

# KIC 005906502

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005906502-01	OBS	No	3.346352	134.192717	38.7	7.270	10.7	8.2	2.63	6031	1.63	3362.46
005906502-02	OBS	No	3.346340	132.509544	17.1	19.215	8.0	5.3	2.63	6031	1.13	3362.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005906502-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005906502-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

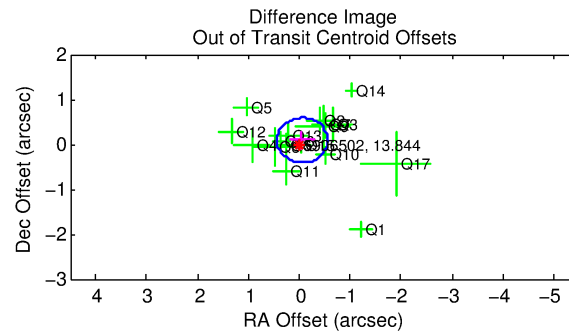
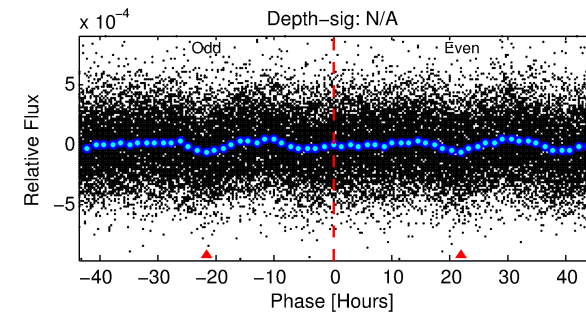
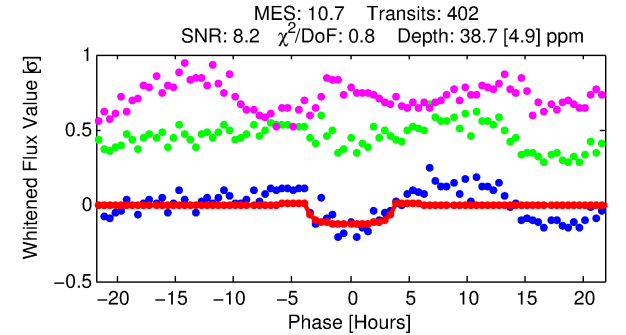
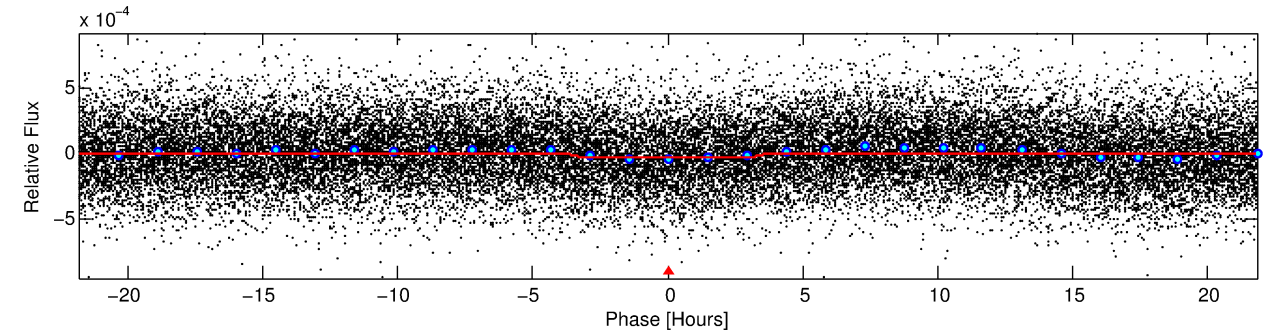
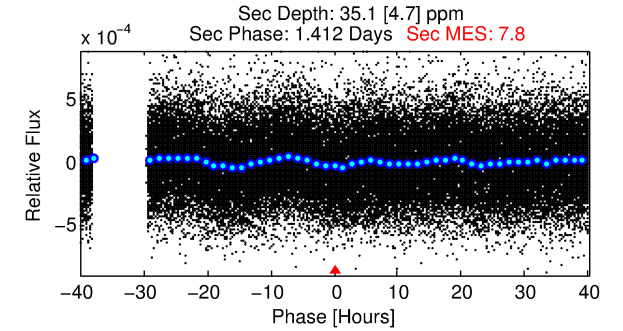
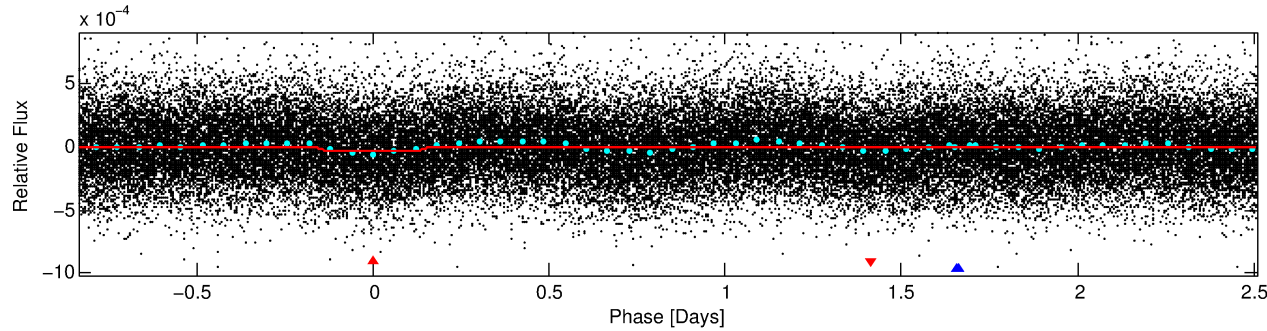
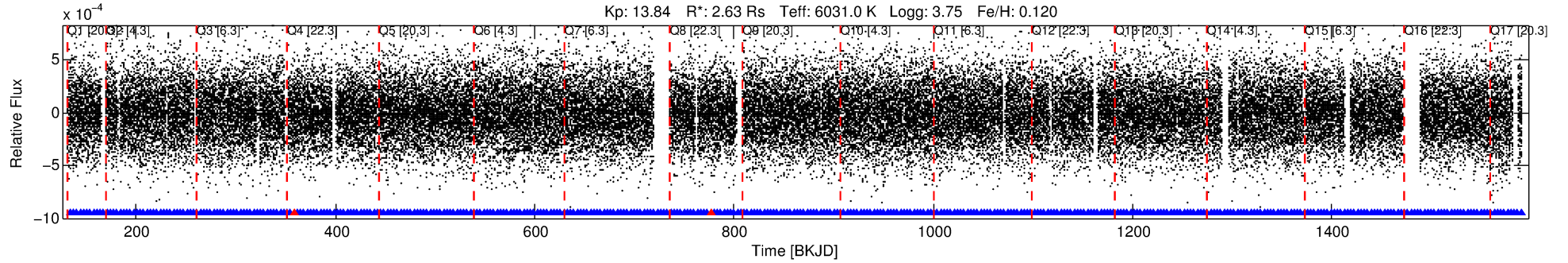
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005906502-01

No Significant Match Found

# DV One-Page Summary

KIC: 5906502 Candidate: 1 of 2 Period: 3.346 d



## DV Fit Results:

Period = 3.34635 [0.00005] d  
Epoch = 134.1927 [0.0086] BKJD  
Rp/R\* = 0.0057 [0.0101]  
a/R\* = 3.58 [27.67]  
b = 0.01 [684.81]  
Seff = 3362.46 [3105.89]  
Teff = 1942 [448] K  
Rp = 1.63 [3.03] Re  
a = 0.0494 [0.0269] AU  
Ag = 17.77 [65.57] [0.26σ]  
Teffp = 6164 [5512] K [0.76σ]

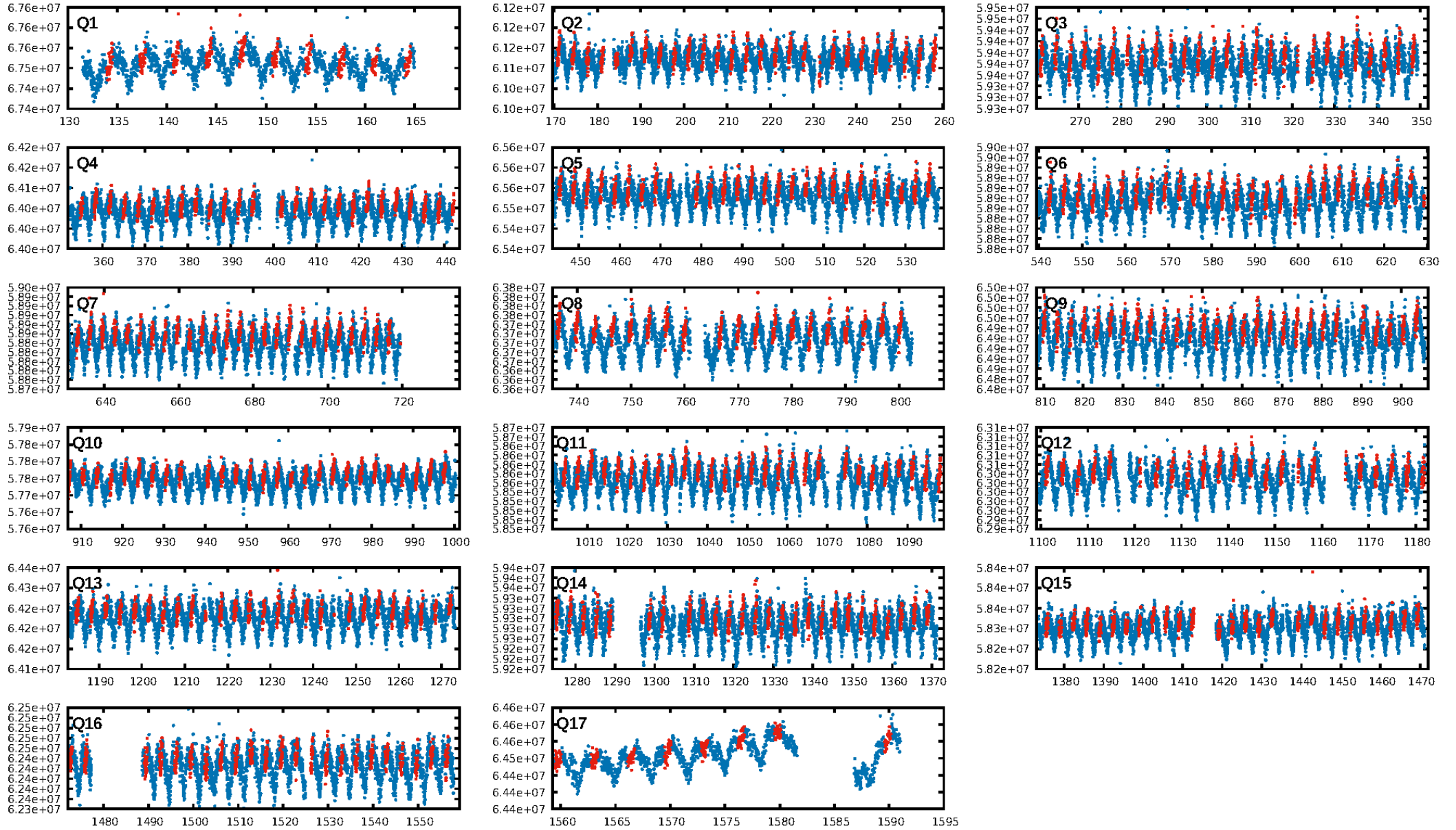
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [382/384]  
GhostDiagnostic-chr: 2.591  
Centroid-sig: 1.5%  
Centroid-so: 1.452 arcsec [1.17σ]  
OotOffset-rm: 0.106 arcsec [0.64σ]  
KicOffset-rm: 0.138 arcsec [0.61σ]  
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: 29-Jan-2016 14:16:56 Z

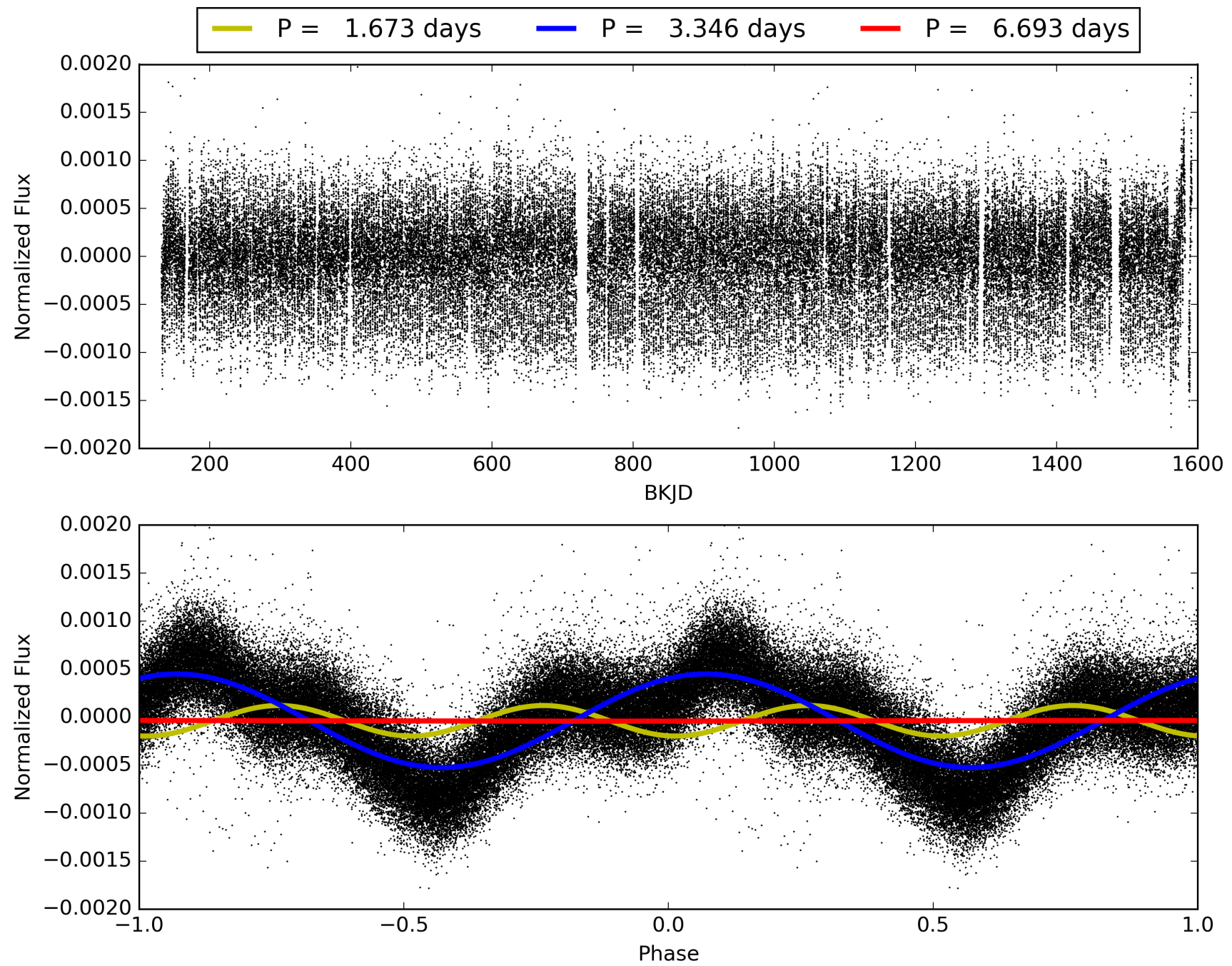
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005906502-01, PDC Light Curves



