

## KIC 010535858

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010535858-01	OBS	7338.01	0.933718	131.547996	64.0	4.971	8.6	9.7	0.42	3615	0.38	132.60
010535858-02	OBS	No	166.731446	195.158250	538.9	16.471	12.9	4.5	0.42	3615	1.11	0.13
010535858-03	OBS	No	287.636030	412.997432	860.6	3.172	8.7	9.6	0.42	3615	1.29	0.06
010535858-05	OBS	No	138.375922	136.700751	689.8	8.201	9.2	7.0	0.42	3615	1.20	0.17
010535858-06	OBS	No	77.099011	156.259842	728.5	3.406	7.3	7.1	0.42	3615	1.22	0.37
010535858-07	OBS	No	209.523411	254.328284	854.7	9.055	7.5	6.4	0.42	3615	1.38	0.10

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010535858-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
010535858-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010535858-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 010535858-01

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	$\sigma_P$	$\sigma_T$
010535858-01	10535858	7614.01	10471345	1:1	466.3	118	4	15.76	15.43	1.12	Col-Anomaly	1	3.38	2.95

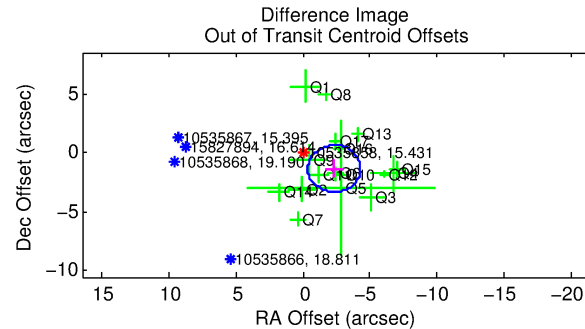
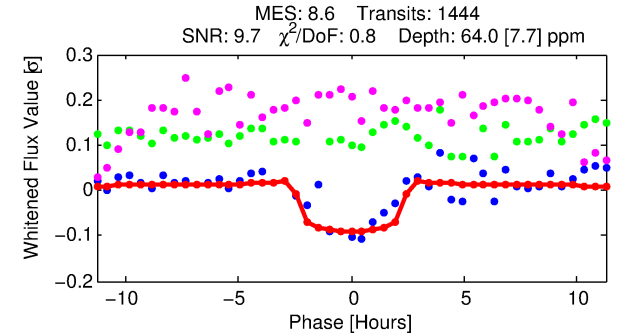
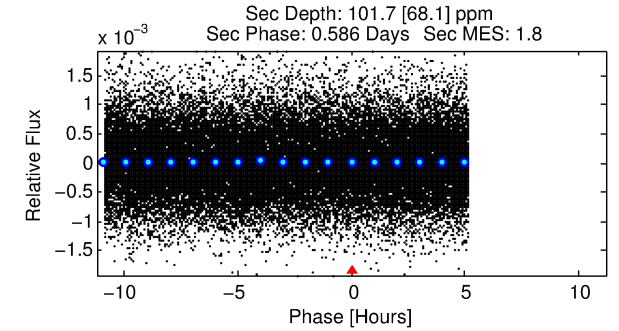
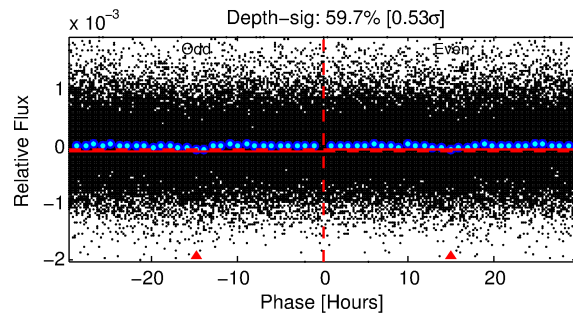
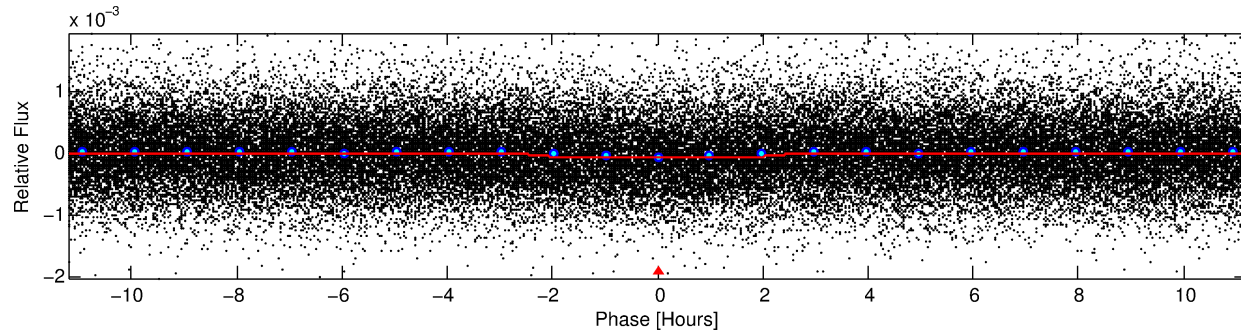
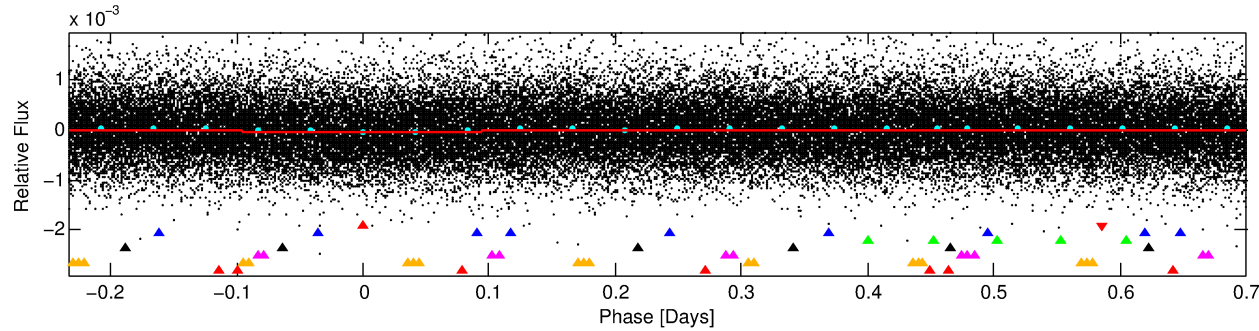
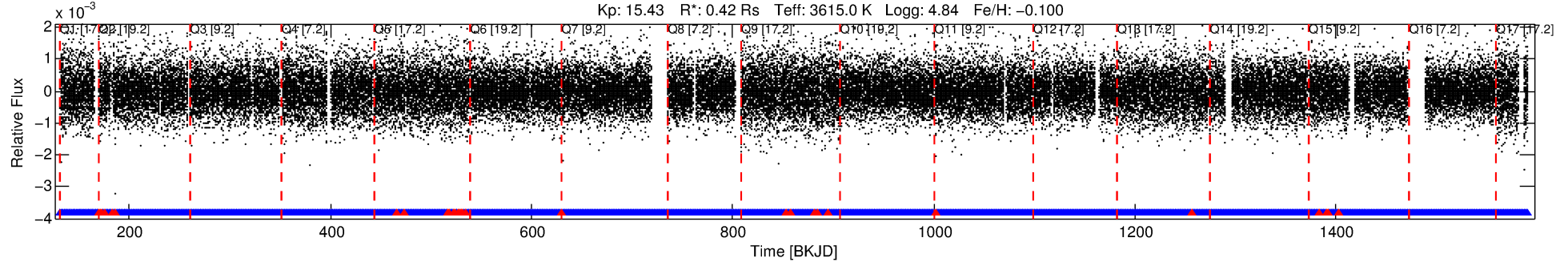
**Notes:**  $P_1:P_2$  is the period ratio. Dist is the distance in arcseconds.  $\Delta$ Row and  $\Delta$ Col are the number of pixels apart in row and column.  $m_2$  and  $m_1$  are the magnitudes of the parent and child.  $D_2/D_1$  is the parent's transit depth divided by the child's.  $\sigma_P$  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: 10535858 Candidate: 1 of 7 Period: 0.934 d

KOI: K07338.01 Corr: 0.913

Kp: 15.43 R\*: 0.42 Rs Teff: 3615.0 K Logg: 4.84 Fe/H: -0.100



## DV Fit Results:

Period = 0.93372 [0.00001] d  
Epoch = 131.5480 [0.0048] BKJD  
Rp/R\* = 0.0083 [0.0069]  
a/R\* = 1.21 [1.46]  
b = 0.83 [1.38]  
Seff = 132.60 [12.01]  
Teq = 865 [20] K  
Rp = 0.38 [0.32] Re  
a = 0.0143 [0.0008] AU  
Ag = 79.25 [142.56] [0.55σ]  
Teffp = 3992 [1795] K [1.74σ]

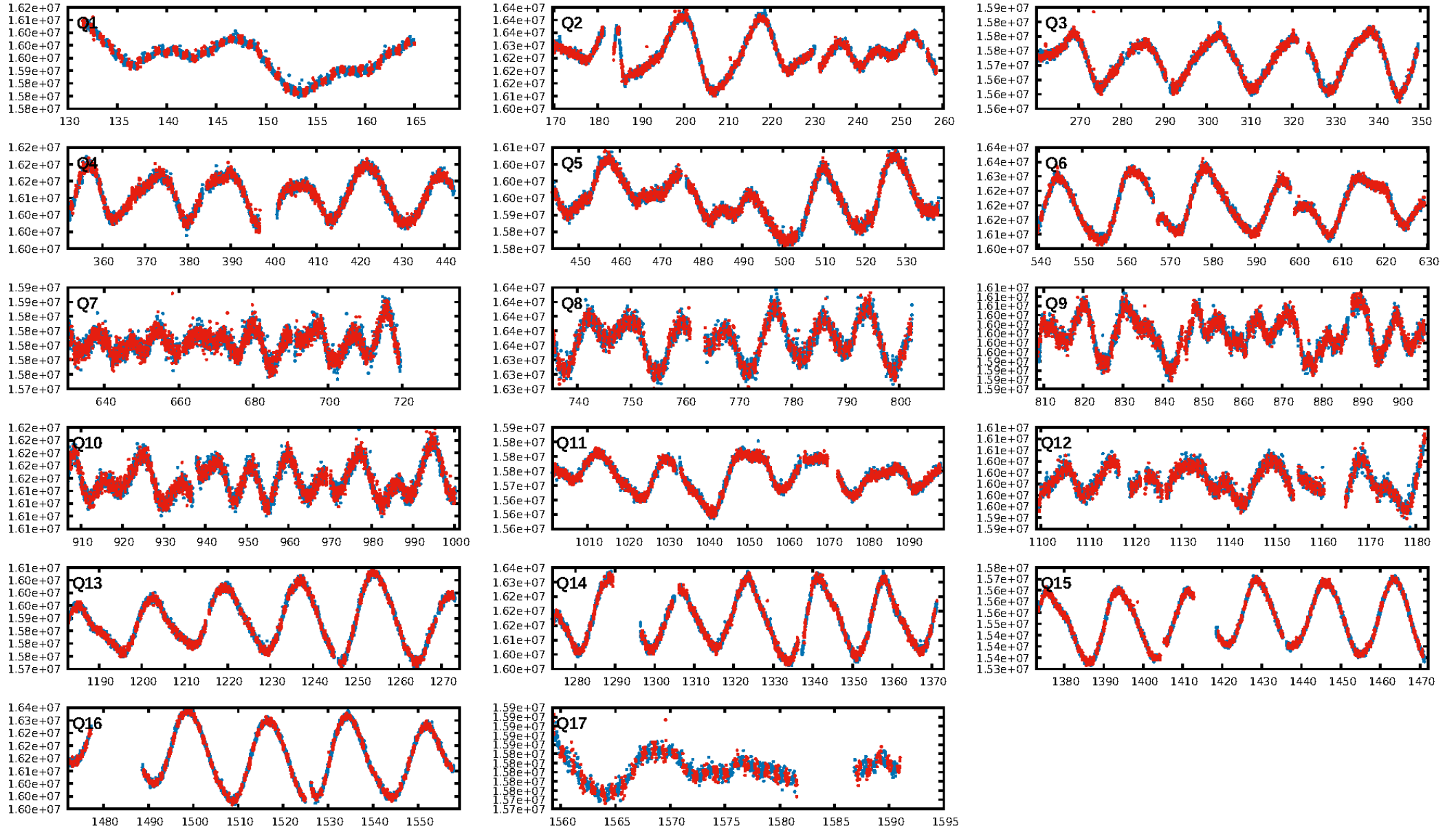
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [303.32σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.28e-17  
RollingBand-fgt: 0.98 [1345/1378]  
**GhostDiagnostic-chr: 0.1208**  
Centroid-sig: 20.6%  
Centroid-so: 0.567 arcsec [0.45σ]  
**OotOffset-rm: 2.669 arcsec [4.07σ]**  
**KicOffset-rm: 2.407 arcsec [3.71σ]**  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.06 [1/17]  
DiffImageOverlap-fno: 1.00 [17/17]

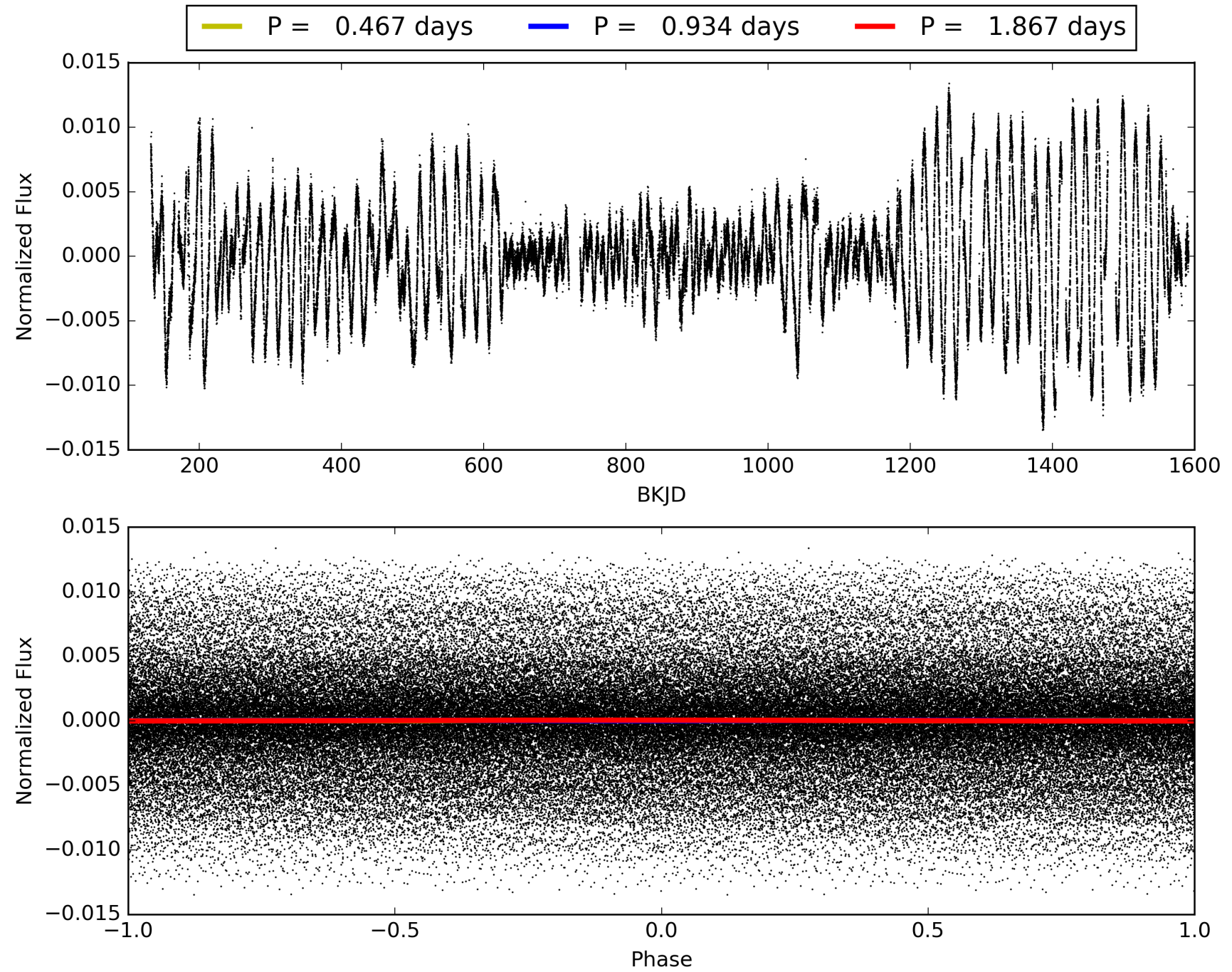
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:40:52 Z

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

# TCE 010535858-01, PDC Light Curves



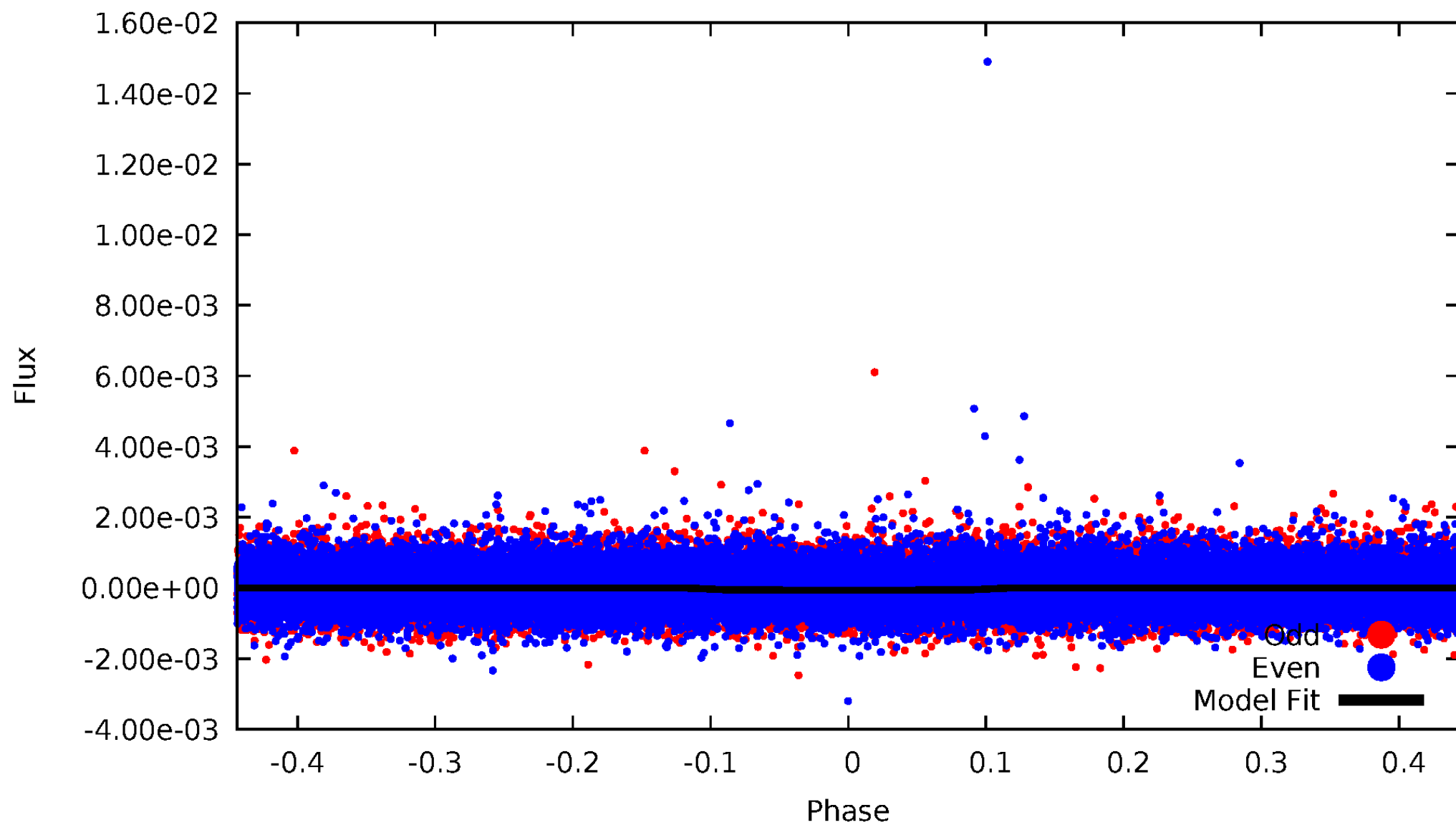
# TCE 010535858-01





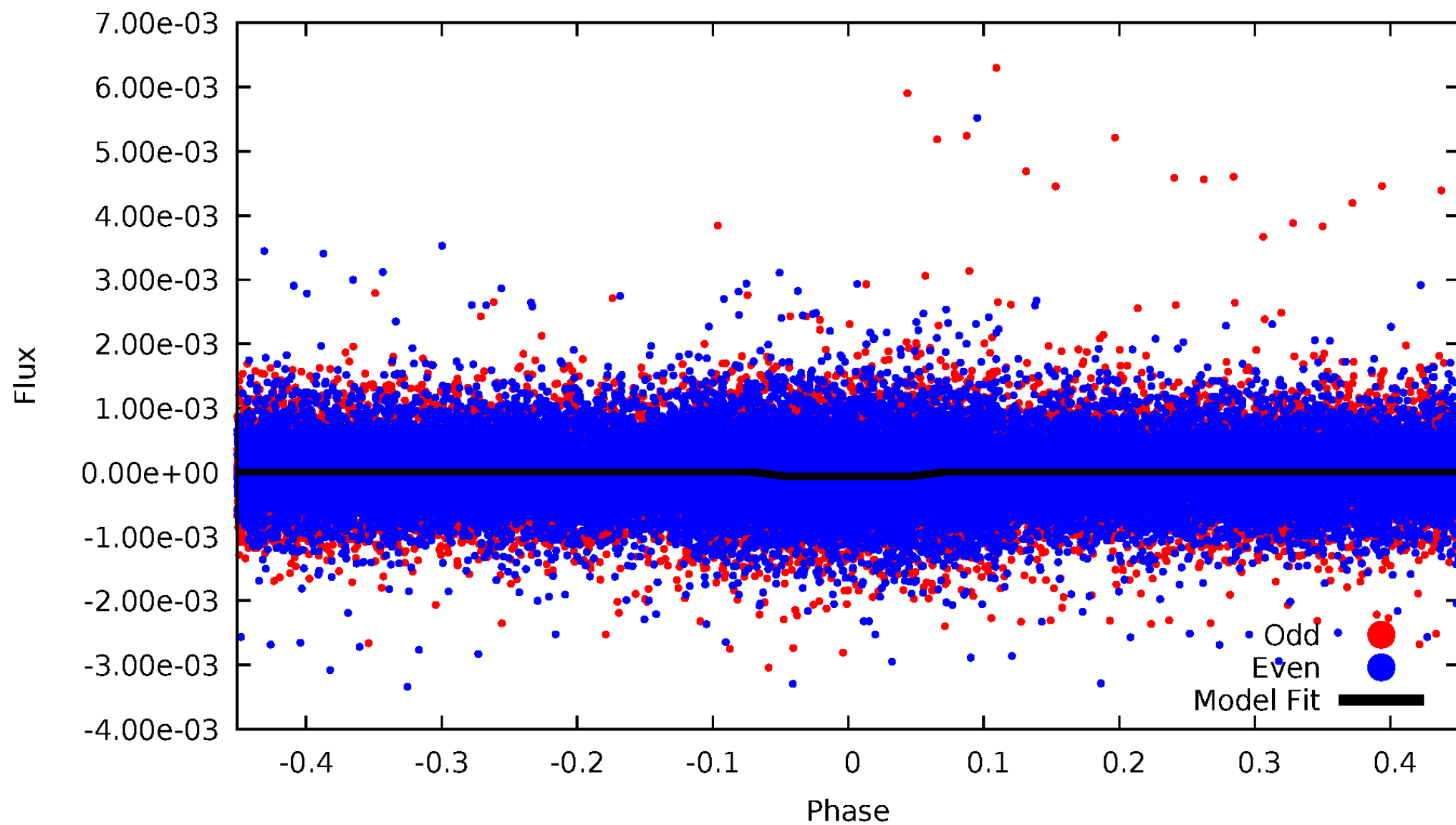
# DV Odd/Even

TCE 010535858-01



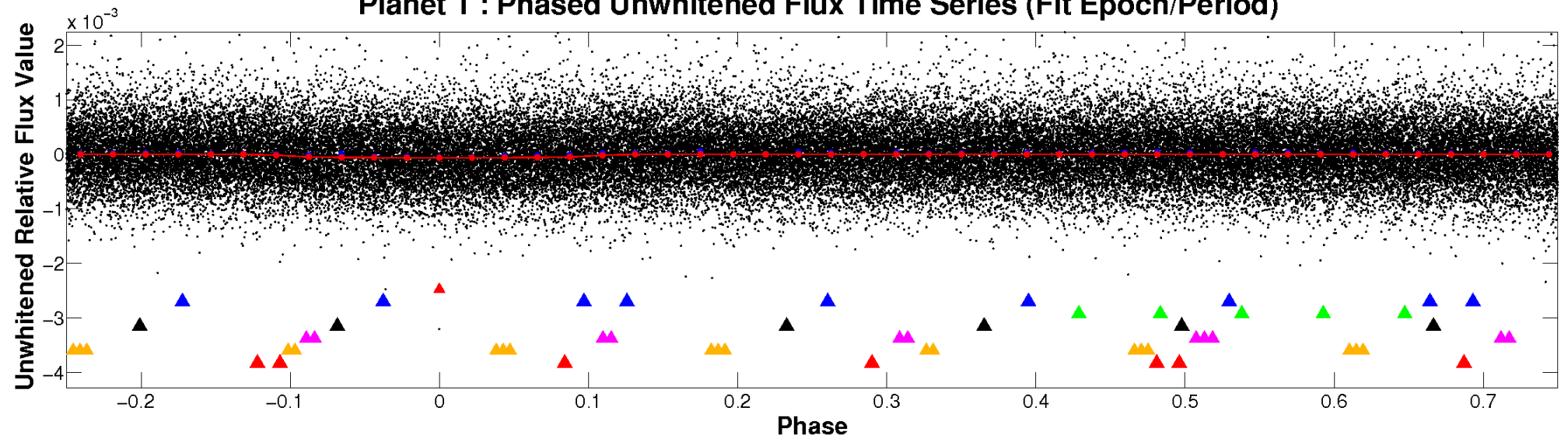
# ALT Odd/Even

TCE 010535858-01

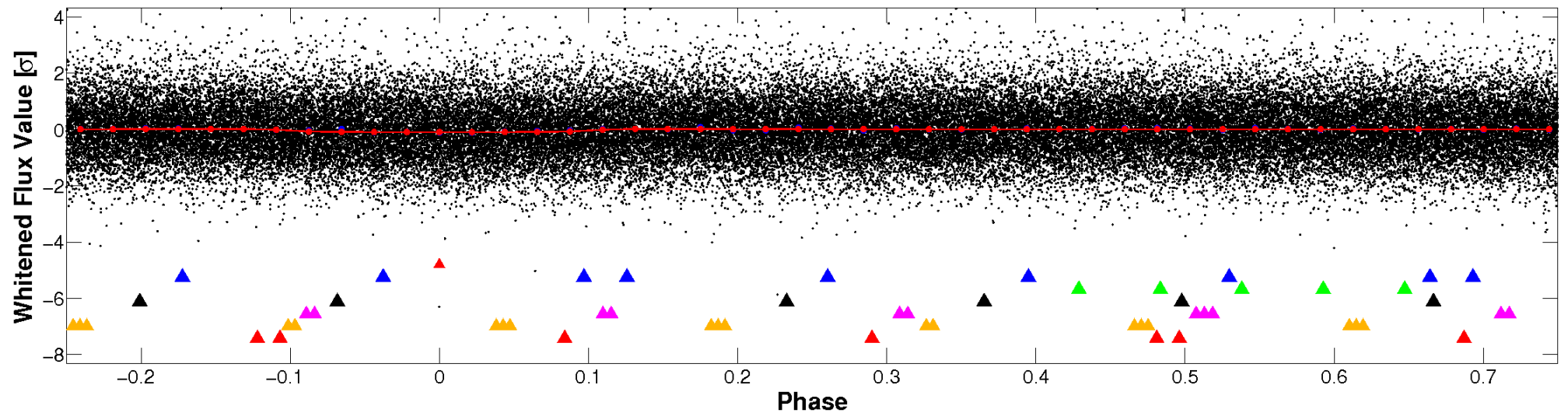


# Non-Whitened Vs. Whitened Light Curve

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

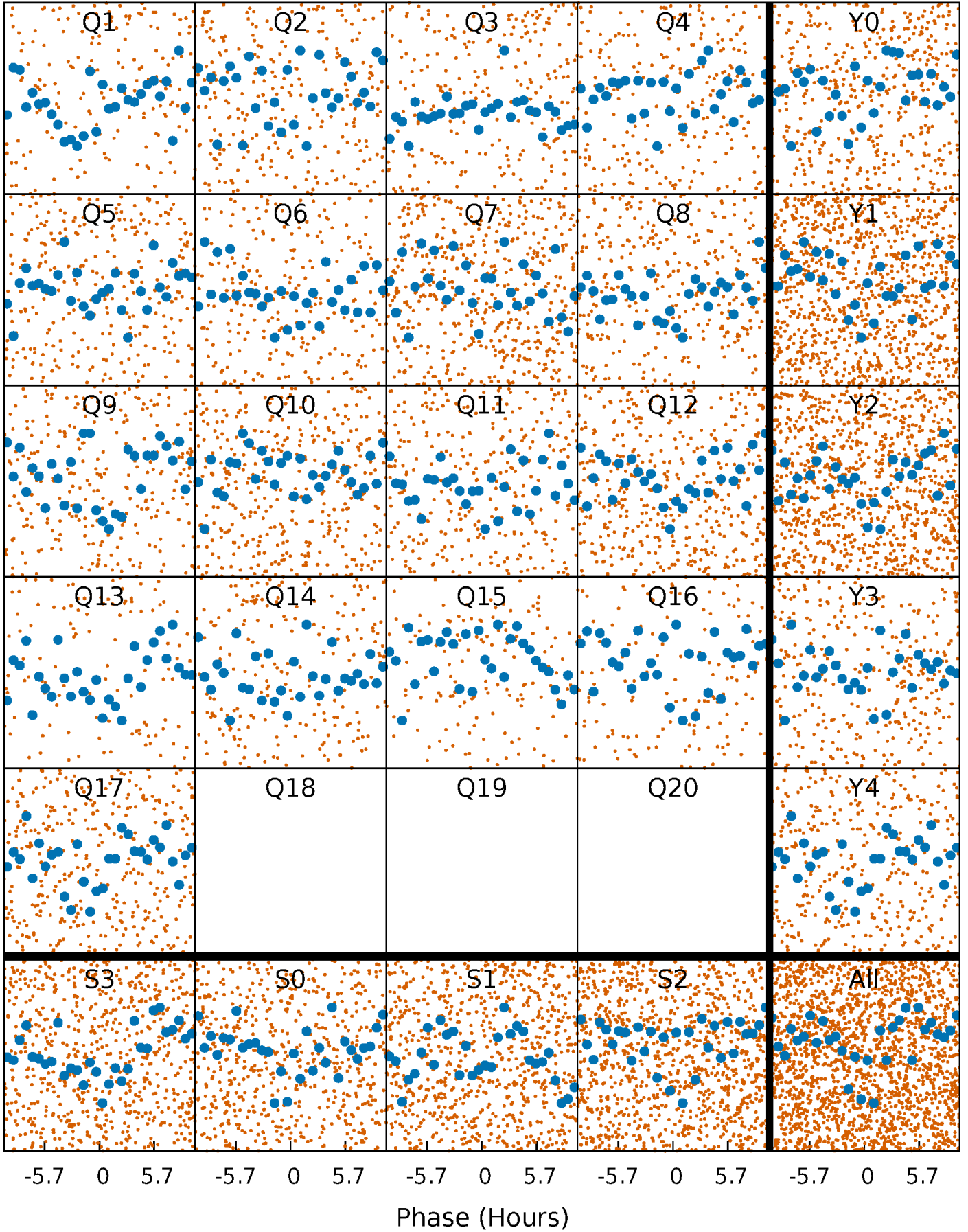


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

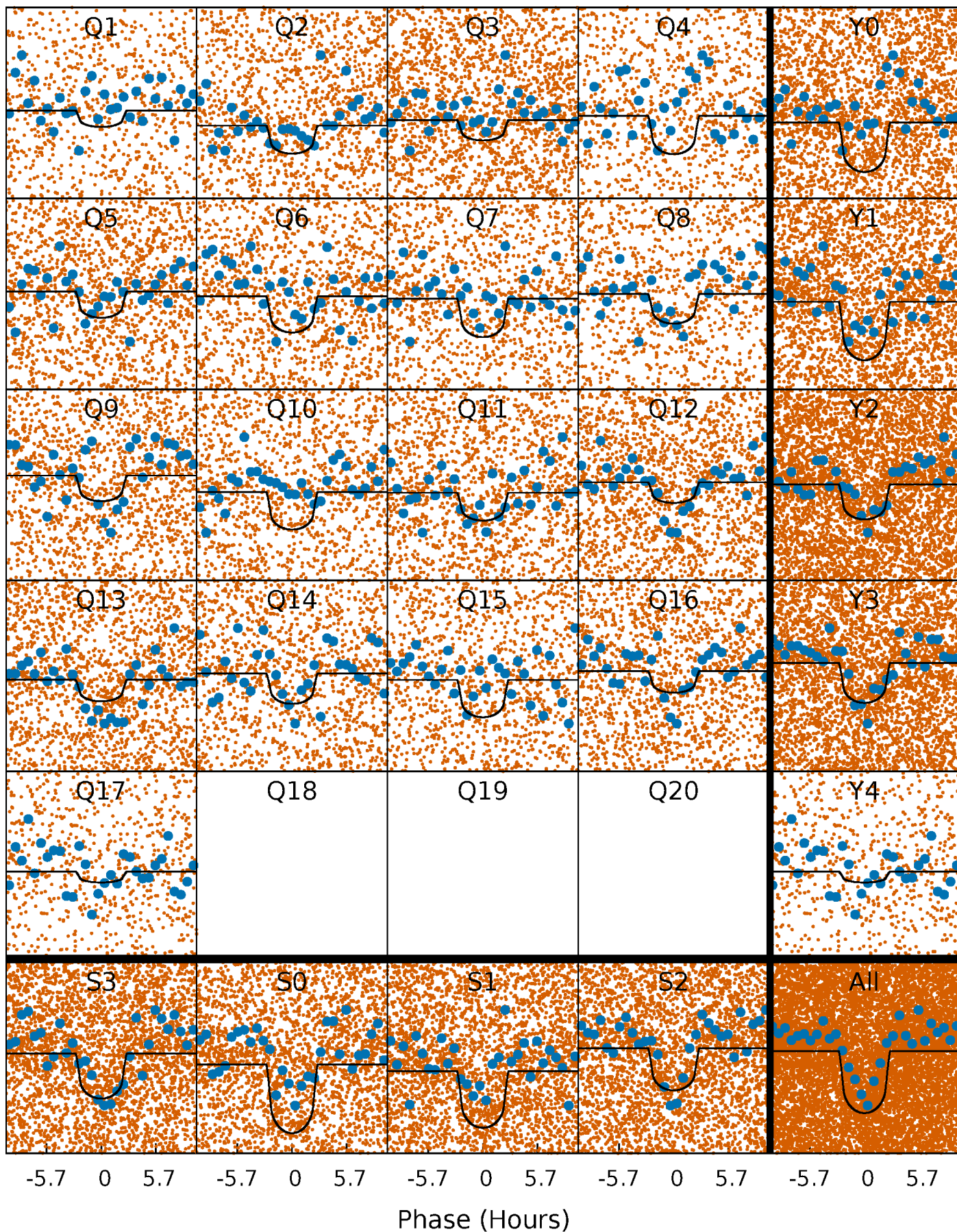
TCE 010535858-01 P= 0.933718 Days  $T_0=131.547996$  (BKJD)





# DV Quarter-Phased Transit Curves

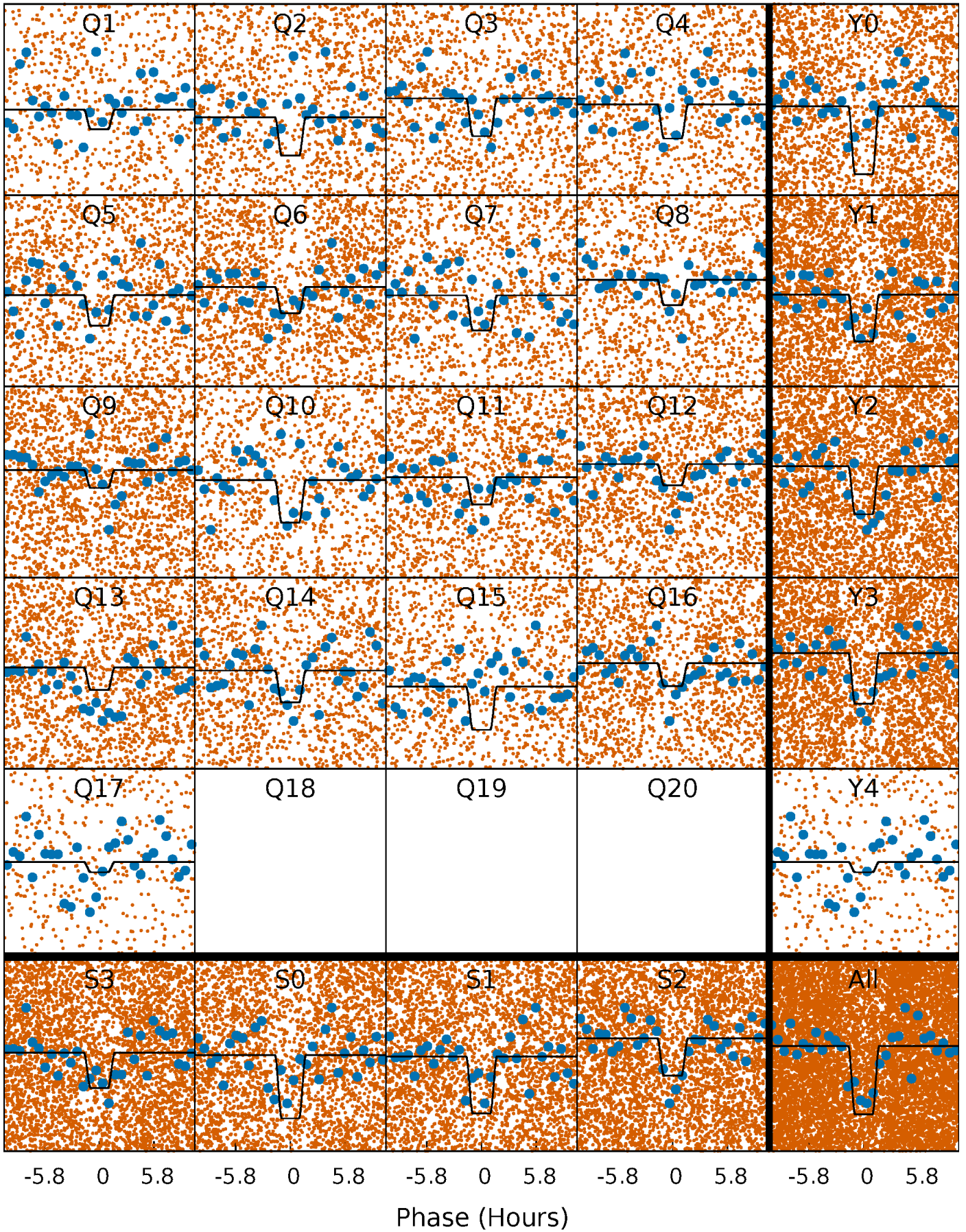
TCE 010535858-01   P= 0.933718 Days    $T_0=131.547996$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

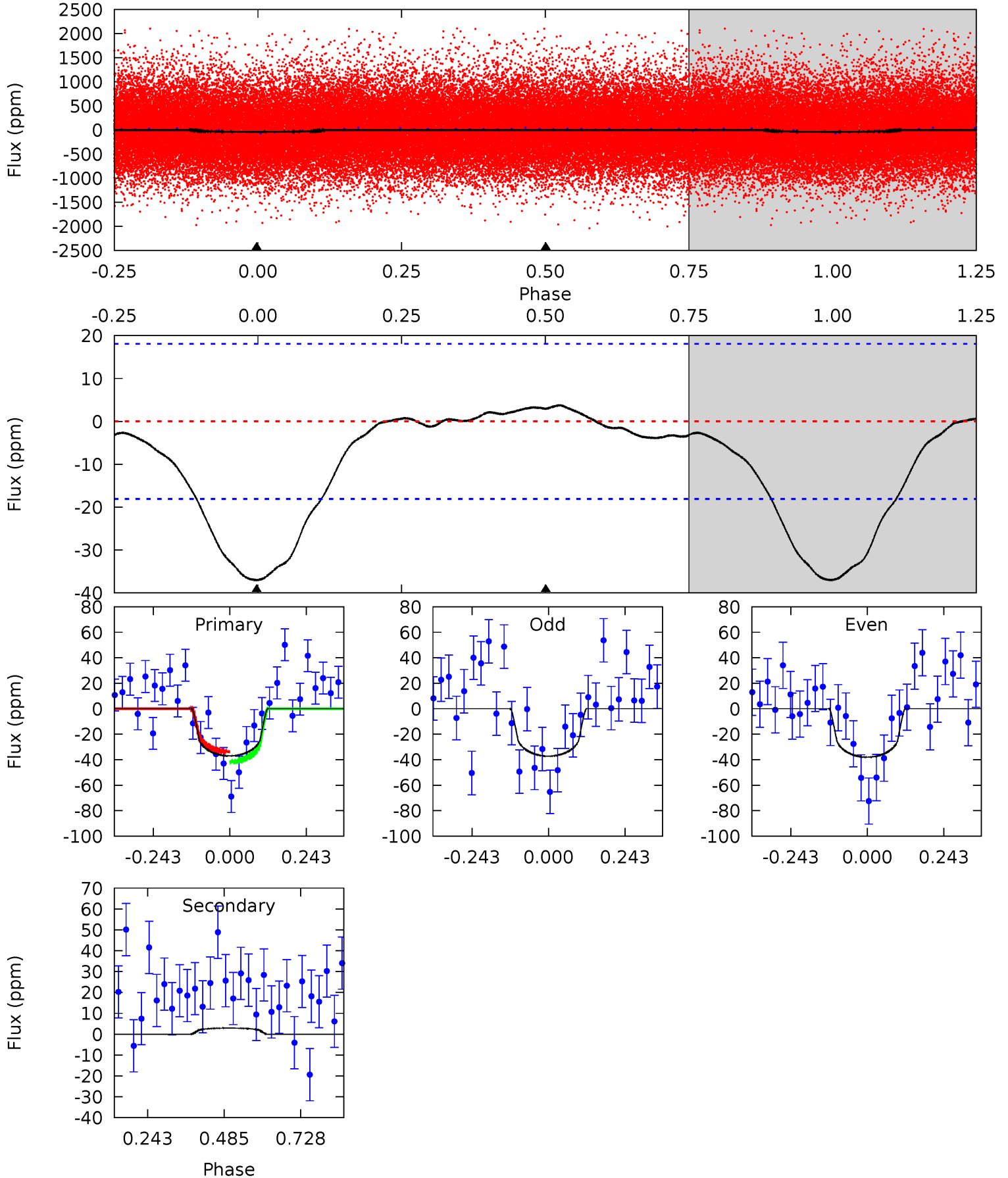
TCE 010535858-01 P= 0.933740 Days  $T_0=131.516521$  (BKJD)



# DV Model-Shift Uniqueness Test

010535858-01, P = 0.933718 Days, E = 130.614278 Days

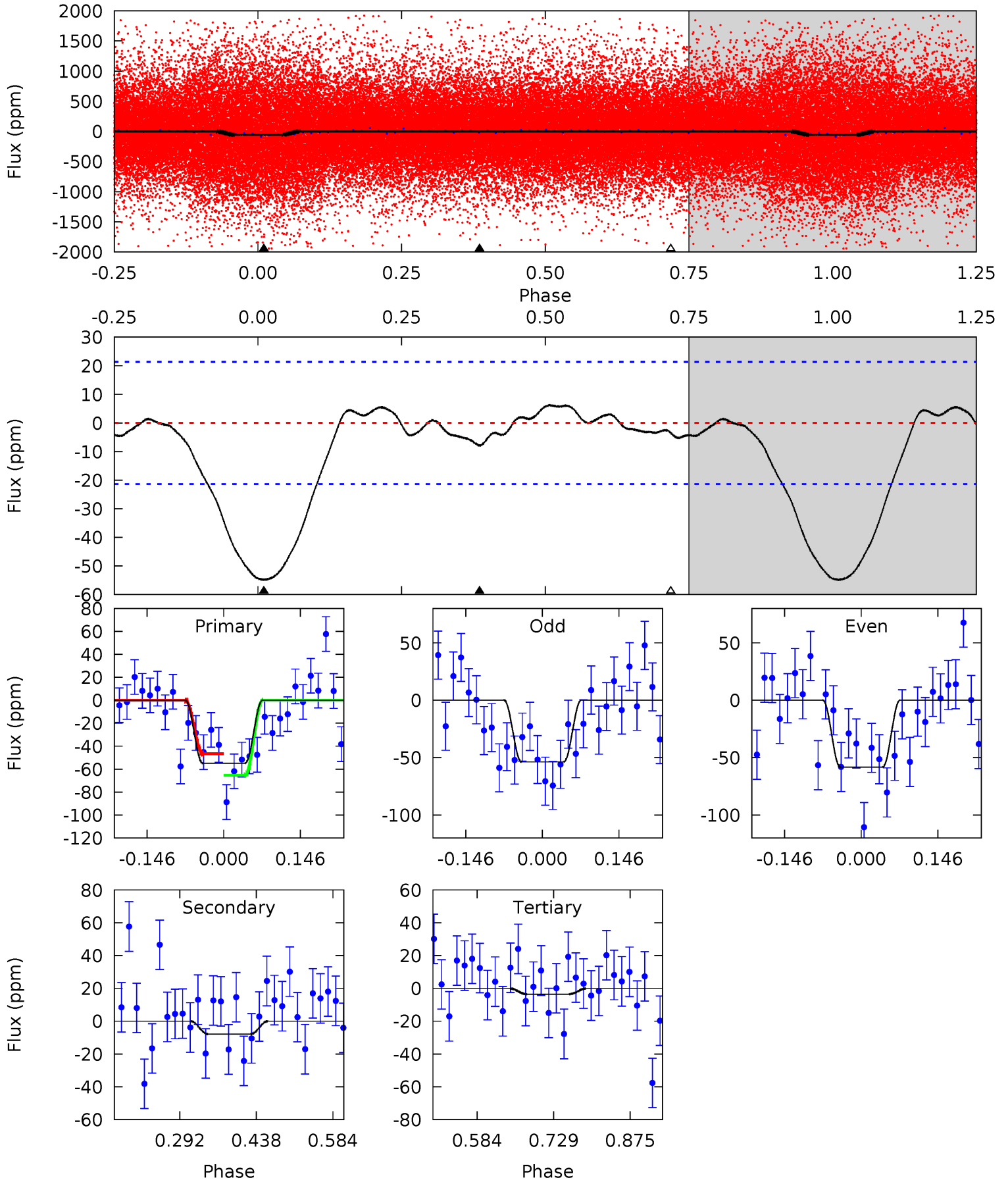
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.95	-0.71	0	0	4.38	1.17	0.43	8.95	8.95	-0.71	-0.71	0.10	0.82	0.09	0.96



# Alt Model-Shift Uniqueness Test

010535858-01, P = 0.933740 Days, E = 130.582781 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
11.5	1.67	0.74	0	4.48	1.45	0.68	10.8	11.5	0.93	1.67	0.48	1.06	0.10	1.99





### Stellar Parameters For KIC 010535858

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3615^{+43}_{-50}$	$4.839^{+0.030}_{-0.033}$	$-0.100^{+0.100}_{-0.100}$	$0.420^{+0.029}_{-0.032}$	$0.445^{+0.025}_{-0.038}$	$8.445^{+1.369}_{-1.178}$
	+1%/-1%	+1%/-1%	+100%/-100%	+7%/-8%	+6%/-9%	+16%/-14%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 010535858-01 / KOI 7338.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$3\pm 4$	$0.41^{+0.31}_{-0.26}$	$1210^{+21}_{-22}$	$-2269^{+4198}_{-624}$	$-1.425^{+2.087}_{-10.309}$
Alt.	$-8\pm 5$	$0.41^{+0.29}_{-0.24}$	$1210^{+23}_{-23}$	$2549^{+816}_{-483}$	$4.855^{+28.410}_{-3.854}$

$T_{\text{max}}$  = 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

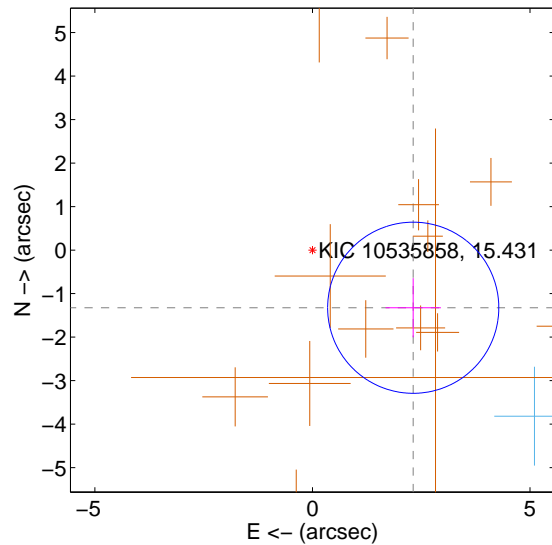
Supplemental centroid analysis for 010535858-01. Kepler magnitude: 15.43. Transit SNR 9.72

There are 1 quarters with good PRF difference image offsets

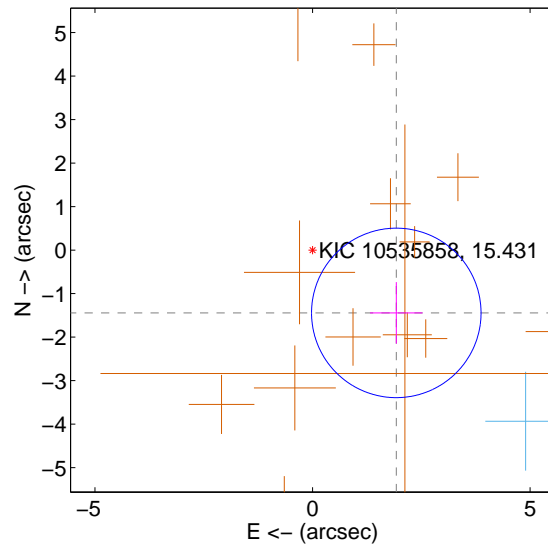
The direct PRF centroid is offset from the target star catalog position by about 0.65 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.669 \pm 0.656$	4.07	$-2.316 \pm 0.635$	$-1.325 \pm 0.681$
PRF-fit source offset from KIC position	$2.407 \pm 0.649$	3.71	$-1.925 \pm 0.604$	$-1.444 \pm 0.707$
photometric centroid source offset	$0.57 \pm 1.25$	0.45	$0.56 \pm 1.26$	$-0.09 \pm 0.86$

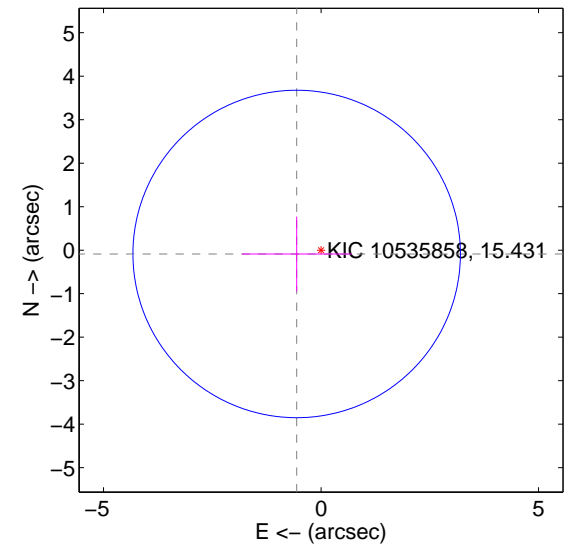
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

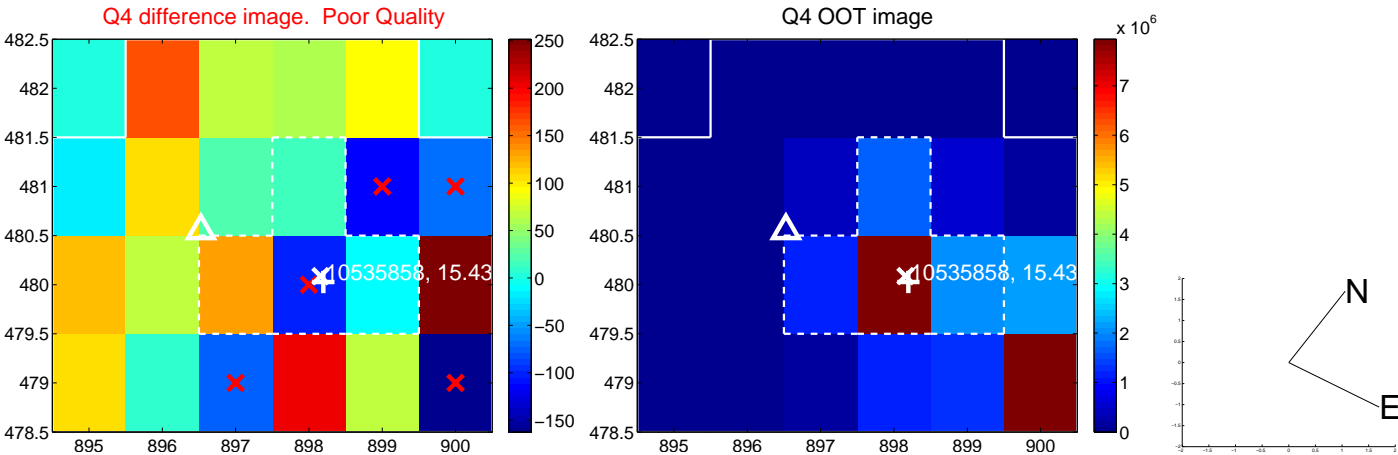
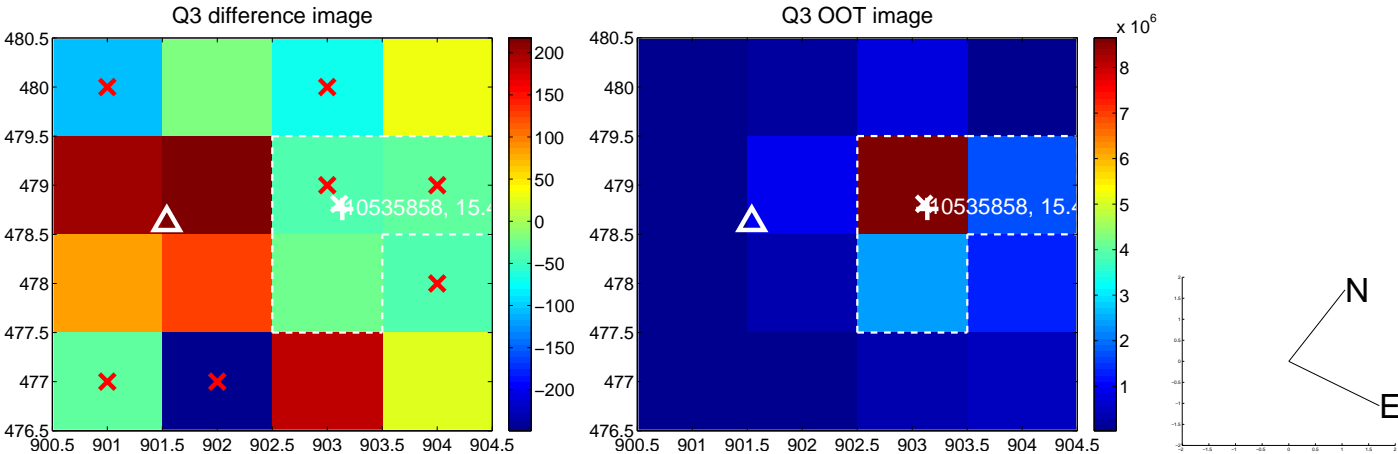
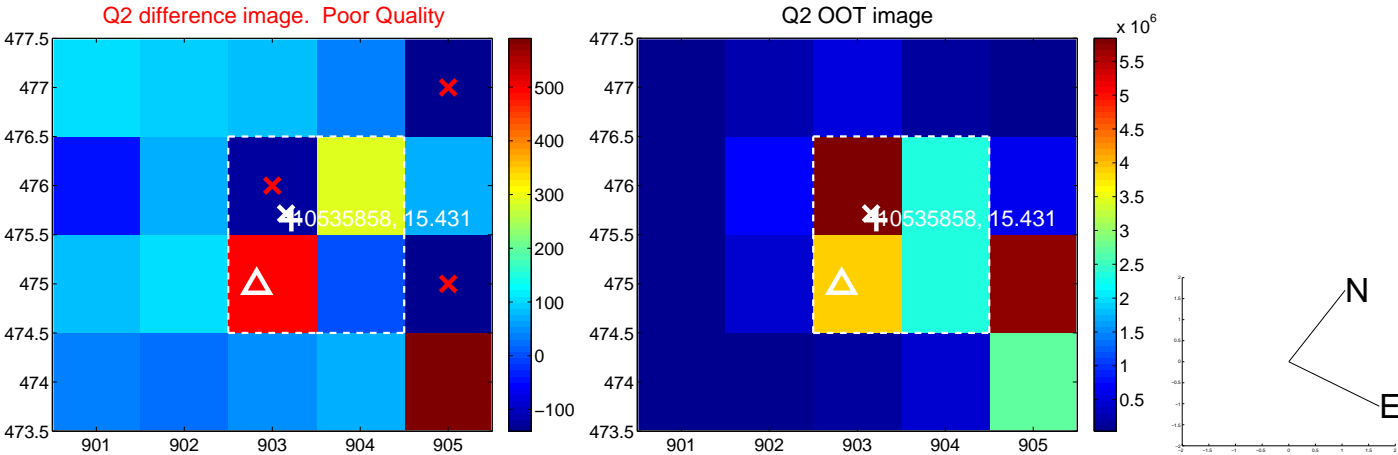
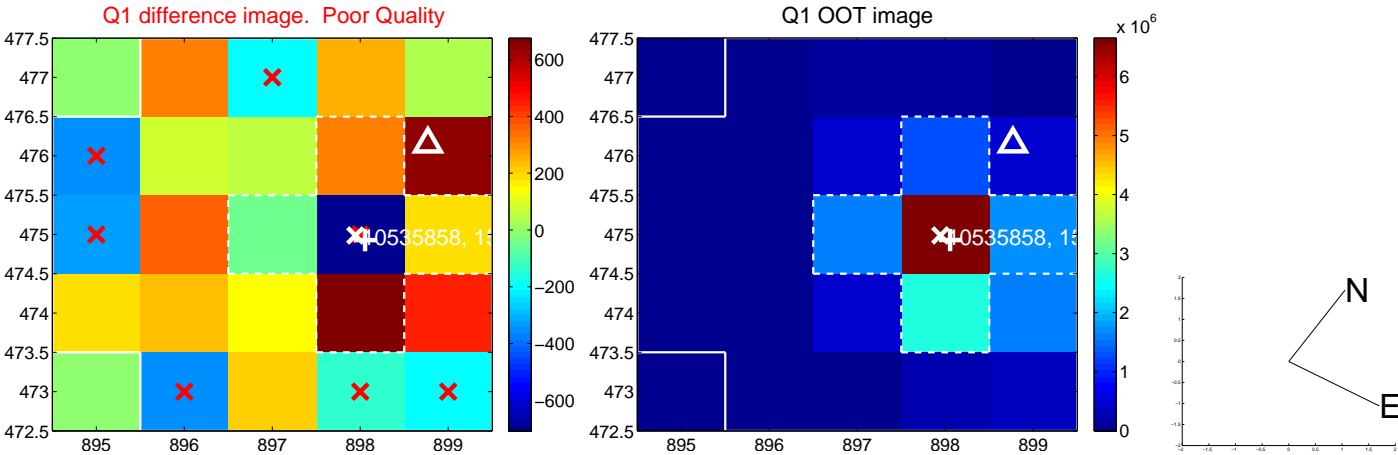


offset from photometric centroids

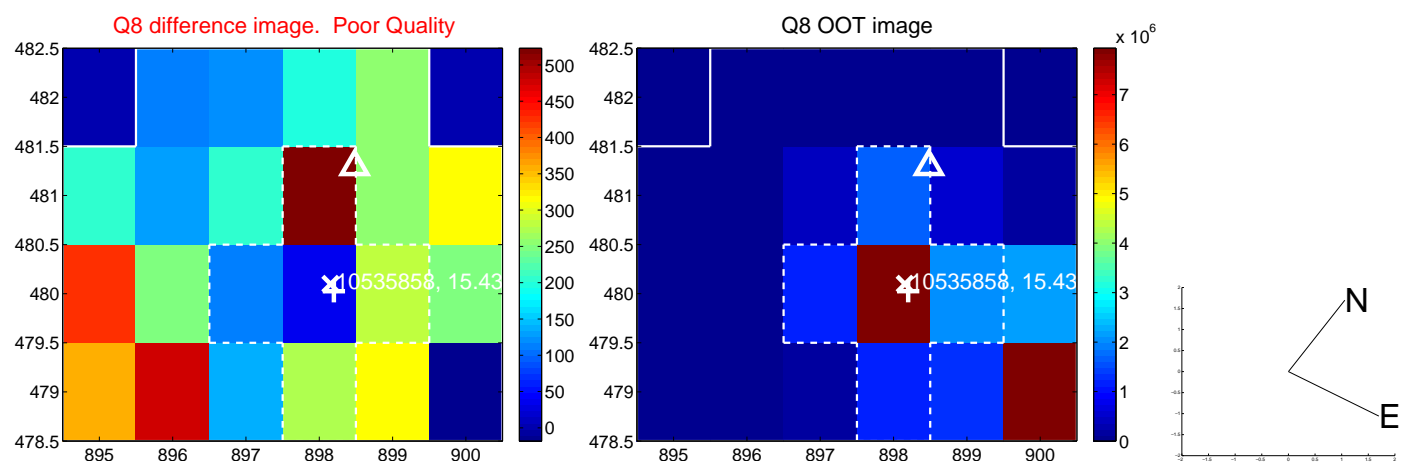
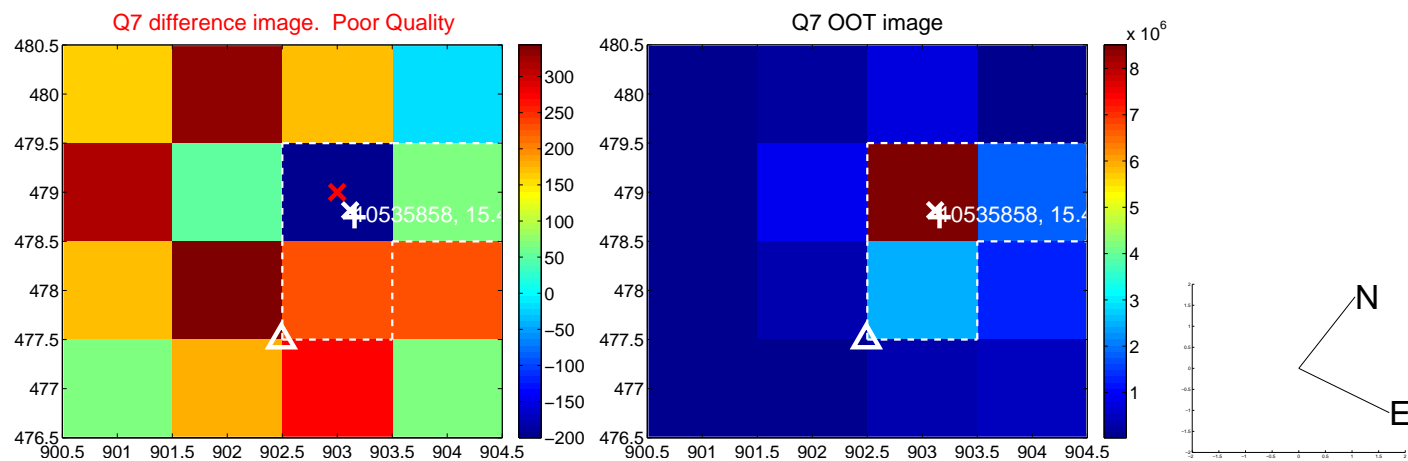
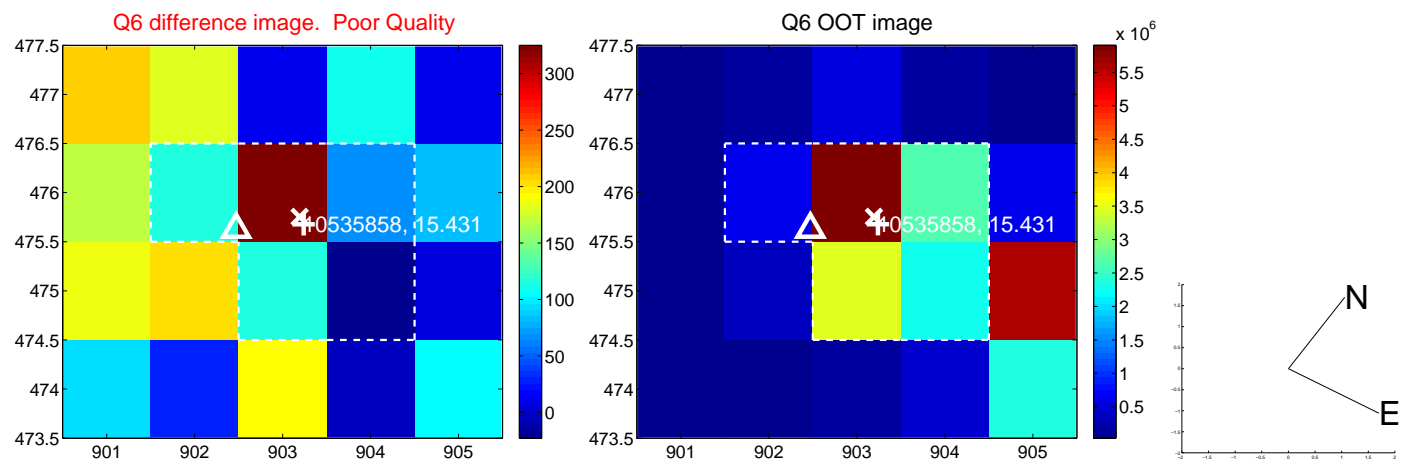
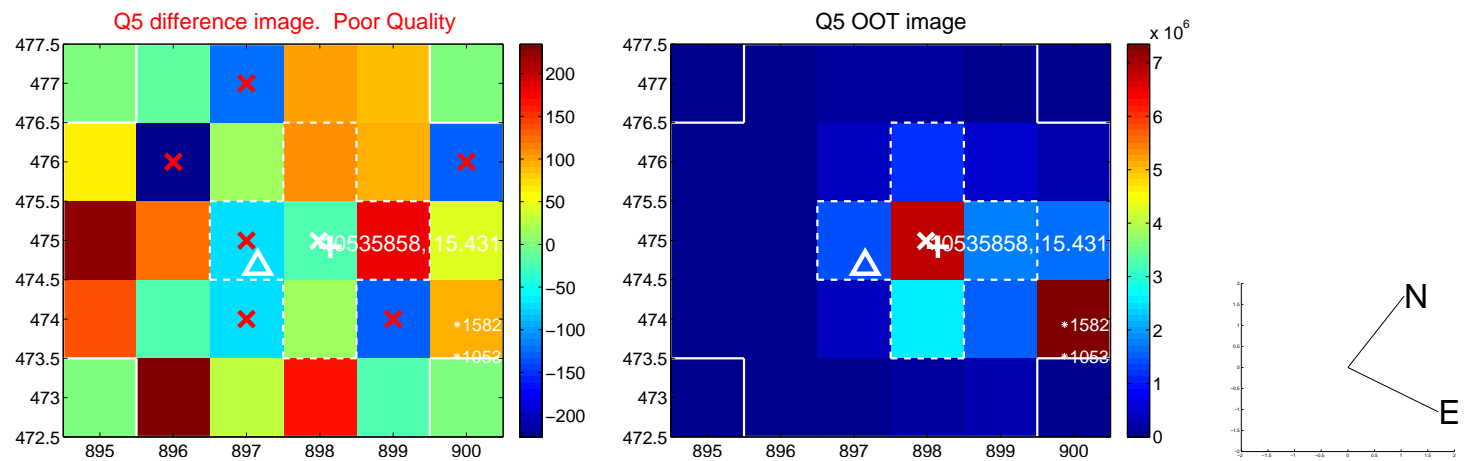


