

# KIC 003955866

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003955866-01	OBS	No	403.866720	228.467027	1579.9	17.537	16.8	17.0	0.96	5549	4.44	0.66
003955866-02	OBS	No	403.887754	195.205361	3472.0	40.262	17.1	34.3	0.96	5549	5.96	0.66
003955866-03	OBS	No	403.887704	229.536416	2783.0	5.745	15.5	17.6	0.96	5549	9.50	0.66
003955866-04	OBS	No	320.315468	379.125188	490.4	7.950	8.9	6.3	0.96	5549	2.34	0.90
003955866-05	OBS	No	387.063656	279.711601	986.2	26.047	8.1	9.3	0.96	5549	3.62	0.70

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003955866-01	OBS	FP	0.00	1	0	1	0	LPP_DV—ALL_TRANS_CHASES—CENT_RESOLVED_OFFSET
003955866-02	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003955866-03	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_FEW_DIFFS—EPHEM_MATCH
003955866-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
003955866-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_DIFFS

**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.

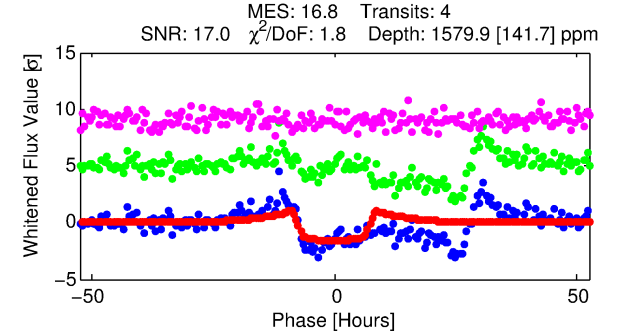
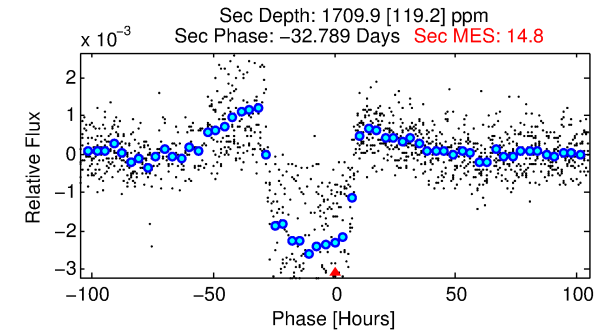
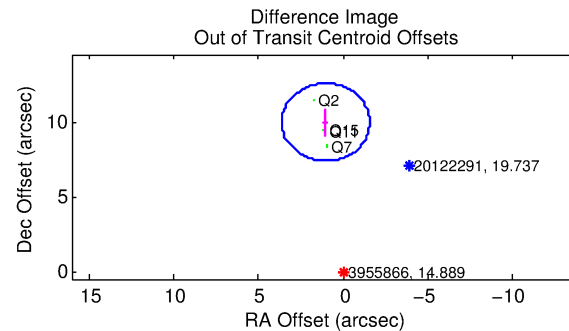
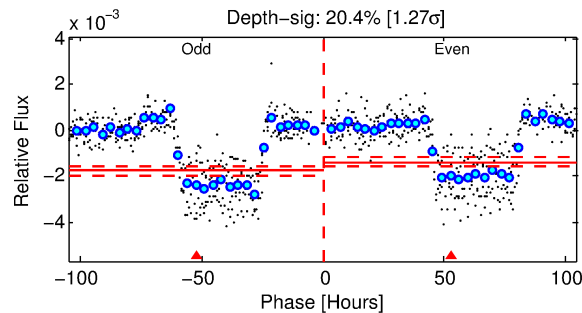
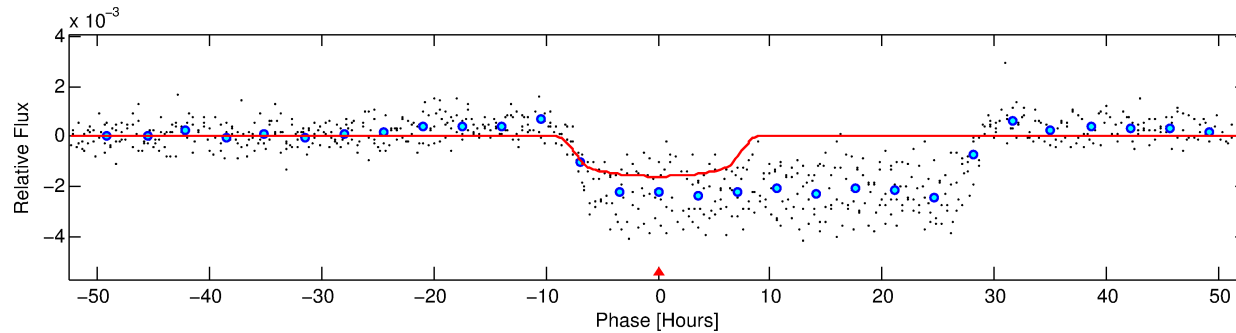
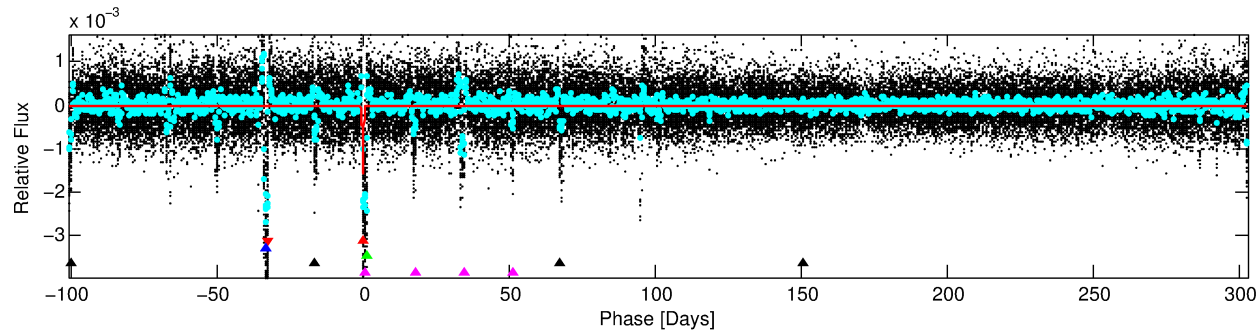
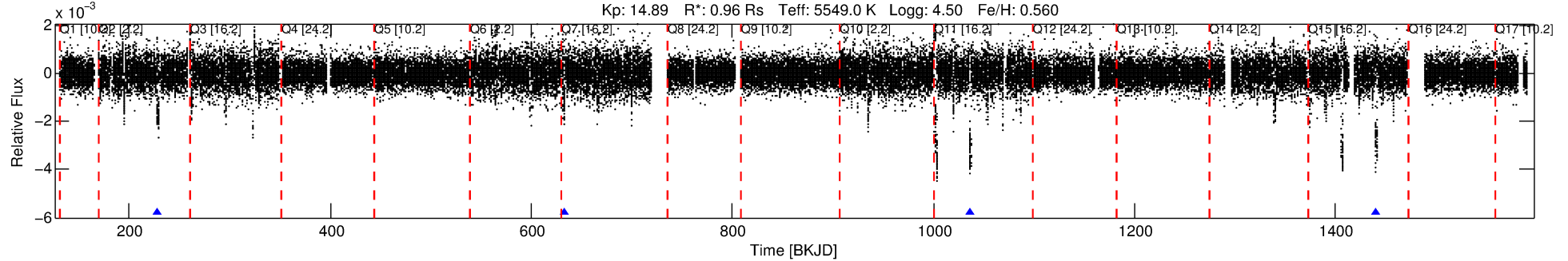
## Ephemeris Match Information For 003955866-01

No Significant Match Found

# DV One-Page Summary

KIC: 3955866 Candidate: 1 of 5 Period: 403.867 d  
KOI: K03897 Corr: No Ephemeris Match

Kp: 14.89 R\*: 0.96 Rs Teff: 5549.0 K Logg: 4.50 Fe/H: 0.560



## DV Fit Results:

Period = 403.86672 [0.00904] d  
Epoch = 228.4670 [0.0171] BKJD  
Rp/R\* = 0.0422 [0.0034]  
a/R\* = 104.72 [25.44]  
b = 0.86 [0.08]  
Seff = 0.66 [0.21]  
Teq = 230 [18] K  
Rp = 4.44 [1.02] Re  
a = 1.0937 [0.2063] AU  
Ag = 57165.44 [19138.93] [2.99σ]  
Teff = 5494 [303] K [17.34σ]

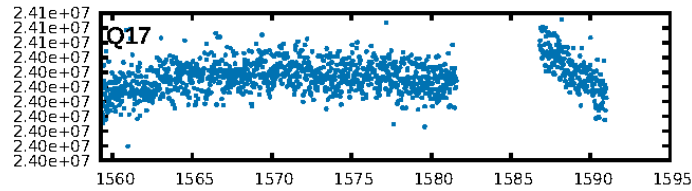
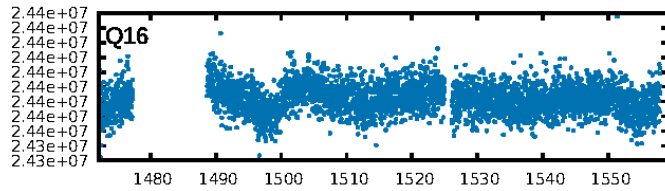
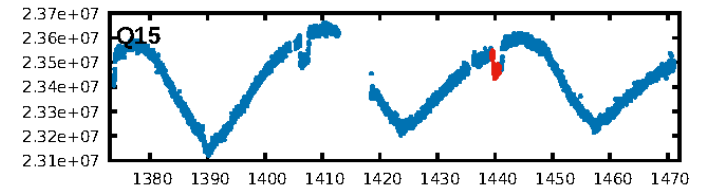
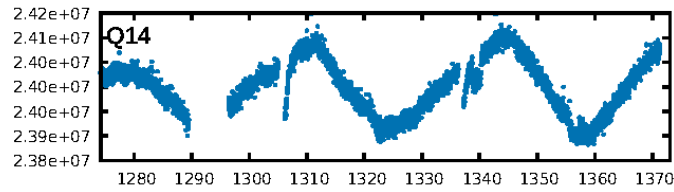
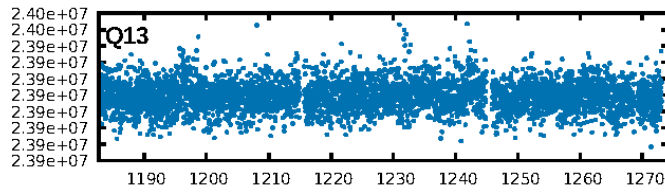
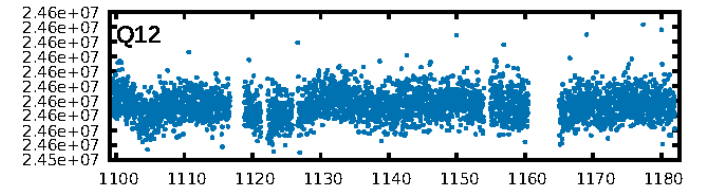
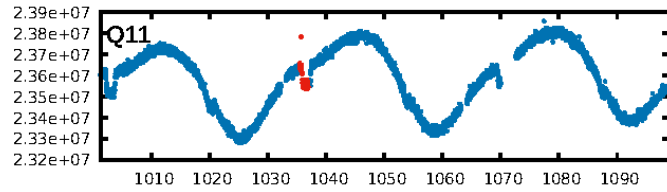
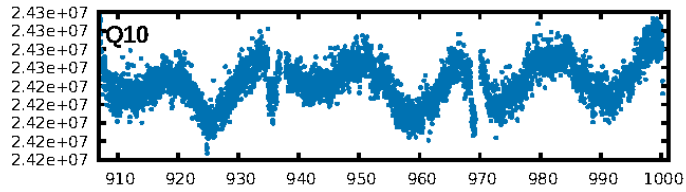
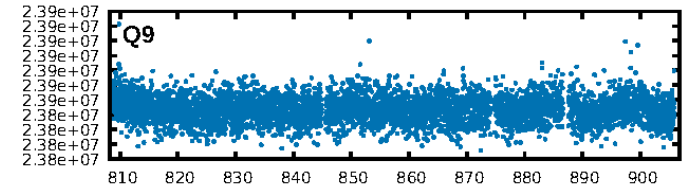
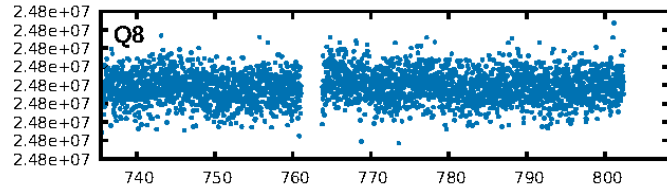
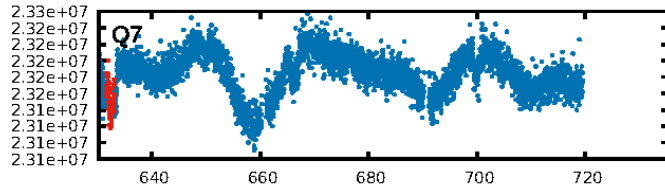
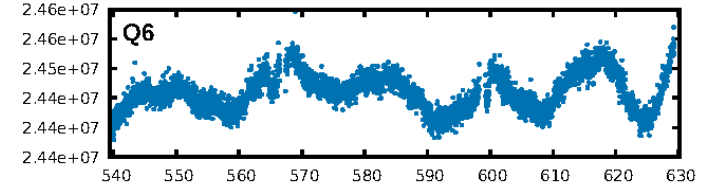
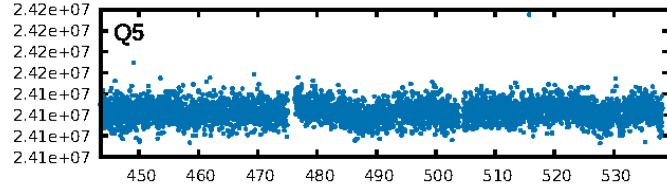
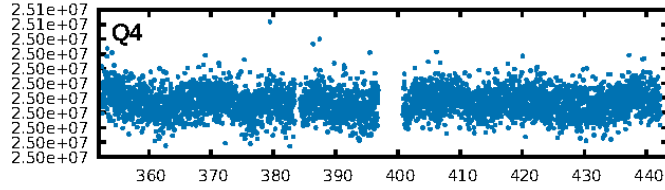
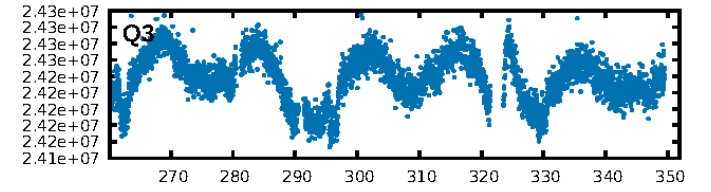
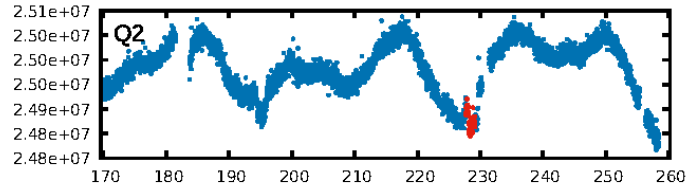
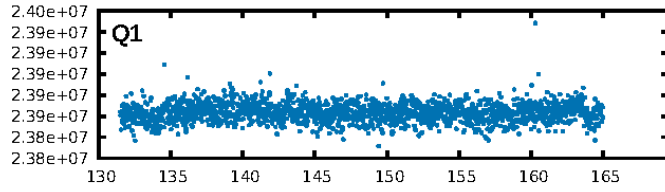
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.84σ]  
LongPeriod-sig: 2.2% [0.03σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 66.5%  
Bootstrap-pfa: 1.49e-18  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.7072  
Centroid-sig: N/A  
Centroid-so: 14.953 arcsec [3.79σ]  
OotOffset-rm: 10.022 arcsec [11.59σ]  
KicOffset-rm: 9.562 arcsec [21.91σ]  
OotOffset-st: 1/3/0/0 [4]  
KicOffset-st: 1/3/0/0 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 0.00 [0/4]

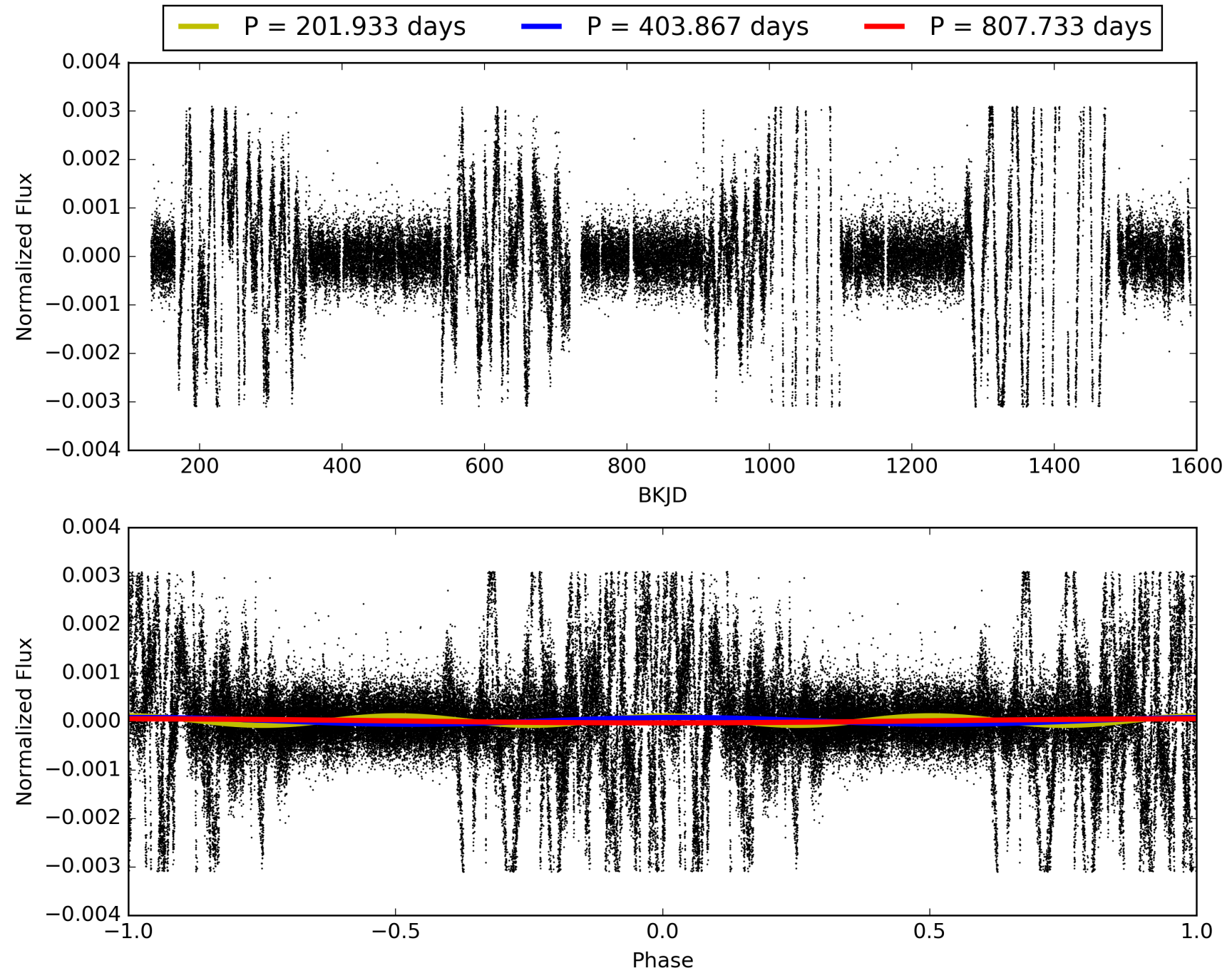
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003955866-01, PDC Light Curves



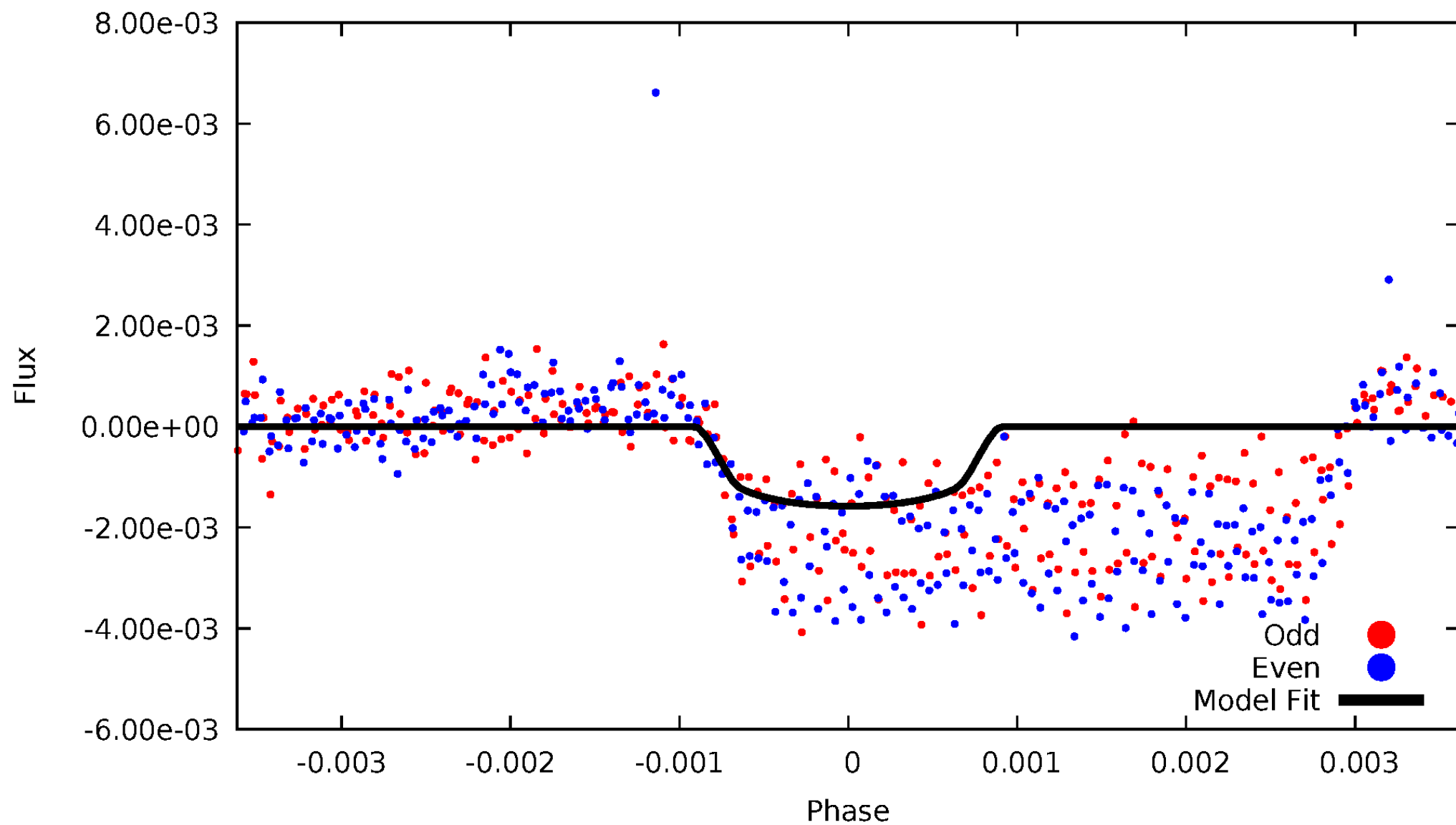
TCE 003955866-01





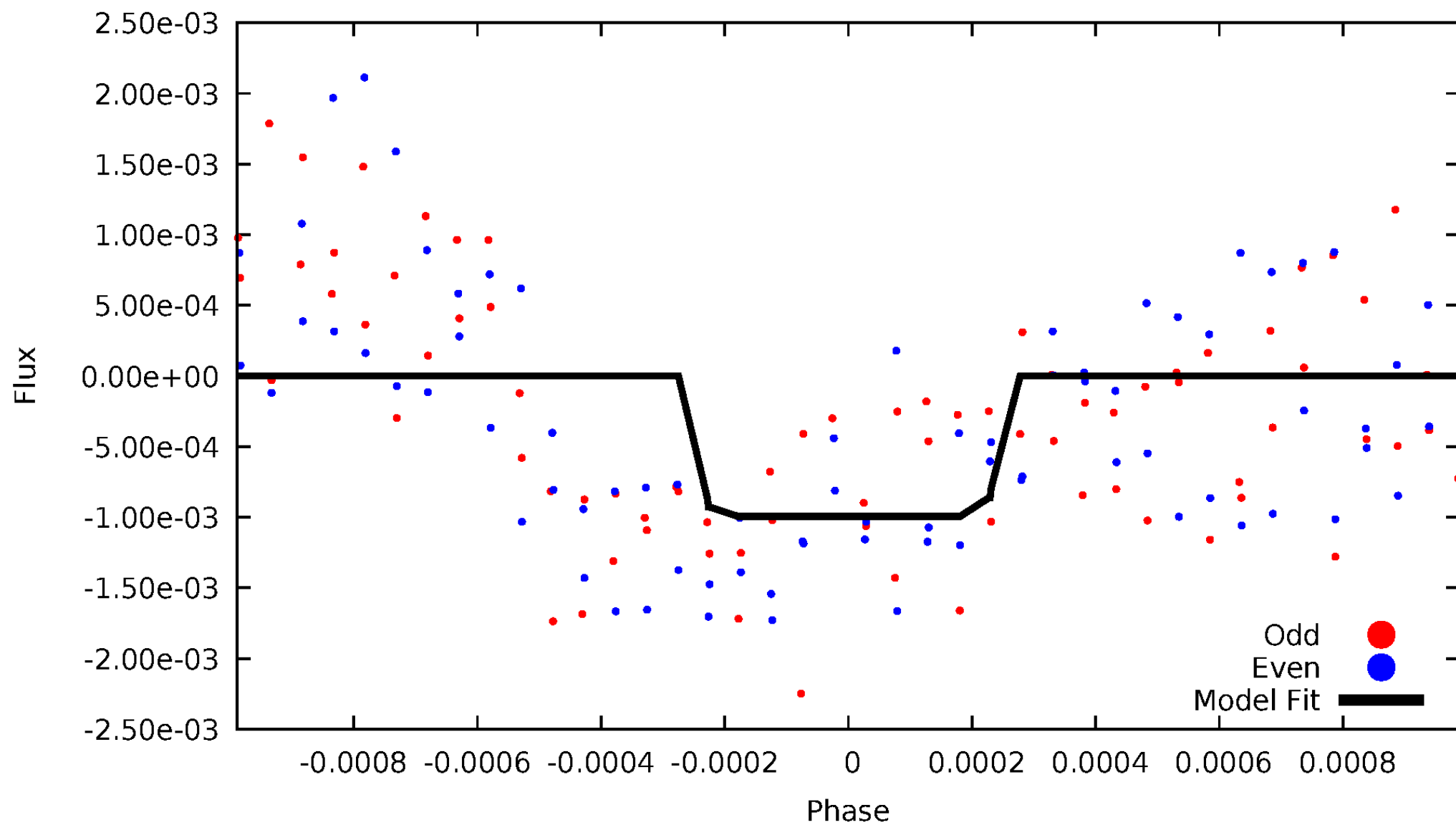
# DV Odd/Even

TCE 003955866-01



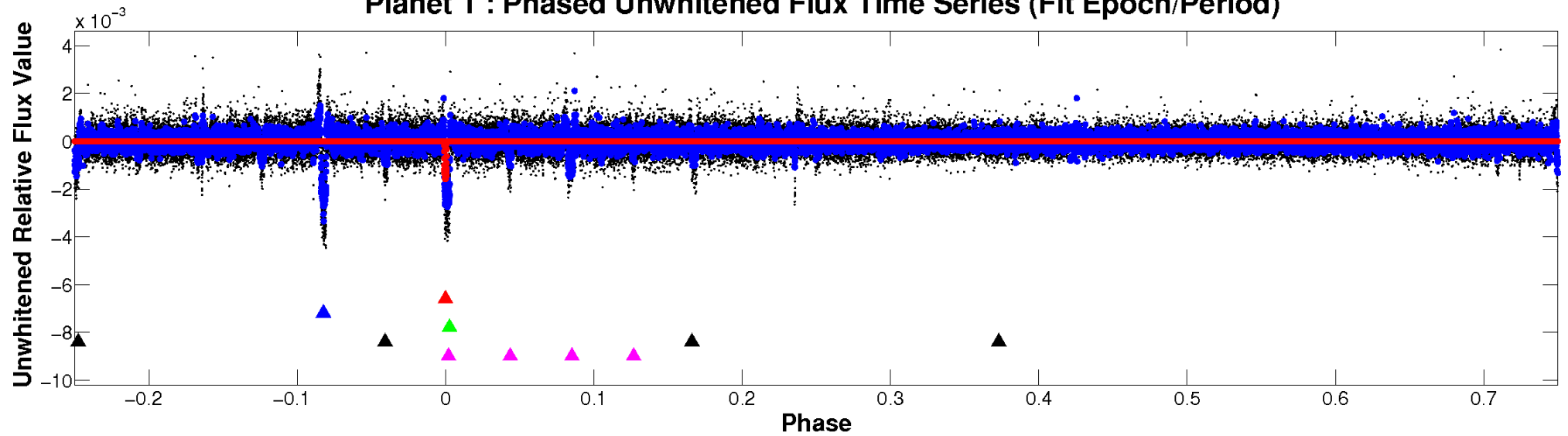
# ALT Odd/Even

TCE 003955866-01

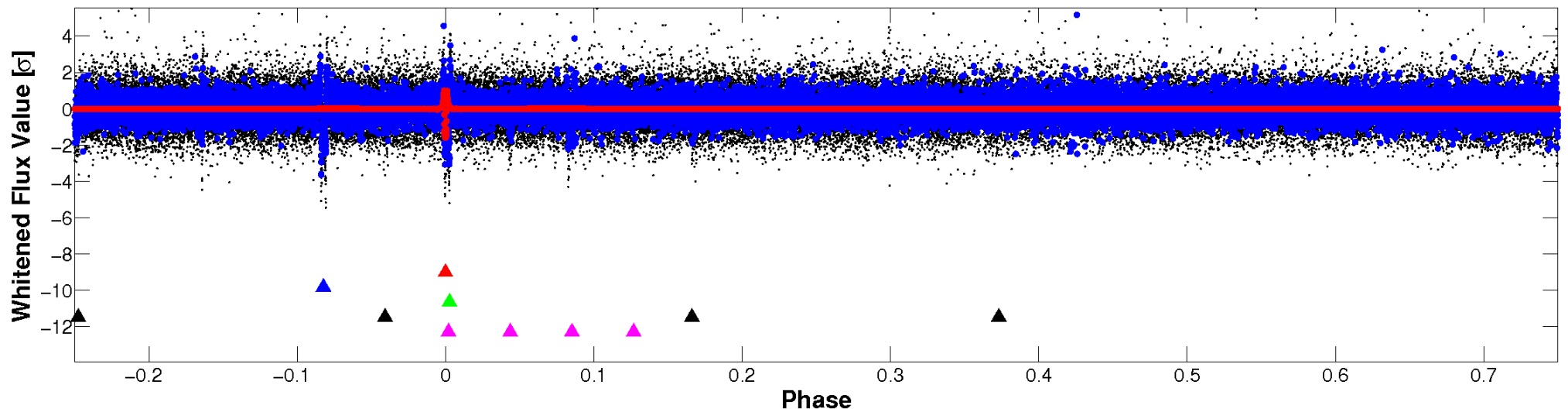


# Non-Whitened Vs. Whitened Light Curve

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

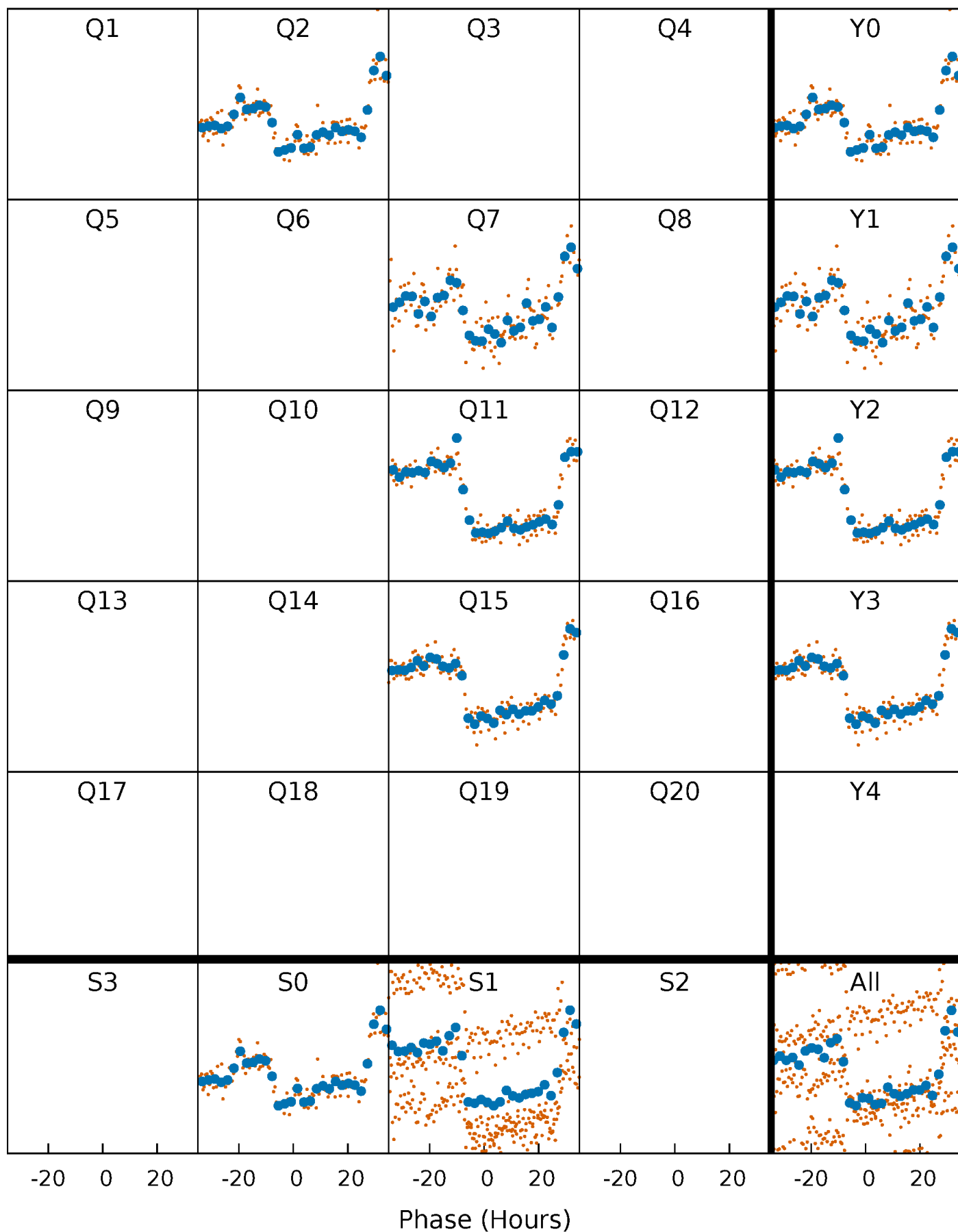


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



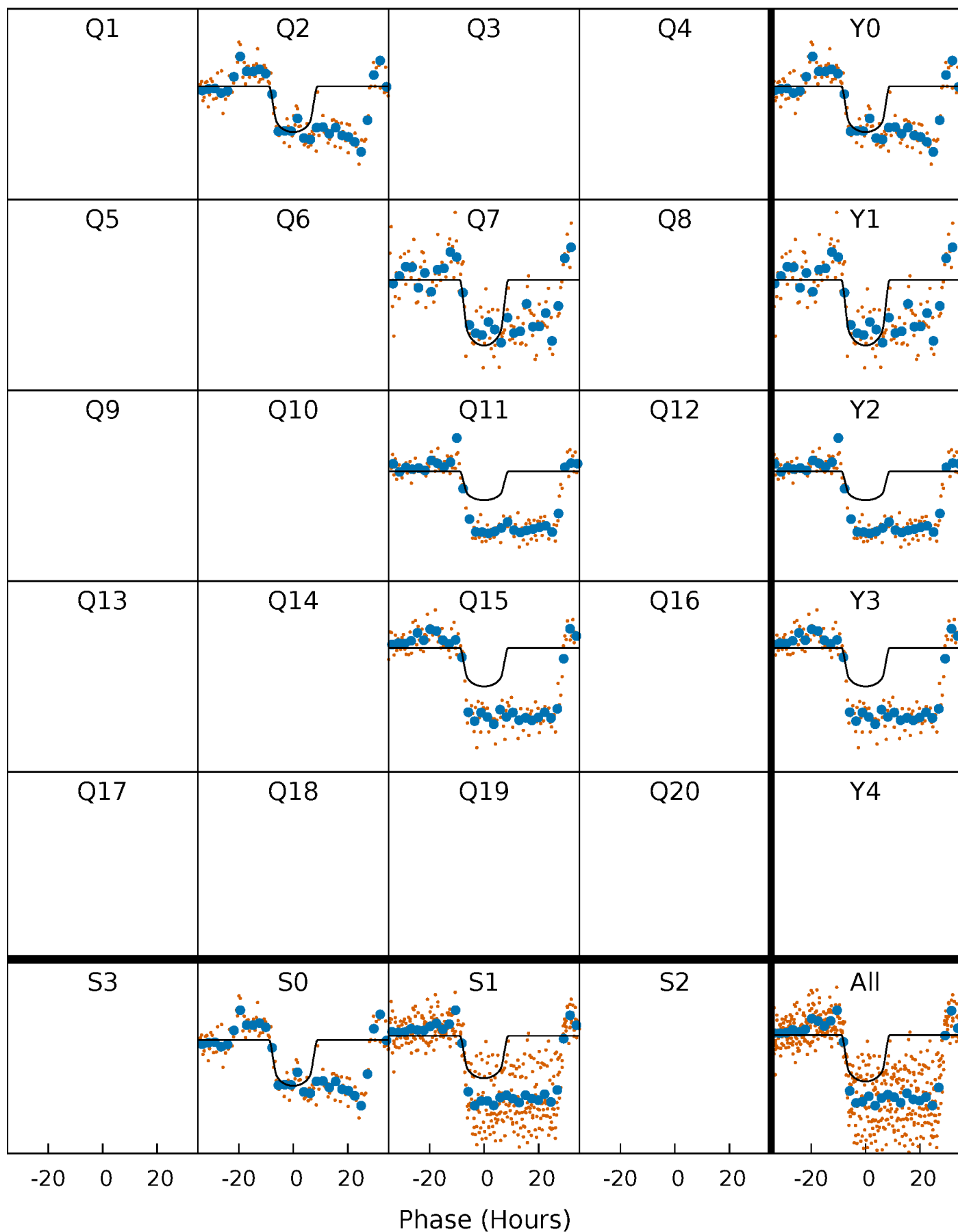
# PDC Quarter-Phased Transit Curves

TCE 003955866-01 P=403.866720 Days  $T_0=228.467027$  (BKJD)



# DV Quarter-Phased Transit Curves

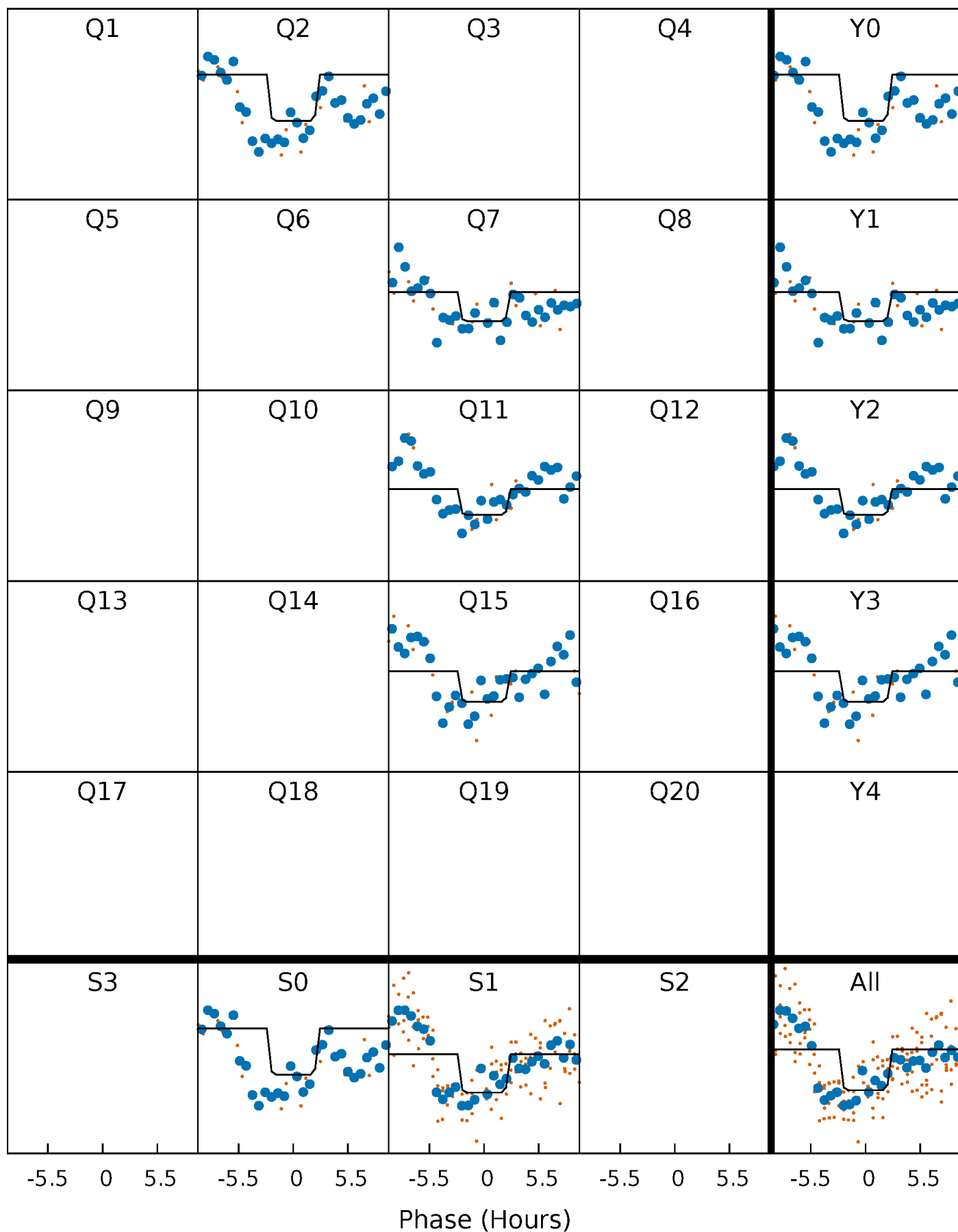
TCE 003955866-01 P=403.866720 Days  $T_0=228.467027$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

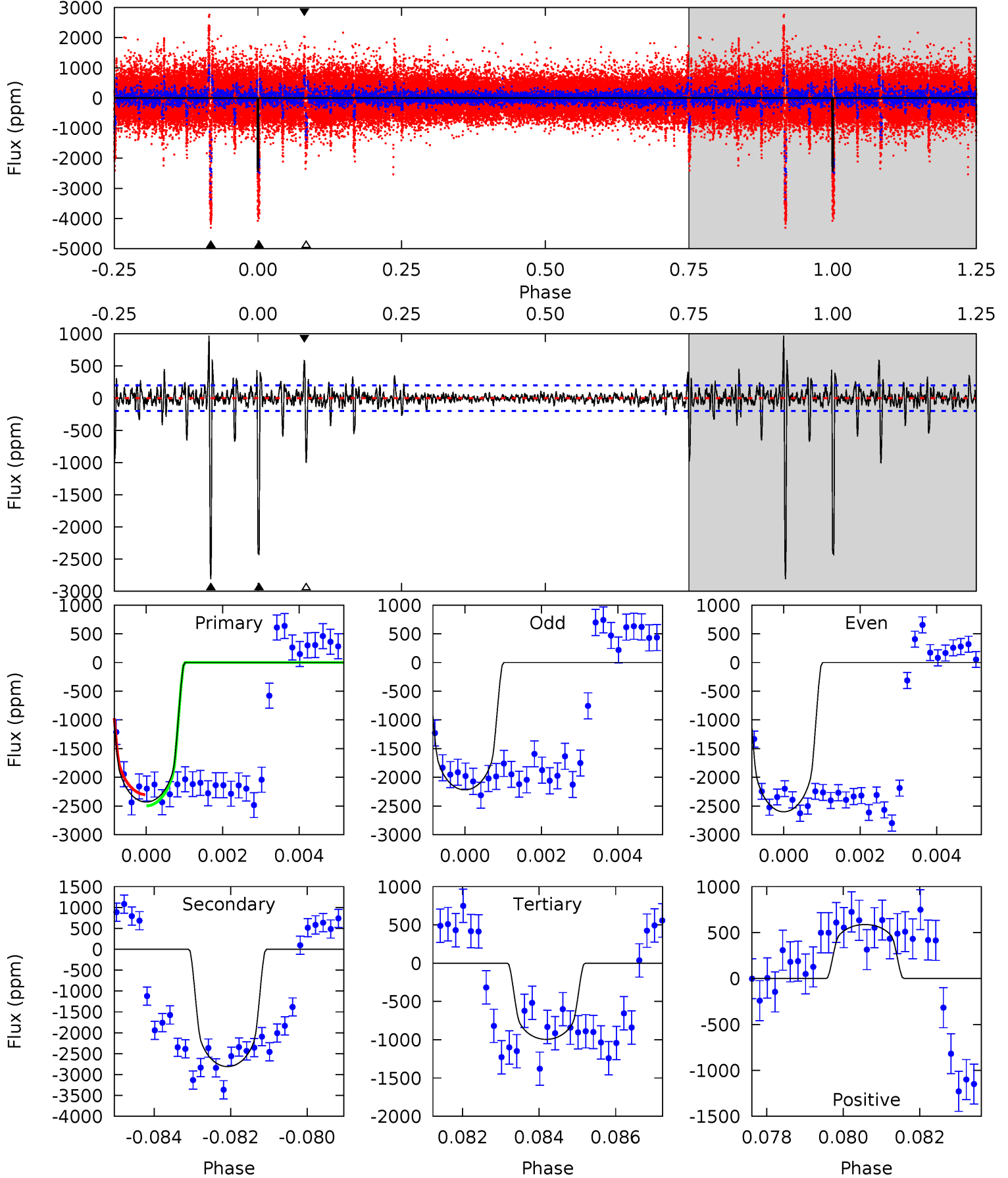
TCE 003955866-01 P=403.869313 Days  $T_0=228.378739$  (BKJD)