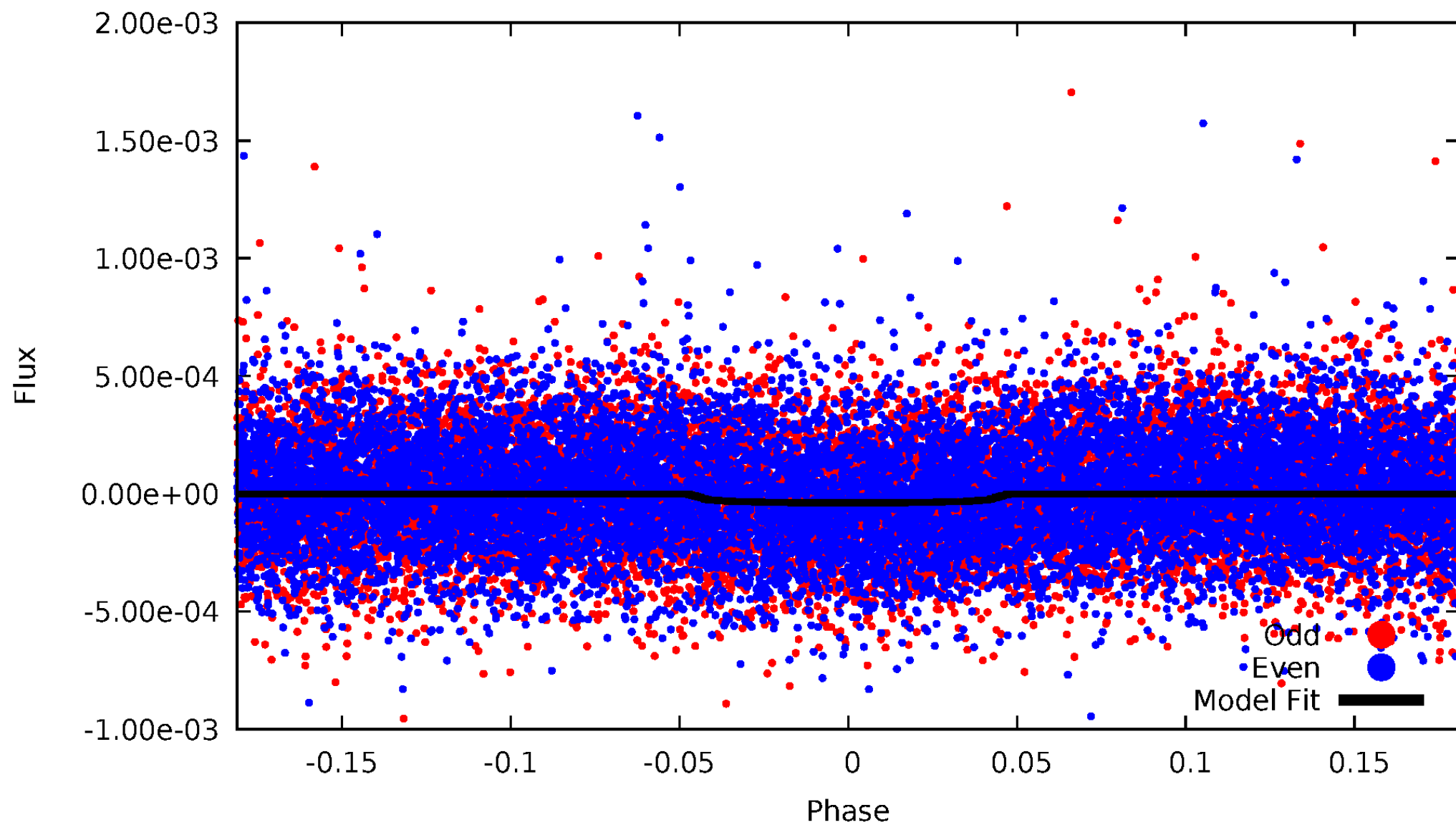


TCE 005906502-01



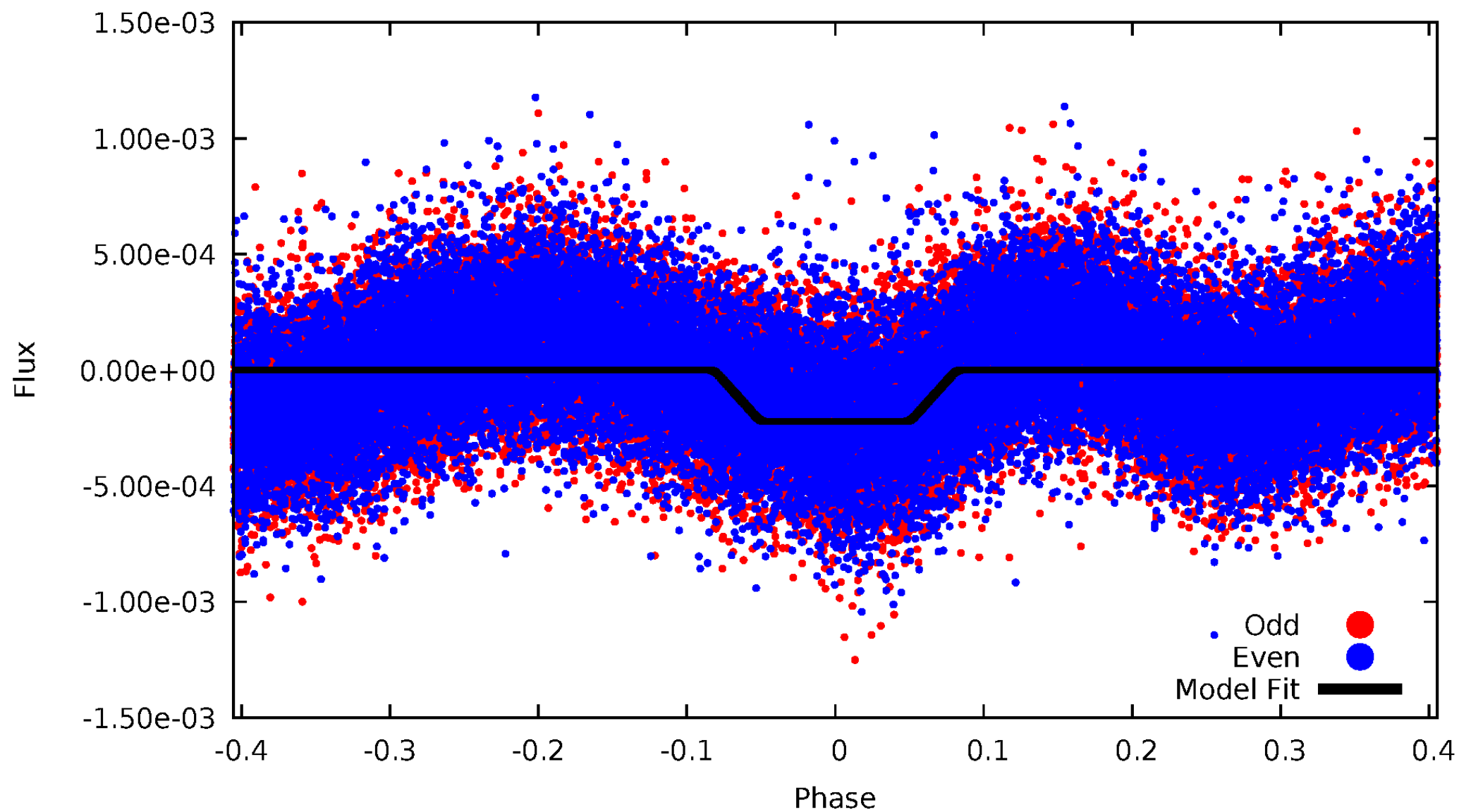
# DV Odd/Even

TCE 005906502-01

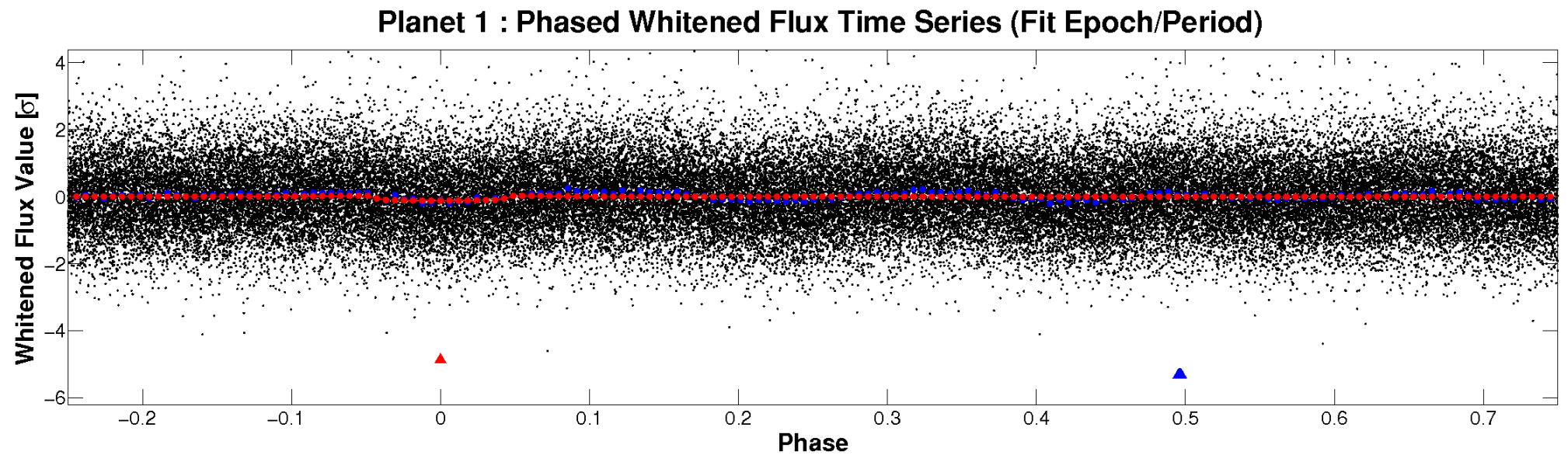
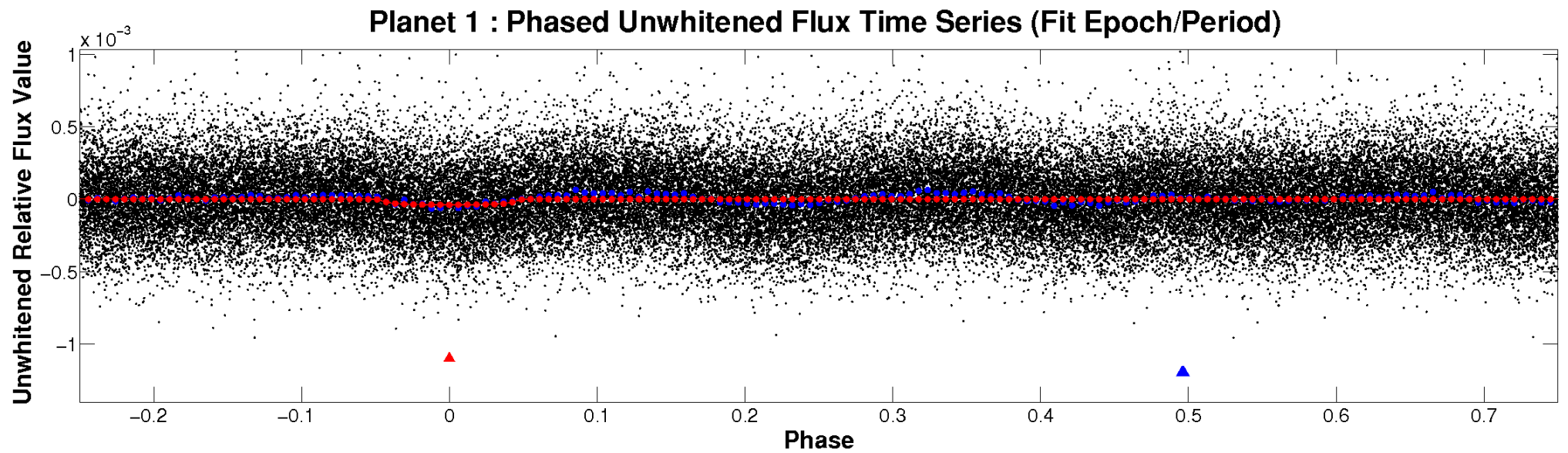


# ALT Odd/Even

TCE 005906502-01



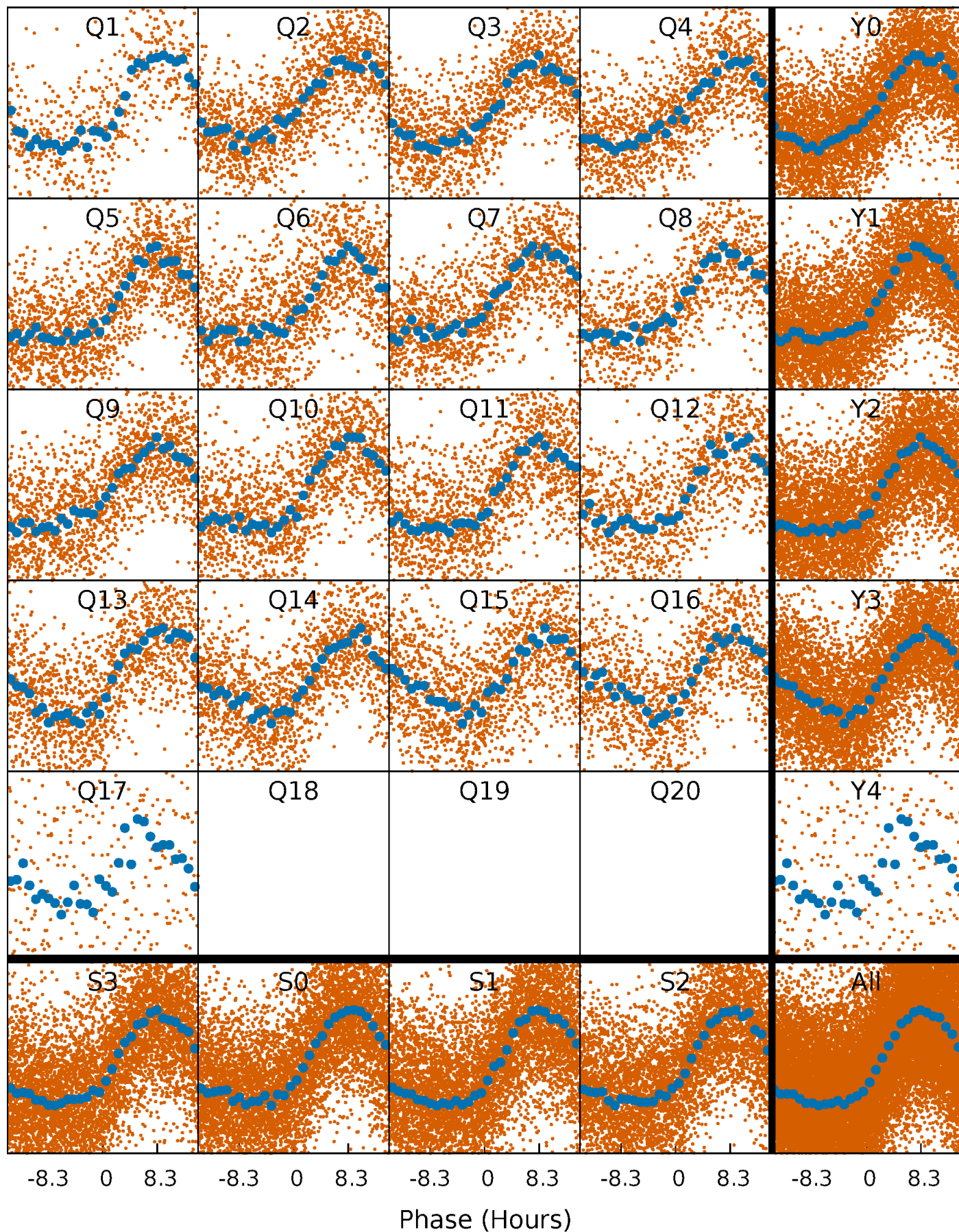
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

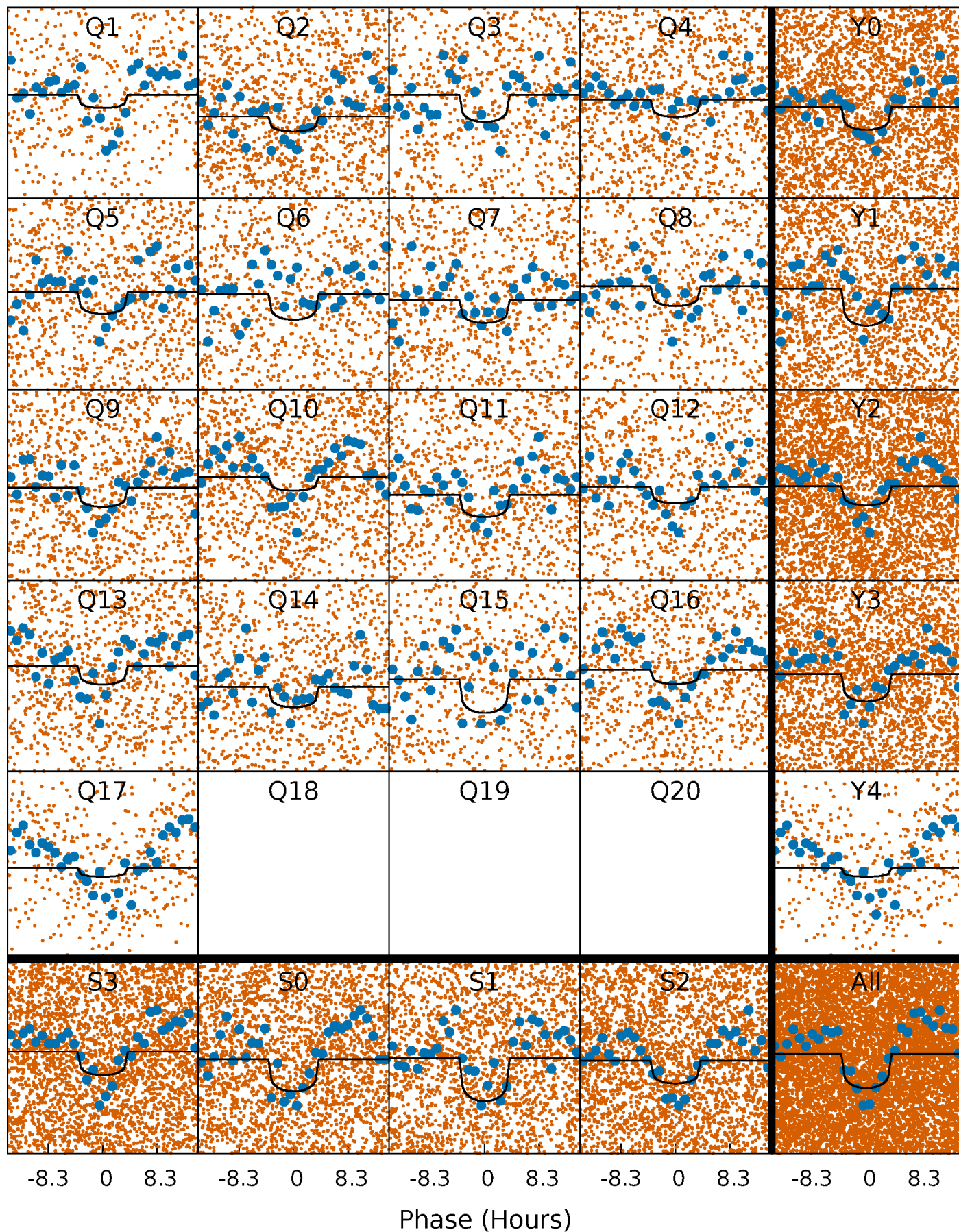
TCE 005906502-01 P= 3.346352 Days  $T_0=134.192717$  (BKJD)





