

# KIC 007889496

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007889496-01	OBS	No	370.896359	264.642448	5935.8	12.500	39.7	-1.0	0.90	5763	6.89	0.79
007889496-02	OBS	No	473.622603	144.698188	969.2	3.679	15.8	6.8	0.90	5763	2.81	0.57
007889496-03	OBS	No	479.610898	133.793175	406.6	1.183	18.0	1.6	0.90	5763	2.12	0.56
007889496-04	OBS	No	560.662830	457.763430	7634.9	5.000	28.9	-1.0	0.90	5763	7.82	0.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007889496-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
007889496-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007889496-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_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—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
007889496-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

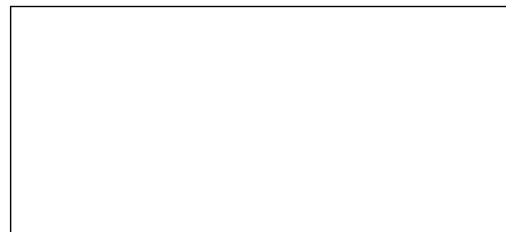
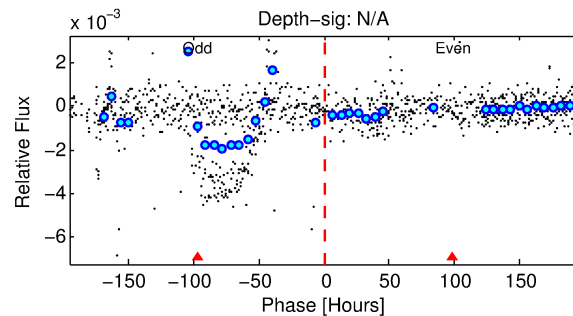
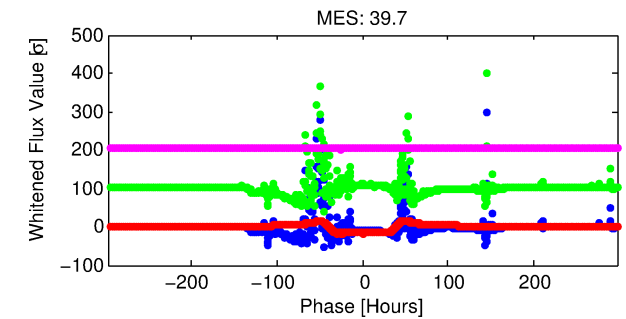
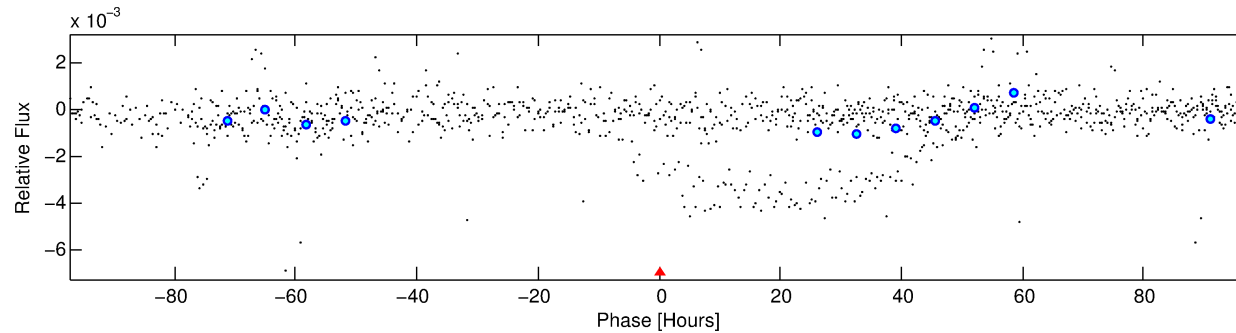
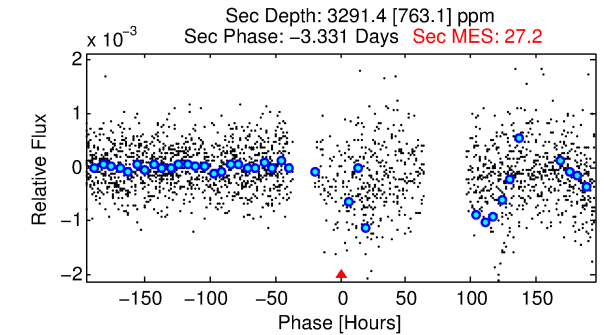
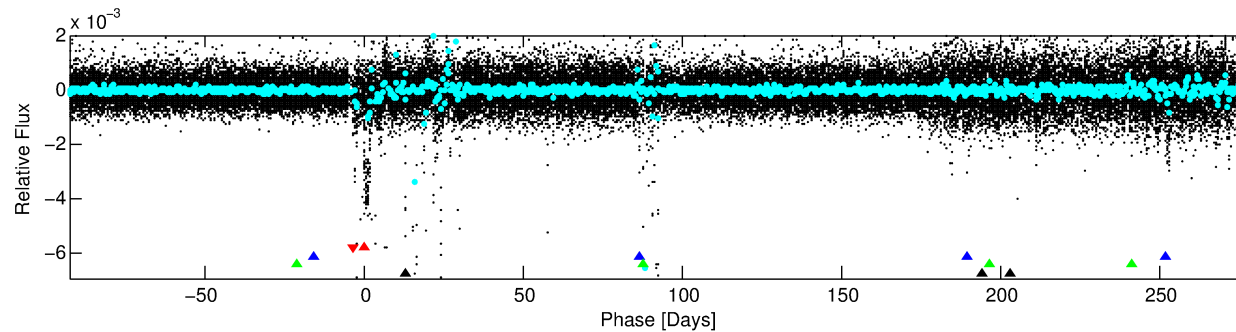
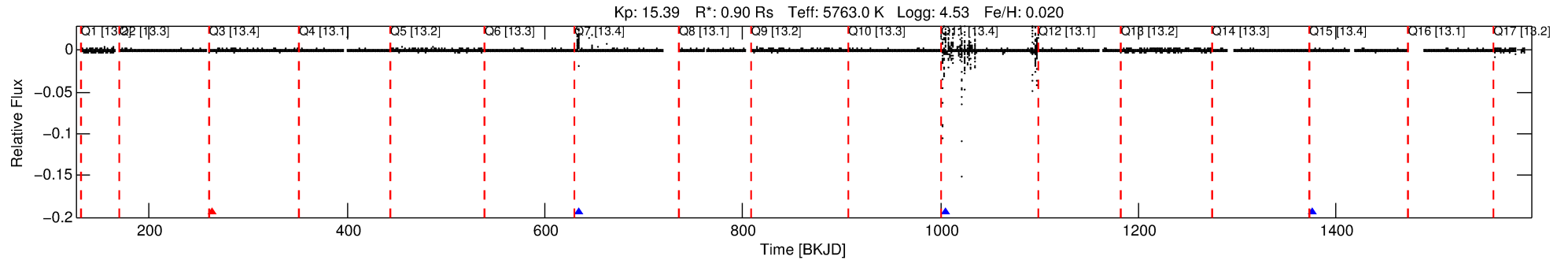
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007889496-01

