

# KIC 005781841

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005781841-01	OBS	No	1.354261	132.787425	274.4	6.925	9.1	13.6	2.06	7631	6.39	15840.66
005781841-02	OBS	No	1.354259	132.110149	360.5	7.317	17.1	21.6	2.06	7631	7.42	15840.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005781841-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005781841-02	OBS	FP	0.00	1	0	0	0	SAME_NTL_PERIOD

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

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

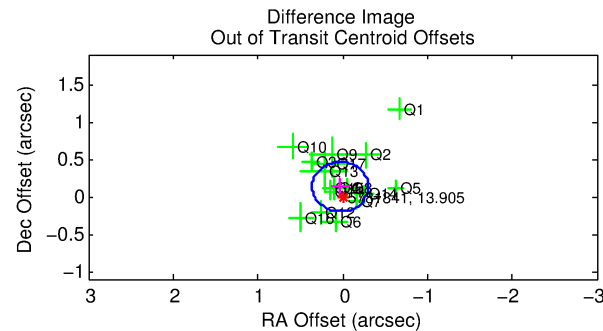
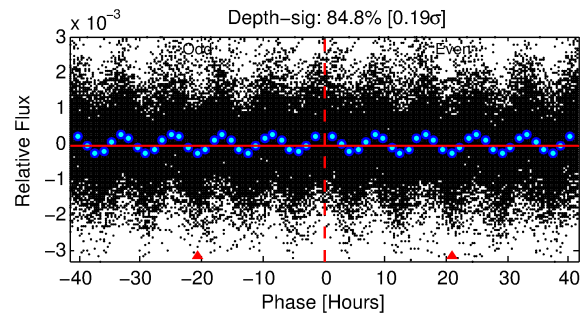
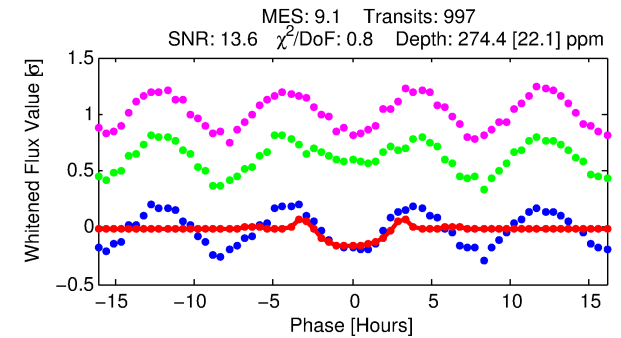
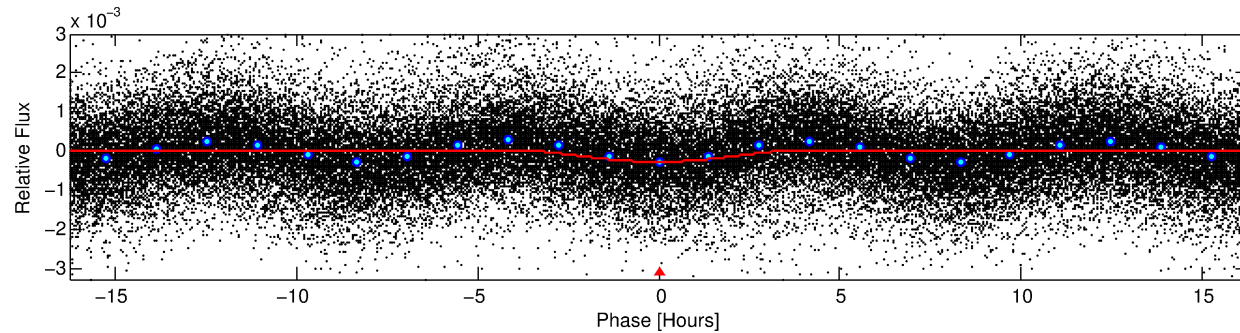
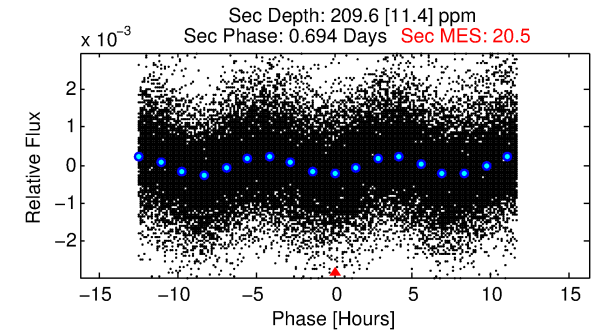
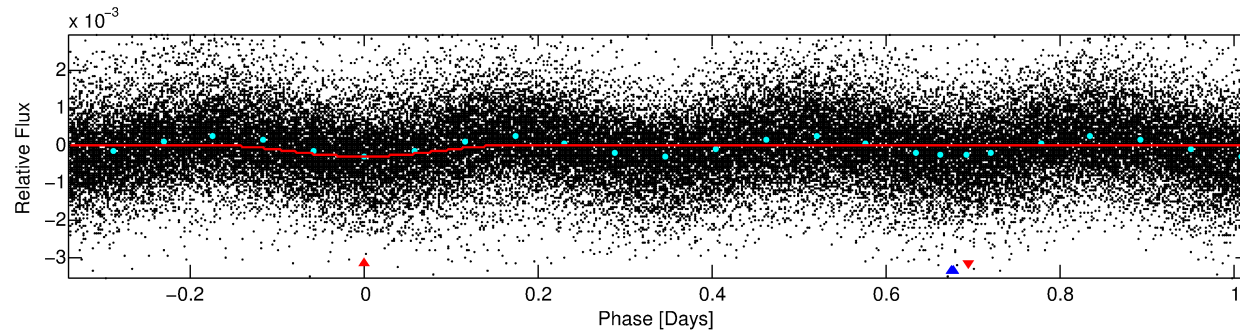
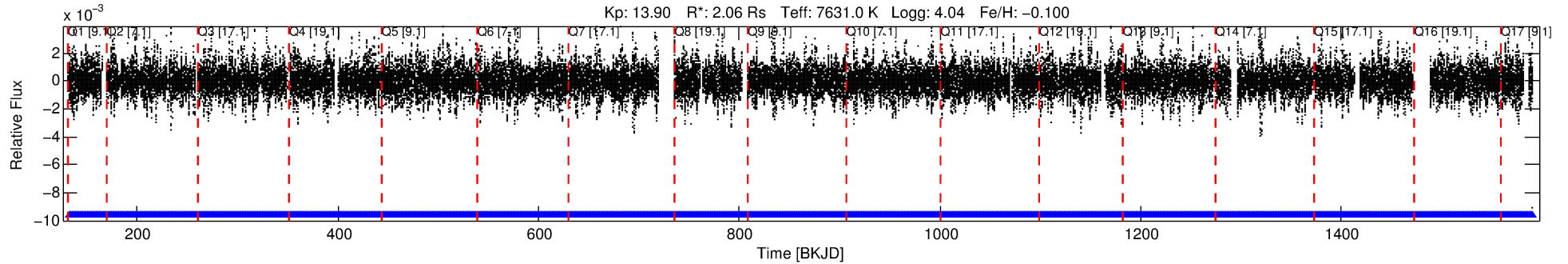
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005781841-01

No Significant Match Found

# DV One-Page Summary

KIC: 5781841 Candidate: 1 of 2 Period: 1.354 d



## DV Fit Results:

Period = 1.35426 [0.00001] d  
Epoch = 132.7874 [0.0035] BKJD  
Rp/R\* = 0.0285 [0.0120]  
a/R\* = 1.07 [0.00]  
b = 1.00 [0.02]  
Seff = 15840.66 [5901.34]  
Teq = 2861 [266] K  
Rp = 6.39 [3.14] Re  
a = 0.0285 [0.0063] AU  
Ag = 2.29 [2.08] [0.62σ]  
Teffp = 5443 [1169] K [2.15σ]

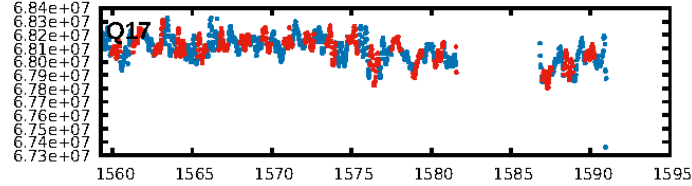
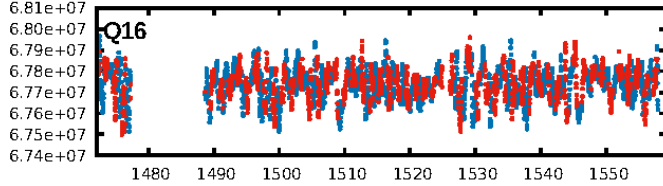
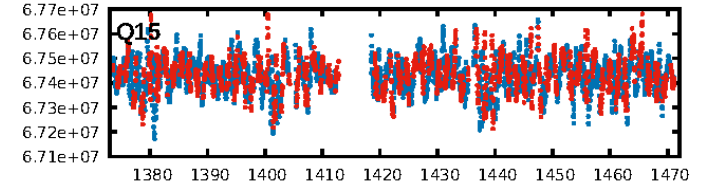
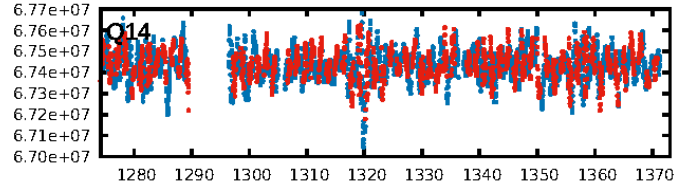
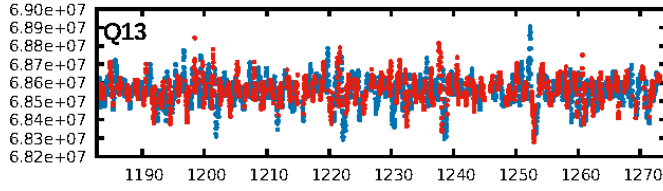
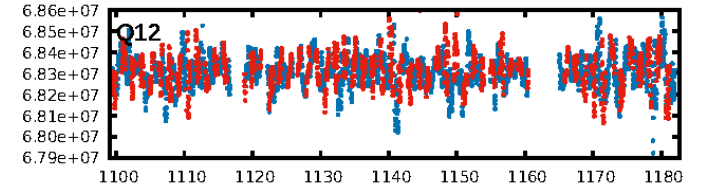
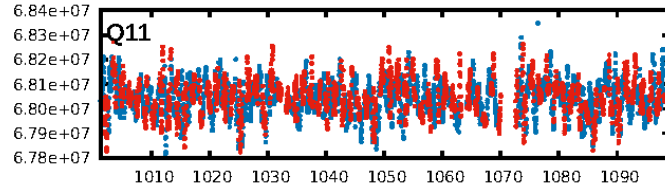
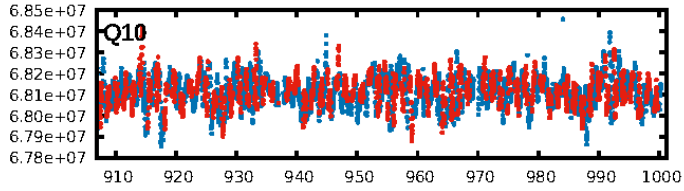
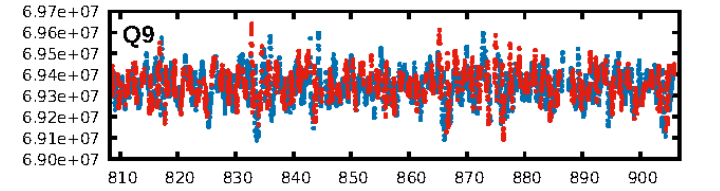
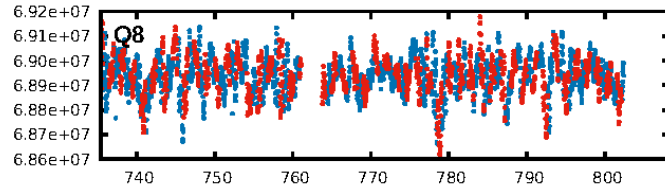
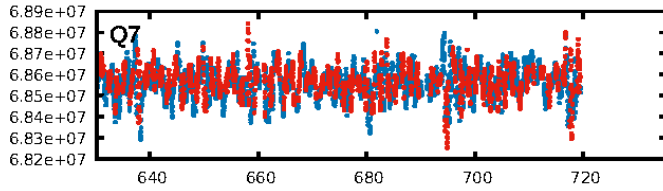
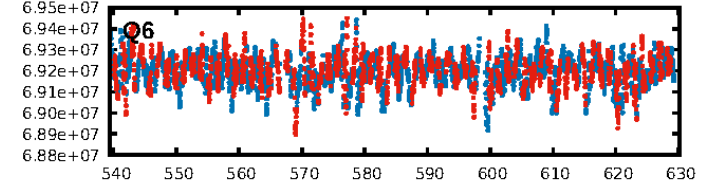
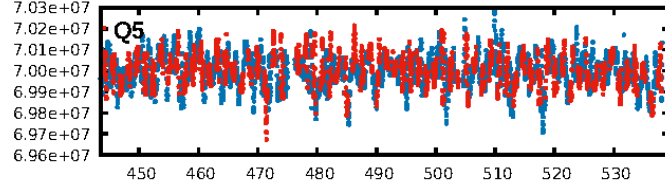
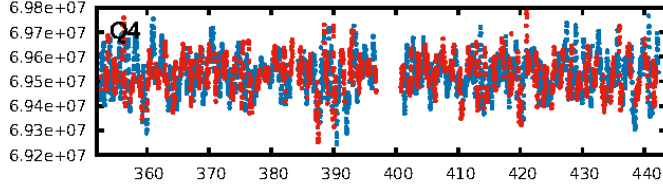
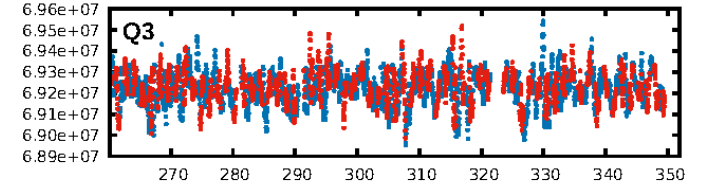
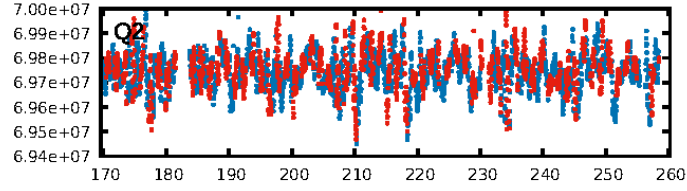
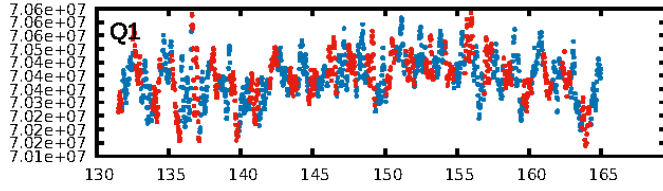
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [953/953]  
GhostDiagnostic-chr: 0.3017  
Centroid-sig: 0.1%  
Centroid-so: 0.205 arcsec [2.02σ]  
OotOffset-rm: 0.135 arcsec [1.23σ]  
KicOffset-rm: 0.096 arcsec [0.89σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

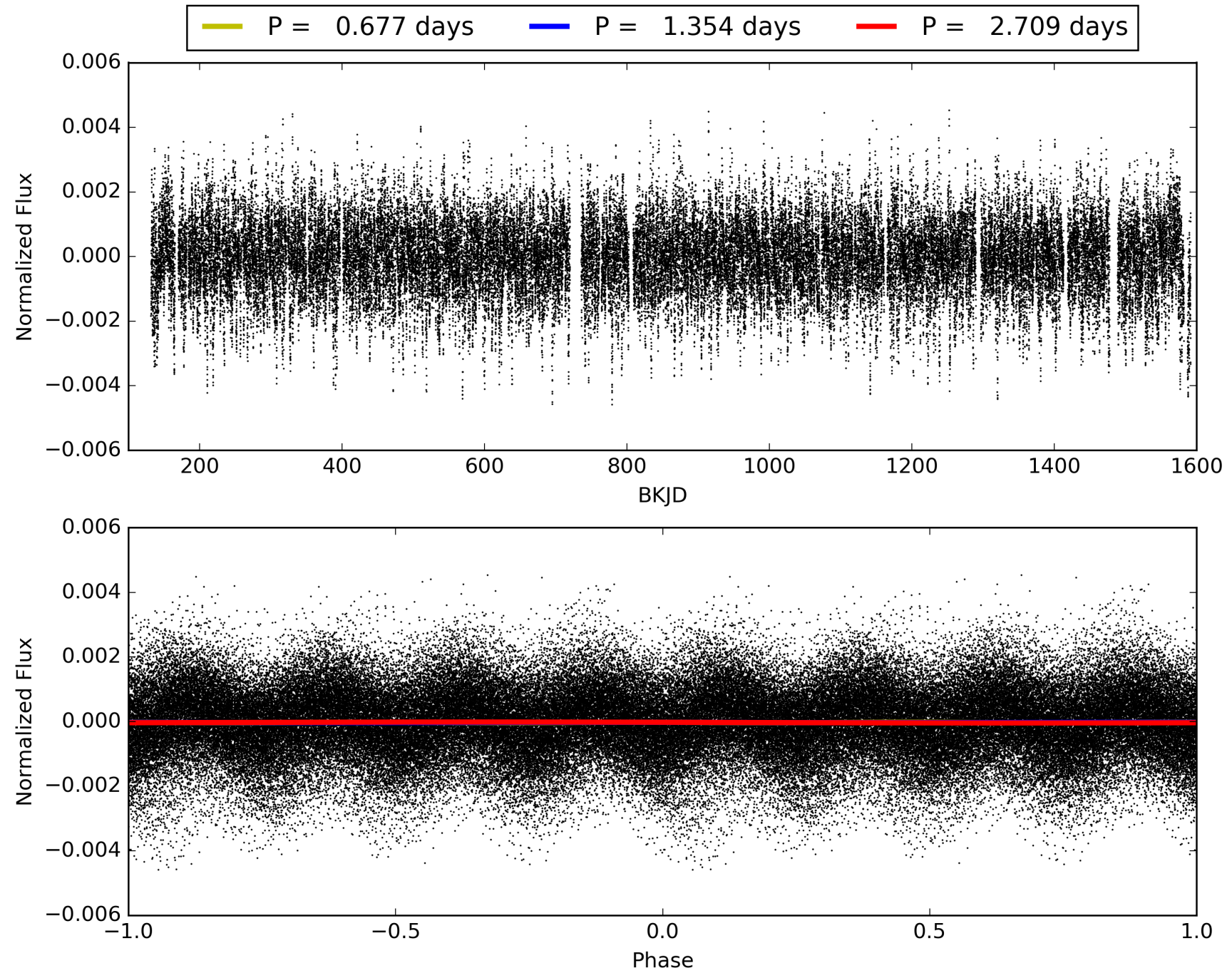
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:24:13 Z

