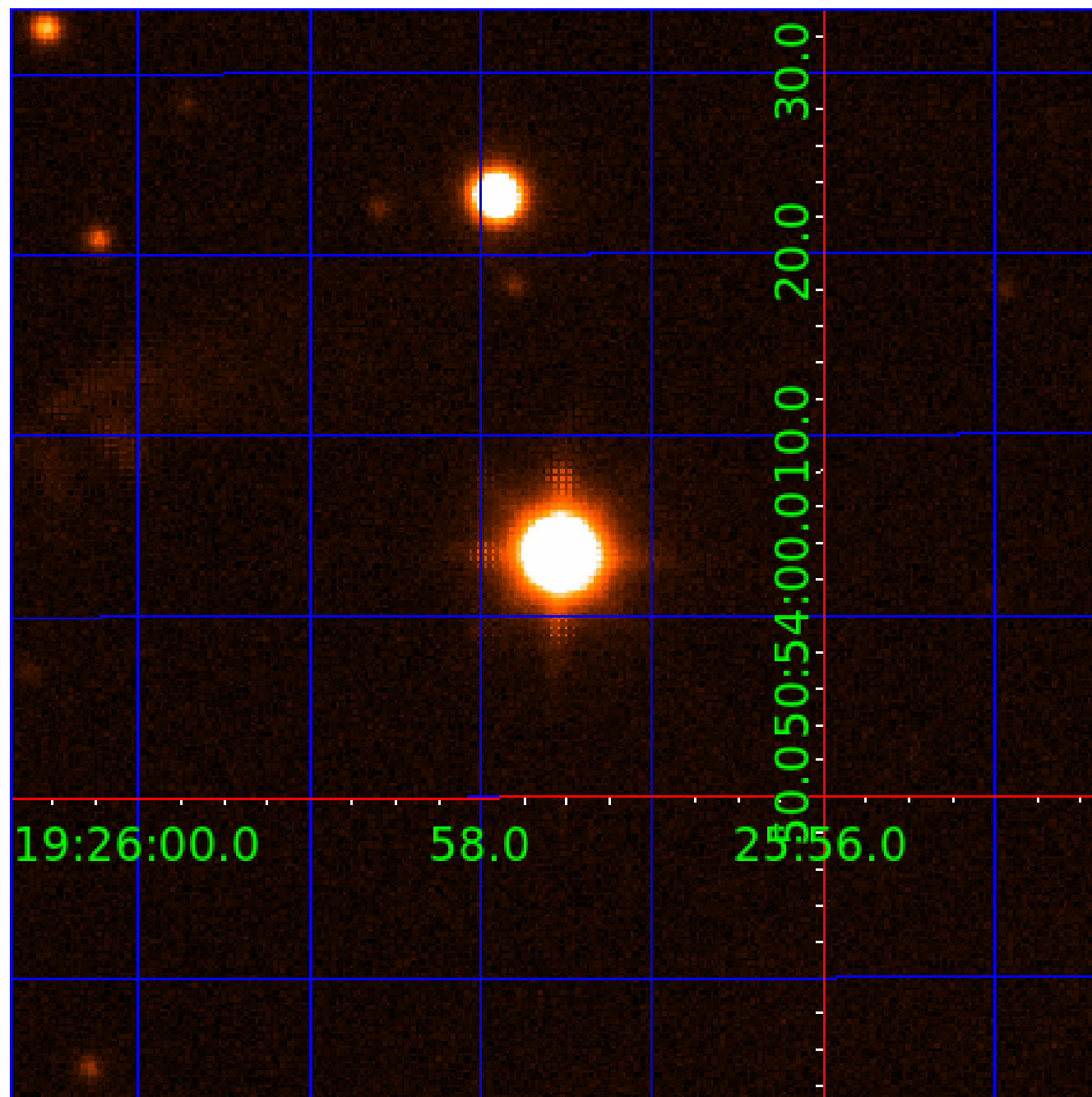


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 012258330

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012258330-01	OBS	No	0.560562	131.936057	10.0	3.719	7.7	7.1	3.52	13203	1.20	870195.78
012258330-02	OBS	No	34.763995	140.622865	378.7	2.902	13.3	11.0	3.52	13203	8.32	3544.94
012258330-03	OBS	No	37.002616	150.599033	43.4	1.486	10.6	2.3	3.52	13203	2.45	3261.91
012258330-04	OBS	No	37.768097	151.711678	291.1	1.005	10.3	7.2	3.52	13203	6.26	3174.06
012258330-05	OBS	No	11.750989	140.282150	222.5	2.539	9.3	12.4	3.52	13203	9.35	15055.07
012258330-06	OBS	No	34.743135	139.521782	280.0	2.754	9.0	9.0	3.52	13203	6.68	3547.78

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258330-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
012258330-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

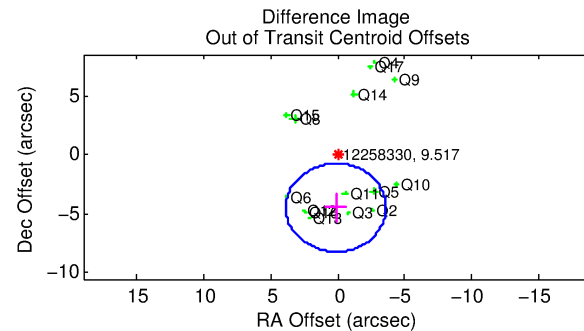
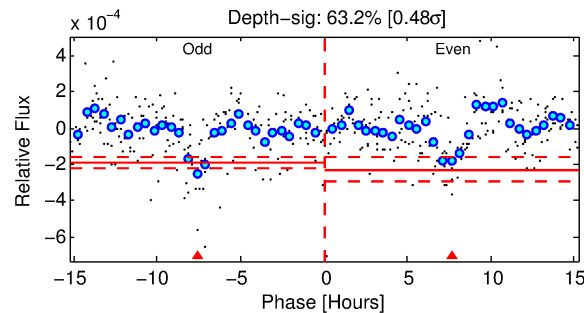
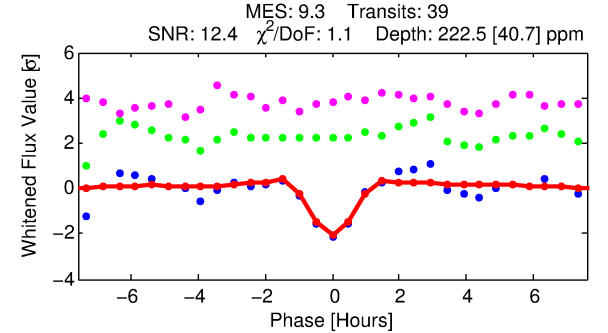
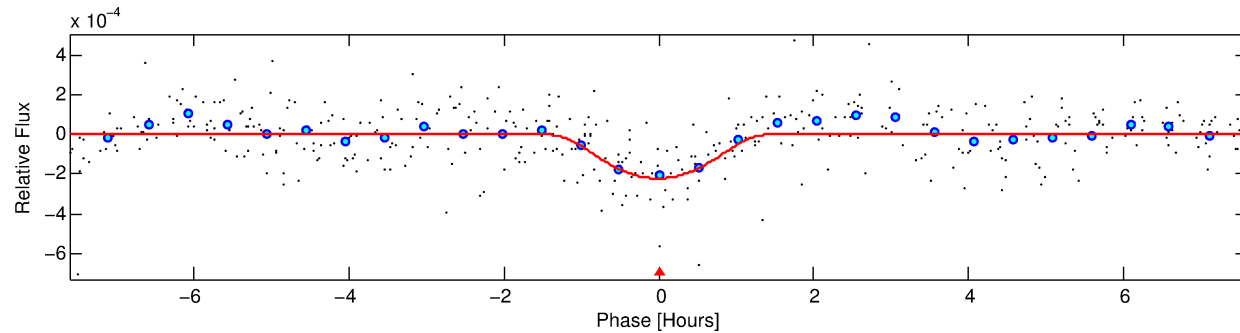
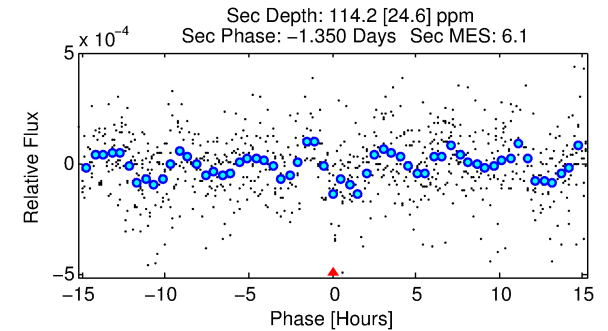
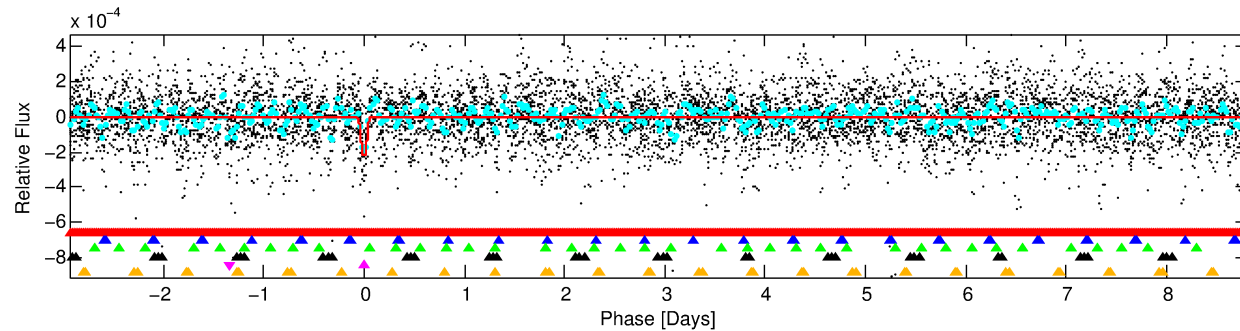
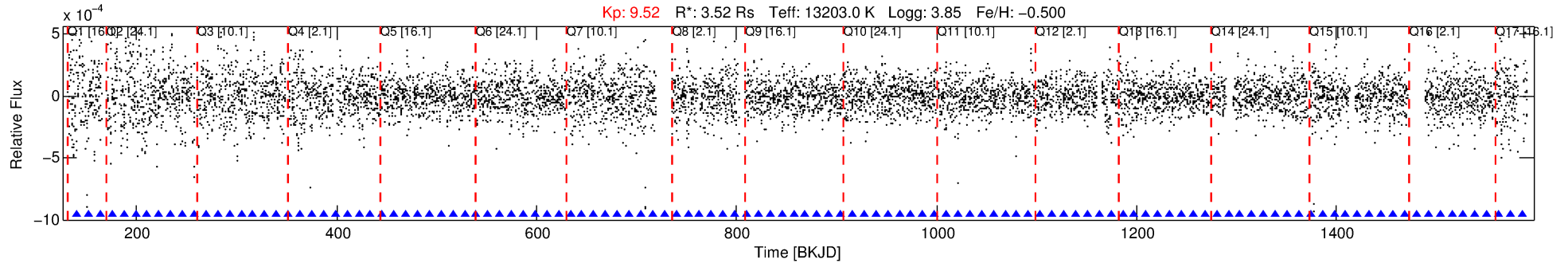
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012258330-05

No Significant Match Found

# DV One-Page Summary

KIC: 12258330 Candidate: 5 of 6 Period: 11.751 d



## DV Fit Results:

Period = 11.75099 [0.00007] d  
Epoch = 140.2821 [0.0048] BKJD  
 $R_p/R^* = 0.0243$  [0.0809]  
 $a/R^* = 7.97$  [7.57]  
 $b = 1.00$  [0.13]  
 $S_{\text{eff}} = 15055.07$  [13449.70]  
 $T_{\text{eq}} = 2825$  [631] K  
 $R_p = 9.35$  [31.31]  $R_E$   
 $a = 0.1496$  [0.0627] AU  
 $A_g = 16.09$  [107.53] [0.14σ]  
 $T_{\text{eff}} = 8746$  [14593] K [0.41σ]

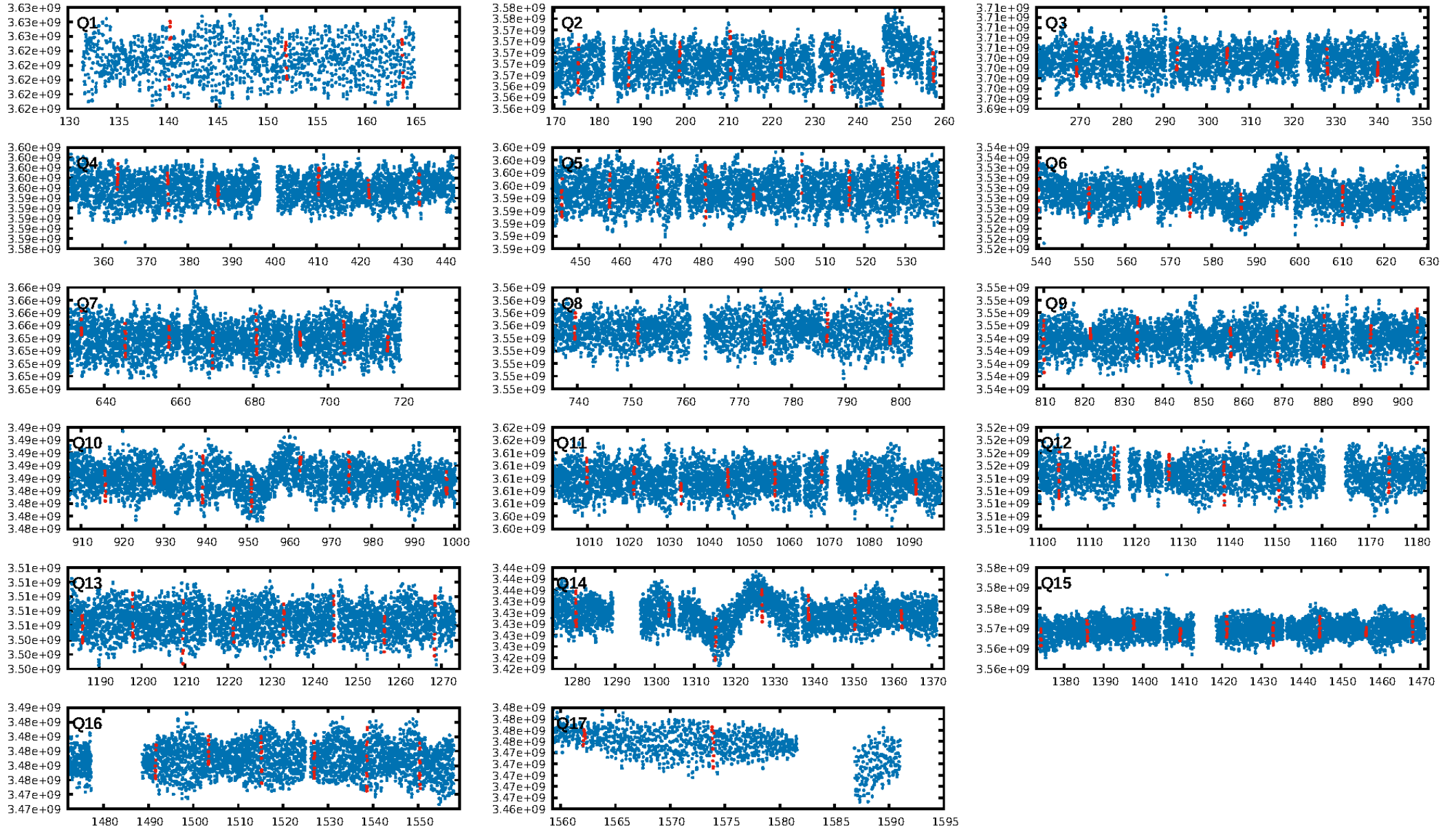
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [59.64σ]  
LongPeriod-sig: 100.0% [147.31σ]  
ModelChiSquare2-sig: 4.6%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.90e-12**  
RollingBand-fgt: 1.00 [37/37]  
GhostDiagnostic-chr: N/A  
**Centroid-sig: 0.0%**  
Centroid-so: 0.904 arcsec [2.35σ]  
**OotOffset-rm: 4.469 arcsec [3.59σ]**  
**KicOffset-rm: 4.567 arcsec [3.18σ]**  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.06 [1/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:14:21 Z

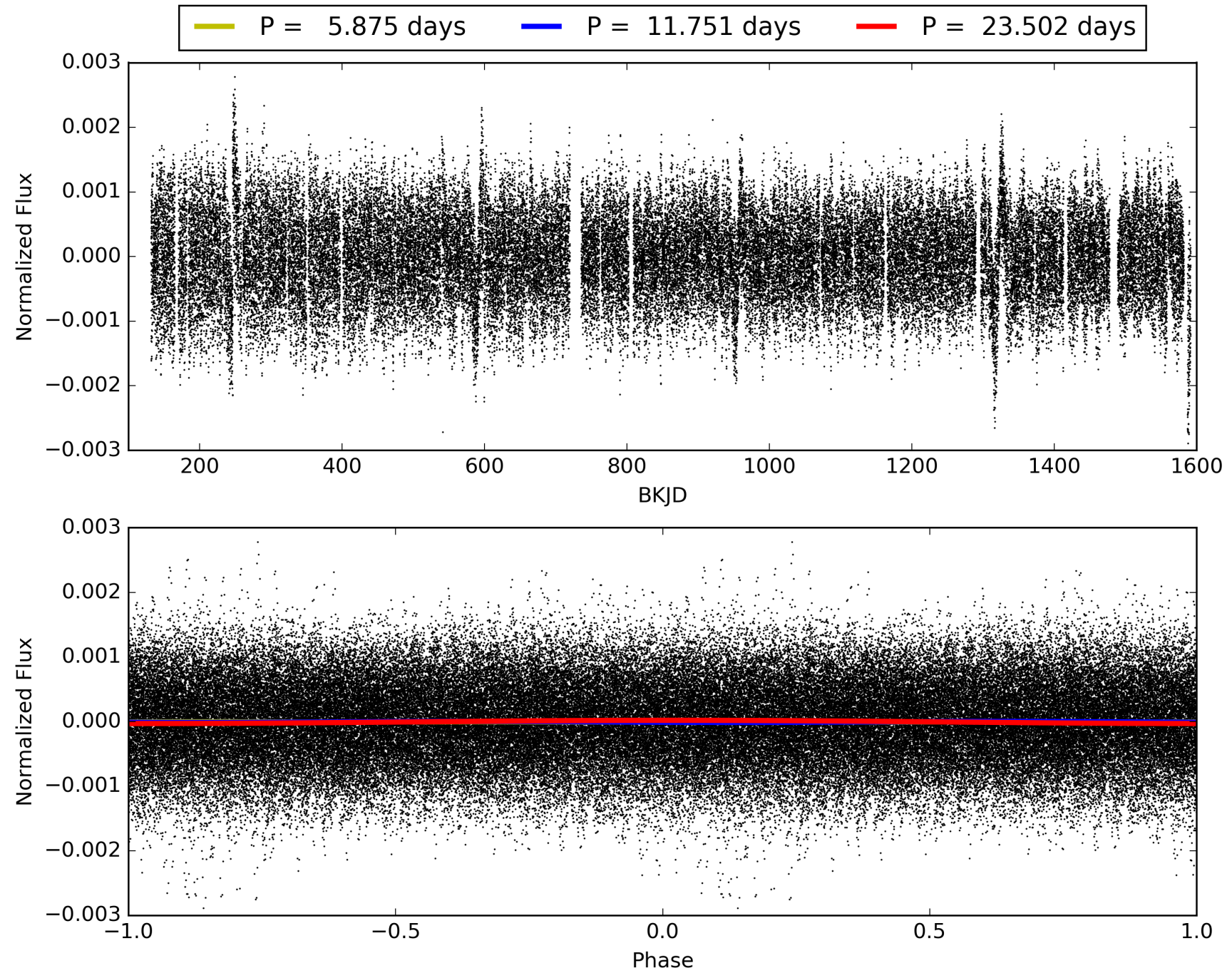
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 012258330-05, PDC Light Curves



