

# KIC 006380533

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006380533-01	OBS	No	1.533445	132.983160	56.9	6.487	7.6	9.5	0.86	5350	0.65	954.47
006380533-02	OBS	No	228.793699	305.343517	1359.4	11.513	16.3	9.5	0.86	5350	3.24	1.21
006380533-03	OBS	No	131.468842	249.832282	821.3	5.423	14.6	7.0	0.86	5350	3.19	2.52
006380533-04	OBS	No	186.433457	161.647854	1260.8	9.594	11.4	8.6	0.86	5350	6.03	1.58
006380533-05	OBS	No	169.888627	237.489259	227.4	3.274	10.4	2.0	0.86	5350	1.49	1.79
006380533-06	OBS	No	499.832334	462.264221	4839.5	38.691	9.5	10.0	0.86	5350	6.00	0.42
006380533-07	OBS	No	209.042130	167.361675	766.6	9.000	10.3	-1.0	0.86	5350	2.35	1.36
006380533-08	OBS	No	149.858044	206.101353	813.8	4.639	9.5	7.3	0.86	5350	2.69	2.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006380533-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
006380533-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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
006380533-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
006380533-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006380533-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

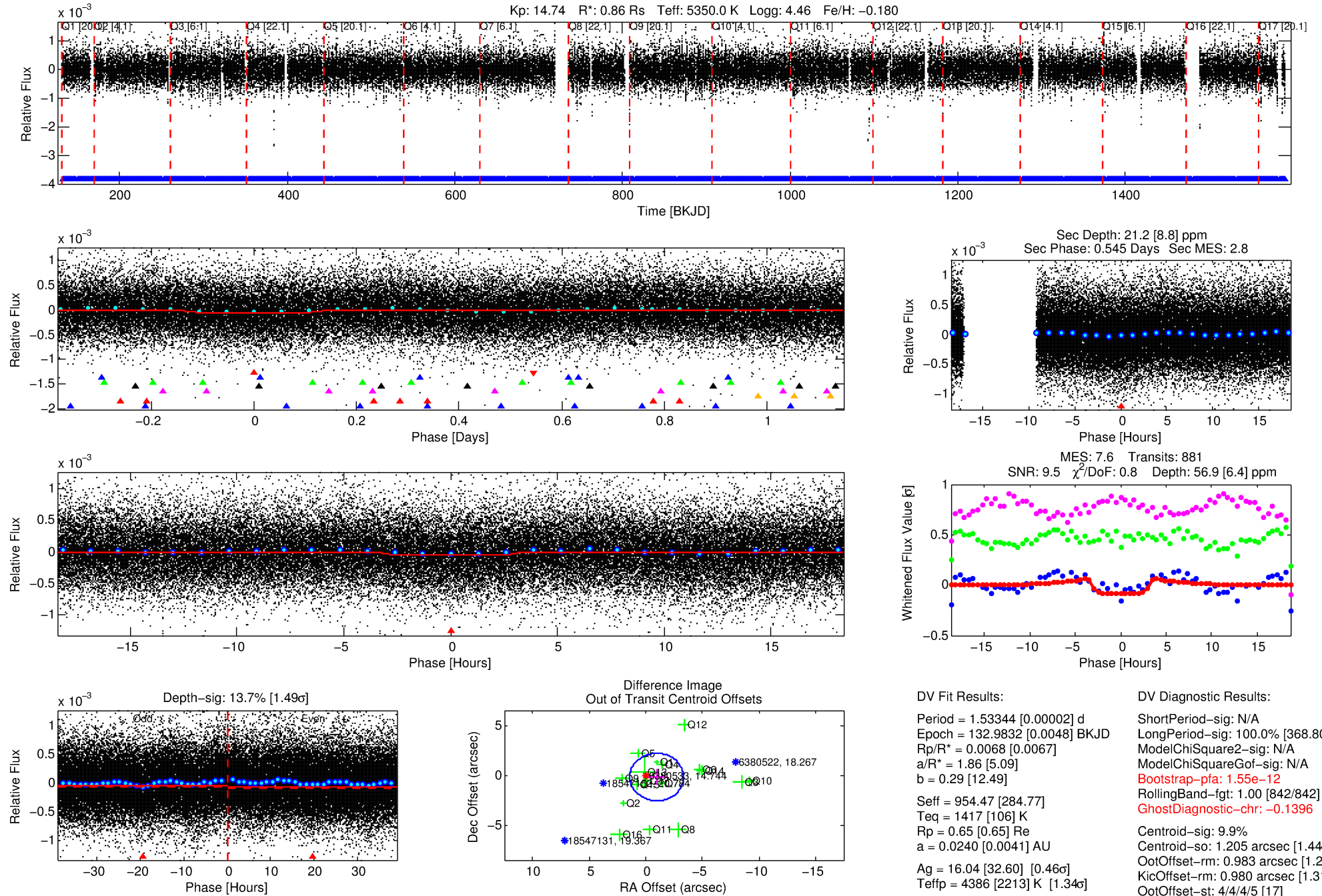
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006380533-01

No Significant Match Found

# DV One-Page Summary

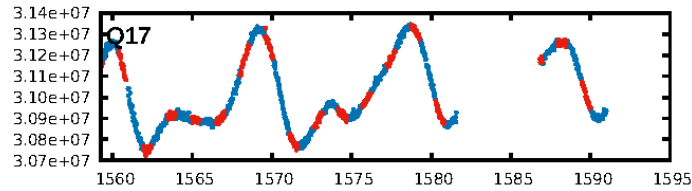
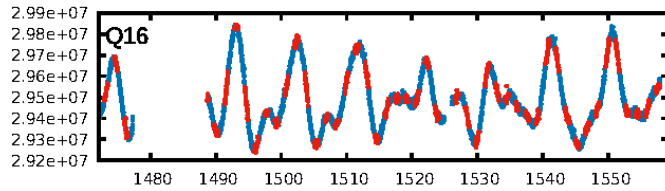
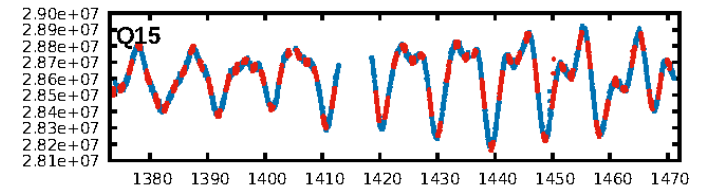
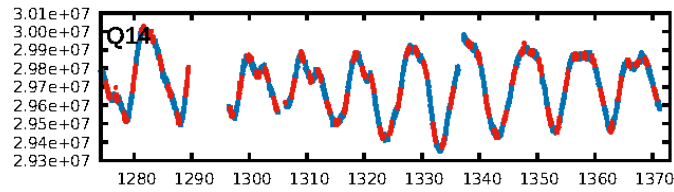
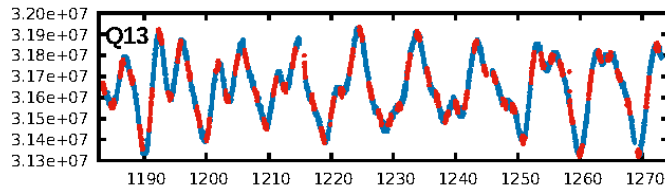
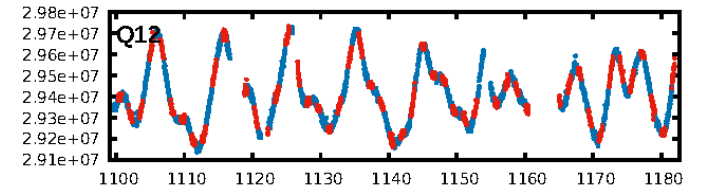
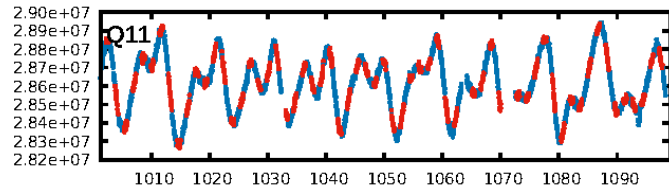
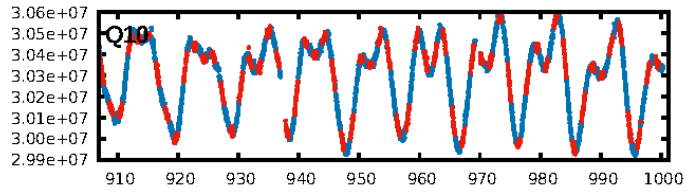
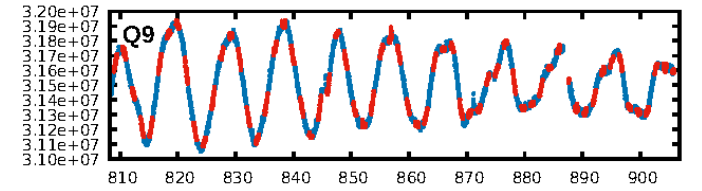
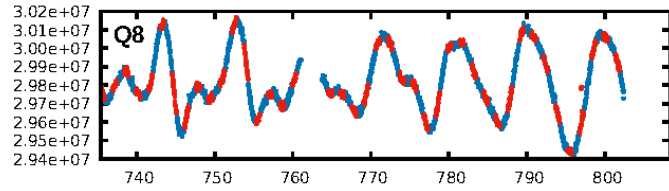
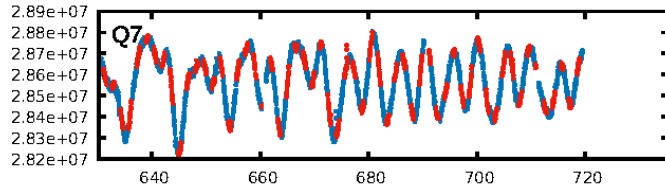
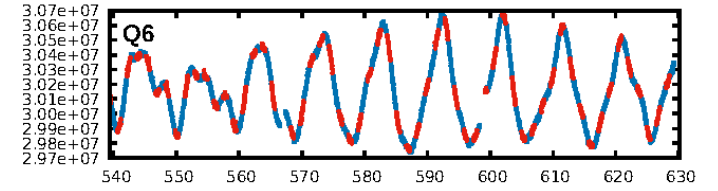
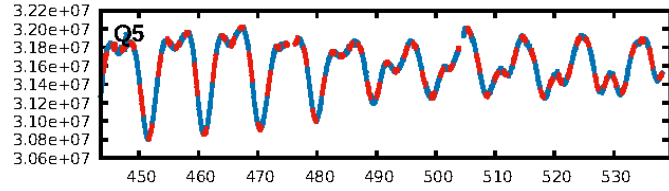
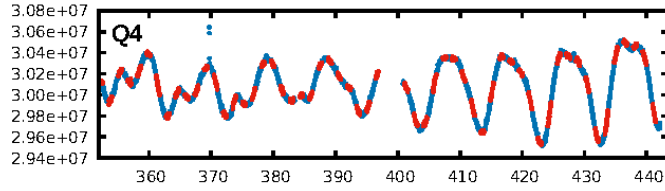
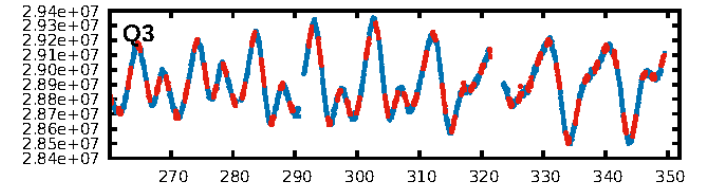
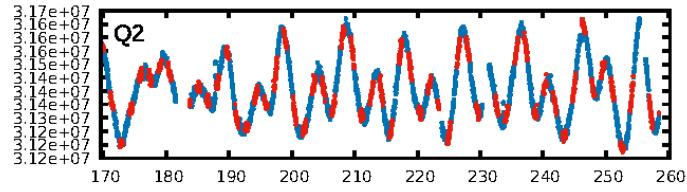
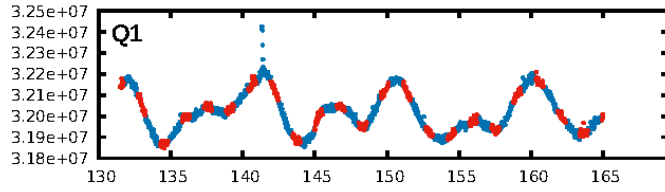
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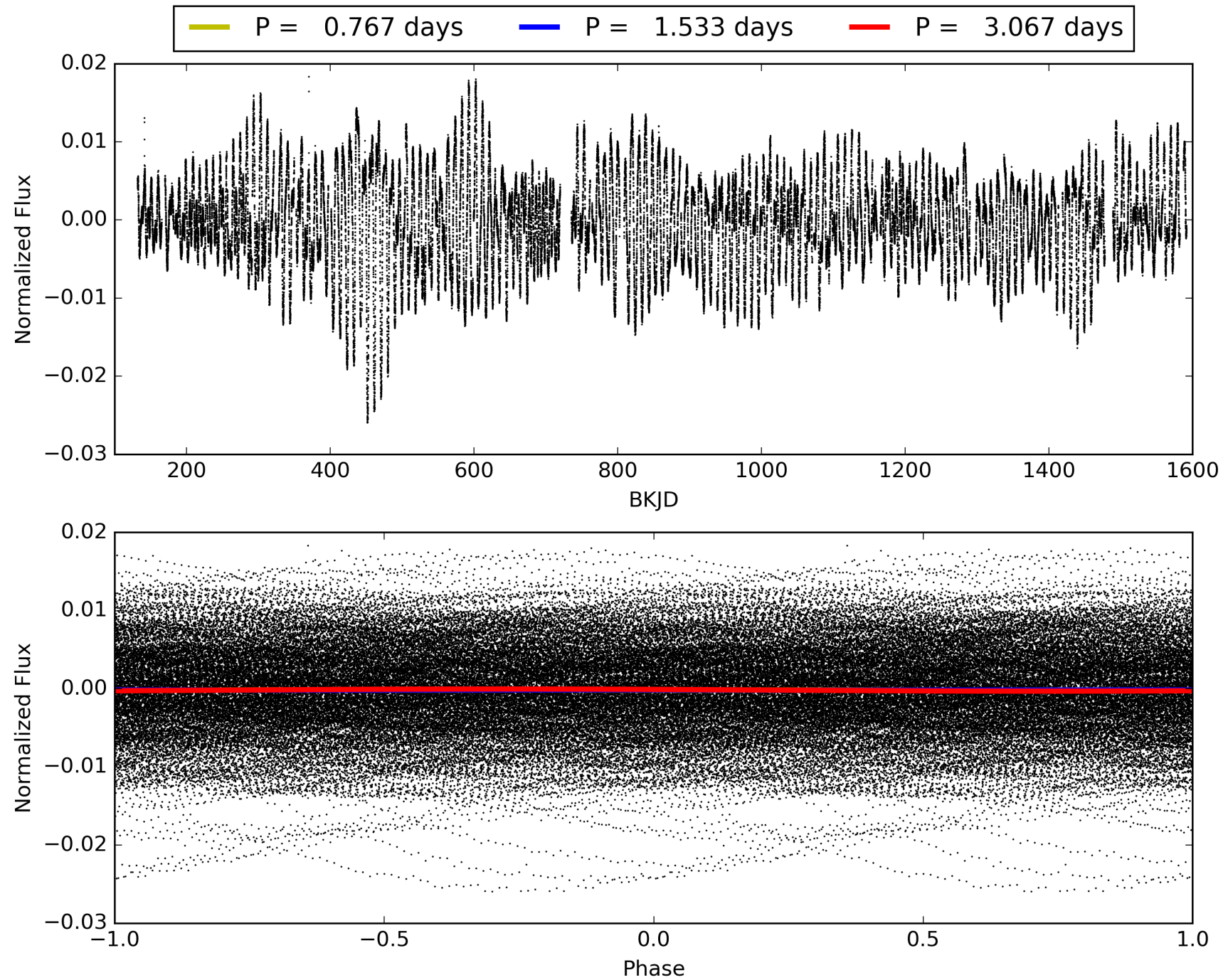
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006380533-01, PDC Light Curves



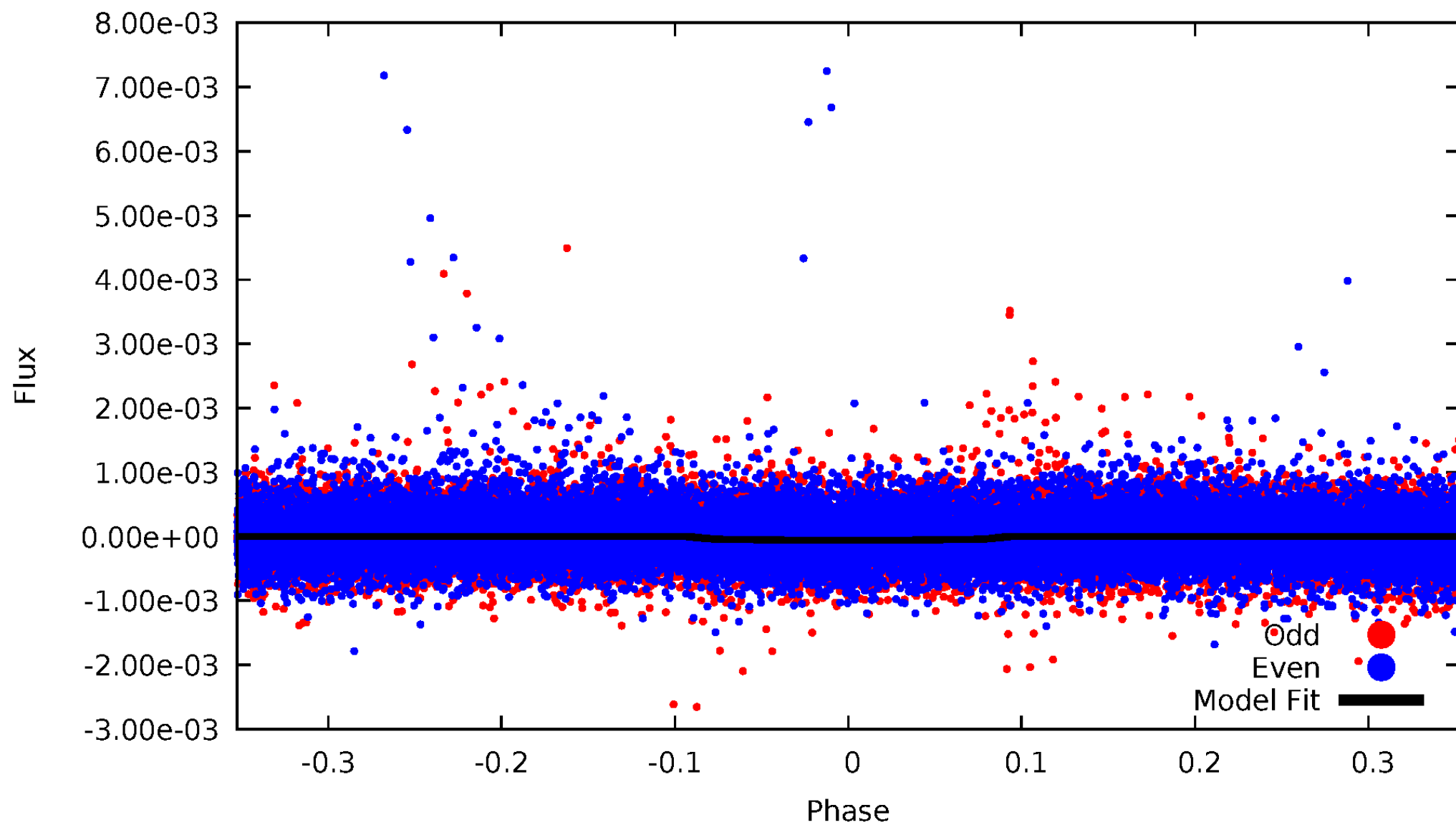
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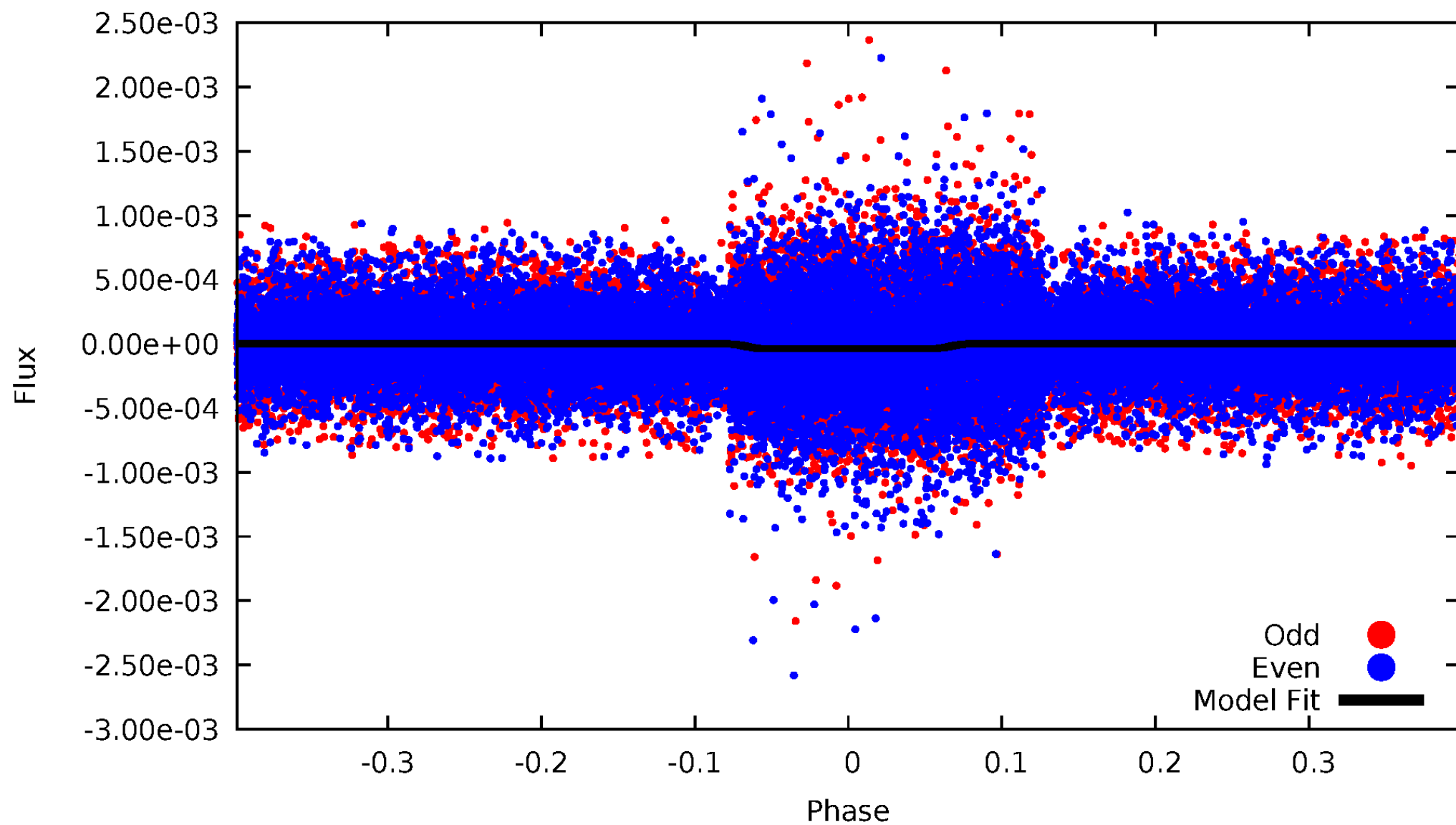
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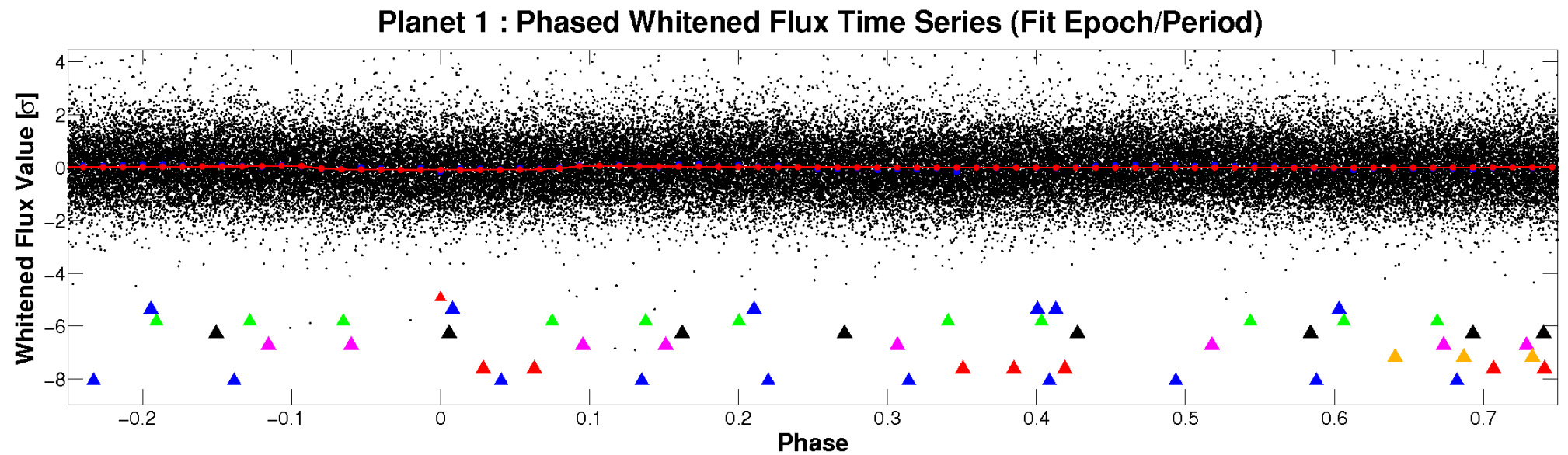
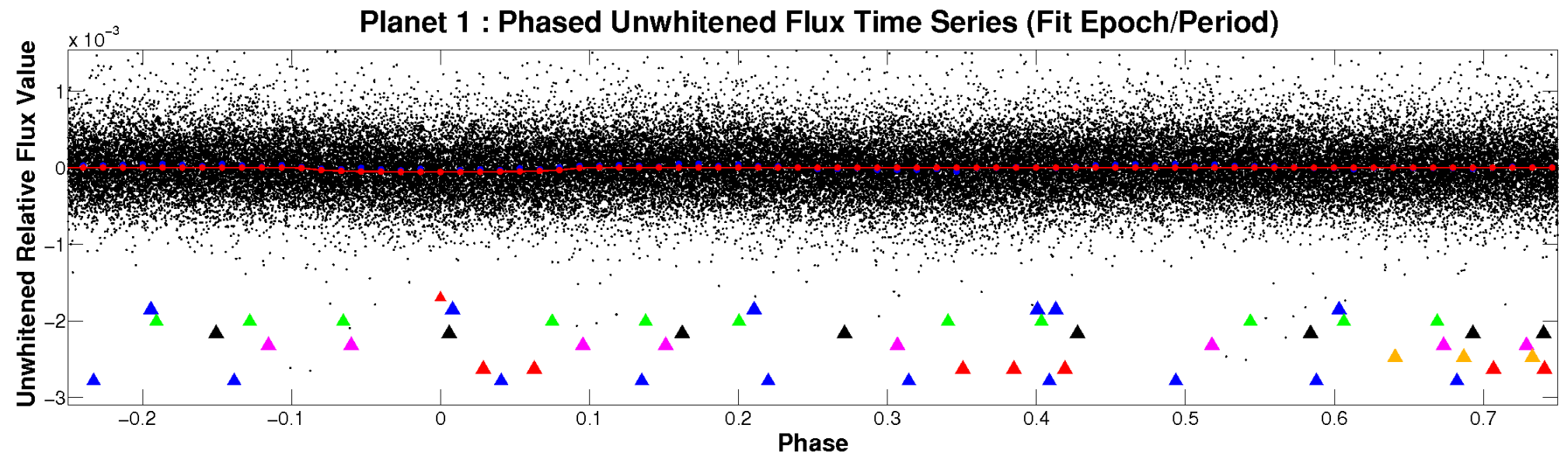


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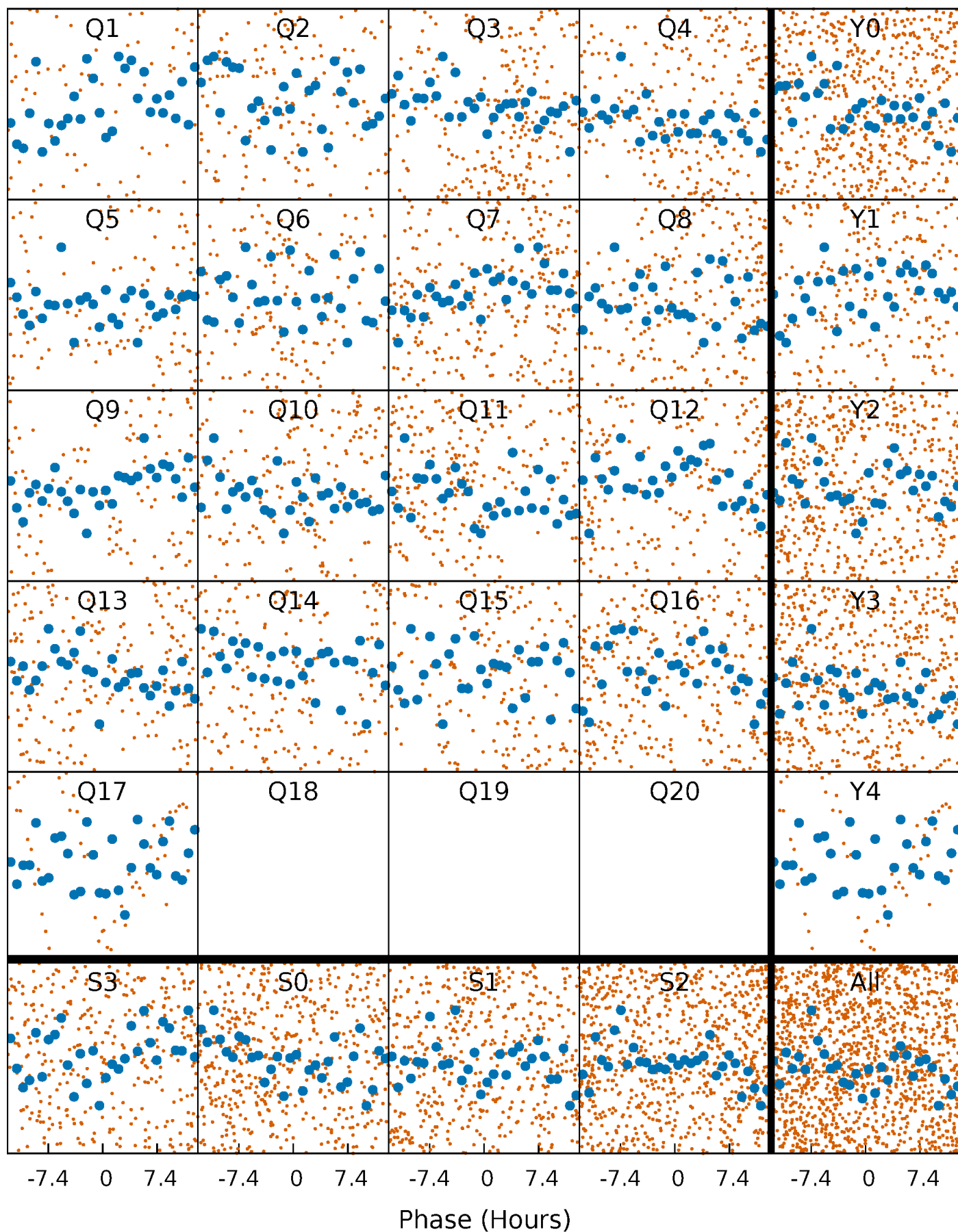


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

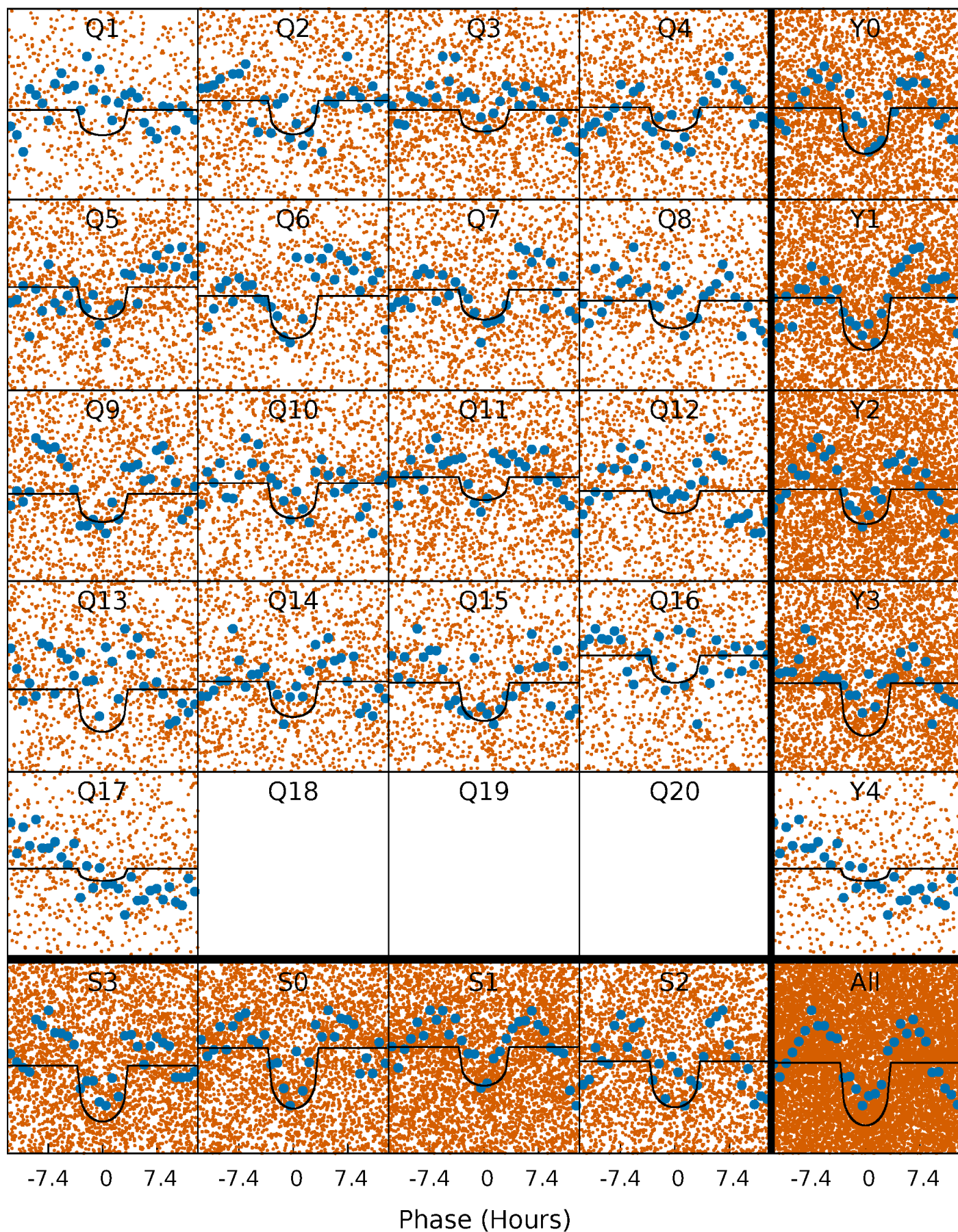
TCE 006380533-01 P= 1.533445 Days  $T_0=132.983160$  (BKJD)





# DV Quarter-Phased Transit Curves

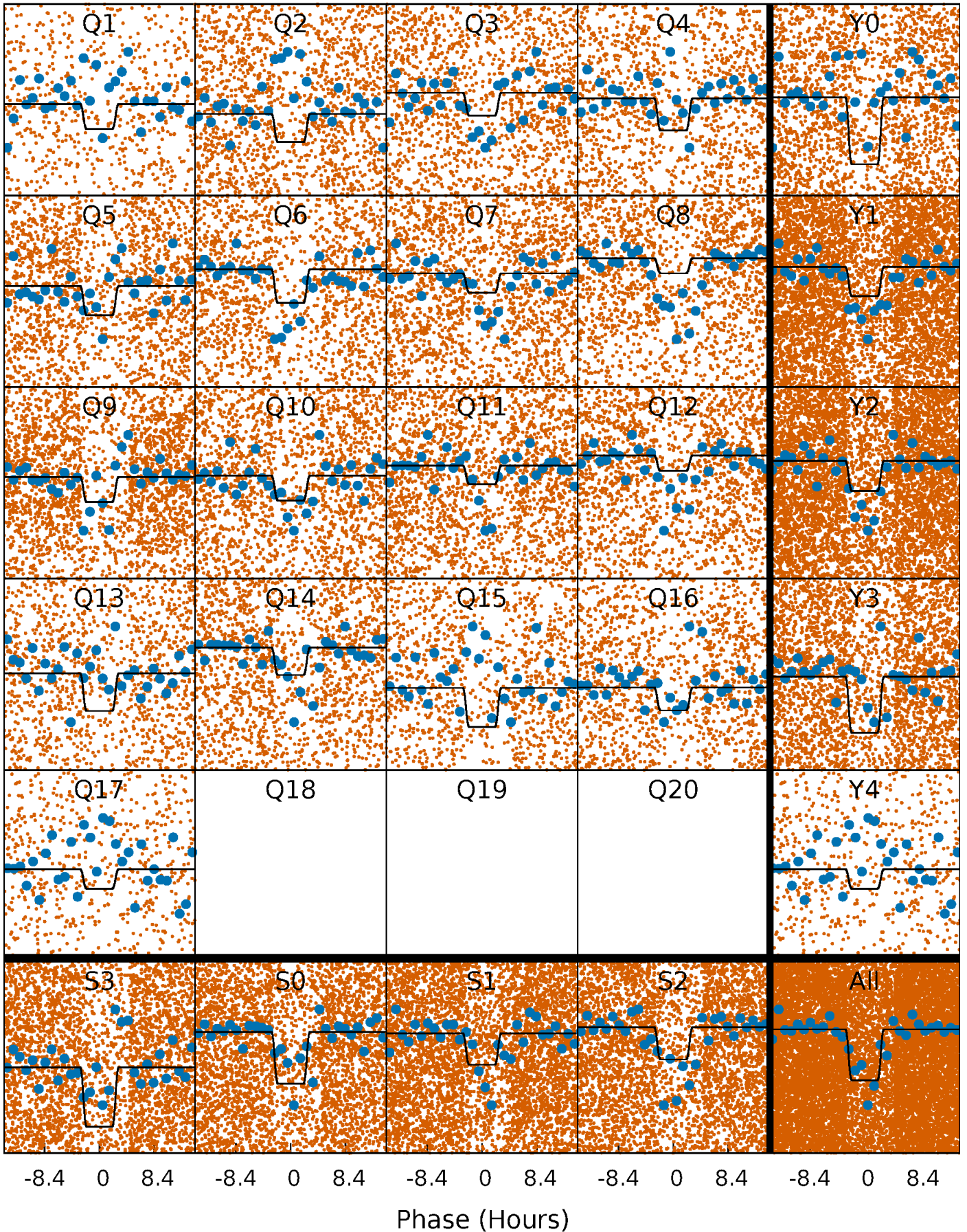
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# Alt. Detrend Quarter-Phased Transit Curves

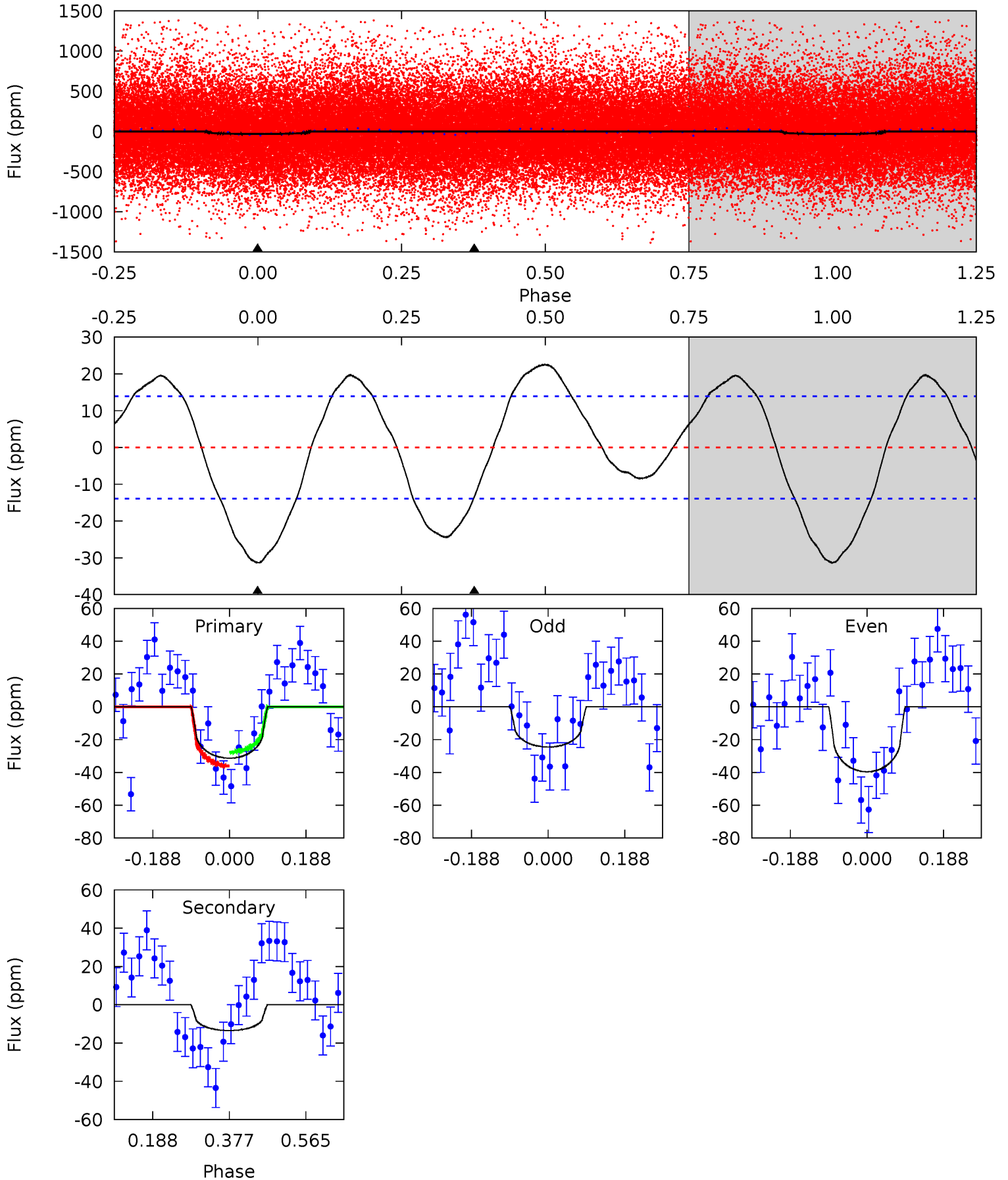
TCE 006380533-01 P= 1.533324 Days  $T_0=133.008138$  (BKJD)



# DV Model-Shift Uniqueness Test

006380533-01, P = 1.533445 Days, E = 131.449715 Days

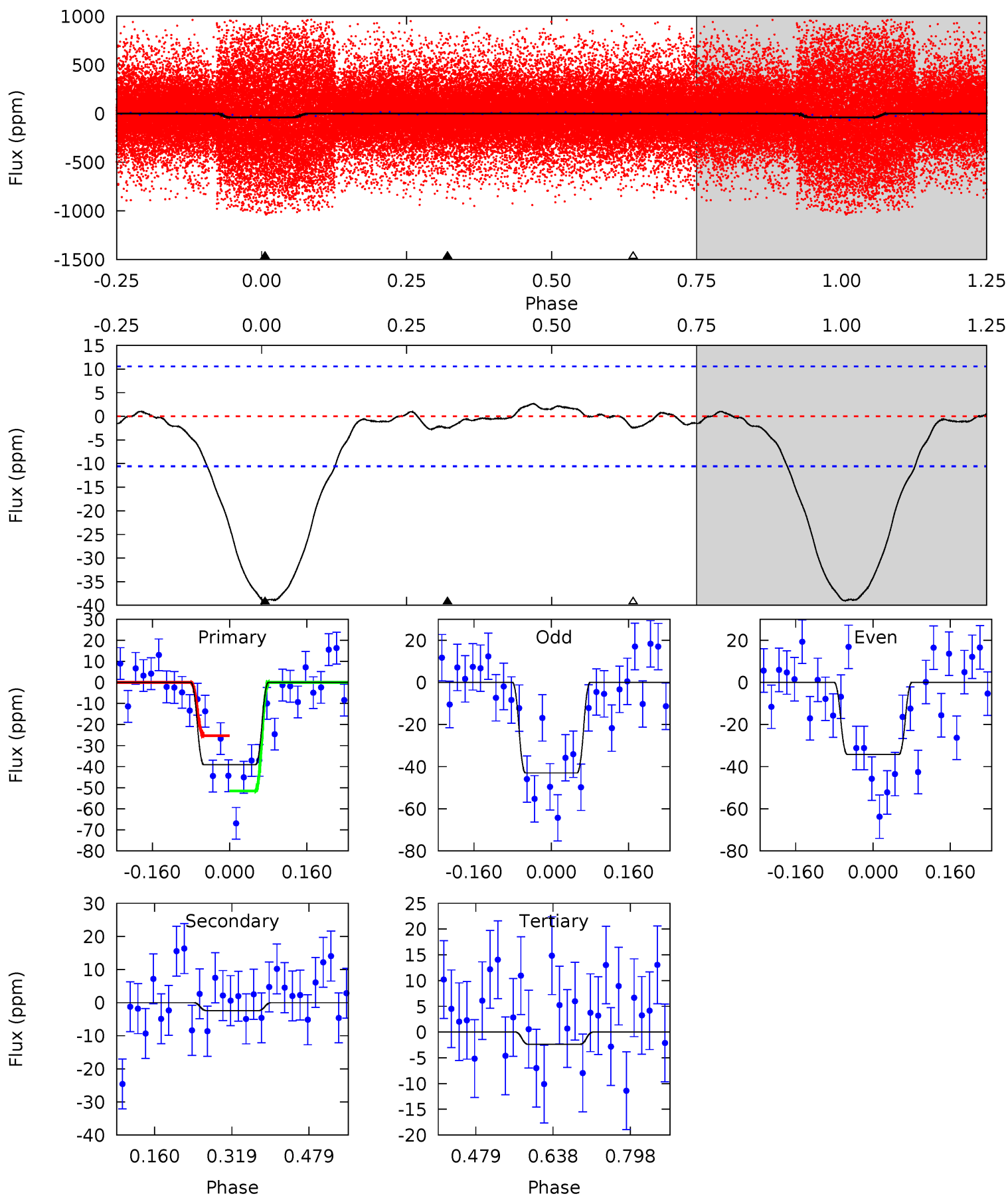
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.97	4.29	0	0	4.43	1.32	2.57	9.97	9.97	4.29	4.29	2.38	0.64	0.42	1.34



# Alt Model-Shift Uniqueness Test

006380533-01, P = 1.533324 Days, E = 131.474814 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
16.5	1.03	1.01	0	4.47	1.41	0.51	15.5	16.5	0.02	1.03	1.86	1.04	0.06	5.50





### Stellar Parameters For KIC 006380533

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5350^{+175}_{-159}$	$4.457^{+0.112}_{-0.154}$	$-0.180^{+0.300}_{-0.300}$	$0.864^{+0.164}_{-0.119}$	$0.780^{+0.122}_{-0.061}$	$1.702^{+0.882}_{-0.721}$
	+3%/-3%	+3%/-3%	+167%/-167%	+19%/-14%	+16%/-8%	+52%/-42%
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 006380533-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-13 \pm 3$	$0.75^{+0.64}_{-0.46}$	$1996^{+114}_{-102}$	$3903^{+1930}_{-701}$	$7.142^{+42.097}_{-4.953}$
Alt.	$-2 \pm 2$	$0.76^{+0.58}_{-0.49}$	$1994^{+125}_{-102}$	$2811^{+1263}_{-5218}$	$1.063^{+8.446}_{-0.967}$

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

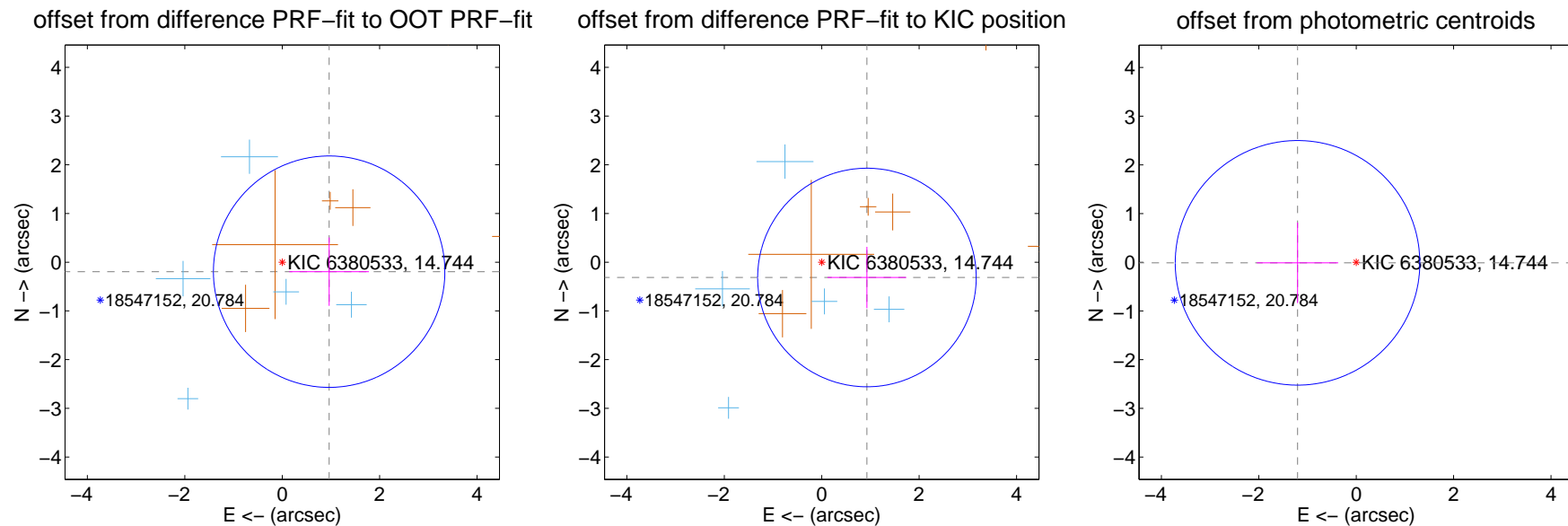
## DV Centroid Data

Supplemental centroid analysis for 006380533-01. Kepler magnitude: 14.74. Transit SNR 9.50

There are 5 quarters with good PRF difference image offsets

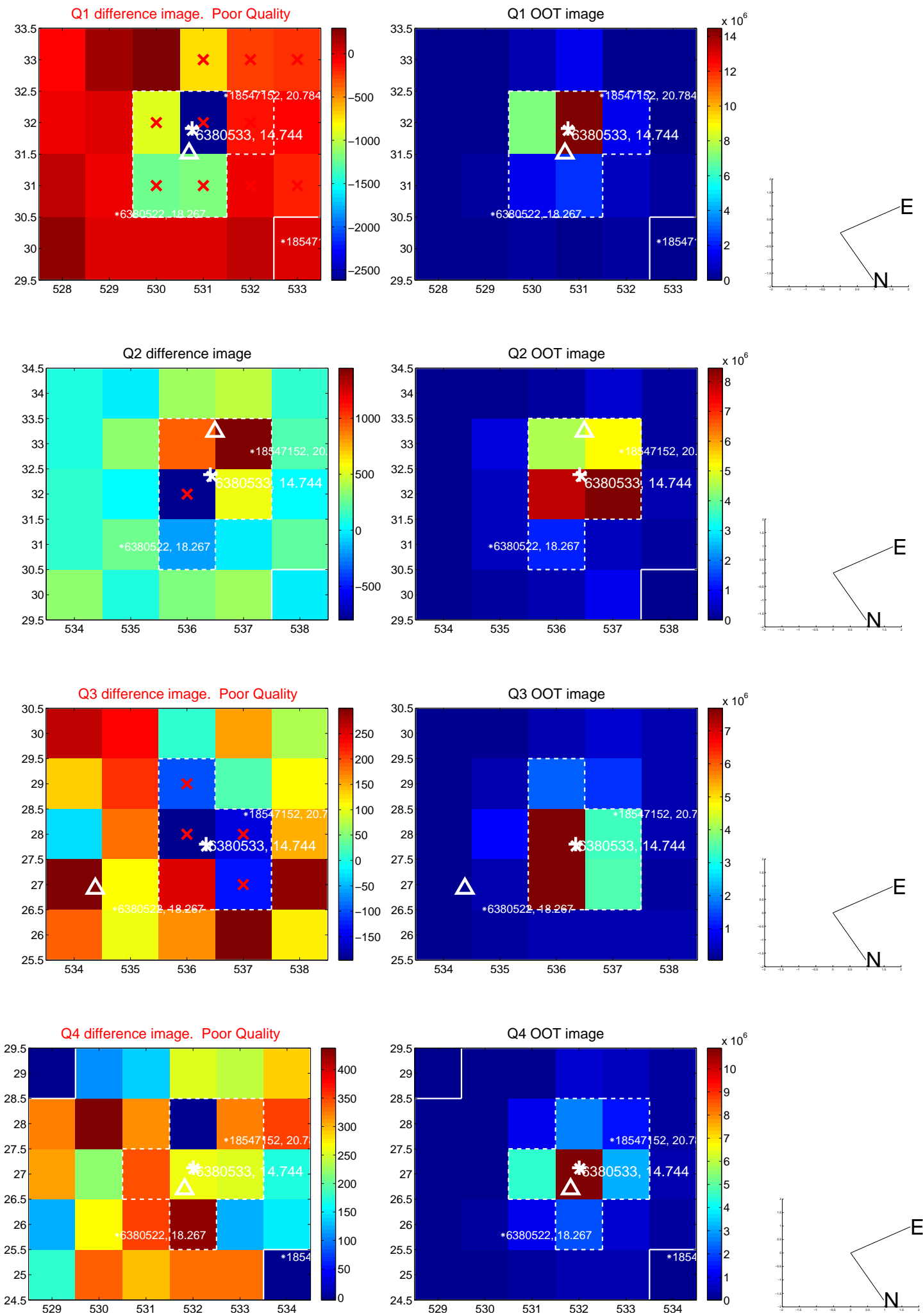
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.983 \pm 0.792$	1.24	$-0.963 \pm 0.818$	$-0.194 \pm 0.701$
PRF-fit source offset from KIC position	$0.980 \pm 0.748$	1.31	$-0.928 \pm 0.808$	$-0.314 \pm 0.630$
photometric centroid source offset	$1.21 \pm 0.84$	1.44	$1.20 \pm 0.84$	$-0.01 \pm 0.83$

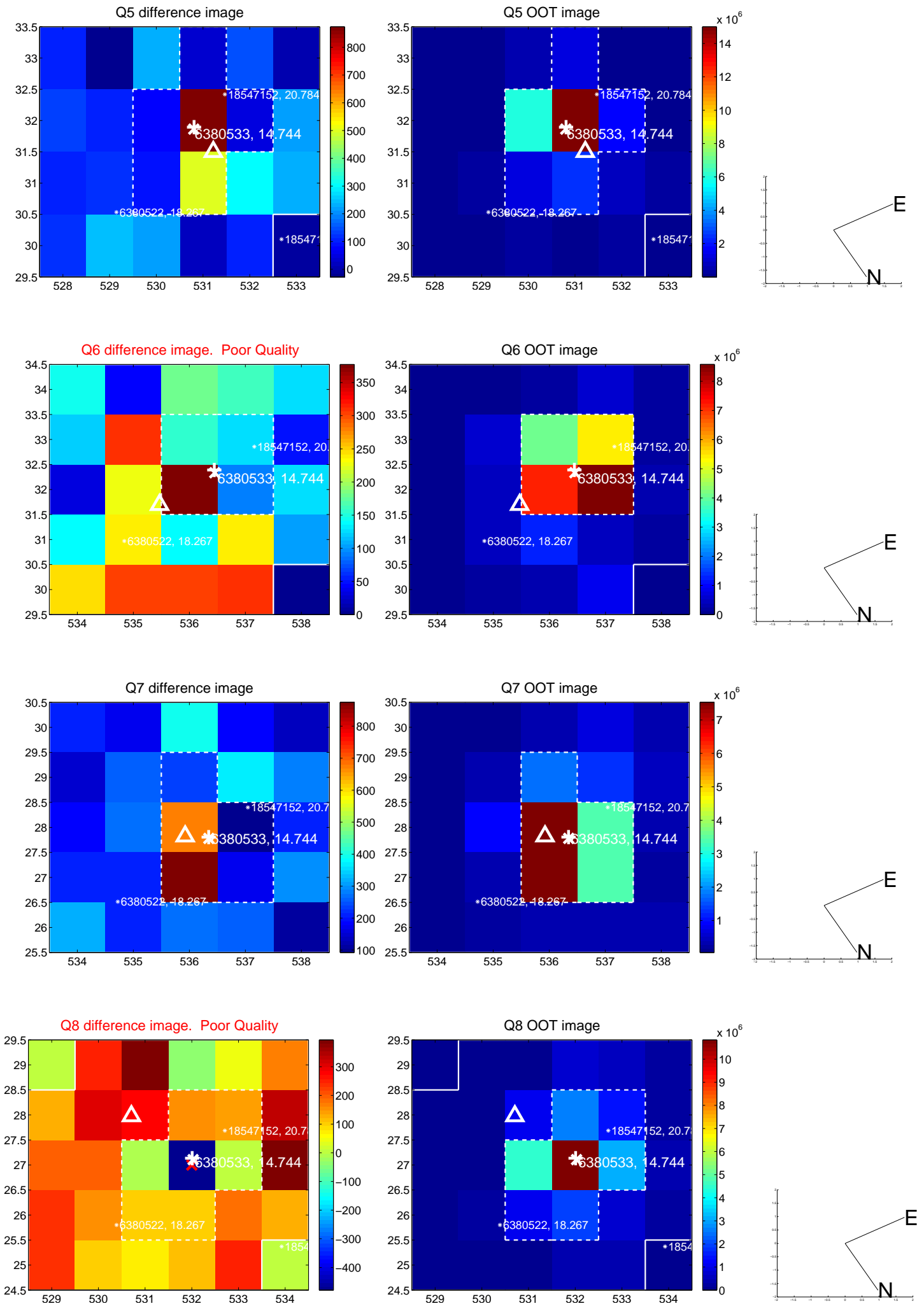


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

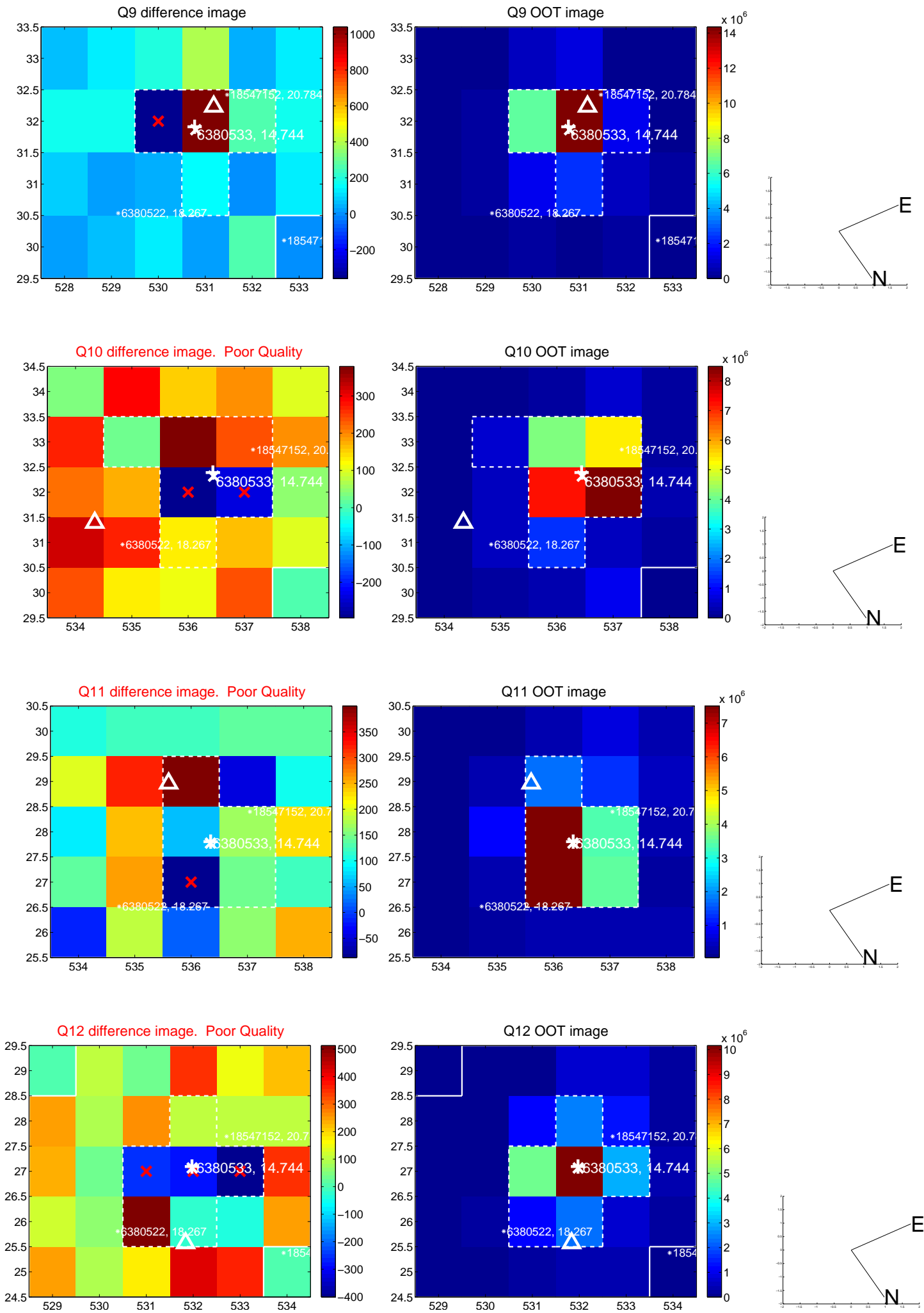


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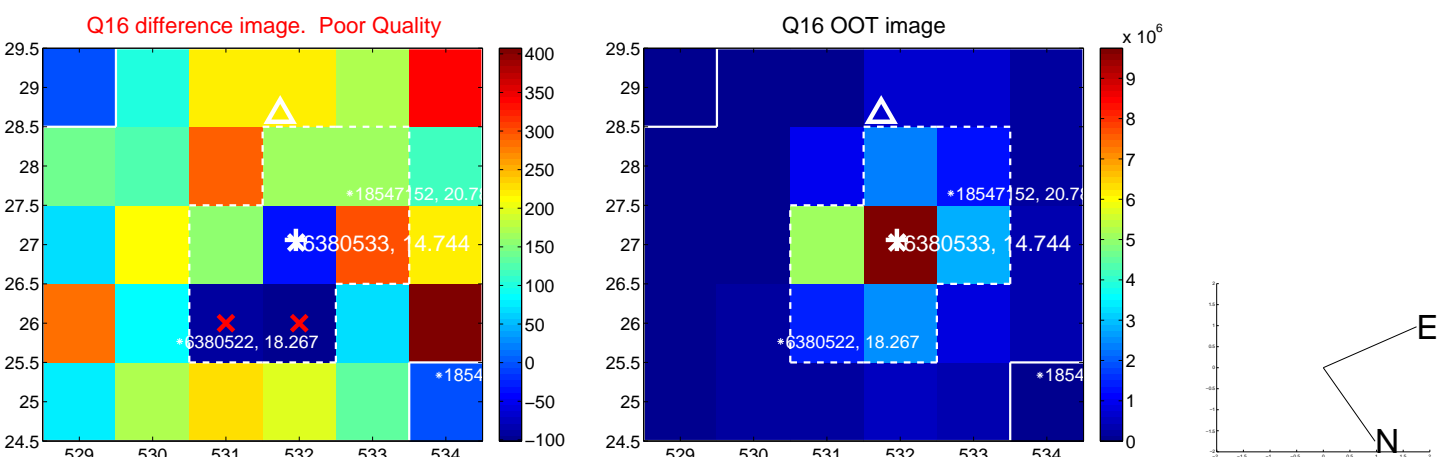
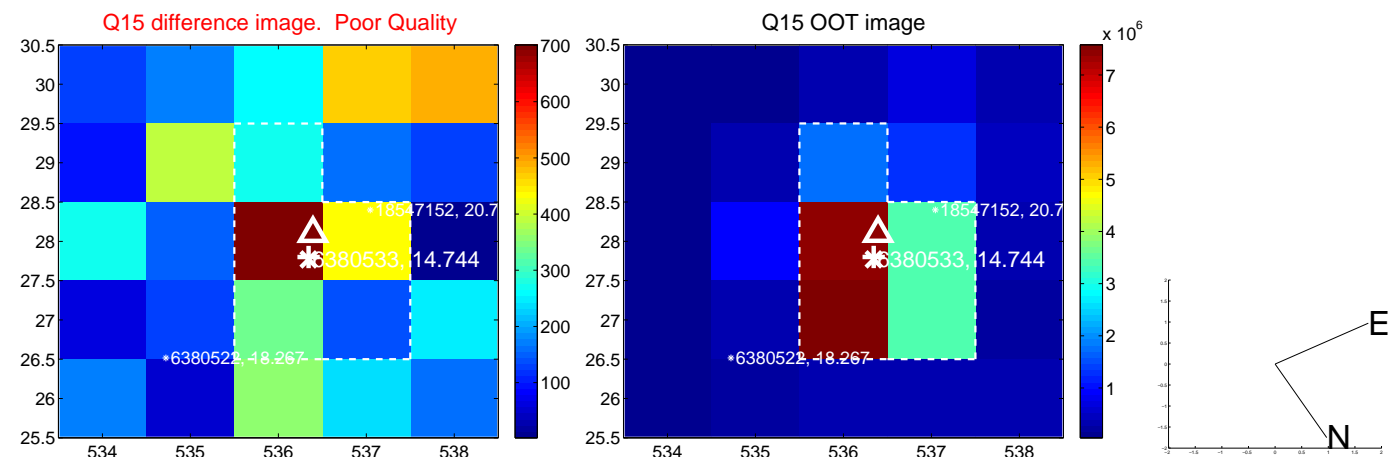
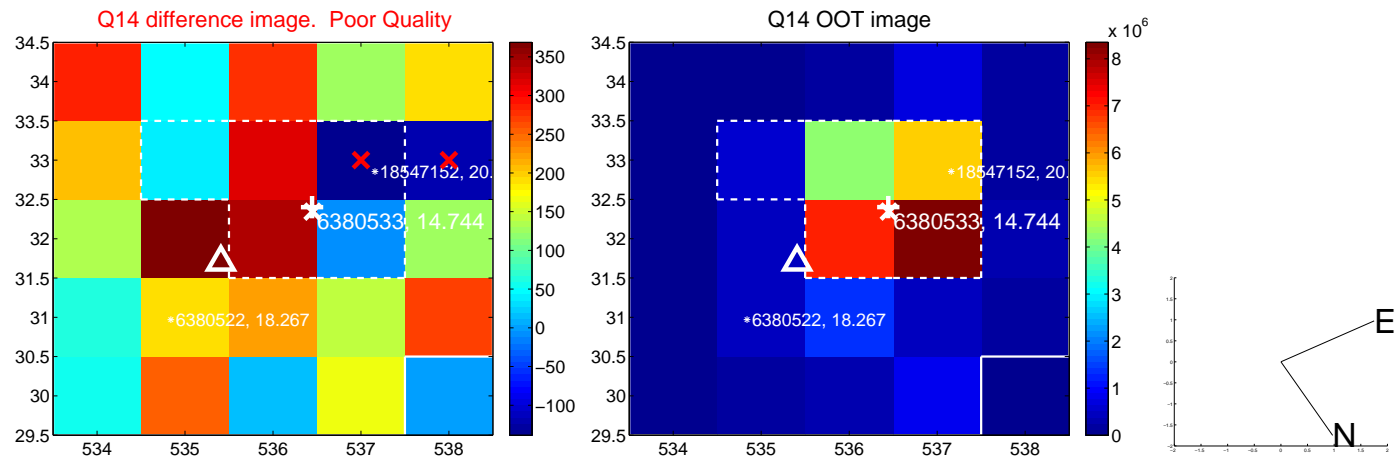
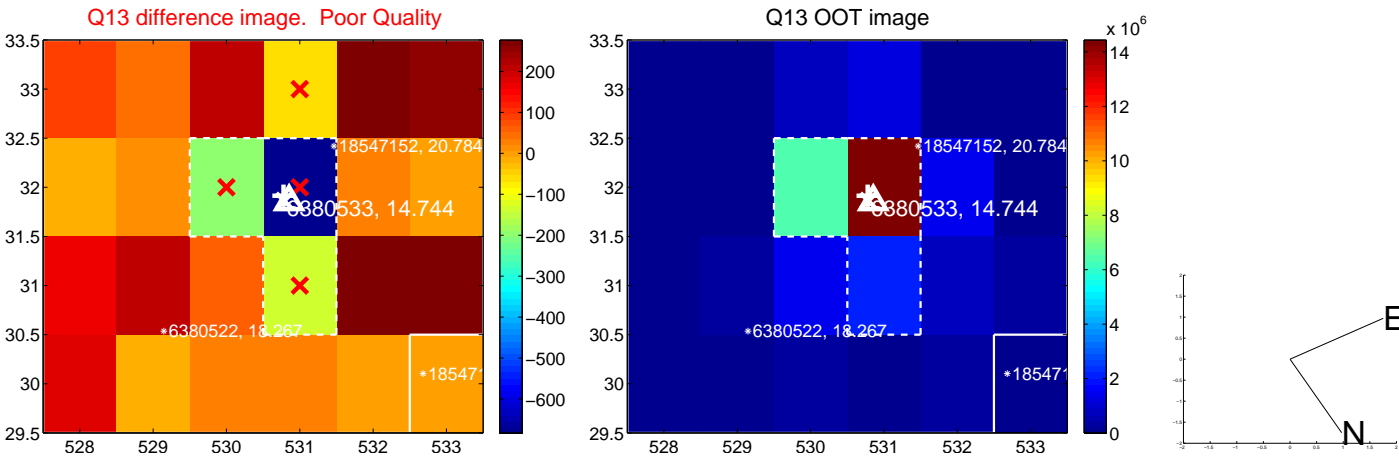




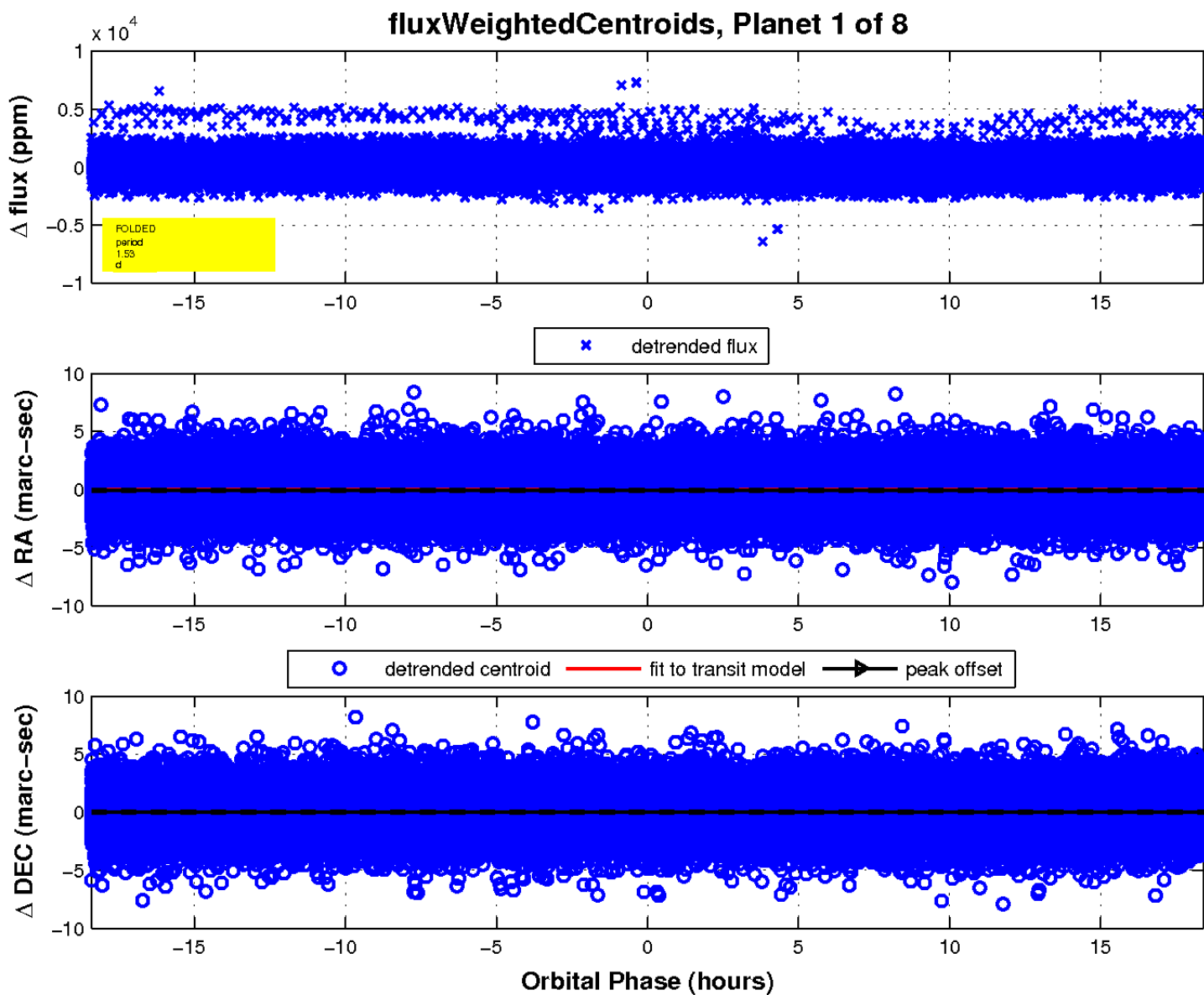
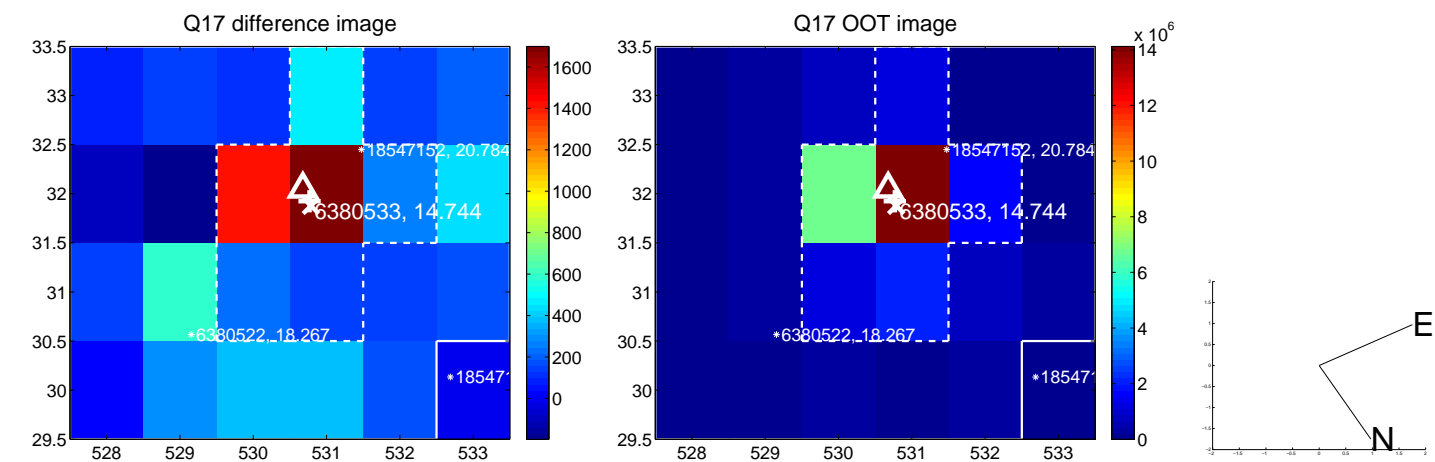
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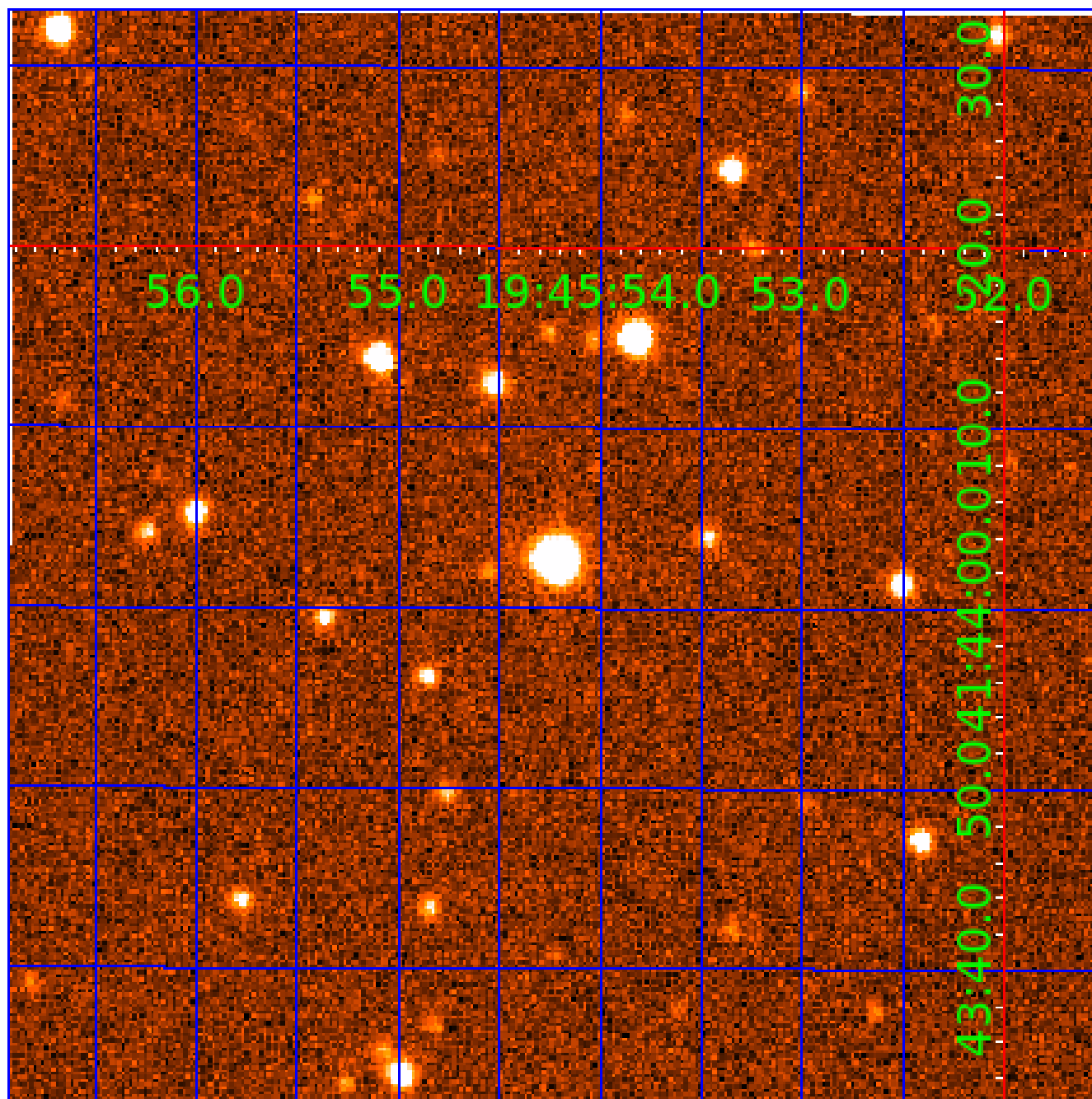


