

# KIC 011858541

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011858541-01	OBS	7486.01	5.674354	135.754861	36341.5	4.166	3020.5	2655.7	1.07	5594	35.00	291.36
011858541-02	OBS	No	5.674357	133.118476	10238.8	3.995	847.9	792.7	1.07	5594	19.07	291.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011858541-01	OBS	FP	0.00	0	1	0	0	<del>MOD_SEC_DV</del> <del>MOD_SEC_ALT</del> <del>DEEP_V_SHAPED</del> <del>HAS_SEC_TCE</del>
011858541-02	OBS	FP	0.00	1	1	0	0	<del>IS_SEC_TCE</del>

**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.

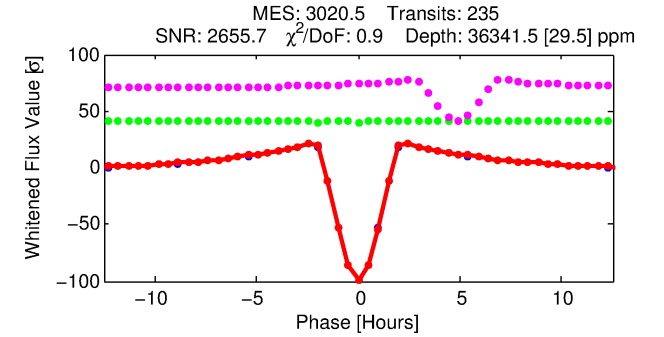
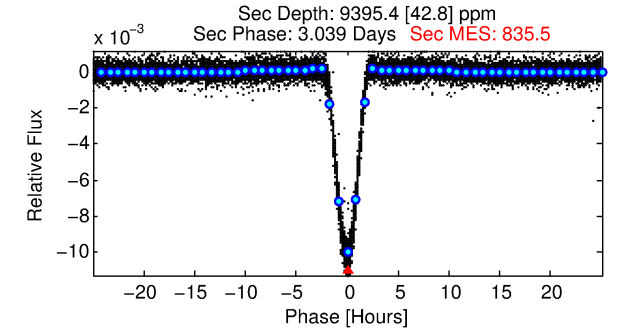
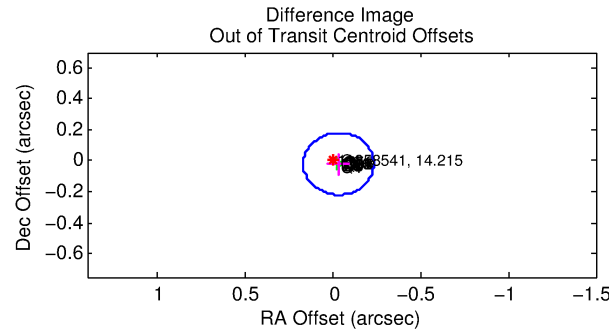
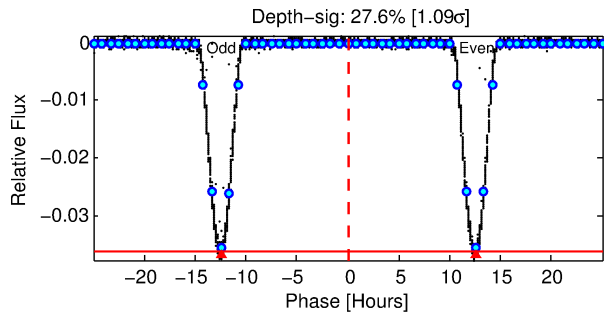
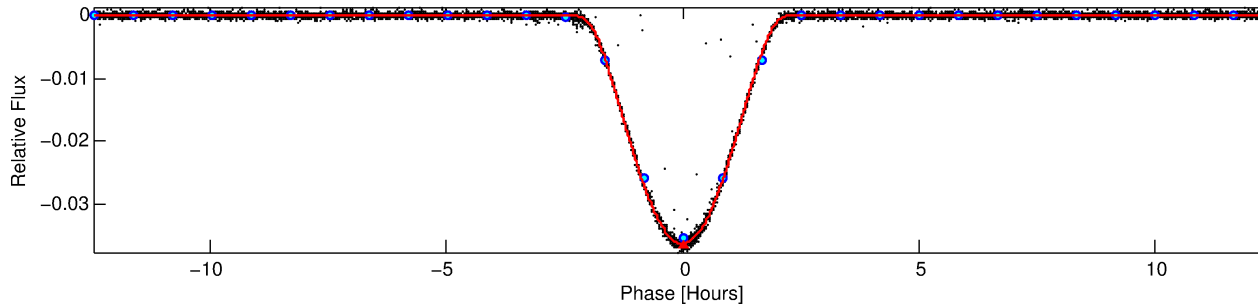
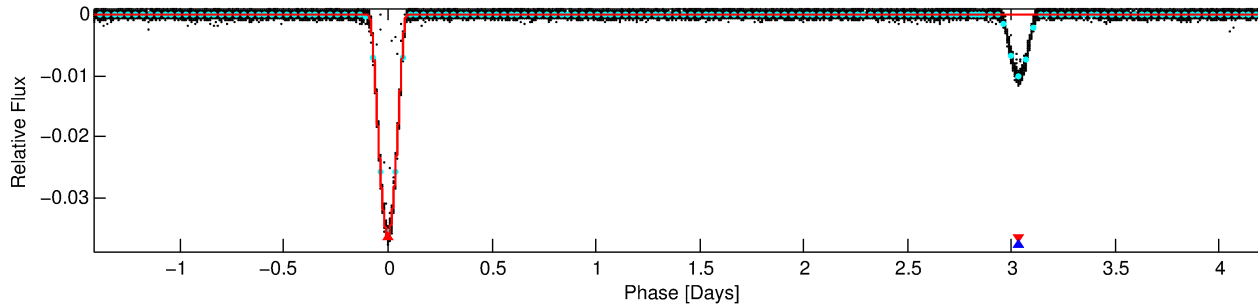
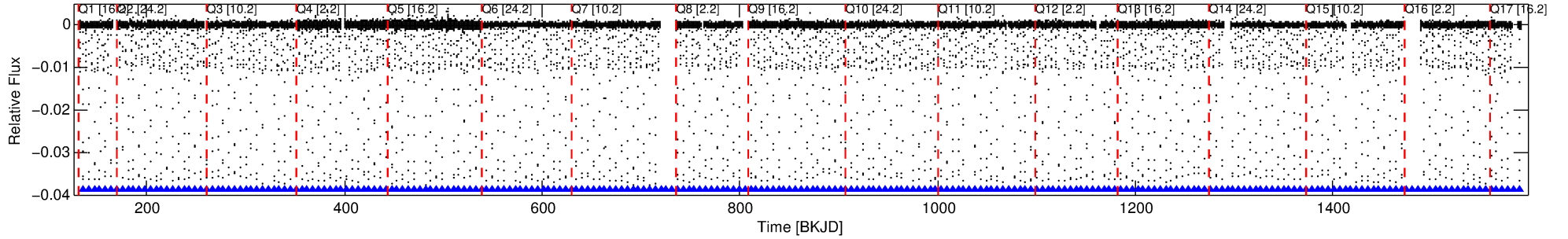
## Ephemeris Match Information For 011858541-01

No Significant Match Found

# DV One-Page Summary

KIC: 11858541 Candidate: 1 of 2 Period: 5.674 d  
KOI: K07486.01 Corr: 0.998

Kp: 14.22 R\*: 1.07 Rs Teff: 5594.0 K Logg: 4.30 Fe/H: -0.160



## DV Fit Results:

Period = 5.67435 [0.00000] d  
Epoch = 135.7549 [0.0000] BKJD  
Rp/R\* = 0.2995 [0.0079]  
a/R\* = 8.80 [0.01]  
b = 0.99 [0.01]  
Seff = 291.35 [129.35]  
Teq = 1053 [117] K  
Rp = 35.00 [11.51] Re  
a = 0.0588 [0.0169] AU  
Ag = 14.57 [6.33] [2.15σ]  
Teffp = 3182 [95] K [14.15σ]

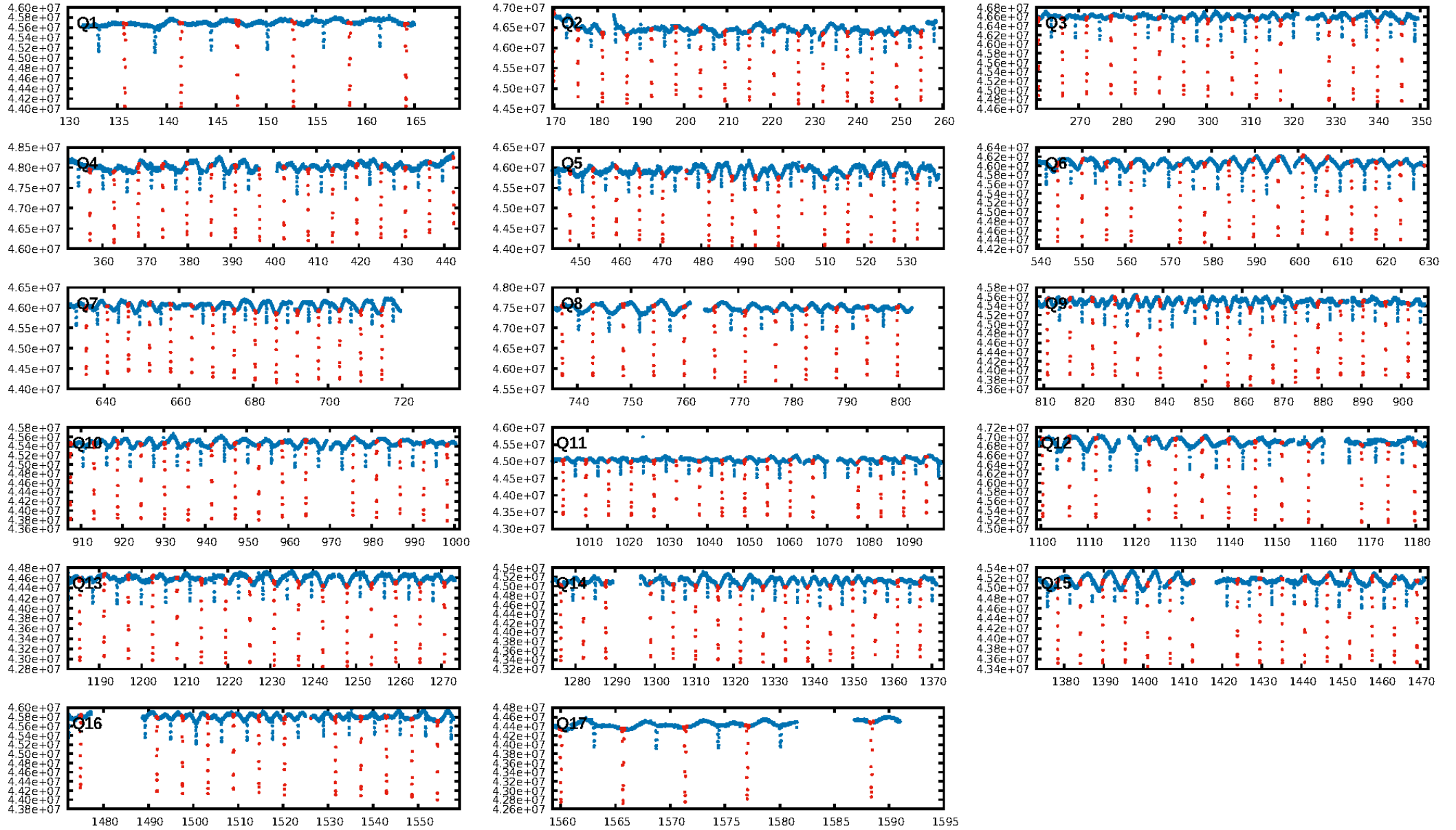
## DV Diagnostic Results:

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 [224/224]  
GhostDiagnostic-chr: 2.742  
Centroid-sig: 0.0%  
Centroid-so: 0.007 arcsec [2.02σ]  
OotOffset-rm: 0.038 arcsec [0.57σ]  
KicOffset-rm: 0.119 arcsec [1.76σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

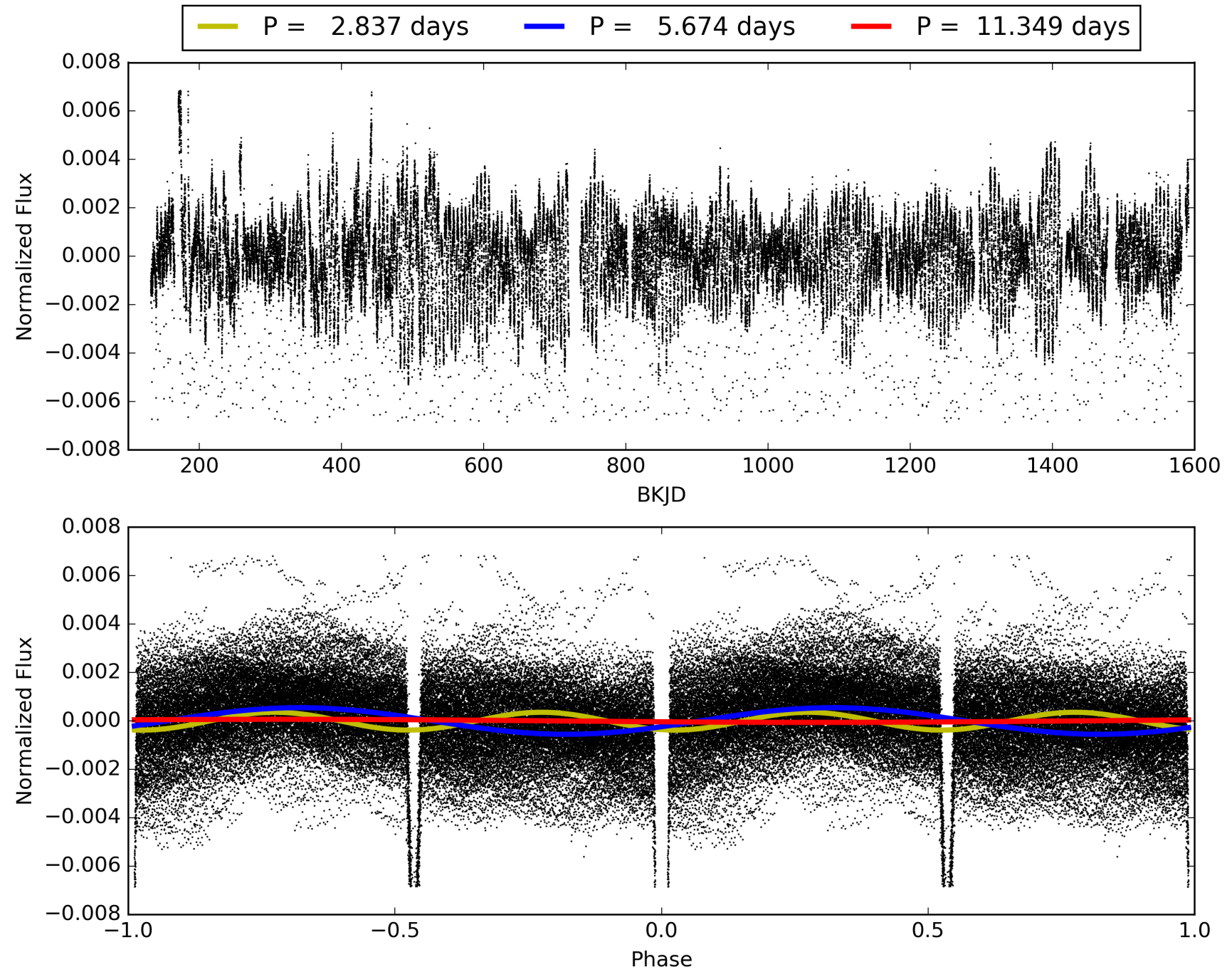
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:22:56 Z