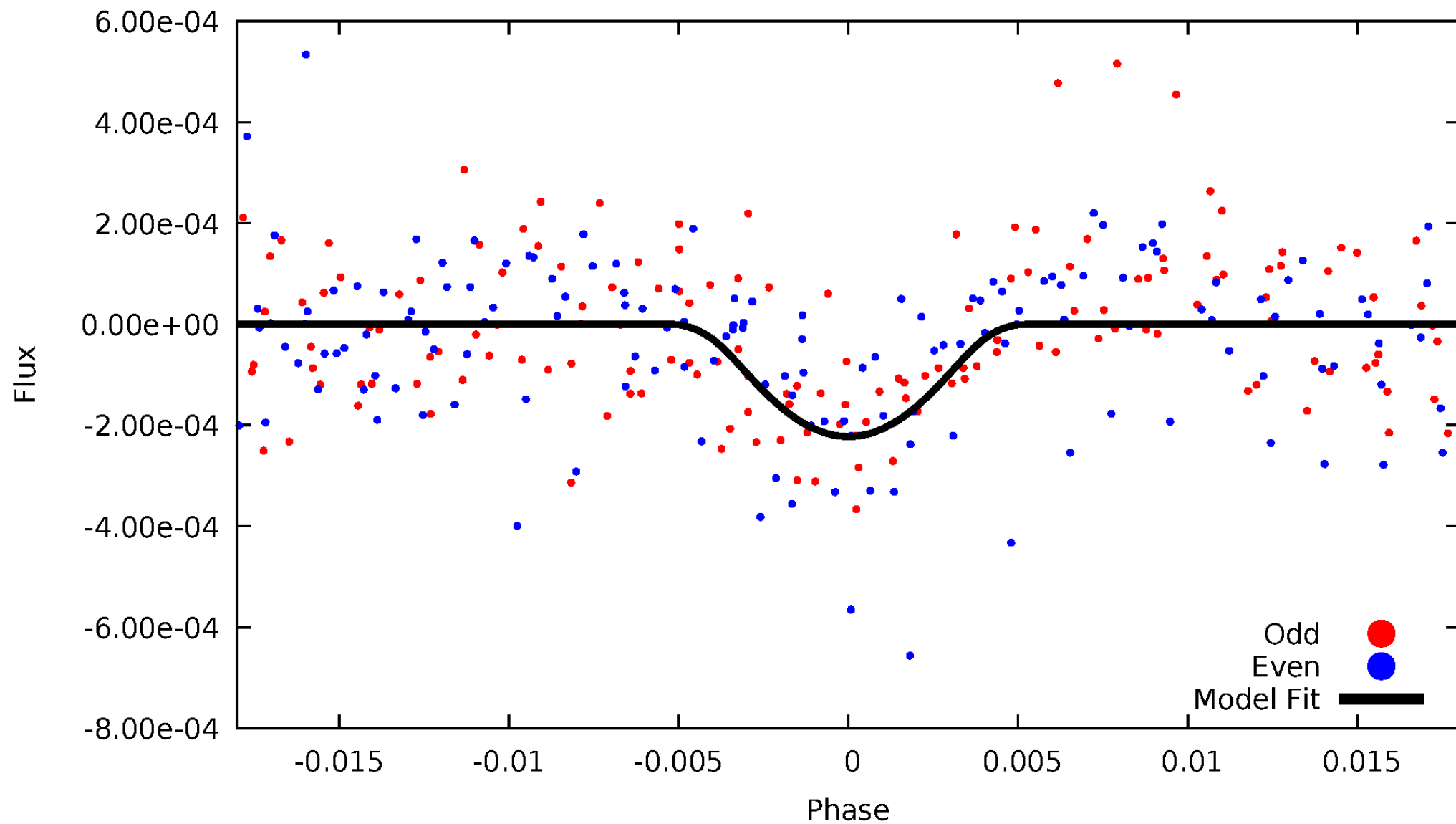


TCE 012258330-05



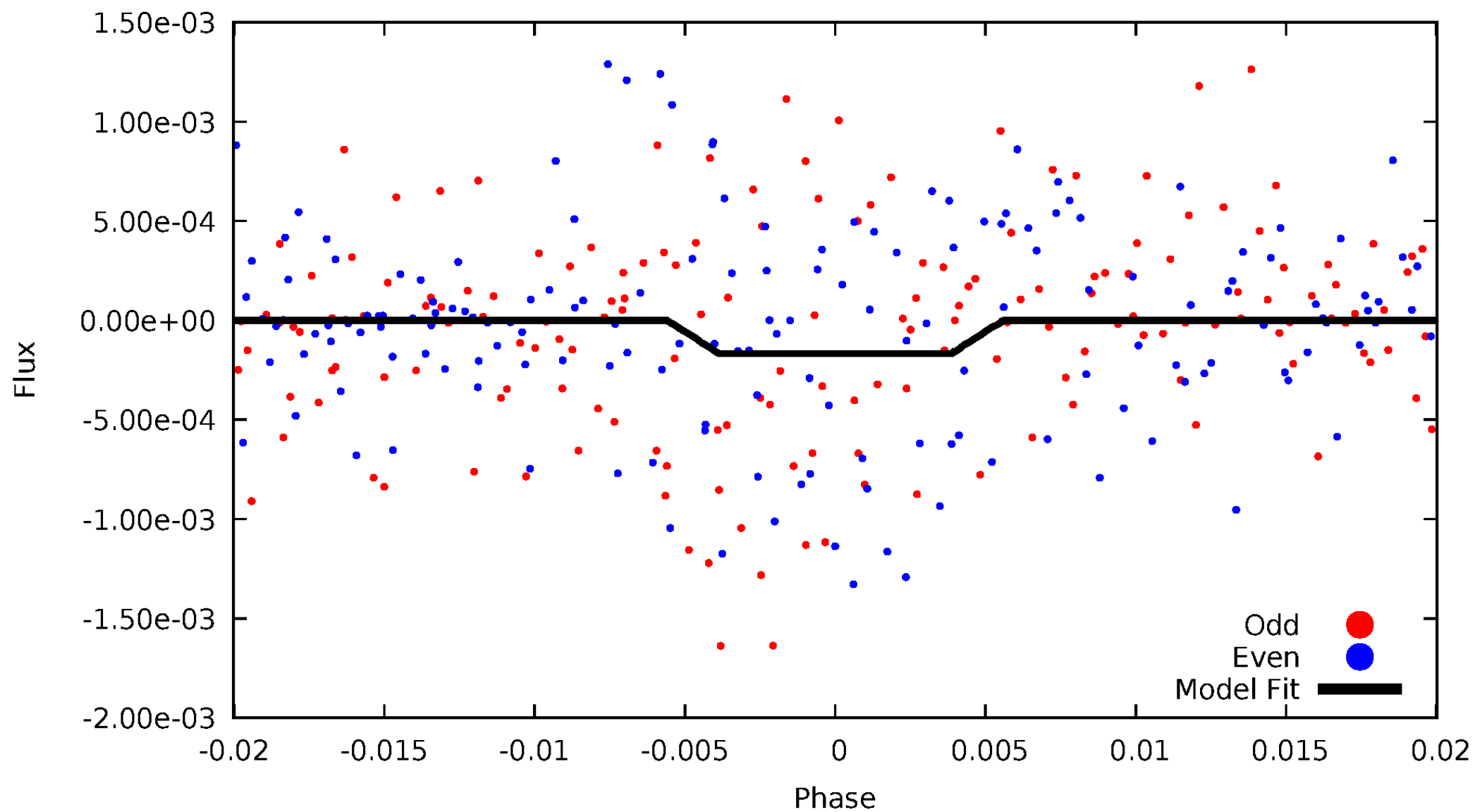
# DV Odd/Even

TCE 012258330-05



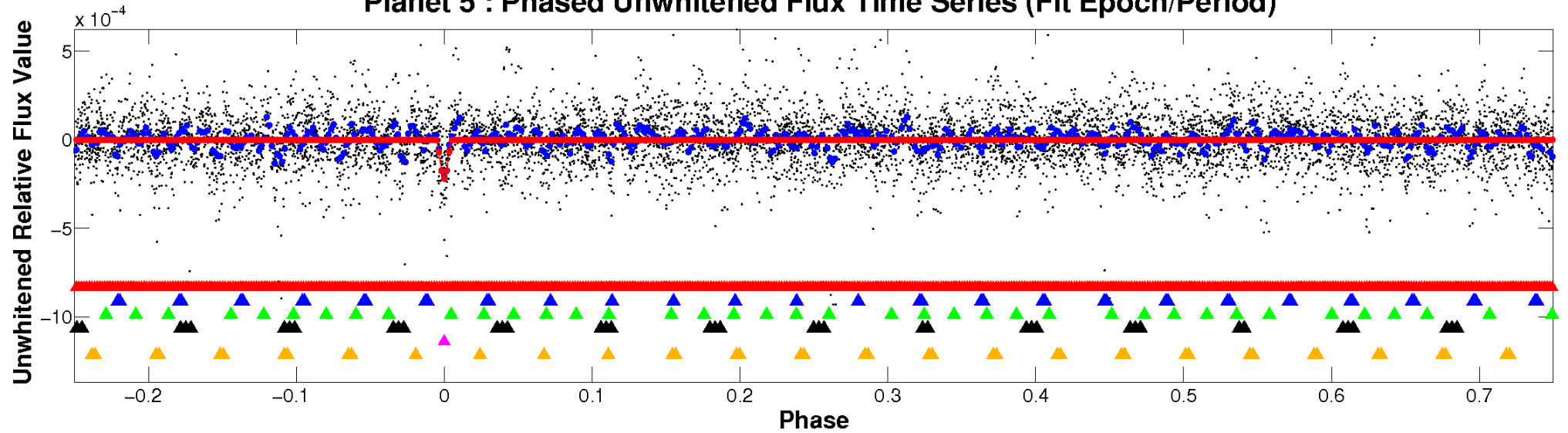
# ALT Odd/Even

TCE 012258330-05

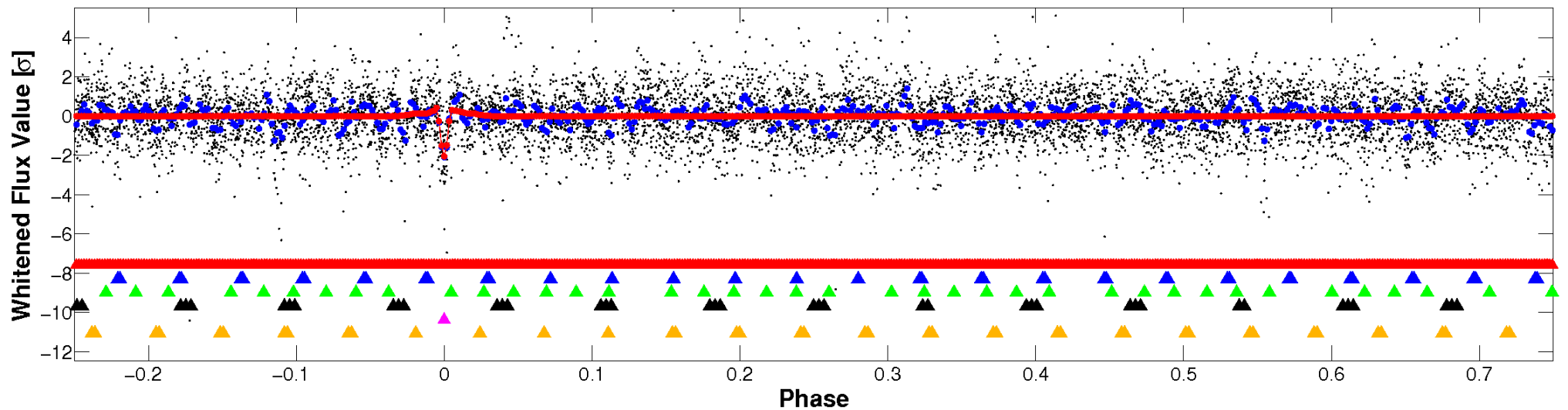


# Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

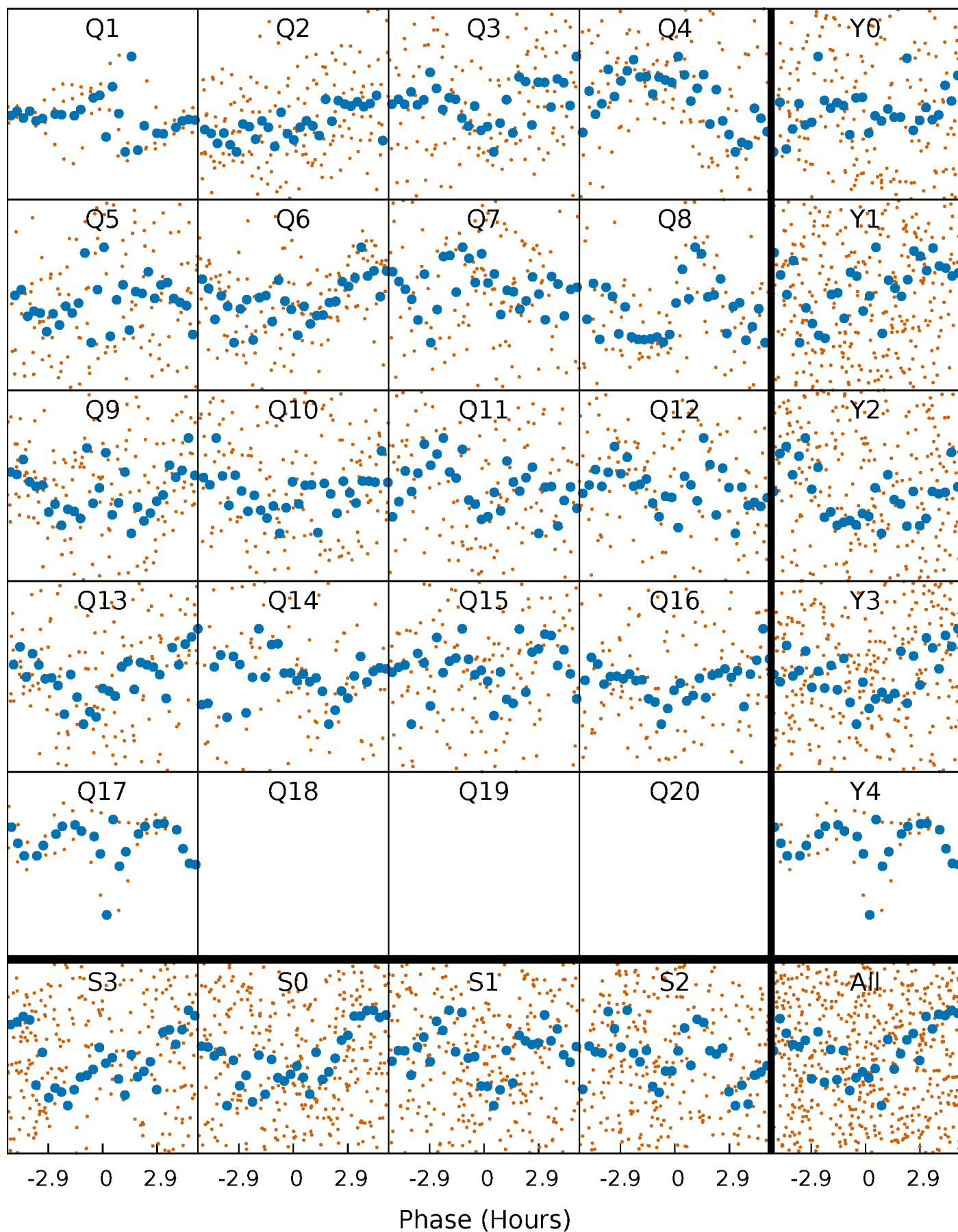


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



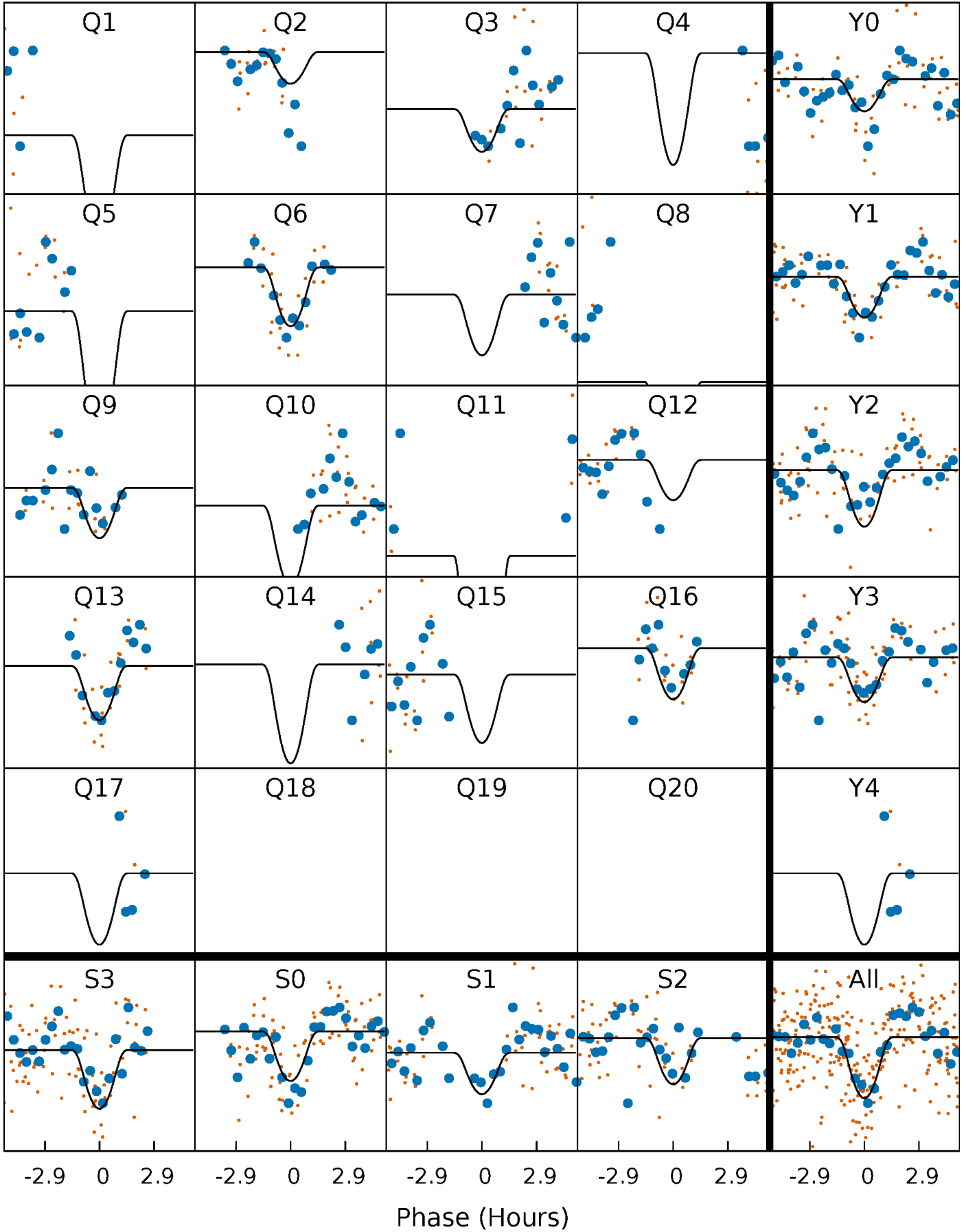
# PDC Quarter-Phased Transit Curves

TCE 012258330-05     $P = 11.750989$  Days     $T_0 = 140.282150$  (BKJD)