# DV Model-Shift Uniqueness Test

003955866-01, P = 403.866720 Days, E = 228.467027 Days

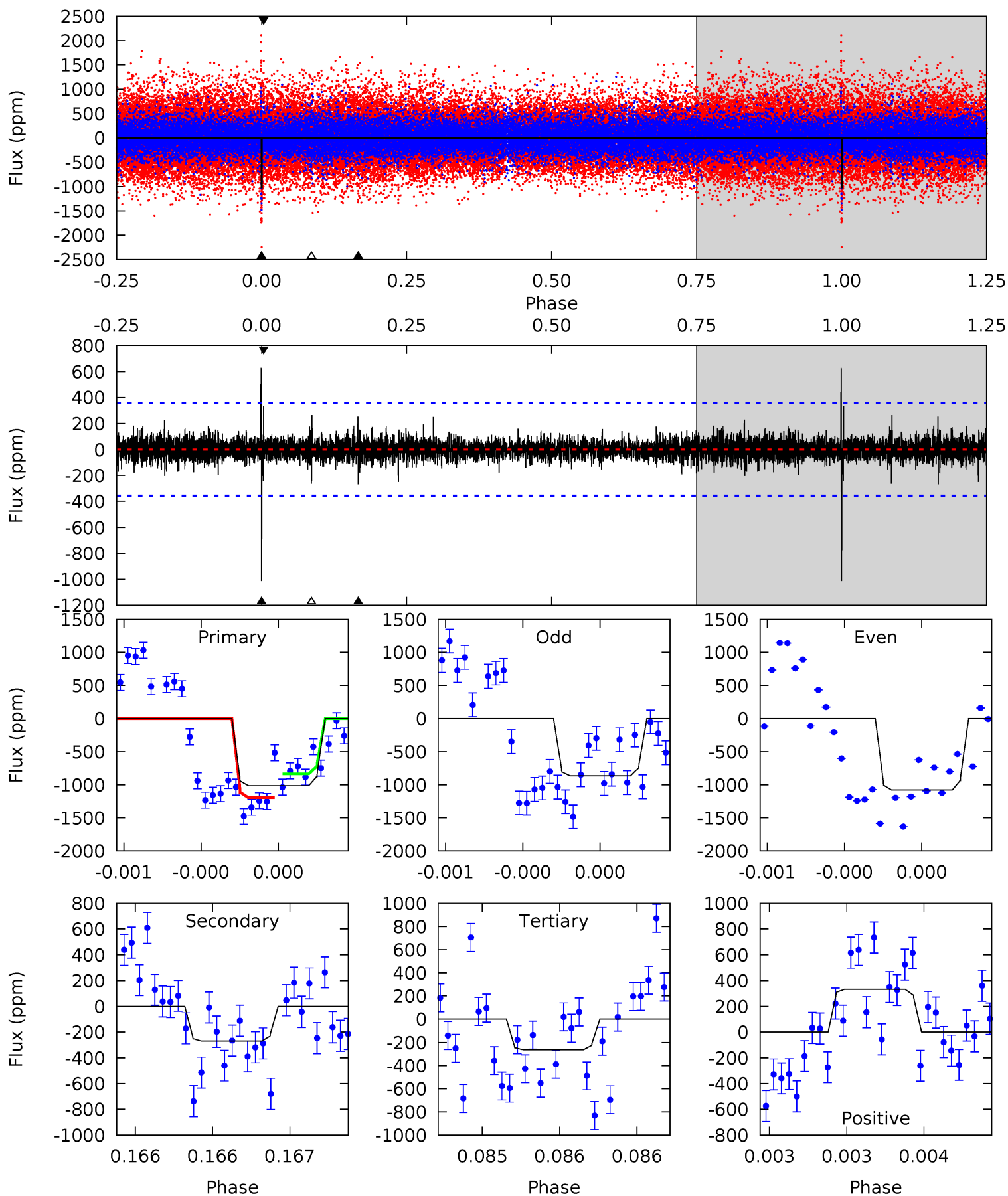
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
65.4	75.6	26.8	15.8	5.34	3.12	3.92	38.7	49.6	48.8	59.8	5.08	1.01	0.26	2.62



# Alt Model-Shift Uniqueness Test

003955866-01, P = 403.869313 Days, E = 228.378739 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	4.23	4.12	5.21	5.59	3.50	0.83	11.8	10.7	0.10	-0.98	1.69	1.07	0.38	2.82



### Stellar Parameters For KIC 003955866

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5549^{+166}_{-183}$	$4.499^{+0.040}_{-0.160}$	$0.560^{+0.050}_{-0.300}$	$0.964^{+0.207}_{-0.089}$	$1.070^{+0.075}_{-0.123}$	$1.681^{+0.349}_{-0.726}$
	+3%/-3%	+1%/-4%	+9%/-54%	+21%/-9%	+7%/-11%	+21%/-43%
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 003955866-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-2809 \pm 37$	$4.57^{+0.66}_{-0.44}$	$327^{+20}_{-14}$	$6181^{+360}_{-327}$	$86357^{+18848}_{-18895}$
Alt.	$-270 \pm 64$	$3.42^{+0.53}_{-0.41}$	$327^{+18}_{-15}$	$4242^{+275}_{-294}$	$14973^{+5810}_{-5244}$

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

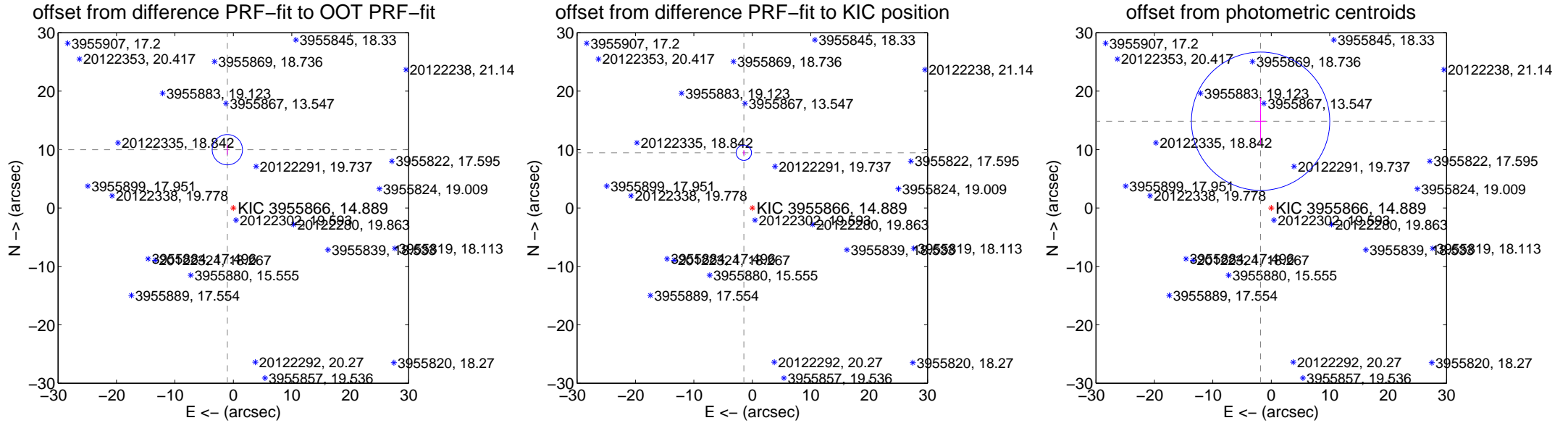
## DV Centroid Data

Supplemental centroid analysis for 003955866-01. Kepler magnitude: 14.89. Transit SNR 17.05

There are 4 quarters with good PRF difference image offsets

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

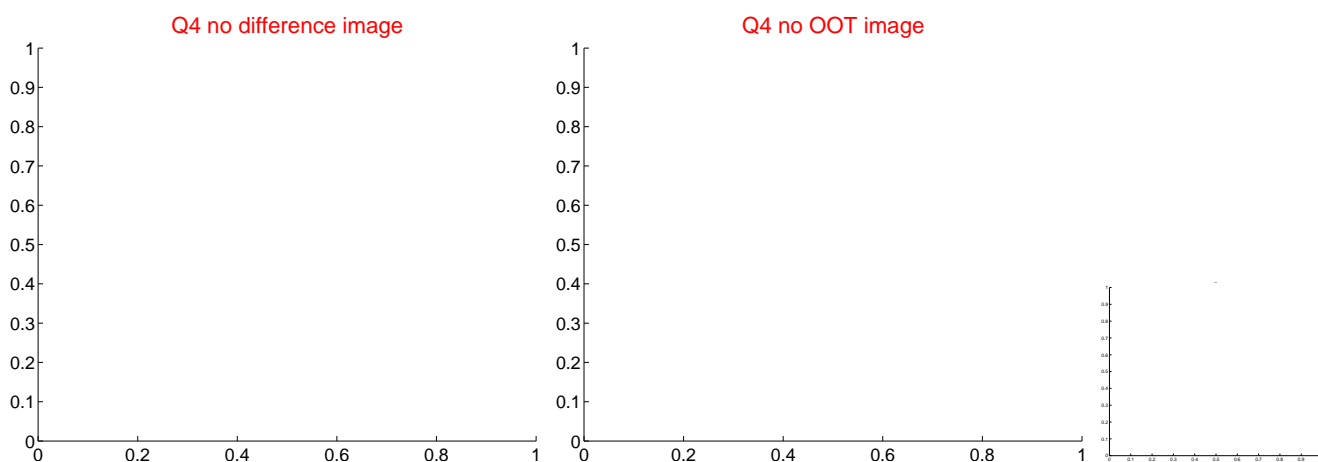
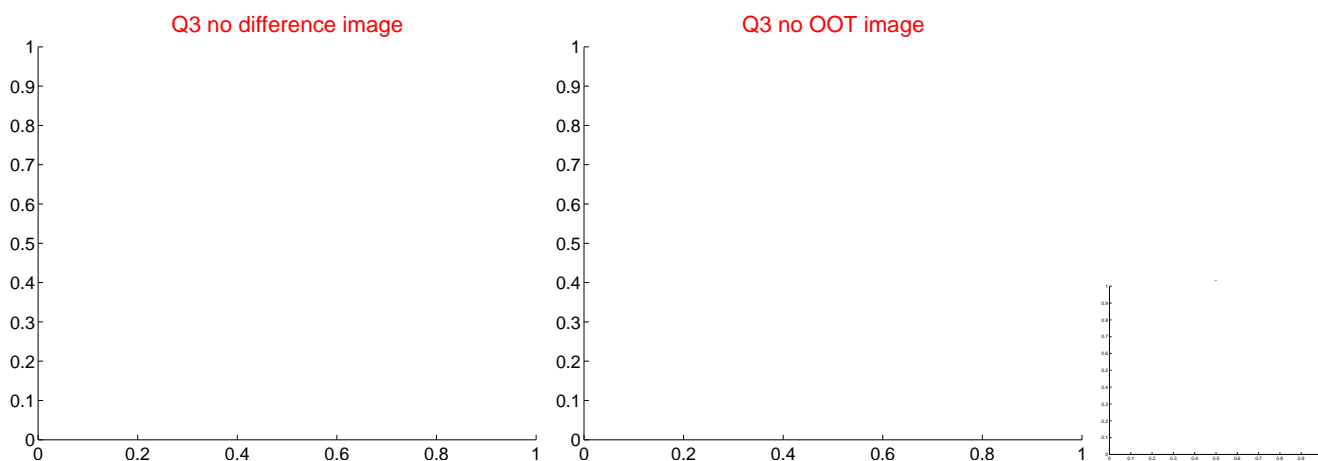
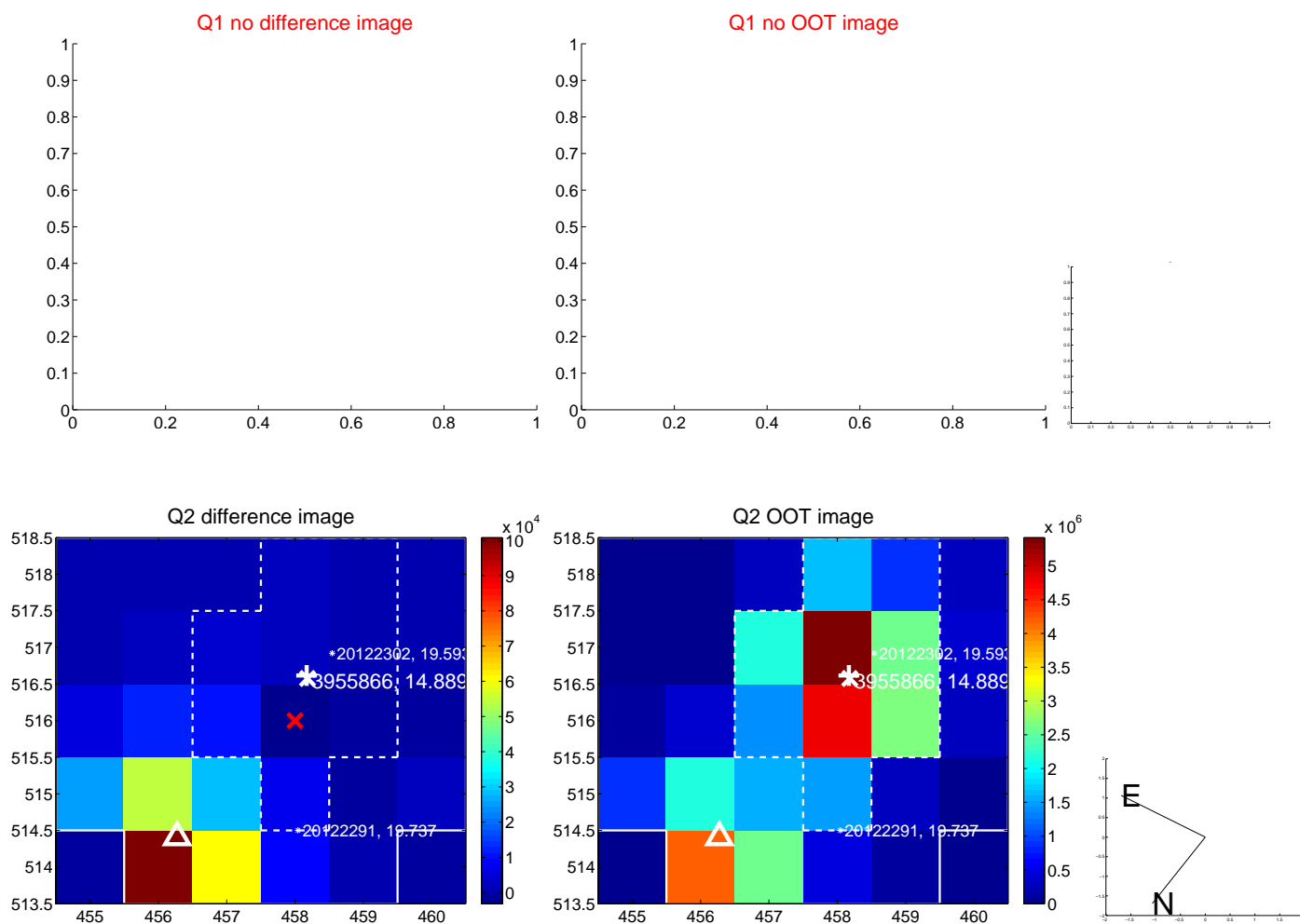
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>10.022 <math>\pm</math> 0.864</b>	<b>11.59</b>	1.028 $\pm$ 0.115	9.969 $\pm$ 0.869
PRF-fit source offset from KIC position	<b>9.562 <math>\pm</math> 0.436</b>	<b>21.91</b>	1.448 $\pm$ 0.145	9.452 $\pm$ 0.422
photometric centroid source offset	<b>14.95 <math>\pm</math> 3.95</b>	<b>3.79</b>	1.83 $\pm$ 0.93	14.84 $\pm$ 3.97



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.

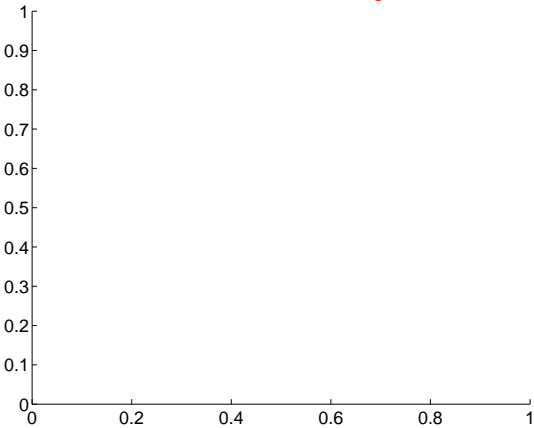
Q5 no difference image



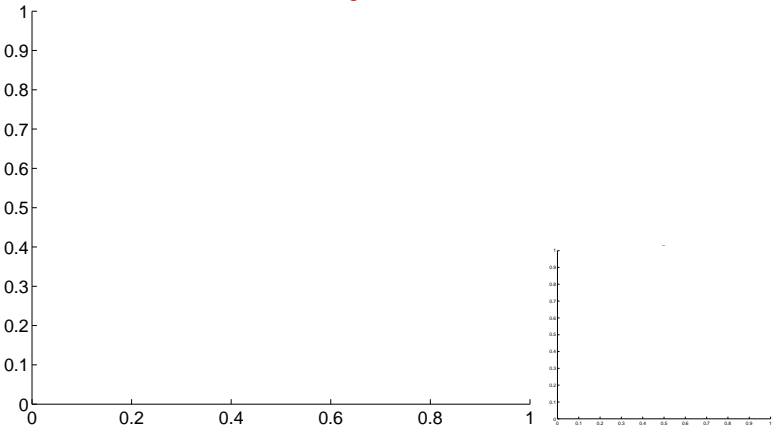
Q5 no OOT image



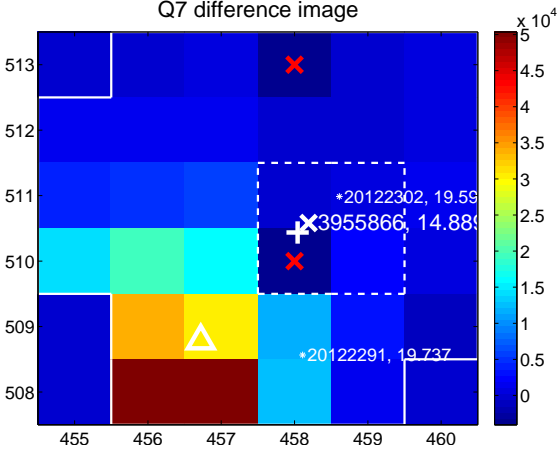
Q6 no difference image



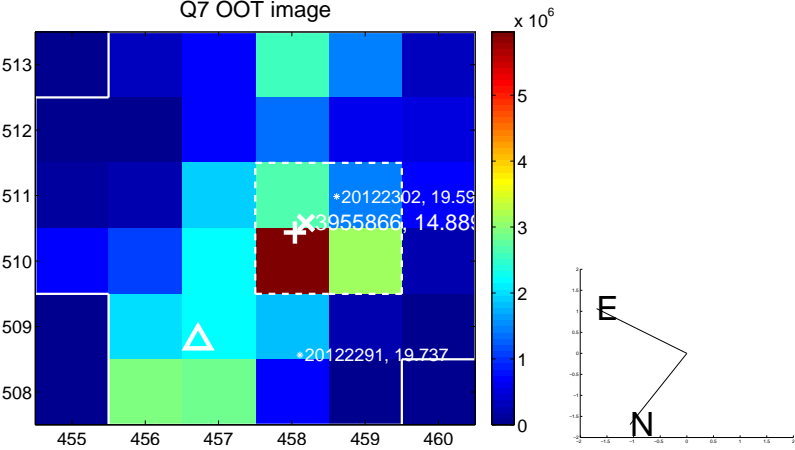
Q6 no OOT image



Q7 difference image



Q7 OOT image



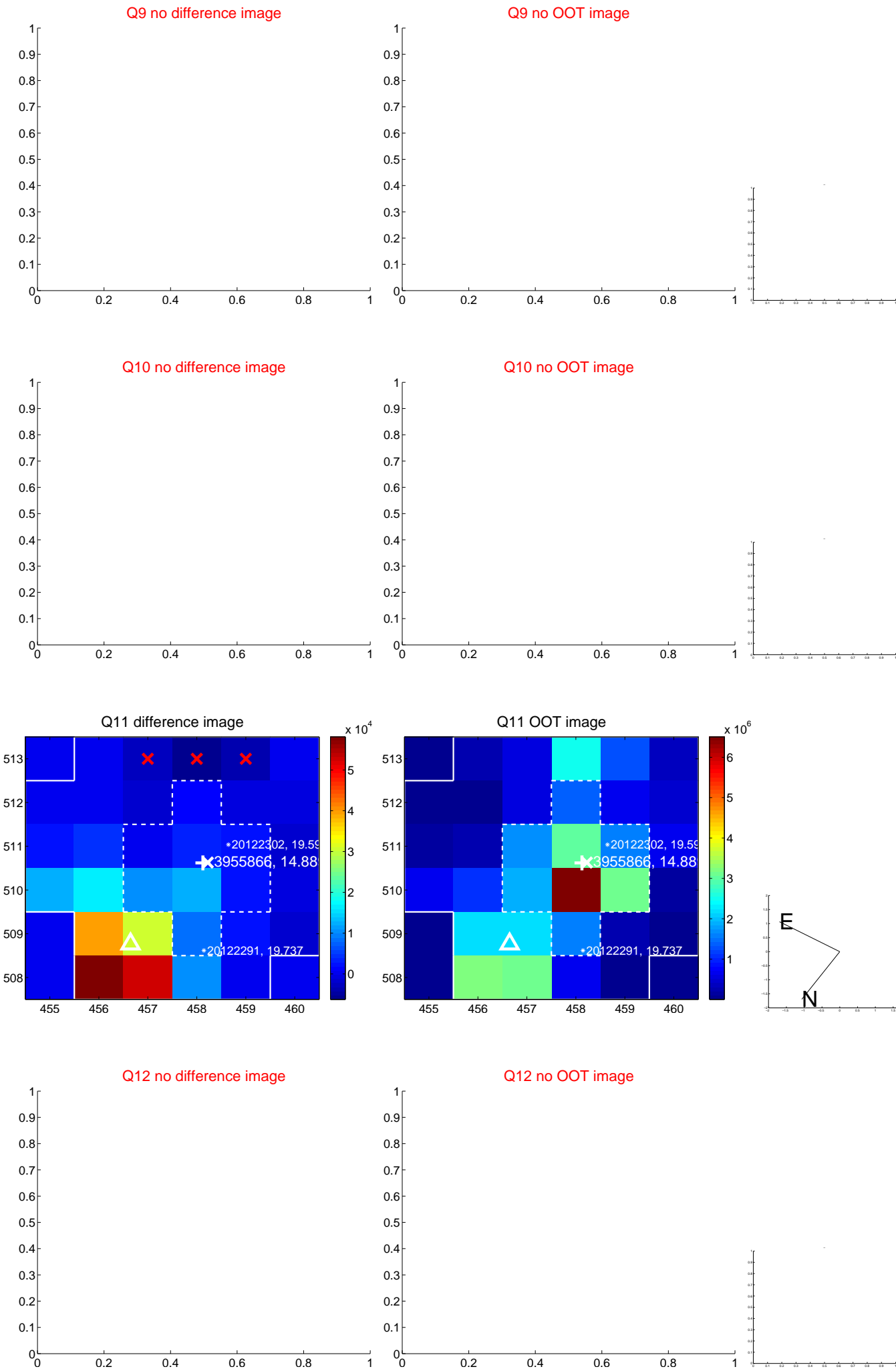
Q8 no difference image



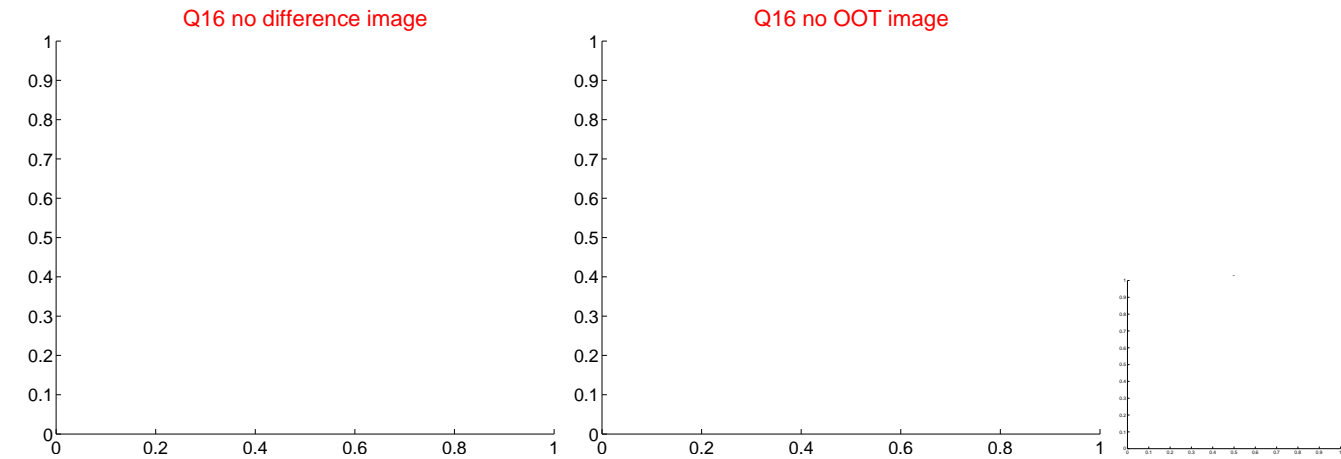
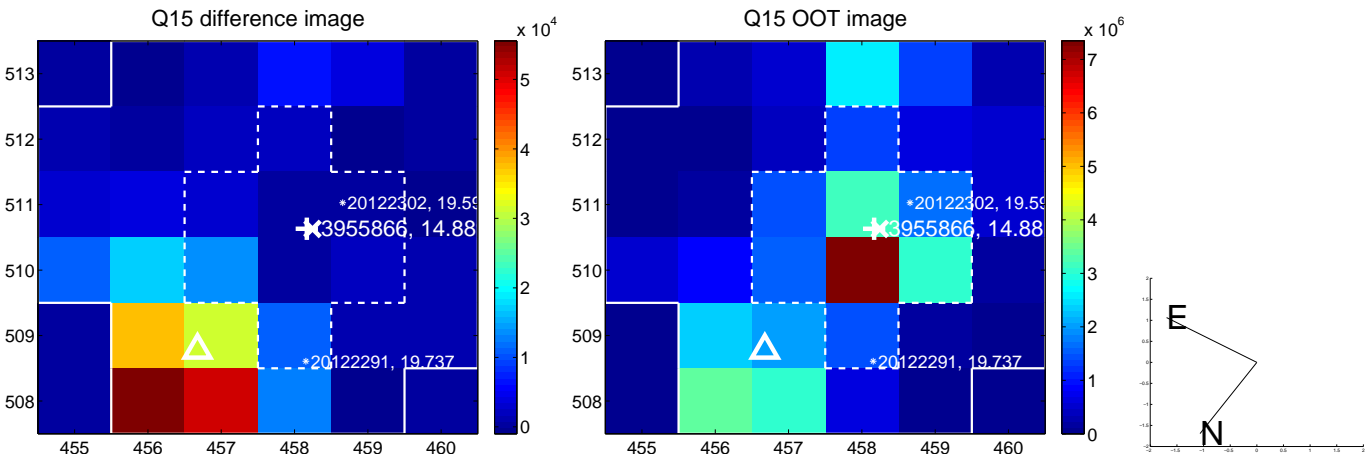
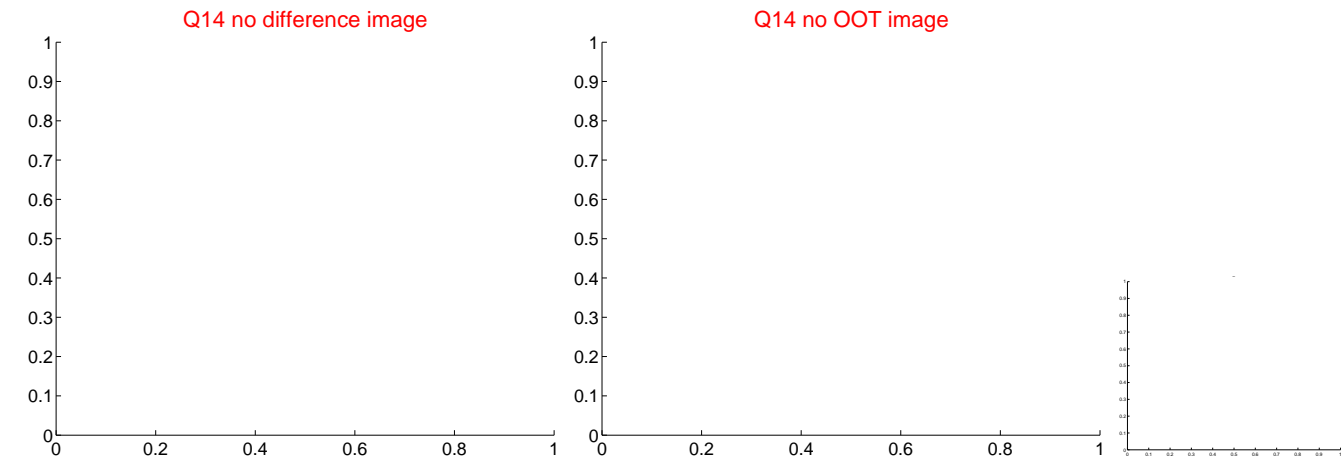
Q8 no OOT image



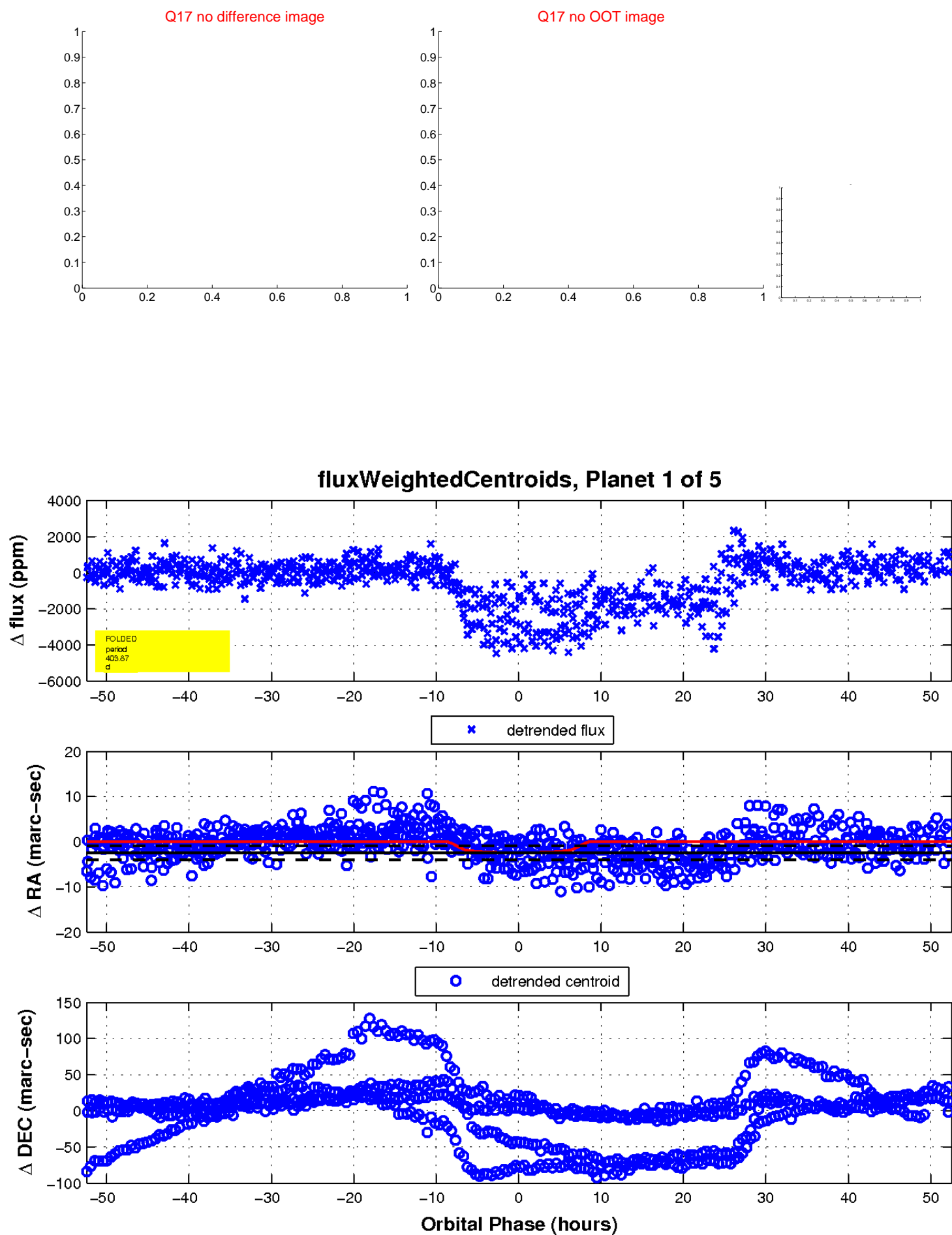
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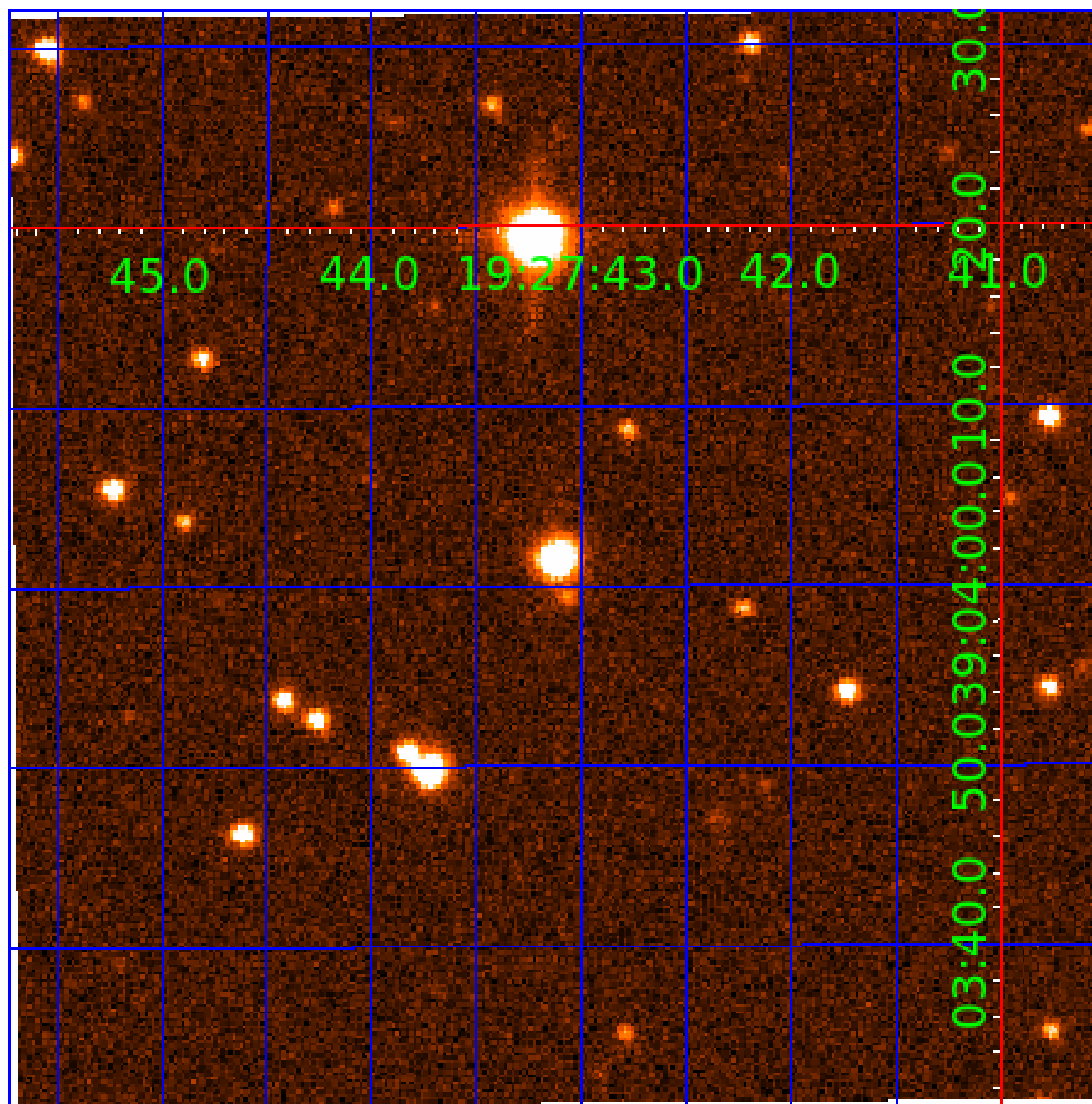
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UKIRT Image

Declination



# KIC 003955866

## Q1-17 DR25 TCE Parameters

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003955866-03	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_FEW_DIFFS—EPHEM_MATCH
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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 003955866-02

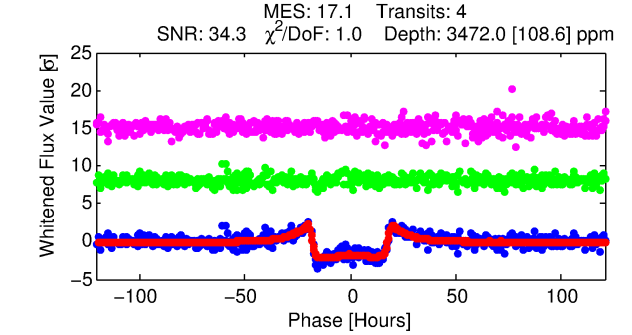
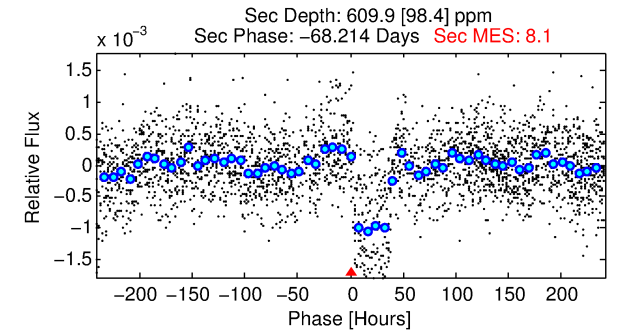
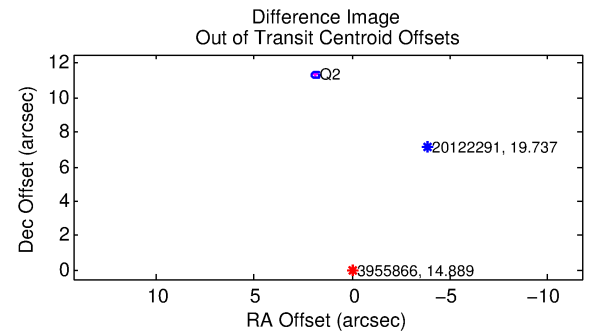
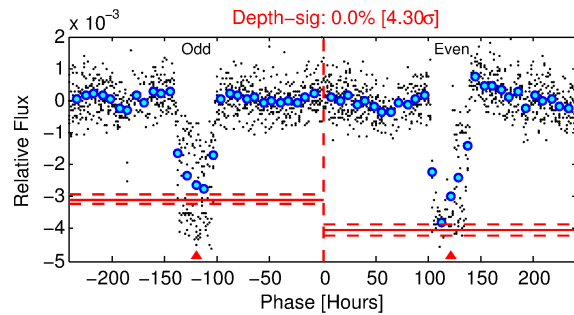
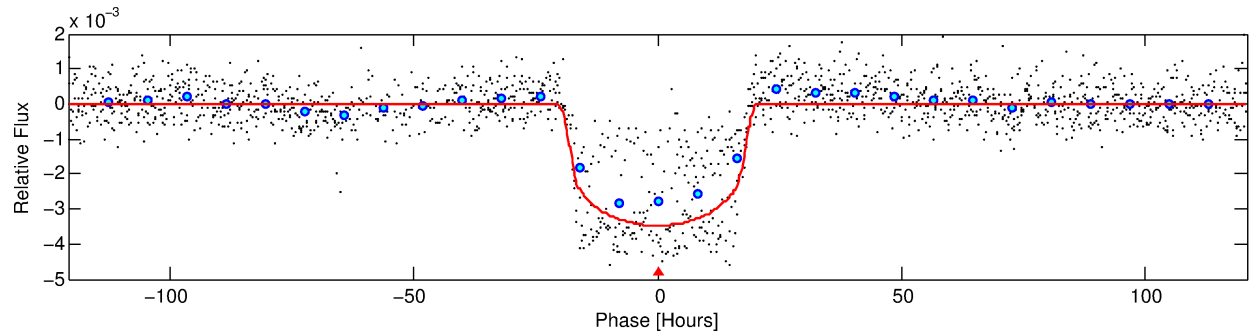
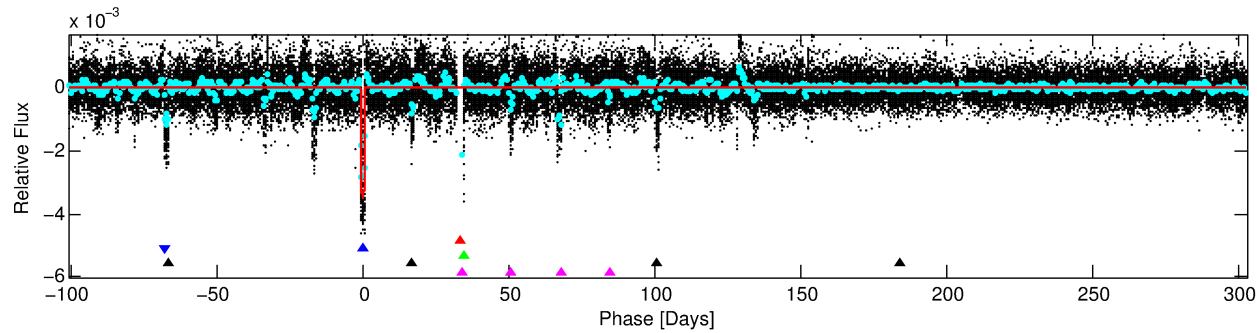
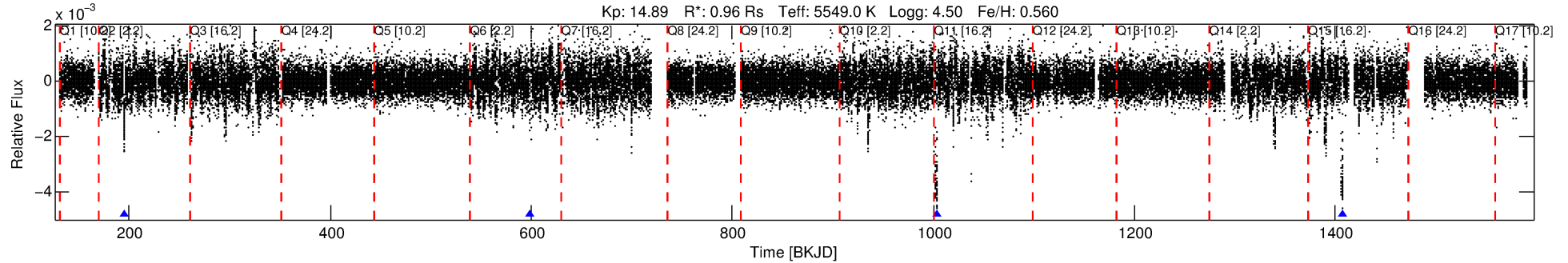
No Significant Match Found

# DV One-Page Summary

KIC: 3955866 Candidate: 2 of 5 Period: 403.888 d

KOI: K03897 Corr: No Ephemeris Match

Kp: 14.89 R\*: 0.96 Rs Teff: 5549.0 K Logg: 4.50 Fe/H: 0.560



## DV Fit Results:

Period = 403.88775 [0.00439] d  
Epoch = 195.2054 [0.0087] BKJD  
Rp/R\* = 0.0566 [0.0016]  
a/R\* = 63.93 [4.94]  
b = 0.65 [0.07]  
Seff = 0.66 [0.21]  
Teq = 230 [18] K  
Rp = 5.96 [1.29] Re  
a = 1.0938 [0.2063] AU  
Ag = 11306.89 [3748.05] [3.02σ]  
Teffp = 3664 [197] K [17.32σ]

