

# KIC 007219906

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007219906-01	OBS	6033.01	35.089751	153.397468	4974.2	4.088	247.7	150.5	0.85	5603	9.29	14.97
007219906-02	OBS	No	35.089711	146.121806	1437.3	4.382	68.1	64.8	0.85	5603	6.21	14.97

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007219906-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_UNRESOLVED_OFFSET
007219906-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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 007219906-01

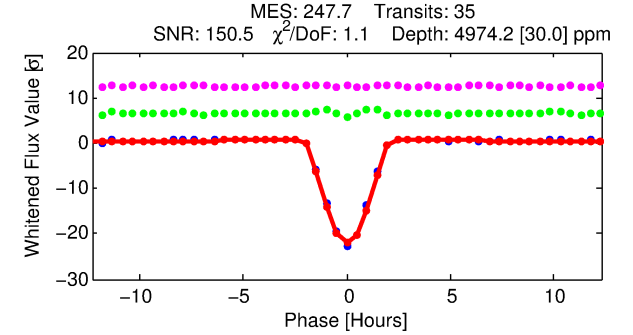
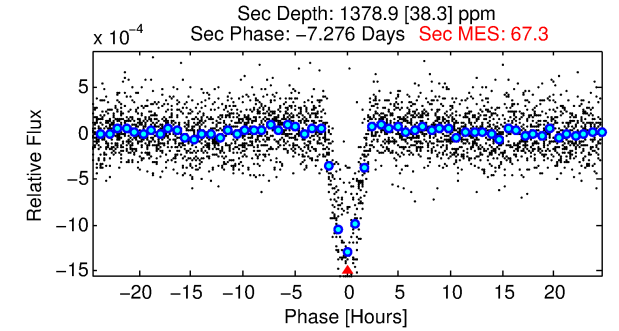
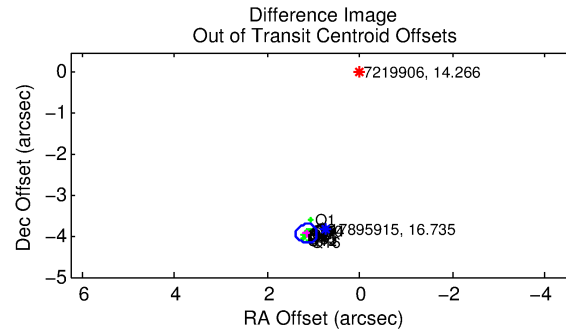
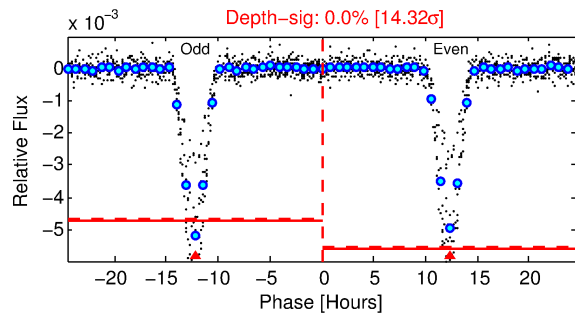
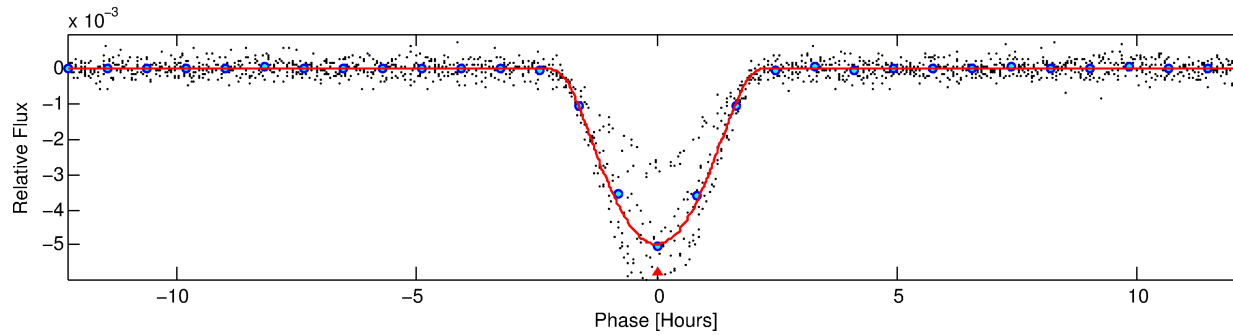
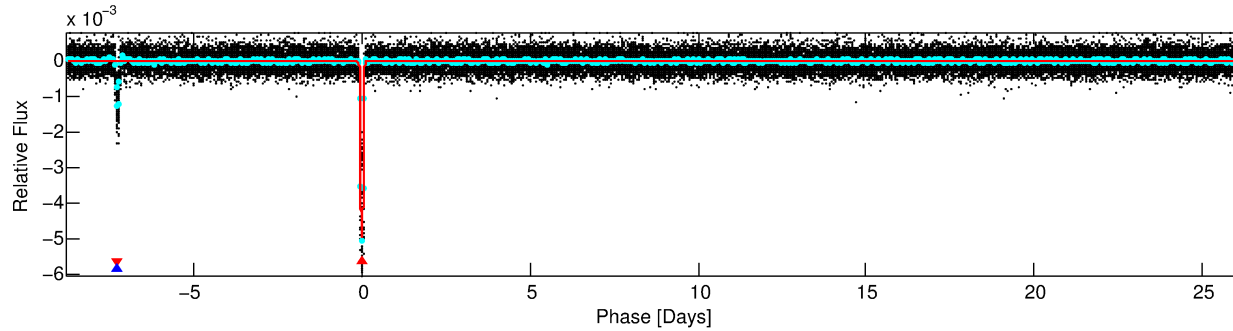
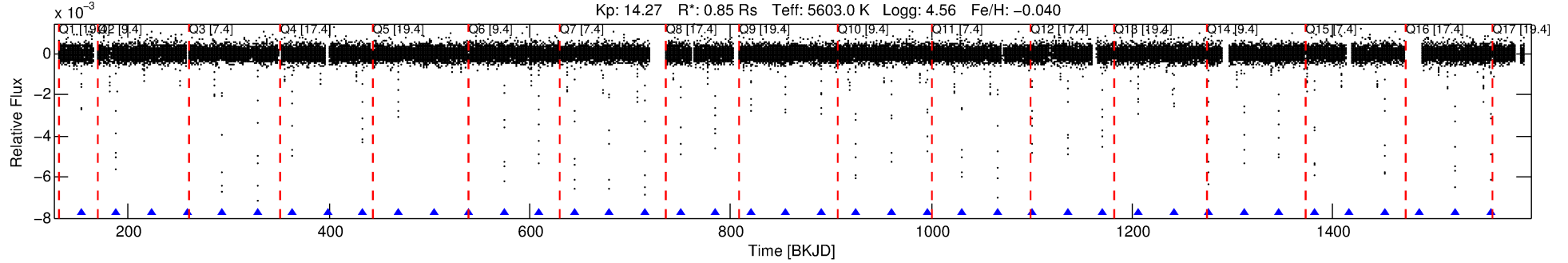
No Significant Match Found

# DV One-Page Summary

KIC: 7219906 Candidate: 1 of 2 Period: 35.090 d

KOI: K06033.01 Corr: 0.994

Kp: 14.27 R\*: 0.85 Rs Teff: 5603.0 K Logg: 4.56 Fe/H: -0.040



## DV Fit Results:

Period = 35.08975 [0.00002] d  
Epoch = 153.3975 [0.0005] BKJD  
Rp/R\* = 0.1006 [0.0122]  
a/R\* = 34.25 [1.12]  
b = 0.97 [0.02]  
Seff = 14.97 [5.17]  
Teq = 502 [43] K  
Rp = 9.29 [2.66] Re  
a = 0.2055 [0.0454] AU  
Ag = 371.44 [150.54] [2.46σ]  
Teff = 3404 [232] K [12.32σ]

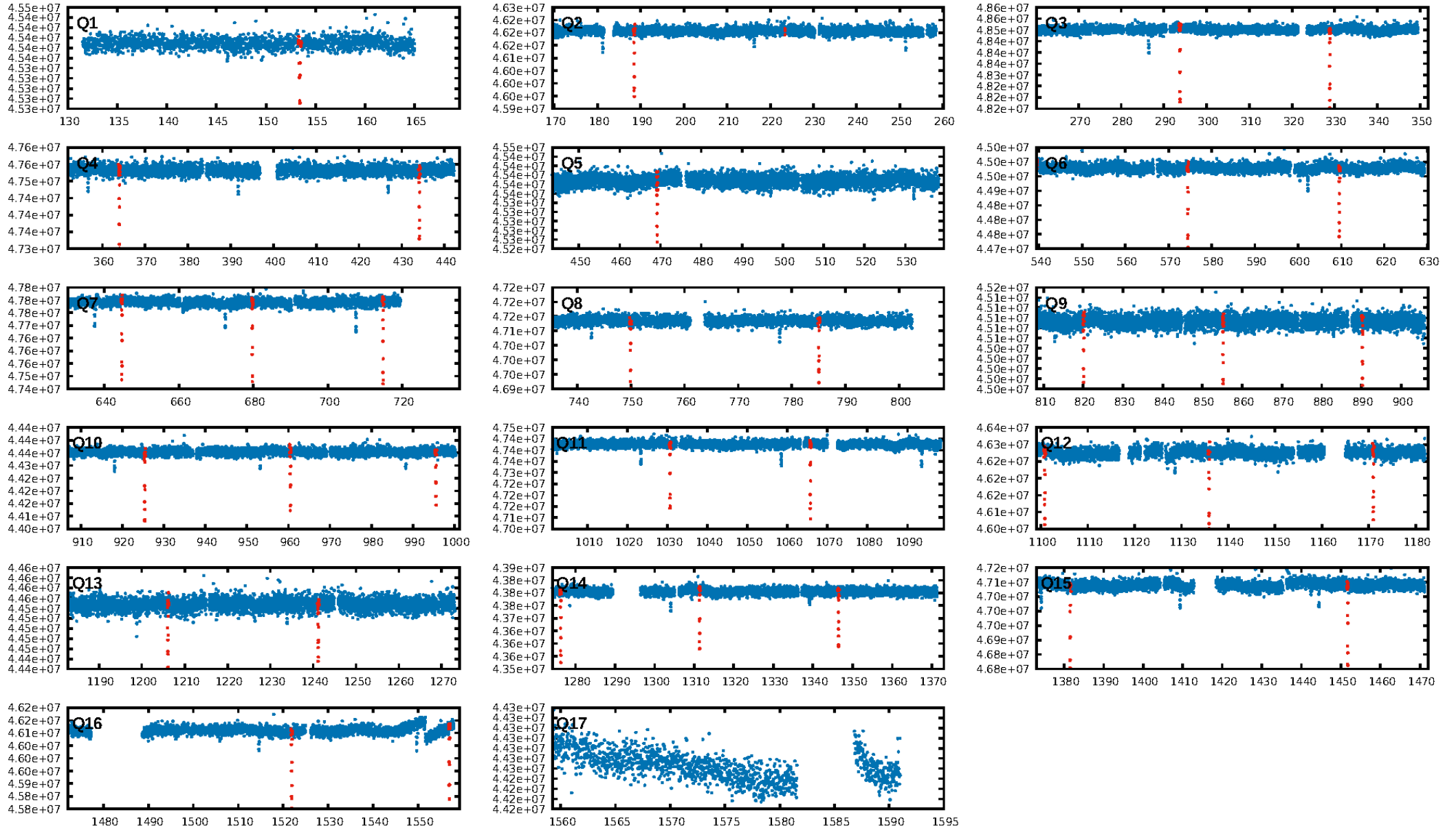
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGoF-sig: 99.9%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [34/34]  
GhostDiagnostic-chr: 0.7943  
Centroid-sig: 0.0%  
Centroid-so: 4.542 arcsec [107.57σ]  
OotOffset-rm: 4.097 arcsec [53.48σ]  
KicOffset-rm: 3.975 arcsec [54.71σ]  
OotOffset-st: 4/4/4/3 [15]  
KicOffset-st: 4/4/4/3 [15]  
DiffImageQuality-fgm: 1.00 [15/15]  
DiffImageOverlap-fno: 1.00 [15/15]

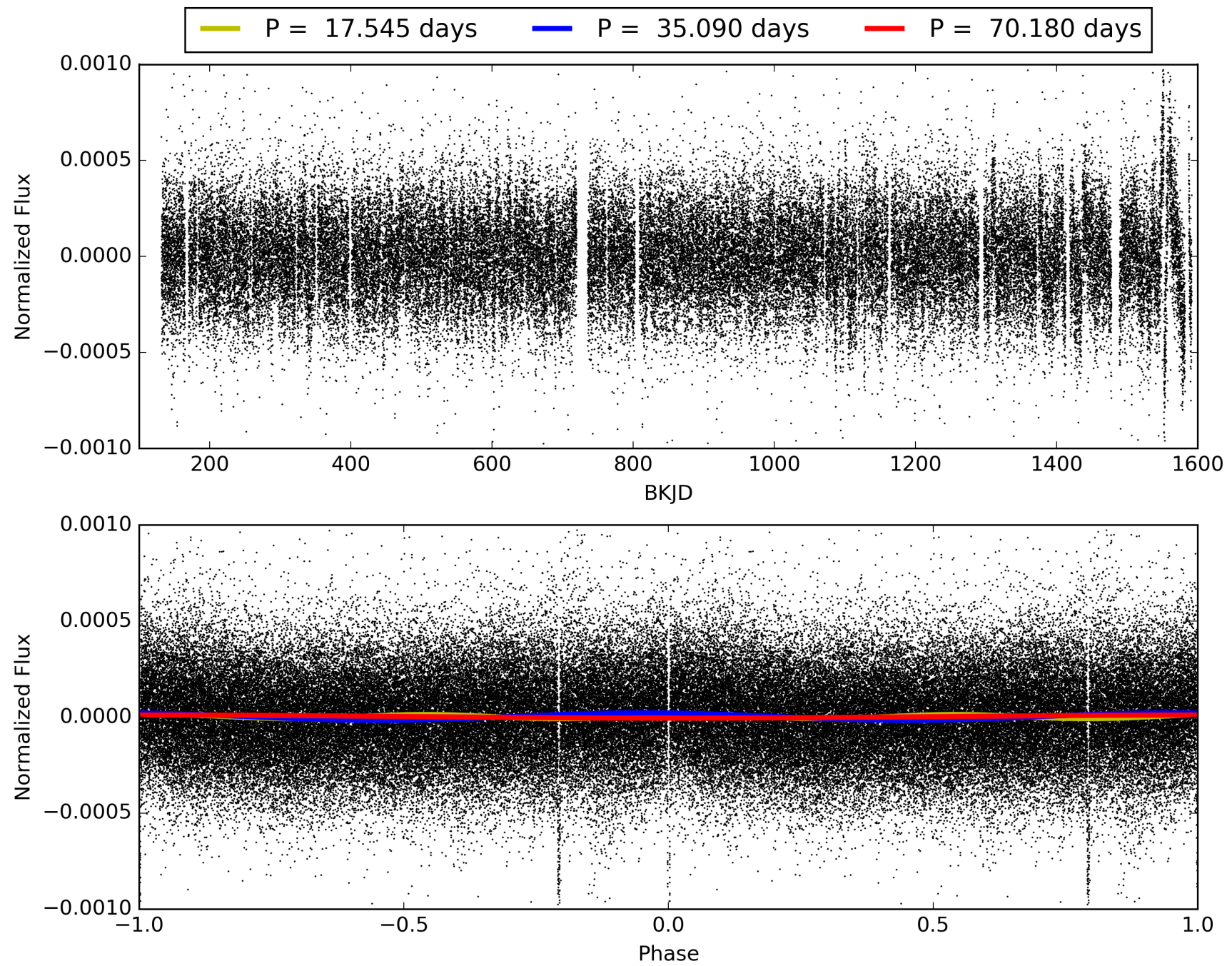
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:15:58 Z

