

# KIC 007450284

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007450284-01	OBS	No	5.059204	132.391824	100.2	10.519	8.5	8.3	3.30	8148	3.67	7924.65
007450284-02	OBS	No	0.646723	131.951071	43.1	4.758	10.8	5.7	3.30	8148	2.19	123064.24
007450284-03	OBS	No	15.409708	144.699562	1096.1	1.748	10.7	12.6	3.30	8148	11.30	1794.86
007450284-04	OBS	No	6.224686	137.478558	176.4	4.570	9.9	5.2	3.30	8148	4.89	6010.81

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007450284-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
007450284-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
007450284-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED—HALO_GHOST
007450284-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

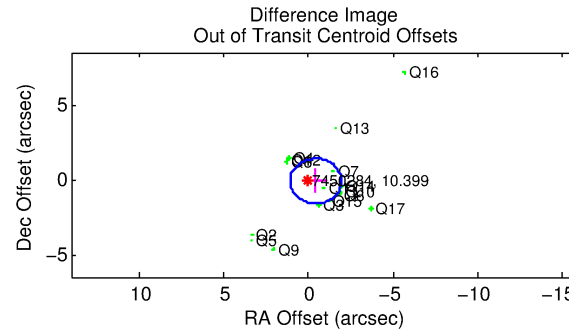
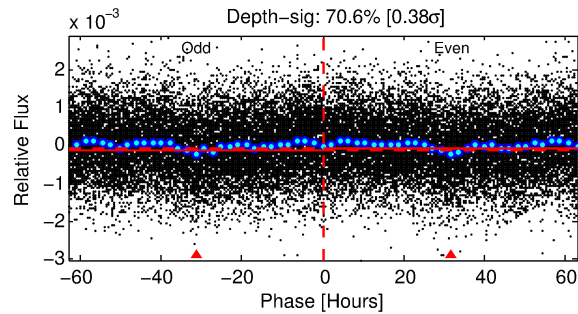
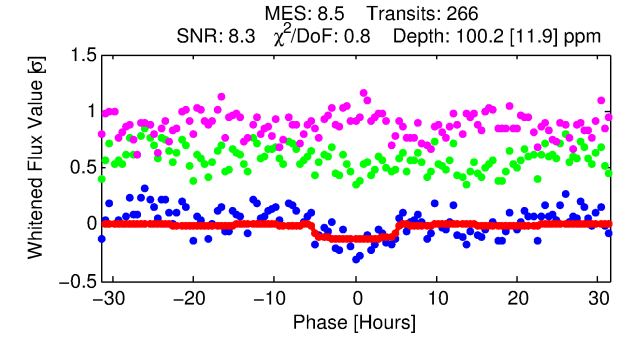
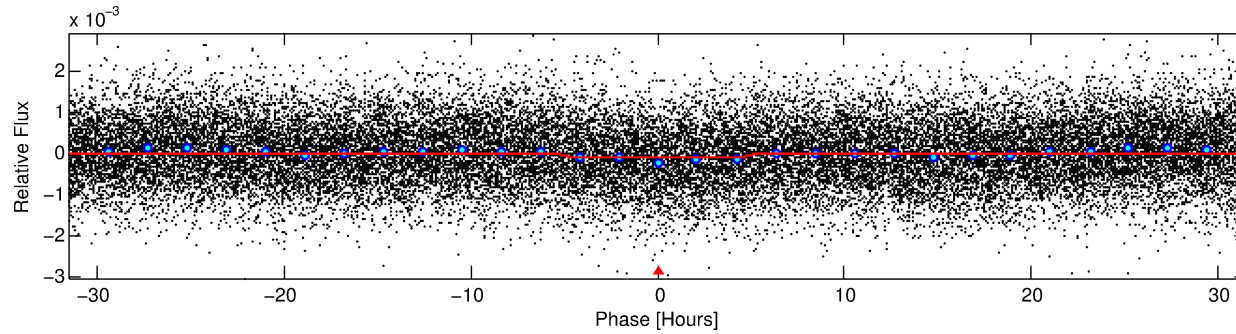
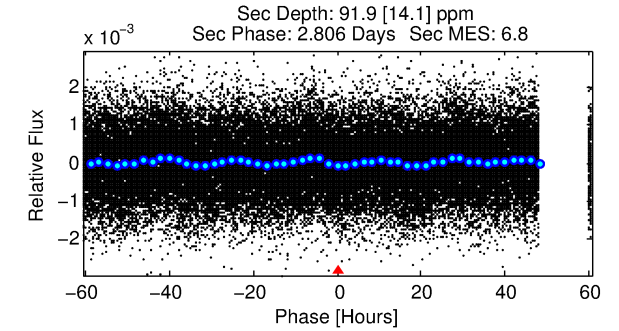
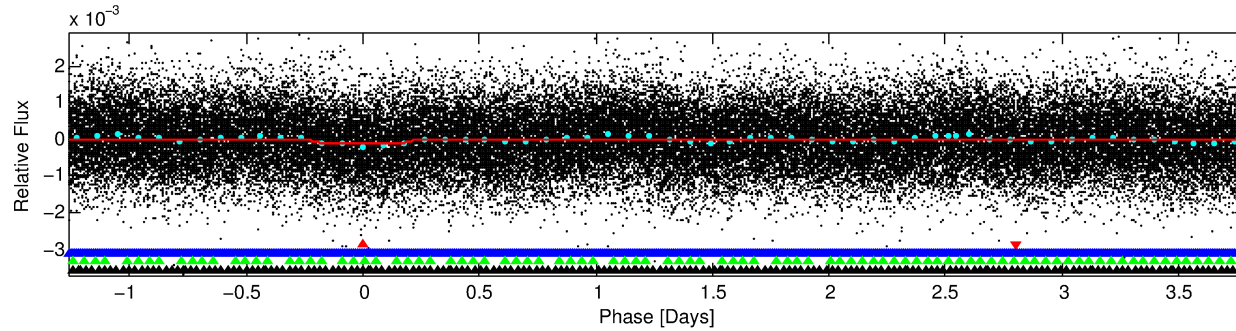
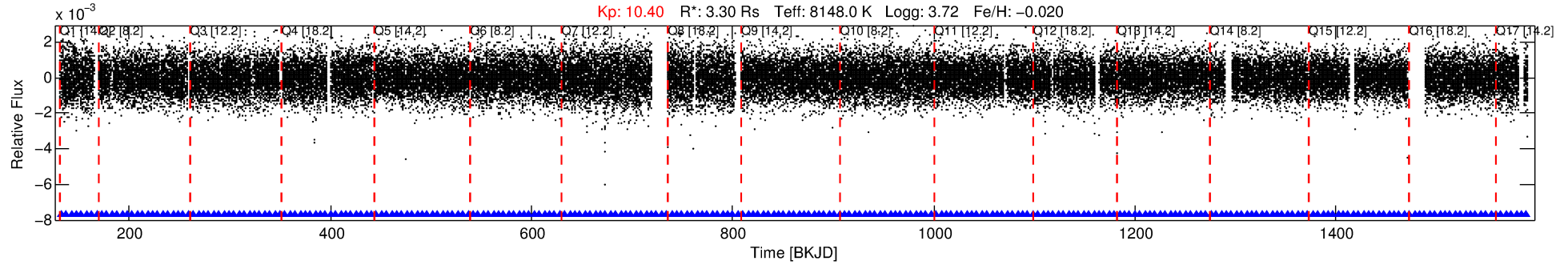
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007450284-01

No Significant Match Found

# DV One-Page Summary

KIC: 7450284 Candidate: 1 of 4 Period: 5.059 d



## DV Fit Results:

Period = 5.05920 [0.00010] d  
Epoch = 132.3918 [0.0149] BKJD  
Rp/R\* = 0.0102 [0.0039]  
a/R\* = 2.35 [4.39]  
b = 0.82 [0.92]  
Seff = 7924.65 [5864.47]  
Teq = 2406 [445] K  
Rp = 3.67 [2.22] Re  
a = 0.0736 [0.0332] AU  
Ag = 20.34 [21.42] [0.90 $\sigma$ ]  
Teffp = 7899 [1563] K [3.38 $\sigma$ ]

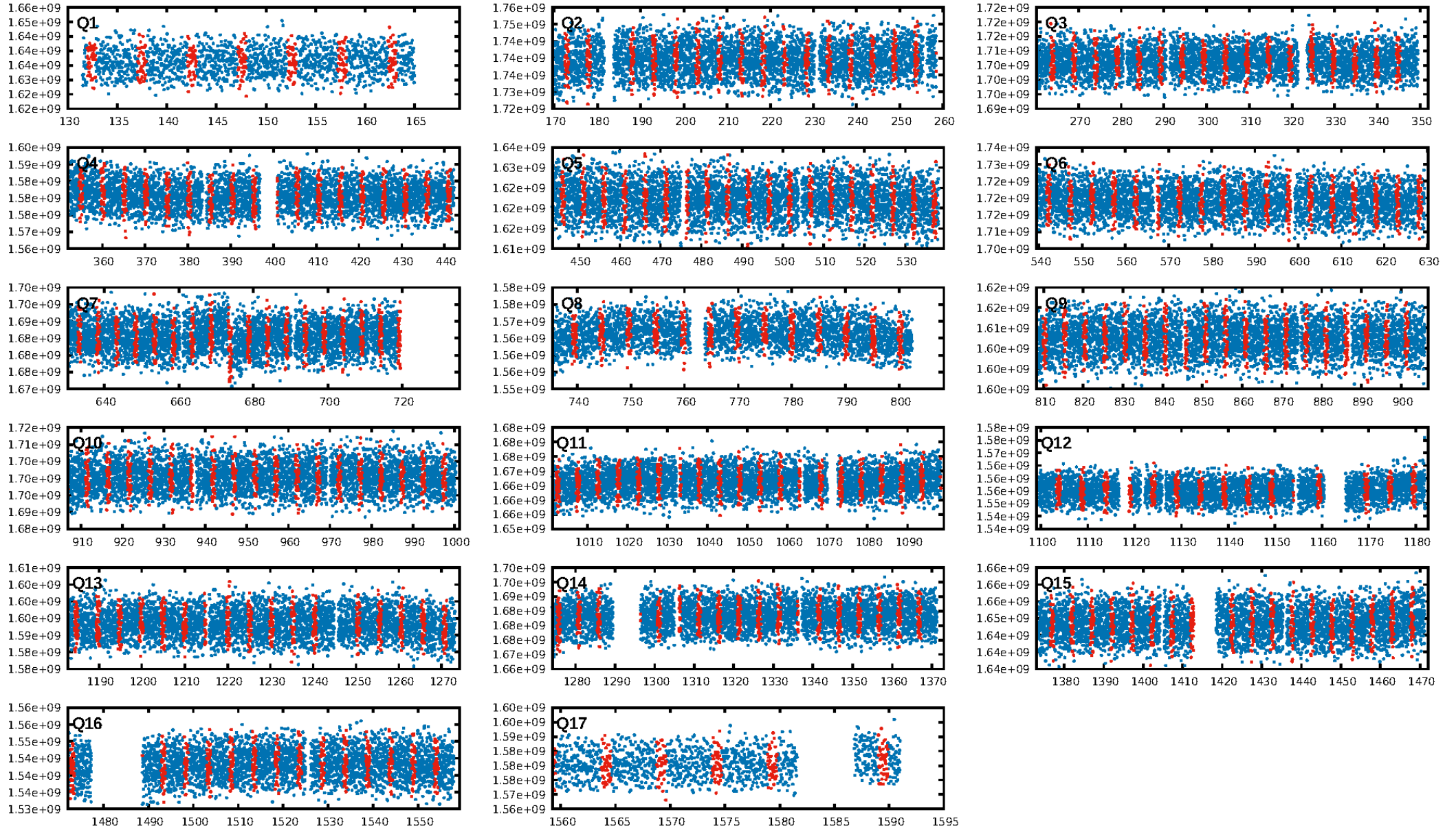
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [9.17 $\sigma$ ]  
LongPeriod-sig: 98.5% [2.44 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.62e-23  
RollingBand-fgt: 1.00 [253/253]  
GhostDiagnostic-chr: 1.967  
Centroid-sig: 98.5%  
Centroid-so: 0.261 arcsec [0.99 $\sigma$ ]  
OotOffset-rm: 0.434 arcsec [0.87 $\sigma$ ]  
KicOffset-rm: 0.976 arcsec [1.28 $\sigma$ ]  
OotOffset-st: 4/4/4 [16]  
KicOffset-st: 4/4/4 [16]  
DiffImageQuality-fgm: 0.25 [4/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:39:44 Z

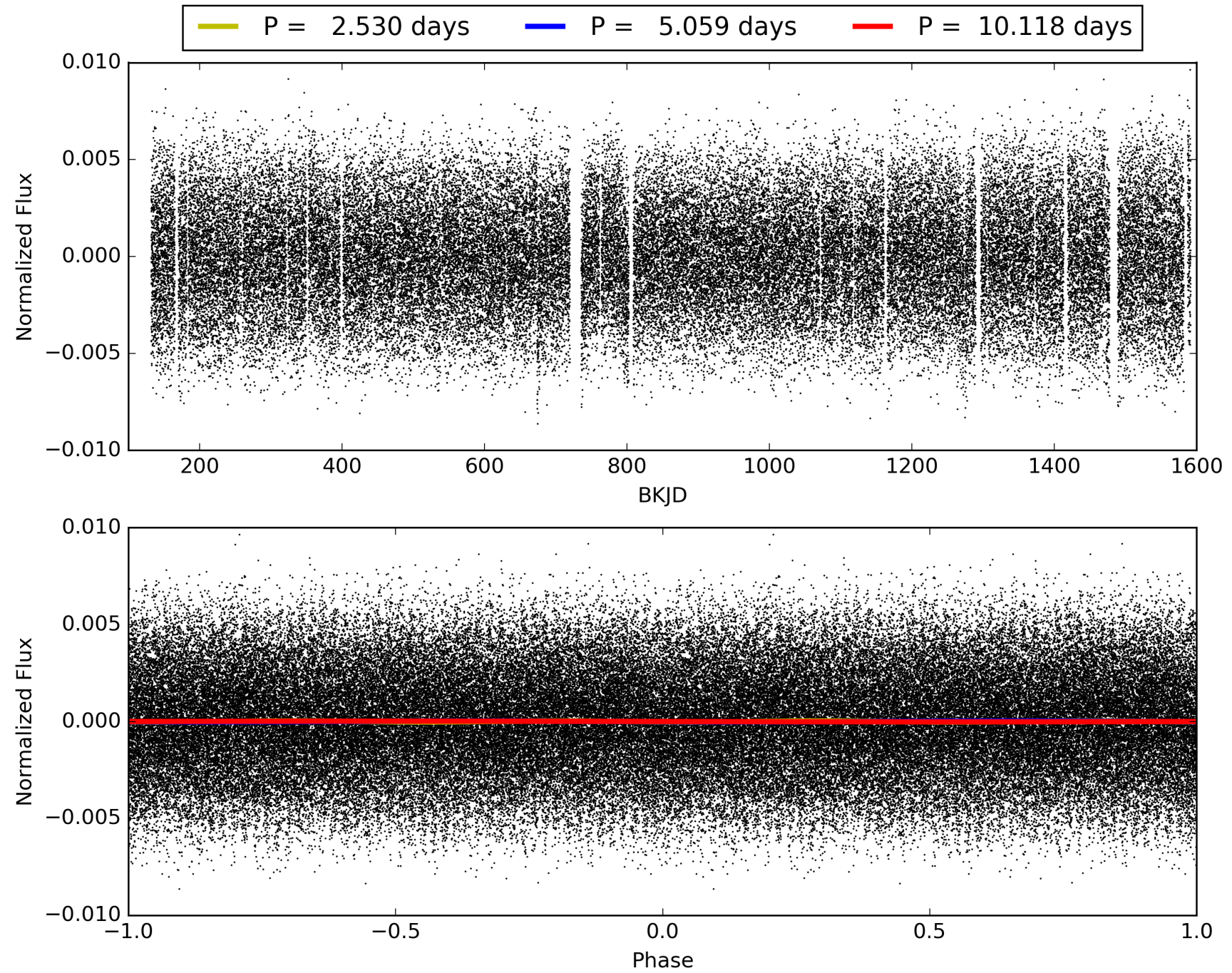
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007450284-01, PDC Light Curves





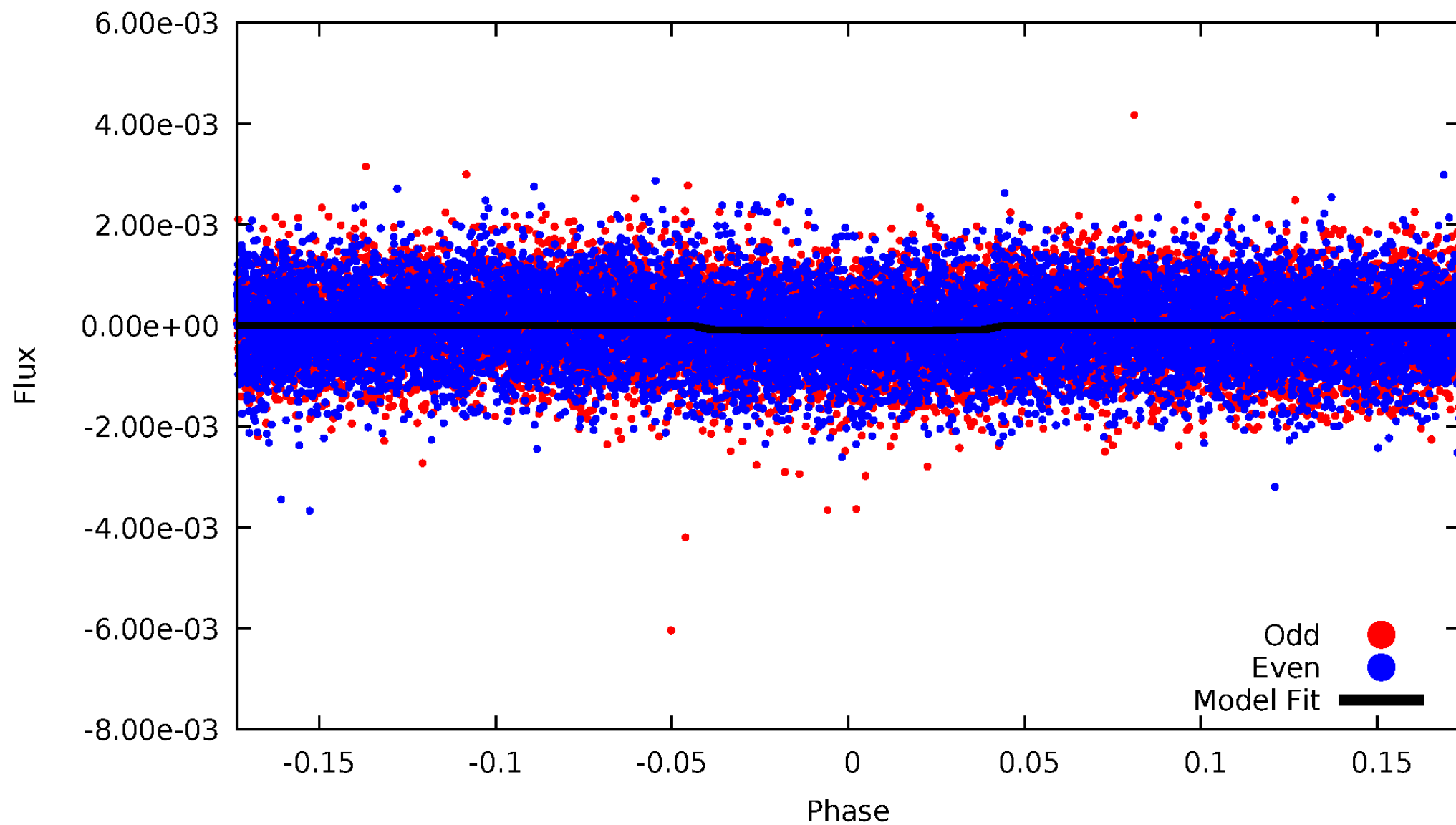
TCE 007450284-01





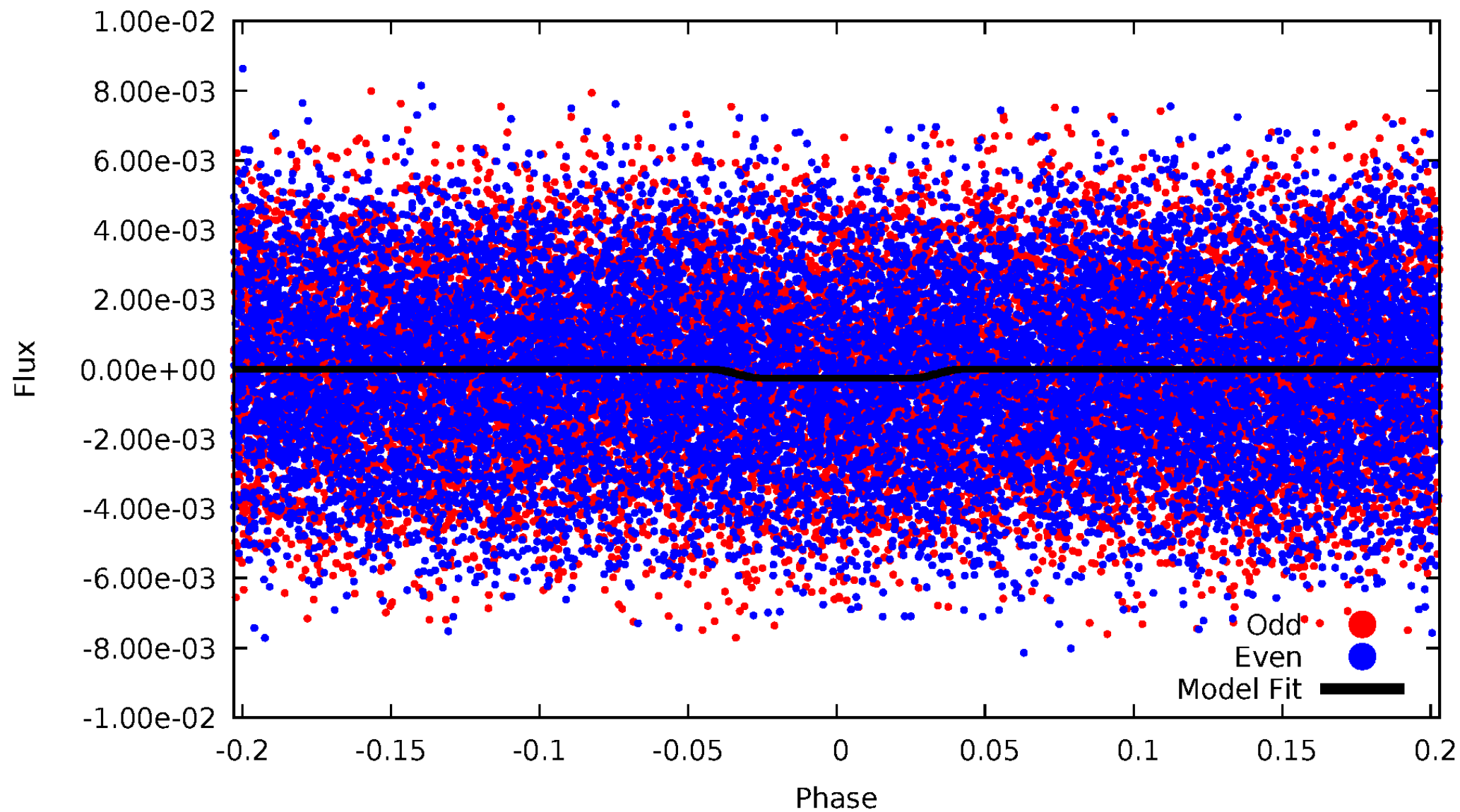
# DV Odd/Even

TCE 007450284-01



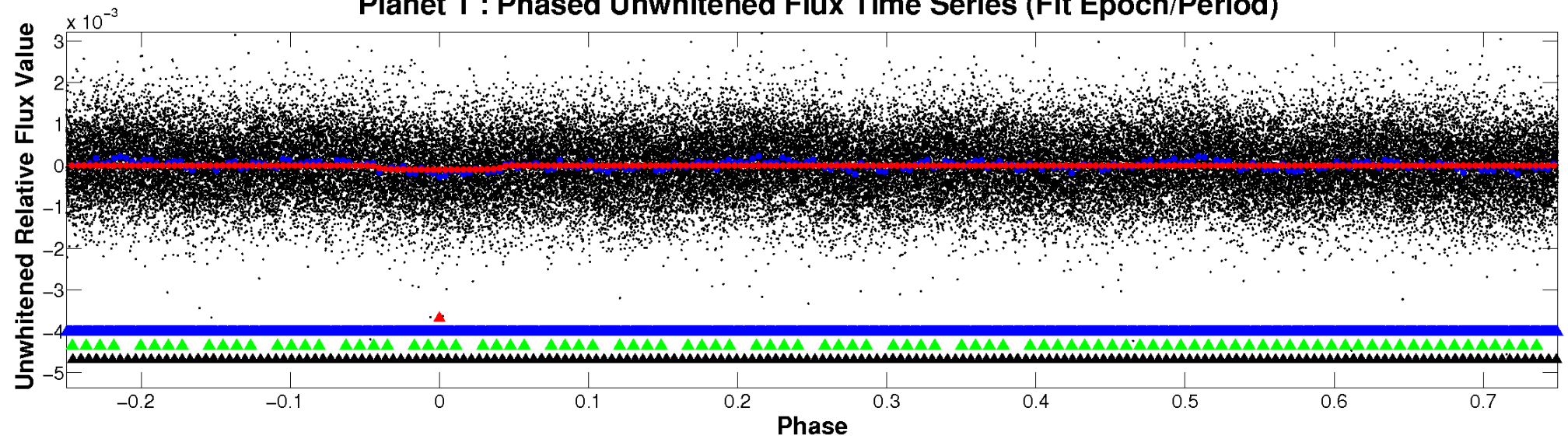
# ALT Odd/Even

TCE 007450284-01

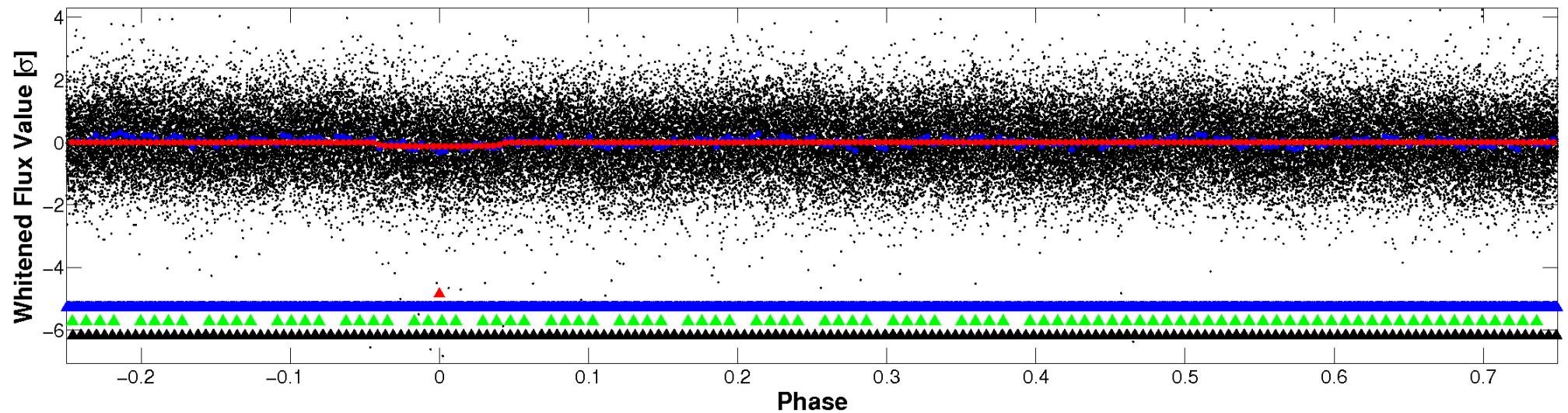


# Non-Whitened Vs. Whitened Light Curve

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



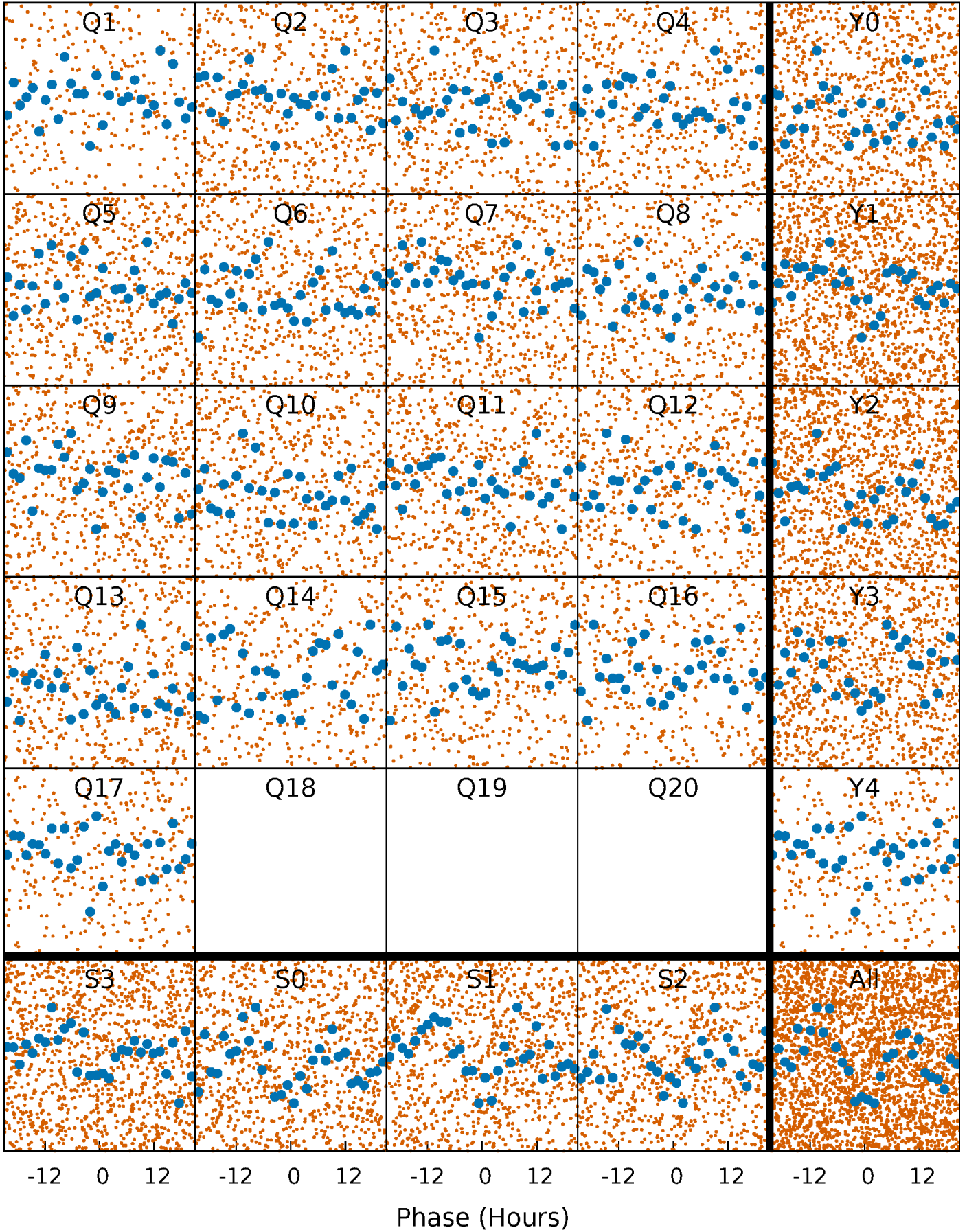
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





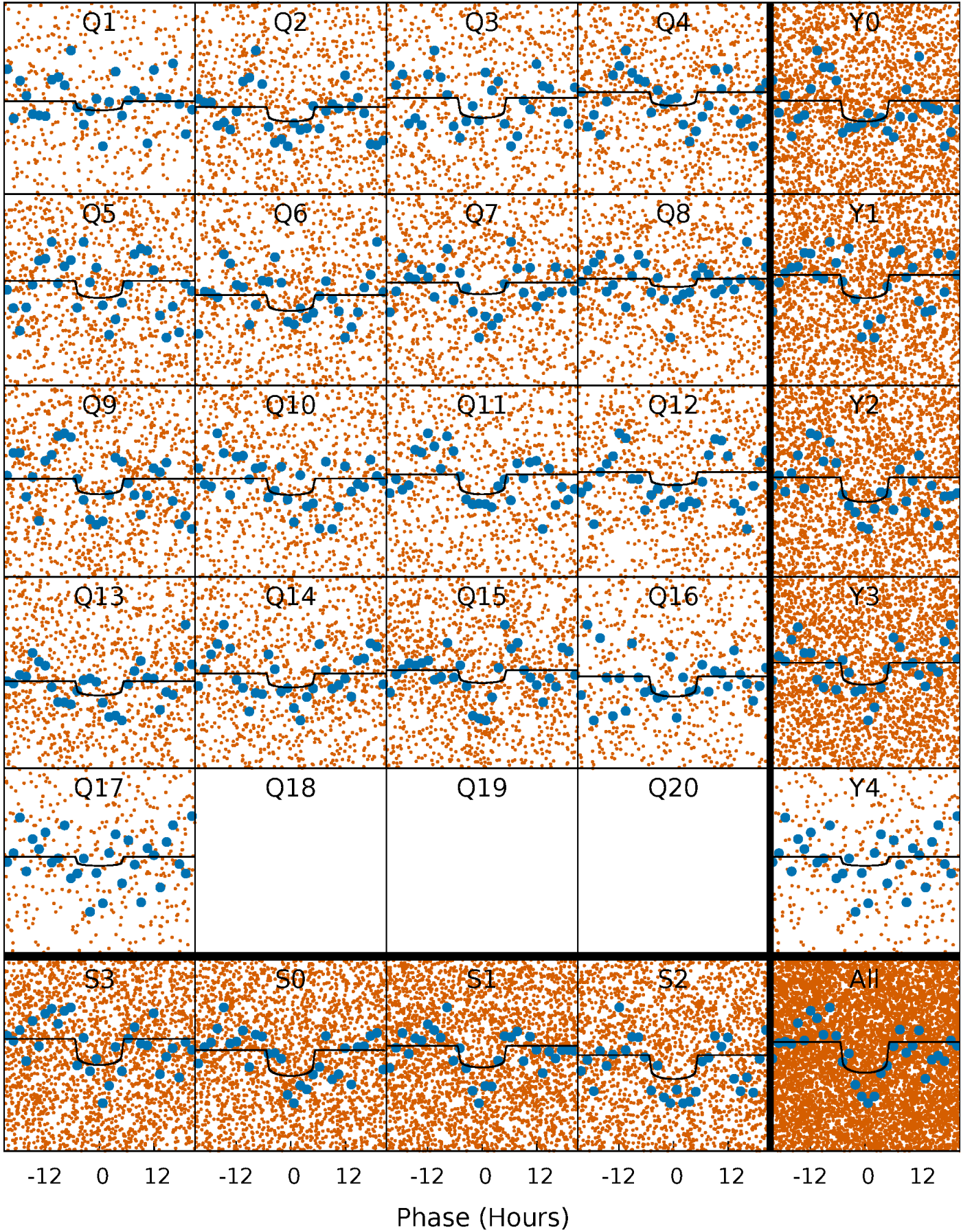
# PDC Quarter-Phased Transit Curves

TCE 007450284-01 P= 5.059204 Days  $T_0=132.391824$  (BKJD)