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

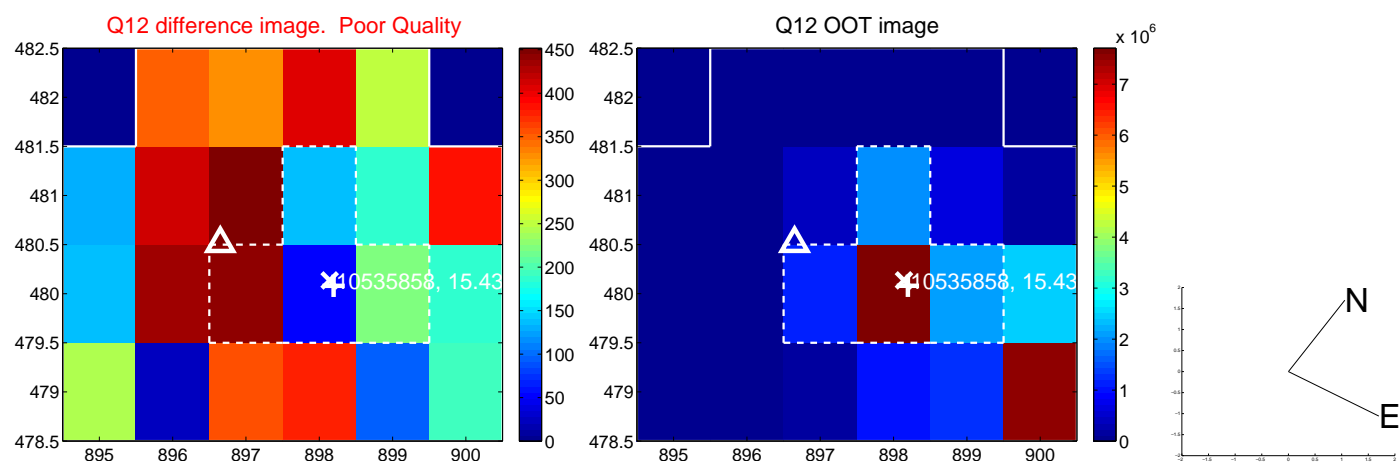
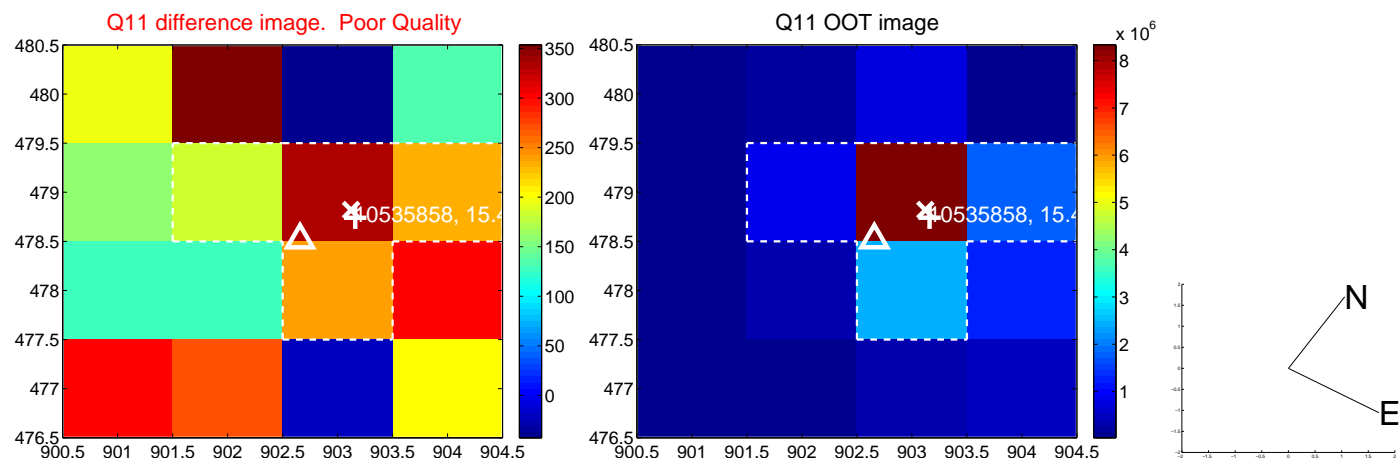
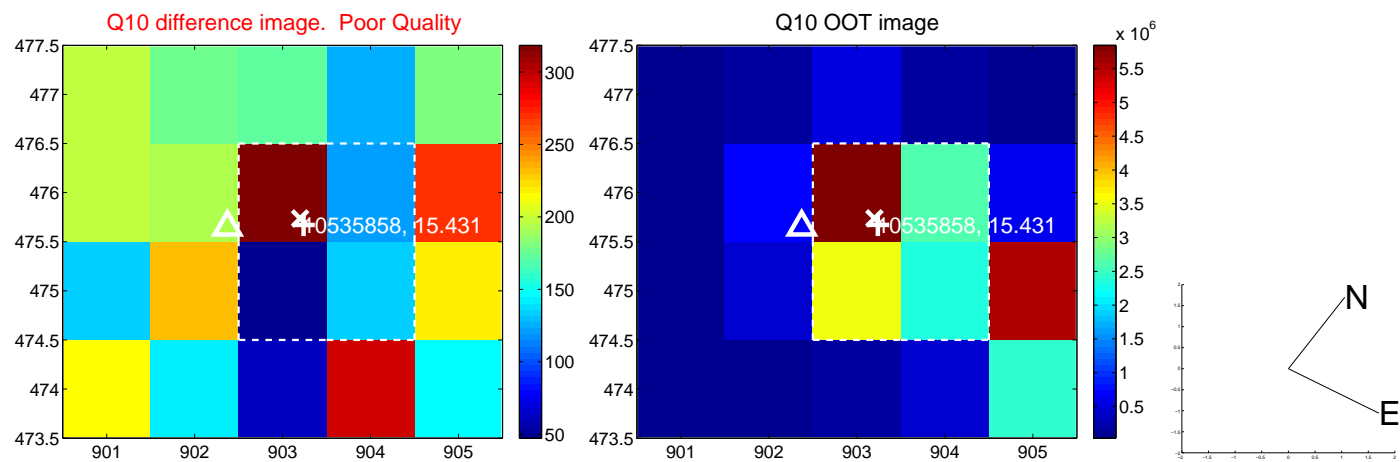
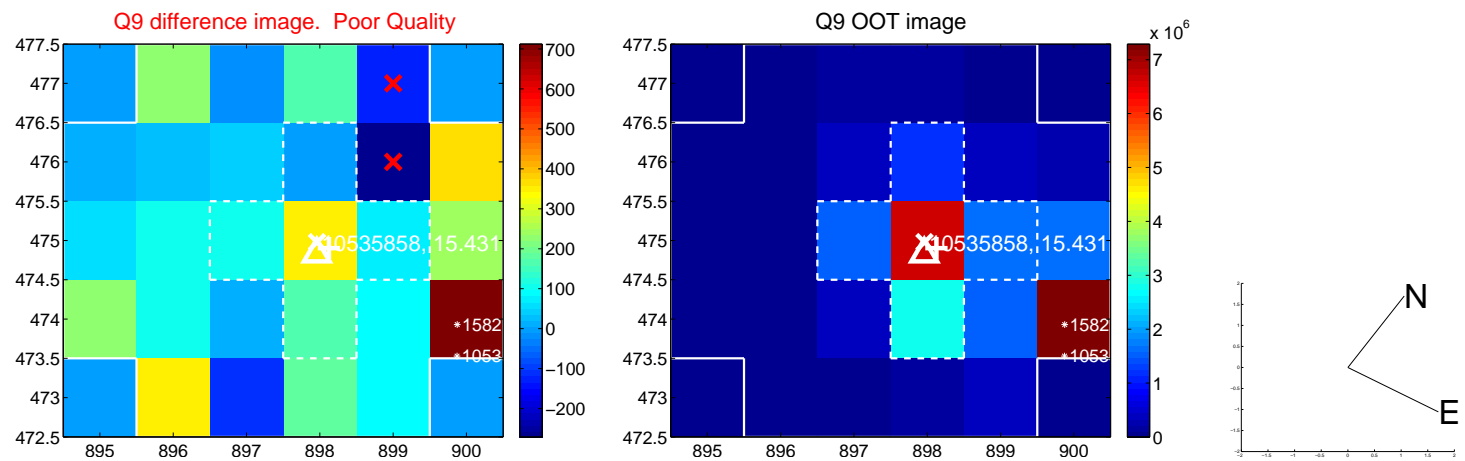


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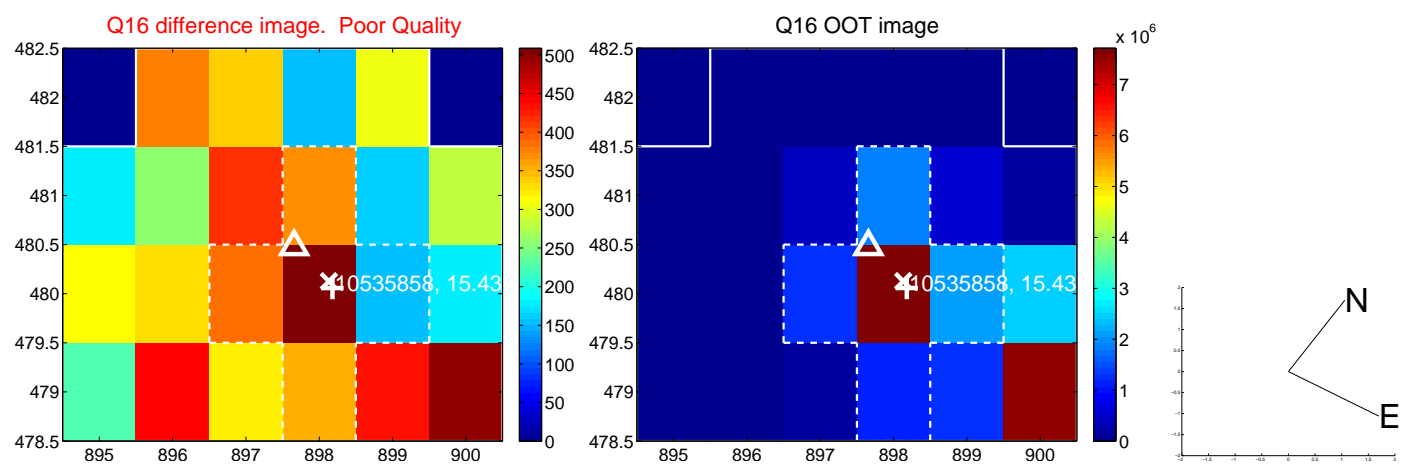
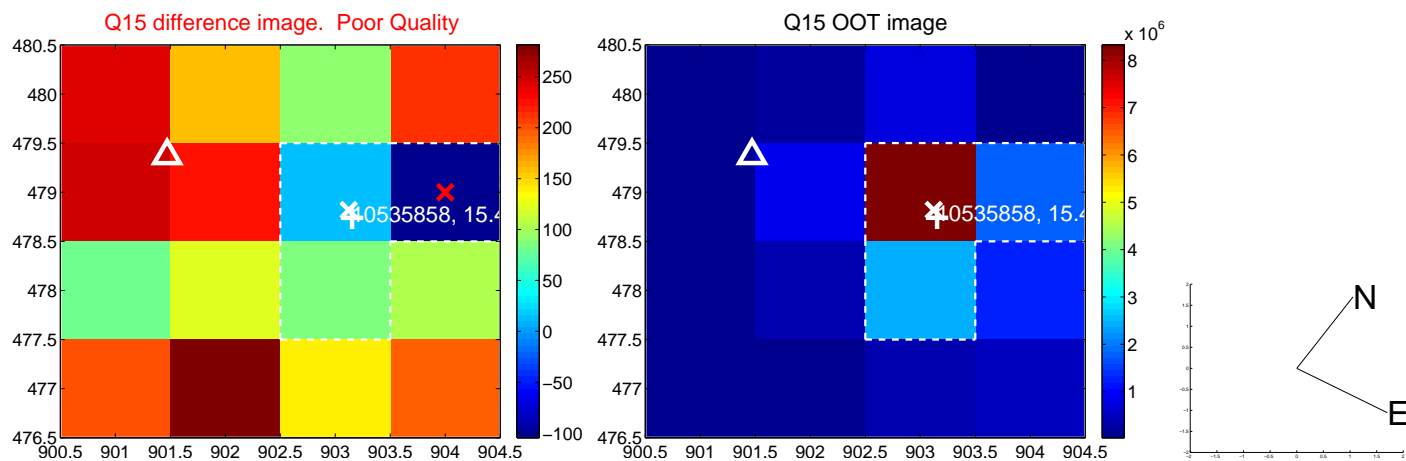
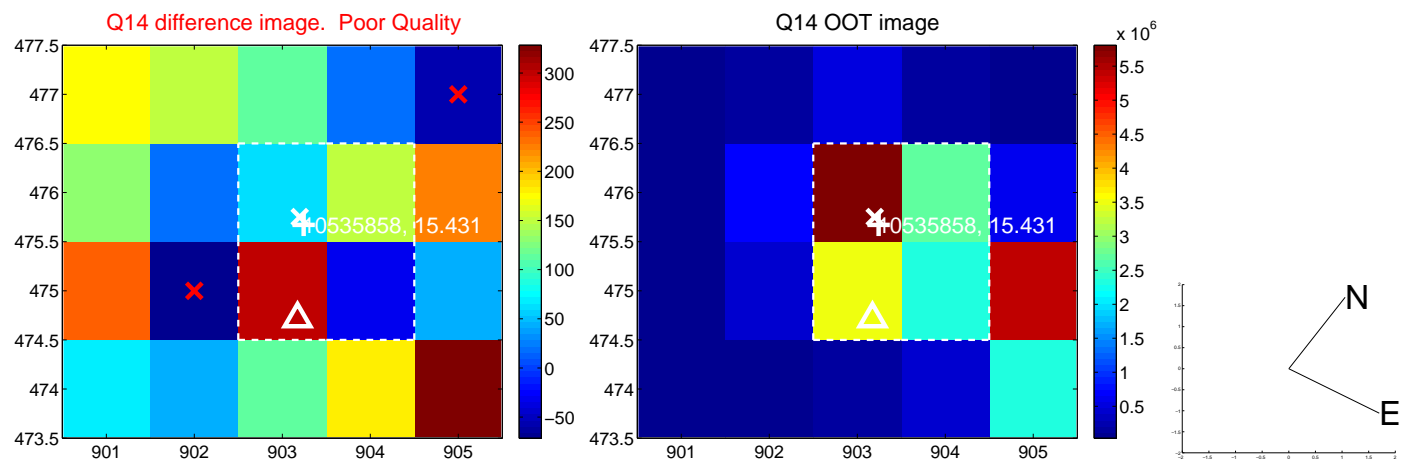
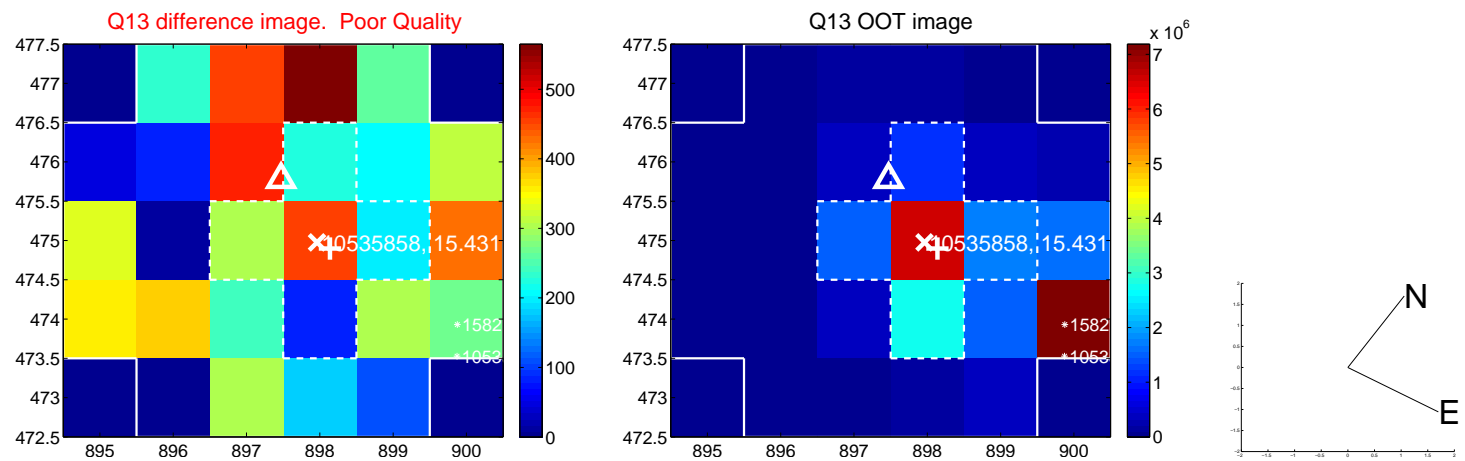




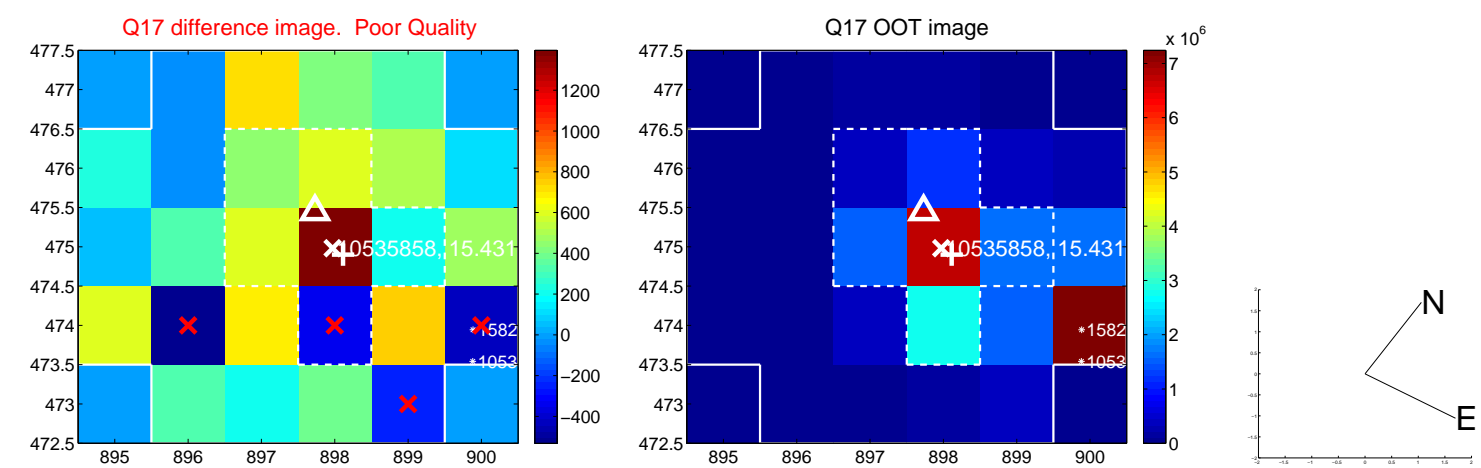
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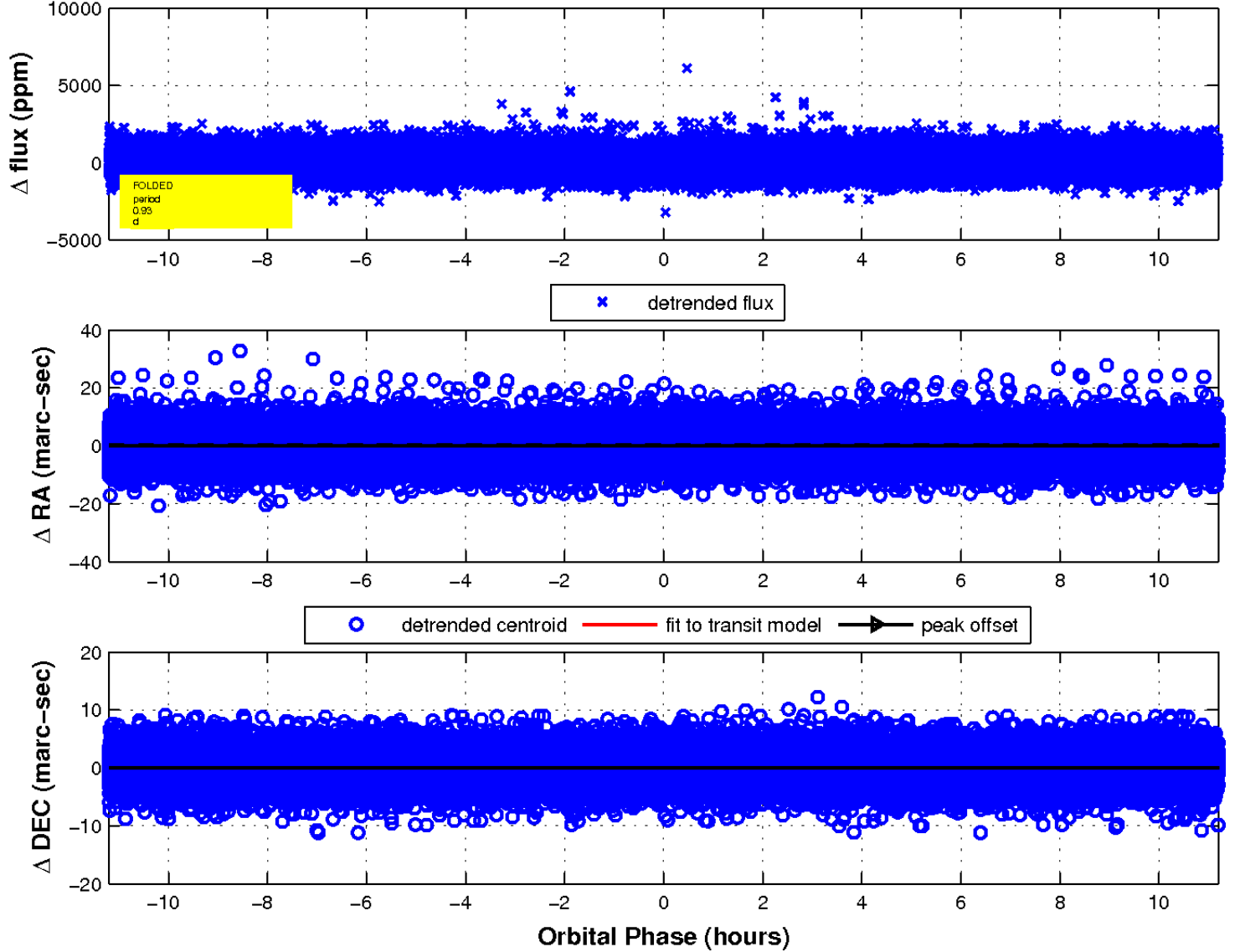
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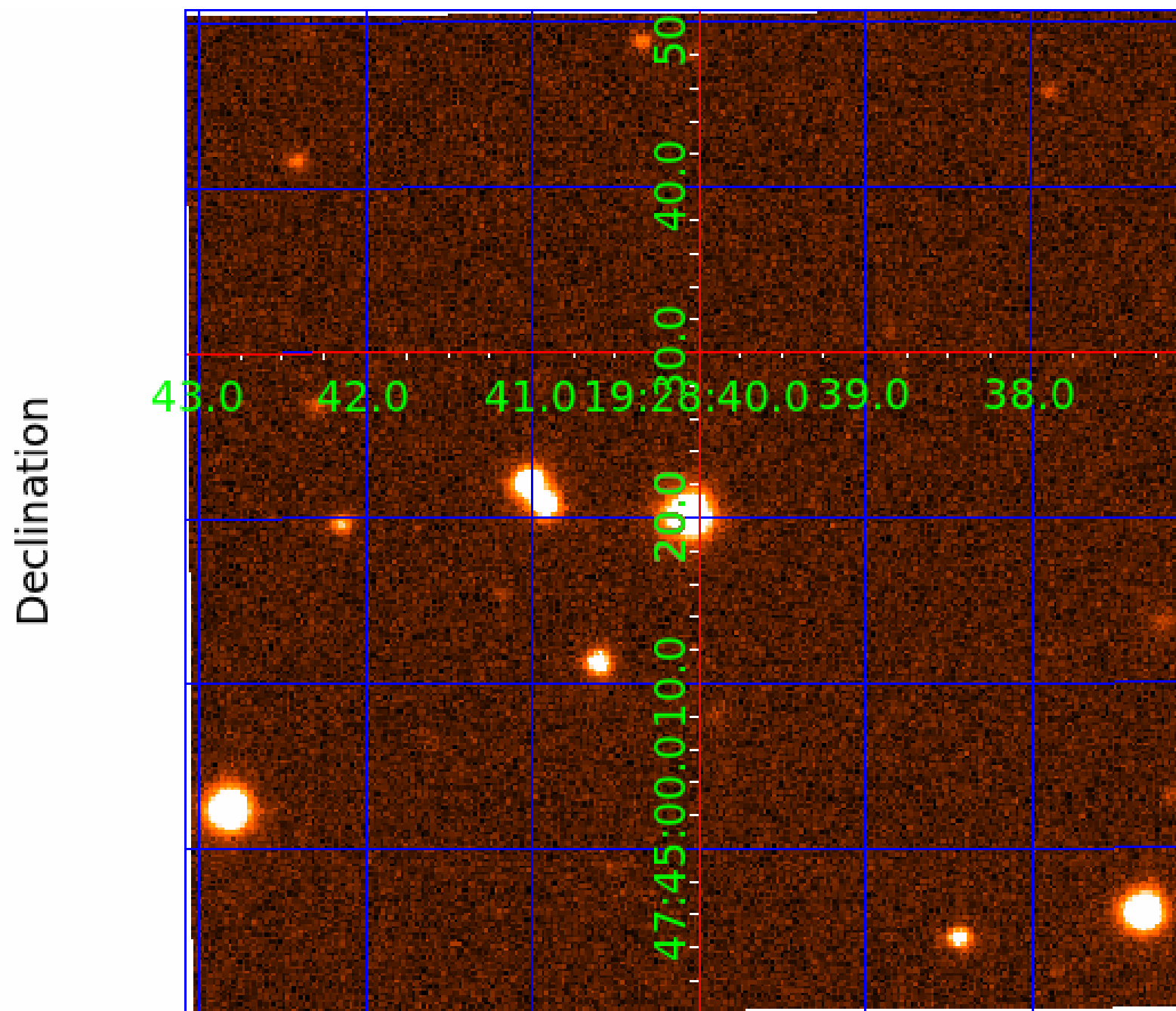
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fluxWeightedCentroids, Planet 1 of 7



UKIRT Image





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010535858-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

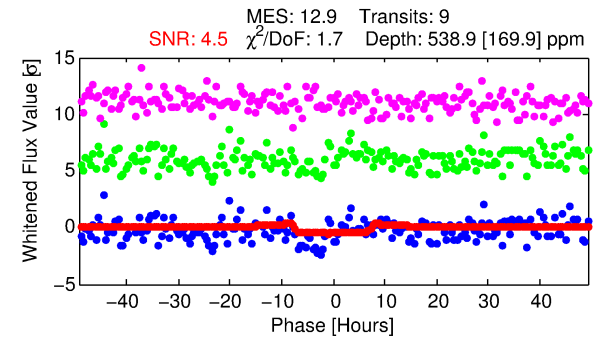
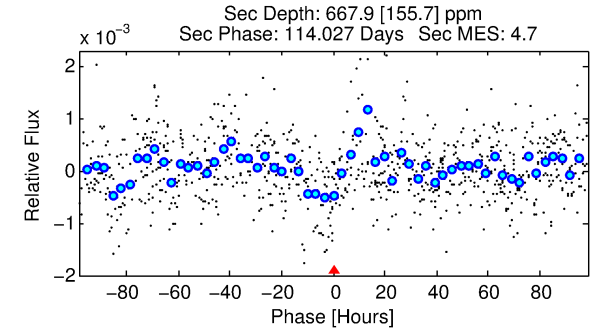
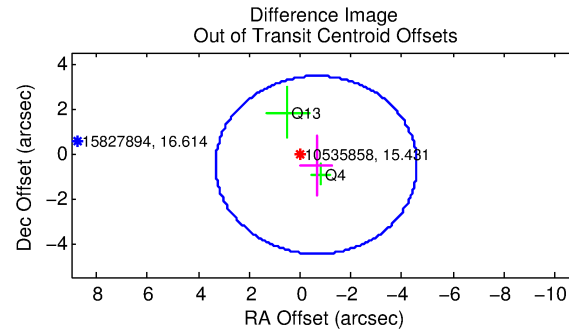
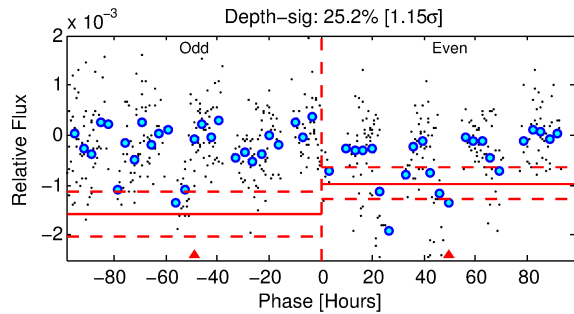
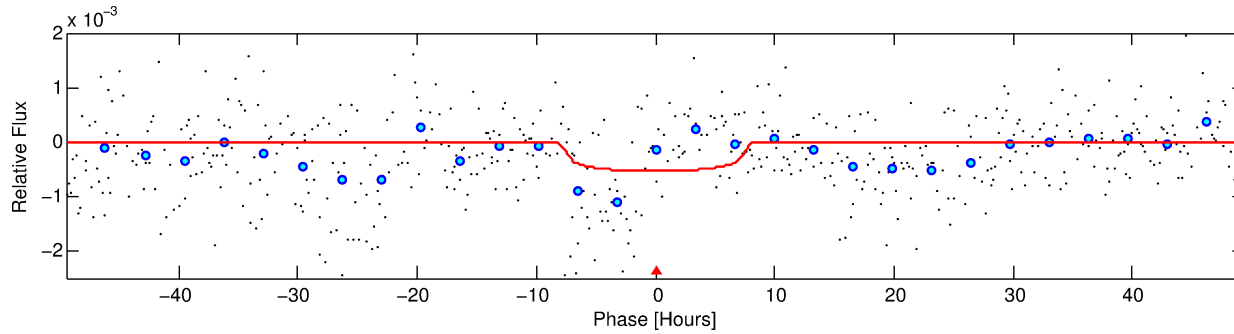
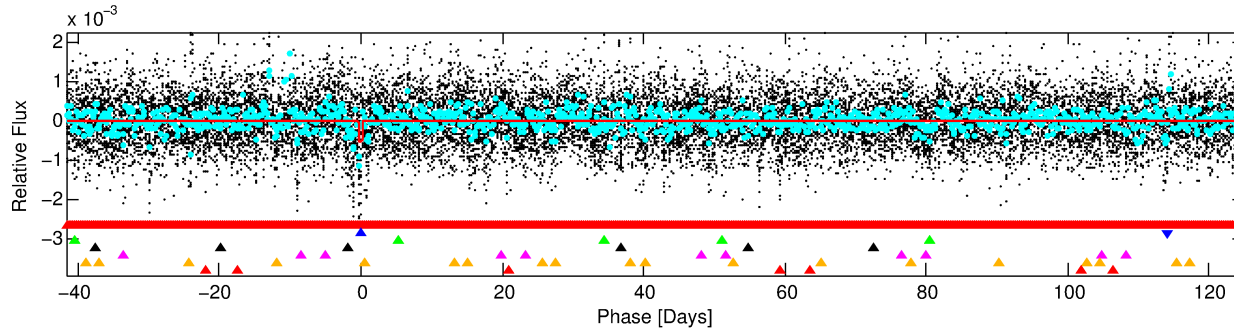
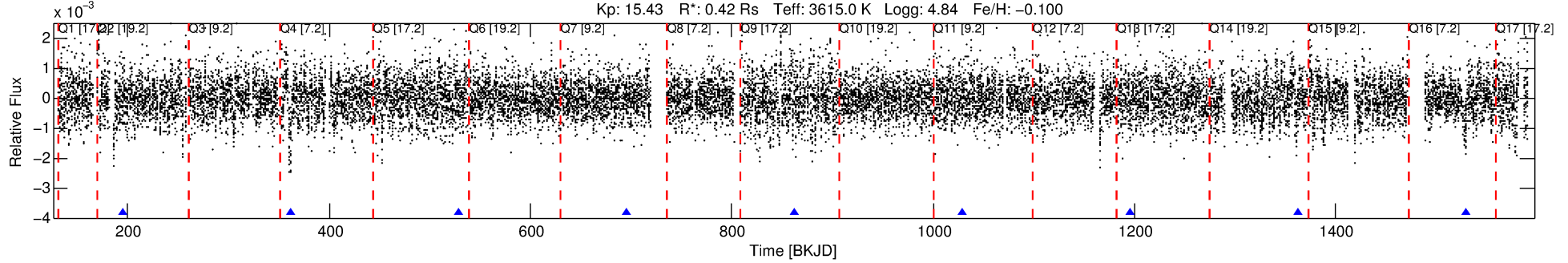
## Ephemeris Match Information For 010535858-02

No Significant Match Found

# DV One-Page Summary

KIC: 10535858 Candidate: 2 of 7 Period: 166.731 d  
KOI: K07338 Corr: No Ephemeris Match

Kp: 15.43 R\*: 0.42 Rs Teff: 3615.0 K Logg: 4.84 Fe/H: -0.100



## DV Fit Results:

Period = 166.73145 [0.01045] d  
Epoch = 195.1582 [0.0449] BKJD  
Rp/R\* = 0.0243 [0.0068]  
a/R\* = 43.63 [41.13]  
b = 0.86 [0.30]  
Seff = 0.13 [0.01]  
Teq = 154 [3] K  
Rp = 1.12 [0.33] Re  
a = 0.4524 [0.0257] AU  
Ag = 60438.33 [37061.26] [1.63σ]  
Teffp = 3725 [569] K [6.27σ]

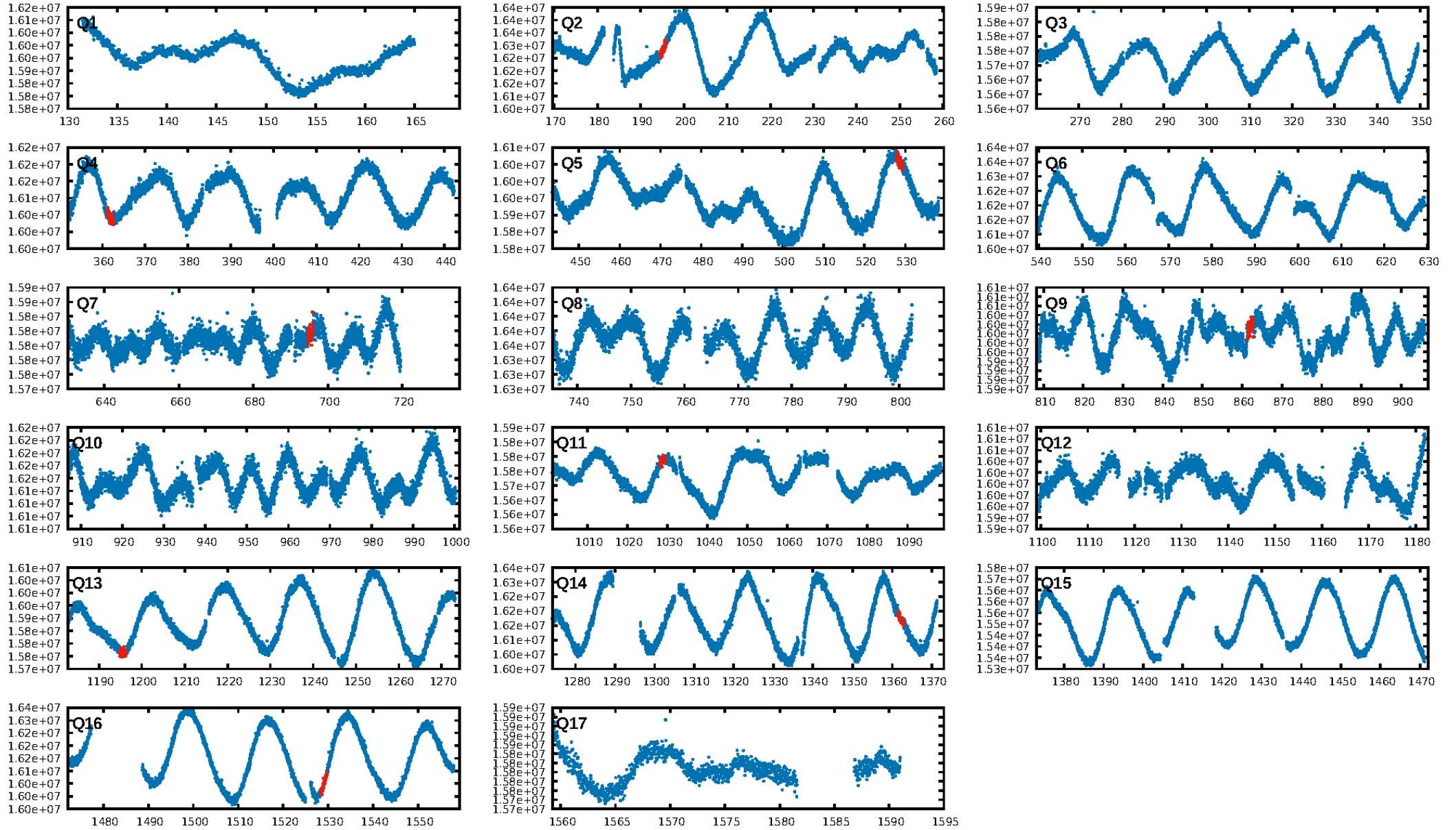
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [36.99σ]  
LongPeriod-sig: 100.0% [54.64σ]  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 8.96e-21  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: 0.3606  
Centroid-sig: 6.8%  
Centroid-so: 2.402 arcsec [1.34σ]  
OotOffset-rm: 0.820 arcsec [0.62σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-rm: 0.690 arcsec [0.62σ]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.00 [0/9]

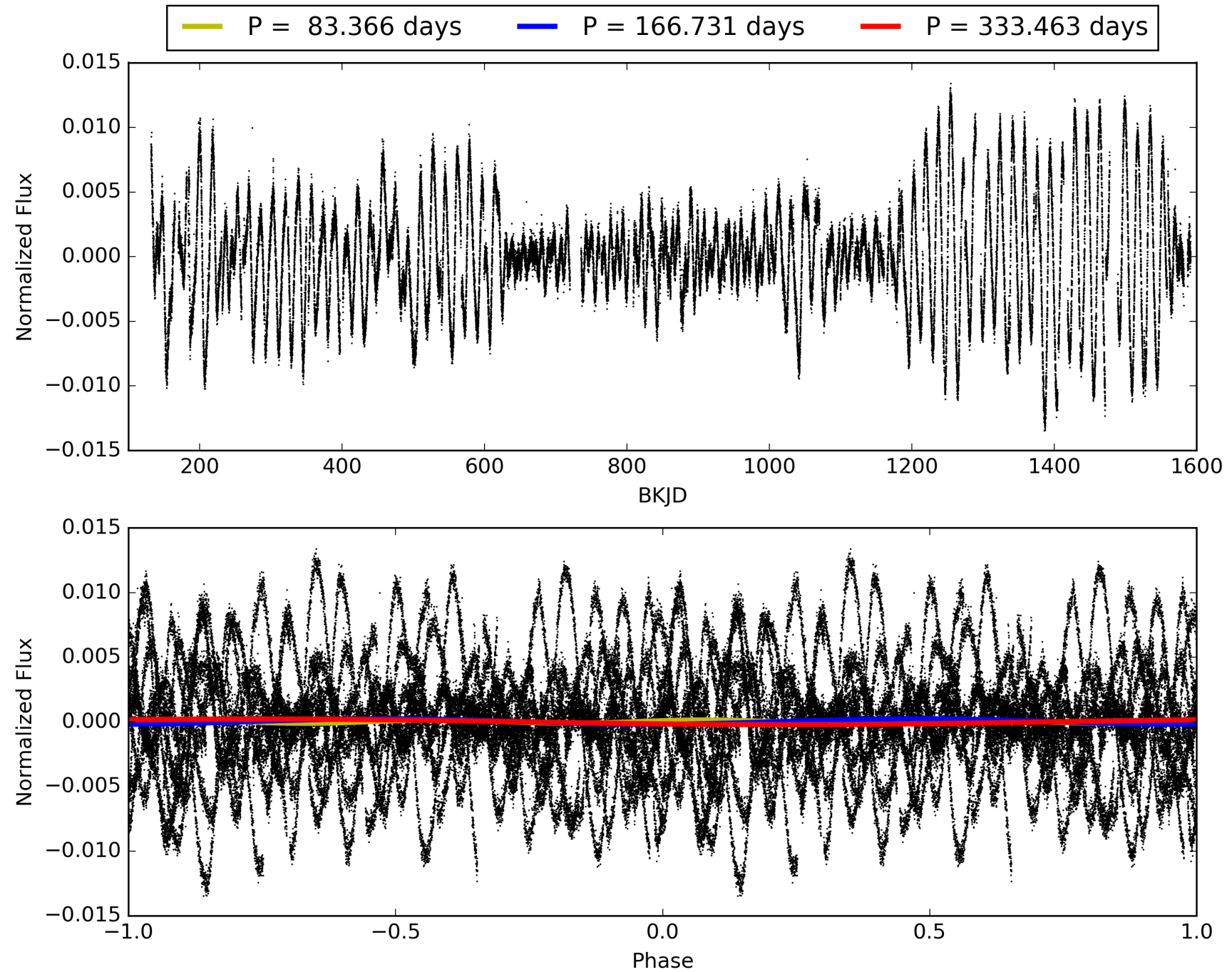
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:41:04 Z

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

# TCE 010535858-02, PDC Light Curves

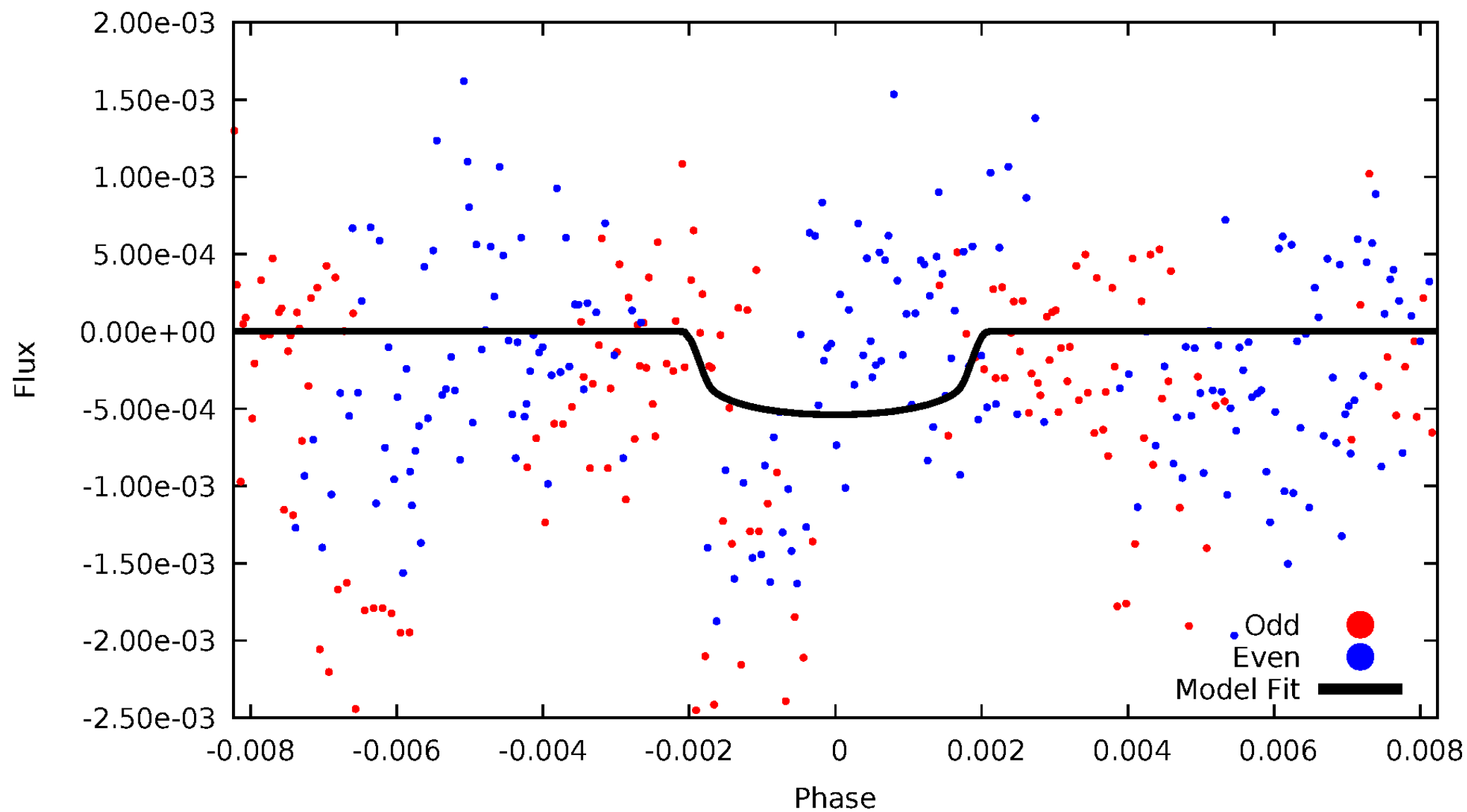


# TCE 010535858-02



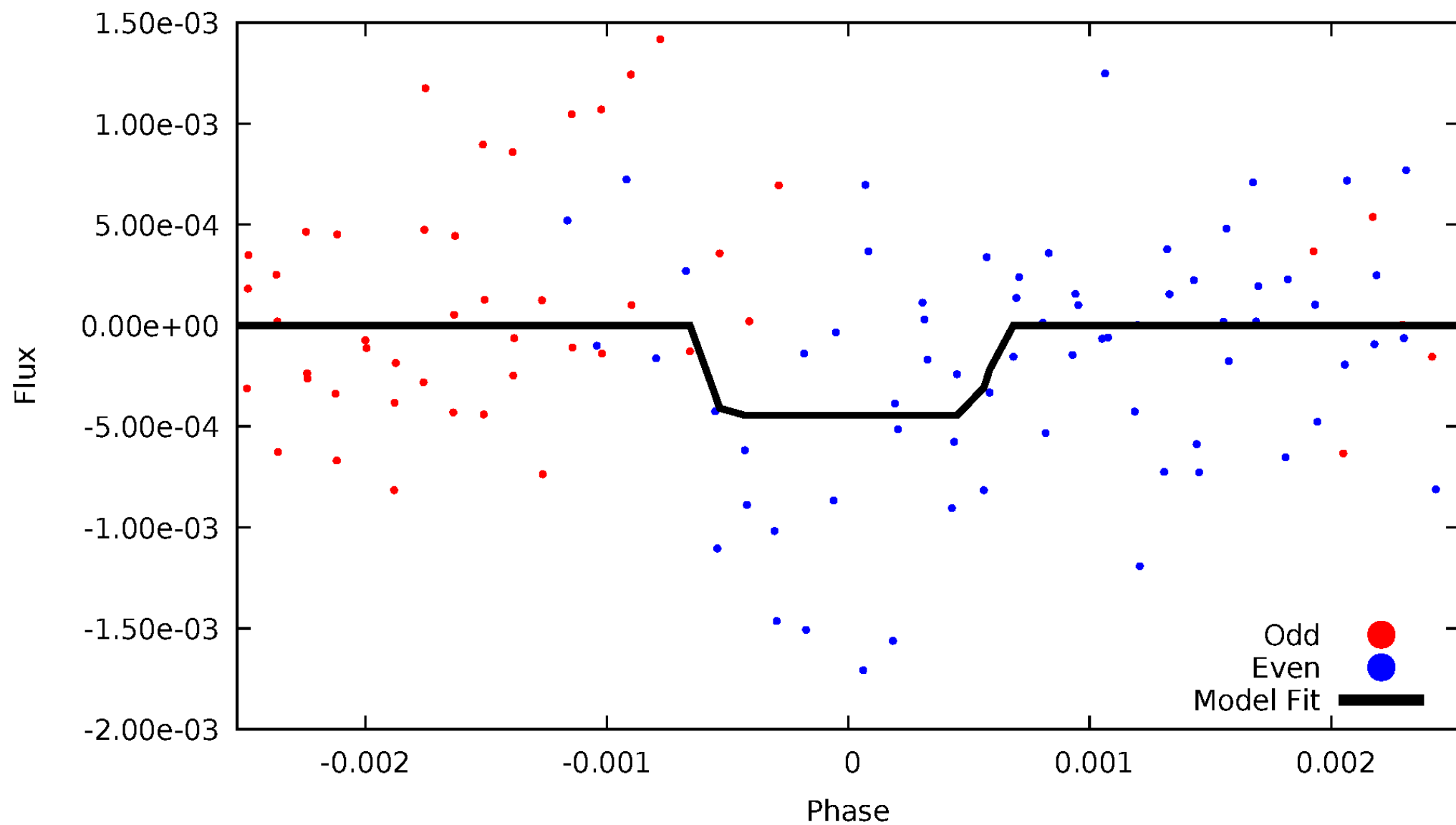
# DV Odd/Even

TCE 010535858-02



# ALT Odd/Even

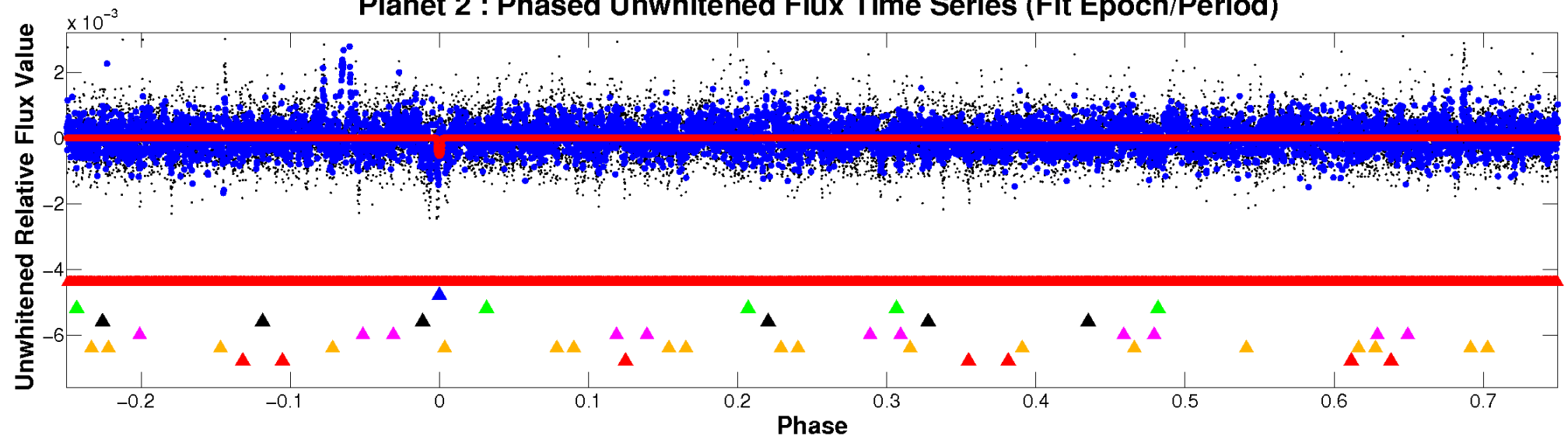
TCE 010535858-02



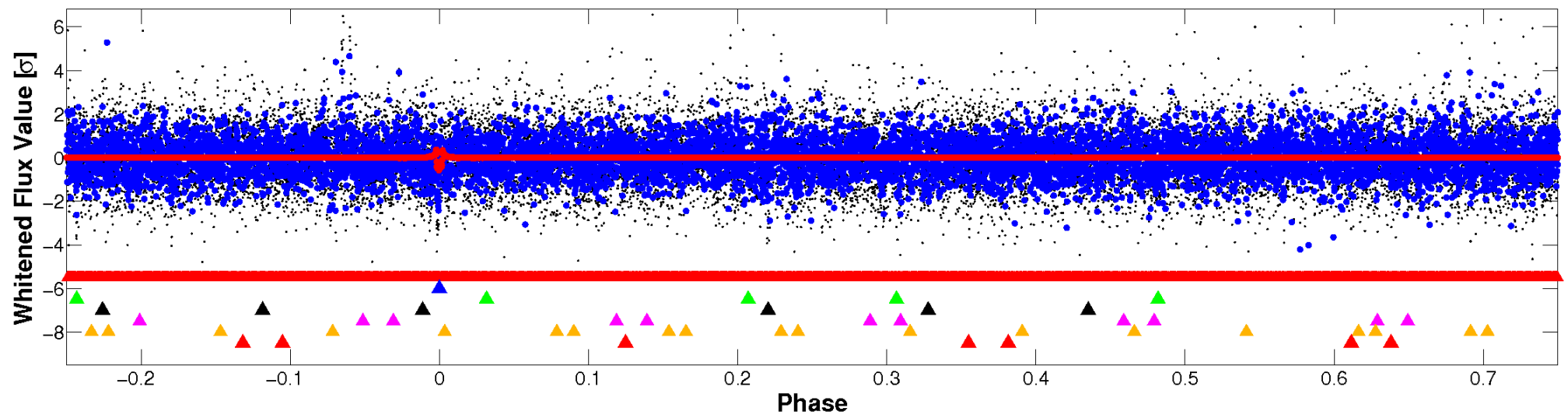


# Non-Whitened Vs. Whitened Light Curve

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

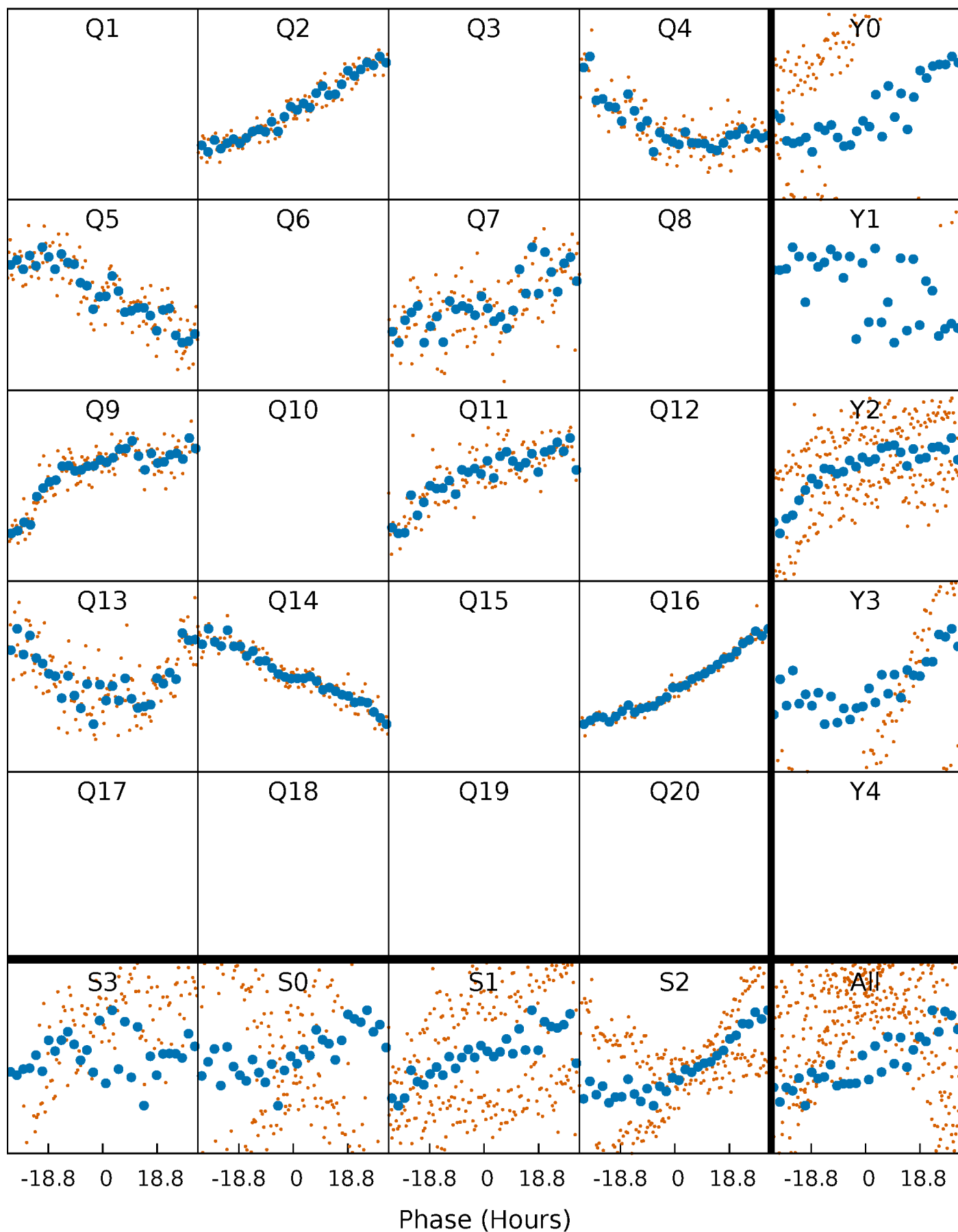


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



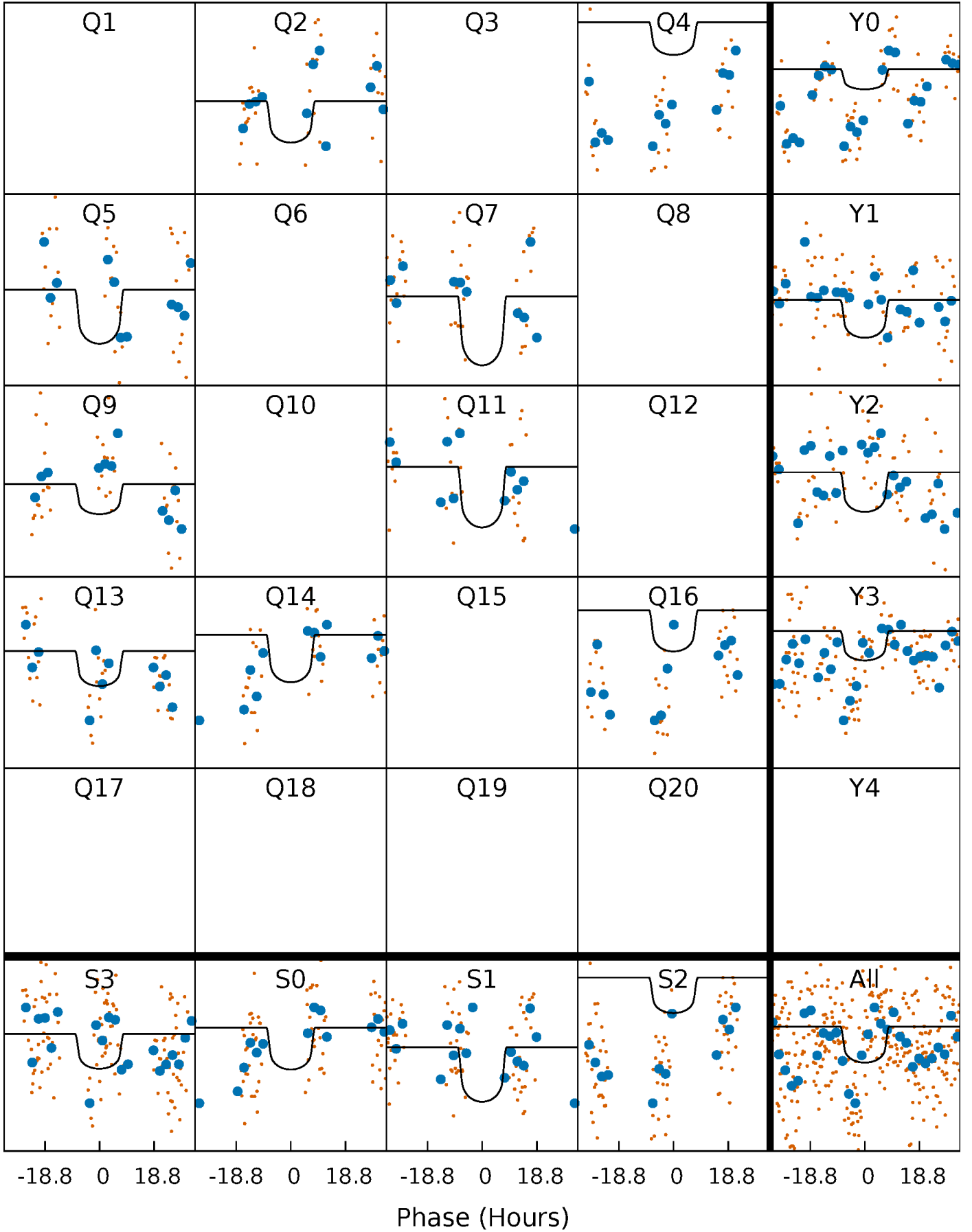
# PDC Quarter-Phased Transit Curves

TCE 010535858-02 P=166.731446 Days  $T_0=195.158250$  (BKJD)



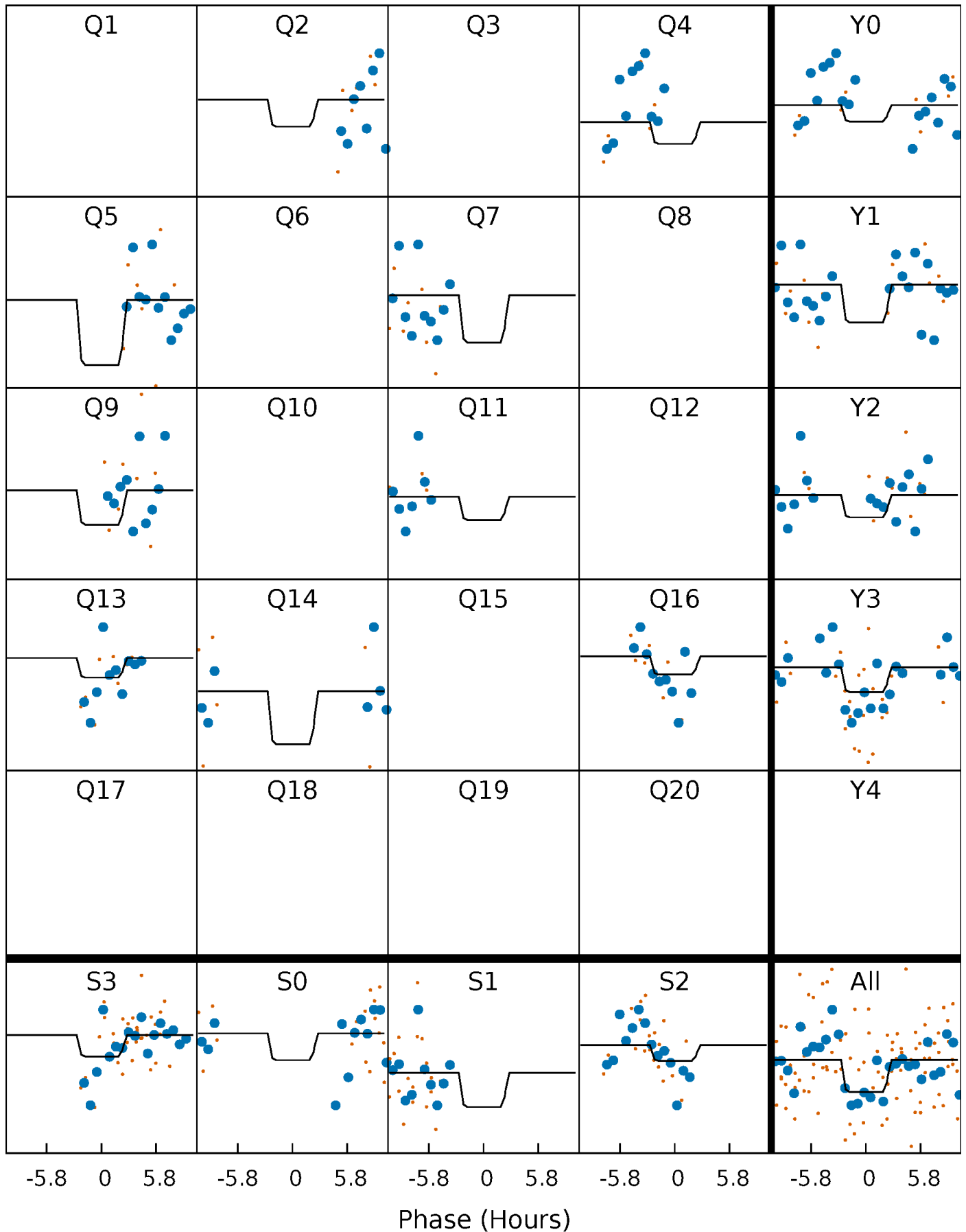
# DV Quarter-Phased Transit Curves

TCE 010535858-02     $P=166.731446$  Days     $T_0=195.158250$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