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

# TCE 007219906-01, PDC Light Curves

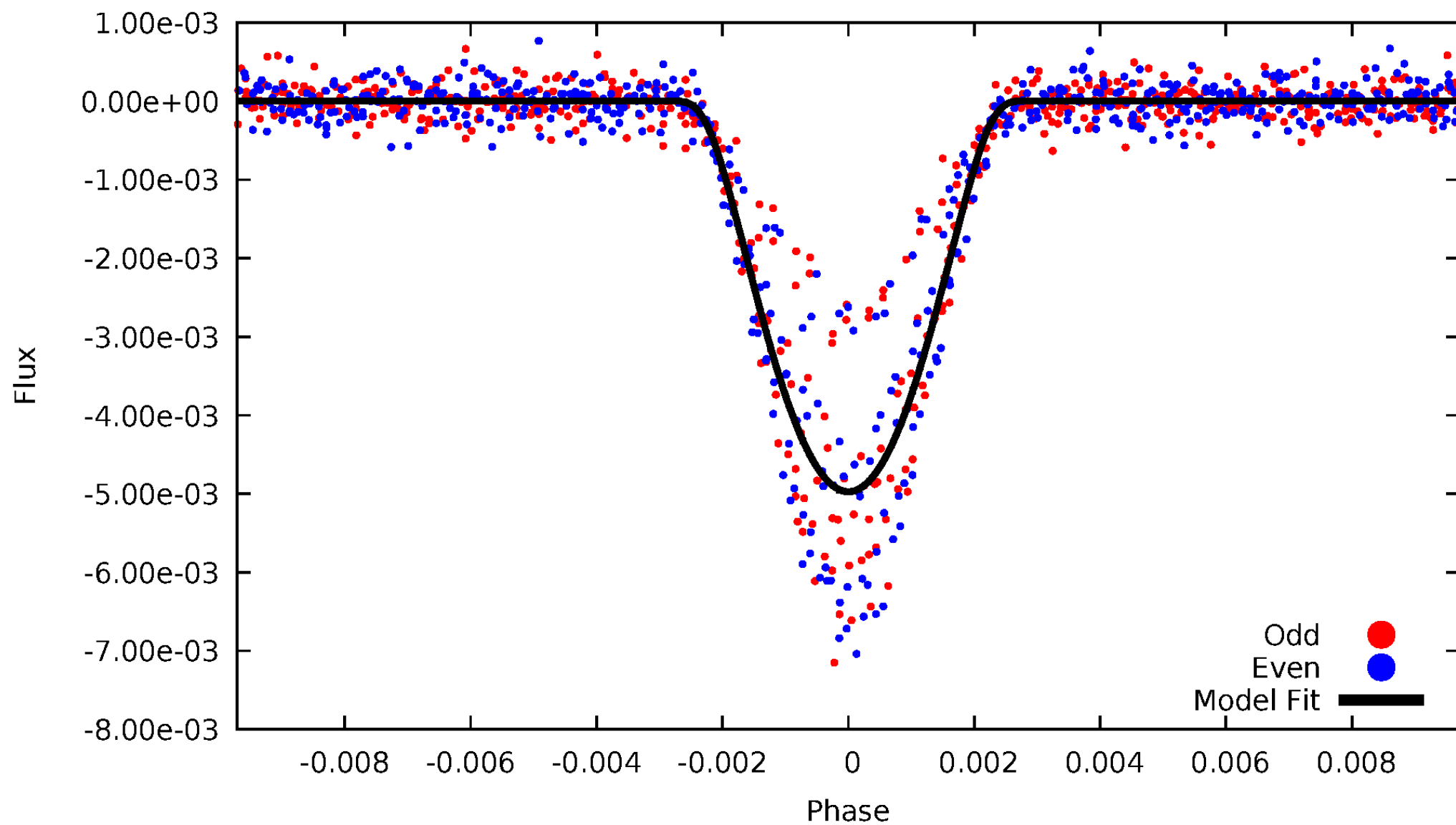


TCE 007219906-01



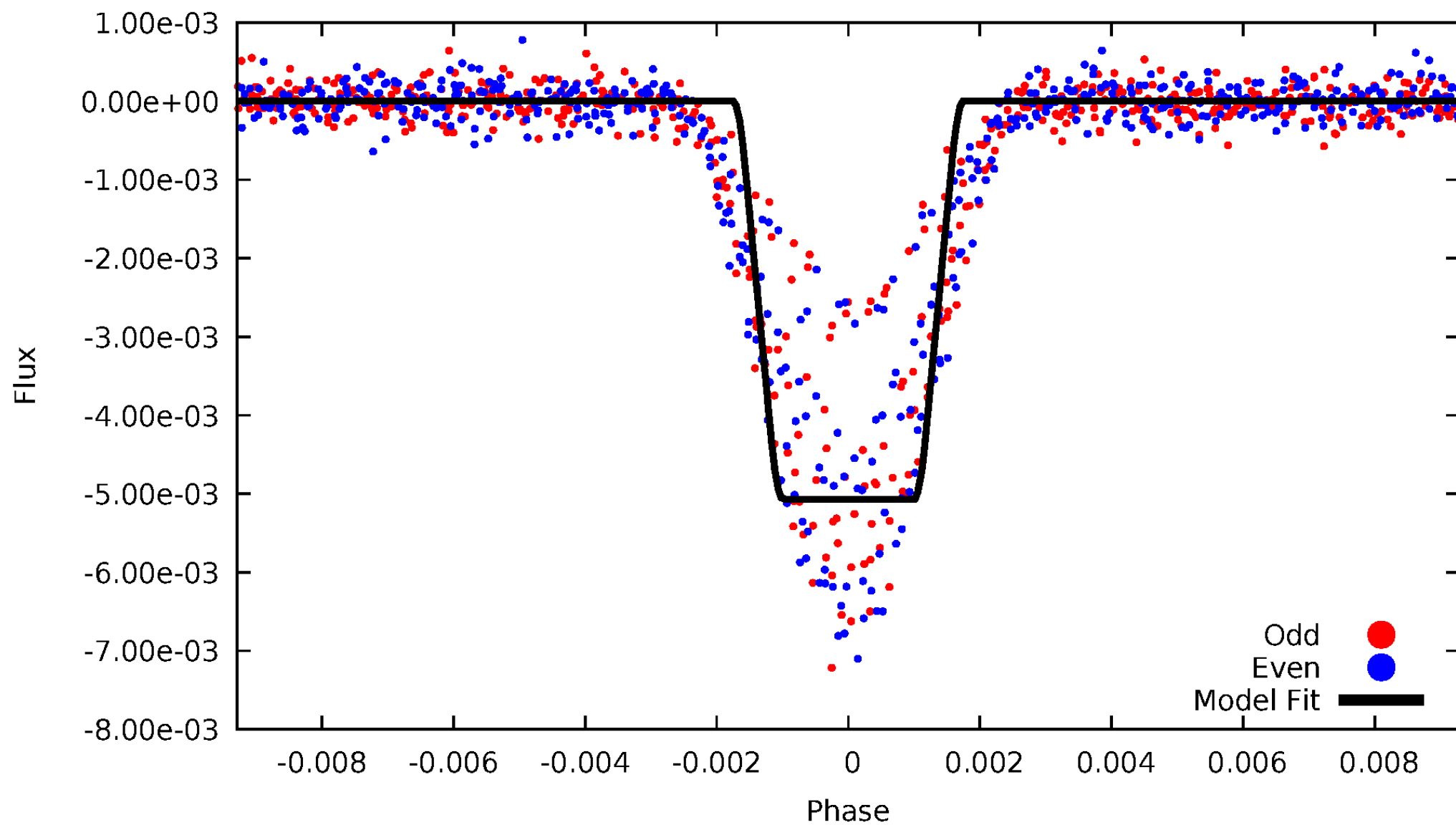
# DV Odd/Even

TCE 007219906-01

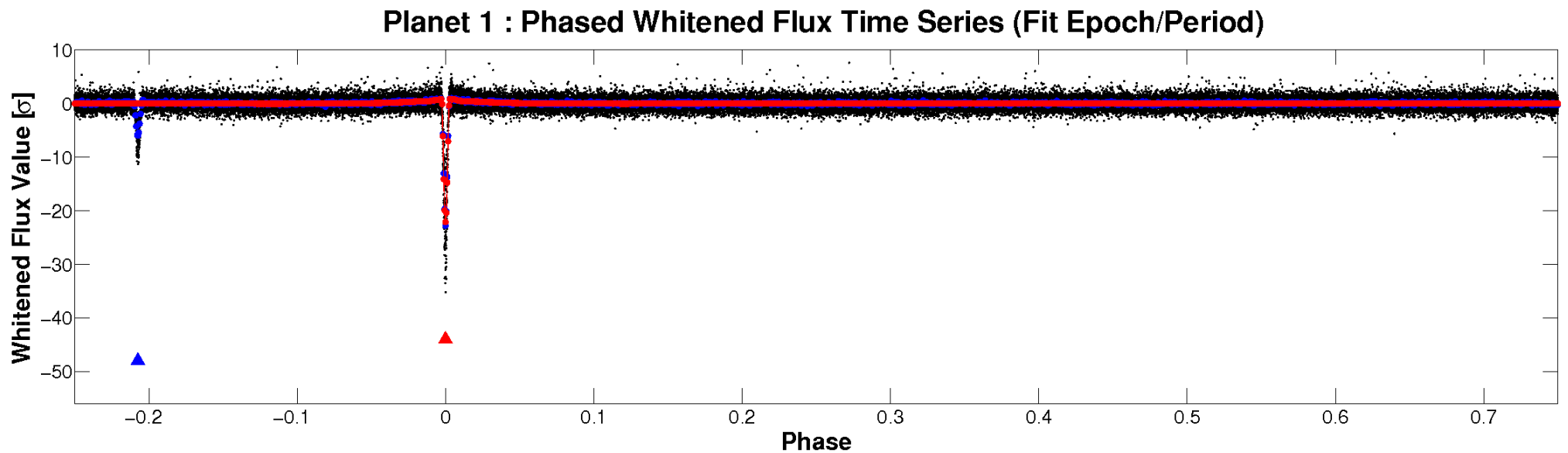
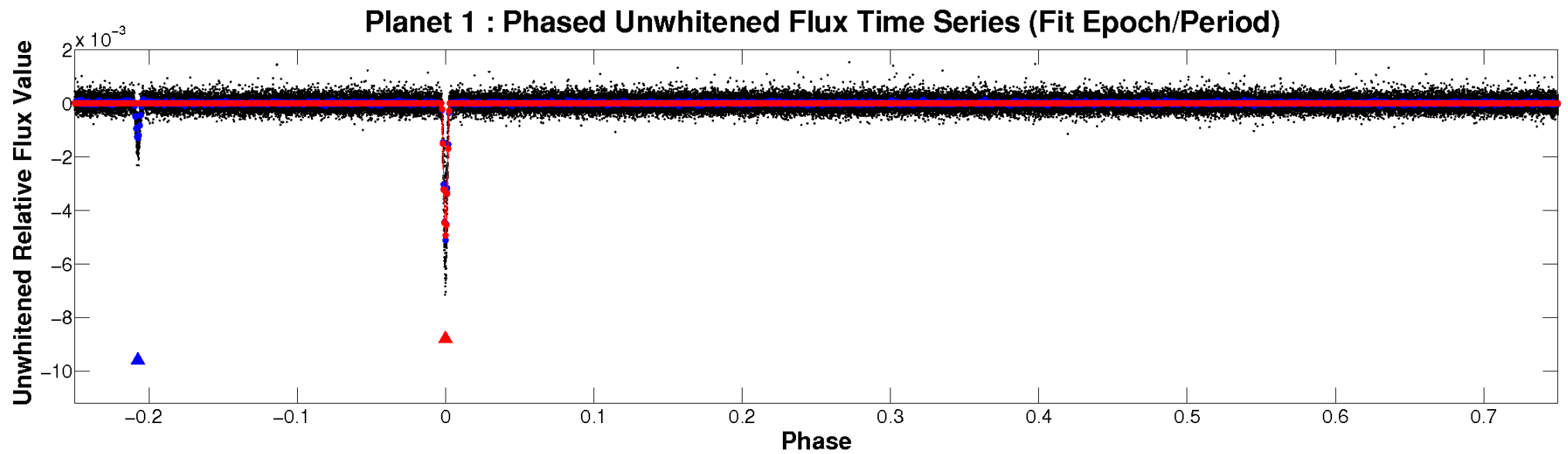


# ALT Odd/Even

TCE 007219906-01



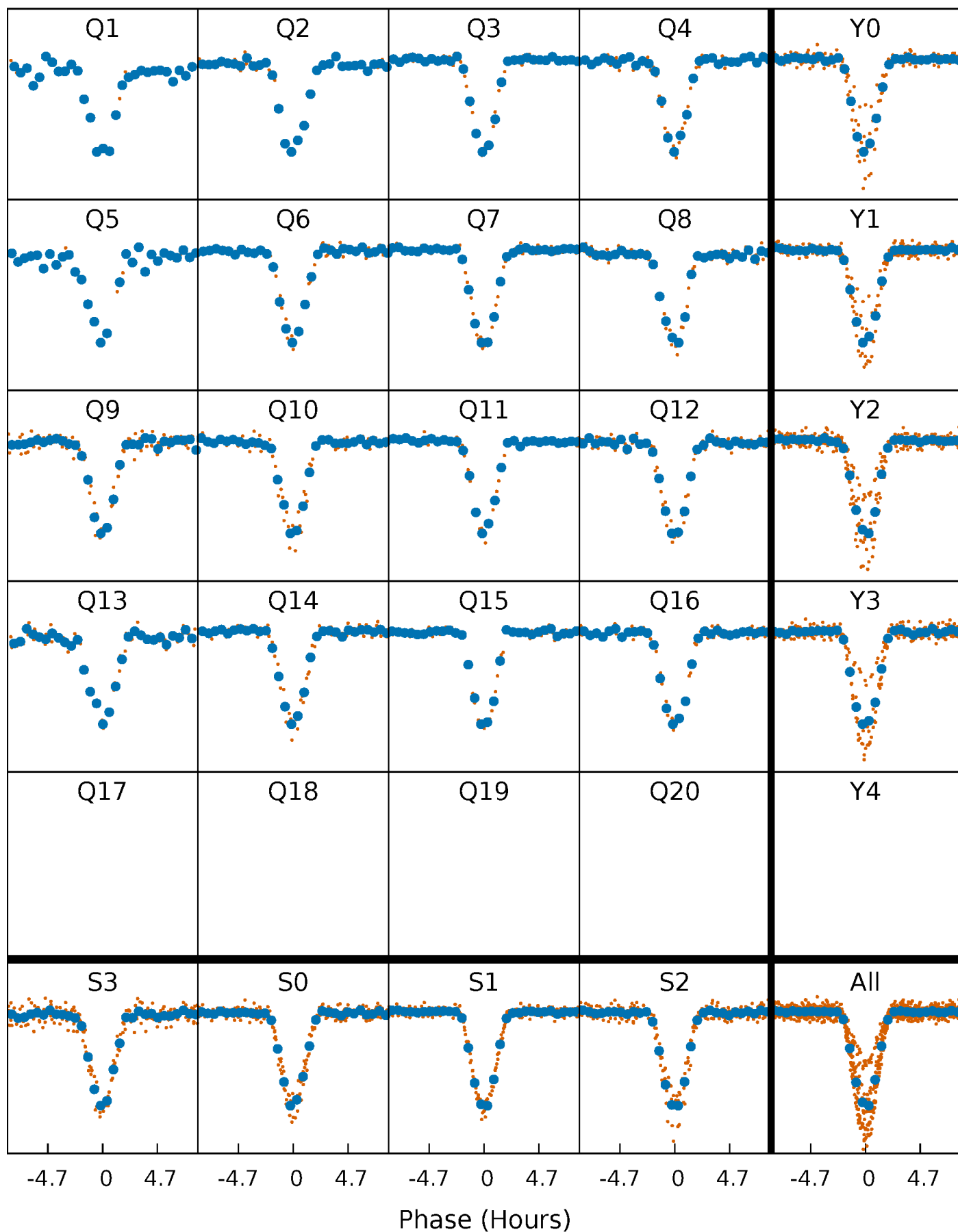
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

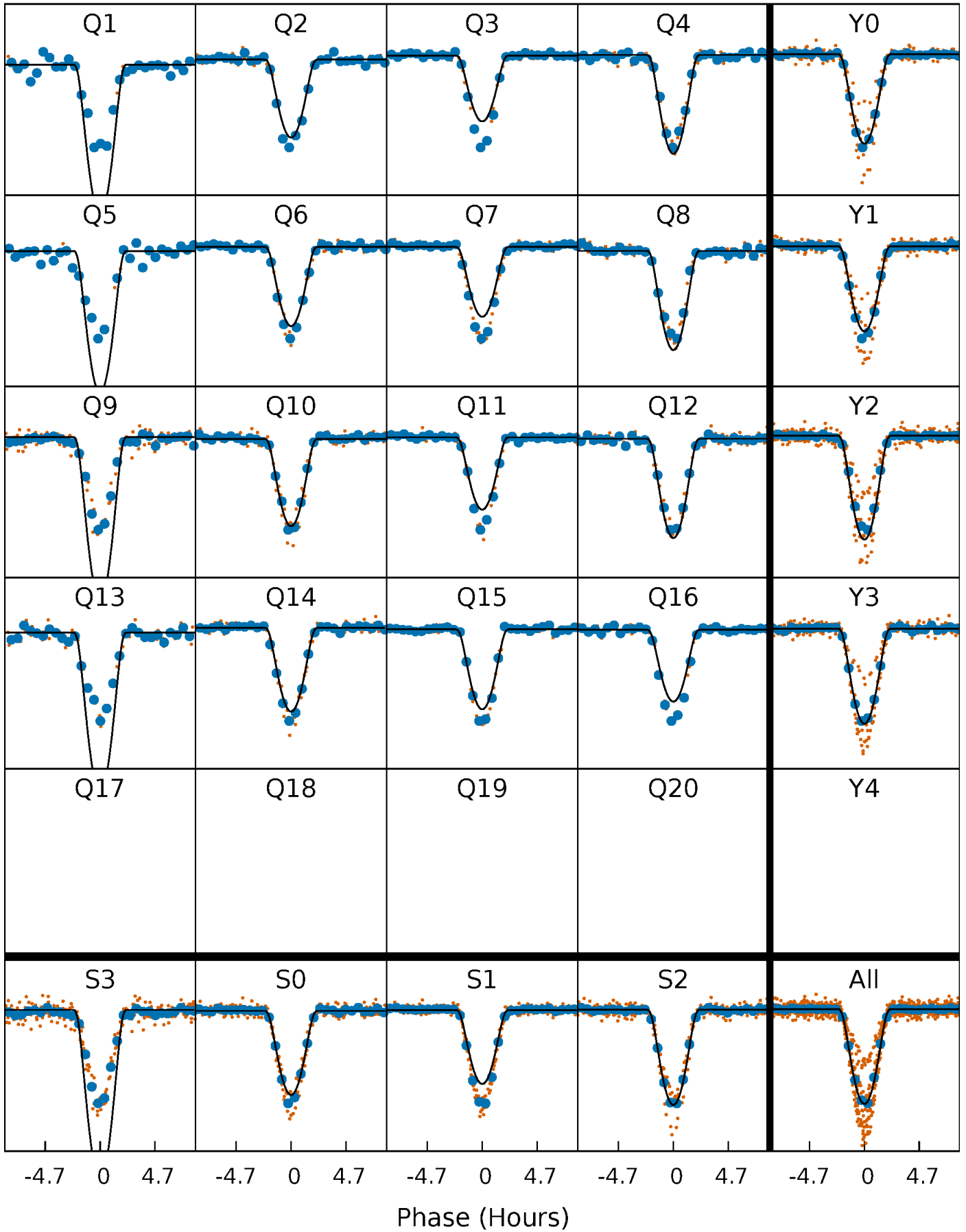
TCE 007219906-01 P= 35.089751 Days  $T_0=153.397468$  (BKJD)





