

# KIC 009845573

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009845573-01	OBS	No	0.656331	132.004389	99.4	0.552	12.6	11.1	2.45	8953	2.56	92379.57
009845573-02	OBS	No	0.656334	131.664600	94.1	0.816	10.6	12.1	2.45	8953	2.46	92379.02
009845573-03	OBS	No	123.004846	248.212995	1184.5	2.546	7.9	8.2	2.45	8953	12.59	86.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009845573-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009845573-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
009845573-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—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.

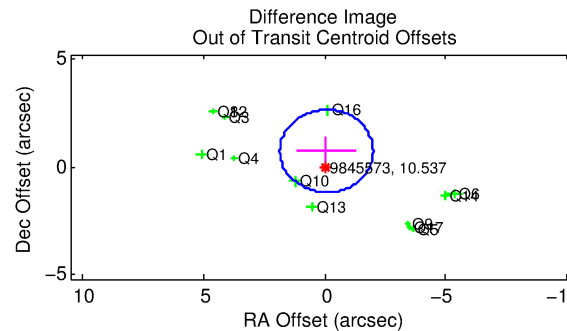
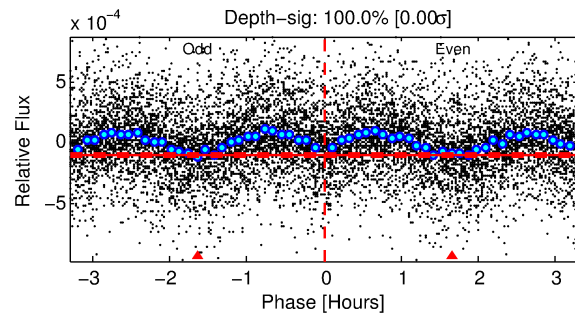
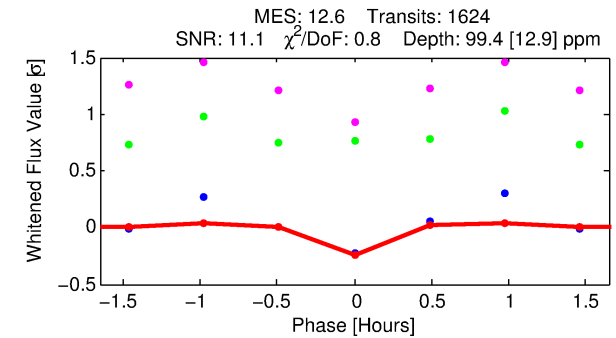
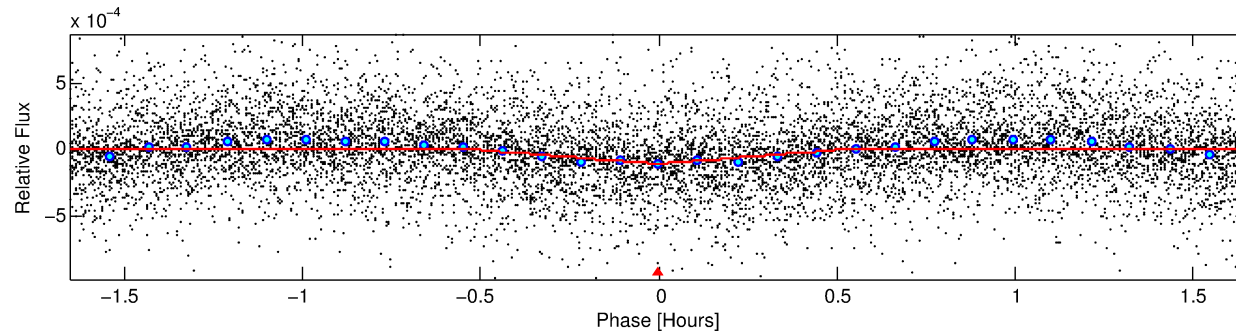
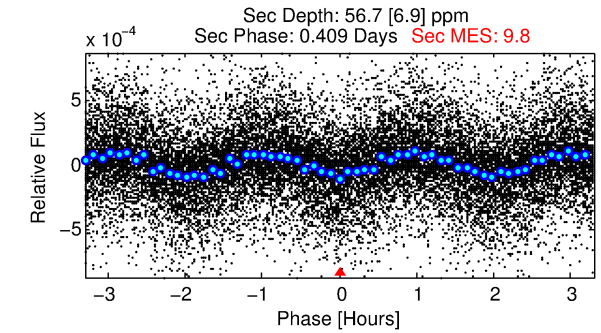
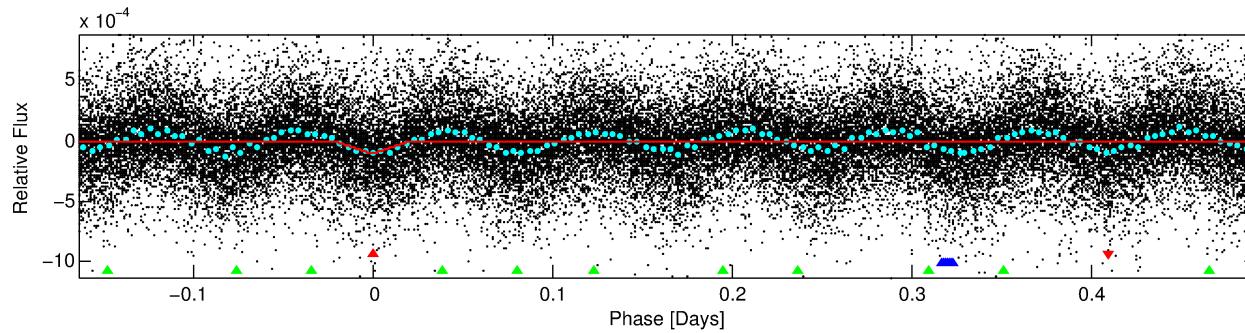
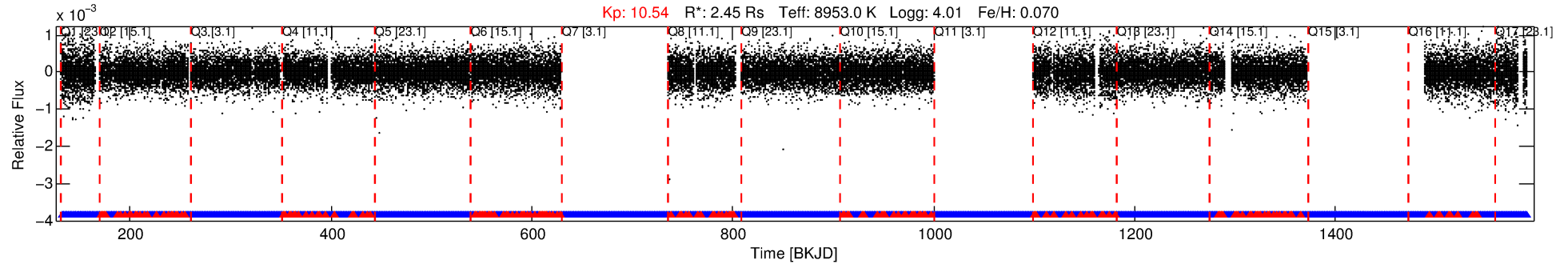
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009845573-01

No Significant Match Found

# DV One-Page Summary

KIC: 9845573 Candidate: 1 of 3 Period: 0.656 d



## DV Fit Results:

Period = 0.65633 [0.00001] d  
Epoch = 132.0044 [0.0009] BKJD  
 $R_p/R^*$  = 0.0096 [0.0082]  
 $a/R^*$  = 9.15 [50.02]  
 $b$  = 0.09 [61.45]  
 $\text{Seff}$  = 92379.57 [40857.47]  
 $T_{\text{eq}}$  = 4445 [492] K  
 $R_p$  = 2.56 [2.34]  $R_e$   
 $a$  = 0.0193 [0.0052] AU  
 $A_g$  = 1.78 [3.15] [0.25σ]  
 $T_{\text{eff}}$  = 7939 [3449] K [1.00σ]

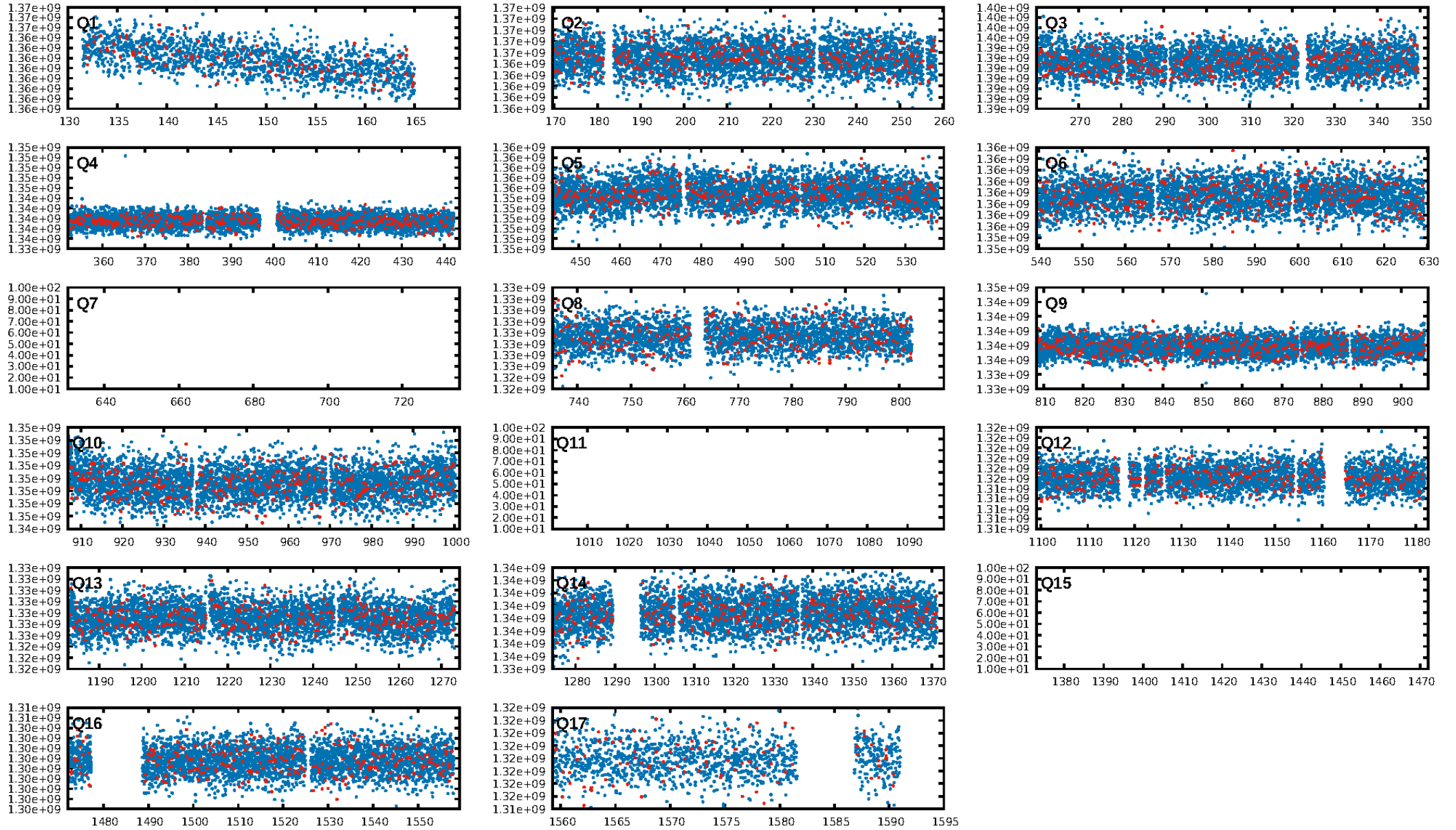
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
**LongPeriod-sig: 0.0% [0.00σ]**  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 8.33e-33  
RollingBand-fgt: 0.88 [1349/1532]  
GhostDiagnostic-chr: 2.419  
Centroid-sig: 53.8%  
Centroid-so: 0.164 arcsec [0.58σ]  
OotOffset-rm: 0.732 arcsec [1.14σ]  
OotOffset-st: 3/1/4/5 [13]  
KicOffset-rm: 0.725 arcsec [0.69σ]  
KicOffset-st: 3/1/4/5 [13]  
DiffImageQuality-fgm: 0.23 [3/13]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:27:33 Z

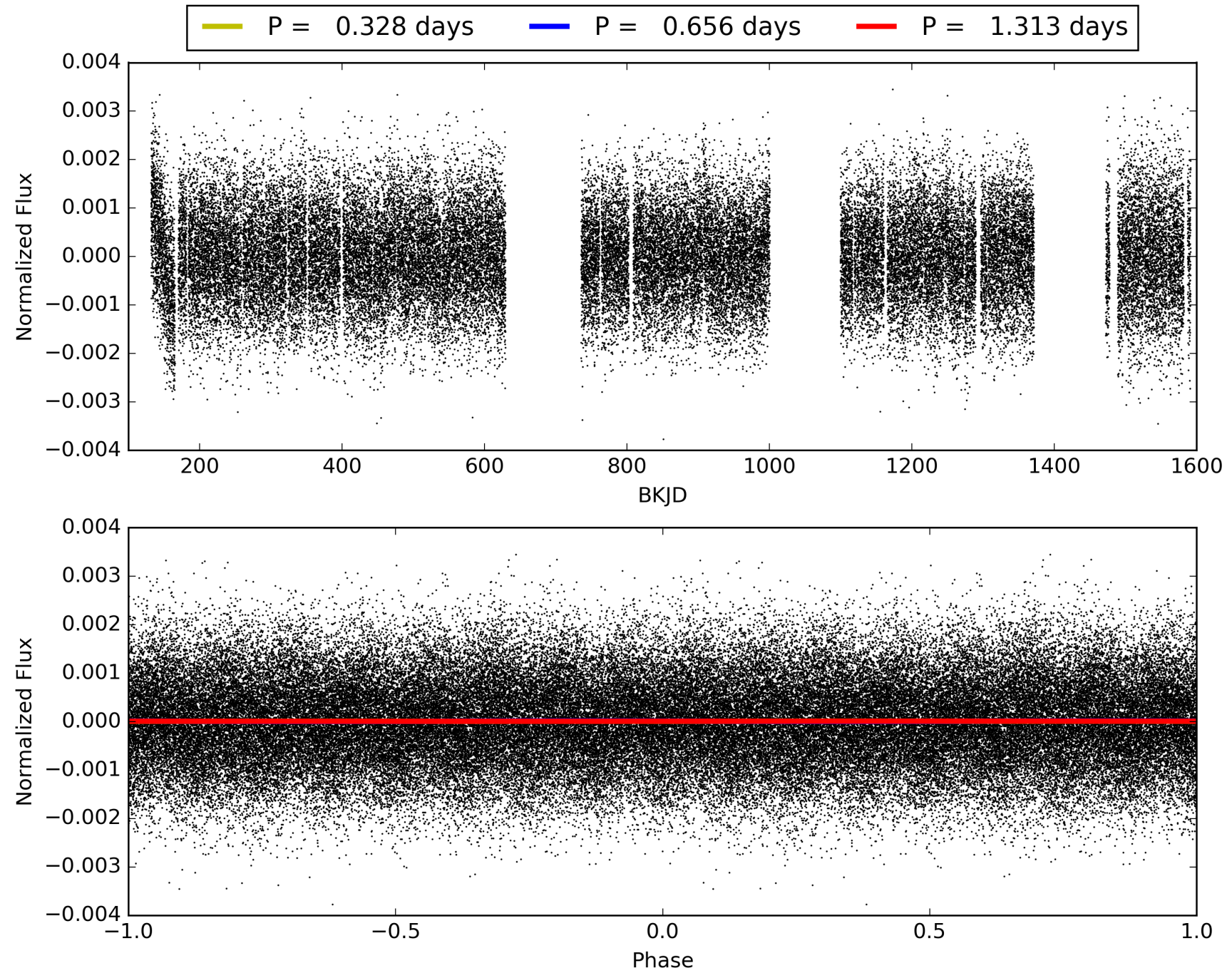
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009845573-01, PDC Light Curves





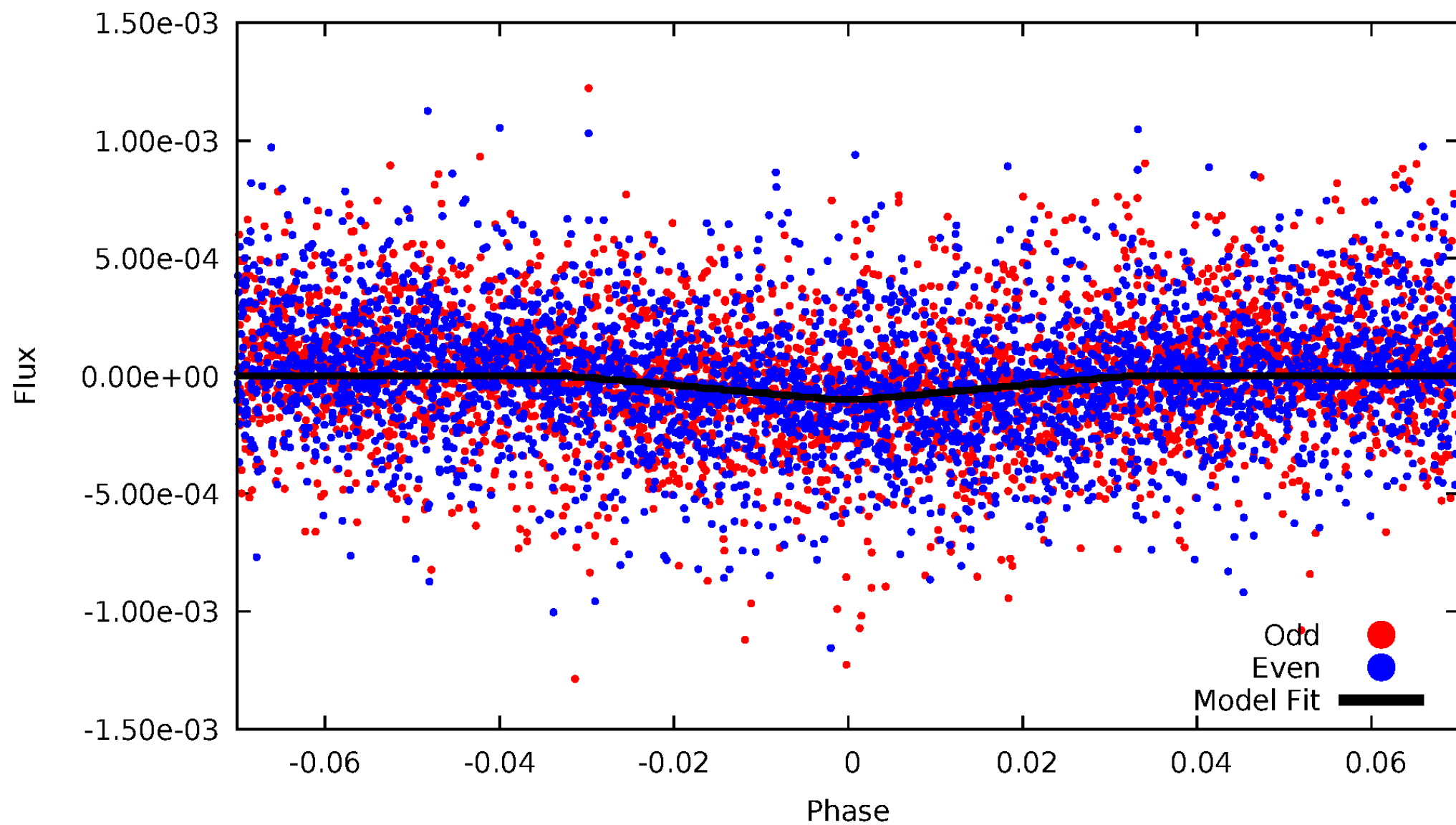
TCE 009845573-01





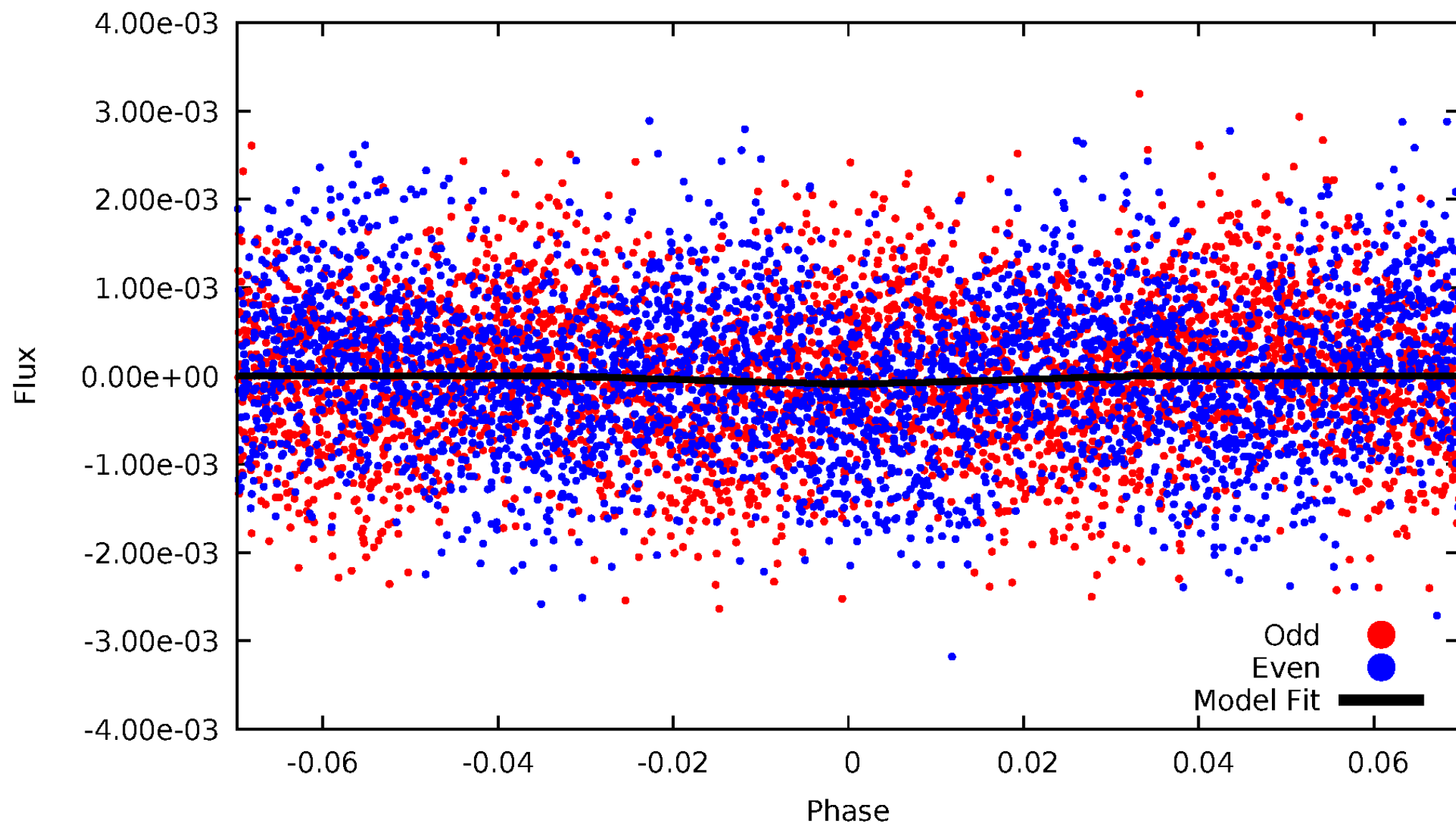
# DV Odd/Even

TCE 009845573-01



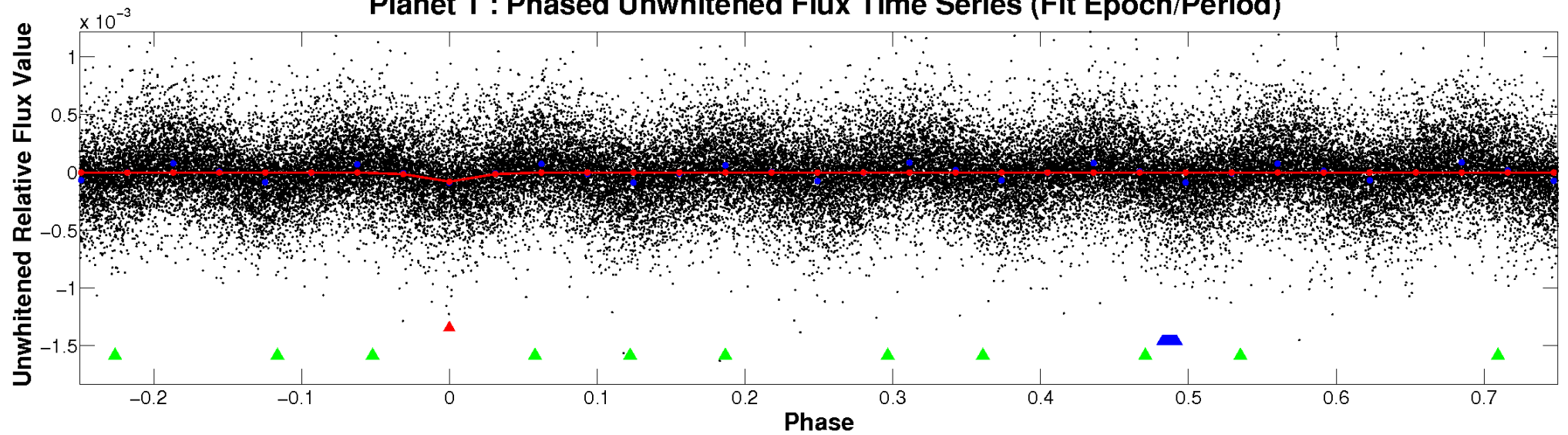
# ALT Odd/Even

TCE 009845573-01

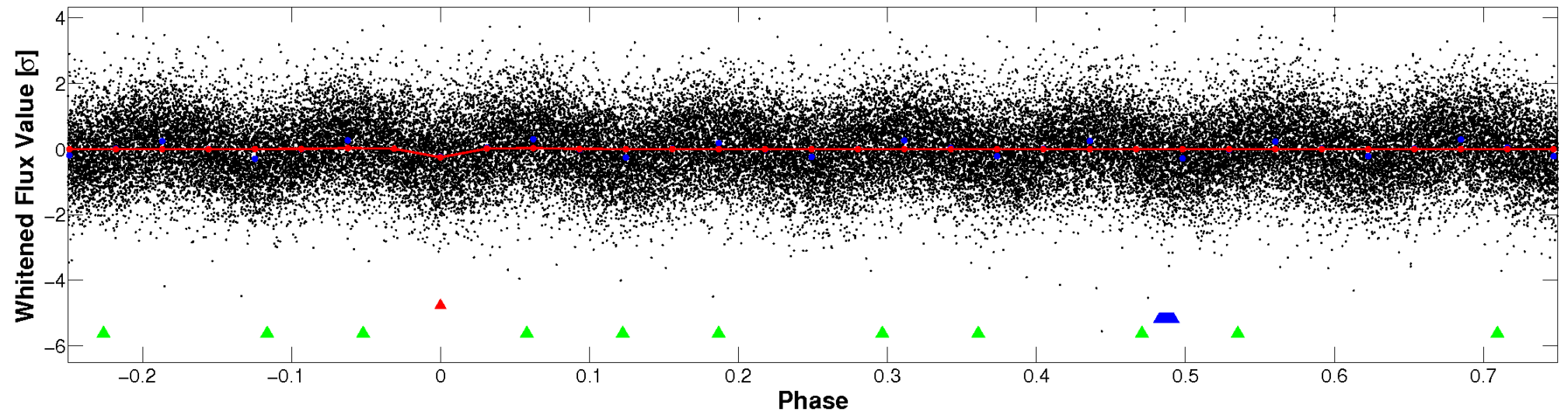


# Non-Whitened Vs. Whitened Light Curve

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



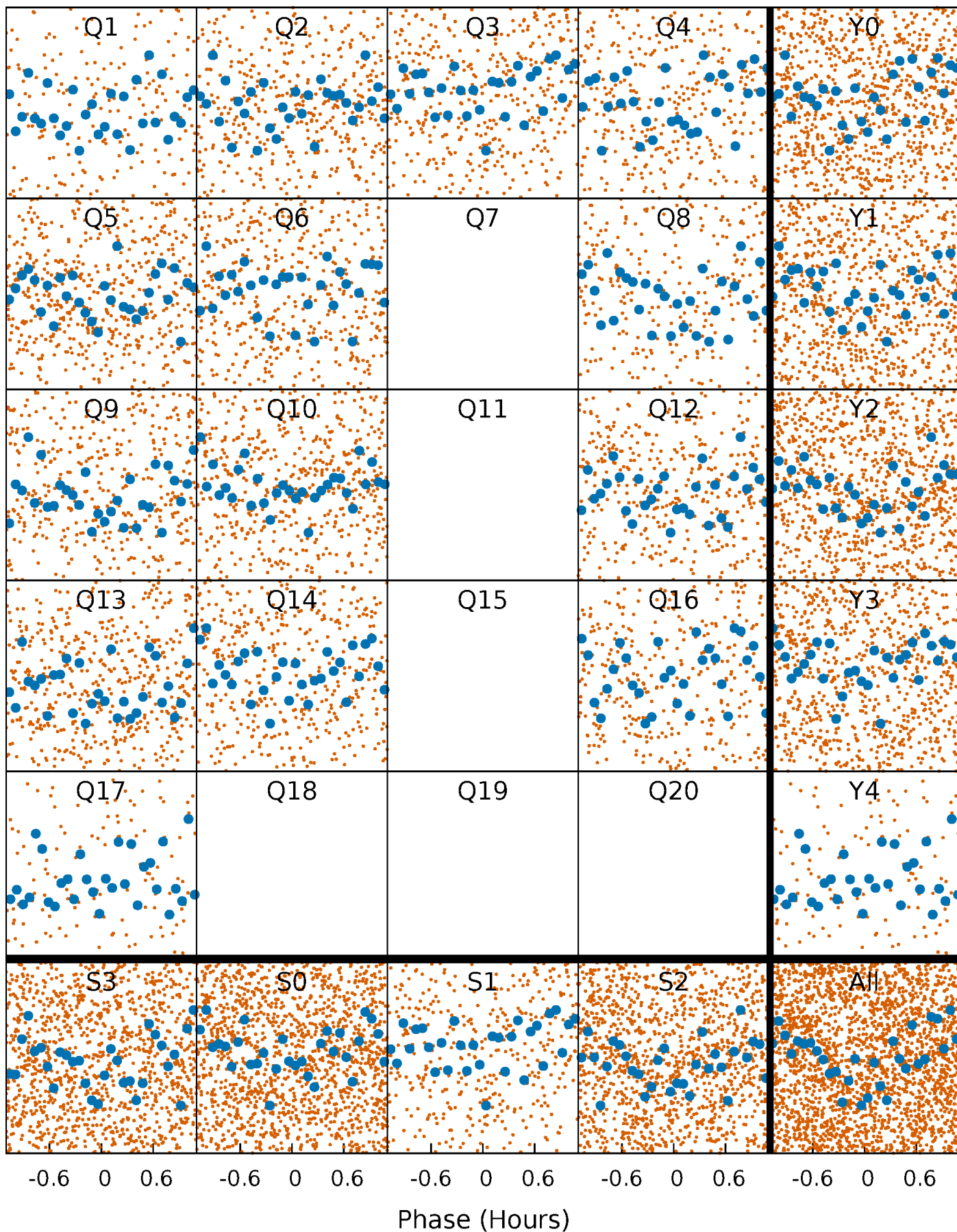
**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**