No Significant Match Found

# DV One-Page Summary

KIC: 7889496 Candidate: 1 of 4 Period: 370.896 d



## TPS TCE Results:

Period = 370.89636 d  
Epoch = 264.6424 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

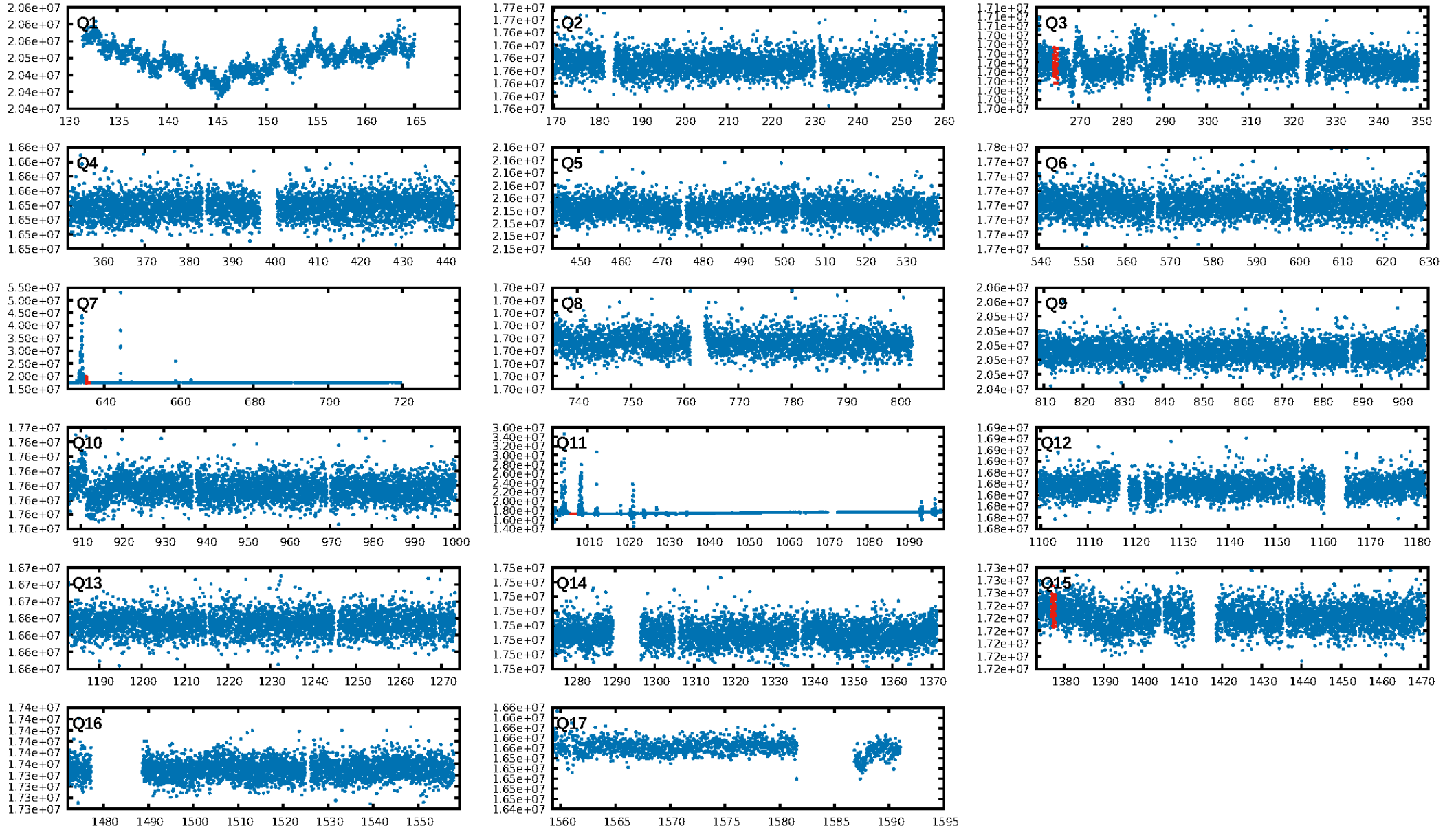
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [189.21σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.81e-18  
RollingBand-fgt: 0.75 [3/4]  
GhostDiagnostic-chr: -1.332

Centroid-sig: 2.4%  
Centroid-so: 2.934 arcsec [2.53σ]  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0 [0]  
KicOffset-st: 0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 1.00 [1/1]