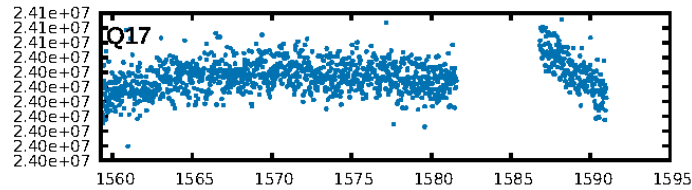
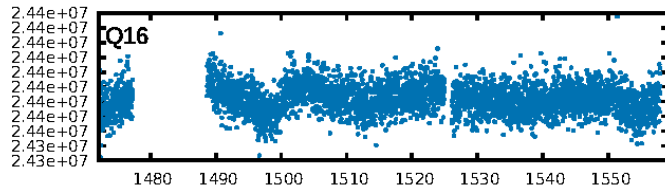
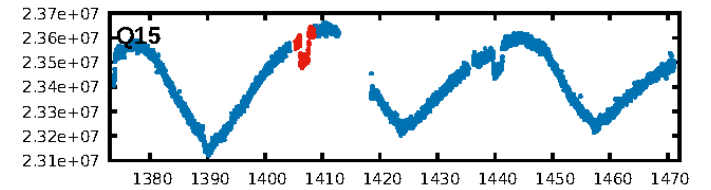
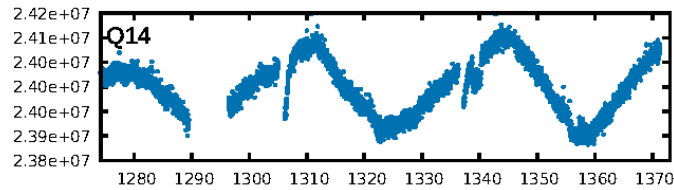
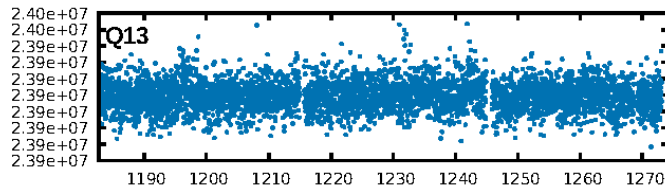
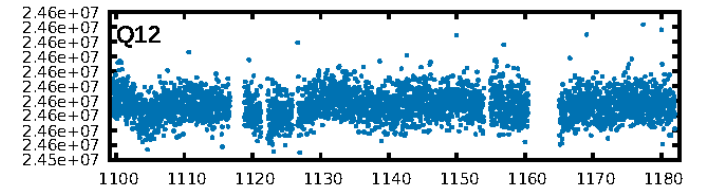
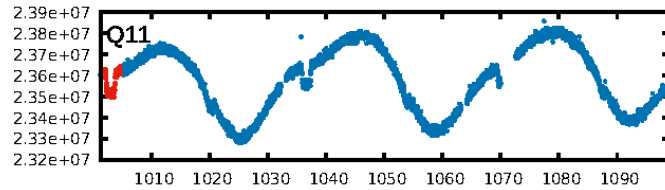
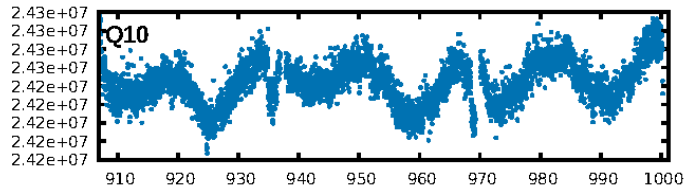
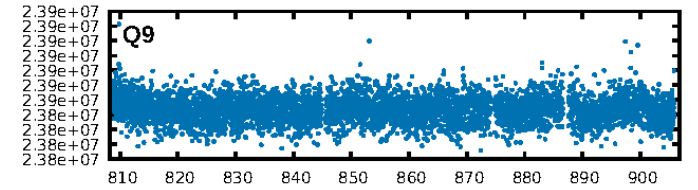
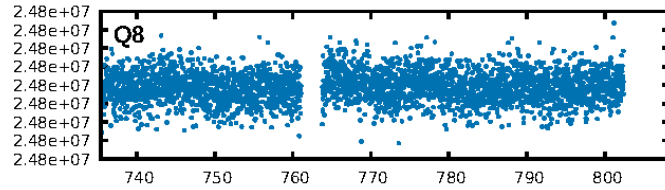
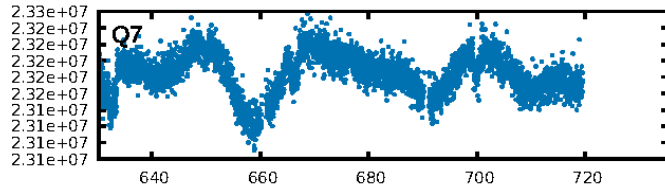
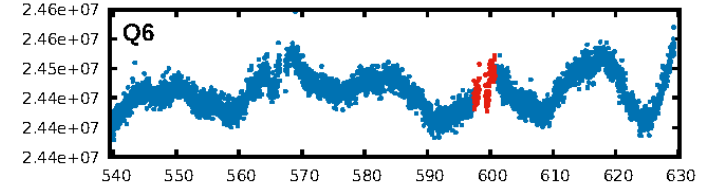
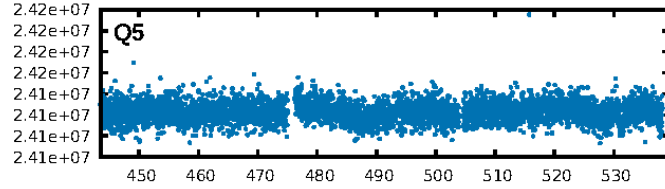
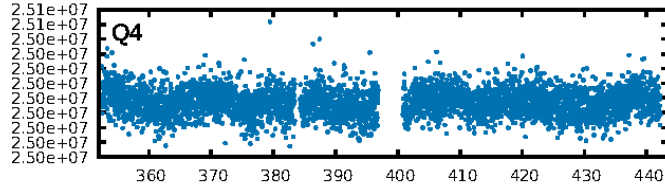
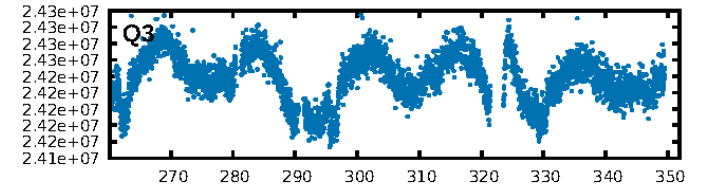
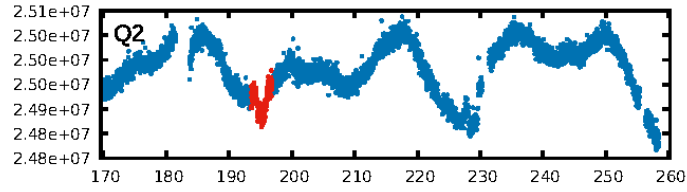
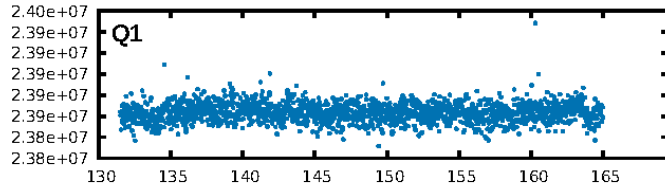
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.12e-19  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.7936  
Centroid-sig: N/A  
Centroid-so: 20.506 arcsec [5.84σ]  
OotOffset-rm: 11.465 arcsec [171.45σ]  
KicOffset-rm: 11.298 arcsec [168.95σ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 1.00 [1/1]  
DiffImageOverlap-fno: 1.00 [1/1]

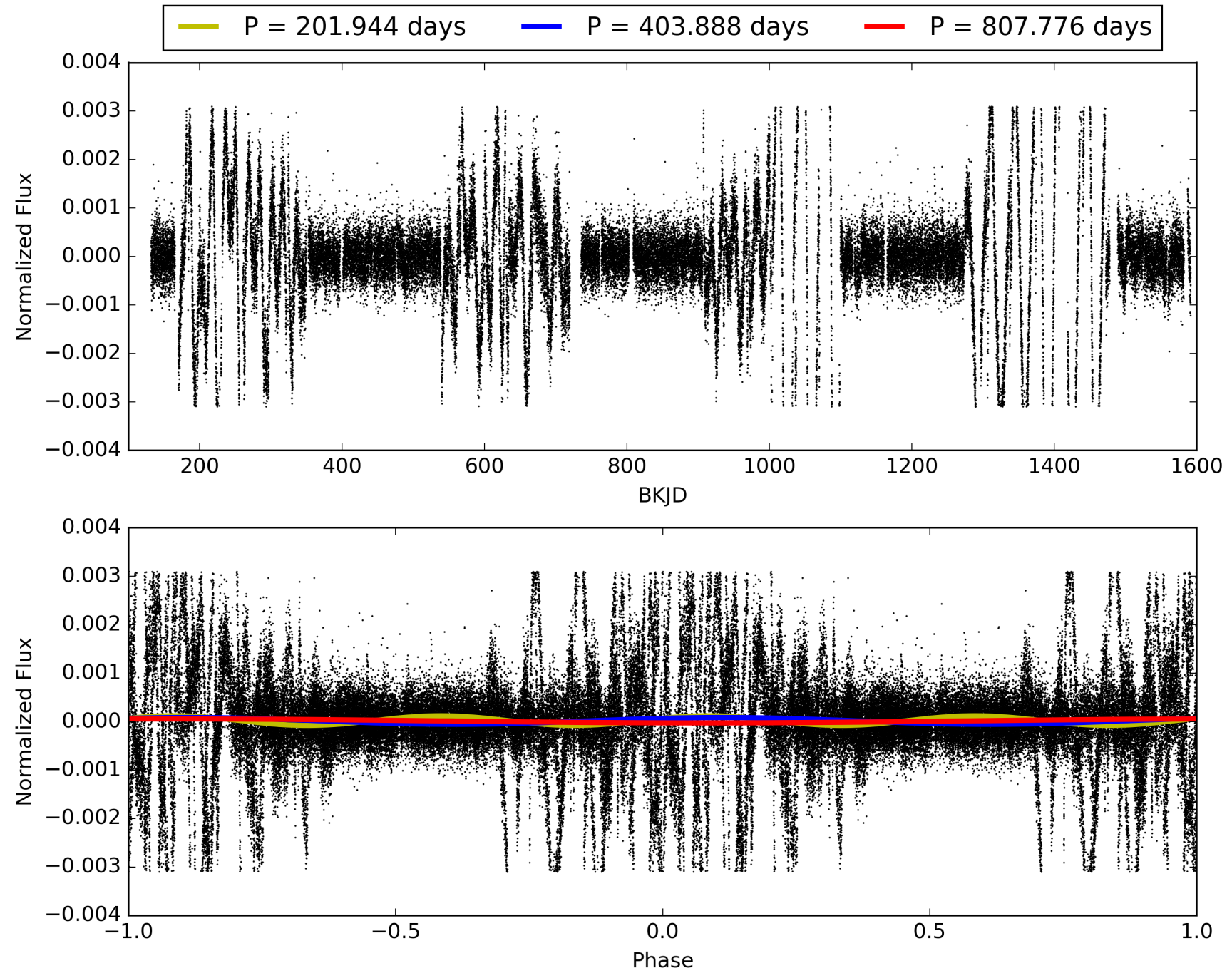
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:56:50 Z

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

# TCE 003955866-02, PDC Light Curves



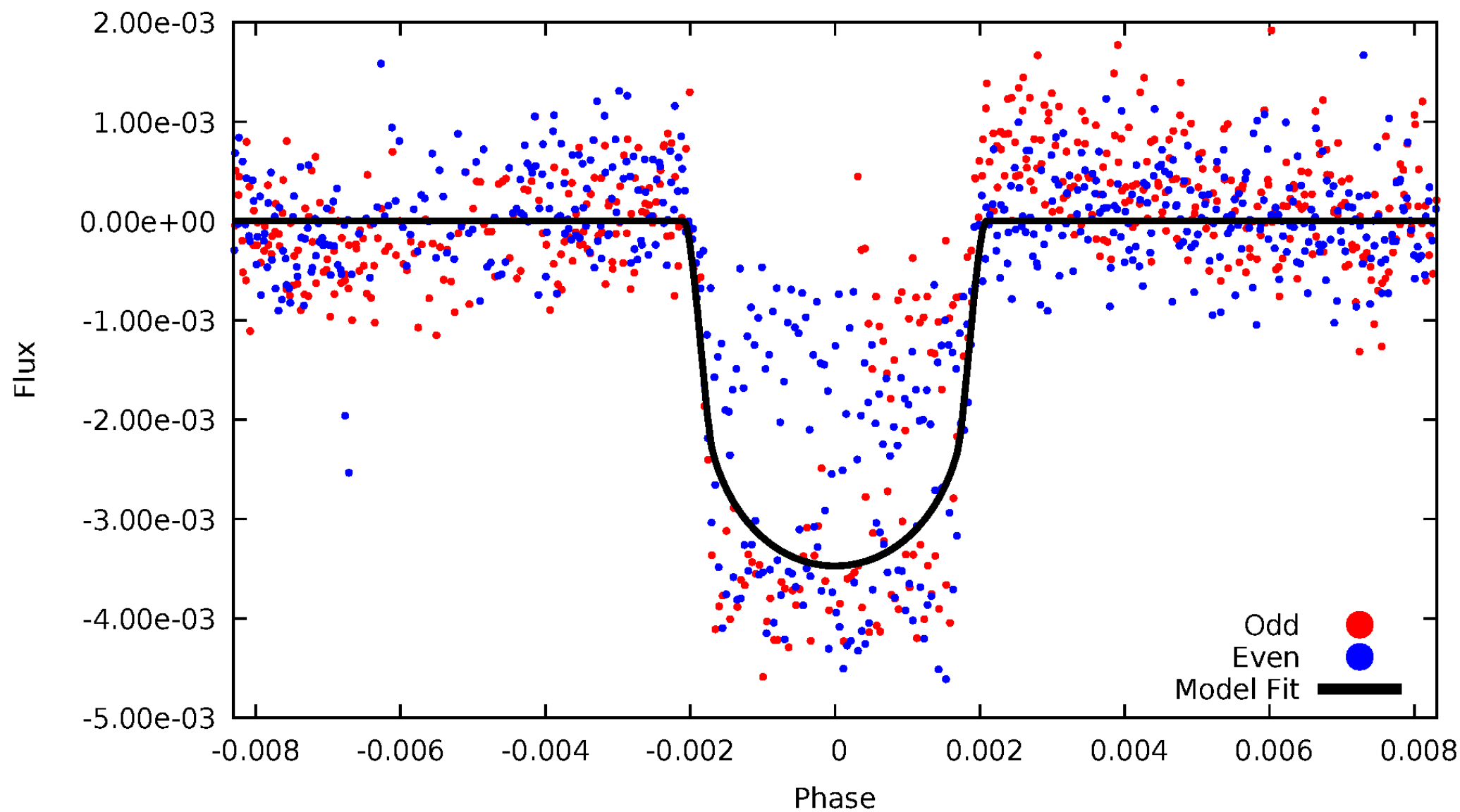
TCE 003955866-02





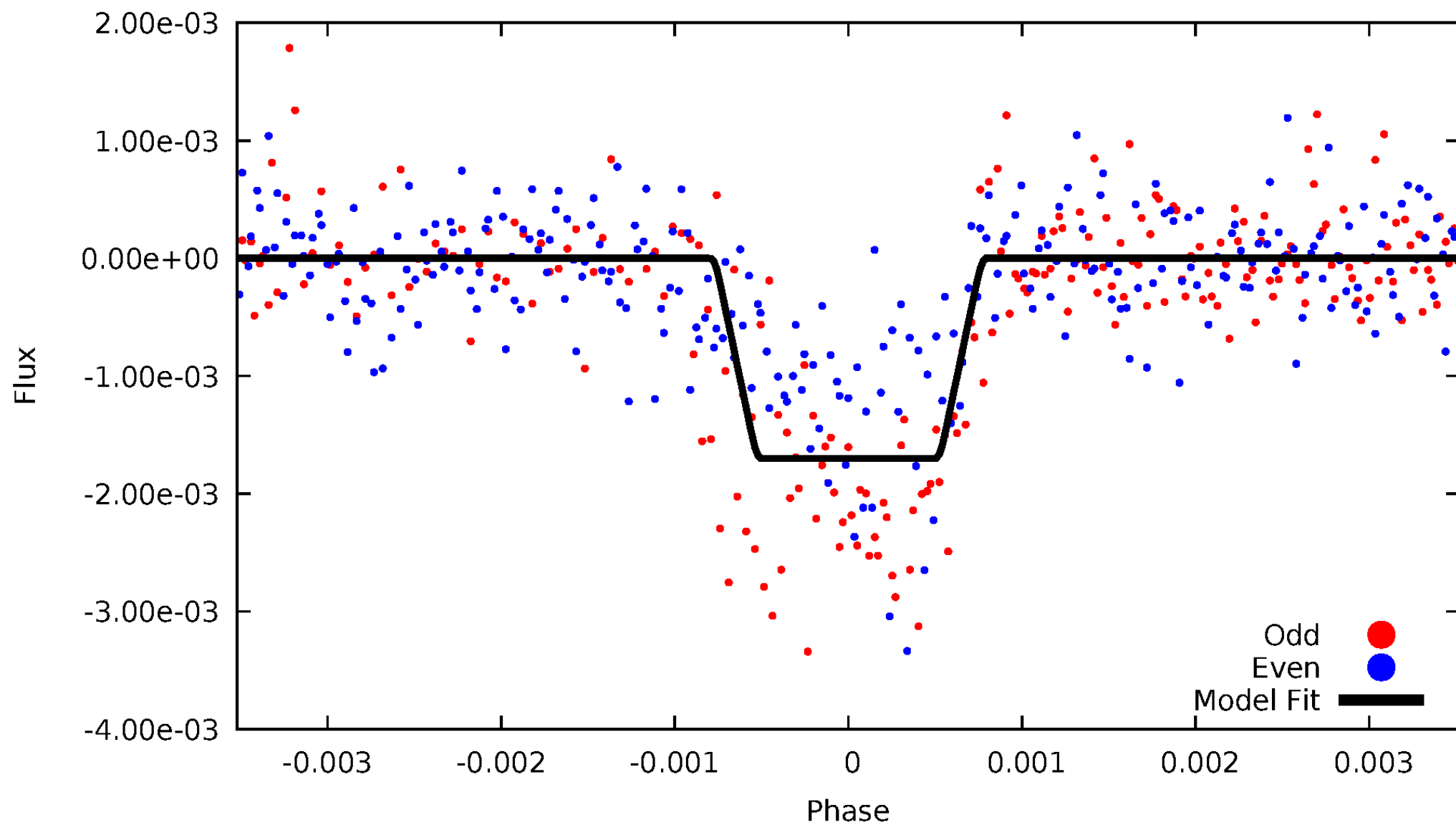
# DV Odd/Even

TCE 003955866-02



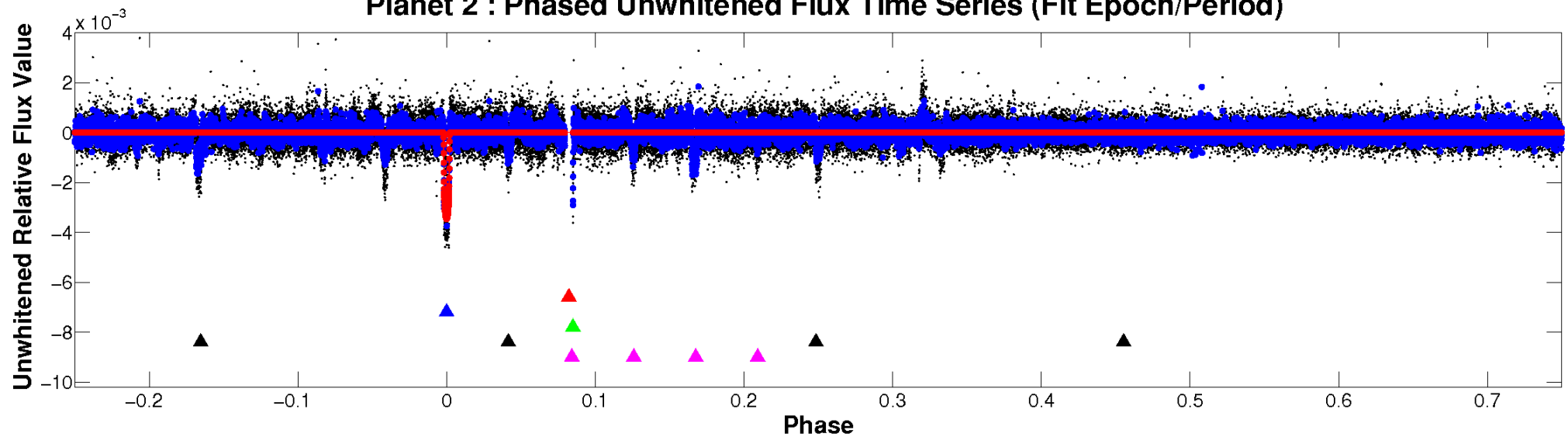
# ALT Odd/Even

TCE 003955866-02

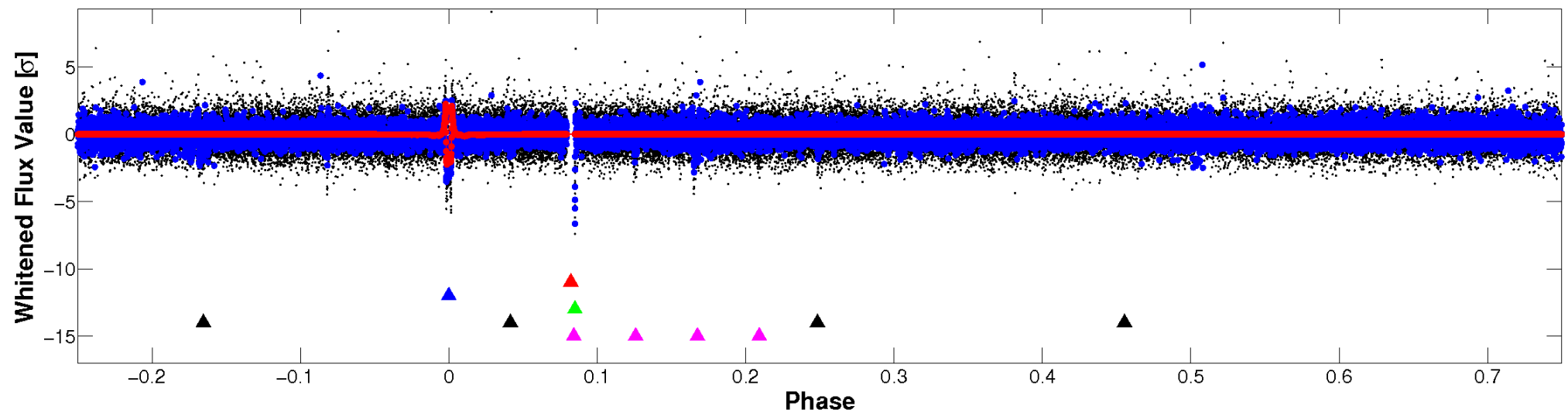


# Non-Whitened Vs. Whitened Light Curve

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

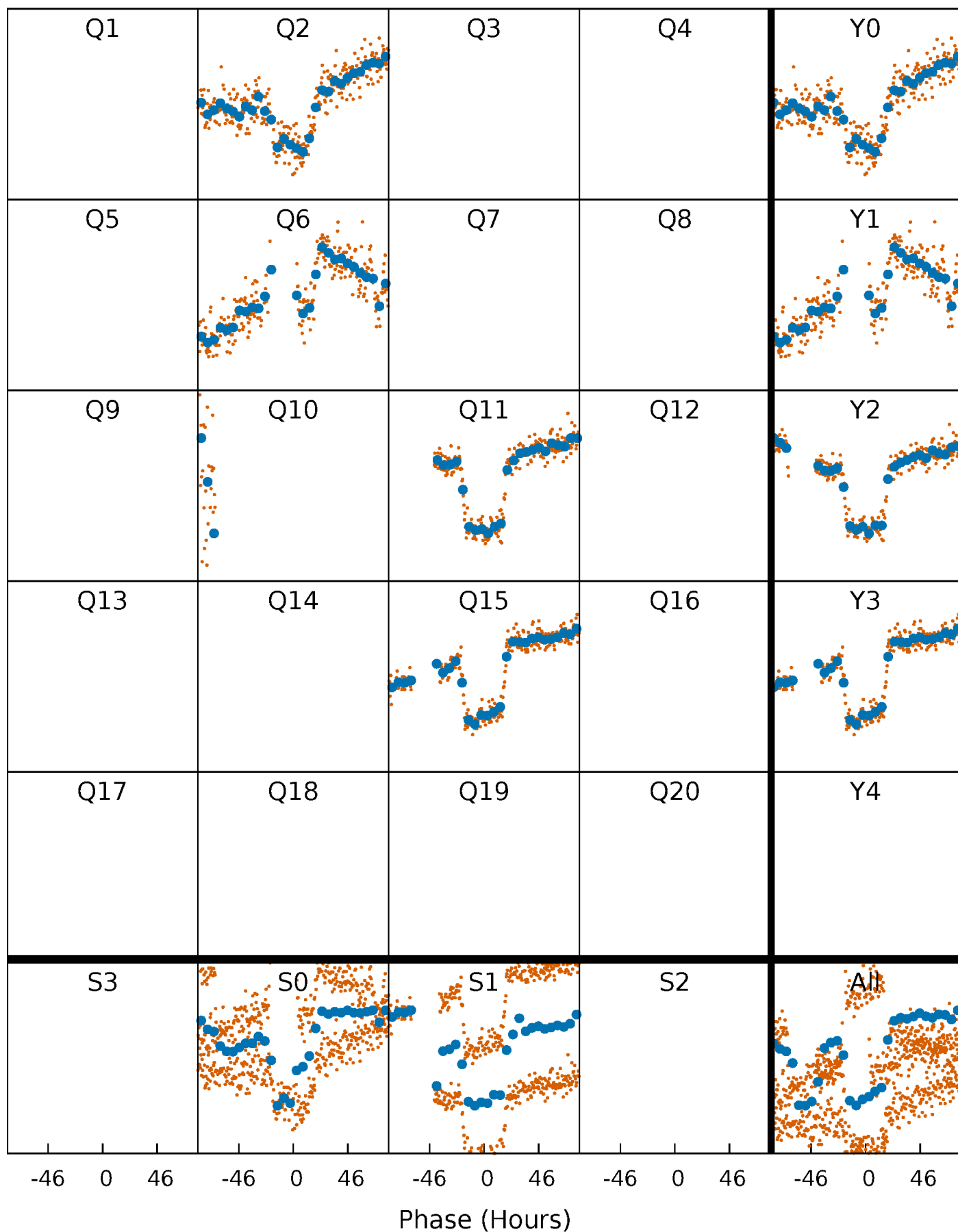


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



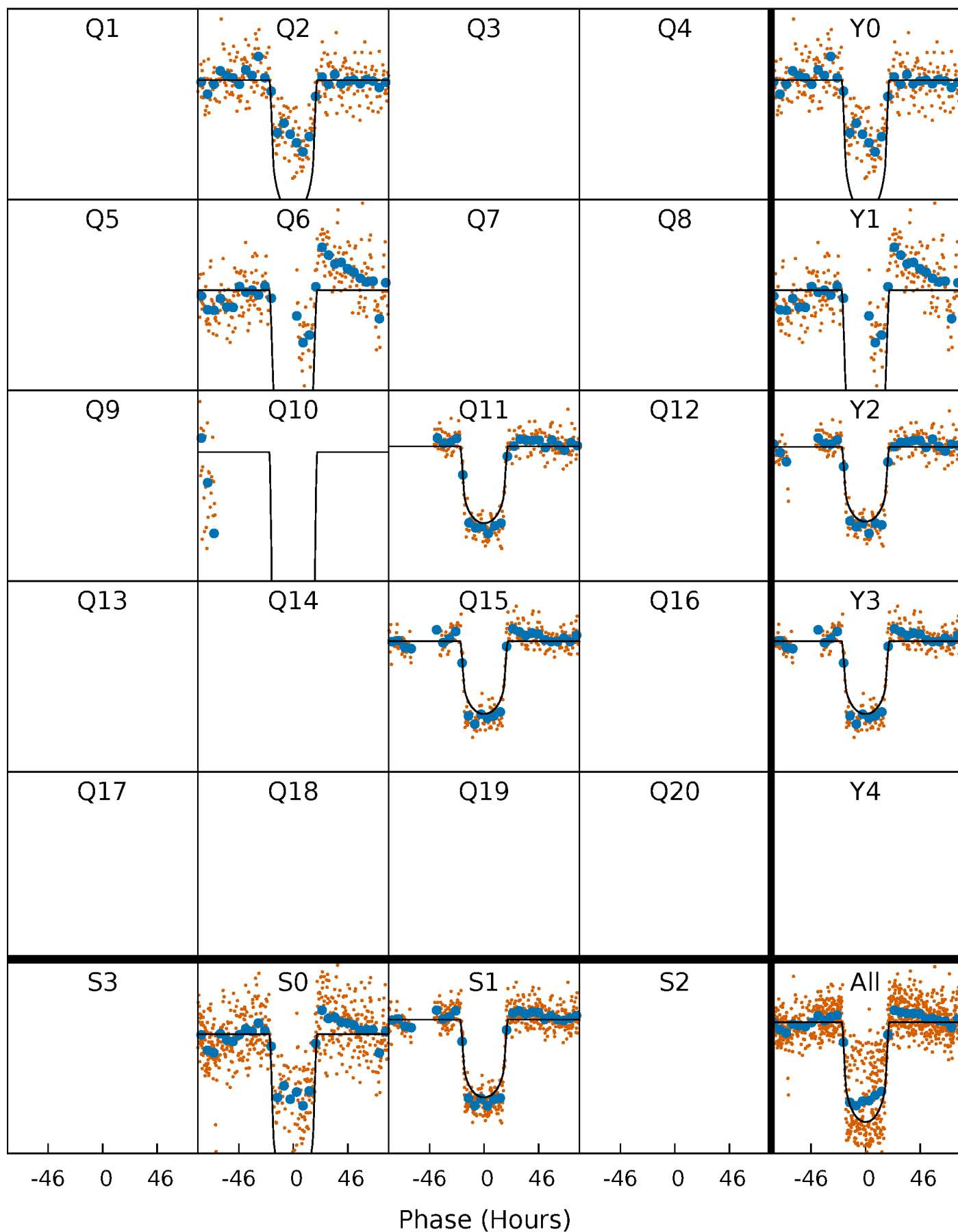
# PDC Quarter-Phased Transit Curves

TCE 003955866-02     $P=403.887754$  Days     $T_0=195.205361$  (BKJD)



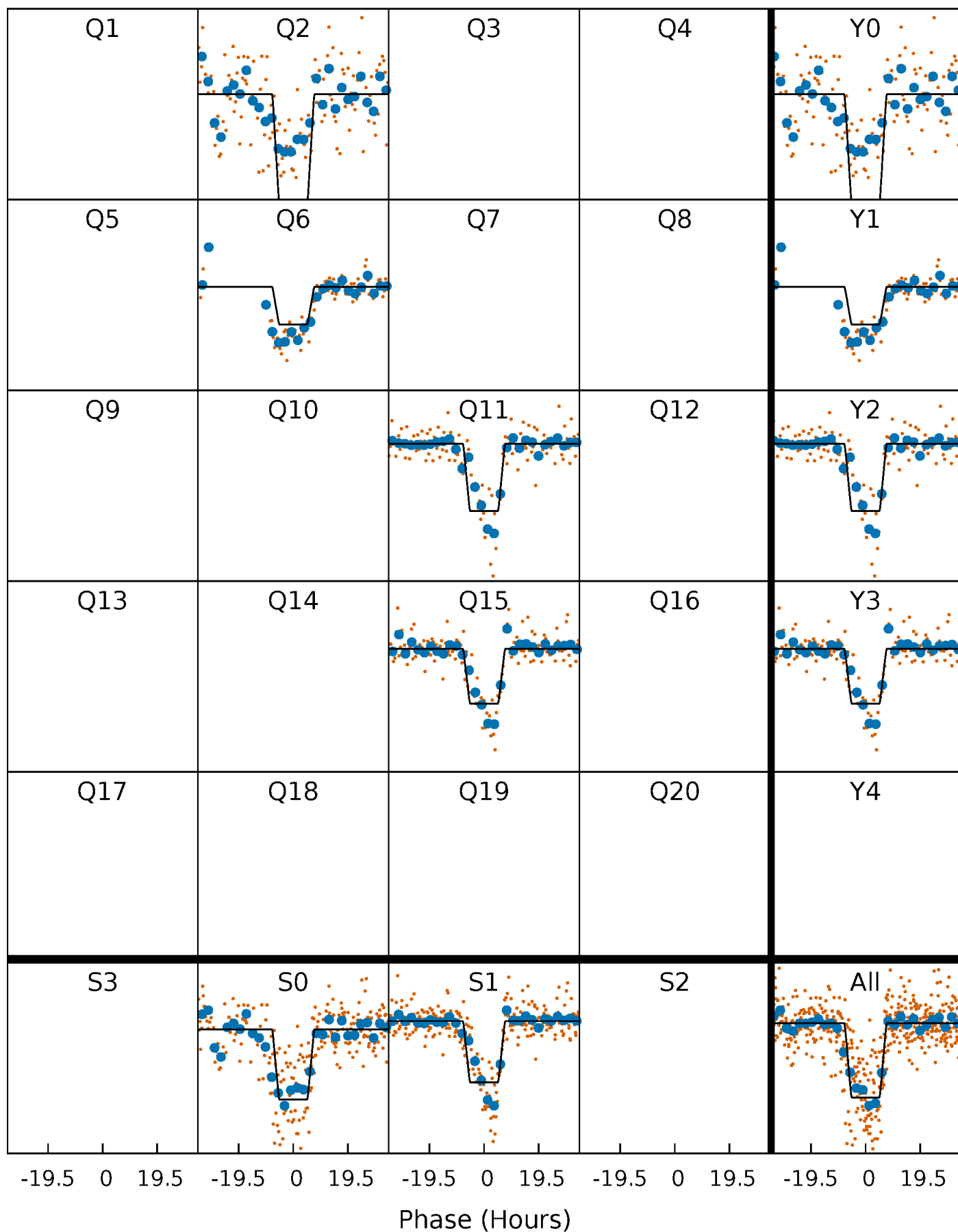
# DV Quarter-Phased Transit Curves

TCE 003955866-02 P=403.887754 Days  $T_0=195.205361$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

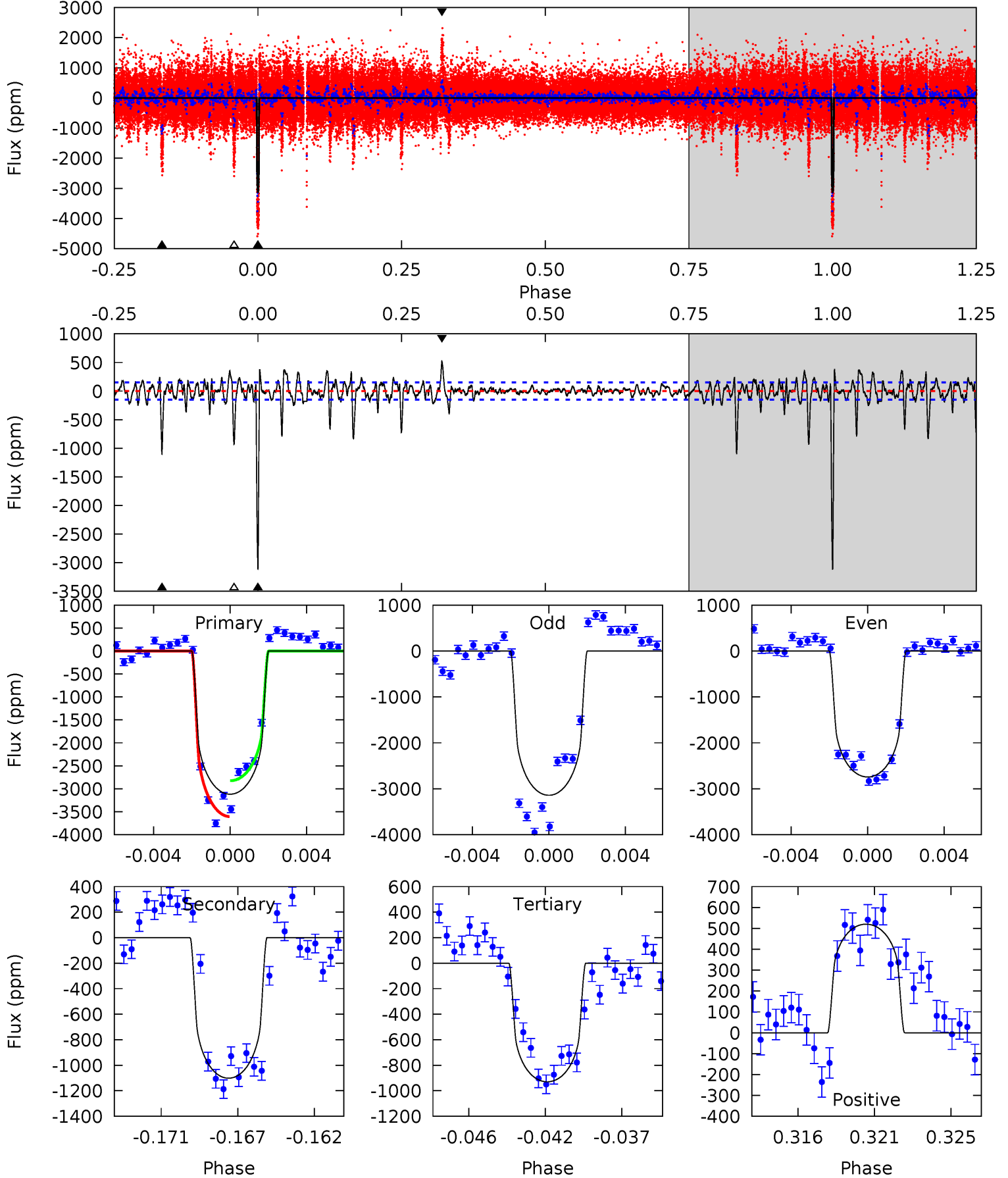
TCE 003955866-02 P=403.882936 Days  $T_0=195.696590$  (BKJD)



# DV Model-Shift Uniqueness Test

003955866-02, P = 403.887754 Days, E = 195.205361 Days

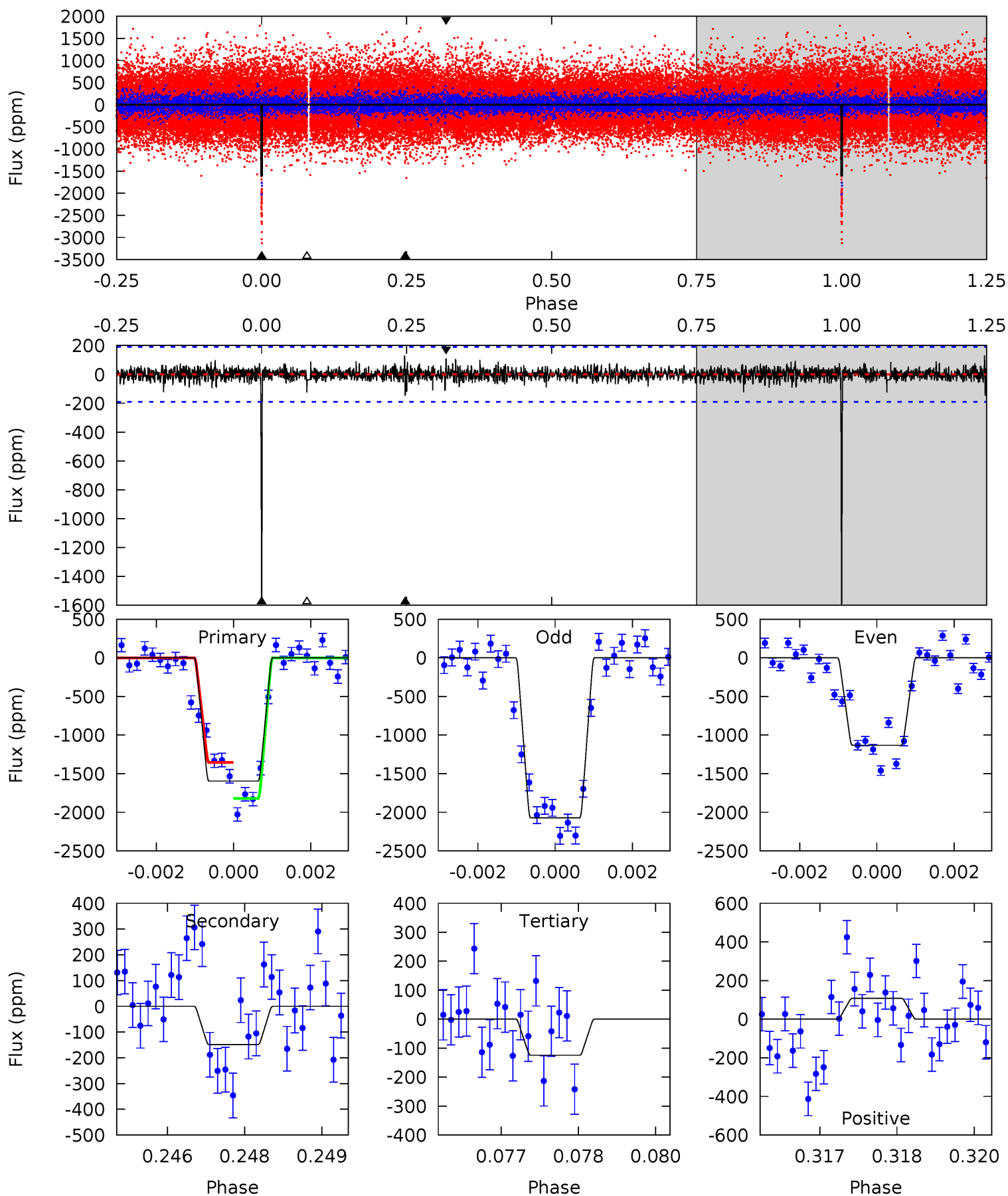
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
108.1	38.2	32.2	18.0	5.19	2.87	4.87	75.9	90.1	5.95	20.2	7.14	0.96	0.14	13.2



# Alt Model-Shift Uniqueness Test

003955866-02, P = 403.882936 Days, E = 195.696590 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
45.0	4.19	3.51	3.05	5.37	3.16	0.77	41.5	41.9	0.68	1.14	13.5	0.97	0.08	6.54





### Stellar Parameters For KIC 003955866

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5549^{+166}_{-183}$	$4.499^{+0.040}_{-0.160}$	$0.560^{+0.050}_{-0.300}$	$0.964^{+0.207}_{-0.089}$	$1.070^{+0.075}_{-0.123}$	$1.681^{+0.349}_{-0.726}$
	+3%/-3%	+1%/-4%	+9%/-54%	+21%/-9%	+7%/-11%	+21%/-43%
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 003955866-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-1102 \pm 29$	$6.09^{+0.73}_{-0.41}$	$328^{+16}_{-15}$	$4432^{+131}_{-127}$	$19119^{+2614}_{-3498}$
Alt.	$-149 \pm 35$	$4.46^{+0.51}_{-0.34}$	$327^{+18}_{-14}$	$3491^{+155}_{-159}$	$4785^{+1483}_{-1452}$

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

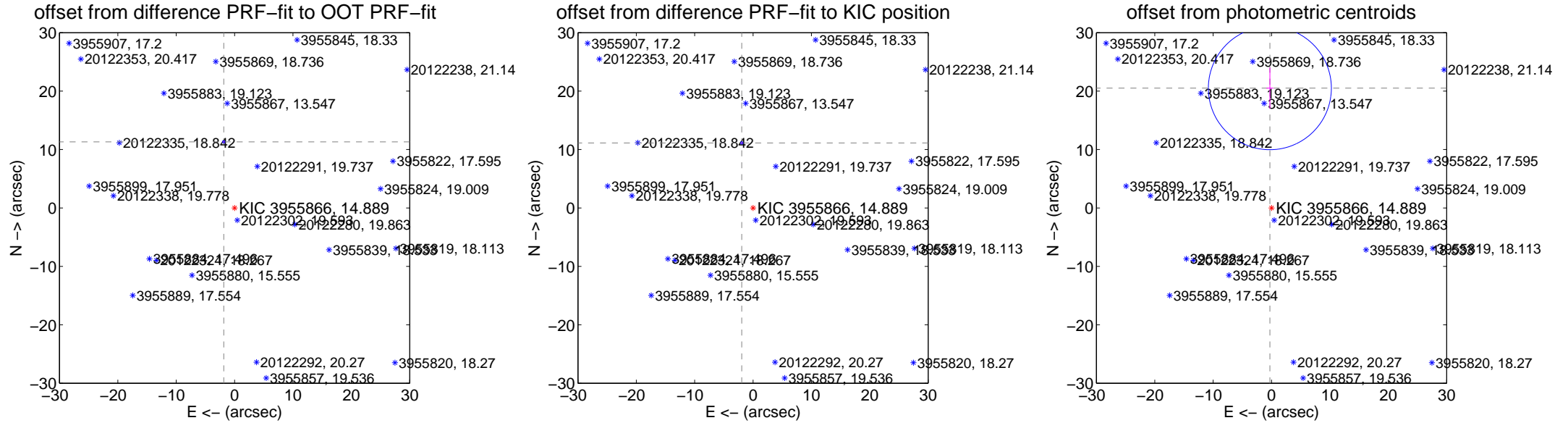
# DV Centroid Data

Supplemental centroid analysis for 003955866-02. Kepler magnitude: 14.89. Transit SNR 34.33

There are 1 quarters with good PRF difference image offsets

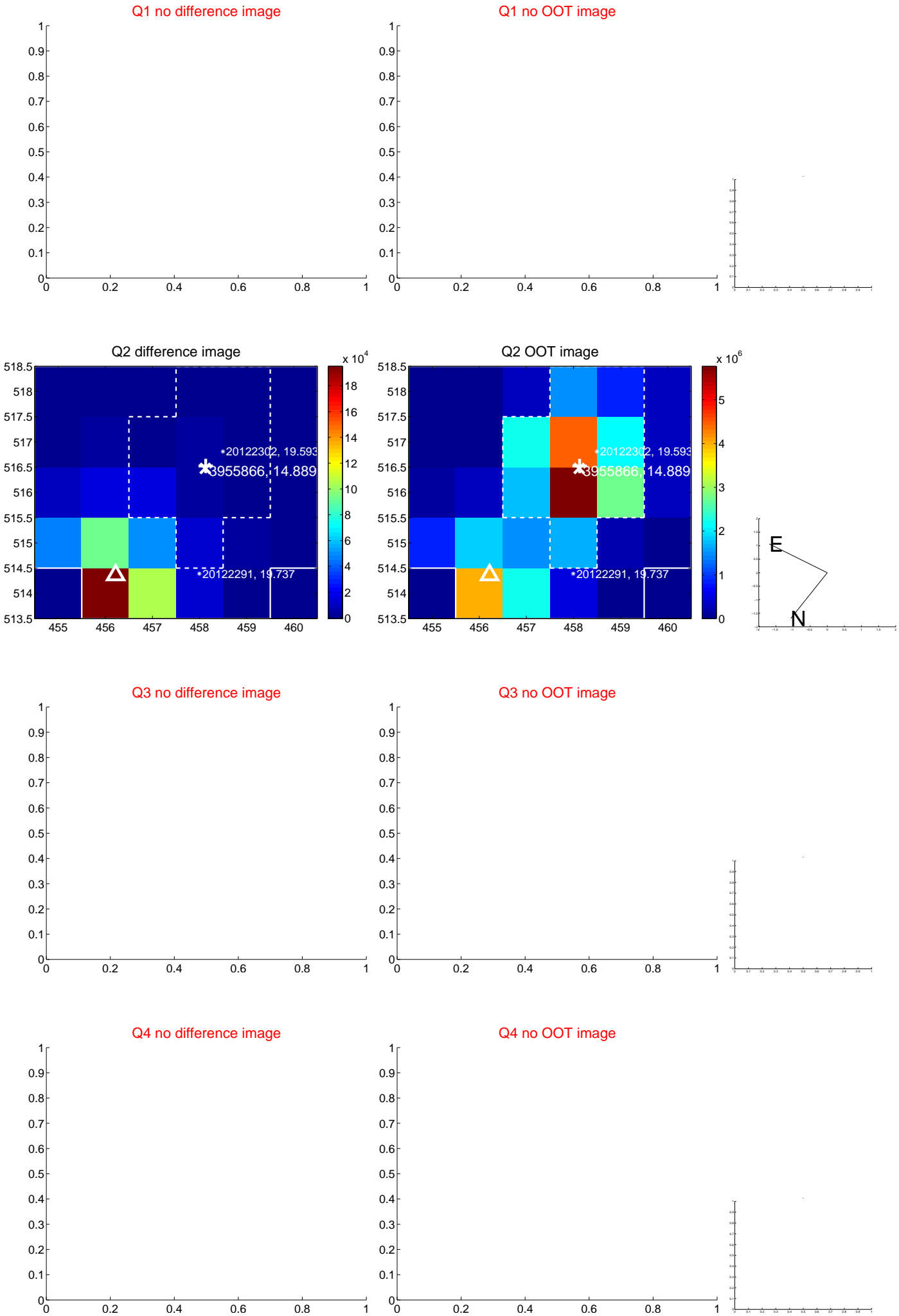
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	11.465 $\pm$ 0.067	171.45	1.860 $\pm$ 0.067	11.313 $\pm$ 0.067
PRF-fit source offset from KIC position	11.298 $\pm$ 0.067	168.95	1.935 $\pm$ 0.067	11.131 $\pm$ 0.067
photometric centroid source offset	20.51 $\pm$ 3.51	5.84	0.28 $\pm$ 0.59	20.50 $\pm$ 3.51



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.