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

# TCE 005781841-01, PDC Light Curves



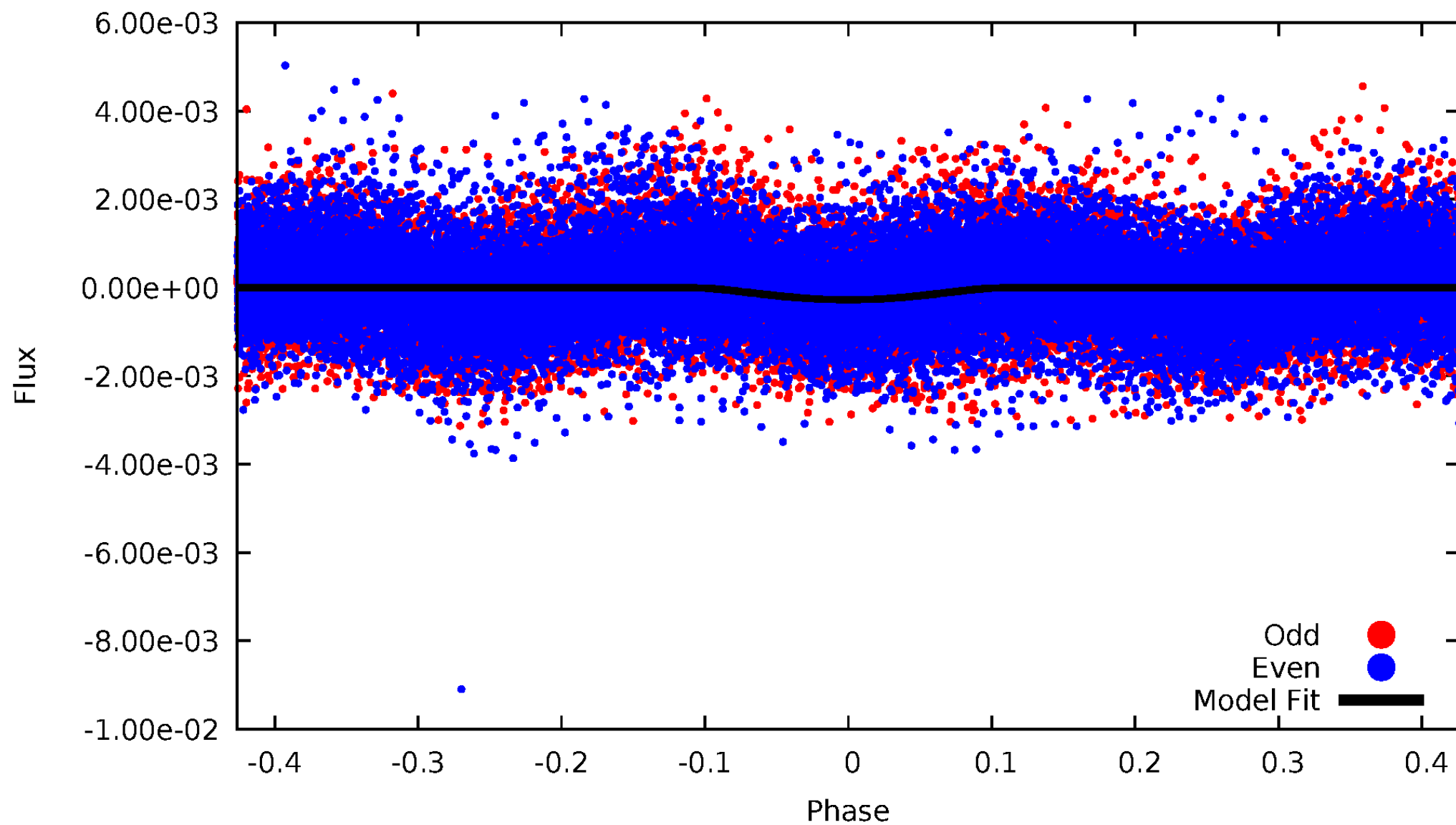
TCE 005781841-01





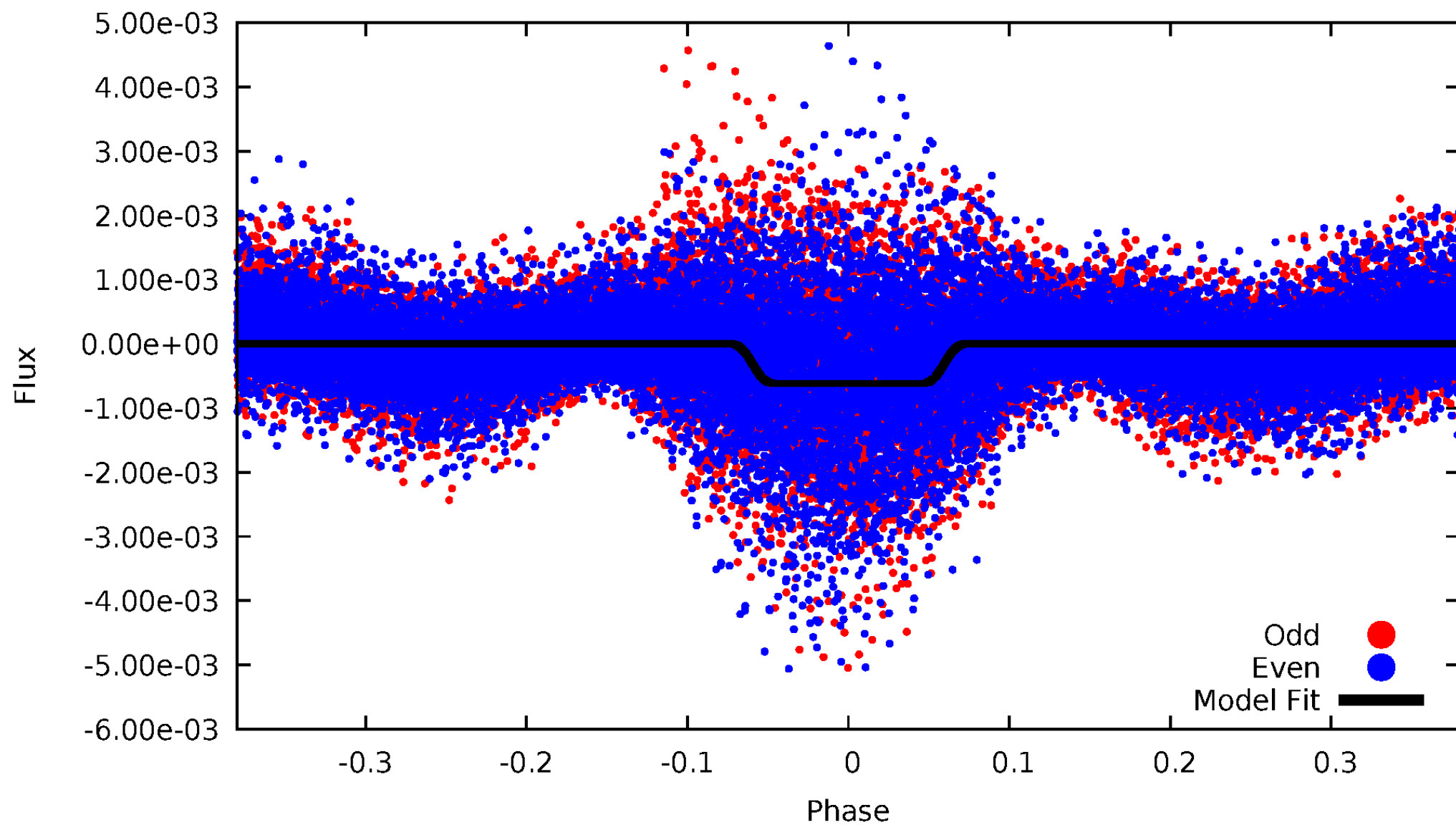
# DV Odd/Even

TCE 005781841-01



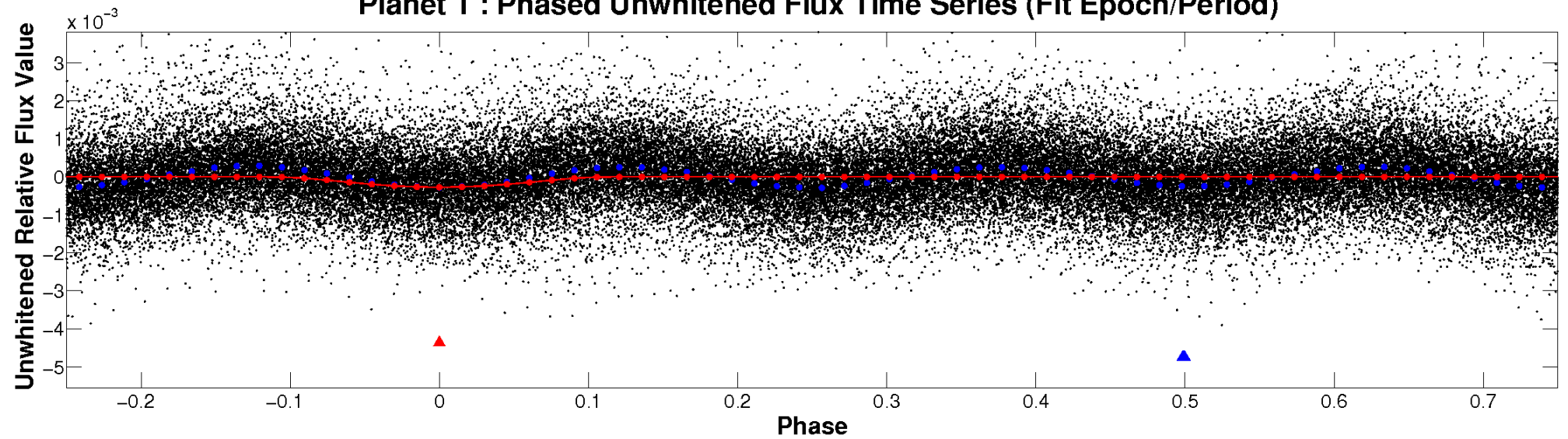
# ALT Odd/Even

TCE 005781841-01

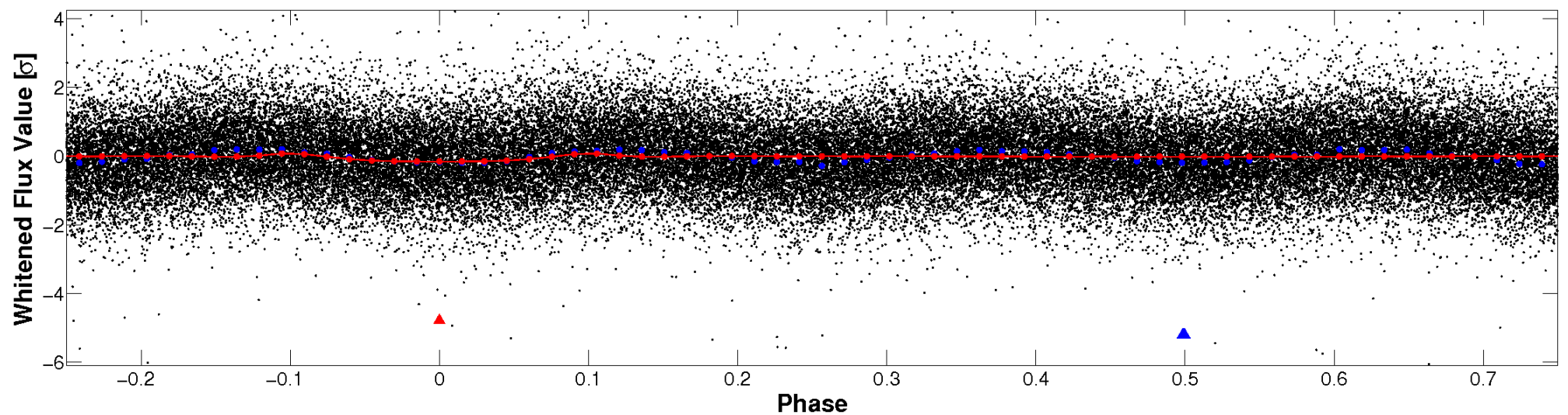


# Non-Whitened Vs. Whitened Light Curve

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

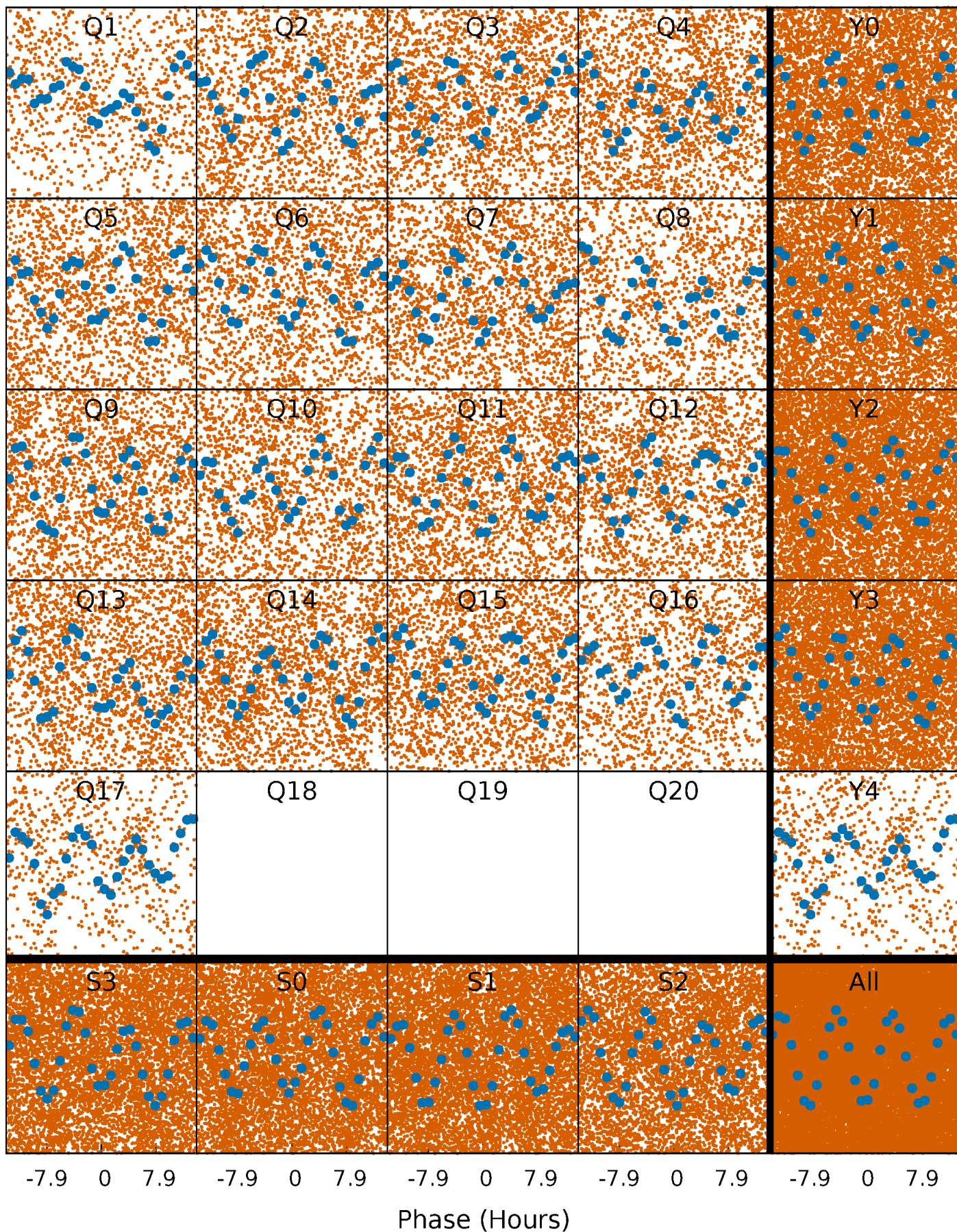


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

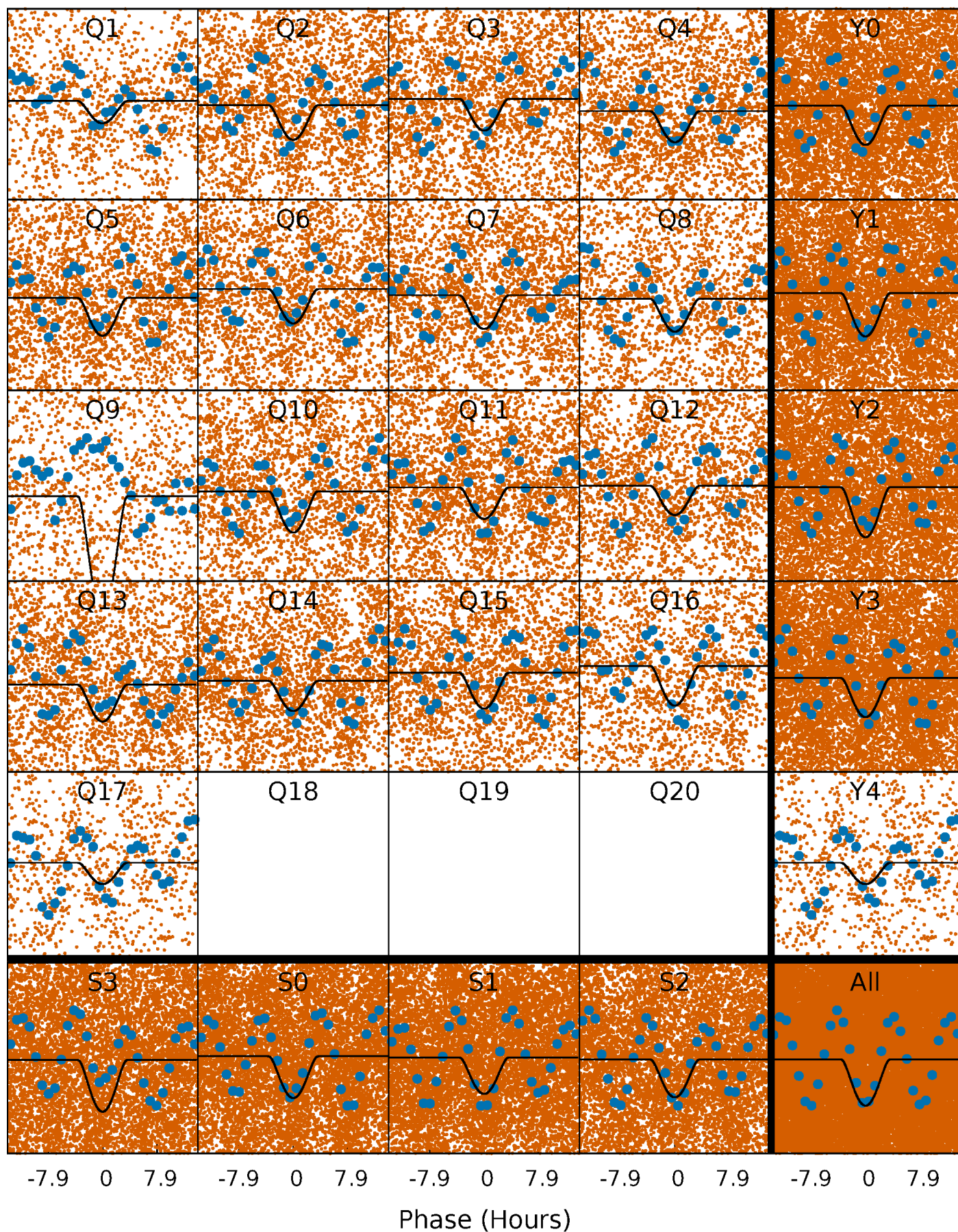
TCE 005781841-01 P= 1.354261 Days  $T_0=132.787426$  (BKJD)