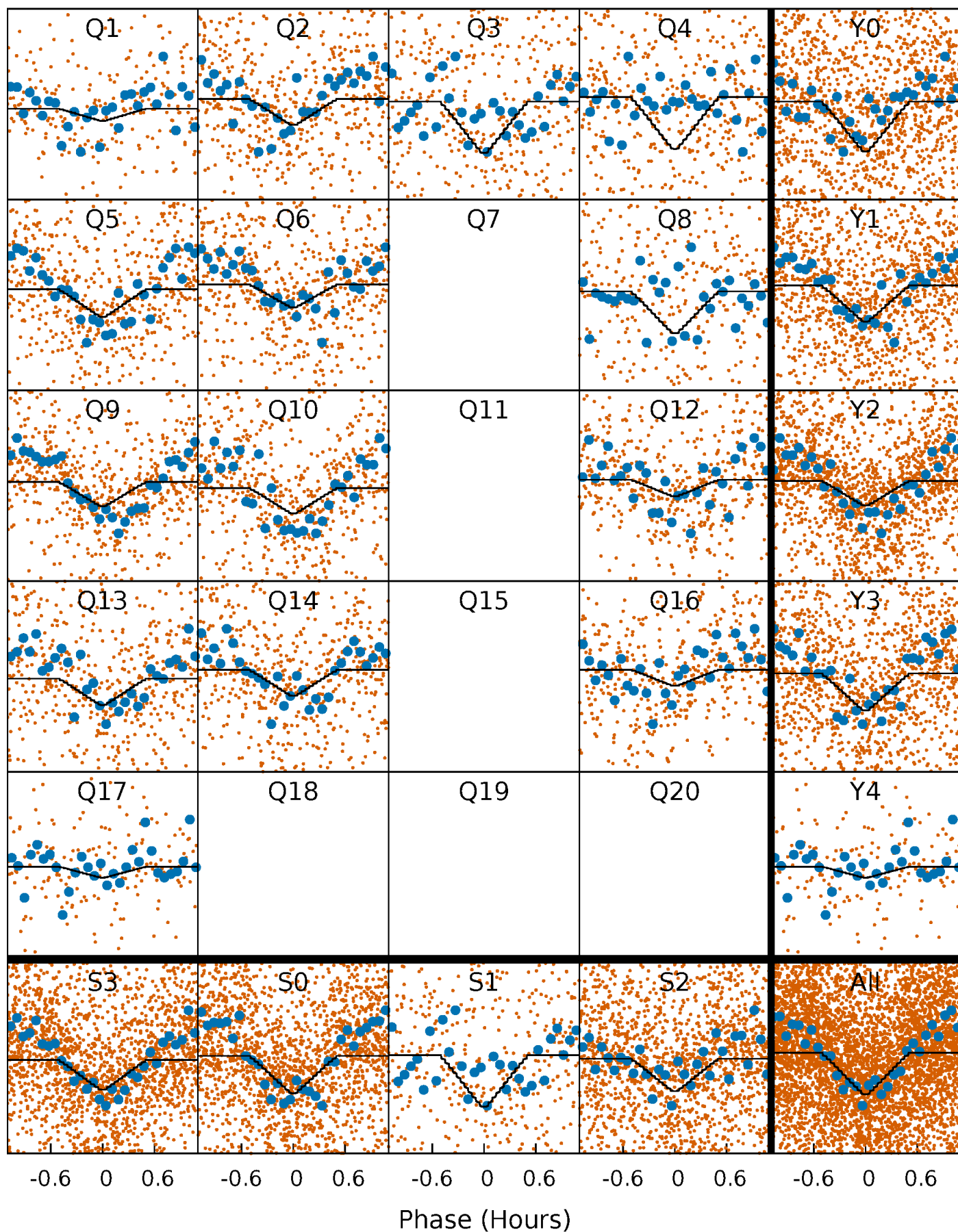
# PDC Quarter-Phased Transit Curves

TCE 009845573-01 P= 0.656331 Days  $T_0=132.004389$  (BKJD)



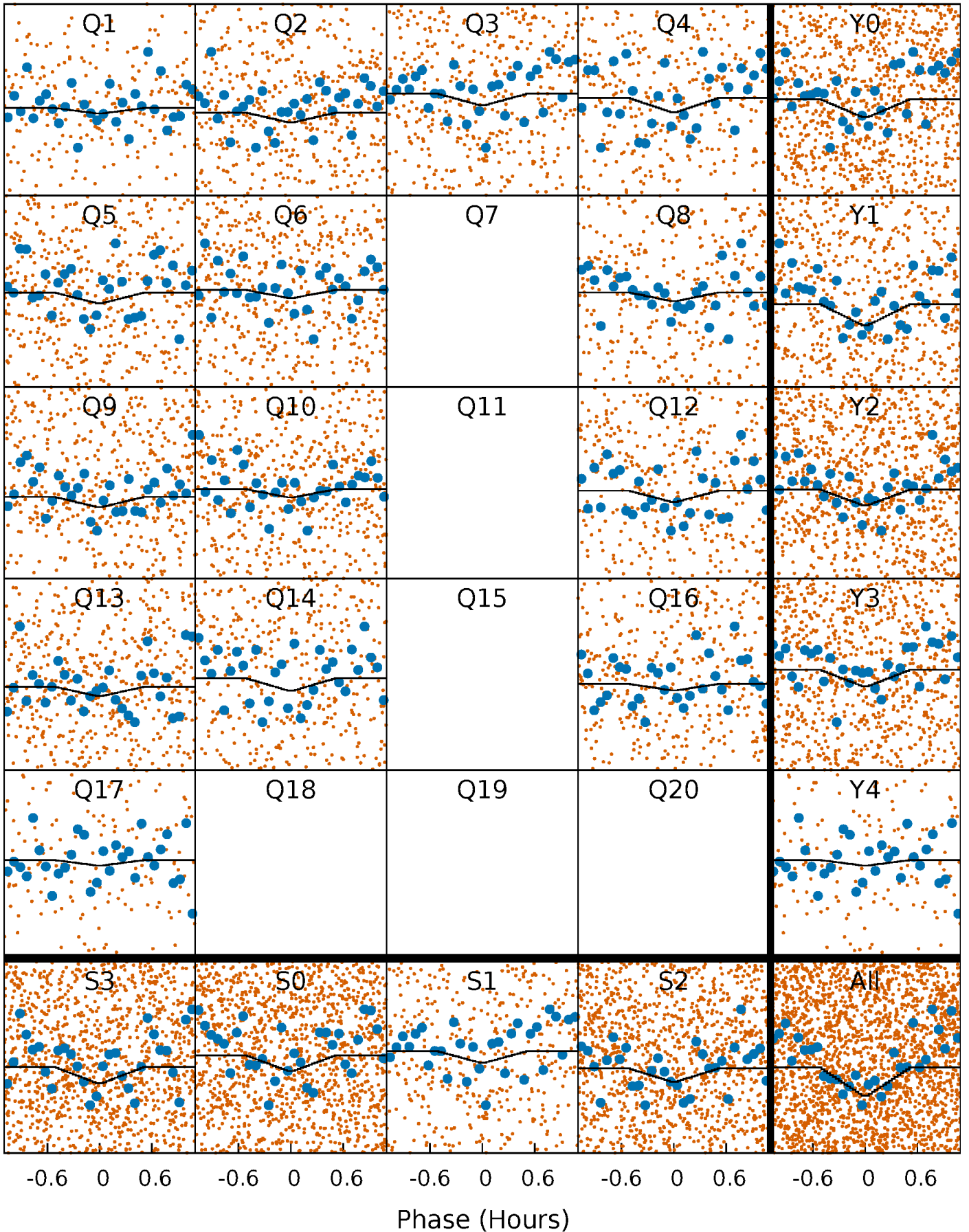
# DV Quarter-Phased Transit Curves

TCE 009845573-01 P= 0.656331 Days  $T_0=132.004389$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009845573-01 P= 0.656331 Days  $T_0=132.004375$  (BKJD)

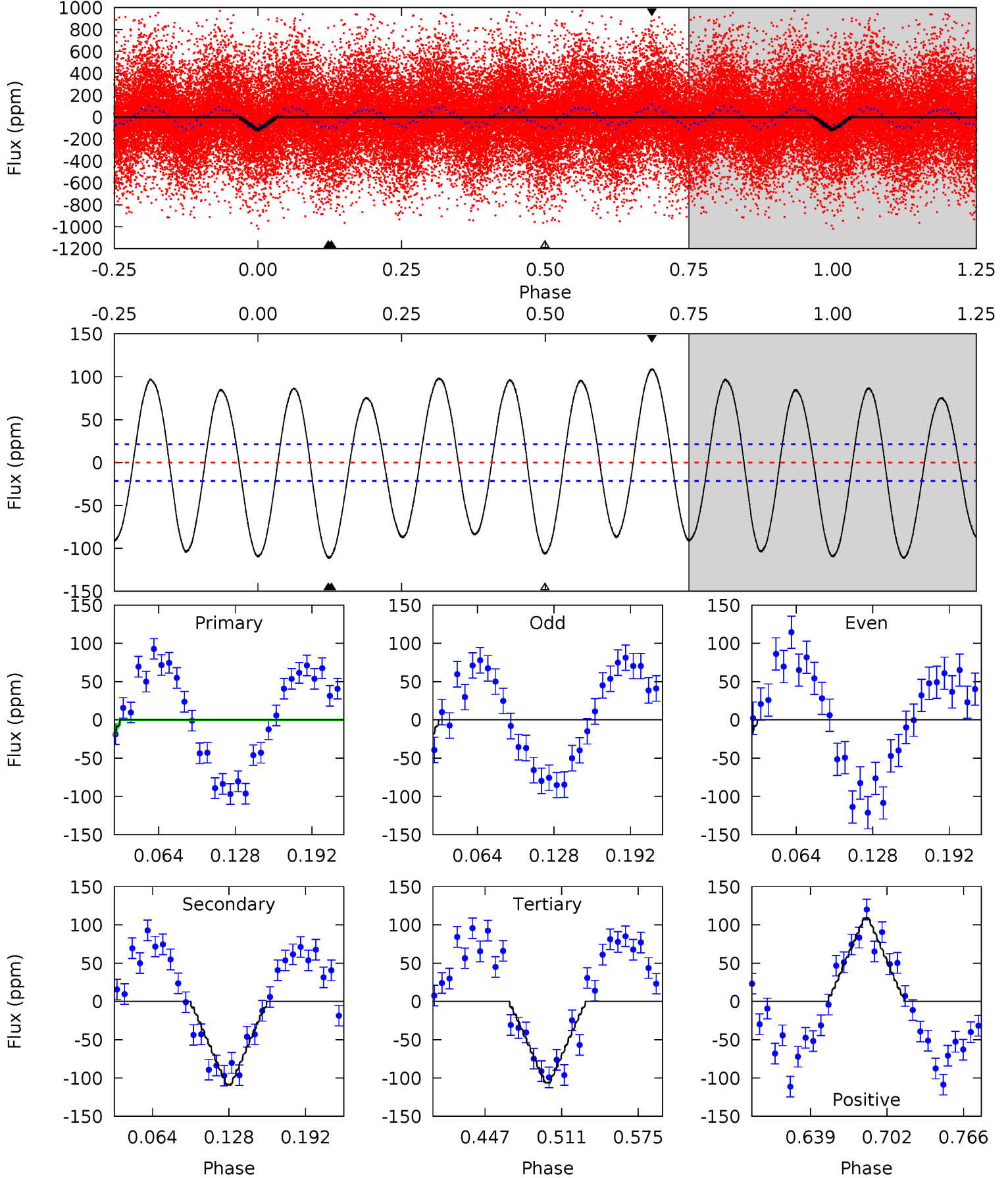




# DV Model-Shift Uniqueness Test

009845573-01, P = 0.656331 Days, E = 131.348058 Days

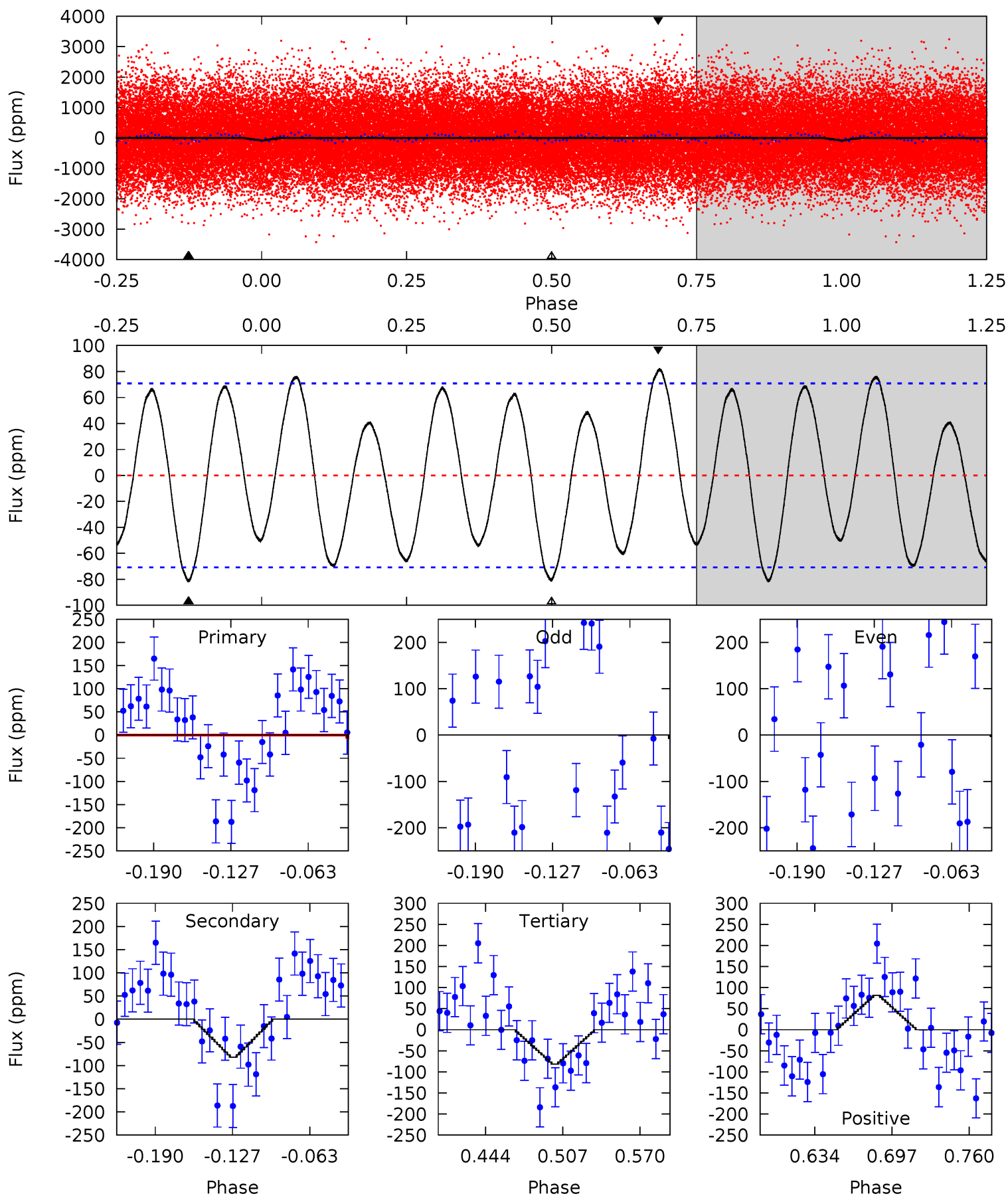
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.1	23.7	23.1	23.7	4.66	1.85	14.6	1.02	0.46	0.54	-0.02	1.33	1.11	0.50	1.21



# Alt Model-Shift Uniqueness Test

009845573-01, P = 0.656331 Days, E = 131.348044 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
5.40	5.40	5.38	5.38	4.66	1.86	2.97	0.02	0.02	0.02	0.02	2.35	1.31	0.50	0.57



### Stellar Parameters For KIC 009845573

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8953^{+251}_{-430}$	$4.009^{+0.222}_{-0.166}$	$0.070^{+0.150}_{-0.650}$	$2.446^{+0.757}_{-0.757}$	$2.226^{+0.337}_{-0.626}$	$0.214^{+0.274}_{-0.105}$
	+3%/-5%	+6%/-4%	+214%/-929%	+31%/-31%	+15%/-28%	+128%/-49%
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 009845573-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-109 \pm 5$	$2.65^{+2.12}_{-1.59}$	$6134^{+494}_{-483}$	$8513^{+12019}_{-2696}$	$3.040^{+15.639}_{-2.086}$
Alt.	$-82 \pm 15$	$2.69^{+2.15}_{-1.71}$	$6133^{+488}_{-516}$	$7671^{+10881}_{-2510}$	$2.222^{+14.339}_{-1.522}$

$T_{\text{max}}$  = 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

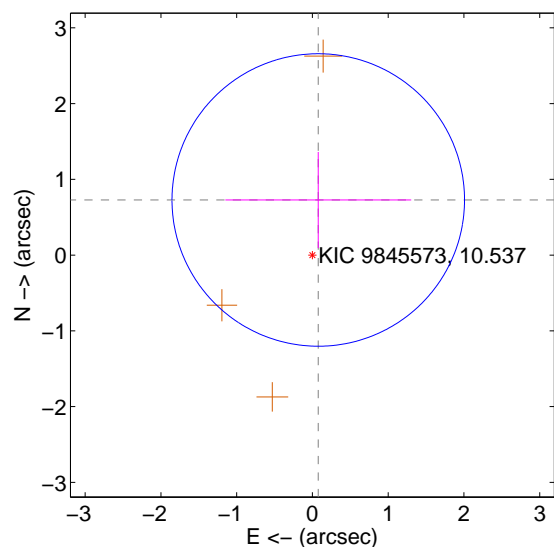
Supplemental centroid analysis for 009845573-01. **Kepler magnitude: 10.54.** Transit SNR 11.12

**There are 3 quarters with good PRF difference image offsets**

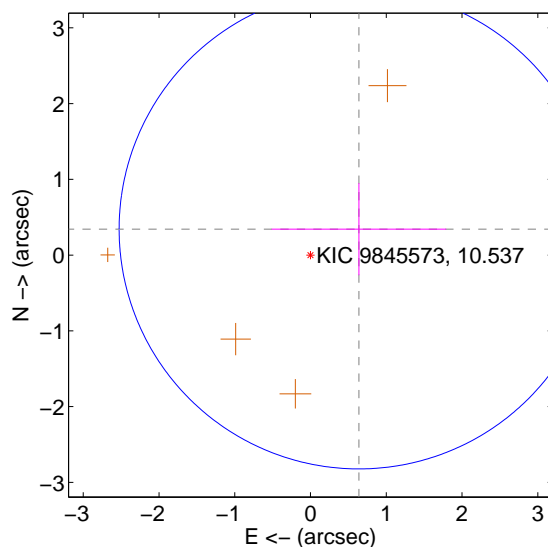
The direct PRF centroid is offset from the target star catalog position by about 0.34 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.732 \pm 0.644$	1.14	$-0.077 \pm 1.227$	$0.728 \pm 0.634$
PRF-fit source offset from KIC position	$0.725 \pm 1.055$	0.69	$-0.639 \pm 1.152$	$0.343 \pm 0.608$
photometric centroid source offset	$0.16 \pm 0.28$	0.58	$0.16 \pm 0.29$	$-0.02 \pm 0.19$

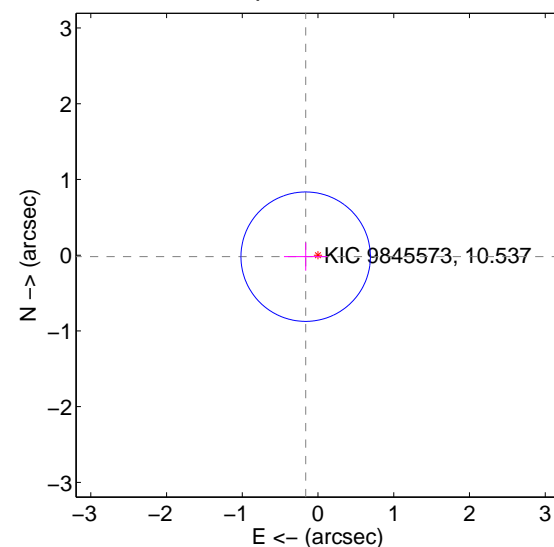
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

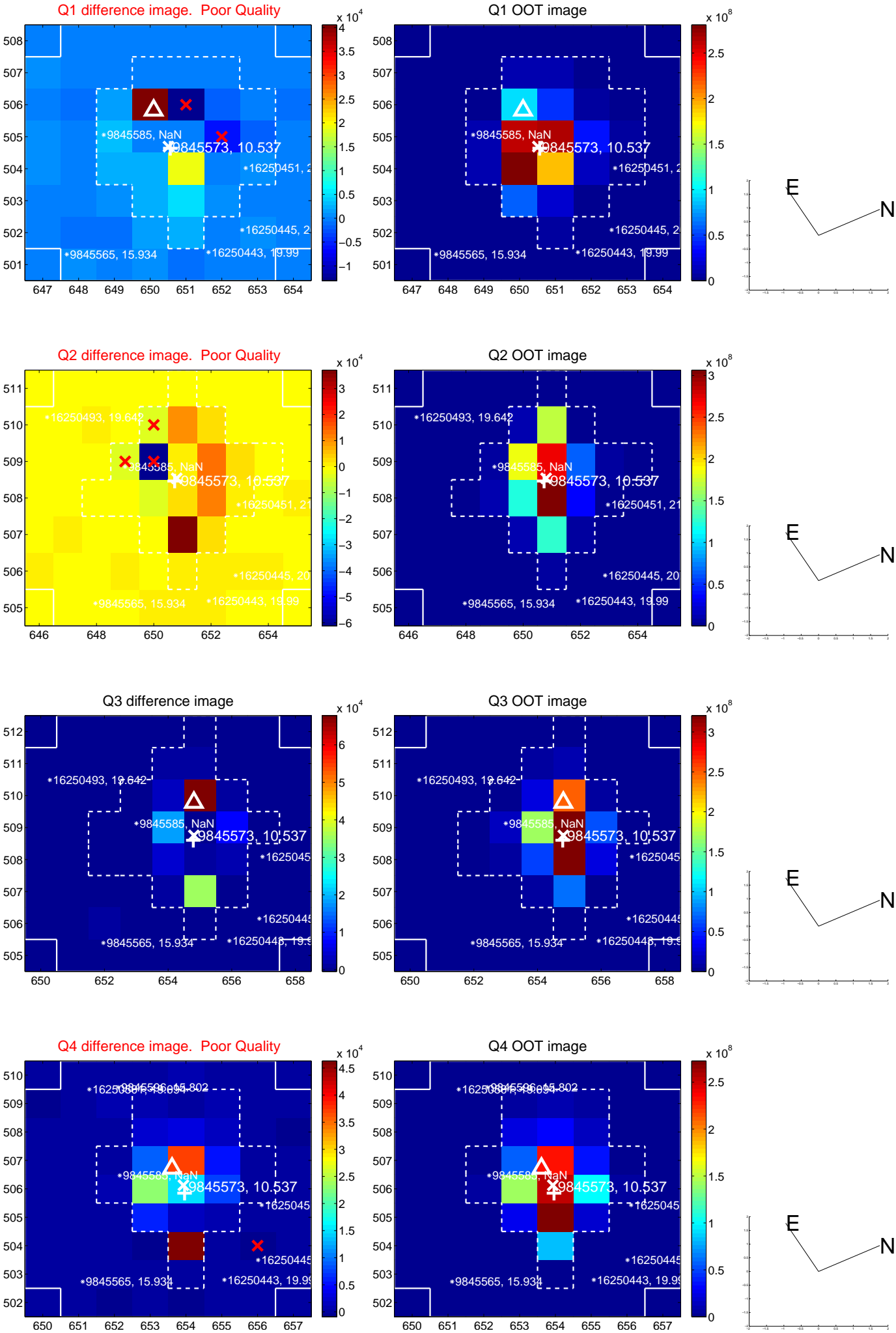


offset from photometric centroids

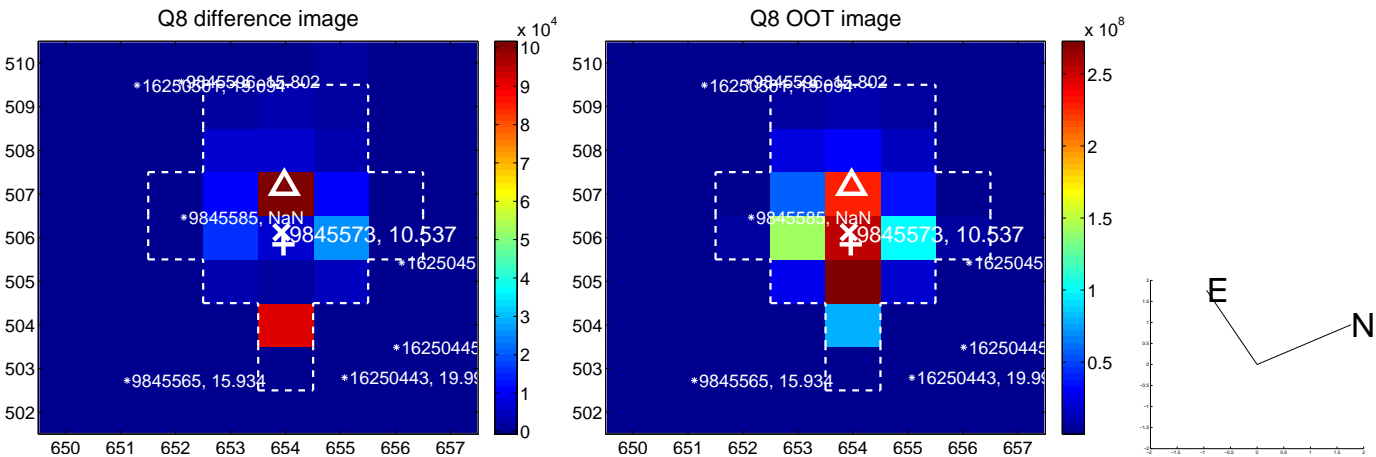
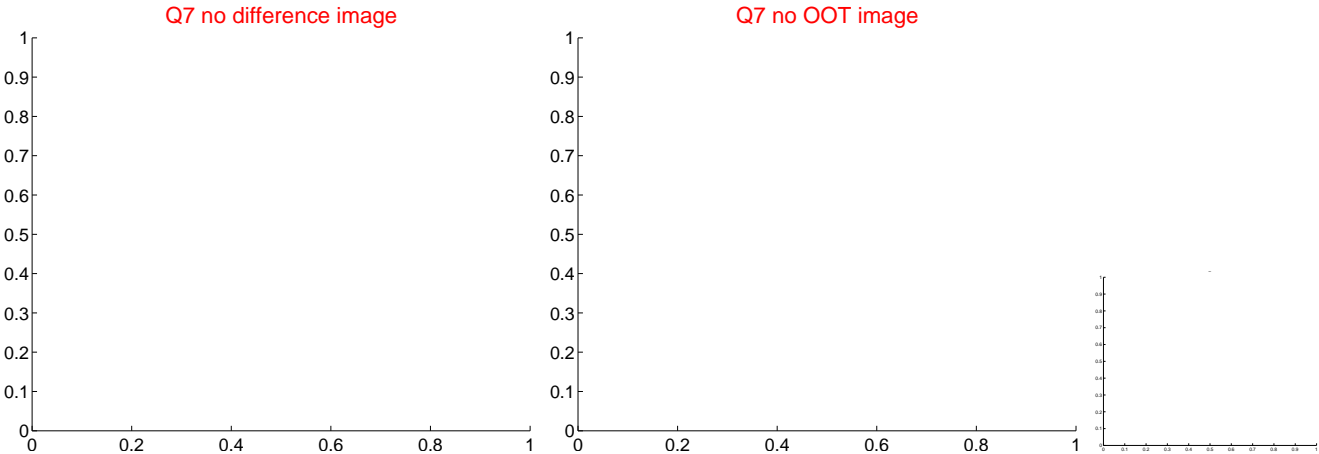
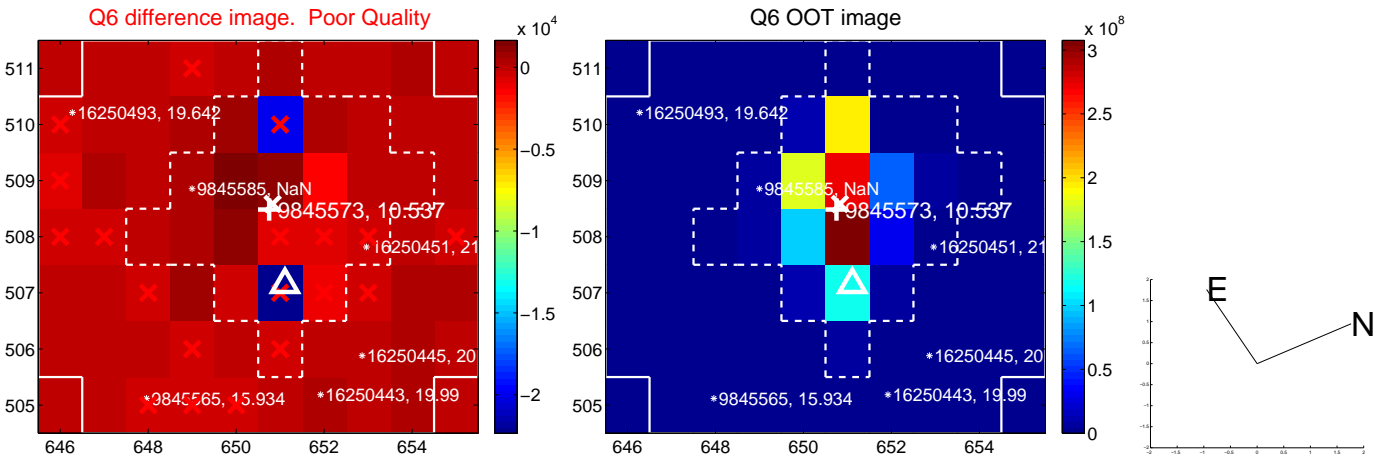
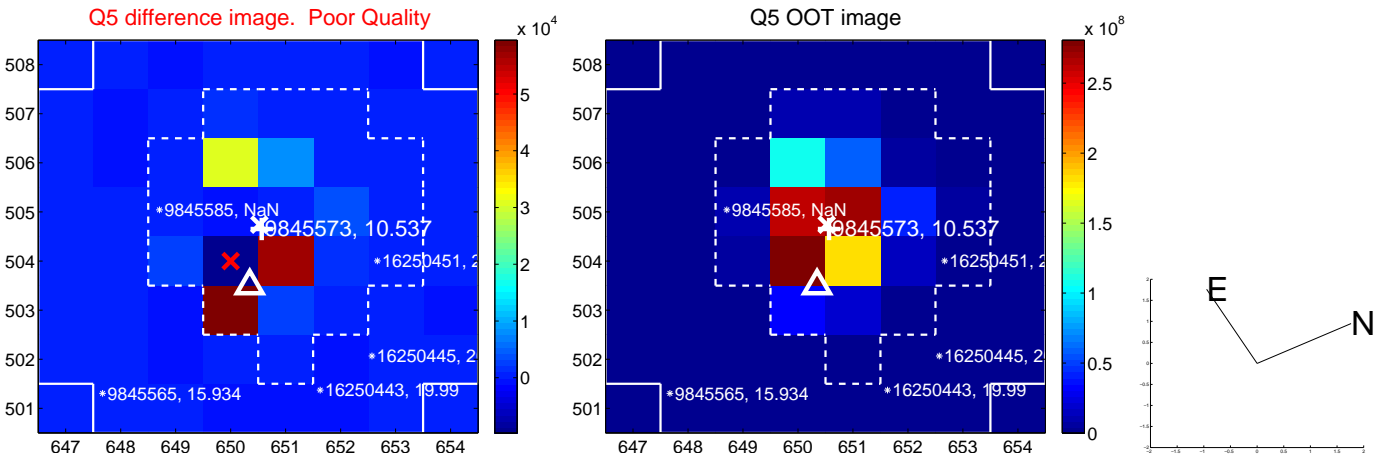