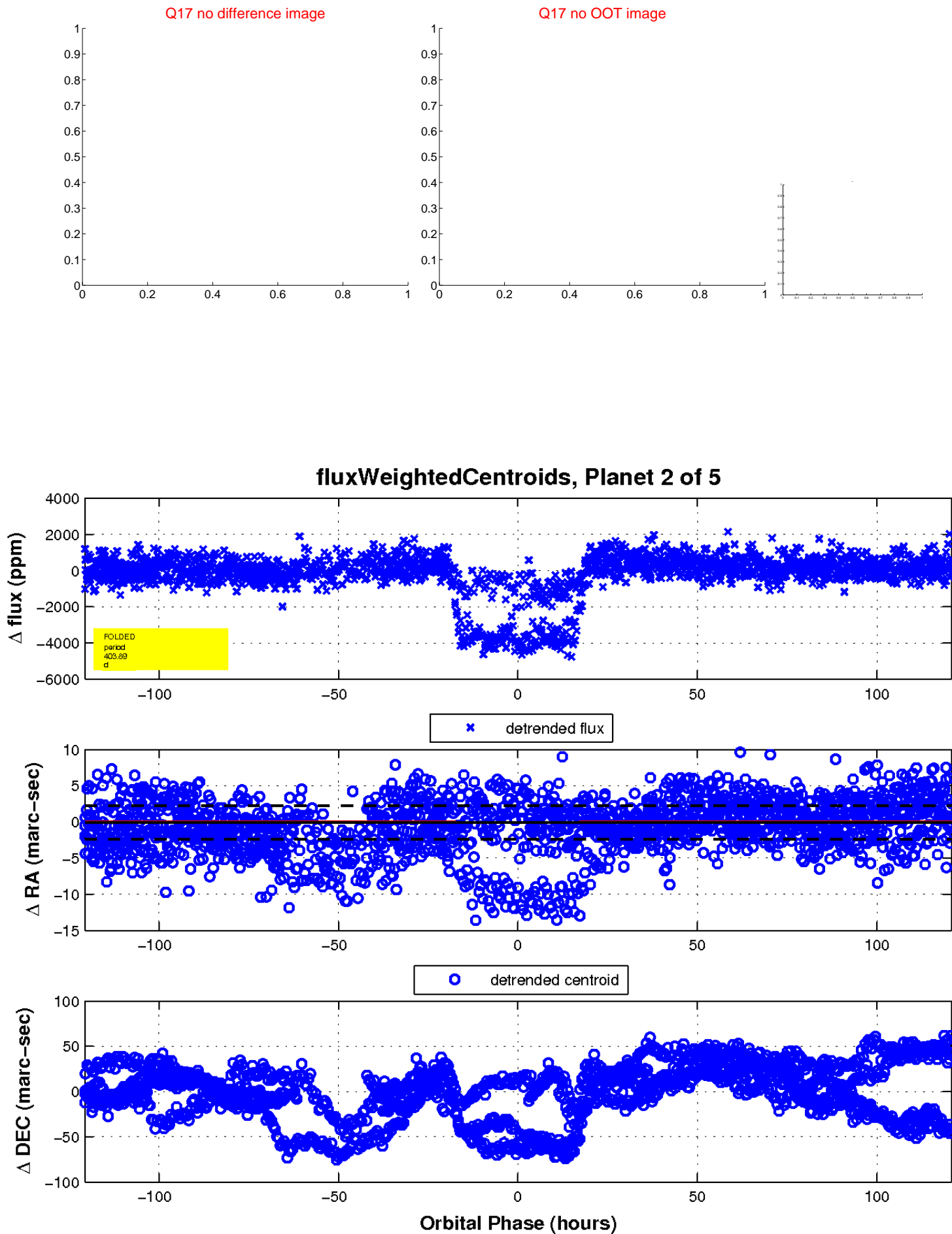
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

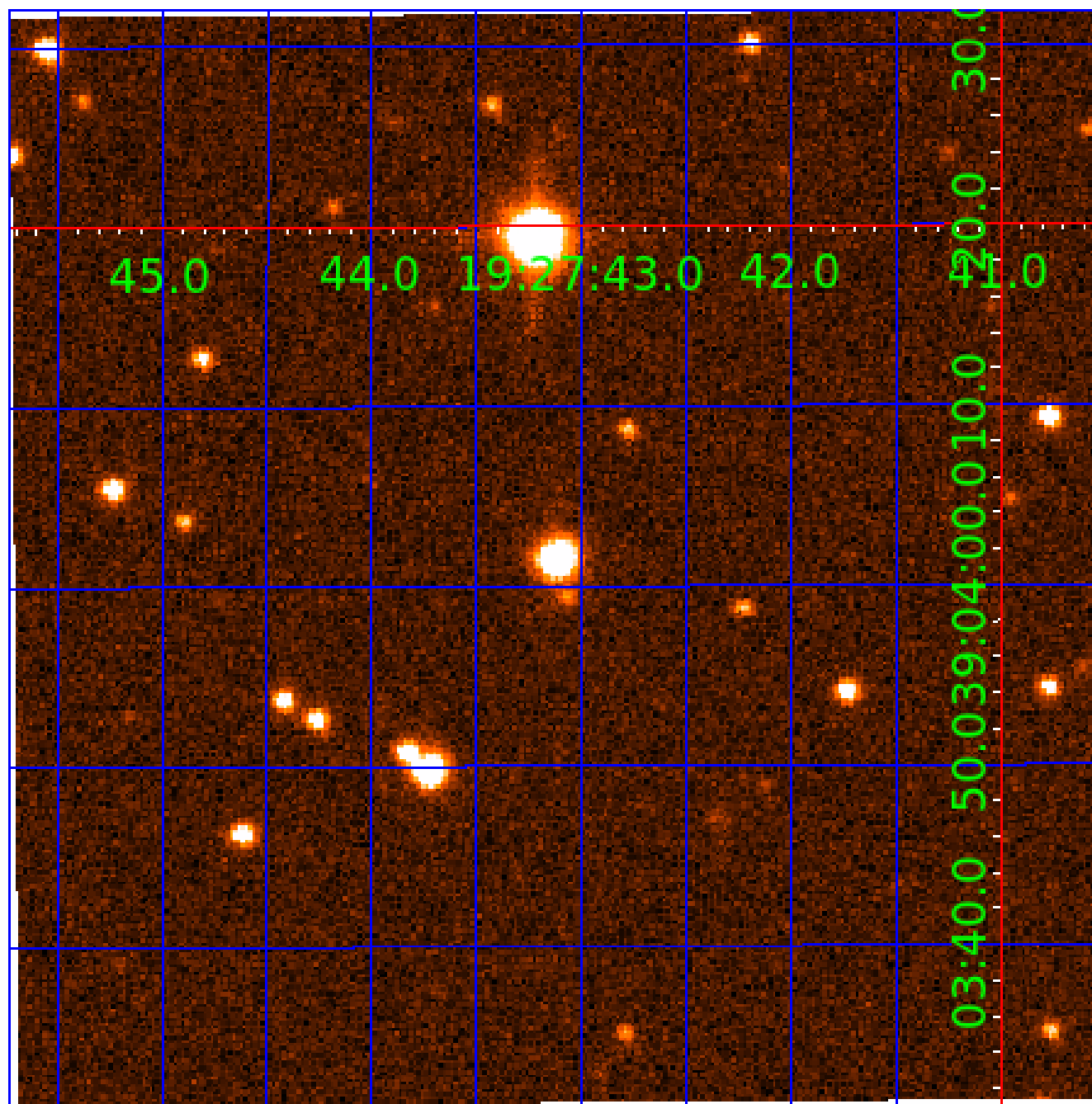


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 003955866

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003955866-01	OBS	No	403.866720	228.467027	1579.9	17.537	16.8	17.0	0.96	5549	4.44	0.66
003955866-02	OBS	No	403.887754	195.205361	3472.0	40.262	17.1	34.3	0.96	5549	5.96	0.66
003955866-03	OBS	No	403.887704	229.536416	2783.0	5.745	15.5	17.6	0.96	5549	9.50	0.66
003955866-04	OBS	No	320.315468	379.125188	490.4	7.950	8.9	6.3	0.96	5549	2.34	0.90
003955866-05	OBS	No	387.063656	279.711601	986.2	26.047	8.1	9.3	0.96	5549	3.62	0.70

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003955866-01	OBS	FP	0.00	1	0	1	0	LPP_DV—ALL_TRANS_CHASES—CENT_RESOLVED_OFFSET
003955866-02	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003955866-03	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_FEW_DIFFS—EPHEM_MATCH
003955866-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
003955866-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_DIFFS

**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 003955866-03

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ( $''$ )	$\Delta$ Row	$\Delta$ Col	$m_2$	$m_1$	$D_2/D_1$	Mechanism	Flag	$\sigma_P$	$\sigma_T$
003955866-03	3955866	003955867-02	3955867	12:1	17.9	3	3	13.55	14.89	4.94	Direct-PRF	0	4.88	1.84

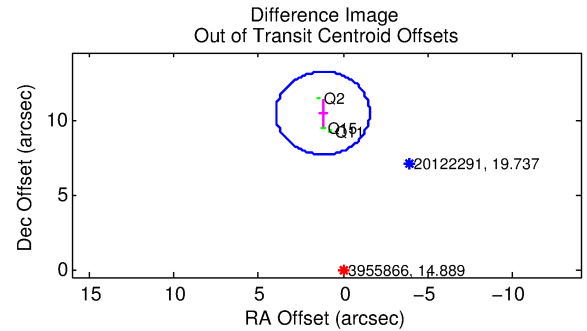
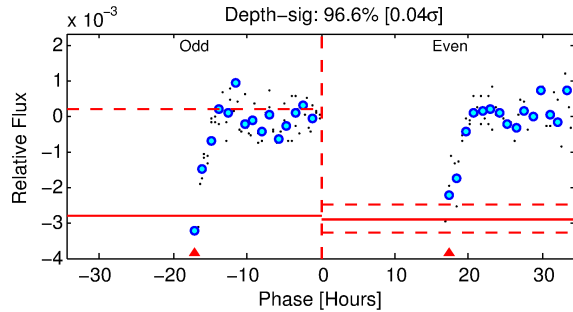
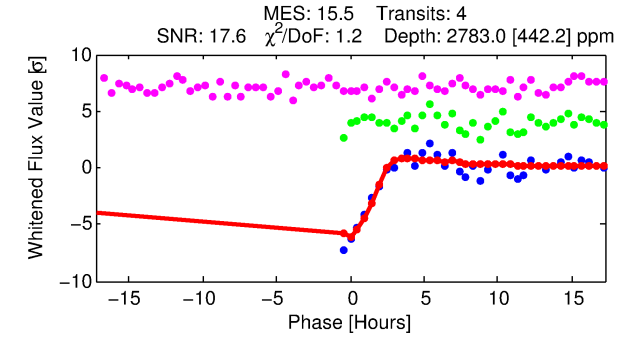
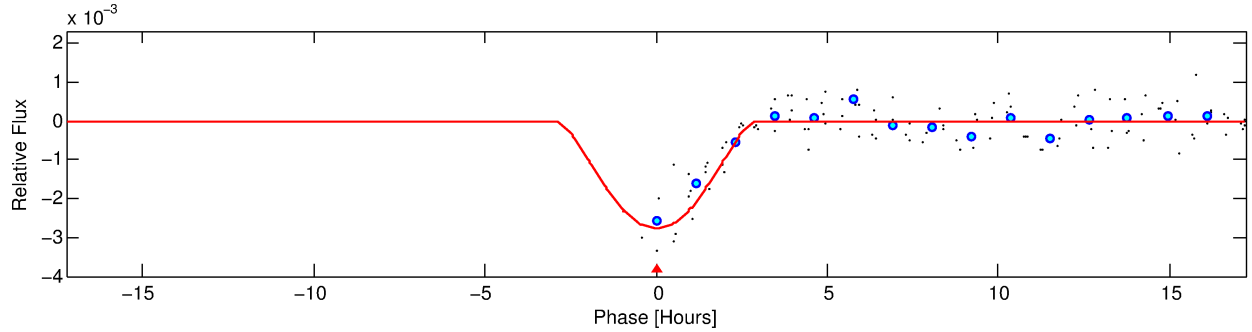
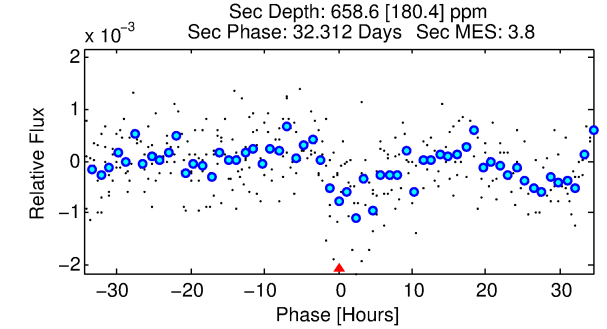
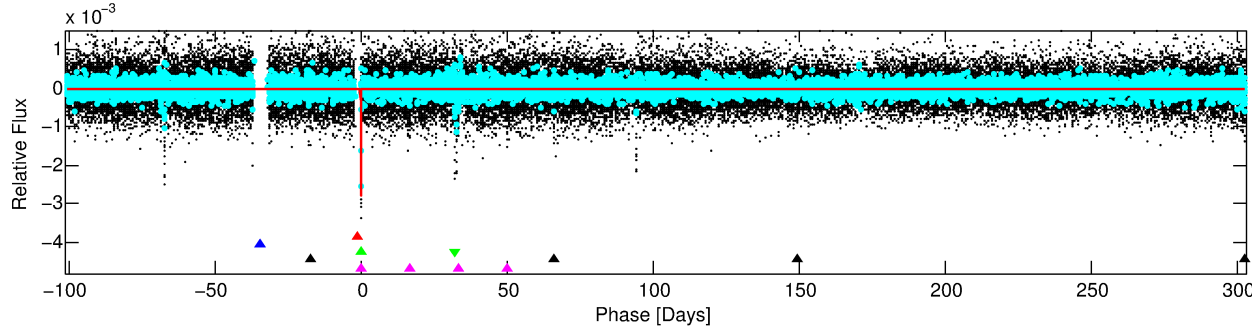
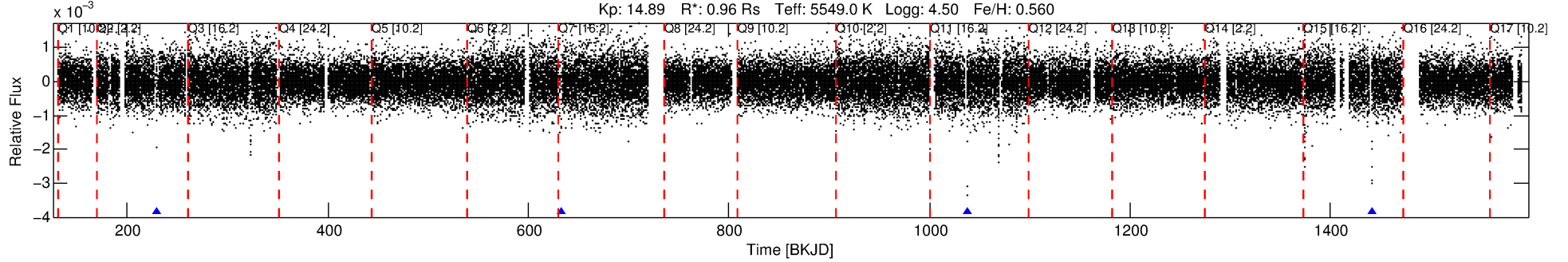
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  and  $\sigma_T$  are the significance of the match in period and epoch. For a match to be considered significant  $\sigma_P < 5.0$  and  $\sigma_T < 5.0$ . Matches which have  $\sigma_P$  and  $\sigma_T$  very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

# DV One-Page Summary

KIC: 3955866 Candidate: 3 of 5 Period: 403.888 d

KOI: K03897 Corr: No Ephemeris Match

Kp: 14.89 R\*: 0.96 Rs Teff: 5549.0 K Logg: 4.50 Fe/H: 0.560



## DV Fit Results:

Period = 403.88770 [0.00368] d  
Epoch = 229.5364 [0.0155] BKJD  
Rp/R\* = 0.0903 [0.2723]  
a/R\* = 238.80 [140.72]  
b = 1.00 [0.40]  
Seff = 0.66 [0.21]  
Teq = 230 [18] K  
Rp = 9.50 [28.72] Re  
a = 1.0938 [0.2063] AU  
Ag = 4804.04 [29033.85] [0.17σ]  
Teff = 2958 [4466] K [0.61σ]

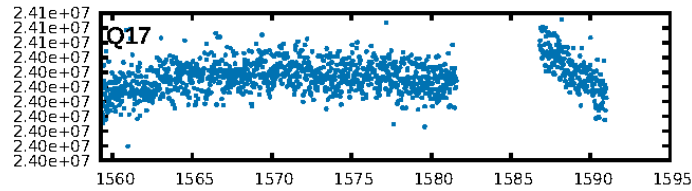
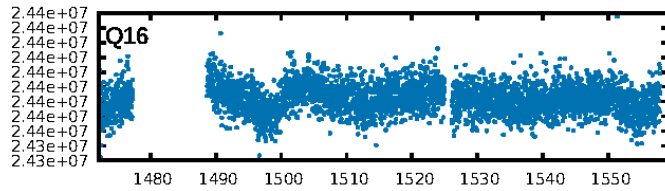
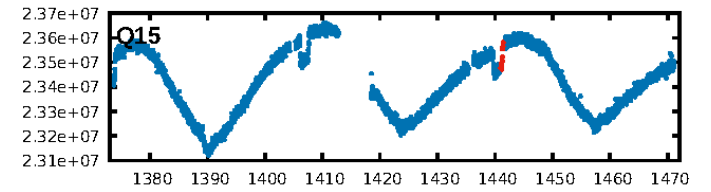
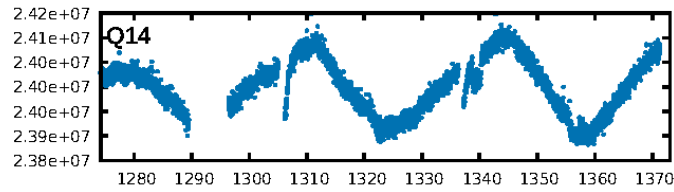
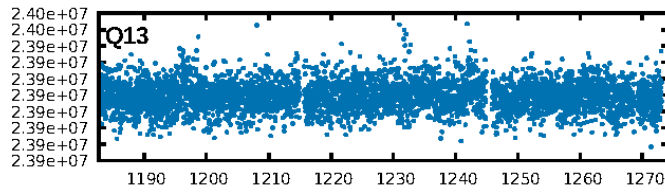
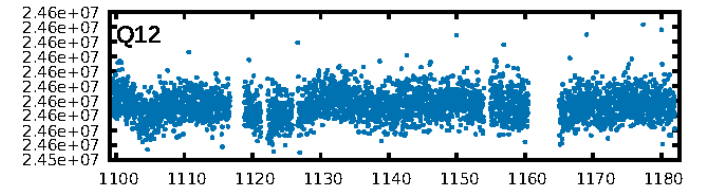
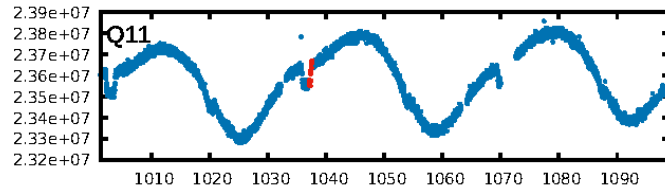
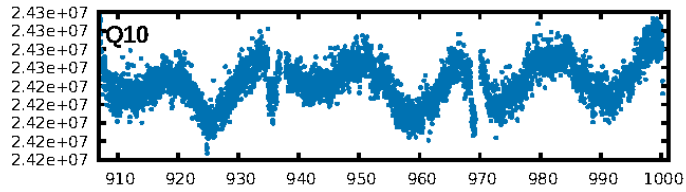
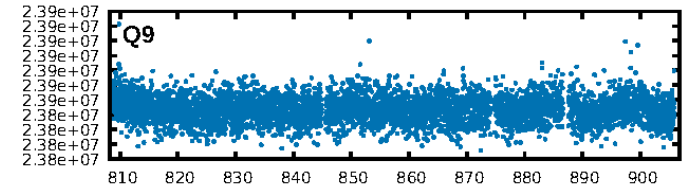
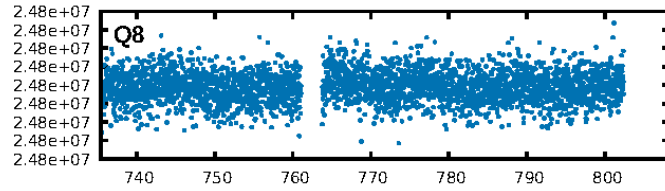
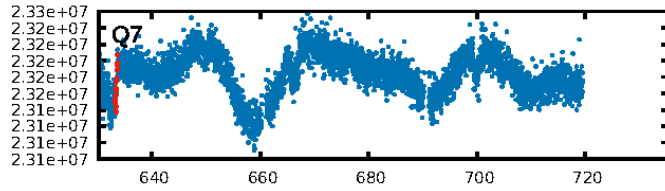
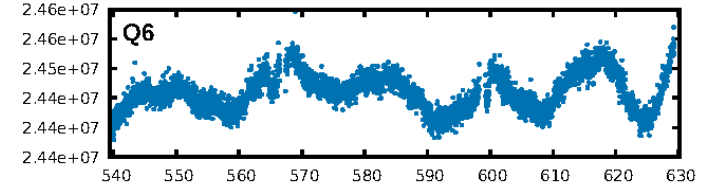
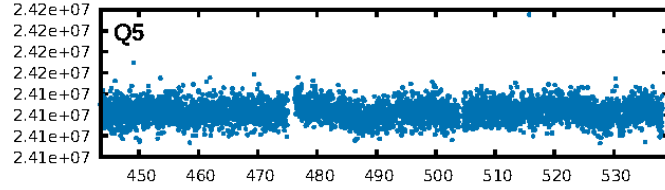
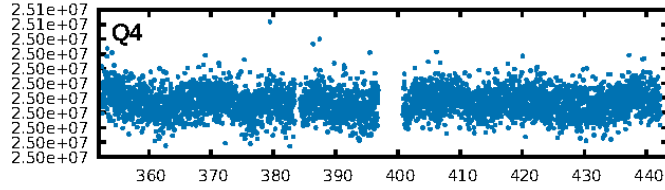
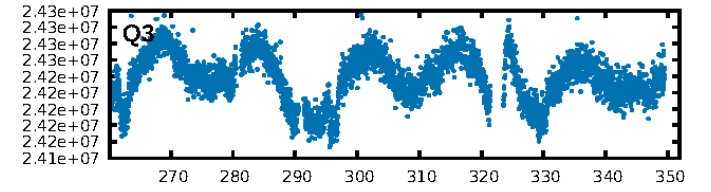
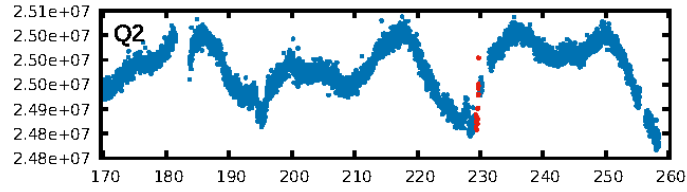
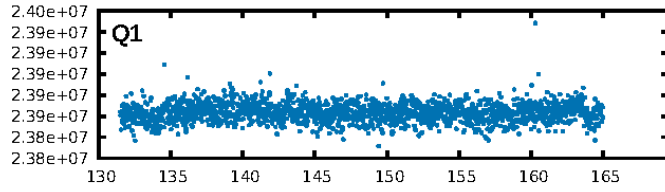
## DV Diagnostic Results:

ShortPeriod-sig: 2.2% [0.03σ]  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.8%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 9.20e-42  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -0.3956  
Centroid-sig: N/A  
Centroid-so: 5.548 arcsec [3.22σ]  
OotOffset-rm: 10.504 arcsec [11.40σ]  
KicOffset-rm: 10.571 arcsec [13.55σ]  
OotOffset-st: 1/2/0/0 [3]  
KicOffset-st: 1/2/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.67 [2/3]

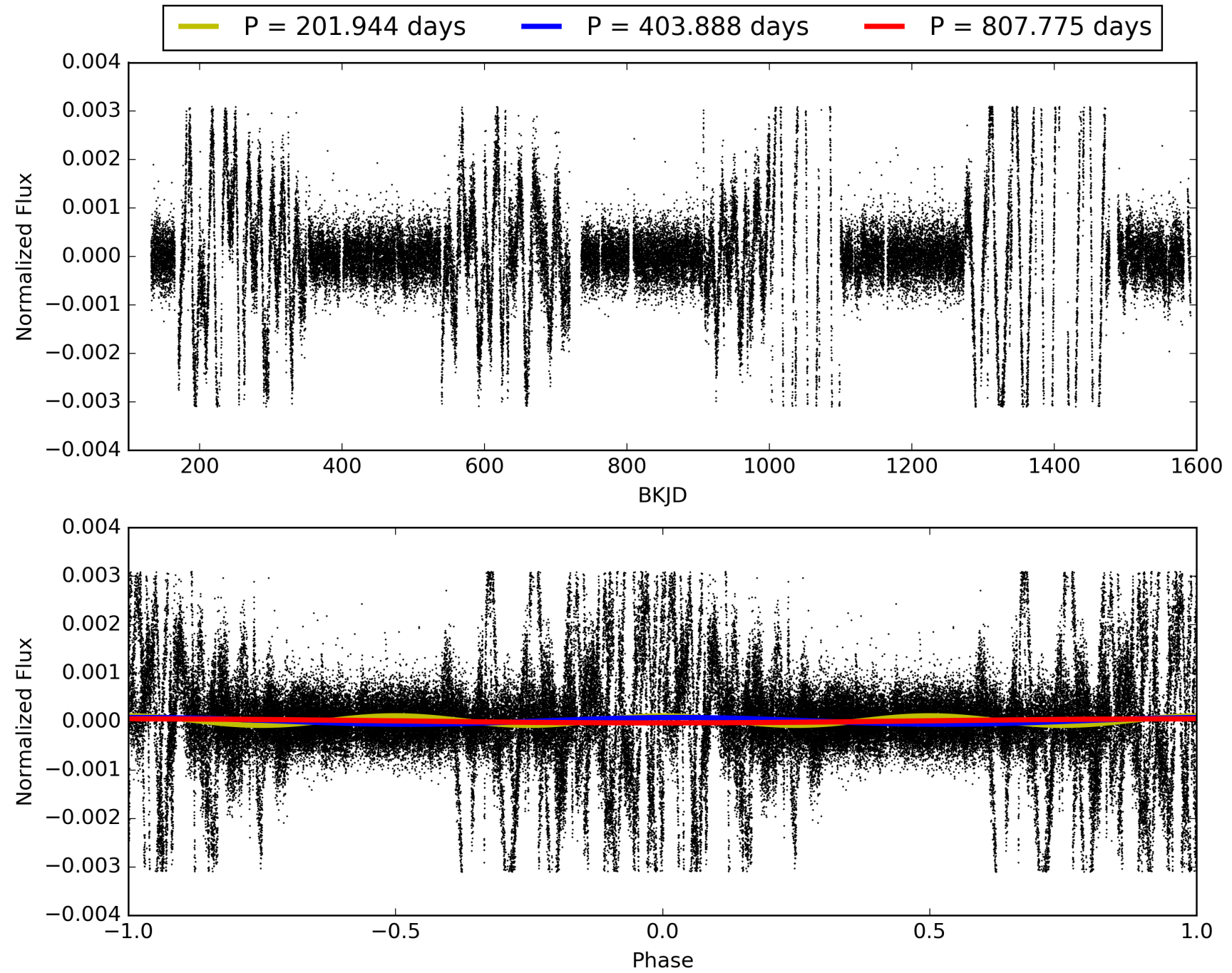
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:57:03 Z

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

# TCE 003955866-03, PDC Light Curves

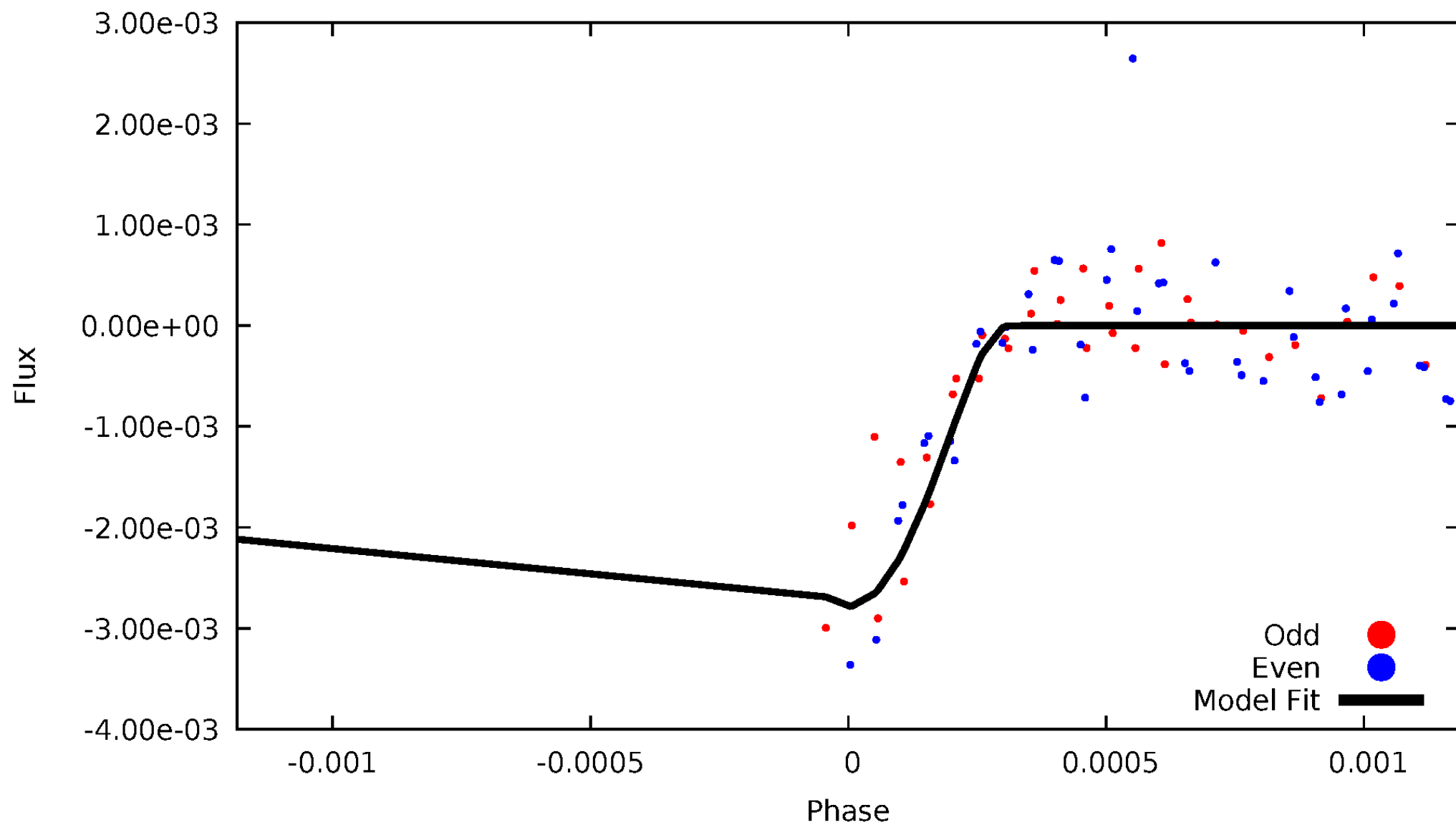


TCE 003955866-03



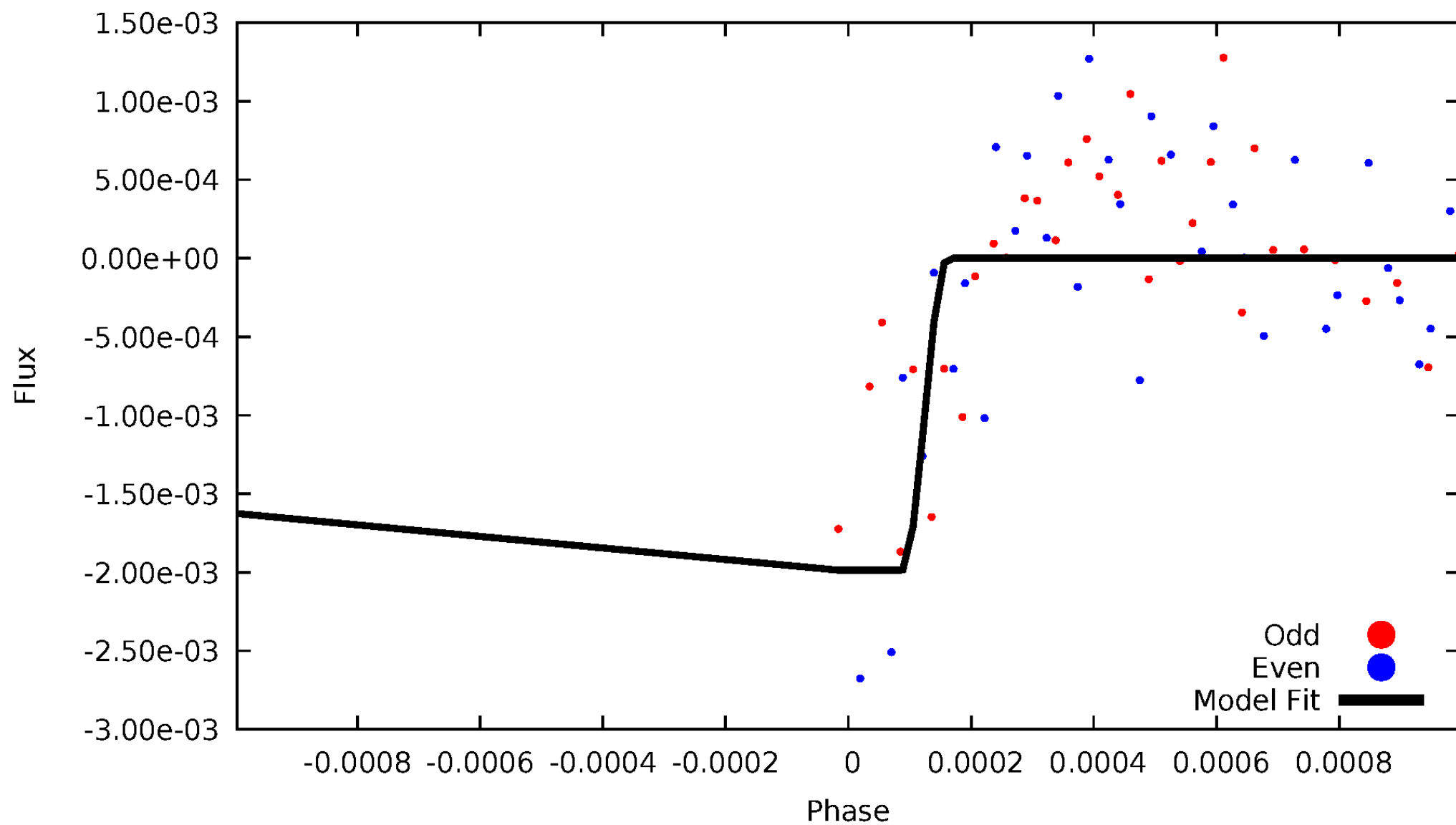
# DV Odd/Even

TCE 003955866-03



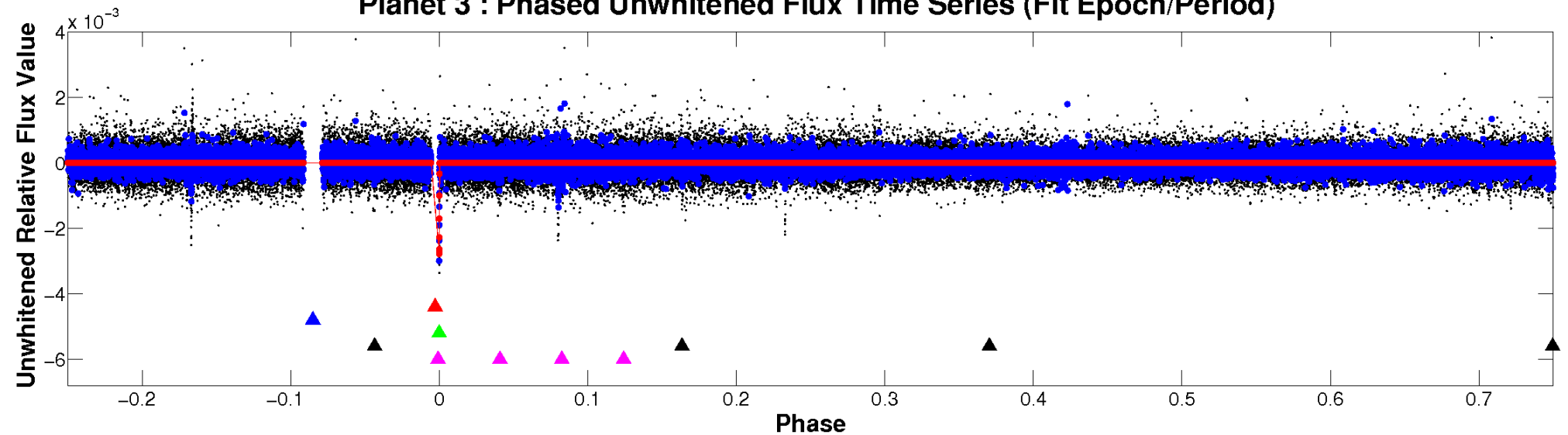
# ALT Odd/Even

TCE 003955866-03

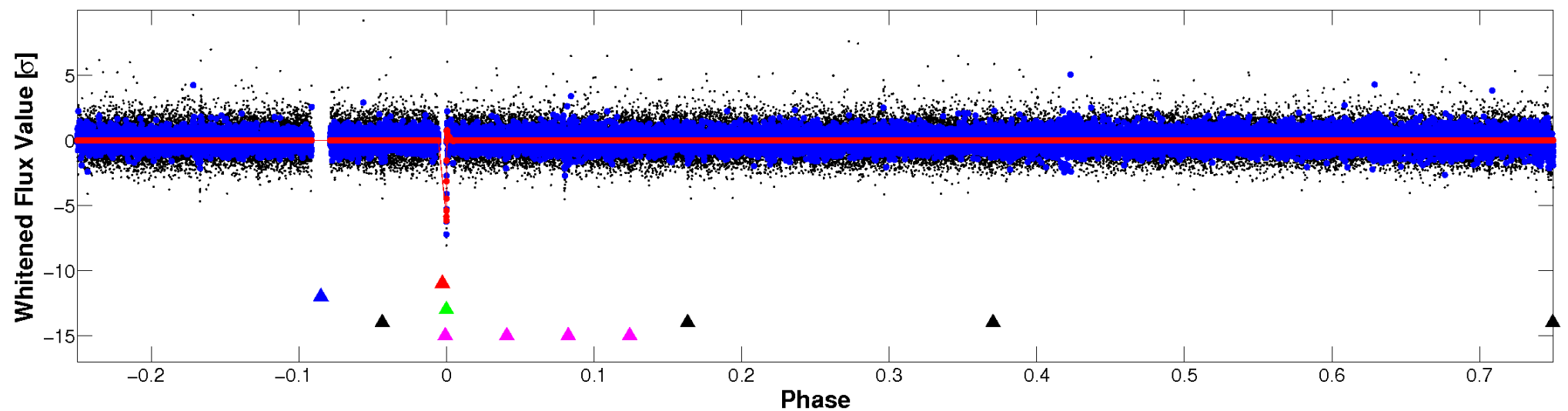


# Non-Whitened Vs. Whitened Light Curve

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

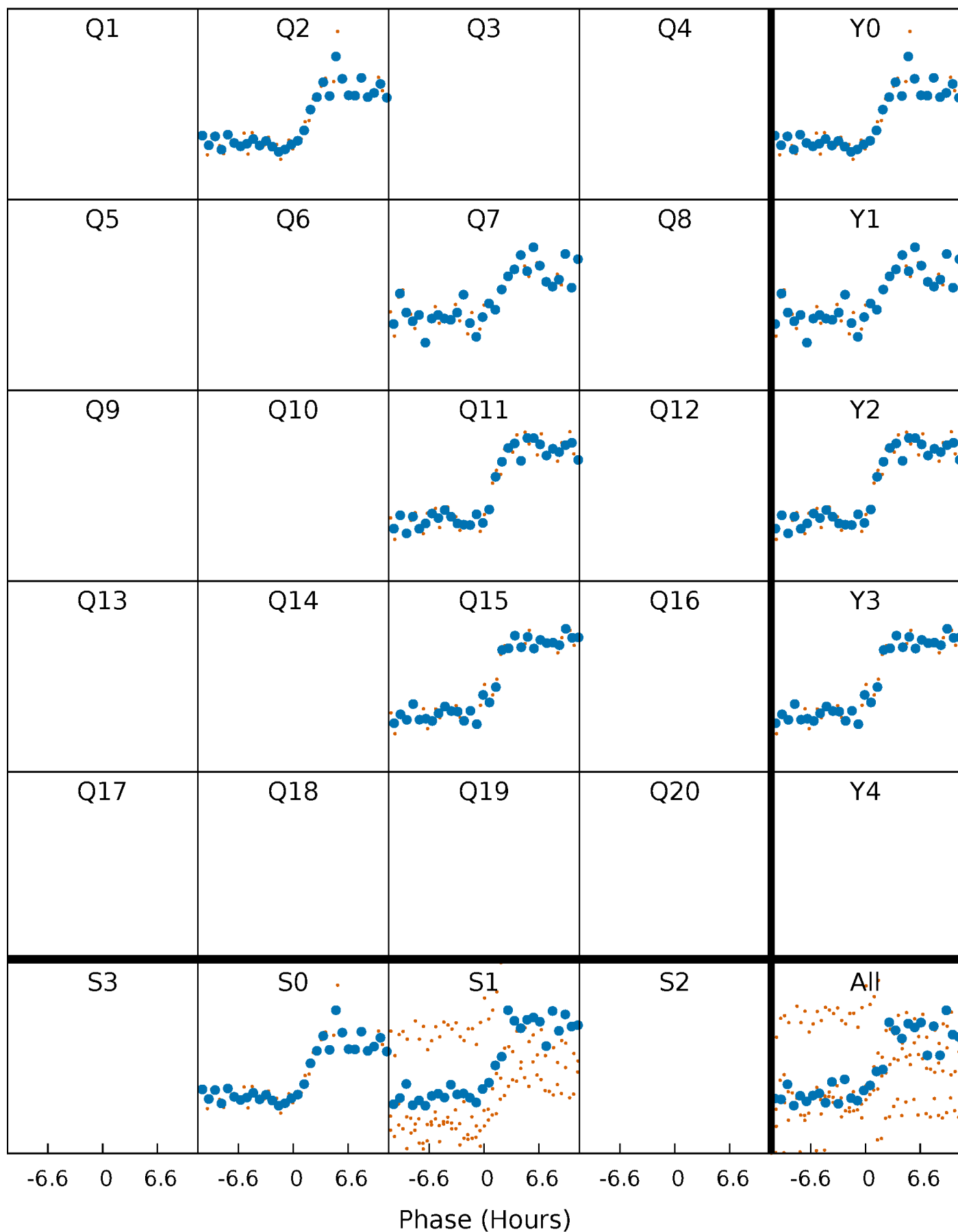


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

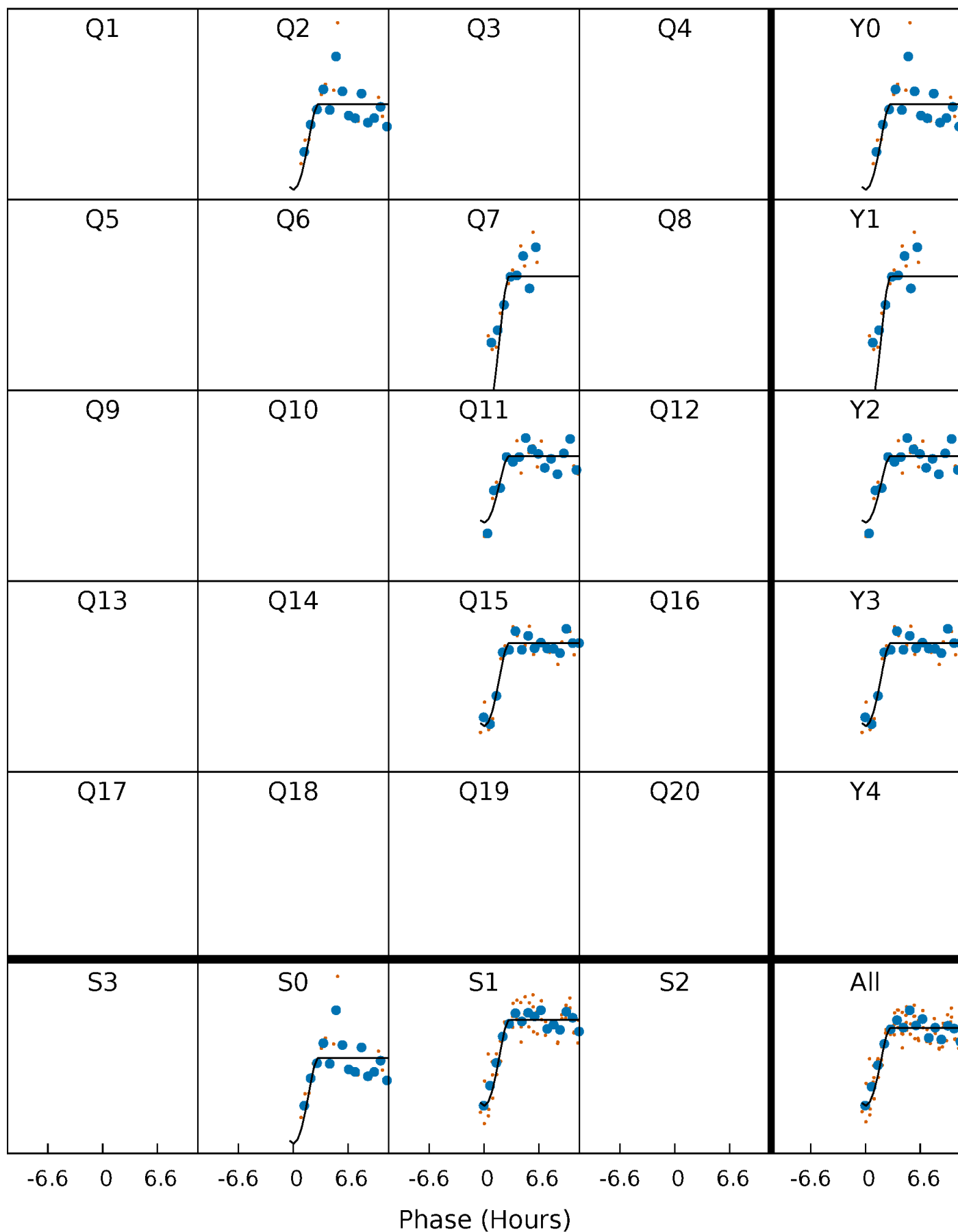
TCE 003955866-03     $P=403.887704$  Days     $T_0=229.536416$  (BKJD)