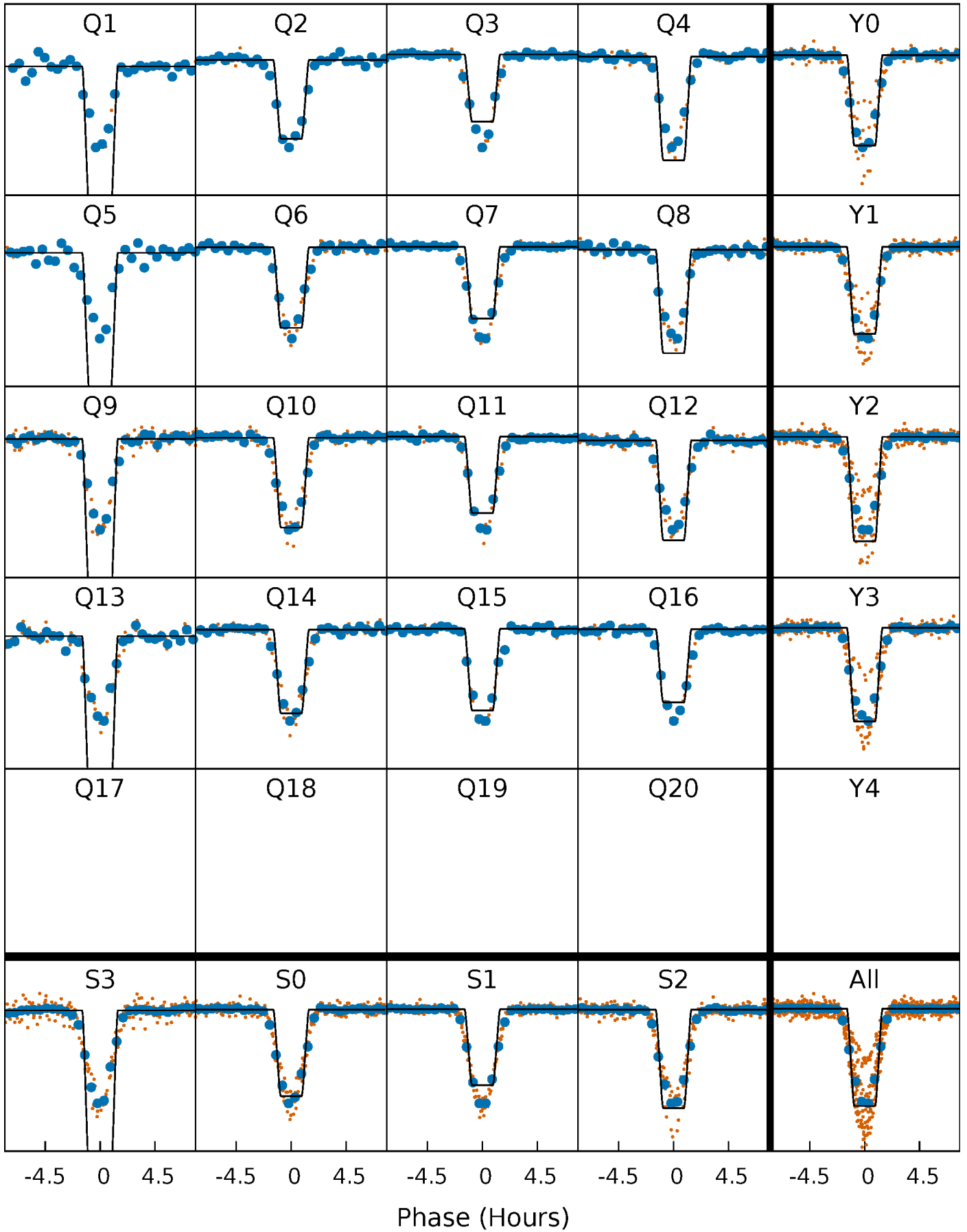
# DV Quarter-Phased Transit Curves

TCE 007219906-01 P= 35.089751 Days  $T_0=153.397468$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

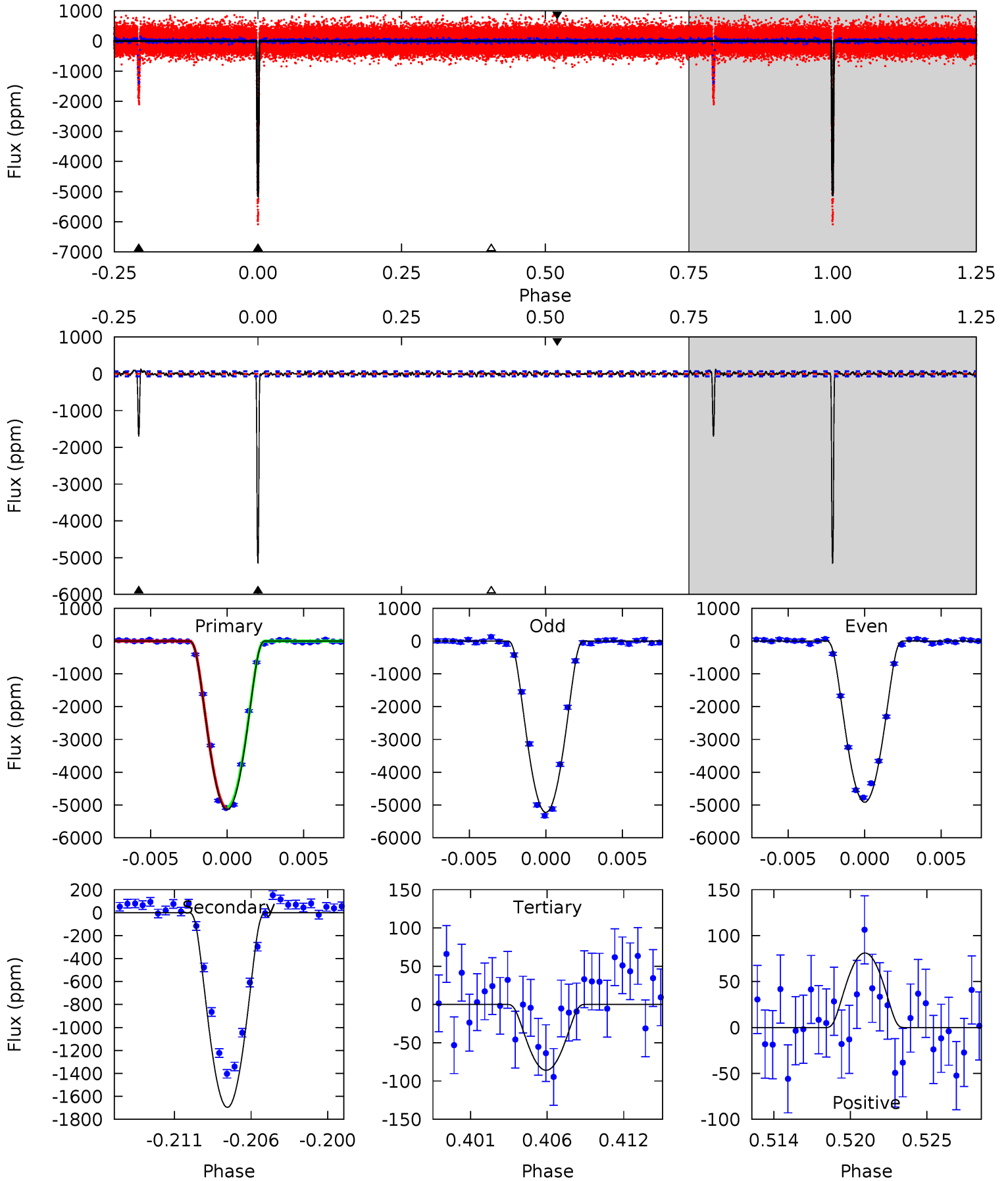
TCE 007219906-01 P= 35.089680 Days  $T_0=153.398866$  (BKJD)



# DV Model-Shift Uniqueness Test

007219906-01, P = 35.089751 Days, E = 118.307717 Days

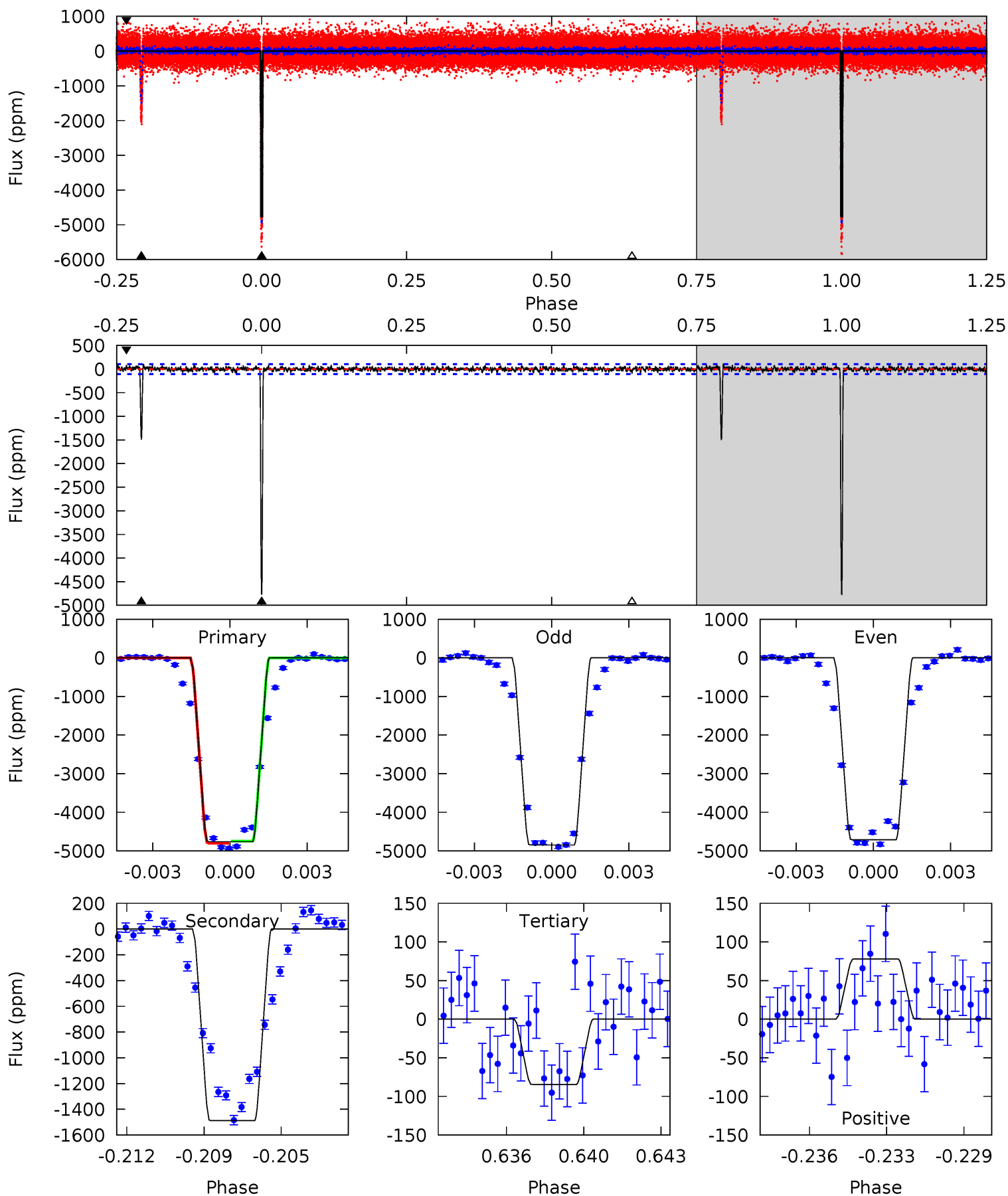
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
378.9	125.0	6.33	5.98	5.14	2.78	1.91	372.6	372.9	118.7	119.0	11.3	0.97	0.02	0



# Alt Model-Shift Uniqueness Test

007219906-01, P = 35.089680 Days, E = 118.309186 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
235.4	73.5	4.18	3.85	5.23	2.93	1.26	231.3	231.6	69.4	69.7	3.24	0.98	0.02	0



### Stellar Parameters For KIC 007219906

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5603^{+152}_{-169}$	$4.556^{+0.031}_{-0.178}$	$-0.040^{+0.300}_{-0.300}$	$0.846^{+0.220}_{-0.073}$	$0.941^{+0.085}_{-0.104}$	$2.188^{+0.366}_{-1.006}$
	+3%/-3%	+1%/-4%	+750%/-750%	+26%/-9%	+9%/-11%	+17%/-46%
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 007219906-01 / KOI 6033.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1696 \pm 14$	$9.78^{+1.61}_{-1.42}$	$717^{+44}_{-31}$	$3911^{+193}_{-165}$	$407^{+144}_{-102}$
Alt.	$-1488 \pm 20$	$6.93^{+1.33}_{-1.27}$	$719^{+43}_{-32}$	$4341^{+312}_{-260}$	$711^{+341}_{-213}$

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

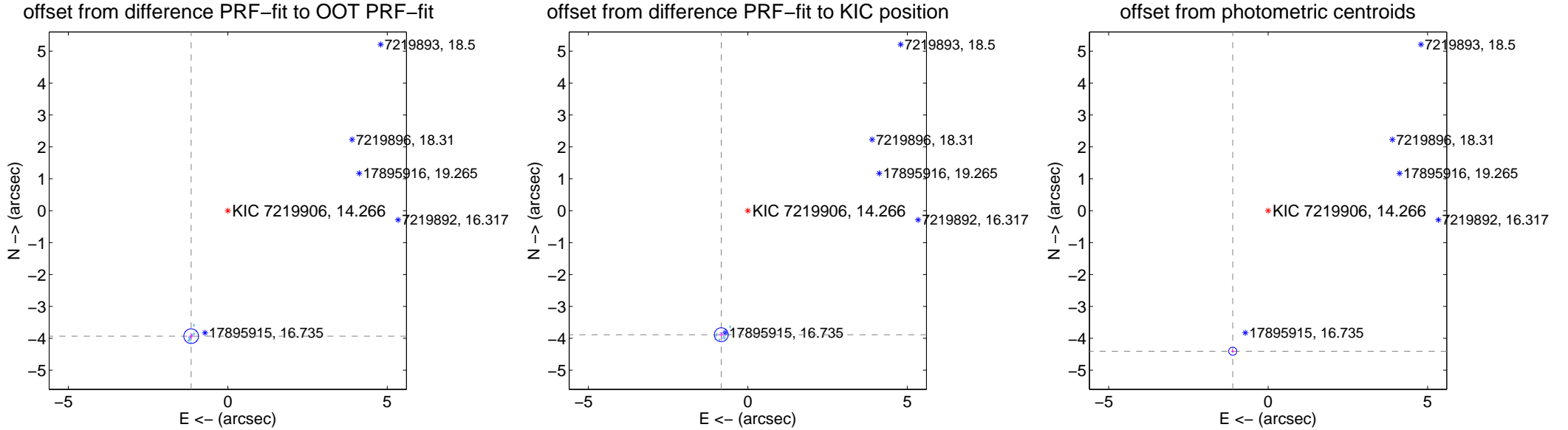
## DV Centroid Data

Supplemental centroid analysis for 007219906-01. Kepler magnitude: 14.27. Transit SNR 150.52

There are 15 quarters with good PRF difference image offsets

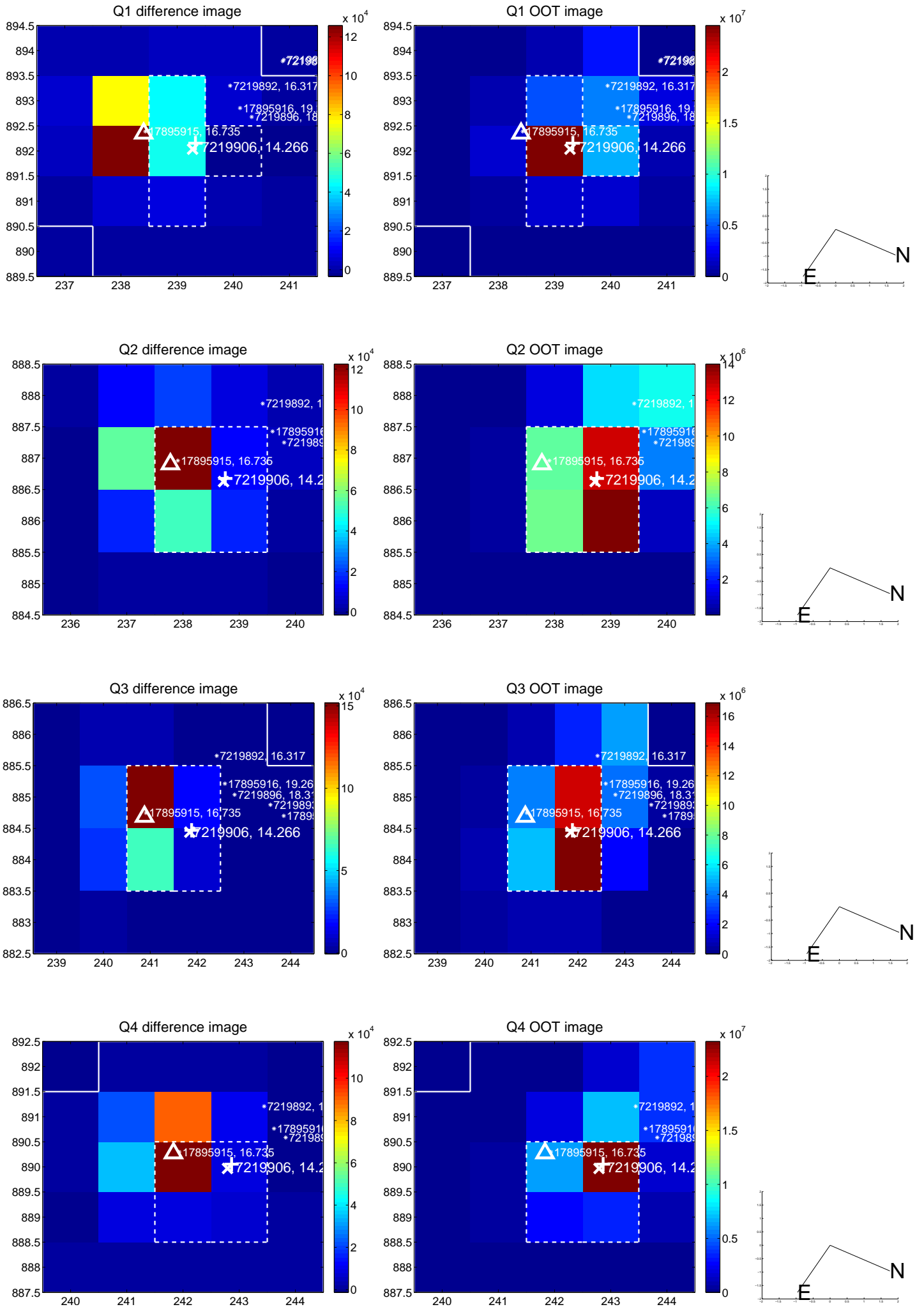
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.097 \pm 0.077$	<b>53.48</b>	$1.149 \pm 0.069$	$-3.932 \pm 0.075$
PRF-fit source offset from KIC position	$3.975 \pm 0.073$	<b>54.71</b>	$0.833 \pm 0.074$	$-3.887 \pm 0.071$
photometric centroid source offset	$4.54 \pm 0.04$	<b>107.57</b>	$1.11 \pm 0.05$	$-4.40 \pm 0.04$