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# UKIRT Image

Declination



# KIC 006380533

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006380533-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
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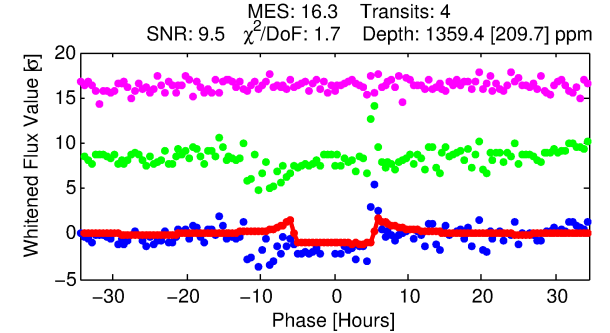
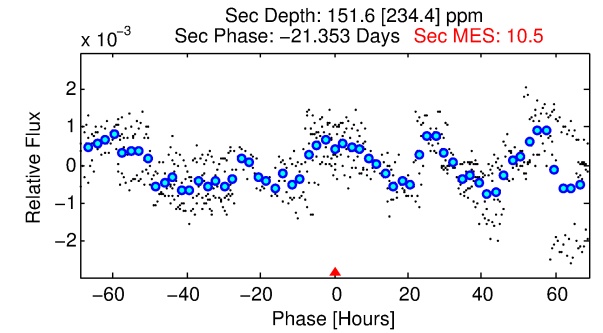
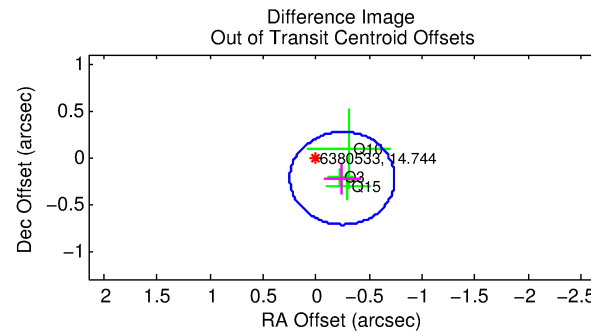
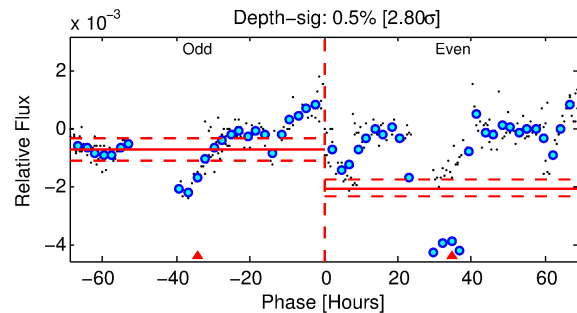
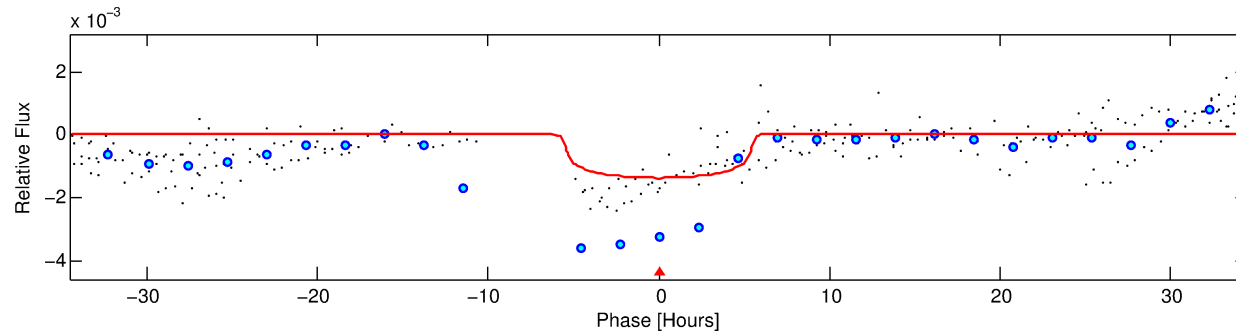
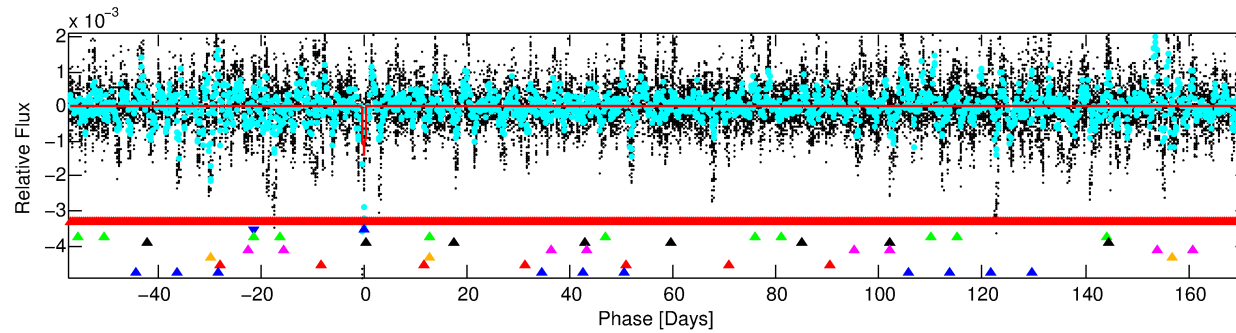
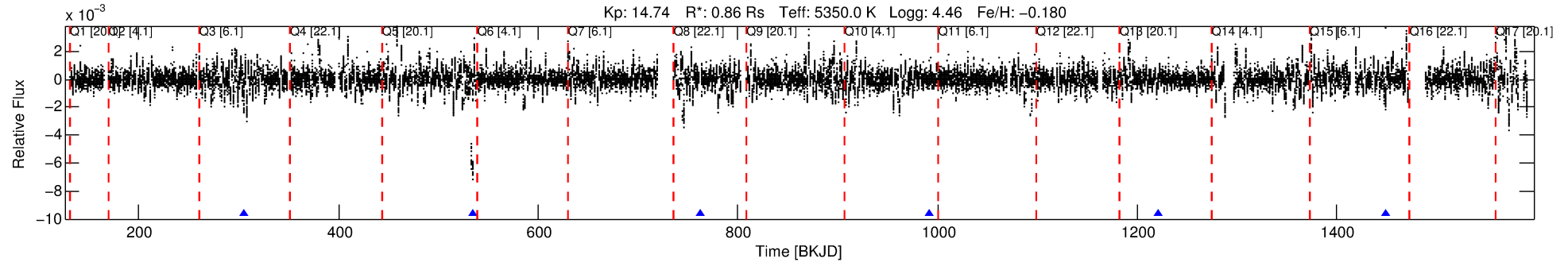
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006380533-02

No Significant Match Found

# DV One-Page Summary

KIC: 6380533 Candidate: 2 of 8 Period: 228.794 d



## DV Fit Results:

Period = 228.79370 [0.00412] d  
Epoch = 305.3435 [0.0126] BKJD  
Rp/R\* = 0.0343 [0.0192]  
a/R\* = 137.02 [291.81]  
b = 0.51 [3.14]  
Seff = 1.21 [0.36]  
Teq = 267 [20] K  
Rp = 3.24 [1.91] Re  
a = 0.6740 [0.1167] AU  
Ag = 3613.17 [6956.55] [0.52 $\sigma$ ]  
Teffp = 3203 [1530] K [1.92 $\sigma$ ]

## DV Diagnostic Results:

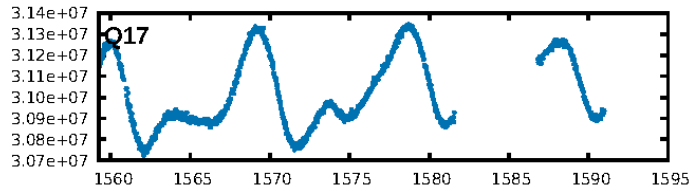
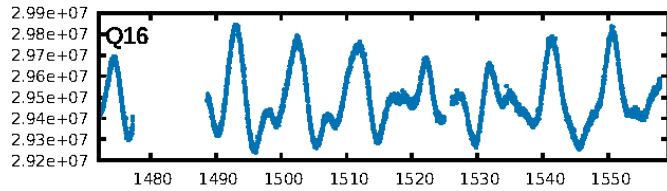
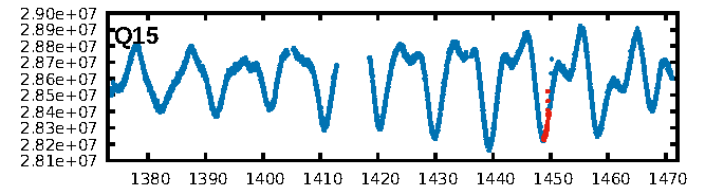
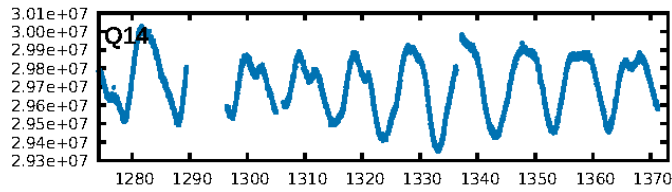
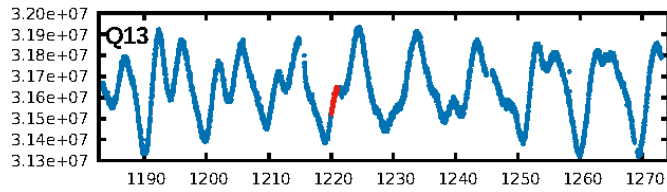
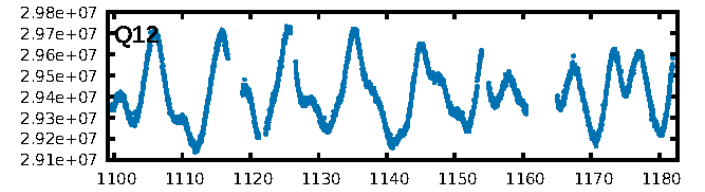
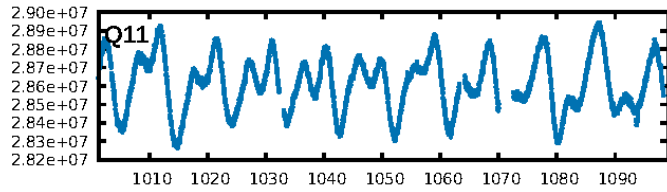
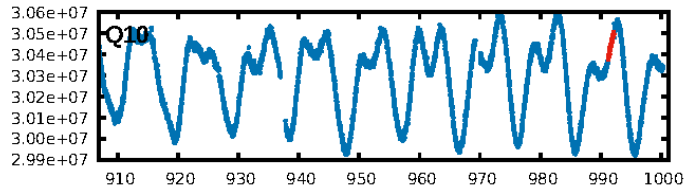
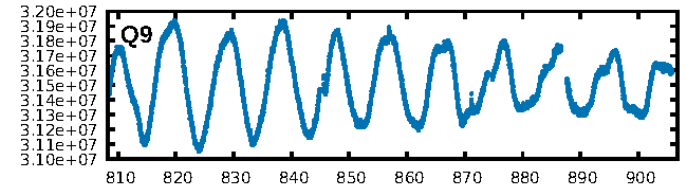
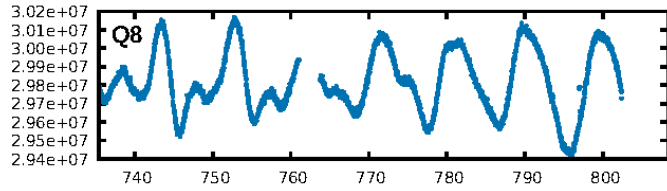
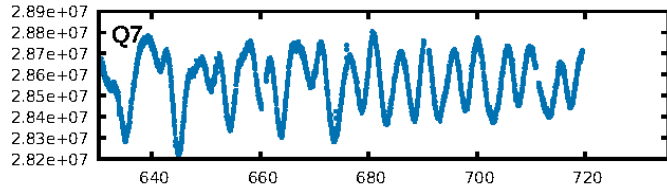
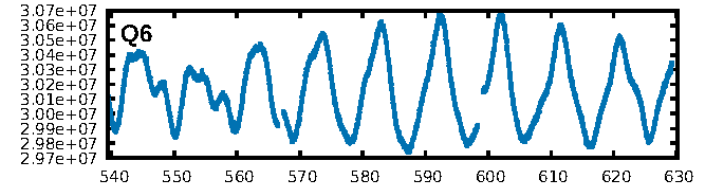
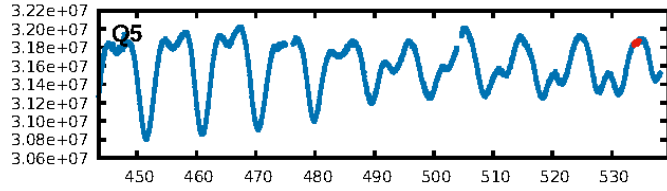
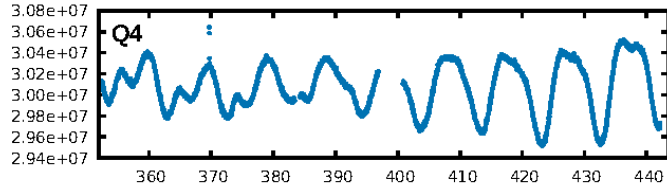
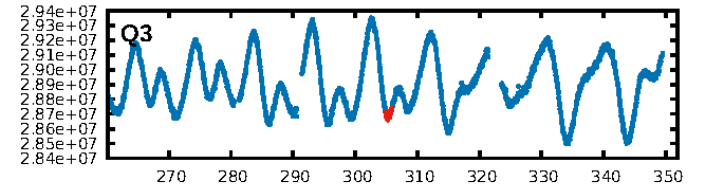
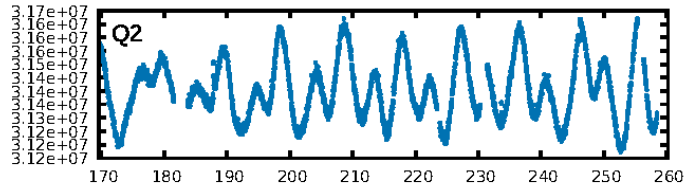
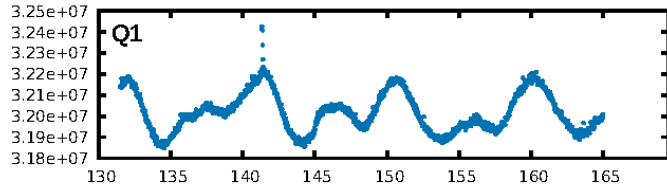
ShortPeriod-sig: 100.0% [32.44 $\sigma$ ]  
LongPeriod-sig: 100.0% [161.14 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 89.4%  
Bootstrap-pfa: 1.21e-24  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 4.795  
Centroid-sig: 95.3%  
Centroid-so: 0.201 arcsec [0.47 $\sigma$ ]  
OotOffset-rm: 0.333 arcsec [2.02 $\sigma$ ]  
KicOffset-rm: 0.425 arcsec [2.59 $\sigma$ ]  
OotOffset-st: 1/2/0/0 [3]  
KicOffset-st: 1/2/0/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/4]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 05:44:53 Z

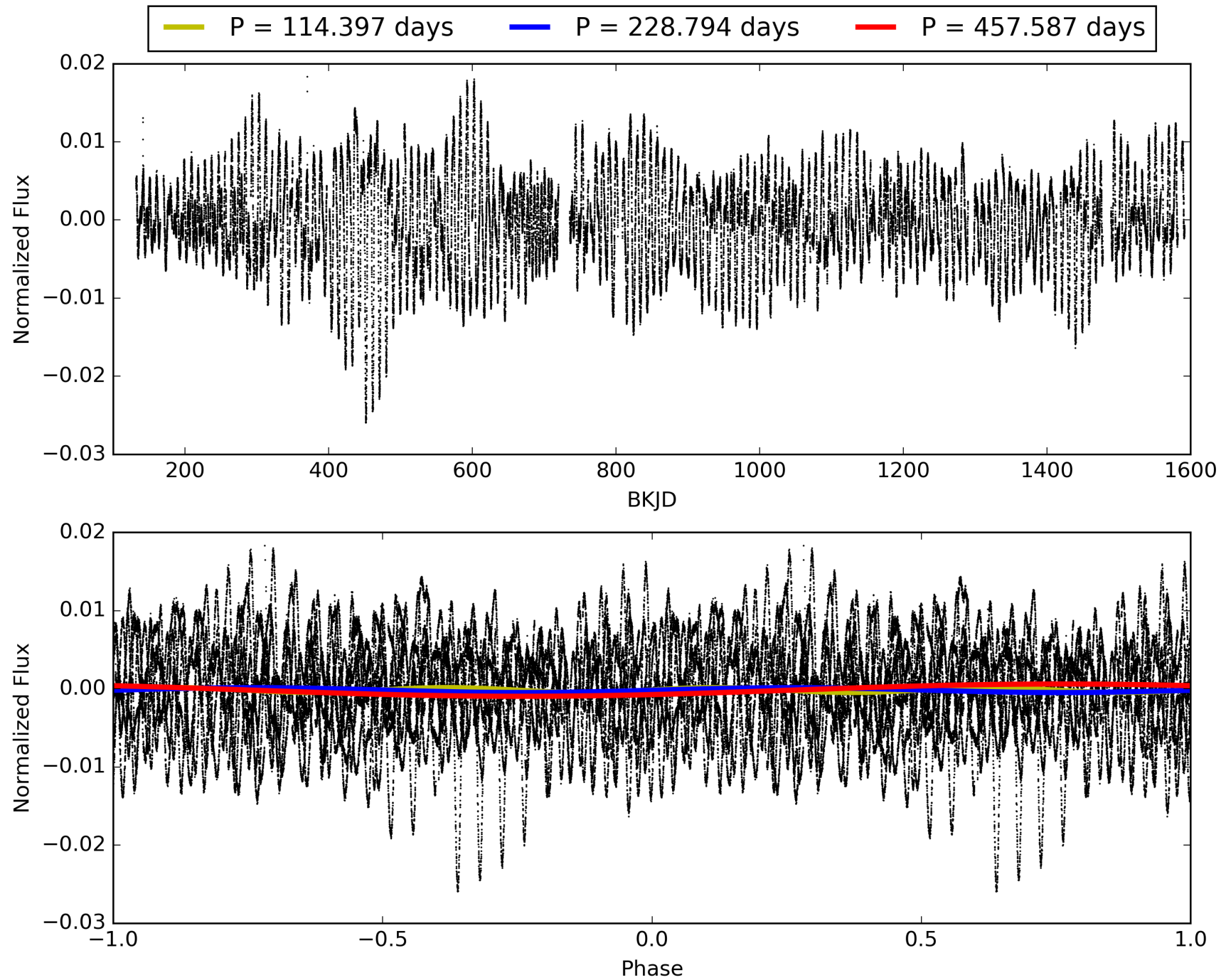
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006380533-02, PDC Light Curves

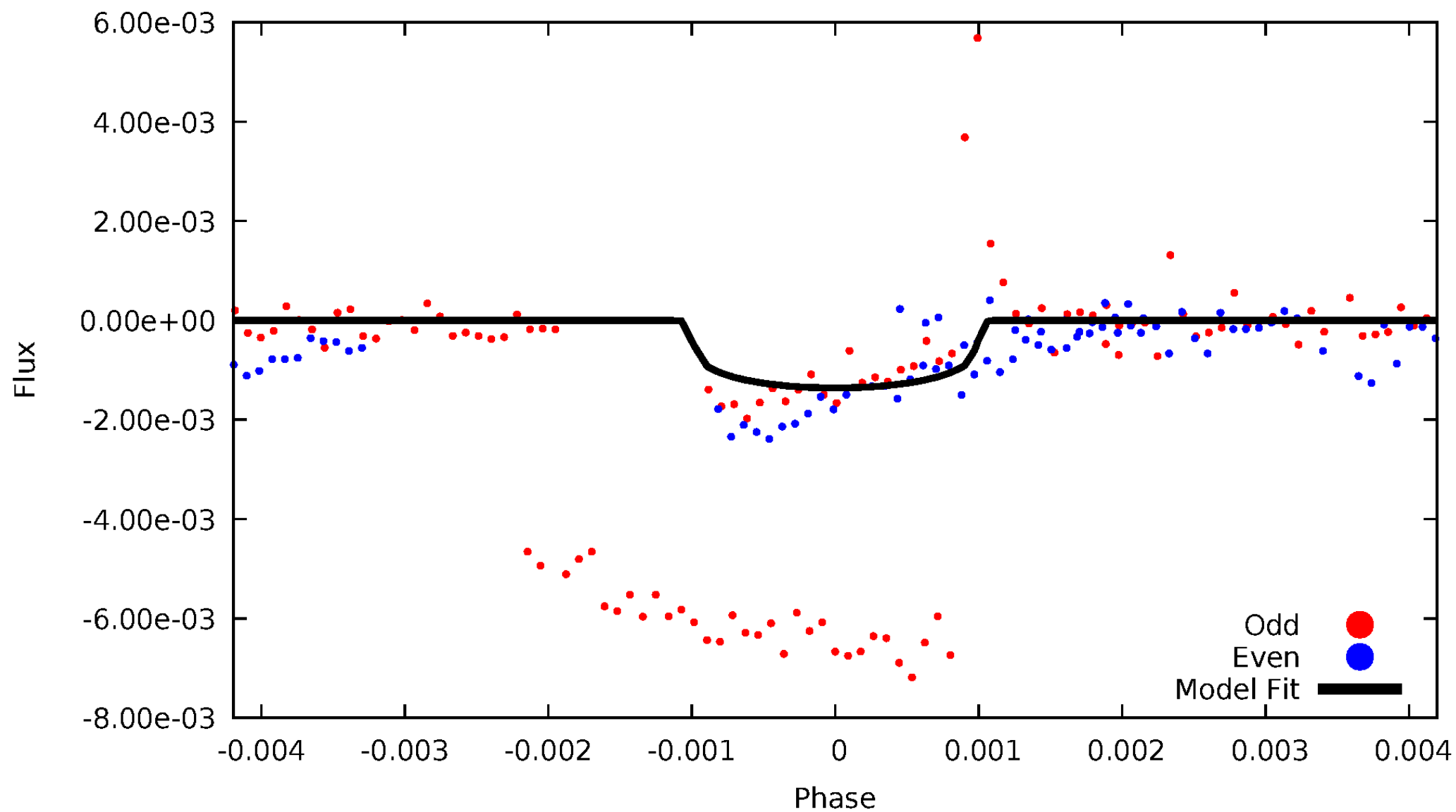


# TCE 006380533-02



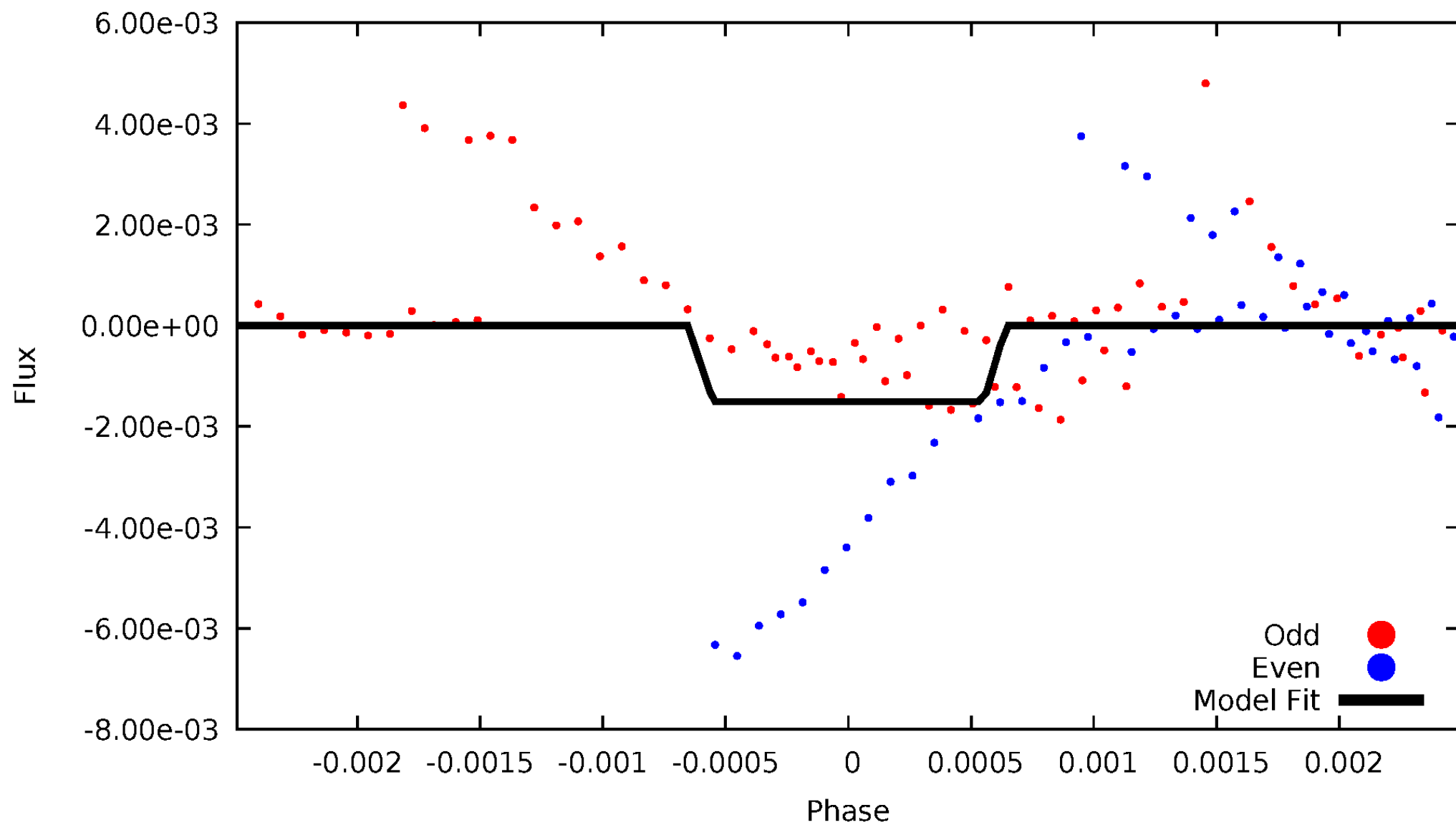
# DV Odd/Even

TCE 006380533-02



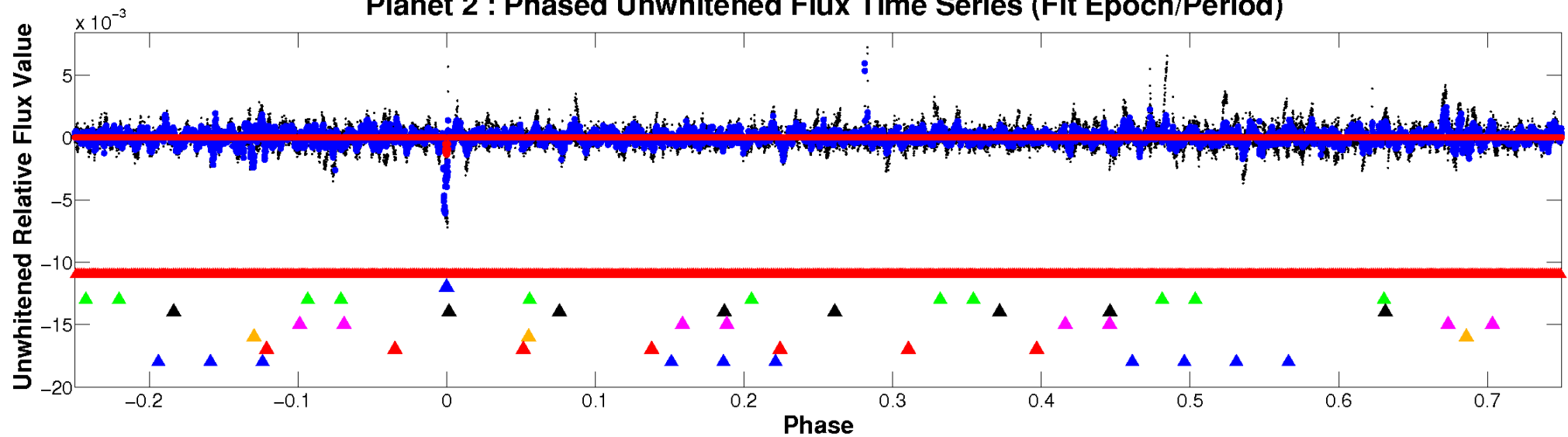
# ALT Odd/Even

TCE 006380533-02

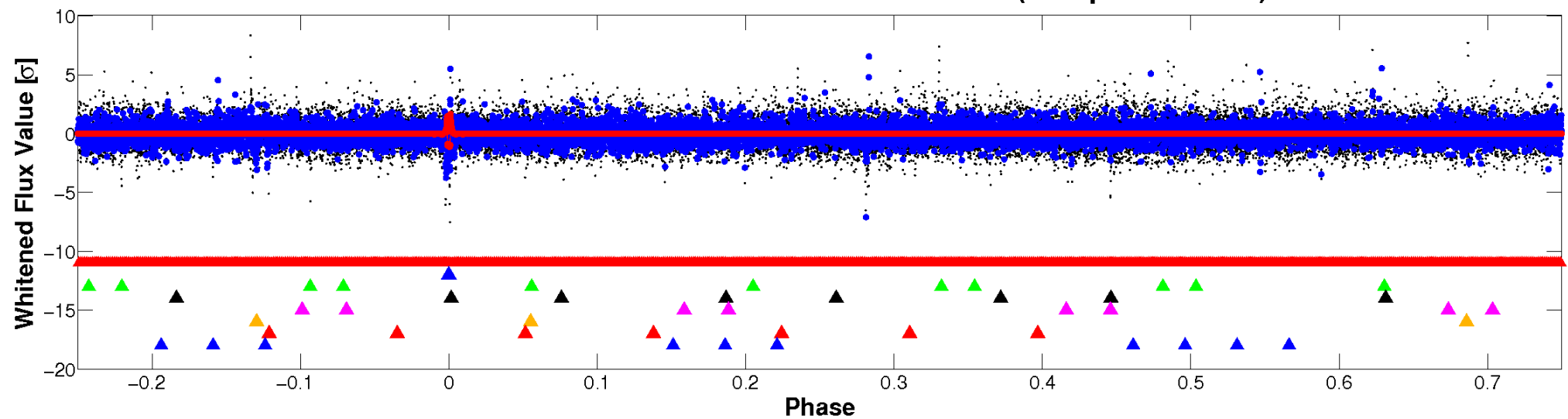


# Non-Whitened Vs. Whitened Light Curve

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

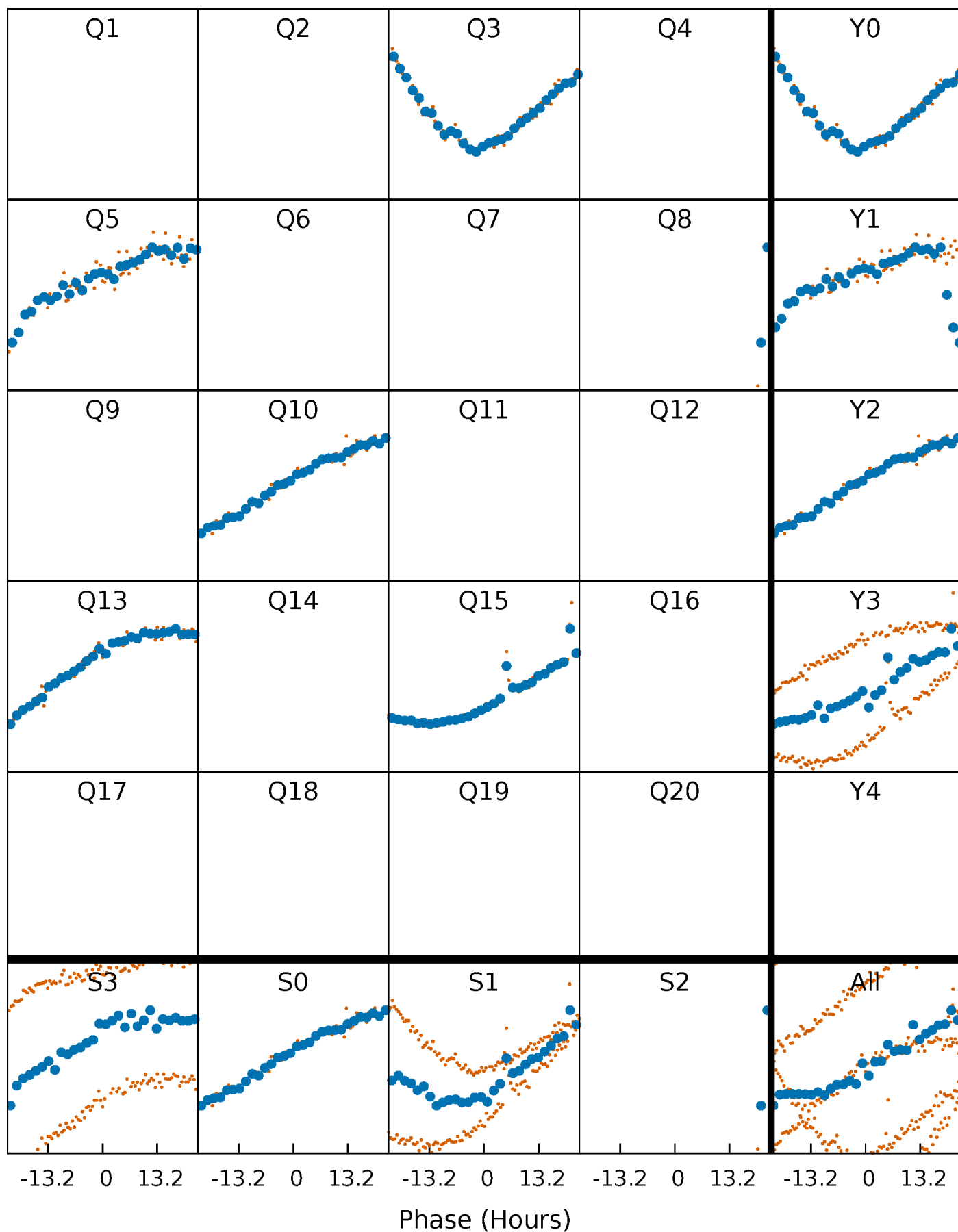


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

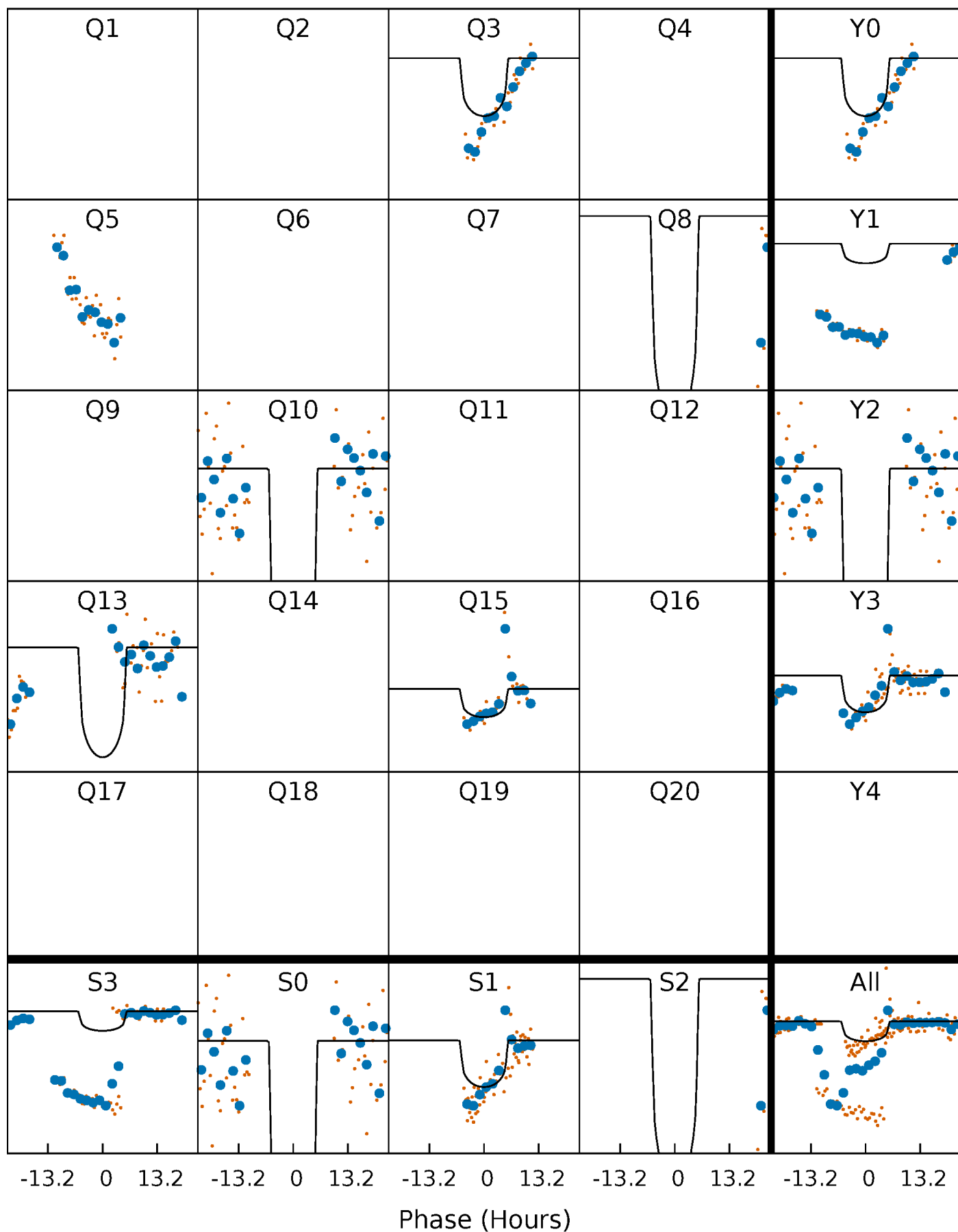
TCE 006380533-02 P=228.793699 Days  $T_0=305.343517$  (BKJD)





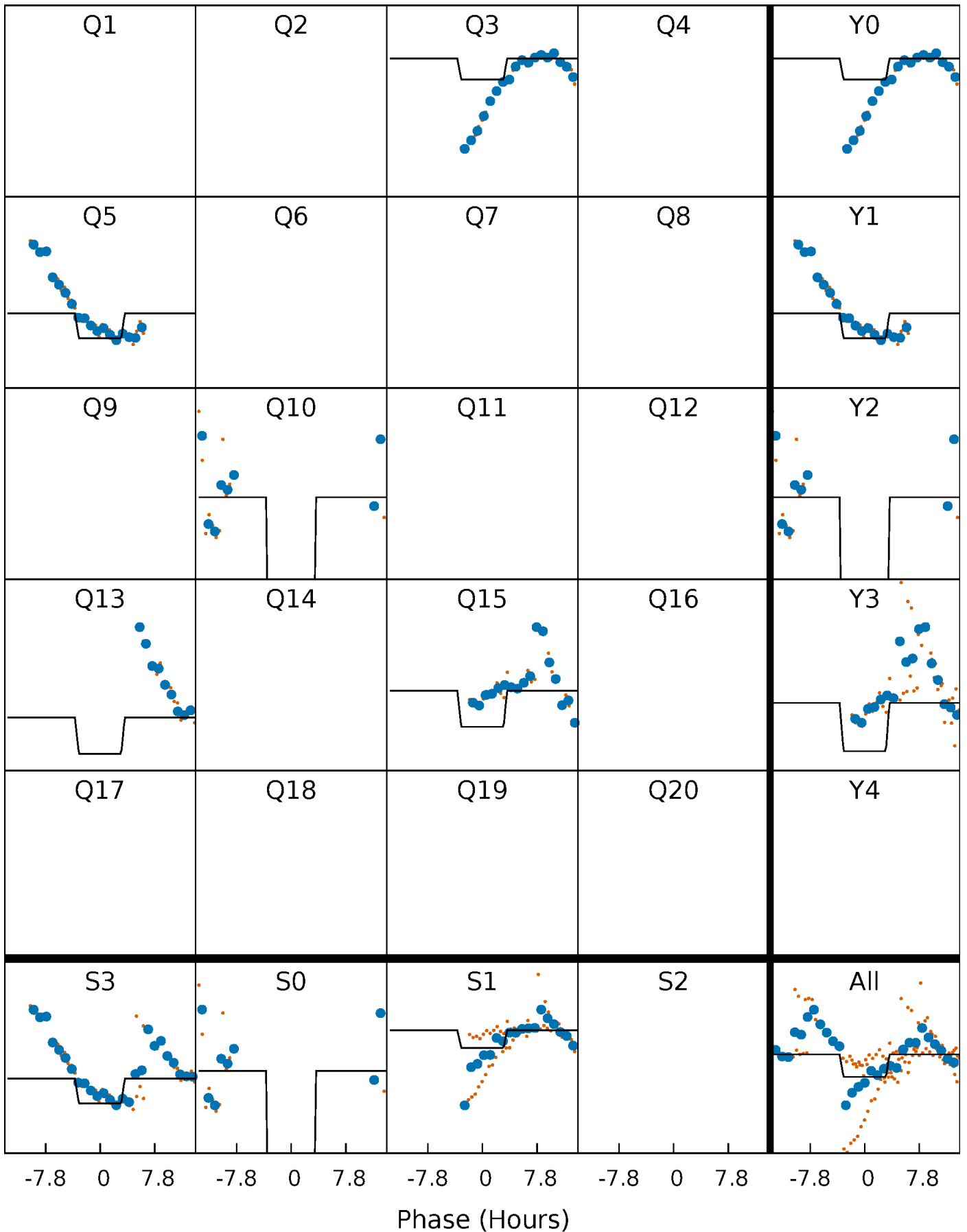
# DV Quarter-Phased Transit Curves

TCE 006380533-02     $P=228.793699$  Days     $T_0=305.343517$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

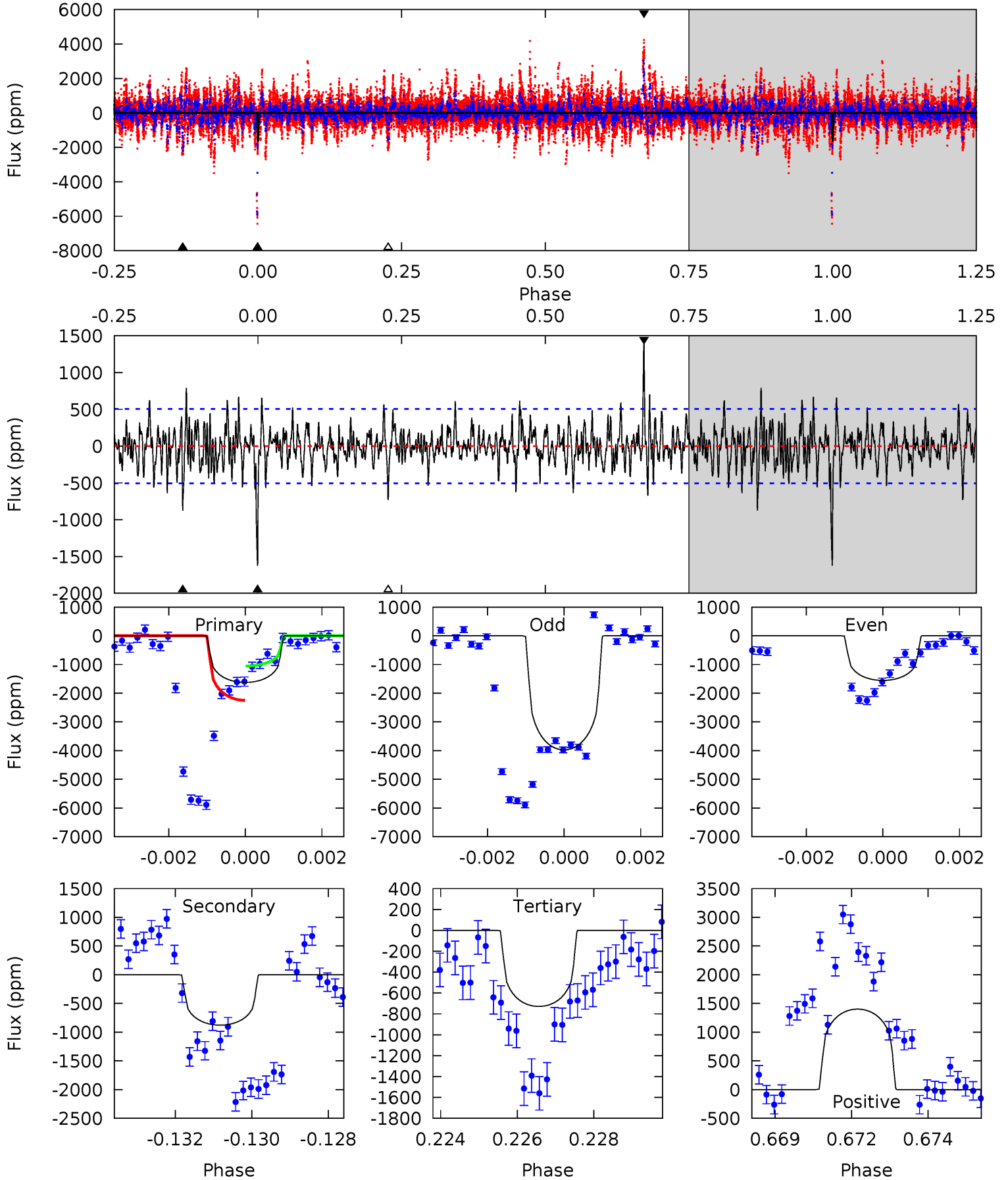
TCE 006380533-02 P=228.780949 Days  $T_0=305.281036$  (BKJD)



# DV Model-Shift Uniqueness Test

006380533-02, P = 228.793699 Days, E = 76.549818 Days

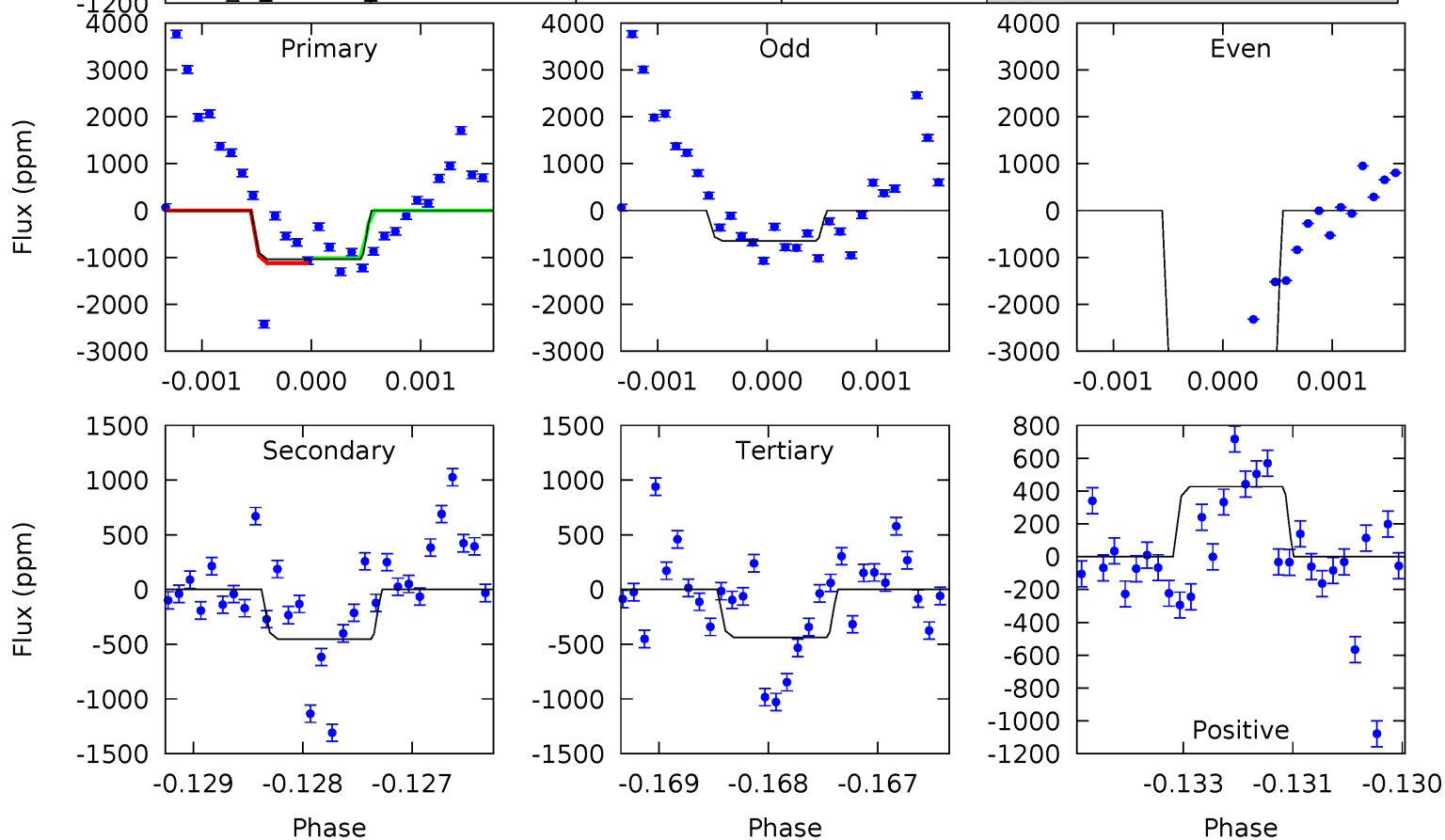
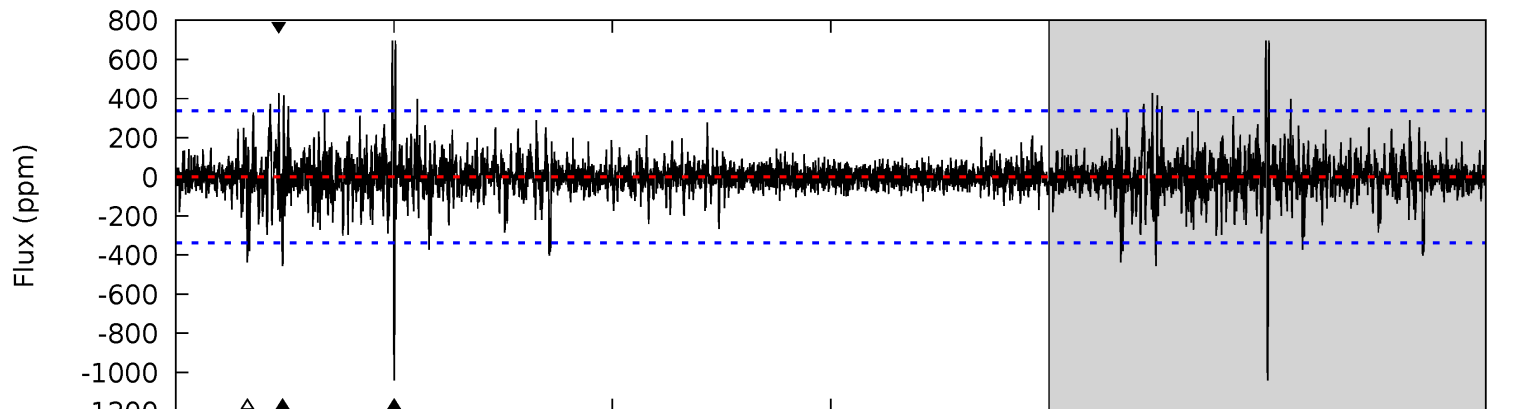
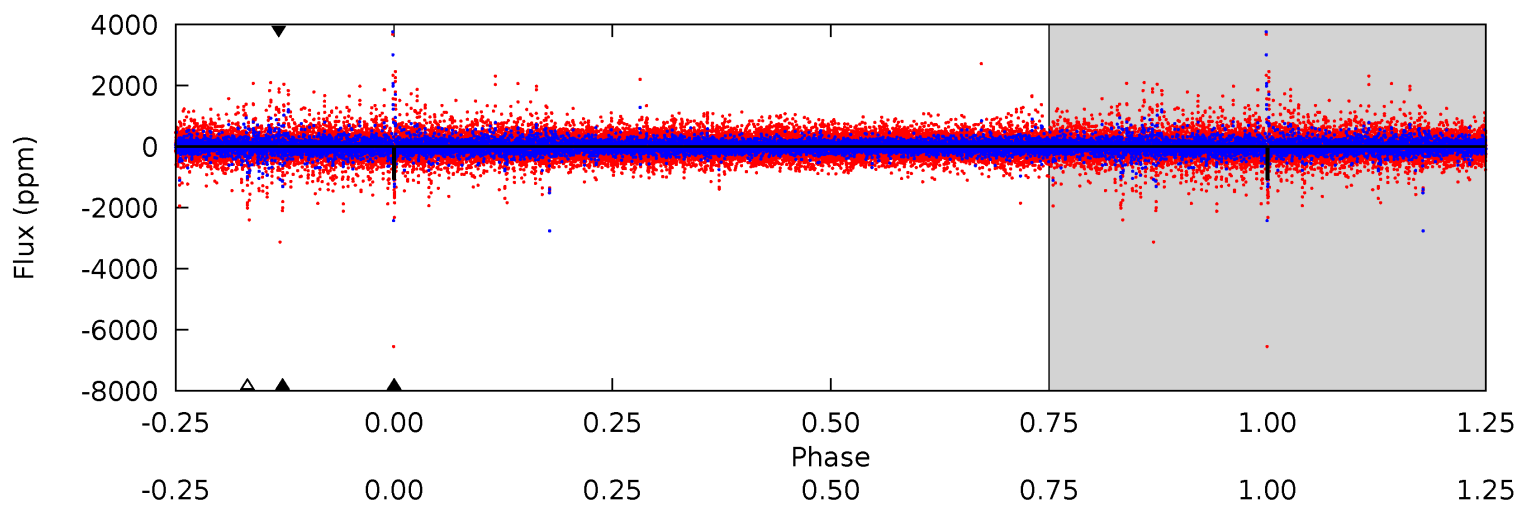
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.1	9.21	7.65	14.7	5.32	3.07	2.25	9.41	2.35	1.56	-5.50	14.0	1.73	0.46	0



# Alt Model-Shift Uniqueness Test

006380533-02, P = 228.780949 Days, E = 76.500087 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
16.7	7.31	7.03	6.86	5.42	3.24	1.21	9.68	9.86	0.28	0.45	30.6	1.96	0.40	0



### Stellar Parameters For KIC 006380533

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5350^{+175}_{-159}$	$4.457^{+0.112}_{-0.154}$	$-0.180^{+0.300}_{-0.300}$	$0.864^{+0.164}_{-0.119}$	$0.780^{+0.122}_{-0.061}$	$1.702^{+0.882}_{-0.721}$
	+3%/-3%	+3%/-3%	+167%/-167%	+19%/-14%	+16%/-8%	+52%/-42%
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 006380533-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-878 \pm 95$	$3.37^{+1.83}_{-1.60}$	$377^{+21}_{-21}$	$4979^{+1890}_{-809}$	$19514^{+51324}_{-11594}$
Alt.	$-455 \pm 62$	$3.77^{+1.95}_{-1.78}$	$375^{+22}_{-20}$	$4204^{+1135}_{-579}$	$8263^{+20494}_{-4767}$

$T_{max}$  = 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

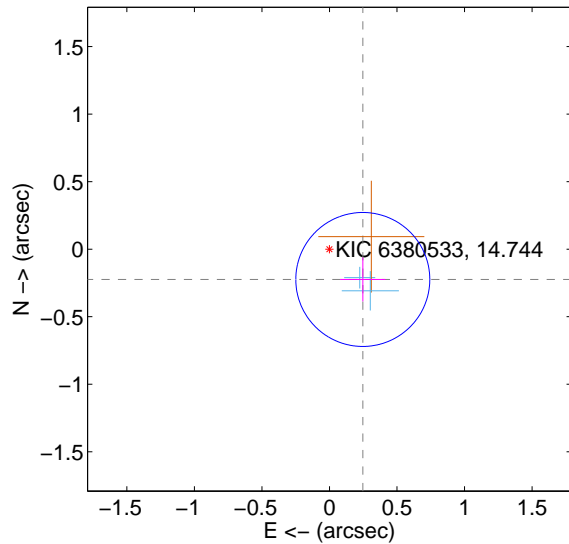
Supplemental centroid analysis for 006380533-02. Kepler magnitude: 14.74. Transit SNR 9.50

There are 2 quarters with good PRF difference image offsets

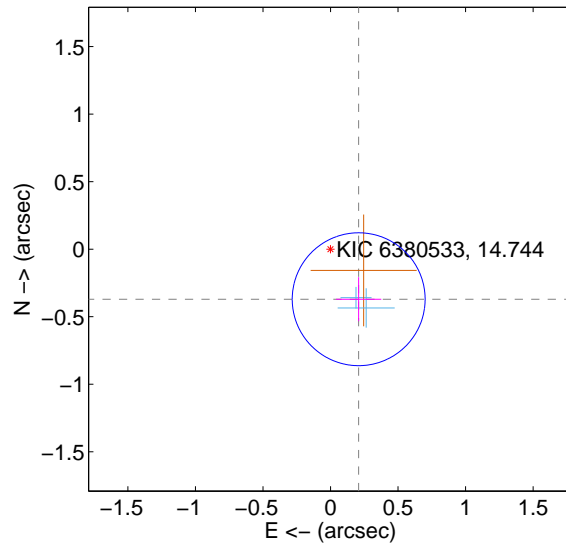
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.333 \pm 0.165$	2.02	$-0.247 \pm 0.167$	$-0.224 \pm 0.163$
PRF-fit source offset from KIC position	$0.425 \pm 0.164$	2.59	$-0.209 \pm 0.167$	$-0.371 \pm 0.163$
photometric centroid source offset	$0.20 \pm 0.43$	0.47	$-0.10 \pm 0.39$	$0.17 \pm 0.45$

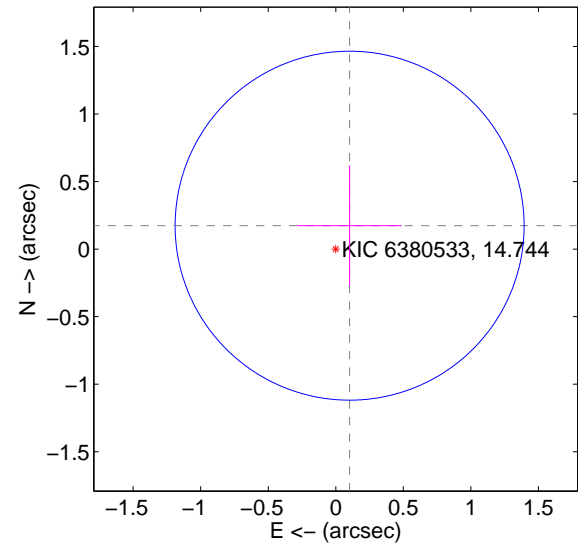
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



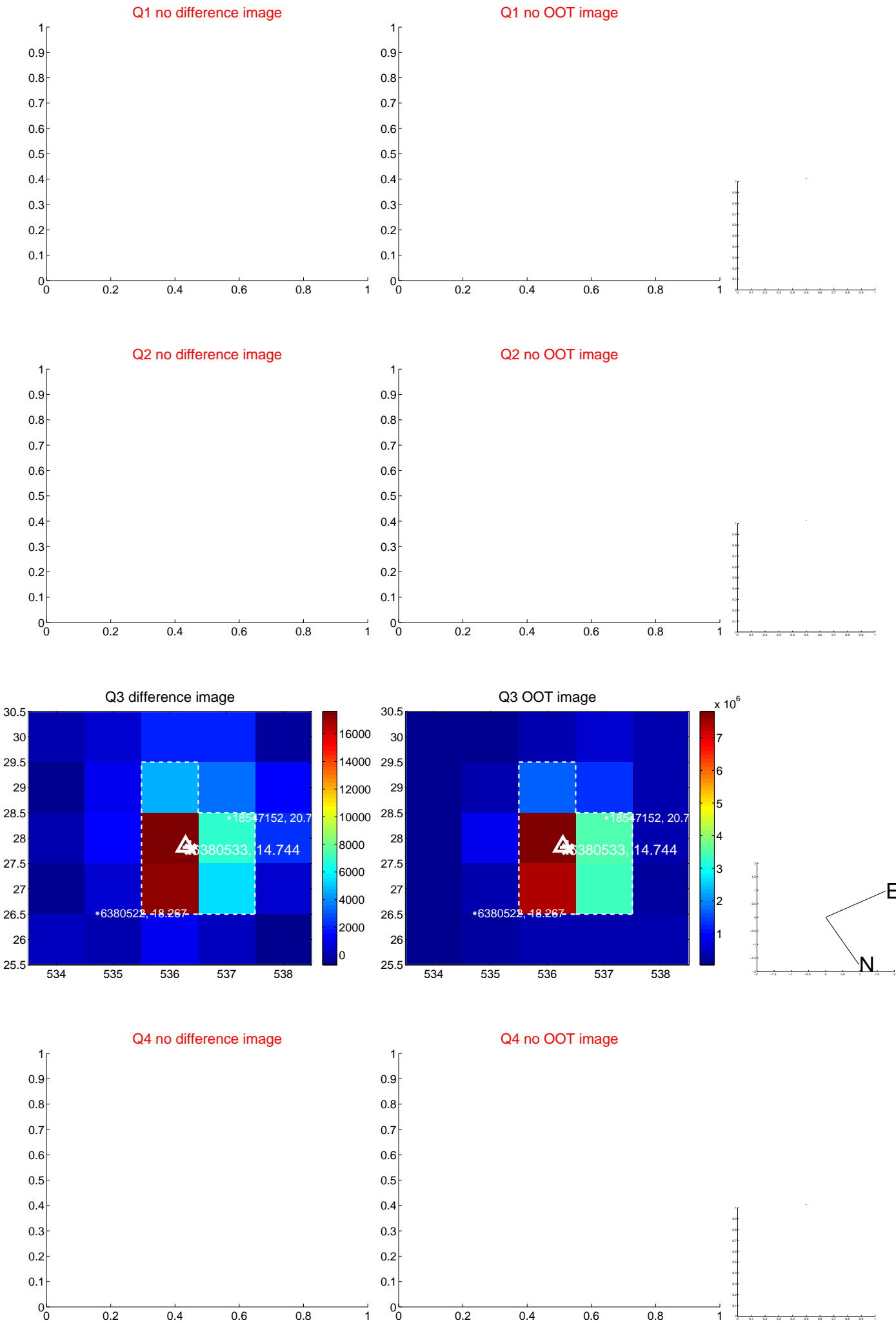
offset from photometric centroids



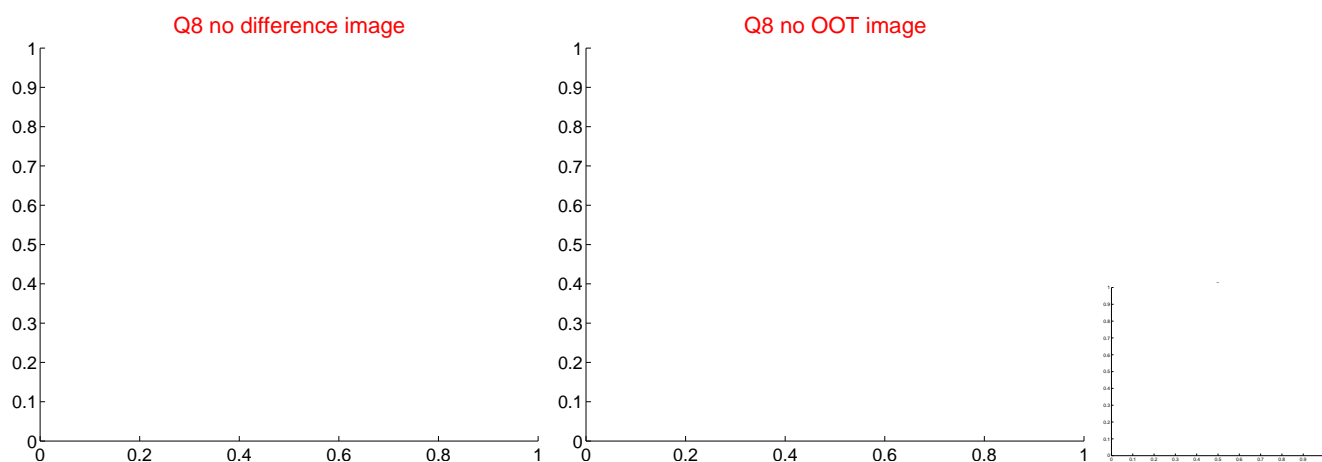
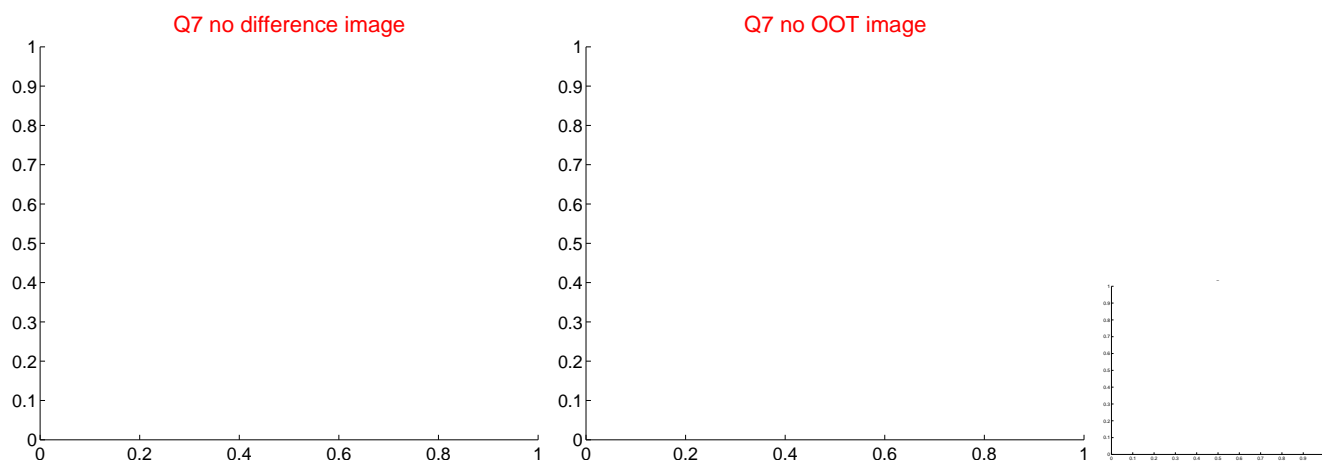
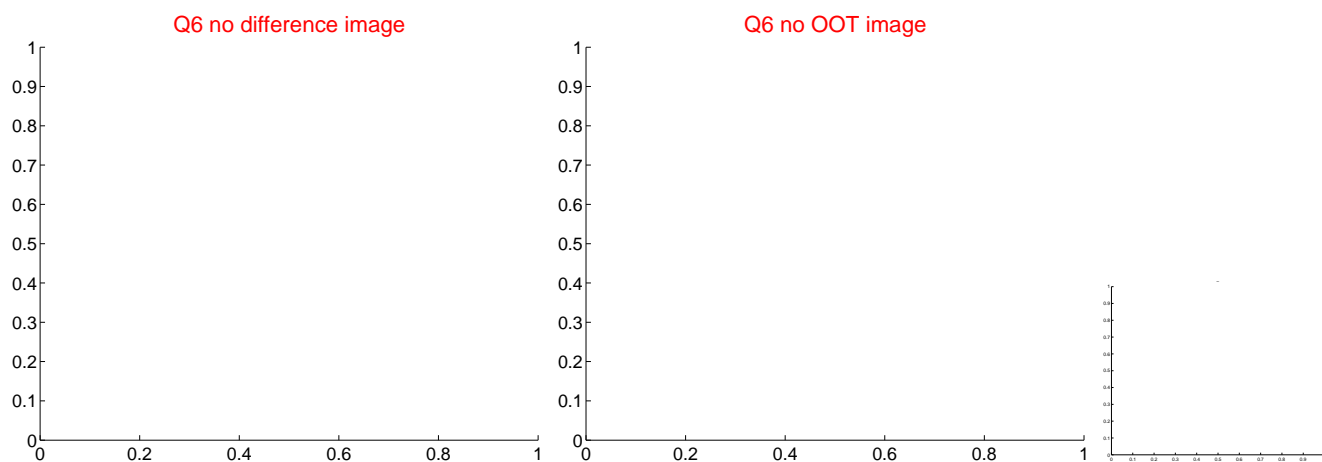
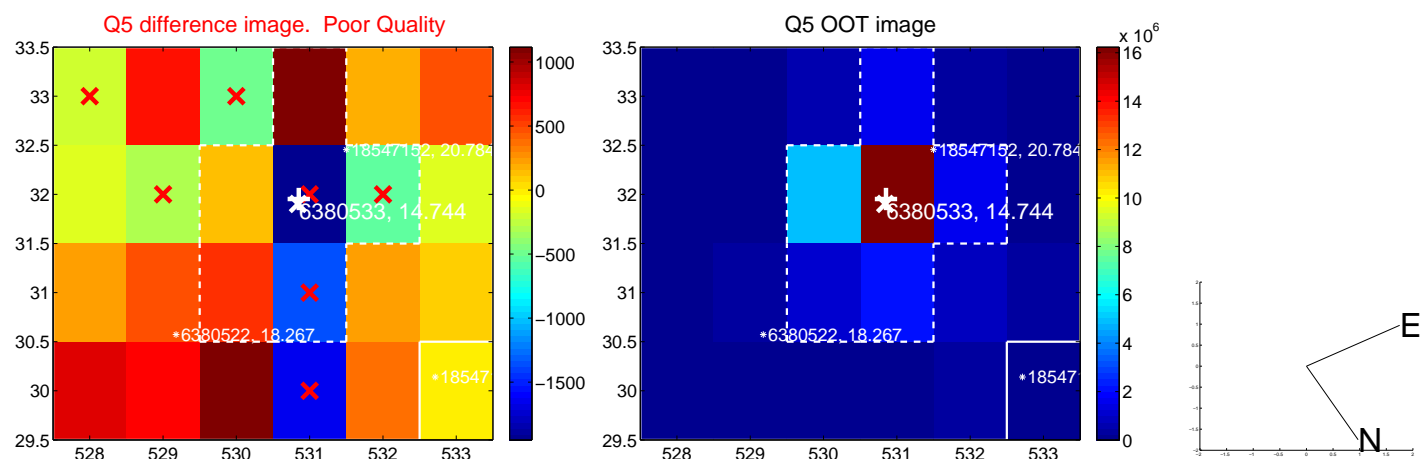
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



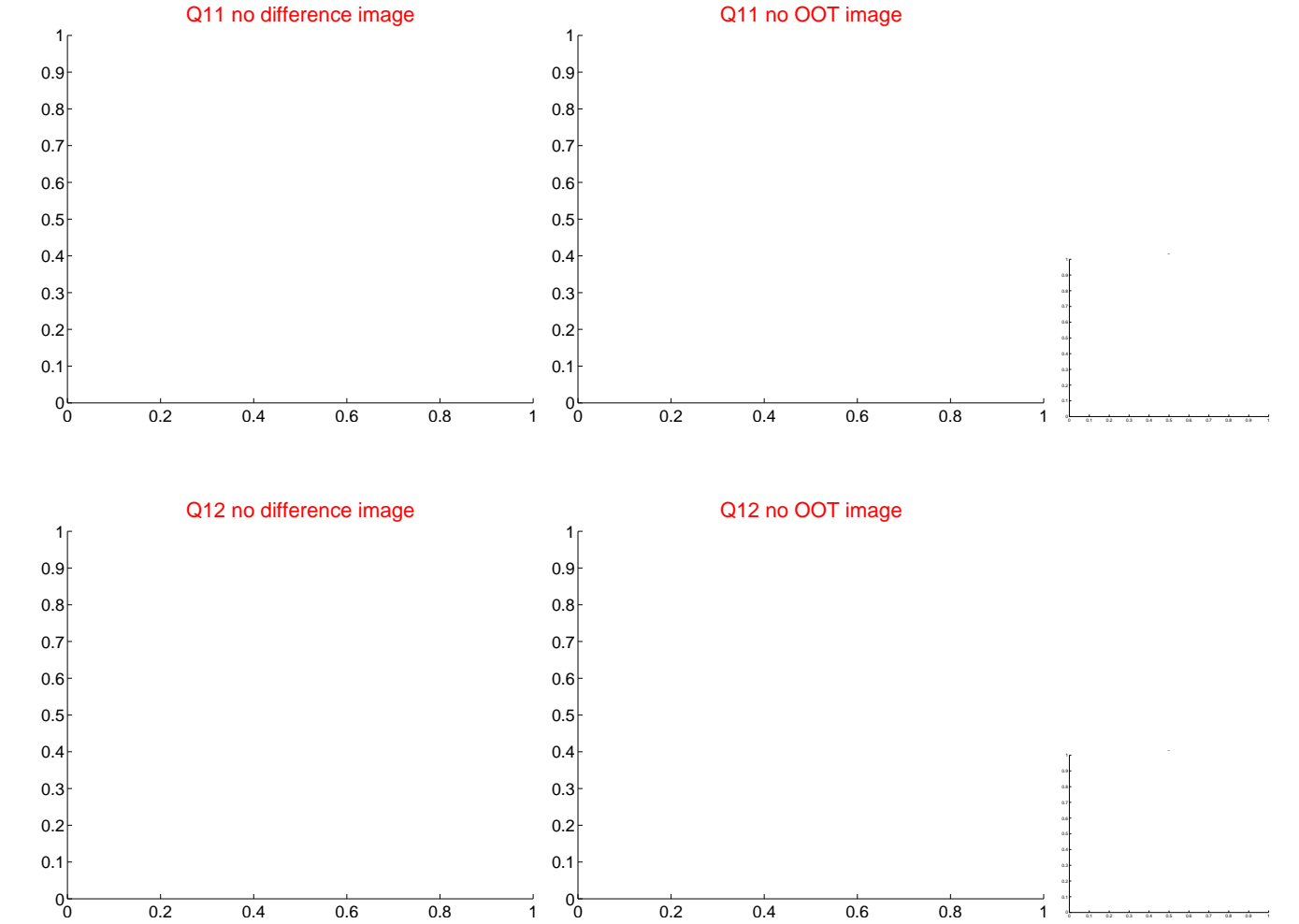
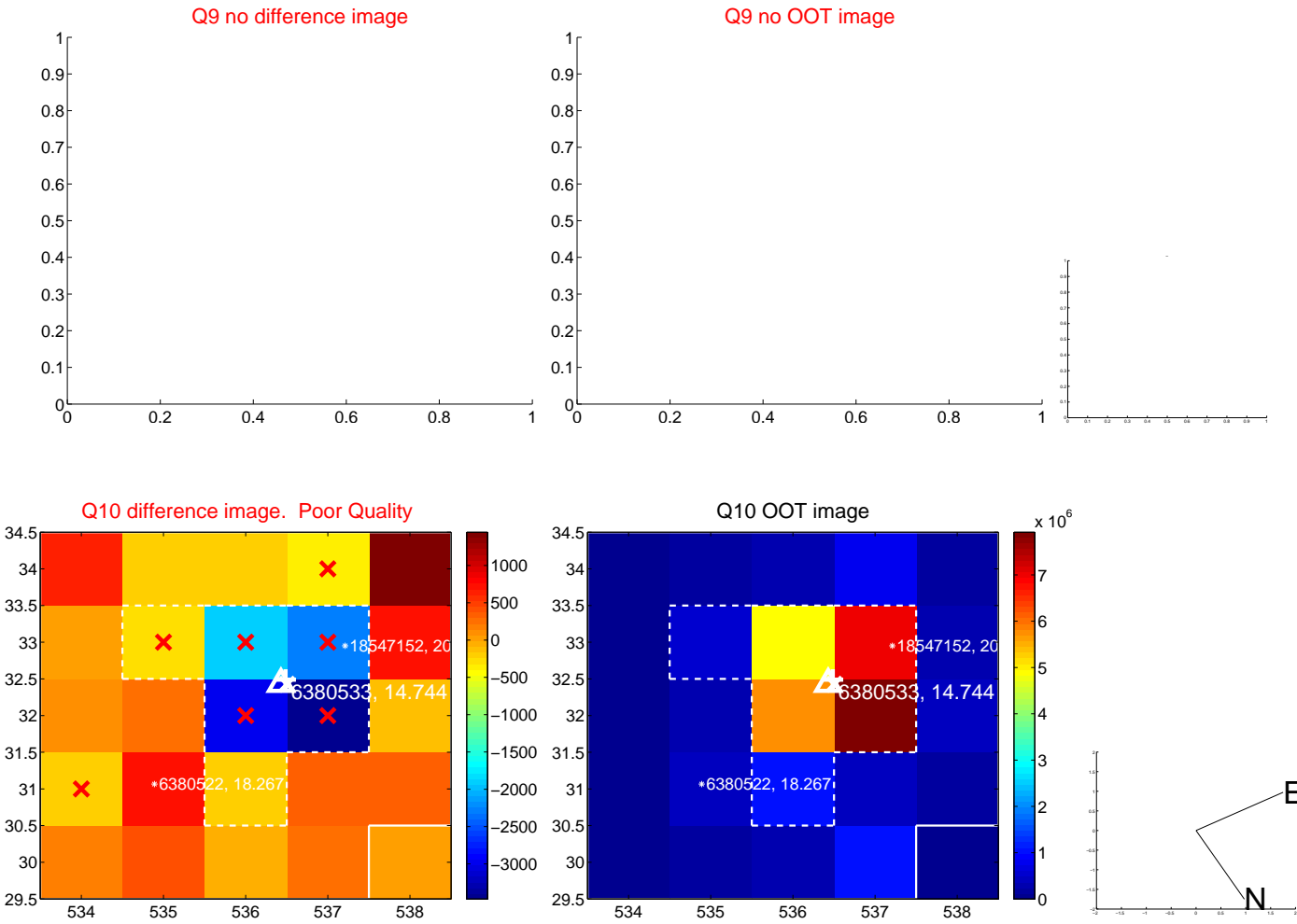
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