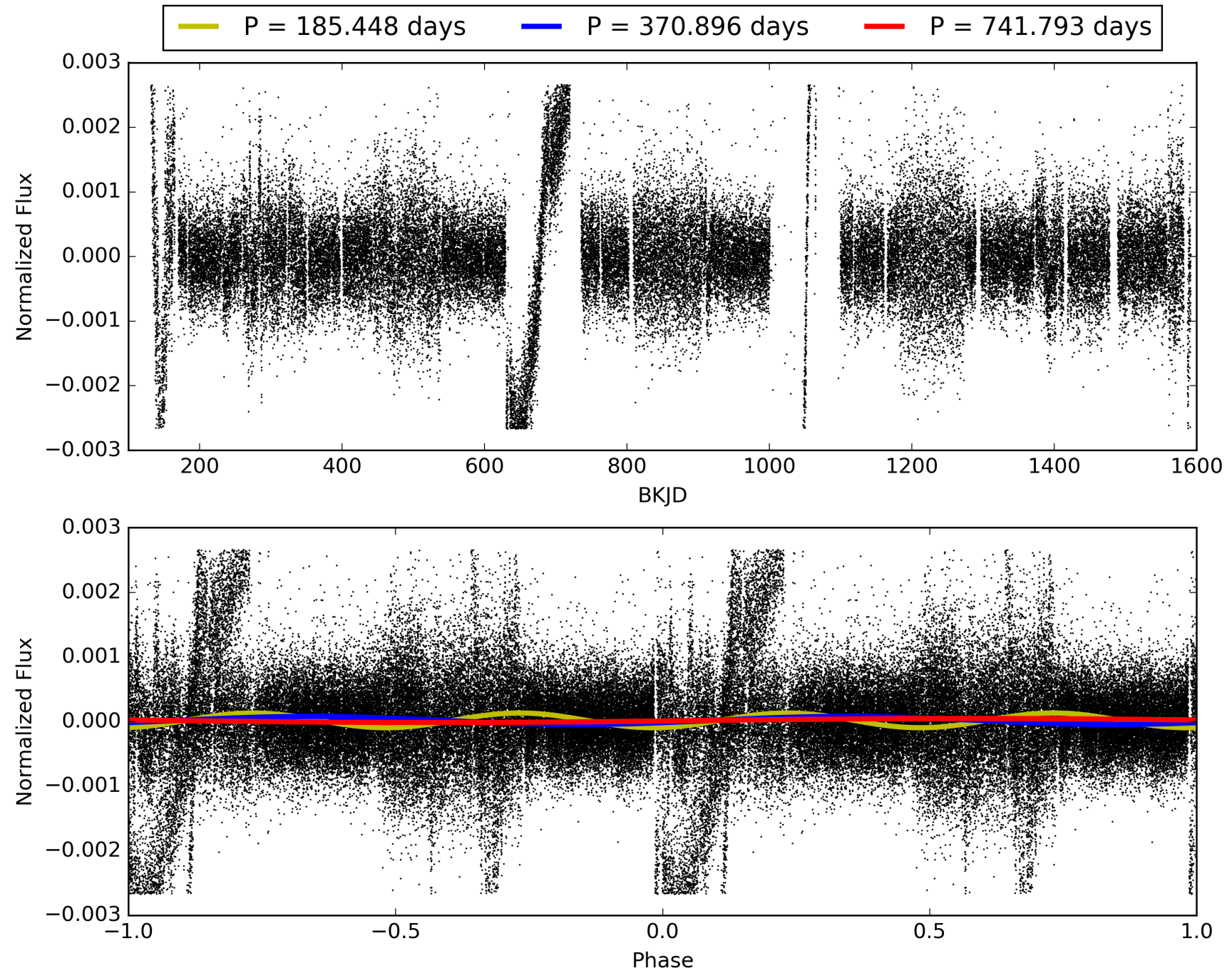
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:33:37 Z

