

# KIC 008056853

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008056853-01	OBS	No	1.670864	133.104151	34.4	7.258	8.9	8.5	0.71	4429	0.52	290.52
008056853-02	OBS	No	441.120466	437.809040	721.6	9.251	15.6	9.3	0.71	4429	2.12	0.17
008056853-03	OBS	No	305.585951	428.199935	507.1	9.374	13.3	5.9	0.71	4429	1.76	0.28
008056853-04	OBS	No	225.156248	190.548826	394.0	9.364	12.5	5.4	0.71	4429	1.60	0.42
008056853-05	OBS	No	307.907910	162.825072	223.0	9.419	11.8	2.5	0.71	4429	1.27	0.28
008056853-06	OBS	No	213.561669	282.933930	79.6	7.168	12.4	1.3	0.71	4429	0.78	0.45
008056853-07	OBS	No	192.807309	132.044532	1526.7	33.730	13.2	8.1	0.71	4429	5.71	0.52
008056853-08	OBS	No	352.018673	141.049465	129.7	2.288	9.0	1.6	0.71	4429	1.02	0.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008056853-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008056853-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008056853-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008056853-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—CENT_KIC_POS
008056853-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET
008056853-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

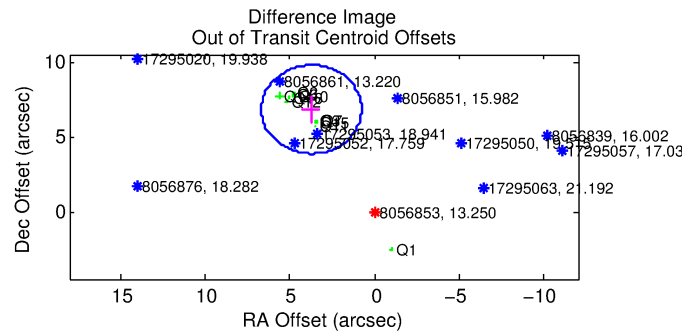
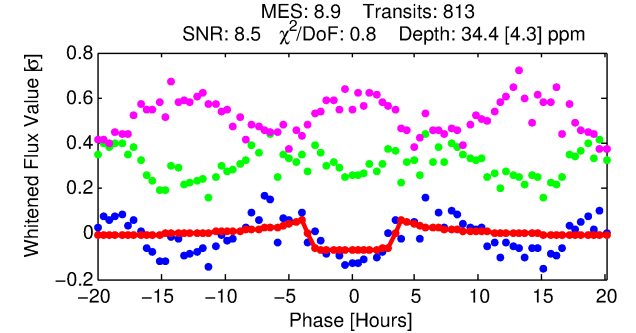
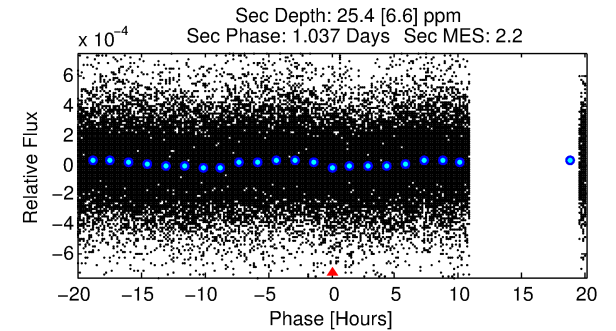
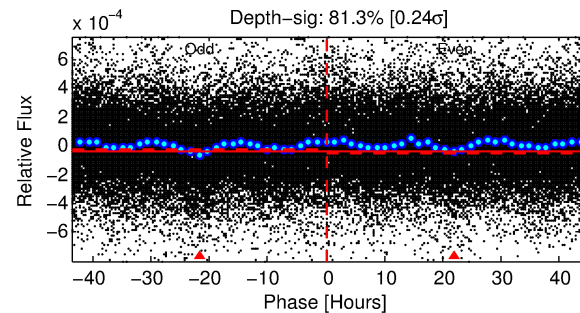
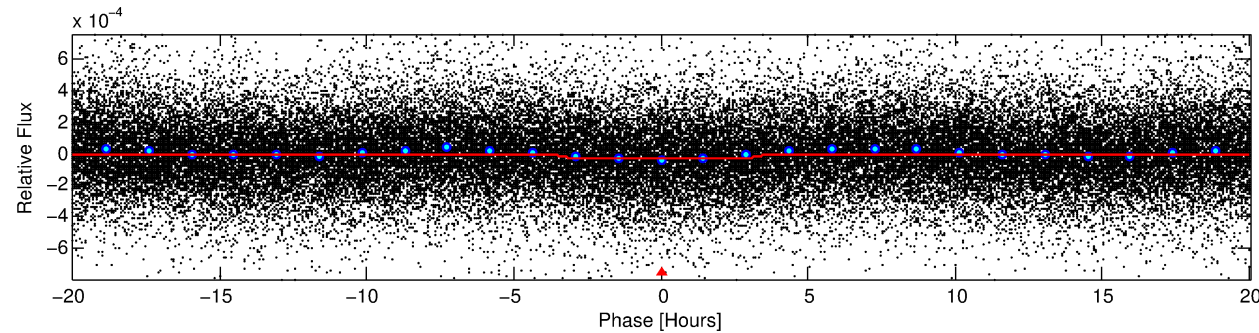
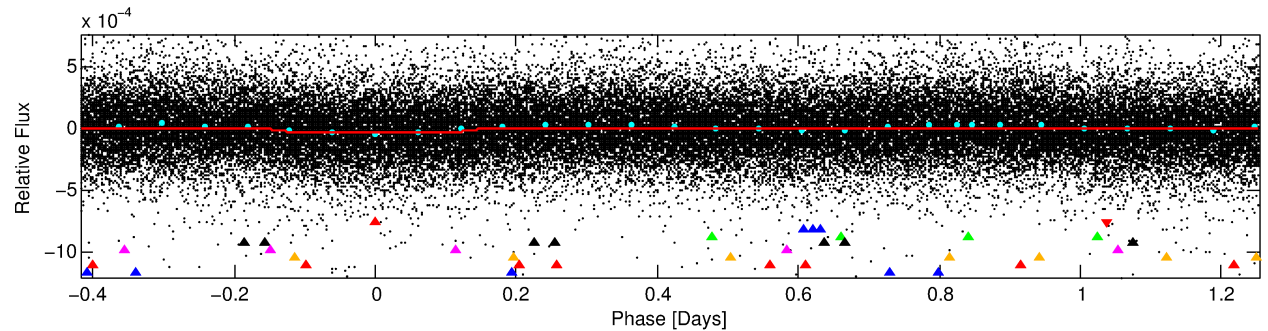
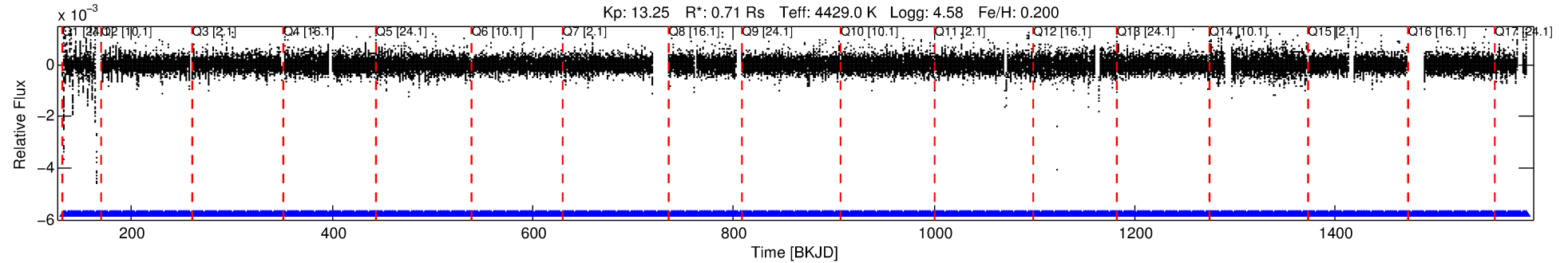
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008056853-01

No Significant Match Found

# DV One-Page Summary

KIC: 8056853 Candidate: 1 of 8 Period: 1.671 d



## DV Fit Results:

Period = 1.67086 [0.00002] d  
Epoch = 133.1042 [0.0049] BKJD  
Rp/R\* = 0.0067 [0.0021]  
a/R\* = 1.23 [0.48]  
b = 0.90 [0.25]  
Seff = 290.52 [44.66]  
Teq = 1053 [40] K  
Rp = 0.52 [0.17] Re  
a = 0.0245 [0.0017] AU  
Ag = 31.42 [21.70] [1.40σ]  
Teffp = 3854 [669] K [4.18σ]

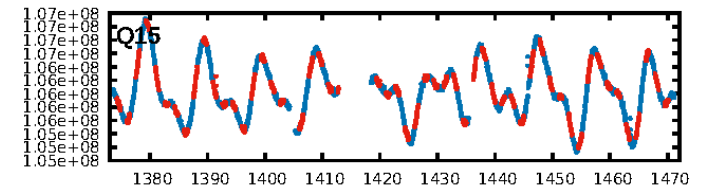
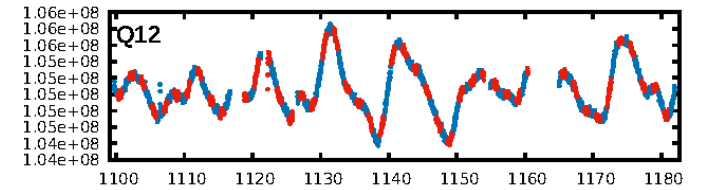
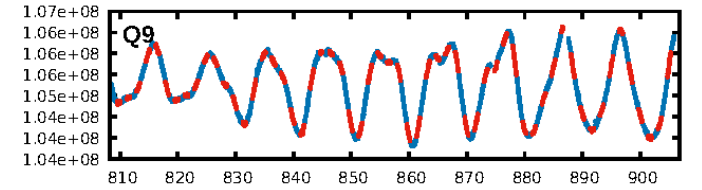
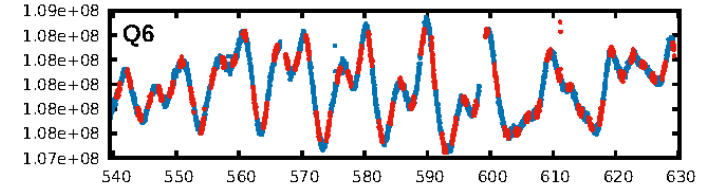
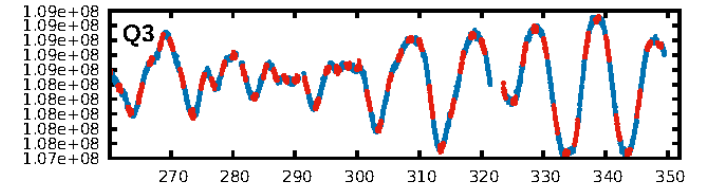
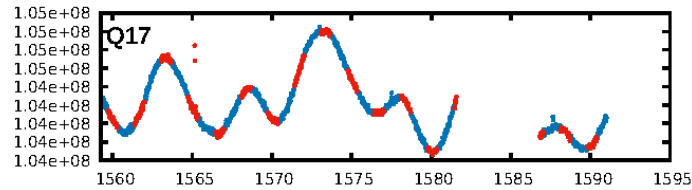
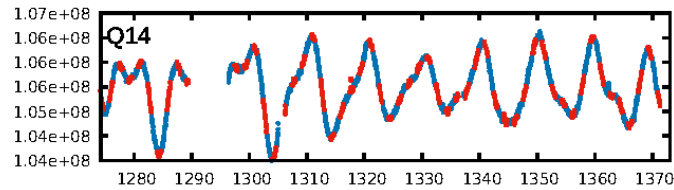
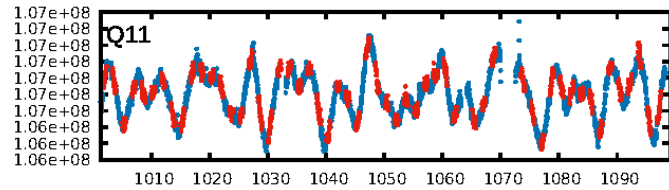
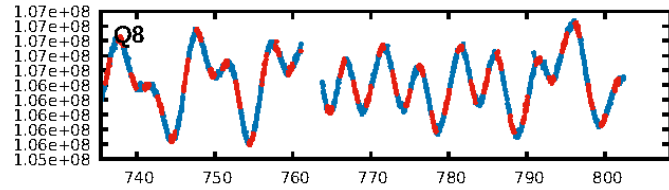
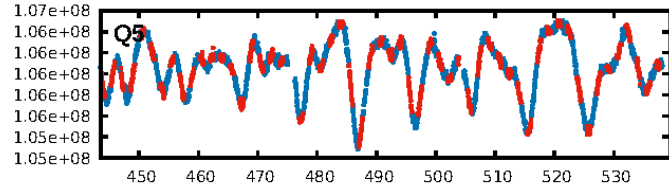
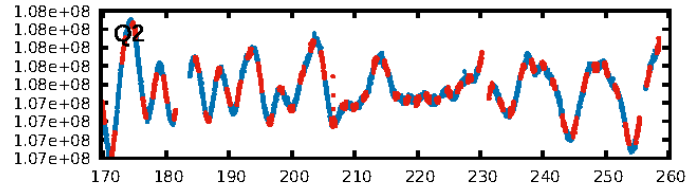
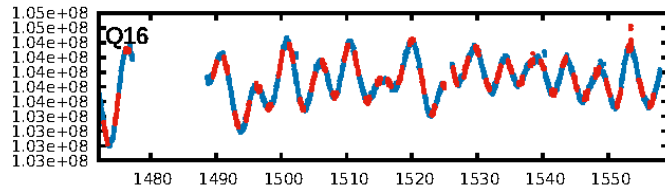
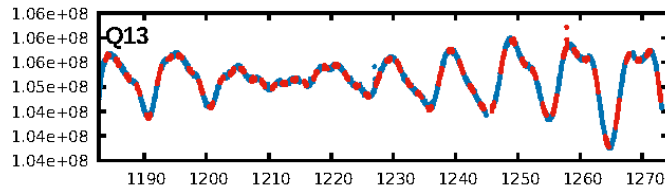
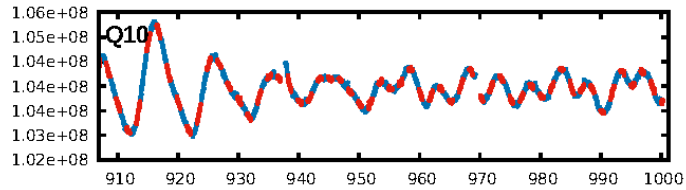
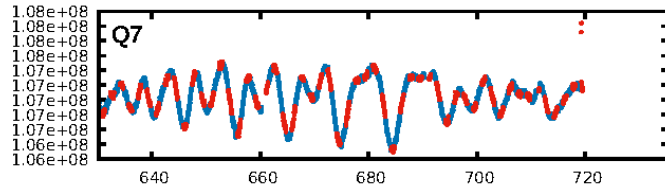
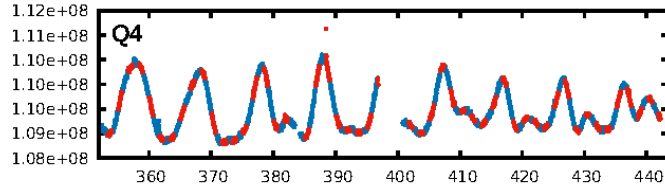
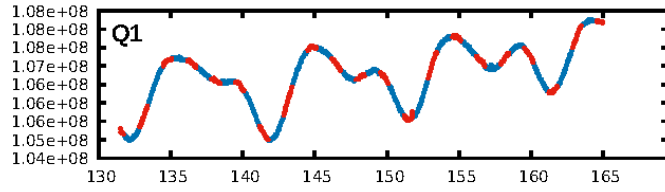
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [132.96σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.33e-13  
RollingBand-fgt: 1.00 [776/776]  
GhostDiagnostic-chr: 1.613  
Centroid-sig: 0.0%  
Centroid-so: 6.606 arcsec [3.09σ]  
OotOffset-rm: 7.780 arcsec [7.90σ]  
KicOffset-rm: 10.024 arcsec [9.97σ]  
OotOffset-st: 4/4/2/1 [11]  
KicOffset-st: 4/4/2/1 [11]  
DiffImageQuality-fgm: 0.91 [10/11]  
DiffImageOverlap-fno: 1.00 [17/17]

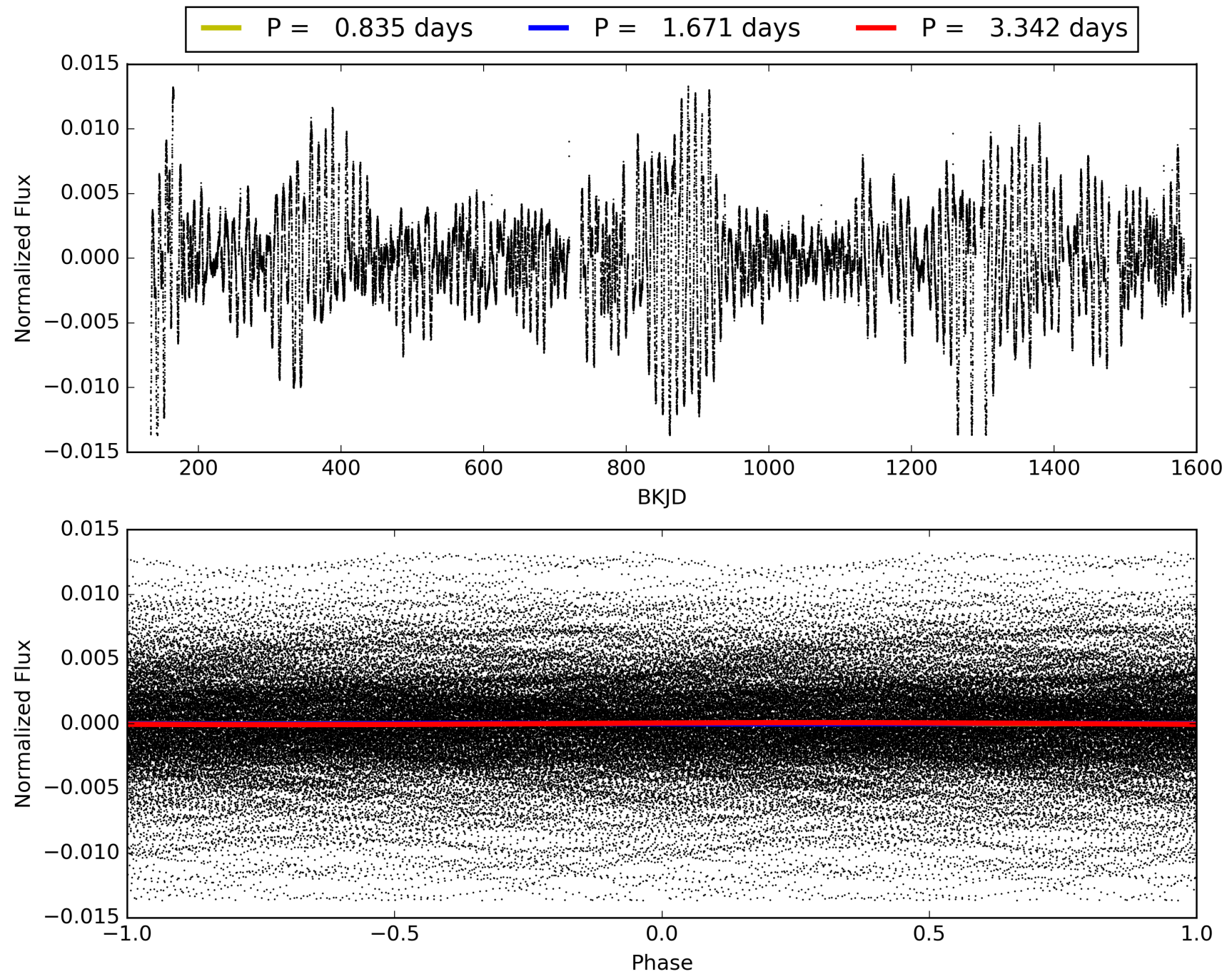
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:13:05 Z

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

# TCE 008056853-01, PDC Light Curves



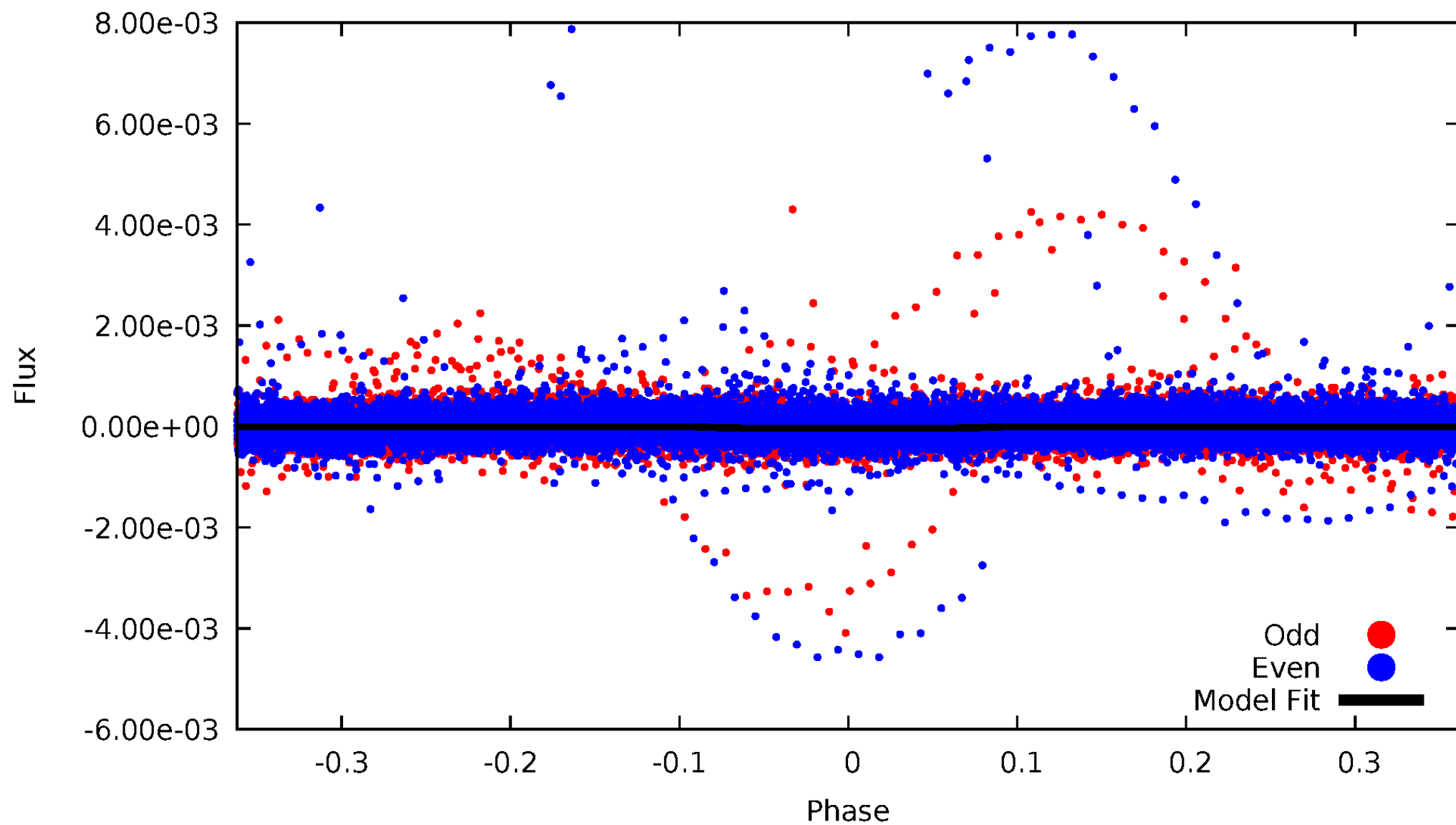
TCE 008056853-01





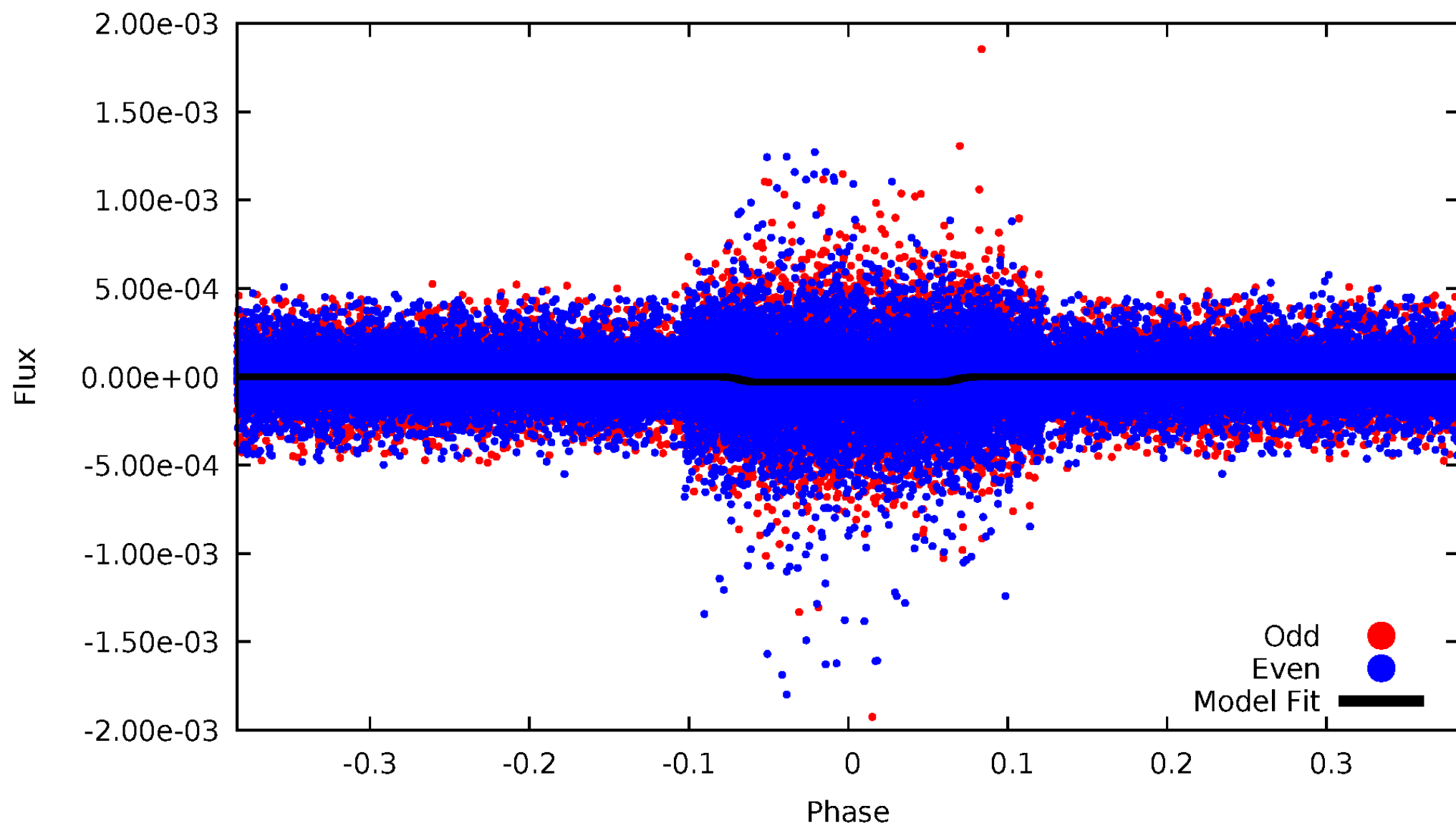
# DV Odd/Even

TCE 008056853-01

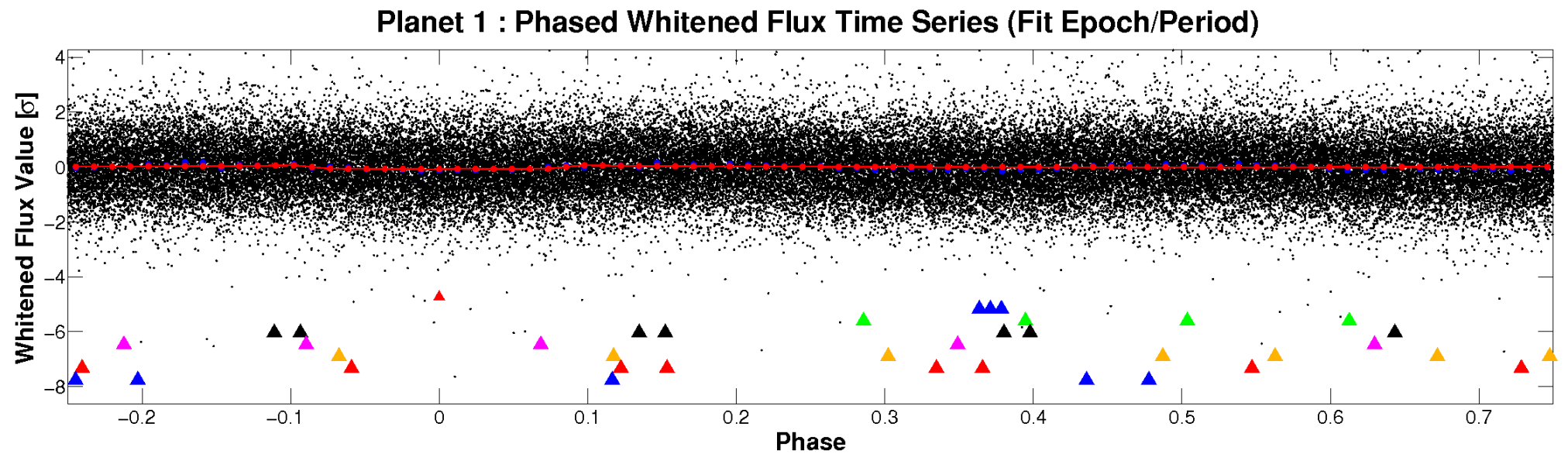
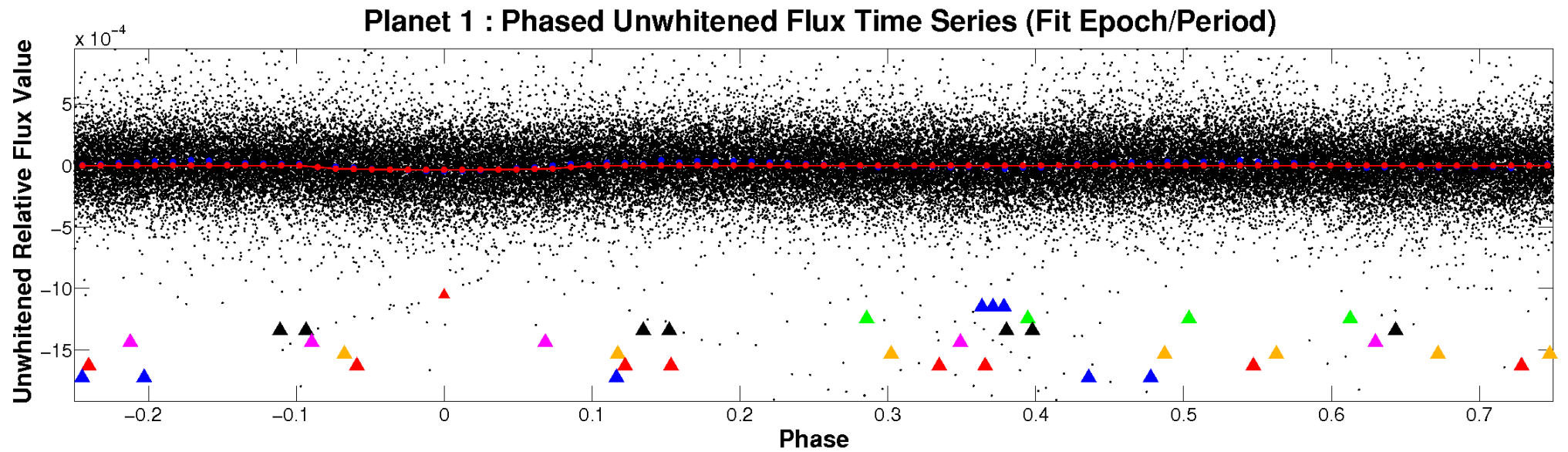


# ALT Odd/Even

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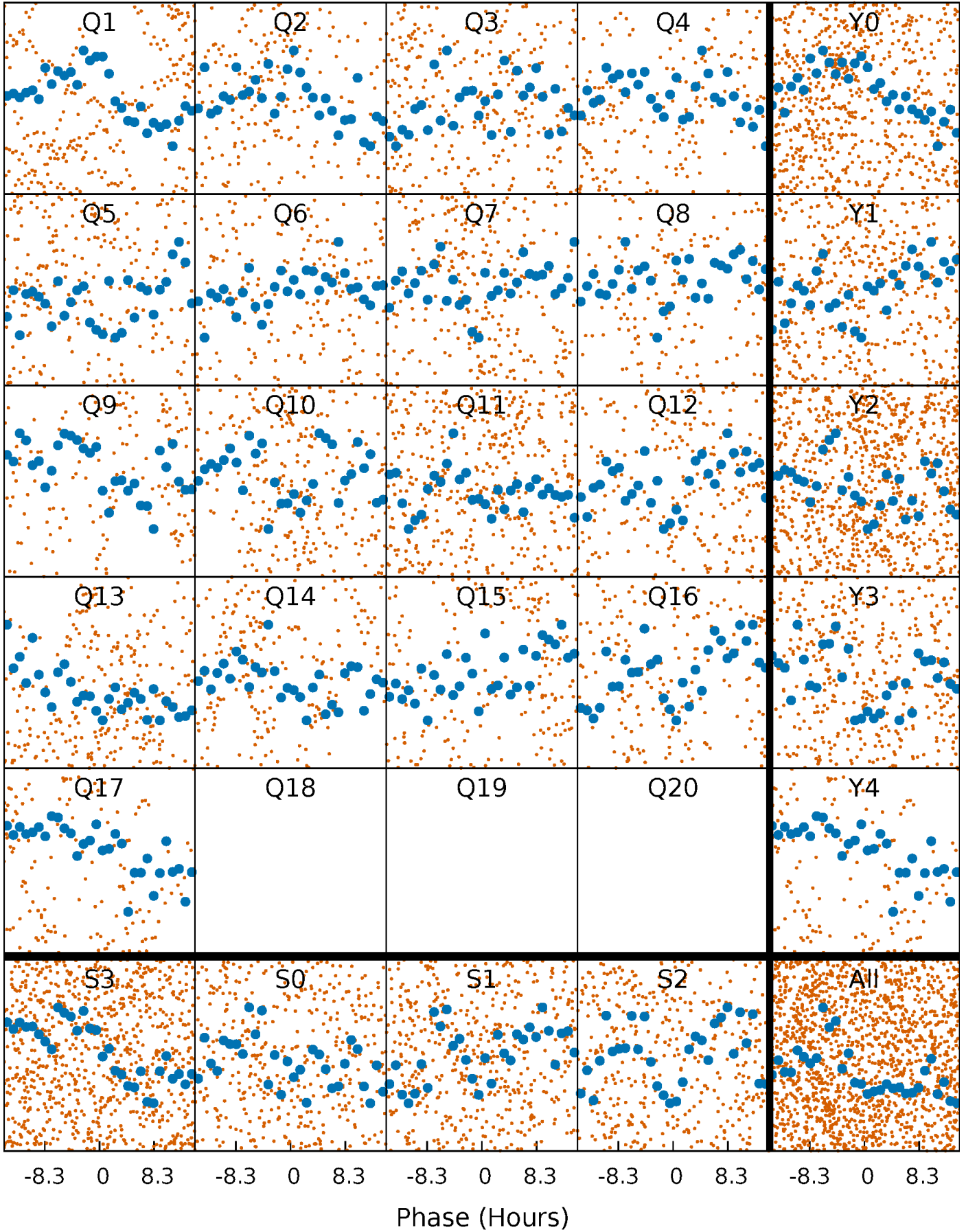


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

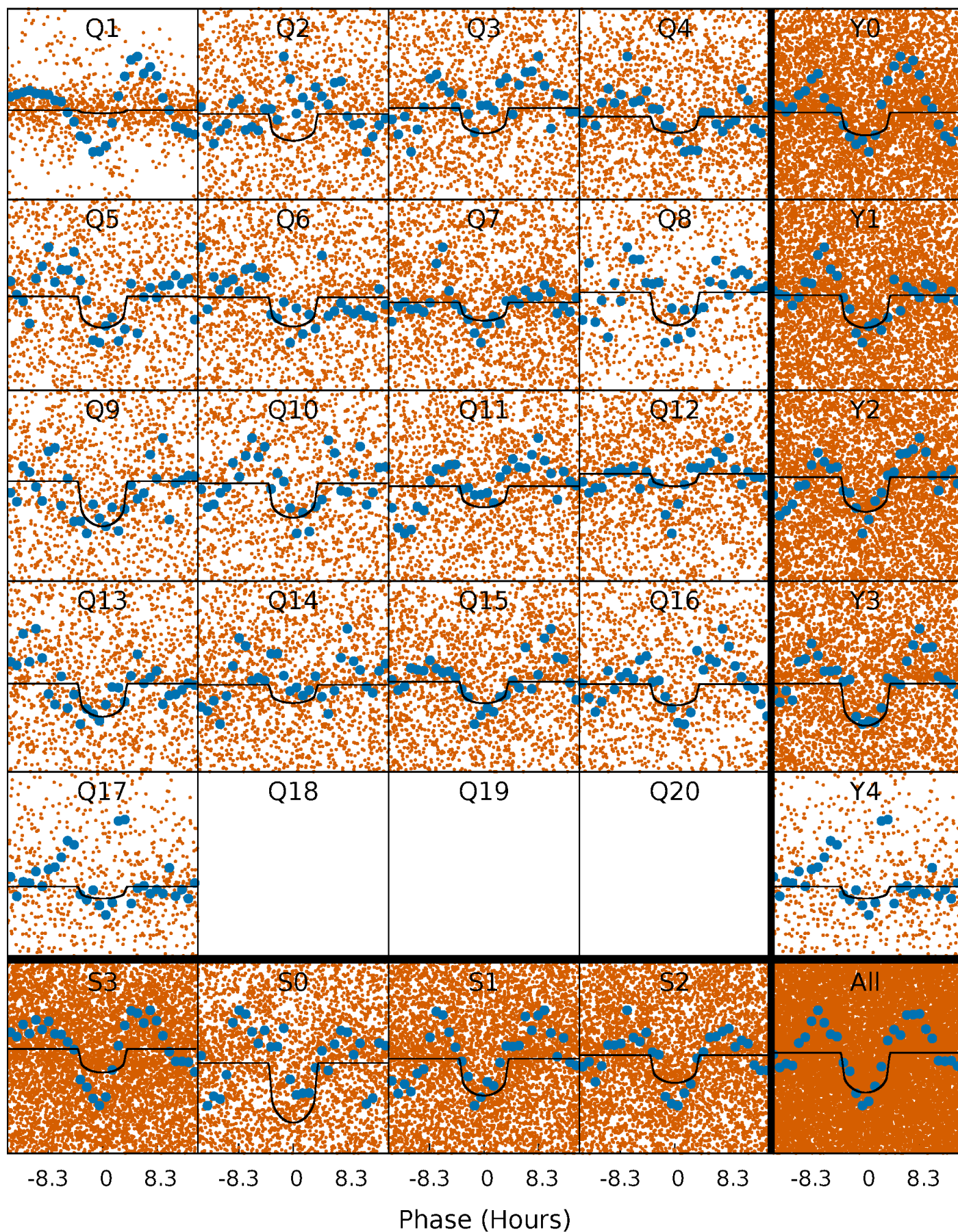
TCE 008056853-01 P= 1.670864 Days  $T_0=133.104151$  (BKJD)





# DV Quarter-Phased Transit Curves

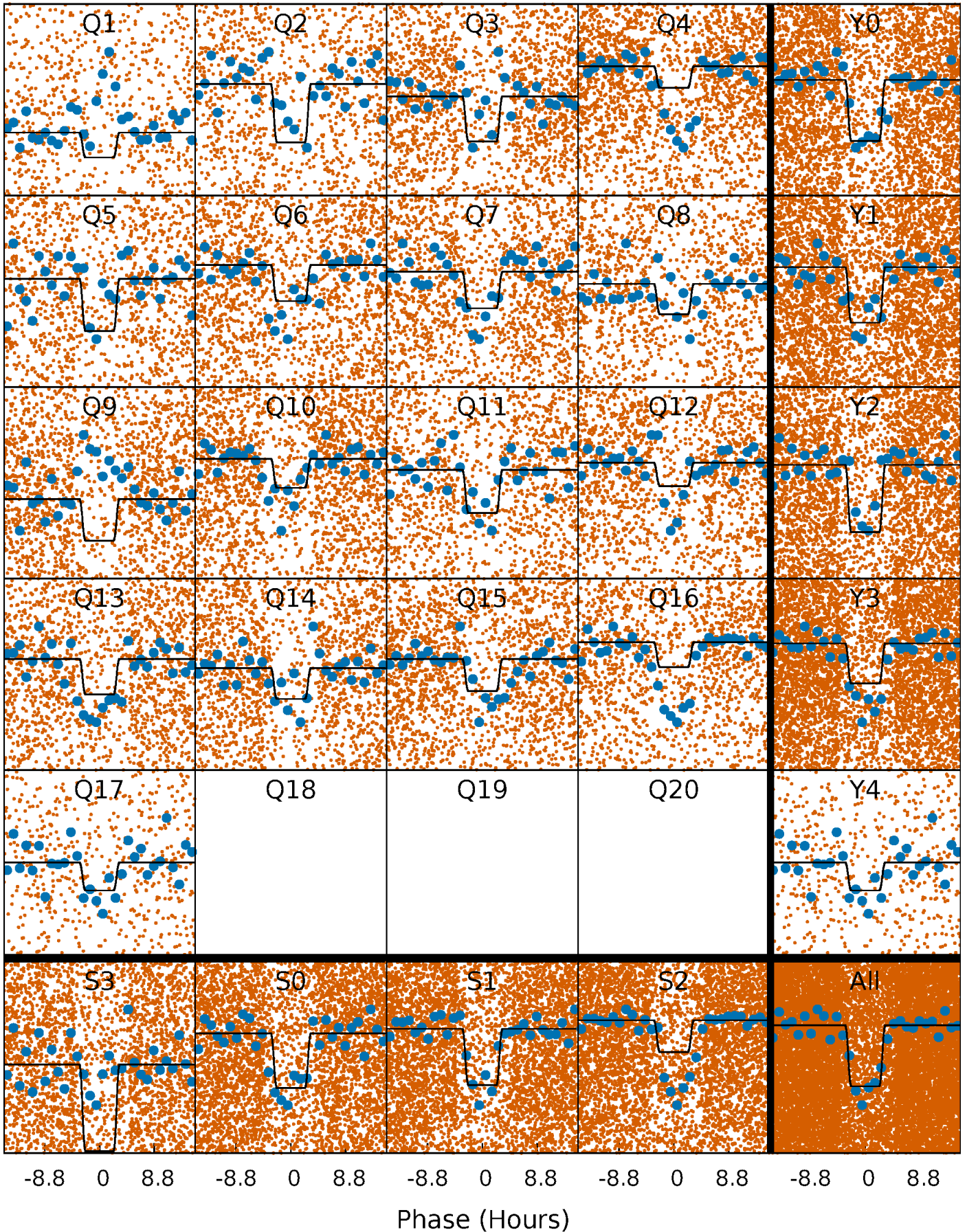
TCE 008056853-01 P= 1.670864 Days  $T_0=133.104151$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

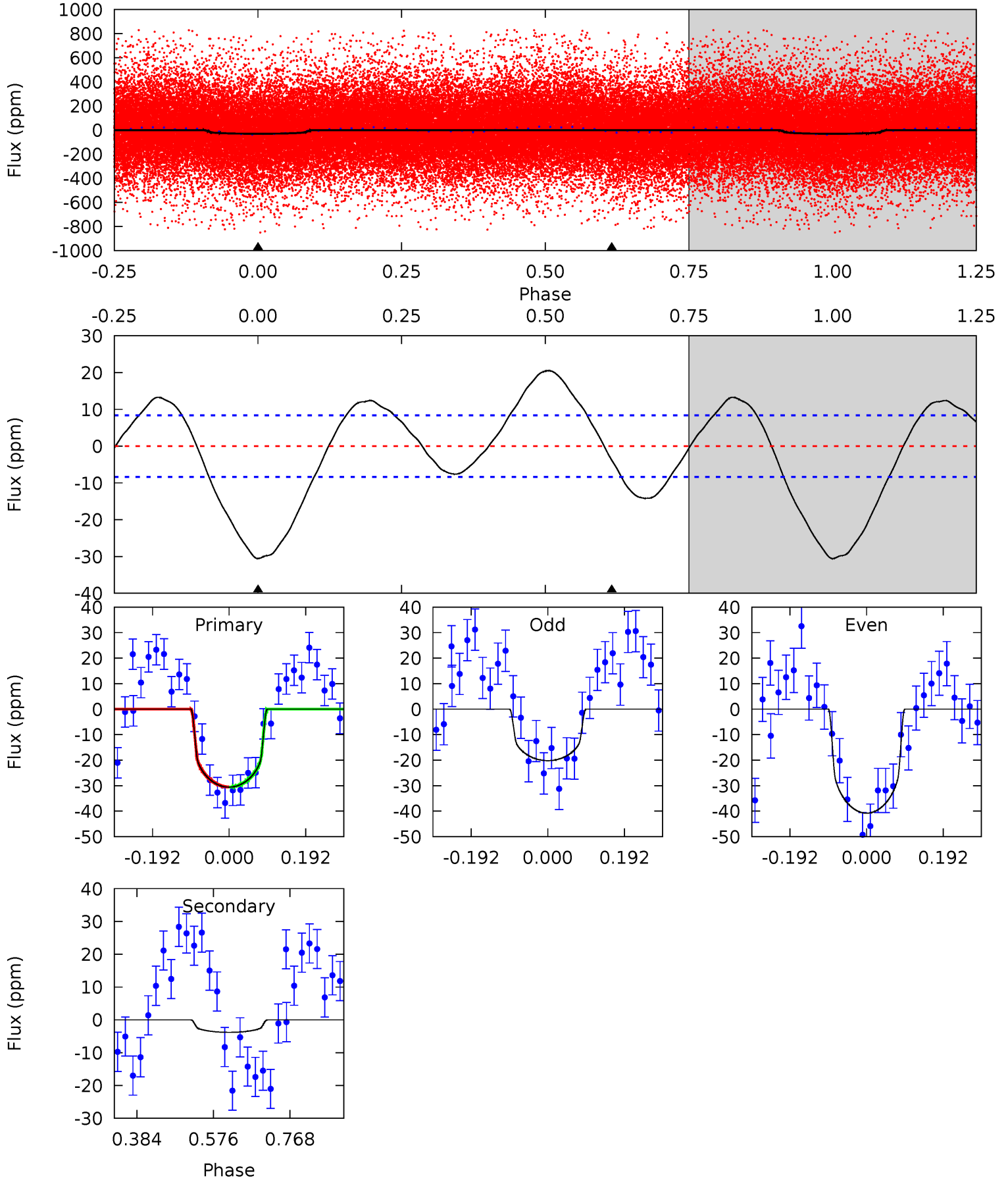
TCE 008056853-01 P= 1.670840 Days  $T_0=133.111072$  (BKJD)



# DV Model-Shift Uniqueness Test

008056853-01, P = 1.670864 Days, E = 131.433287 Days

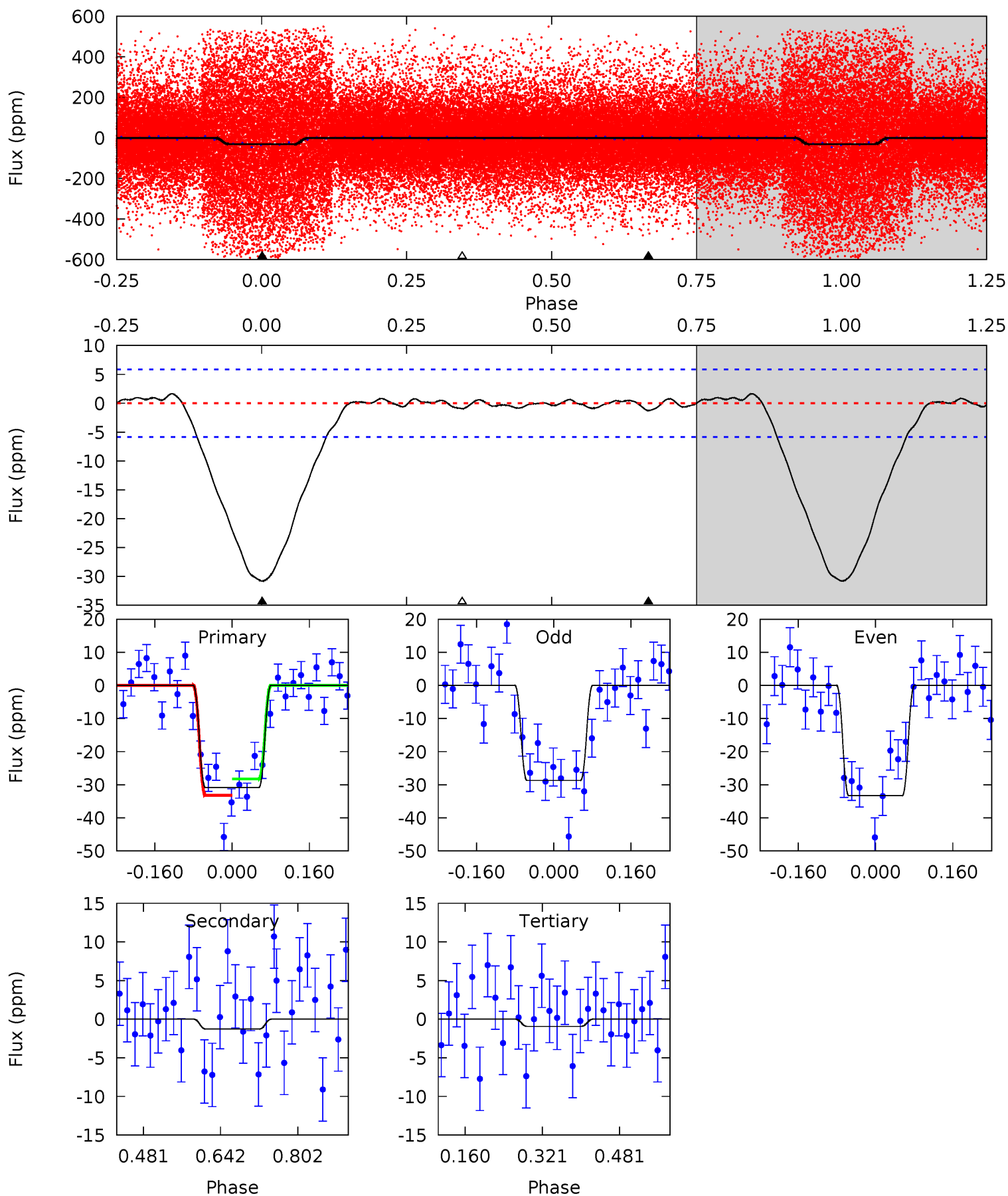
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.2	2.02	0	0	4.43	1.30	3.44	16.2	16.2	2.02	2.02	5.39	0.82	0.40	0.01



# Alt Model-Shift Uniqueness Test

008056853-01, P = 1.670840 Days, E = 131.440232 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
23.5	0.97	0.72	0	4.46	1.40	0.36	22.8	23.5	0.25	0.97	1.74	1.26	0.05	1.89





### Stellar Parameters For KIC 008056853

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4429^{+132}_{-132}$	$4.581^{+0.052}_{-0.016}$	$0.200^{+0.200}_{-0.300}$	$0.712^{+0.029}_{-0.059}$	$0.704^{+0.048}_{-0.054}$	$2.750^{+0.636}_{-0.220}$
	+3%/-3%	+1%/-0%	+100%/-150%	+4%/-8%	+7%/-8%	+23%/-8%
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 008056853-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-4 \pm 2$	$0.51^{+0.16}_{-0.17}$	$1459^{+50}_{-52}$	$2944^{+413}_{-366}$	$4.826^{+6.400}_{-2.795}$
Alt.	$-1 \pm 1$	$0.41^{+0.17}_{-0.15}$	$1462^{+47}_{-49}$	$2629^{+525}_{-4838}$	$2.147^{+5.602}_{-2.333}$

$T_{\text{max}}$  = 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

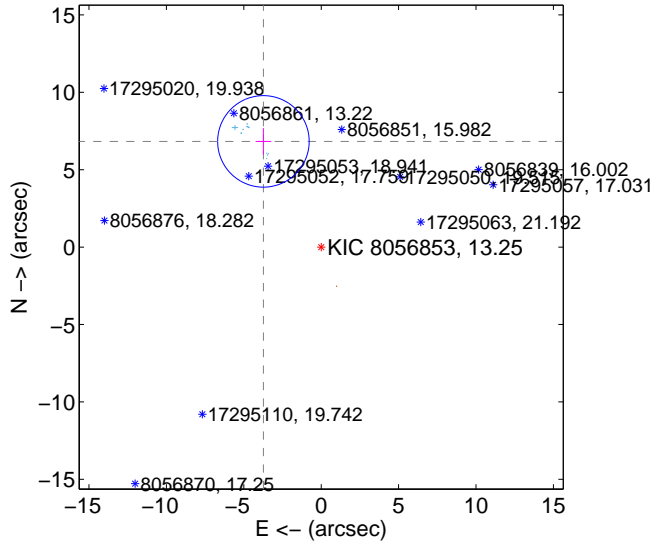
Supplemental centroid analysis for 008056853-01. Kepler magnitude: 13.25. Transit SNR 8.45

There are 10 quarters with good PRF difference image offsets

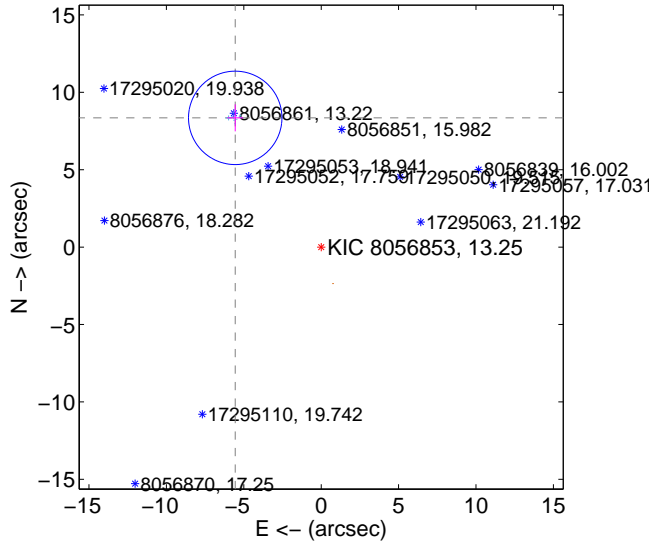
The direct PRF centroid is offset from the target star catalog position by about 1.23 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$7.780 \pm 0.985$	7.90	$3.732 \pm 0.505$	$6.826 \pm 0.853$
PRF-fit source offset from KIC position	$10.024 \pm 1.005$	9.97	$5.551 \pm 0.511$	$8.346 \pm 0.874$
photometric centroid source offset	$6.61 \pm 2.14$	3.09	$-2.37 \pm 1.47$	$6.17 \pm 2.22$

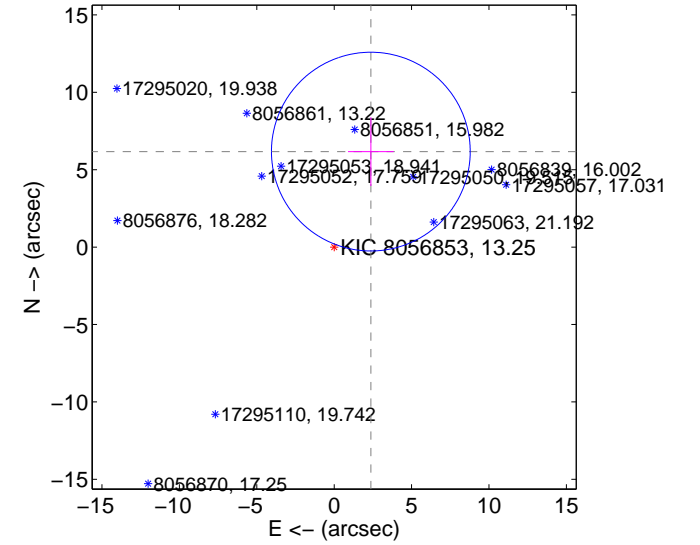
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

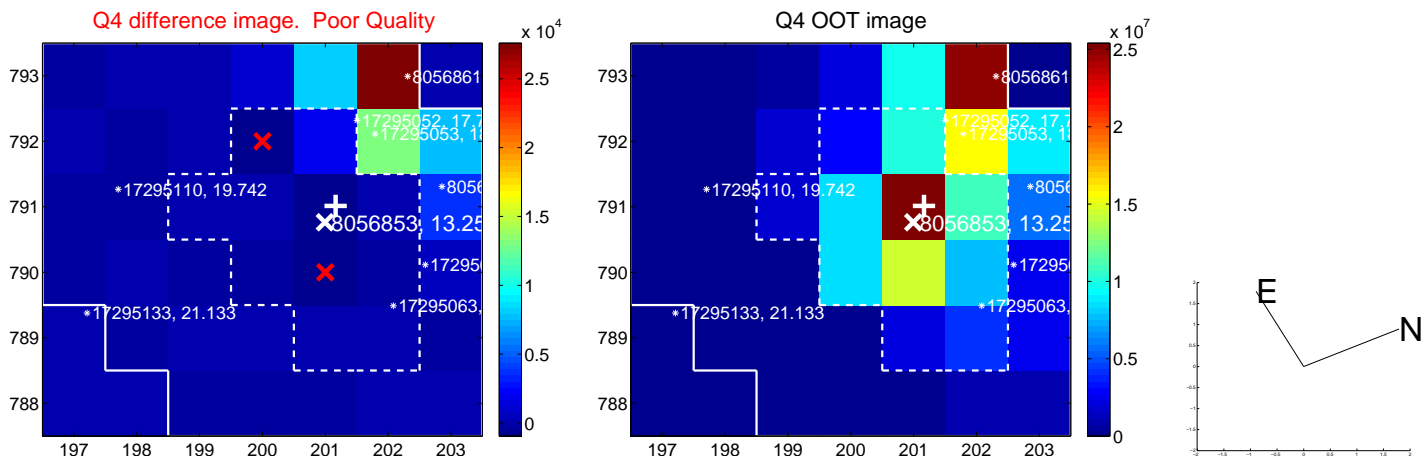
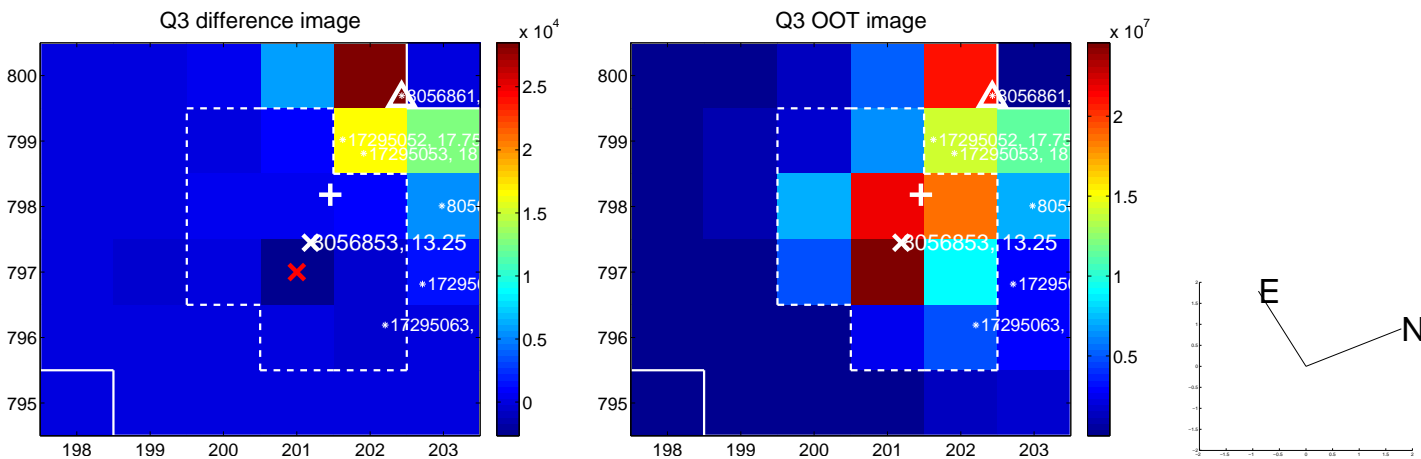
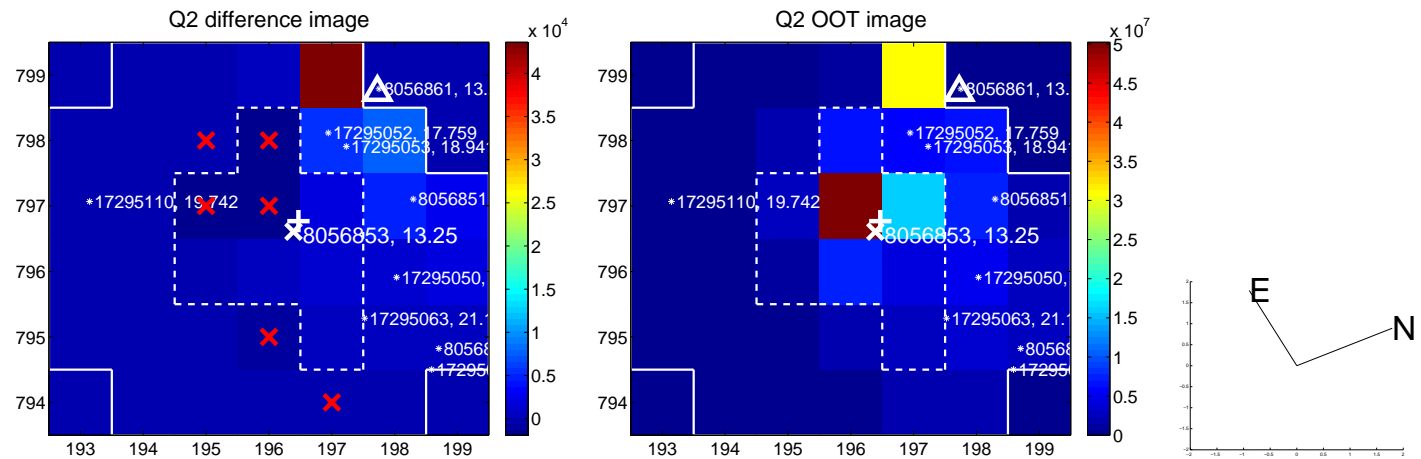
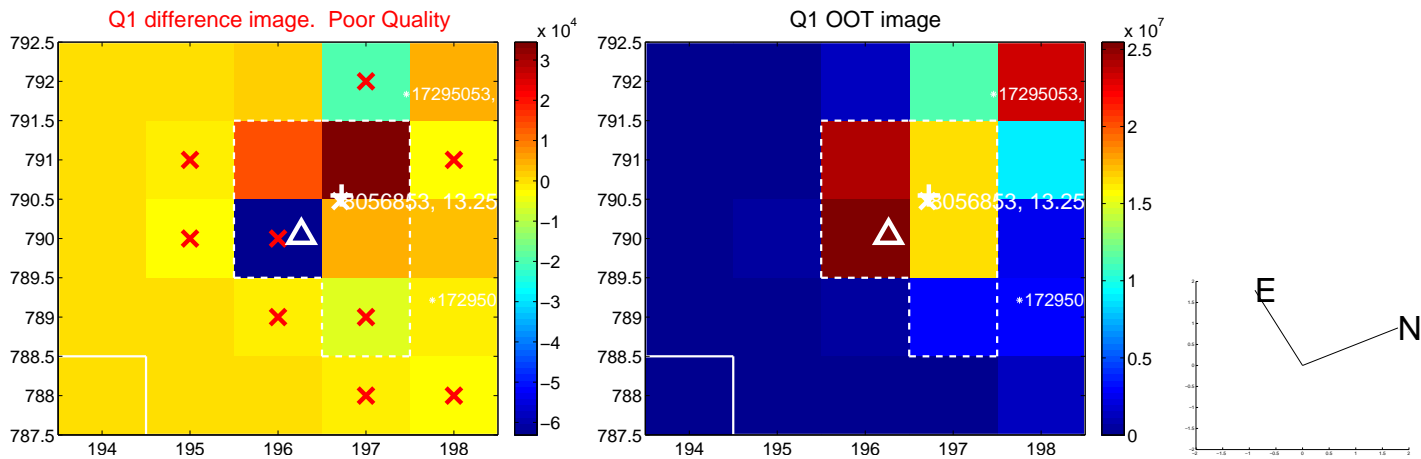


offset from photometric centroids

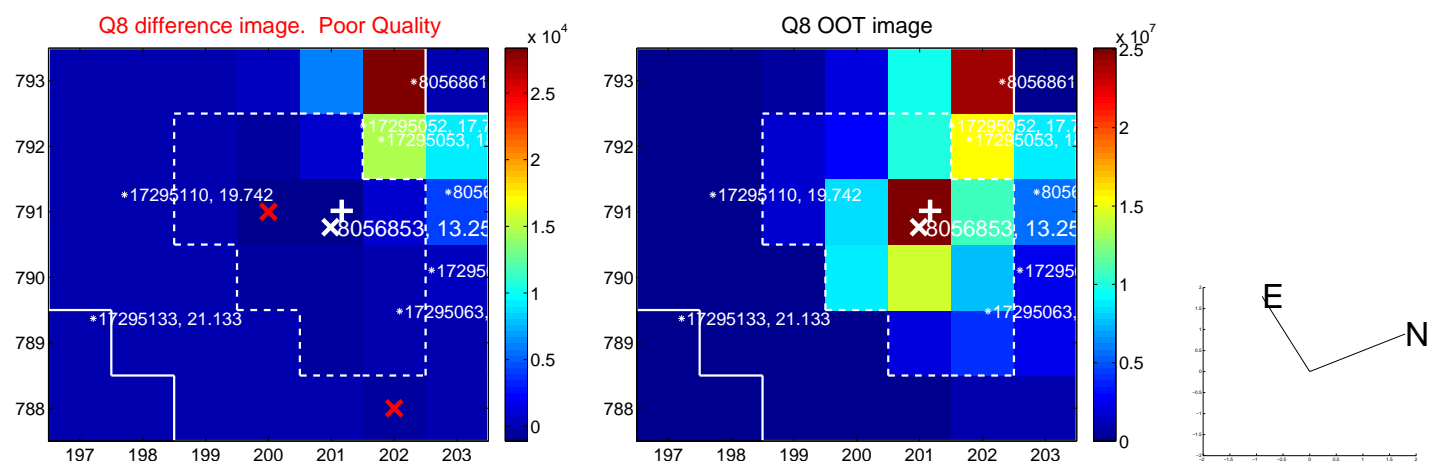
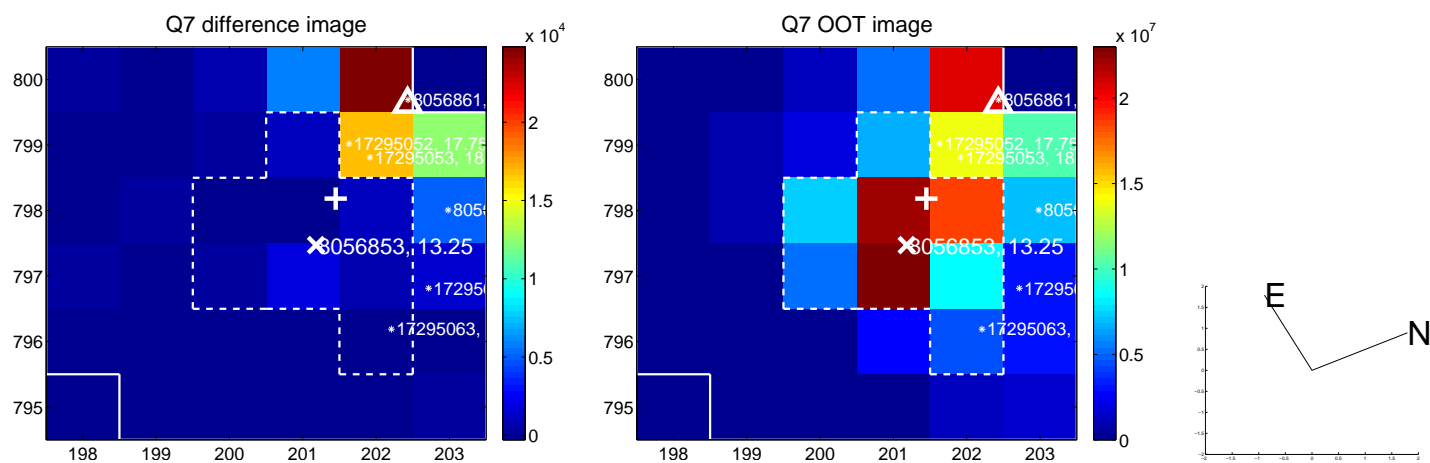
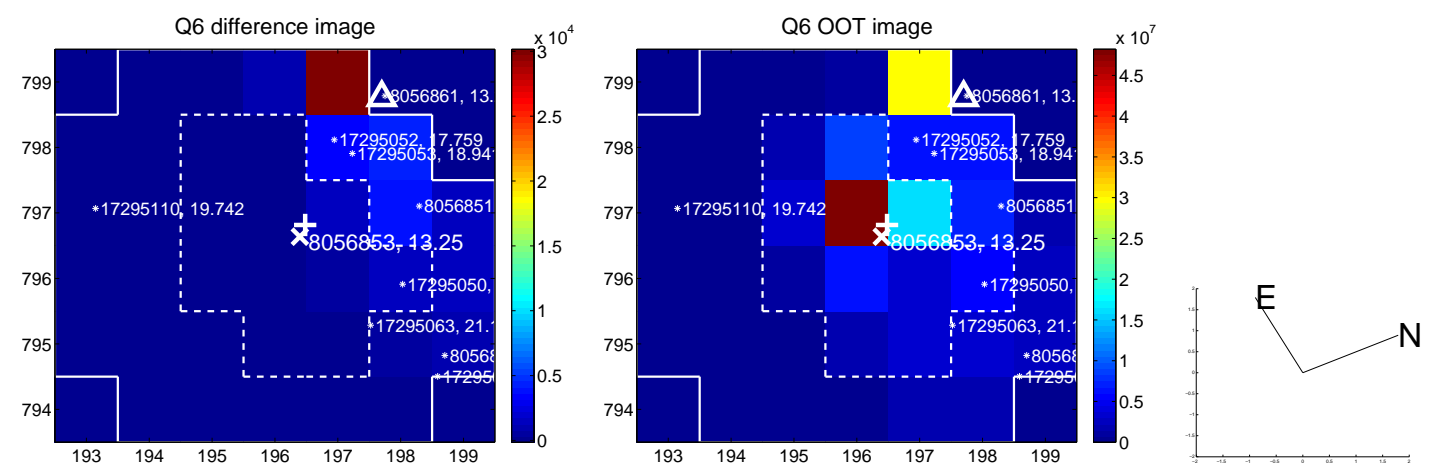
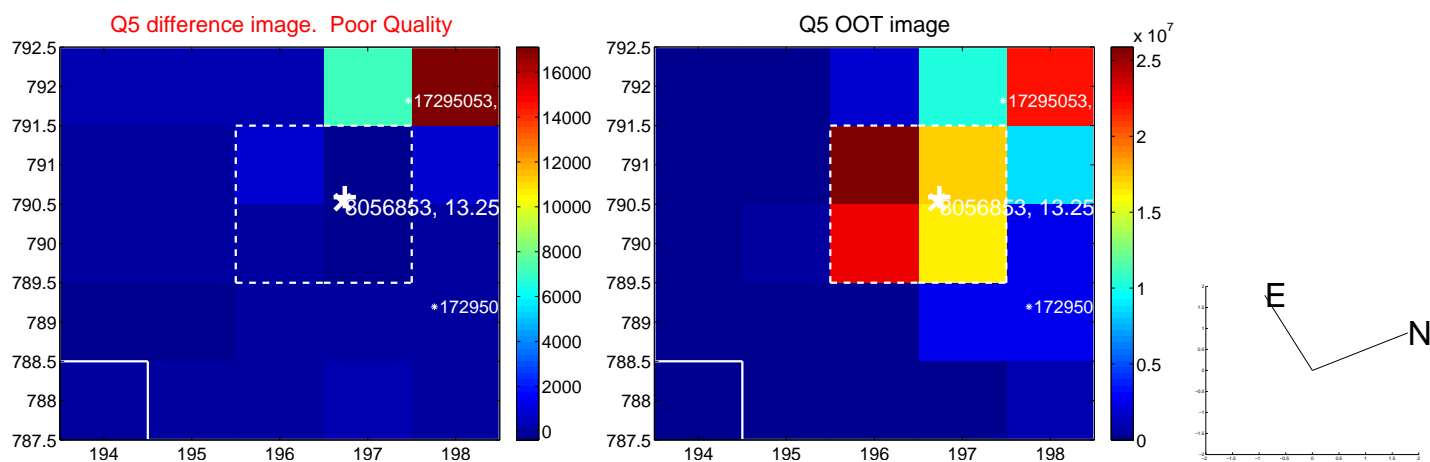


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

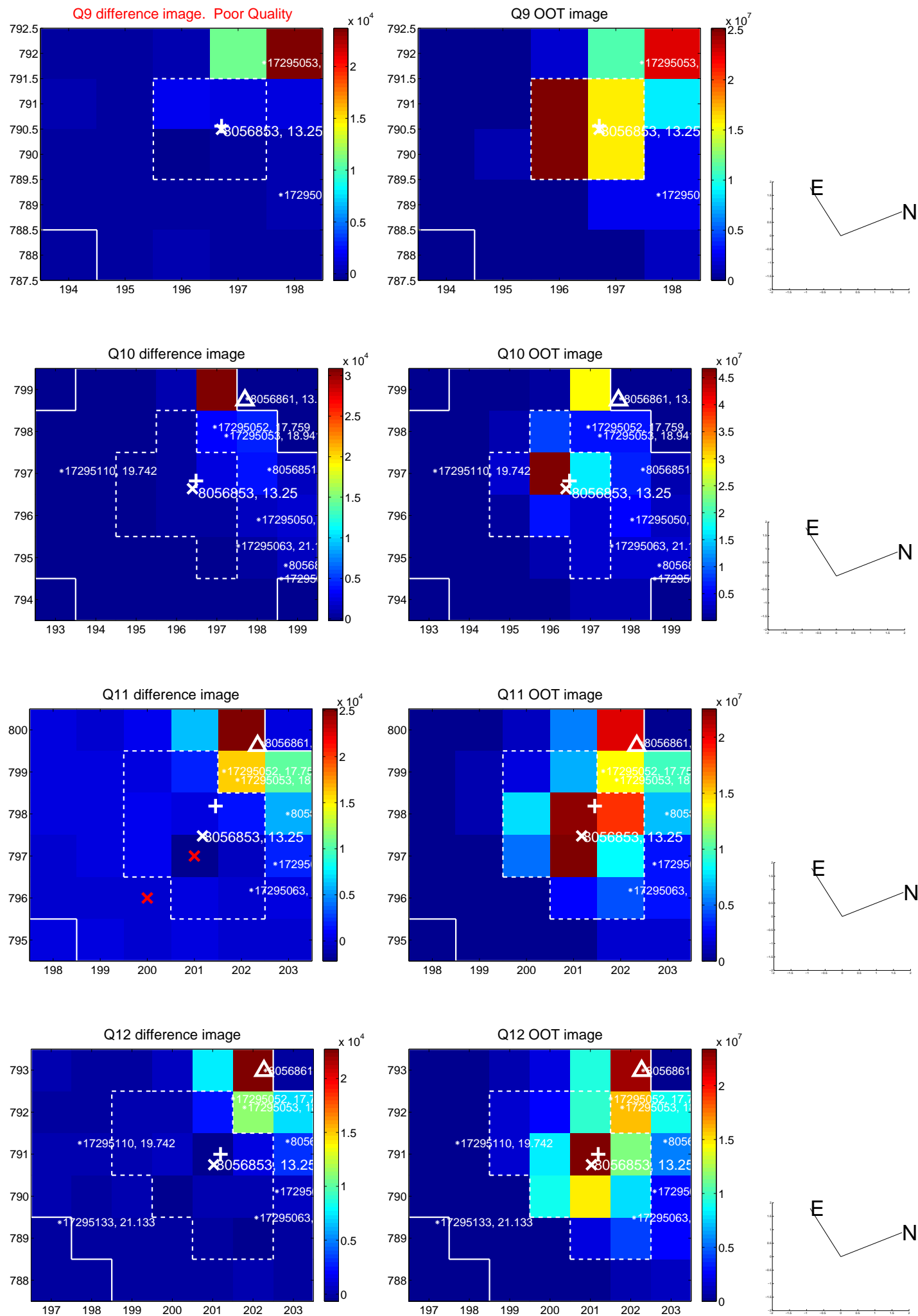


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

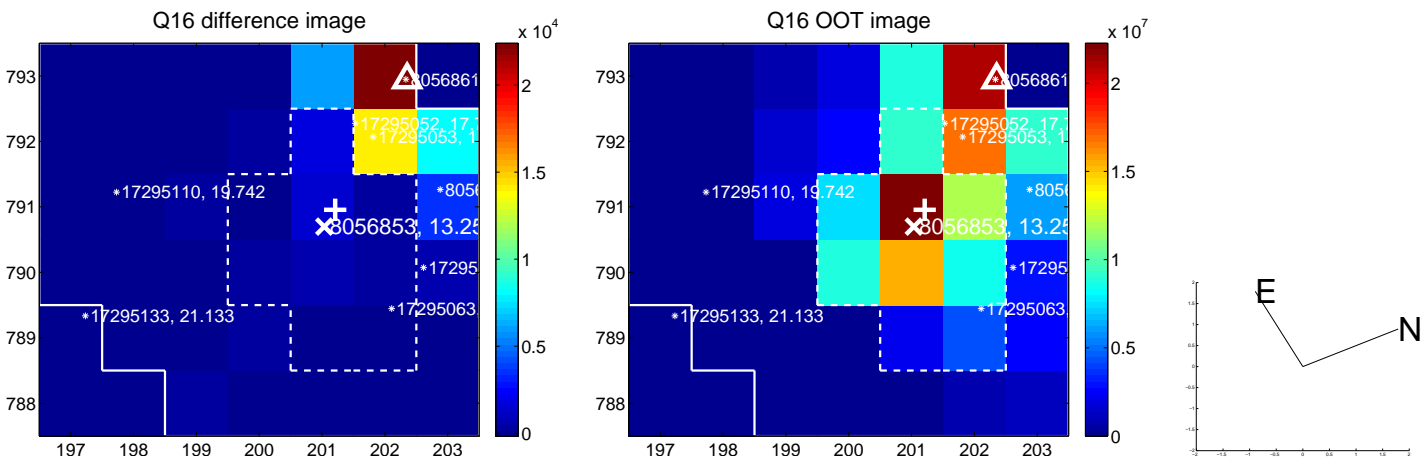
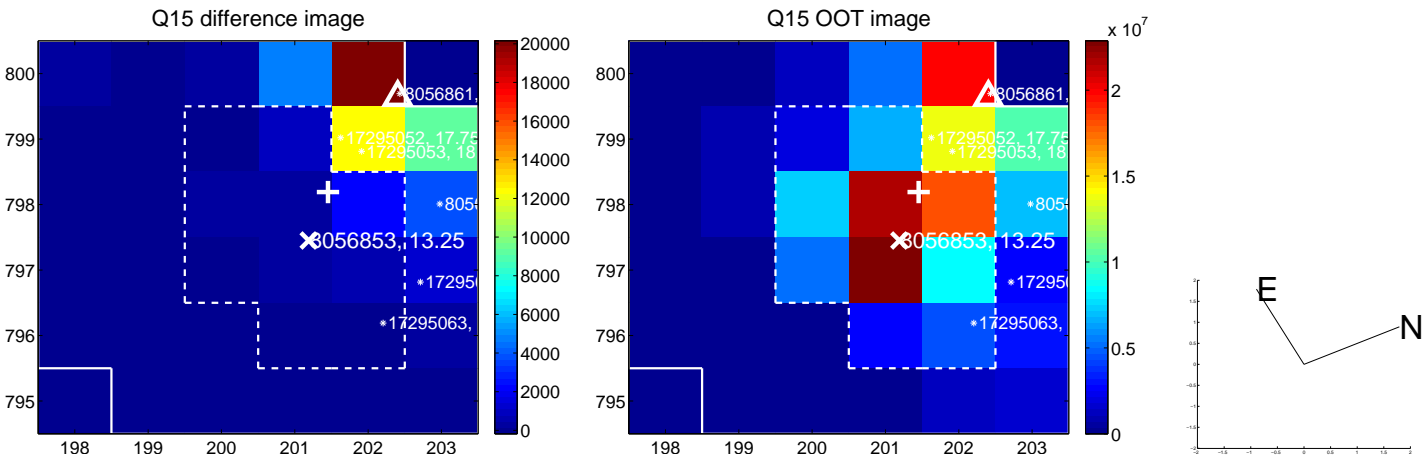
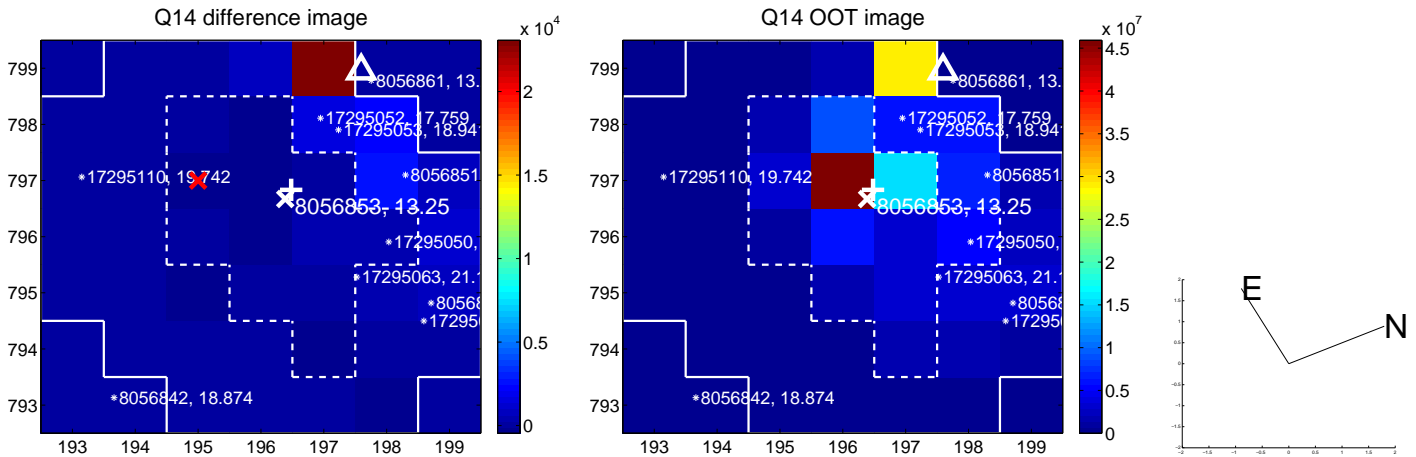
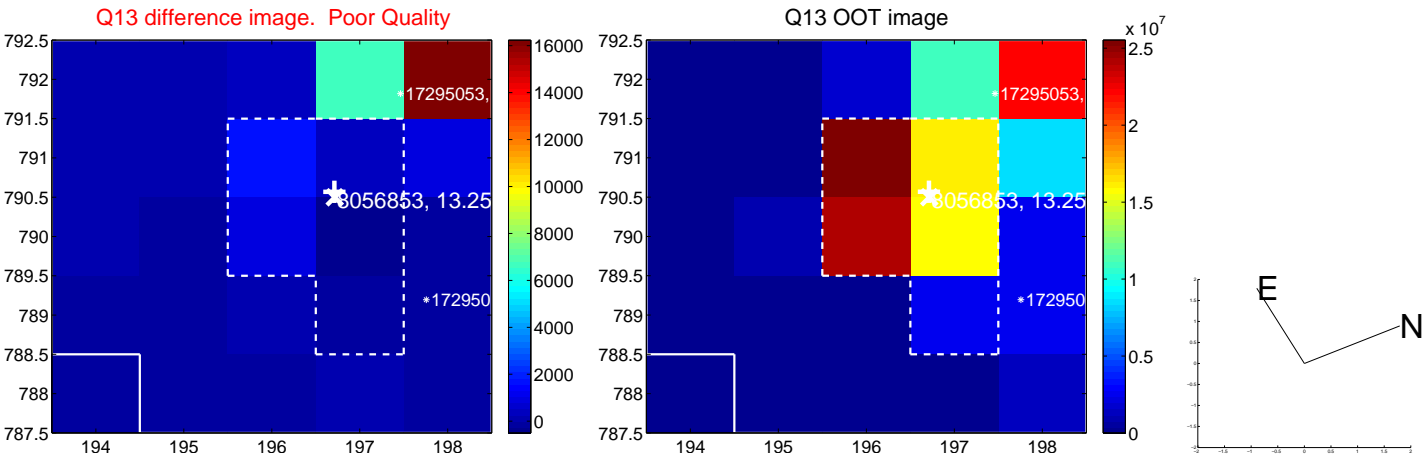