# DV Quarter-Phased Transit Curves

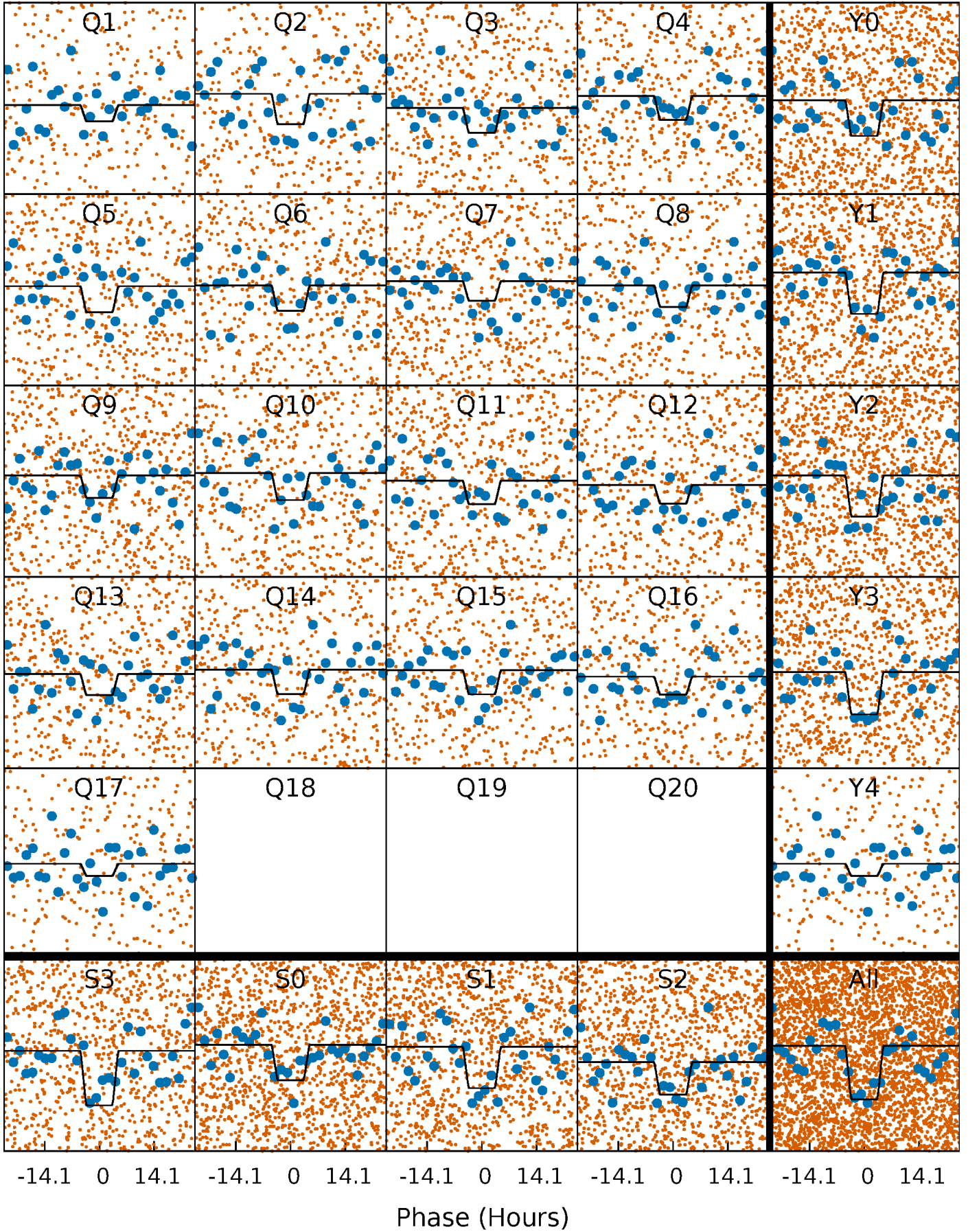
TCE 007450284-01   P= 5.059204 Days    $T_0=132.391824$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007450284-01 P= 5.059129 Days  $T_0=132.394534$  (BKJD)

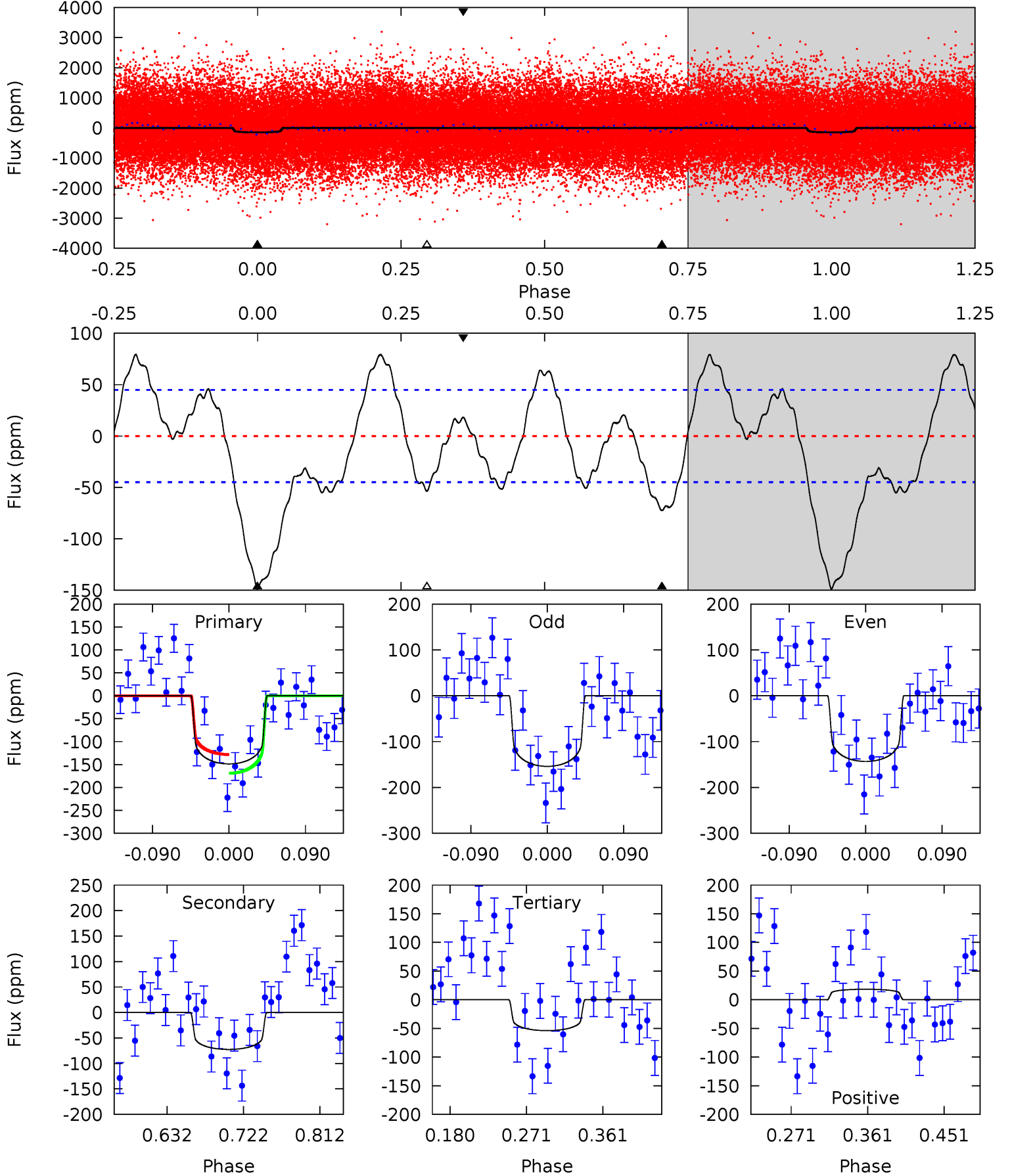




# DV Model-Shift Uniqueness Test

007450284-01, P = 5.059204 Days, E = 127.332620 Days

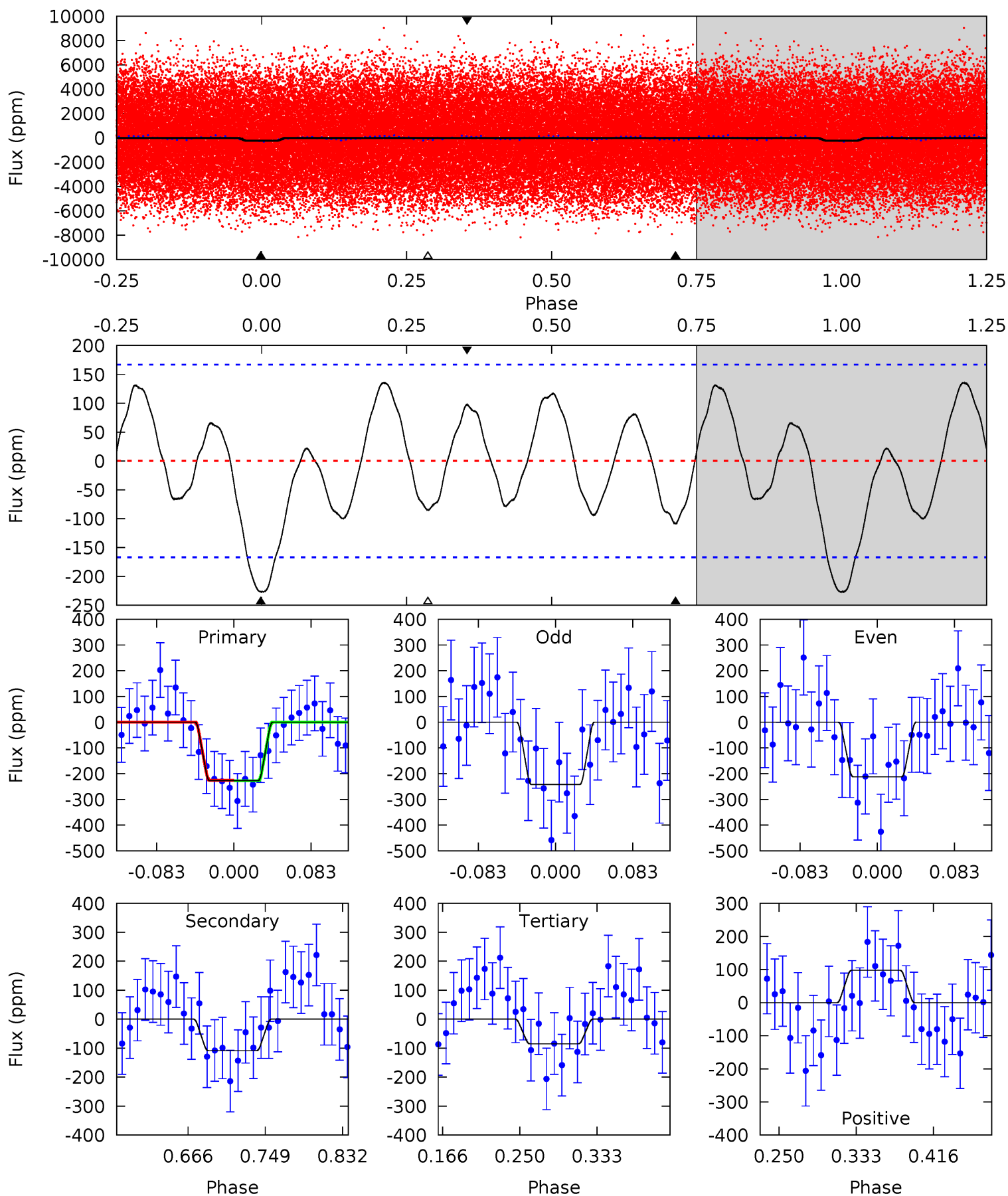
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	7.40	5.49	1.87	4.59	1.69	3.96	9.68	13.3	1.91	5.53	0.55	0.91	0.35	2.09



# Alt Model-Shift Uniqueness Test

007450284-01, P = 5.059129 Days, E = 127.335405 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
6.26	3.00	2.35	2.69	4.60	1.73	1.87	3.91	3.57	0.65	0.31	0.41	1.13	0.37	0.03



### Stellar Parameters For KIC 007450284

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8148^{+225}_{-366}$	$3.719^{+0.420}_{-0.140}$	$-0.020^{+0.250}_{-0.400}$	$3.296^{+0.840}_{-1.561}$	$2.075^{+0.348}_{-0.523}$	$0.082^{+0.310}_{-0.033}$
	+3%/-4%	+11%/-4%	+1250%/-2000%	+25%/-47%	+17%/-25%	+380%/-40%
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 007450284-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-72 \pm 10$	$3.36^{+1.66}_{-1.43}$	$3293^{+252}_{-406}$	$7228^{+2623}_{-1206}$	$19^{+35}_{-10}$
Alt.	$-109 \pm 36$	$5.28^{+1.85}_{-1.72}$	$3286^{+271}_{-389}$	$6238^{+1292}_{-843}$	$11^{+12}_{-5}$

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



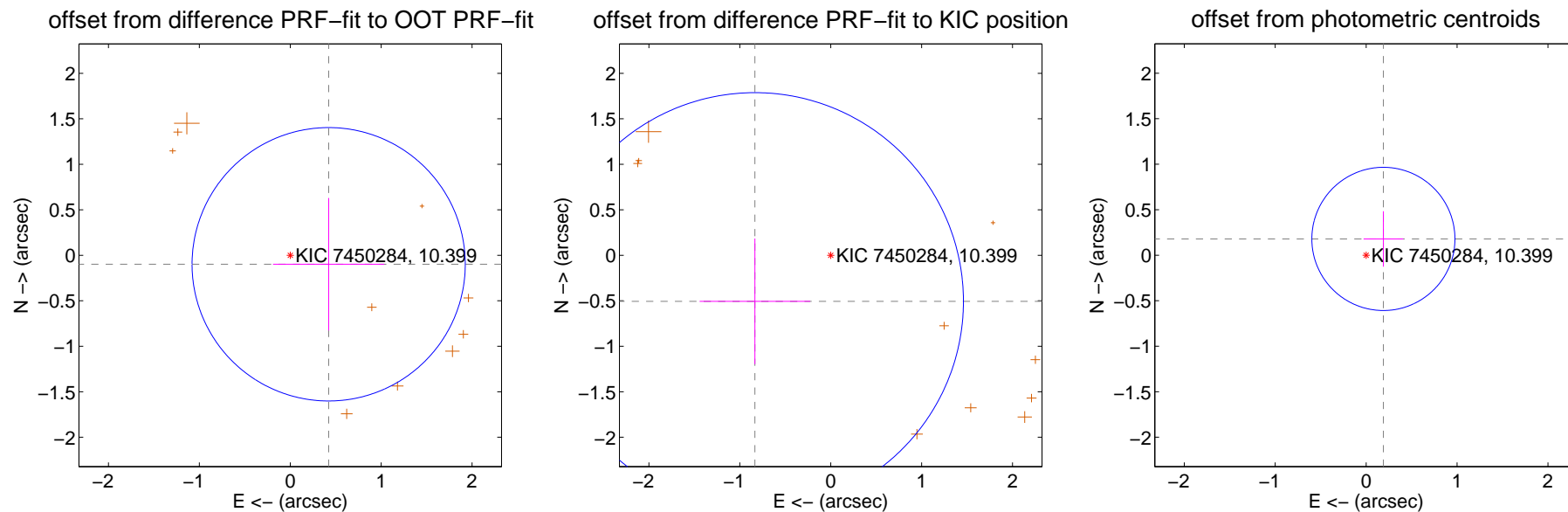
## DV Centroid Data

Supplemental centroid analysis for 007450284-01. **Kepler magnitude: 10.40.** Transit SNR 8.34

There are 4 quarters with good PRF difference image offsets

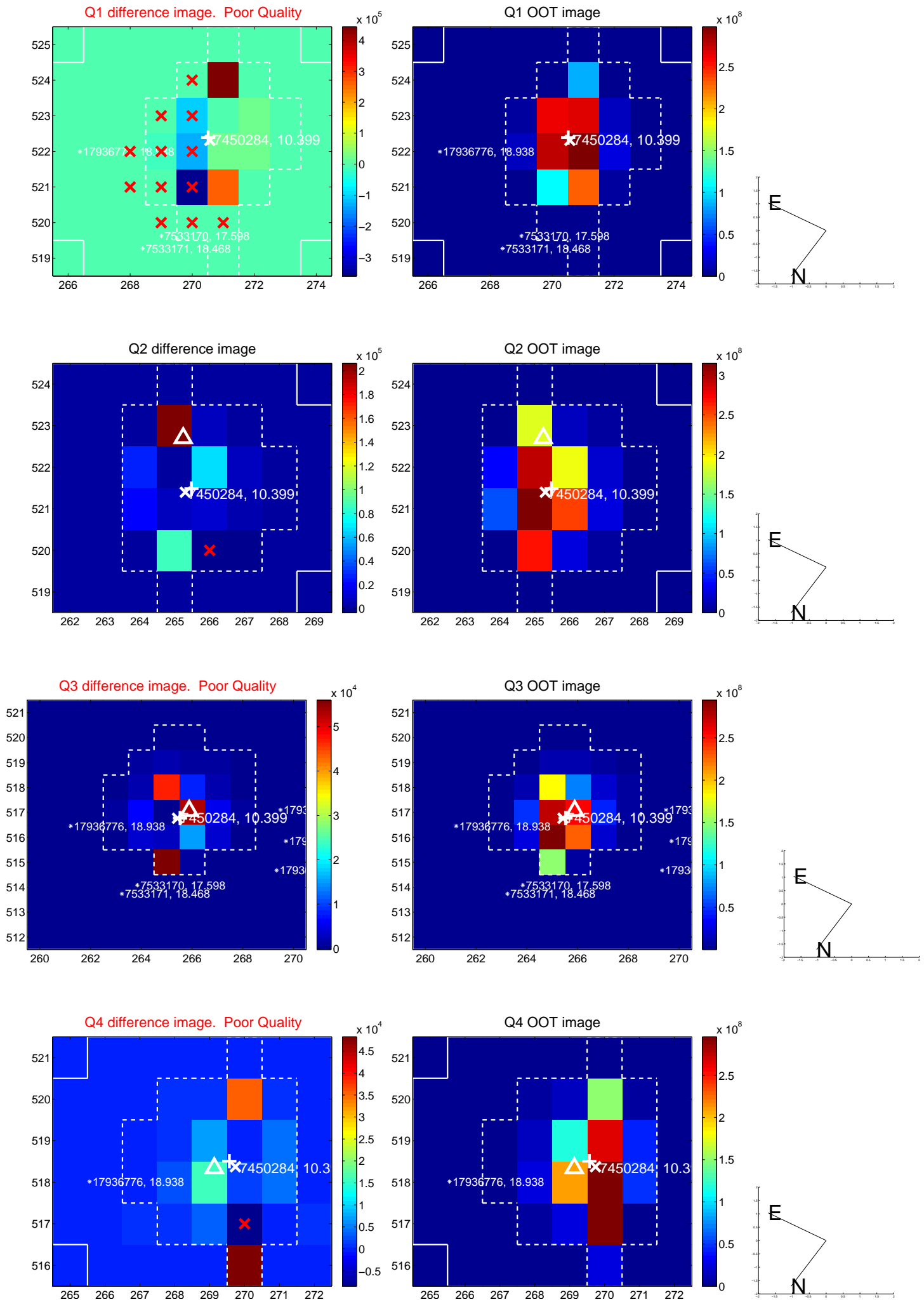
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.434 \pm 0.501$	0.87	$-0.422 \pm 0.612$	$-0.099 \pm 0.729$
PRF-fit source offset from KIC position	$0.976 \pm 0.765$	1.28	$0.834 \pm 0.608$	$-0.507 \pm 0.691$
photometric centroid source offset	$0.26 \pm 0.26$	0.99	$-0.19 \pm 0.22$	$0.18 \pm 0.30$

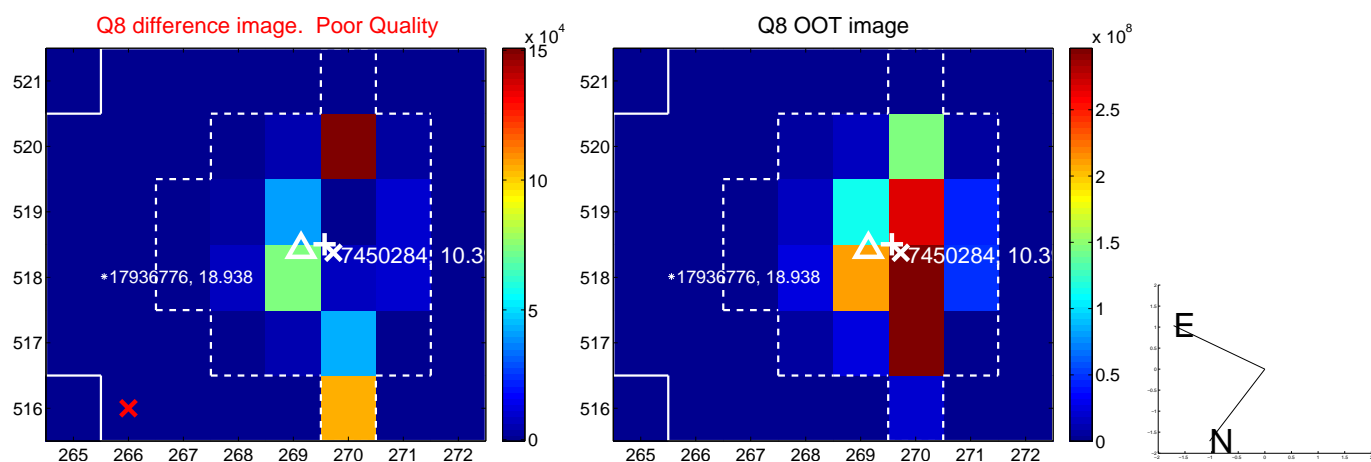
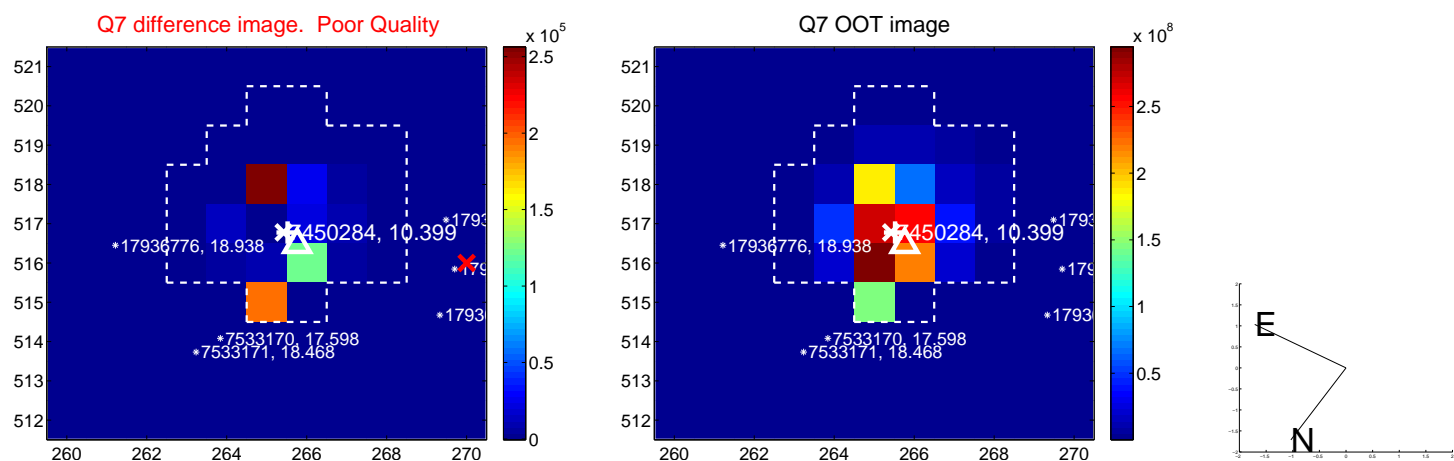
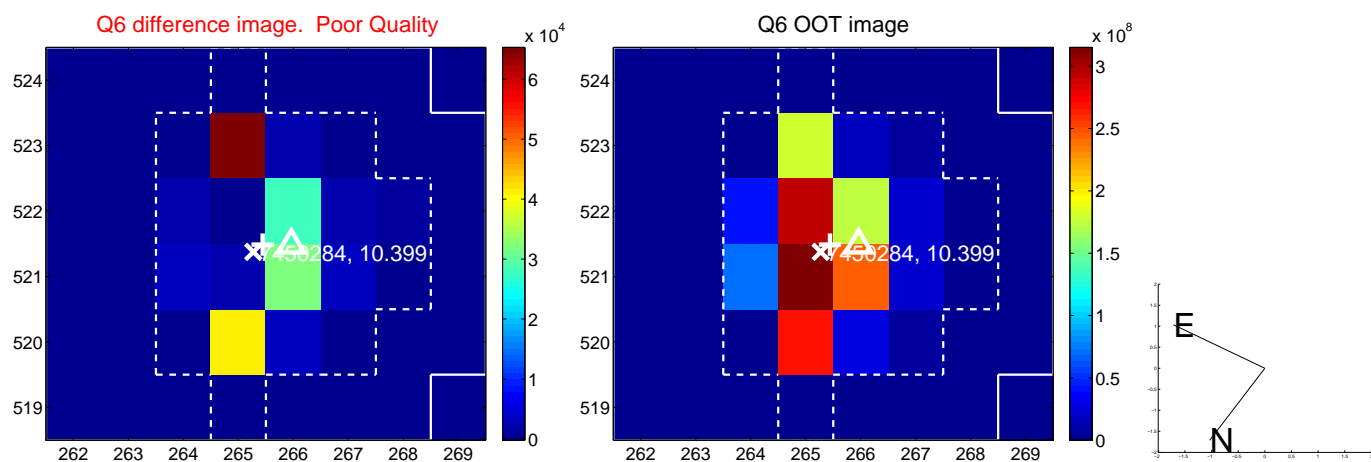
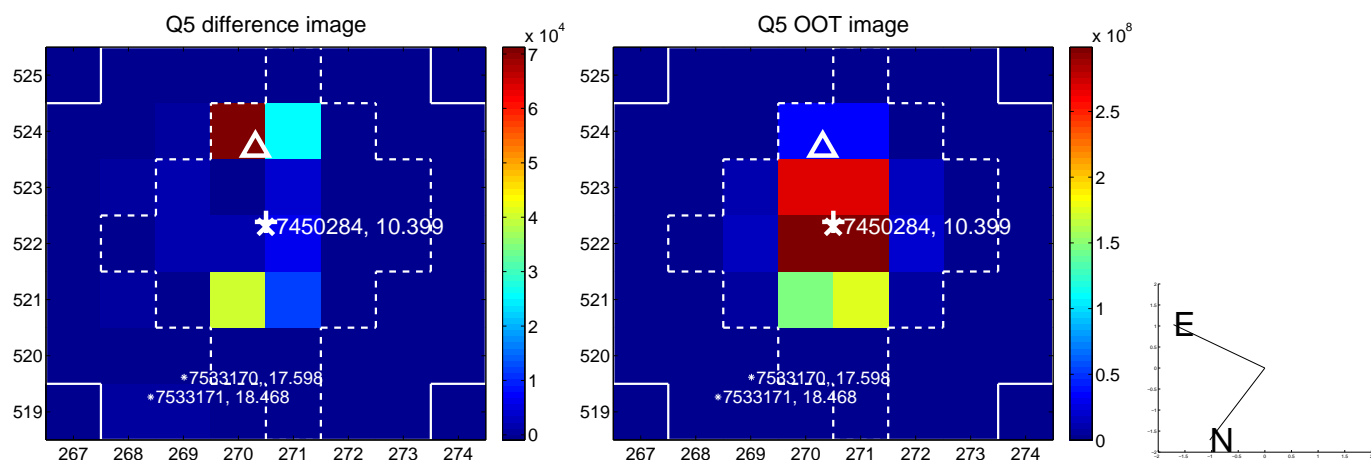


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

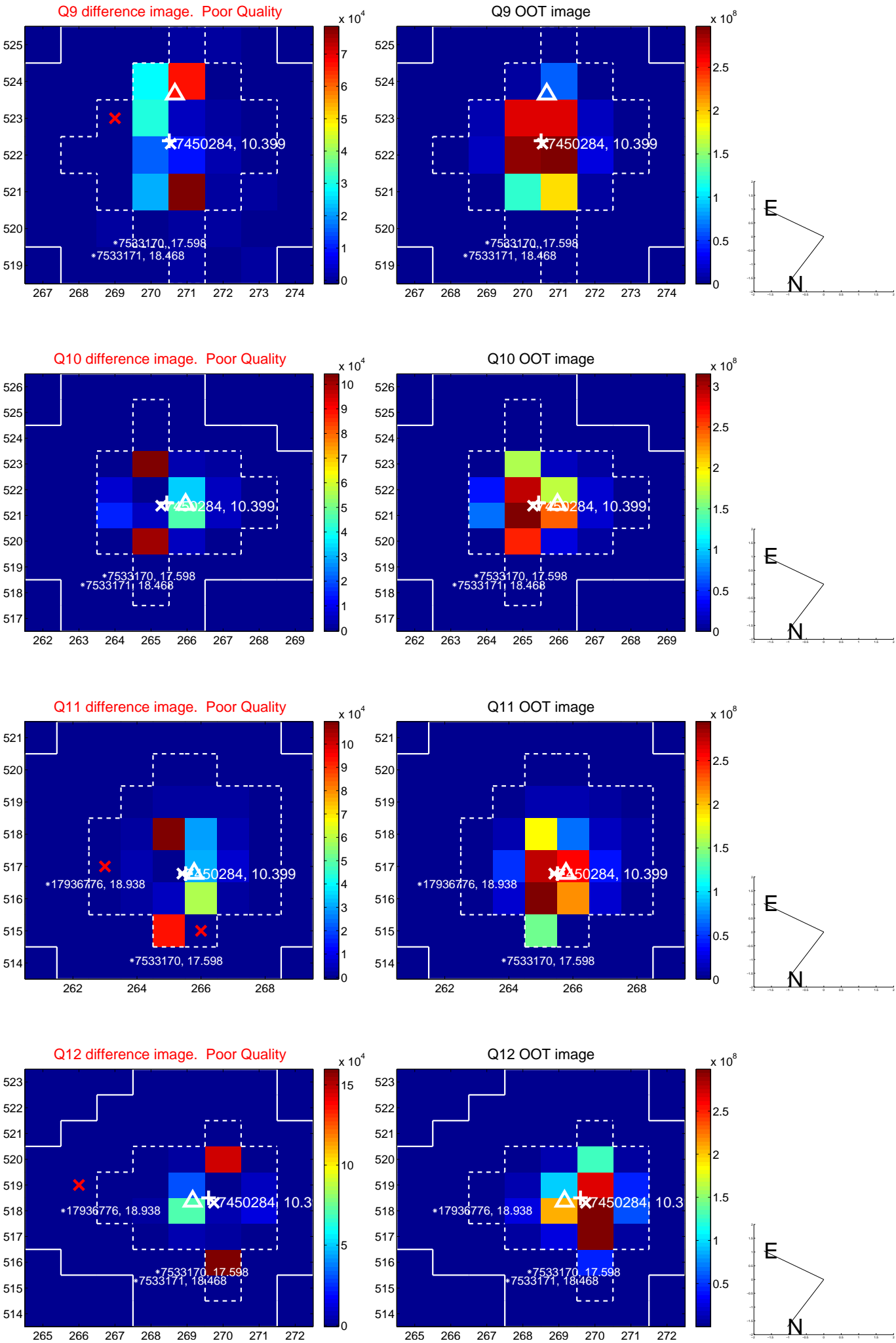


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

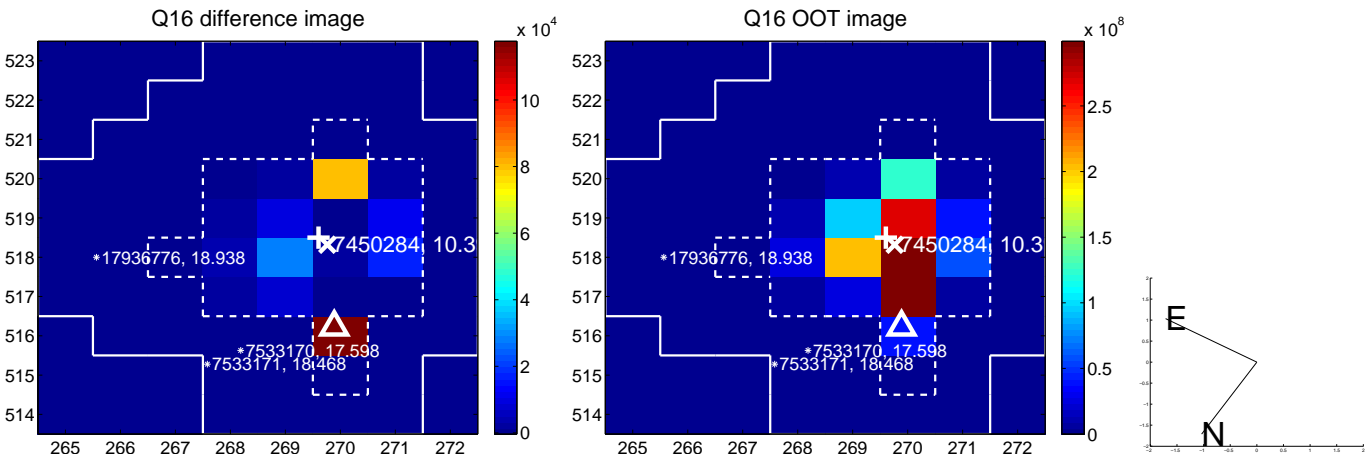
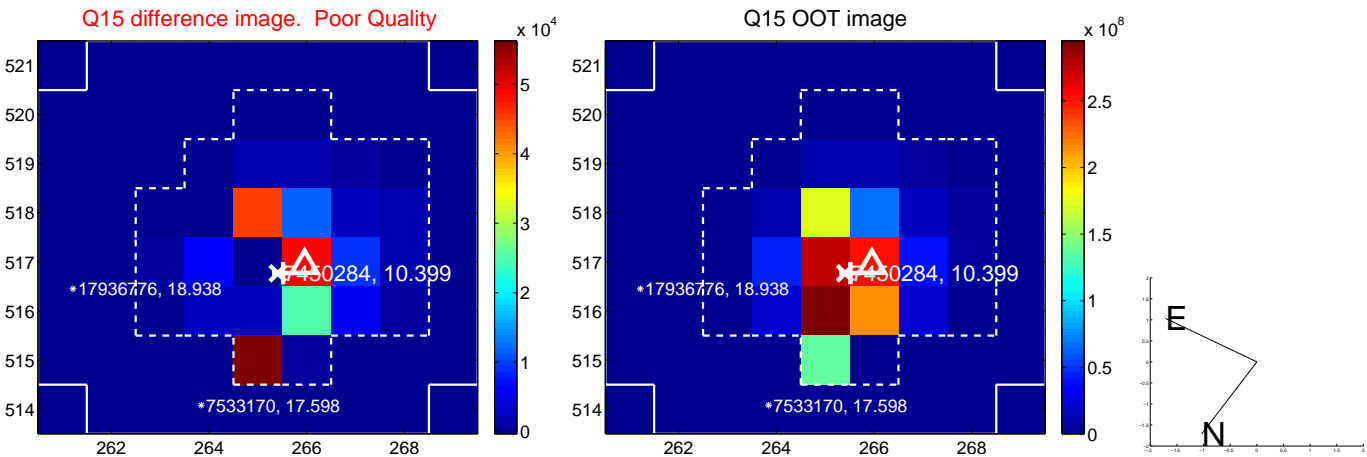
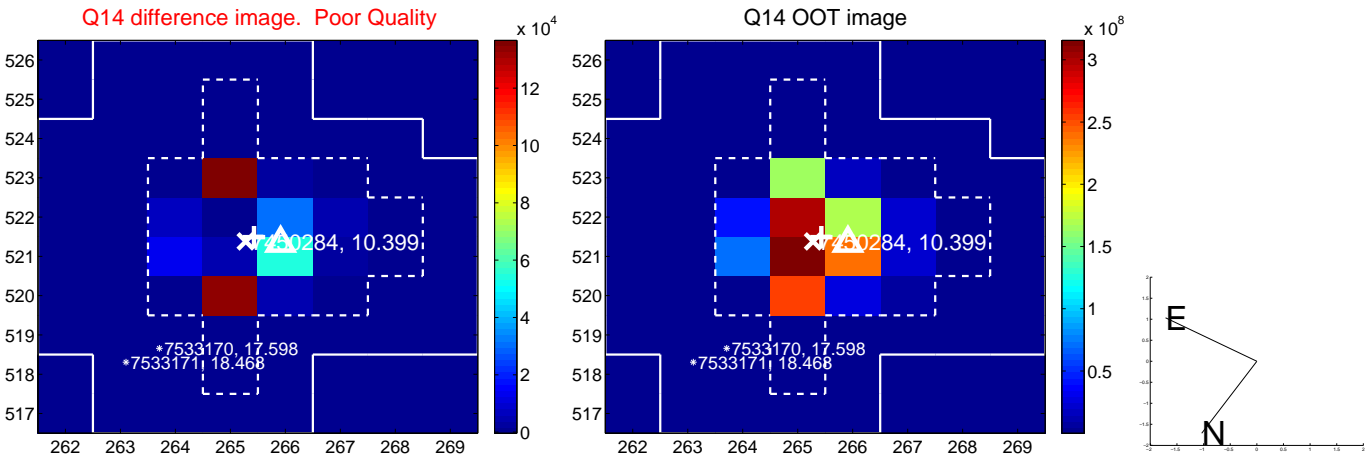
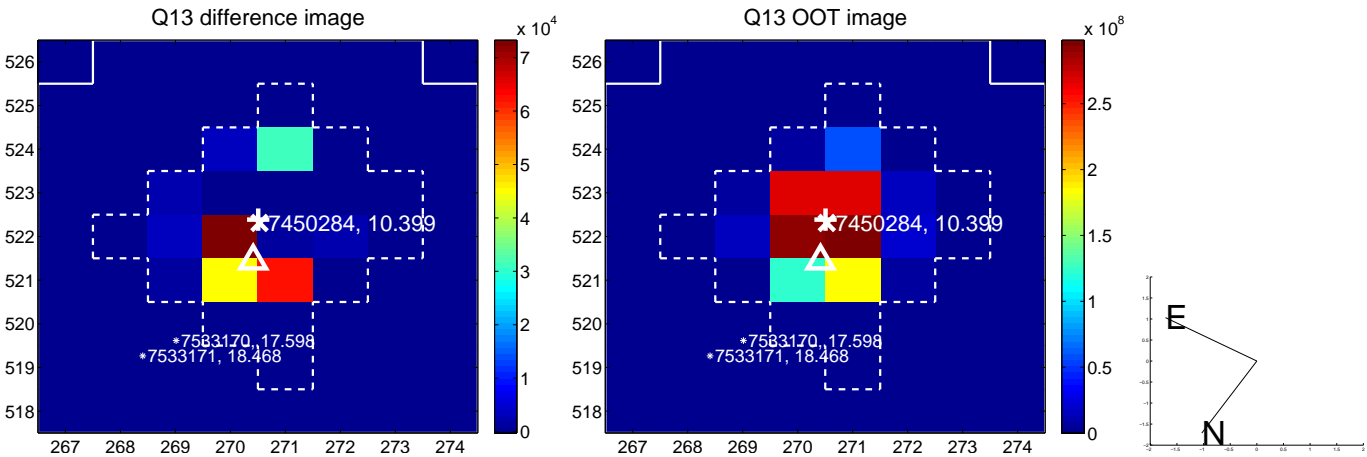