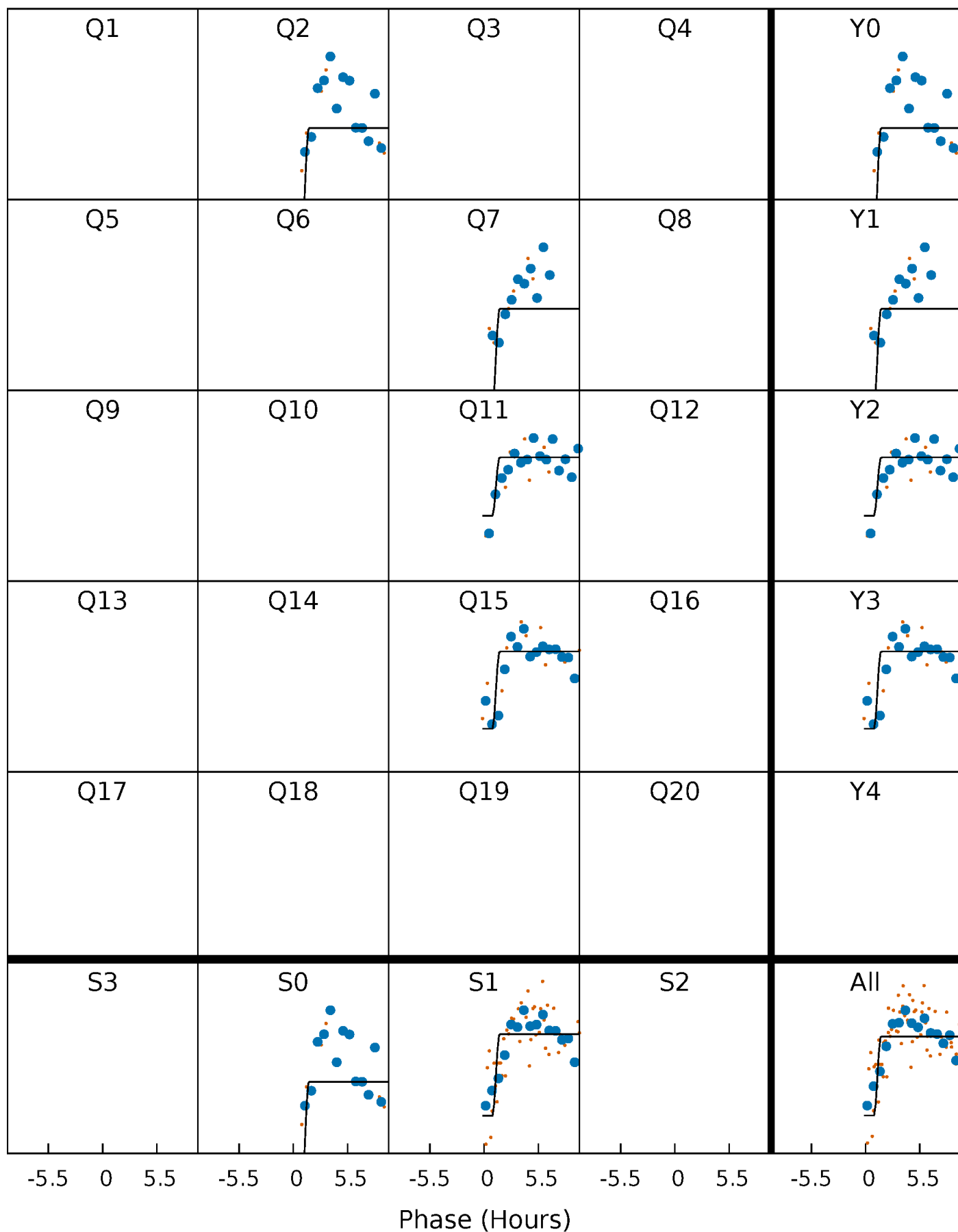
# DV Quarter-Phased Transit Curves

TCE 003955866-03 P=403.887704 Days  $T_0=229.536416$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

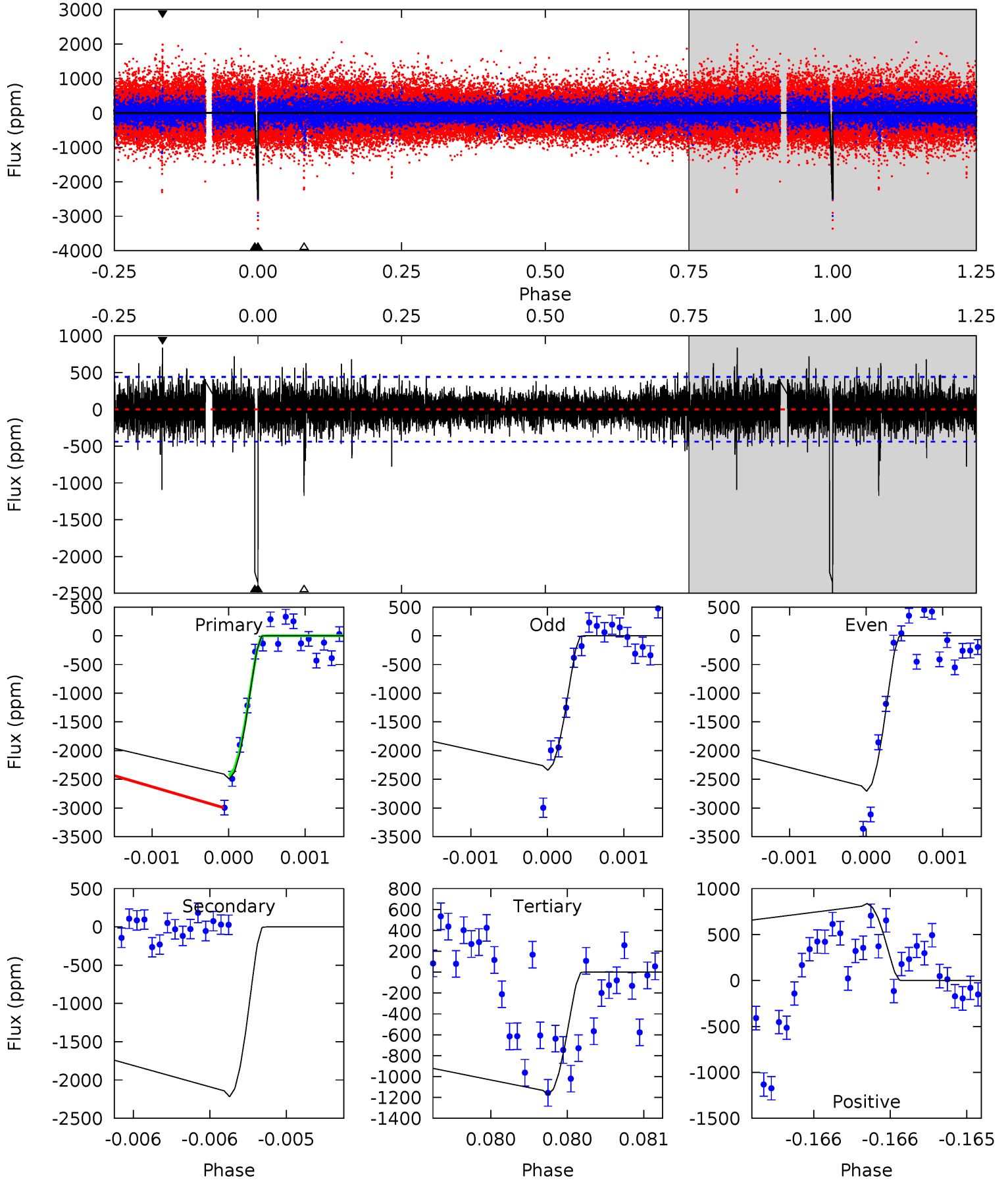
TCE 003955866-03     $P=403.882936$  Days     $T_0=229.539539$  (BKJD)



# DV Model-Shift Uniqueness Test

003955866-03, P = 403.887704 Days, E = 229.536416 Days

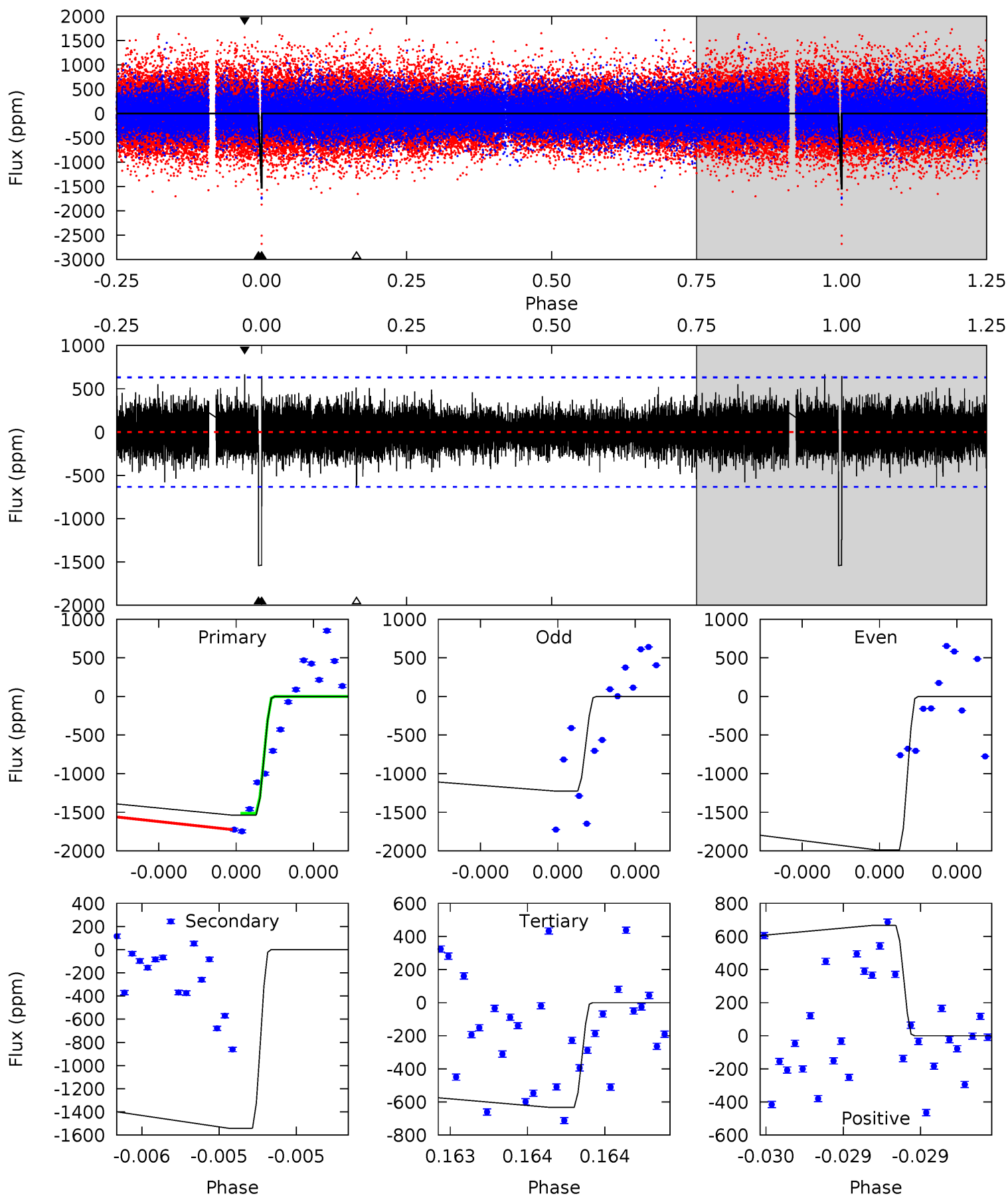
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.2	27.8	14.7	10.5	5.51	3.39	1.82	16.5	20.8	13.1	17.3	2.28	0.95	0.25	1.35



# Alt Model-Shift Uniqueness Test

003955866-03, P = 403.882936 Days, E = 229.539539 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
13.7	13.7	5.64	5.94	5.64	3.58	1.21	8.07	7.77	8.10	7.80	3.52	1.17	0.30	0.52



### Stellar Parameters For KIC 003955866

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5549^{+166}_{-183}$	$4.499^{+0.040}_{-0.160}$	$0.560^{+0.050}_{-0.300}$	$0.964^{+0.207}_{-0.089}$	$1.070^{+0.075}_{-0.123}$	$1.681^{+0.349}_{-0.726}$
	+3%/-3%	+1%/-4%	+9%/-54%	+21%/-9%	+7%/-11%	+21%/-43%
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 003955866-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2216 \pm 80$	$26.51^{+23.70}_{-18.19}$	$328^{+18}_{-14}$	$3081^{+1447}_{-488}$	$2031^{+19155}_{-1470}$
Alt.	$-1541 \pm 112$	$21.25^{+22.82}_{-14.68}$	$327^{+18}_{-15}$	$3124^{+1542}_{-568}$	$2219^{+21801}_{-1698}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

$T_{obs}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{obs}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{obs} \gg T_{max}$  AND  $A_{obs} \gg 1.0$

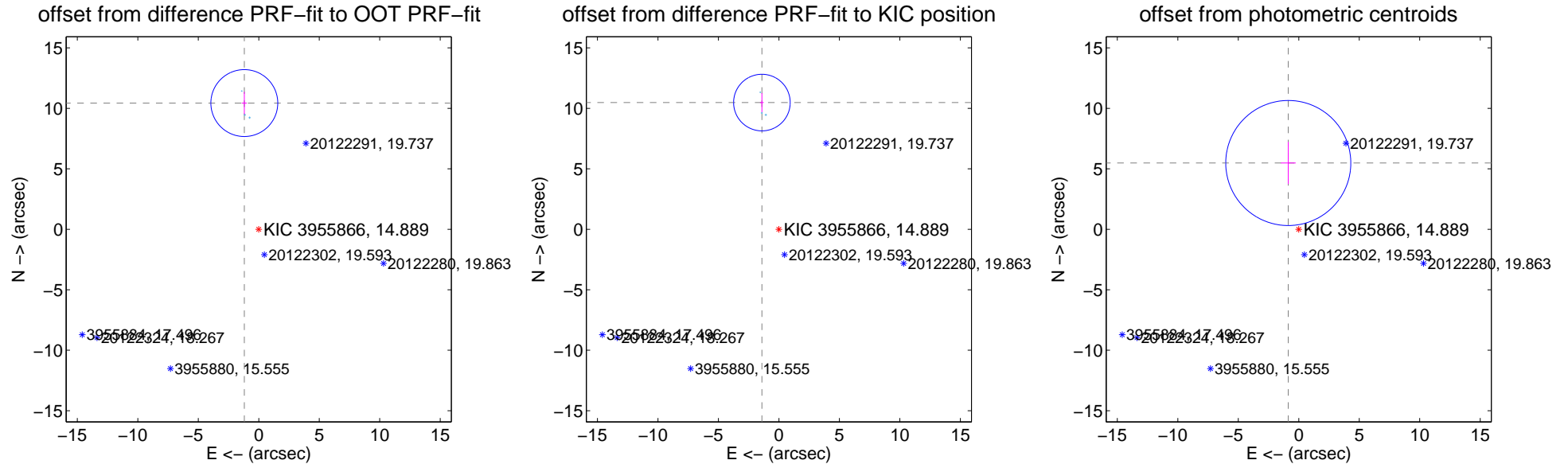
## DV Centroid Data

Supplemental centroid analysis for 003955866-03. Kepler magnitude: 14.89. Transit SNR 17.58

There are 3 quarters with good PRF difference image offsets

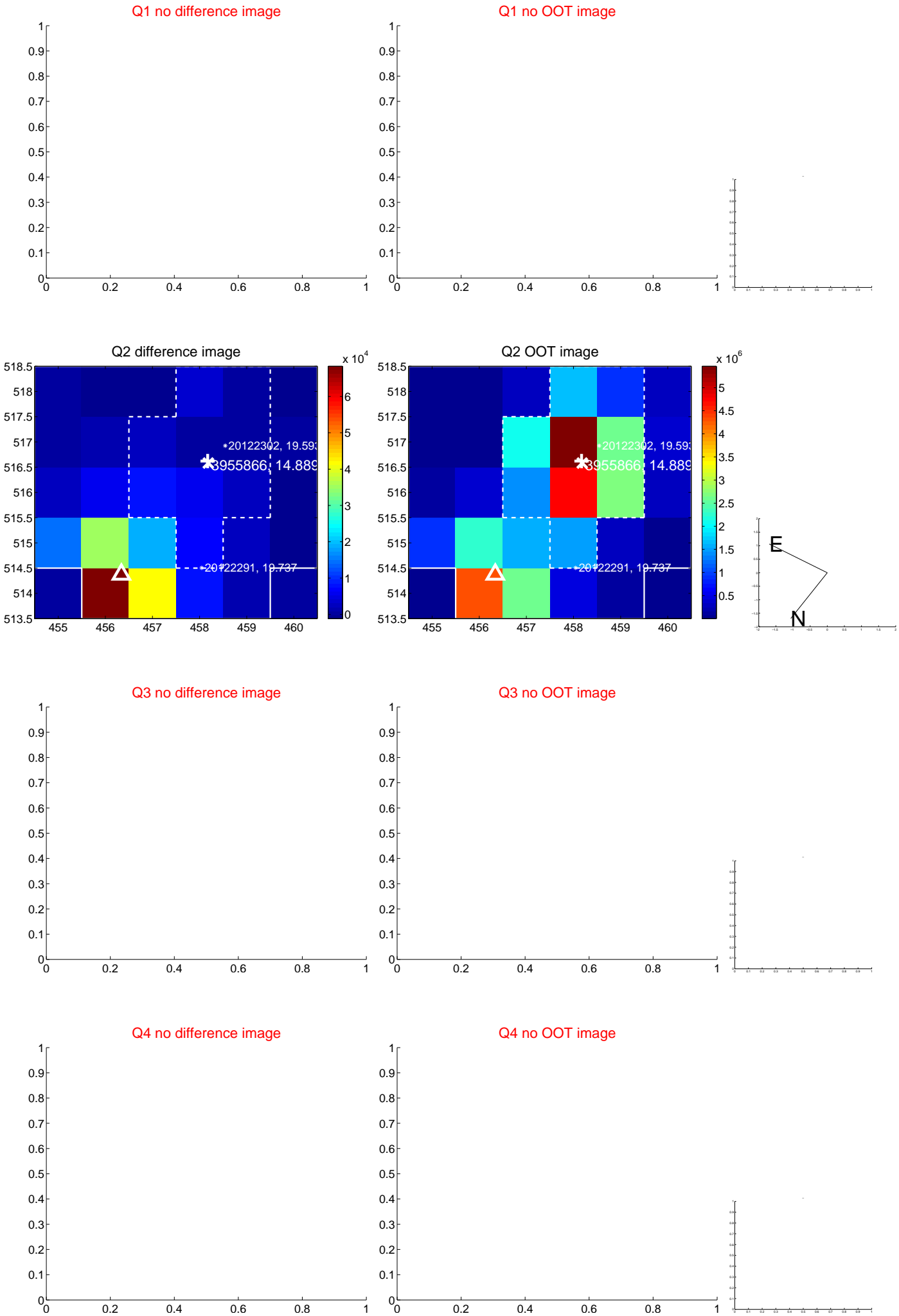
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$10.504 \pm 0.922$	11.40	$1.195 \pm 0.207$	$10.436 \pm 0.927$
PRF-fit source offset from KIC position	$10.571 \pm 0.780$	13.55	$1.406 \pm 0.155$	$10.477 \pm 0.787$
photometric centroid source offset	$5.55 \pm 1.72$	3.22	$0.87 \pm 0.61$	$5.48 \pm 1.74$



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.

Q9 no difference image



Q9 no OOT image



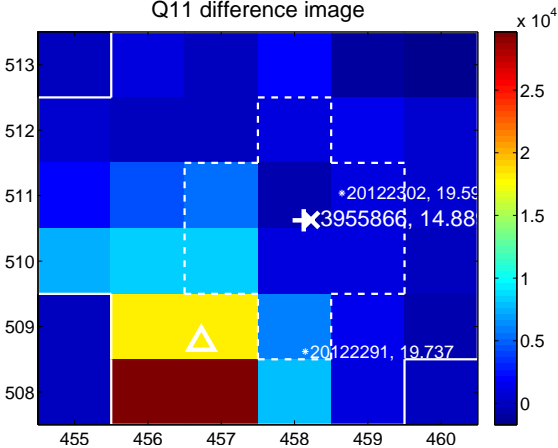
Q10 no difference image



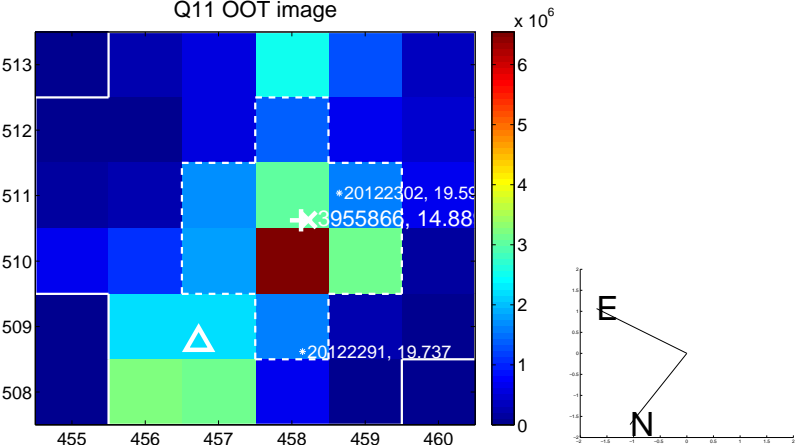
Q10 no OOT image



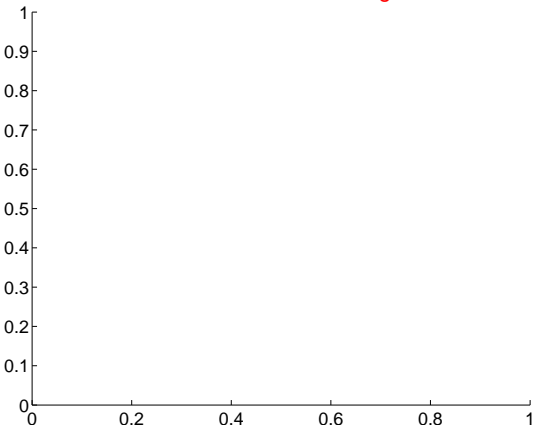
Q11 difference image



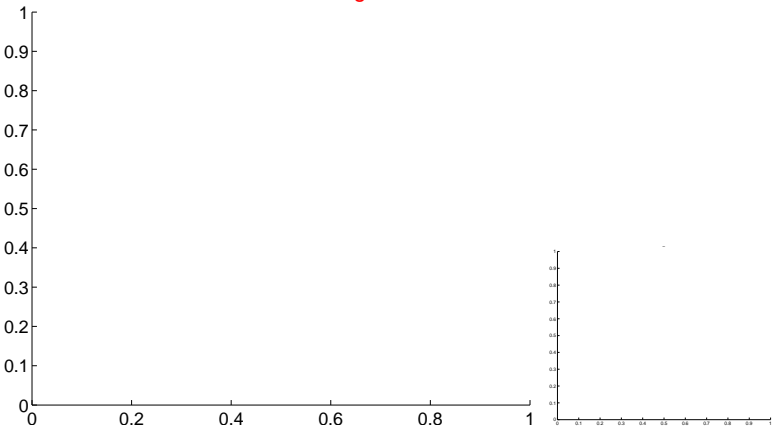
Q11 OOT image



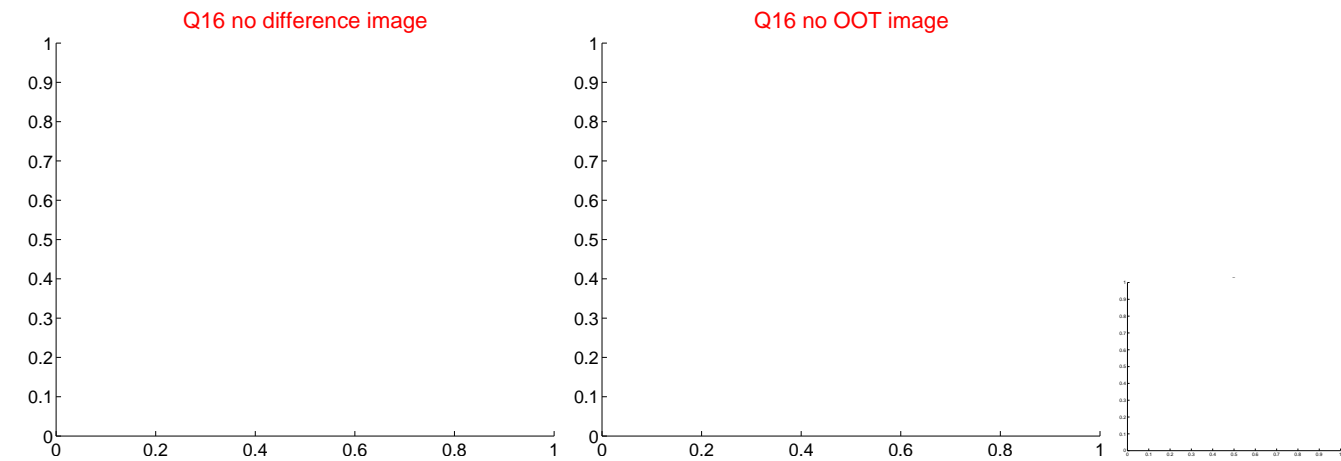
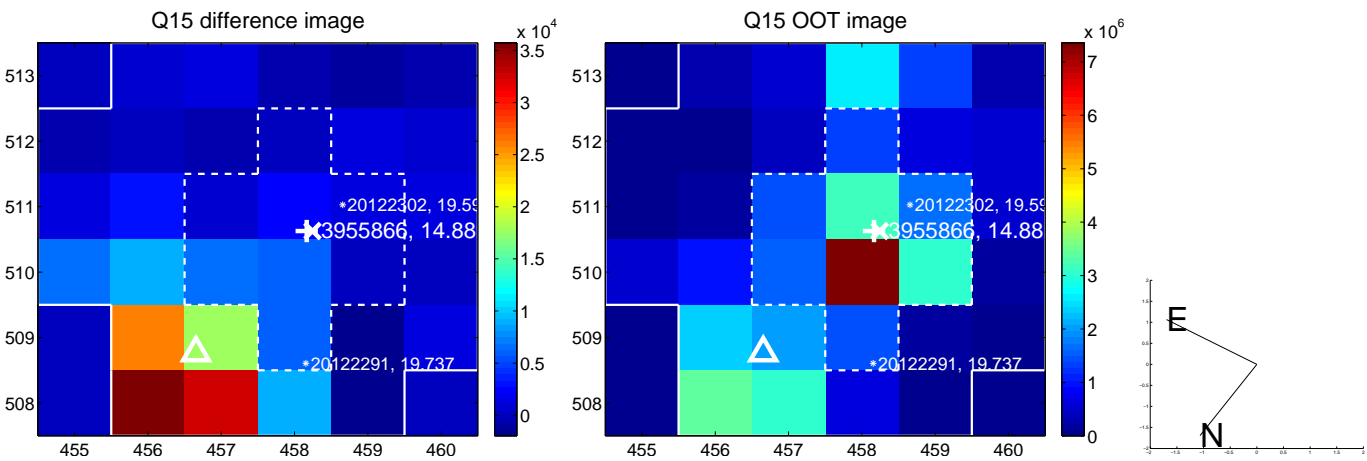
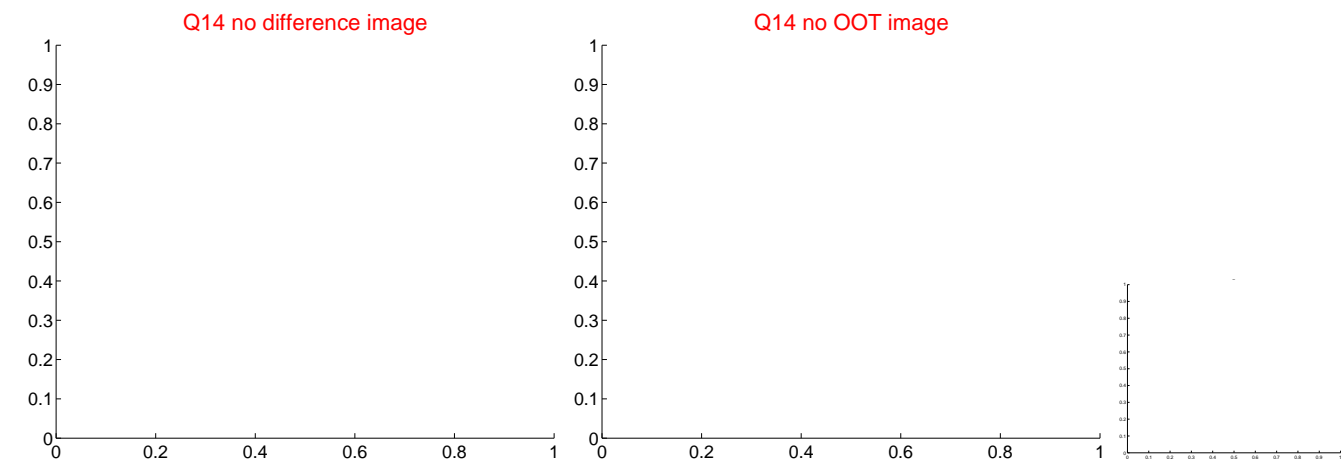
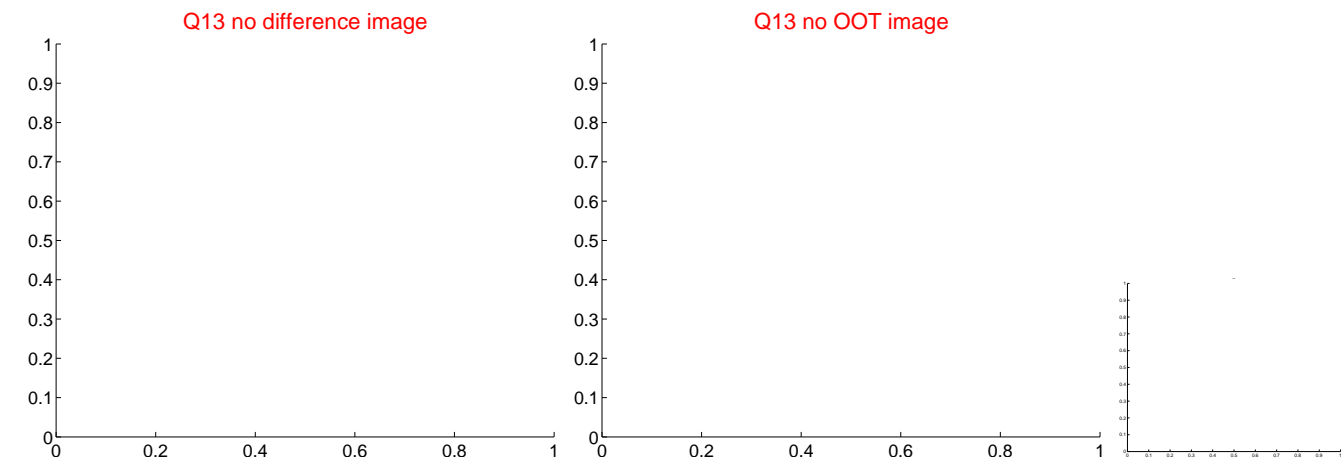
Q12 no difference image



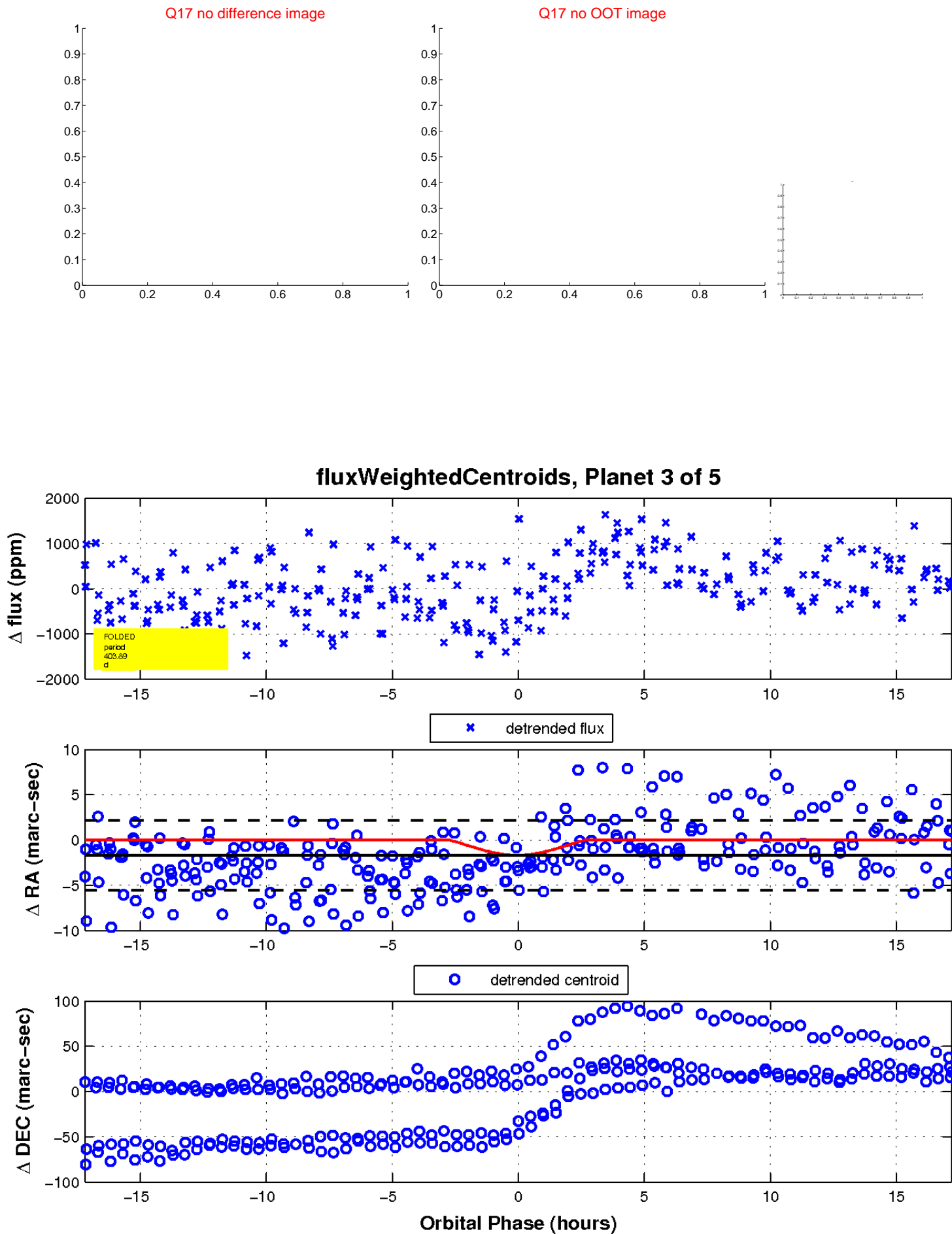
Q12 no OOT image



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

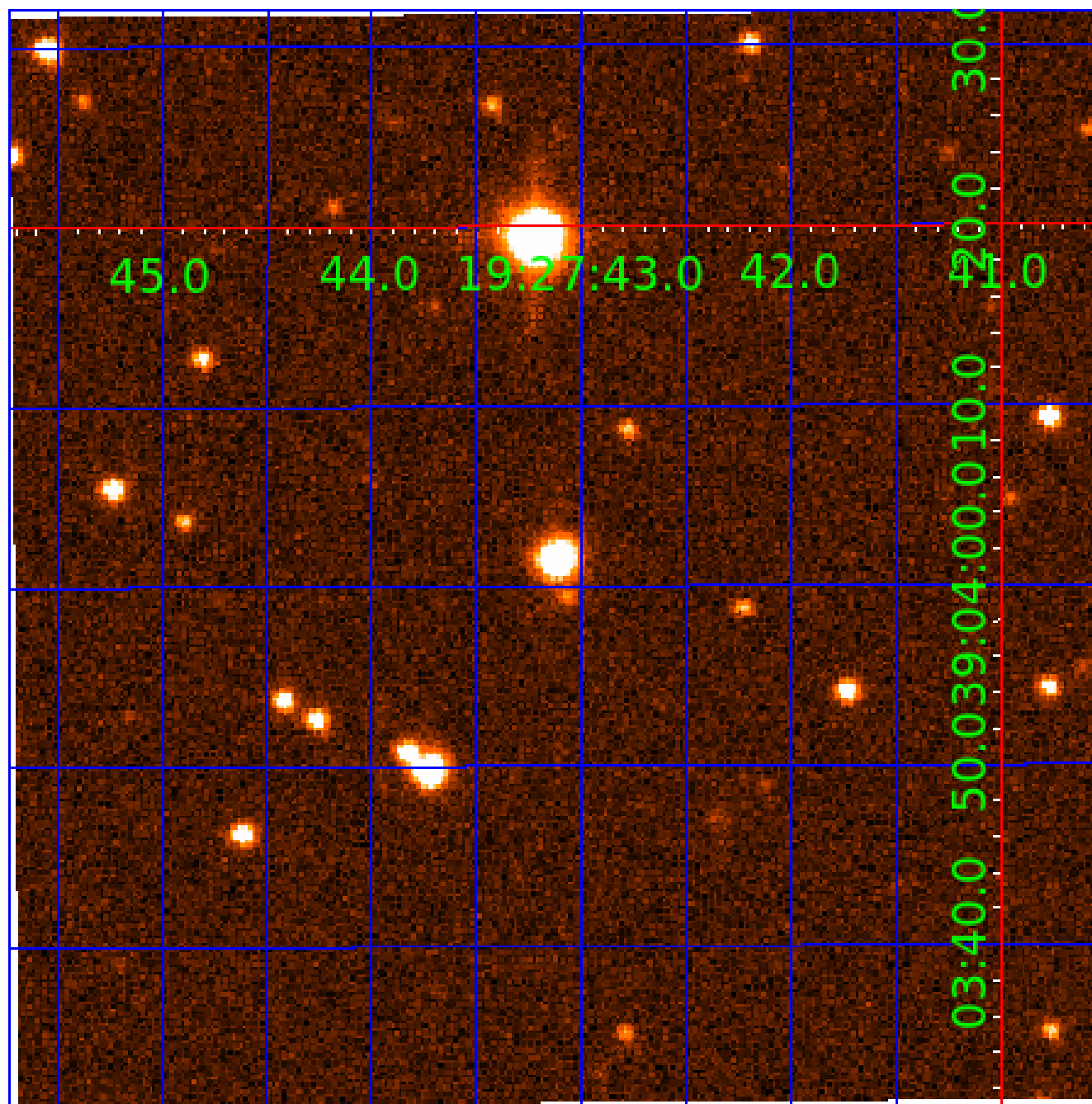


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 003955866

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003955866-01	OBS	No	403.866720	228.467027	1579.9	17.537	16.8	17.0	0.96	5549	4.44	0.66
003955866-02	OBS	No	403.887754	195.205361	3472.0	40.262	17.1	34.3	0.96	5549	5.96	0.66
003955866-03	OBS	No	403.887704	229.536416	2783.0	5.745	15.5	17.6	0.96	5549	9.50	0.66
003955866-04	OBS	No	320.315468	379.125188	490.4	7.950	8.9	6.3	0.96	5549	2.34	0.90
003955866-05	OBS	No	387.063656	279.711601	986.2	26.047	8.1	9.3	0.96	5549	3.62	0.70

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003955866-01	OBS	FP	0.00	1	0	1	0	LPP_DV—ALL_TRANS_CHASES—CENT_RESOLVED_OFFSET
003955866-02	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003955866-03	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_FEW_DIFFS—EPHEM_MATCH
003955866-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
003955866-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_DIFFS