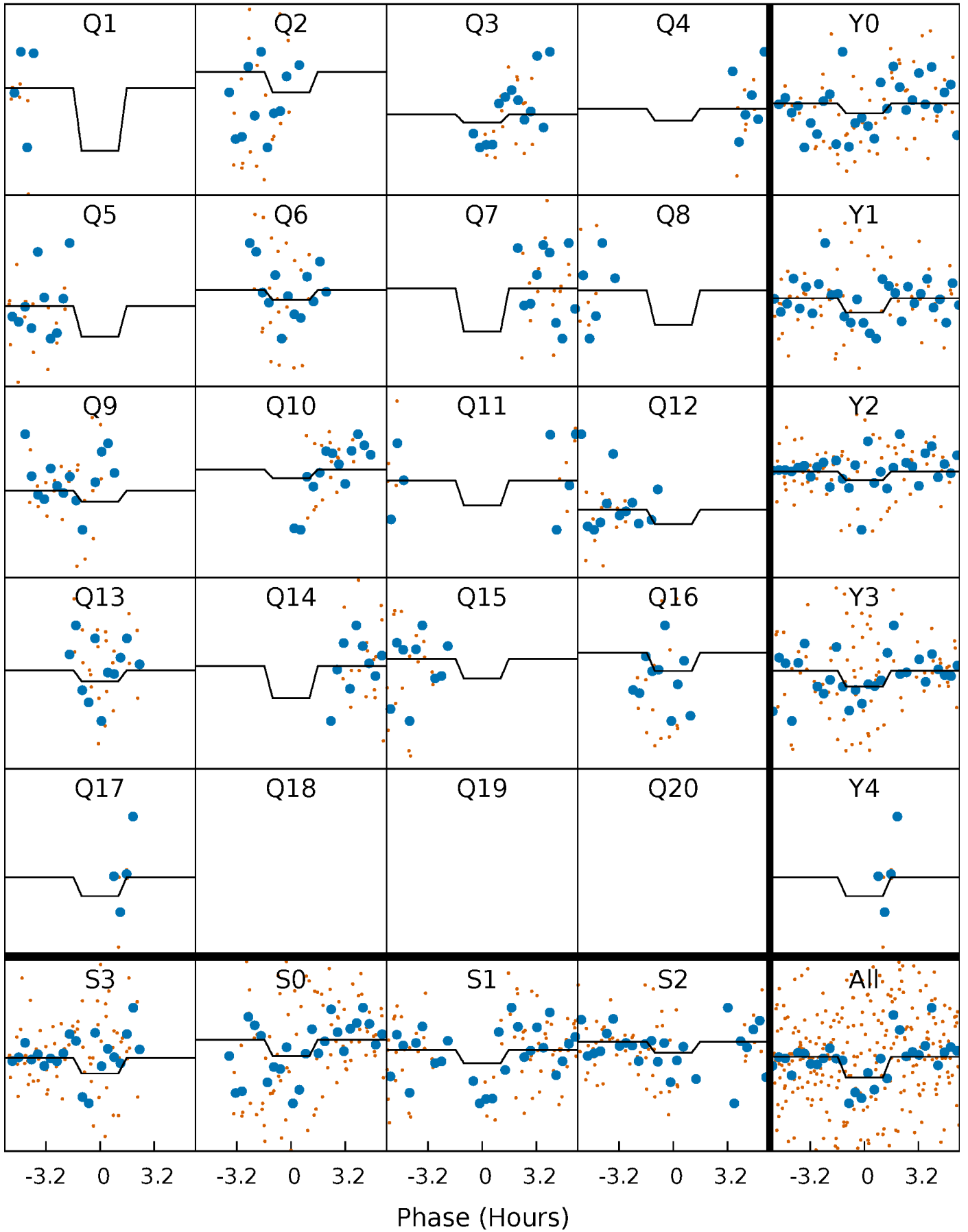
# DV Quarter-Phased Transit Curves

TCE 012258330-05   P= 11.750989 Days    $T_0=140.282150$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 012258330-05     $P = 11.751017$  Days     $T_0 = 140.289703$  (BKJD)

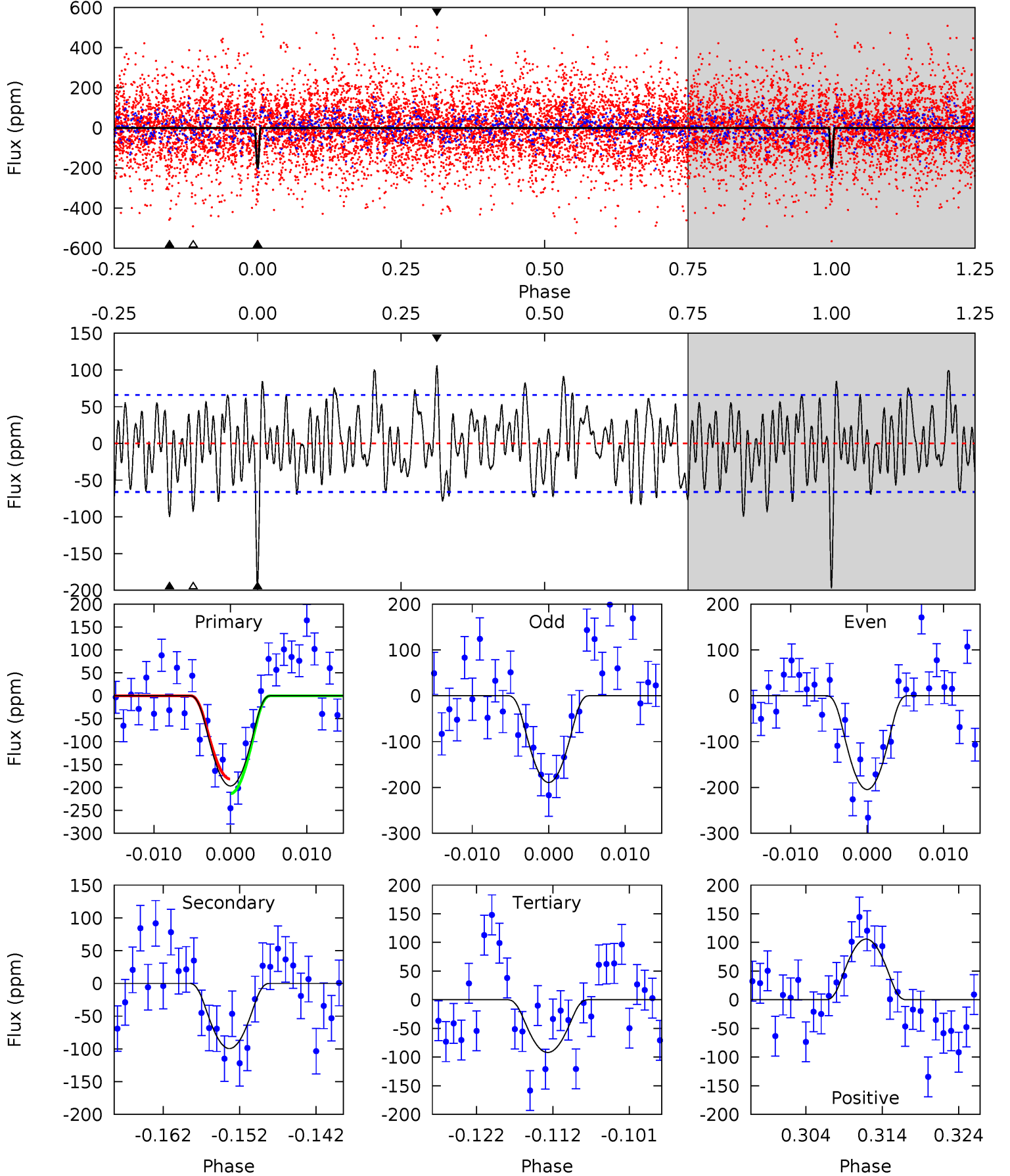




# DV Model-Shift Uniqueness Test

012258330-05, P = 11.750989 Days, E = 128.531161 Days

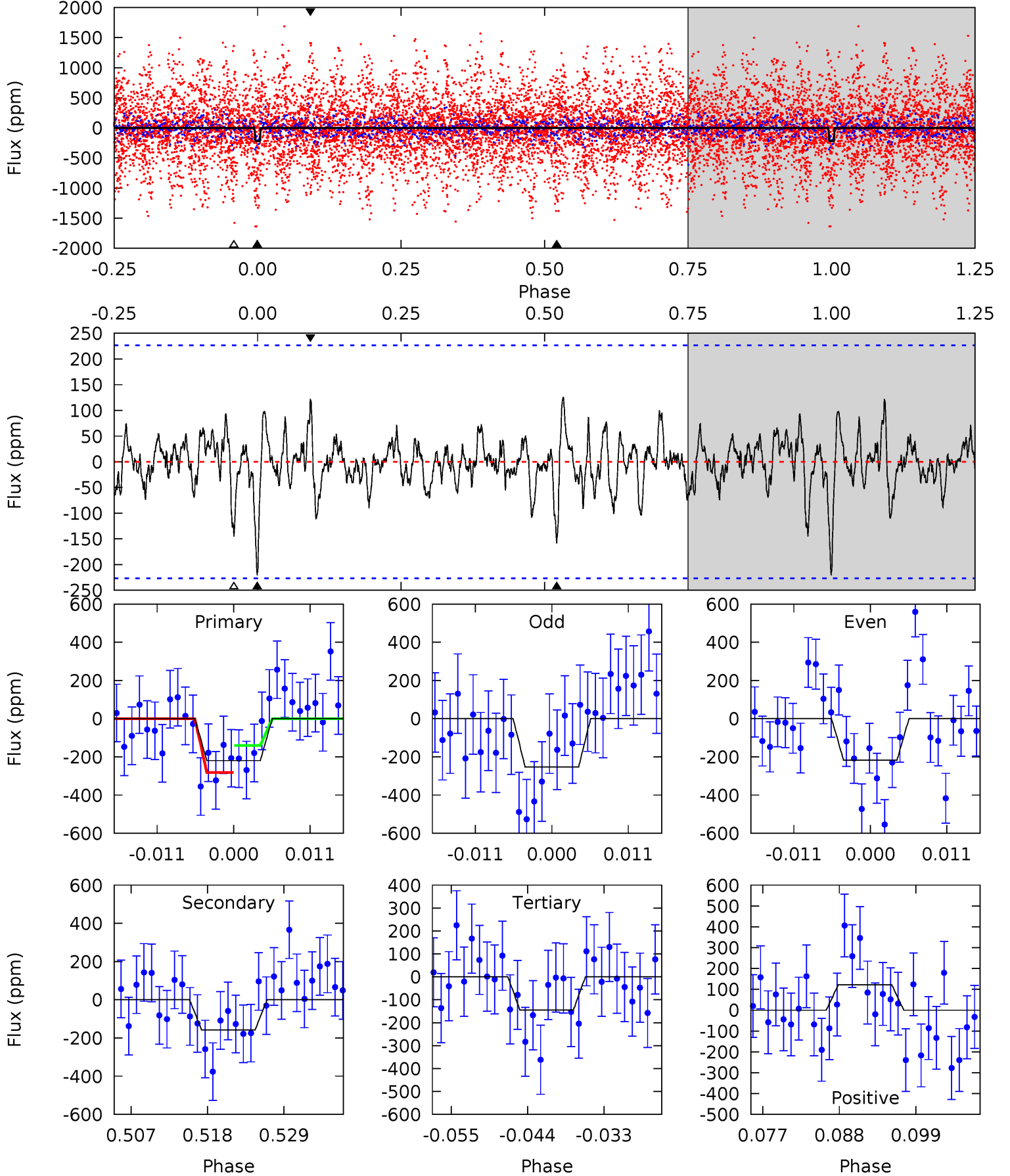
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	7.56	6.99	8.04	5.02	2.57	2.80	7.96	6.91	0.57	-0.48	0.59	0.83	0.35	1.21



# Alt Model-Shift Uniqueness Test

012258330-05, P = 11.751017 Days, E = 128.538686 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
4.85	3.50	3.21	2.70	5.01	2.54	0.88	1.64	2.15	0.29	0.80	0.41	4.67	0.36	1.58



### Stellar Parameters For KIC 012258330

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$13203^{+480}_{-1923}$	$3.855^{+0.400}_{-0.100}$	$-0.500^{+0.600}_{-0.050}$	$3.518^{+0.402}_{-1.508}$	$3.230^{+0.098}_{-0.880}$	$0.104^{+0.351}_{-0.032}$
	+4%/-15%	+10%/-3%	+120%/-10%	+11%/-43%	+3%/-27%	+336%/-31%
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 012258330-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-100 \pm 13$	$22.73^{+26.32}_{-15.29}$	$3705^{+409}_{-559}$	$4177^{+3051}_{-1258}$	$2.211^{+19.312}_{-1.739}$
Alt.	$-158 \pm 45$	$20.41^{+22.07}_{-14.86}$	$3692^{+416}_{-572}$	$5006^{+5231}_{-1512}$	$4.470^{+54.613}_{-3.490}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

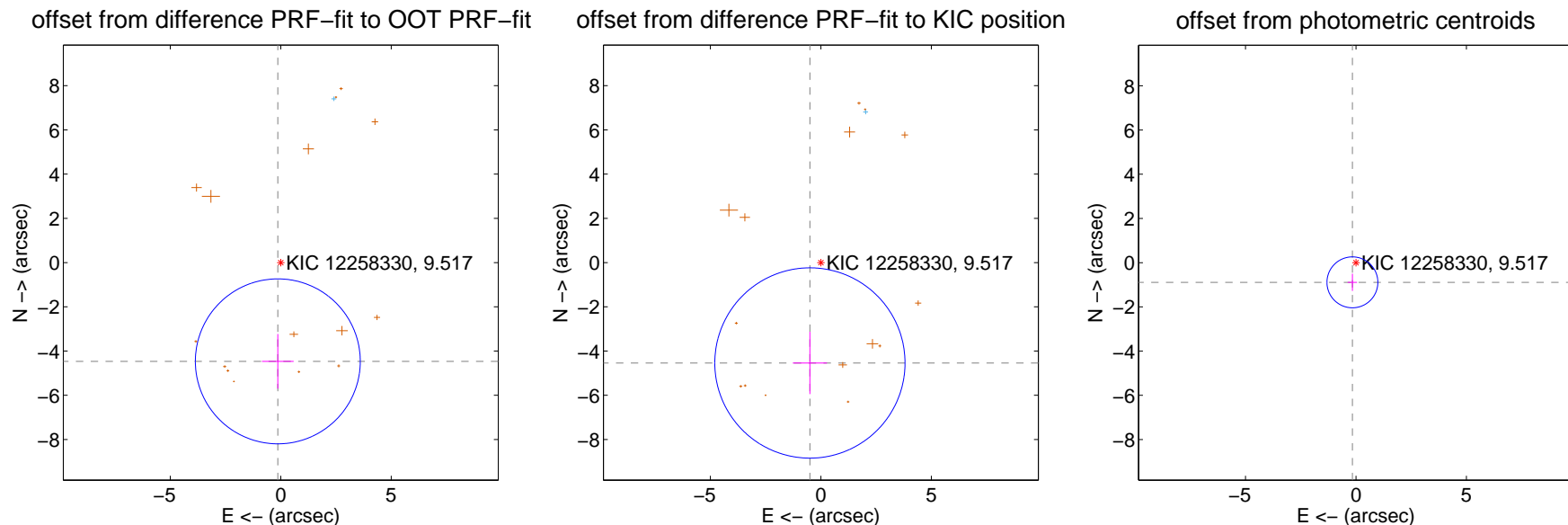
## DV Centroid Data

Supplemental centroid analysis for 012258330-05. **Kepler magnitude: 9.52.** Transit SNR 12.41

**There are 1 quarters with good PRF difference image offsets**

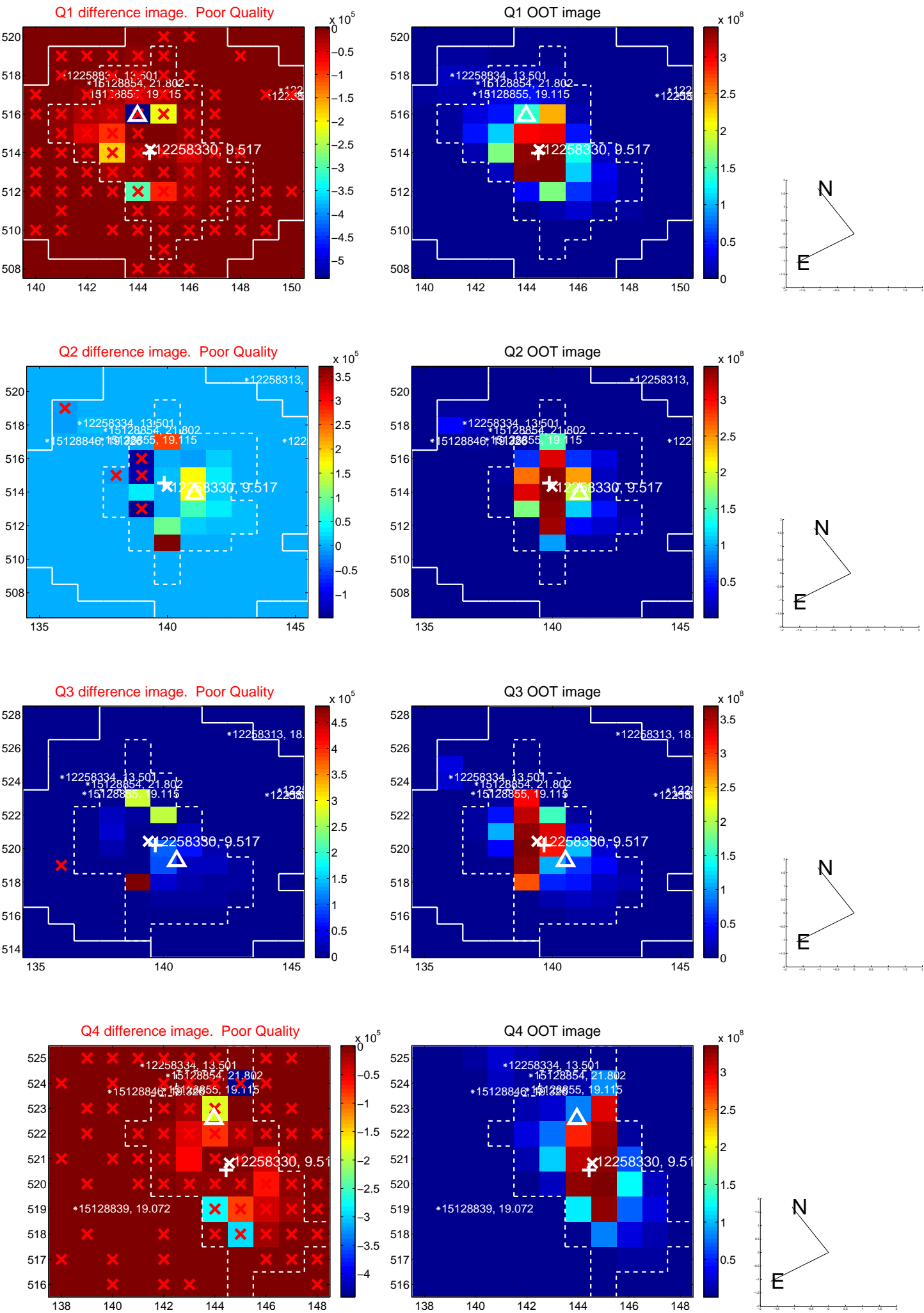
The direct PRF centroid is offset from the target star catalog position by about 0.71 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.469 \pm 1.243</math></b>	<b>3.59</b>	$0.133 \pm 0.716$	$-4.467 \pm 1.236$
PRF-fit source offset from KIC position	<b><math>4.567 \pm 1.434</math></b>	<b>3.18</b>	$0.496 \pm 0.773$	$-4.540 \pm 1.410$
photometric centroid source offset	$0.90 \pm 0.38$	2.35	$0.16 \pm 0.21$	$-0.89 \pm 0.39$