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

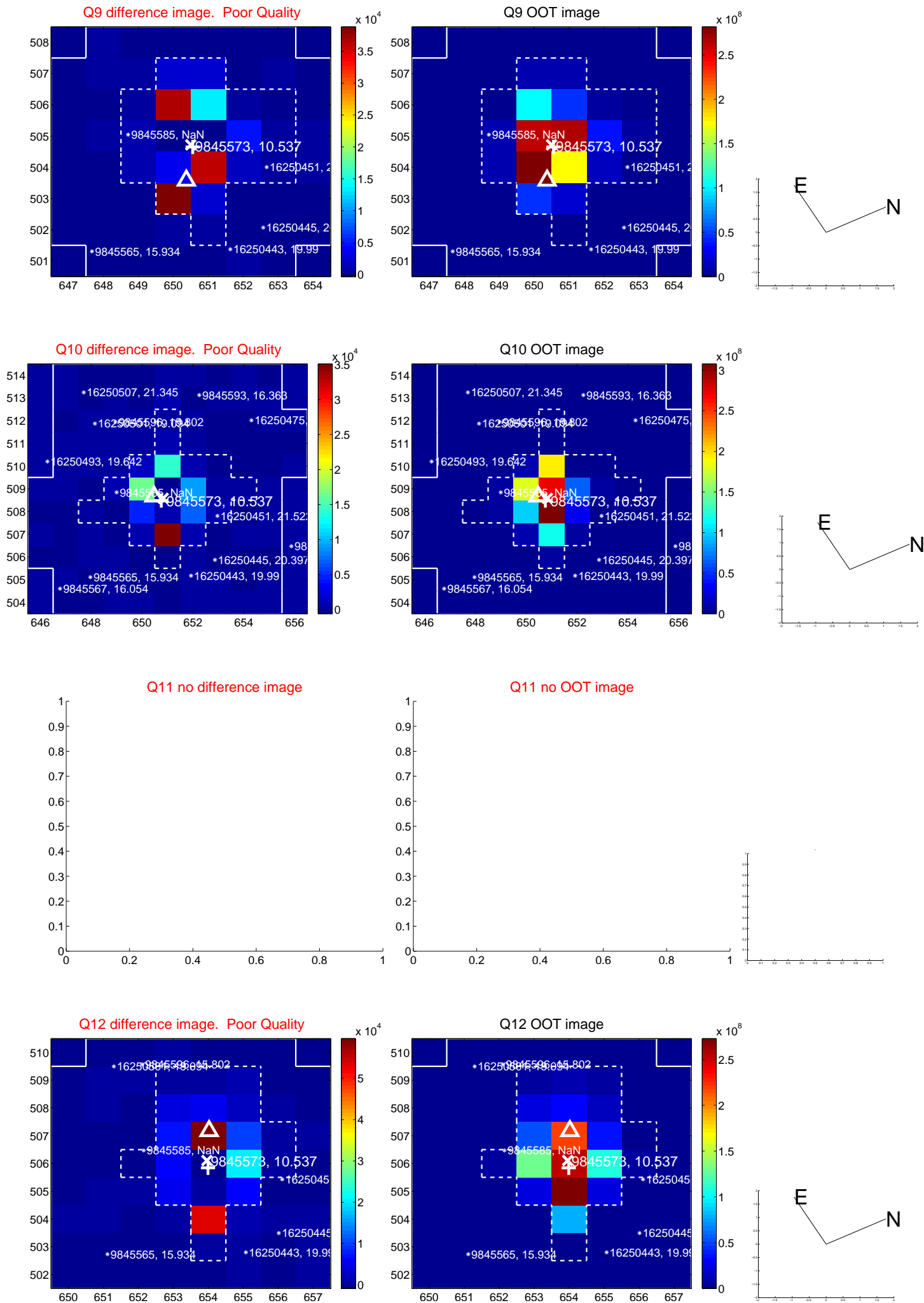


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

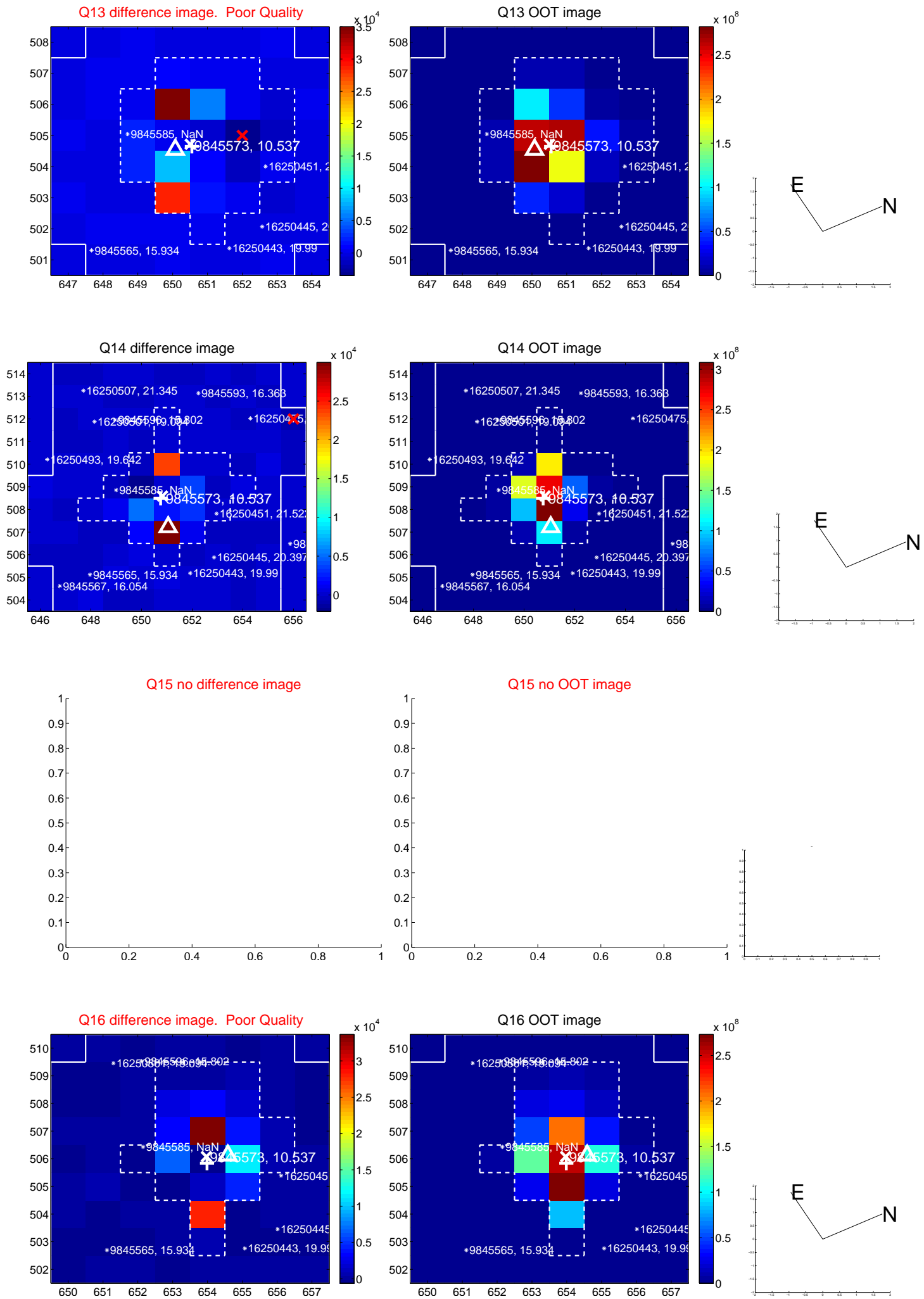




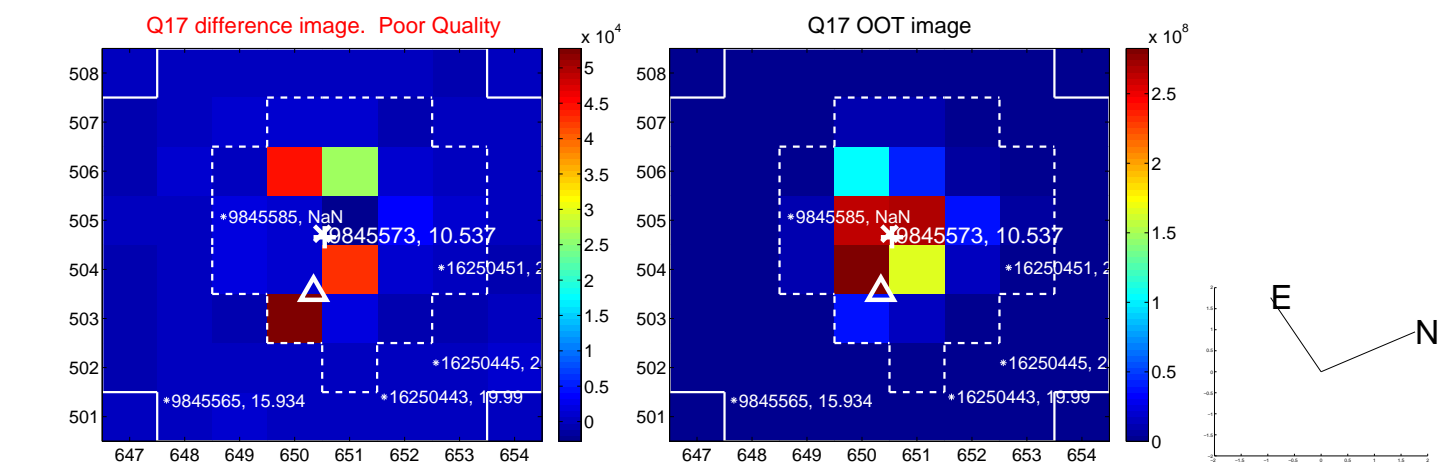
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



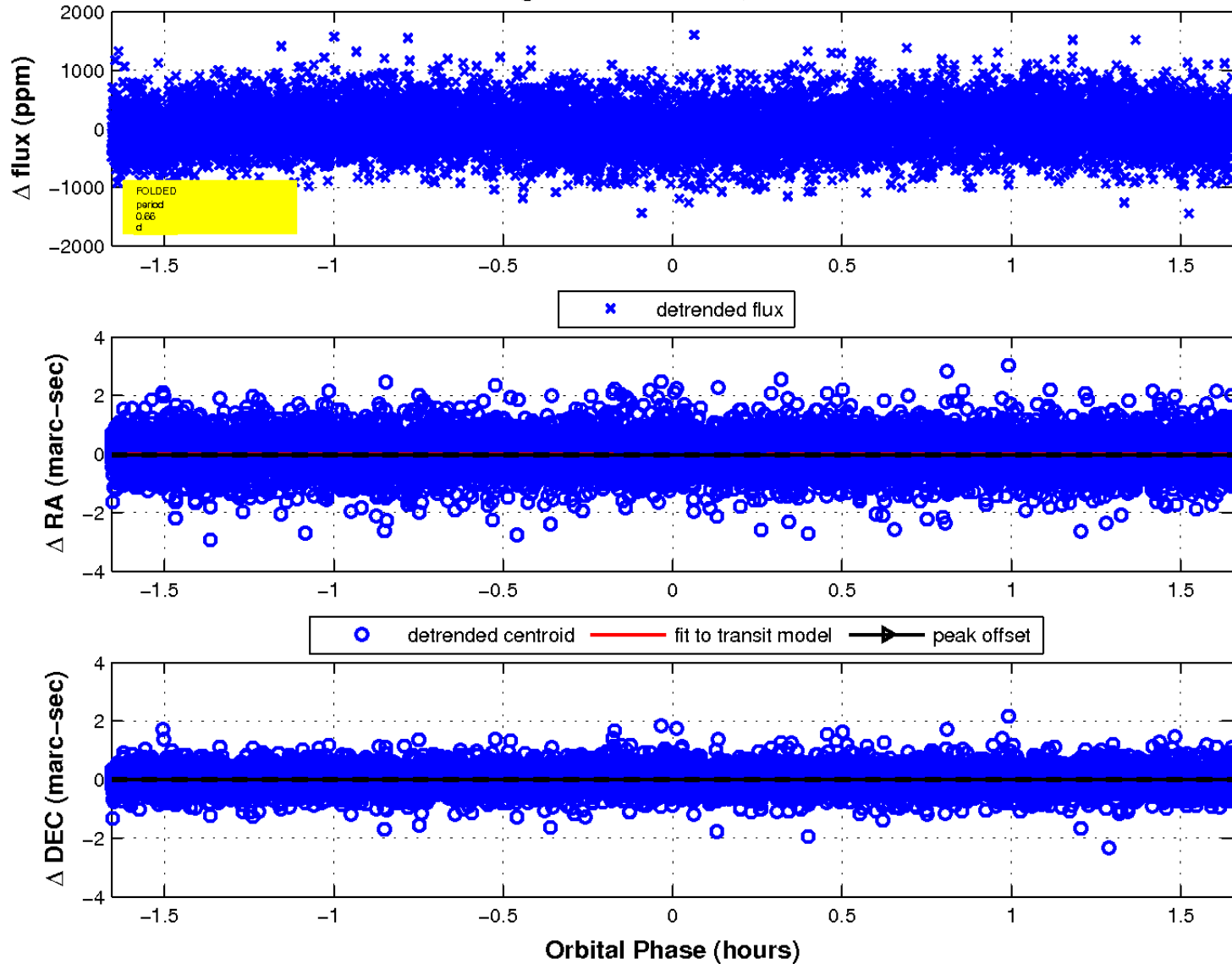
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

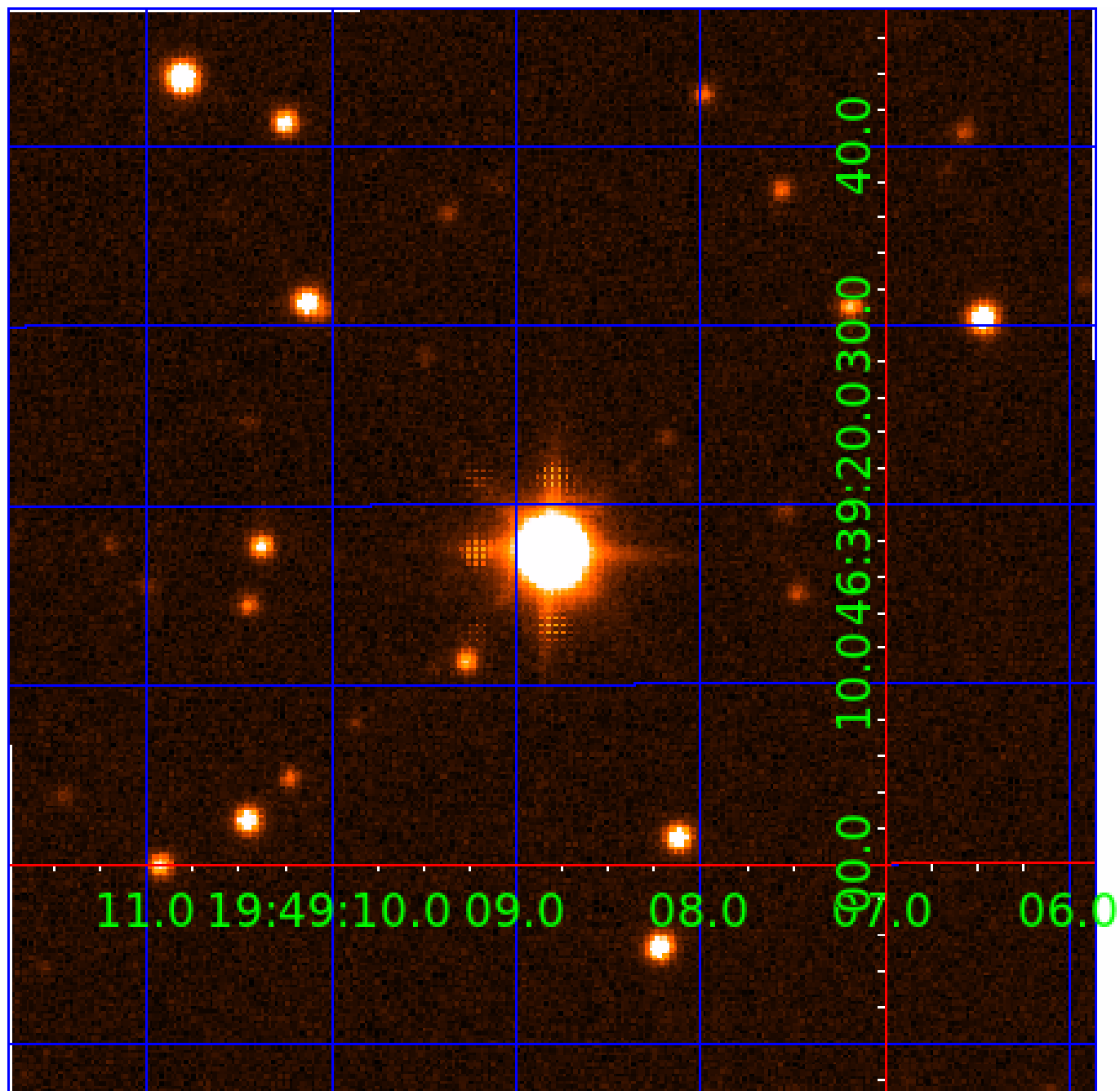


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination





# KIC 009845573

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009845573-01	OBS	No	0.656331	132.004389	99.4	0.552	12.6	11.1	2.45	8953	2.56	92379.57
009845573-02	OBS	No	0.656334	131.664600	94.1	0.816	10.6	12.1	2.45	8953	2.46	92379.02
009845573-03	OBS	No	123.004846	248.212995	1184.5	2.546	7.9	8.2	2.45	8953	12.59	86.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009845573-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009845573-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
009845573-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—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.

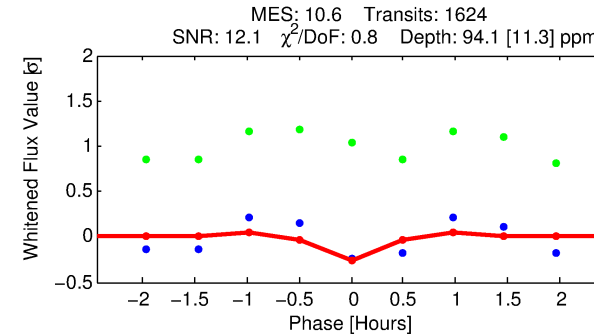
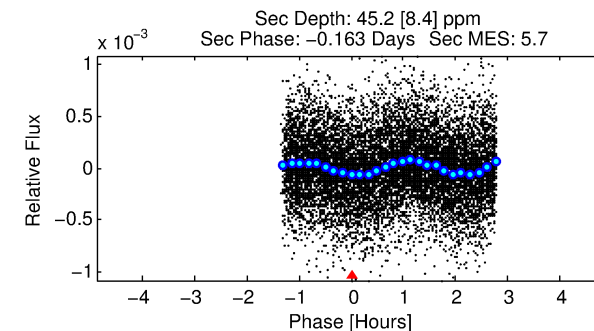
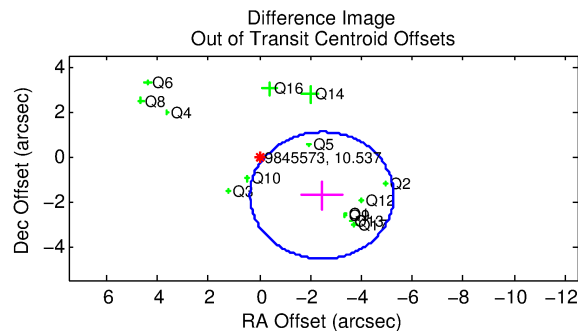
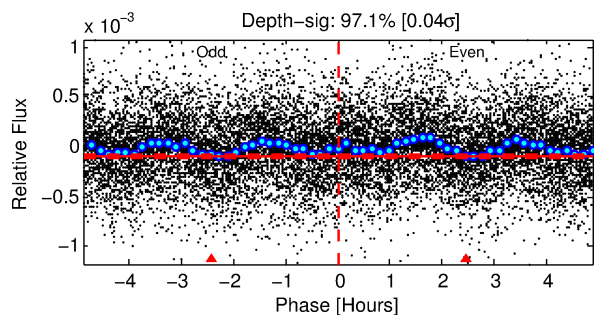
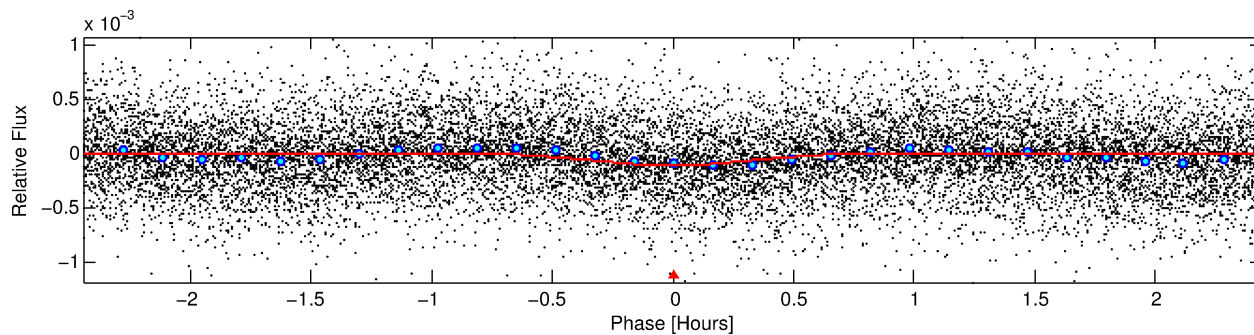
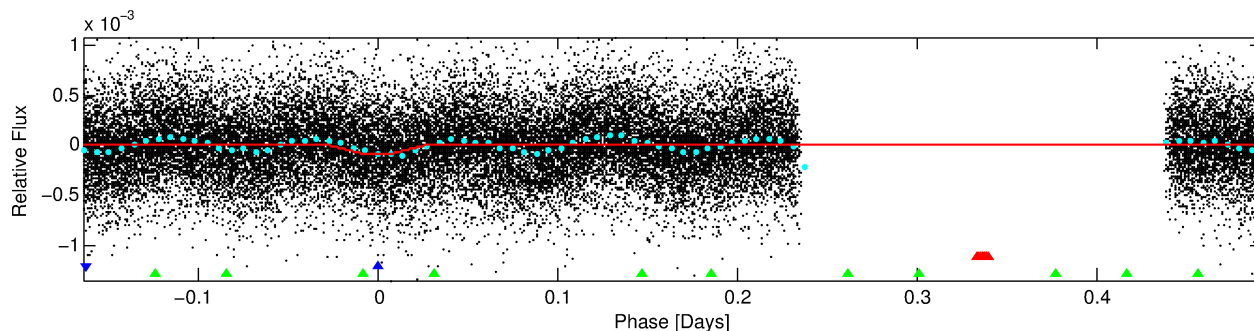
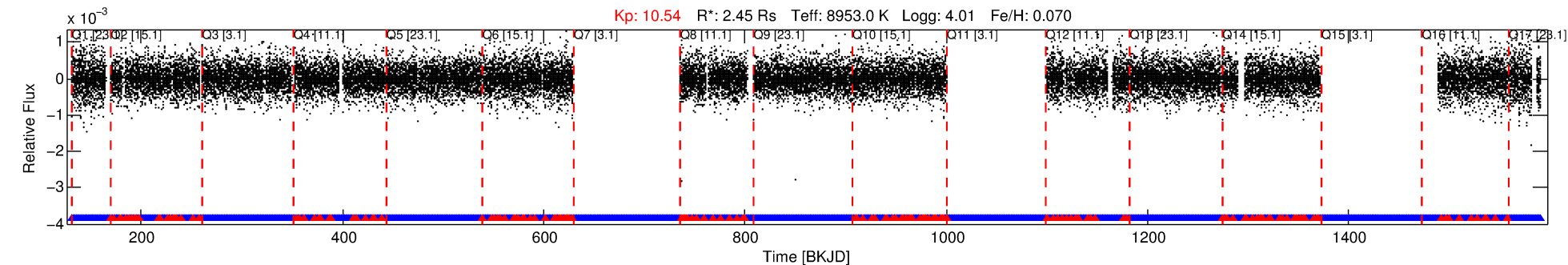
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009845573-02

No Significant Match Found

# DV One-Page Summary

KIC: 9845573 Candidate: 2 of 3 Period: 0.656 d



## DV Fit Results:

Period = 0.65633 [0.00001] d  
Epoch = 131.6646 [0.0010] BKJD  
Rp/R\* = 0.0092 [0.0048]  
a/R\* = 6.02 [19.22]  
b = 0.26 [11.68]  
Seff = 92379.02 [40857.22]  
Teff = 4445 [492] K  
Rp = 2.46 [1.48] Re  
a = 0.0193 [0.0052] AU  
Ag = 1.54 [1.73] [0.31 $\sigma$ ]  
Teffp = 7654 [2041] K [1.53 $\sigma$ ]