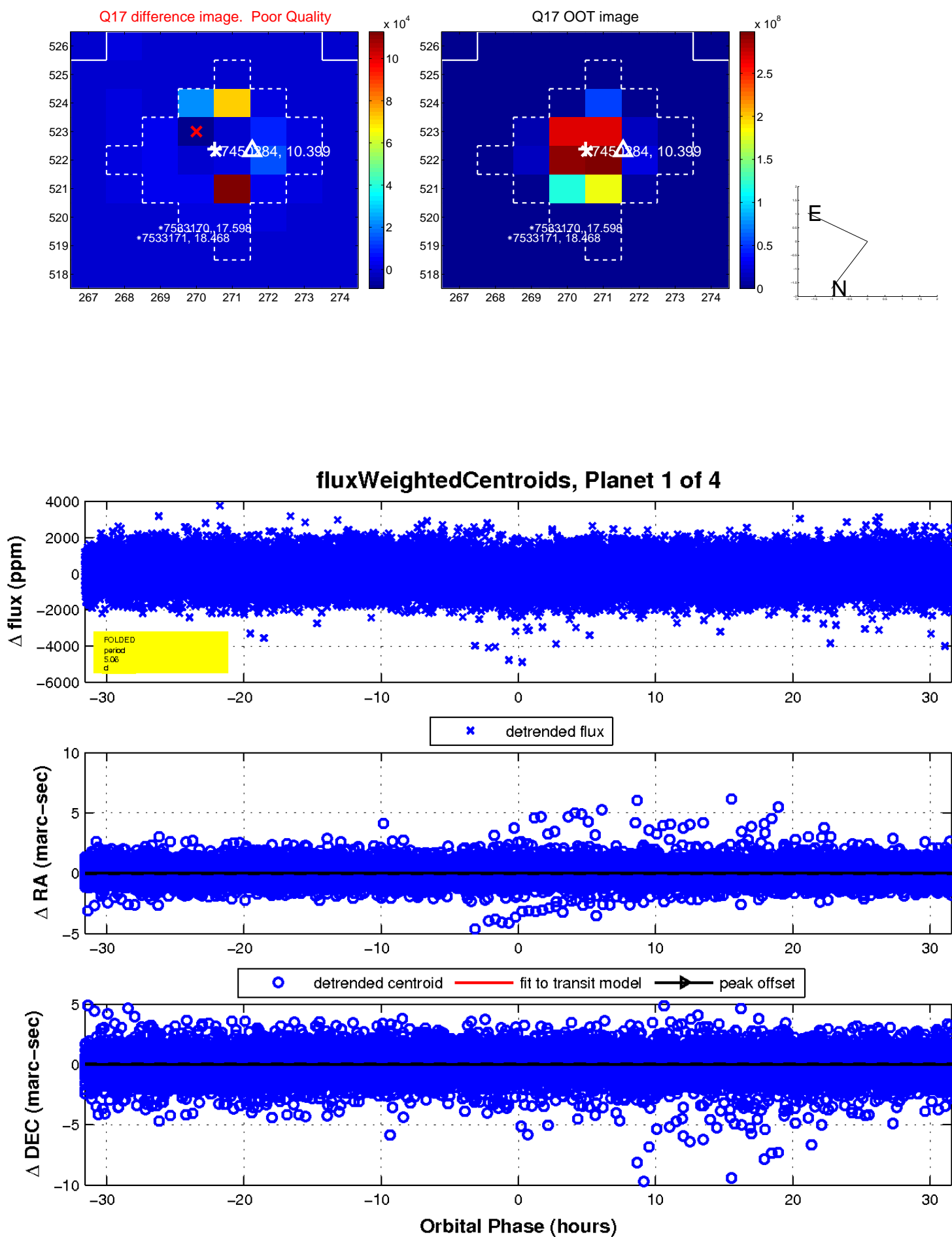
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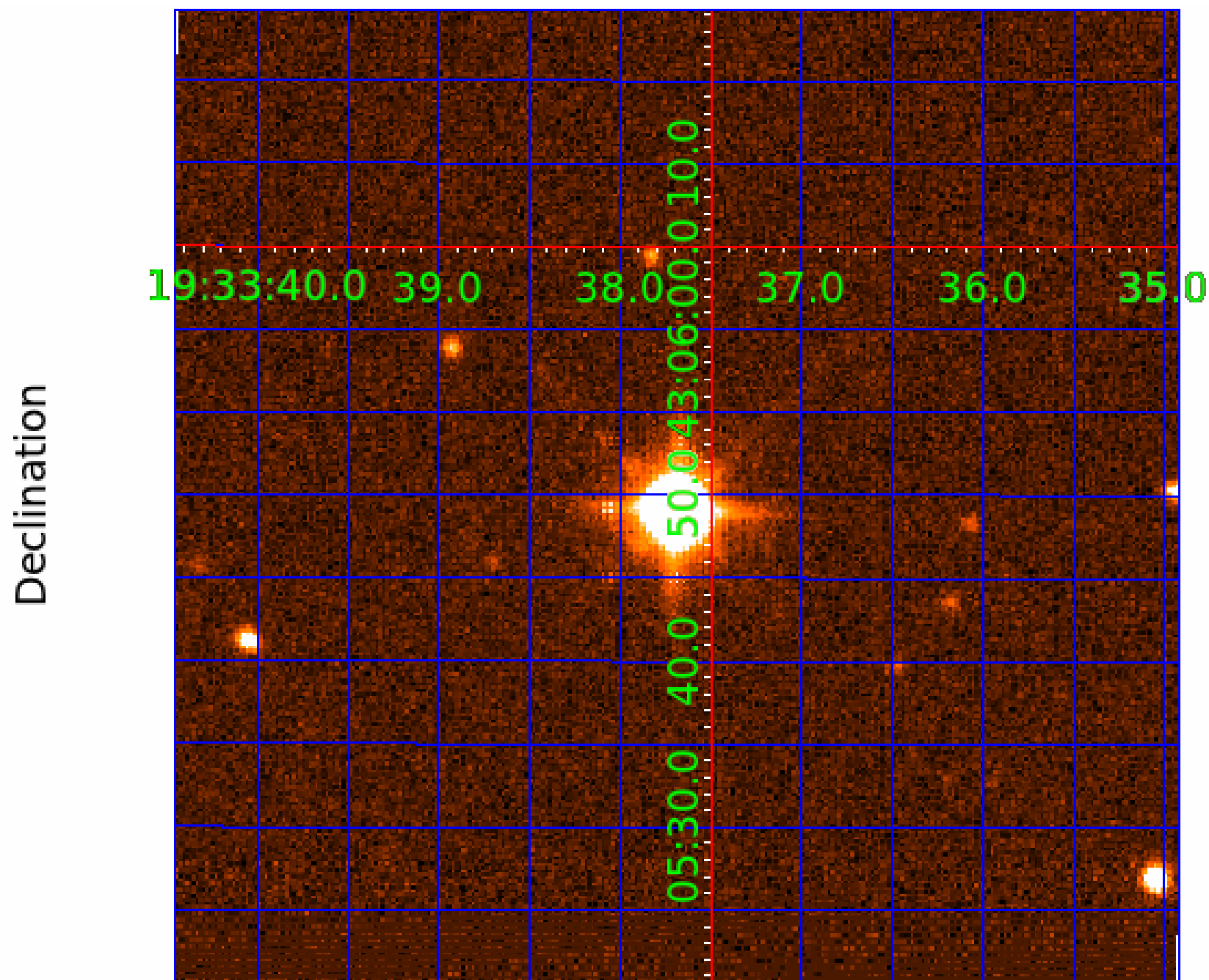
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 007450284

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007450284-01	OBS	No	5.059204	132.391824	100.2	10.519	8.5	8.3	3.30	8148	3.67	7924.65
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007450284-04	OBS	No	6.224686	137.478558	176.4	4.570	9.9	5.2	3.30	8148	4.89	6010.81

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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007450284-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
007450284-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED—HALO_GHOST
007450284-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

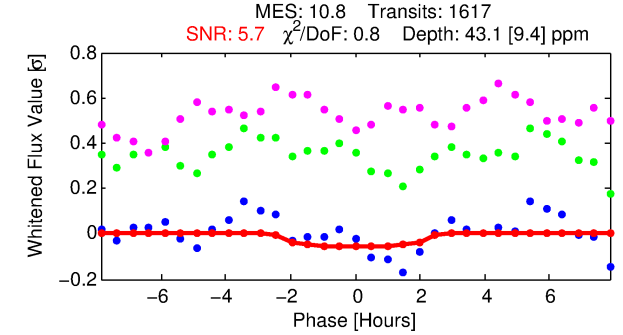
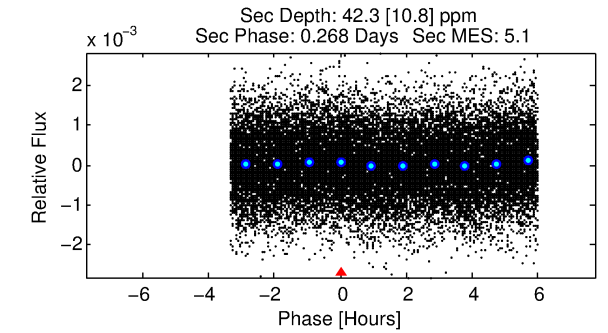
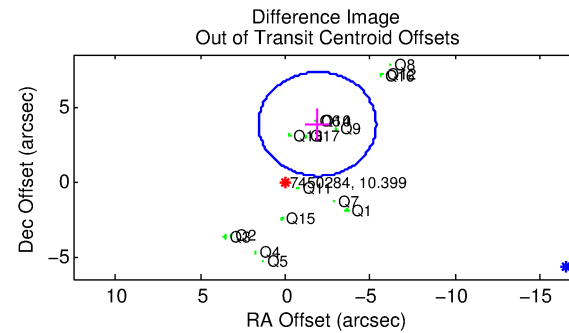
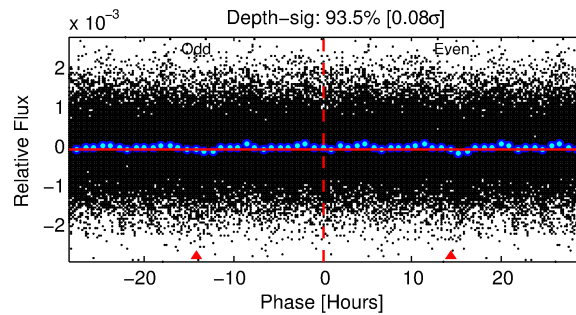
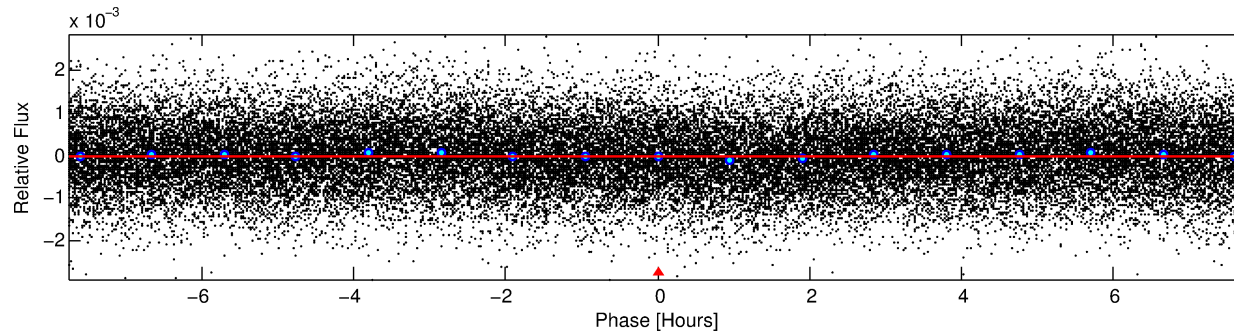
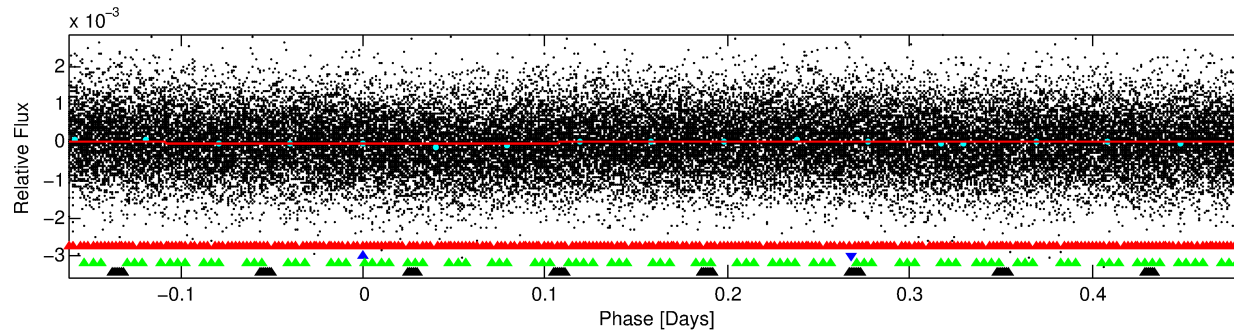
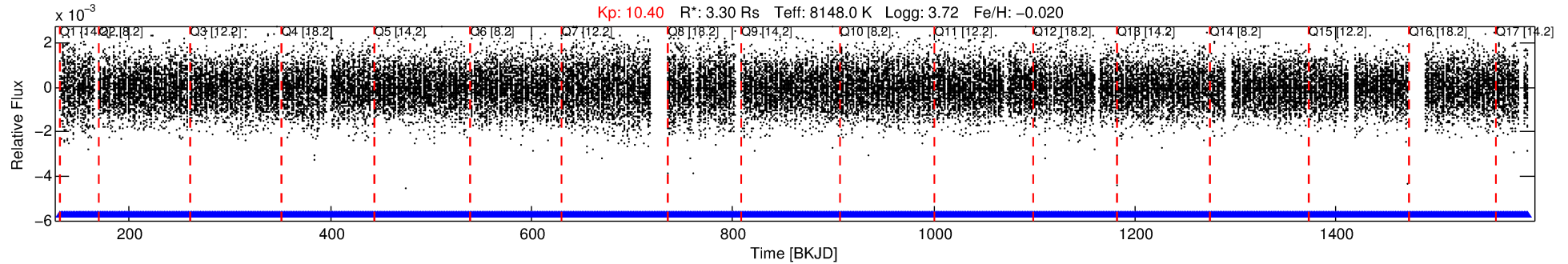
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007450284-02

No Significant Match Found

# DV One-Page Summary

KIC: 7450284 Candidate: 2 of 4 Period: 0.647 d



## DV Fit Results:

Period = 0.64672 [0.00002] d  
Epoch = 131.9511 [0.0085] BKJD  
Rp/R\* = 0.0061 [0.0114]  
a/R\* = 1.22 [4.23]  
b = 0.19 [55.71]  
Seff = 123064.24 [91071.00]  
Teq = 4776 [884] K  
Rp = 2.19 [4.21] Re  
a = 0.0187 [0.0084] AU  
Ag = 1.68 [6.40] [0.11 $\sigma$ ]  
Teffp = 8412 [7854] K [0.46 $\sigma$ ]

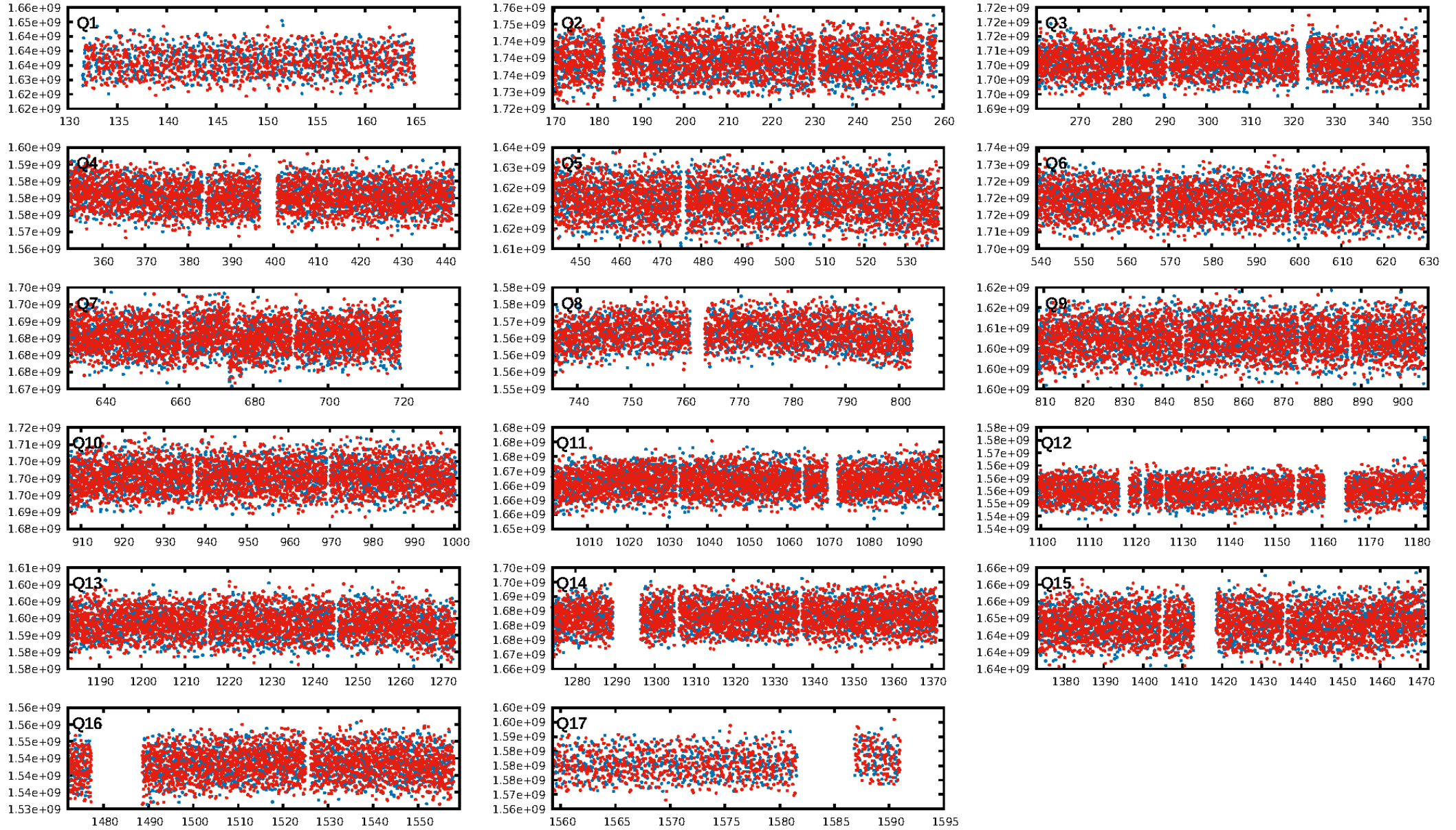
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [9.17 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 5.02e-23  
RollingBand-fgt: 1.00 [1546/1546]  
GhostDiagnostic-chr: 1.03  
Centroid-sig: 12.2%  
Centroid-so: 0.572 arcsec [2.13 $\sigma$ ]  
OotOffset-rm: 4.289 arcsec [3.70 $\sigma$ ]  
KicOffset-rm: 4.101 arcsec [3.55 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.35 [6/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:39:58 Z

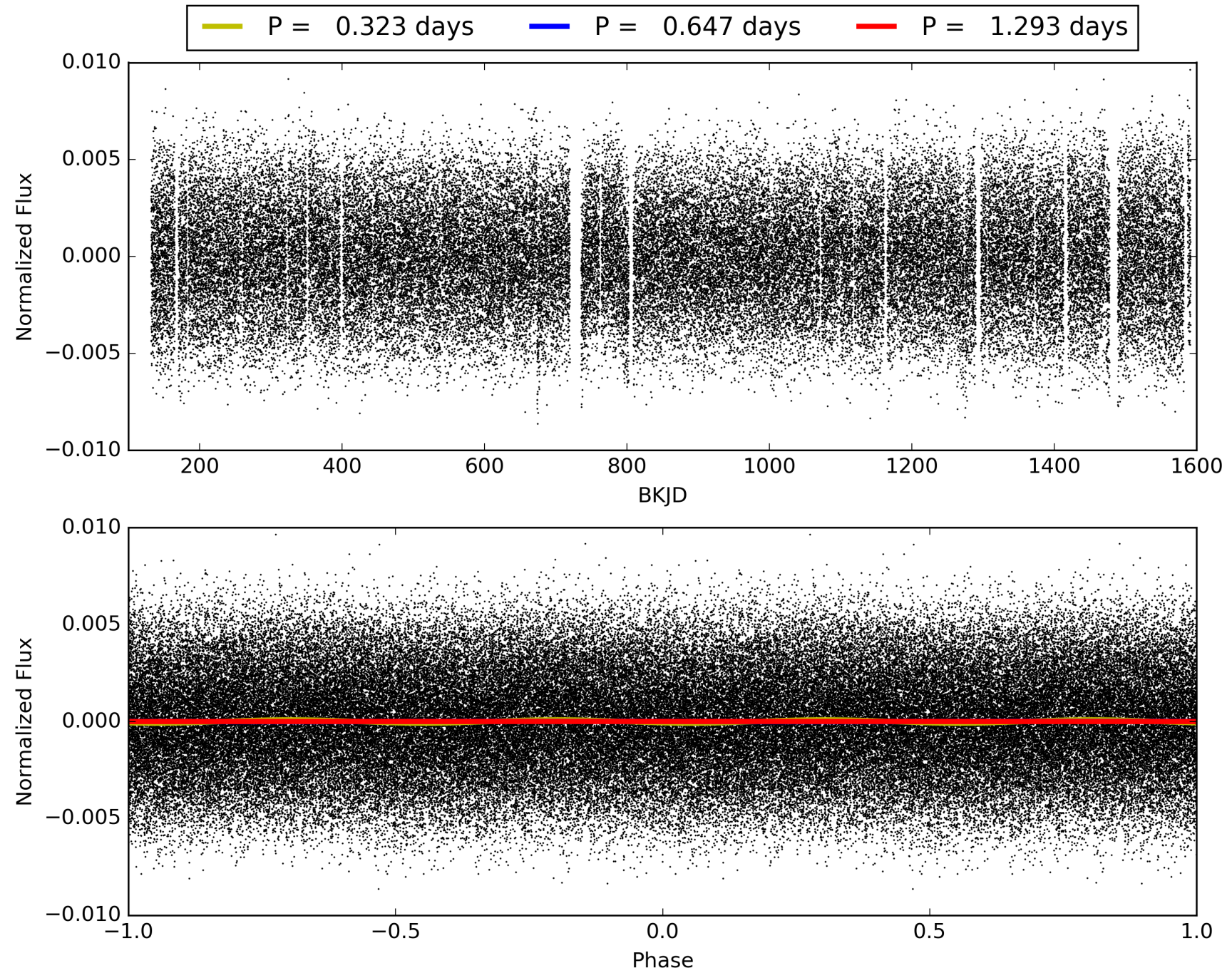
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007450284-02, PDC Light Curves





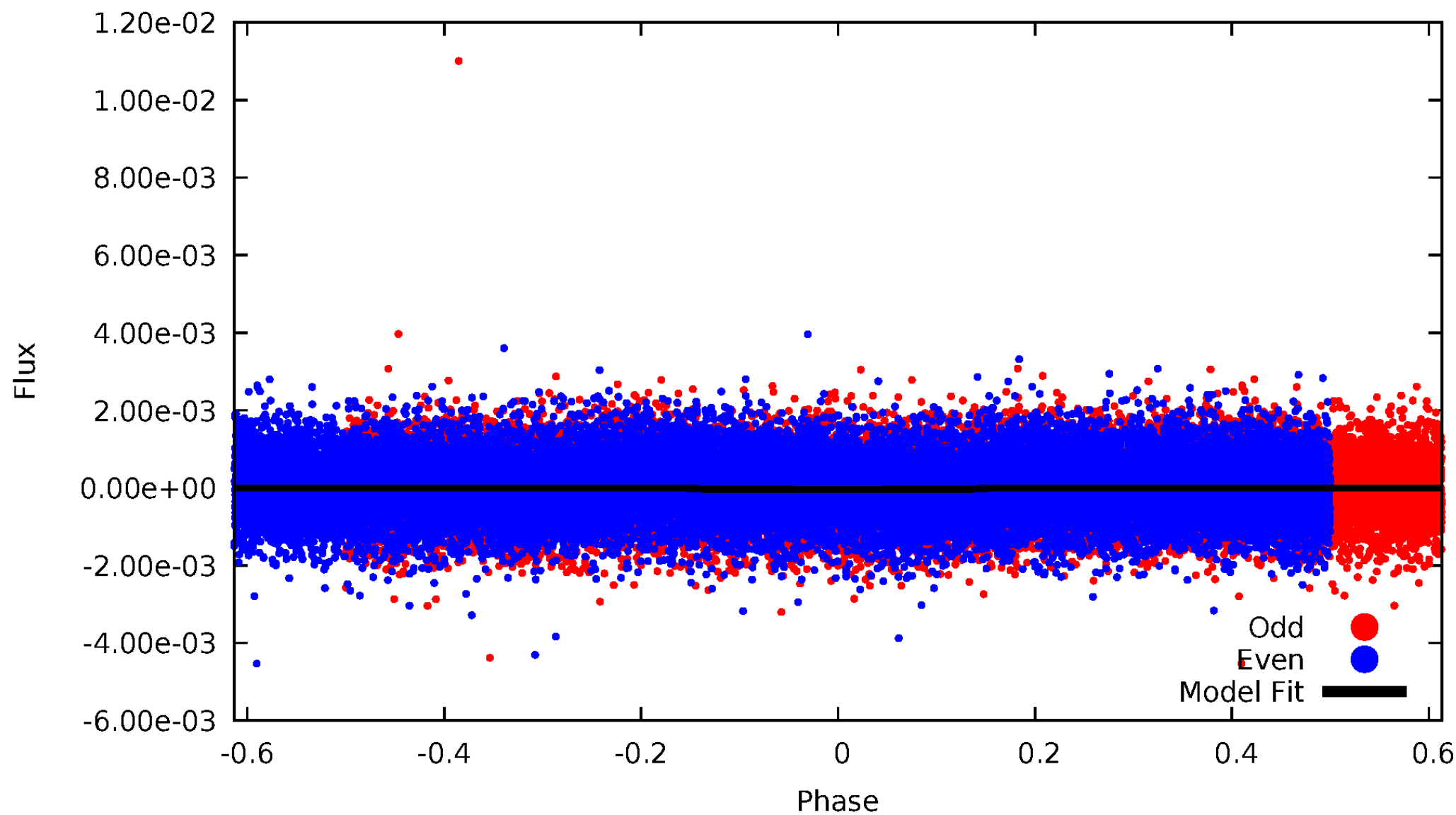
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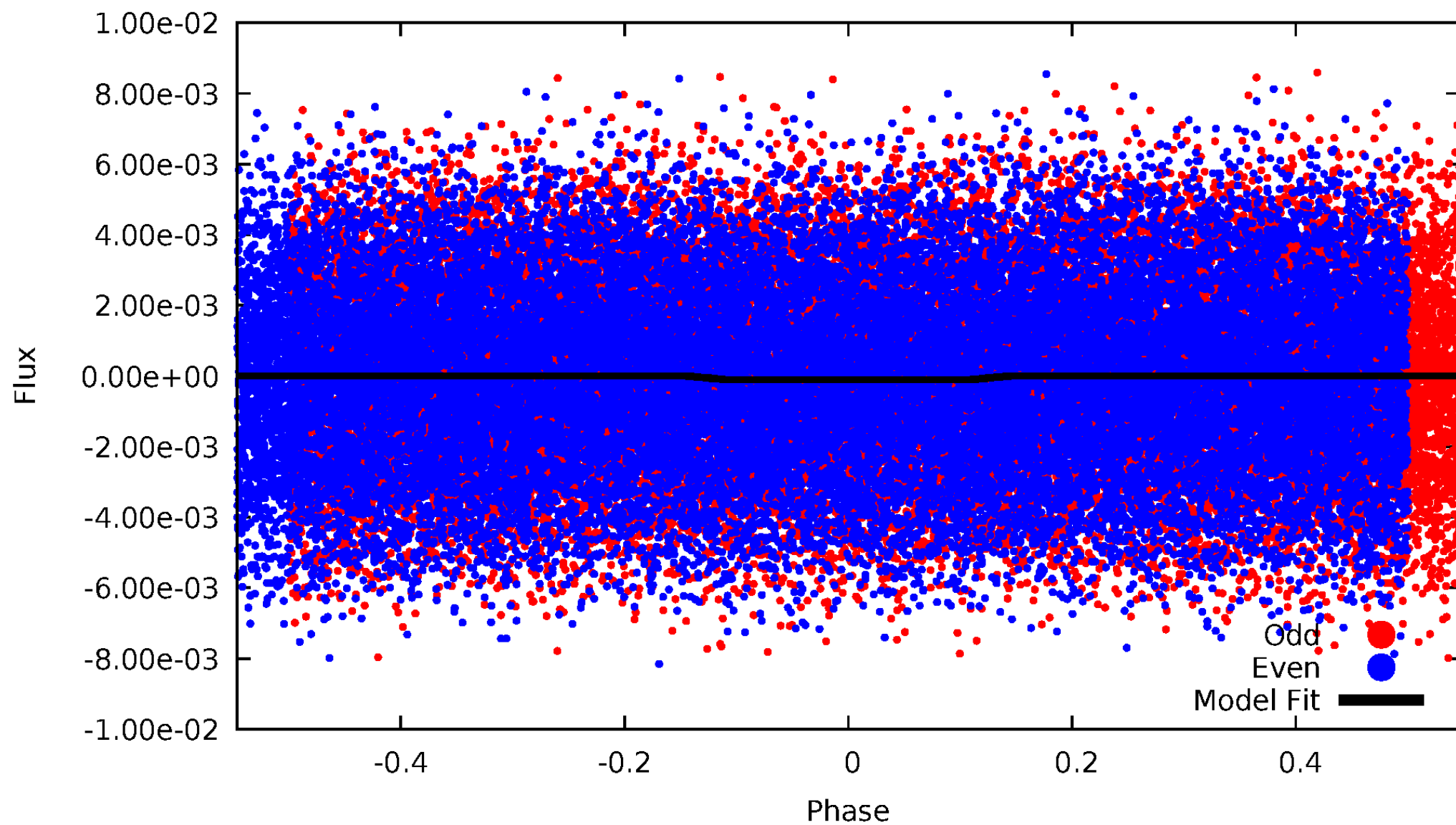
# DV Odd/Even

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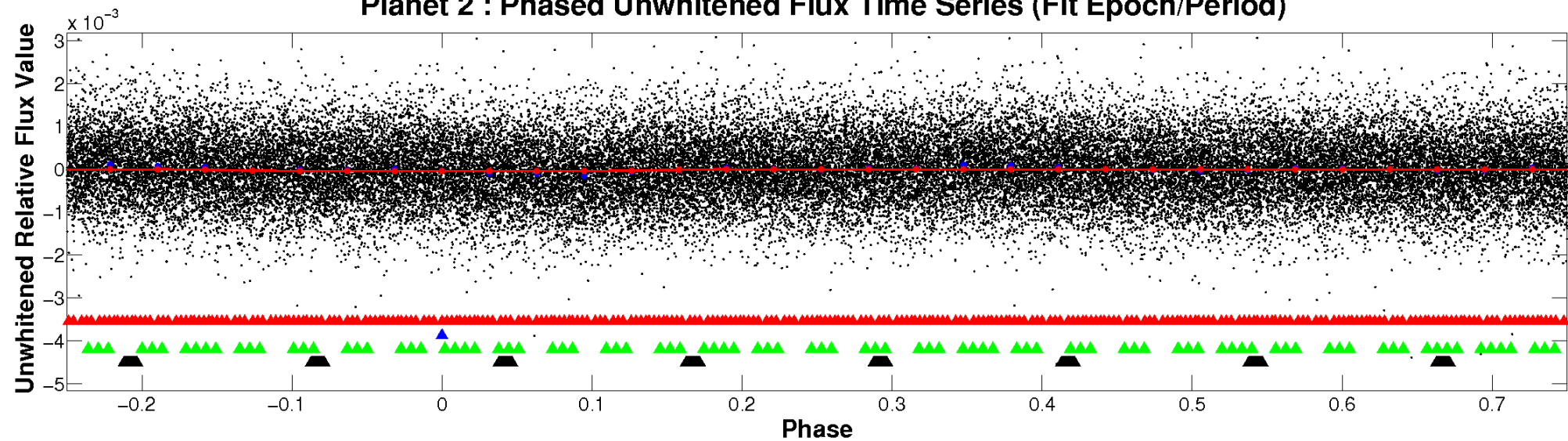
# ALT Odd/Even