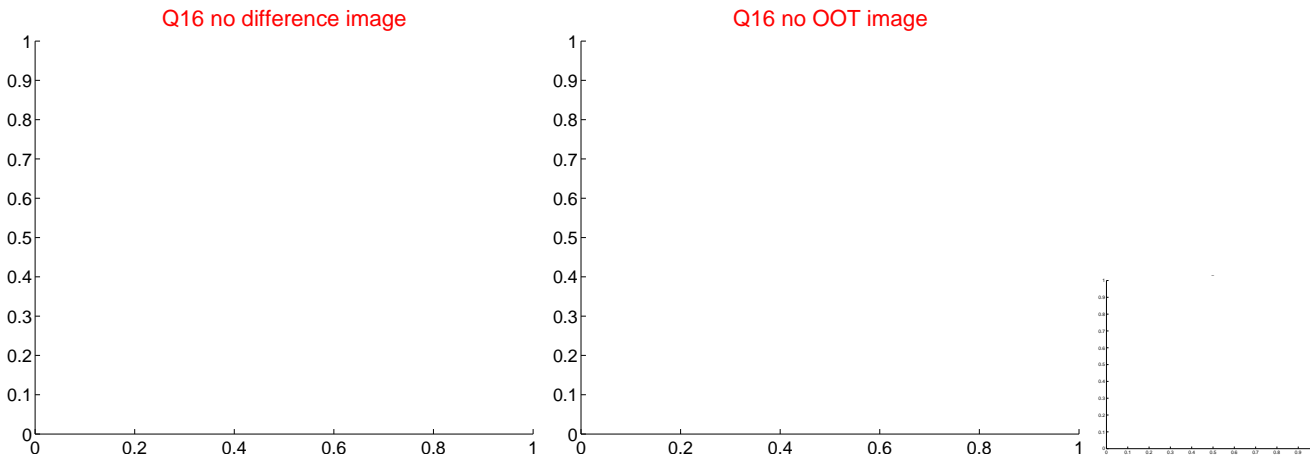
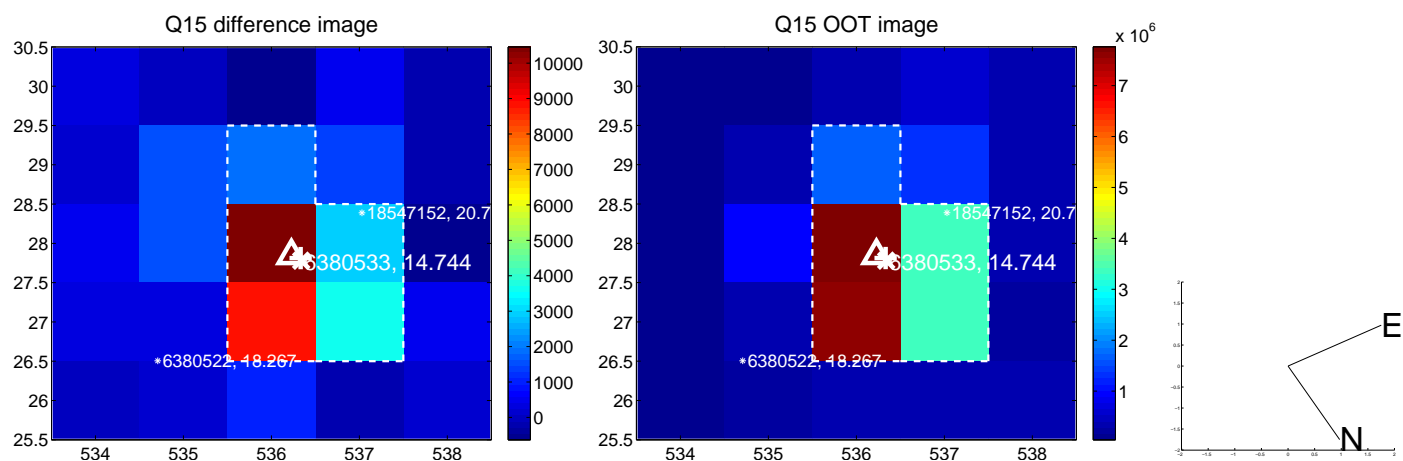
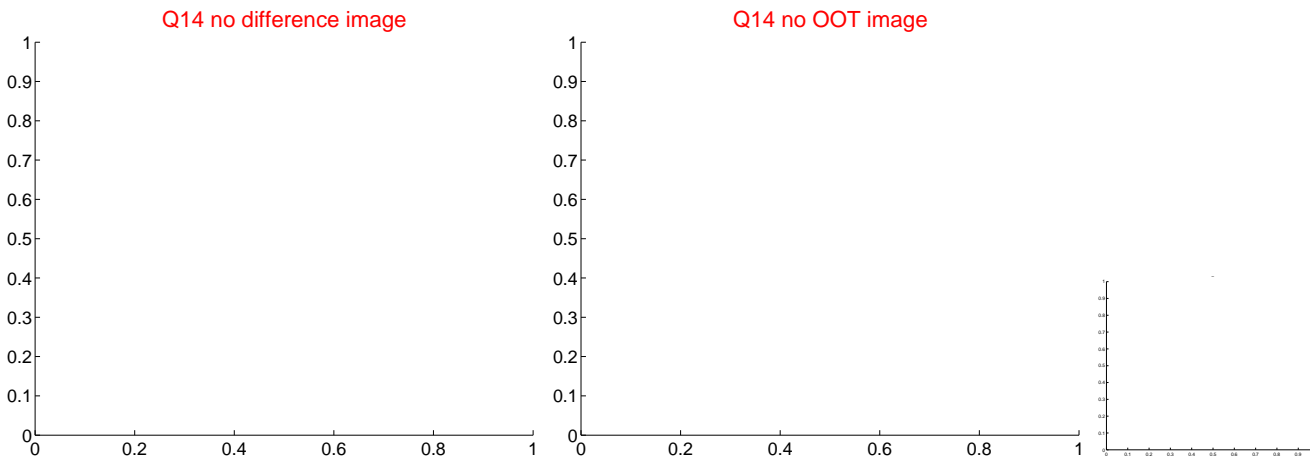
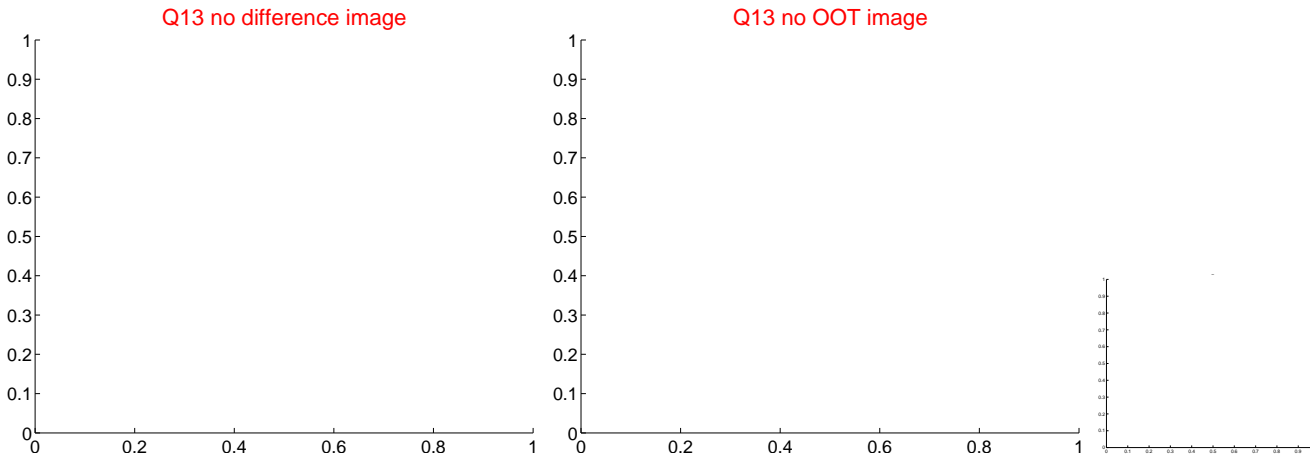
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



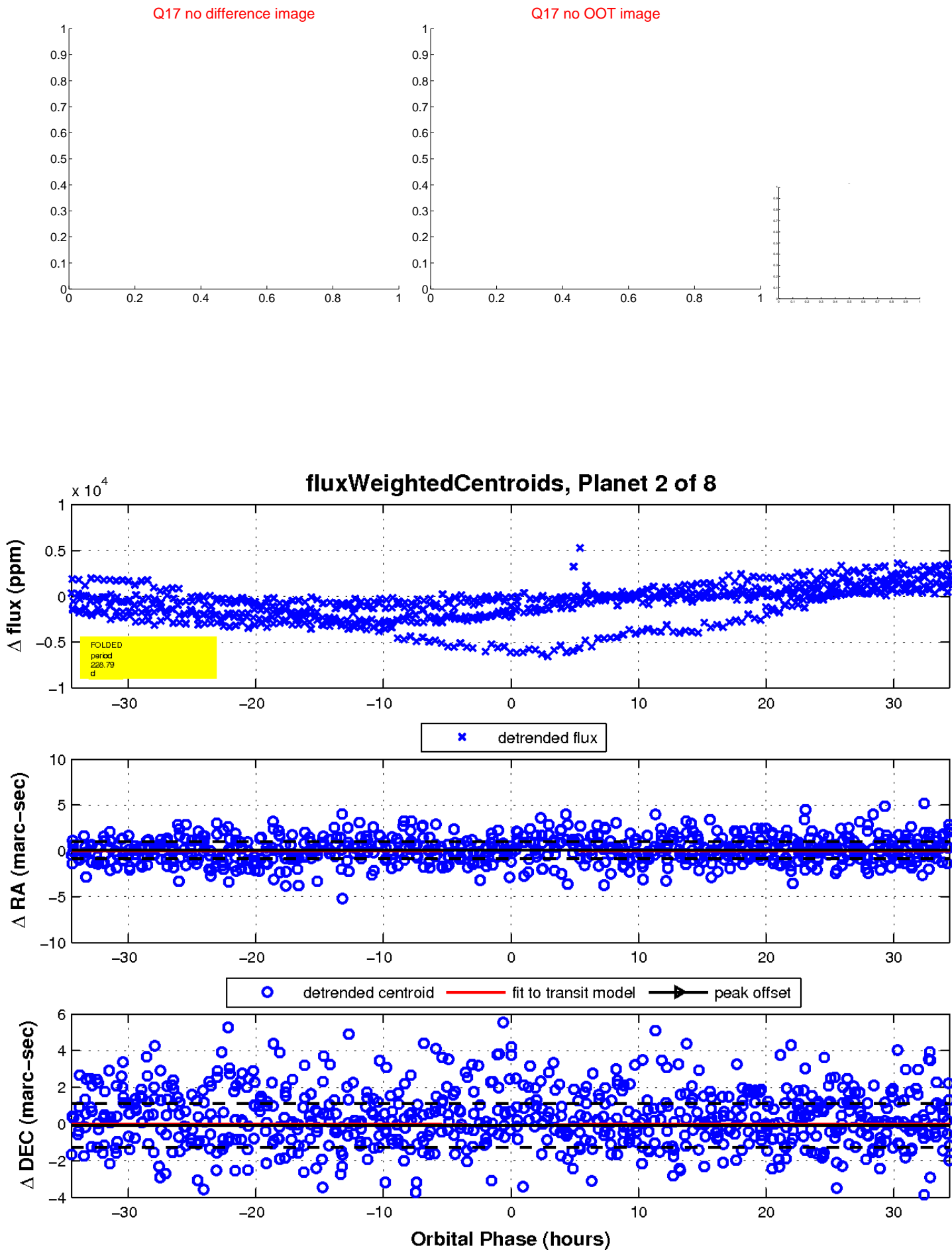
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



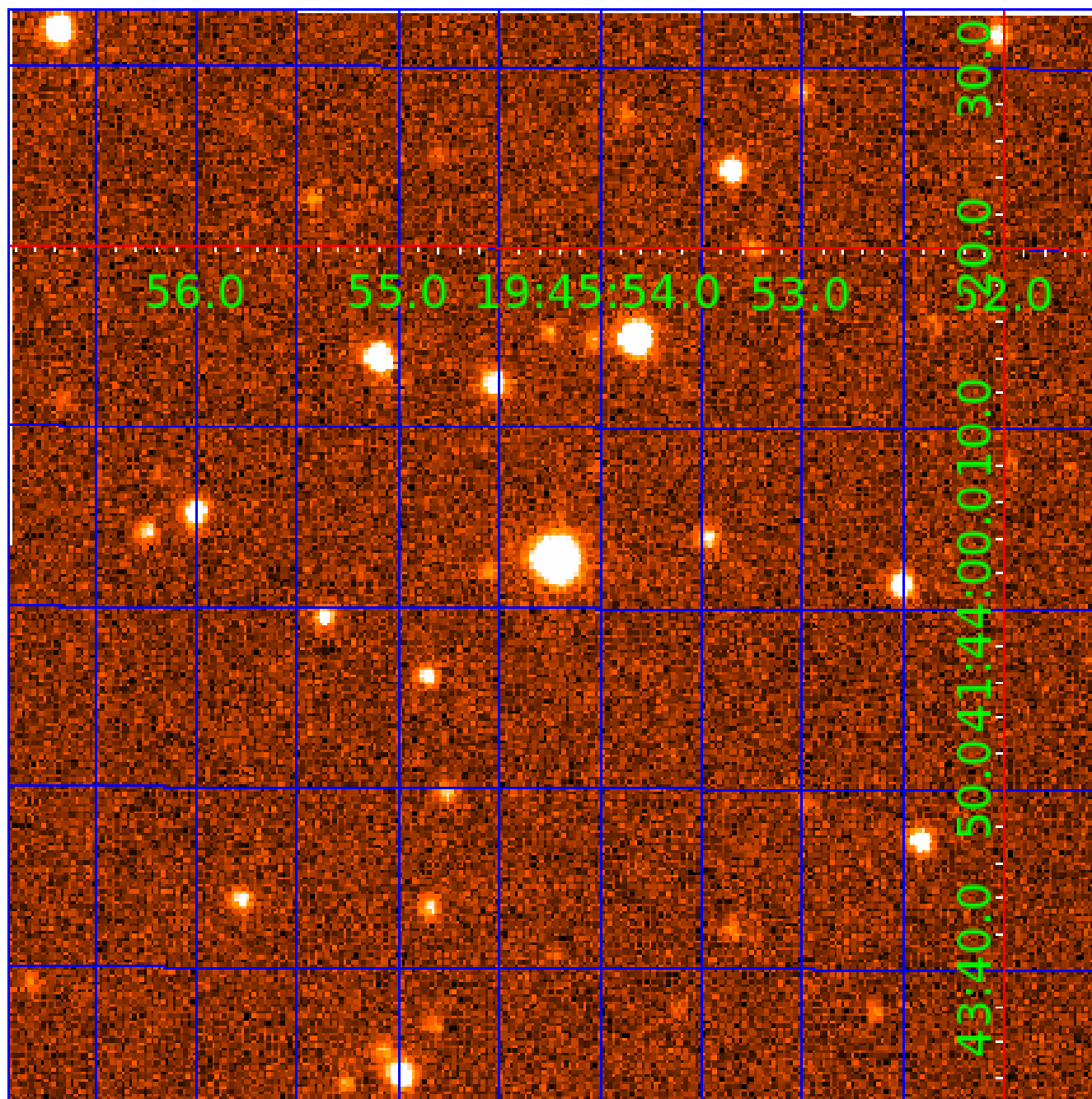
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





# UKIRT Image

Declination



# KIC 006380533

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006380533-01	OBS	No	1.533445	132.983160	56.9	6.487	7.6	9.5	0.86	5350	0.65	954.47
006380533-02	OBS	No	228.793699	305.343517	1359.4	11.513	16.3	9.5	0.86	5350	3.24	1.21
006380533-03	OBS	No	131.468842	249.832282	821.3	5.423	14.6	7.0	0.86	5350	3.19	2.52
006380533-04	OBS	No	186.433457	161.647854	1260.8	9.594	11.4	8.6	0.86	5350	6.03	1.58
006380533-05	OBS	No	169.888627	237.489259	227.4	3.274	10.4	2.0	0.86	5350	1.49	1.79
006380533-06	OBS	No	499.832334	462.264221	4839.5	38.691	9.5	10.0	0.86	5350	6.00	0.42
006380533-07	OBS	No	209.042130	167.361675	766.6	9.000	10.3	-1.0	0.86	5350	2.35	1.36
006380533-08	OBS	No	149.858044	206.101353	813.8	4.639	9.5	7.3	0.86	5350	2.69	2.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006380533-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
006380533-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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
006380533-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
006380533-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006380533-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

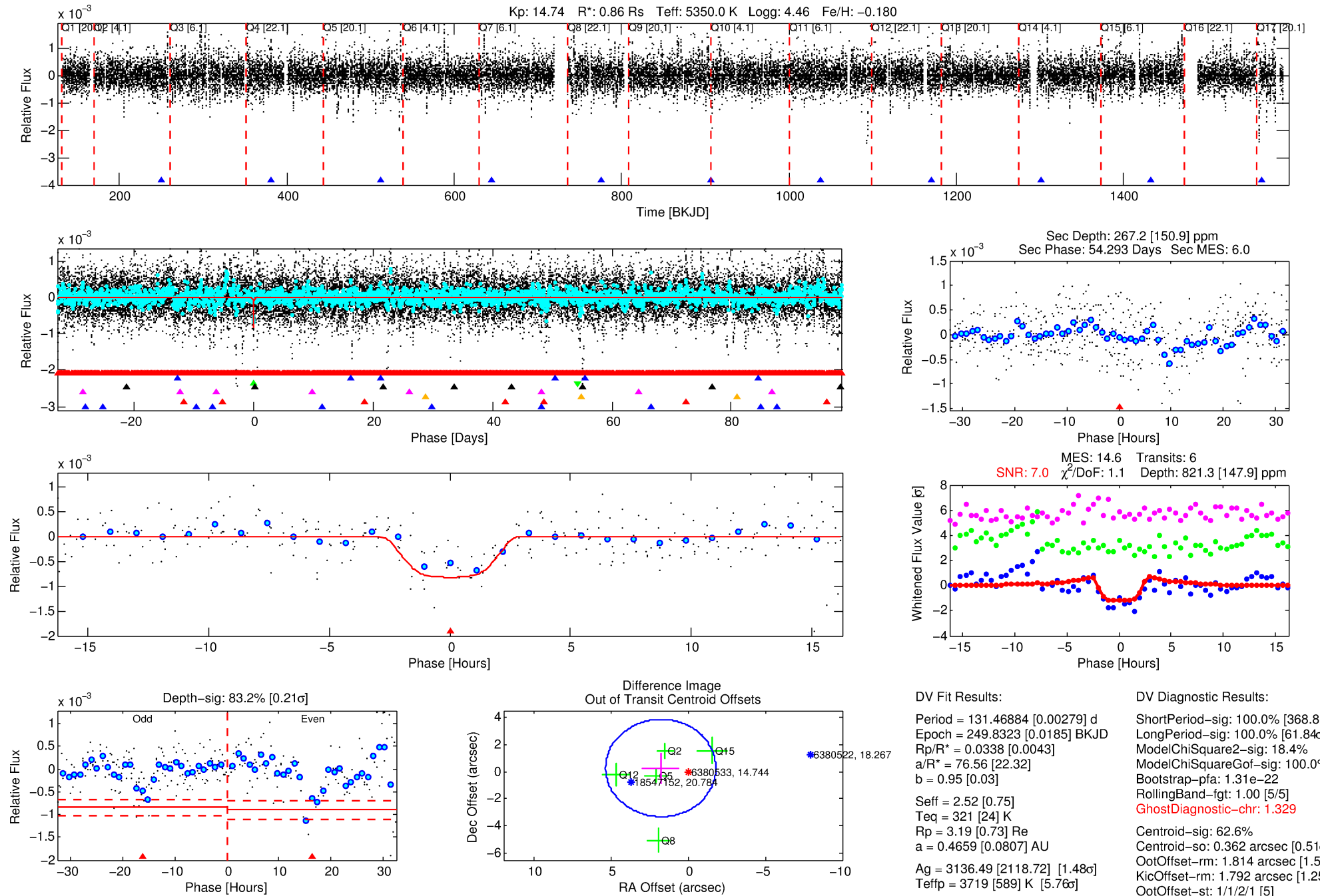
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006380533-03

No Significant Match Found

# DV One-Page Summary

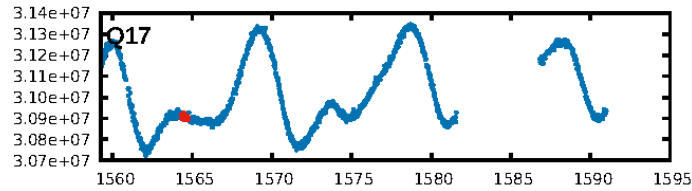
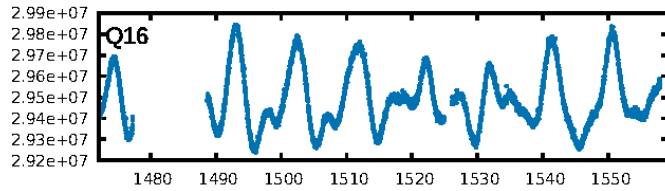
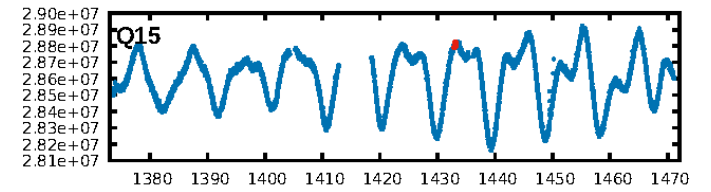
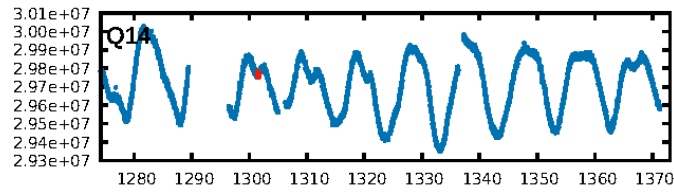
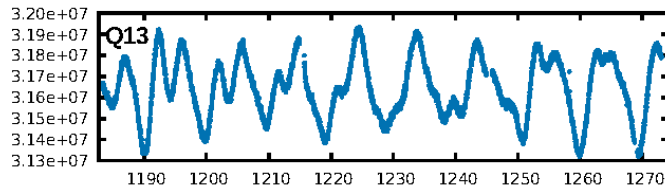
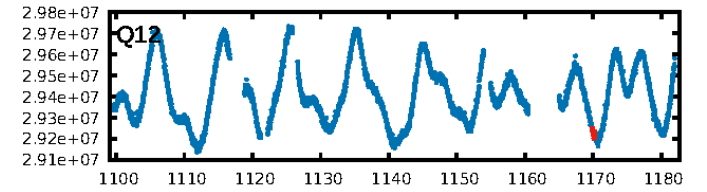
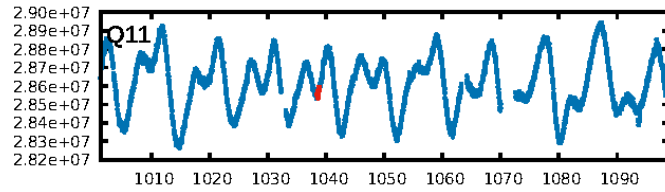
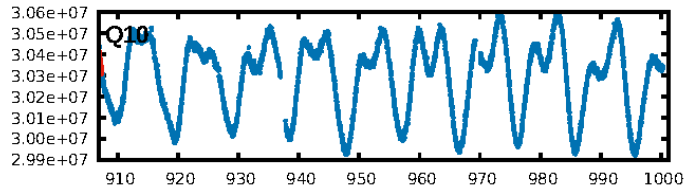
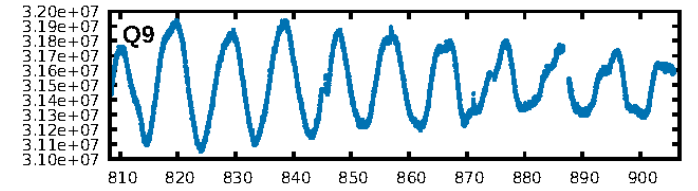
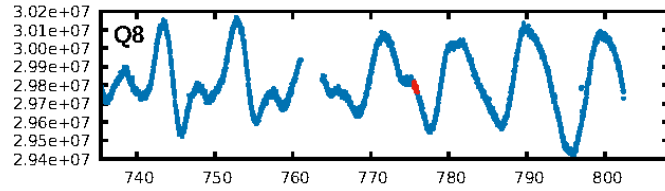
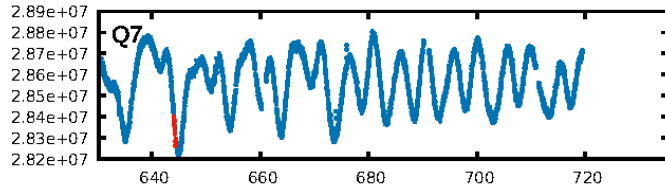
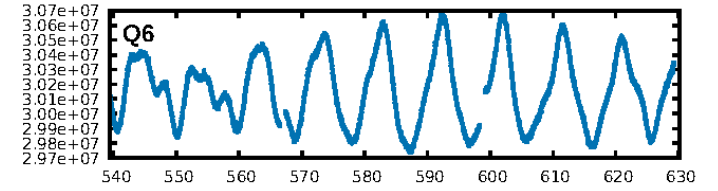
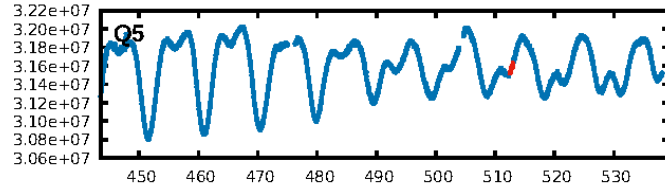
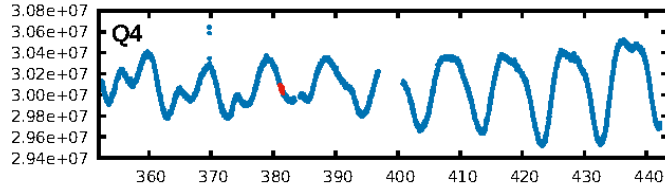
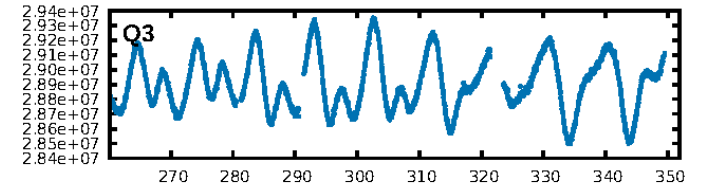
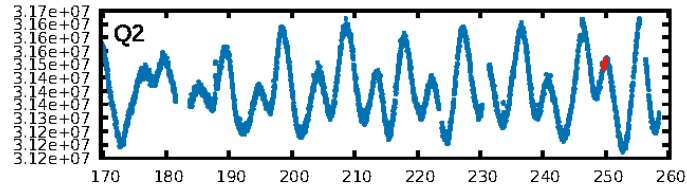
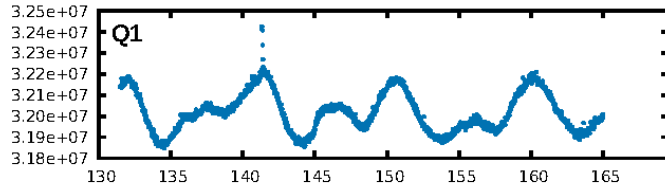
KIC: 6380533 Candidate: 3 of 8 Period: 131.469 d



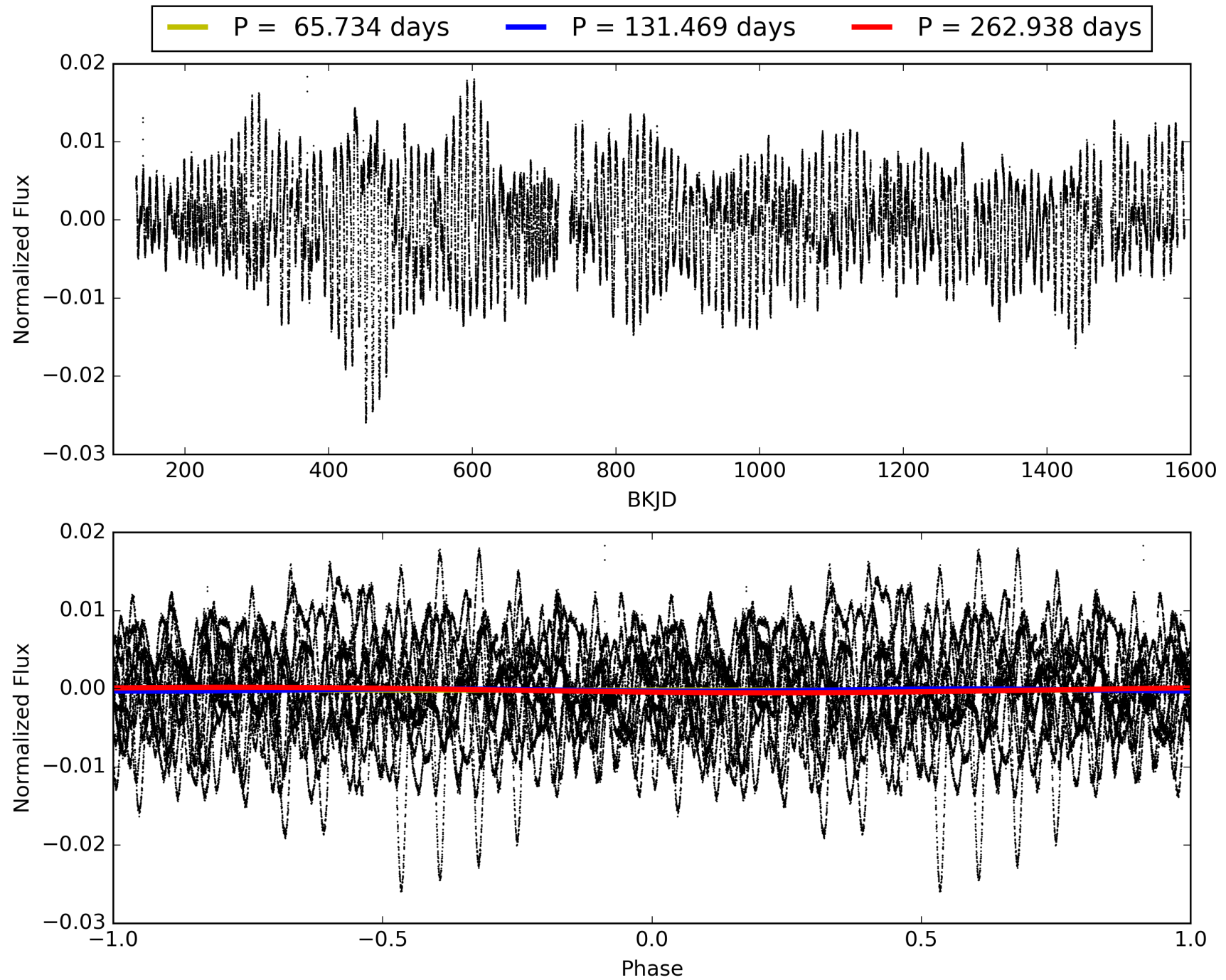
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 05:44:58 Z

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

# TCE 006380533-03, PDC Light Curves

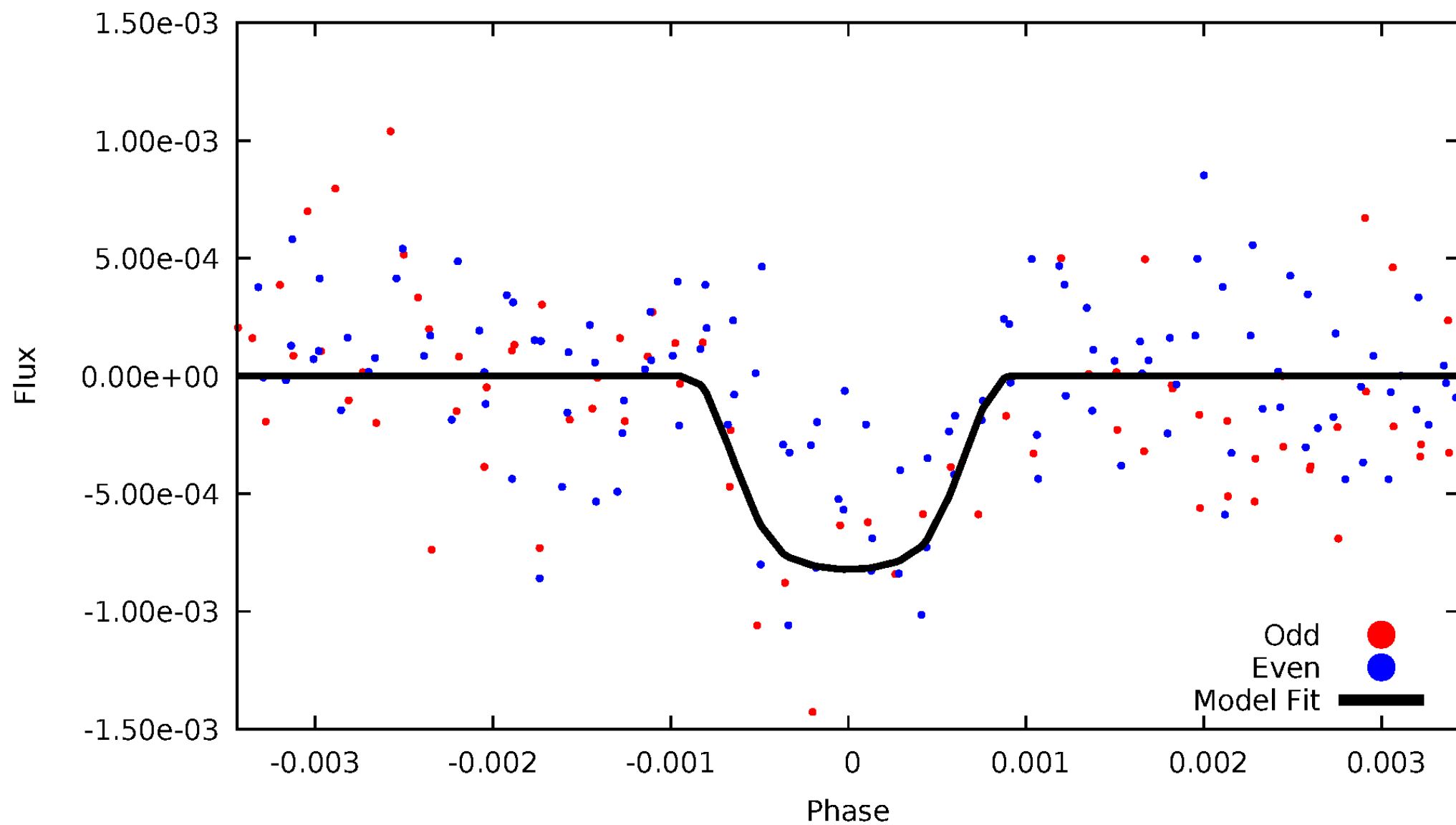


TCE 006380533-03



# DV Odd/Even

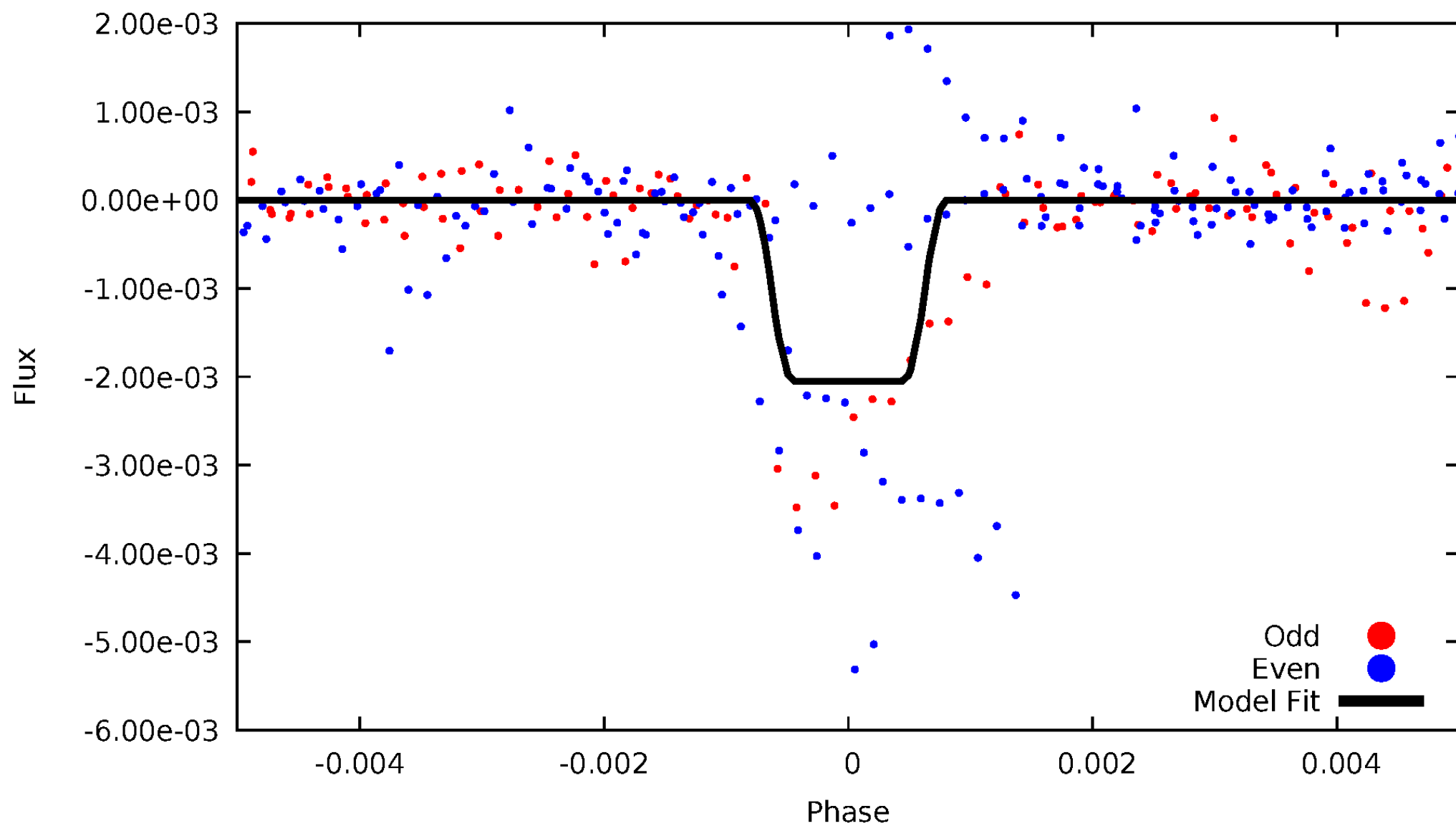
TCE 006380533-03





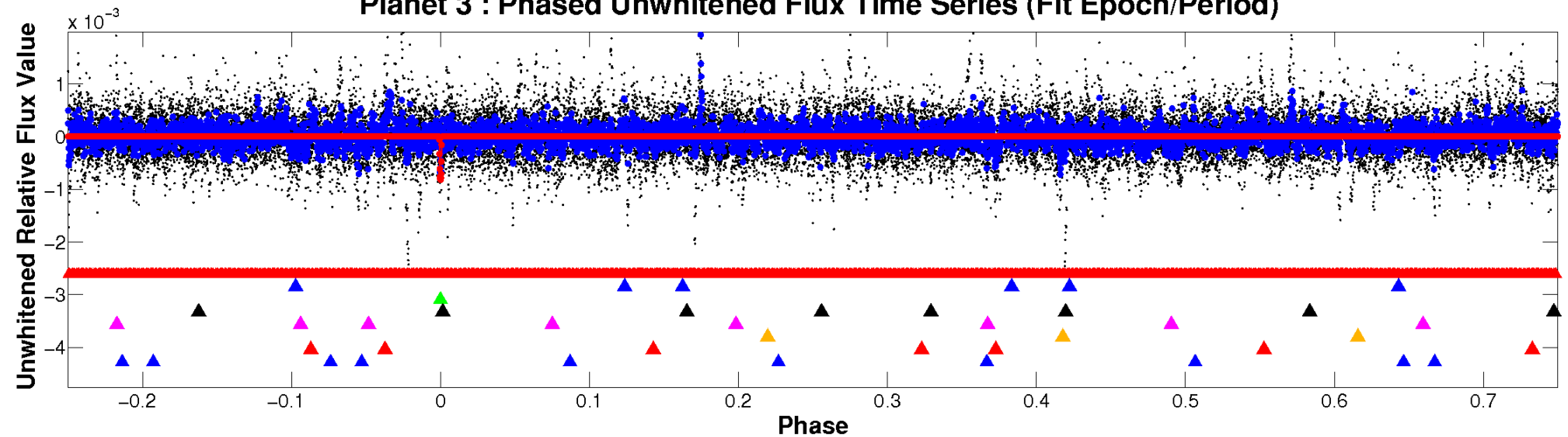
# ALT Odd/Even

TCE 006380533-03

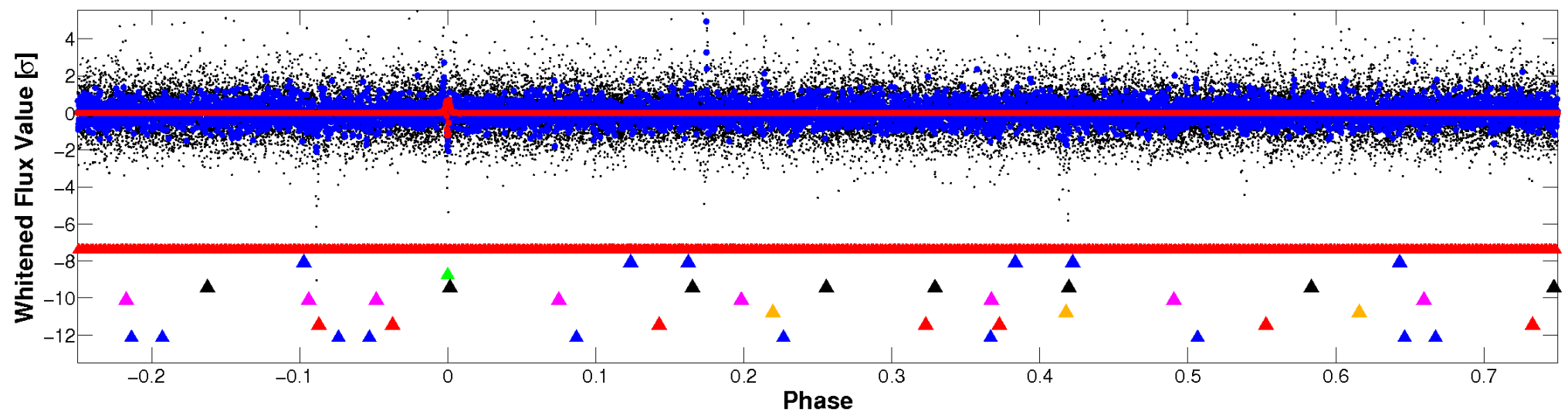


# Non-Whitened Vs. Whitened Light Curve

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

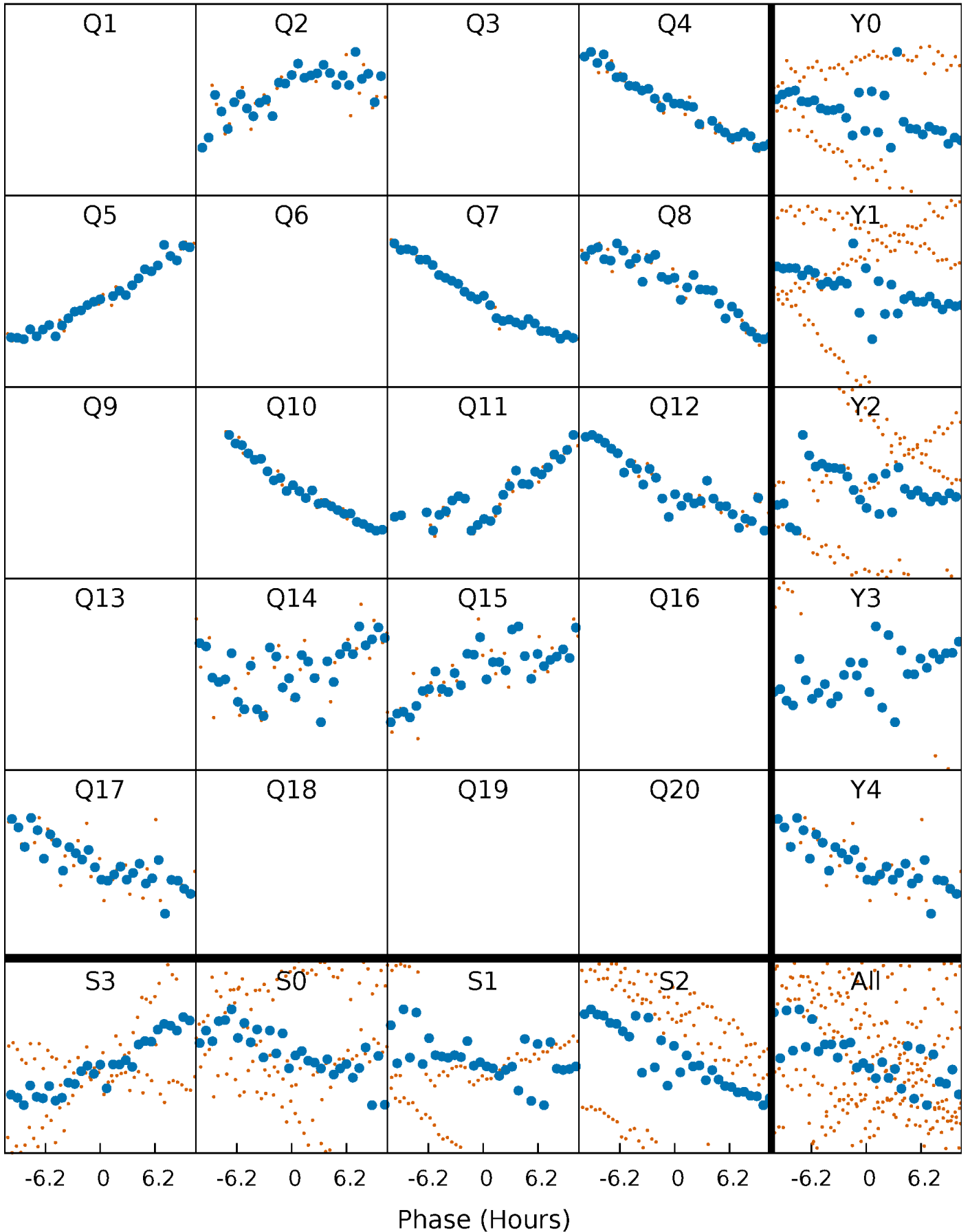


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



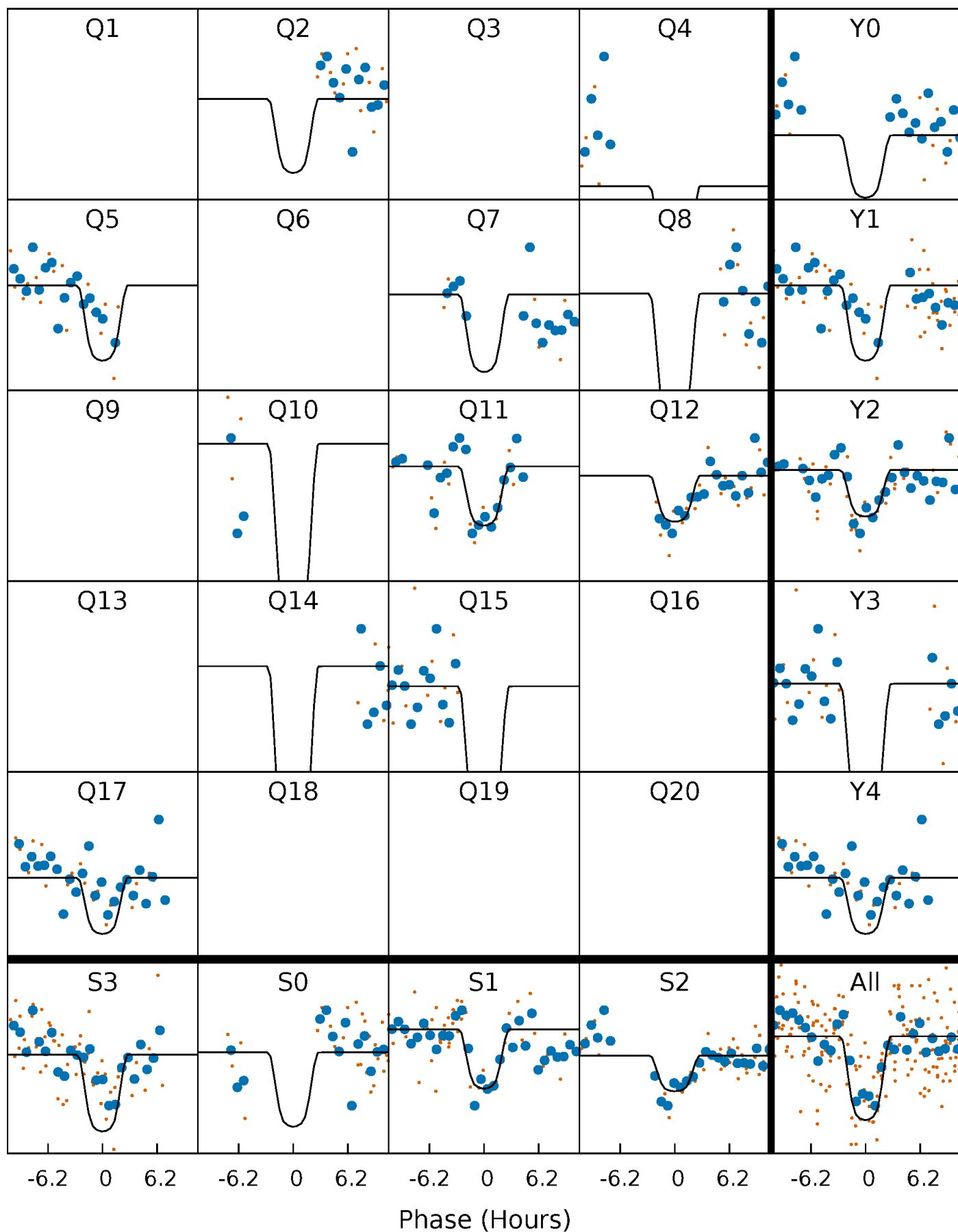
# PDC Quarter-Phased Transit Curves

TCE 006380533-03 P=131.468842 Days  $T_0=249.832282$  (BKJD)



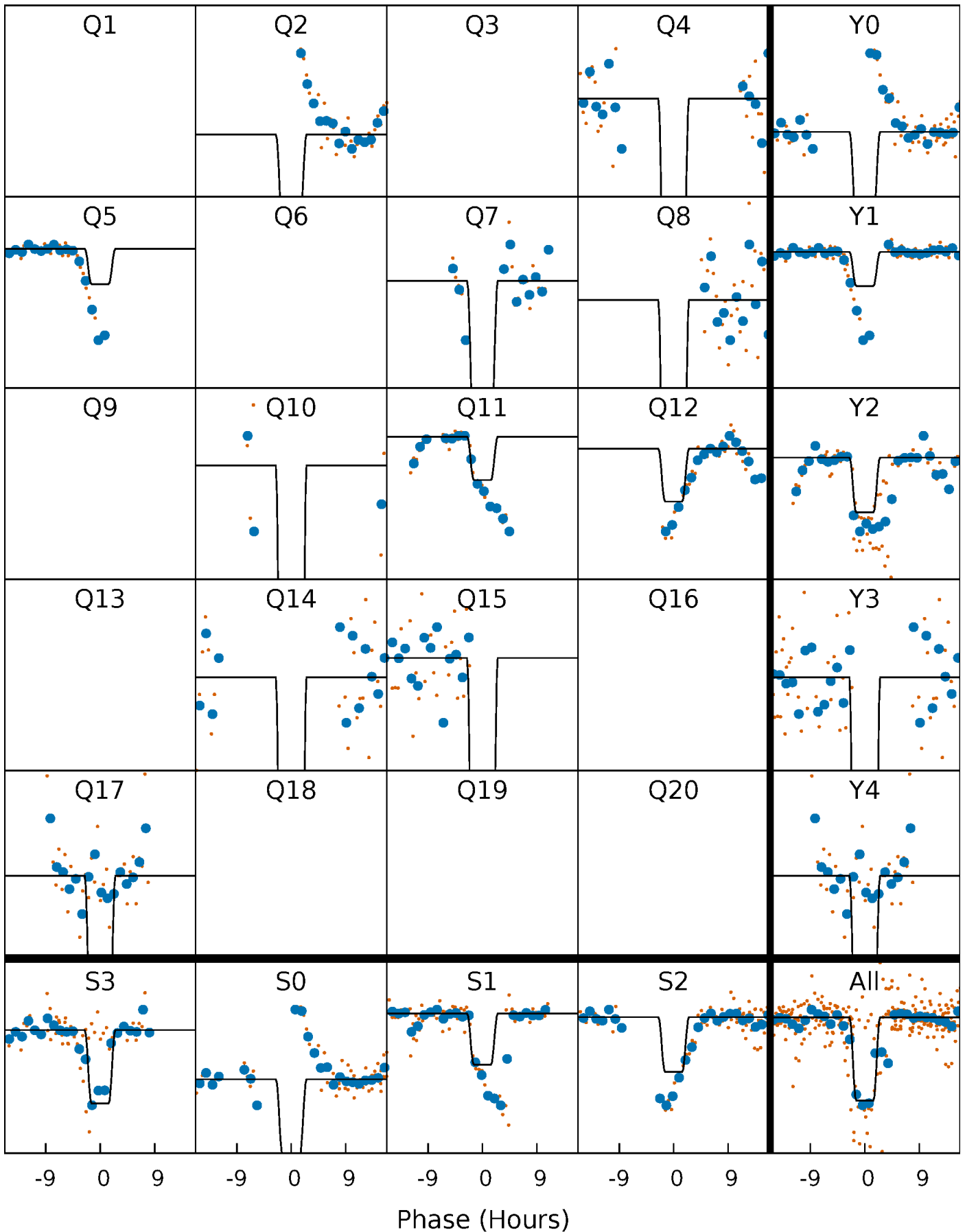
# DV Quarter-Phased Transit Curves

TCE 006380533-03 P=131.468842 Days  $T_0=249.832282$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

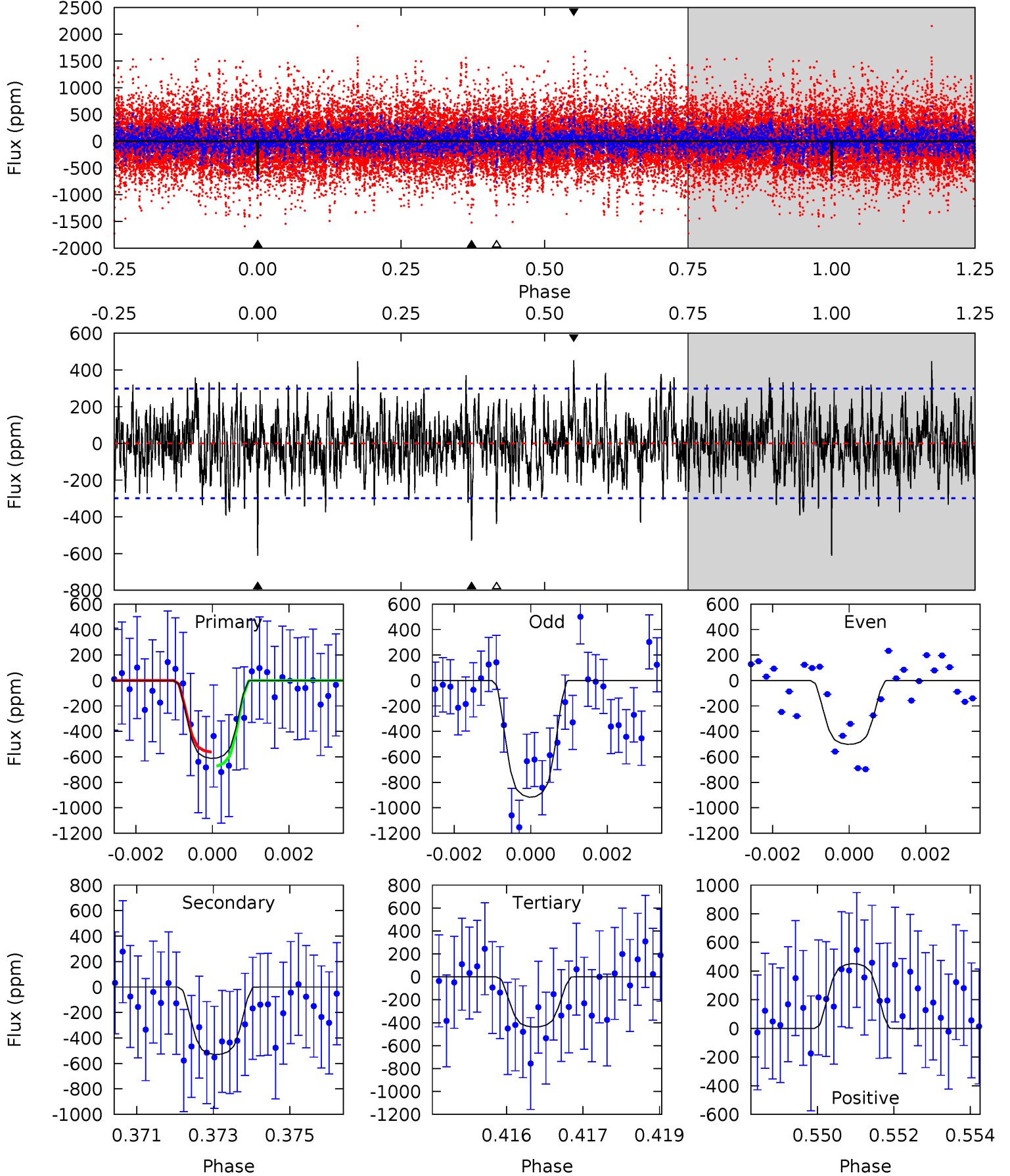
TCE 006380533-03 P=131.457105 Days  $T_0=249.902825$  (BKJD)



# DV Model-Shift Uniqueness Test

006380533-03, P = 131.468842 Days, E = 118.363440 Days

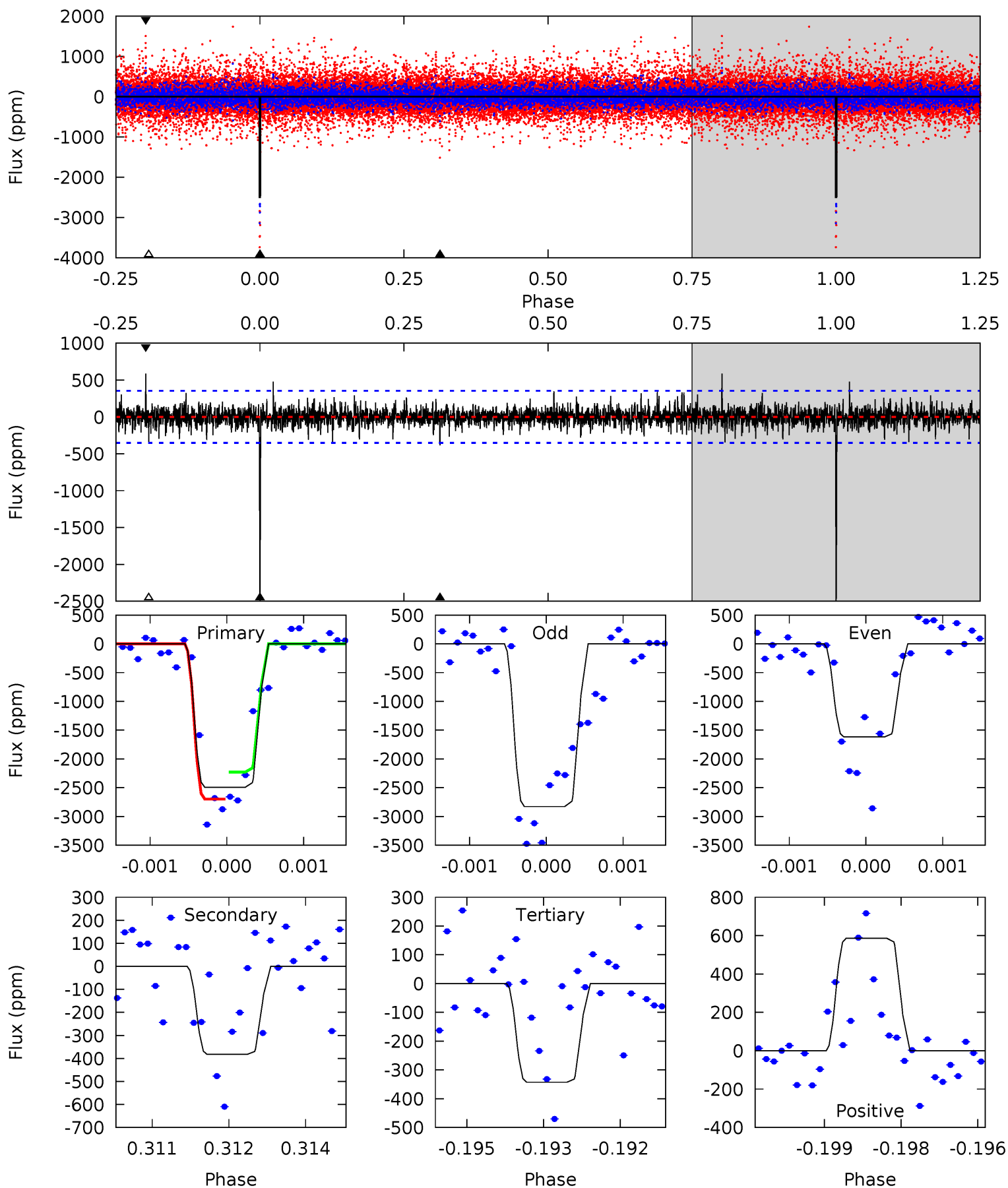
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.9	9.48	7.84	8.09	5.34	3.11	2.23	3.11	2.86	1.64	1.40	3.34	1.14	0.42	1.00



# Alt Model-Shift Uniqueness Test

006380533-03, P = 131.457105 Days, E = 118.445720 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
37.9	5.82	5.22	8.92	5.38	3.18	1.26	32.7	29.0	0.60	-3.11	8.20	0.59	0.19	3.57





### Stellar Parameters For KIC 006380533

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5350^{+175}_{-159}$	$4.457^{+0.112}_{-0.154}$	$-0.180^{+0.300}_{-0.300}$	$0.864^{+0.164}_{-0.119}$	$0.780^{+0.122}_{-0.061}$	$1.702^{+0.882}_{-0.721}$
	+3%/-3%	+3%/-3%	+167%/-167%	+19%/-14%	+16%/-8%	+52%/-42%
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 006380533-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-530 \pm 56$	$3.23^{+0.57}_{-0.47}$	$452^{+26}_{-22}$	$4557^{+320}_{-251}$	$6089^{+2525}_{-1761}$
Alt.	$-382 \pm 66$	$4.35^{+0.59}_{-0.55}$	$454^{+26}_{-24}$	$3866^{+190}_{-184}$	$2411^{+910}_{-640}$

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

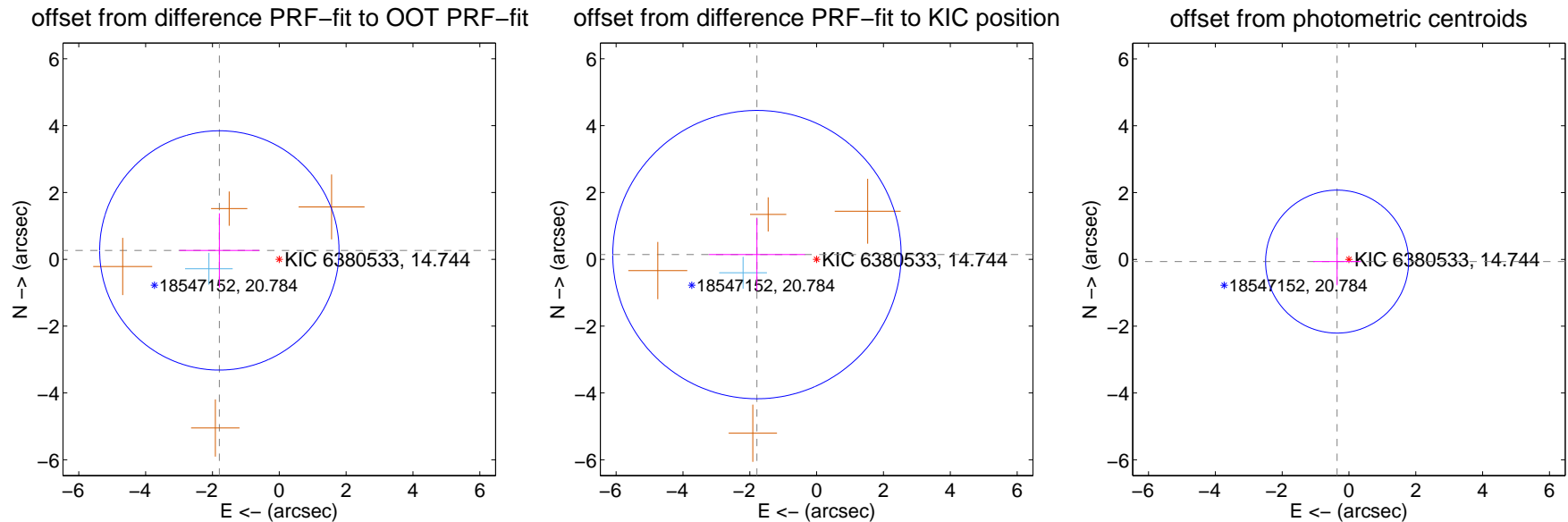
## DV Centroid Data

Supplemental centroid analysis for 006380533-03. Kepler magnitude: 14.74. Transit SNR 6.97

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.814 \pm 1.194$	1.52	$1.794 \pm 1.195$	$0.266 \pm 1.111$
PRF-fit source offset from KIC position	$1.792 \pm 1.438$	1.25	$1.786 \pm 1.440$	$0.141 \pm 1.081$
photometric centroid source offset	$0.36 \pm 0.71$	0.51	$0.36 \pm 0.71$	$-0.07 \pm 0.71$



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.

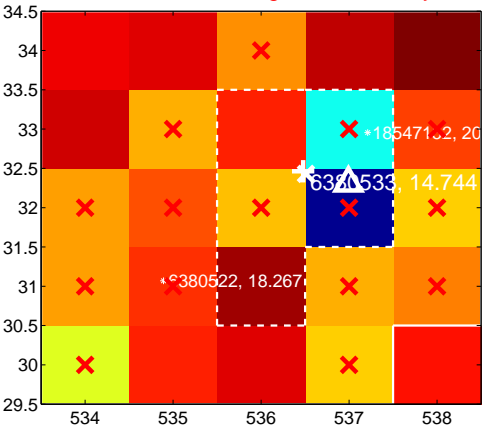
Q1 no difference image



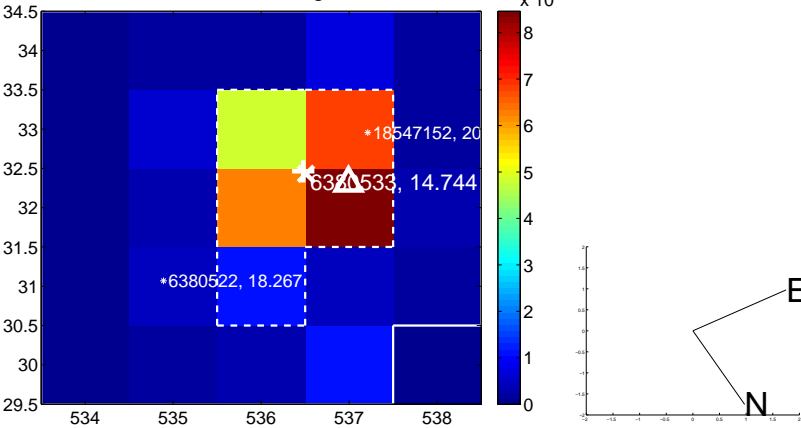
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



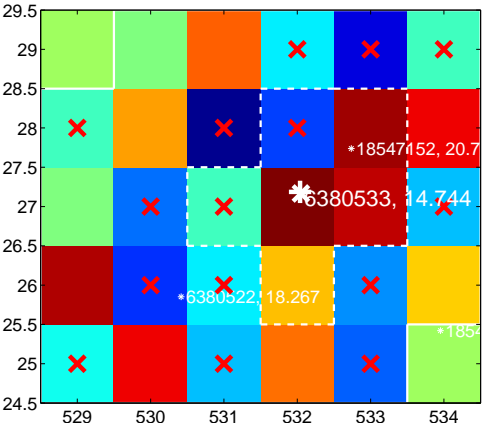
Q3 no difference image



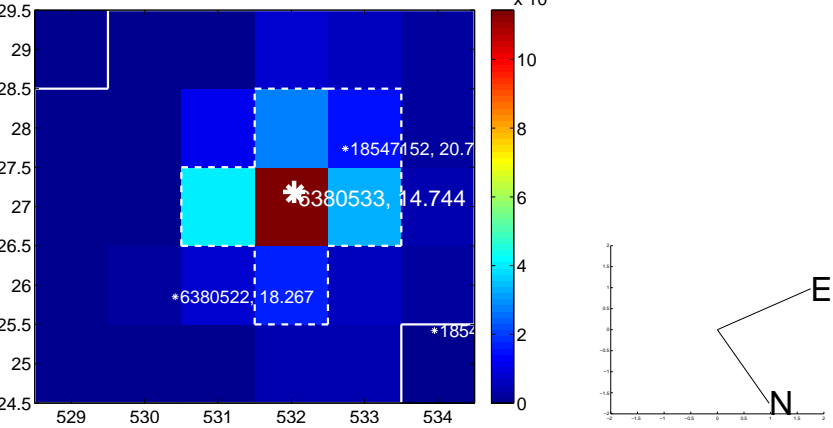
Q3 no OOT image



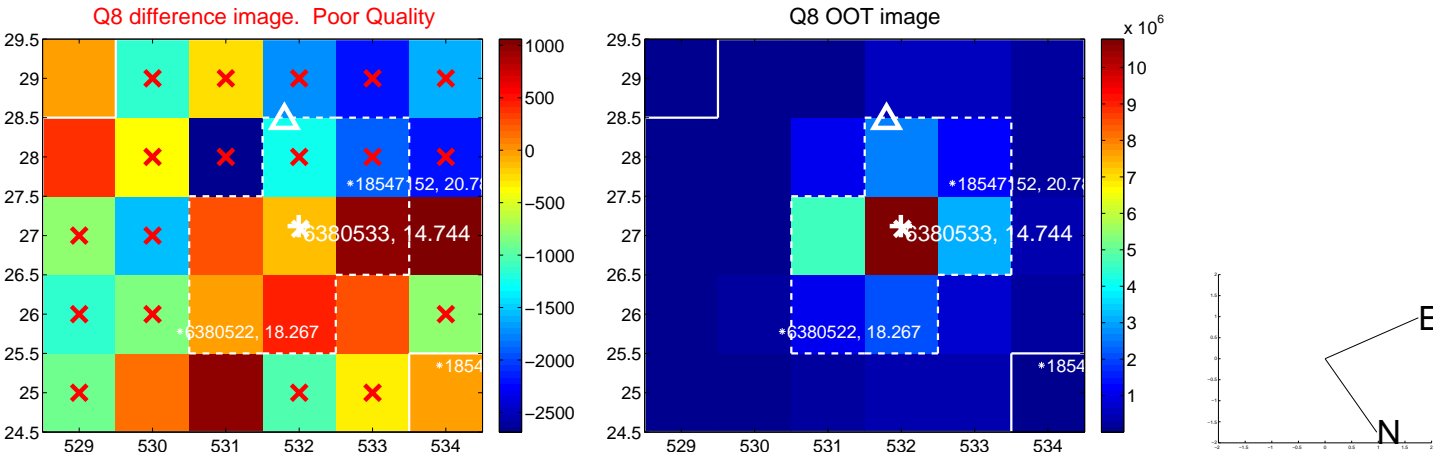
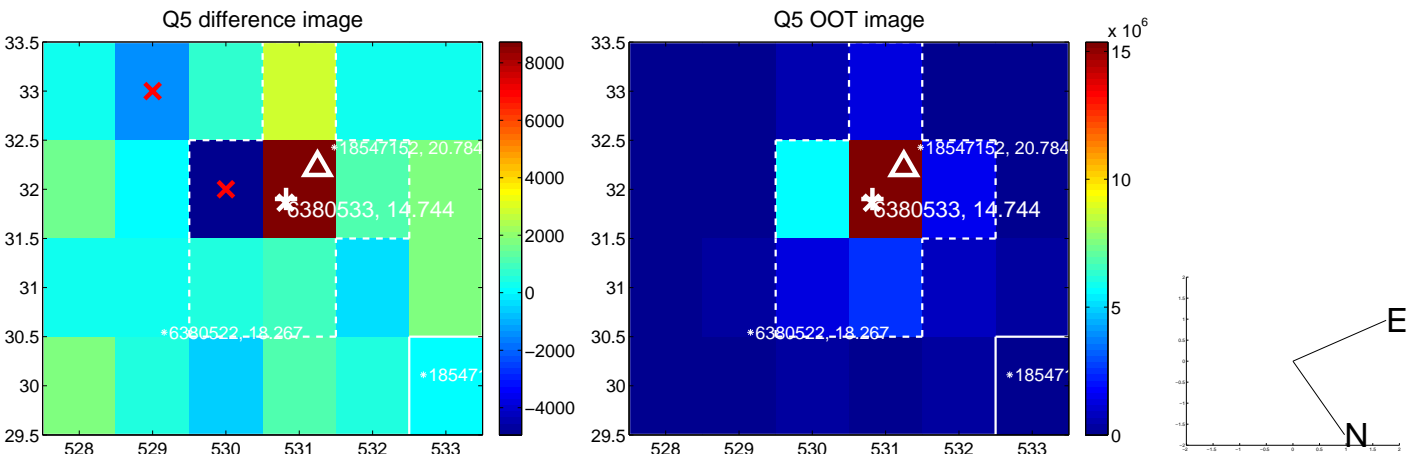
Q4 difference image. Poor Quality



Q4 OOT image



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



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

Q9 no difference image



Q9 no OOT image



Q10 no difference image



Q10 no OOT image



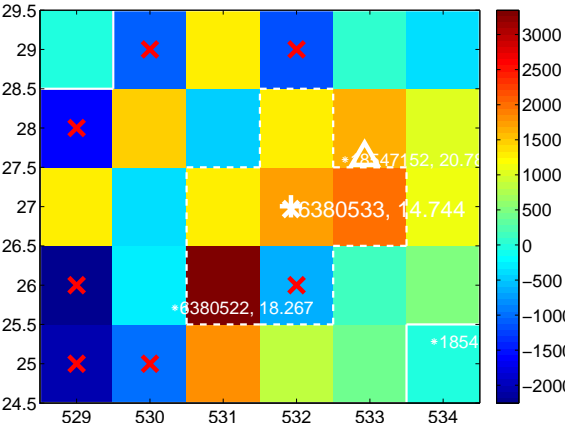
Q11 no difference image



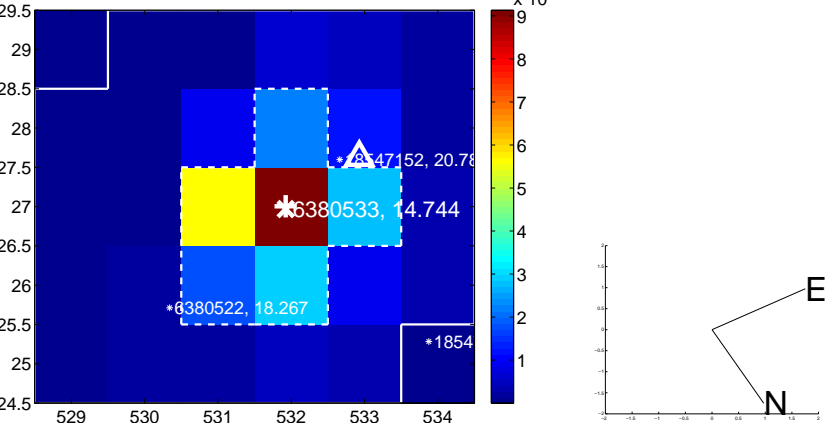
Q11 no OOT image



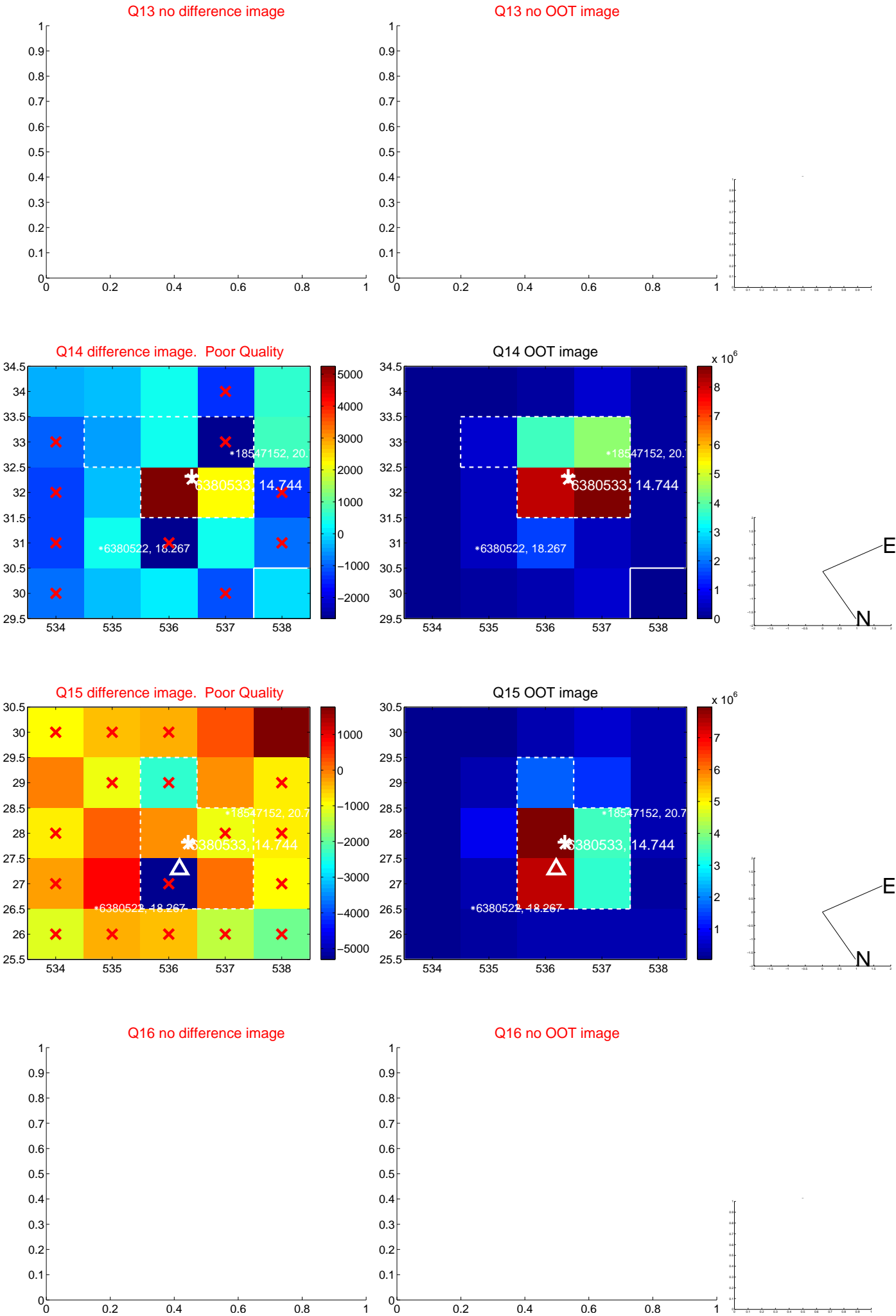
Q12 difference image. Poor Quality



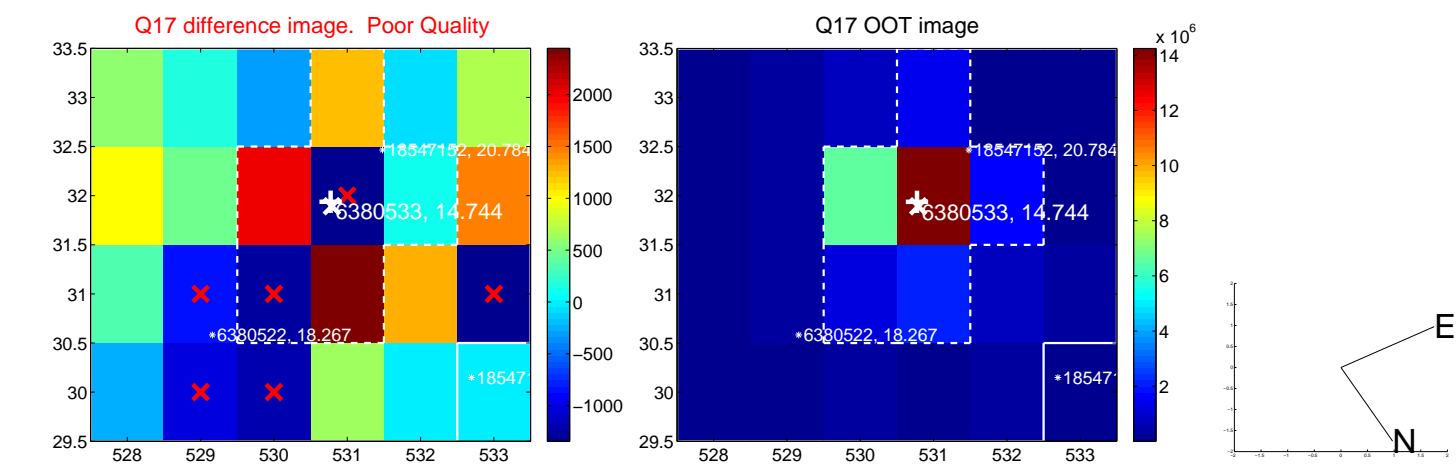
Q12 OOT image



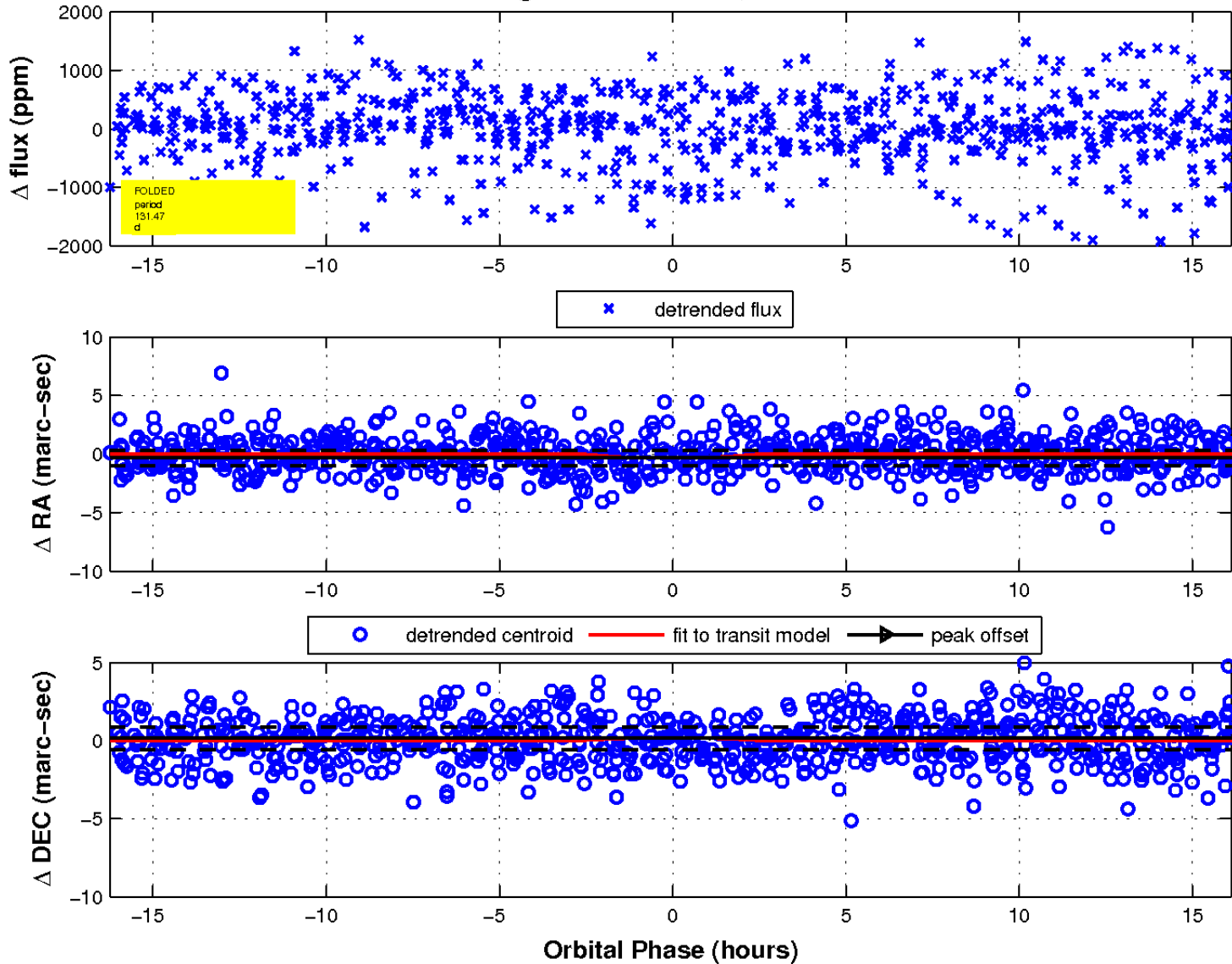
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