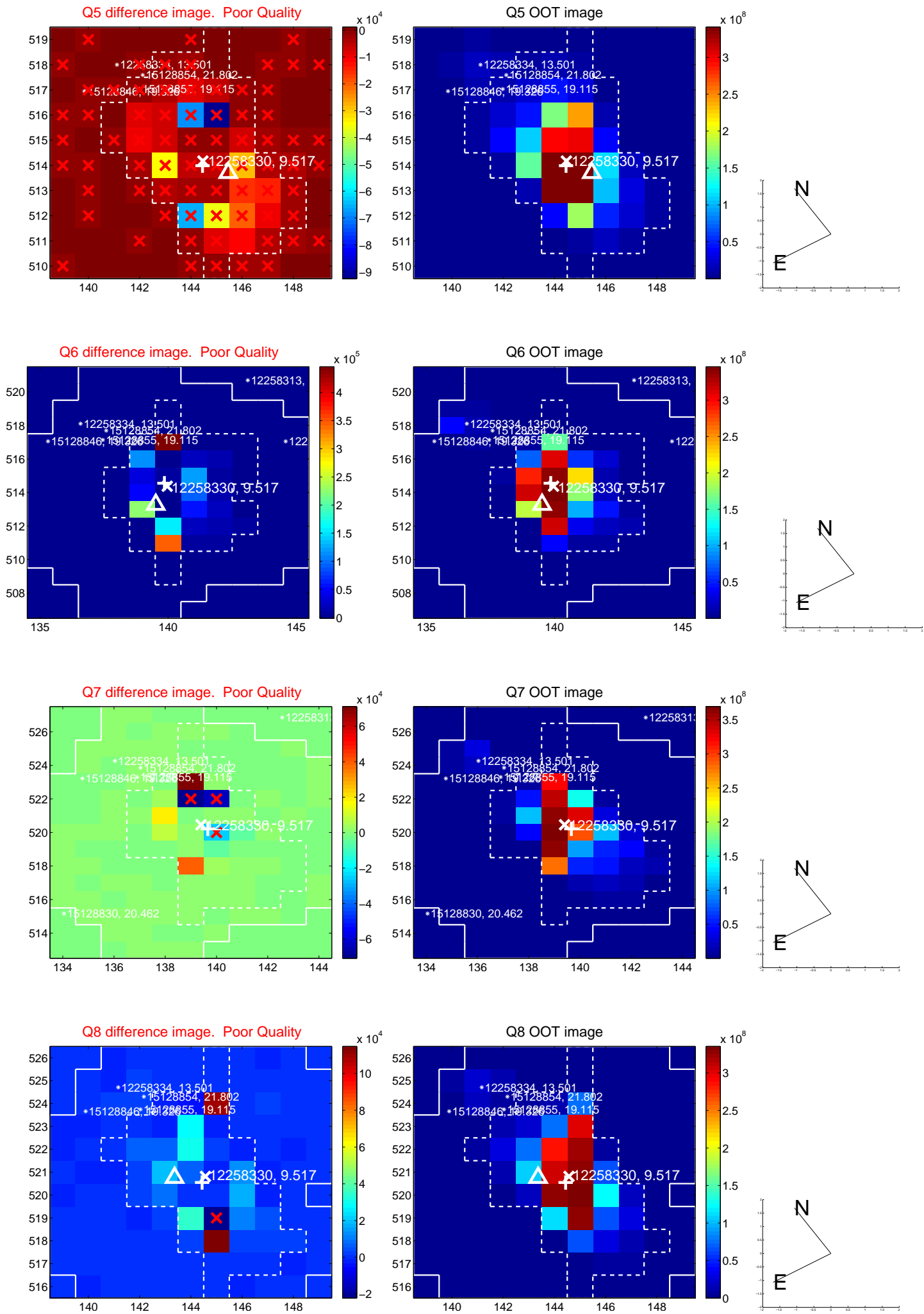


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

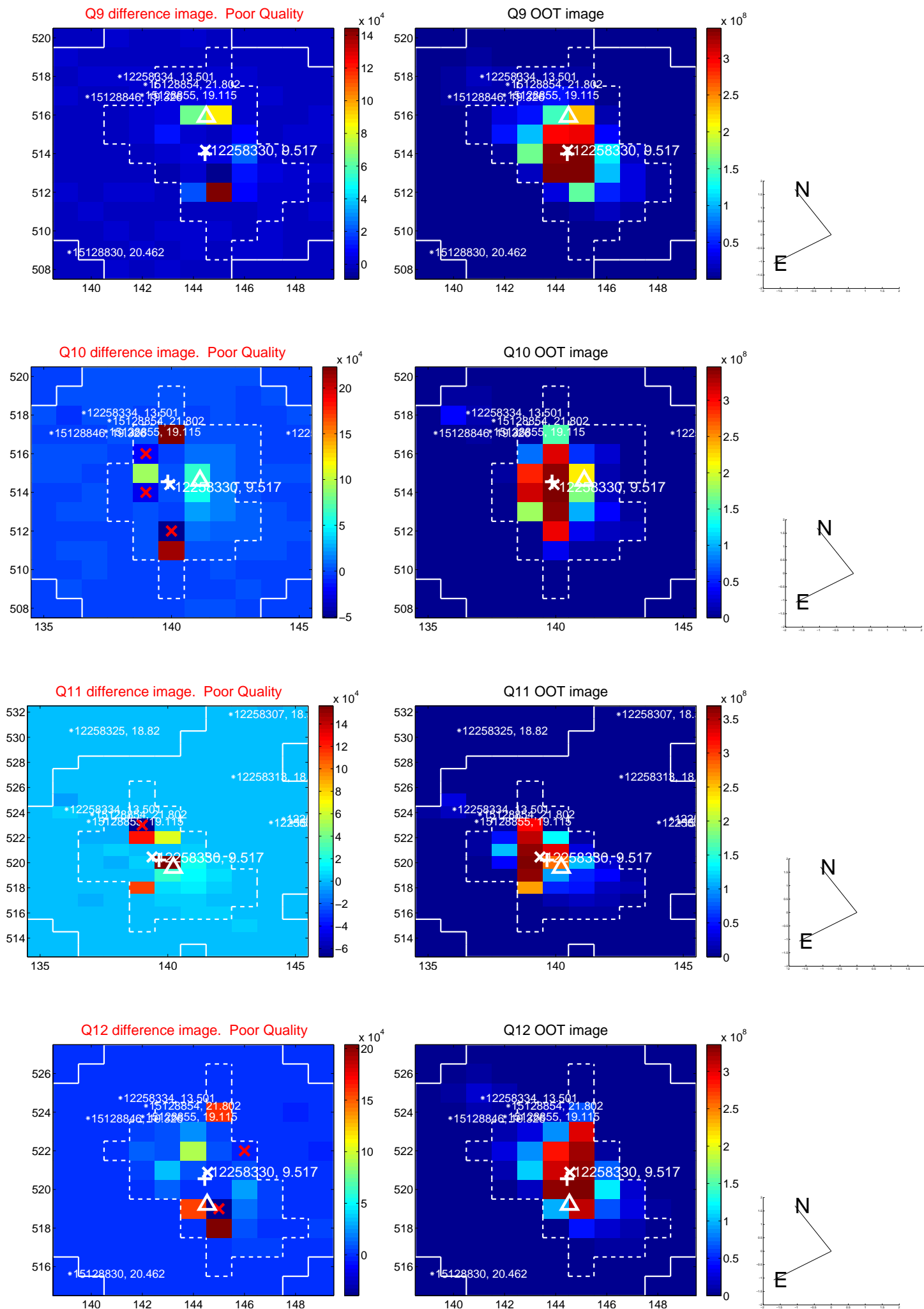
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

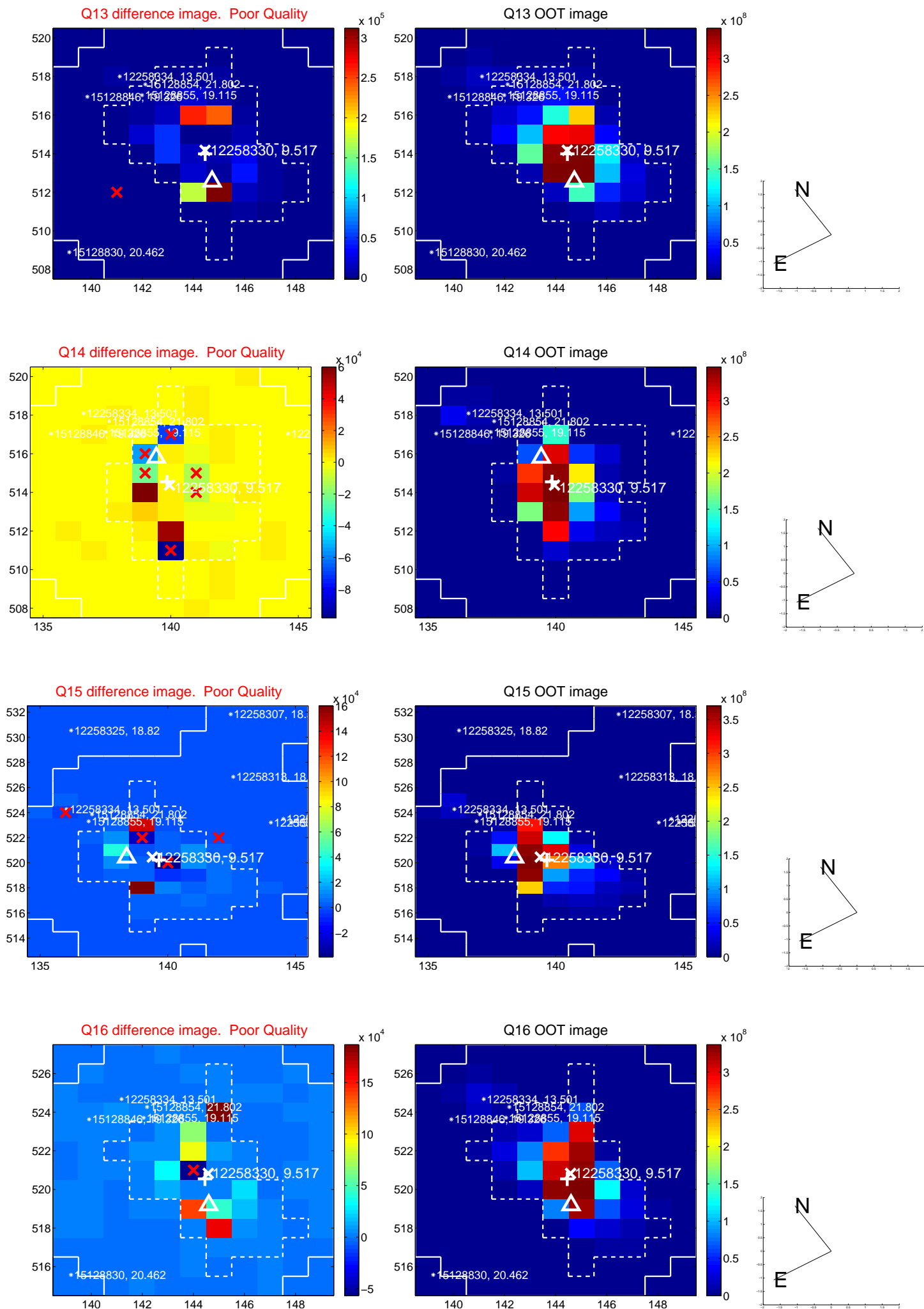


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

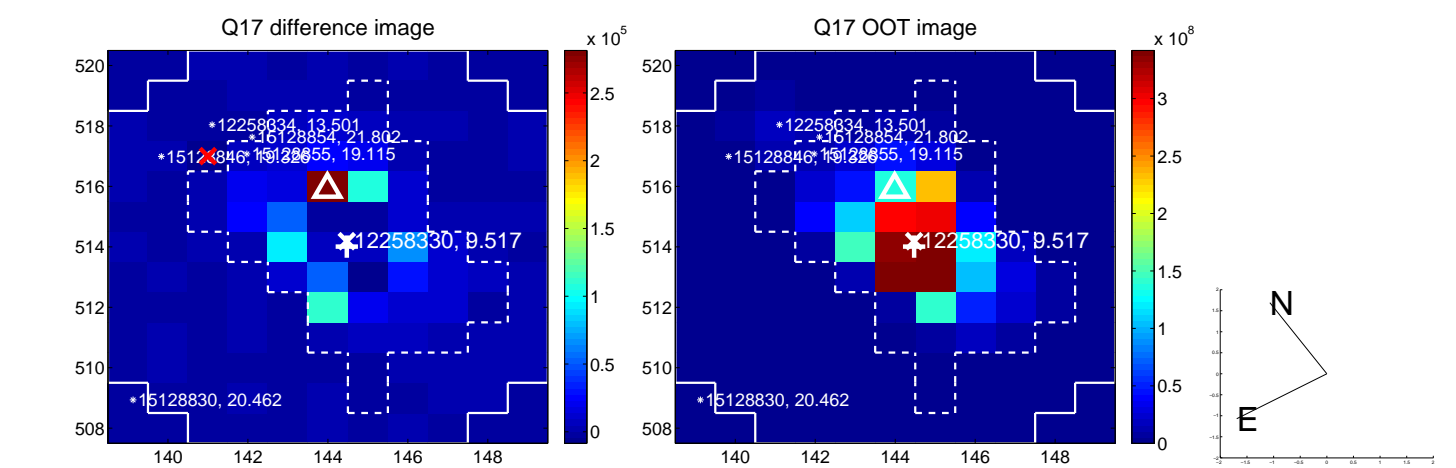




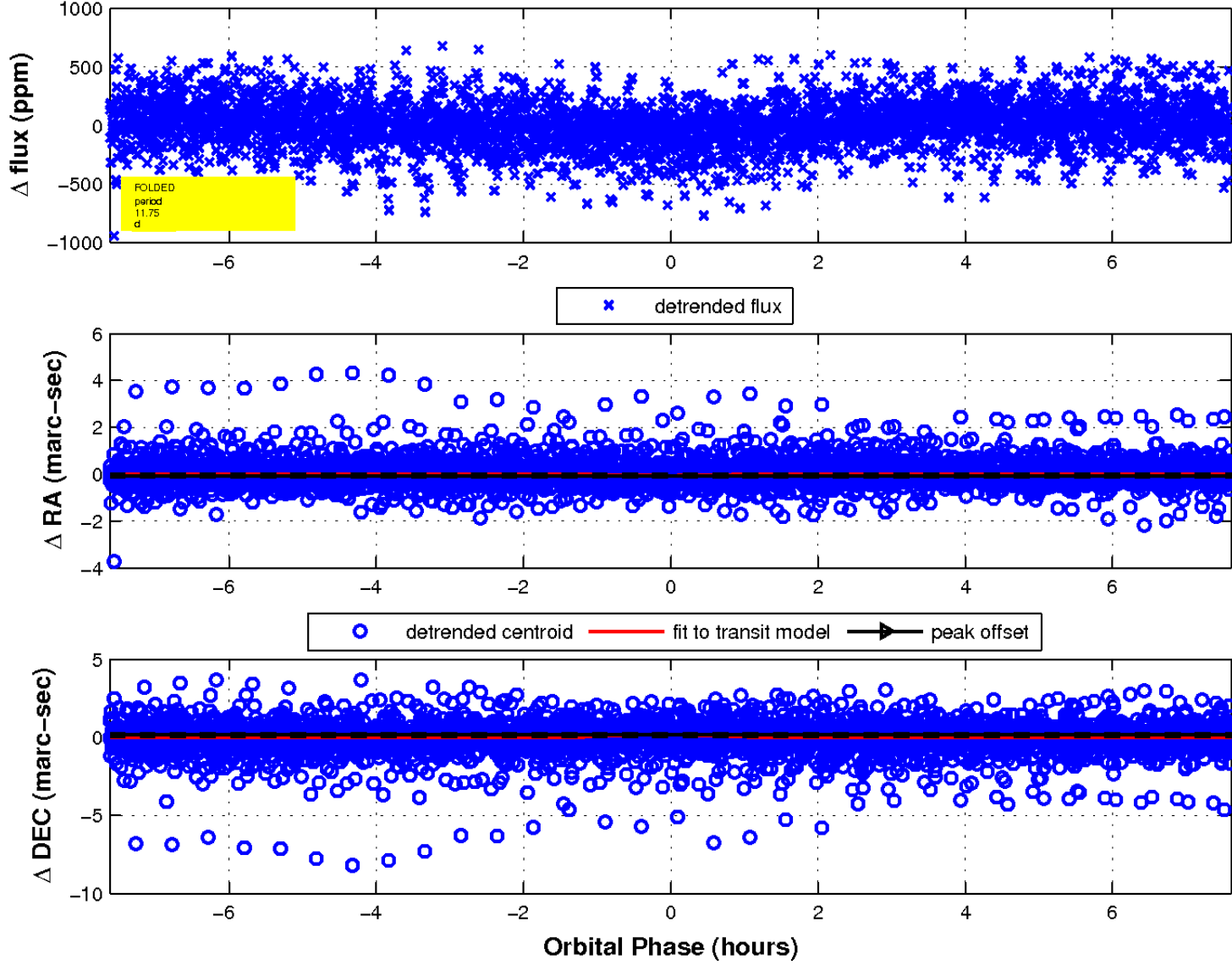
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