TCE 007450284-02

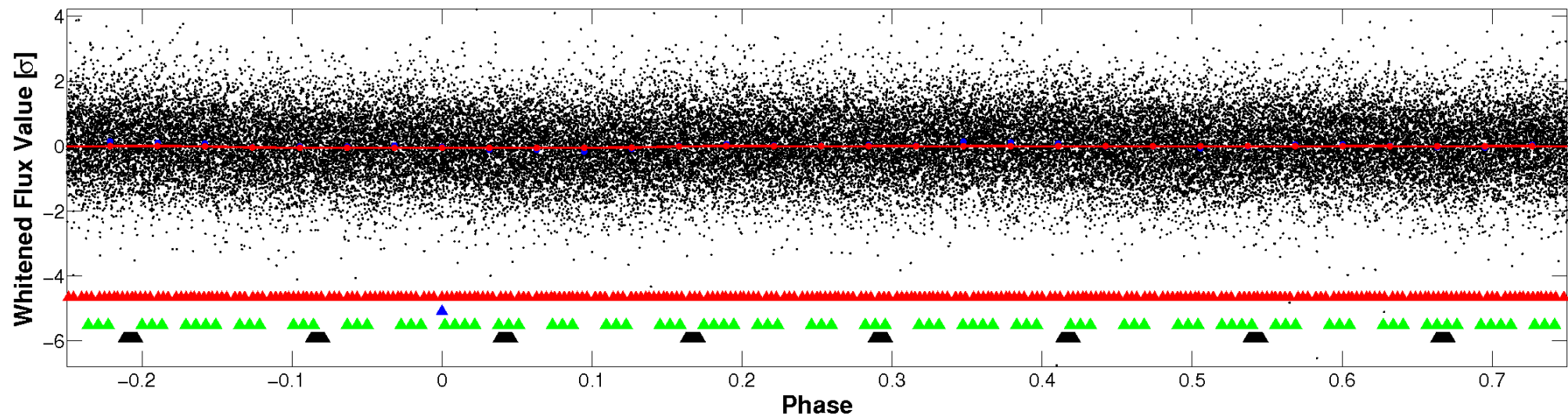


# Non-Whitened Vs. Whitened Light Curve

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

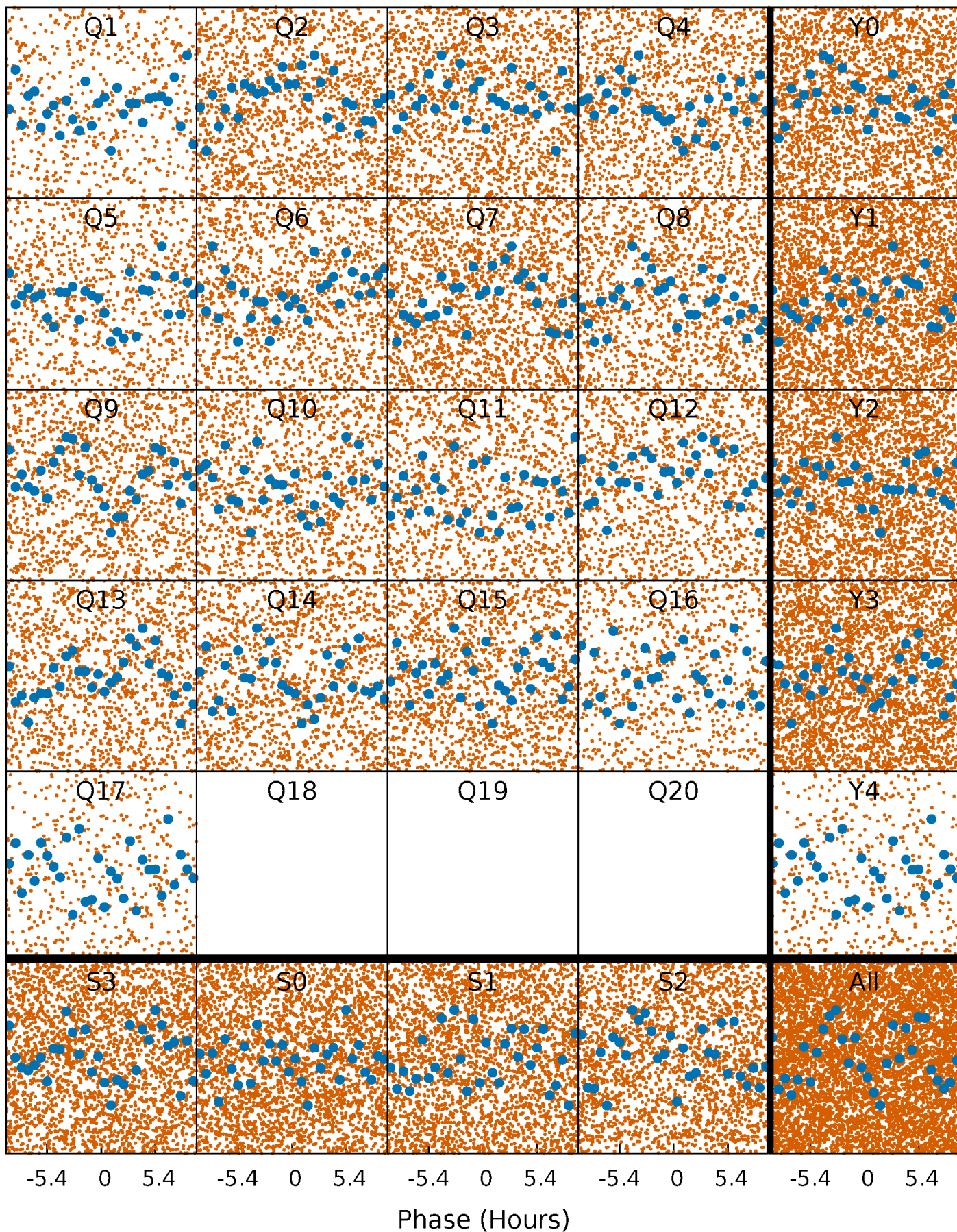


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

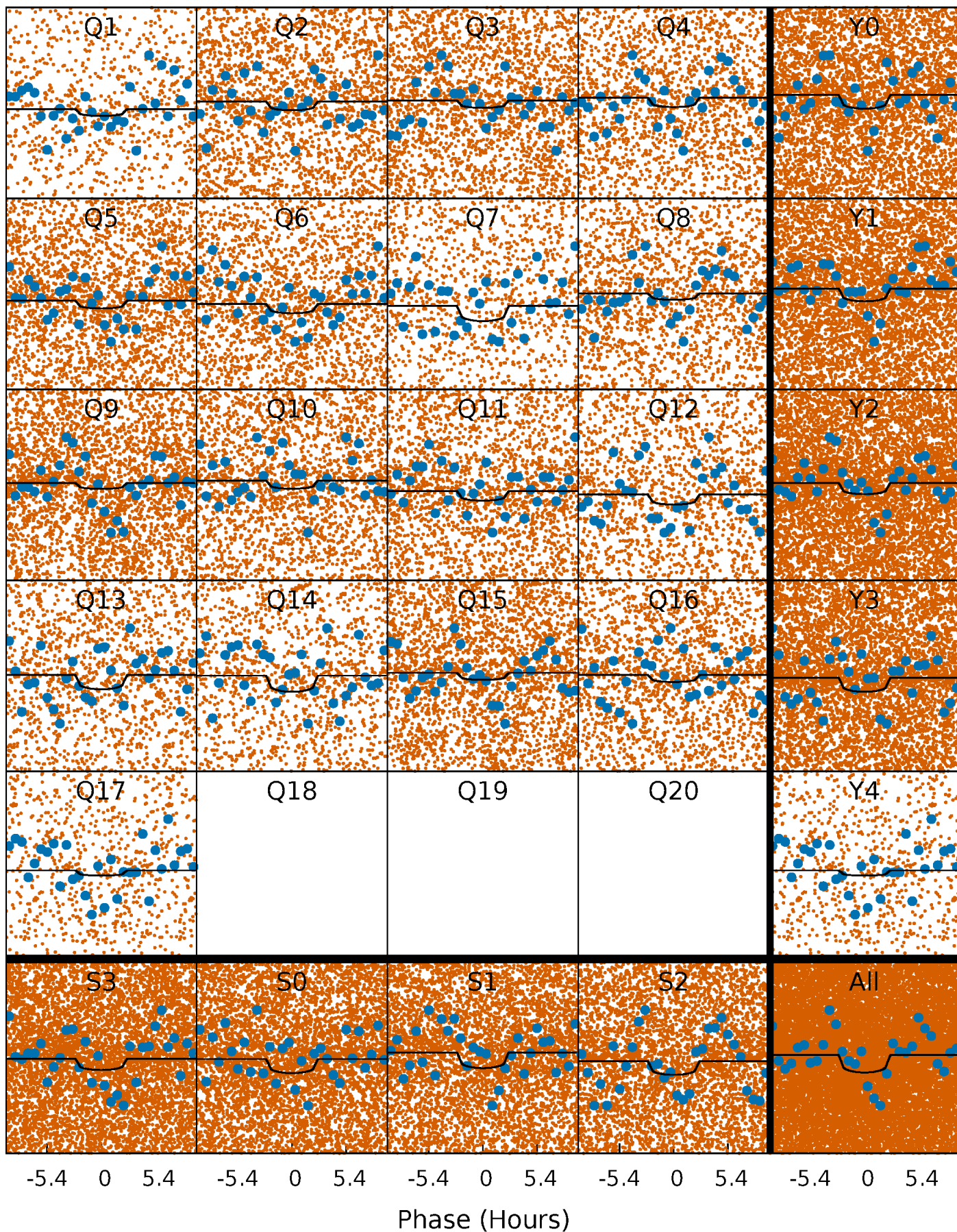
TCE 007450284-02   P= 0.646723 Days    $T_0=131.951071$  (BKJD)





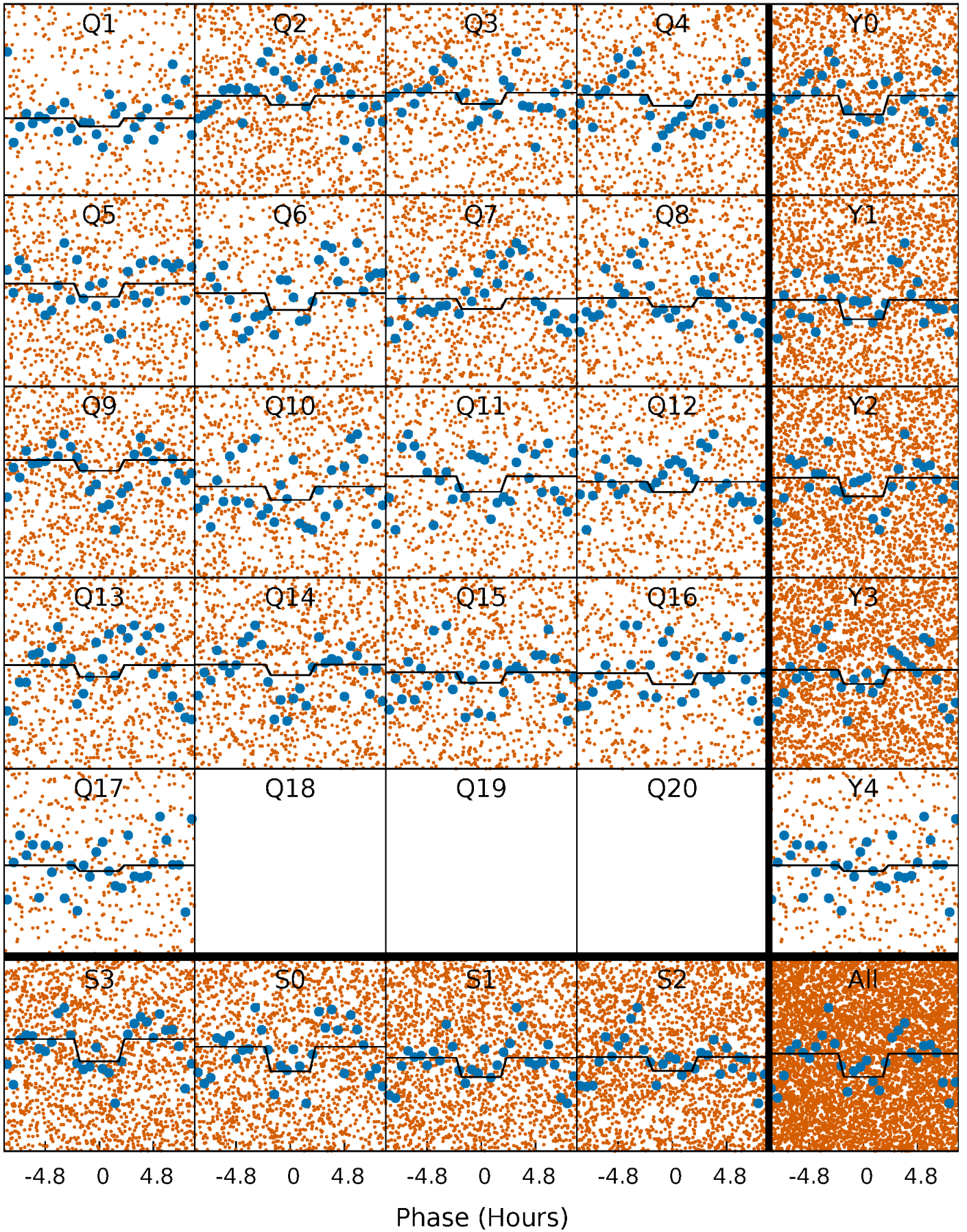
# DV Quarter-Phased Transit Curves

TCE 007450284-02   P= 0.646723 Days    $T_0=131.951071$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007450284-02   P= 0.646754 Days    $T_0=131.946113$  (BKJD)

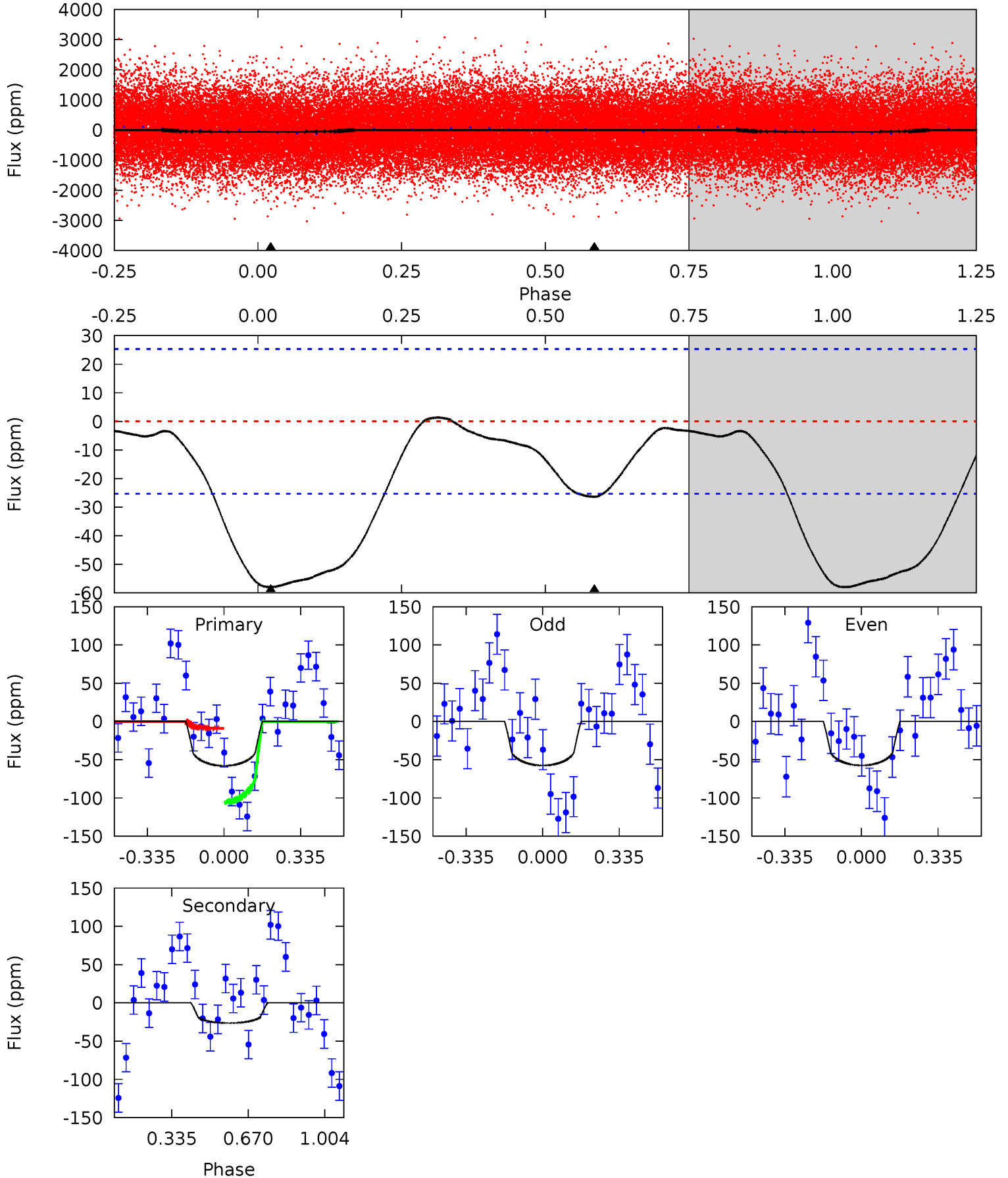




# DV Model-Shift Uniqueness Test

007450284-02, P = 0.646723 Days, E = 131.304348 Days

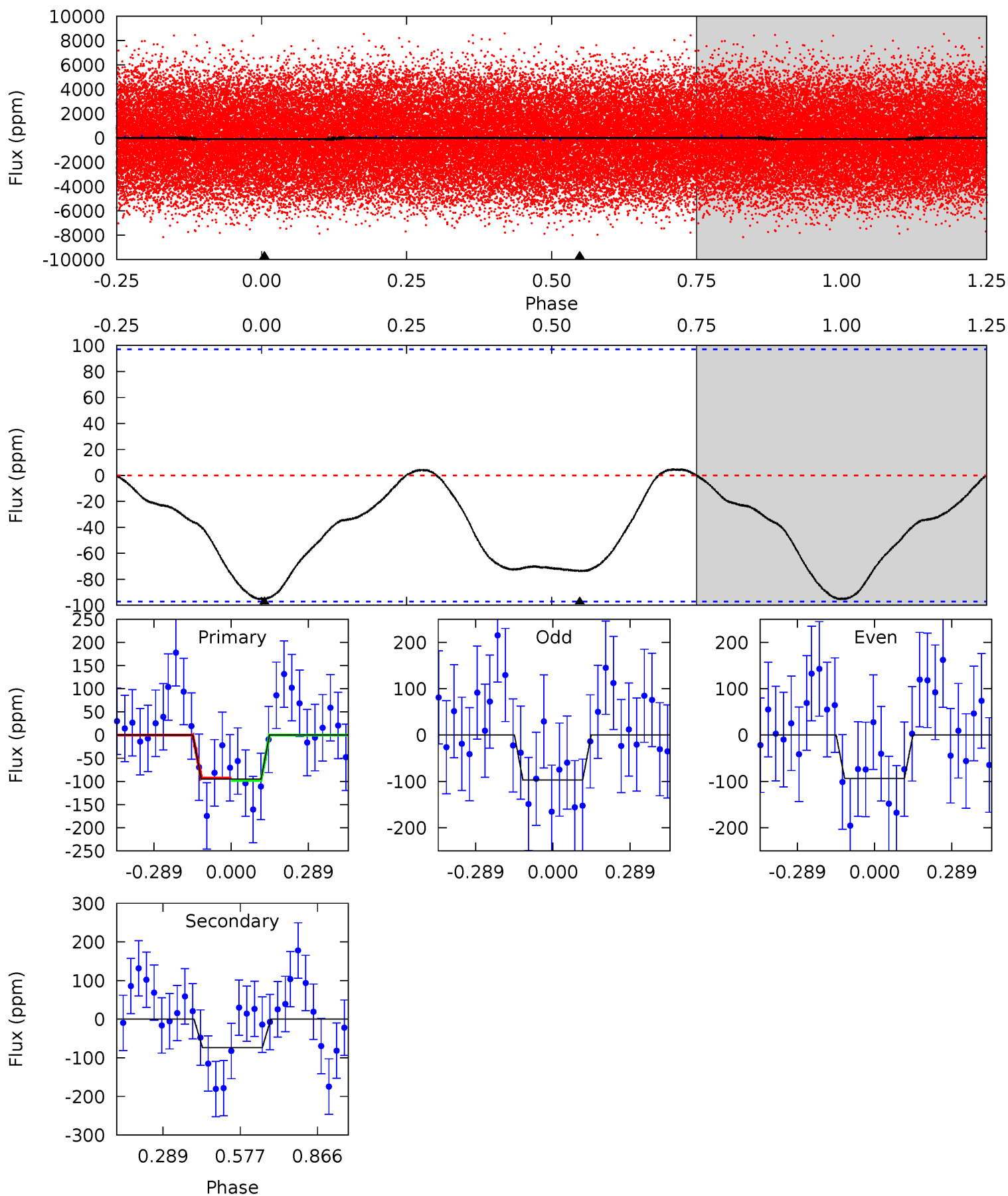
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.85	4.49	0	0	4.30	0.96	0.53	9.85	9.85	4.49	4.49	0.01	1.11	0.02	8.21



# Alt Model-Shift Uniqueness Test

007450284-02, P = 0.646754 Days, E = 131.299359 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
4.25	3.29	0	0	4.34	1.06	0.22	4.25	4.25	3.29	3.29	0.07	0.99	0.05	0.11





### Stellar Parameters For KIC 007450284

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8148^{+225}_{-366}$	$3.719^{+0.420}_{-0.140}$	$-0.020^{+0.250}_{-0.400}$	$3.296^{+0.840}_{-1.561}$	$2.075^{+0.348}_{-0.523}$	$0.082^{+0.310}_{-0.033}$
	+3%/-4%	+11%/-4%	+1250%/-2000%	+25%/-47%	+17%/-25%	+380%/-40%
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 007450284-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-26 \pm 6$	$3.30^{+3.41}_{-2.20}$	$6455^{+562}_{-777}$	$4301^{+6105}_{-9045}$	$0.458^{+3.519}_{-0.352}$
Alt.	$-74 \pm 22$	$4.18^{+3.71}_{-2.75}$	$6502^{+551}_{-786}$	$5717^{+6193}_{-9884}$	$0.803^{+4.754}_{-0.605}$

$T_{max}$  = 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

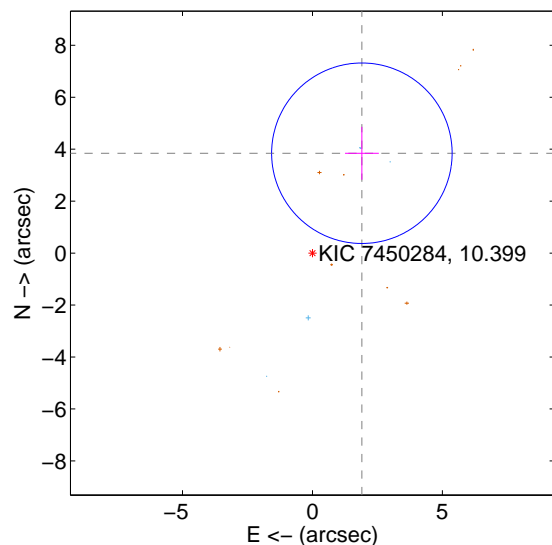
Supplemental centroid analysis for 007450284-02. **Kepler magnitude: 10.40.** Transit SNR 5.66

There are 6 quarters with good PRF difference image offsets

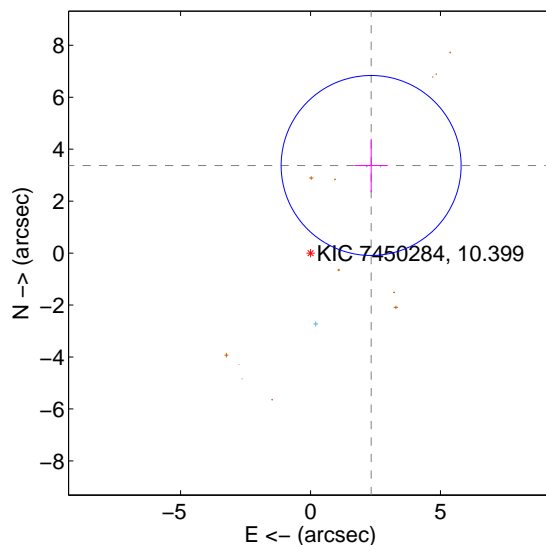
The direct PRF centroid is offset from the target star catalog position by about 0.32 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>4.289 <math>\pm</math> 1.158</b>	<b>3.70</b>	-1.903 $\pm$ 0.650	3.844 $\pm$ 1.019
PRF-fit source offset from KIC position	<b>4.101 <math>\pm</math> 1.155</b>	<b>3.55</b>	-2.333 $\pm$ 0.624	3.372 $\pm$ 1.028
photometric centroid source offset	0.57 $\pm$ 0.27	2.13	-0.40 $\pm$ 0.22	0.41 $\pm$ 0.31

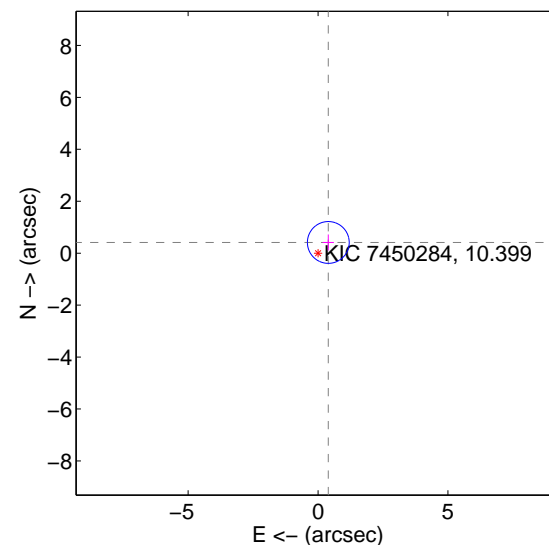
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

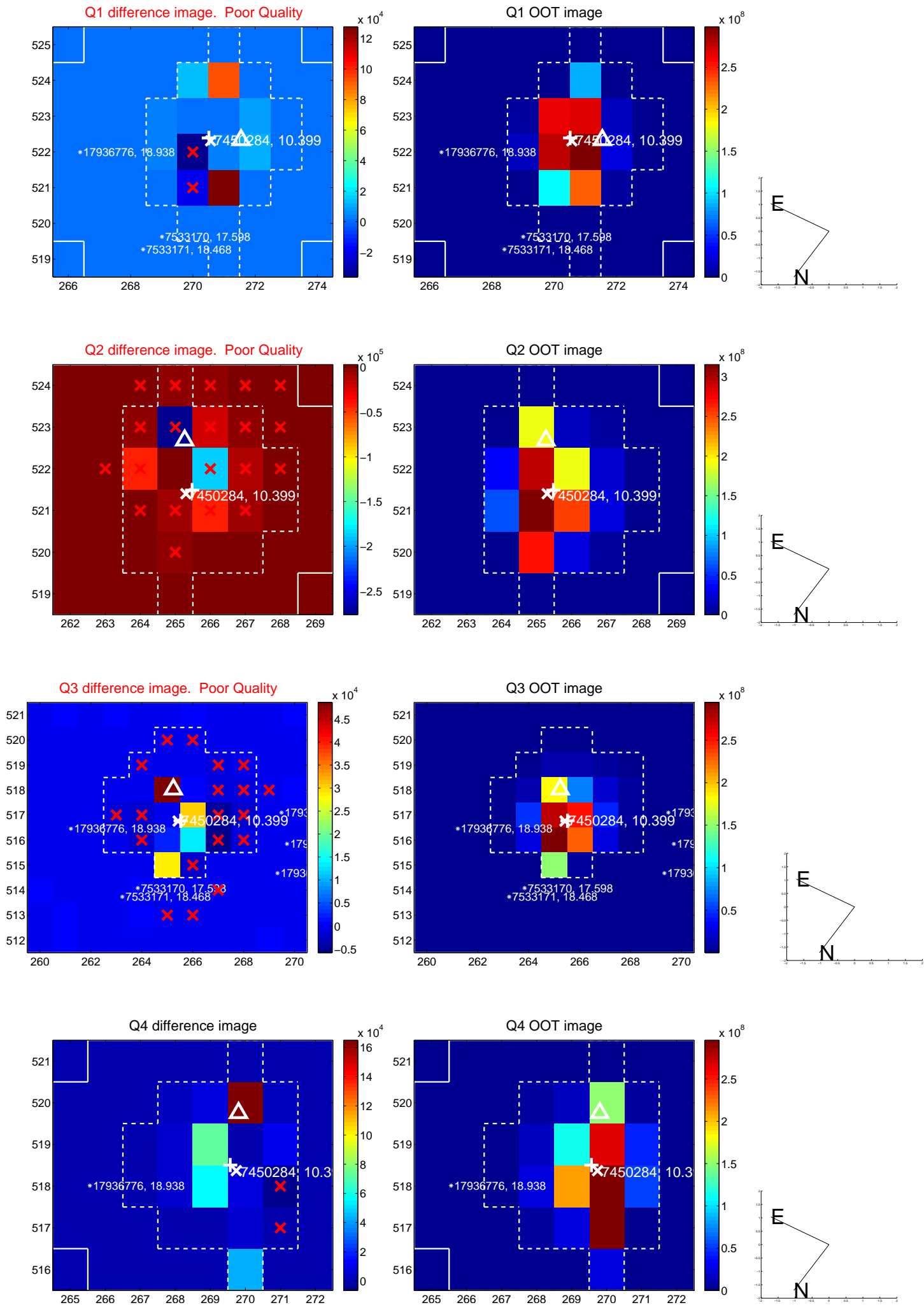


offset from photometric centroids

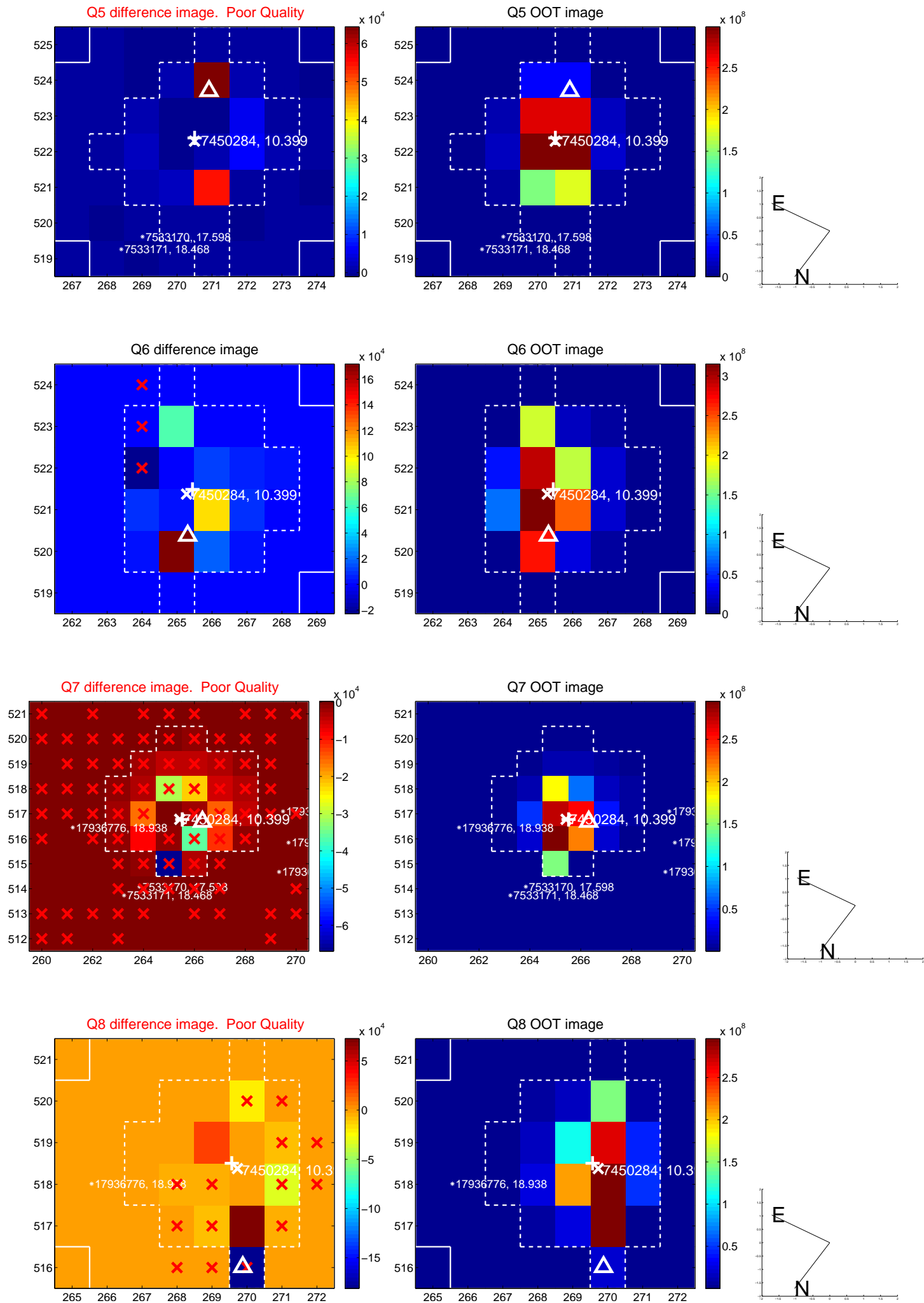


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

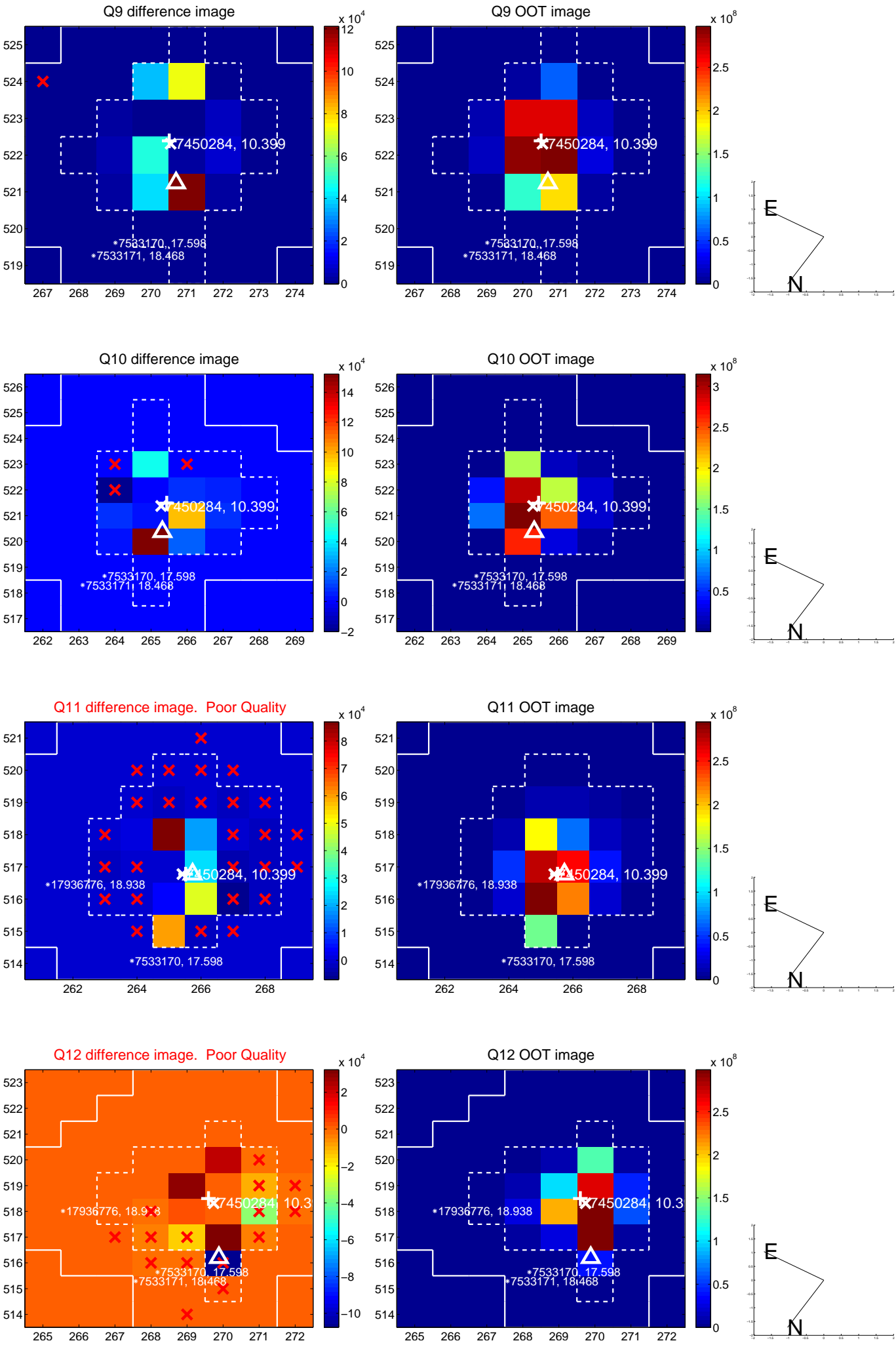
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