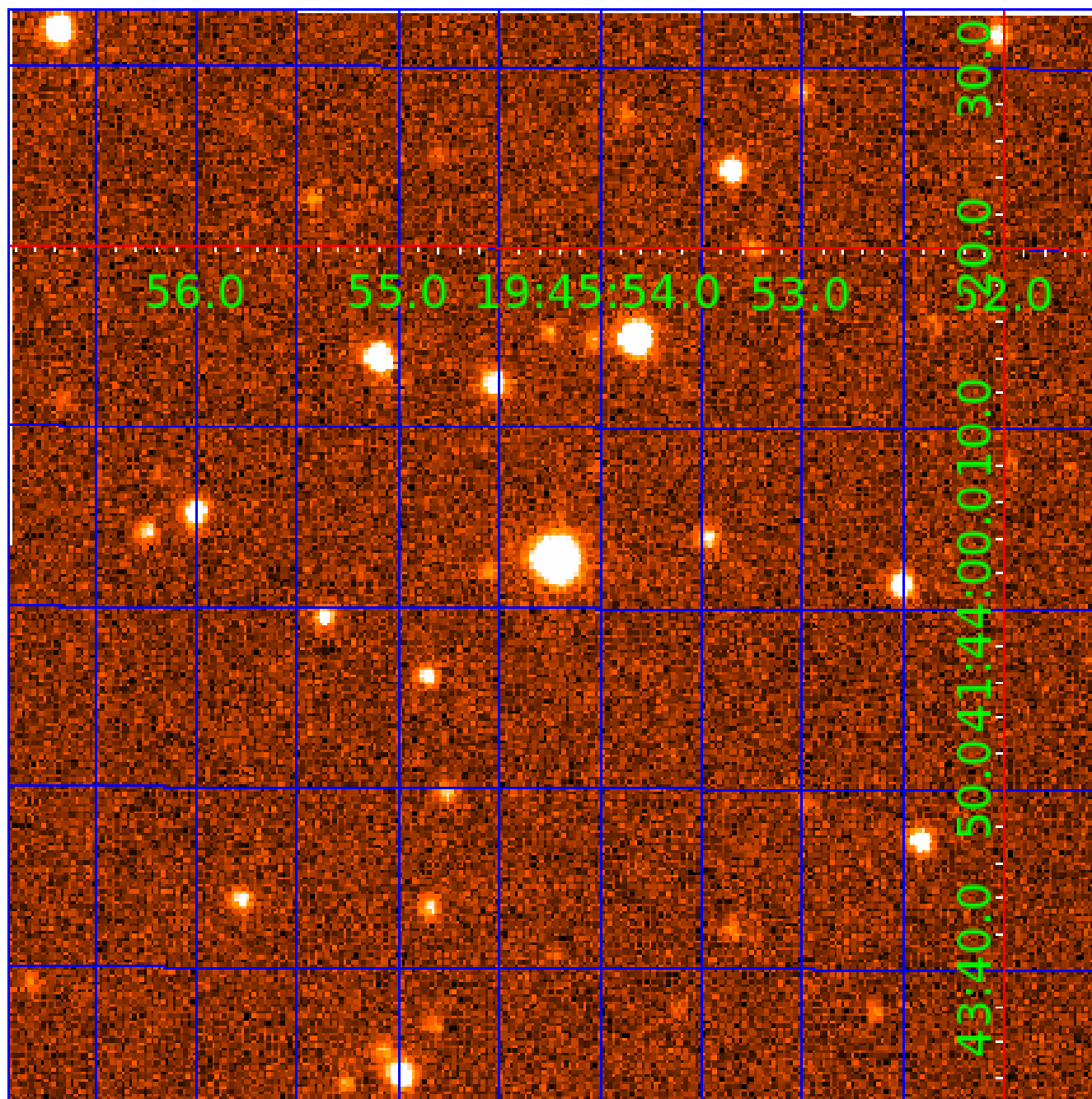
fluxWeightedCentroids, Planet 3 of 8





# UKIRT Image

Declination



# KIC 006380533

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006380533-01	OBS	No	1.533445	132.983160	56.9	6.487	7.6	9.5	0.86	5350	0.65	954.47
006380533-02	OBS	No	228.793699	305.343517	1359.4	11.513	16.3	9.5	0.86	5350	3.24	1.21
006380533-03	OBS	No	131.468842	249.832282	821.3	5.423	14.6	7.0	0.86	5350	3.19	2.52
006380533-04	OBS	No	186.433457	161.647854	1260.8	9.594	11.4	8.6	0.86	5350	6.03	1.58
006380533-05	OBS	No	169.888627	237.489259	227.4	3.274	10.4	2.0	0.86	5350	1.49	1.79
006380533-06	OBS	No	499.832334	462.264221	4839.5	38.691	9.5	10.0	0.86	5350	6.00	0.42
006380533-07	OBS	No	209.042130	167.361675	766.6	9.000	10.3	-1.0	0.86	5350	2.35	1.36
006380533-08	OBS	No	149.858044	206.101353	813.8	4.639	9.5	7.3	0.86	5350	2.69	2.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006380533-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
006380533-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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
006380533-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
006380533-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006380533-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

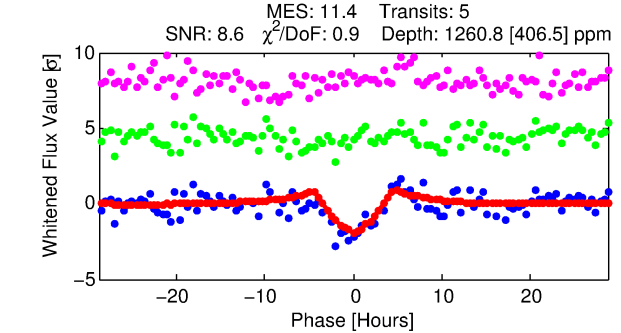
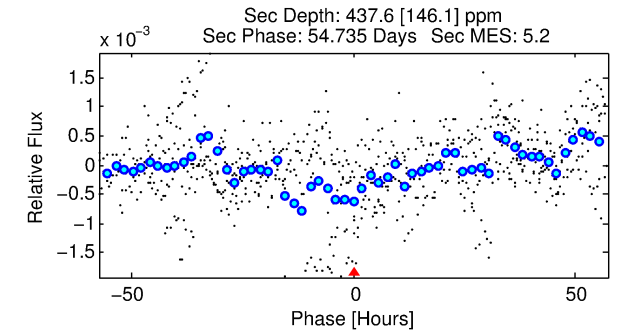
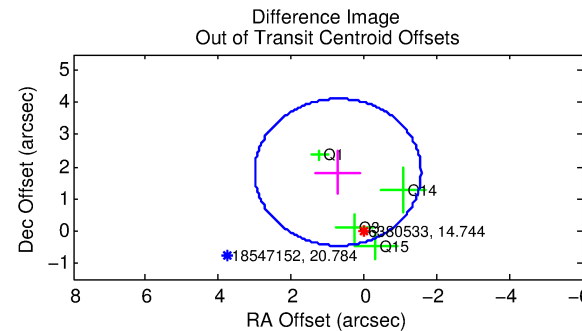
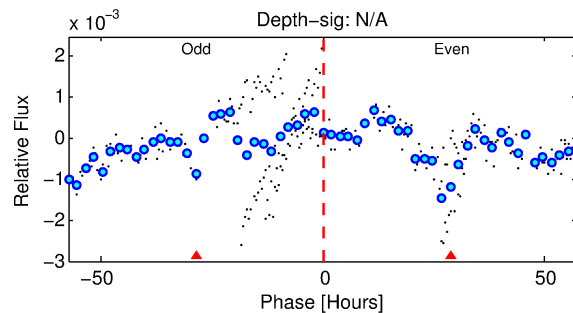
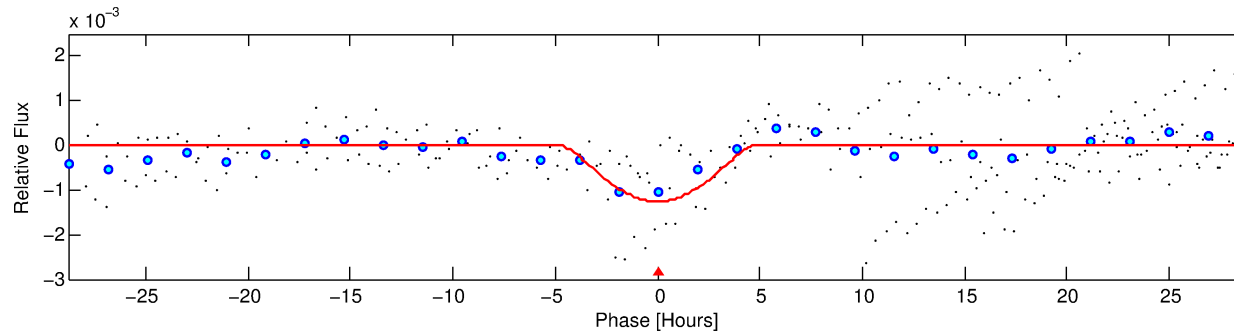
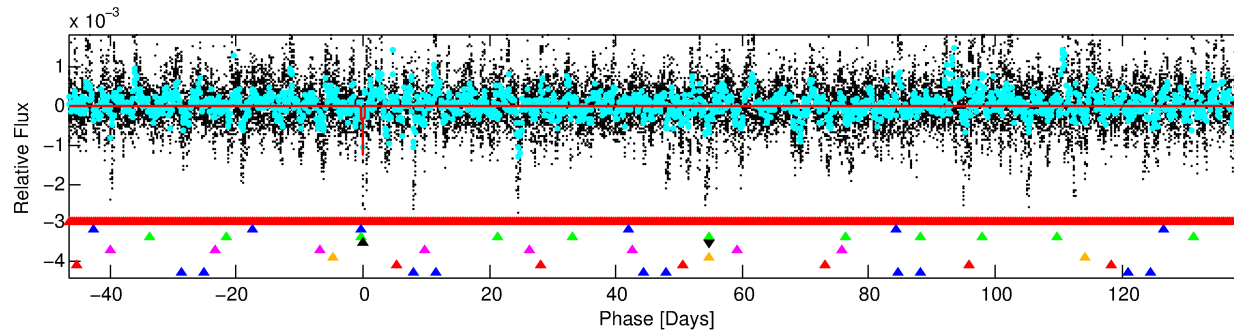
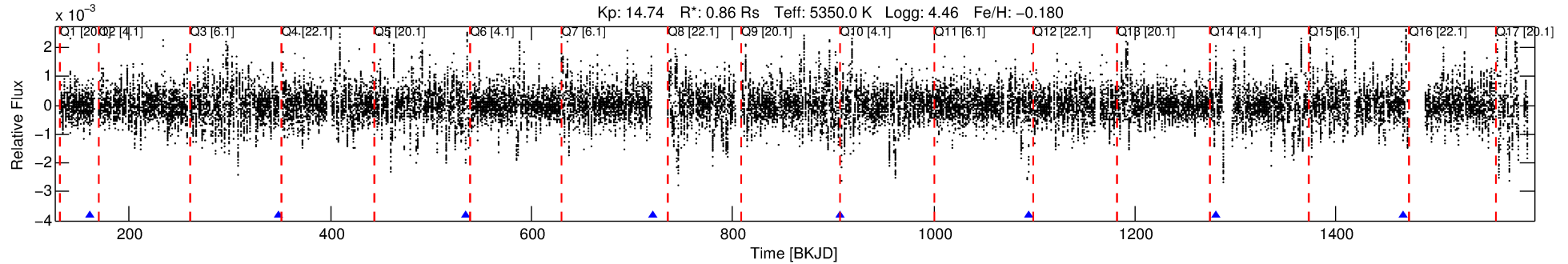
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006380533-04

No Significant Match Found

# DV One-Page Summary

KIC: 6380533 Candidate: 4 of 8 Period: 186.433 d



## DV Fit Results:

Period = 186.43346 [0.00391] d  
Epoch = 161.6479 [0.0161] BKJD  
Rp/R\* = 0.0640 [0.1810]  
a/R\* = 54.07 [34.80]  
b = 1.00 [0.27]  
Seff = 1.58 [0.47]  
Teq = 286 [21] K  
Rp = 6.03 [17.10] Re  
a = 0.5880 [0.1018] AU  
Ag = 2288.10 [12984.74] [0.18σ]  
Teff = 3059 [4337] K [0.64σ]

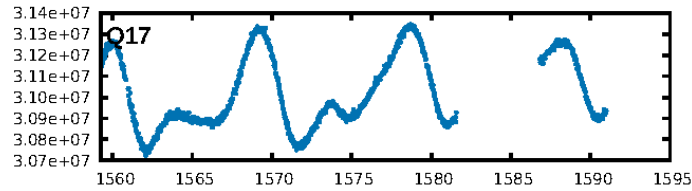
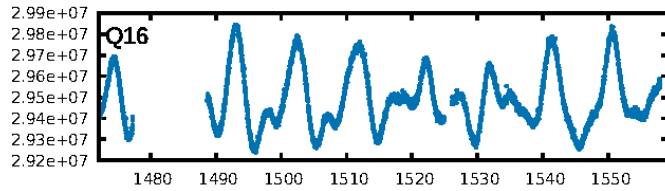
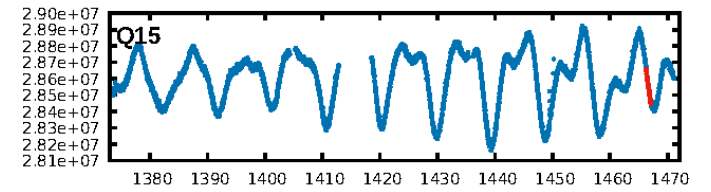
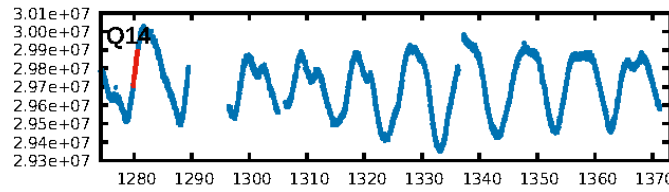
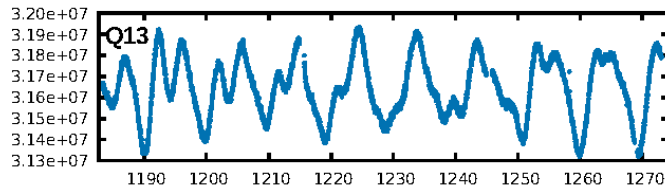
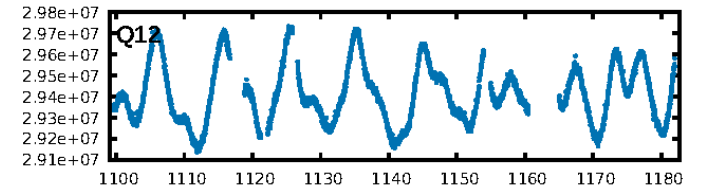
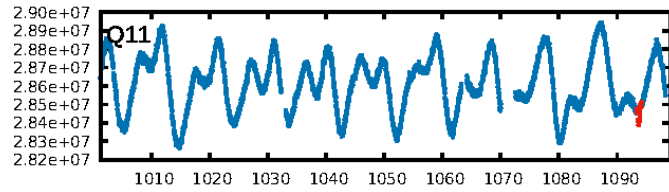
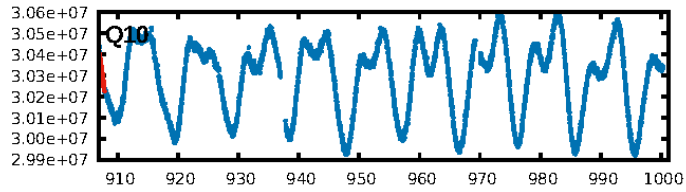
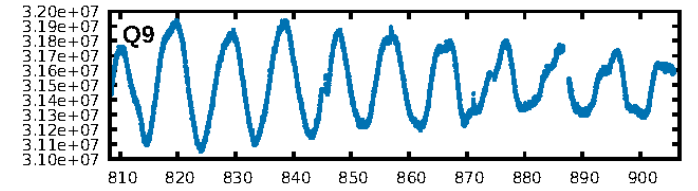
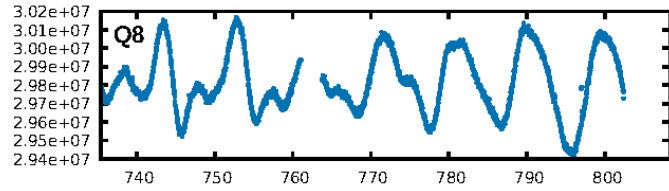
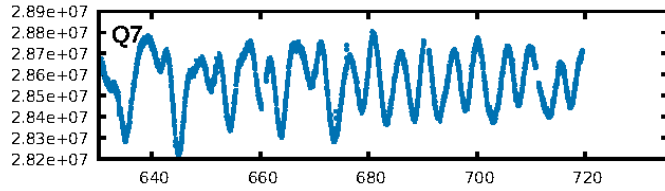
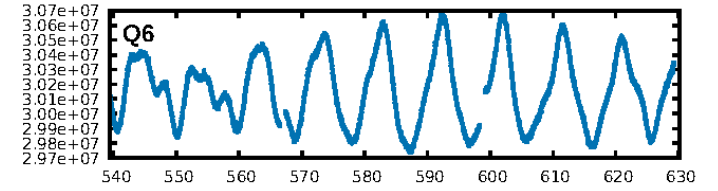
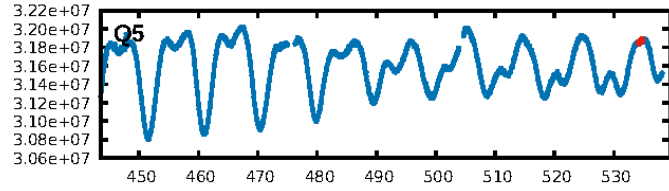
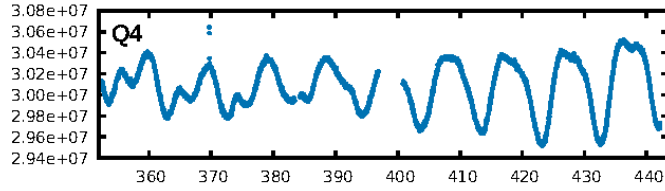
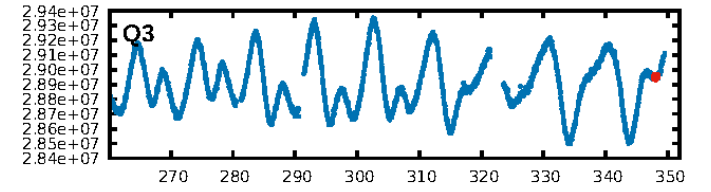
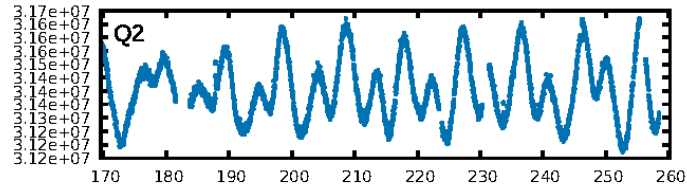
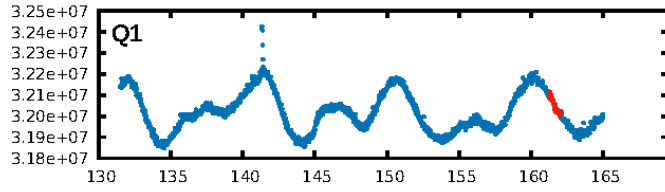
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [39.17σ]  
LongPeriod-sig: 100.0% [41.25σ]  
ModelChiSquare2-sig: 0.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.85e-14  
RollingBand-fgt: 1.00 [4/4]  
**GhostDiagnostic-chr: 0.7365**  
Centroid-sig: 88.7%  
Centroid-so: 0.203 arcsec [0.42σ]  
OotOffset-rm: 1.958 arcsec [2.57σ]  
KicOffset-rm: 1.853 arcsec [2.88σ]  
OotOffset-st: 1/2/0/1 [4]  
KicOffset-st: 1/2/0/1 [4]  
DiffImageQuality-fgm: 0.75 [3/4]  
DiffImageOverlap-fno: 0.00 [0/5]

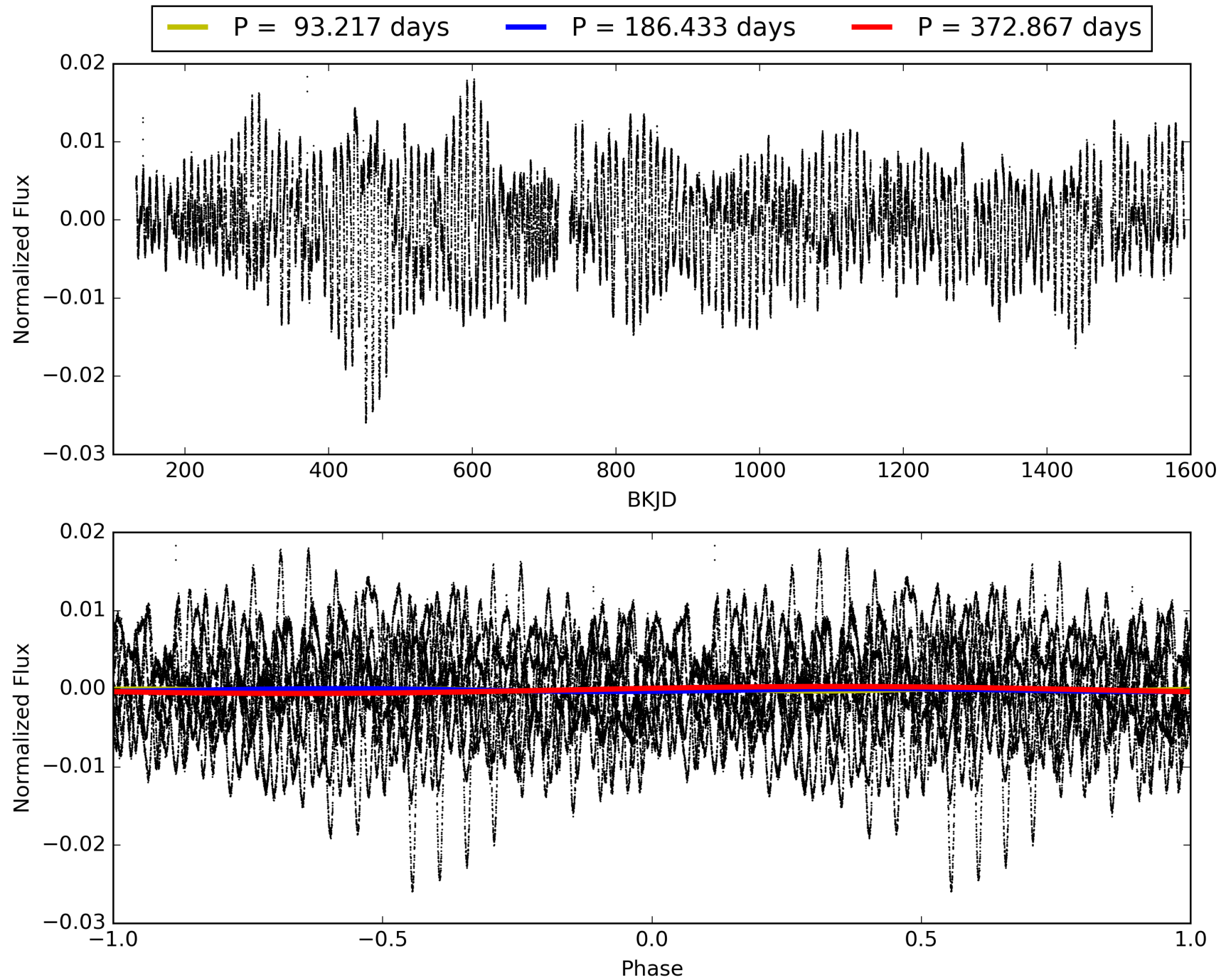
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 05:45:04 Z

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

# TCE 006380533-04, PDC Light Curves

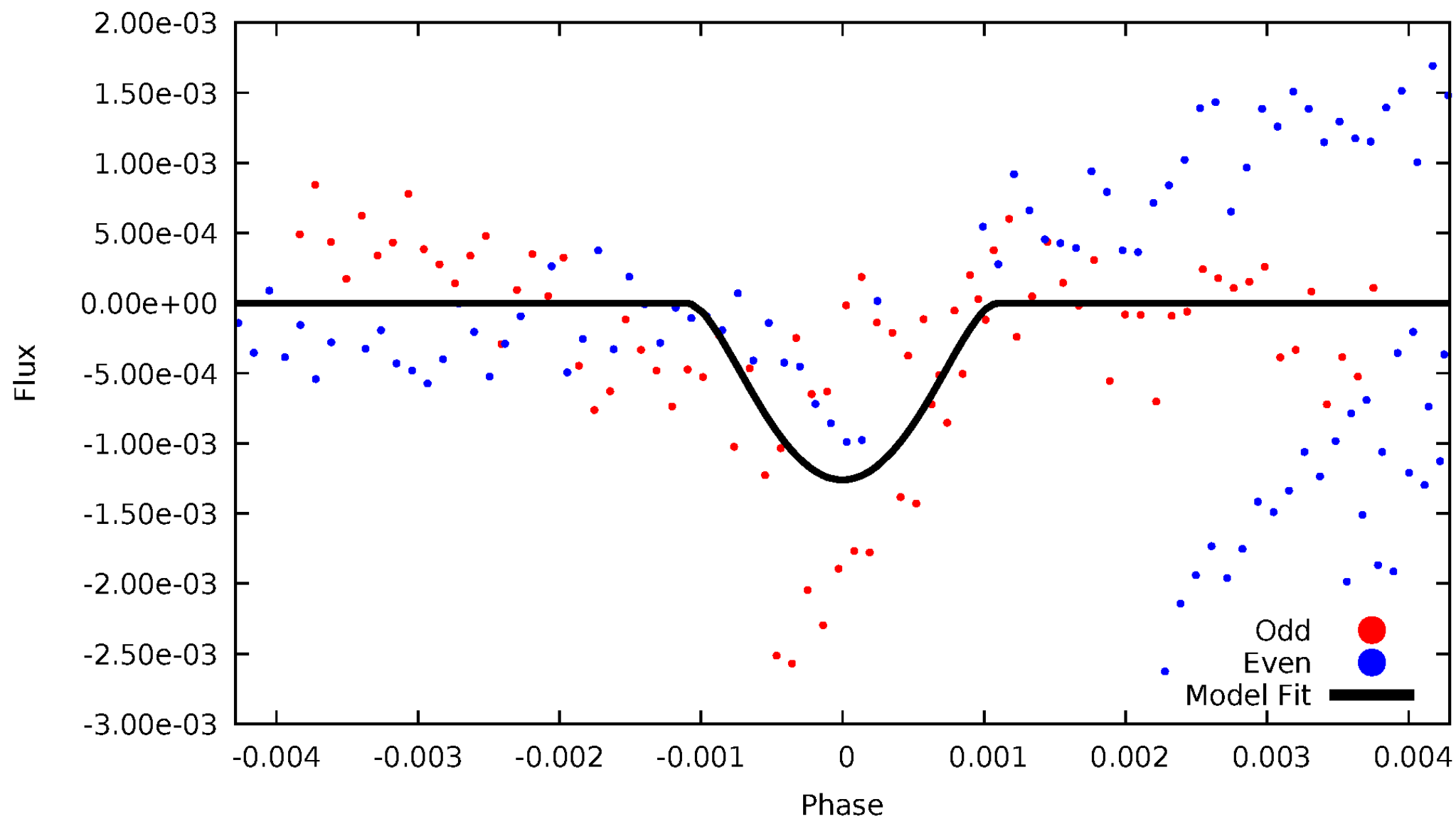


# TCE 006380533-04



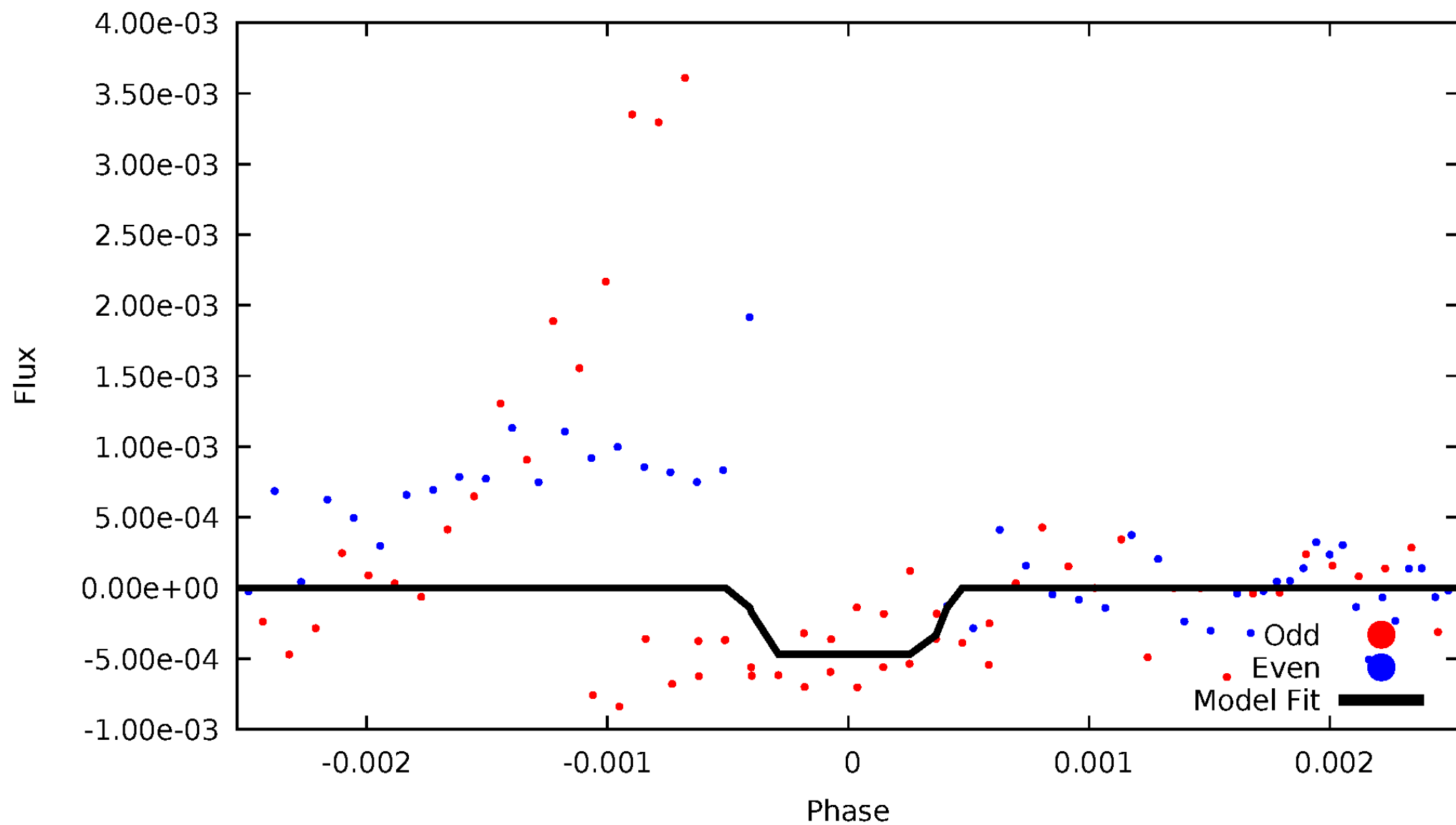
# DV Odd/Even

TCE 006380533-04



# ALT Odd/Even

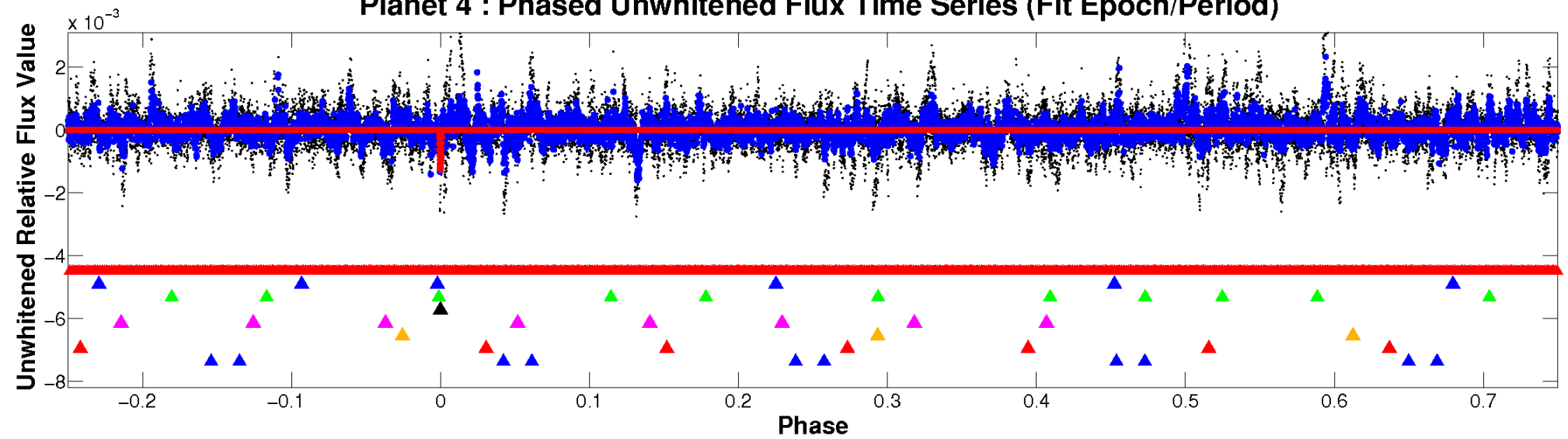
TCE 006380533-04



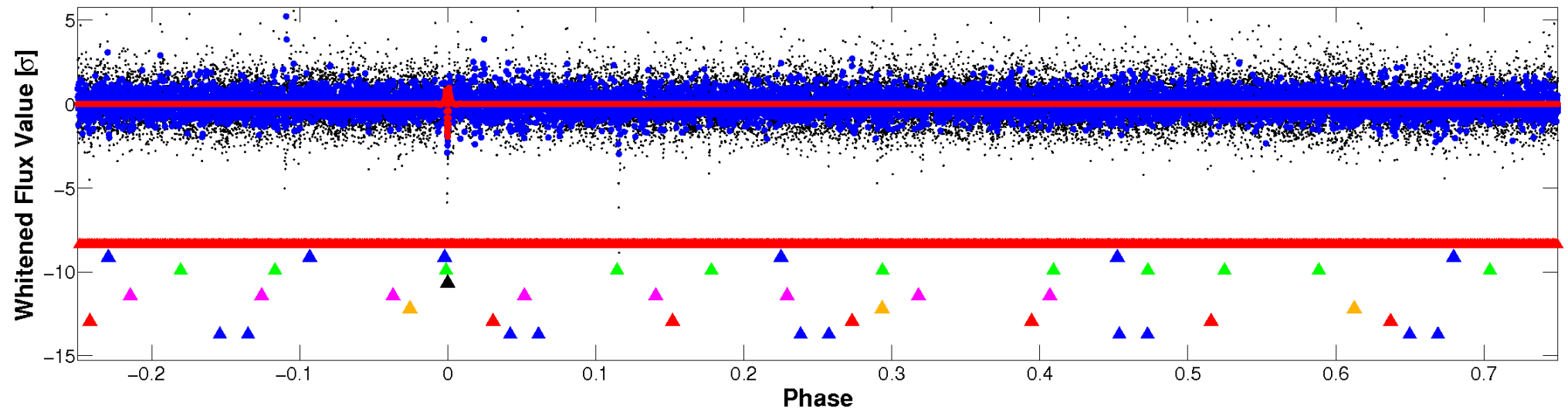


# Non-Whitened Vs. Whitened Light Curve

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

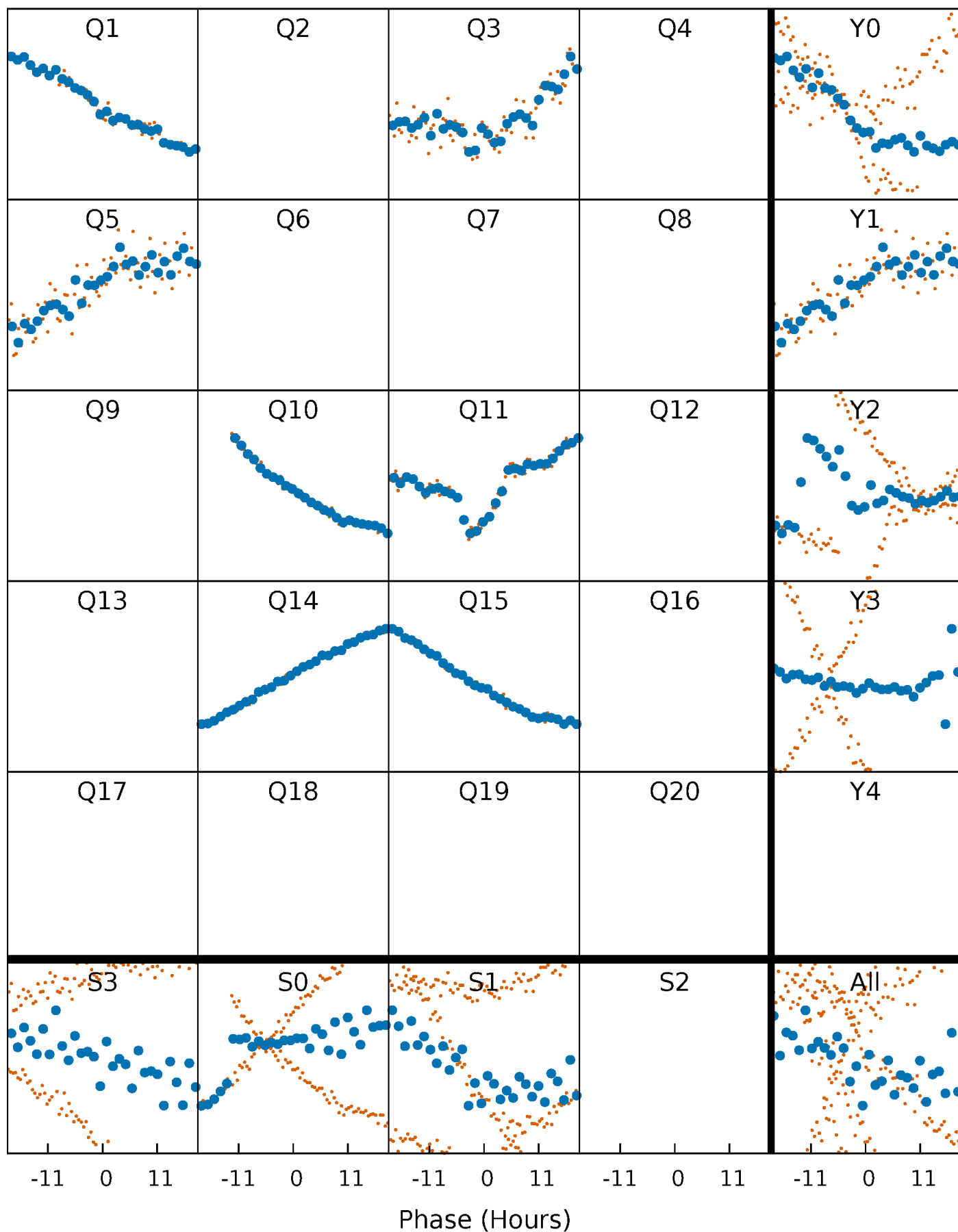


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



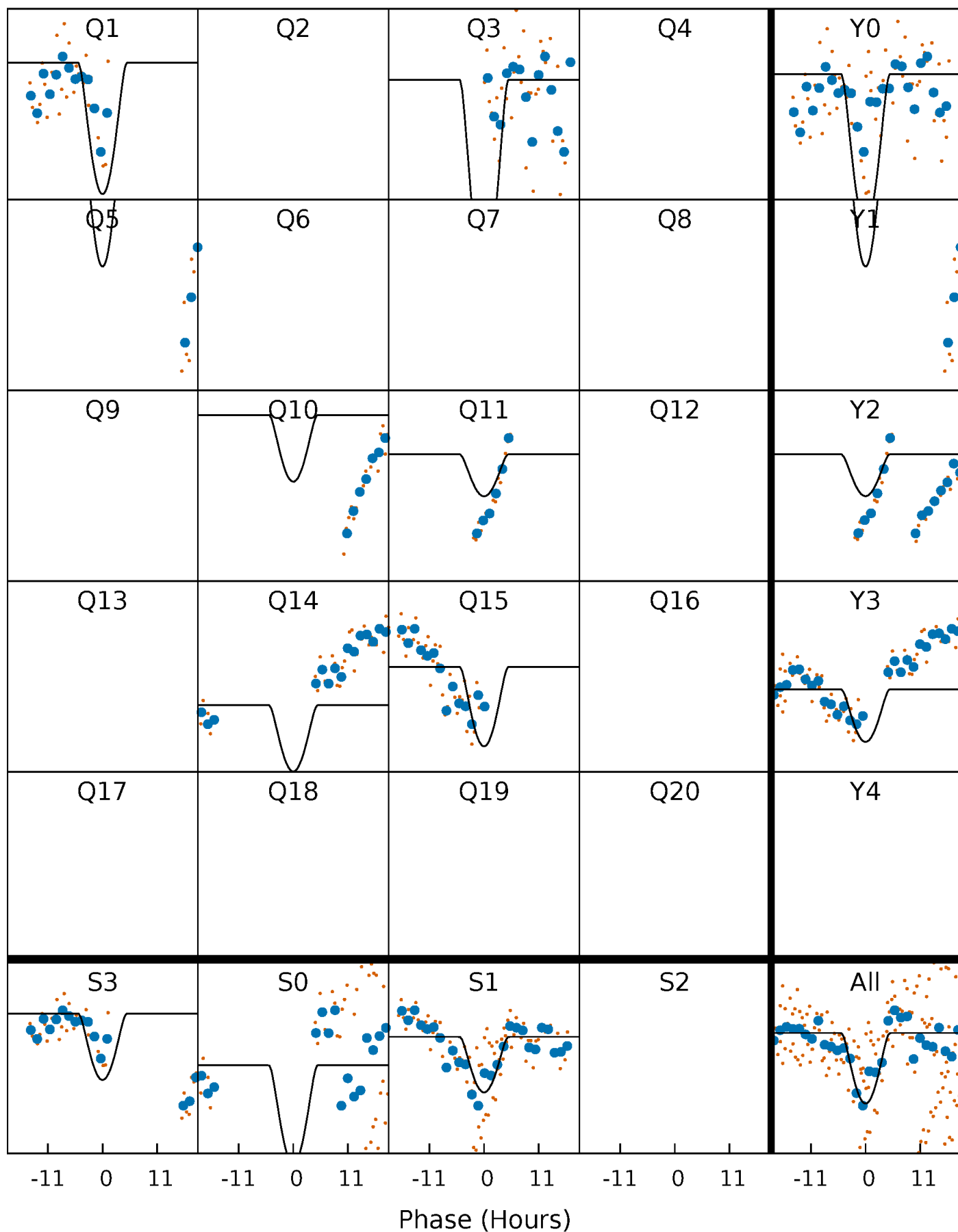
# PDC Quarter-Phased Transit Curves

TCE 006380533-04 P=186.433457 Days  $T_0=161.647854$  (BKJD)



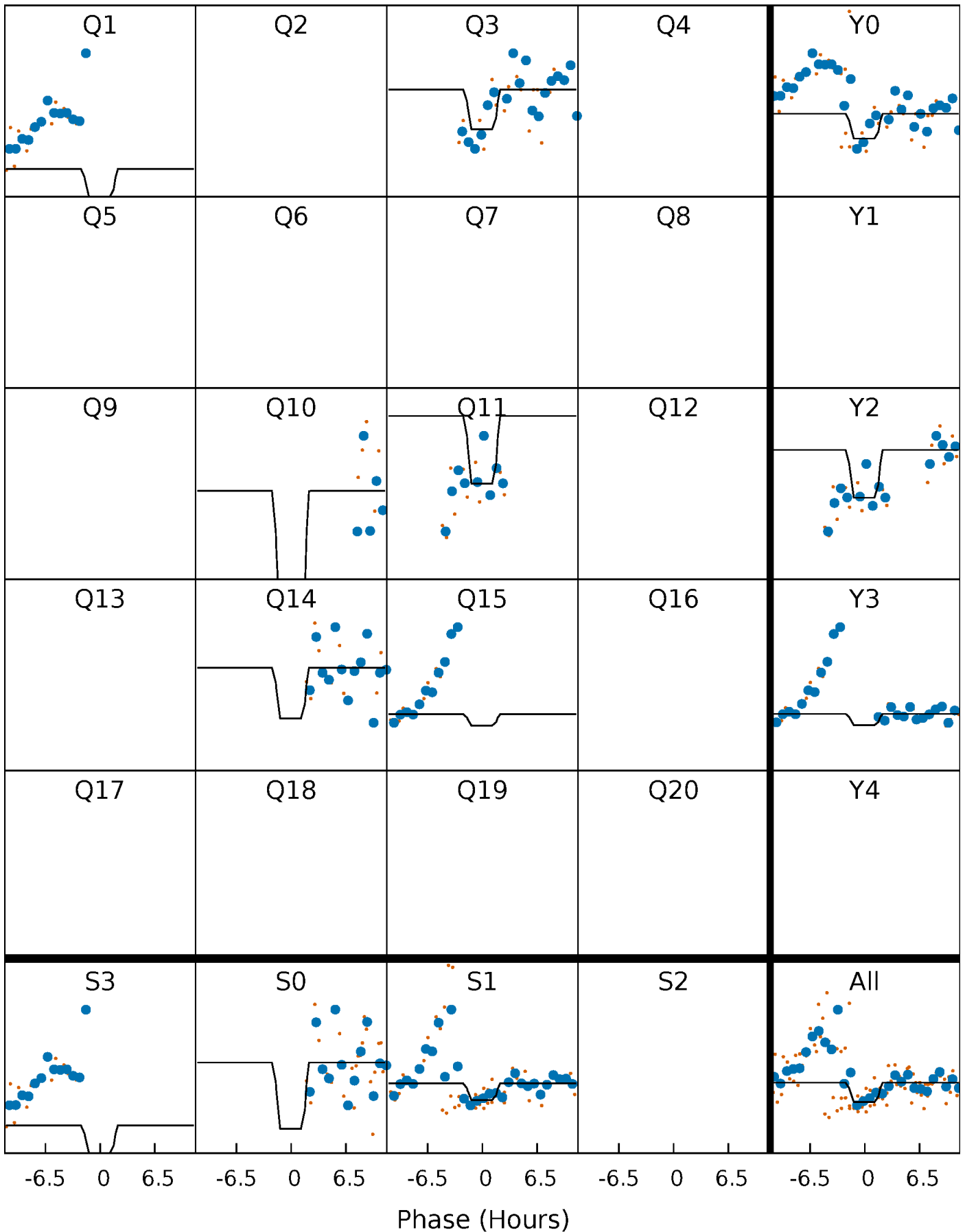
# DV Quarter-Phased Transit Curves

TCE 006380533-04     $P=186.433457$  Days     $T_0=161.647854$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

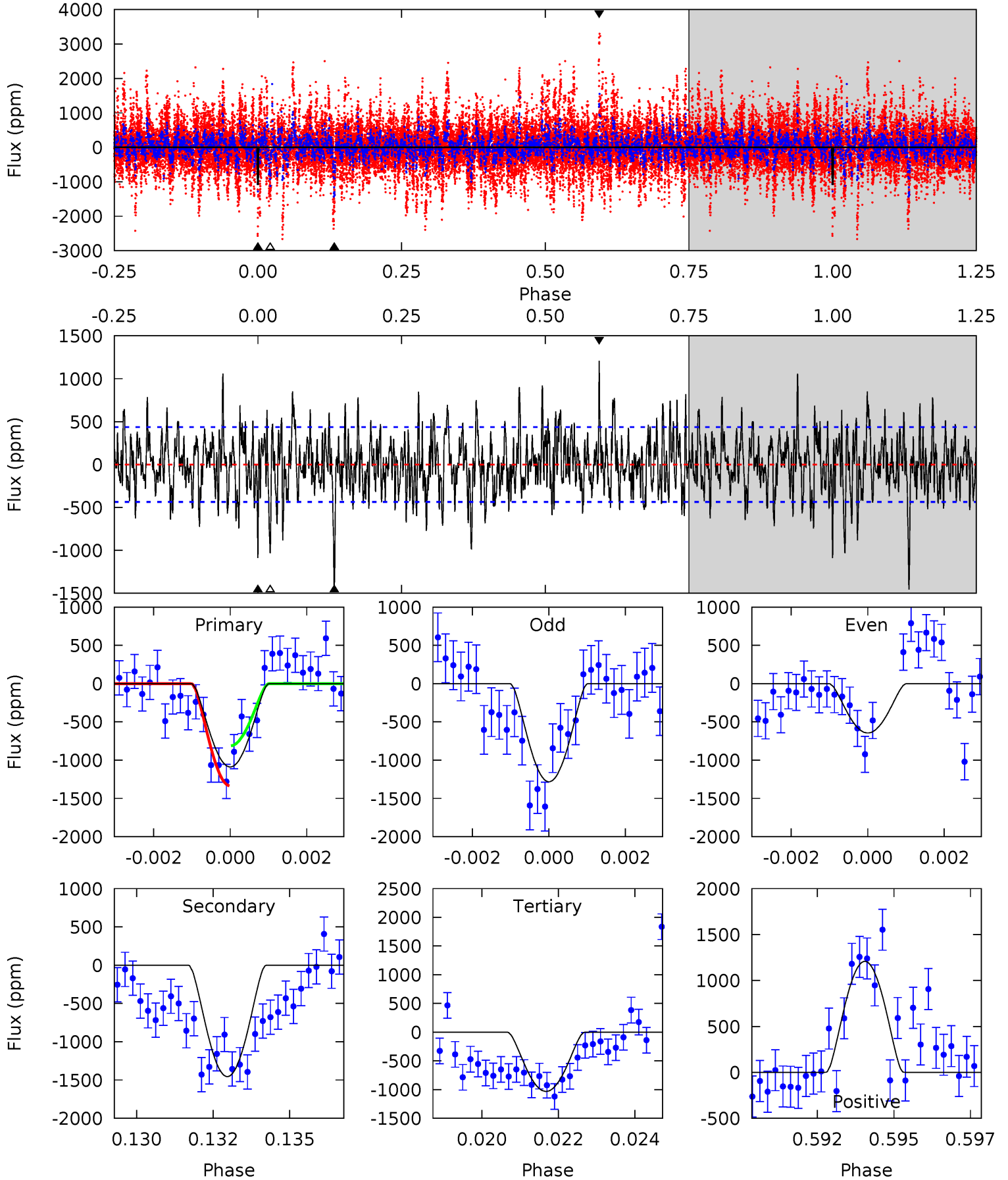
TCE 006380533-04 P=186.431150 Days  $T_0=161.770254$  (BKJD)



# DV Model-Shift Uniqueness Test

006380533-04, P = 186.433457 Days, E = 161.647854 Days

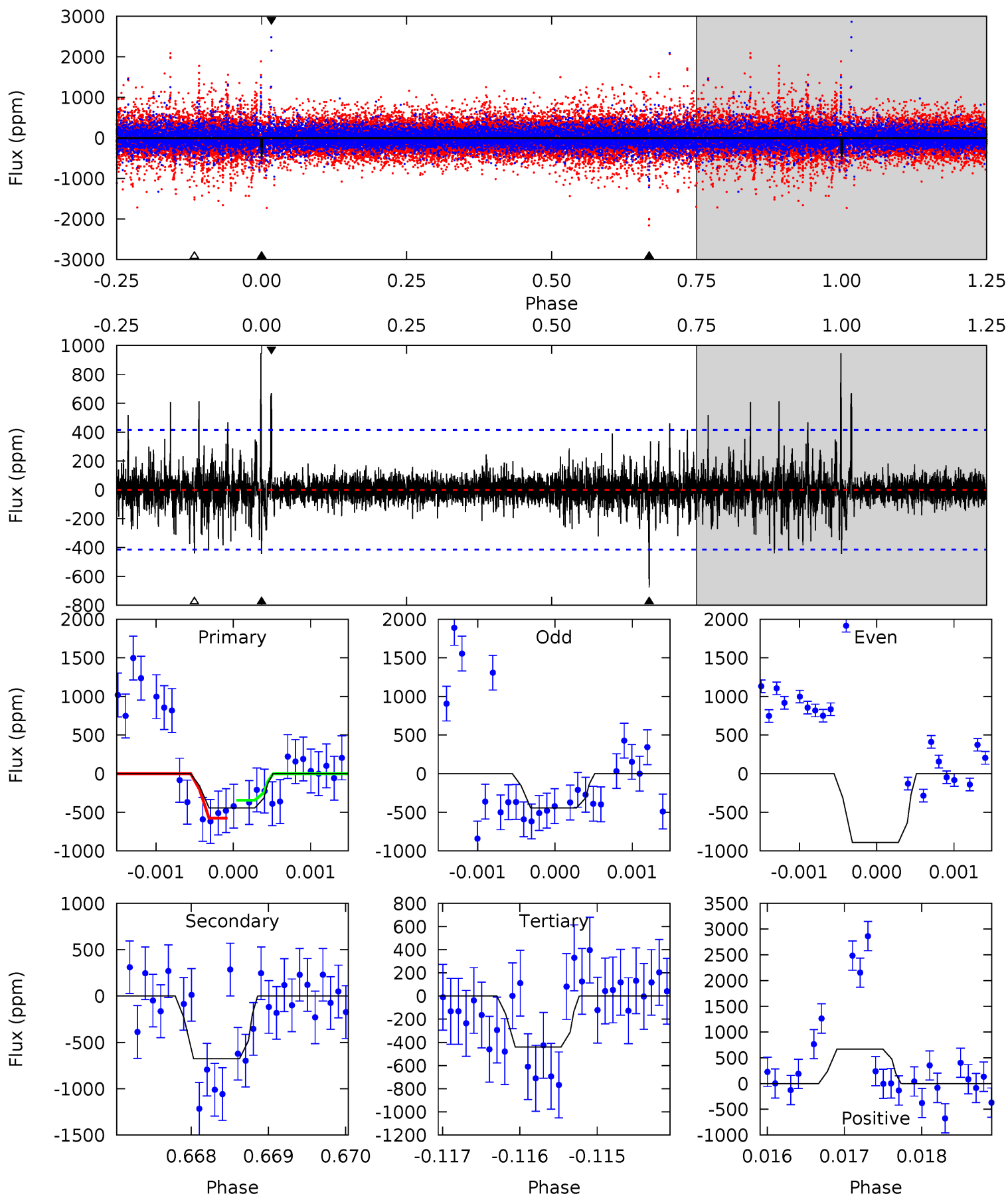
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.3	17.7	12.5	14.7	5.31	3.07	3.53	0.70	-1.45	5.16	3.00	3.44	-2.25	0.45	3.20



# Alt Model-Shift Uniqueness Test

006380533-04, P = 186.431150 Days, E = 161.770254 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
5.83	8.91	5.79	8.82	5.47	3.31	1.11	0.04	-2.99	3.12	0.09	1.99	1.00	0.58	1.44



### Stellar Parameters For KIC 006380533

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5350^{+175}_{-159}$	$4.457^{+0.112}_{-0.154}$	$-0.180^{+0.300}_{-0.300}$	$0.864^{+0.164}_{-0.119}$	$0.780^{+0.122}_{-0.061}$	$1.702^{+0.882}_{-0.721}$
	+3%/-3%	+3%/-3%	+167%/-167%	+19%/-14%	+16%/-8%	+52%/-42%
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 006380533-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1455 \pm 82$	$14.72^{+15.27}_{-9.71}$	$403^{+25}_{-21}$	$3240^{+1456}_{-576}$	$1329^{+10180}_{-1010}$
Alt.	$-676 \pm 76$	$12.52^{+14.63}_{-8.75}$	$401^{+26}_{-20}$	$3019^{+1472}_{-524}$	$846^{+8183}_{-671}$

$T_{max}$  = 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

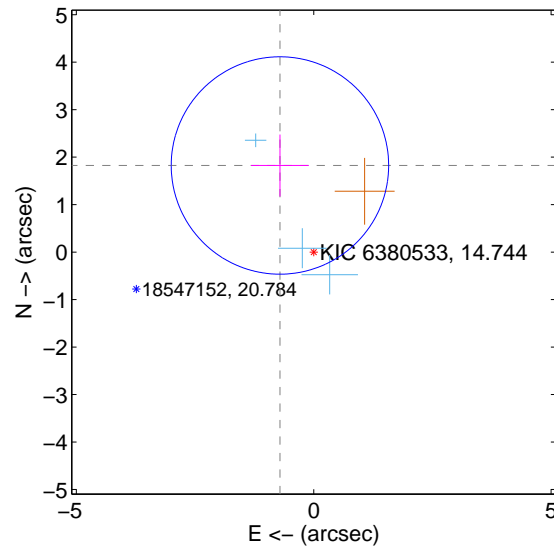
Supplemental centroid analysis for 006380533-04. Kepler magnitude: 14.74. Transit SNR 8.57

There are 3 quarters with good PRF difference image offsets

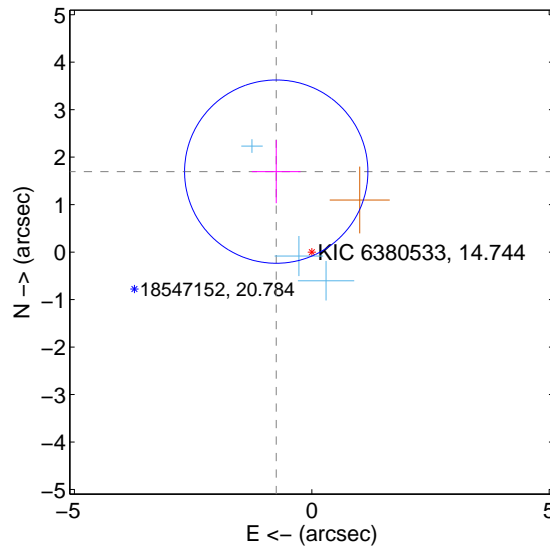
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.958 \pm 0.763$	2.57	$0.711 \pm 0.606$	$1.824 \pm 0.653$
PRF-fit source offset from KIC position	$1.853 \pm 0.643$	2.88	$0.749 \pm 0.513$	$1.695 \pm 0.666$
photometric centroid source offset	$0.20 \pm 0.48$	0.42	$0.11 \pm 0.48$	$0.17 \pm 0.48$

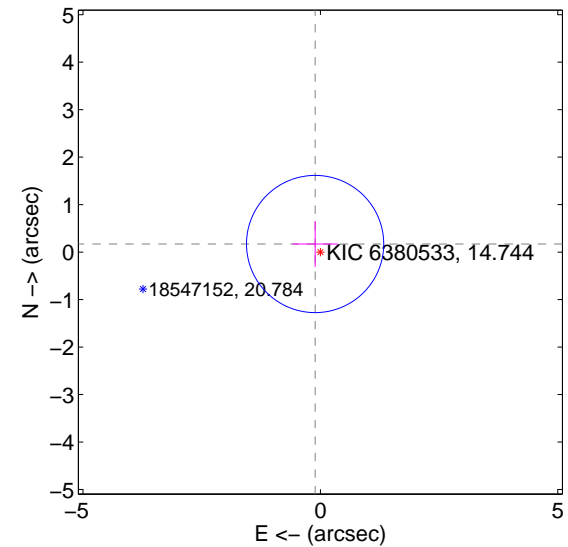
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



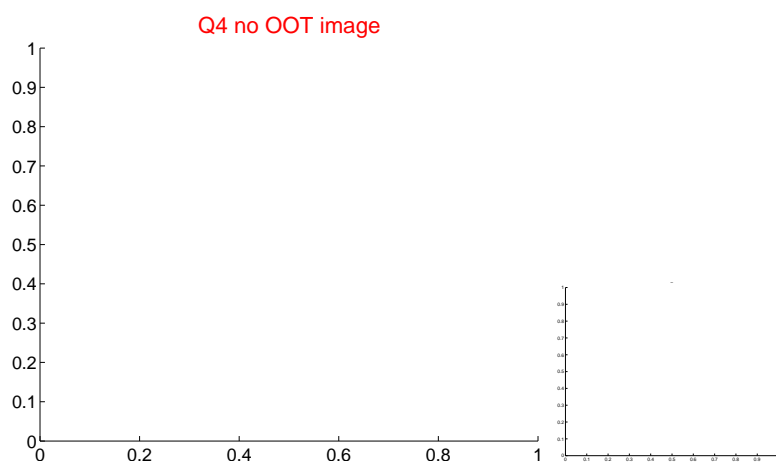
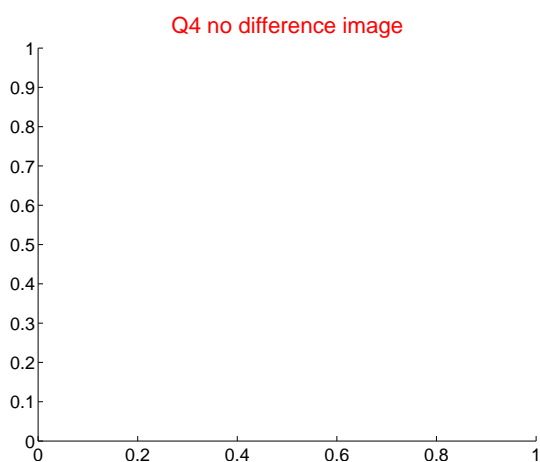
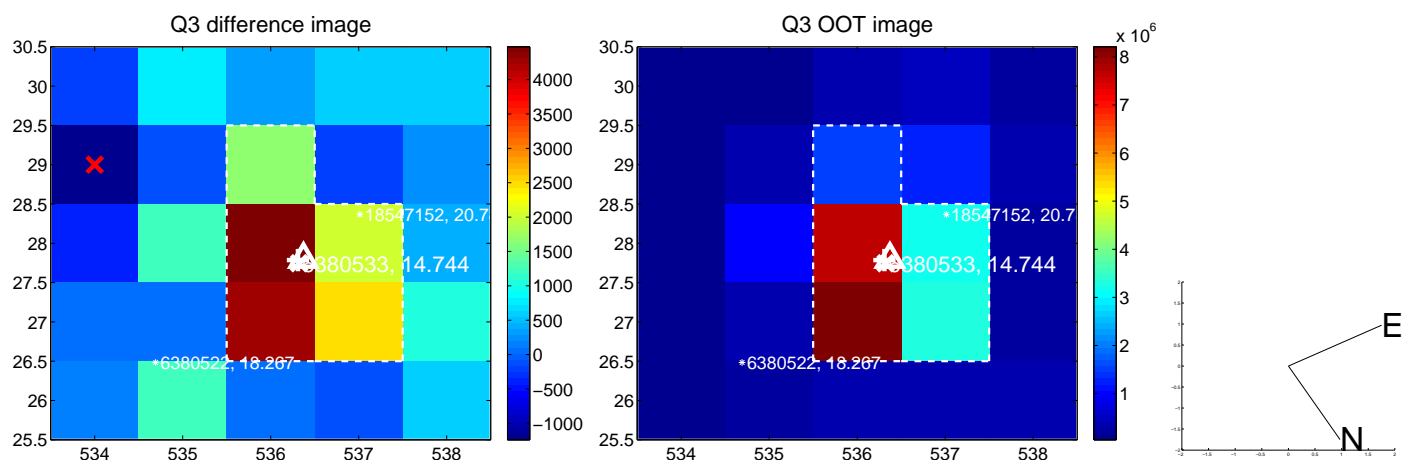
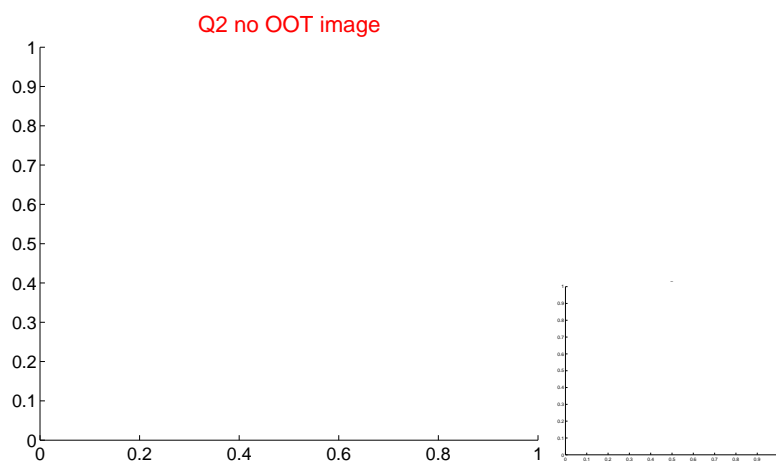
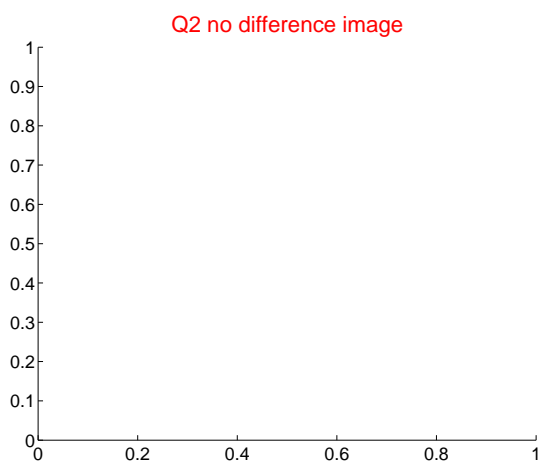
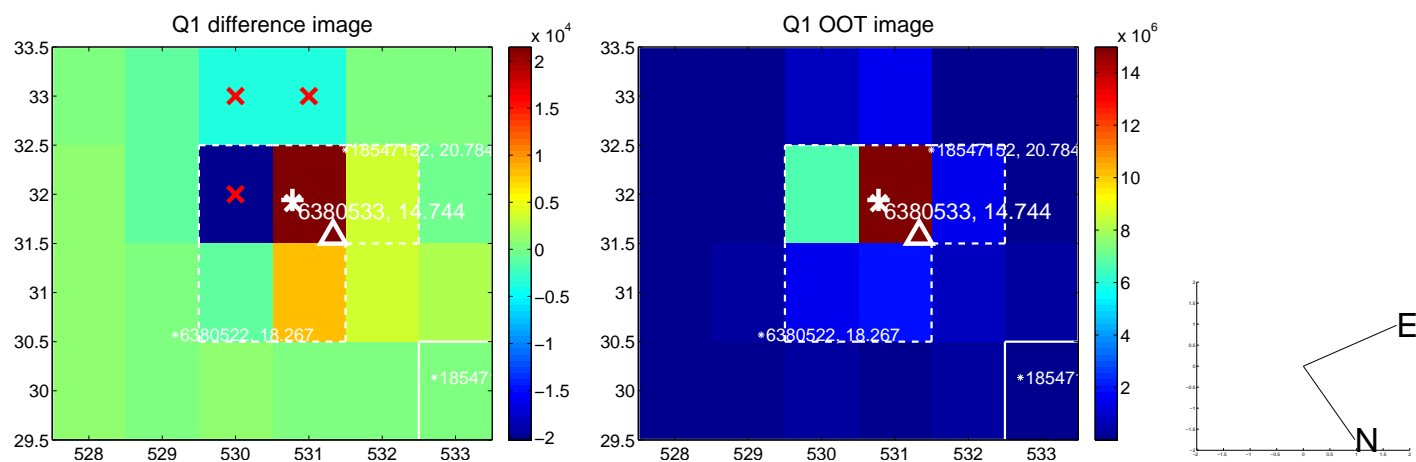
offset from photometric centroids



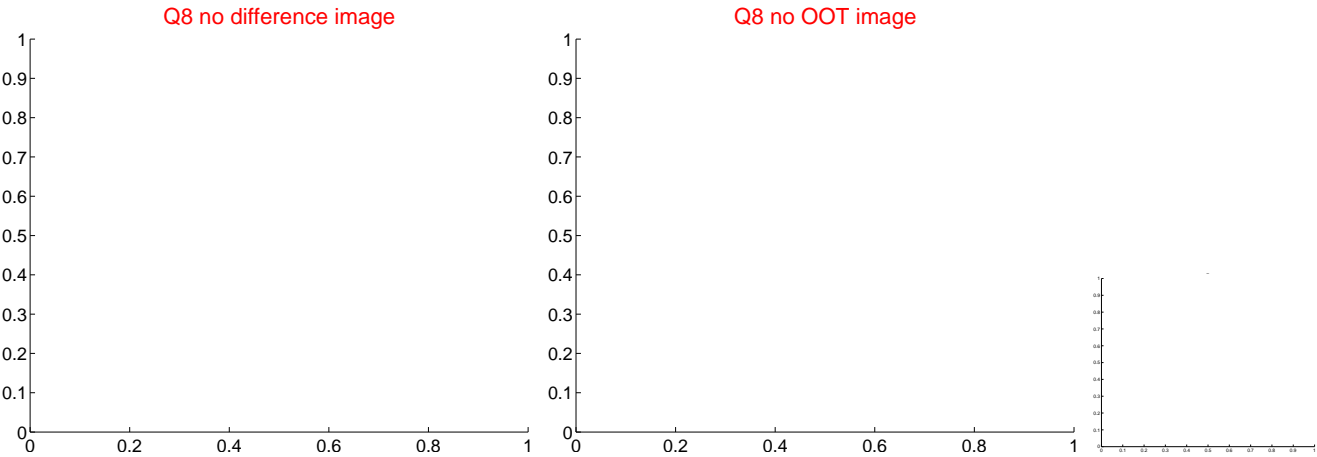
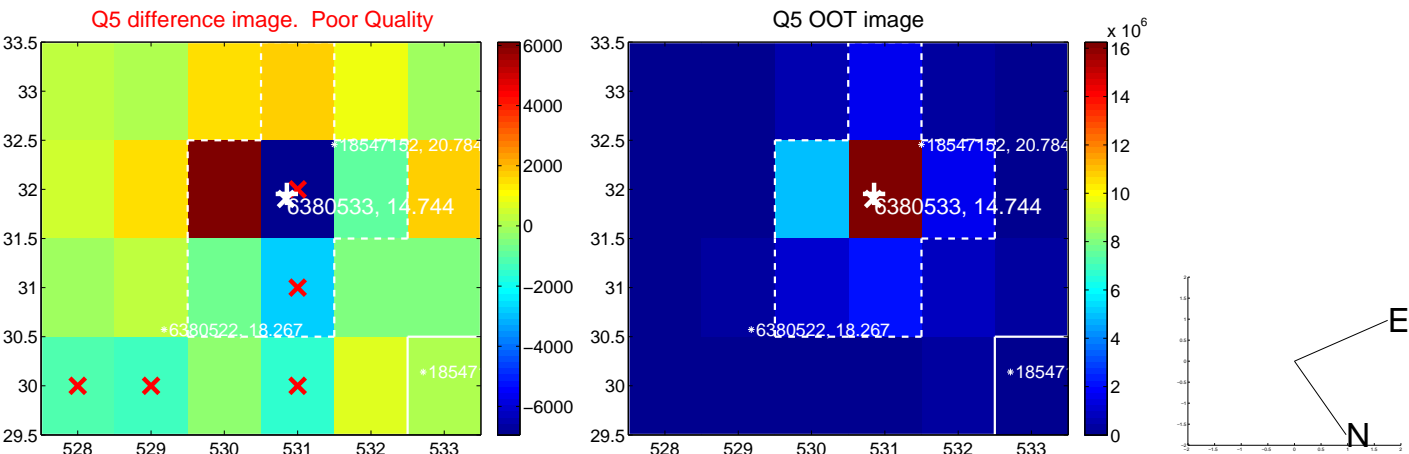
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