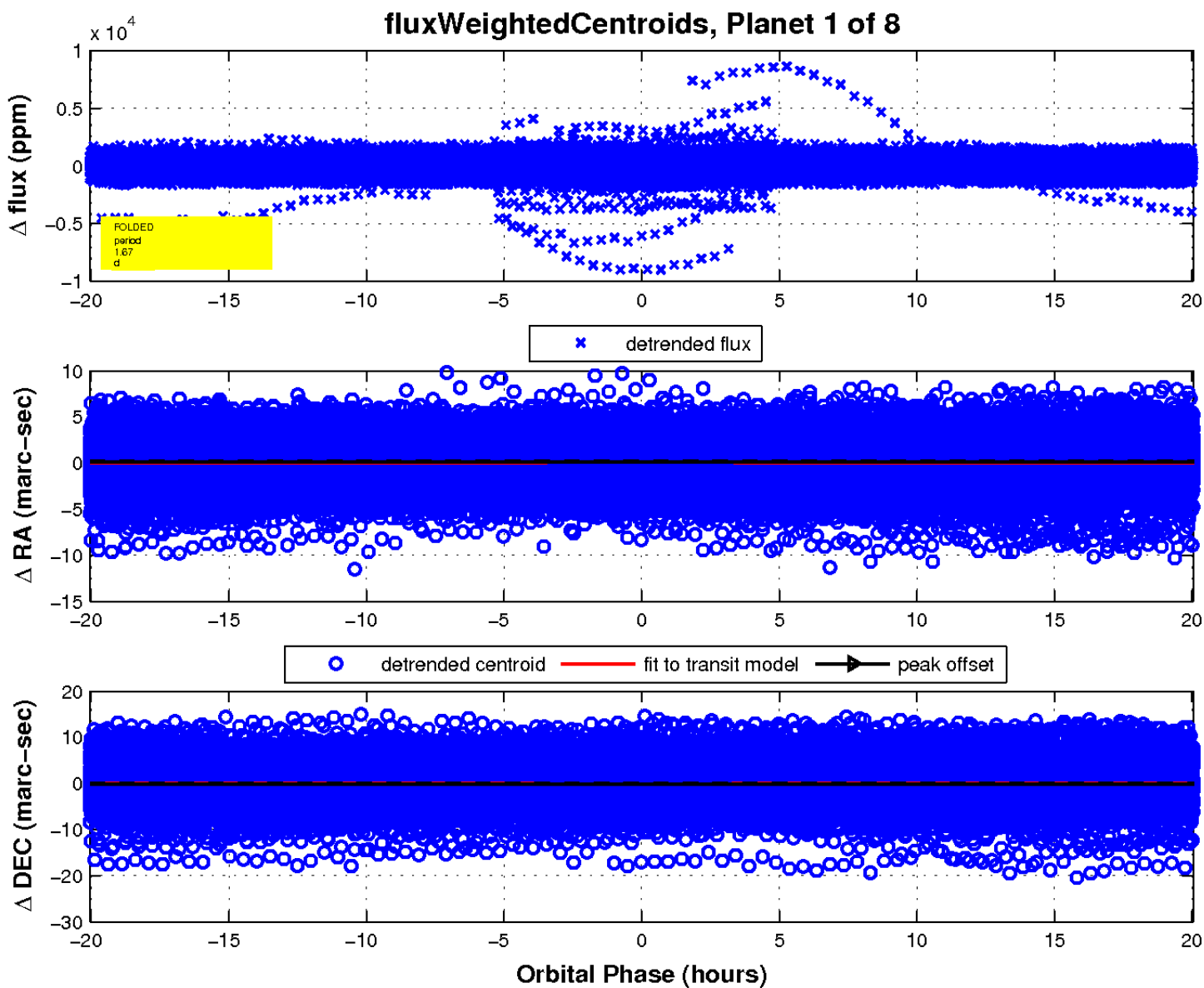
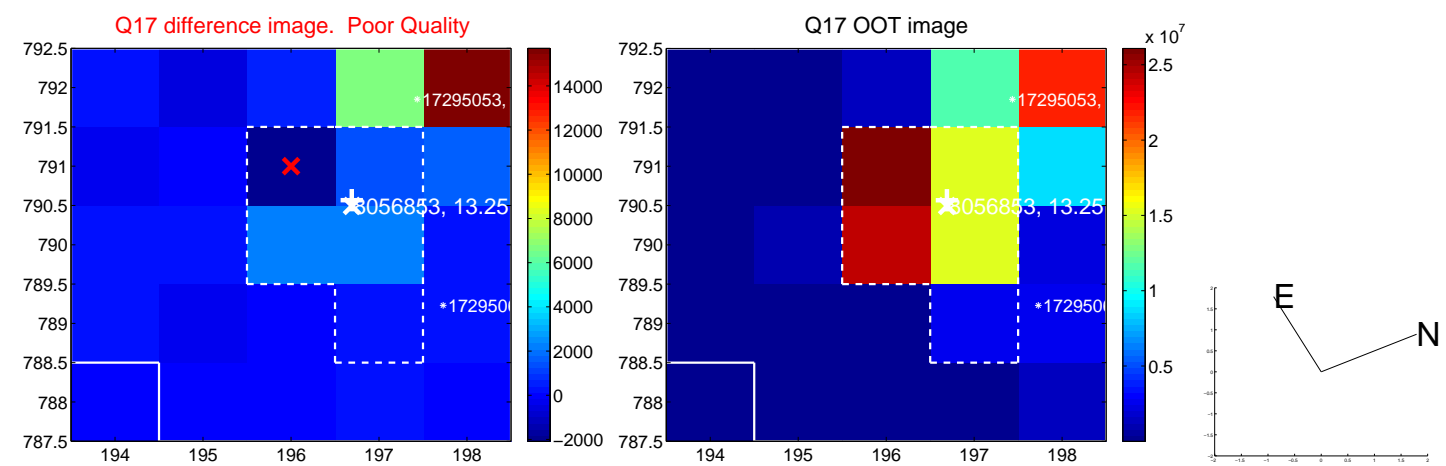
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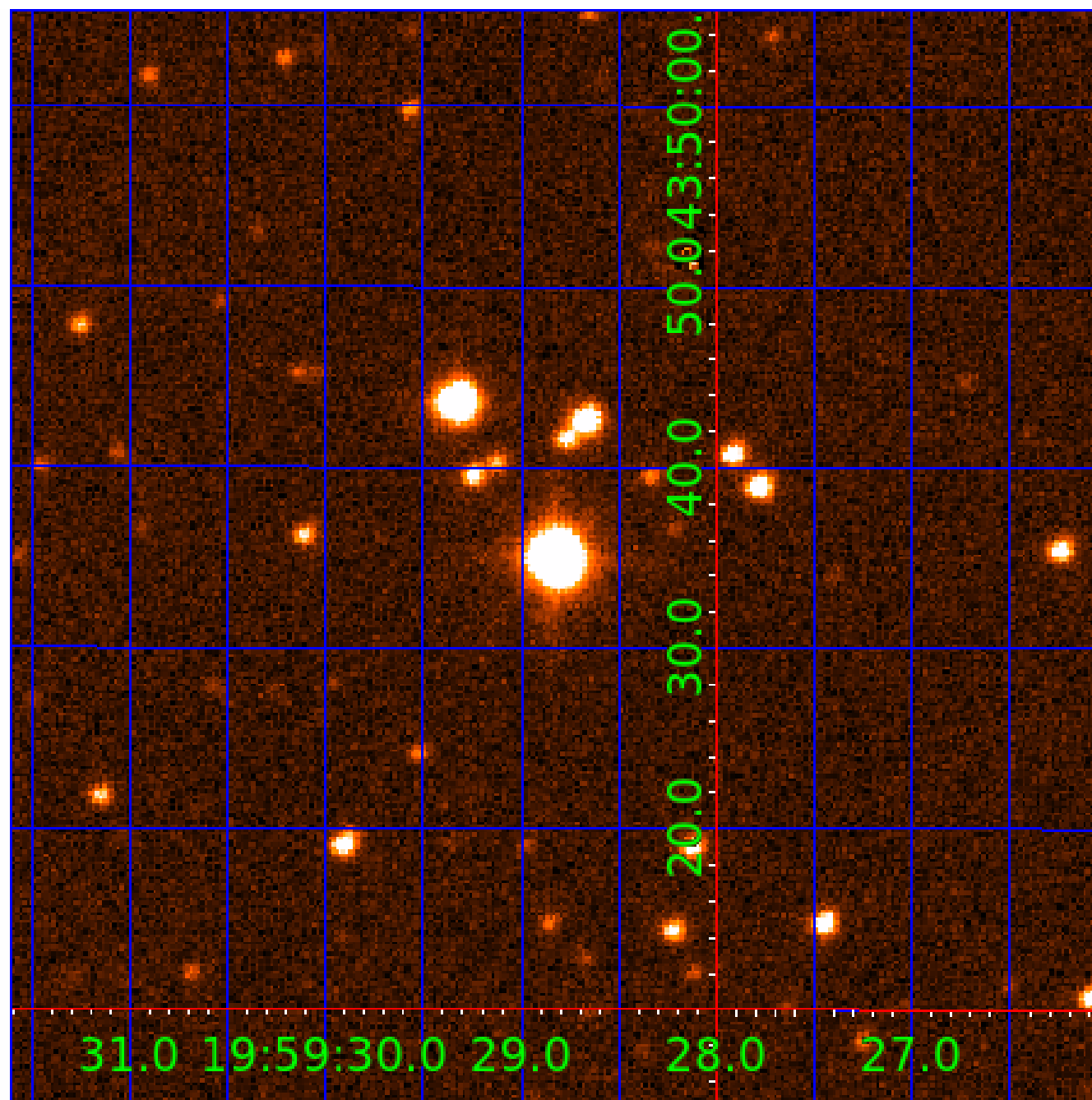


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 008056853

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008056853-01	OBS	No	1.670864	133.104151	34.4	7.258	8.9	8.5	0.71	4429	0.52	290.52
008056853-02	OBS	No	441.120466	437.809040	721.6	9.251	15.6	9.3	0.71	4429	2.12	0.17
008056853-03	OBS	No	305.585951	428.199935	507.1	9.374	13.3	5.9	0.71	4429	1.76	0.28
008056853-04	OBS	No	225.156248	190.548826	394.0	9.364	12.5	5.4	0.71	4429	1.60	0.42
008056853-05	OBS	No	307.907910	162.825072	223.0	9.419	11.8	2.5	0.71	4429	1.27	0.28
008056853-06	OBS	No	213.561669	282.933930	79.6	7.168	12.4	1.3	0.71	4429	0.78	0.45
008056853-07	OBS	No	192.807309	132.044532	1526.7	33.730	13.2	8.1	0.71	4429	5.71	0.52
008056853-08	OBS	No	352.018673	141.049465	129.7	2.288	9.0	1.6	0.71	4429	1.02	0.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008056853-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008056853-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008056853-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008056853-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—CENT_KIC_POS
008056853-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET
008056853-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

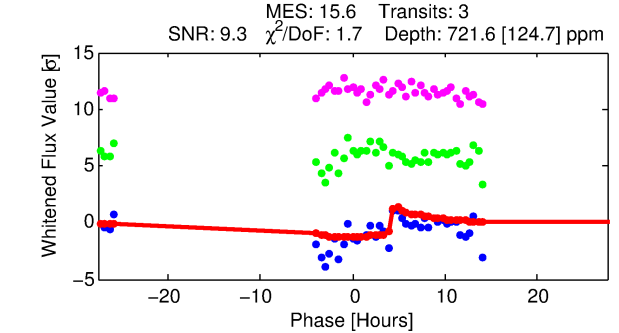
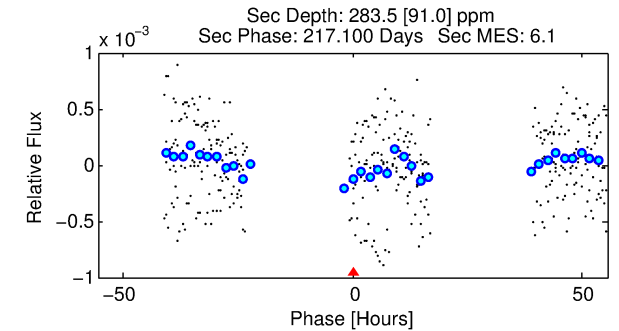
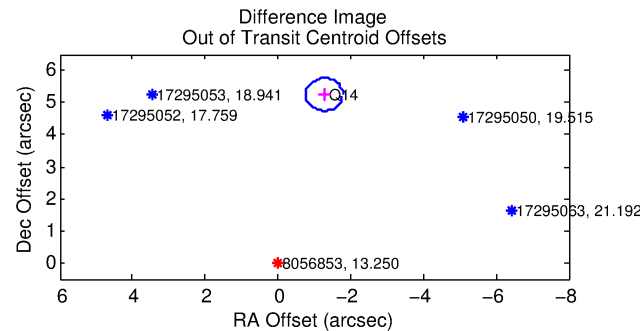
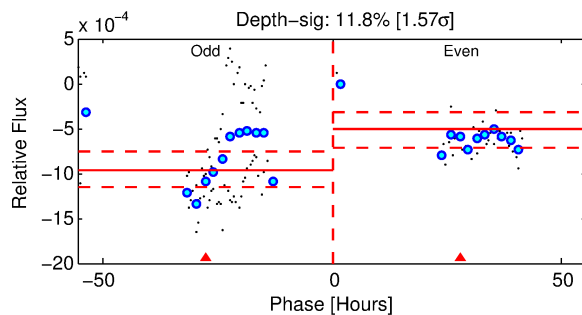
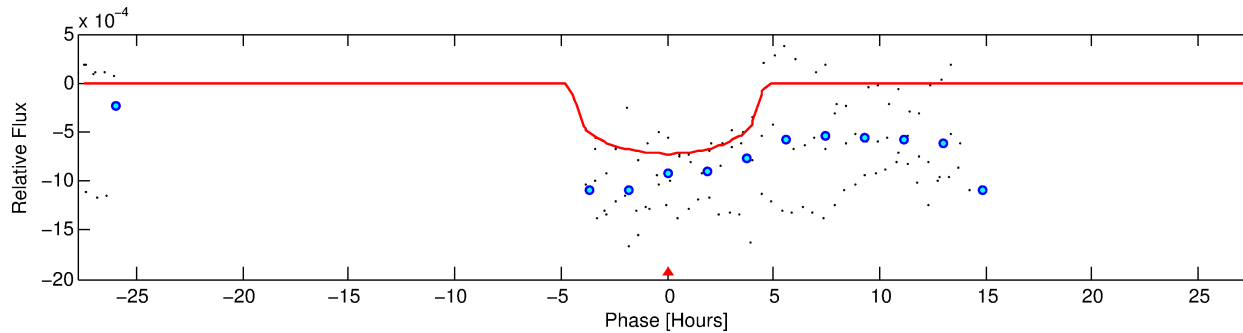
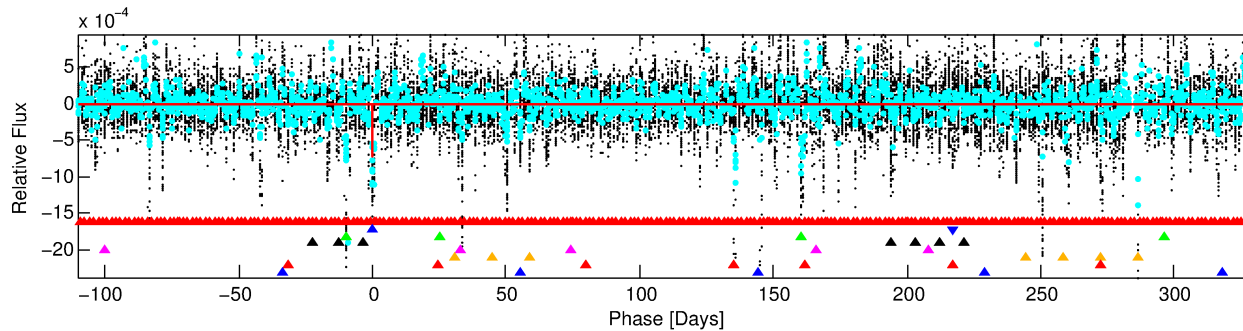
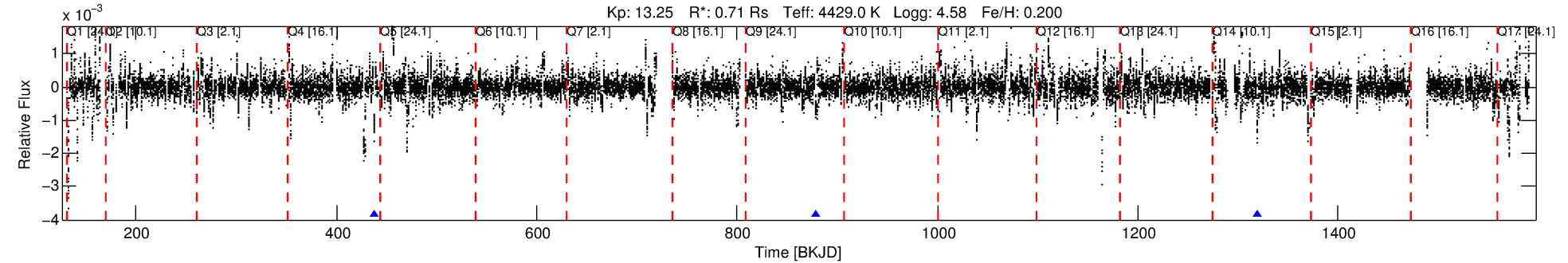
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008056853-02

No Significant Match Found

# DV One-Page Summary

KIC: 8056853 Candidate: 2 of 8 Period: 441.120 d



## DV Fit Results:

Period = 441.12047 [0.01099] d  
Epoch = 437.8090 [0.0360] BKJD  
Rp/R\* = 0.0273 [0.0093]  
a/R\* = 245.94 [261.59]  
b = 0.77 [0.50]  
Seff = 0.17 [0.03]  
Teq = 164 [6] K  
Rp = 2.12 [0.74] Re  
a = 1.0094 [0.0688] AU  
Ag = 35286.50 [26733.47] [1.32 $\sigma$ ]  
Teffp = 3477 [661] K [5.01 $\sigma$ ]

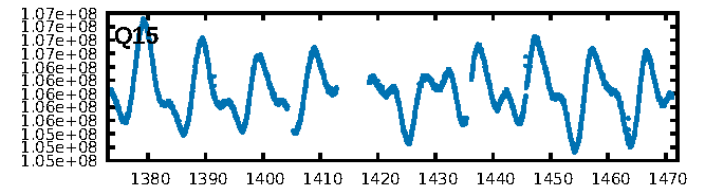
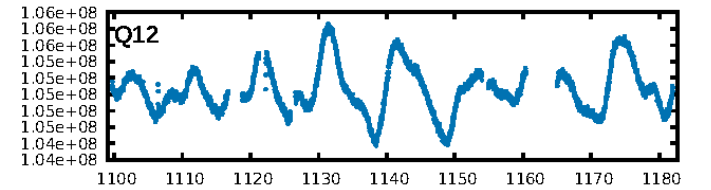
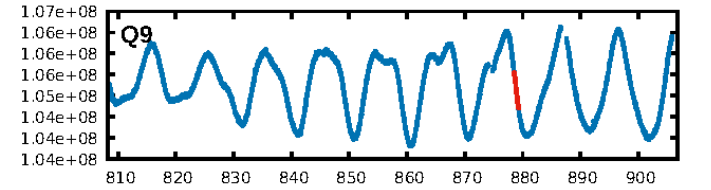
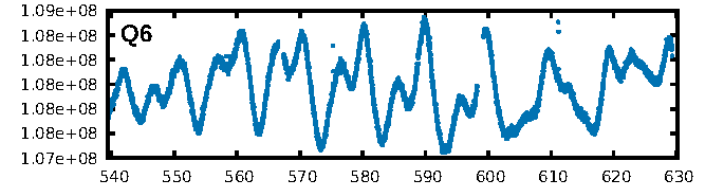
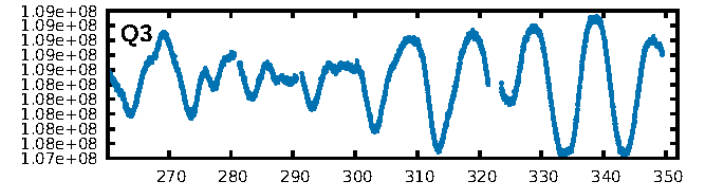
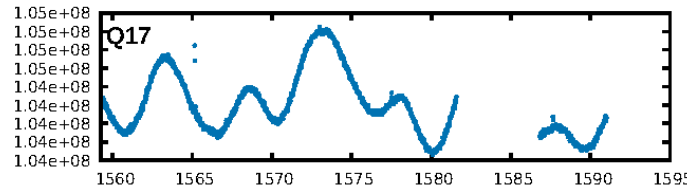
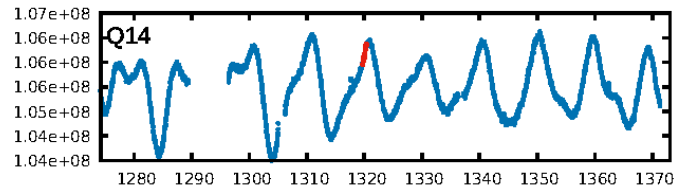
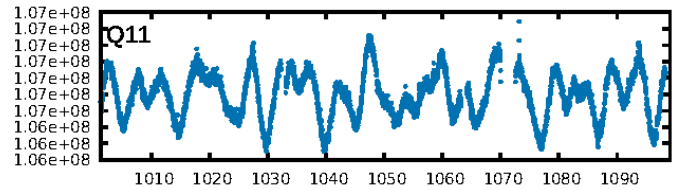
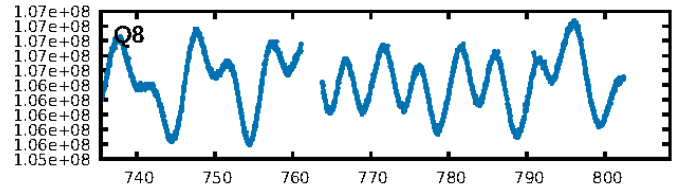
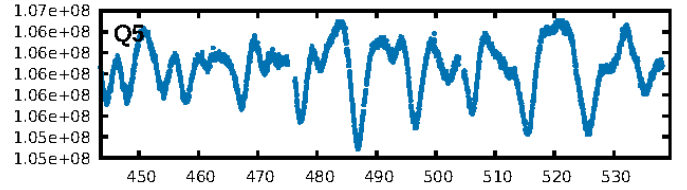
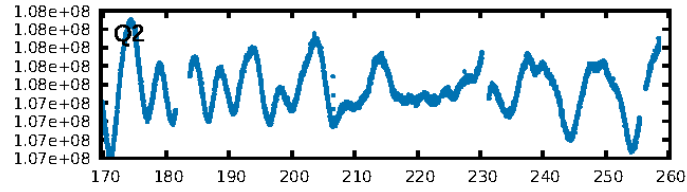
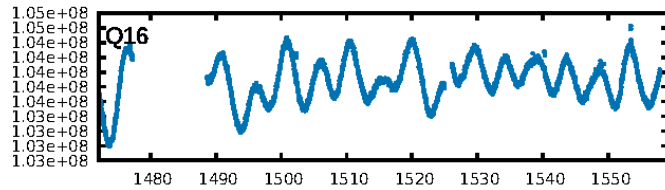
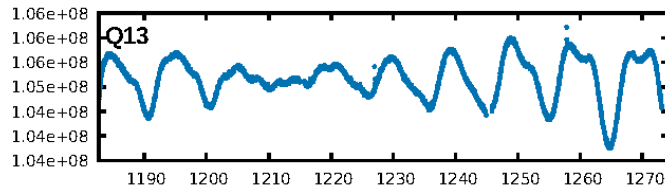
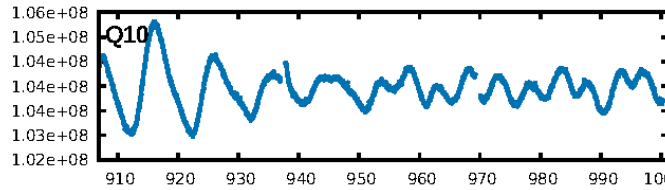
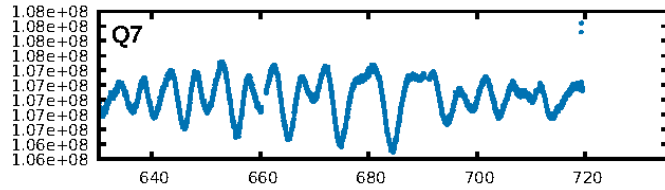
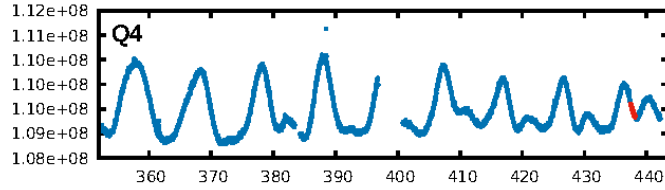
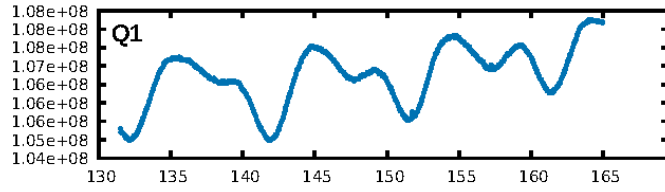
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [224.39 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 35.0%  
ModelChiSquareGof-sig: 22.9%  
Bootstrap-pfa: 1.02e-20  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.6596**  
Centroid-sig: 78.5%  
Centroid-so: 2.027 arcsec [1.20 $\sigma$ ]  
OotOffset-rm: 5.403 arcsec [31.85 $\sigma$ ]  
KicOffset-rm: 5.900 arcsec [34.74 $\sigma$ ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 0.00 [0/3]

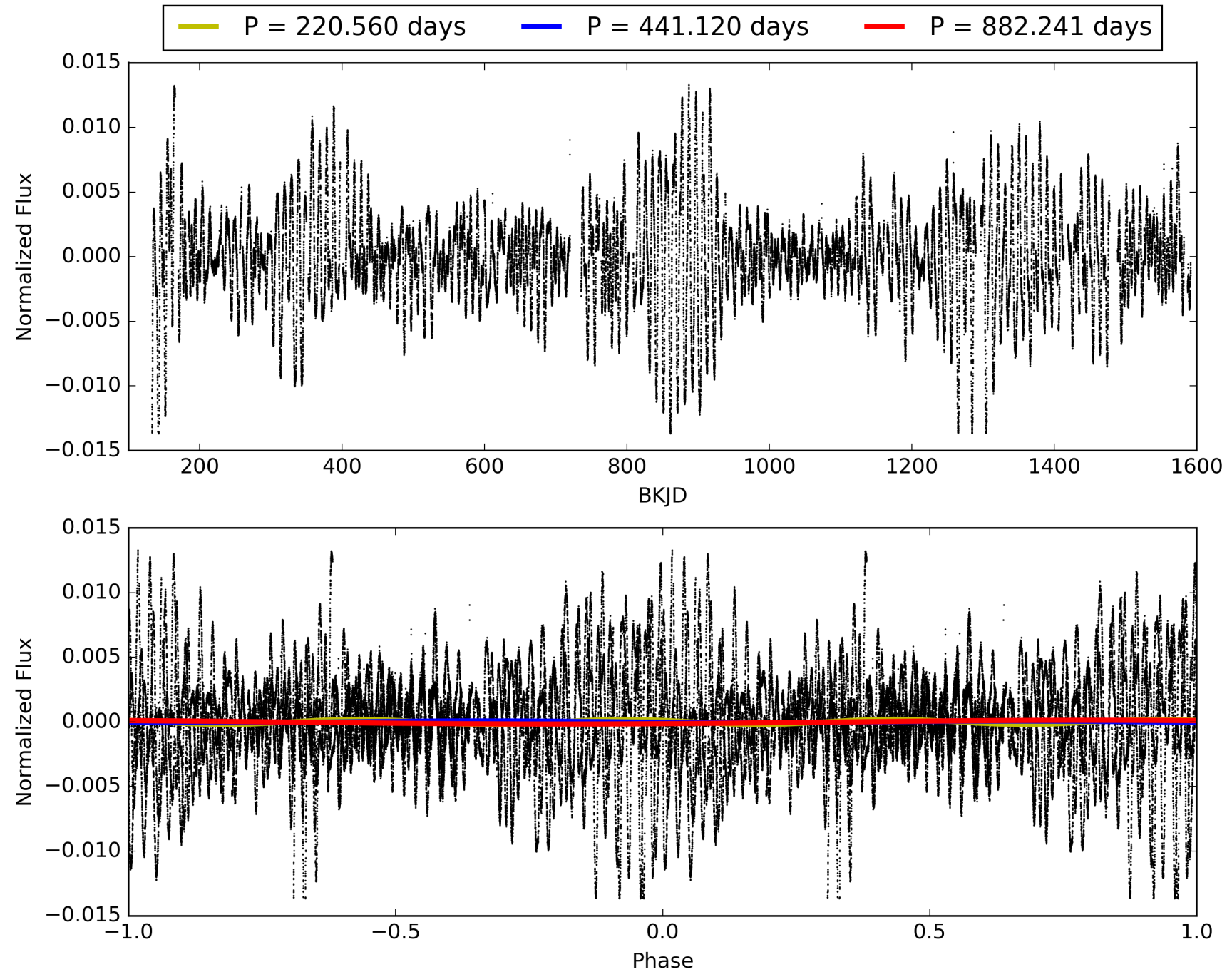
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:13:17 Z

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

# TCE 008056853-02, PDC Light Curves

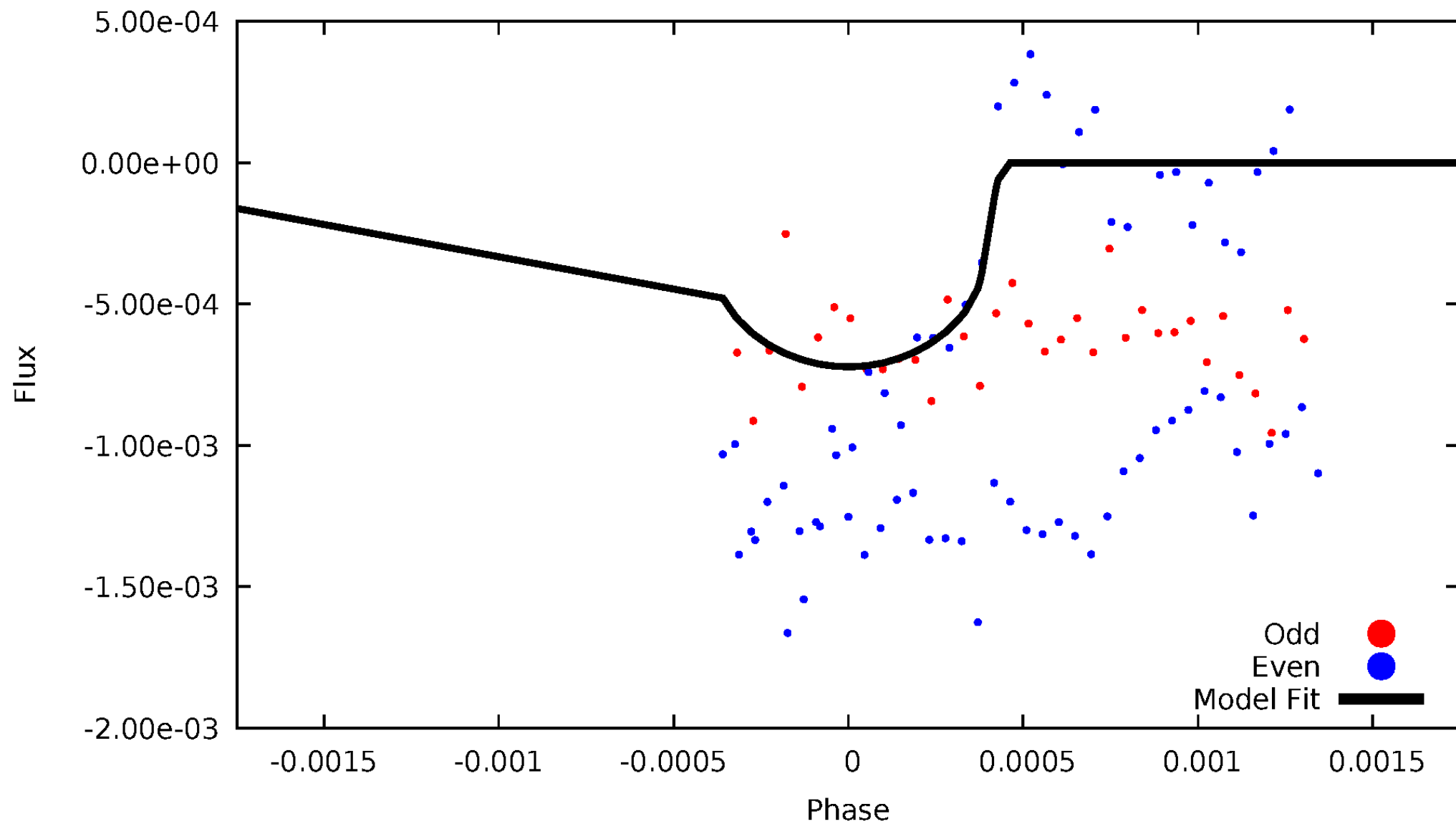


TCE 008056853-02



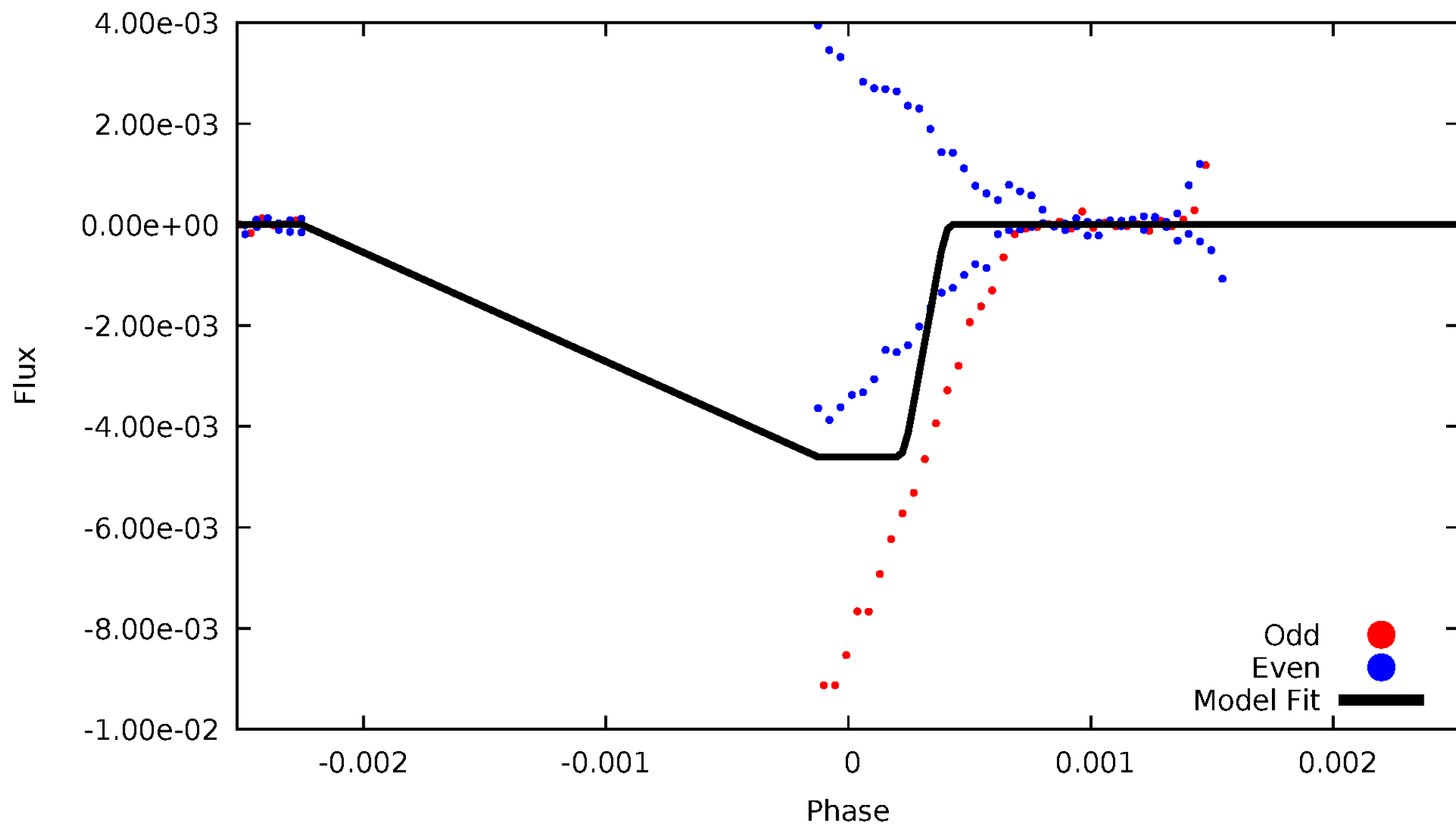
# DV Odd/Even

TCE 008056853-02



# ALT Odd/Even

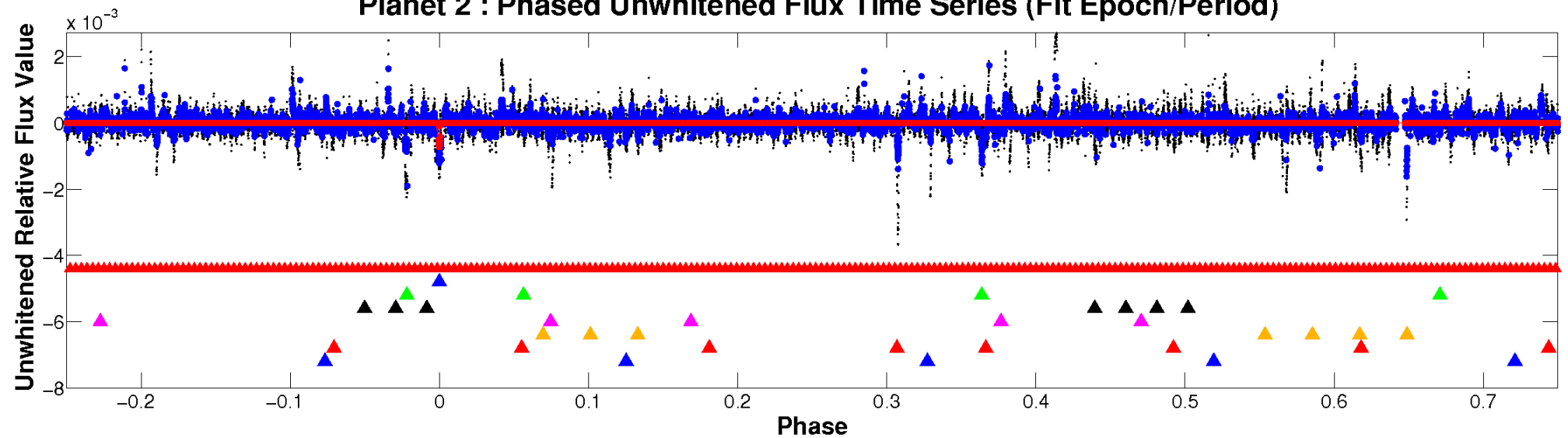
TCE 008056853-02



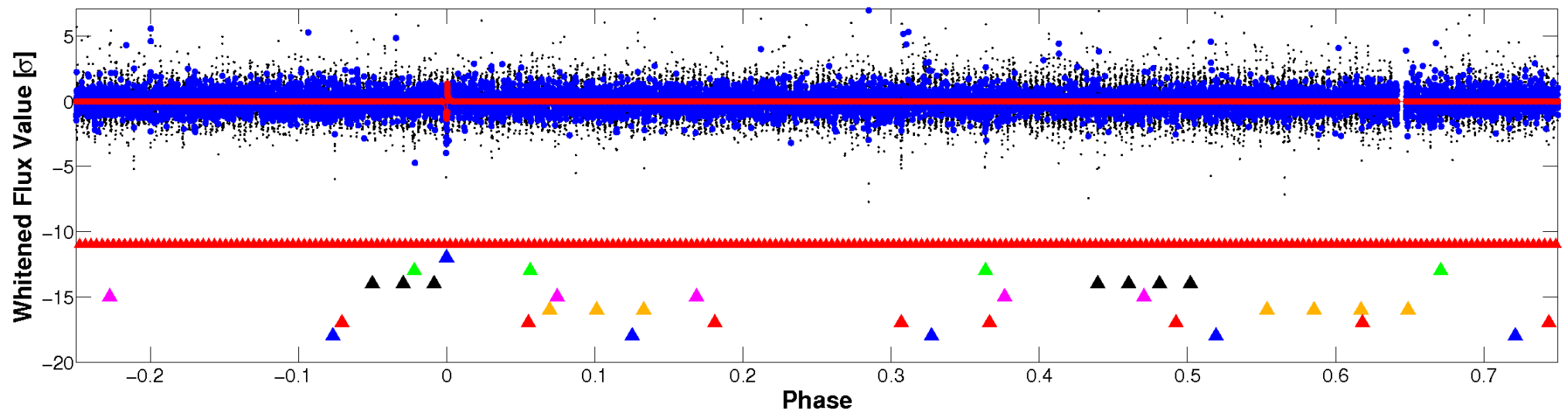


# Non-Whitened Vs. Whitened Light Curve

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

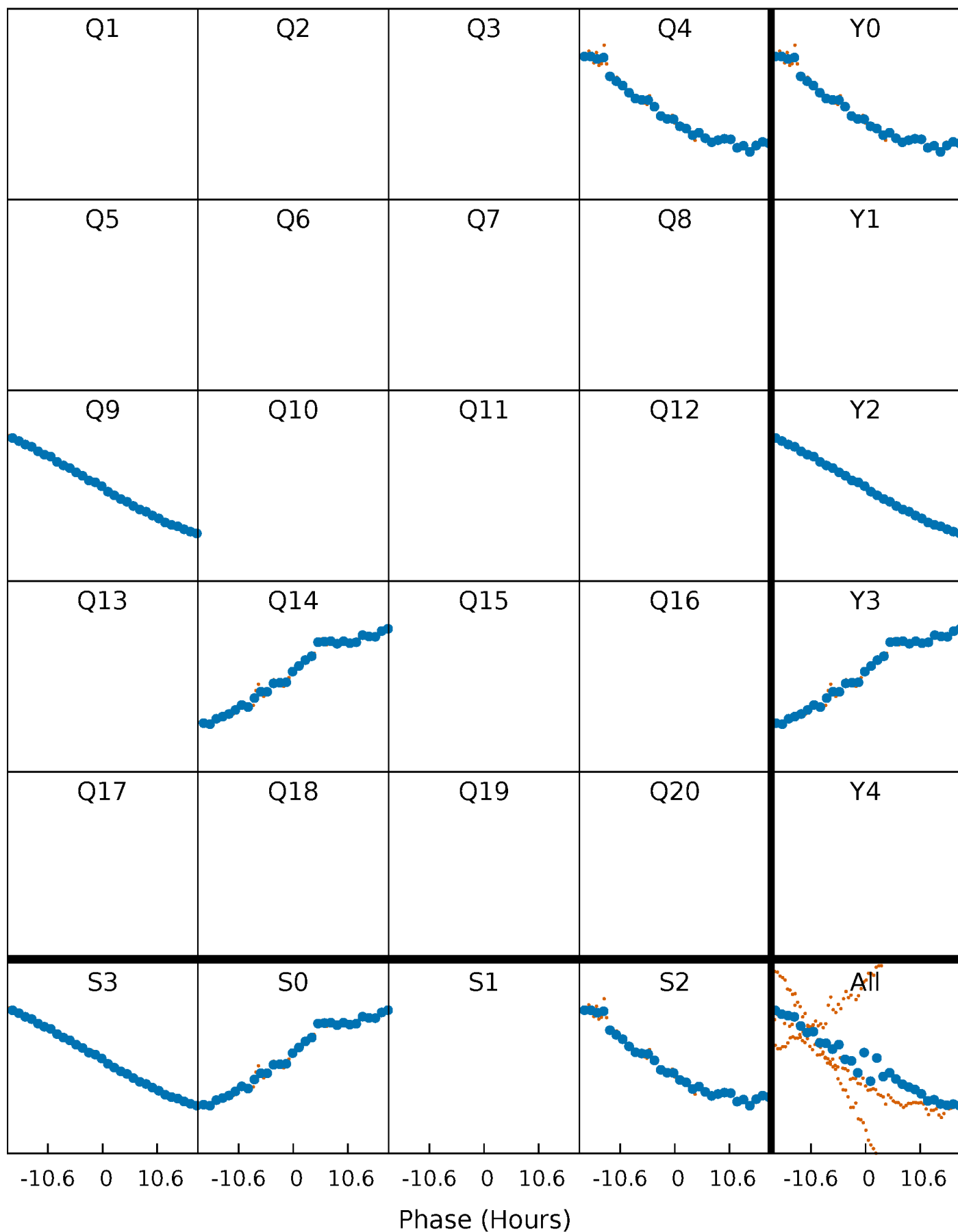


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



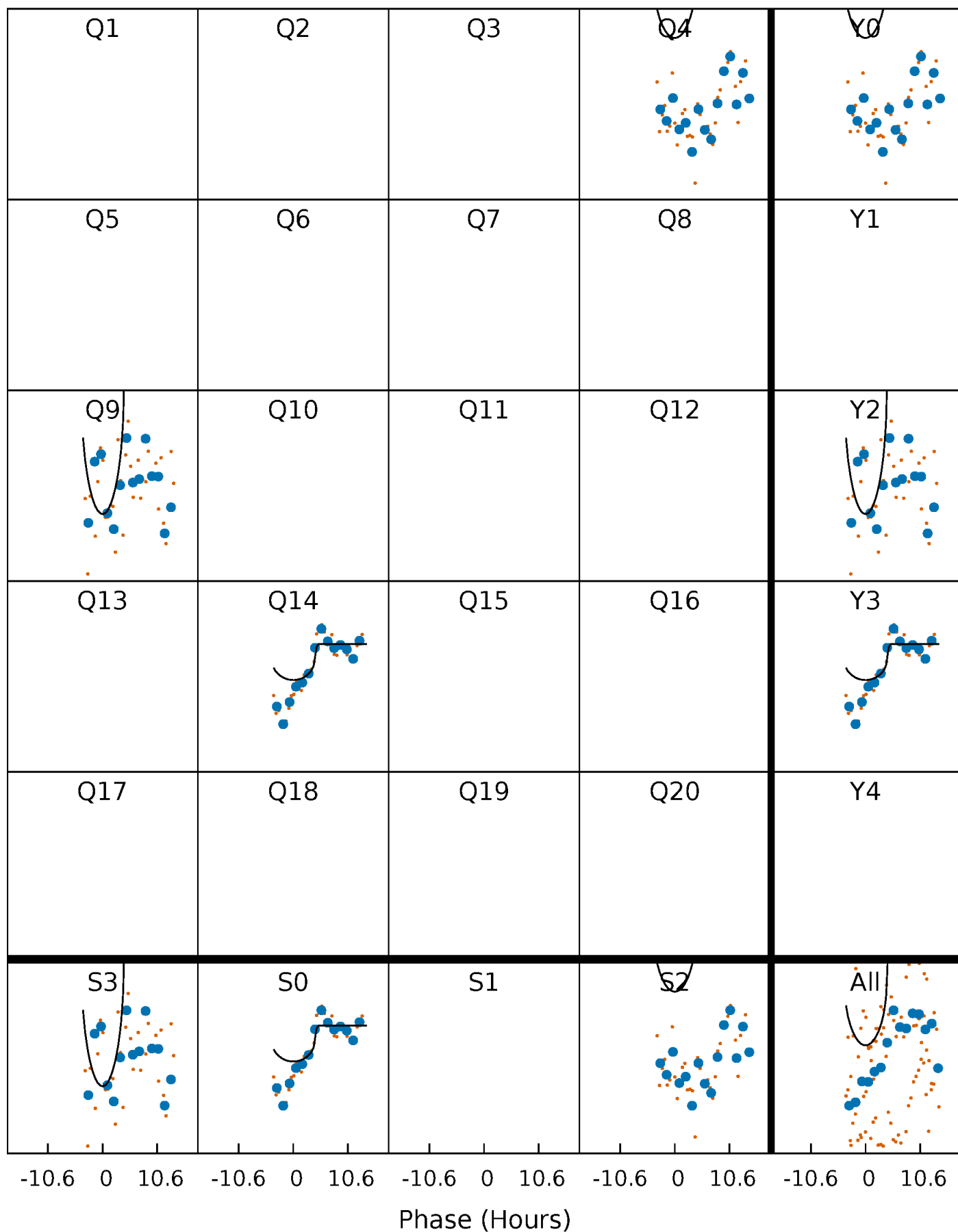
# PDC Quarter-Phased Transit Curves

TCE 008056853-02 P=441.120466 Days  $T_0=437.809040$  (BKJD)



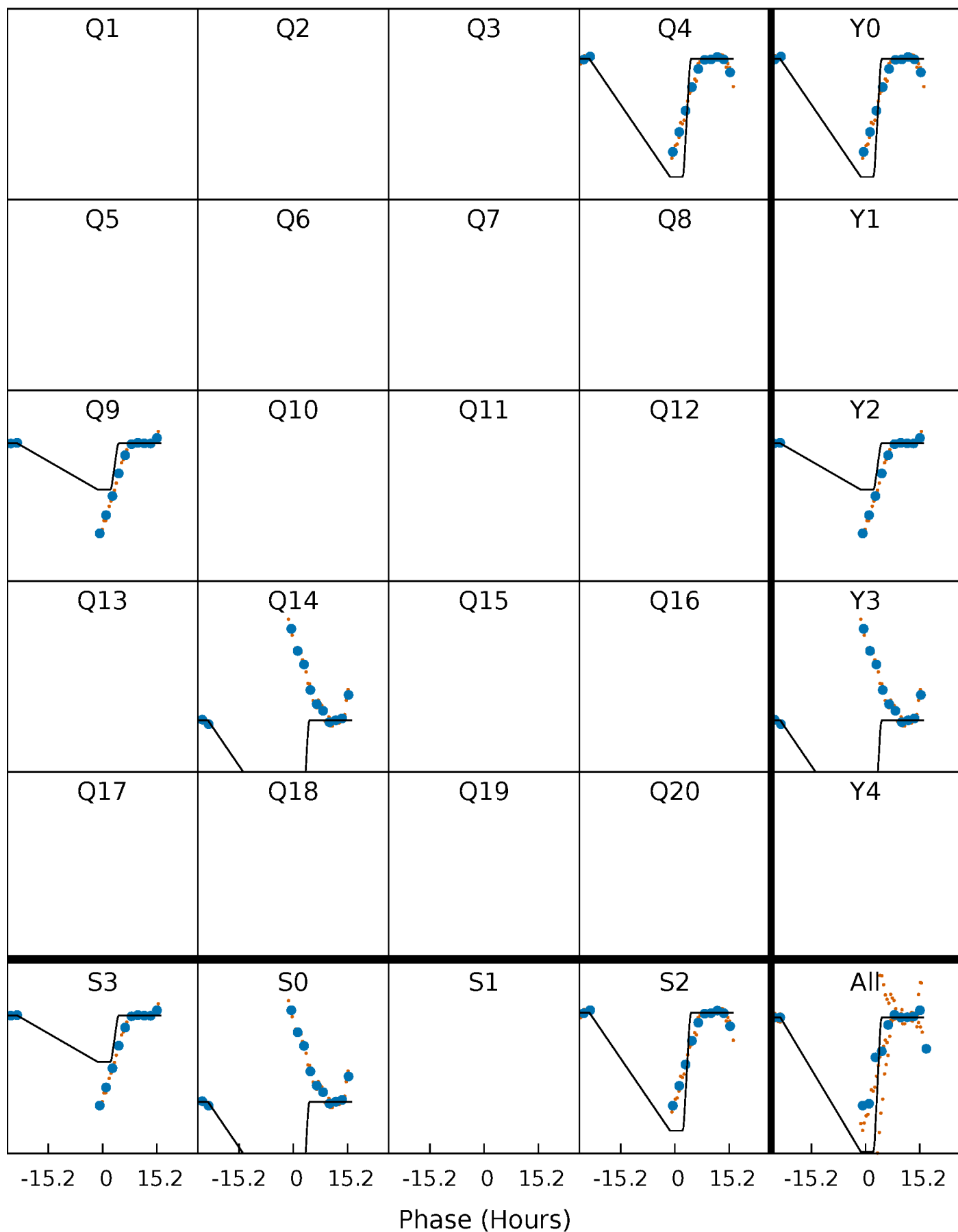
# DV Quarter-Phased Transit Curves

TCE 008056853-02 P=441.120466 Days  $T_0=437.809040$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

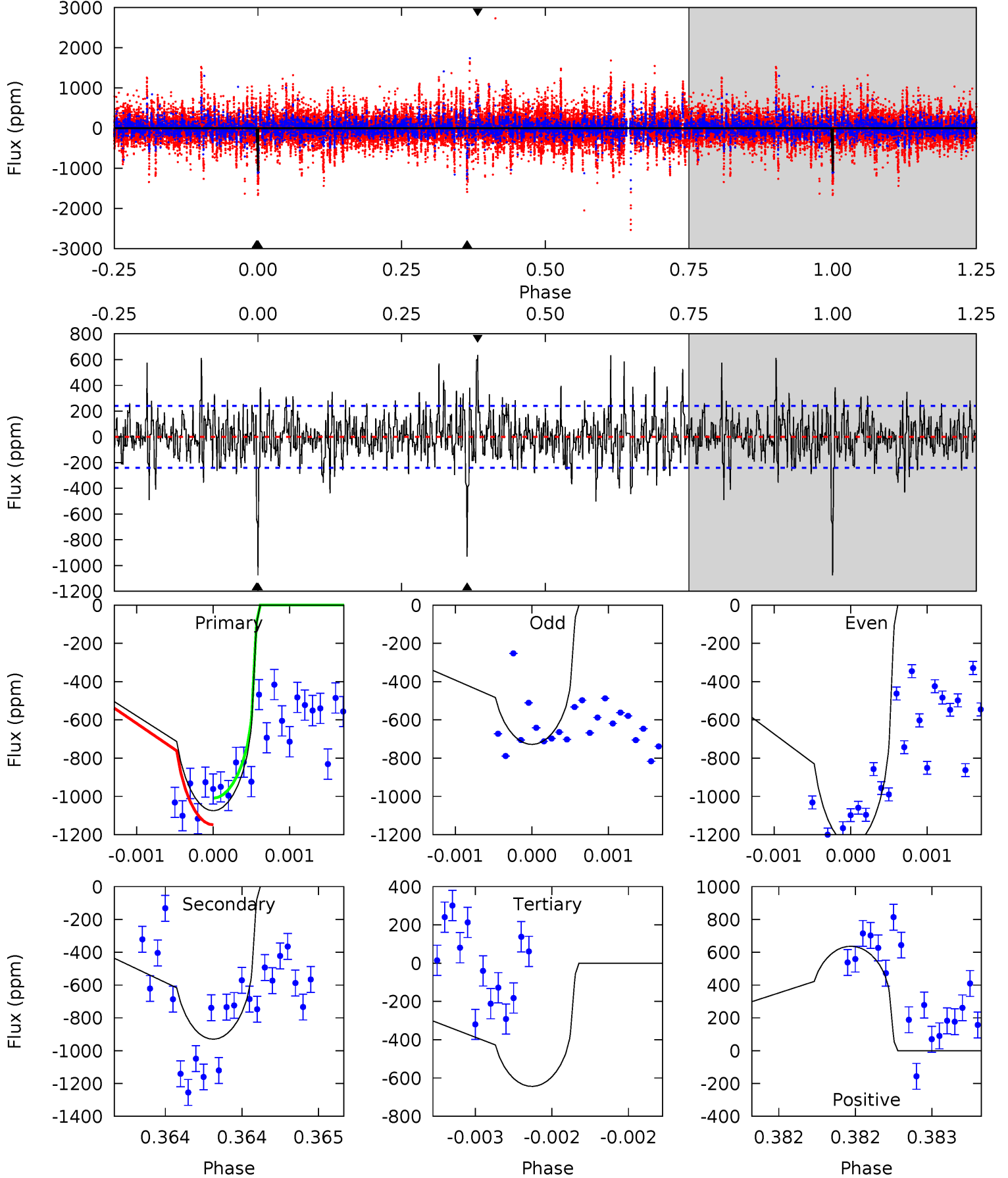
TCE 008056853-02 P=441.112882 Days  $T_0=437.720925$  (BKJD)



# DV Model-Shift Uniqueness Test

008056853-02, P = 441.120466 Days, E = 437.809040 Days

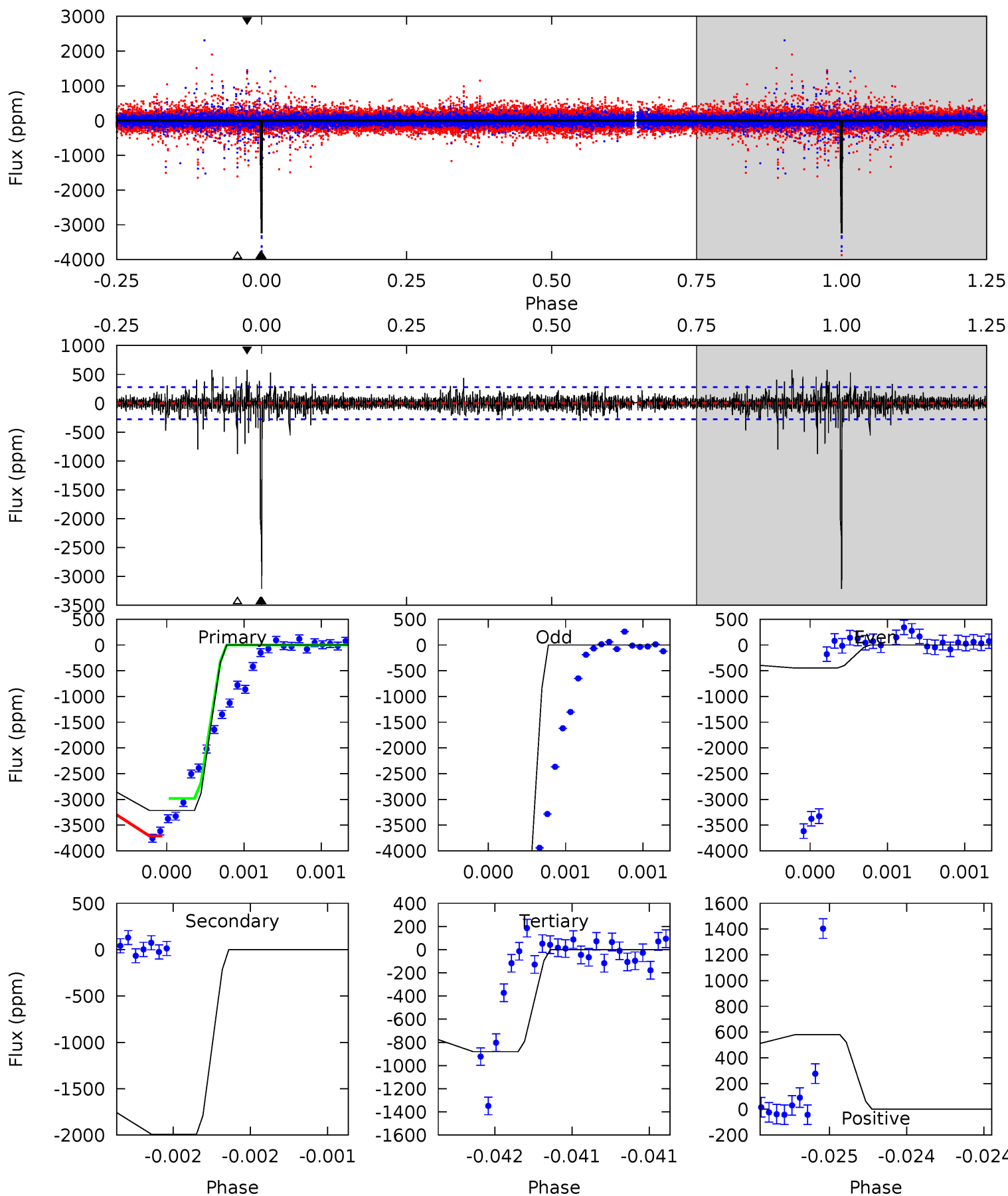
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
24.5	21.2	14.7	14.5	5.50	3.37	3.33	9.84	10.0	6.53	6.70	4.83	0.97	0.37	1.57



# Alt Model-Shift Uniqueness Test

008056853-02, P = 441.112882 Days, E = 437.720925 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
64.2	39.7	17.6	11.6	5.55	3.45	1.30	46.6	52.6	22.2	28.2	101.2	0.81	0.15	0



### Stellar Parameters For KIC 008056853

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4429^{+132}_{-132}$	$4.581^{+0.052}_{-0.016}$	$0.200^{+0.200}_{-0.300}$	$0.712^{+0.029}_{-0.059}$	$0.704^{+0.048}_{-0.054}$	$2.750^{+0.636}_{-0.220}$
	+3%/-3%	+1%/-0%	+100%/-150%	+4%/-8%	+7%/-8%	+23%/-8%
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 008056853-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-930 \pm 44$	$2.14^{+0.71}_{-0.73}$	$227^{+7}_{-7}$	$4581^{+882}_{-478}$	$116605^{+146741}_{-51462}$
Alt.	$-1991 \pm 50$	$5.22^{+0.75}_{-0.77}$	$227^{+7}_{-7}$	$3812^{+226}_{-198}$	$41565^{+15153}_{-9646}$

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



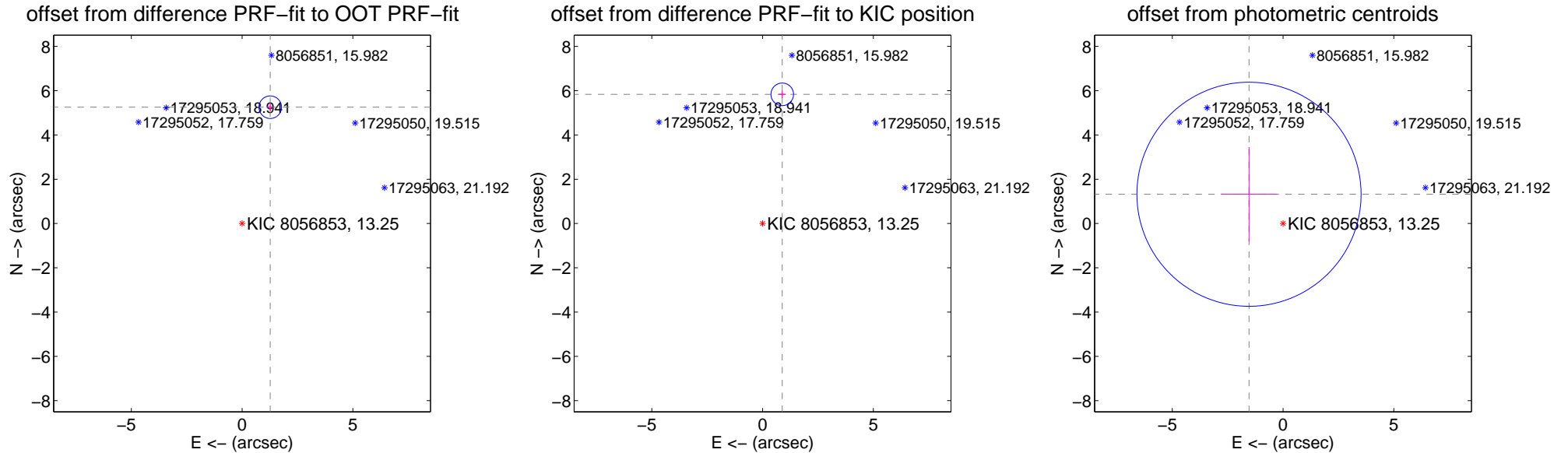
## DV Centroid Data

Supplemental centroid analysis for 008056853-02. Kepler magnitude: 13.25. Transit SNR 9.27

There are 0 quarters with good PRF difference image offsets

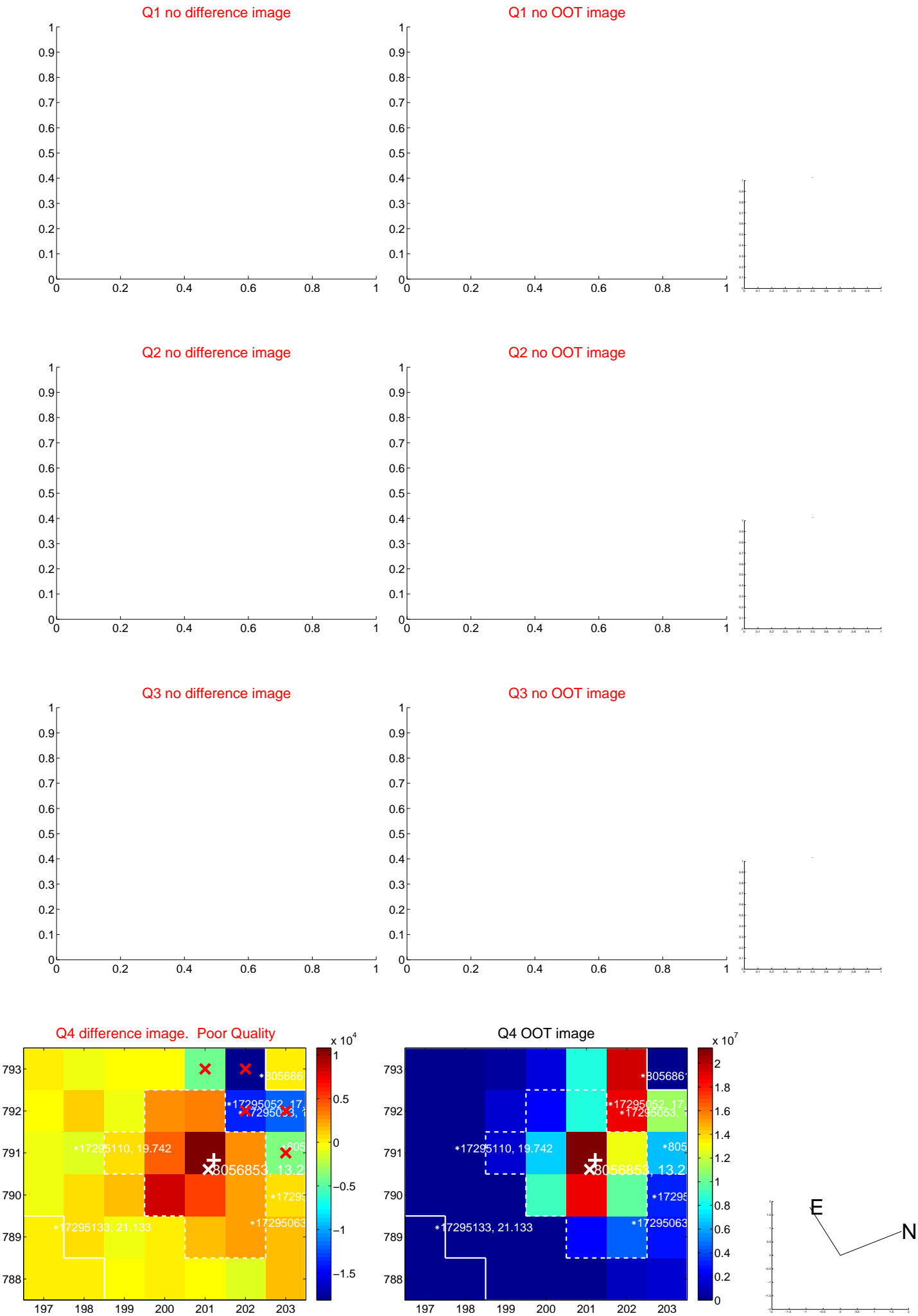
The direct PRF centroid is offset from the target star catalog position by about 0.70 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	5.403 $\pm$ 0.170	31.85	-1.271 $\pm$ 0.164	5.252 $\pm$ 0.170
PRF-fit source offset from KIC position	5.900 $\pm$ 0.170	34.74	-0.888 $\pm$ 0.164	5.833 $\pm$ 0.170
photometric centroid source offset	2.03 $\pm$ 1.69	1.20	1.54 $\pm$ 1.26	1.32 $\pm$ 2.13

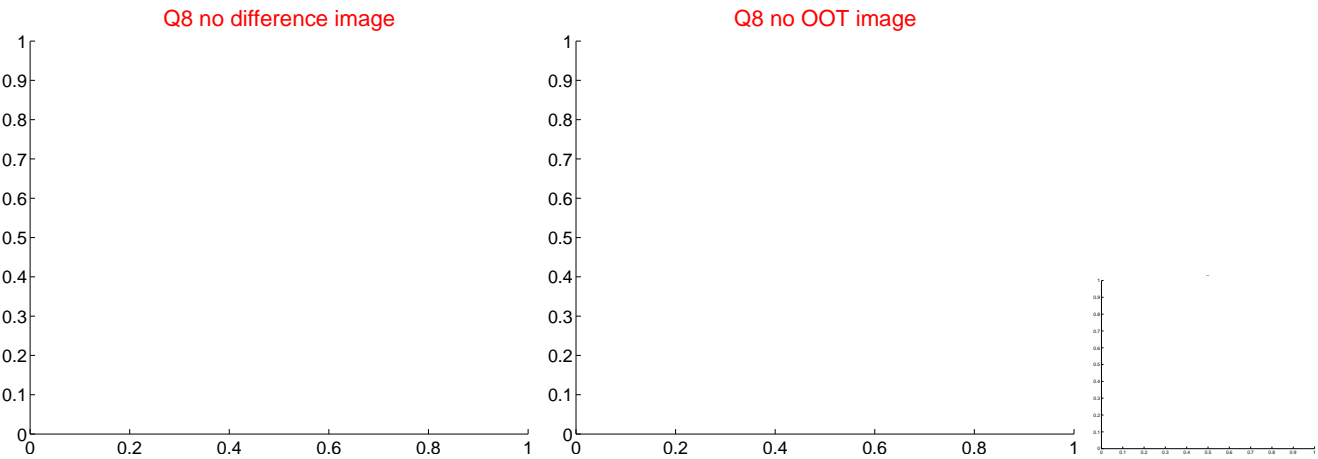
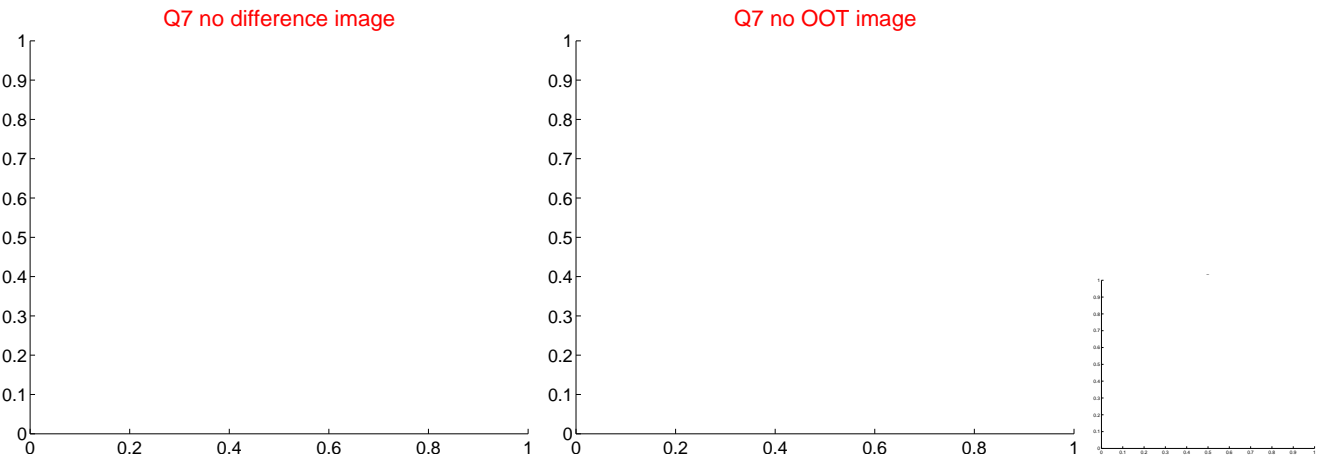
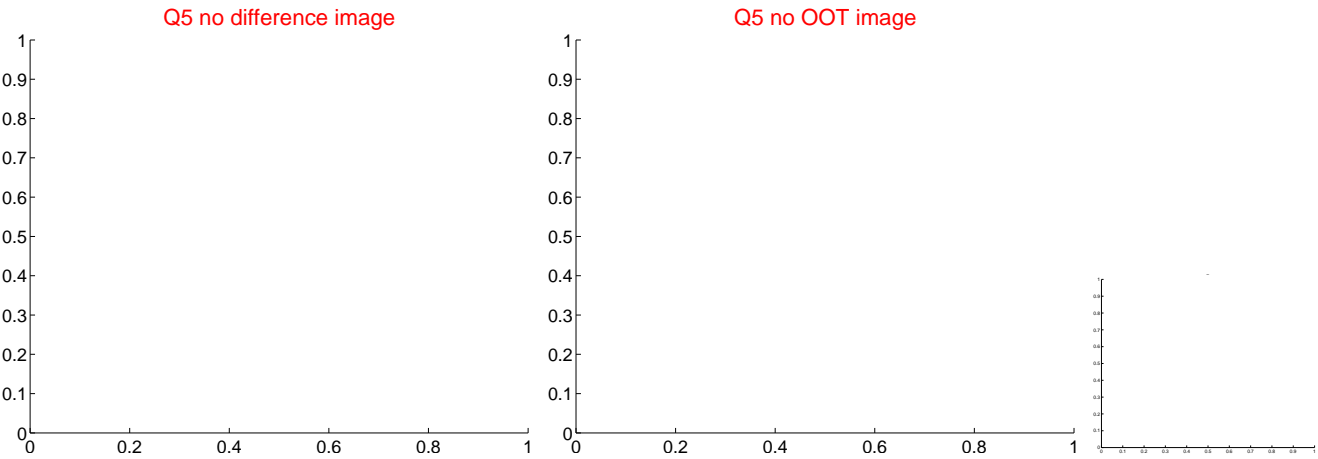


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

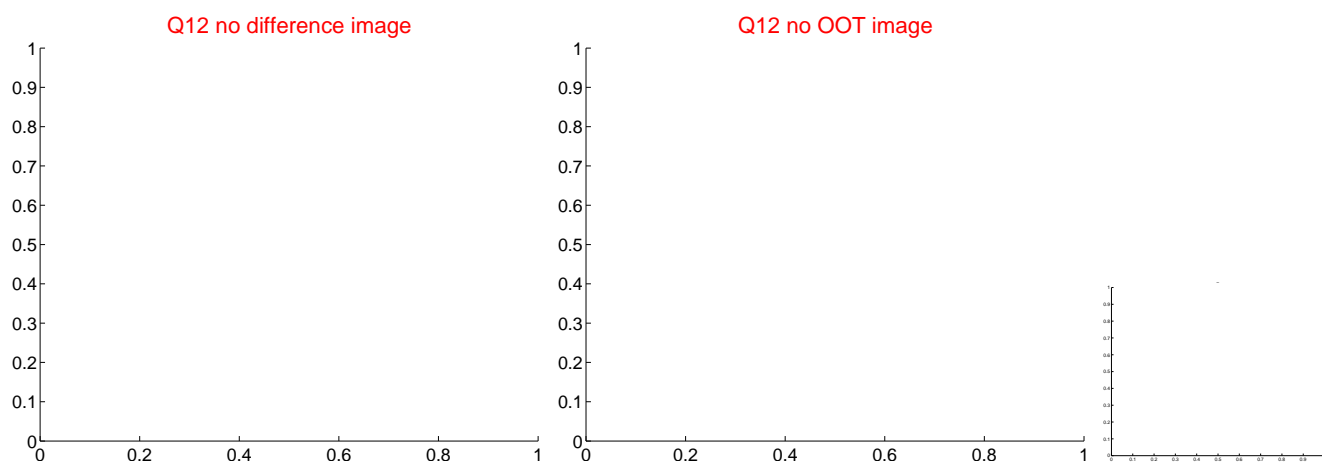
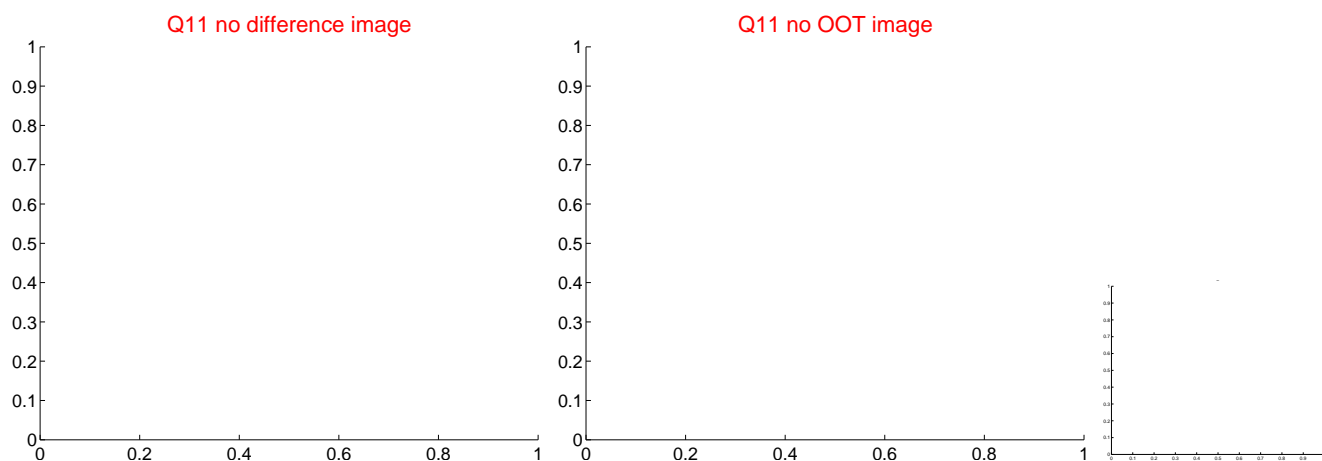
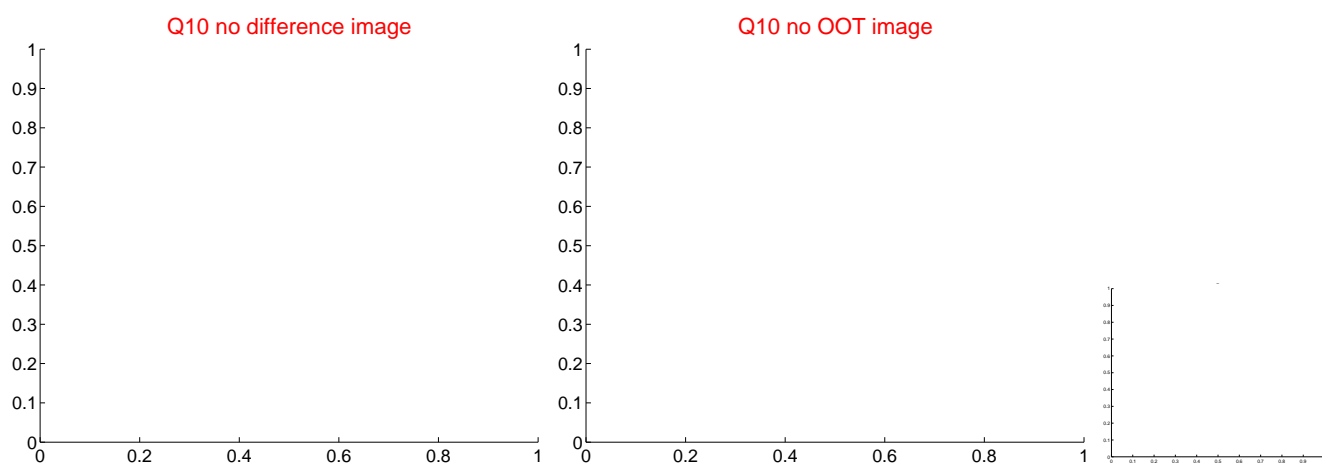
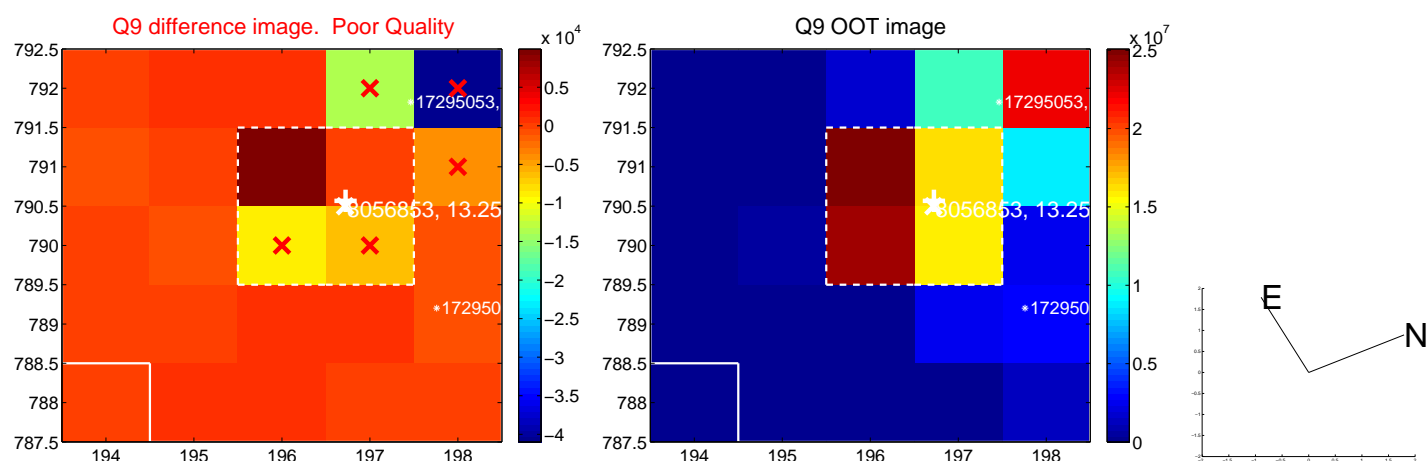
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