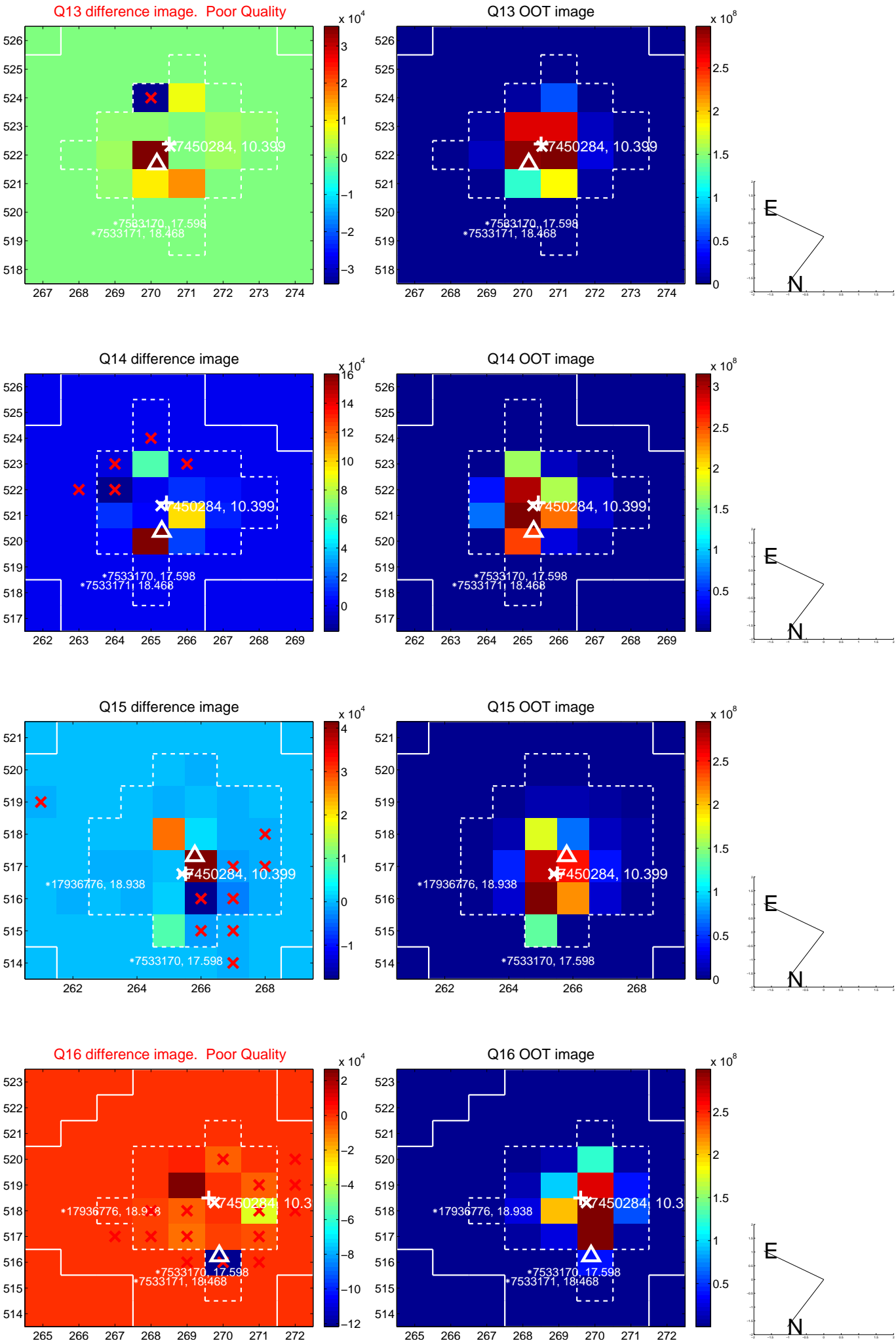


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

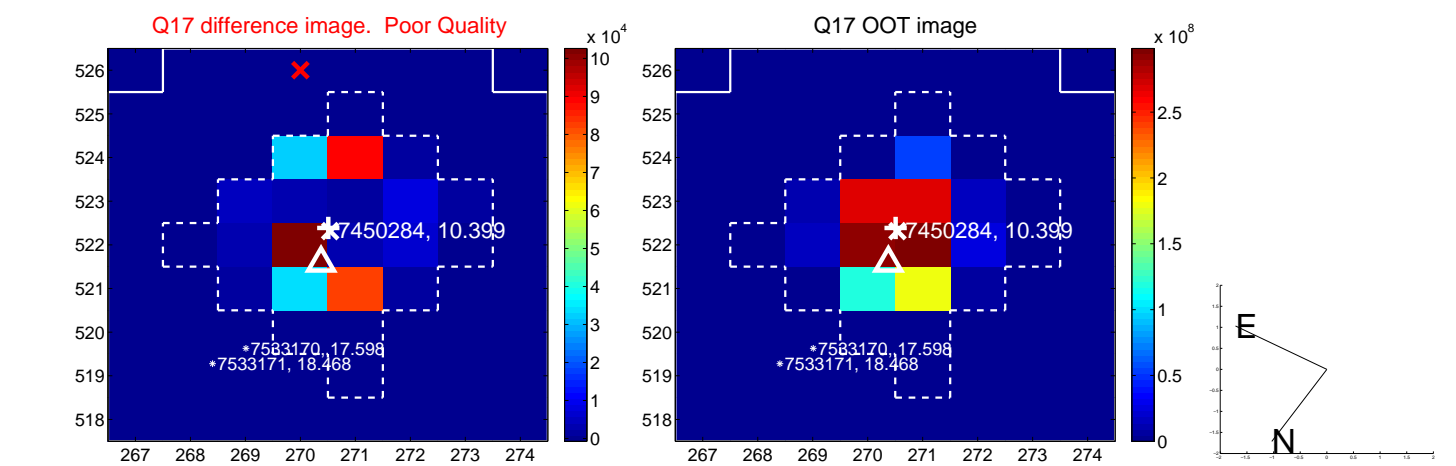




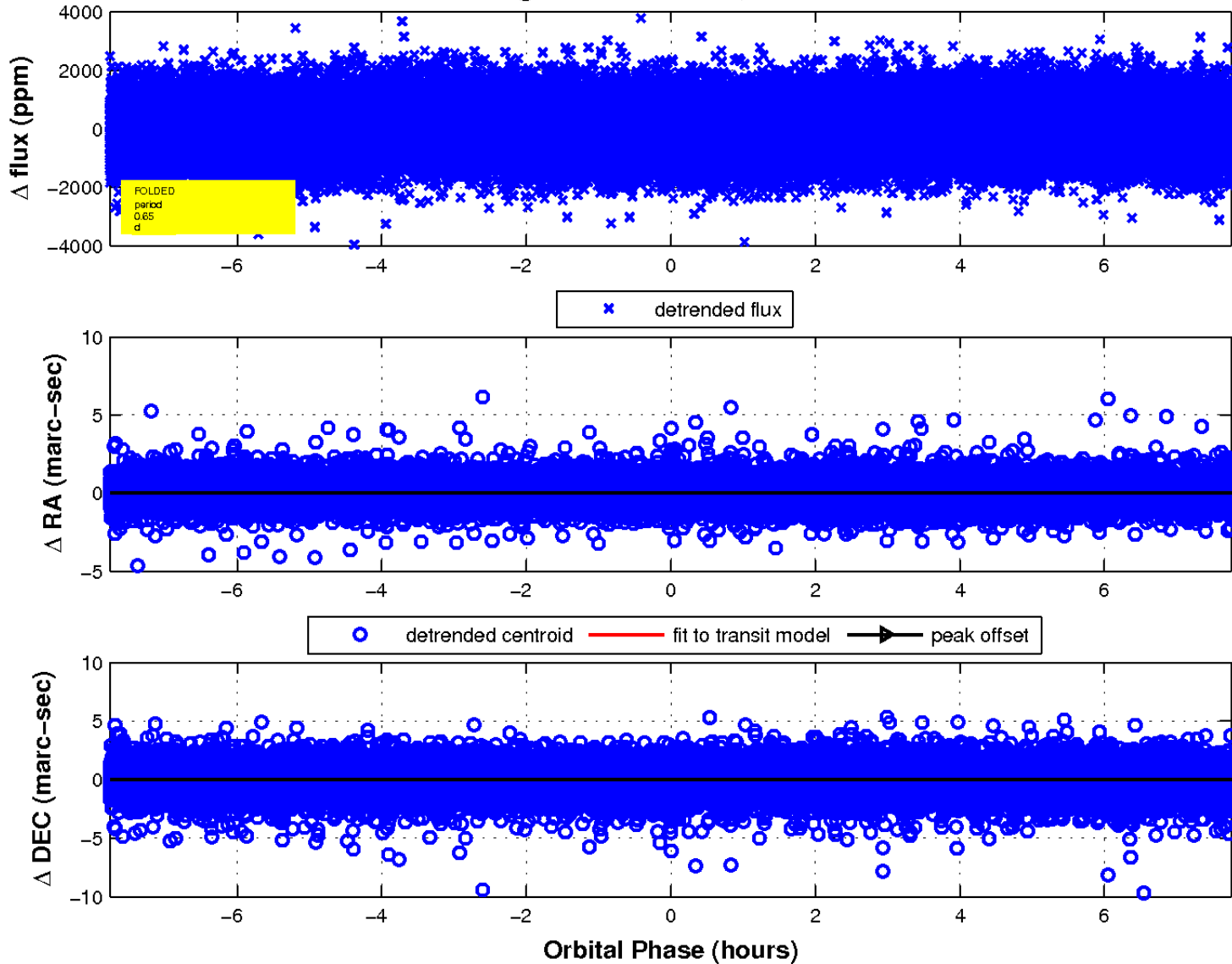
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



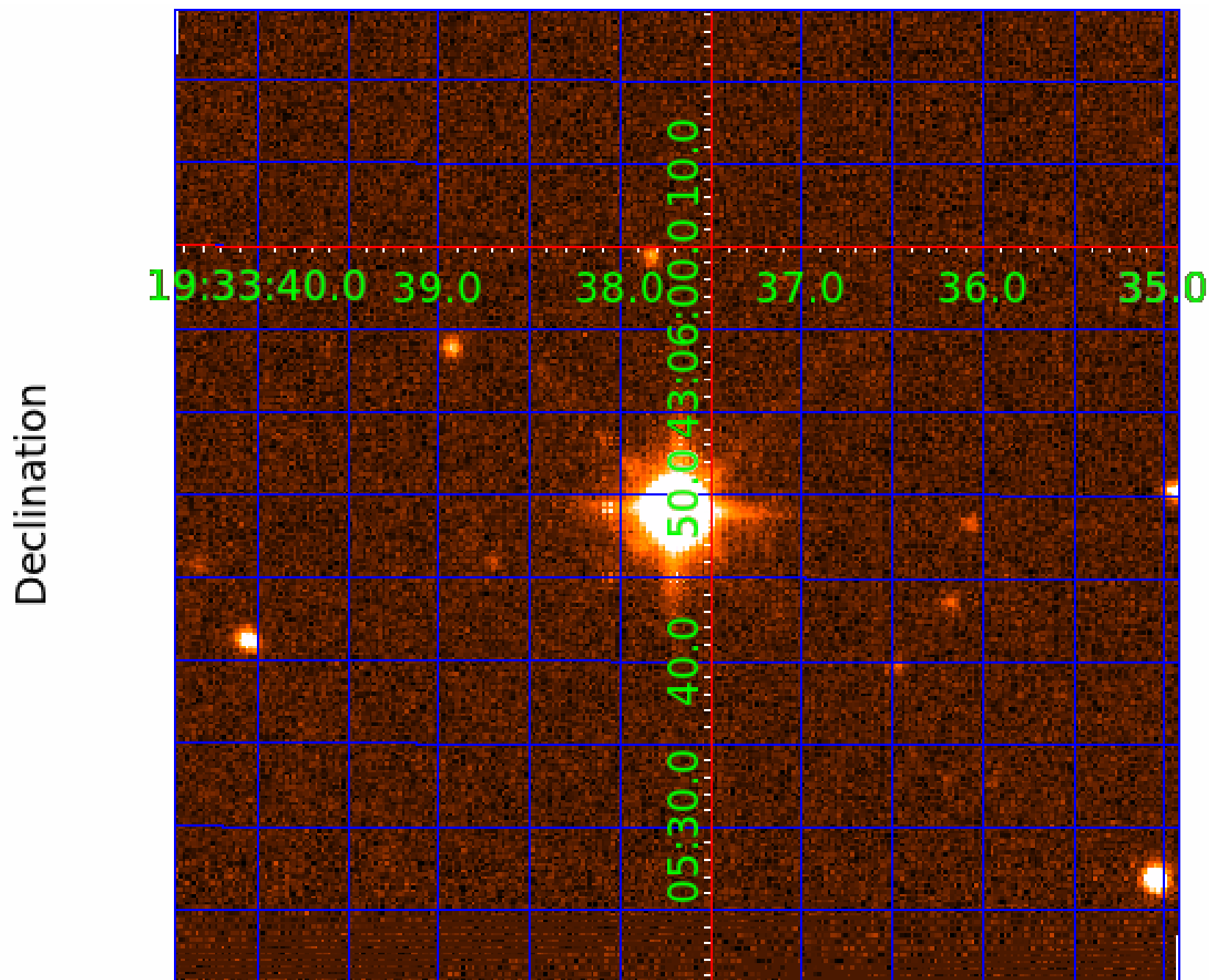
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 2 of 4



UKIRT Image



# KIC 007450284

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007450284-01	OBS	No	5.059204	132.391824	100.2	10.519	8.5	8.3	3.30	8148	3.67	7924.65
007450284-02	OBS	No	0.646723	131.951071	43.1	4.758	10.8	5.7	3.30	8148	2.19	123064.24
007450284-03	OBS	No	15.409708	144.699562	1096.1	1.748	10.7	12.6	3.30	8148	11.30	1794.86
007450284-04	OBS	No	6.224686	137.478558	176.4	4.570	9.9	5.2	3.30	8148	4.89	6010.81

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007450284-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
007450284-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
007450284-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED—HALO_GHOST
007450284-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

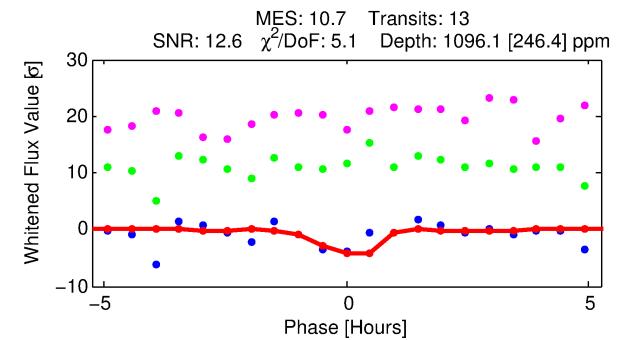
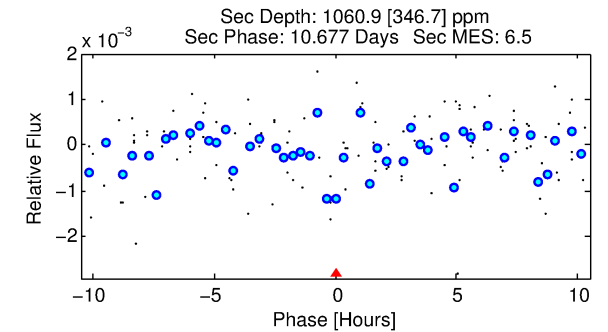
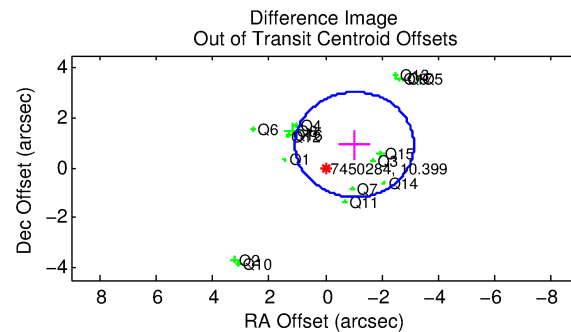
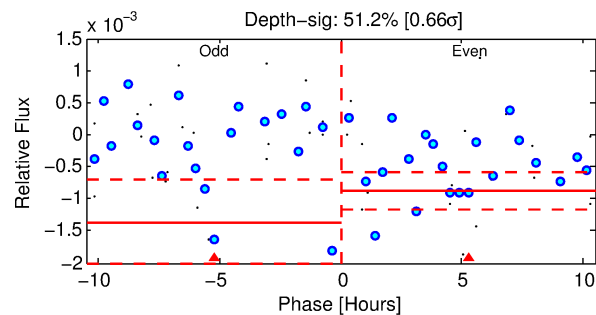
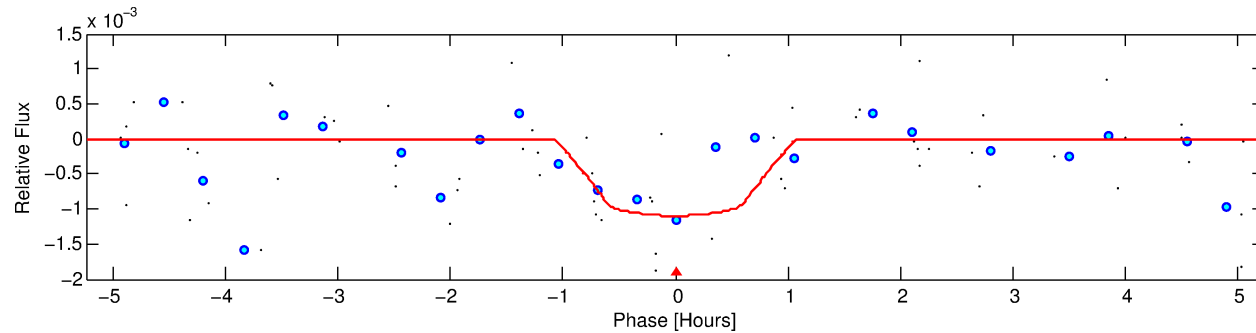
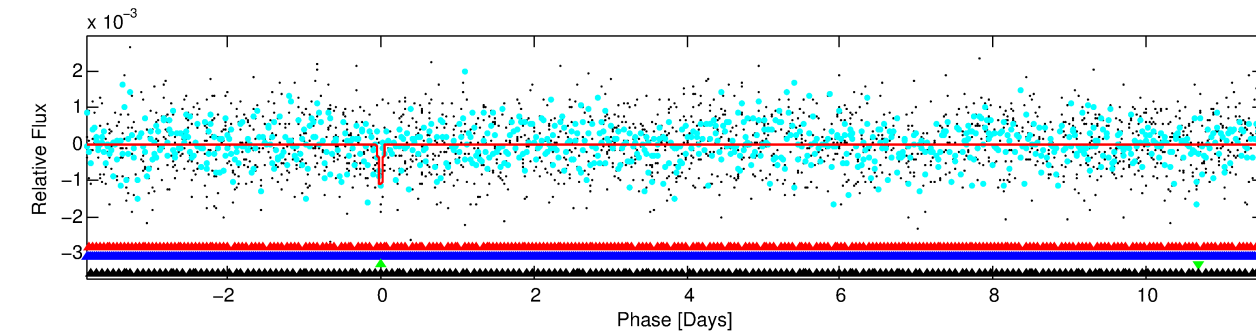
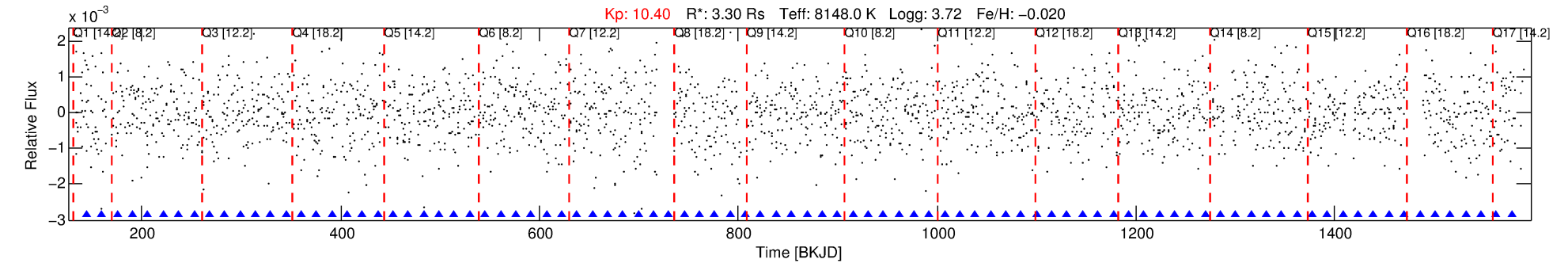
Ephemeris Match Information For 007450284-03

No Significant Match Found



# DV One-Page Summary

KIC: 7450284 Candidate: 3 of 4 Period: 15.410 d



## DV Fit Results:

Period = 15.40971 [0.00017] d  
Epoch = 144.6996 [0.0099] BKJD  
Rp/R\* = 0.0314 [0.1509]  
a/R\* = 61.87 [1694.52]  
b = 0.47 [45.89]  
Seff = 1794.86 [1328.25]  
Teq = 1660 [307] K  
Rp = 11.30 [54.55] Re  
a = 0.1546 [0.0698] AU  
Ag = 109.28 [1053.63] [0.10 $\sigma$ ]  
Teff = 8297 [19946] K [0.33 $\sigma$ ]

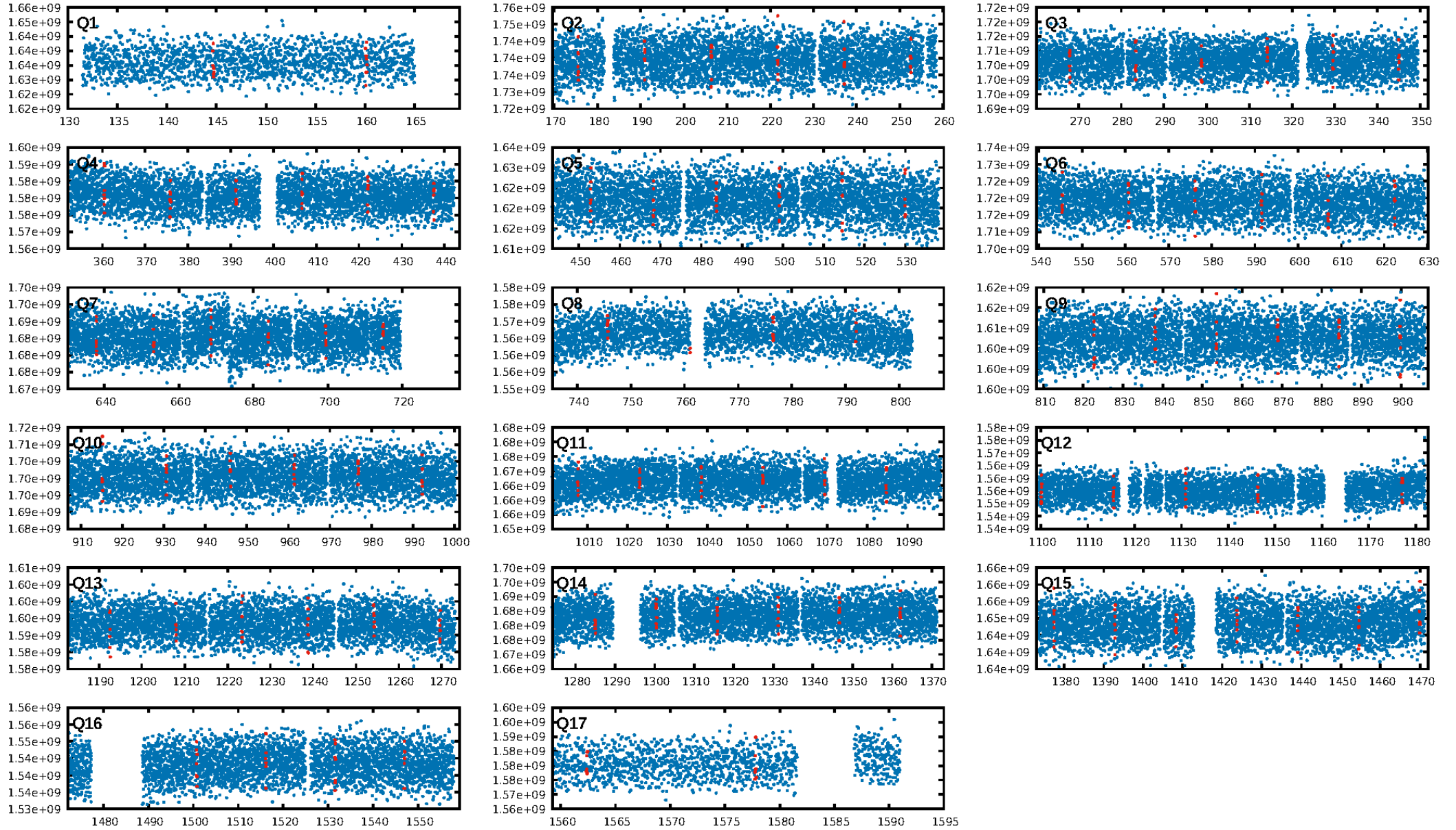
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [45.05 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 96.8%  
Bootstrap-pfa: 1.89e-14  
RollingBand-fgt: 1.00 [12/12]  
GhostDiagnostic-chr: 0.1782  
Centroid-sig: 0.8%  
Centroid-so: 0.188 arcsec [2.04 $\sigma$ ]  
OotOffset-rm: 1.378 arcsec [1.97 $\sigma$ ]  
KicOffset-rm: 1.076 arcsec [1.81 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.12 [2/17]  
DiffImageOverlap-fno: 0.00 [0/17]

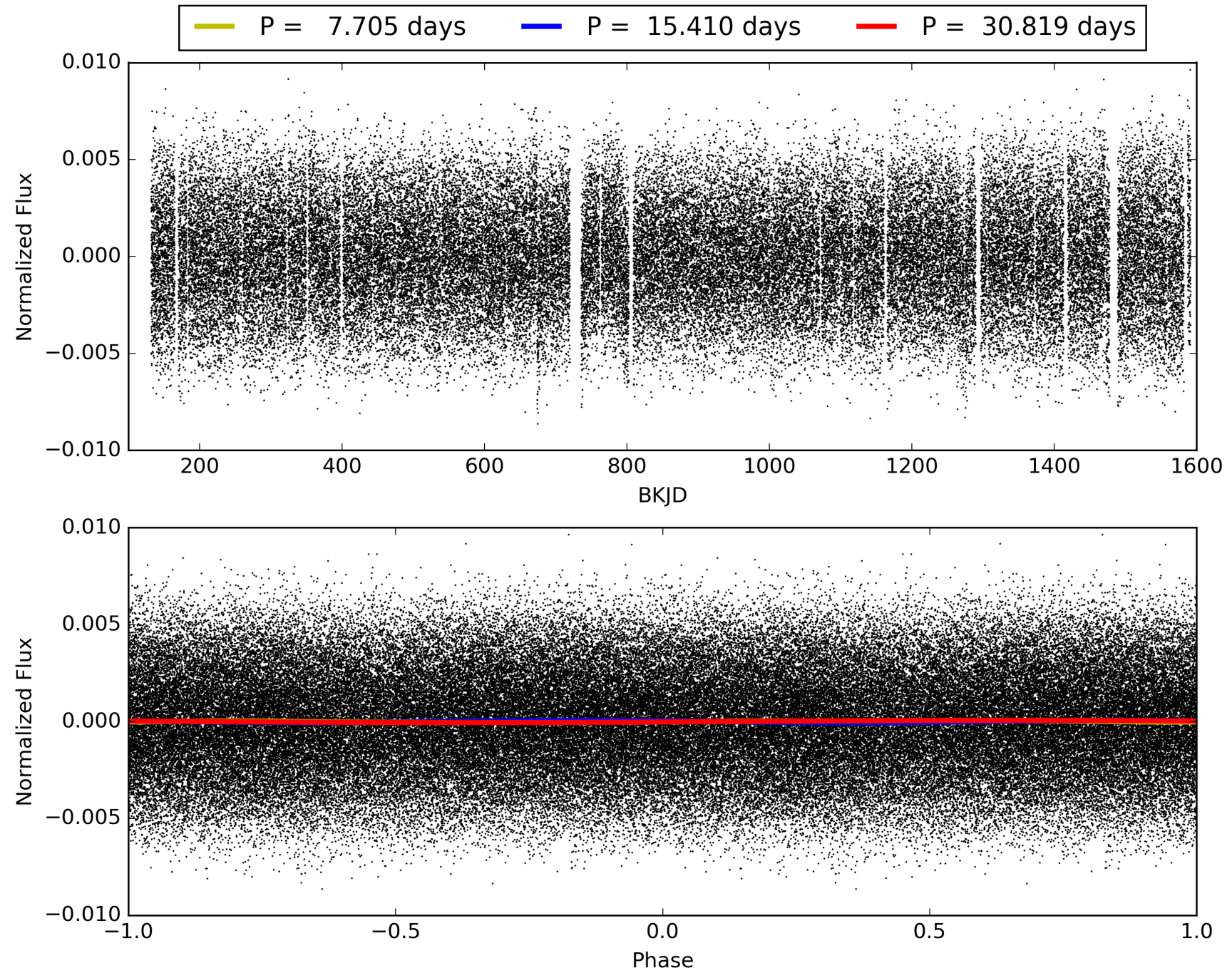
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:40:07 Z

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

# TCE 007450284-03, PDC Light Curves

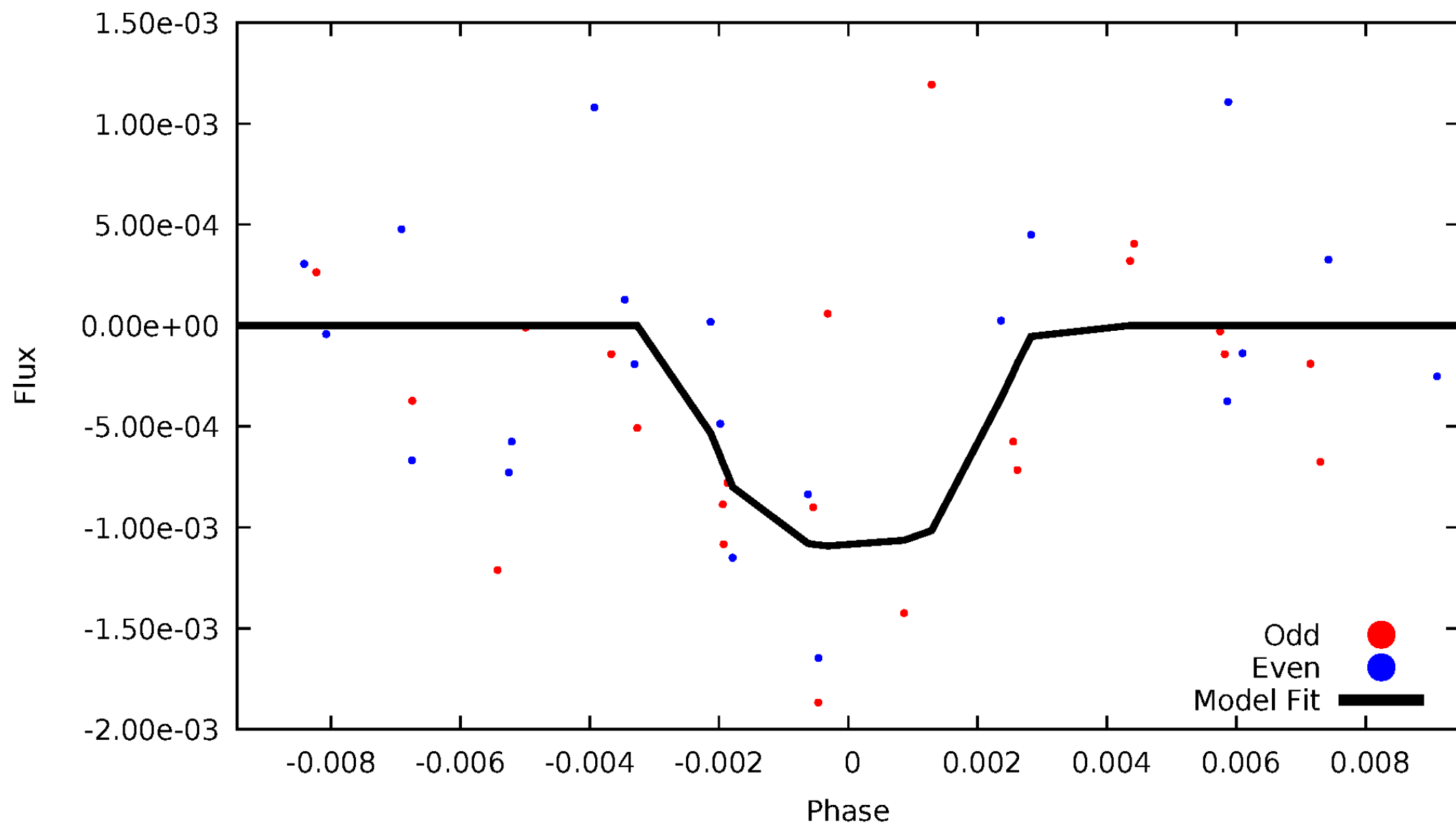


TCE 007450284-03



# DV Odd/Even

TCE 007450284-03





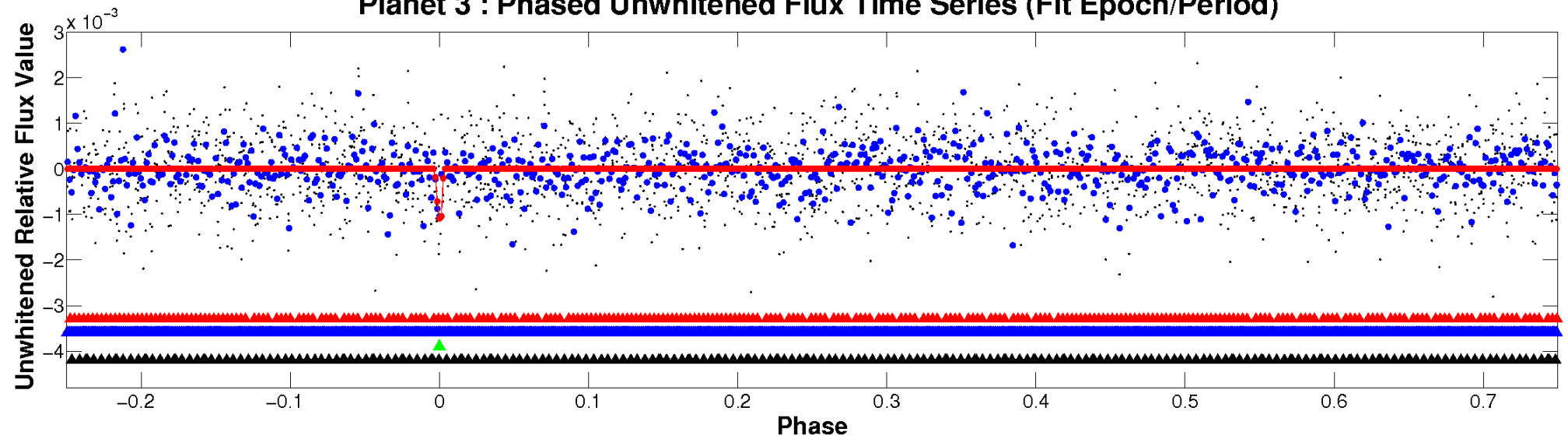


ALT Odd/Even

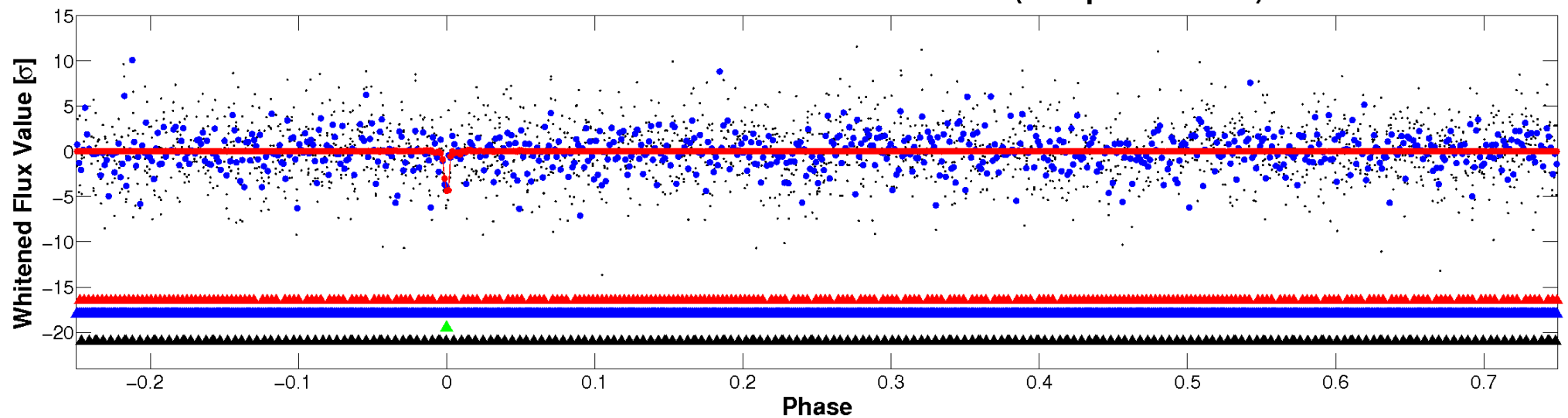
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