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



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



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

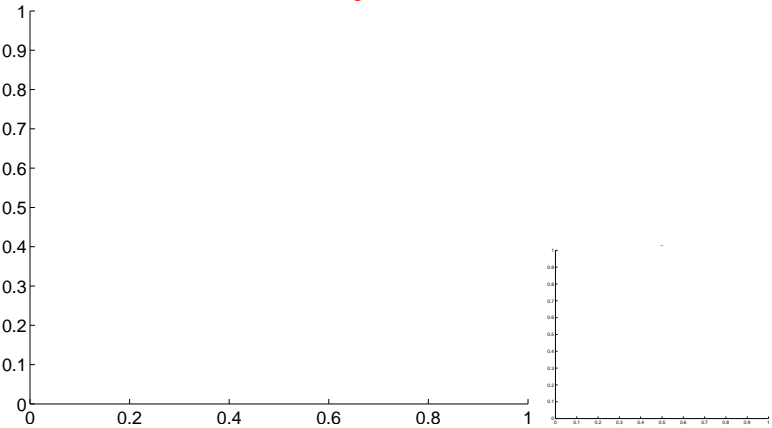


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

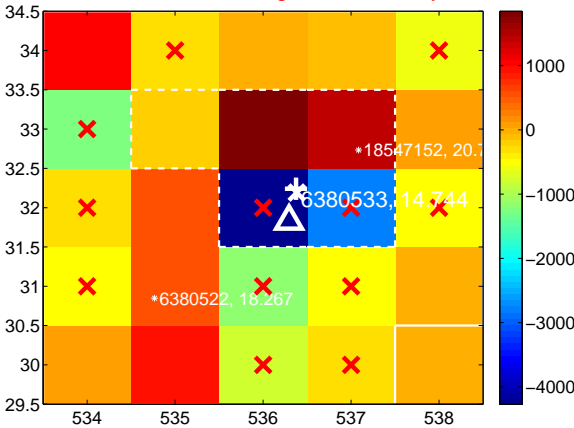
Q13 no difference image



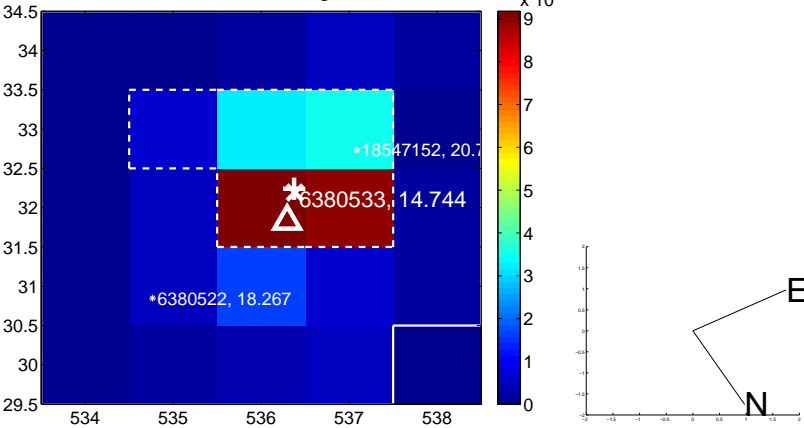
Q13 no OOT image



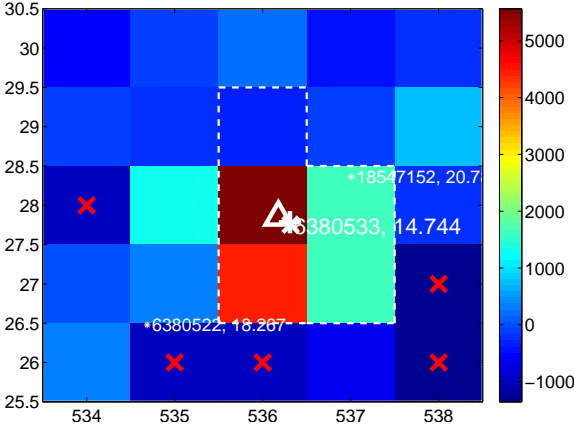
Q14 difference image. Poor Quality



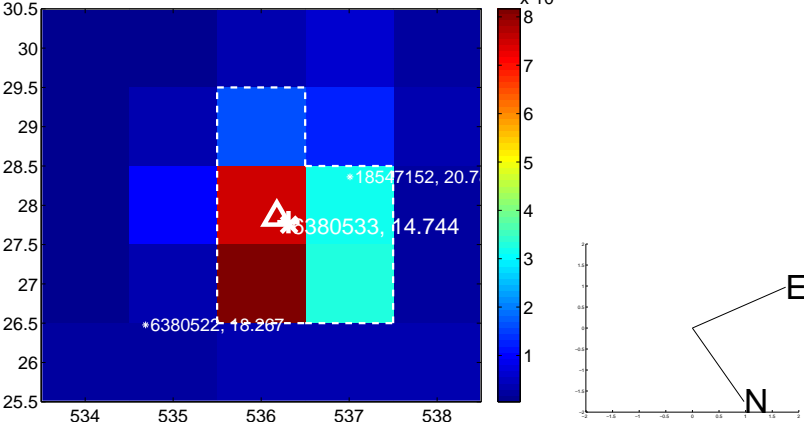
Q14 OOT image



Q15 difference image



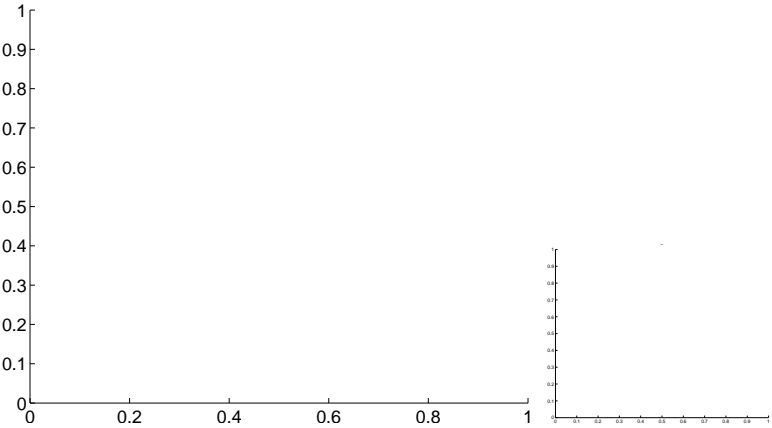
Q15 OOT image



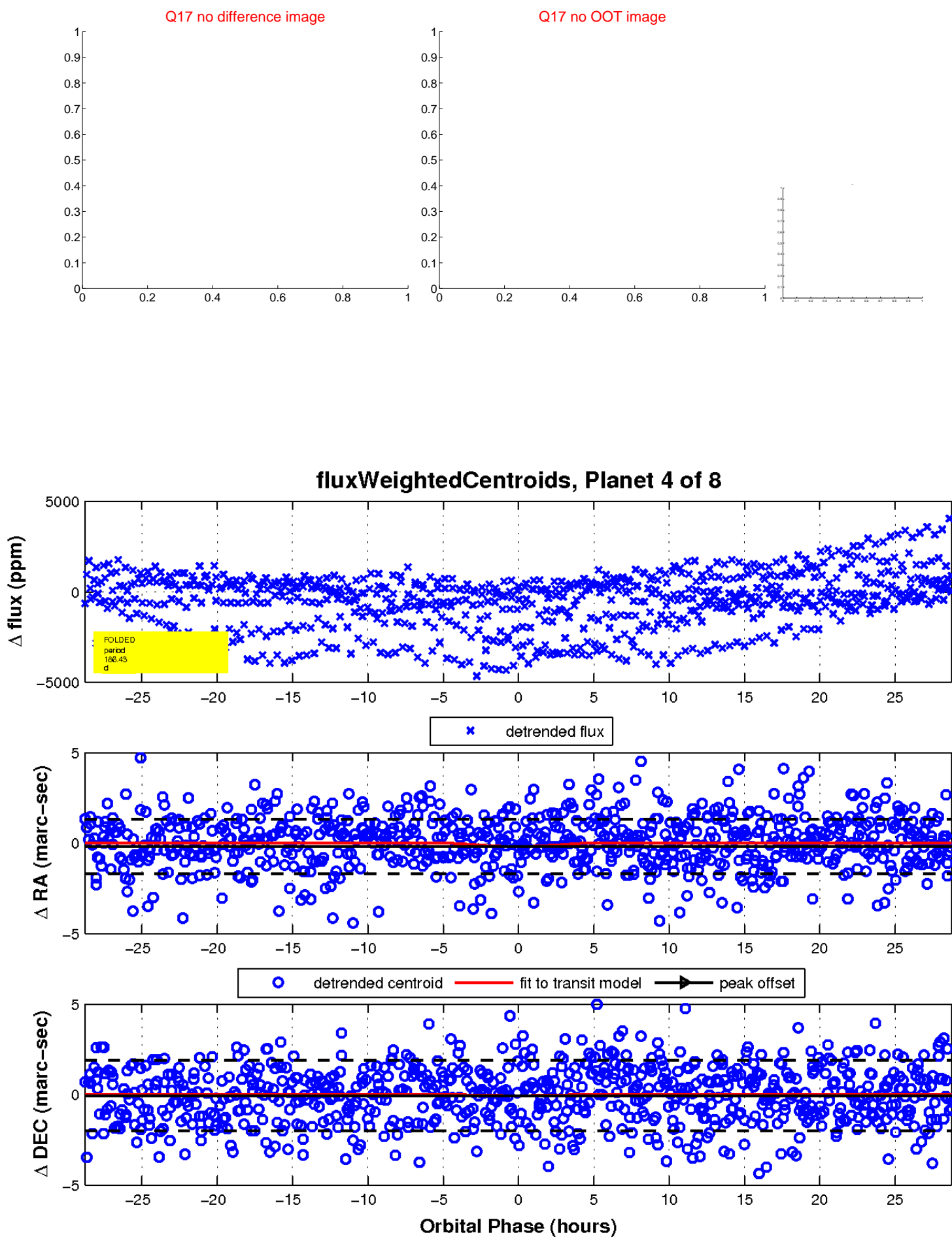
Q16 no difference image



Q16 no OOT image

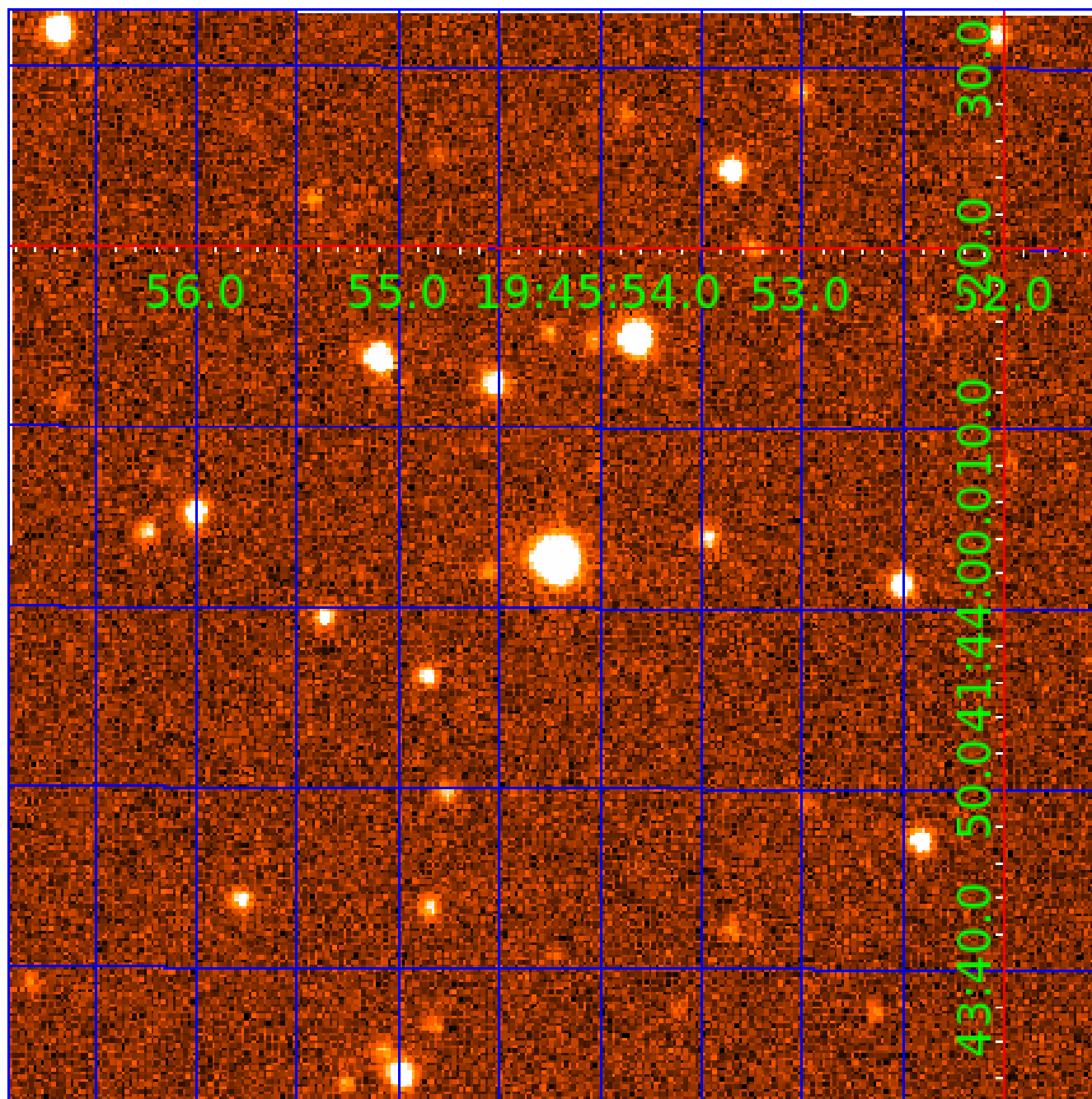


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 006380533

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006380533-01	OBS	No	1.533445	132.983160	56.9	6.487	7.6	9.5	0.86	5350	0.65	954.47
006380533-02	OBS	No	228.793699	305.343517	1359.4	11.513	16.3	9.5	0.86	5350	3.24	1.21
006380533-03	OBS	No	131.468842	249.832282	821.3	5.423	14.6	7.0	0.86	5350	3.19	2.52
006380533-04	OBS	No	186.433457	161.647854	1260.8	9.594	11.4	8.6	0.86	5350	6.03	1.58
006380533-05	OBS	No	169.888627	237.489259	227.4	3.274	10.4	2.0	0.86	5350	1.49	1.79
006380533-06	OBS	No	499.832334	462.264221	4839.5	38.691	9.5	10.0	0.86	5350	6.00	0.42
006380533-07	OBS	No	209.042130	167.361675	766.6	9.000	10.3	-1.0	0.86	5350	2.35	1.36
006380533-08	OBS	No	149.858044	206.101353	813.8	4.639	9.5	7.3	0.86	5350	2.69	2.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006380533-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
006380533-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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
006380533-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
006380533-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006380533-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

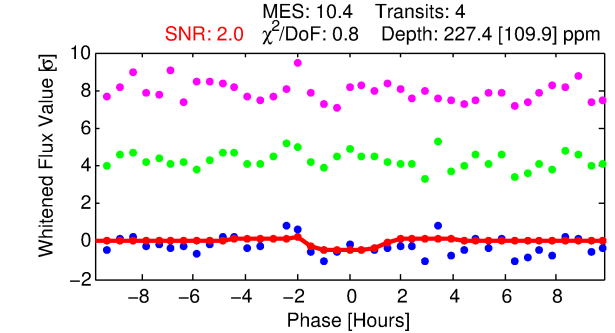
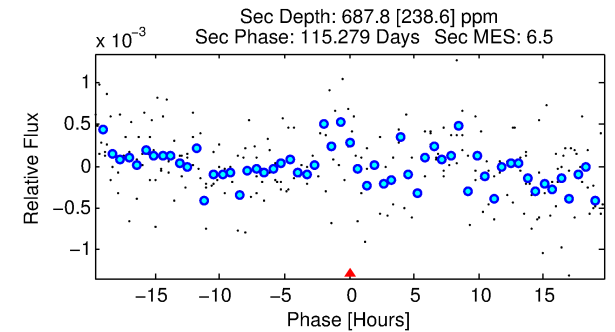
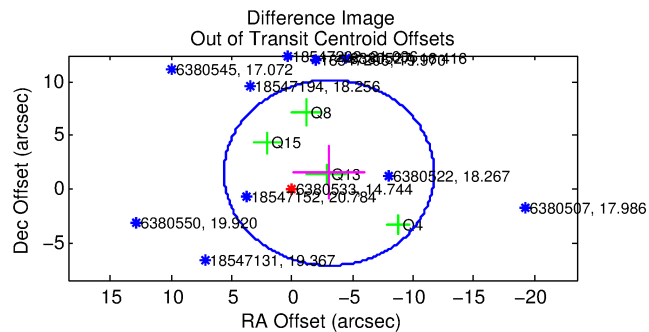
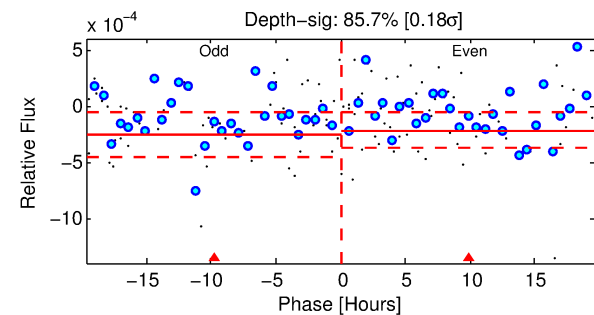
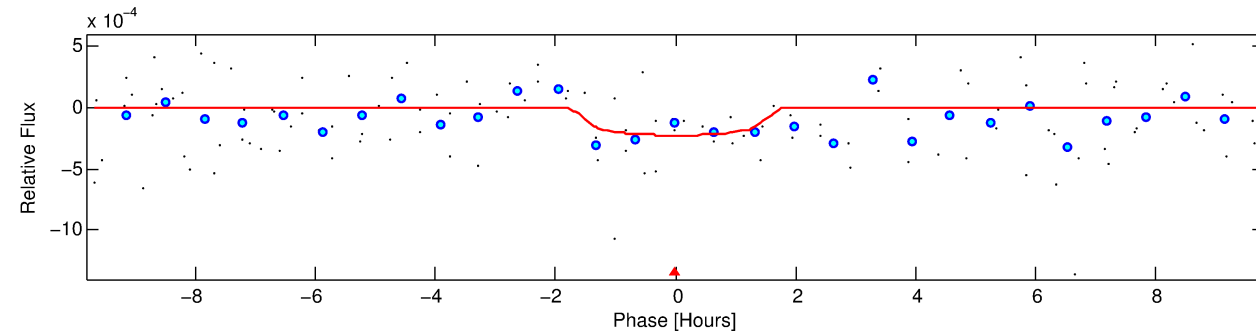
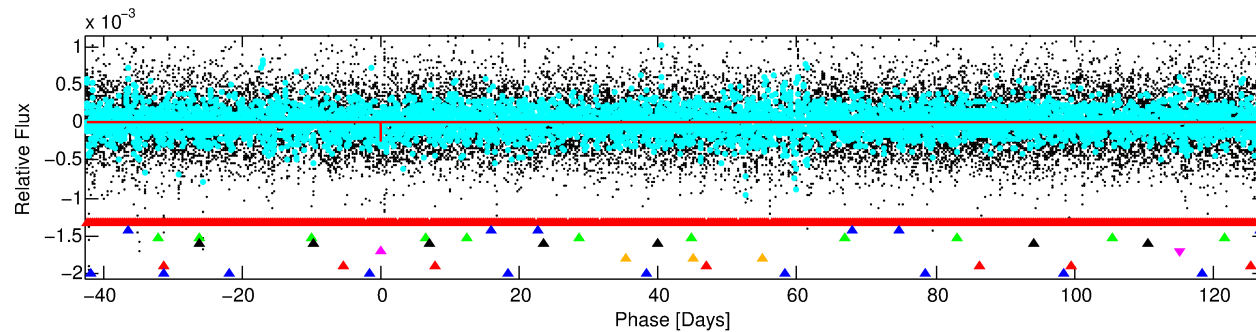
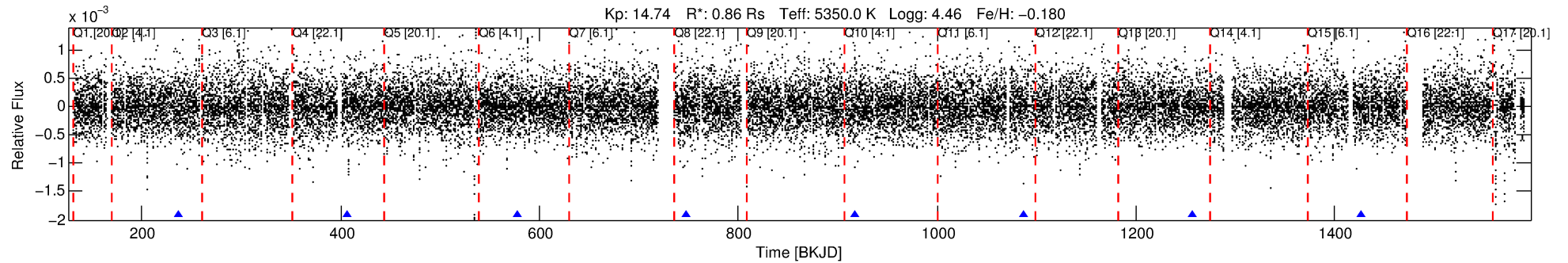
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006380533-05

No Significant Match Found

# DV One-Page Summary

KIC: 6380533 Candidate: 5 of 8 Period: 169.889 d



## DV Fit Results:

Period = 169.88863 [0.00806] d  
 Epoch = 237.4893 [0.0408] BKJD  
 Rp/R\* = 0.0158 [0.0482]  
 a/R\* = 226.84 [2852.19]  
 b = 0.84 [4.53]  
 Seff = 1.79 [0.54]  
 Teq = 295 [22] K  
 Rp = 1.49 [4.55] Re  
 a = 0.5527 [0.0957] AU  
 Ag = 52245.11 [319871.02] [0.16 $\sigma$ ]  
 Tefp = 6898 [10551] K [0.63 $\sigma$ ]

## DV Diagnostic Results:

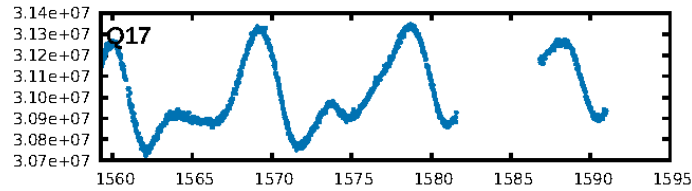
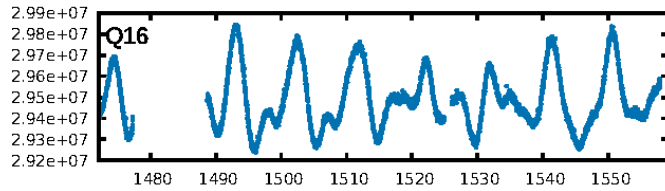
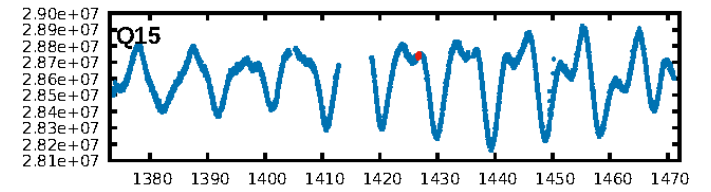
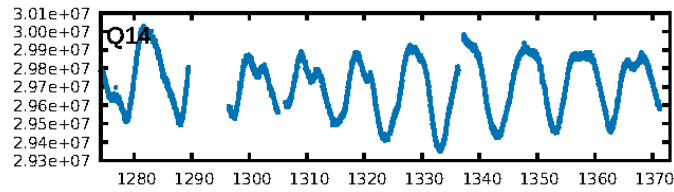
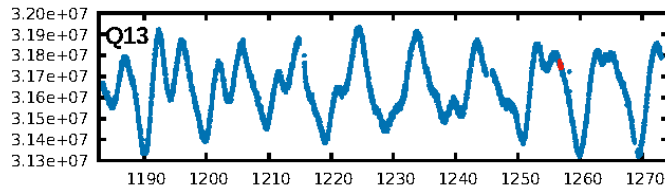
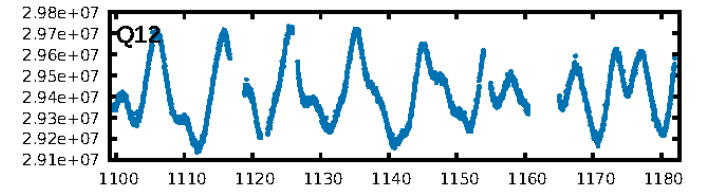
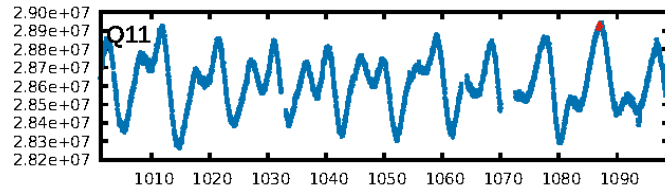
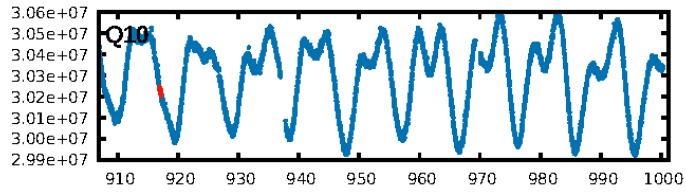
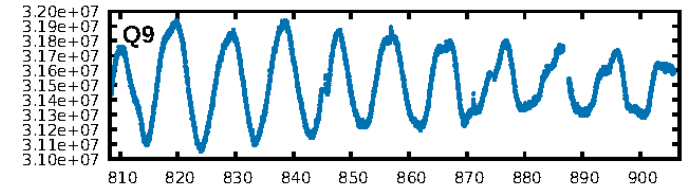
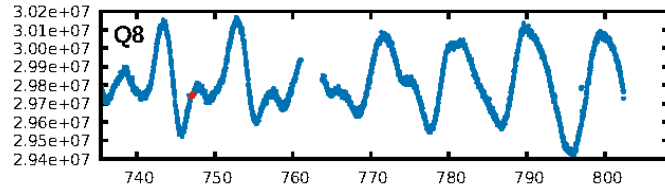
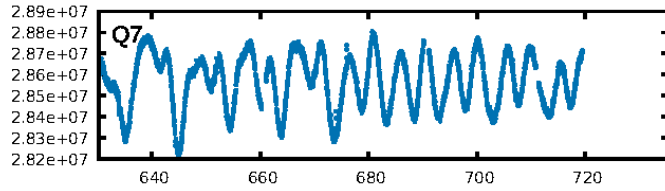
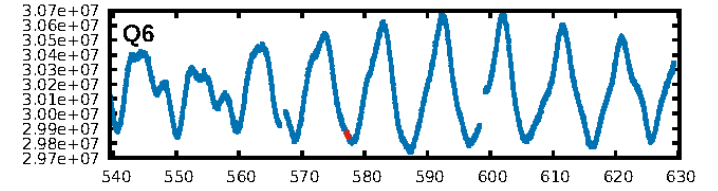
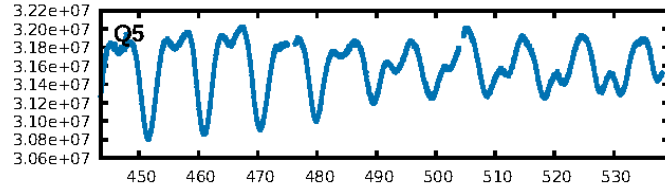
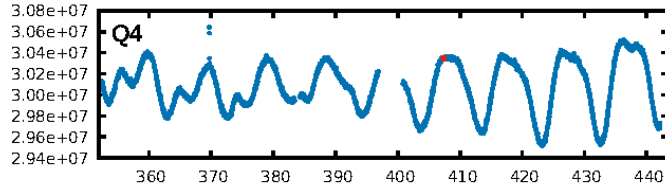
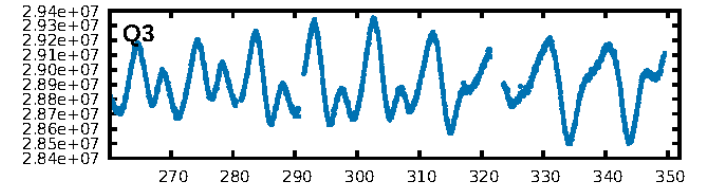
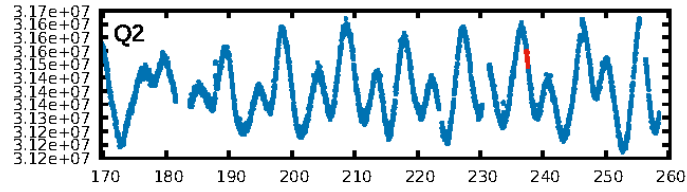
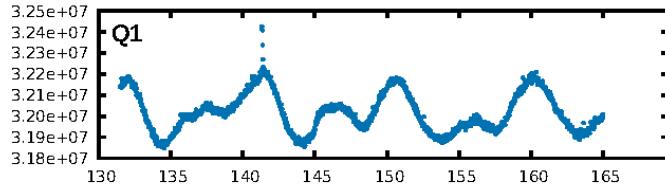
ShortPeriod-sig: 100.0% [84.67 $\sigma$ ]  
 LongPeriod-sig: 100.0% [39.17 $\sigma$ ]  
 ModelChiSquare2-sig: 64.6%  
 ModelChiSquareGof-sig: 100.0%  
 Bootstrap-pfa: 9.76e-13  
 RollingBand-fgt: 1.00 [4/4]  
 GhostDiagnostic-chr: 1.116  
 Centroid-sig: 27.0%  
 Centroid-so: 3.172 arcsec [1.04 $\sigma$ ]  
 OotOffset-rm: 3.402 arcsec [1.18 $\sigma$ ]  
 KicOffset-rm: 3.315 arcsec [1.14 $\sigma$ ]  
 OotOffset-st: 0/1/2/1 [4]  
 KicOffset-st: 0/1/2/1 [4]  
 DiffImageQuality-fgm: 0.00 [0/4]  
 DiffImageOverlap-fno: 0.25 [2/8]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 05:45:10 Z

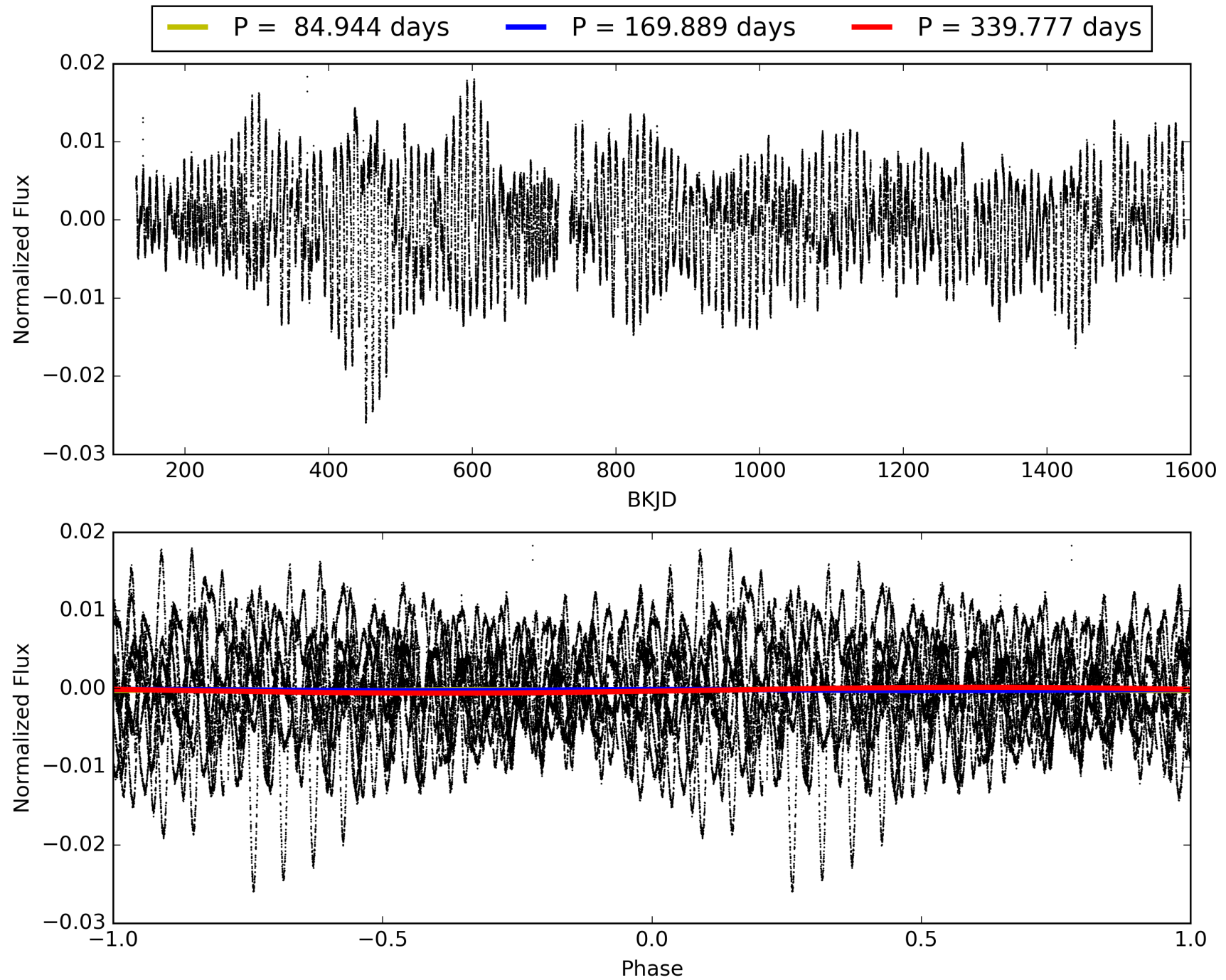
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006380533-05, PDC Light Curves

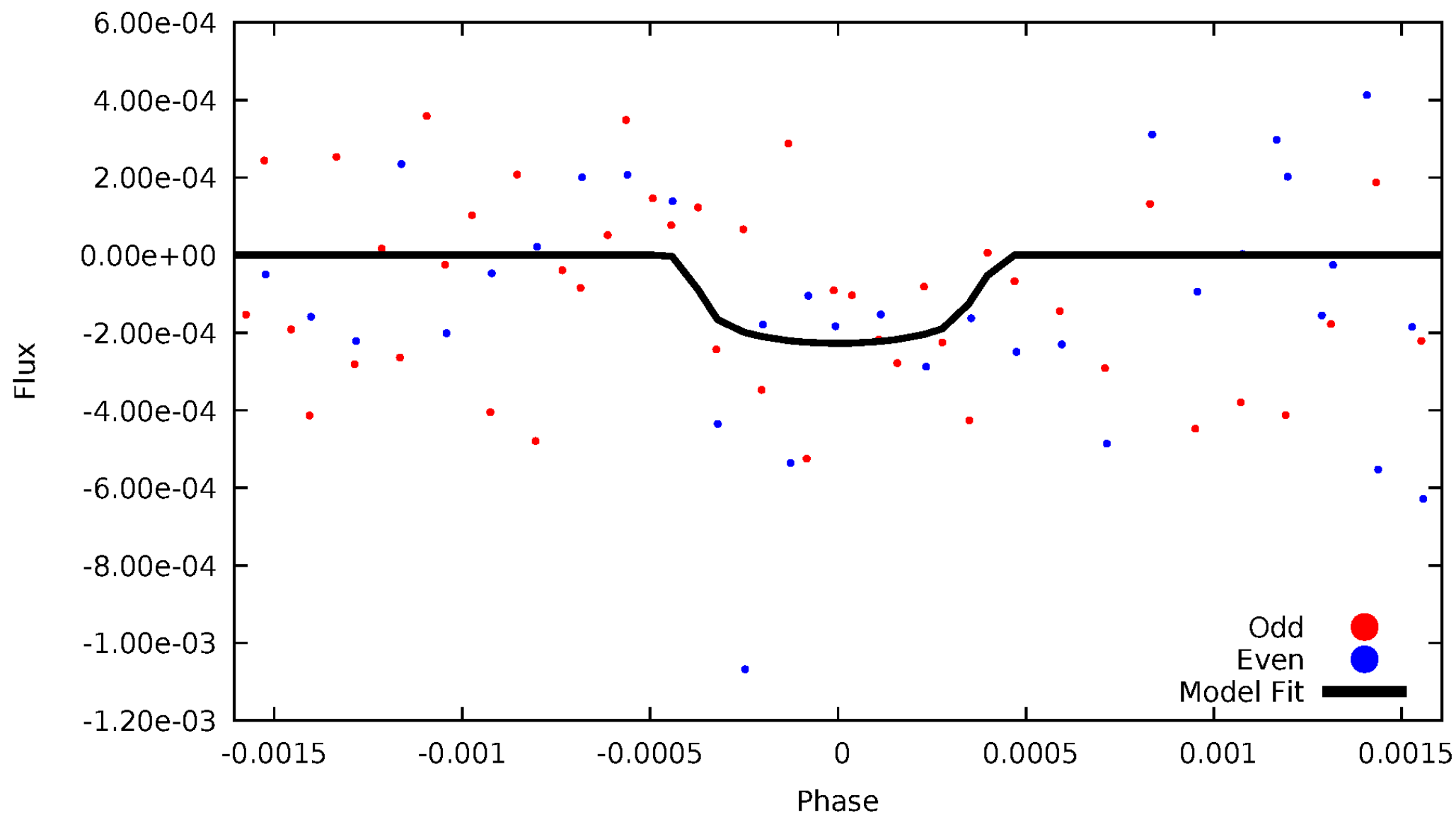


TCE 006380533-05



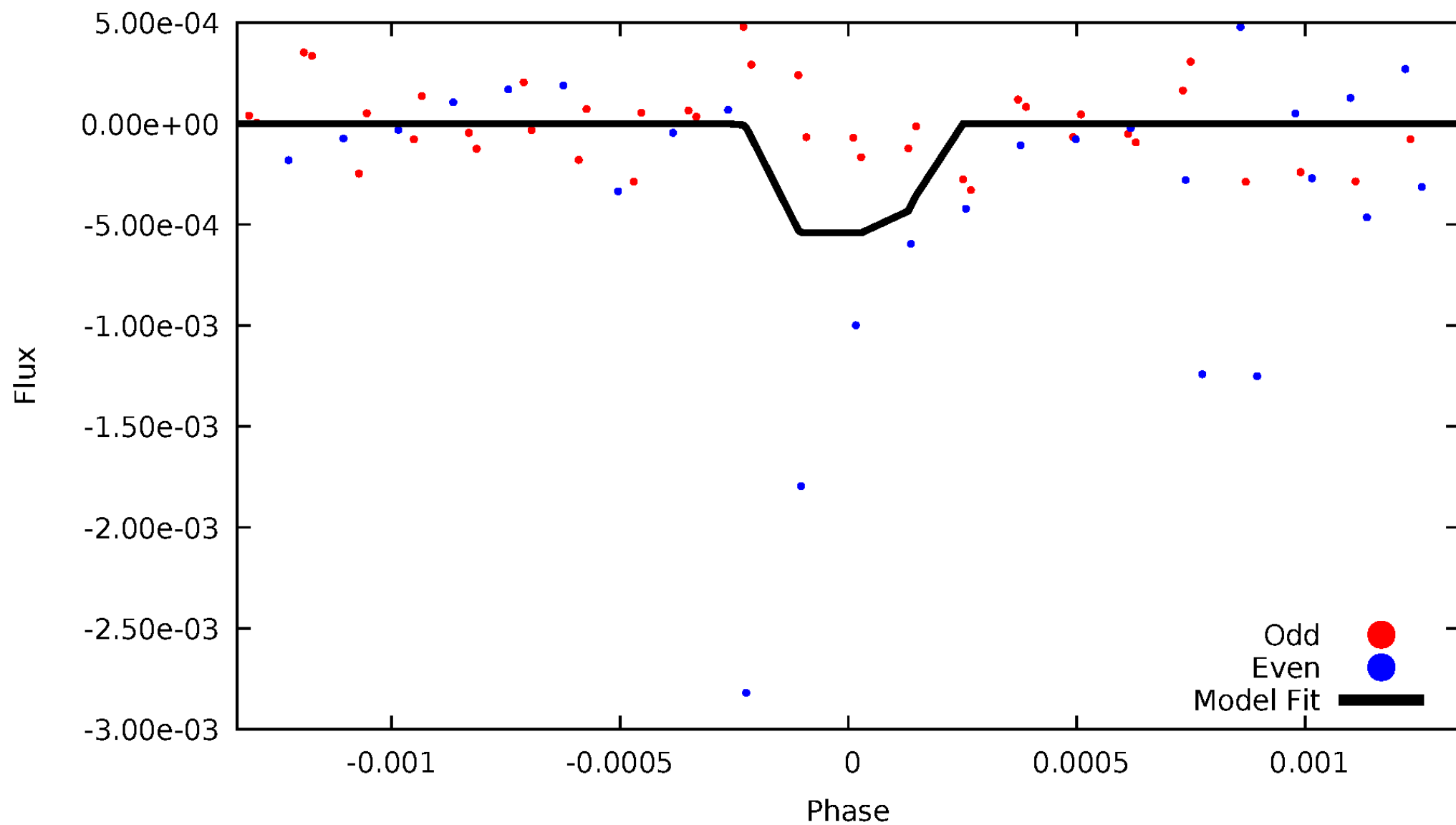
# DV Odd/Even

TCE 006380533-05



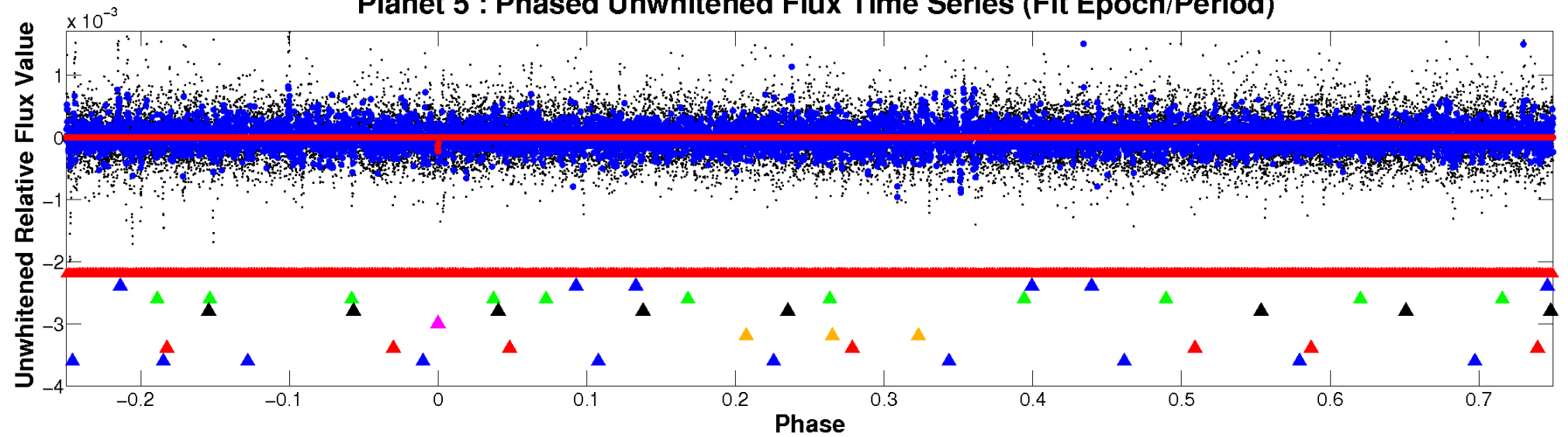
# ALT Odd/Even

TCE 006380533-05

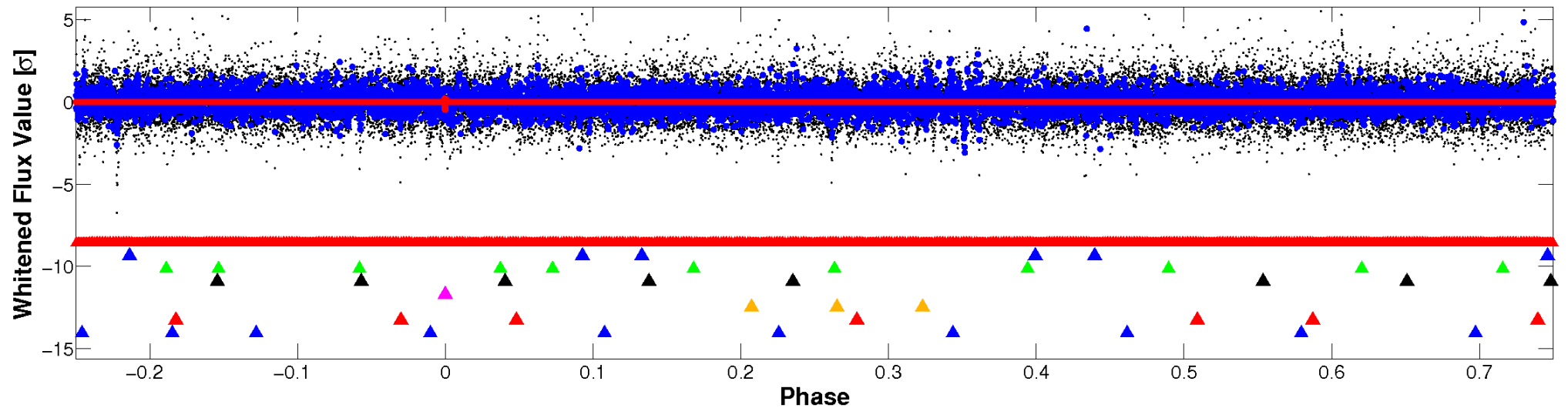


# Non-Whitened Vs. Whitened Light Curve

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

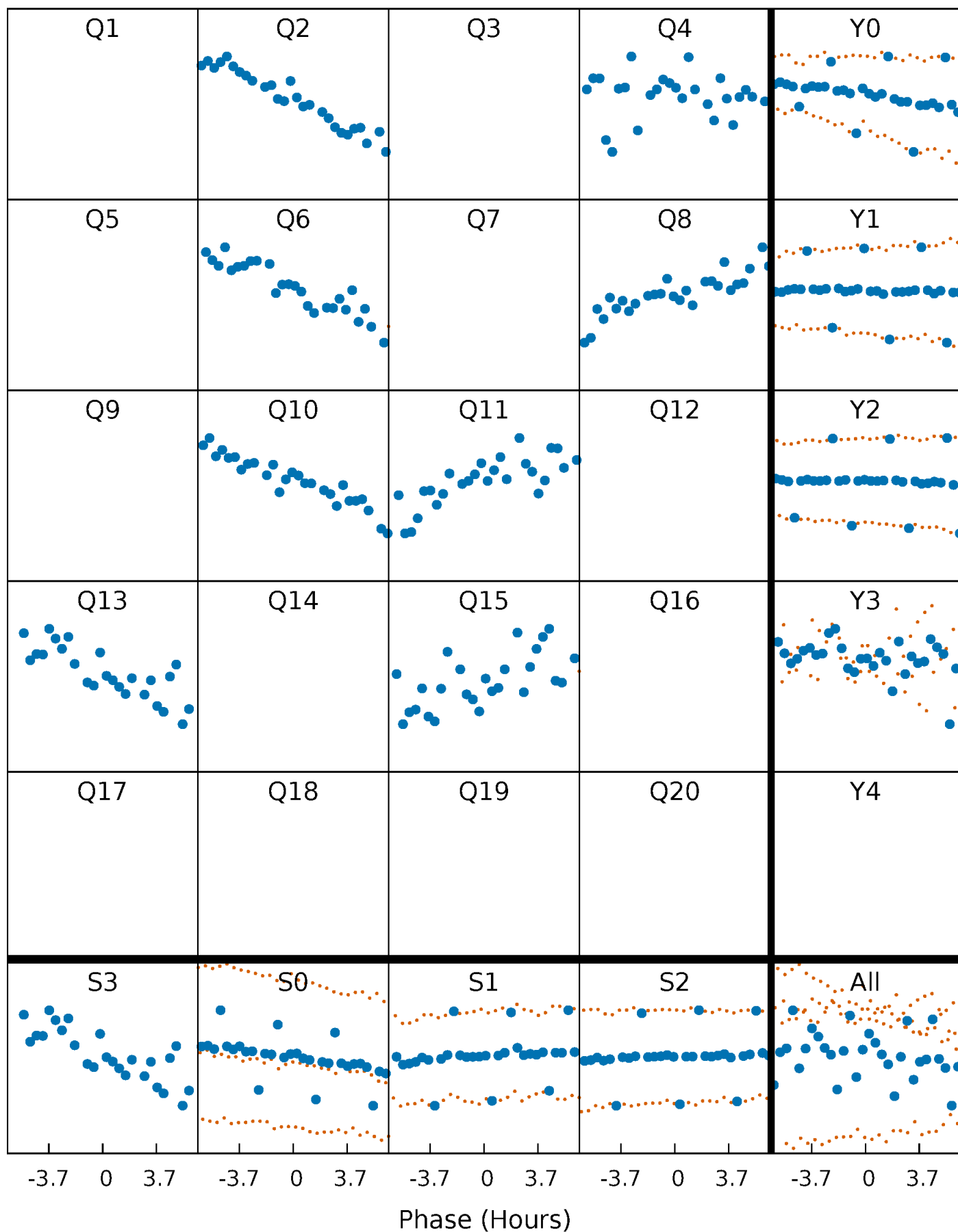


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



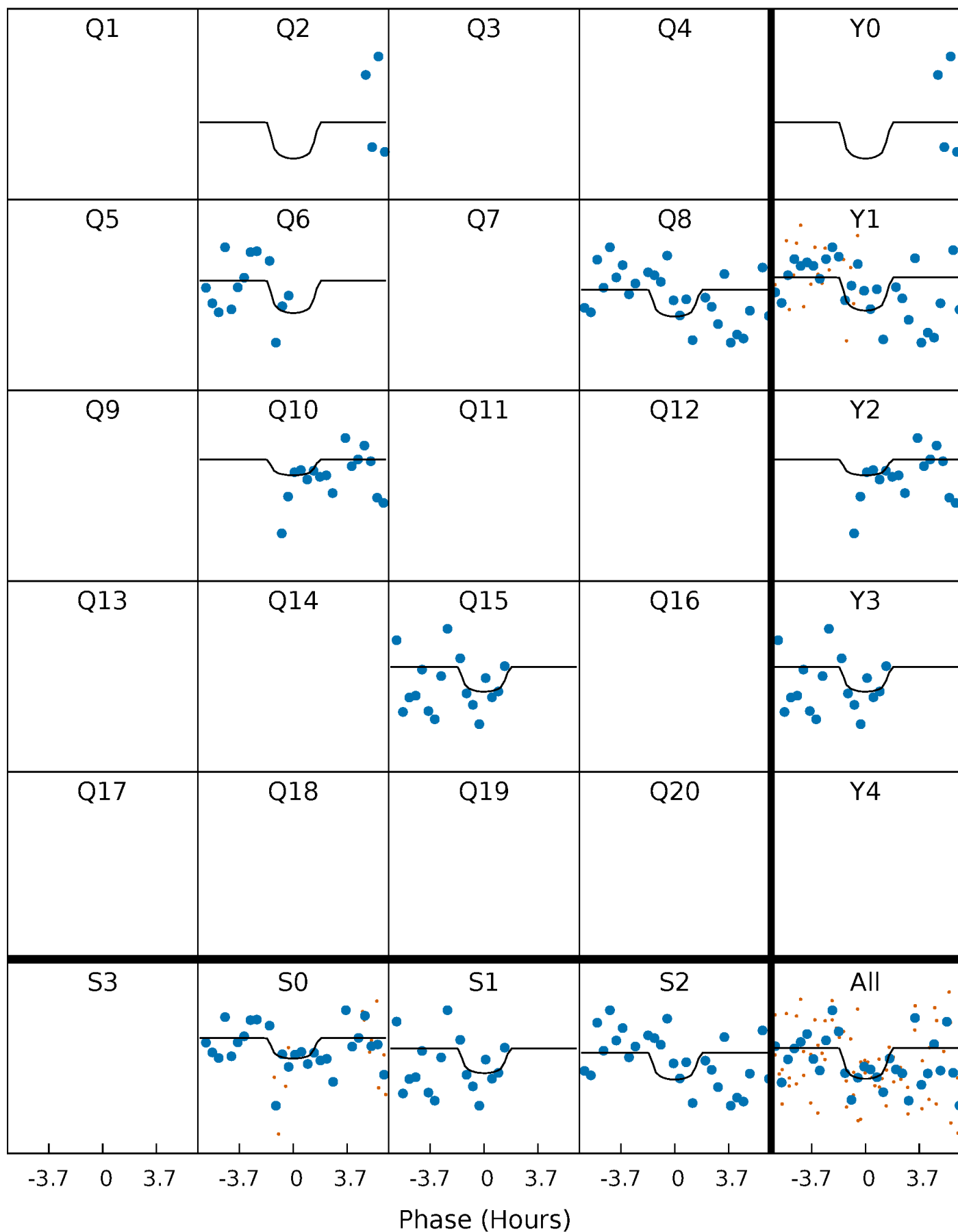
# PDC Quarter-Phased Transit Curves

TCE 006380533-05 P=169.888627 Days  $T_0=237.489259$  (BKJD)



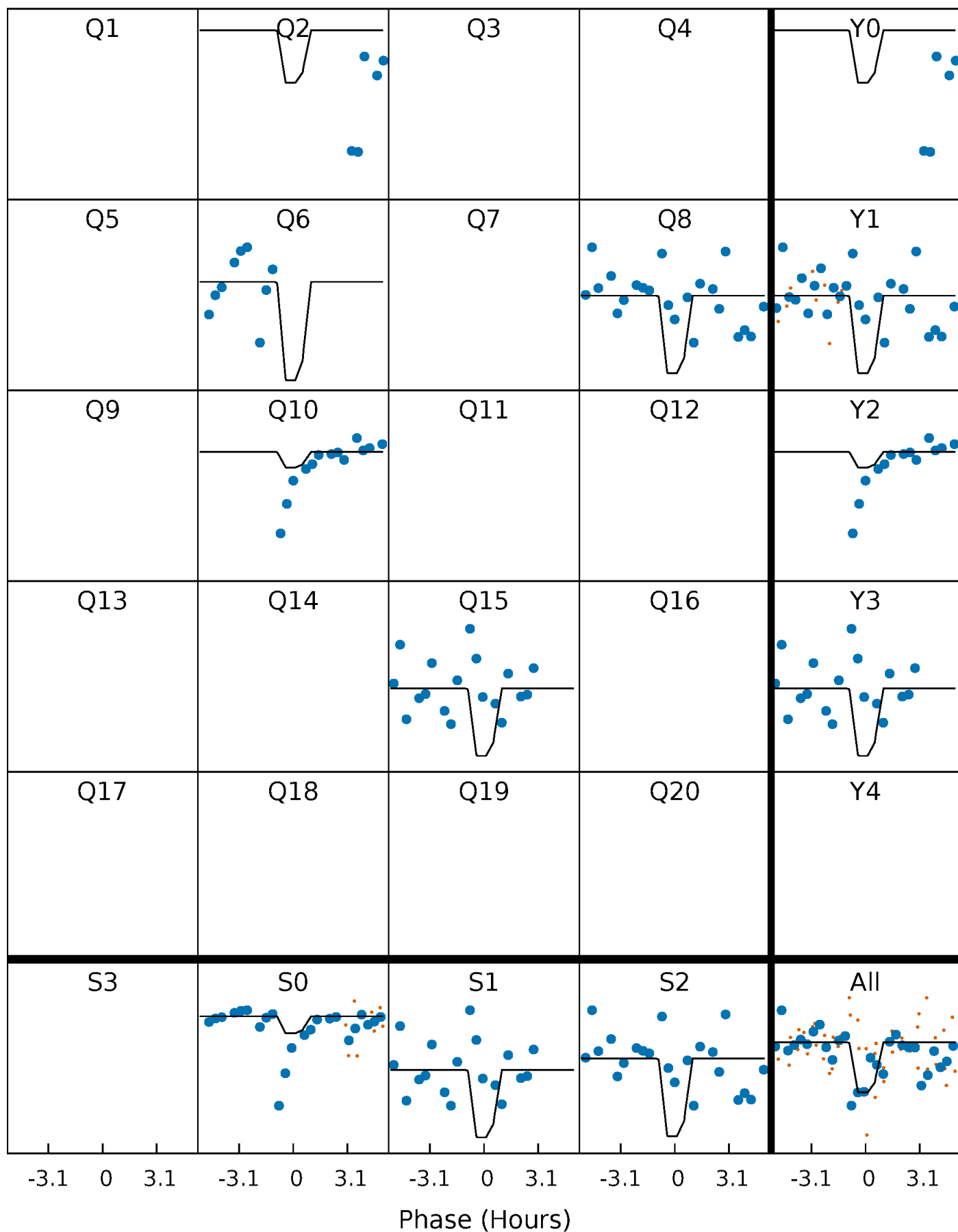
# DV Quarter-Phased Transit Curves

TCE 006380533-05     $P=169.888627$  Days     $T_0=237.489259$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006380533-05 P=169.870995 Days  $T_0=237.555839$  (BKJD)

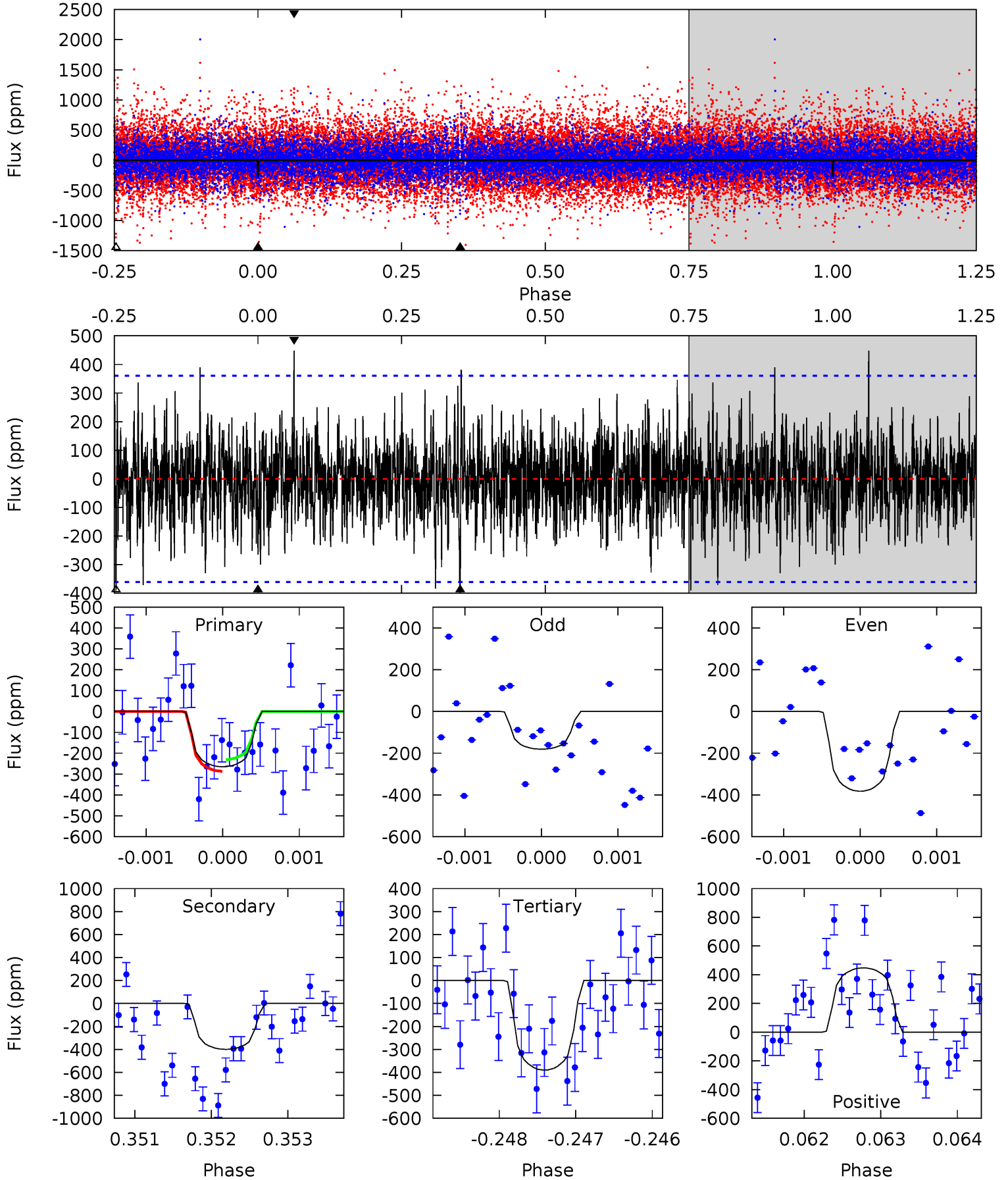




# DV Model-Shift Uniqueness Test

006380533-05, P = 169.888627 Days, E = 67.600632 Days

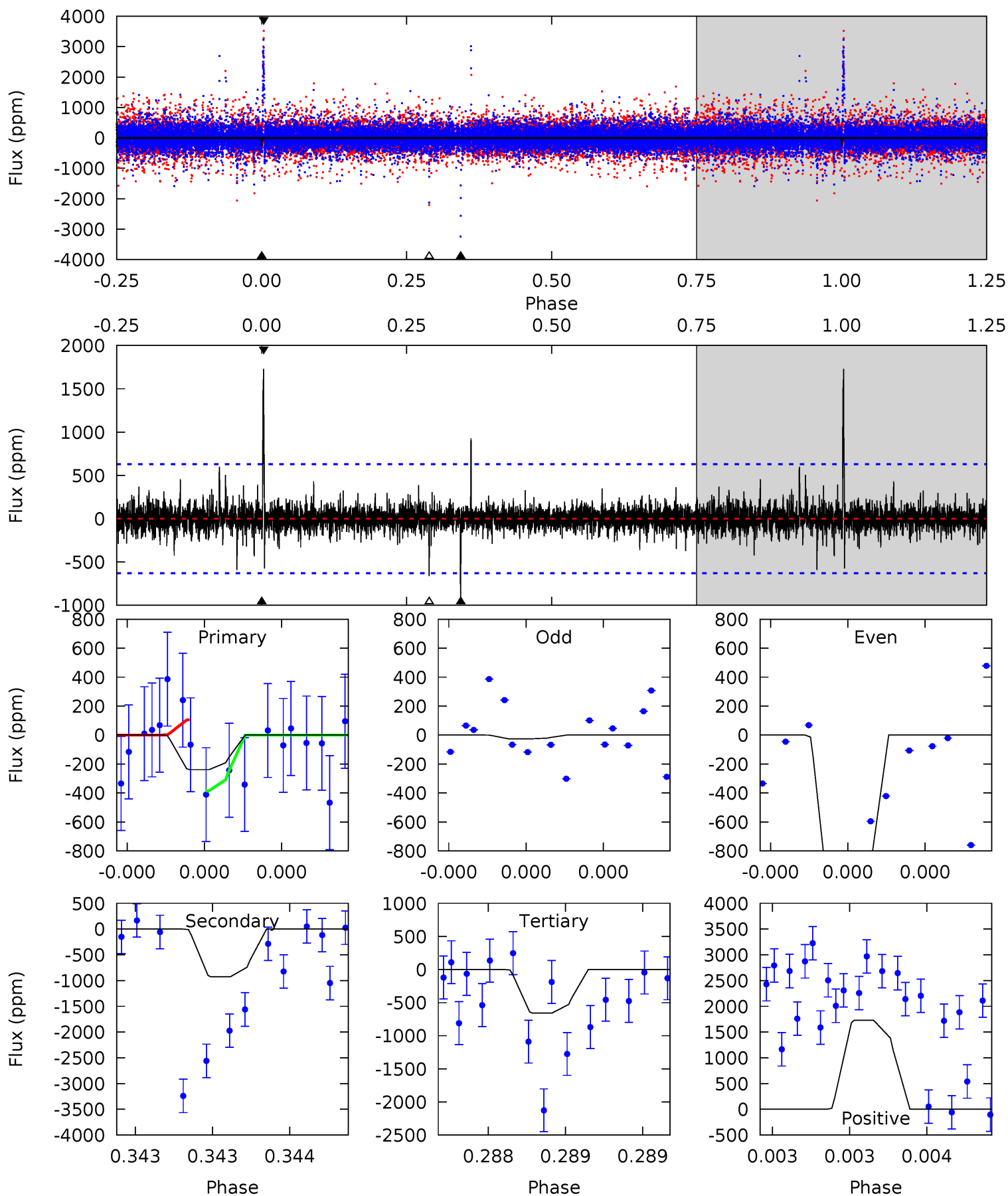
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.02	6.07	5.92	6.80	5.47	3.32	1.50	-1.90	-2.78	0.14	-0.73	1.49	0.94	0.53	0.41



# Alt Model-Shift Uniqueness Test

006380533-05, P = 169.870995 Days, E = 67.684844 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
2.12	8.21	5.84	15.3	5.58	3.49	0.92	-3.72	-13.2	2.37	-7.10	4.03	5.43	0.65	1.19



### Stellar Parameters For KIC 006380533

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5350^{+175}_{-159}$	$4.457^{+0.112}_{-0.154}$	$-0.180^{+0.300}_{-0.300}$	$0.864^{+0.164}_{-0.119}$	$0.780^{+0.122}_{-0.061}$	$1.702^{+0.882}_{-0.721}$
	+3%/-3%	+3%/-3%	+167%/-167%	+19%/-14%	+16%/-8%	+52%/-42%
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 006380533-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-400 \pm 66$	$3.98^{+4.12}_{-2.81}$	$415^{+25}_{-22}$	$4035^{+2651}_{-833}$	$4293^{+45690}_{-3271}$
Alt.	$-926 \pm 113$	$4.22^{+3.83}_{-2.95}$	$415^{+25}_{-23}$	$4615^{+3769}_{-960}$	$8663^{+92512}_{-6265}$

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

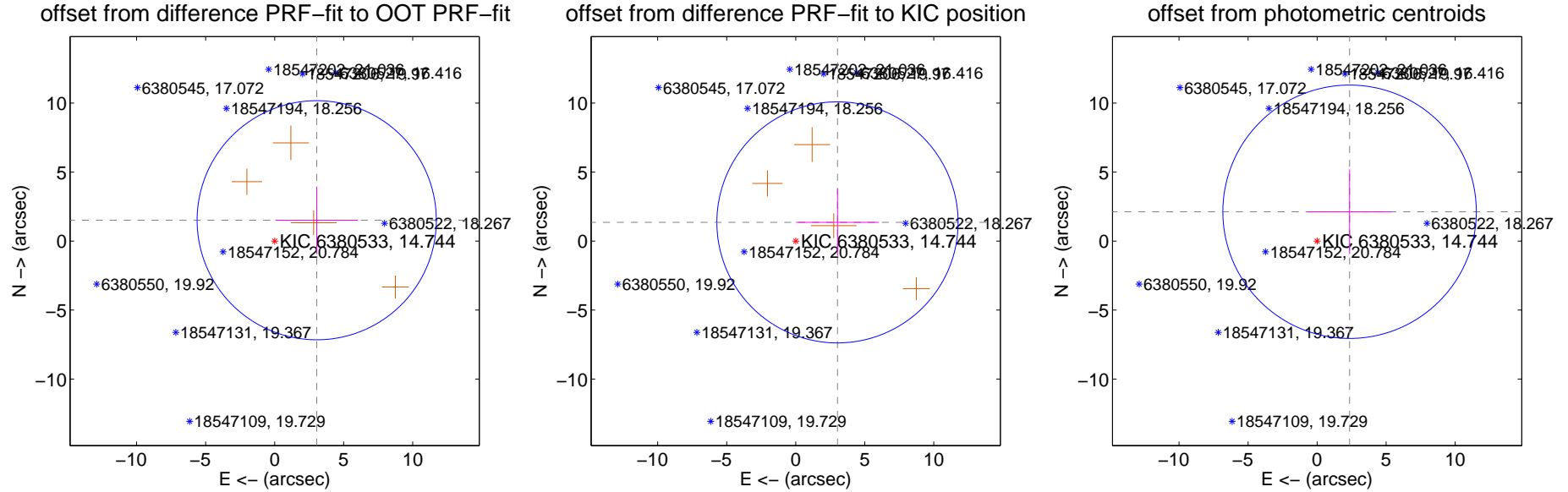
## DV Centroid Data

Supplemental centroid analysis for 006380533-05. Kepler magnitude: 14.74. Transit SNR 2.04

There are 0 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.402 \pm 2.888$	1.18	$-3.049 \pm 2.989$	$1.510 \pm 2.438$
PRF-fit source offset from KIC position	$3.315 \pm 2.912$	1.14	$-3.026 \pm 2.999$	$1.355 \pm 2.434$
photometric centroid source offset	$3.17 \pm 3.06$	1.04	$-2.35 \pm 3.06$	$2.13 \pm 3.06$



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.

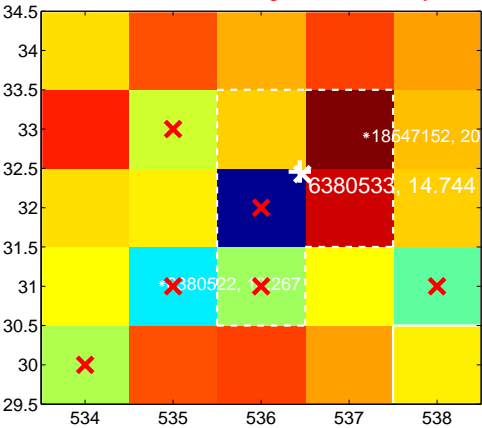
Q1 no difference image



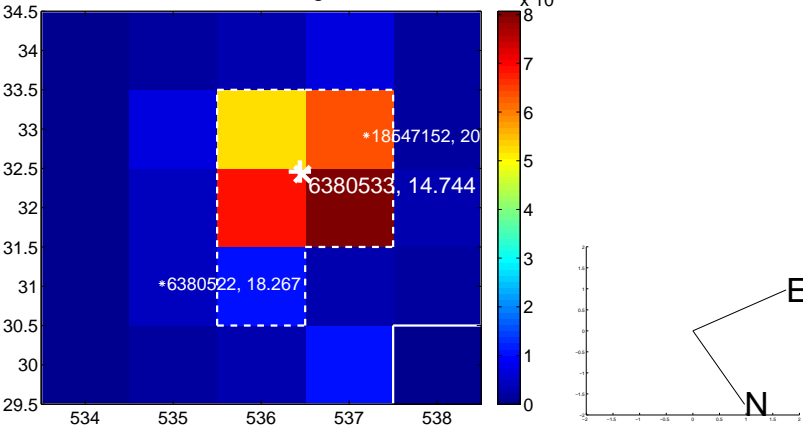
Q1 no OOT image



Q2 difference image. Poor Quality



Q2 OOT image



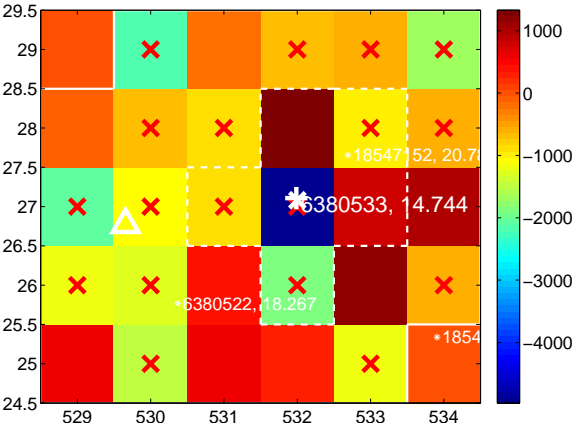
Q3 no difference image



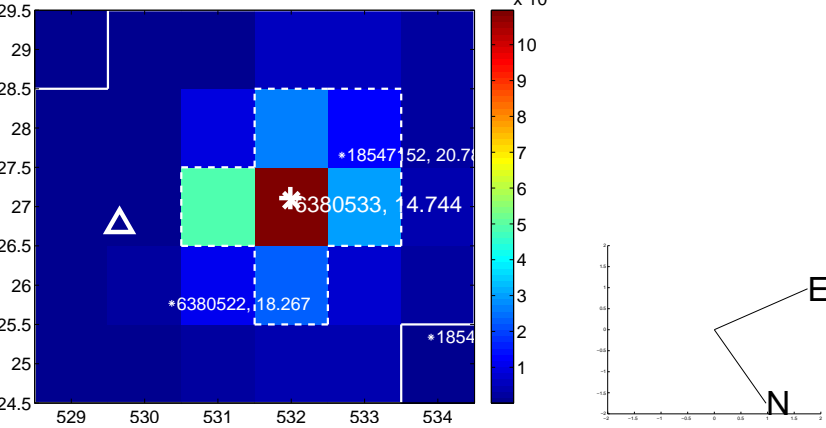
Q3 no OOT image



Q4 difference image. Poor Quality



Q4 OOT image

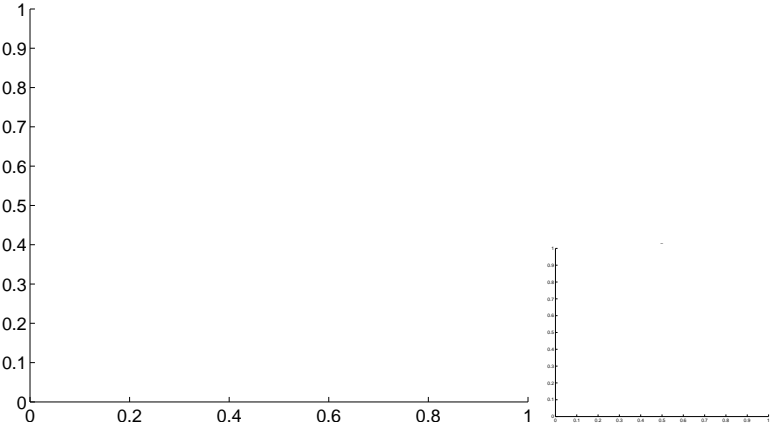


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

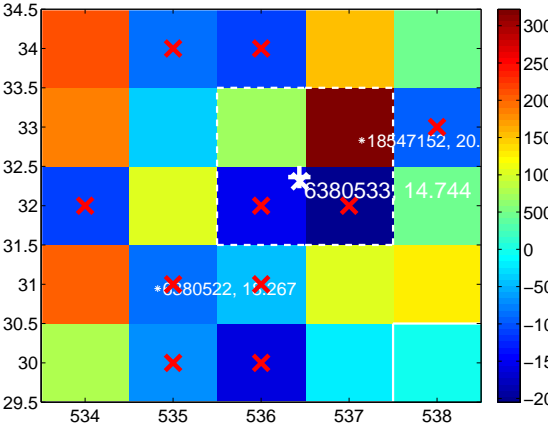
Q5 no difference image



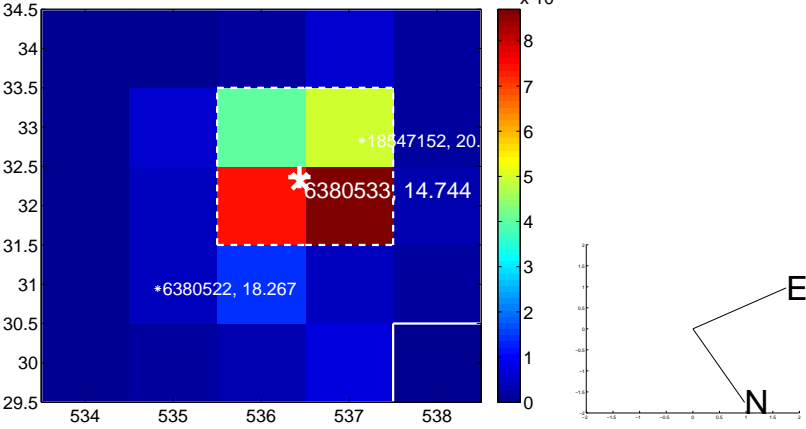
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



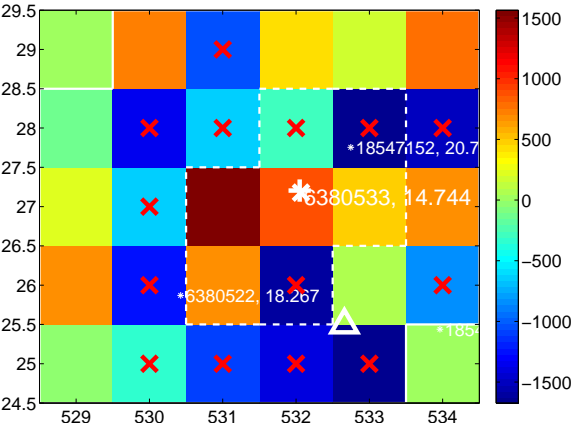
Q7 no difference image



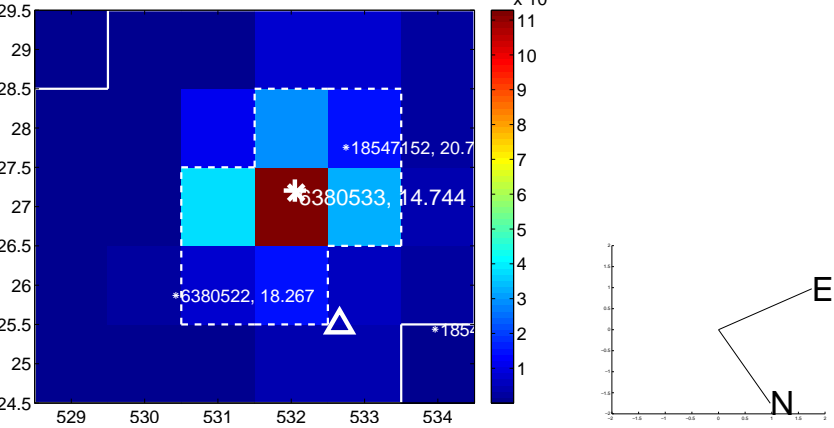
Q7 no OOT image



Q8 difference image. Poor Quality



Q8 OOT image



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

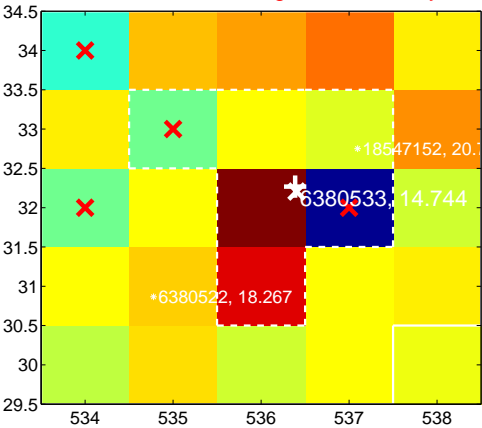
Q9 no difference image



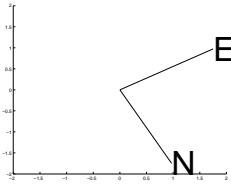
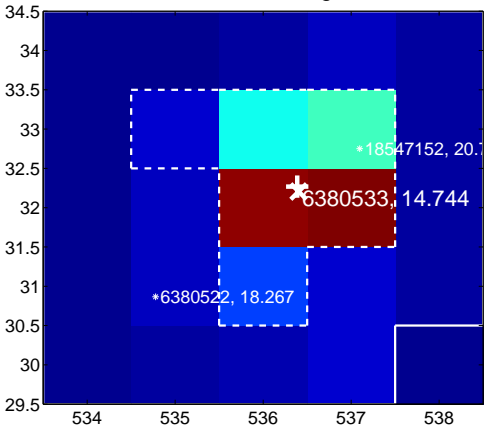
Q9 no OOT image



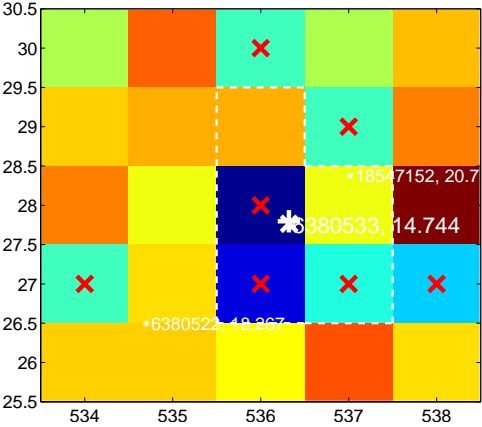
Q10 difference image. Poor Quality



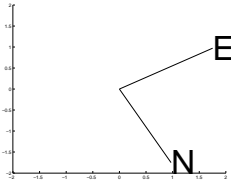
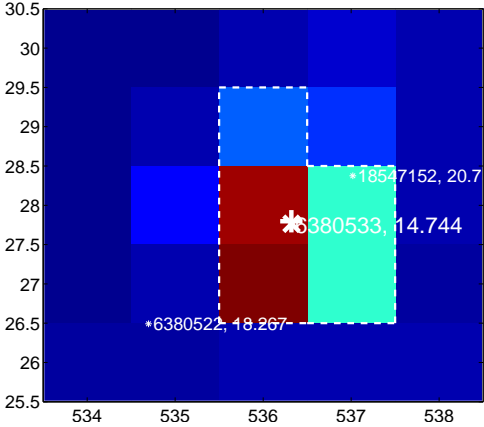
Q10 OOT image



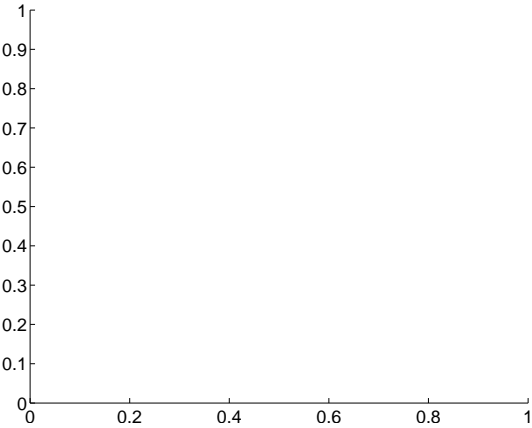
Q11 difference image. Poor Quality



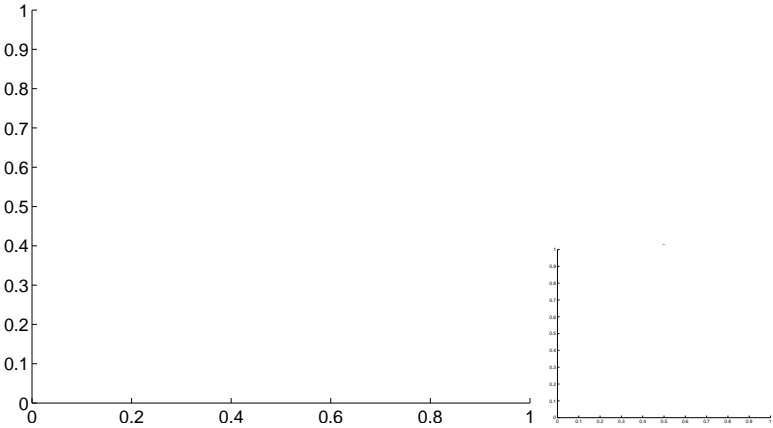
Q11 OOT image



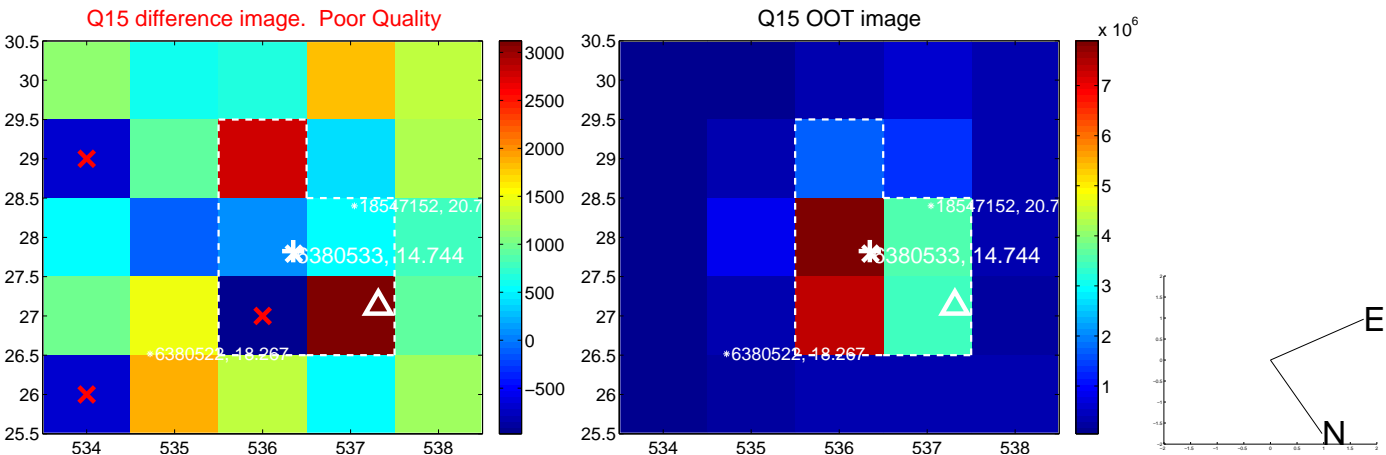
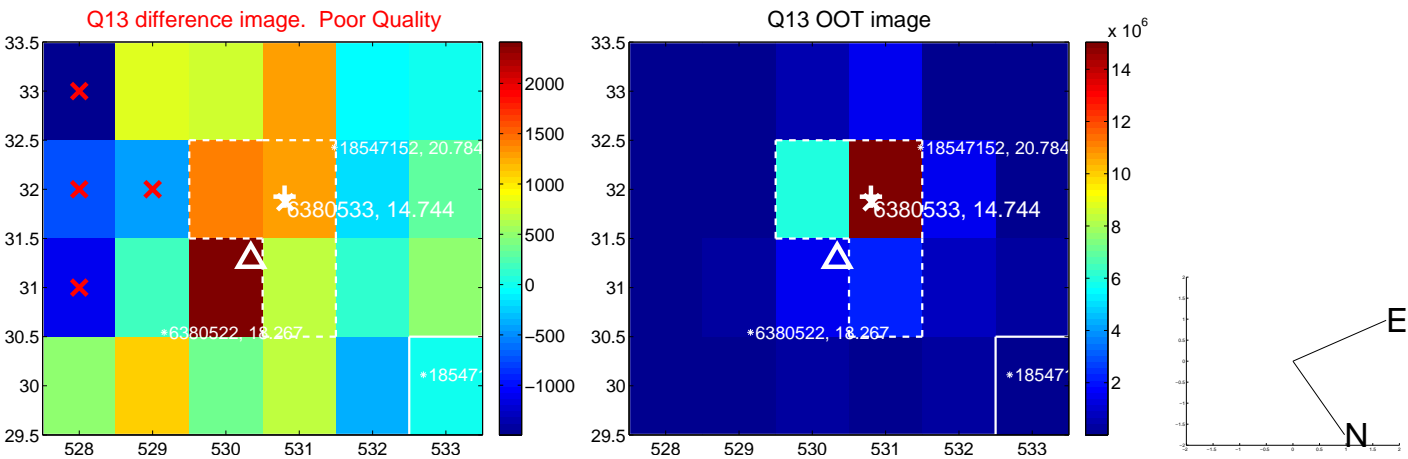
Q12 no difference image