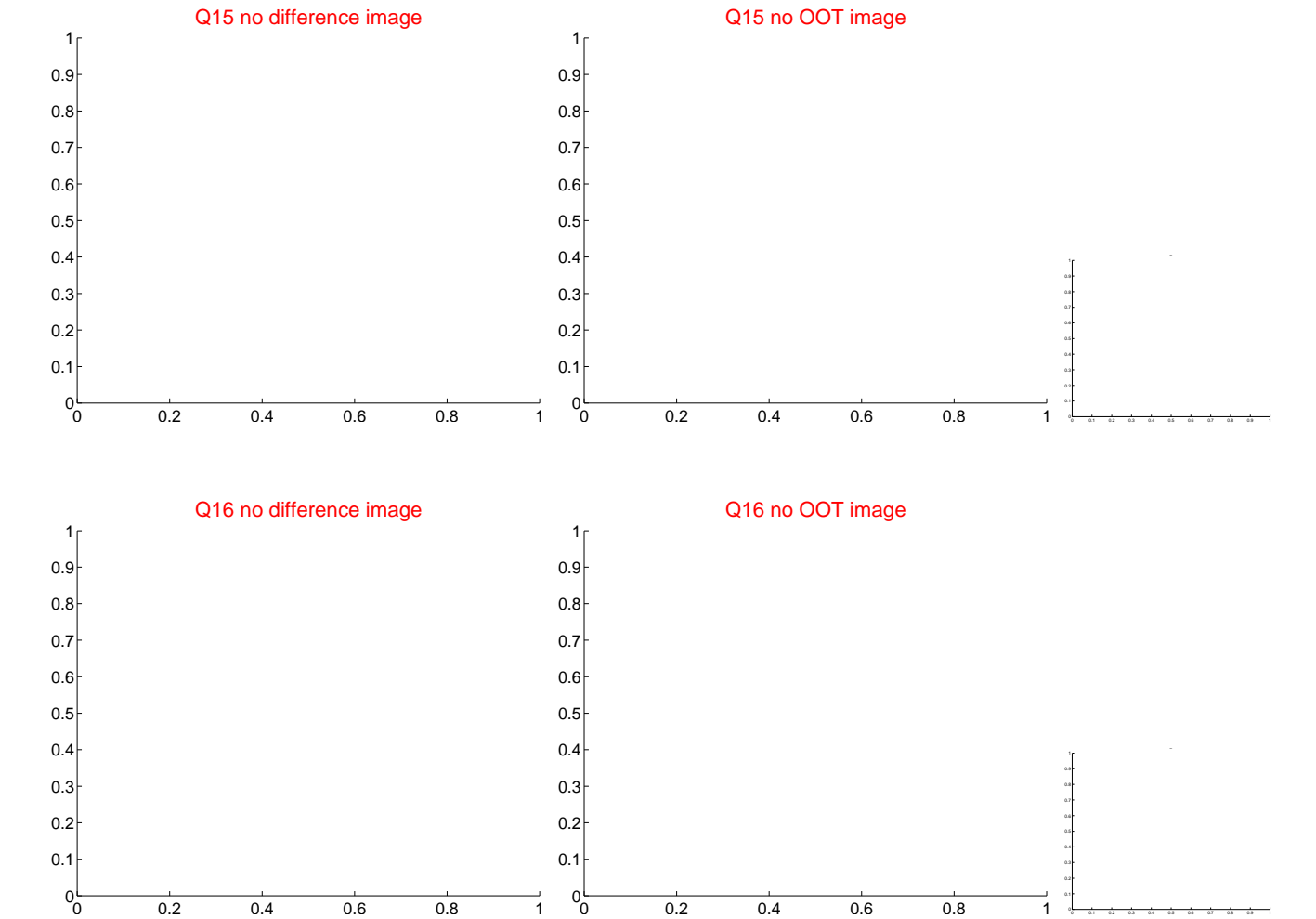
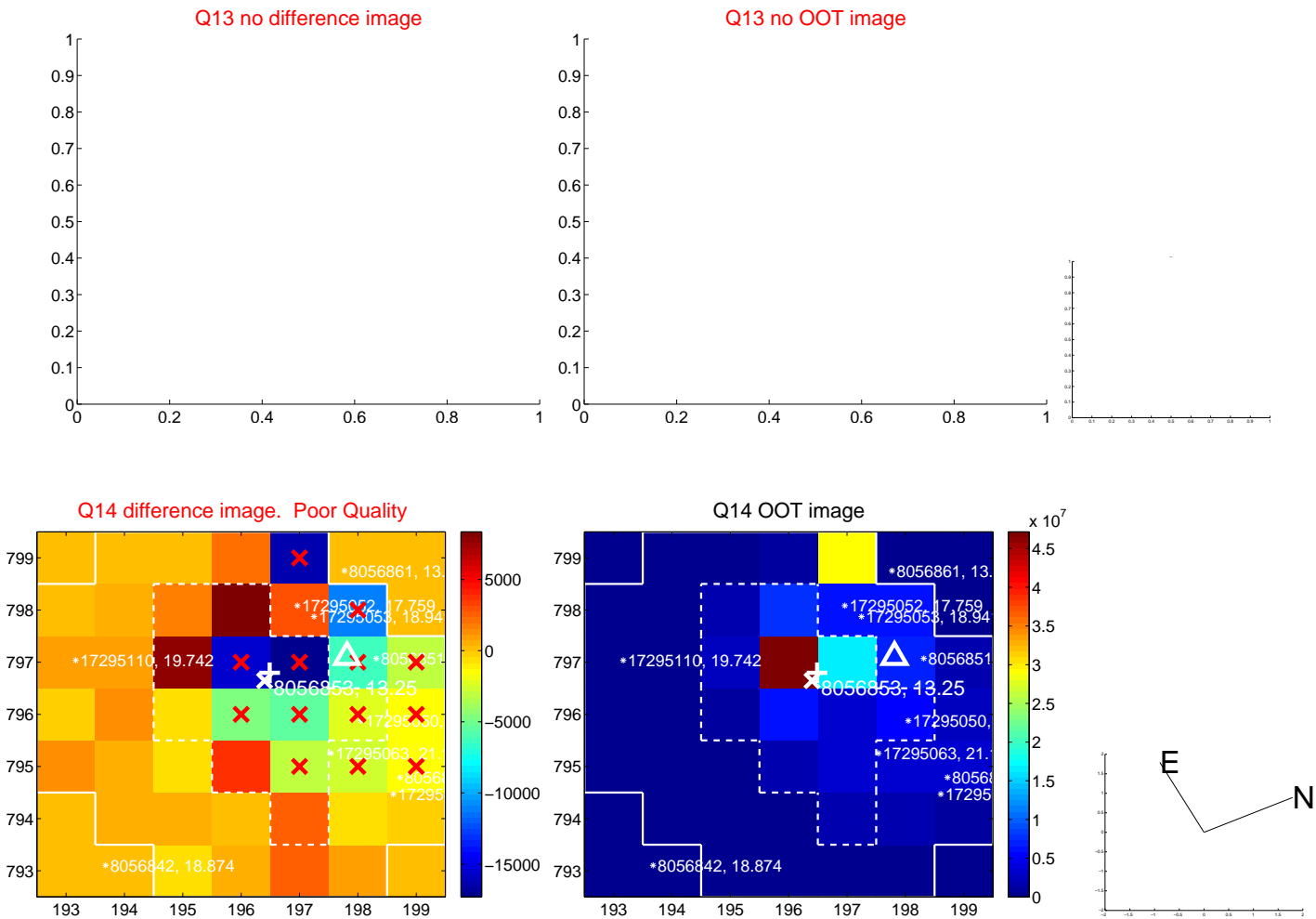
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

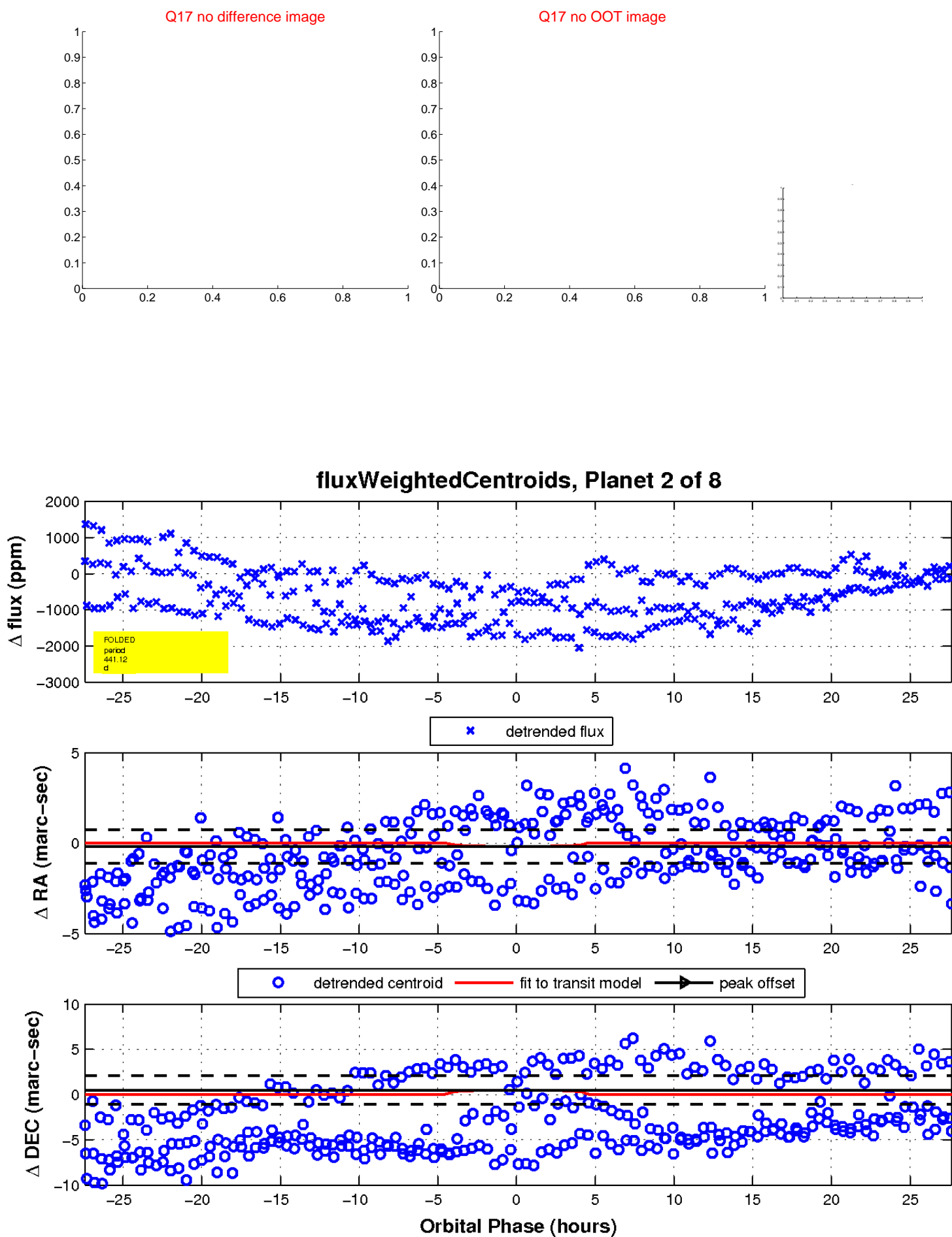


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



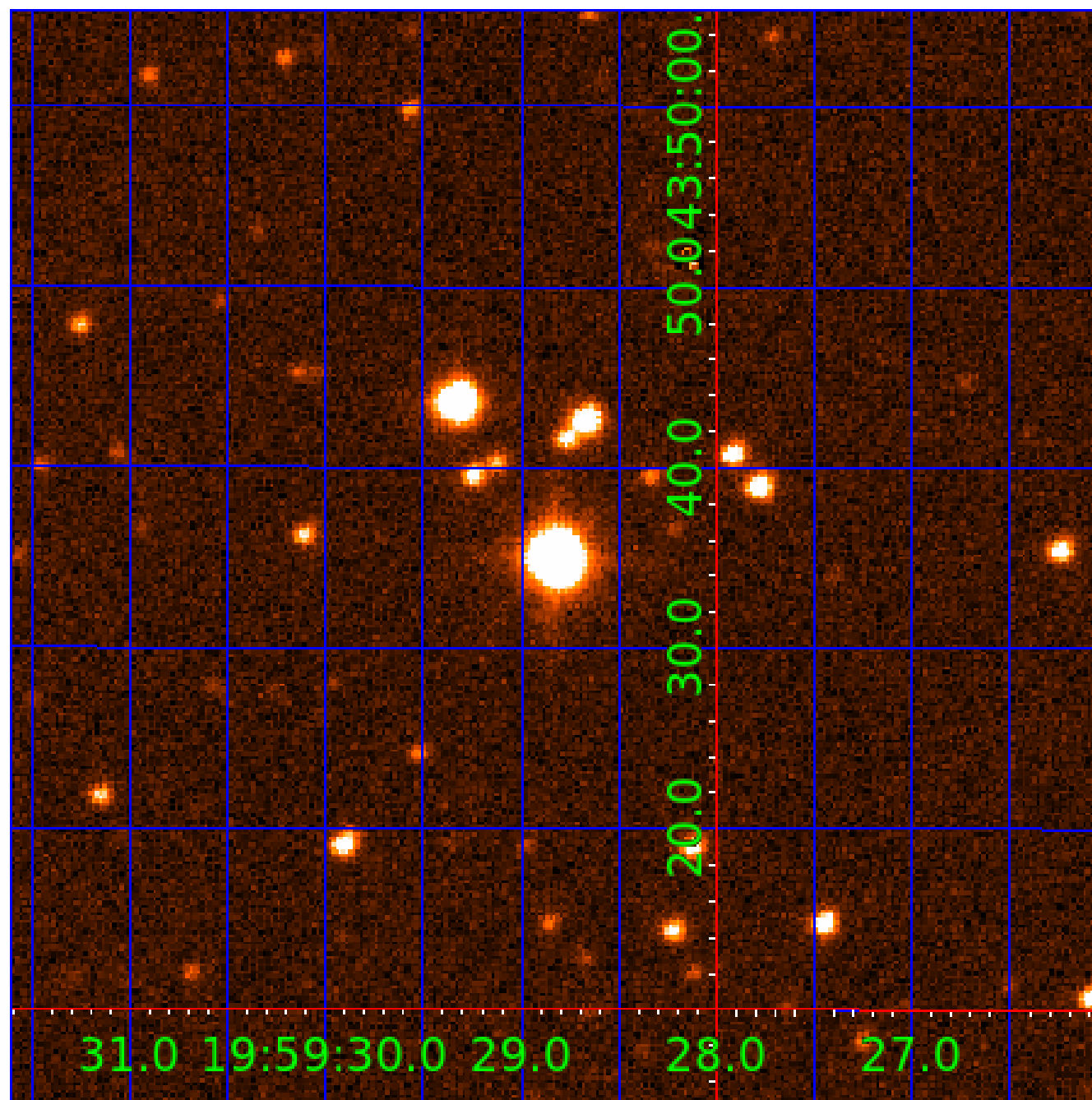


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008056853

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008056853-01	OBS	No	1.670864	133.104151	34.4	7.258	8.9	8.5	0.71	4429	0.52	290.52
008056853-02	OBS	No	441.120466	437.809040	721.6	9.251	15.6	9.3	0.71	4429	2.12	0.17
008056853-03	OBS	No	305.585951	428.199935	507.1	9.374	13.3	5.9	0.71	4429	1.76	0.28
008056853-04	OBS	No	225.156248	190.548826	394.0	9.364	12.5	5.4	0.71	4429	1.60	0.42
008056853-05	OBS	No	307.907910	162.825072	223.0	9.419	11.8	2.5	0.71	4429	1.27	0.28
008056853-06	OBS	No	213.561669	282.933930	79.6	7.168	12.4	1.3	0.71	4429	0.78	0.45
008056853-07	OBS	No	192.807309	132.044532	1526.7	33.730	13.2	8.1	0.71	4429	5.71	0.52
008056853-08	OBS	No	352.018673	141.049465	129.7	2.288	9.0	1.6	0.71	4429	1.02	0.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008056853-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008056853-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008056853-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008056853-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—CENT_KIC_POS
008056853-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET
008056853-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

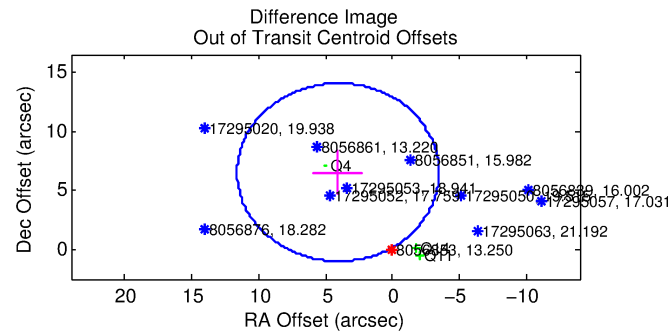
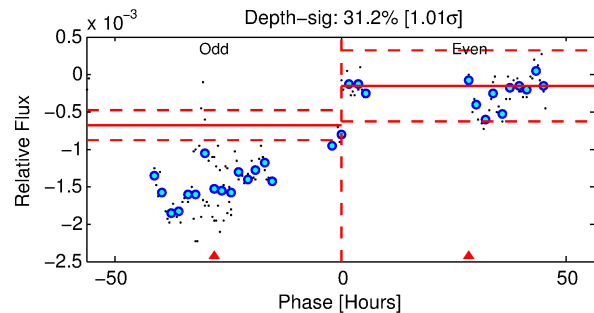
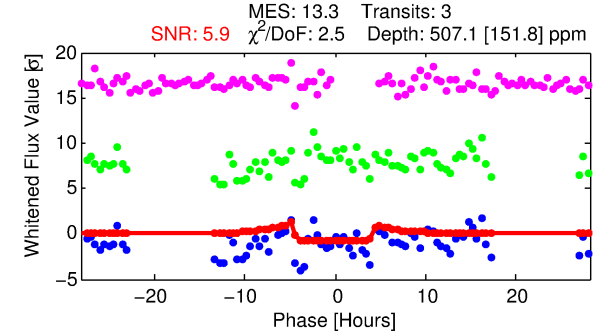
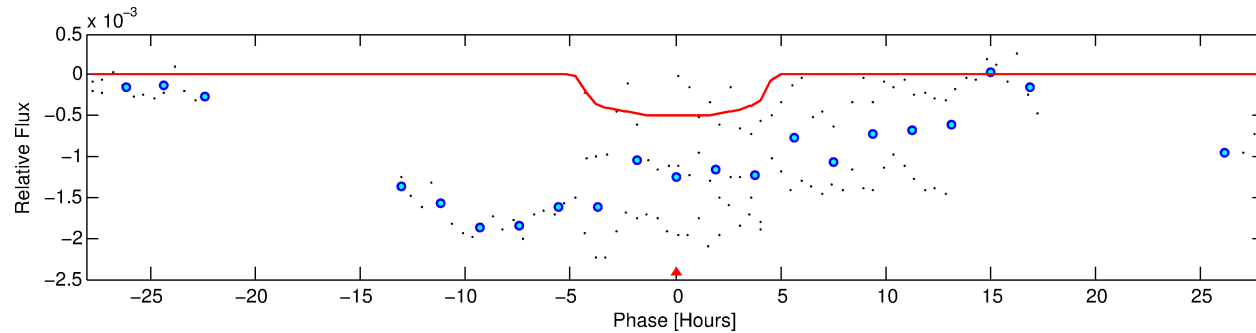
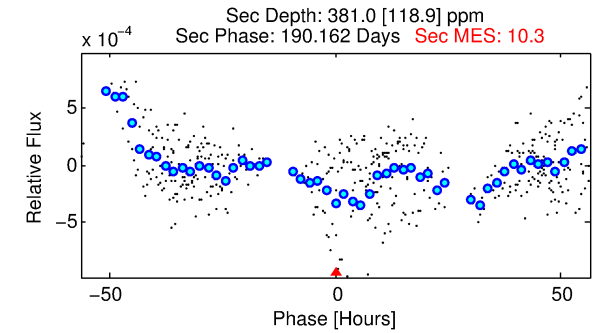
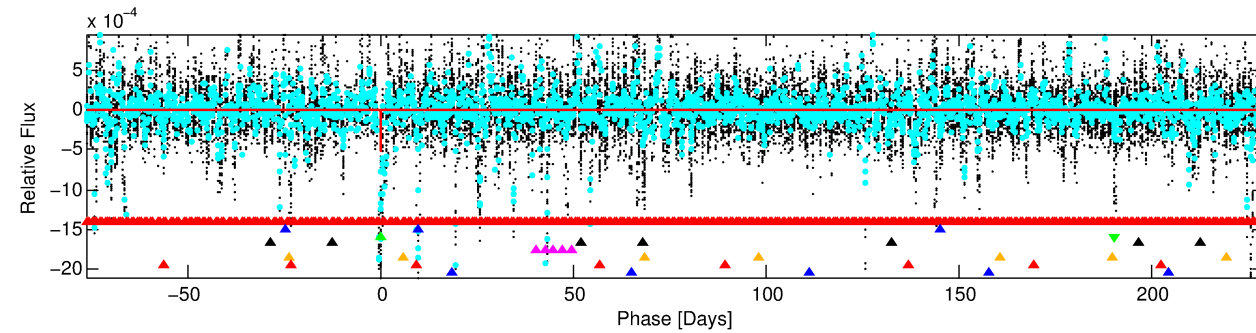
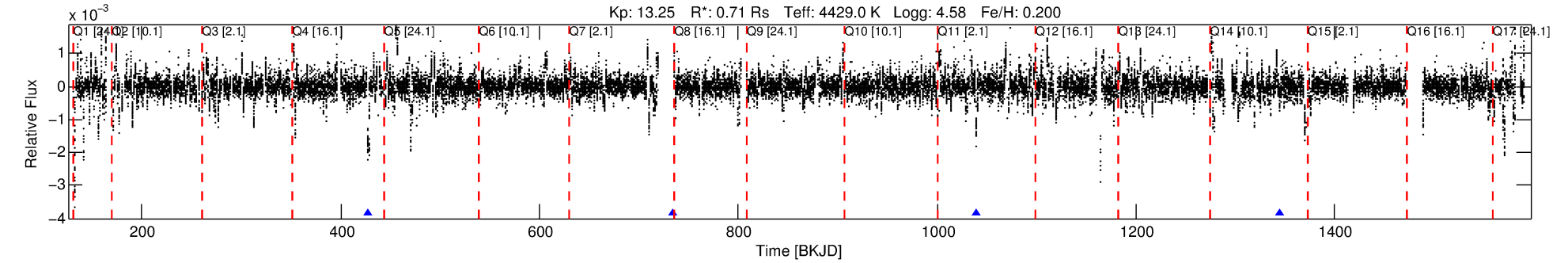
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008056853-03

No Significant Match Found

# DV One-Page Summary

KIC: 8056853 Candidate: 3 of 8 Period: 305.586 d



## DV Fit Results:

Period = 305.58595 [0.01414] d  
Epoch = 428.1999 [0.0244] BKJD  
Rp/R\* = 0.0227 [0.0191]  
a/R\* = 170.56 [446.00]  
b = 0.76 [1.48]  
Seff = 0.28 [0.04]  
Teff = 185 [7] K  
Rp = 1.76 [1.49] Re  
a = 0.7903 [0.0539] AU  
Ag = 42100.94 [72098.19] [0.58 $\sigma$ ]  
Teffp = 4107 [1760] K [2.23 $\sigma$ ]

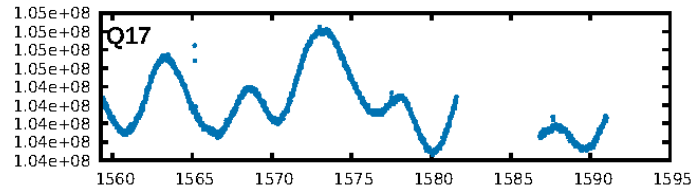
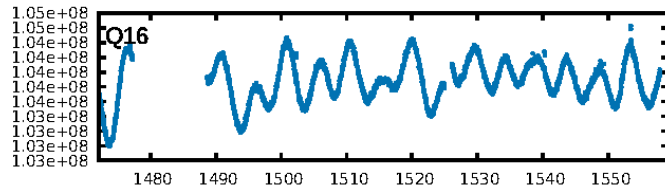
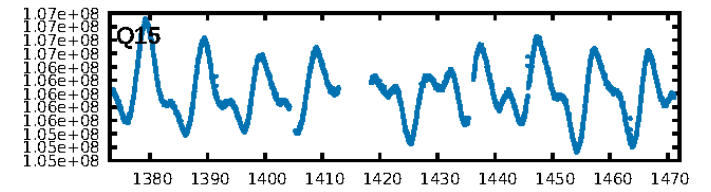
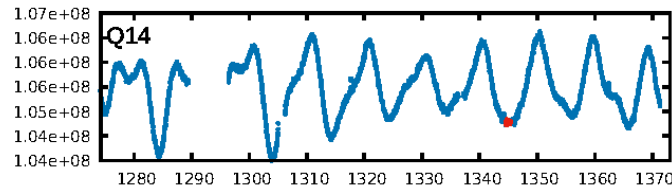
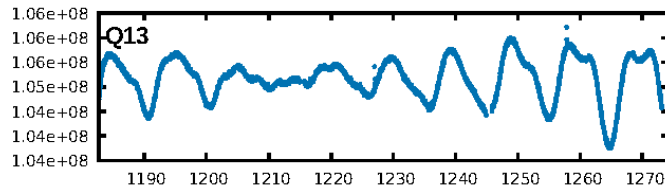
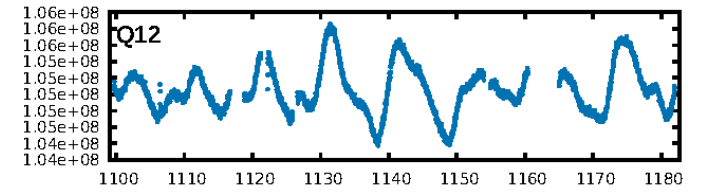
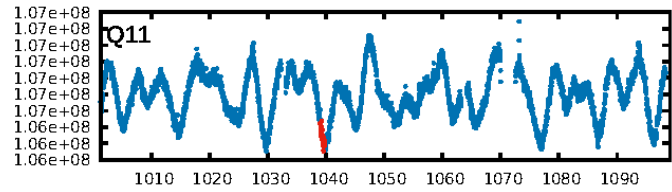
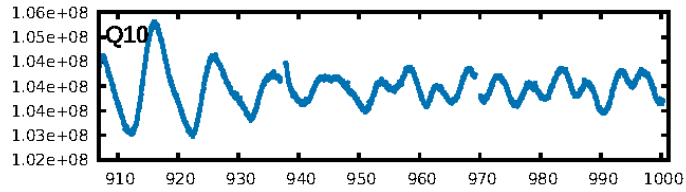
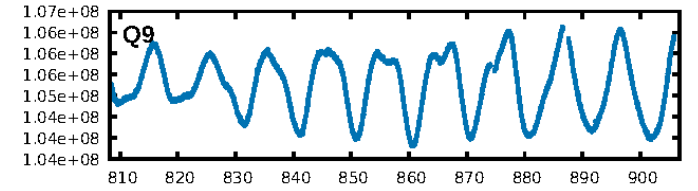
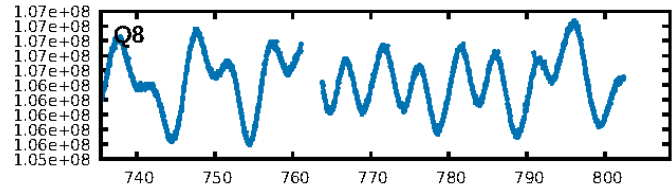
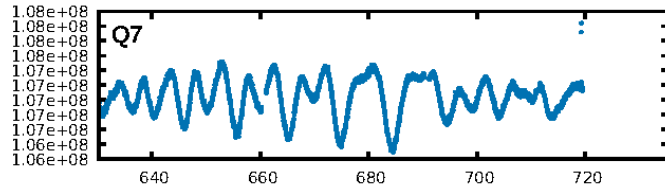
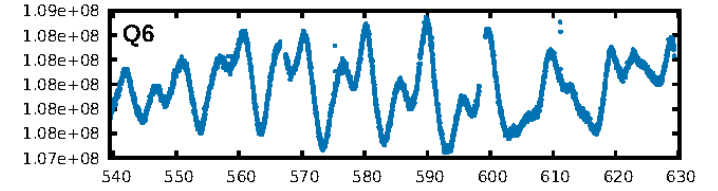
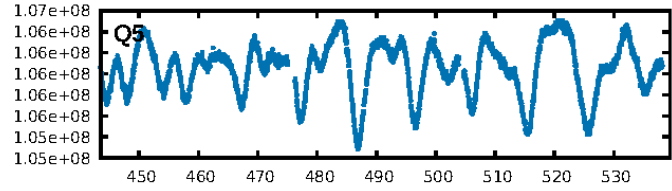
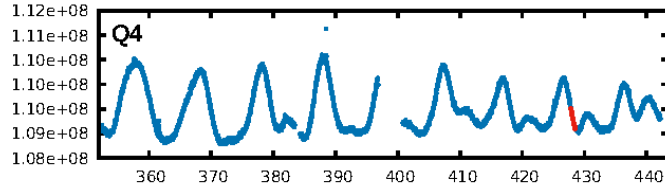
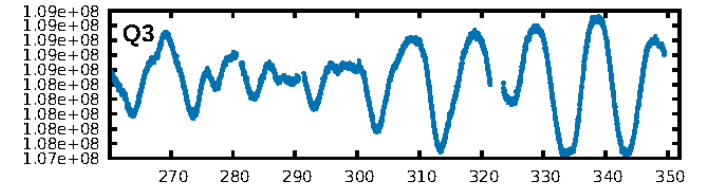
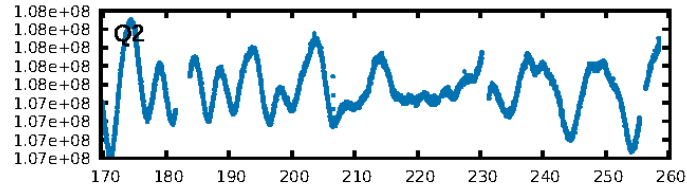
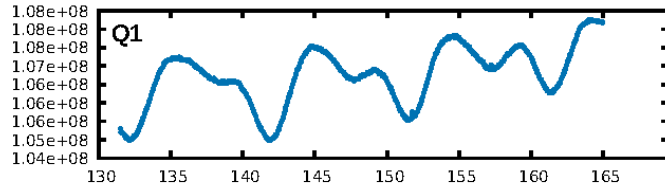
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [145.69 $\sigma$ ]  
LongPeriod-sig: 100.0% [4.19 $\sigma$ ]  
ModelChiSquare2-sig: 1.7%  
ModelChiSquareGof-sig: 3.7%  
Bootstrap-pfa: 1.94e-13  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: -0.2032**  
Centroid-sig: 4.2%  
Centroid-so: 6.358 arcsec [2.50 $\sigma$ ]  
**OotOffset-rm: 7.682 arcsec [3.06 $\sigma$ ]**  
**KicOffset-rm: 8.858 arcsec [3.04 $\sigma$ ]**  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:13:23 Z

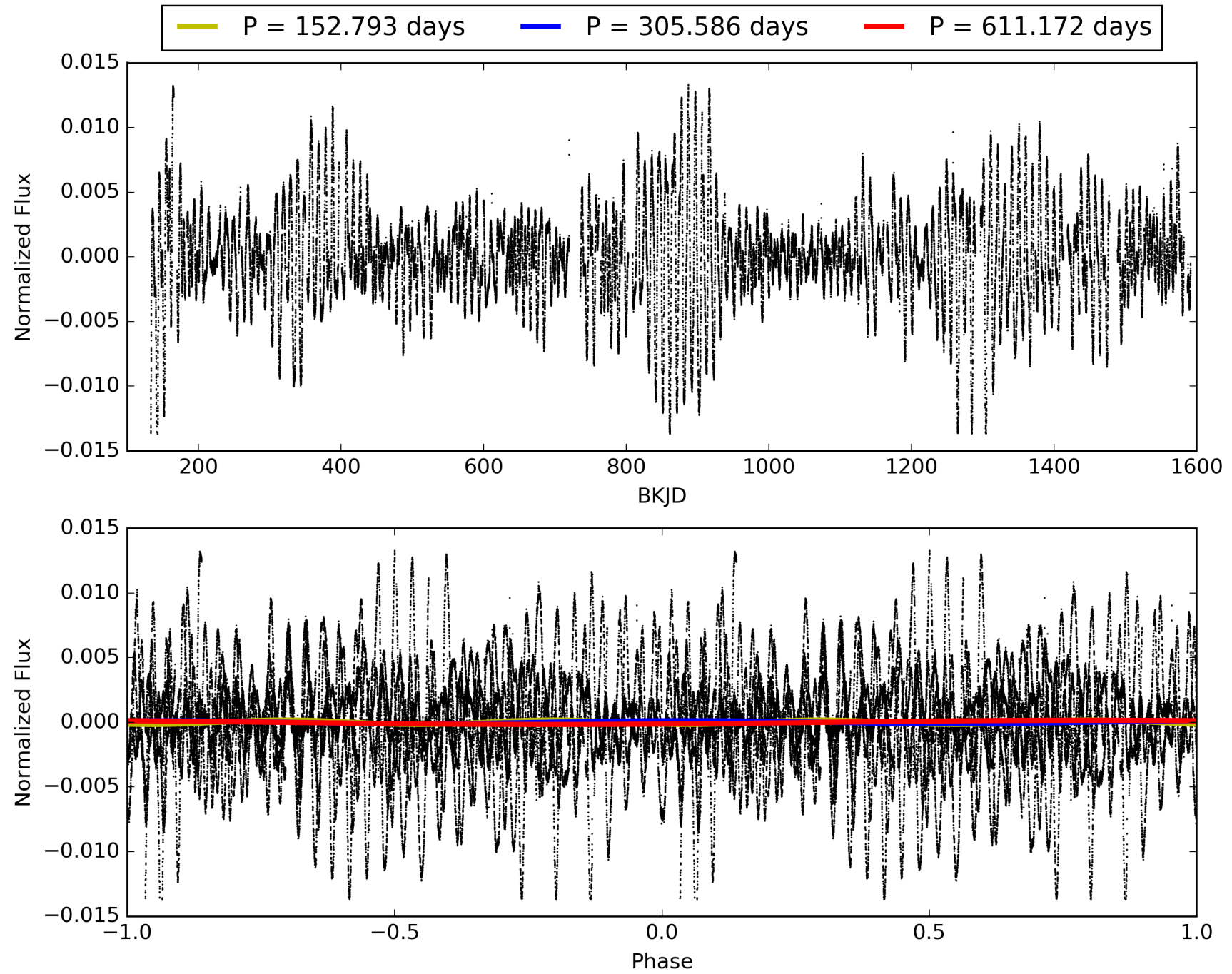
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008056853-03, PDC Light Curves



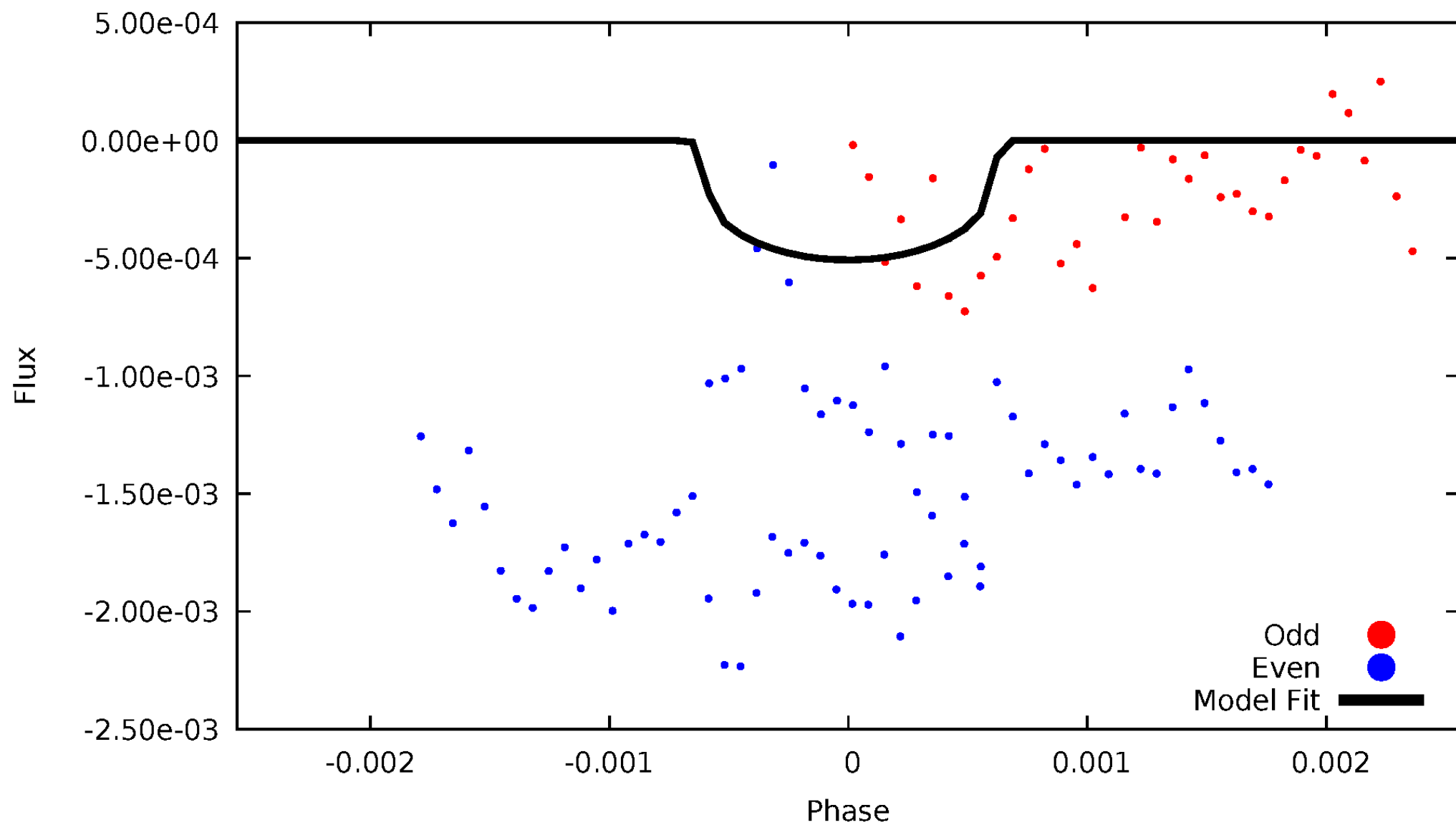


TCE 008056853-03



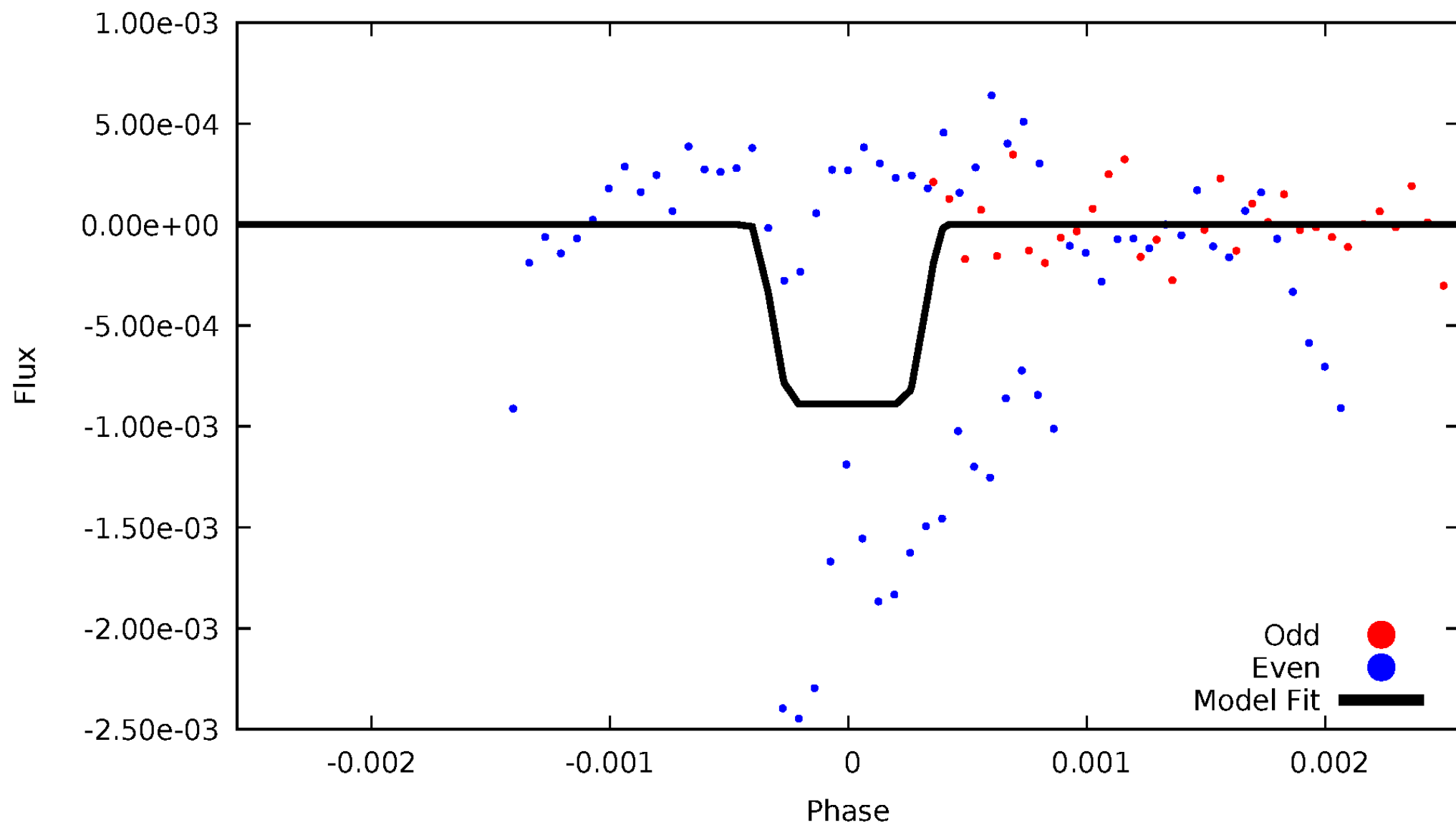
# DV Odd/Even

TCE 008056853-03



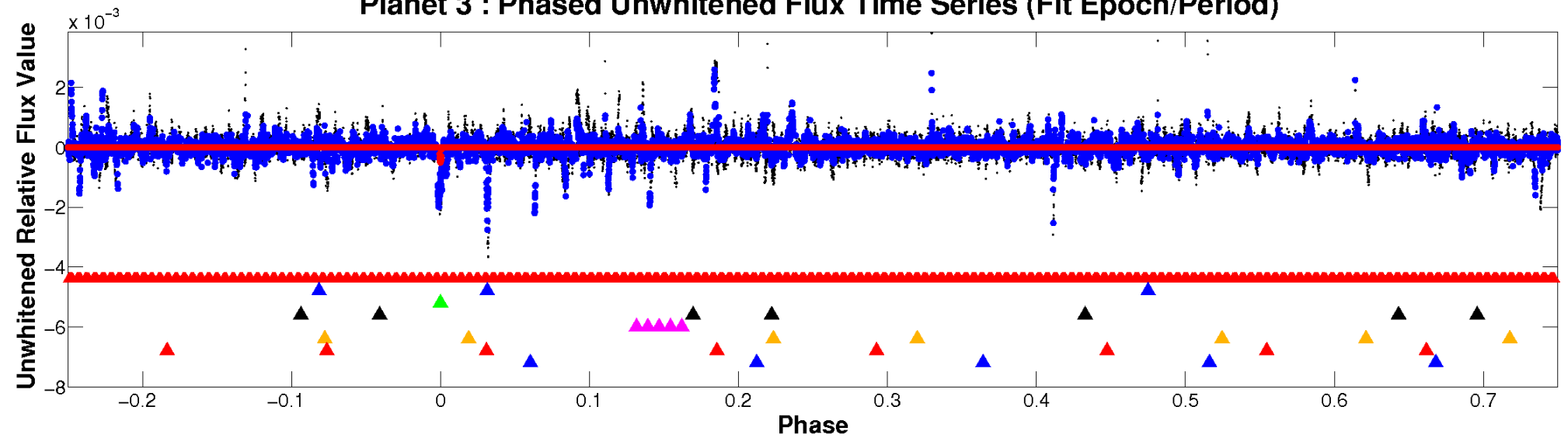
# ALT Odd/Even

TCE 008056853-03

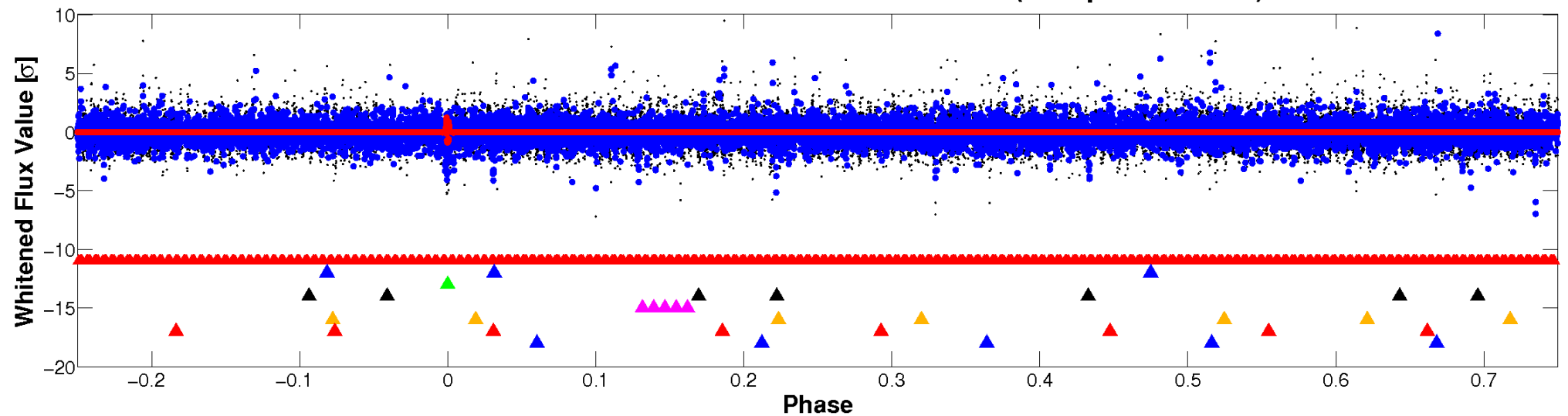


# Non-Whitened Vs. Whitened Light Curve

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

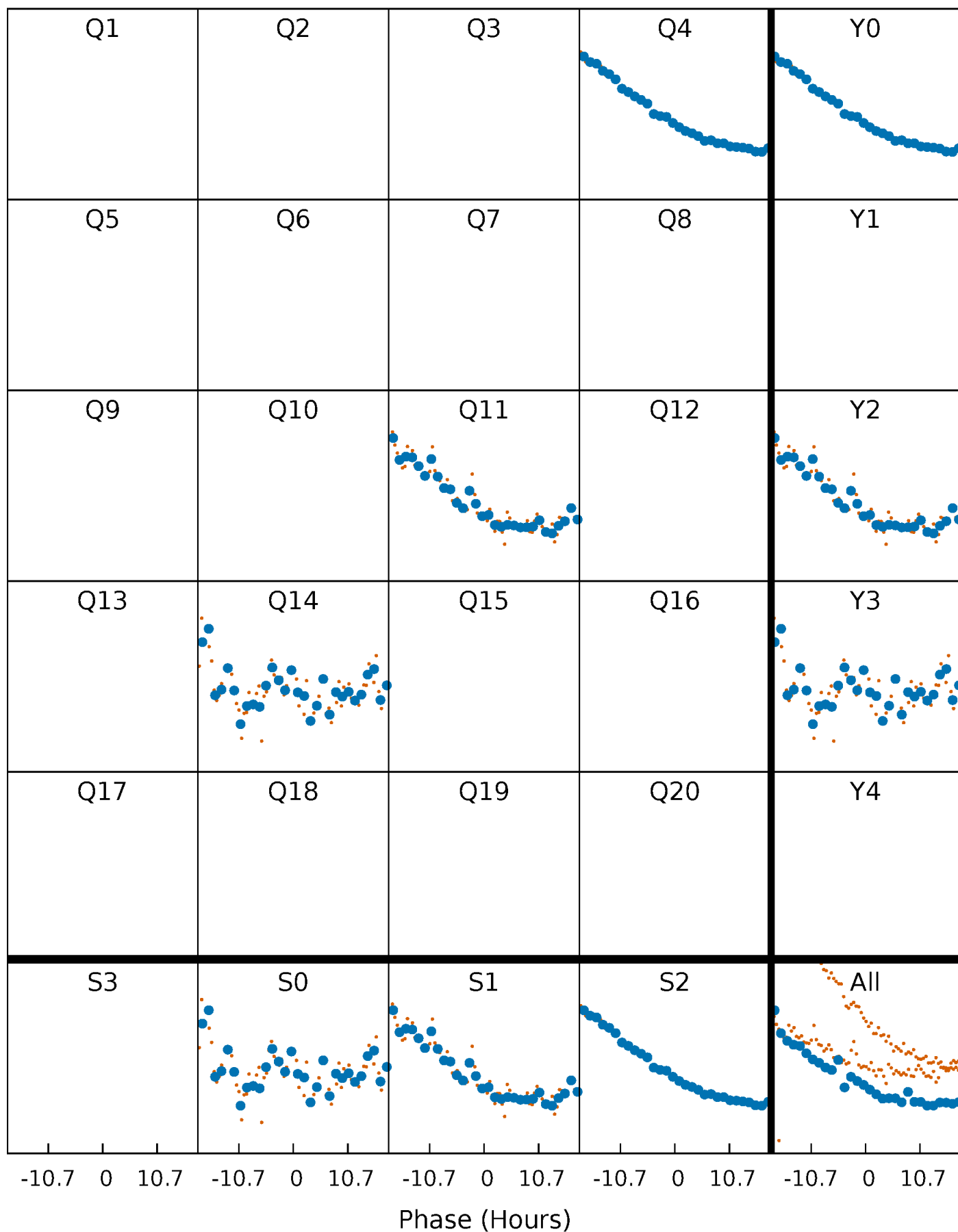


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



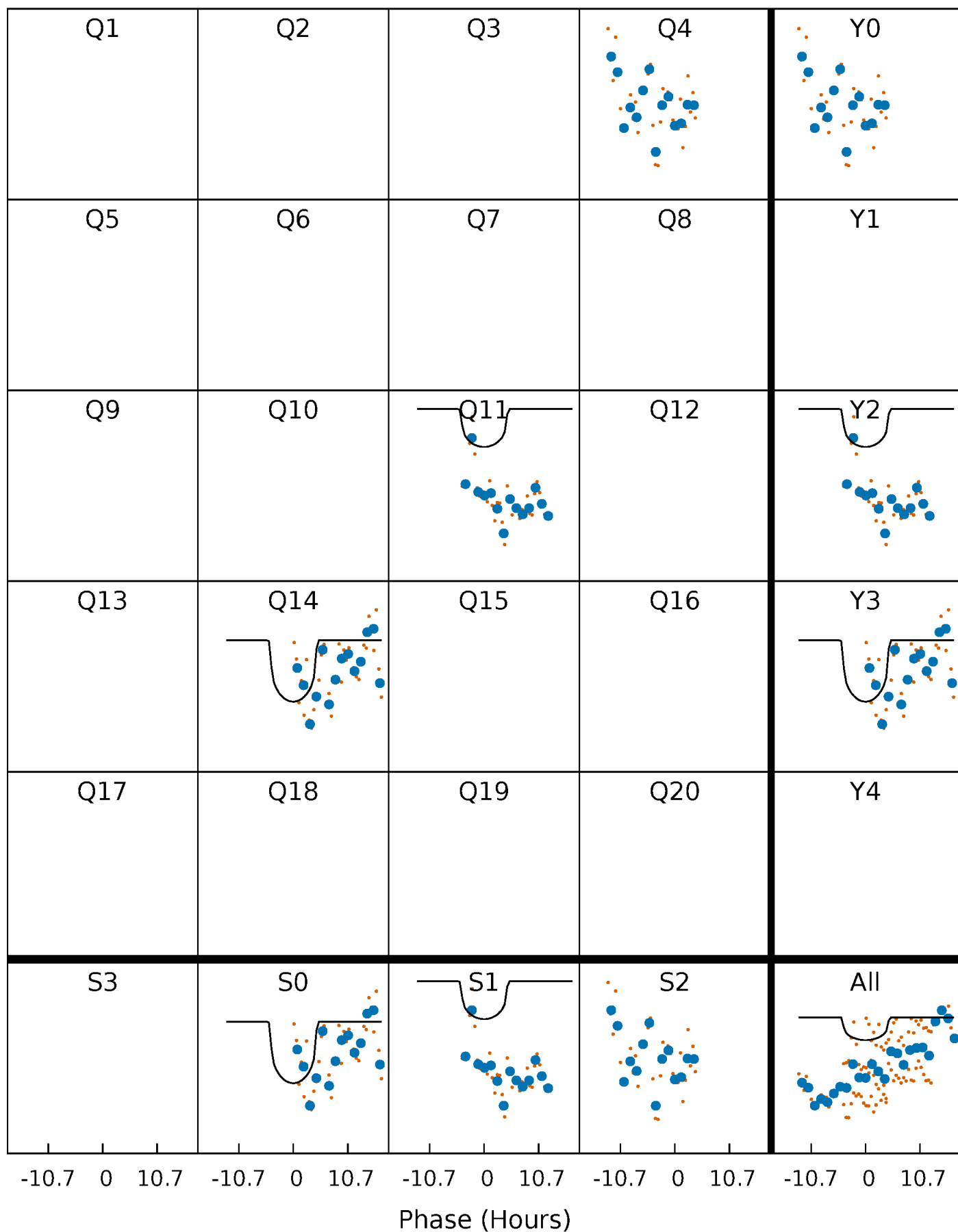
# PDC Quarter-Phased Transit Curves

TCE 008056853-03 P=305.585951 Days  $T_0=428.199935$  (BKJD)



# DV Quarter-Phased Transit Curves

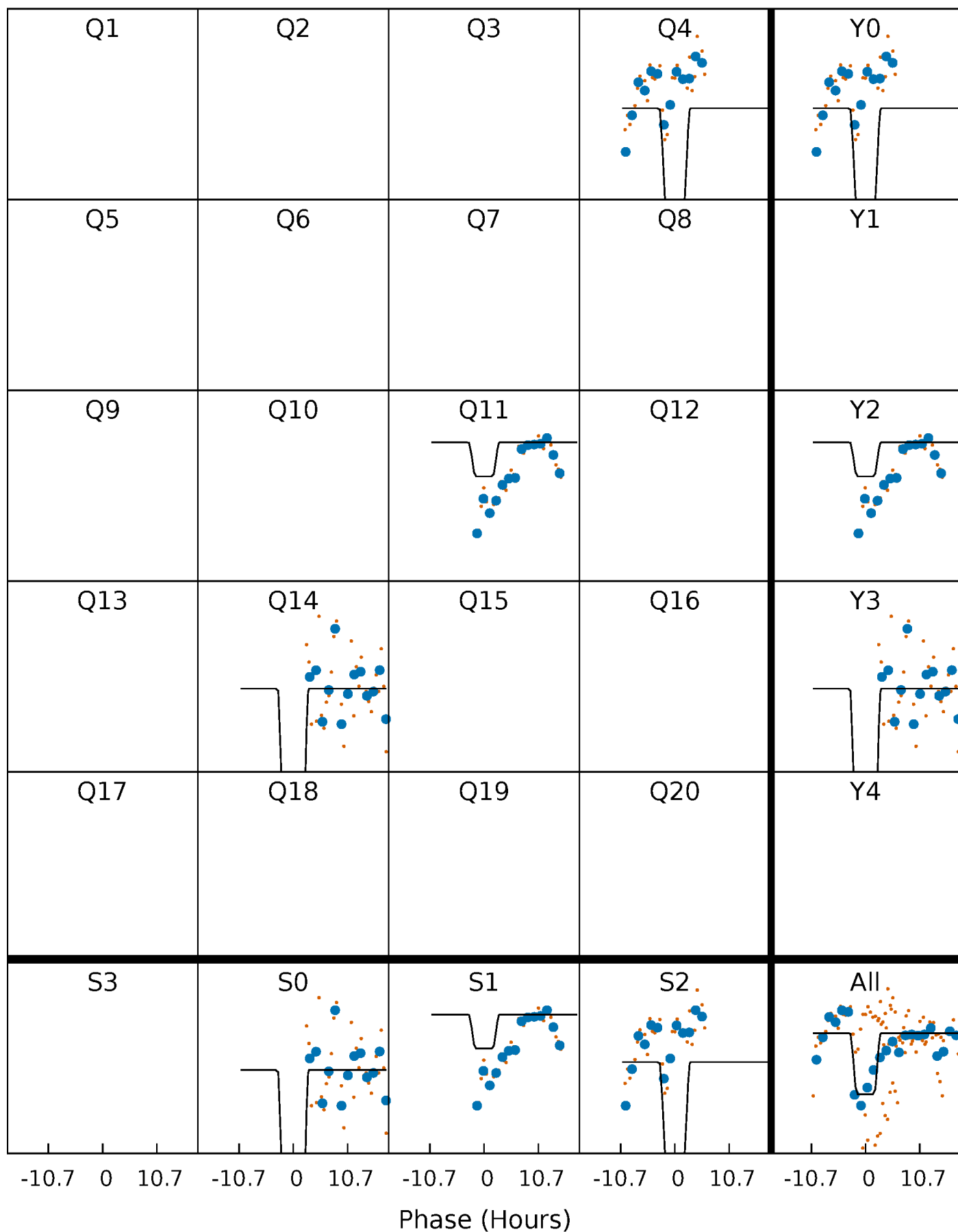
TCE 008056853-03 P=305.585951 Days  $T_0=428.199935$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

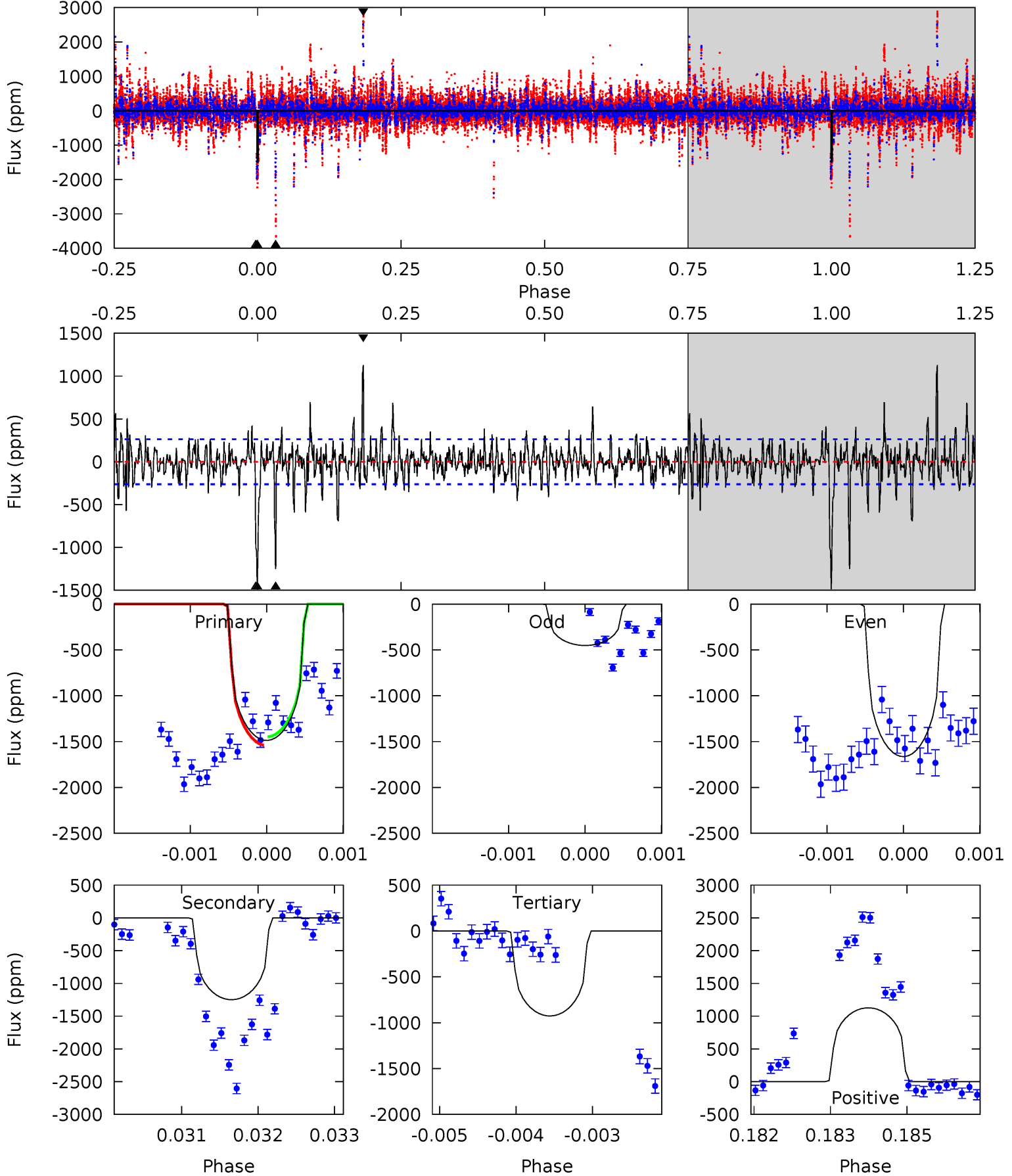
TCE 008056853-03 P=305.577079 Days  $T_0=428.123723$  (BKJD)



# DV Model-Shift Uniqueness Test

008056853-03, P = 305.585951 Days, E = 122.613984 Days

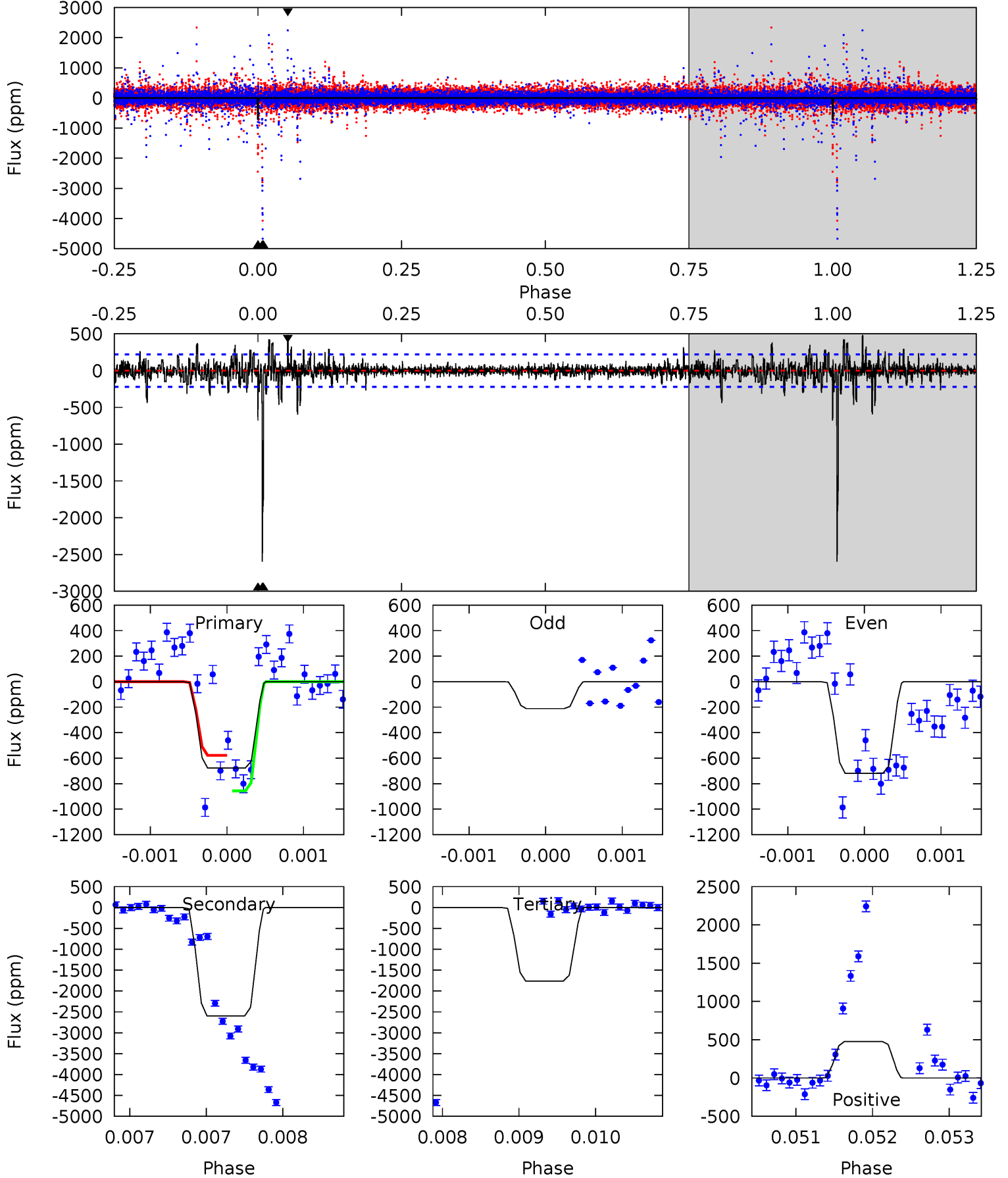
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
30.6	25.7	19.1	23.2	5.41	3.22	3.10	11.5	7.42	6.64	2.52	9.39	1.04	0.43	0.95



# Alt Model-Shift Uniqueness Test

008056853-03, P = 305.577079 Days, E = 122.546644 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
16.9	64.6	43.9	11.9	5.49	3.34	1.50	-27.0	4.97	20.8	52.7	2.38	1.00	0.16	3.28



### Stellar Parameters For KIC 008056853

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4429^{+132}_{-132}$	$4.581^{+0.052}_{-0.016}$	$0.200^{+0.200}_{-0.300}$	$0.712^{+0.029}_{-0.059}$	$0.704^{+0.048}_{-0.054}$	$2.750^{+0.636}_{-0.220}$
	+3%/-3%	+1%/-0%	+100%/-150%	+4%/-8%	+7%/-8%	+23%/-8%
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 008056853-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1249 \pm 49$	$2.02^{+1.38}_{-1.24}$	$257^{+8}_{-9}$	$4957^{+3089}_{-880}$	$106414^{+565840}_{-68402}$
Alt.	$-2595 \pm 40$	$2.42^{+1.36}_{-1.34}$	$257^{+9}_{-9}$	$5375^{+3015}_{-882}$	$155606^{+618447}_{-92410}$

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

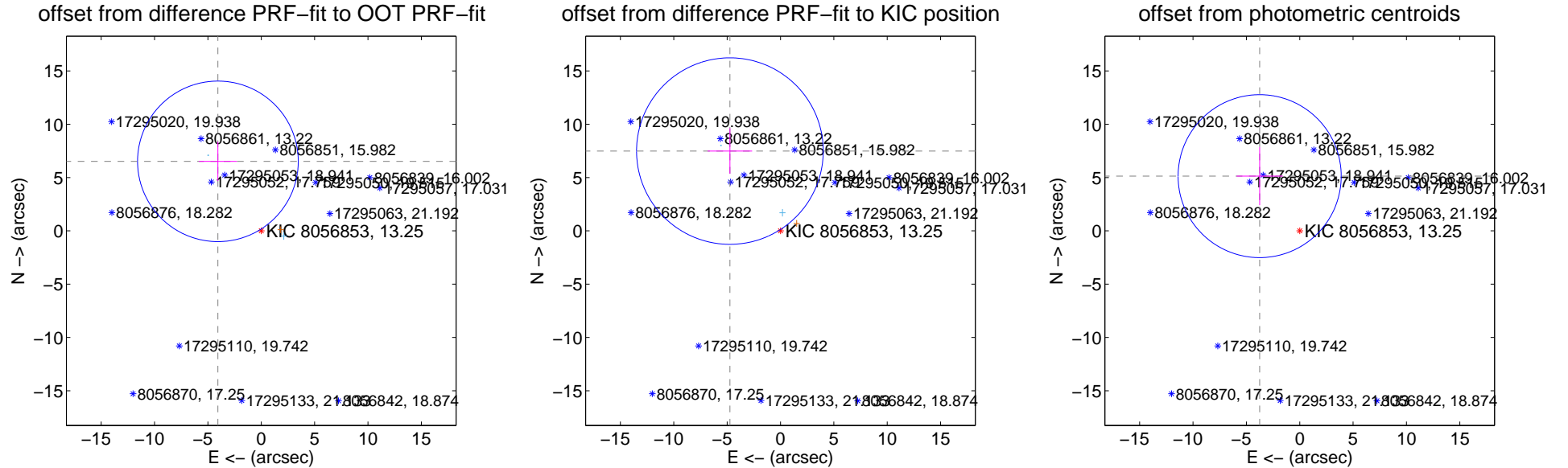
## DV Centroid Data

Supplemental centroid analysis for 008056853-03. Kepler magnitude: 13.25. Transit SNR 5.94

There are 2 quarters with good PRF difference image offsets

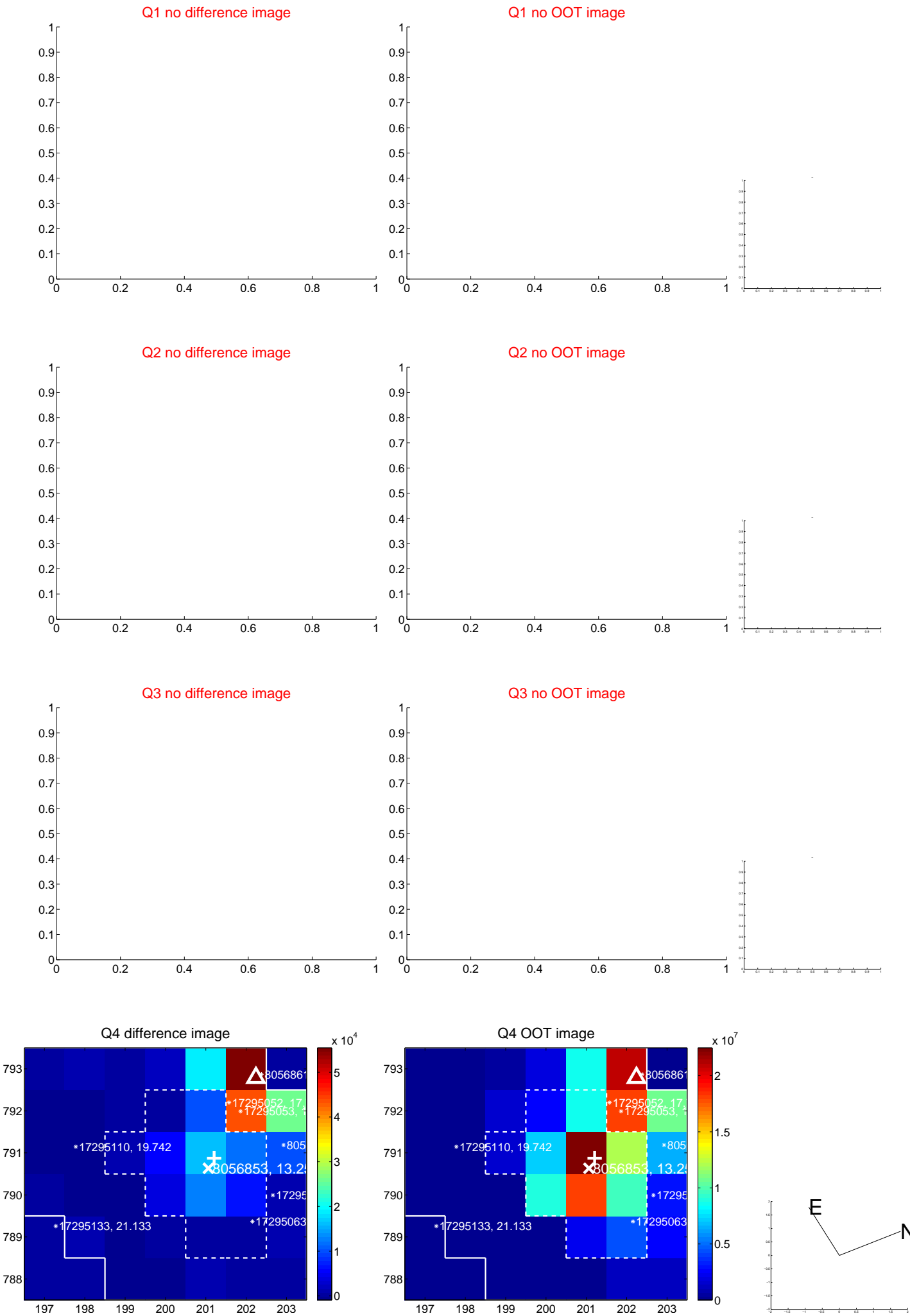
The direct PRF centroid is offset from the target star catalog position by about 0.66 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$7.682 \pm 2.509$	3.06	$4.061 \pm 1.784$	$6.520 \pm 1.847$
PRF-fit source offset from KIC position	$8.858 \pm 2.915$	3.04	$4.739 \pm 2.085$	$7.483 \pm 2.132$
photometric centroid source offset	$6.36 \pm 2.55$	2.50	$3.75 \pm 2.17$	$5.13 \pm 2.73$



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

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





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



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

Q9 no difference image



Q9 no OOT image



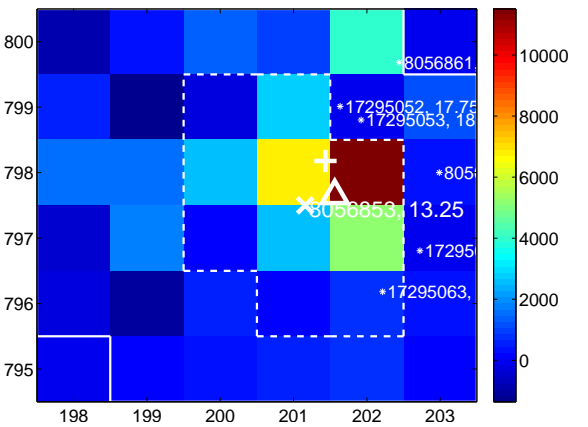
Q10 no difference image



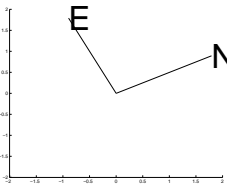
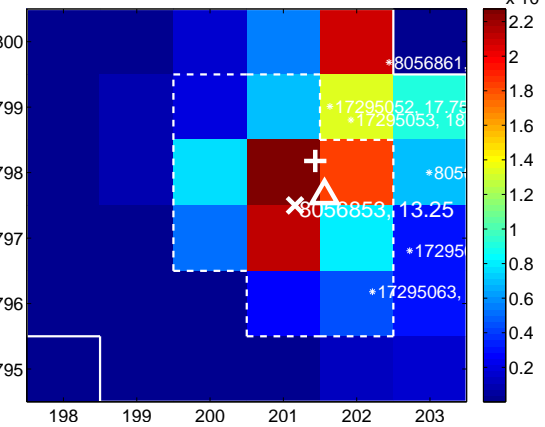
Q10 no OOT image



Q11 difference image



Q11 OOT image



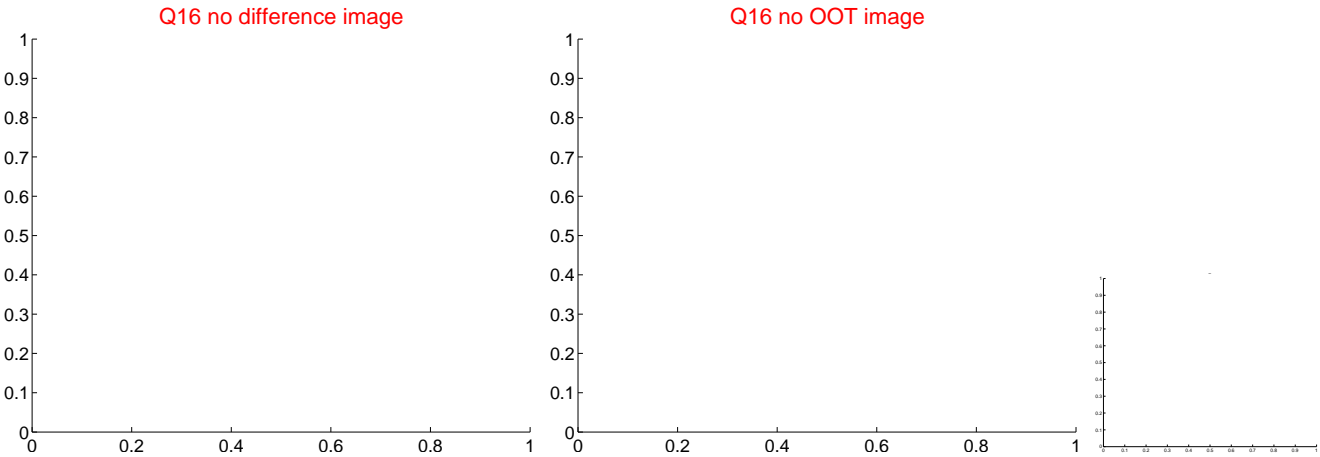
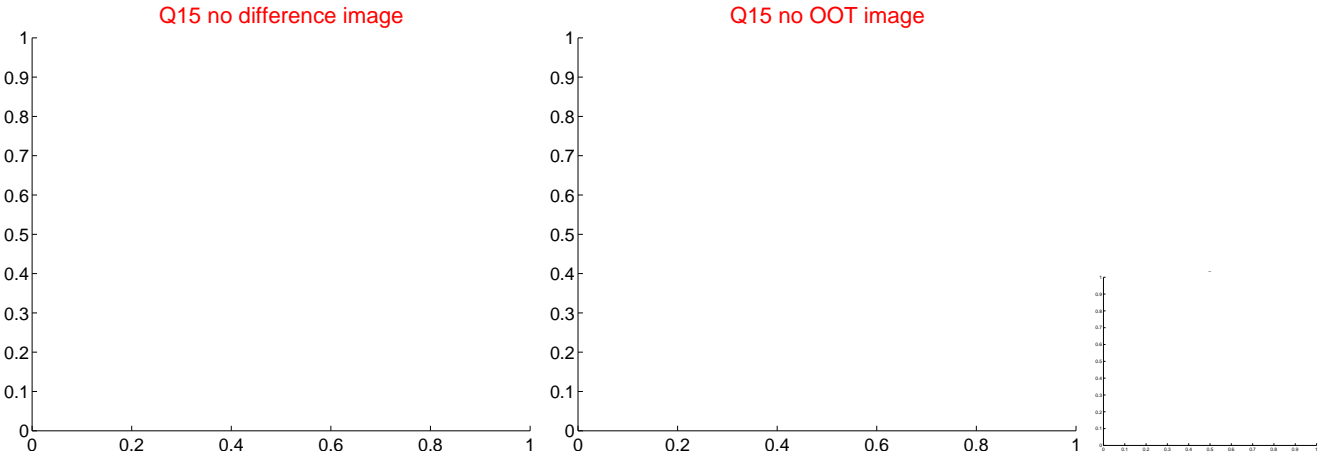
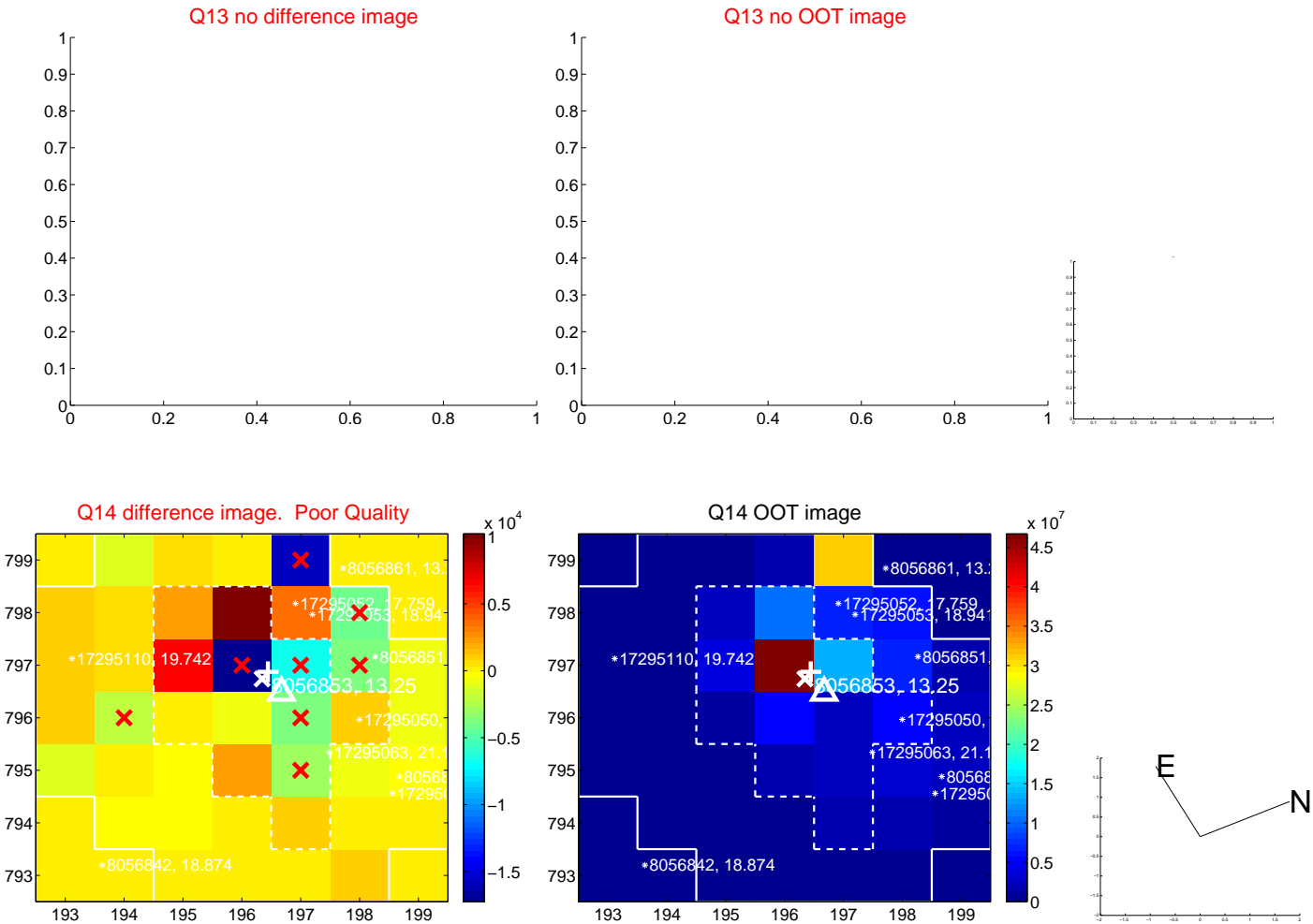
Q12 no difference image