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

# TCE 011858541-01, PDC Light Curves

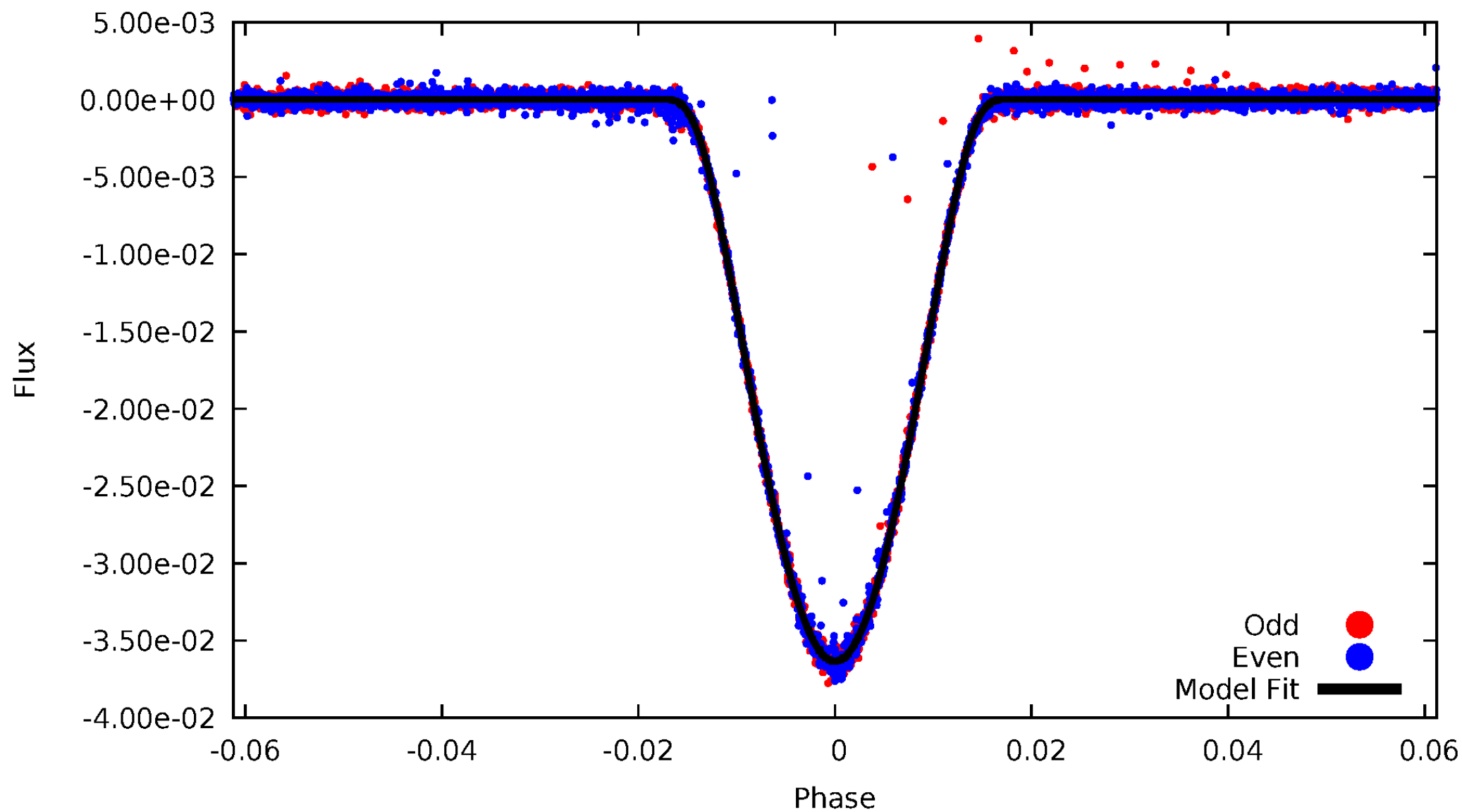


# TCE 011858541-01



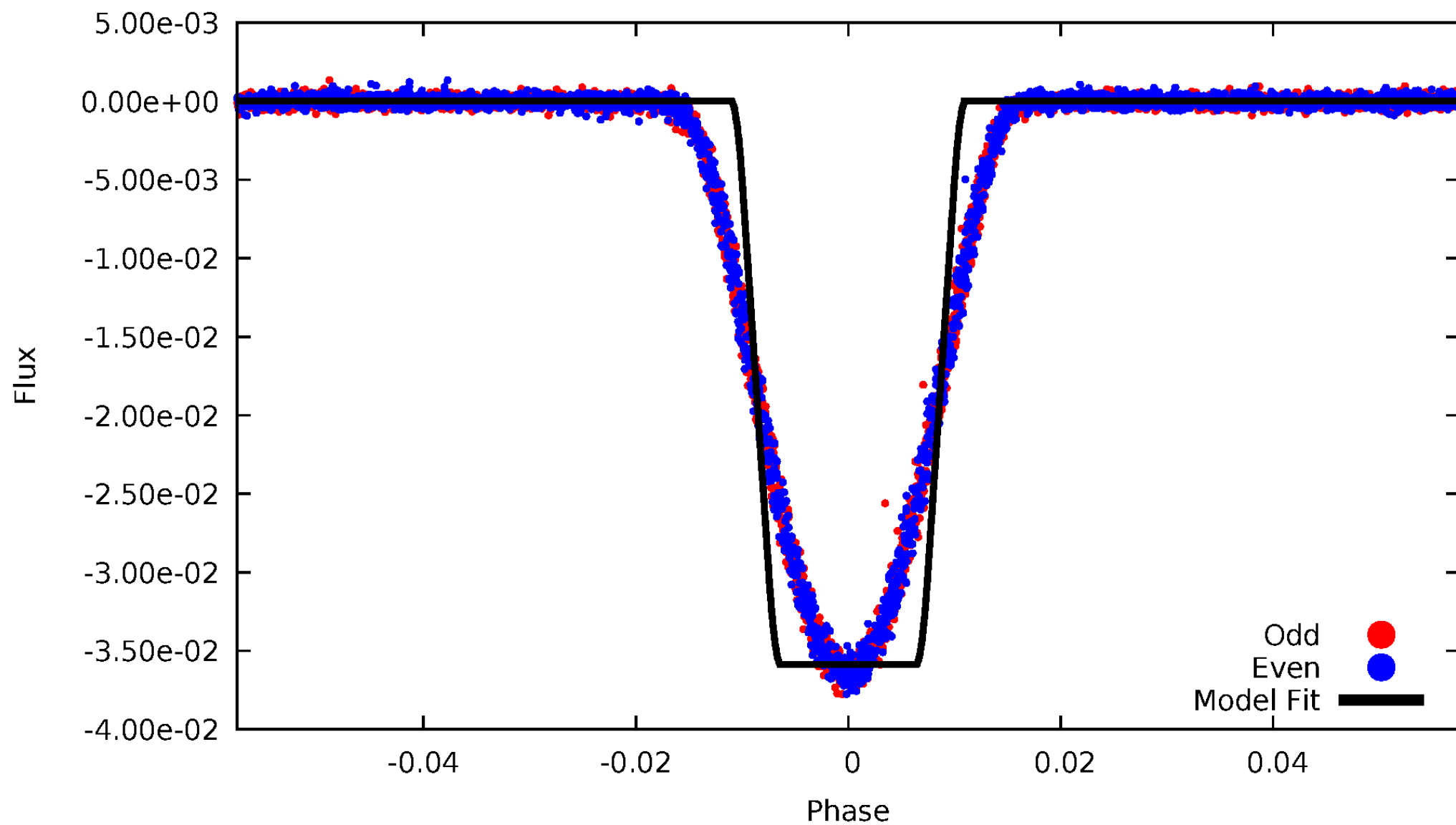
# DV Odd/Even

TCE 011858541-01



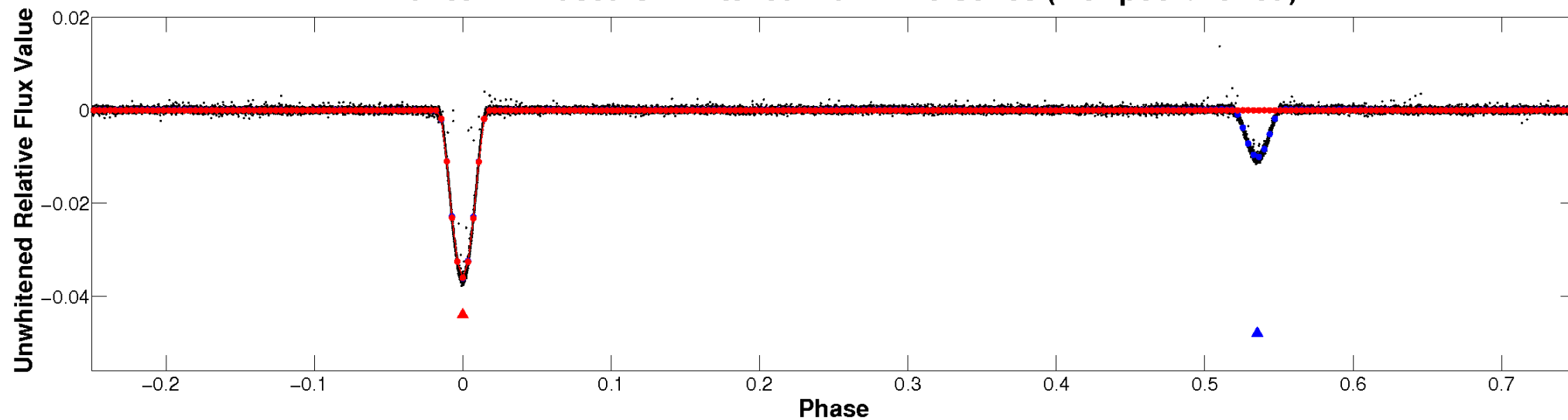
# ALT Odd/Even

TCE 011858541-01

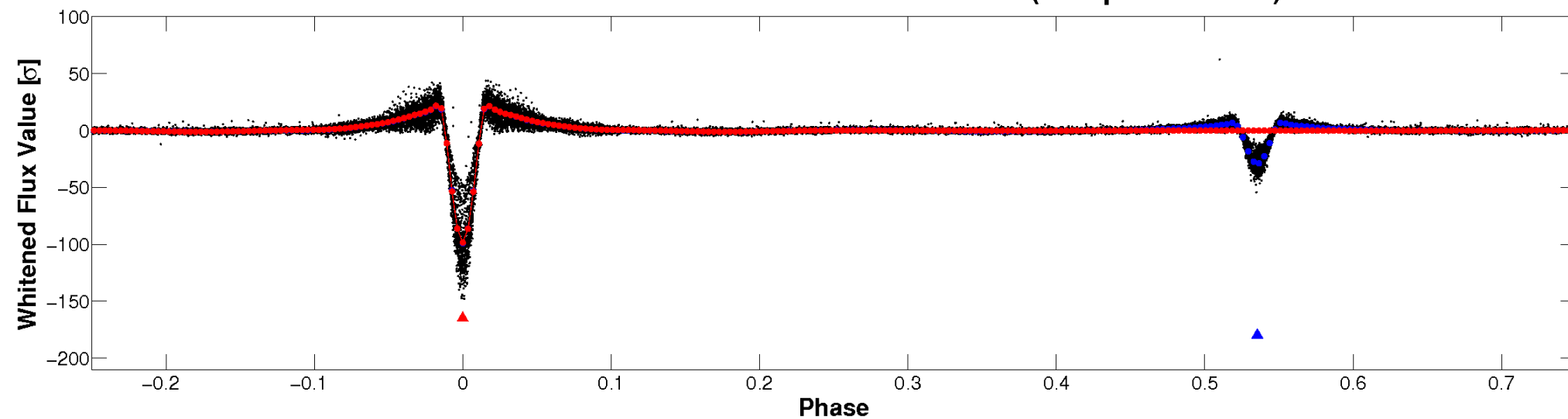


# Non-Whitened Vs. Whitened Light Curve

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

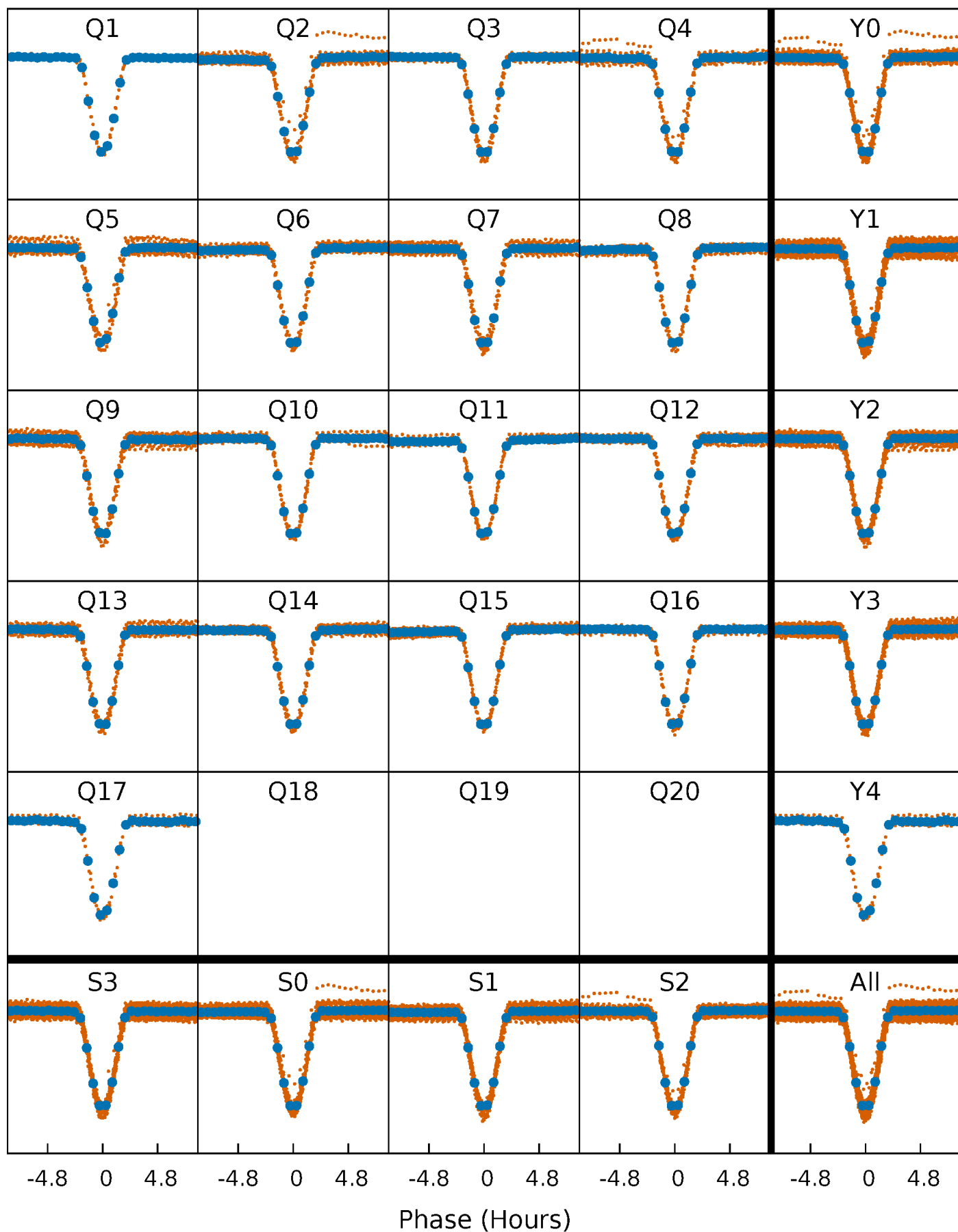


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

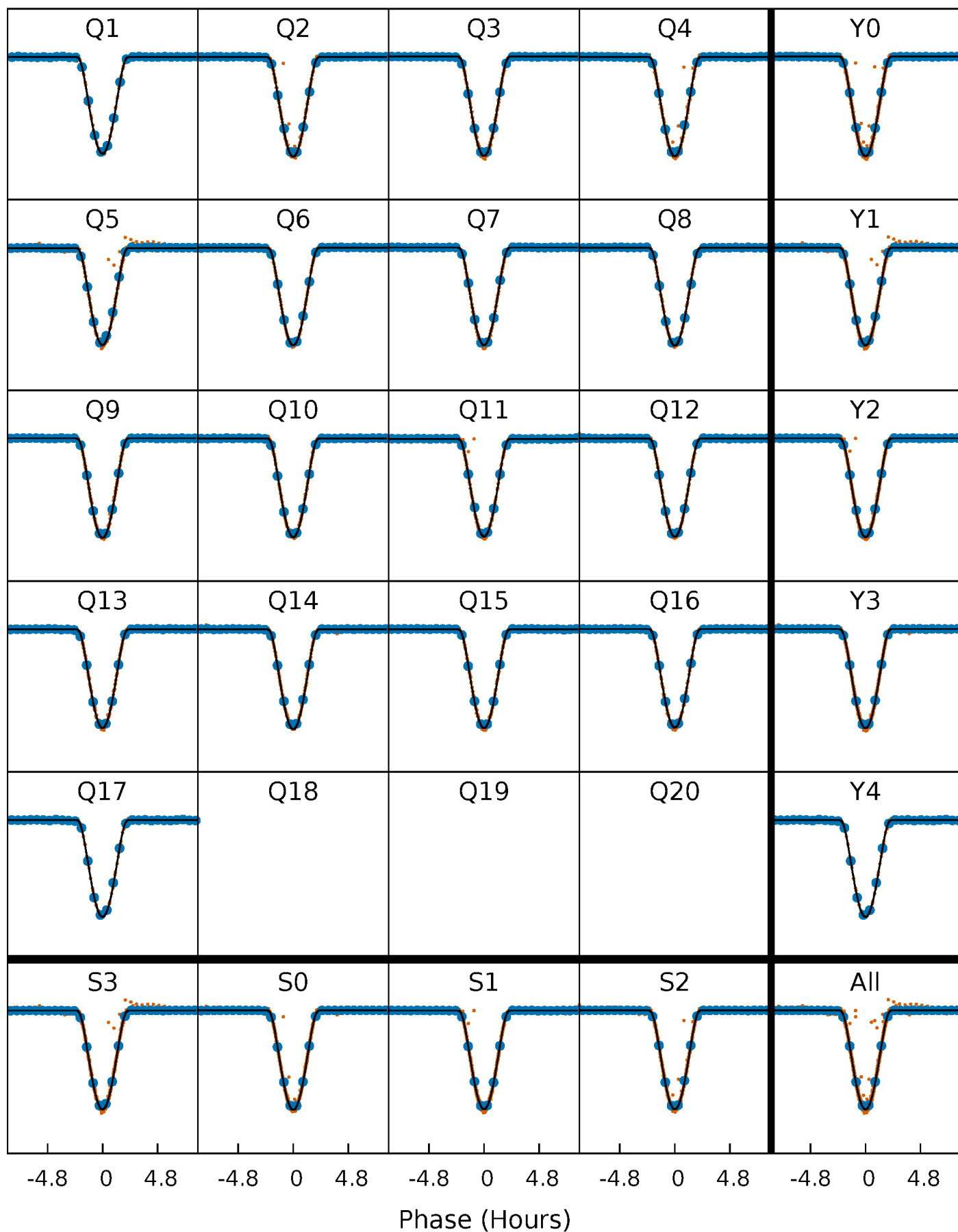
TCE 011858541-01 P= 5.674354 Days  $T_0=135.754861$  (BKJD)





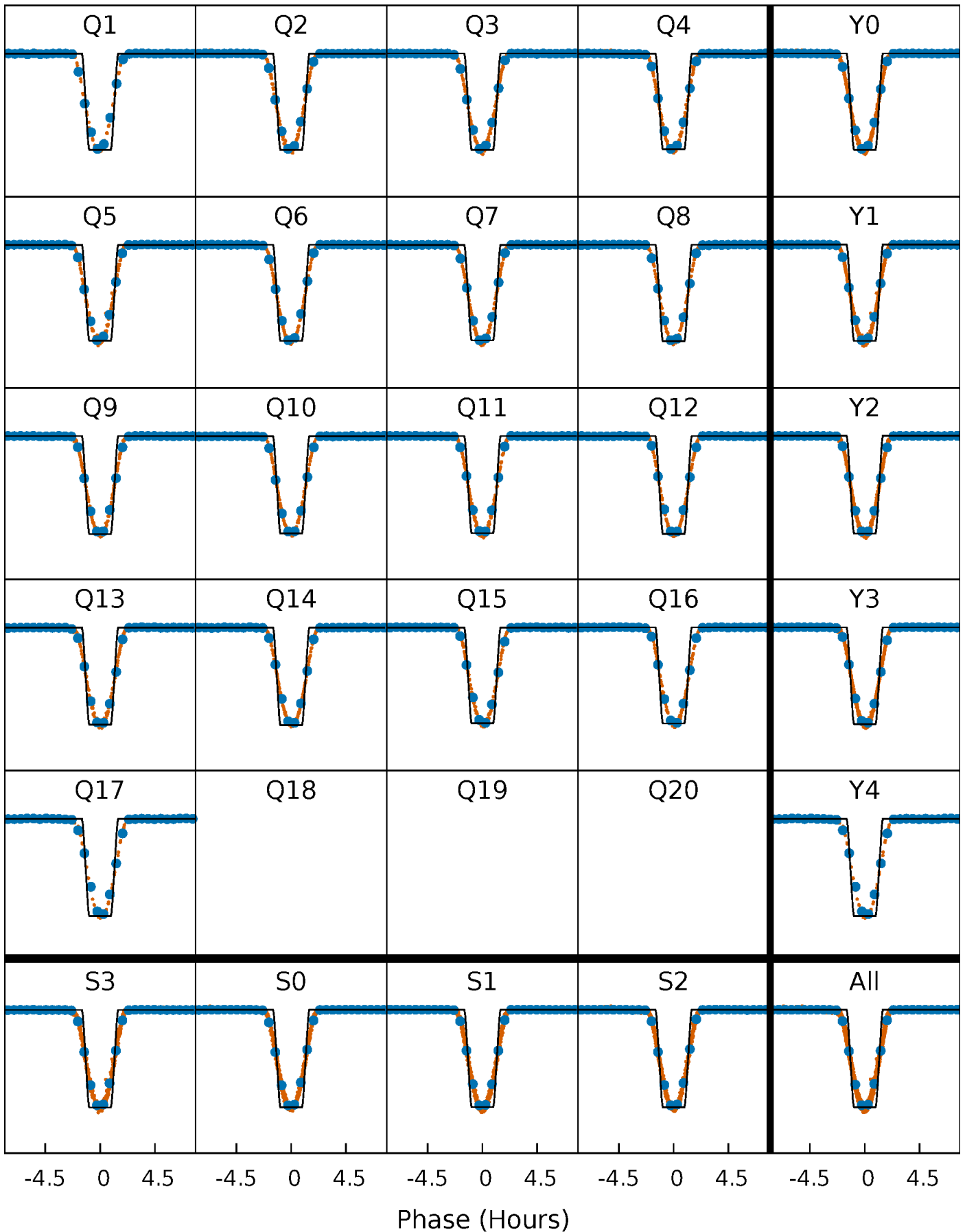
# DV Quarter-Phased Transit Curves

TCE 011858541-01 P= 5.674354 Days  $T_0=135.754861$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

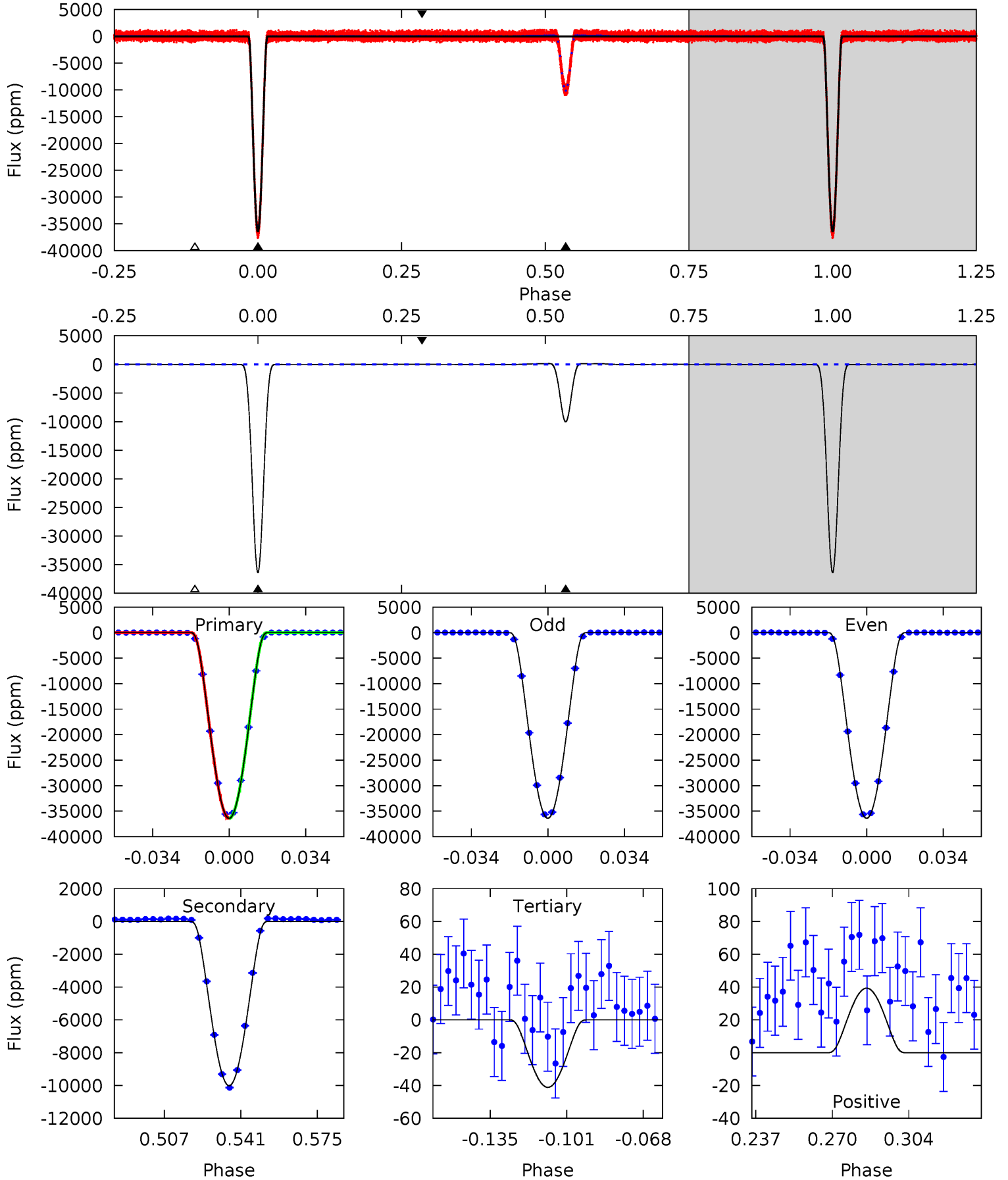
TCE 011858541-01   P= 5.674326 Days    $T_0=135.758545$  (BKJD)