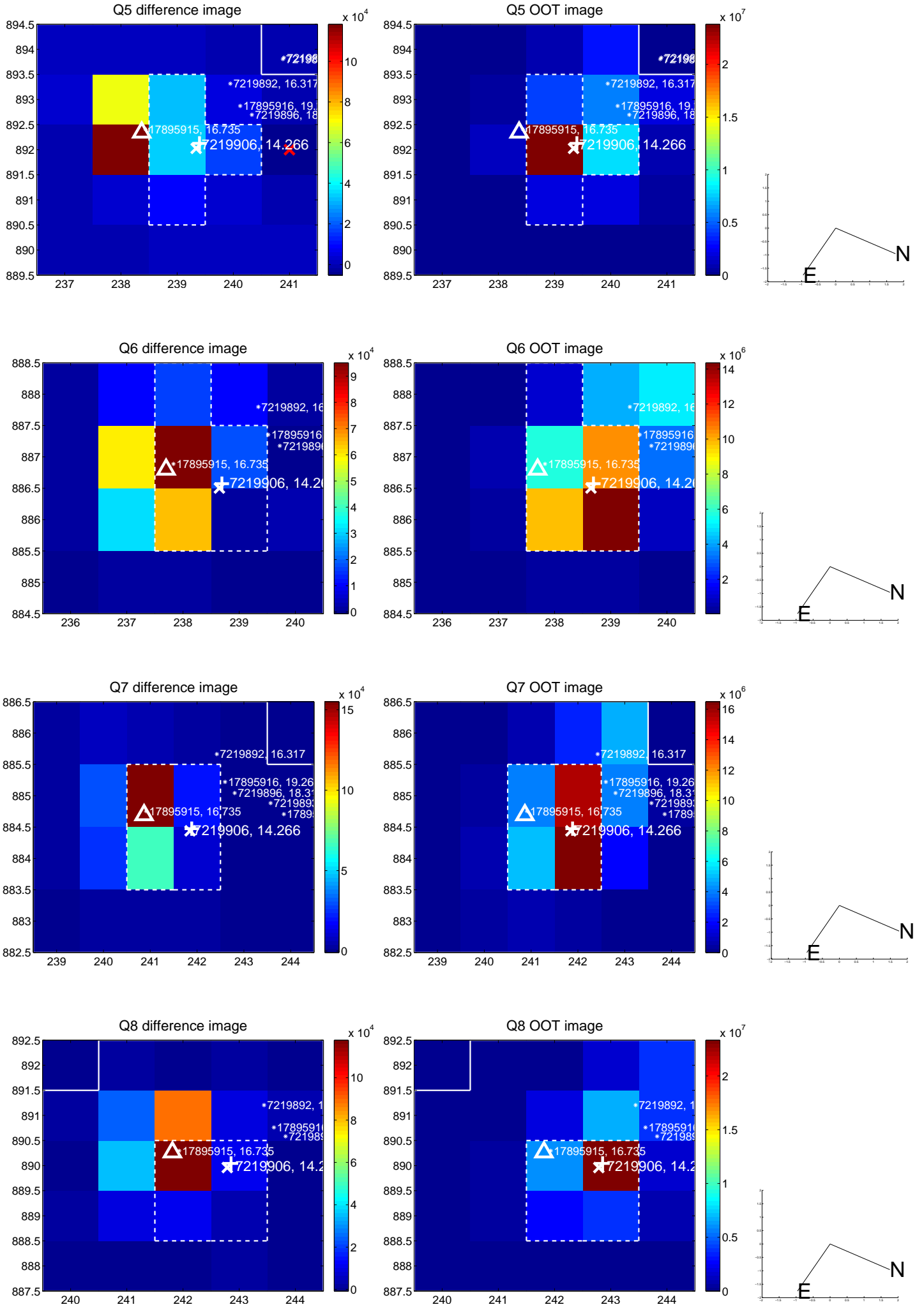
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

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

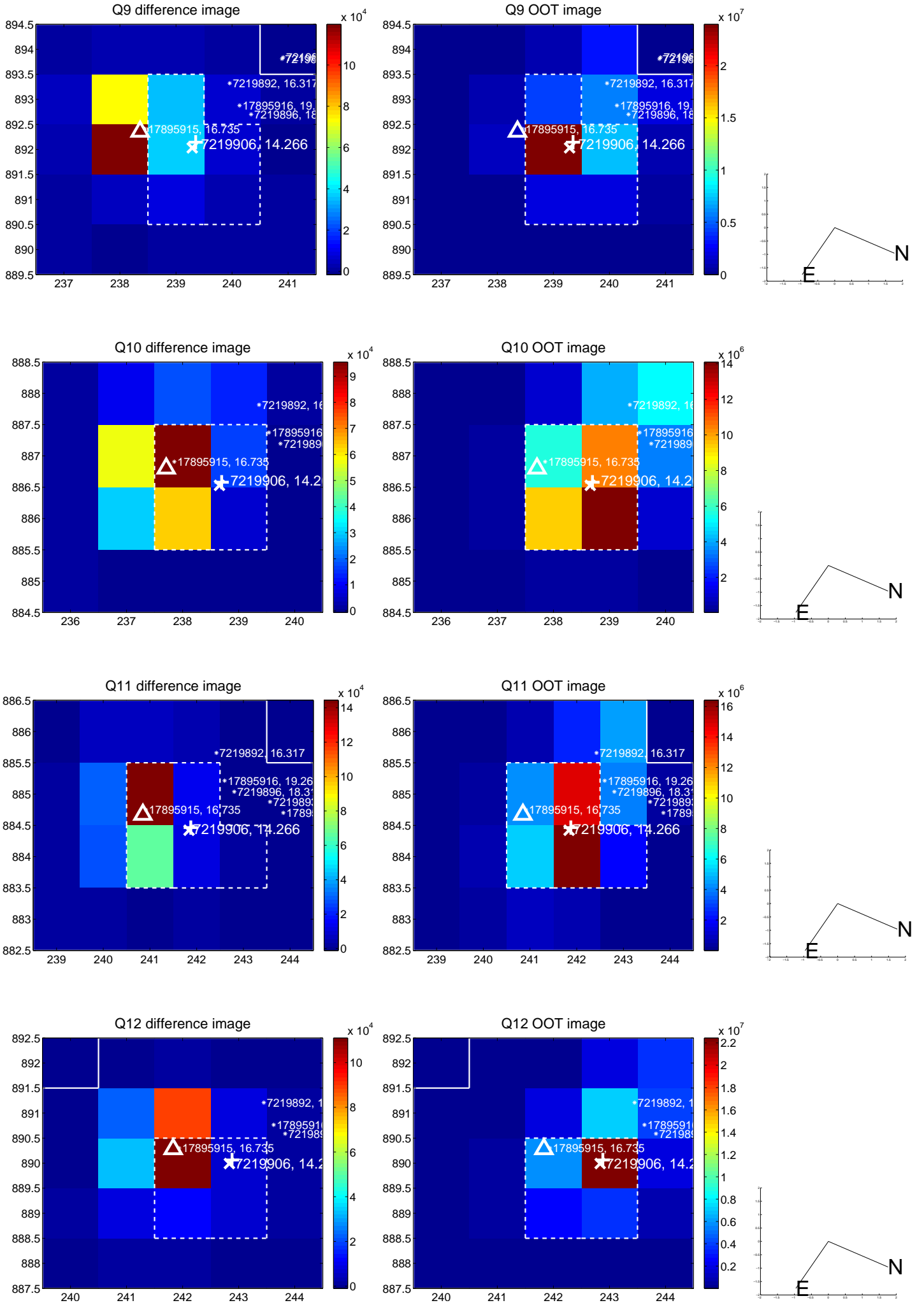




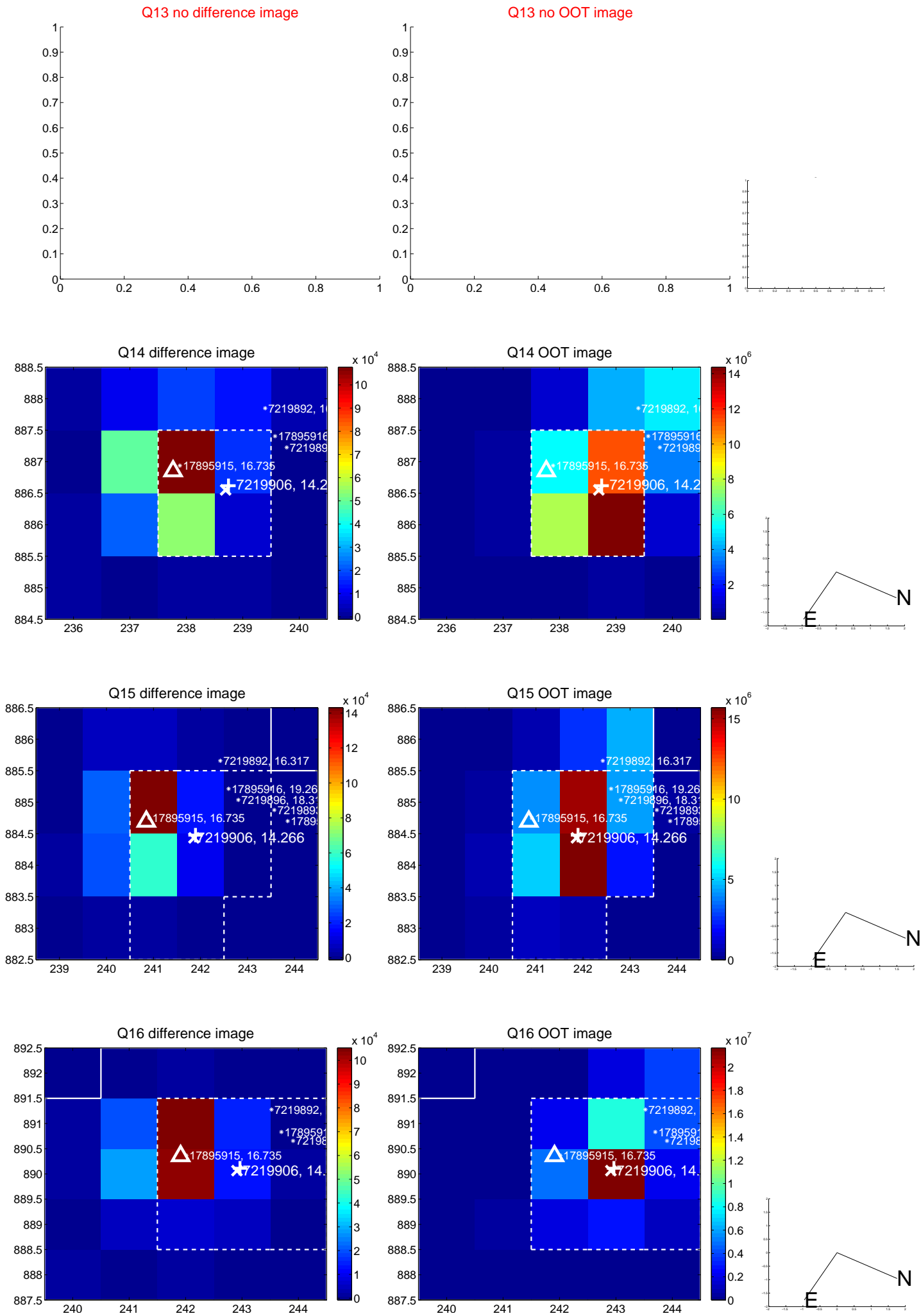
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



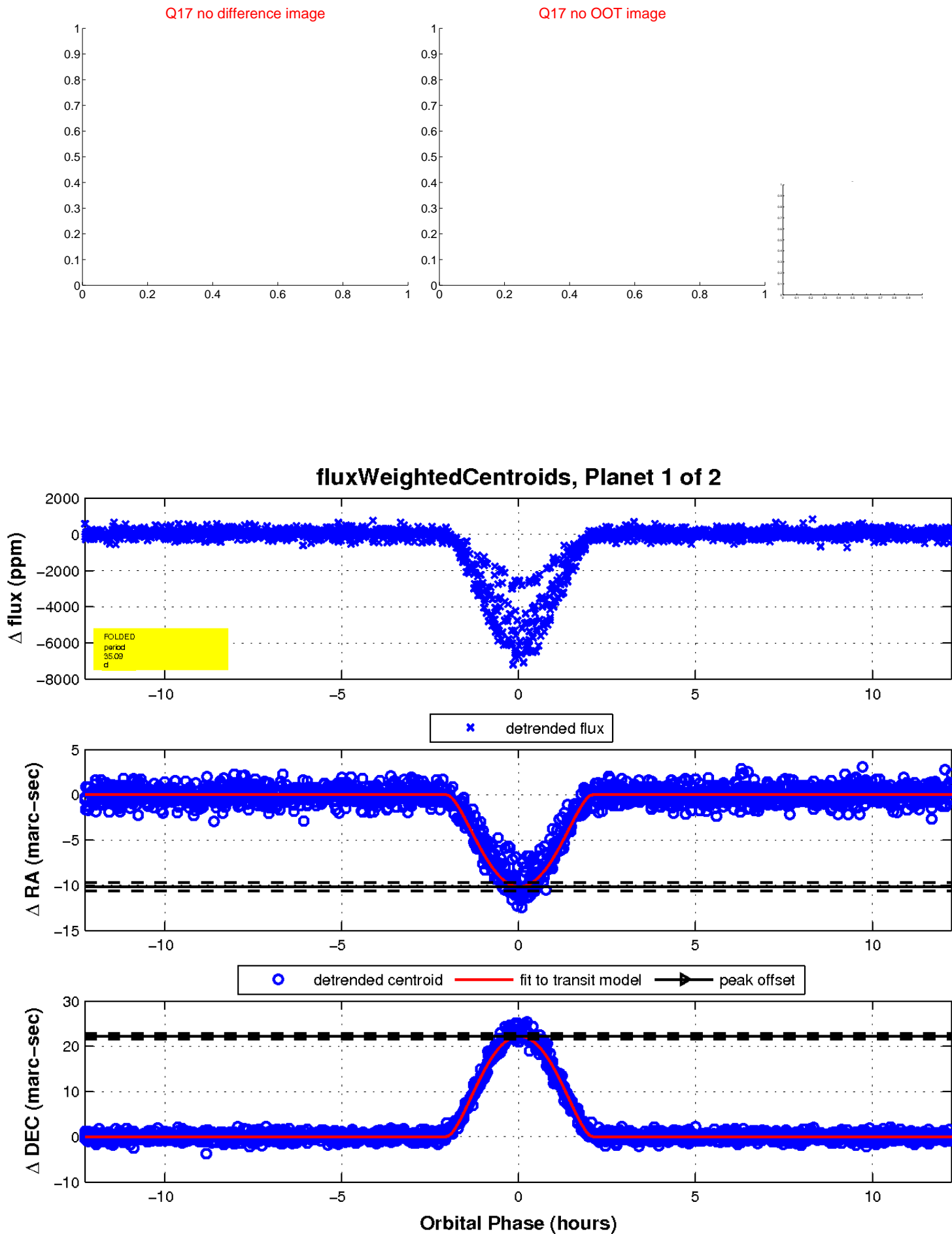
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

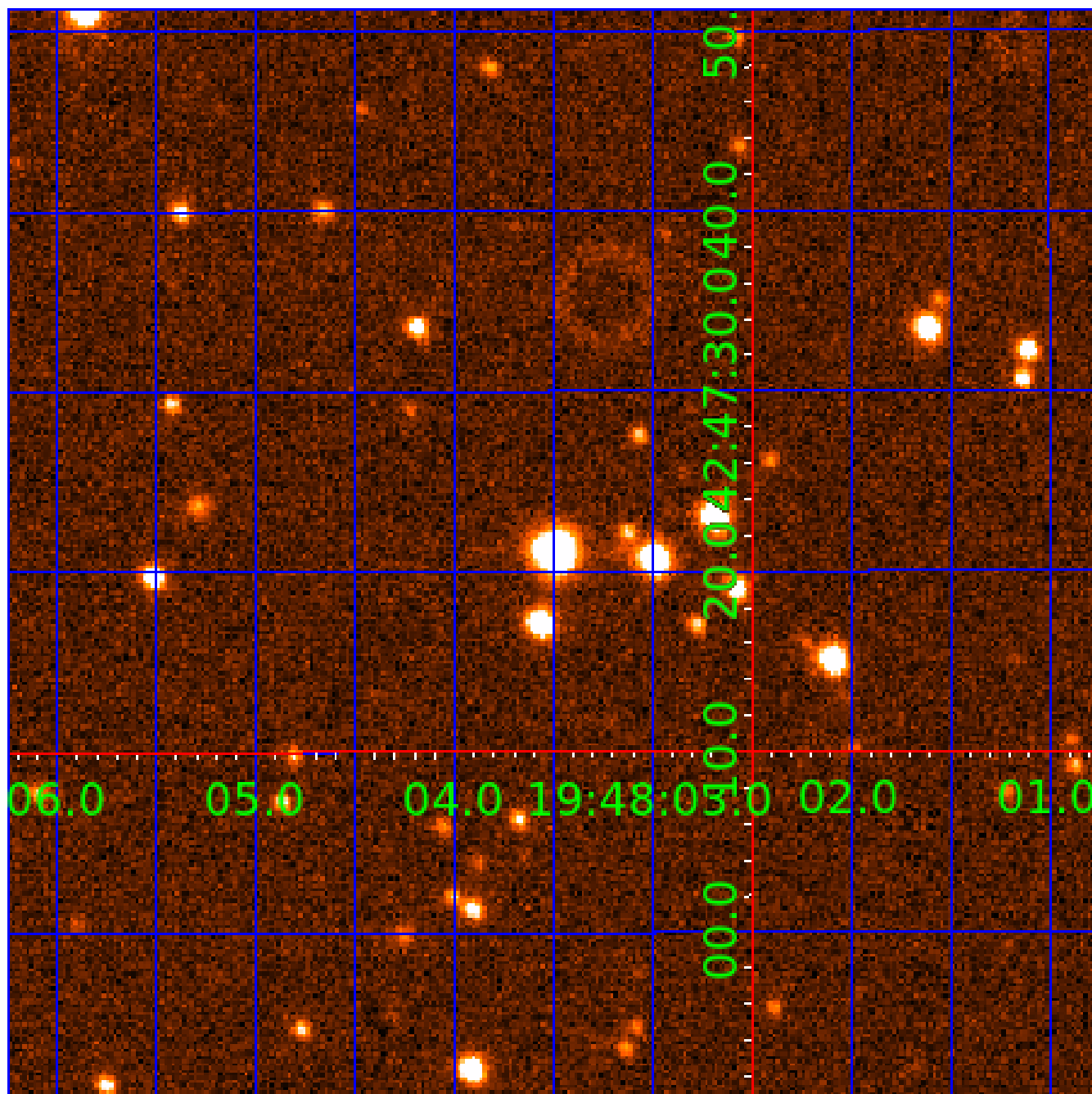


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007219906

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007219906-01	OBS	6033.01	35.089751	153.397468	4974.2	4.088	247.7	150.5	0.85	5603	9.29	14.97
007219906-02	OBS	No	35.089711	146.121806	1437.3	4.382	68.1	64.8	0.85	5603	6.21	14.97

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007219906-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_UNRESOLVED_OFFSET
007219906-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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 007219906-02