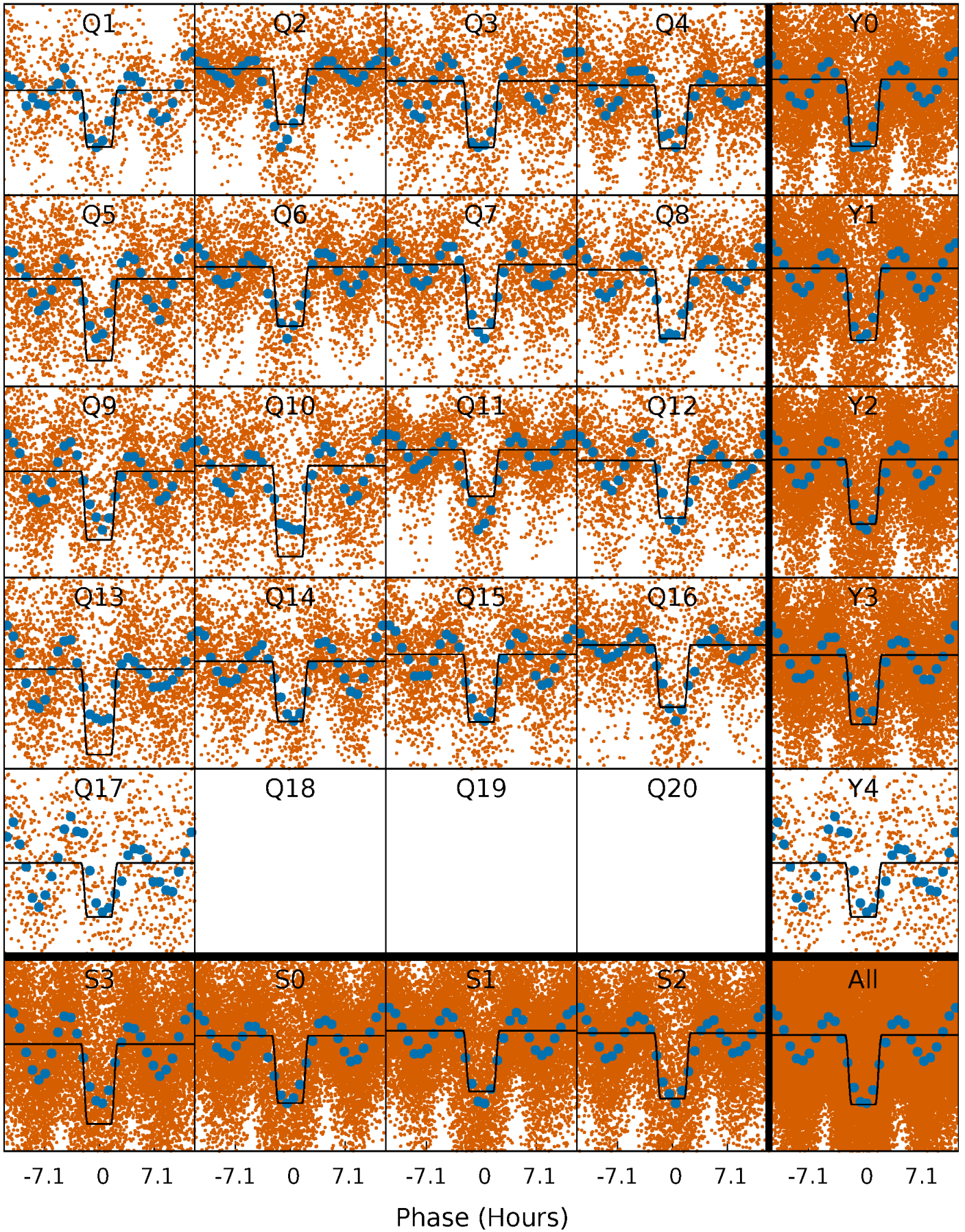
# DV Quarter-Phased Transit Curves

TCE 005781841-01 P= 1.354261 Days  $T_0=132.787426$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005781841-01   P= 1.354284 Days    $T_0=132.774017$  (BKJD)

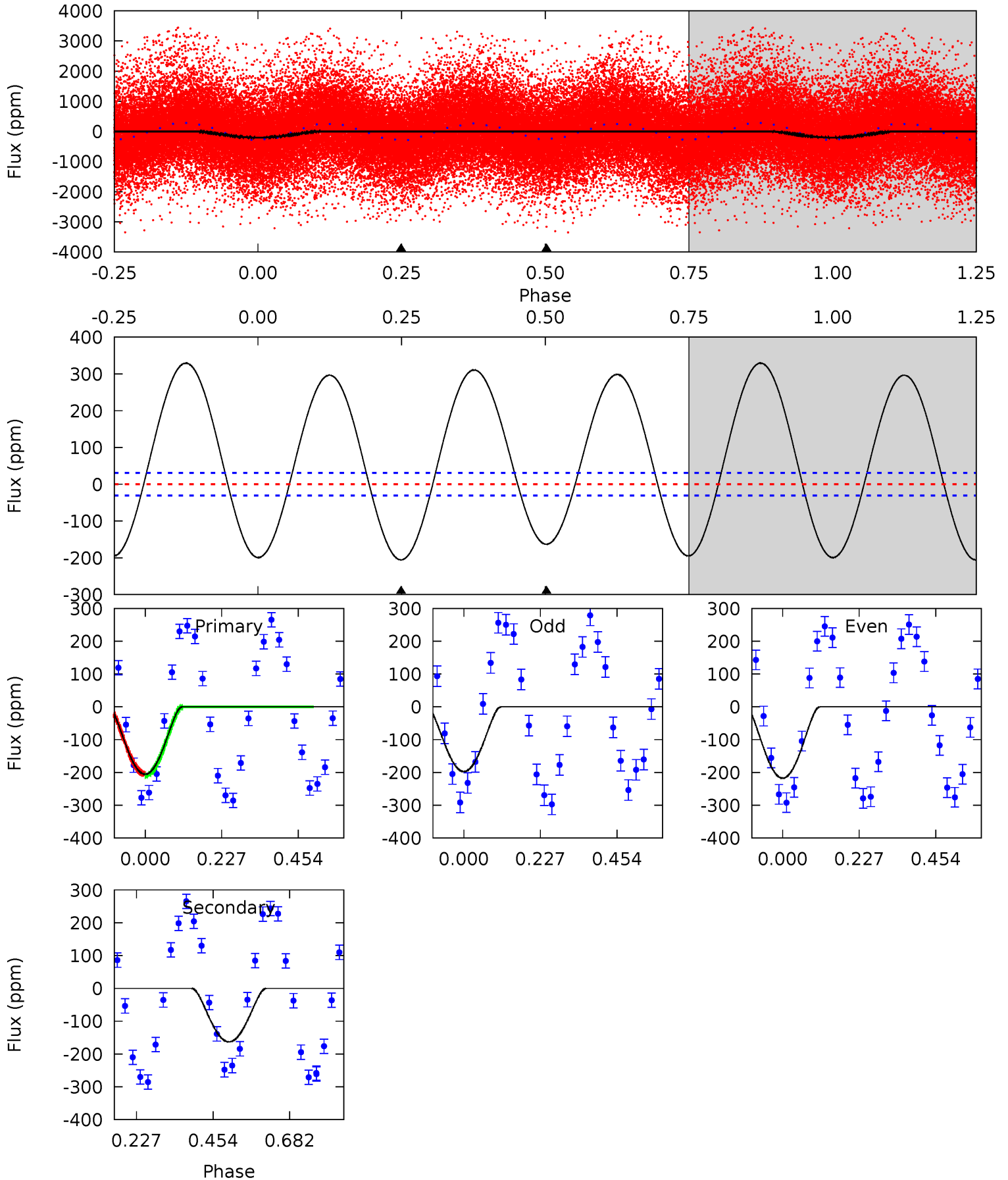




# DV Model-Shift Uniqueness Test

005781841-01, P = 1.354261 Days, E = 131.433165 Days

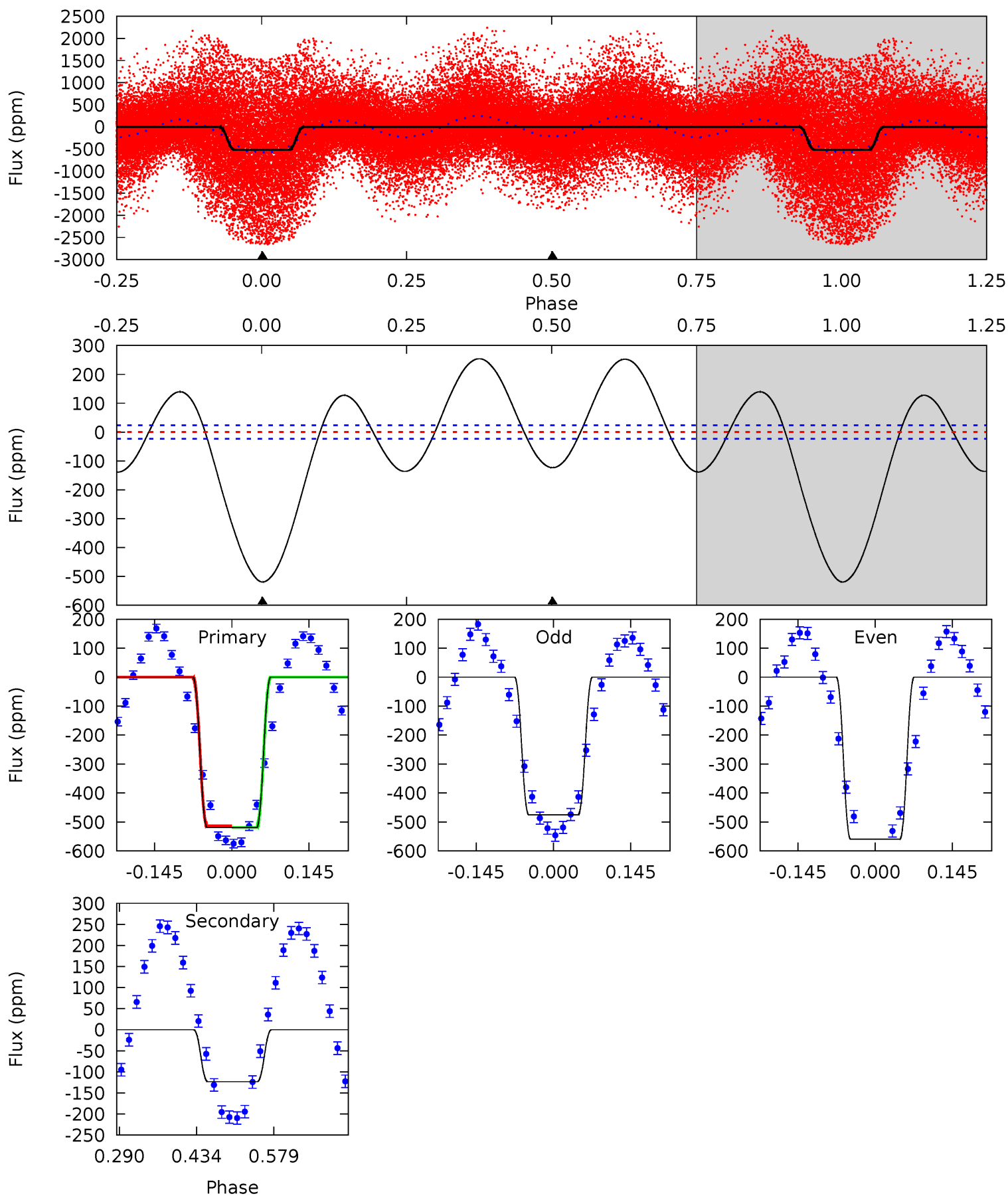
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.5	23.4	0	0	4.39	1.21	27.8	29.5	29.5	23.4	23.4	1.44	0.87	0.62	0.42



# Alt Model-Shift Uniqueness Test

005781841-01, P = 1.354284 Days, E = 131.419733 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
99.8	23.7	0	0	4.49	1.46	21.3	99.8	99.8	23.7	23.7	7.98	1.04	0.33	0





### Stellar Parameters For KIC 005781841

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7631^{+211}_{-316}$	$4.037^{+0.187}_{-0.153}$	$-0.100^{+0.200}_{-0.350}$	$2.057^{+0.525}_{-0.525}$	$1.678^{+0.198}_{-0.273}$	$0.272^{+0.283}_{-0.121}$
	+3%/-4%	+5%/-4%	+200%/-350%	+26%/-26%	+12%/-16%	+104%/-44%
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 005781841-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-163 \pm 7$	$6.17^{+2.84}_{-2.57}$	$3963^{+276}_{-294}$	$4904^{+1589}_{-816}$	$1.898^{+3.630}_{-1.032}$
Alt.	$-123 \pm 5$	$5.48^{+2.81}_{-2.53}$	$3981^{+276}_{-317}$	$4900^{+1849}_{-922}$	$1.809^{+4.465}_{-1.023}$

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

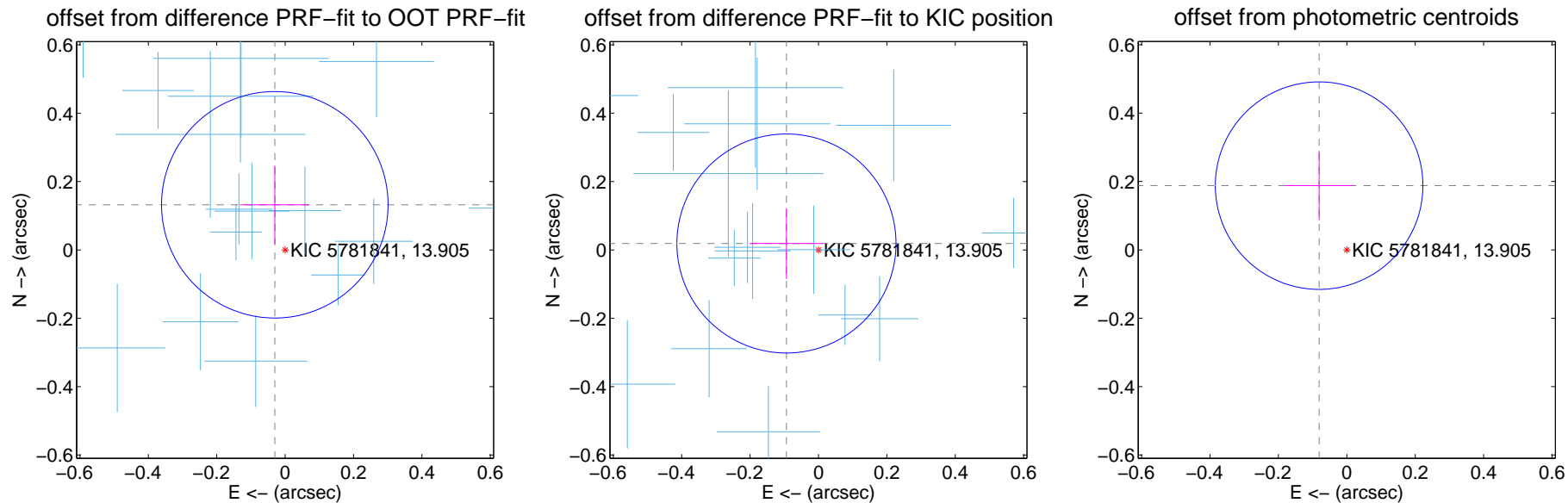
## DV Centroid Data

Supplemental centroid analysis for 005781841-01. Kepler magnitude: 13.90. Transit SNR 13.62