# DV Model-Shift Uniqueness Test

011858541-01, P = 5.674354 Days, E = 130.080507 Days

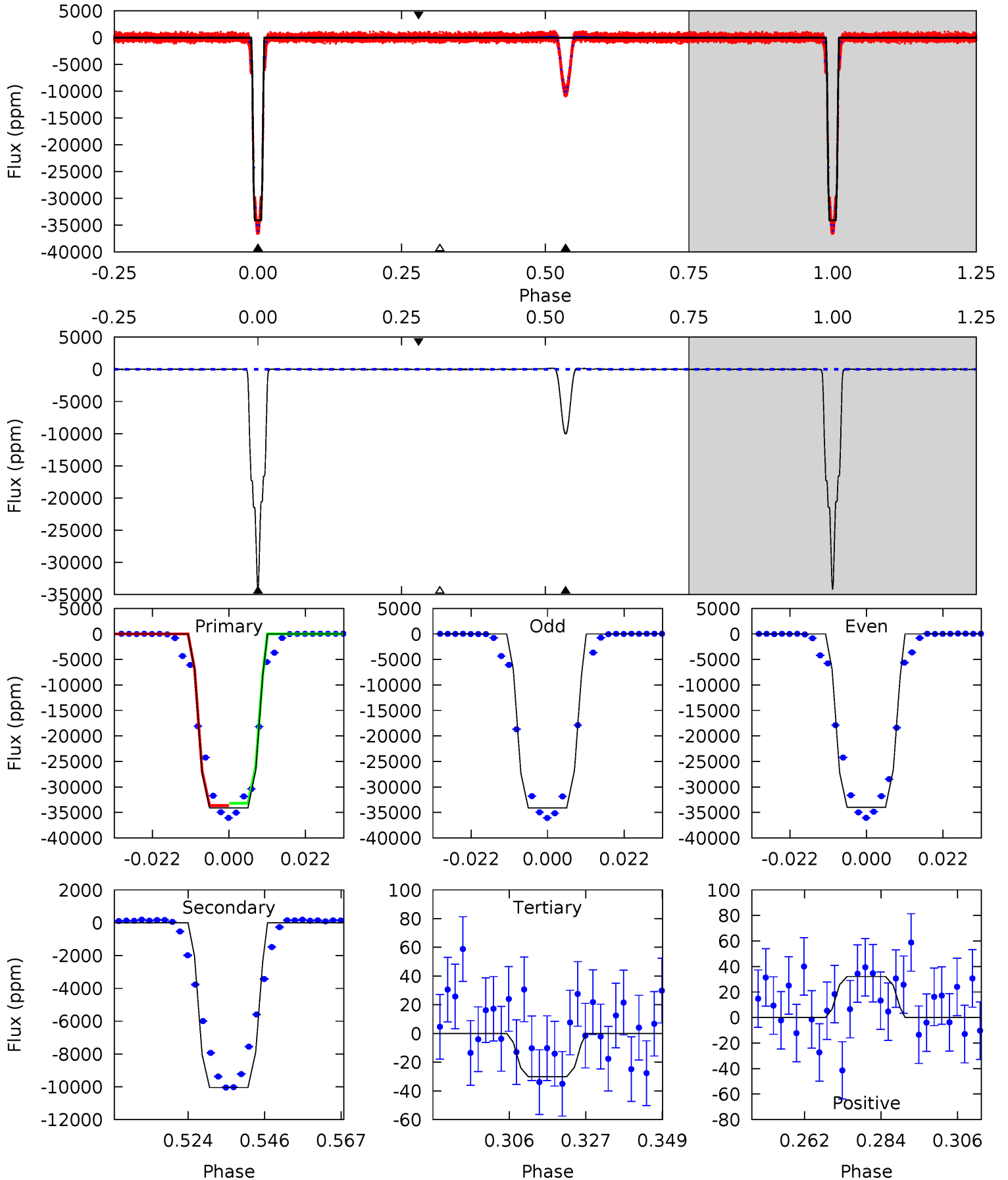
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5739	1579	6.49	6.20	4.79	2.12	5.66	5732	5733	1573	1573	0.53	0.99	0.00	0.60



# Alt Model-Shift Uniqueness Test

011858541-01, P = 5.674326 Days, E = 130.084219 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
3233	952.5	2.85	3.05	4.87	2.29	2.66	3230	3230	949.6	949.5	5.44	1.00	0.00	4.26



### Stellar Parameters For KIC 011858541

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5594^{+149}_{-149}$	$4.303^{+0.242}_{-0.220}$	$-0.160^{+0.300}_{-0.250}$	$1.071^{+0.351}_{-0.234}$	$0.841^{+0.122}_{-0.071}$	$0.964^{+1.081}_{-0.500}$
	+3%/-3%	+6%/-5%	+188%/-156%	+33%/-22%	+15%/-8%	+112%/-52%
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 011858541-01 / KOI 7486.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-10014 \pm 6$	$34.87^{+6.10}_{-5.01}$	$1464^{+122}_{-114}$	$3646^{+74}_{-78}$	$16^{+6}_{-4}$
Alt.	$-10046 \pm 11$	$22.04^{+4.07}_{-3.03}$	$1465^{+126}_{-113}$	$4292^{+109}_{-112}$	$40^{+13}_{-11}$

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

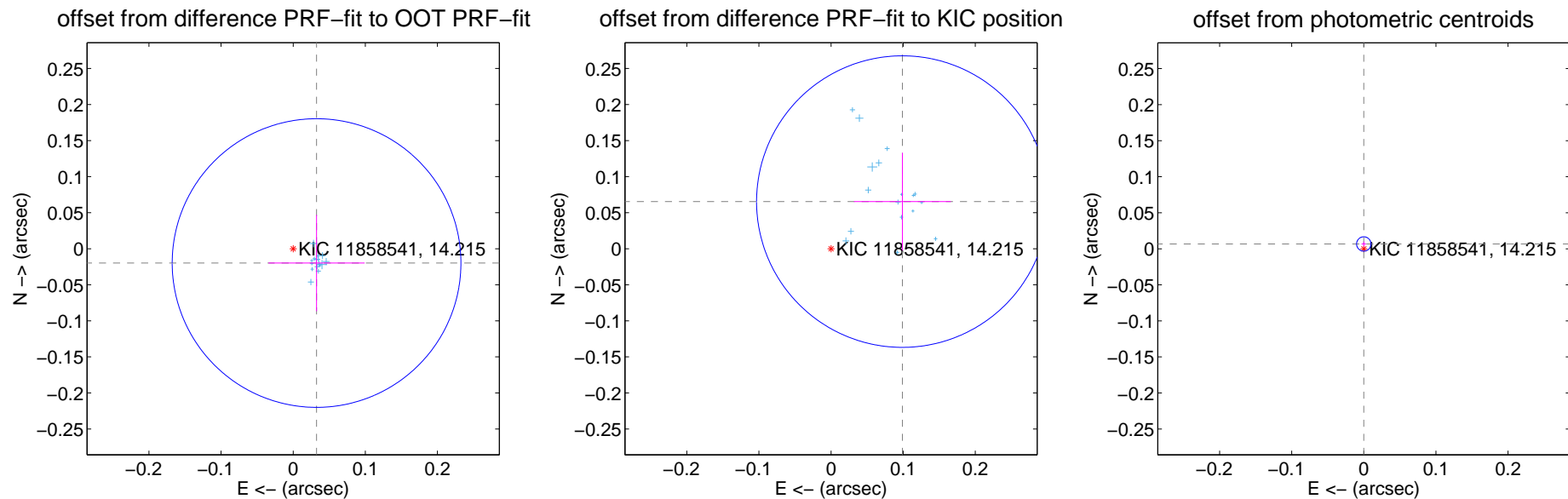
## DV Centroid Data

Supplemental centroid analysis for 011858541-01. Kepler magnitude: 14.21. Transit SNR 2655.67

There are 17 quarters with good PRF difference image offsets

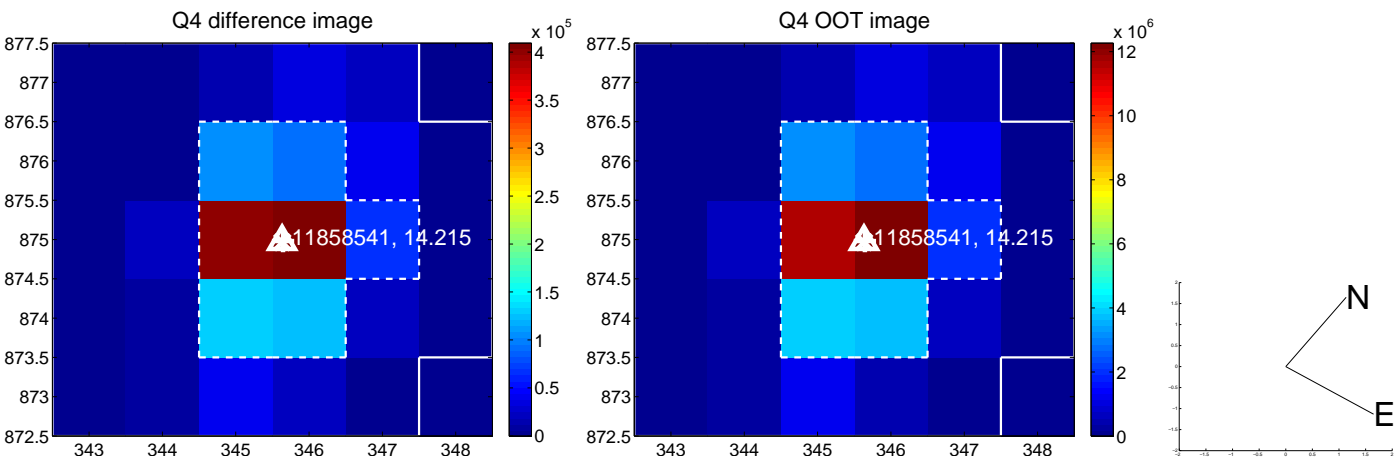
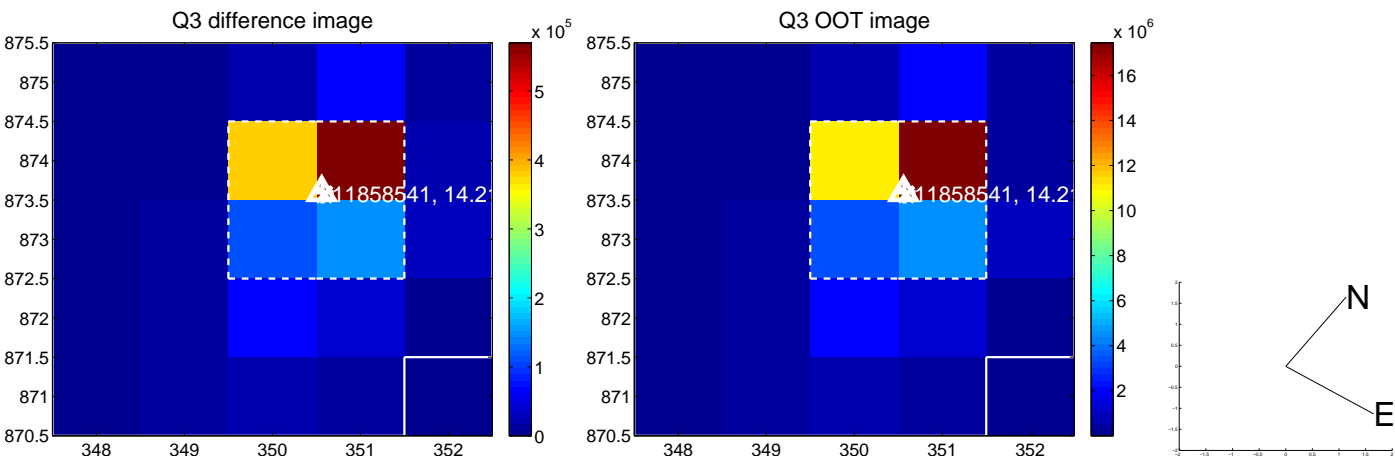
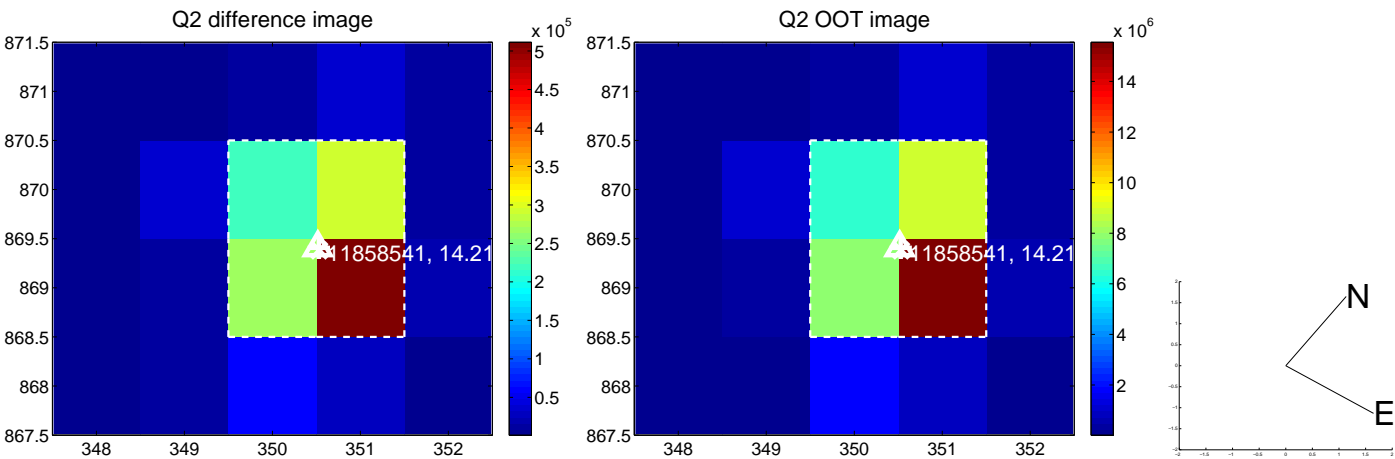
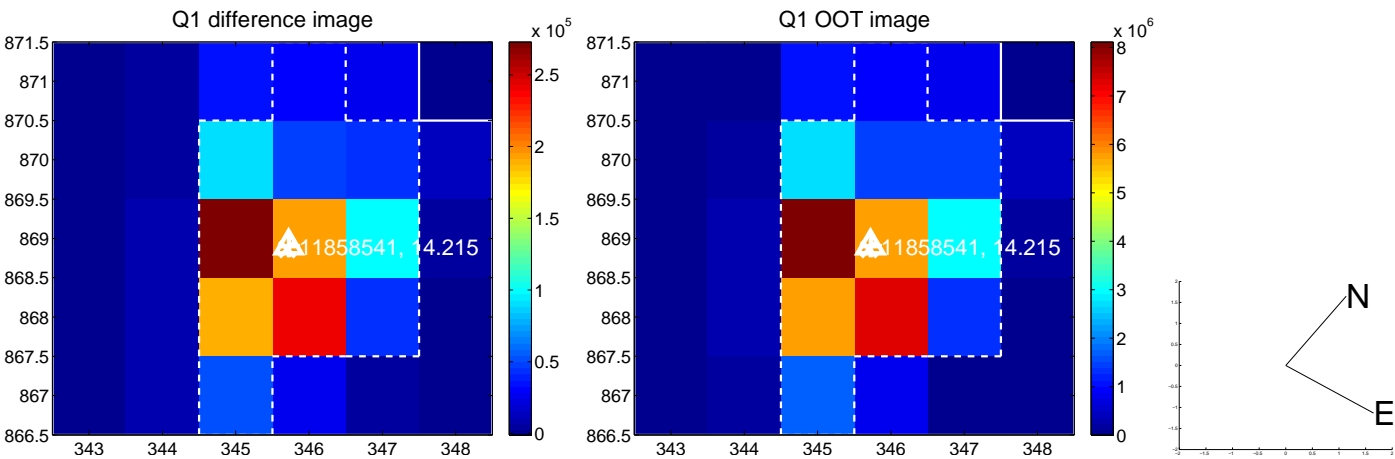
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.038 \pm 0.067$	0.57	$-0.032 \pm 0.067$	$-0.020 \pm 0.067$
PRF-fit source offset from KIC position	$0.119 \pm 0.067$	1.76	$-0.099 \pm 0.067$	$0.065 \pm 0.068$
photometric centroid source offset	$0.01 \pm 0.00$	2.02	$0.00 \pm 0.00$	$0.01 \pm 0.00$

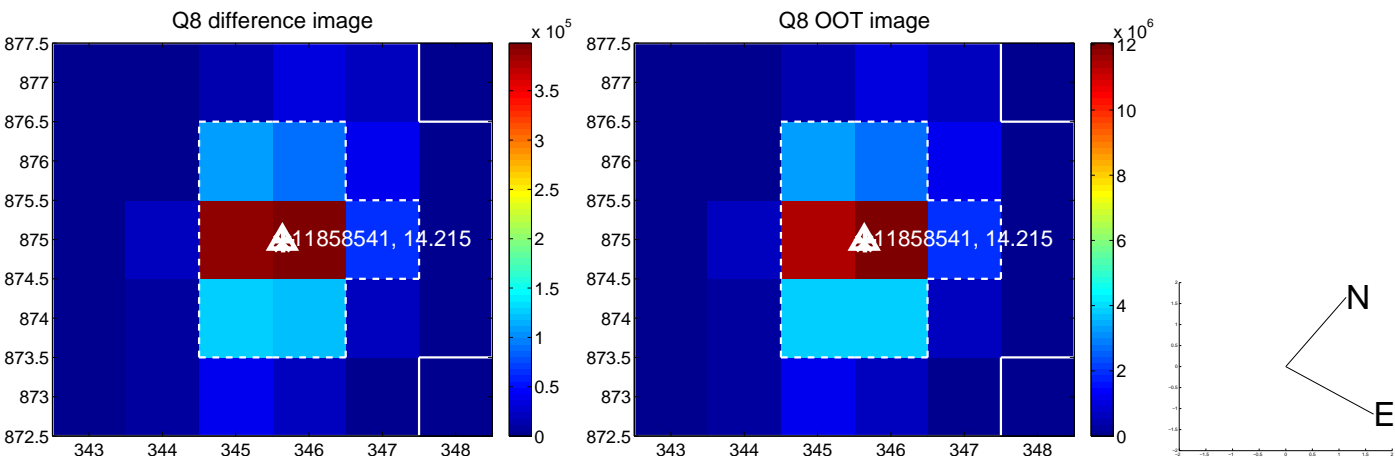
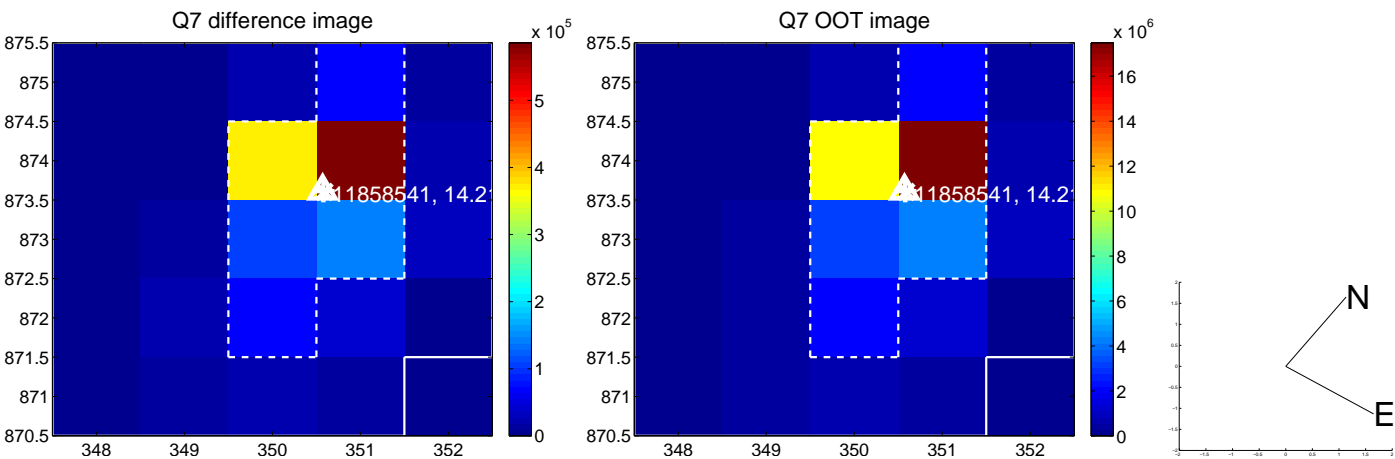
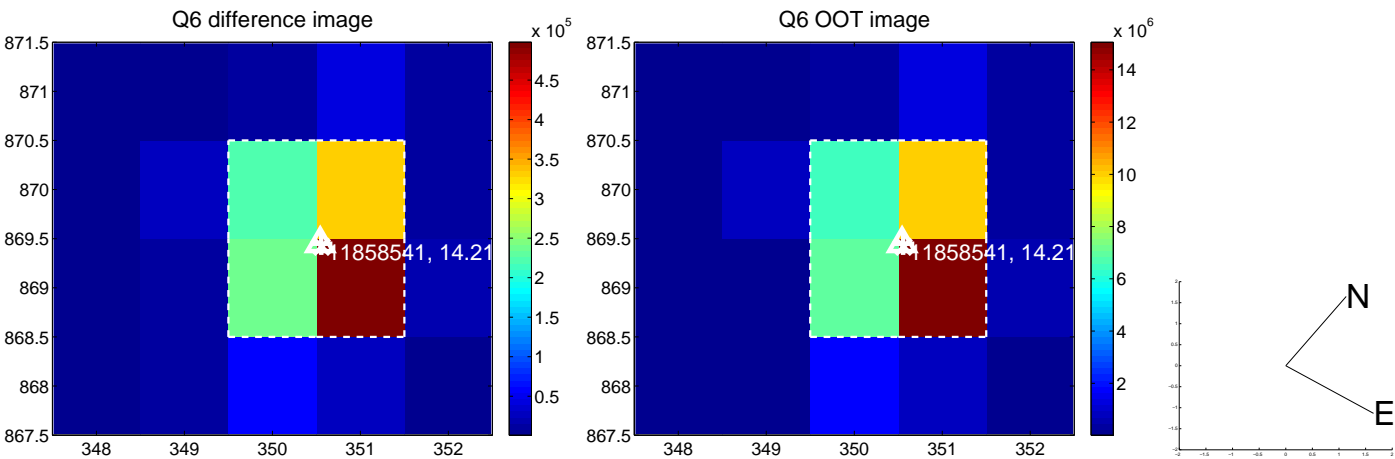
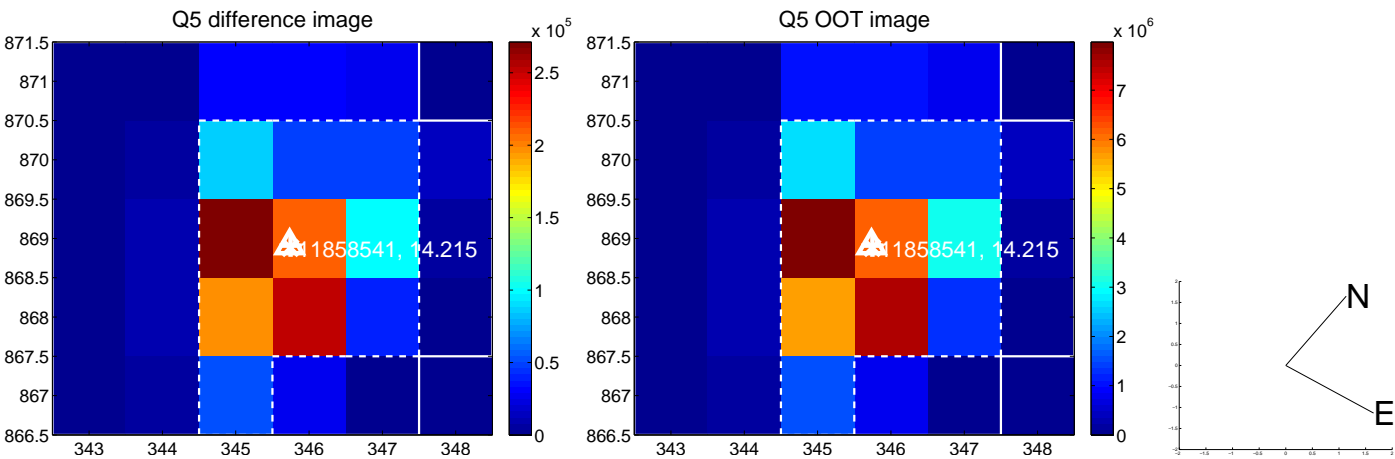