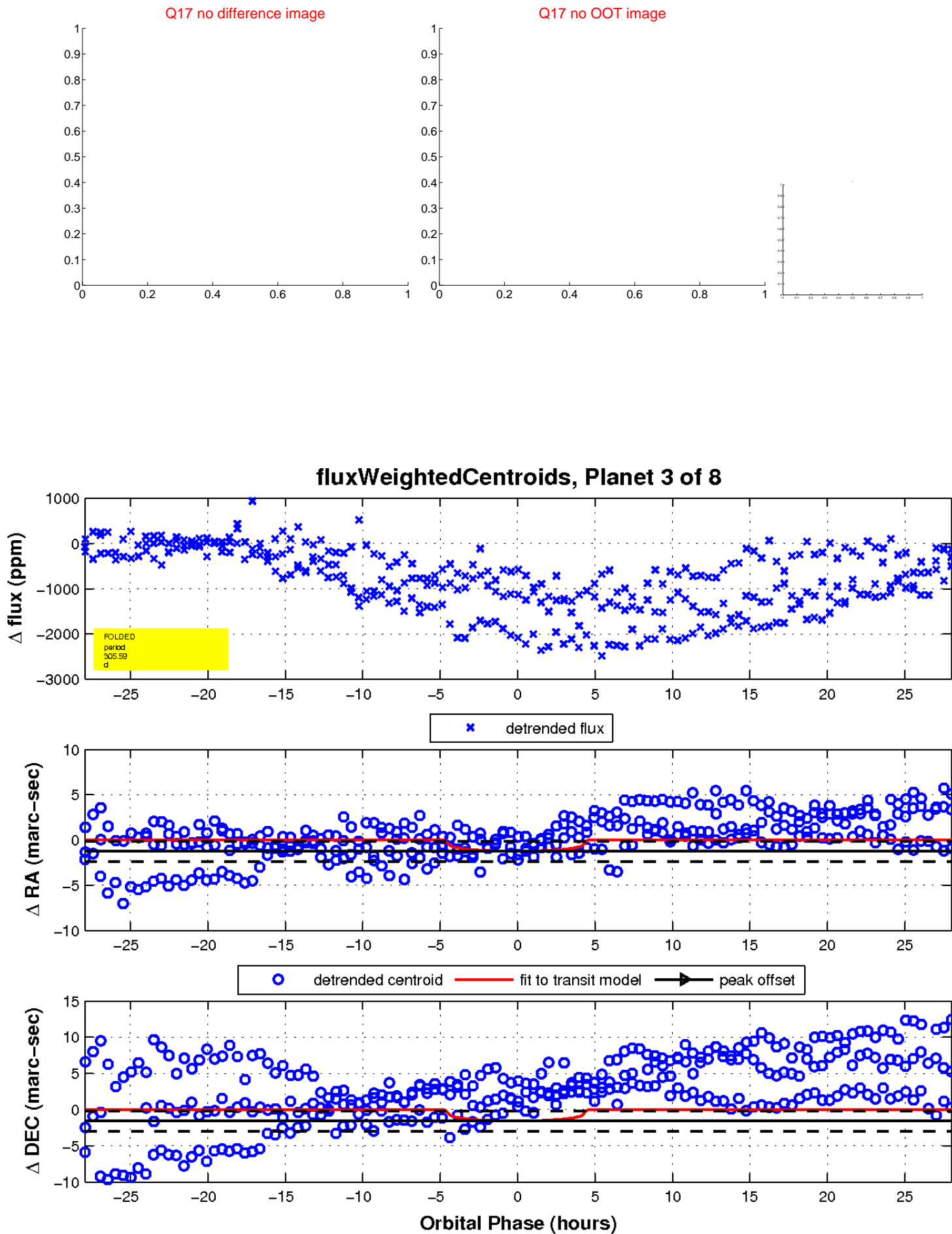
Q12 no OOT image



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

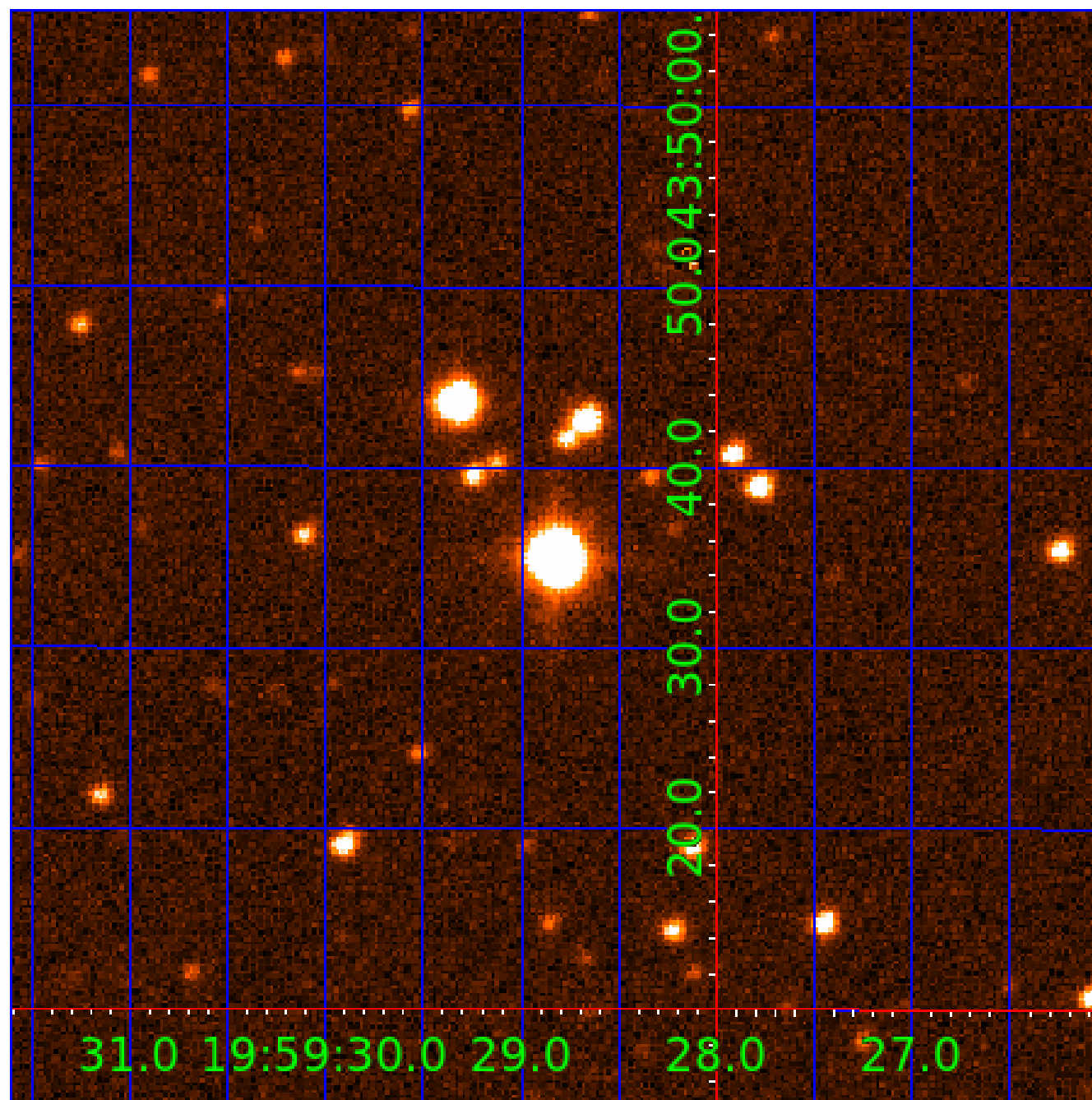


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008056853

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008056853-01	OBS	No	1.670864	133.104151	34.4	7.258	8.9	8.5	0.71	4429	0.52	290.52
008056853-02	OBS	No	441.120466	437.809040	721.6	9.251	15.6	9.3	0.71	4429	2.12	0.17
008056853-03	OBS	No	305.585951	428.199935	507.1	9.374	13.3	5.9	0.71	4429	1.76	0.28
008056853-04	OBS	No	225.156248	190.548826	394.0	9.364	12.5	5.4	0.71	4429	1.60	0.42
008056853-05	OBS	No	307.907910	162.825072	223.0	9.419	11.8	2.5	0.71	4429	1.27	0.28
008056853-06	OBS	No	213.561669	282.933930	79.6	7.168	12.4	1.3	0.71	4429	0.78	0.45
008056853-07	OBS	No	192.807309	132.044532	1526.7	33.730	13.2	8.1	0.71	4429	5.71	0.52
008056853-08	OBS	No	352.018673	141.049465	129.7	2.288	9.0	1.6	0.71	4429	1.02	0.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008056853-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008056853-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008056853-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008056853-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—CENT_KIC_POS
008056853-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET
008056853-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

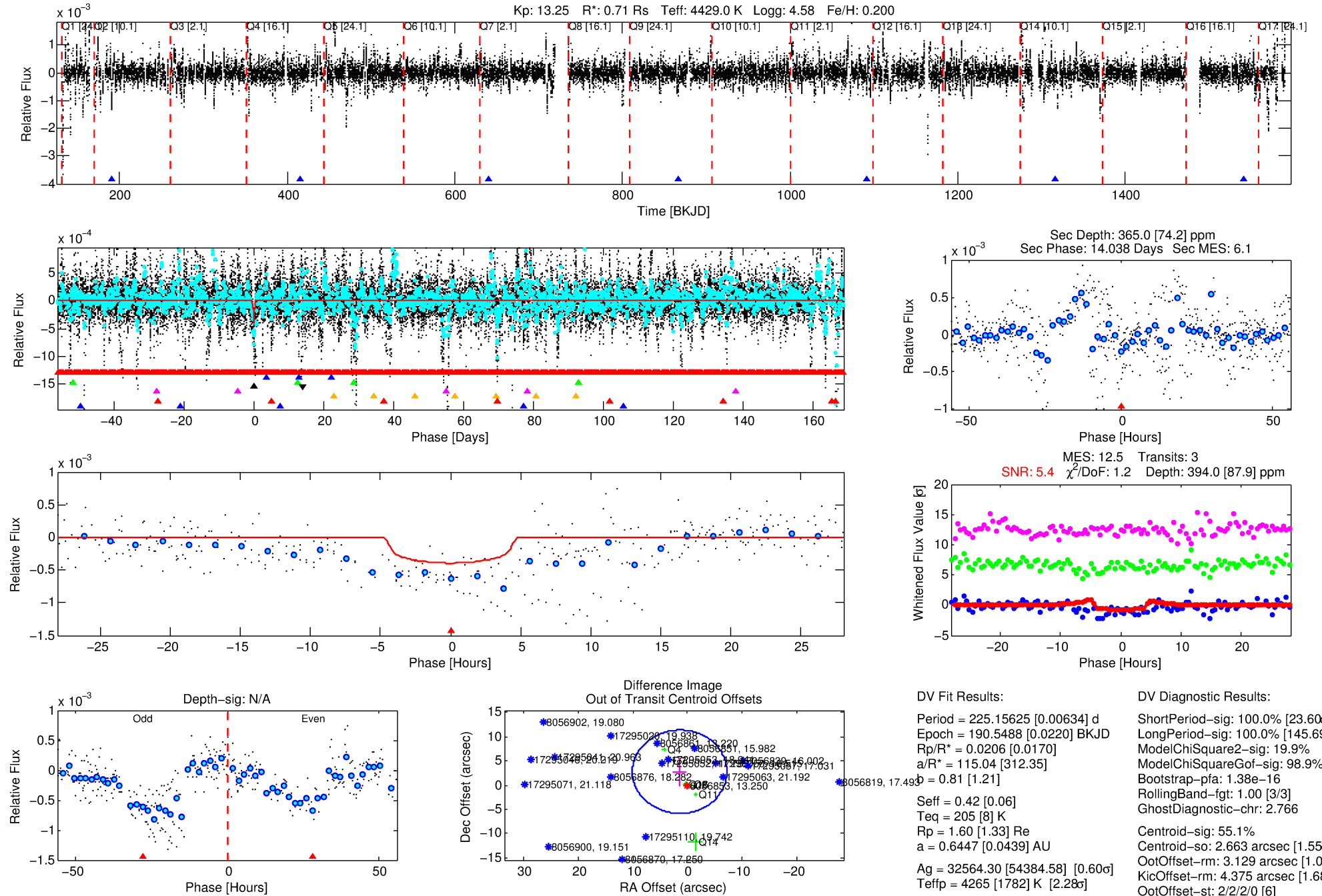
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Ephemeris Match Information For 008056853-04

No Significant Match Found

# DV One-Page Summary

KIC: 8056853 Candidate: 4 of 8 Period: 225.156 d

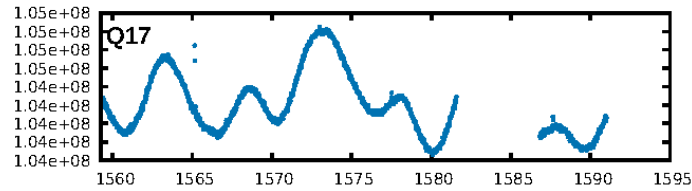
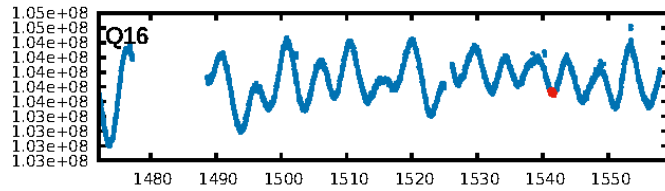
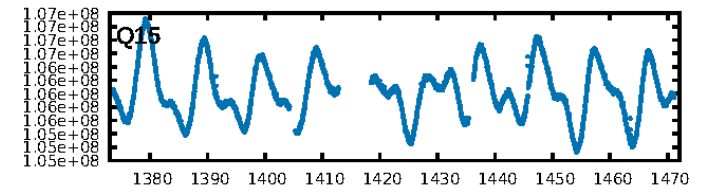
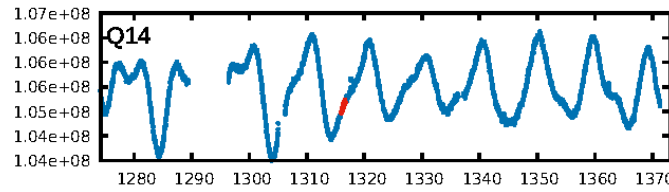
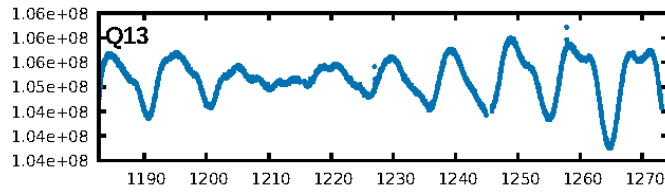
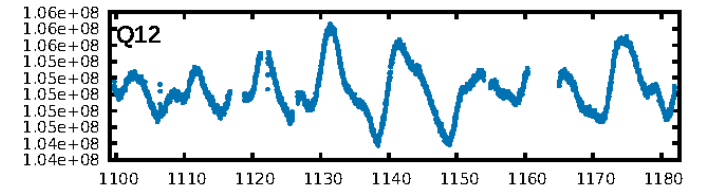
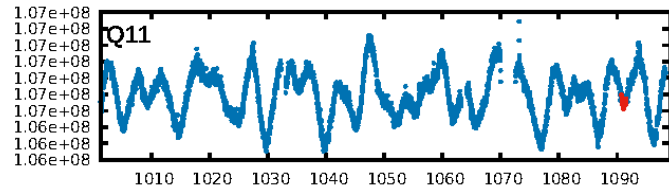
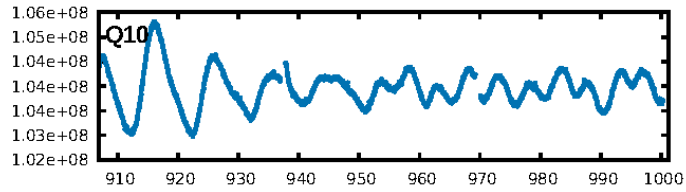
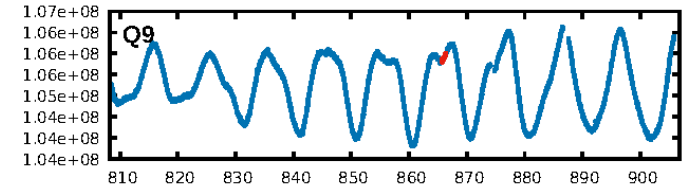
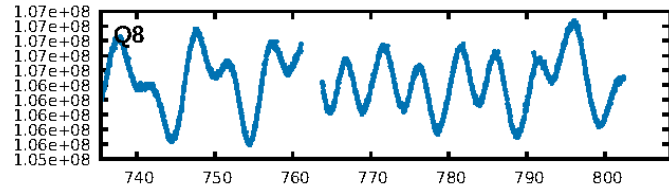
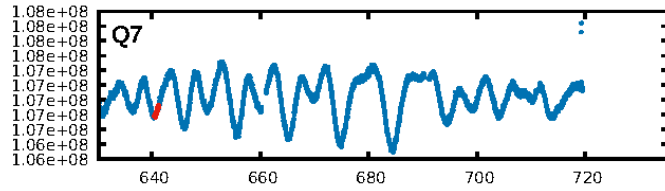
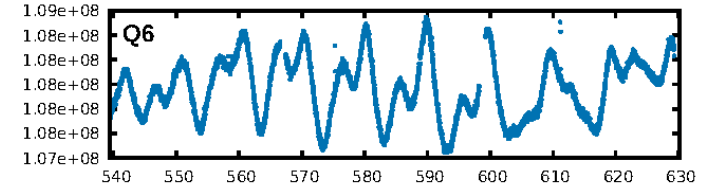
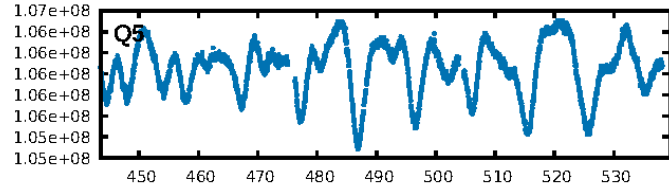
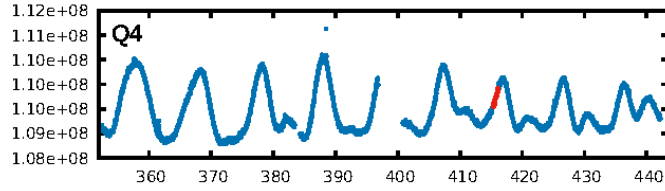
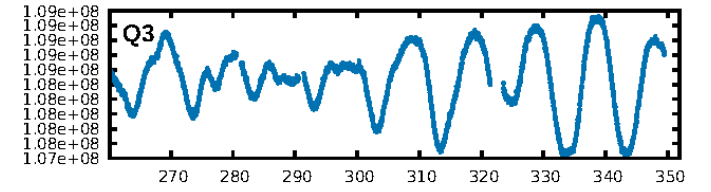
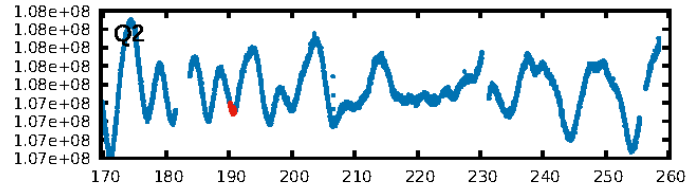
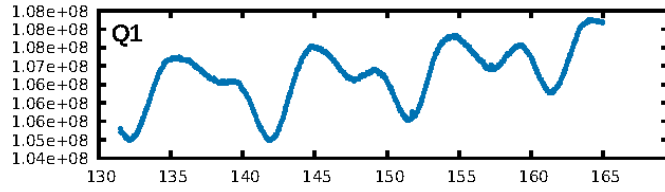


Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:13:34 Z

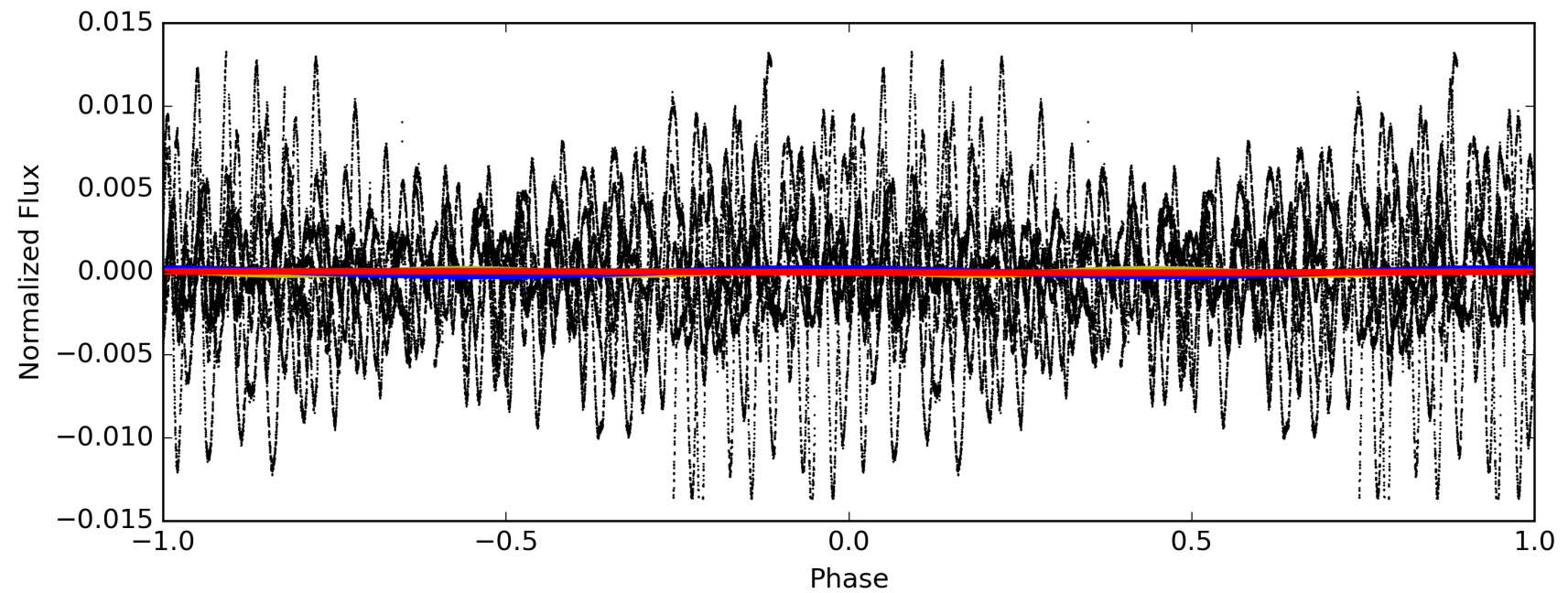
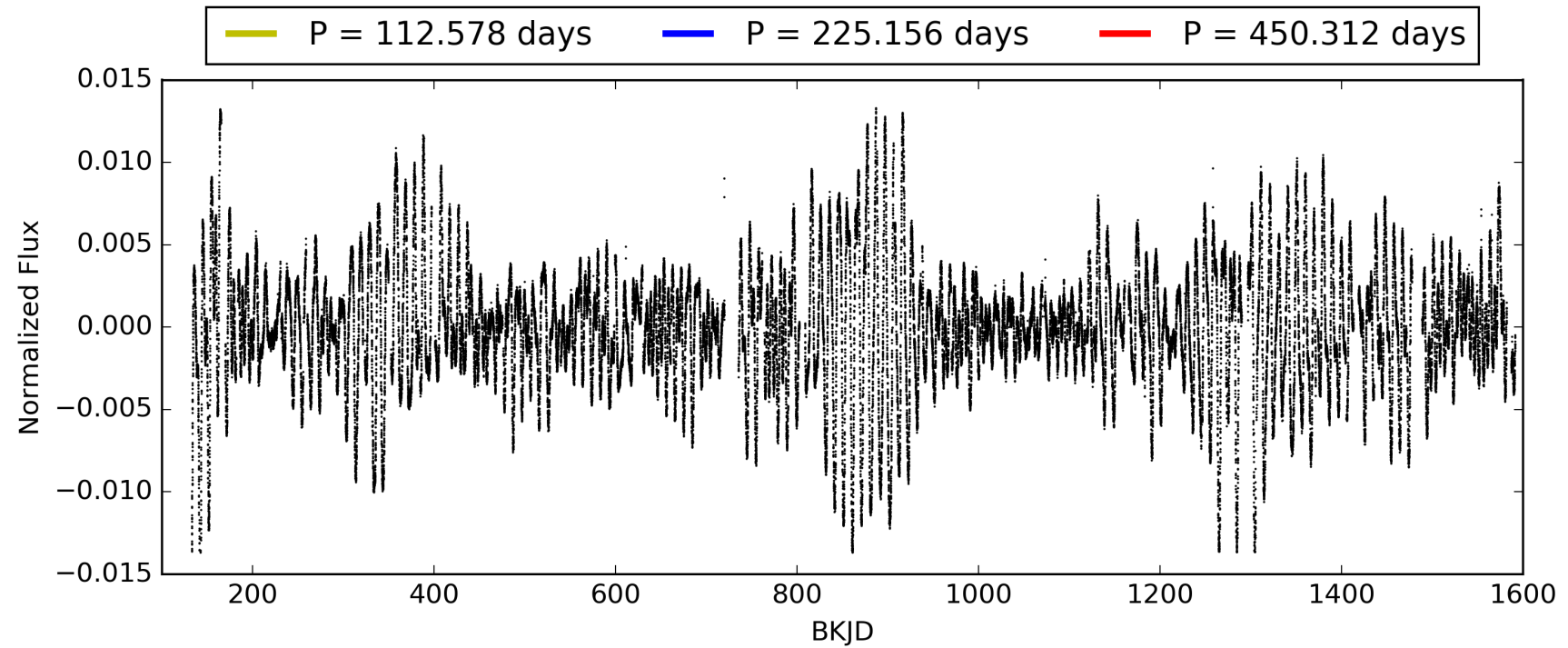
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 008056853-04, PDC Light Curves

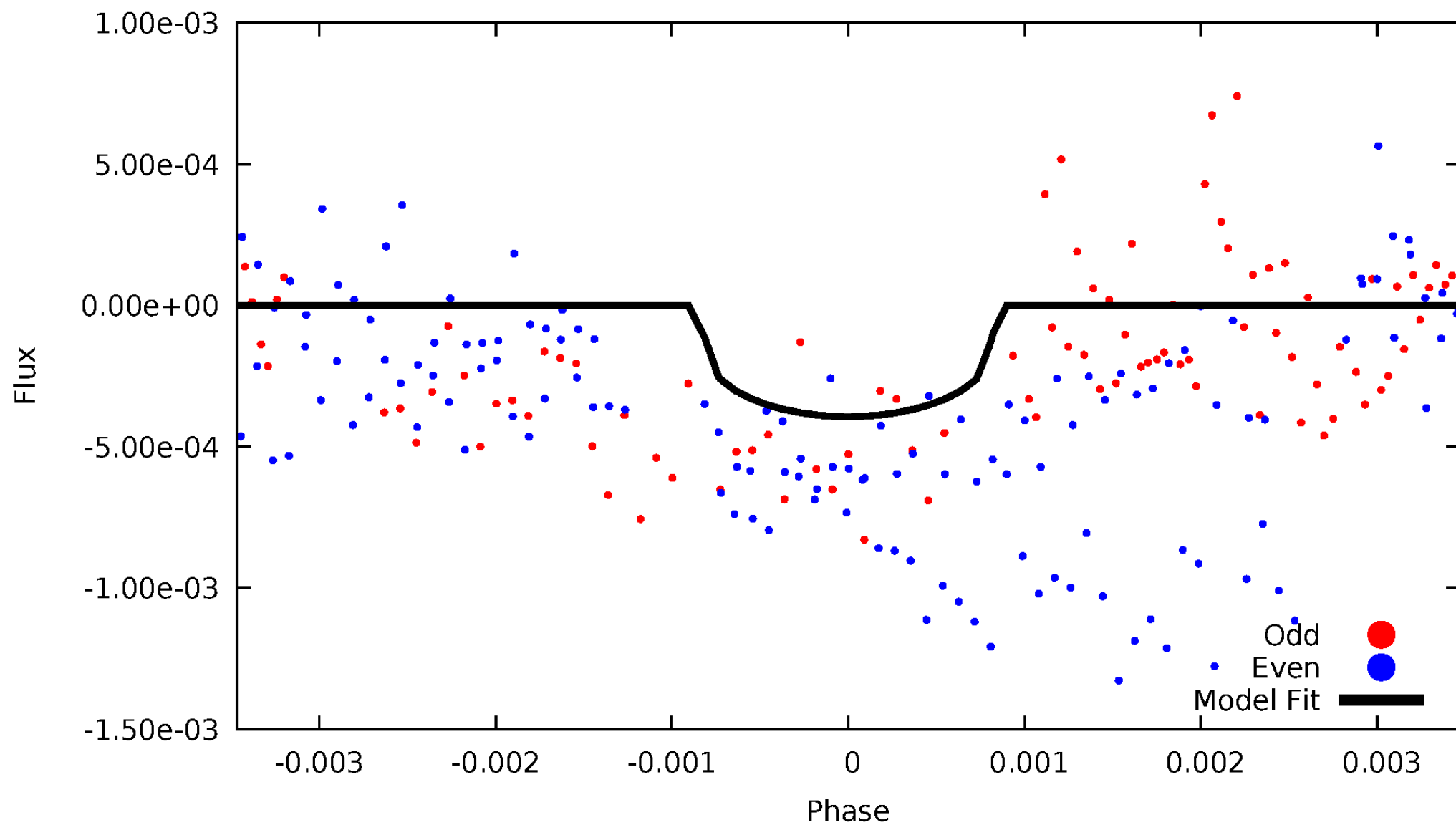


TCE 008056853-04



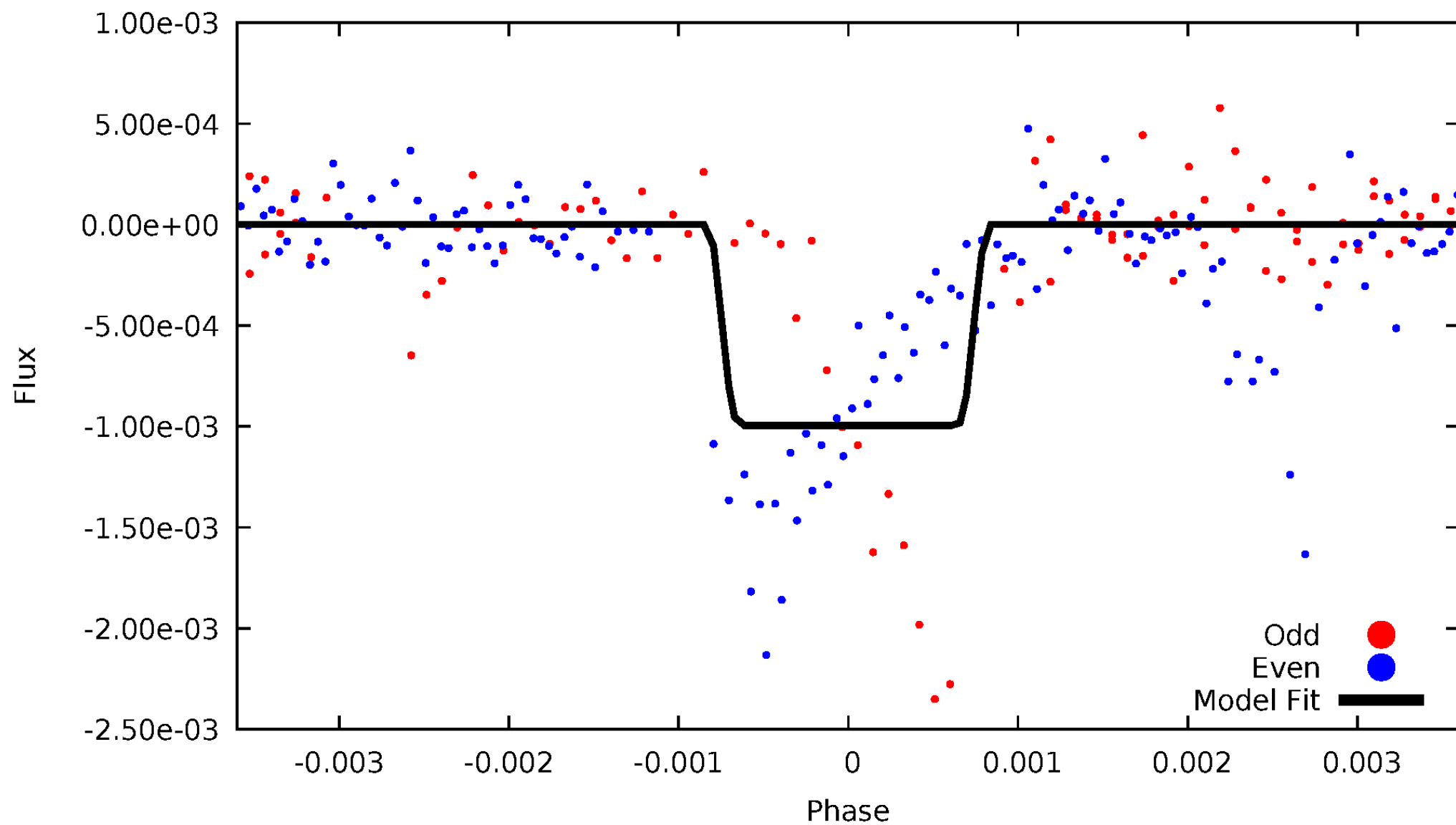
# DV Odd/Even

TCE 008056853-04



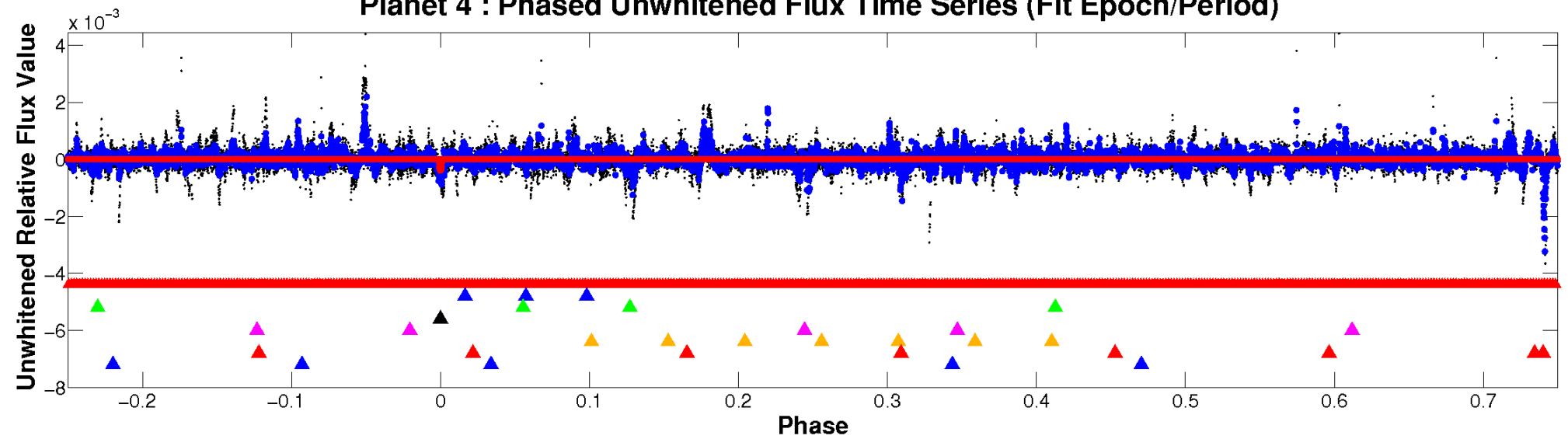
# ALT Odd/Even

TCE 008056853-04

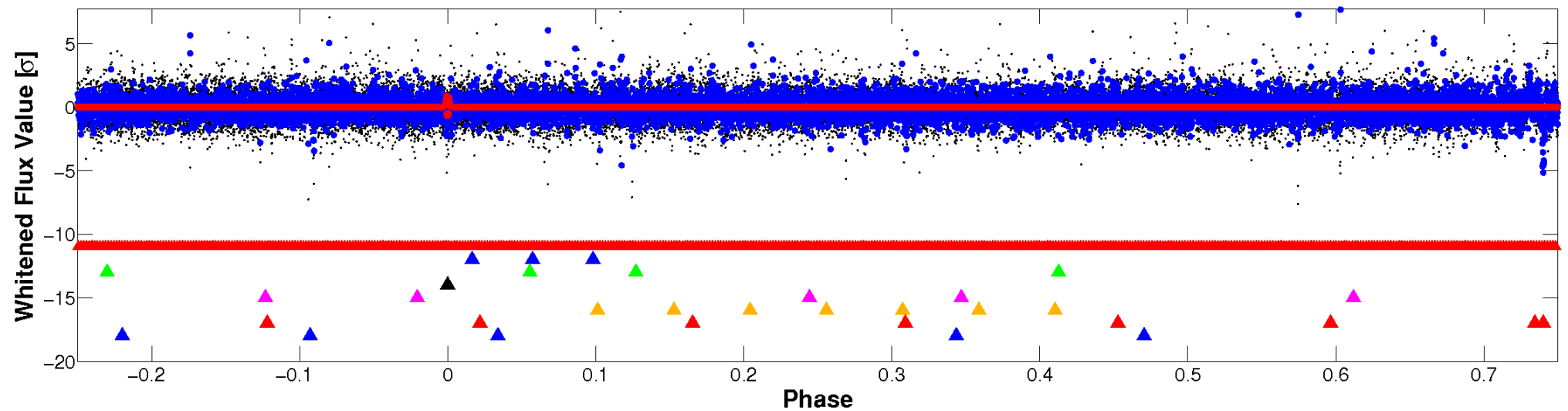


# Non-Whitened Vs. Whitened Light Curve

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

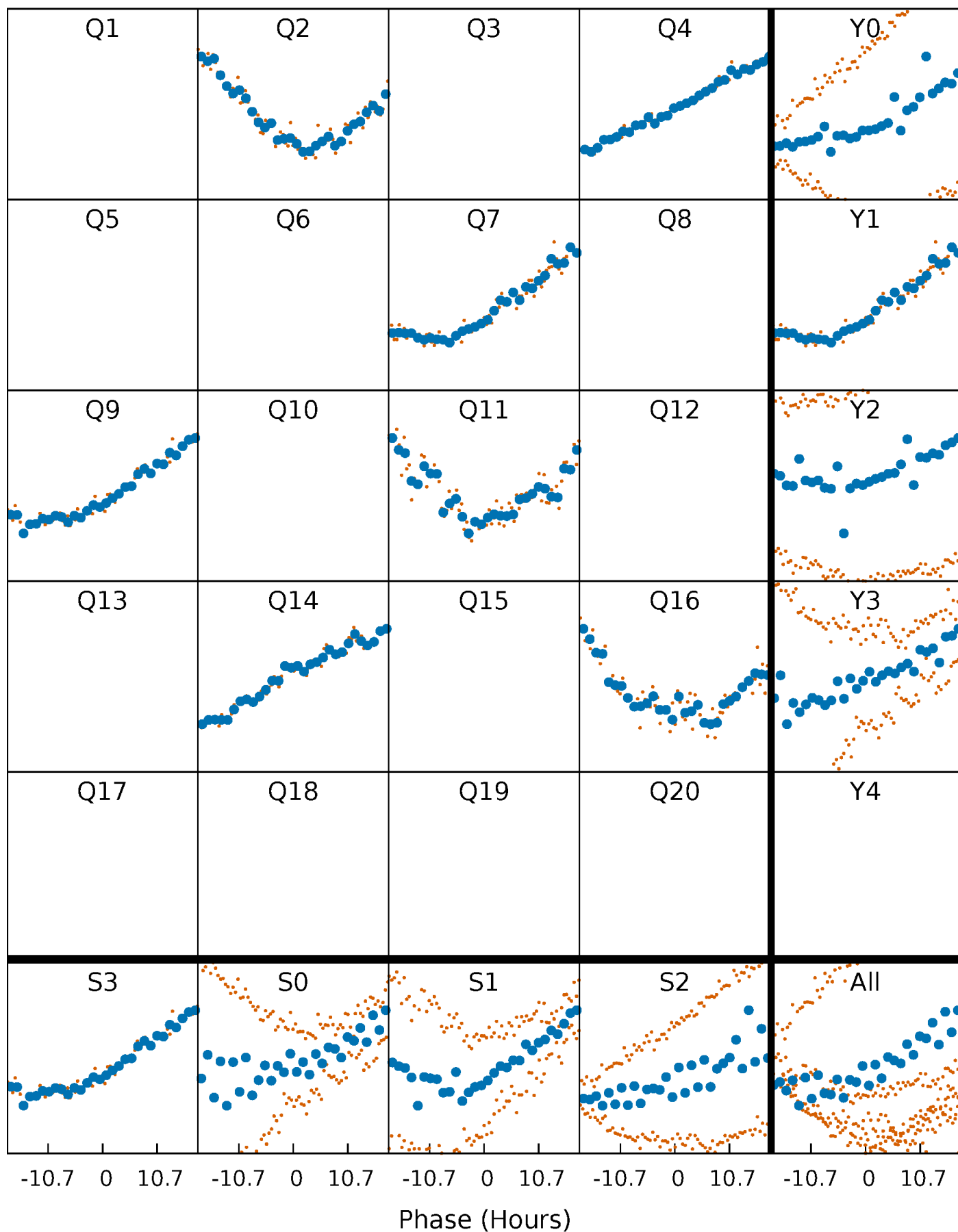


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



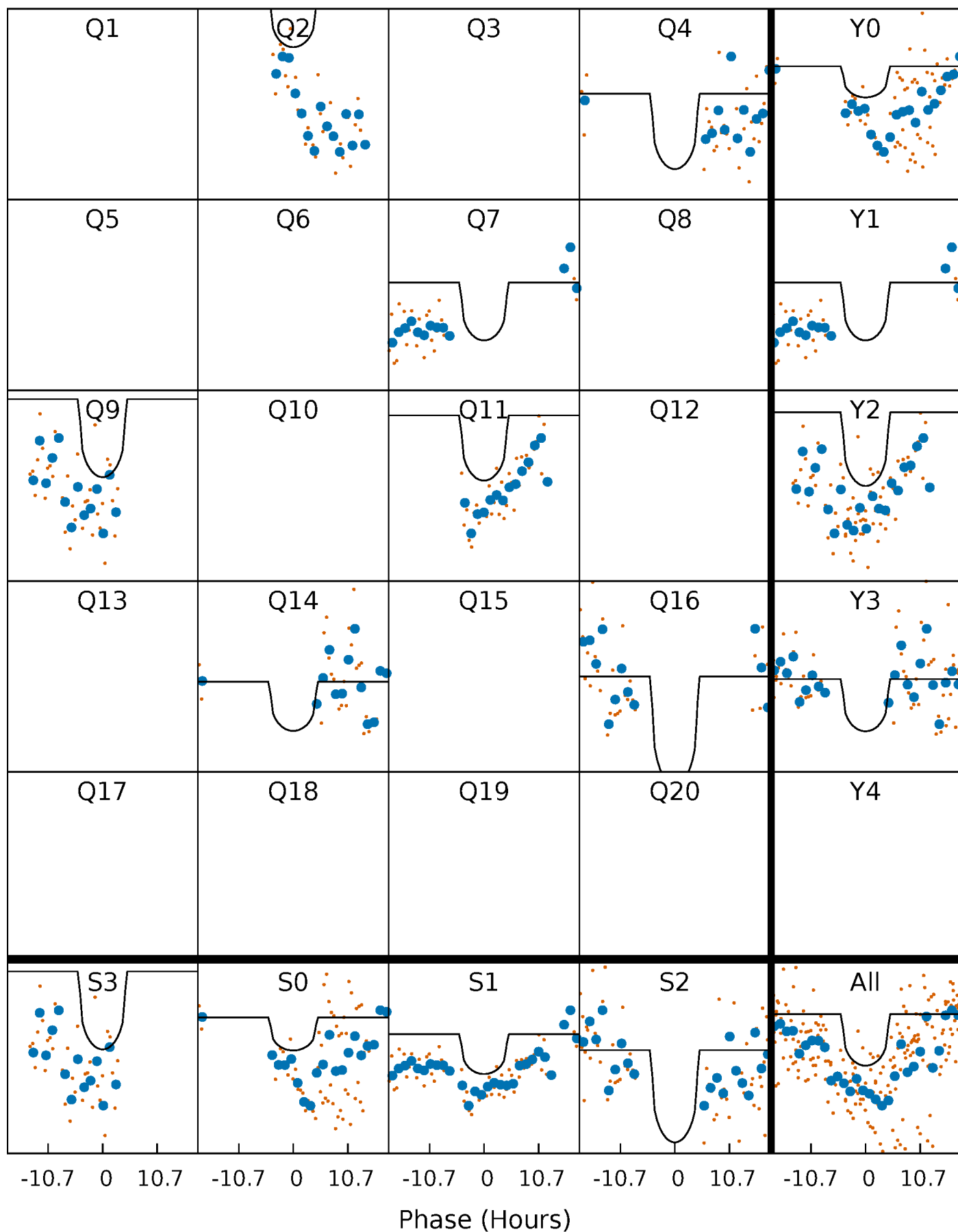
# PDC Quarter-Phased Transit Curves

TCE 008056853-04 P=225.156248 Days  $T_0=190.548826$  (BKJD)



# DV Quarter-Phased Transit Curves

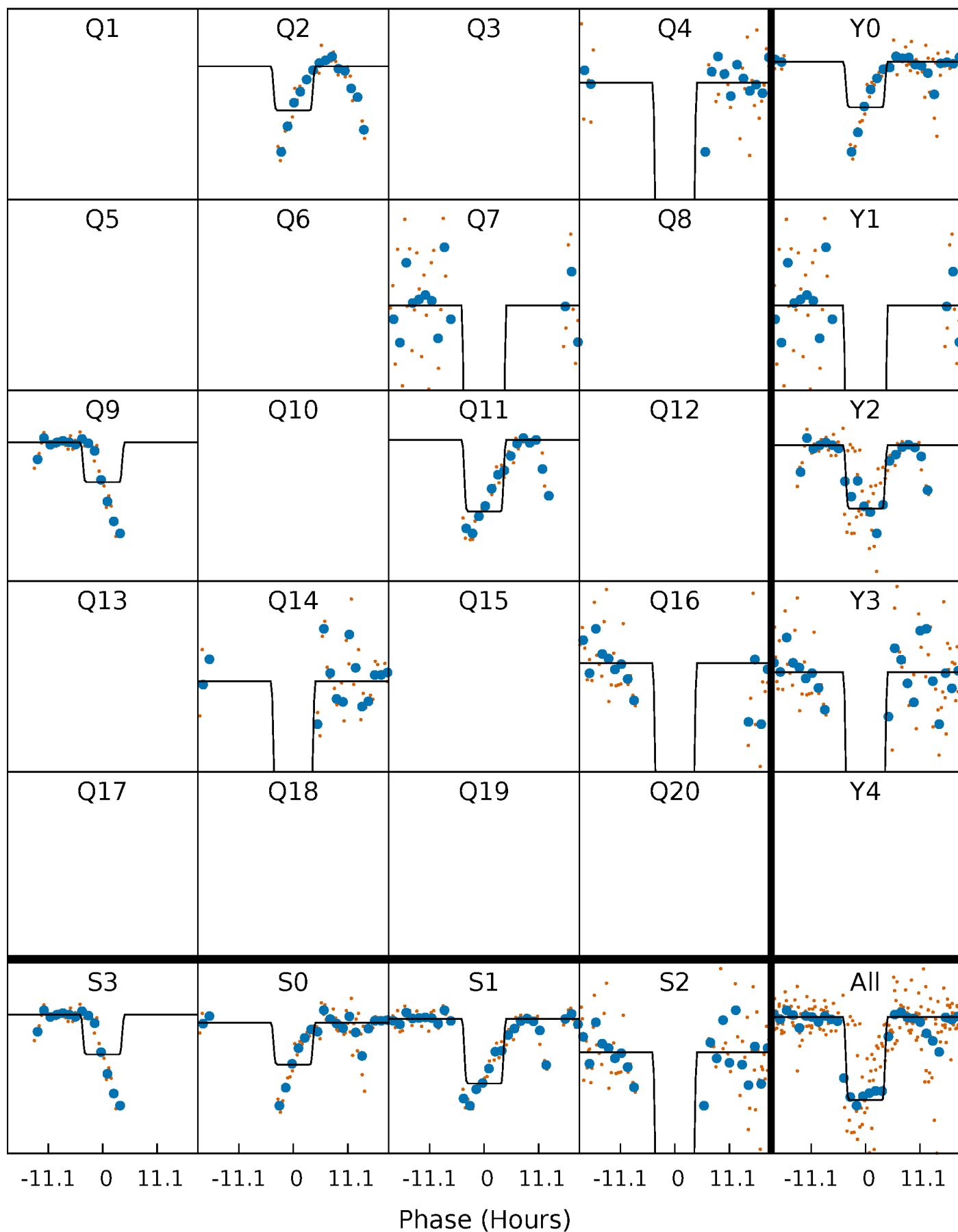
TCE 008056853-04     $P=225.156248$  Days     $T_0=190.548826$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

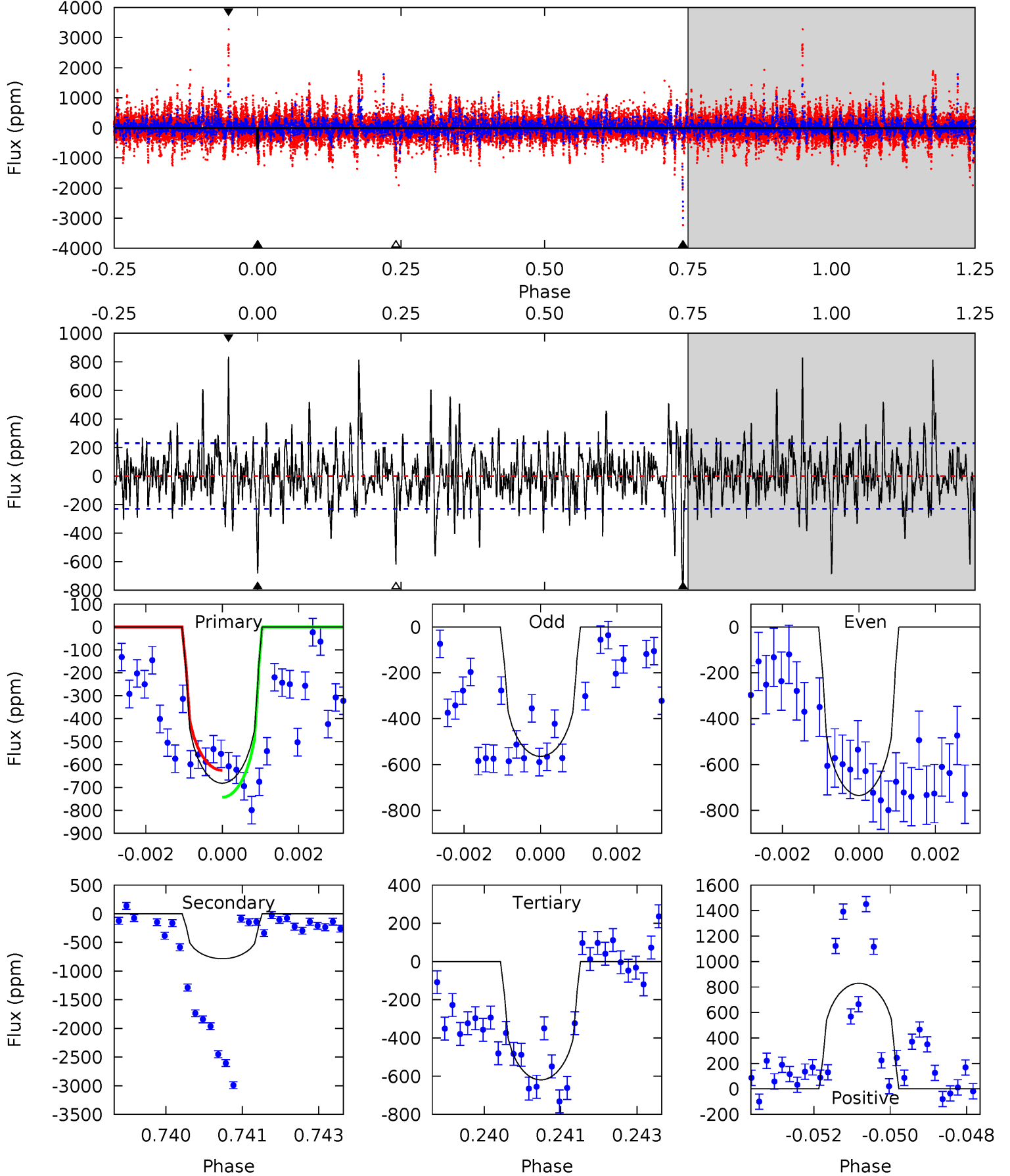
TCE 008056853-04 P=225.164209 Days  $T_0=190.512475$  (BKJD)



# DV Model-Shift Uniqueness Test

008056853-04, P = 225.156248 Days, E = 190.548826 Days

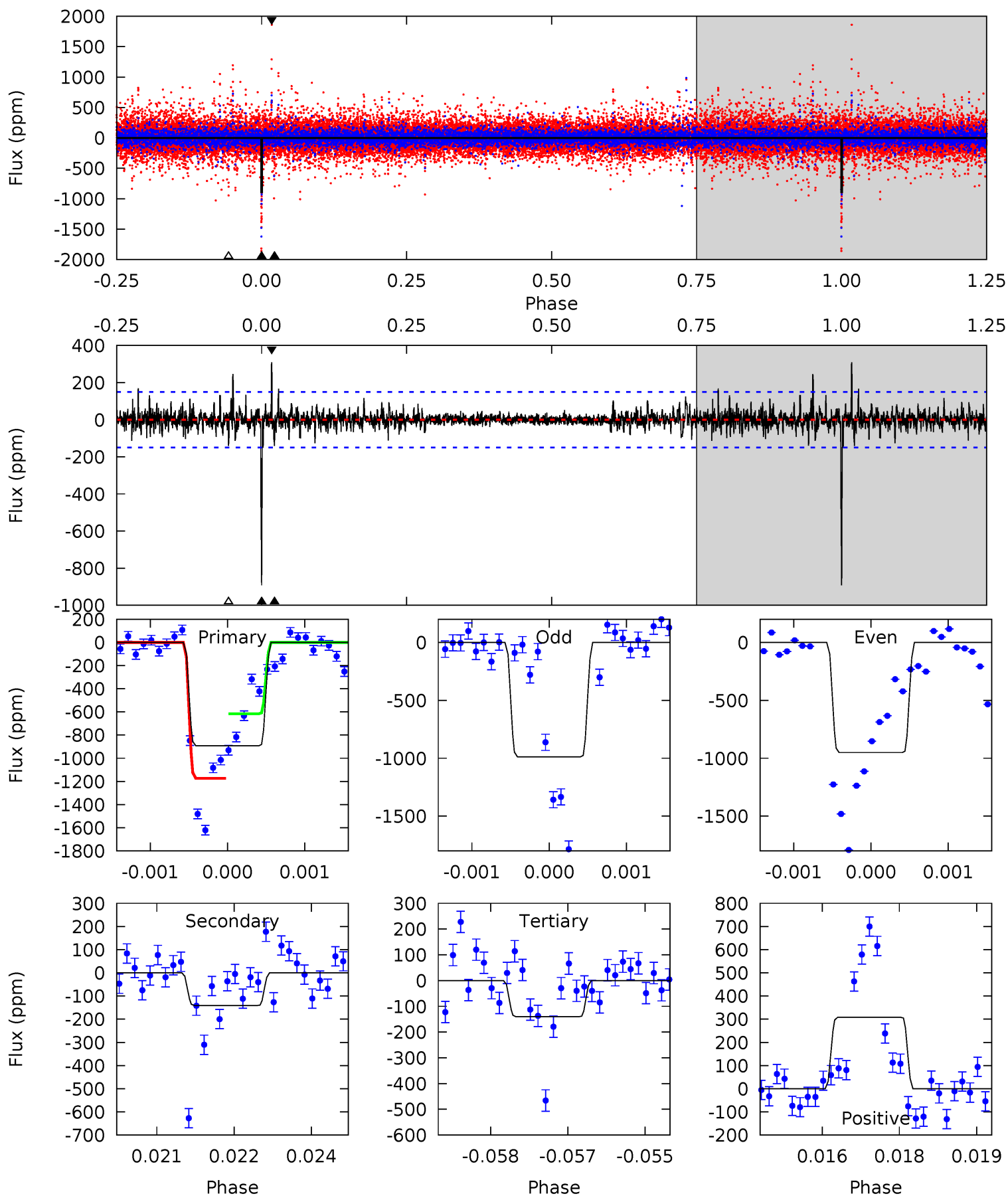
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	18.3	14.4	19.3	5.35	3.13	3.63	1.45	-3.45	3.85	-1.05	1.71	1.05	0.51	1.39



# Alt Model-Shift Uniqueness Test

008056853-04, P = 225.164209 Days, E = 190.512475 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
32.0	5.06	5.03	11.1	5.38	3.18	1.14	26.9	20.9	0.03	-6.00	0.64	1.00	0.26	10.0



### Stellar Parameters For KIC 008056853

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4429^{+132}_{-132}$	$4.581^{+0.052}_{-0.016}$	$0.200^{+0.200}_{-0.300}$	$0.712^{+0.029}_{-0.059}$	$0.704^{+0.048}_{-0.054}$	$2.750^{+0.636}_{-0.220}$
	+3%/-3%	+1%/-0%	+100%/-150%	+4%/-8%	+7%/-8%	+23%/-8%
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 008056853-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-785 \pm 43$	$1.77^{+1.26}_{-1.02}$	$285^{+9}_{-9}$	$4780^{+2434}_{-889}$	$58232^{+261733}_{-38550}$
Alt.	$-141 \pm 28$	$2.50^{+1.27}_{-1.26}$	$285^{+9}_{-10}$	$3166^{+774}_{-358}$	$5207^{+15118}_{-3013}$

$T_{max}$  = 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

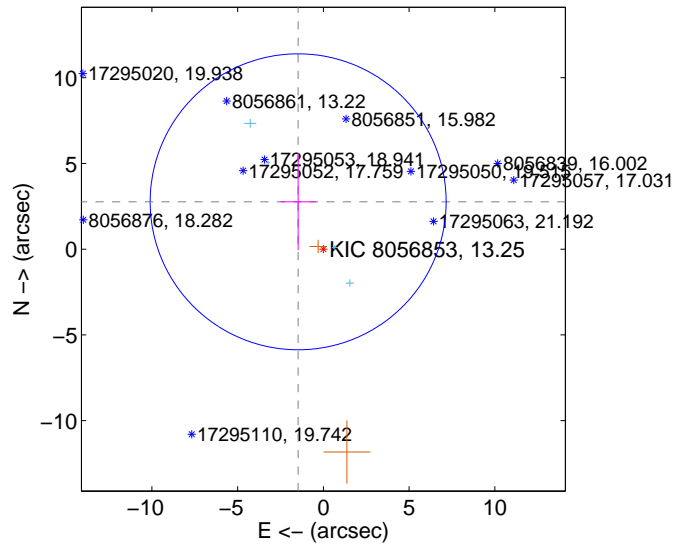
Supplemental centroid analysis for 008056853-04. Kepler magnitude: 13.25. Transit SNR 5.41

There are 4 quarters with good PRF difference image offsets

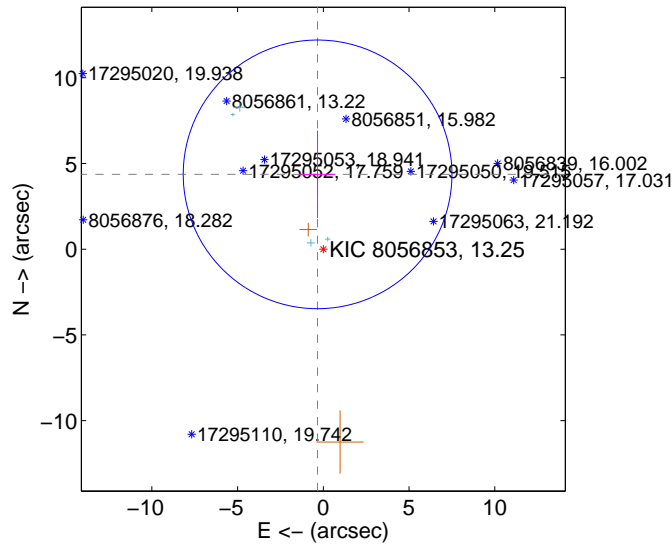
The direct PRF centroid is offset from the target star catalog position by about 1.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.129 \pm 2.877$	1.09	$1.470 \pm 1.031$	$2.762 \pm 2.821$
PRF-fit source offset from KIC position	$4.375 \pm 2.611$	1.68	$0.334 \pm 1.042$	$4.362 \pm 2.553$
photometric centroid source offset	$2.66 \pm 1.72$	1.55	$2.31 \pm 1.53$	$1.33 \pm 2.20$

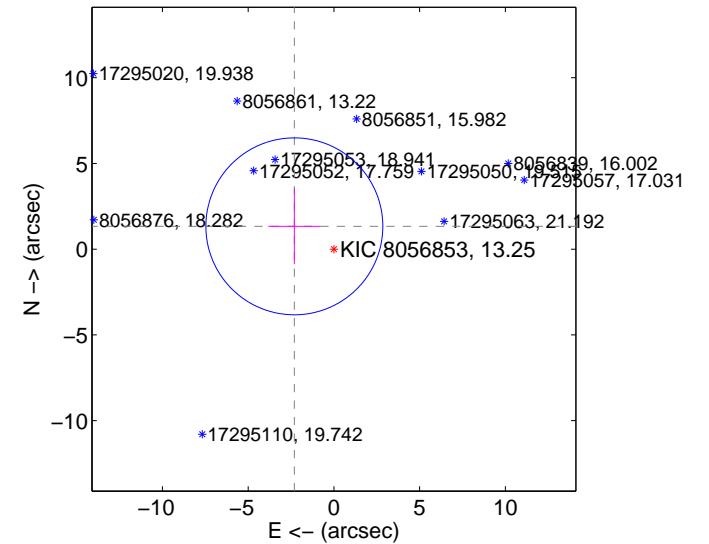
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

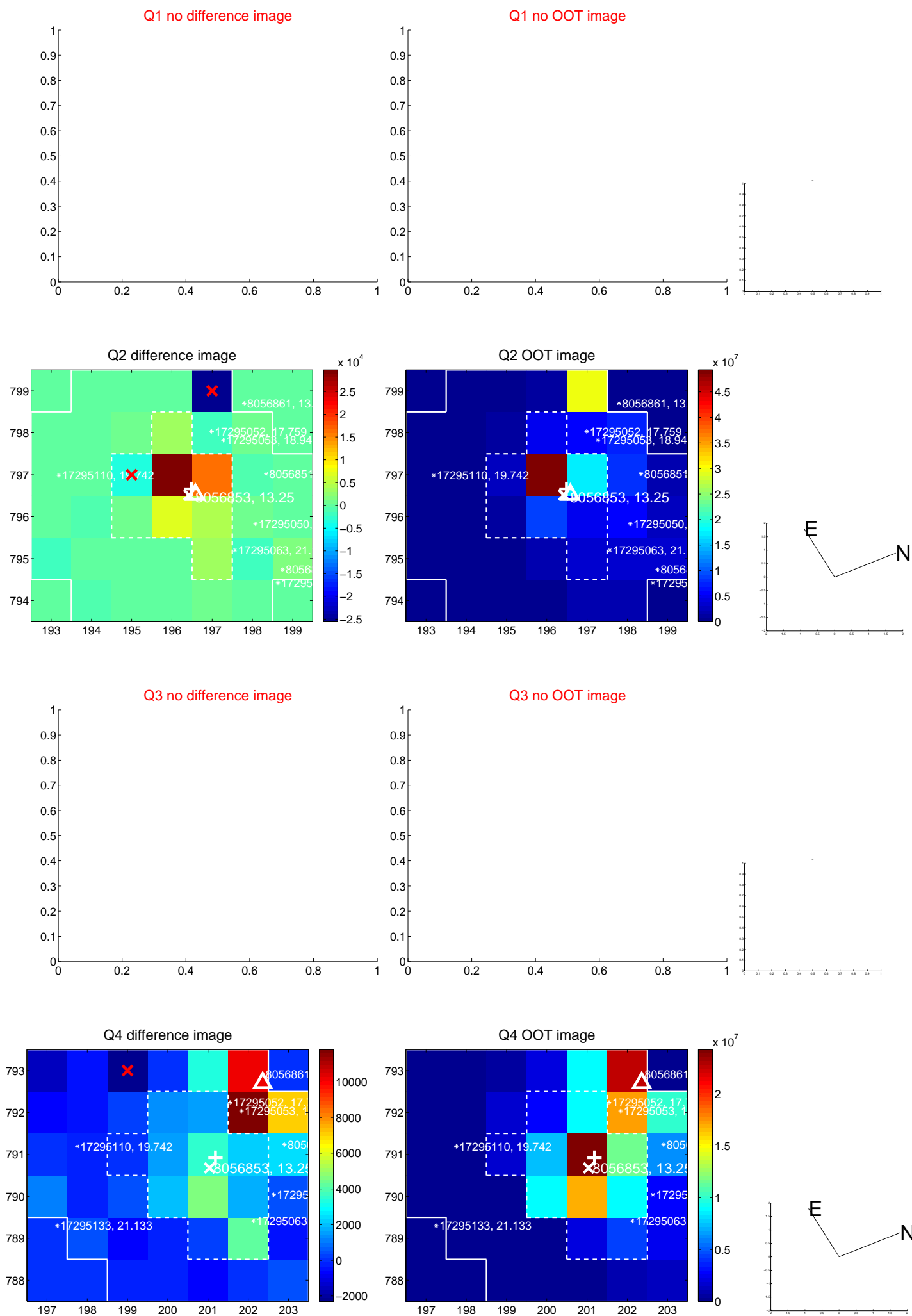


offset from photometric centroids

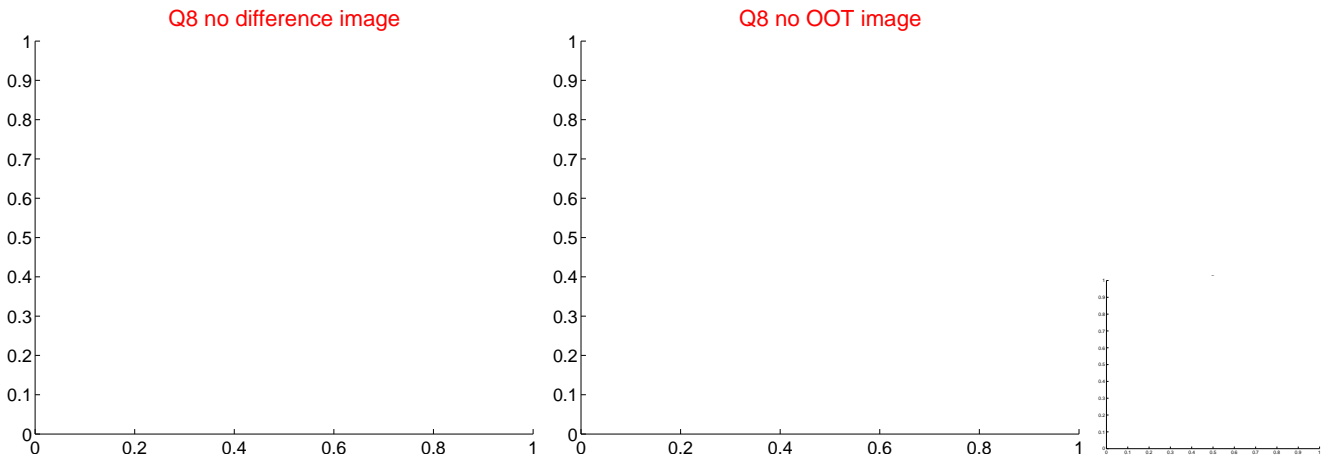
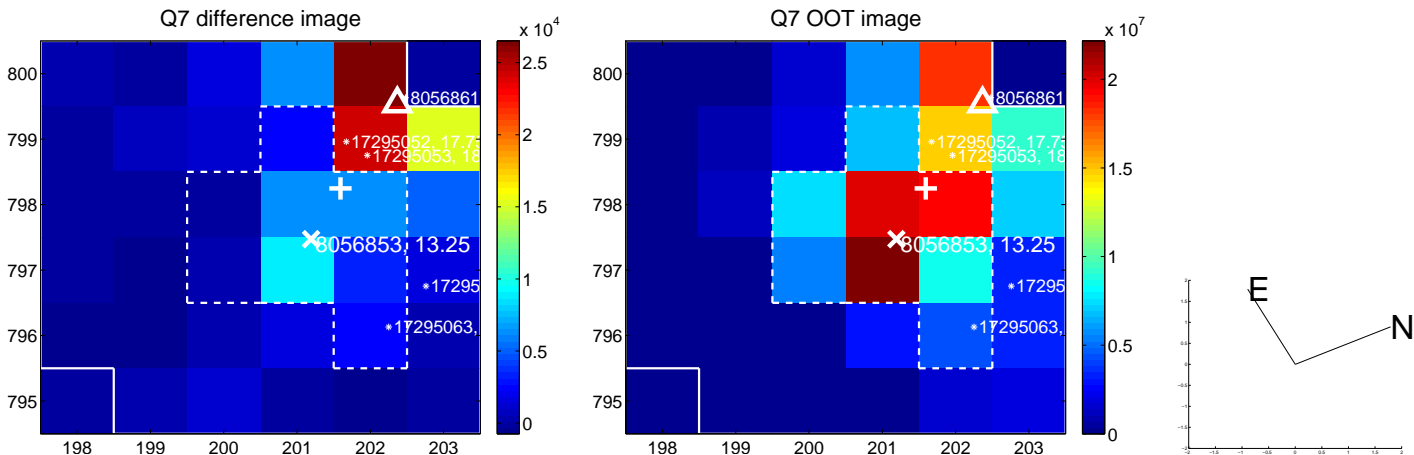
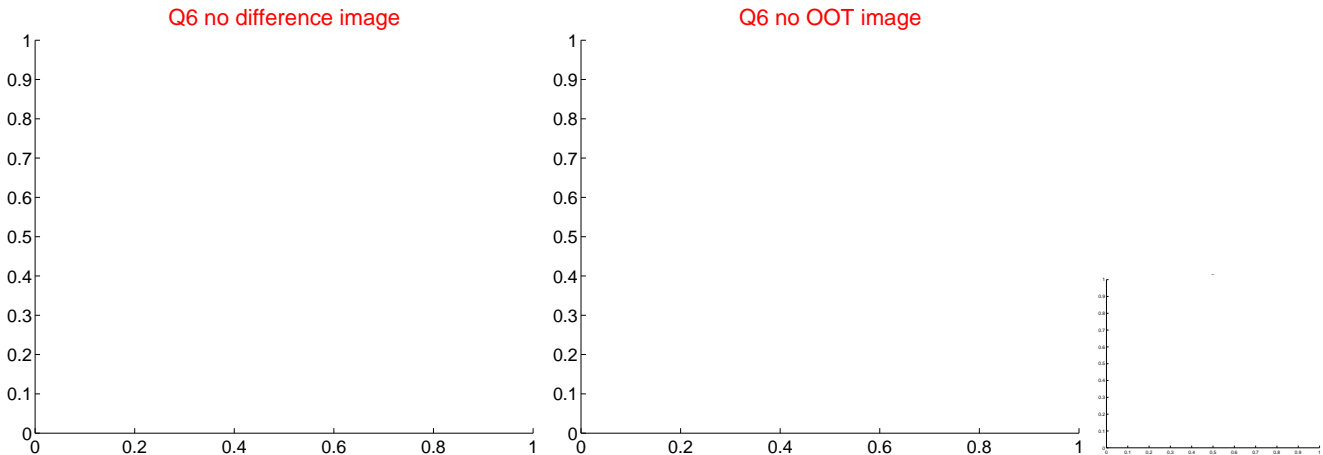
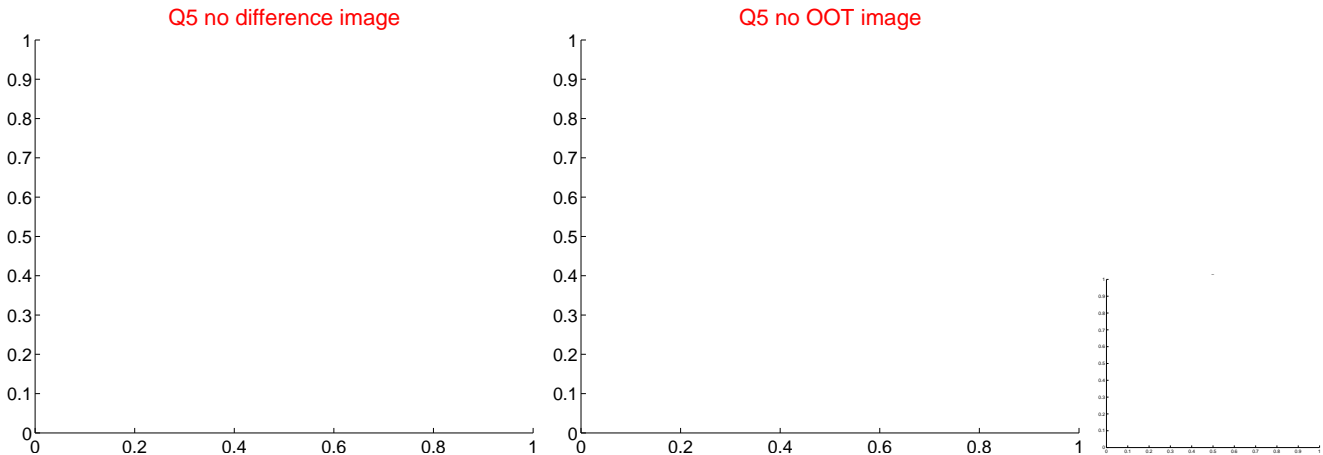


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

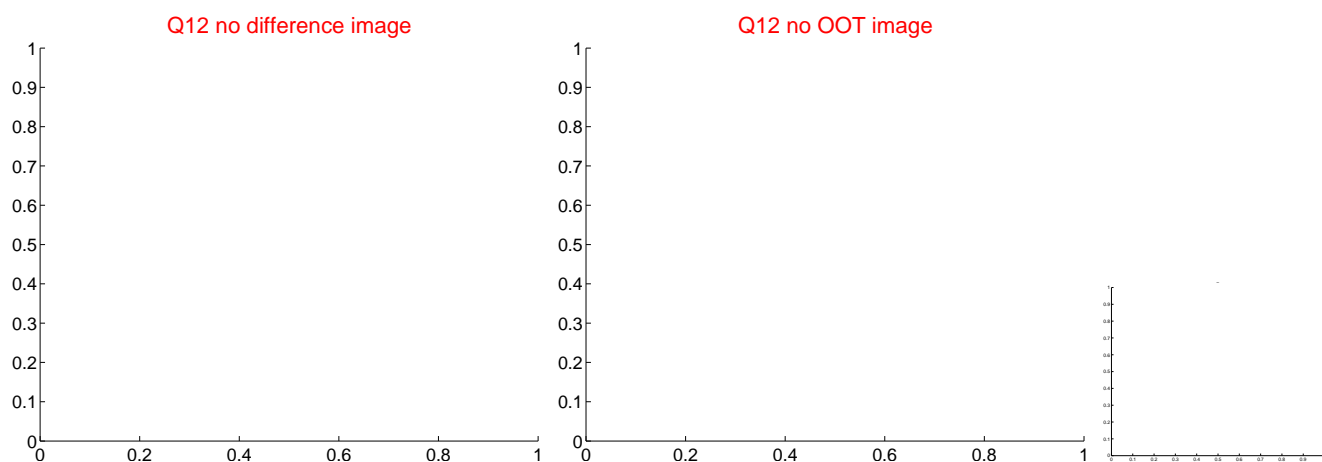
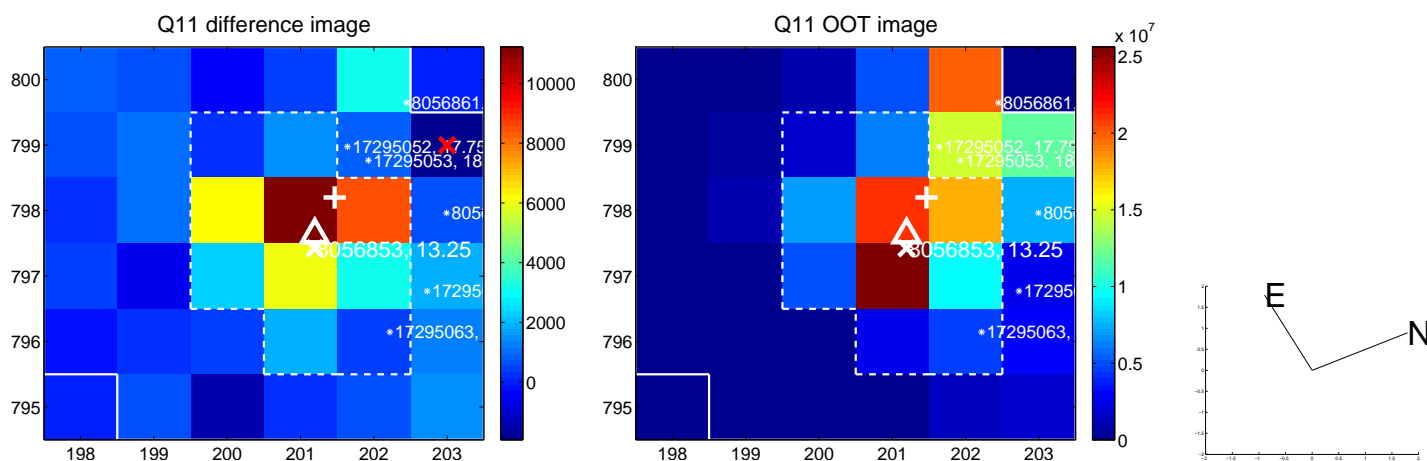
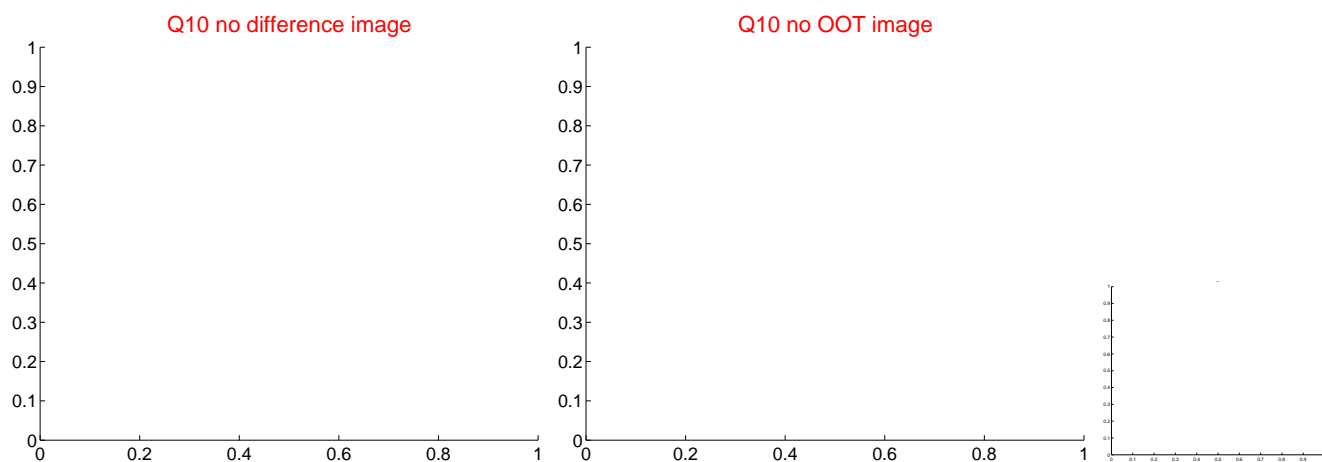
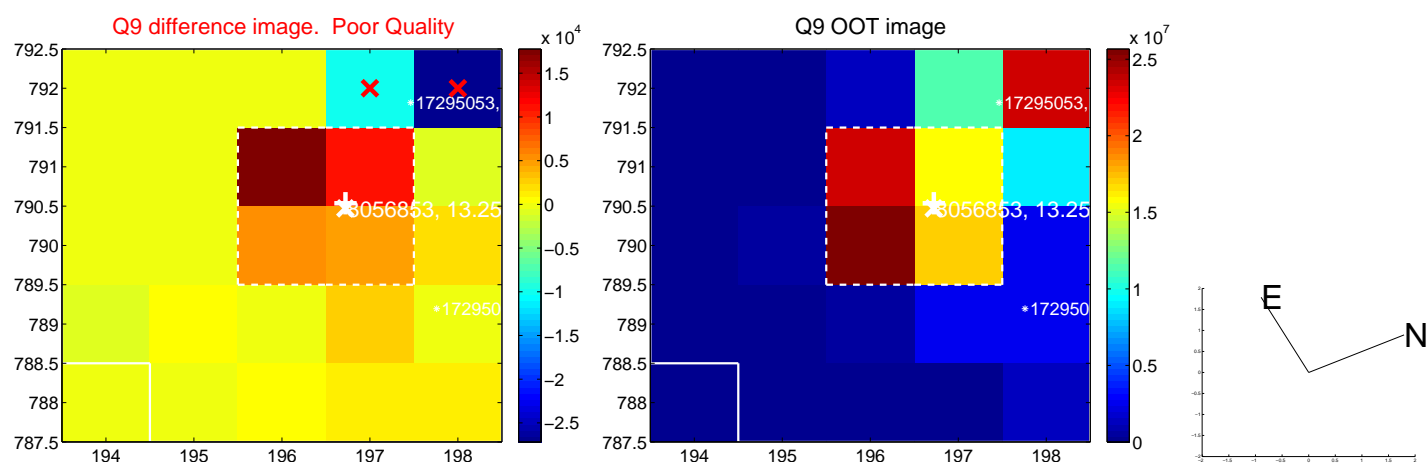
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

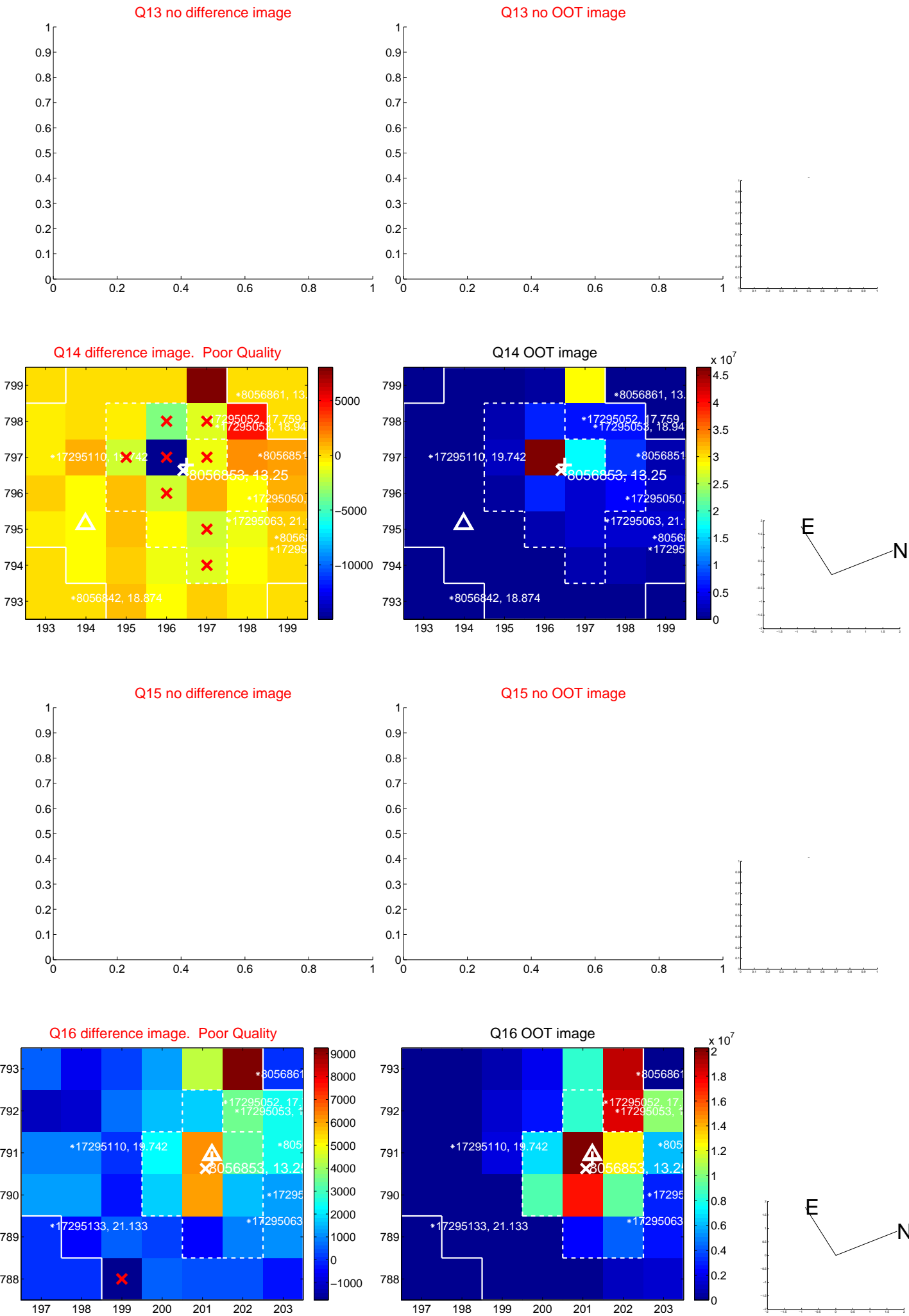


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

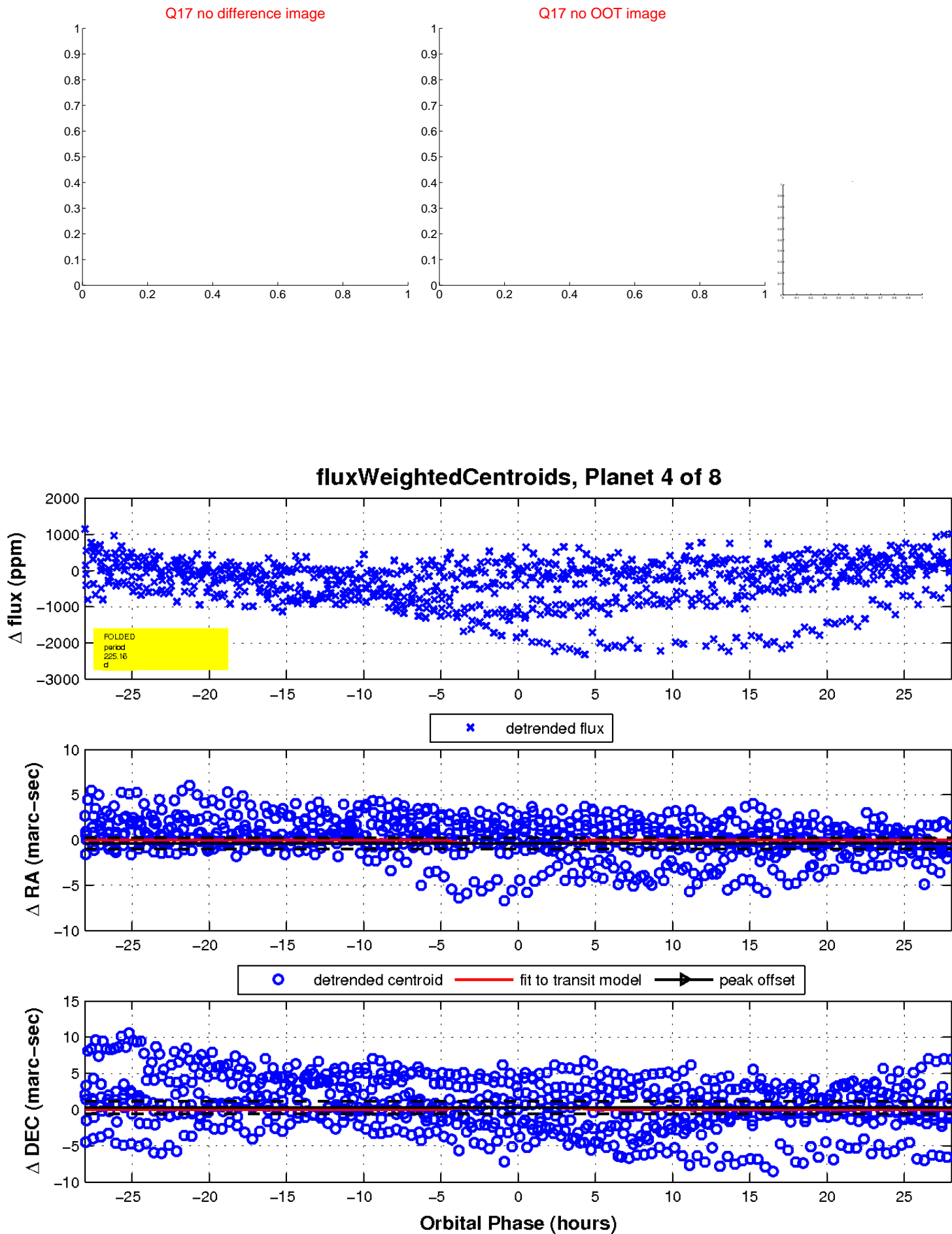




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

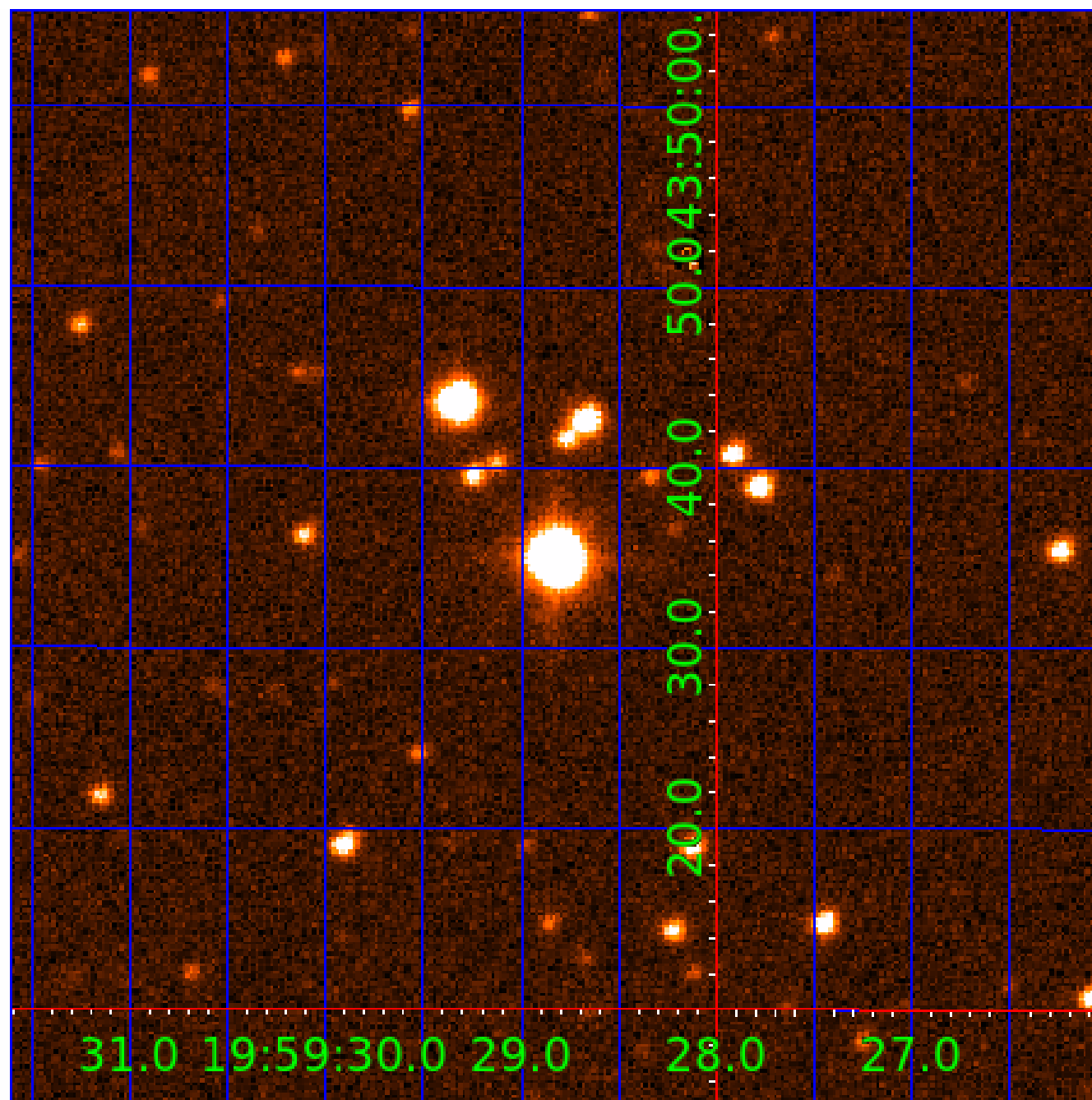


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008056853

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008056853-01	OBS	No	1.670864	133.104151	34.4	7.258	8.9	8.5	0.71	4429	0.52	290.52
008056853-02	OBS	No	441.120466	437.809040	721.6	9.251	15.6	9.3	0.71	4429	2.12	0.17
008056853-03	OBS	No	305.585951	428.199935	507.1	9.374	13.3	5.9	0.71	4429	1.76	0.28
008056853-04	OBS	No	225.156248	190.548826	394.0	9.364	12.5	5.4	0.71	4429	1.60	0.42
008056853-05	OBS	No	307.907910	162.825072	223.0	9.419	11.8	2.5	0.71	4429	1.27	0.28
008056853-06	OBS	No	213.561669	282.933930	79.6	7.168	12.4	1.3	0.71	4429	0.78	0.45
008056853-07	OBS	No	192.807309	132.044532	1526.7	33.730	13.2	8.1	0.71	4429	5.71	0.52
008056853-08	OBS	No	352.018673	141.049465	129.7	2.288	9.0	1.6	0.71	4429	1.02	0.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008056853-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008056853-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008056853-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008056853-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—CENT_KIC_POS
008056853-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET
008056853-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