There are 17 quarters with good PRF difference image offsets

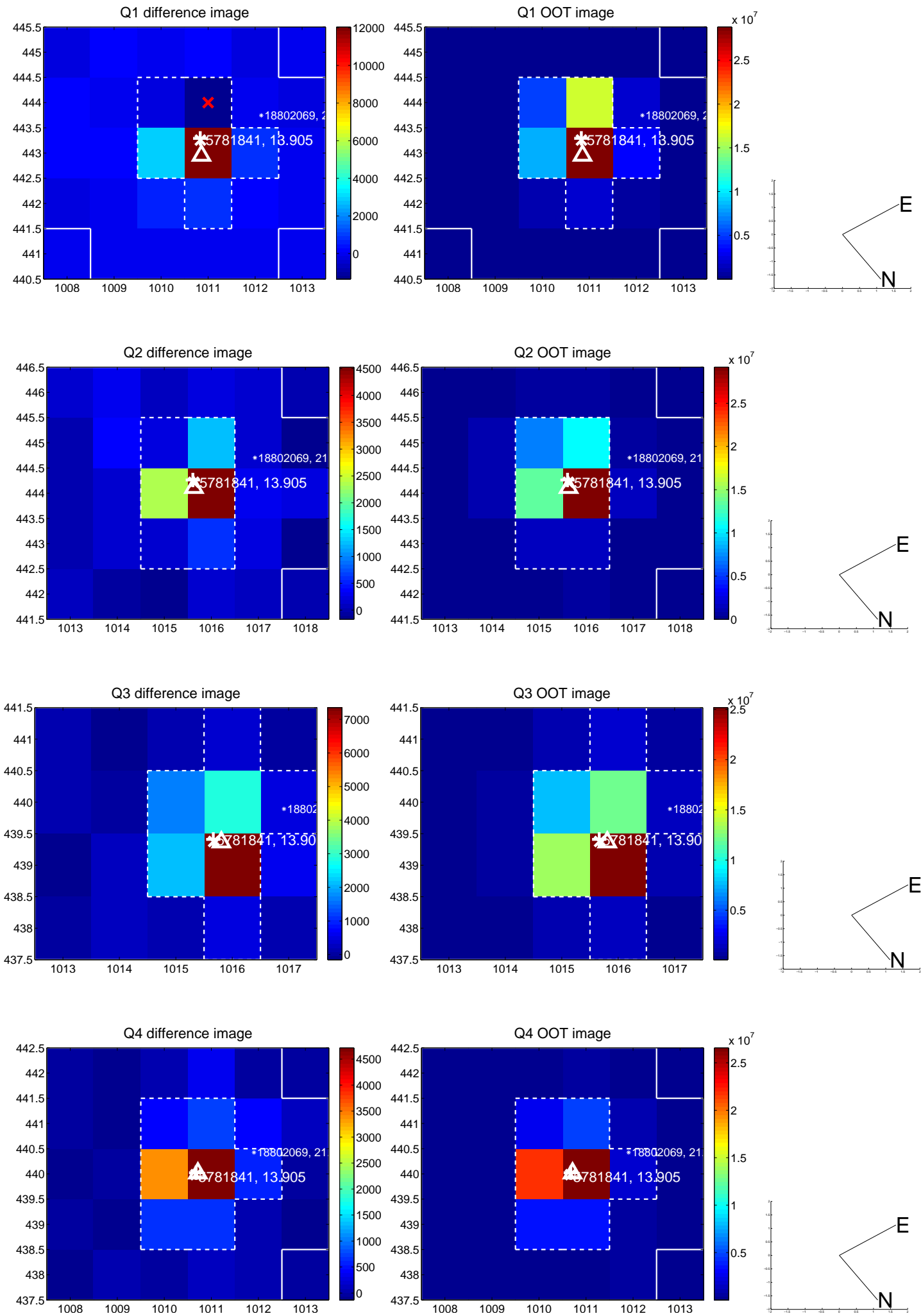
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.135 \pm 0.110$	1.23	$0.030 \pm 0.102$	$0.132 \pm 0.115$
PRF-fit source offset from KIC position	$0.096 \pm 0.107$	0.89	$0.094 \pm 0.107$	$0.019 \pm 0.104$
photometric centroid source offset	$0.20 \pm 0.10$	2.02	$0.08 \pm 0.10$	$0.19 \pm 0.10$

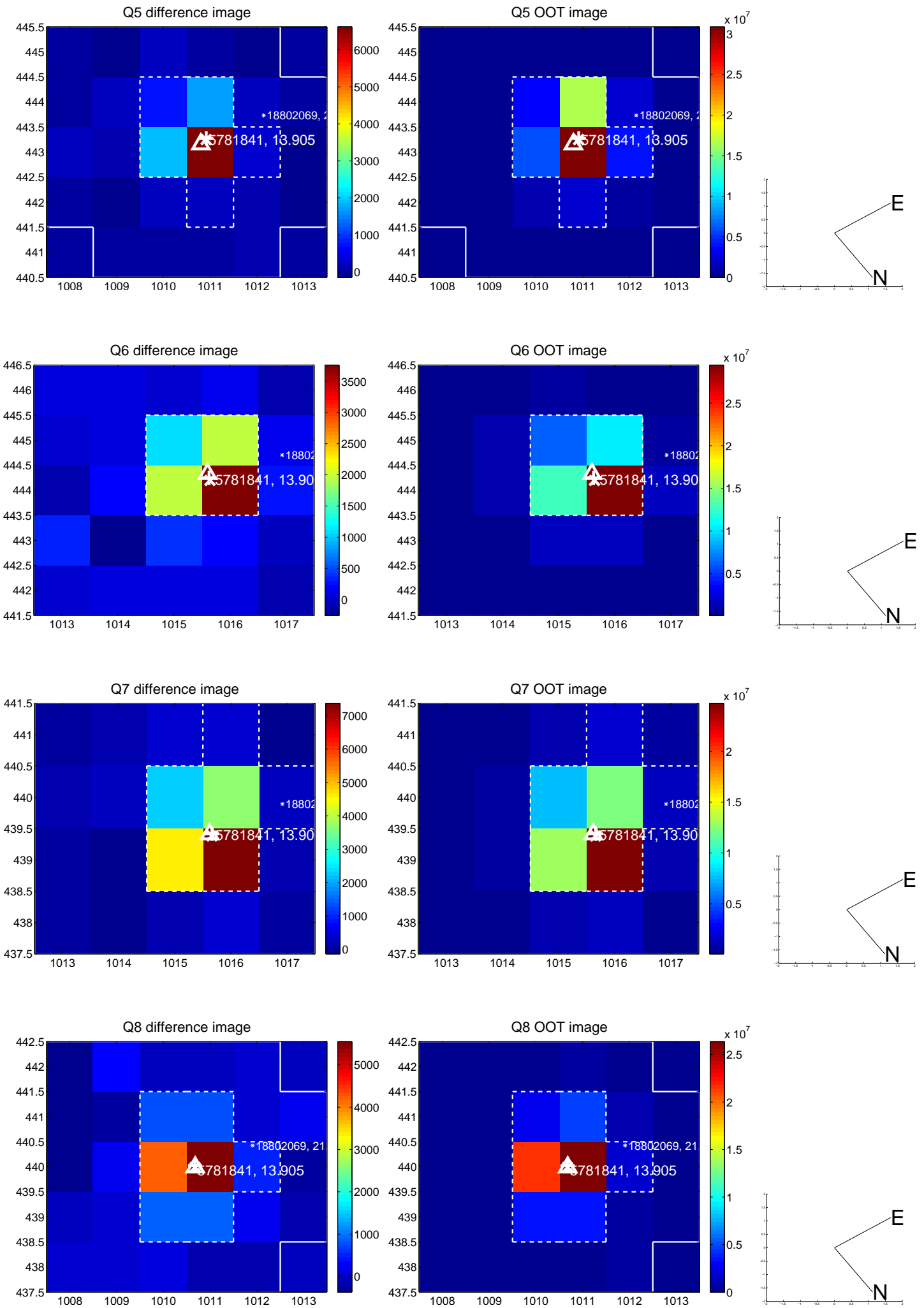


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

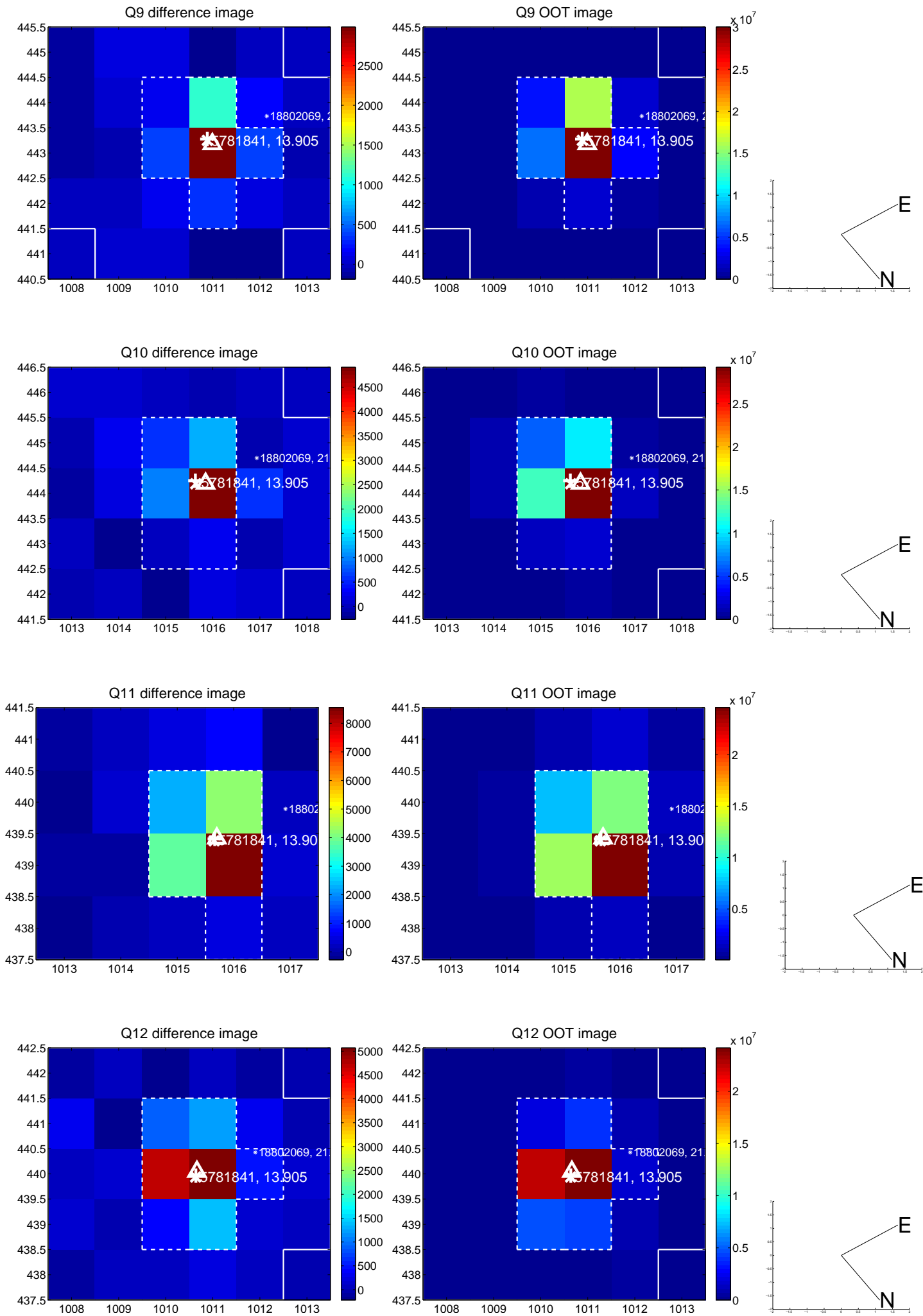


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

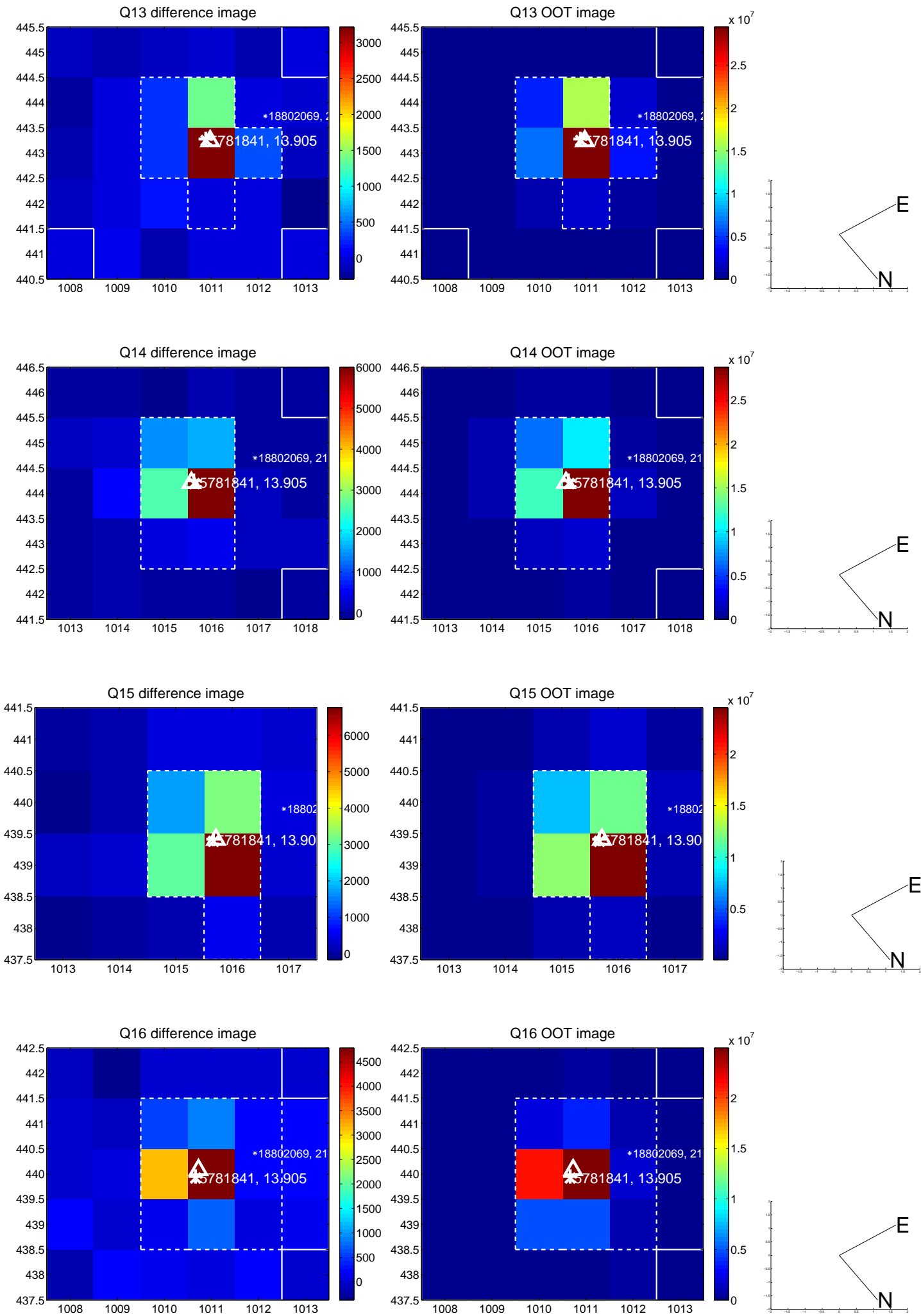




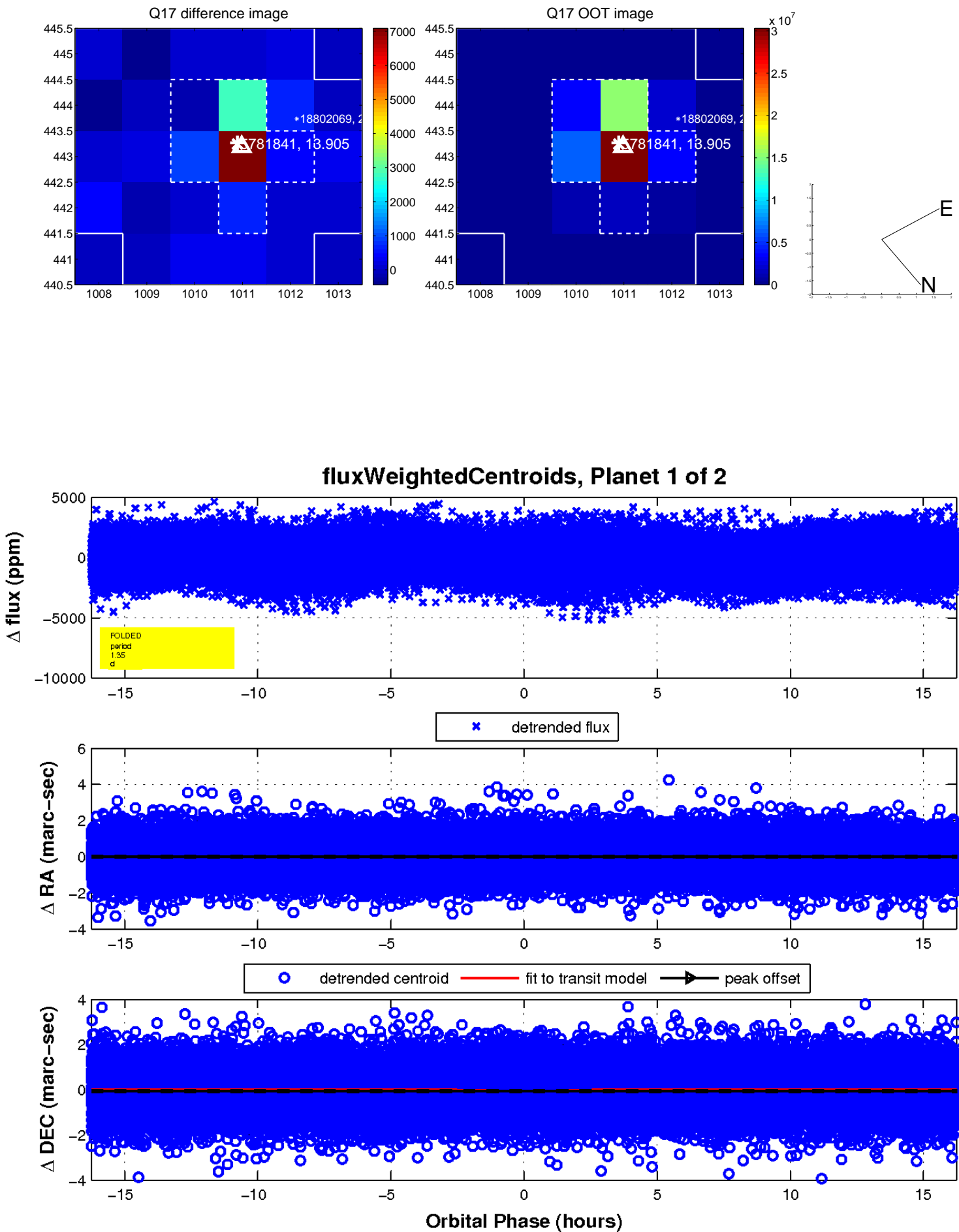
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