Q12 no OOT image

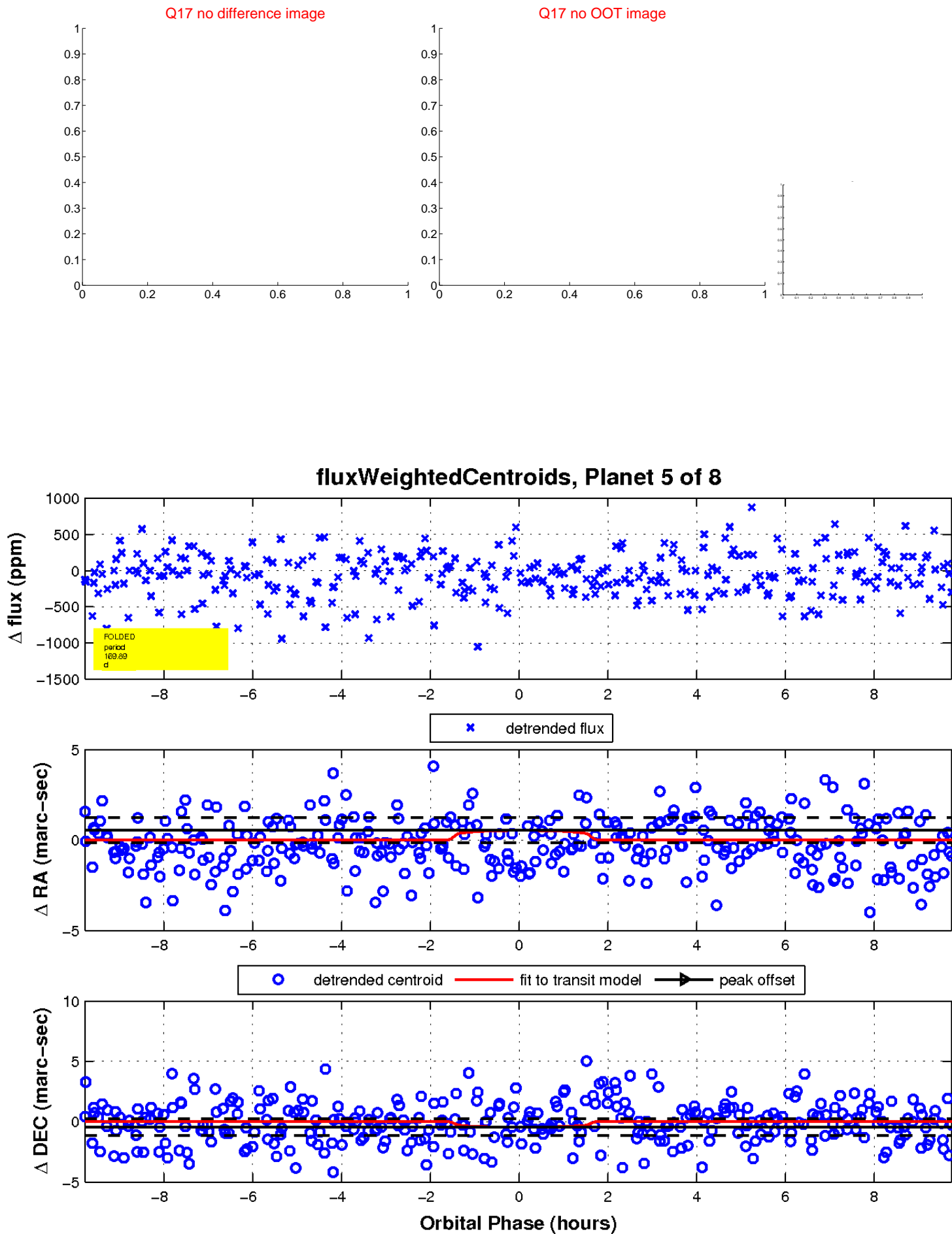


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



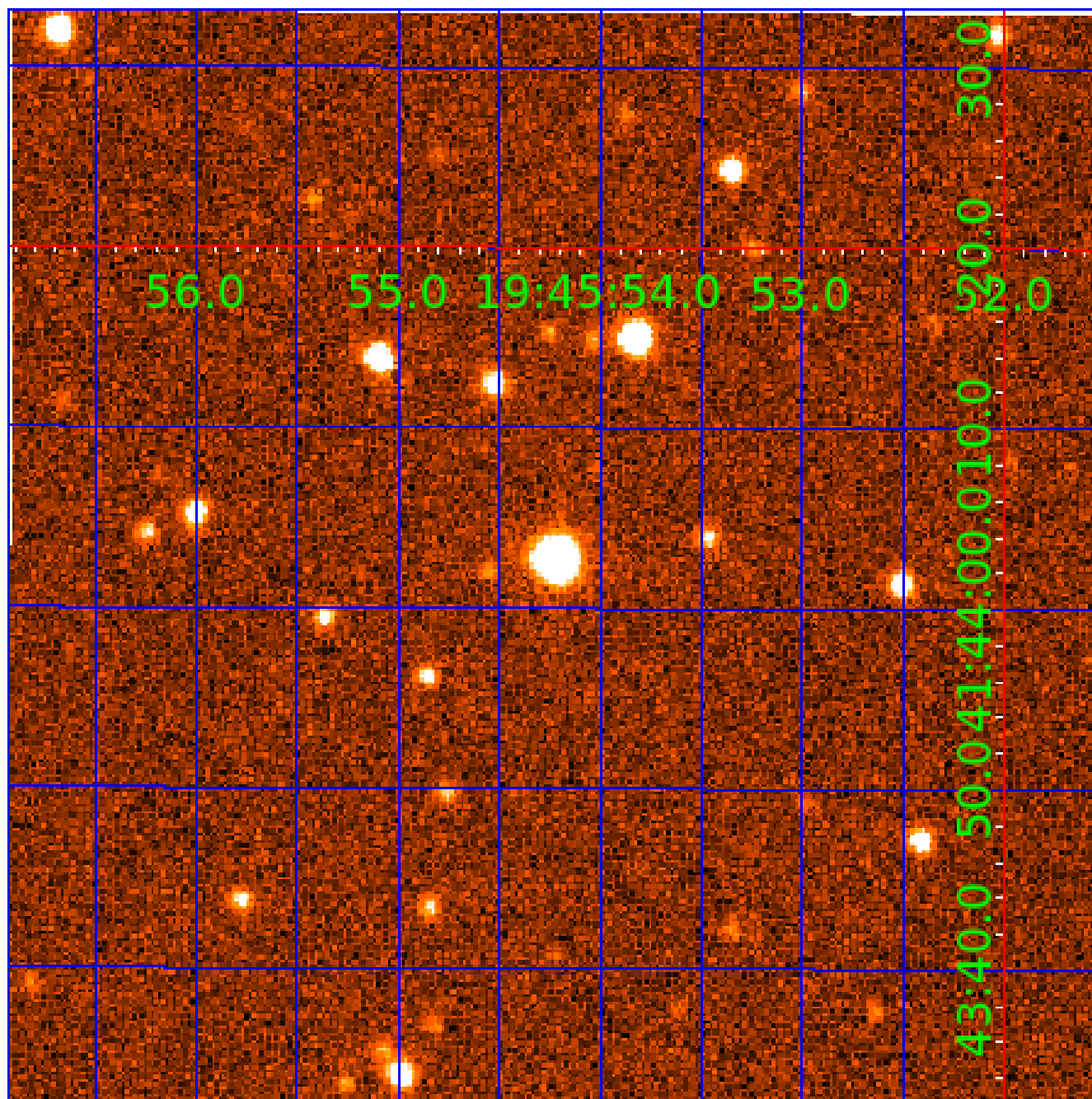


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 006380533

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006380533-01	OBS	No	1.533445	132.983160	56.9	6.487	7.6	9.5	0.86	5350	0.65	954.47
006380533-02	OBS	No	228.793699	305.343517	1359.4	11.513	16.3	9.5	0.86	5350	3.24	1.21
006380533-03	OBS	No	131.468842	249.832282	821.3	5.423	14.6	7.0	0.86	5350	3.19	2.52
006380533-04	OBS	No	186.433457	161.647854	1260.8	9.594	11.4	8.6	0.86	5350	6.03	1.58
006380533-05	OBS	No	169.888627	237.489259	227.4	3.274	10.4	2.0	0.86	5350	1.49	1.79
006380533-06	OBS	No	499.832334	462.264221	4839.5	38.691	9.5	10.0	0.86	5350	6.00	0.42
006380533-07	OBS	No	209.042130	167.361675	766.6	9.000	10.3	-1.0	0.86	5350	2.35	1.36
006380533-08	OBS	No	149.858044	206.101353	813.8	4.639	9.5	7.3	0.86	5350	2.69	2.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006380533-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
006380533-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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
006380533-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
006380533-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006380533-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

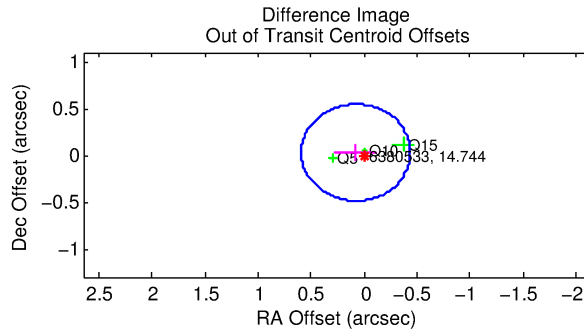
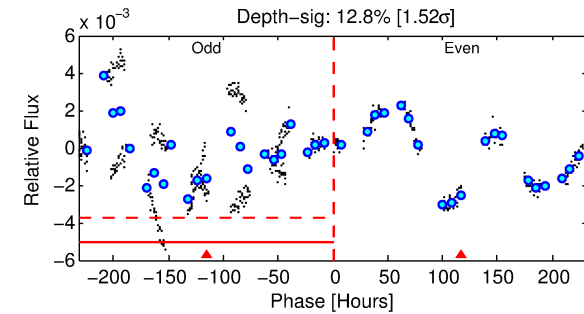
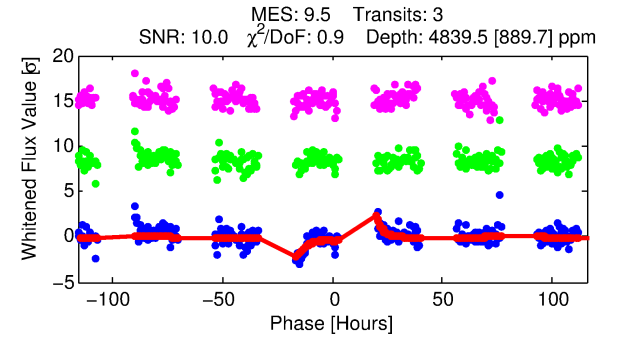
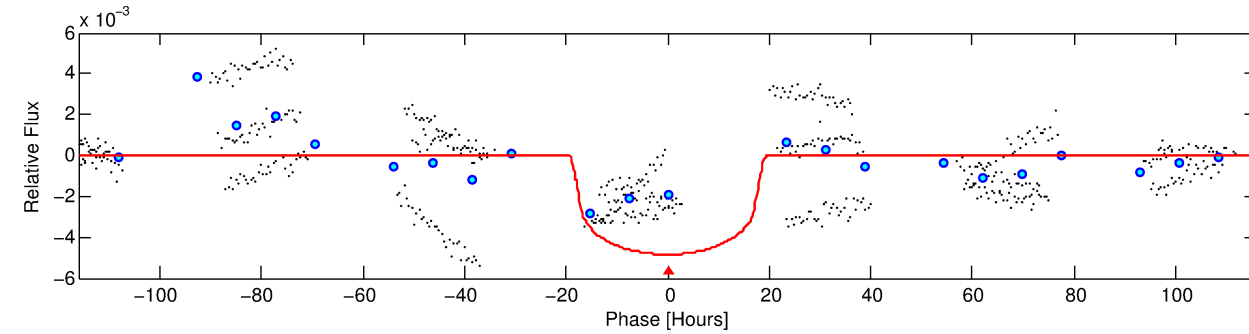
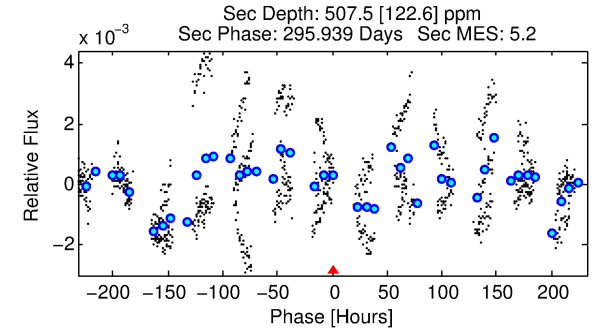
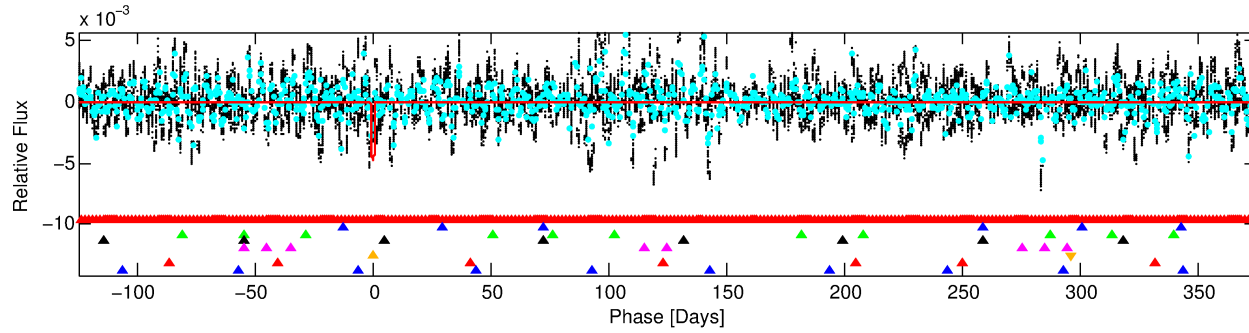
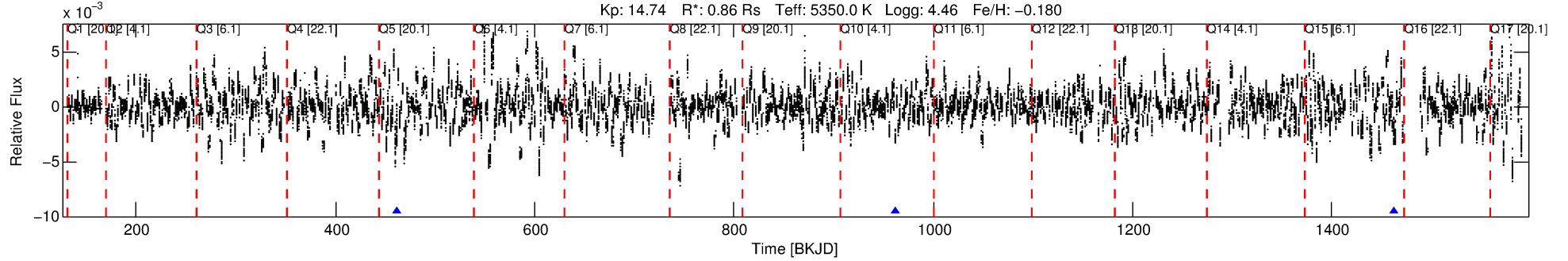
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 006380533-06

No Significant Match Found

# DV One-Page Summary

KIC: 6380533 Candidate: 6 of 8 Period: 499.832 d



## DV Fit Results:

Period = 499.83233 [0.03601] d  
Epoch = 462.2642 [0.0535] BKJD  
Rp/R\* = 0.0636 [0.0218]  
a/R\* = 98.60 [118.84]  
b = 0.36 [2.89]  
Seff = 0.43 [0.13]  
Teq = 206 [15] K  
Rp = 5.99 [2.35] Re  
a = 1.1348 [0.1965] AU  
Ag = 10005.01 [7743.77] [1.29 $\sigma$ ]  
Teffp = 3185 [587] K [5.07 $\sigma$ ]

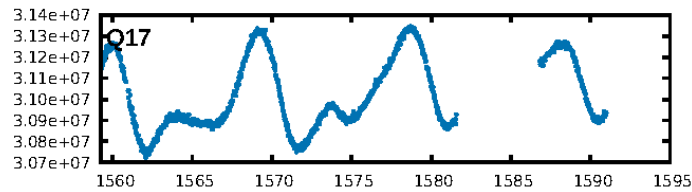
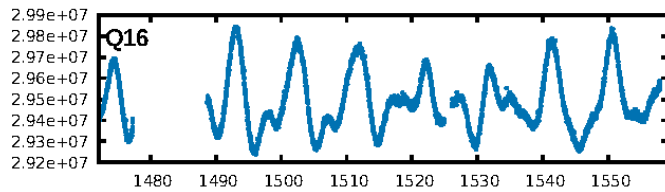
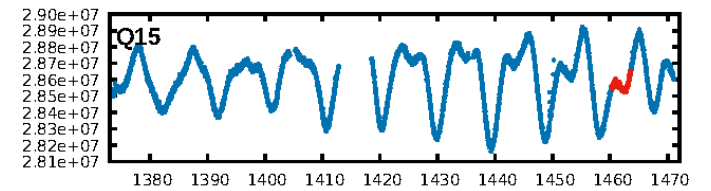
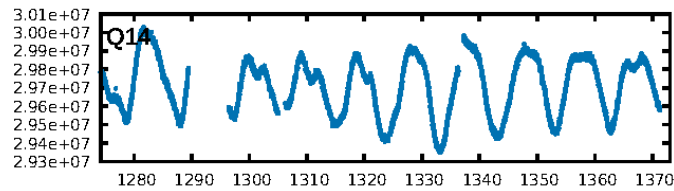
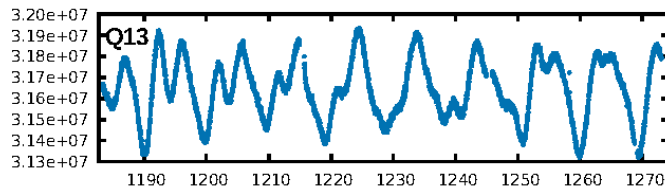
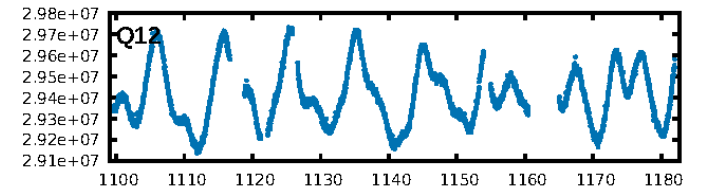
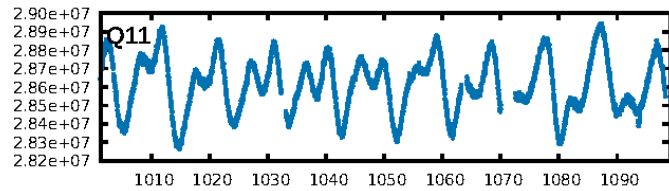
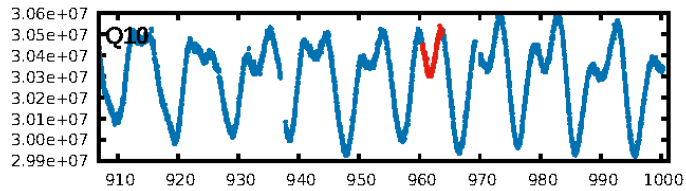
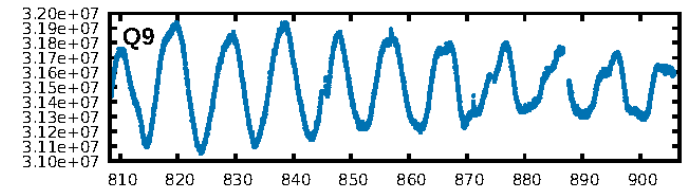
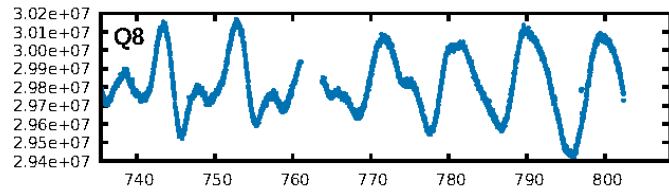
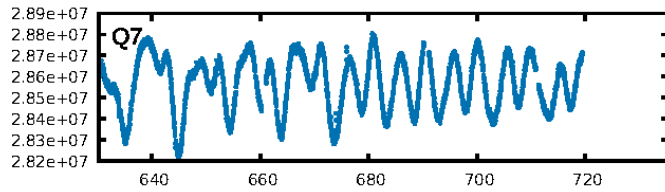
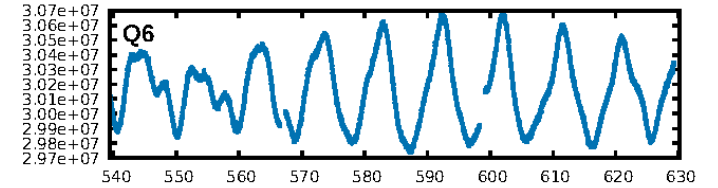
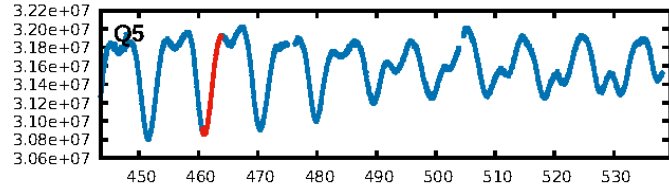
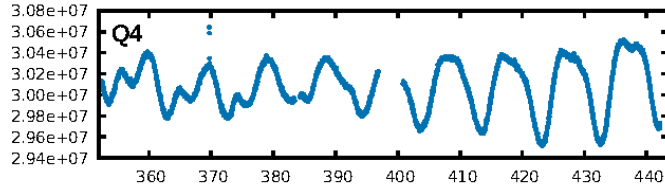
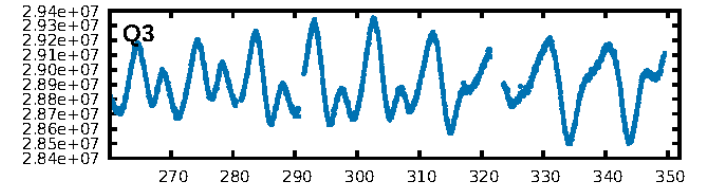
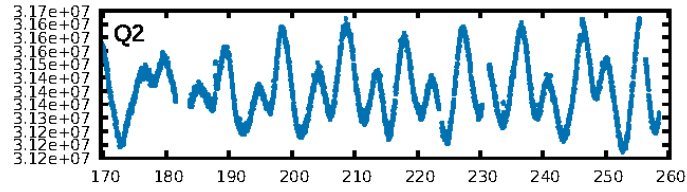
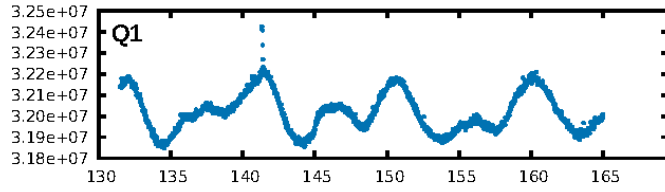
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [161.14 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 6.5%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.44e-09**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -1.225  
Centroid-sig: 86.8%  
Centroid-so: 0.165 arcsec [1.32 $\sigma$ ]  
OotOffset-rm: 0.084 arcsec [0.49 $\sigma$ ]  
KicOffset-rm: 0.232 arcsec [1.80 $\sigma$ ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.00 [0/3]

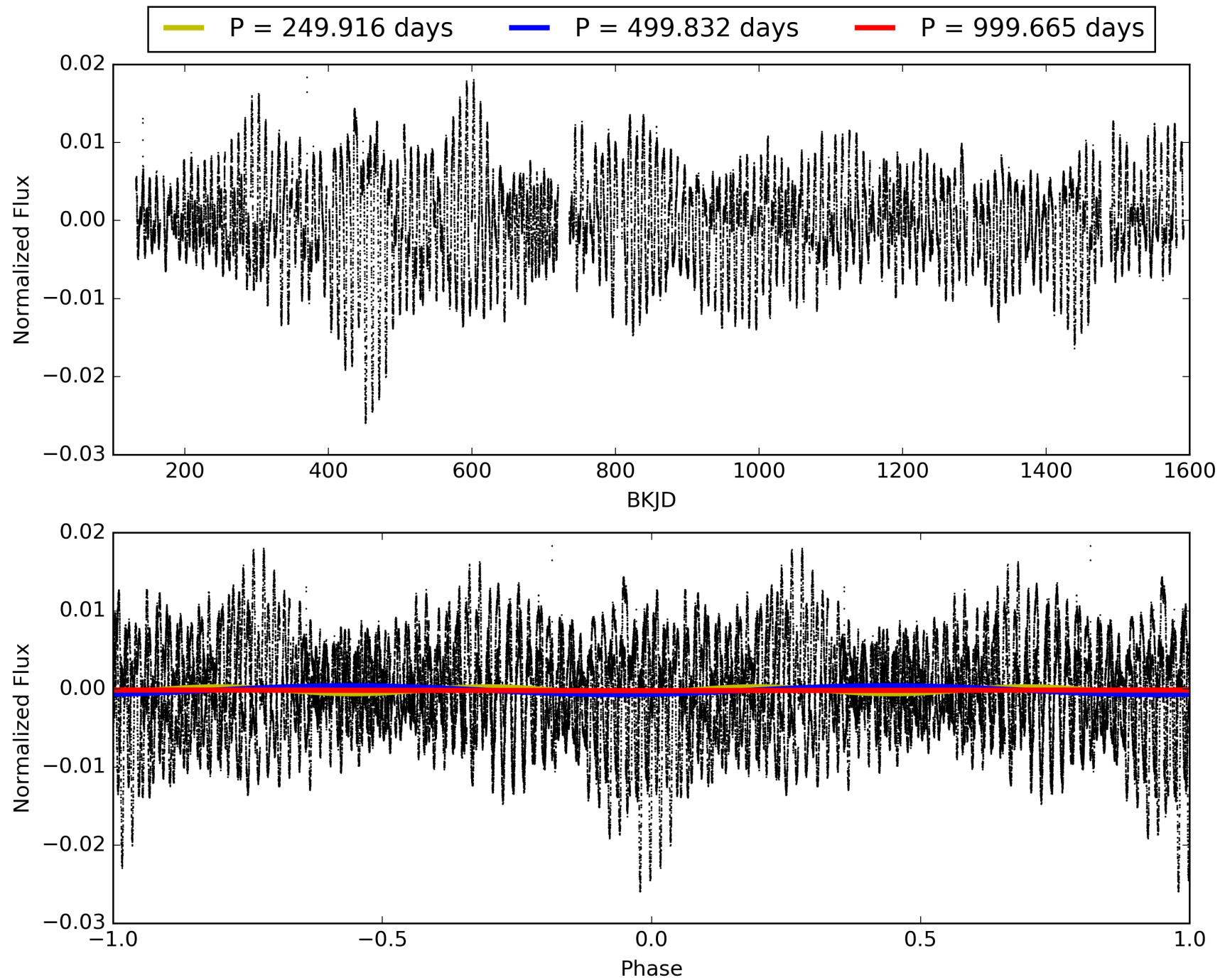
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 05:45:17 Z

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

# TCE 006380533-06, PDC Light Curves

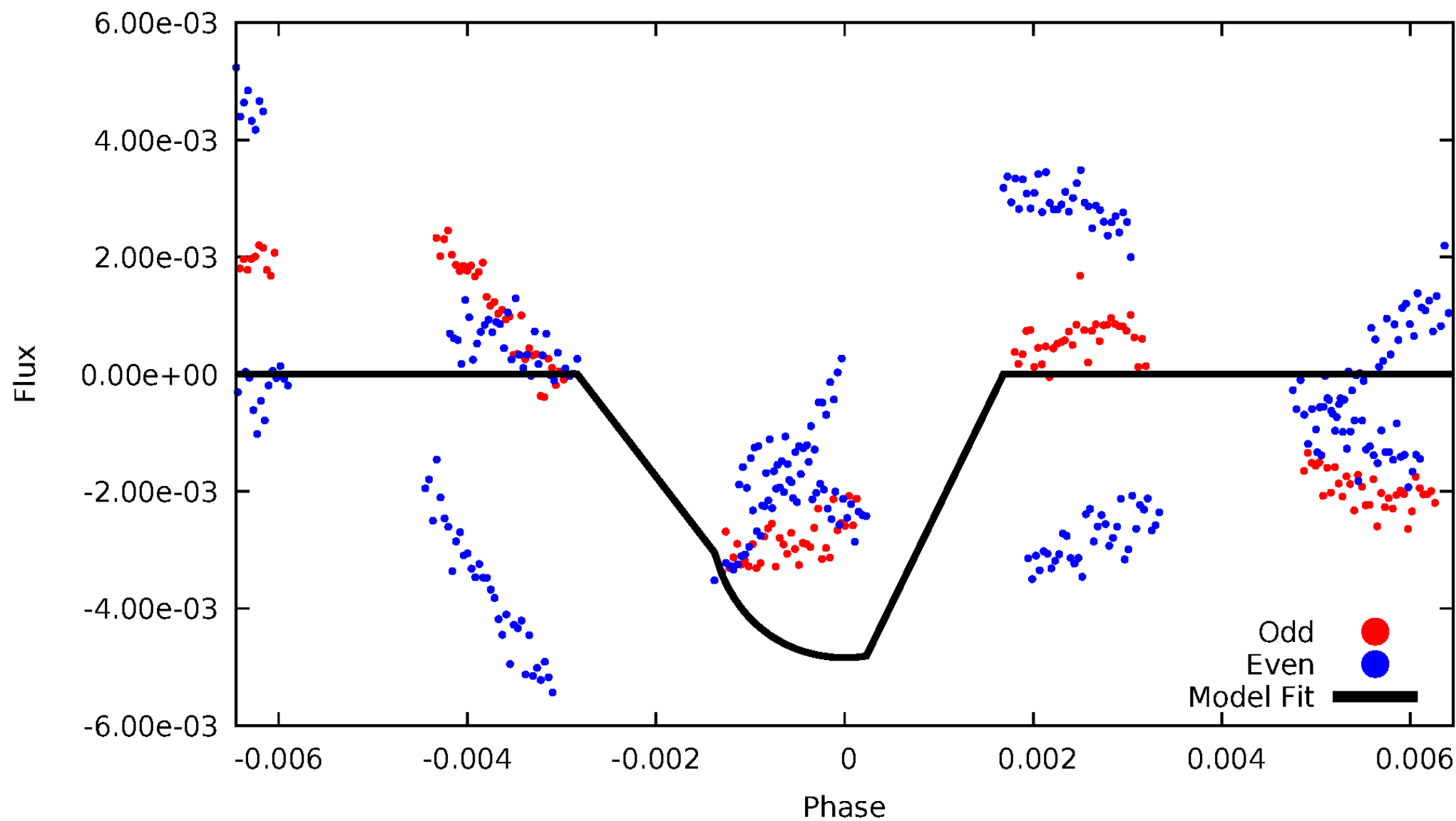


TCE 006380533-06



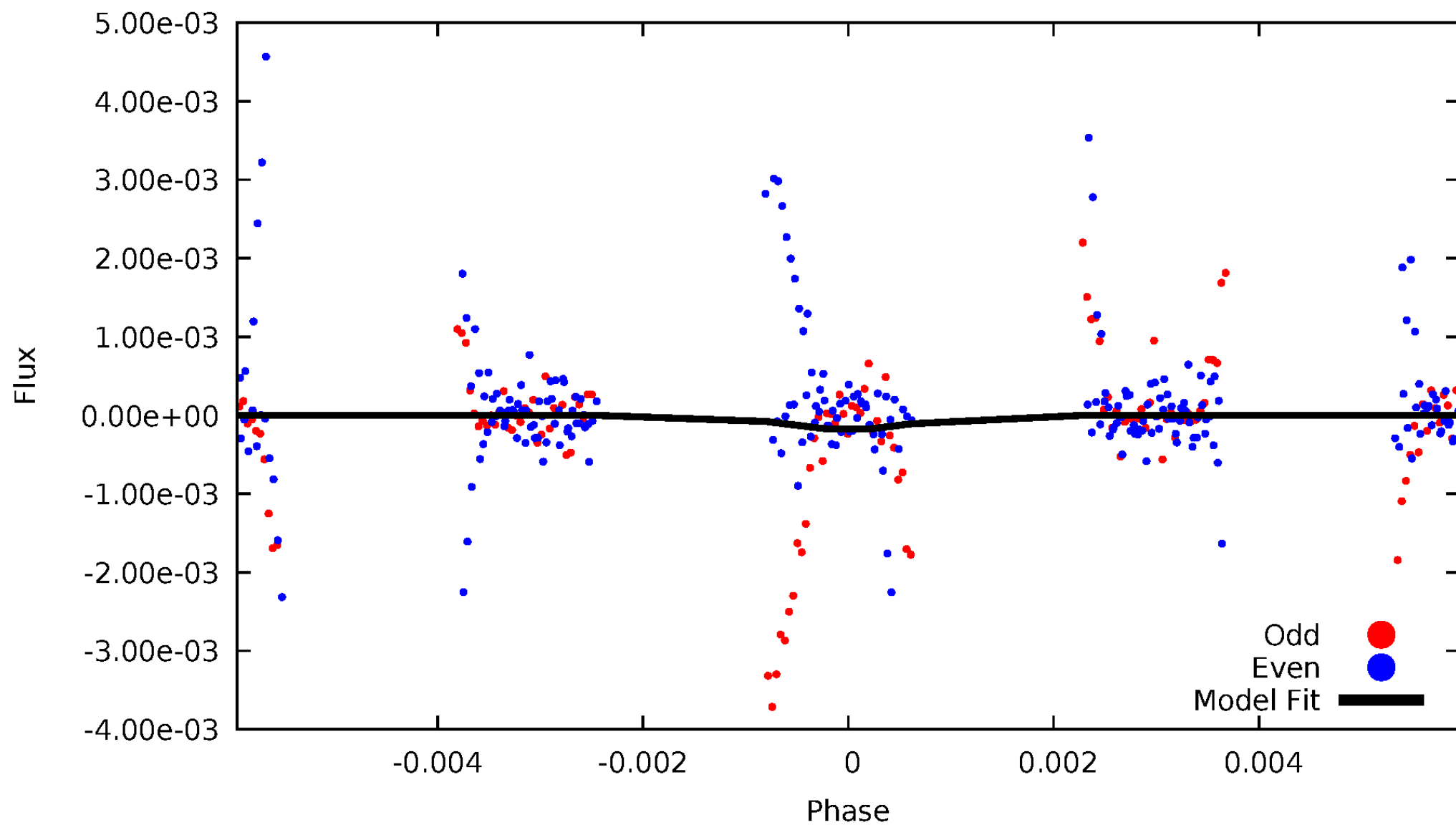
# DV Odd/Even

TCE 006380533-06



# ALT Odd/Even

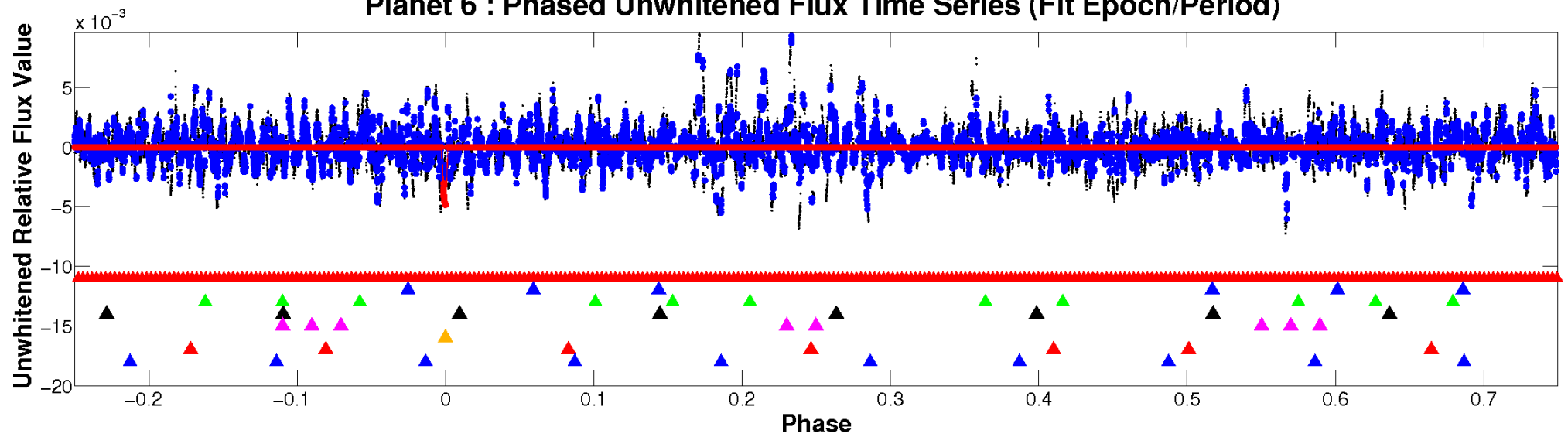
TCE 006380533-06



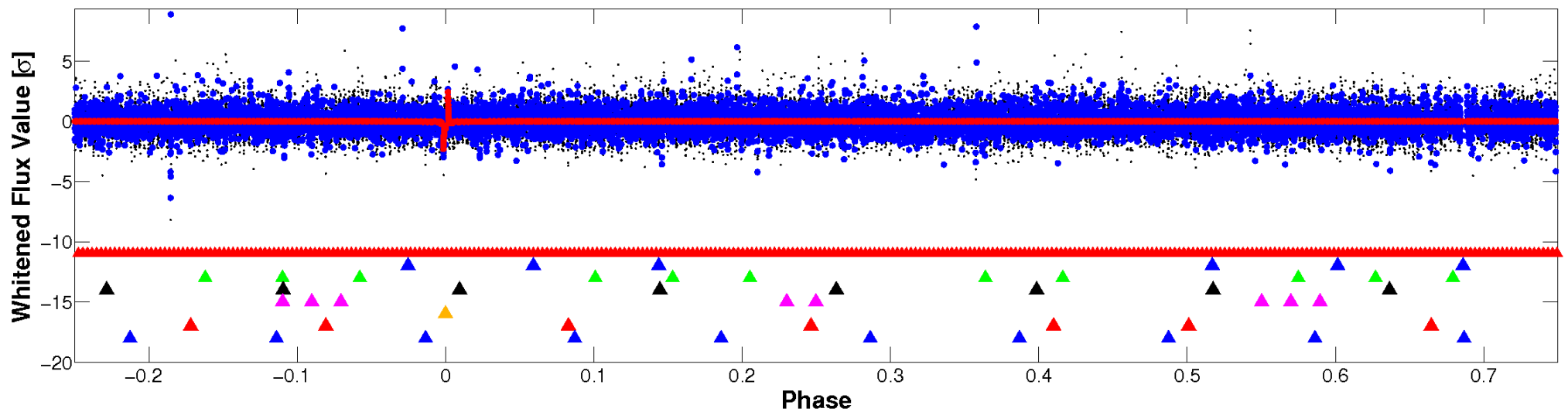


# Non-Whitened Vs. Whitened Light Curve

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

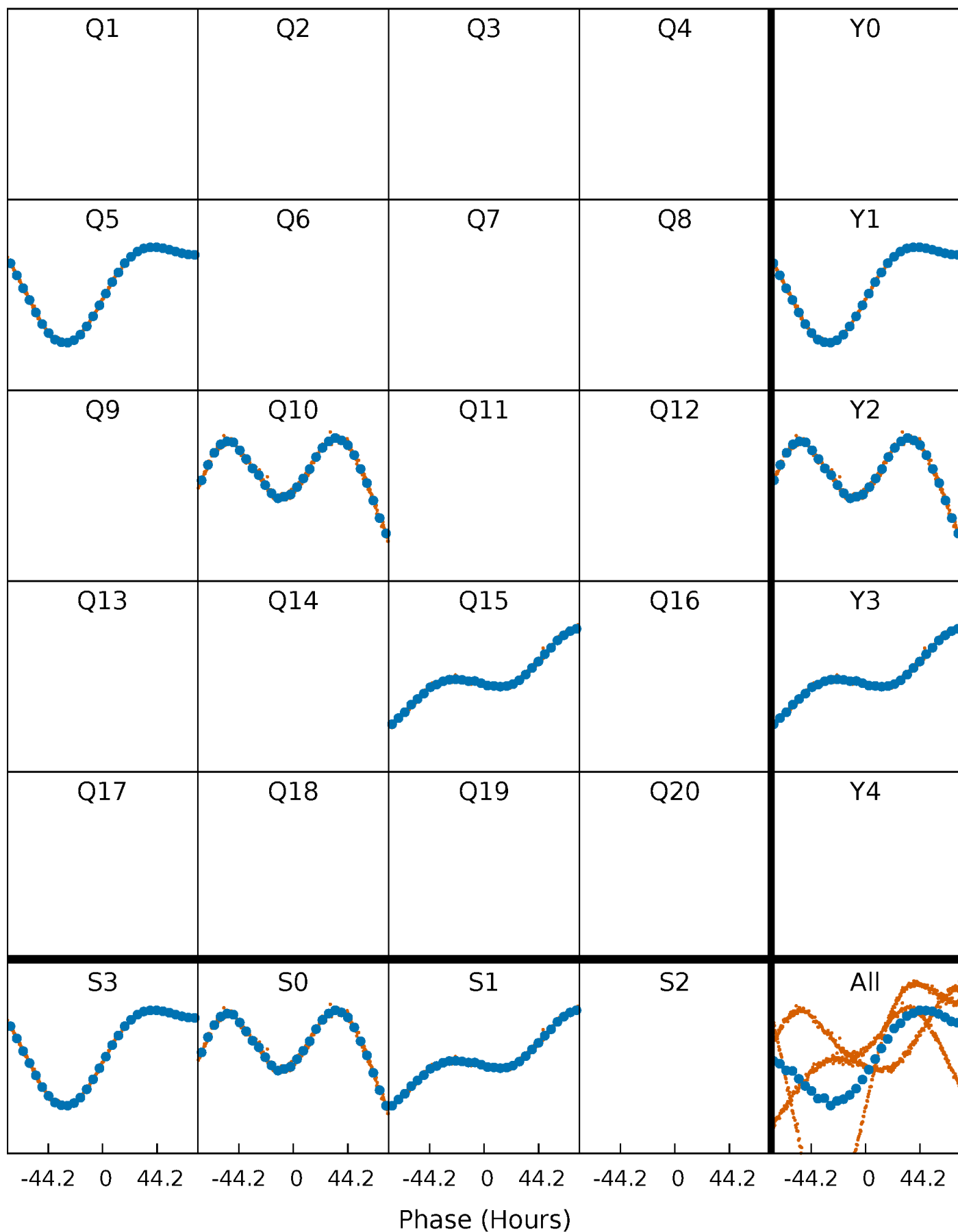


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



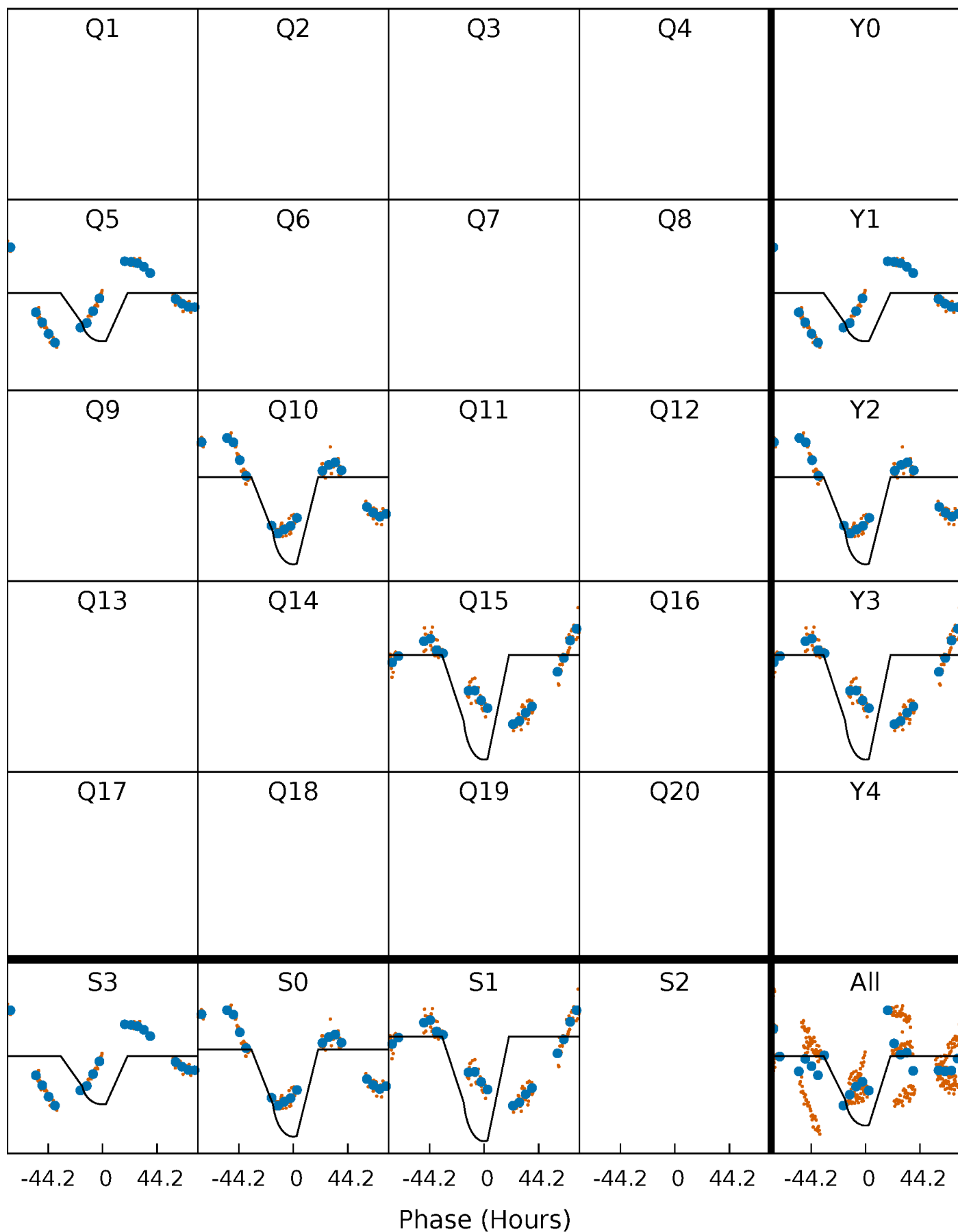
# PDC Quarter-Phased Transit Curves

TCE 006380533-06 P=499.832334 Days  $T_0=462.264221$  (BKJD)



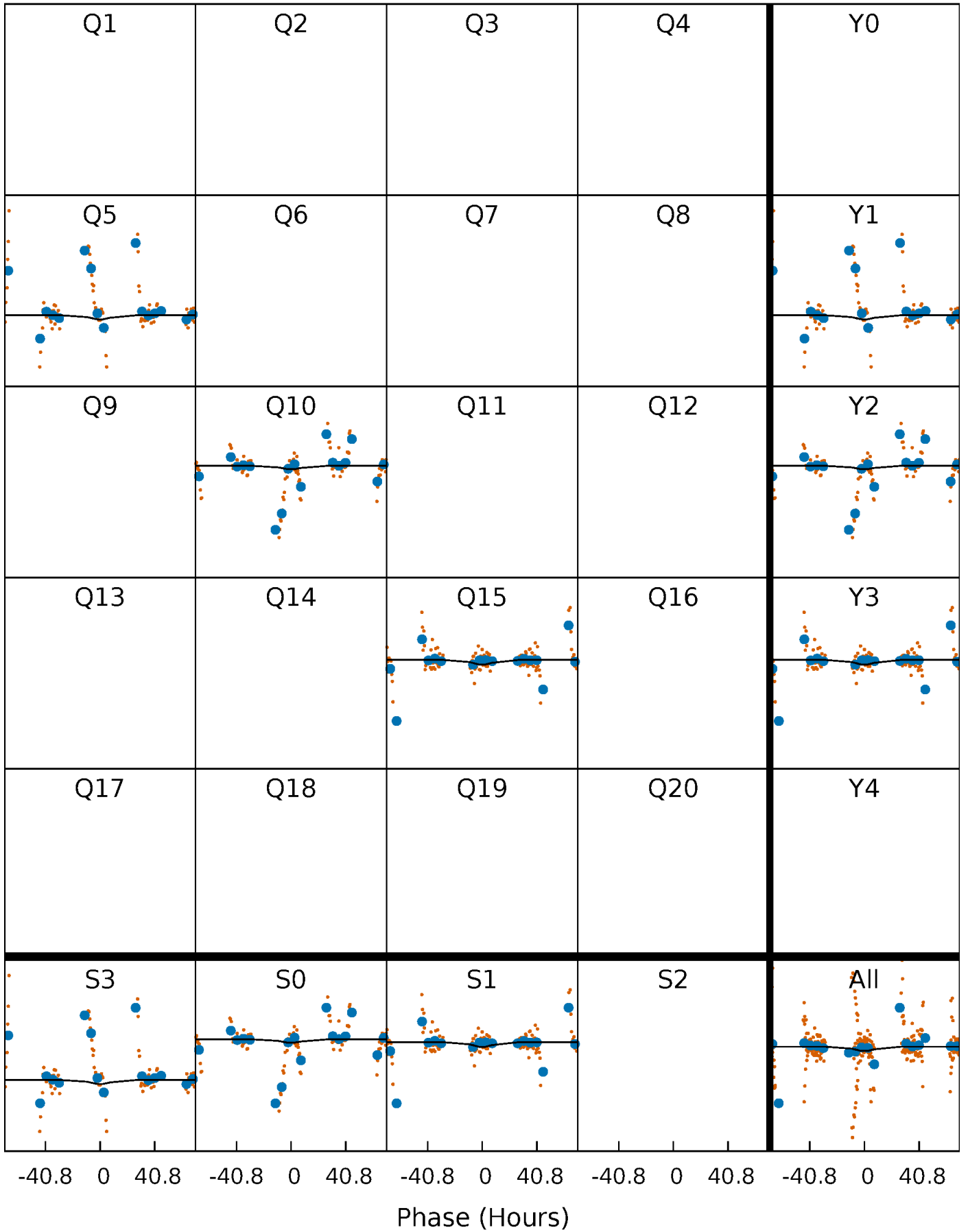
# DV Quarter-Phased Transit Curves

TCE 006380533-06     $P=499.832334$  Days     $T_0=462.264221$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

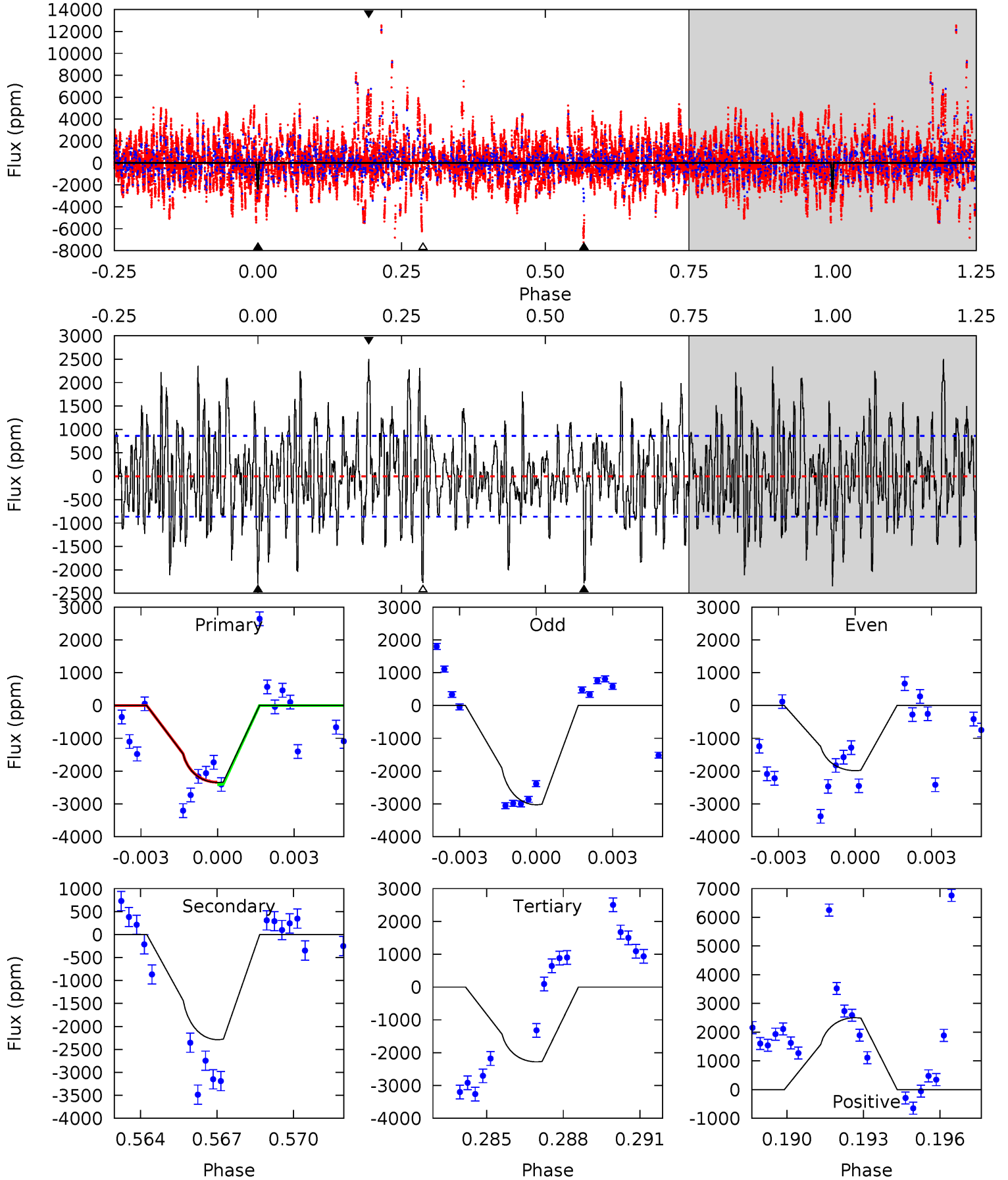
TCE 006380533-06 P=499.879801 Days  $T_0=461.977168$  (BKJD)



# DV Model-Shift Uniqueness Test

006380533-06, P = 499.832334 Days, E = 462.264221 Days

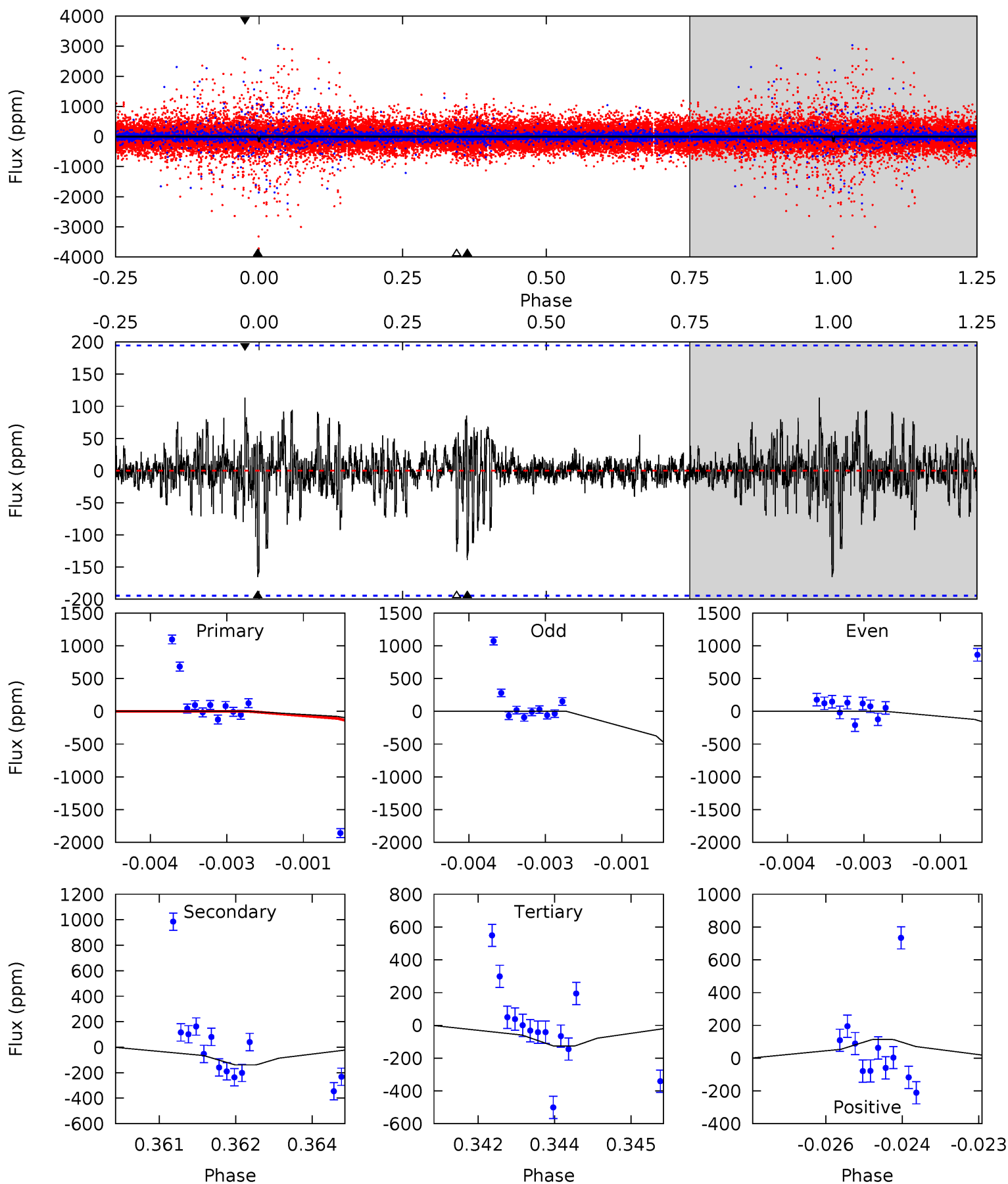
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.3	13.9	13.9	15.2	5.25	2.96	4.51	0.41	-0.95	0.05	-1.31	3.17	1.15	0.52	0.13



# Alt Model-Shift Uniqueness Test

006380533-06, P = 499.879801 Days, E = 461.977168 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
4.58	3.85	3.49	3.14	5.39	3.19	0.68	1.09	1.44	0.36	0.71	6.76	2.06	0.41	1.78



### Stellar Parameters For KIC 006380533

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5350^{+175}_{-159}$	$4.457^{+0.112}_{-0.154}$	$-0.180^{+0.300}_{-0.300}$	$0.864^{+0.164}_{-0.119}$	$0.780^{+0.122}_{-0.061}$	$1.702^{+0.882}_{-0.721}$
	+3%/-3%	+3%/-3%	+167%/-167%	+19%/-14%	+16%/-8%	+52%/-42%
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 006380533-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2289 \pm 164$	$6.09^{+2.30}_{-2.13}$	$290^{+18}_{-14}$	$4736^{+981}_{-539}$	$43757^{+59713}_{-20531}$
Alt.	$-139 \pm 36$	$2.01^{+1.89}_{-1.33}$	$290^{+17}_{-15}$	$4230^{+2632}_{-855}$	$24857^{+191785}_{-18828}$

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

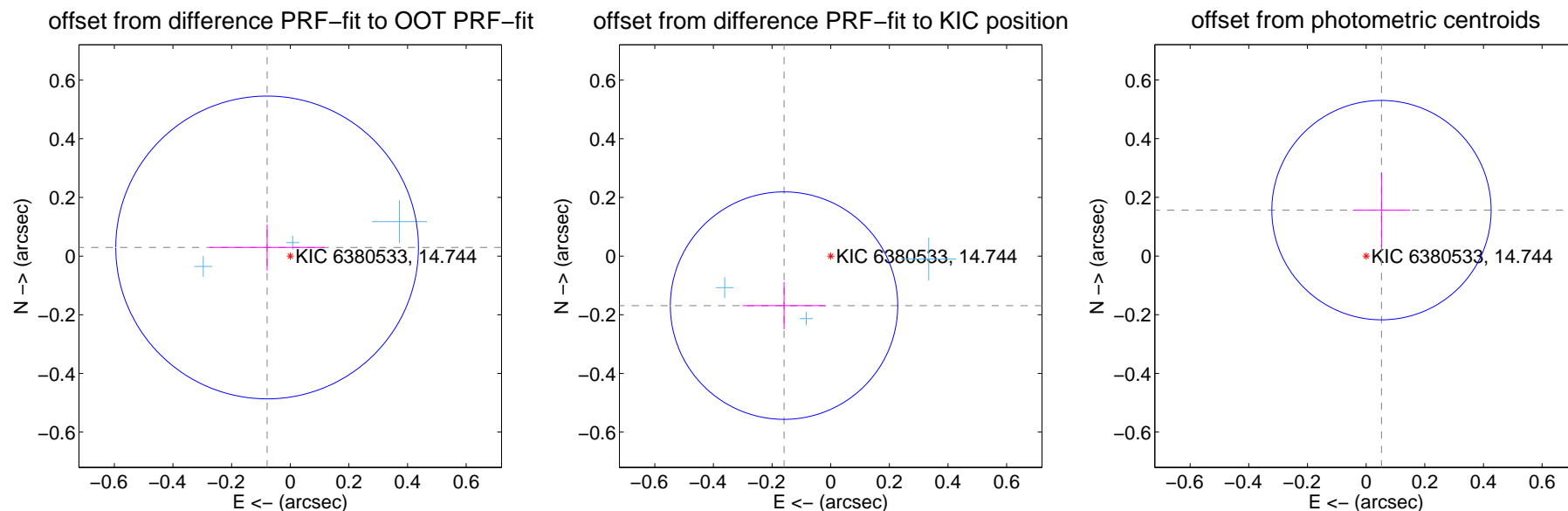
## DV Centroid Data

Supplemental centroid analysis for 006380533-06. Kepler magnitude: 14.74. Transit SNR 10.01

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.084 \pm 0.172$	0.49	$0.079 \pm 0.196$	$0.029 \pm 0.079$
PRF-fit source offset from KIC position	$0.232 \pm 0.129$	1.80	$0.159 \pm 0.141$	$-0.169 \pm 0.081$
photometric centroid source offset	$0.16 \pm 0.12$	1.32	$-0.05 \pm 0.10$	$0.16 \pm 0.13$



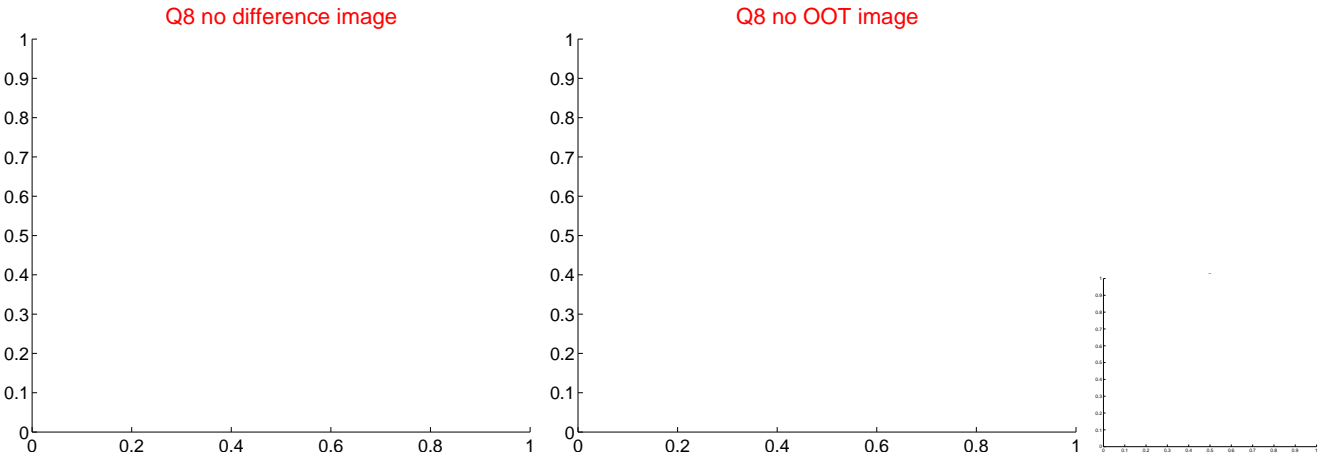
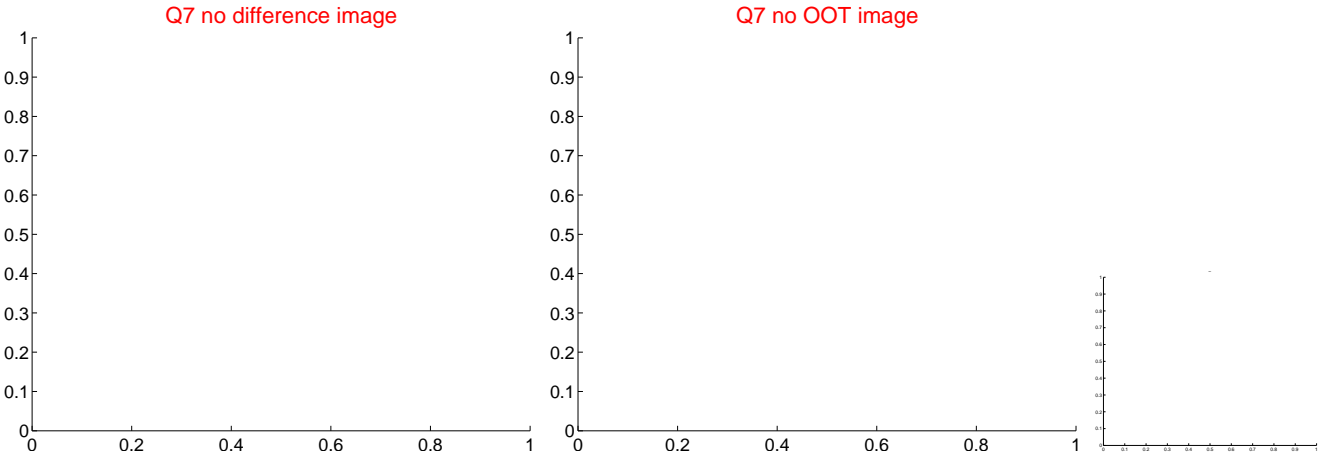
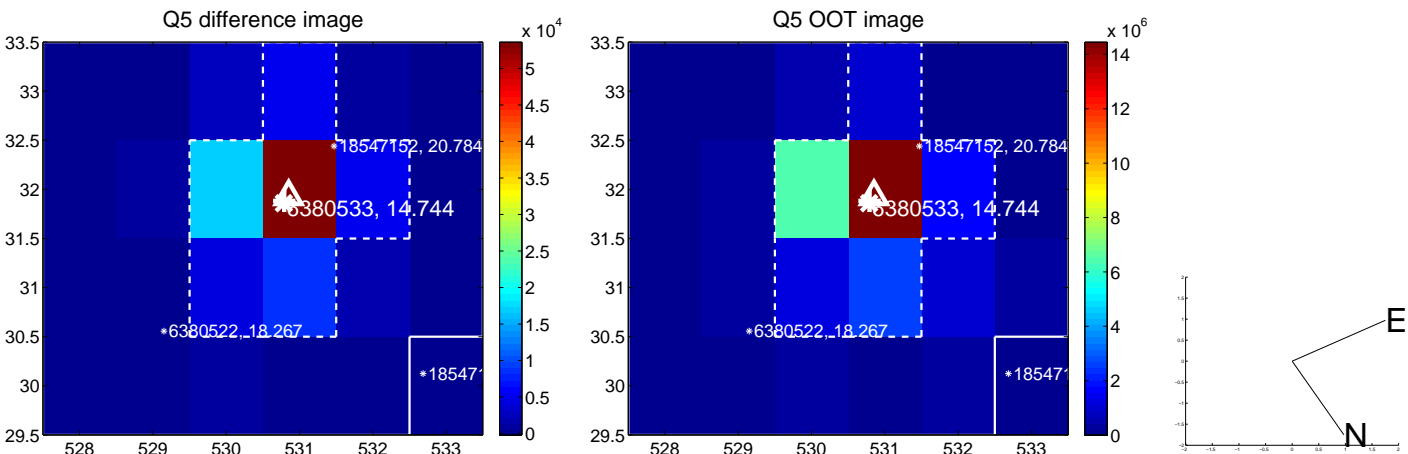
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

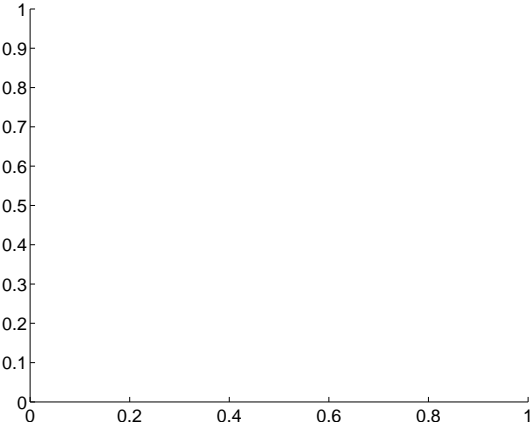


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

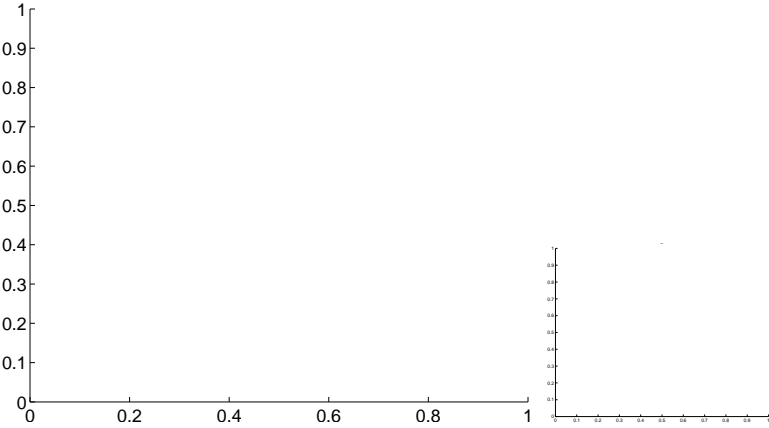


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

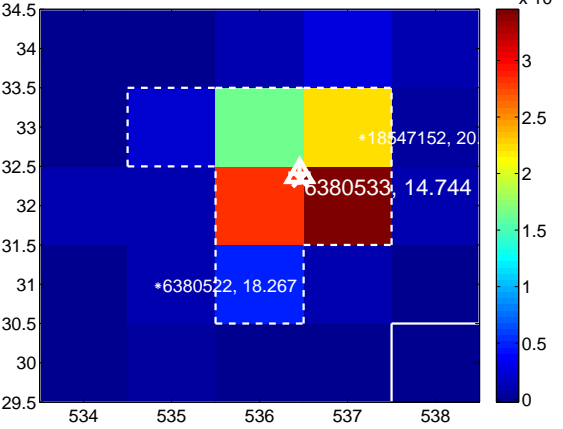
Q9 no difference image



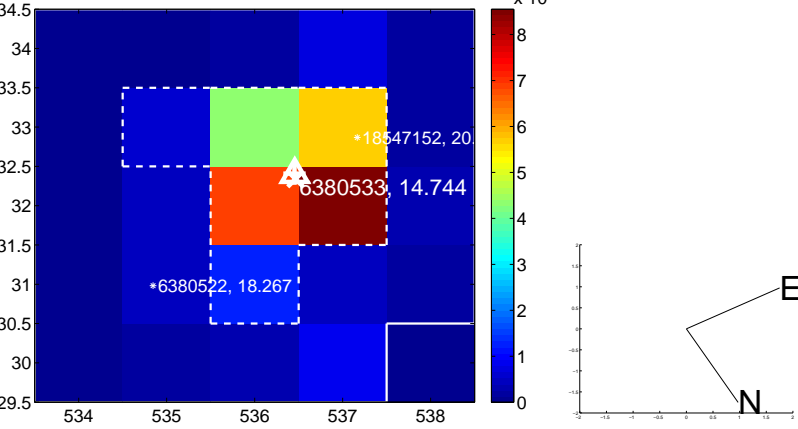
Q9 no OOT image



Q10 difference image



Q10 OOT image



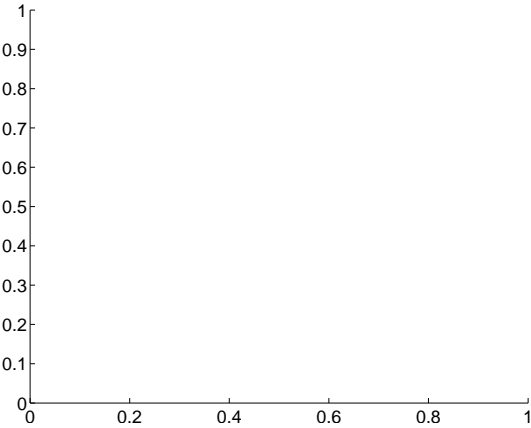
Q11 no difference image



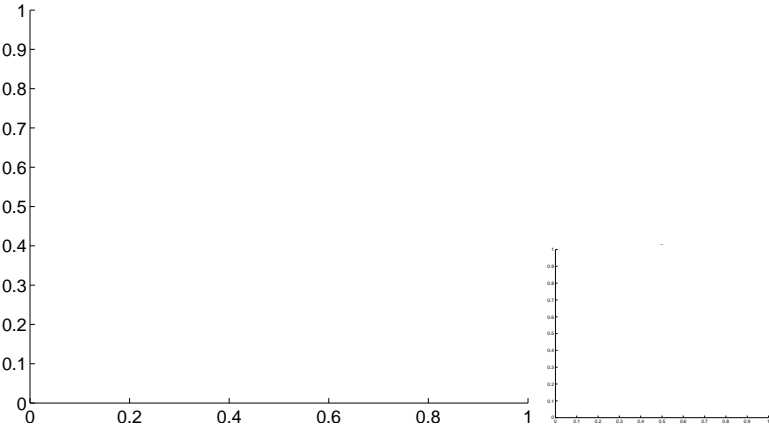
Q11 no OOT image



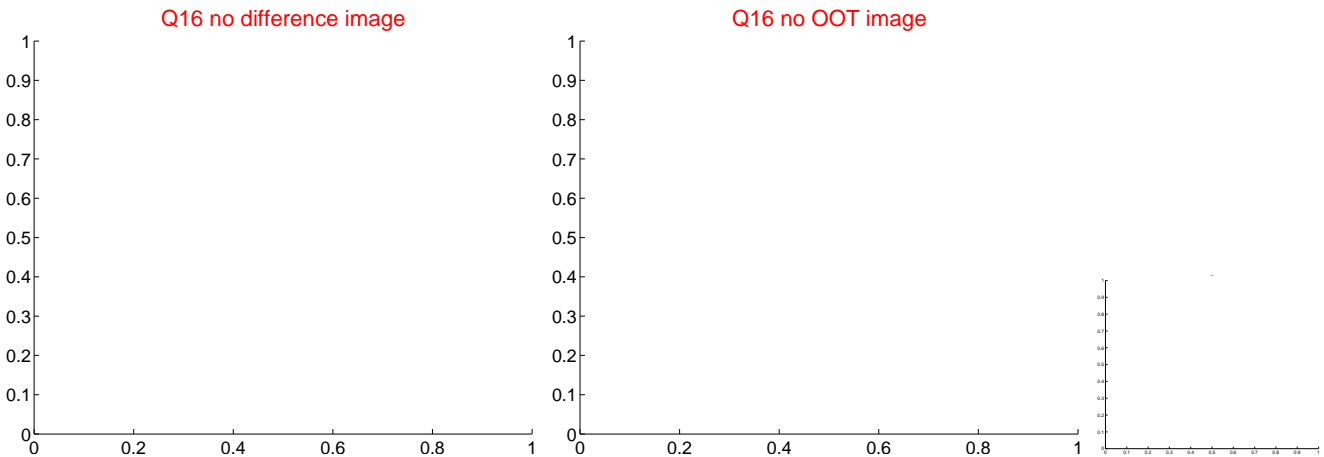
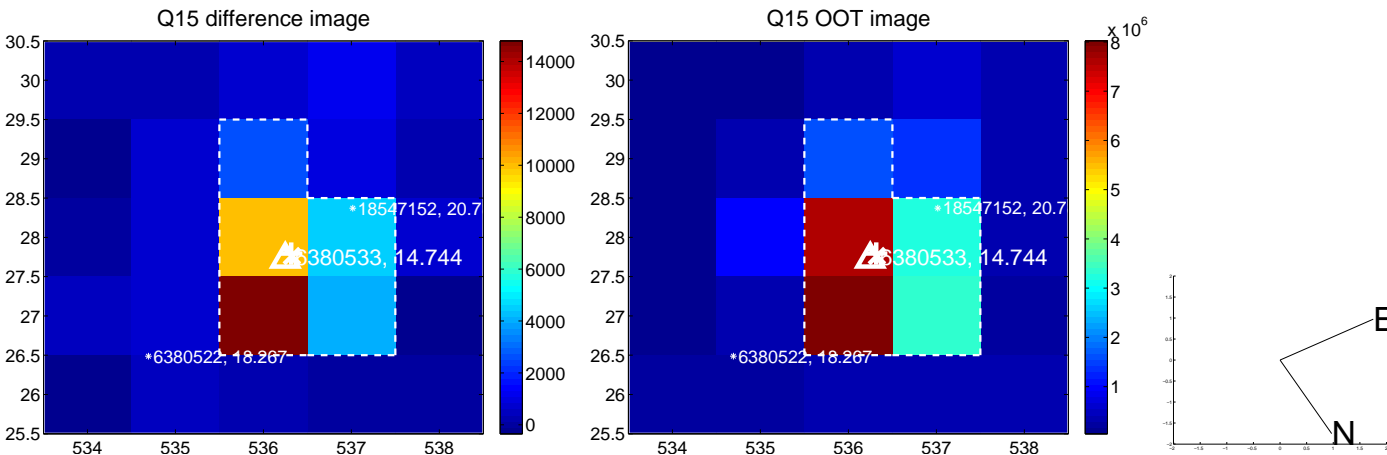
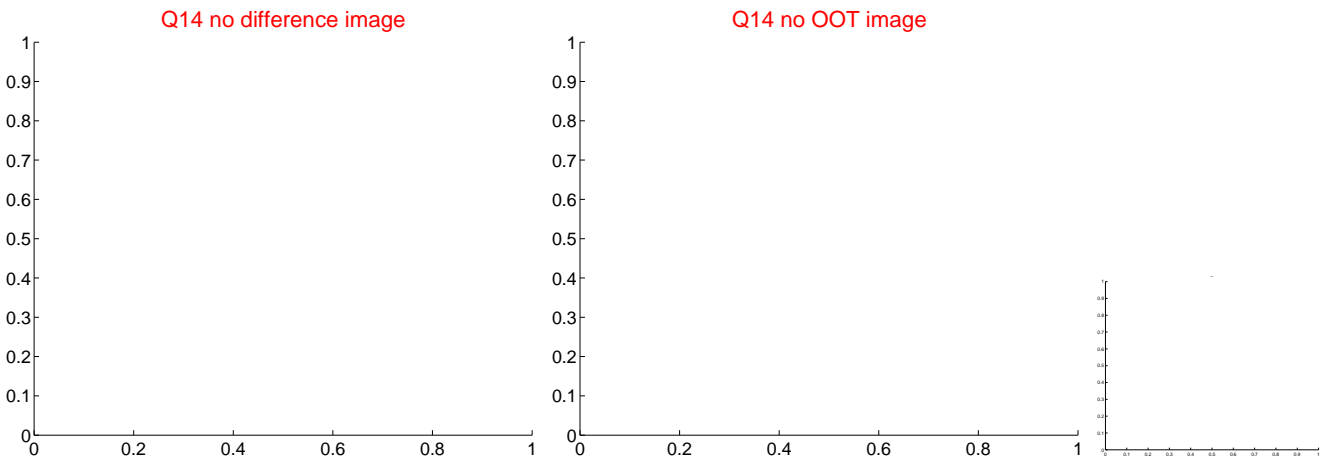
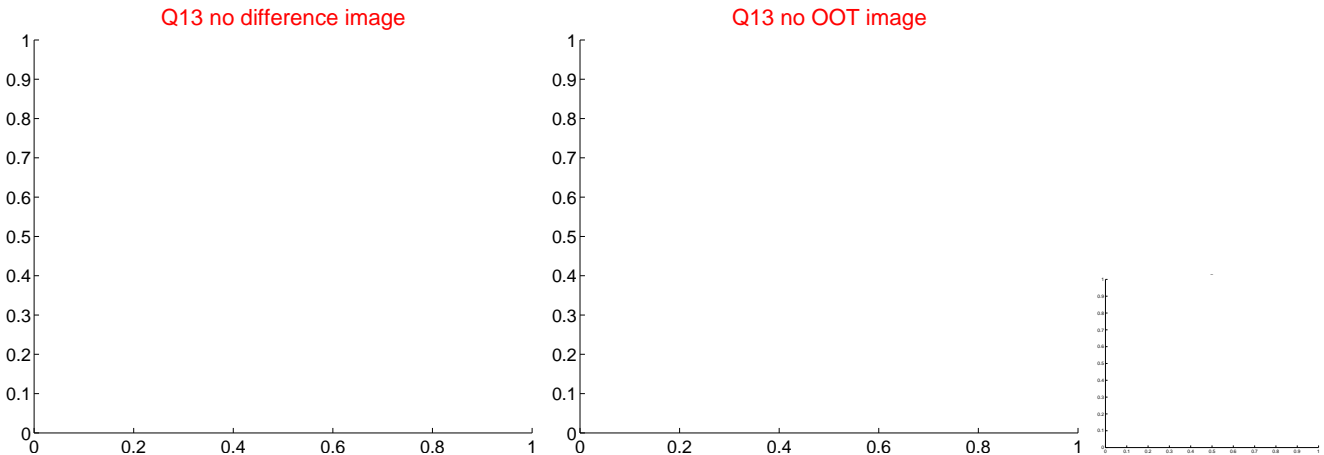
Q12 no difference image