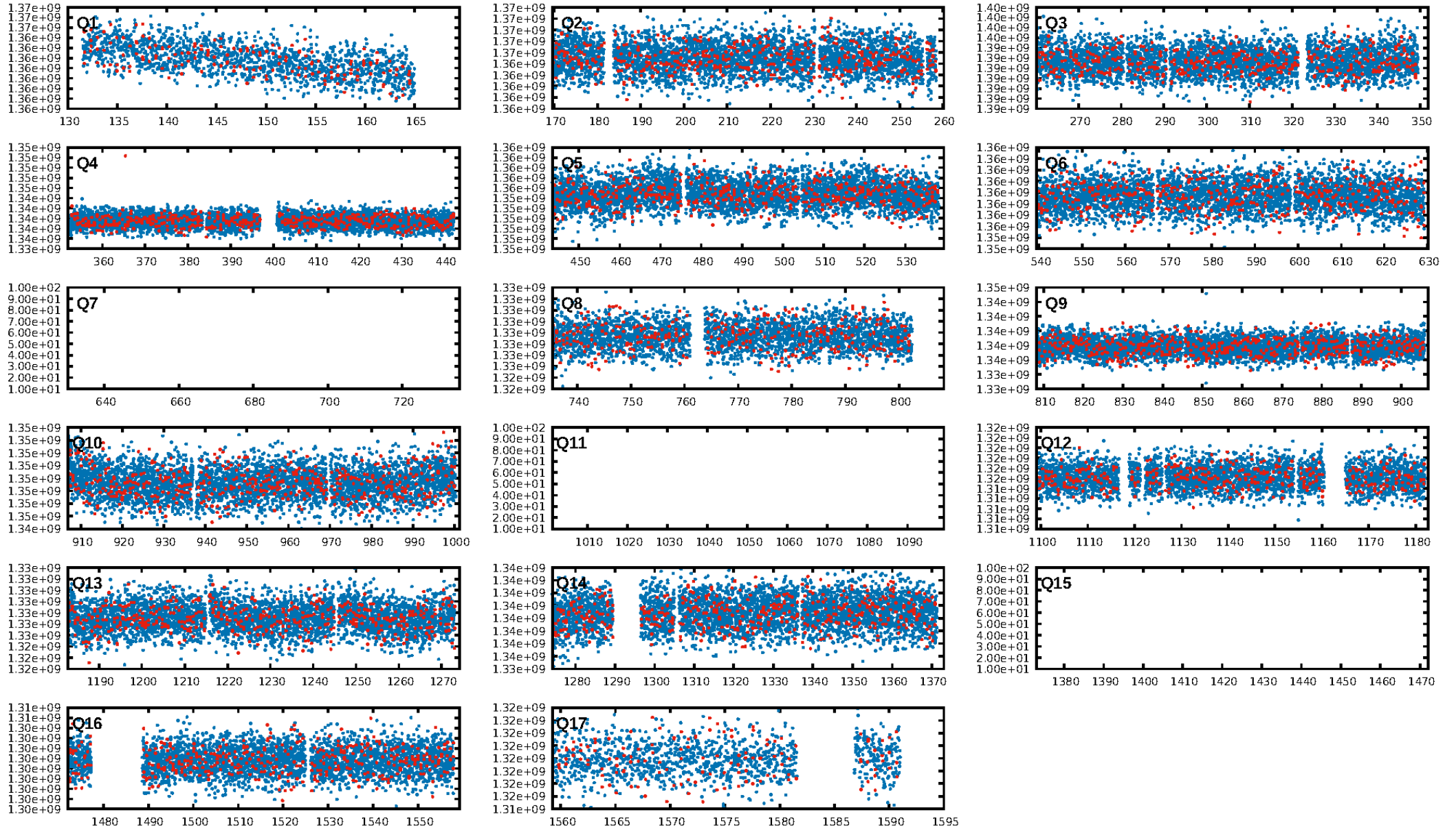
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 $\sigma$ ]  
LongPeriod-sig: 100.0% [1098.38 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.17e-24  
RollingBand-fgt: 0.89 [1369/1533]  
GhostDiagnostic-chr: 3.556  
Centroid-sig: 26.4%  
Centroid-so: 0.151 arcsec [0.78 $\sigma$ ]  
OotOffset-rm: 3.008 arcsec [3.20 $\sigma$ ]  
KicOffset-rm: 3.397 arcsec [3.43 $\sigma$ ]  
OotOffset-st: 4/1/4/5 [14]  
KicOffset-st: 4/1/4/5 [14]  
DiffImageQuality-fgm: 0.21 [3/14]  
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Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:27:40 Z

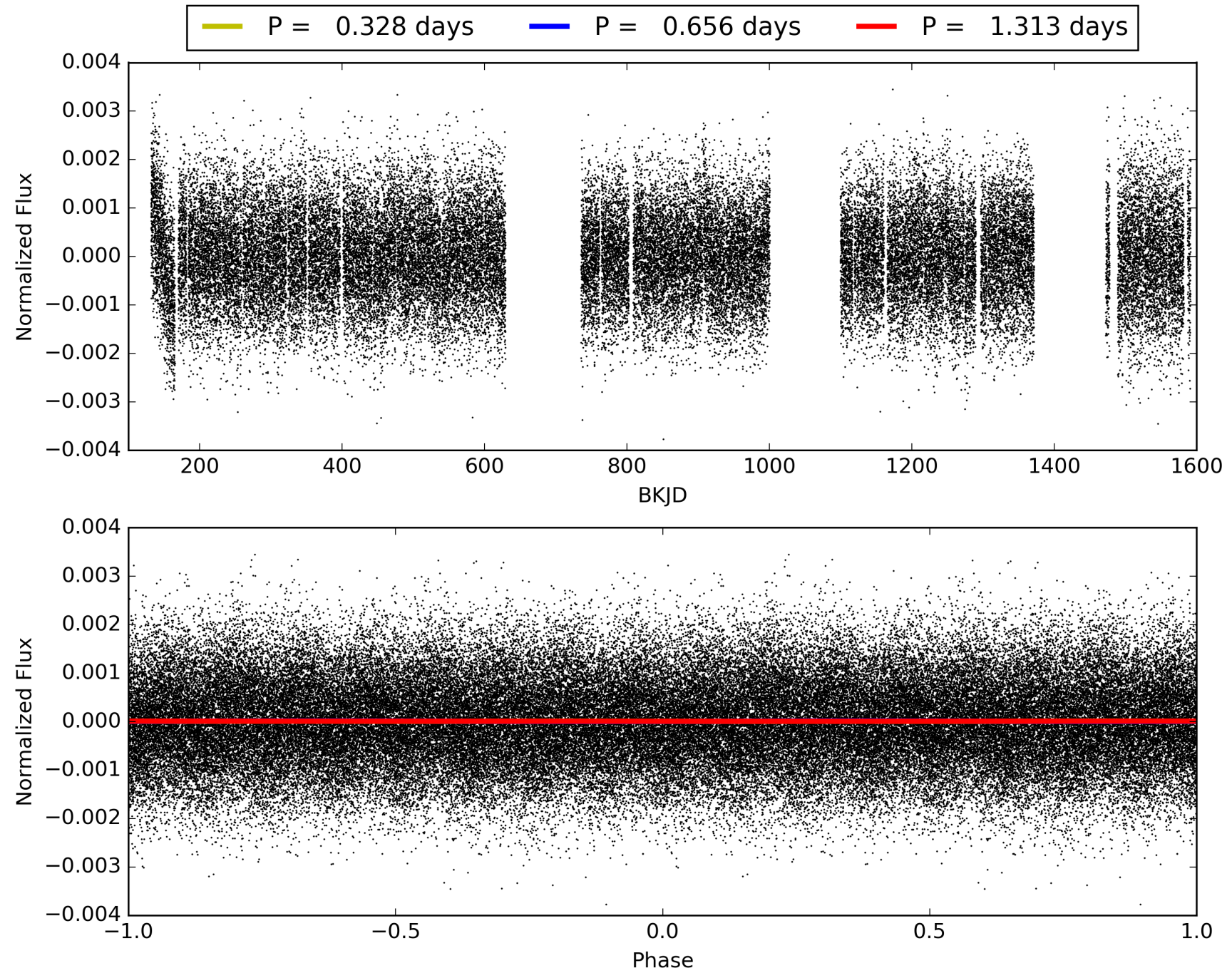
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009845573-02, PDC Light Curves



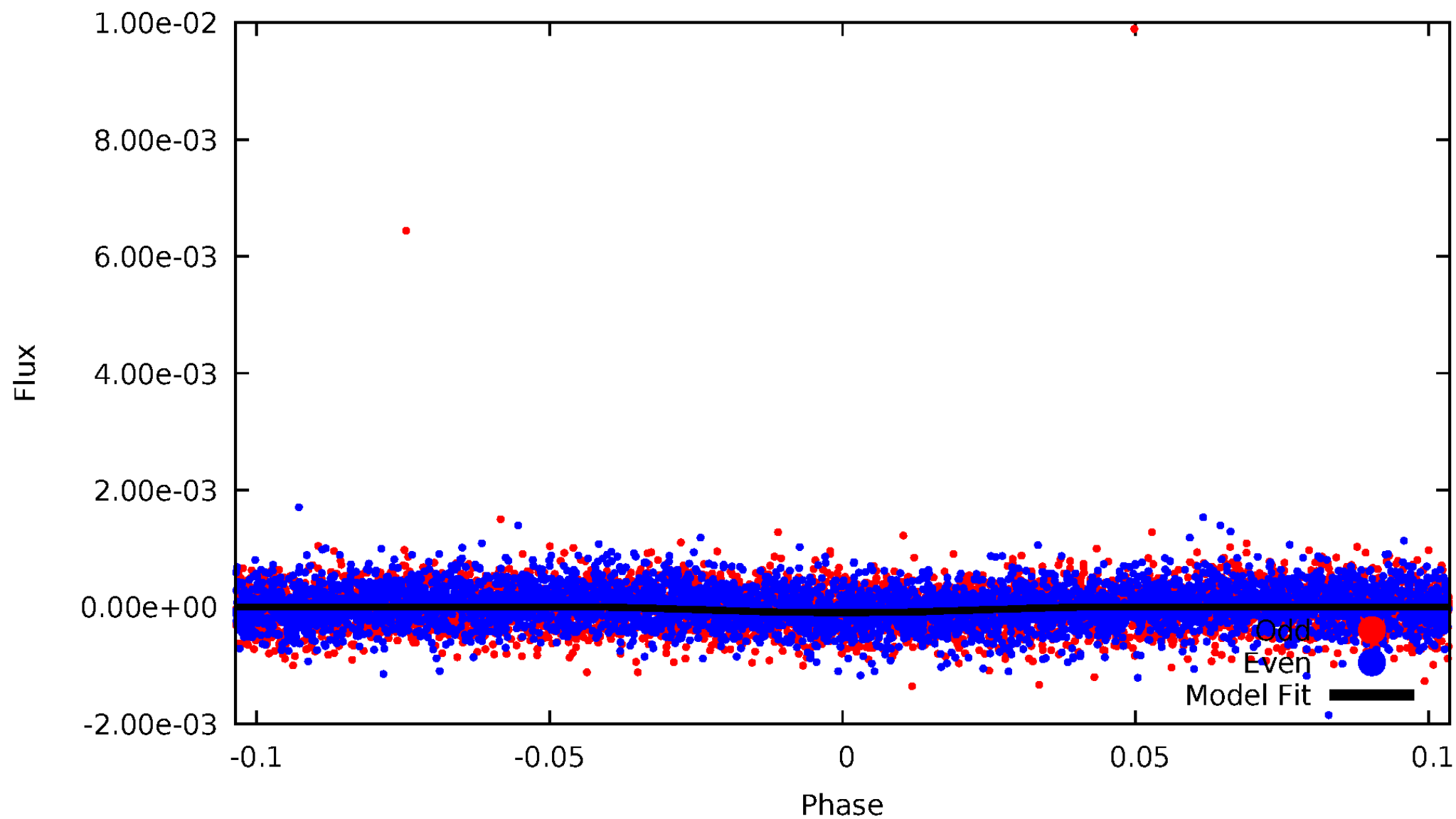


TCE 009845573-02



# DV Odd/Even

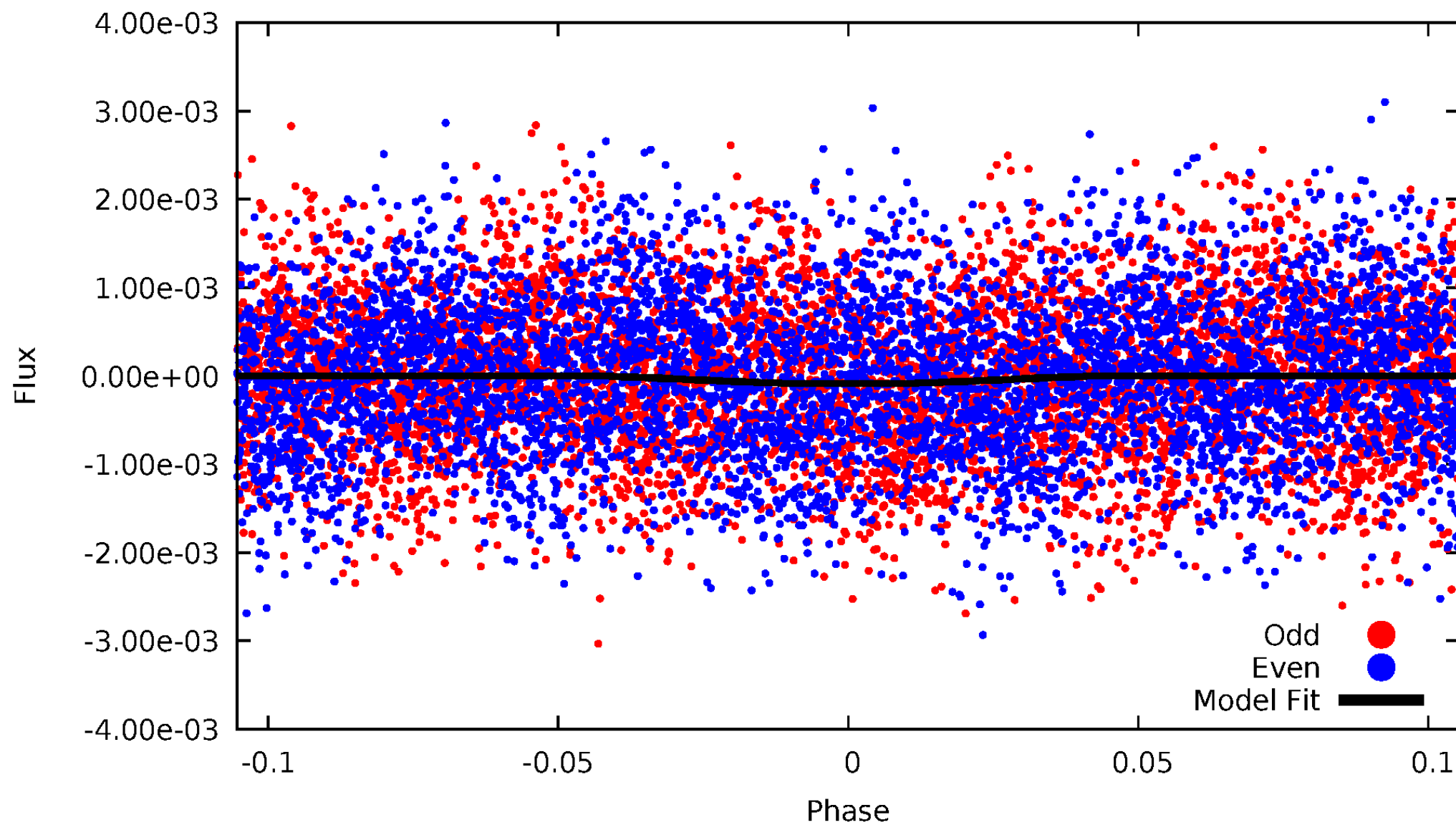
TCE 009845573-02





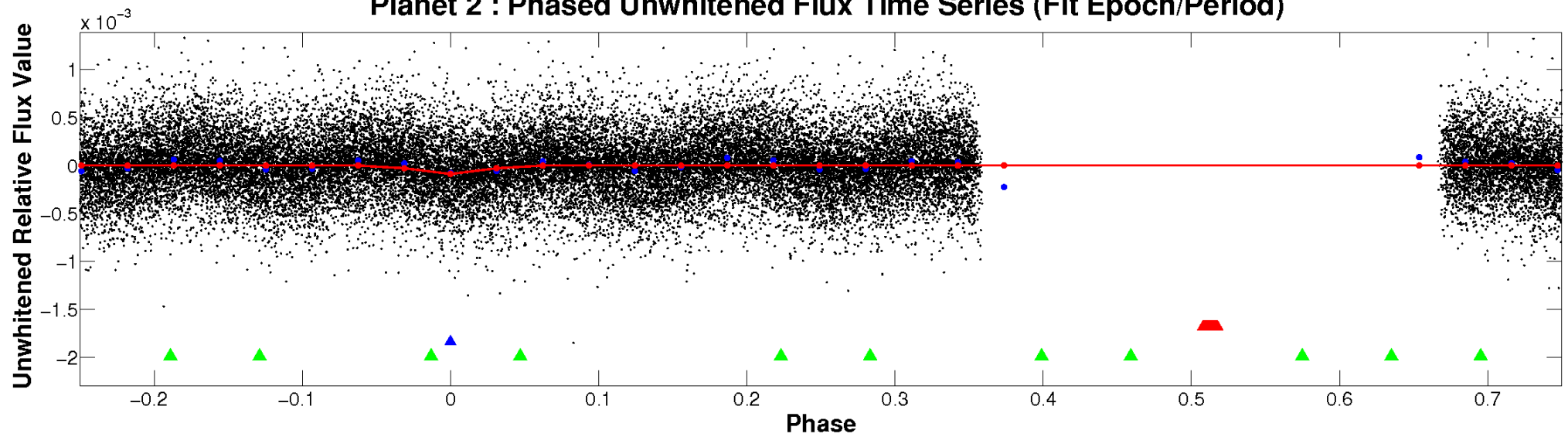
ALT Odd/Even

TCE 009845573-02

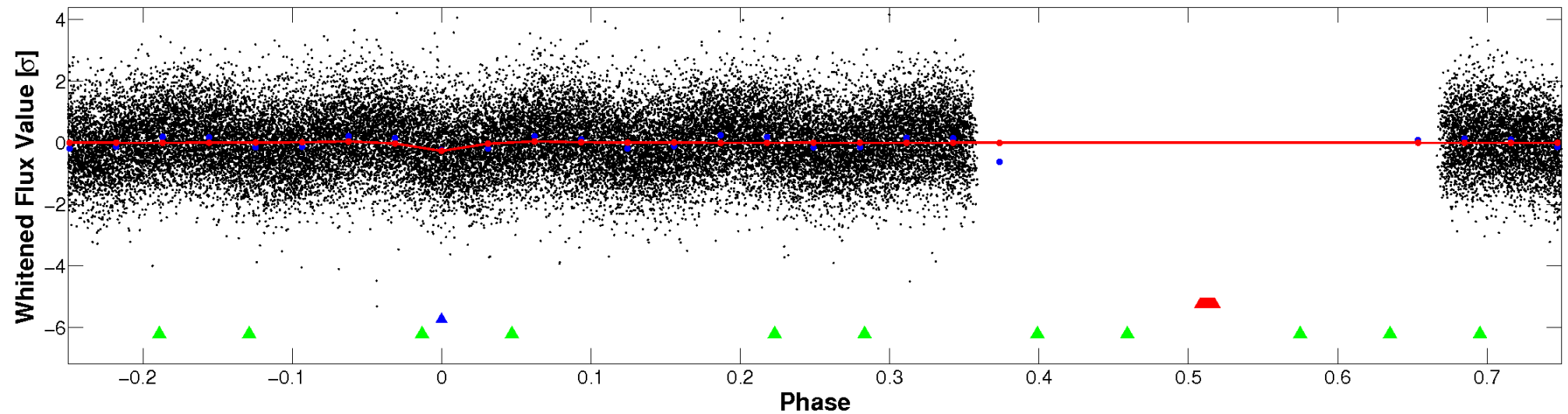


# Non-Whitened Vs. Whitened Light Curve

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

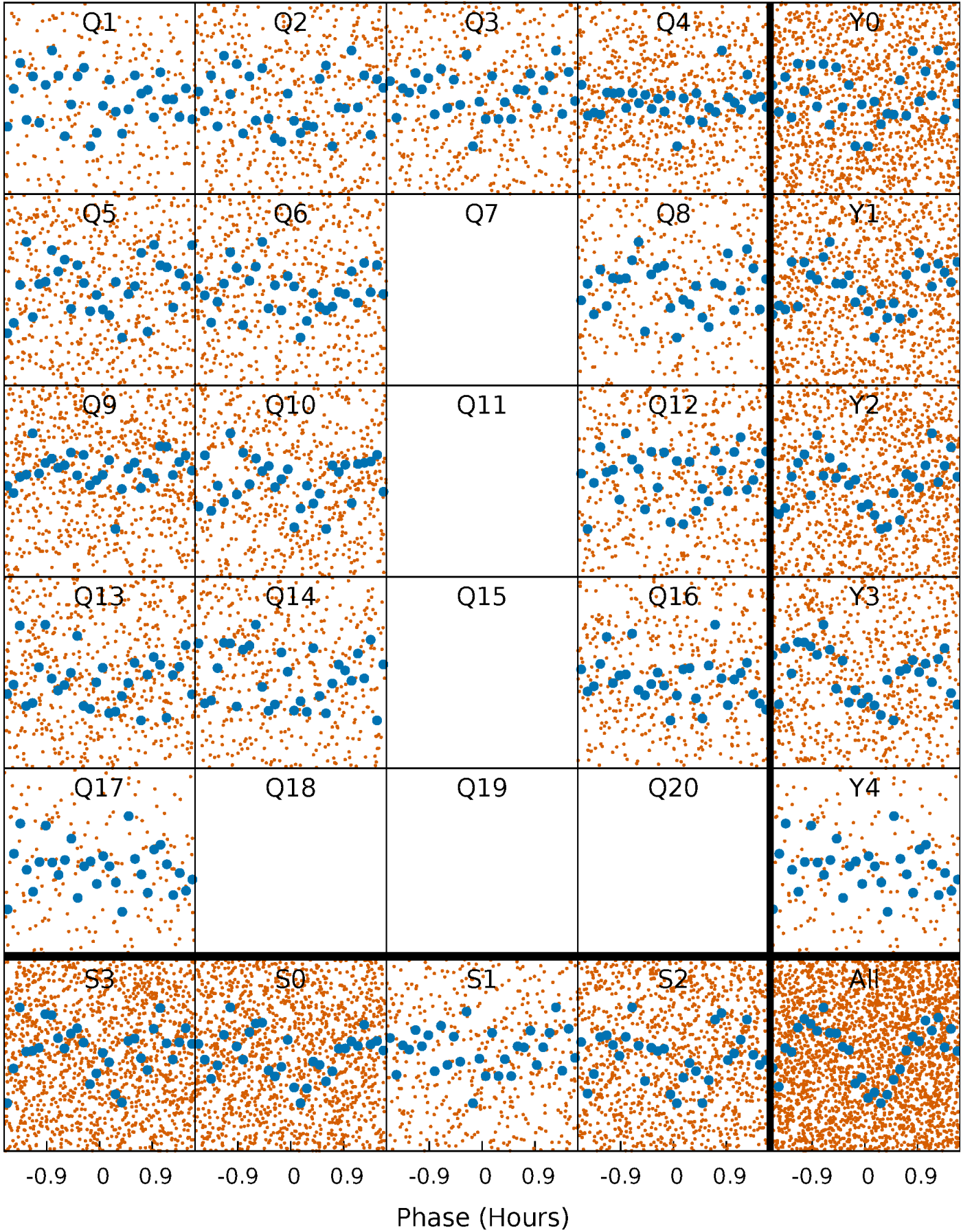


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



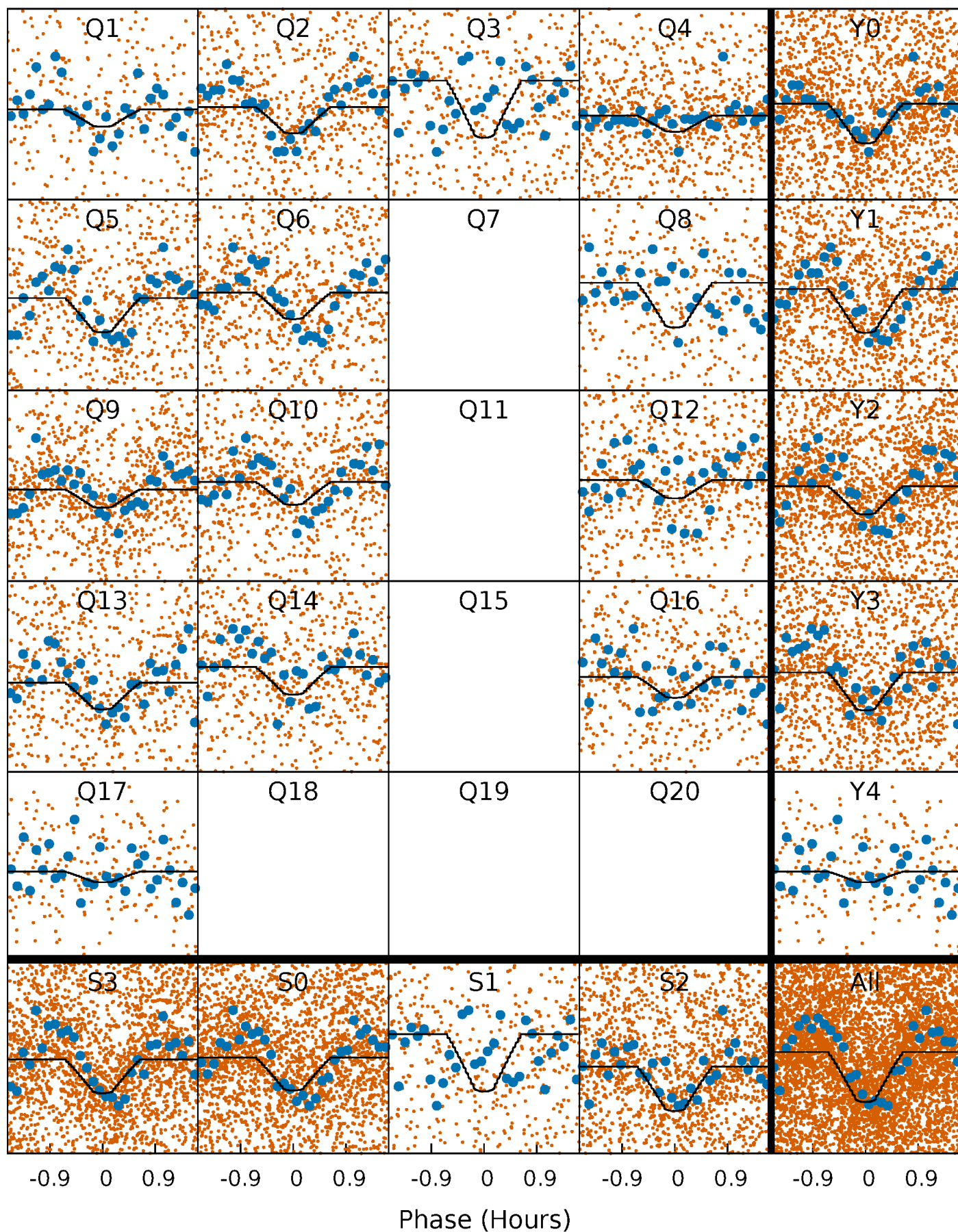
# PDC Quarter-Phased Transit Curves

TCE 009845573-02   P= 0.656334 Days    $T_0=131.664600$  (BKJD)



# DV Quarter-Phased Transit Curves

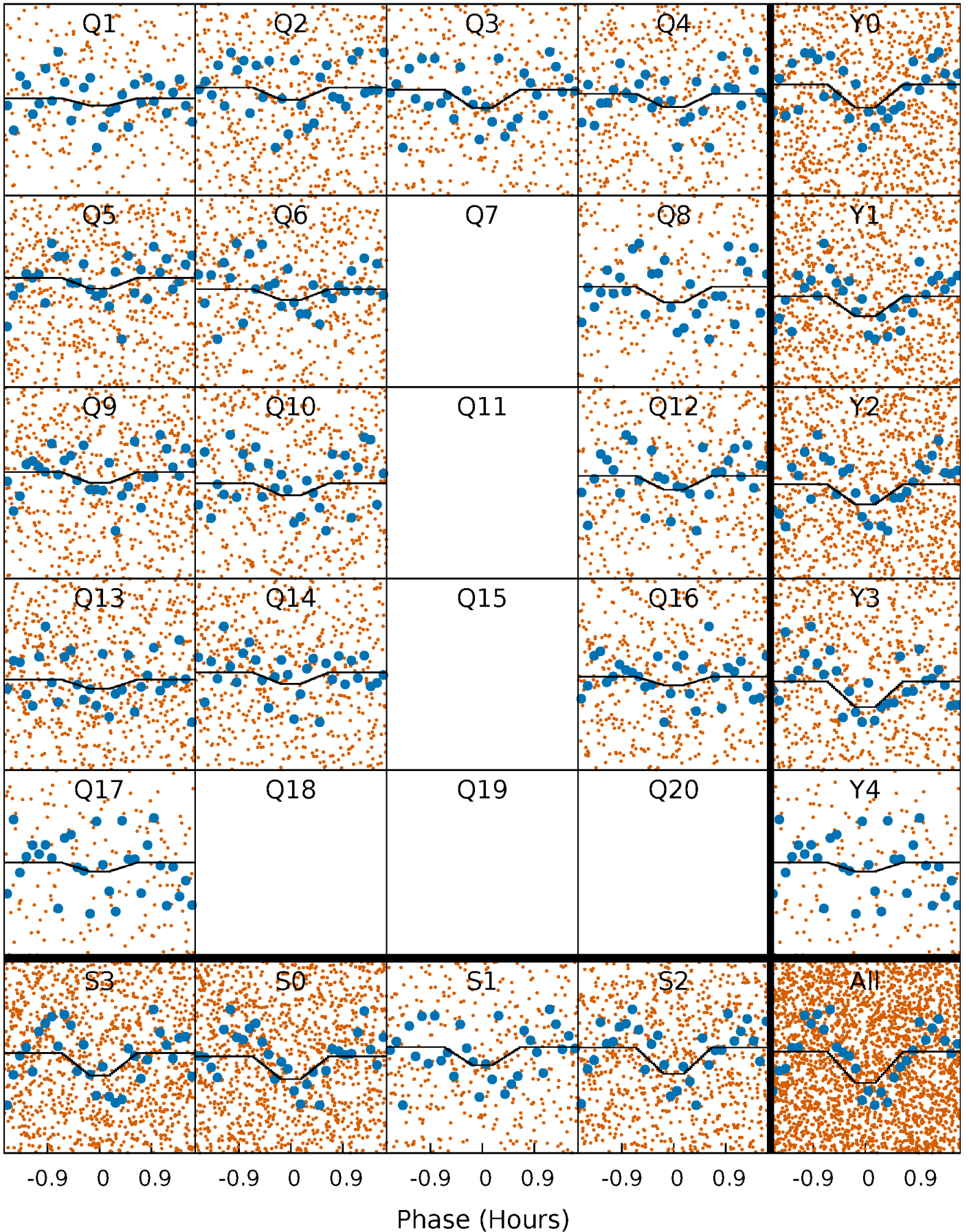
TCE 009845573-02   P= 0.656334 Days    $T_0=131.664600$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 009845573-02   P= 0.656337 Days    $T_0=131.661423$  (BKJD)