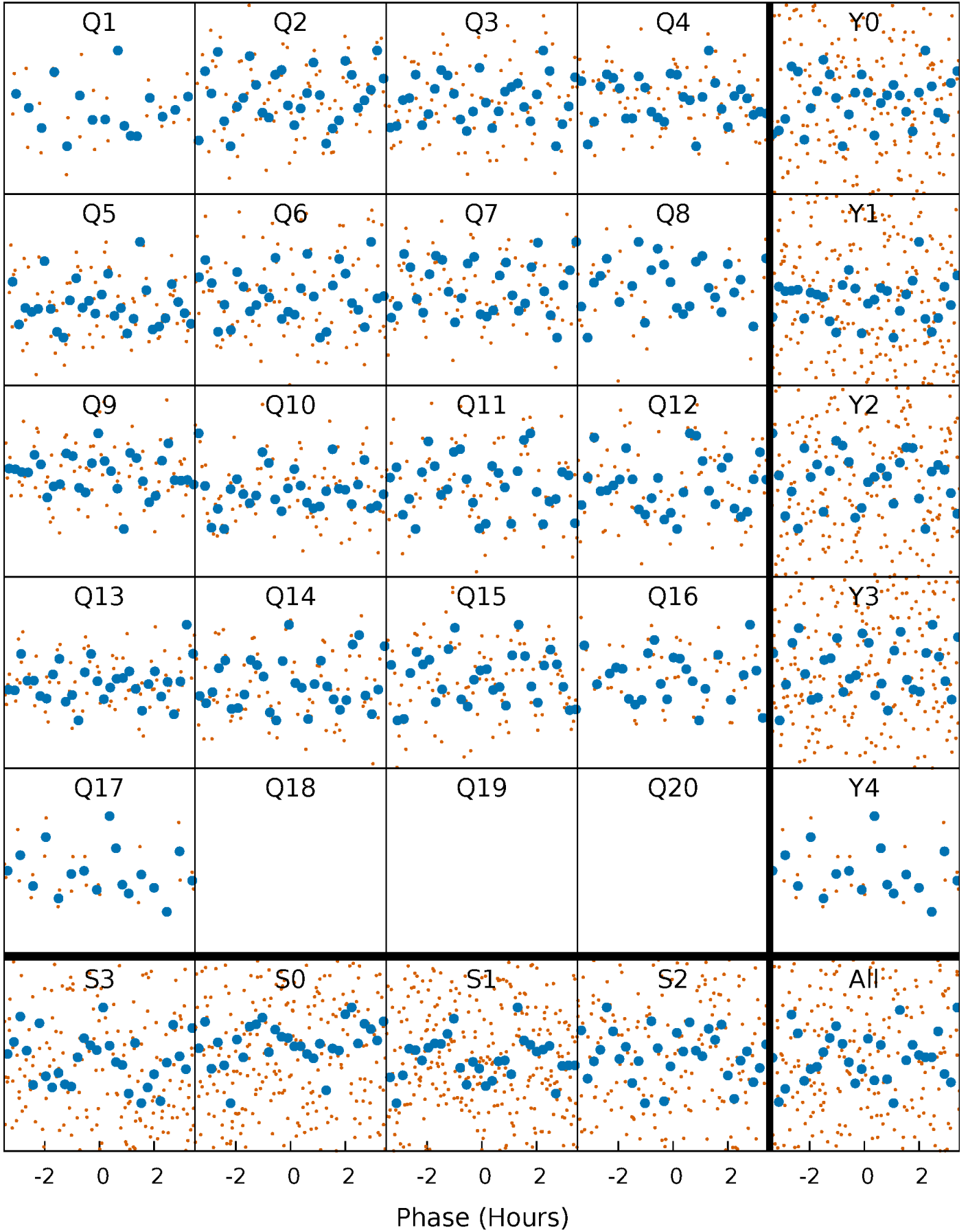


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

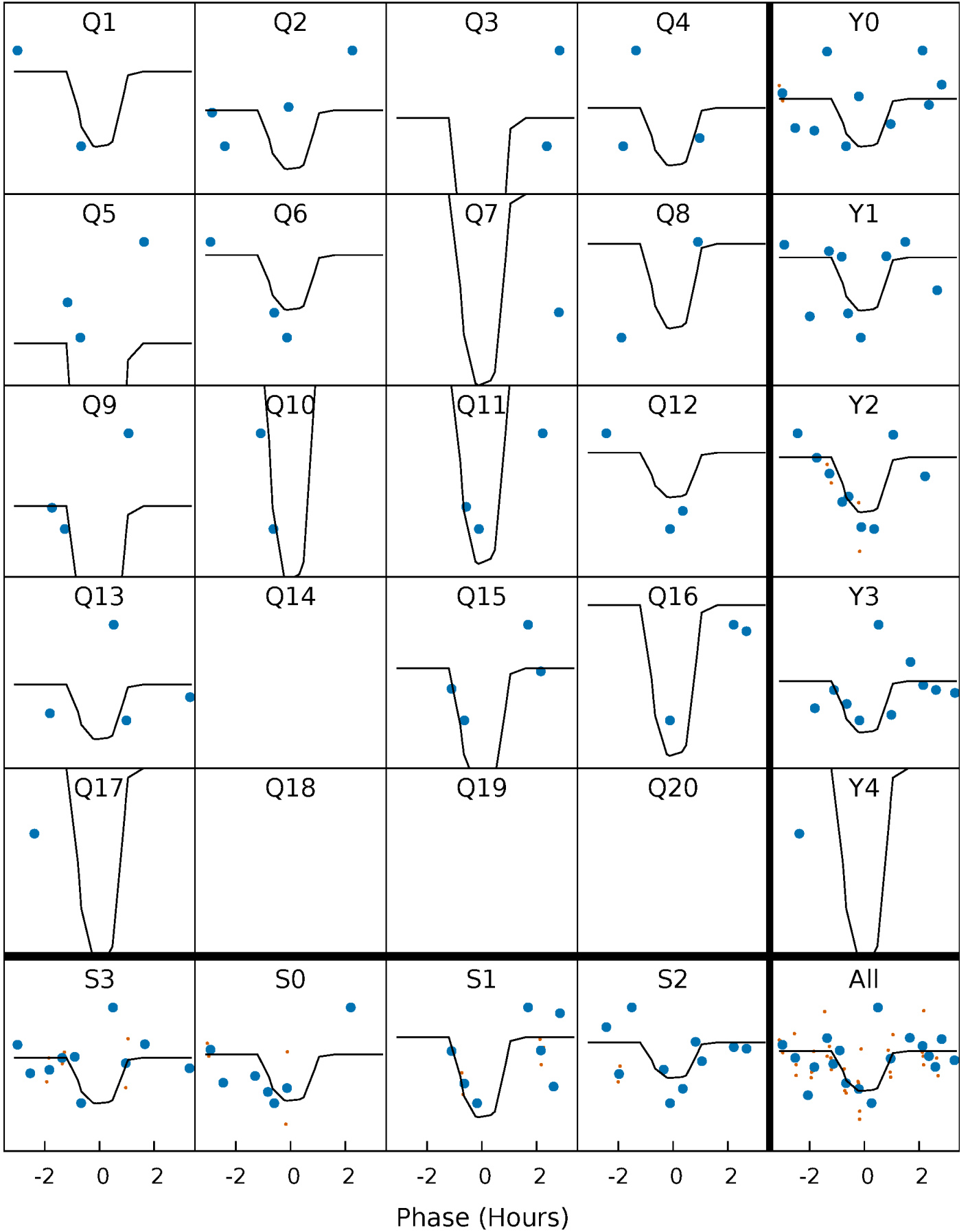
TCE 007450284-03   P= 15.409708 Days    $T_0=144.699562$  (BKJD)





# DV Quarter-Phased Transit Curves

TCE 007450284-03 P= 15.409708 Days  $T_0=144.699562$  (BKJD)

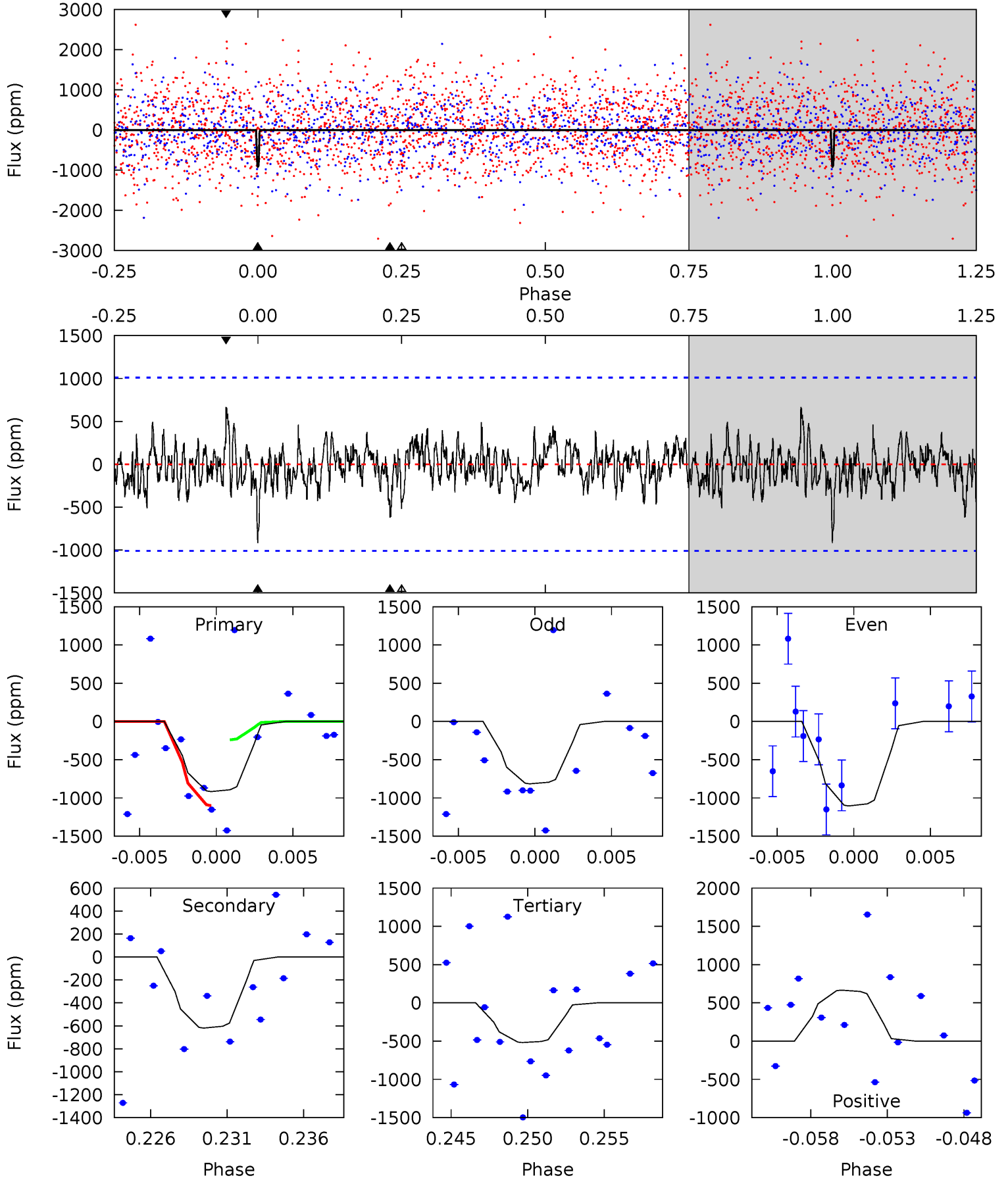


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

007450284-03, P = 15.409708 Days, E = 129.289854 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
4.69	3.17	2.65	3.40	5.17	2.82	0.96	2.04	1.28	0.52	-0.24	0.73	0.61	0.42	2.11



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.



### Stellar Parameters For KIC 007450284

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8148^{+225}_{-366}$	$3.719^{+0.420}_{-0.140}$	$-0.020^{+0.250}_{-0.400}$	$3.296^{+0.840}_{-1.561}$	$2.075^{+0.348}_{-0.523}$	$0.082^{+0.310}_{-0.033}$
	+3%/-4%	+11%/-4%	+1250%/-2000%	+25%/-47%	+17%/-25%	+380%/-40%
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 007450284-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-620 \pm 196$	$36.39^{+42.58}_{-26.50}$	$2253^{+190}_{-276}$	$3952^{+2972}_{-932}$	$5.991^{+70.650}_{-4.760}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

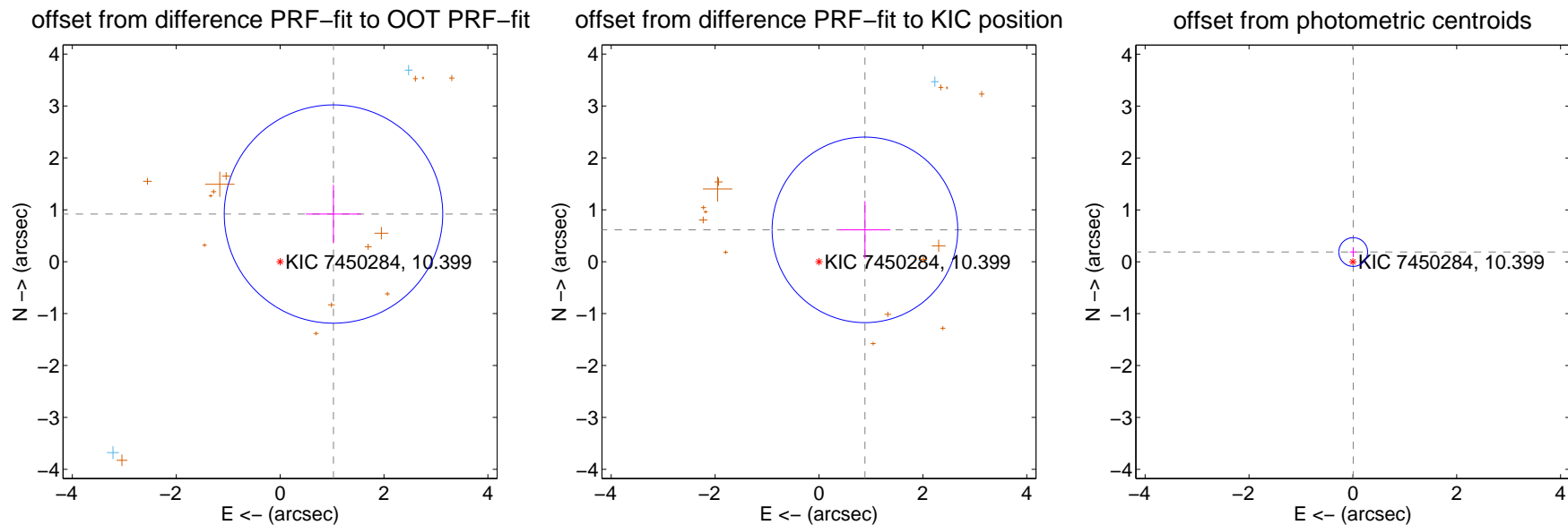
## DV Centroid Data

Supplemental centroid analysis for 007450284-03. **Kepler magnitude: 10.40.** Transit SNR 12.64

**There are 2 quarters with good PRF difference image offsets**

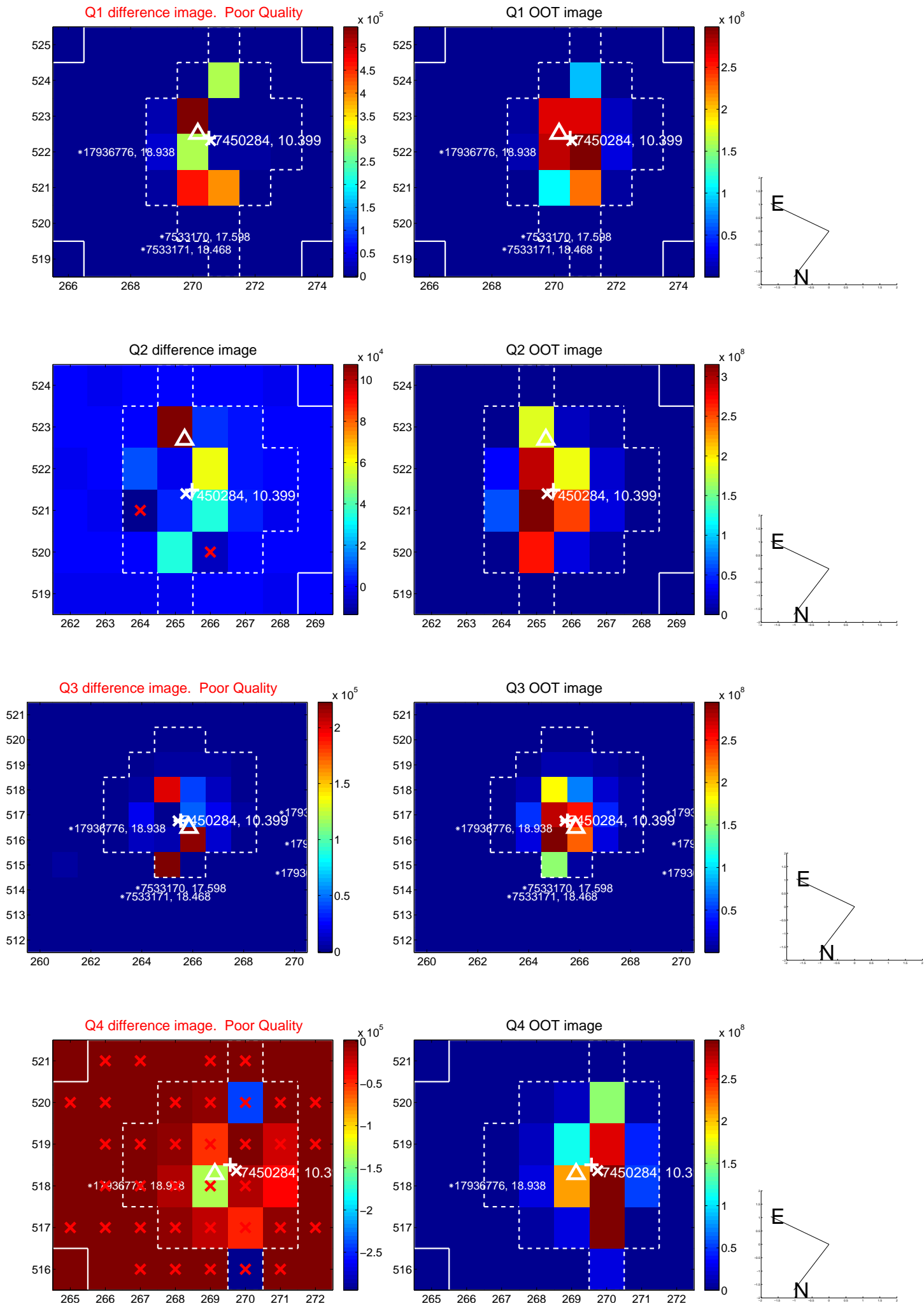
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.378 \pm 0.701$	1.97	$-1.028 \pm 0.531$	$0.918 \pm 0.564$
PRF-fit source offset from KIC position	$1.076 \pm 0.596$	1.81	$-0.884 \pm 0.493$	$0.613 \pm 0.554$
photometric centroid source offset	$0.19 \pm 0.09$	2.04	$-0.01 \pm 0.06$	$0.19 \pm 0.09$

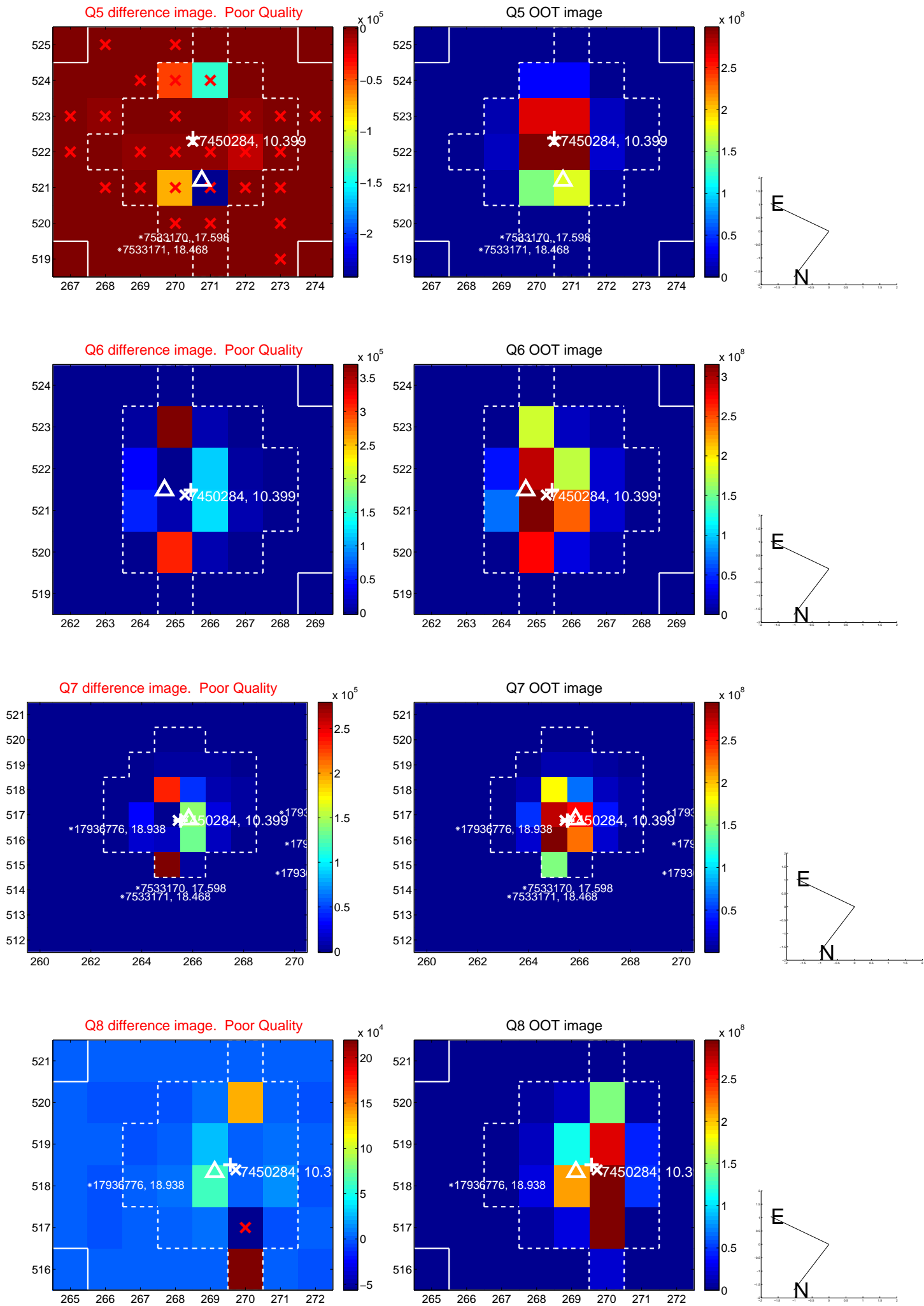


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

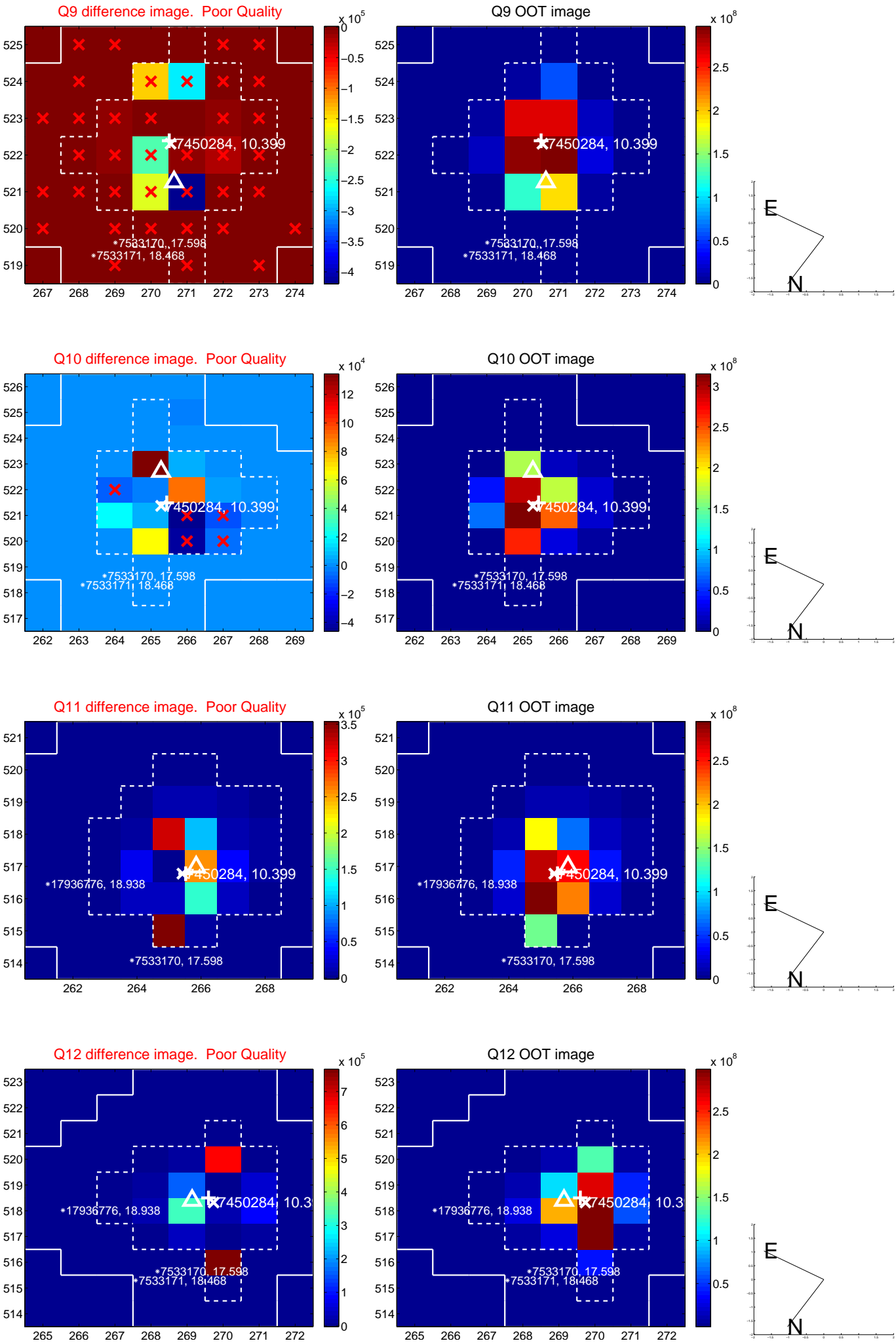
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

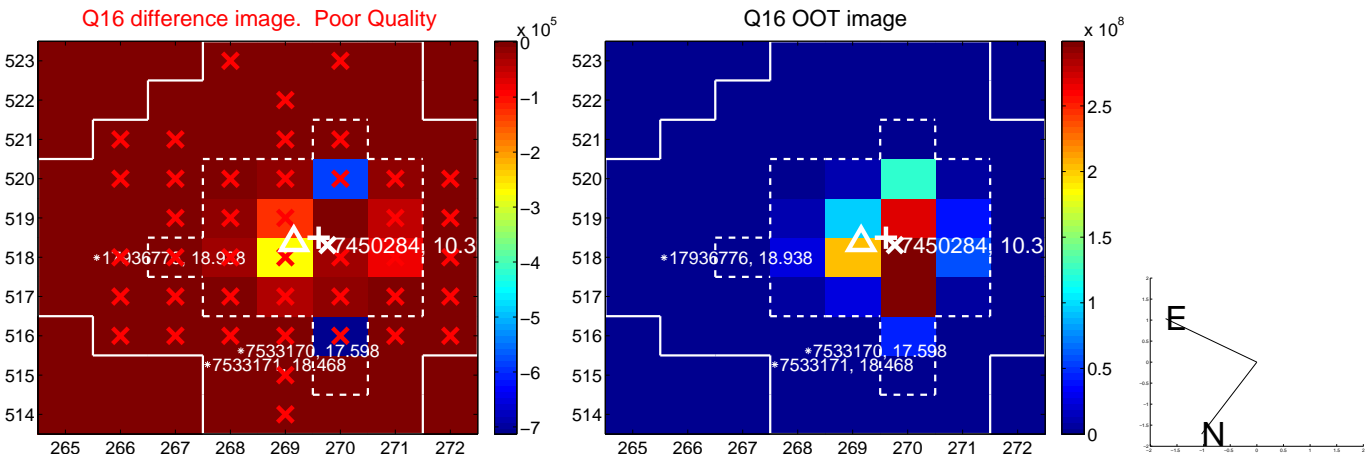
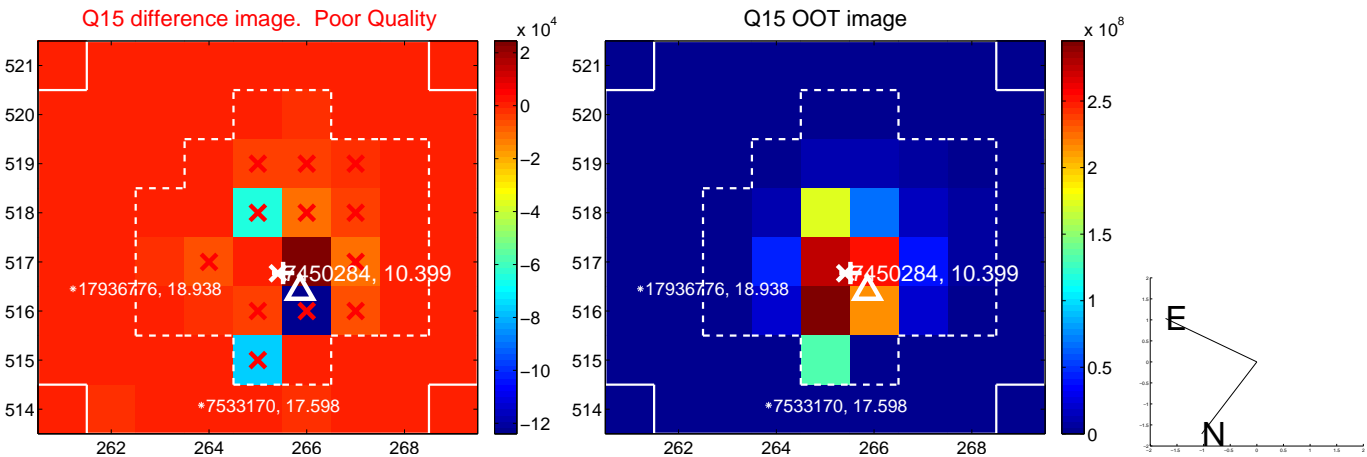
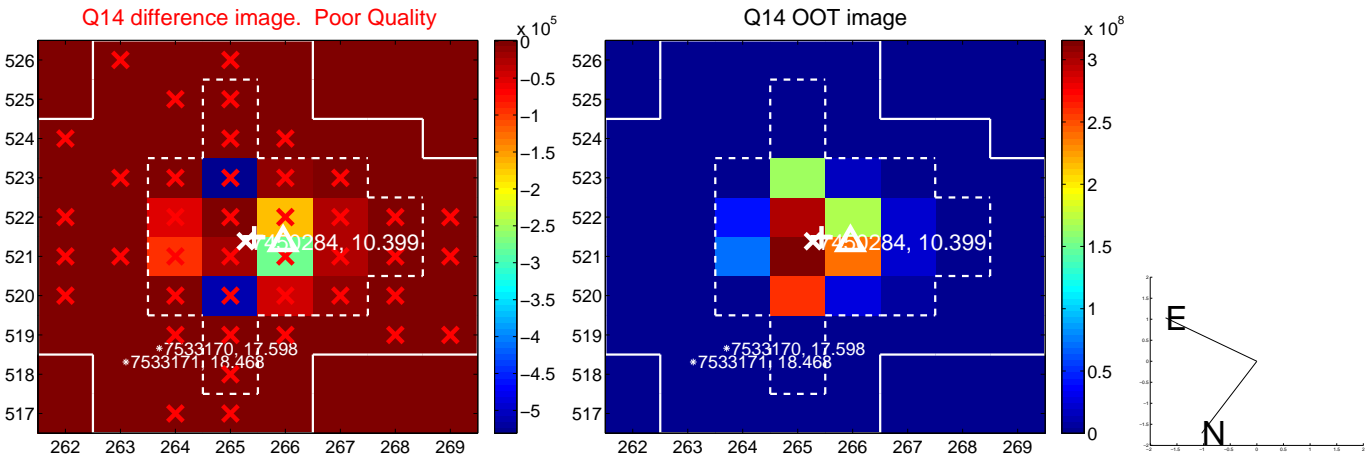
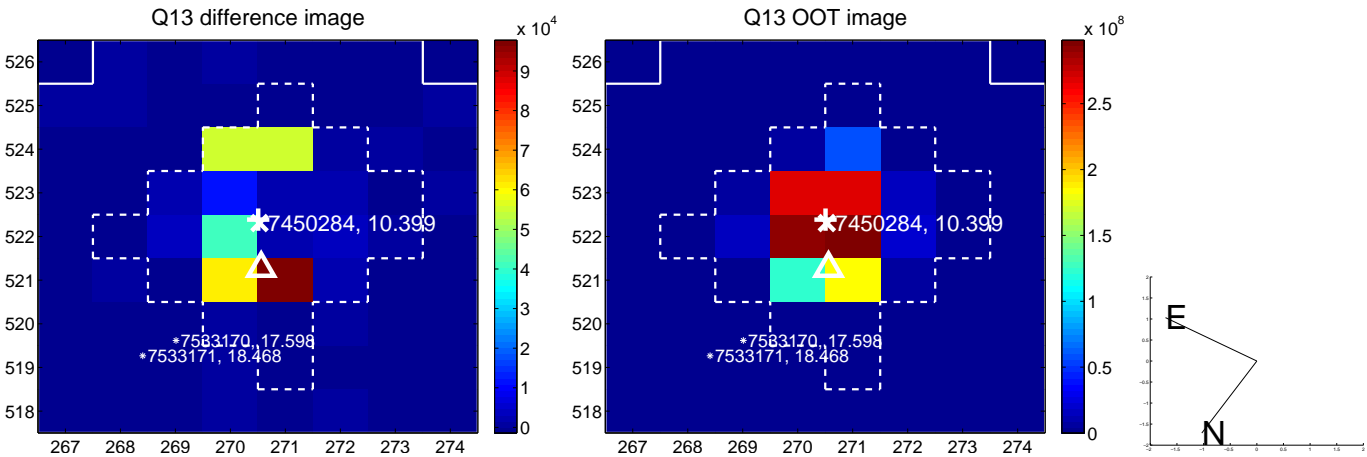


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

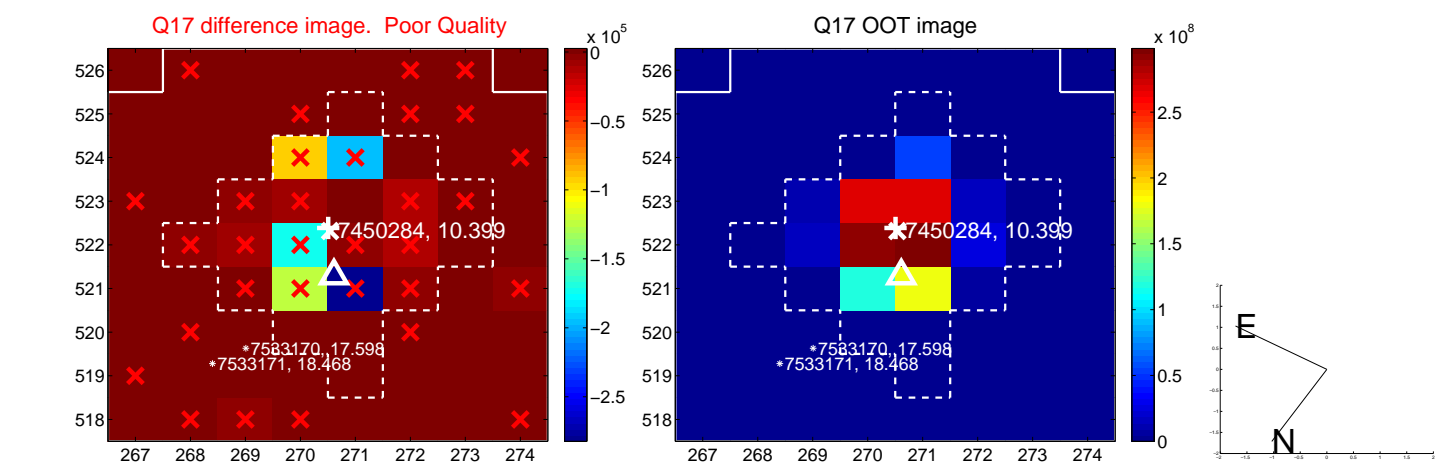




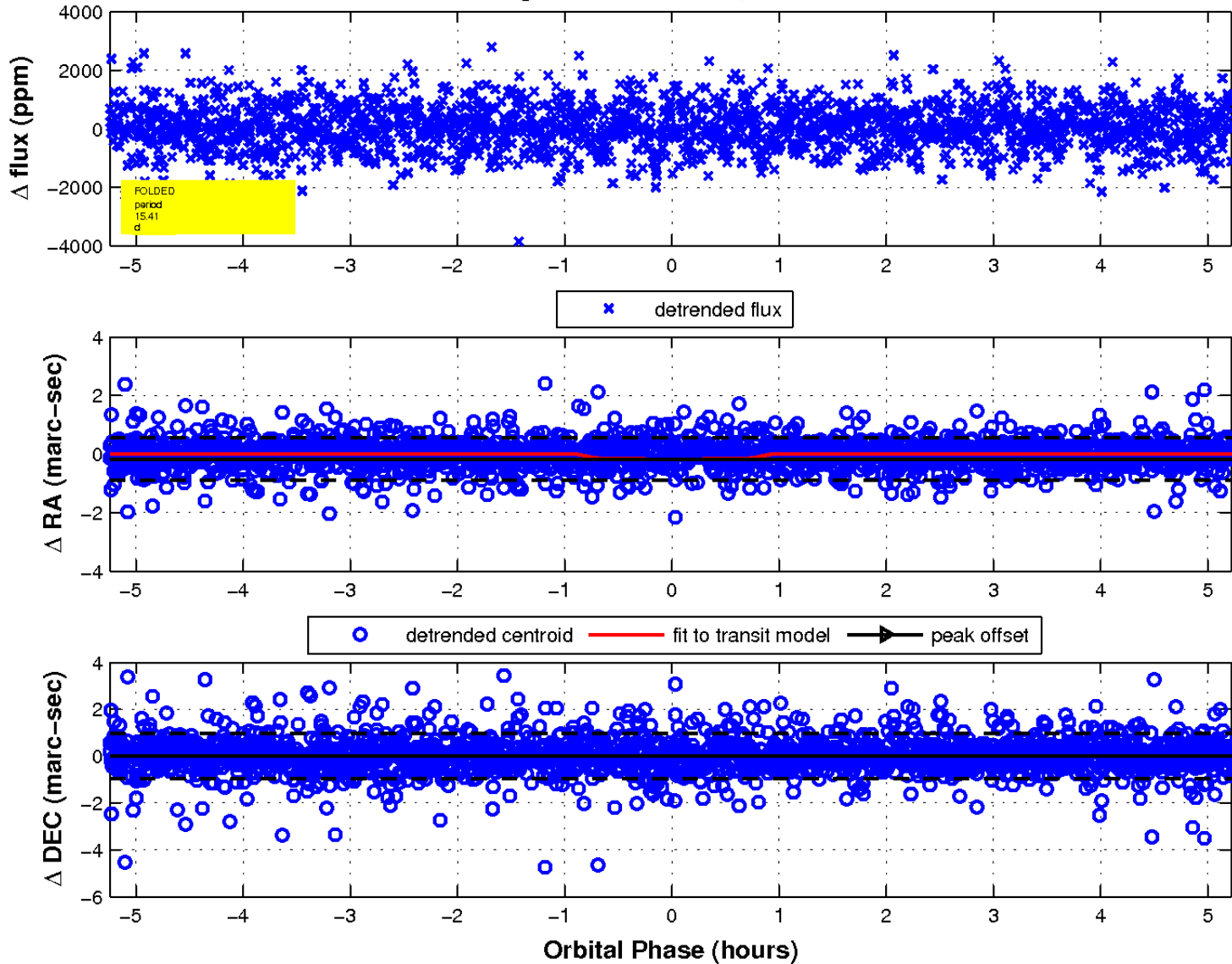
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



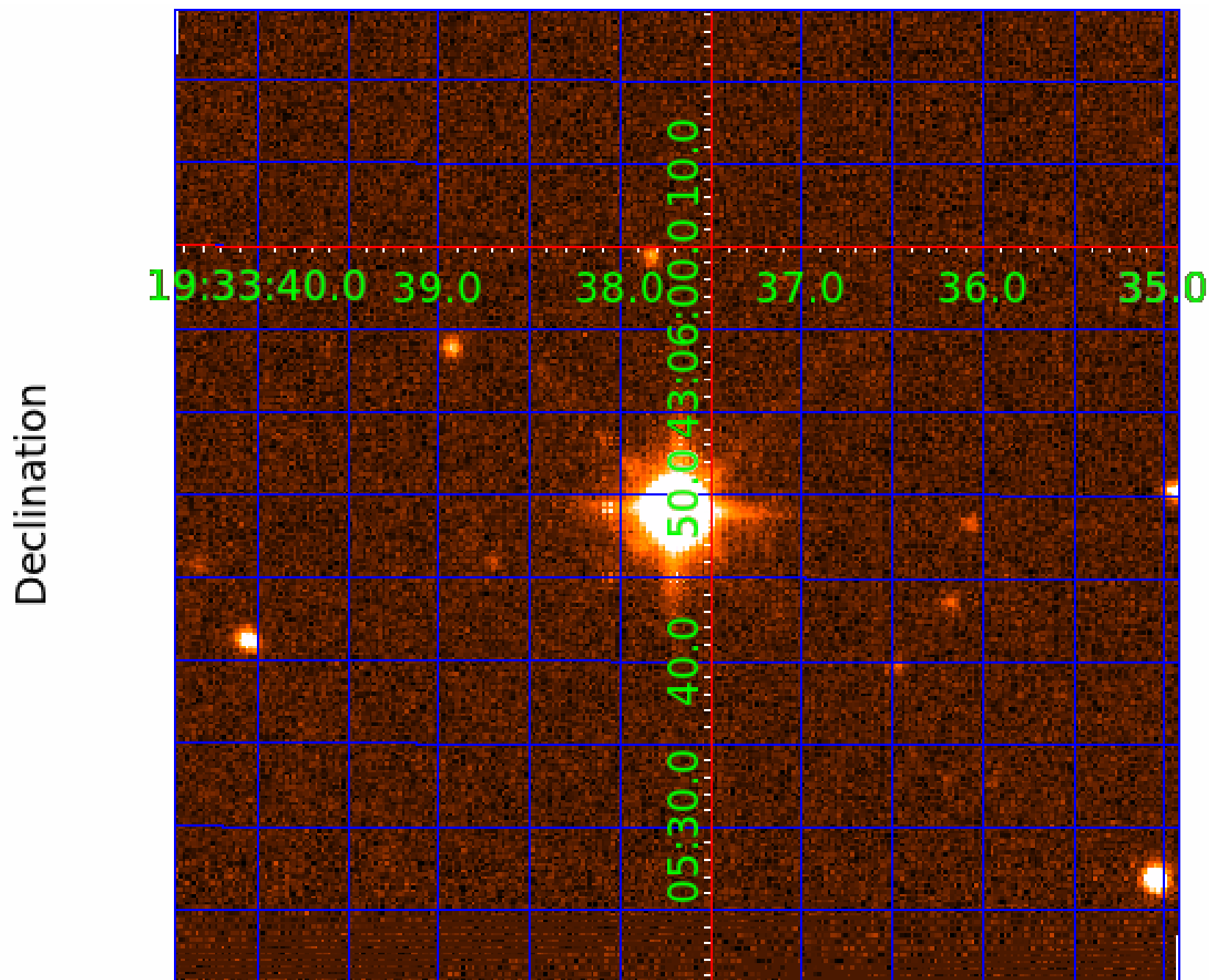
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 3 of 4



UKIRT Image



# KIC 007450284

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007450284-01	OBS	No	5.059204	132.391824	100.2	10.519	8.5	8.3	3.30	8148	3.67	7924.65
007450284-02	OBS	No	0.646723	131.951071	43.1	4.758	10.8	5.7	3.30	8148	2.19	123064.24
007450284-03	OBS	No	15.409708	144.699562	1096.1	1.748	10.7	12.6	3.30	8148	11.30	1794.86
007450284-04	OBS	No	6.224686	137.478558	176.4	4.570	9.9	5.2	3.30	8148	4.89	6010.81

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007450284-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_SATURATED
007450284-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_SATURATED
007450284-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—CENT_SATURATED—HALO_GHOST
007450284-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_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.