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

# TCE 007889496-01, PDC Light Curves

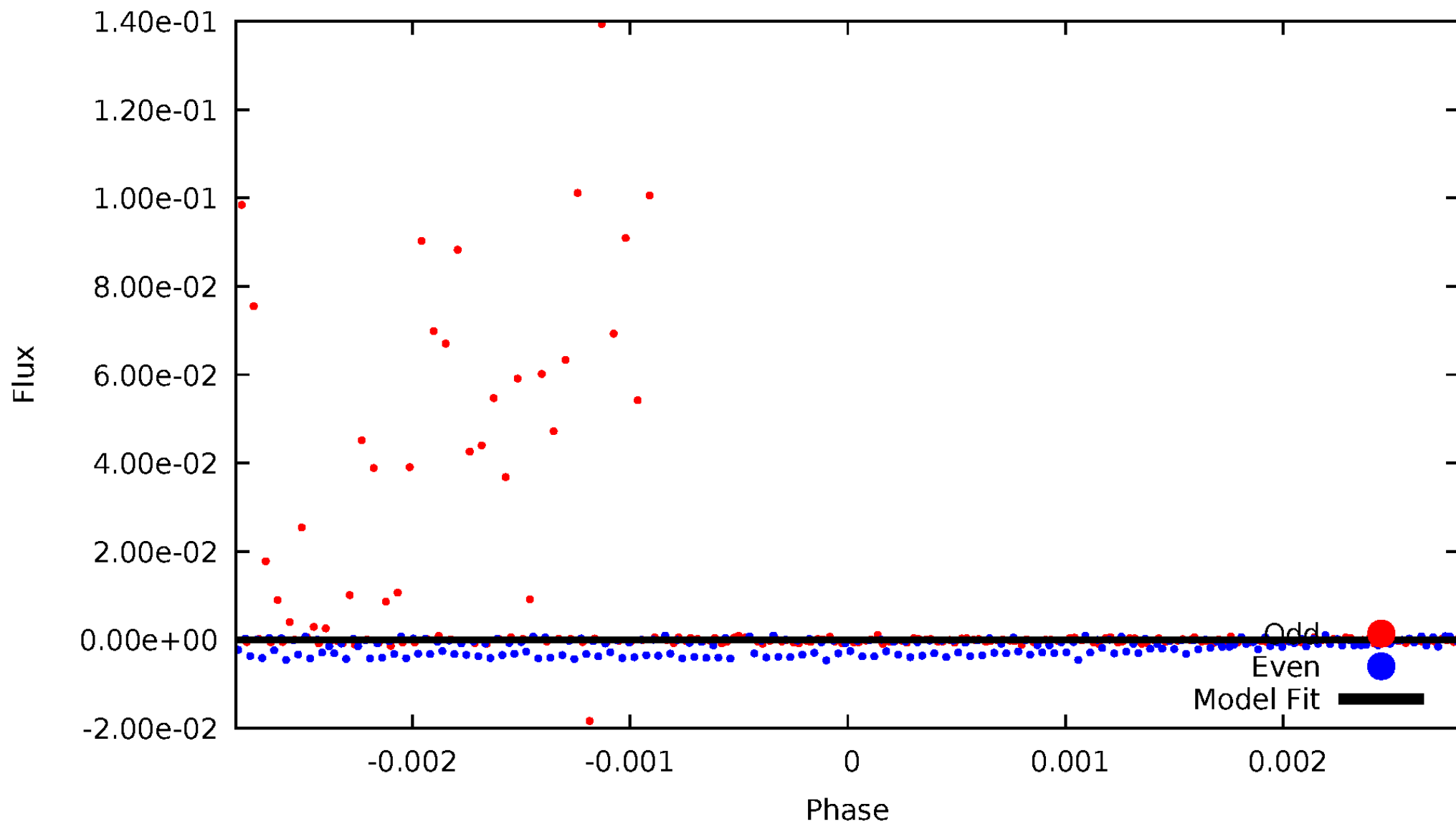


TCE 007889496-01