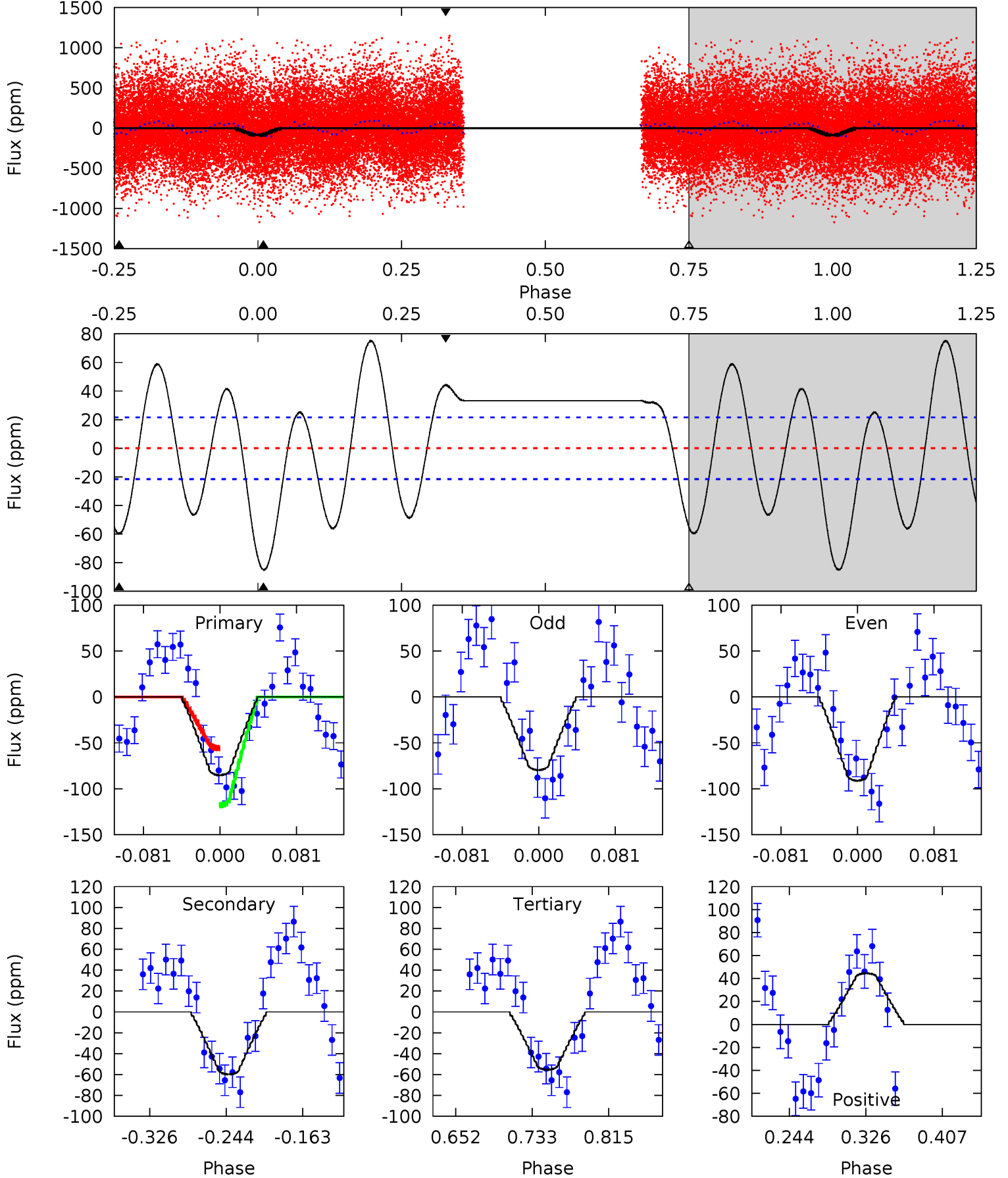




# DV Model-Shift Uniqueness Test

009845573-02, P = 0.656334 Days, E = 131.008266 Days

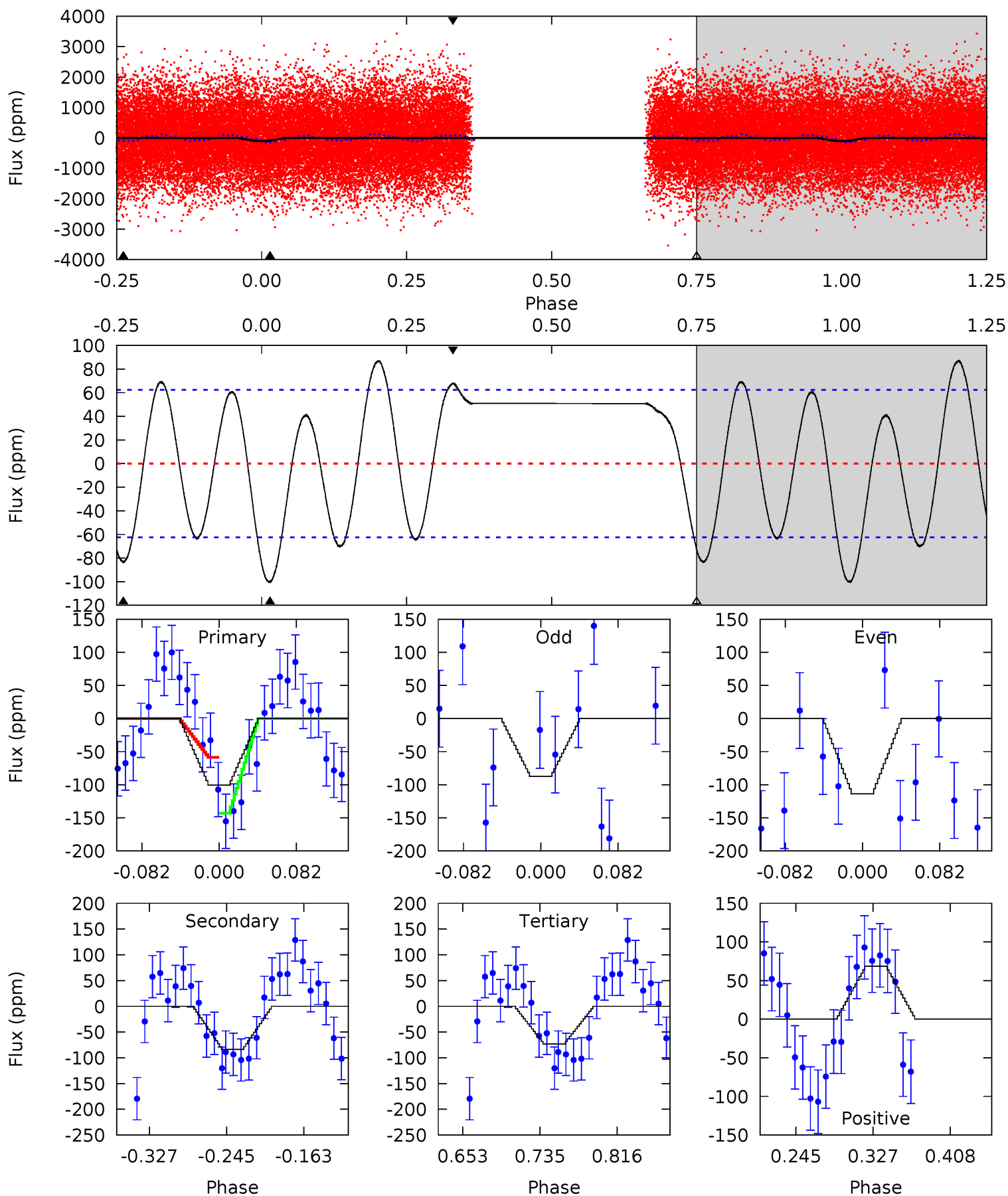
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.1	12.7	11.8	9.47	4.61	1.74	7.95	6.37	8.68	0.95	3.26	1.24	0.99	0.47	6.68



# Alt Model-Shift Uniqueness Test

009845573-02, P = 0.656337 Days, E = 131.005086 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.41	6.17	5.38	5.05	4.61	1.74	3.53	2.03	2.36	0.78	1.12	0.97	0.85	0.46	3.08



### Stellar Parameters For KIC 009845573

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8953^{+251}_{-430}$	$4.009^{+0.222}_{-0.166}$	$0.070^{+0.150}_{-0.650}$	$2.446^{+0.757}_{-0.757}$	$2.226^{+0.337}_{-0.626}$	$0.214^{+0.274}_{-0.105}$
	+3%/-5%	+6%/-4%	+214%/-929%	+31%/-31%	+15%/-28%	+128%/-49%
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 009845573-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-60 \pm 5$	$2.40^{+1.37}_{-1.17}$	$6105^{+503}_{-527}$	$7436^{+4476}_{-1797}$	$2.036^{+5.625}_{-1.192}$
Alt.	$-84 \pm 14$	$2.30^{+1.30}_{-1.09}$	$6149^{+503}_{-542}$	$8575^{+6266}_{-2189}$	$3.070^{+8.485}_{-1.892}$

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

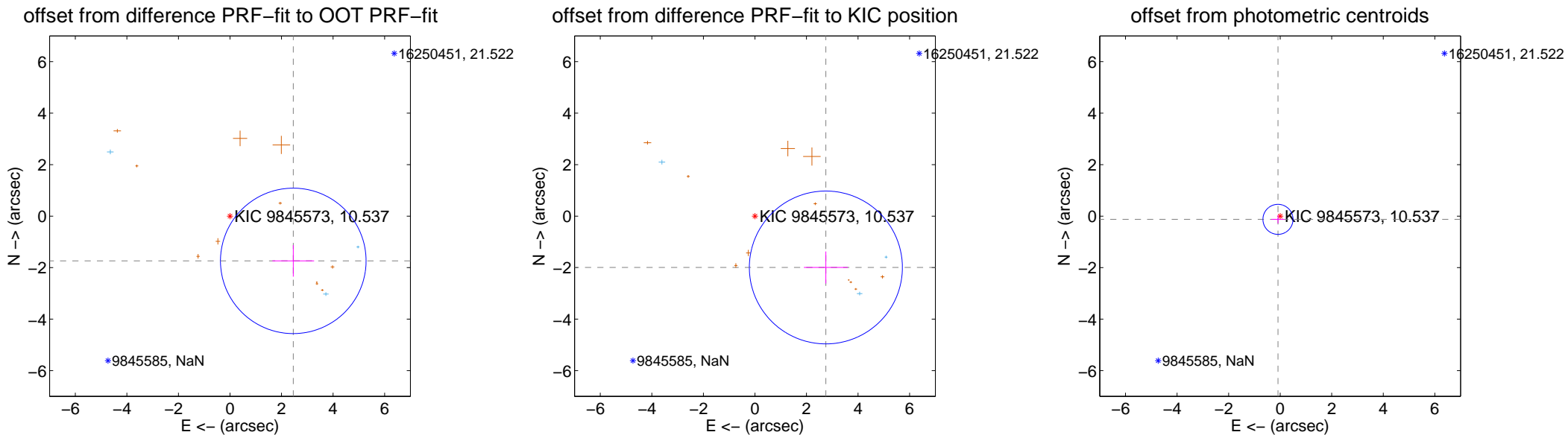
## DV Centroid Data

Supplemental centroid analysis for 009845573-02. **Kepler magnitude: 10.54.** Transit SNR 12.07

**There are 3 quarters with good PRF difference image offsets**

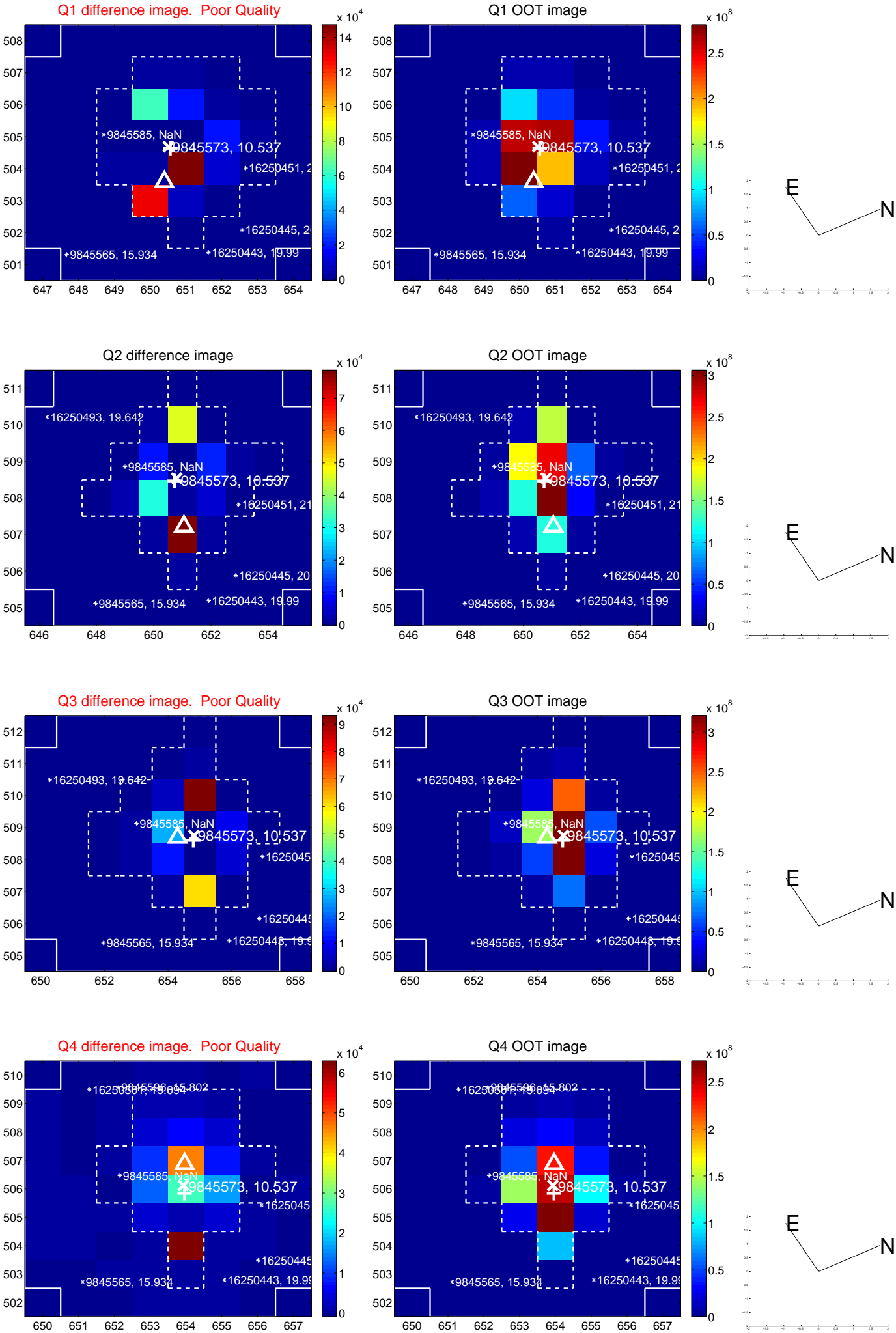
The direct PRF centroid is offset from the target star catalog position by about 0.34 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>3.008 \pm 0.941</math></b>	<b>3.20</b>	$-2.455 \pm 0.810$	$-1.737 \pm 0.612$
PRF-fit source offset from KIC position	<b><math>3.397 \pm 0.989</math></b>	<b>3.43</b>	$-2.751 \pm 0.852$	$-1.993 \pm 0.620$
photometric centroid source offset	$0.15 \pm 0.19$	0.78	$0.09 \pm 0.25$	$-0.12 \pm 0.16$



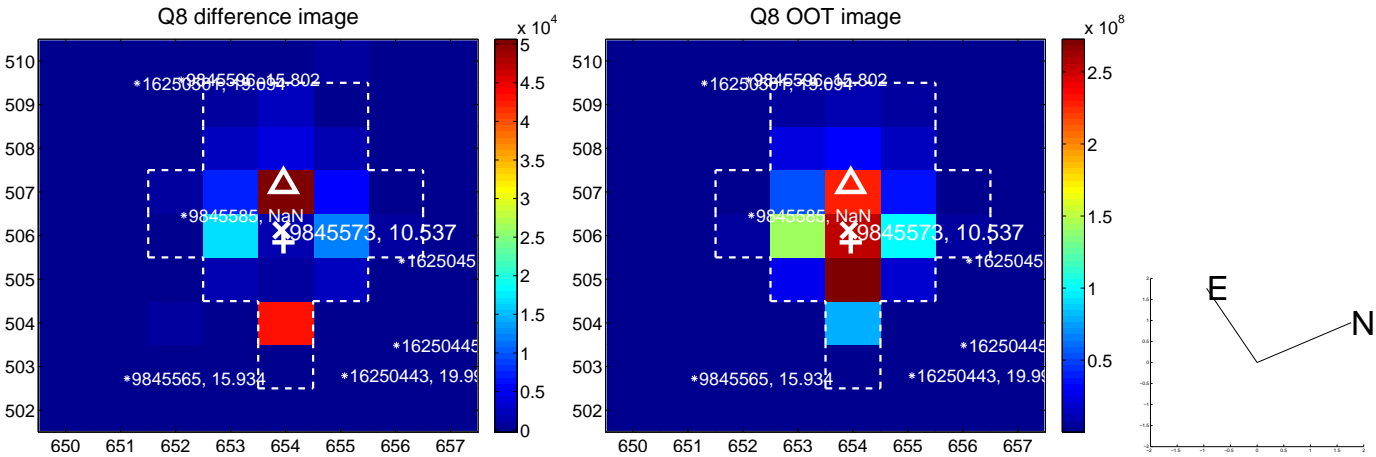
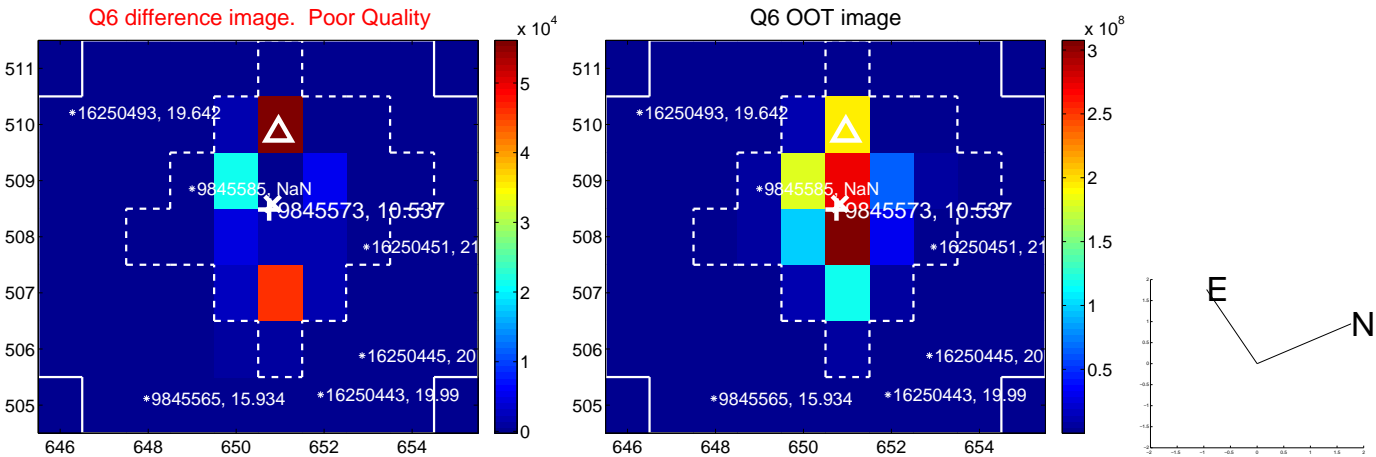
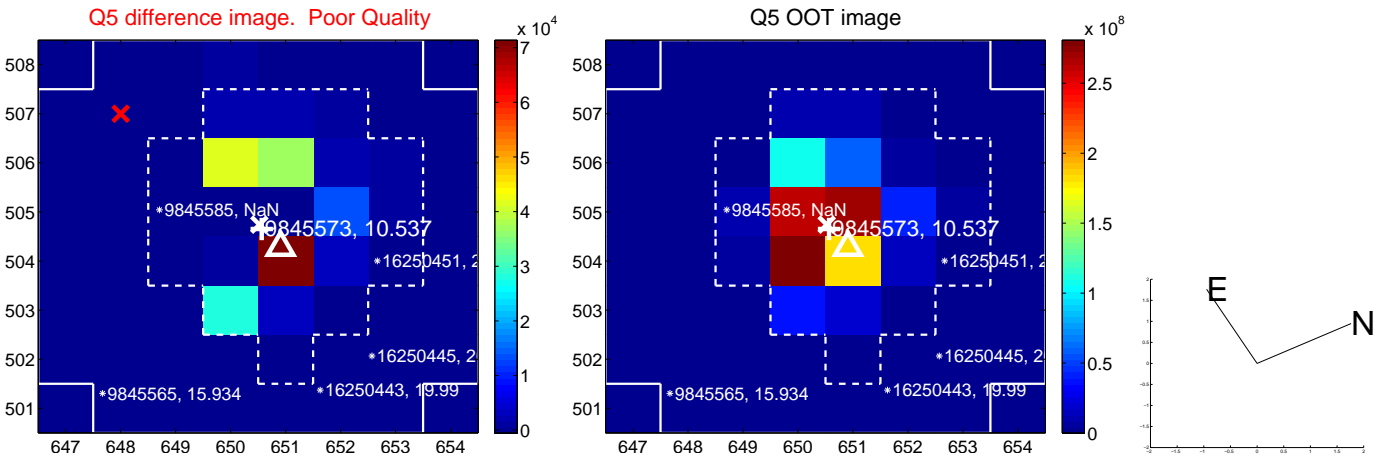
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

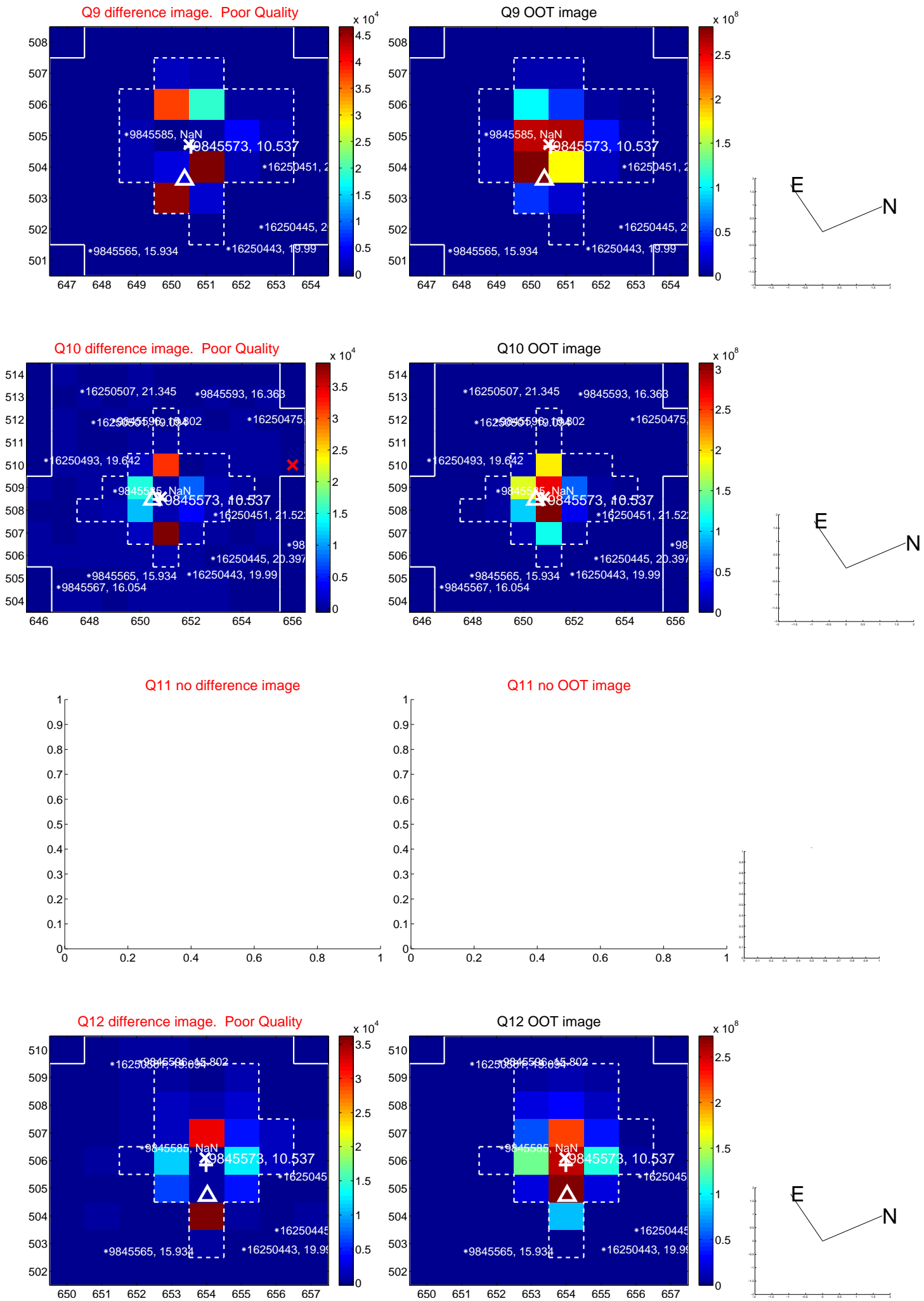




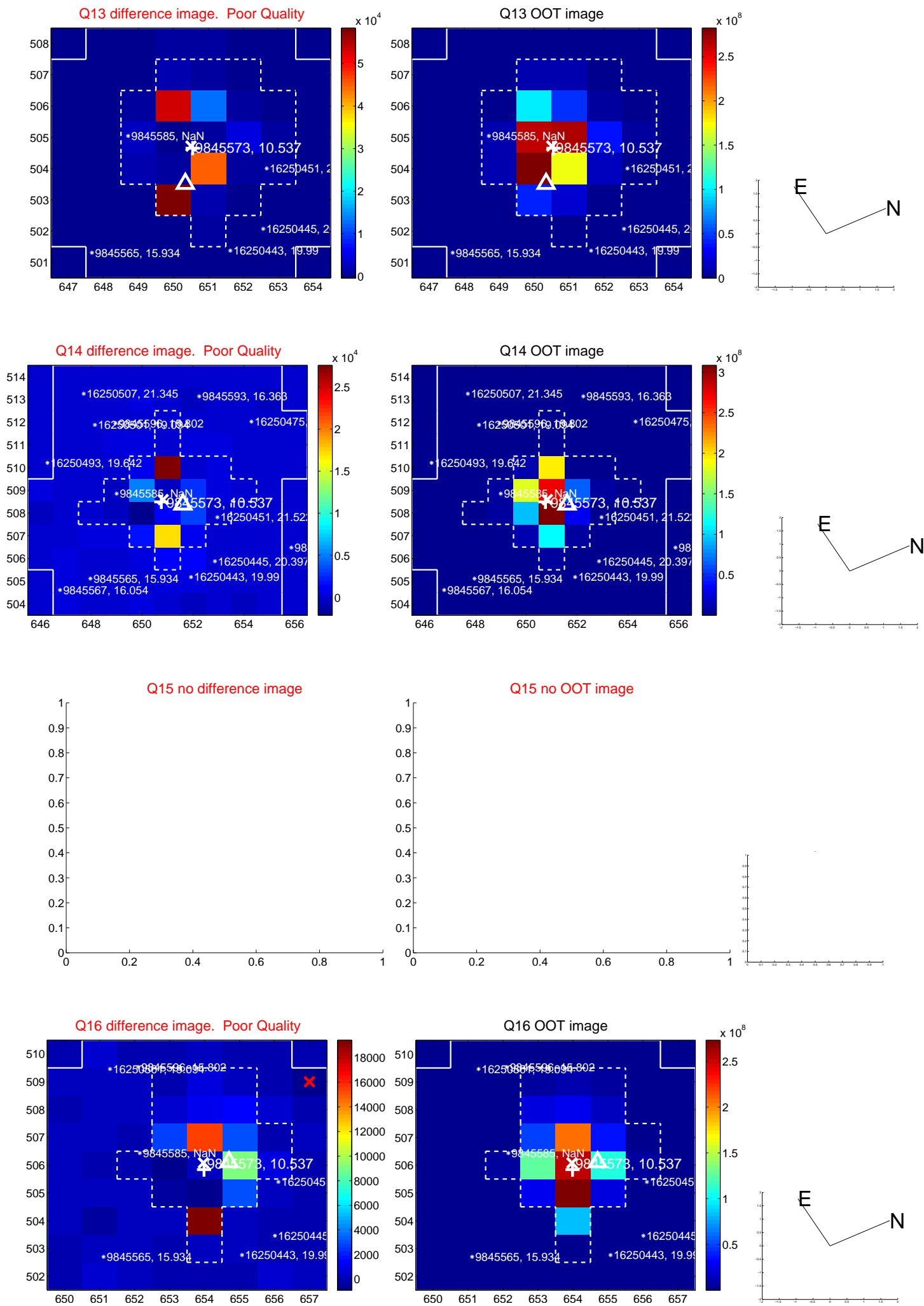
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