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

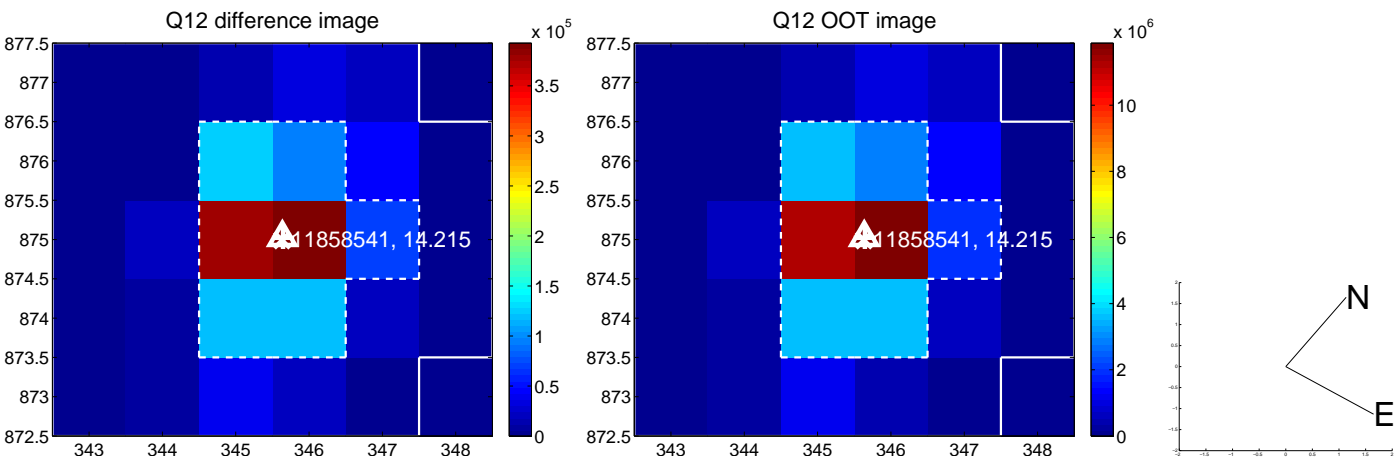
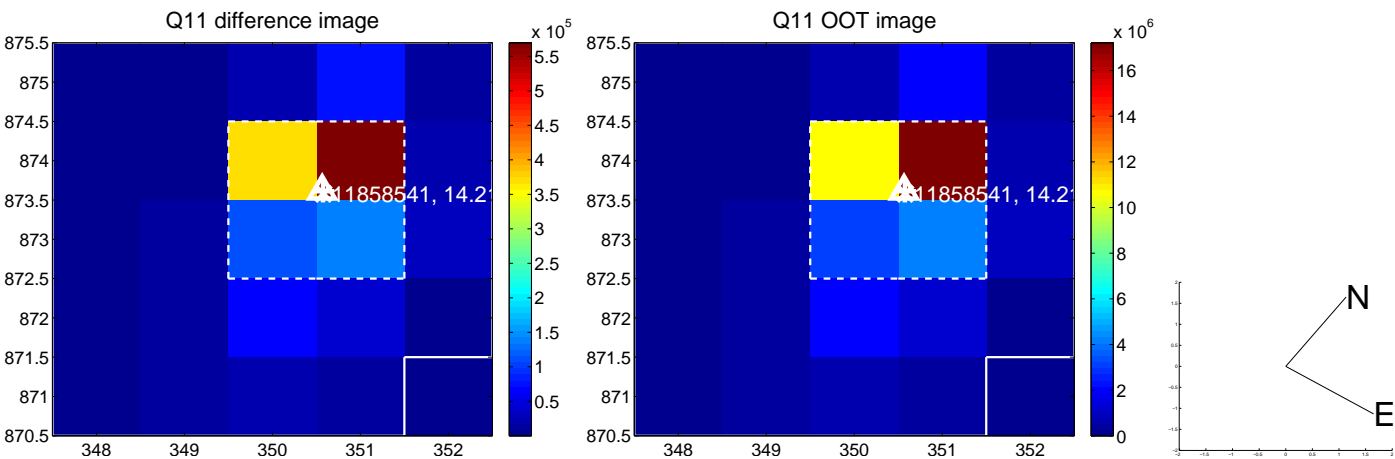
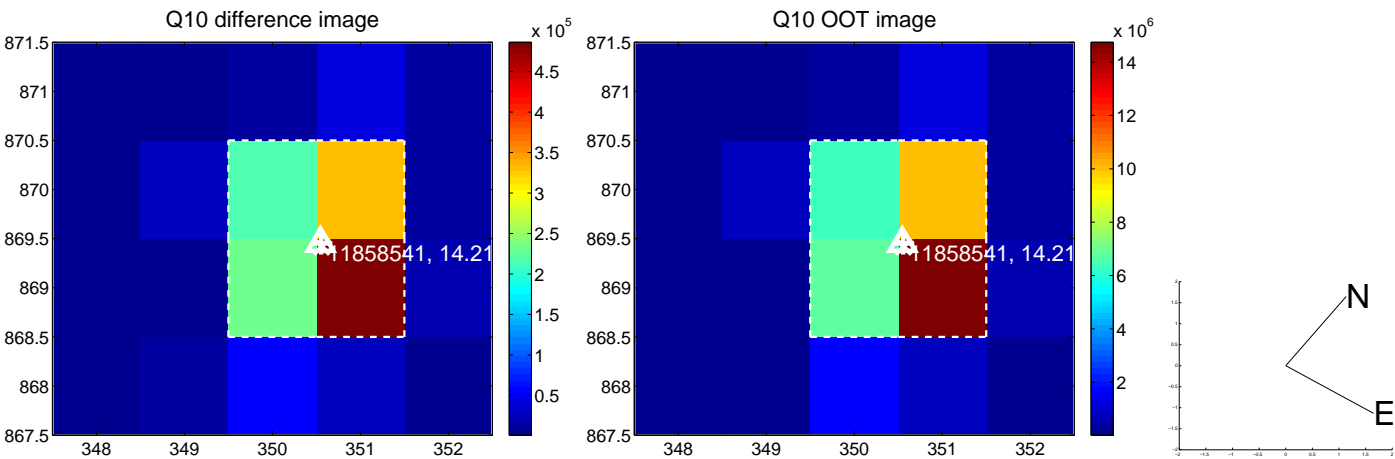
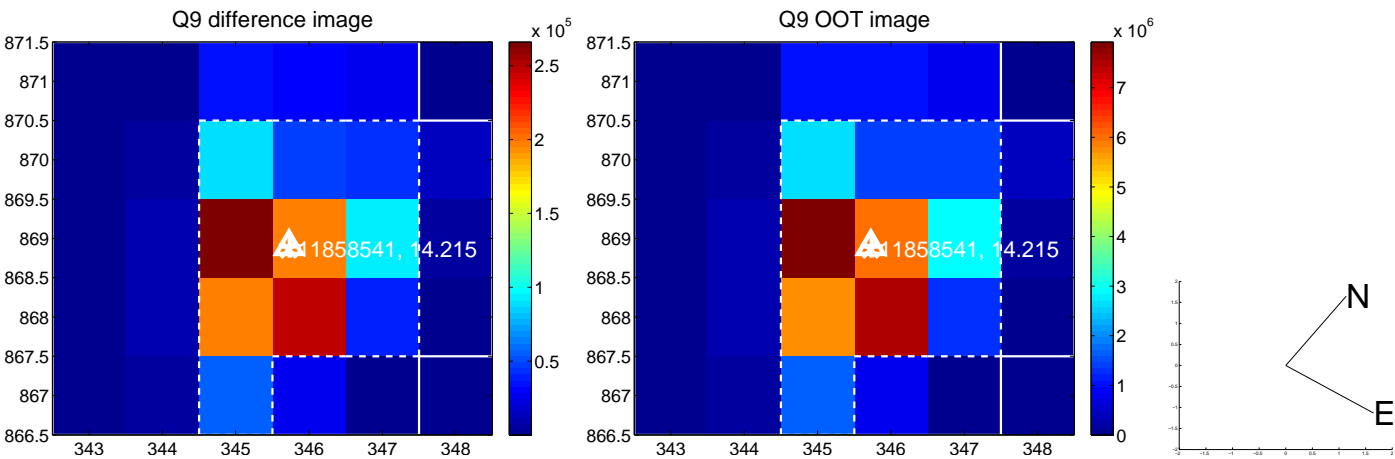


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

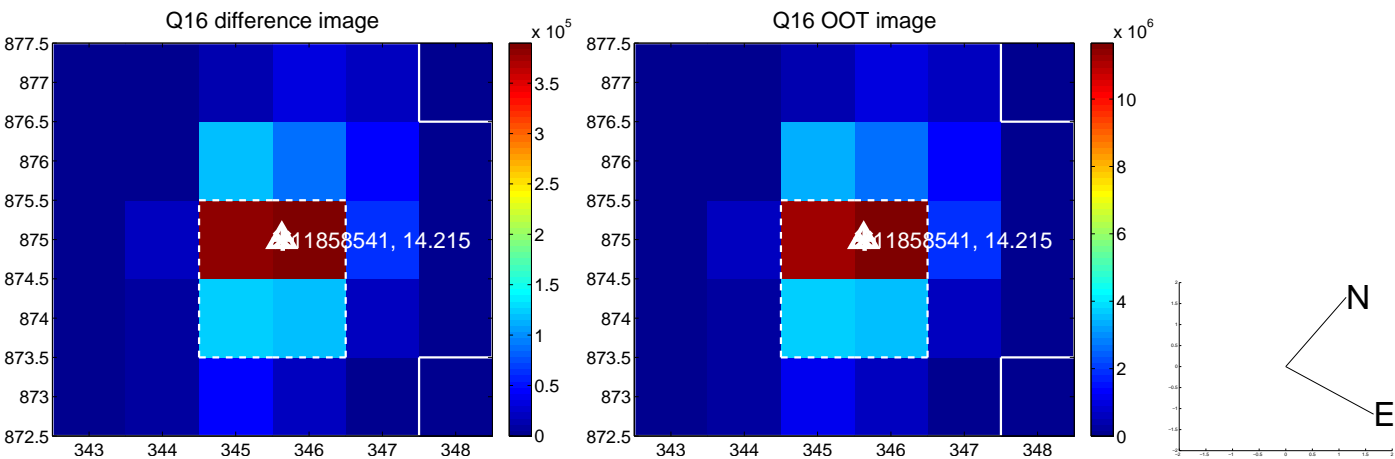
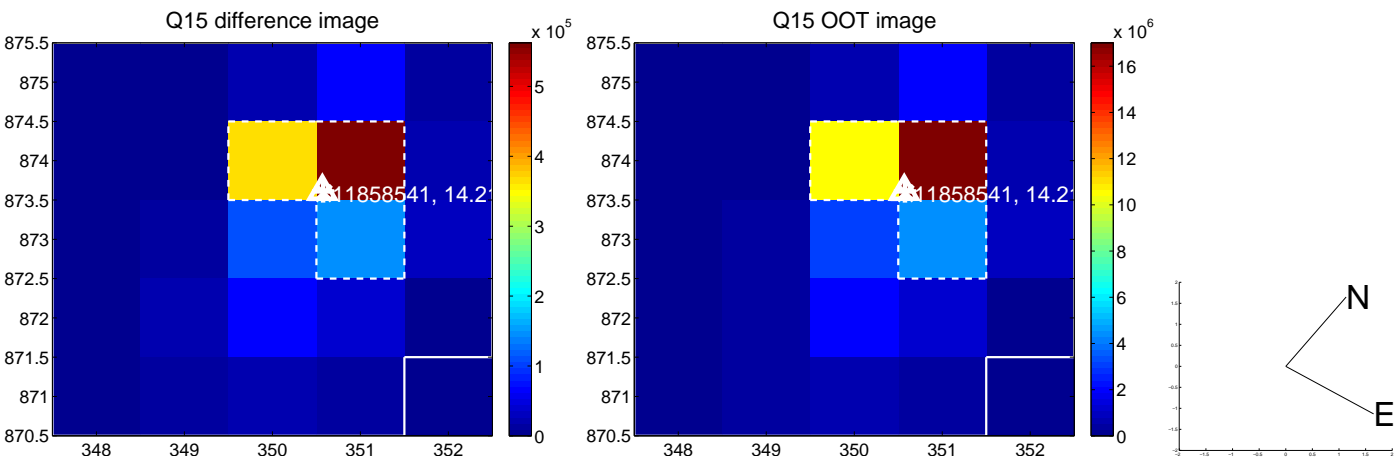
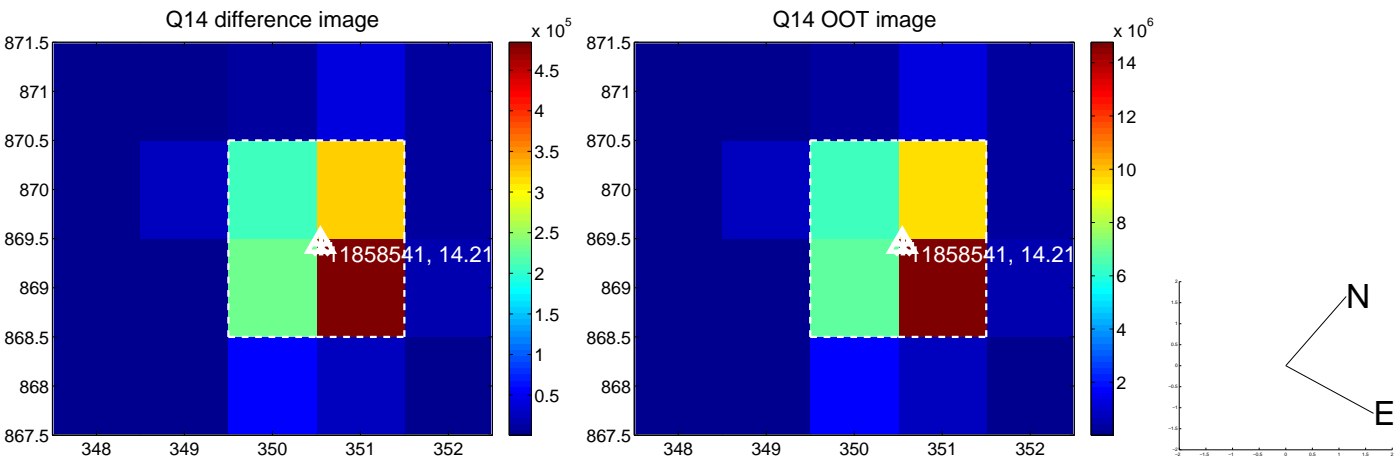
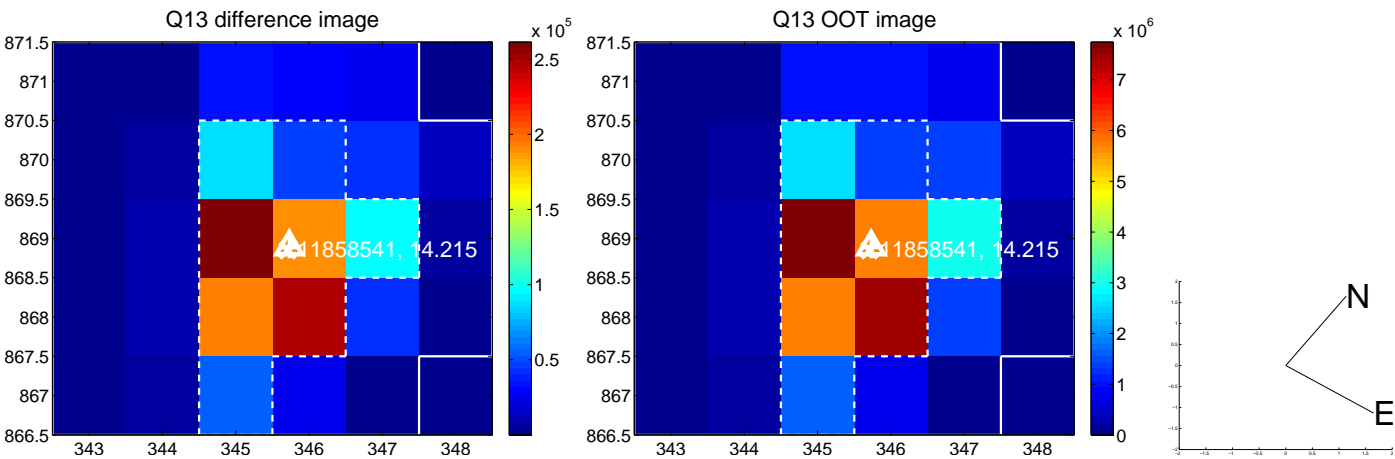




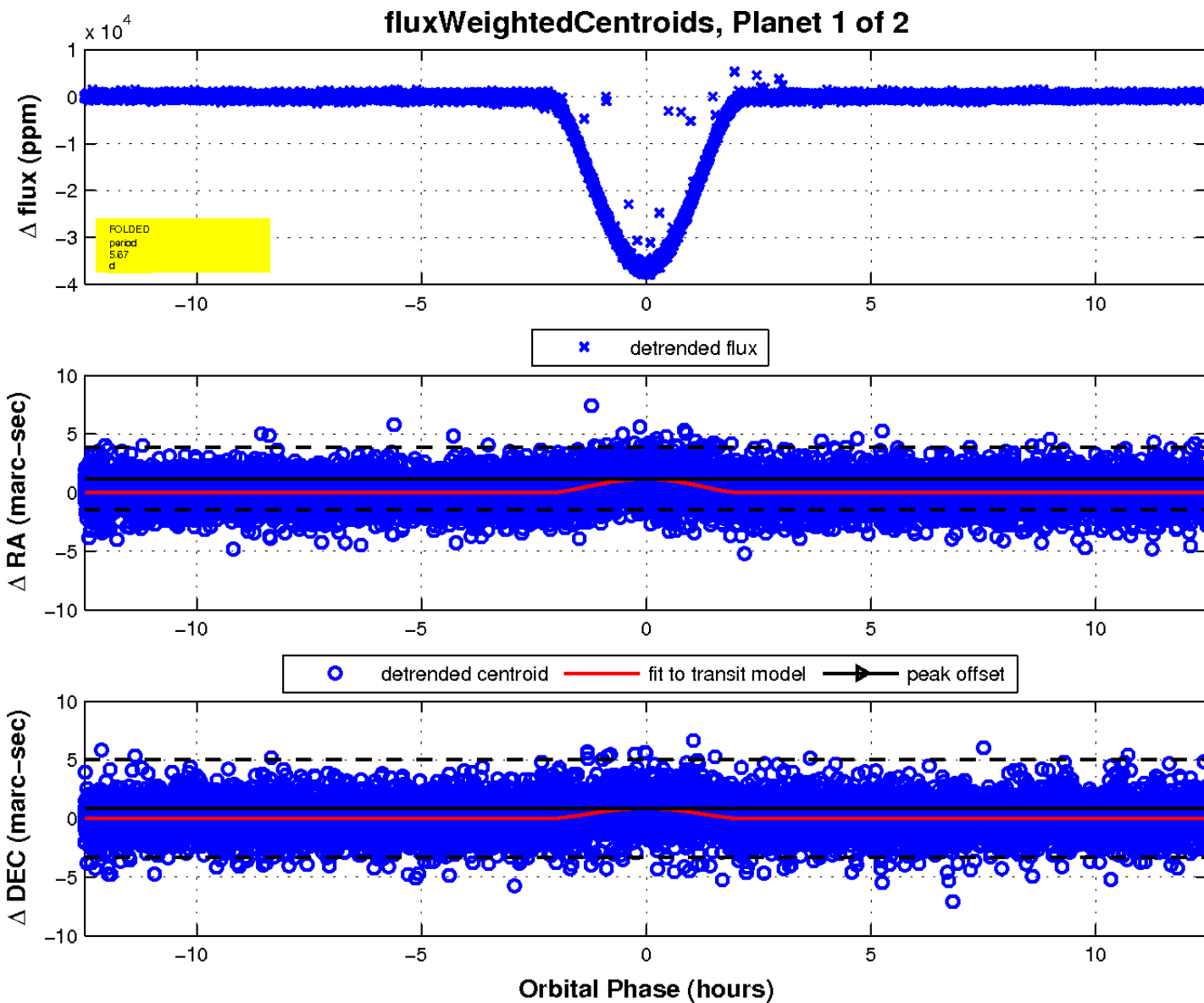
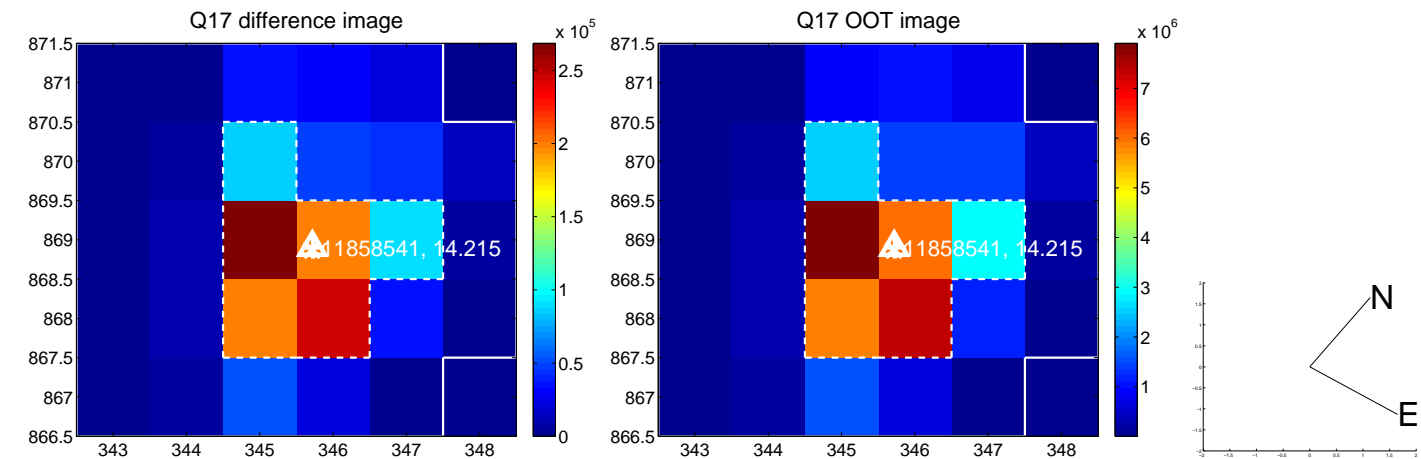
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