**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 003955866-04

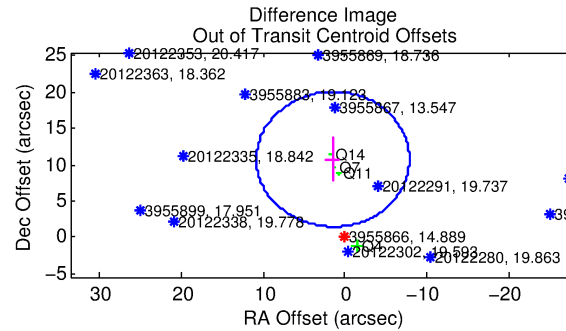
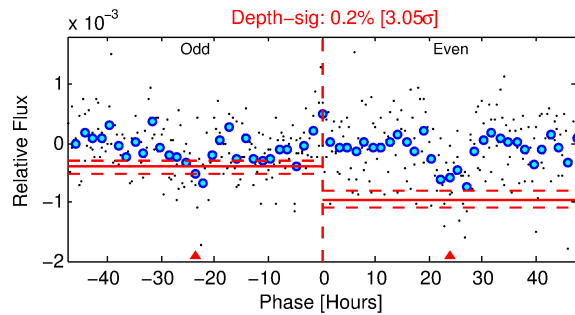
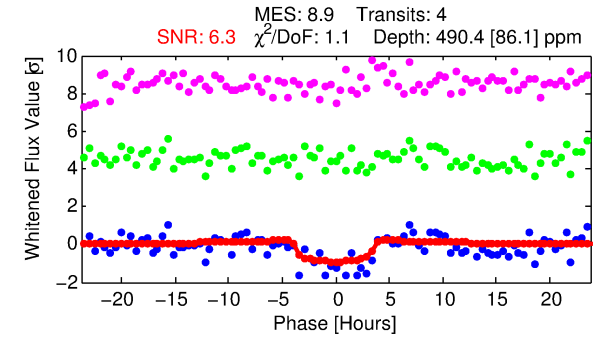
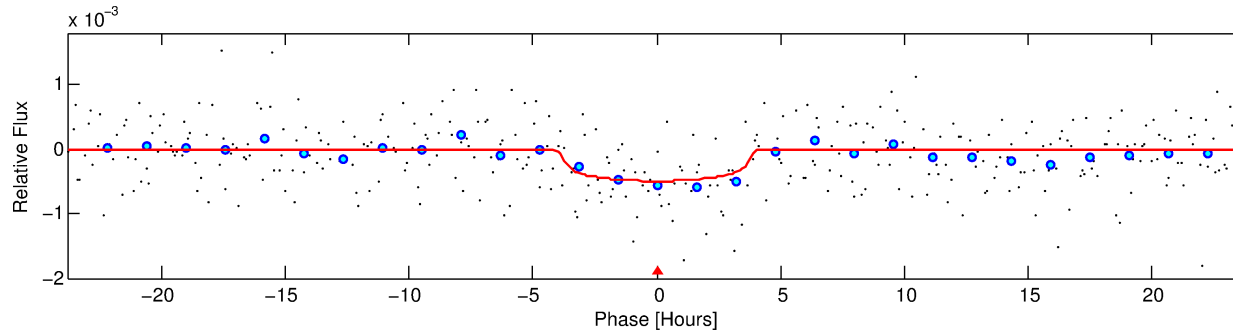
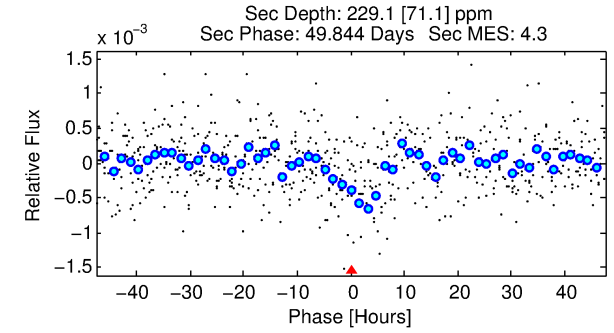
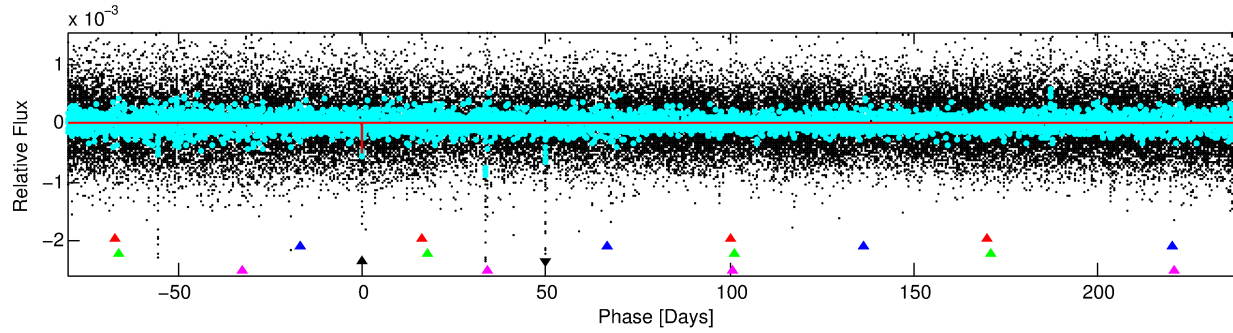
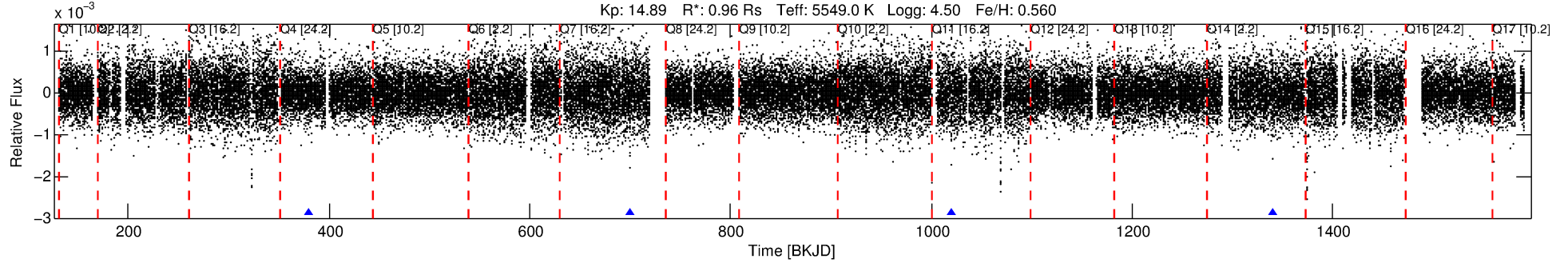
No Significant Match Found

# DV One-Page Summary

KIC: 3955866 Candidate: 4 of 5 Period: 320.315 d

KOI: K03897 Corr: No Ephemeris Match

Kp: 14.89 R\*: 0.96 Rs Teff: 5549.0 K Logg: 4.50 Fe/H: 0.560



## DV Fit Results:

Period = 320.31547 [0.00995] d  
Epoch = 379.1252 [0.0198] BKJD  
Rp/R\* = 0.0223 [0.0182]  
a/R\* = 206.92 [651.62]  
b = 0.77 [1.69]  
Seff = 0.90 [0.28]  
Teq = 248 [19] K  
Rp = 2.34 [1.98] Re  
a = 0.9371 [0.1768] AU  
Ag = 20142.48 [33911.65] [0.59σ]  
Teff = 4573 [1903] K [2.27σ]

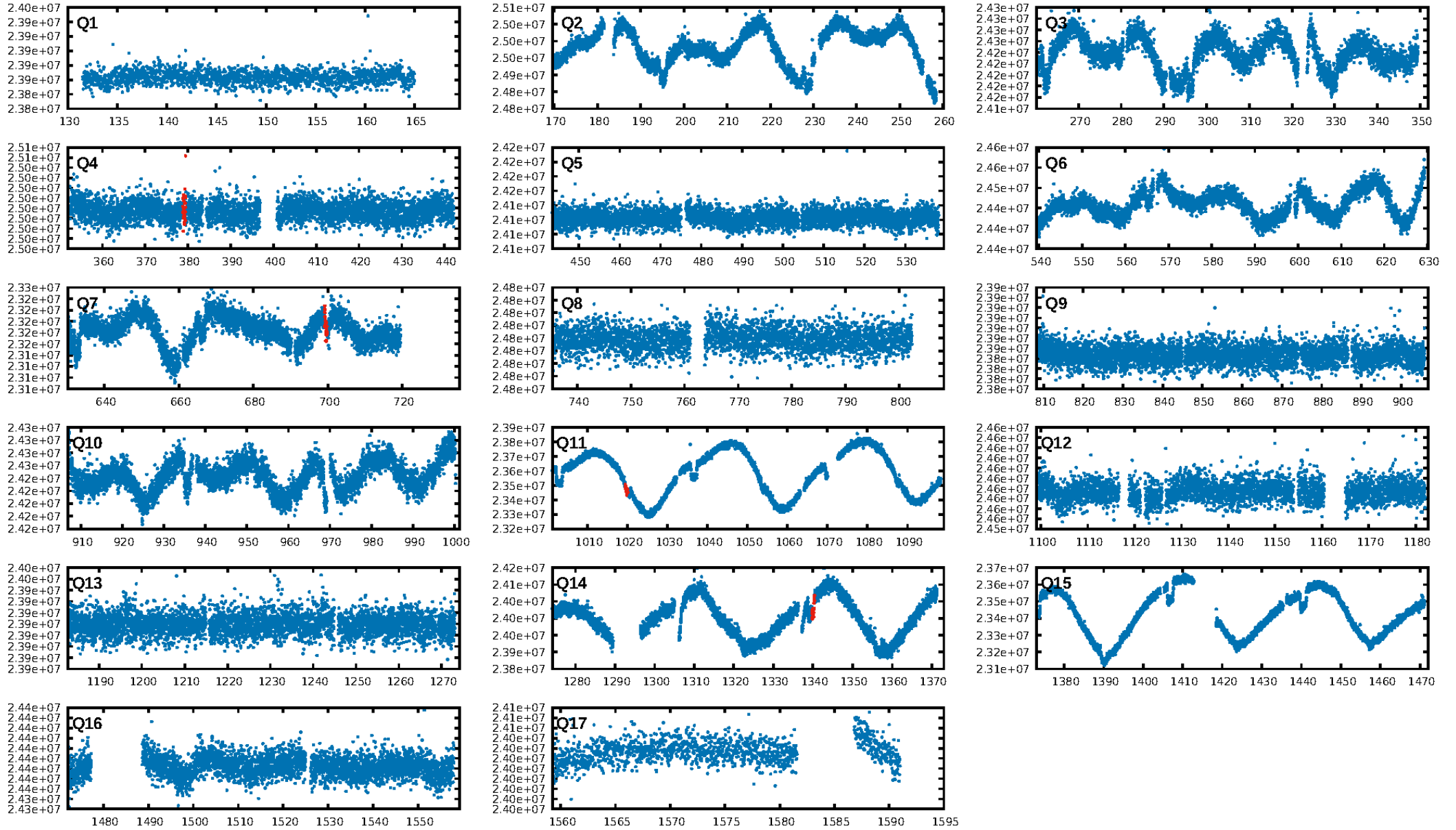
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [58.82σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGoF-sig: 94.5%  
Bootstrap-pfa: 1.84e-13  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.01035  
Centroid-sig: N/A  
Centroid-so: 6.510 arcsec [1.88σ]  
OotOffset-rm: 10.853 arcsec [3.50σ]  
KicOffset-rm: 10.875 arcsec [4.67σ]  
OotOffset-st: 1/2/1/0 [4]  
KicOffset-st: 1/2/1/0 [4]  
DiffImageQuality-fgm: 0.75 [3/4]  
DiffImageOverlap-fno: 1.00 [4/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:57:13 Z

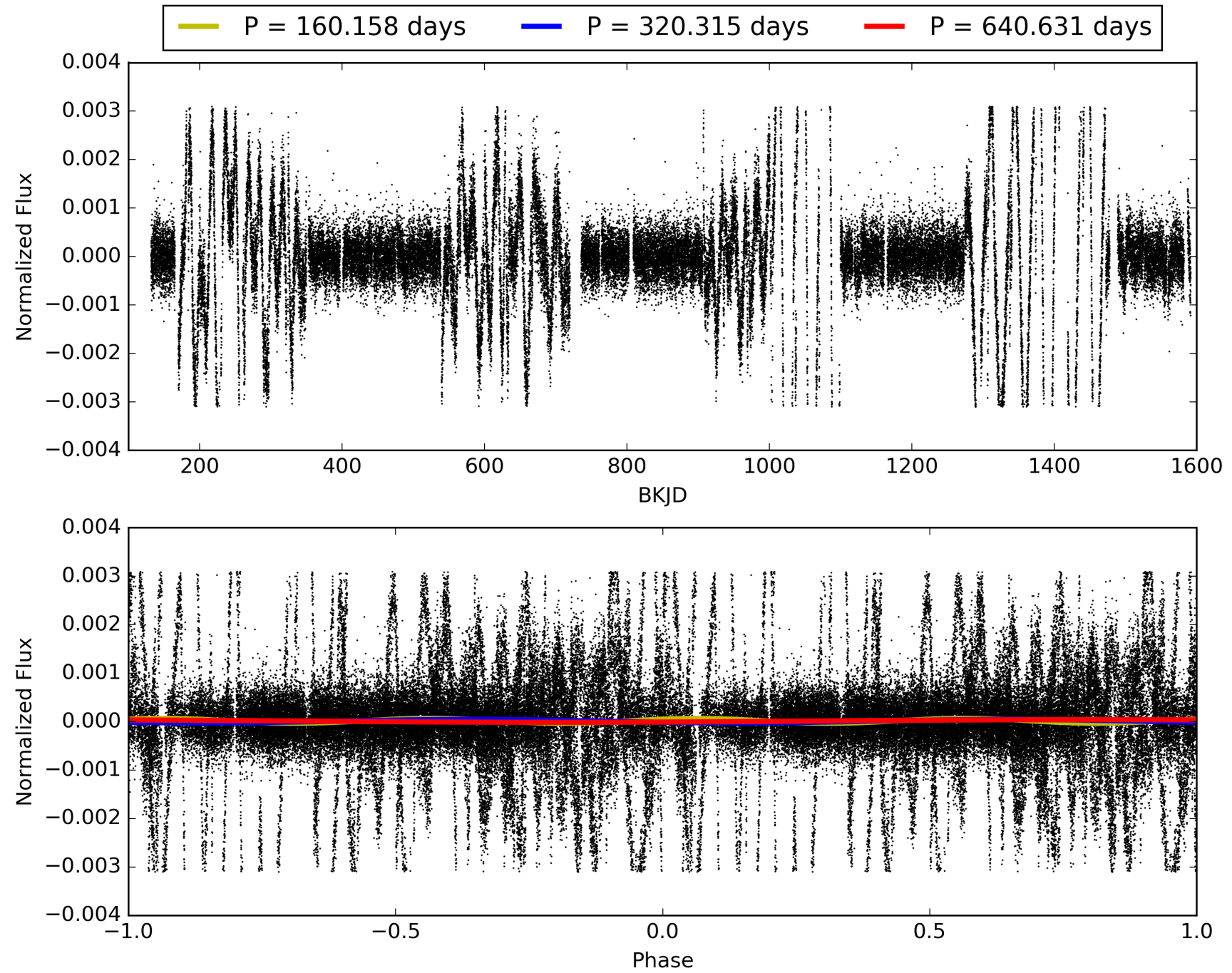
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003955866-04, PDC Light Curves





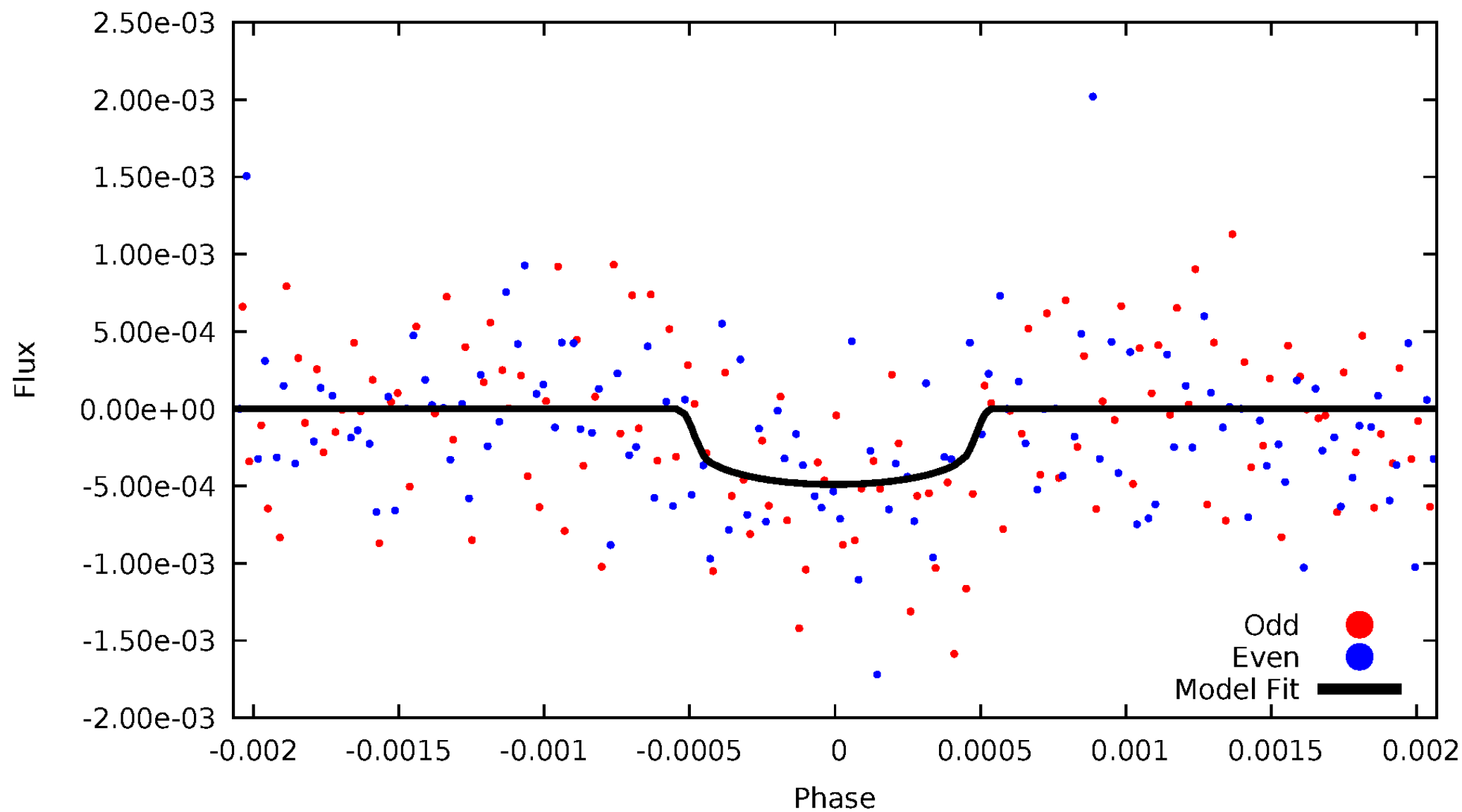
TCE 003955866-04





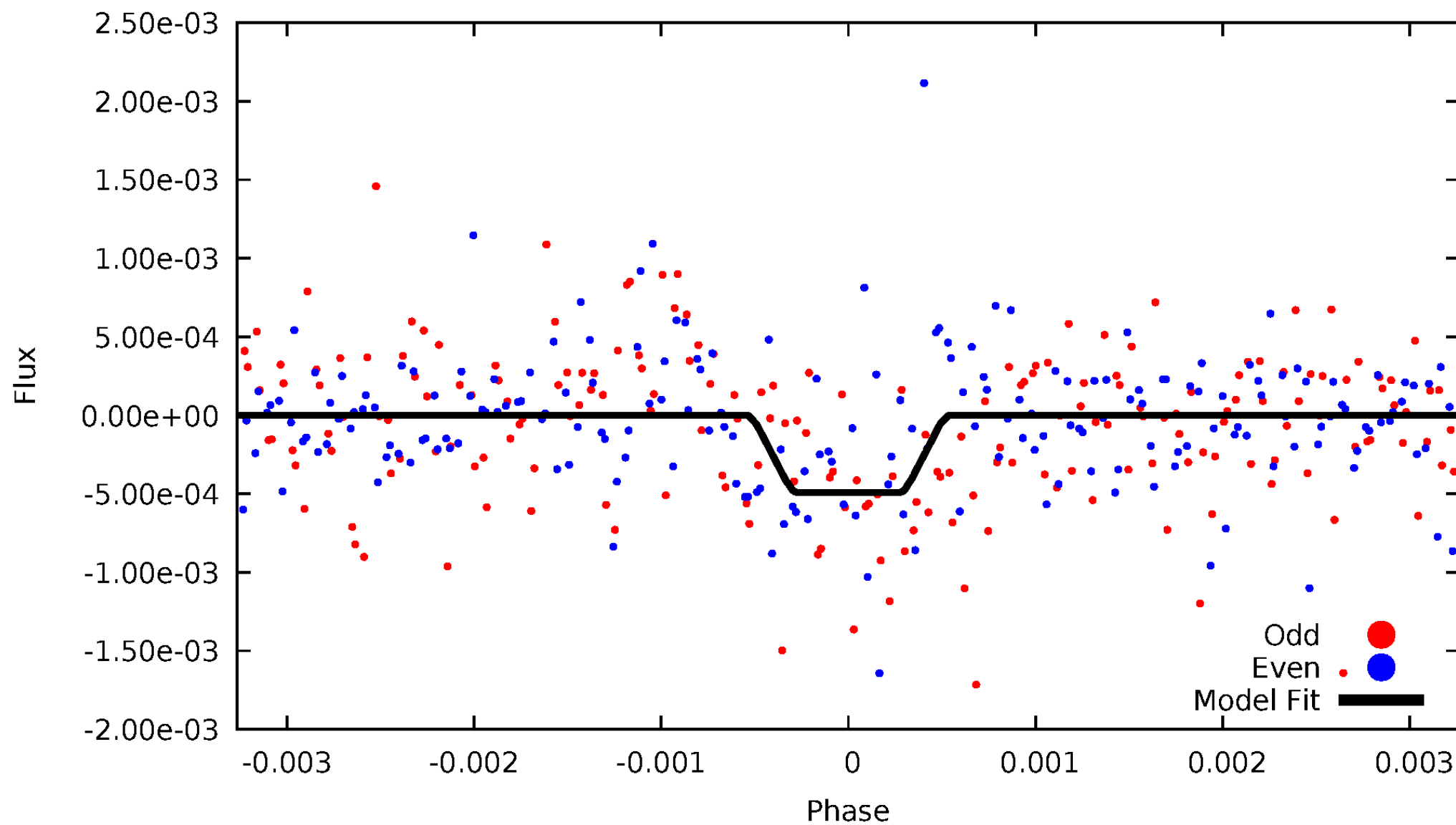
# DV Odd/Even

TCE 003955866-04



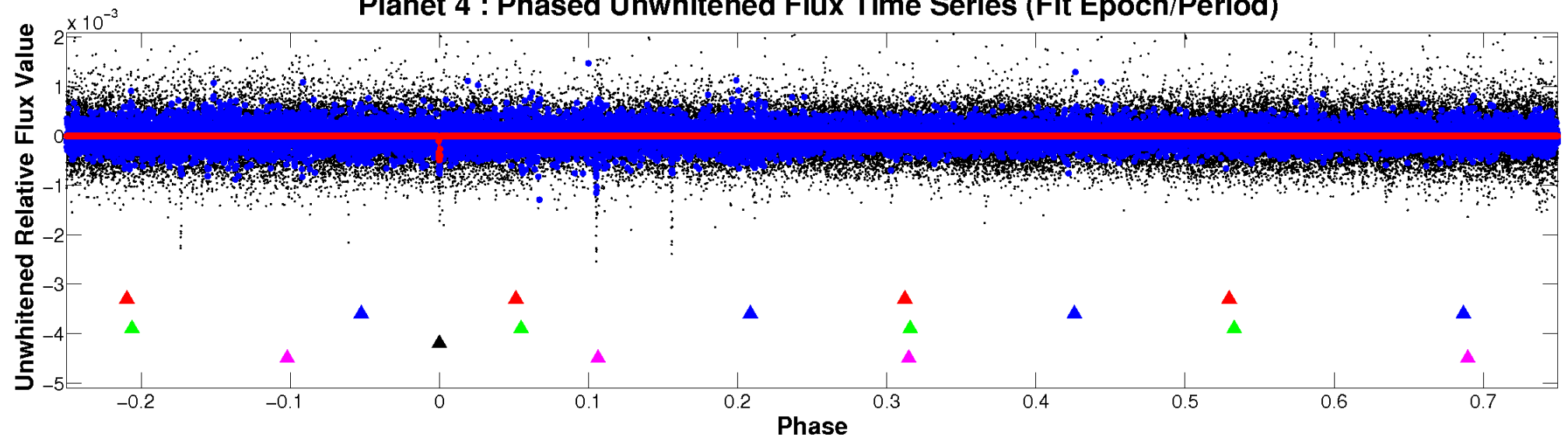
# ALT Odd/Even

TCE 003955866-04

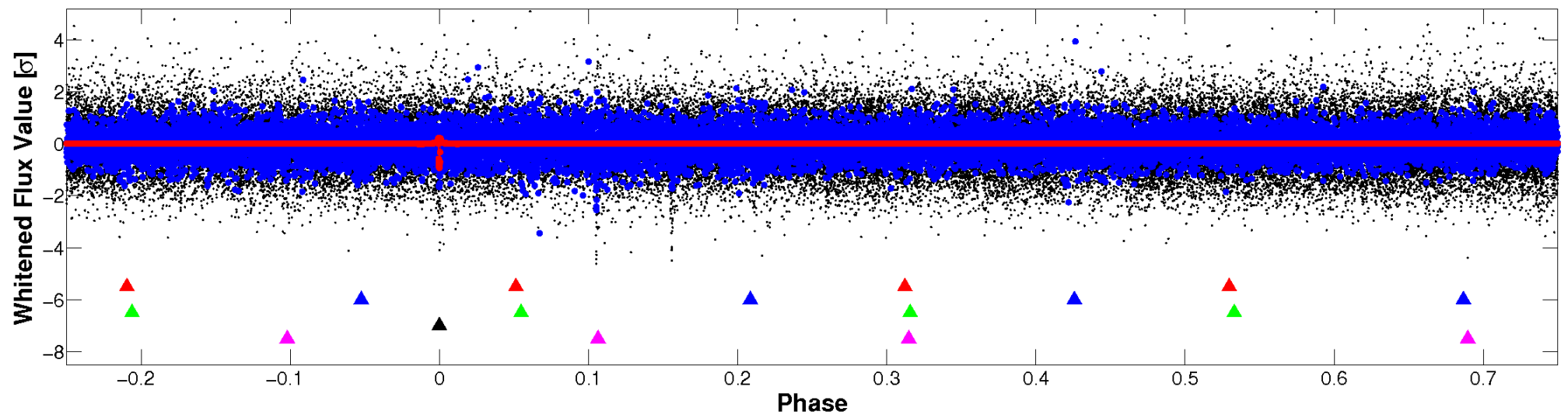


# Non-Whitened Vs. Whitened Light Curve

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

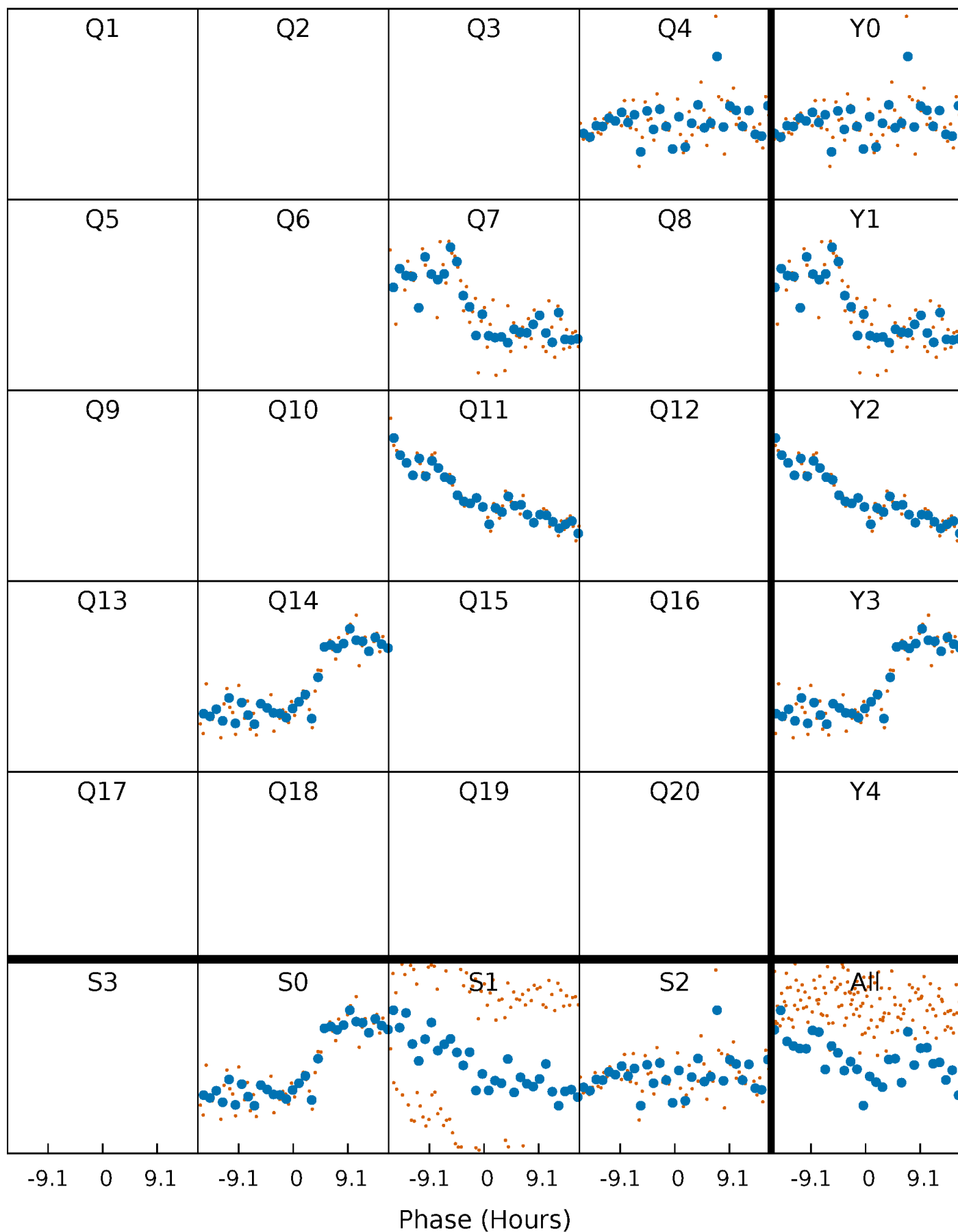


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



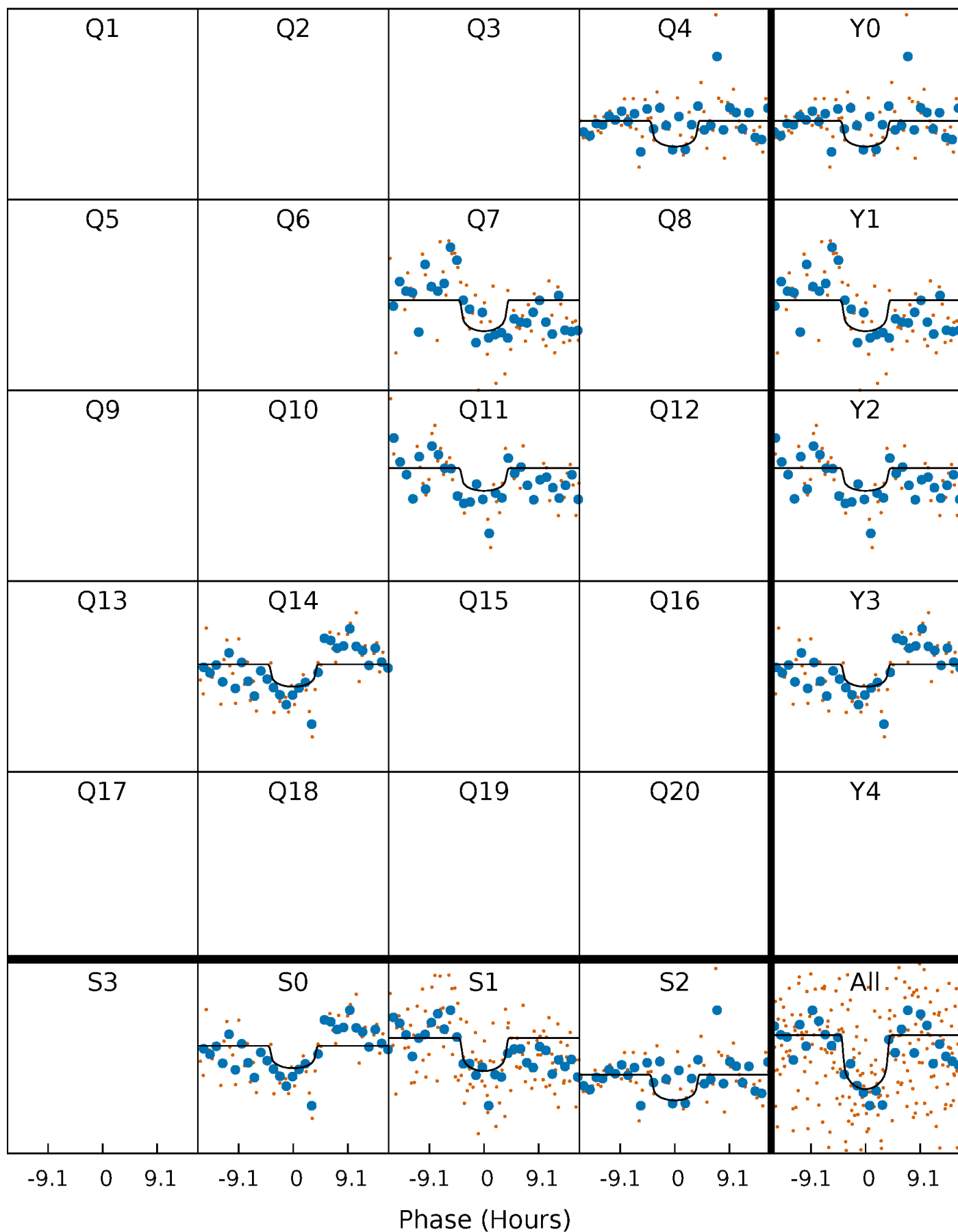
# PDC Quarter-Phased Transit Curves

TCE 003955866-04     $P=320.315468$  Days     $T_0=379.125188$  (BKJD)



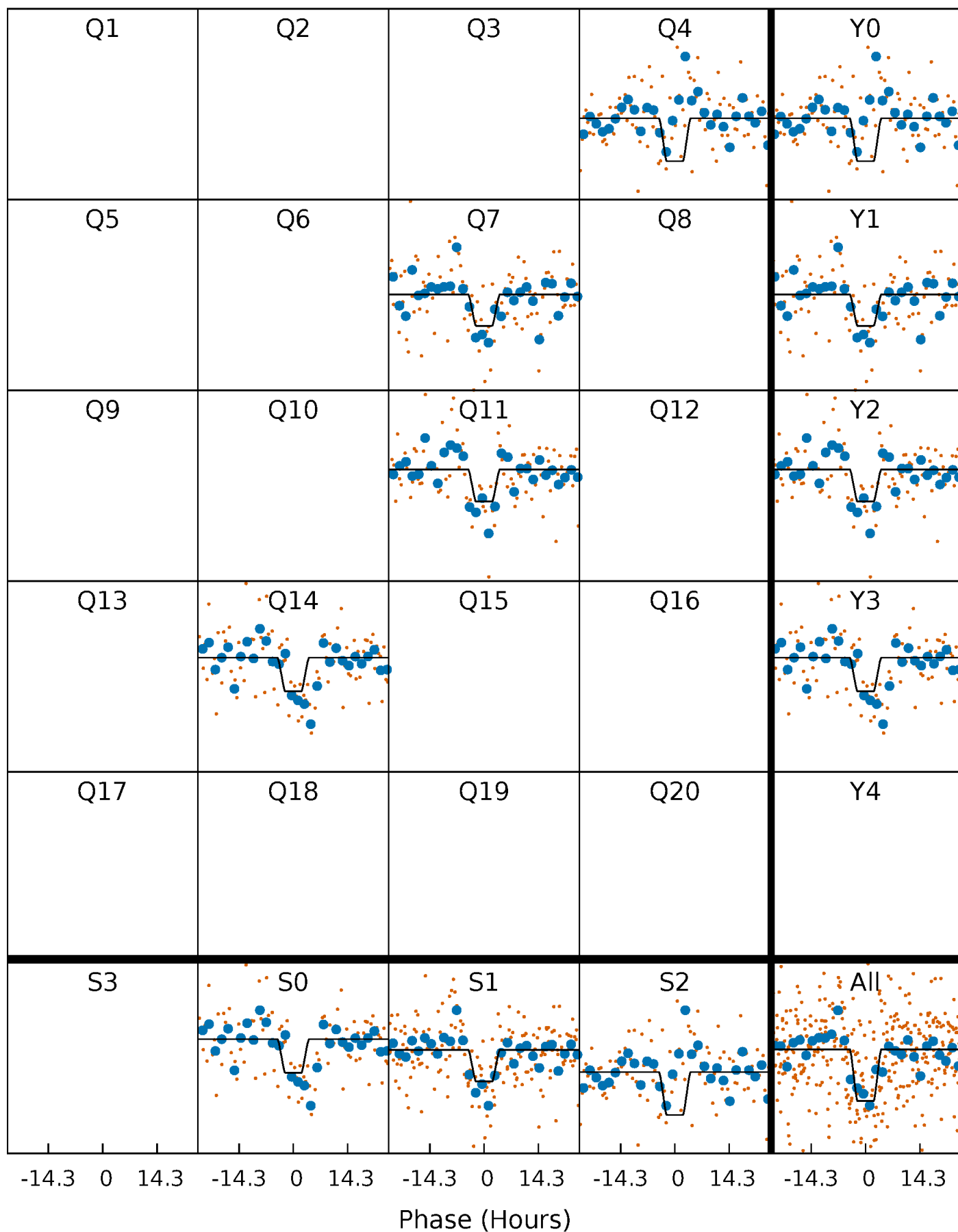
# DV Quarter-Phased Transit Curves

TCE 003955866-04 P=320.315468 Days  $T_0=379.125188$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

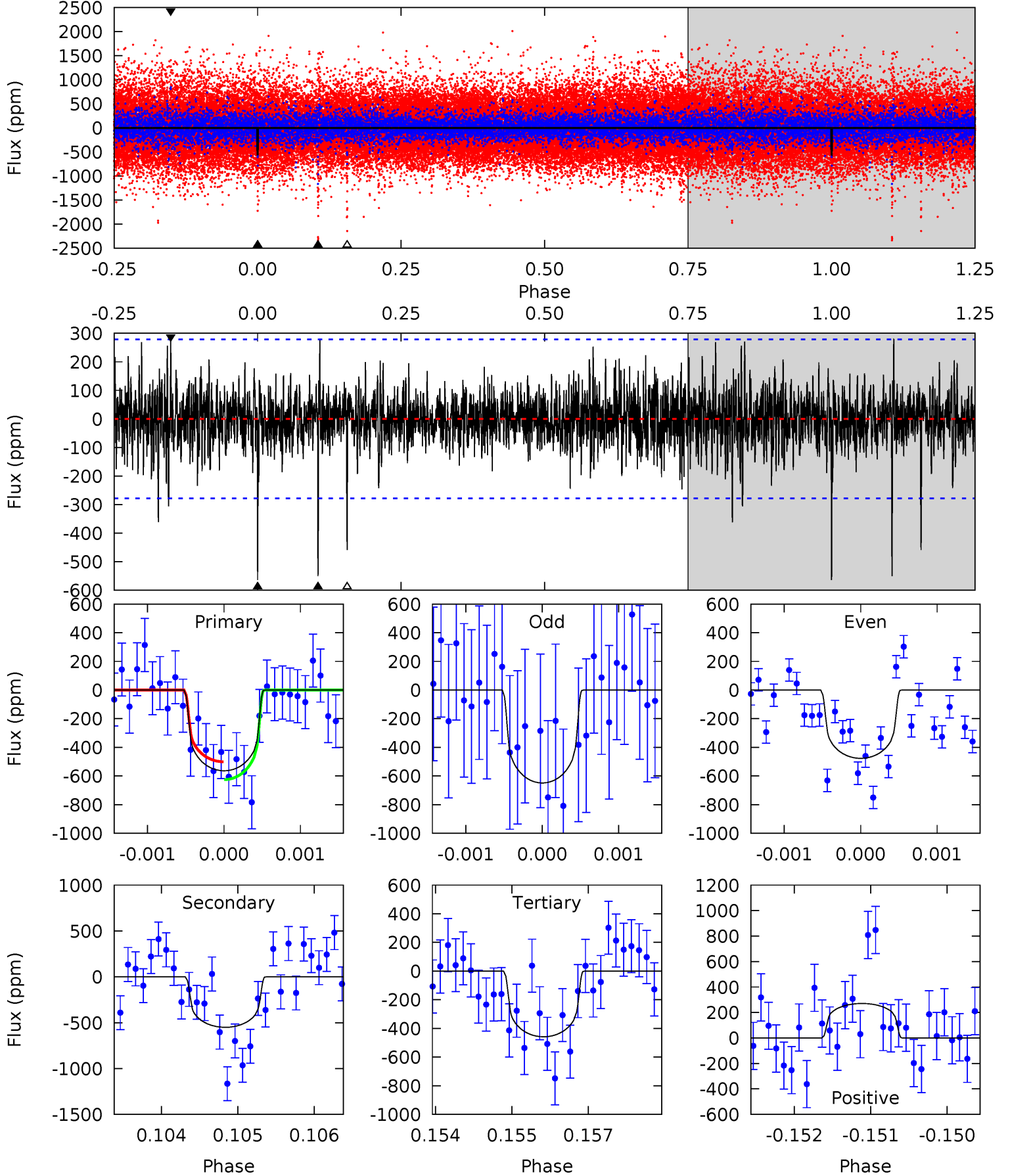
TCE 003955866-04 P=320.234752 Days  $T_0=379.279793$  (BKJD)



# DV Model-Shift Uniqueness Test

003955866-04,  $P = 320.315468$  Days,  $E = 58.809720$  Days

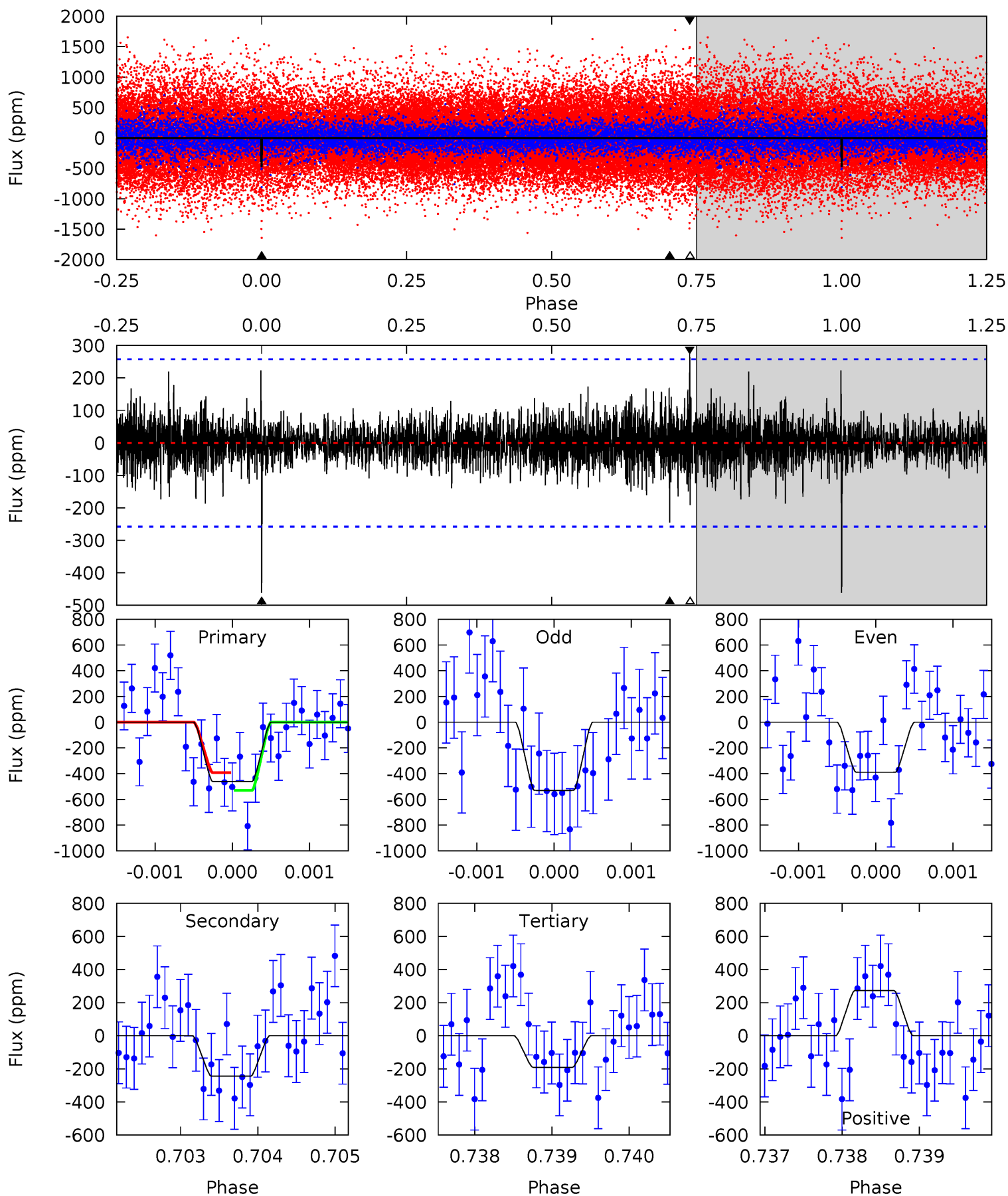
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.0	10.8	8.96	5.30	5.44	3.28	1.38	2.06	5.73	1.80	5.47	1.68	0.88	0.33	1.22



# Alt Model-Shift Uniqueness Test

003955866-04, P = 320.234752 Days, E = 59.045041 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.73	5.16	4.03	5.76	5.44	3.27	1.01	5.71	3.98	1.13	-0.60	1.48	0.80	0.37	1.46