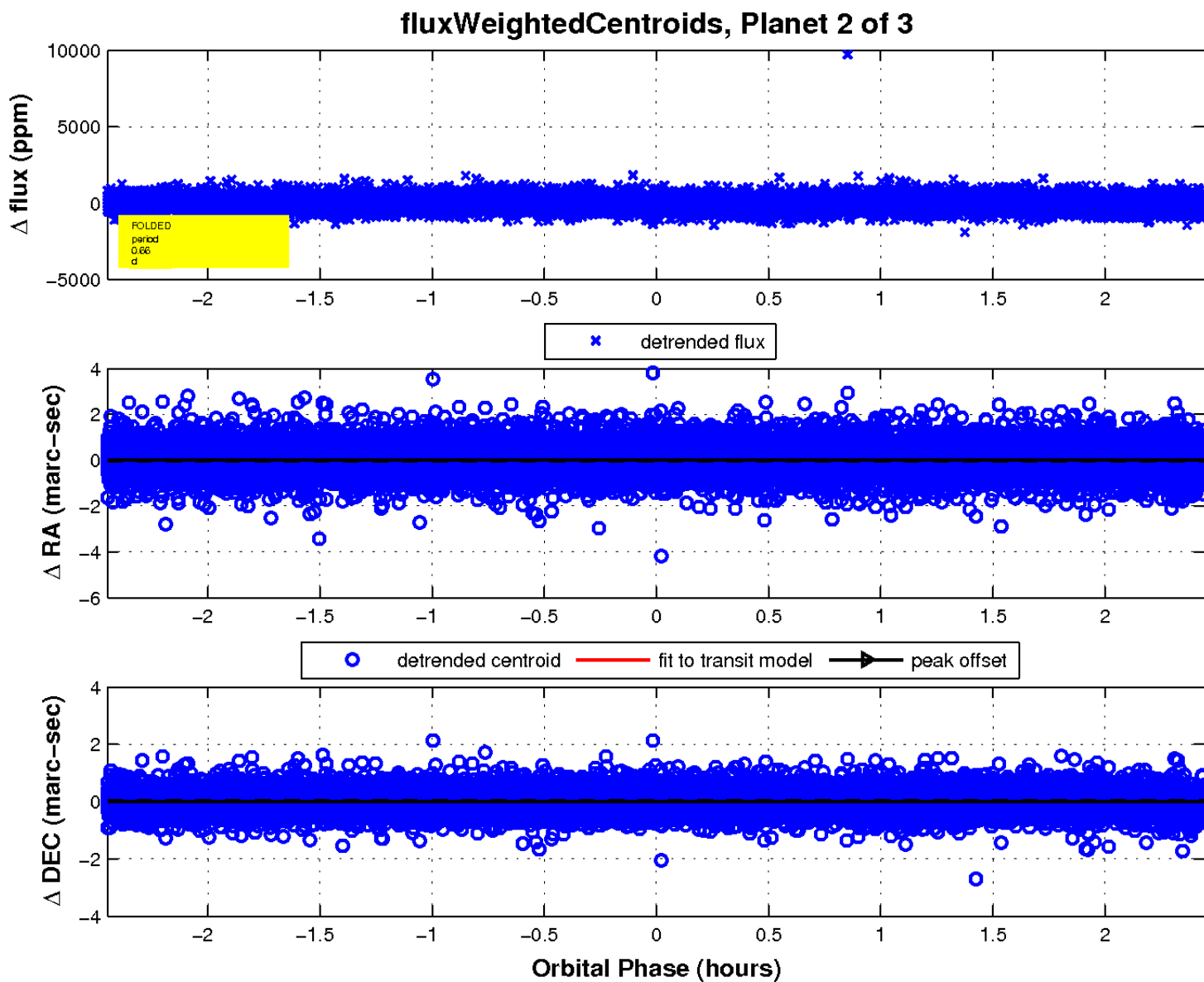
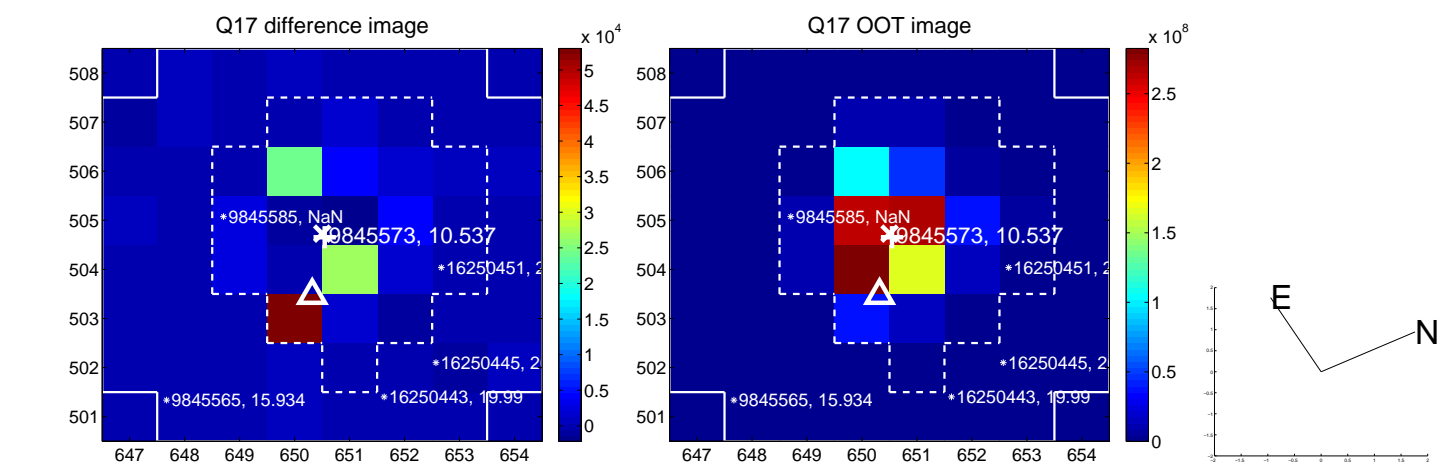
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

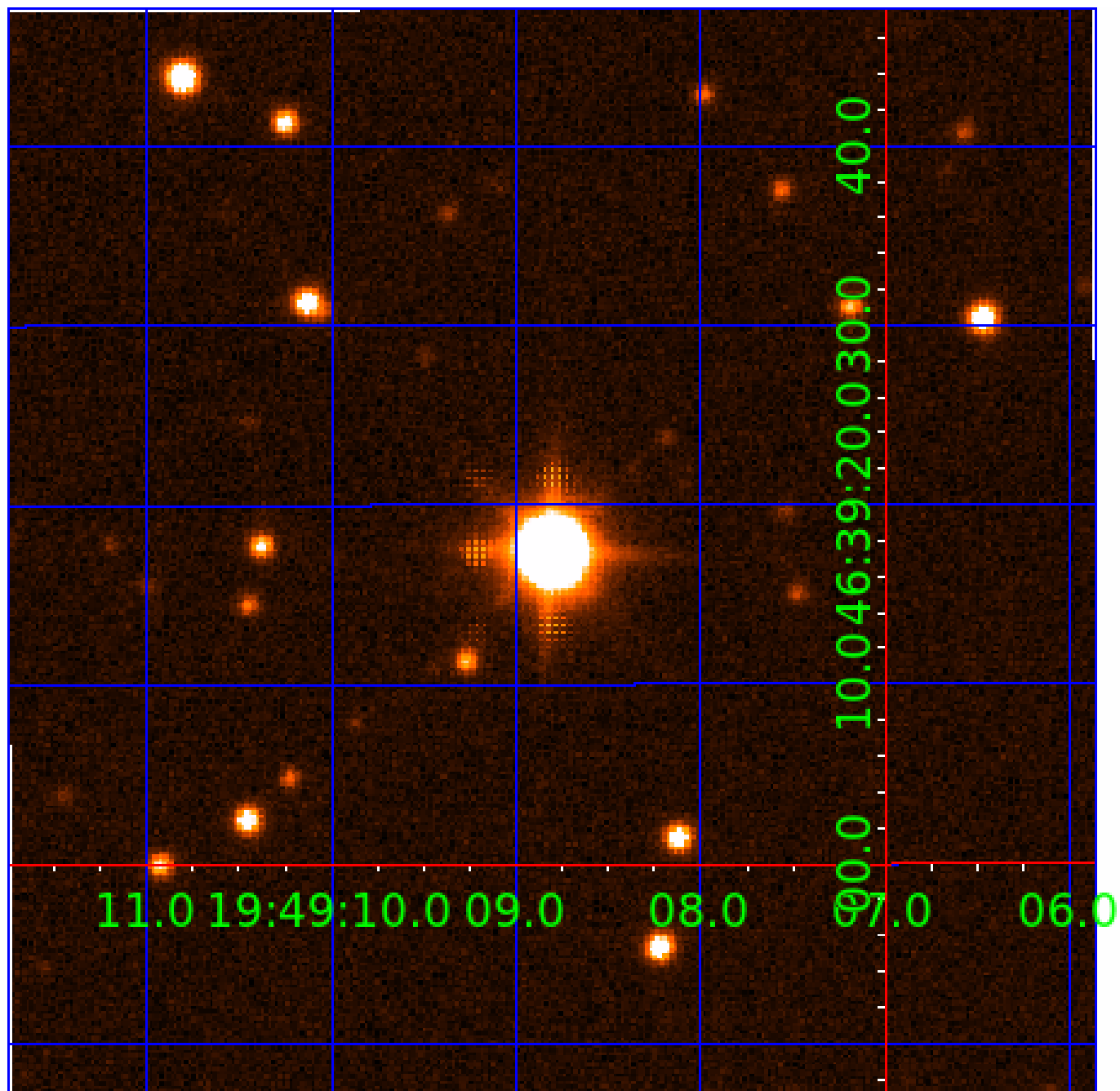


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009845573

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009845573-01	OBS	No	0.656331	132.004389	99.4	0.552	12.6	11.1	2.45	8953	2.56	92379.57
009845573-02	OBS	No	0.656334	131.664600	94.1	0.816	10.6	12.1	2.45	8953	2.46	92379.02
009845573-03	OBS	No	123.004846	248.212995	1184.5	2.546	7.9	8.2	2.45	8953	12.59	86.13

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009845573-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
009845573-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_SATURATED
009845573-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—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.

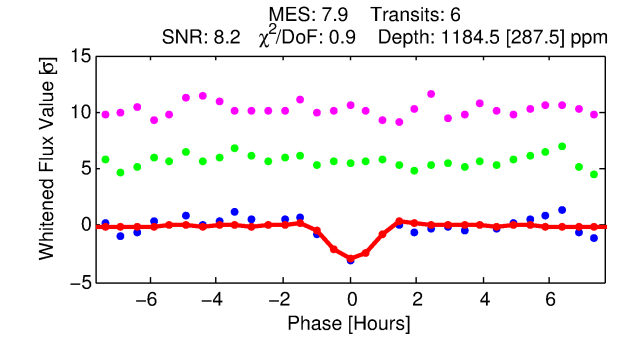
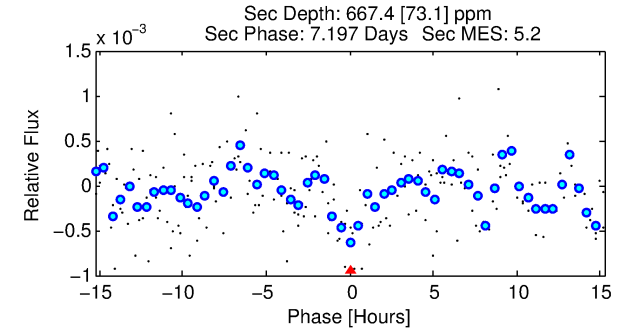
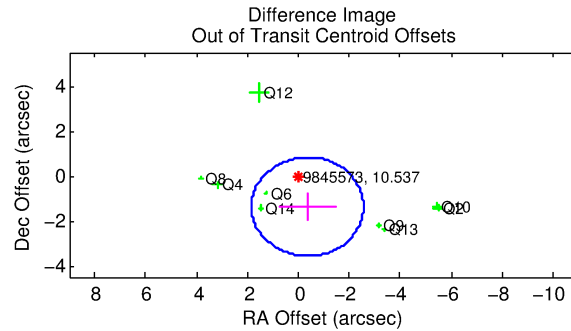
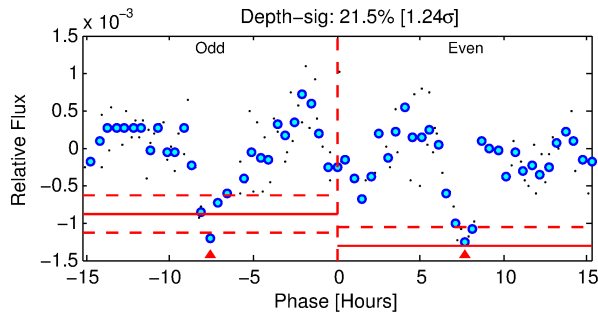
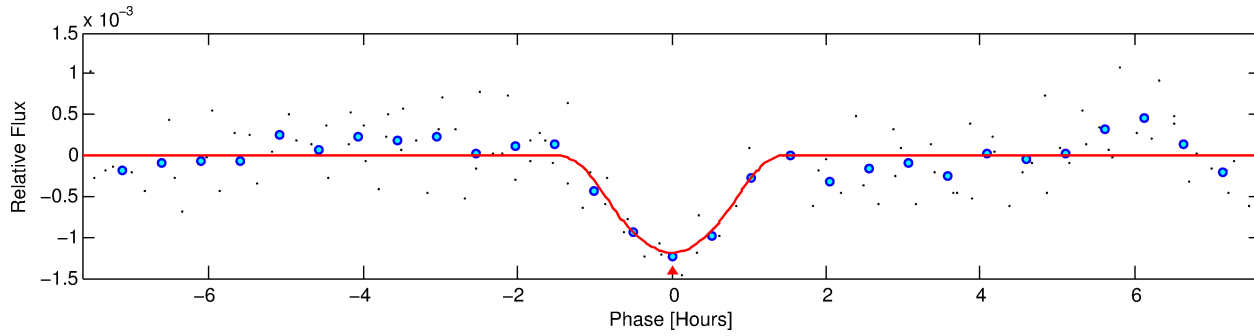
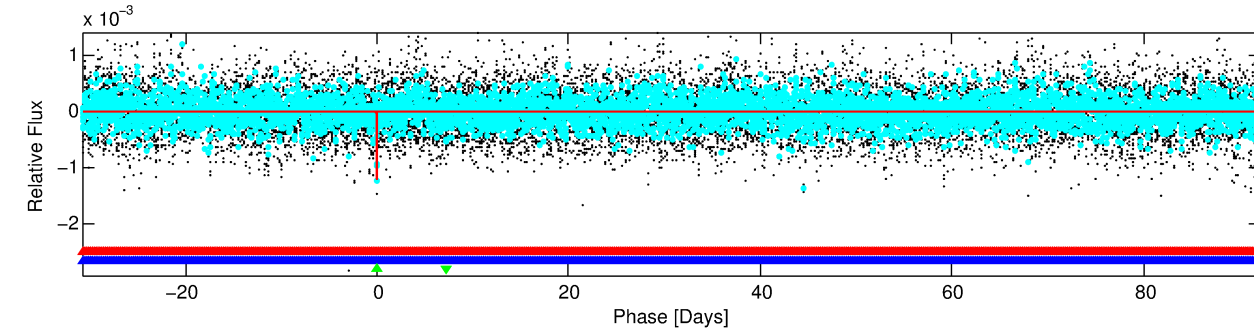
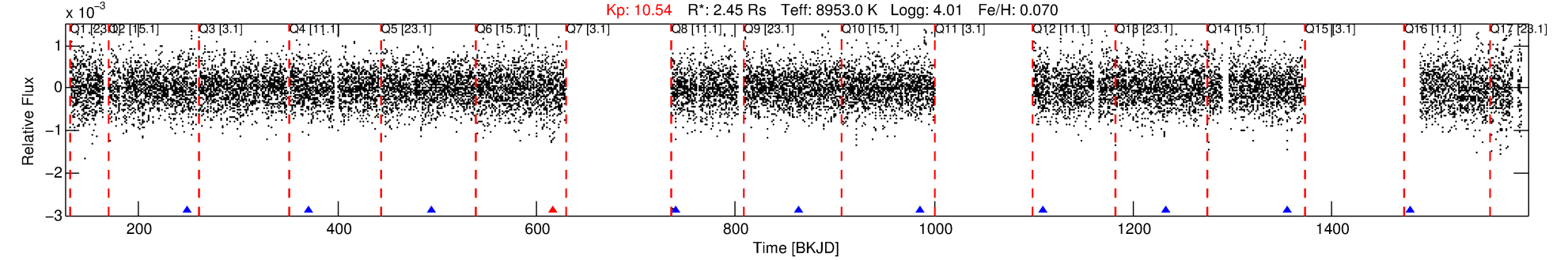
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009845573-03

No Significant Match Found

# DV One-Page Summary

KIC: 9845573 Candidate: 3 of 3 Period: 123.005 d



## DV Fit Results:

Period = 123.00485 [0.00153] d  
Epoch = 248.2130 [0.0096] BKJD  
Rp/R\* = 0.0472 [0.1245]  
a/R\* = 133.53 [135.48]  
b = 0.98 [0.23]  
Seff = 86.13 [38.10]  
Teq = 777 [86] K  
Rp = 12.59 [33.46] Re  
a = 0.6323 [0.1692] AU  
Ag = 925.85 [4901.69] [0.19σ]  
Teffp = 6625 [8750] K [0.67σ]

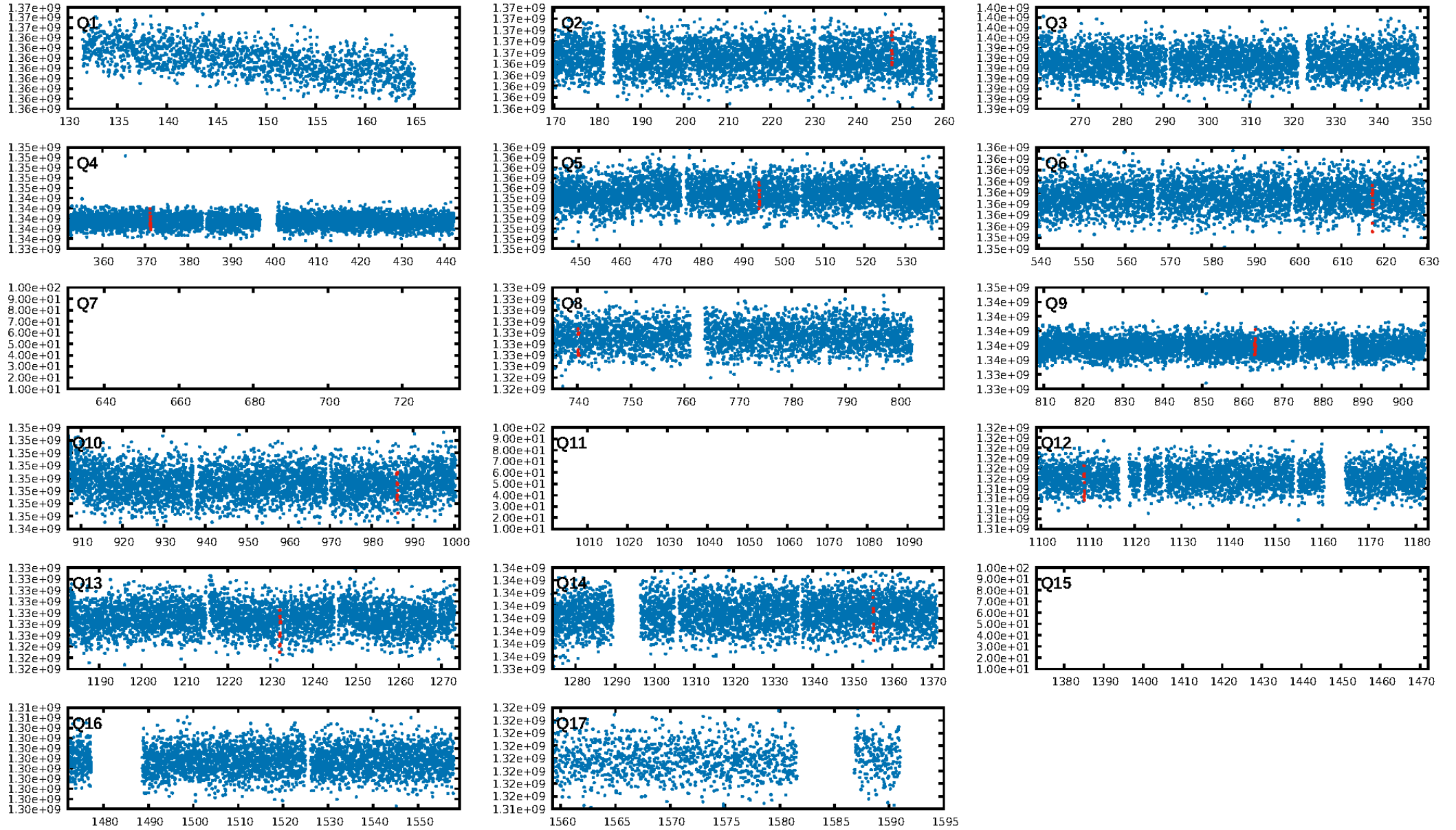
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [1098.38σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 74.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 3.63e-11**  
RollingBand-fgt: 0.83 [5/6]  
**GhostDiagnostic-chr: -5.913**  
**Centroid-sig: 0.1%**  
Centroid-so: 0.497 arcsec [2.14σ]  
OotOffset-rm: 1.419 arcsec [1.94σ]  
KicOffset-rm: 1.919 arcsec [2.37σ]  
OotOffset-st: 4/0/3/2 [9]  
KicOffset-st: 4/0/3/2 [9]  
DiffImageQuality-fgm: 0.11 [1/9]  
DiffImageOverlap-fno: 0.00 [0/10]

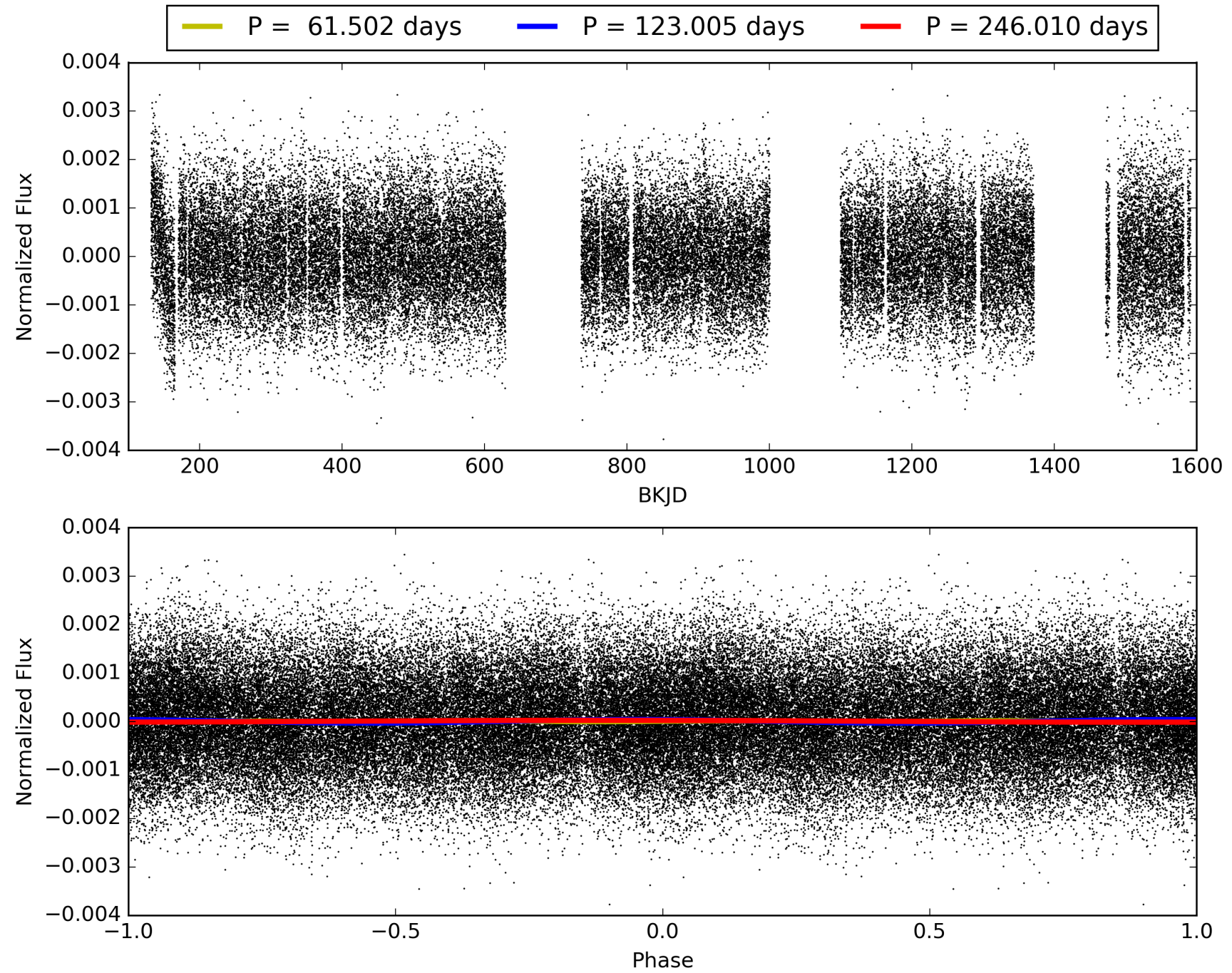
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:27:47 Z