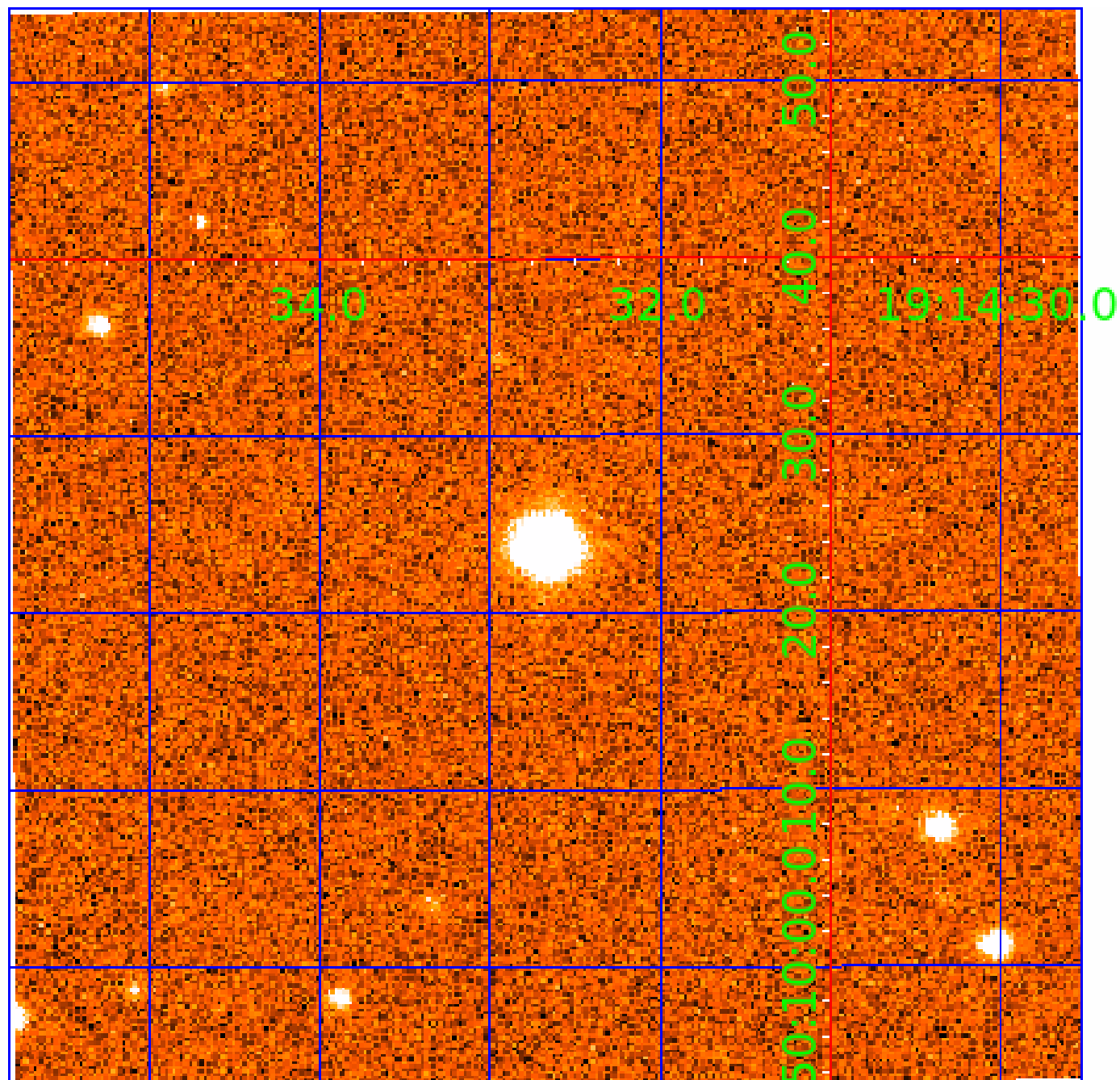


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011858541

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011858541-01	OBS	7486.01	5.674354	135.754861	36341.5	4.166	3020.5	2655.7	1.07	5594	35.00	291.36
011858541-02	OBS	No	5.674357	133.118476	10238.8	3.995	847.9	792.7	1.07	5594	19.07	291.35

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011858541-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—DEEP_V_SHAPED—HAS_SEC_TCE
011858541-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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 011858541-02

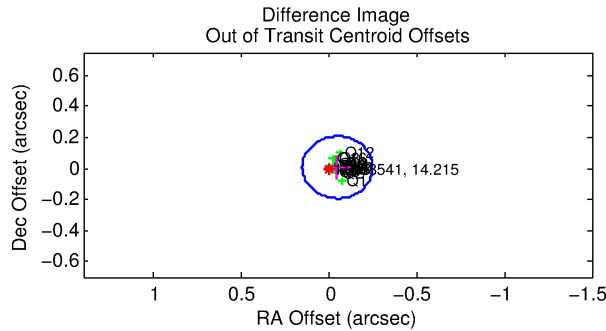
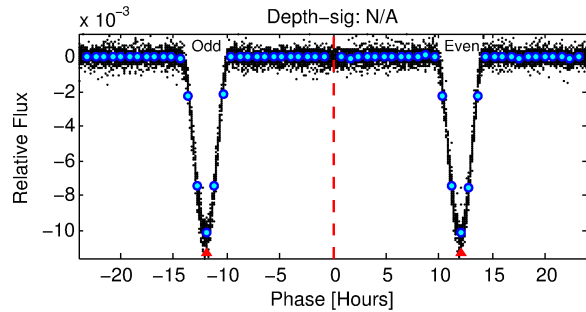
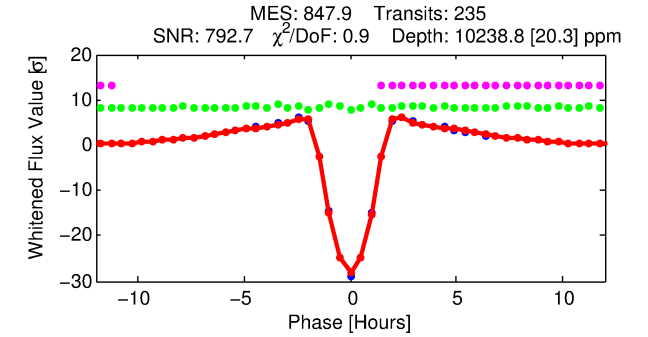
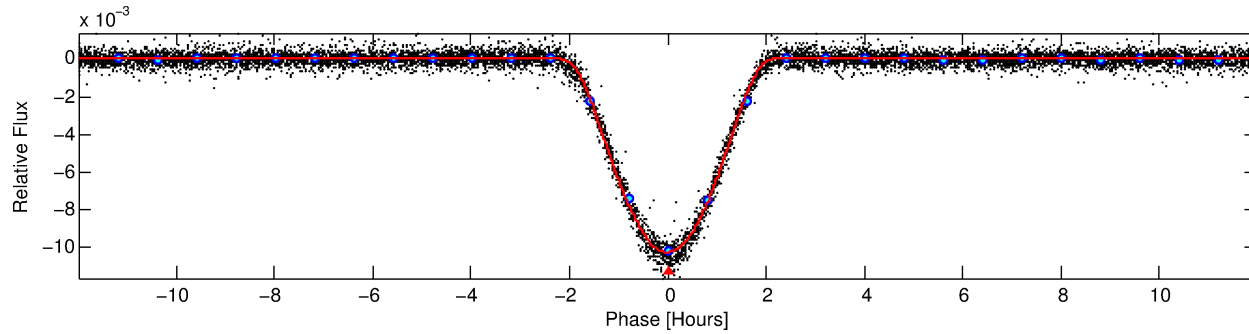
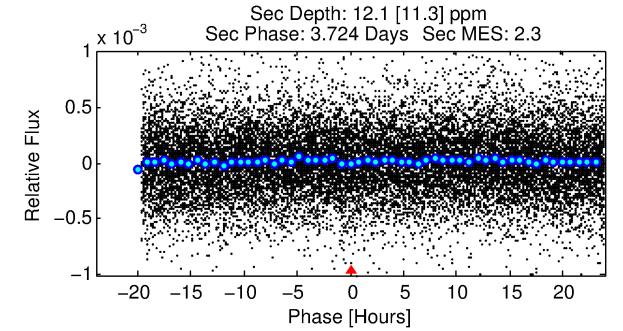
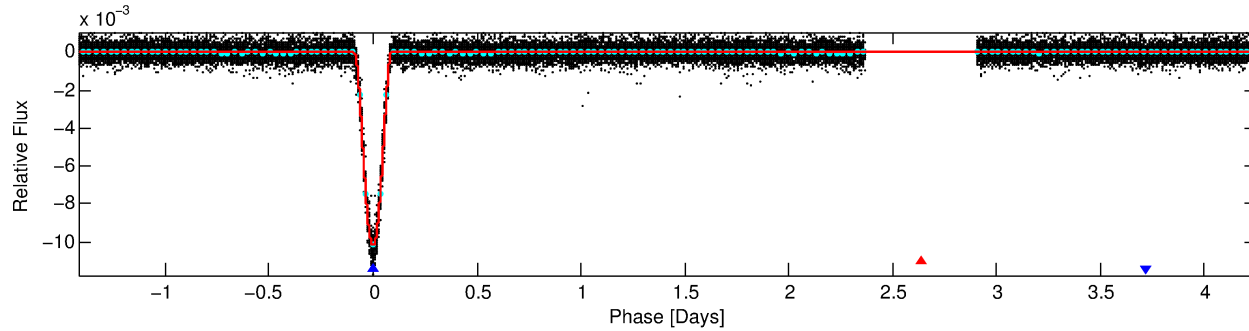
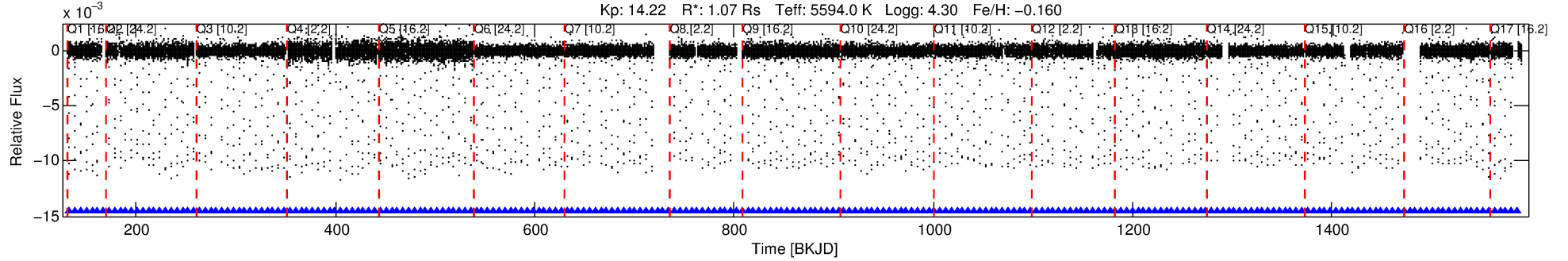
No Significant Match Found

# DV One-Page Summary

KIC: 11858541 Candidate: 2 of 2 Period: 5.674 d

KOI: K07486 Corr: No Ephemeris Match

Kp: 14.22 R\*: 1.07 Rs Teff: 5594.0 K Logg: 4.30 Fe/H: -0.160



## DV Fit Results:

Period = 5.67436 [0.00000] d  
Epoch = 133.1185 [0.0001] BKJD  
Rp/R\* = 0.1632 [0.0087]  
a/R\* = 6.67 [0.05]  
b = 0.99 [0.01]  
Seff = 291.35 [129.35]  
Teq = 1053 [117] K  
Rp = 19.07 [6.33] Re  
a = 0.0588 [0.0169] AU  
Ag = 0.06 [0.07] [-14.29σ]  
Teffp = 817 [193] K [-1.05σ]

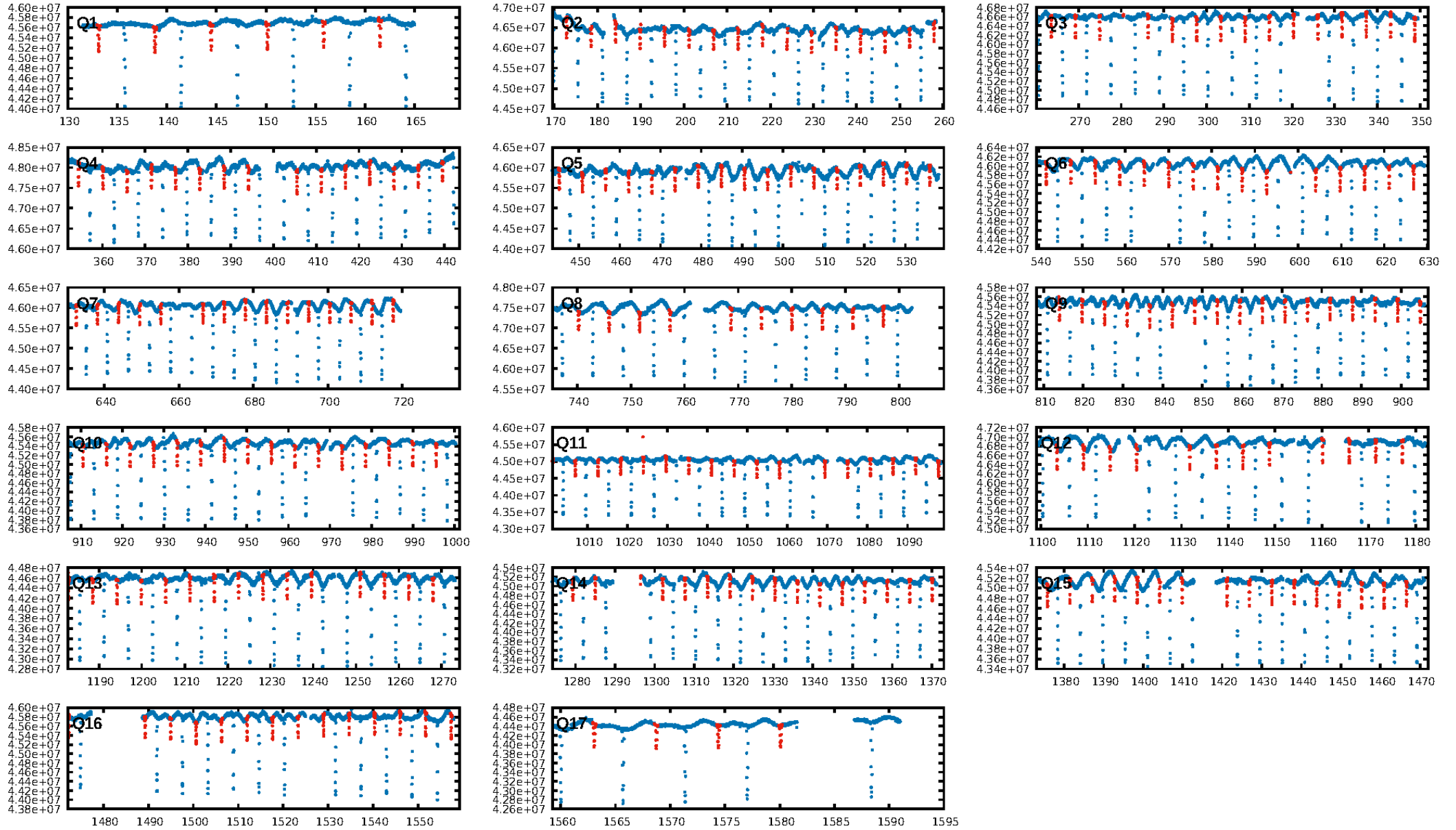
## DV Diagnostic Results:

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 [225/225]  
GhostDiagnostic-chr: 2.864  
Centroid-sig: 0.0%  
Centroid-so: 0.039 arcsec [3.38σ]  
OotOffset-rm: 0.048 arcsec [0.72σ]  
KicOffset-rm: 0.148 arcsec [2.19σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:23:02 Z

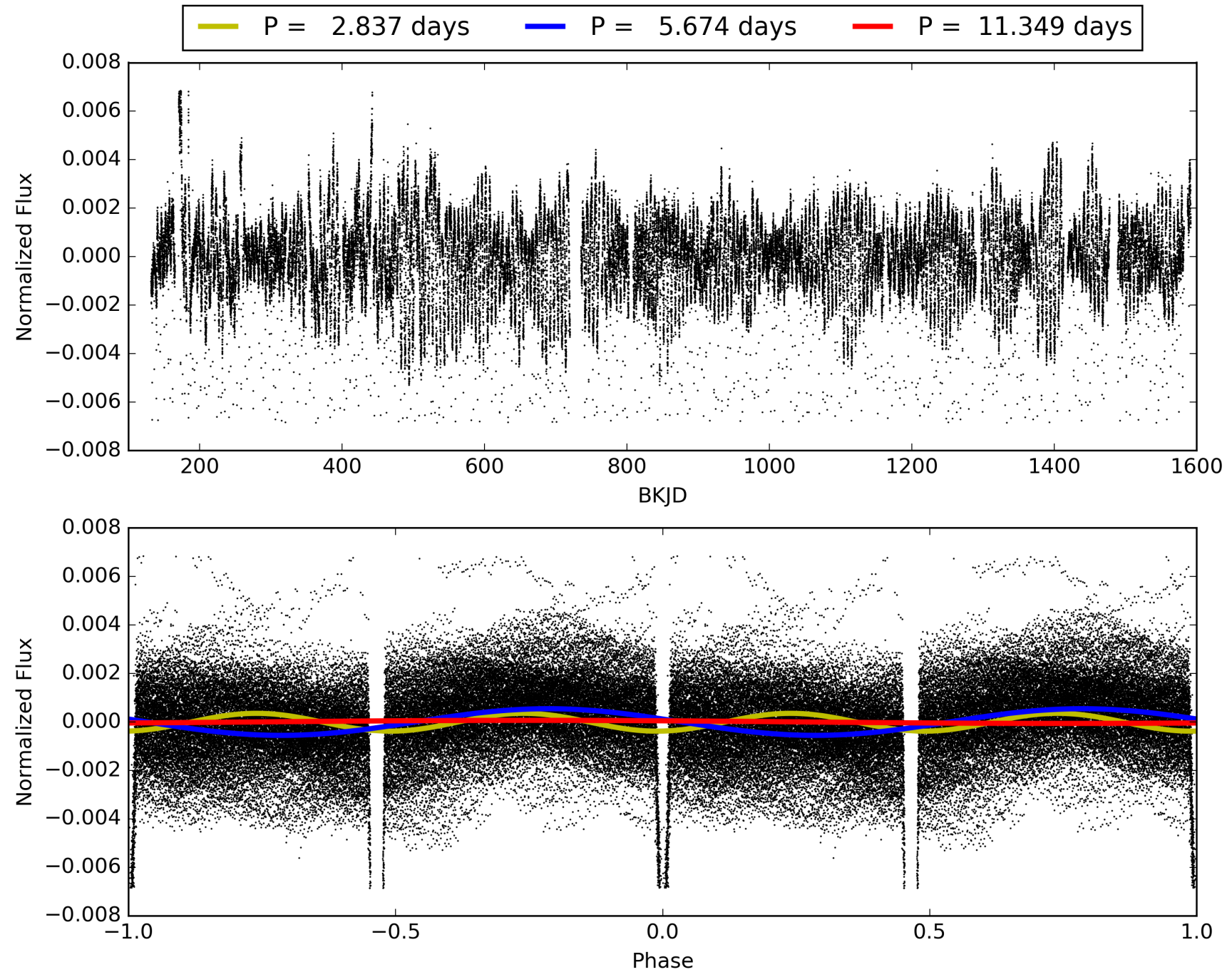
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011858541-02, PDC Light Curves