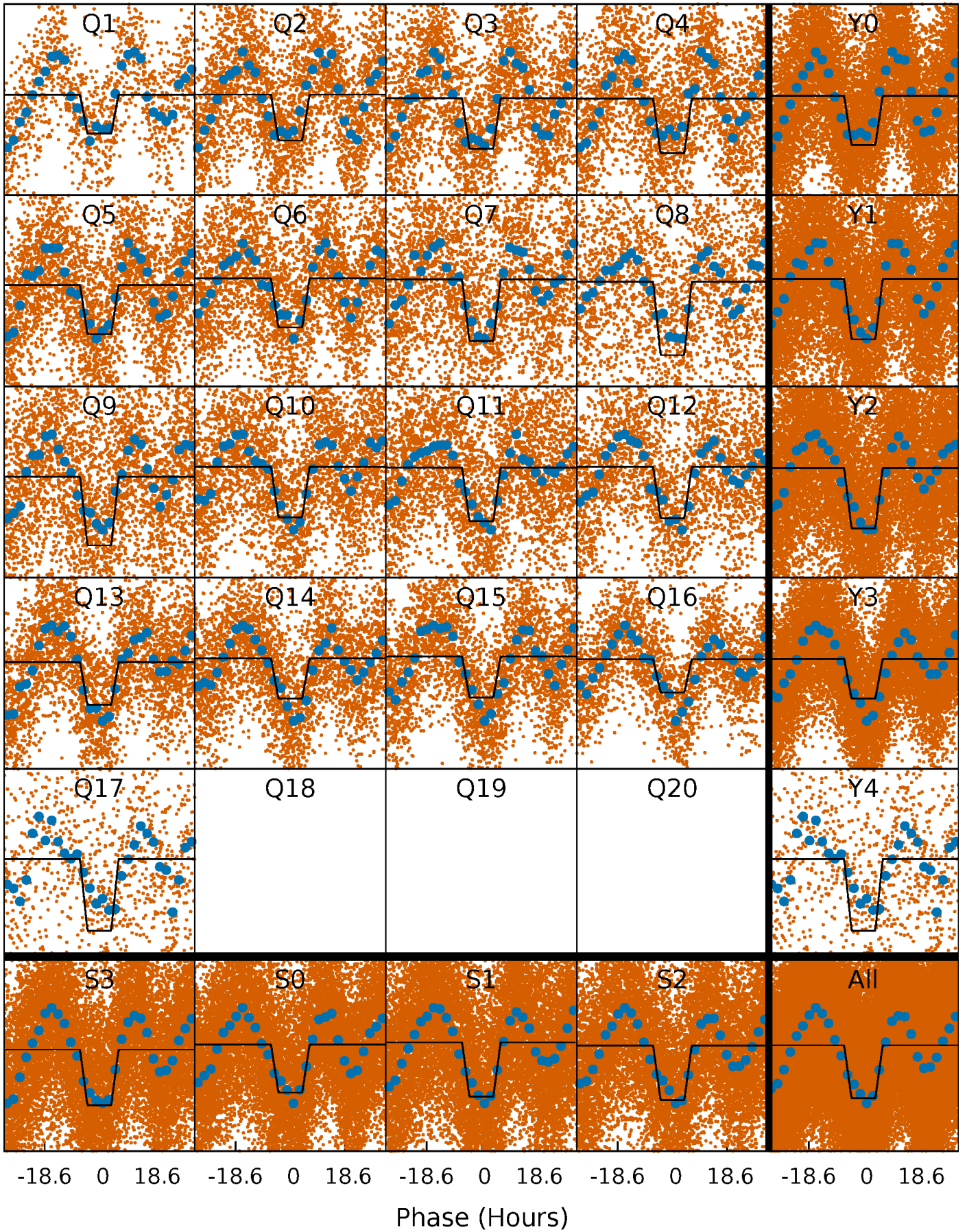
# DV Quarter-Phased Transit Curves

TCE 005906502-01 P= 3.346352 Days  $T_0=134.192717$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005906502-01 P= 3.346127 Days  $T_0=134.107699$  (BKJD)

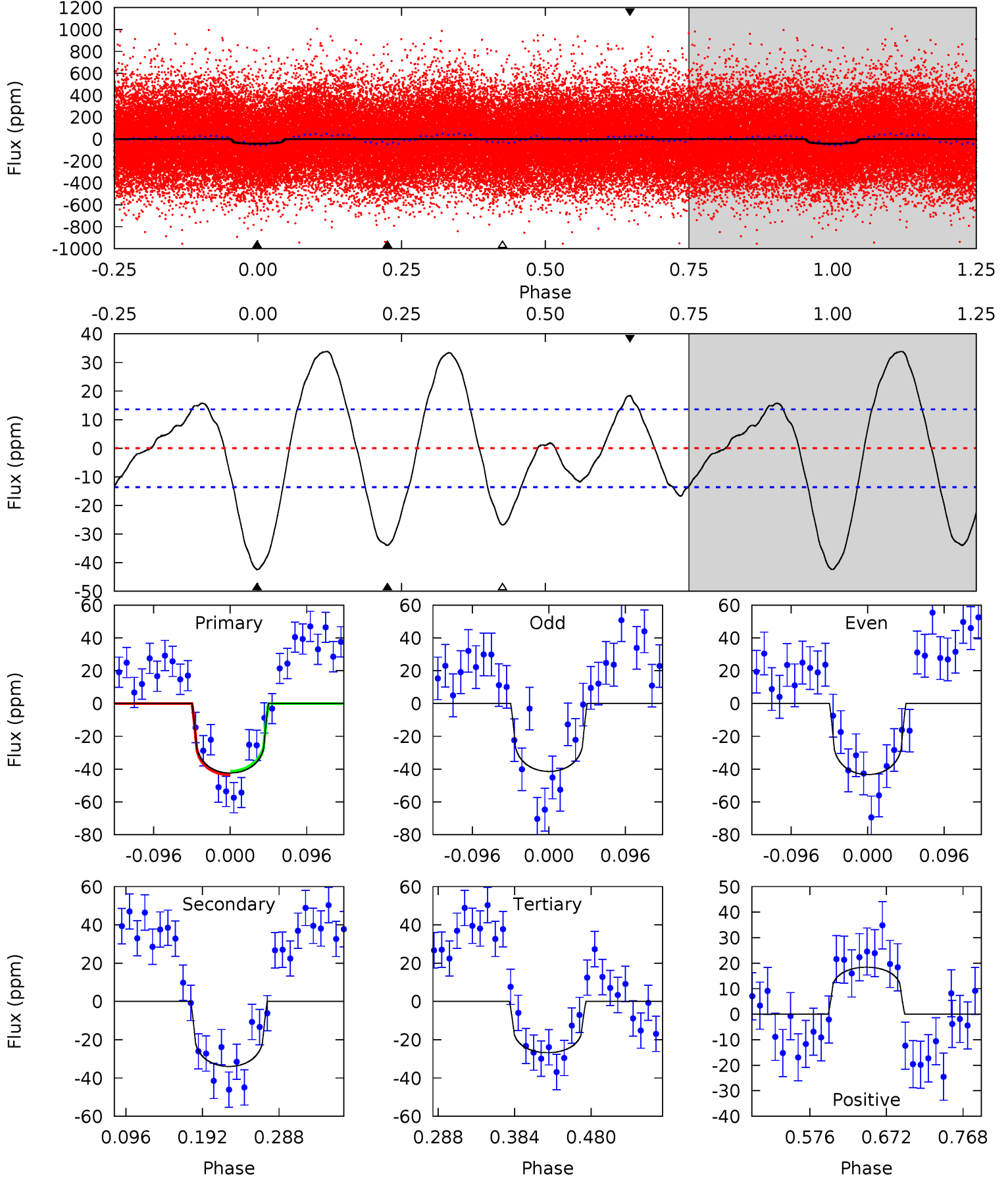




# DV Model-Shift Uniqueness Test

005906502-01, P = 3.346352 Days, E = 130.846365 Days

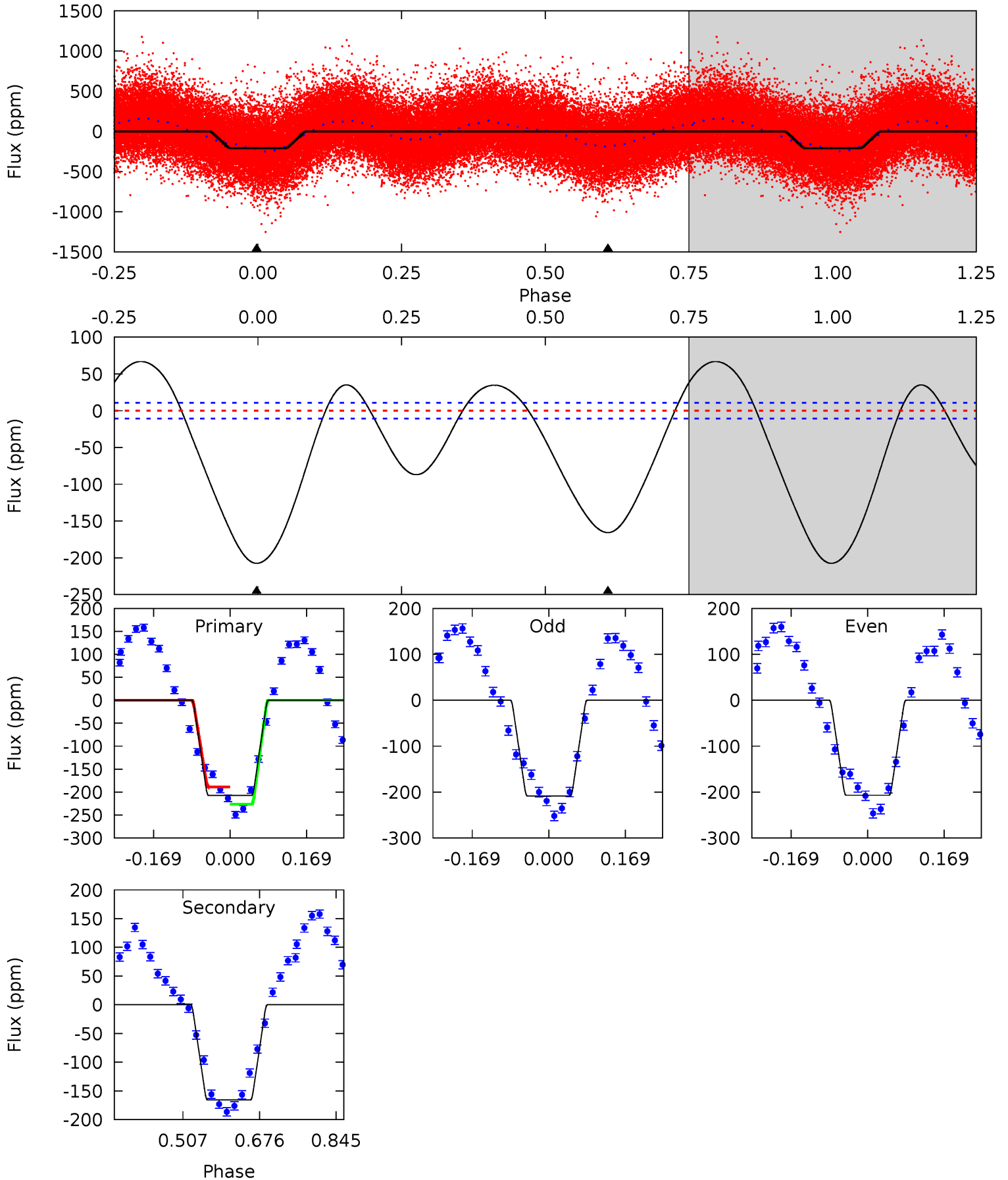
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	11.4	8.99	6.19	4.57	1.66	5.10	5.24	8.05	2.41	5.22	0.32	0.88	0.44	0.34



# Alt Model-Shift Uniqueness Test

005906502-01, P = 3.346127 Days, E = 130.761572 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
86.4	69.0	0	0	4.45	1.38	21.1	86.4	86.4	69.0	69.0	0.33	1.04	0.24	7.56





### Stellar Parameters For KIC 005906502

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6031^{+211}_{-211}$	$3.755^{+0.552}_{-0.097}$	$0.120^{+0.250}_{-0.300}$	$2.633^{+0.480}_{-1.343}$	$1.438^{+0.203}_{-0.376}$	$0.111^{+0.681}_{-0.044}$
	+3%/-3%	+15%/-3%	+208%/-250%	+18%/-51%	+14%/-26%	+613%/-40%
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 005906502-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-34 \pm 3$	$2.29^{+2.19}_{-1.50}$	$2622^{+209}_{-373}$	$4819^{+3519}_{-1114}$	$8.523^{+61.861}_{-6.219}$
Alt.	$-166 \pm 2$	$3.84^{+3.03}_{-2.18}$	$2607^{+224}_{-391}$	$5463^{+2840}_{-1091}$	$15^{+65}_{-10}$

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

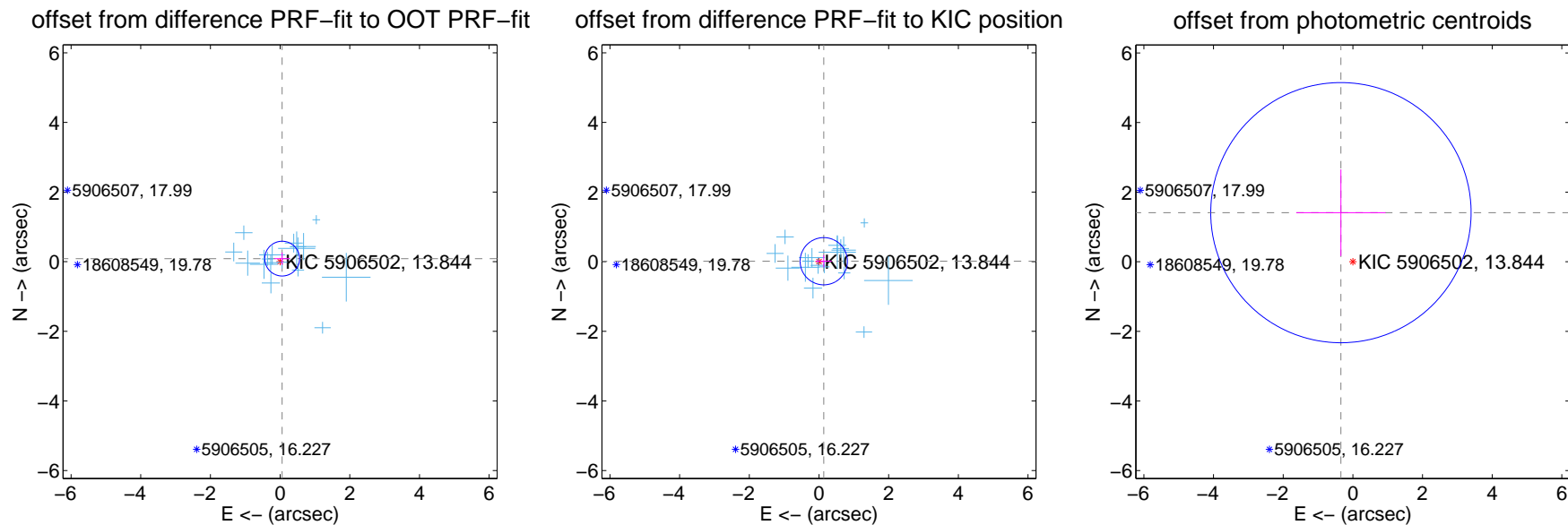
## DV Centroid Data

Supplemental centroid analysis for 005906502-01. Kepler magnitude: 13.84. Transit SNR 8.18

There are 17 quarters with good PRF difference image offsets

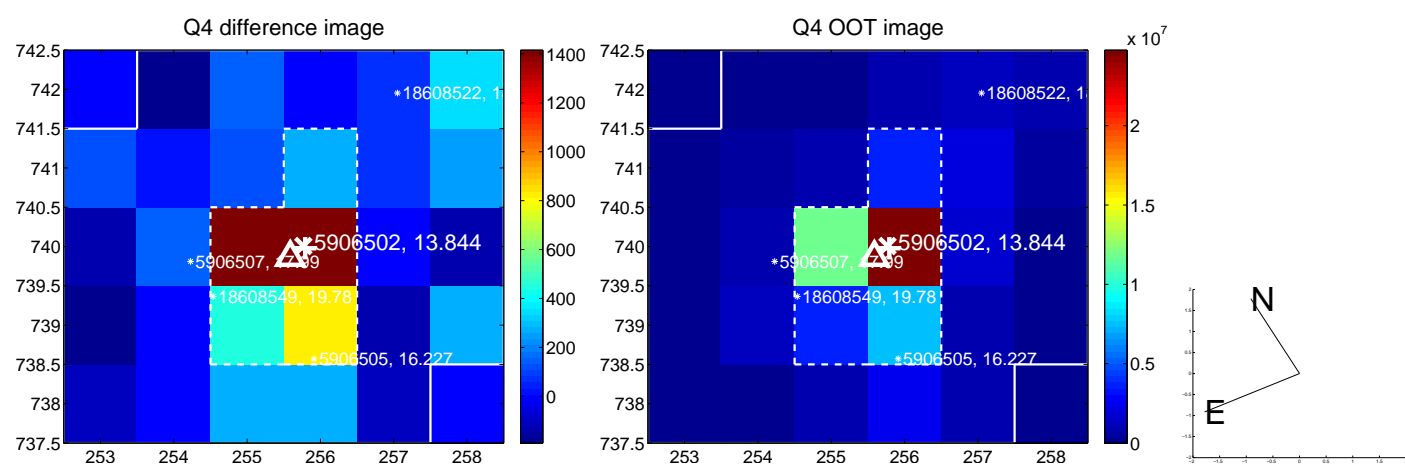
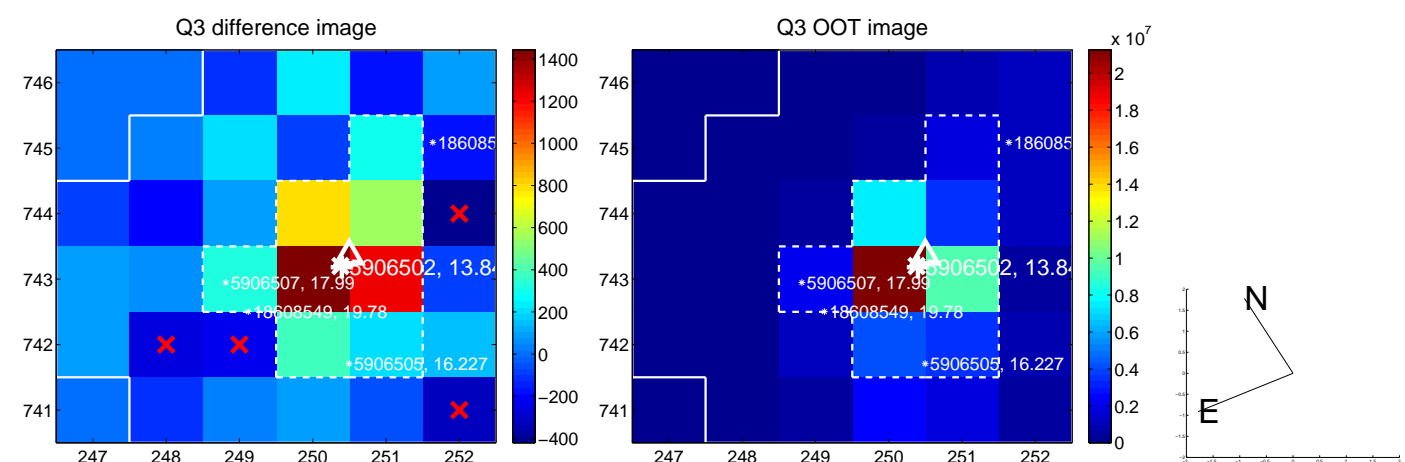
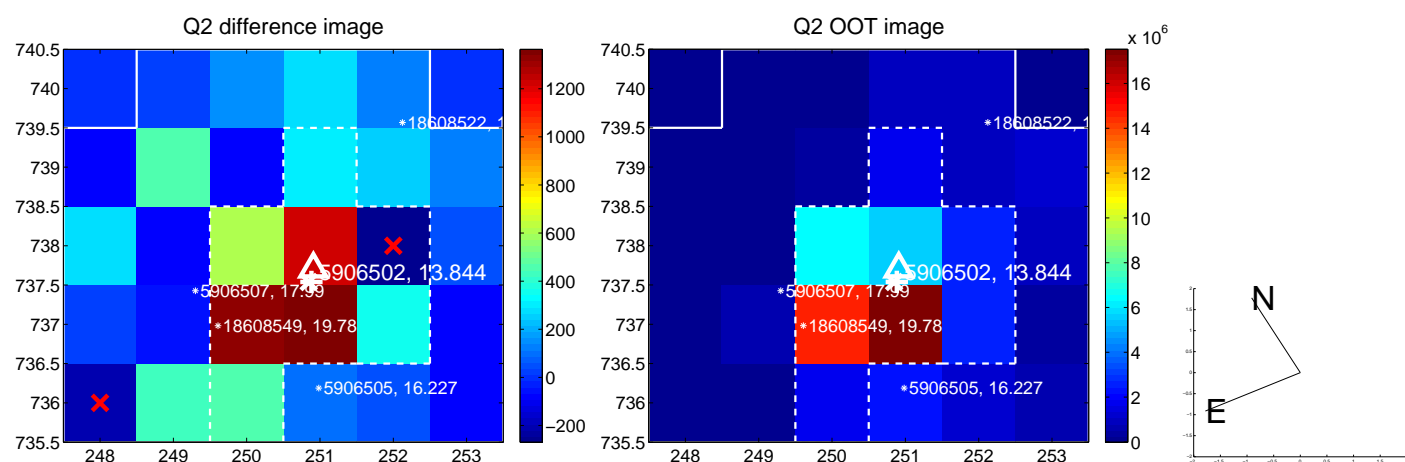
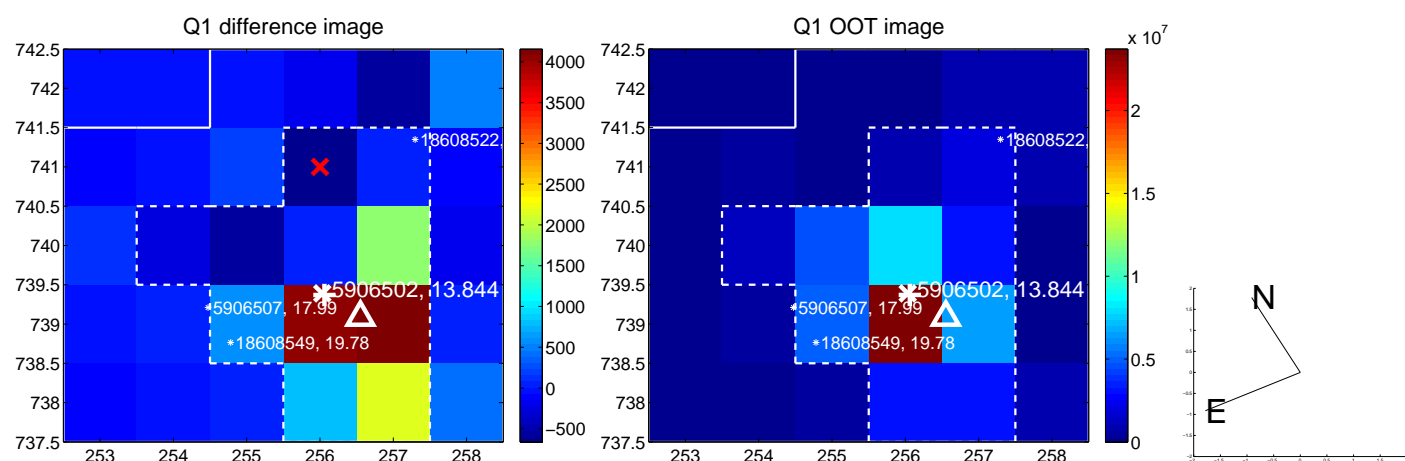
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.106 \pm 0.166$	0.64	$-0.059 \pm 0.221$	$0.088 \pm 0.177$
PRF-fit source offset from KIC position	$0.138 \pm 0.226$	0.61	$-0.137 \pm 0.230$	$0.013 \pm 0.177$
photometric centroid source offset	$1.45 \pm 1.25$	1.17	$0.34 \pm 1.28$	$1.41 \pm 1.24$