Q12 no OOT image



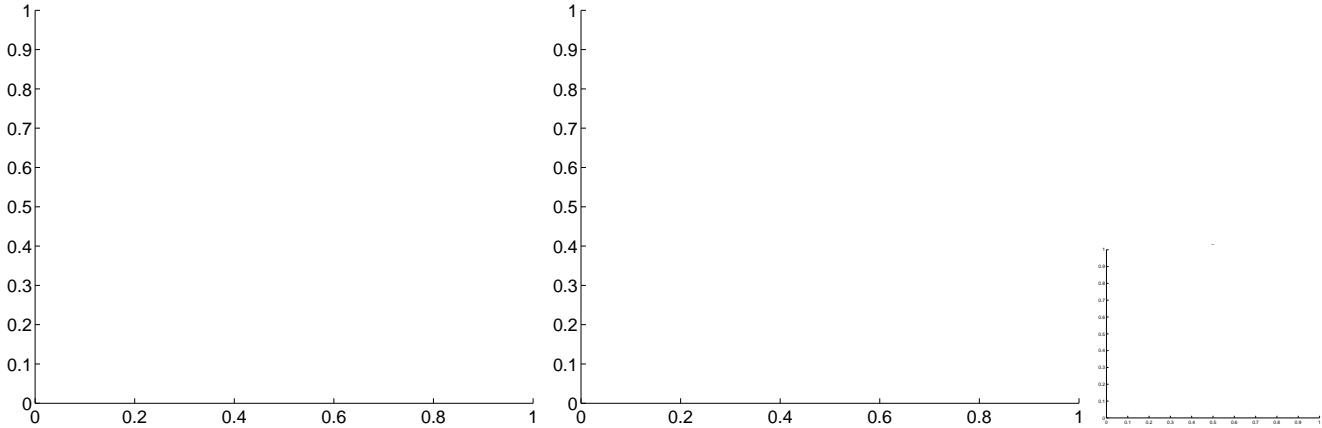
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



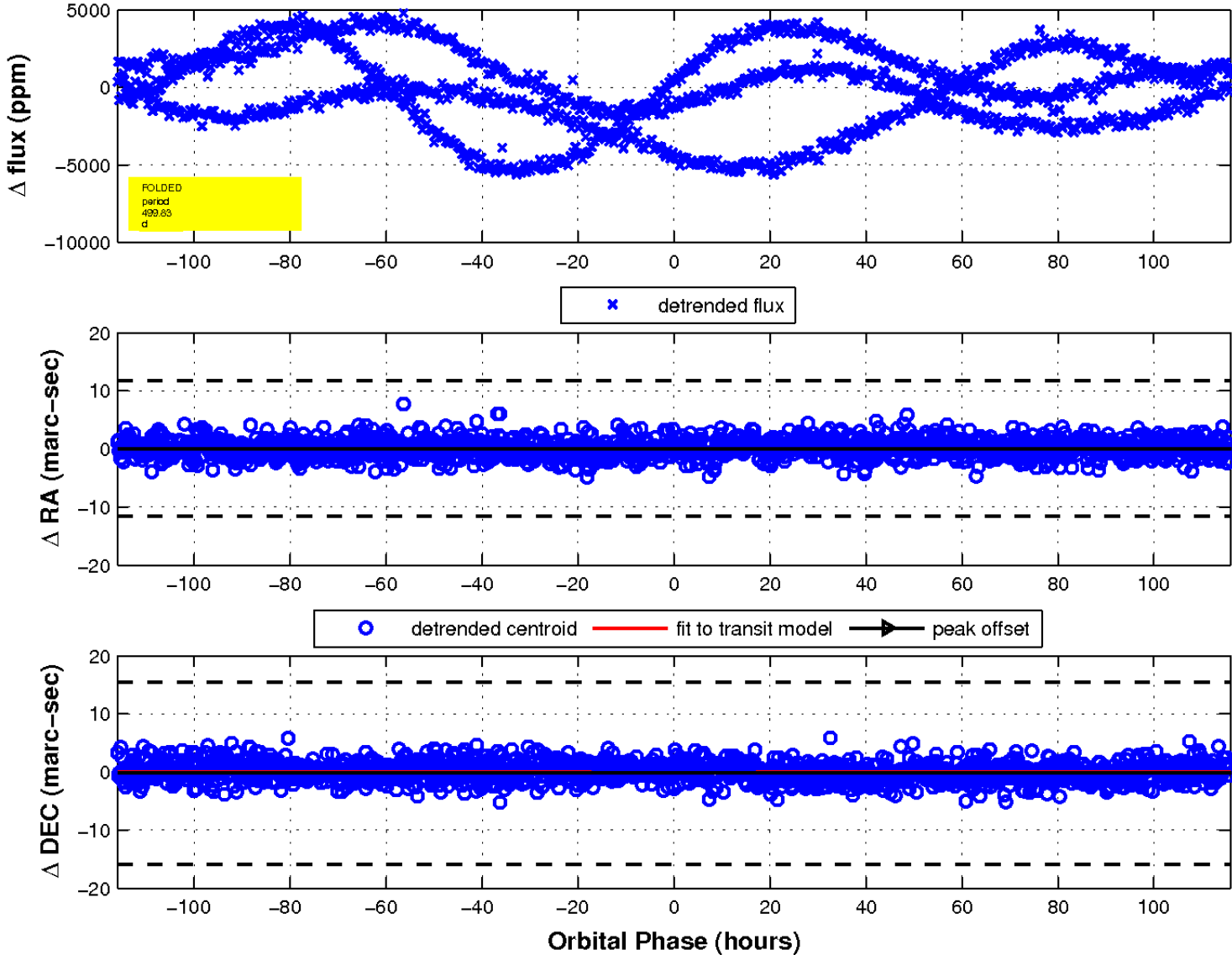
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q17 no difference image

Q17 no OOT image

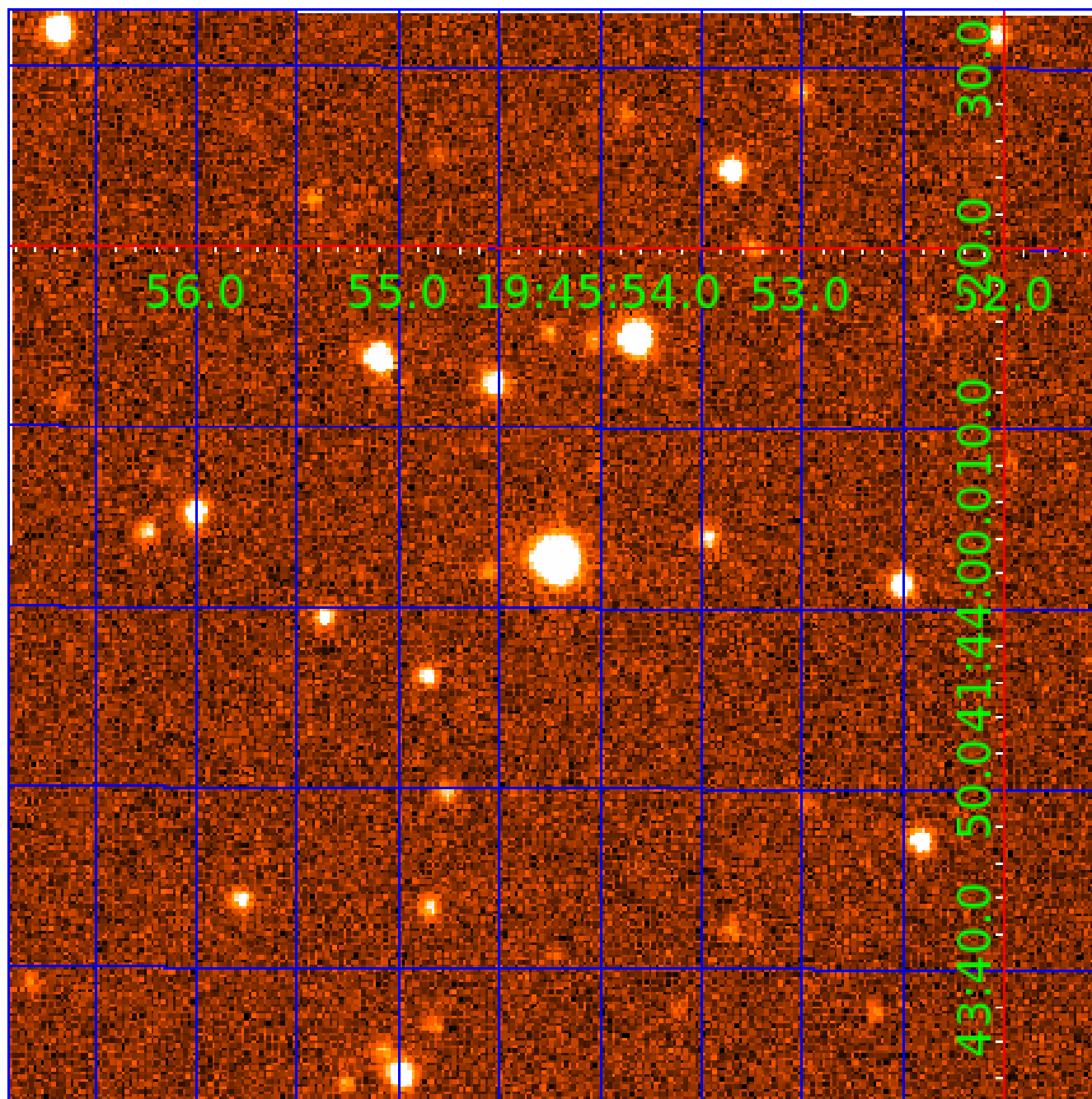


fluxWeightedCentroids, Planet 6 of 8



# UKIRT Image

Declination



# KIC 006380533

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006380533-01	OBS	No	1.533445	132.983160	56.9	6.487	7.6	9.5	0.86	5350	0.65	954.47
006380533-02	OBS	No	228.793699	305.343517	1359.4	11.513	16.3	9.5	0.86	5350	3.24	1.21
006380533-03	OBS	No	131.468842	249.832282	821.3	5.423	14.6	7.0	0.86	5350	3.19	2.52
006380533-04	OBS	No	186.433457	161.647854	1260.8	9.594	11.4	8.6	0.86	5350	6.03	1.58
006380533-05	OBS	No	169.888627	237.489259	227.4	3.274	10.4	2.0	0.86	5350	1.49	1.79
006380533-06	OBS	No	499.832334	462.264221	4839.5	38.691	9.5	10.0	0.86	5350	6.00	0.42
006380533-07	OBS	No	209.042130	167.361675	766.6	9.000	10.3	-1.0	0.86	5350	2.35	1.36
006380533-08	OBS	No	149.858044	206.101353	813.8	4.639	9.5	7.3	0.86	5350	2.69	2.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006380533-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
006380533-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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
006380533-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
006380533-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006380533-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—CENT_FEW_DIFFS

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

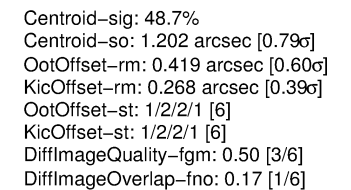
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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 006380533-07

No Significant Match Found

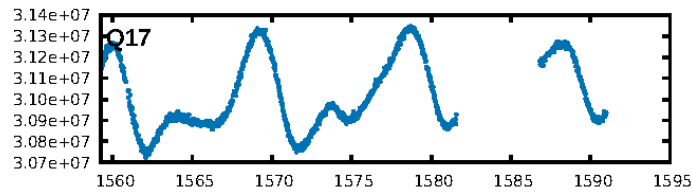
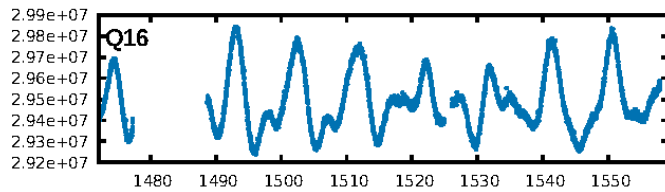
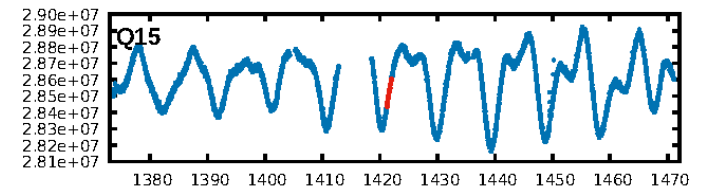
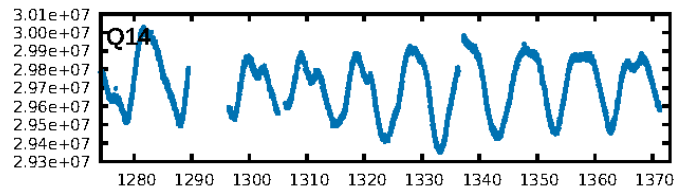
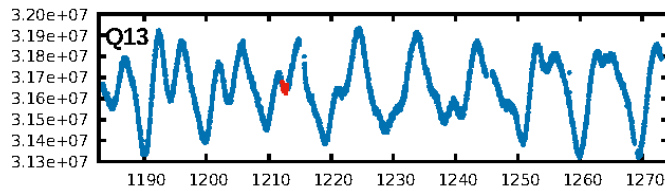
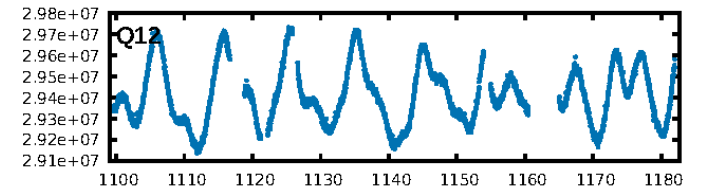
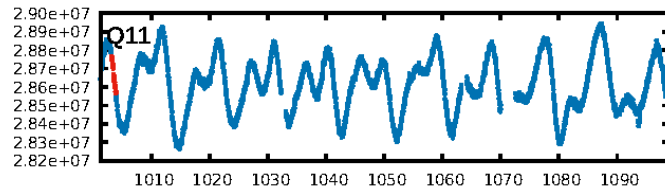
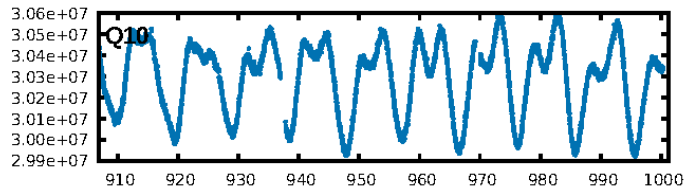
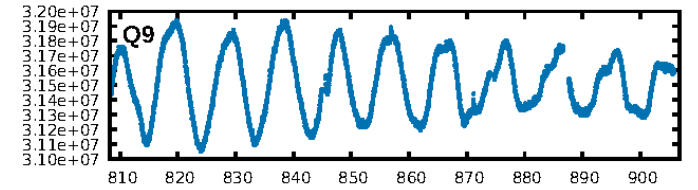
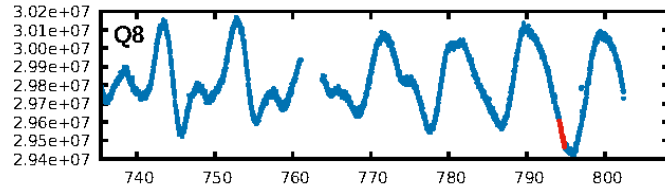
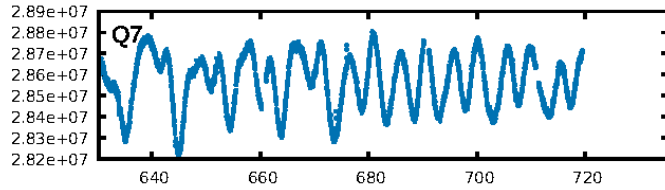
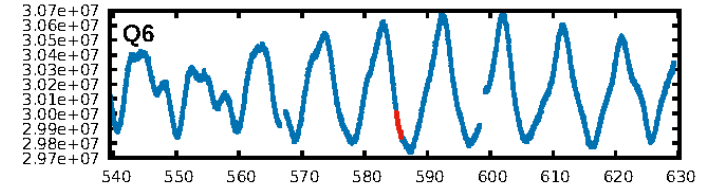
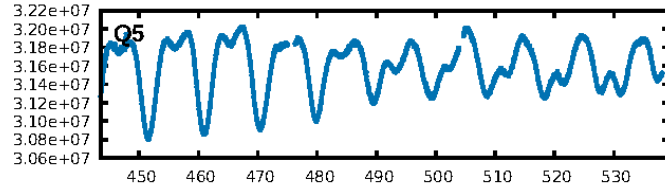
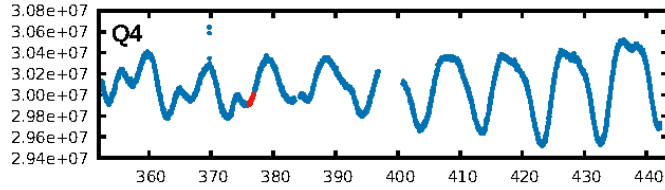
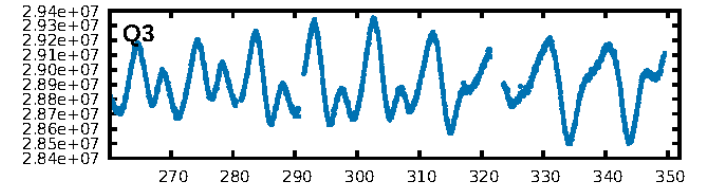
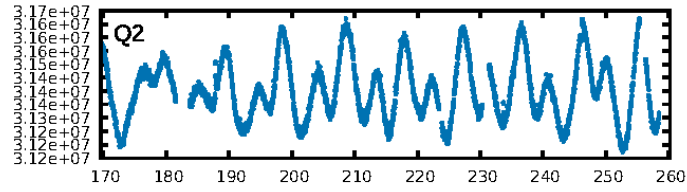
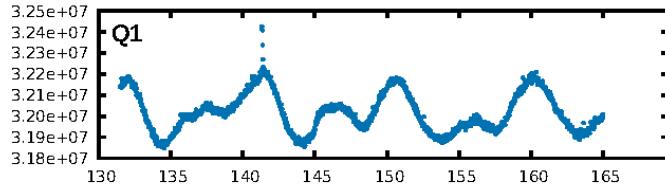
## KIC: 6380533    Candidate: 7 of 8    Period: 209.042 d



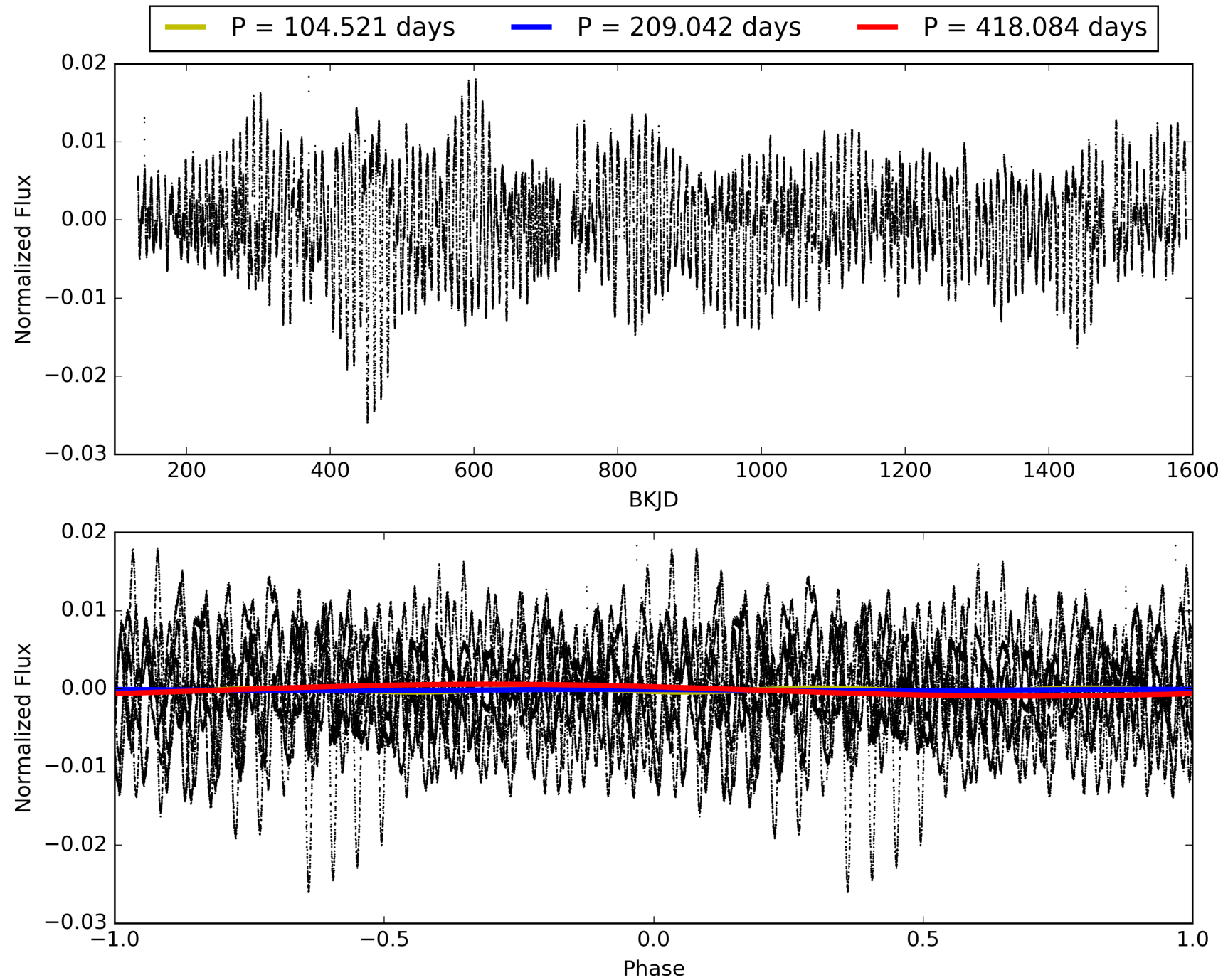
**This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center**



# TCE 006380533-07, PDC Light Curves

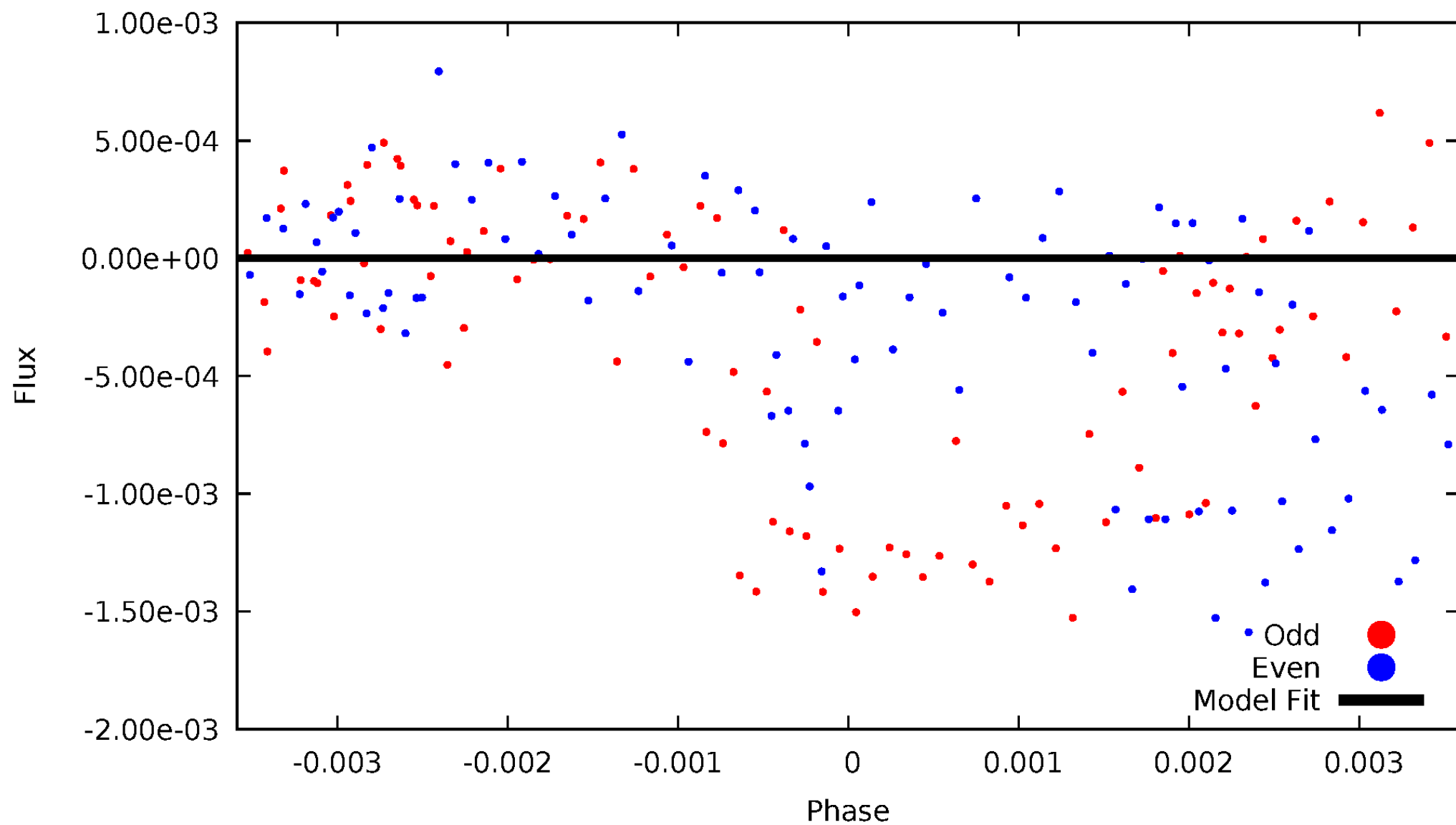


TCE 006380533-07



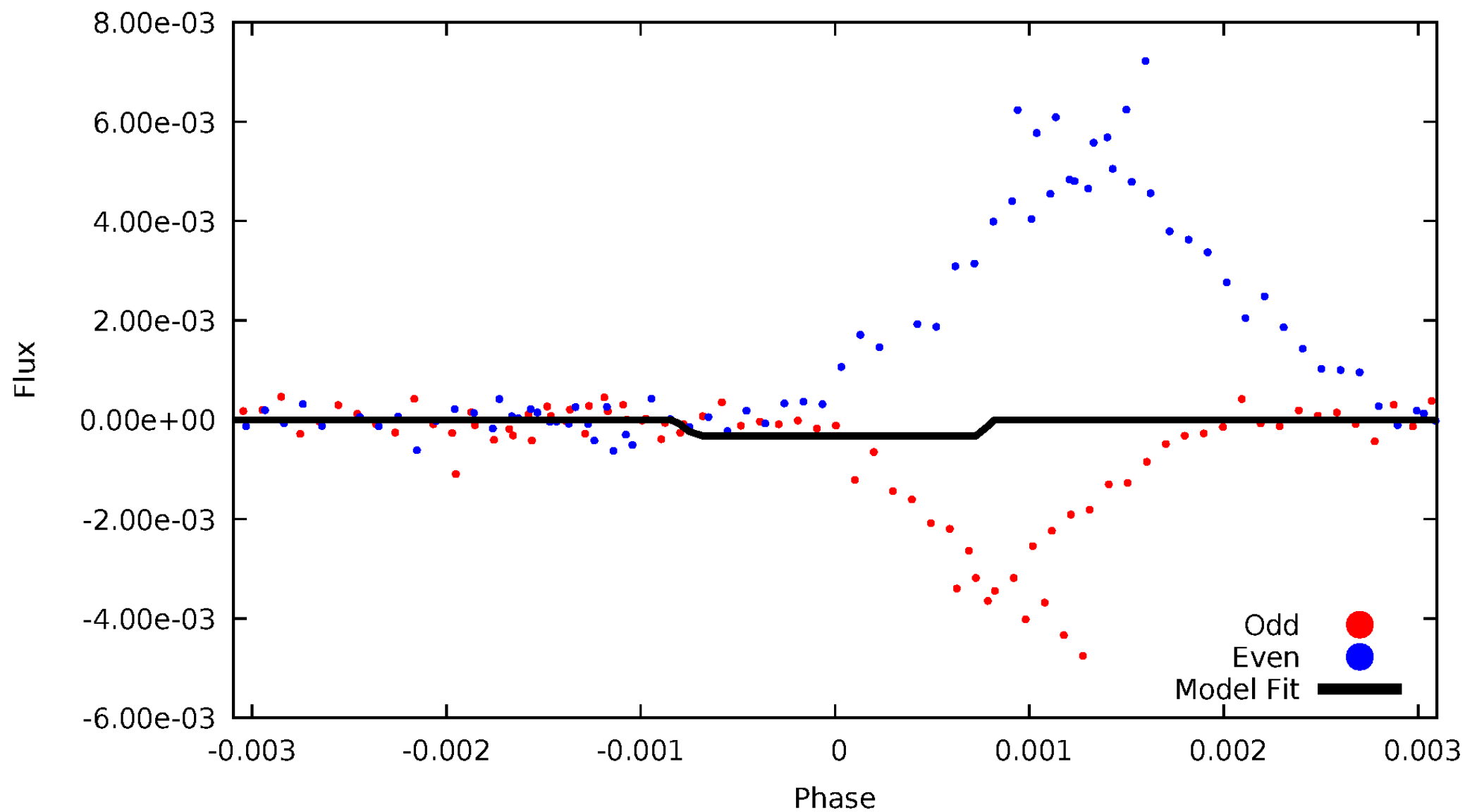
# DV Odd/Even

TCE 006380533-07

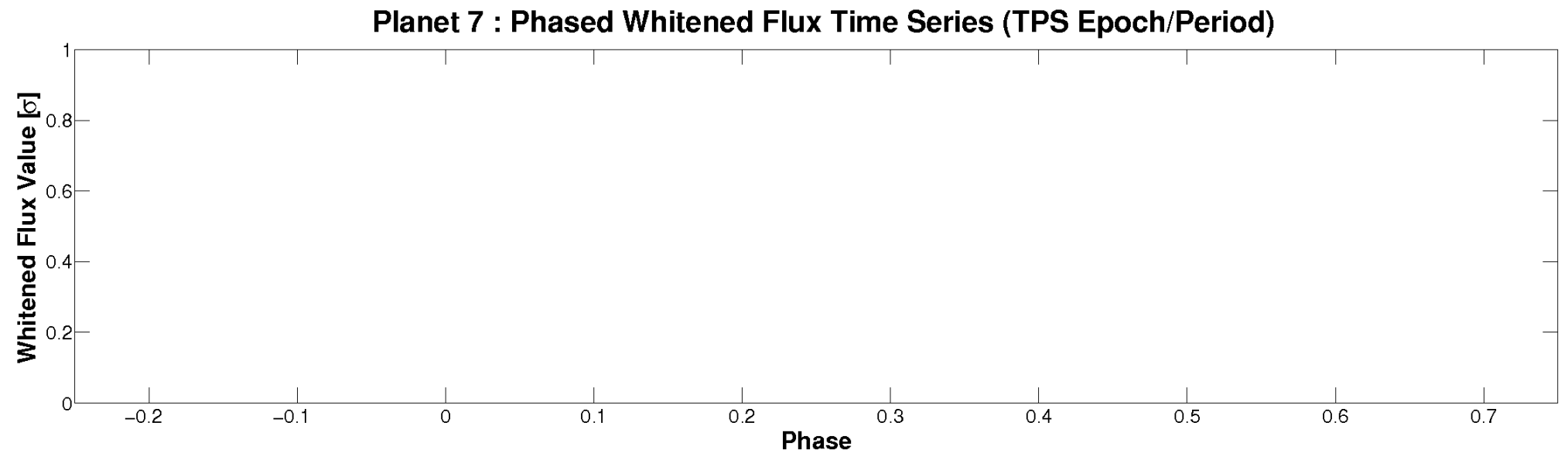
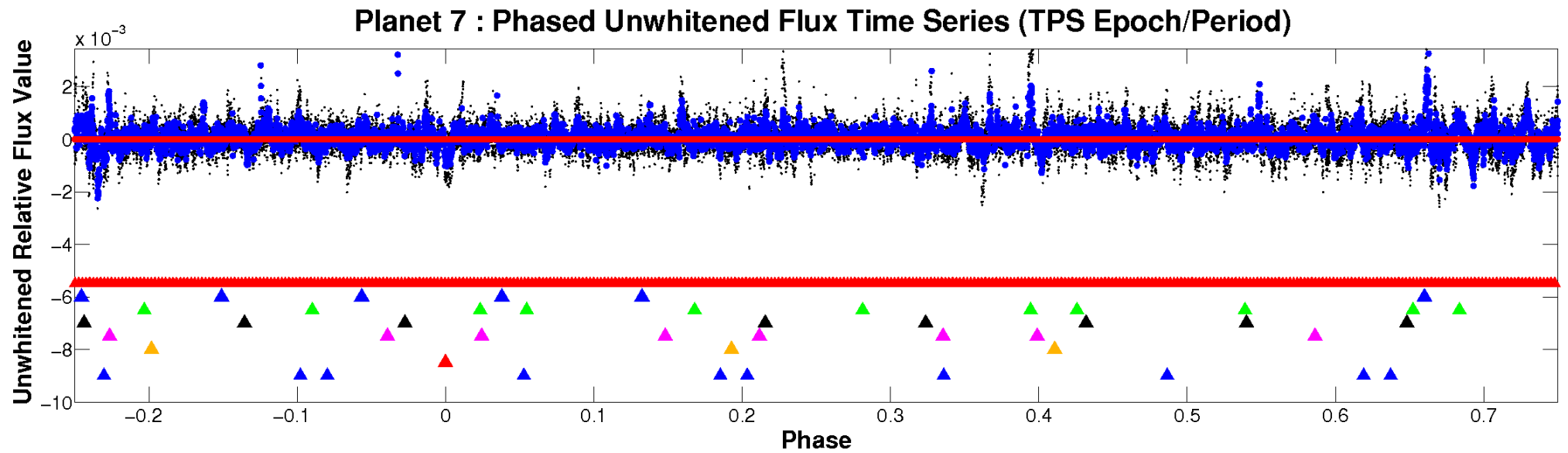


# ALT Odd/Even

TCE 006380533-07

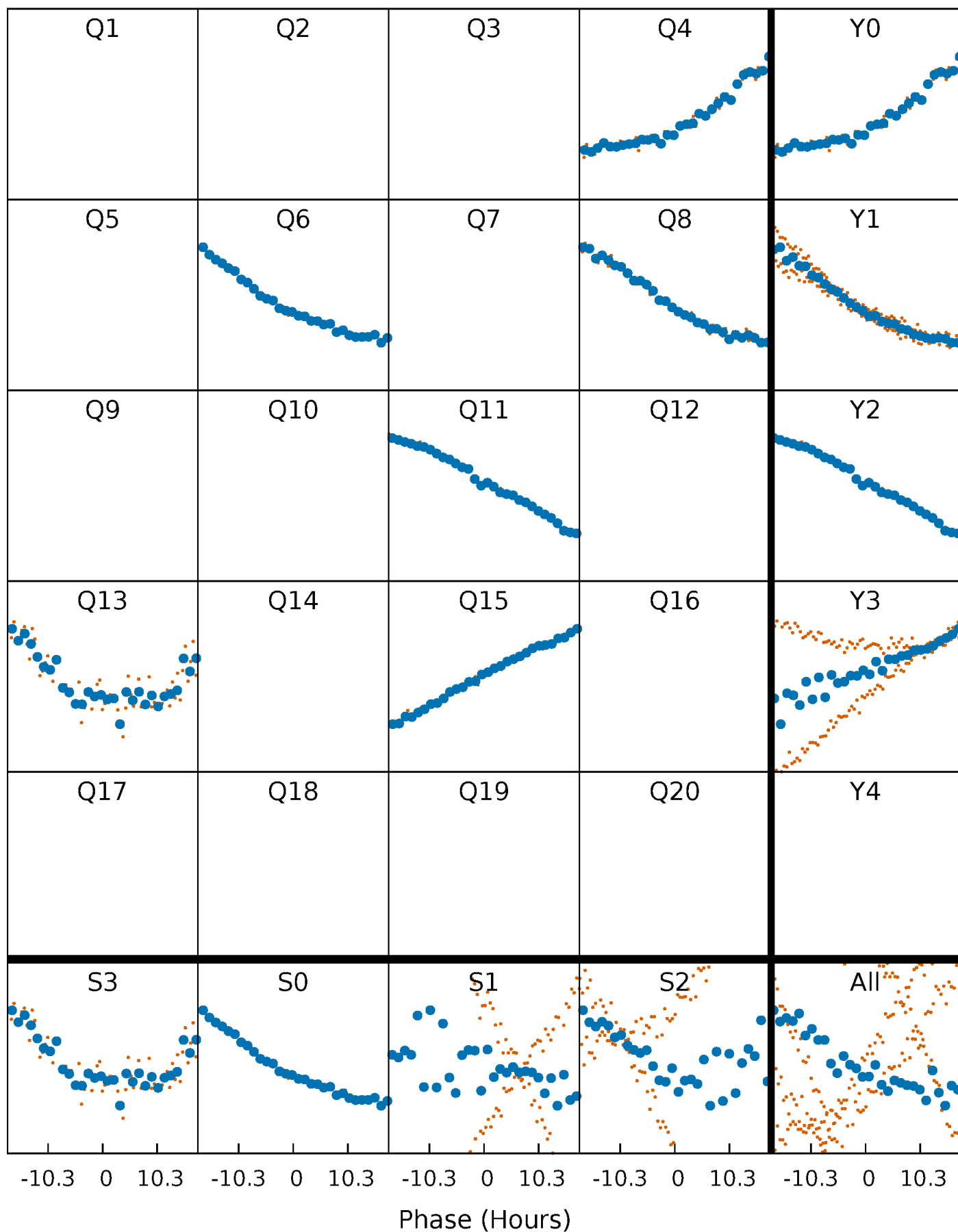


# Non-Whitened Vs. Whitened Light Curve



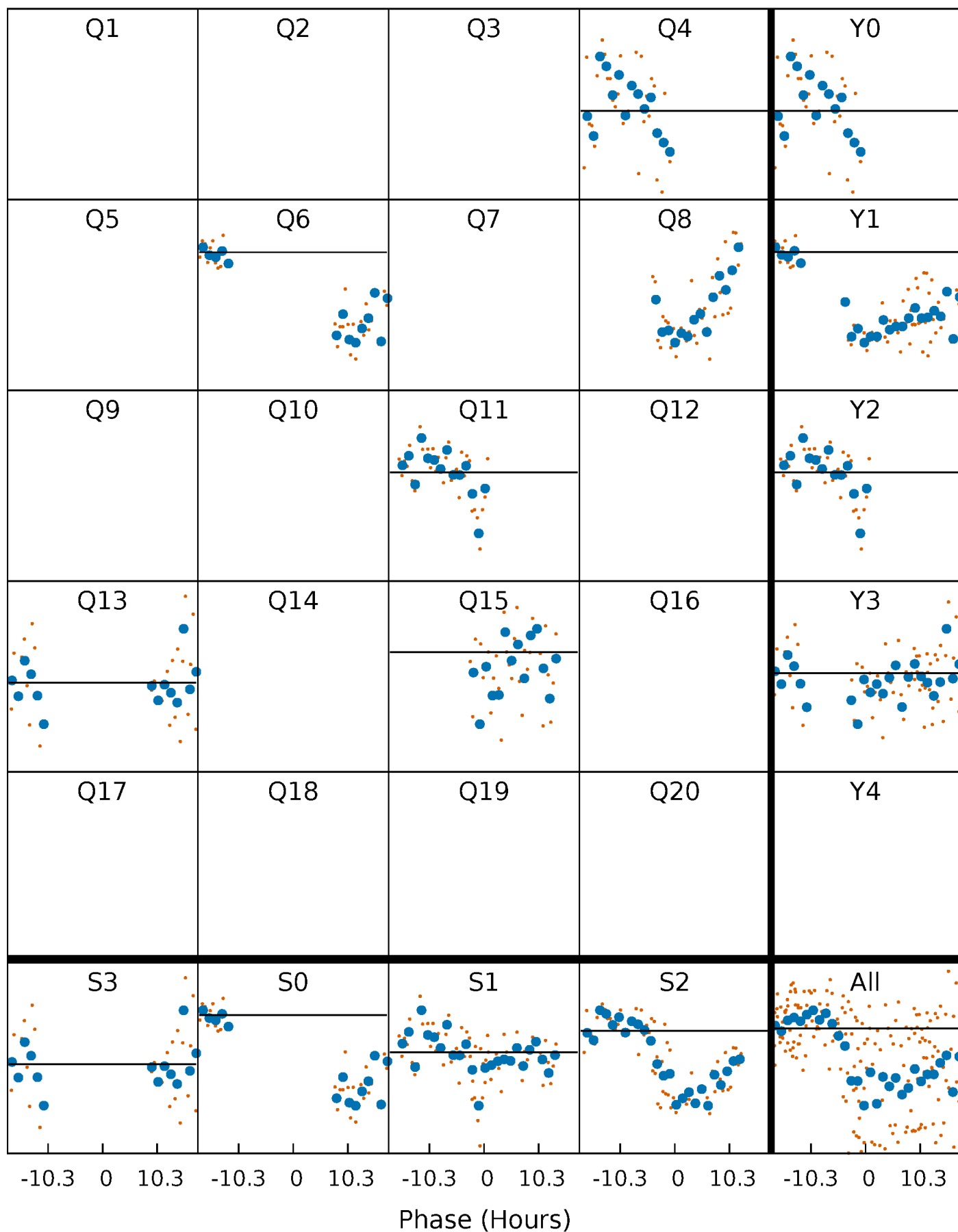
# PDC Quarter-Phased Transit Curves

TCE 006380533-07     $P=209.042130$  Days     $T_0=167.361675$  (BKJD)



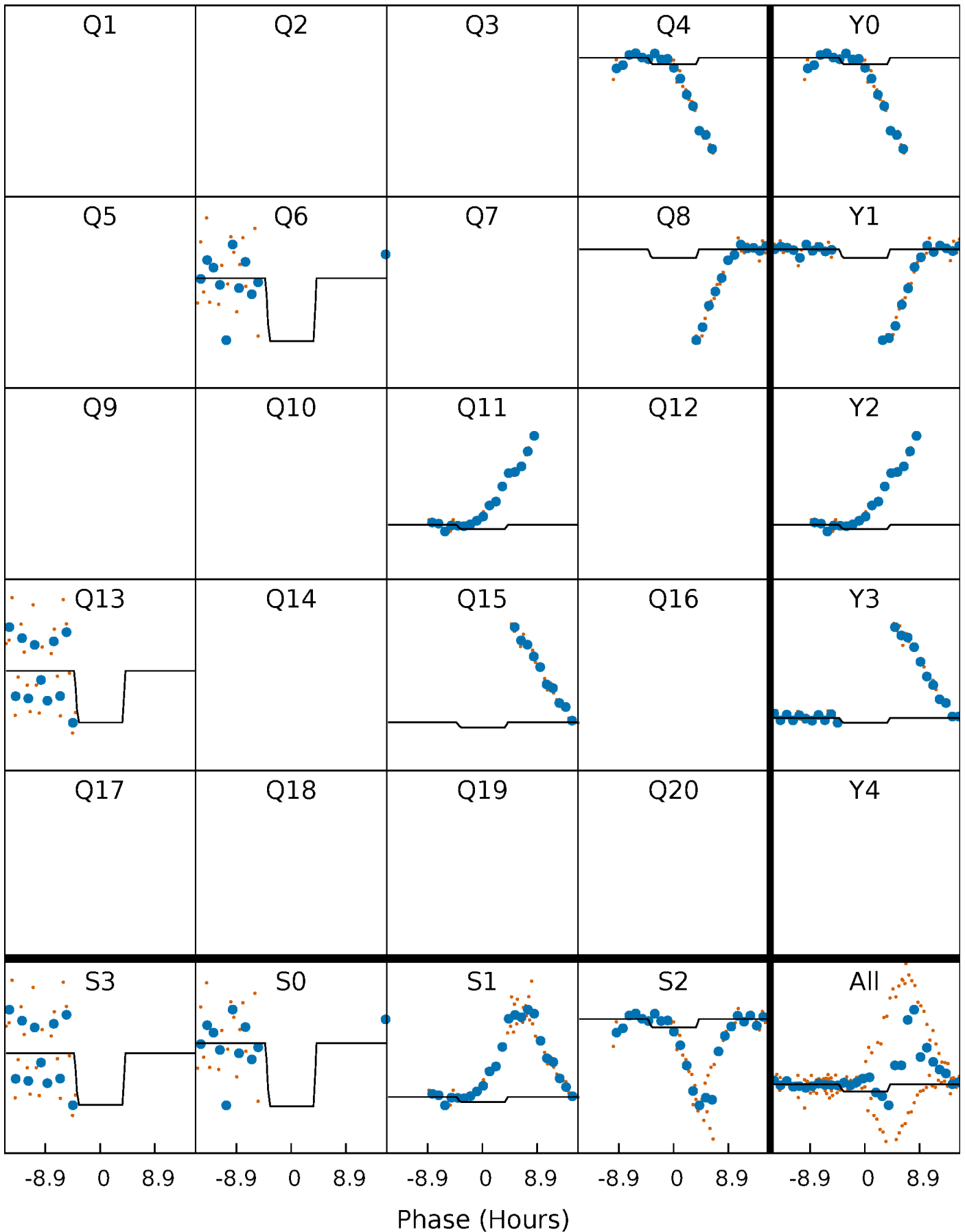
# DV Quarter-Phased Transit Curves

TCE 006380533-07     $P=209.042130$  Days     $T_0=167.361675$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006380533-07     $P=209.042130$  Days     $T_0=167.056471$  (BKJD)

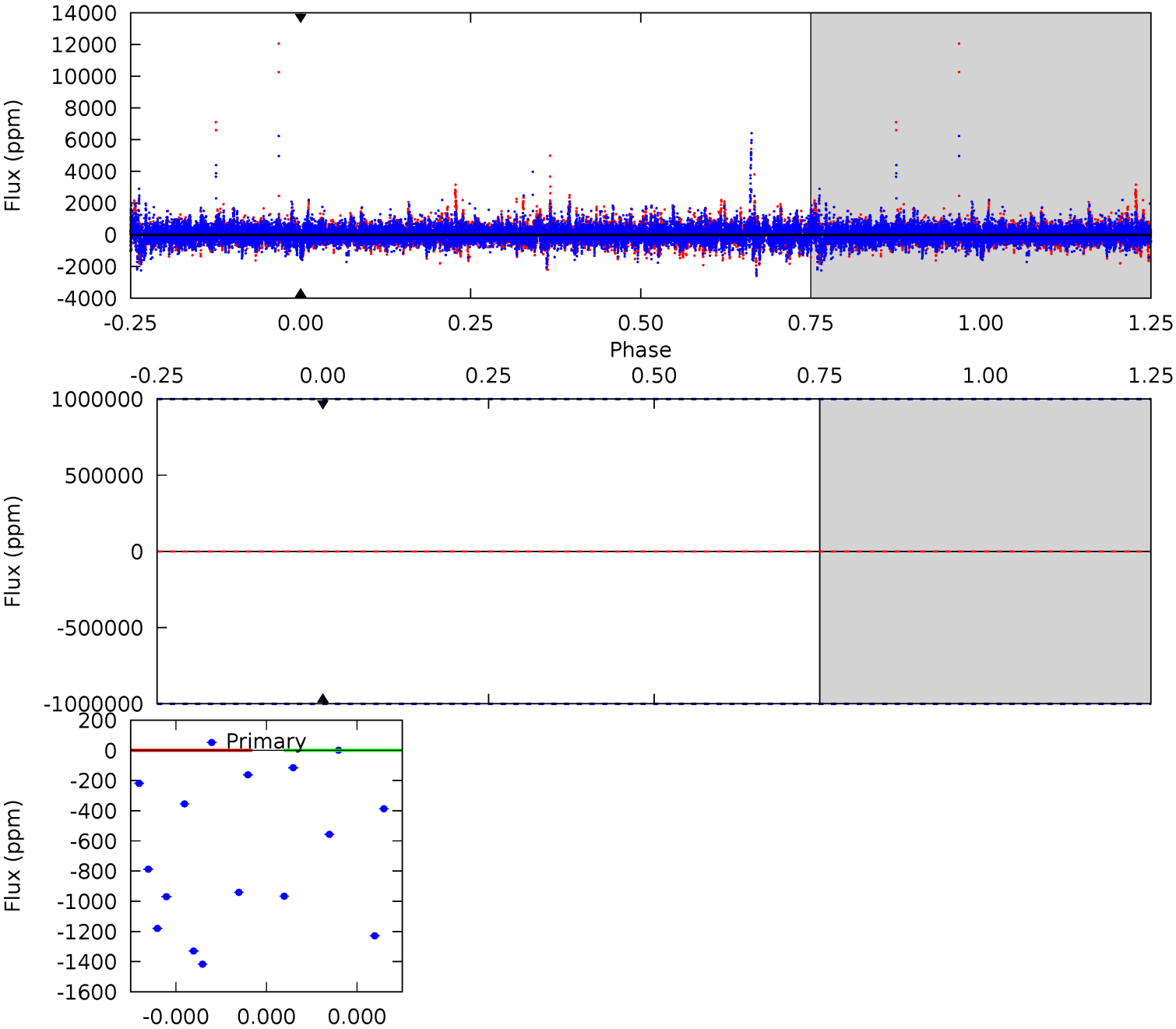




# DV Model-Shift Uniqueness Test

006380533-07, P = 209.042130 Days, E = 167.361675 Days

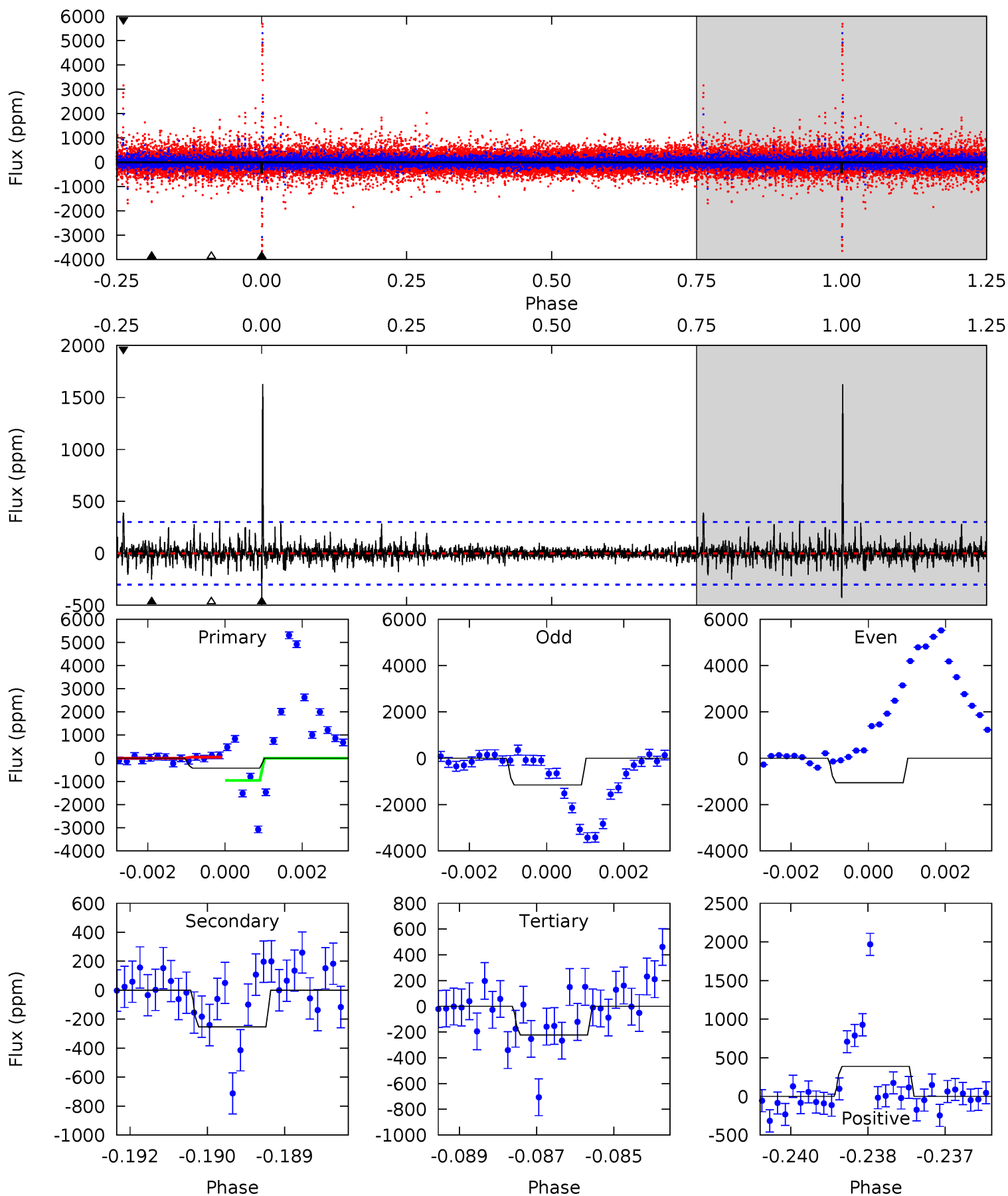
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006380533-07, P = 209.042130 Days, E = 167.056471 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
7.62	4.50	3.95	6.94	5.37	3.15	1.08	3.67	0.68	0.55	-2.44	0.80	1.19	0.79	8.25



### Stellar Parameters For KIC 006380533

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5350^{+175}_{-159}$	$4.457^{+0.112}_{-0.154}$	$-0.180^{+0.300}_{-0.300}$	$0.864^{+0.164}_{-0.119}$	$0.780^{+0.122}_{-0.061}$	$1.702^{+0.882}_{-0.721}$
	+3%/-3%	+3%/-3%	+167%/-167%	+19%/-14%	+16%/-8%	+52%/-42%
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 006380533-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$7.59^{+7.61}_{-5.36}$	$388^{+24}_{-19}$	$-3903^{+21503}_{-11209}$	$-5157.040^{+748337.174}_{-628338.635}$
Alt.	$-252 \pm 56$	$7.07^{+7.51}_{-4.98}$	$386^{+22}_{-20}$	$3080^{+1603}_{-527}$	$1132^{+11134}_{-866}$

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

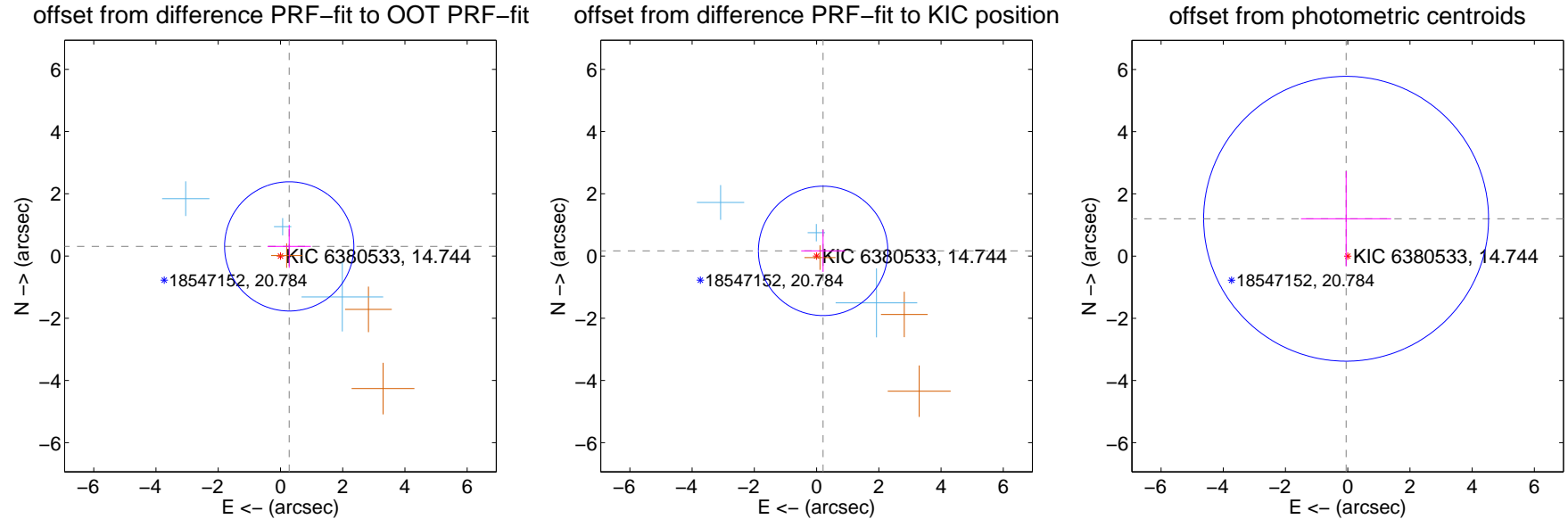
## DV Centroid Data

Supplemental centroid analysis for 006380533-07. Kepler magnitude: 14.74. Transit SNR -1.00

There are 3 quarters with good PRF difference image offsets

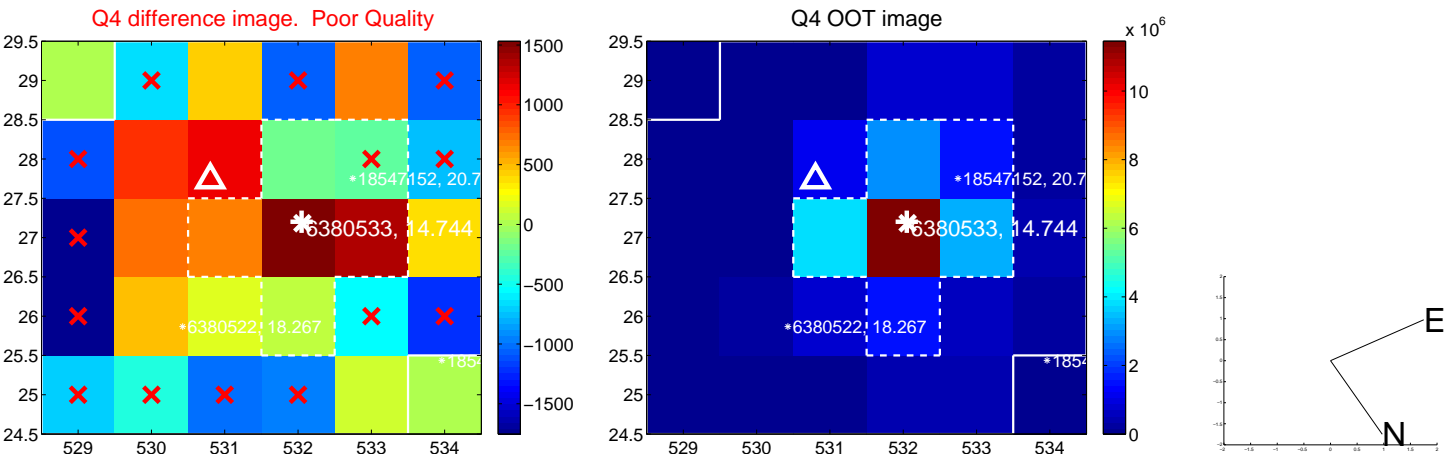
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.419 \pm 0.692$	0.60	$-0.282 \pm 0.696$	$0.309 \pm 0.689$
PRF-fit source offset from KIC position	$0.268 \pm 0.693$	0.39	$-0.210 \pm 0.703$	$0.166 \pm 0.678$
photometric centroid source offset	$1.20 \pm 1.53$	0.79	$0.05 \pm 1.45$	$1.20 \pm 1.53$

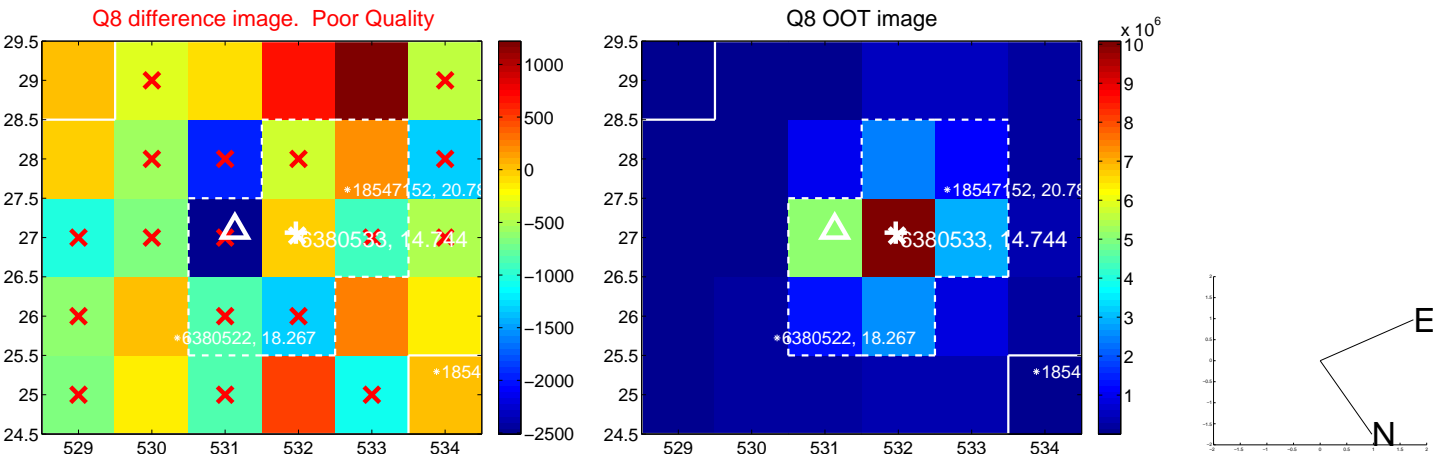
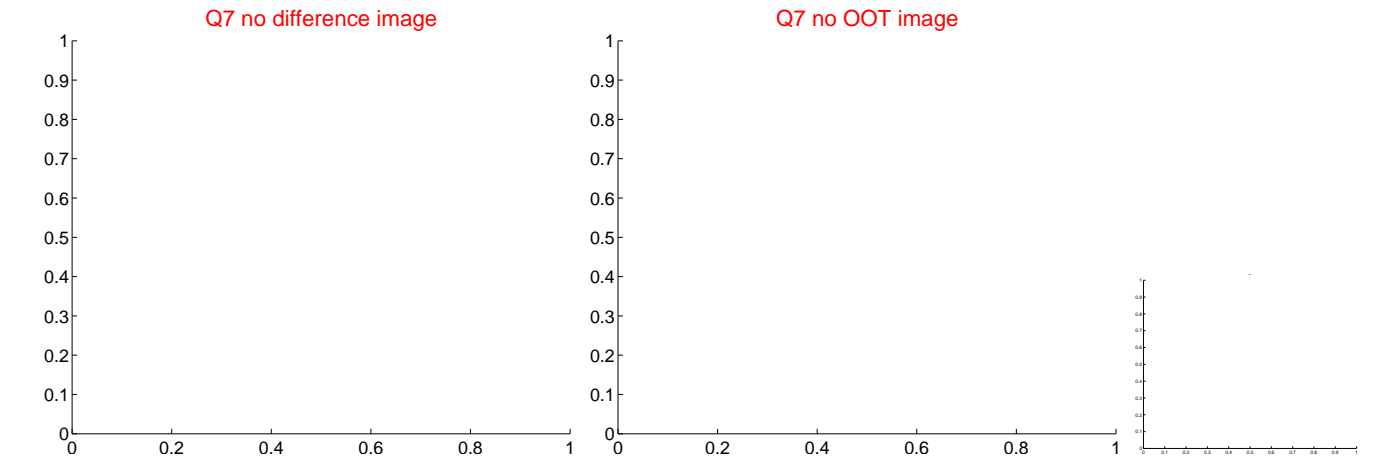
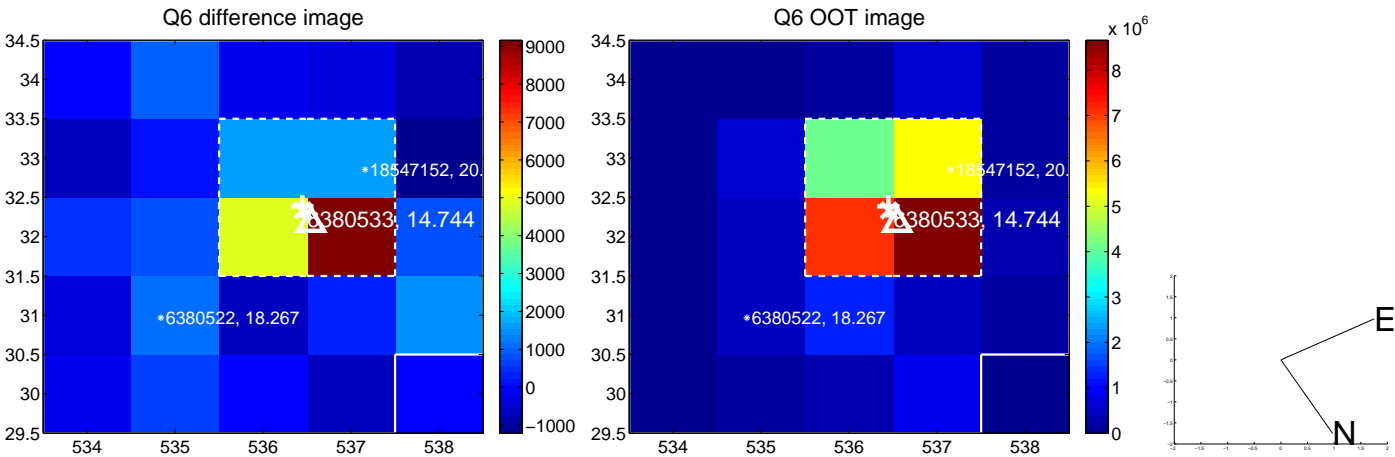
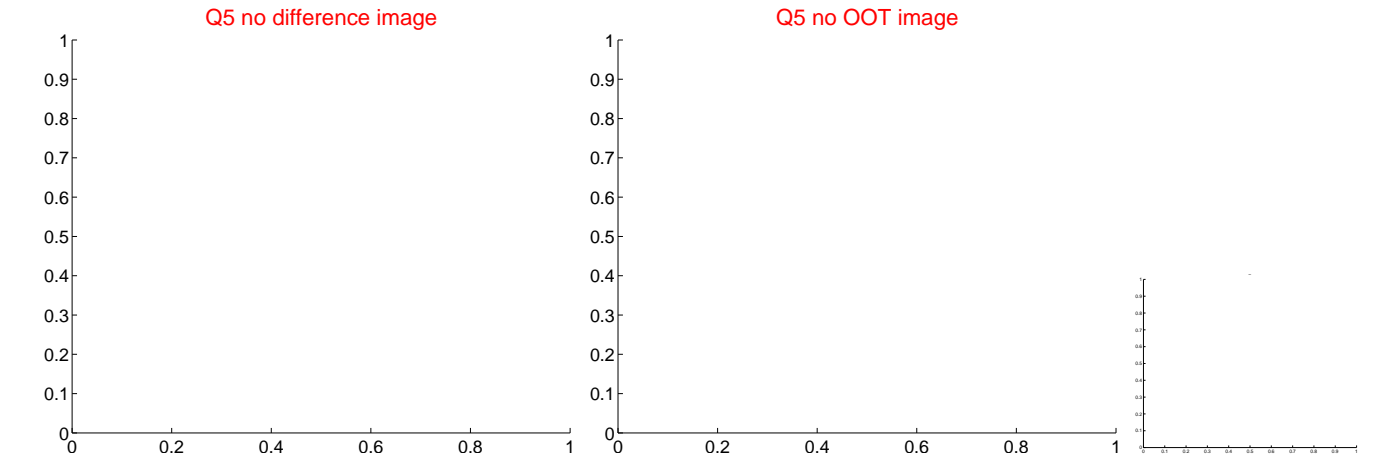


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

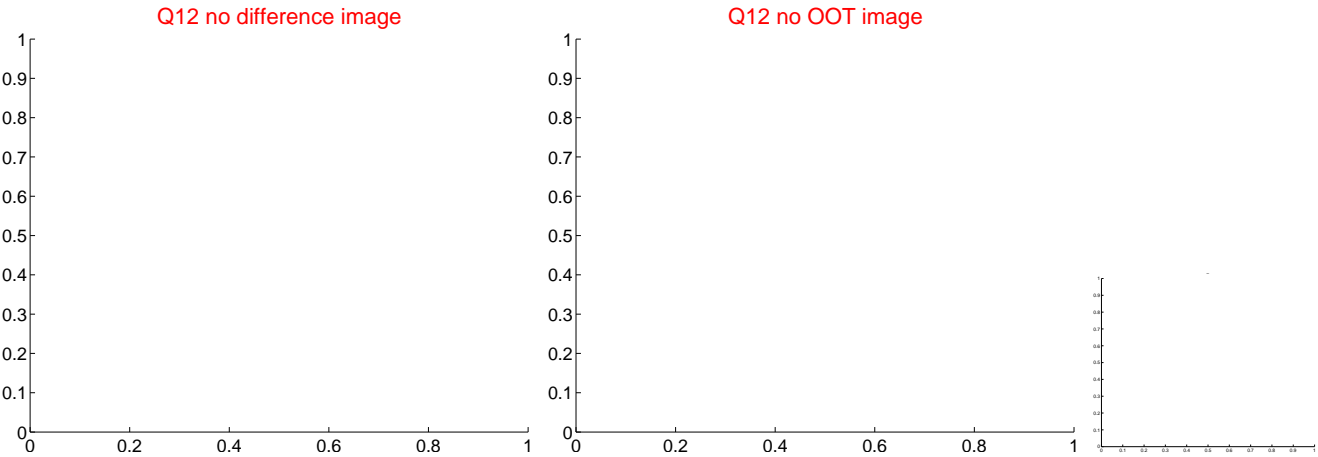
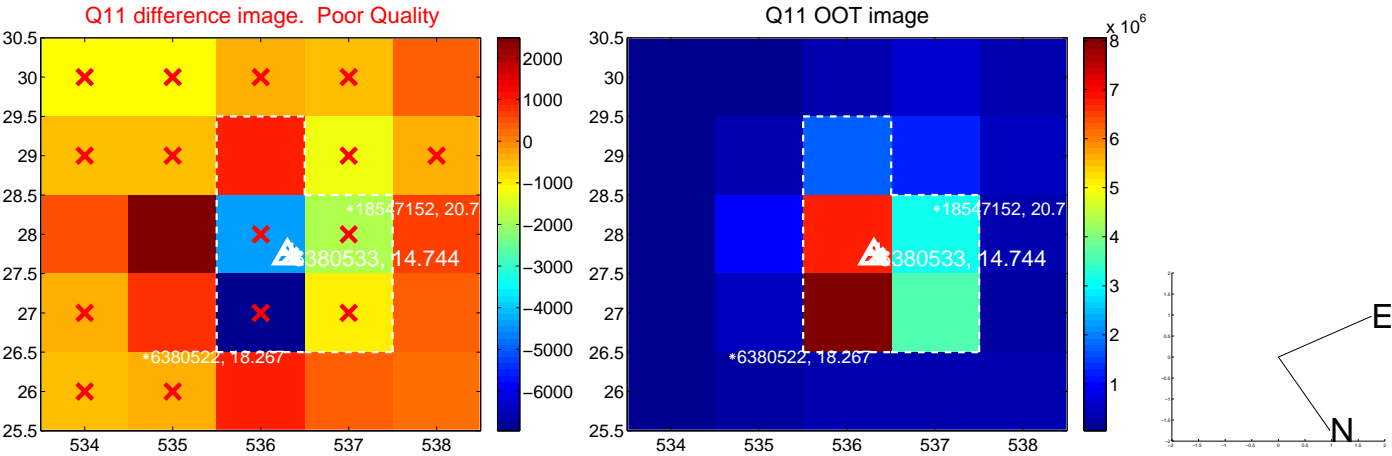
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



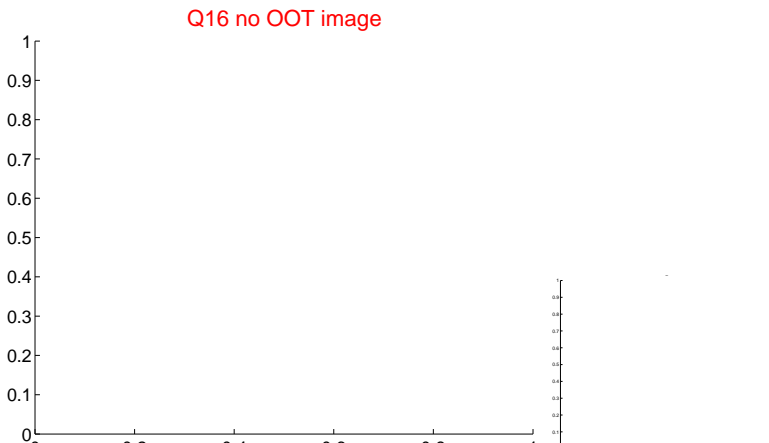
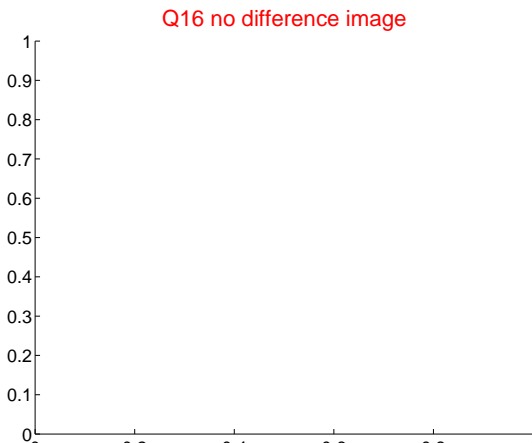
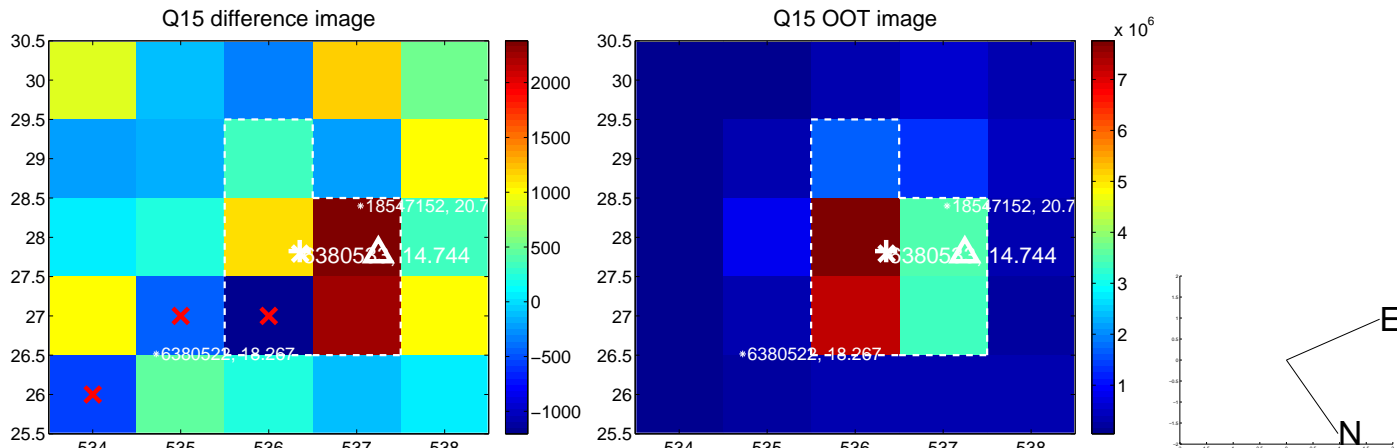
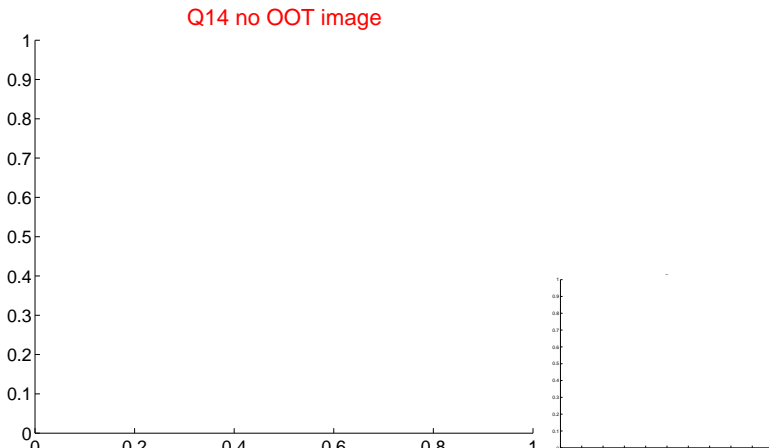
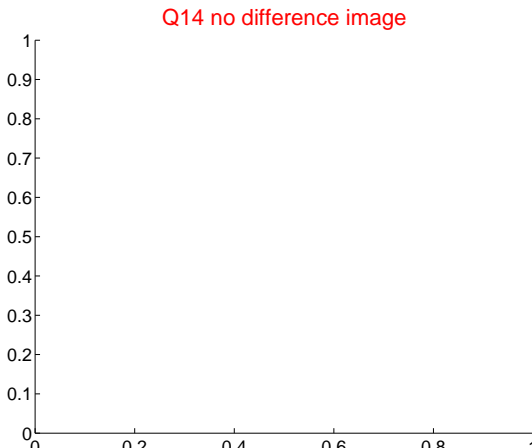
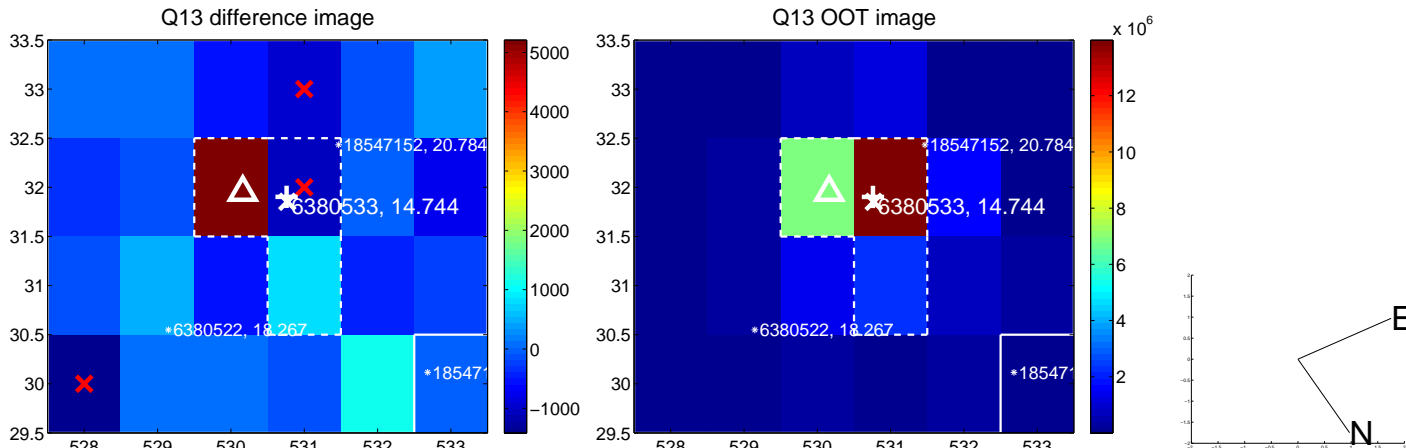
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

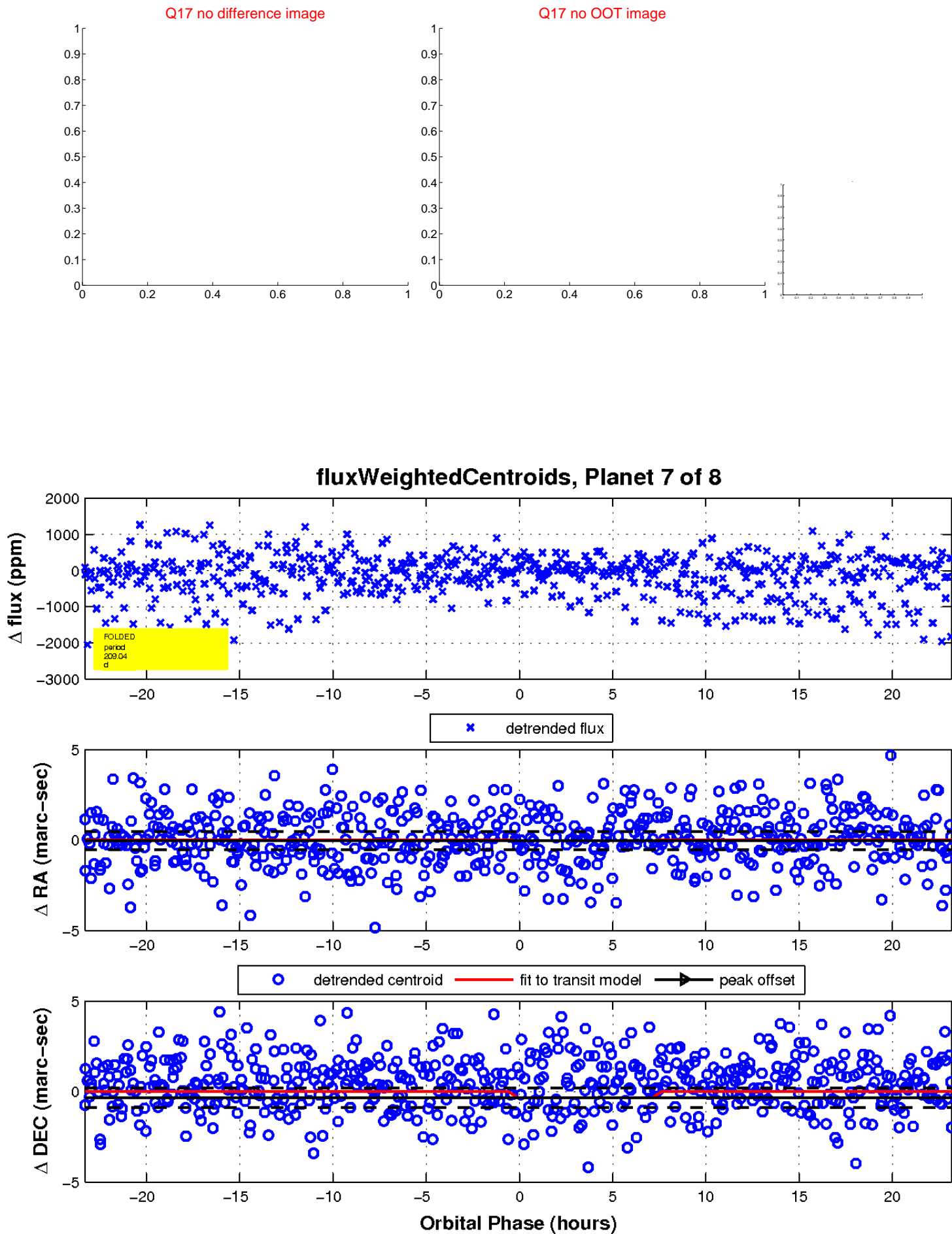


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



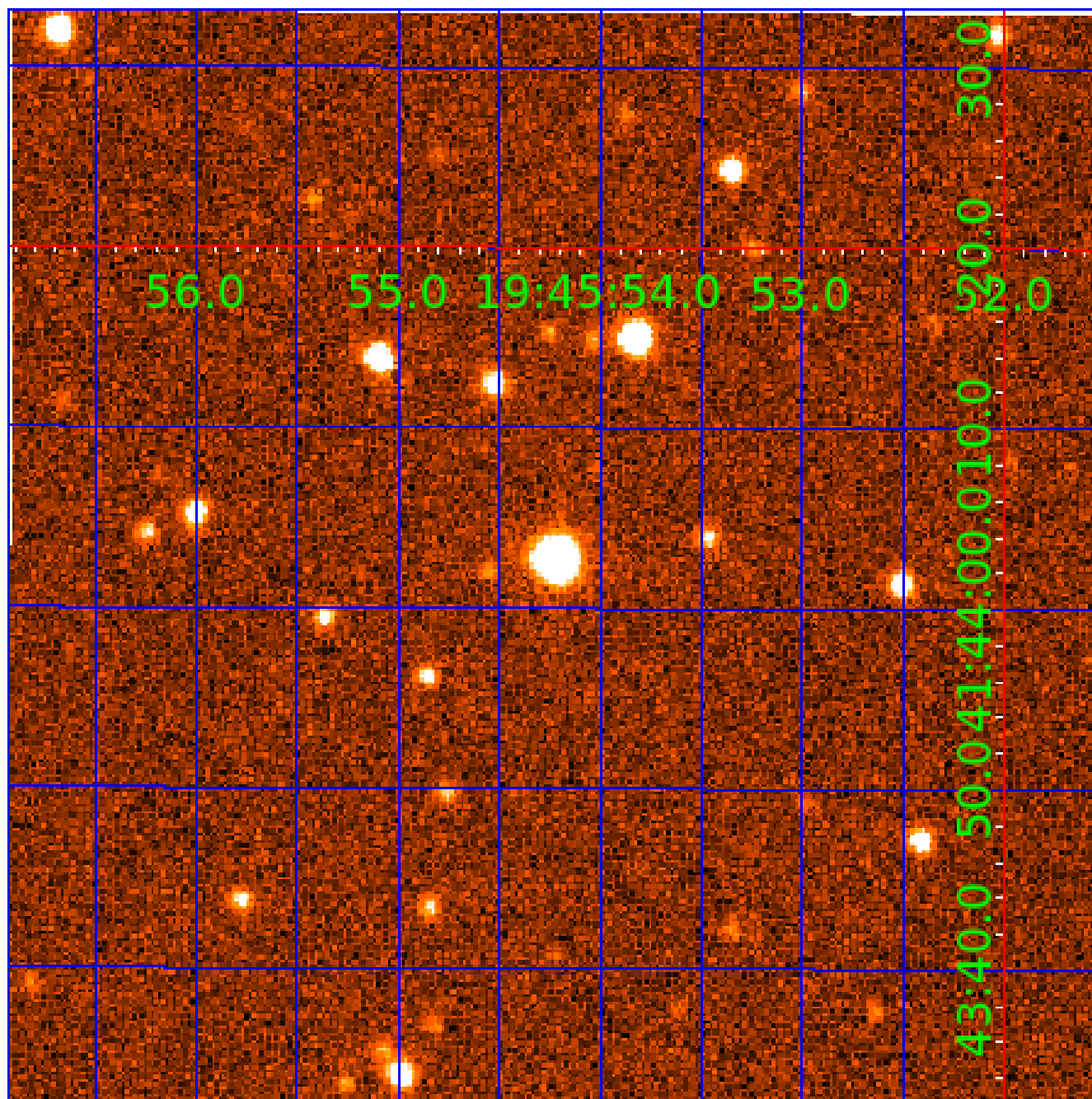


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 006380533

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006380533-01	OBS	No	1.533445	132.983160	56.9	6.487	7.6	9.5	0.86	5350	0.65	954.47
006380533-02	OBS	No	228.793699	305.343517	1359.4	11.513	16.3	9.5	0.86	5350	3.24	1.21
006380533-03	OBS	No	131.468842	249.832282	821.3	5.423	14.6	7.0	0.86	5350	3.19	2.52
006380533-04	OBS	No	186.433457	161.647854	1260.8	9.594	11.4	8.6	0.86	5350	6.03	1.58
006380533-05	OBS	No	169.888627	237.489259	227.4	3.274	10.4	2.0	0.86	5350	1.49	1.79
006380533-06	OBS	No	499.832334	462.264221	4839.5	38.691	9.5	10.0	0.86	5350	6.00	0.42
006380533-07	OBS	No	209.042130	167.361675	766.6	9.000	10.3	-1.0	0.86	5350	2.35	1.36
006380533-08	OBS	No	149.858044	206.101353	813.8	4.639	9.5	7.3	0.86	5350	2.69	2.12

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006380533-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
006380533-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
006380533-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_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
006380533-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
006380533-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
006380533-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—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.