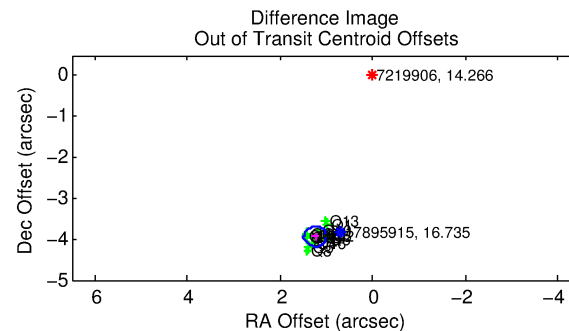
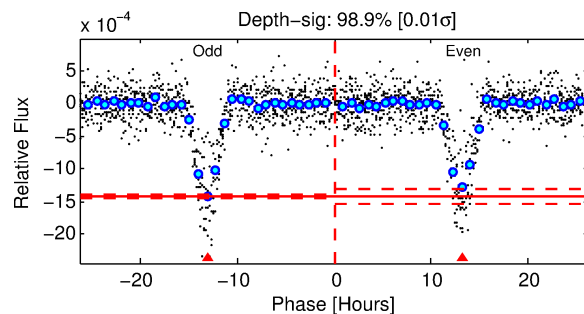
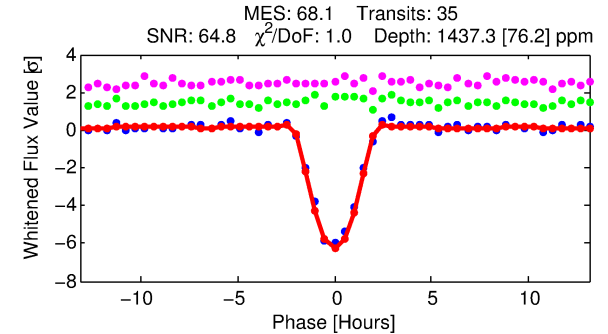
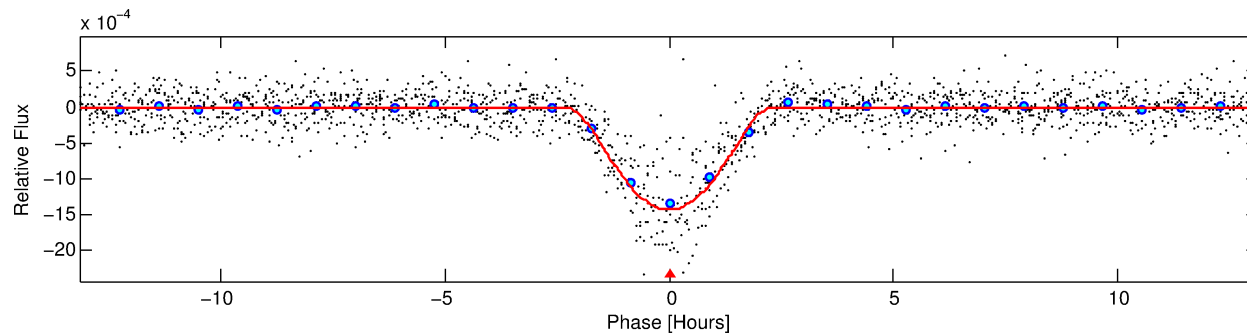
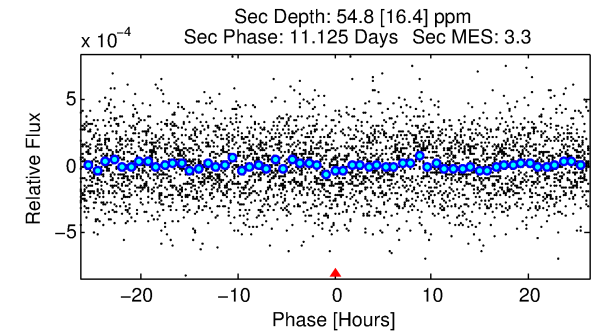
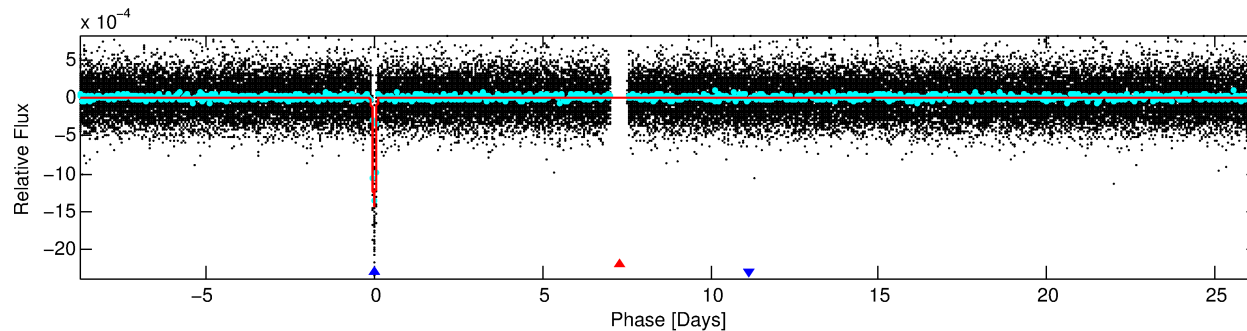
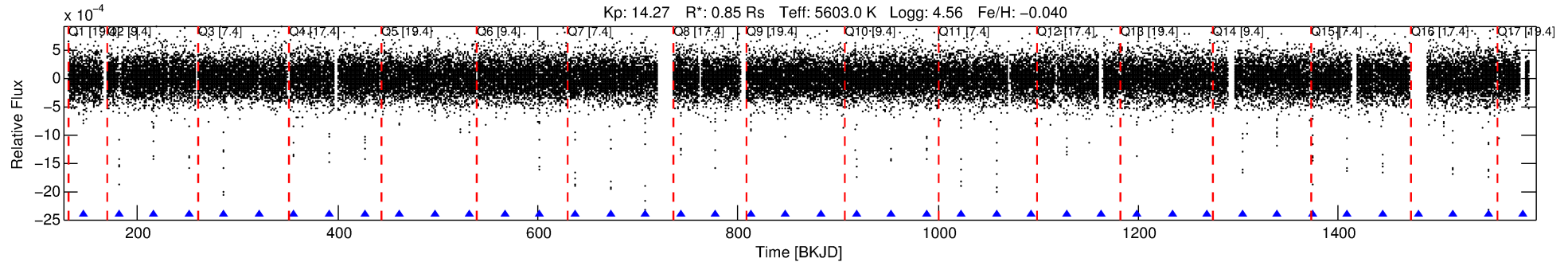
No Significant Match Found

# DV One-Page Summary

KIC: 7219906 Candidate: 2 of 2 Period: 35.090 d

KOI: K06033 Corr: No Ephemeris Match

Kp: 14.27 R\*: 0.85 Rs Teff: 5603.0 K Logg: 4.56 Fe/H: -0.040



## DV Fit Results:

Period = 35.08971 [0.00007] d  
Epoch = 146.1218 [0.0015] BKJD  
Rp/R\* = 0.0672 [0.0430]  
a/R\* = 22.94 [3.32]  
b = 1.00 [0.06]  
Seff = 14.97 [5.17]  
Teq = 502 [43] K  
Rp = 6.21 [4.28] Re  
a = 0.2055 [0.0454] AU  
Ag = 33.03 [44.68] [0.72σ]  
Teffp = 1859 [613] K [2.21σ]

## DV Diagnostic Results:

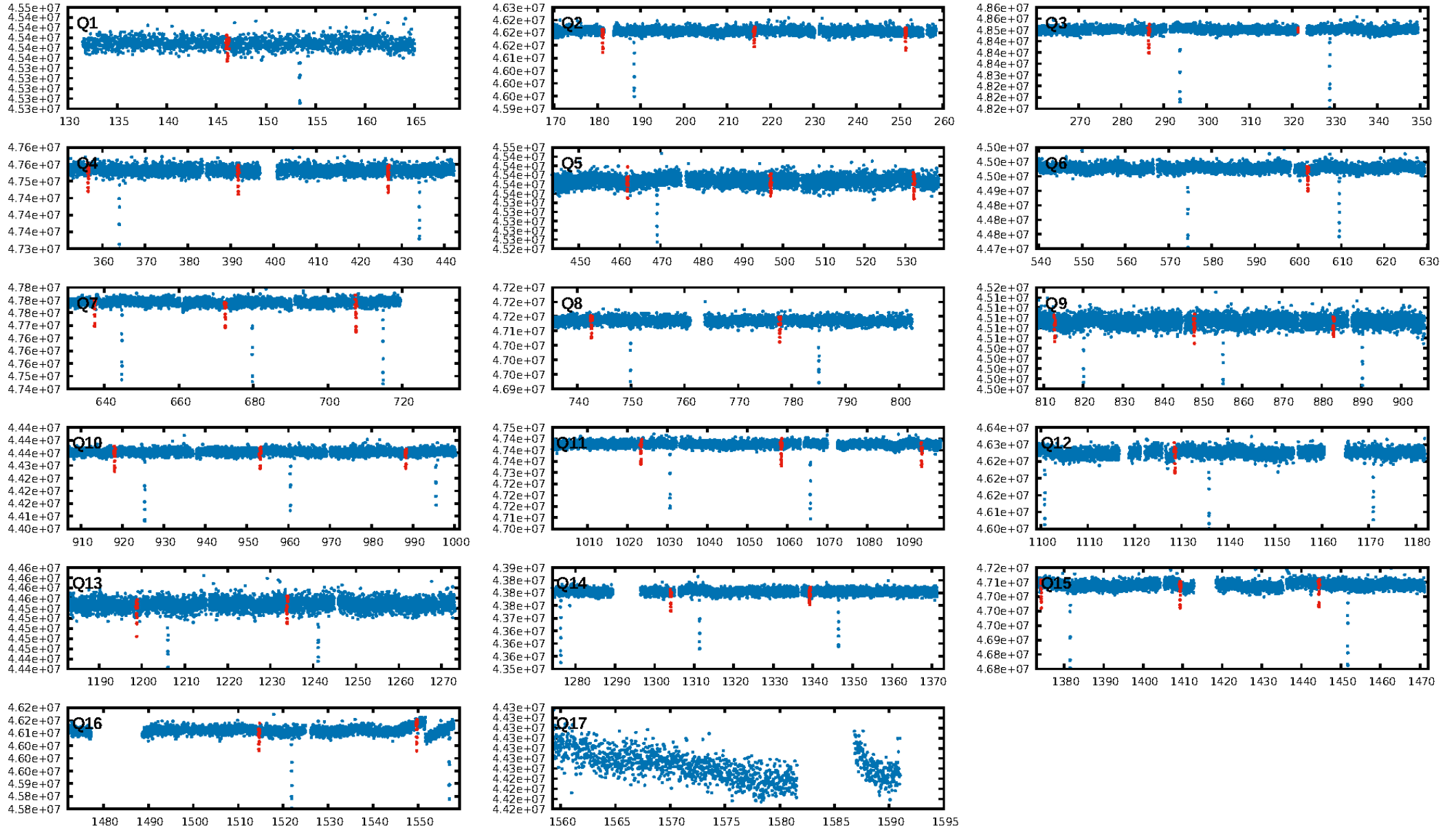
ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 0.00e+00  
RollingBand-fgt: 1.00 [34/34]  
GhostDiagnostic-chr: 0.8232  
Centroid-sig: 0.0%  
Centroid-so: 4.588 arcsec [32.05σ]  
OotOffset-rm: 4.127 arcsec [50.45σ]  
KicOffset-rm: 4.009 arcsec [47.88σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [16/16]

Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 06:16:04 Z

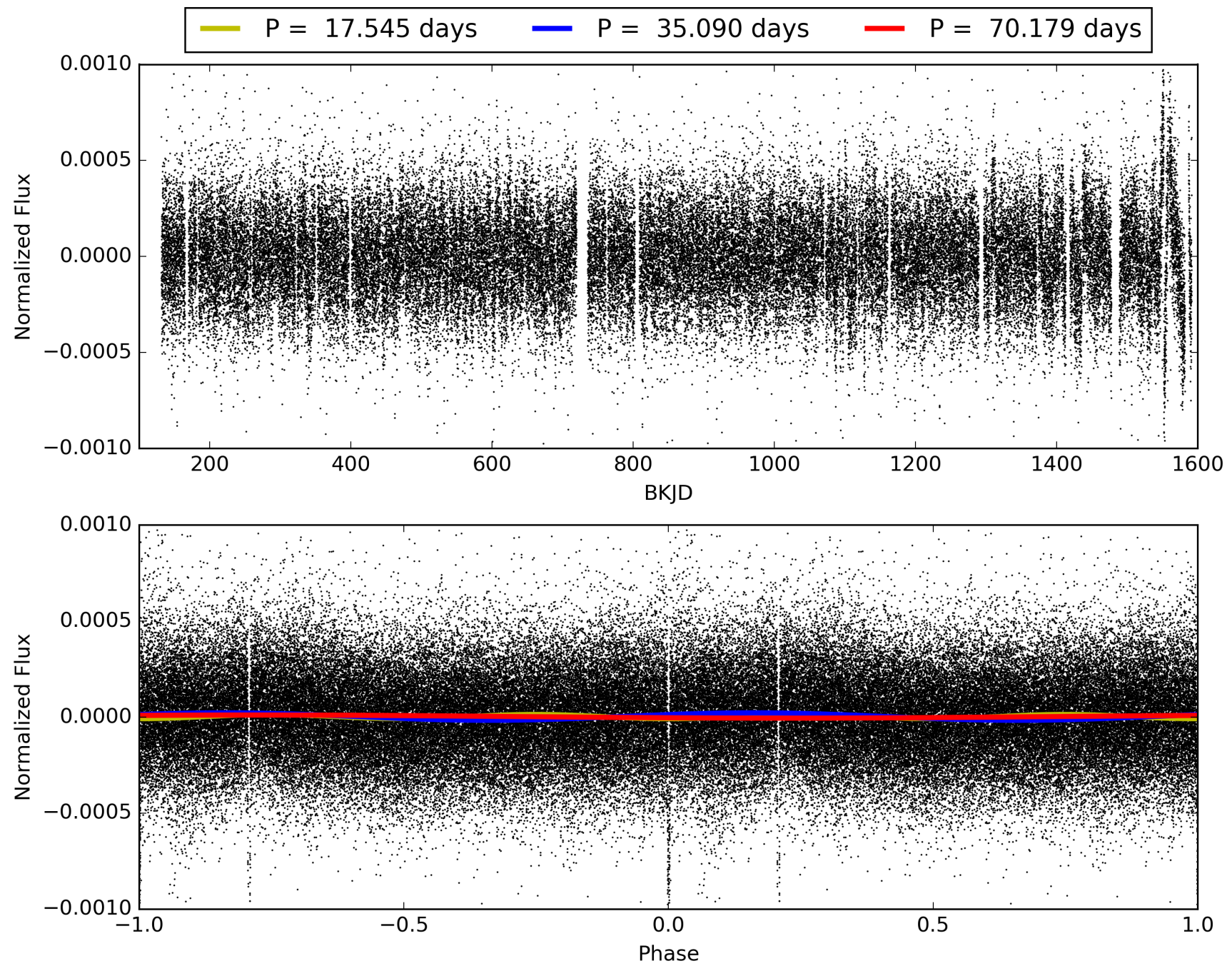
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 007219906-02, PDC Light Curves