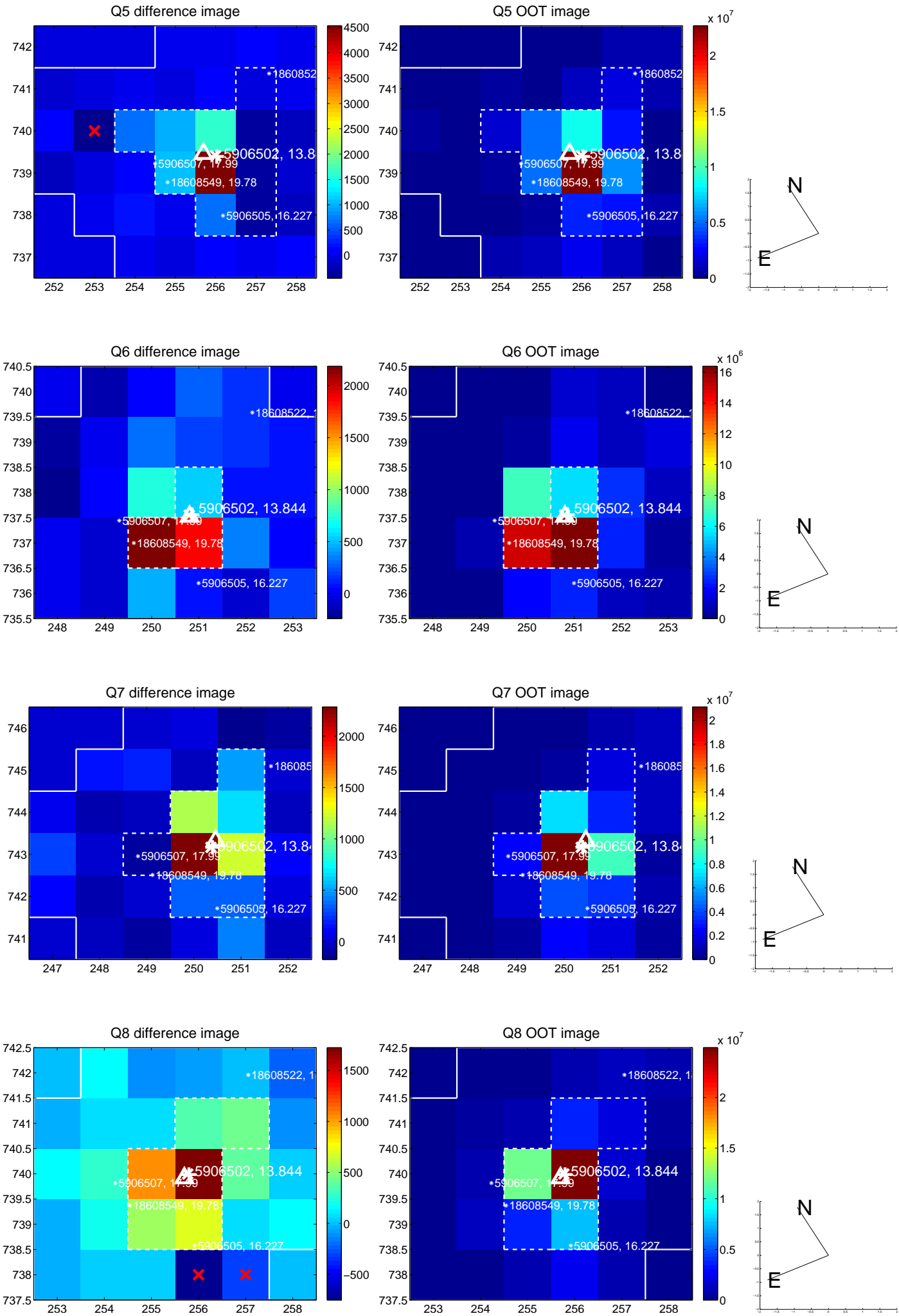


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

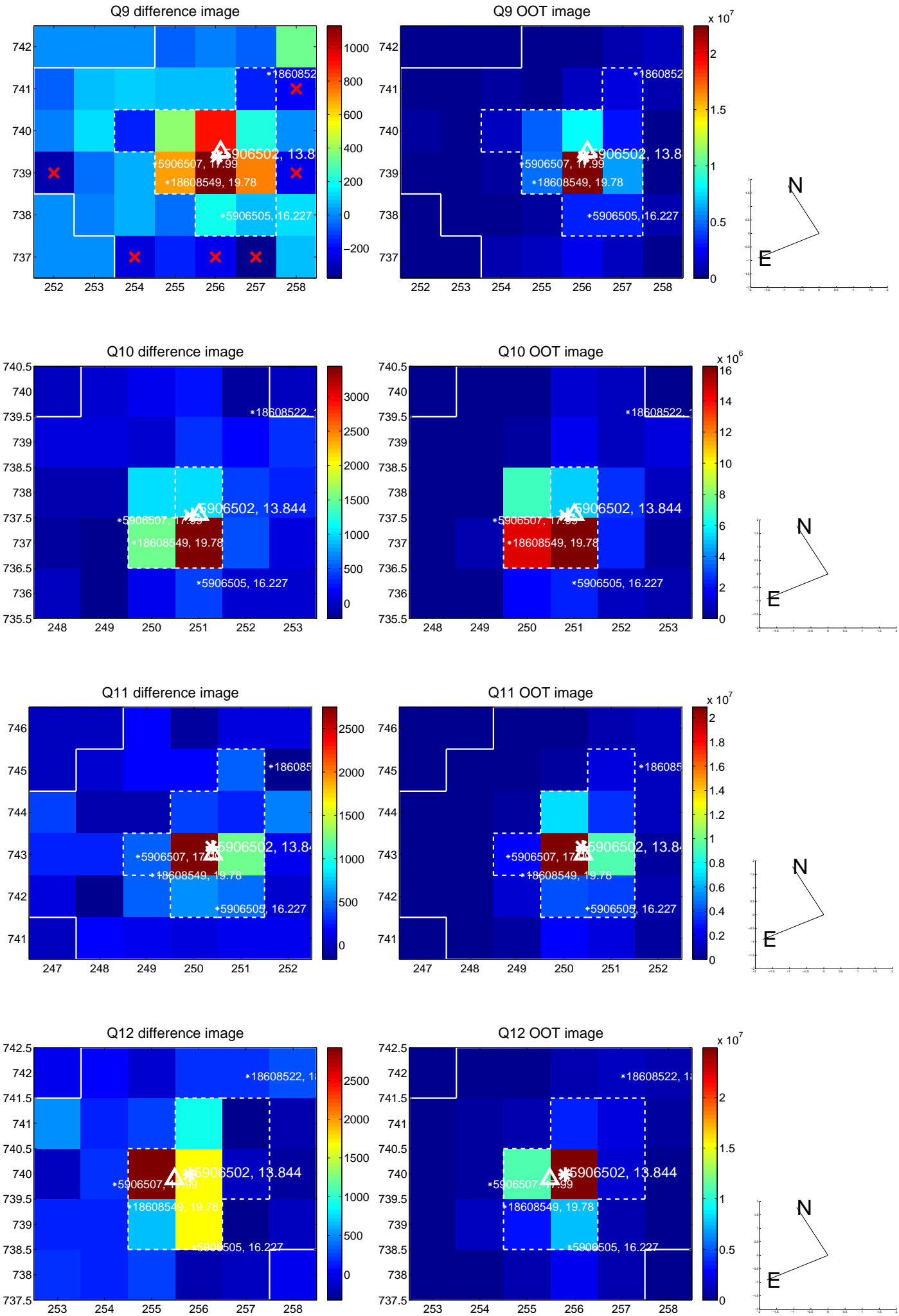


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

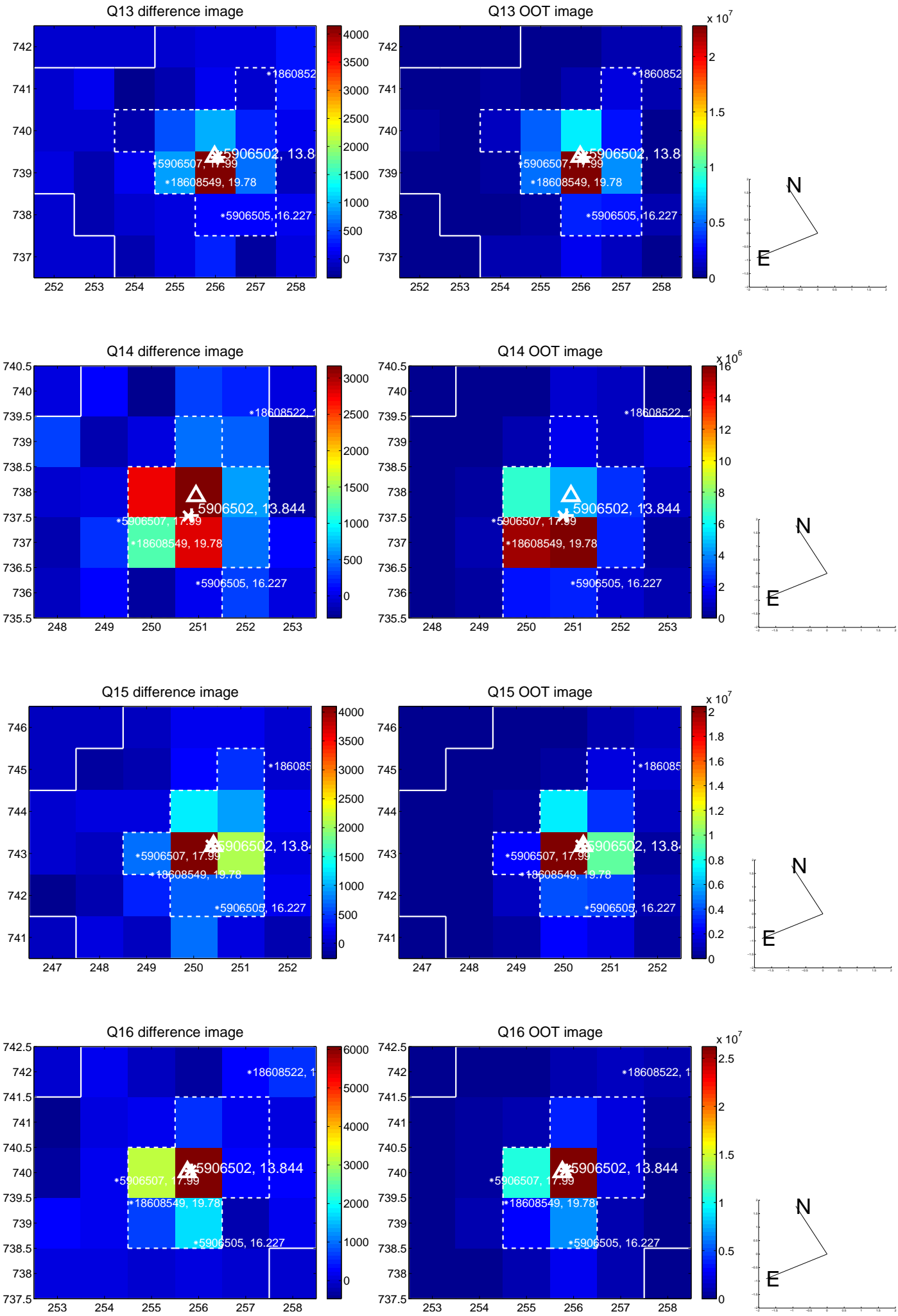




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

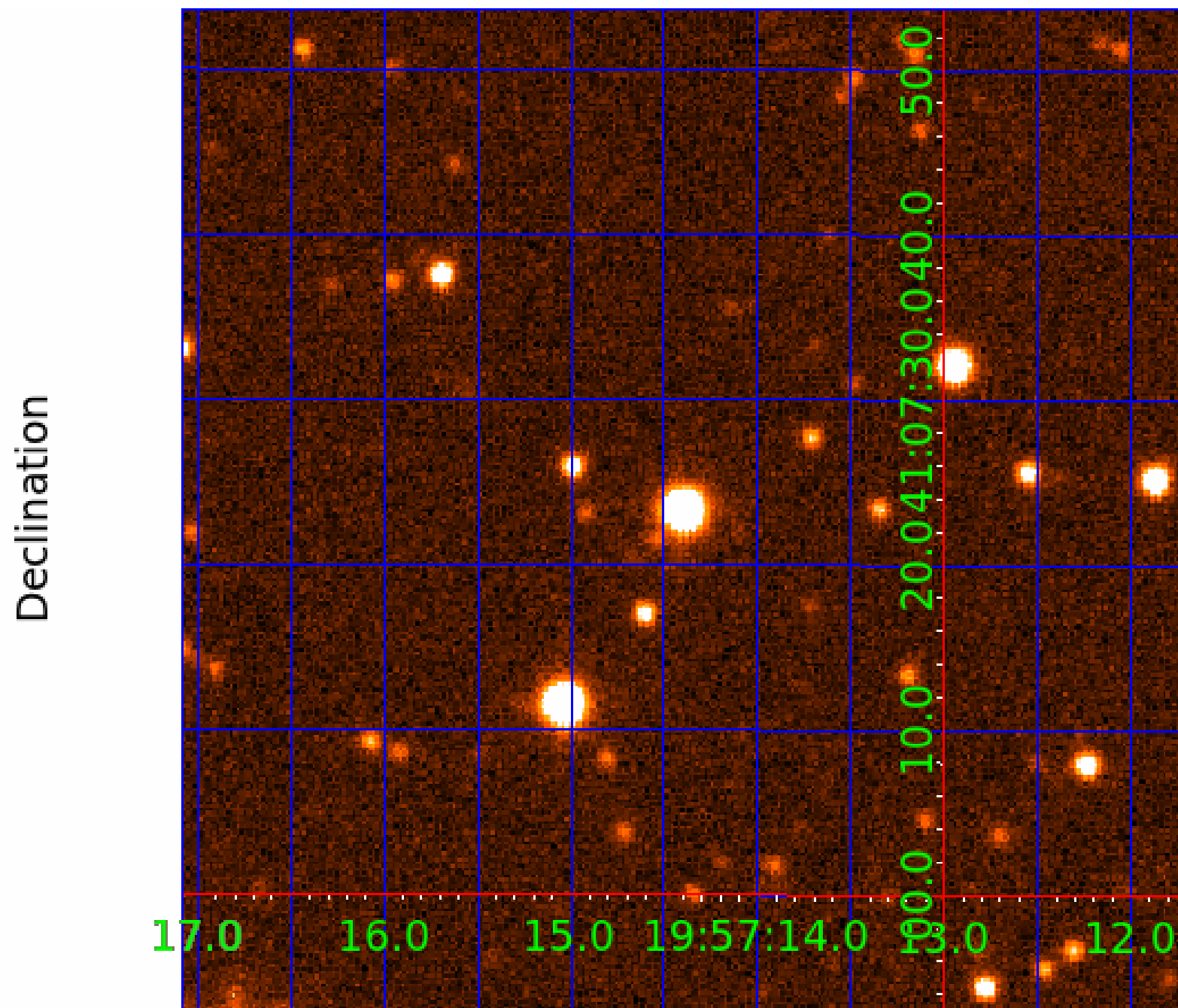


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image





# KIC 005906502

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005906502-01	OBS	No	3.346352	134.192717	38.7	7.270	10.7	8.2	2.63	6031	1.63	3362.46
005906502-02	OBS	No	3.346340	132.509544	17.1	19.215	8.0	5.3	2.63	6031	1.13	3362.47