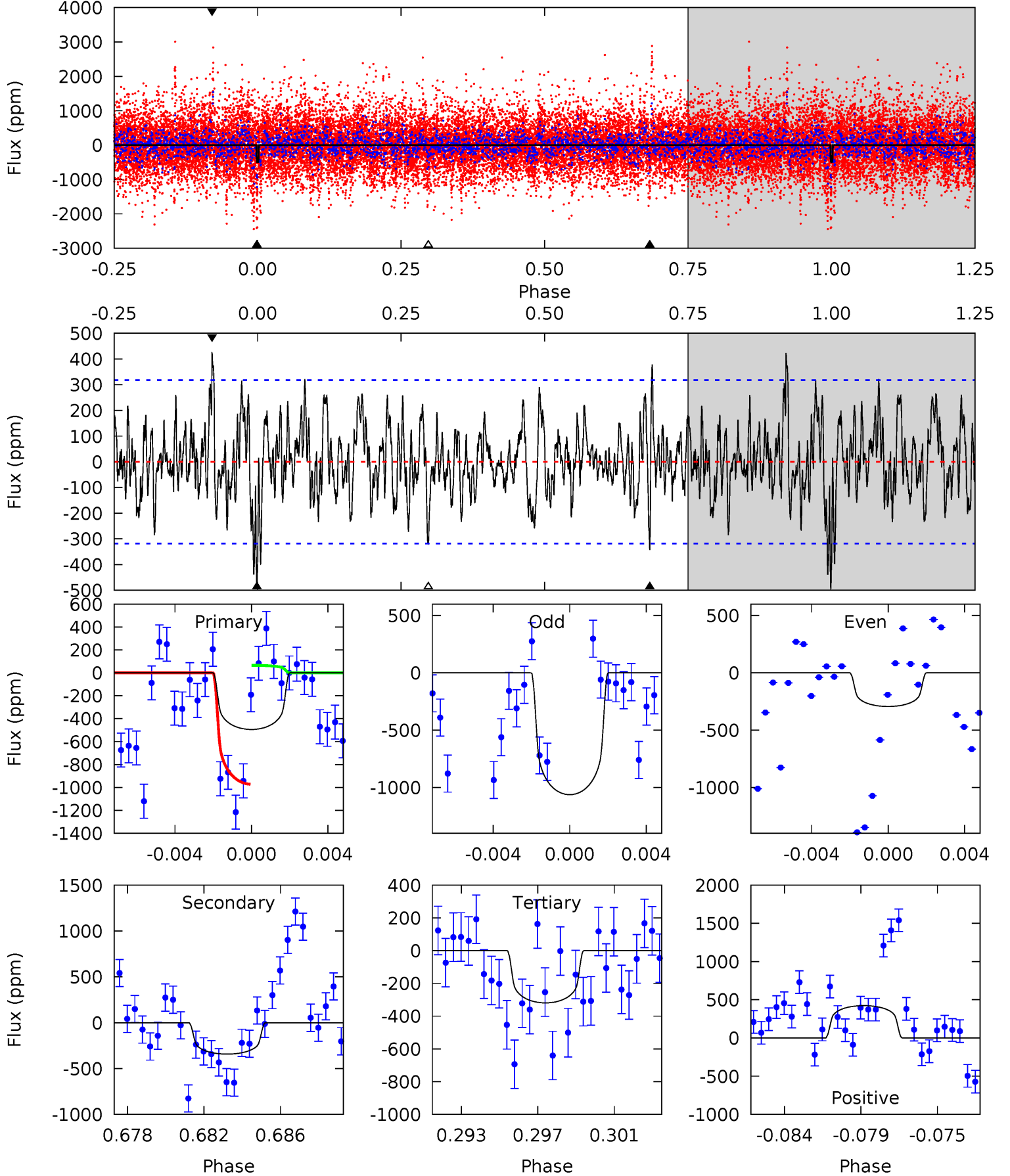
TCE 010535858-02 P=166.718091 Days  $T_0=195.167518$  (BKJD)



# DV Model-Shift Uniqueness Test

010535858-02,  $P = 166.731446$  Days,  $E = 28.426804$  Days

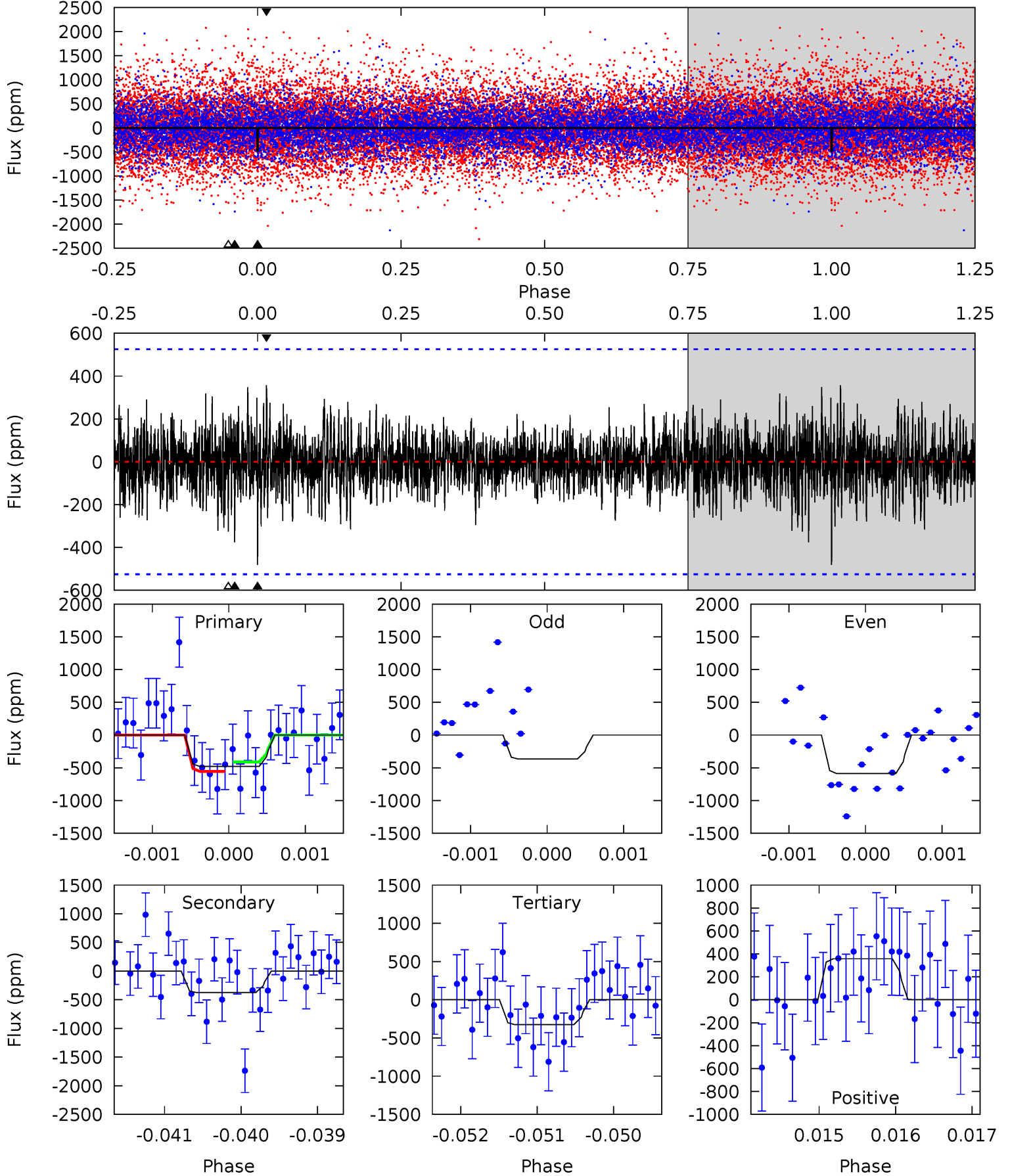
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.07	5.59	5.21	6.91	5.19	2.86	1.93	2.86	1.16	0.38	-1.32	5.81	15.1	0.46	7.38



# Alt Model-Shift Uniqueness Test

010535858-02, P = 166.718091 Days, E = 28.449427 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
4.97	3.87	3.36	3.69	5.43	3.25	0.94	1.60	1.28	0.51	0.19	0.76	0.82	0.43	0.74



### Stellar Parameters For KIC 010535858

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3615^{+43}_{-50}$	$4.839^{+0.030}_{-0.033}$	$-0.100^{+0.100}_{-0.100}$	$0.420^{+0.029}_{-0.032}$	$0.445^{+0.025}_{-0.038}$	$8.445^{+1.369}_{-1.178}$
	+1%/-1%	+1%/-1%	+100%/-100%	+7%/-8%	+6%/-9%	+16%/-14%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 010535858-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-342 \pm 61$	$1.13^{+0.33}_{-0.33}$	$215^{+4}_{-4}$	$3297^{+418}_{-253}$	$30476^{+33136}_{-13118}$
Alt.	$-375 \pm 97$	$0.98^{+0.30}_{-0.31}$	$215^{+4}_{-4}$	$3503^{+492}_{-311}$	$43644^{+52113}_{-19181}$

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



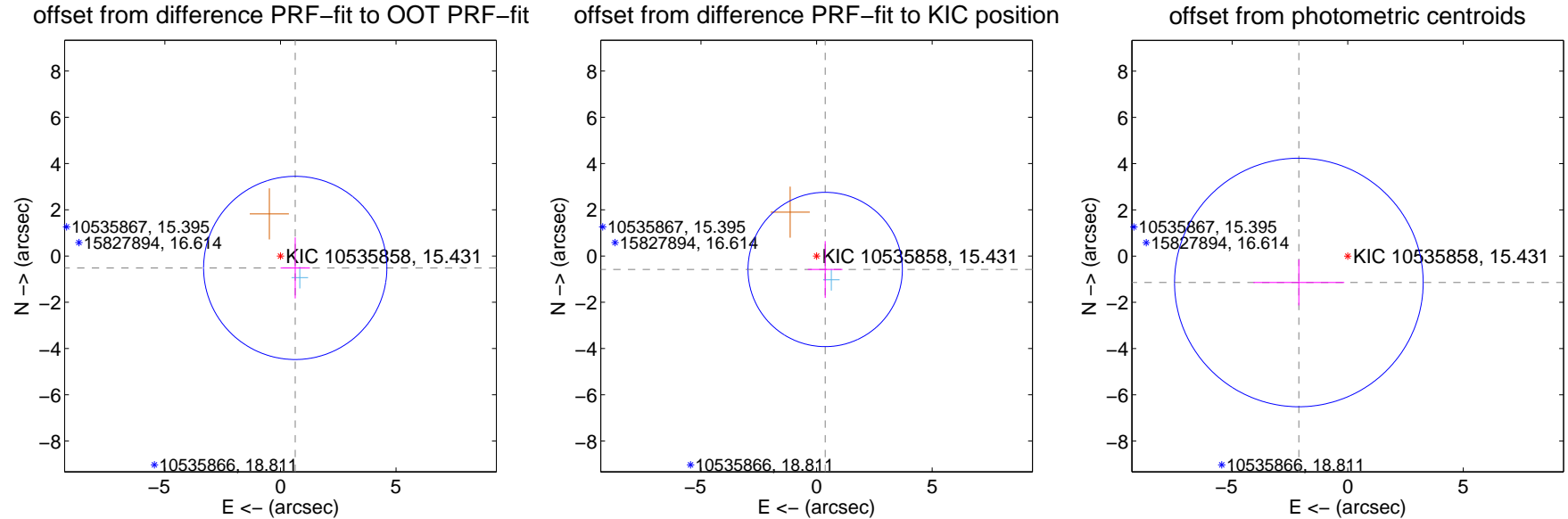
## DV Centroid Data

Supplemental centroid analysis for 010535858-02. Kepler magnitude: 15.43. Transit SNR 4.50

There are 1 quarters with good PRF difference image offsets

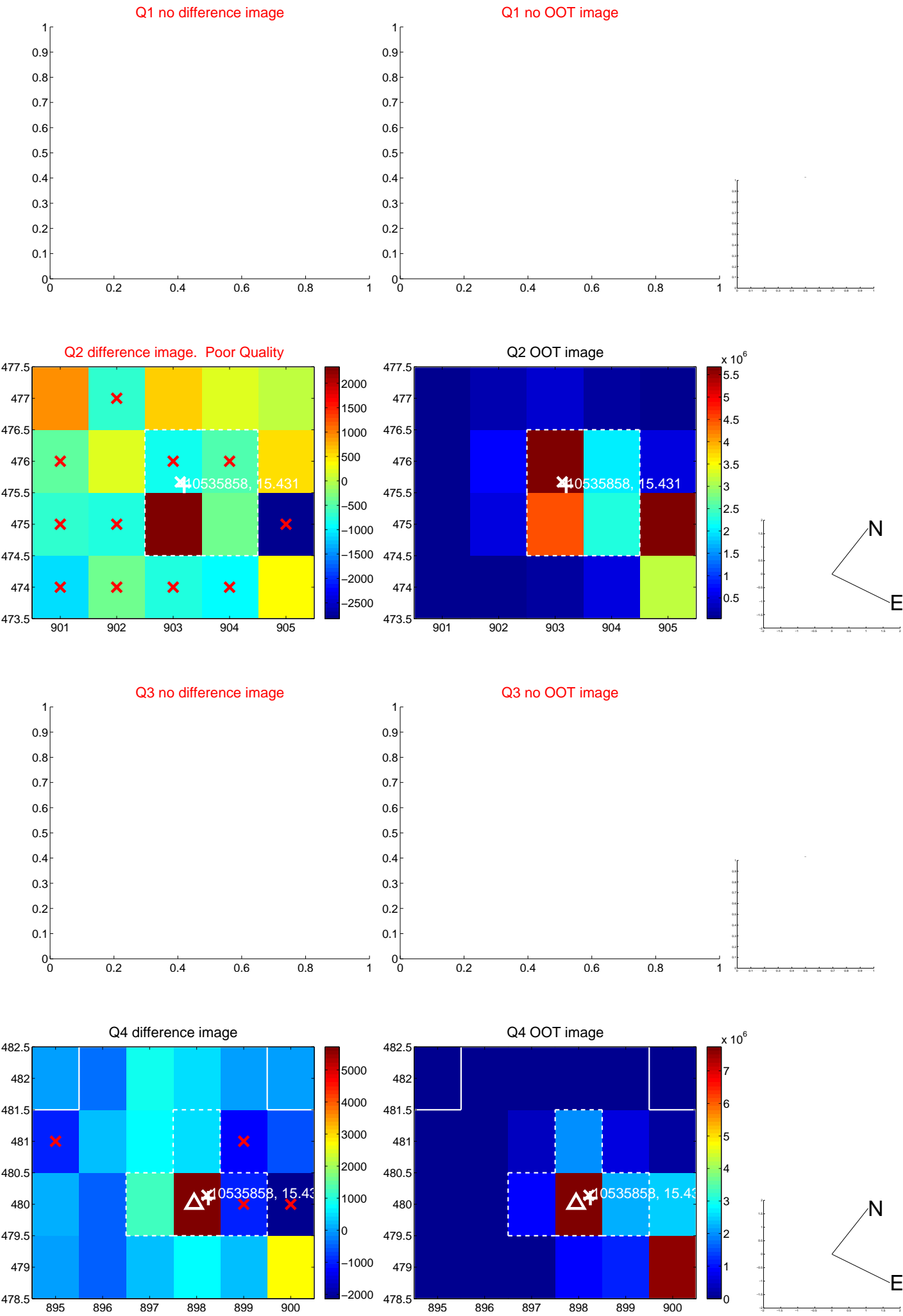
The direct PRF centroid is offset from the target star catalog position by about 0.66 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.820 \pm 1.321$	0.62	$-0.639 \pm 0.634$	$-0.515 \pm 1.321$
PRF-fit source offset from KIC position	$0.690 \pm 1.112$	0.62	$-0.372 \pm 0.748$	$-0.581 \pm 1.231$
photometric centroid source offset	$2.40 \pm 1.79$	1.34	$2.11 \pm 1.97$	$-1.14 \pm 0.99$

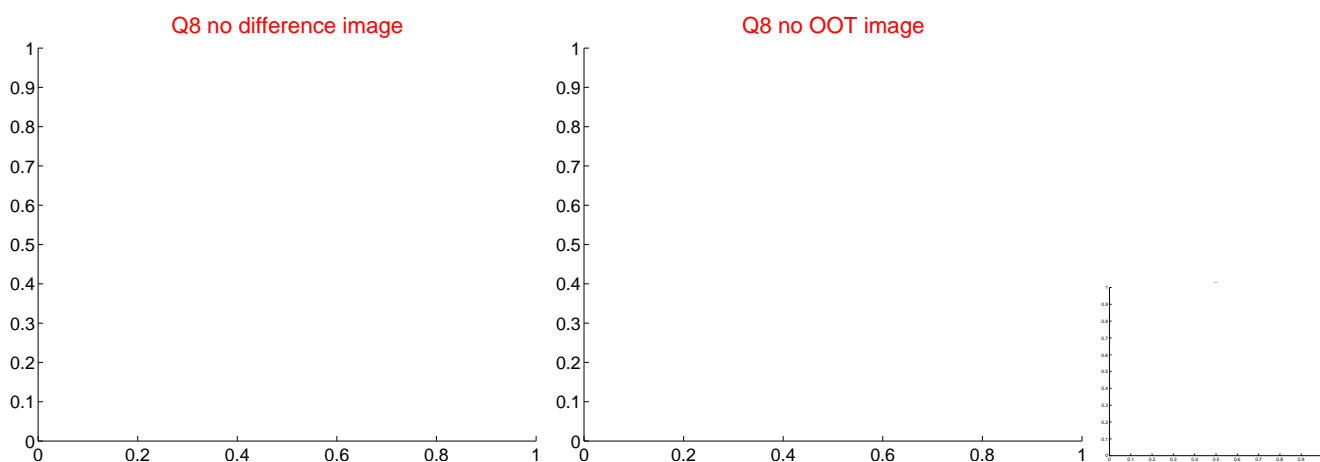
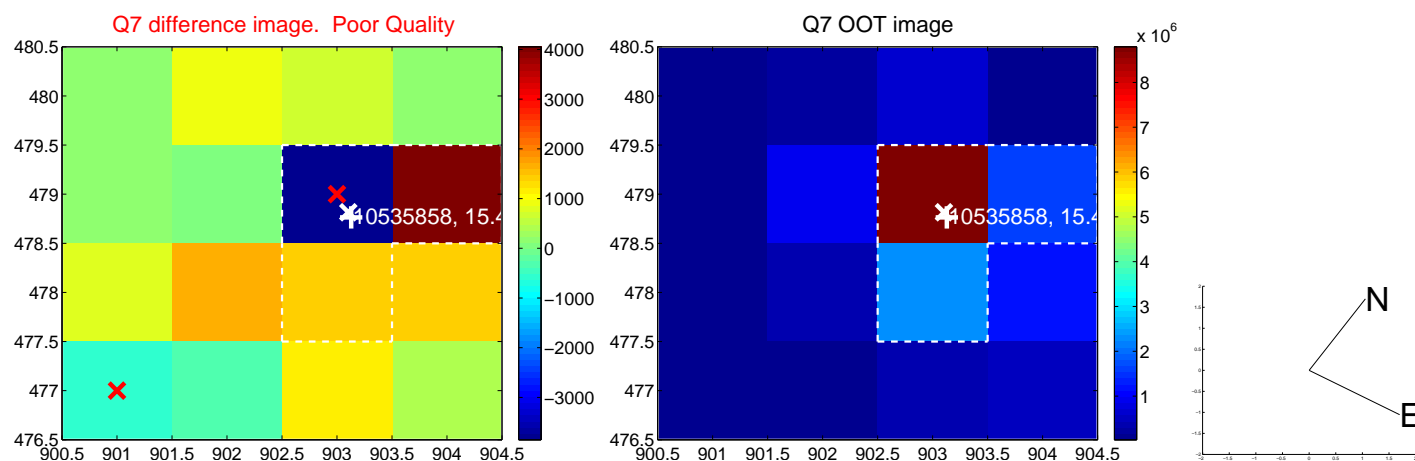
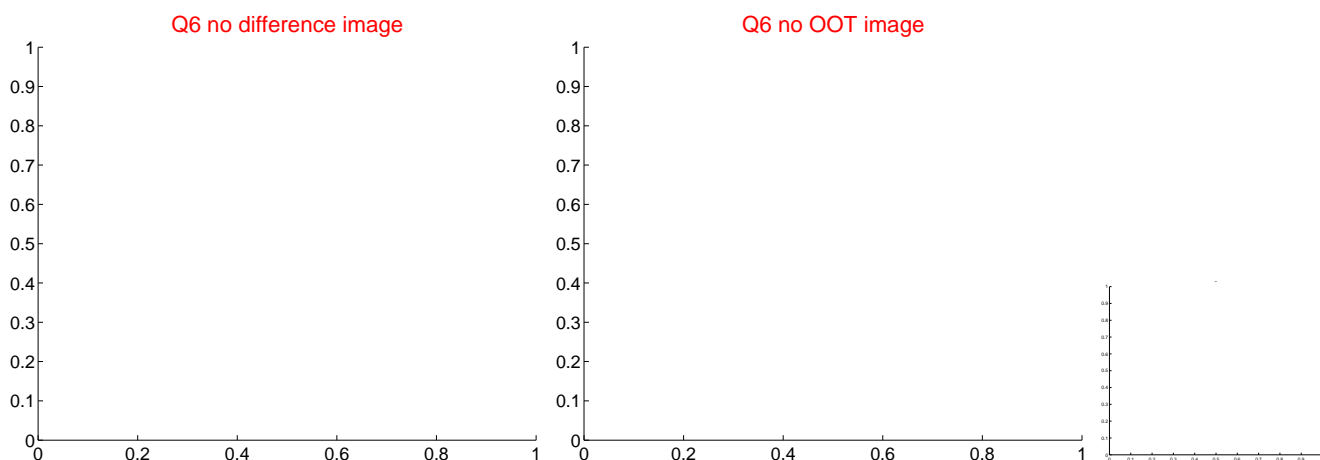
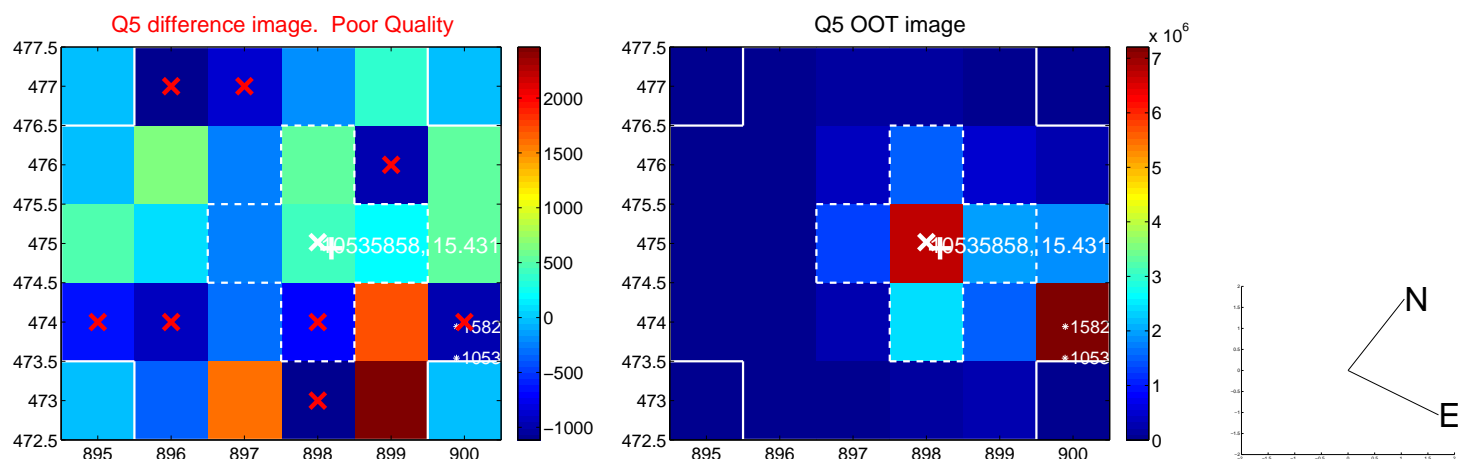


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

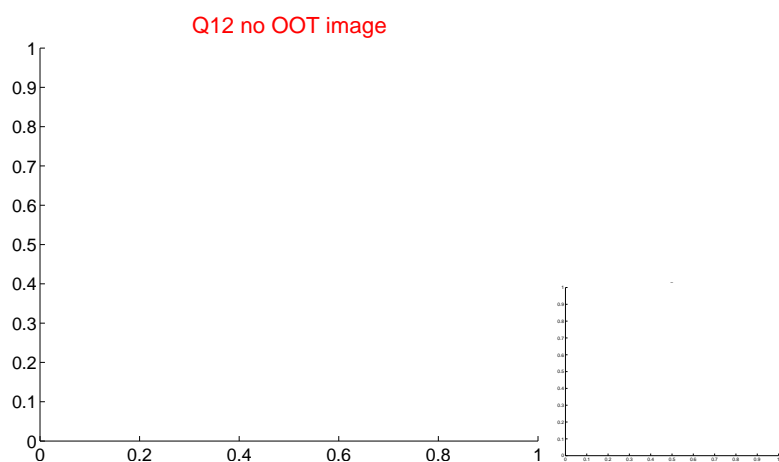
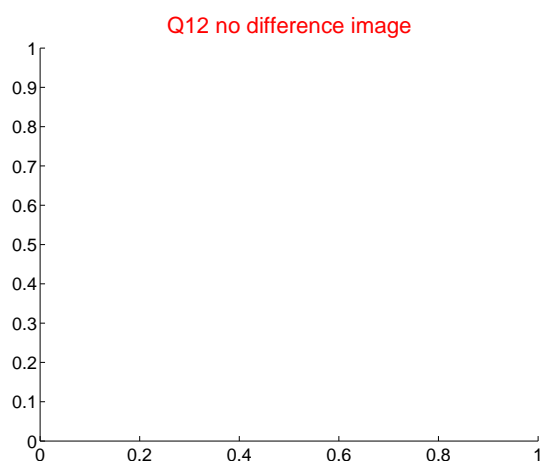
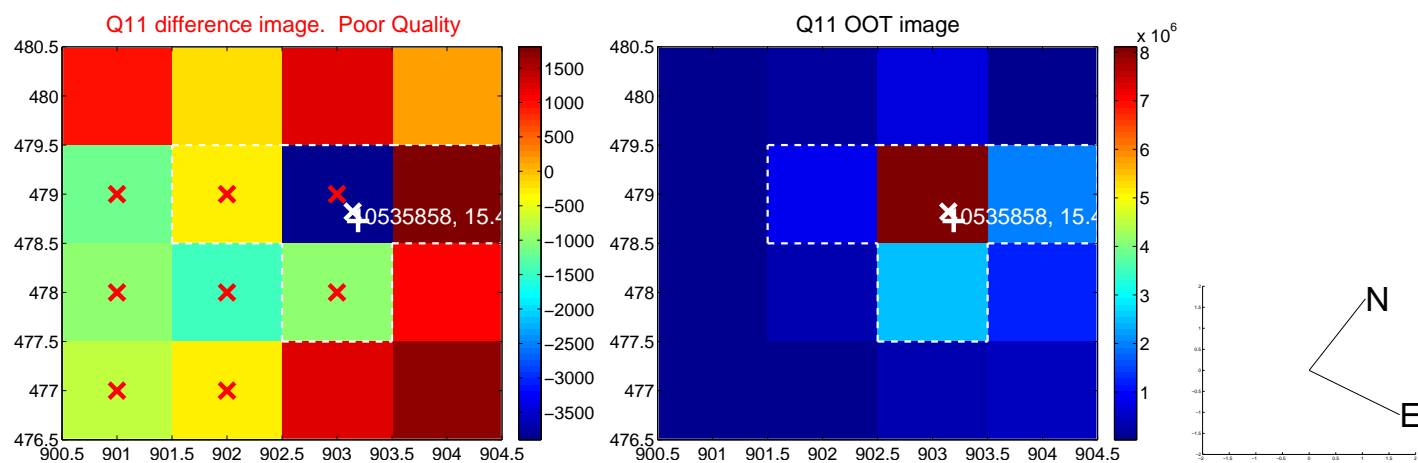
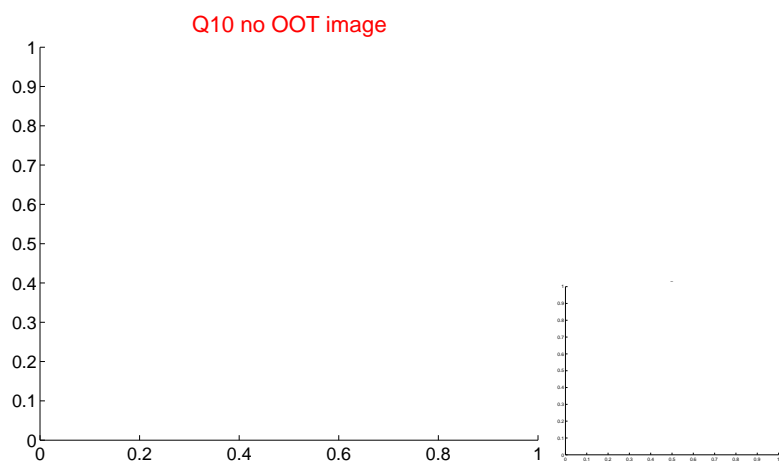
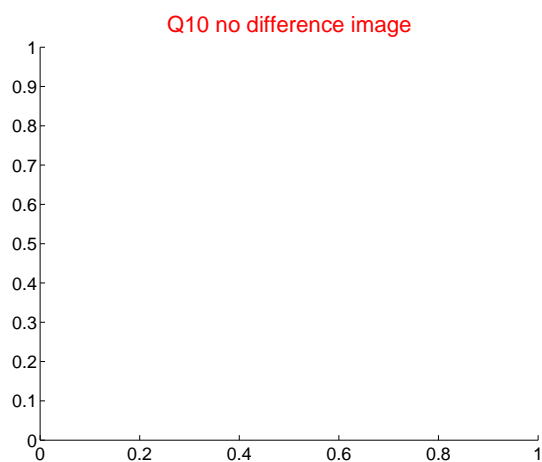
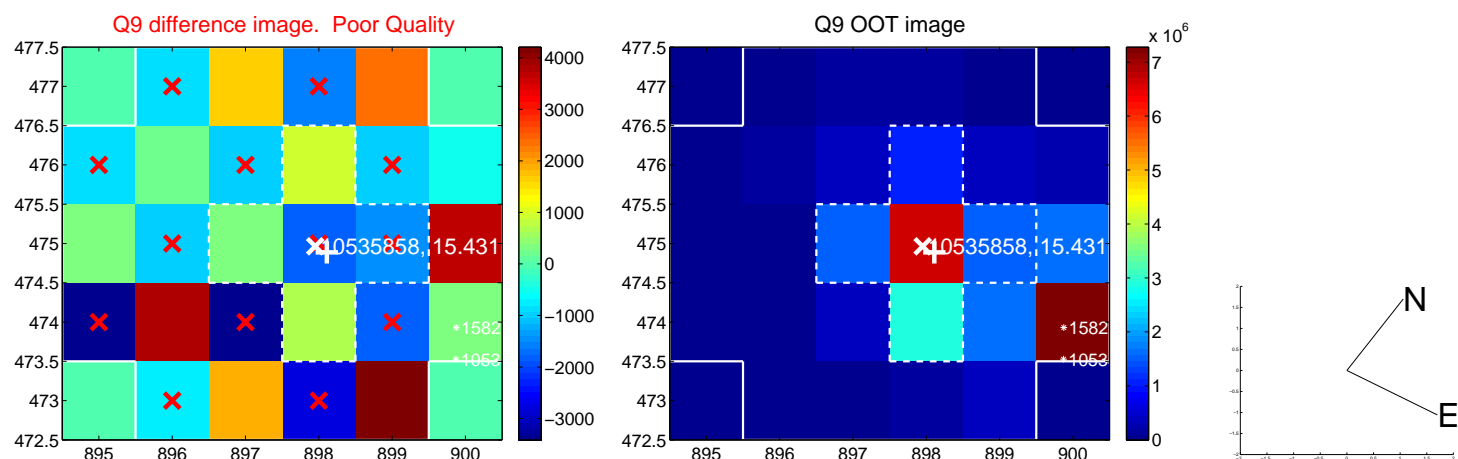
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



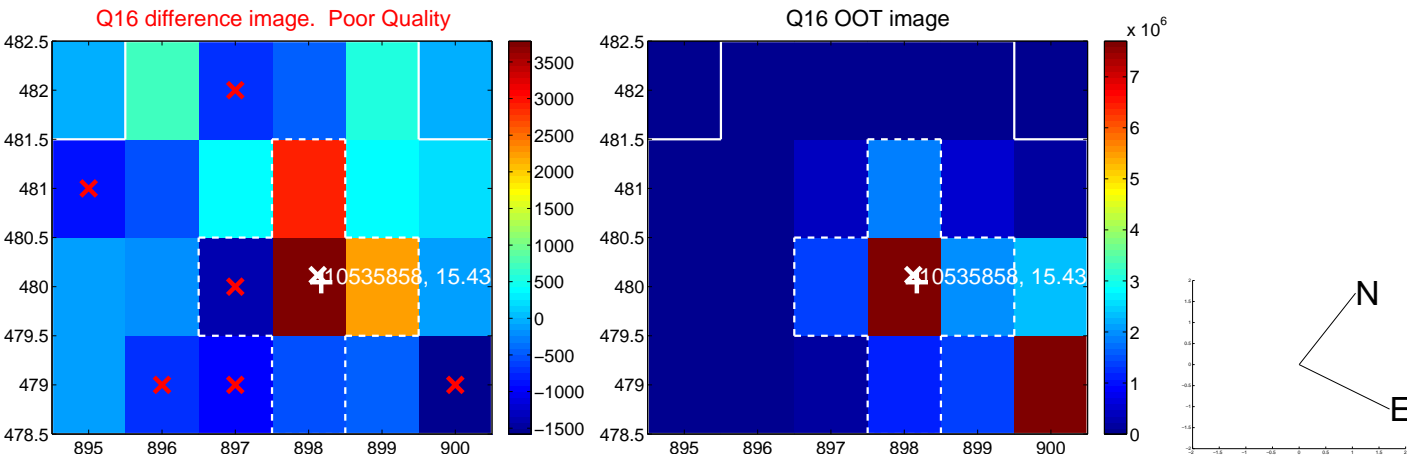
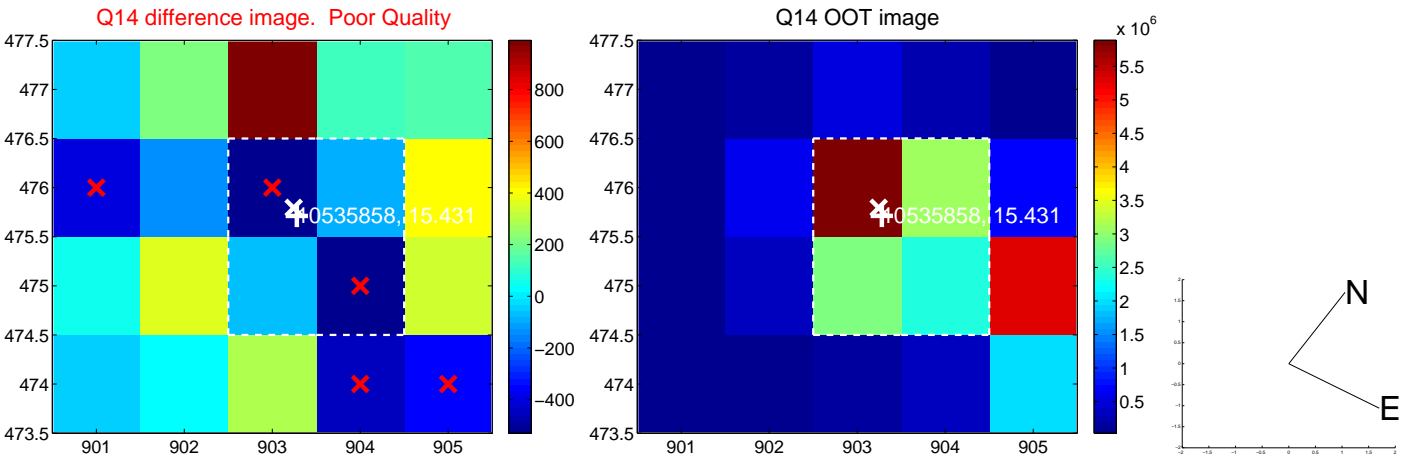
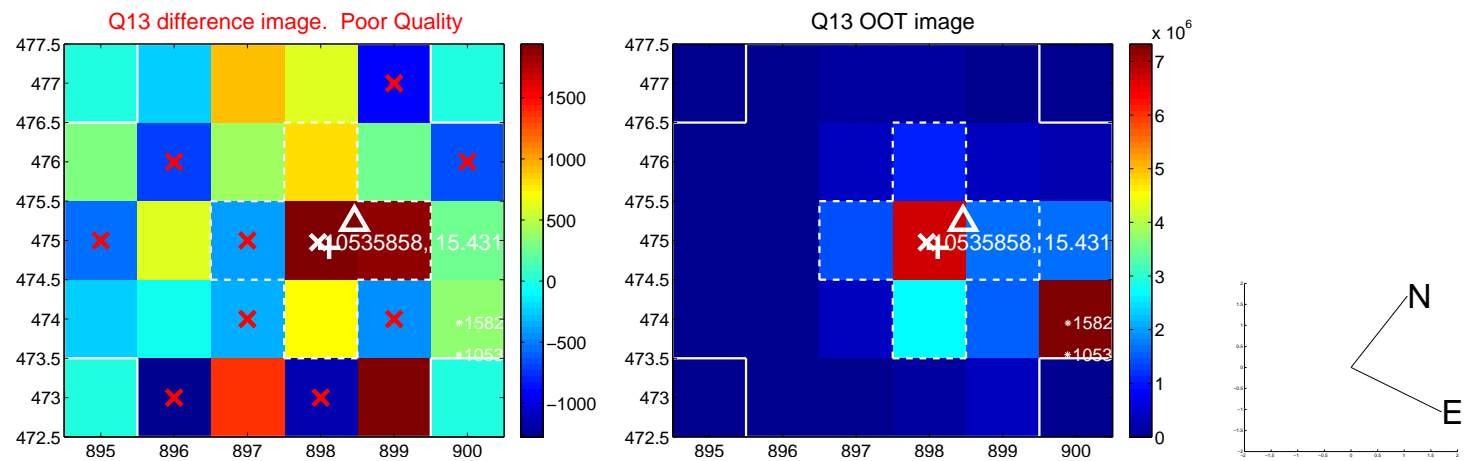
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

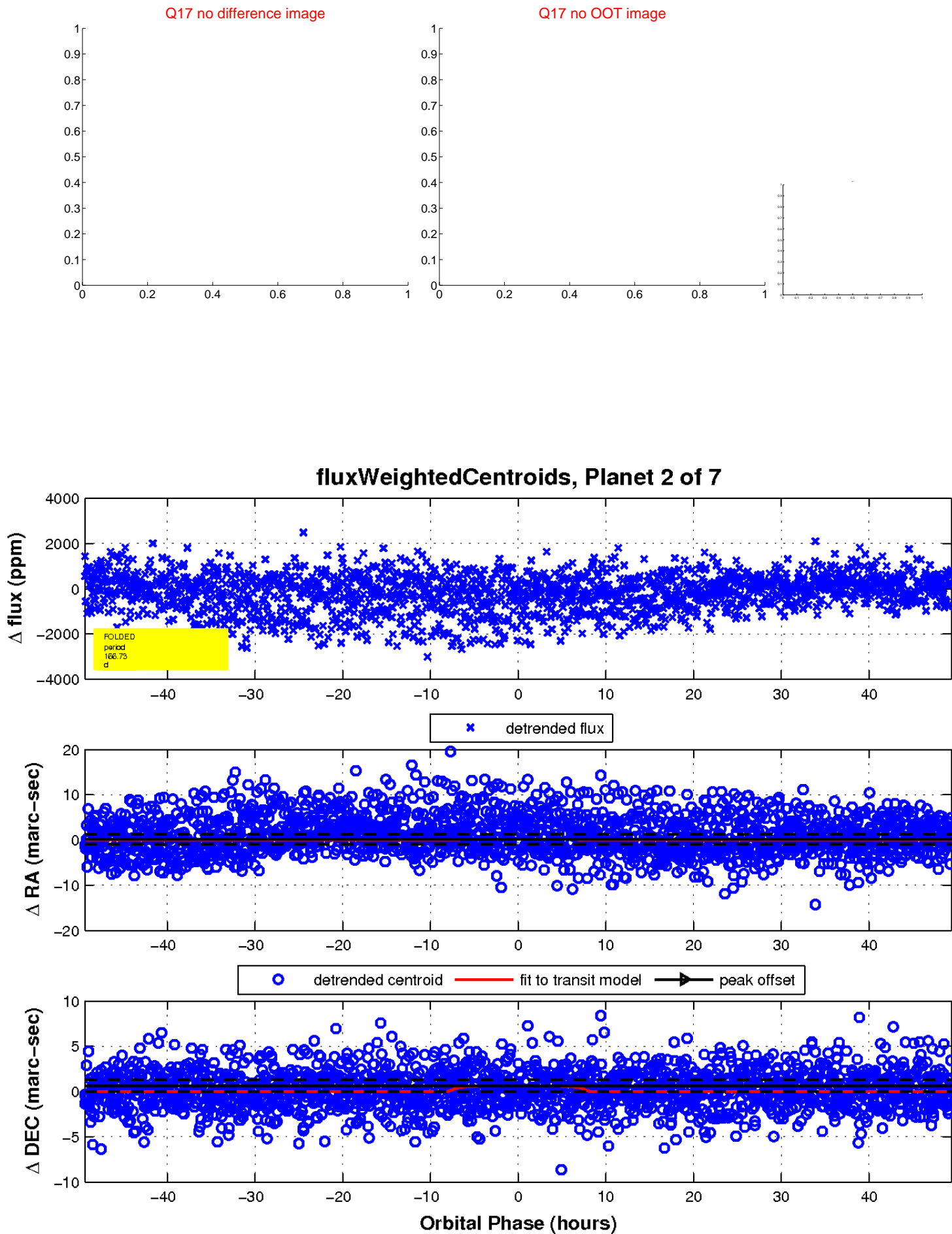


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

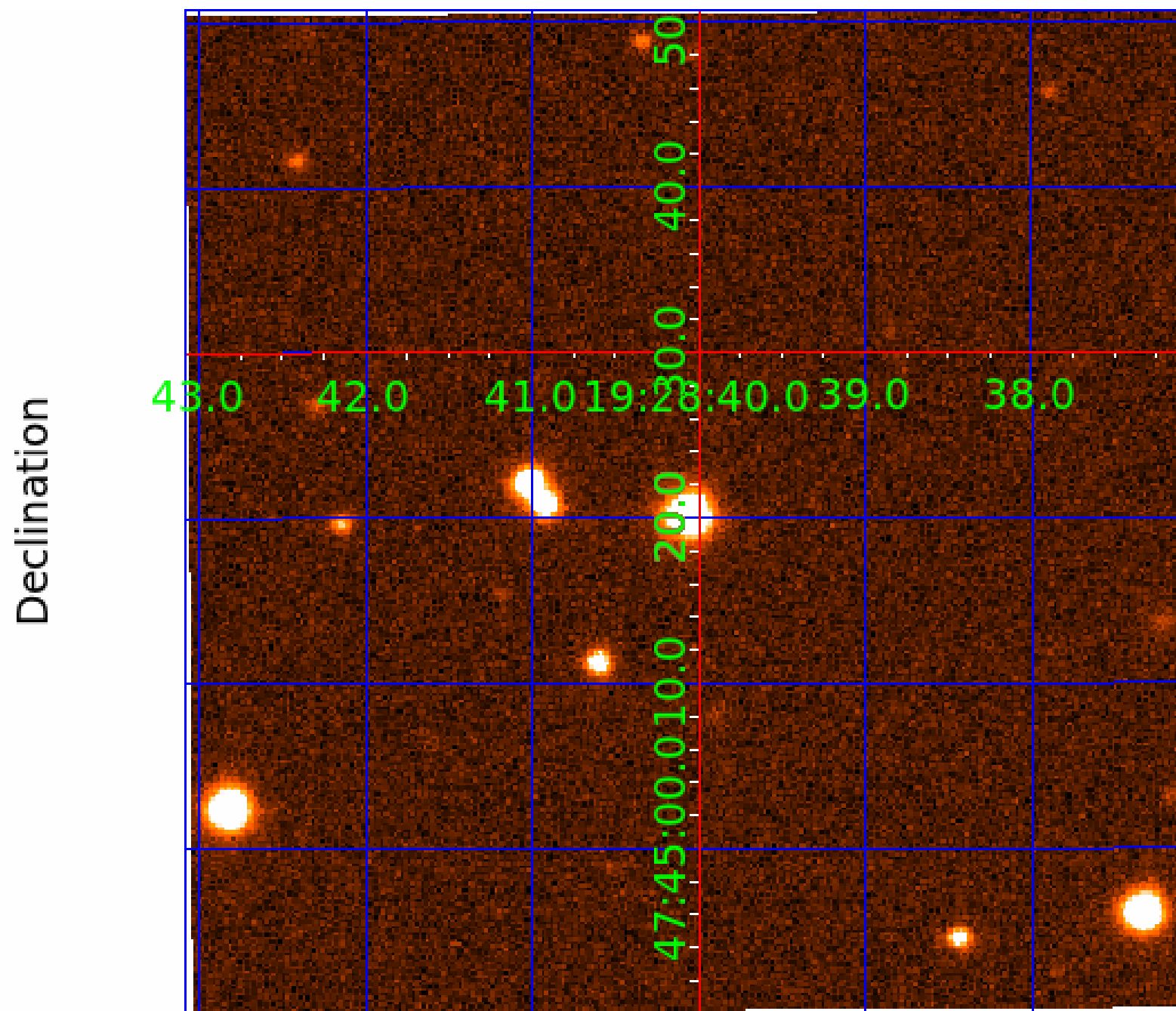




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



# KIC 010535858

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010535858-01	OBS	7338.01	0.933718	131.547996	64.0	4.971	8.6	9.7	0.42	3615	0.38	132.60
010535858-02	OBS	No	166.731446	195.158250	538.9	16.471	12.9	4.5	0.42	3615	1.11	0.13
010535858-03	OBS	No	287.636030	412.997432	860.6	3.172	8.7	9.6	0.42	3615	1.29	0.06
010535858-05	OBS	No	138.375922	136.700751	689.8	8.201	9.2	7.0	0.42	3615	1.20	0.17
010535858-06	OBS	No	77.099011	156.259842	728.5	3.406	7.3	7.1	0.42	3615	1.22	0.37
010535858-07	OBS	No	209.523411	254.328284	854.7	9.055	7.5	6.4	0.42	3615	1.38	0.10

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010535858-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
010535858-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010535858-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 010535858-03

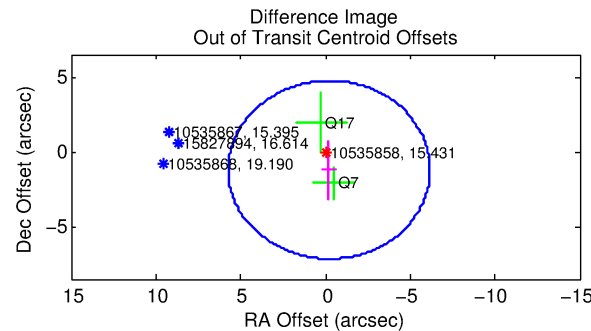
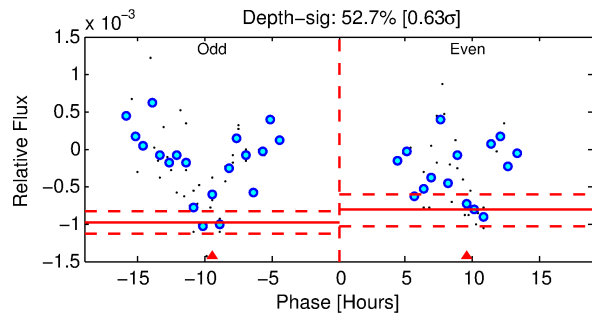
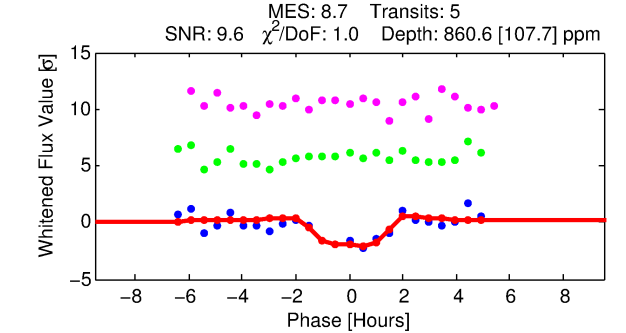
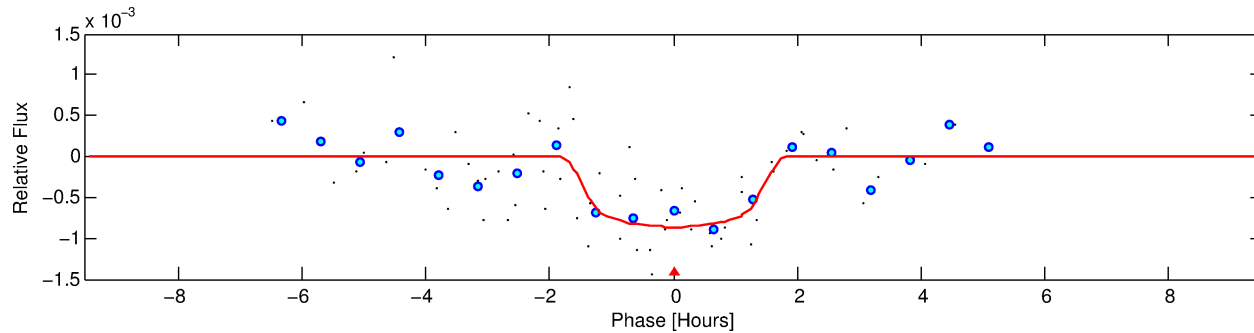
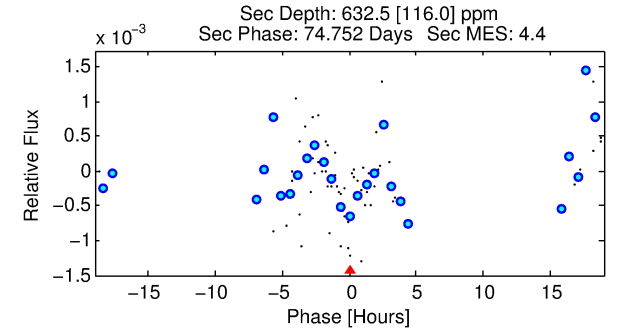
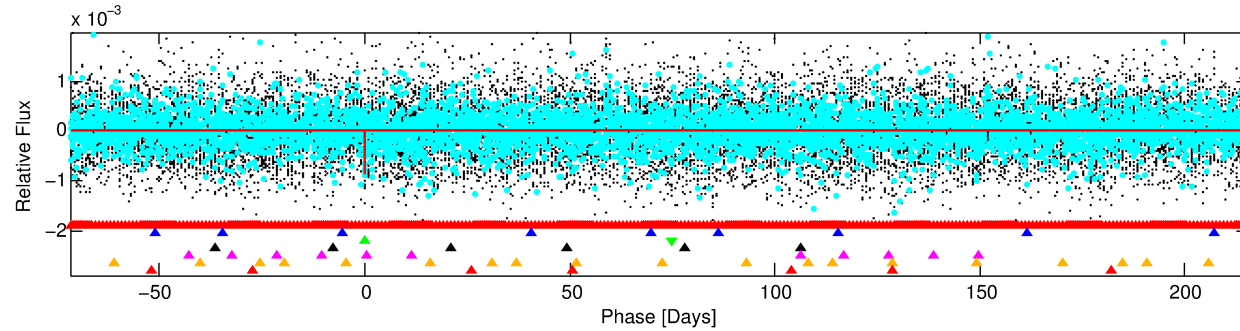
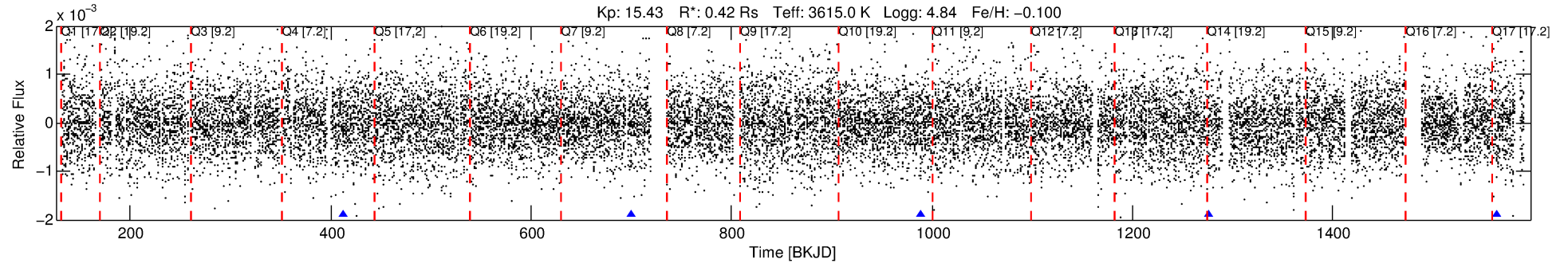
No Significant Match Found

# DV One-Page Summary

KIC: 10535858 Candidate: 3 of 7 Period: 287.636 d

KOI: K07338 Corr: No Ephemeris Match

Kp: 15.43 R\*: 0.42 Rs Teff: 3615.0 K Logg: 4.84 Fe/H: -0.100



## DV Fit Results:

Period = 287.63603 [0.00356] d  
Epoch = 412.9974 [0.0064] BKJD  
Rp/R\* = 0.0282 [0.0788]  
a/R\* = 555.57 [6838.30]  
b = 0.64 [11.29]  
Seff = 0.06 [0.01]  
Teq = 128 [3] K  
Rp = 1.29 [3.61] Re  
a = 0.6508 [0.0369] AU  
Ag = 88007.12 [491426.97] [0.18σ]  
Teffp = 3412 [4763] K [0.69σ]

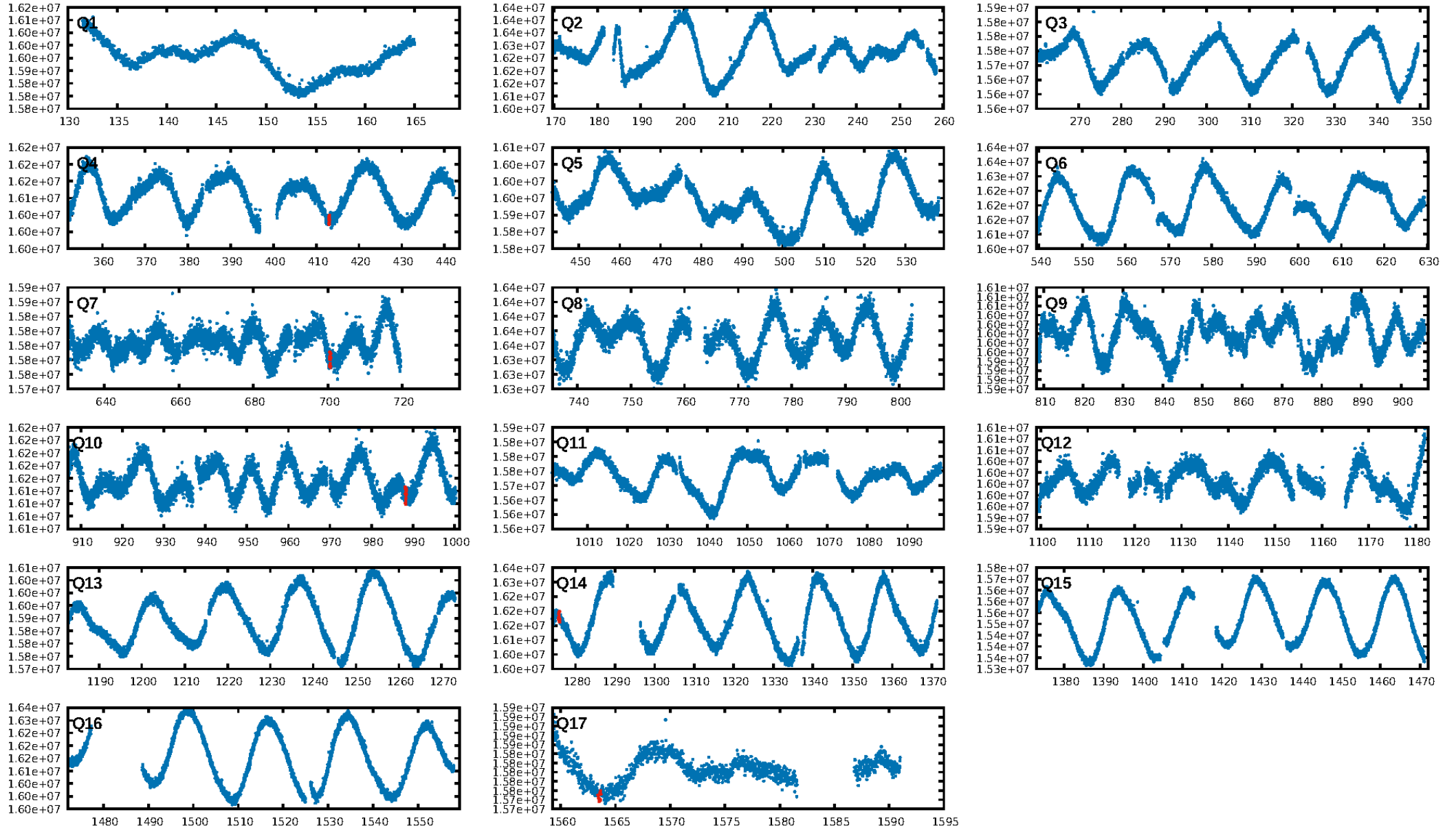
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [40.06σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 77.8%  
ModelChiSquareGof-sig: 97.8%  
**Bootstrap-pfa: 3.31e-10**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 3.011  
Centroid-sig: 95.7%  
Centroid-so: 2.048 arcsec [1.18σ]  
OotOffset-rm: 1.231 arcsec [0.62σ]  
KicOffset-rm: 1.307 arcsec [0.64σ]  
OotOffset-st: 0/1/0/1 [2]  
KicOffset-st: 0/1/0/1 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.40 [2/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:41:10 Z

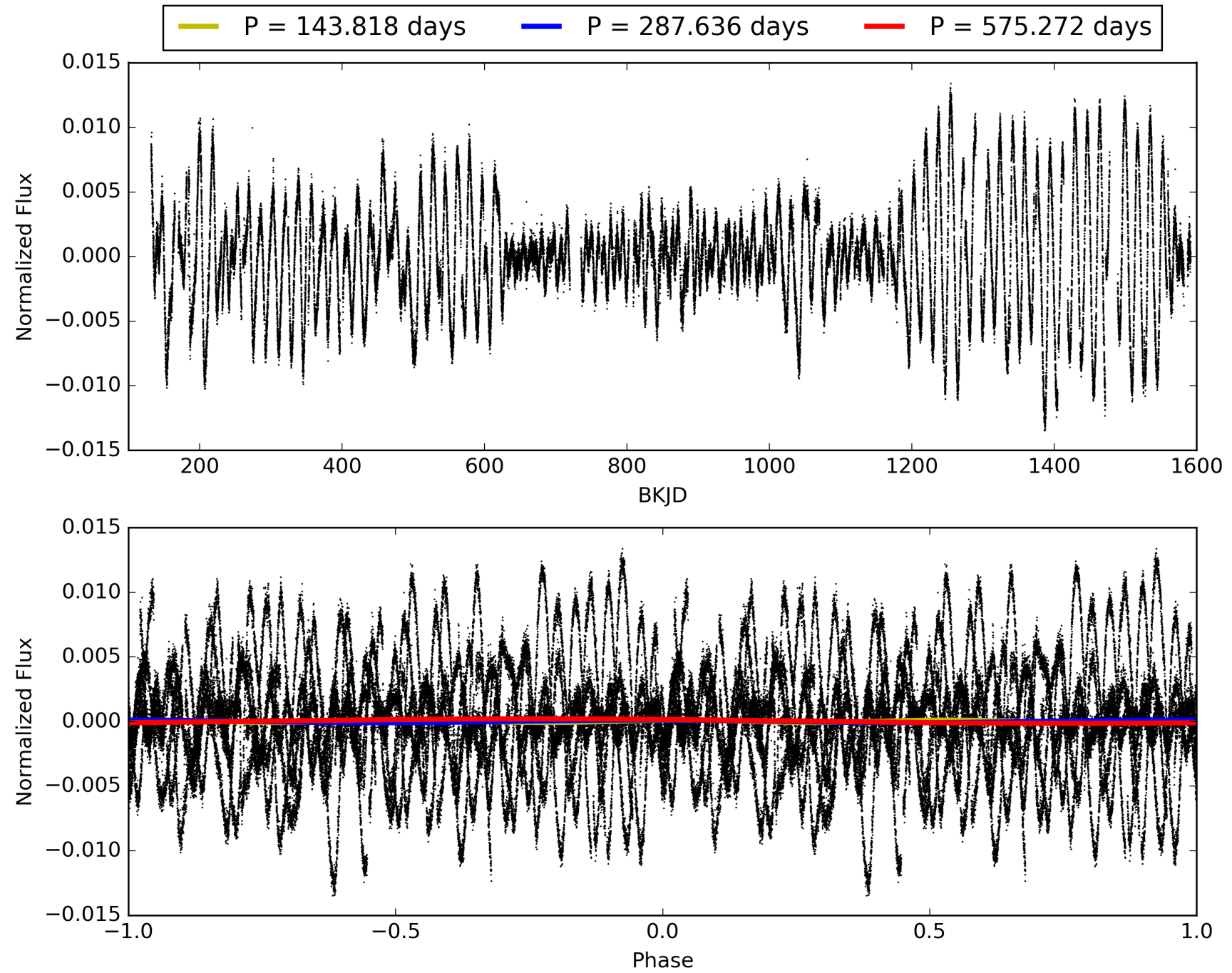
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010535858-03, PDC Light Curves