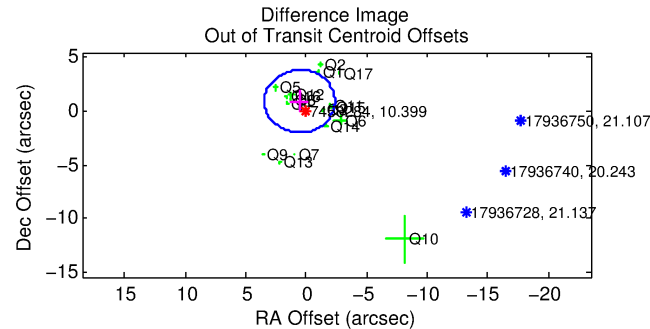
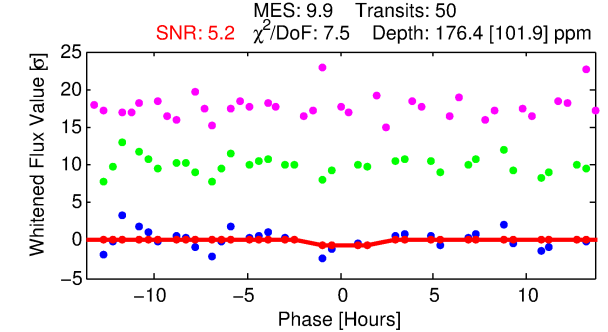
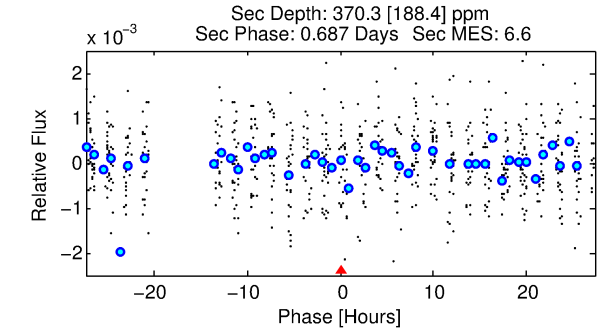
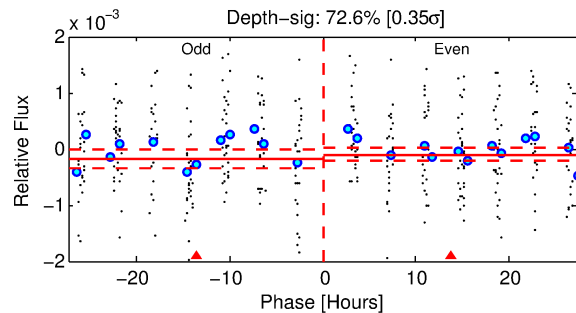
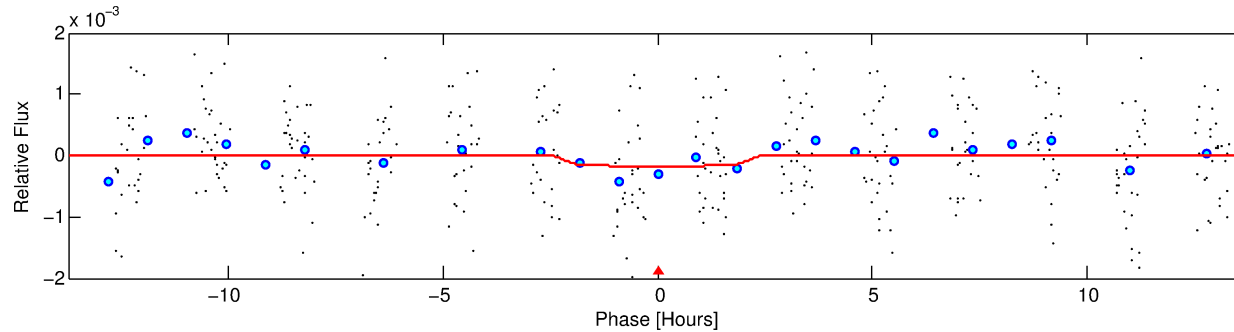
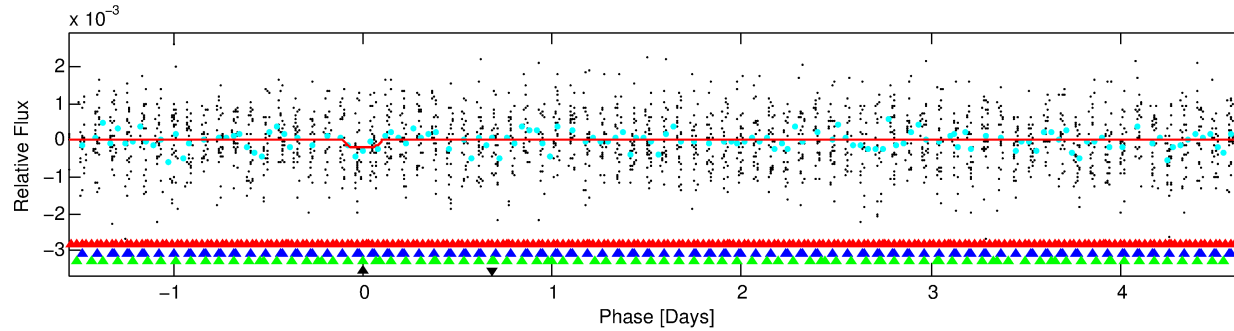
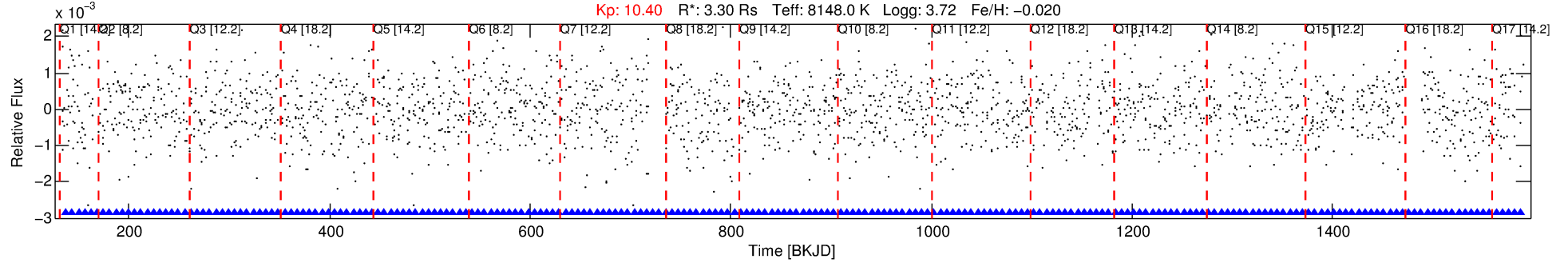
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007450284-04

No Significant Match Found

# DV One-Page Summary

KIC: 7450284 Candidate: 4 of 4 Period: 6.225 d



## DV Fit Results:

Period = 6.22469 [0.00203] d  
Epoch = 137.4786 [0.1935] BKJD  
Rp/R\* = 0.0136 [0.0609]  
a/R\* = 6.13 [158.78]  
b = 0.83 [10.34]  
Seff = 6010.81 [4448.17]  
Teq = 2245 [415] K  
Rp = 4.89 [22.03] Re  
a = 0.0845 [0.0381] AU  
Ag = 60.84 [547.78] [0.11 $\sigma$ ]  
Teffp = 9695 [21758] K [0.34 $\sigma$ ]

## DV Diagnostic Results:

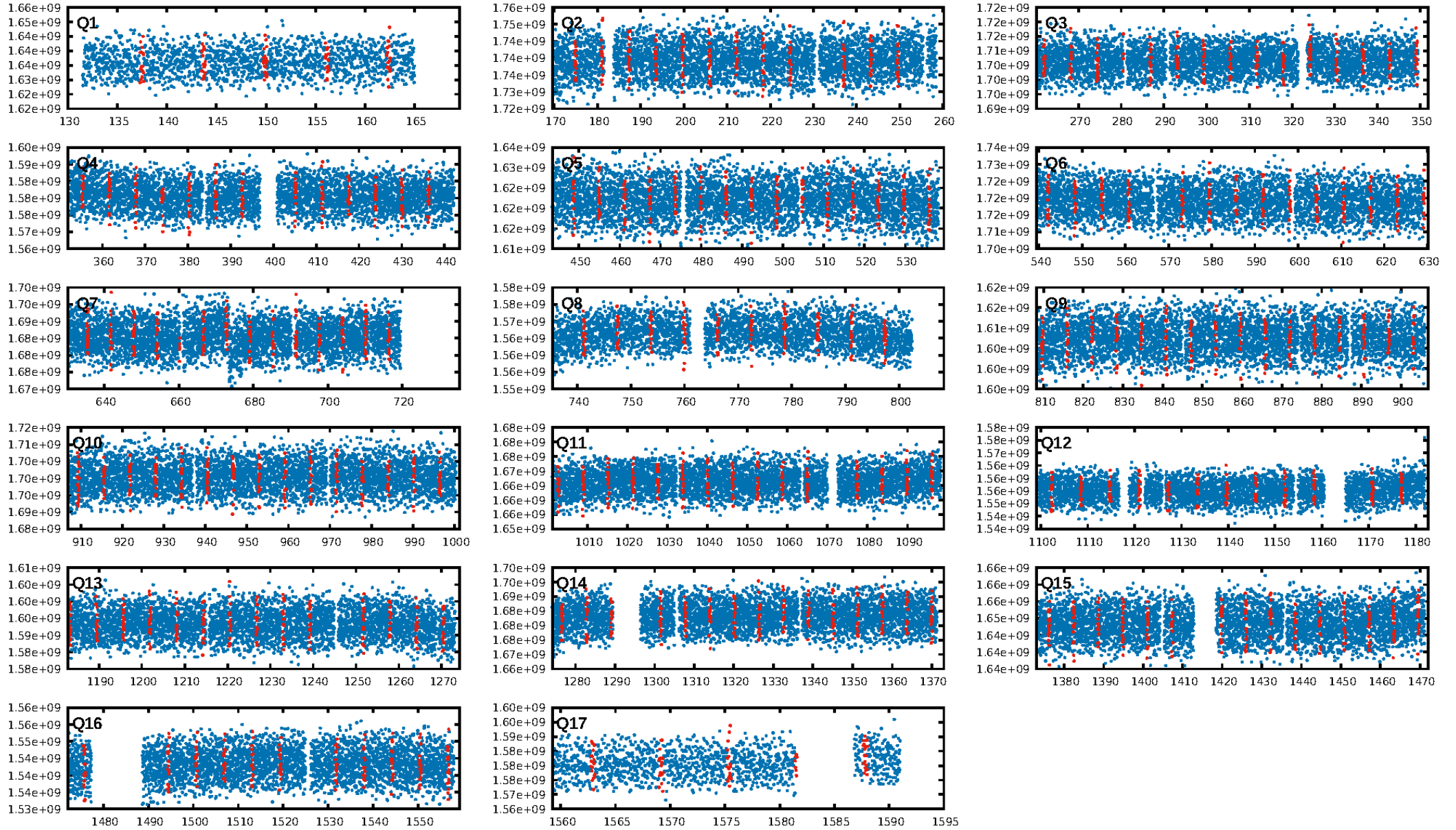
ShortPeriod-sig: 98.5% [2.44 $\sigma$ ]  
LongPeriod-sig: 100.0% [45.05 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: 9.01e-14  
RollingBand-fgt: 1.00 [48/48]  
GhostDiagnostic-chr: 0.7693  
Centroid-sig: 12.9%  
Centroid-so: 0.372 arcsec [2.11 $\sigma$ ]  
OotOffset-rm: 1.082 arcsec [1.11 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 1.098 arcsec [1.08 $\sigma$ ]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.24 [4/17]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 02:40:11 Z

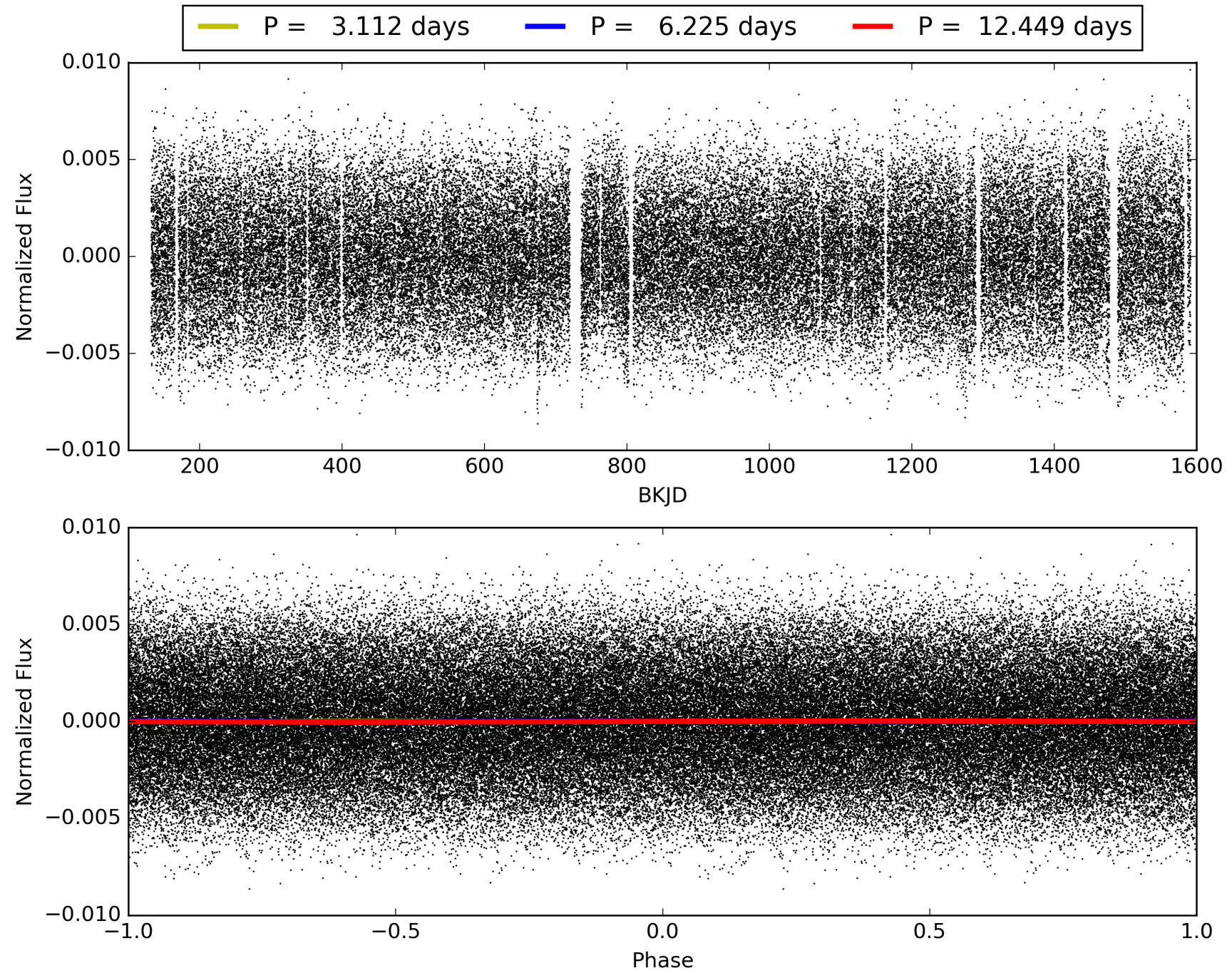
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 007450284-04, PDC Light Curves

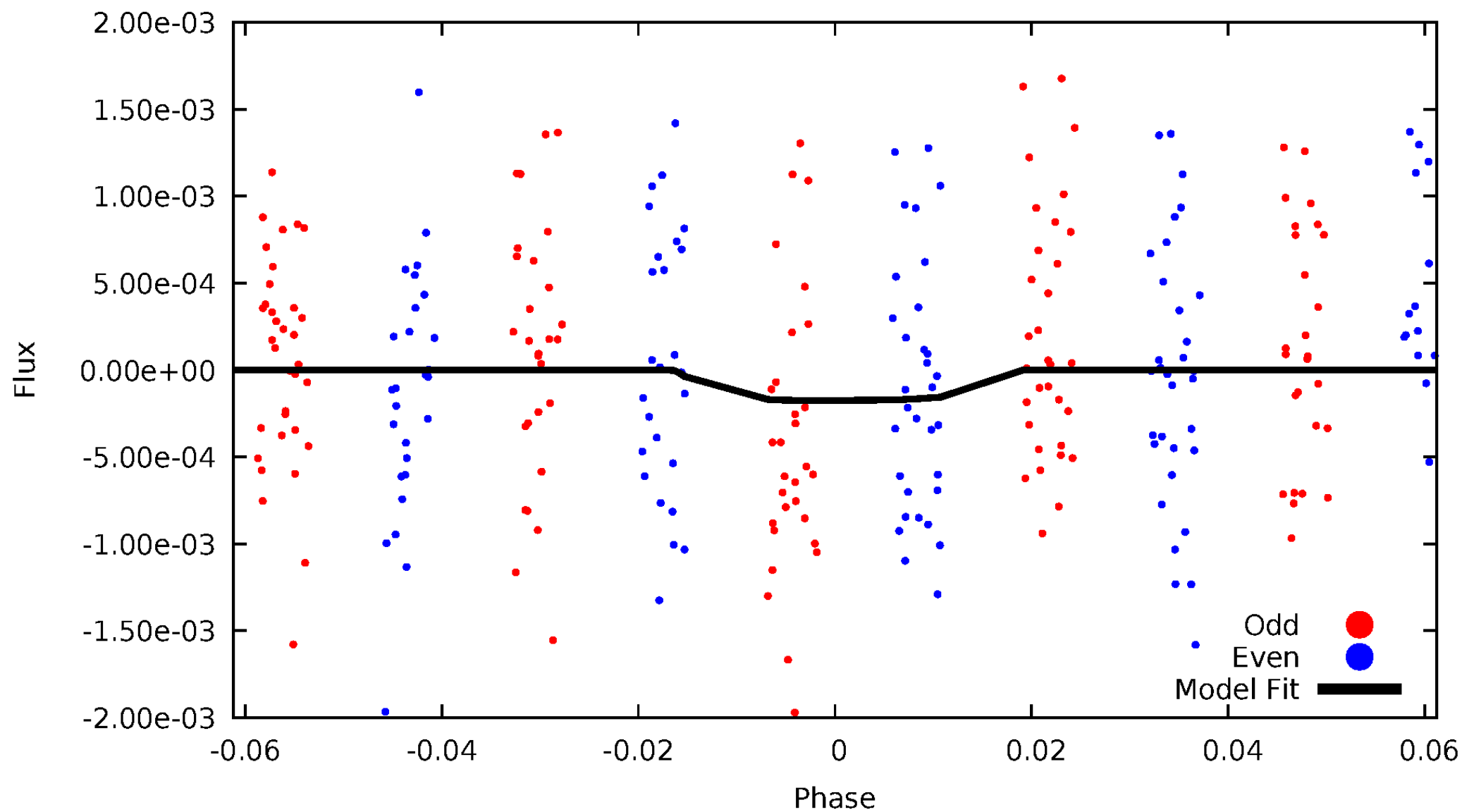


TCE 007450284-04



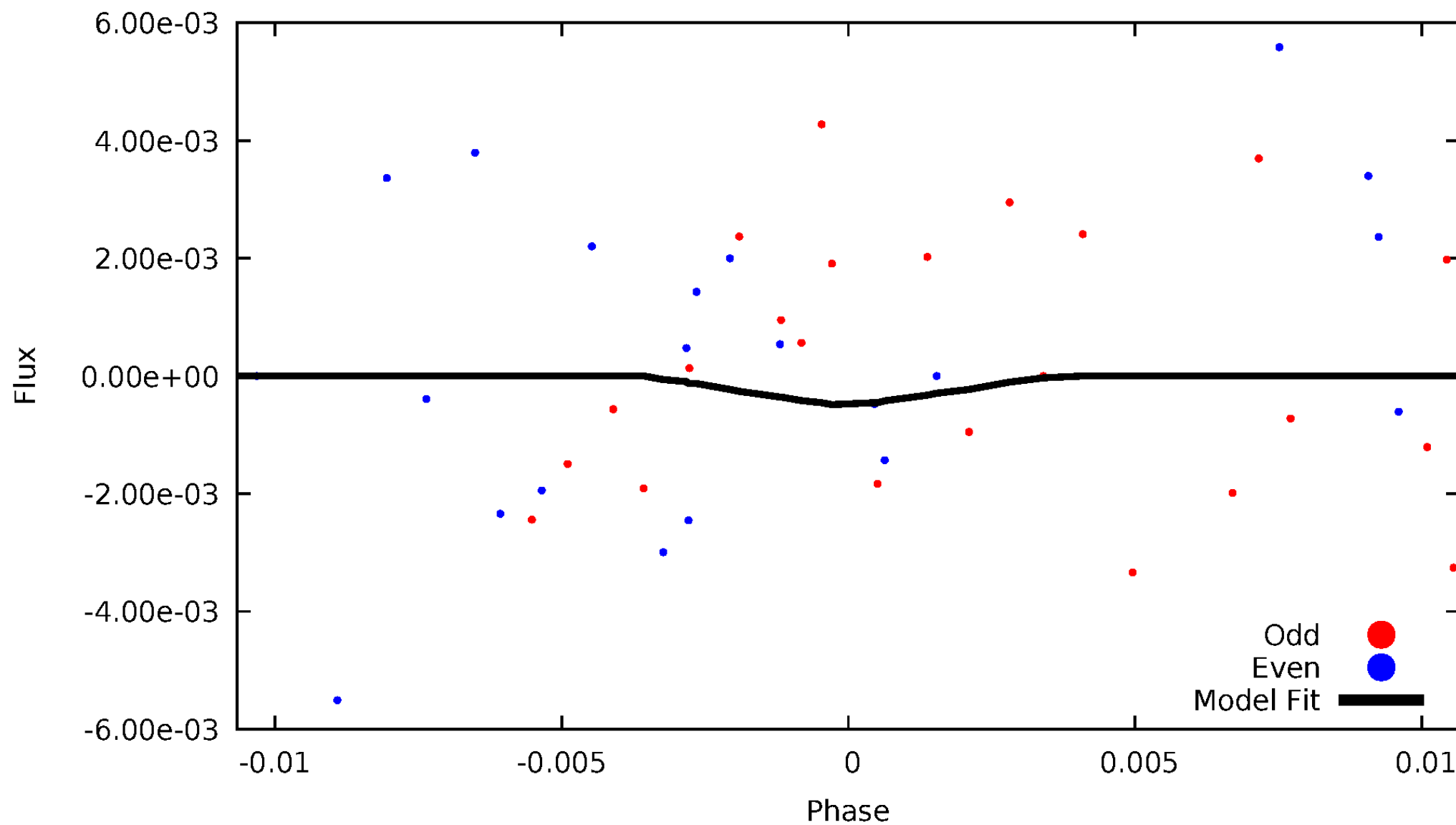
# DV Odd/Even

TCE 007450284-04



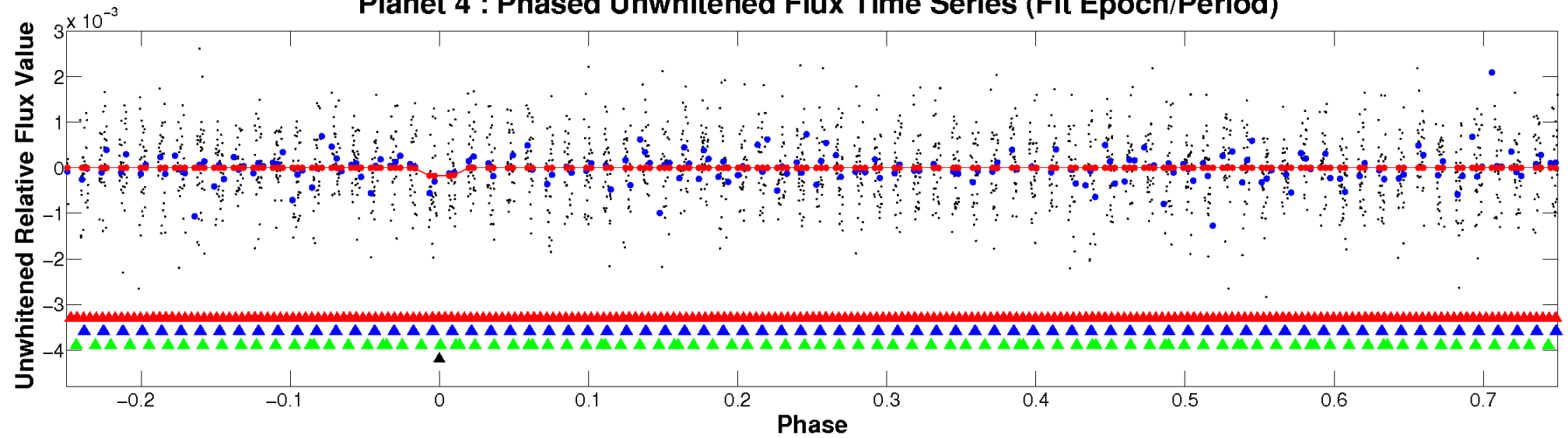
# ALT Odd/Even

TCE 007450284-04

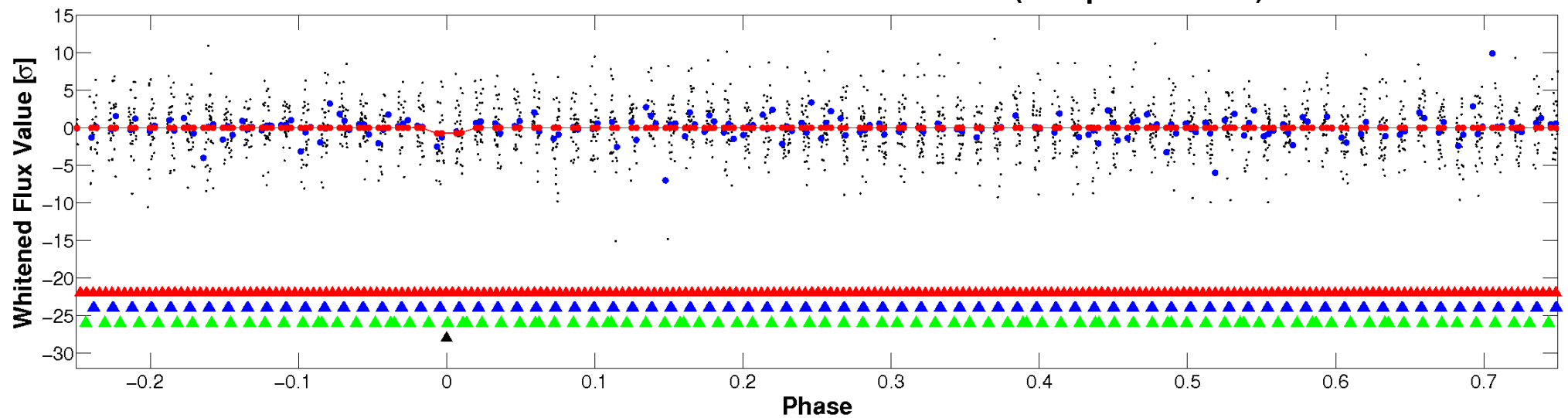


# Non-Whitened Vs. Whitened Light Curve

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



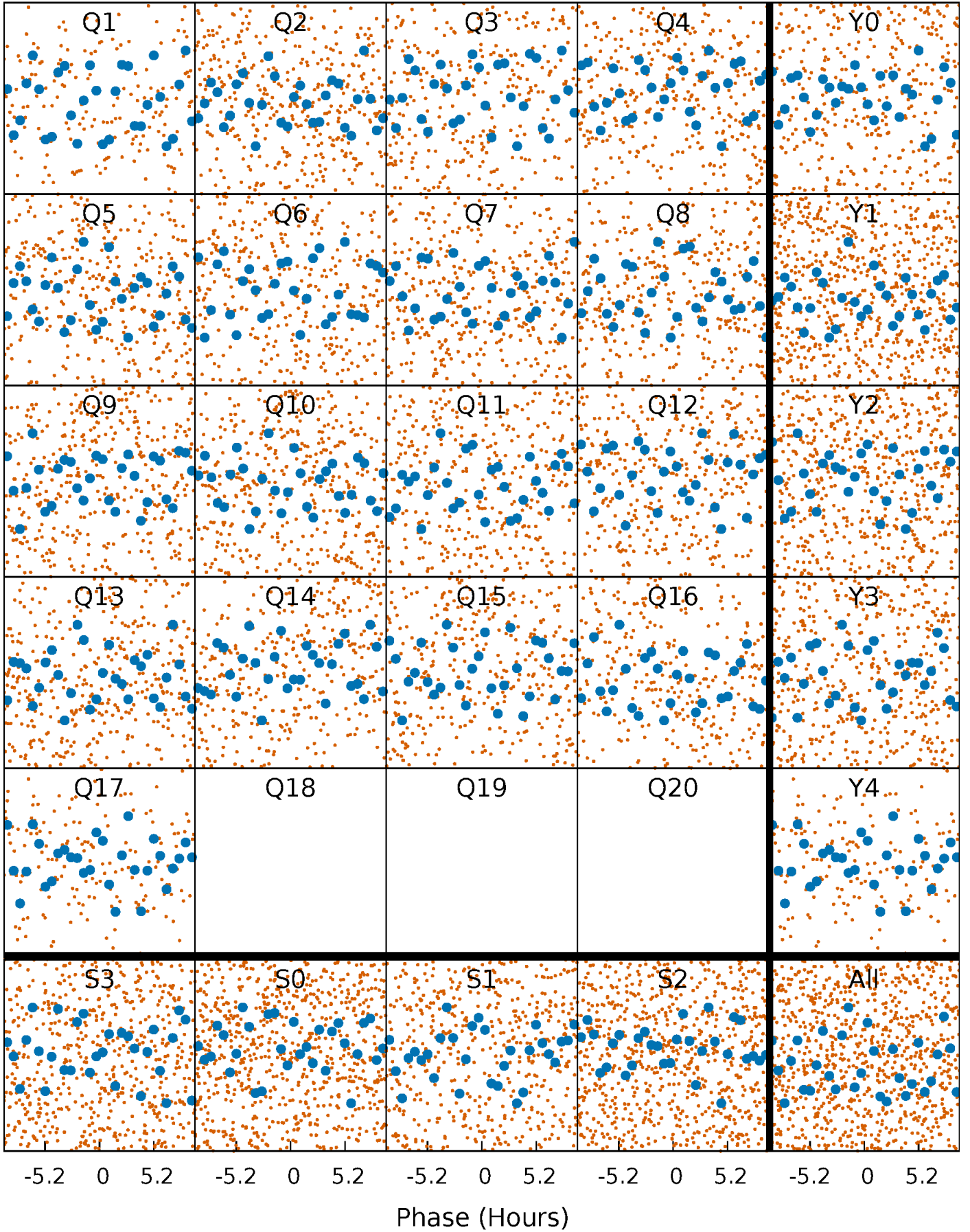
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