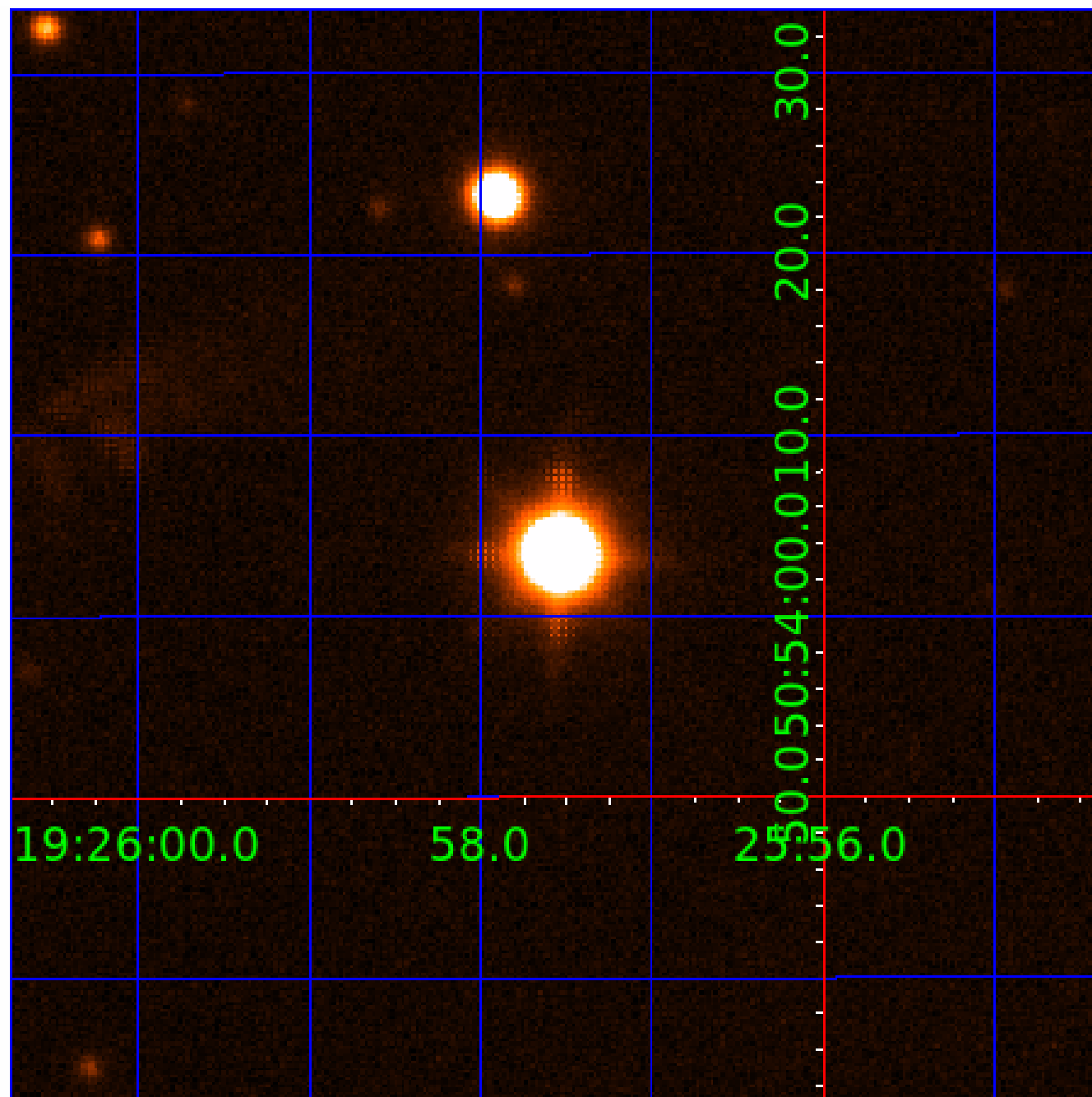


fluxWeightedCentroids, Planet 5 of 6



UKIRT Image

Declination



# KIC 012258330

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
012258330-01	OBS	No	0.560562	131.936057	10.0	3.719	7.7	7.1	3.52	13203	1.20	870195.78
012258330-02	OBS	No	34.763995	140.622865	378.7	2.902	13.3	11.0	3.52	13203	8.32	3544.94
012258330-03	OBS	No	37.002616	150.599033	43.4	1.486	10.6	2.3	3.52	13203	2.45	3261.91
012258330-04	OBS	No	37.768097	151.711678	291.1	1.005	10.3	7.2	3.52	13203	6.26	3174.06
012258330-05	OBS	No	11.750989	140.282150	222.5	2.539	9.3	12.4	3.52	13203	9.35	15055.07
012258330-06	OBS	No	34.743135	139.521782	280.0	2.754	9.0	9.0	3.52	13203	6.68	3547.78

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
012258330-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
012258330-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—CENT_SATURATED
012258330-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—CENT_SATURATED
012258330-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

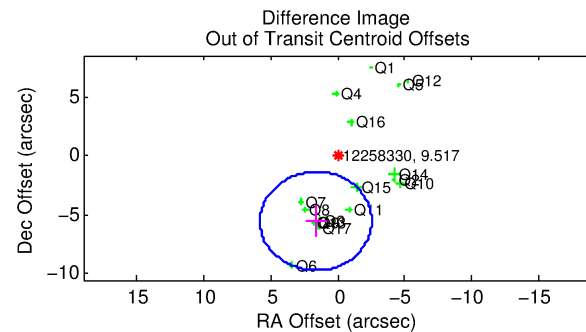
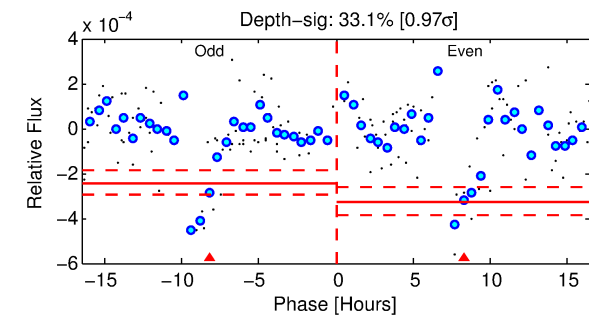
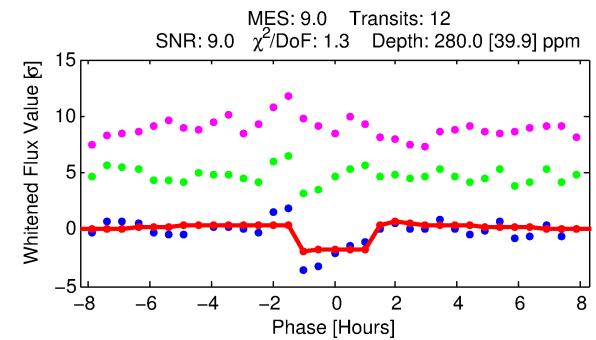
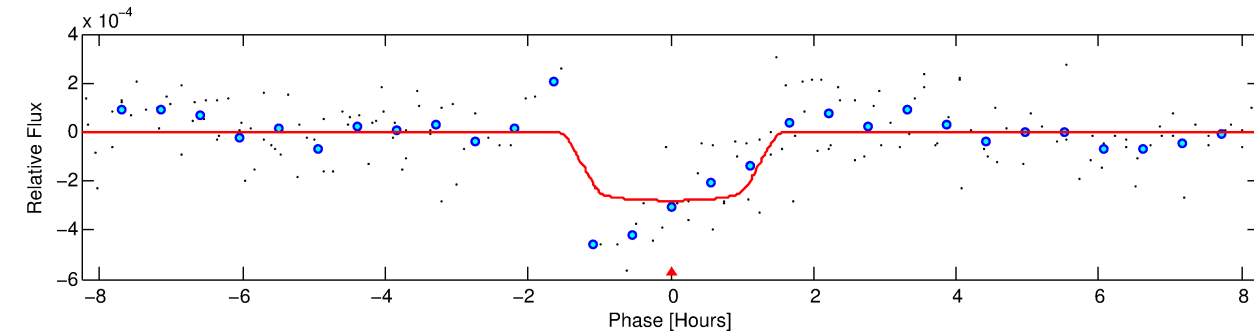
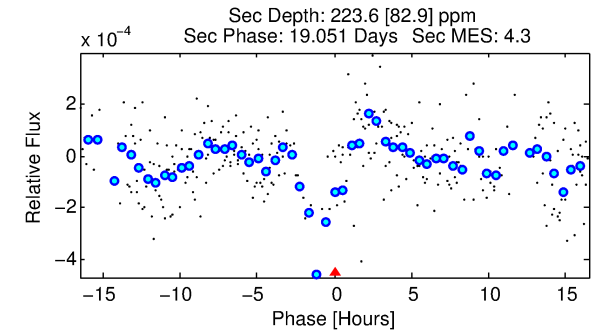
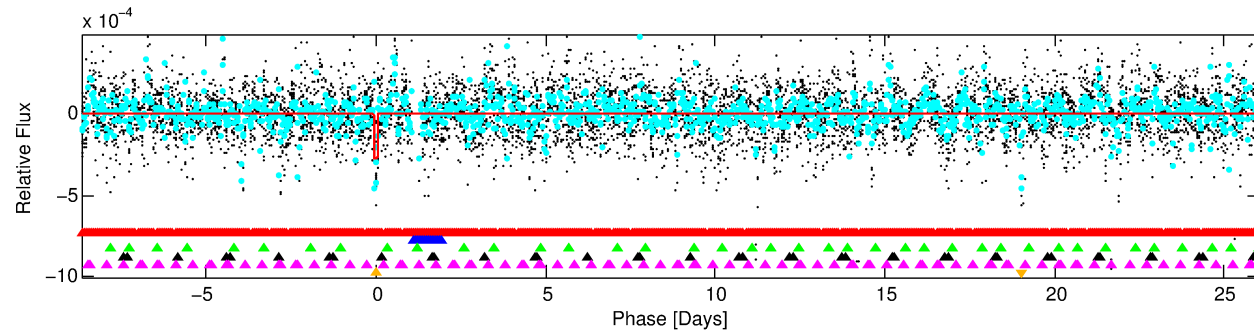
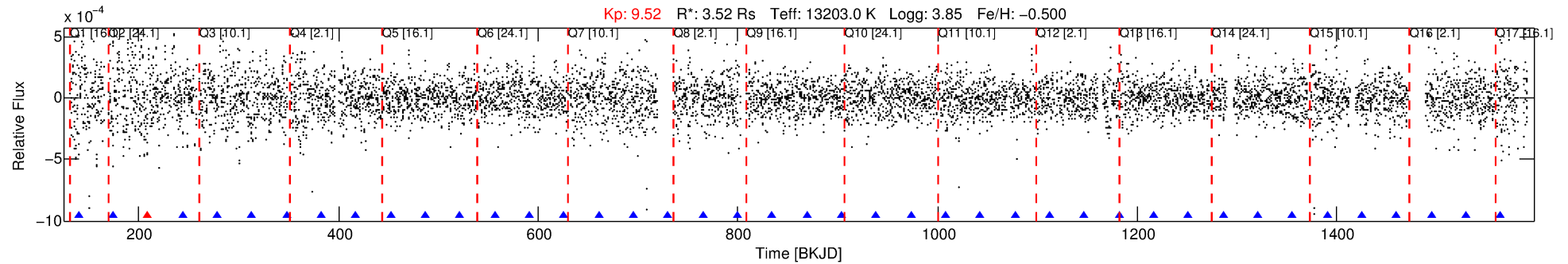
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 012258330-06

No Significant Match Found

# DV One-Page Summary

KIC: 12258330 Candidate: 6 of 6 Period: 34.743 d



## DV Fit Results:

Period = 34.74314 [0.00112] d  
Epoch = 139.5218 [0.0127] BKJD  
Rp/R\* = 0.0174 [0.0049]  
a/R\* = 45.78 [124.22]  
b = 0.90 [0.56]  
Seff = 3547.78 [3169.47]  
Teq = 1968 [440] K  
Rp = 6.68 [3.43] Re  
a = 0.3082 [0.1293] AU  
Ag = 261.83 [250.29] [1.04σ]  
Teffp = 12239 [2727] K [3.72σ]

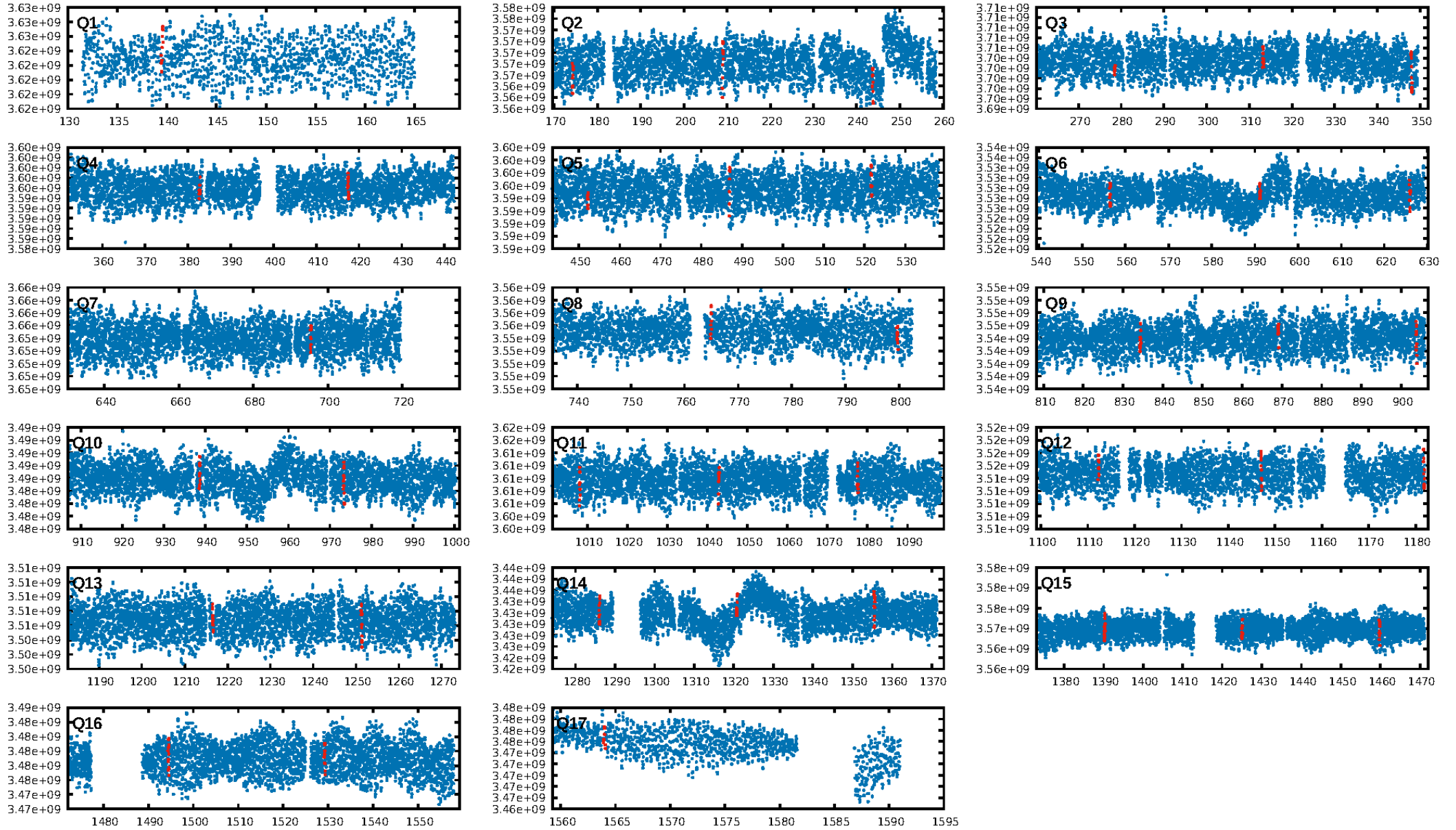
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [147.31σ]  
LongPeriod-sig: 10.0% [0.13σ]  
ModelChiSquare2-sig: 0.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 9.57e-14  
RollingBand-fgt: 0.90 [9/10]  
GhostDiagnostic-chr: N/A  
Centroid-sig: 82.6%  
Centroid-so: 0.322 arcsec [0.92σ]  
OotOffset-rm: 5.758 arcsec [4.14σ]  
KicOffset-rm: 6.468 arcsec [4.71σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.06 [1/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 02:14:25 Z

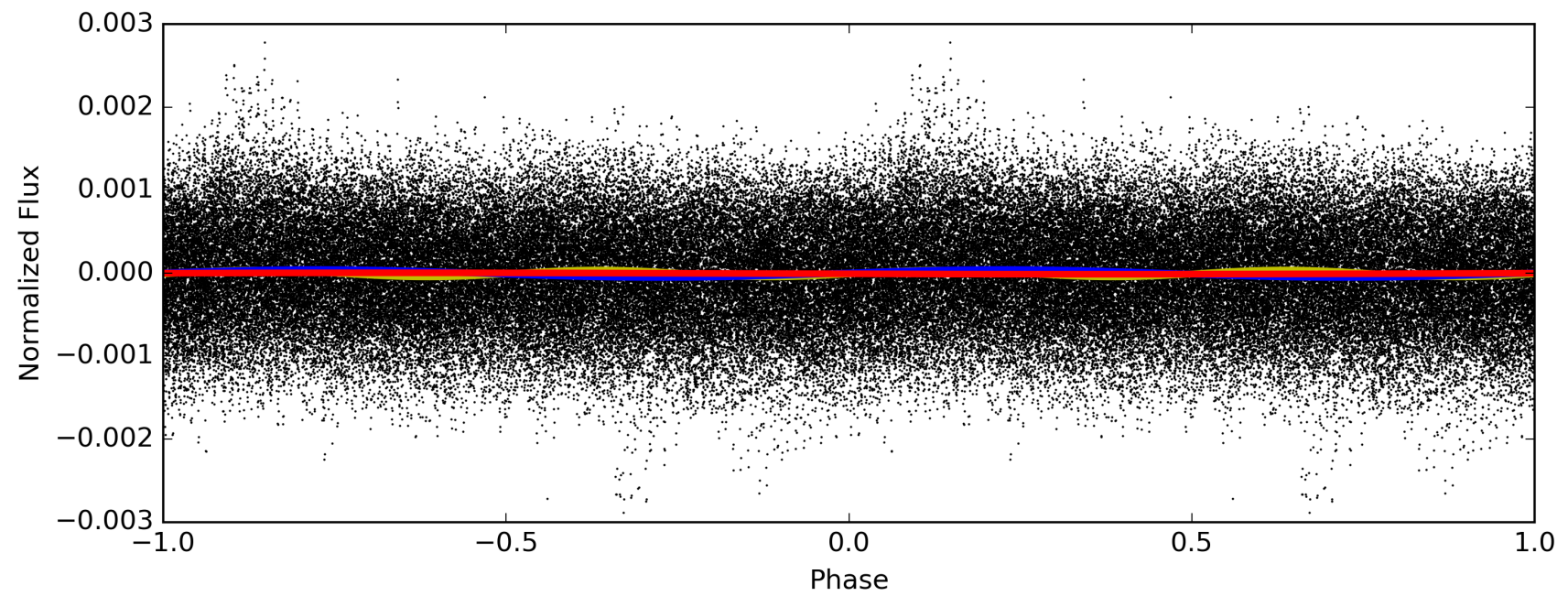
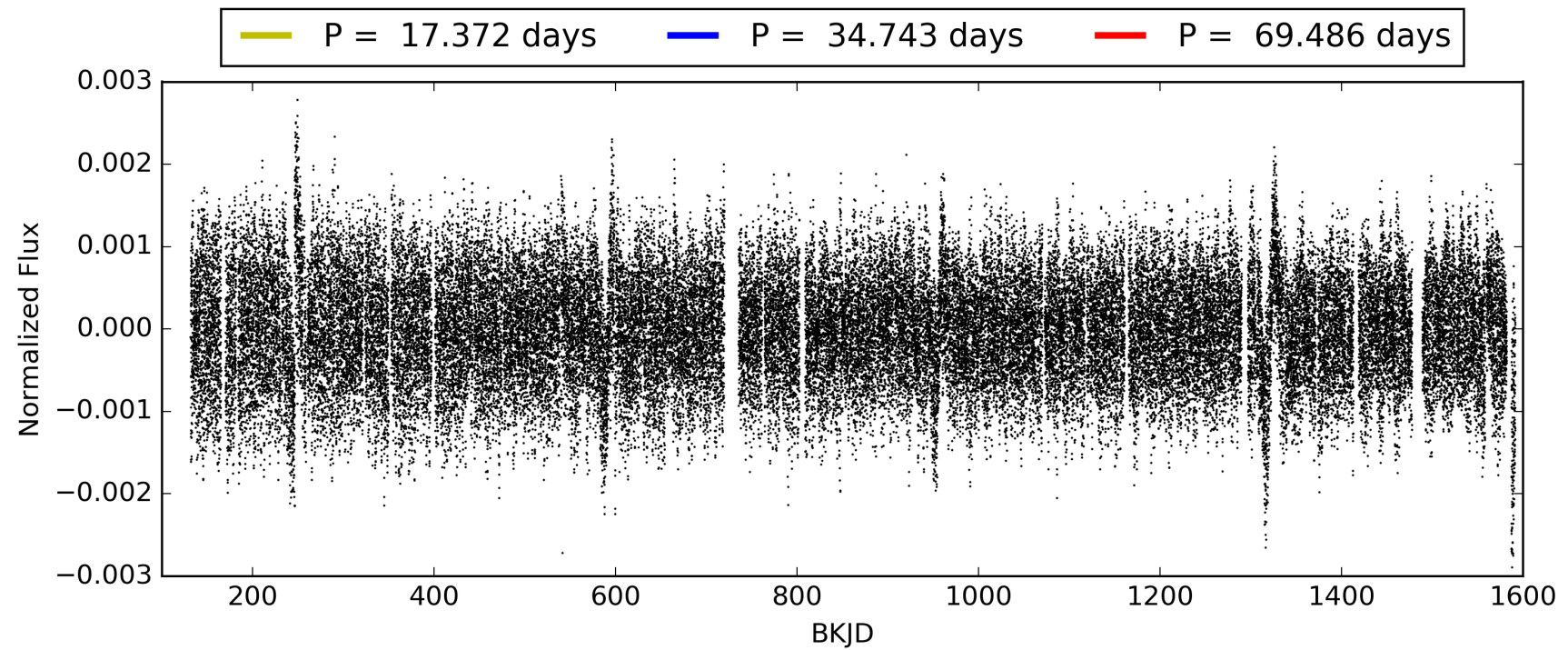
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 012258330-06, PDC Light Curves