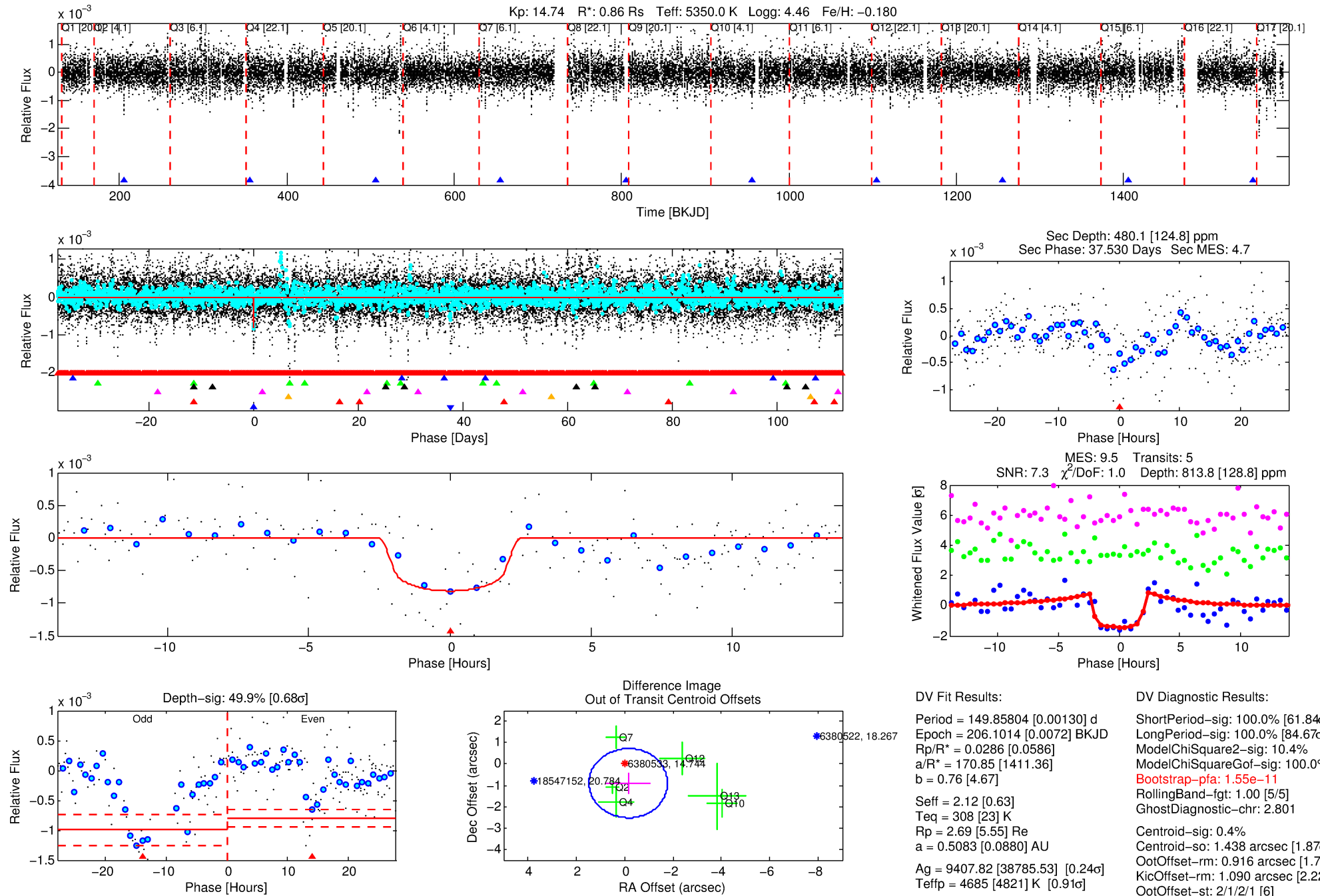
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006380533-08

No Significant Match Found

# DV One-Page Summary

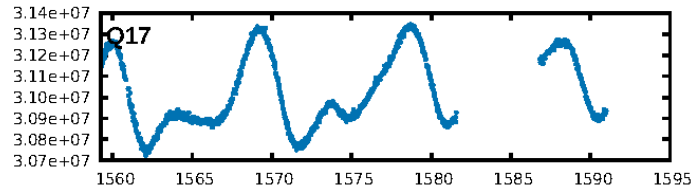
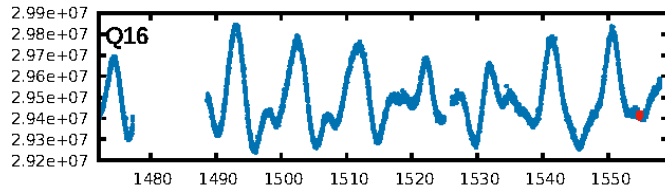
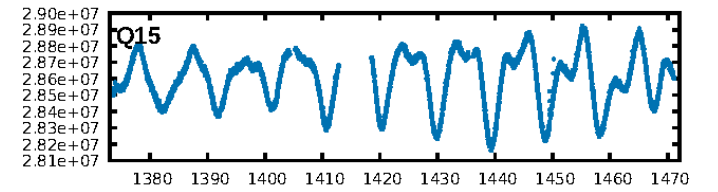
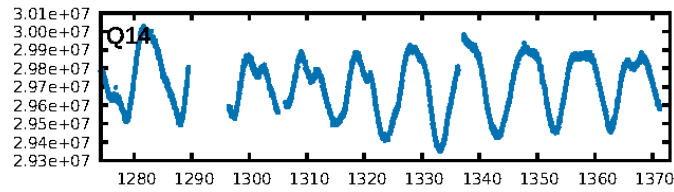
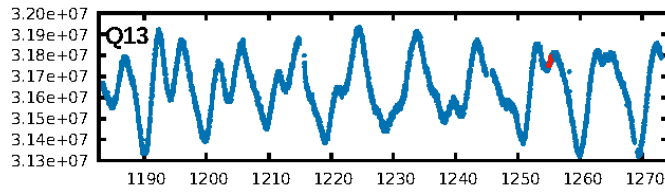
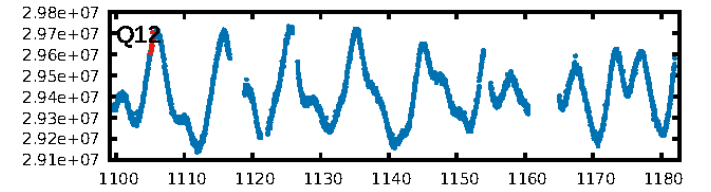
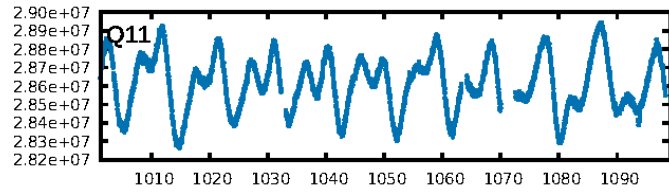
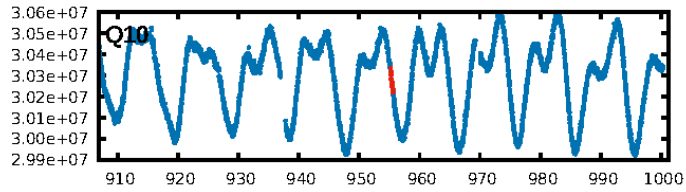
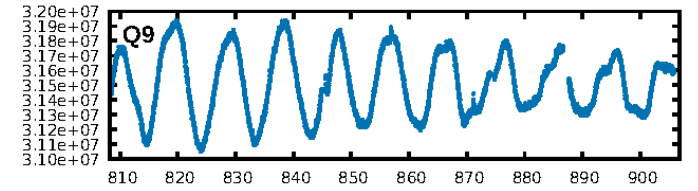
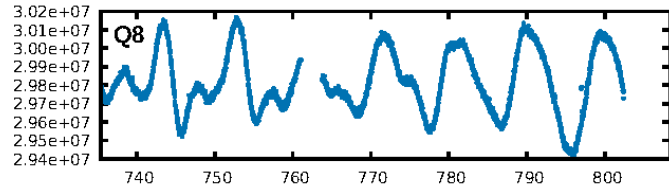
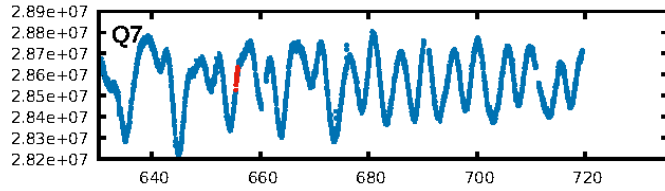
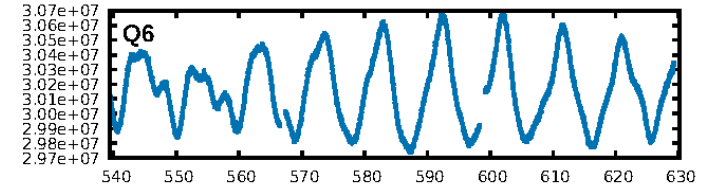
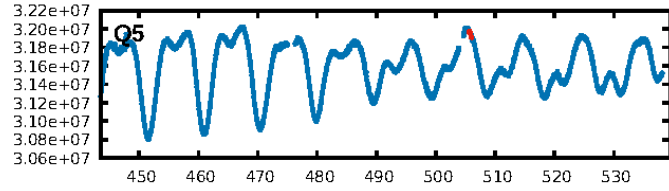
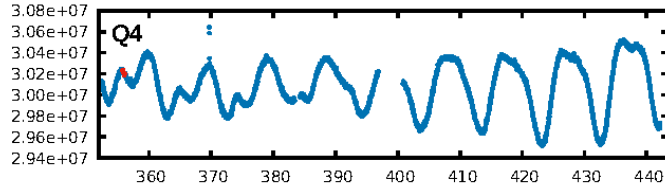
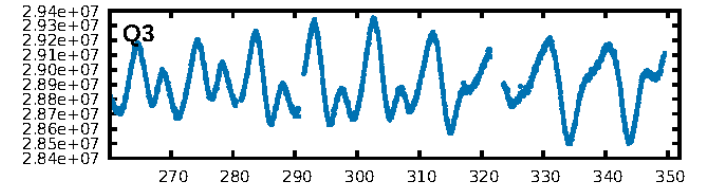
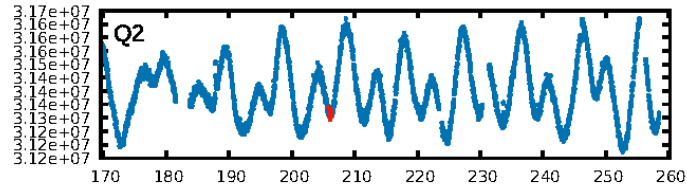
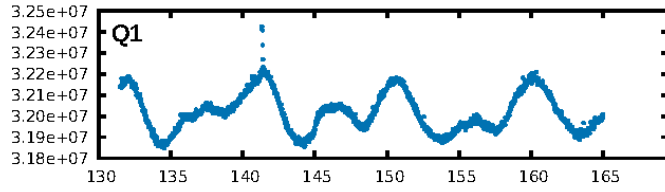
KIC: 6380533 Candidate: 8 of 8 Period: 149.858 d



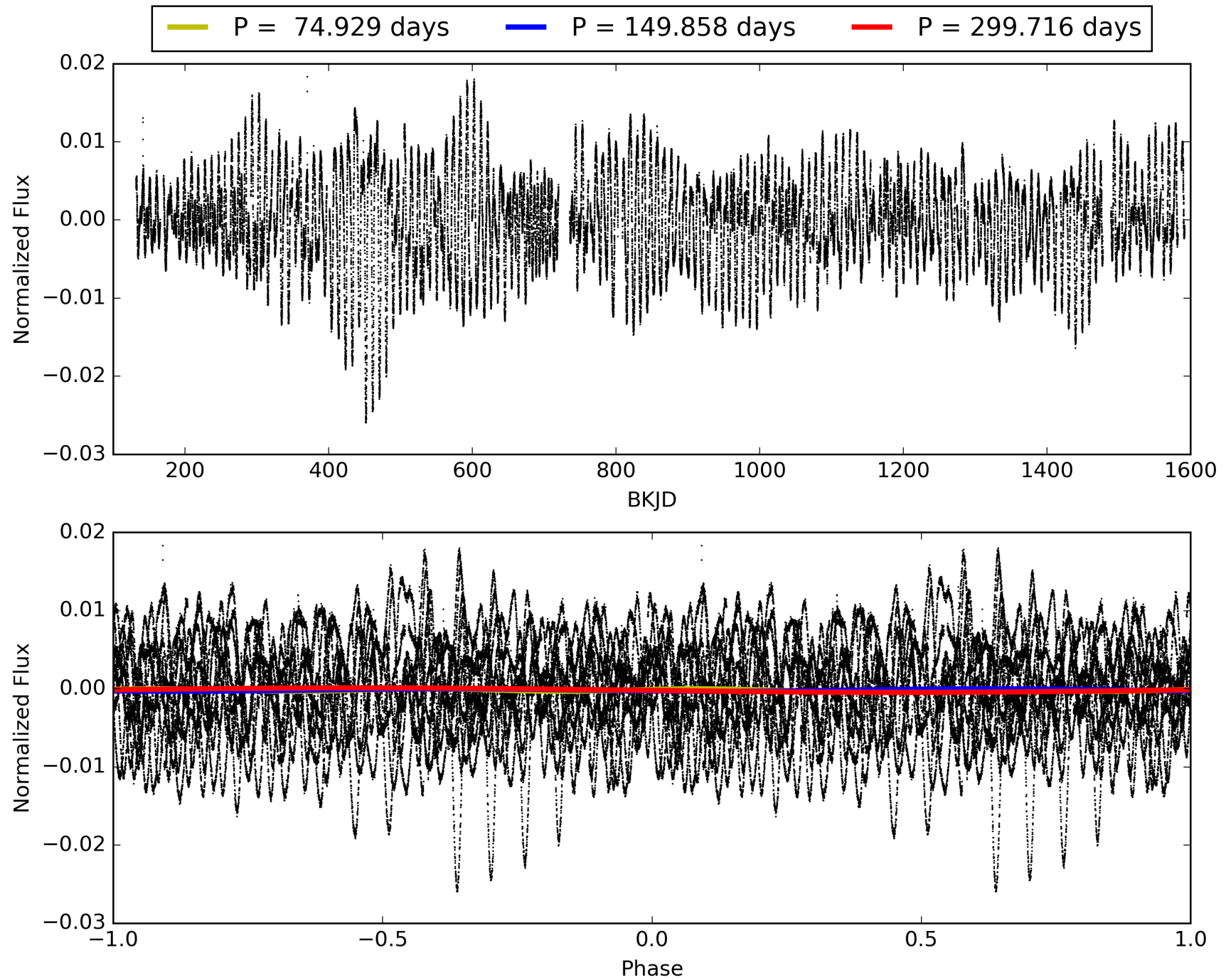
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 05:45:27 Z

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

# TCE 006380533-08, PDC Light Curves

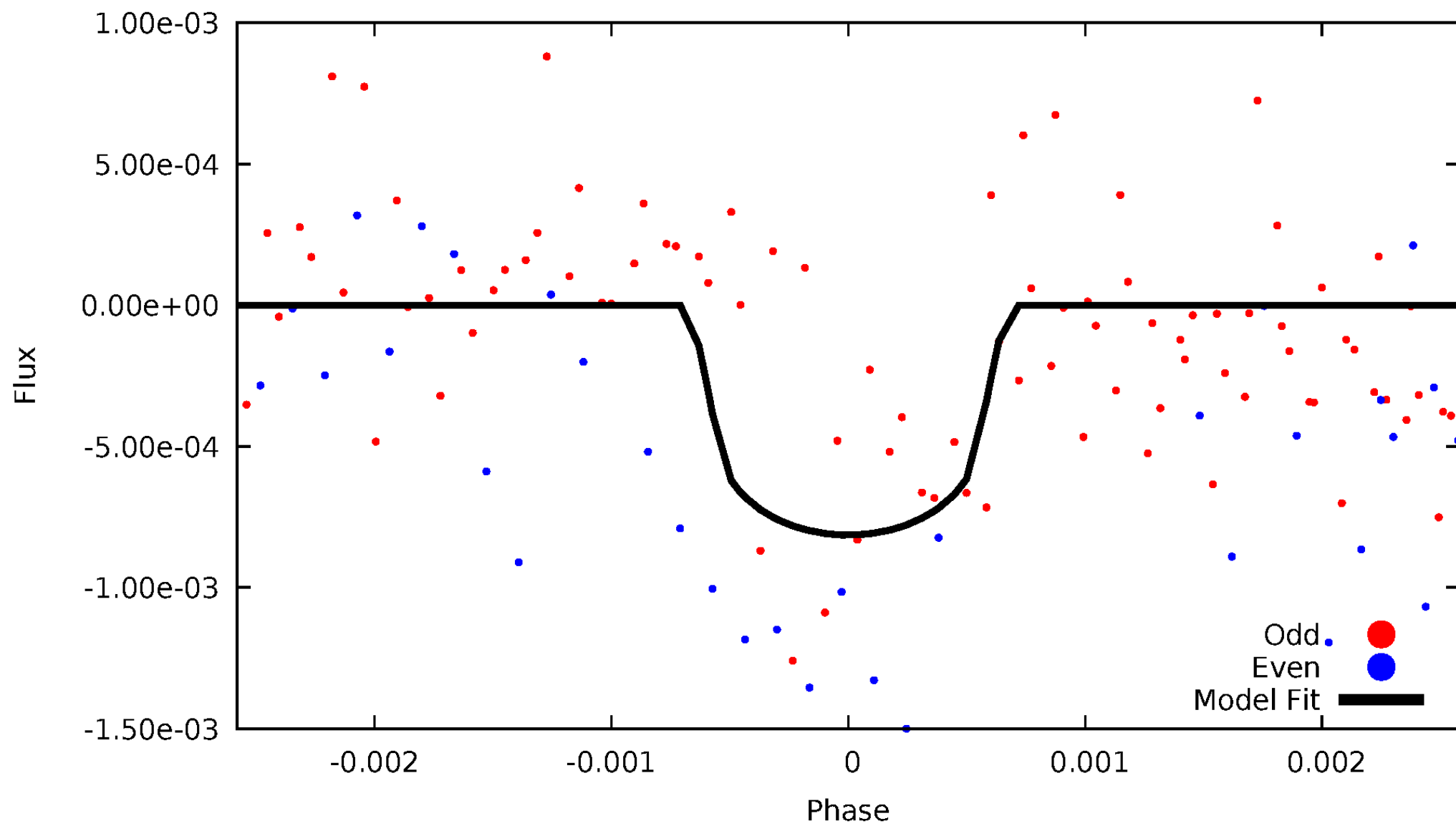


# TCE 006380533-08



# DV Odd/Even

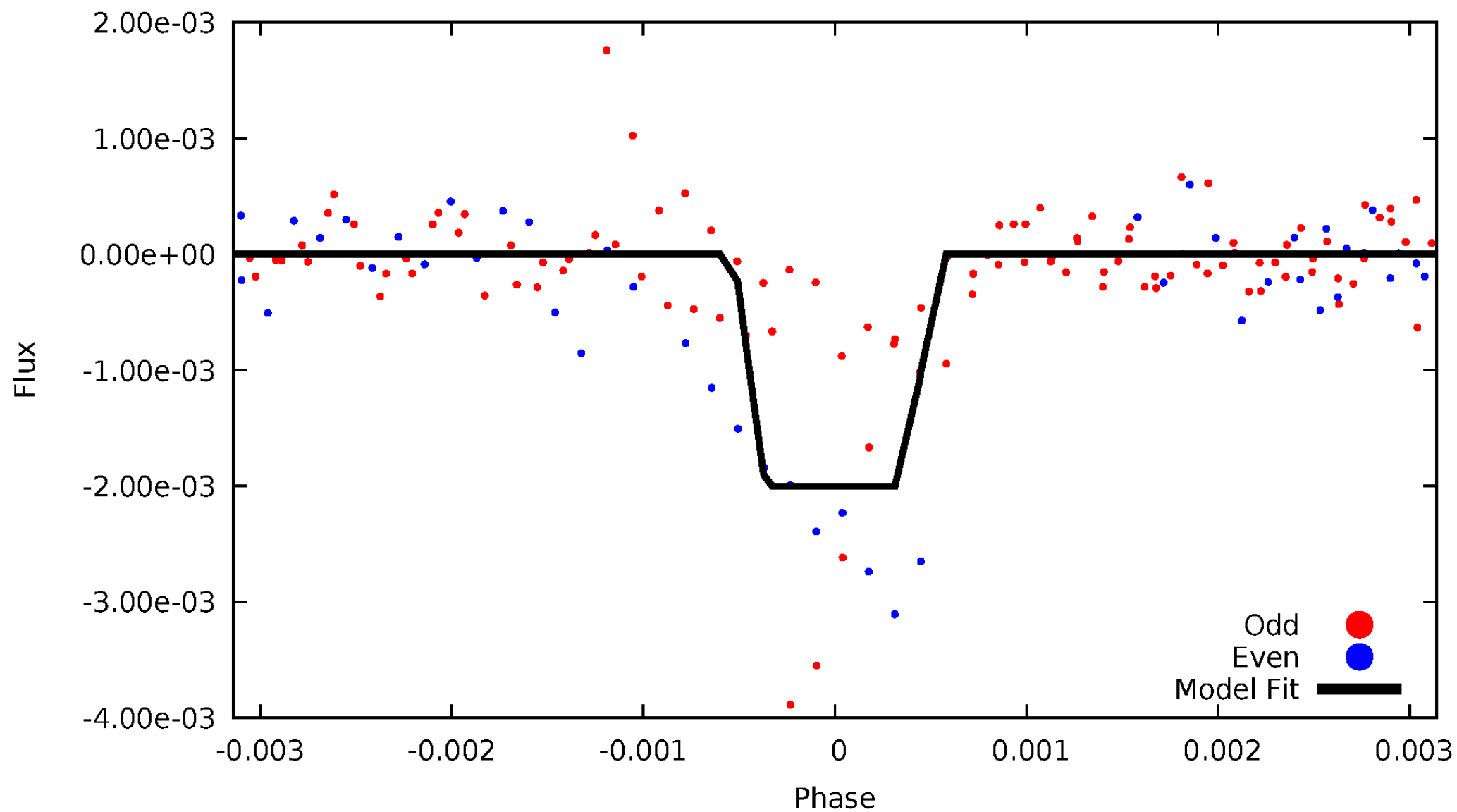
TCE 006380533-08





# ALT Odd/Even

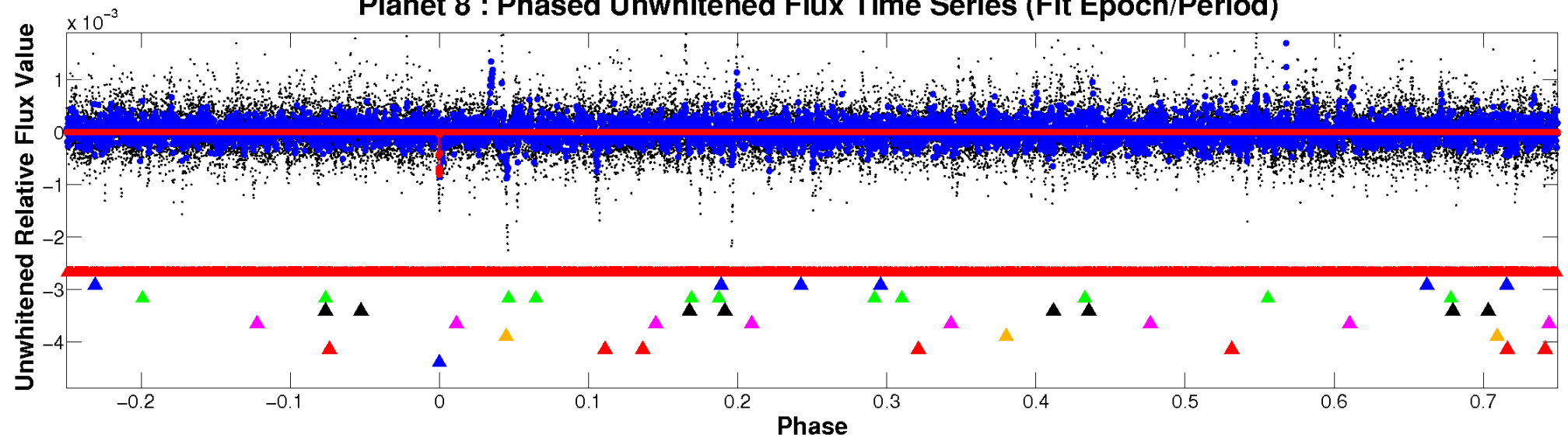
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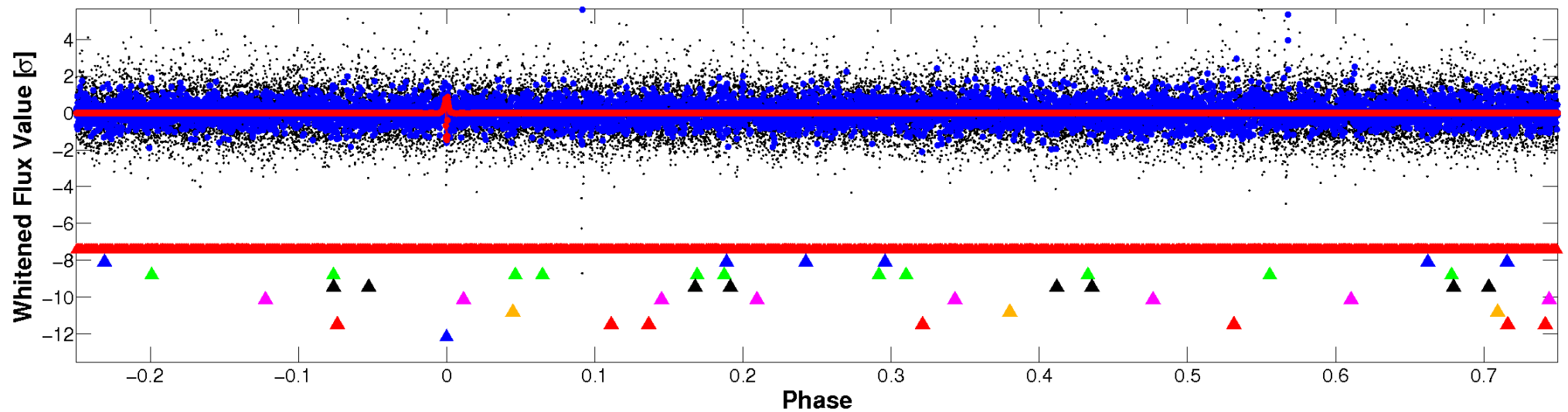


# Non-Whitened Vs. Whitened Light Curve

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

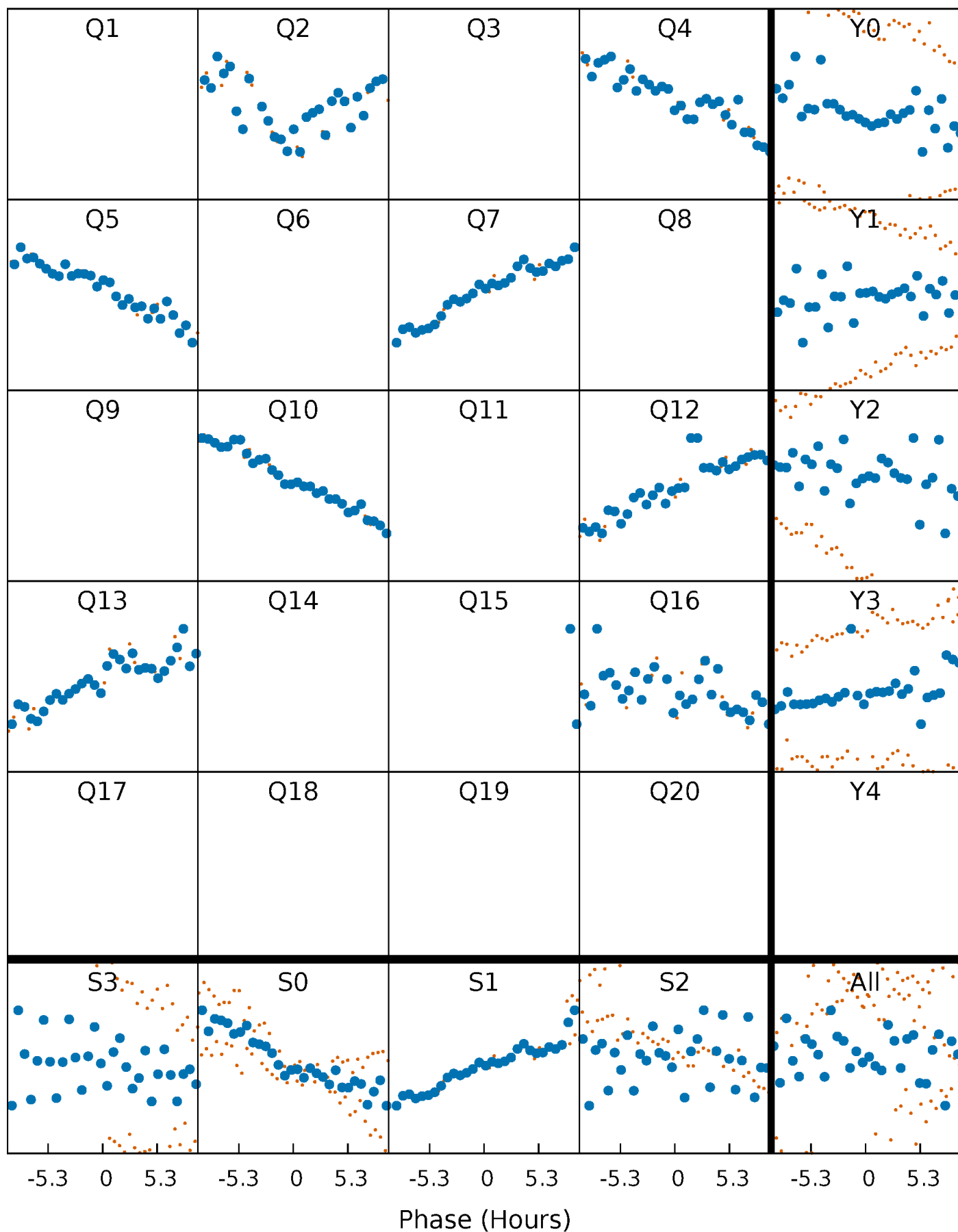


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



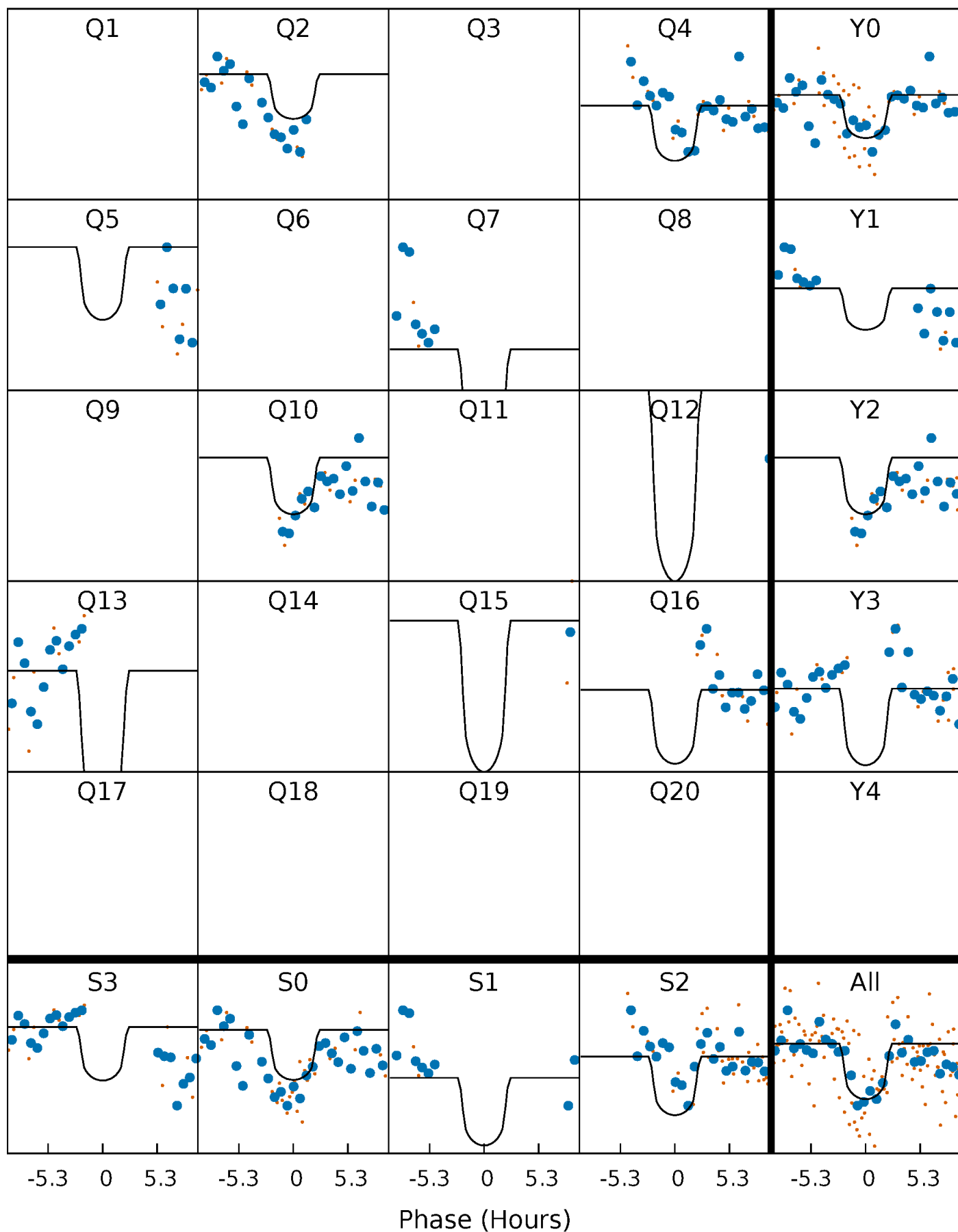
# PDC Quarter-Phased Transit Curves

TCE 006380533-08 P=149.858044 Days  $T_0=206.101353$  (BKJD)



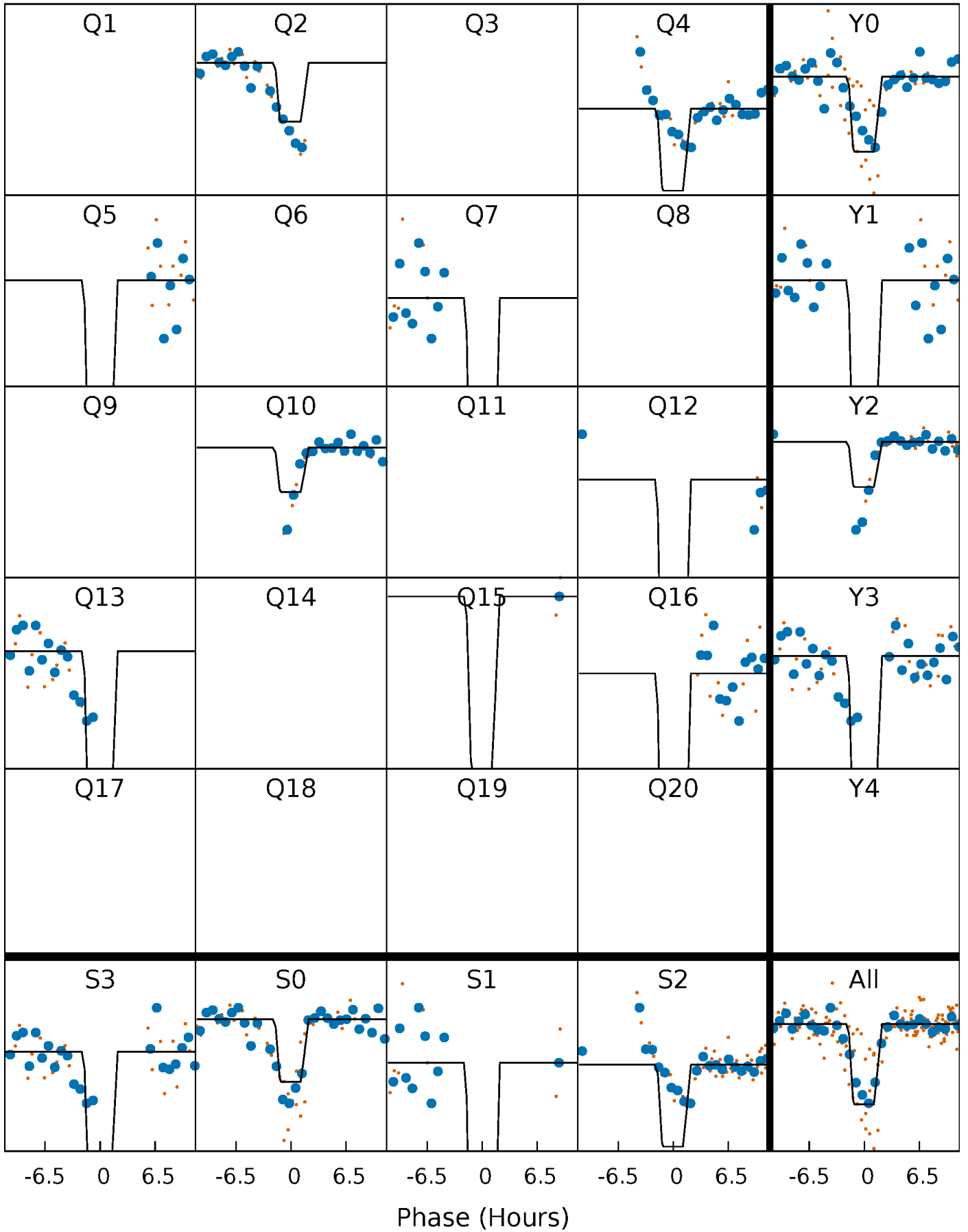
# DV Quarter-Phased Transit Curves

TCE 006380533-08 P=149.858044 Days  $T_0=206.101353$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

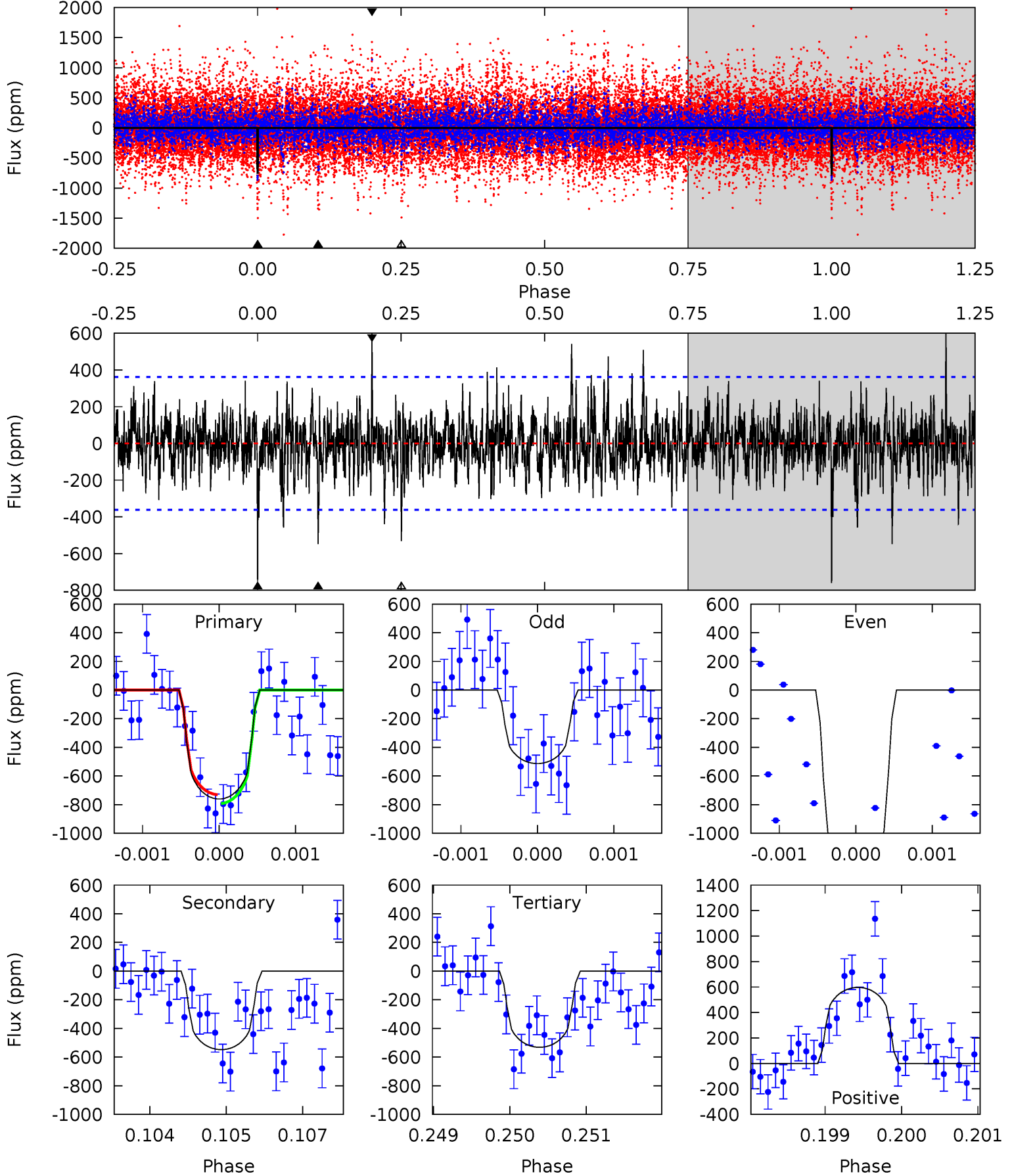
TCE 006380533-08 P=149.855909 Days  $T_0=206.091265$  (BKJD)



# DV Model-Shift Uniqueness Test

006380533-08, P = 149.858044 Days, E = 56.243309 Days

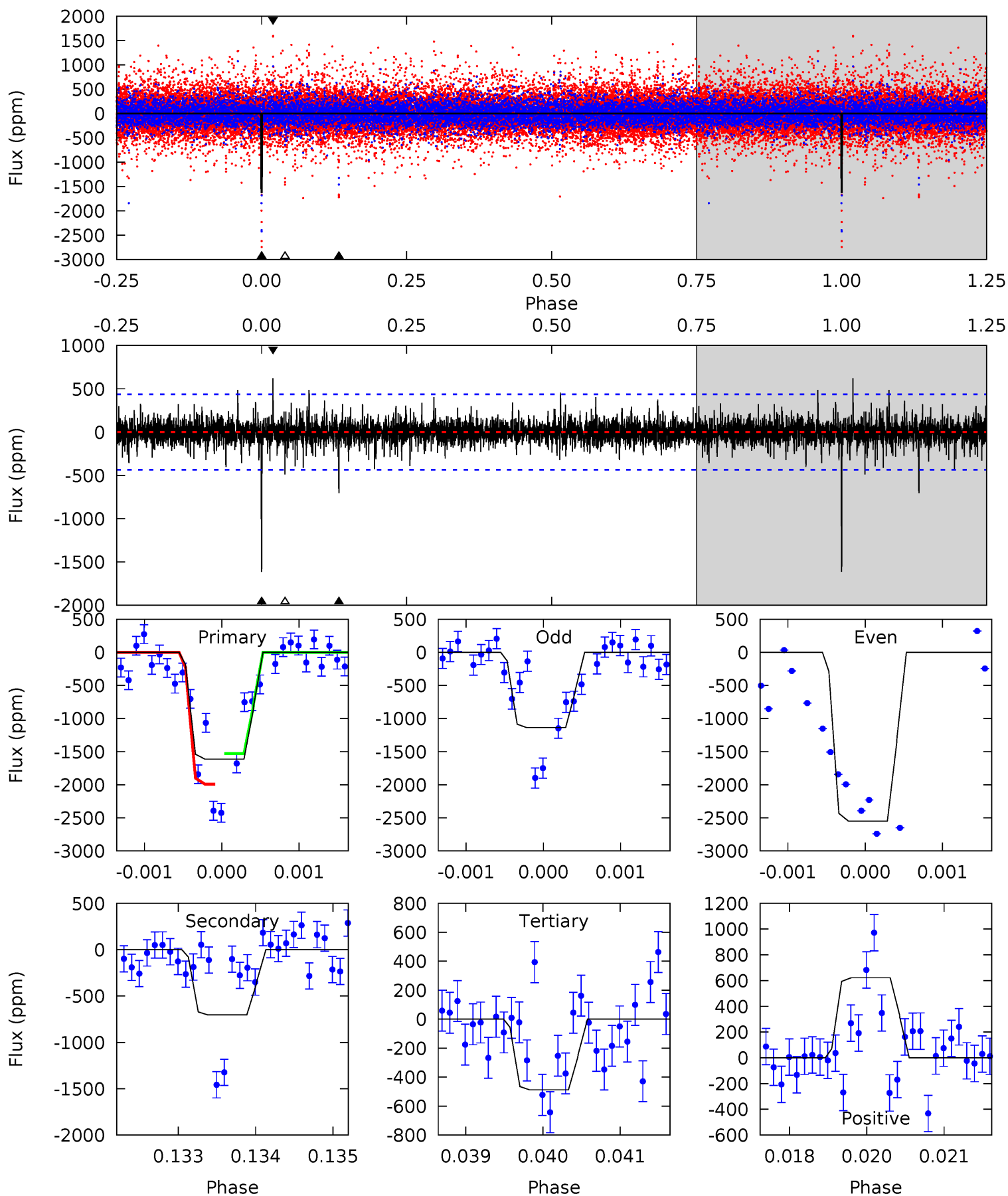
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
11.3	8.17	7.93	8.90	5.40	3.20	1.78	3.42	2.44	0.24	-0.73	5.19	0.86	0.44	0.47



# Alt Model-Shift Uniqueness Test

006380533-08, P = 149.855909 Days, E = 56.235356 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
20.1	8.79	6.09	7.76	5.44	3.27	1.19	14.1	12.4	2.70	1.02	9.34	0.98	0.28	3.01



### Stellar Parameters For KIC 006380533

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5350^{+175}_{-159}$	$4.457^{+0.112}_{-0.154}$	$-0.180^{+0.300}_{-0.300}$	$0.864^{+0.164}_{-0.119}$	$0.780^{+0.122}_{-0.061}$	$1.702^{+0.882}_{-0.721}$
	+3%/-3%	+3%/-3%	+167%/-167%	+19%/-14%	+16%/-8%	+52%/-42%
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 006380533-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-548 \pm 67$	$5.07^{+5.14}_{-3.52}$	$433^{+23}_{-23}$	$3895^{+2517}_{-754}$	$3027^{+29140}_{-2289}$
Alt.	$-703 \pm 80$	$5.89^{+4.99}_{-3.68}$	$434^{+26}_{-24}$	$3858^{+1896}_{-712}$	$2940^{+18108}_{-2099}$

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

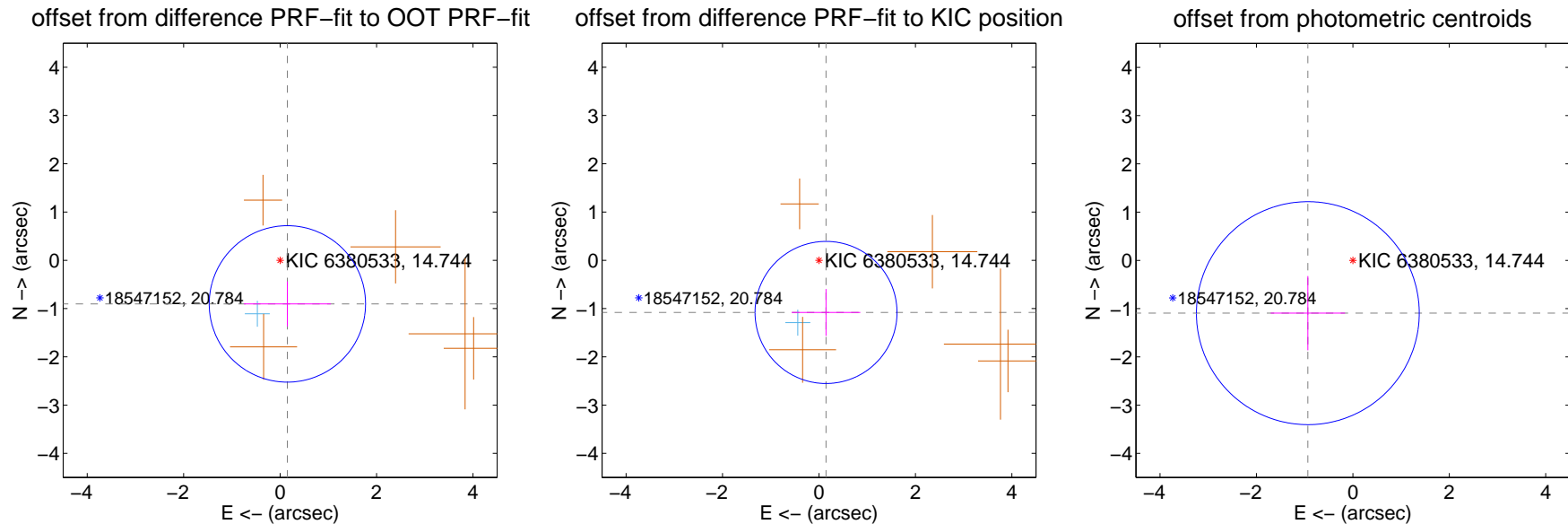
## DV Centroid Data

Supplemental centroid analysis for 006380533-08. Kepler magnitude: 14.74. Transit SNR 7.29

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.22 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.916 \pm 0.540$	1.70	$-0.151 \pm 0.902$	$-0.904 \pm 0.466$
PRF-fit source offset from KIC position	$1.090 \pm 0.491$	2.22	$-0.146 \pm 0.710$	$-1.080 \pm 0.486$
photometric centroid source offset	$1.44 \pm 0.77$	1.87	$0.93 \pm 0.77$	$-1.09 \pm 0.77$



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.

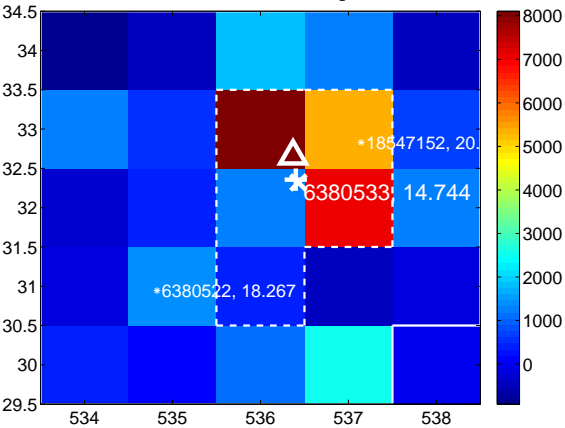
Q1 no difference image



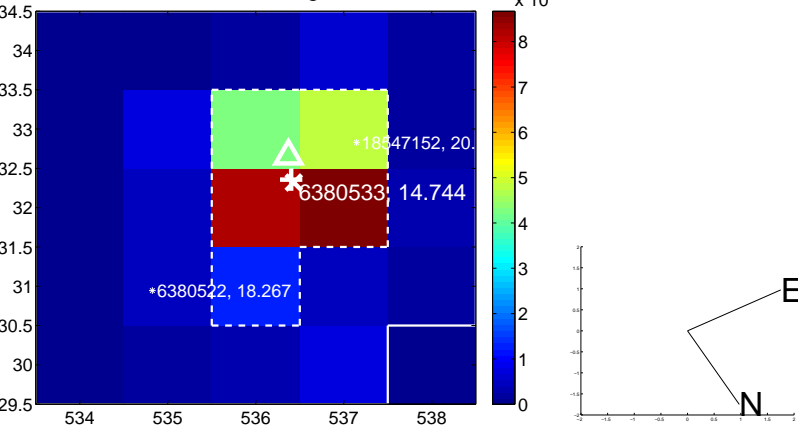
Q1 no OOT image



Q2 difference image



Q2 OOT image



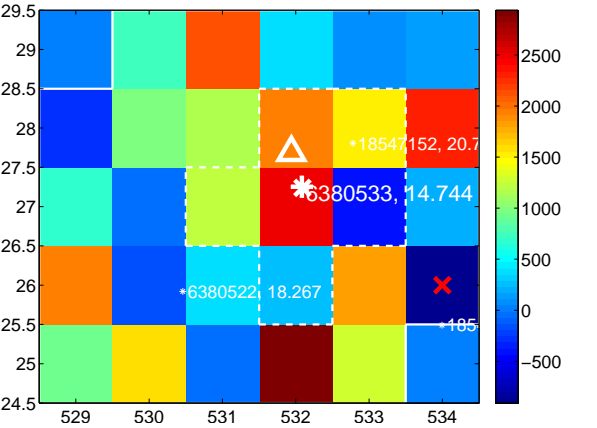
Q3 no difference image



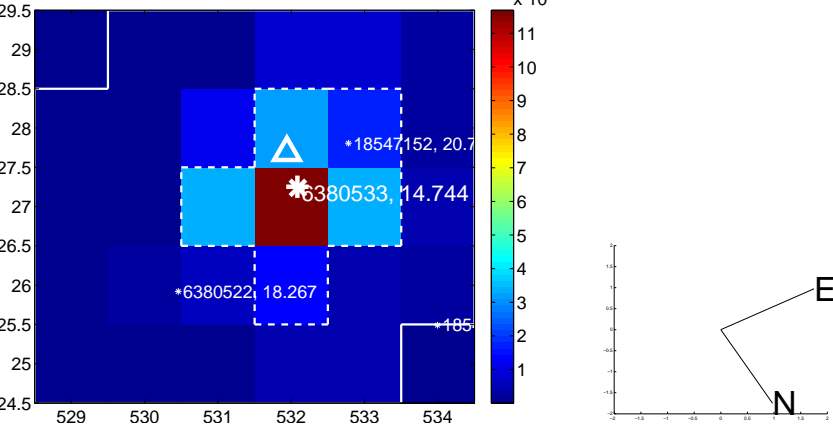
Q3 no OOT image



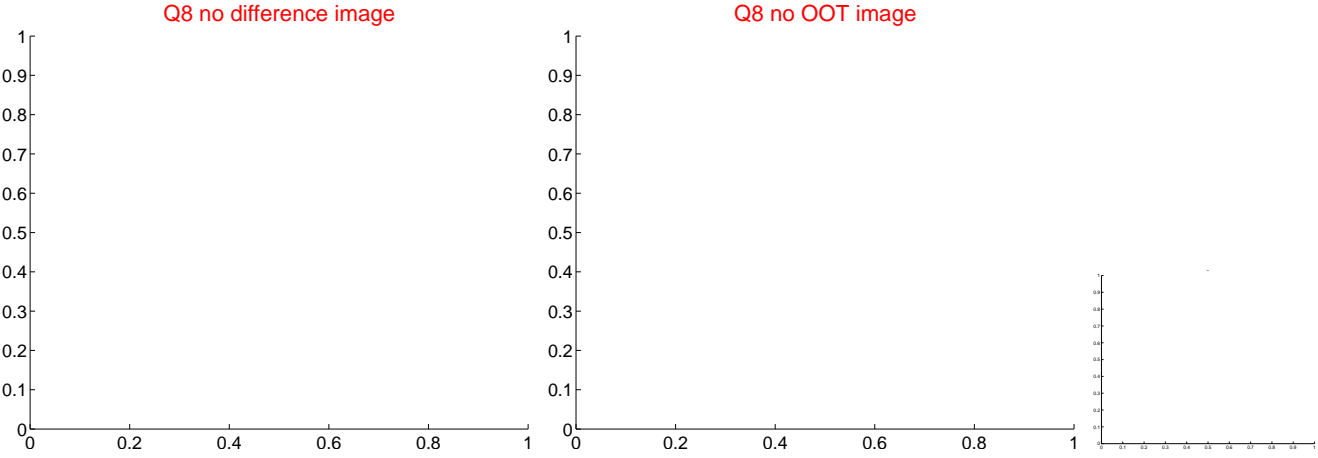
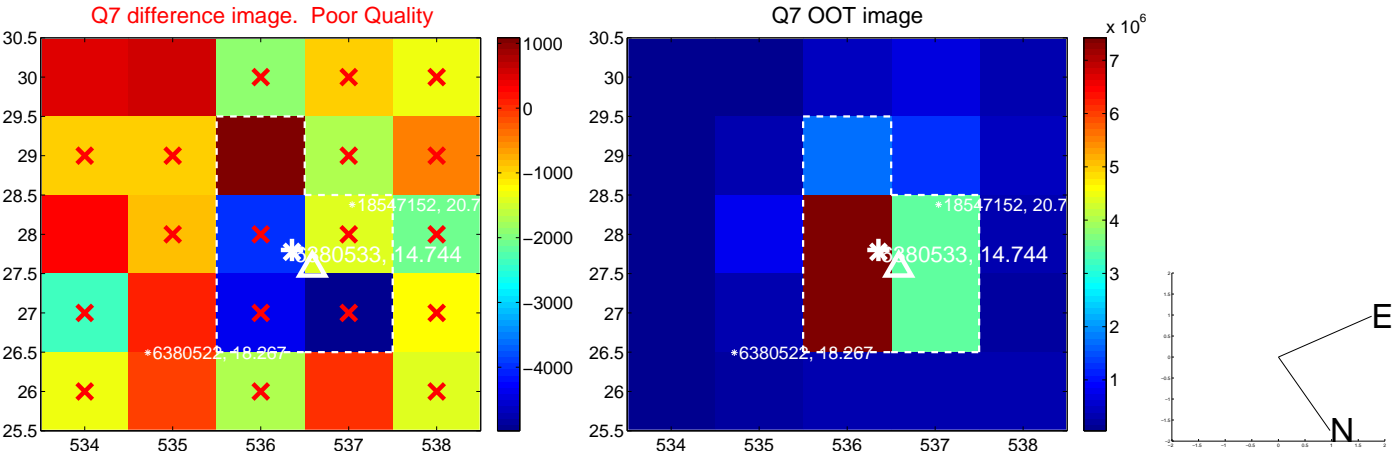
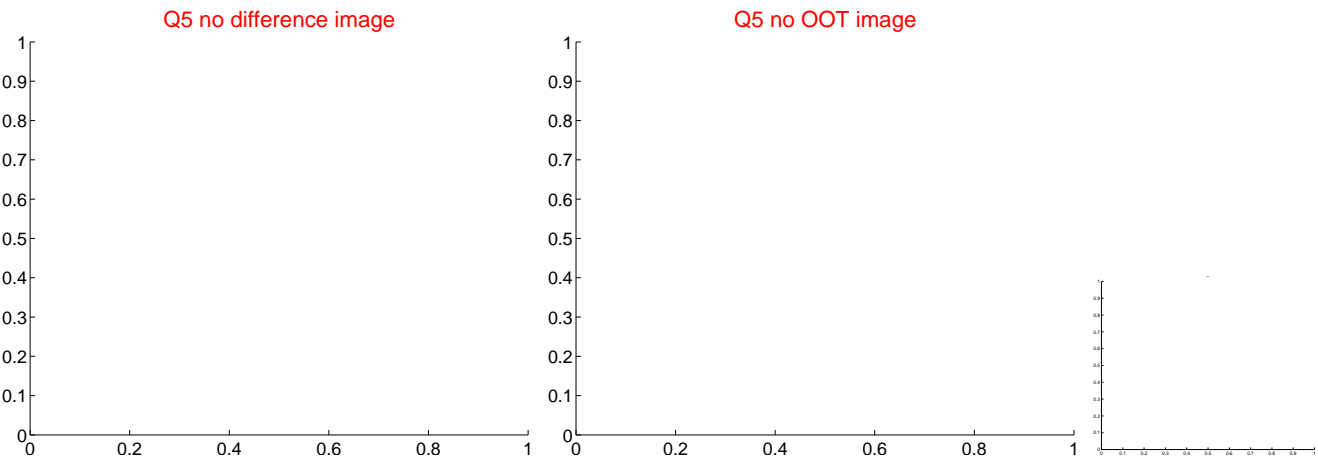
Q4 difference image. Poor Quality



Q4 OOT image



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



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

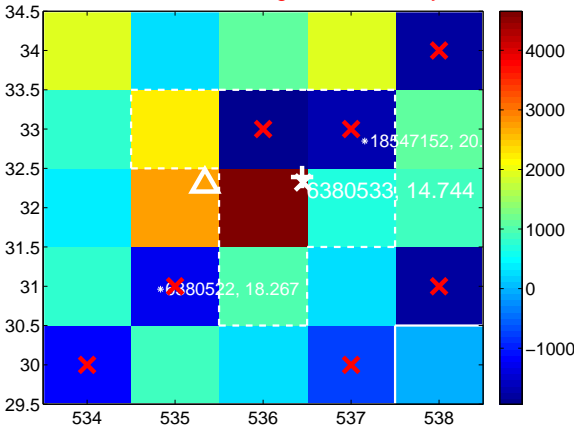
Q9 no difference image



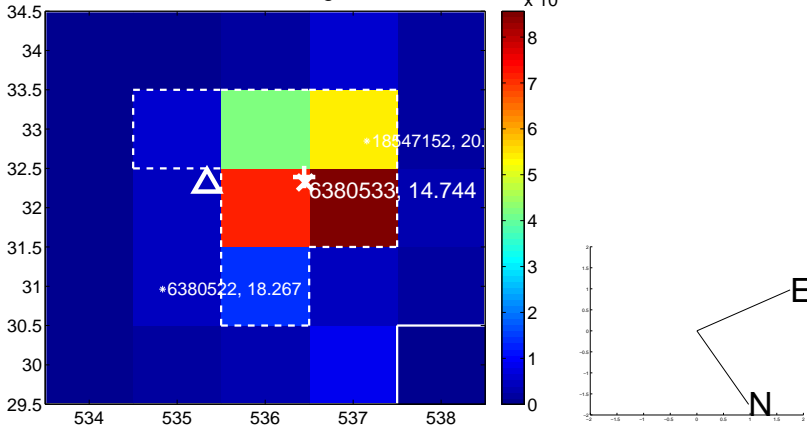
Q9 no OOT image



Q10 difference image. Poor Quality



Q10 OOT image



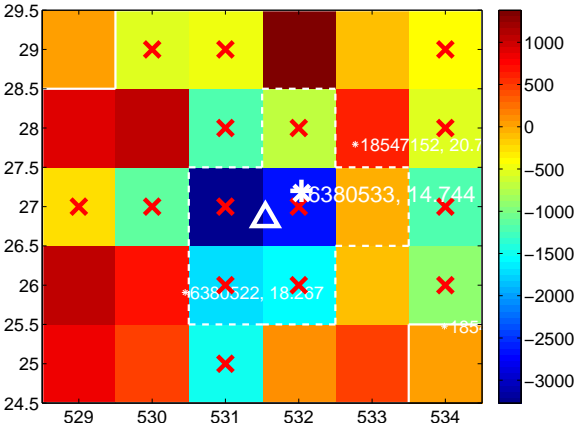
Q11 no difference image



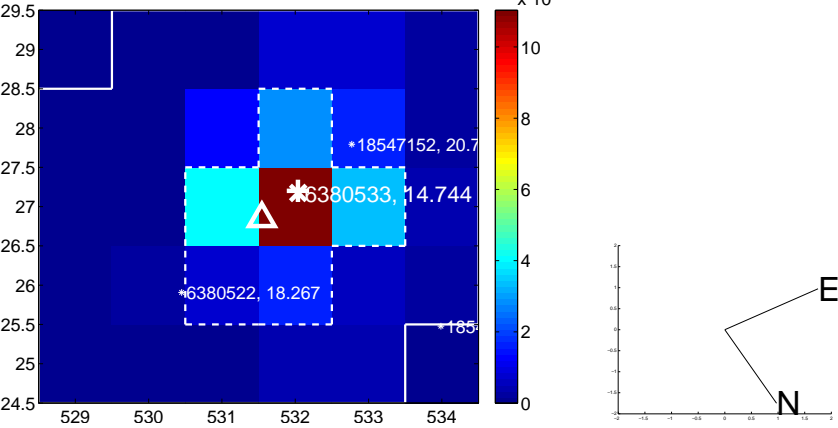
Q11 no OOT image



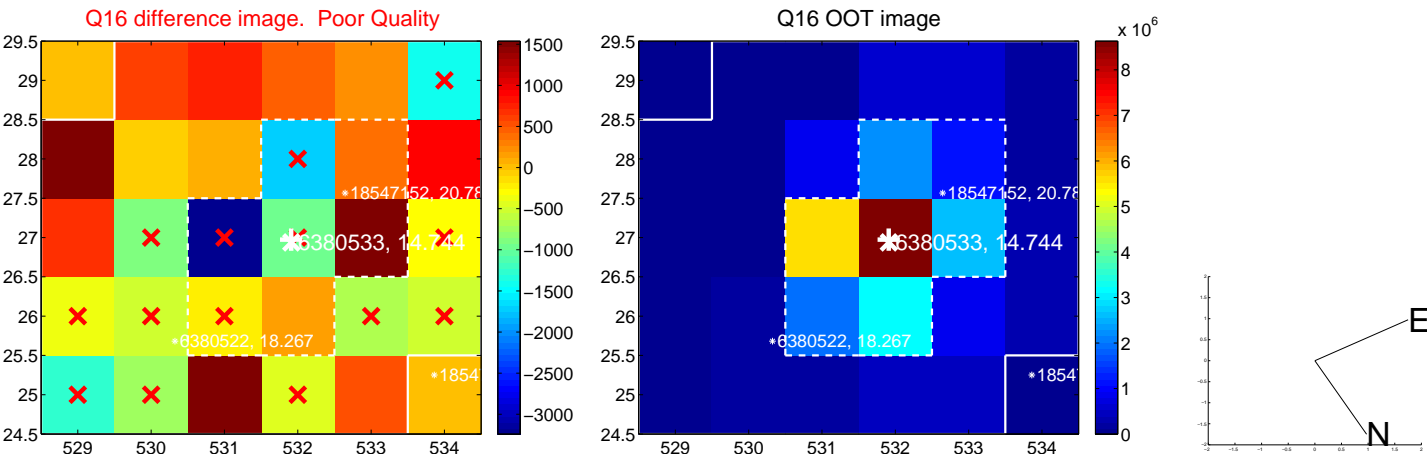
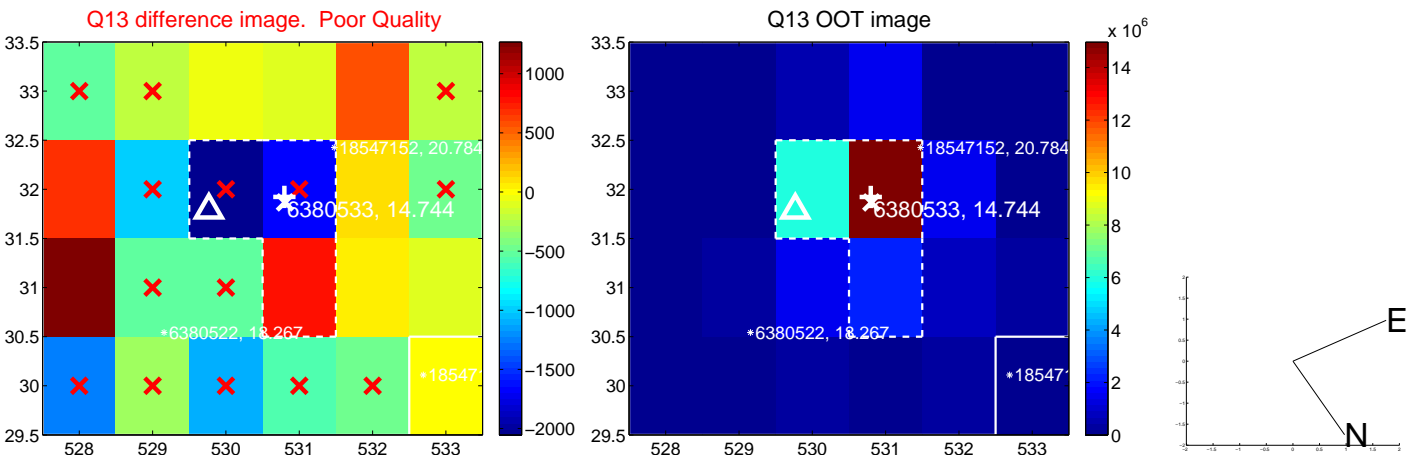
Q12 difference image. Poor Quality



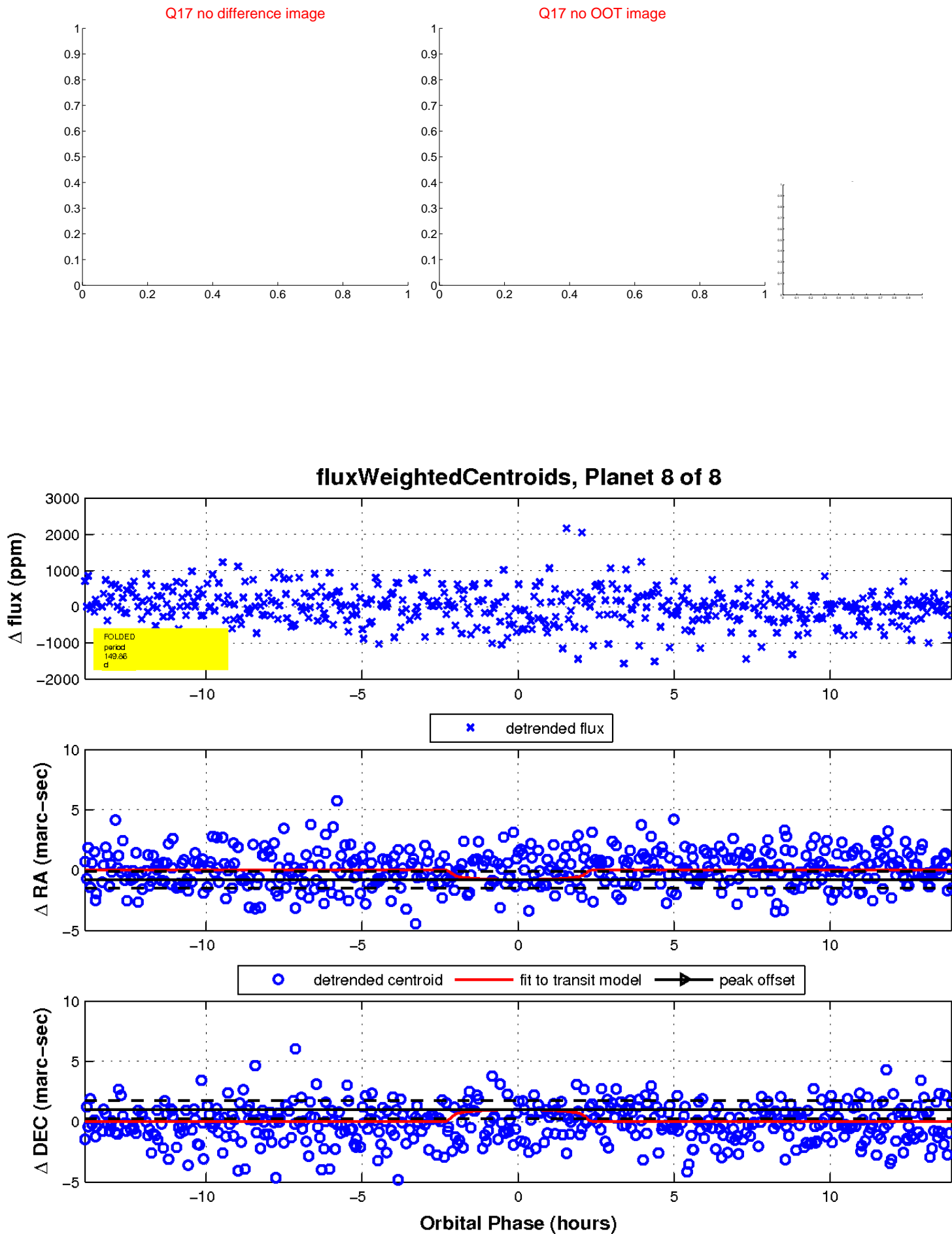
Q12 OOT image



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



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



# UKIRT Image

Declination