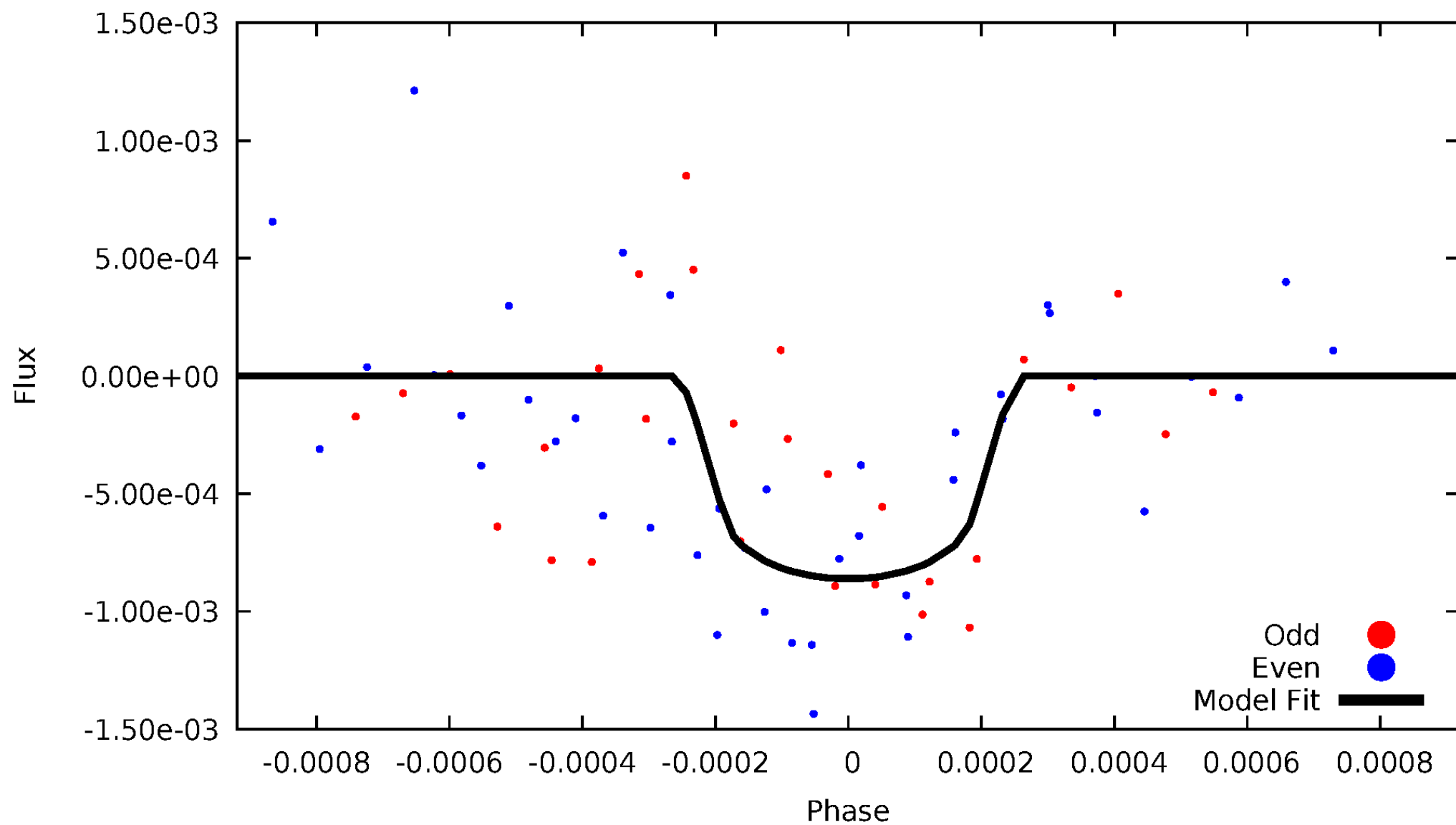


# TCE 010535858-03



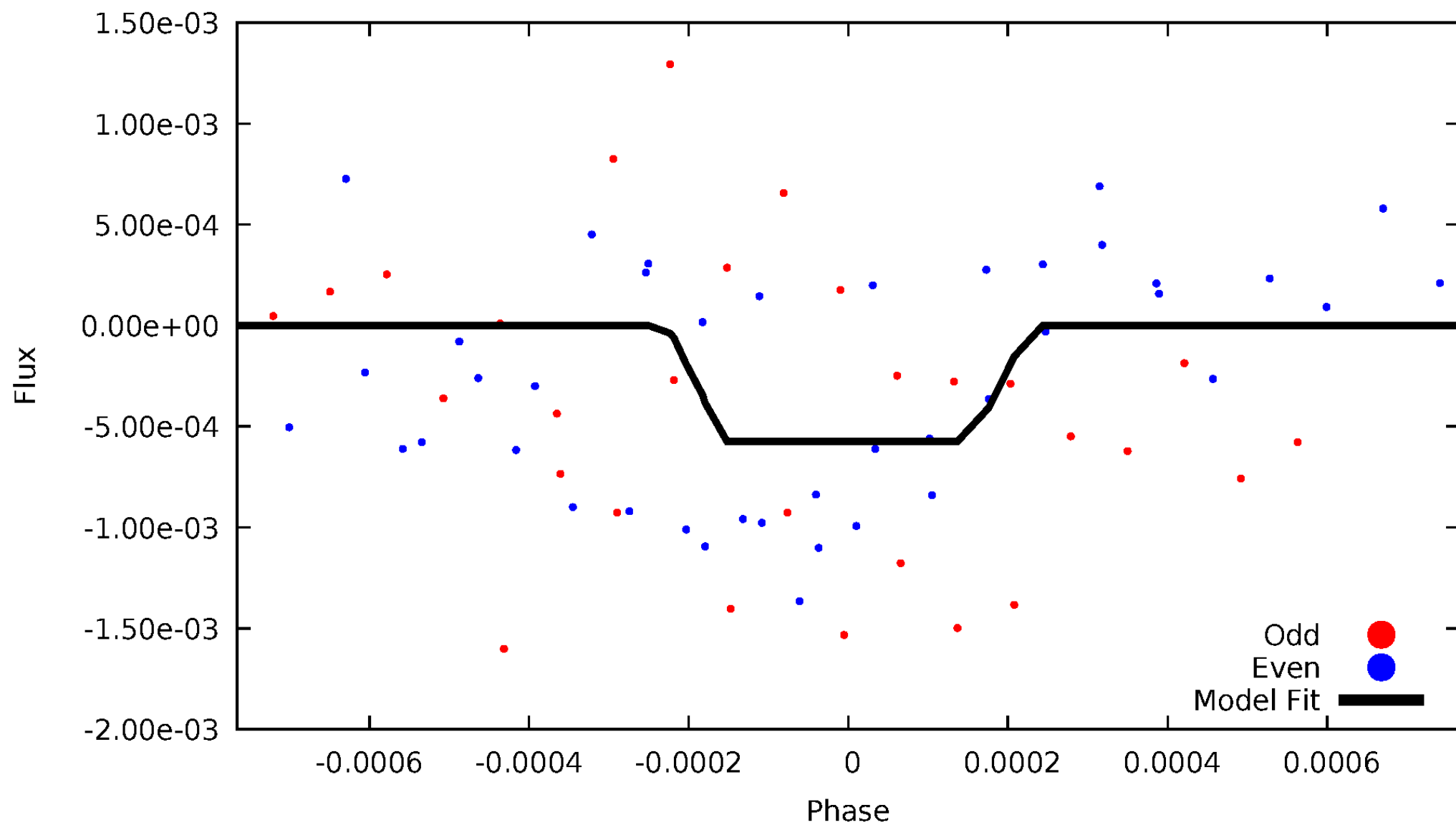
# DV Odd/Even

TCE 010535858-03



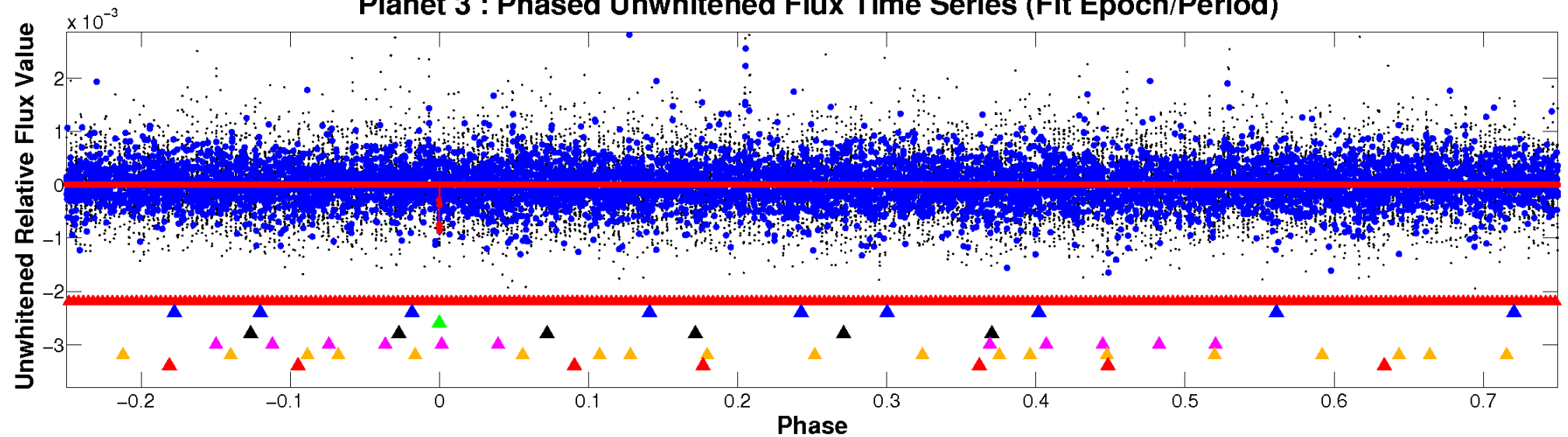
# ALT Odd/Even

TCE 010535858-03

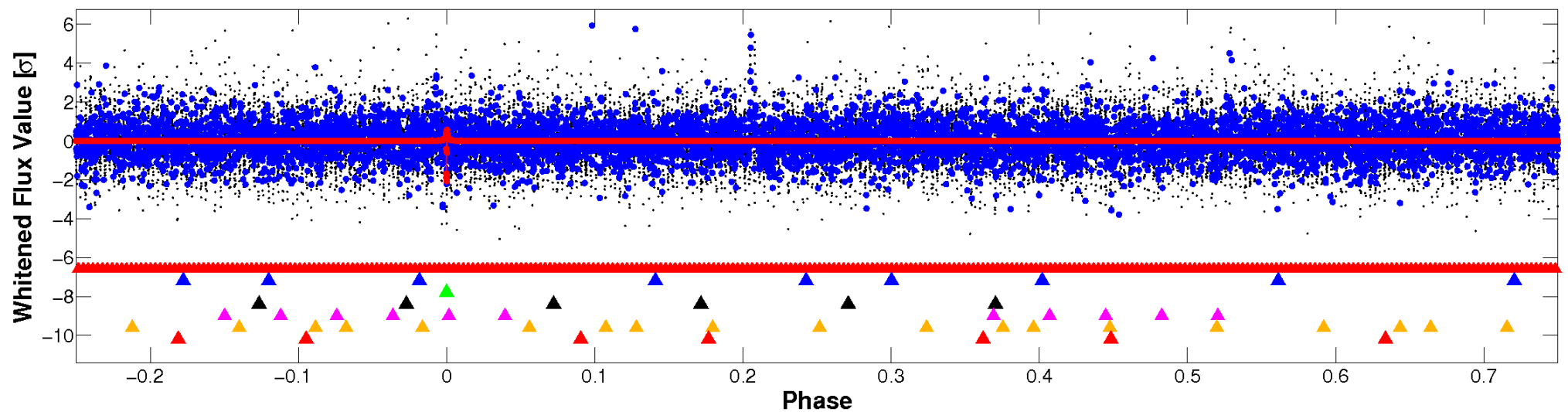


# Non-Whitened Vs. Whitened Light Curve

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

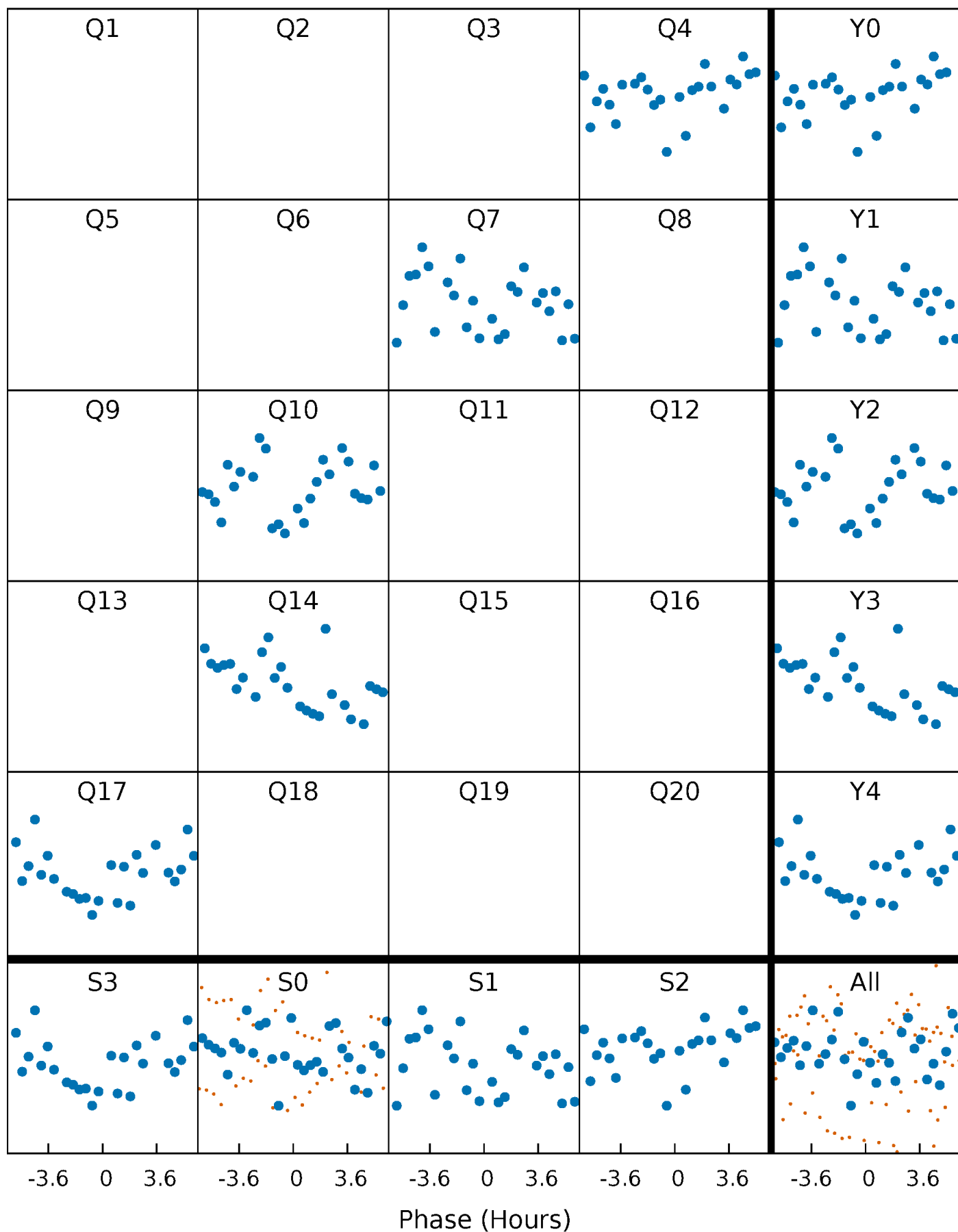


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



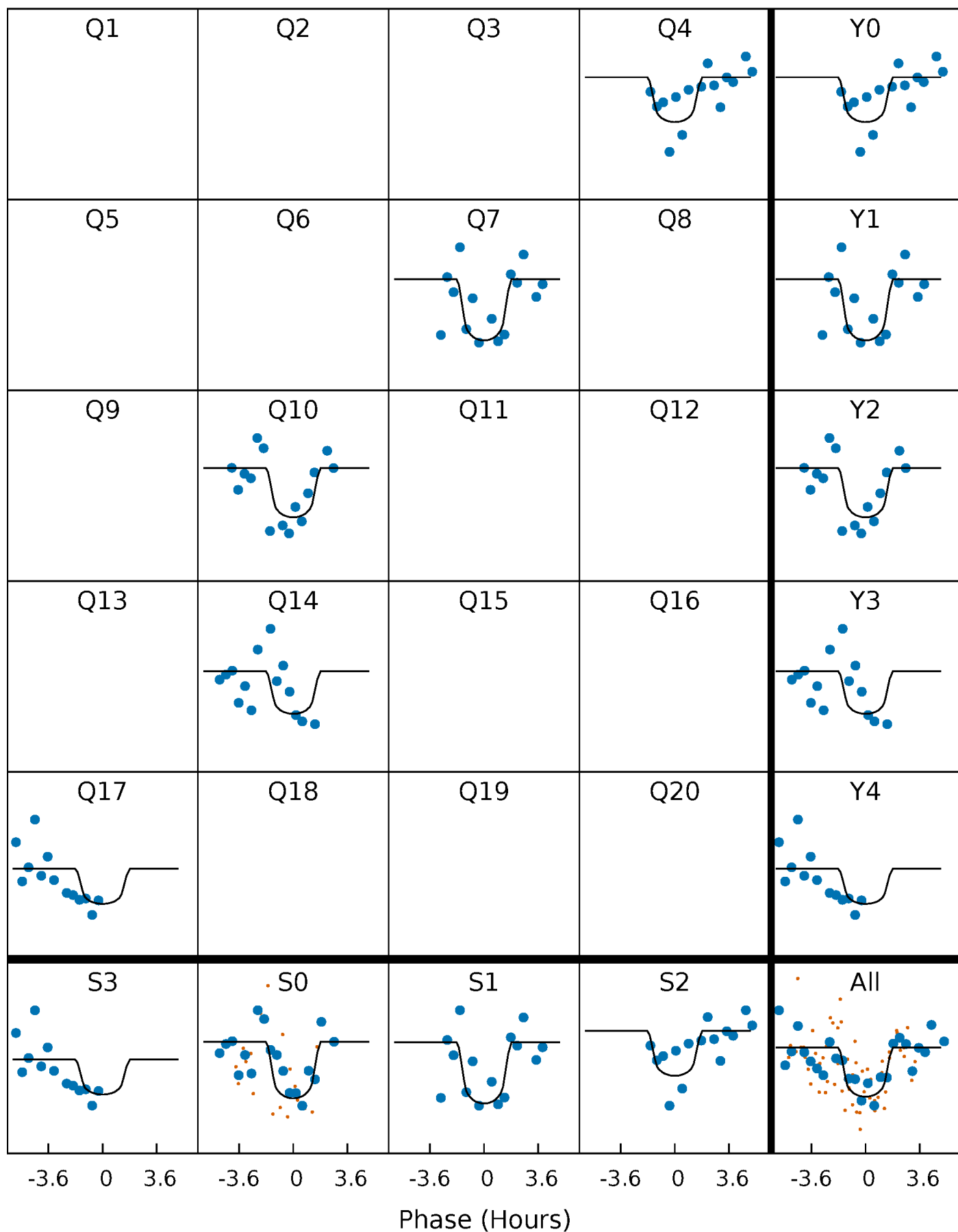
# PDC Quarter-Phased Transit Curves

TCE 010535858-03 P=287.636030 Days  $T_0=412.997432$  (BKJD)



# DV Quarter-Phased Transit Curves

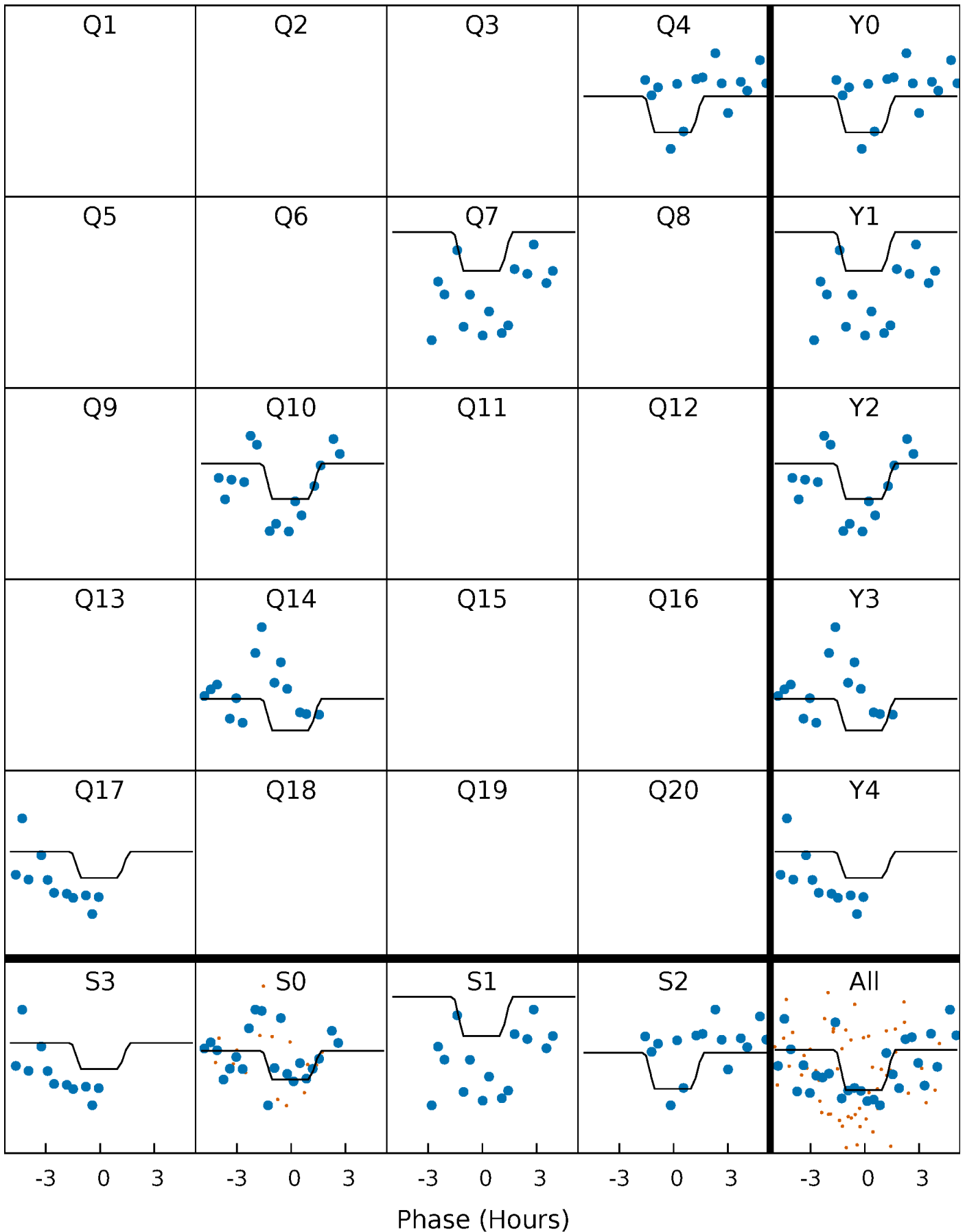
TCE 010535858-03 P=287.636030 Days  $T_0=412.997432$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

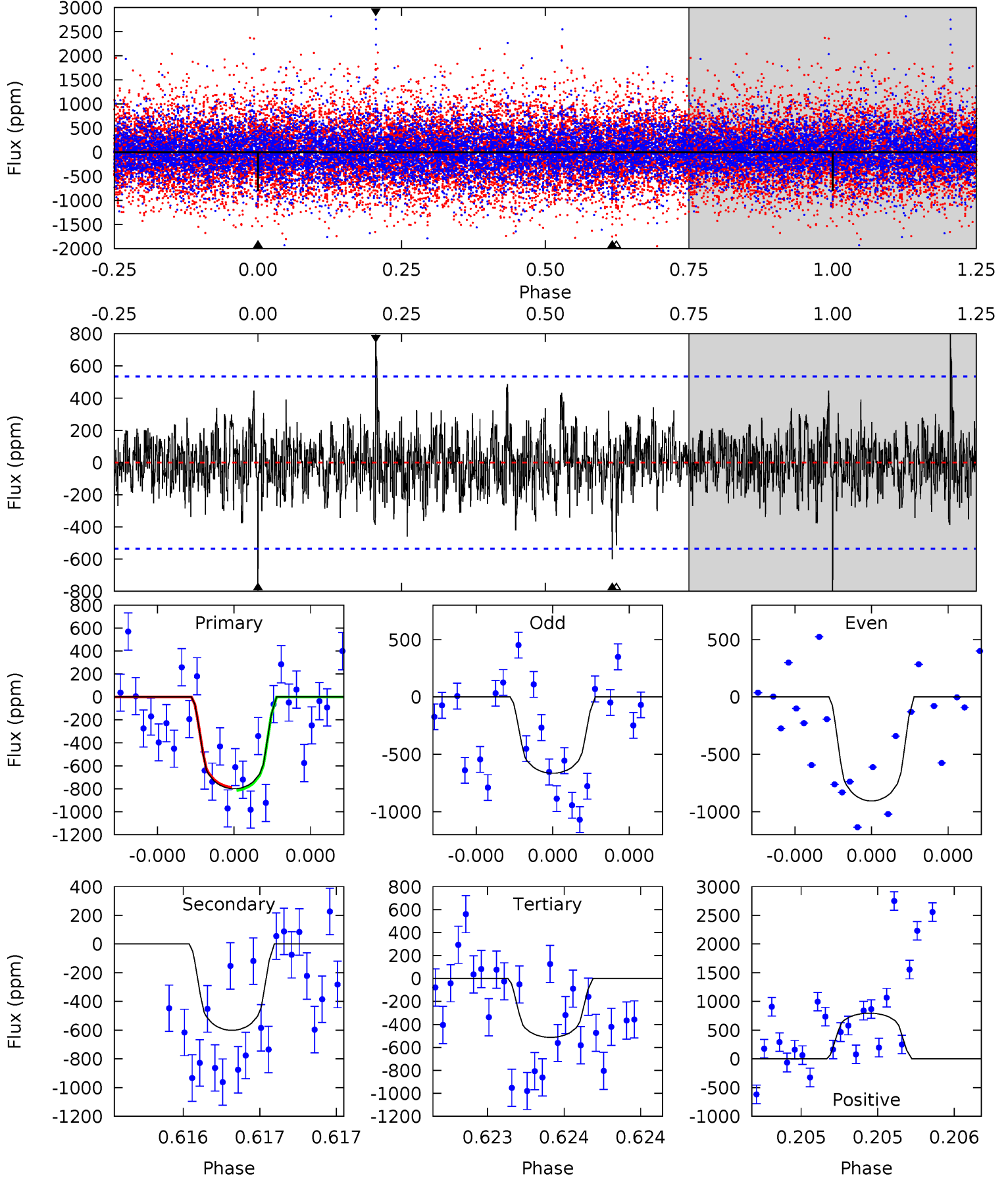
TCE 010535858-03     $P=287.635173$  Days     $T_0=412.994075$  (BKJD)



# DV Model-Shift Uniqueness Test

010535858-03, P = 287.636030 Days, E = 125.361402 Days

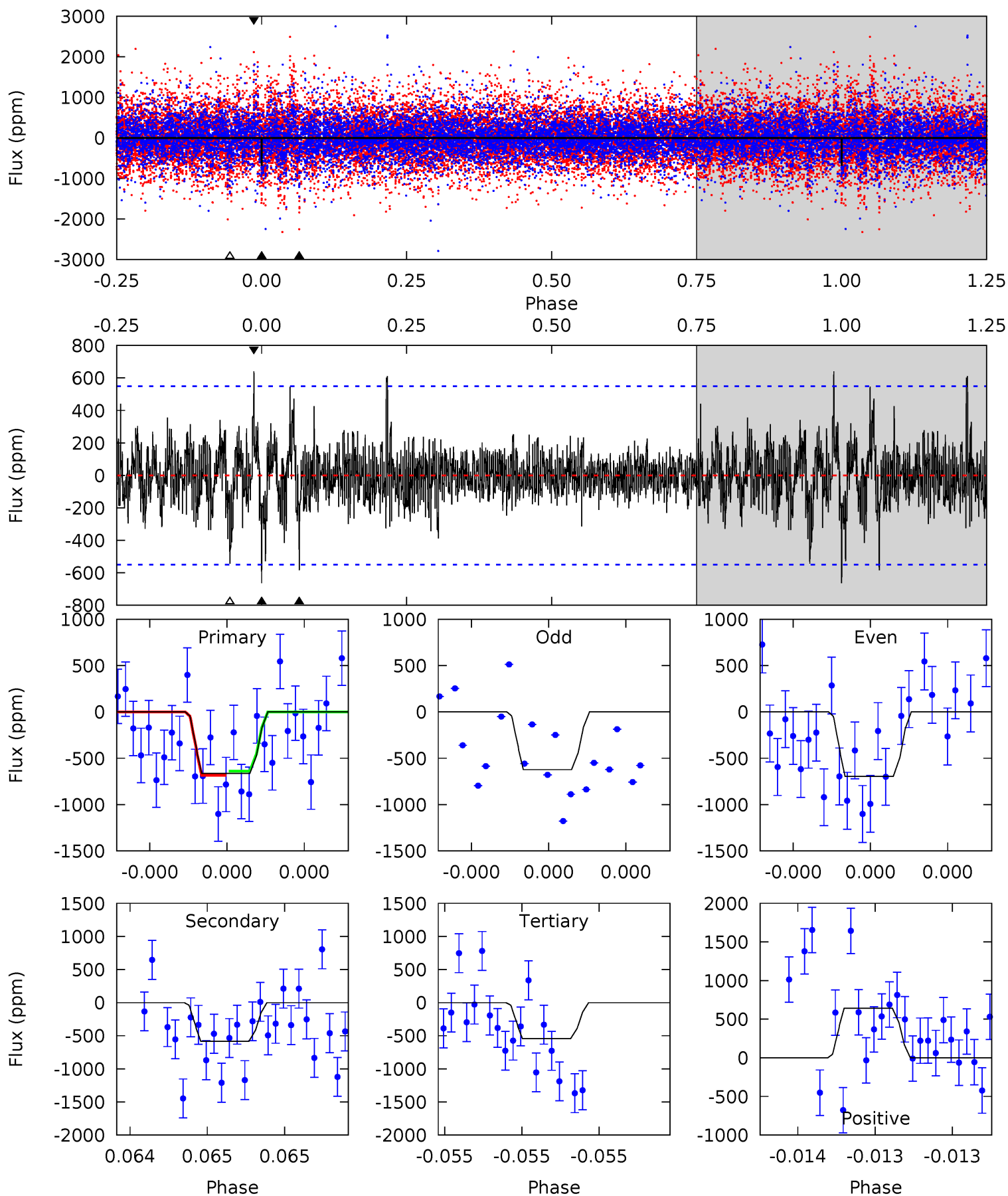
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.34	6.27	5.35	8.30	5.58	3.49	1.36	2.99	0.04	0.92	-2.03	1.26	1.02	0.50	0.14



# Alt Model-Shift Uniqueness Test

010535858-03, P = 287.635173 Days, E = 125.358902 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
6.75	5.93	5.53	6.53	5.59	3.50	1.25	1.23	0.23	0.41	-0.59	0.37	0.77	0.49	0.23



### Stellar Parameters For KIC 010535858

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3615^{+43}_{-50}$	$4.839^{+0.030}_{-0.033}$	$-0.100^{+0.100}_{-0.100}$	$0.420^{+0.029}_{-0.032}$	$0.445^{+0.025}_{-0.038}$	$8.445^{+1.369}_{-1.178}$
	+1%/-1%	+1%/-1%	+100%/-100%	+7%/-8%	+6%/-9%	+16%/-14%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 010535858-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-601 \pm 96$	$2.86^{+3.06}_{-2.00}$	$179^{+3}_{-3}$	$2754^{+1199}_{-447}$	$17513^{+170096}_{-13503}$
Alt.	$-583 \pm 98$	$2.84^{+3.18}_{-1.96}$	$179^{+3}_{-3}$	$2754^{+1178}_{-472}$	$16489^{+161473}_{-12762}$

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

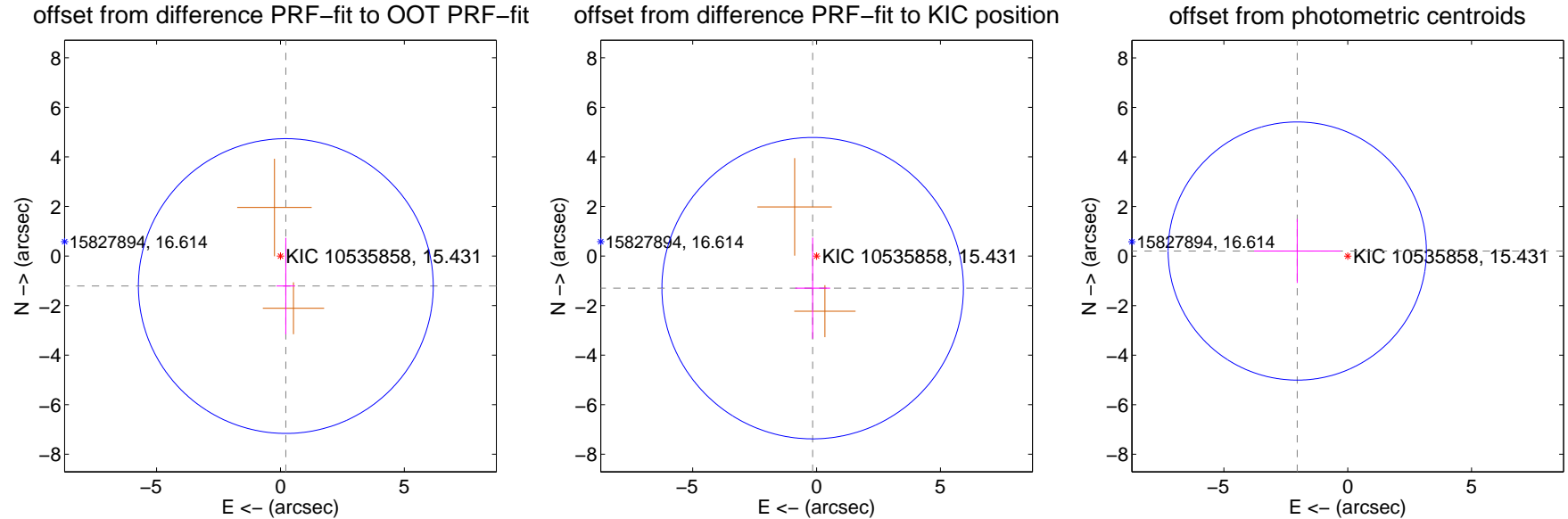
## DV Centroid Data

Supplemental centroid analysis for 010535858-03. Kepler magnitude: 15.43. Transit SNR 9.65

There are 0 quarters with good PRF difference image offsets

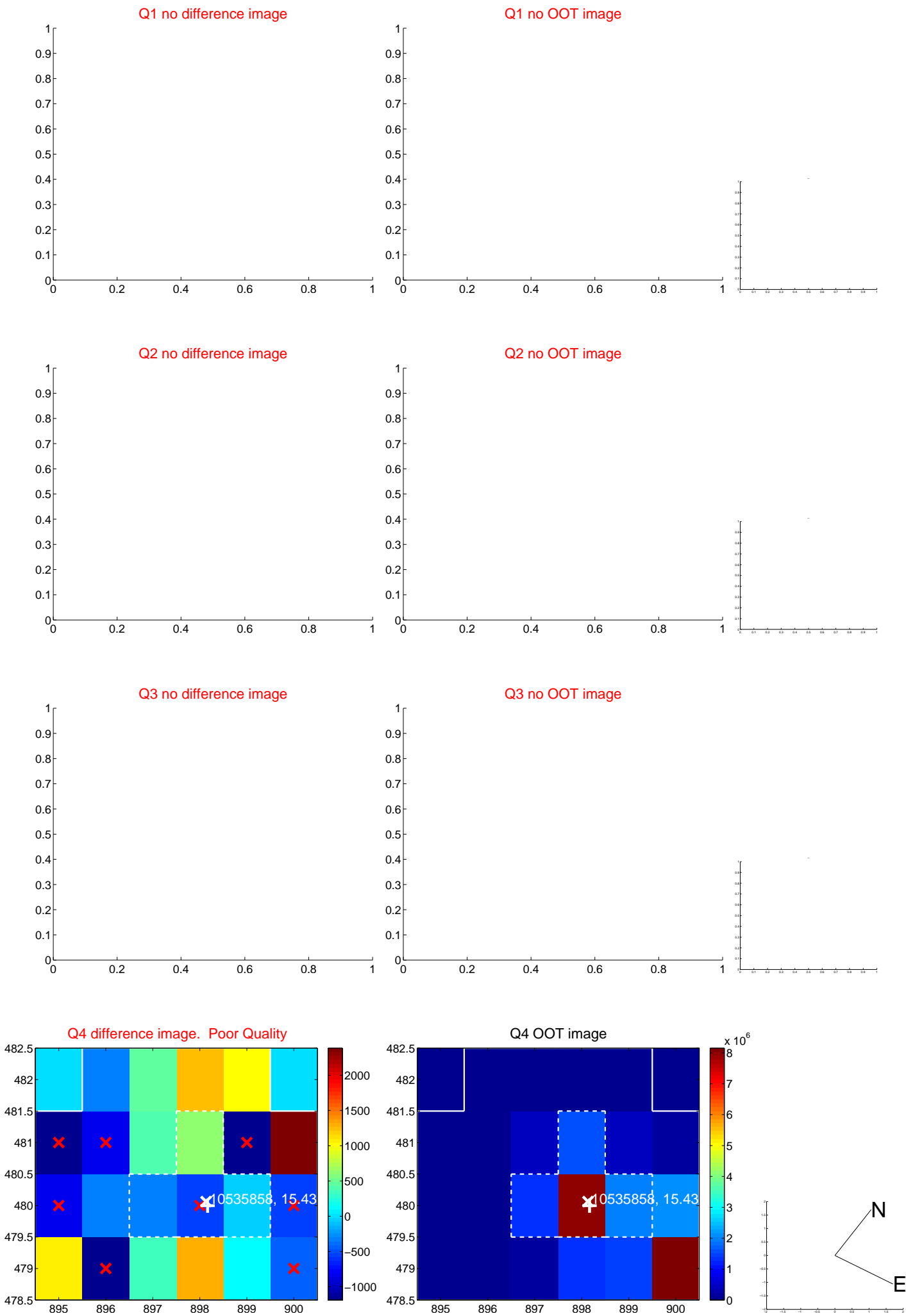
The direct PRF centroid is offset from the target star catalog position by about 0.65 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.231 \pm 1.984$	0.62	$-0.217 \pm 0.374$	$-1.212 \pm 1.949$
PRF-fit source offset from KIC position	$1.307 \pm 2.028$	0.64	$0.158 \pm 0.703$	$-1.298 \pm 2.041$
photometric centroid source offset	$2.05 \pm 1.74$	1.18	$2.04 \pm 1.74$	$0.20 \pm 1.29$



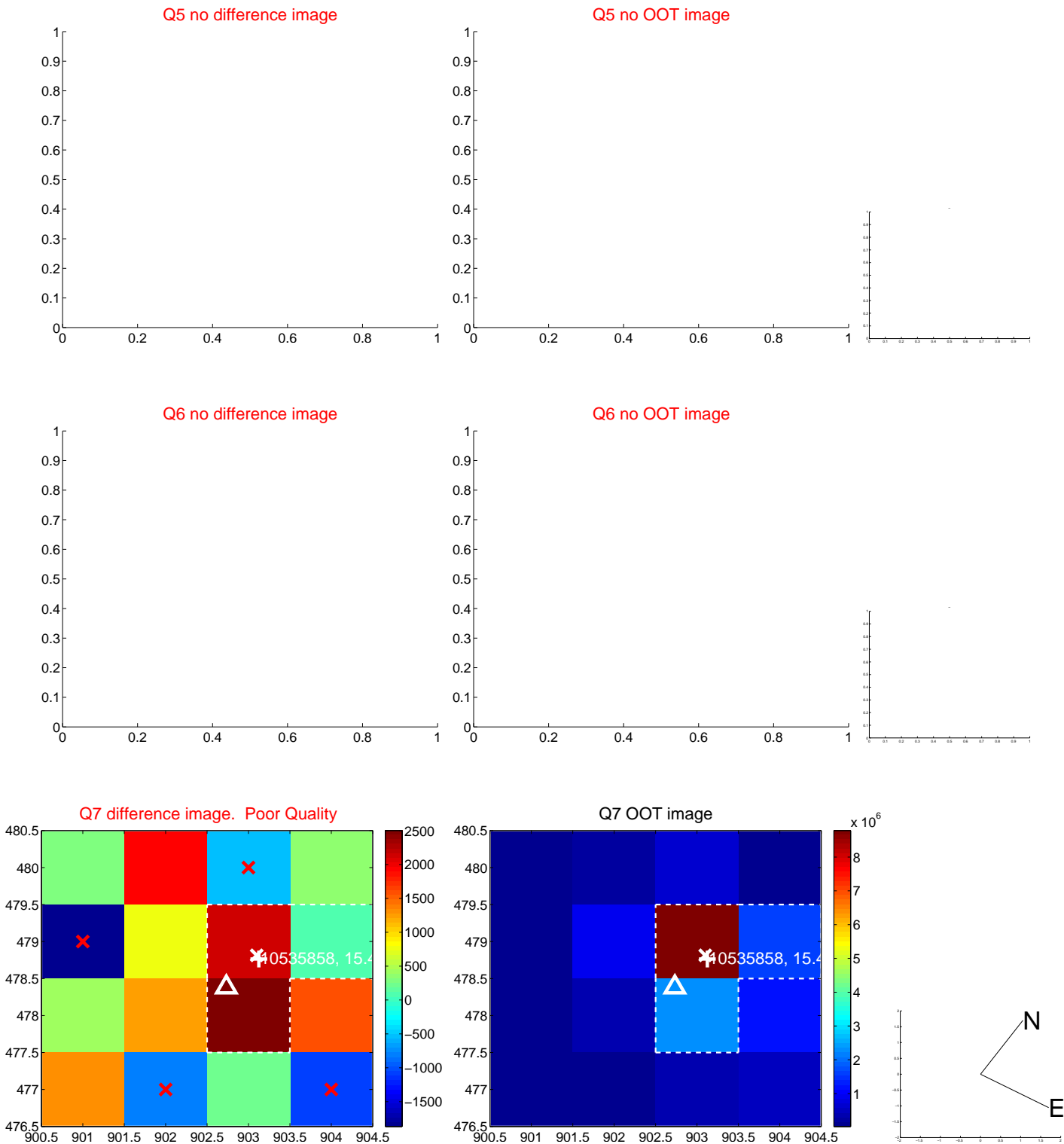
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three- $\sigma$ . 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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

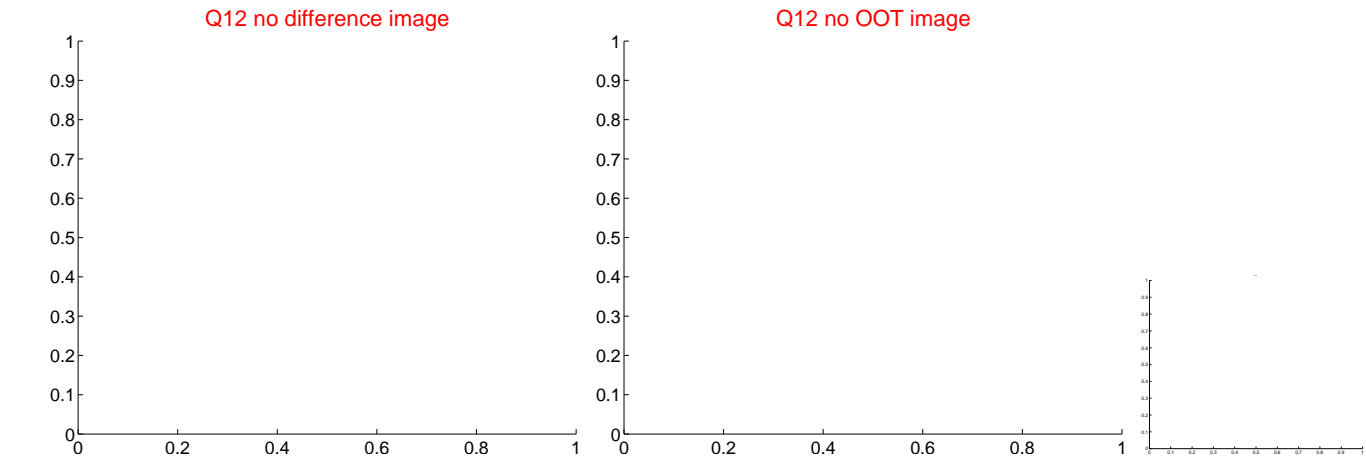
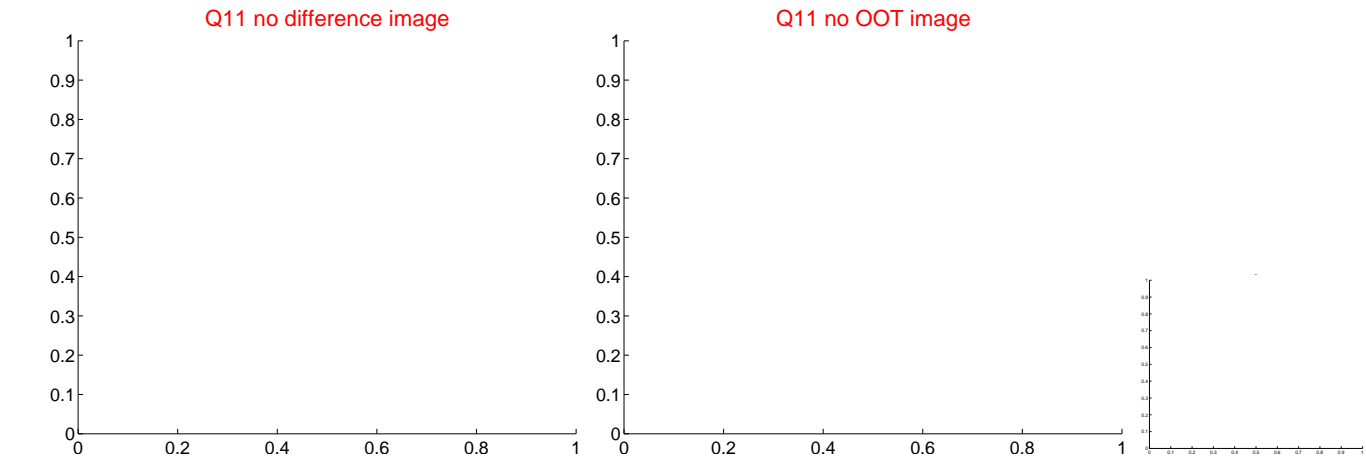
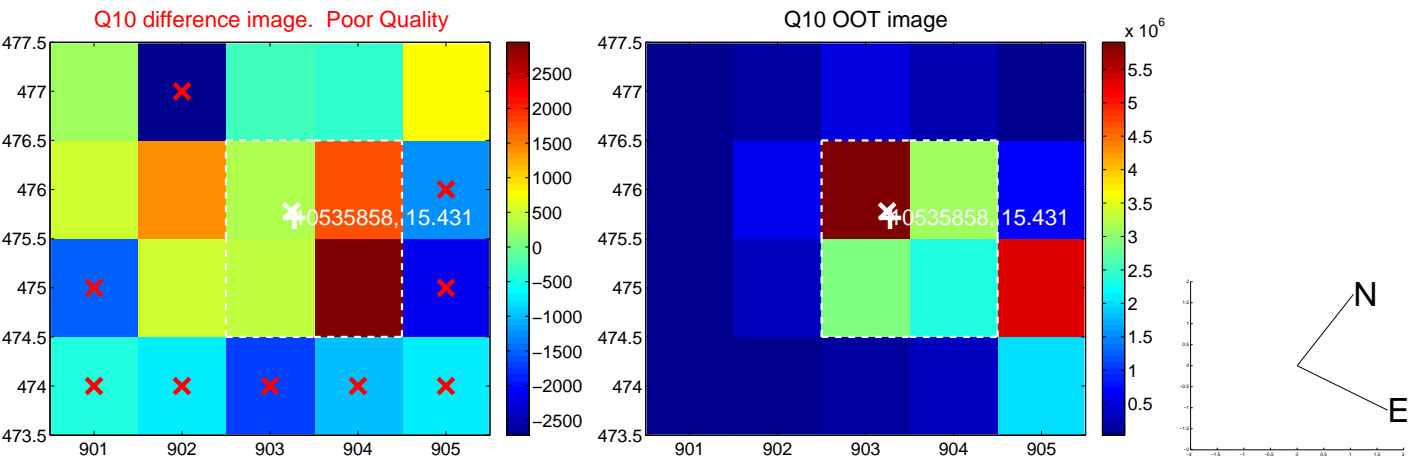
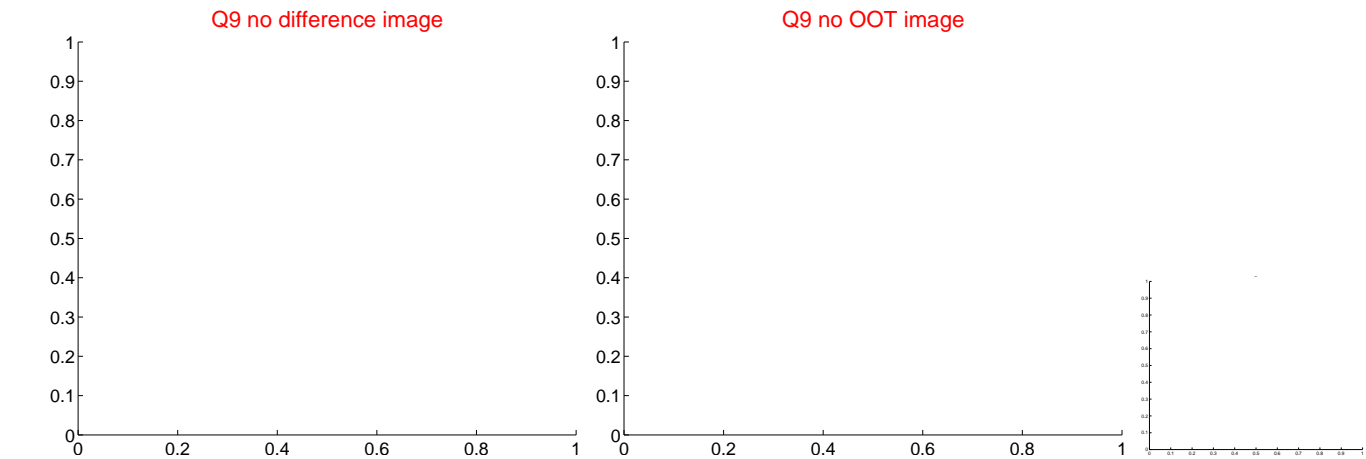




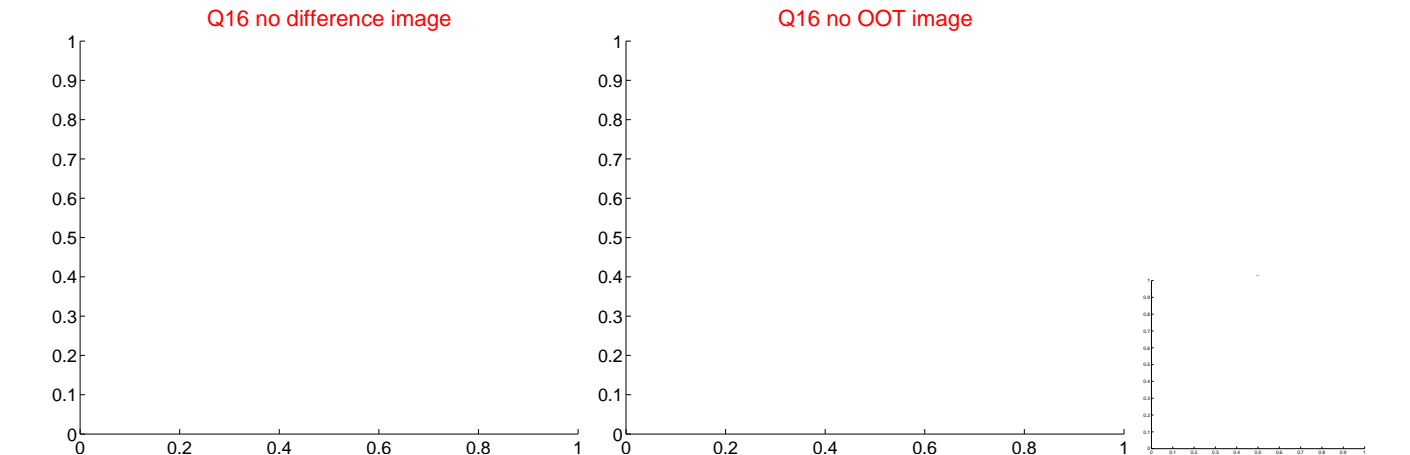
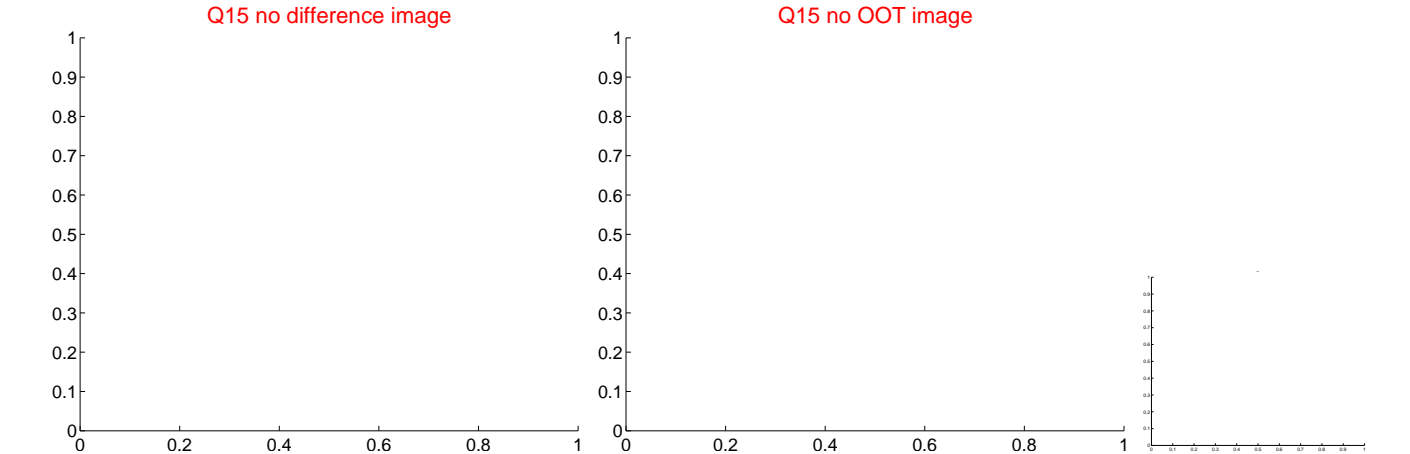
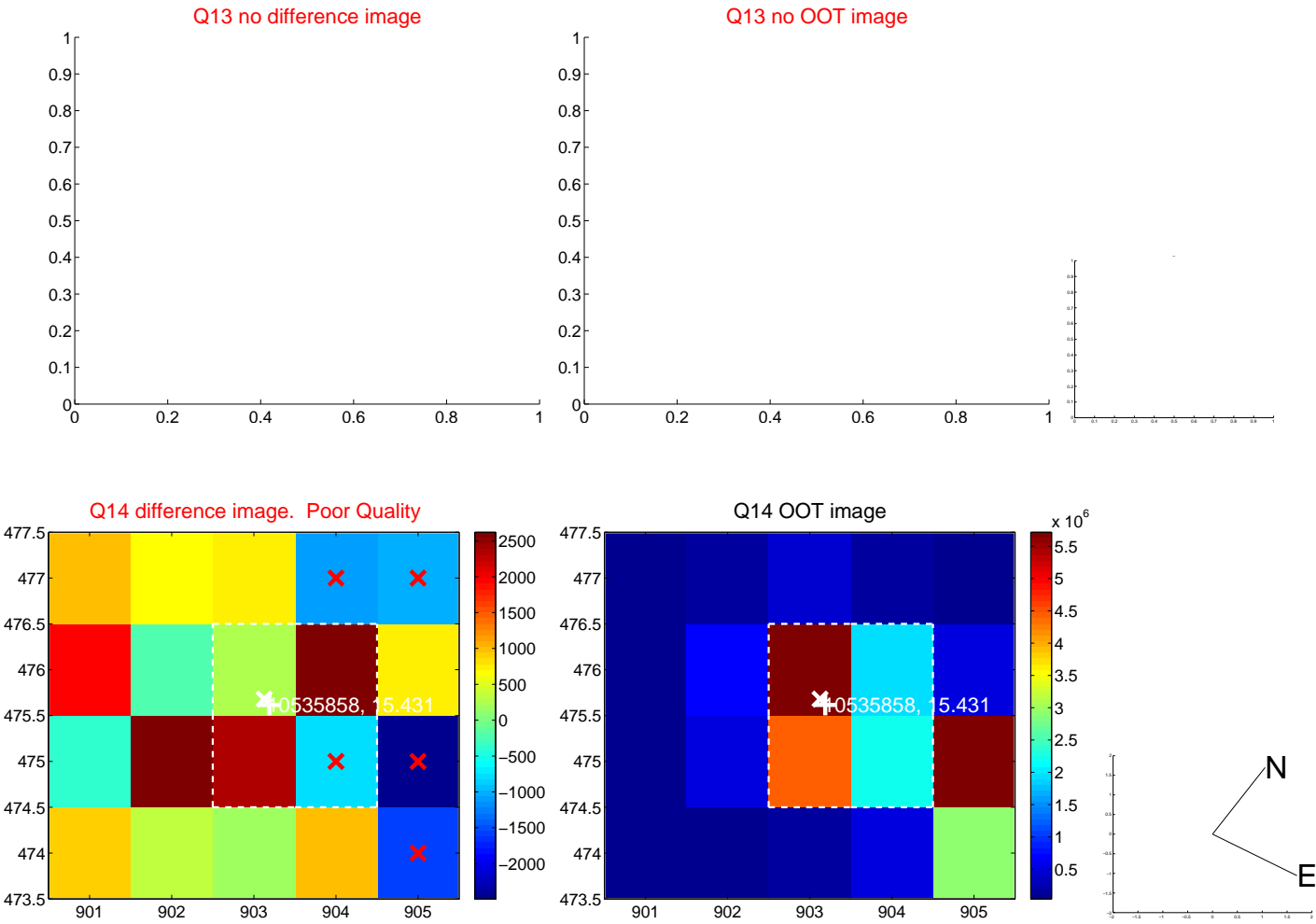
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



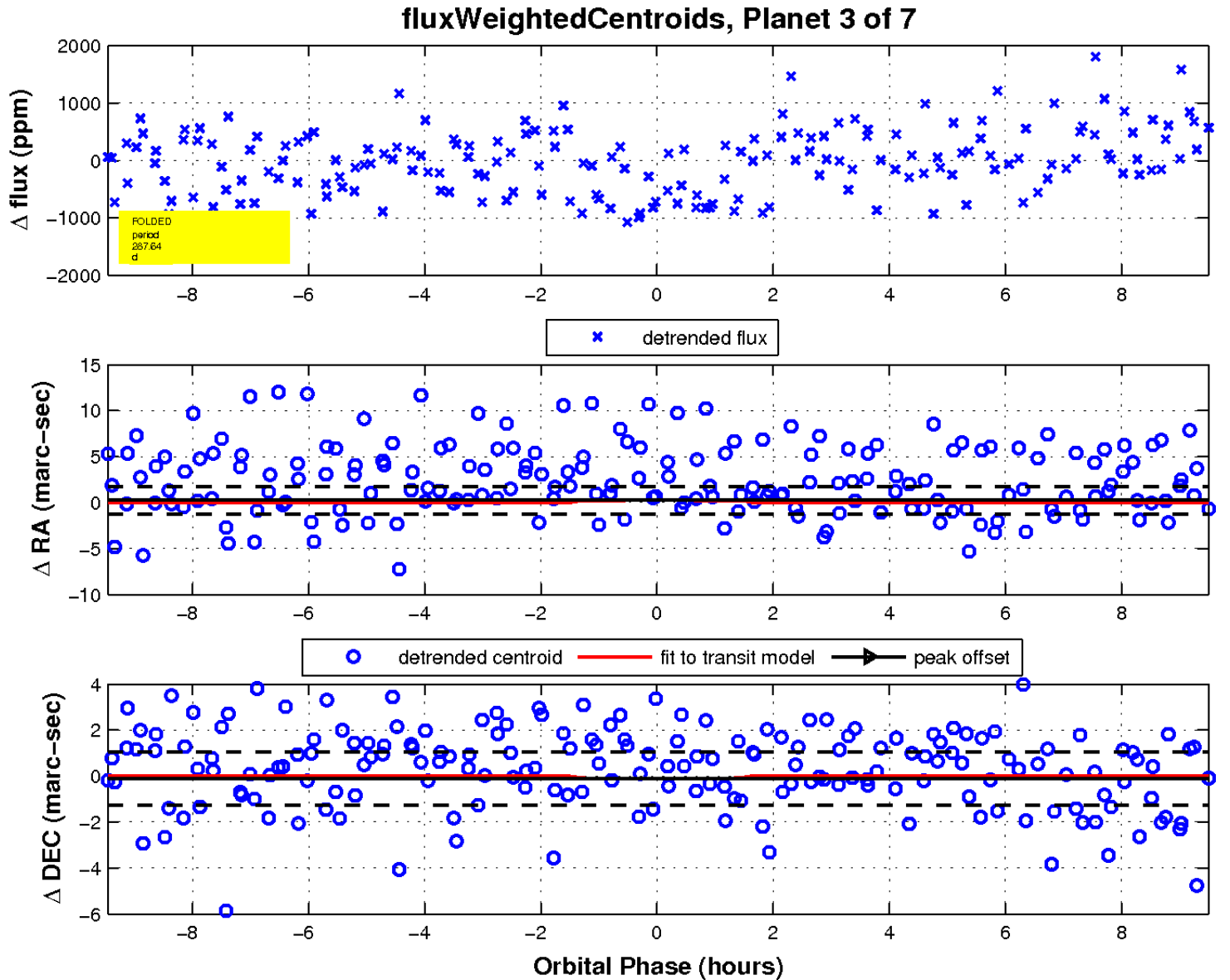
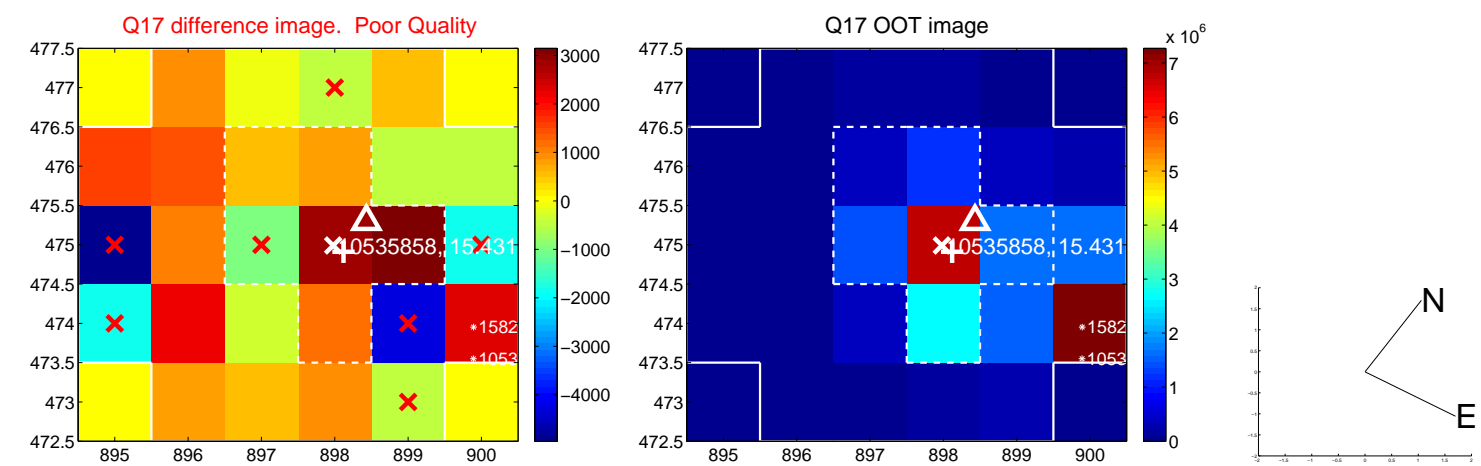
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



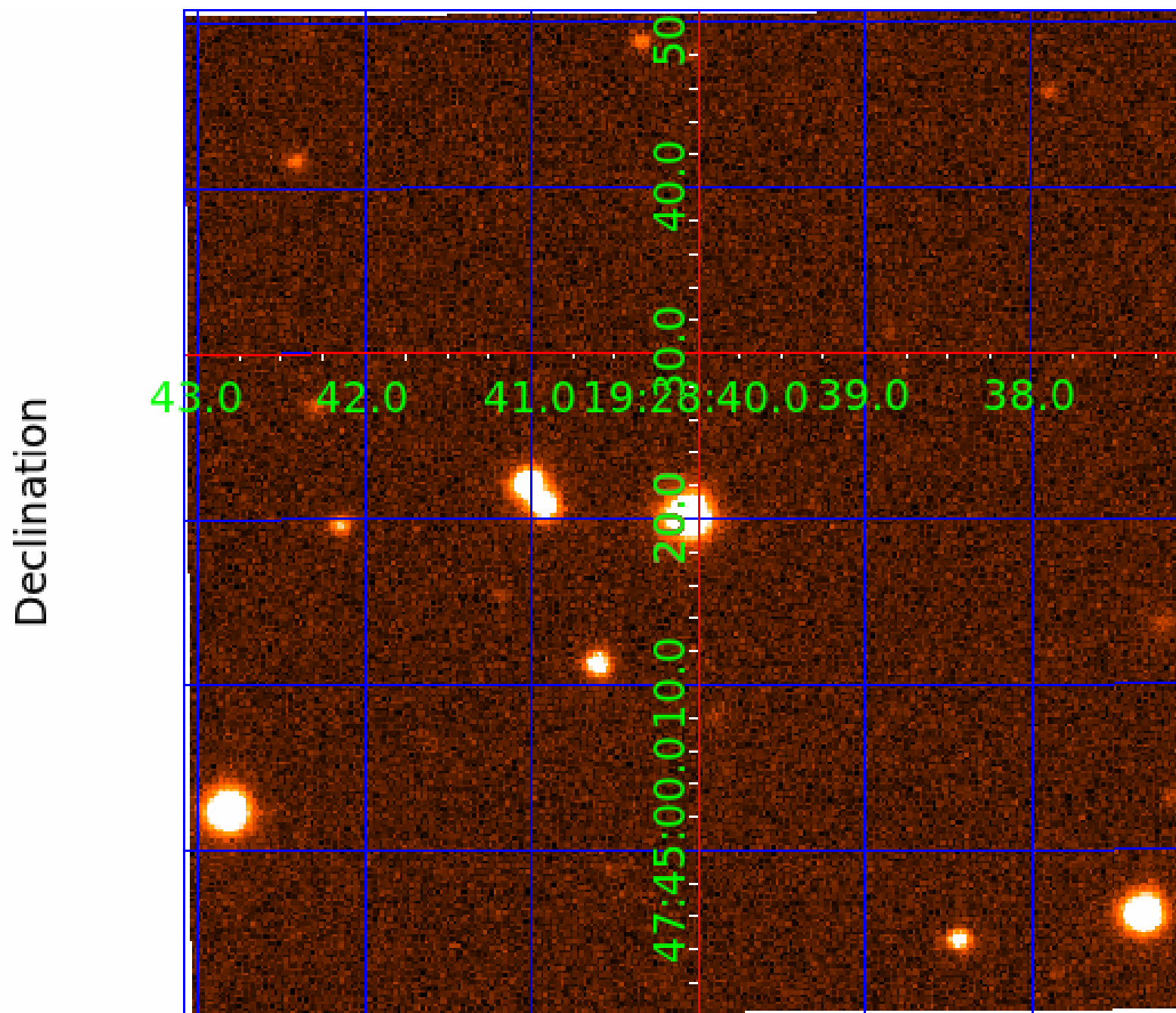
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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



UKIRT Image



# KIC 010535858

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010535858-01	OBS	7338.01	0.933718	131.547996	64.0	4.971	8.6	9.7	0.42	3615	0.38	132.60
010535858-02	OBS	No	166.731446	195.158250	538.9	16.471	12.9	4.5	0.42	3615	1.11	0.13
010535858-03	OBS	No	287.636030	412.997432	860.6	3.172	8.7	9.6	0.42	3615	1.29	0.06
010535858-05	OBS	No	138.375922	136.700751	689.8	8.201	9.2	7.0	0.42	3615	1.20	0.17
010535858-06	OBS	No	77.099011	156.259842	728.5	3.406	7.3	7.1	0.42	3615	1.22	0.37
010535858-07	OBS	No	209.523411	254.328284	854.7	9.055	7.5	6.4	0.42	3615	1.38	0.10

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010535858-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
010535858-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010535858-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