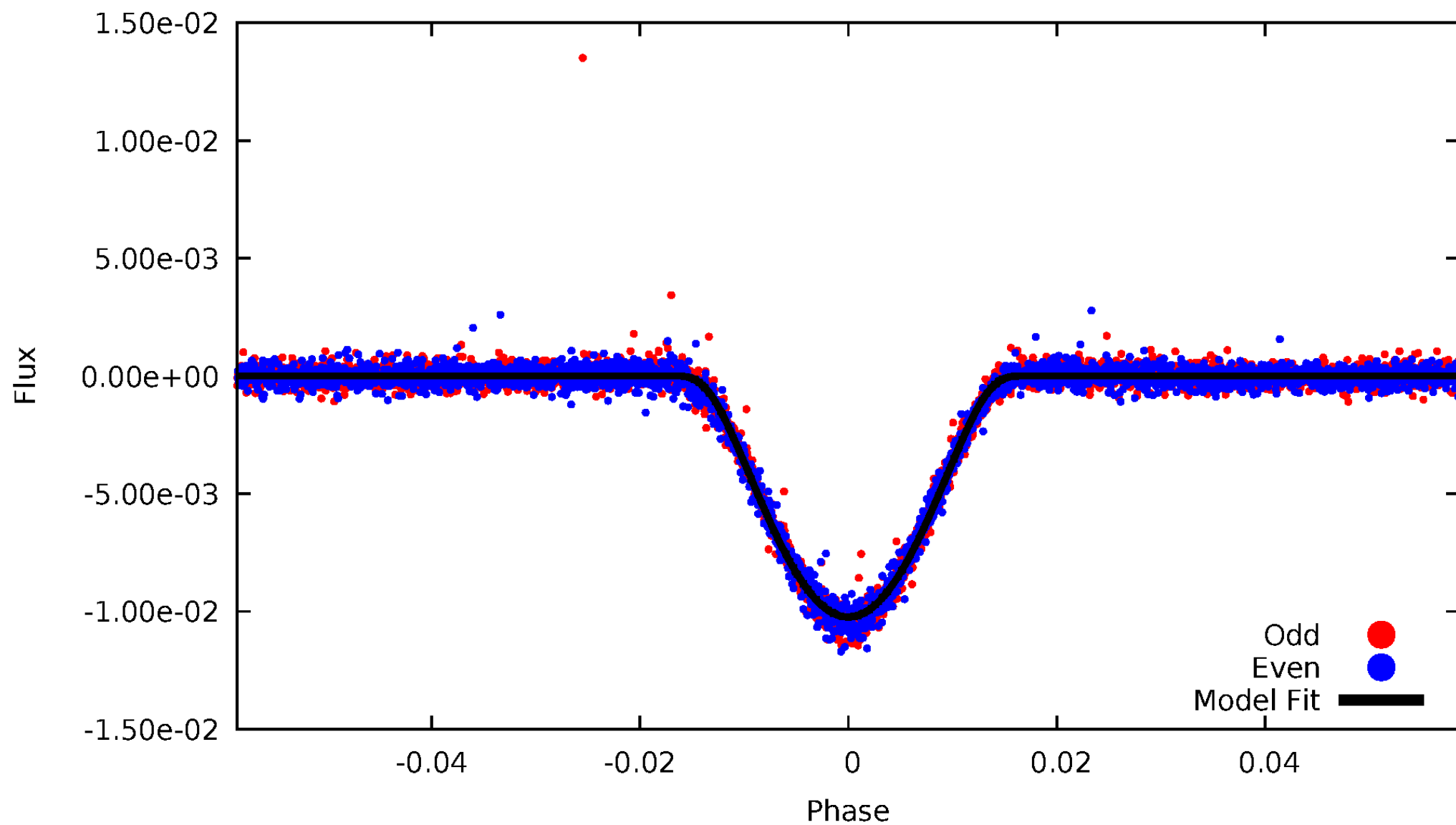
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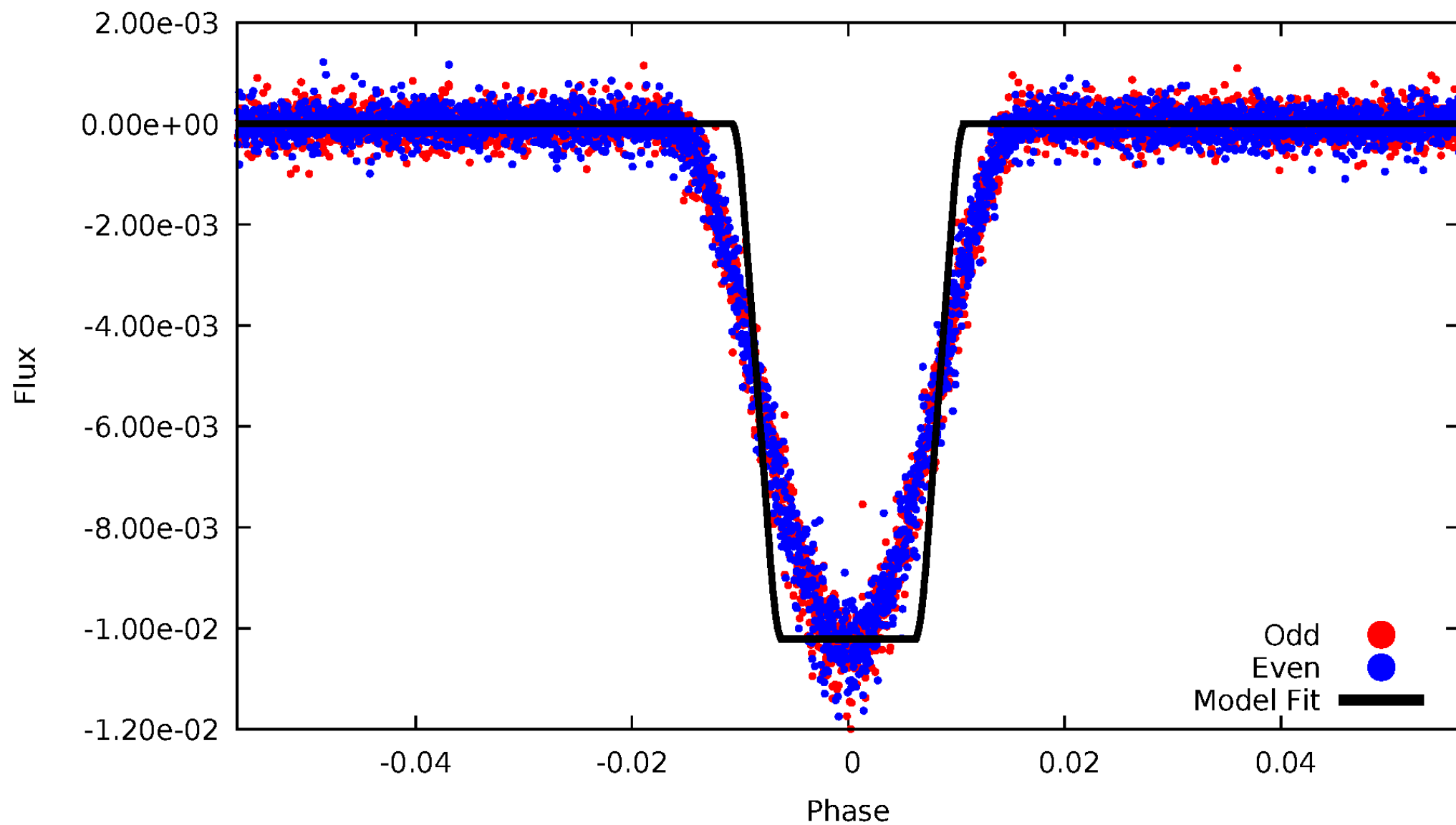
# DV Odd/Even

TCE 011858541-02



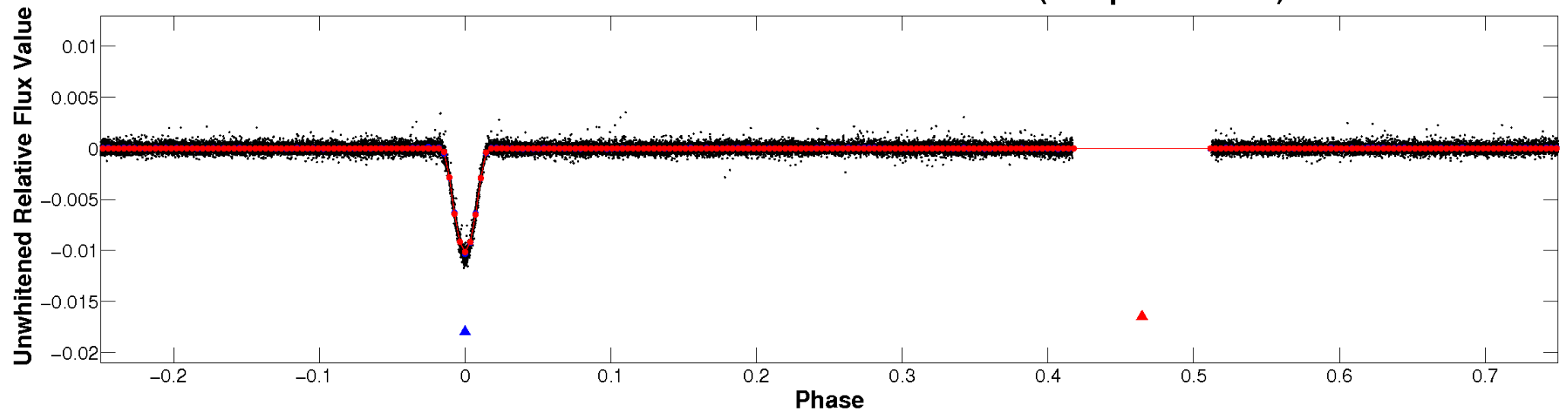
# ALT Odd/Even

TCE 011858541-02

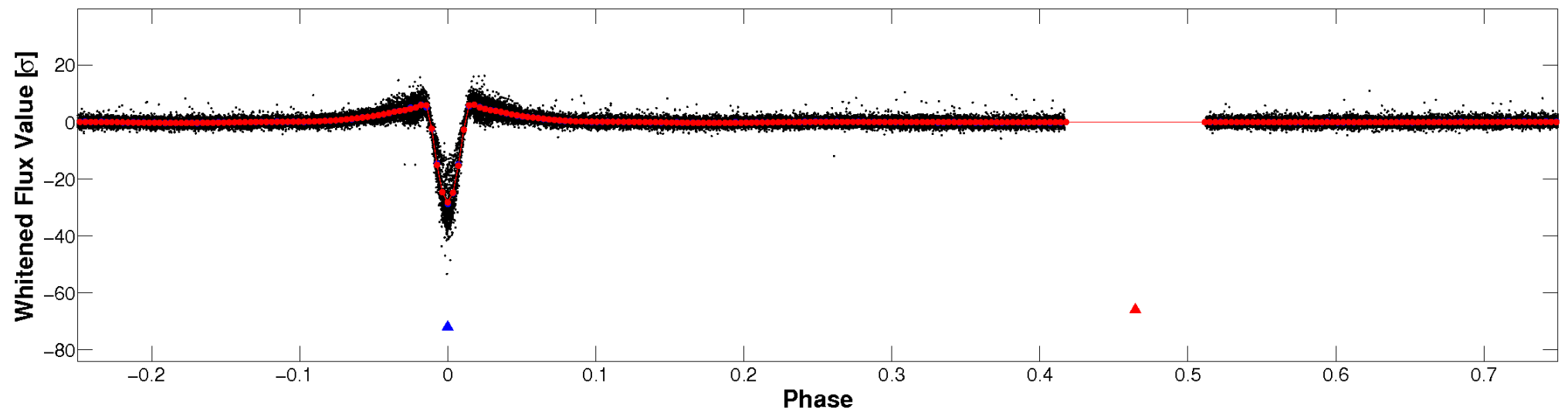


# Non-Whitened Vs. Whitened Light Curve

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

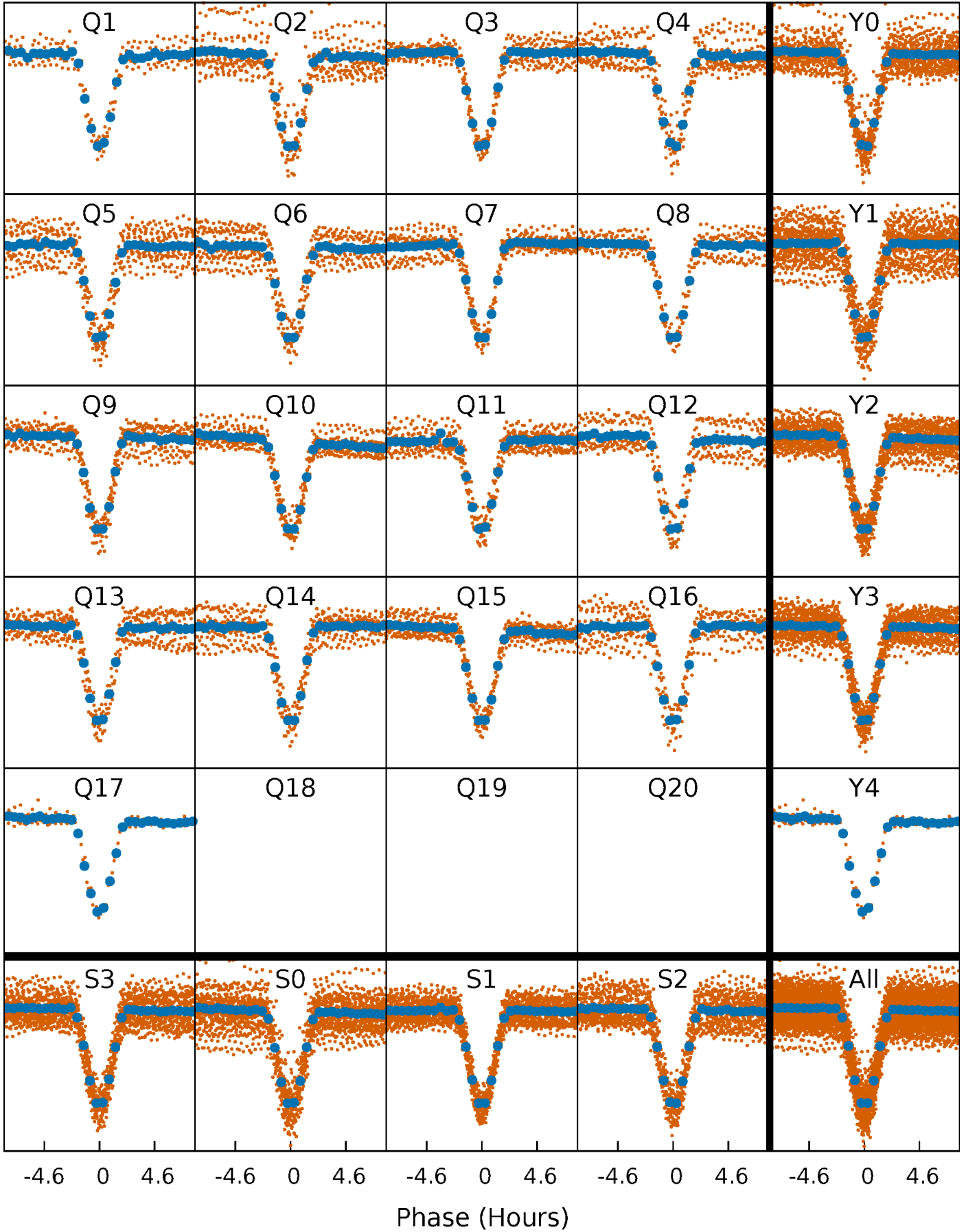


**Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



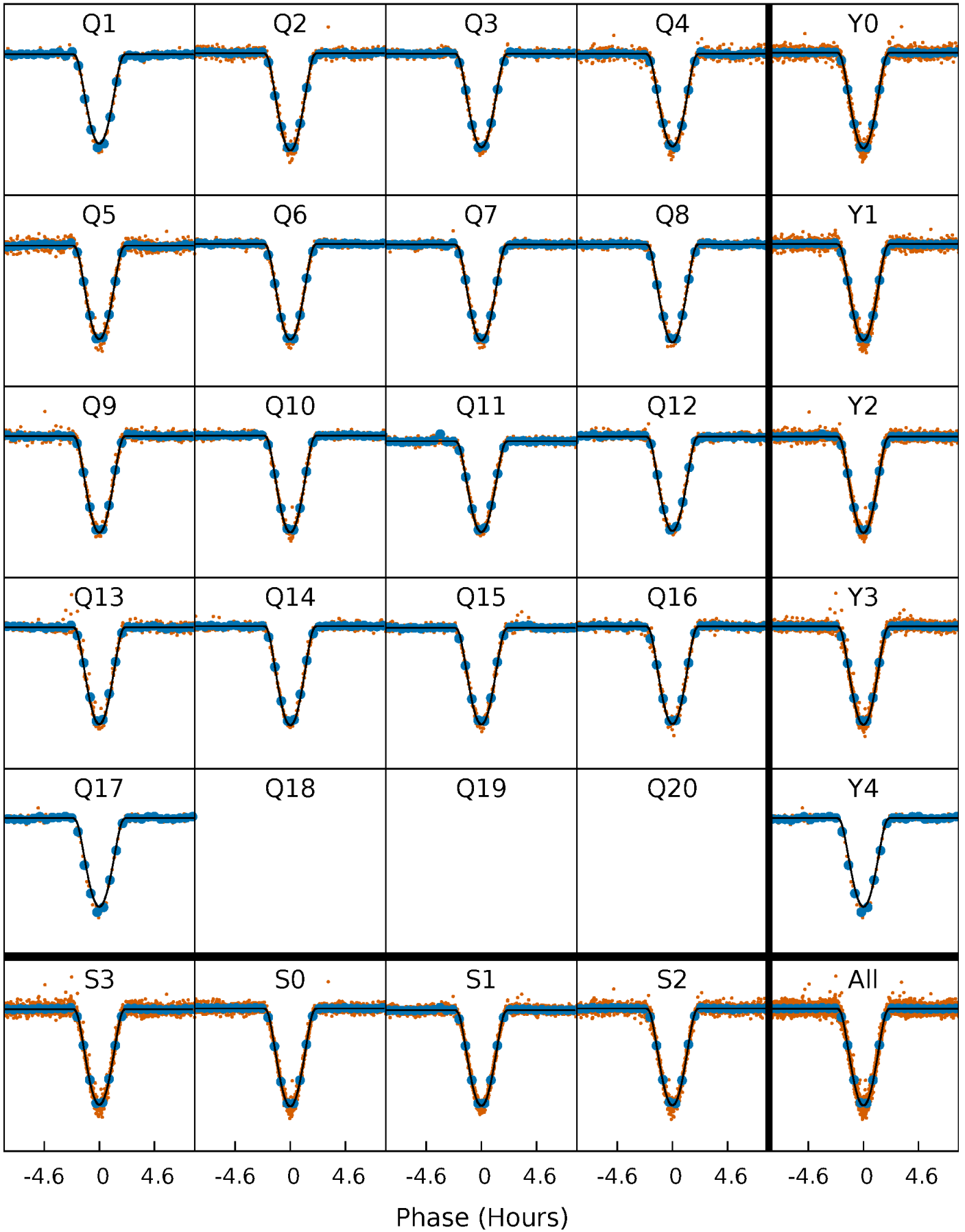
# PDC Quarter-Phased Transit Curves

TCE 011858541-02 P= 5.674357 Days  $T_0=133.118476$  (BKJD)



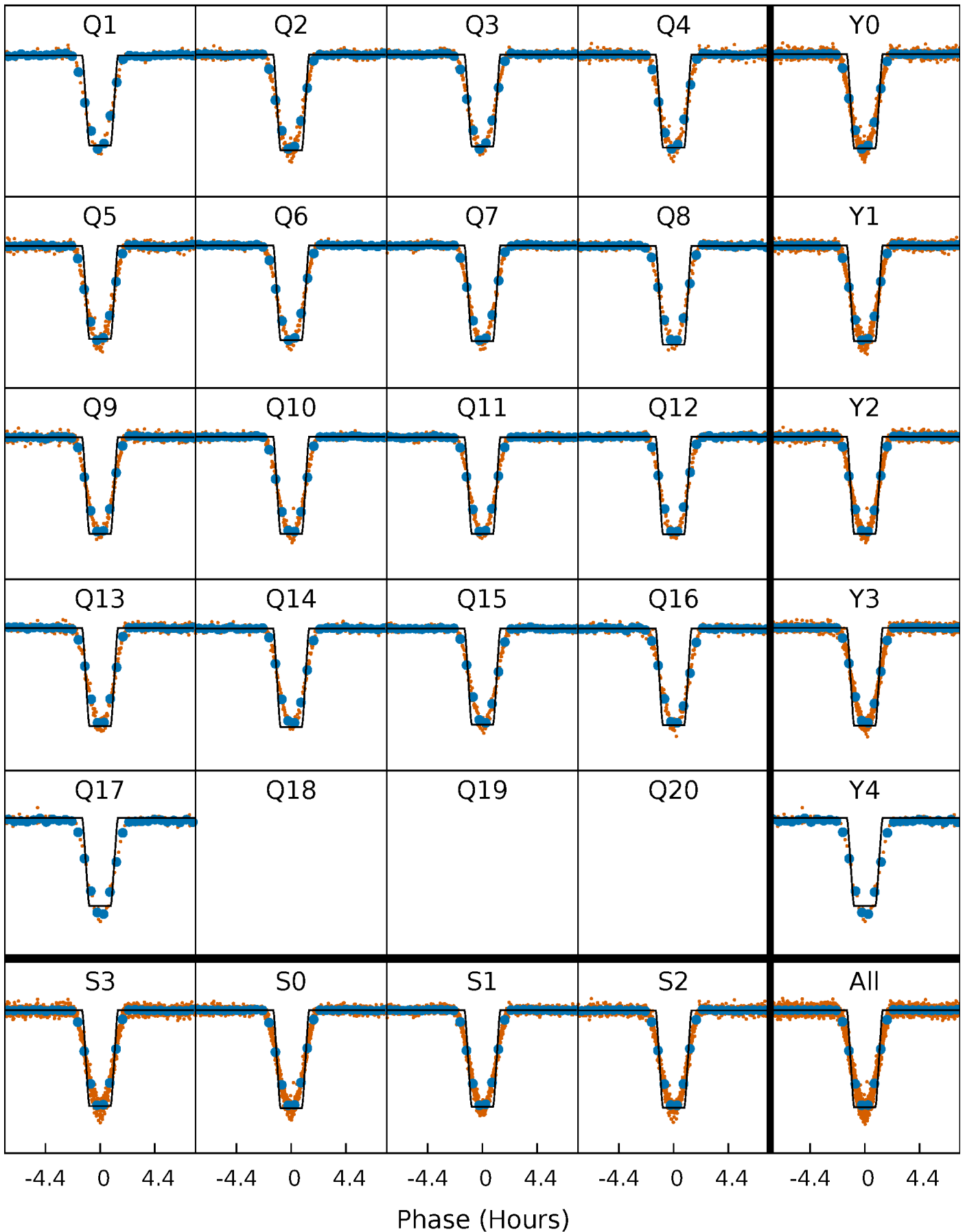
# DV Quarter-Phased Transit Curves

TCE 011858541-02 P= 5.674357 Days  $T_0=133.118476$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