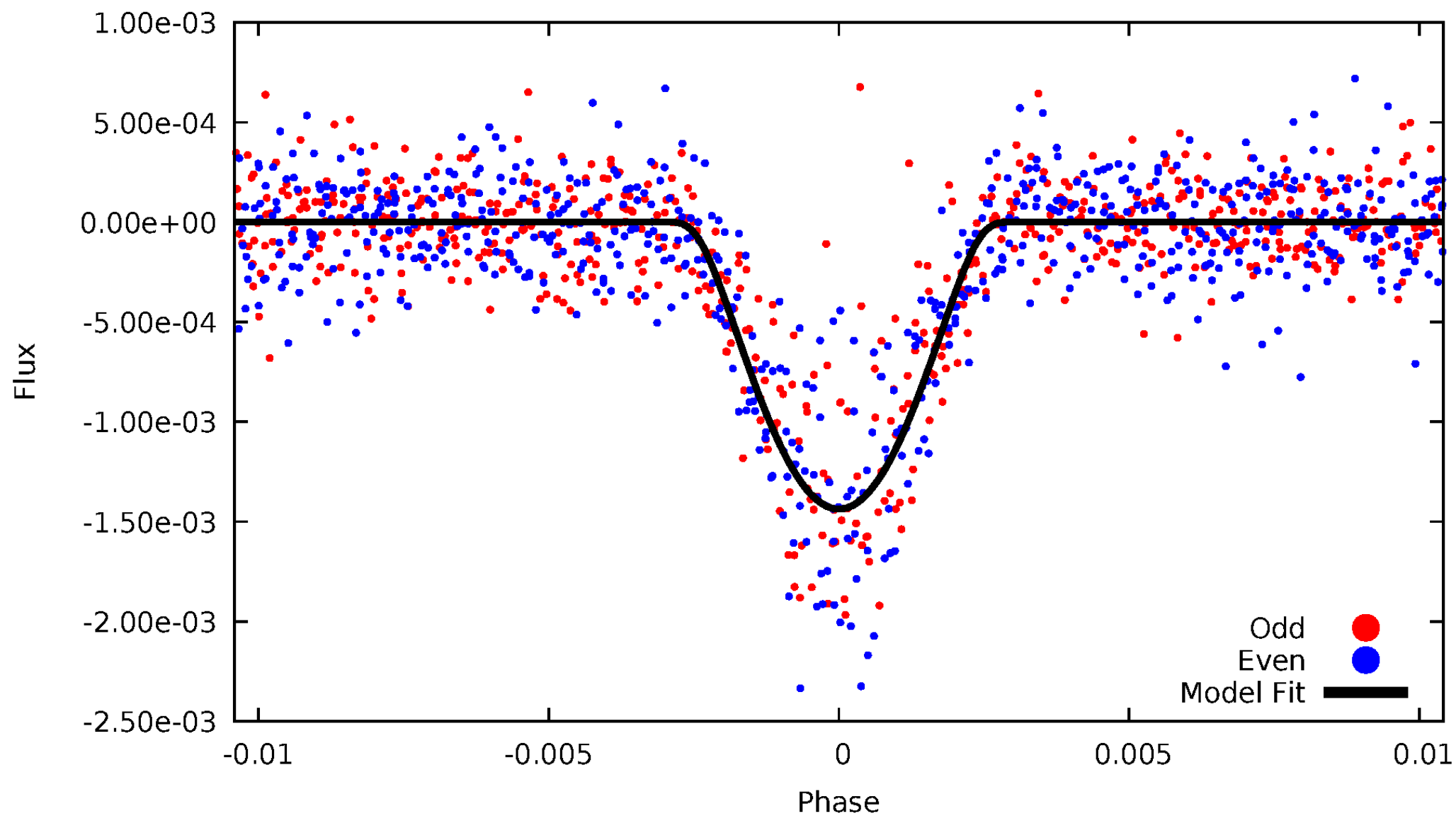


TCE 007219906-02



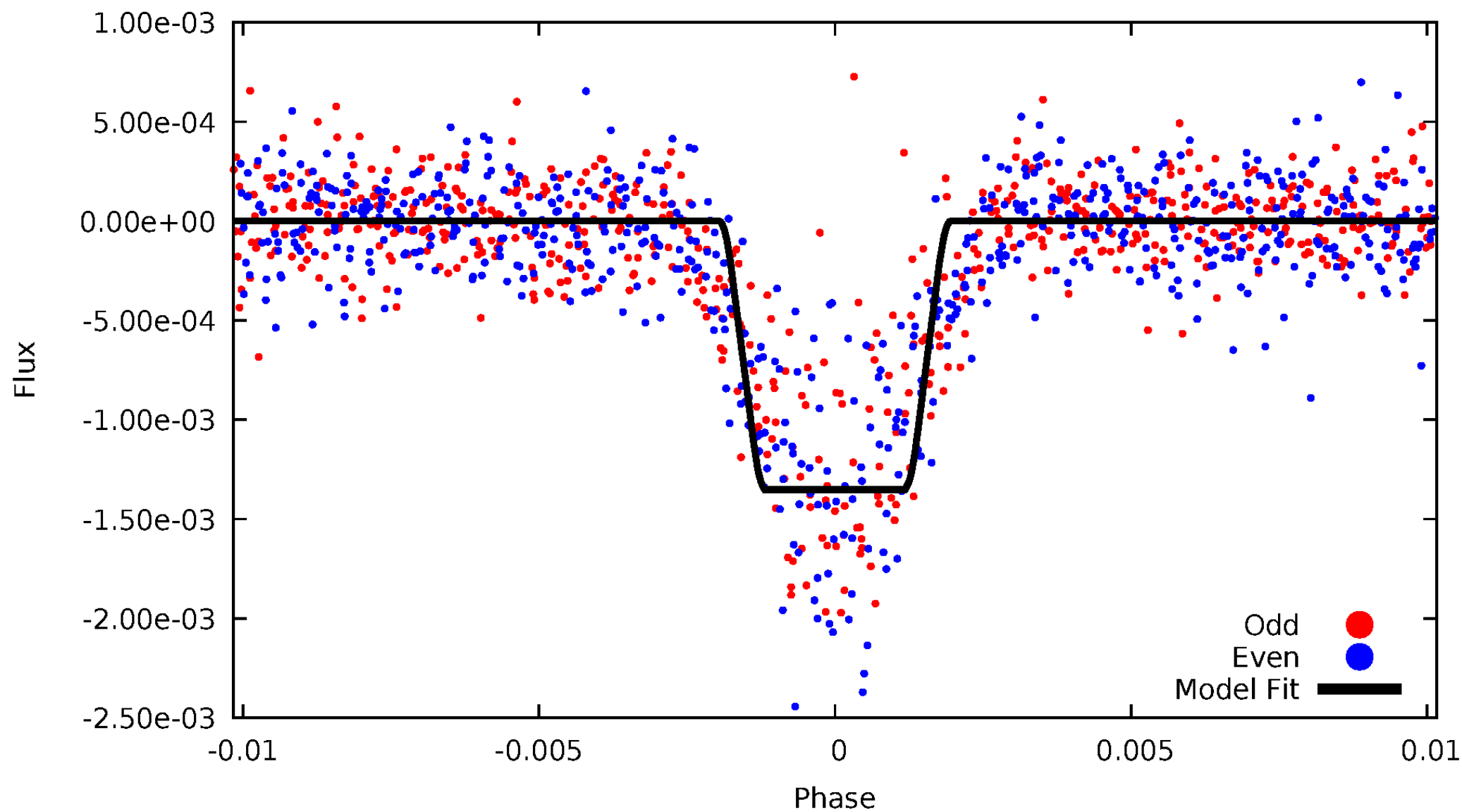
# DV Odd/Even

TCE 007219906-02



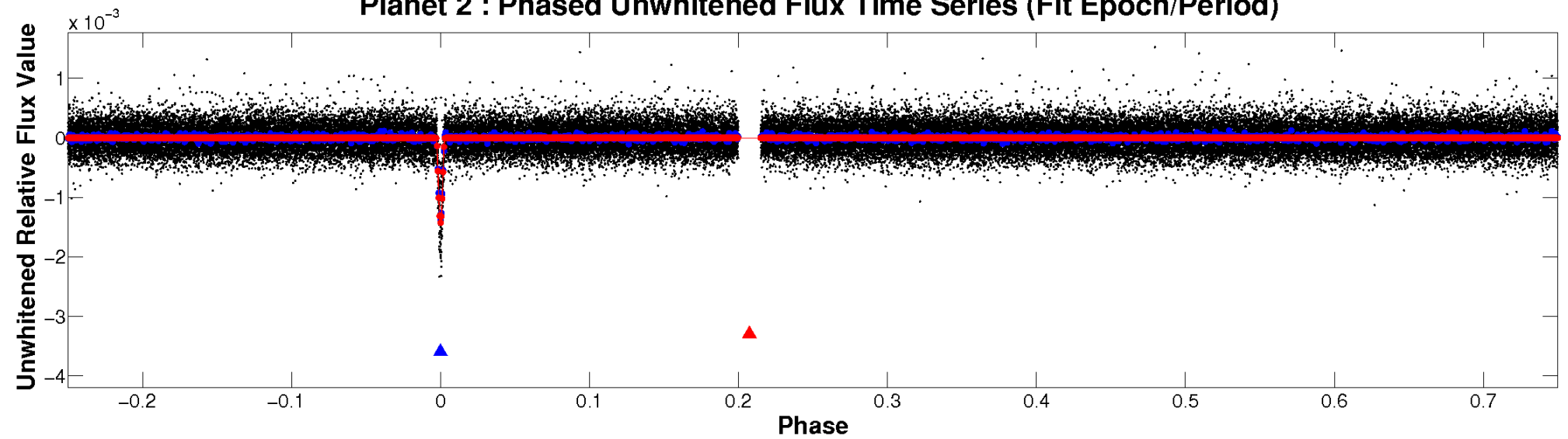
# ALT Odd/Even

TCE 007219906-02

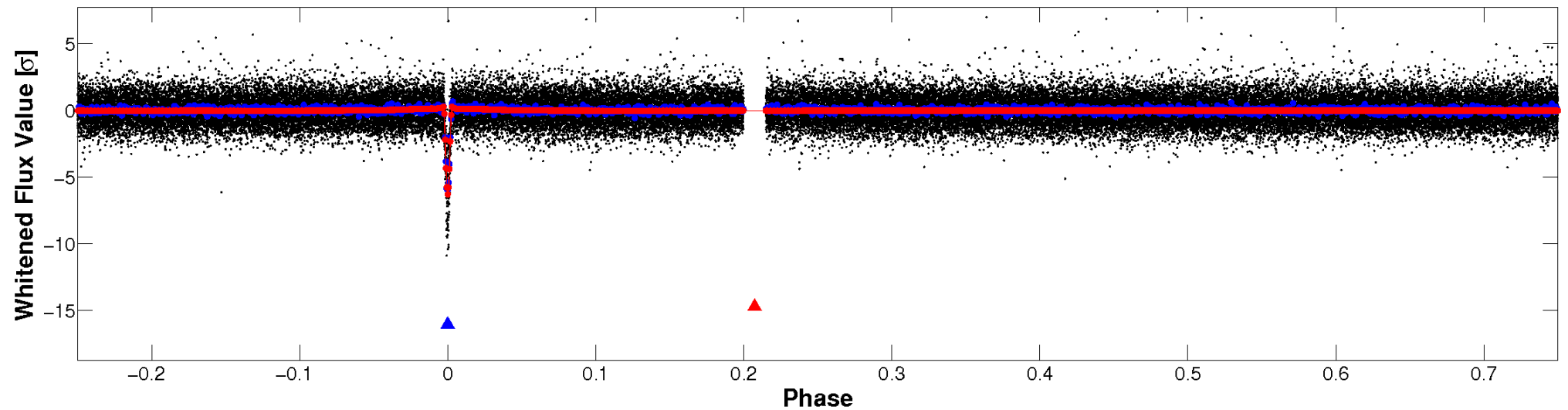


# Non-Whitened Vs. Whitened Light Curve

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

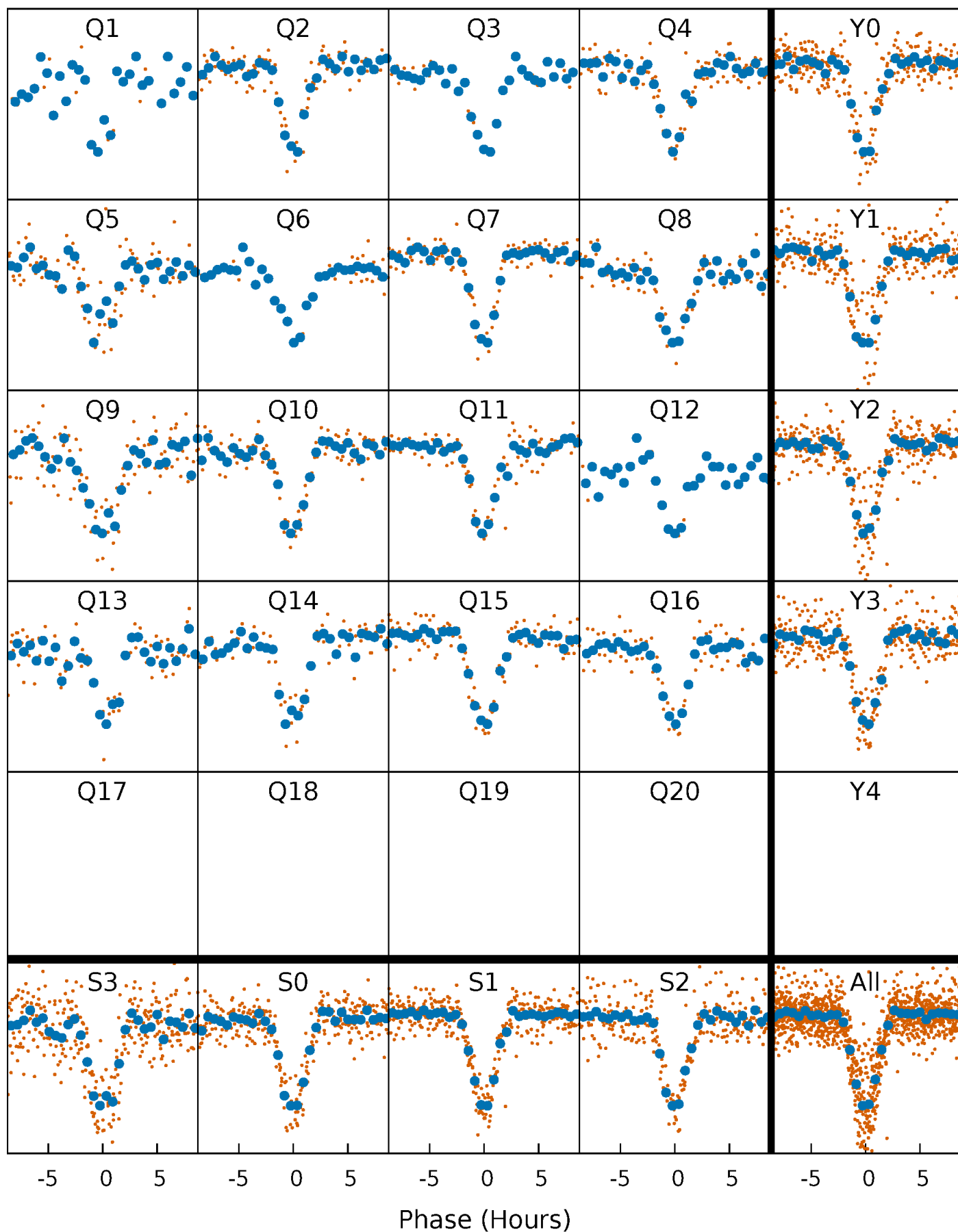


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

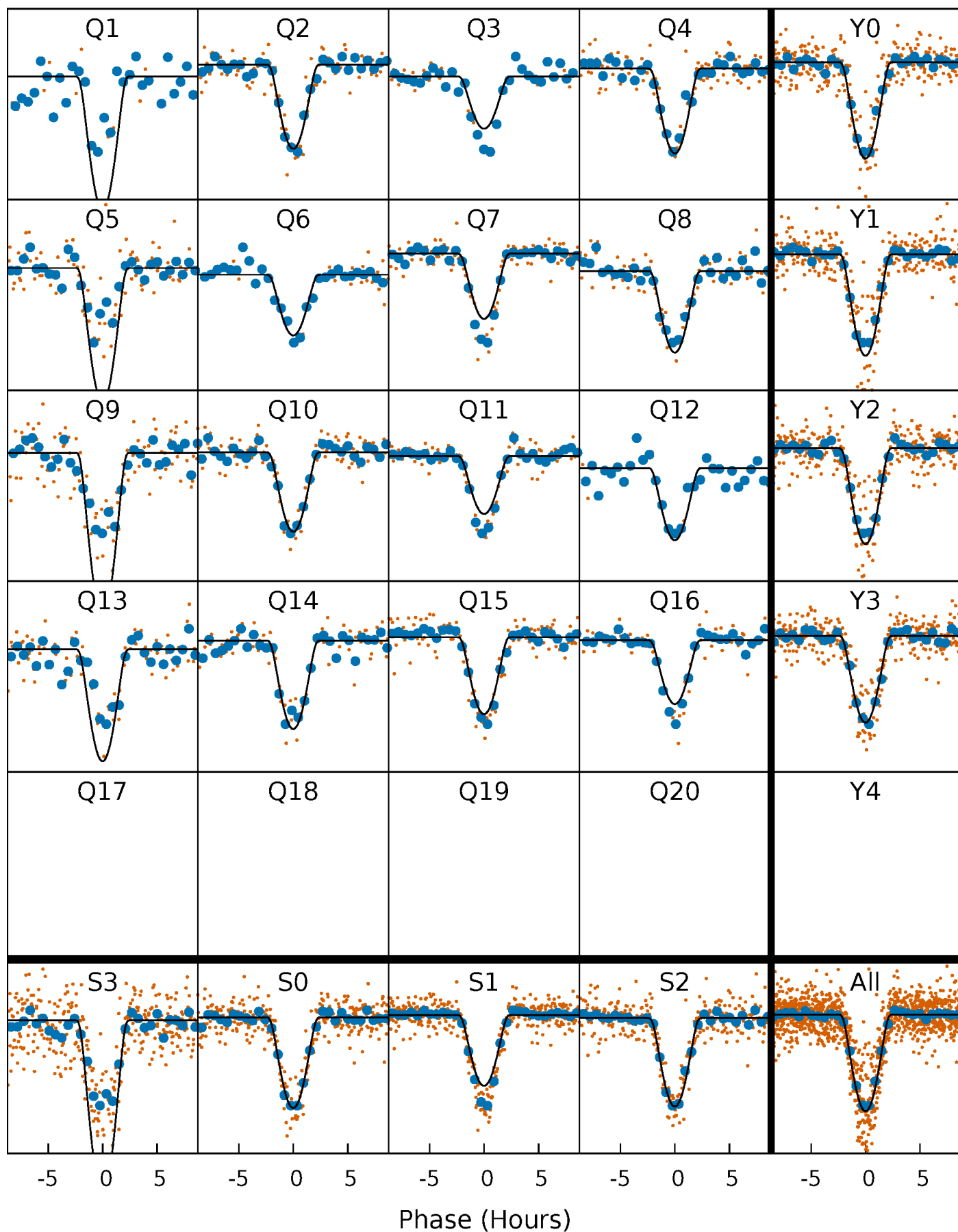
TCE 007219906-02   P= 35.089711 Days    $T_0=146.121806$  (BKJD)





# DV Quarter-Phased Transit Curves

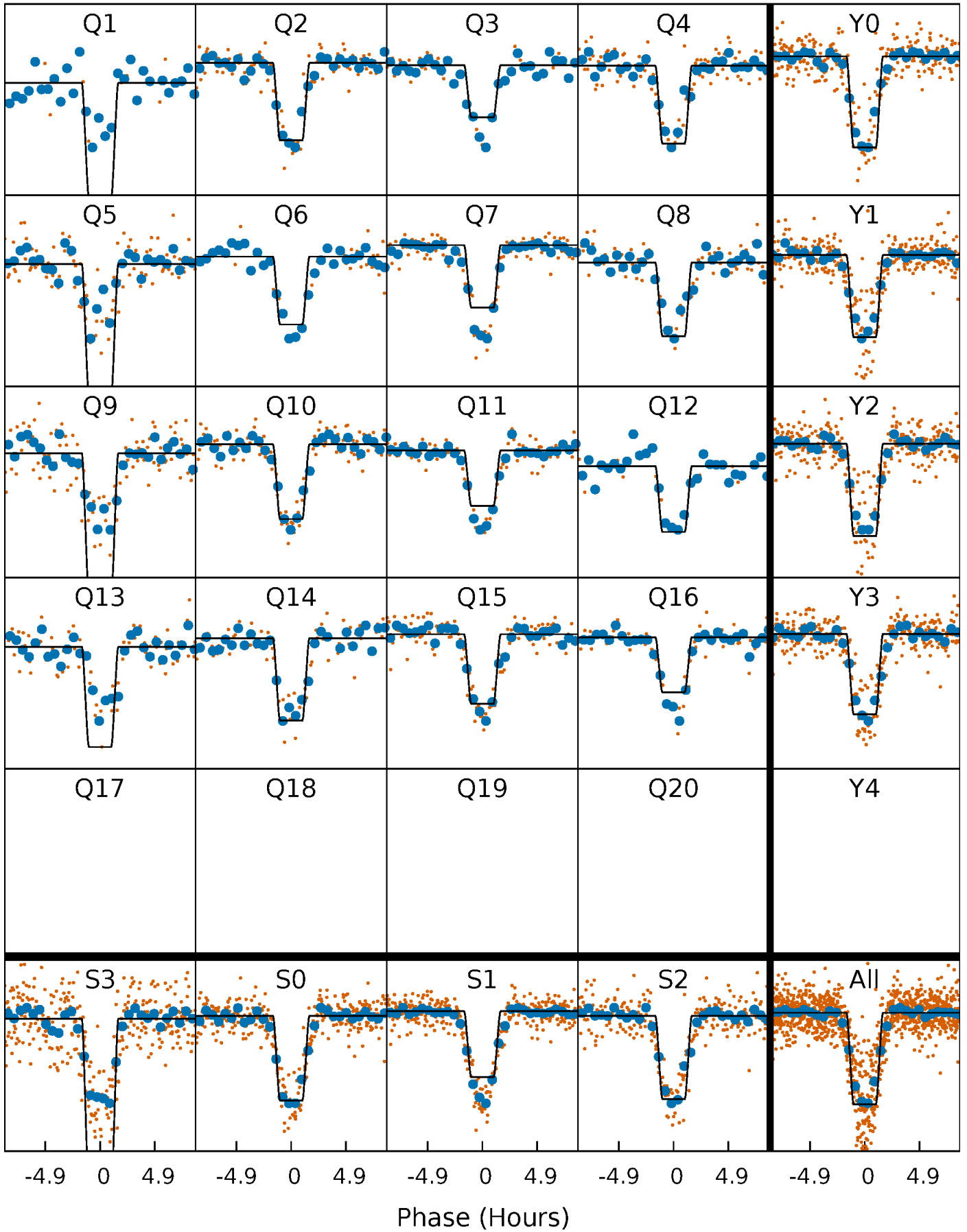
TCE 007219906-02   P= 35.089711 Days    $T_0=146.121806$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