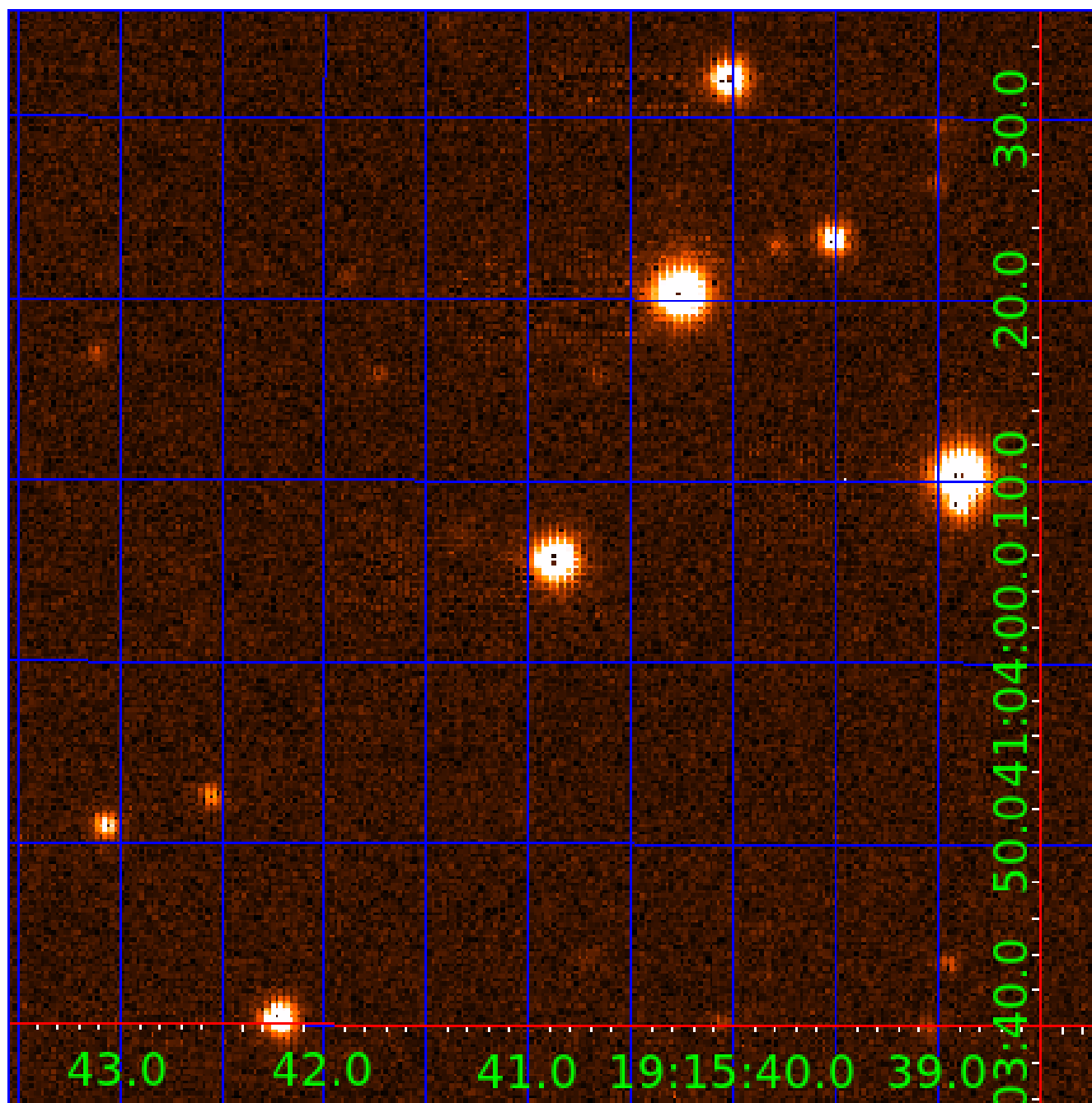


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005781841

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005781841-01	OBS	No	1.354261	132.787425	274.4	6.925	9.1	13.6	2.06	7631	6.39	15840.66
005781841-02	OBS	No	1.354259	132.110149	360.5	7.317	17.1	21.6	2.06	7631	7.42	15840.69

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005781841-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
005781841-02	OBS	FP	0.00	1	0	0	0	SAME_NTL_PERIOD

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

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

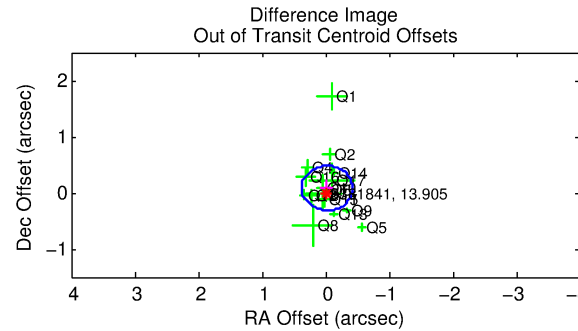
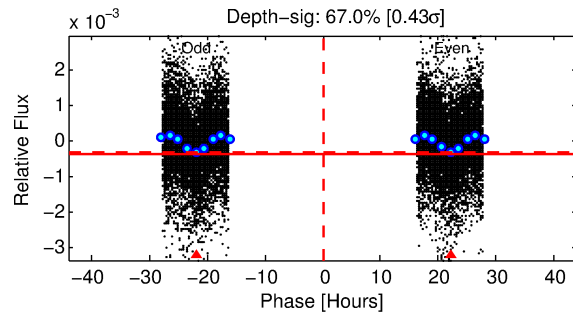
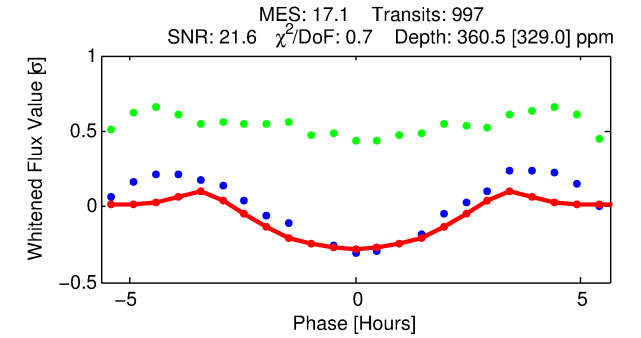
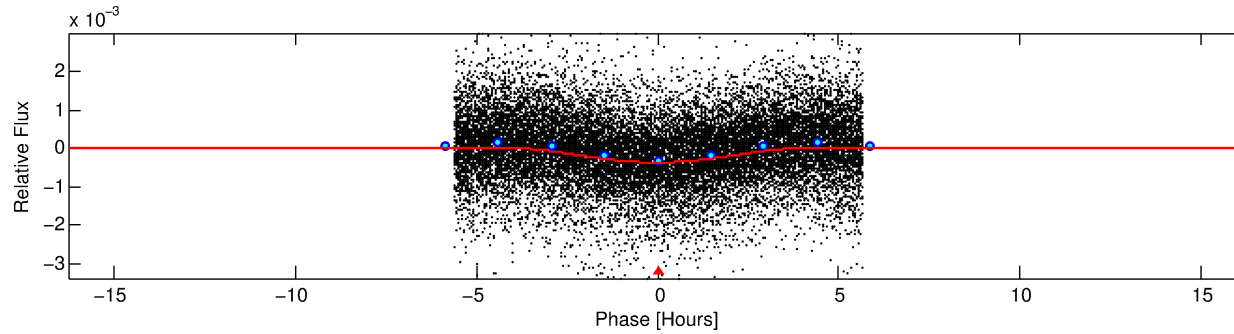
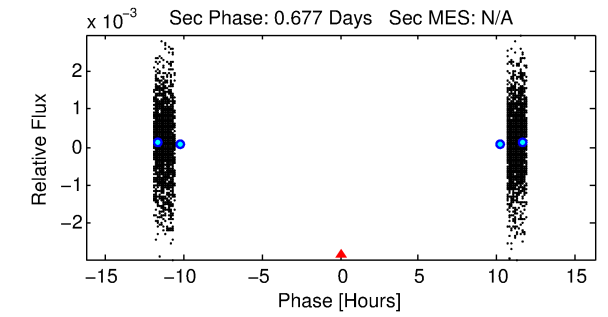
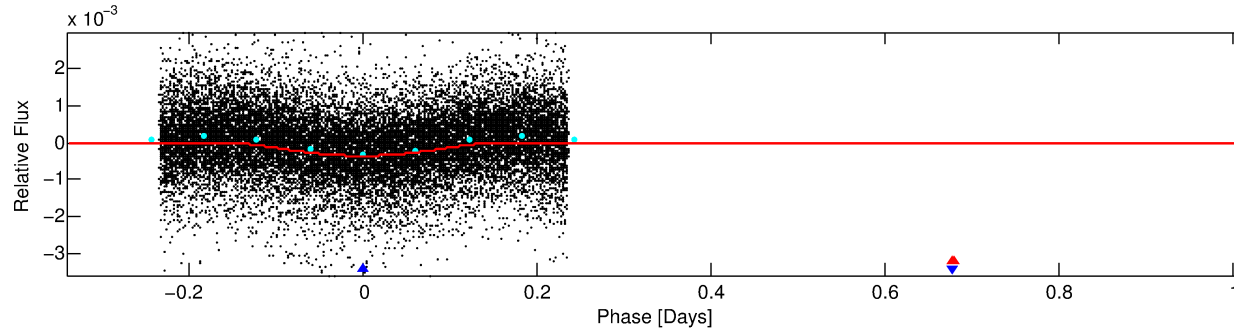
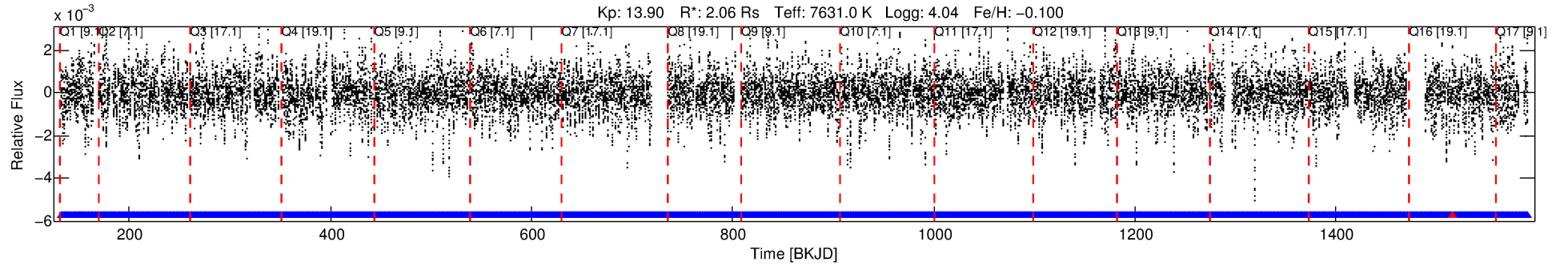
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005781841-02

No Significant Match Found

# DV One-Page Summary

KIC: 5781841 Candidate: 2 of 2 Period: 1.354 d



## DV Fit Results:

Period = 1.35426 [0.00001] d  
Epoch = 132.1101 [0.0031] BKJD  
Rp/R\* = 0.0330 [0.0140]  
a/R\* = 1.08 [0.00]  
b = 1.00 [0.00]  
Seff = 15840.69 [5901.35]  
Teff = 2861 [266] K  
Rp = 7.42 [3.66] Re  
a = 0.0285 [0.0063] AU

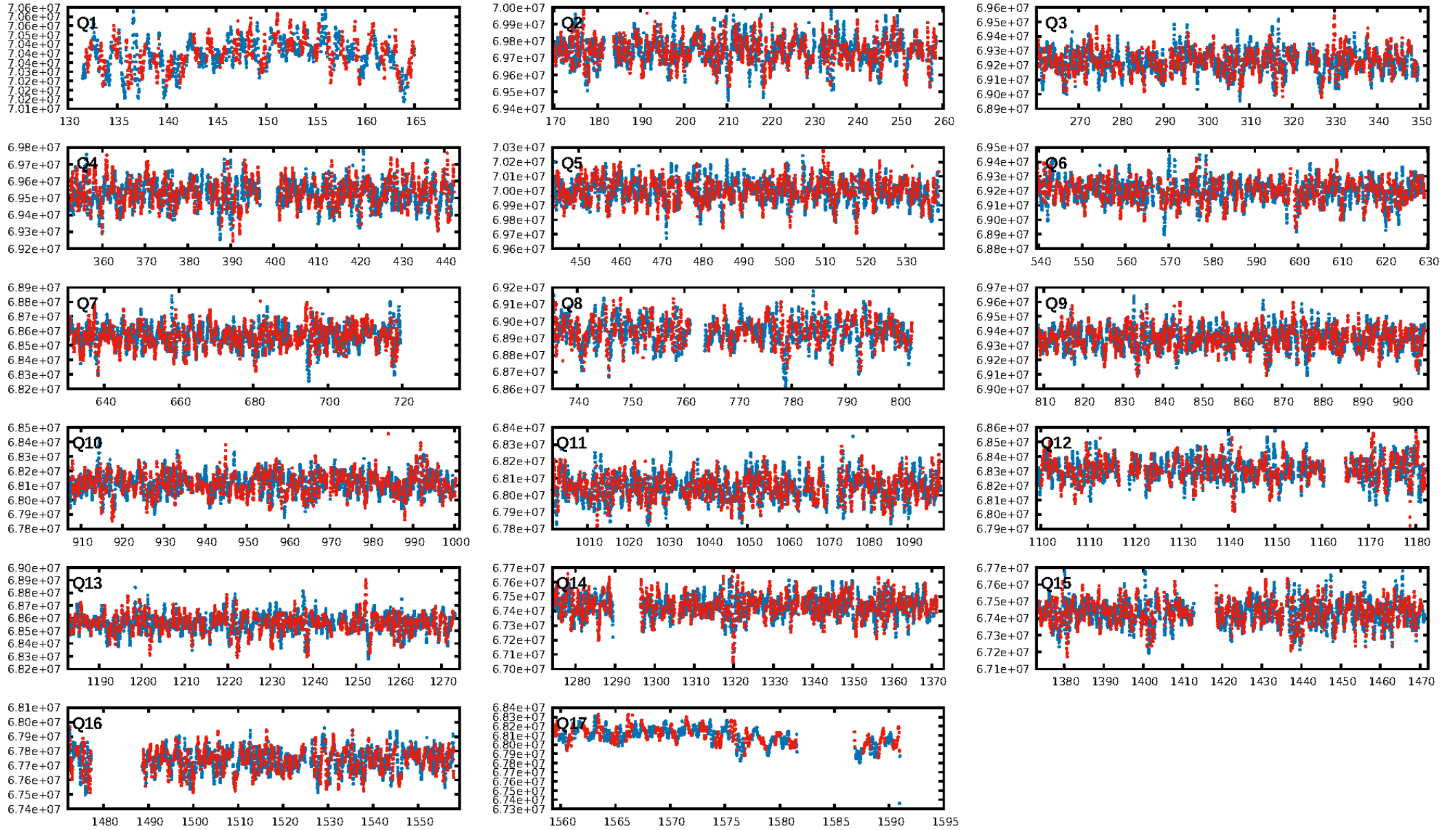
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [951/952]  
GhostDiagnostic-chr: 14.49  
Centroid-sig: 0.3%  
Centroid-so: 0.138 arcsec [1.87σ]  
OotOffset-rm: 0.084 arcsec [0.64σ]  
KicOffset-rm: 0.065 arcsec [0.66σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 0.00 [0/17]

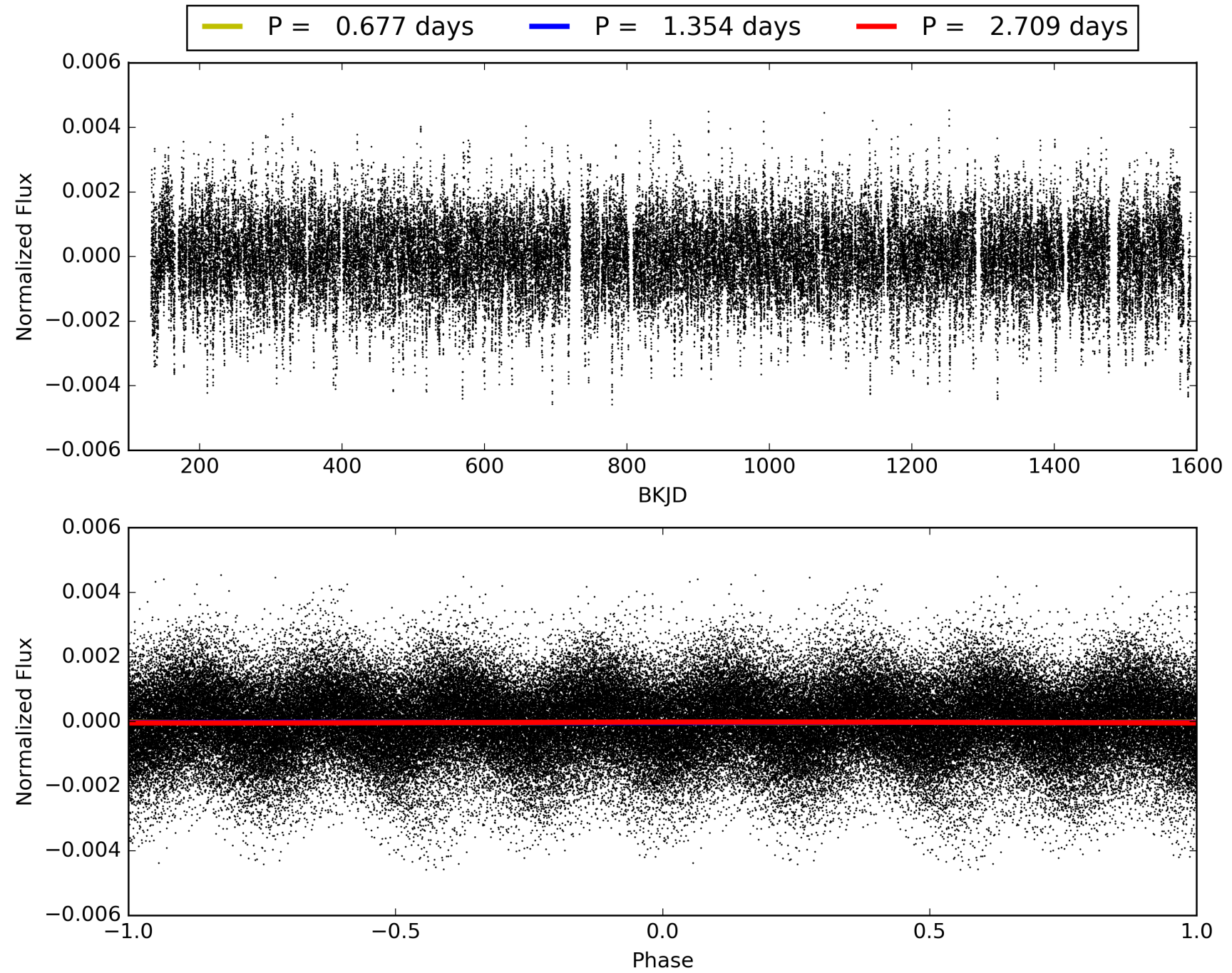
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 18:24:27 Z