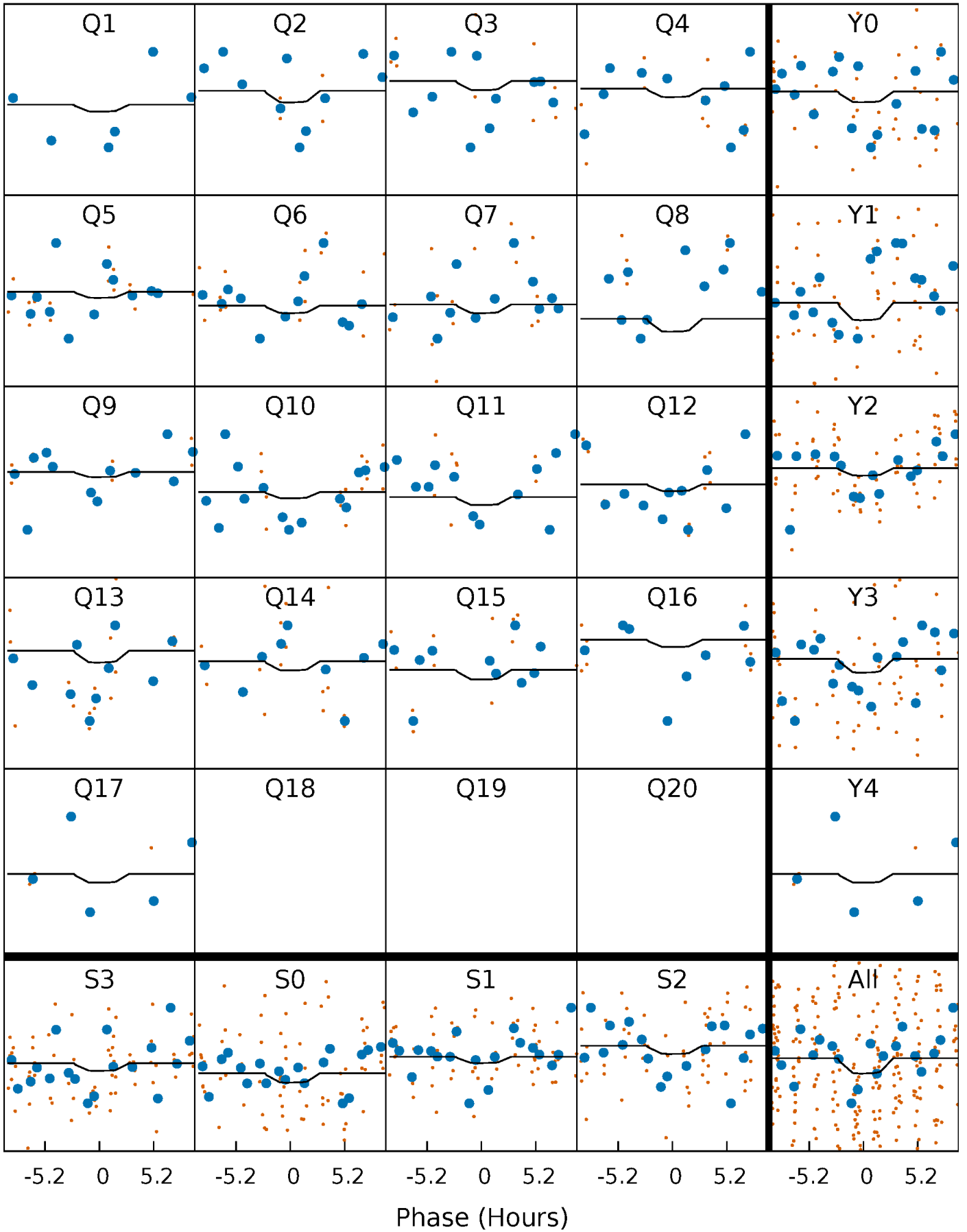
# PDC Quarter-Phased Transit Curves

TCE 007450284-04    P= 6.224686 Days     $T_0=137.478558$  (BKJD)



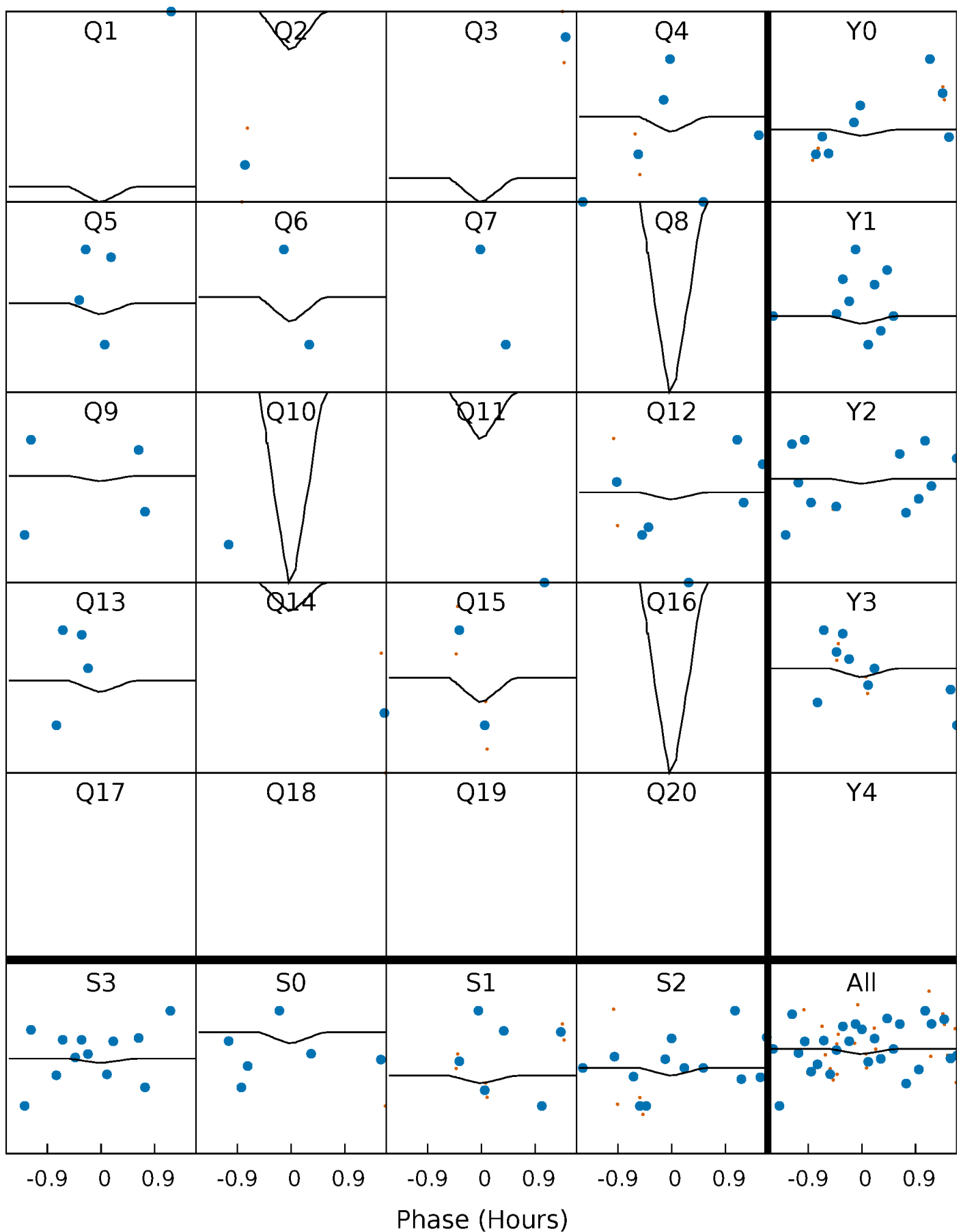
# DV Quarter-Phased Transit Curves

TCE 007450284-04   P= 6.224686 Days    $T_0=137.478558$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

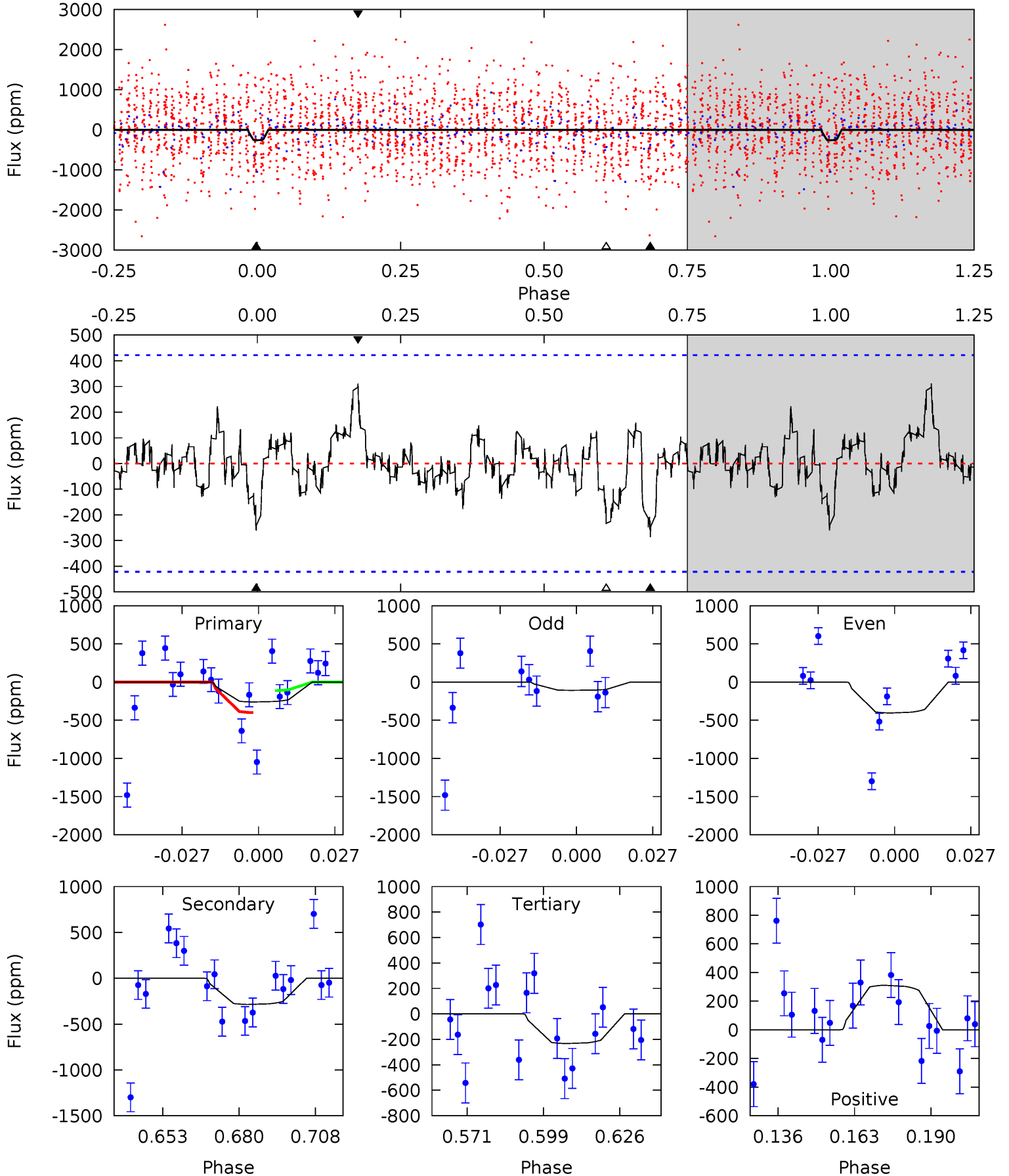
TCE 007450284-04 P= 6.224171 Days  $T_0=137.644986$  (BKJD)



# DV Model-Shift Uniqueness Test

007450284-04, P = 6.224686 Days, E = 131.253872 Days

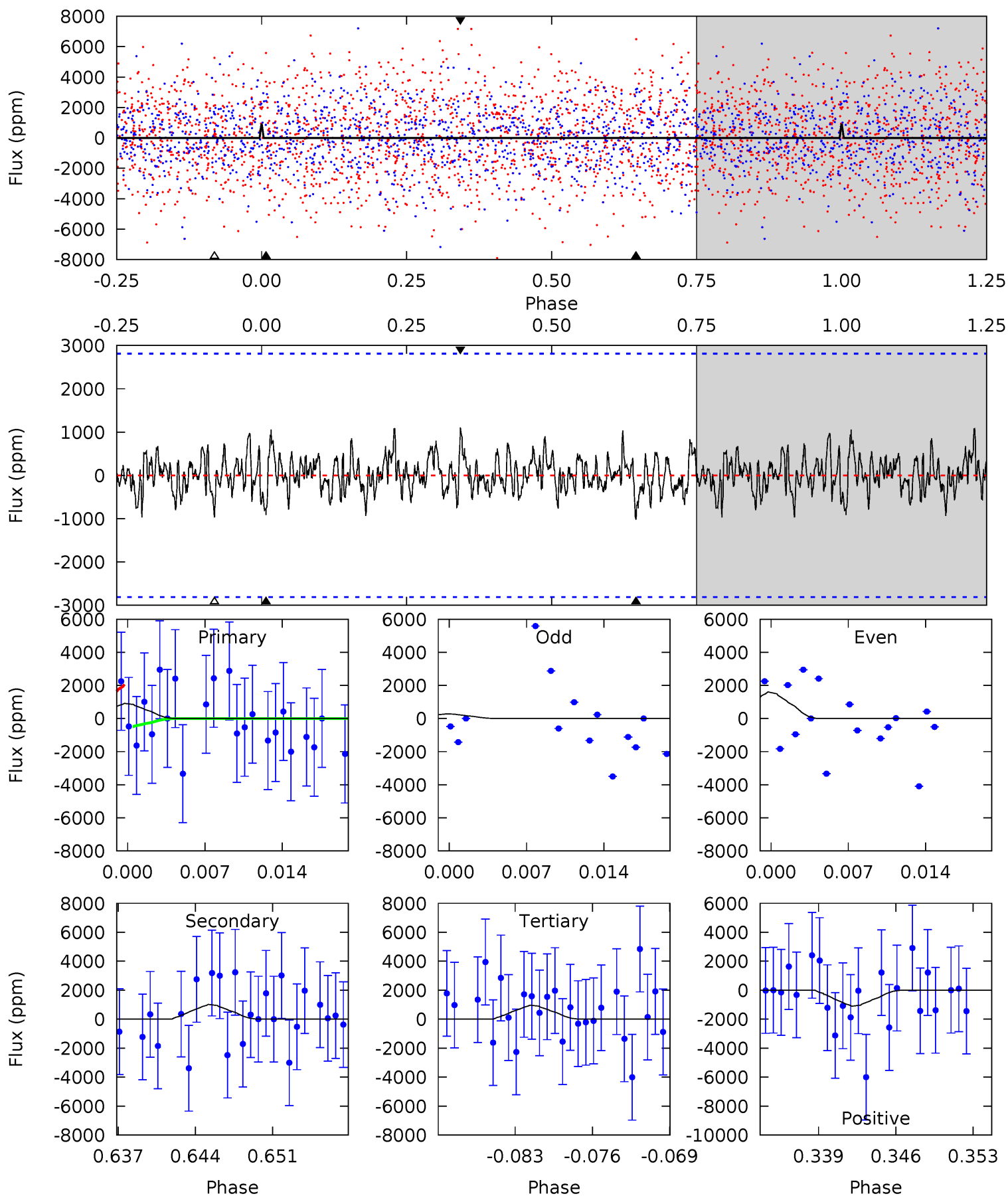
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.99	3.28	2.67	3.57	4.83	2.21	0.91	0.32	-0.58	0.61	-0.29	1.69	0.57	0.52	1.66



# Alt Model-Shift Uniqueness Test

007450284-04, P = 6.224171 Days, E = 131.420815 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
1.65	1.85	1.75	2.01	5.10	2.70	0.64	-0.10	-0.36	0.10	-0.16	1.20	-40.3	0.52	1.41





### Stellar Parameters For KIC 007450284

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8148^{+225}_{-366}$	$3.719^{+0.420}_{-0.140}$	$-0.020^{+0.250}_{-0.400}$	$3.296^{+0.840}_{-1.561}$	$2.075^{+0.348}_{-0.523}$	$0.082^{+0.310}_{-0.033}$
	+3%/-4%	+11%/-4%	+1250%/-2000%	+25%/-47%	+17%/-25%	+380%/-40%
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 007450284-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-286 \pm 87$	$14.45^{+17.74}_{-10.38}$	$3040^{+277}_{-368}$	$4858^{+4881}_{-1336}$	$5.128^{+62.184}_{-4.065}$
Alt.	$-1020 \pm 552$	$16.10^{+18.01}_{-11.46}$	$3053^{+251}_{-391}$	$5986^{+7816}_{-1750}$	$13^{+137}_{-11}$

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

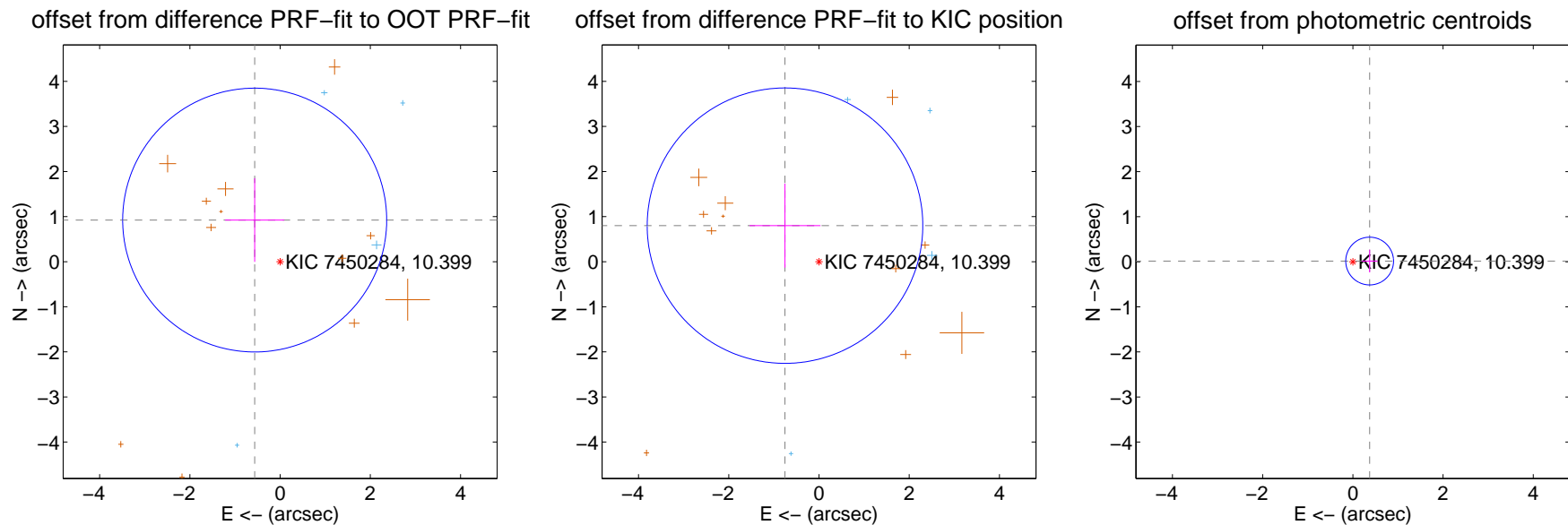
## DV Centroid Data

Supplemental centroid analysis for 007450284-04. **Kepler magnitude: 10.40.** Transit SNR 5.24

There are 4 quarters with good PRF difference image offsets

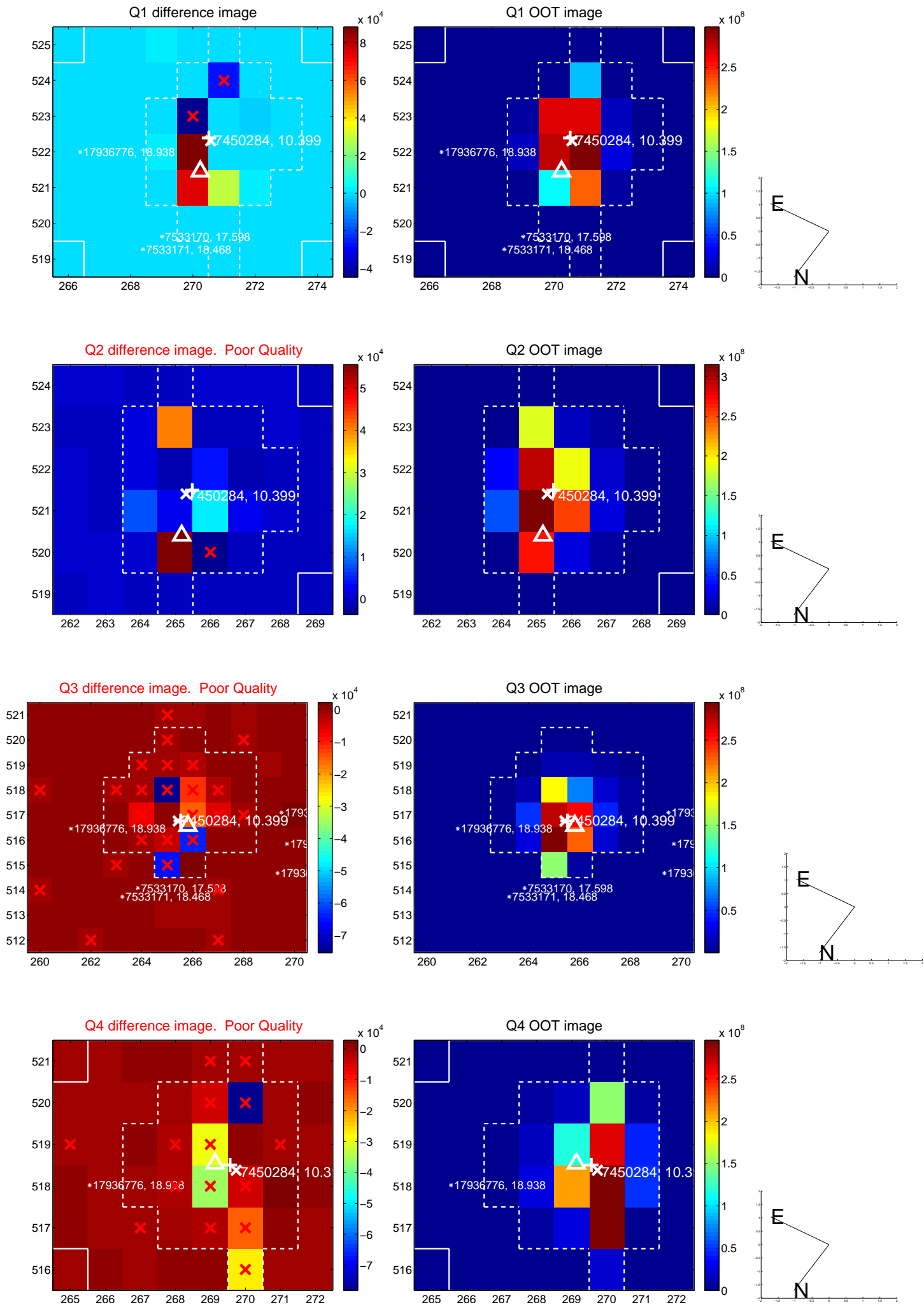
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.082 \pm 0.975$	1.11	$0.563 \pm 0.655$	$0.923 \pm 0.927$
PRF-fit source offset from KIC position	$1.098 \pm 1.018$	1.08	$0.753 \pm 0.787$	$0.799 \pm 0.931$
photometric centroid source offset	$0.37 \pm 0.18$	2.11	$-0.37 \pm 0.18$	$0.02 \pm 0.25$

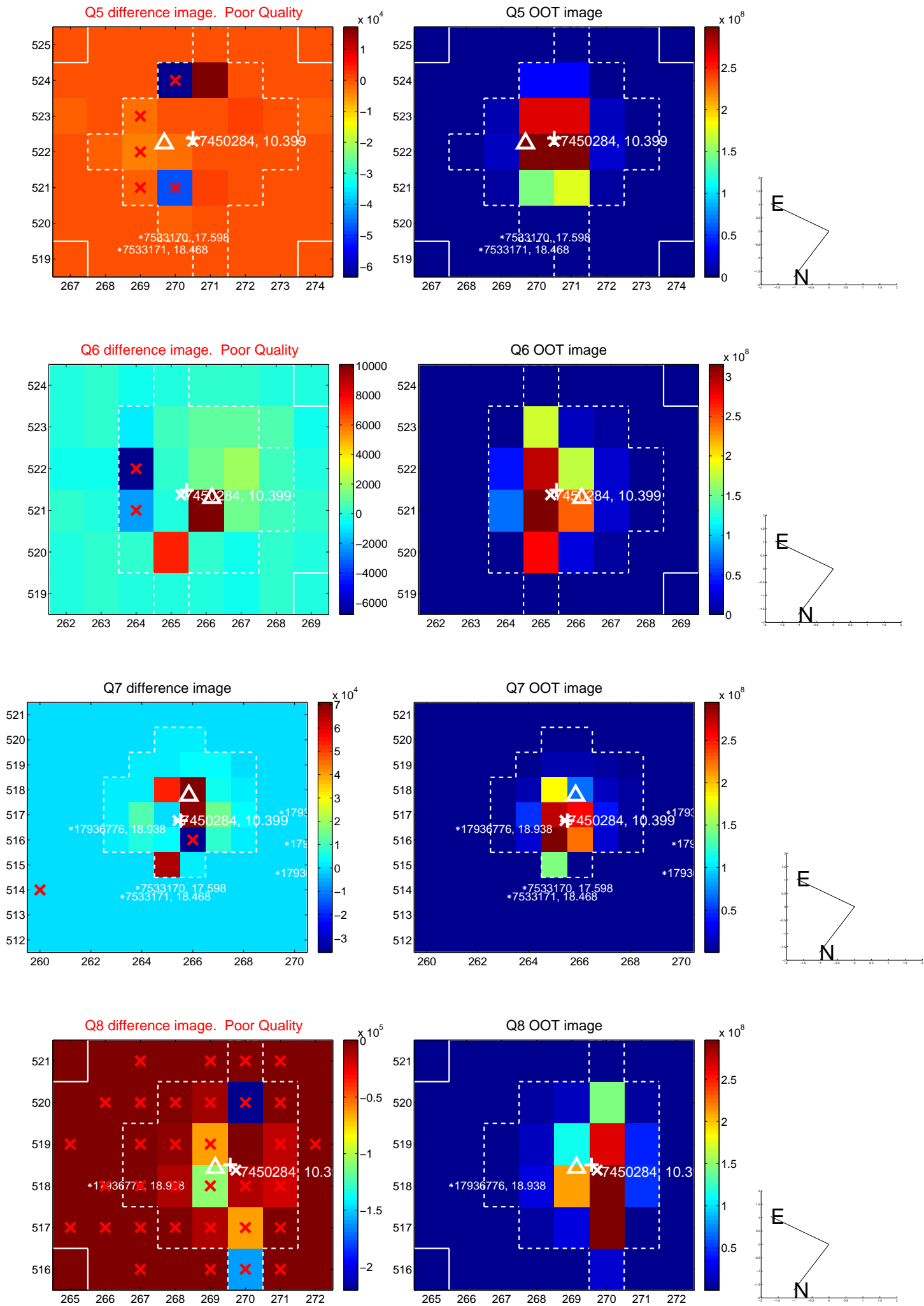


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

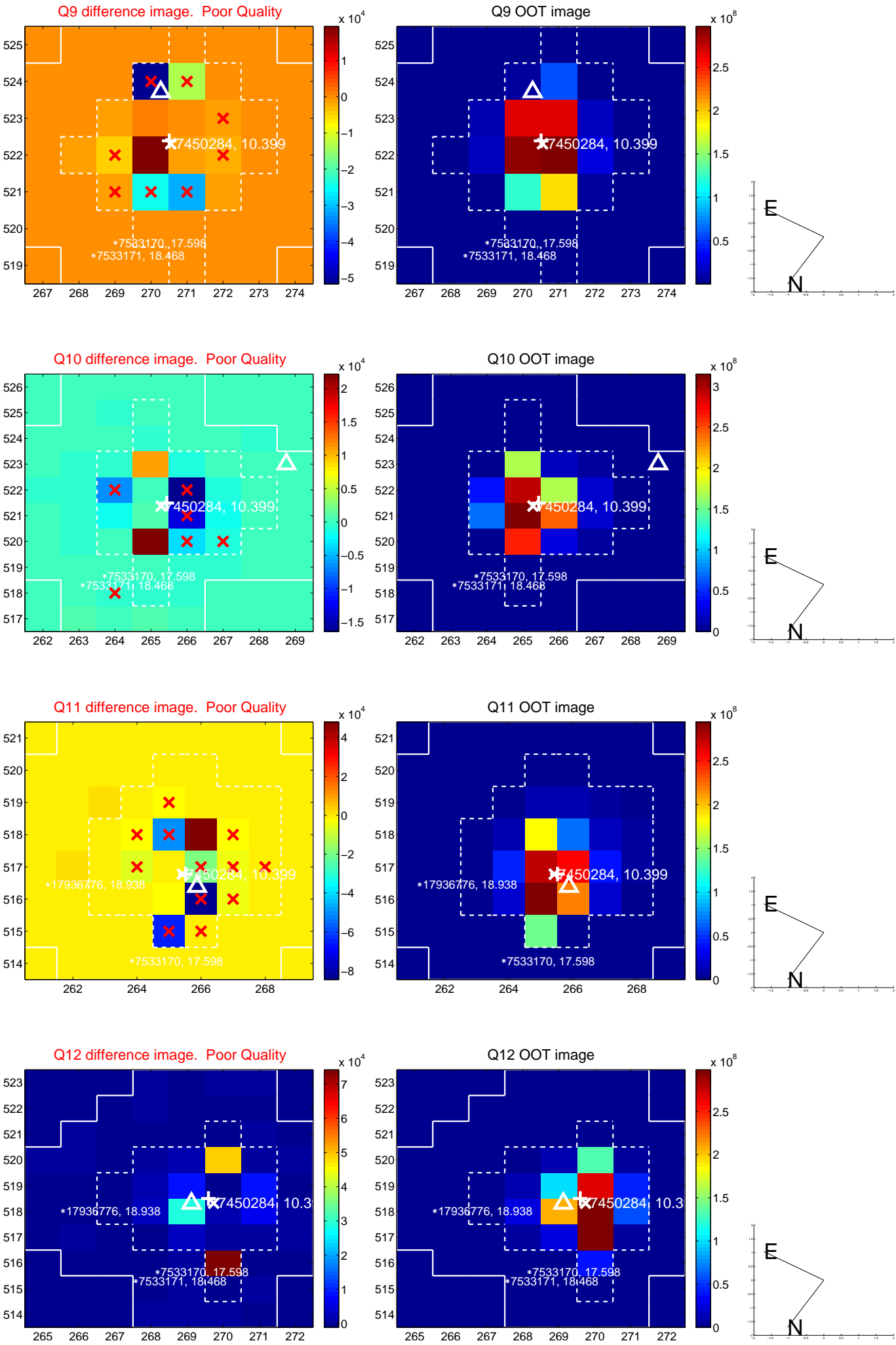
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



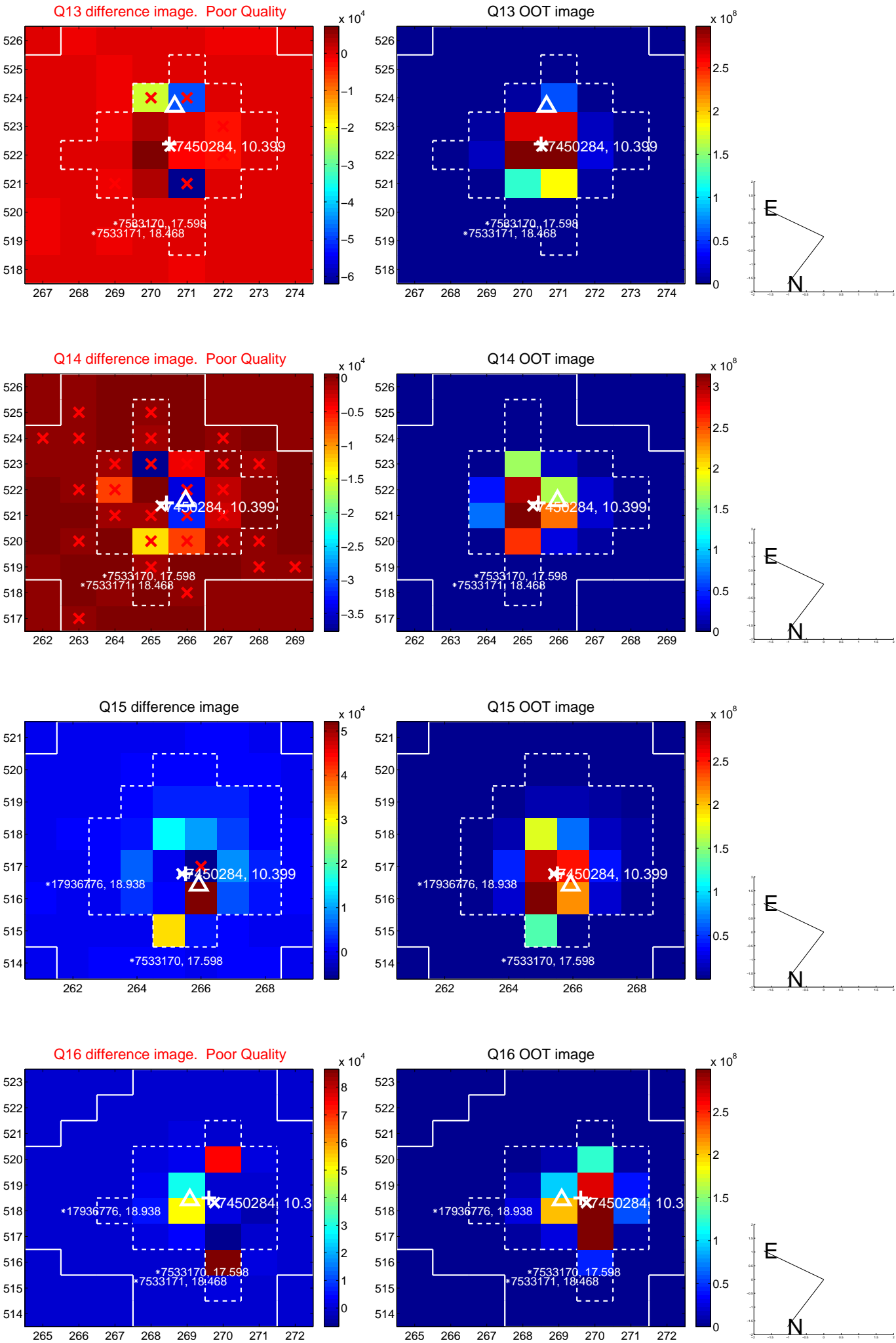
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

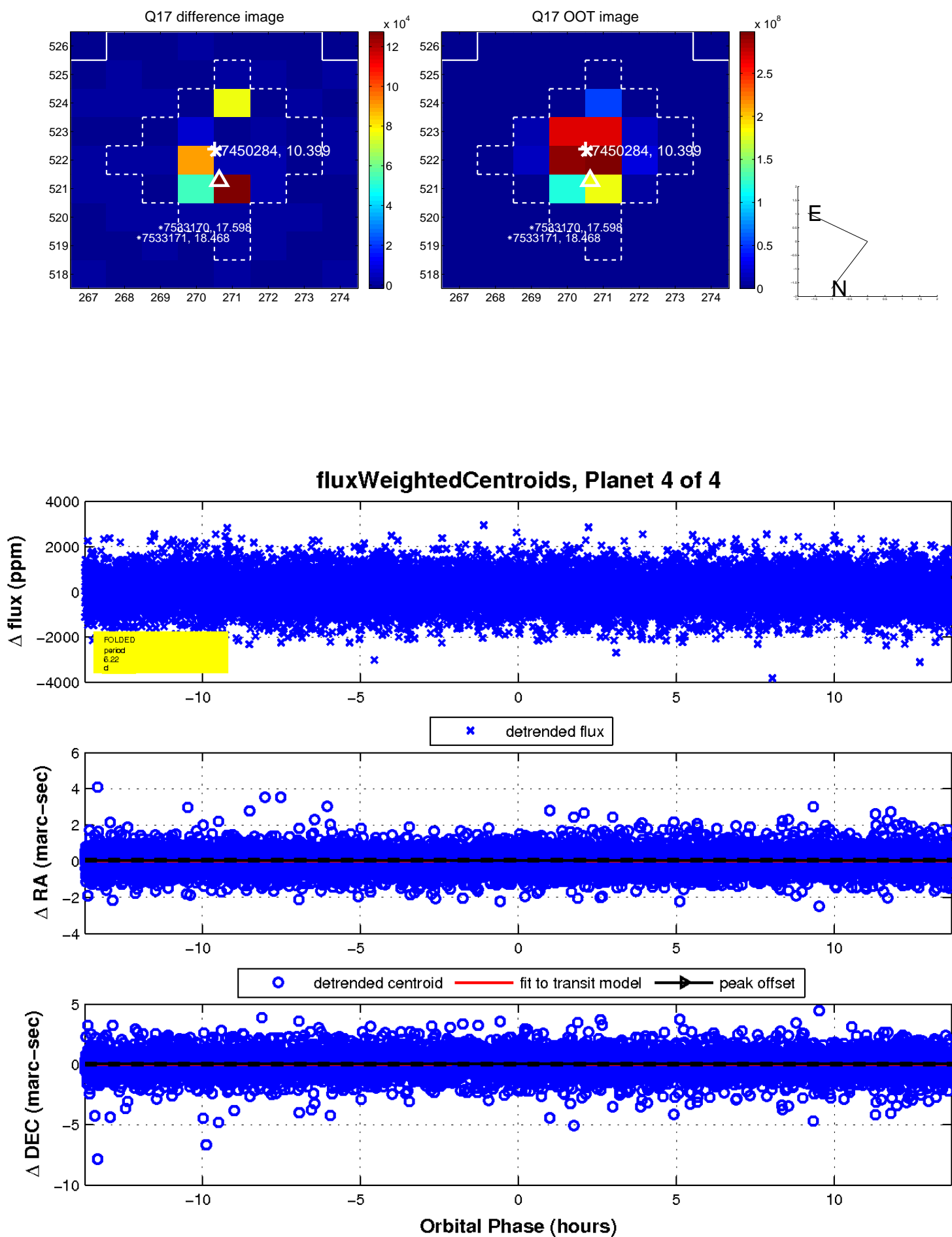


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