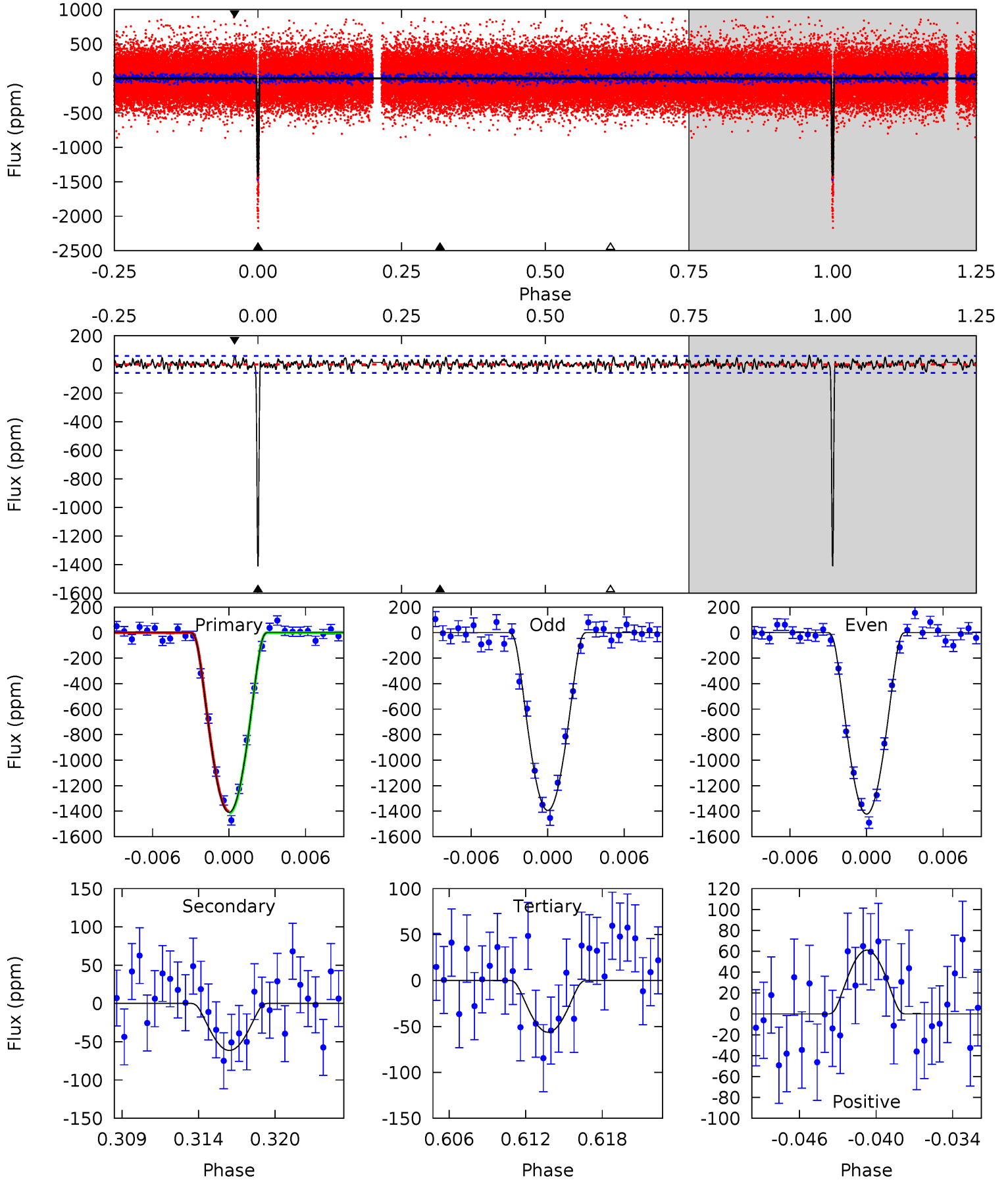
TCE 007219906-02 P= 35.089572 Days  $T_0=146.124406$  (BKJD)



# DV Model-Shift Uniqueness Test

007219906-02, P = 35.089711 Days, E = 111.032095 Days

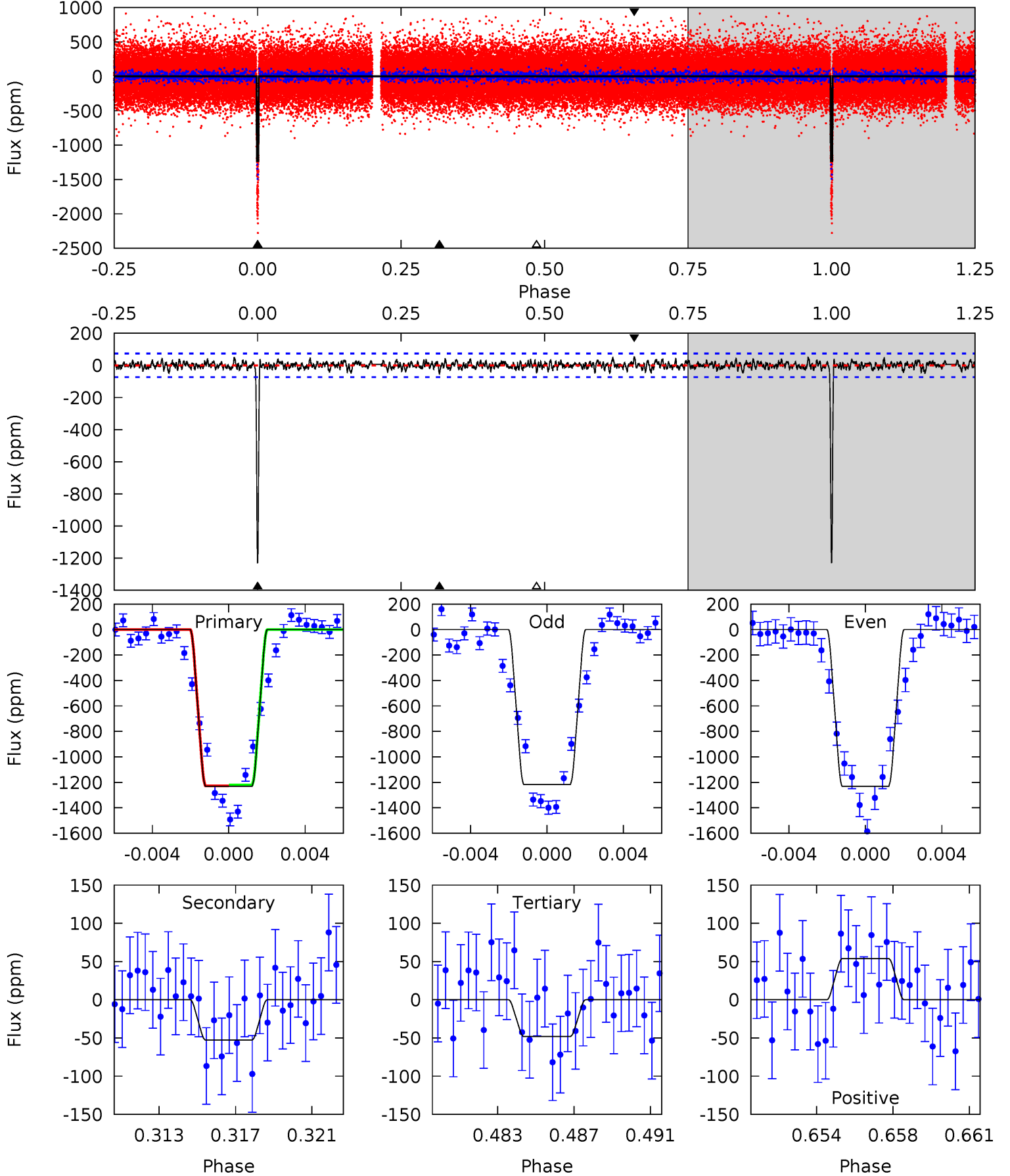
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
121.5	5.29	4.85	5.26	5.13	2.76	1.56	116.6	116.2	0.44	0.03	1.25	0.99	0.04	0.64



# Alt Model-Shift Uniqueness Test

007219906-02,  $P = 35.089572$  Days,  $E = 111.034834$  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
87.2	3.74	3.41	3.82	5.21	2.89	1.15	83.8	83.4	0.33	-0.07	0.50	0.99	0.04	0.18



### Stellar Parameters For KIC 007219906

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5603^{+152}_{-169}$	$4.556^{+0.031}_{-0.178}$	$-0.040^{+0.300}_{-0.300}$	$0.846^{+0.220}_{-0.073}$	$0.941^{+0.085}_{-0.104}$	$2.188^{+0.366}_{-1.006}$
	+3%/-3%	+1%/-4%	+750%/-750%	+26%/-9%	+9%/-11%	+17%/-46%
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 007219906-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-61 \pm 12$	$6.78^{+3.95}_{-3.75}$	$717^{+41}_{-30}$	$2647^{+706}_{-288}$	$30^{+116}_{-18}$
Alt.	$-53 \pm 14$	$4.64^{+3.83}_{-3.07}$	$716^{+44}_{-30}$	$2868^{+1222}_{-410}$	$54^{+477}_{-38}$

$T_{\text{max}}$  = 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

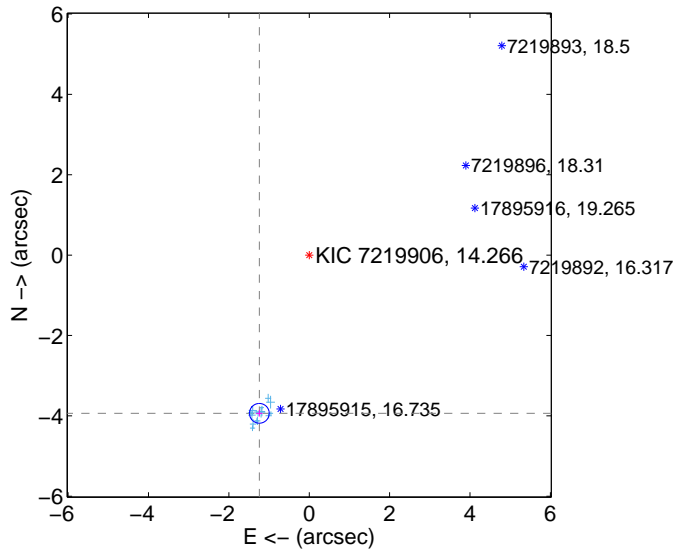
Supplemental centroid analysis for 007219906-02. Kepler magnitude: 14.27. Transit SNR 64.79

There are 16 quarters with good PRF difference image offsets

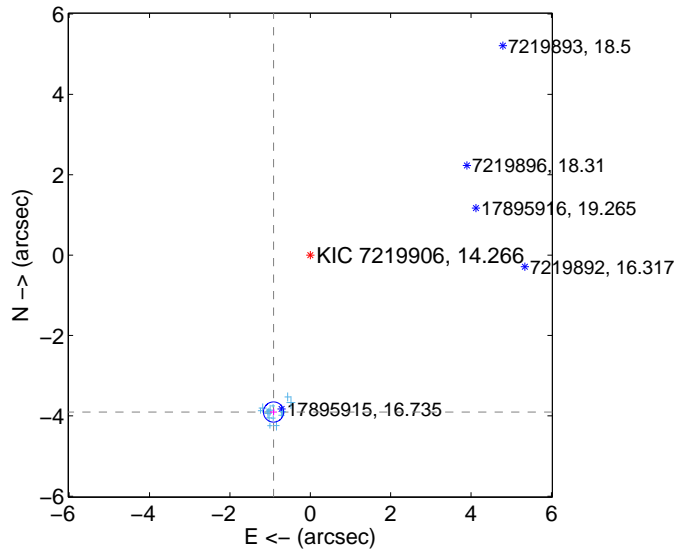
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.127 \pm 0.082$	50.45	$1.241 \pm 0.078$	$-3.936 \pm 0.079$
PRF-fit source offset from KIC position	$4.009 \pm 0.084$	47.88	$0.914 \pm 0.087$	$-3.904 \pm 0.081$
photometric centroid source offset	$4.59 \pm 0.14$	32.05	$1.15 \pm 0.15$	$-4.44 \pm 0.14$

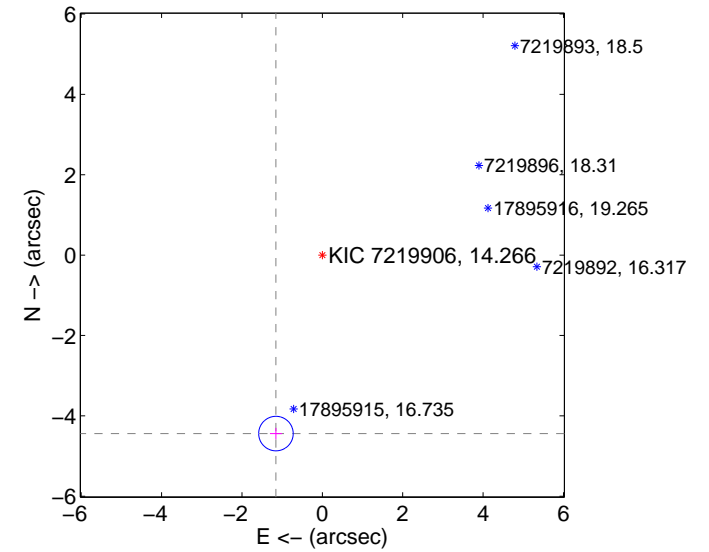
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