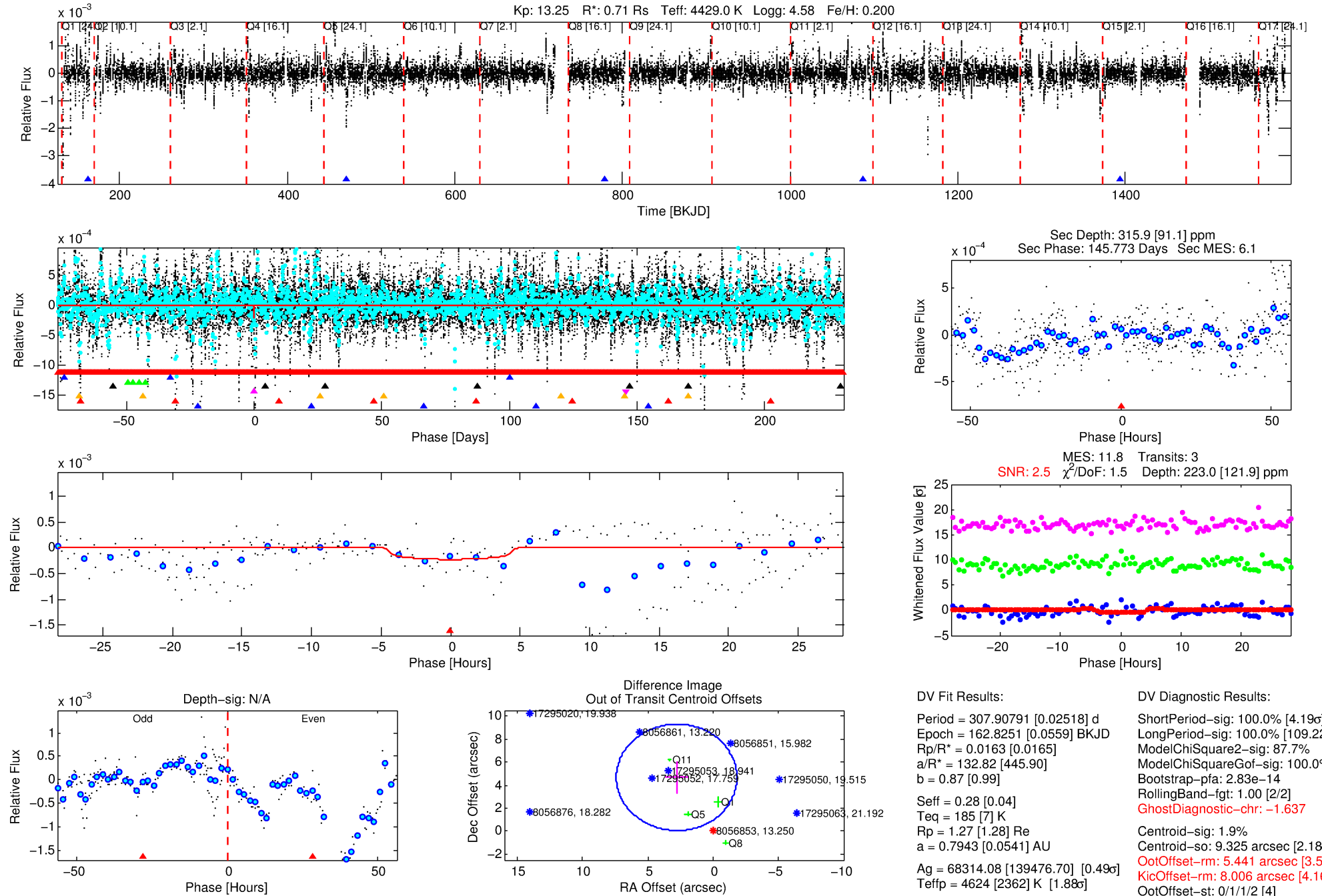
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008056853-05

No Significant Match Found

# DV One-Page Summary

KIC: 8056853 Candidate: 5 of 8 Period: 307.908 d



## DV Fit Results:

Period = 307.90791 [0.02518] d  
Epoch = 162.8251 [0.0559] BKJD  
Rp/R\* = 0.0163 [0.0165]  
a/R\* = 132.82 [445.90]  
b = 0.87 [0.99]  
Seff = 0.28 [0.04]  
Teq = 185 [7] K  
Rp = 1.27 [1.28] Re  
a = 0.7943 [0.0541] AU  
Ag = 68314.08 [139476.70] [0.49] $\sigma$   
Teffp = 4624 [2362] K [1.88] $\sigma$

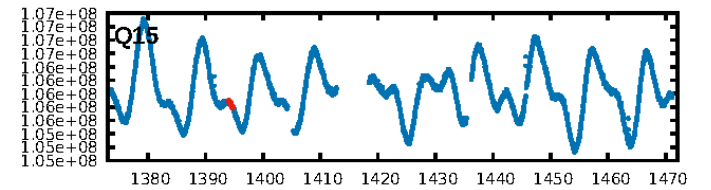
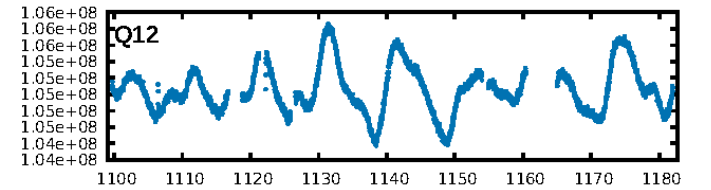
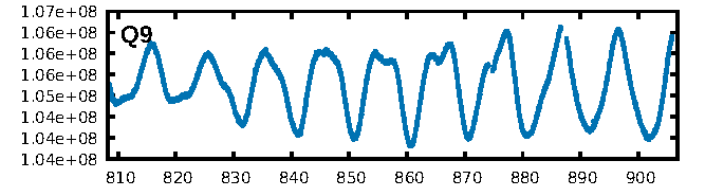
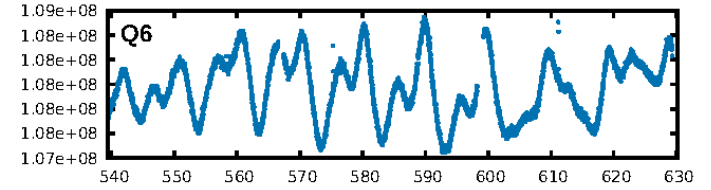
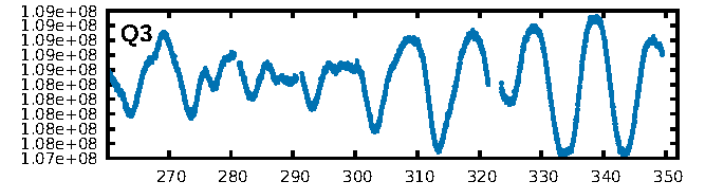
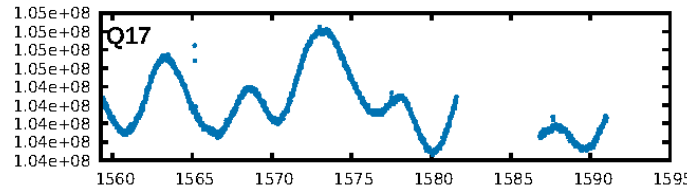
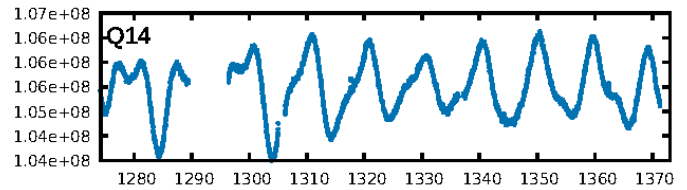
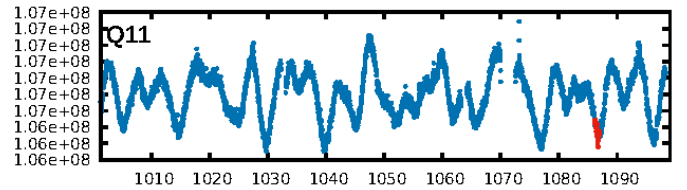
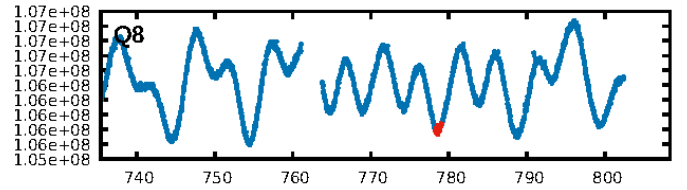
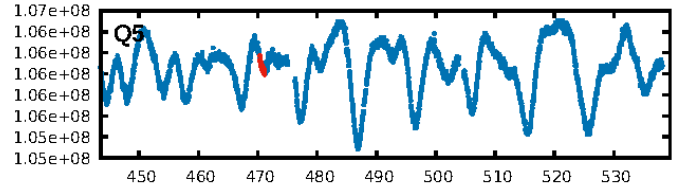
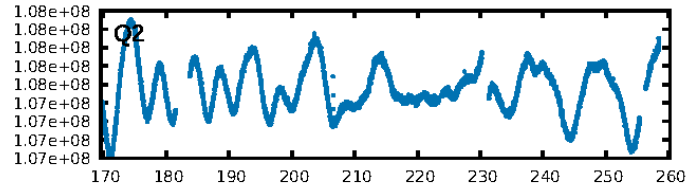
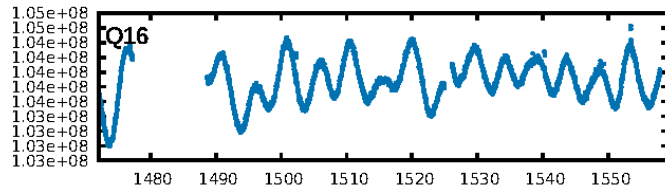
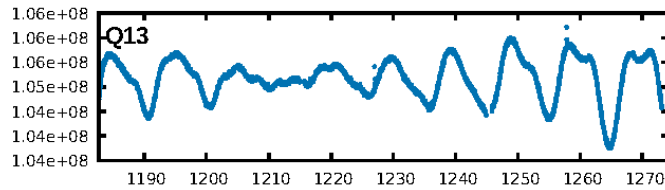
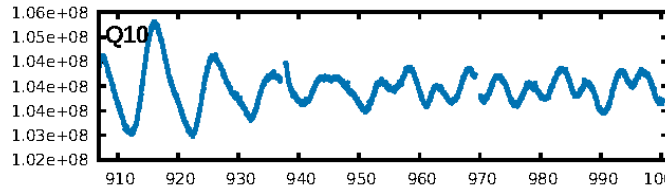
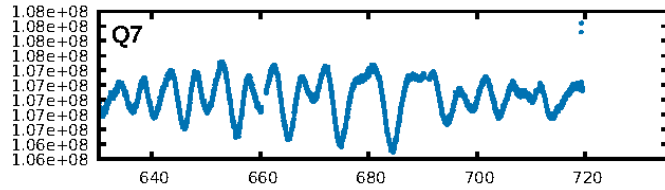
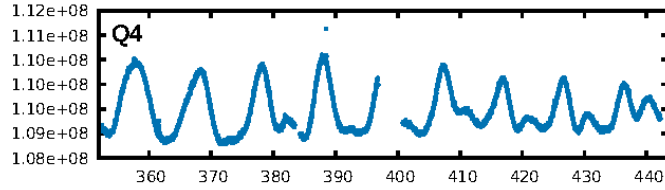
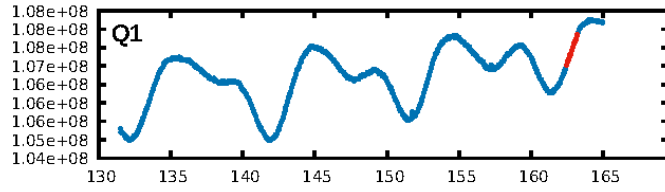
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.19 $\sigma$ ]  
LongPeriod-sig: 100.0% [109.22 $\sigma$ ]  
ModelChiSquare2-sig: 87.7%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 2.83e-14  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -1.637  
Centroid-sig: 1.9%  
Centroid-so: 9.325 arcsec [2.18 $\sigma$ ]  
OotOffset-rm: 5.441 arcsec [3.54 $\sigma$ ]  
KicOffset-rm: 8.006 arcsec [4.16 $\sigma$ ]  
OotOffset-st: 0/1/1/2 [4]  
KicOffset-st: 0/1/1/2 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 0.00 [0/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:13:47 Z

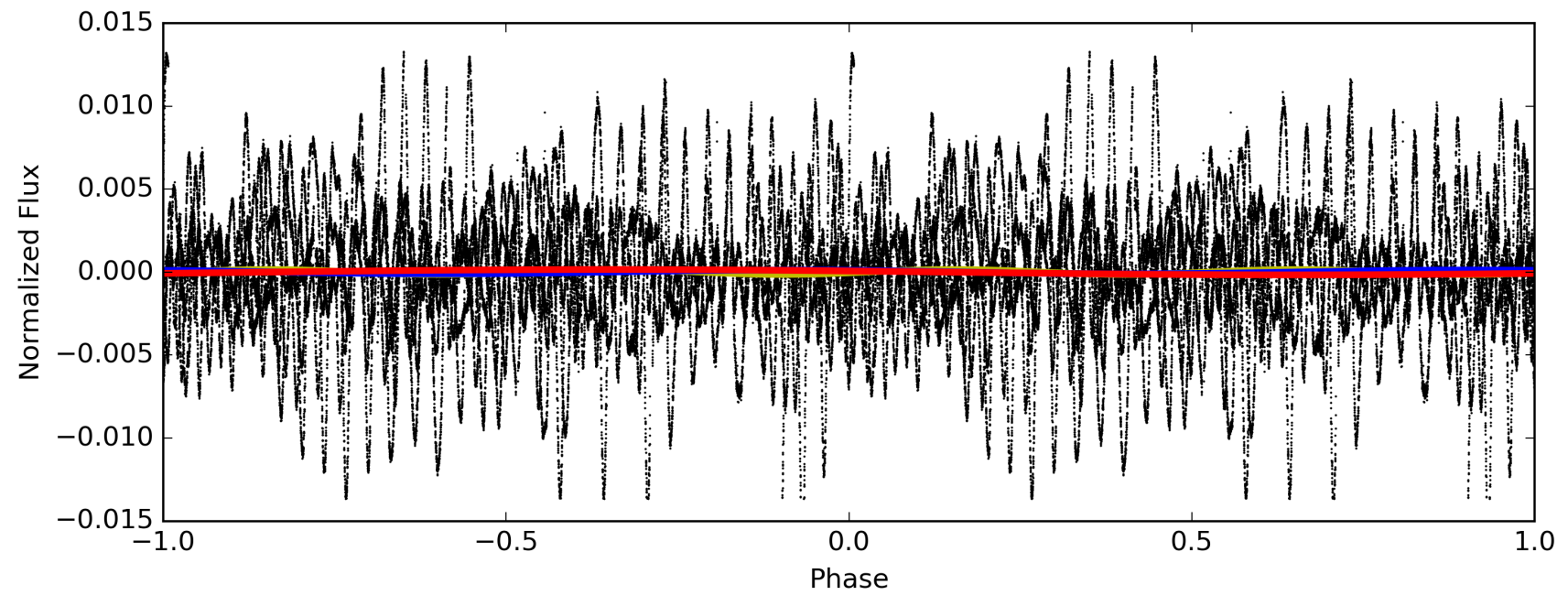
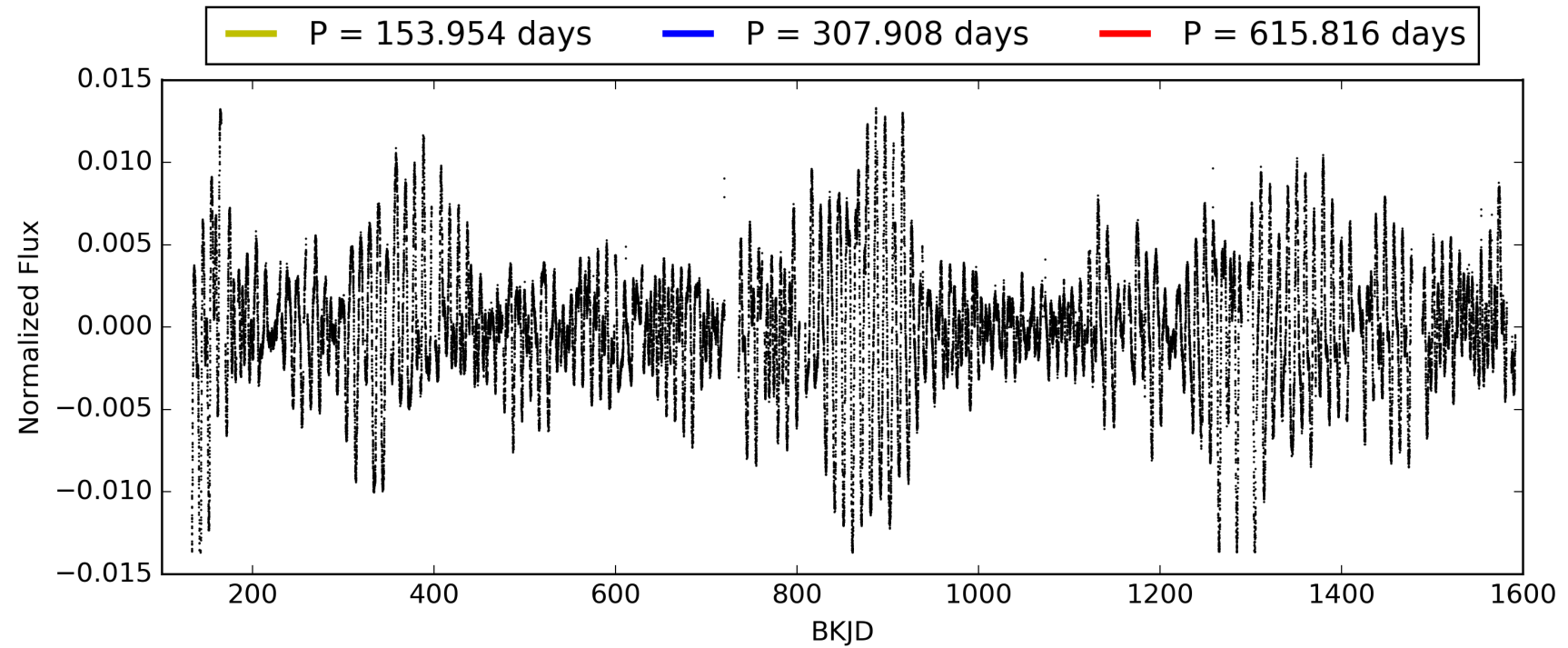
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008056853-05, PDC Light Curves



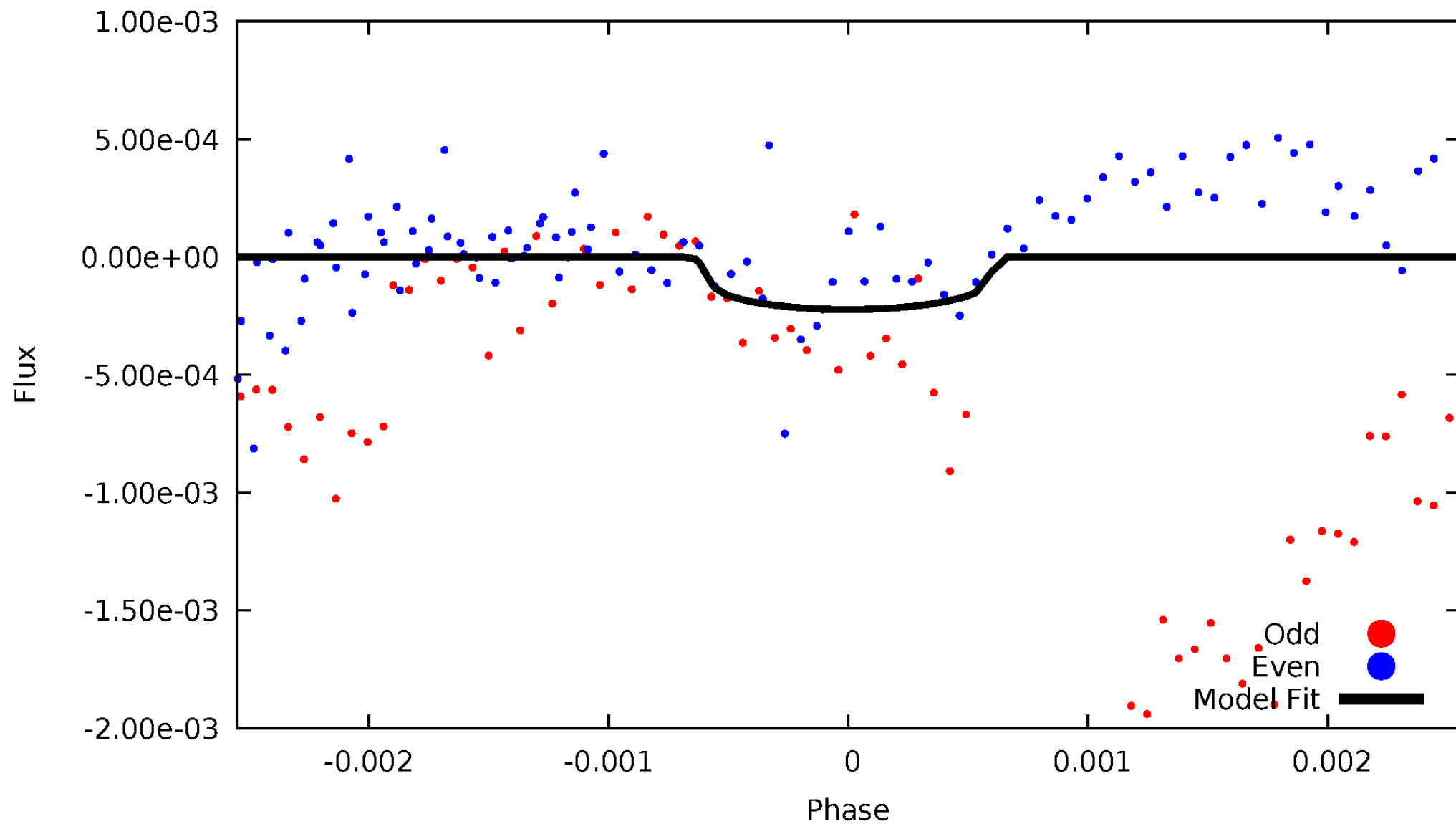


TCE 008056853-05



# DV Odd/Even

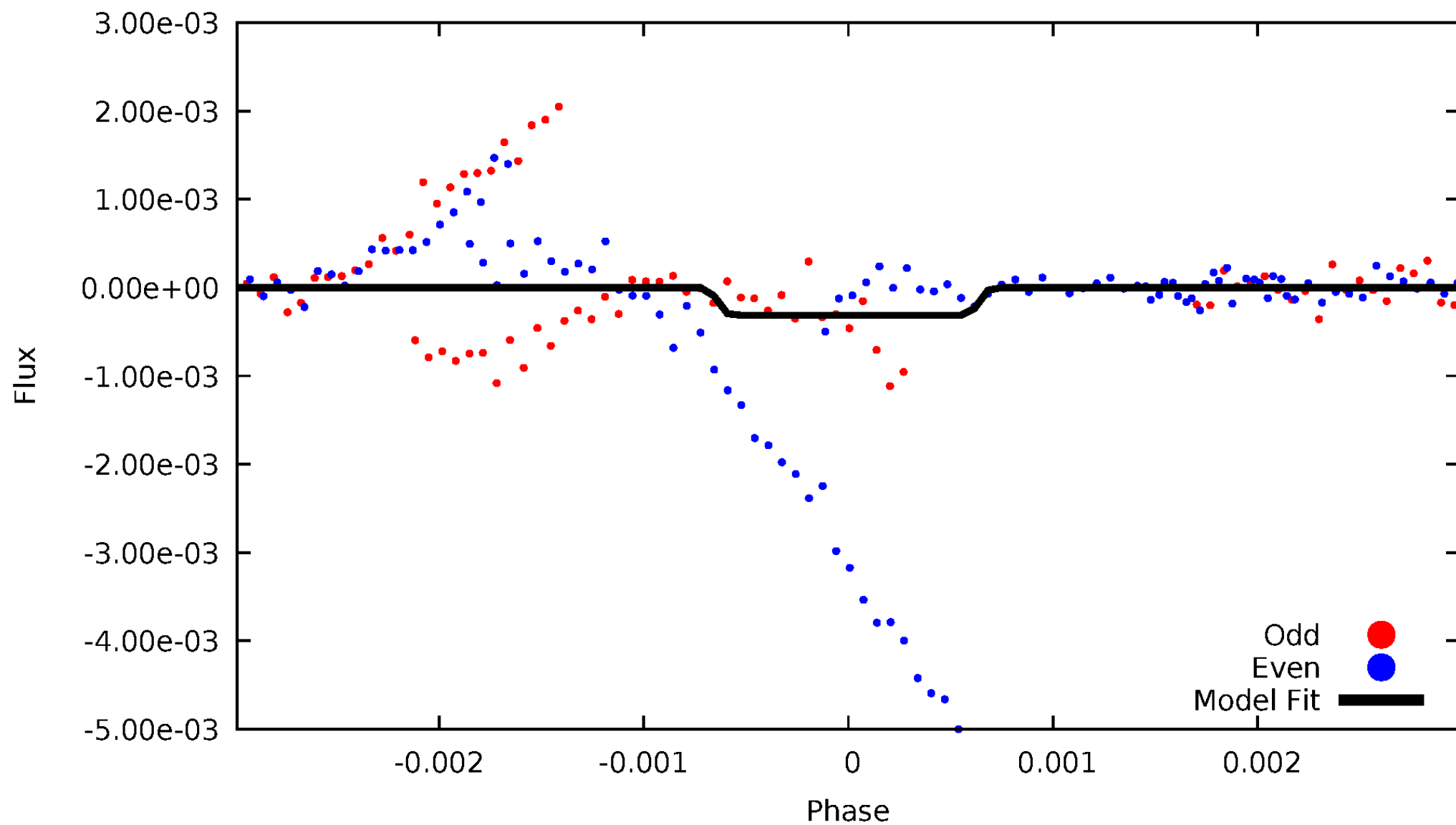
TCE 008056853-05





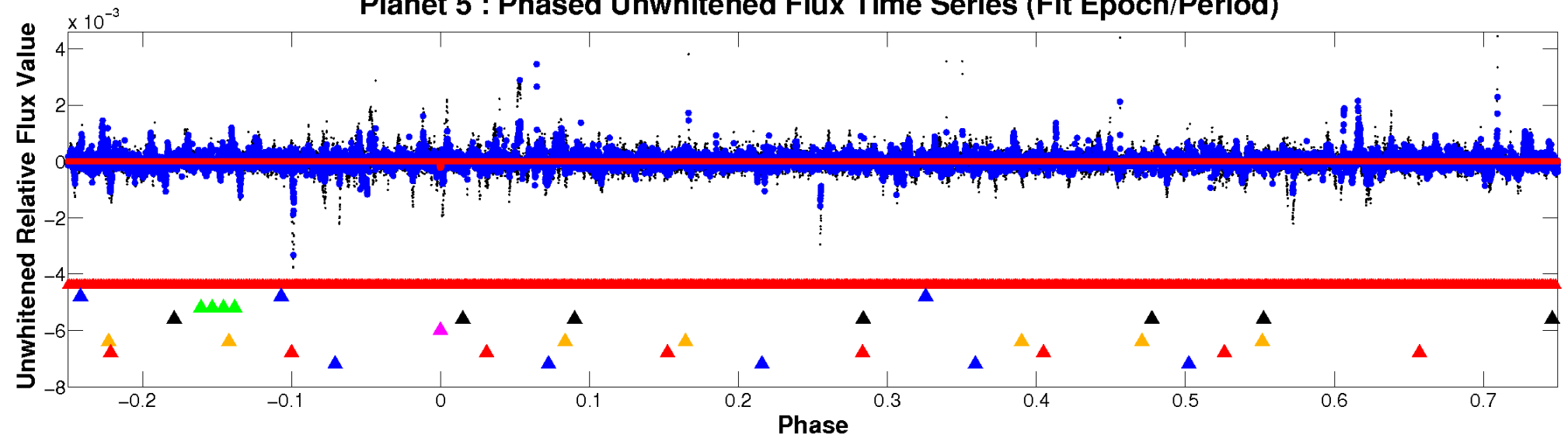
# ALT Odd/Even

TCE 008056853-05

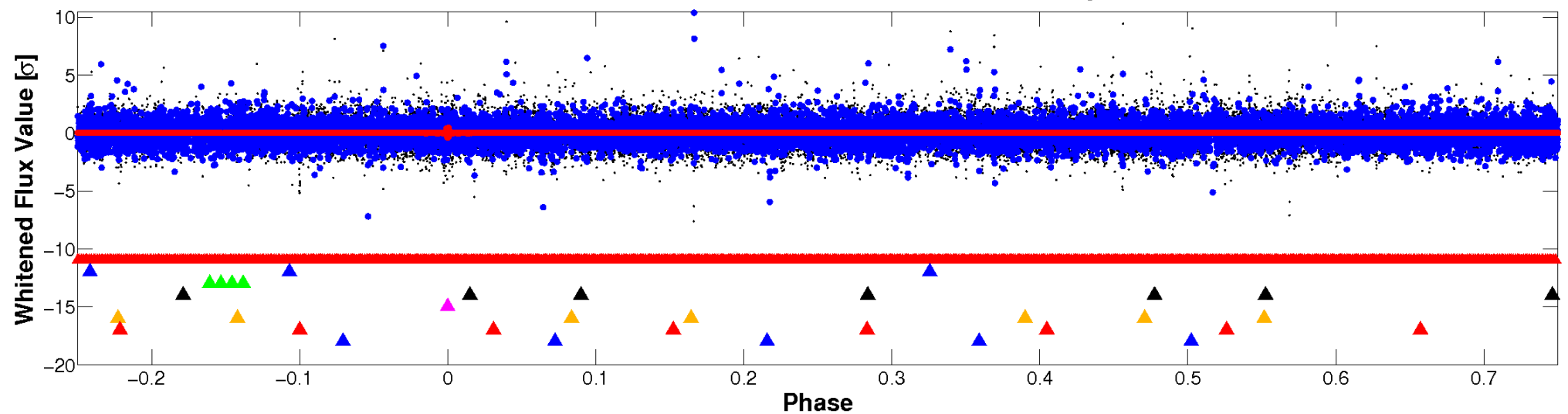


# Non-Whitened Vs. Whitened Light Curve

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

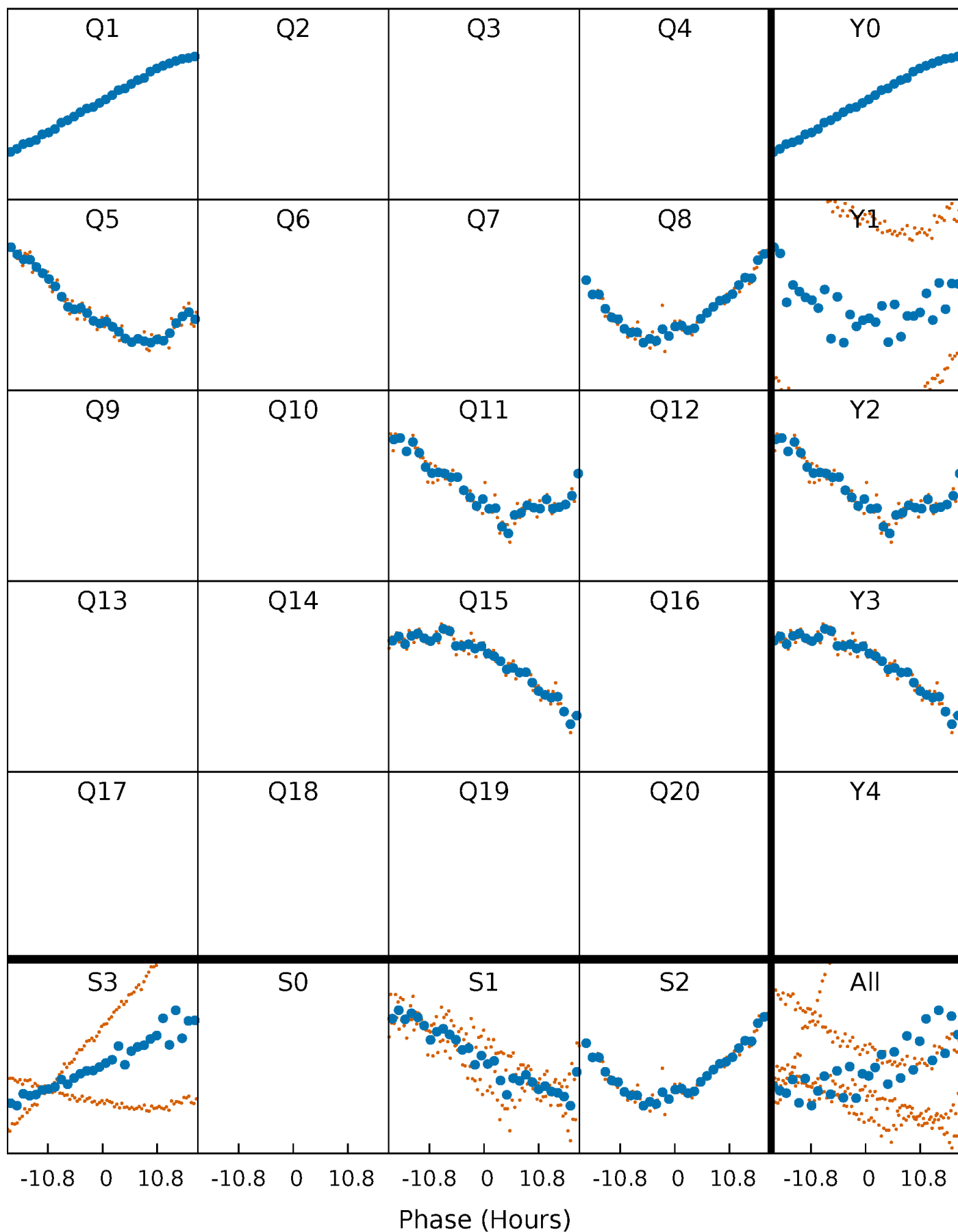


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



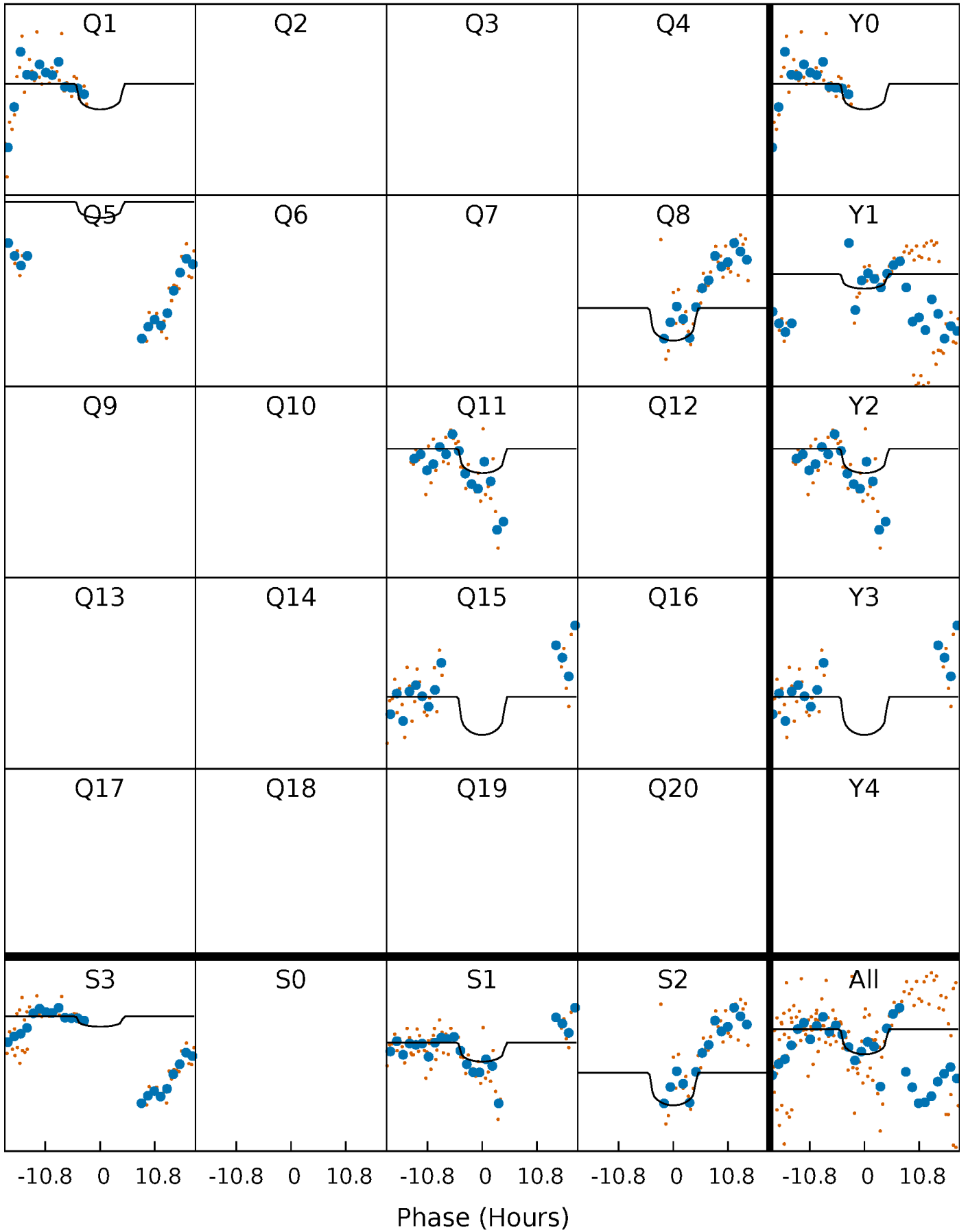
# PDC Quarter-Phased Transit Curves

TCE 008056853-05     $P=307.907910$  Days     $T_0=162.825072$  (BKJD)



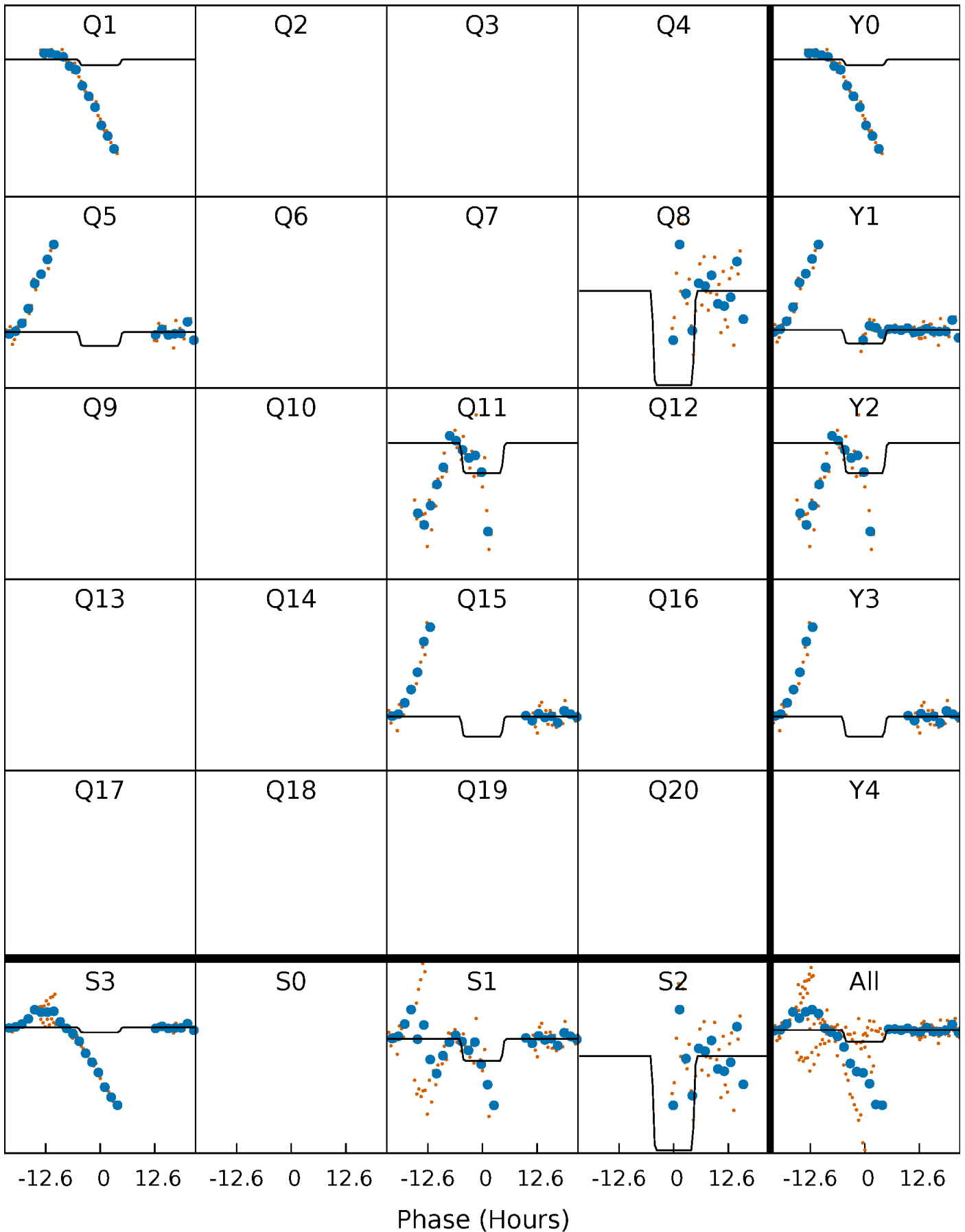
# DV Quarter-Phased Transit Curves

TCE 008056853-05     $P=307.907910$  Days     $T_0=162.825072$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

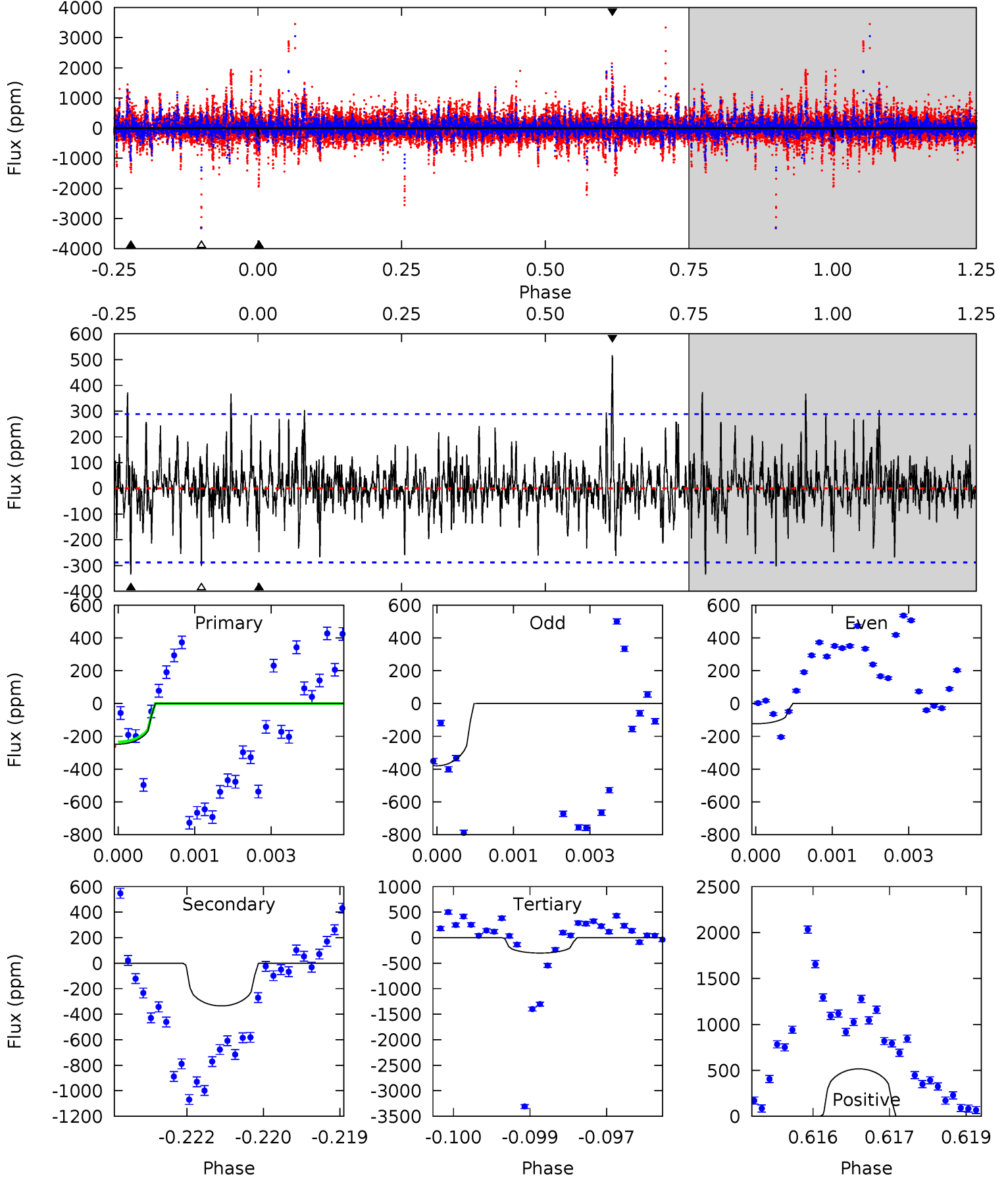
TCE 008056853-05     $P=308.022295$  Days     $T_0=162.549521$  (BKJD)



# DV Model-Shift Uniqueness Test

008056853-05, P = 307.907910 Days, E = 162.825072 Days

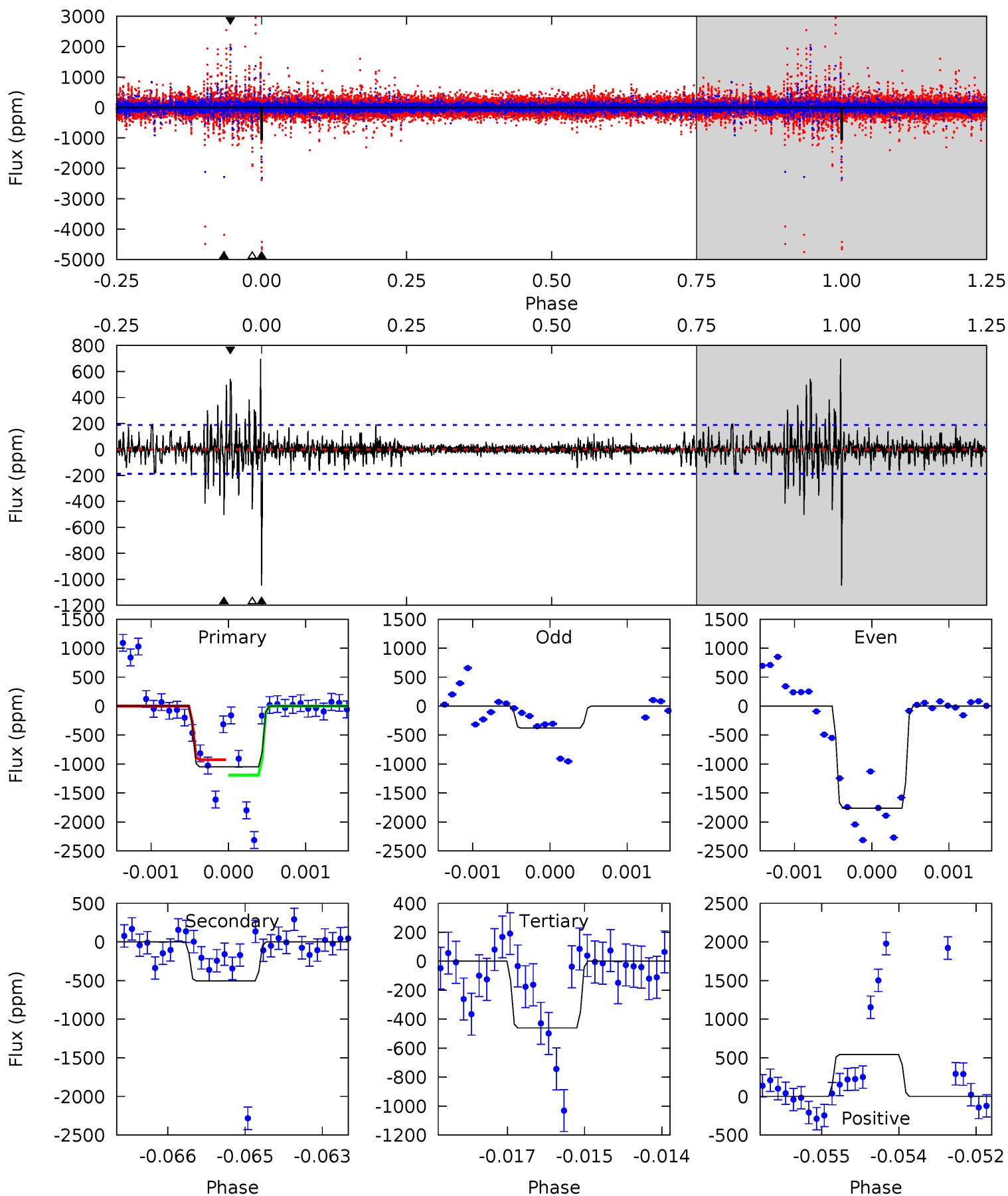
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.64	6.27	5.66	9.67	5.40	3.20	1.46	-1.01	-5.02	0.62	-3.39	2.29	1.69	0.61	0.25



# Alt Model-Shift Uniqueness Test

008056853-05, P = 308.022295 Days, E = 162.549521 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
30.1	14.5	13.2	15.6	5.39	3.19	1.74	16.8	14.5	1.26	-1.08	17.8	3.44	0.40	3.79



### Stellar Parameters For KIC 008056853

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4429^{+132}_{-132}$	$4.581^{+0.052}_{-0.016}$	$0.200^{+0.200}_{-0.300}$	$0.712^{+0.029}_{-0.059}$	$0.704^{+0.048}_{-0.054}$	$2.750^{+0.636}_{-0.220}$
	+3%/-3%	+1%/-0%	+100%/-150%	+4%/-8%	+7%/-8%	+23%/-8%
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 008056853-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-335 \pm 53$	$1.60^{+1.12}_{-1.00}$	$256^{+9}_{-8}$	$4225^{+2211}_{-725}$	$46129^{+277014}_{-30298}$
Alt.	$-504 \pm 35$	$1.54^{+1.22}_{-0.92}$	$256^{+9}_{-9}$	$4674^{+2539}_{-939}$	$73741^{+388073}_{-50173}$

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



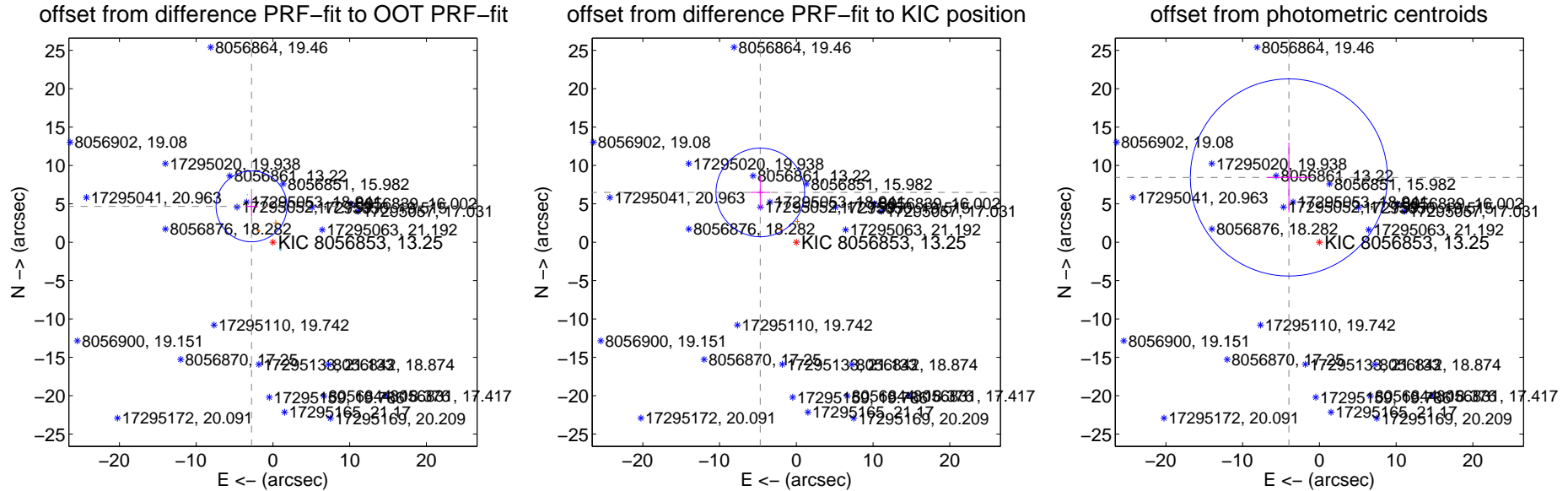
## DV Centroid Data

Supplemental centroid analysis for 008056853-05. Kepler magnitude: 13.25. Transit SNR 2.48

There are 2 quarters with good PRF difference image offsets

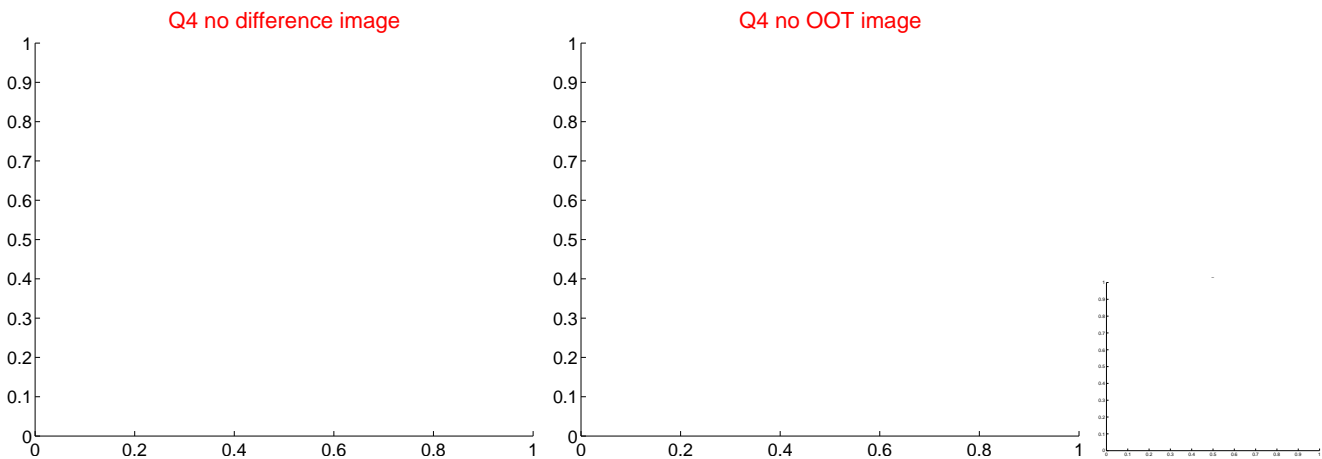
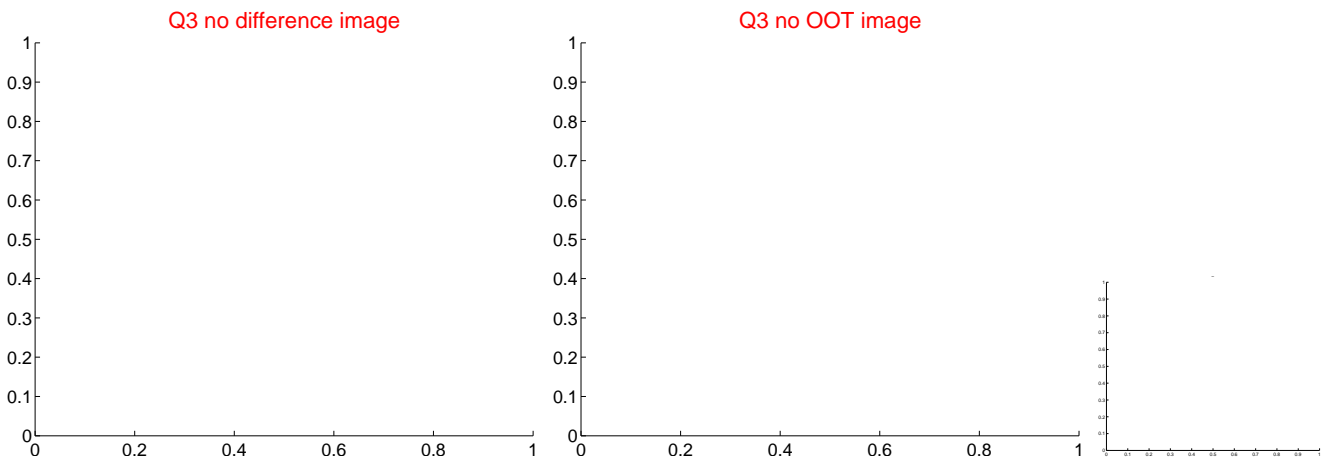
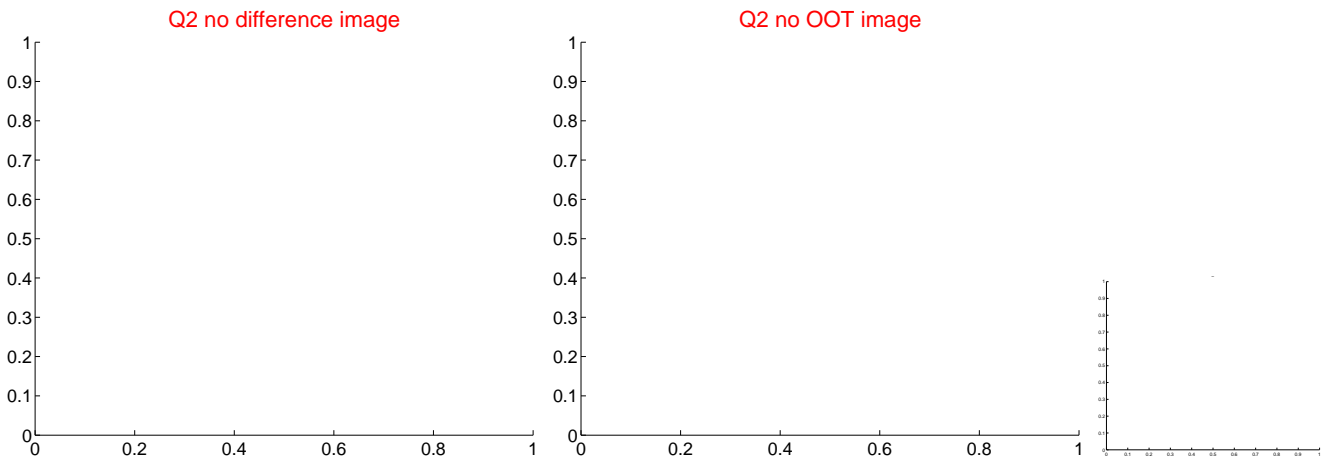
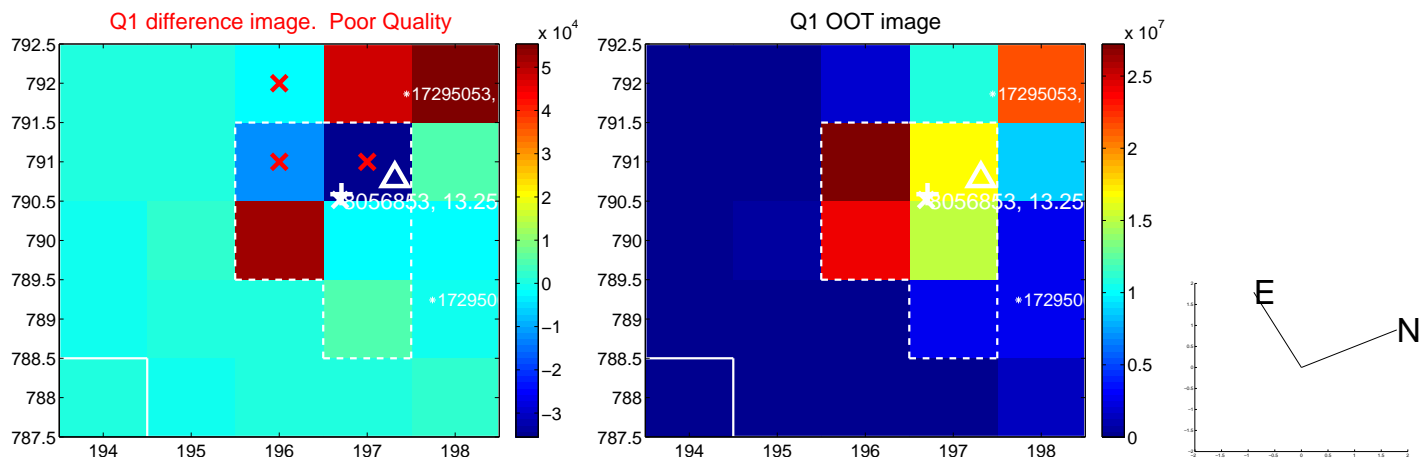
The OOT PRF centroid is offset from the target star catalog position by about 3.19 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$5.441 \pm 1.539$	3.54	$2.794 \pm 0.845$	$4.669 \pm 1.327$
PRF-fit source offset from KIC position	$8.006 \pm 1.925$	4.16	$4.696 \pm 1.292$	$6.484 \pm 2.185$
photometric centroid source offset	$9.33 \pm 4.28$	2.18	$3.97 \pm 2.81$	$8.44 \pm 4.54$

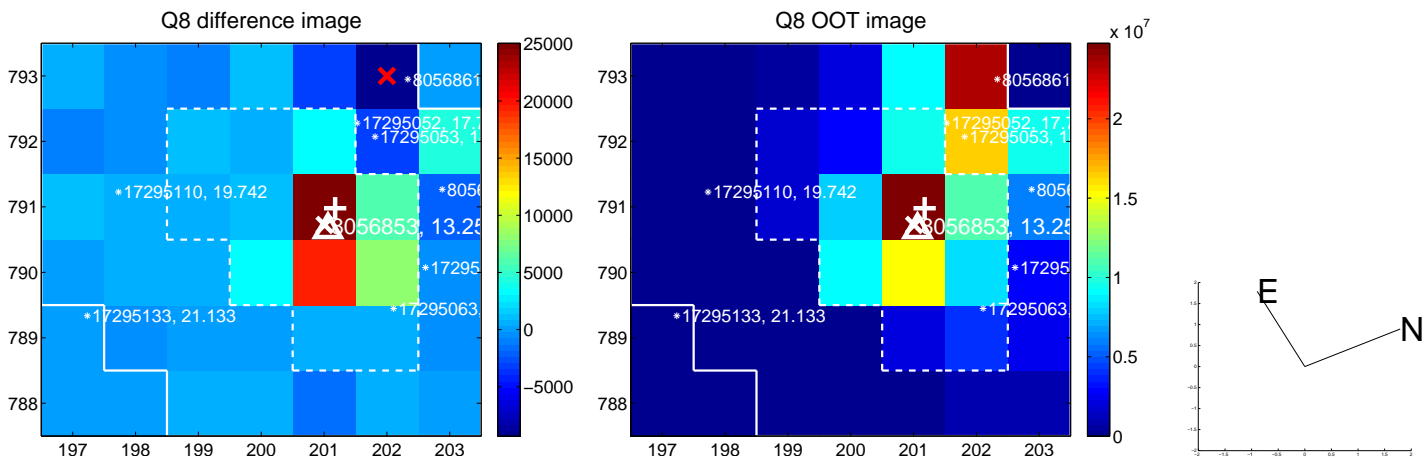
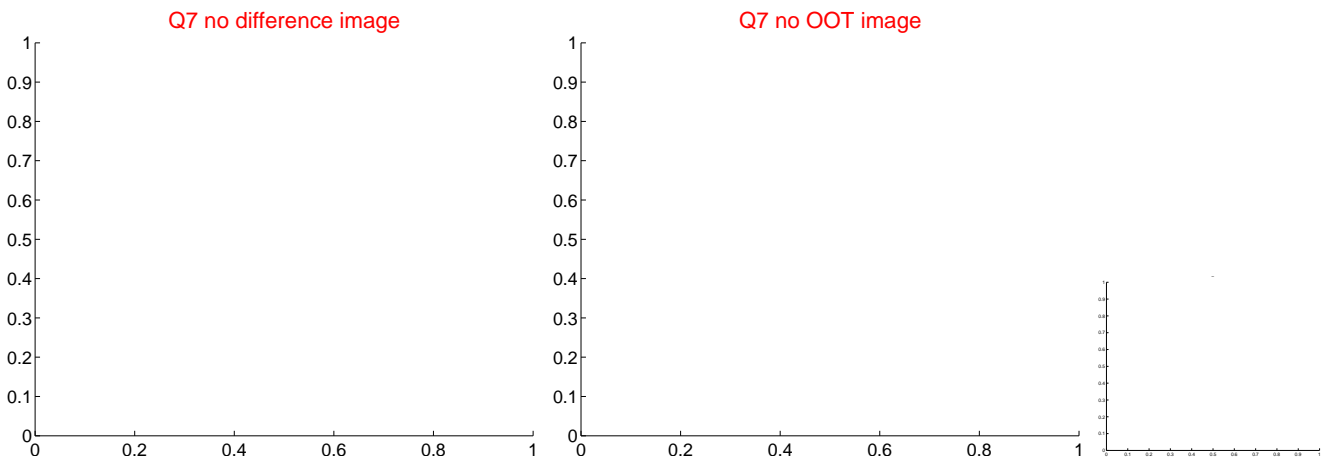
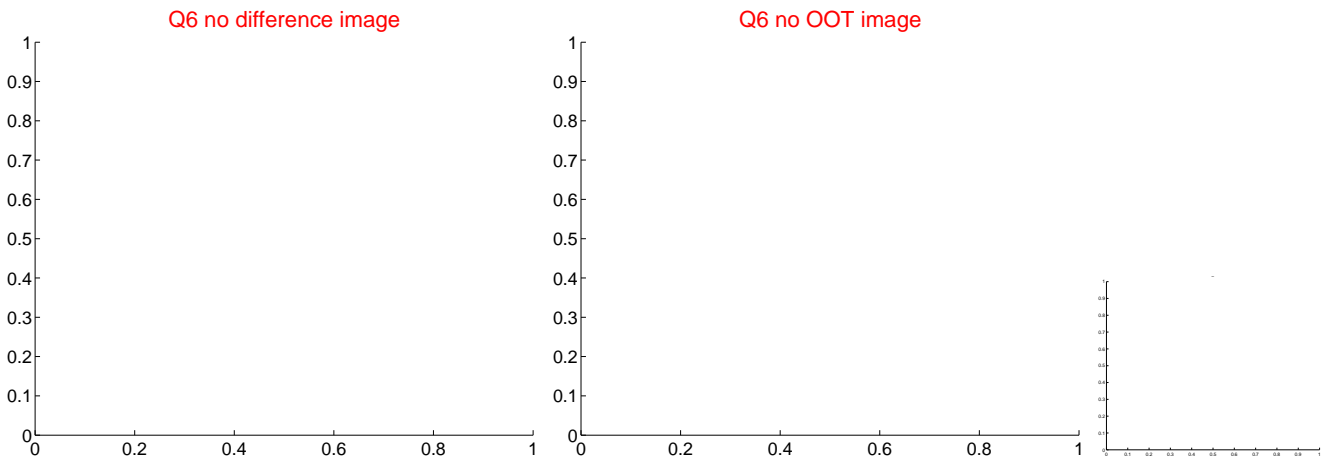
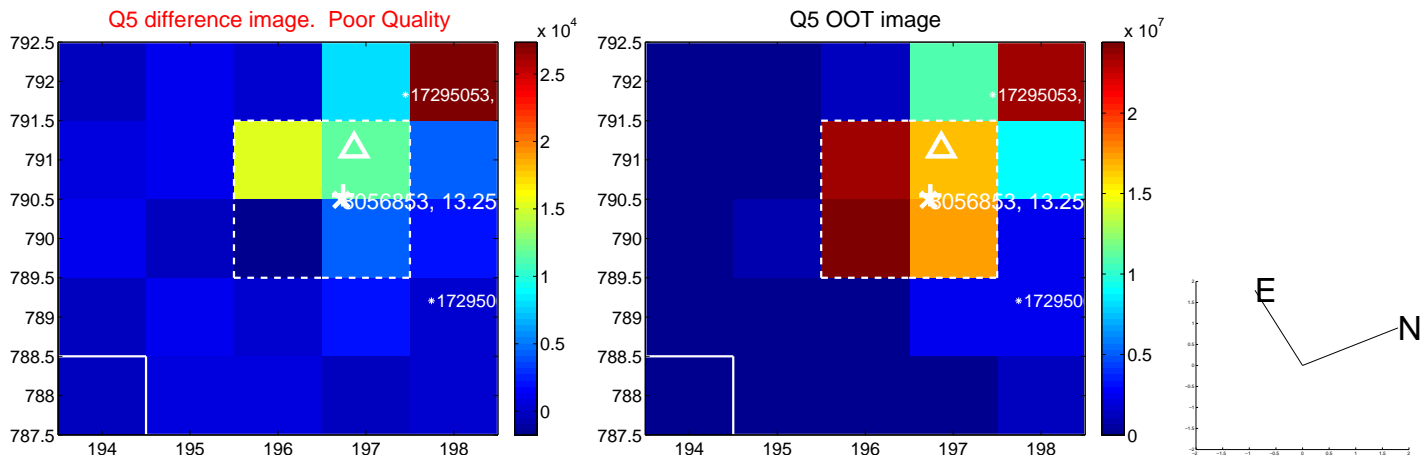


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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



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



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

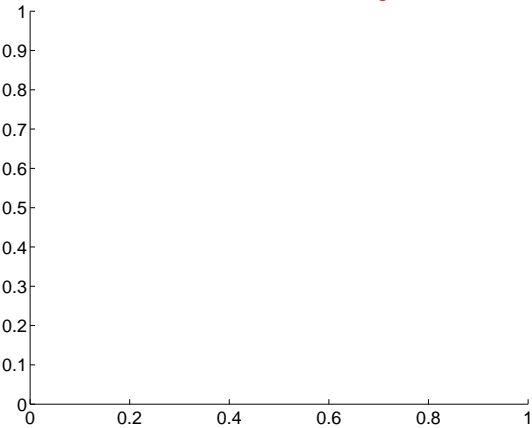
Q9 no difference image



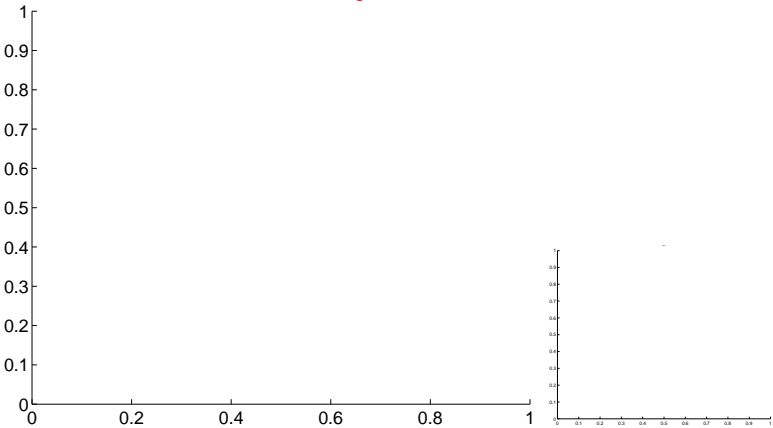
Q9 no OOT image



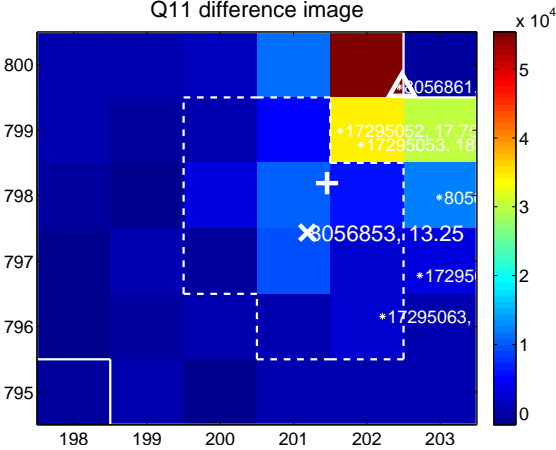
Q10 no difference image



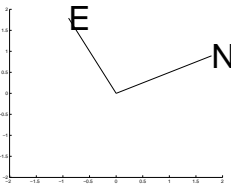
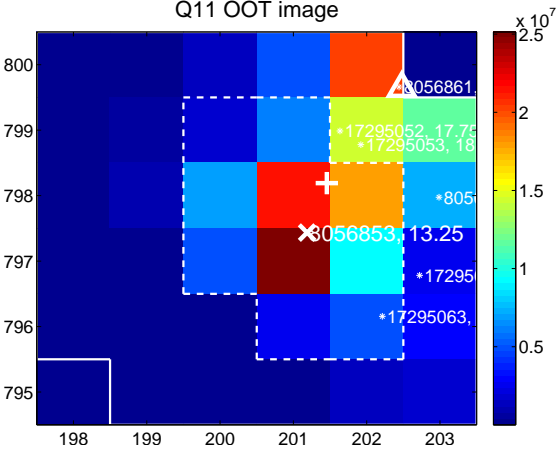
Q10 no OOT image