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005906502-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005906502-02	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

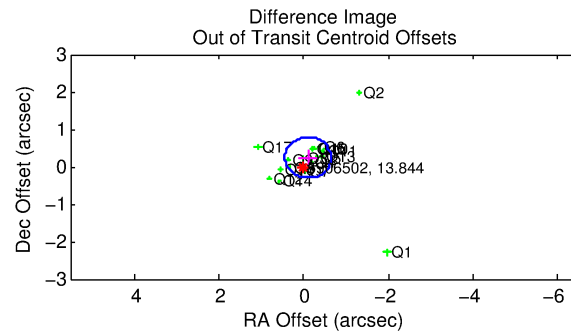
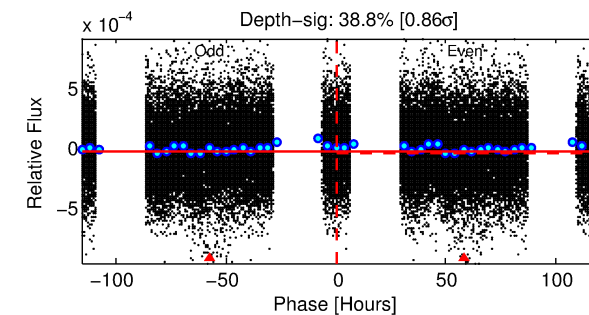
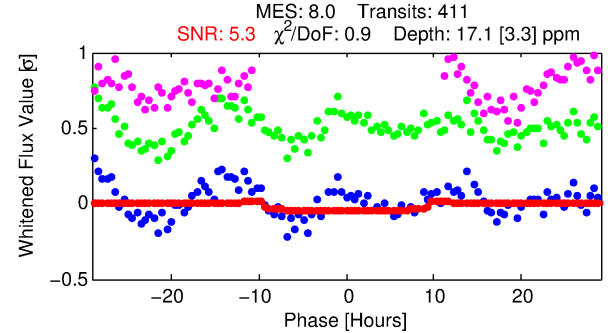
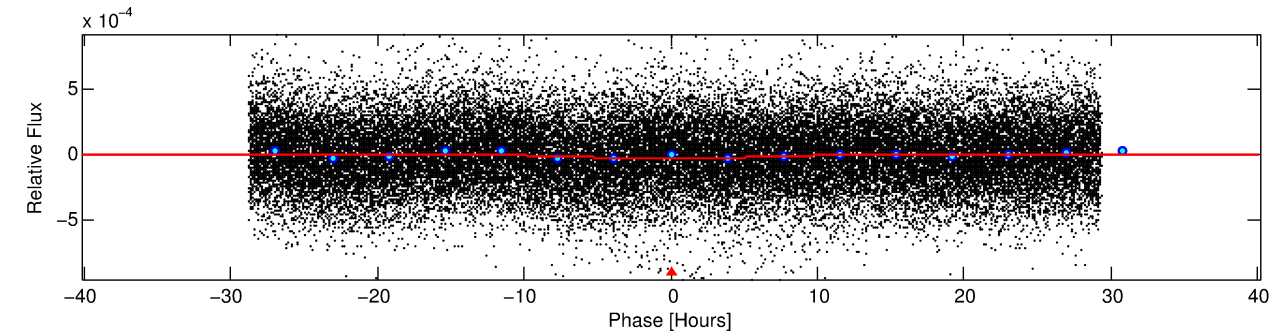
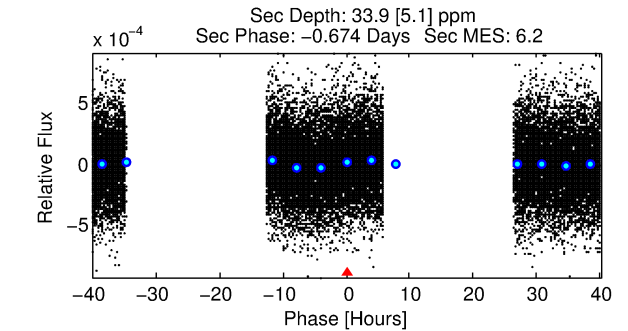
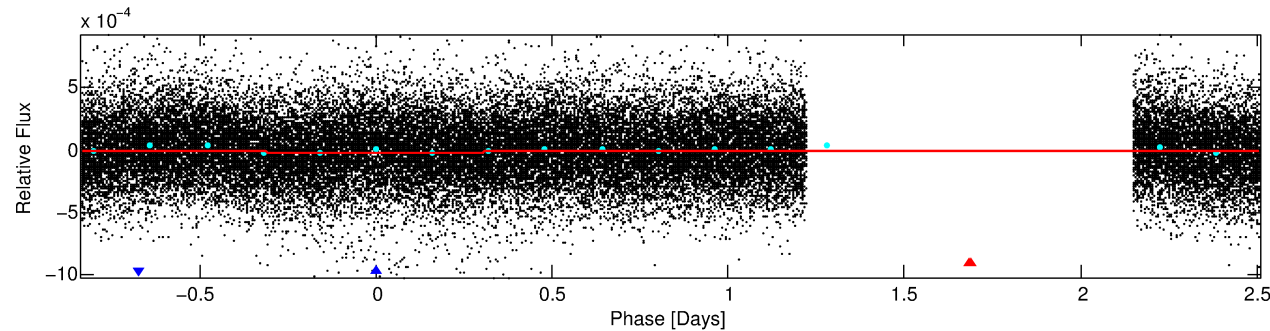
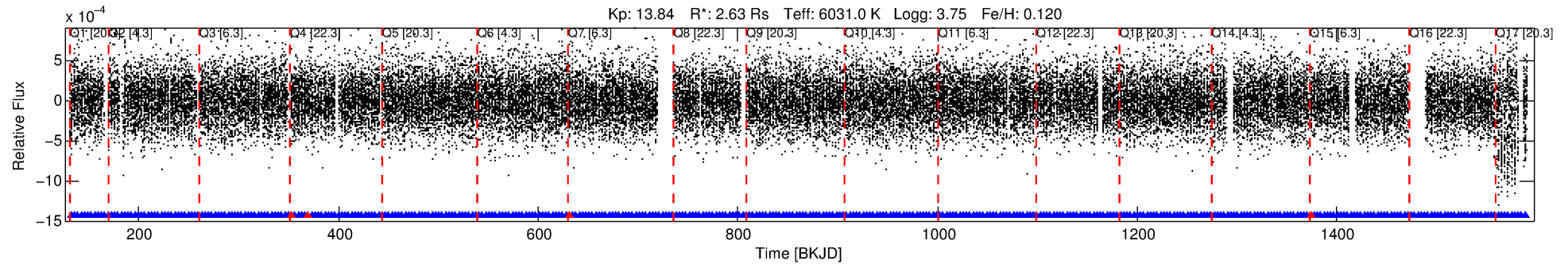
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005906502-02

No Significant Match Found

# DV One-Page Summary

KIC: 5906502 Candidate: 2 of 2 Period: 3.346 d



## DV Fit Results:

Period = 3.34634 [0.00012] d  
Epoch = 132.5095 [0.0235] BKJD  
Rp/R\* = 0.0039 [0.0039]  
a/R\* = 1.33 [2.77]  
b = 0.58 [5.42]  
Seff = 3362.47 [3105.91]  
Teff = 1942 [448] K  
Rp = 1.13 [1.27] Re  
a = 0.0494 [0.0269] AU  
Ag = 35.50 [78.13] [0.44σ]  
Teffp = 7328 [3677] K [1.45σ]

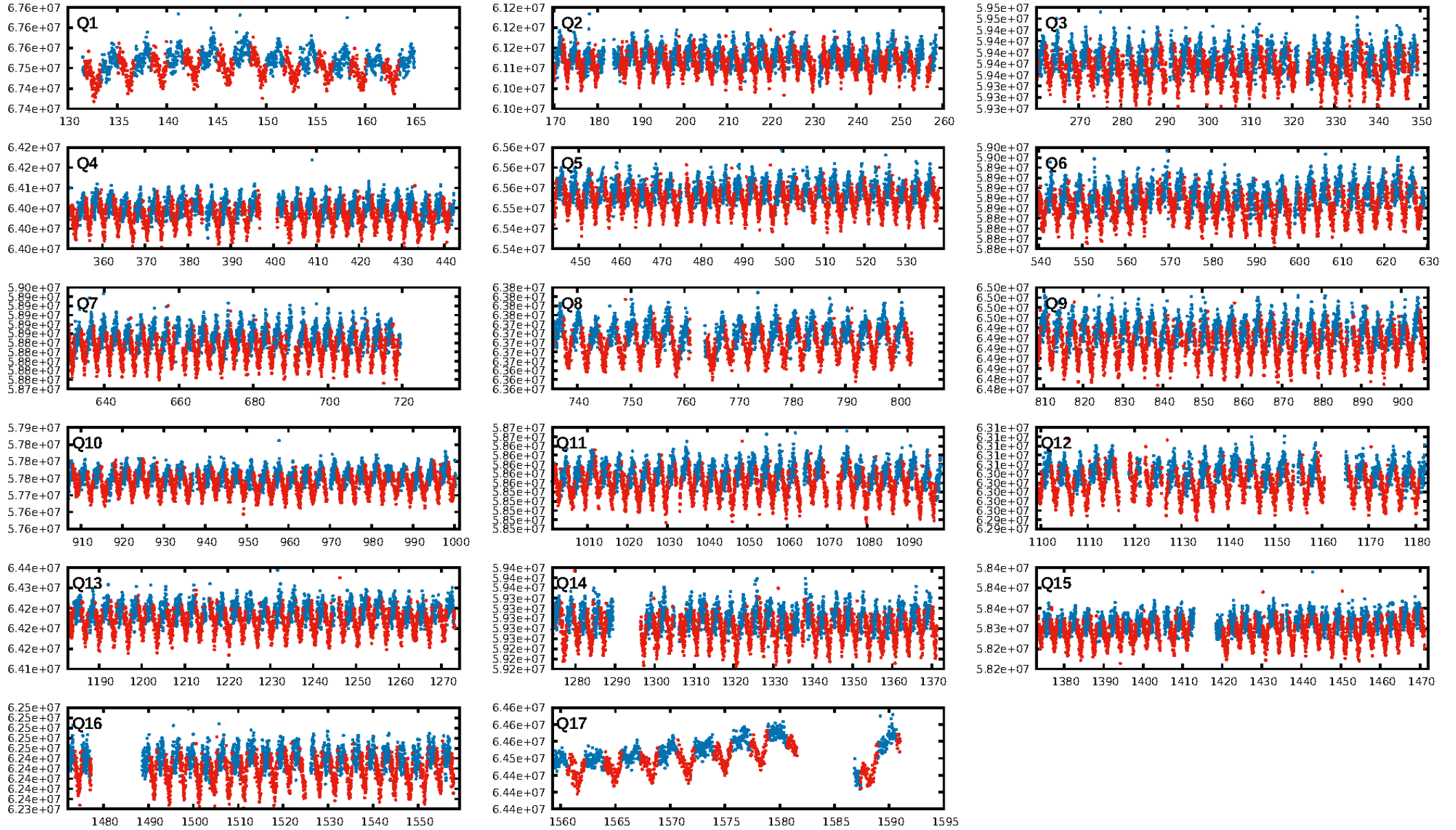
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGoF-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [389/393]  
GhostDiagnostic-chr: 0.6519  
Centroid-sig: 0.0%  
Centroid-so: 12.655 arcsec [6.15σ]  
OotOffset-rm: 0.267 arcsec [1.47σ]  
KicOffset-rm: 0.282 arcsec [1.51σ]  
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]

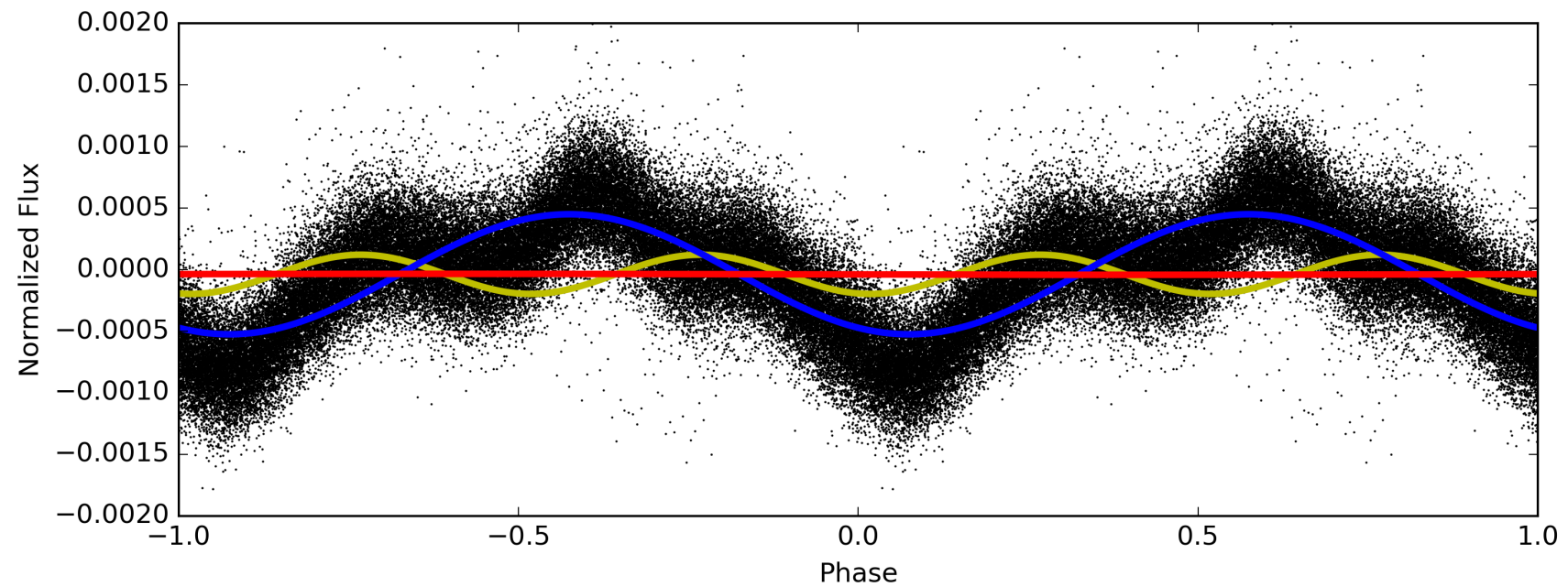
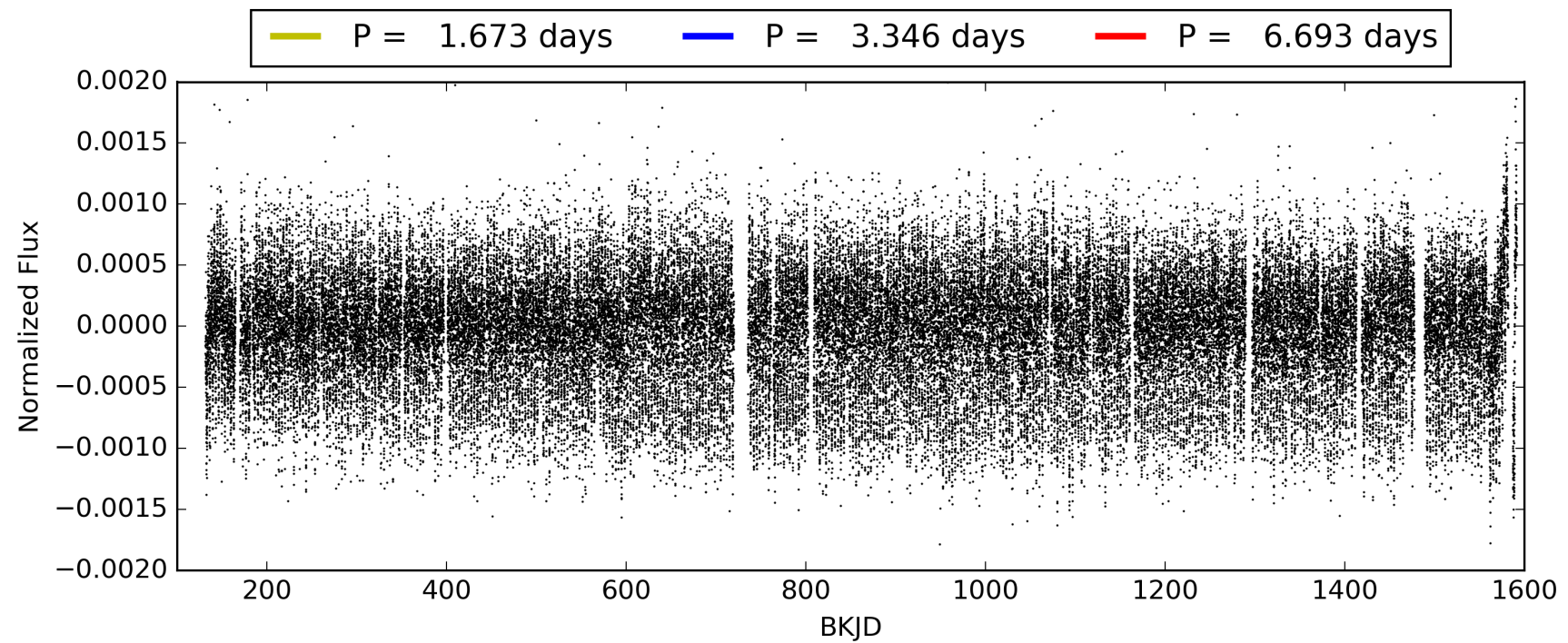
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 14:17:09 Z