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

# TCE 005781841-02, PDC Light Curves

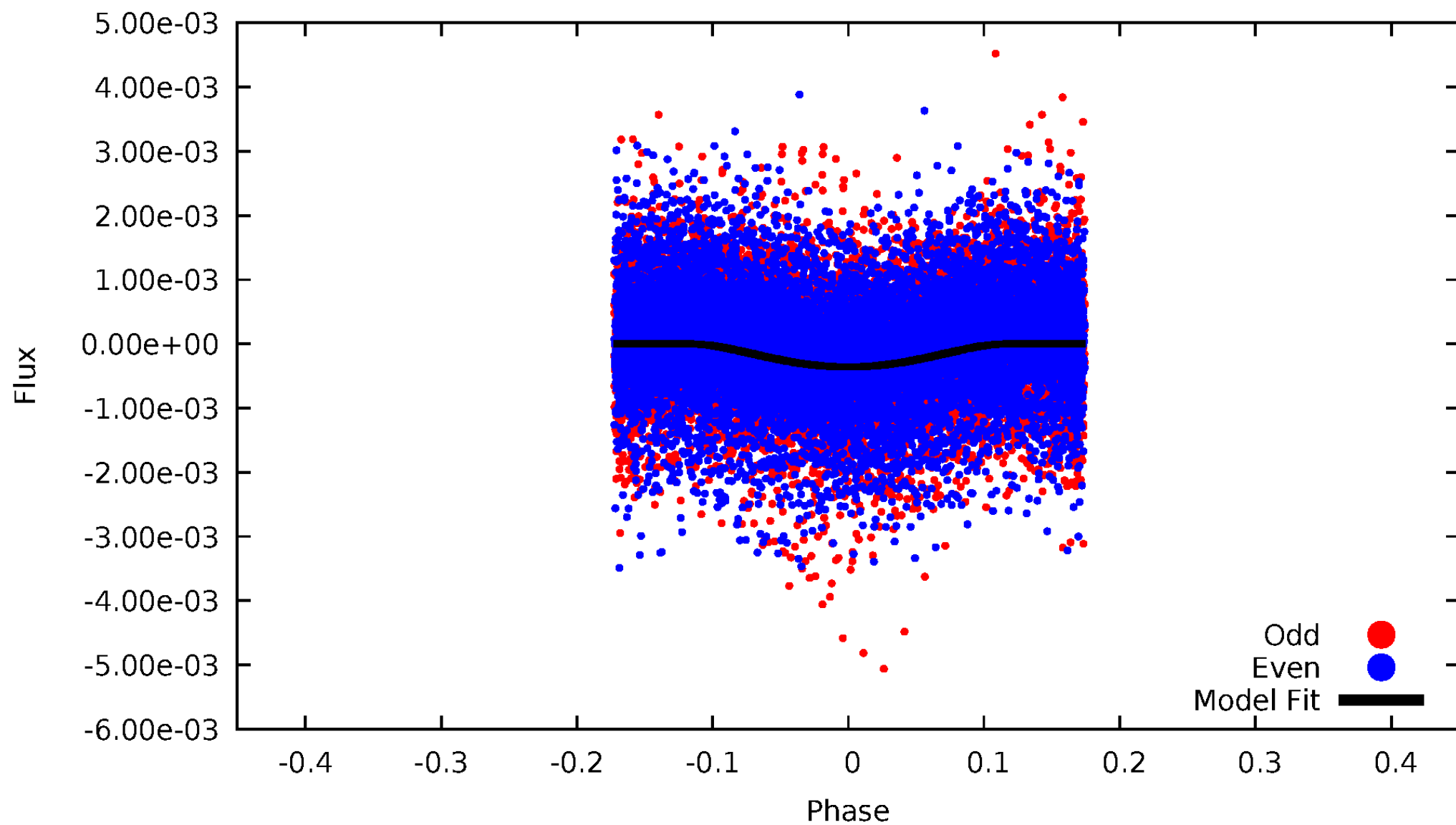


# TCE 005781841-02



DV Odd/Even

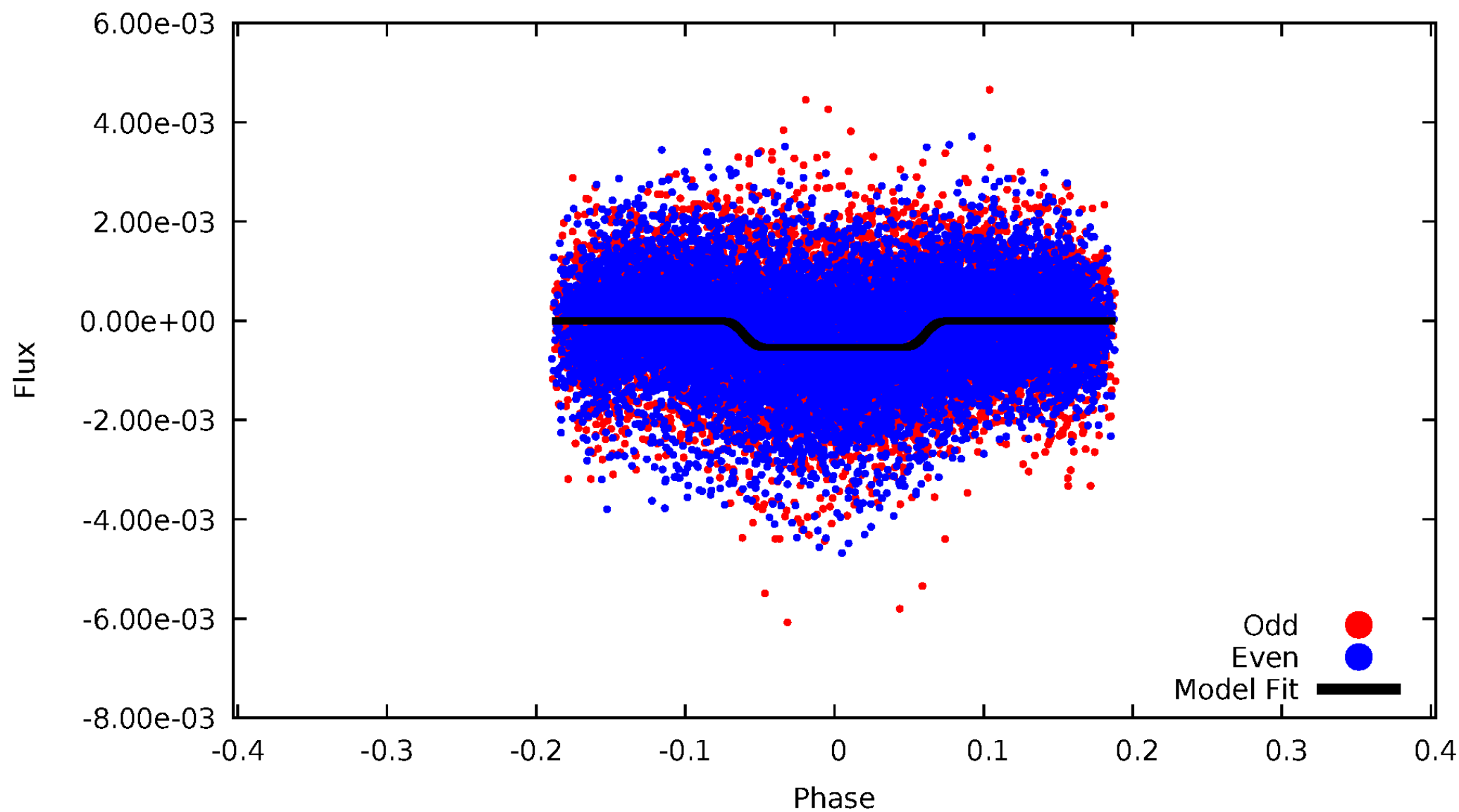
TCE 005781841-02





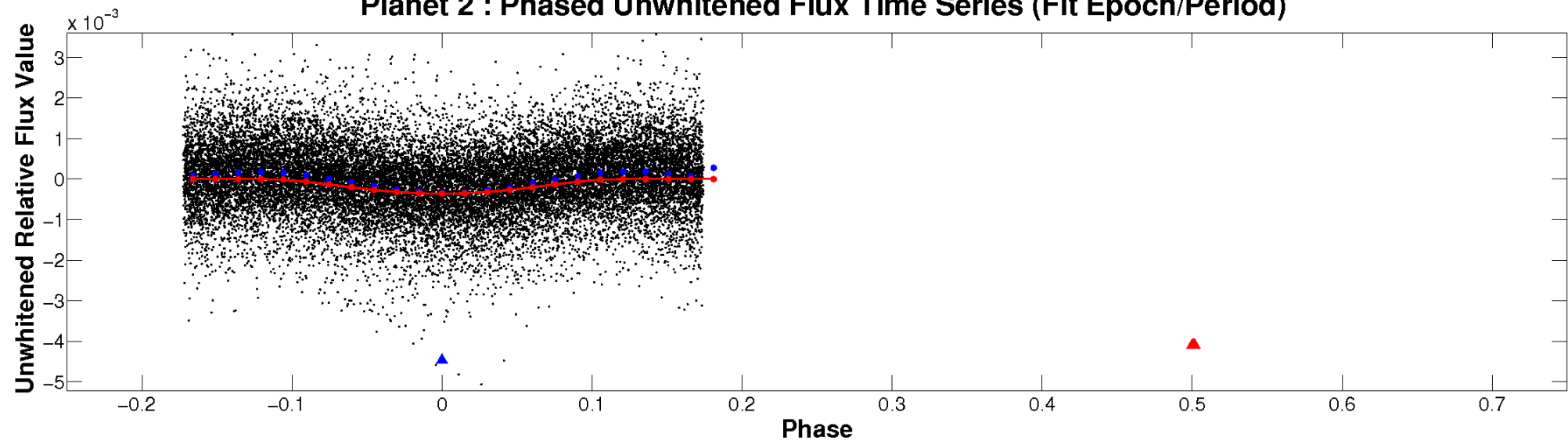
# ALT Odd/Even

TCE 005781841-02

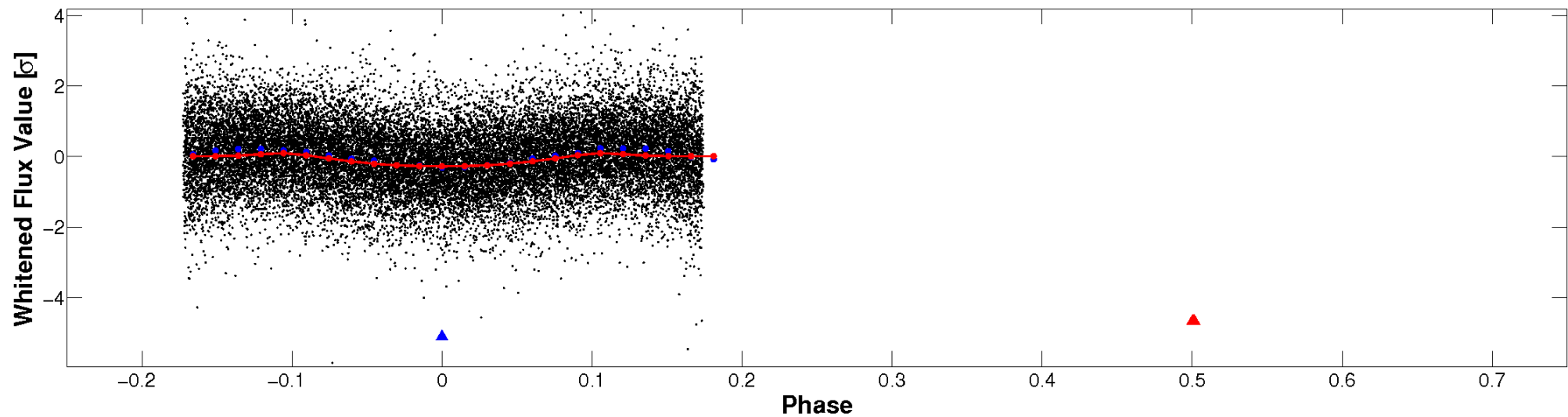


# Non-Whitened Vs. Whitened Light Curve

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

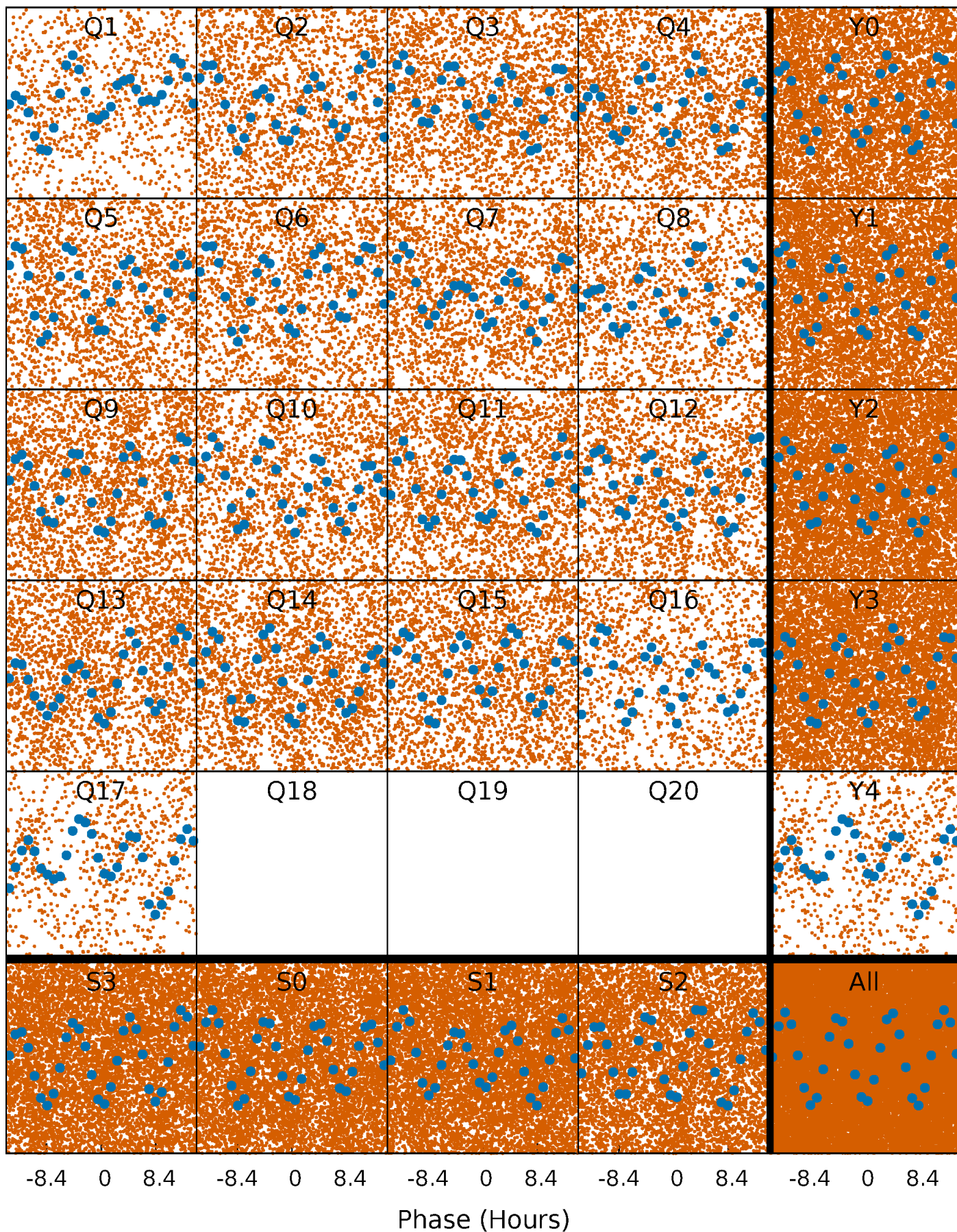


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



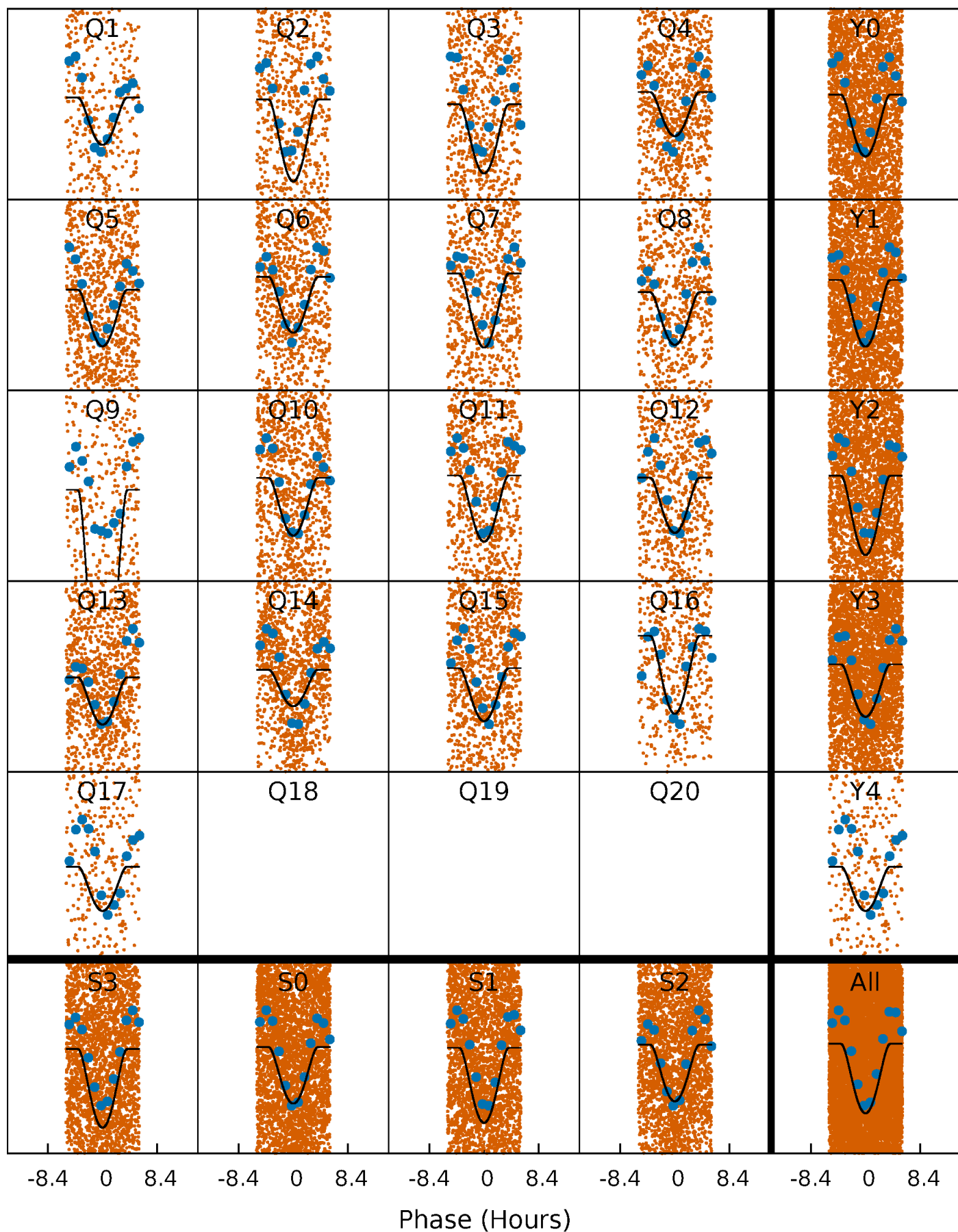
# PDC Quarter-Phased Transit Curves

TCE 005781841-02   P= 1.354259 Days    $T_0=132.110149$  (BKJD)