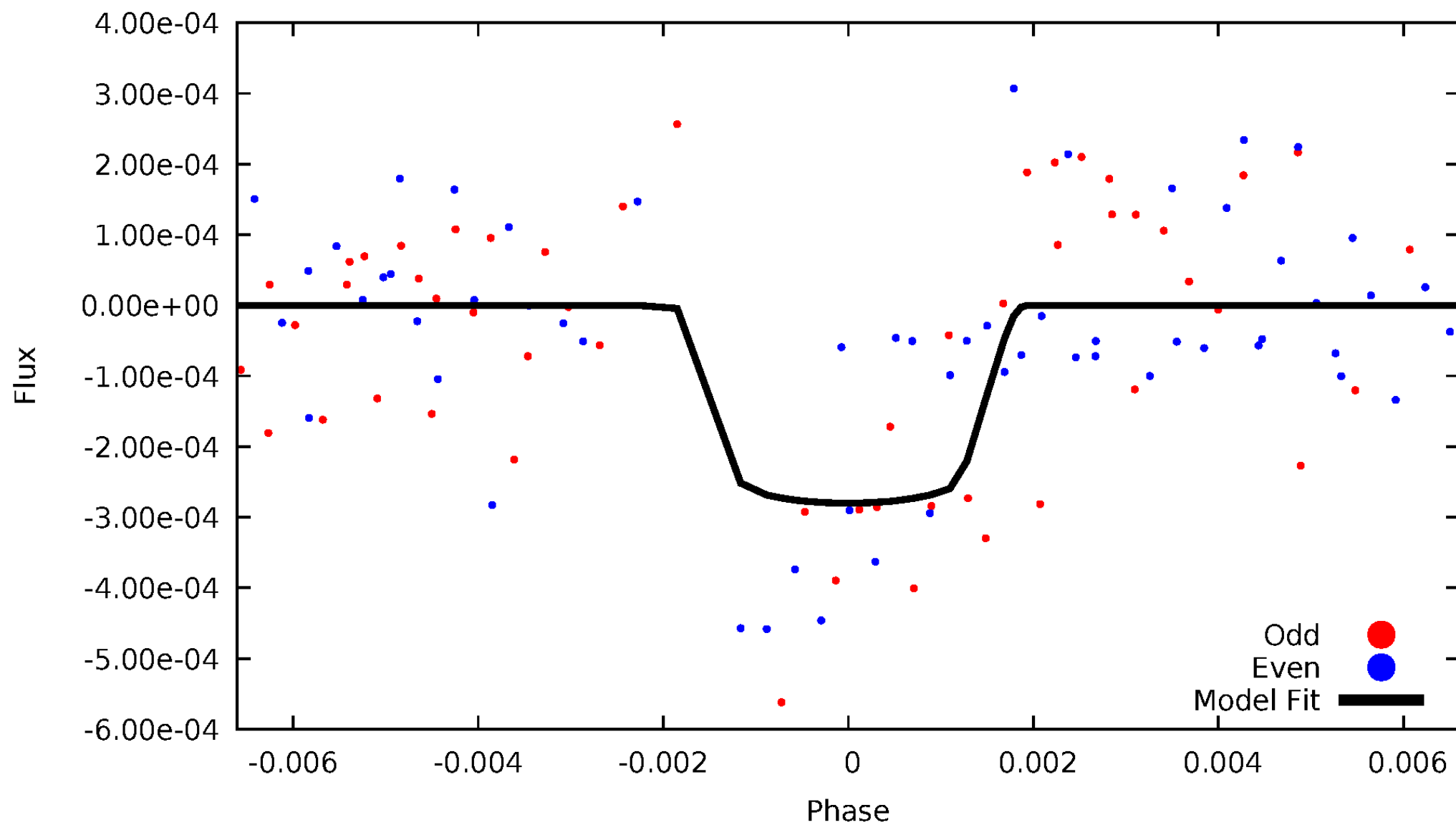
TCE 012258330-06





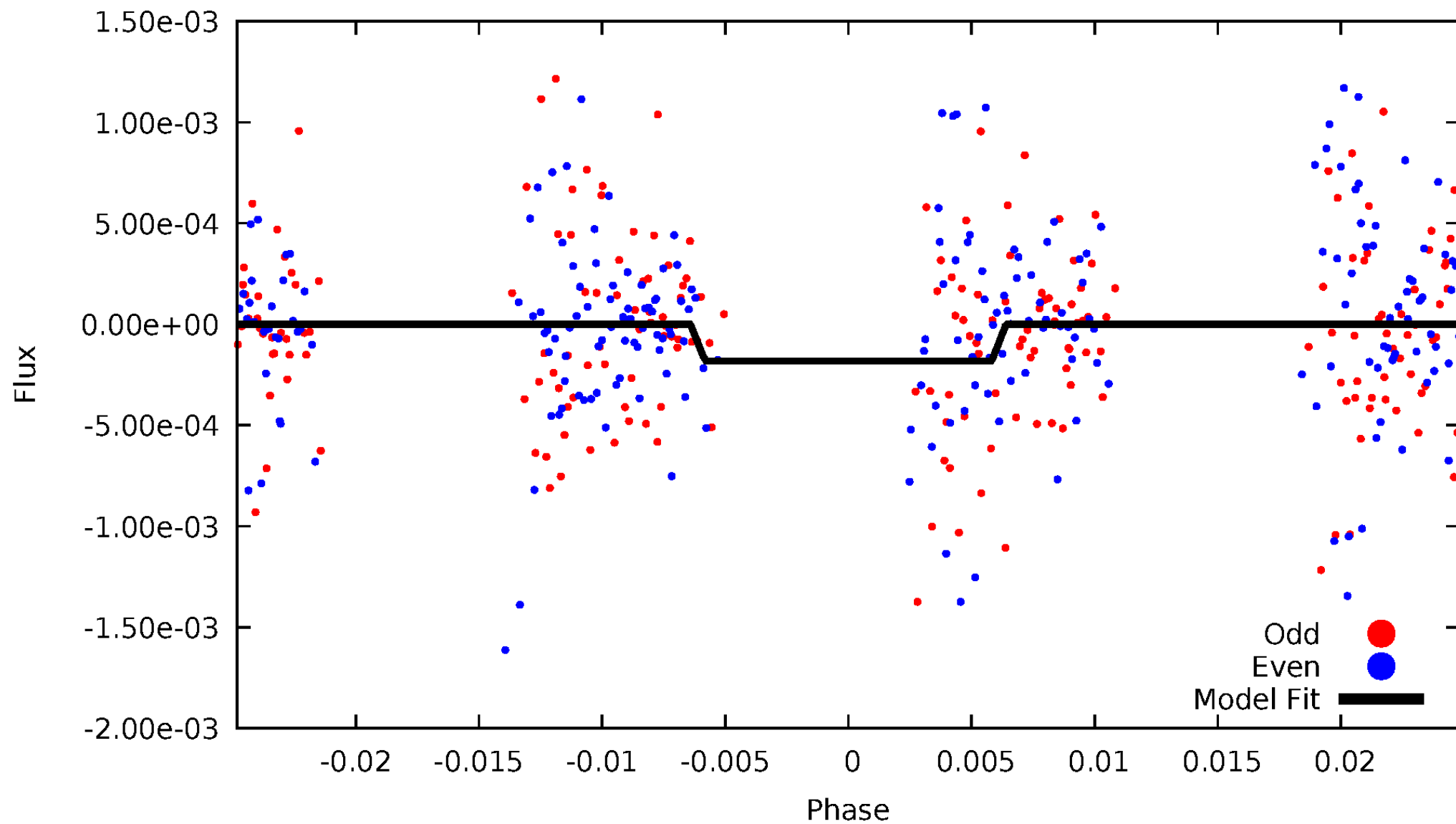
# DV Odd/Even

TCE 012258330-06



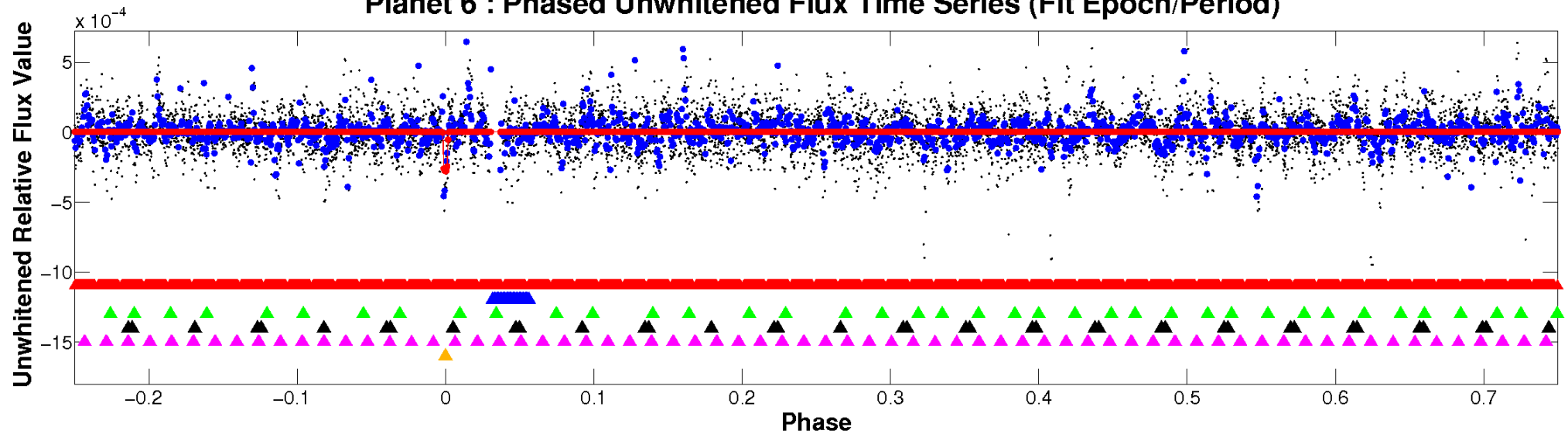
# ALT Odd/Even

TCE 012258330-06

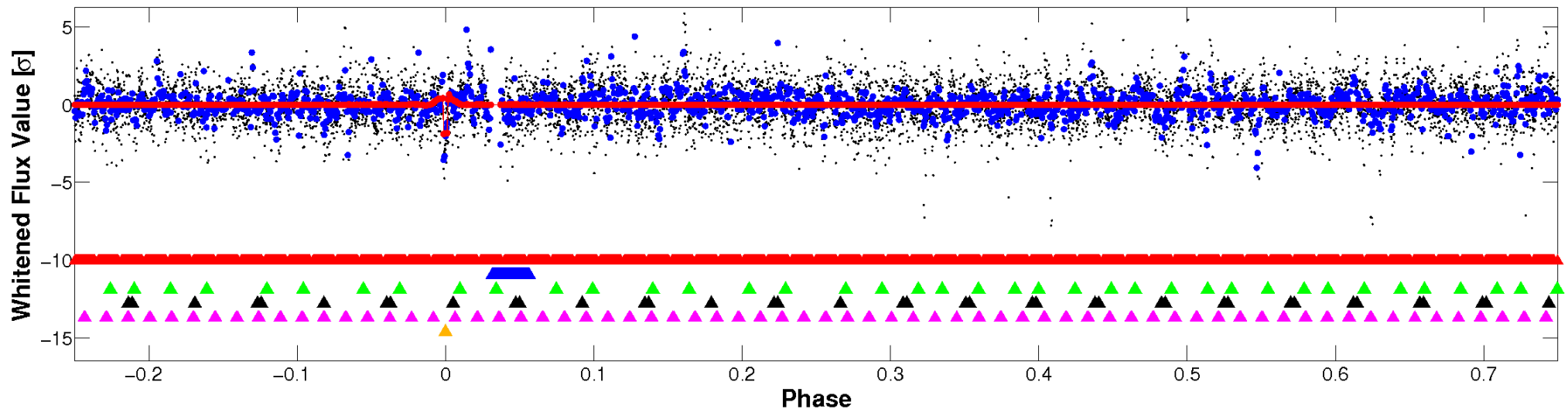


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

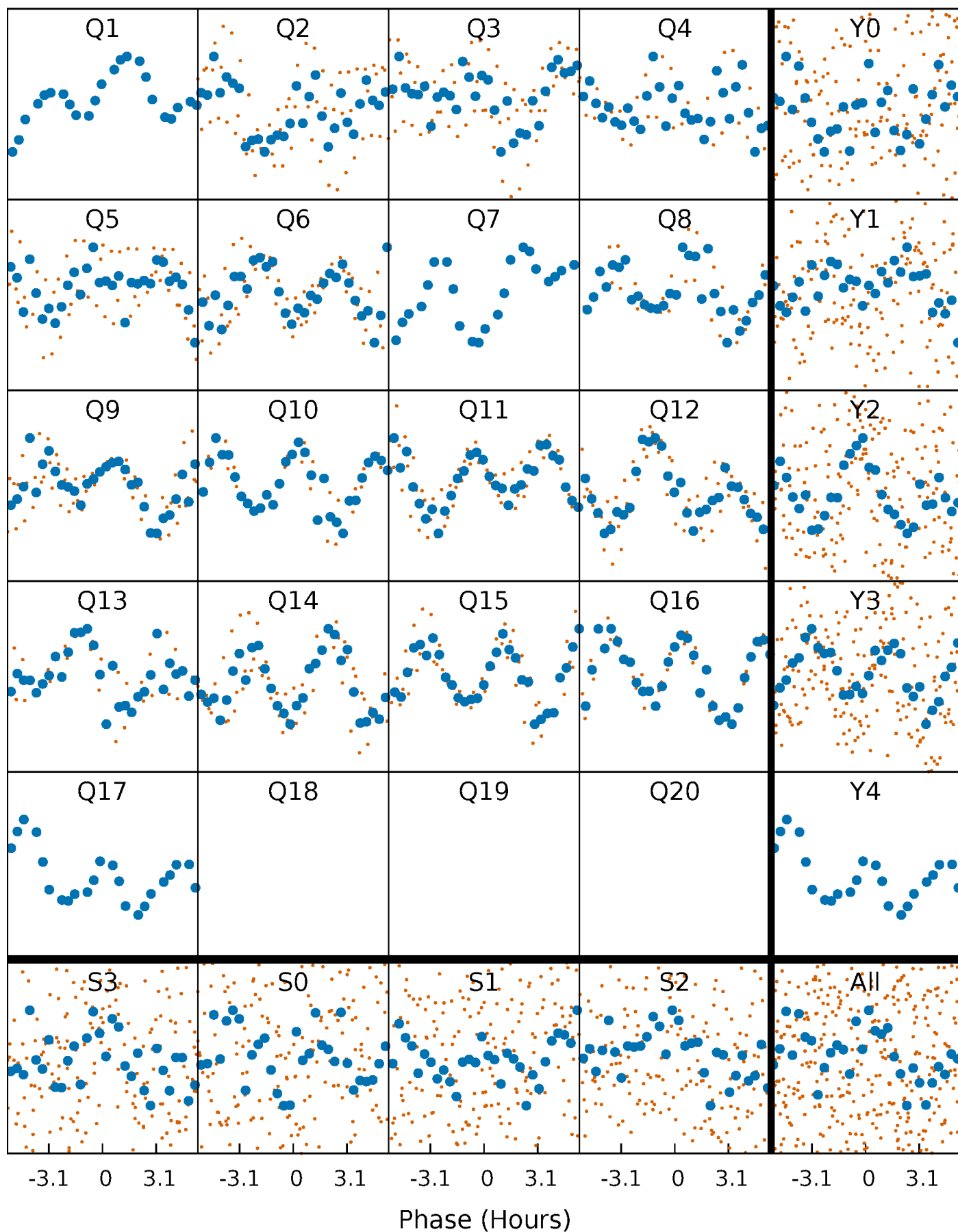


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



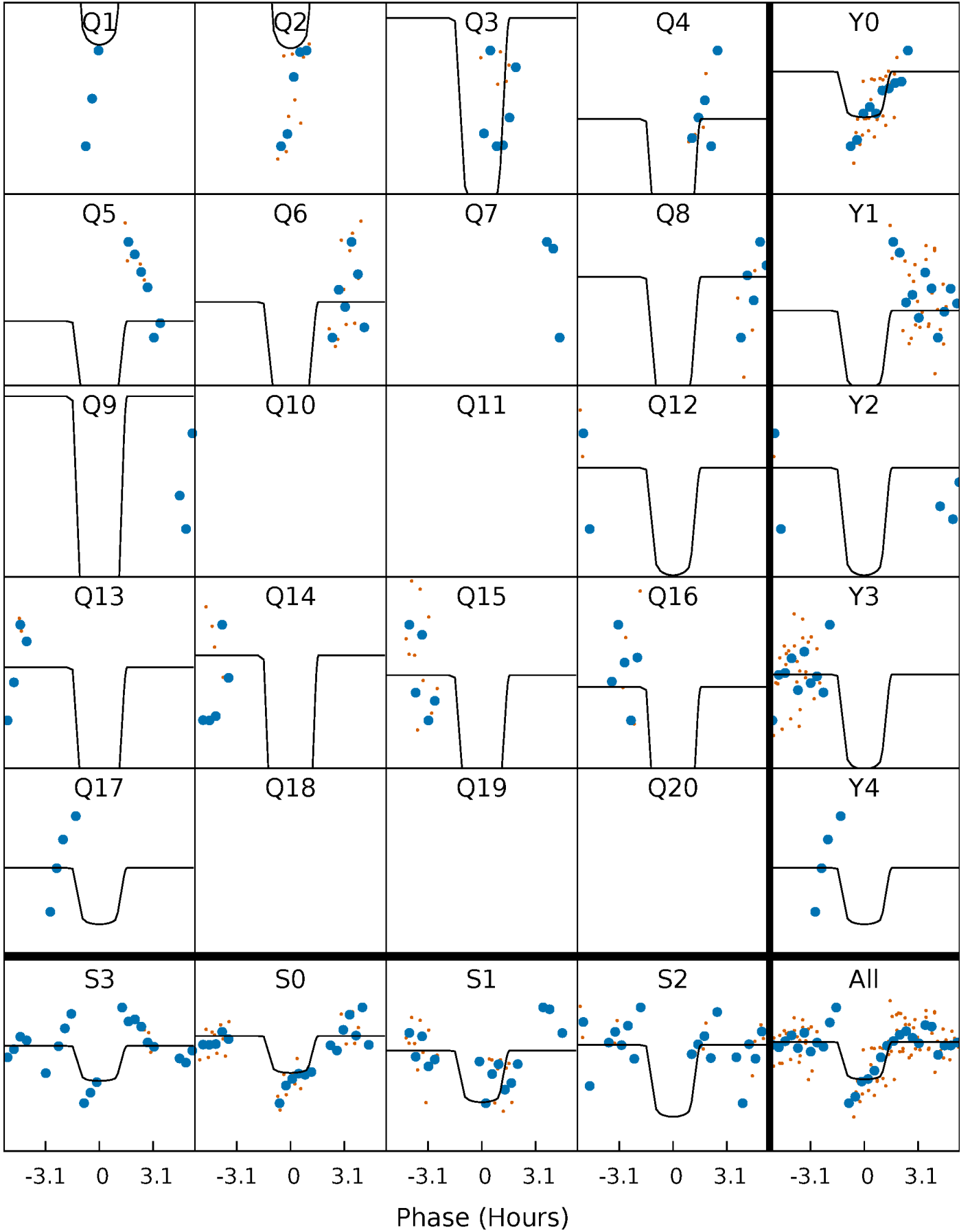
# PDC Quarter-Phased Transit Curves

TCE 012258330-06 P= 34.743135 Days  $T_0=139.521782$  (BKJD)