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

# TCE 005906502-02, PDC Light Curves



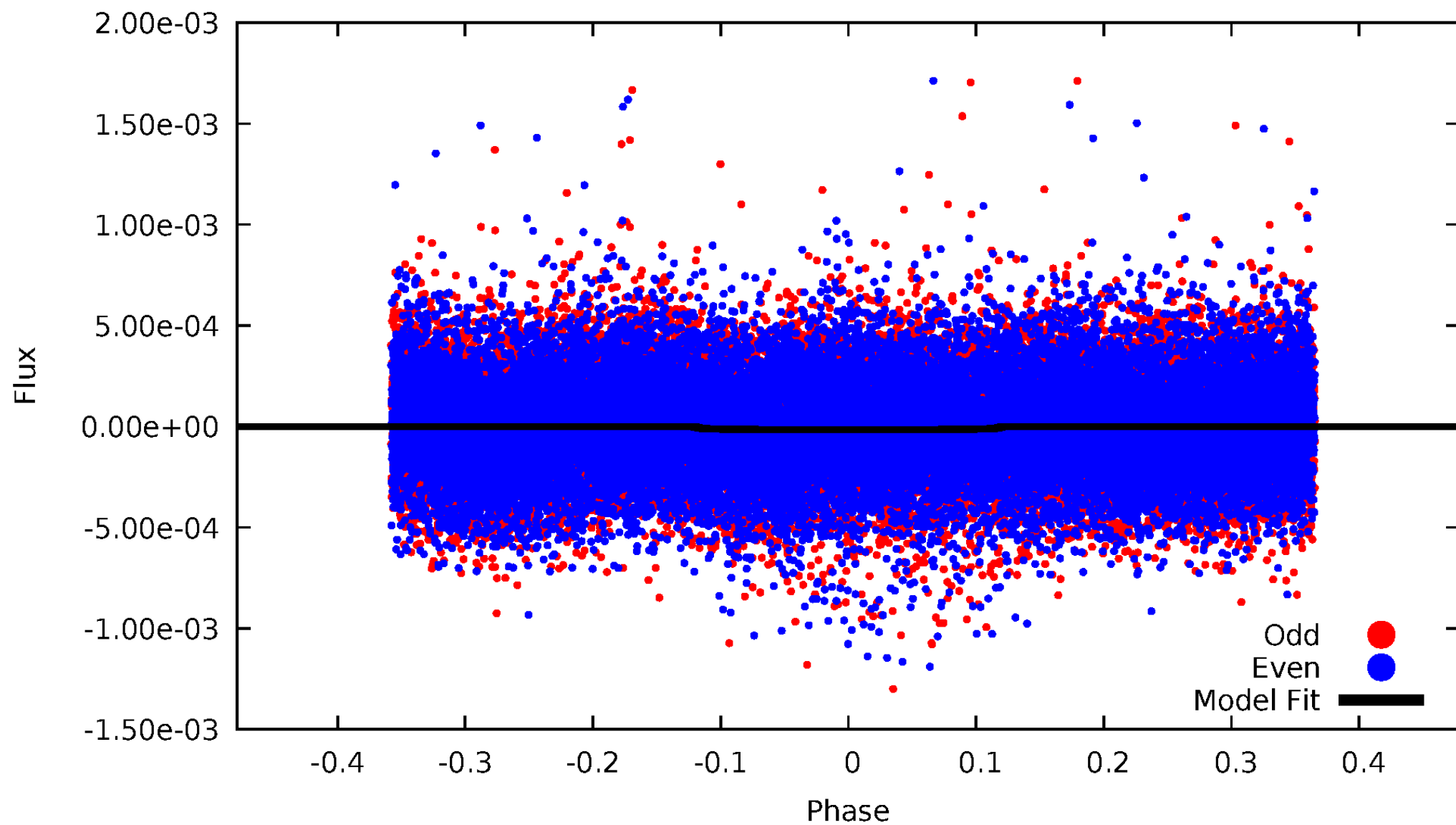
TCE 005906502-02





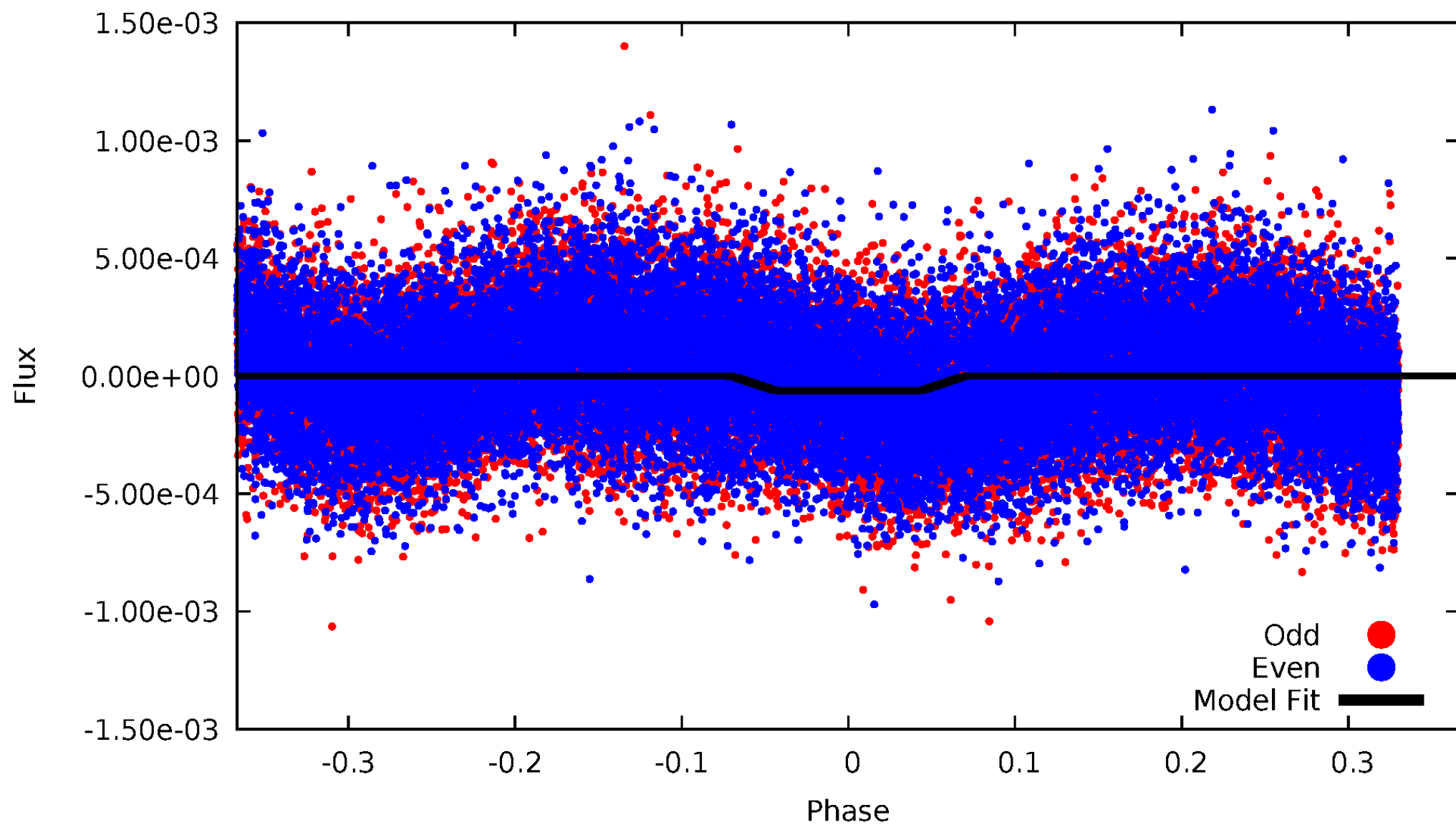
# DV Odd/Even

TCE 005906502-02



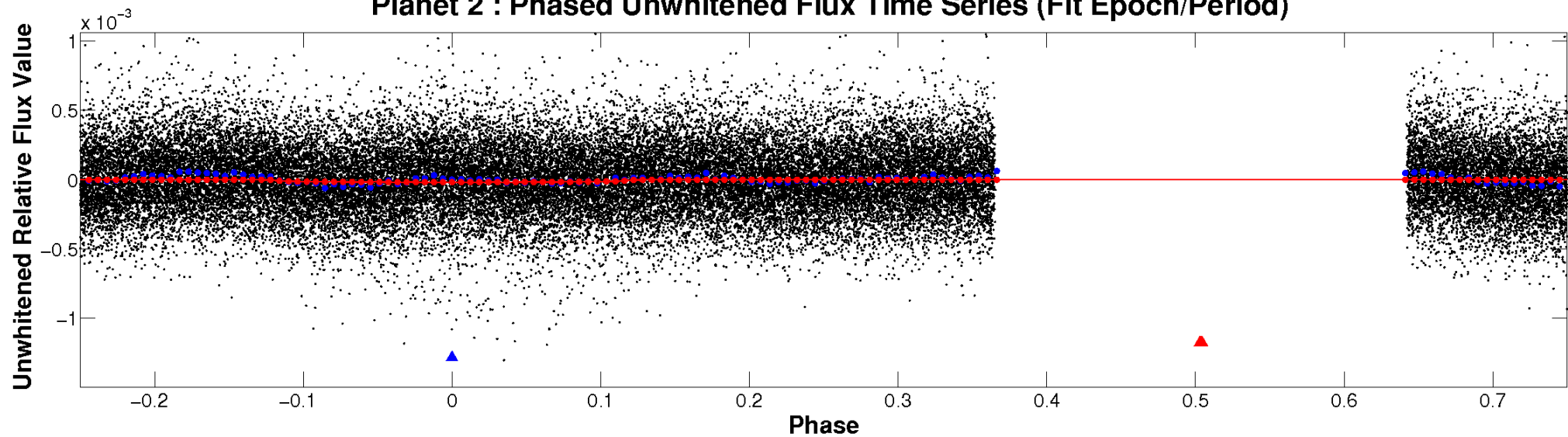
# ALT Odd/Even

TCE 005906502-02

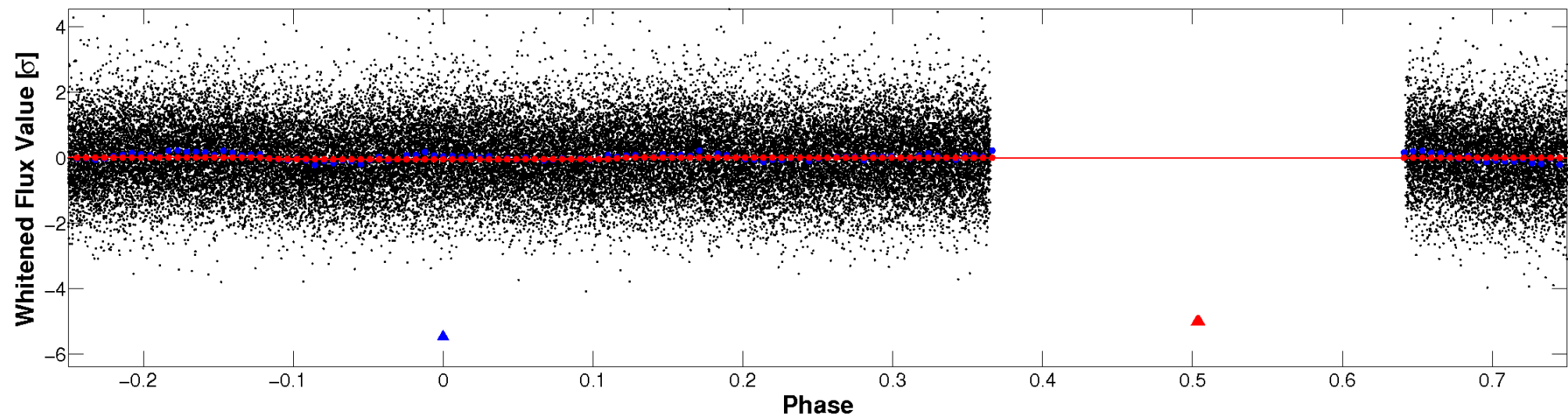


# Non-Whitened Vs. Whitened Light Curve

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

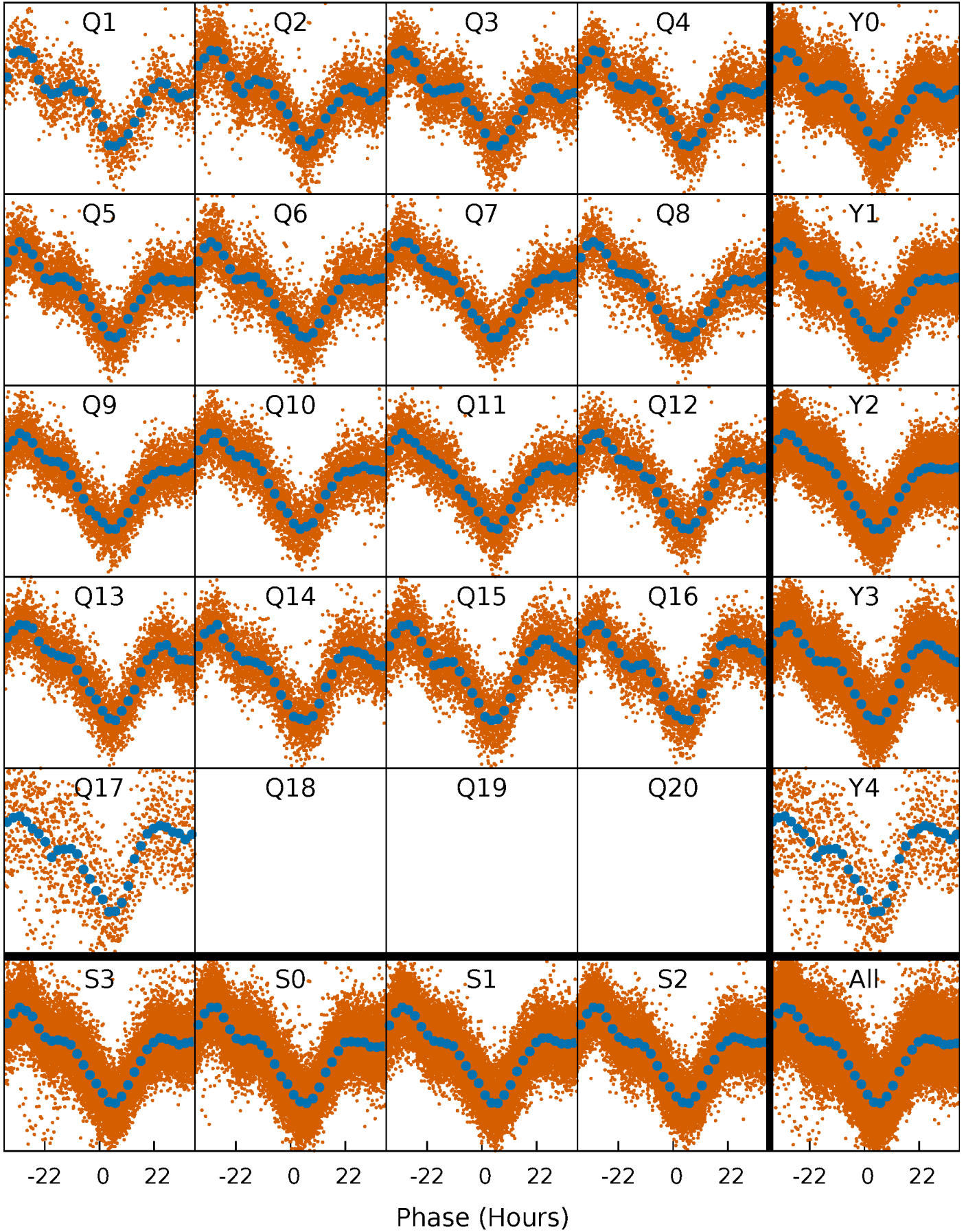


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

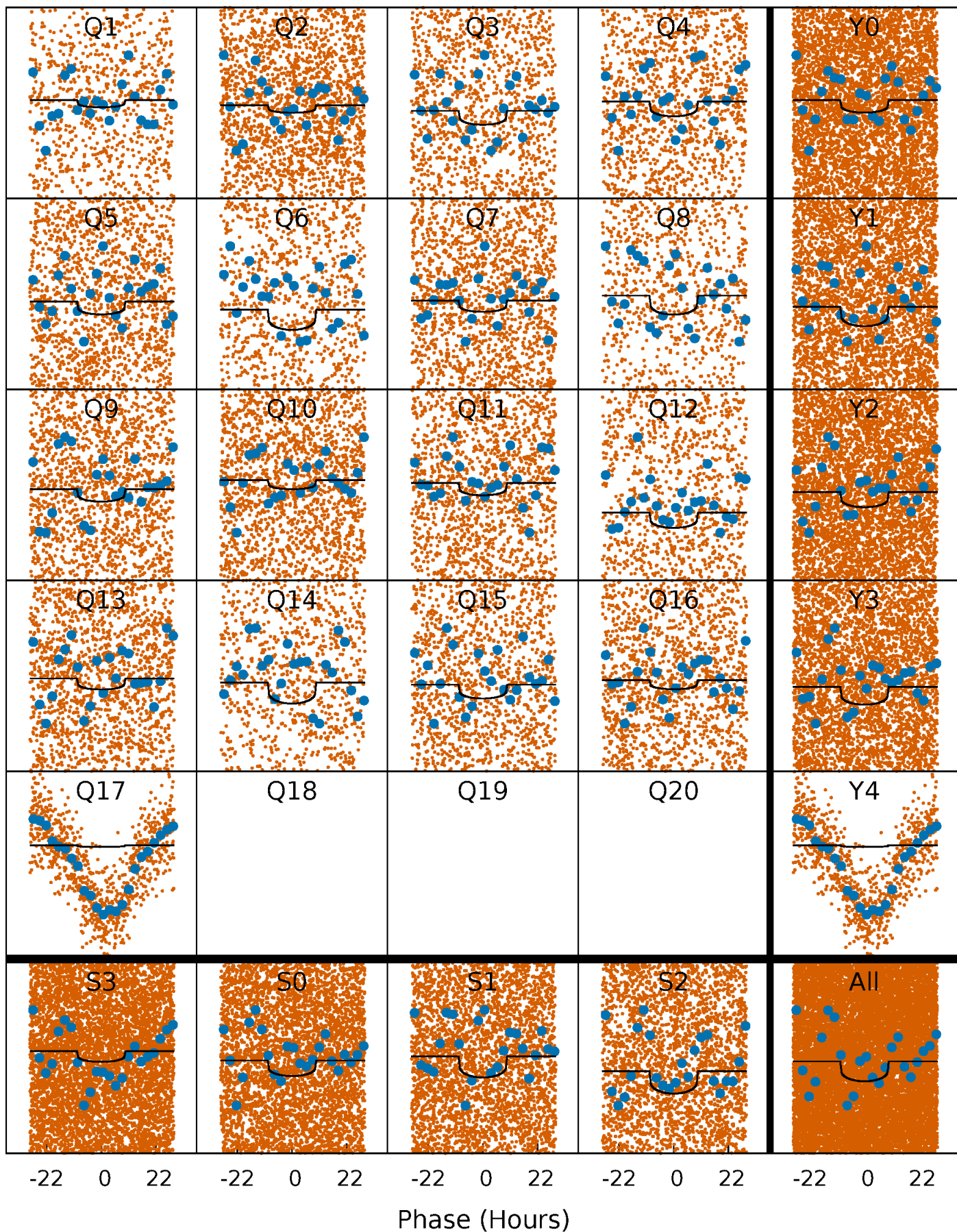
TCE 005906502-02     $P = 3.346340$  Days     $T_0 = 132.509544$  (BKJD)