Q11 difference image



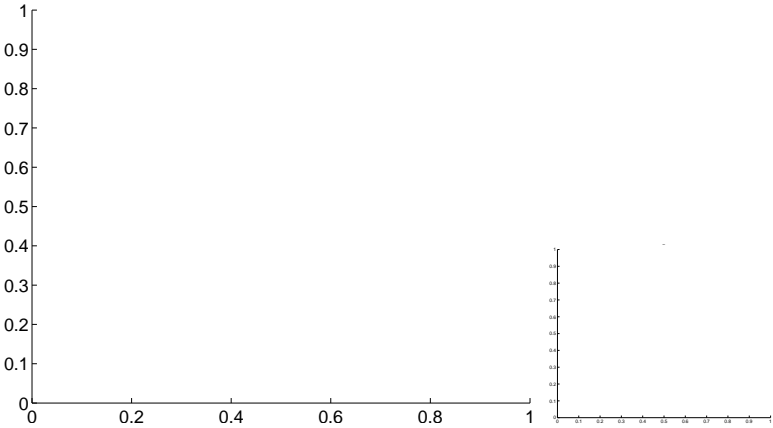
Q11 OOT image



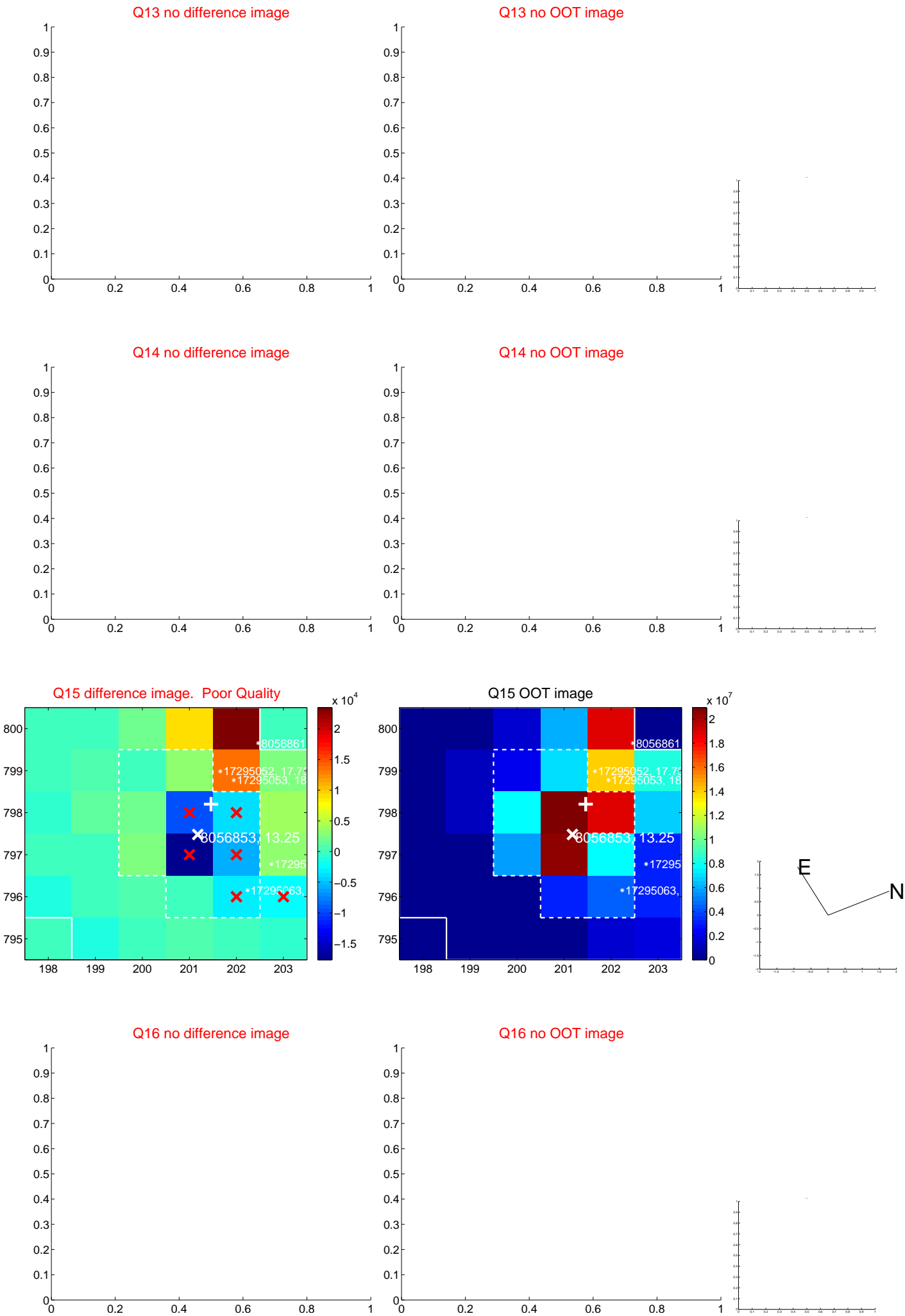
Q12 no difference image



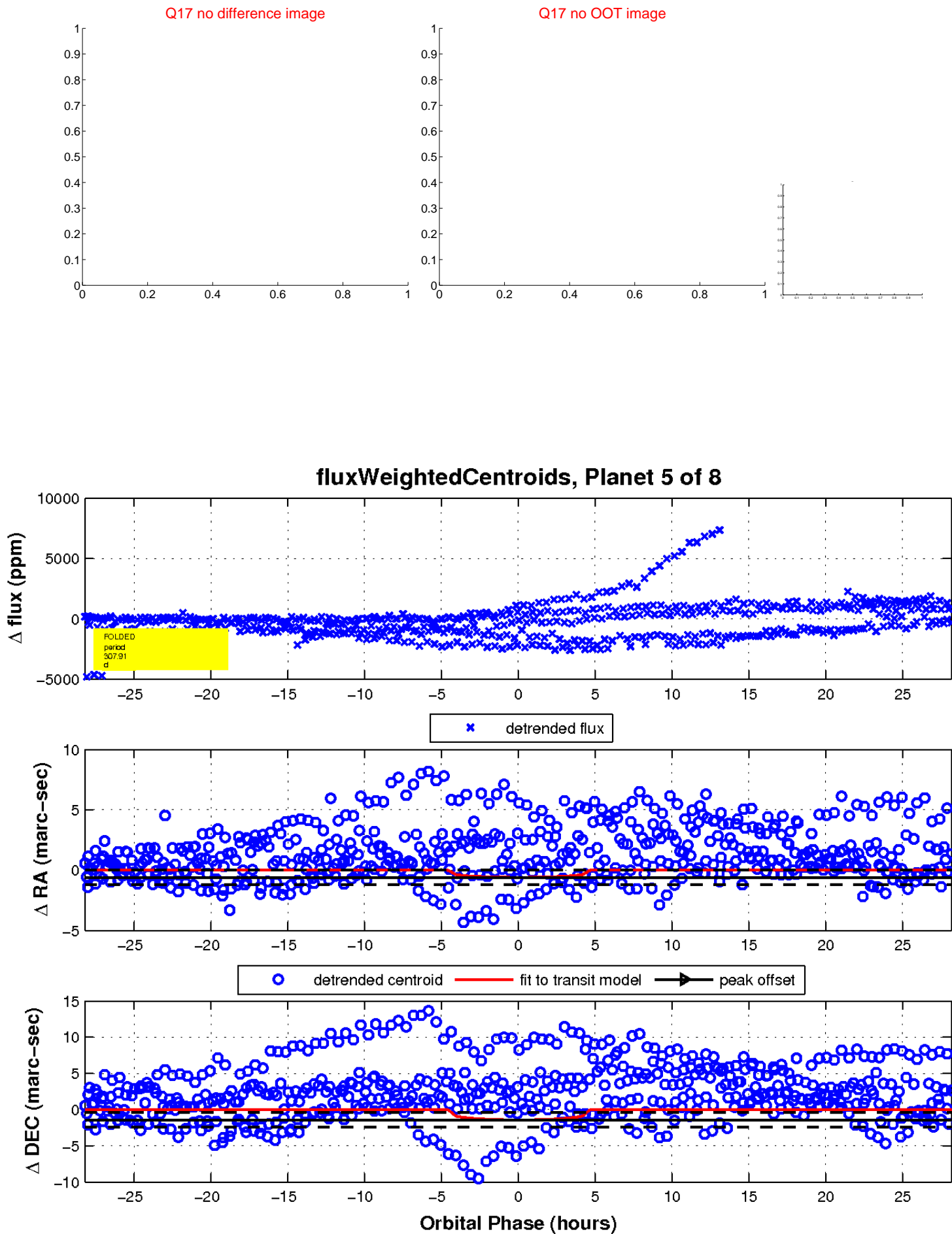
Q12 no OOT image



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

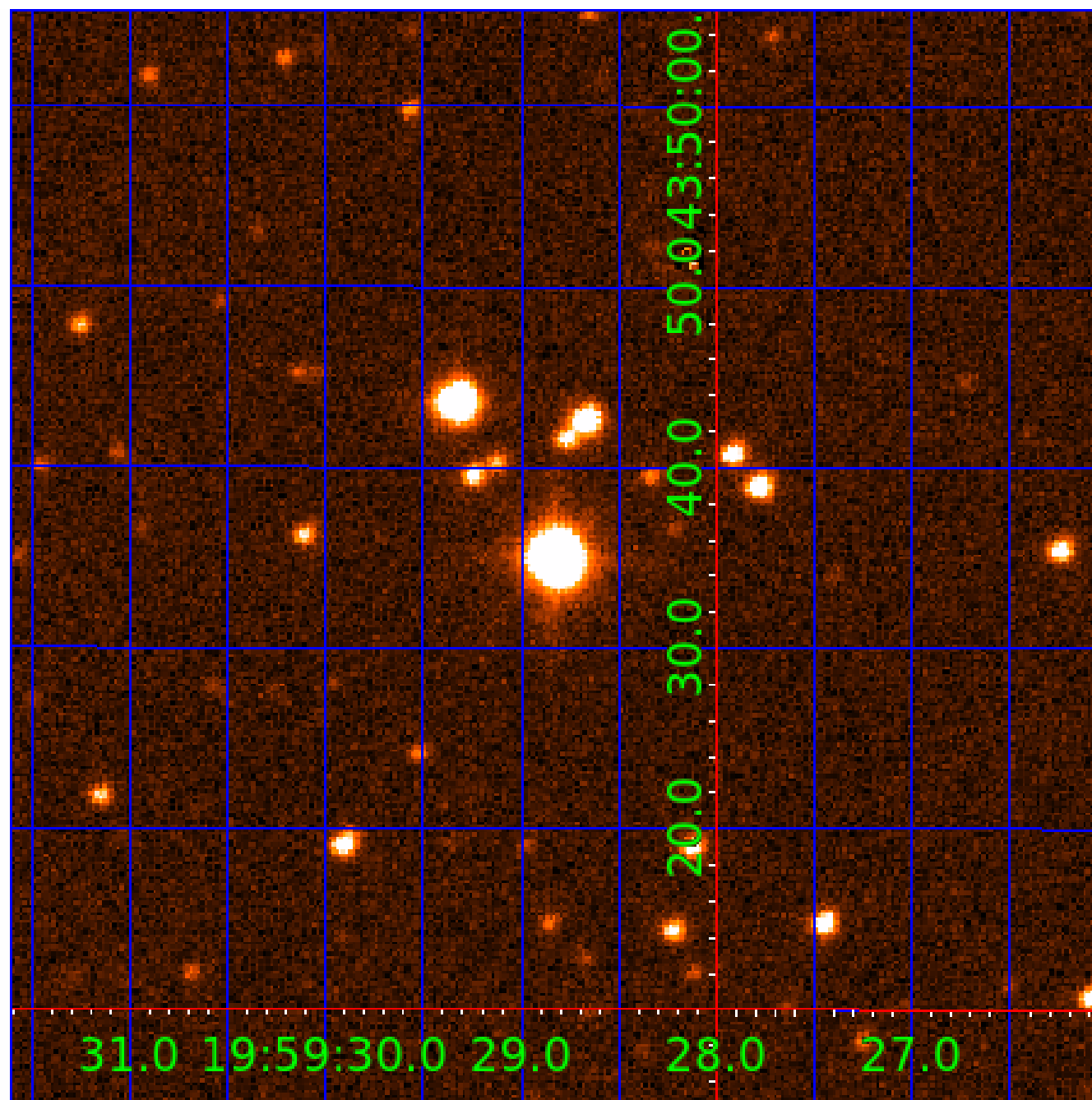


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008056853

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008056853-01	OBS	No	1.670864	133.104151	34.4	7.258	8.9	8.5	0.71	4429	0.52	290.52
008056853-02	OBS	No	441.120466	437.809040	721.6	9.251	15.6	9.3	0.71	4429	2.12	0.17
008056853-03	OBS	No	305.585951	428.199935	507.1	9.374	13.3	5.9	0.71	4429	1.76	0.28
008056853-04	OBS	No	225.156248	190.548826	394.0	9.364	12.5	5.4	0.71	4429	1.60	0.42
008056853-05	OBS	No	307.907910	162.825072	223.0	9.419	11.8	2.5	0.71	4429	1.27	0.28
008056853-06	OBS	No	213.561669	282.933930	79.6	7.168	12.4	1.3	0.71	4429	0.78	0.45
008056853-07	OBS	No	192.807309	132.044532	1526.7	33.730	13.2	8.1	0.71	4429	5.71	0.52
008056853-08	OBS	No	352.018673	141.049465	129.7	2.288	9.0	1.6	0.71	4429	1.02	0.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008056853-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008056853-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008056853-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008056853-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—CENT_KIC_POS
008056853-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET
008056853-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

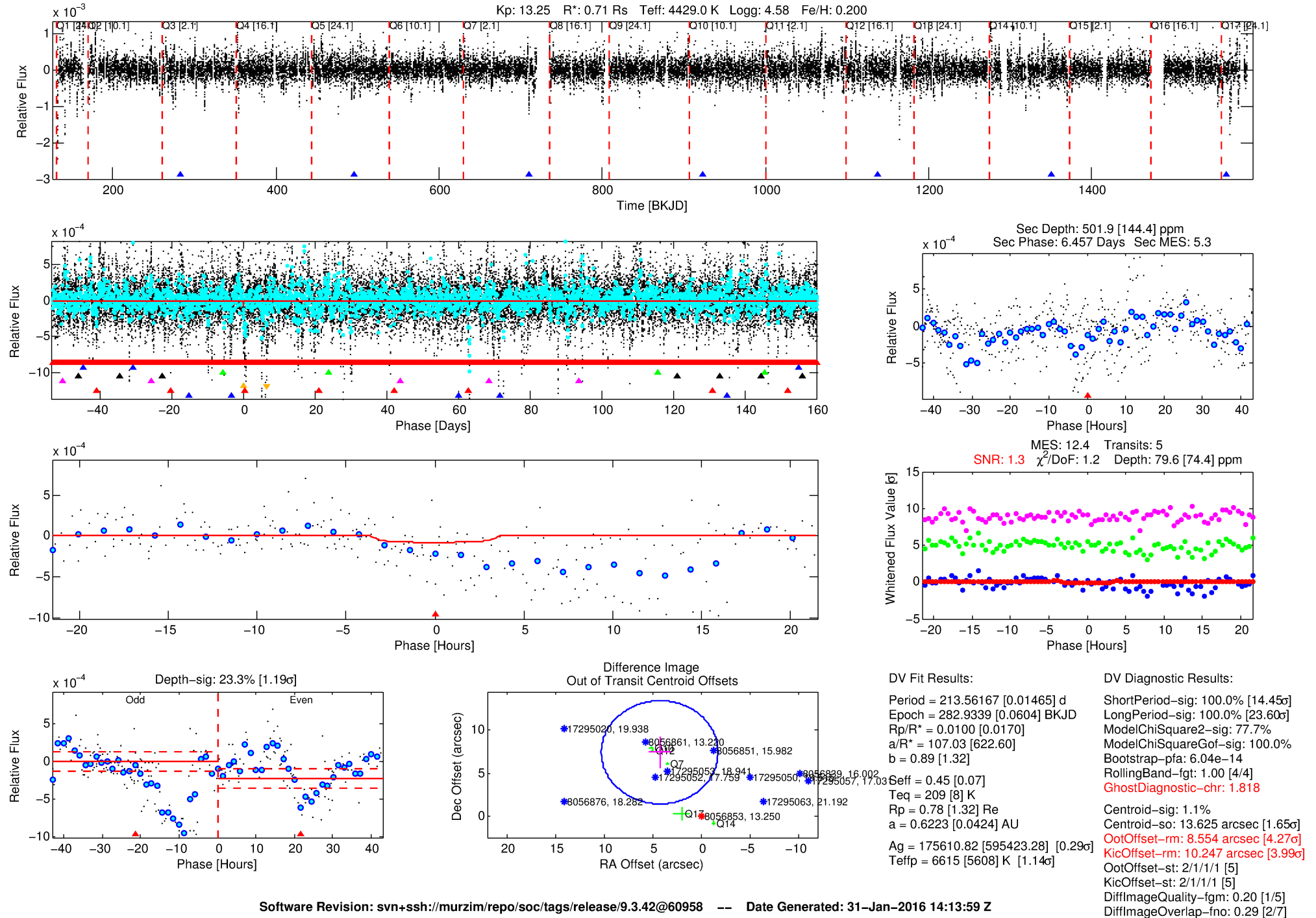
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008056853-06

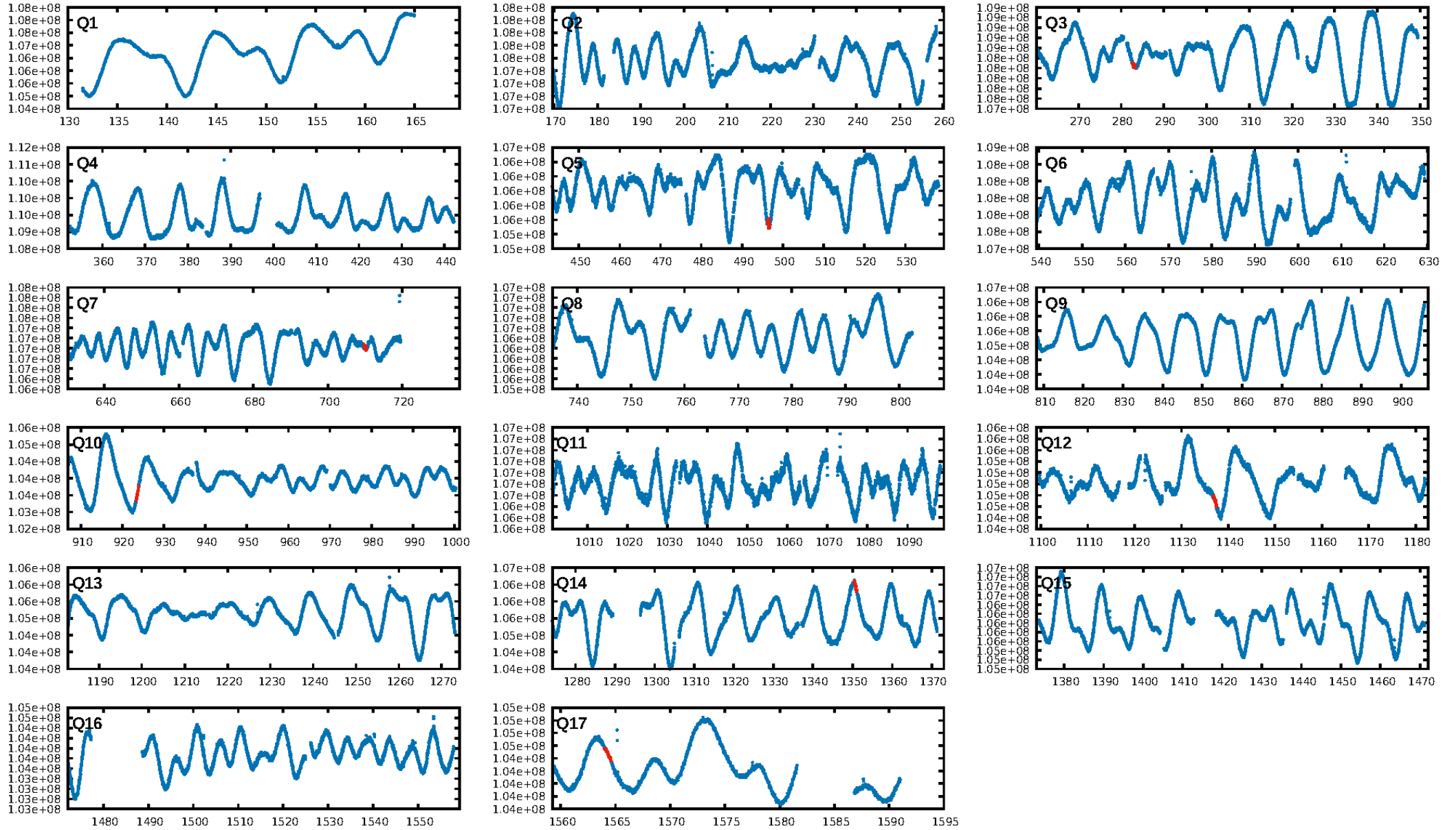
No Significant Match Found



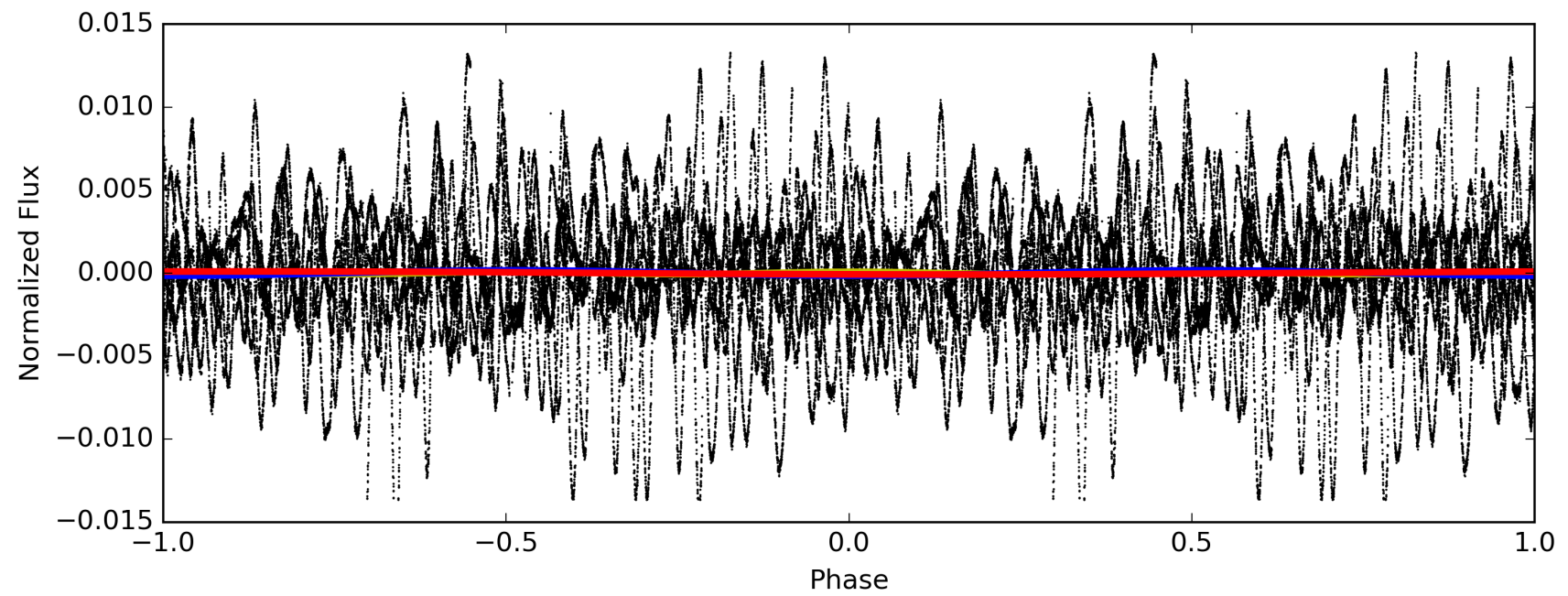
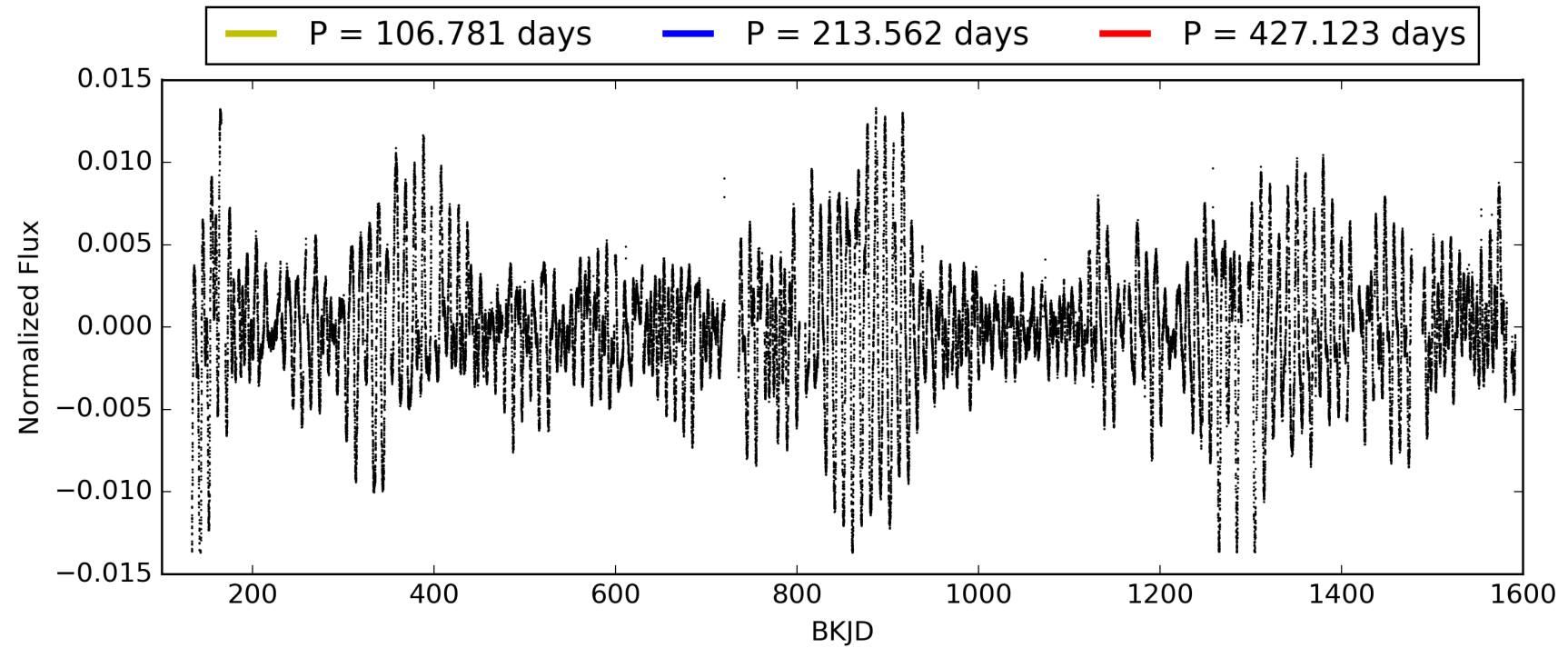
KIC: 8056853    Candidate: 6 of 8    Period: 213.562 d



# TCE 008056853-06, PDC Light Curves

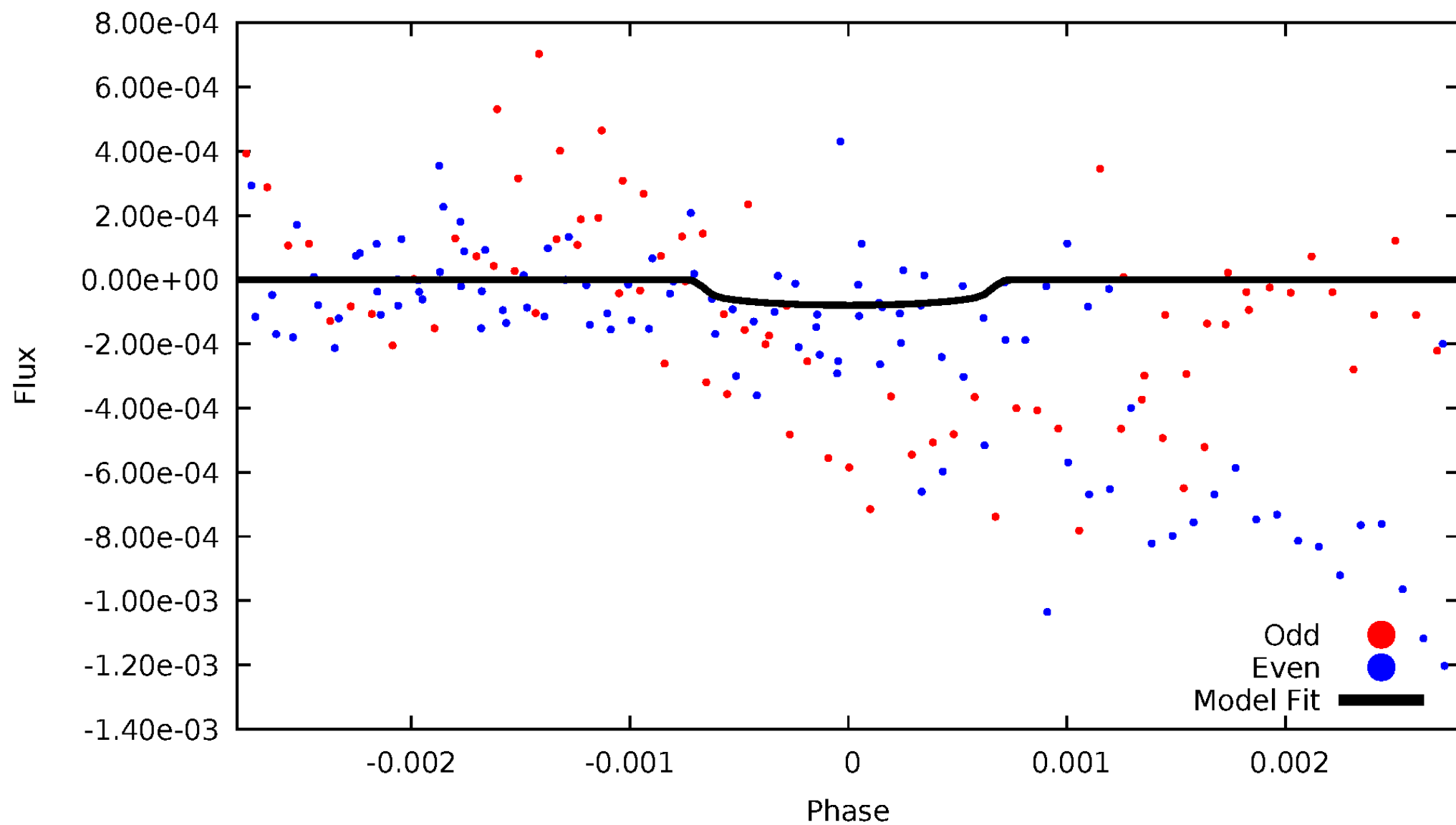


TCE 008056853-06



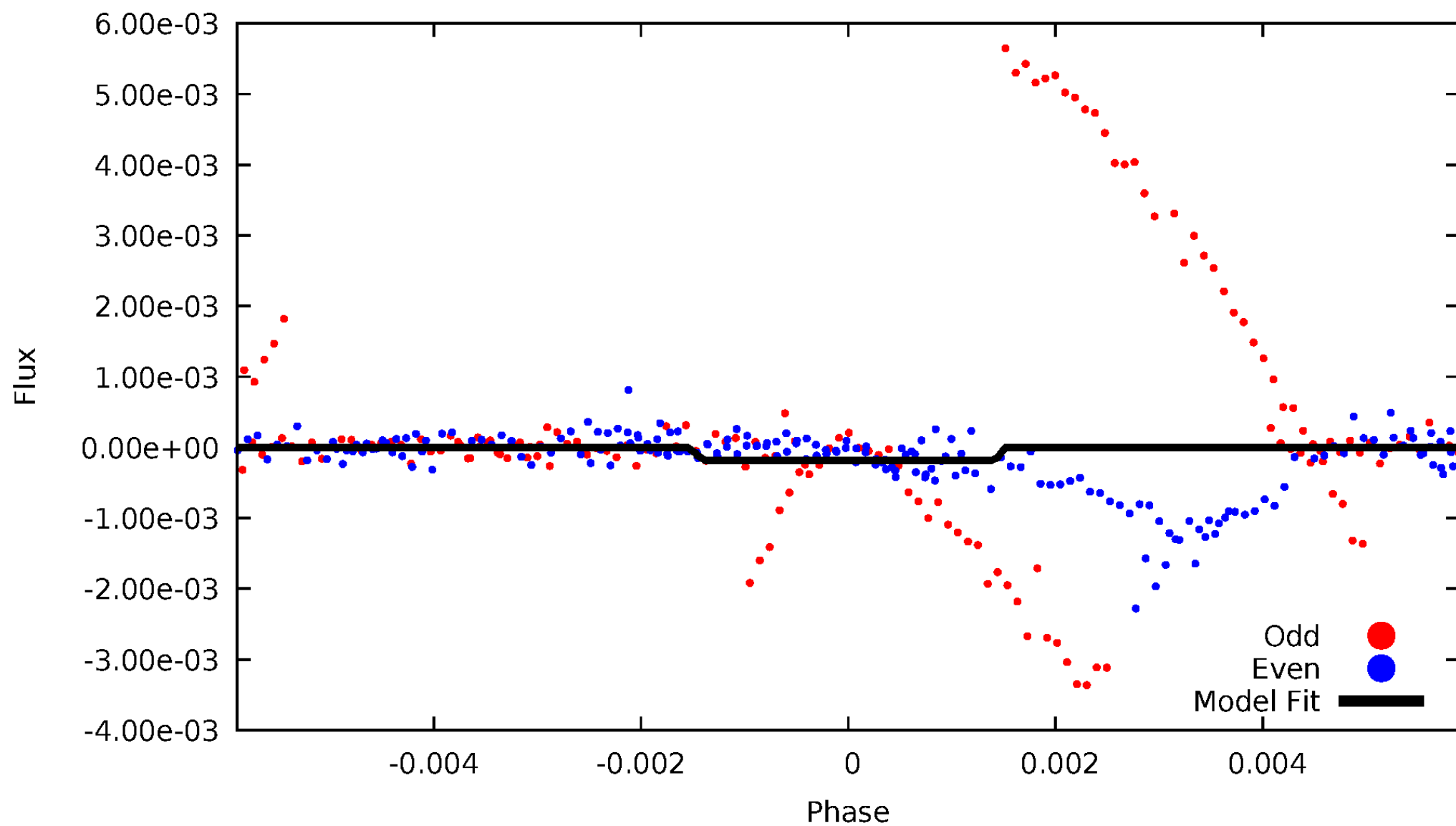
# DV Odd/Even

TCE 008056853-06



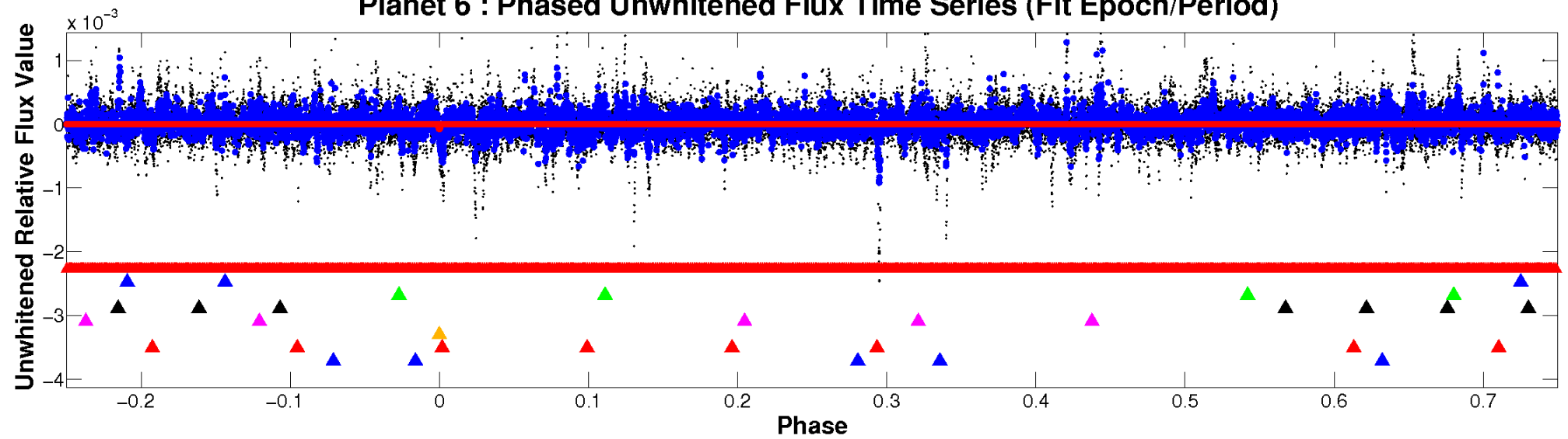
# ALT Odd/Even

TCE 008056853-06

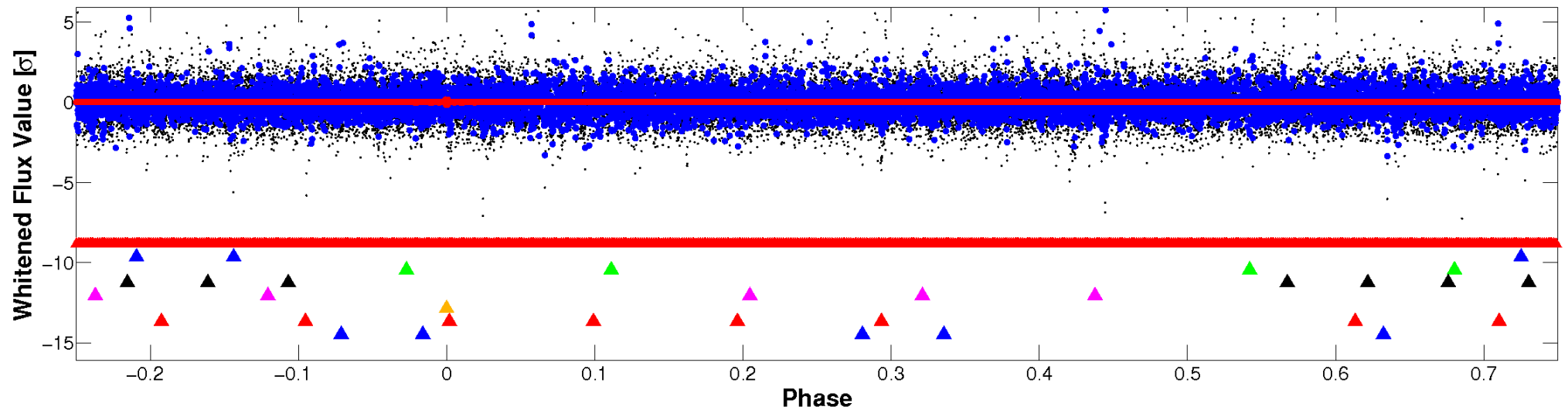


# Non-Whitened Vs. Whitened Light Curve

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

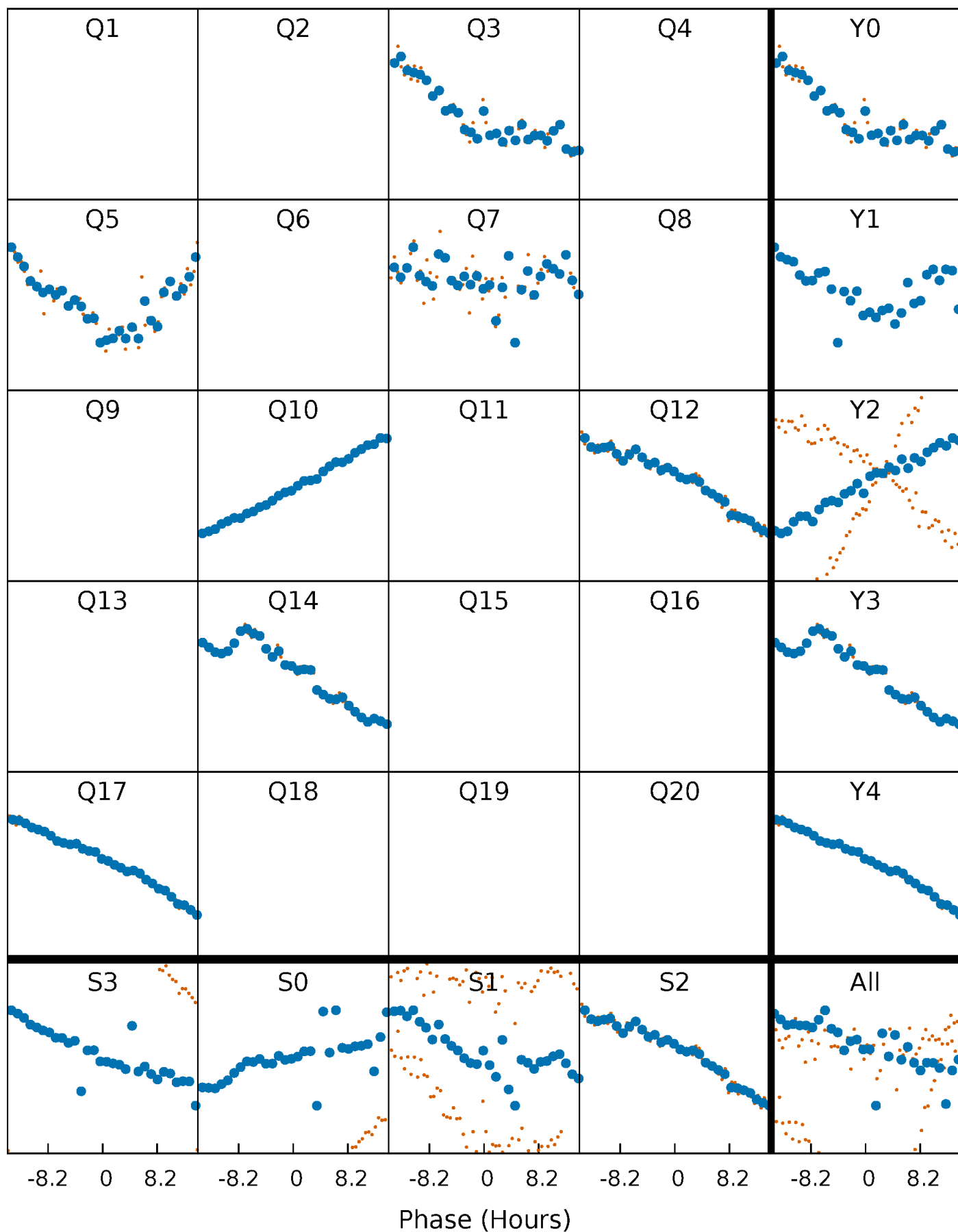


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



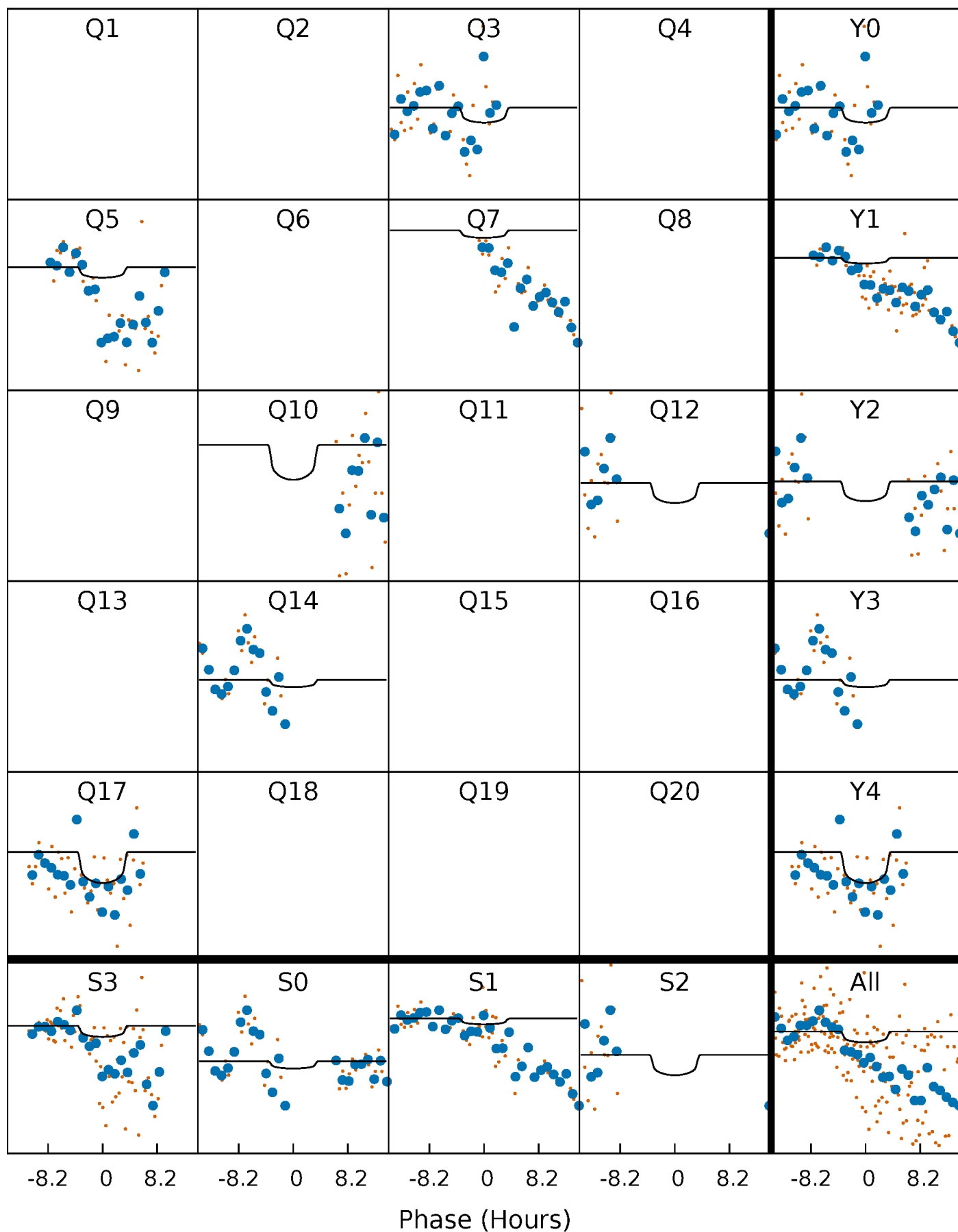
# PDC Quarter-Phased Transit Curves

TCE 008056853-06 P=213.561669 Days  $T_0=282.933930$  (BKJD)



# DV Quarter-Phased Transit Curves

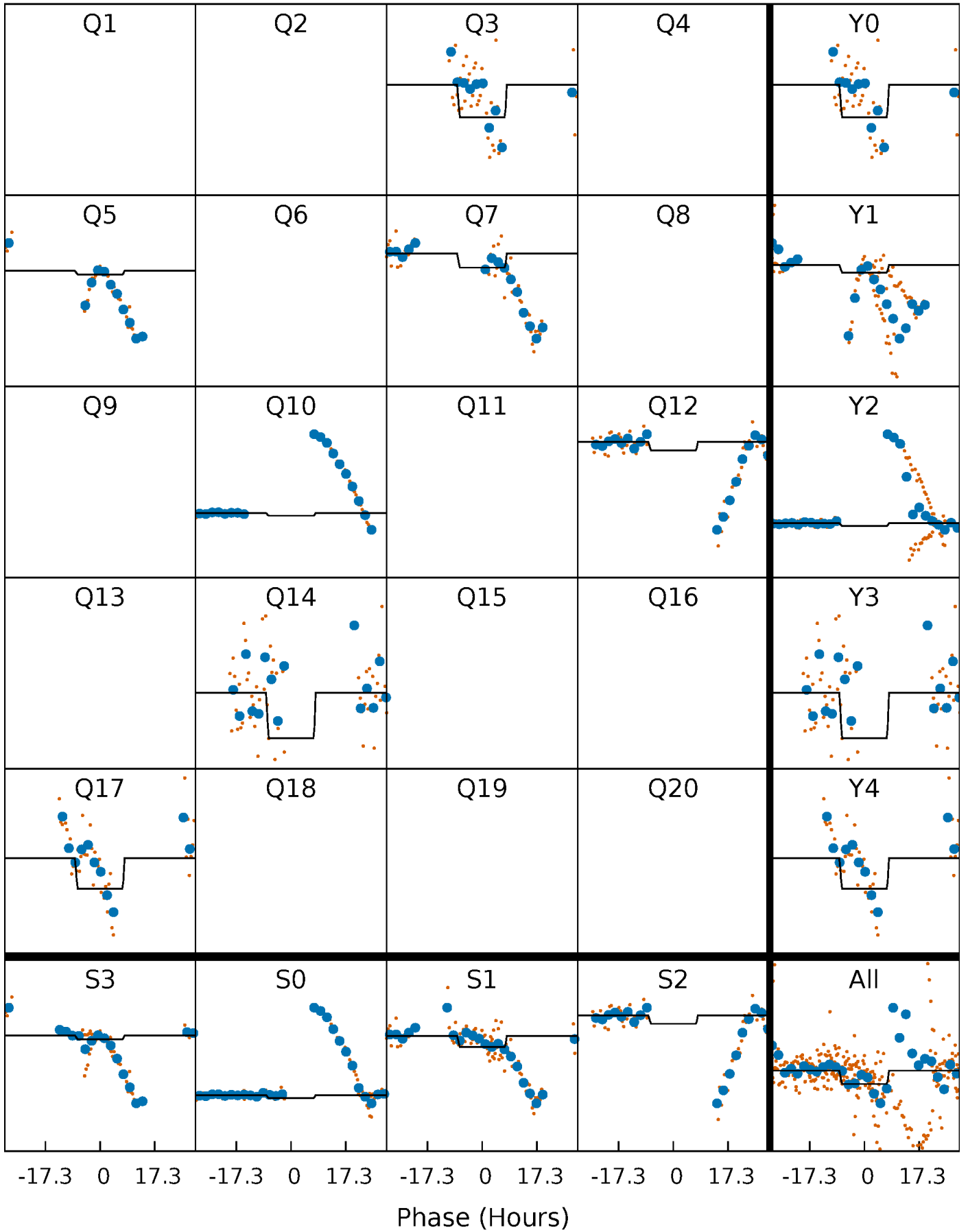
TCE 008056853-06 P=213.561669 Days  $T_0=282.933930$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

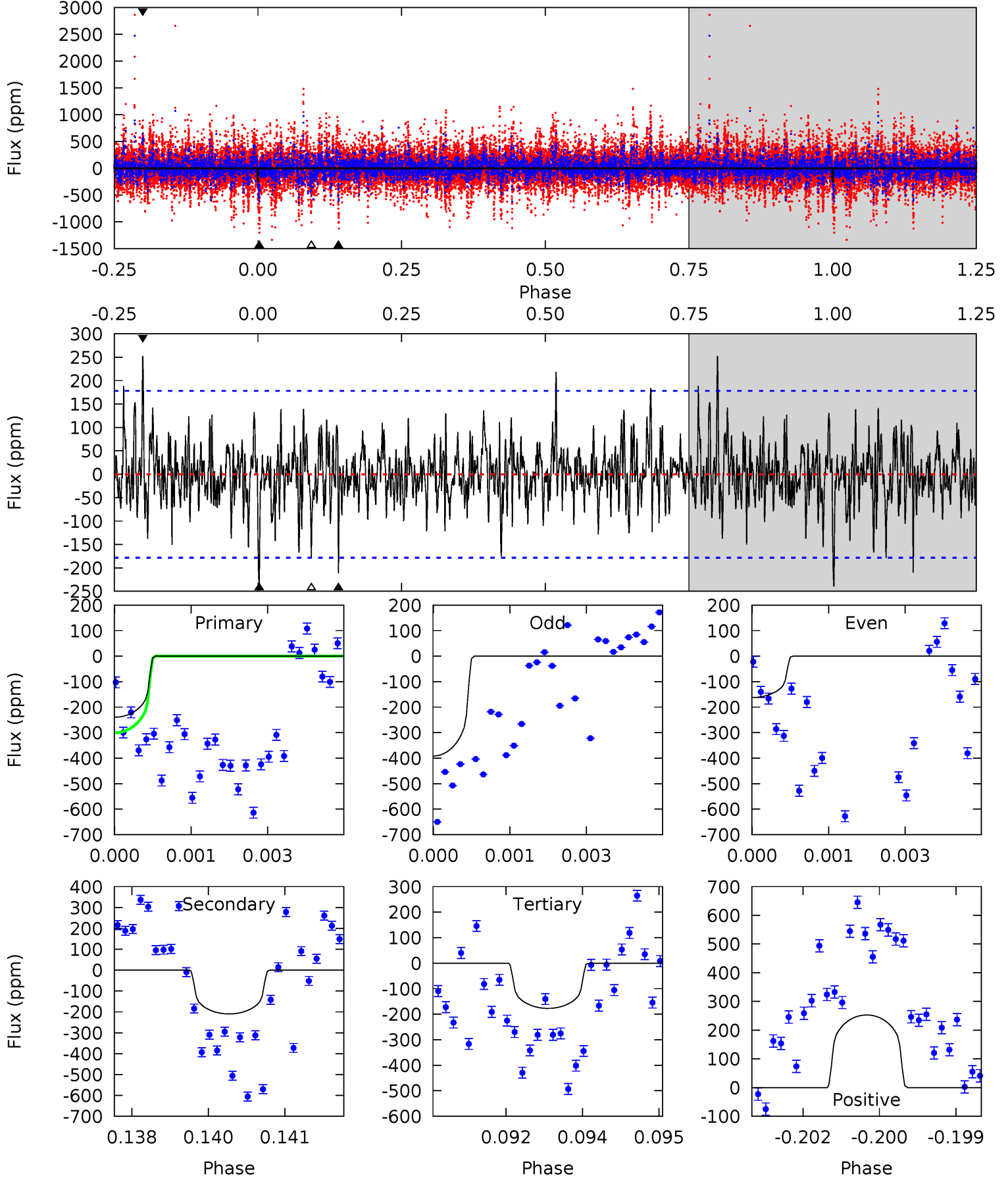
TCE 008056853-06     $P=213.605625$  Days     $T_0=282.746499$  (BKJD)



# DV Model-Shift Uniqueness Test

008056853-06, P = 213.561669 Days, E = 69.372261 Days

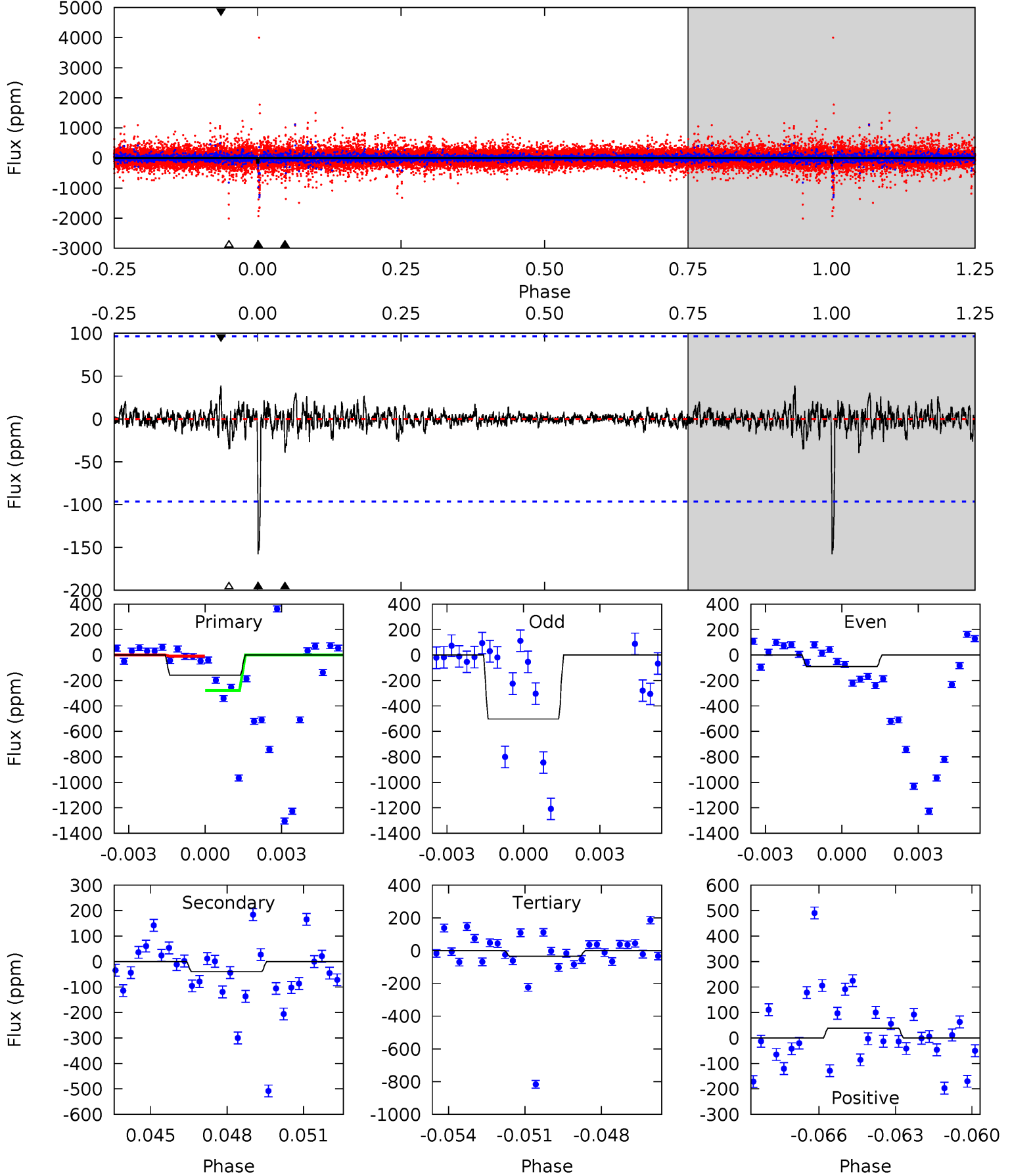
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.24	6.35	5.36	7.65	5.39	3.19	1.54	1.89	-0.40	0.99	-1.30	3.19	0.95	0.51	1.82



# Alt Model-Shift Uniqueness Test

008056853-06, P = 213.605625 Days, E = 69.140874 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
8.60	2.14	1.89	2.11	5.25	2.97	0.41	6.71	6.49	0.25	0.02	9.33	2.13	0.20	7.30



### Stellar Parameters For KIC 008056853

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4429^{+132}_{-132}$	$4.581^{+0.052}_{-0.016}$	$0.200^{+0.200}_{-0.300}$	$0.712^{+0.029}_{-0.059}$	$0.704^{+0.048}_{-0.054}$	$2.750^{+0.636}_{-0.220}$
	+3%/-3%	+1%/-0%	+100%/-150%	+4%/-8%	+7%/-8%	+23%/-8%
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 008056853-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-210 \pm 33$	$1.21^{+1.08}_{-0.81}$	$290^{+10}_{-9}$	$4269^{+2876}_{-858}$	$30010^{+243166}_{-21793}$
Alt.	$-39 \pm 18$	$1.44^{+1.06}_{-0.97}$	$290^{+9}_{-9}$	$3106^{+1247}_{-509}$	$4119^{+30175}_{-2987}$

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

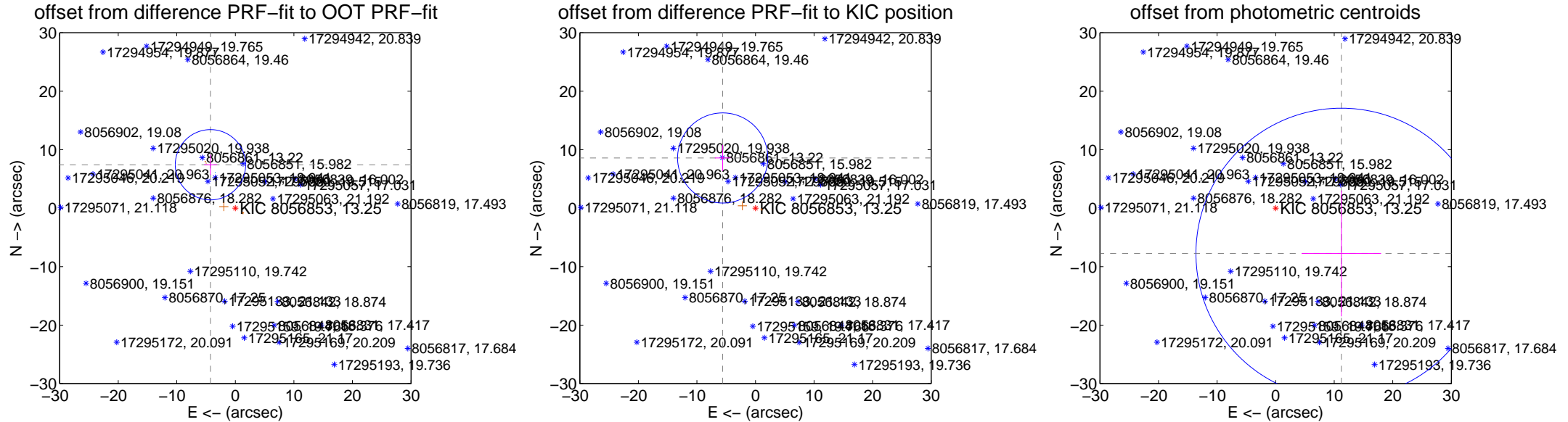
## DV Centroid Data

Supplemental centroid analysis for 008056853-06. Kepler magnitude: 13.25. Transit SNR 1.29

There are 1 quarters with good PRF difference image offsets

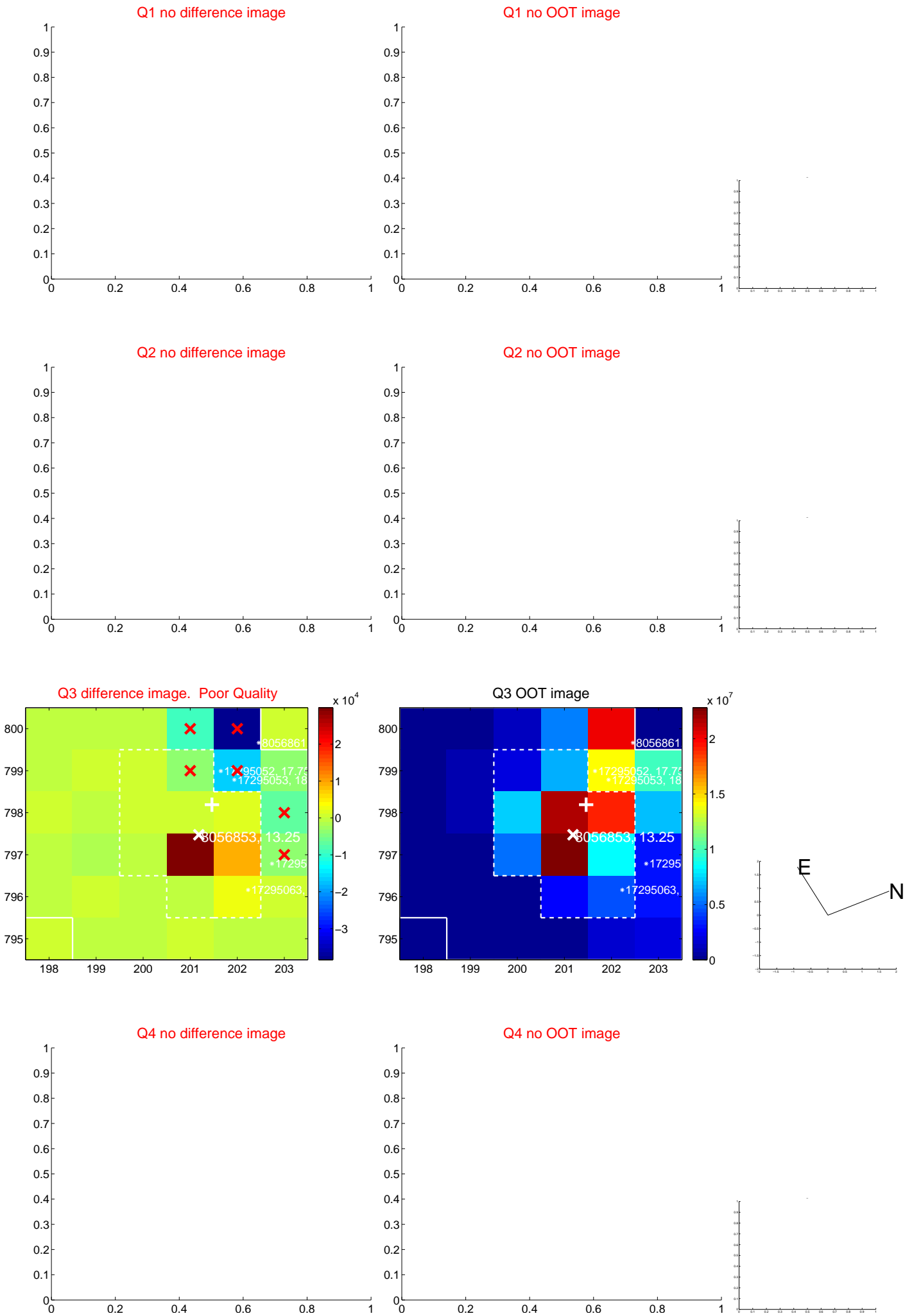
The direct PRF centroid is offset from the target star catalog position by about 0.30 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$8.554 \pm 2.003$	4.27	$4.248 \pm 1.099$	$7.425 \pm 1.711$
PRF-fit source offset from KIC position	$10.247 \pm 2.568$	3.99	$5.597 \pm 1.340$	$8.583 \pm 2.246$
photometric centroid source offset	$13.63 \pm 8.28$	1.65	$-11.22 \pm 6.79$	$-7.73 \pm 10.76$

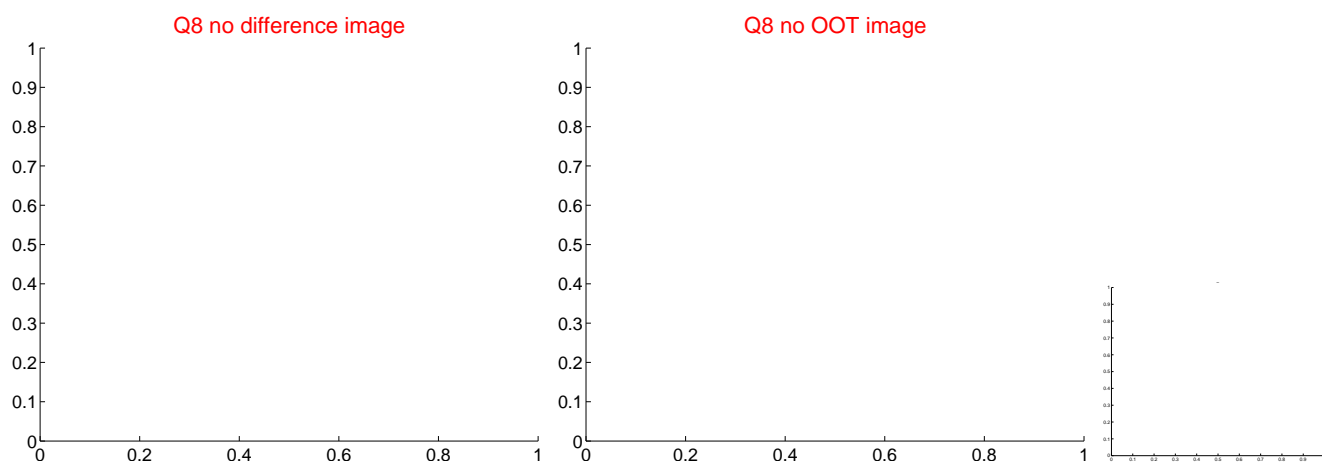
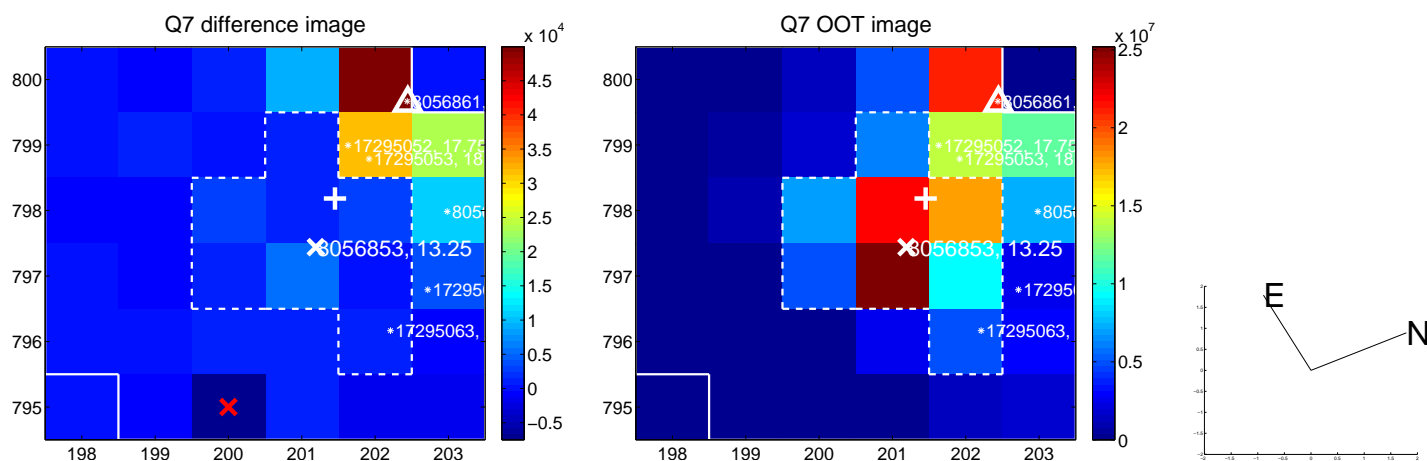
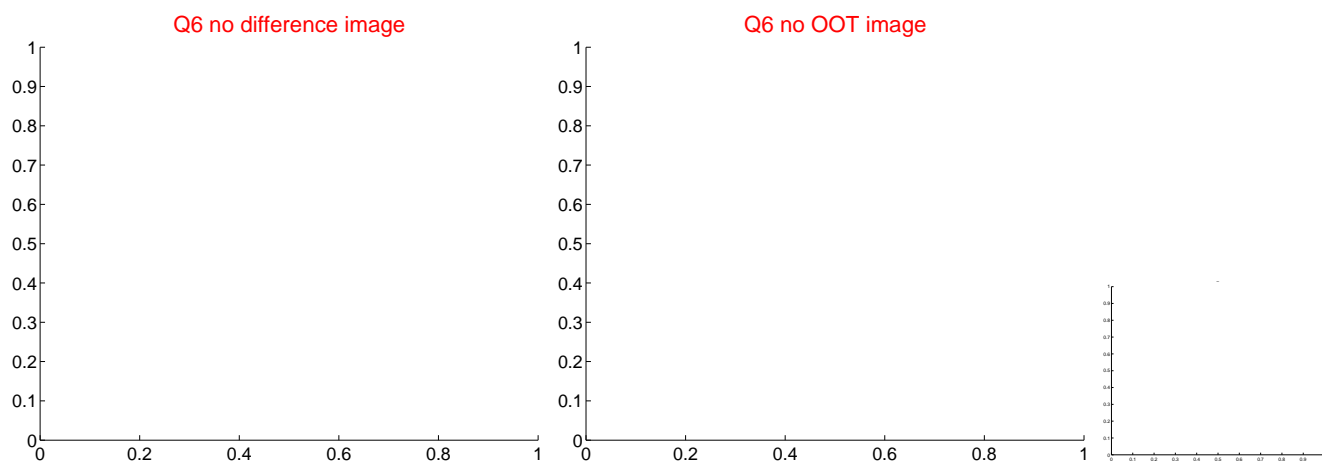
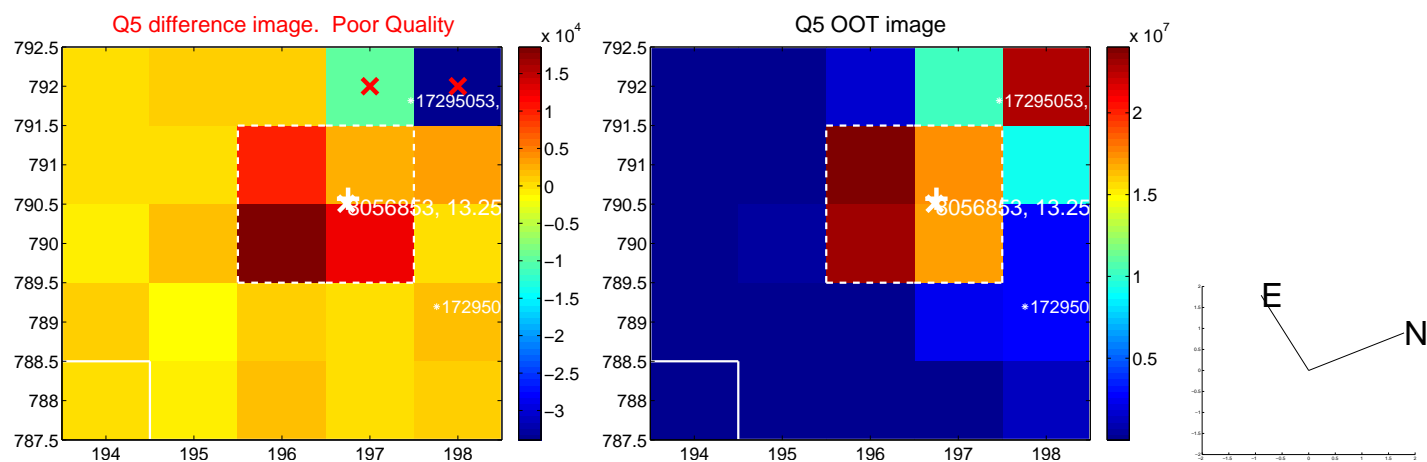


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

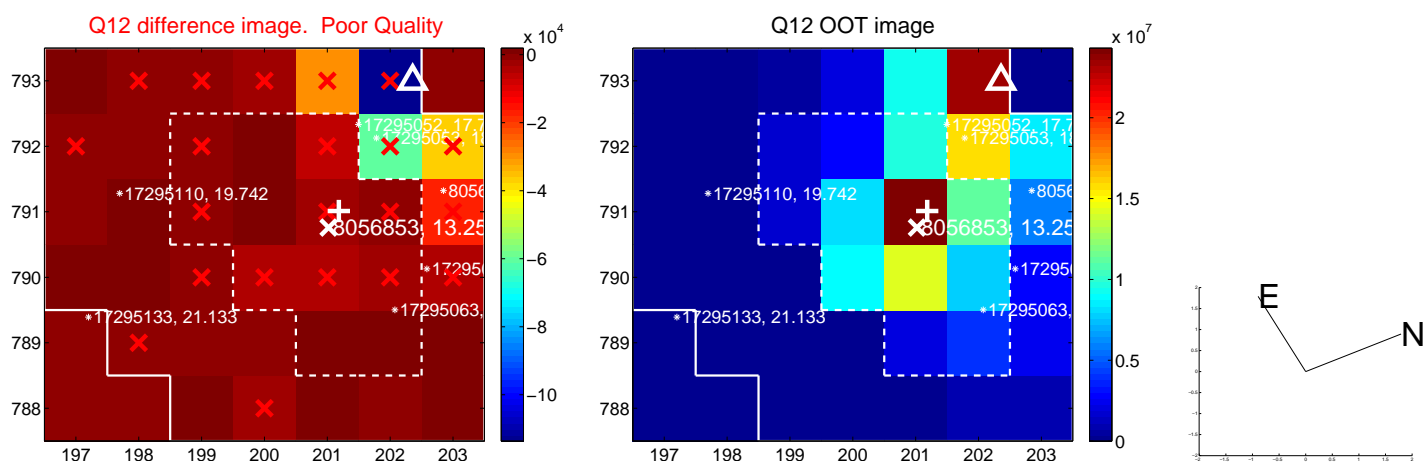
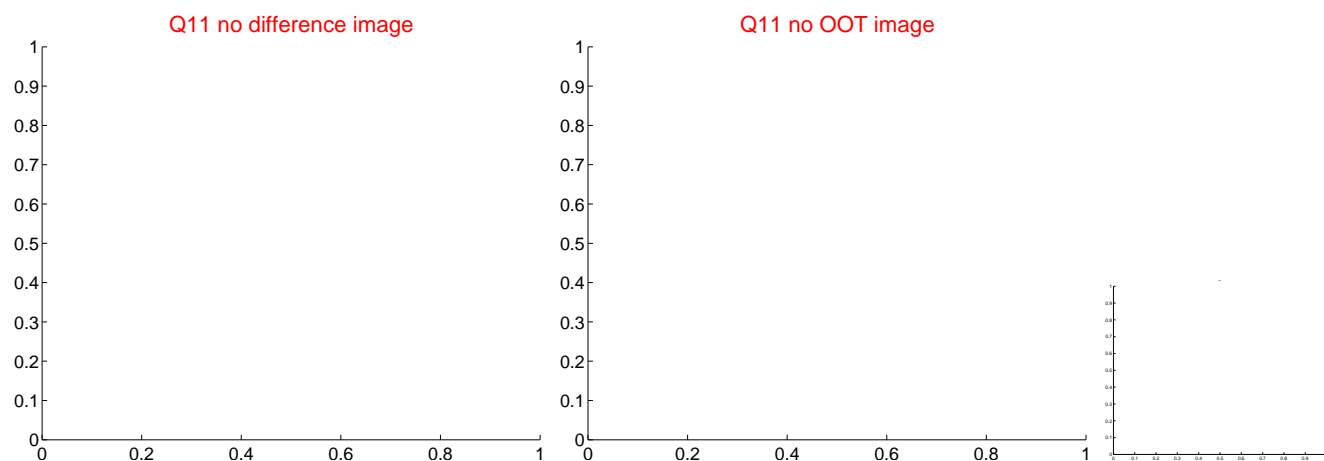
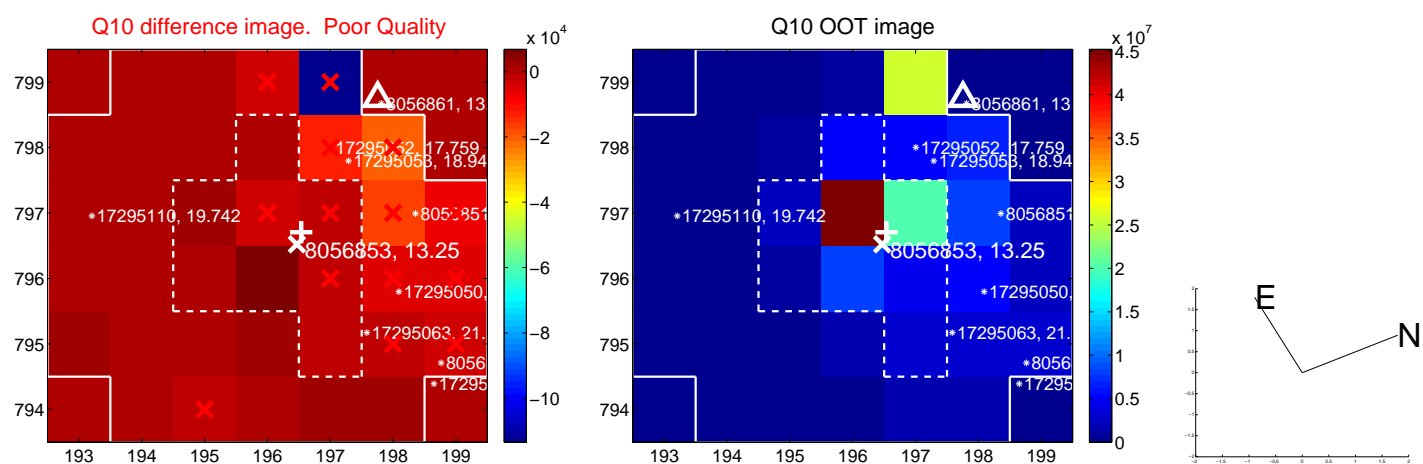
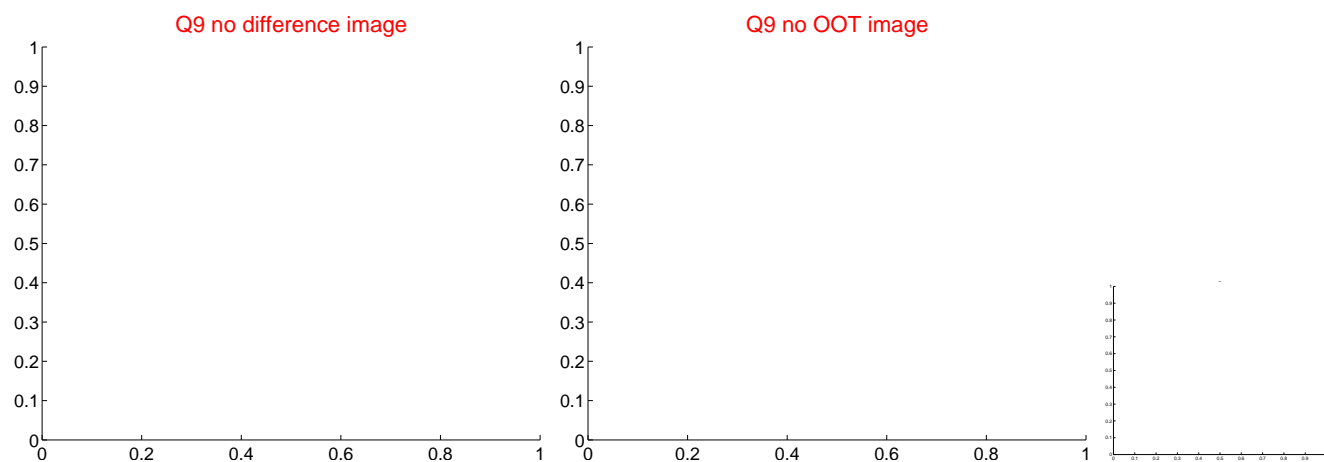
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

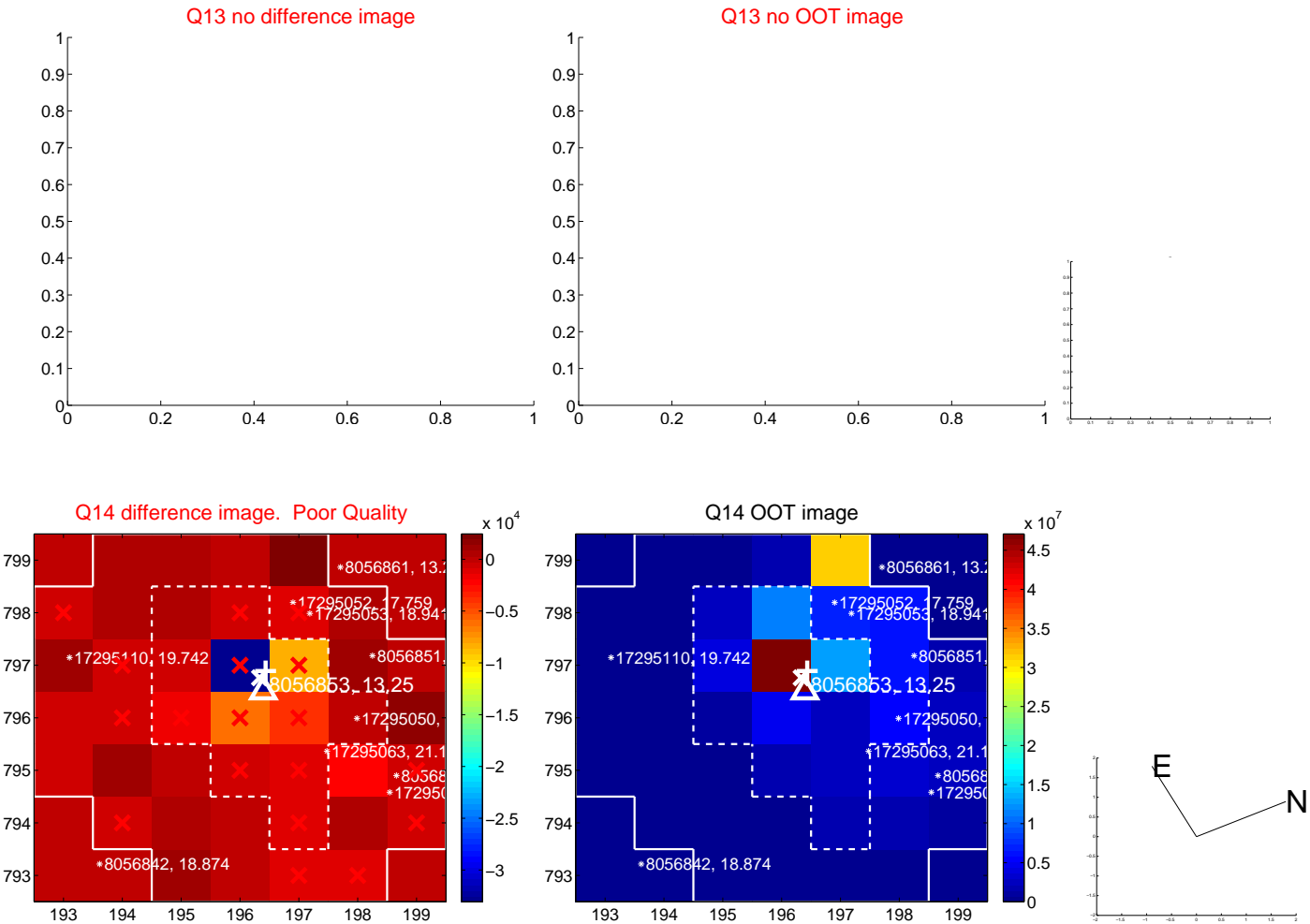


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value





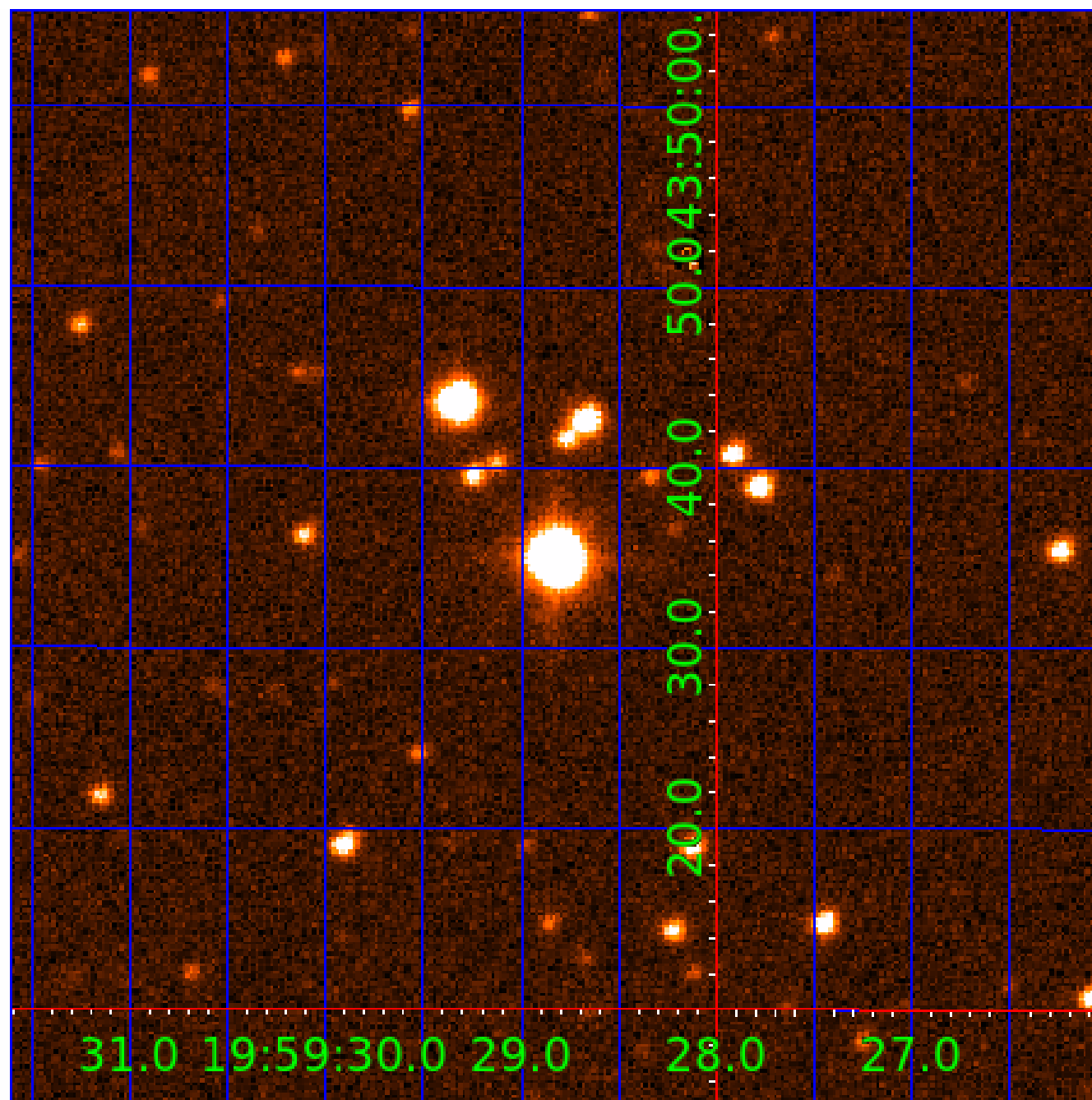
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 008056853

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008056853-01	OBS	No	1.670864	133.104151	34.4	7.258	8.9	8.5	0.71	4429	0.52	290.52
008056853-02	OBS	No	441.120466	437.809040	721.6	9.251	15.6	9.3	0.71	4429	2.12	0.17
008056853-03	OBS	No	305.585951	428.199935	507.1	9.374	13.3	5.9	0.71	4429	1.76	0.28
008056853-04	OBS	No	225.156248	190.548826	394.0	9.364	12.5	5.4	0.71	4429	1.60	0.42
008056853-05	OBS	No	307.907910	162.825072	223.0	9.419	11.8	2.5	0.71	4429	1.27	0.28
008056853-06	OBS	No	213.561669	282.933930	79.6	7.168	12.4	1.3	0.71	4429	0.78	0.45
008056853-07	OBS	No	192.807309	132.044532	1526.7	33.730	13.2	8.1	0.71	4429	5.71	0.52
008056853-08	OBS	No	352.018673	141.049465	129.7	2.288	9.0	1.6	0.71	4429	1.02	0.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008056853-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008056853-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008056853-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008056853-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—CENT_KIC_POS
008056853-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET
008056853-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