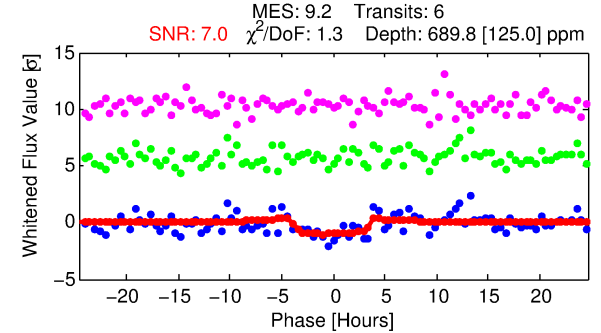
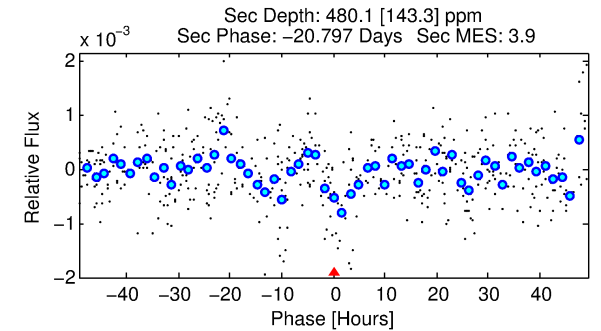
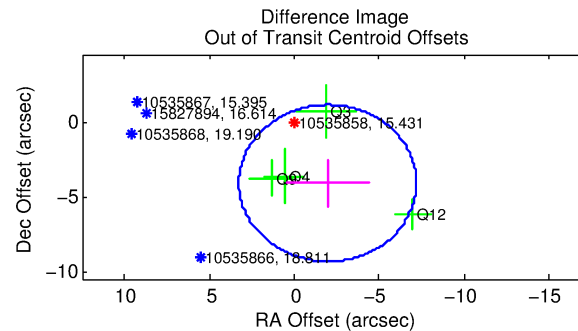
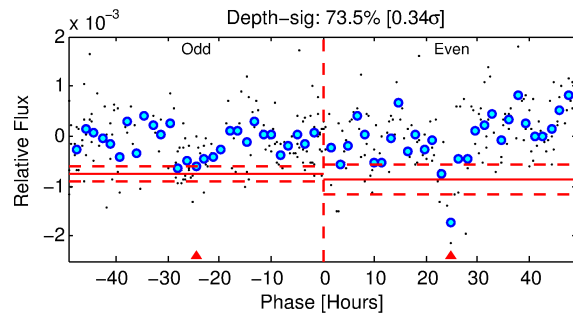
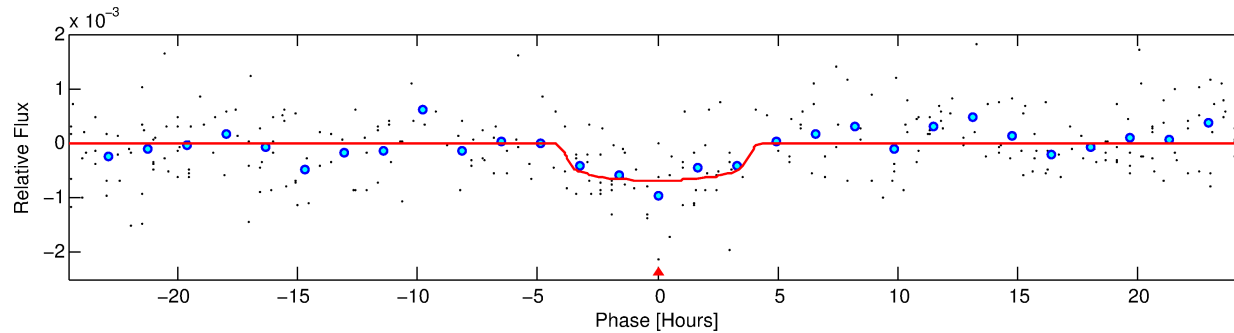
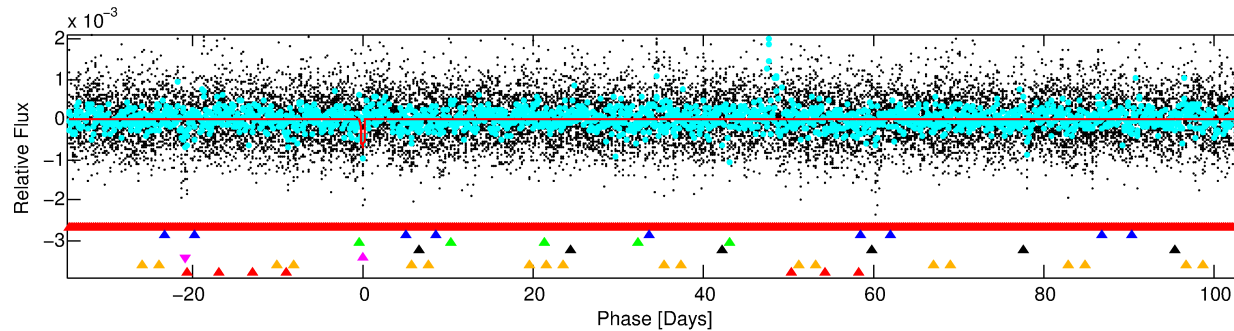
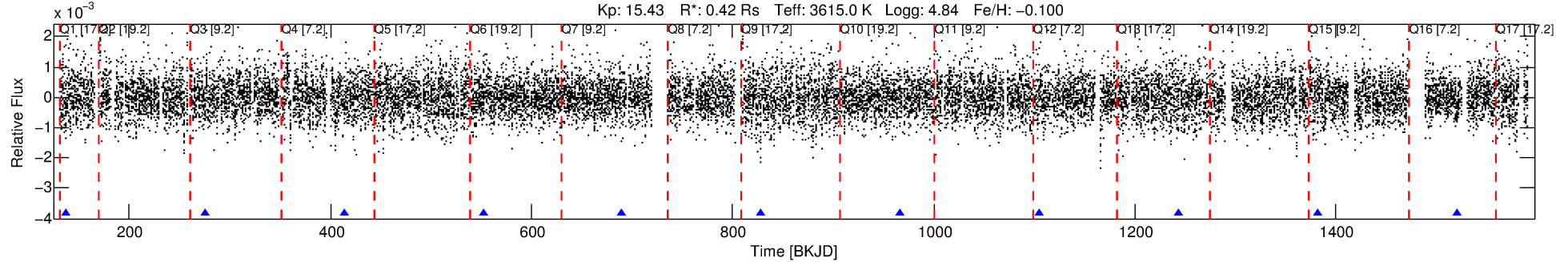
Ephemeris Match Information For 010535858-05

No Significant Match Found

# DV One-Page Summary

KIC: 10535858 Candidate: 5 of 7 Period: 138.376 d  
KOI: K07338 Corr: No Ephemeris Match

Kp: 15.43 R\*: 0.42 Rs Teff: 3615.0 K Logg: 4.84 Fe/H: -0.100



## DV Fit Results:

Period = 138.37592 [0.00504] d  
Epoch = 136.7008 [0.0361] BKJD  
Rp/R\* = 0.0261 [0.0233]  
a/R\* = 90.13 [350.99]  
b = 0.75 [2.28]  
Seff = 0.17 [0.02]  
Teq = 164 [4] K  
Rp = 1.20 [1.07] Re  
a = 0.3995 [0.0227] AU  
Ag = 29479.64 [53367.88] [0.55σ]  
Teffp = 3313 [1499] K [2.10σ]

## DV Diagnostic Results:

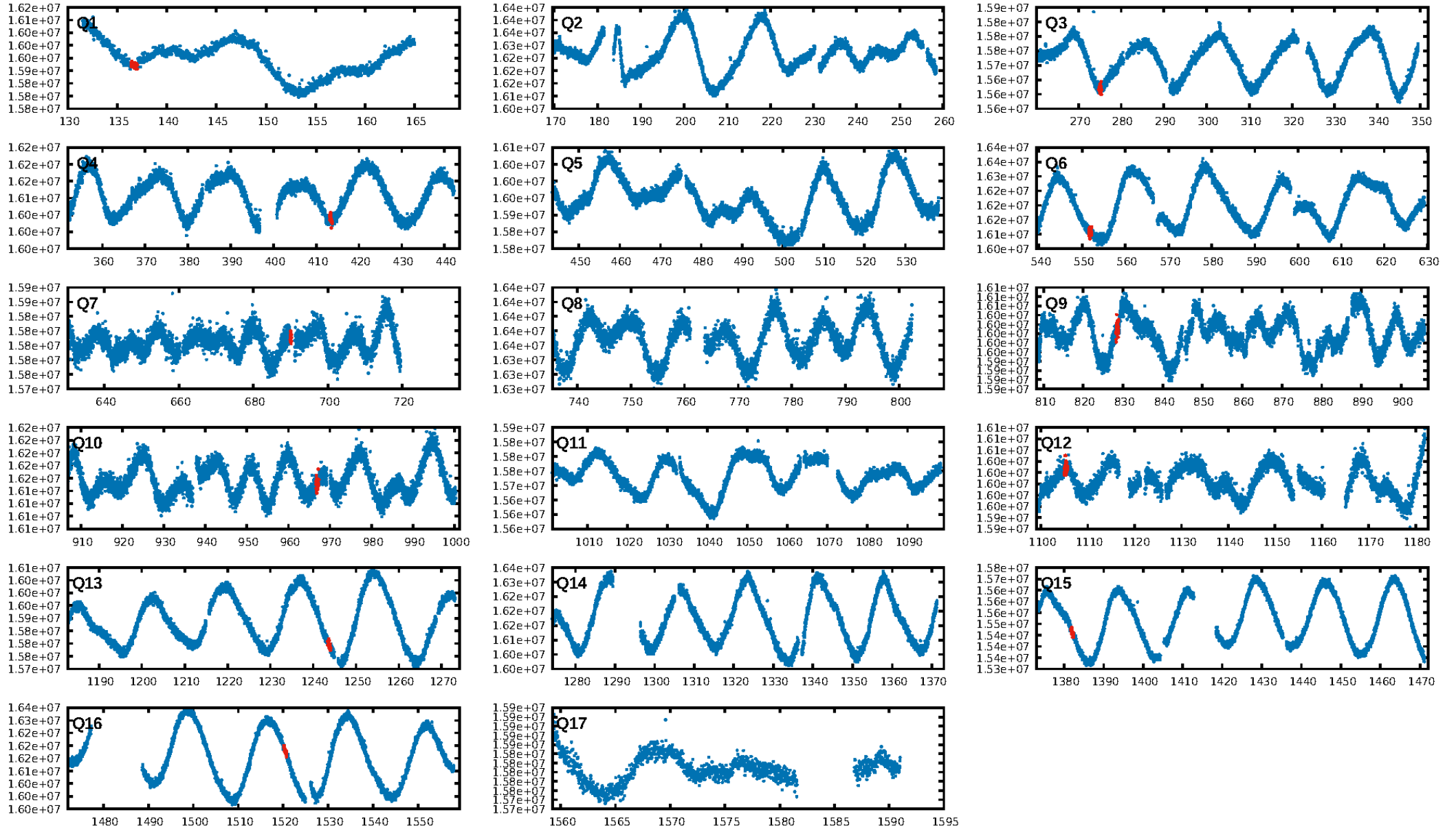
ShortPeriod-sig: 100.0% [165.61σ]  
LongPeriod-sig: 100.0% [36.99σ]  
ModelChiSquare2-sig: 57.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.62e-13  
RollingBand-fgt: 1.00 [5/5]  
**GhostDiagnostic-chr: 2.889**  
Centroid-sig: 0.3%  
Centroid-so: 3.216 arcsec [2.63σ]  
OotOffset-rm: 4.552 arcsec [2.61σ]  
KicOffset-rm: 4.441 arcsec [2.66σ]  
OotOffset-st: 0/1/2/1 [4]  
KicOffset-st: 0/1/2/1 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.00 [0/9]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:41:20 Z

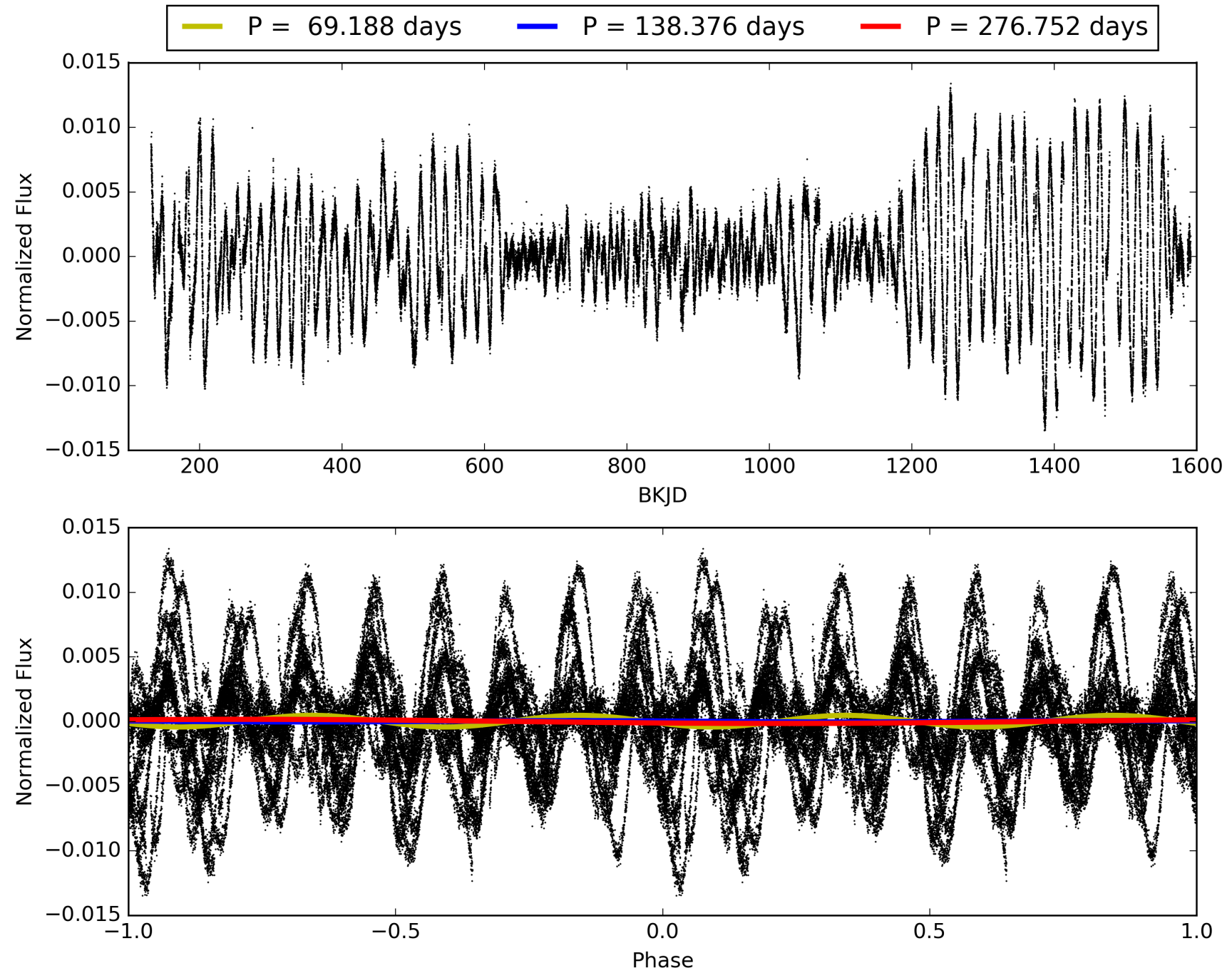
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 010535858-05, PDC Light Curves

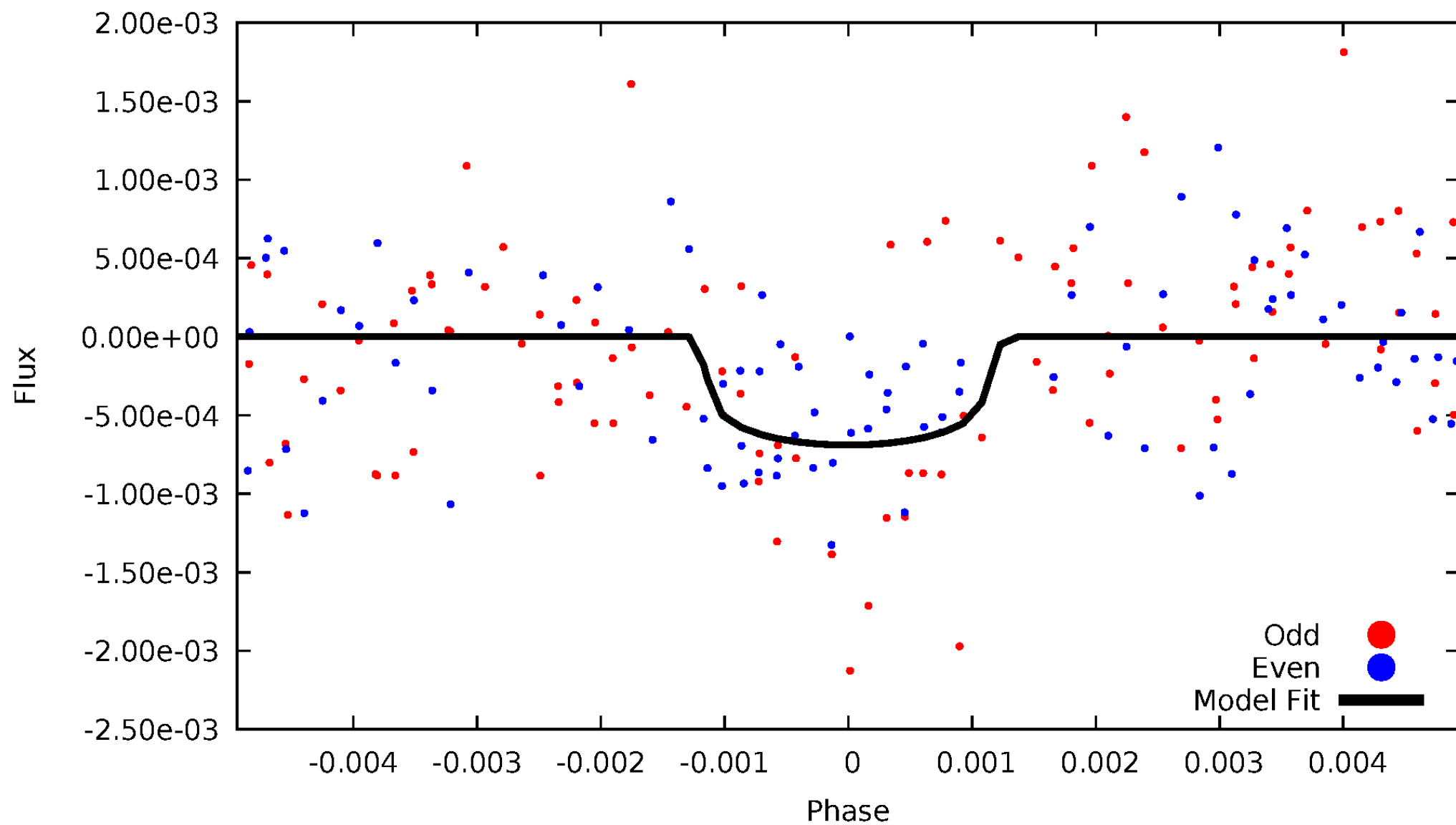


# TCE 010535858-05



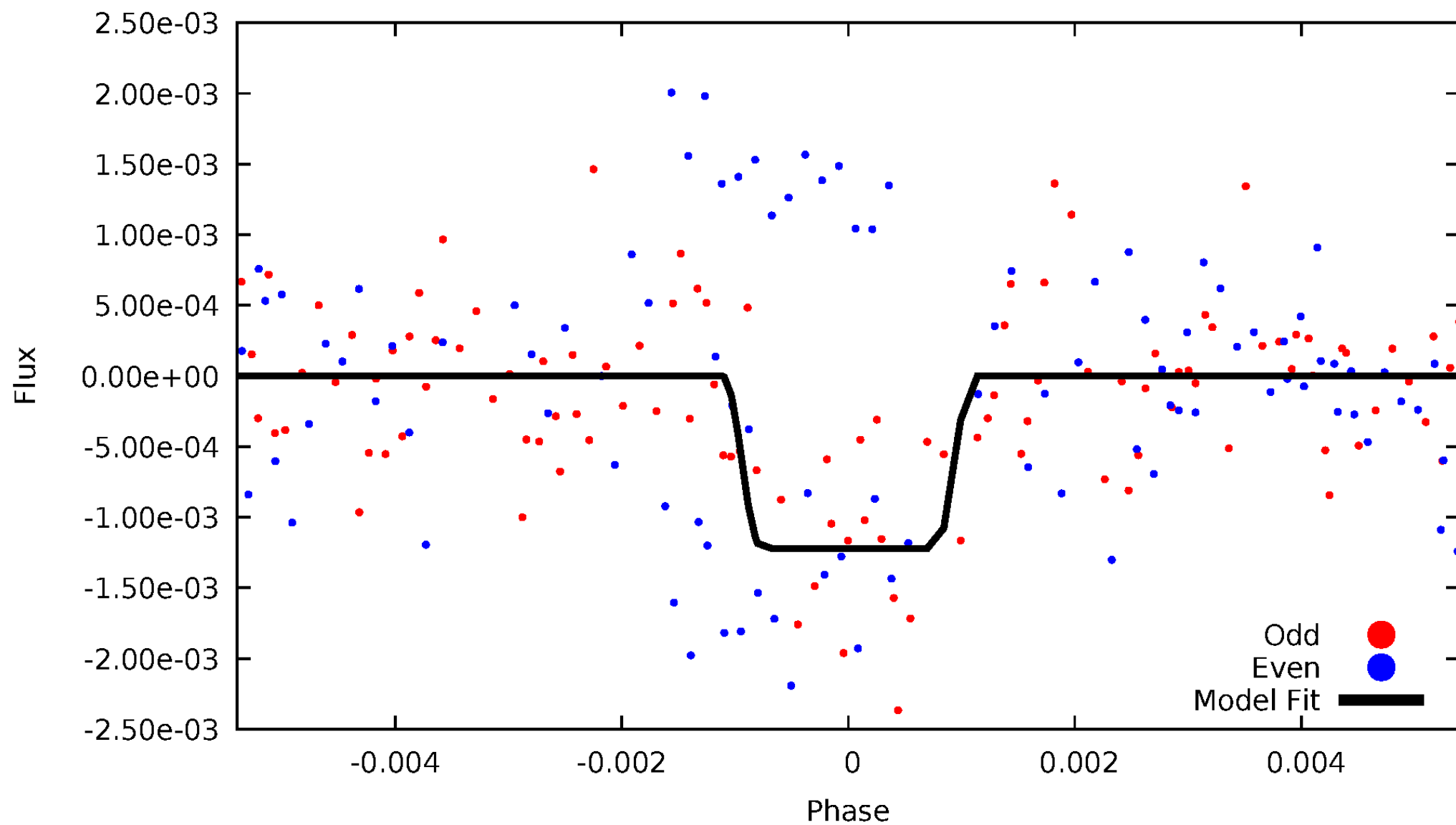
# DV Odd/Even

TCE 010535858-05



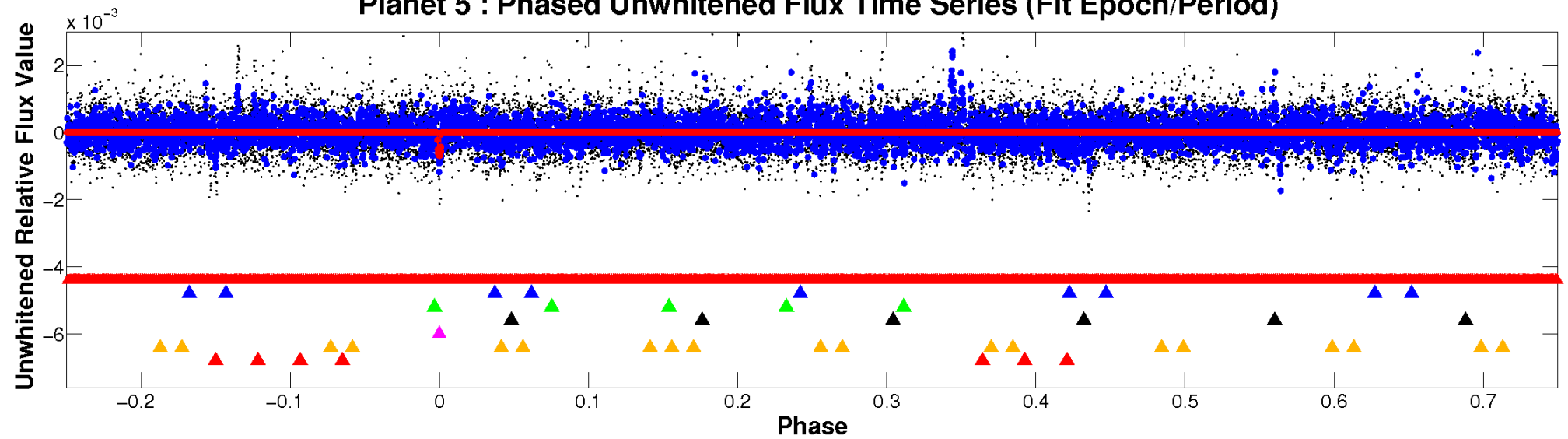
# ALT Odd/Even

TCE 010535858-05

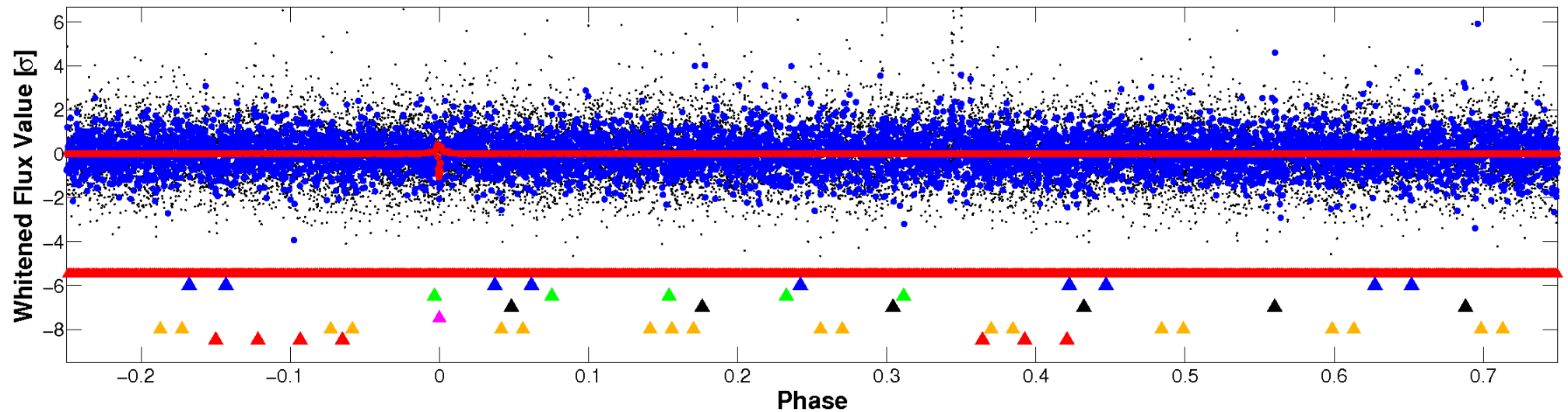


# Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

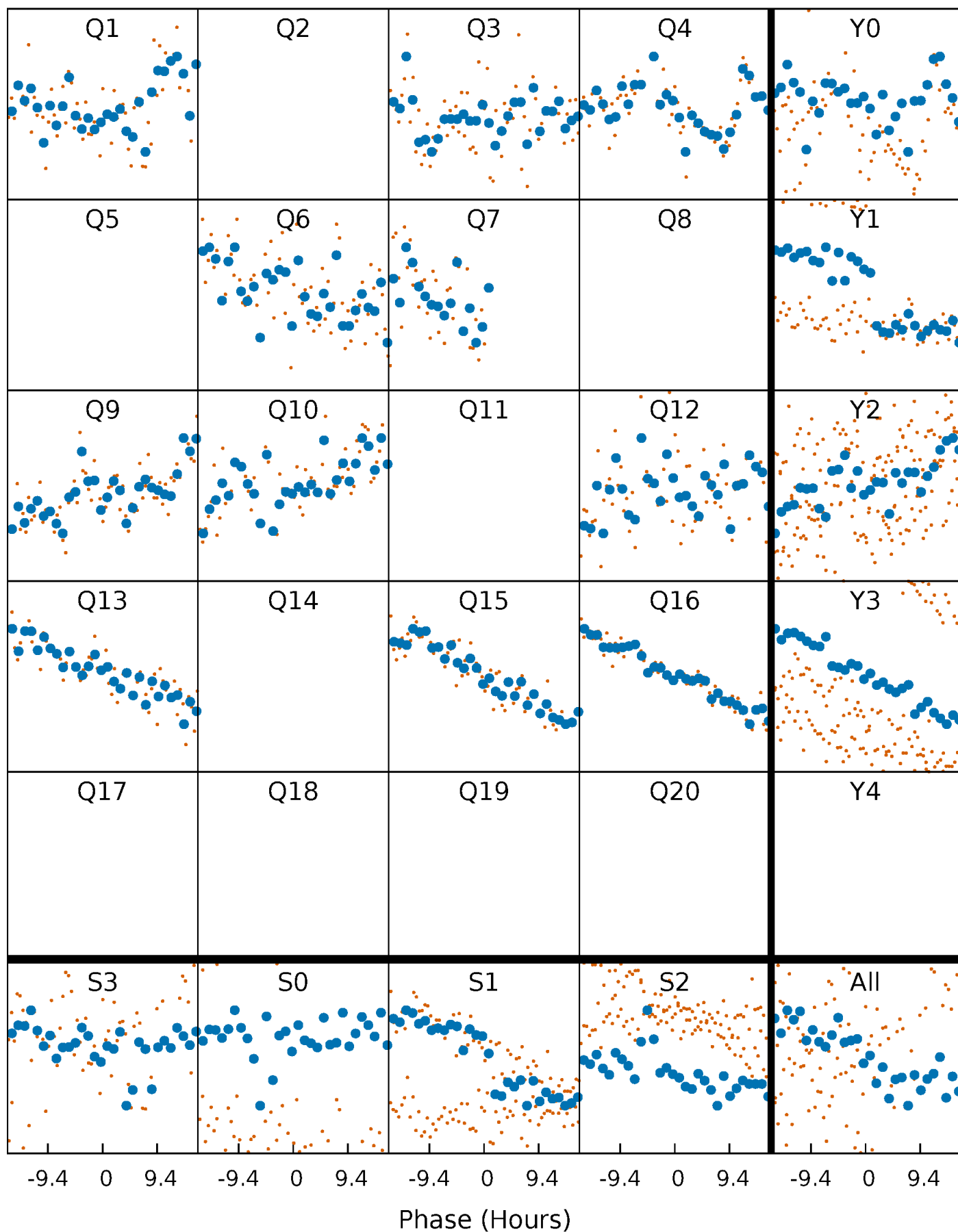


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



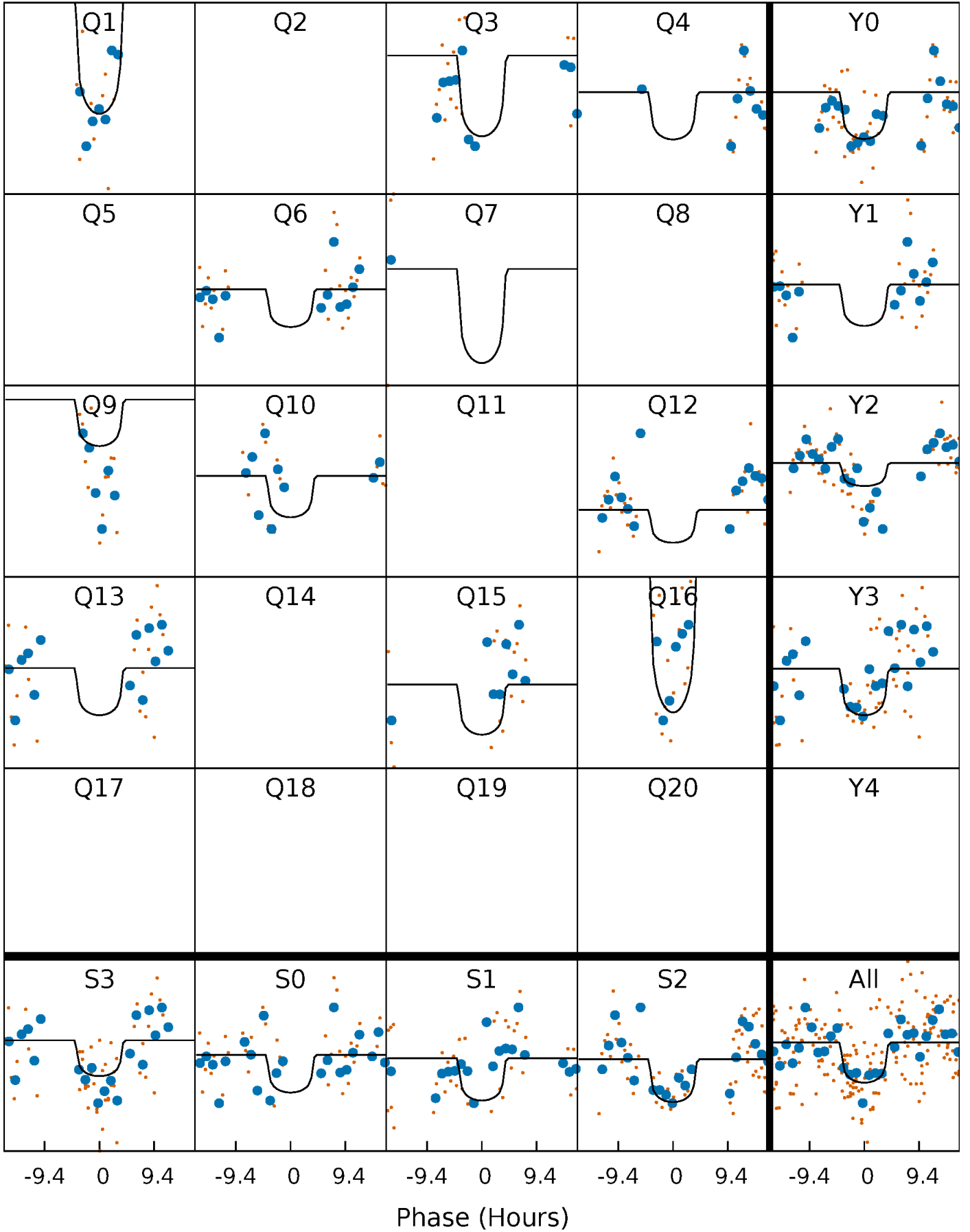
# PDC Quarter-Phased Transit Curves

TCE 010535858-05     $P=138.375922$  Days     $T_0=136.700751$  (BKJD)



# DV Quarter-Phased Transit Curves

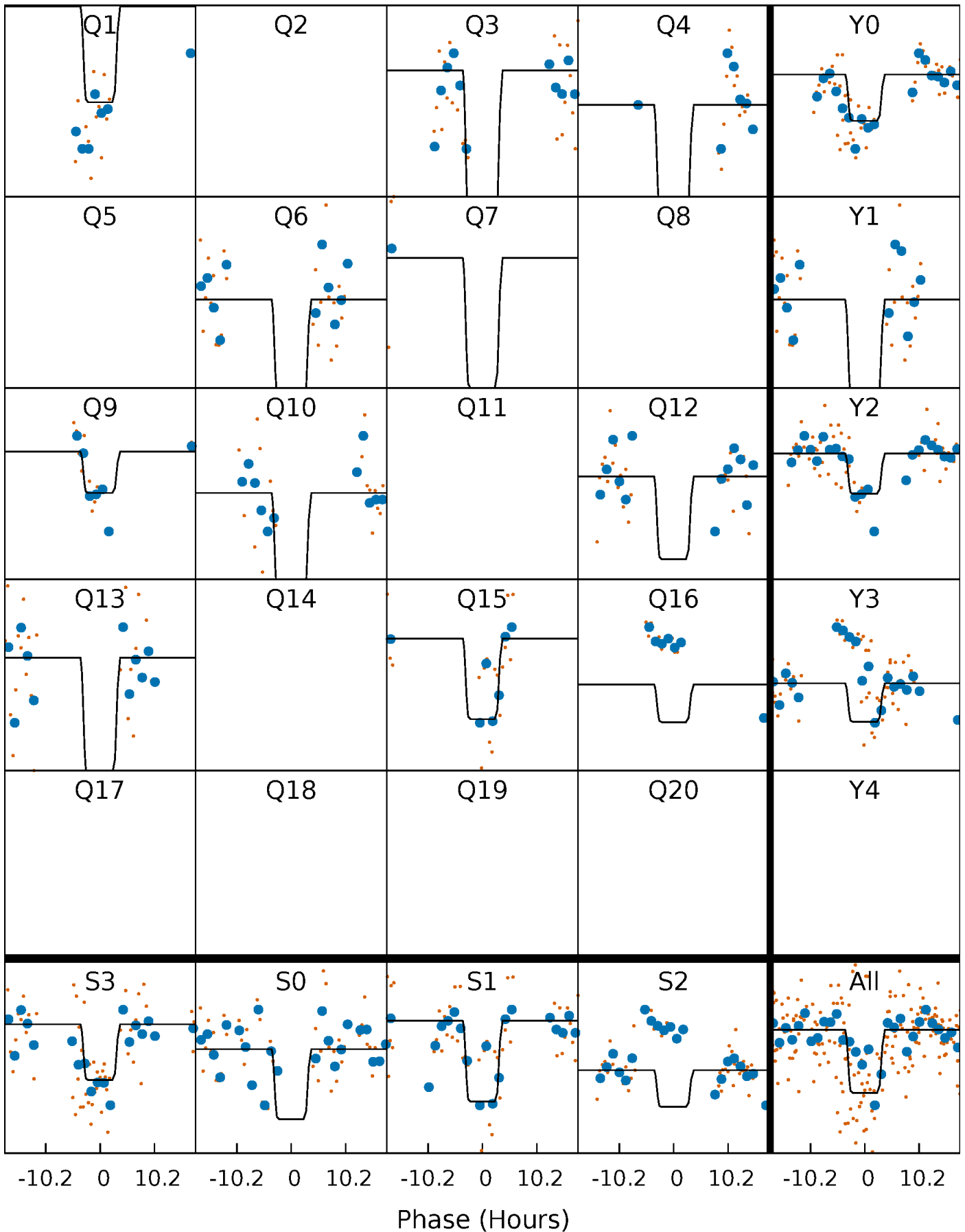
TCE 010535858-05     $P=138.375922$  Days     $T_0=136.700751$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

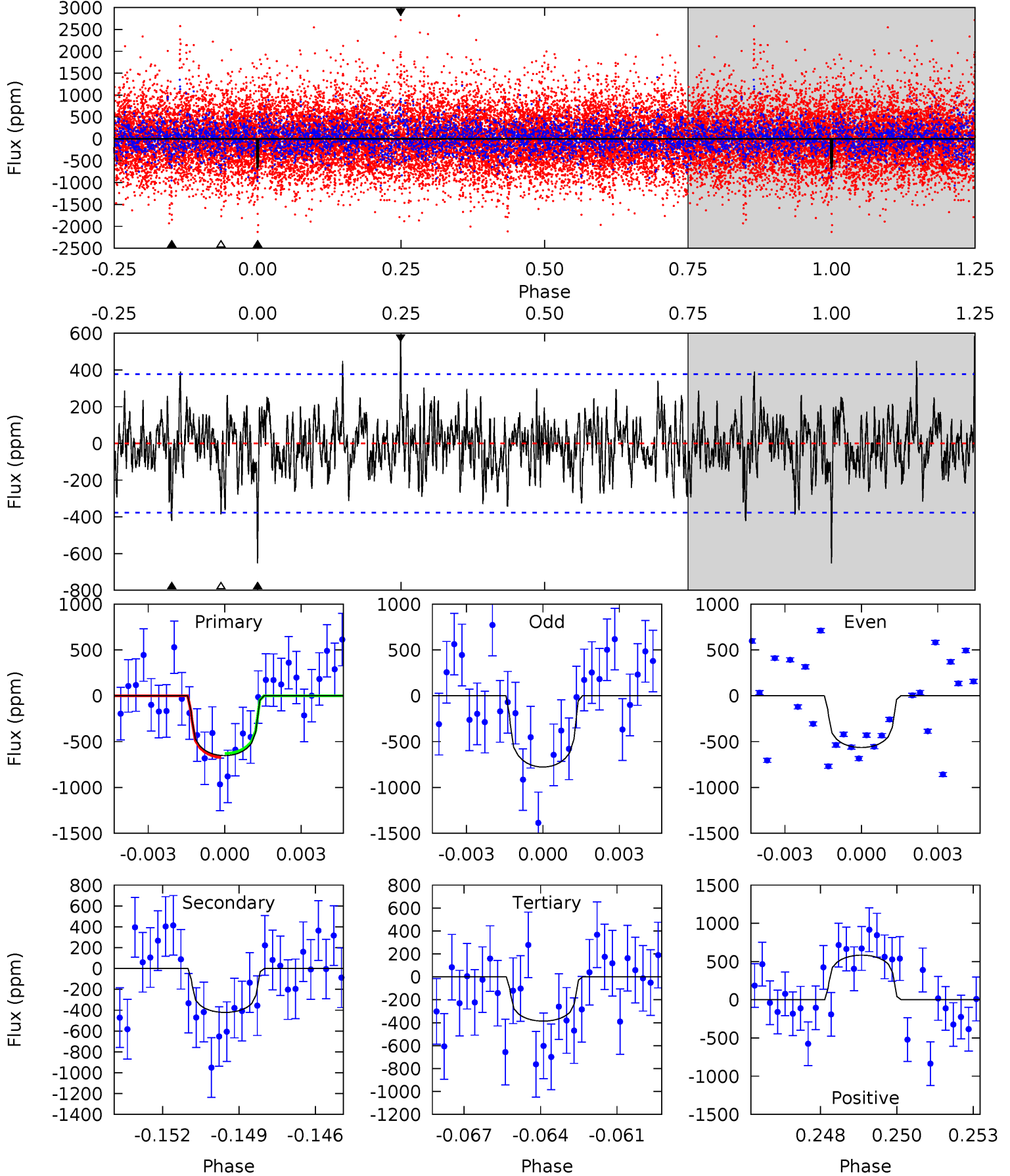
TCE 010535858-05   P=138.378414 Days    $T_0=136.751845$  (BKJD)



# DV Model-Shift Uniqueness Test

010535858-05, P = 138.375922 Days, E = 136.700751 Days

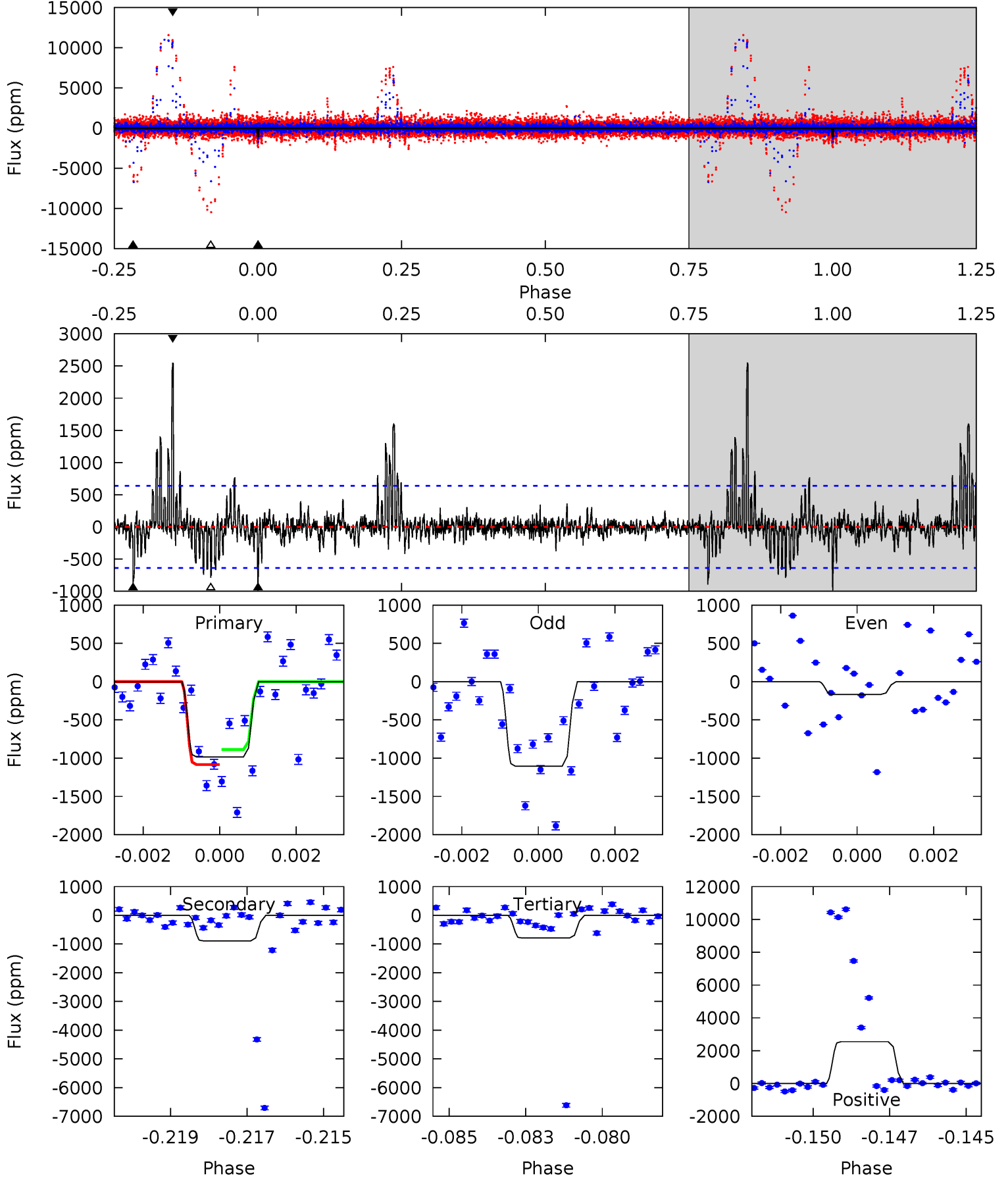
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.14	5.90	5.41	8.17	5.27	3.00	1.69	3.73	0.97	0.50	-2.26	1.46	1.03	0.47	0.31



# Alt Model-Shift Uniqueness Test

010535858-05, P = 138.378414 Days, E = 136.751845 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
8.18	7.43	6.58	21.2	5.31	3.06	1.79	1.61	-13.1	0.85	-13.8	2.65	0.69	0.72	0.82



### Stellar Parameters For KIC 010535858

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3615^{+43}_{-50}$	$4.839^{+0.030}_{-0.033}$	$-0.100^{+0.100}_{-0.100}$	$0.420^{+0.029}_{-0.032}$	$0.445^{+0.025}_{-0.038}$	$8.445^{+1.369}_{-1.178}$
	+1%/-1%	+1%/-1%	+100%/-100%	+7%/-8%	+6%/-9%	+16%/-14%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 010535858-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-422 \pm 71$	$1.41^{+0.99}_{-0.92}$	$228^{+4}_{-5}$	$3184^{+1245}_{-429}$	$18643^{+120381}_{-12243}$
Alt.	$-892 \pm 120$	$1.70^{+1.03}_{-0.89}$	$228^{+4}_{-4}$	$3368^{+964}_{-434}$	$26914^{+95550}_{-16607}$

$T_{max}$  = 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

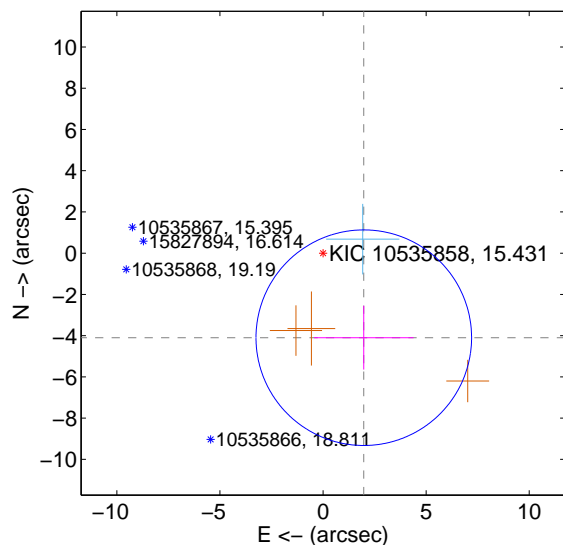
Supplemental centroid analysis for 010535858-05. Kepler magnitude: 15.43. Transit SNR 7.01

There are 1 quarters with good PRF difference image offsets

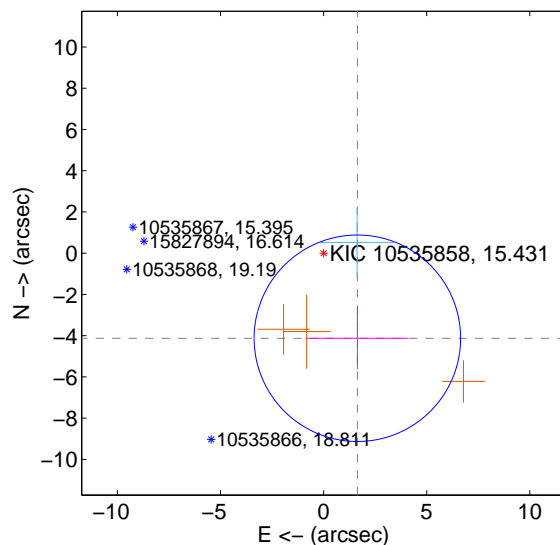
The direct PRF centroid is offset from the target star catalog position by about 0.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.552 \pm 1.743$	2.61	$-1.977 \pm 2.412$	$-4.100 \pm 1.547$
PRF-fit source offset from KIC position	$4.441 \pm 1.669$	2.66	$-1.639 \pm 2.477$	$-4.127 \pm 1.503$
photometric centroid source offset	$3.22 \pm 1.22$	2.63	$2.90 \pm 1.30$	$-1.38 \pm 0.80$

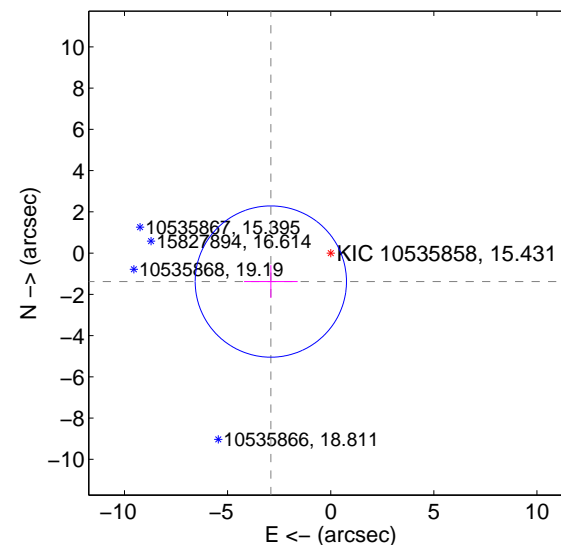
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

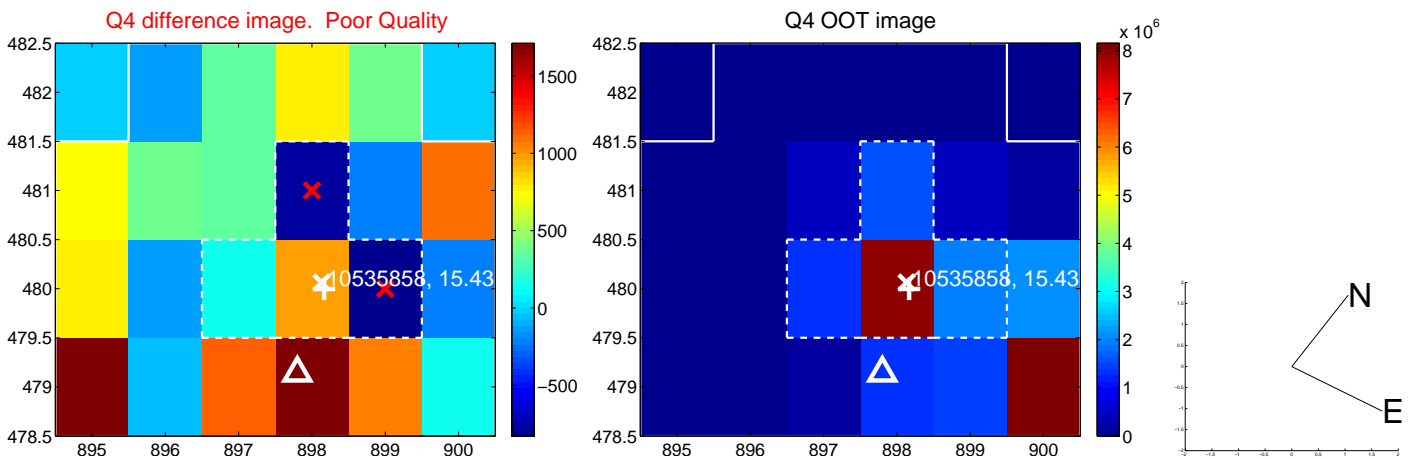
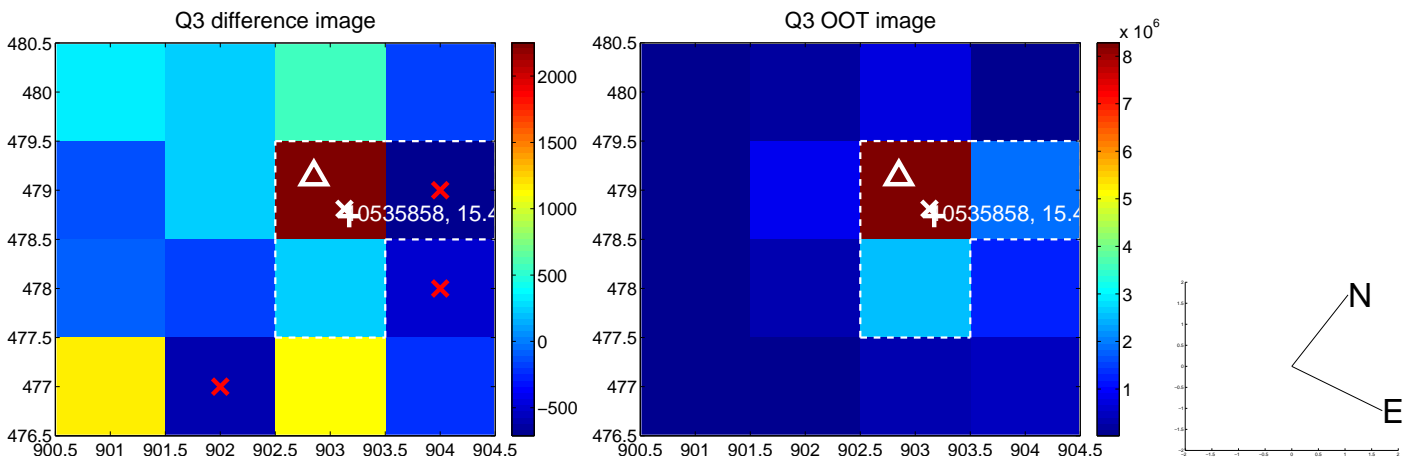
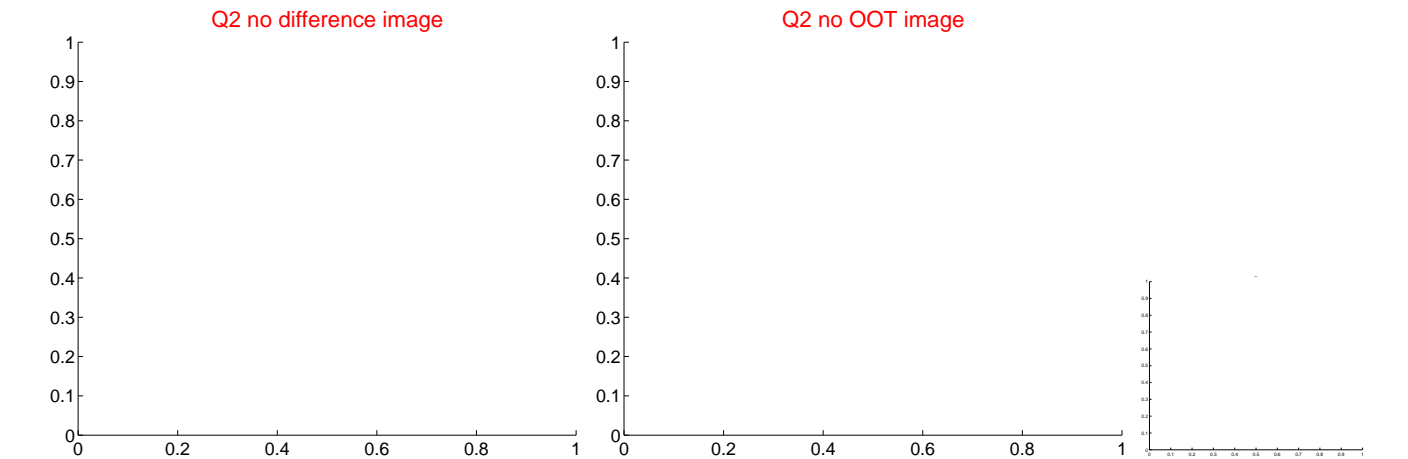
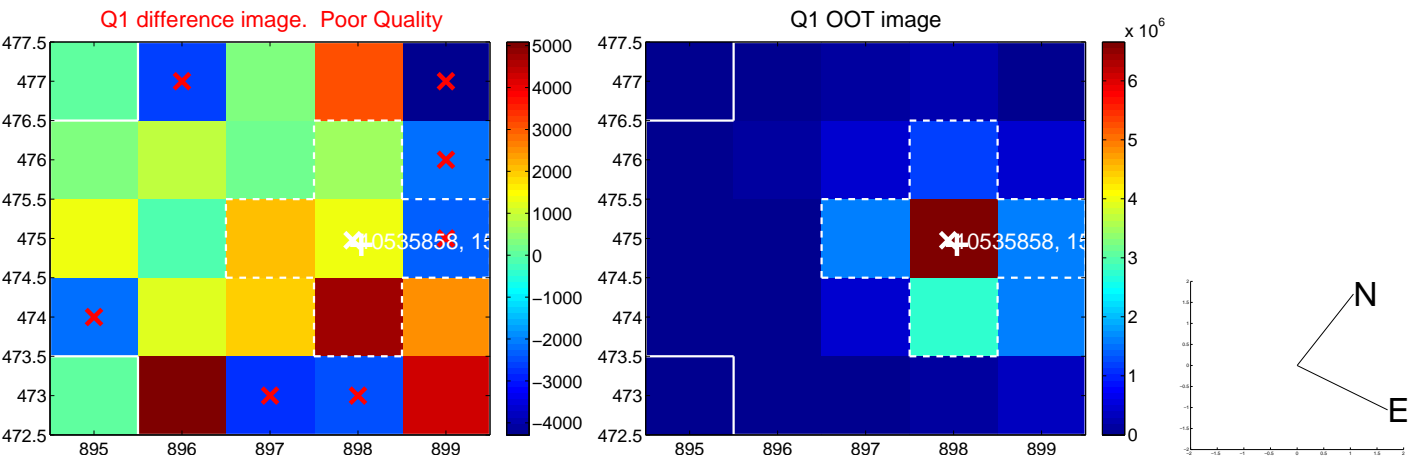


offset from photometric centroids

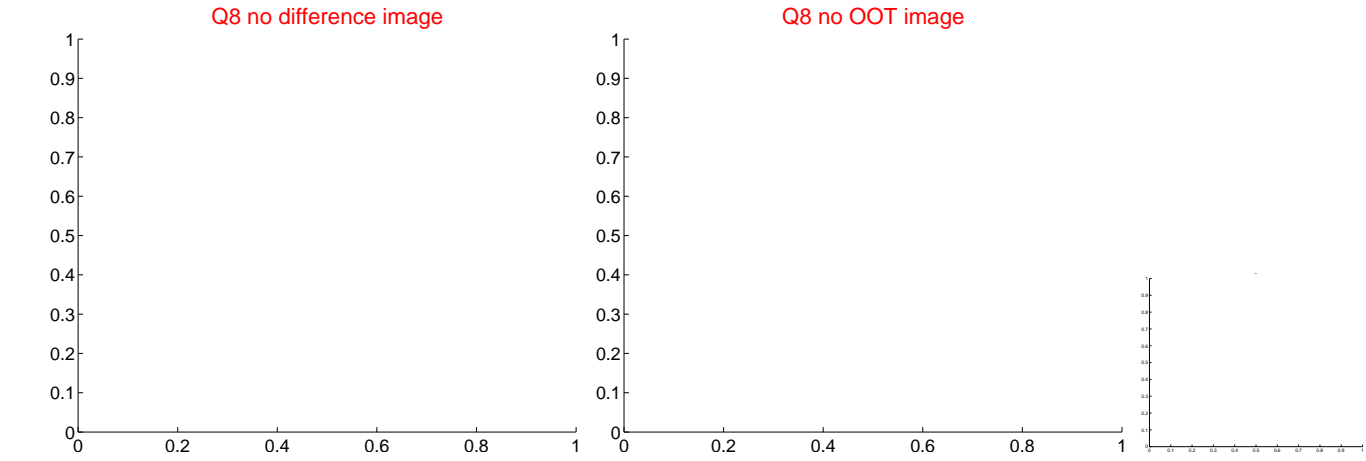
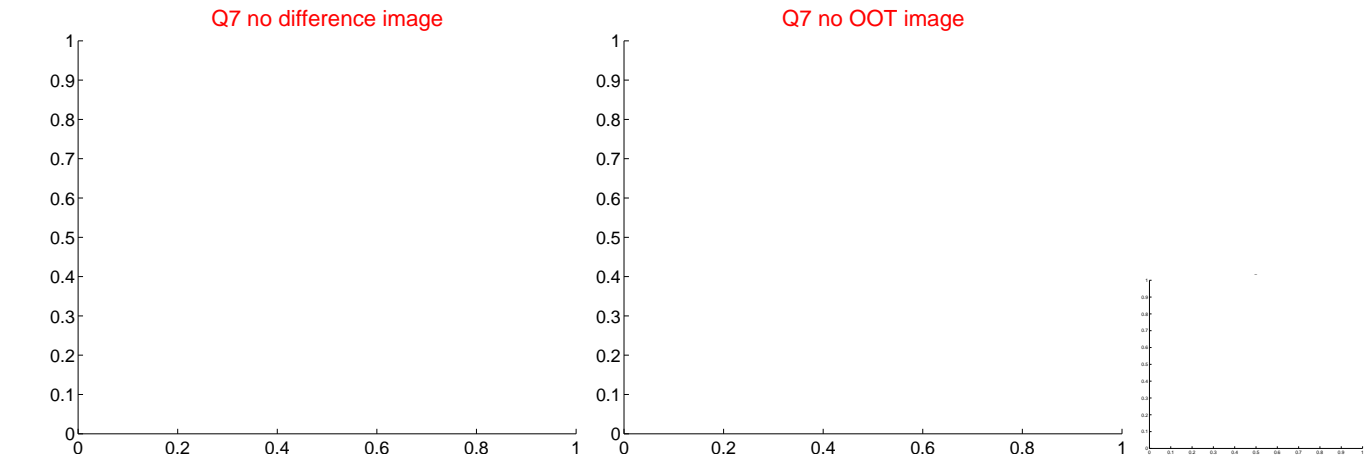
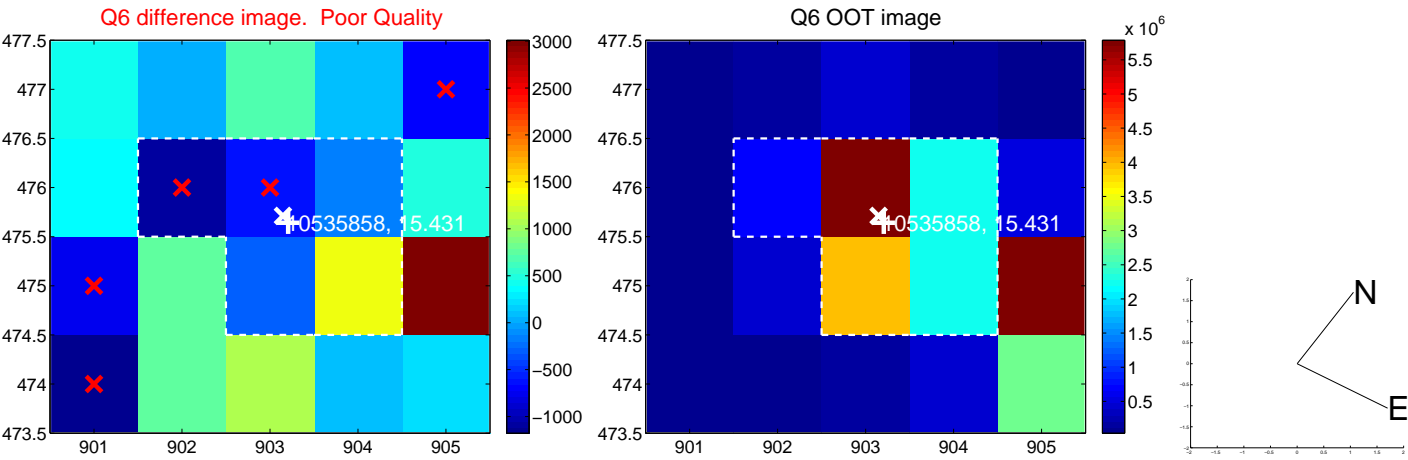
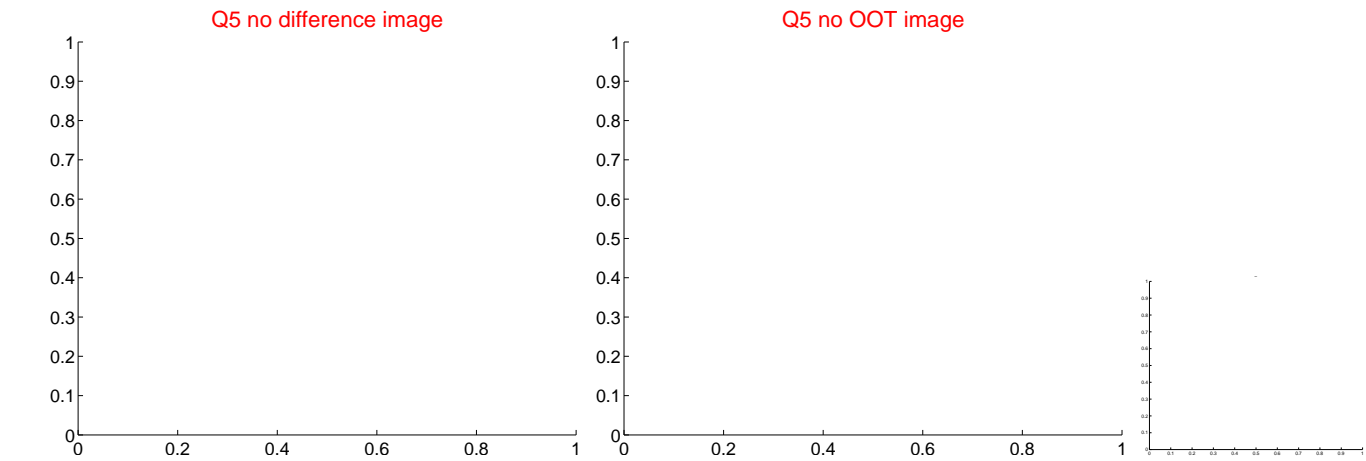