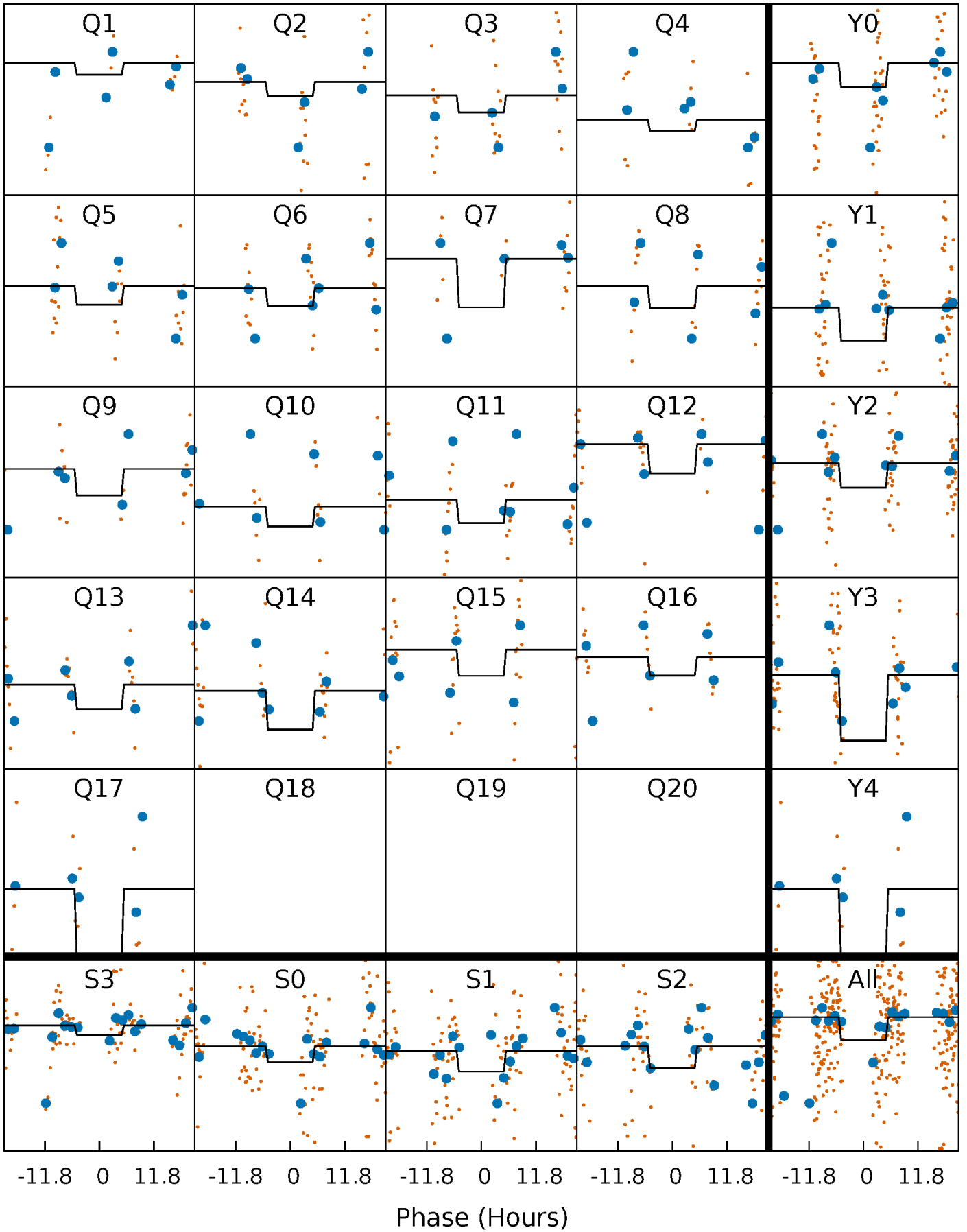
# DV Quarter-Phased Transit Curves

TCE 012258330-06   P= 34.743135 Days    $T_0=139.521782$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

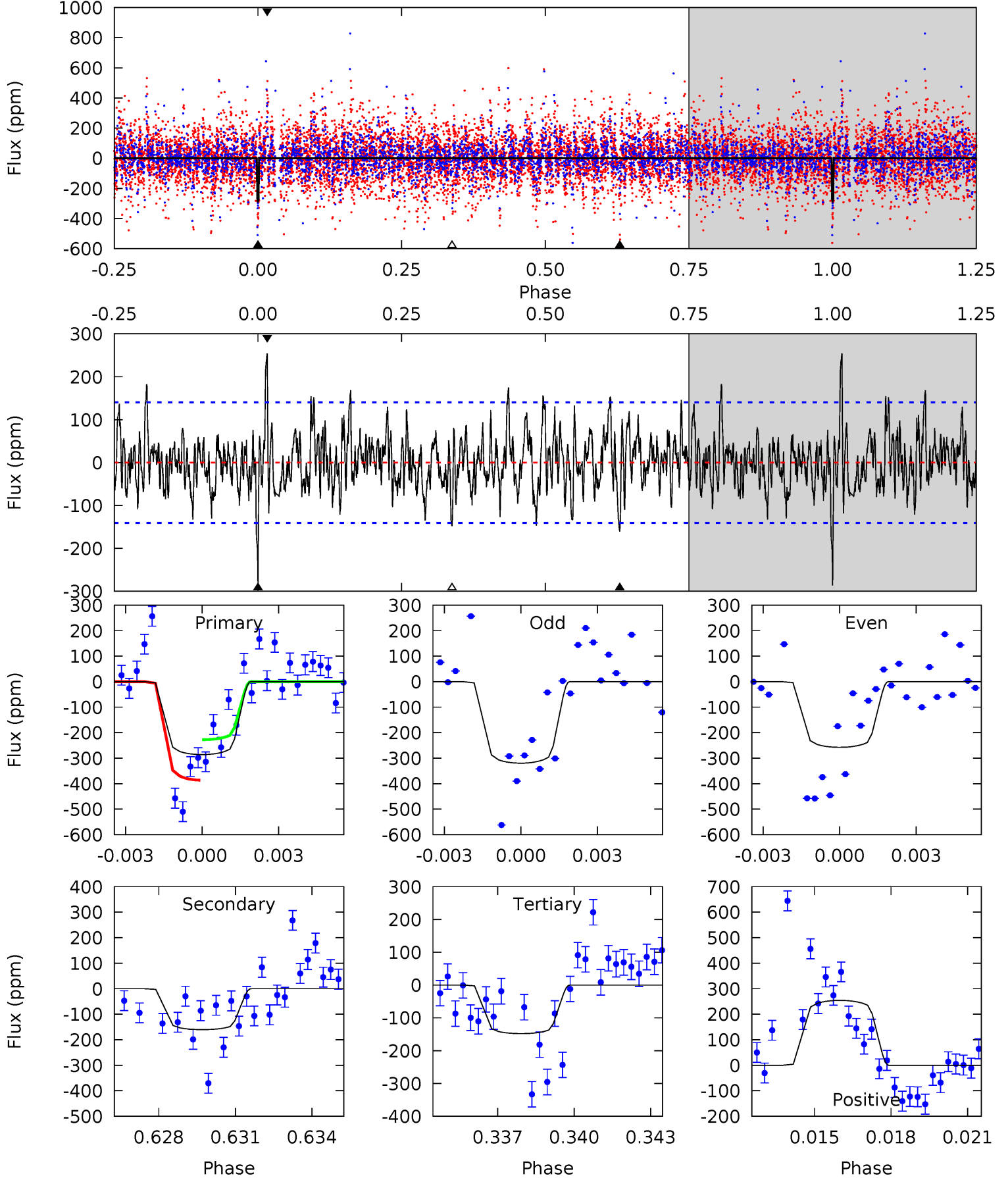
TCE 012258330-06 P= 34.748983 Days  $T_0=139.393071$  (BKJD)



# DV Model-Shift Uniqueness Test

012258330-06, P = 34.743135 Days, E = 104.778647 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
10.7	6.00	5.54	9.50	5.25	2.96	1.95	5.16	1.19	0.46	-3.50	1.16	0.75	0.47	2.68

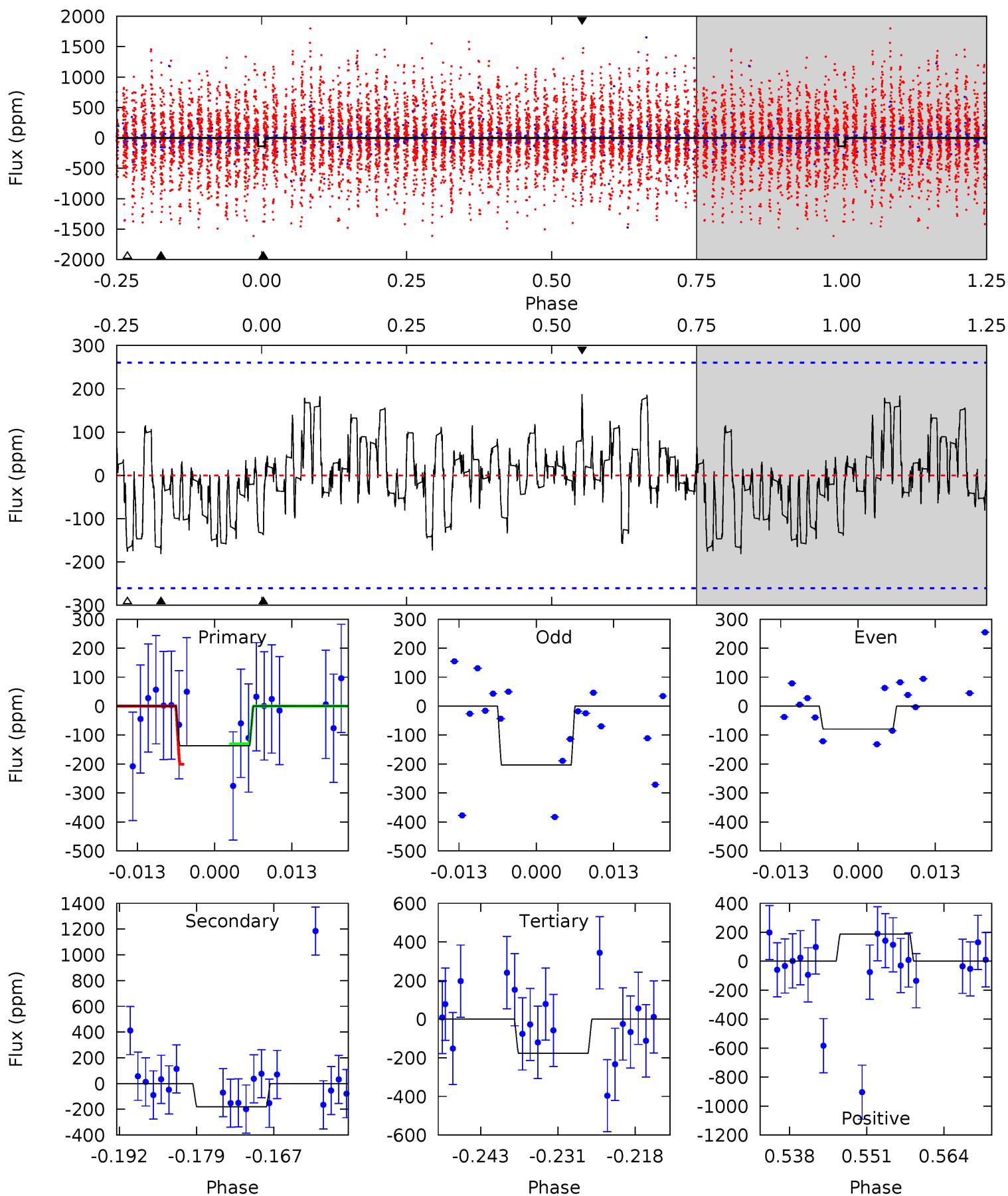




# Alt Model-Shift Uniqueness Test

012258330-06, P = 34.748983 Days, E = 104.644088 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
2.63	3.47	3.37	3.59	4.98	2.49	1.16	-0.74	-0.97	0.10	-0.13	1.19	0.86	0.51	0.47



### Stellar Parameters For KIC 012258330

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$13203^{+480}_{-1923}$	$3.855^{+0.400}_{-0.100}$	$-0.500^{+0.600}_{-0.050}$	$3.518^{+0.402}_{-1.508}$	$3.230^{+0.098}_{-0.880}$	$0.104^{+0.351}_{-0.032}$
	+4%/-15%	+10%/-3%	+120%/-10%	+11%/-43%	+3%/-27%	+336%/-31%
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 012258330-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-160 \pm 27$	$5.99^{+2.10}_{-1.92}$	$2591^{+279}_{-380}$	$9903^{+3352}_{-1833}$	$222^{+268}_{-103}$
Alt.	$-181 \pm 52$	$4.76^{+1.94}_{-1.94}$	$2613^{+249}_{-426}$	$12547^{+7314}_{-3247}$	$407^{+719}_{-218}$

$T_{max}$  = 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

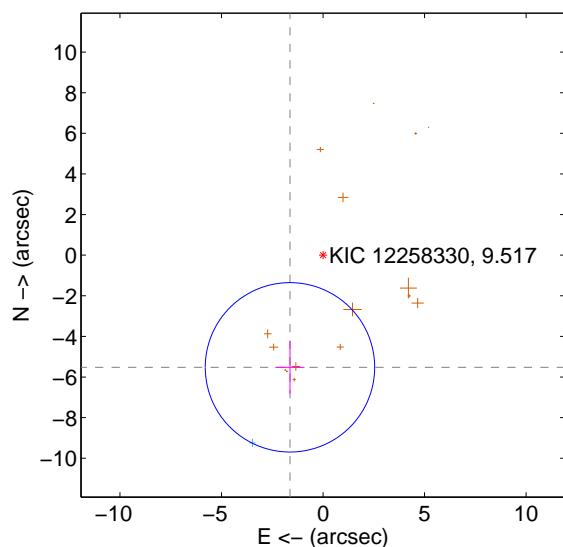
Supplemental centroid analysis for 012258330-06. **Kepler magnitude: 9.52.** Transit SNR 9.05

**There are 1 quarters with good PRF difference image offsets**

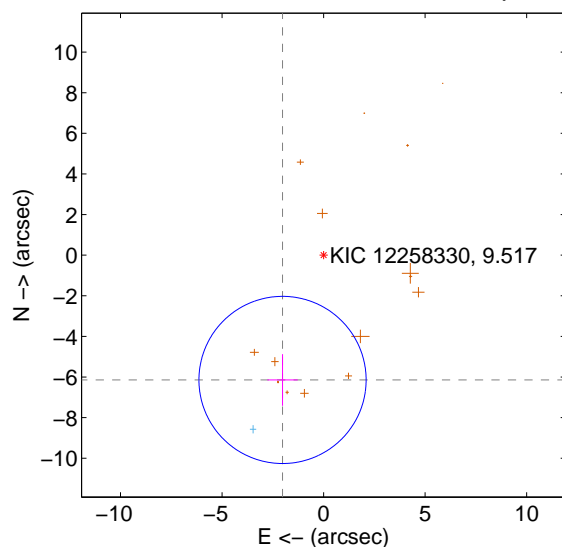
The direct PRF centroid is offset from the target star catalog position by about 0.73 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>5.758 \pm 1.390</math></b>	<b>4.14</b>	$1.628 \pm 0.719$	$-5.523 \pm 1.292$
PRF-fit source offset from KIC position	<b><math>6.468 \pm 1.372</math></b>	<b>4.71</b>	$2.022 \pm 0.749$	$-6.144 \pm 1.271$
photometric centroid source offset	$0.32 \pm 0.35$	0.92	$-0.22 \pm 0.22$	$-0.24 \pm 0.43$

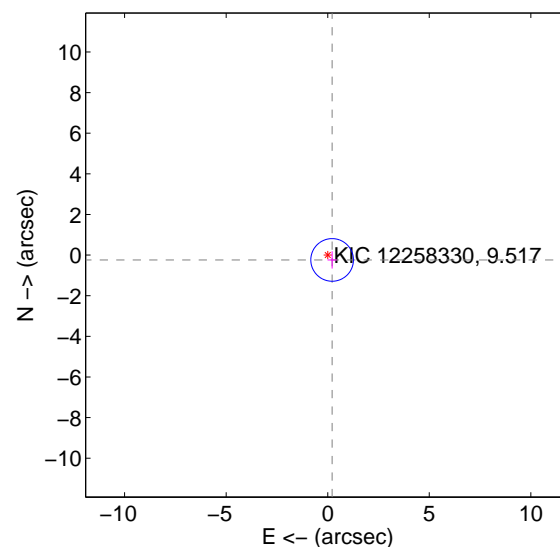
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