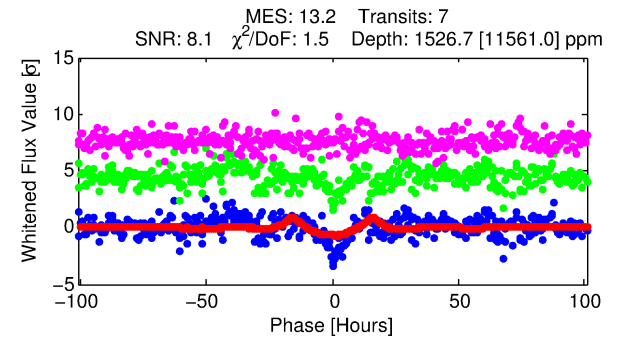
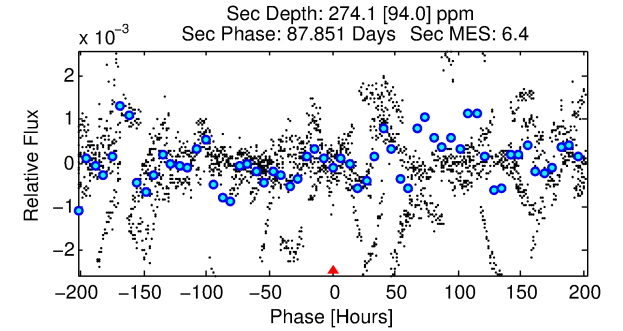
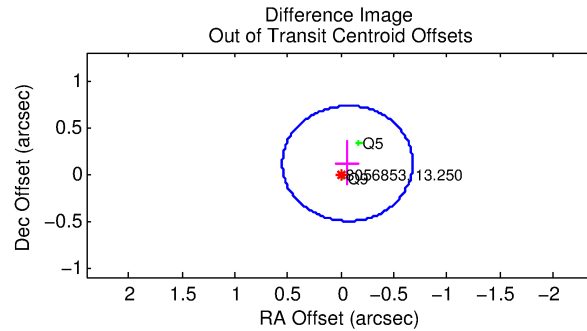
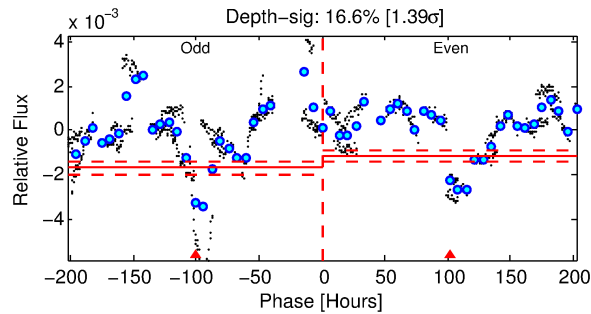
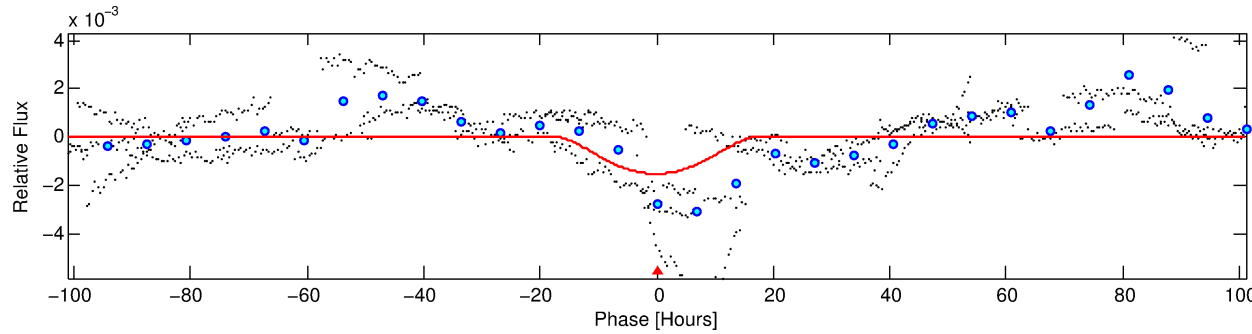
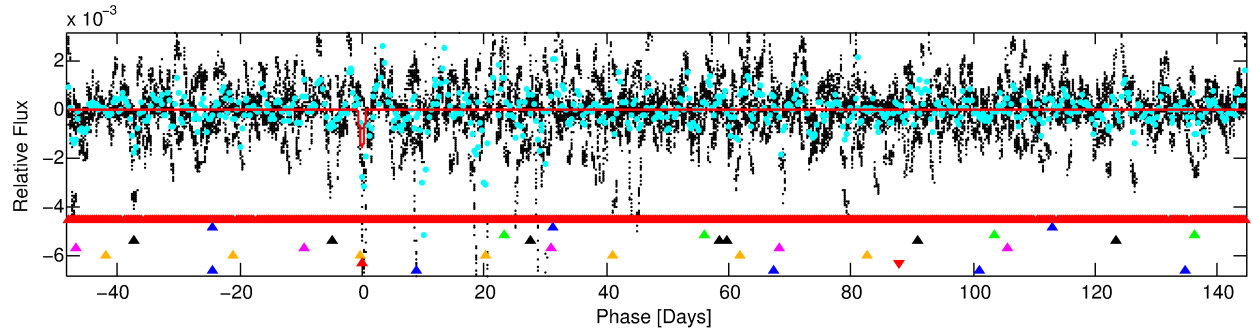
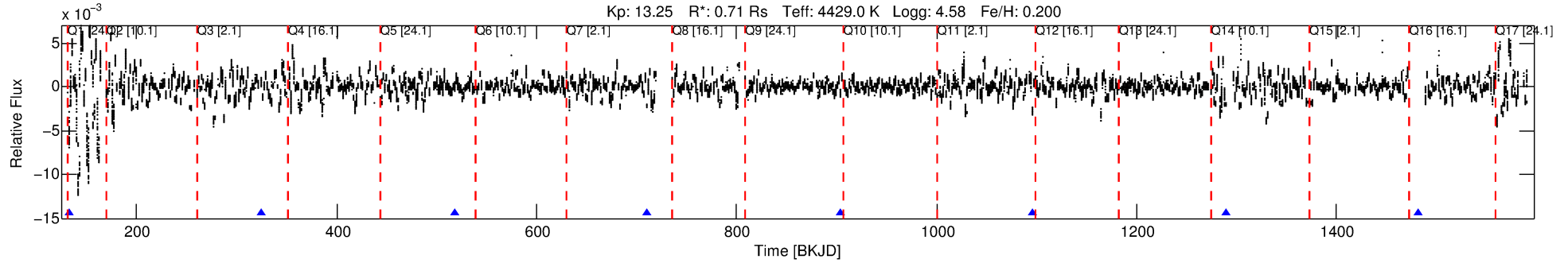
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 008056853-07

No Significant Match Found

# DV One-Page Summary

KIC: 8056853 Candidate: 7 of 8 Period: 192.807 d



## DV Fit Results:

Period = 192.80731 [0.01783] d  
Epoch = 132.0445 [0.0636] BKJD  
Rp/R\* = 0.0735 [0.1124]  
a/R\* = 17.08 [5.17]  
b = 1.00 [0.52]  
Seff = 0.52 [0.08]  
Teq = 216 [8] K  
Rp = 5.71 [8.75] Re  
a = 0.5813 [0.0396] AU  
Ag = 1563.06 [4814.16] [0.32 $\sigma$ ]  
Teffp = 2102 [1619] K [1.16 $\sigma$ ]

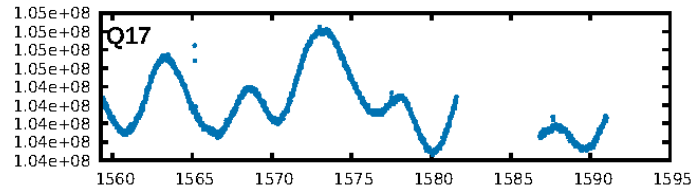
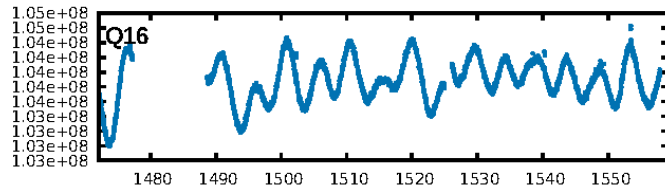
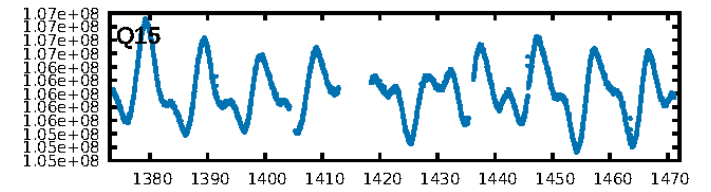
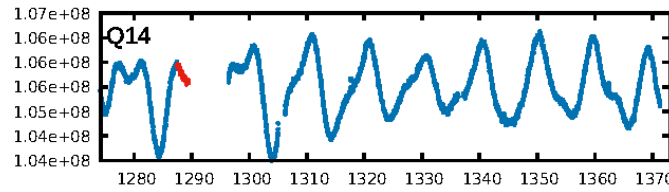
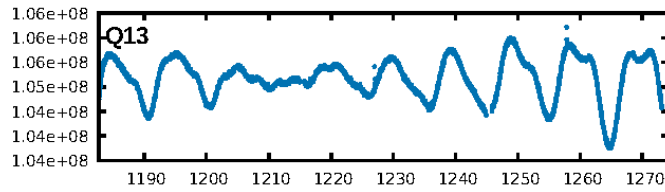
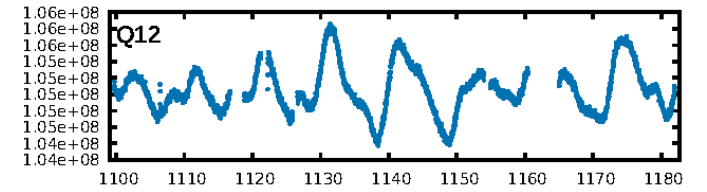
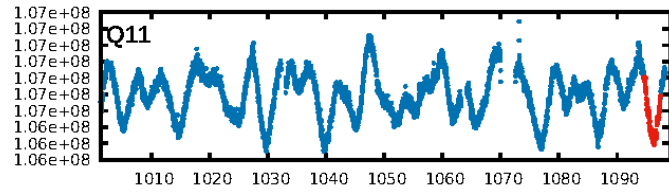
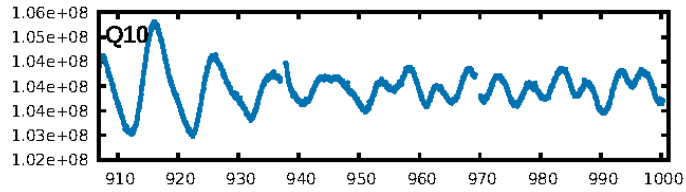
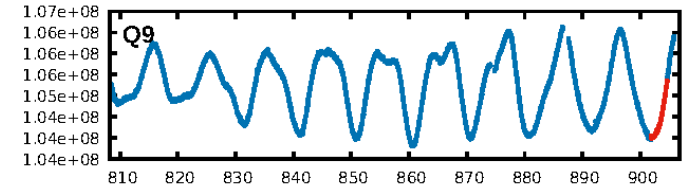
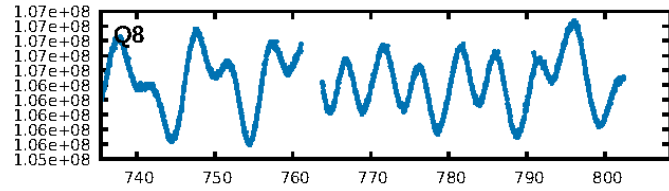
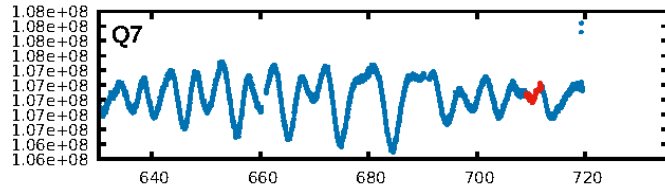
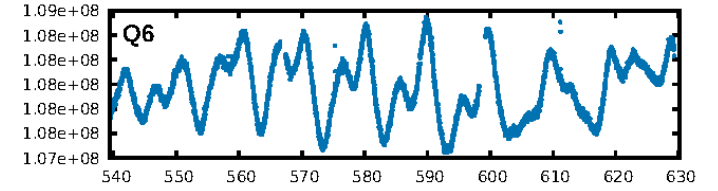
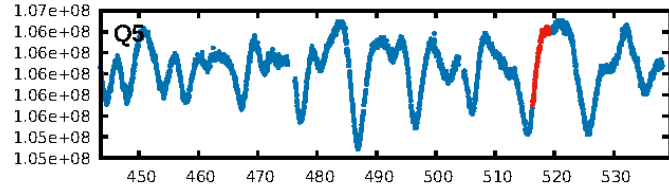
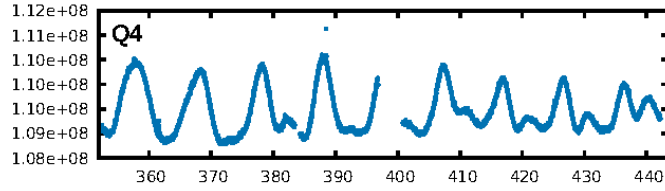
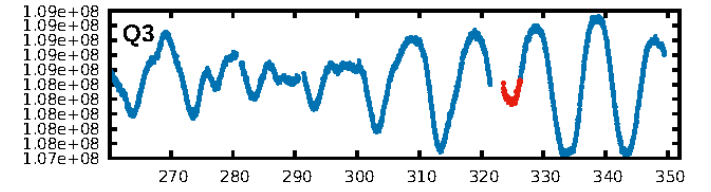
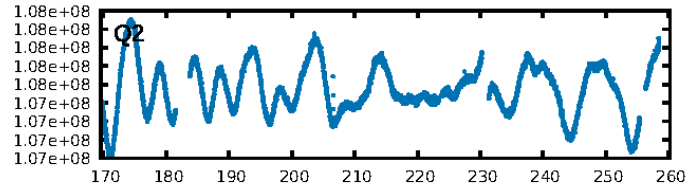
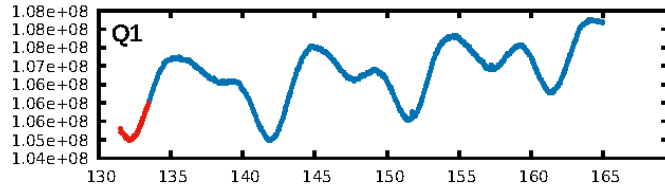
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [132.96 $\sigma$ ]  
LongPeriod-sig: 100.0% [14.45 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.30e-14  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 30.02  
Centroid-sig: 0.0%  
Centroid-so: 0.823 arcsec [0.97 $\sigma$ ]  
OotOffset-rm: 0.130 arcsec [0.63 $\sigma$ ]  
KicOffset-rm: 0.357 arcsec [1.59 $\sigma$ ]  
OotOffset-st: 0/0/0/2 [2]  
KicOffset-st: 0/0/0/2 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.00 [0/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:14:08 Z

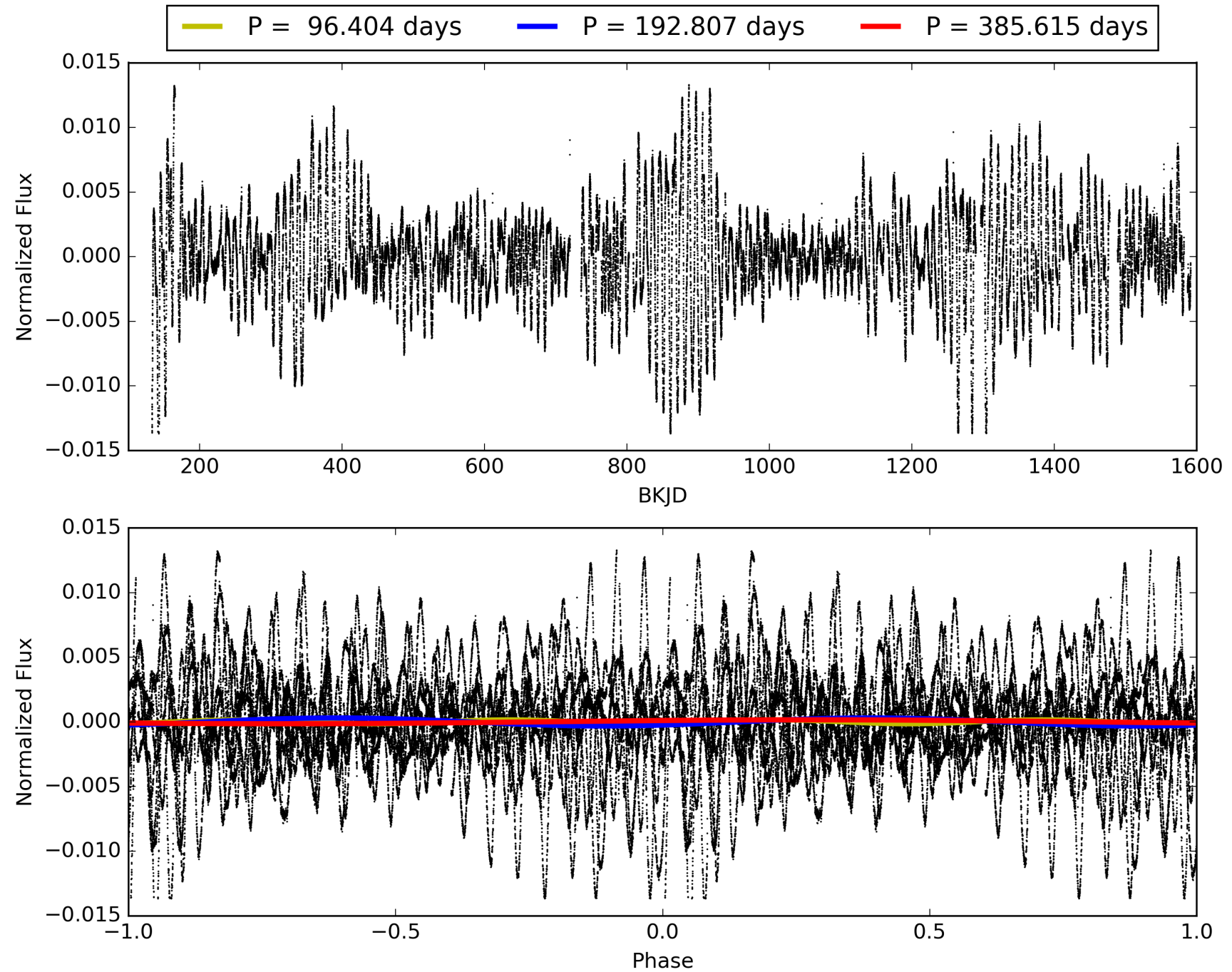
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 008056853-07, PDC Light Curves



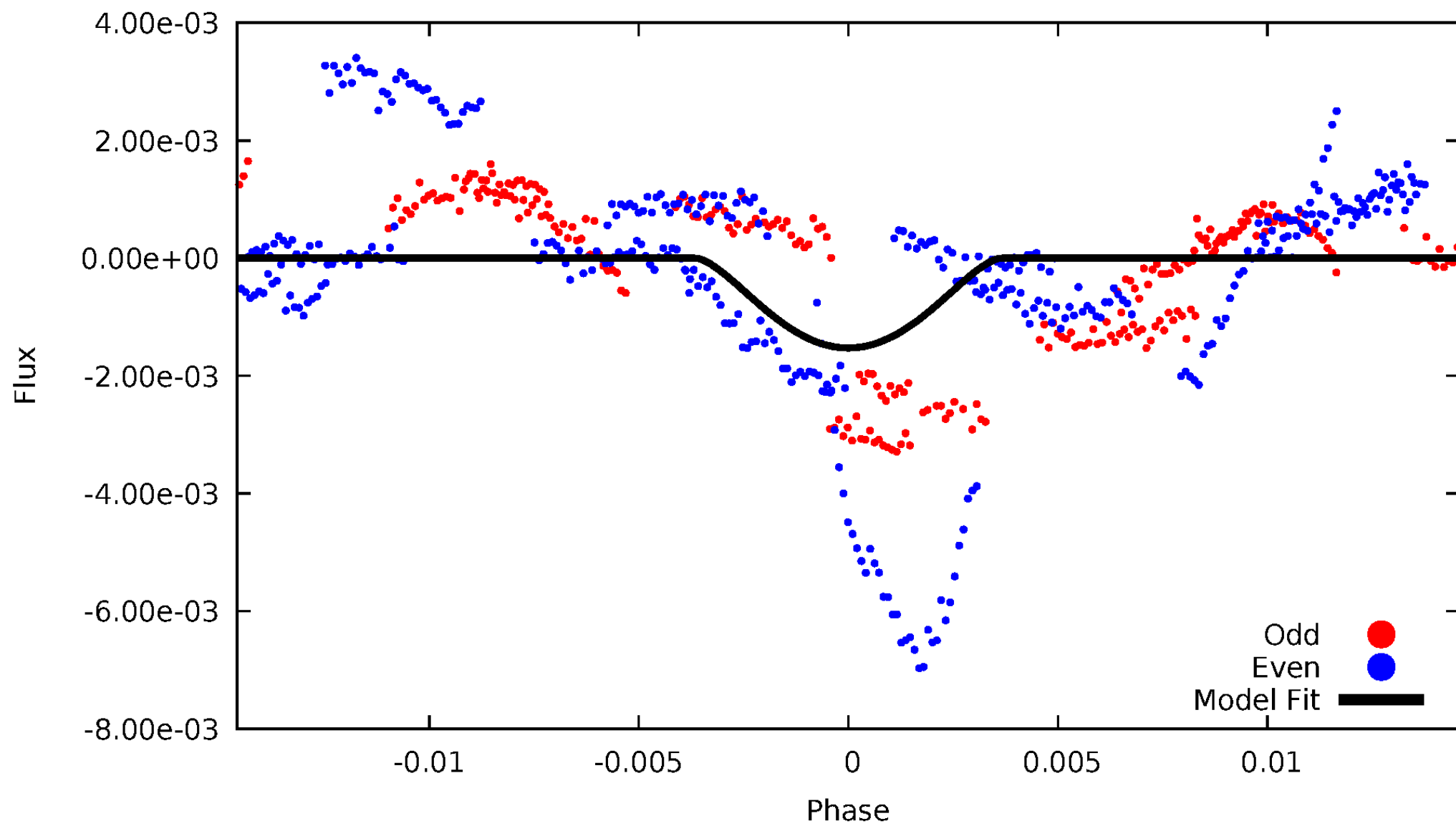


TCE 008056853-07



# DV Odd/Even

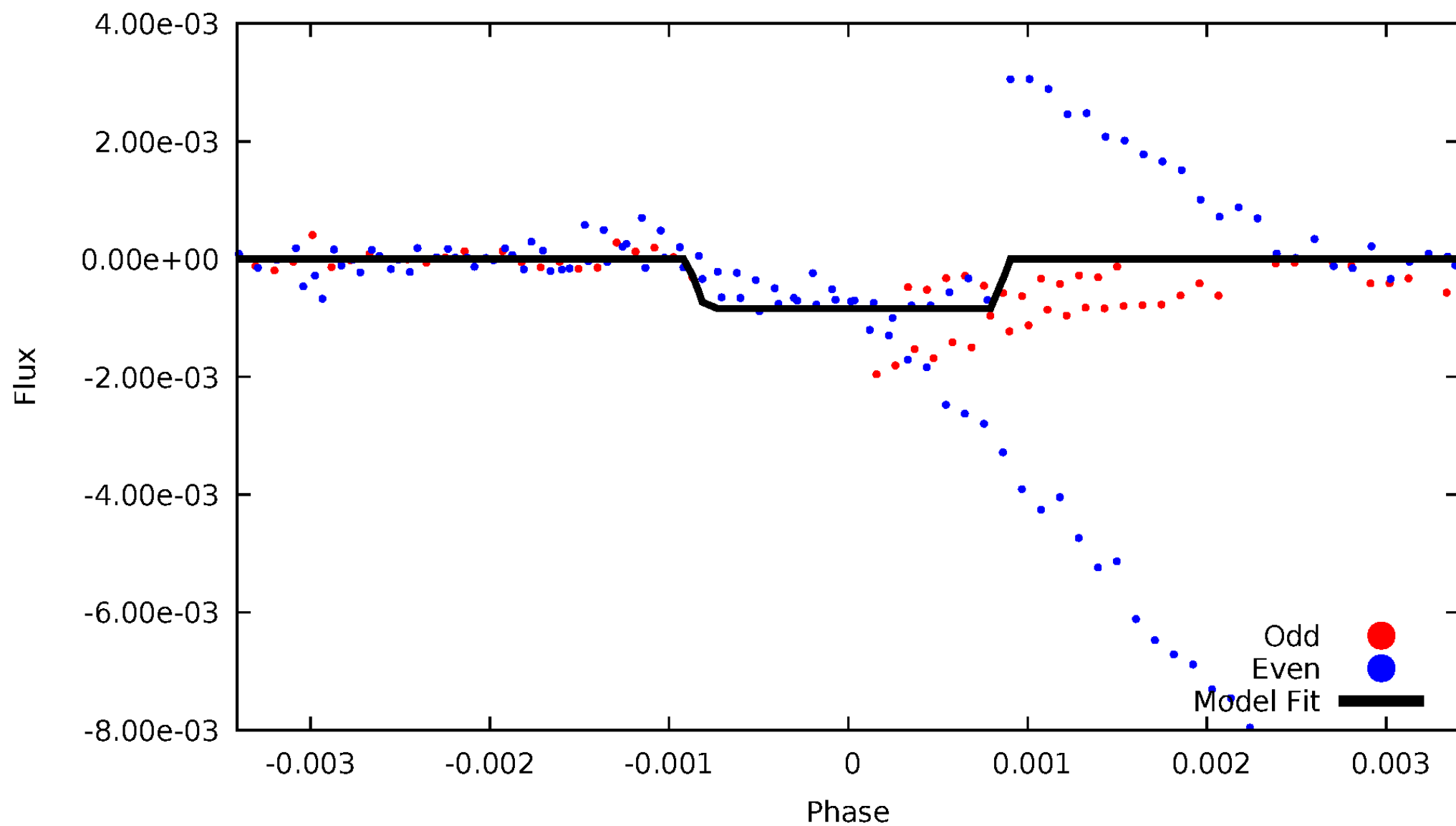
TCE 008056853-07





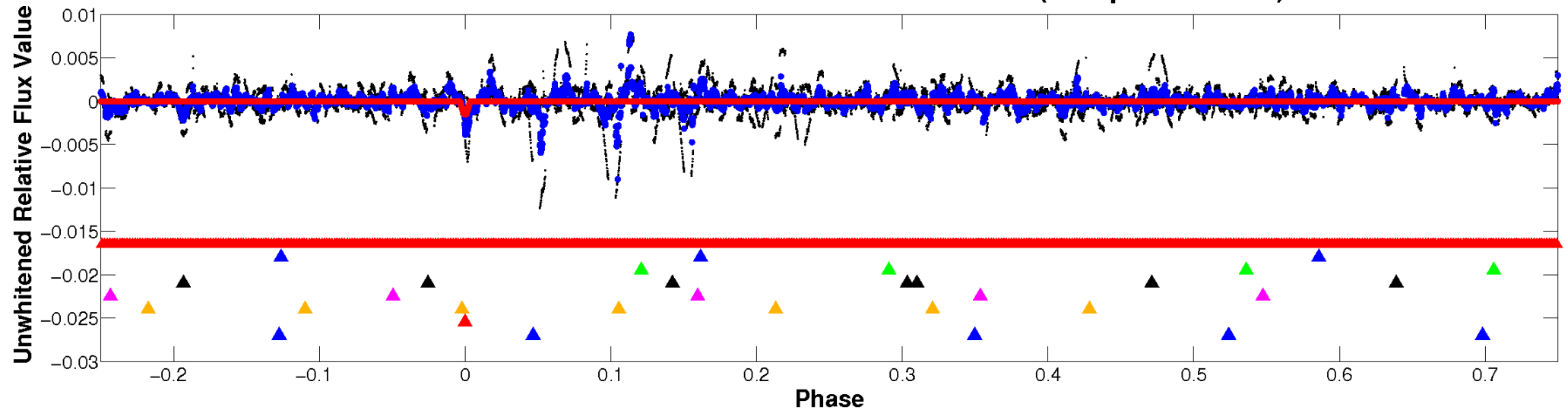
# ALT Odd/Even

TCE 008056853-07

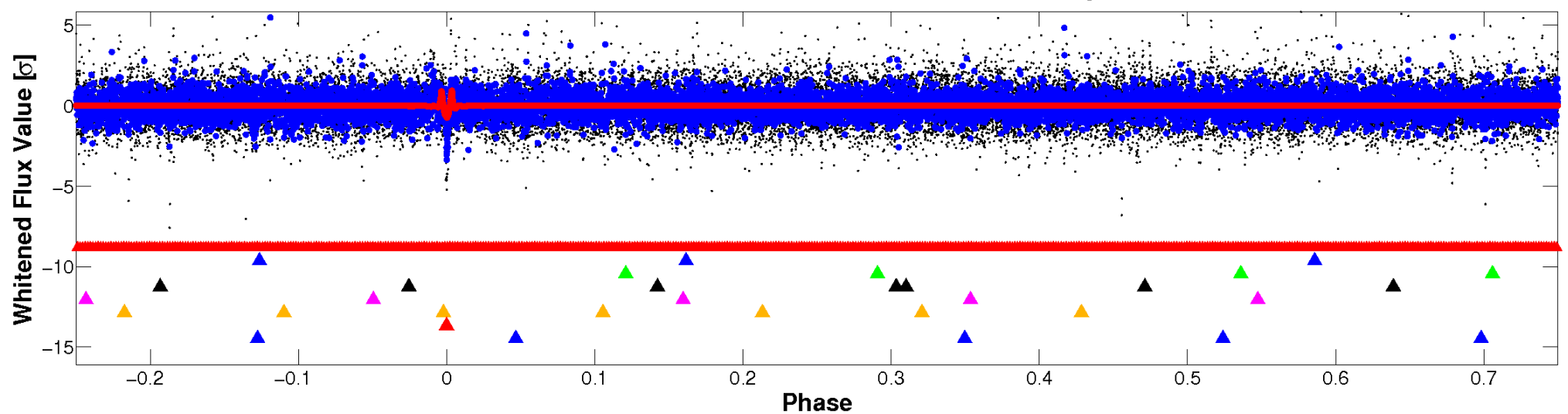


# Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

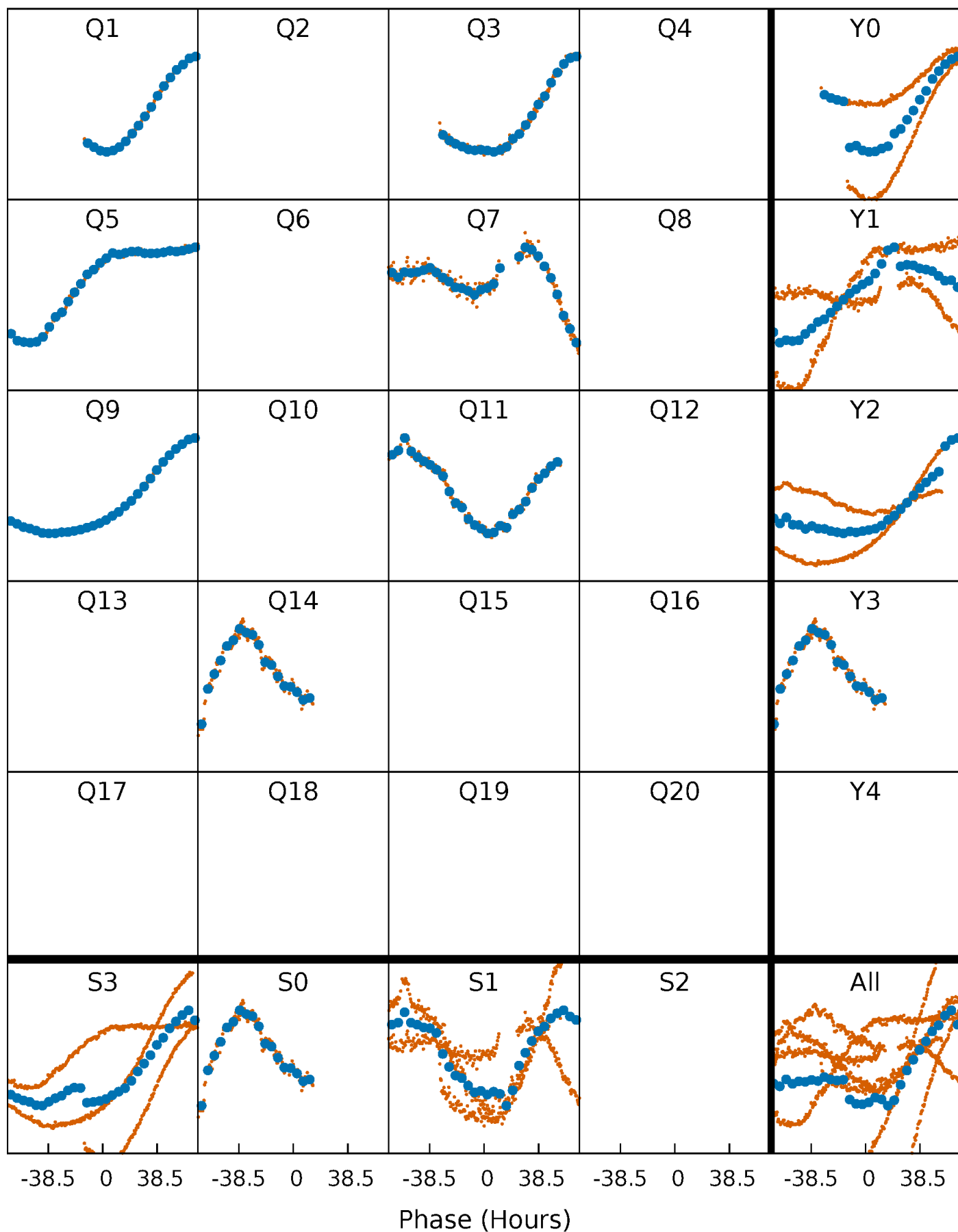


Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



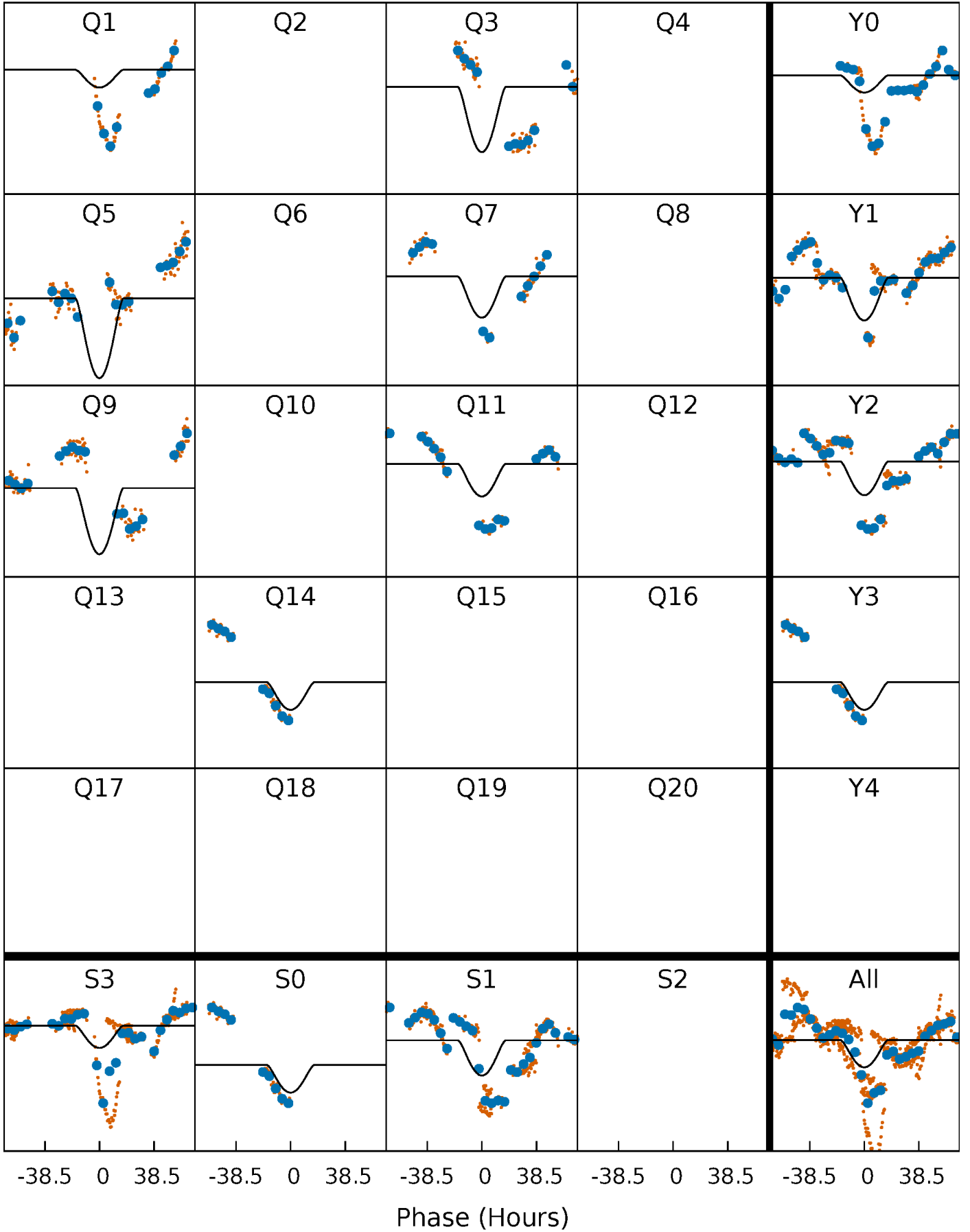
# PDC Quarter-Phased Transit Curves

TCE 008056853-07 P=192.807309 Days  $T_0=132.044532$  (BKJD)



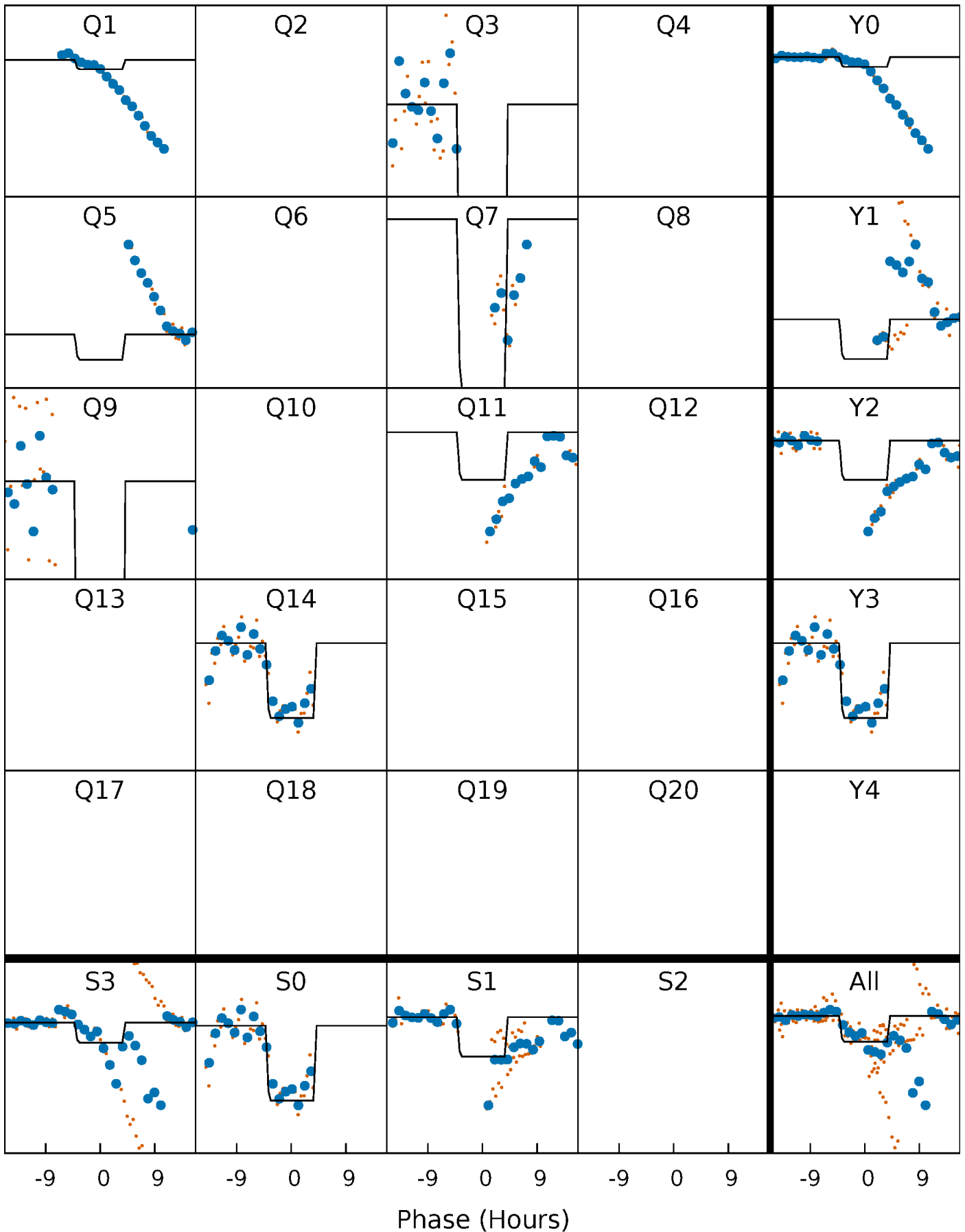
# DV Quarter-Phased Transit Curves

TCE 008056853-07     $P=192.807309$  Days     $T_0=132.044532$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

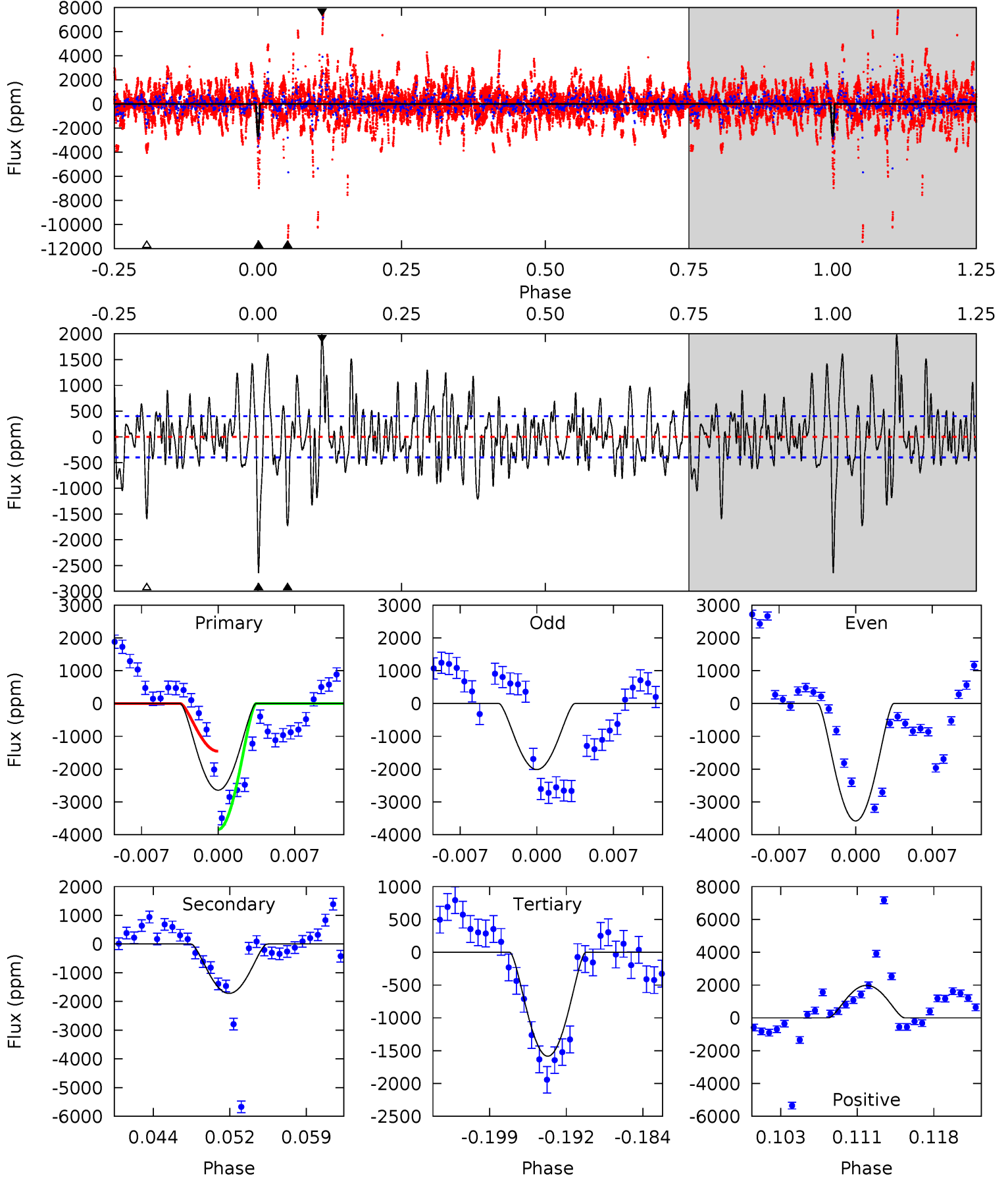
TCE 008056853-07 P=192.756583 Days  $T_0=132.183401$  (BKJD)



# DV Model-Shift Uniqueness Test

008056853-07, P = 192.807309 Days, E = 132.044532 Days

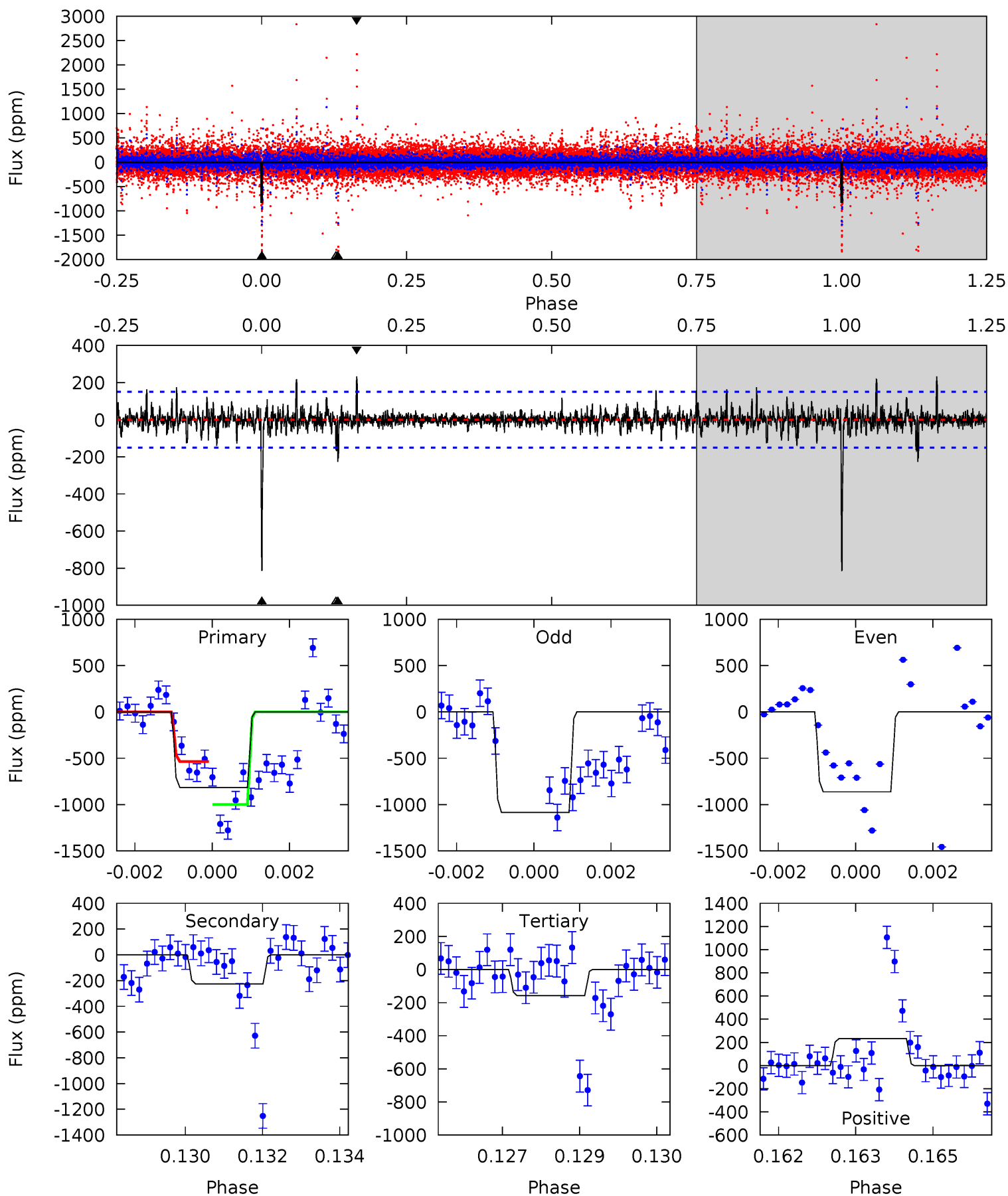
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.6	21.8	20.1	25.1	5.08	2.68	6.24	13.4	8.43	1.72	-3.29	8.66	0.69	0.43	15.0



# Alt Model-Shift Uniqueness Test

008056853-07, P = 192.756583 Days, E = 132.183401 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.0	8.06	5.62	8.27	5.35	3.13	1.17	23.4	20.8	2.44	-0.21	2.97	1.03	0.22	8.04



### Stellar Parameters For KIC 008056853

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4429^{+132}_{-132}$	$4.581^{+0.052}_{-0.016}$	$0.200^{+0.200}_{-0.300}$	$0.712^{+0.029}_{-0.059}$	$0.704^{+0.048}_{-0.054}$	$2.750^{+0.636}_{-0.220}$
	+3%/-3%	+1%/-0%	+100%/-150%	+4%/-8%	+7%/-8%	+23%/-8%
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 008056853-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1720 \pm 79$	$8.17^{+7.60}_{-5.12}$	$300^{+10}_{-10}$	$3225^{+1279}_{-544}$	$4853^{+32823}_{-3583}$
Alt.	$-226 \pm 28$	$6.64^{+6.60}_{-4.51}$	$300^{+10}_{-11}$	$2595^{+1005}_{-409}$	$983^{+8847}_{-746}$

$T_{max}$  = 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

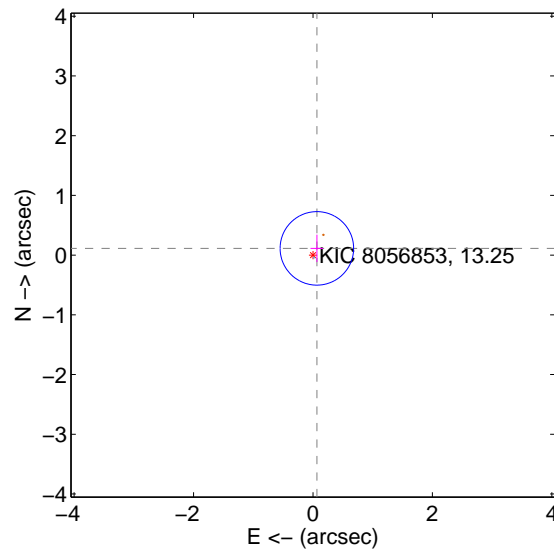
Supplemental centroid analysis for 008056853-07. Kepler magnitude: 13.25. Transit SNR 8.10

There are 1 quarters with good PRF difference image offsets

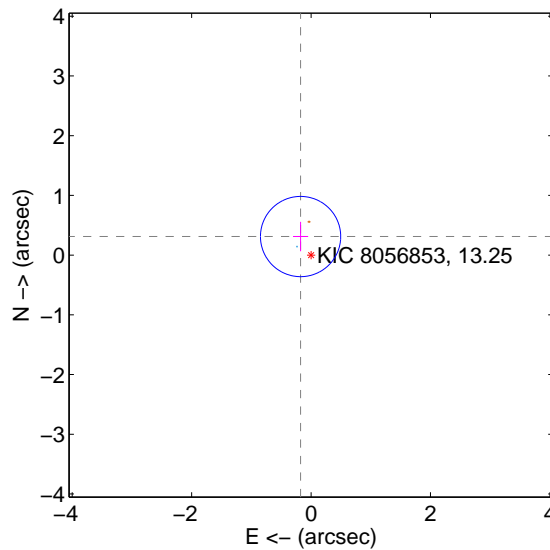
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.130 \pm 0.205$	0.63	$-0.065 \pm 0.106$	$0.113 \pm 0.229$
PRF-fit source offset from KIC position	$0.357 \pm 0.224$	1.59	$0.175 \pm 0.127$	$0.311 \pm 0.247$
photometric centroid source offset	$0.82 \pm 0.85$	0.97	$0.60 \pm 0.55$	$-0.56 \pm 1.11$

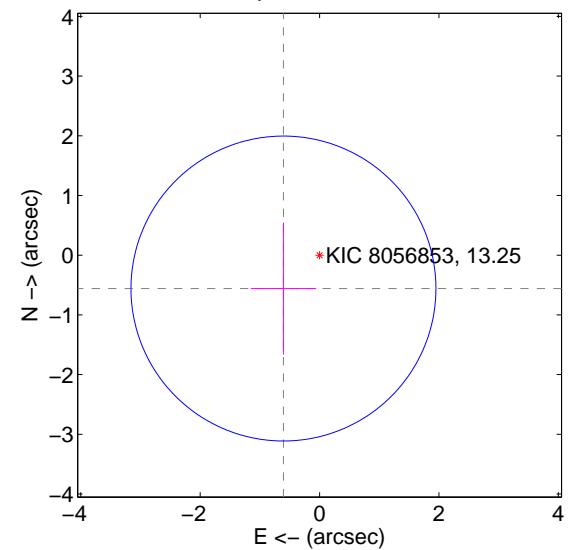
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

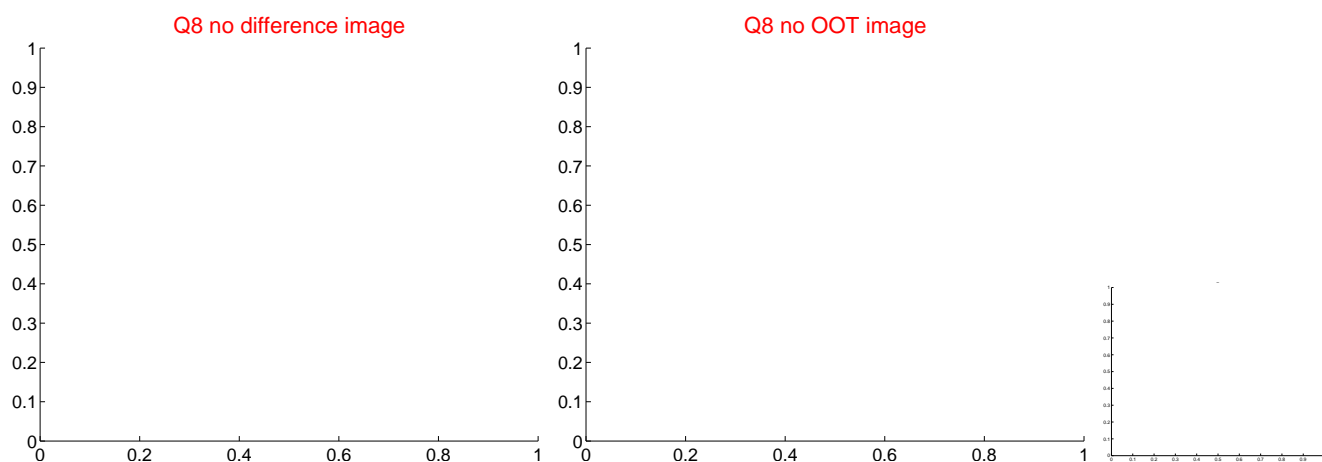
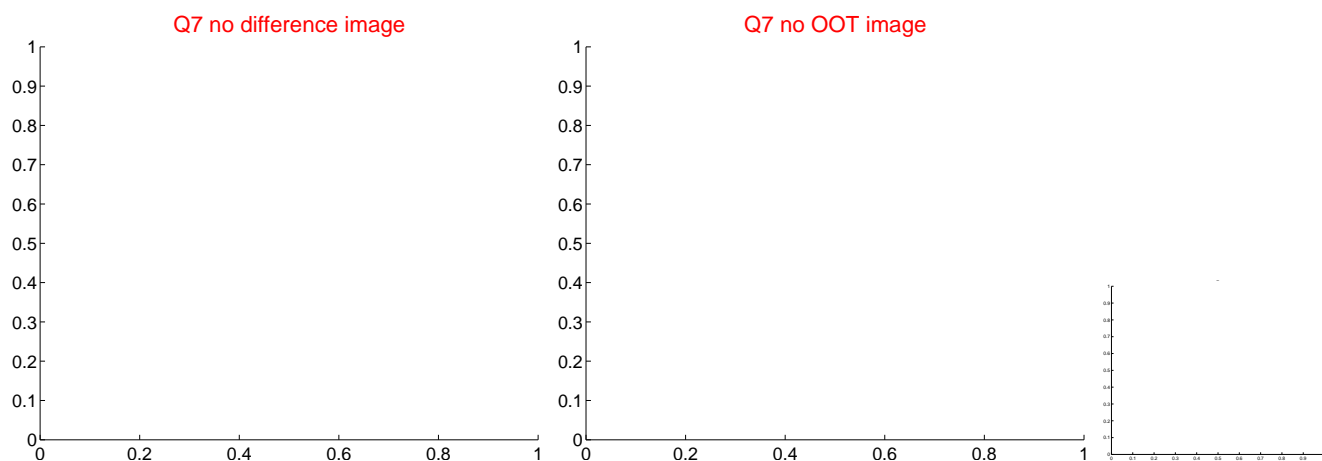
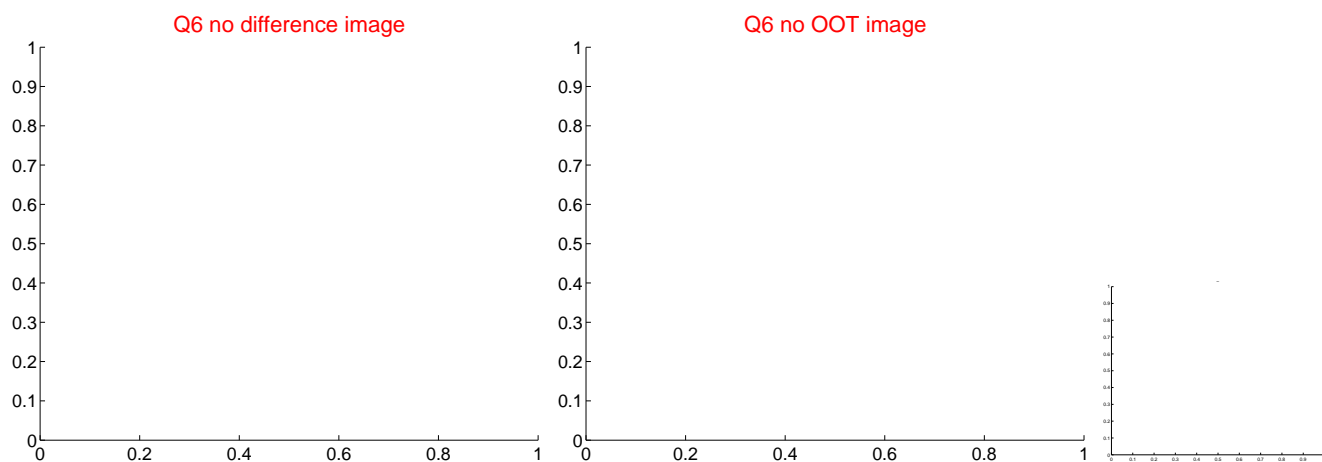
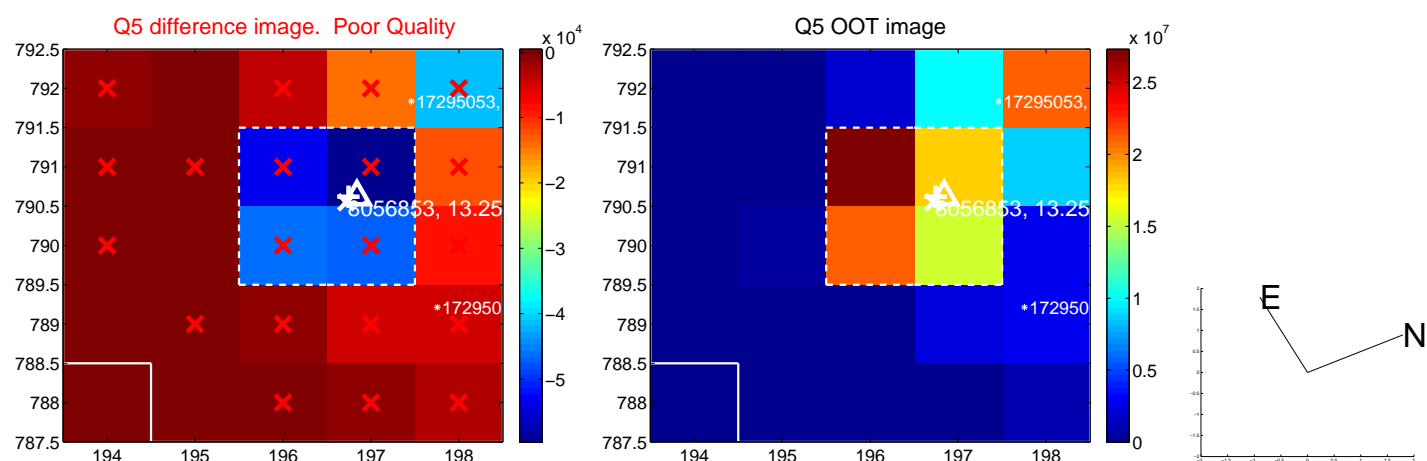


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

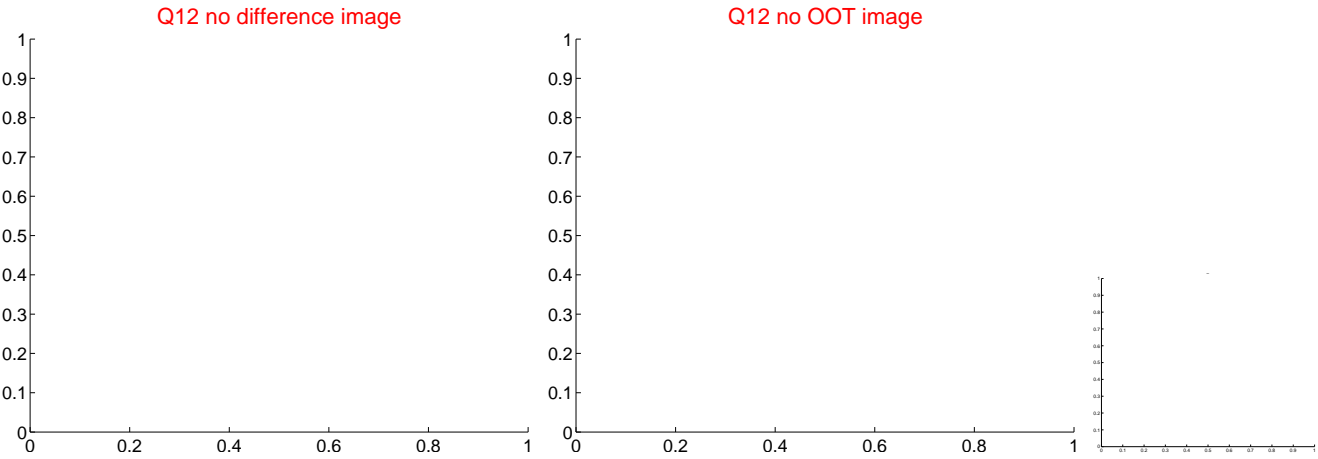
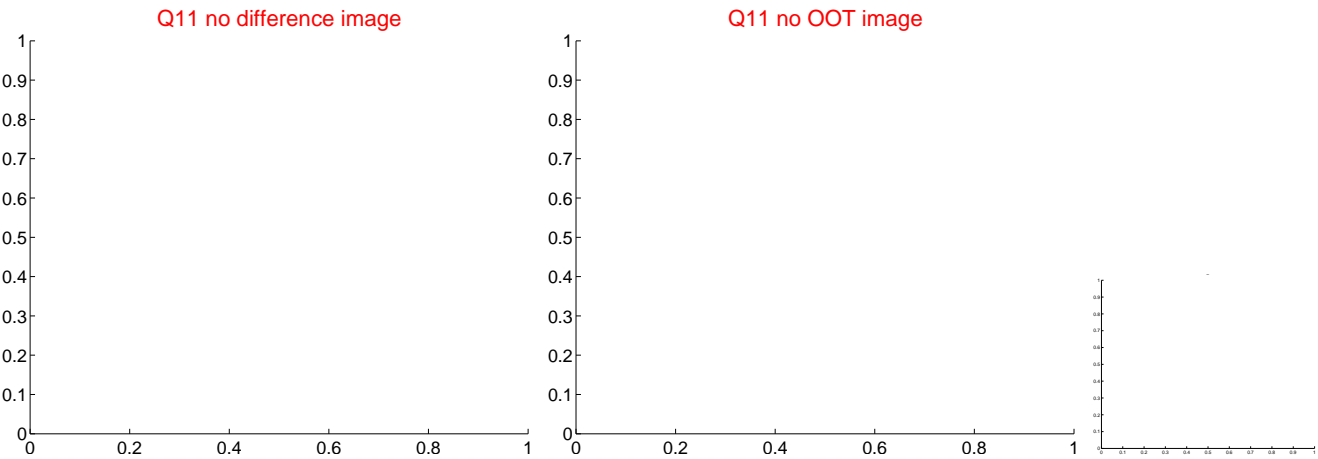
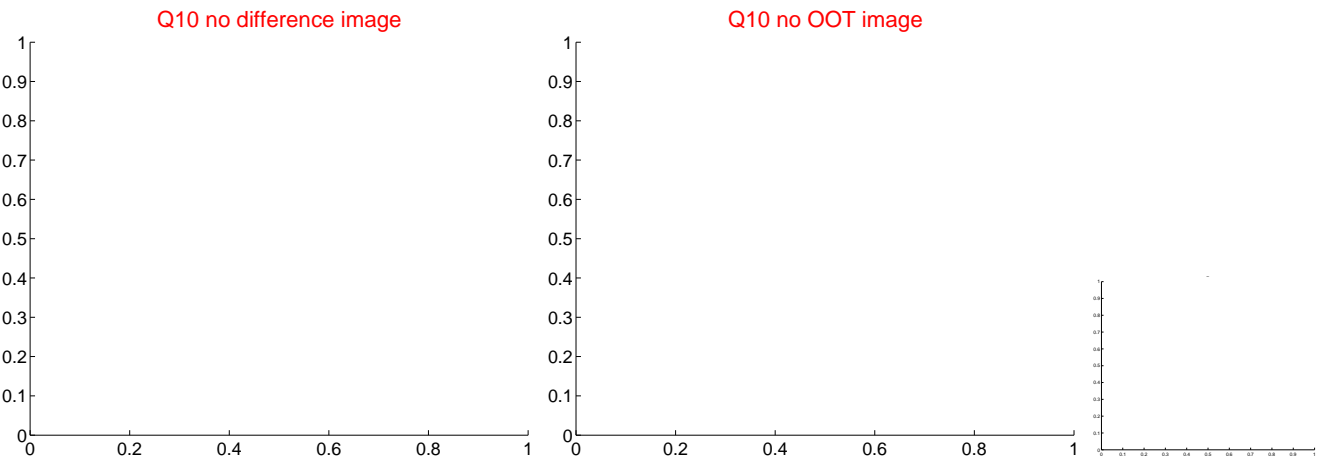
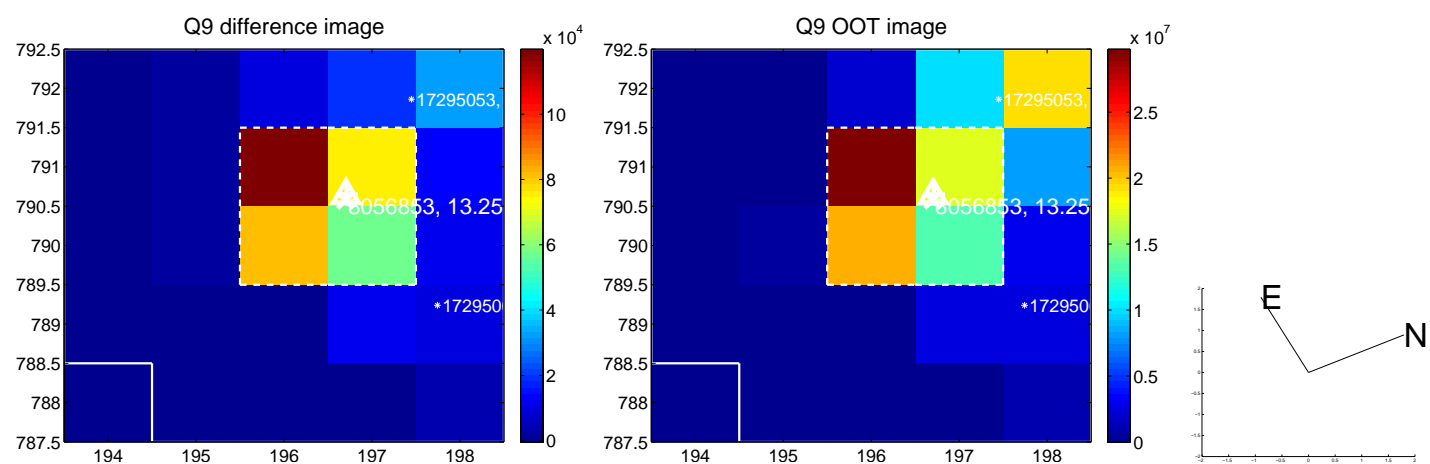
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



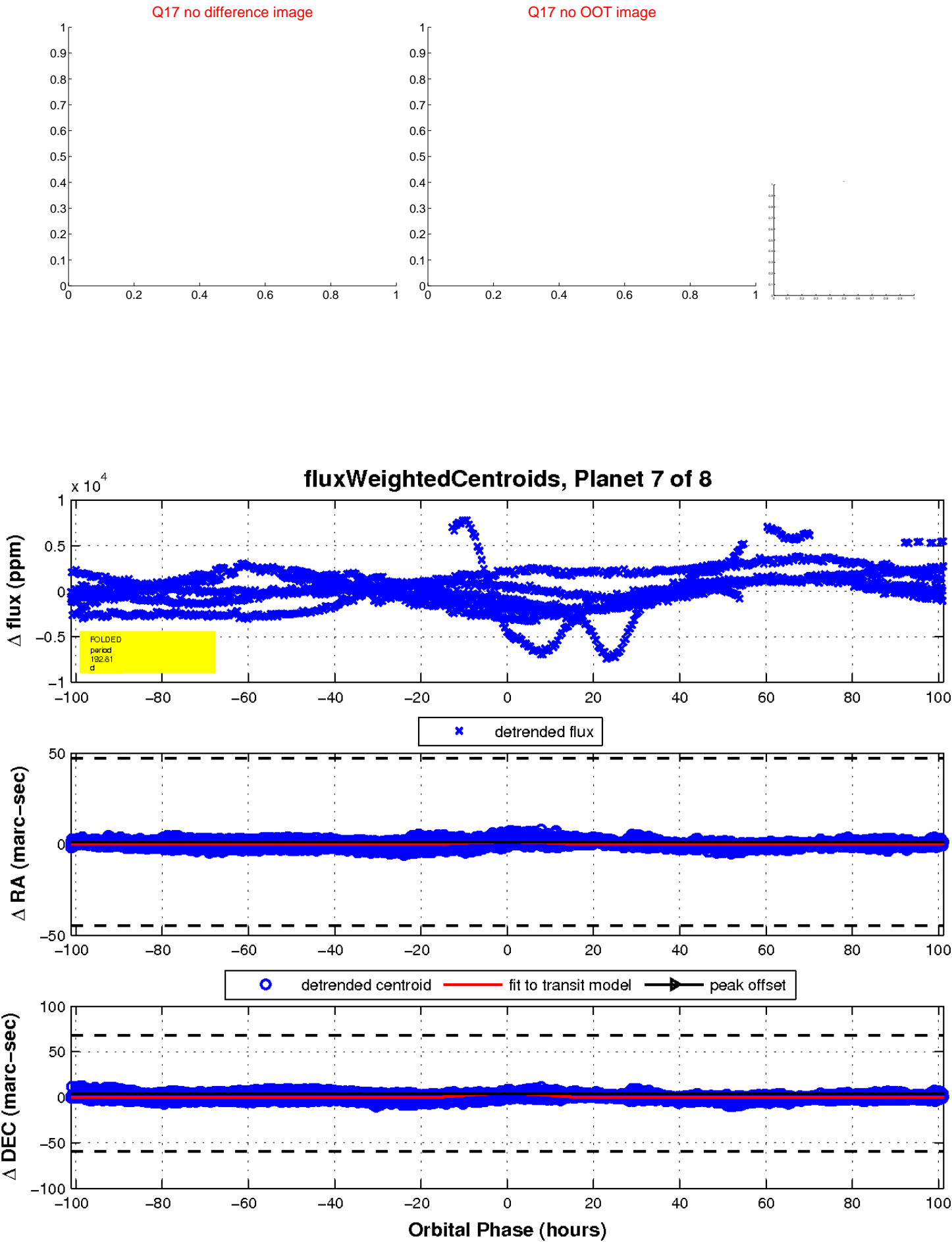
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

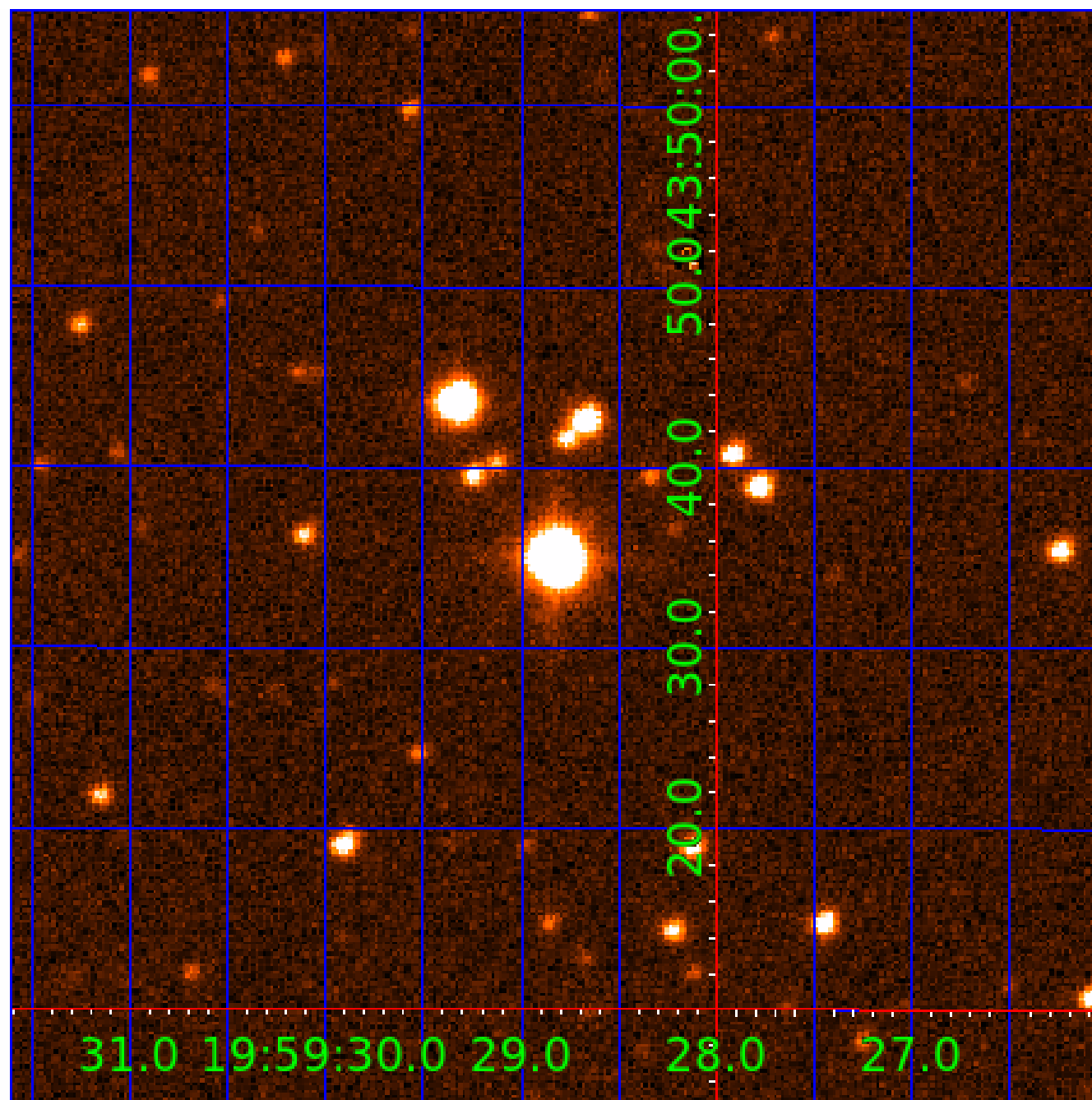


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 008056853

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
008056853-01	OBS	No	1.670864	133.104151	34.4	7.258	8.9	8.5	0.71	4429	0.52	290.52
008056853-02	OBS	No	441.120466	437.809040	721.6	9.251	15.6	9.3	0.71	4429	2.12	0.17
008056853-03	OBS	No	305.585951	428.199935	507.1	9.374	13.3	5.9	0.71	4429	1.76	0.28
008056853-04	OBS	No	225.156248	190.548826	394.0	9.364	12.5	5.4	0.71	4429	1.60	0.42
008056853-05	OBS	No	307.907910	162.825072	223.0	9.419	11.8	2.5	0.71	4429	1.27	0.28
008056853-06	OBS	No	213.561669	282.933930	79.6	7.168	12.4	1.3	0.71	4429	0.78	0.45
008056853-07	OBS	No	192.807309	132.044532	1526.7	33.730	13.2	8.1	0.71	4429	5.71	0.52
008056853-08	OBS	No	352.018673	141.049465	129.7	2.288	9.0	1.6	0.71	4429	1.02	0.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008056853-01	OBS	FP	0.00	1	0	1	0	LPP_DV—CENT_RESOLVED_OFFSET
008056853-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—CENT_FEW_DIFFS
008056853-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_TER_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
008056853-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_POS_DV—CENT_KIC_POS
008056853-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—CENT_RESOLVED_OFFSET
008056853-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
008056853-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—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.