### Stellar Parameters For KIC 003955866

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5549^{+166}_{-183}$	$4.499^{+0.040}_{-0.160}$	$0.560^{+0.050}_{-0.300}$	$0.964^{+0.207}_{-0.089}$	$1.070^{+0.075}_{-0.123}$	$1.681^{+0.349}_{-0.726}$
	+3%/-3%	+1%/-4%	+9%/-54%	+21%/-9%	+7%/-11%	+21%/-43%
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 003955866-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-550 \pm 51$	$2.65^{+1.83}_{-1.50}$	$353^{+19}_{-15}$	$5450^{+2933}_{-1131}$	$35254^{+157841}_{-22634}$
Alt.	$-245 \pm 47$	$2.61^{+1.93}_{-1.58}$	$354^{+19}_{-16}$	$4602^{+2359}_{-803}$	$16643^{+92761}_{-11067}$

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

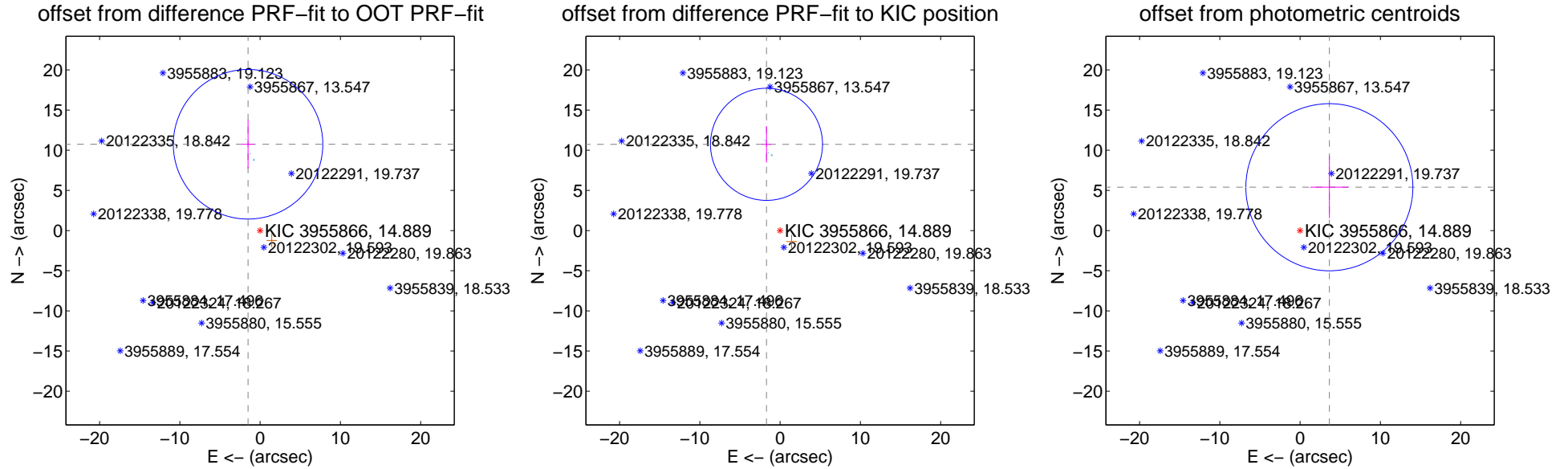
## DV Centroid Data

Supplemental centroid analysis for 003955866-04. Kepler magnitude: 14.89. Transit SNR 6.34

There are 3 quarters with good PRF difference image offsets

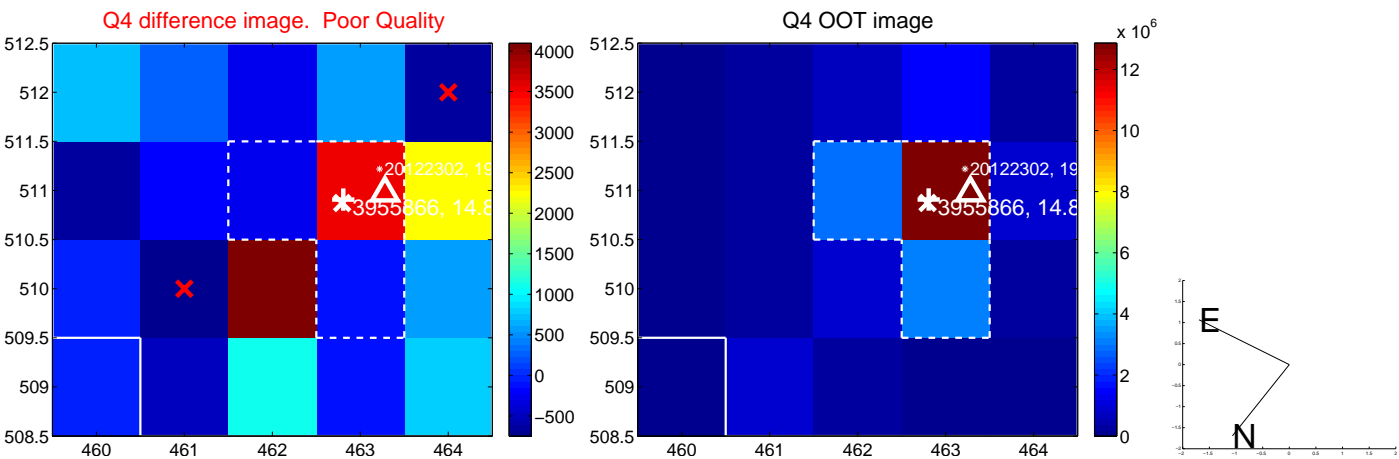
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>10.853 \pm 3.105</math></b>	<b>3.50</b>	$1.506 \pm 0.773$	$10.748 \pm 3.028$
PRF-fit source offset from KIC position	<b><math>10.875 \pm 2.327</math></b>	<b>4.67</b>	$1.698 \pm 0.572$	$10.742 \pm 2.267$
photometric centroid source offset	$6.51 \pm 3.47$	1.88	$-3.64 \pm 2.39$	$5.40 \pm 3.86$

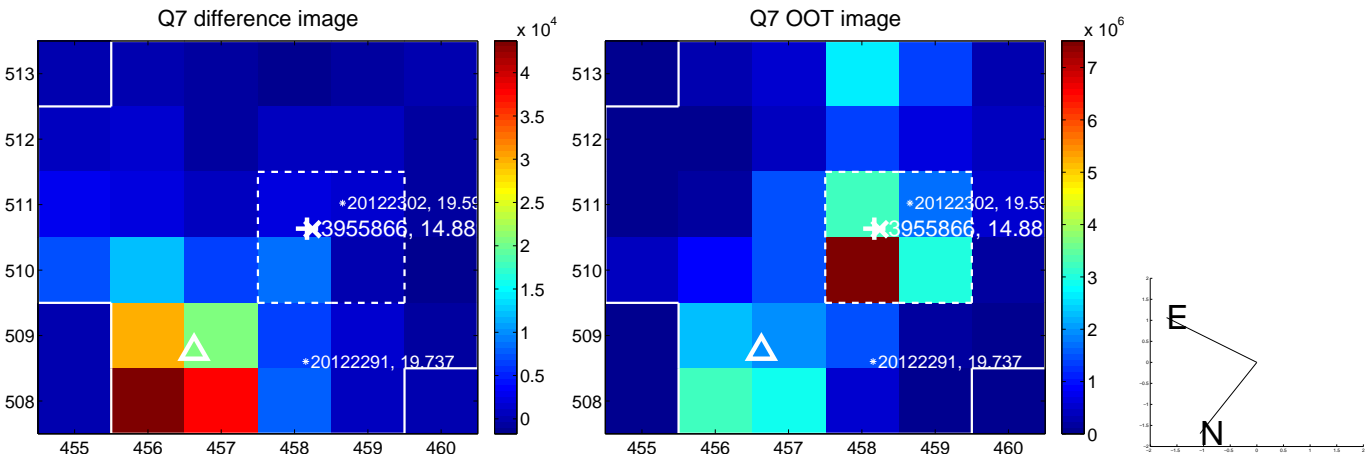


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

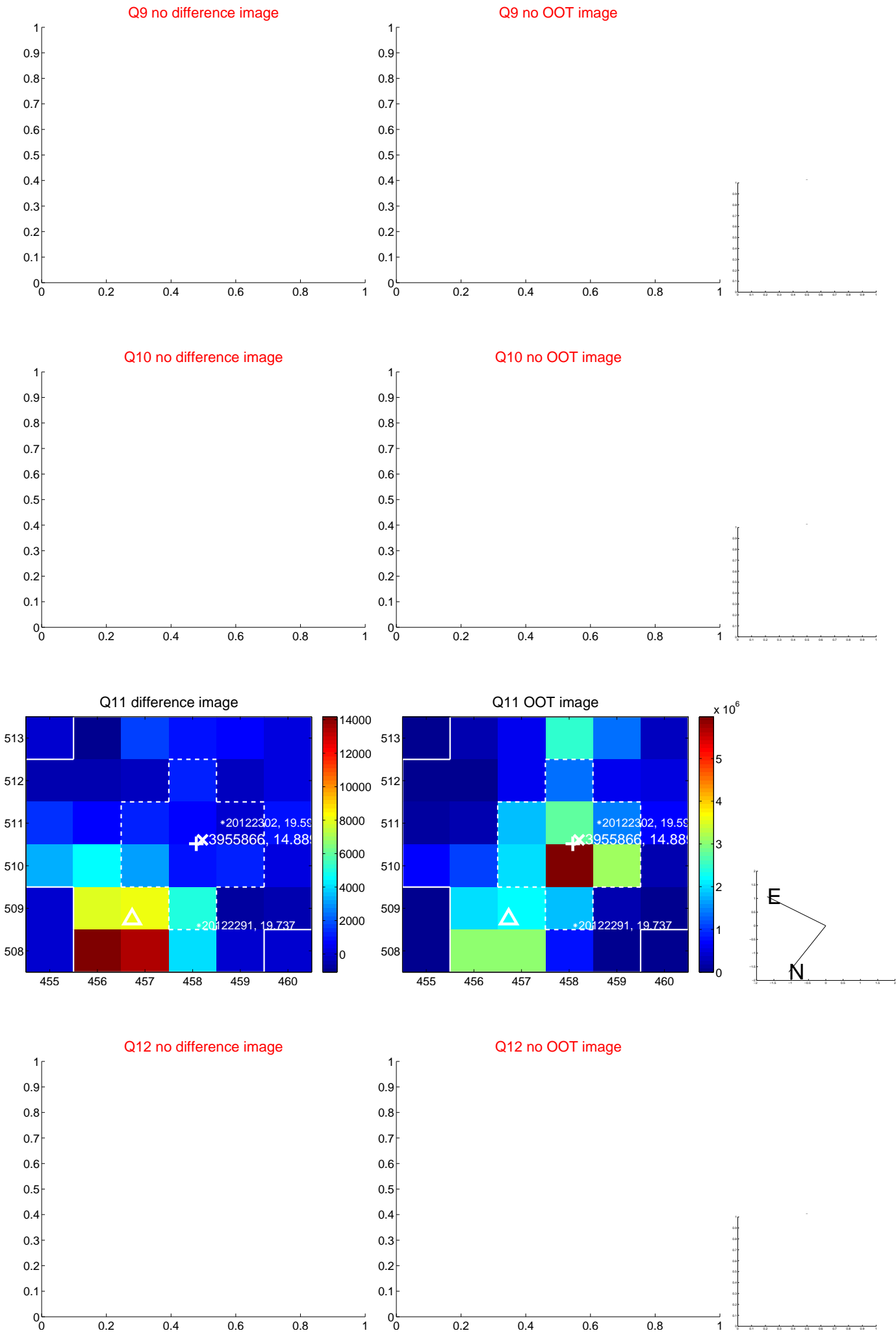
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



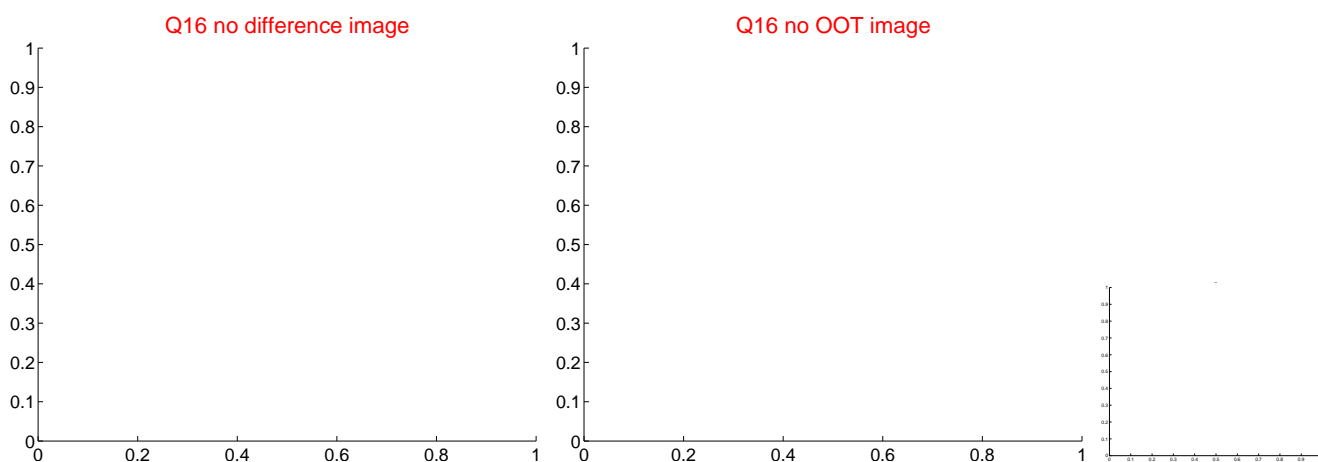
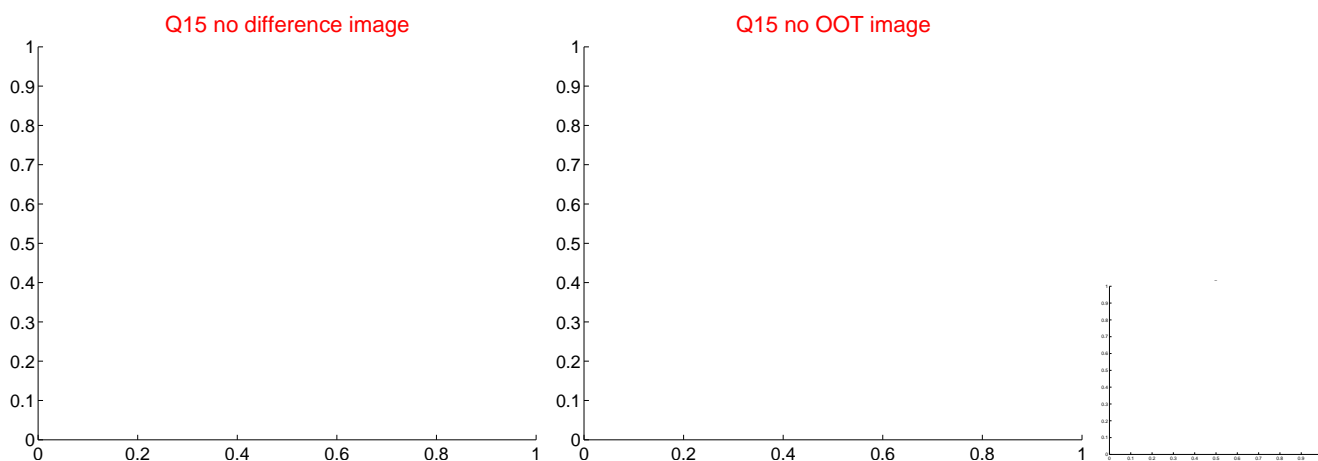
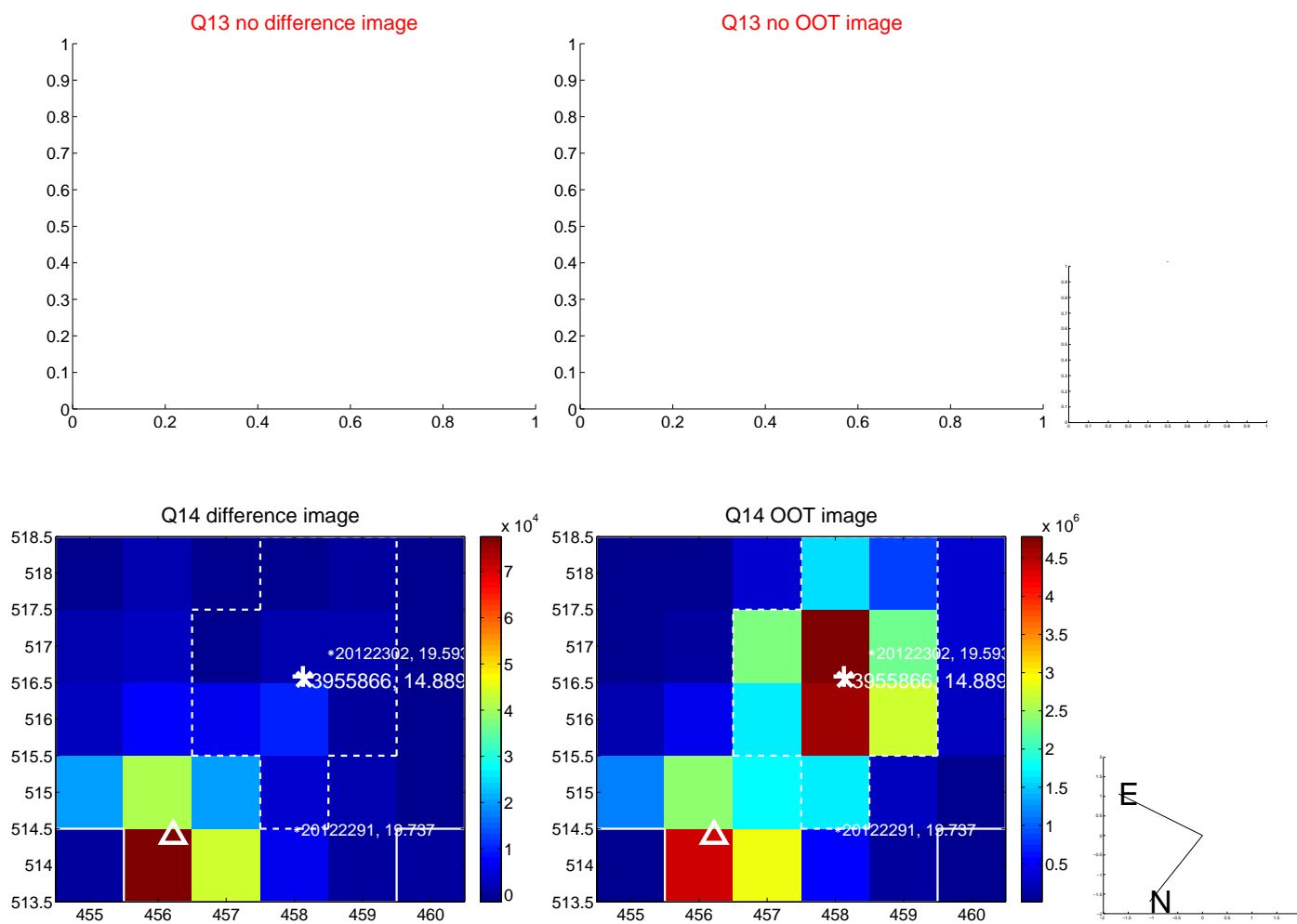
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



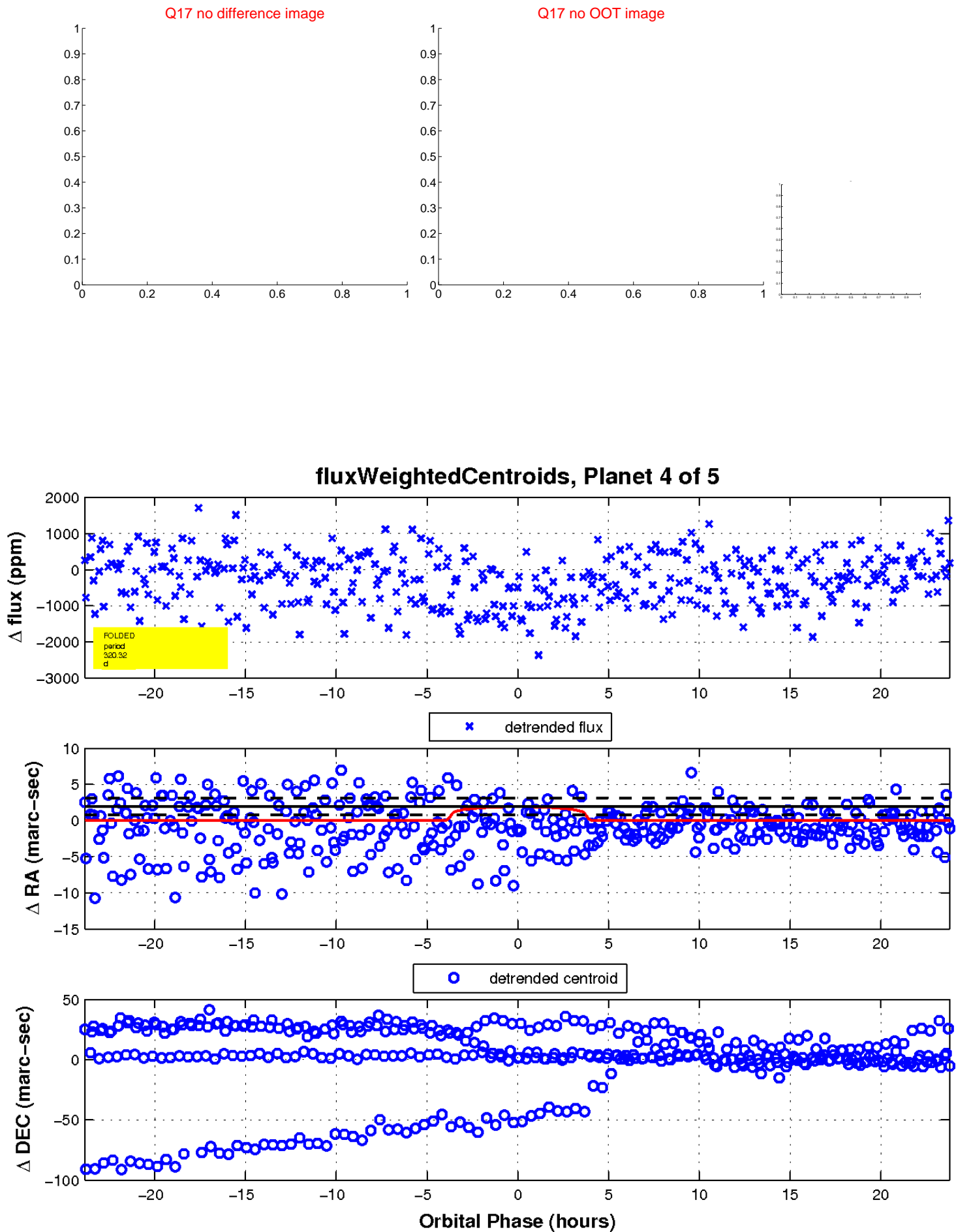
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

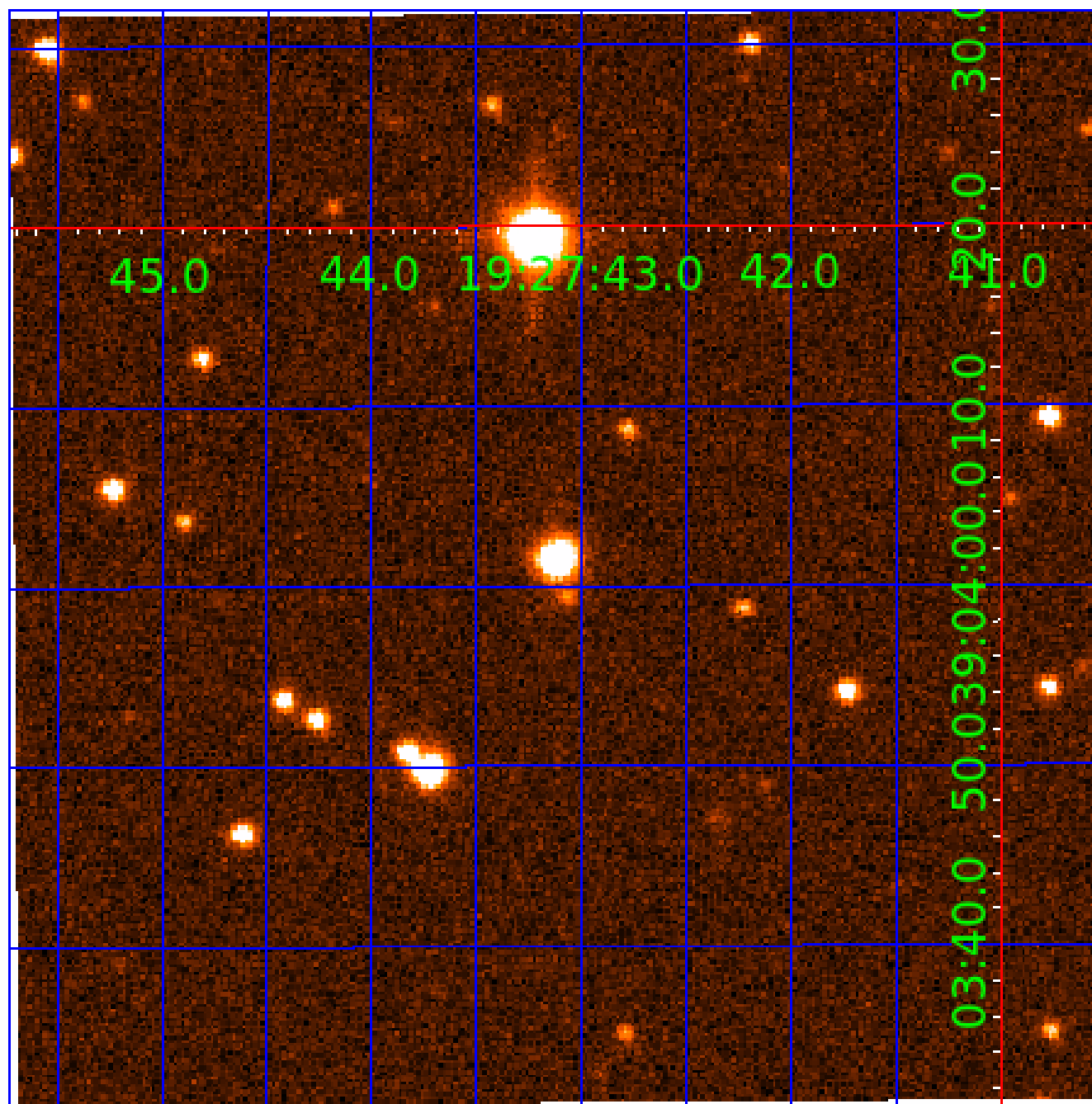


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 003955866

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003955866-01	OBS	No	403.866720	228.467027	1579.9	17.537	16.8	17.0	0.96	5549	4.44	0.66
003955866-02	OBS	No	403.887754	195.205361	3472.0	40.262	17.1	34.3	0.96	5549	5.96	0.66
003955866-03	OBS	No	403.887704	229.536416	2783.0	5.745	15.5	17.6	0.96	5549	9.50	0.66
003955866-04	OBS	No	320.315468	379.125188	490.4	7.950	8.9	6.3	0.96	5549	2.34	0.90
003955866-05	OBS	No	387.063656	279.711601	986.2	26.047	8.1	9.3	0.96	5549	3.62	0.70

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003955866-01	OBS	FP	0.00	1	0	1	0	LPP_DV—ALL_TRANS_CHASES—CENT_RESOLVED_OFFSET
003955866-02	OBS	FP	0.00	1	0	0	0	ALL_TRANS_CHASES—SAME_NTL_PERIOD—CENT_FEW_DIFFS
003955866-03	OBS	FP	0.00	1	0	0	1	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_FEW_DIFFS—EPHEM_MATCH
003955866-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
003955866-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—ALL_TRANS_CHASES—CENT_FEW_DIFFS

**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 003955866-05

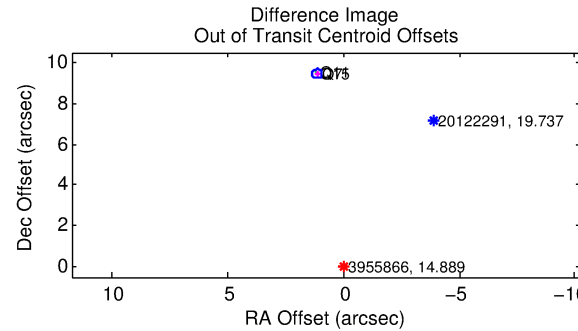
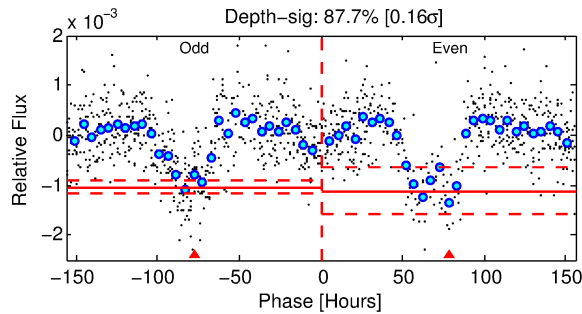
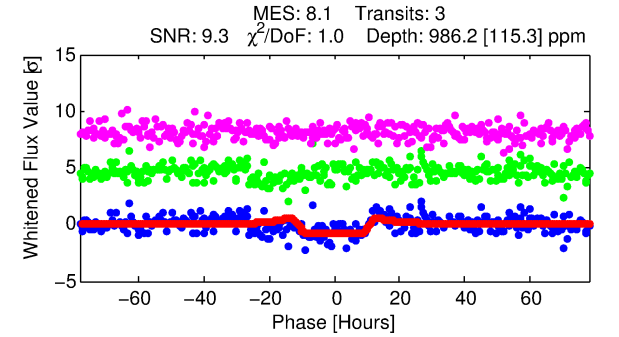
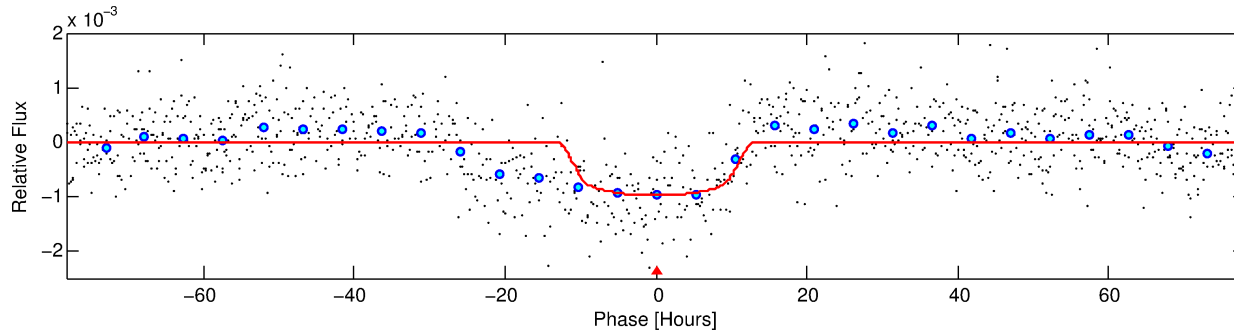
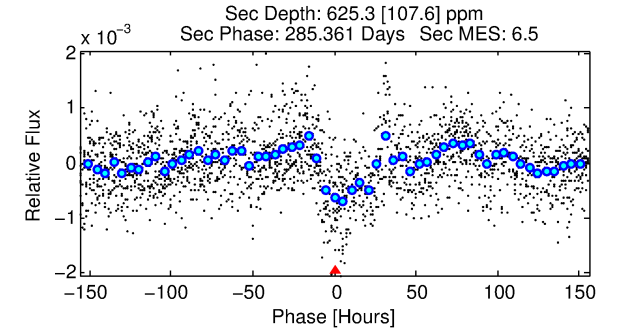
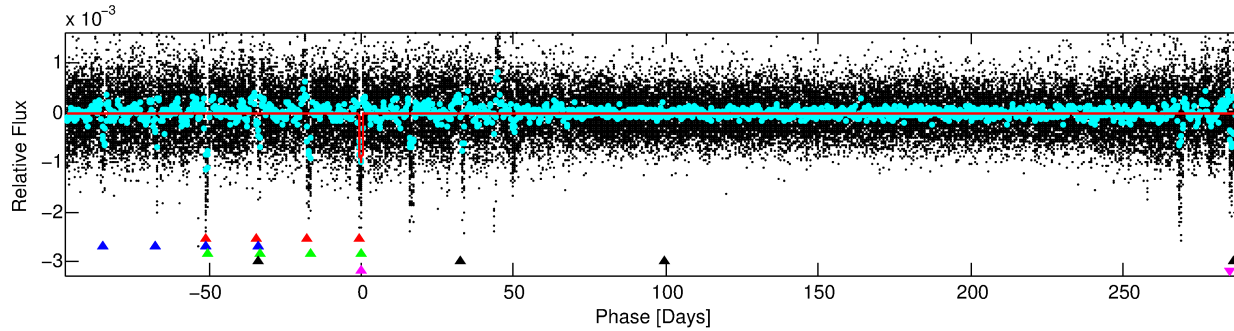
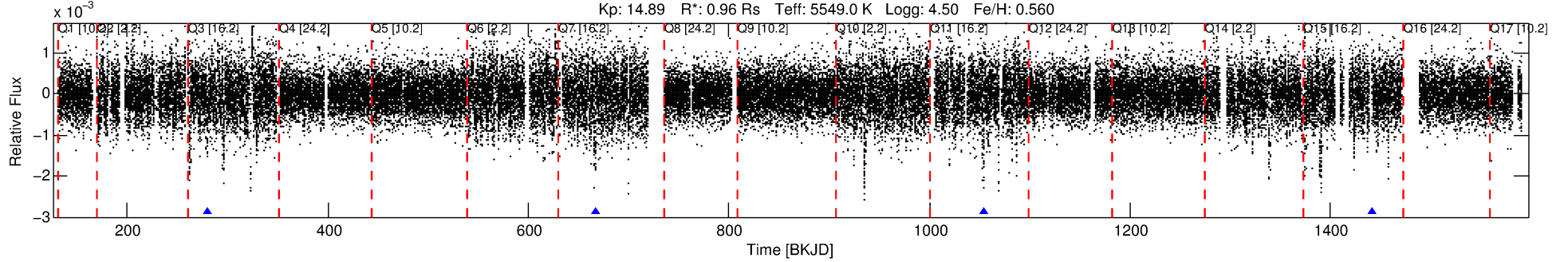
No Significant Match Found

# DV One-Page Summary

KIC: 3955866 Candidate: 5 of 5 Period: 387.064 d

KOI: K03897 Corr: No Ephemeris Match

Kp: 14.89 R\*: 0.96 Rs Teff: 5549.0 K Logg: 4.50 Fe/H: 0.560



## DV Fit Results:

Period = 387.06366 [0.02169] d  
Epoch = 279.7116 [0.0308] BKJD  
Rp/R\* = 0.0345 [0.0031]  
a/R\* = 59.29 [14.97]  
b = 0.89 [0.06]  
Seff = 0.70 [0.22]  
Teq = 233 [18] K  
Rp = 3.62 [0.85] Re  
a = 1.0632 [0.2005] AU  
Ag = 29595.88 [11223.30] [2.64σ]  
Teff = 4727 [335] K [13.39σ]

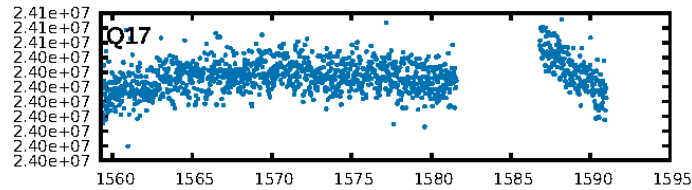
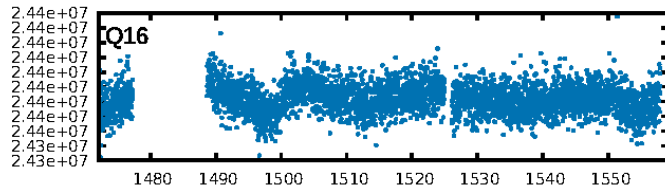
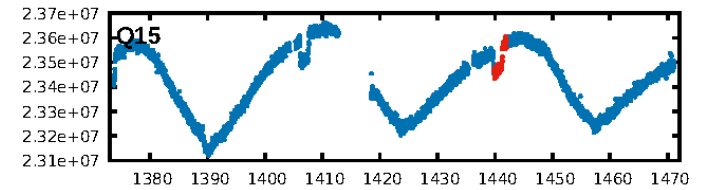
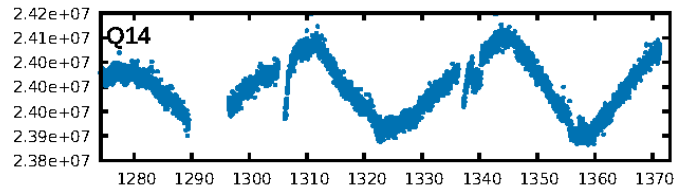
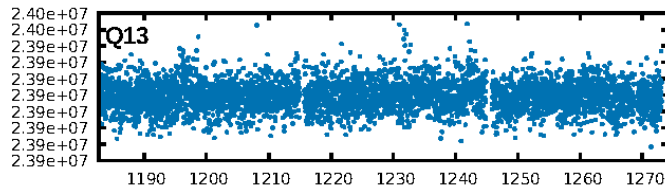
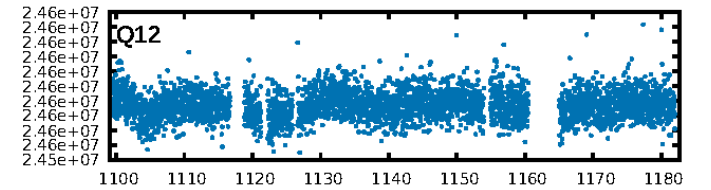
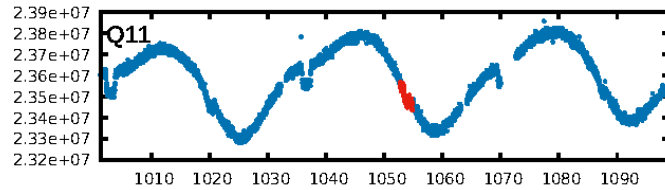
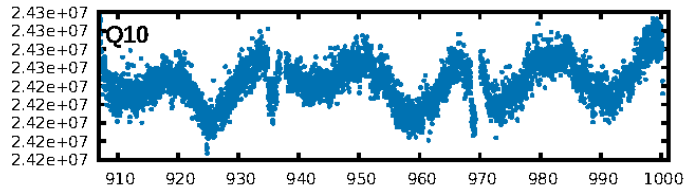
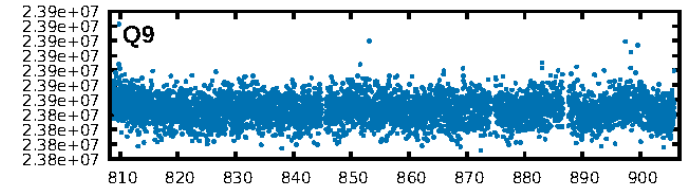
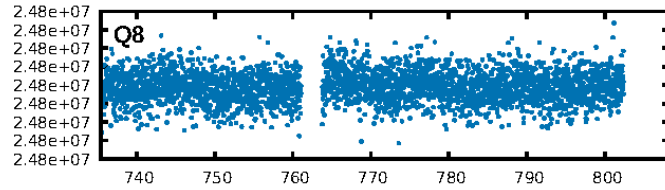
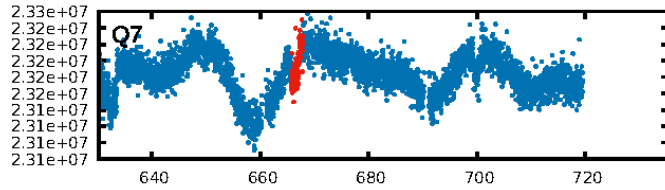
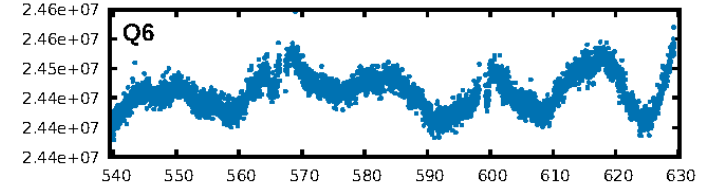
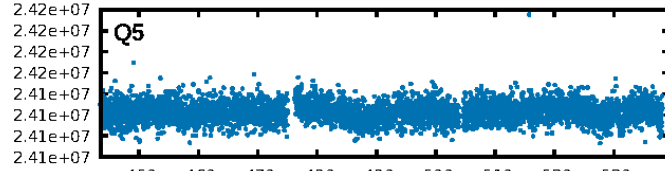
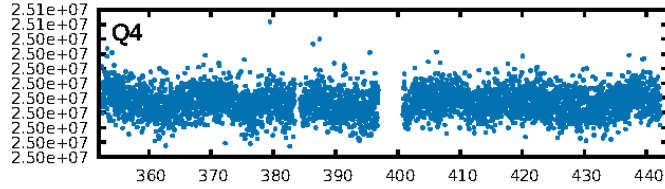
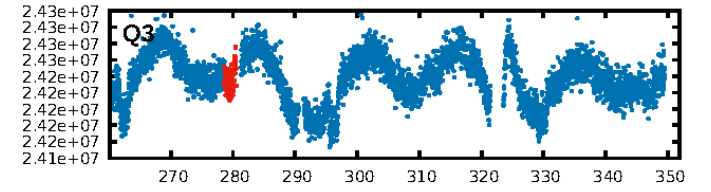
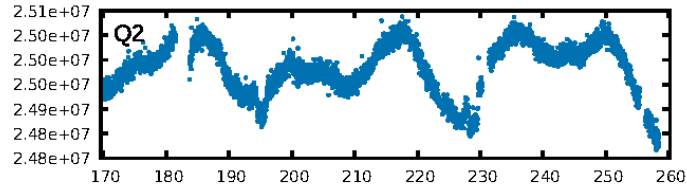
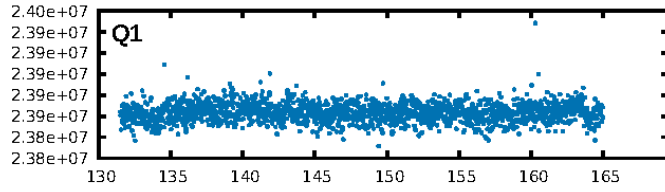
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [58.82σ]  
LongPeriod-sig: 100.0% [12.84σ]  
ModelChiSquare2-sig: 10.6%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 1.08e-07  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -0.3916  
Centroid-sig: N/A  
Centroid-so: 13.738 arcsec [2.03σ]  
OotOffset-rm: 9.529 arcsec [125.95σ]  
KicOffset-rm: 9.738 arcsec [139.06σ]  
OotOffset-st: 0/3/0/0 [3]  
KicOffset-st: 0/3/0/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.67 [2/3]

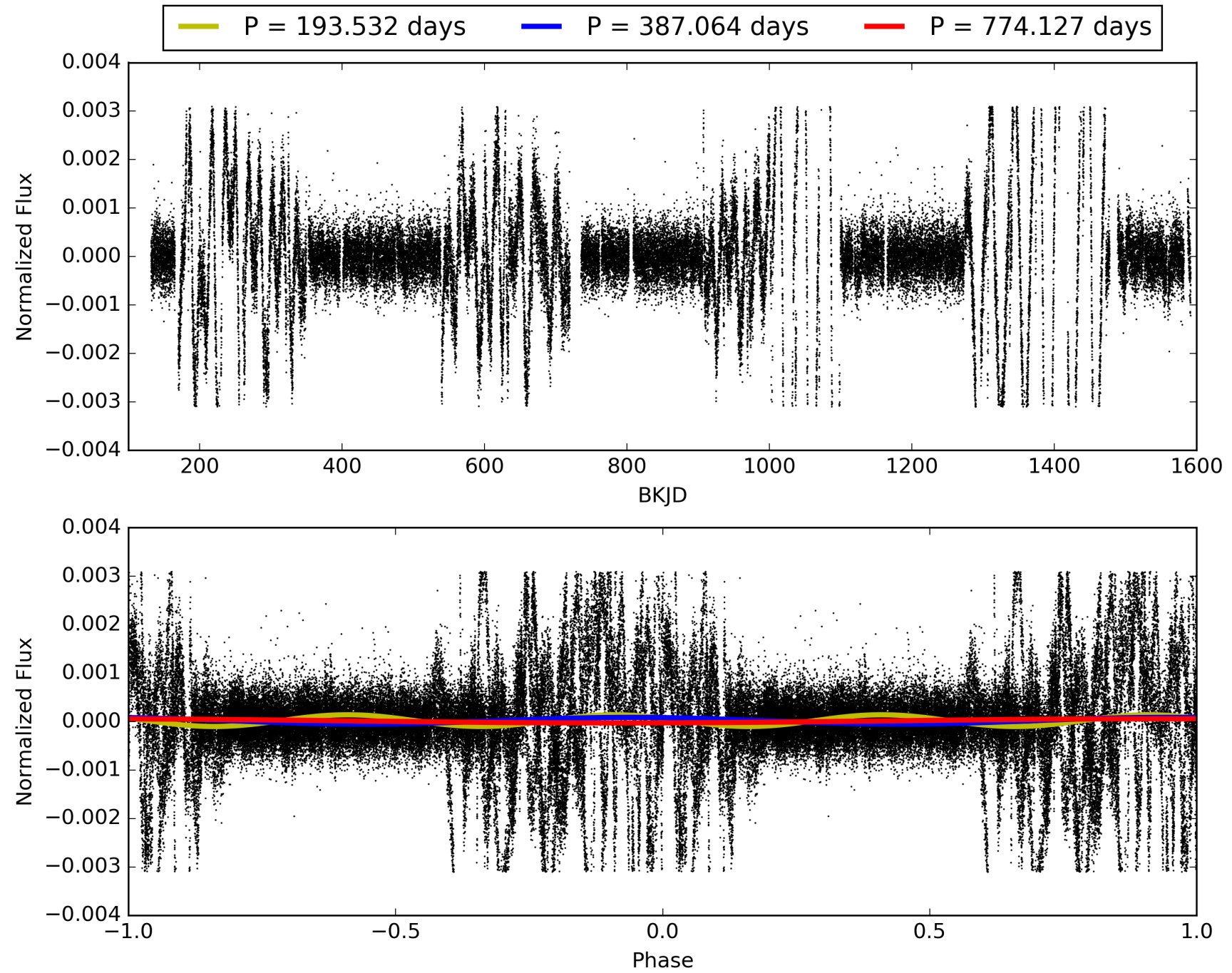
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 13:57:21 Z