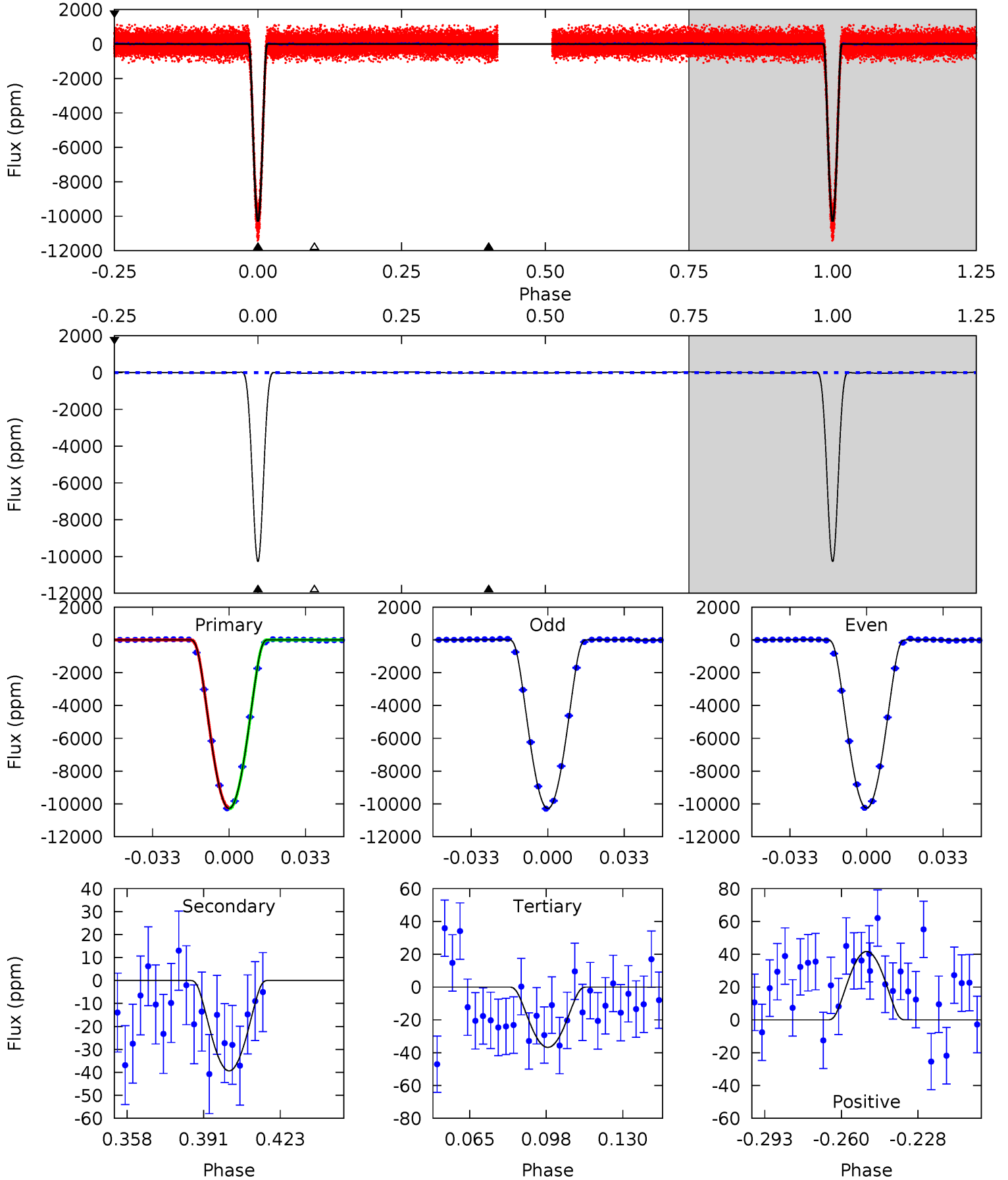
TCE 011858541-02 P= 5.674326 Days  $T_0=133.122546$  (BKJD)



# DV Model-Shift Uniqueness Test

011858541-02, P = 5.674357 Days, E = 127.444119 Days

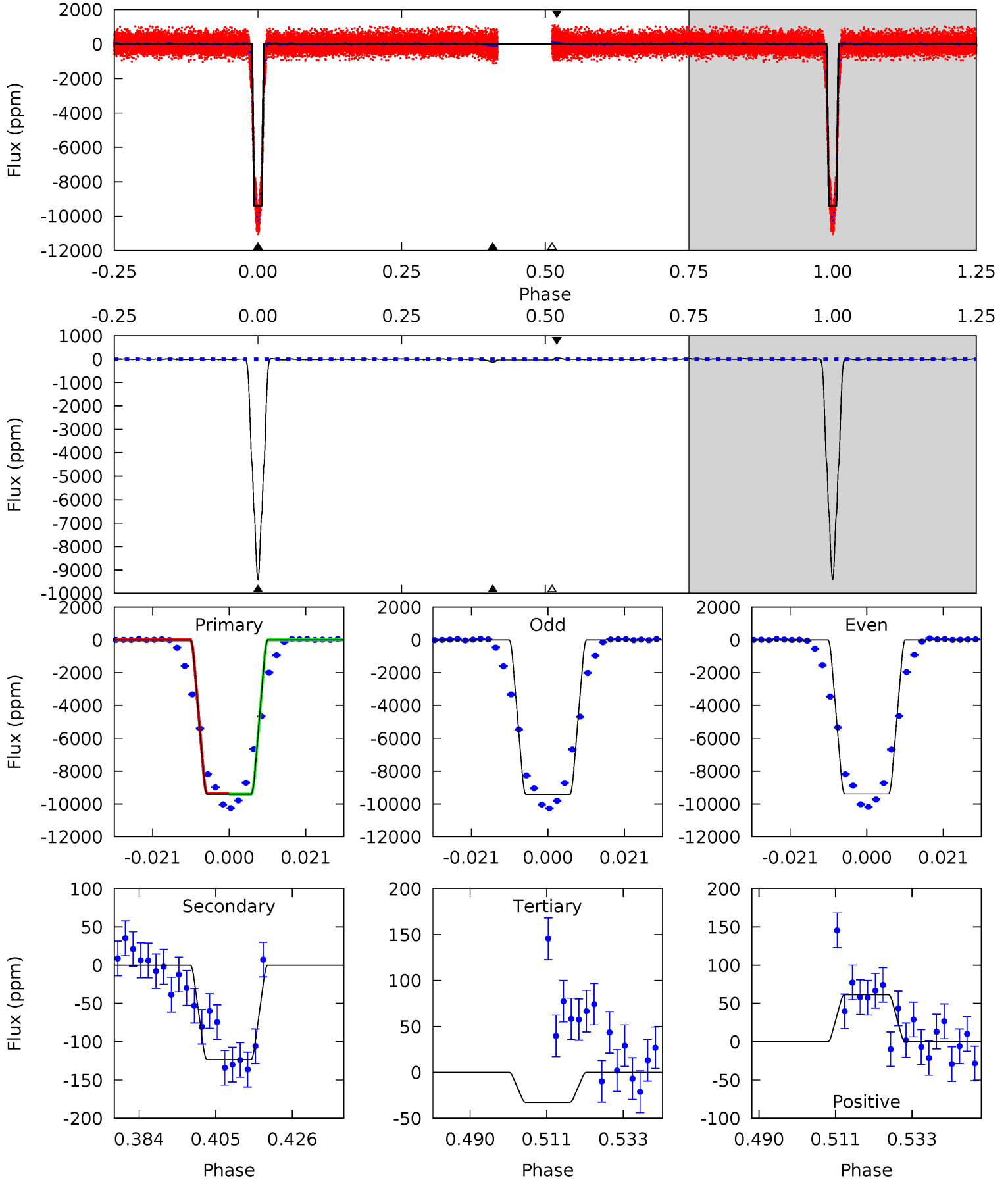
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1641	6.29	5.88	6.66	4.79	2.14	2.84	1636	1635	0.41	-0.37	2.01	1.00	0.00	4.78



# Alt Model-Shift Uniqueness Test

011858541-02, P = 5.674326 Days, E = 127.448220 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
1171	15.3	4.07	7.64	4.88	2.30	1.45	1167	1163	11.3	7.70	1.75	1.01	0.01	1.94





### Stellar Parameters For KIC 011858541

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5594^{+149}_{-149}$	$4.303^{+0.242}_{-0.220}$	$-0.160^{+0.300}_{-0.250}$	$1.071^{+0.351}_{-0.234}$	$0.841^{+0.122}_{-0.071}$	$0.964^{+1.081}_{-0.500}$
	+3%/-3%	+6%/-5%	+188%/-156%	+33%/-22%	+15%/-8%	+112%/-52%
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 011858541-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-39 \pm 6$	$18.92^{+3.75}_{-2.70}$	$1465^{+139}_{-110}$	$-1909^{+378}_{-177}$	$0.207^{+0.084}_{-0.063}$
Alt.	$-123 \pm 8$	$11.68^{+2.50}_{-1.78}$	$1461^{+136}_{-105}$	$2587^{+87}_{-93}$	$1.725^{+0.728}_{-0.552}$

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

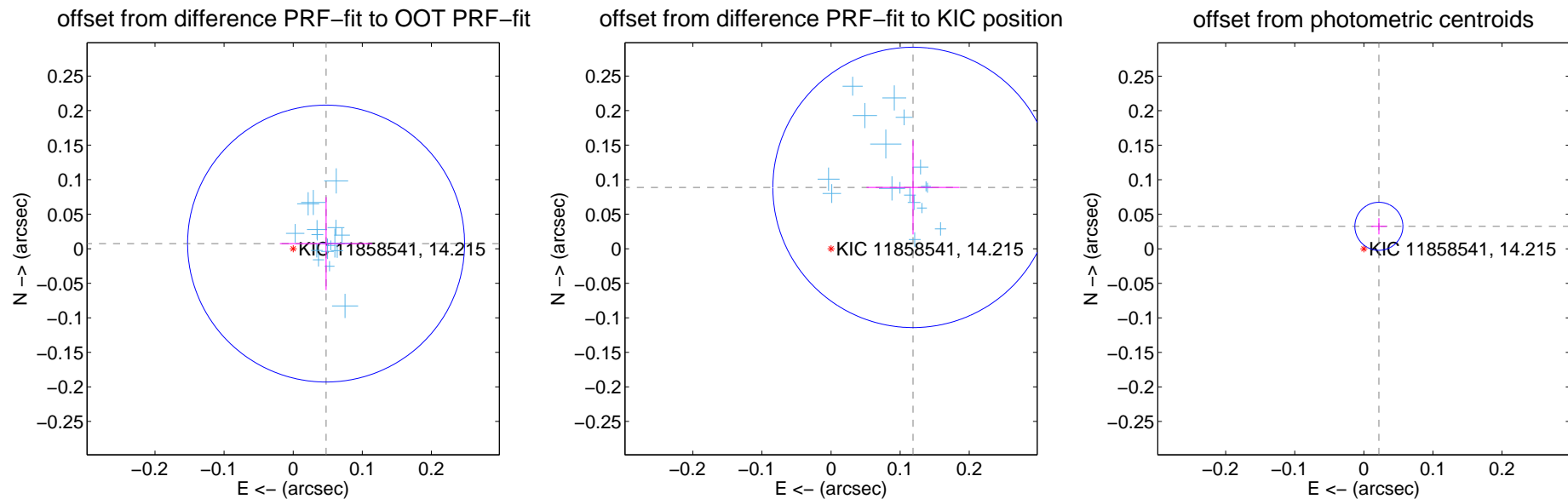
## DV Centroid Data

Supplemental centroid analysis for 011858541-02. Kepler magnitude: 14.21. Transit SNR 792.74

There are 17 quarters with good PRF difference image offsets

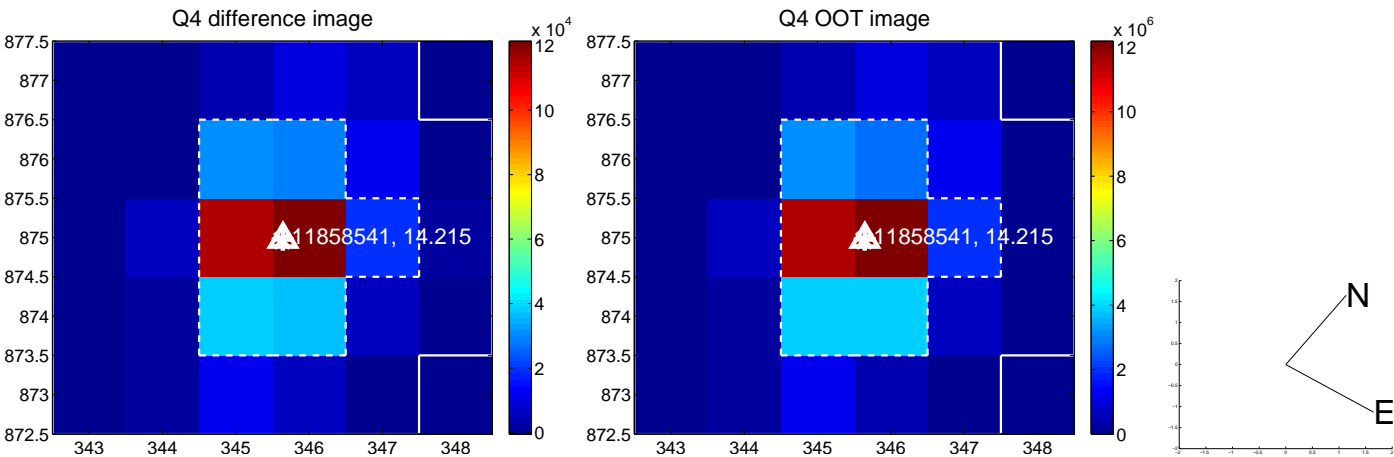
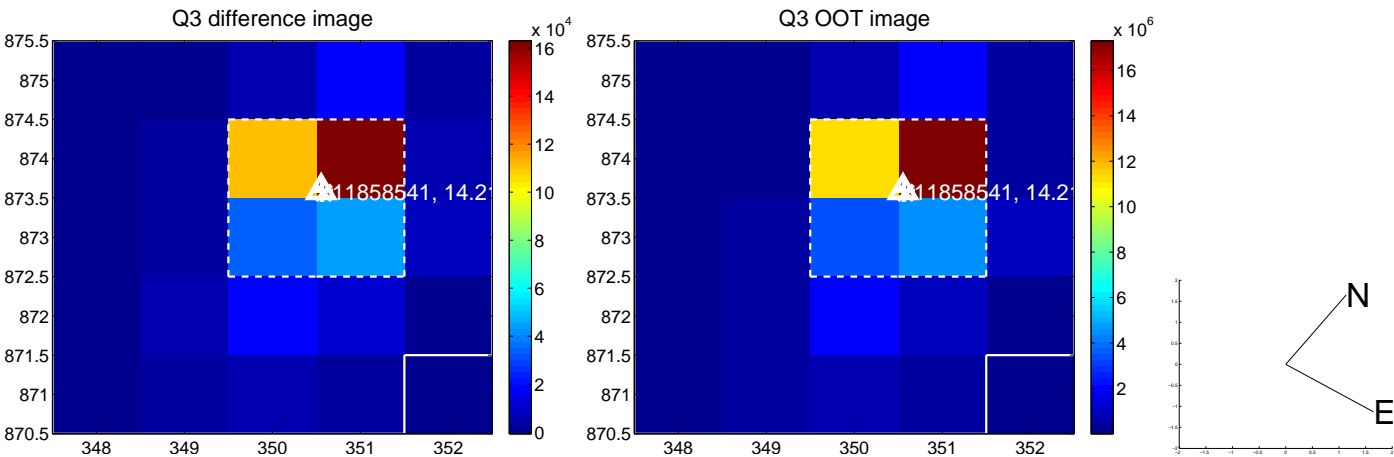
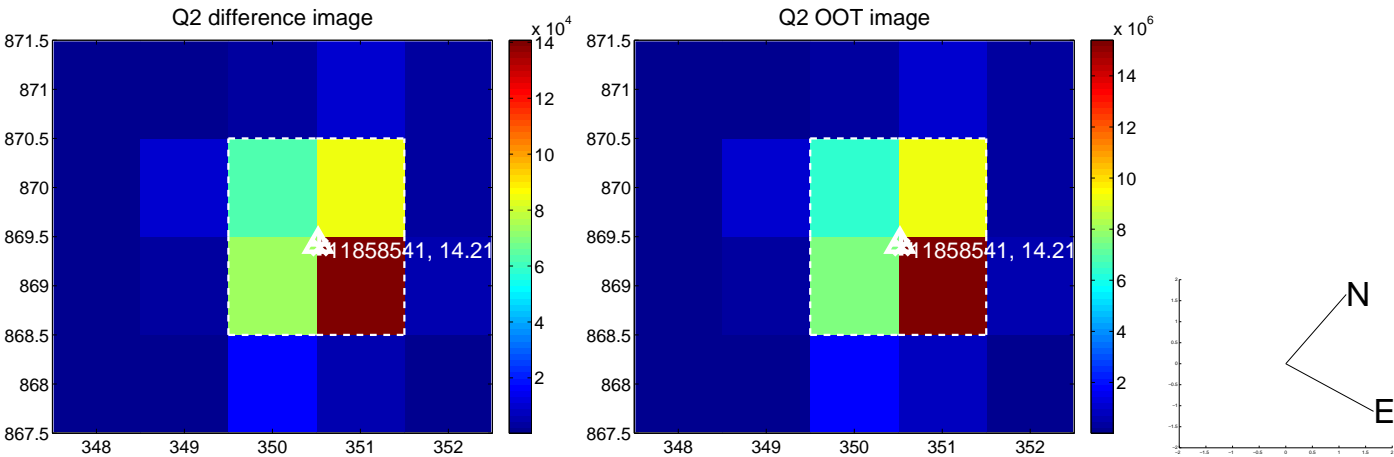
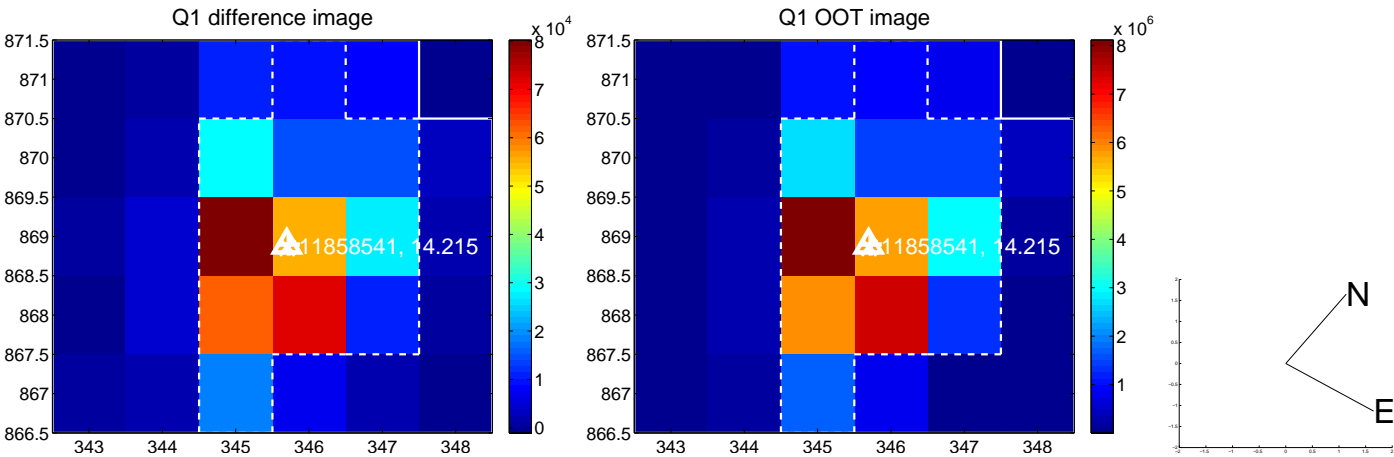
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.048 \pm 0.067$	0.72	$-0.048 \pm 0.067$	$0.007 \pm 0.067$
PRF-fit source offset from KIC position	$0.148 \pm 0.068$	2.19	$-0.119 \pm 0.067$	$0.089 \pm 0.068$
photometric centroid source offset	$0.04 \pm 0.01$	3.38	$-0.02 \pm 0.01$	$0.03 \pm 0.01$