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

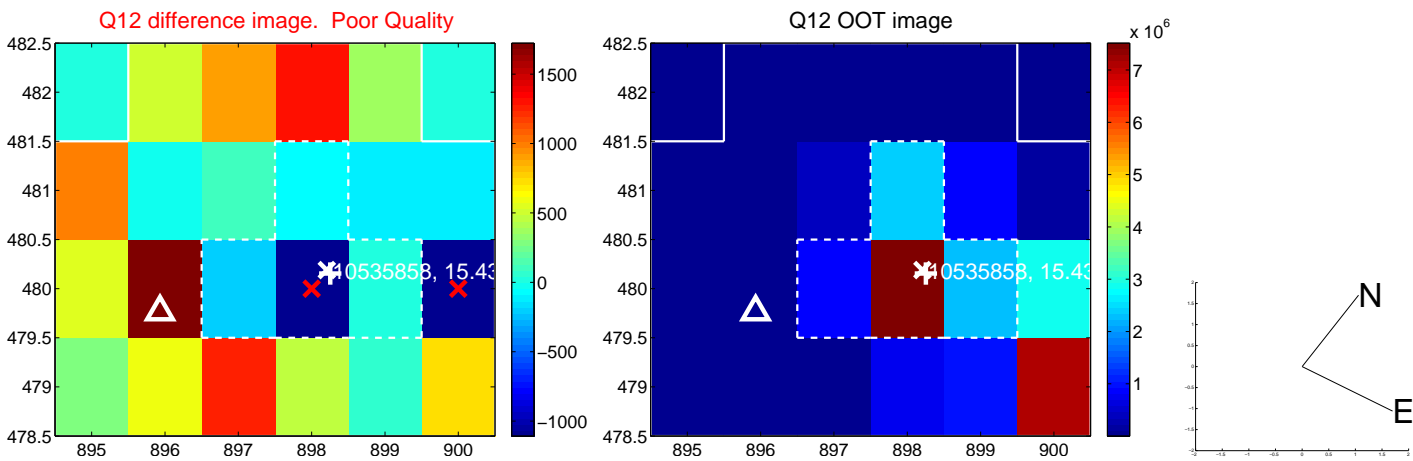
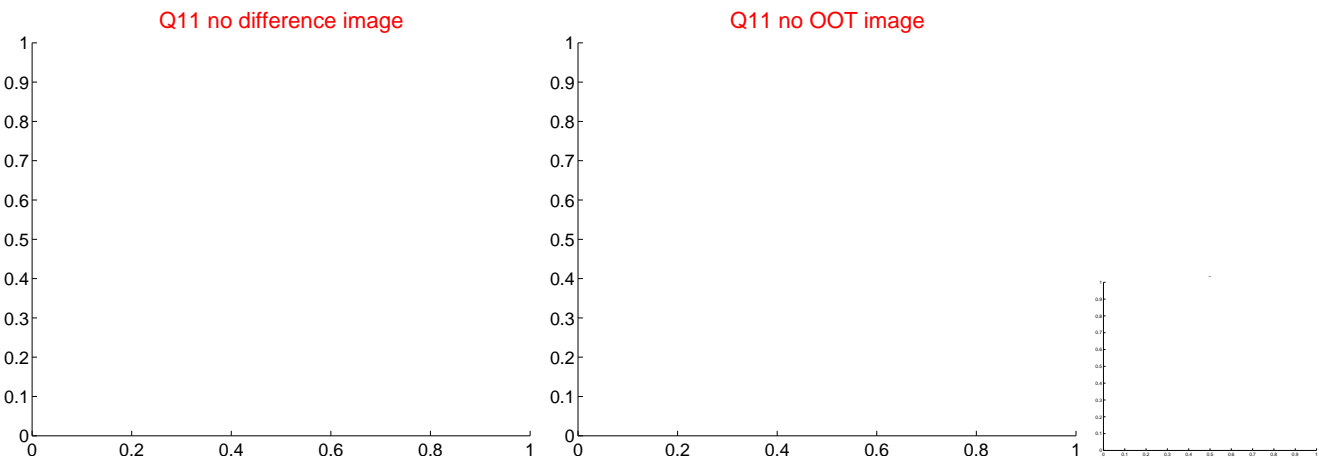
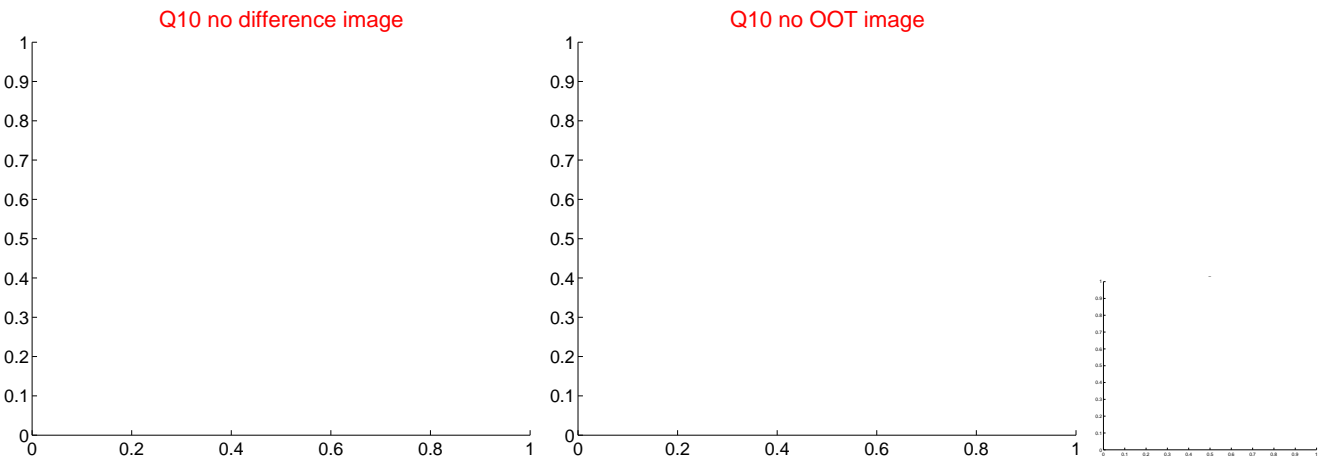
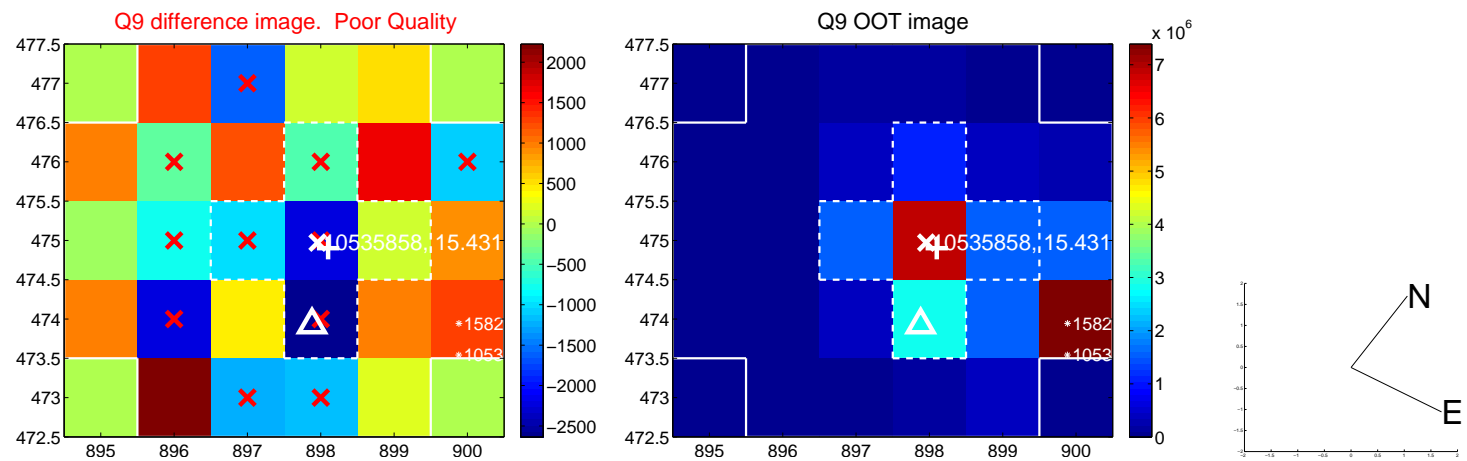


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

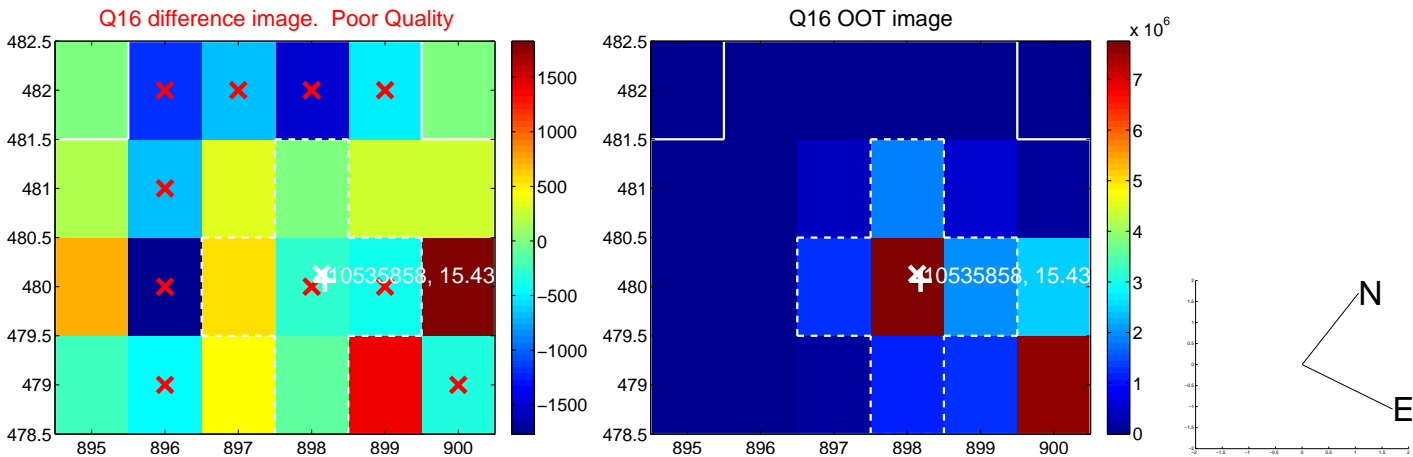
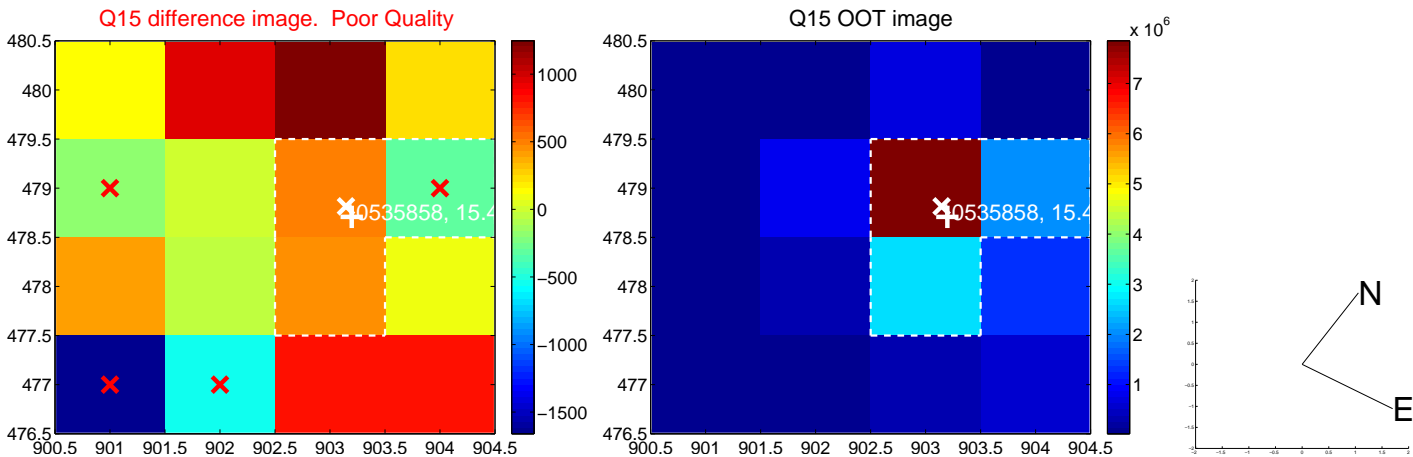
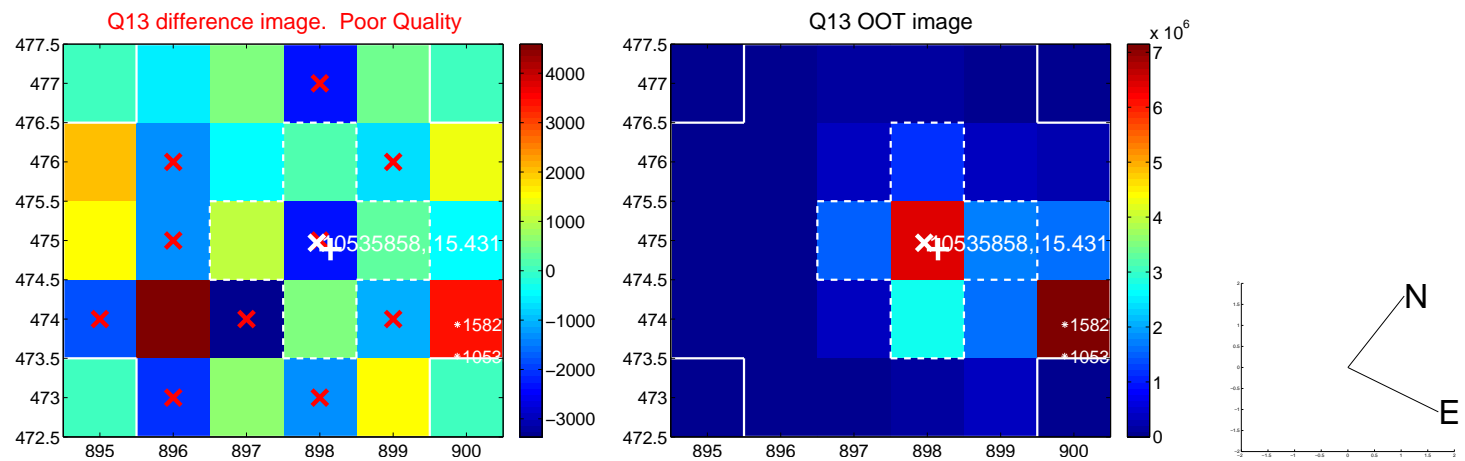




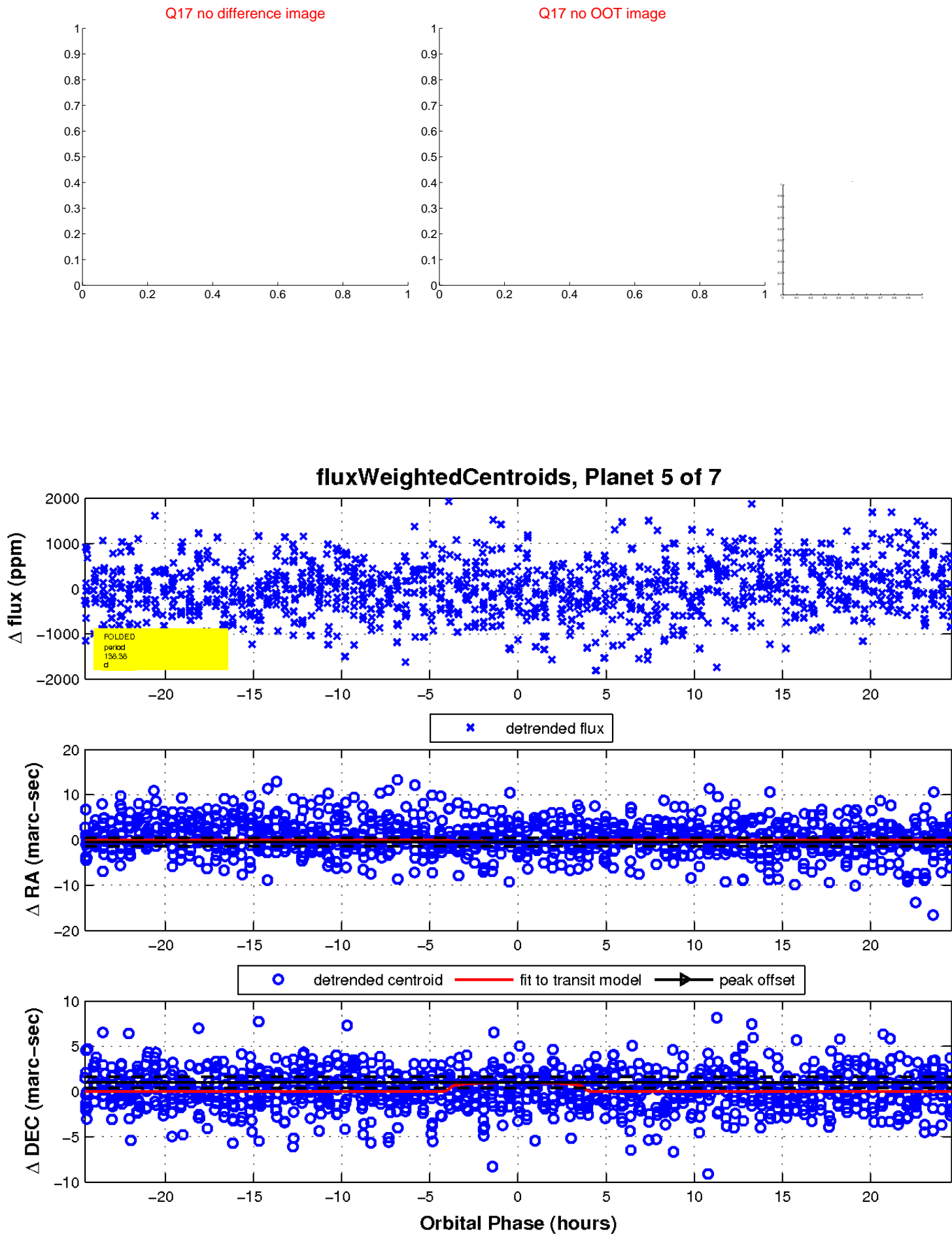
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



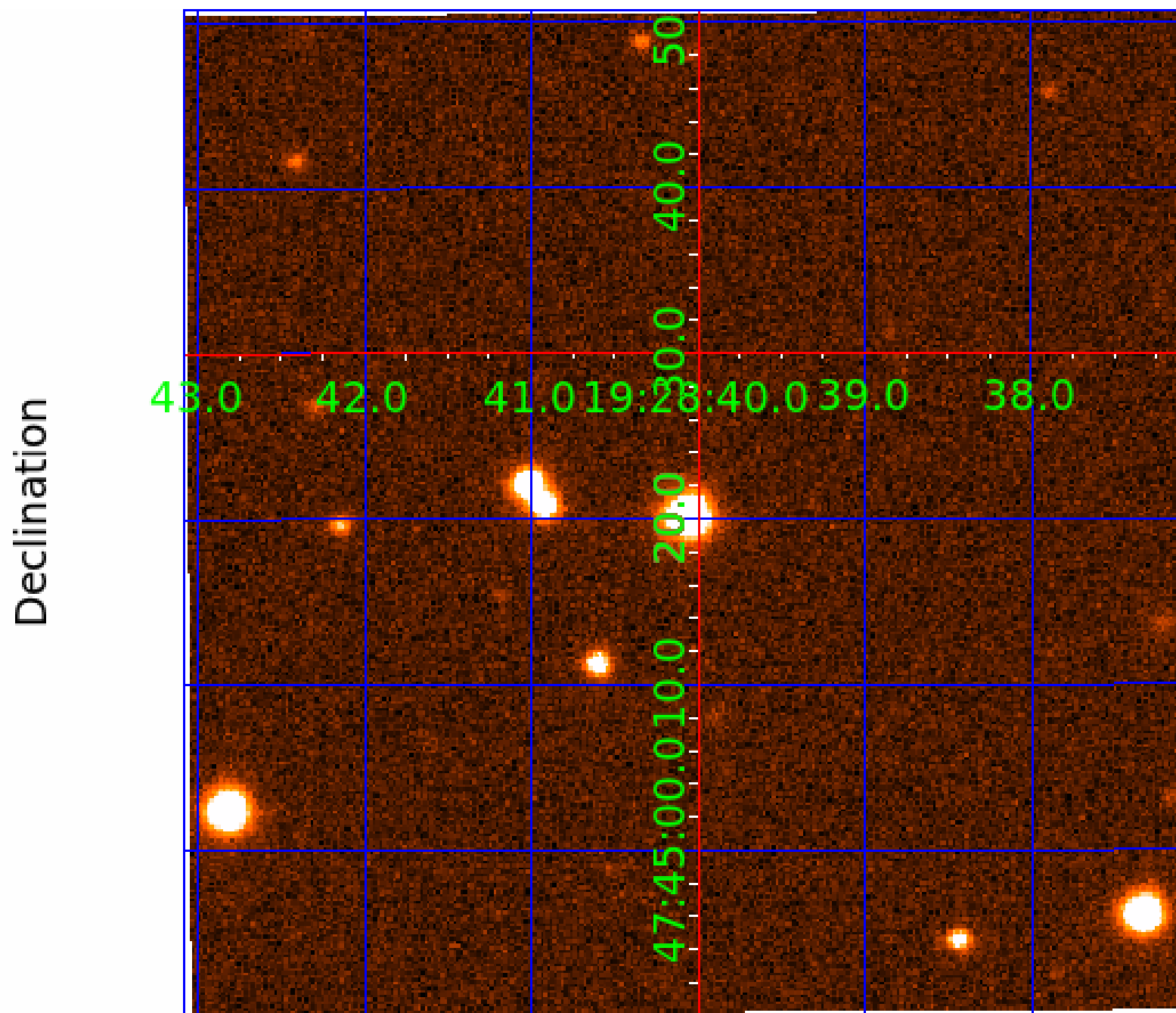
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 010535858

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010535858-01	OBS	7338.01	0.933718	131.547996	64.0	4.971	8.6	9.7	0.42	3615	0.38	132.60
010535858-02	OBS	No	166.731446	195.158250	538.9	16.471	12.9	4.5	0.42	3615	1.11	0.13
010535858-03	OBS	No	287.636030	412.997432	860.6	3.172	8.7	9.6	0.42	3615	1.29	0.06
010535858-05	OBS	No	138.375922	136.700751	689.8	8.201	9.2	7.0	0.42	3615	1.20	0.17
010535858-06	OBS	No	77.099011	156.259842	728.5	3.406	7.3	7.1	0.42	3615	1.22	0.37
010535858-07	OBS	No	209.523411	254.328284	854.7	9.055	7.5	6.4	0.42	3615	1.38	0.10

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010535858-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
010535858-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010535858-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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.

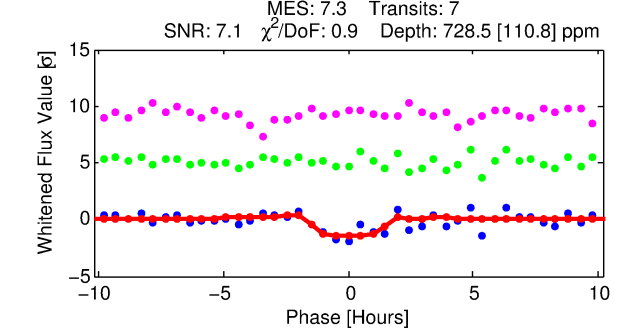
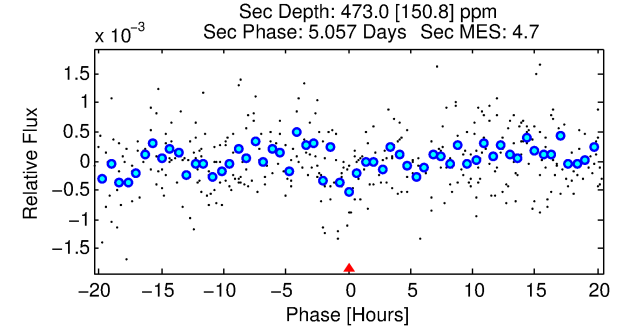
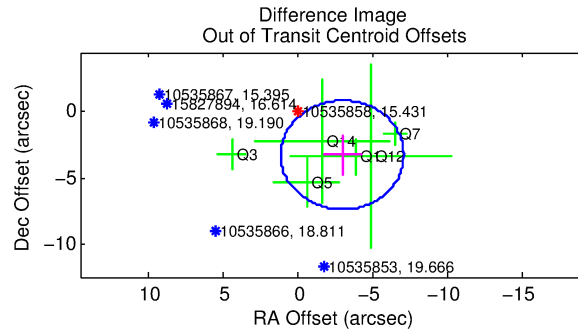
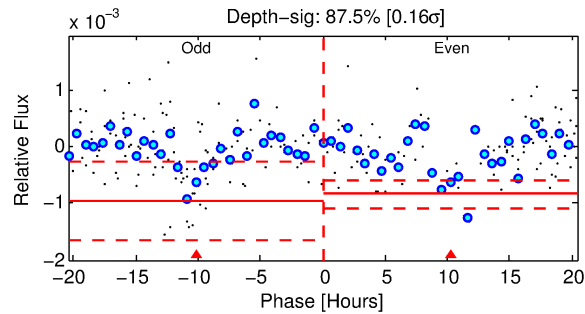
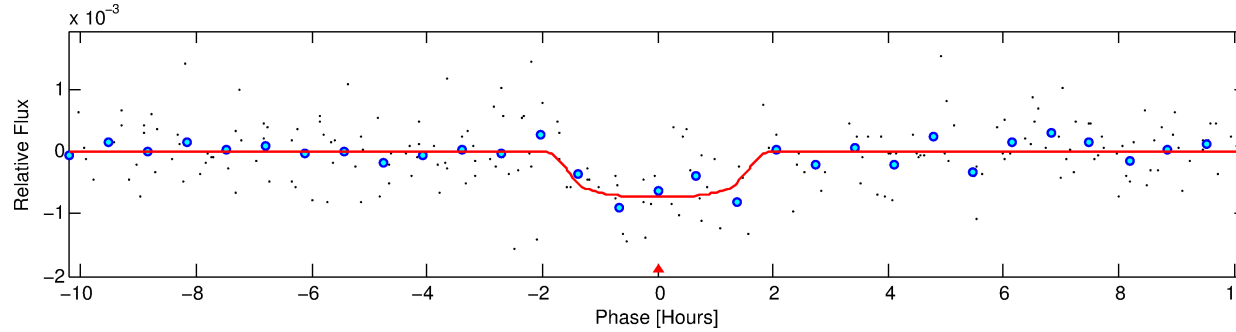
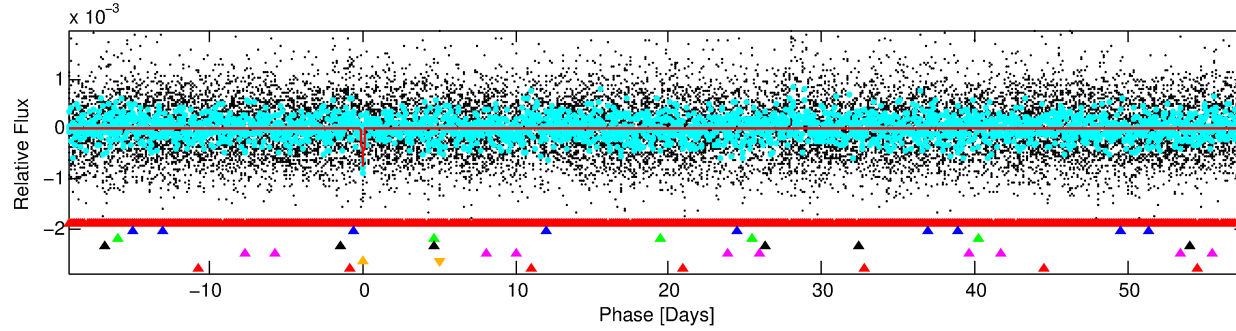
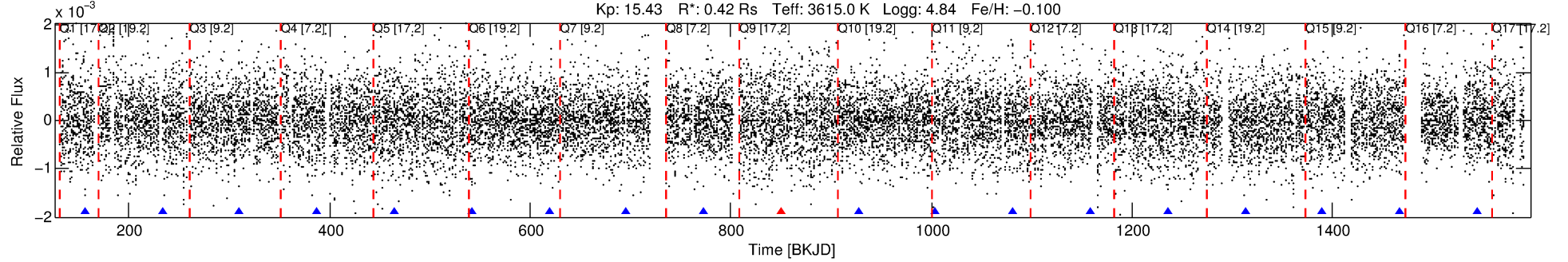
Ephemeris Match Information For 010535858-06

No Significant Match Found

# DV One-Page Summary

KIC: 10535858 Candidate: 6 of 7 Period: 77.099 d  
KOI: K07338 Corr: No Ephemeris Match

Kp: 15.43 R\*: 0.42 Rs Teff: 3615.0 K Logg: 4.84 Fe/H: -0.100



## DV Fit Results:

Period = 77.09901 [0.00105] d  
Epoch = 156.2598 [0.0098] BKJD  
Rp/R\* = 0.0266 [0.0561]  
a/R\* = 125.37 [1163.83]  
b = 0.73 [6.09]  
Seff = 0.37 [0.03]  
Teq = 199 [5] K  
Rp = 1.22 [2.57] Re  
a = 0.2705 [0.0154] AU  
Ag = 12814.70 [54257.48] [0.24σ]  
Teffp = 3269 [3460] K [0.89σ]

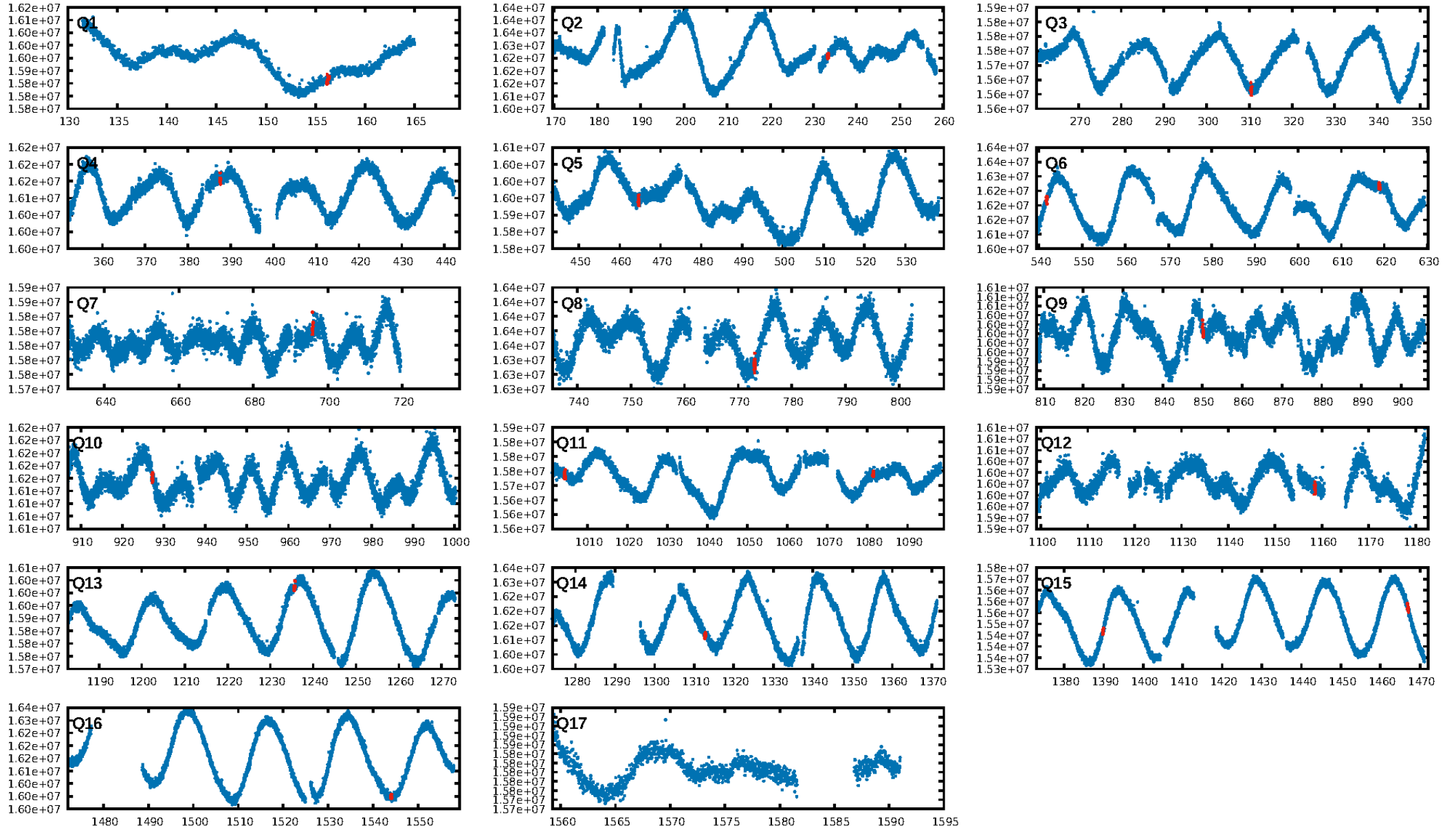
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [303.32σ]  
LongPeriod-sig: 100.0% [165.61σ]  
ModelChiSquare2-sig: 55.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 3.91e-09**  
RollingBand-fgt: 0.83 [5/6]  
GhostDiagnostic-chr: 1.957  
Centroid-sig: 47.5%  
Centroid-so: 3.233 arcsec [2.76σ]  
**OotOffset-rm: 4.446 arcsec [3.24σ]**  
KicOffset-rm: 4.155 arcsec [2.98σ]  
OotOffset-st: 1/2/1/2 [6]  
KicOffset-st: 1/2/1/2 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 0.00 [0/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:41:24 Z

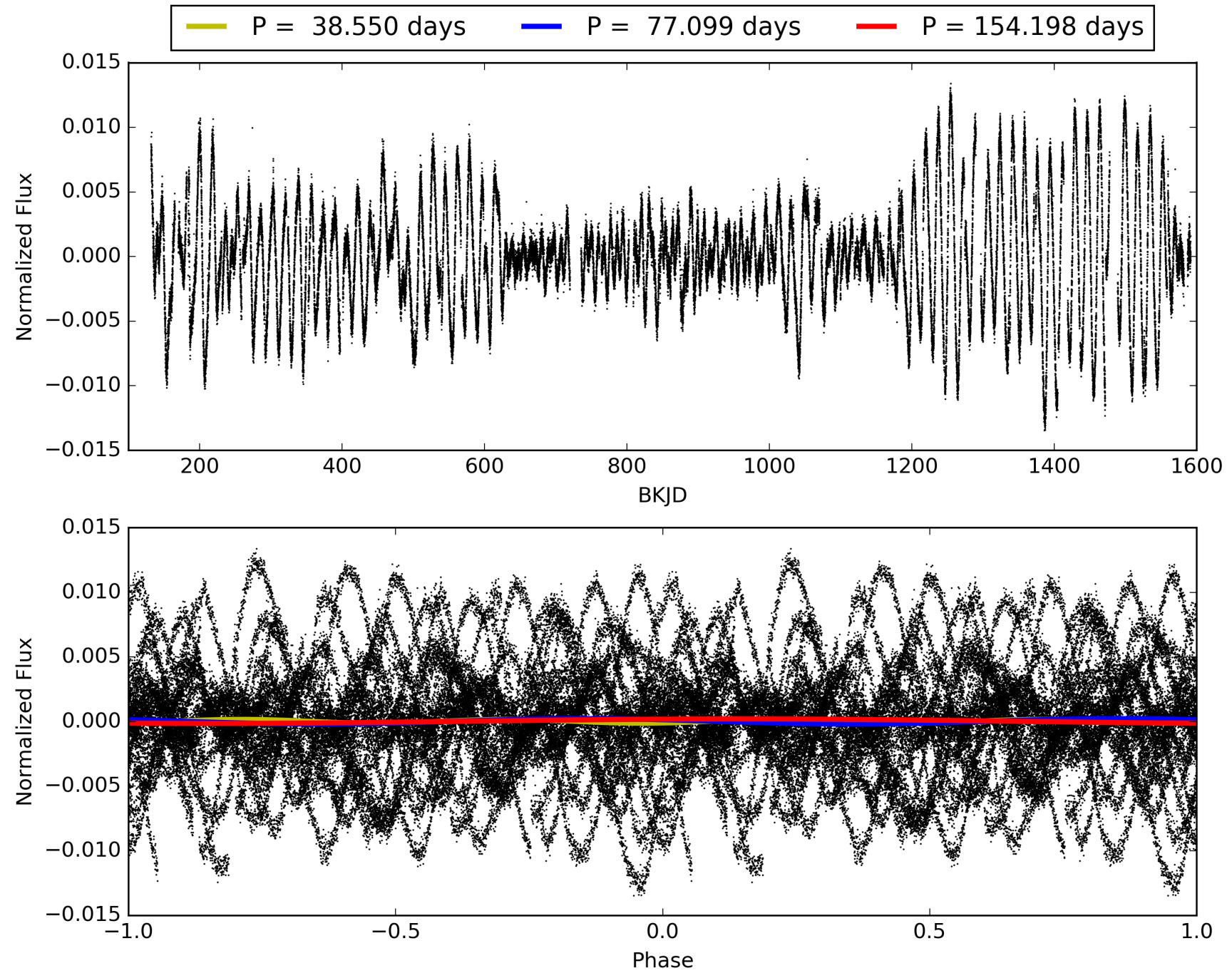
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010535858-06, PDC Light Curves



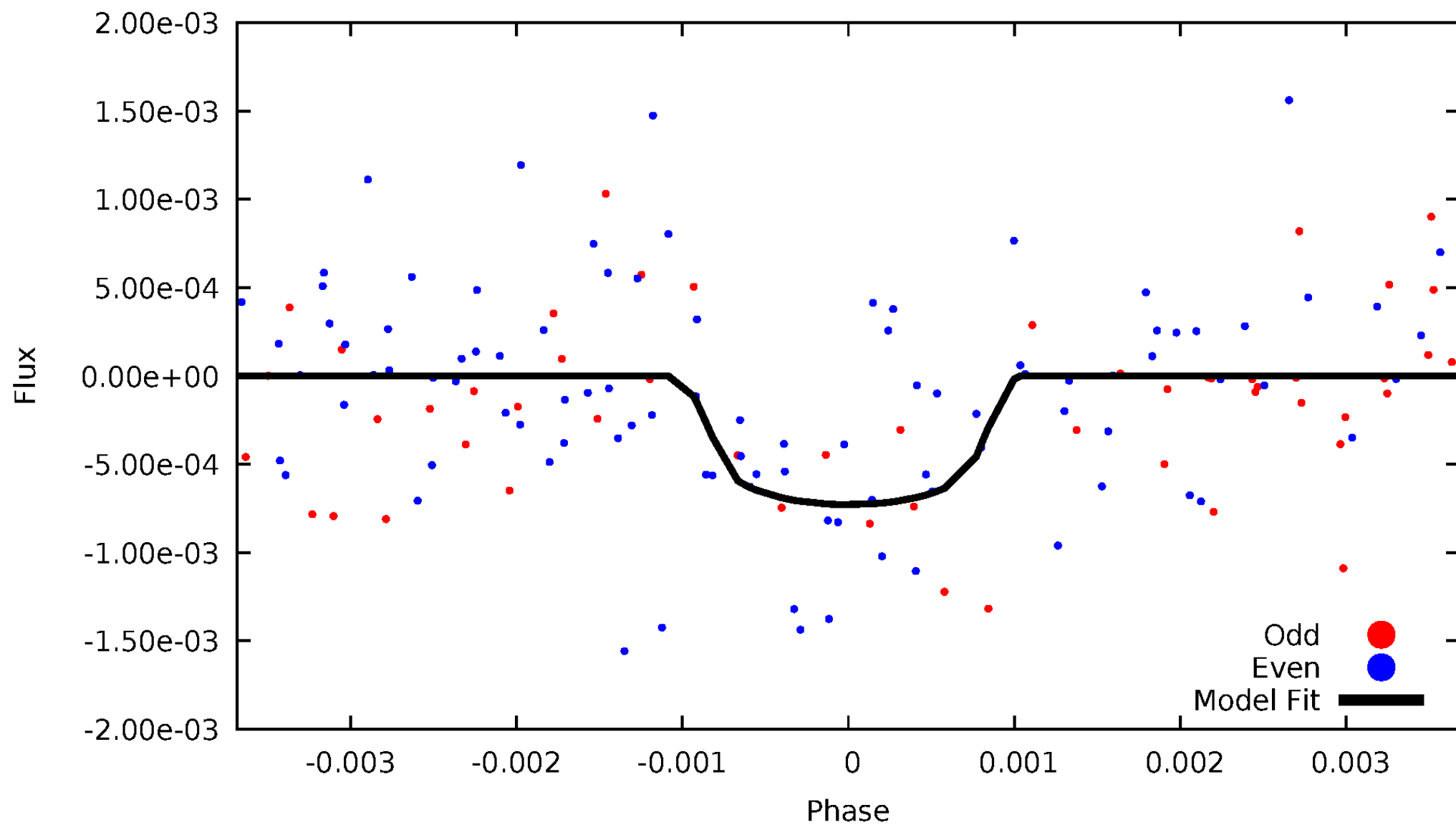


# TCE 010535858-06



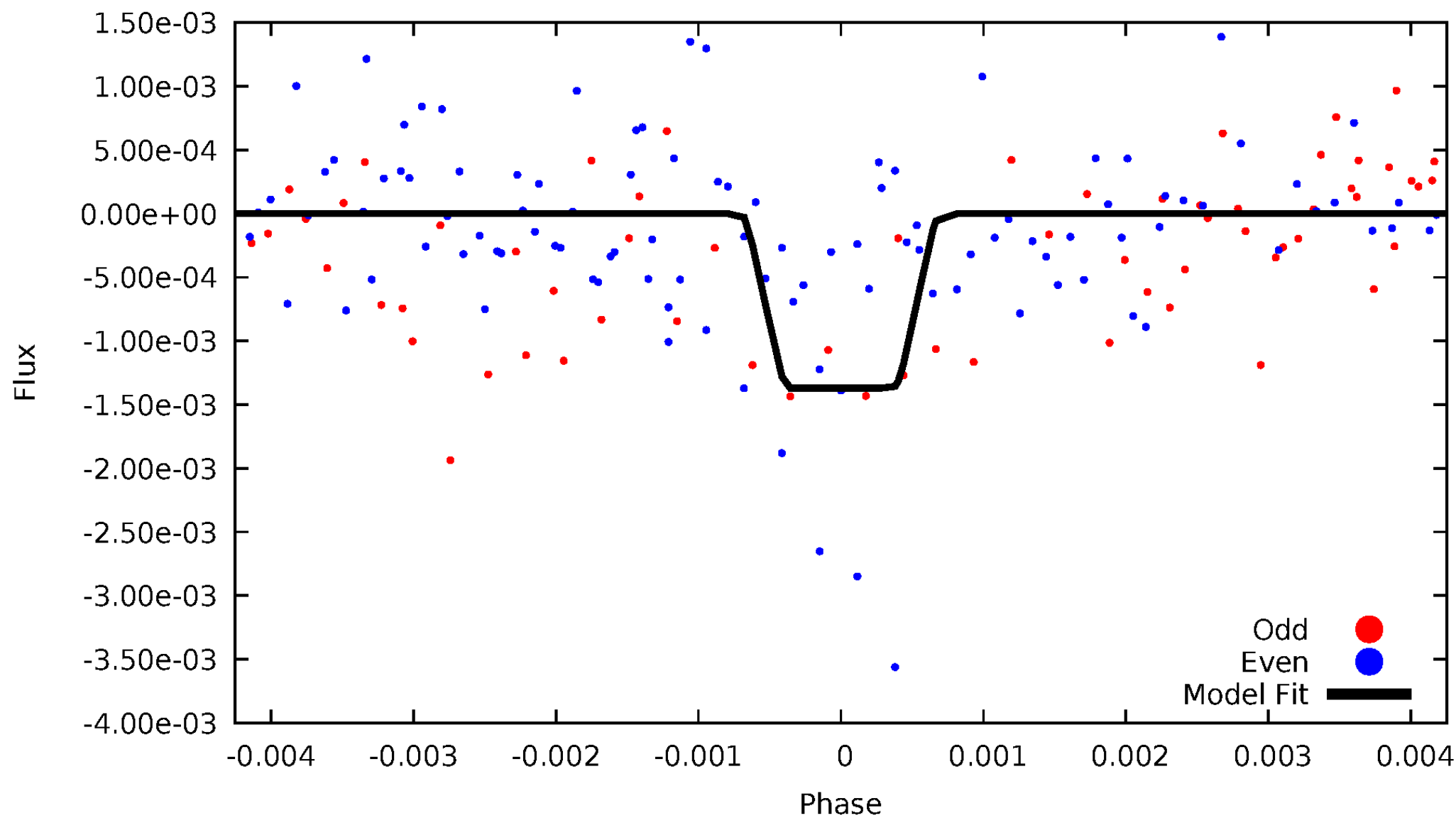
# DV Odd/Even

TCE 010535858-06



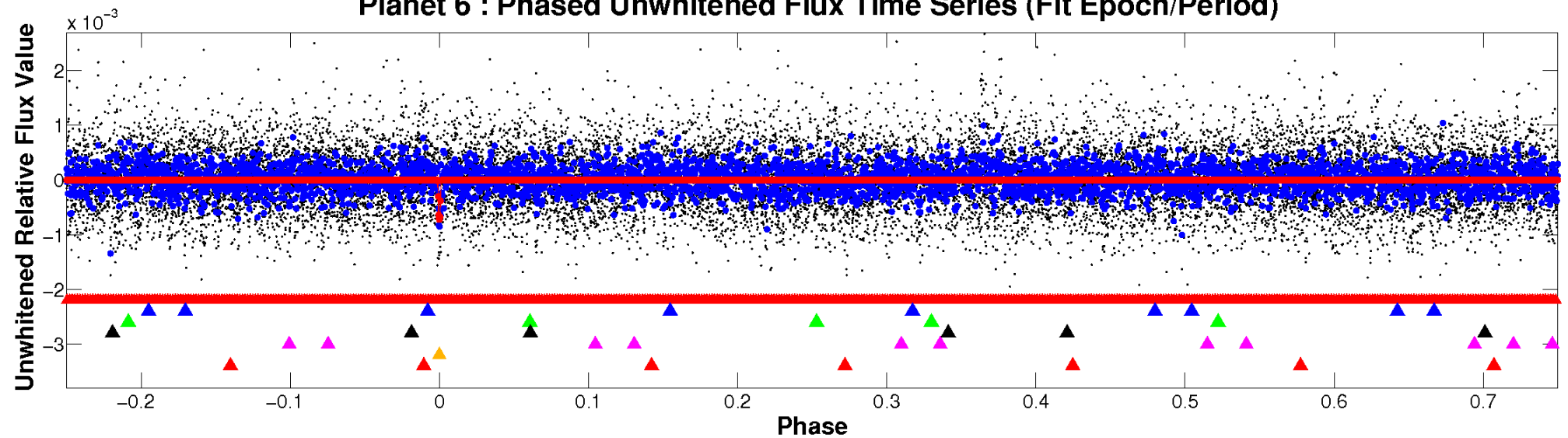
# ALT Odd/Even

TCE 010535858-06

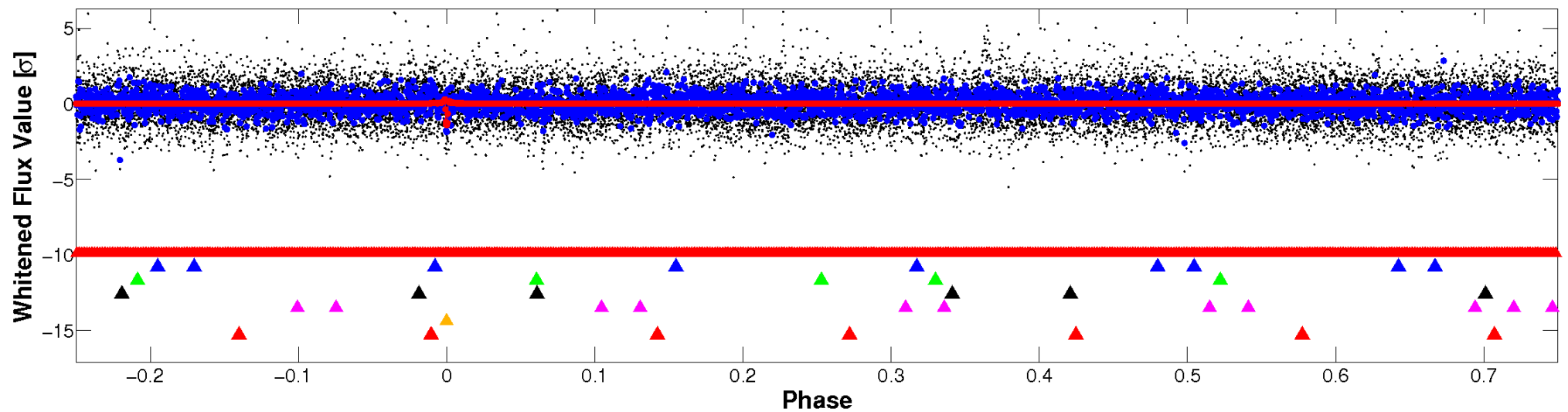


# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

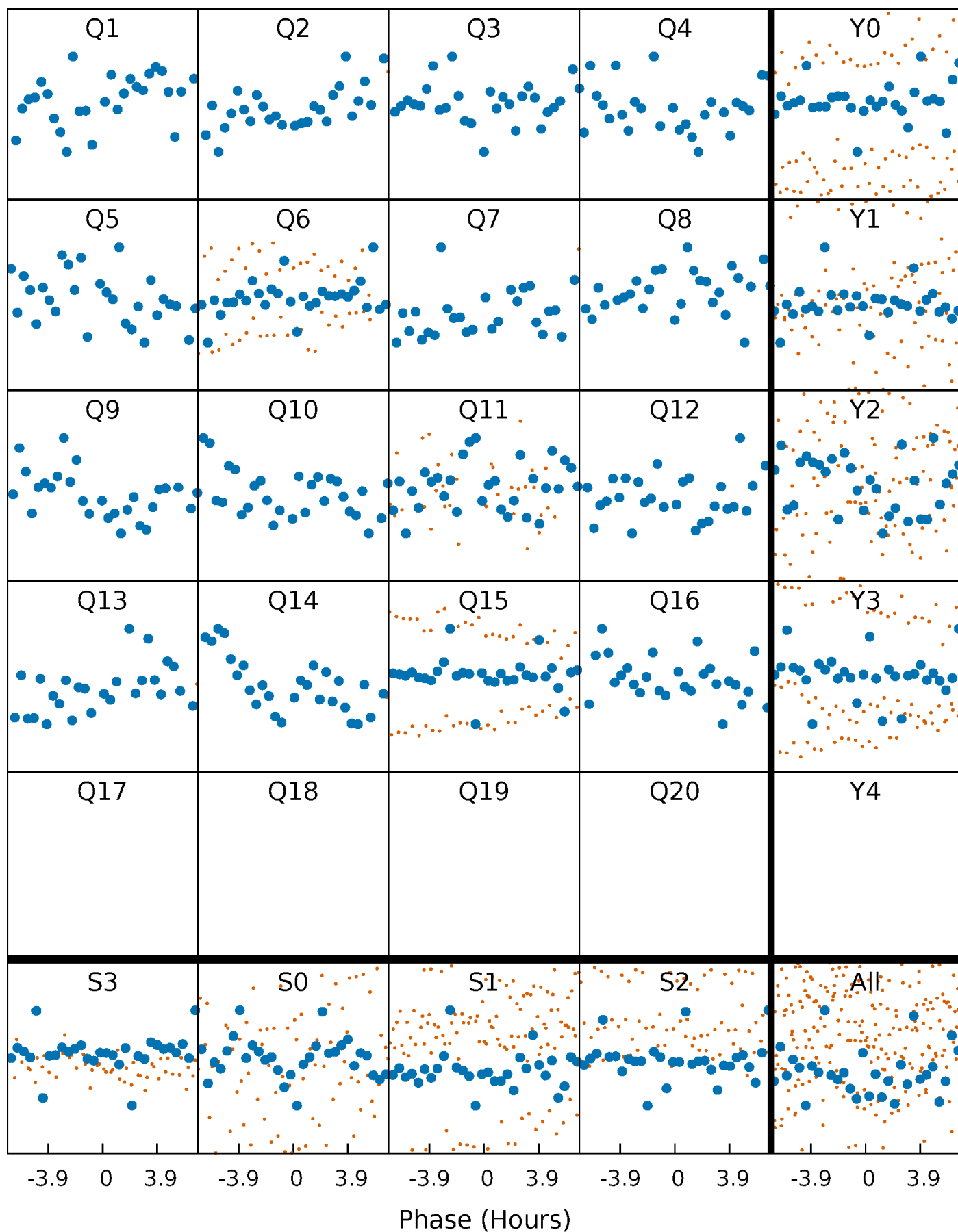


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



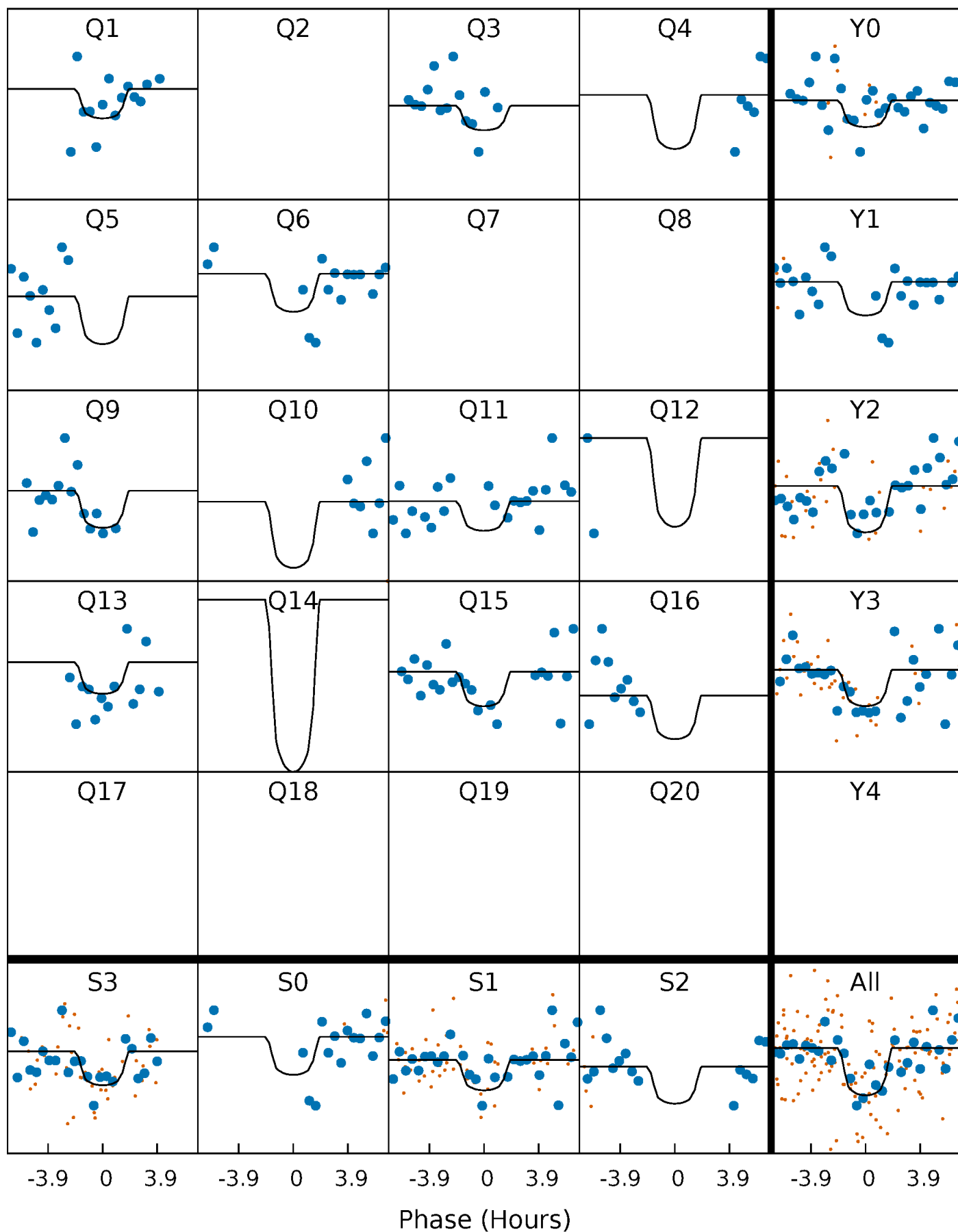
# PDC Quarter-Phased Transit Curves

TCE 010535858-06 P= 77.099011 Days  $T_0=156.259842$  (BKJD)



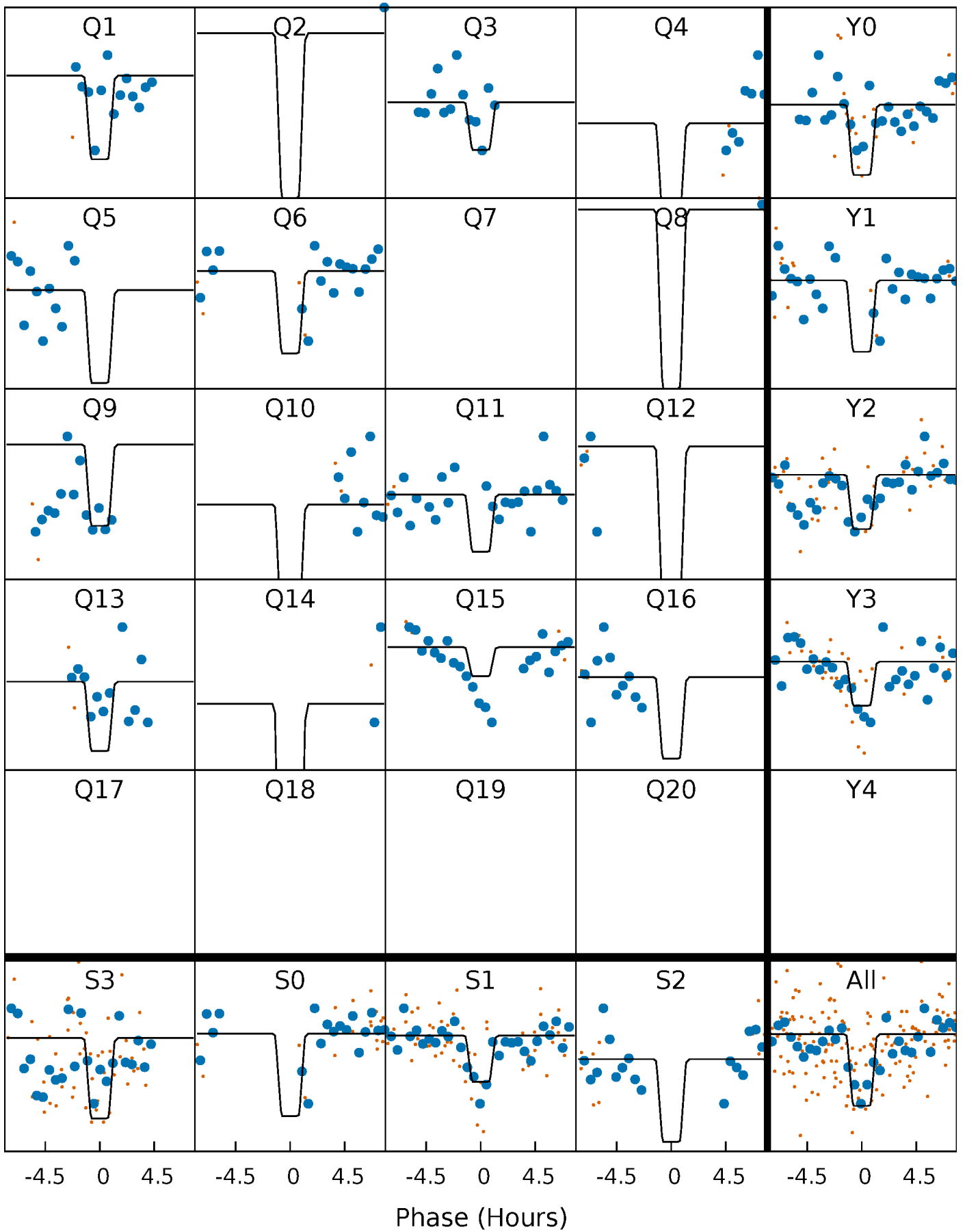
# DV Quarter-Phased Transit Curves

TCE 010535858-06   P= 77.099011 Days    $T_0=156.259842$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

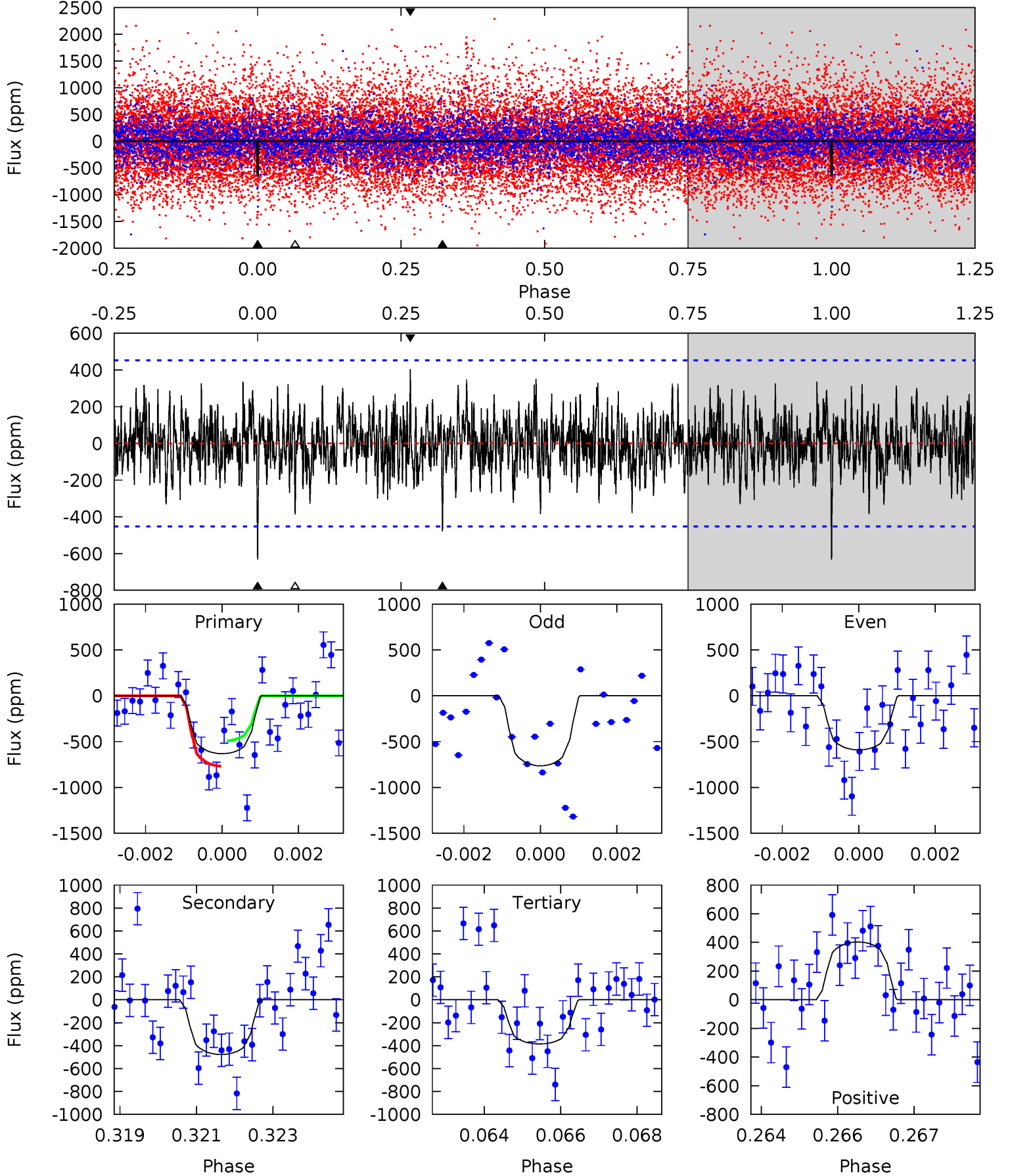
TCE 010535858-06 P= 77.099812 Days  $T_0=156.249069$  (BKJD)



# DV Model-Shift Uniqueness Test

010535858-06, P = 77.099011 Days, E = 79.160831 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.44	5.62	4.54	4.75	5.33	3.09	1.39	2.90	2.69	1.08	0.87	0.83	0.92	0.39	1.62