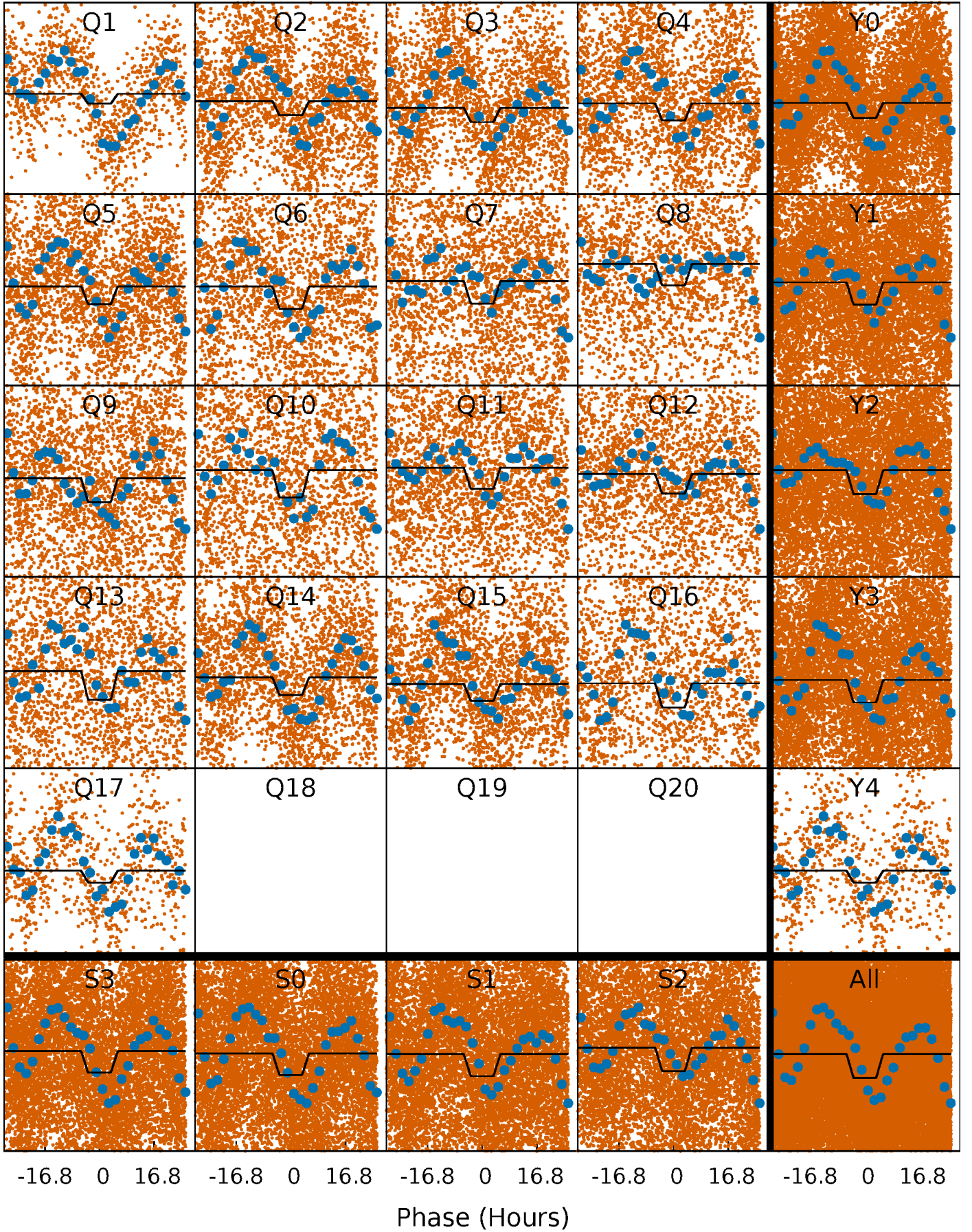
# DV Quarter-Phased Transit Curves

TCE 005906502-02     $P = 3.346340$  Days     $T_0 = 132.509544$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005906502-02     $P = 3.346356$  Days     $T_0 = 132.622572$  (BKJD)

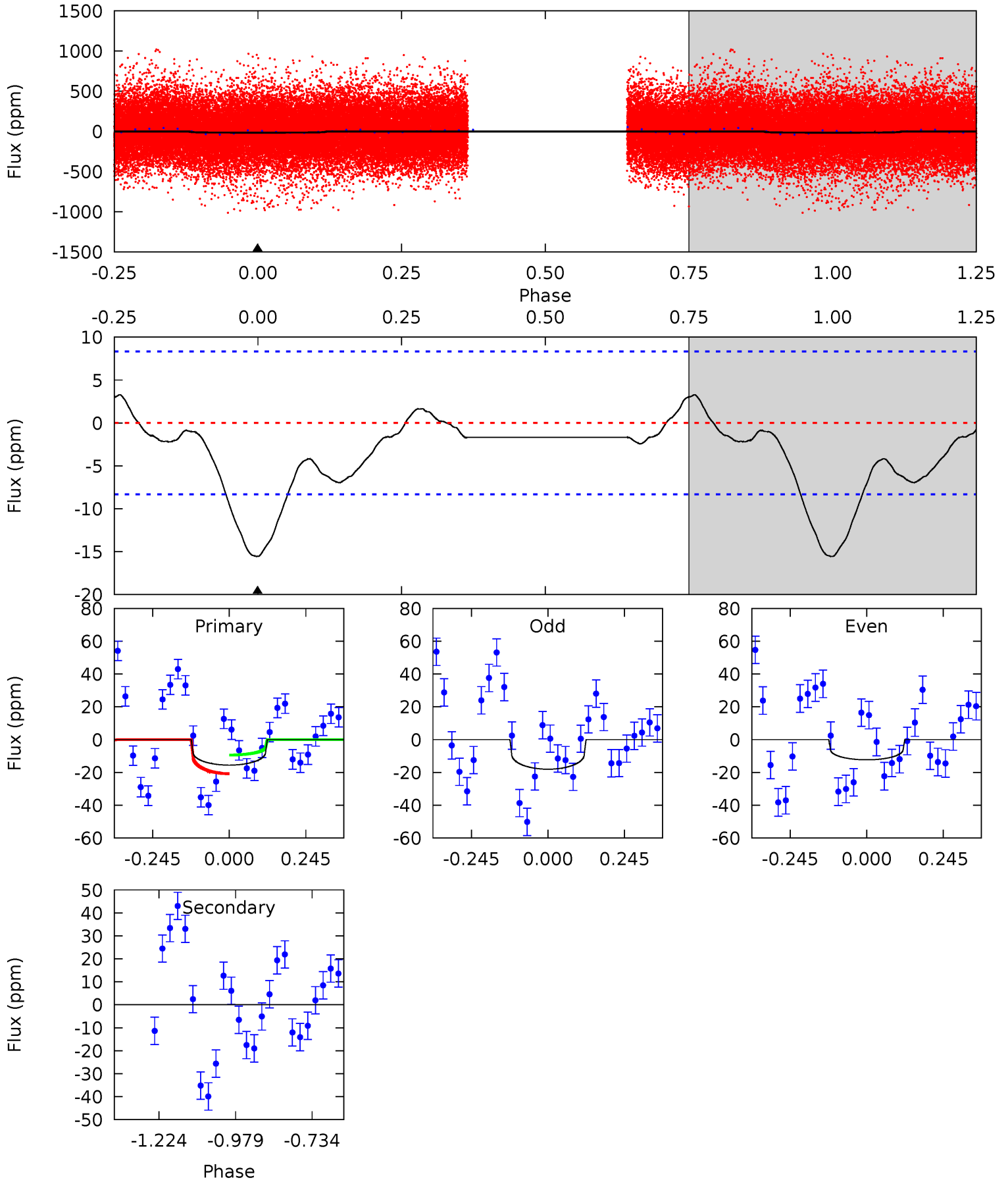




# DV Model-Shift Uniqueness Test

005906502-02, P = 3.346340 Days, E = 129.163204 Days

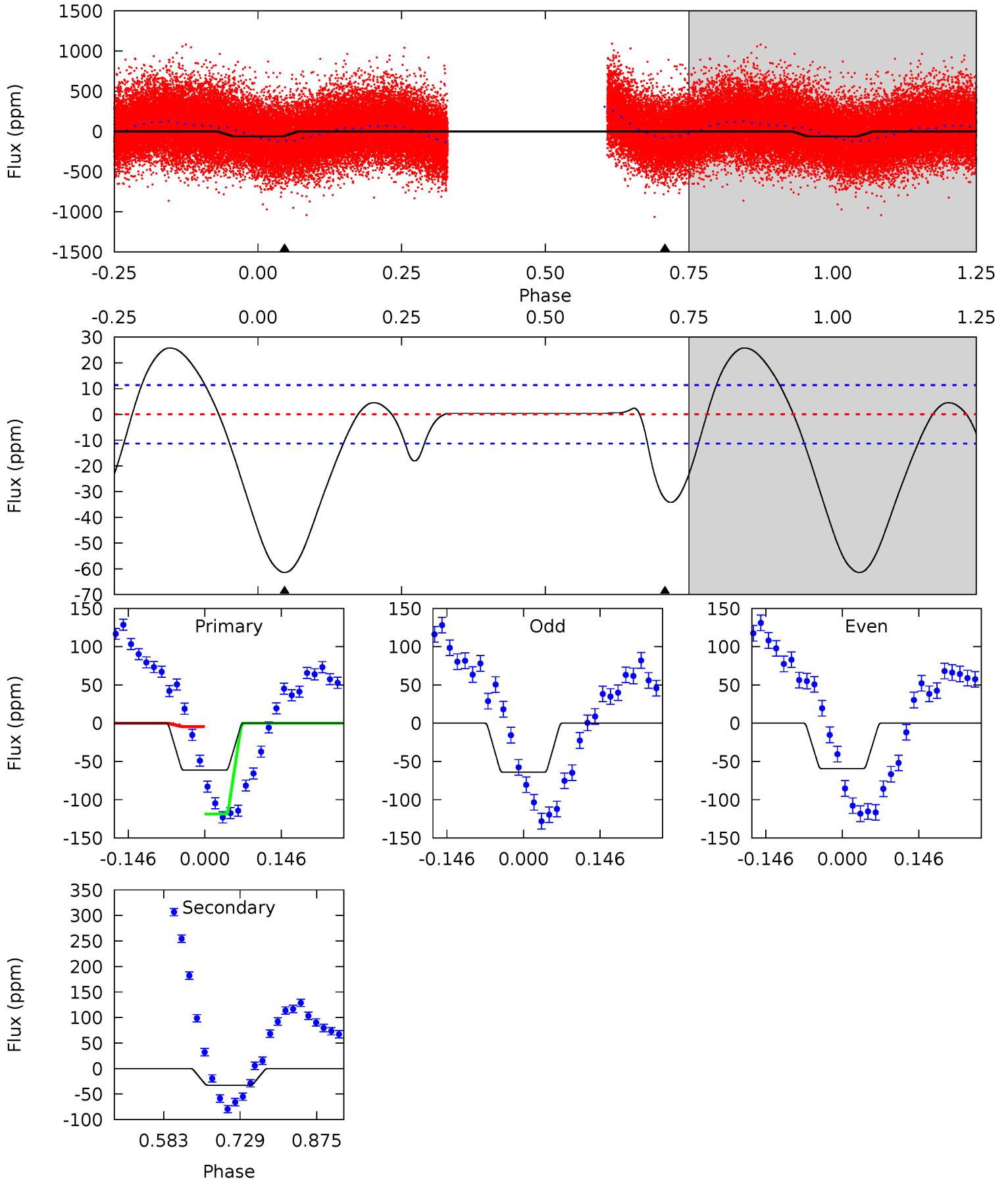
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.17	0	0	0	4.37	1.16	0.78	8.17	8.17	0	0	1.50	1.75	0.17	2.98



# Alt Model-Shift Uniqueness Test

005906502-02, P = 3.346356 Days, E = 129.276216 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
24.2	13.0	0	0	4.48	1.45	5.15	24.2	24.2	13.0	13.0	0.93	1.15	0.30	23.6



### Stellar Parameters For KIC 005906502

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6031^{+211}_{-211}$	$3.755^{+0.552}_{-0.097}$	$0.120^{+0.250}_{-0.300}$	$2.633^{+0.480}_{-1.343}$	$1.438^{+0.203}_{-0.376}$	$0.111^{+0.681}_{-0.044}$
	+3%/-3%	+15%/-3%	+208%/-250%	+18%/-51%	+14%/-26%	+613%/-40%
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 005906502-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 2$	$1.12^{+1.01}_{-0.72}$	$2632^{+191}_{-373}$	$-2927^{+6786}_{-1142}$	$-0.081^{+2.882}_{-3.358}$
Alt.	$-33 \pm 3$	$1.91^{+1.24}_{-0.97}$	$2624^{+210}_{-374}$	$5203^{+2047}_{-857}$	$12^{+36}_{-7}$

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

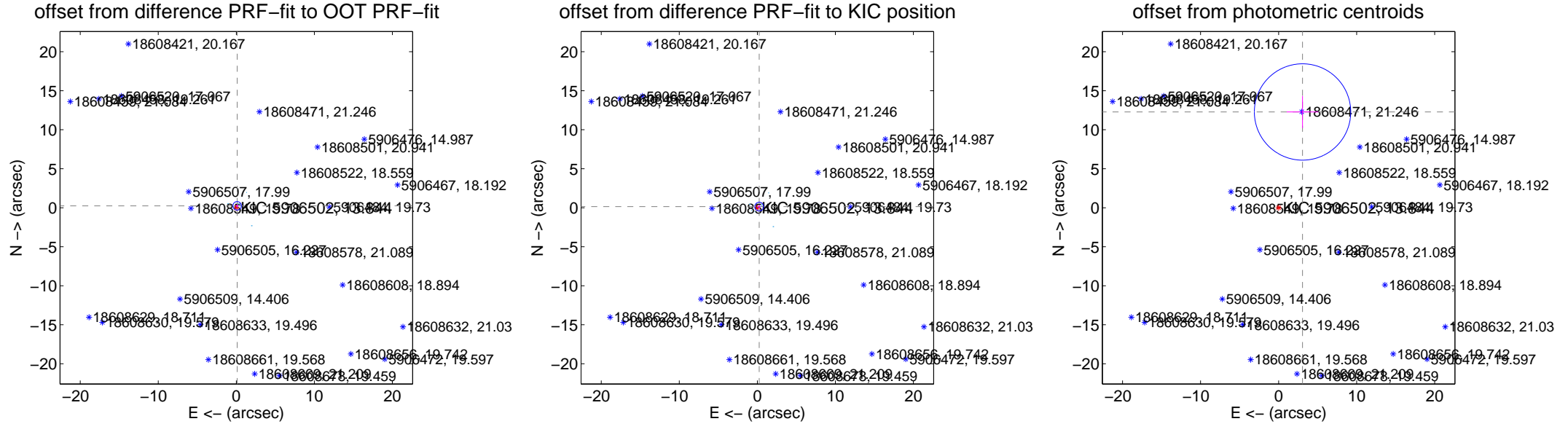
## DV Centroid Data

Supplemental centroid analysis for 005906502-02. Kepler magnitude: 13.84. Transit SNR 5.31

There are 17 quarters with good PRF difference image offsets

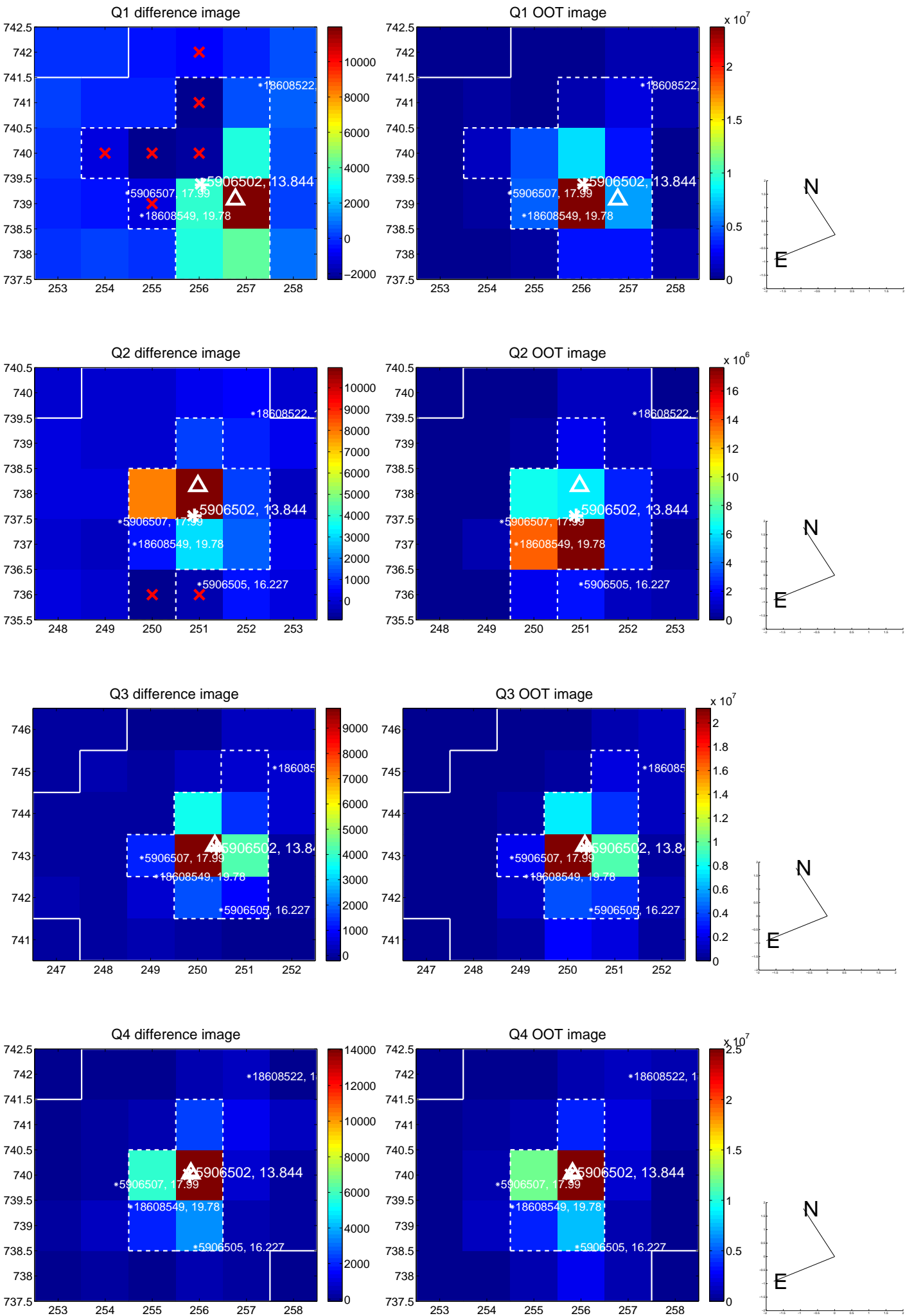
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.267 \pm 0.181$	1.47	$-0.108 \pm 0.185$	$0.244 \pm 0.190$
PRF-fit source offset from KIC position	$0.282 \pm 0.187$	1.51	$-0.240 \pm 0.186$	$0.148 \pm 0.208$
photometric centroid source offset	$12.65 \pm 2.06$	6.15	$-3.07 \pm 2.03$	$12.28 \pm 2.06$