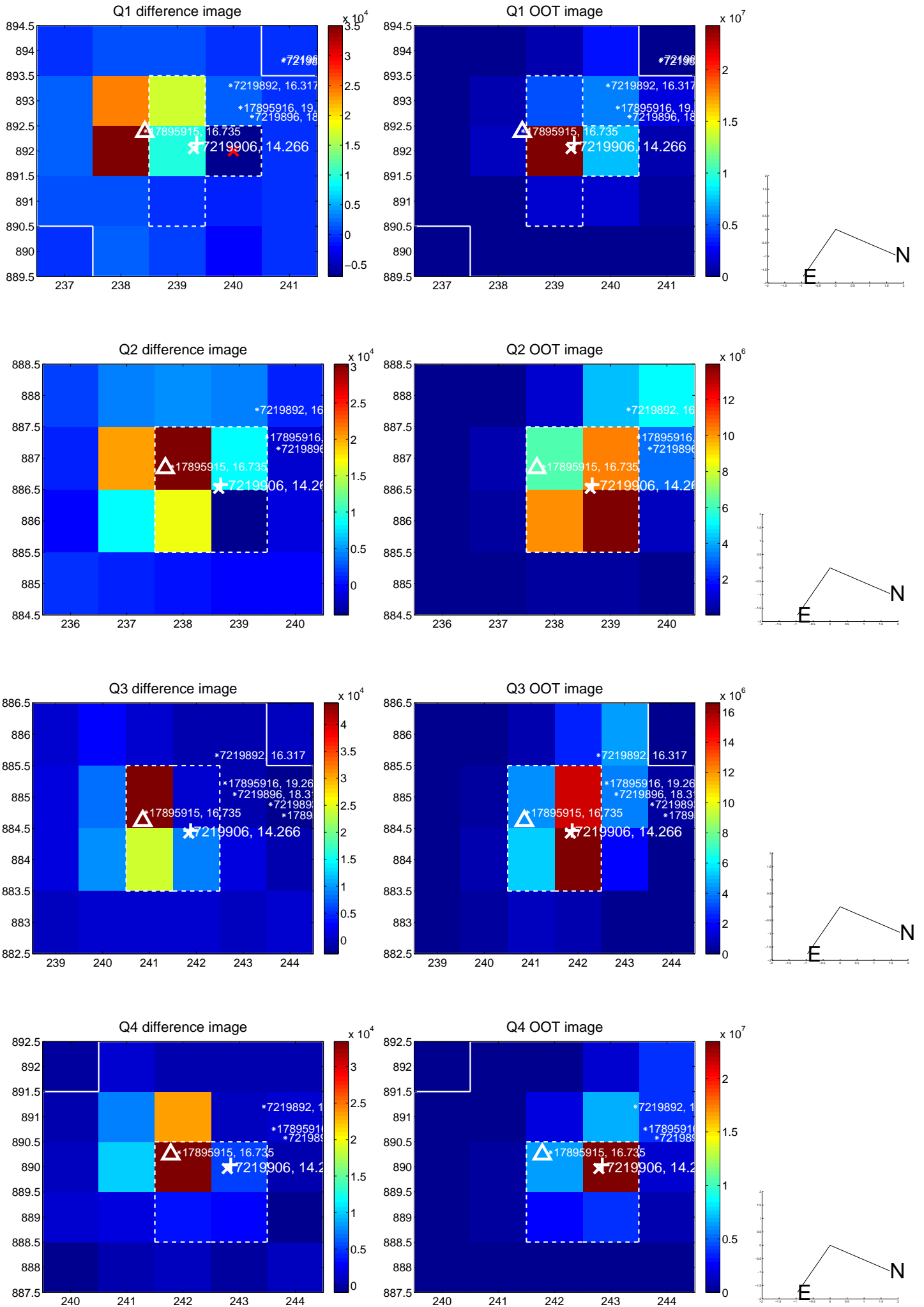


offset from photometric centroids

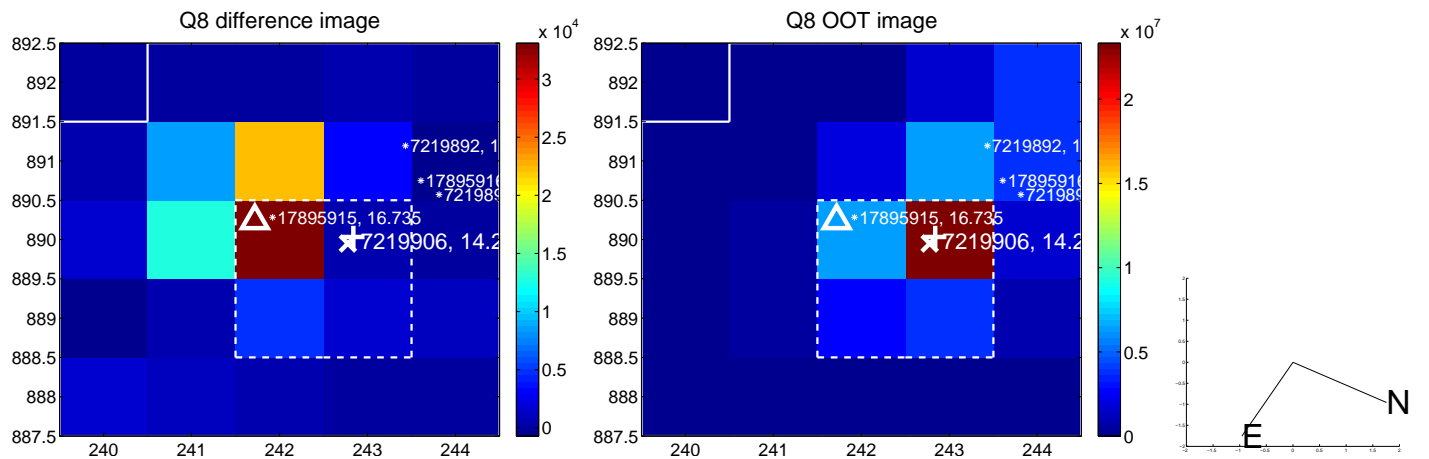
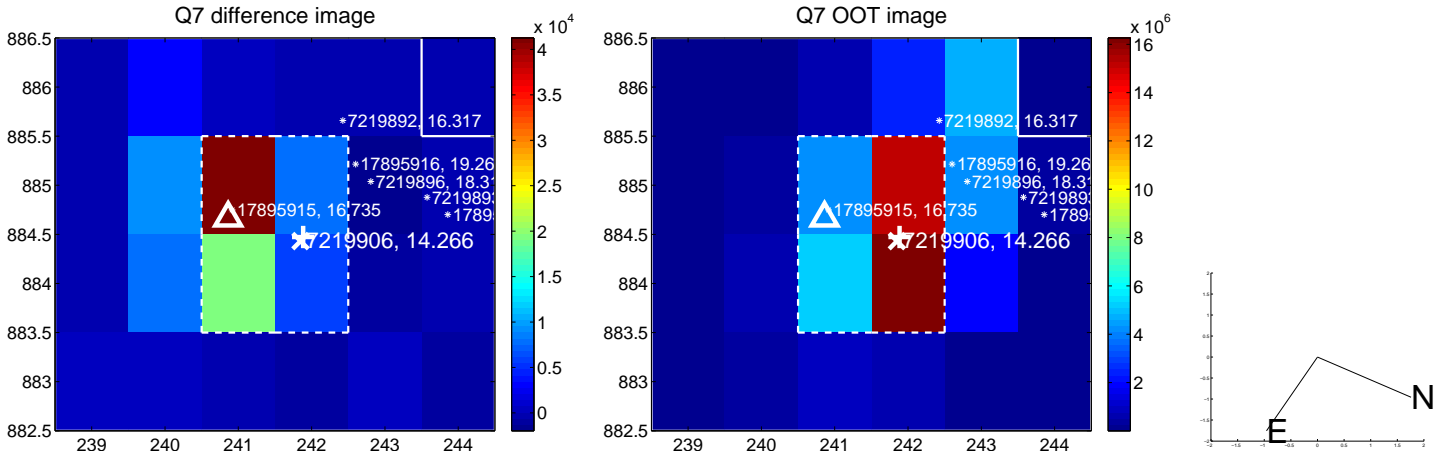
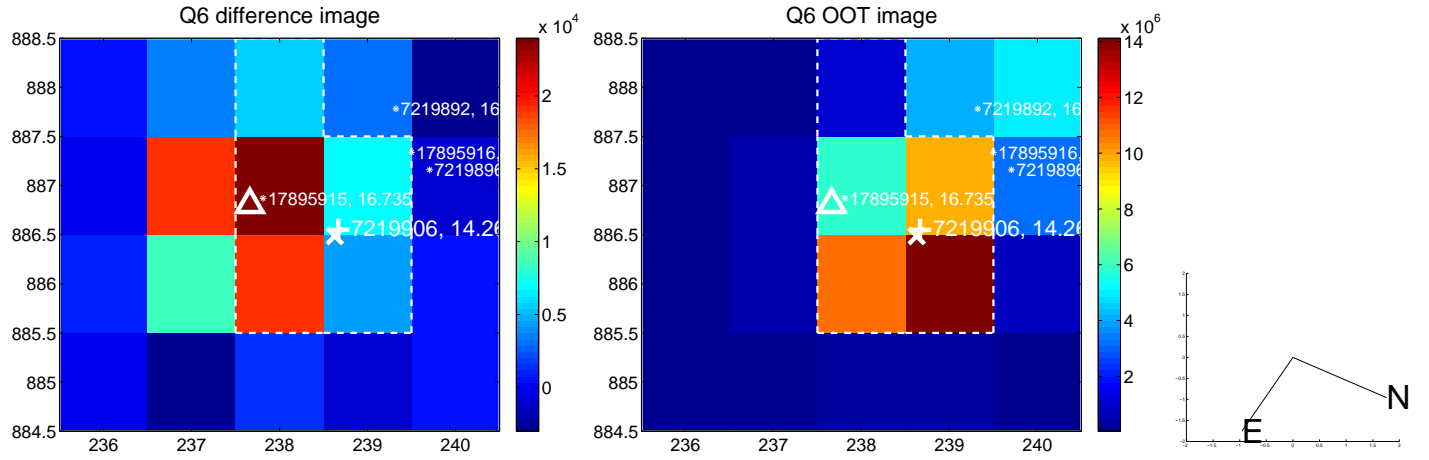
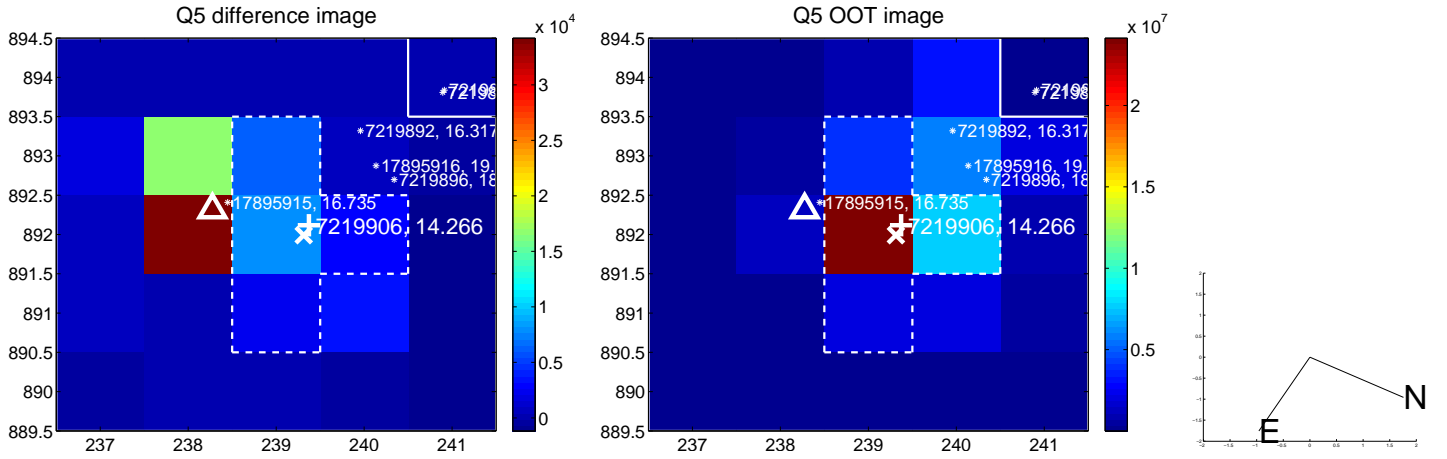


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . Red \*: target star. Blue \*: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000 are from the UKIRT catalog.

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

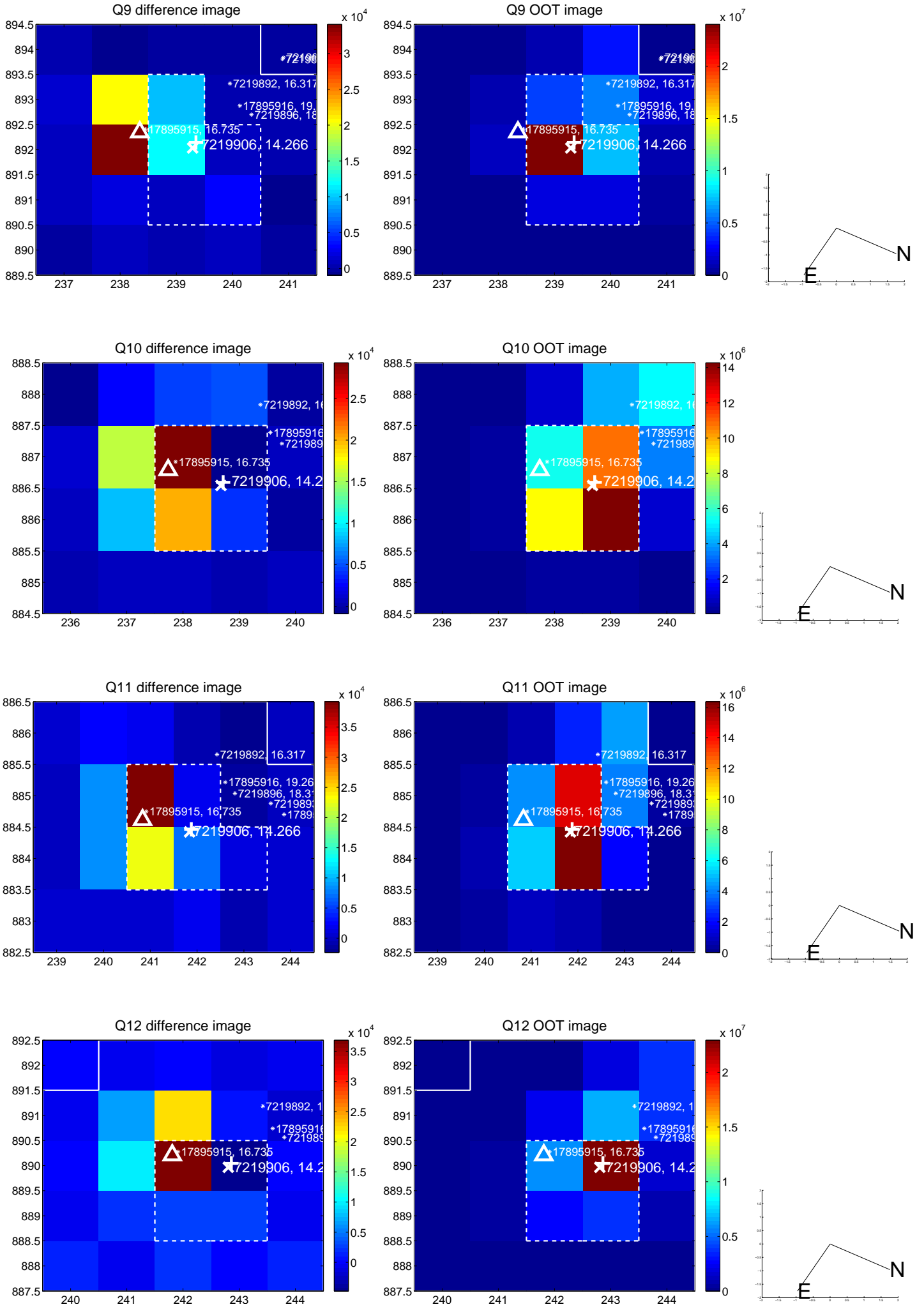


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

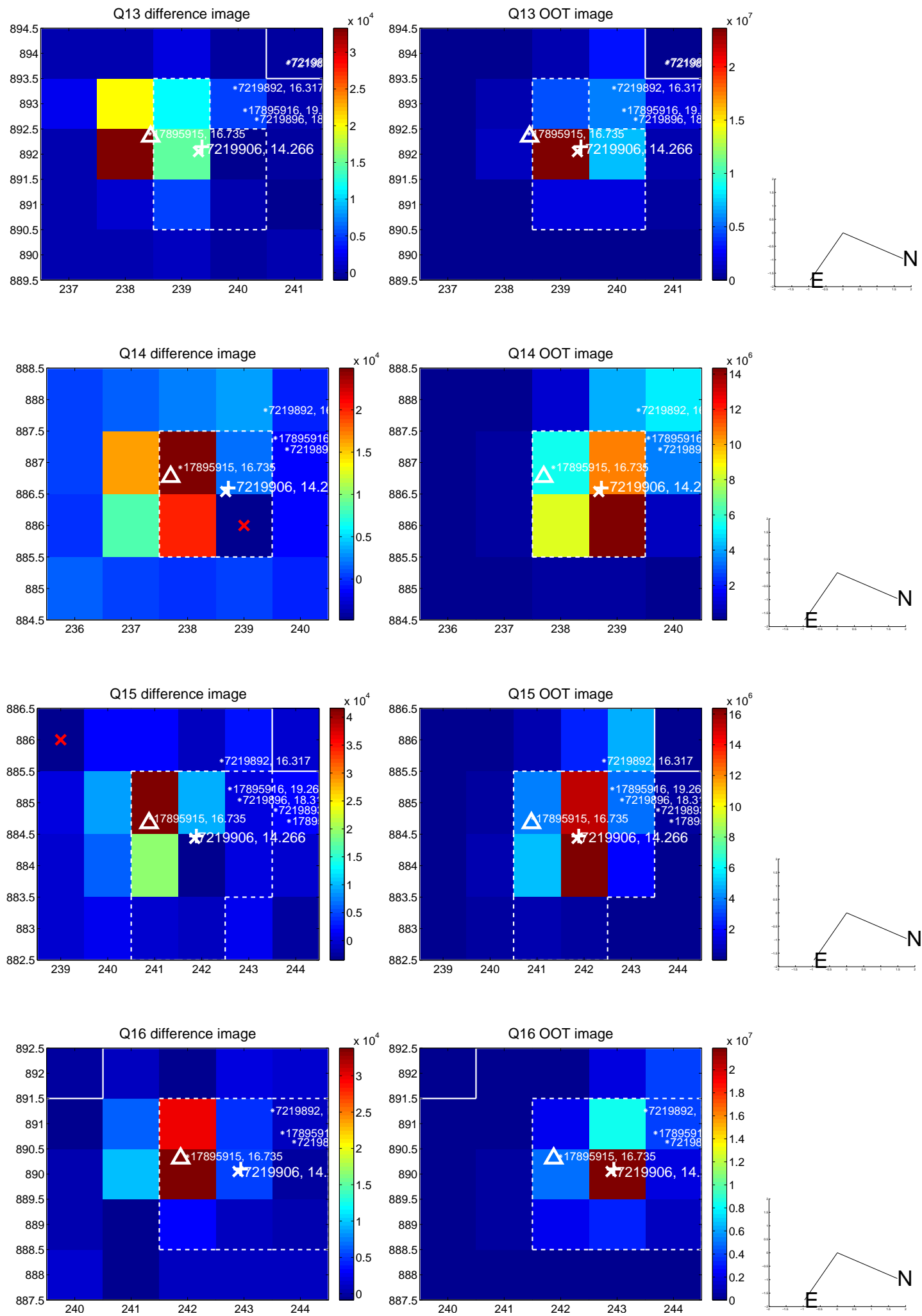




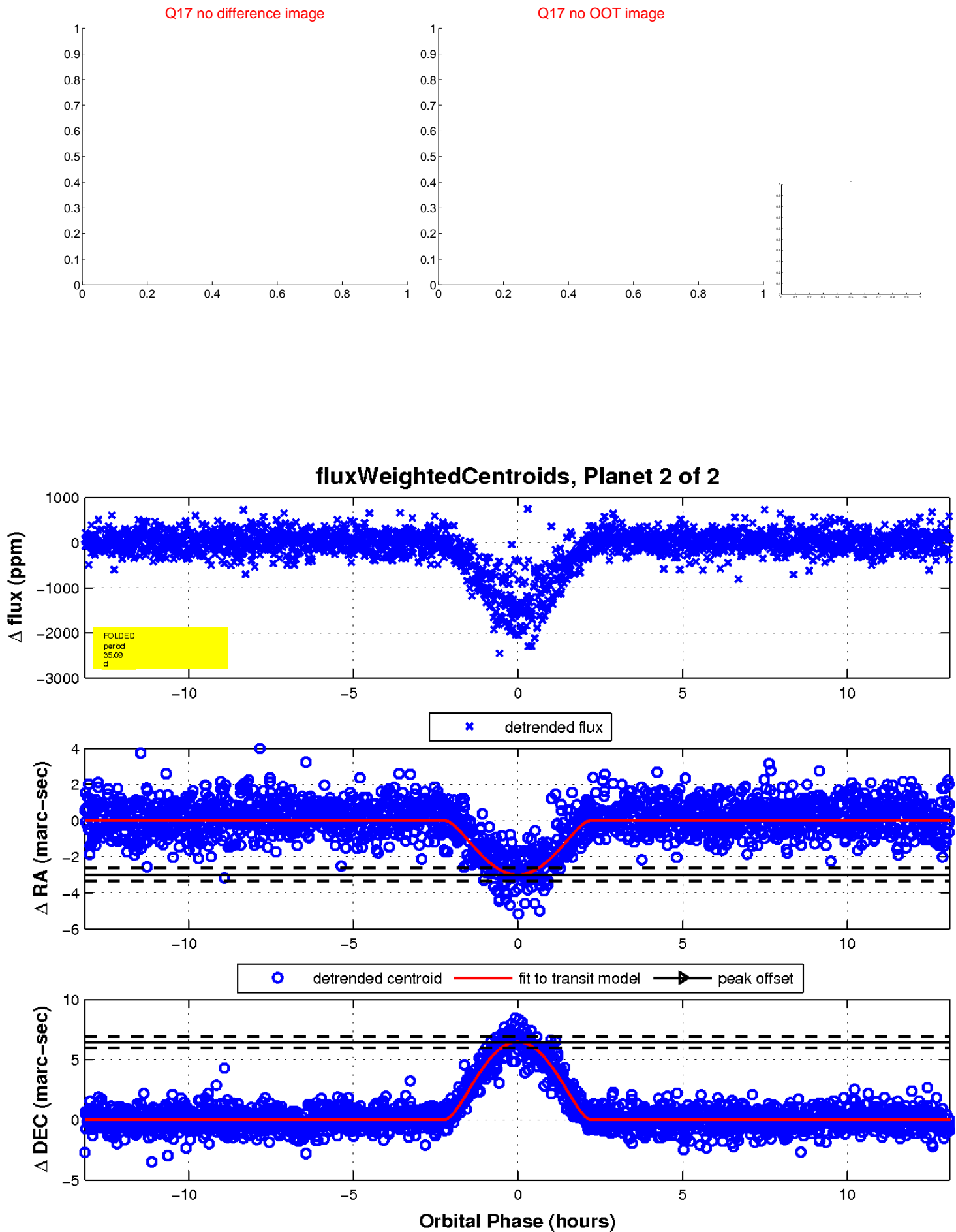
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