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

# TCE 009845573-03, PDC Light Curves

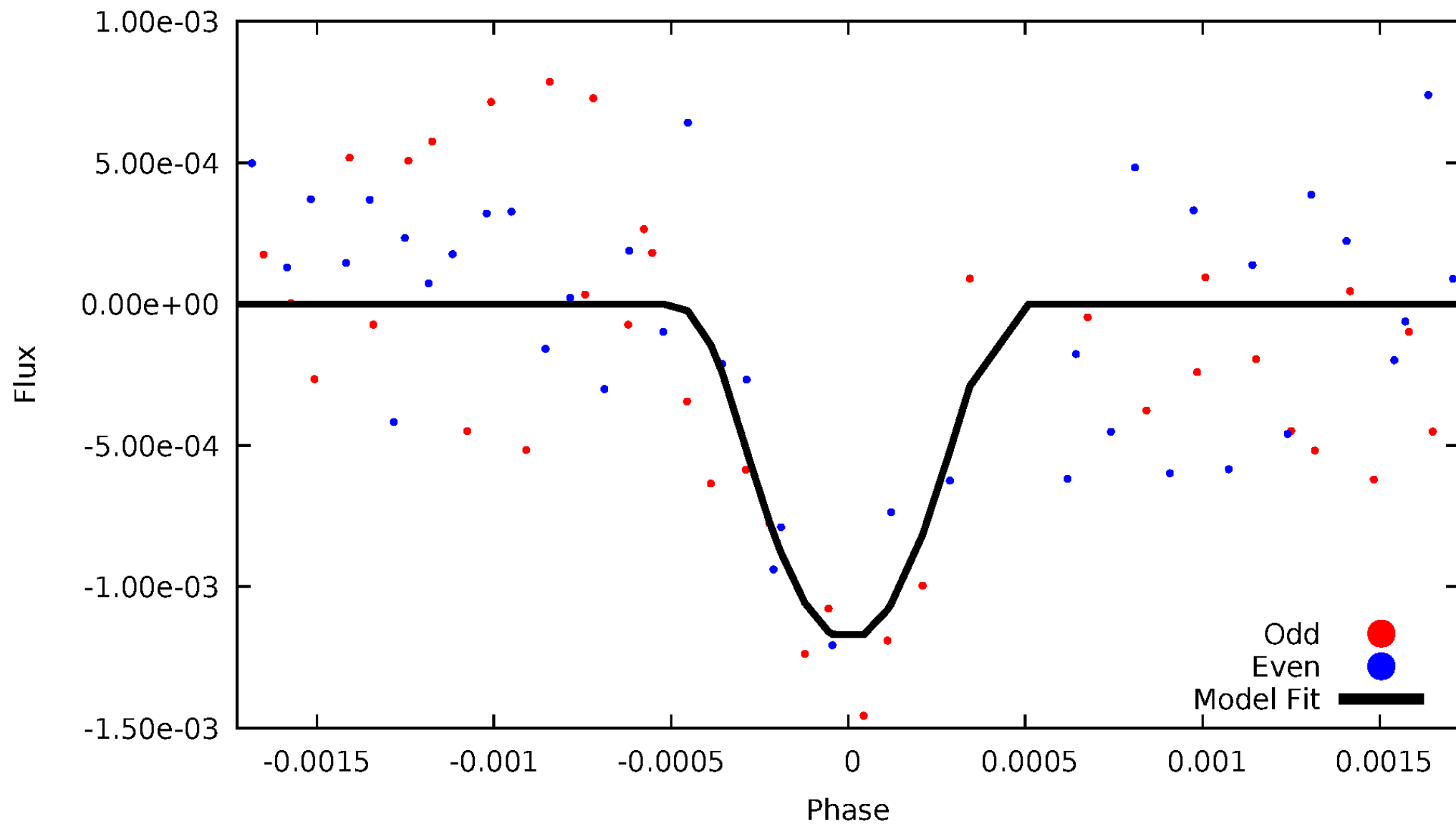


TCE 009845573-03



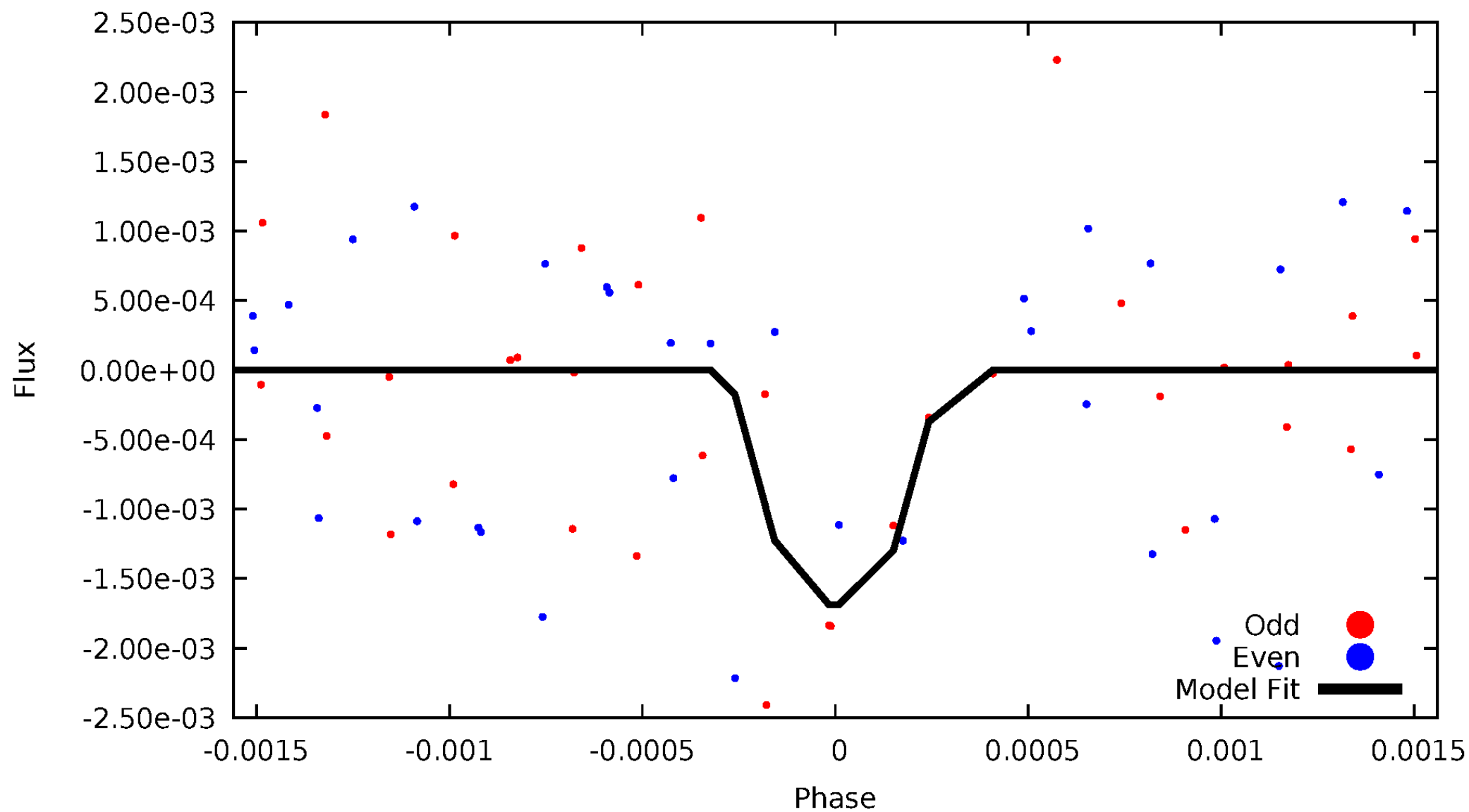
# DV Odd/Even

TCE 009845573-03



# ALT Odd/Even

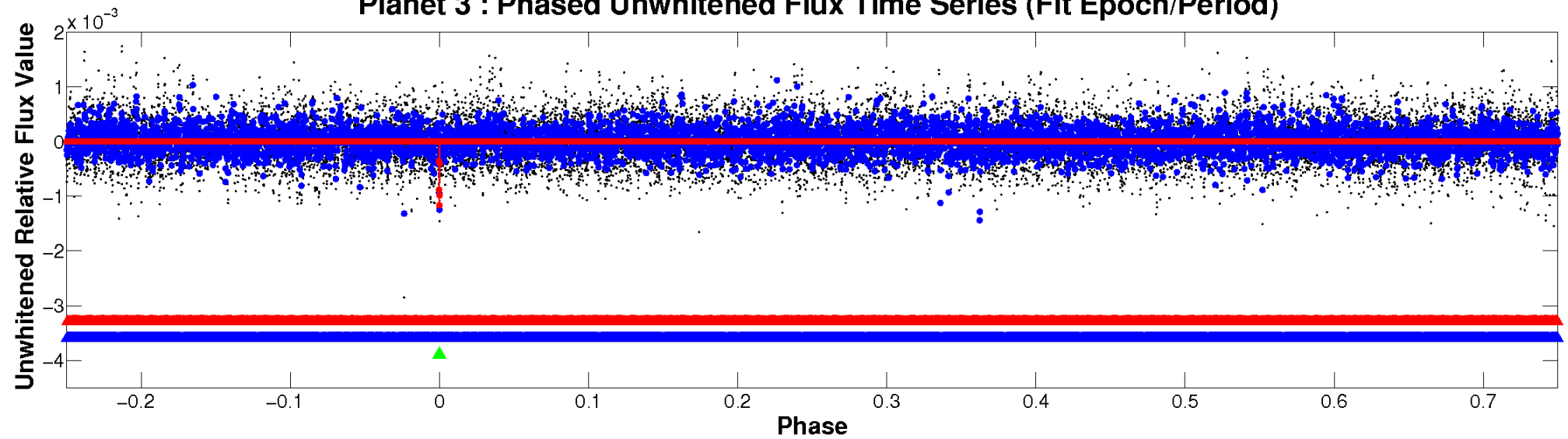
TCE 009845573-03



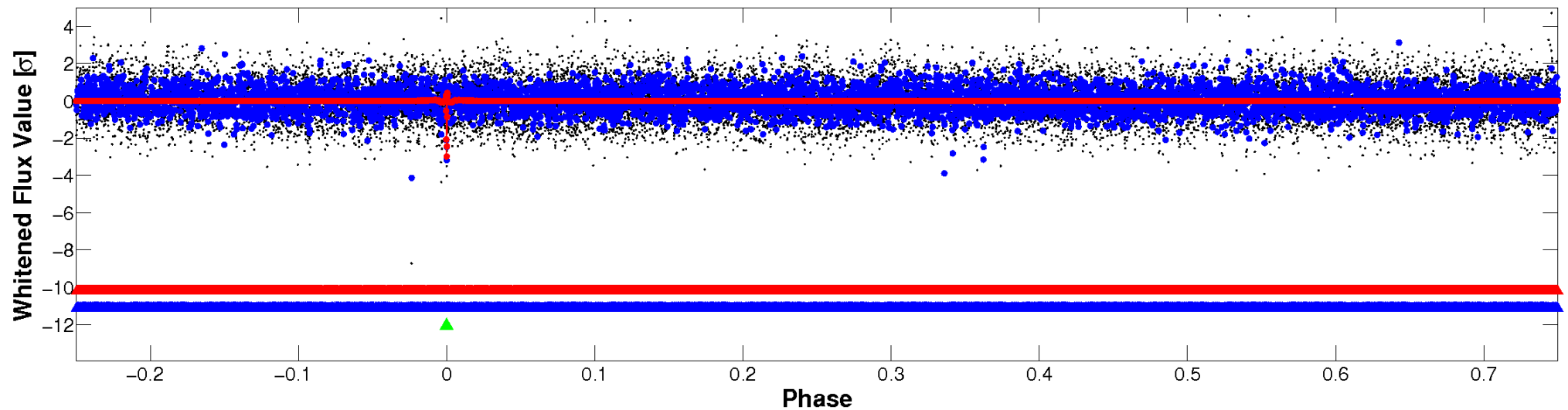


# Non-Whitened Vs. Whitened Light Curve

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

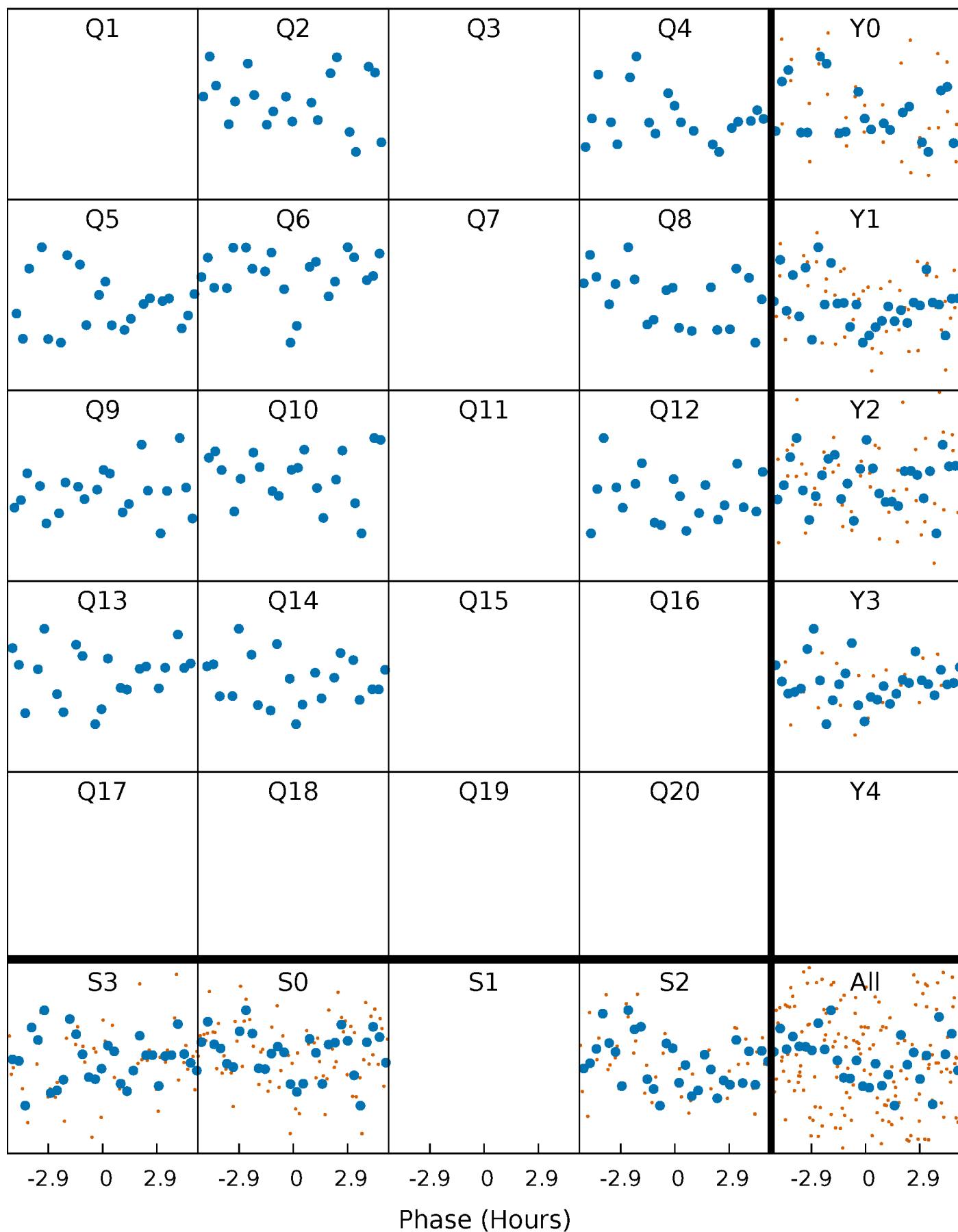


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



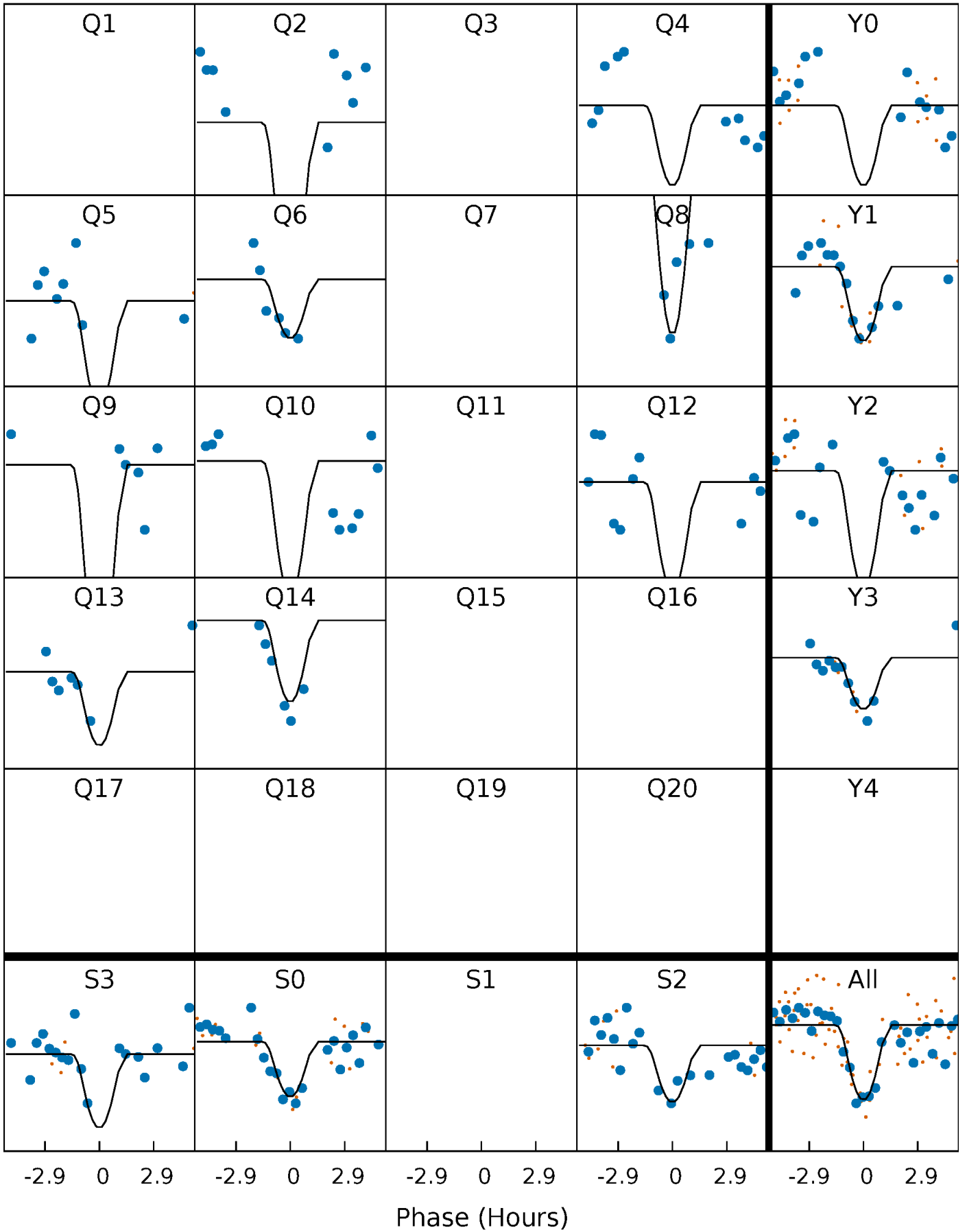
# PDC Quarter-Phased Transit Curves

TCE 009845573-03 P=123.004846 Days  $T_0=248.212995$  (BKJD)



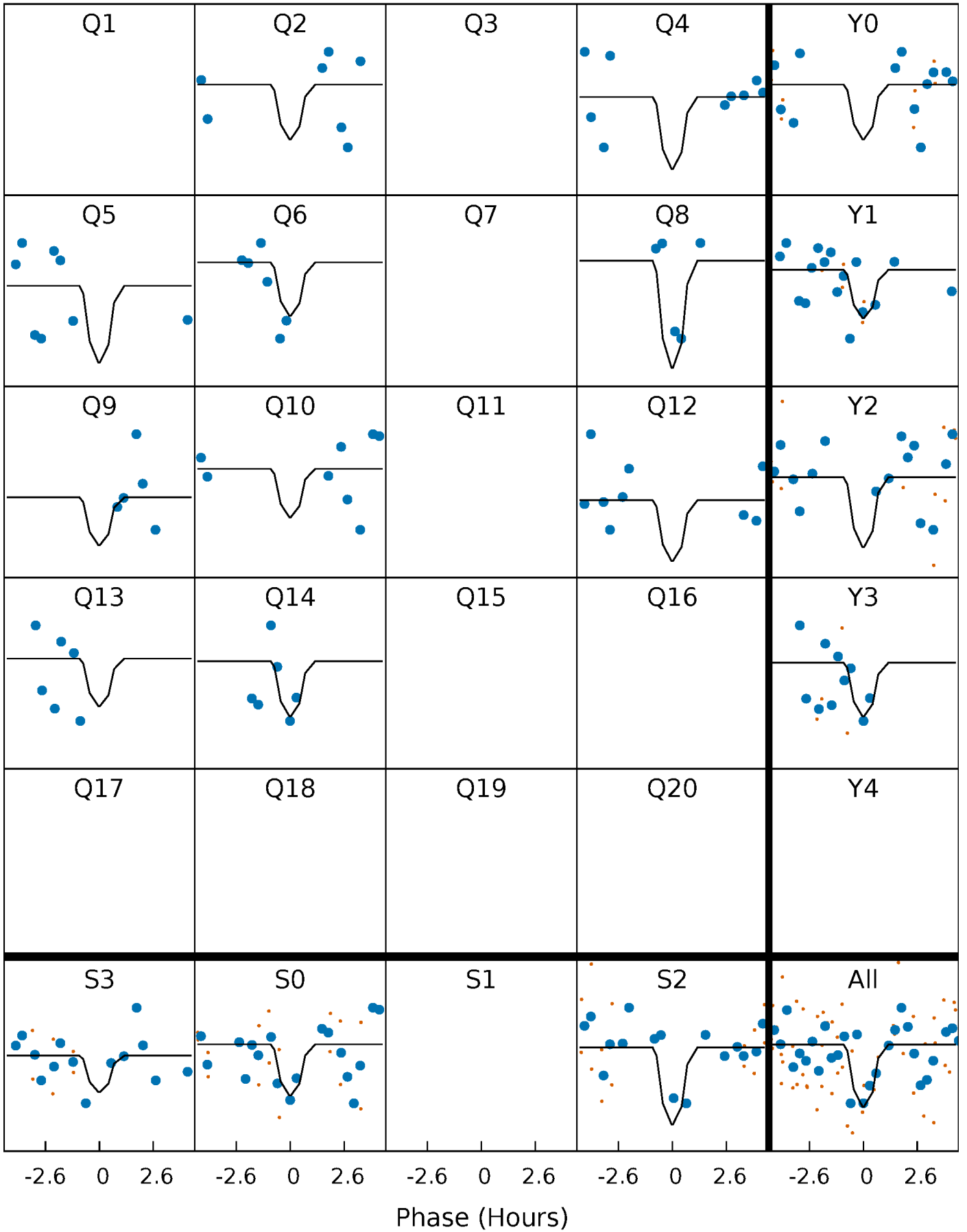
# DV Quarter-Phased Transit Curves

TCE 009845573-03 P=123.004846 Days  $T_0=248.212995$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

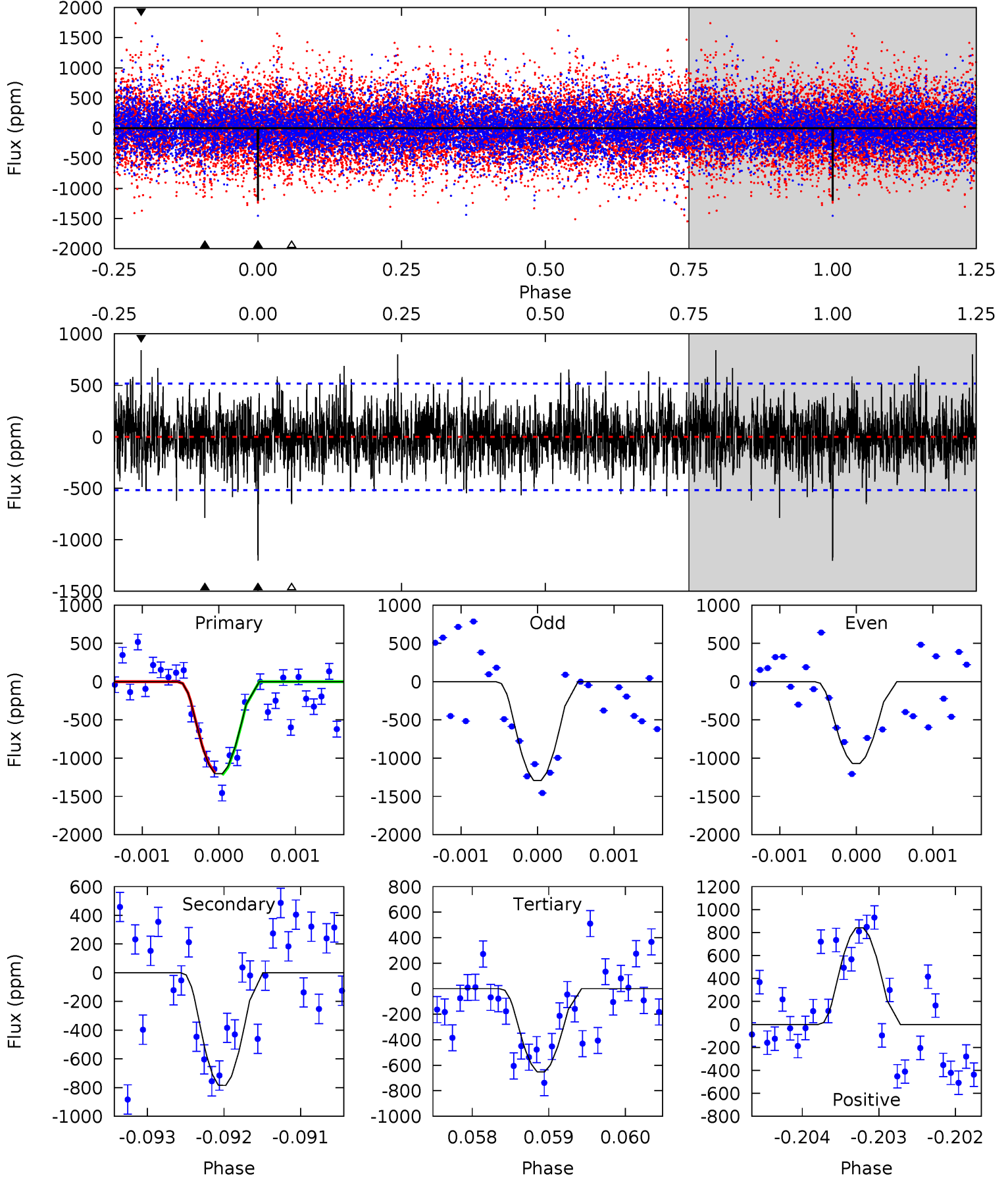
TCE 009845573-03 P=123.003558 Days  $T_0=248.231900$  (BKJD)



# DV Model-Shift Uniqueness Test

009845573-03, P = 123.004846 Days, E = 125.208149 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
12.7	8.28	6.89	8.88	5.46	3.30	2.02	5.81	3.82	1.40	-0.60	1.17	0.95	0.41	0.14

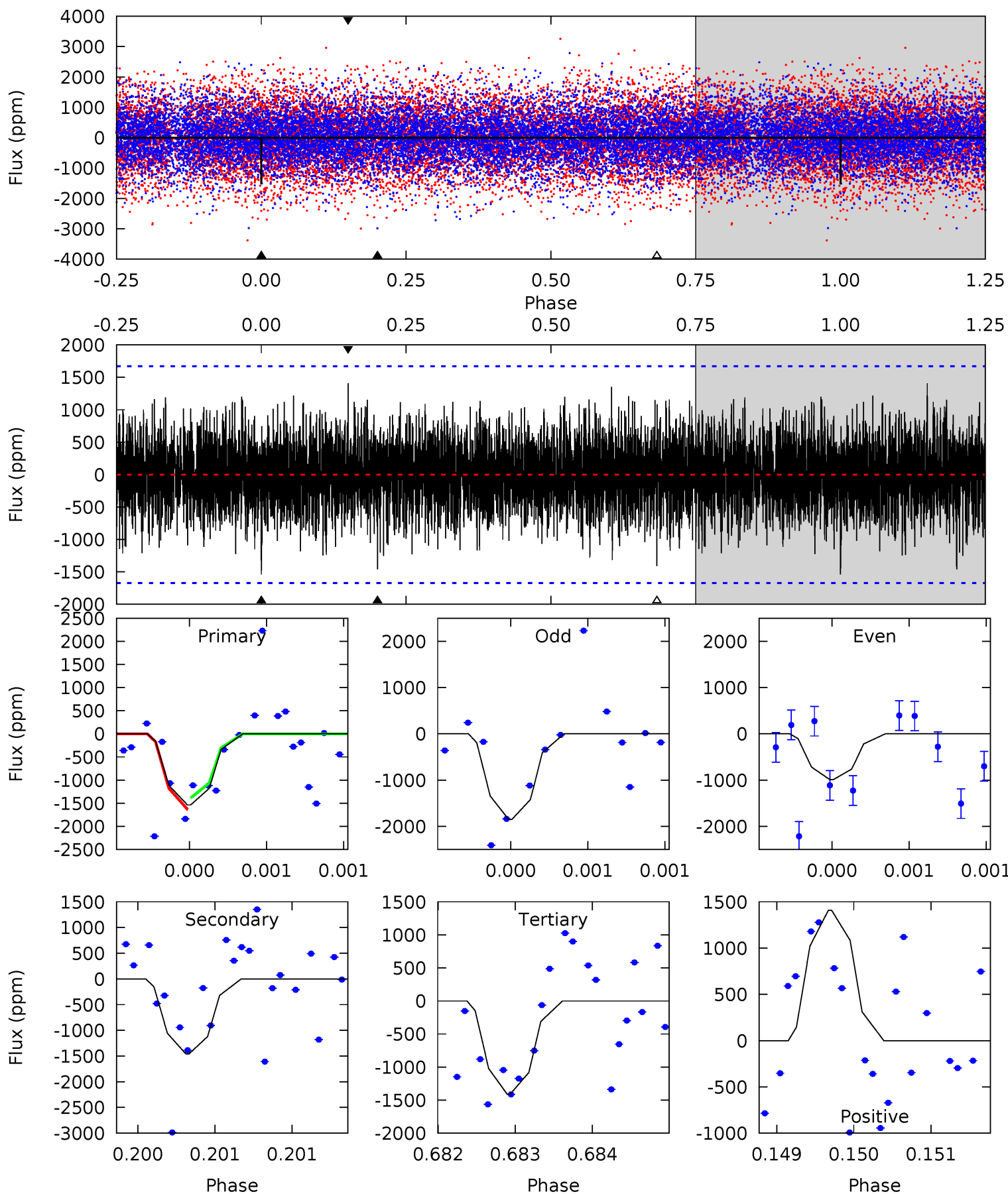




# Alt Model-Shift Uniqueness Test

009845573-03, P = 123.003558 Days, E = 125.228342 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
5.09	4.83	4.67	4.67	5.54	3.44	1.39	0.43	0.42	0.16	0.16	1.38	1.09	0.48	0.40



### Stellar Parameters For KIC 009845573

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$8953^{+251}_{-430}$	$4.009^{+0.222}_{-0.166}$	$0.070^{+0.150}_{-0.650}$	$2.446^{+0.757}_{-0.757}$	$2.226^{+0.337}_{-0.626}$	$0.214^{+0.274}_{-0.105}$
	+3%/-5%	+6%/-4%	+214%/-929%	+31%/-31%	+15%/-28%	+128%/-49%
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 009845573-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-785 \pm 95$	$26.64^{+26.11}_{-18.01}$	$1072^{+79}_{-94}$	$4619^{+3229}_{-999}$	$233^{+2158}_{-173}$
Alt.	$-1457 \pm 302$	$25.46^{+28.89}_{-17.31}$	$1070^{+86}_{-89}$	$5249^{+4838}_{-1291}$	$465^{+4038}_{-362}$