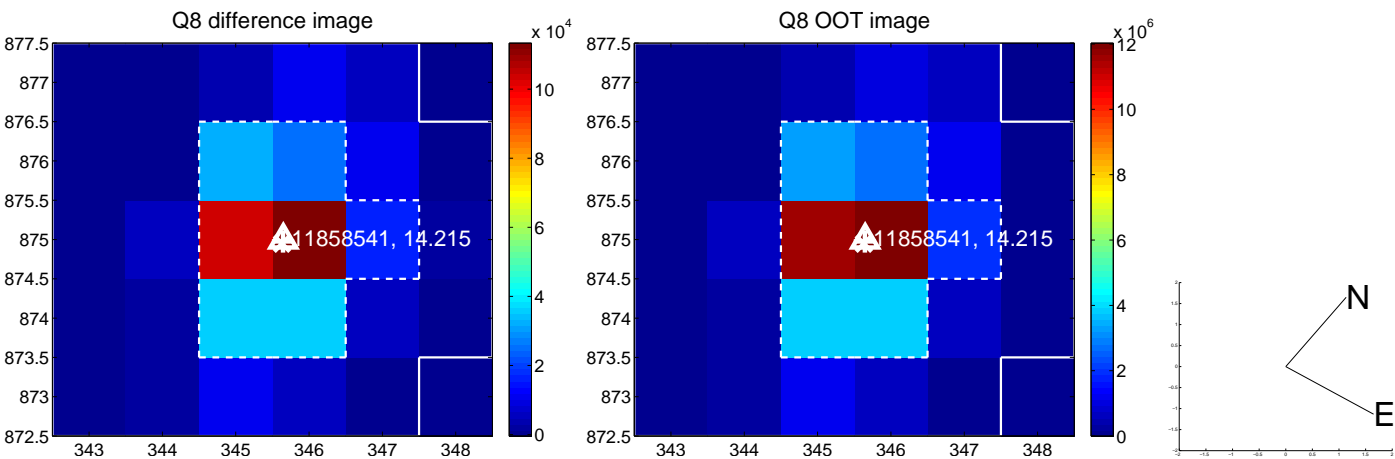
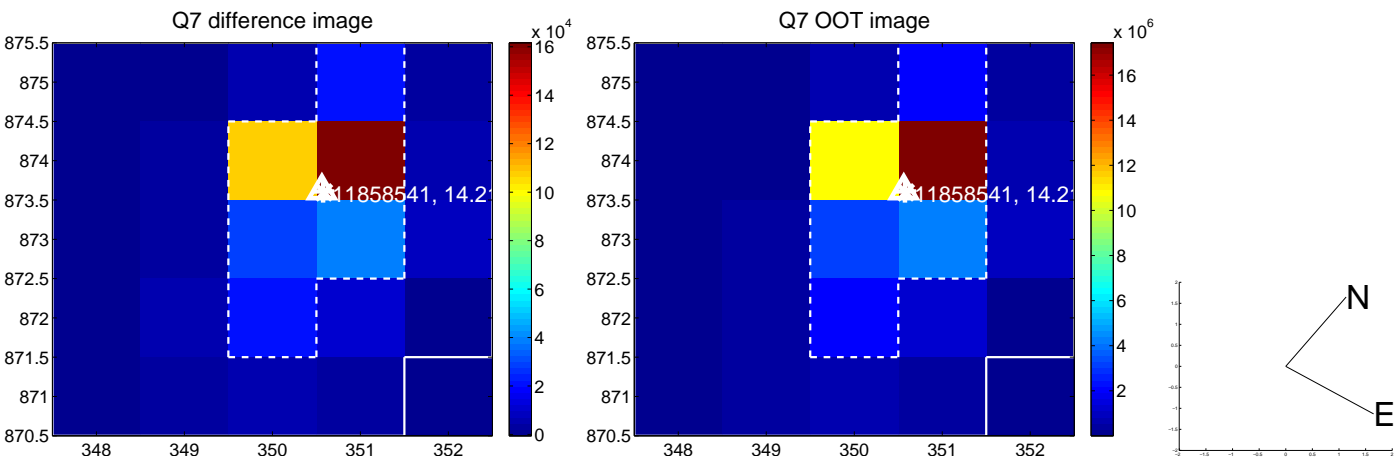
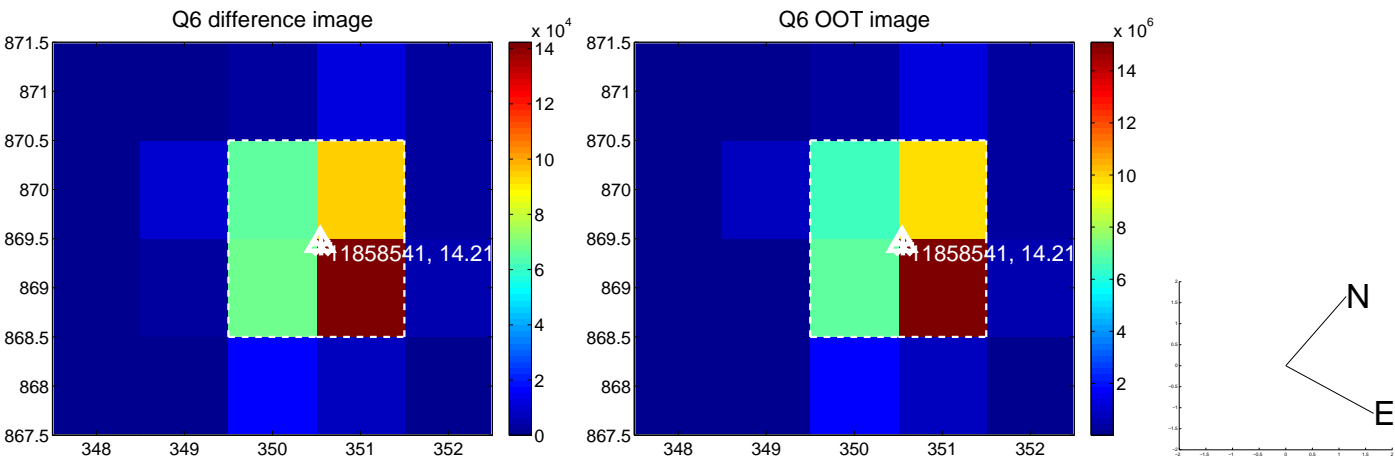
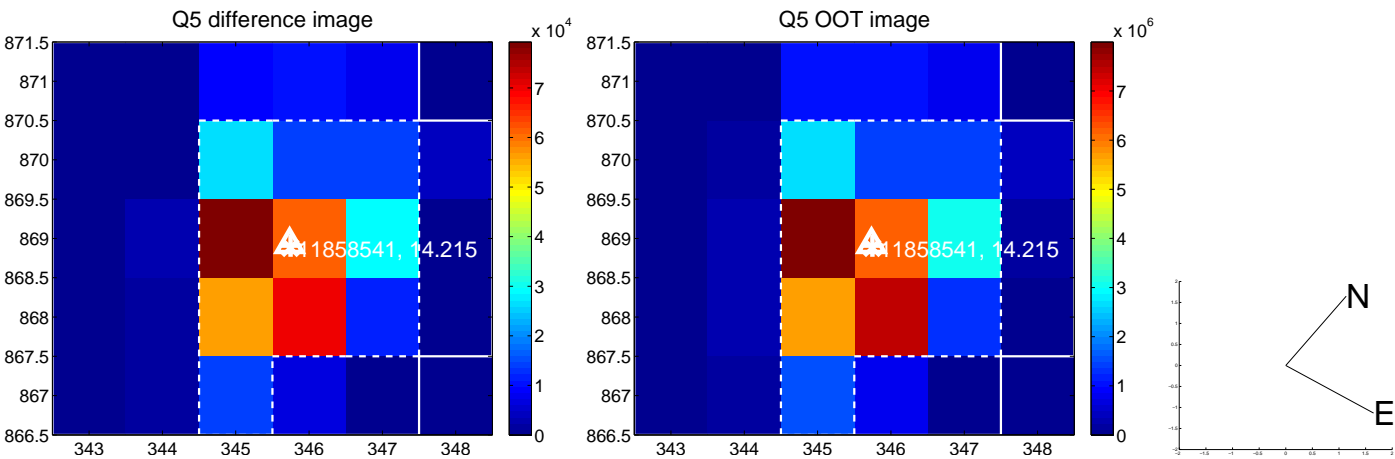


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

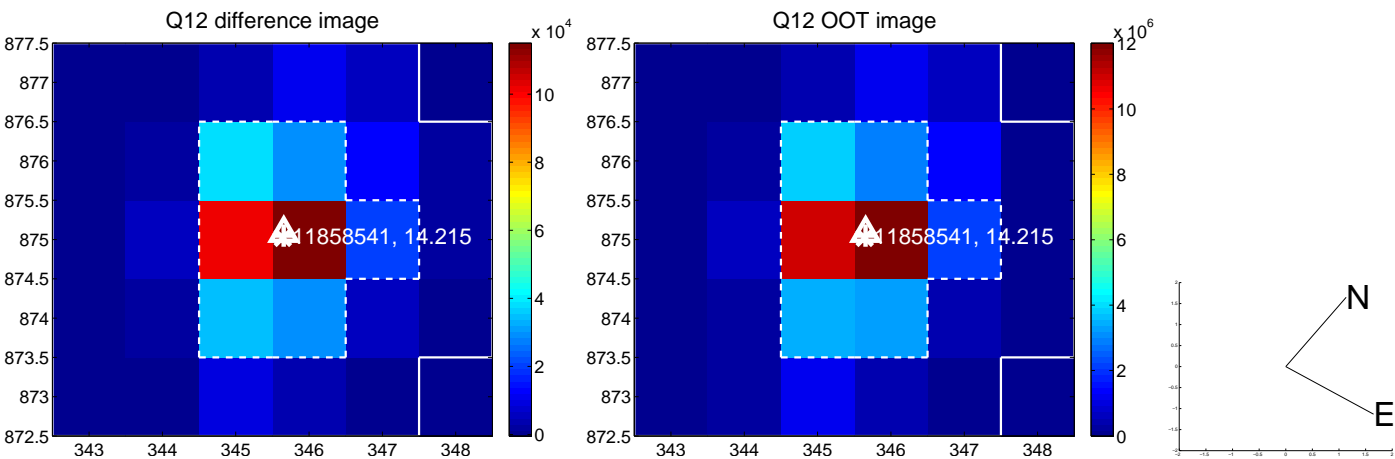
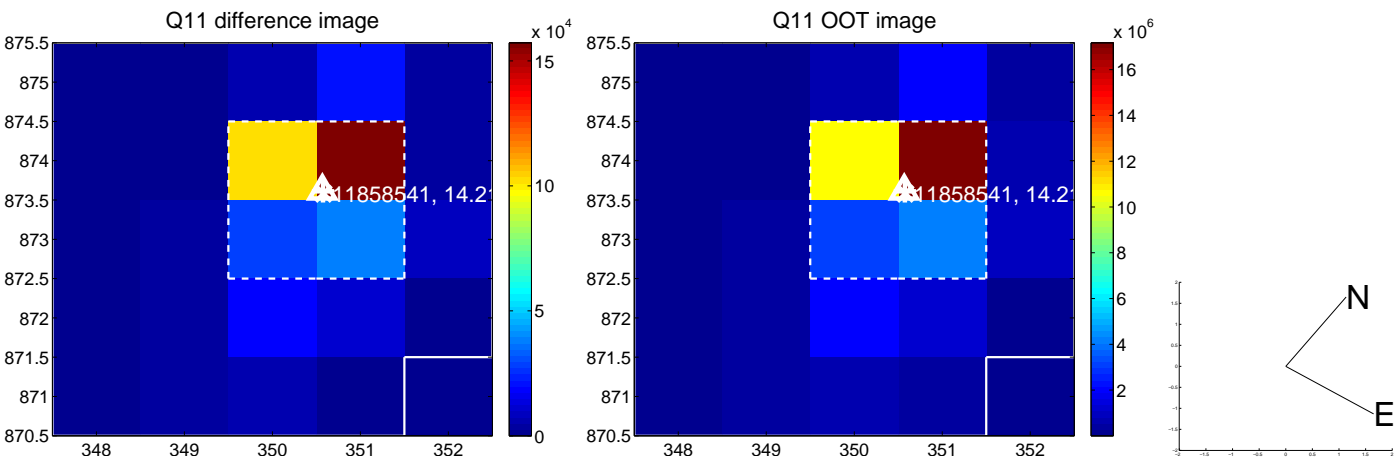
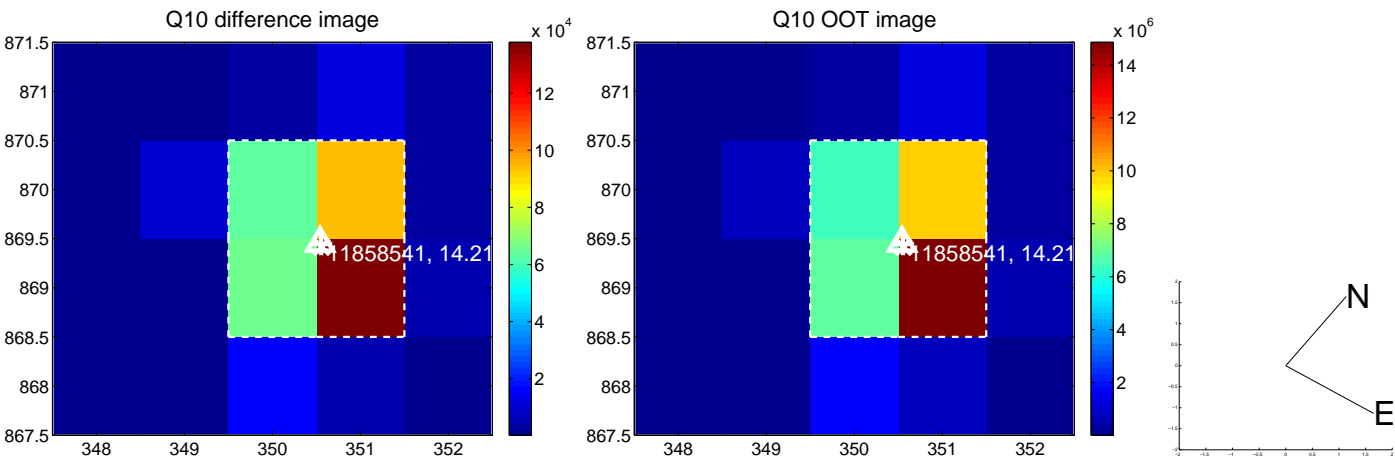
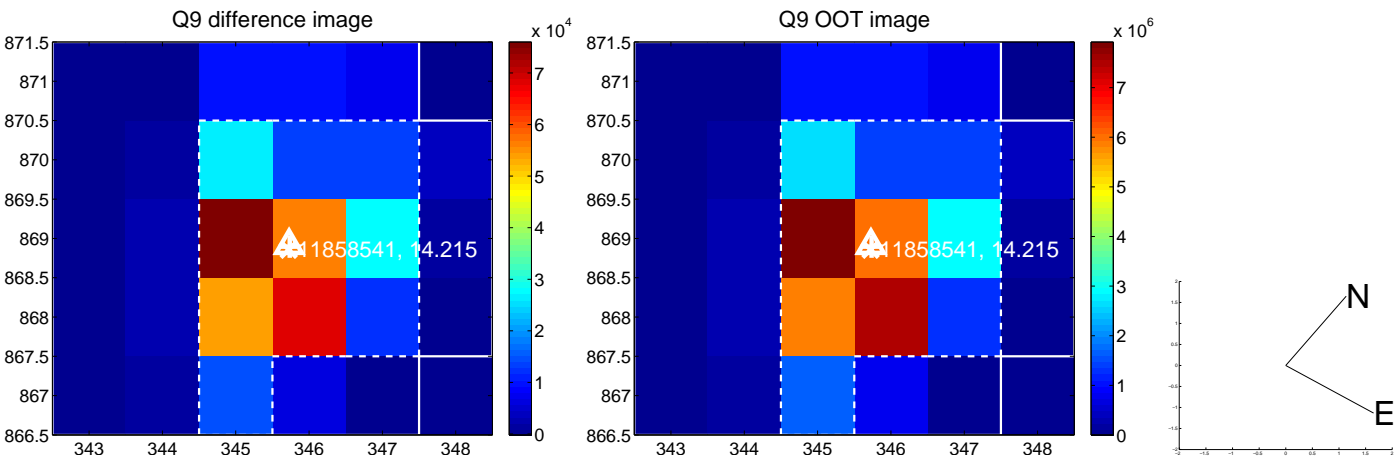
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



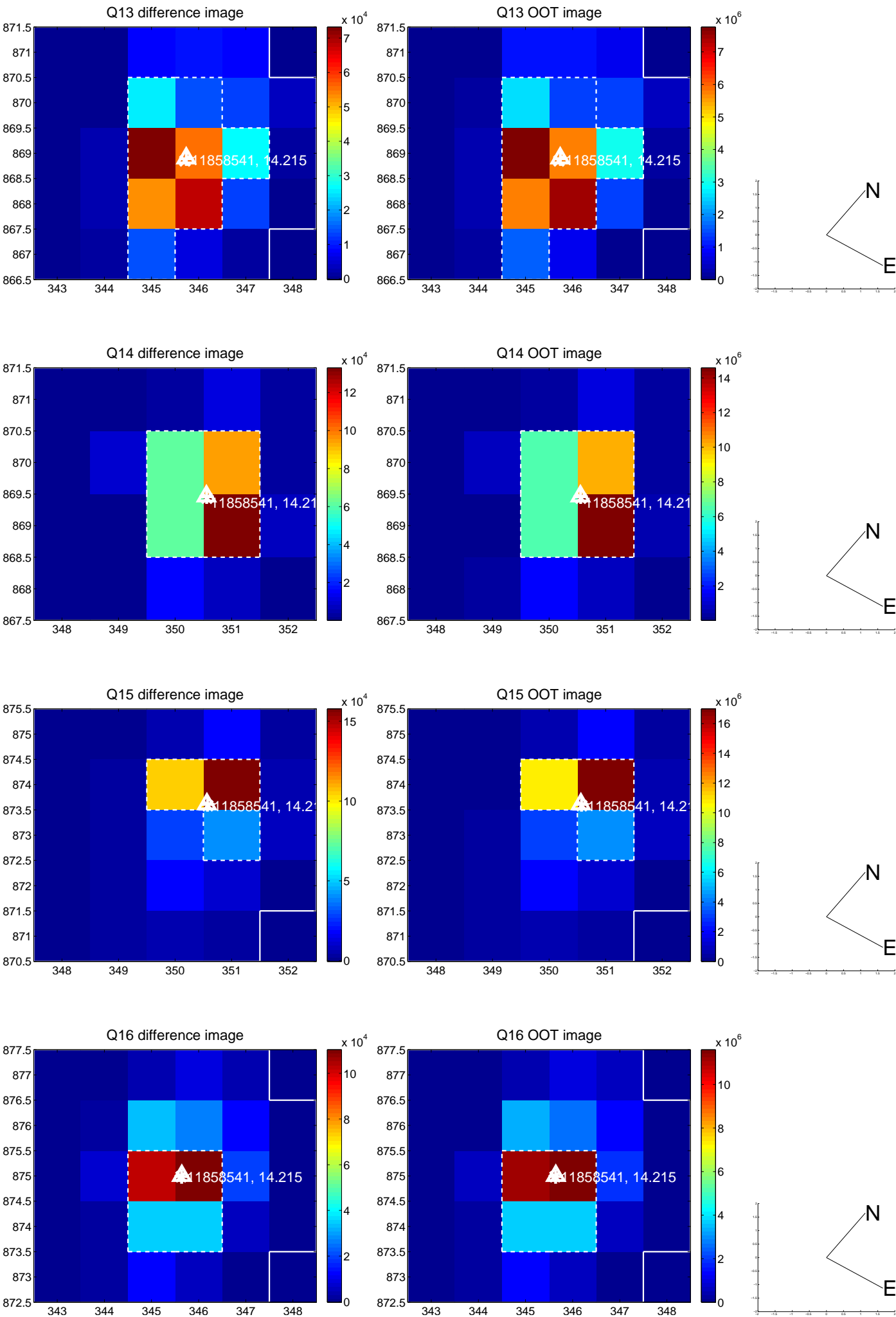
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



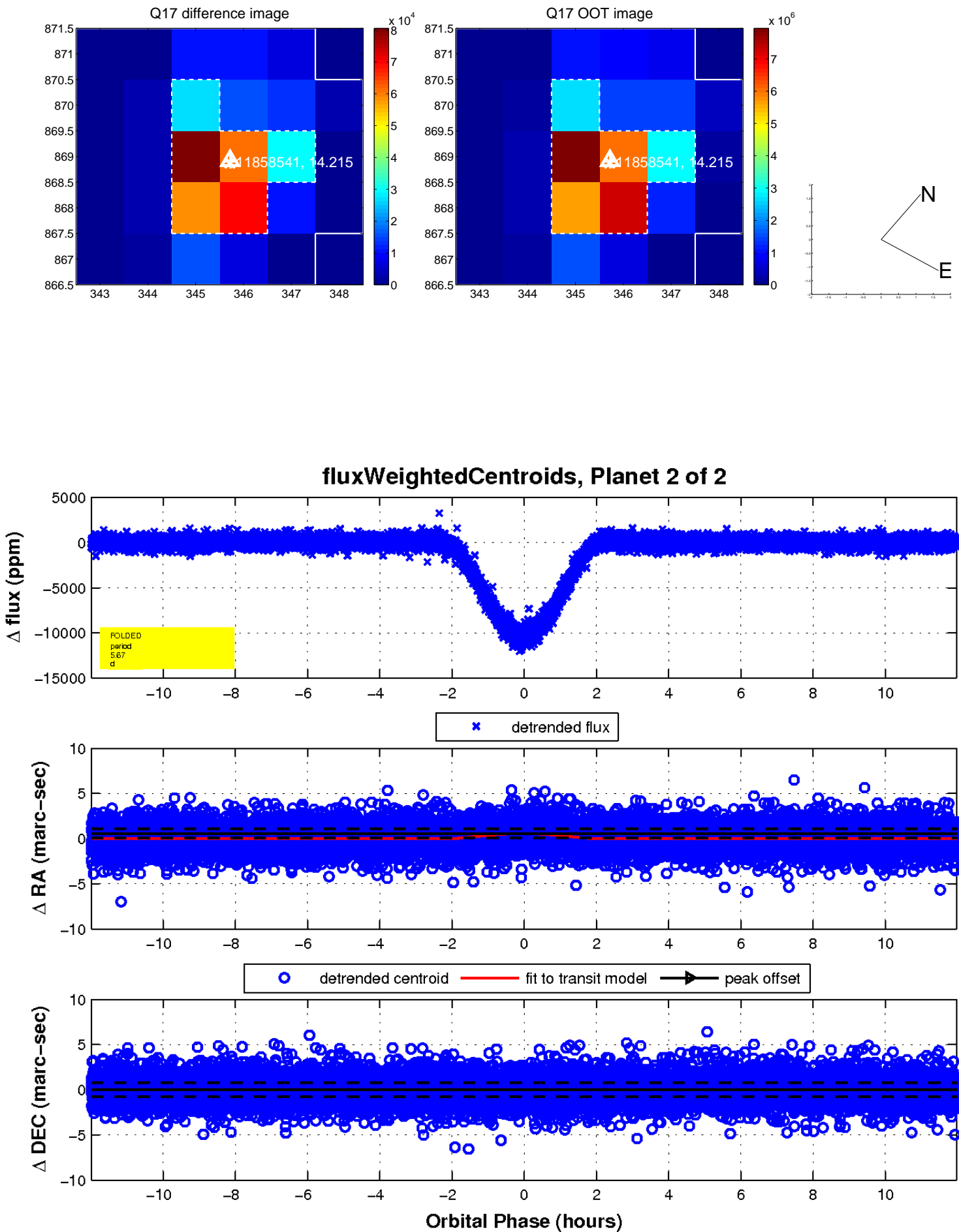
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