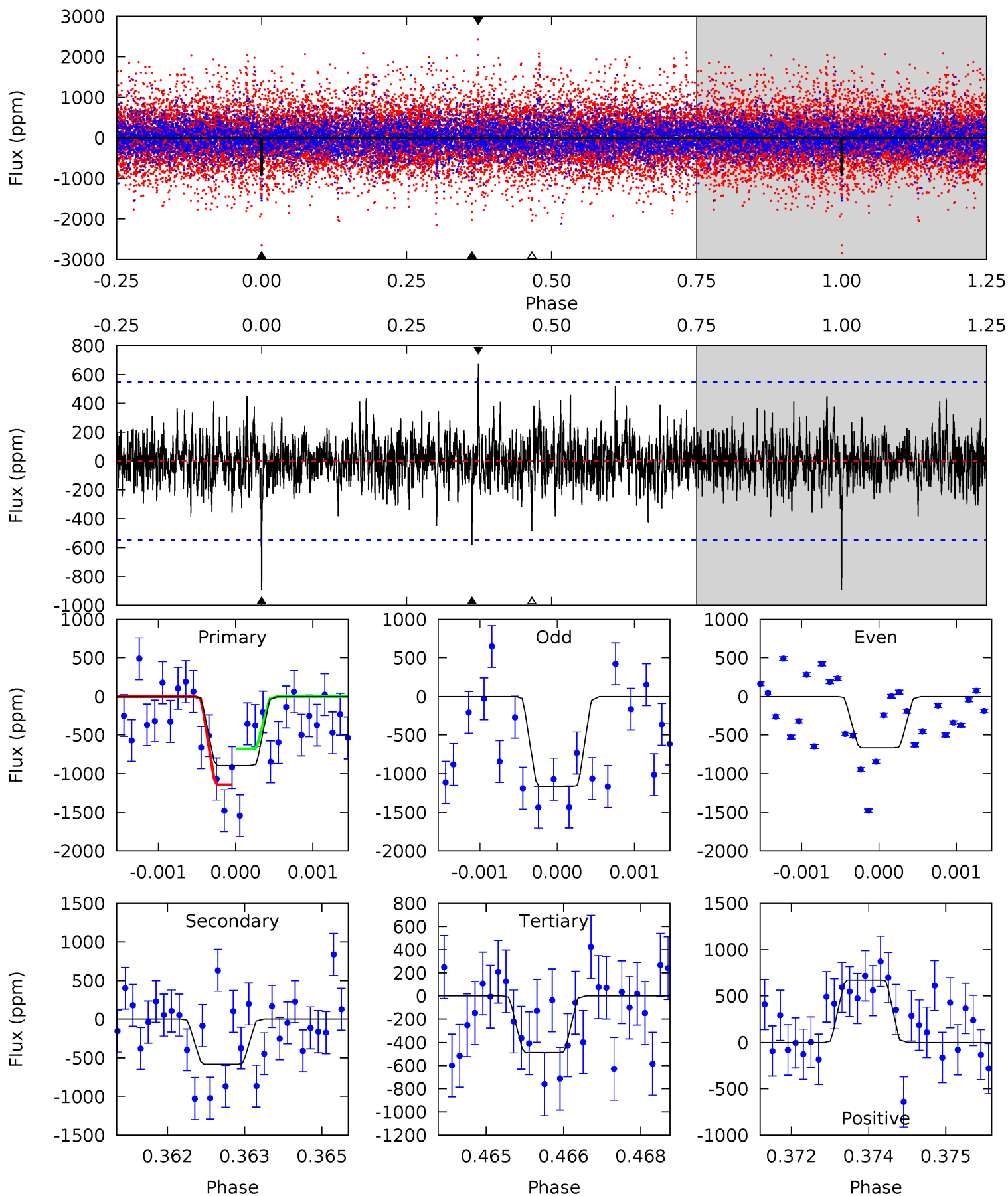




# Alt Model-Shift Uniqueness Test

010535858-06, P = 77.099812 Days, E = 79.149257 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
8.76	5.71	4.78	6.60	5.38	3.18	1.26	3.98	2.16	0.94	-0.89	2.14	1.74	0.43	2.27



### Stellar Parameters For KIC 010535858

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3615^{+43}_{-50}$	$4.839^{+0.030}_{-0.033}$	$-0.100^{+0.100}_{-0.100}$	$0.420^{+0.029}_{-0.032}$	$0.445^{+0.025}_{-0.038}$	$8.445^{+1.369}_{-1.178}$
	+1%/-1%	+1%/-1%	+100%/-100%	+7%/-8%	+6%/-9%	+16%/-14%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 010535858-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-477 \pm 85$	$2.29^{+2.13}_{-1.56}$	$278^{+5}_{-5}$	$2827^{+1207}_{-427}$	$3641^{+32921}_{-2681}$
Alt.	$-582 \pm 102$	$2.51^{+2.29}_{-1.65}$	$278^{+5}_{-5}$	$2818^{+1112}_{-407}$	$3549^{+27931}_{-2547}$

$T_{max}$  = 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

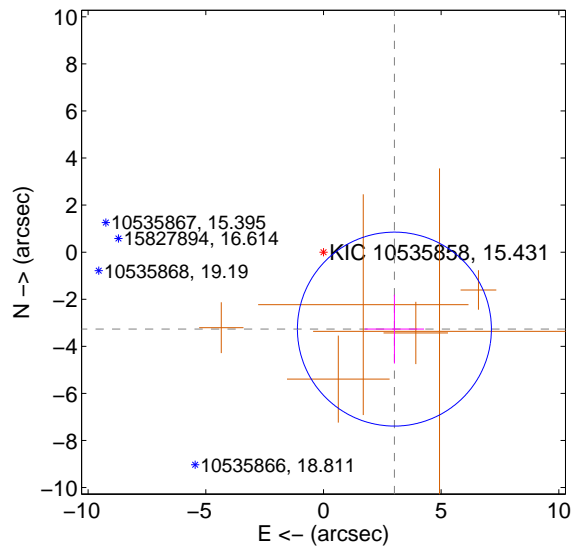
Supplemental centroid analysis for 010535858-06. Kepler magnitude: 15.43. Transit SNR 7.15

There are 0 quarters with good PRF difference image offsets

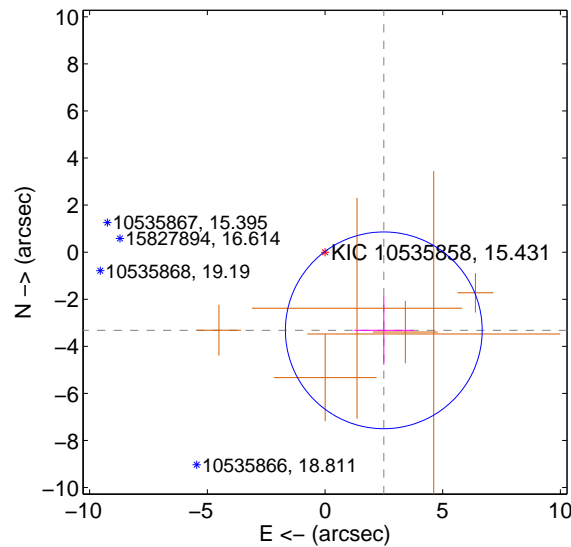
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	4.446 $\pm$ 1.373	3.24	-3.014 $\pm$ 1.259	-3.269 $\pm$ 1.464
PRF-fit source offset from KIC position	4.155 $\pm$ 1.393	2.98	-2.497 $\pm$ 1.259	-3.321 $\pm$ 1.464
photometric centroid source offset	3.23 $\pm$ 1.17	2.76	3.21 $\pm$ 1.17	0.41 $\pm$ 0.82

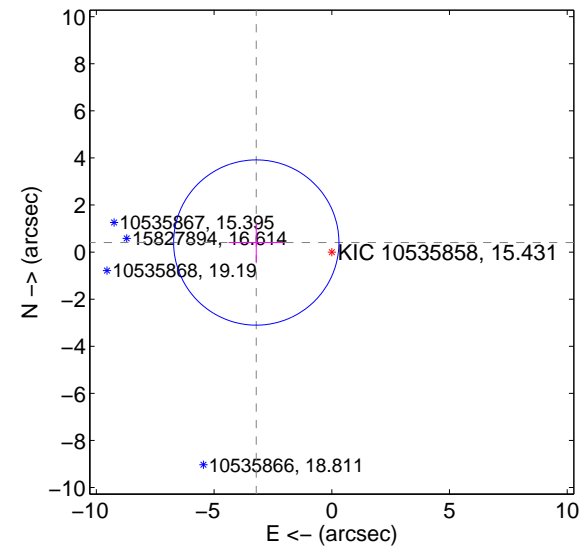
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

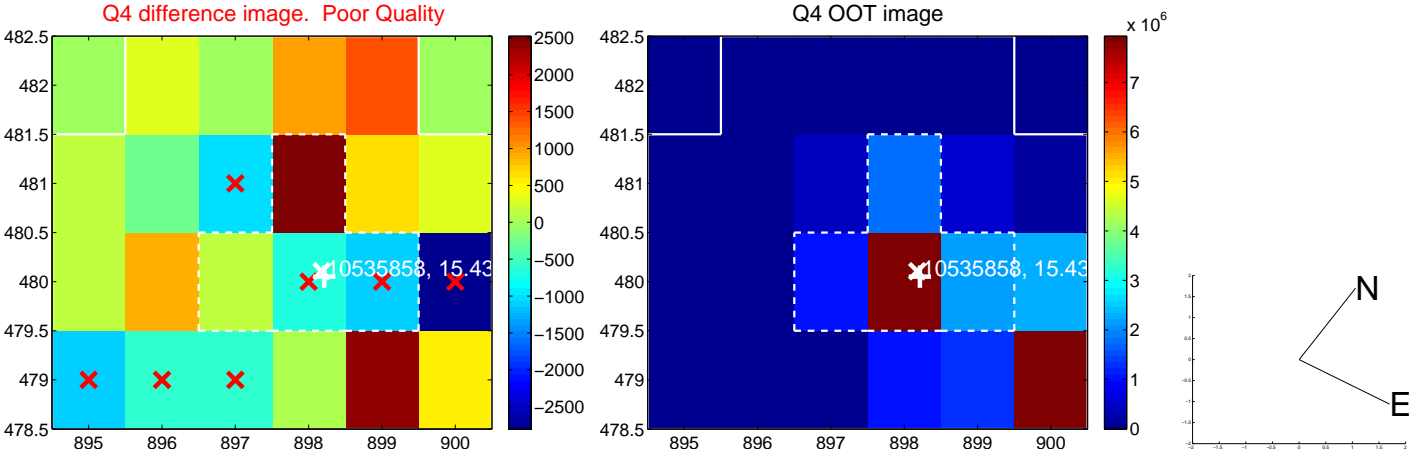
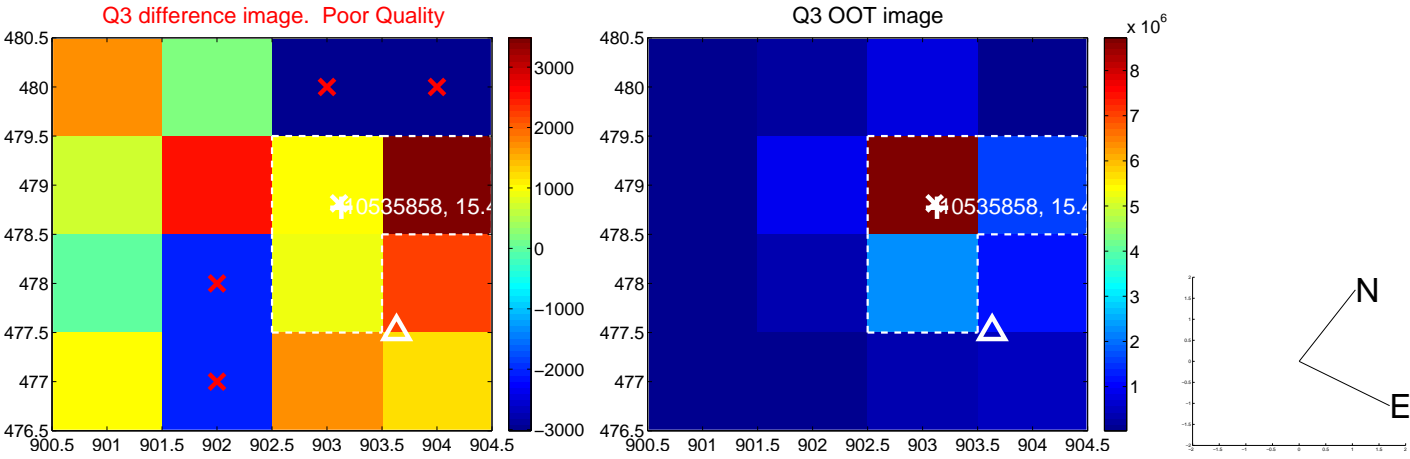
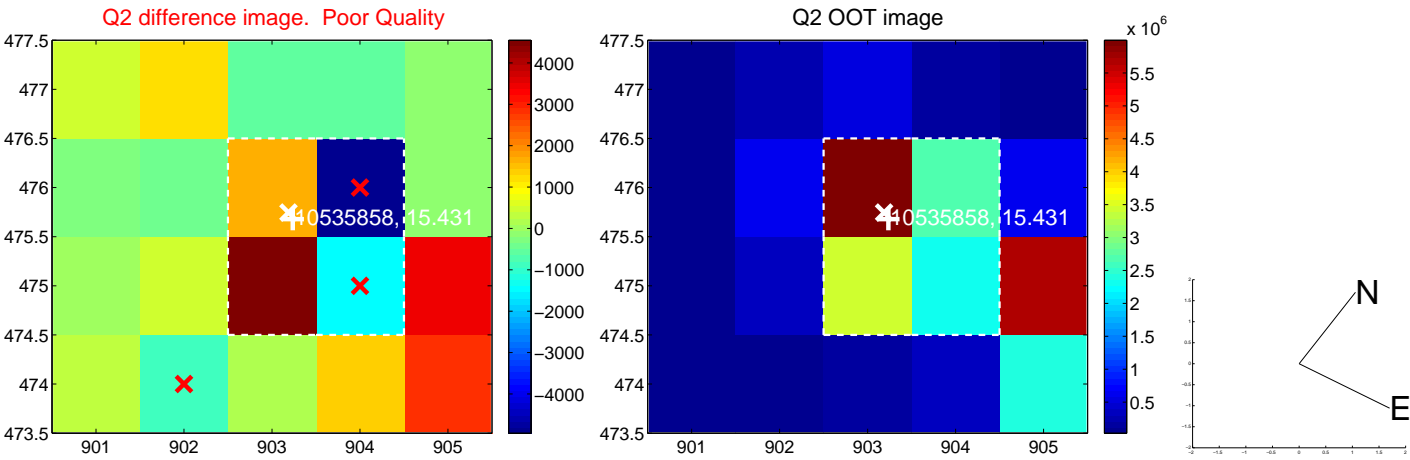
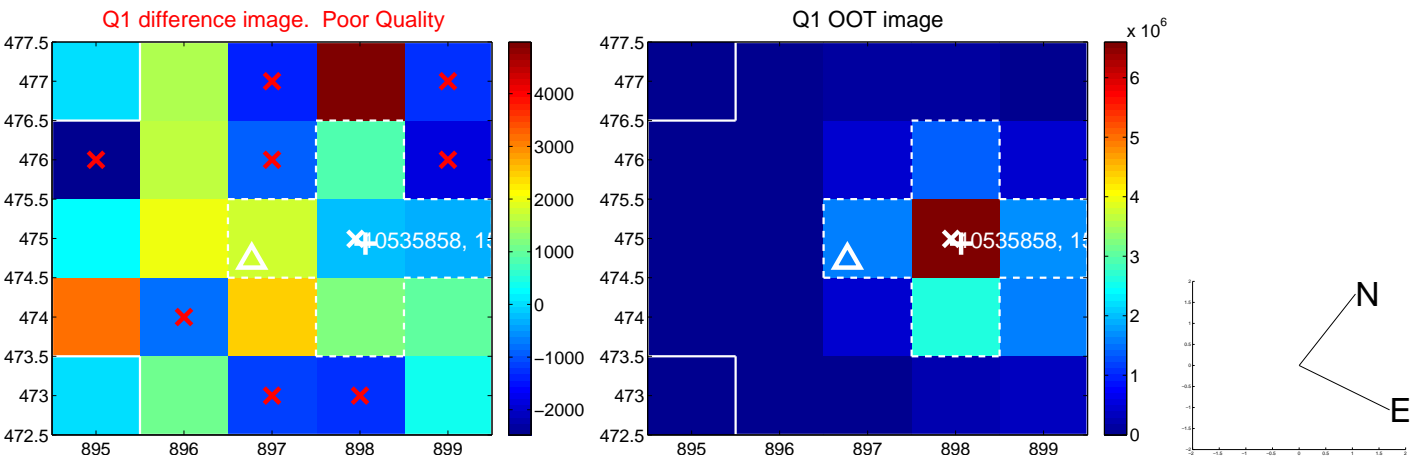


offset from photometric centroids

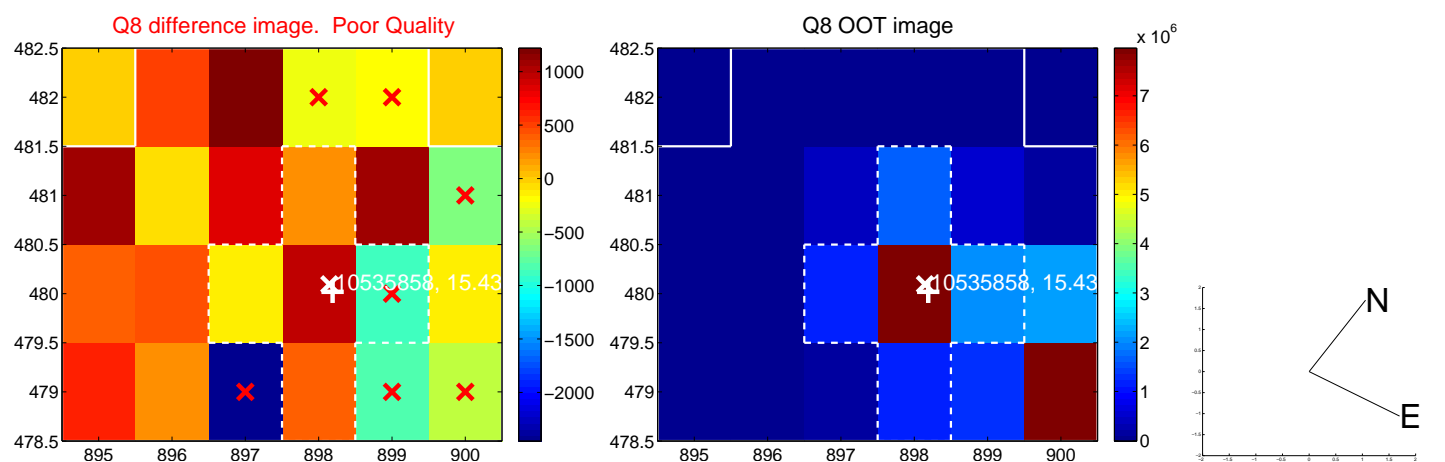
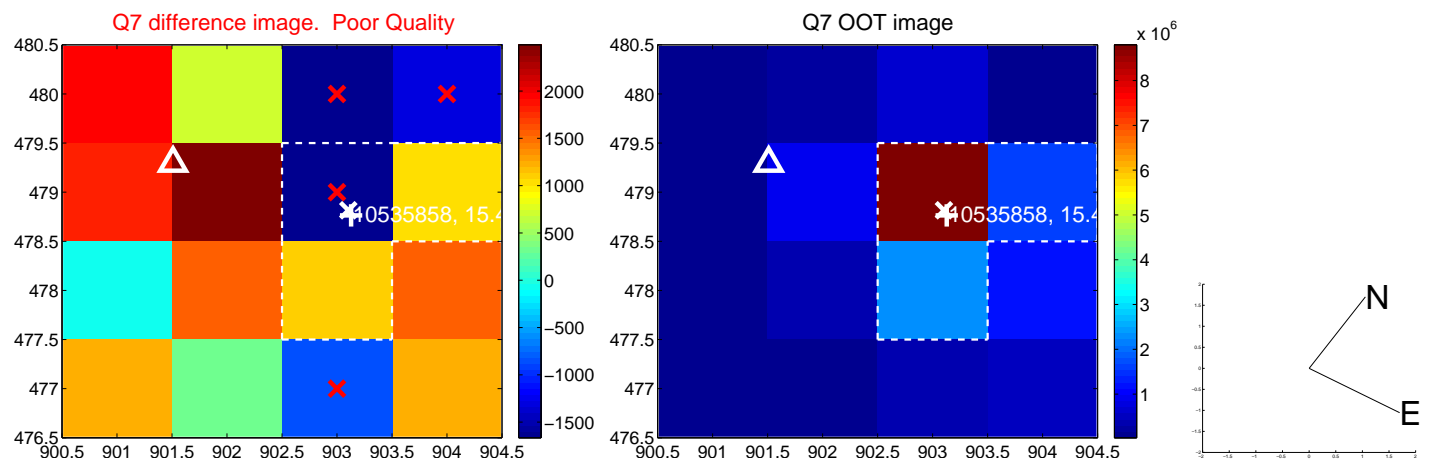
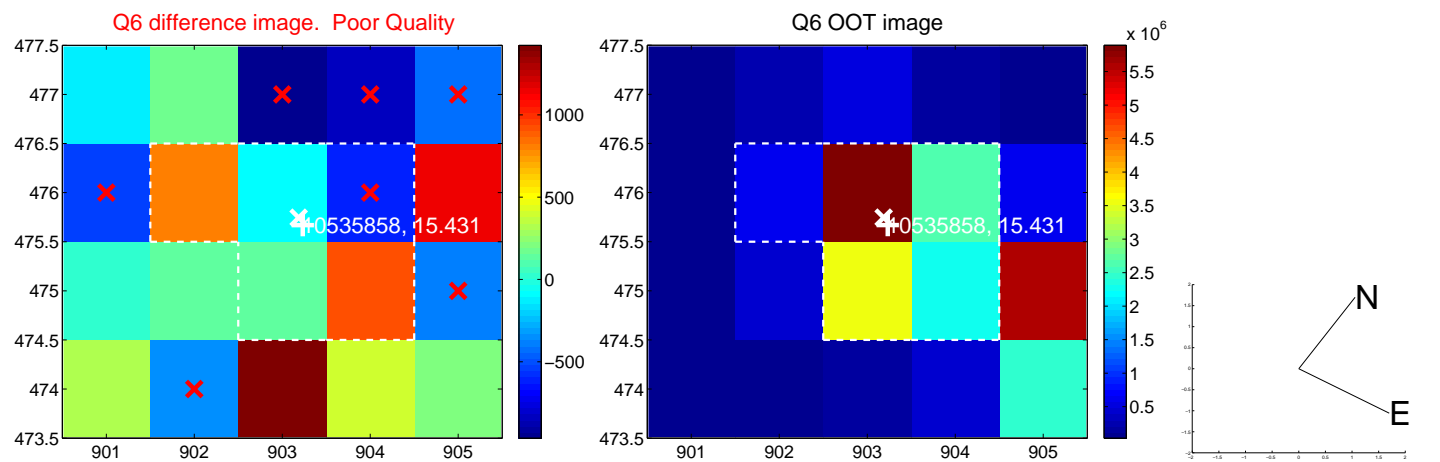
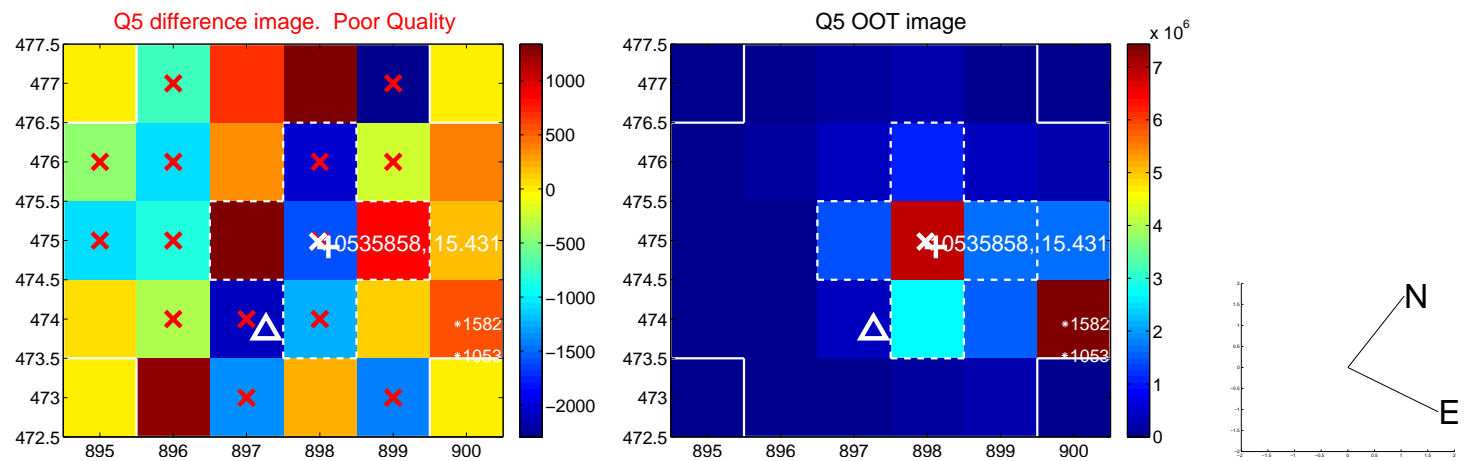


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

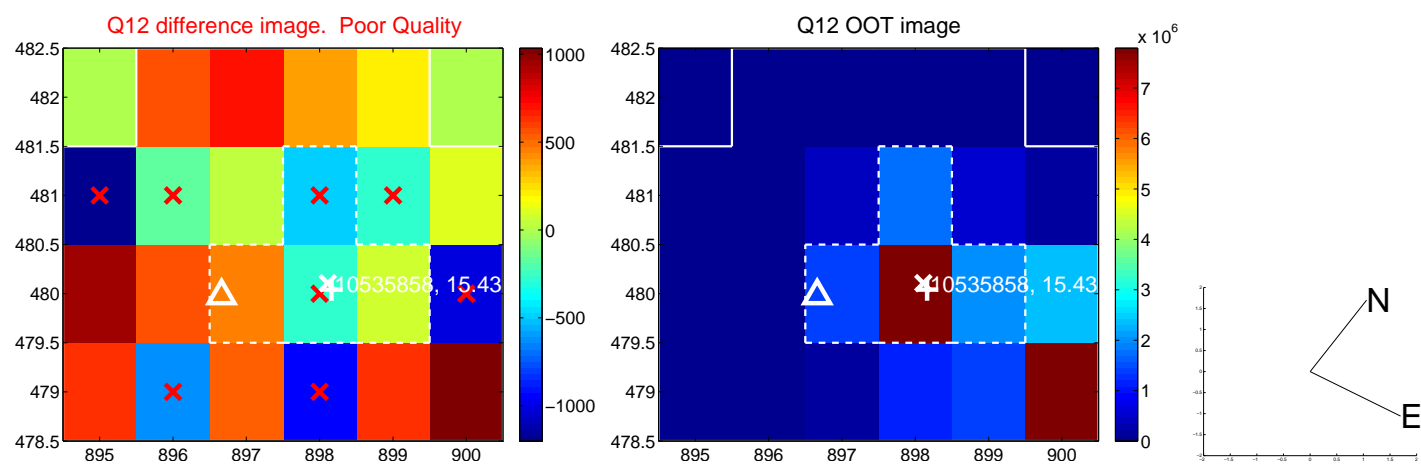
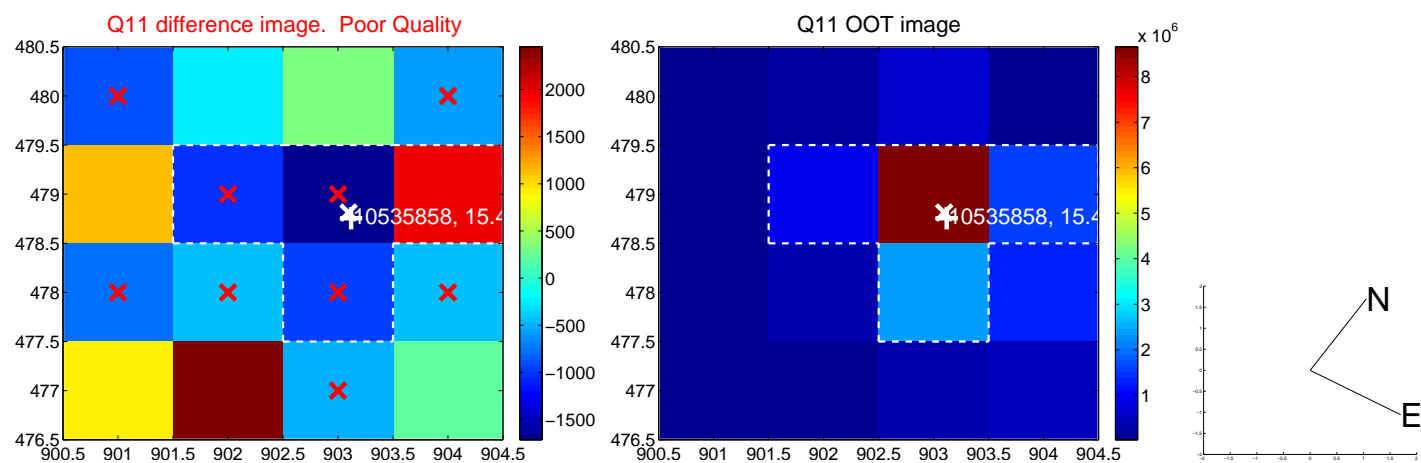
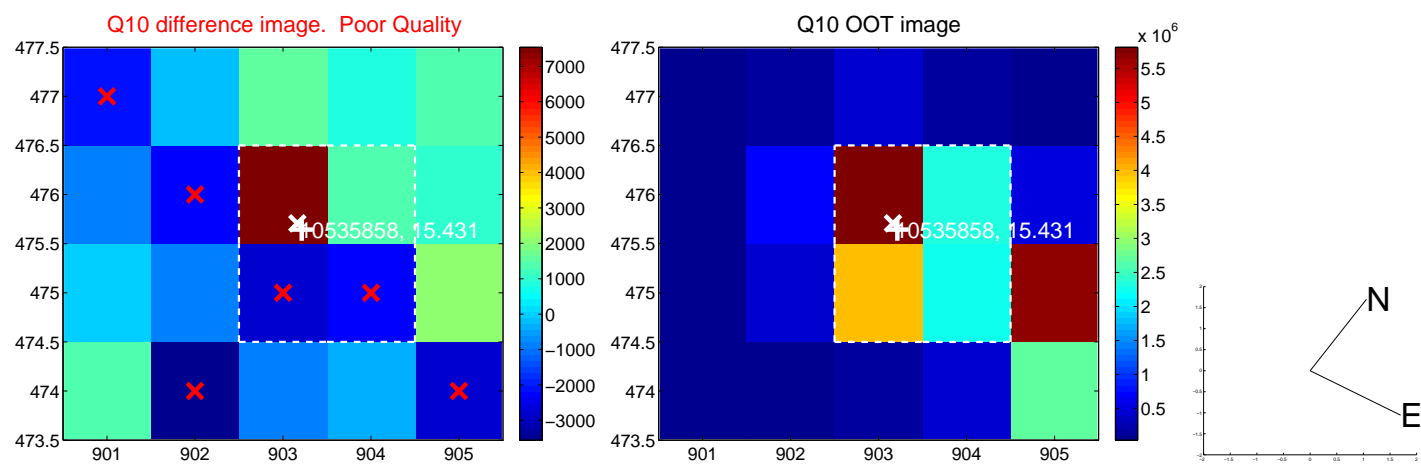
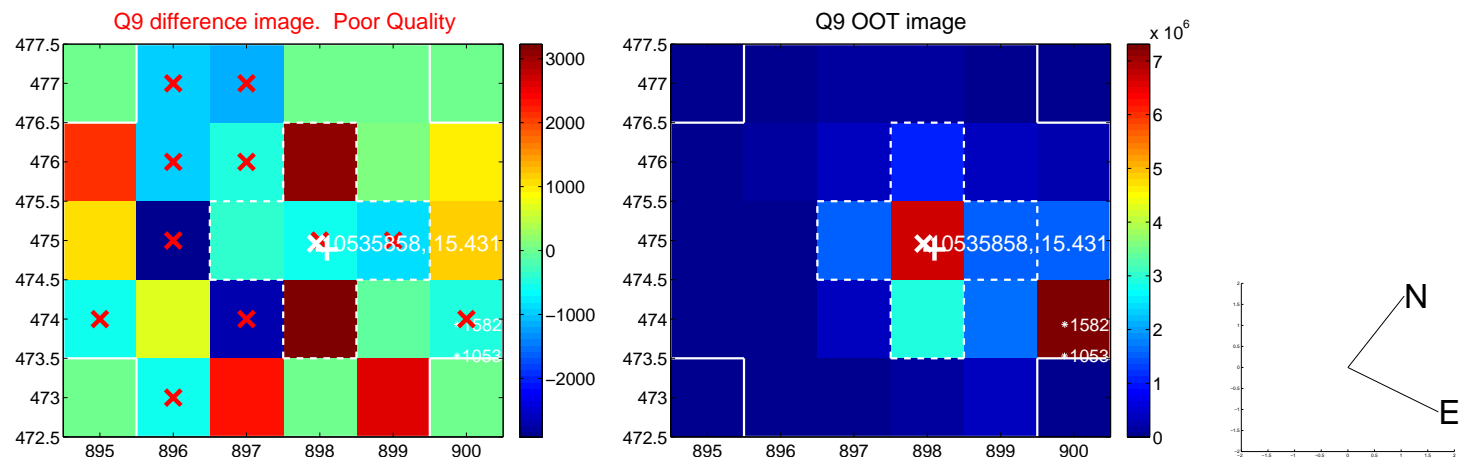
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



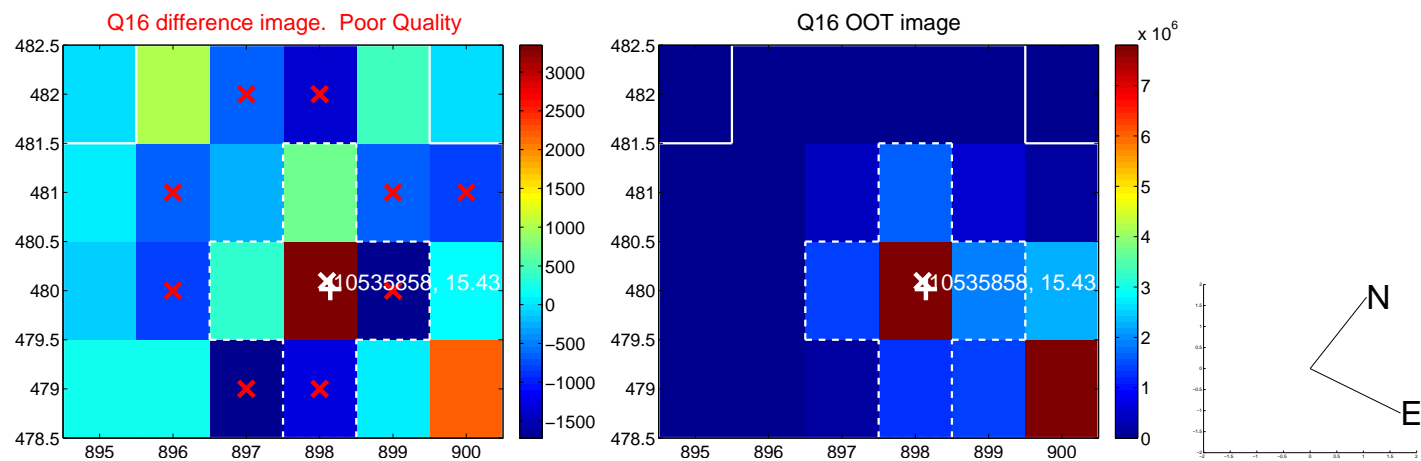
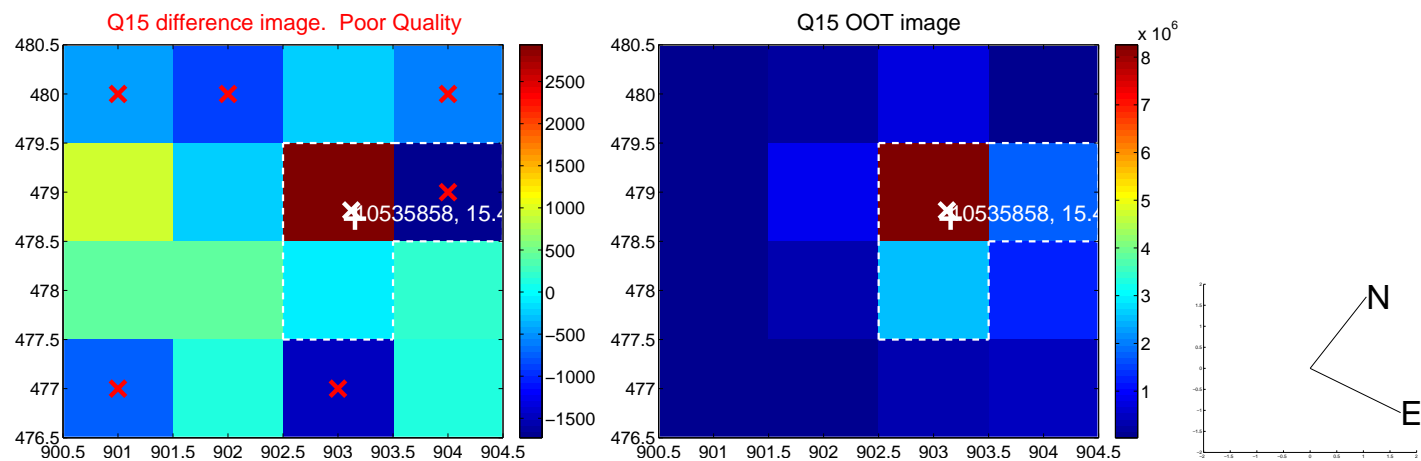
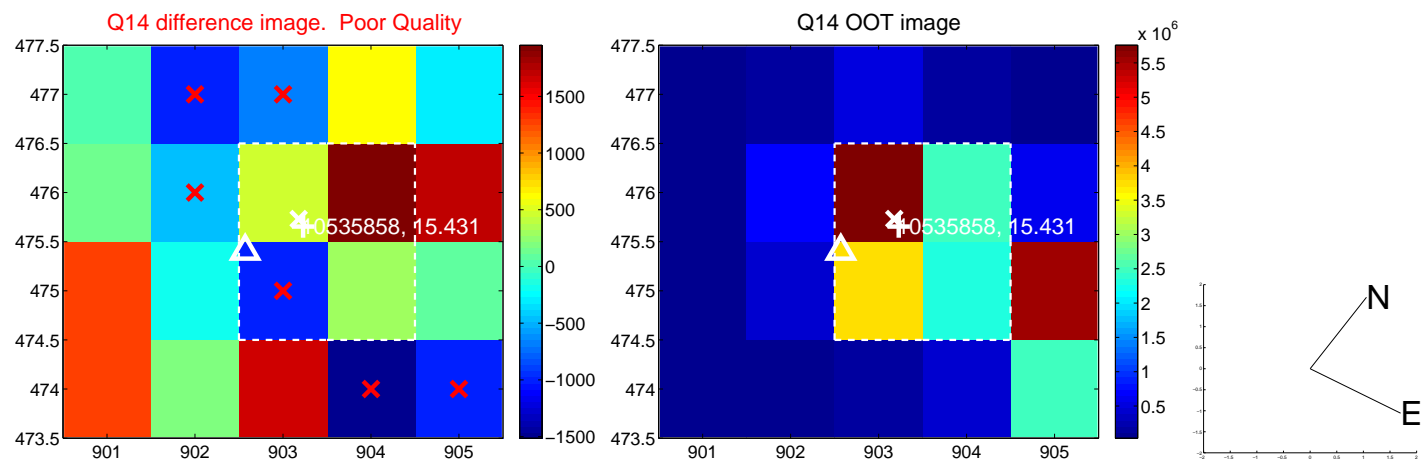
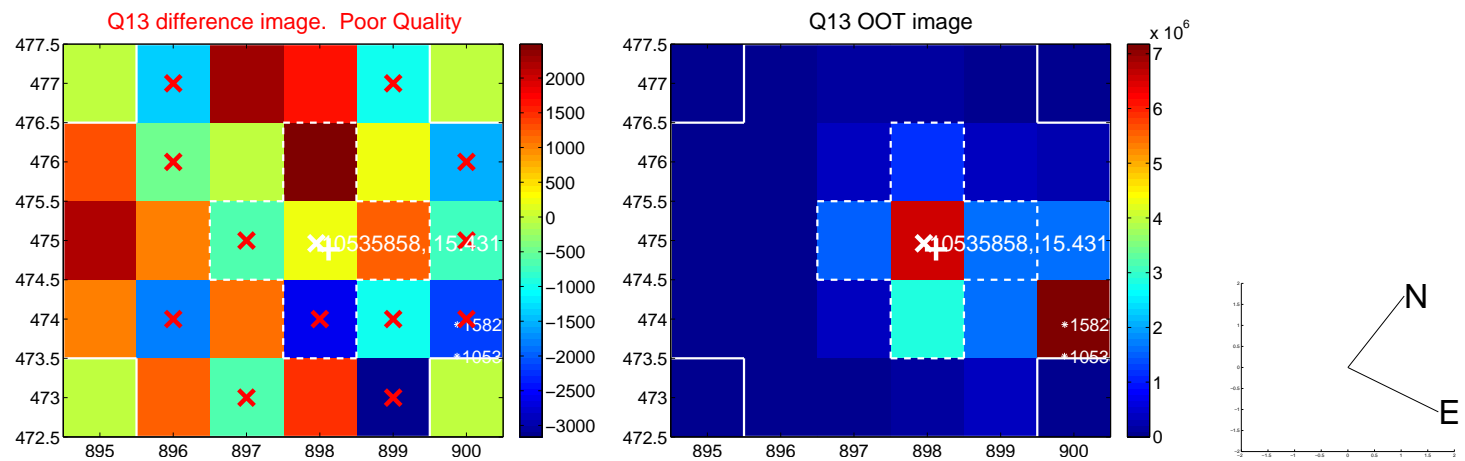
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



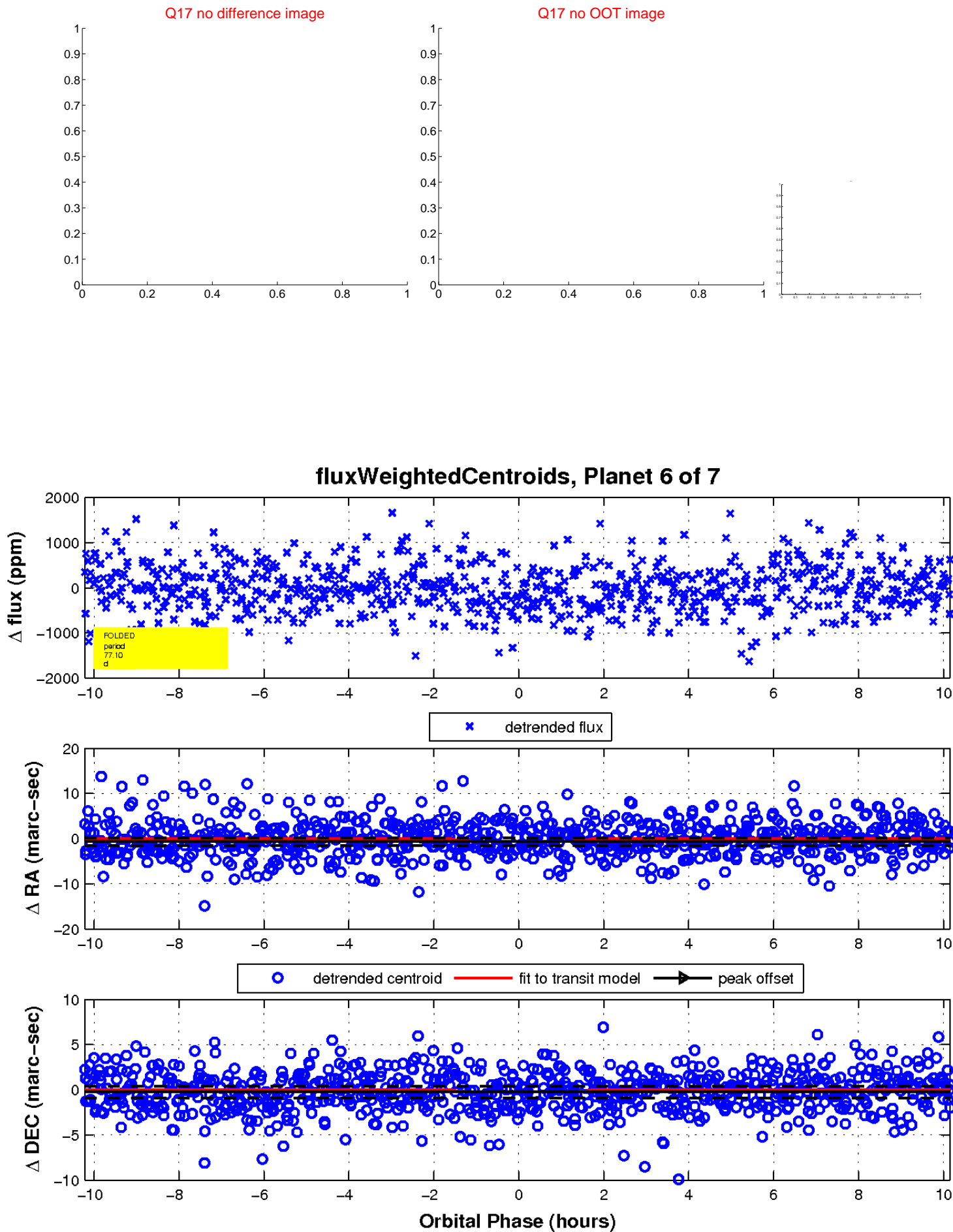
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

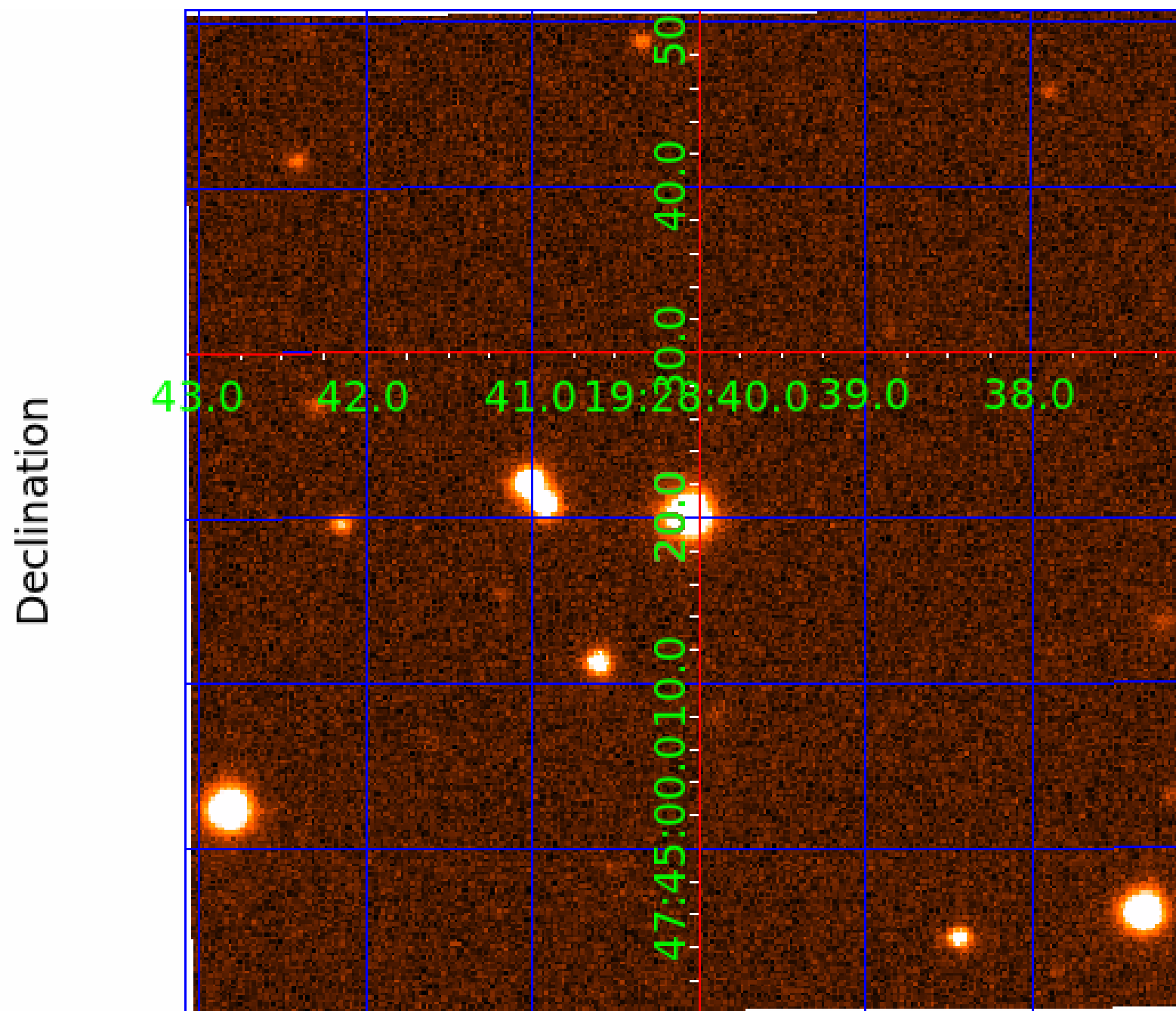


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image



# KIC 010535858

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010535858-01	OBS	7338.01	0.933718	131.547996	64.0	4.971	8.6	9.7	0.42	3615	0.38	132.60
010535858-02	OBS	No	166.731446	195.158250	538.9	16.471	12.9	4.5	0.42	3615	1.11	0.13
010535858-03	OBS	No	287.636030	412.997432	860.6	3.172	8.7	9.6	0.42	3615	1.29	0.06
010535858-05	OBS	No	138.375922	136.700751	689.8	8.201	9.2	7.0	0.42	3615	1.20	0.17
010535858-06	OBS	No	77.099011	156.259842	728.5	3.406	7.3	7.1	0.42	3615	1.22	0.37
010535858-07	OBS	No	209.523411	254.328284	854.7	9.055	7.5	6.4	0.42	3615	1.38	0.10

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010535858-01	OBS	FP	0.00	1	0	1	1	LPP_DV—CENT_KIC_POS—HALO_GHOST—EPHEM_MATCH
010535858-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010535858-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
010535858-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—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 010535858-07

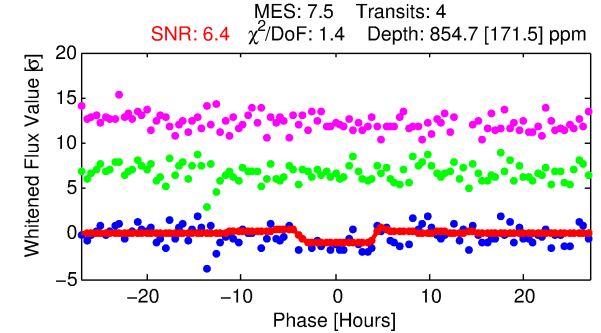
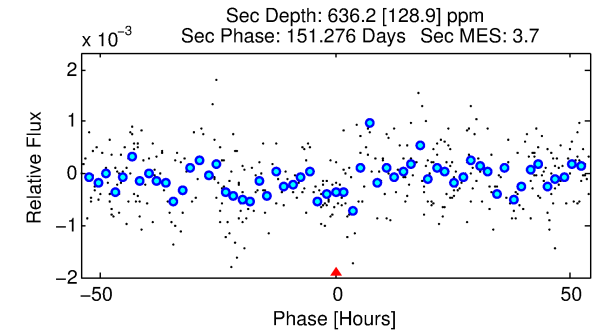
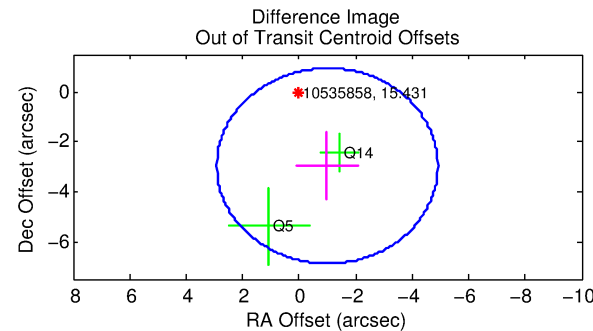
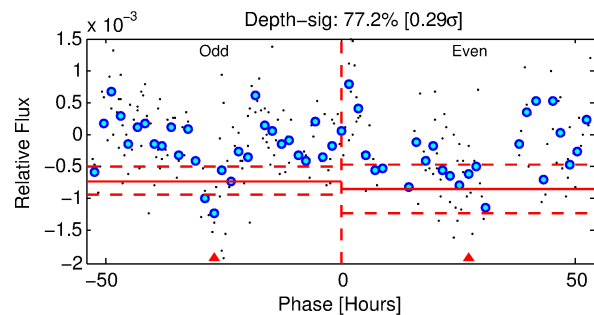
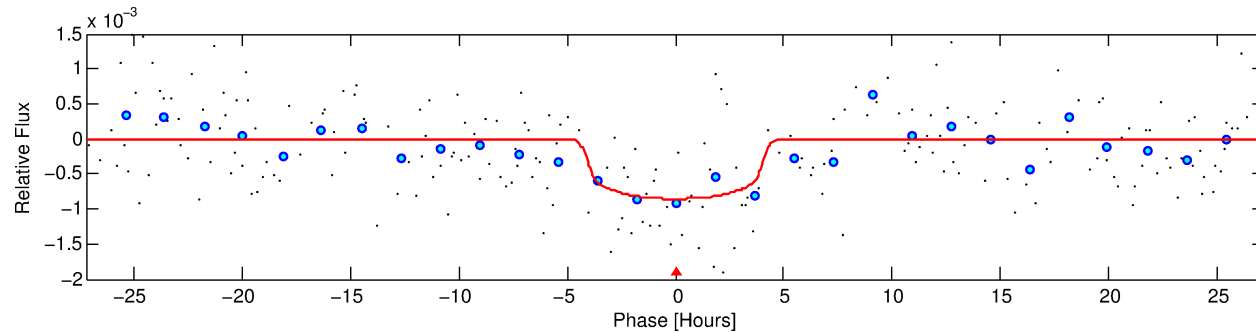
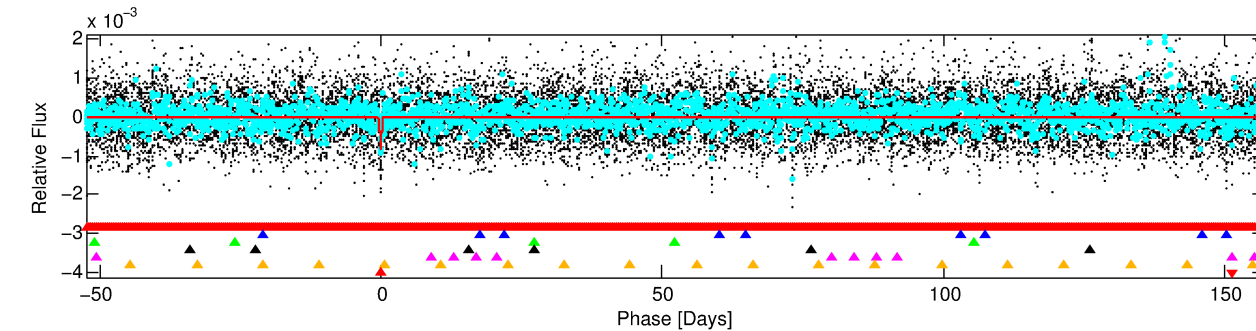
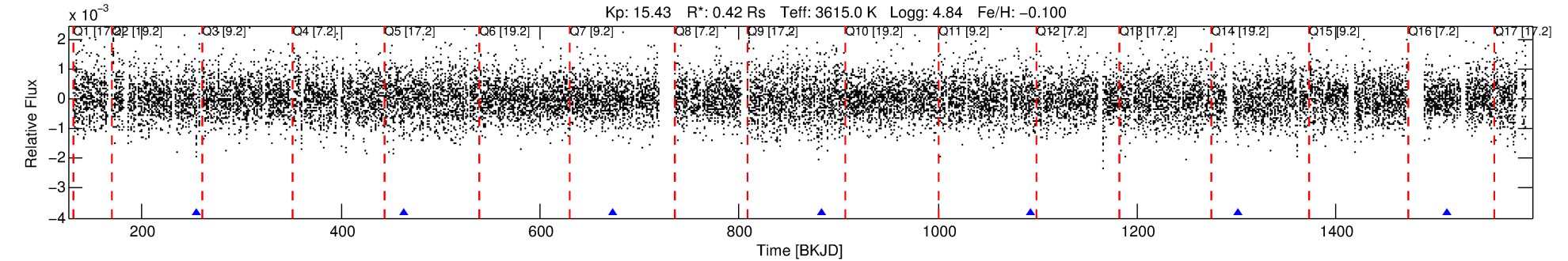
No Significant Match Found

# DV One-Page Summary

KIC: 10535858 Candidate: 7 of 7 Period: 209.523 d

KOI: K07338 Corr: No Ephemeris Match

Kp: 15.43 R\*: 0.42 Rs Teff: 3615.0 K Logg: 4.84 Fe/H: -0.100



## DV Fit Results:

Period = 209.52341 [0.03276] d  
Epoch = 254.3283 [0.0876] BKJD  
Rp/R\* = 0.0302 [0.0123]  
a/R\* = 107.46 [189.51]  
b = 0.83 [0.63]  
Seff = 0.10 [0.01]  
Teq = 142 [3] K  
Rp = 1.38 [0.57] Re  
a = 0.5268 [0.0299] AU  
Ag = 50719.83 [42671.82] [1.19σ]  
Teffp = 3304 [694] K [4.56σ]

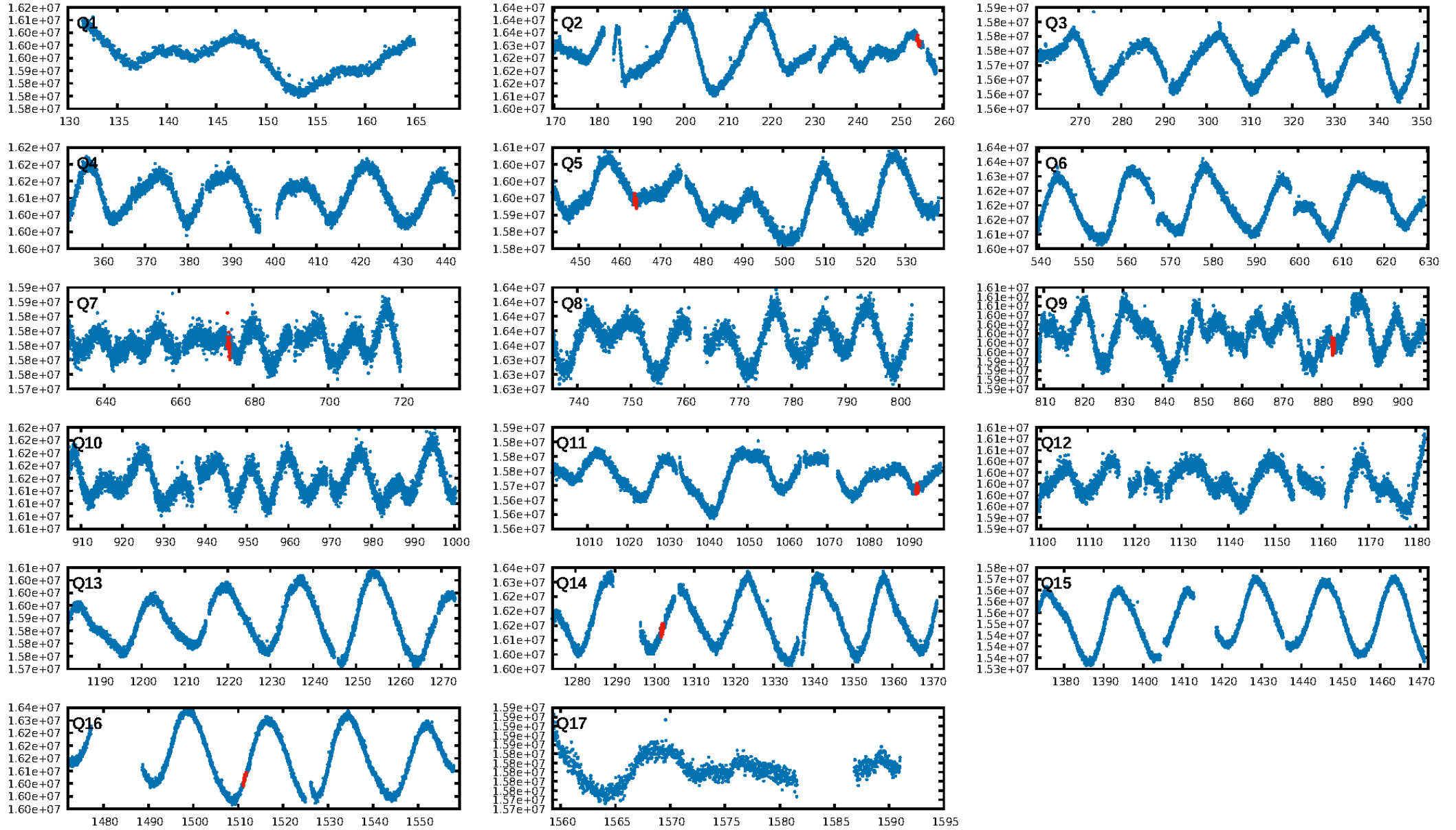
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [54.64σ]  
LongPeriod-sig: 100.0% [62.18σ]  
ModelChiSquare2-sig: 5.7%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 5.03e-09**  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -5.462  
Centroid-sig: 3.5%  
Centroid-so: 0.460 arcsec [0.33σ]  
OotOffset-rm: 3.133 arcsec [2.40σ]  
KicOffset-rm: 3.128 arcsec [2.53σ]  
OotOffset-st: 1/0/0/1 [2]  
KicOffset-st: 1/0/0/1 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 0.00 [0/7]

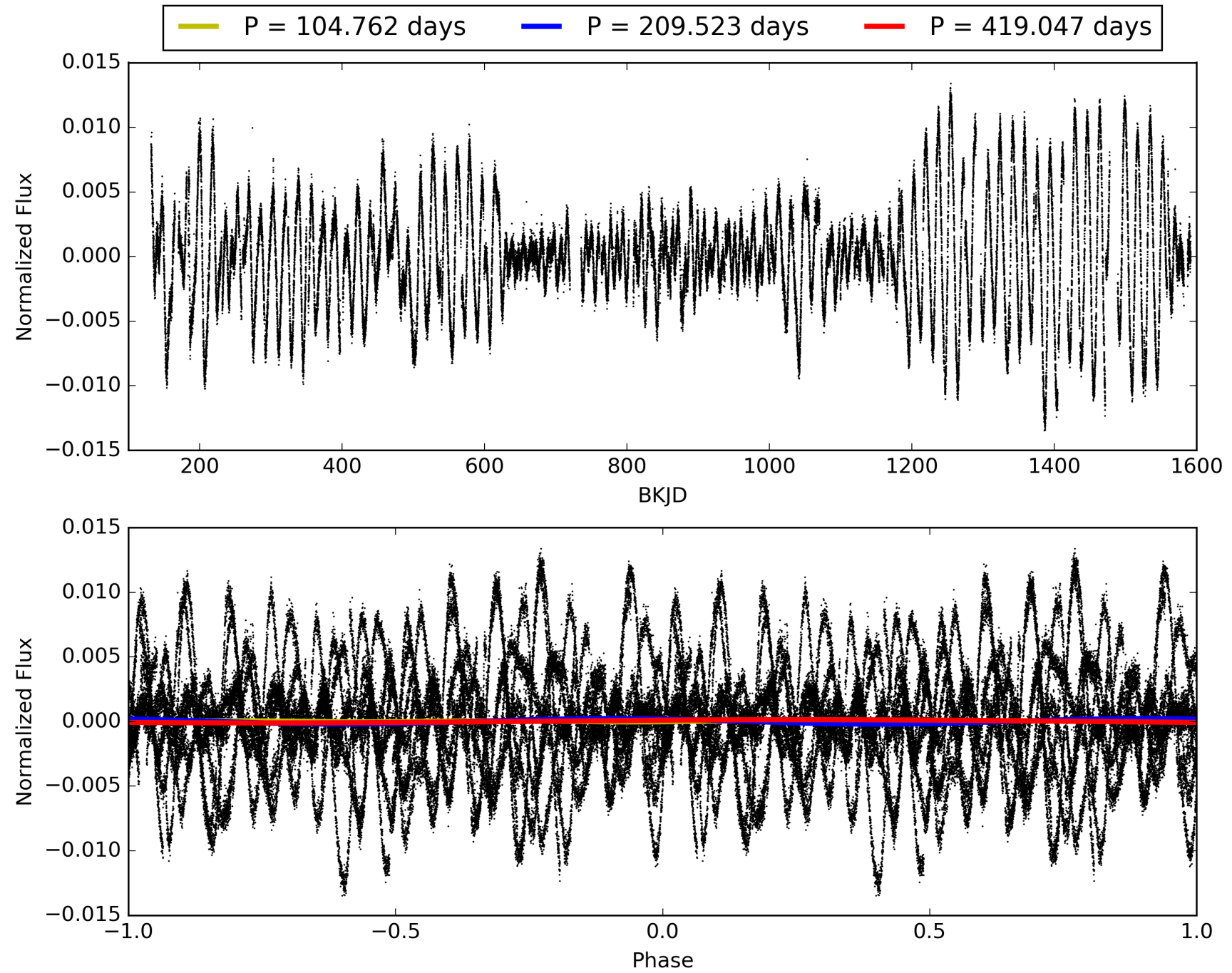
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:41:29 Z