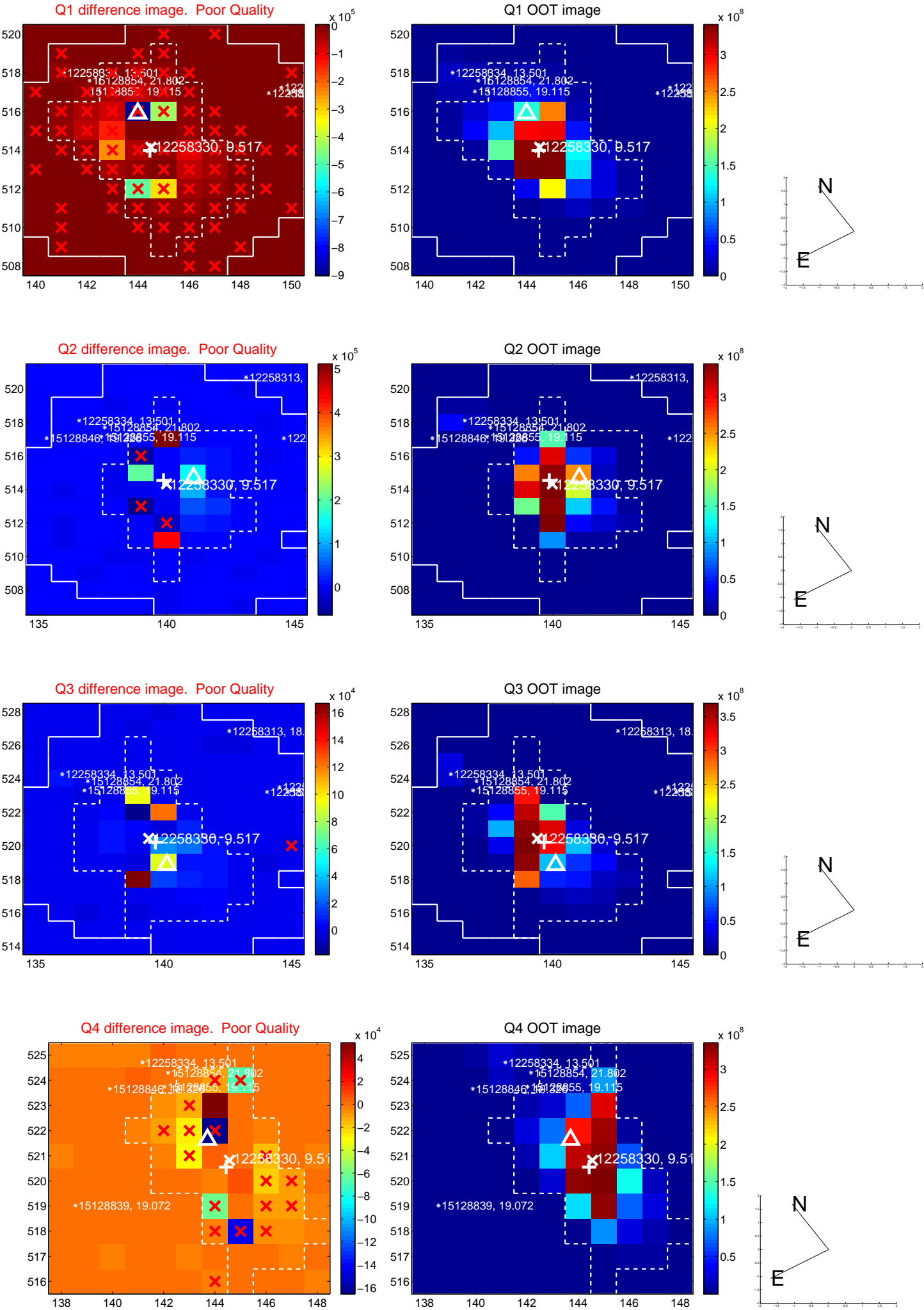


offset from photometric centroids

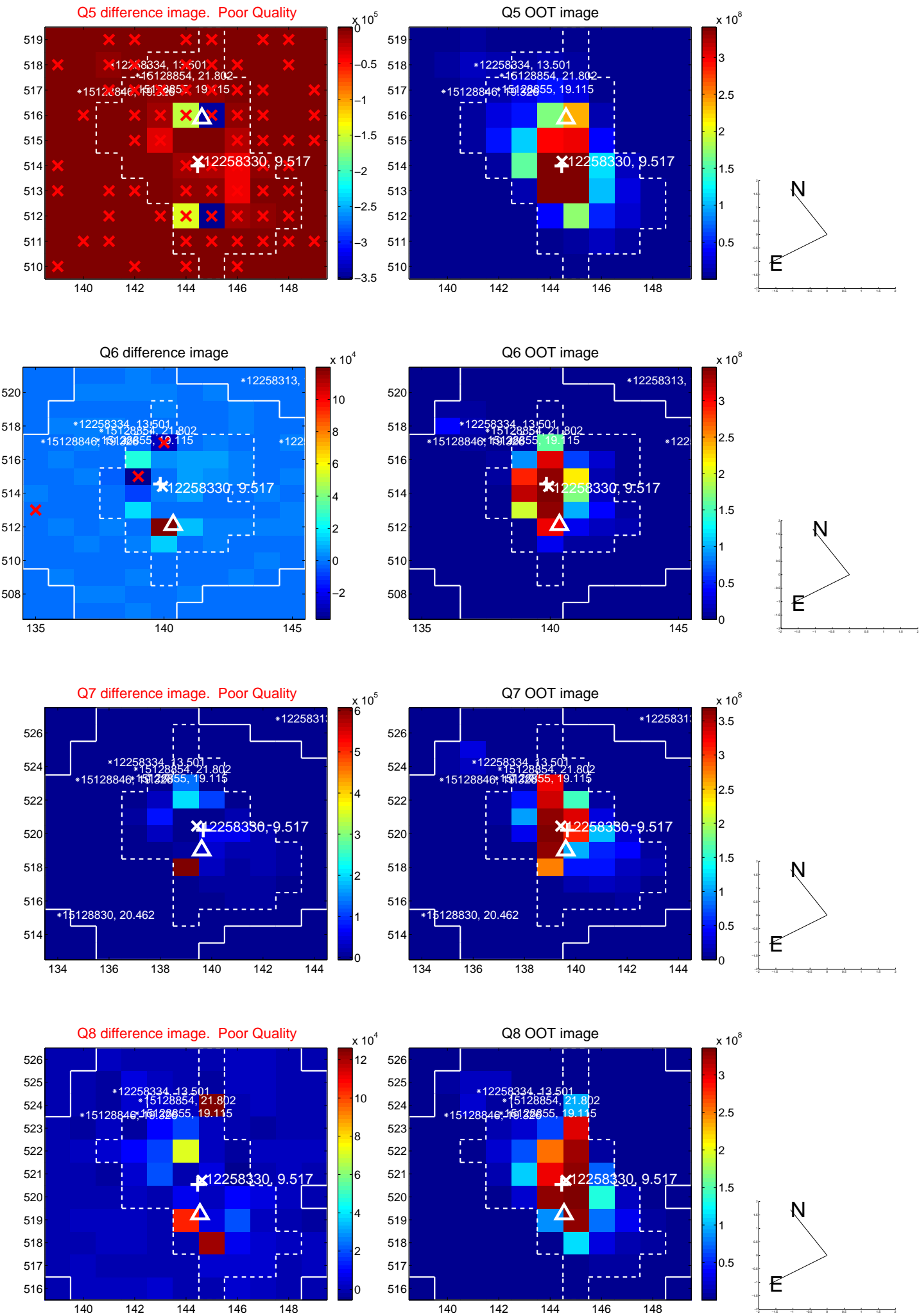


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

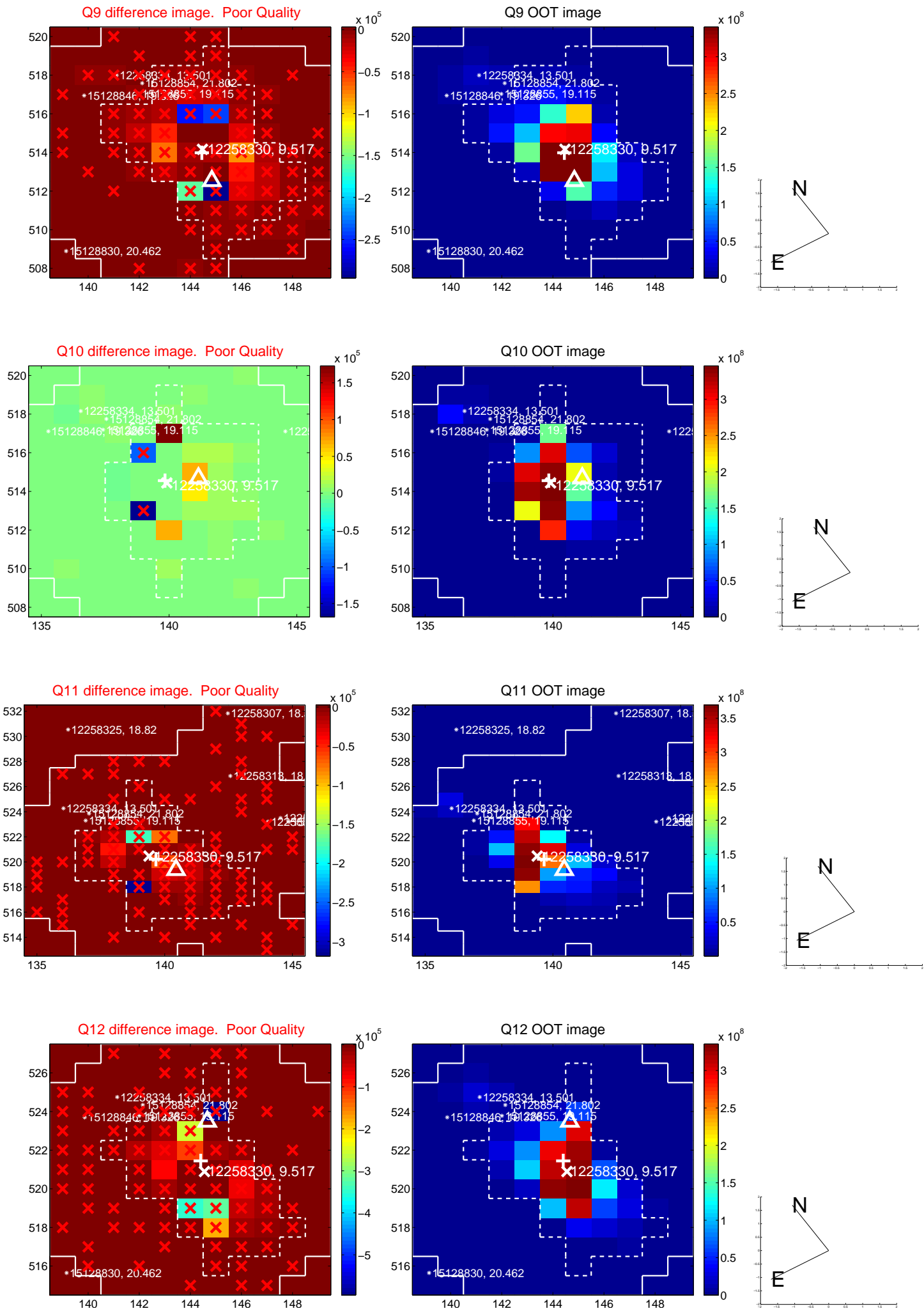
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



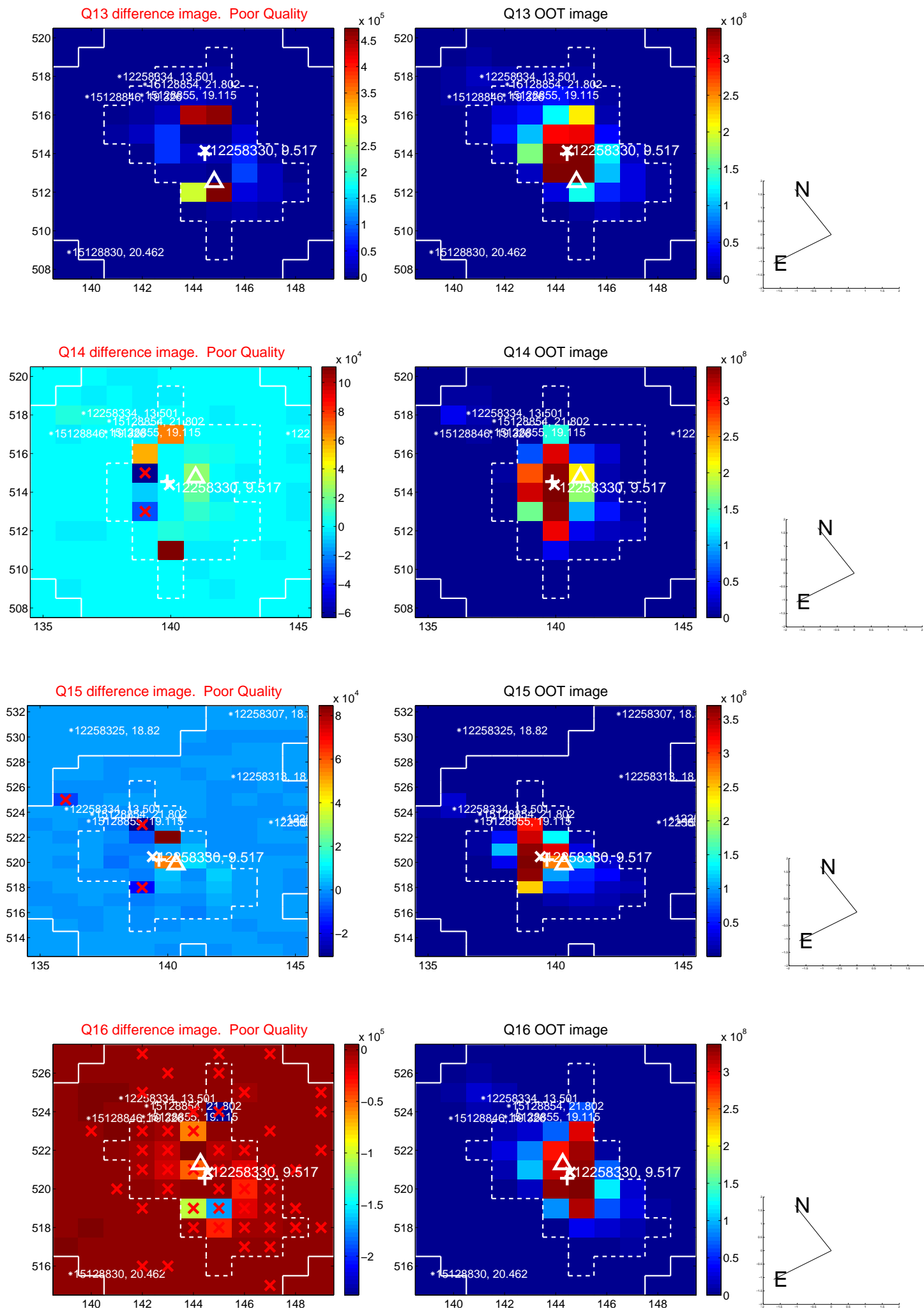
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

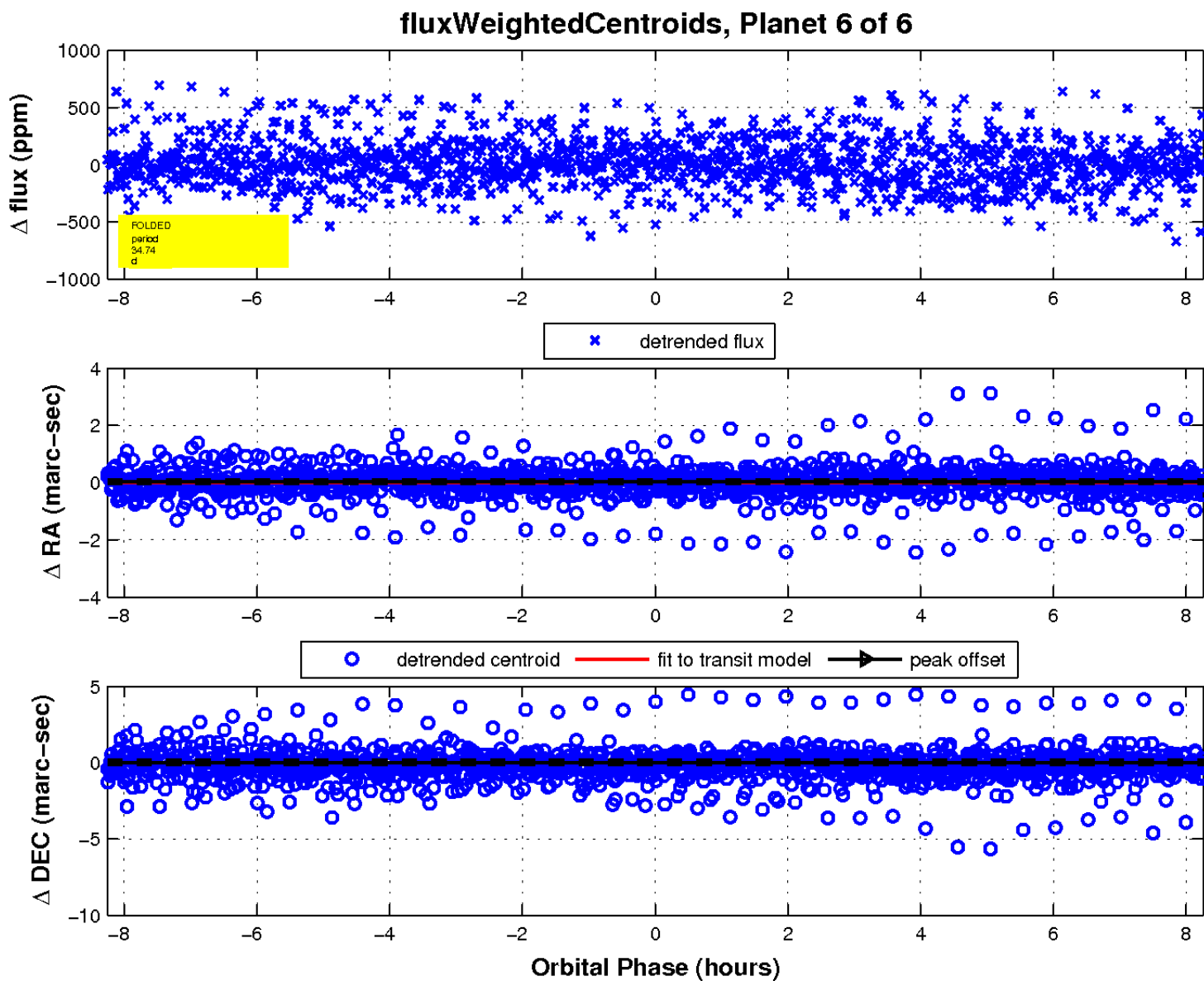
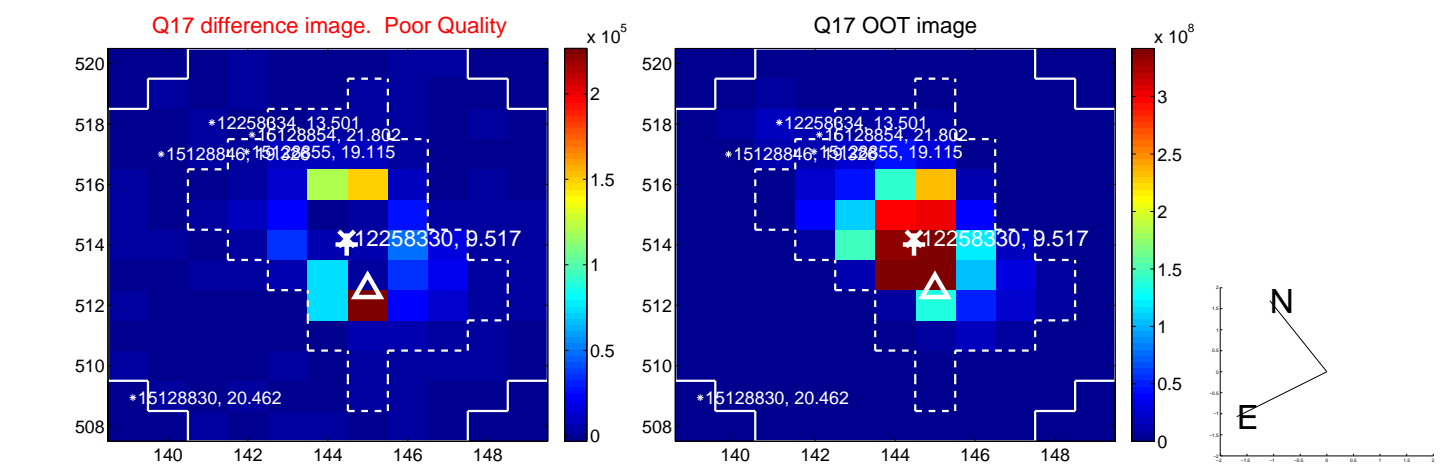


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

Declination