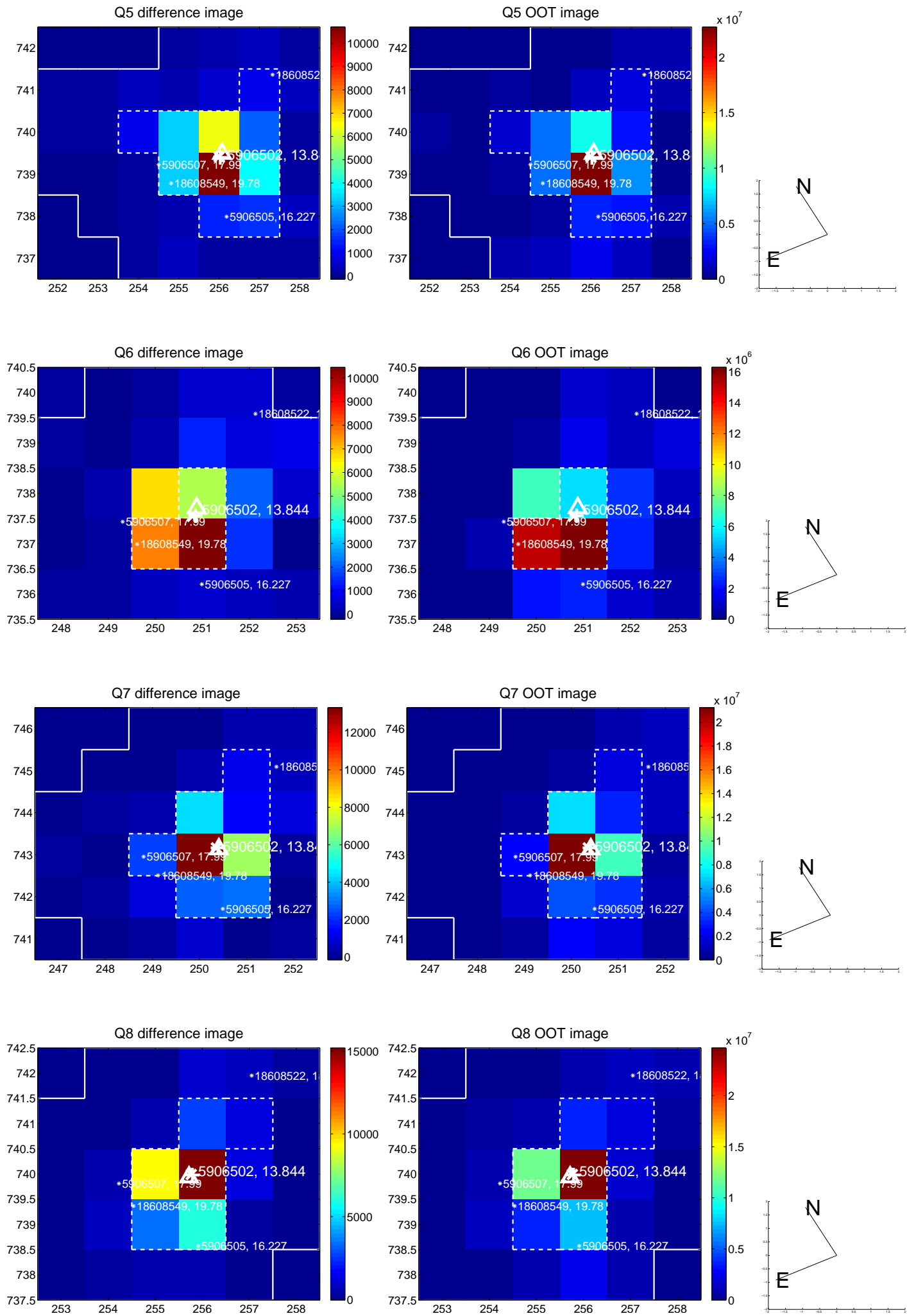


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

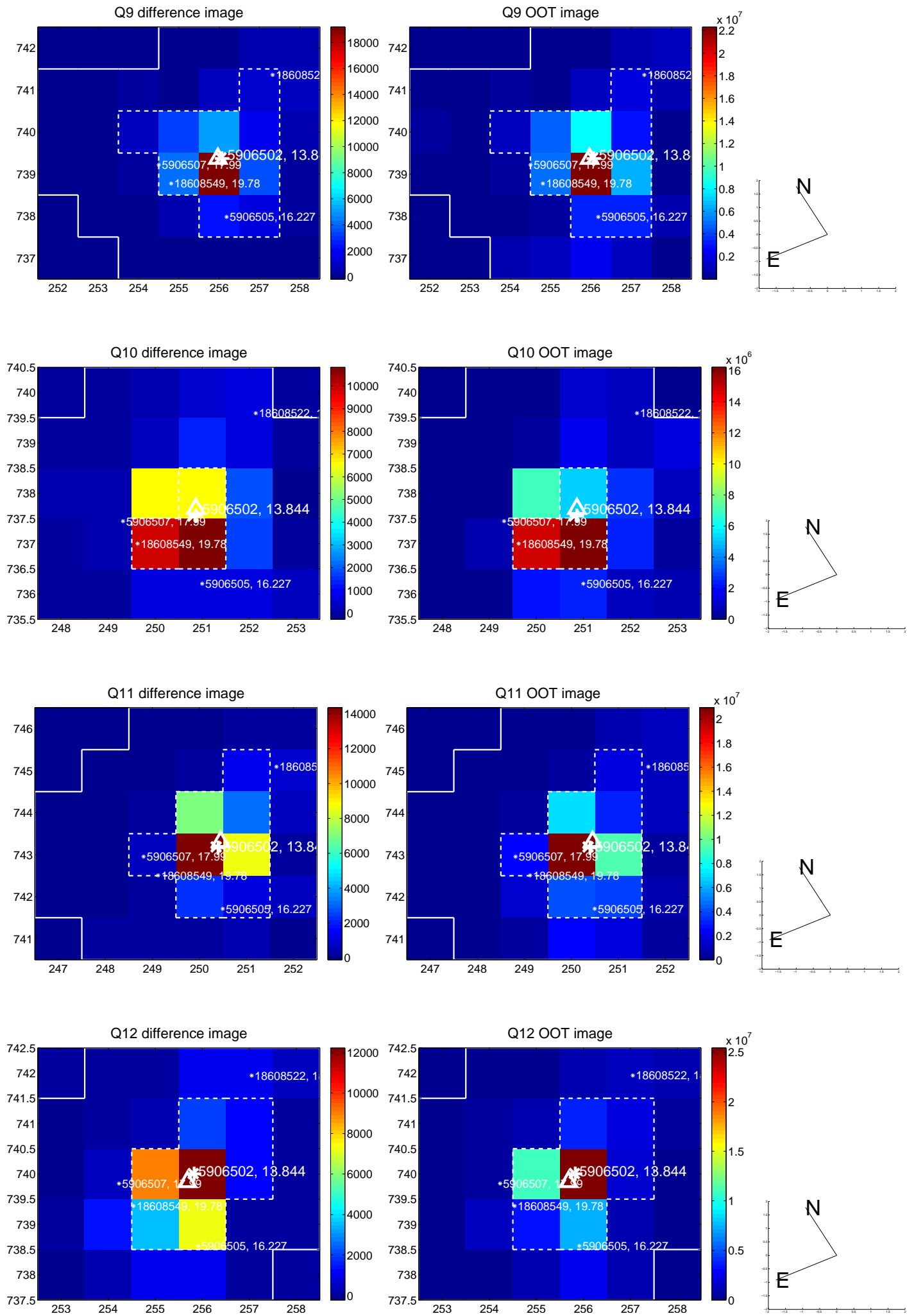


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

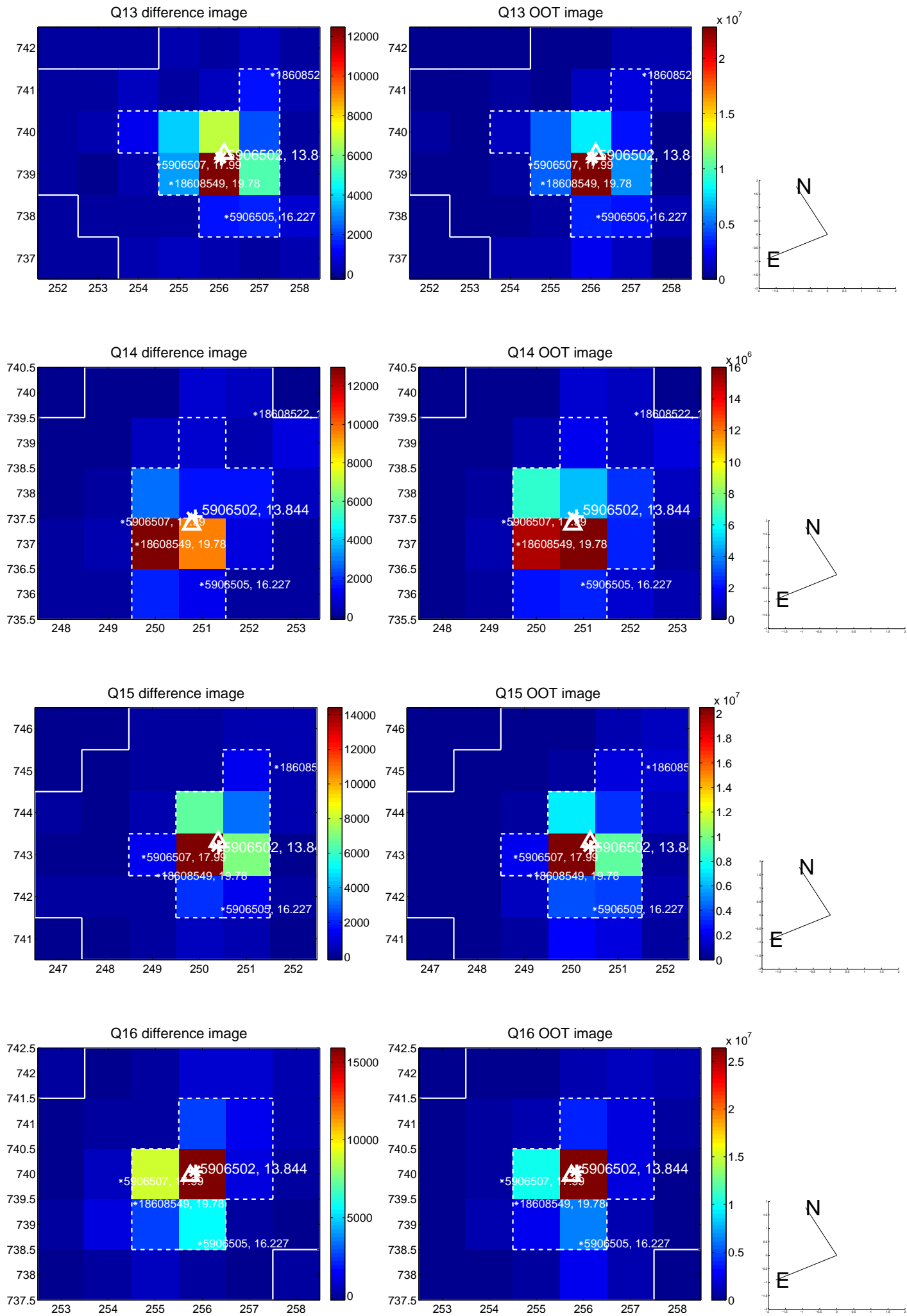




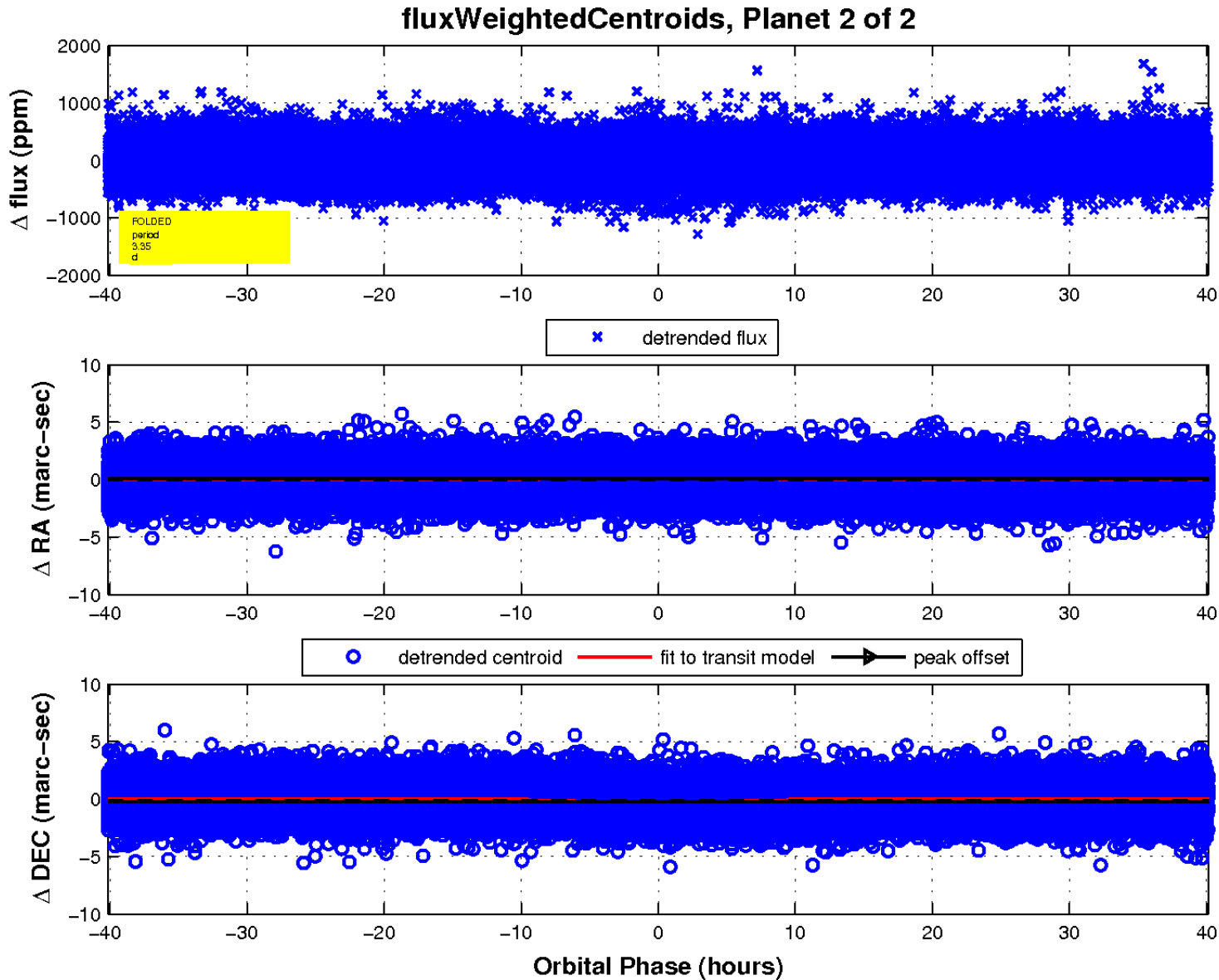
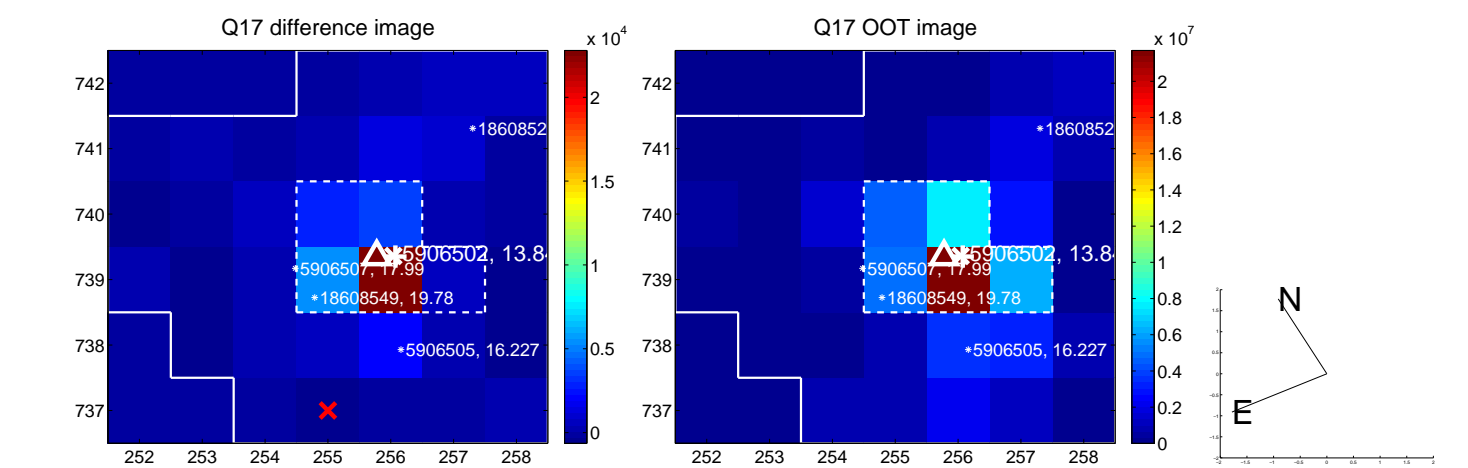
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white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