# DV Quarter-Phased Transit Curves

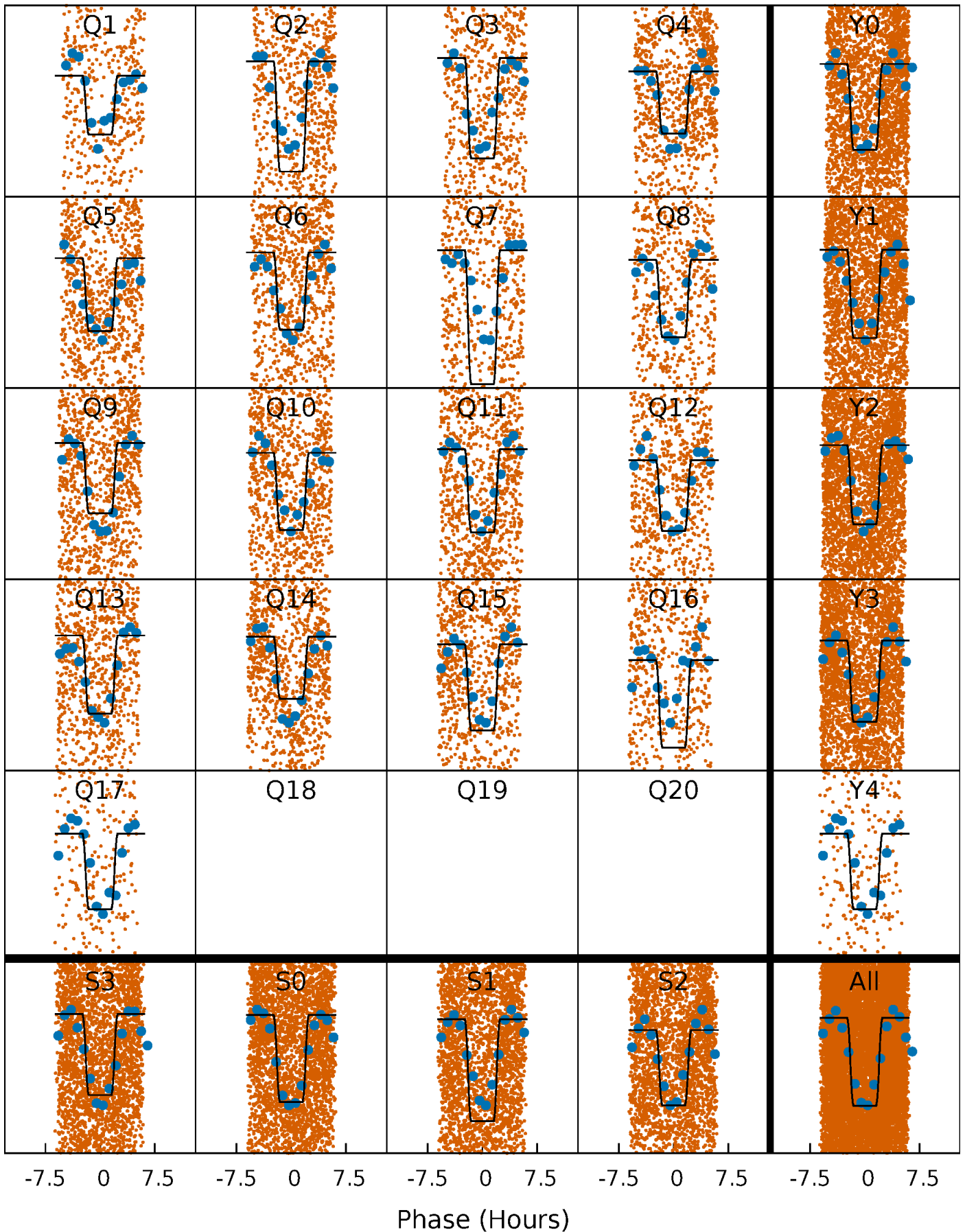
TCE 005781841-02   P= 1.354259 Days    $T_0=132.110149$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 005781841-02   P= 1.354303 Days    $T_0=132.088206$  (BKJD)

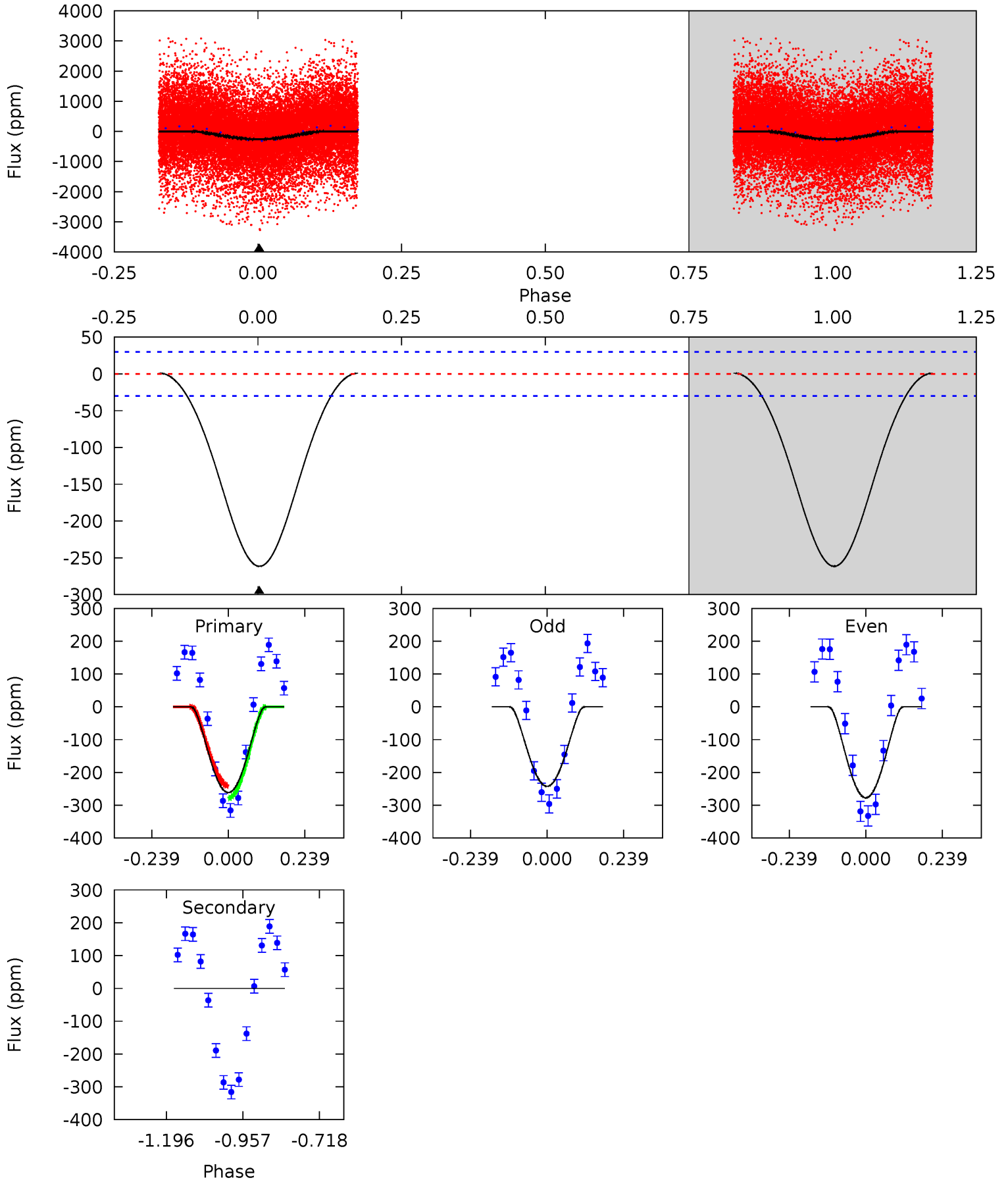




# DV Model-Shift Uniqueness Test

005781841-02, P = 1.354259 Days, E = 130.755890 Days

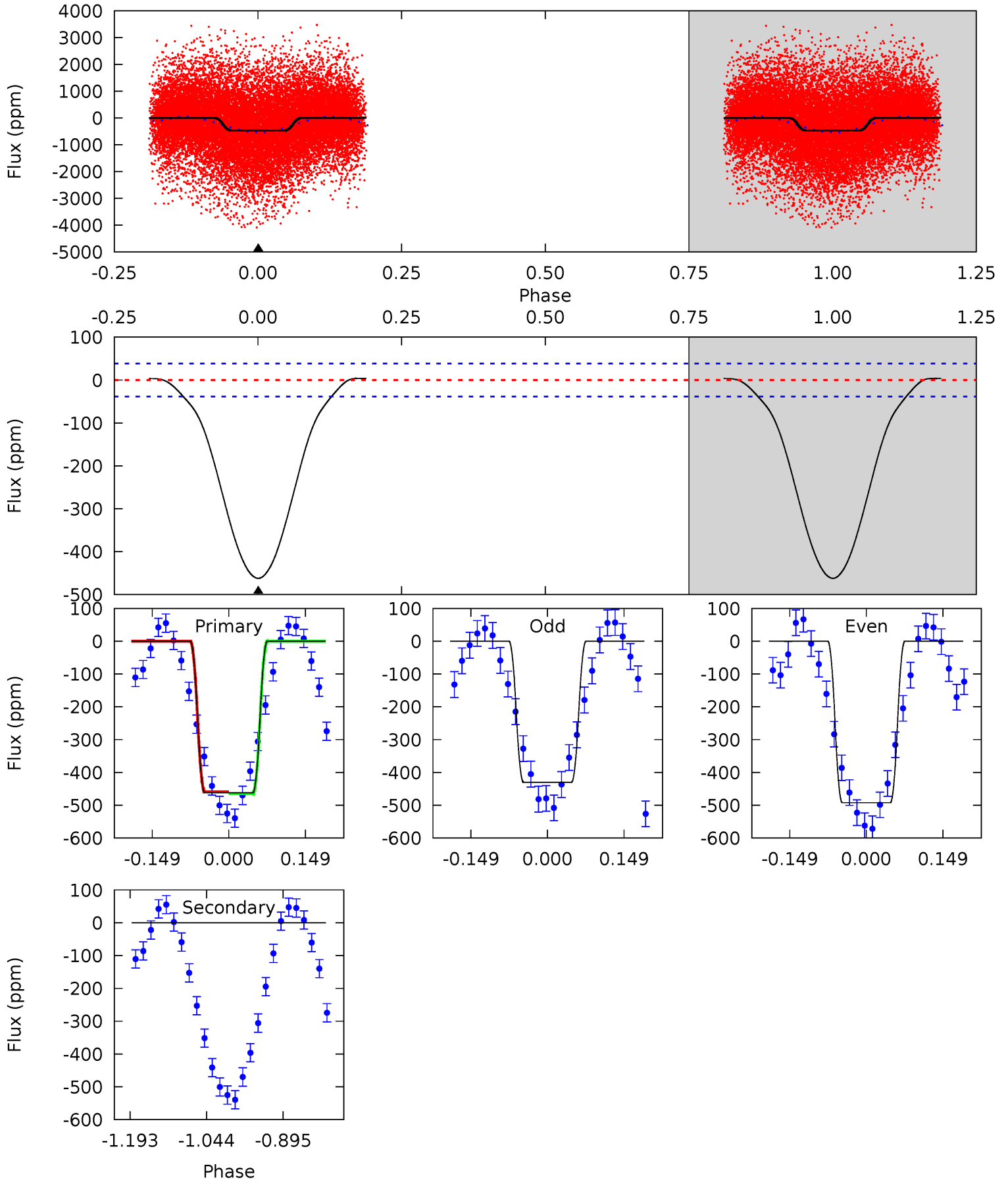
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.2	0	0	0	4.38	1.18	0.18	38.2	38.2	0	0	2.56	1.18	0.00	2.81



# Alt Model-Shift Uniqueness Test

005781841-02, P = 1.354303 Days, E = 130.733903 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
54.1	0	0	0	4.48	1.44	0.54	54.1	54.1	0	0	3.65	1.09	0.01	0.26



### Stellar Parameters For KIC 005781841

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7631^{+211}_{-316}$	$4.037^{+0.187}_{-0.153}$	$-0.100^{+0.200}_{-0.350}$	$2.057^{+0.525}_{-0.525}$	$1.678^{+0.198}_{-0.273}$	$0.272^{+0.283}_{-0.121}$
	+3%/-4%	+5%/-4%	+200%/-350%	+26%/-26%	+12%/-16%	+104%/-44%
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 005781841-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 7$	$7.38^{+3.10}_{-3.07}$	$3965^{+301}_{-288}$	$-3640^{+230}_{-241}$	$-0.001^{+0.060}_{-0.071}$
Alt.	$0 \pm 9$	$5.16^{+3.15}_{-2.84}$	$3974^{+276}_{-328}$	$-3634^{+482}_{-393}$	$-0.005^{+0.173}_{-0.186}$

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

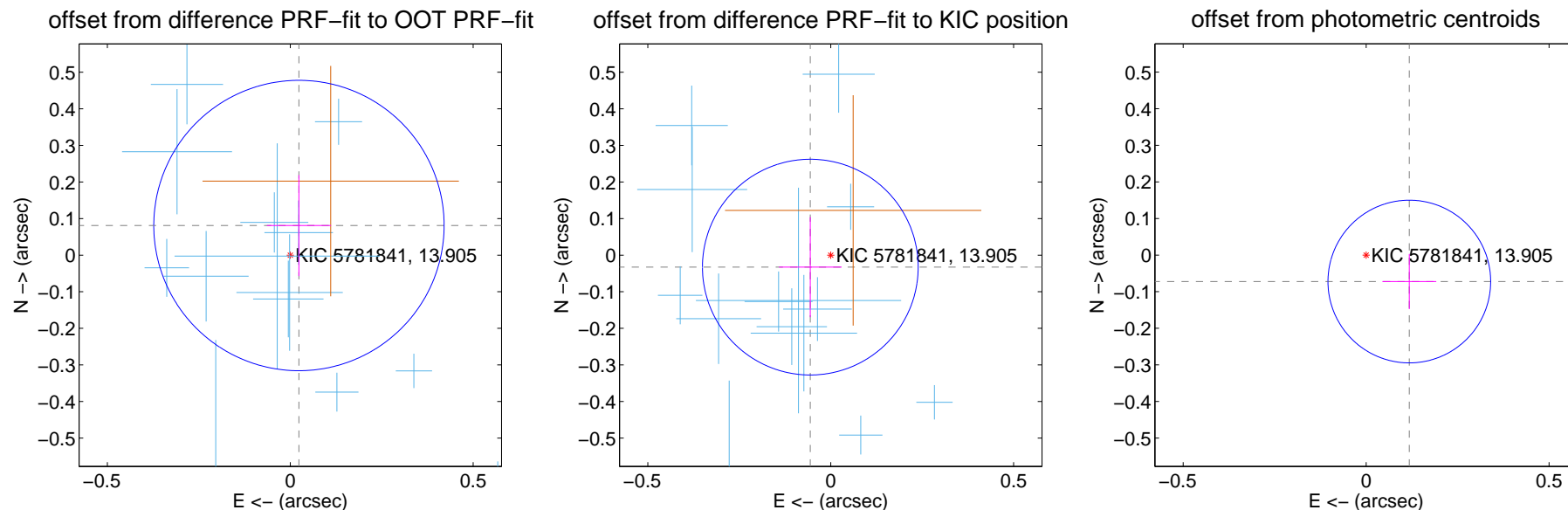
## DV Centroid Data

Supplemental centroid analysis for 005781841-02. Kepler magnitude: 13.90. Transit SNR 21.64

There are 16 quarters with good PRF difference image offsets

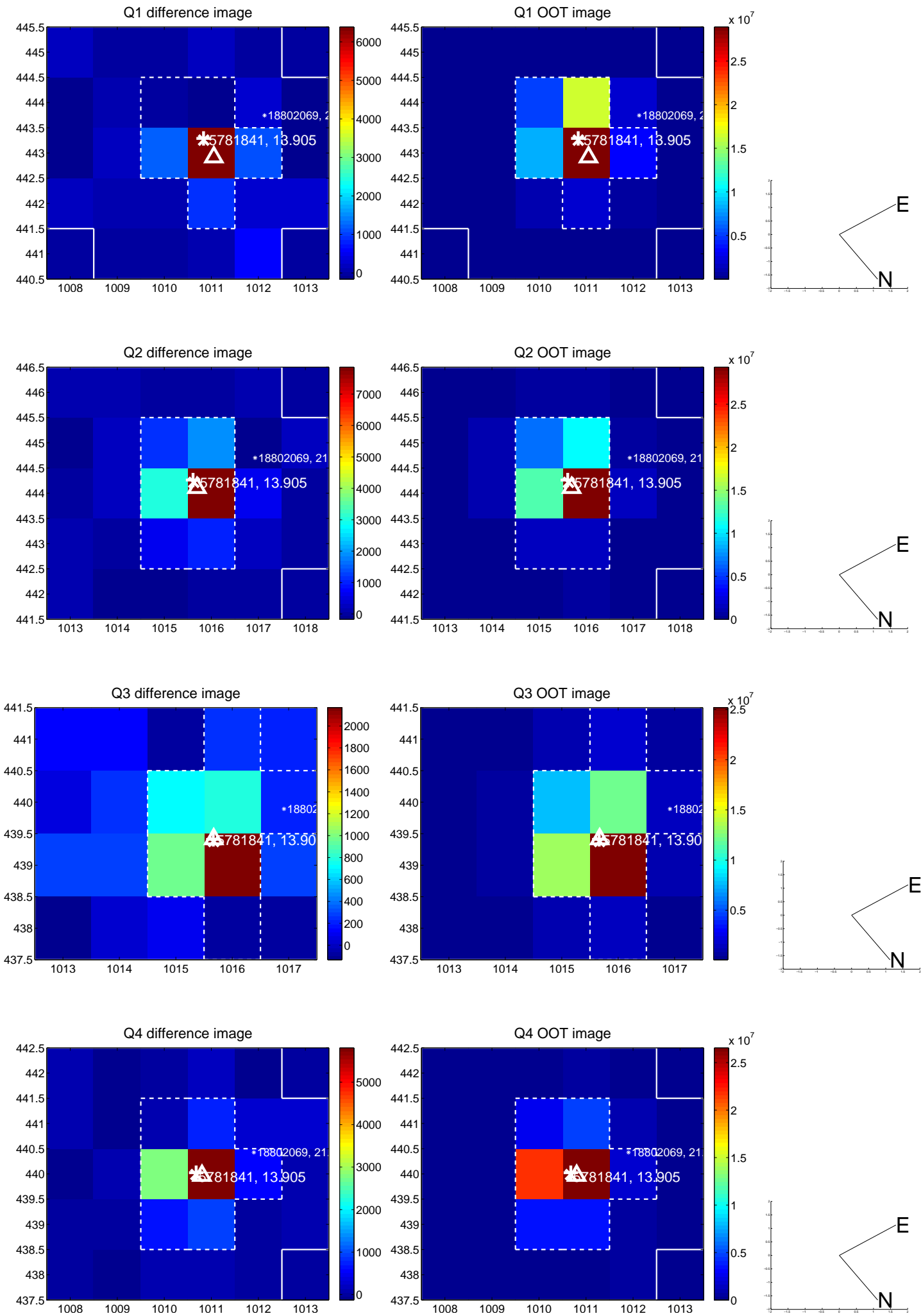
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.084 \pm 0.132$	0.64	$-0.024 \pm 0.088$	$0.081 \pm 0.138$
PRF-fit source offset from KIC position	$0.065 \pm 0.098$	0.66	$0.056 \pm 0.086$	$-0.033 \pm 0.137$
photometric centroid source offset	$0.14 \pm 0.07$	1.87	$-0.12 \pm 0.07$	$-0.07 \pm 0.08$