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

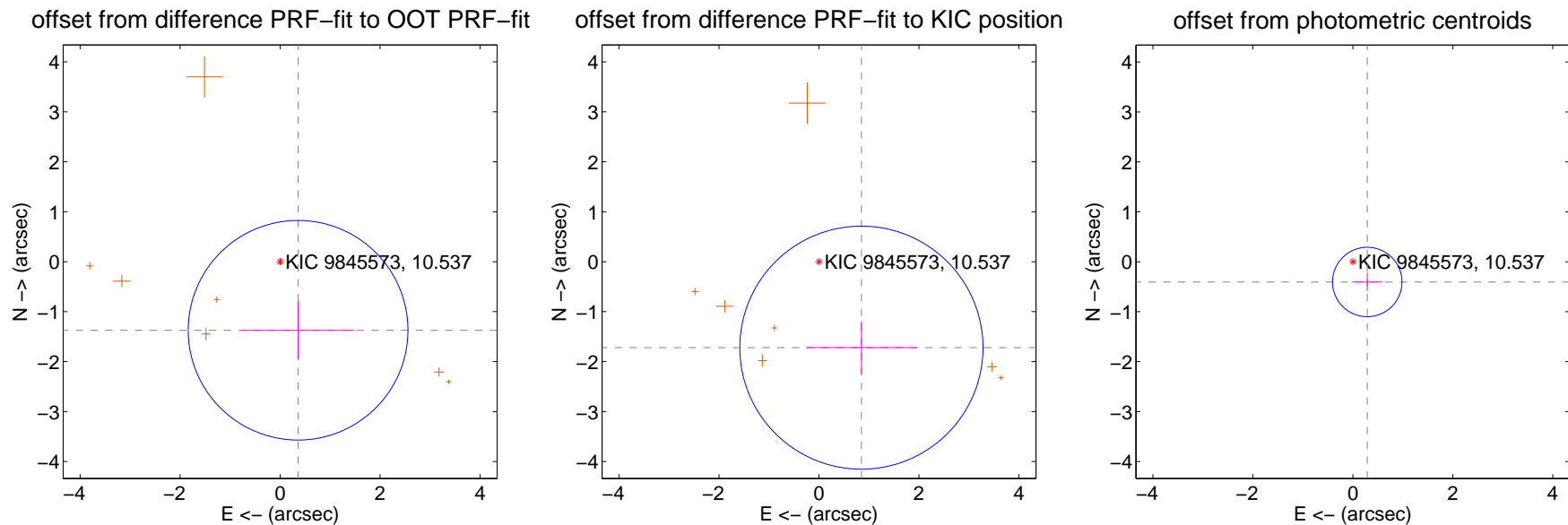
## DV Centroid Data

Supplemental centroid analysis for 009845573-03. **Kepler magnitude: 10.54.** Transit SNR 8.18

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

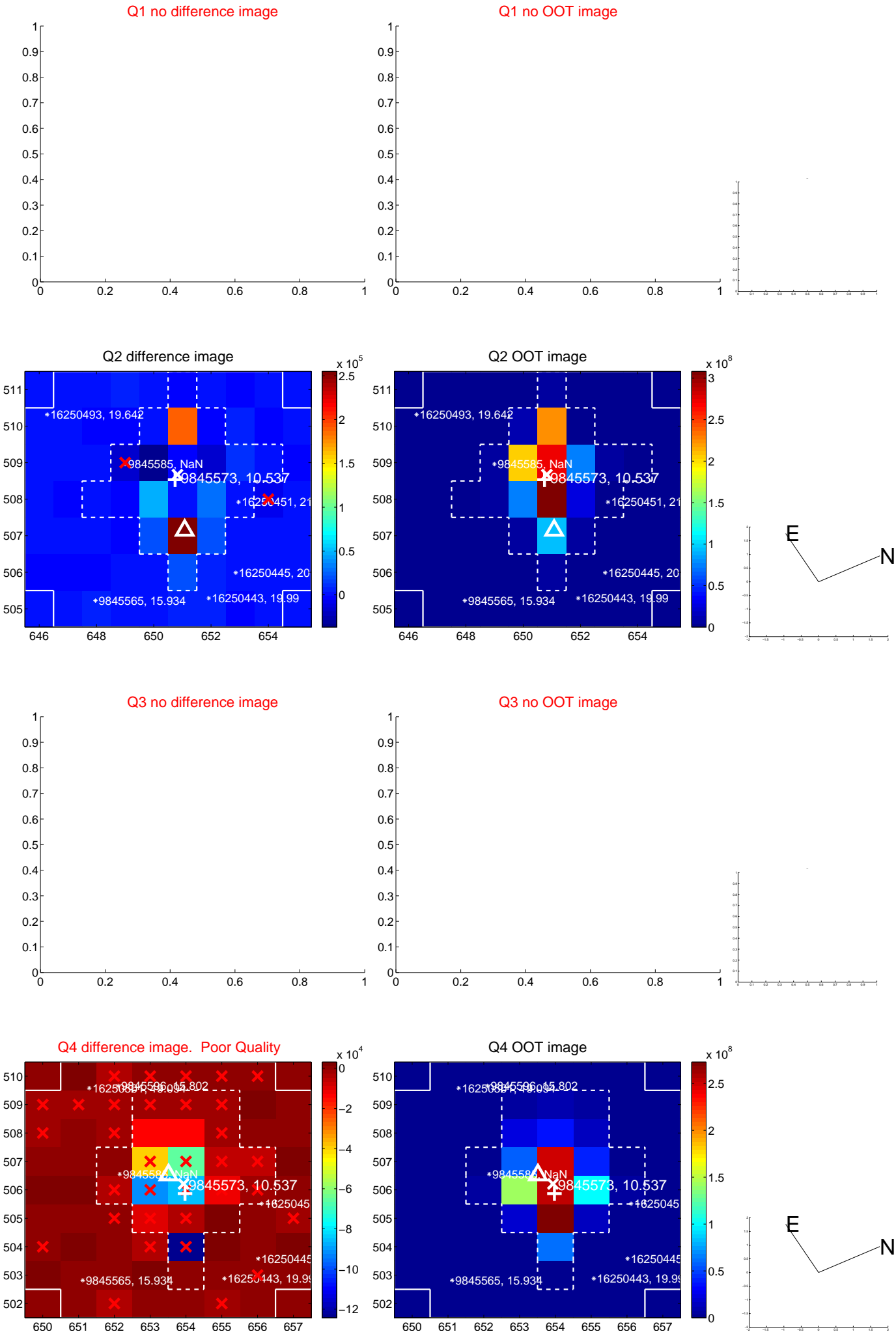
The direct PRF centroid is offset from the target star catalog position by about 0.64 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.419 \pm 0.733$	1.94	$-0.360 \pm 1.120$	$-1.373 \pm 0.576$
PRF-fit source offset from KIC position	$1.919 \pm 0.811$	2.37	$-0.849 \pm 1.107$	$-1.721 \pm 0.534$
photometric centroid source offset	$0.50 \pm 0.23$	2.14	$-0.29 \pm 0.30$	$-0.40 \pm 0.18$

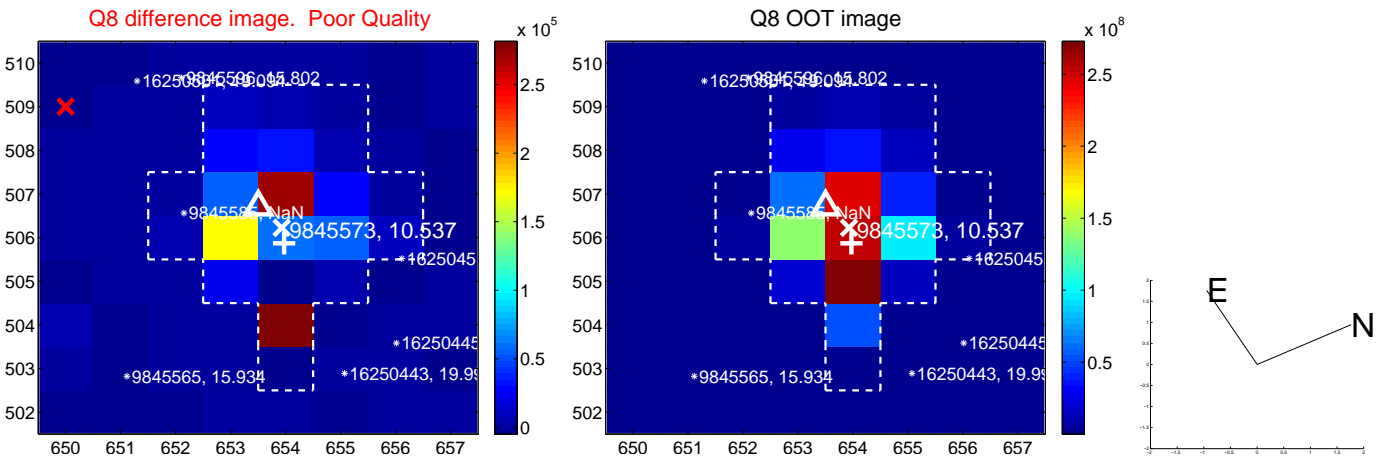
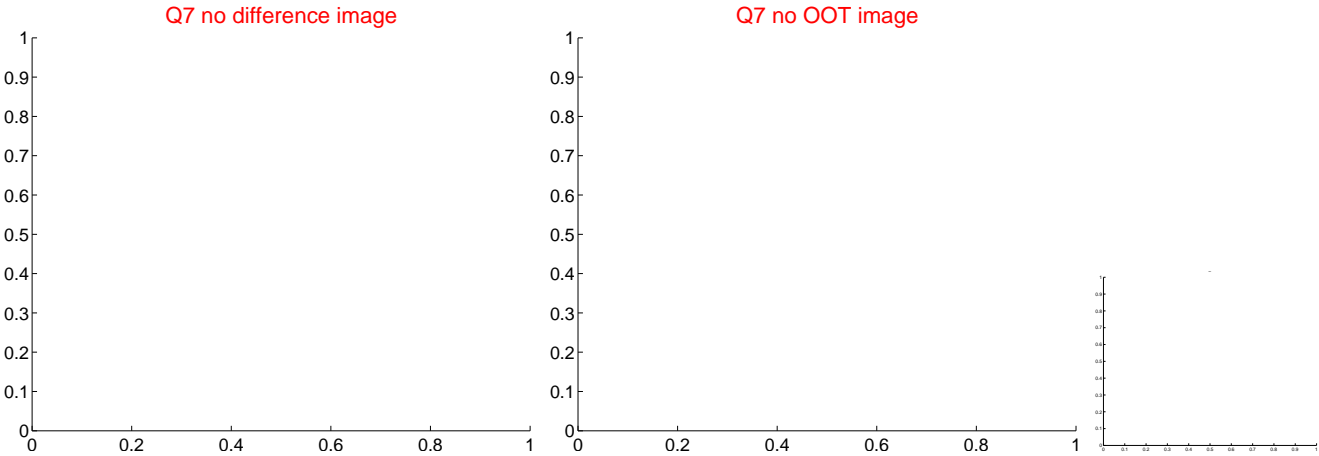
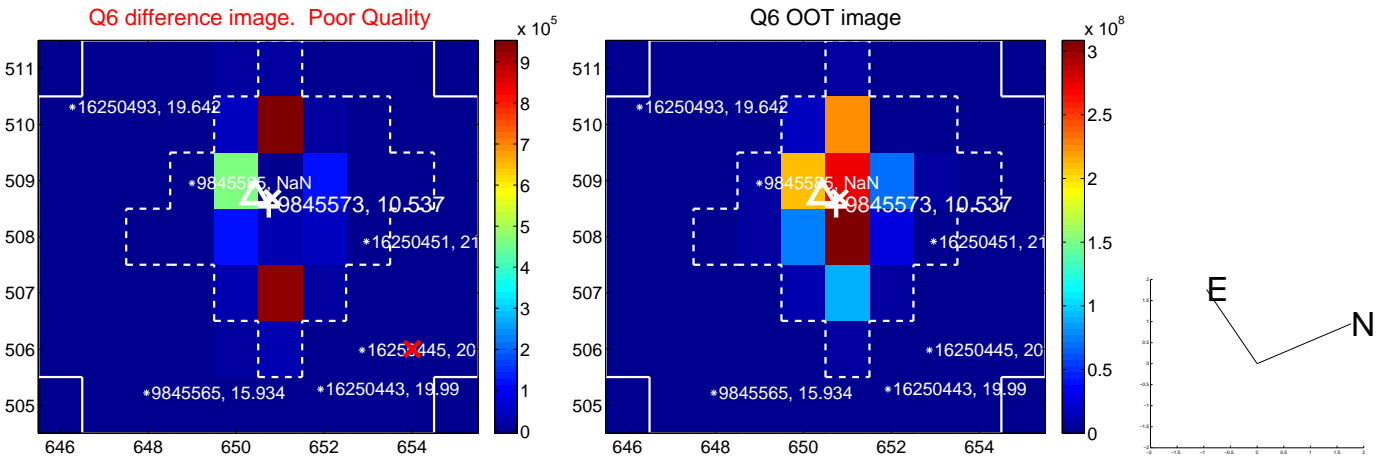
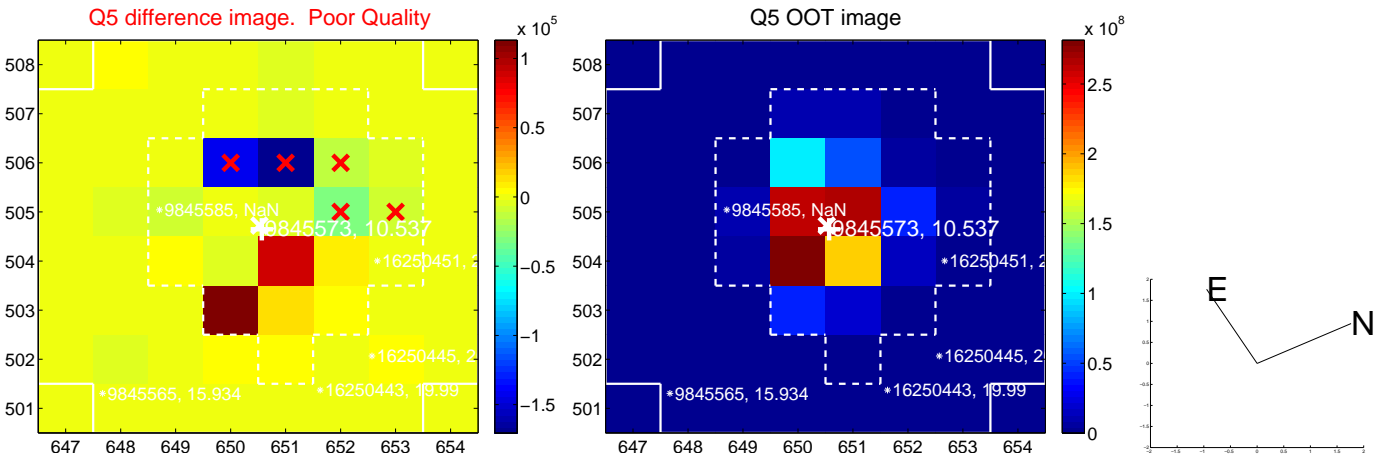


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

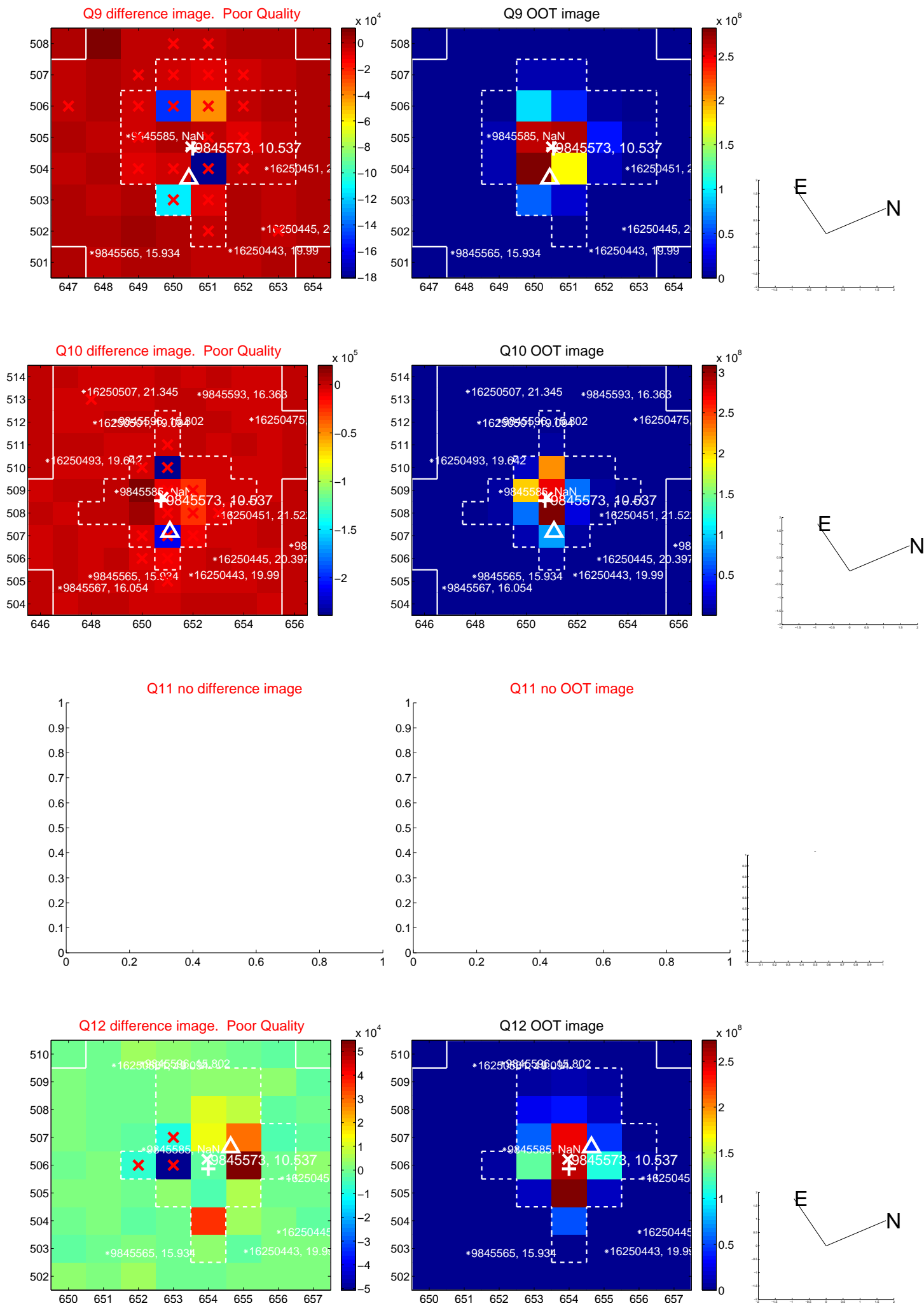
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

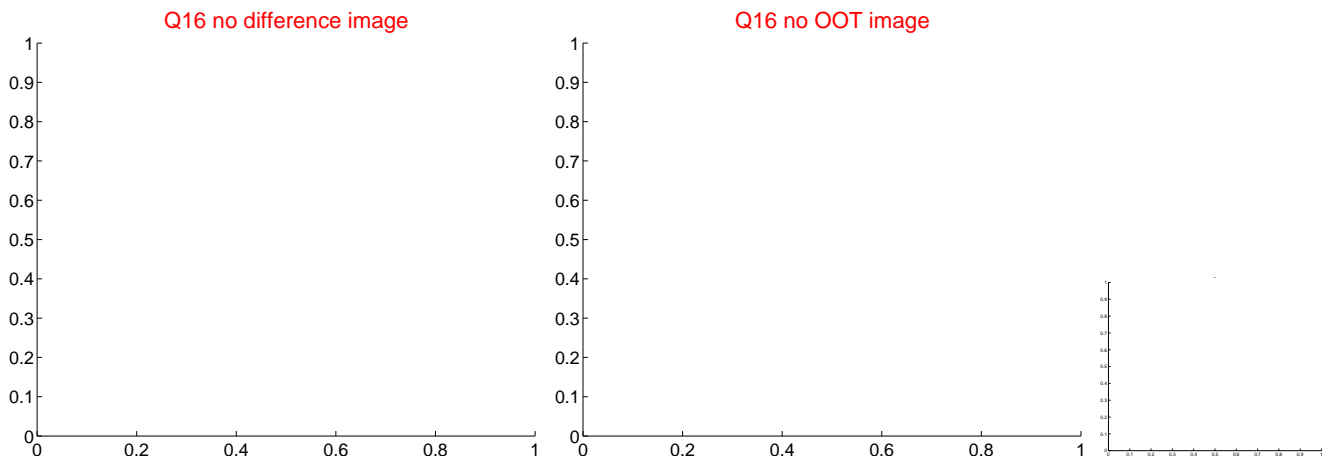
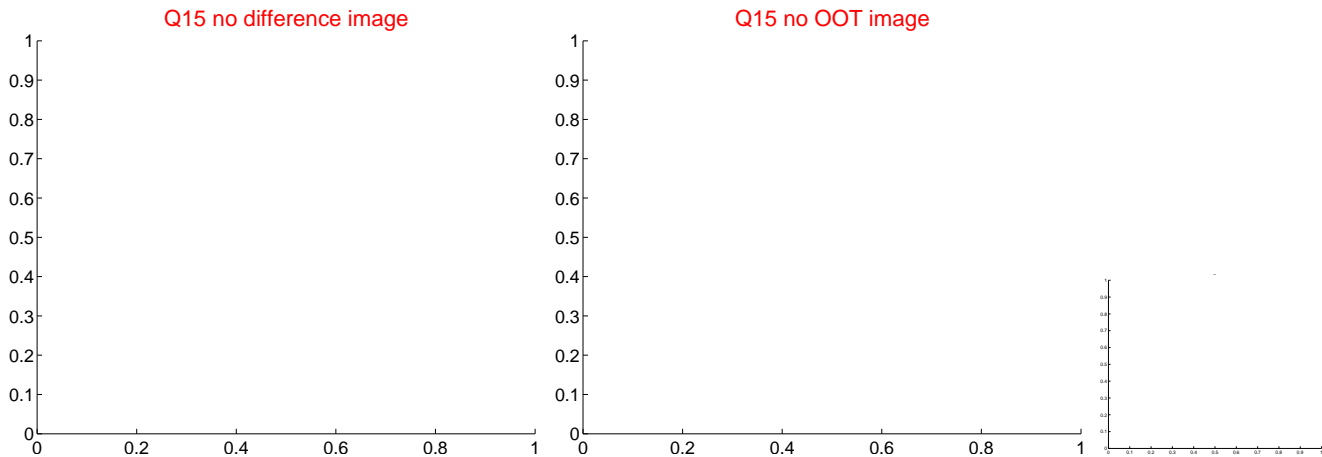
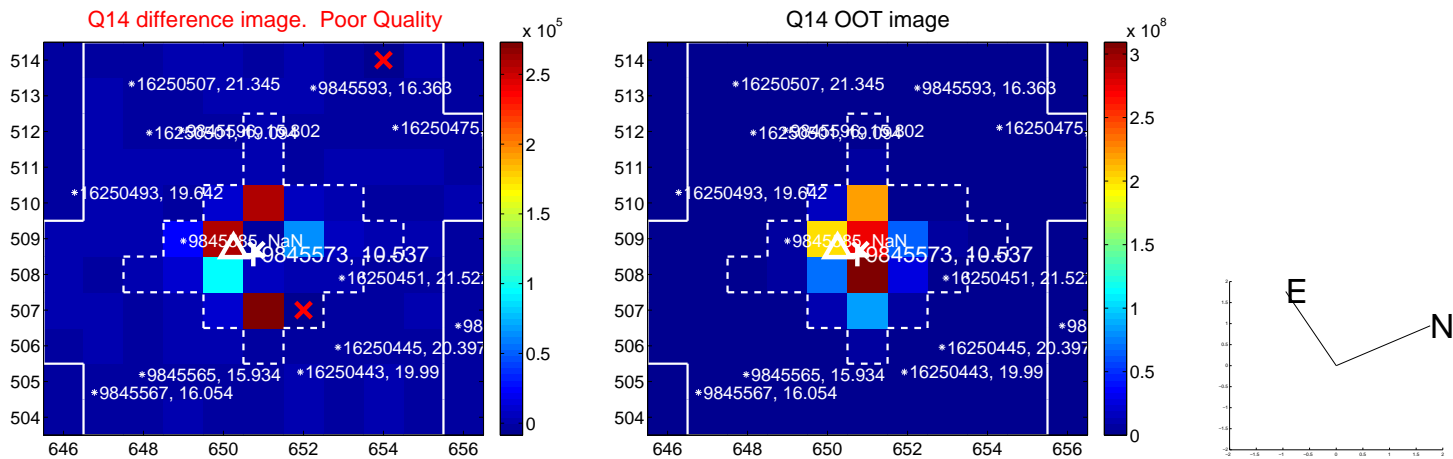
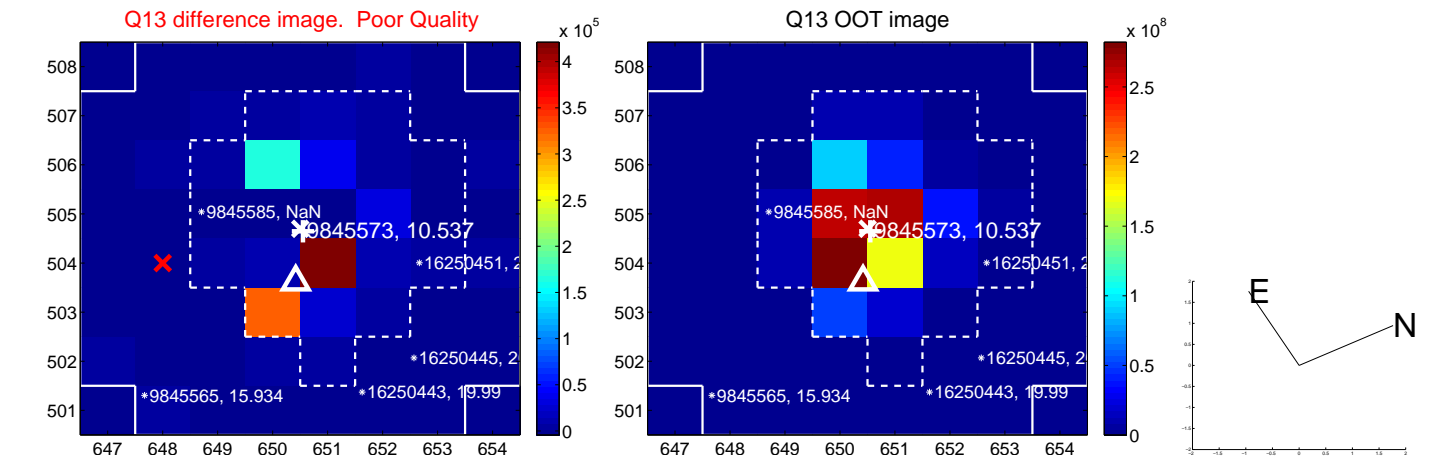


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

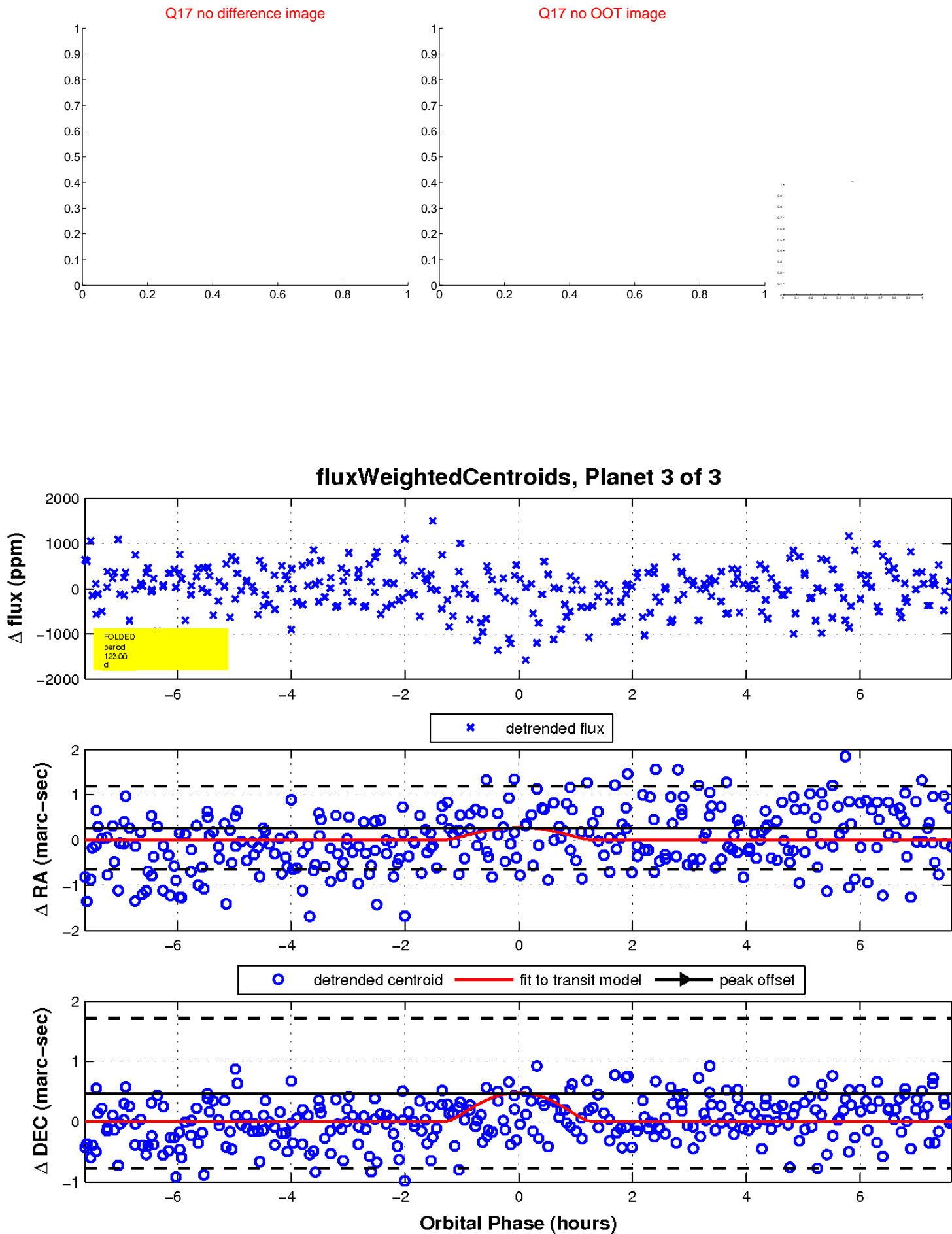




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