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

# TCE 003955866-05, PDC Light Curves

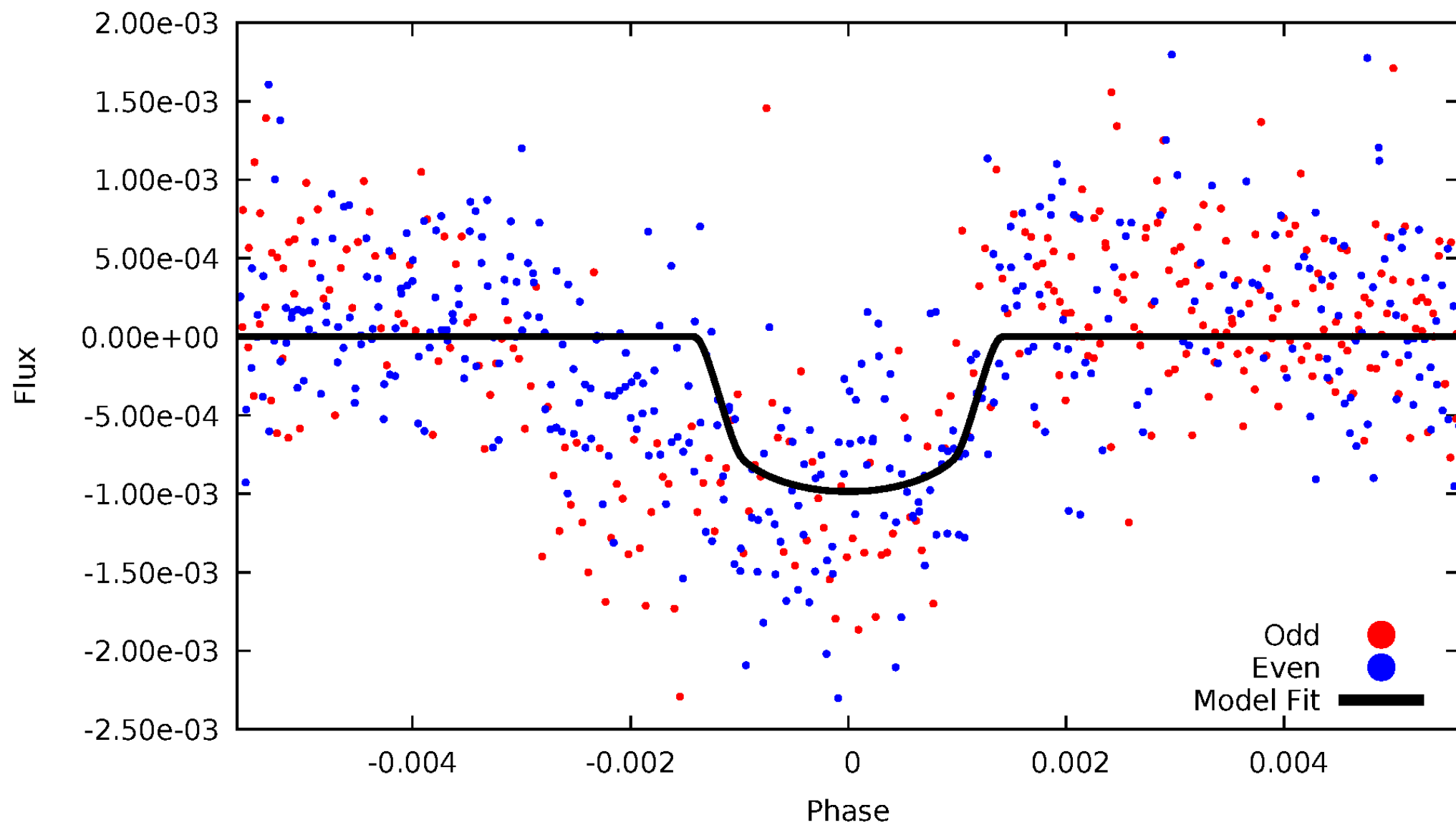


TCE 003955866-05



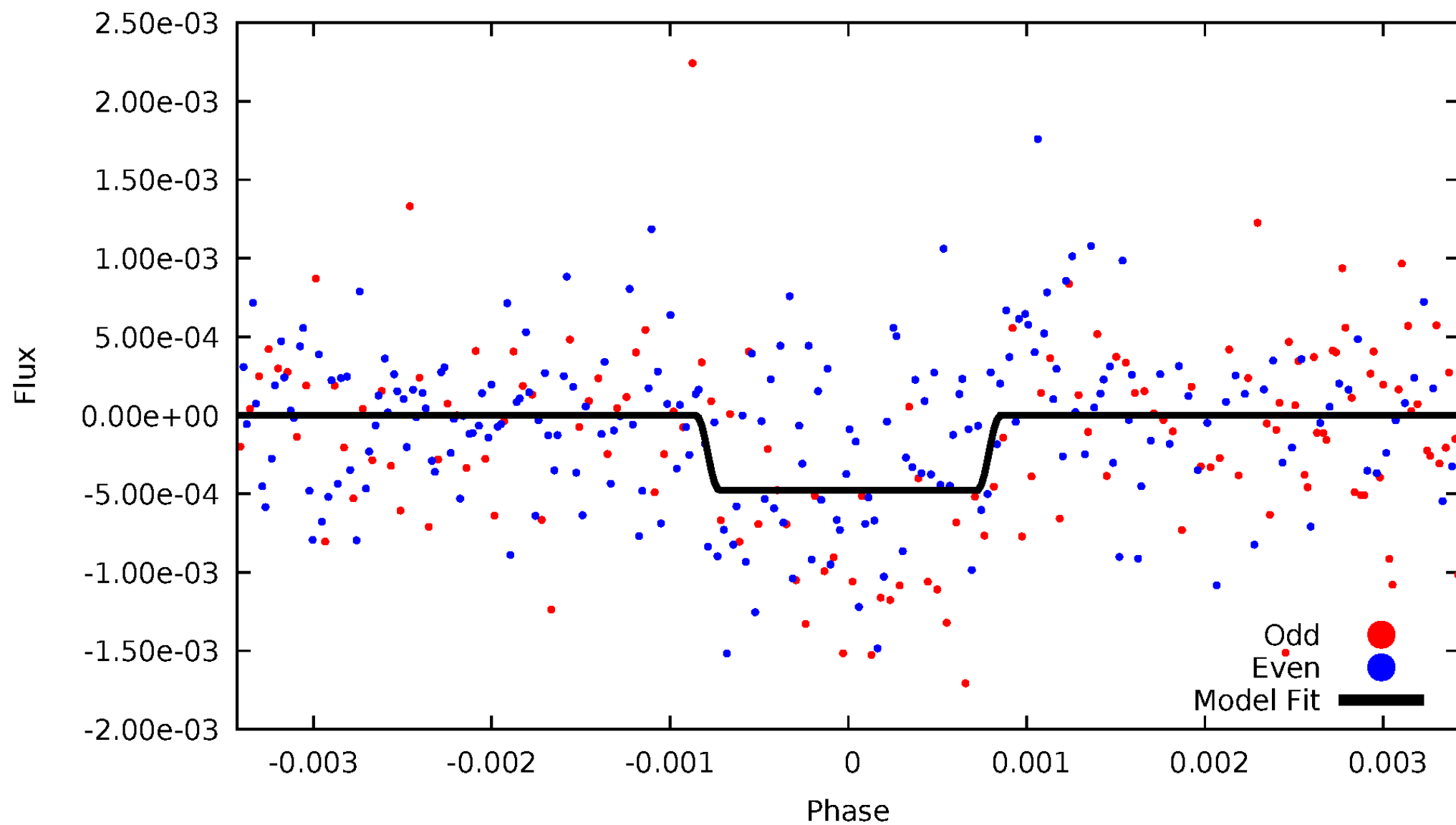
# DV Odd/Even

TCE 003955866-05



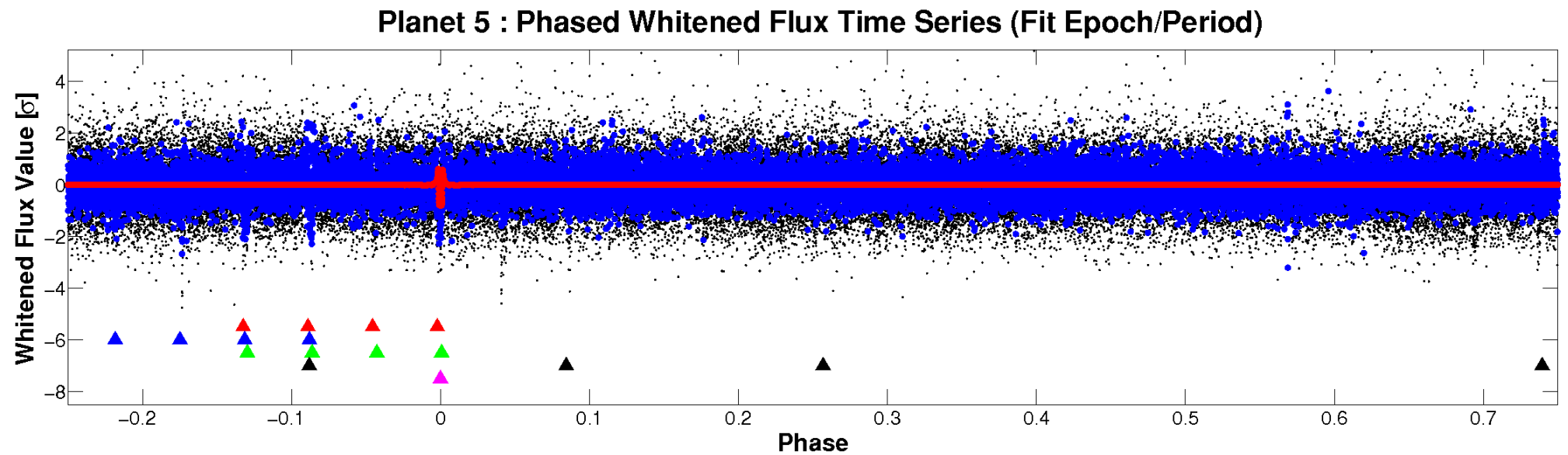
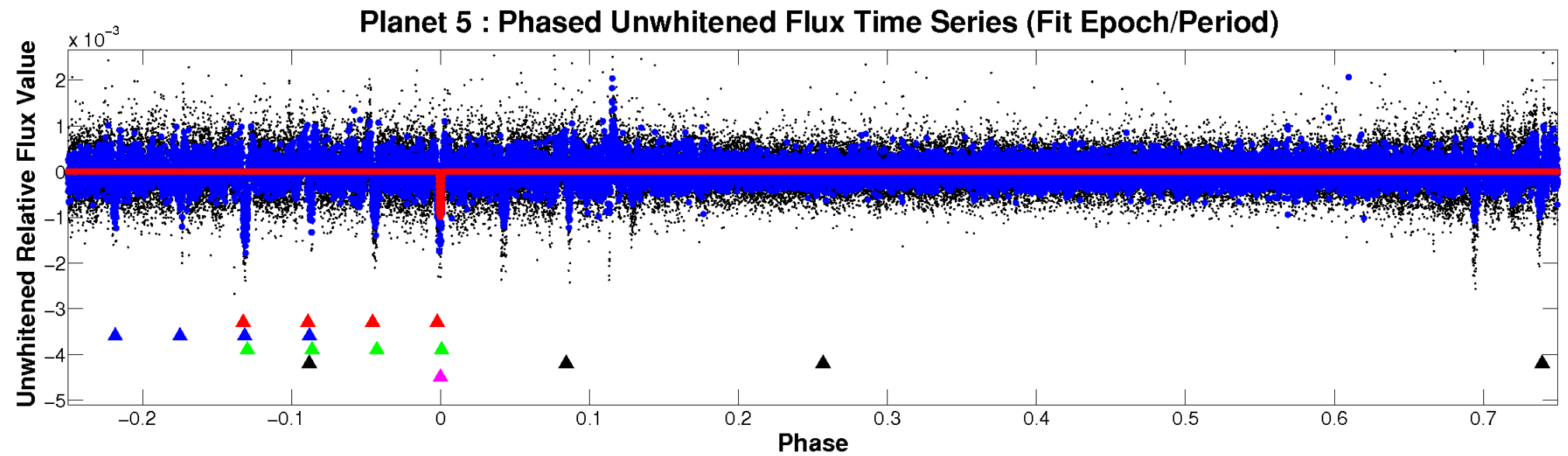
# ALT Odd/Even

TCE 003955866-05



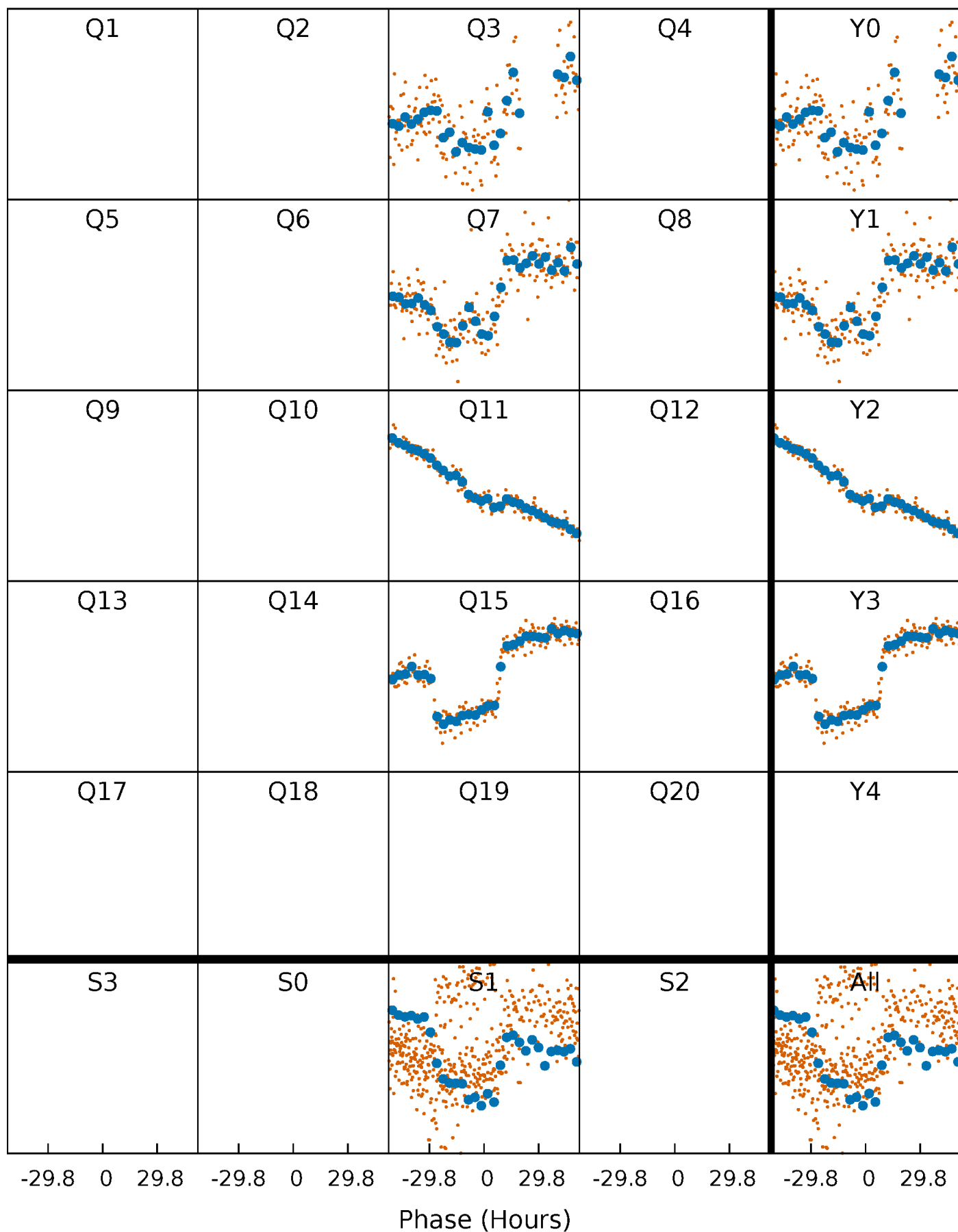


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

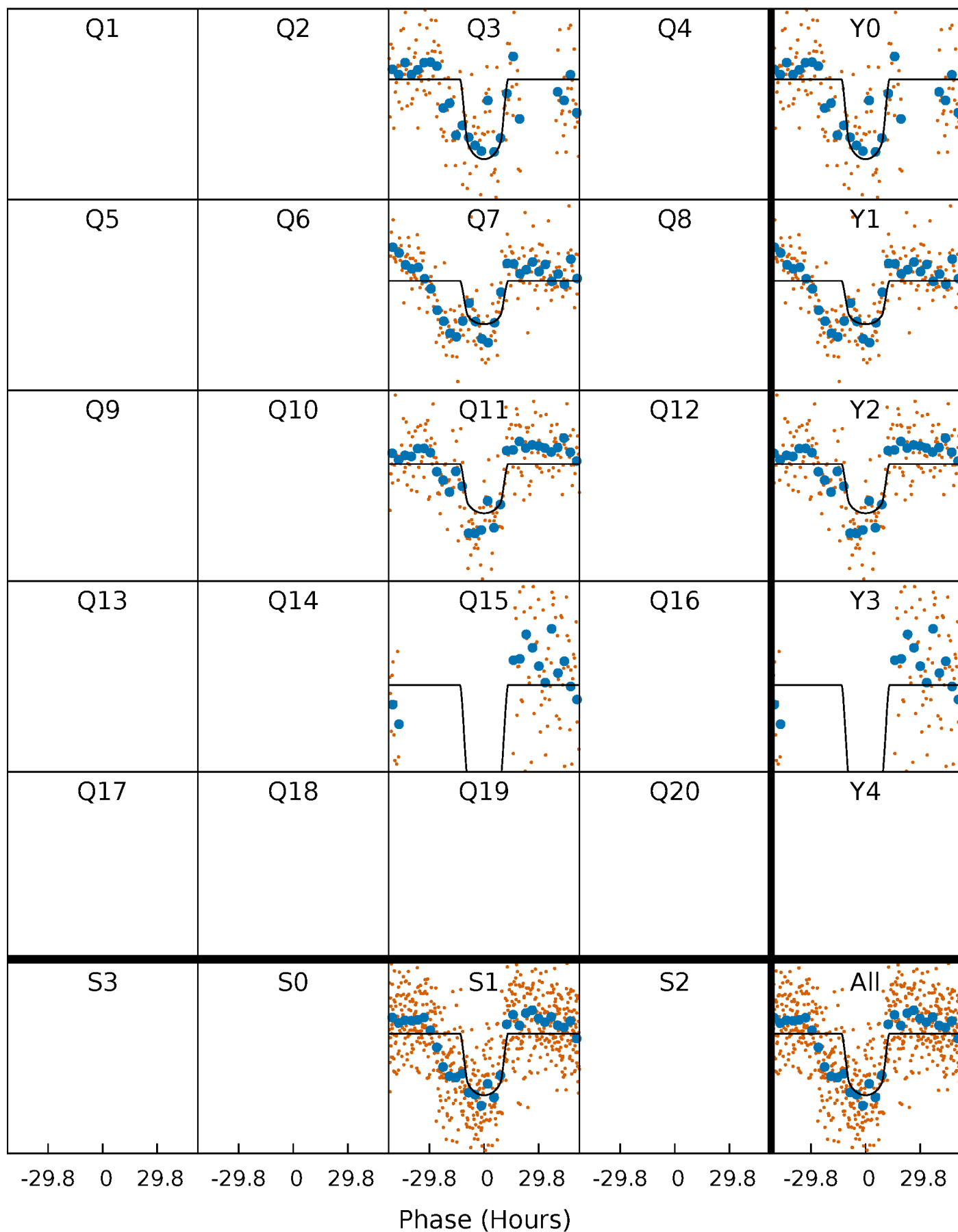
TCE 003955866-05     $P=387.063656$  Days     $T_0=279.711600$  (BKJD)





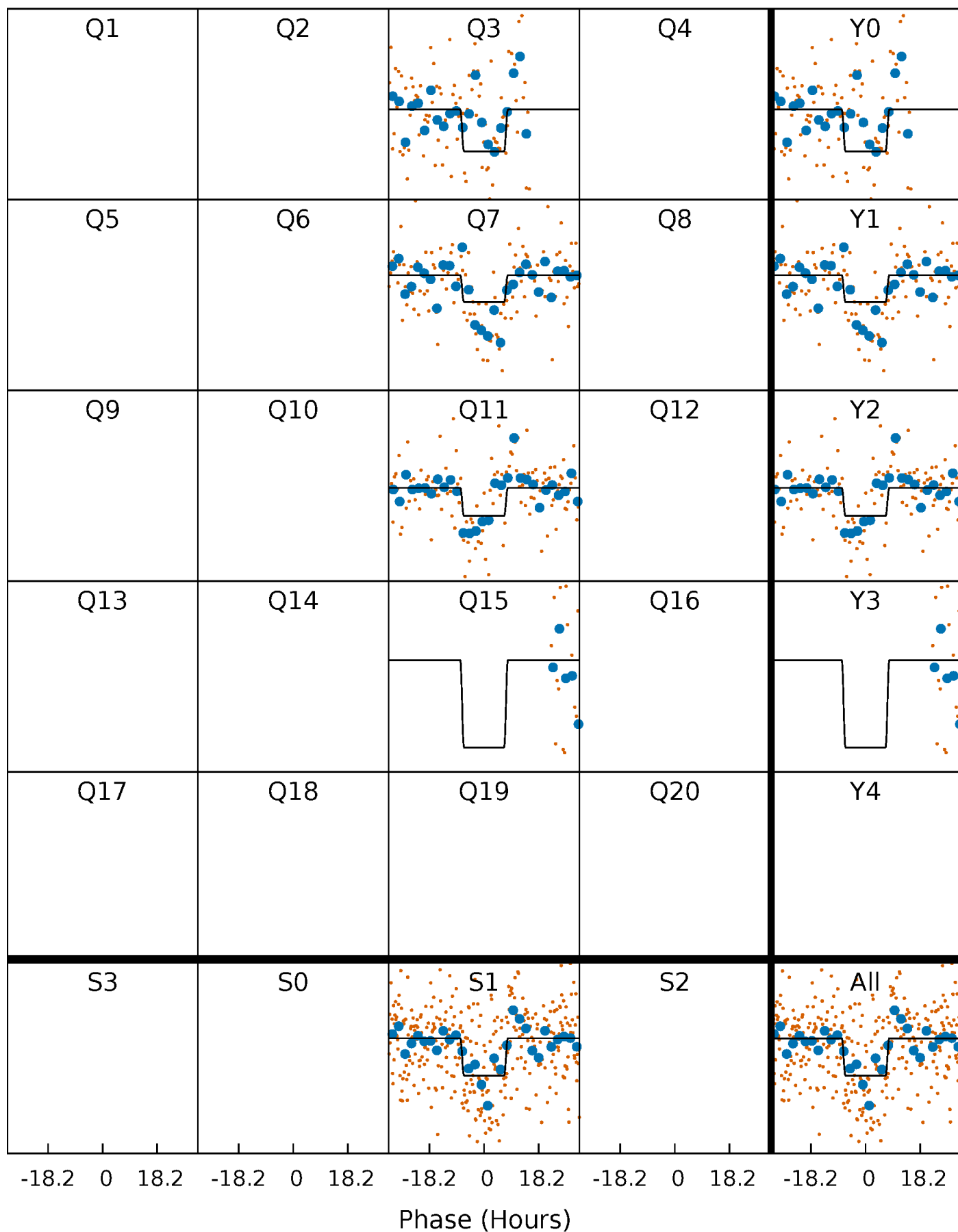
# DV Quarter-Phased Transit Curves

TCE 003955866-05     $P=387.063656$  Days     $T_0=279.711600$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

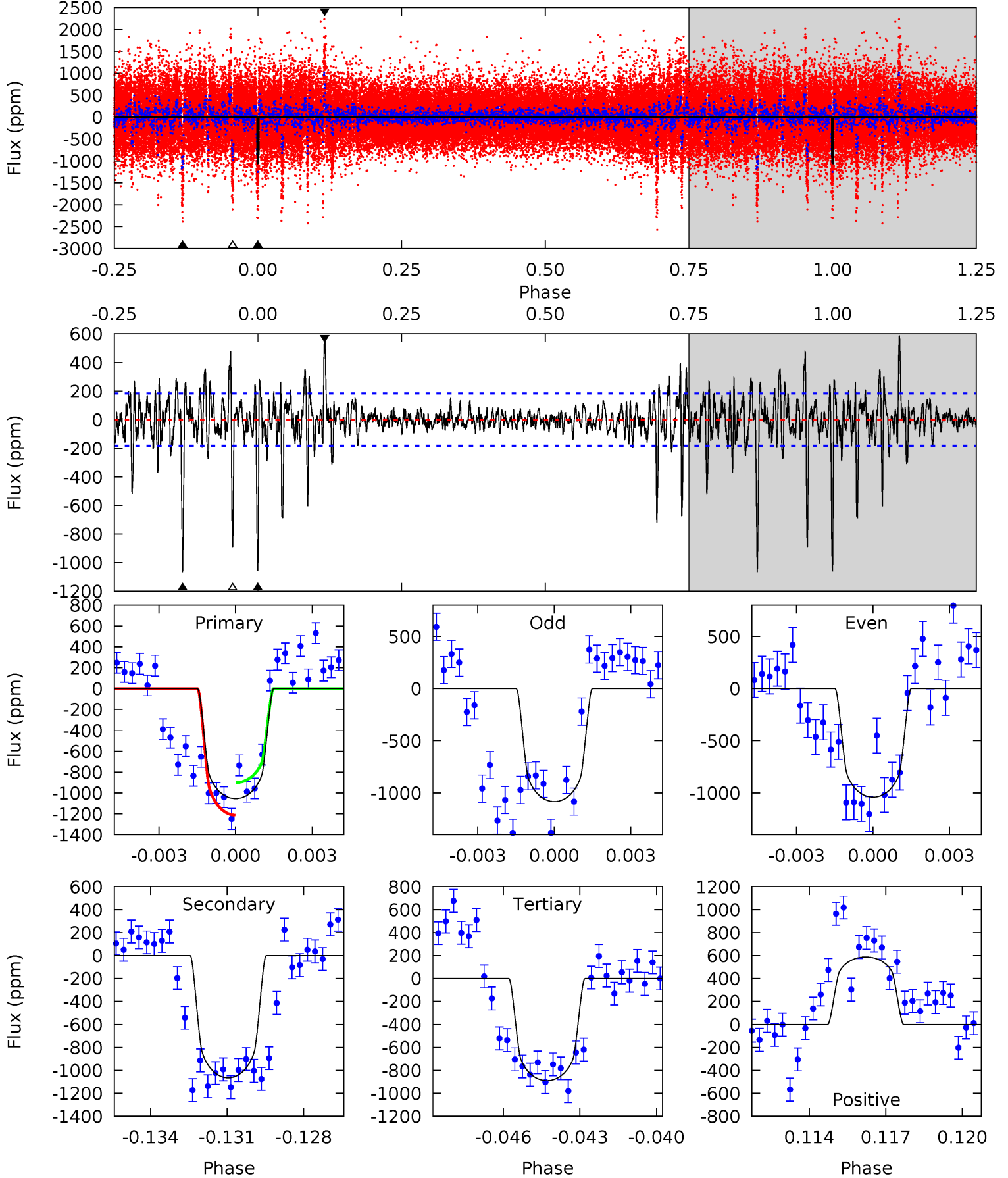
TCE 003955866-05     $P=386.916270$  Days     $T_0=279.906331$  (BKJD)



# DV Model-Shift Uniqueness Test

003955866-05, P = 387.063656 Days, E = 279.711600 Days

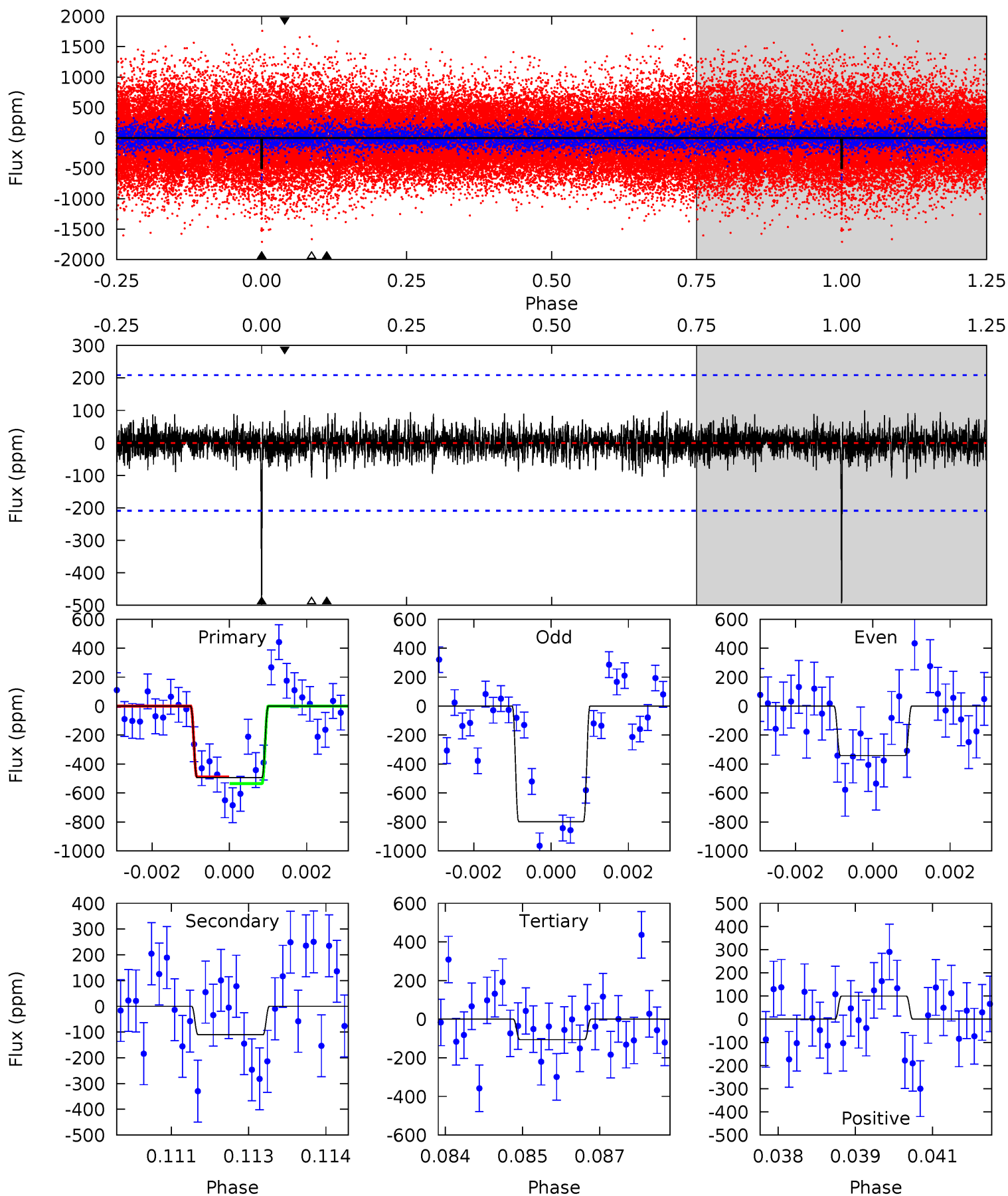
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.2	30.5	25.5	16.9	5.26	2.98	3.54	4.73	13.4	5.03	13.7	0.58	1.01	0.36	4.48



# Alt Model-Shift Uniqueness Test

003955866-05, P = 386.916270 Days, E = 279.906331 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	2.84	2.72	2.56	5.36	3.14	0.72	9.95	10.1	0.12	0.28	5.52	0.98	0.17	0.60



### Stellar Parameters For KIC 003955866

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5549^{+166}_{-183}$	$4.499^{+0.040}_{-0.160}$	$0.560^{+0.050}_{-0.300}$	$0.964^{+0.207}_{-0.089}$	$1.070^{+0.075}_{-0.123}$	$1.681^{+0.349}_{-0.726}$
	+3%/-3%	+1%/-4%	+9%/-54%	+21%/-9%	+7%/-11%	+21%/-43%
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 003955866-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1065 \pm 35$	$3.74^{+0.54}_{-0.42}$	$332^{+19}_{-15}$	$5397^{+329}_{-255}$	$46045^{+12507}_{-9806}$
Alt.	$-111 \pm 39$	$2.40^{+0.44}_{-0.40}$	$333^{+19}_{-16}$	$4098^{+362}_{-353}$	$11441^{+6560}_{-4725}$

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

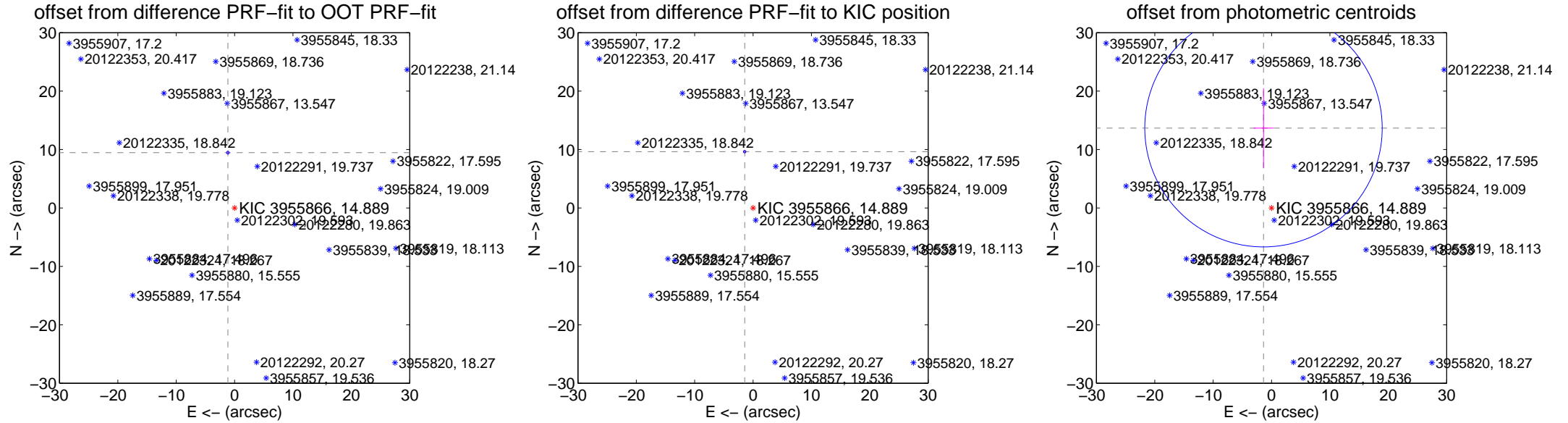
# DV Centroid Data

Supplemental centroid analysis for 003955866-05. Kepler magnitude: 14.89. Transit SNR 9.32

There are 3 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	9.529 $\pm$ 0.076	125.95	1.148 $\pm$ 0.074	9.459 $\pm$ 0.076
PRF-fit source offset from KIC position	9.738 $\pm$ 0.070	139.06	1.433 $\pm$ 0.070	9.632 $\pm$ 0.070
photometric centroid source offset	13.74 $\pm$ 6.78	2.03	1.38 $\pm$ 1.69	13.67 $\pm$ 6.81



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.

Q5 no difference image



Q5 no OOT image



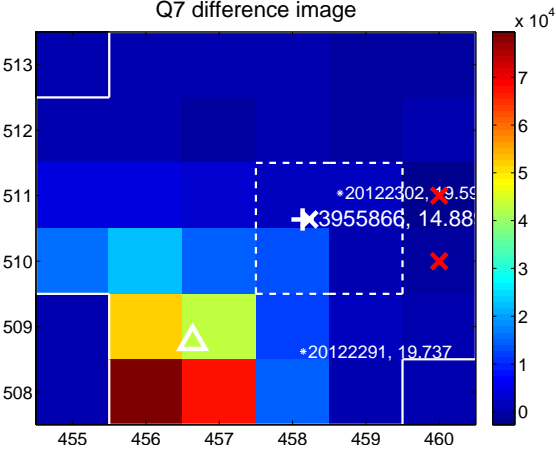
Q6 no difference image



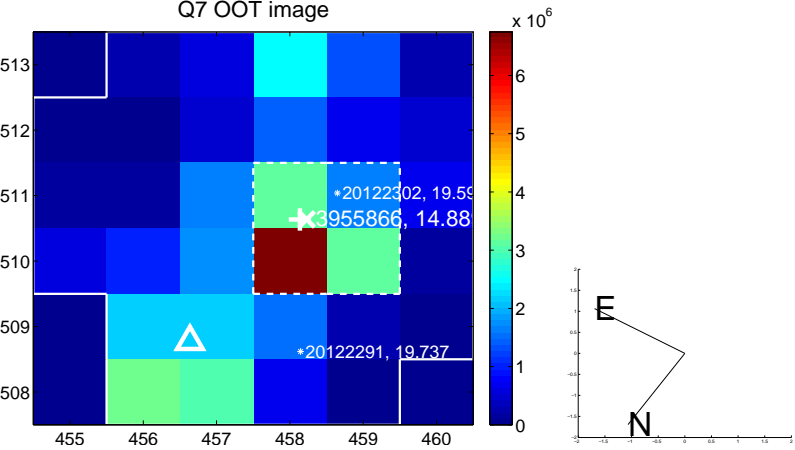
Q6 no OOT image



Q7 difference image



Q7 OOT image



Q8 no difference image

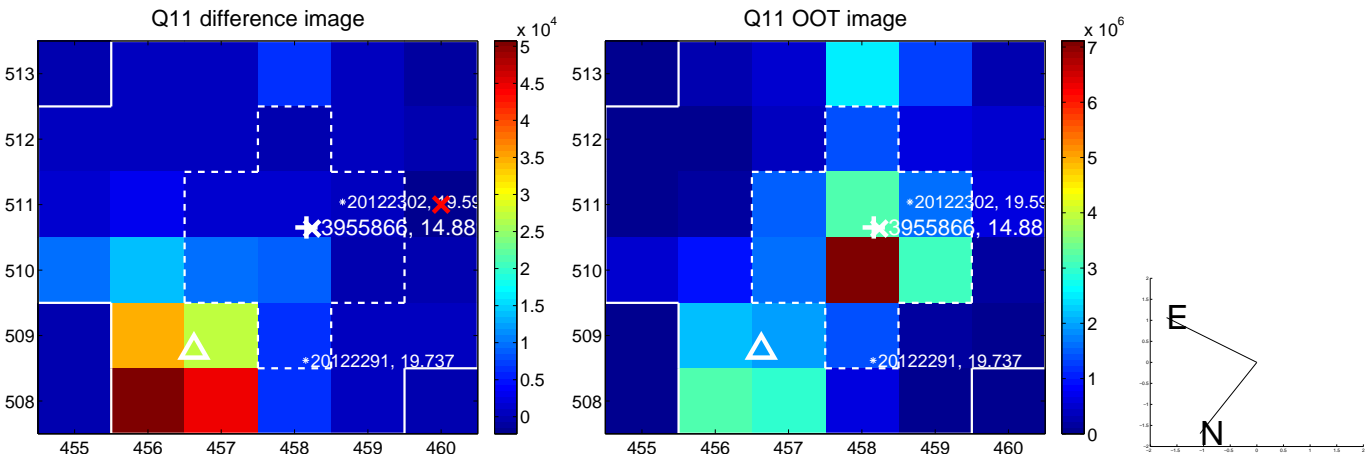


Q8 no OOT image

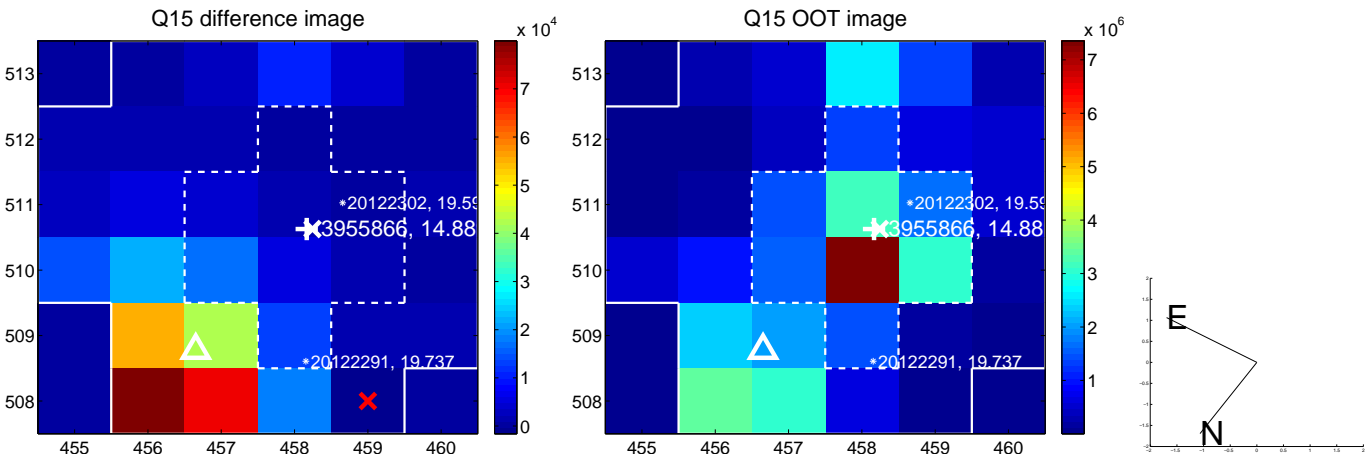




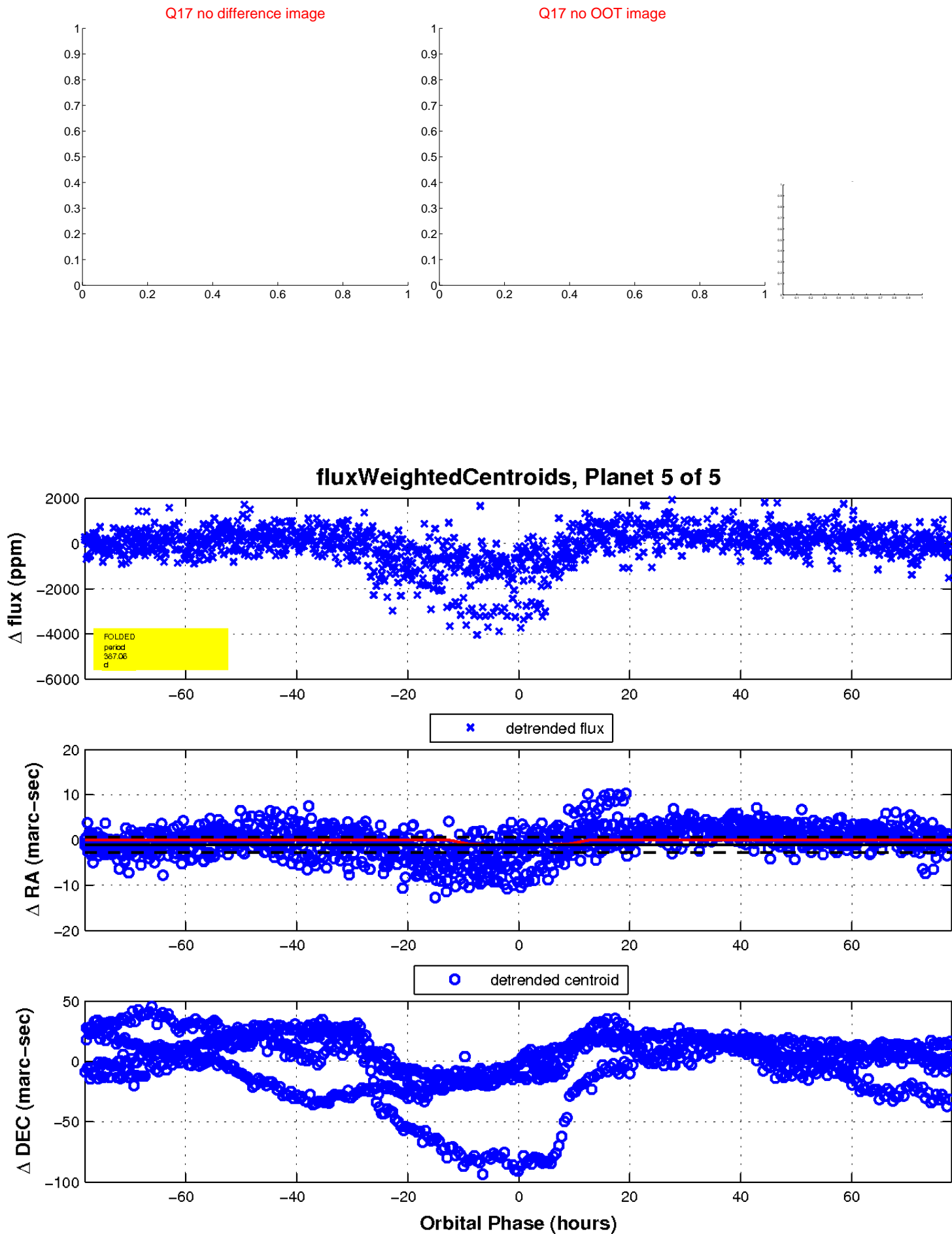
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