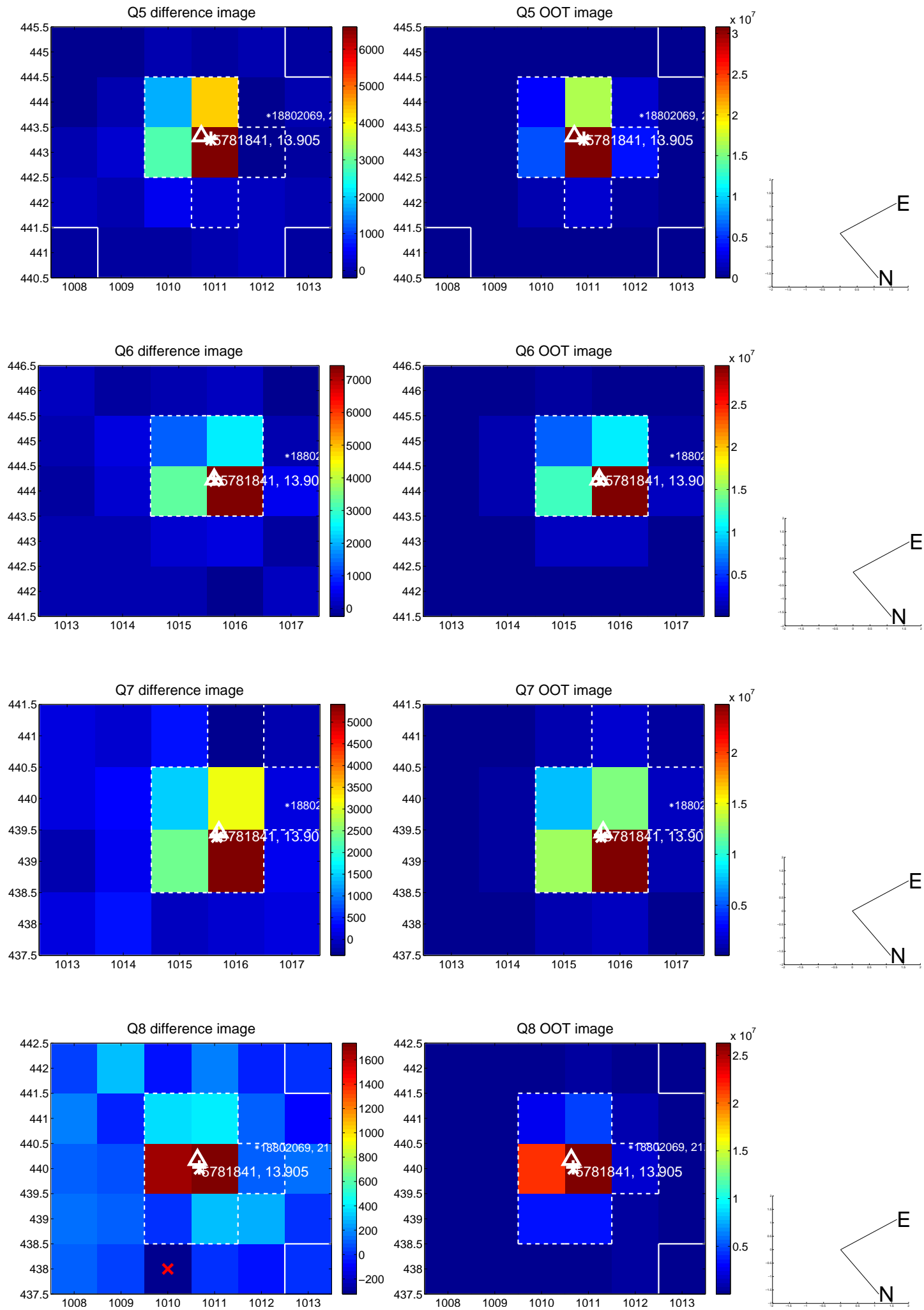
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

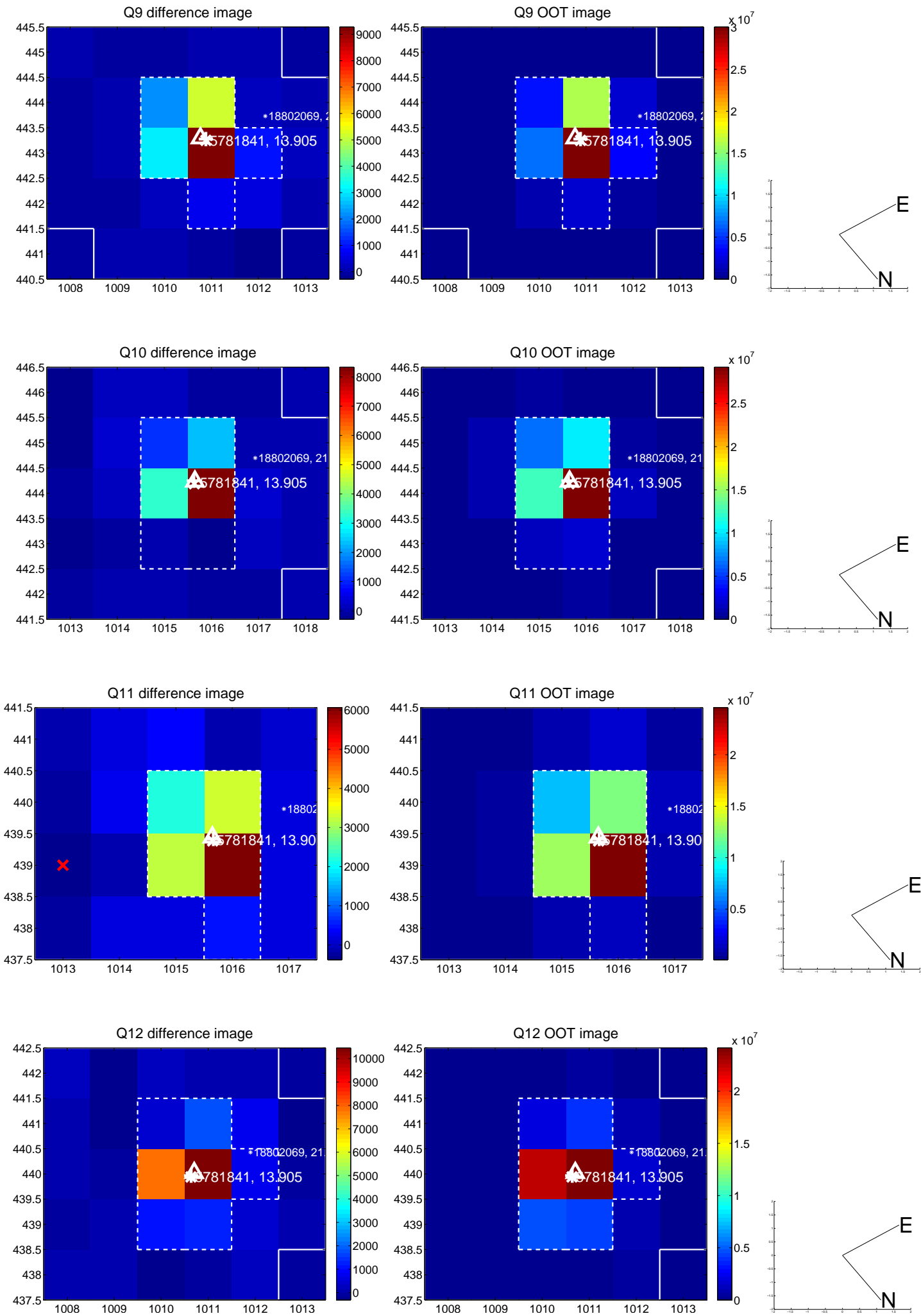




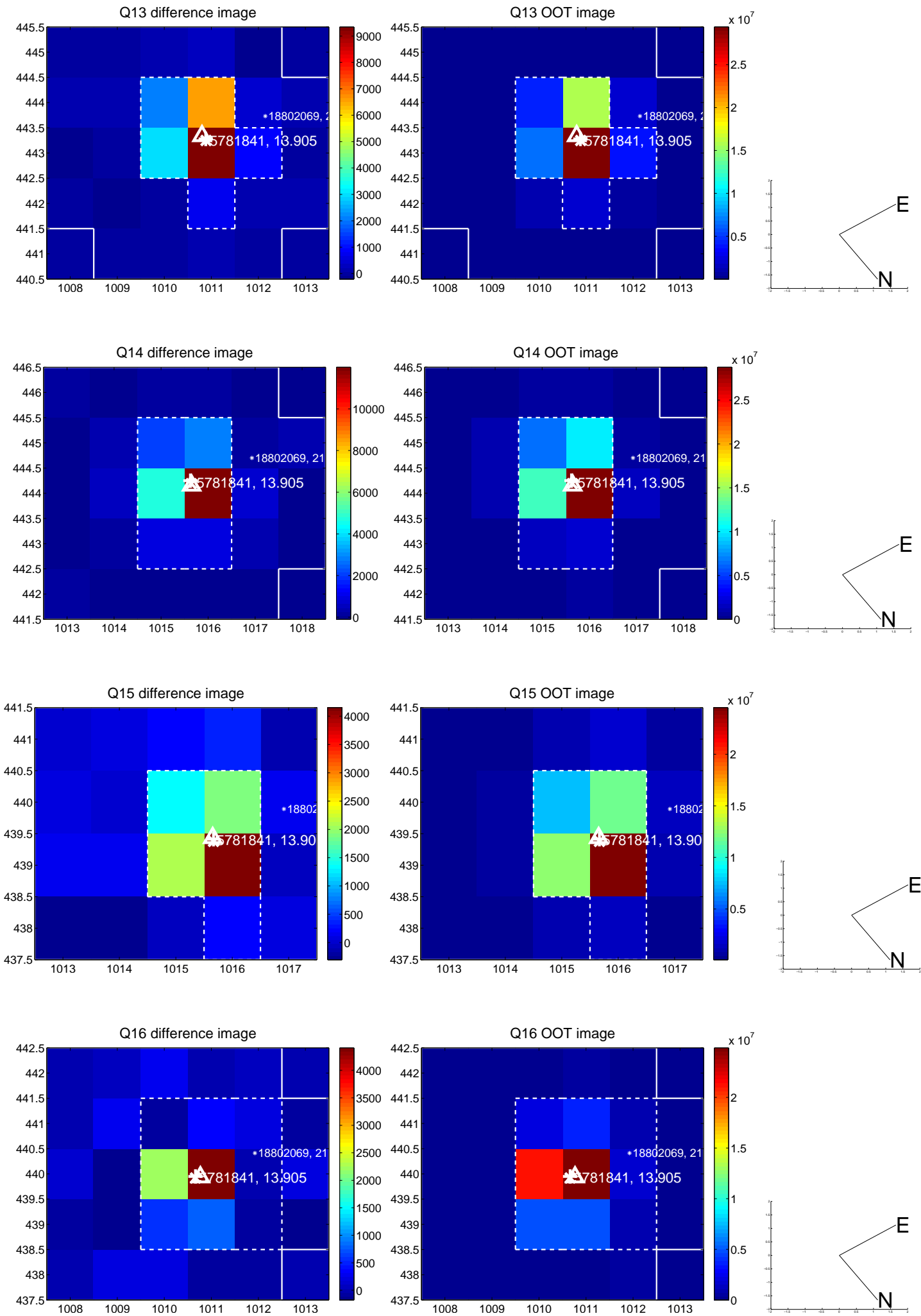
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



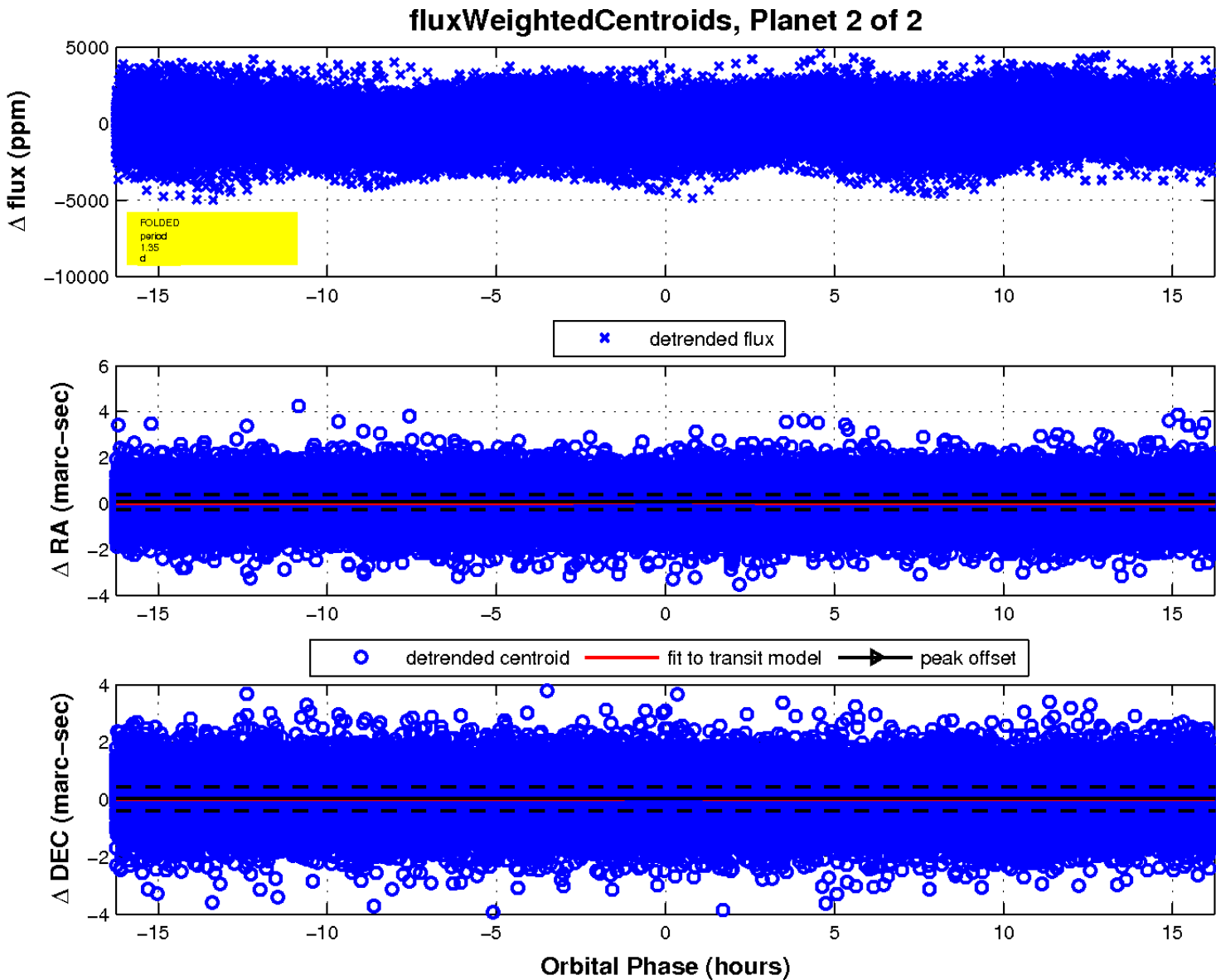
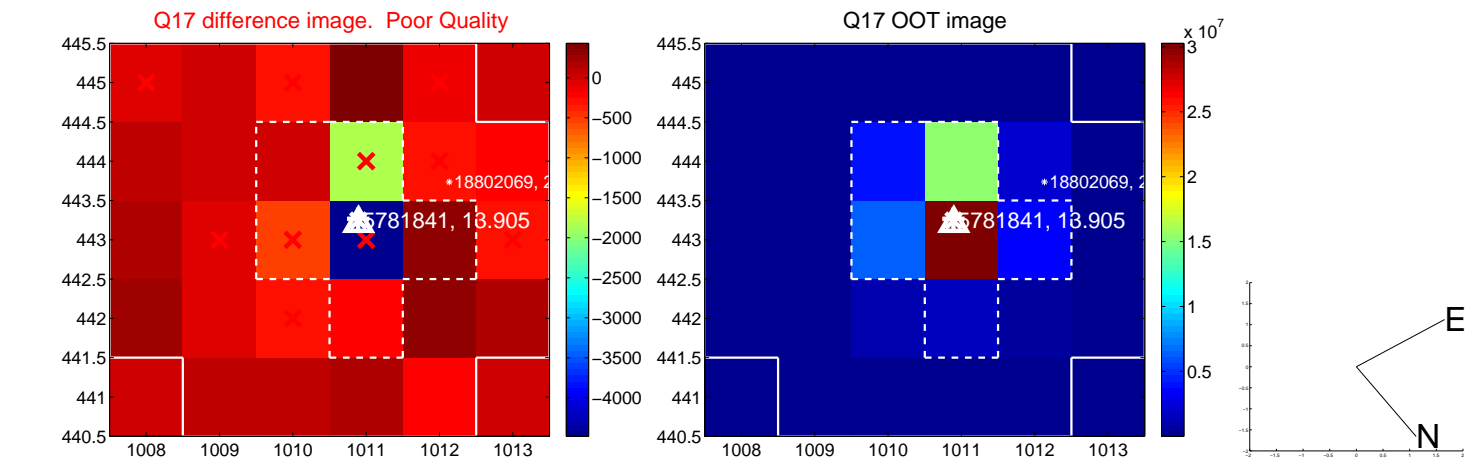
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