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

# TCE 010535858-07, PDC Light Curves

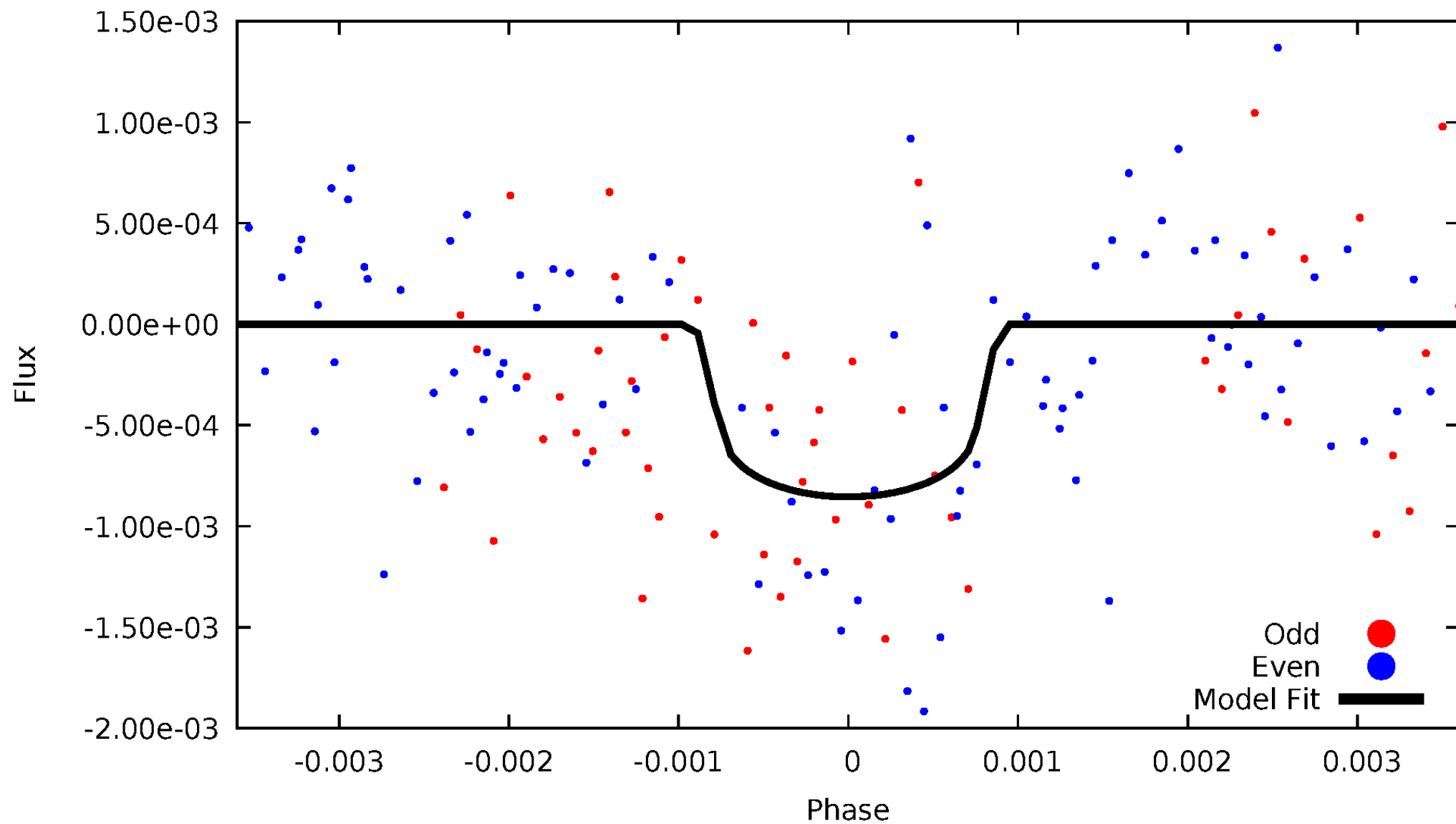


TCE 010535858-07



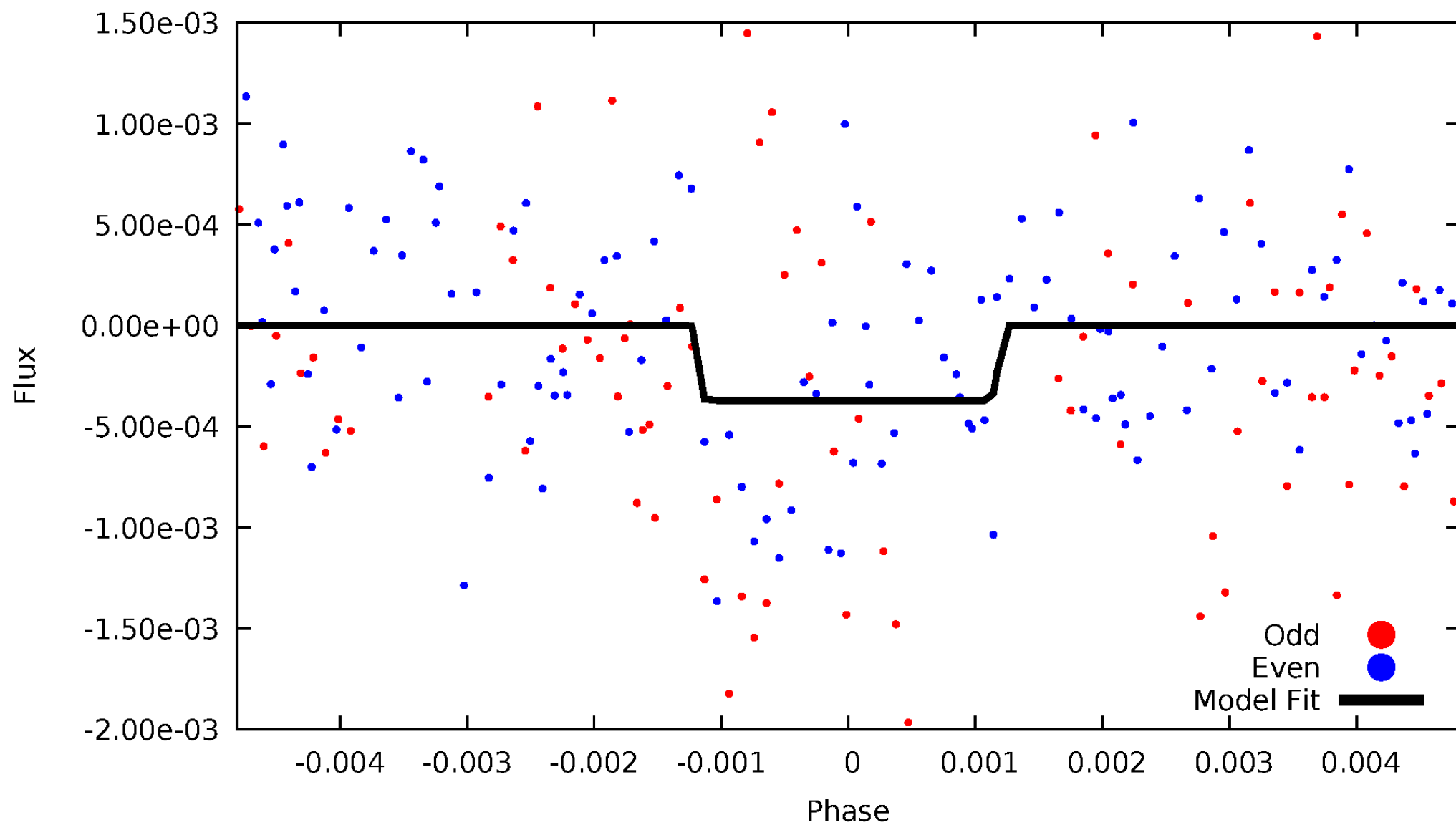
# DV Odd/Even

TCE 010535858-07

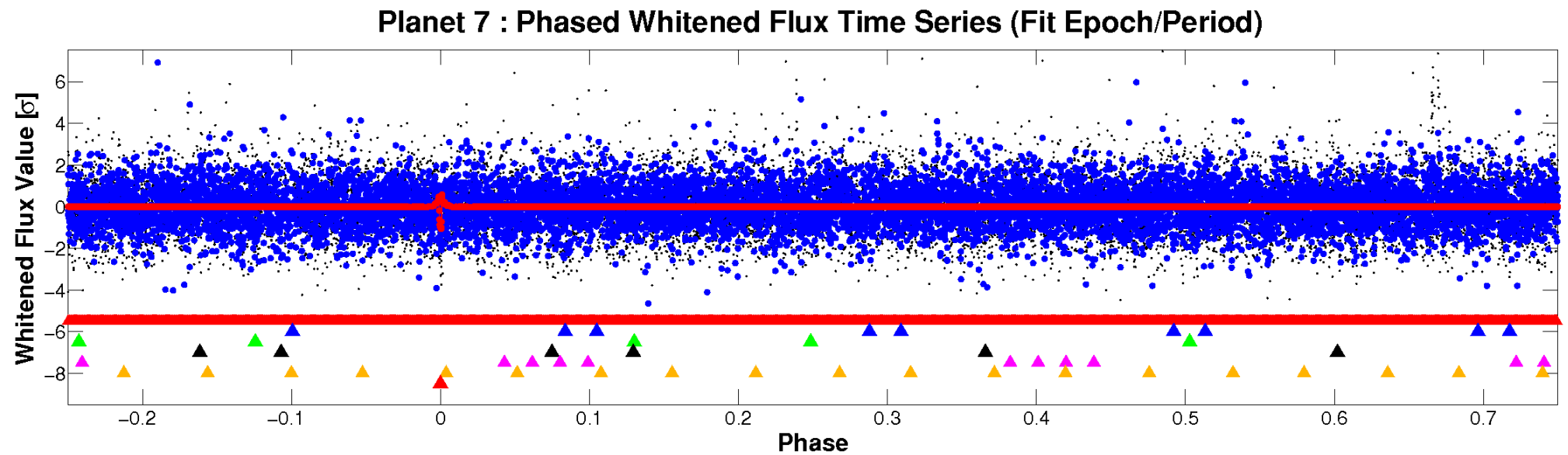
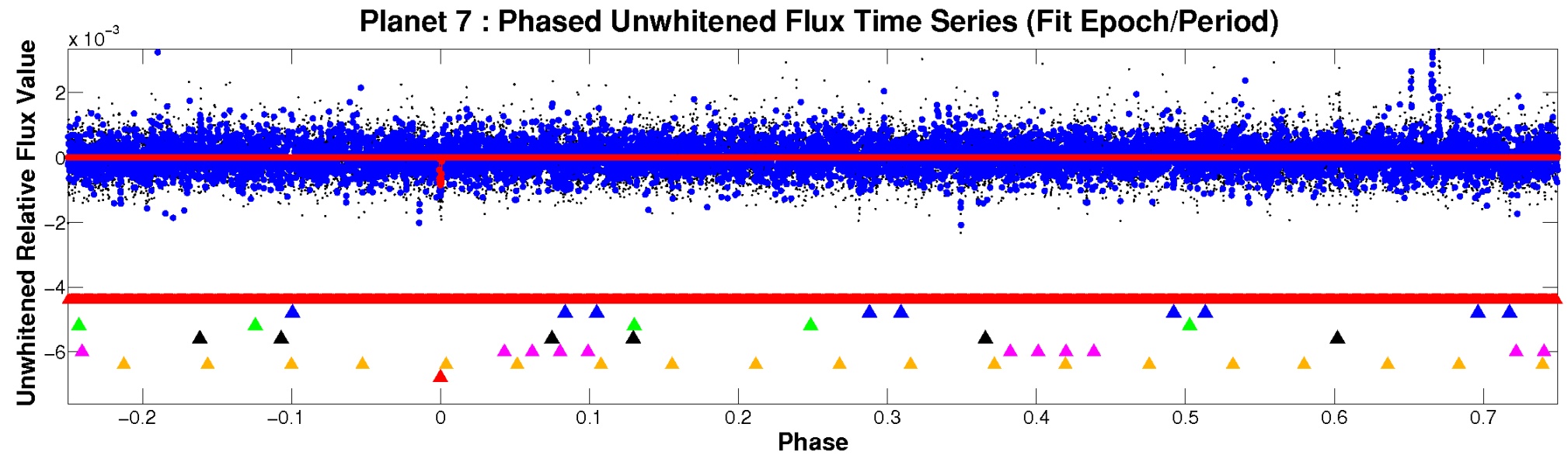


# ALT Odd/Even

TCE 010535858-07



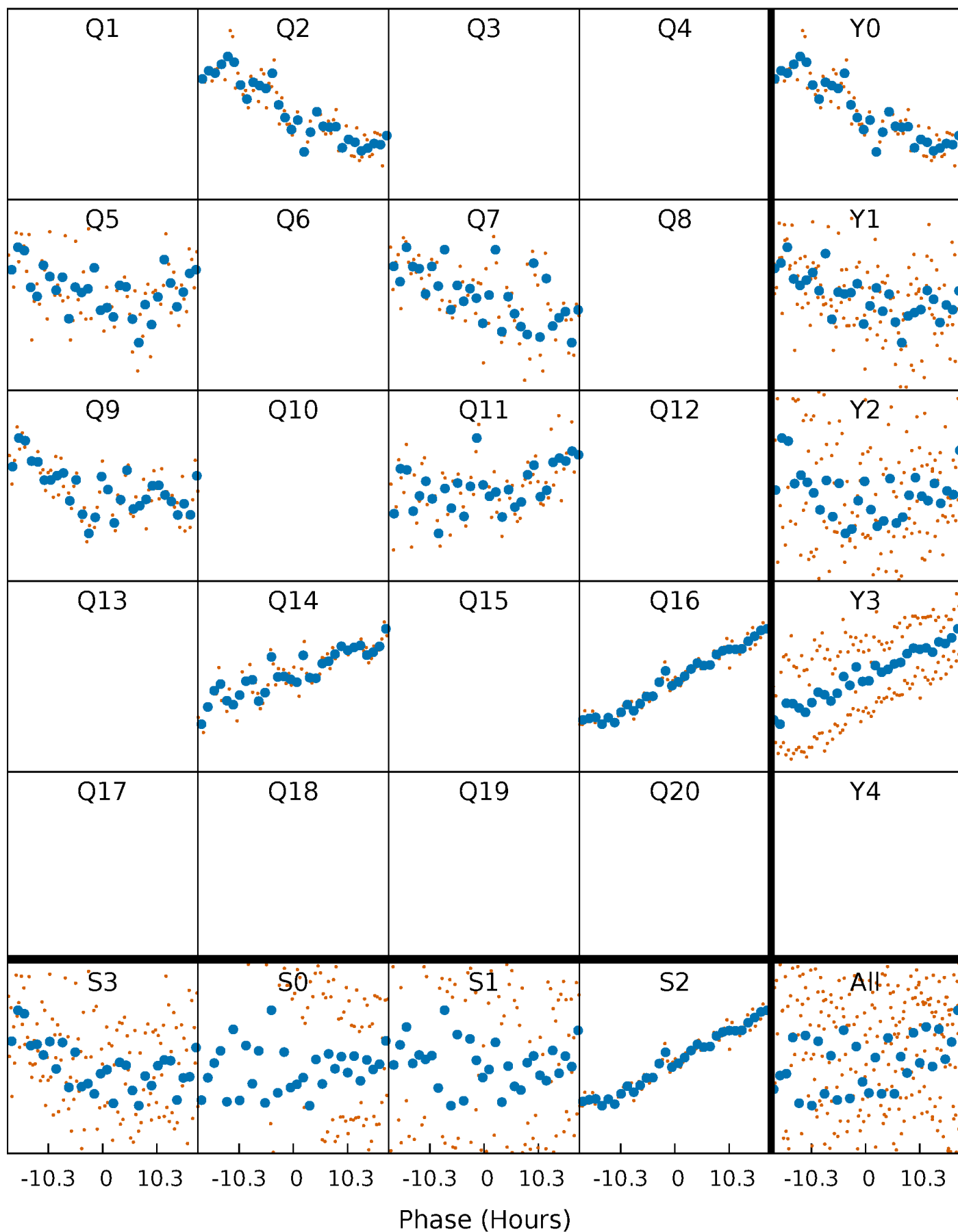
# Non-Whitened Vs. Whitened Light Curve





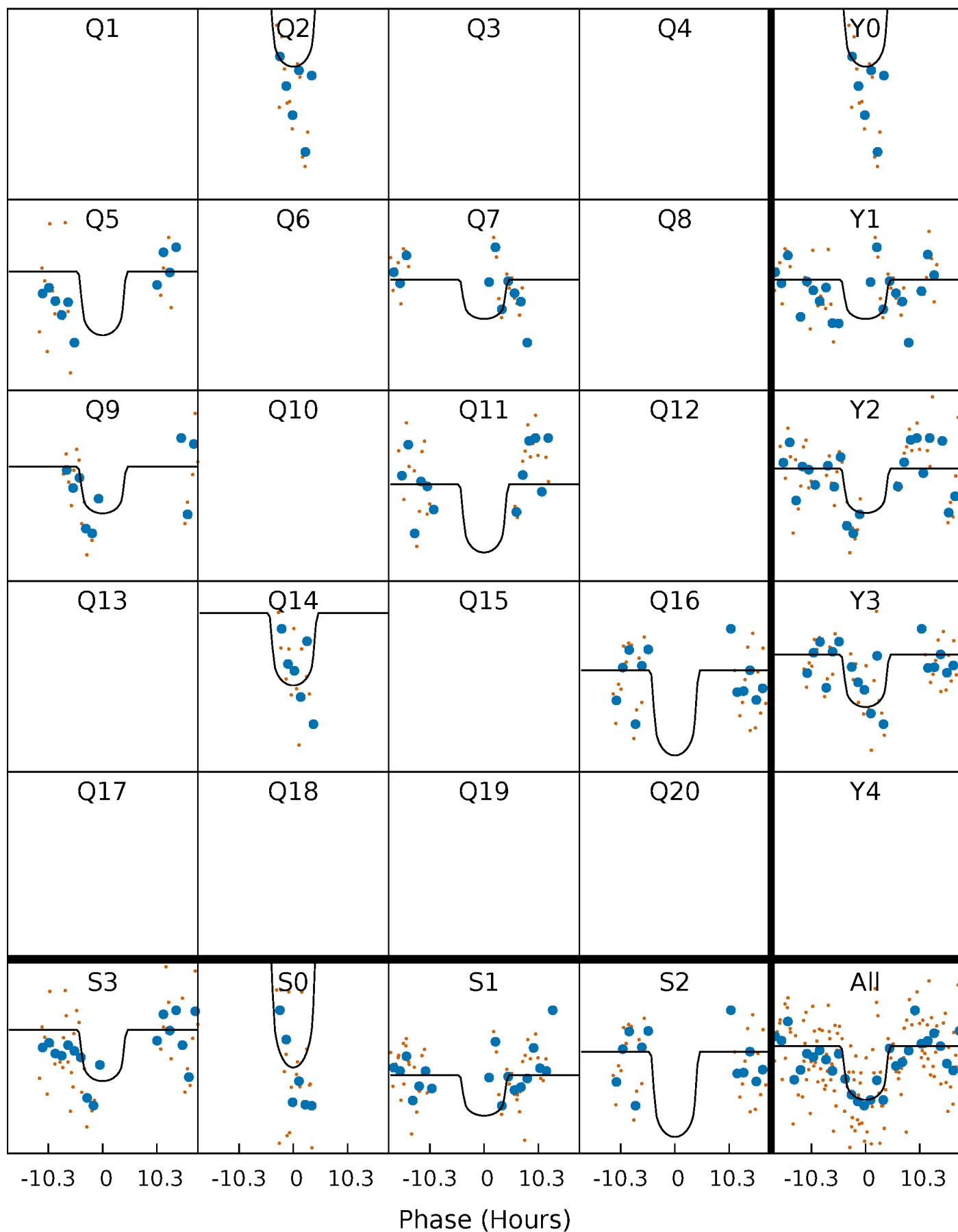
# PDC Quarter-Phased Transit Curves

TCE 010535858-07     $P=209.523411$  Days     $T_0=254.328284$  (BKJD)



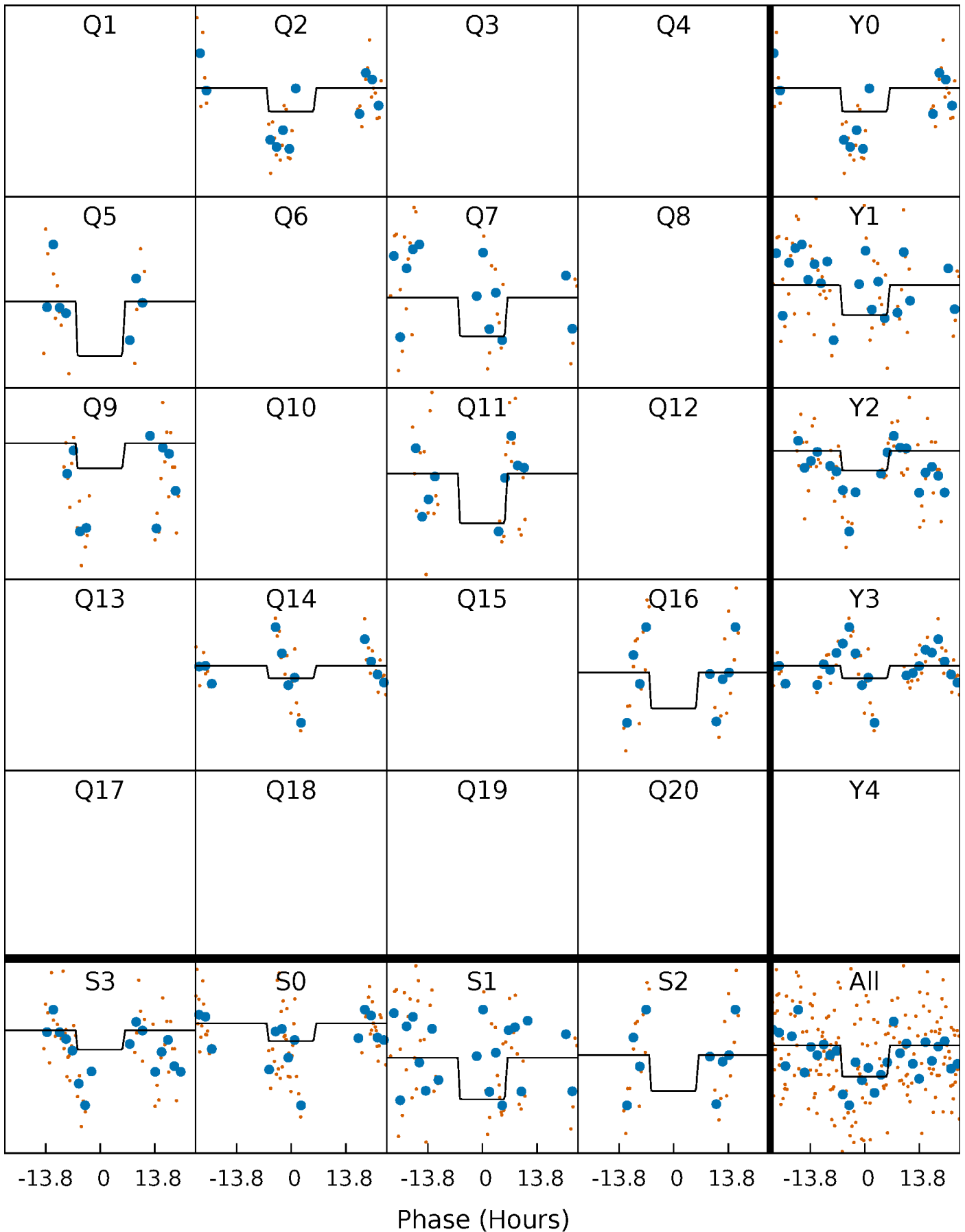
# DV Quarter-Phased Transit Curves

TCE 010535858-07     $P=209.523411$  Days     $T_0=254.328284$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

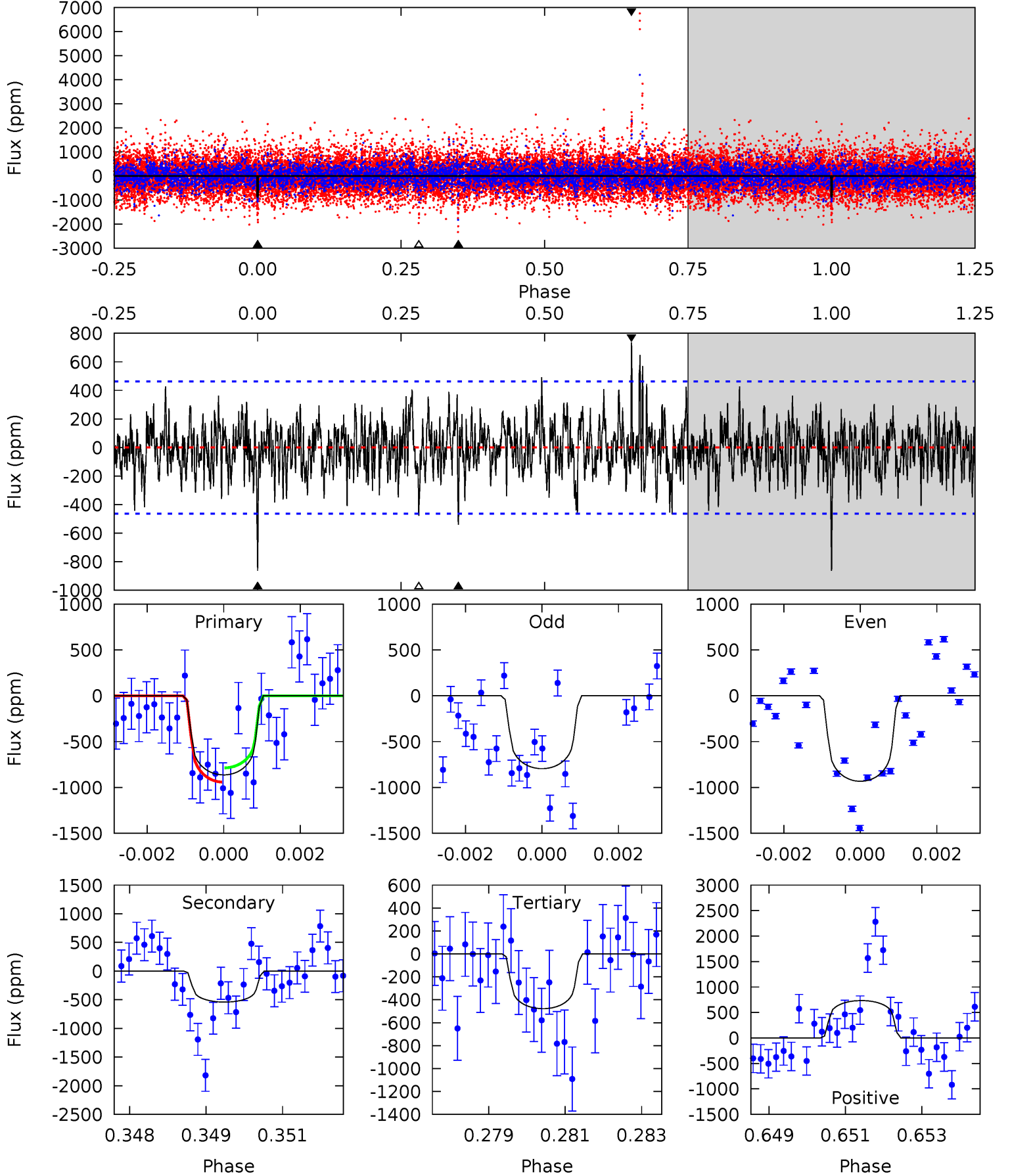
TCE 010535858-07 P=209.512102 Days  $T_0=254.433879$  (BKJD)



# DV Model-Shift Uniqueness Test

010535858-07,  $P = 209.523411$  Days,  $E = 44.804873$  Days

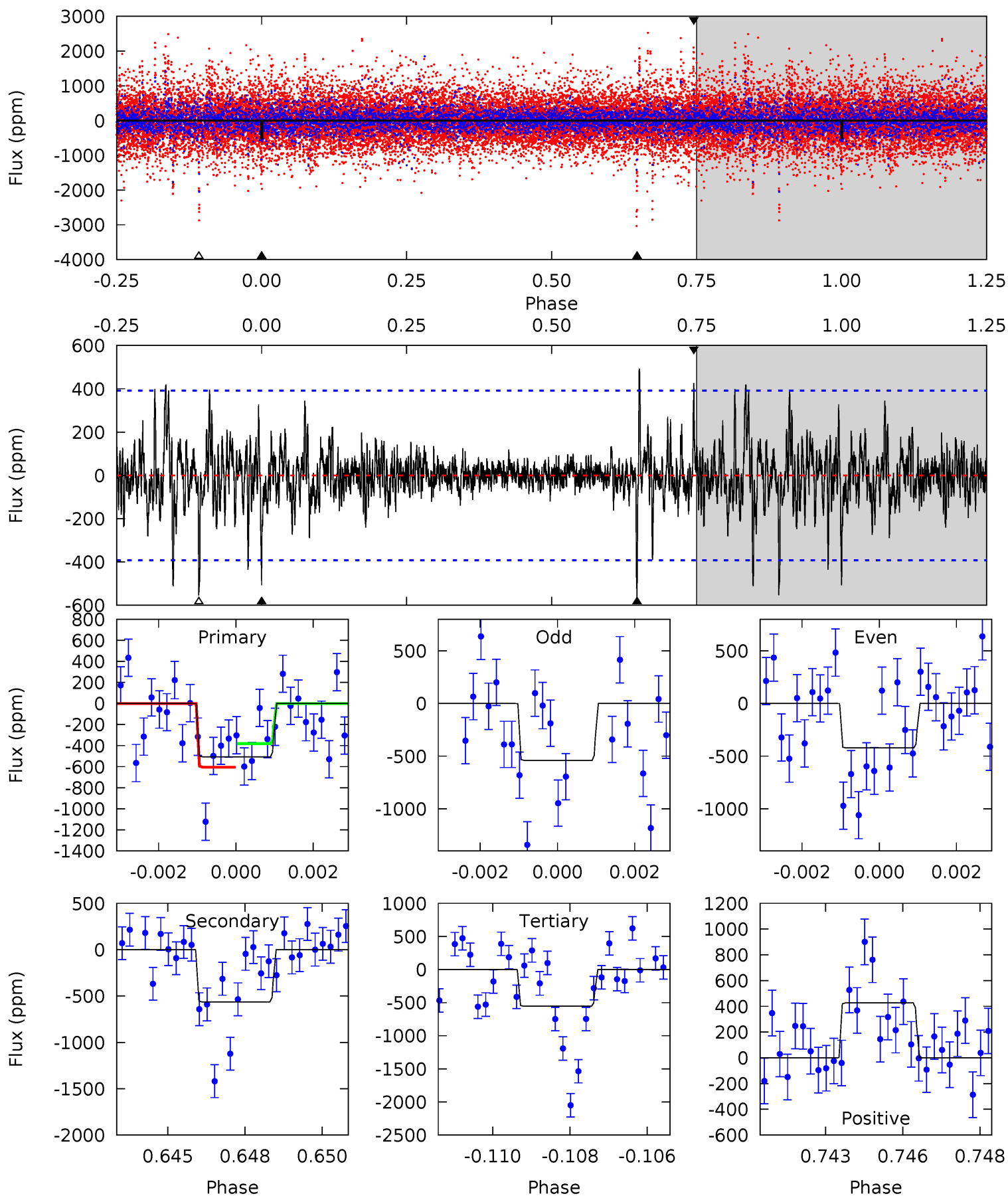
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.96	6.24	5.52	8.47	5.34	3.12	1.76	4.44	1.49	0.72	-2.23	0.77	0.85	0.46	0.90



# Alt Model-Shift Uniqueness Test

010535858-07, P = 209.512102 Days, E = 44.921777 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
6.86	7.63	7.48	5.76	5.29	3.04	1.33	-0.62	1.10	0.15	1.87	0.78	1.46	0.47	1.51



### Stellar Parameters For KIC 010535858

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$3615^{+43}_{-50}$	$4.839^{+0.030}_{-0.033}$	$-0.100^{+0.100}_{-0.100}$	$0.420^{+0.029}_{-0.032}$	$0.445^{+0.025}_{-0.038}$	$8.445^{+1.369}_{-1.178}$
	+1%/-1%	+1%/-1%	+100%/-100%	+7%/-8%	+6%/-9%	+16%/-14%
Source	PHO2	PHO2	PHO2	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 010535858-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-541 \pm 87$	$1.37^{+0.60}_{-0.53}$	$199^{+4}_{-4}$	$3324^{+636}_{-336}$	$43243^{+81209}_{-22163}$
Alt.	$-565 \pm 74$	$0.93^{+0.56}_{-0.51}$	$199^{+4}_{-4}$	$3804^{+1348}_{-525}$	$97603^{+401046}_{-58863}$

$T_{\text{max}}$  = 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

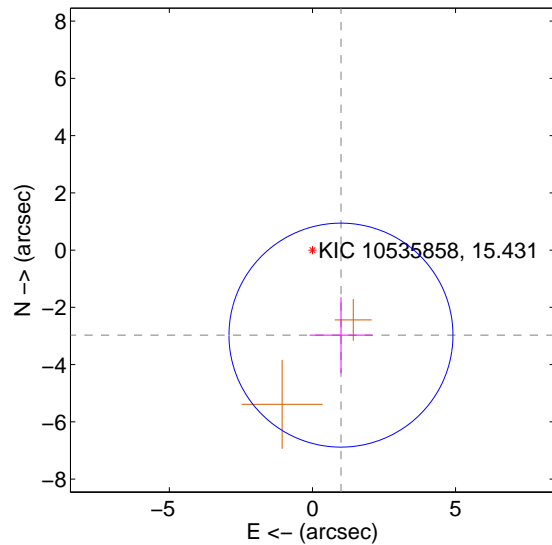
Supplemental centroid analysis for 010535858-07. Kepler magnitude: 15.43. Transit SNR 6.39

There are 0 quarters with good PRF difference image offsets

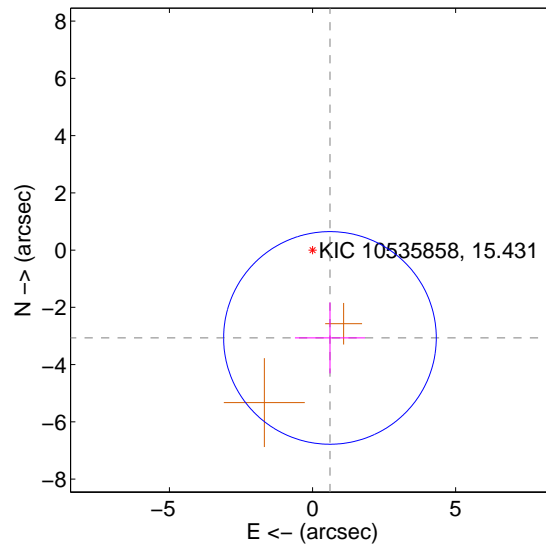
The direct PRF centroid is offset from the target star catalog position by about 0.36 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.133 \pm 1.304$	2.40	$-0.996 \pm 1.099$	$-2.970 \pm 1.325$
PRF-fit source offset from KIC position	$3.128 \pm 1.238$	2.53	$-0.609 \pm 1.224$	$-3.068 \pm 1.238$
photometric centroid source offset	$0.46 \pm 1.38$	0.33	$-0.46 \pm 1.38$	$-0.01 \pm 0.84$

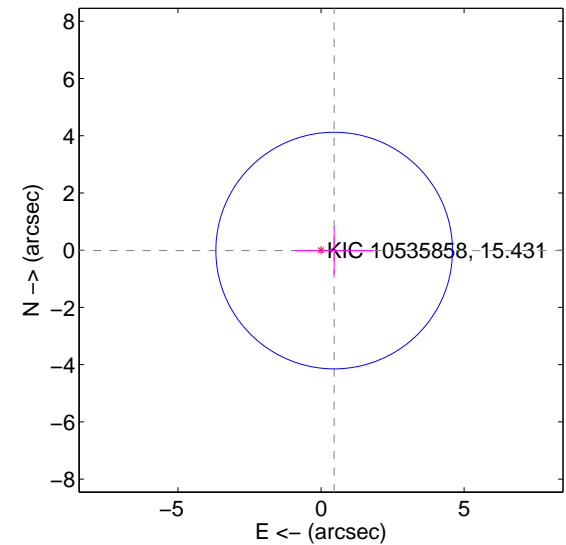
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

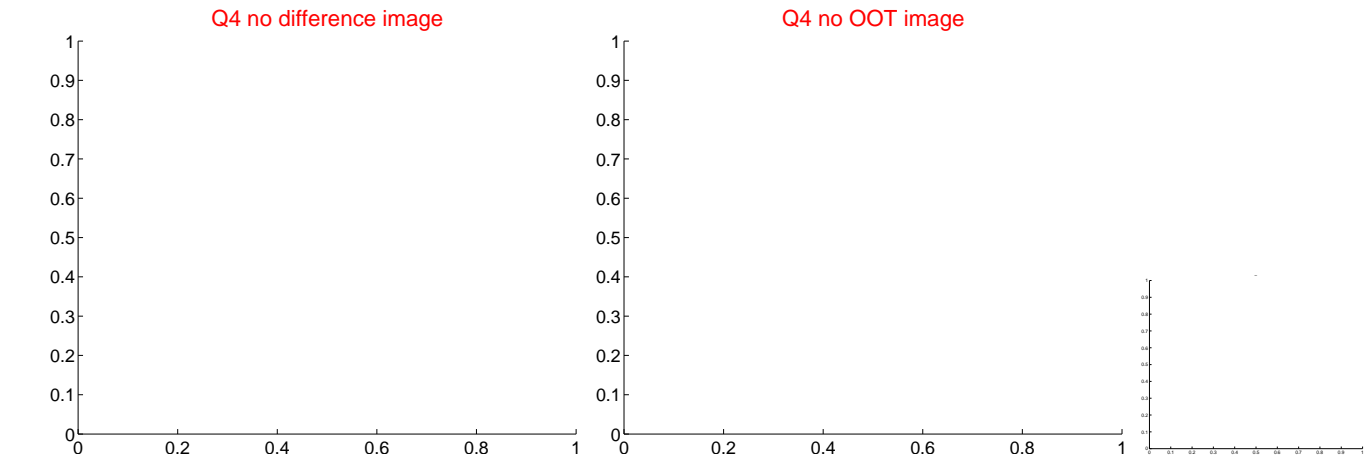
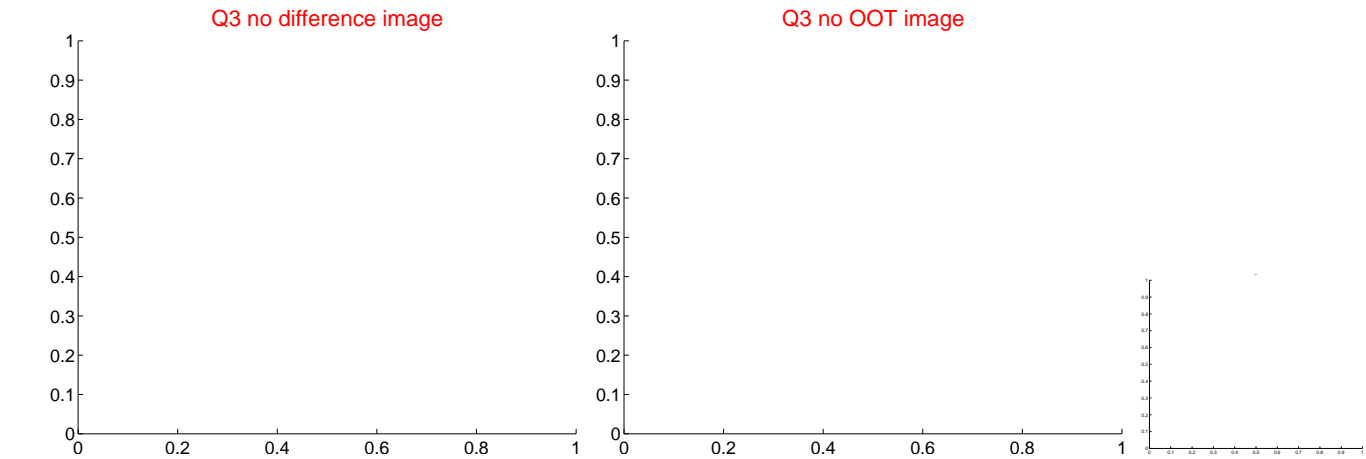
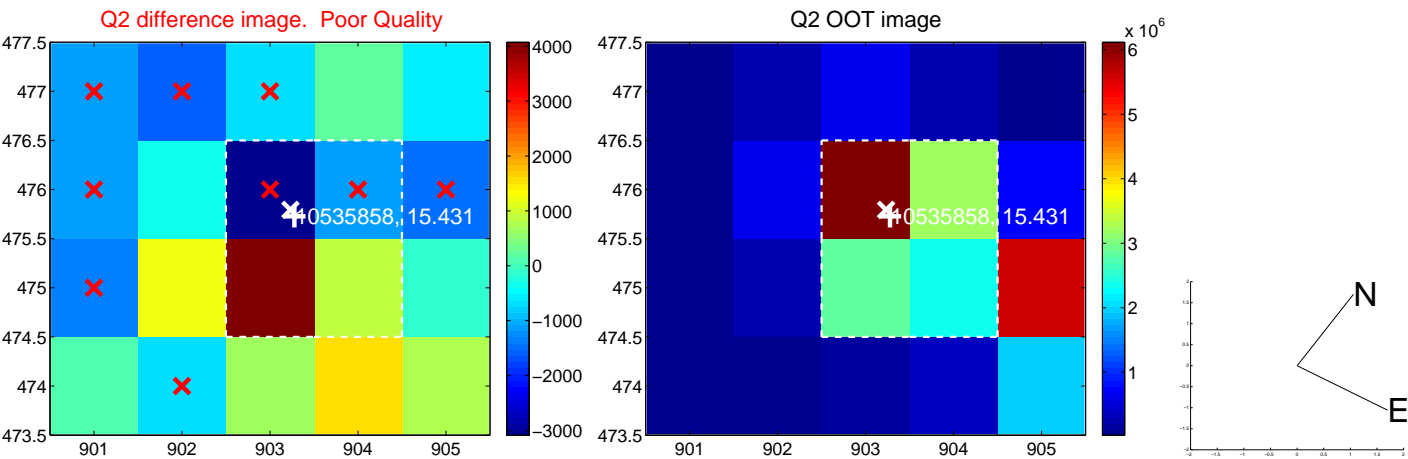
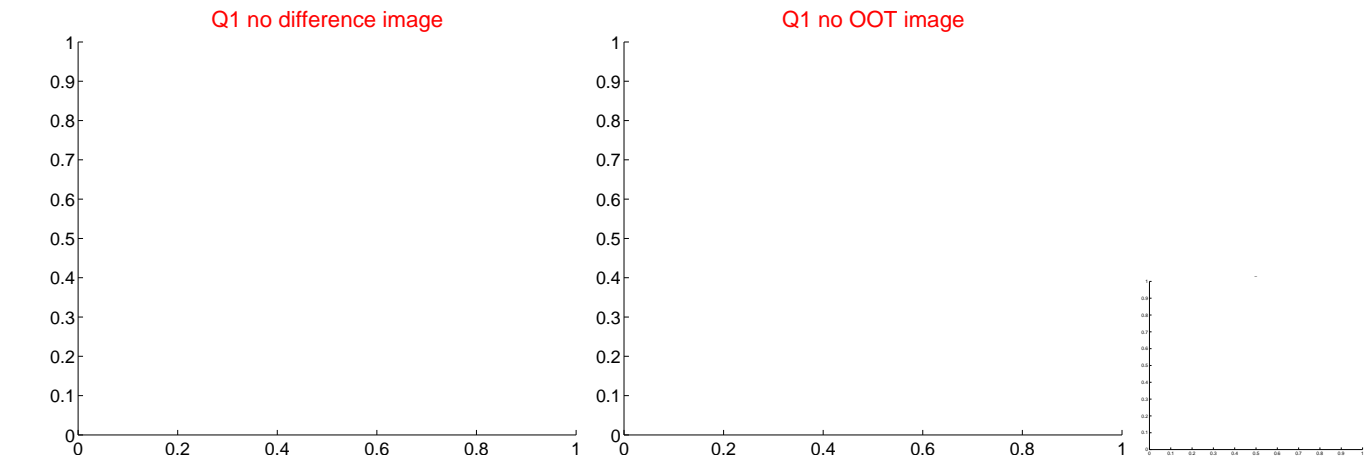


offset from photometric centroids



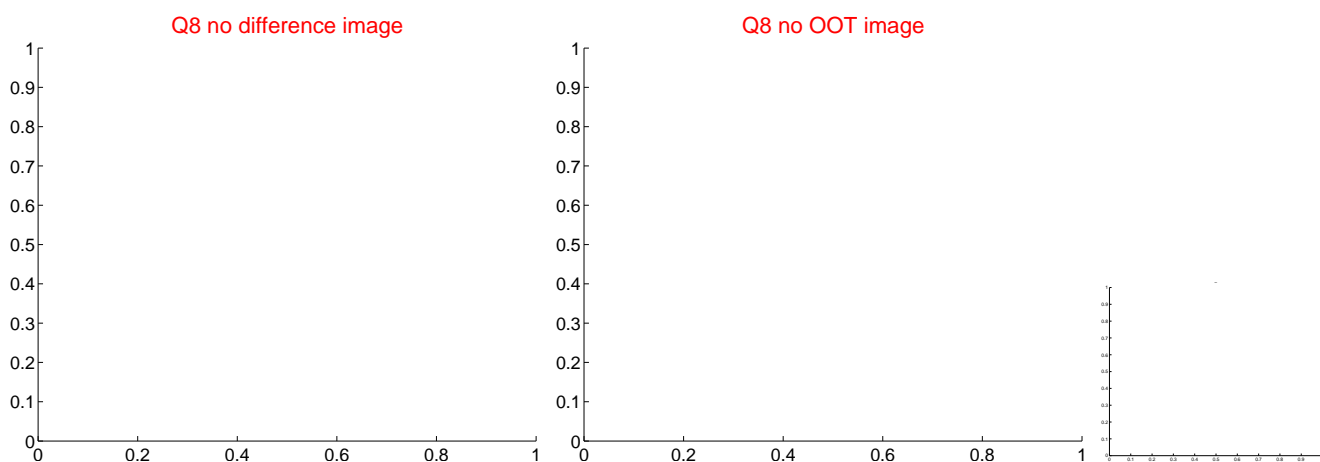
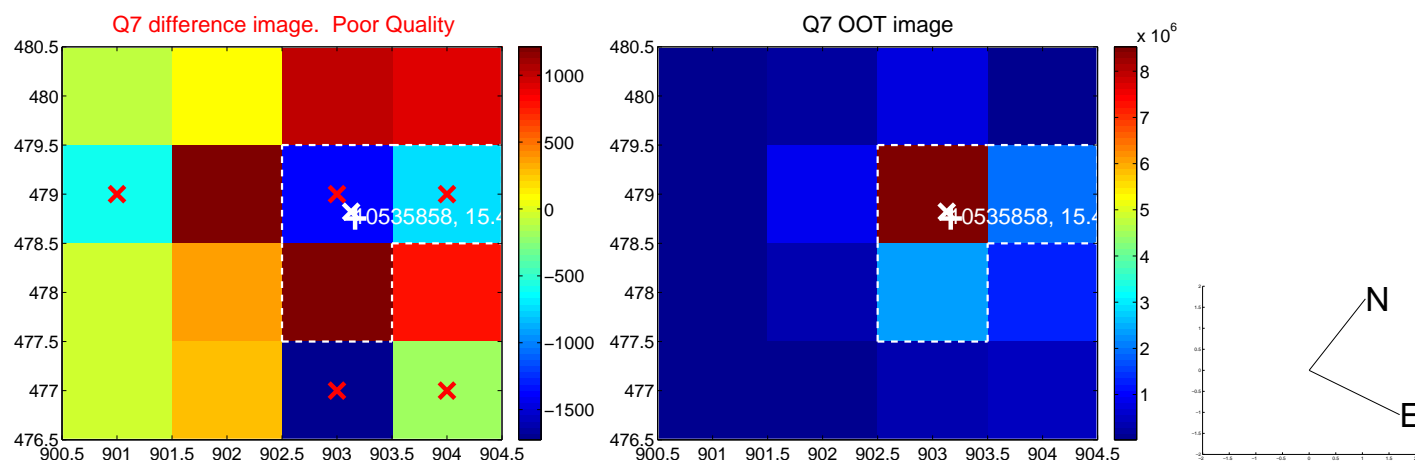
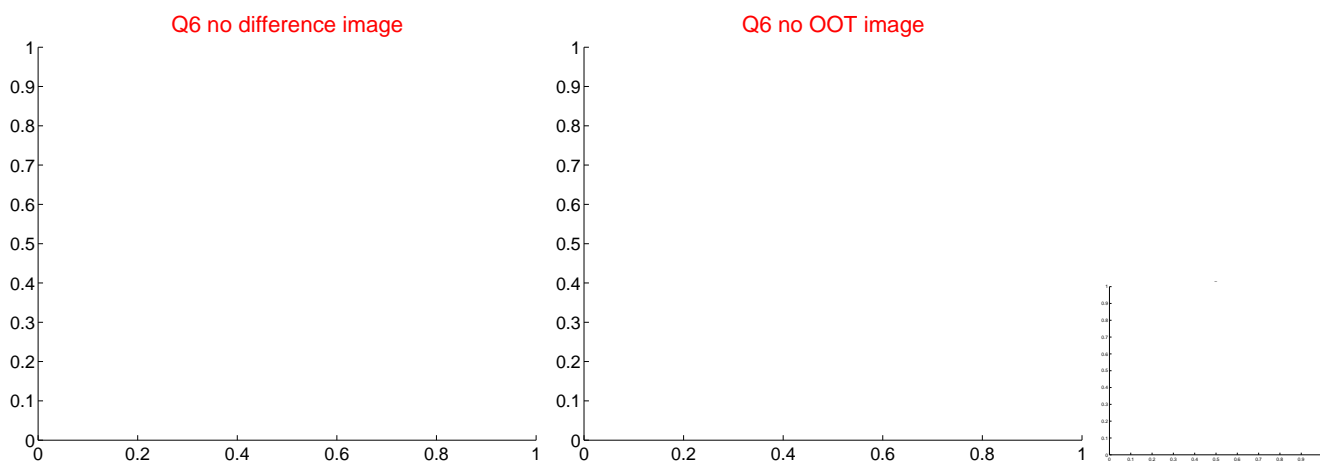
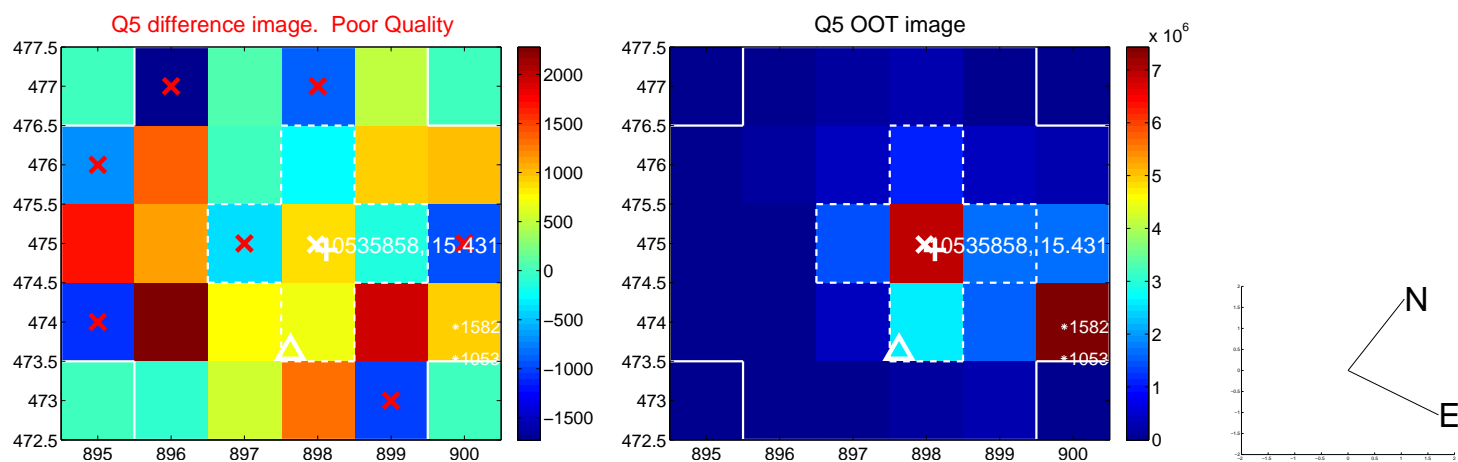
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

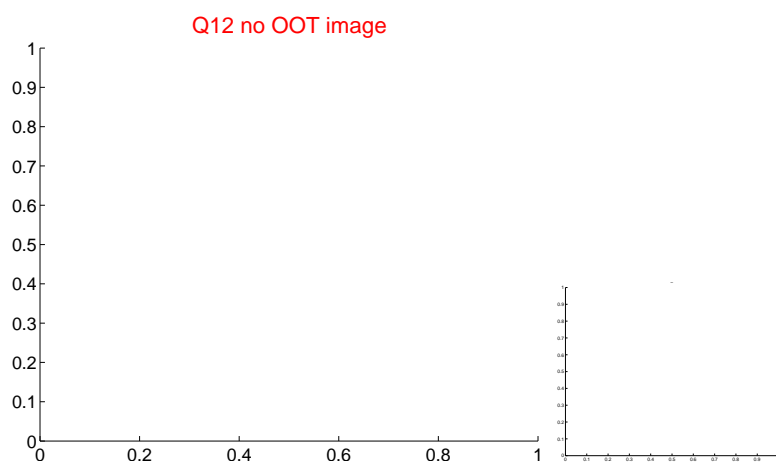
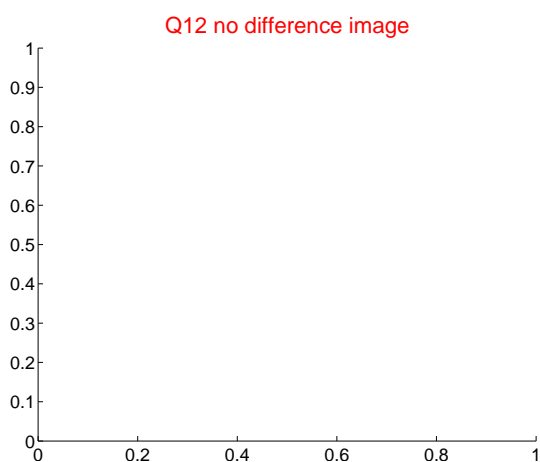
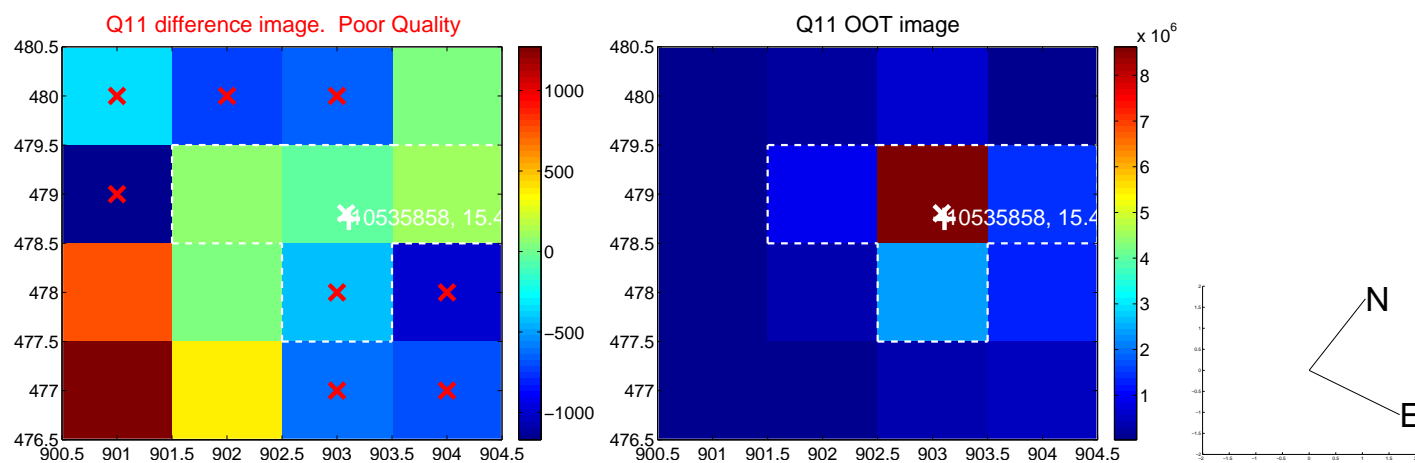
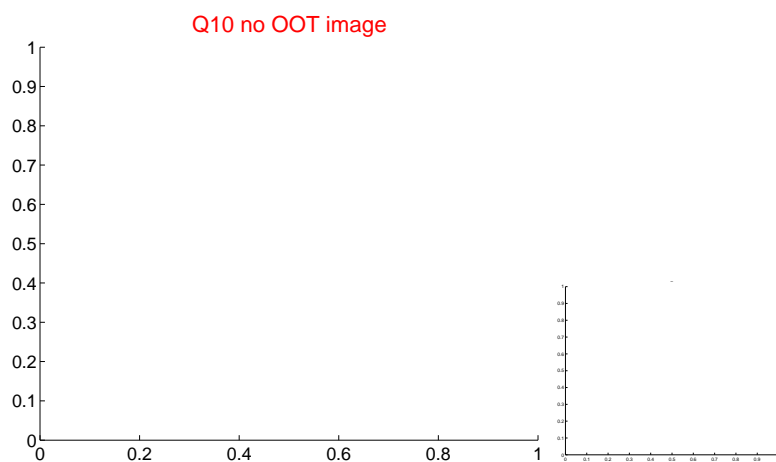
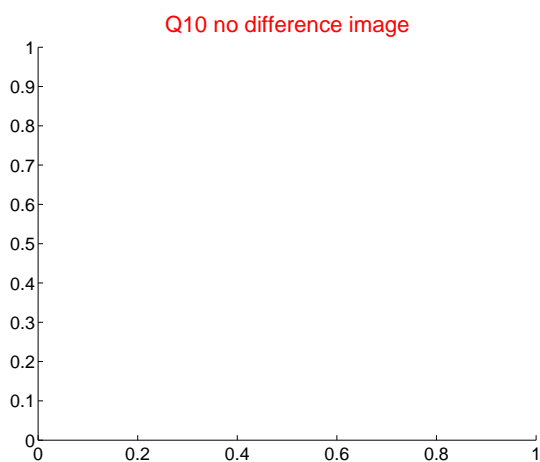
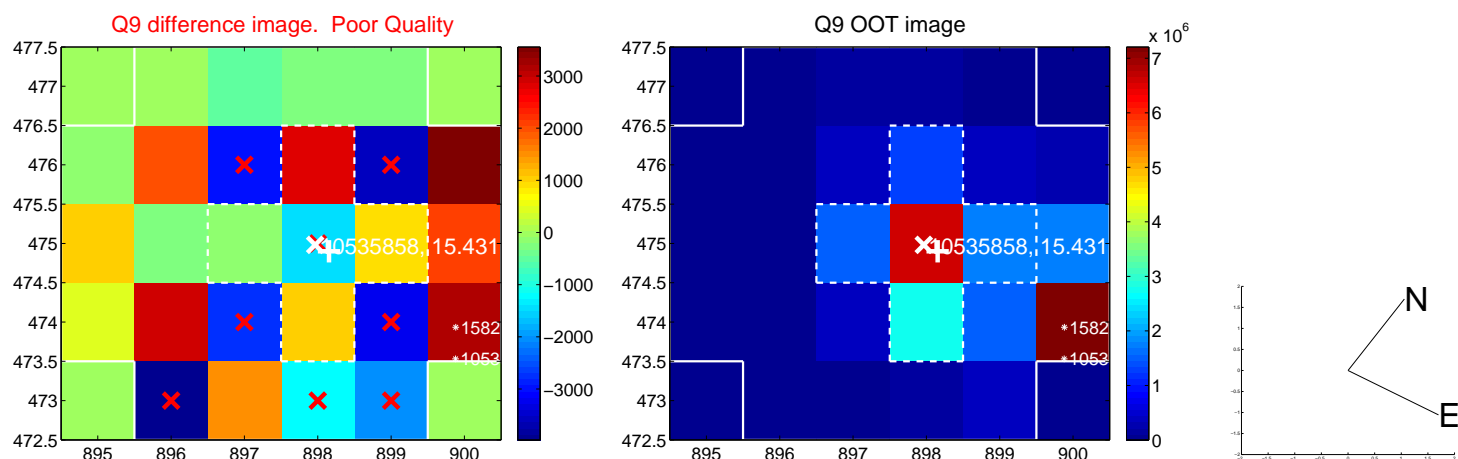




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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



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

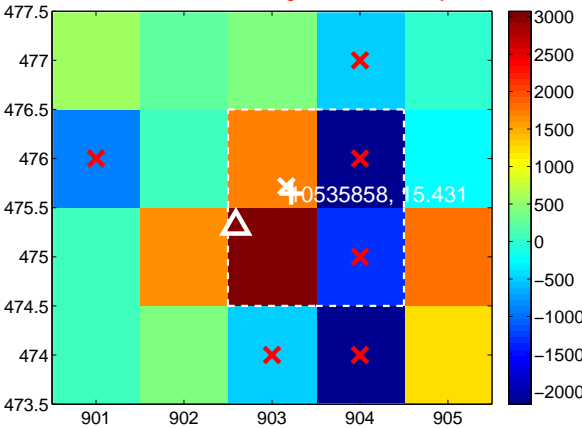
Q13 no difference image



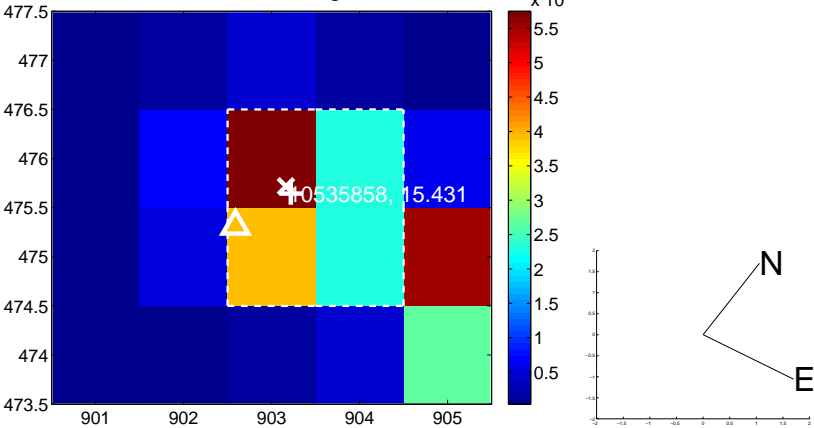
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



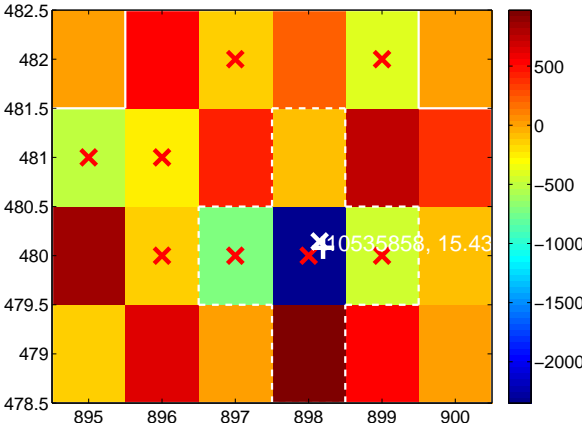
Q15 no difference image



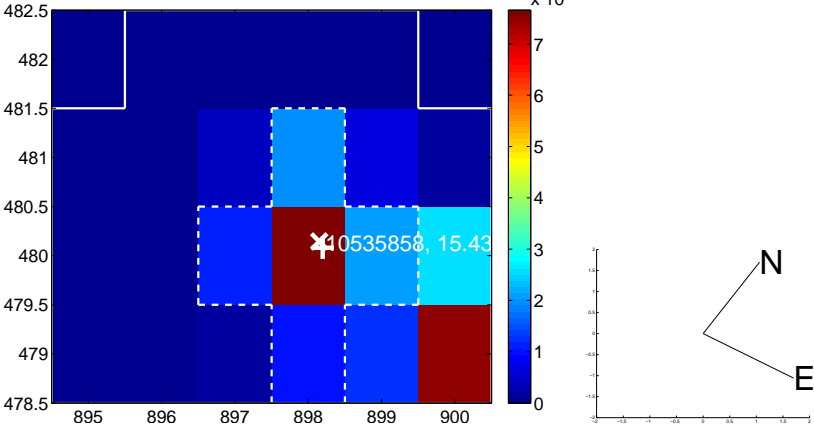
Q15 no OOT image



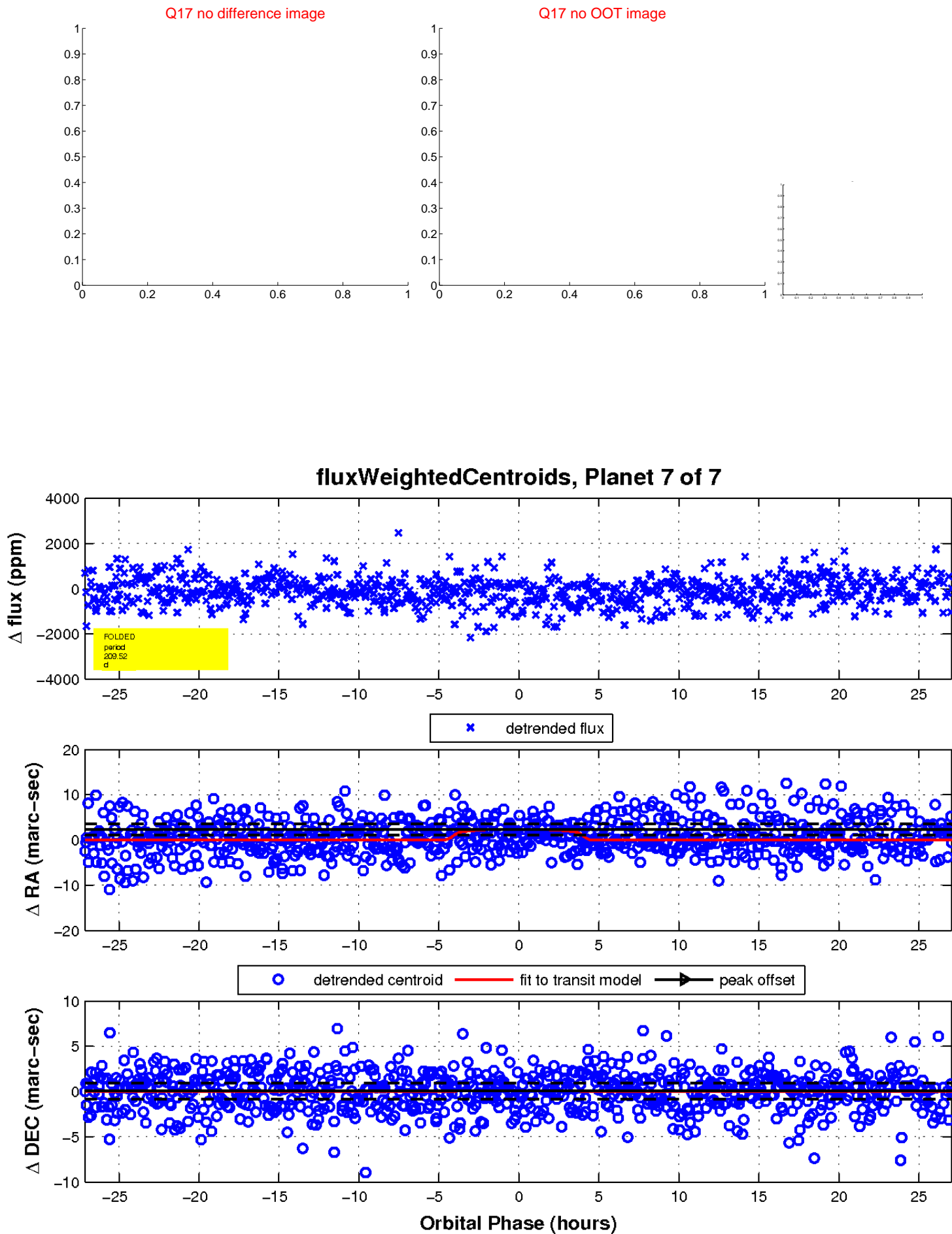
Q16 difference image. Poor Quality



Q16 OOT image



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



UKIRT Image