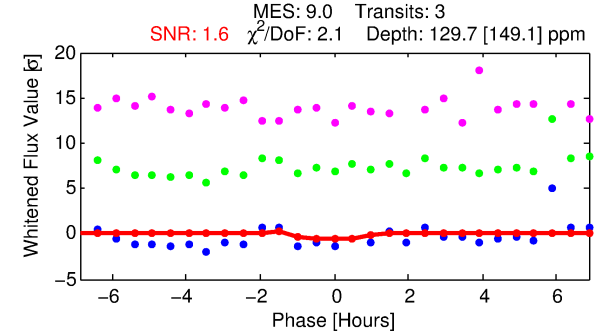
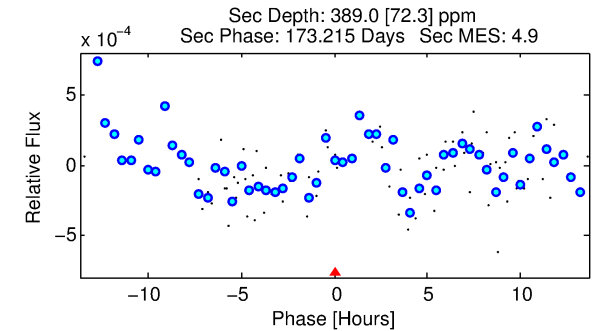
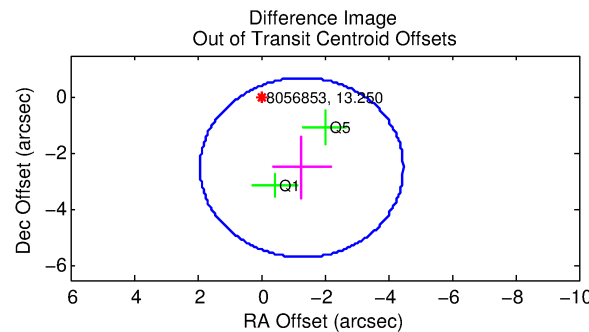
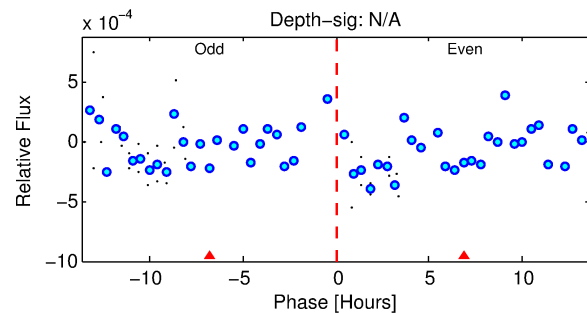
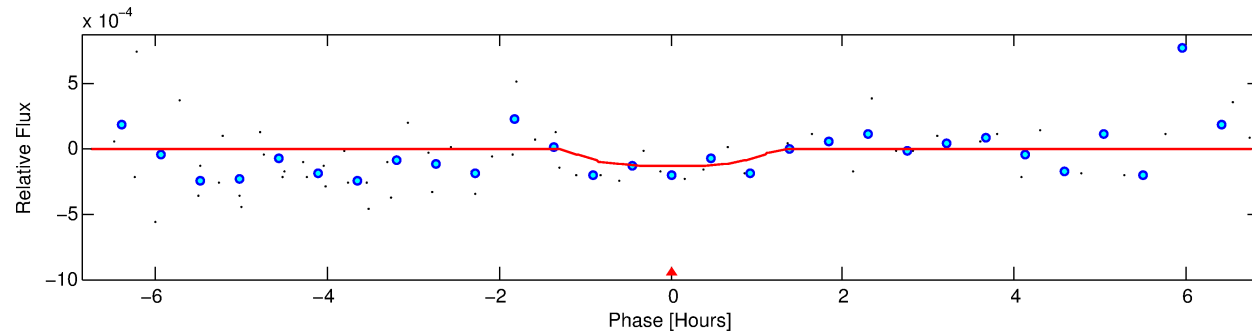
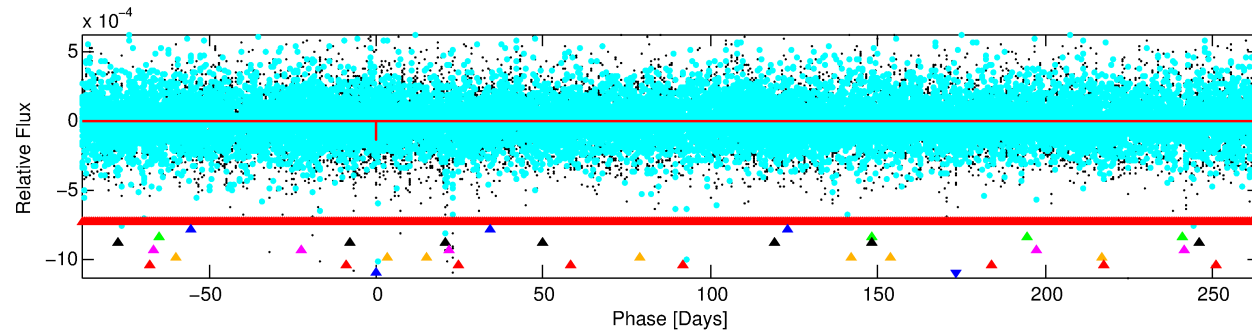
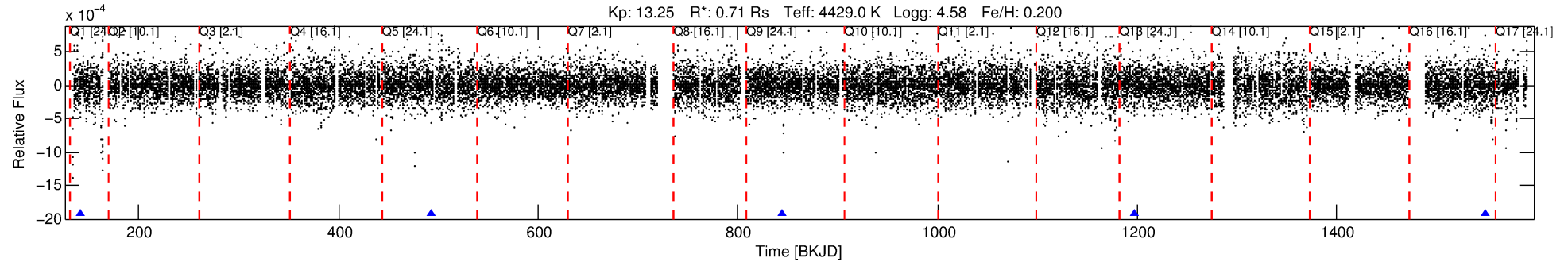
Ephemeris Match Information For 008056853-08

No Significant Match Found



# DV One-Page Summary

KIC: 8056853 Candidate: 8 of 8 Period: 352.019 d



## DV Fit Results:

Period = 352.01867 [0.02240] d  
Epoch = 141.0495 [0.0675] BKJD  
Rp/R\* = 0.0131 [0.0932]  
a/R\* = 531.50 [13842.05]  
b = 0.91 [5.28]  
Seff = 0.23 [0.04]  
Teq = 177 [7] K  
Rp = 1.02 [7.24] Re  
a = 0.8684 [0.0592] AU  
Ag = 156397.78 [2229923.81] [0.07σ]  
Teffp = 5440 [19390] K [0.27σ]

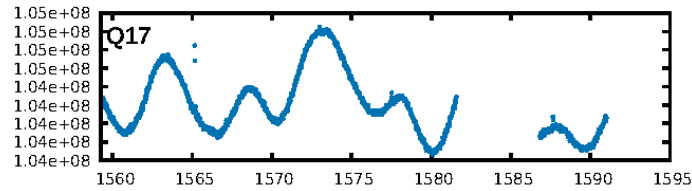
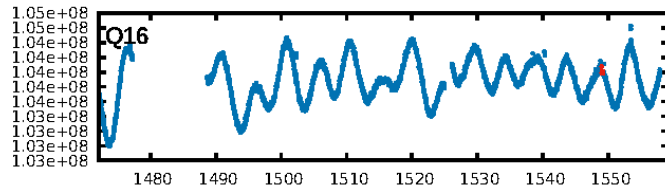
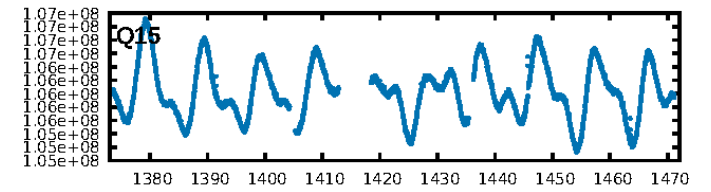
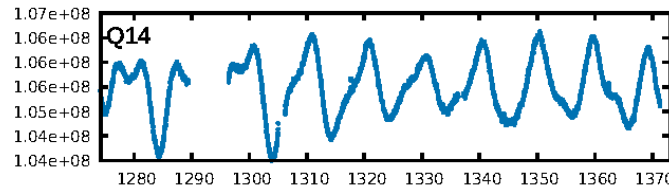
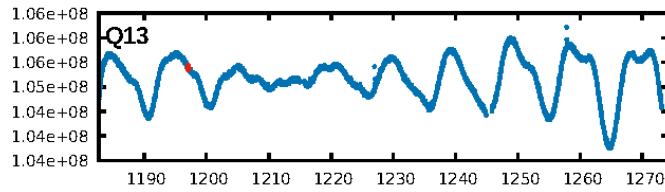
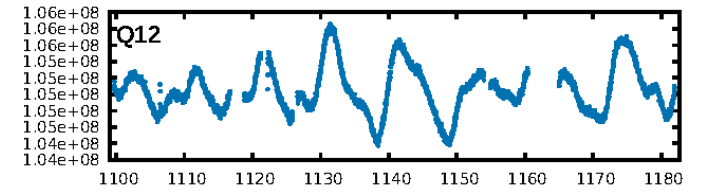
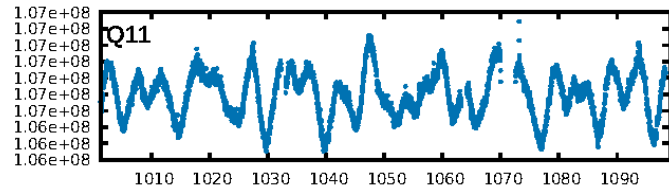
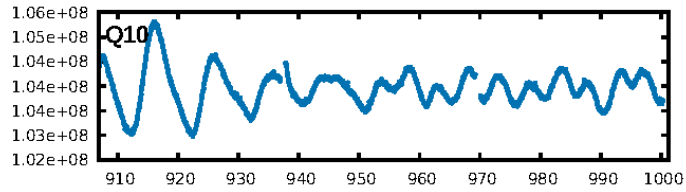
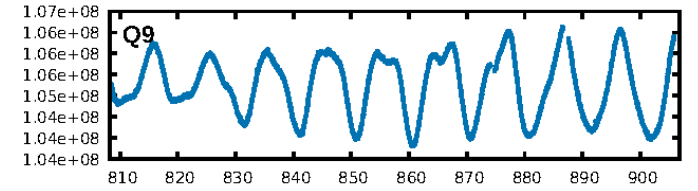
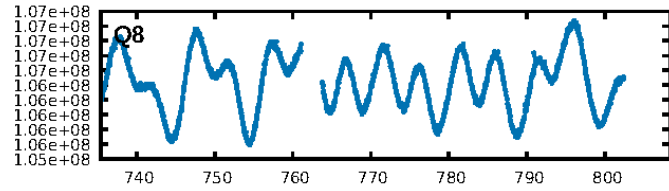
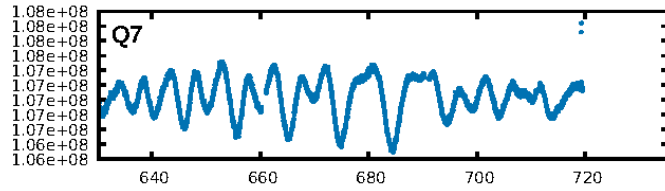
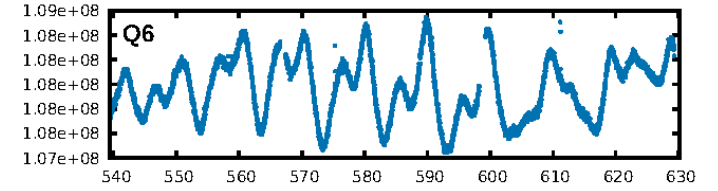
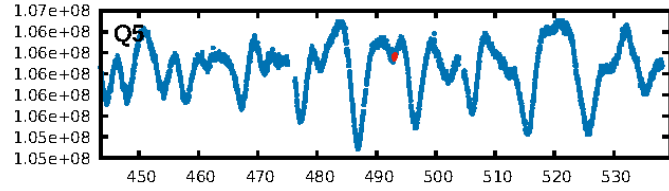
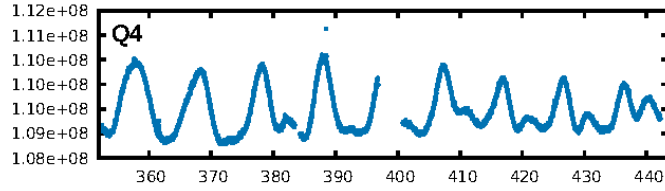
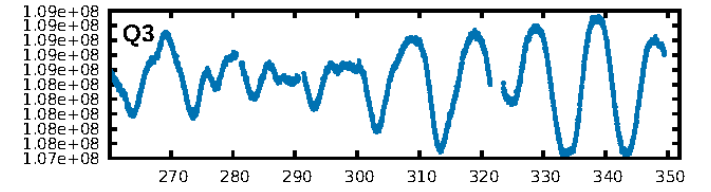
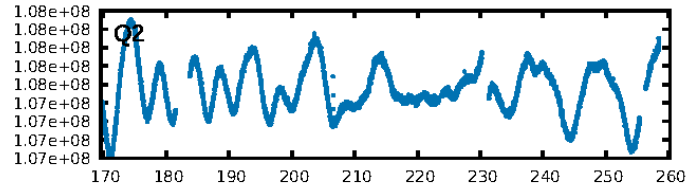
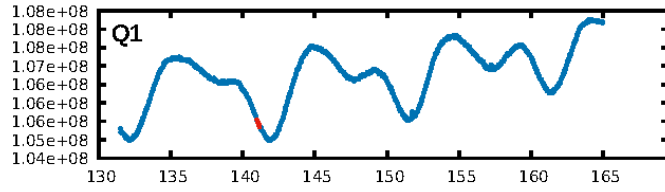
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [109.22σ]  
LongPeriod-sig: 100.0% [224.39σ]  
ModelChiSquare2-sig: 5.5%  
ModelChiSquareGof-sig: 96.5%  
**Bootstrap-pfa: 3.09e-10**  
RollingBand-fgt: 1.00 [2/2]  
**GhostDiagnostic-chr: 0.5663**  
Centroid-sig: 0.6%  
Centroid-so: 14.889 arcsec [1.80σ]  
OotOffset-rm: 2.808 arcsec [2.64σ]  
OotOffset-st: 0/0/0/2 [2]  
KicOffset-rm: 2.577 arcsec [2.37σ]  
KicOffset-st: 0/0/0/2 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.67 [2/3]

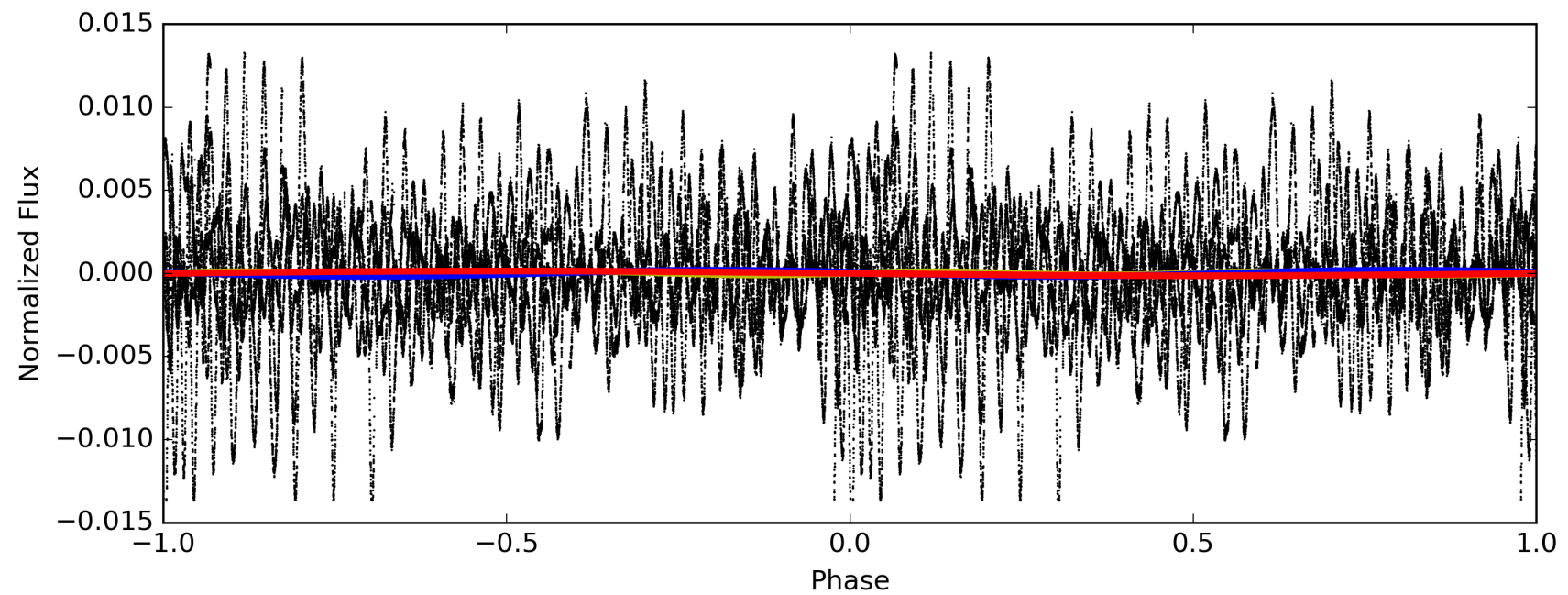
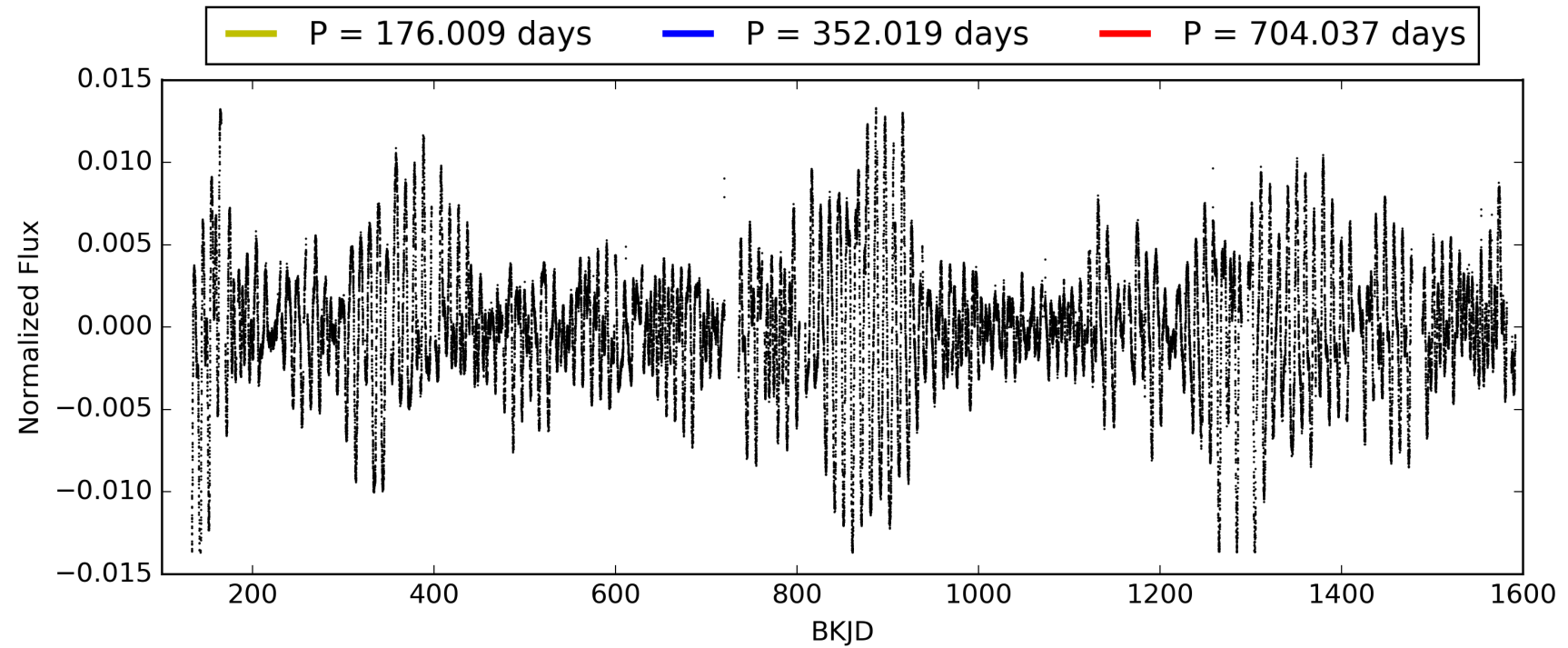
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:14:19 Z

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

# TCE 008056853-08, PDC Light Curves

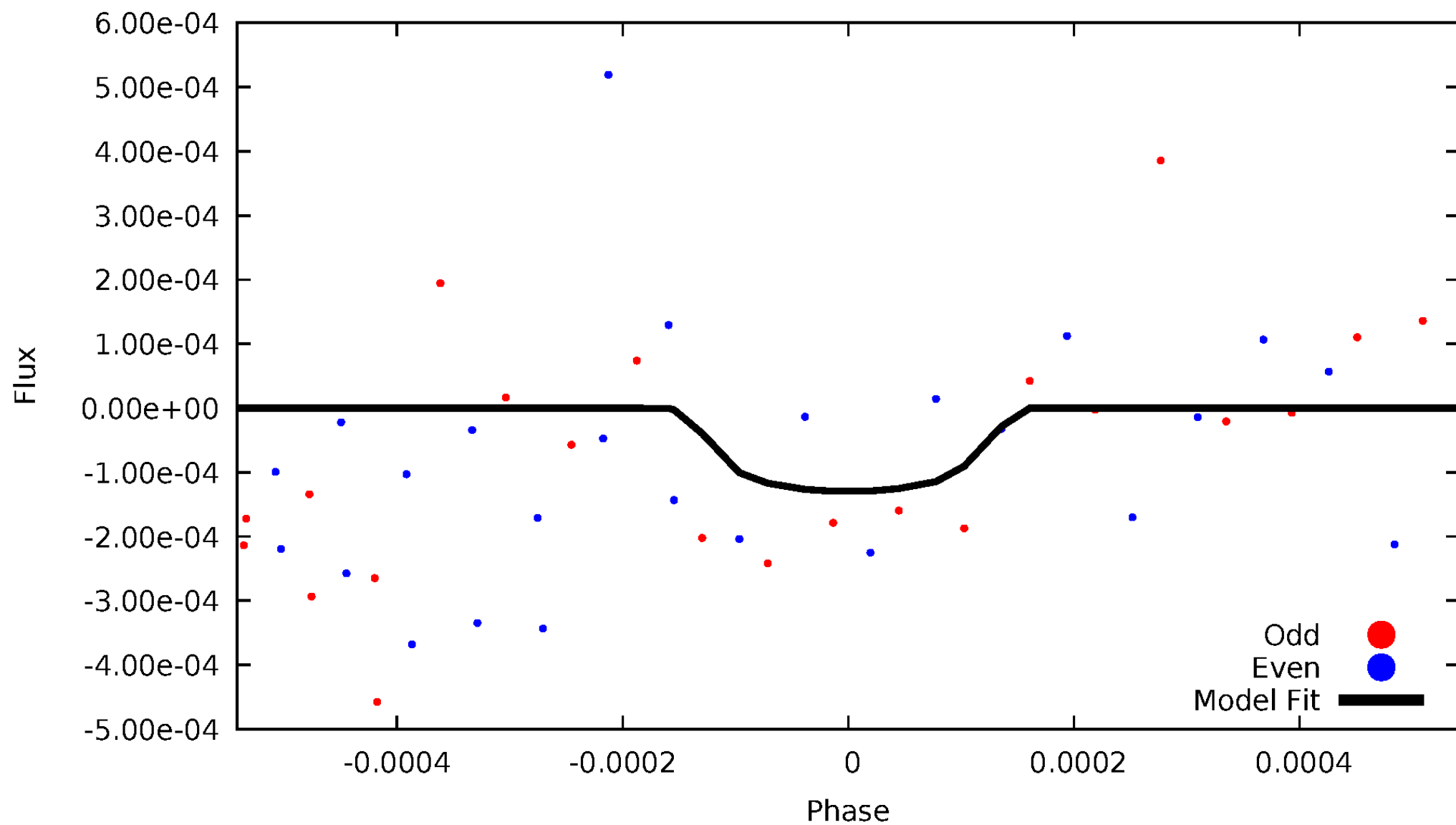


TCE 008056853-08



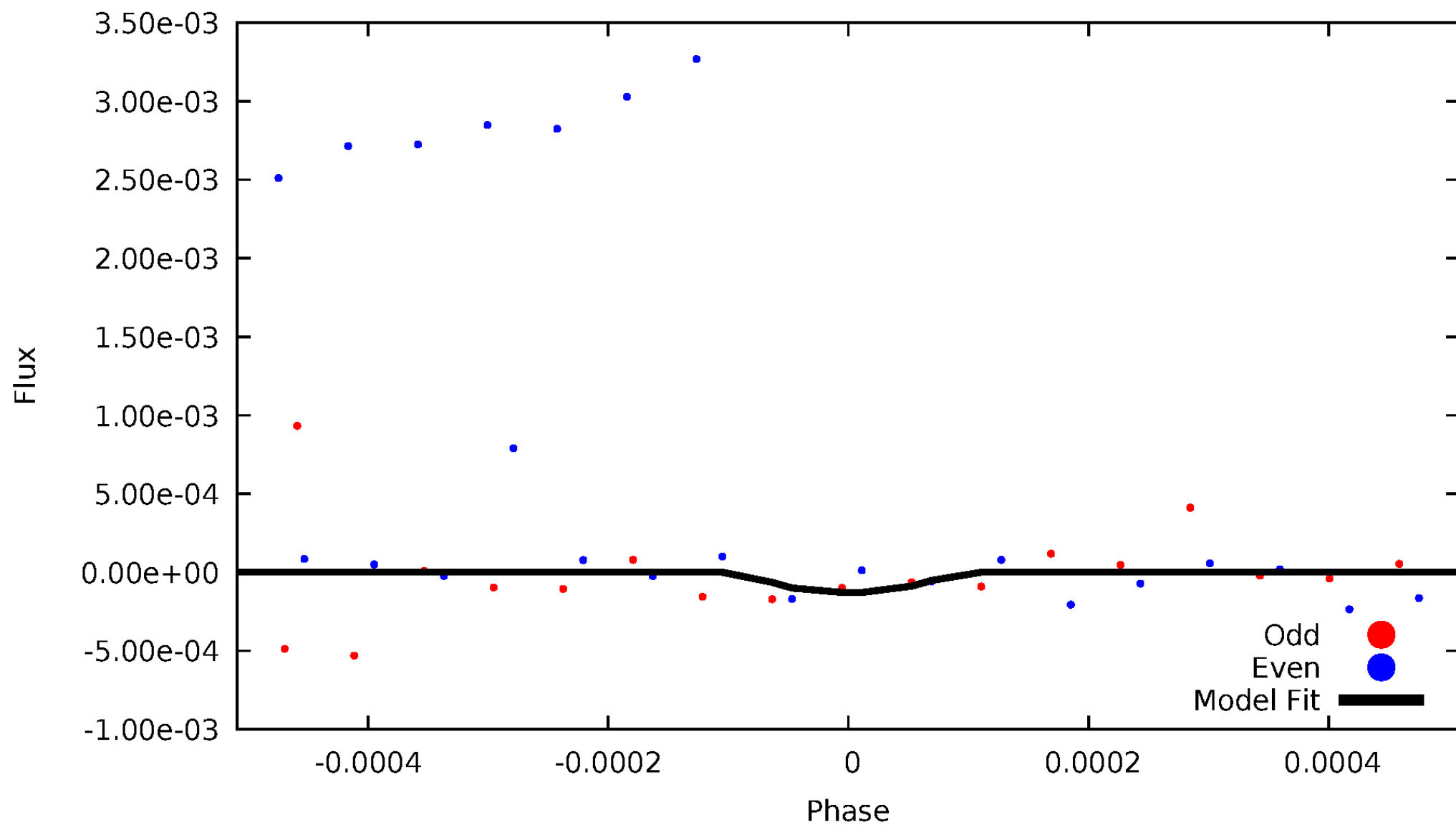
# DV Odd/Even

TCE 008056853-08



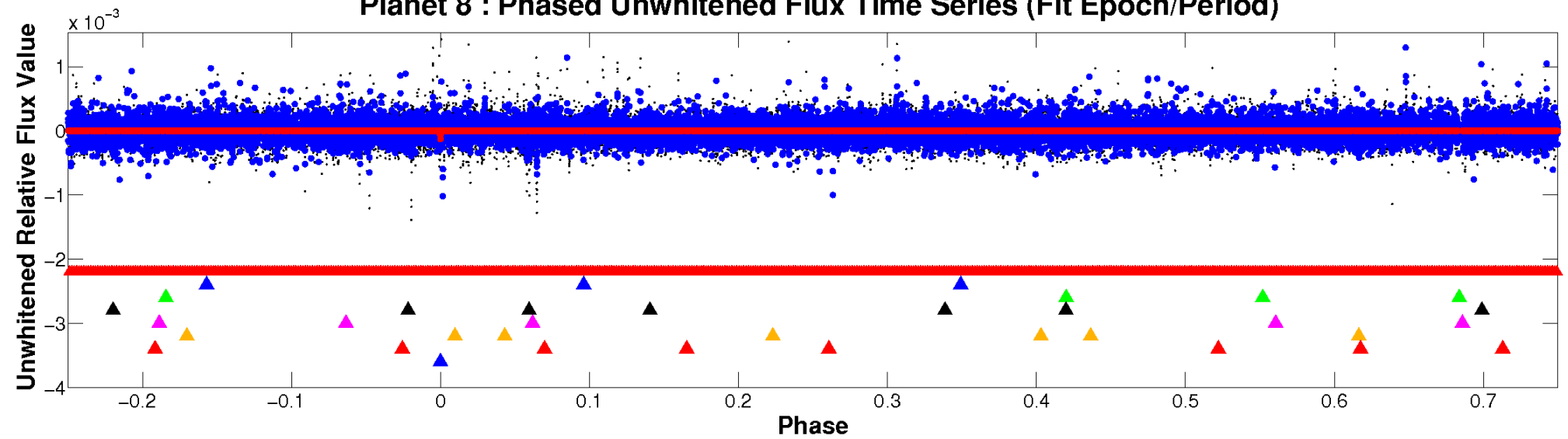
# ALT Odd/Even

TCE 008056853-08

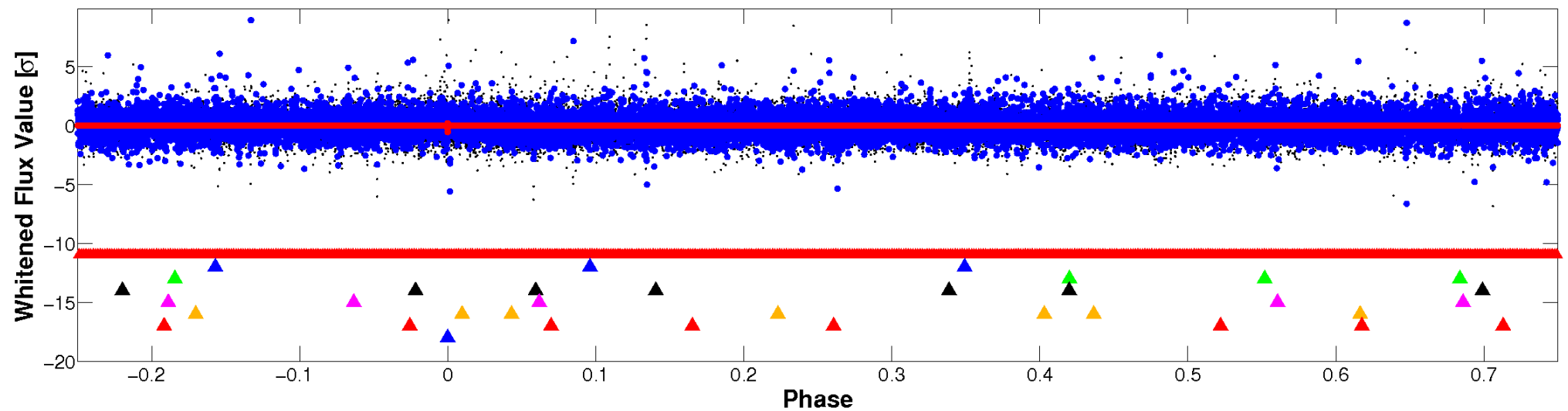


# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

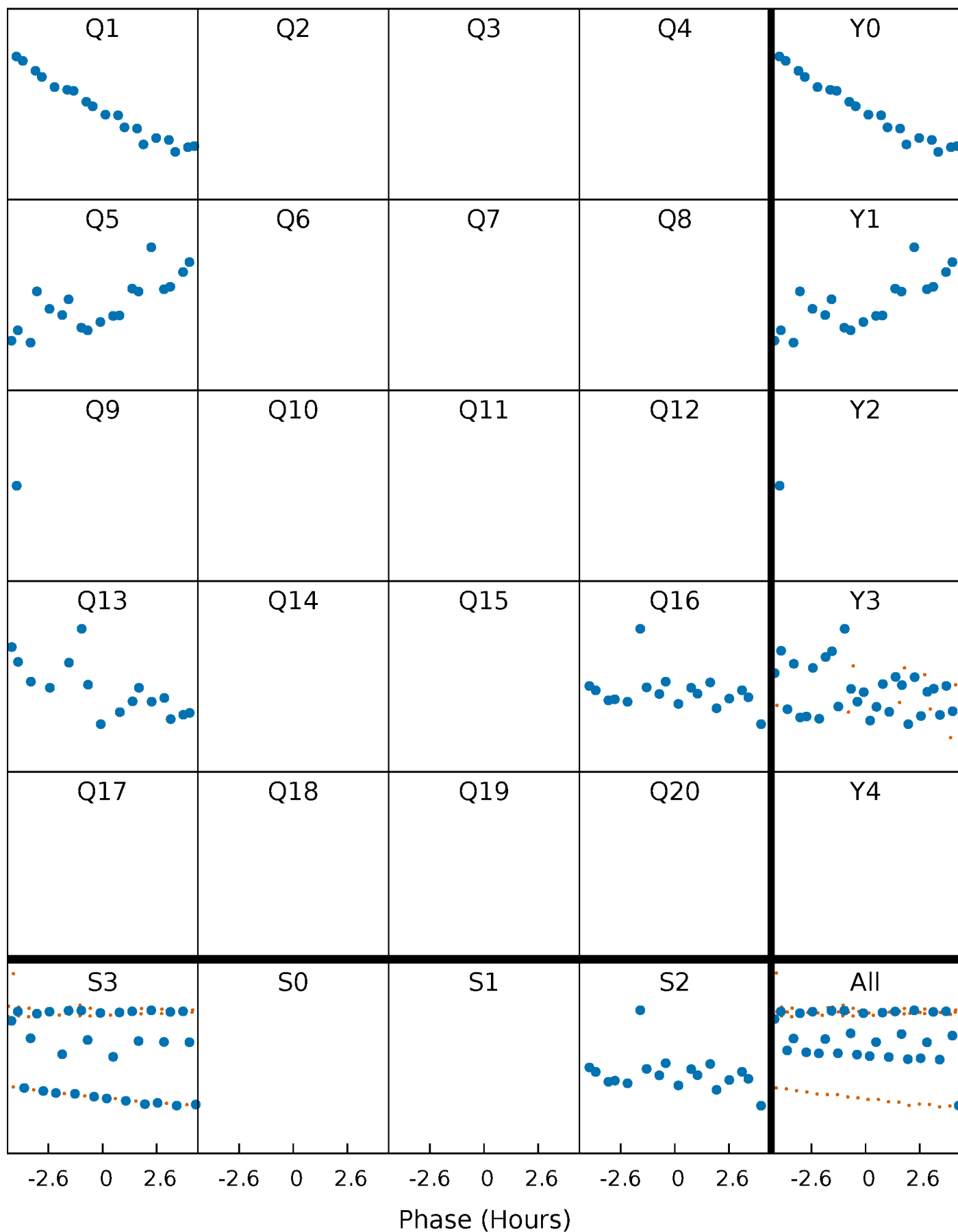


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



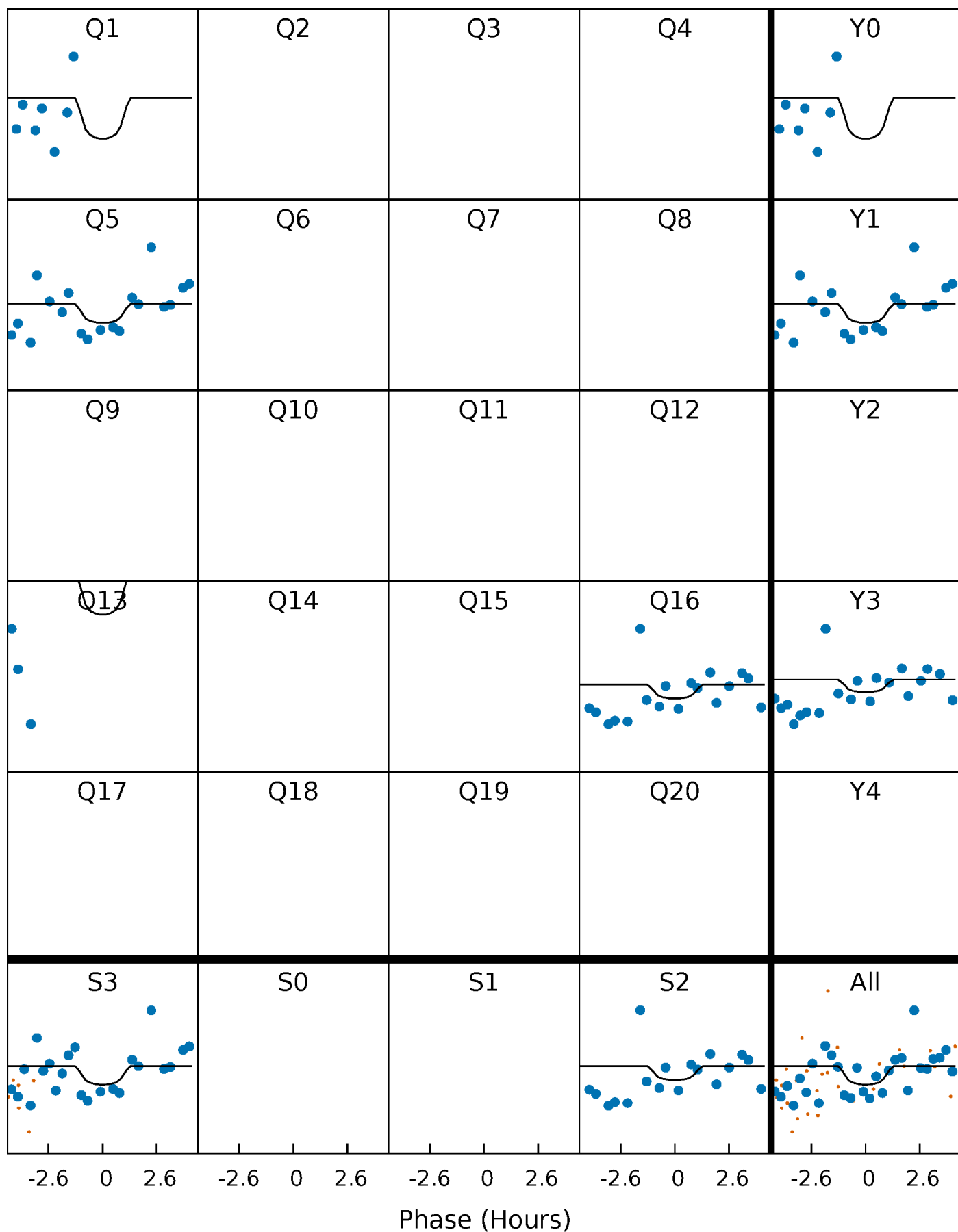
# PDC Quarter-Phased Transit Curves

TCE 008056853-08 P=352.018673 Days  $T_0=141.049465$  (BKJD)



# DV Quarter-Phased Transit Curves

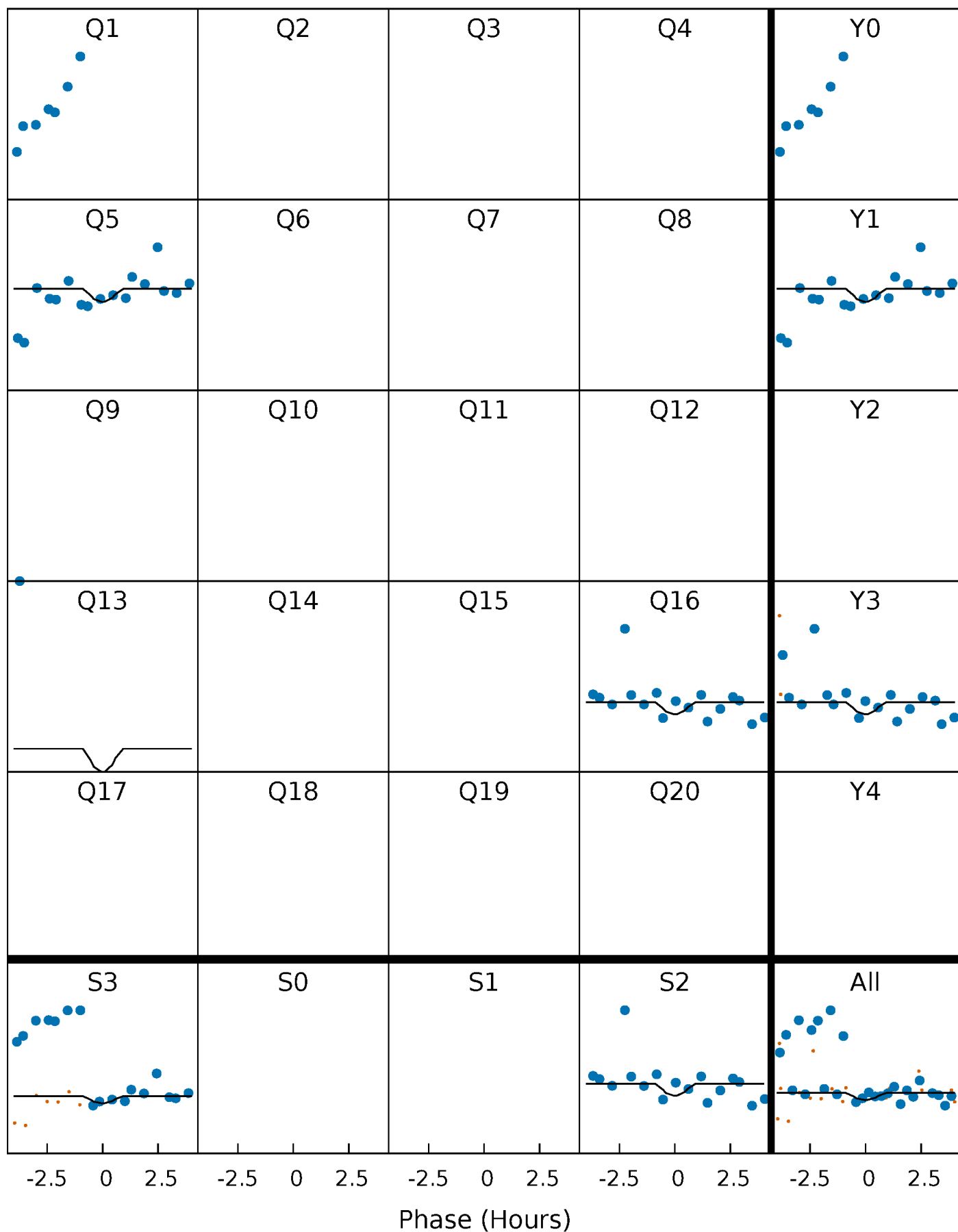
TCE 008056853-08 P=352.018673 Days  $T_0=141.049465$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

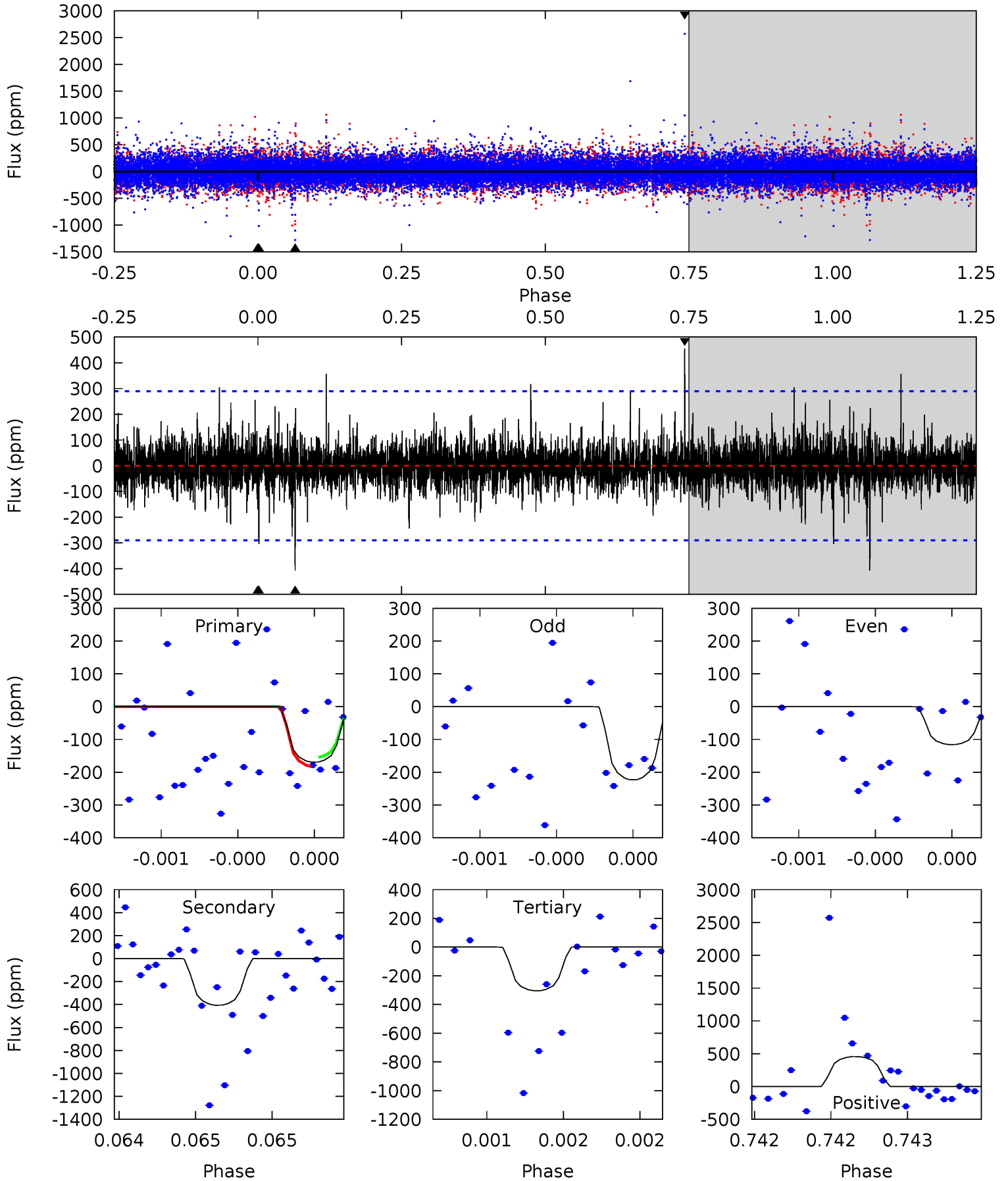
TCE 008056853-08 P=352.027410 Days  $T_0=141.037903$  (BKJD)



# DV Model-Shift Uniqueness Test

008056853-08, P = 352.018673 Days, E = 141.049465 Days

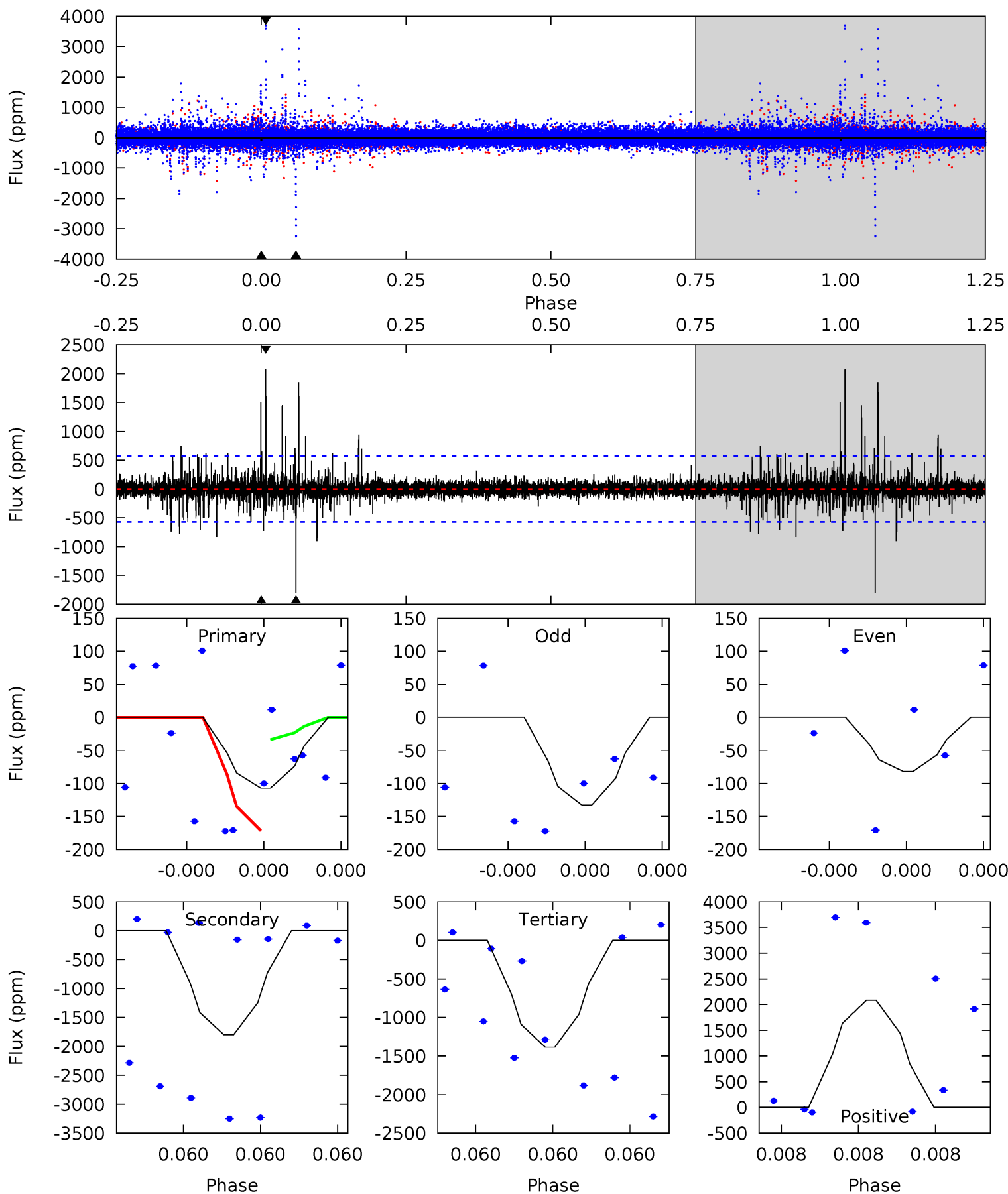
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.30	7.91	5.92	8.87	5.63	3.57	1.08	-2.62	-5.57	2.00	-0.96	1.03	1.00	0.53	0.27



# Alt Model-Shift Uniqueness Test

008056853-08, P = 352.027410 Days, E = 141.037903 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
1.08	18.2	14.0	21.1	5.80	3.82	1.16	-12.9	-20.0	4.19	-2.89	0.22	1.00	0.54	0.71



### Stellar Parameters For KIC 008056853

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4429^{+132}_{-132}$	$4.581^{+0.052}_{-0.016}$	$0.200^{+0.200}_{-0.300}$	$0.712^{+0.029}_{-0.059}$	$0.704^{+0.048}_{-0.054}$	$2.750^{+0.636}_{-0.220}$
	+3%/-3%	+1%/-0%	+100%/-150%	+4%/-8%	+7%/-8%	+23%/-8%
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 008056853-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-407 \pm 51$	$5.17^{+5.63}_{-3.39}$	$246^{+8}_{-8}$	$2978^{+1230}_{-510}$	$6471^{+47724}_{-4997}$
Alt.	$-1799 \pm 99$	$4.89^{+5.41}_{-3.47}$	$245^{+9}_{-8}$	$3826^{+2651}_{-811}$	$31285^{+356453}_{-24276}$

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

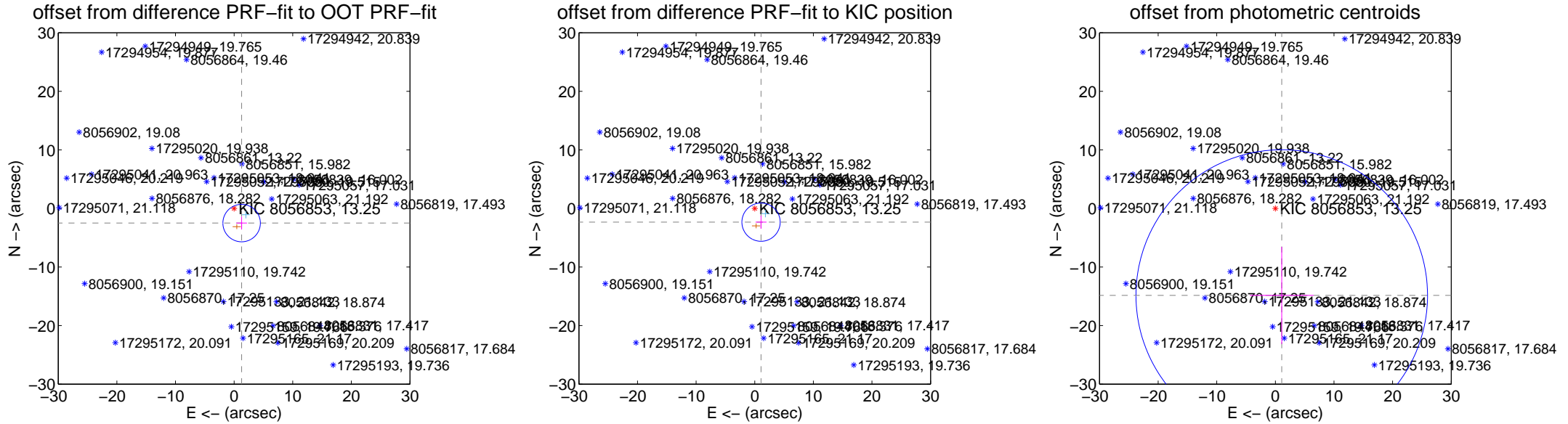
## DV Centroid Data

Supplemental centroid analysis for 008056853-08. Kepler magnitude: 13.25. Transit SNR 1.55

There are 1 quarters with good PRF difference image offsets

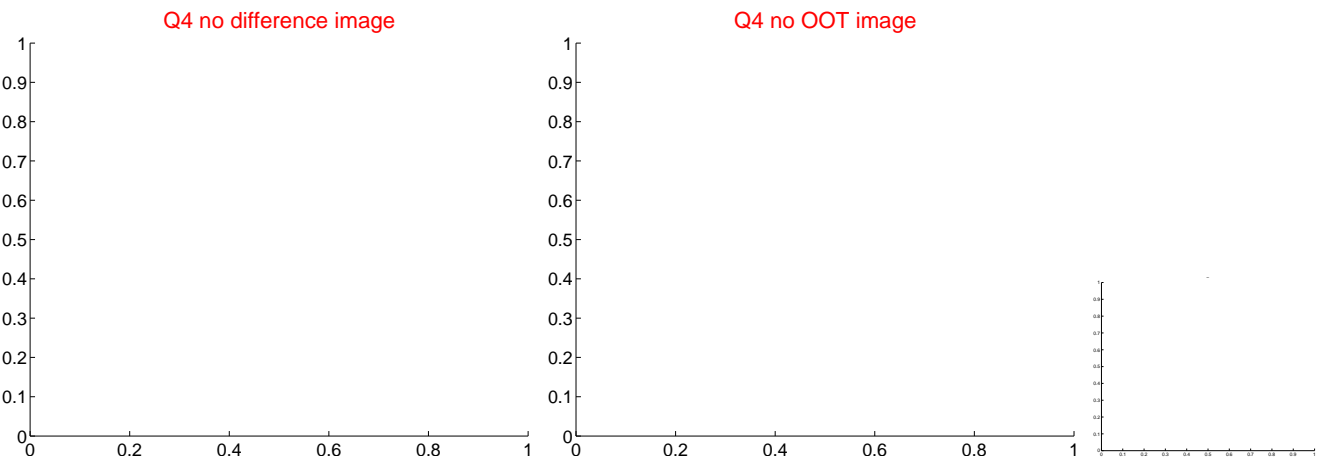
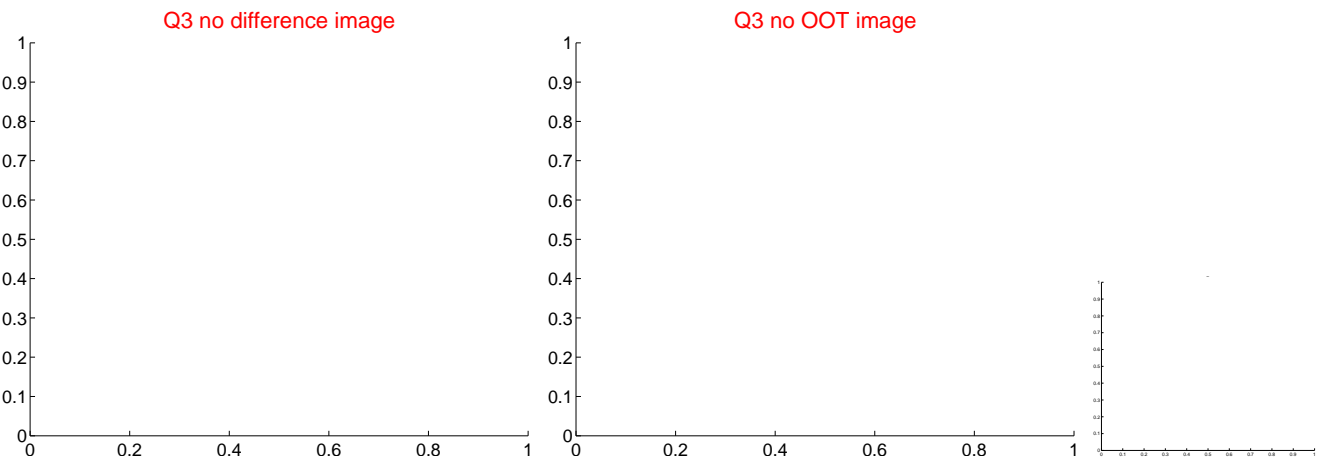
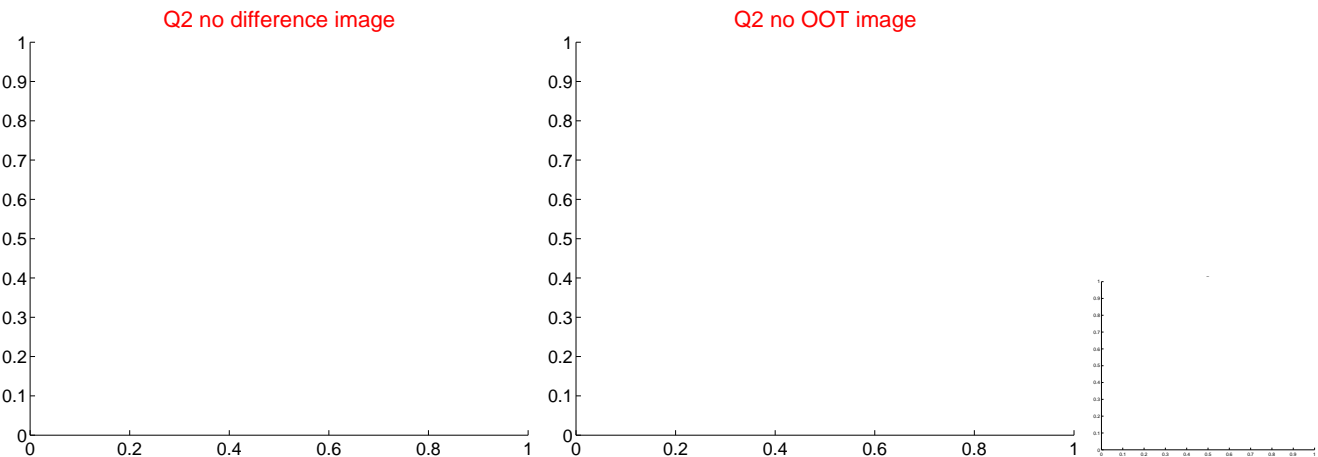
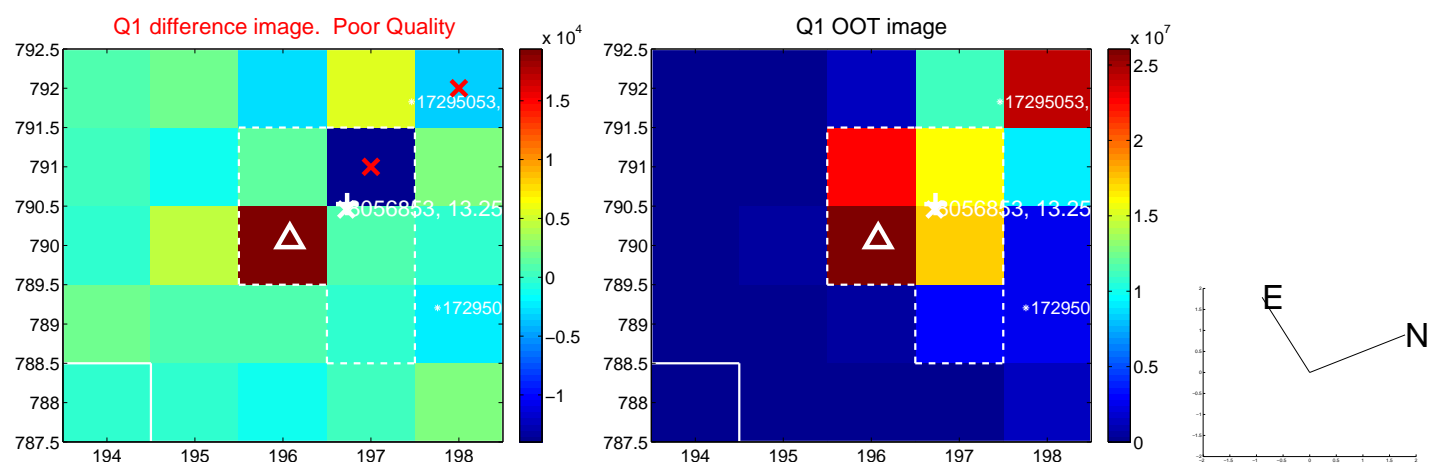
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.808 \pm 1.066$	2.64	$-1.282 \pm 0.908$	$-2.498 \pm 1.103$
PRF-fit source offset from KIC position	$2.577 \pm 1.088$	2.37	$-1.076 \pm 0.934$	$-2.341 \pm 1.118$
photometric centroid source offset	$14.89 \pm 8.29$	1.80	$-1.09 \pm 5.44$	$-14.85 \pm 8.30$

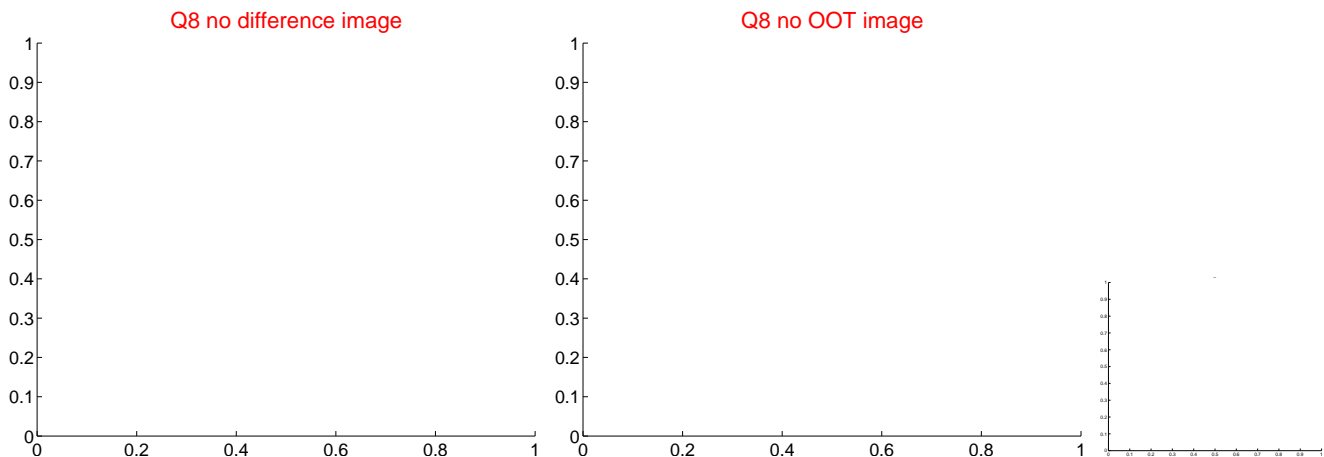
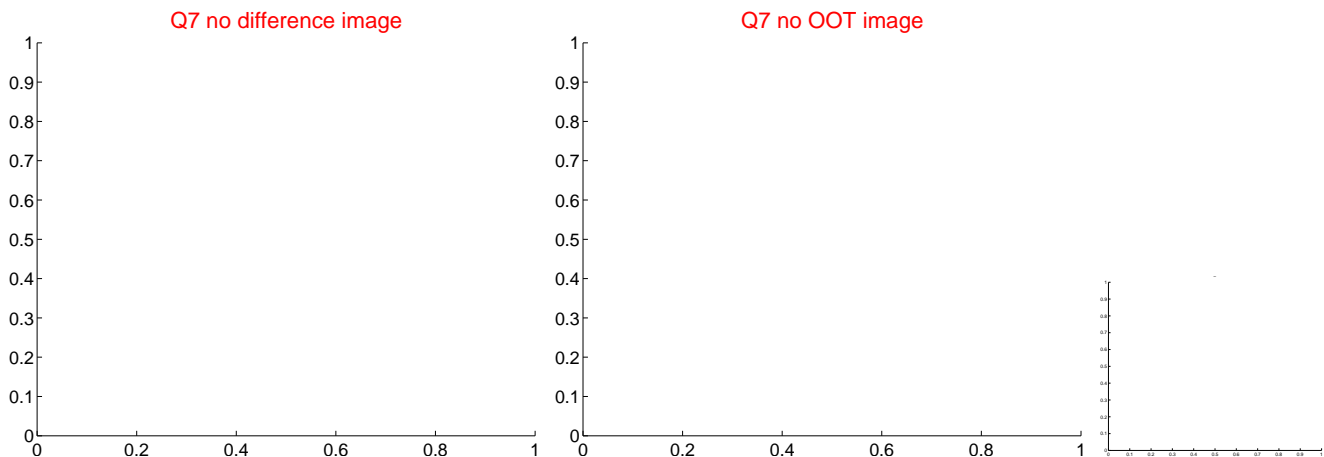
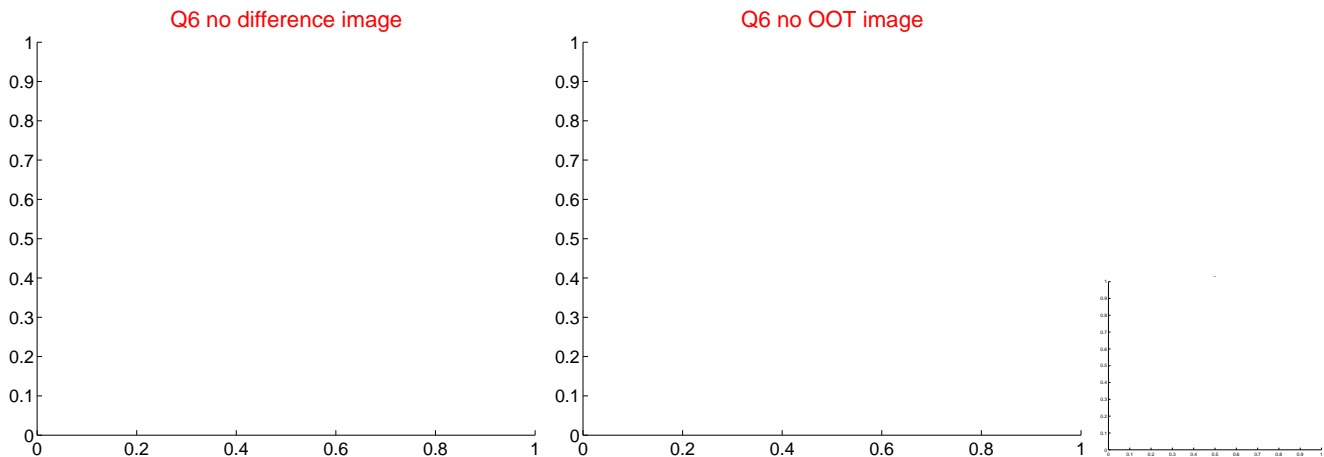
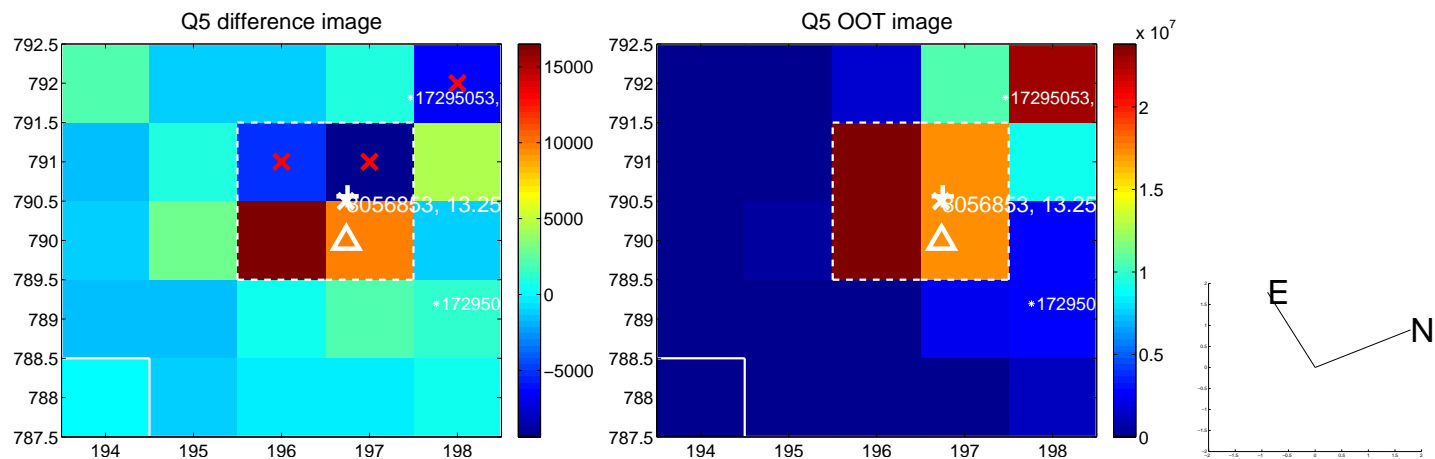


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

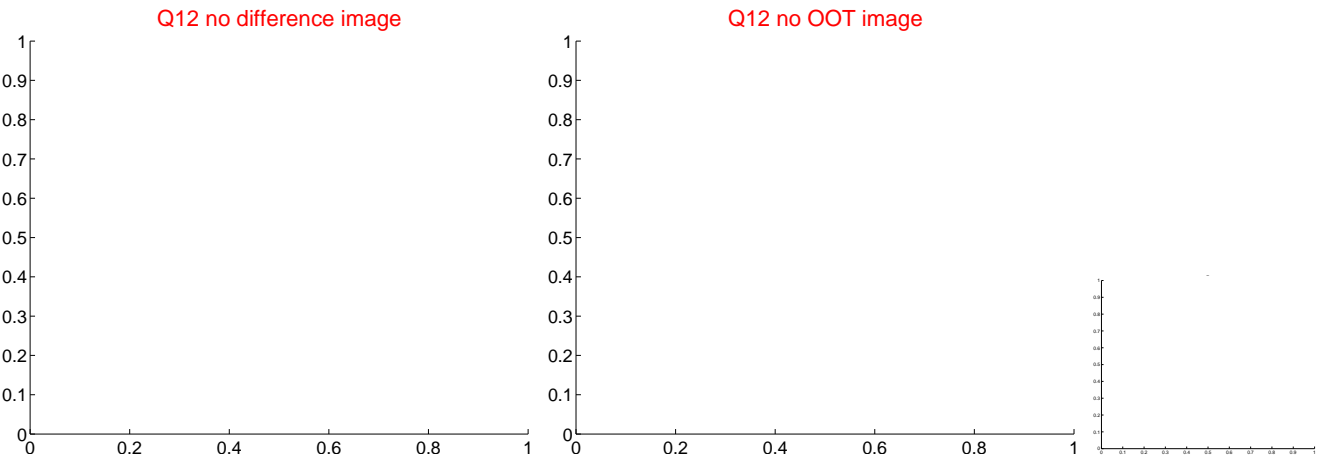
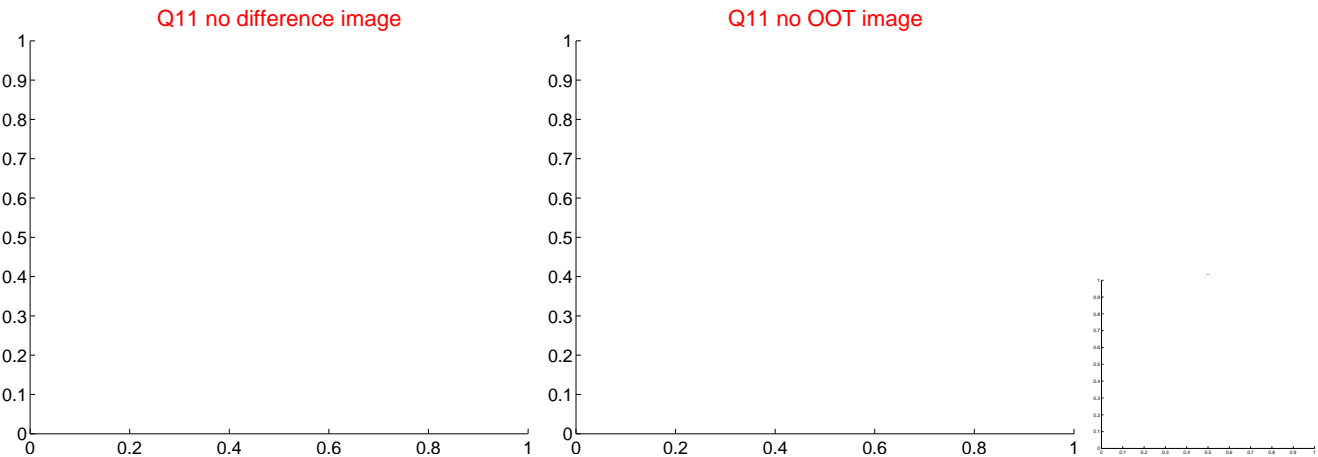
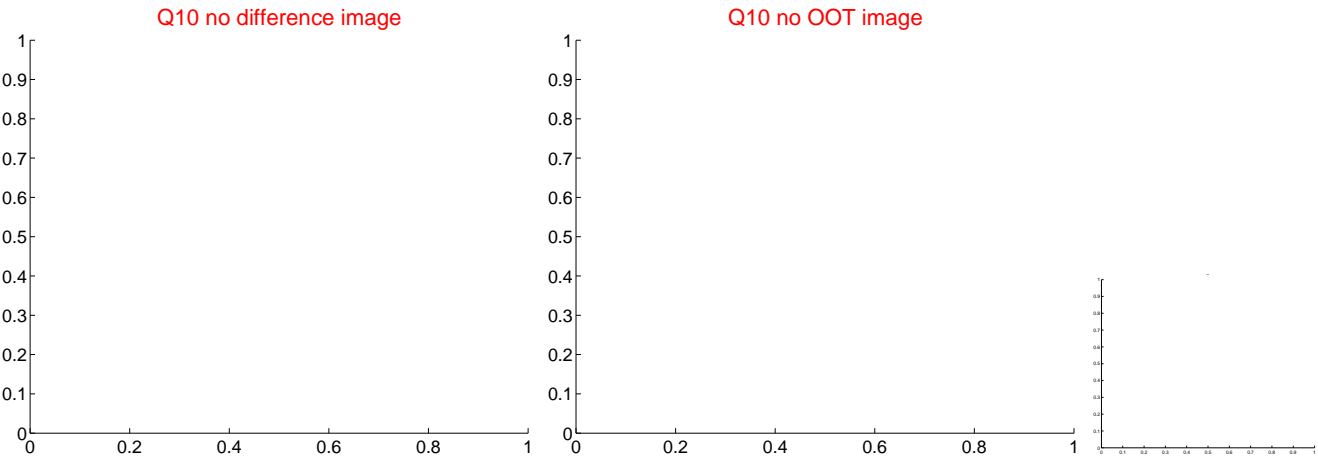
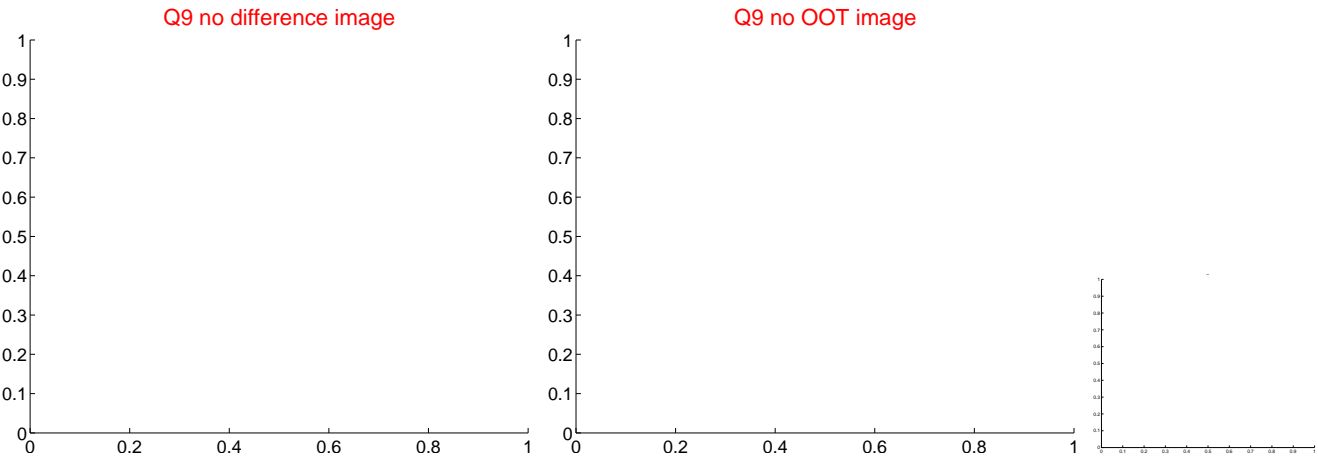
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

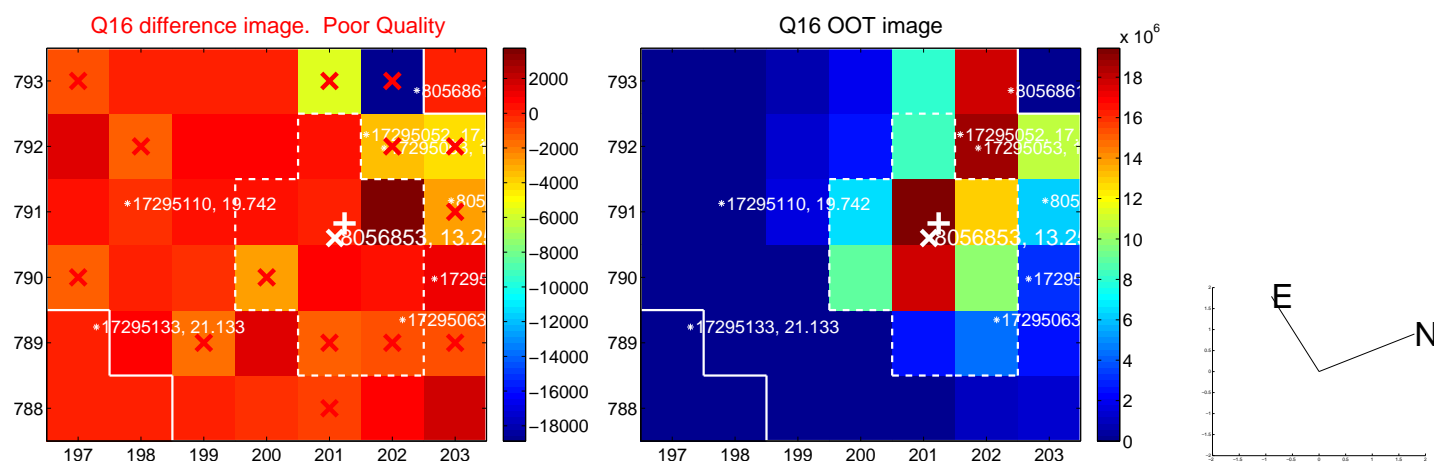
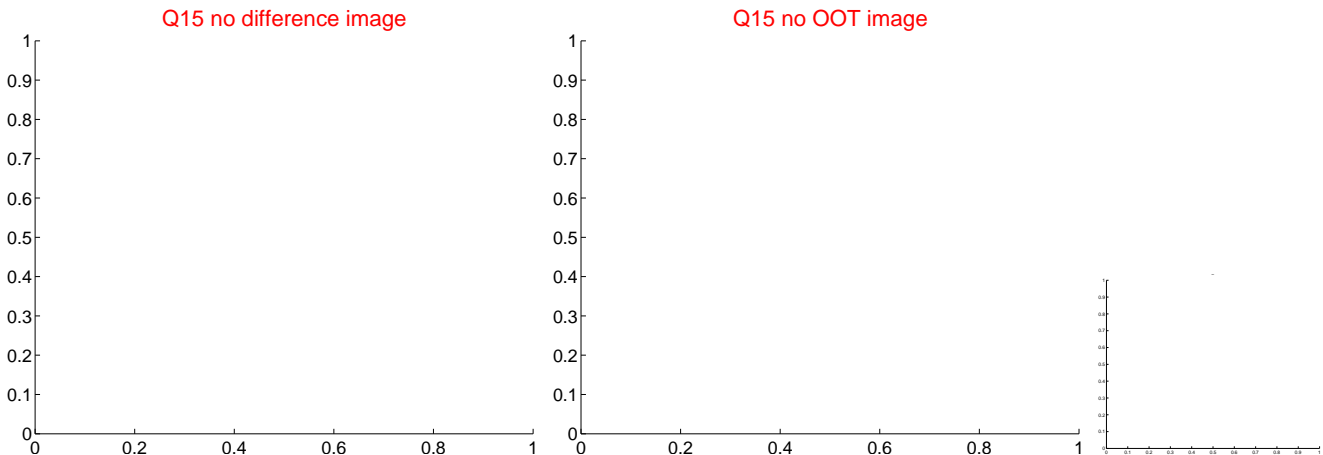
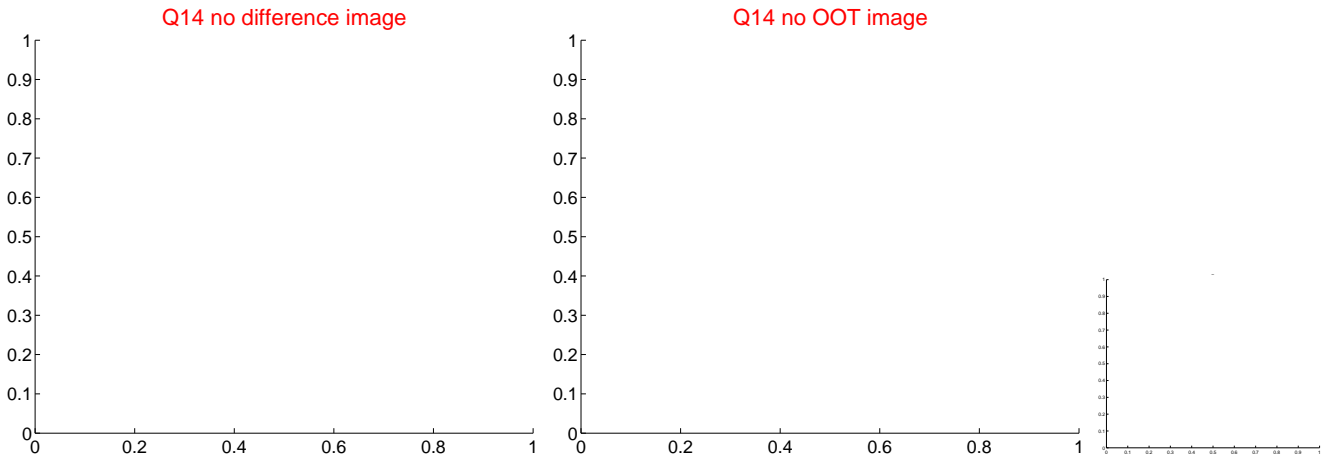
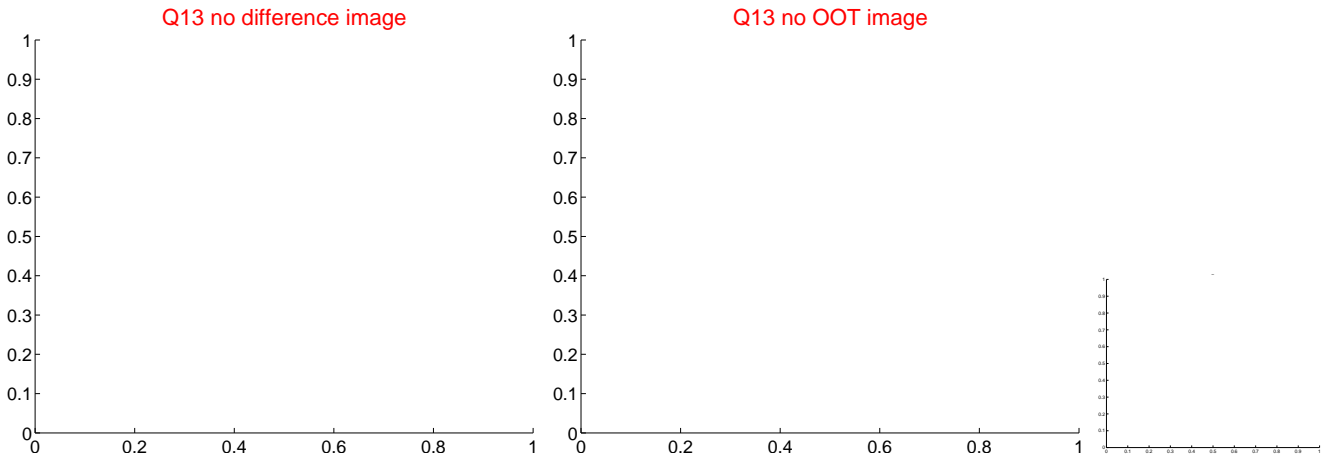


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

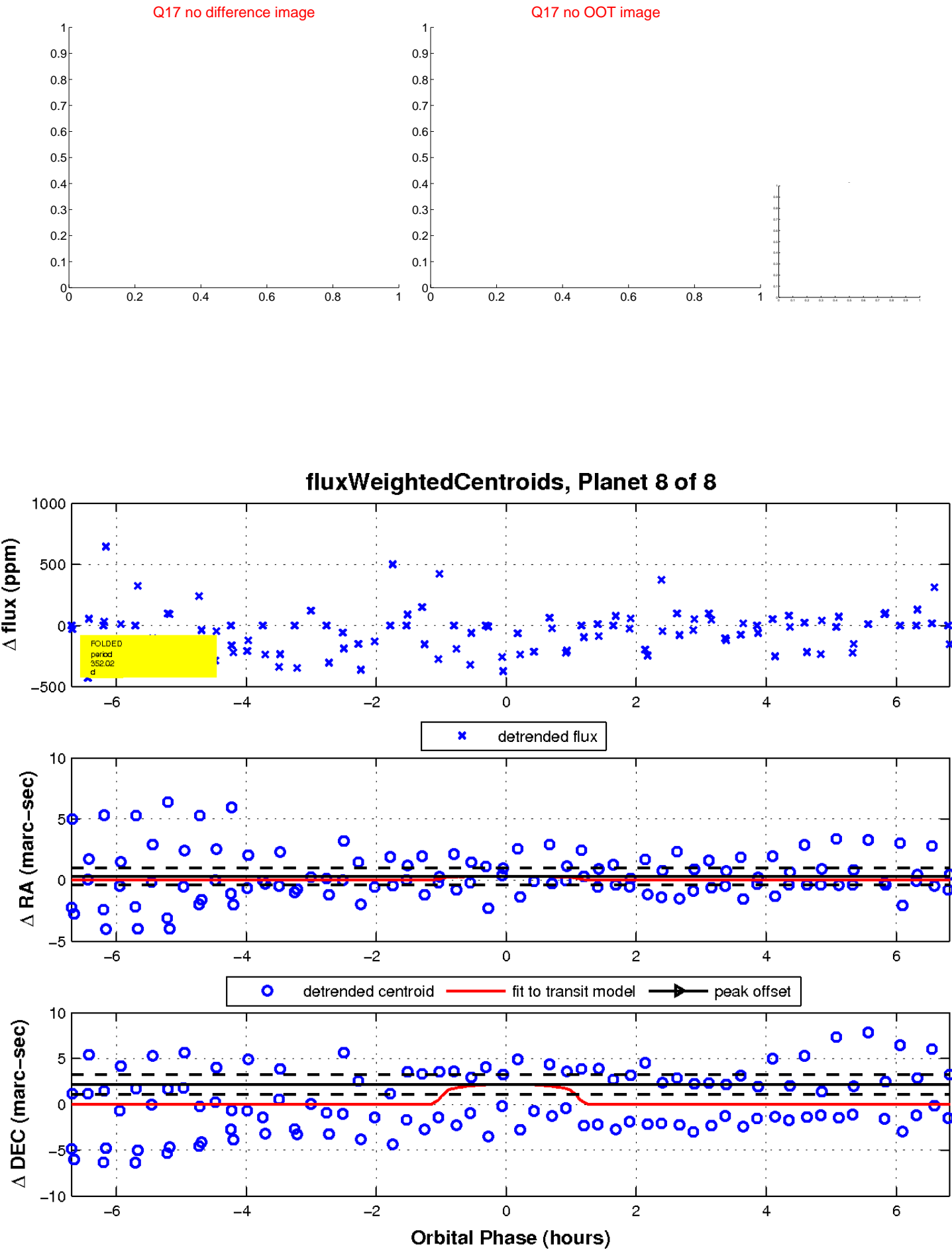




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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



UKIRT Image

Declination