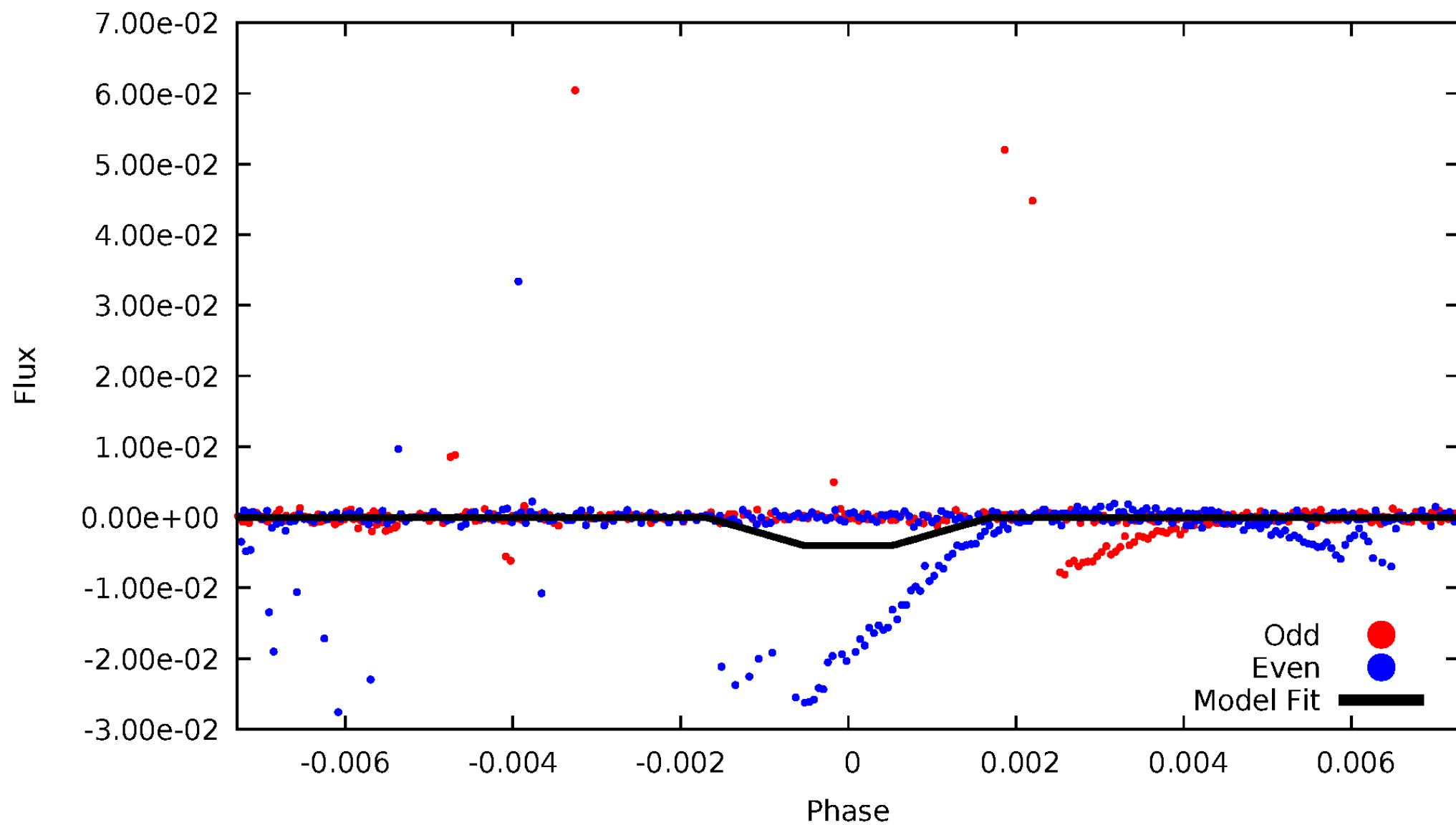
# DV Odd/Even

TCE 007889496-01



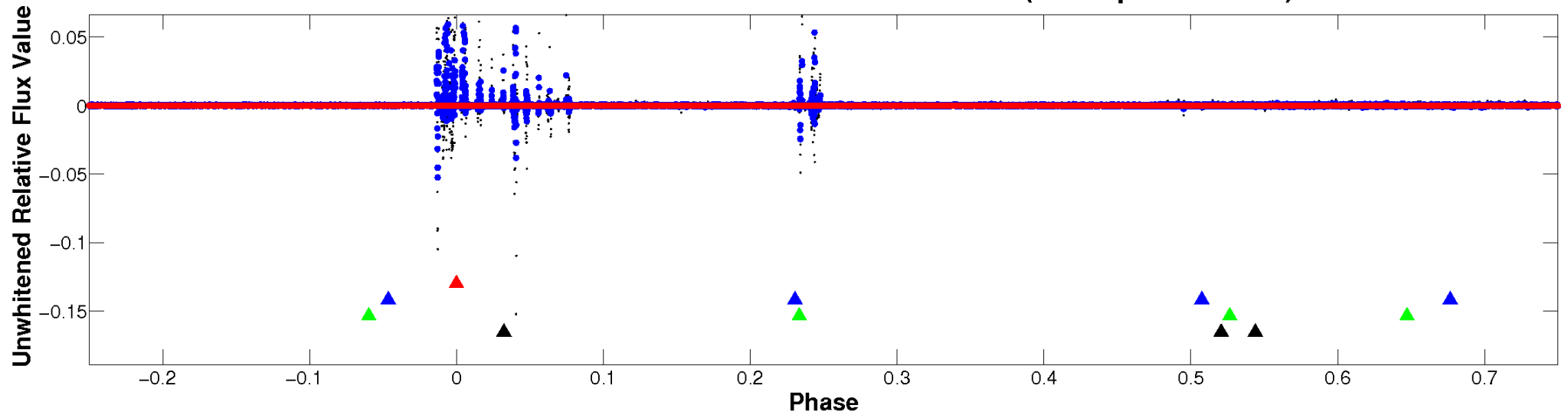
# ALT Odd/Even

TCE 007889496-01

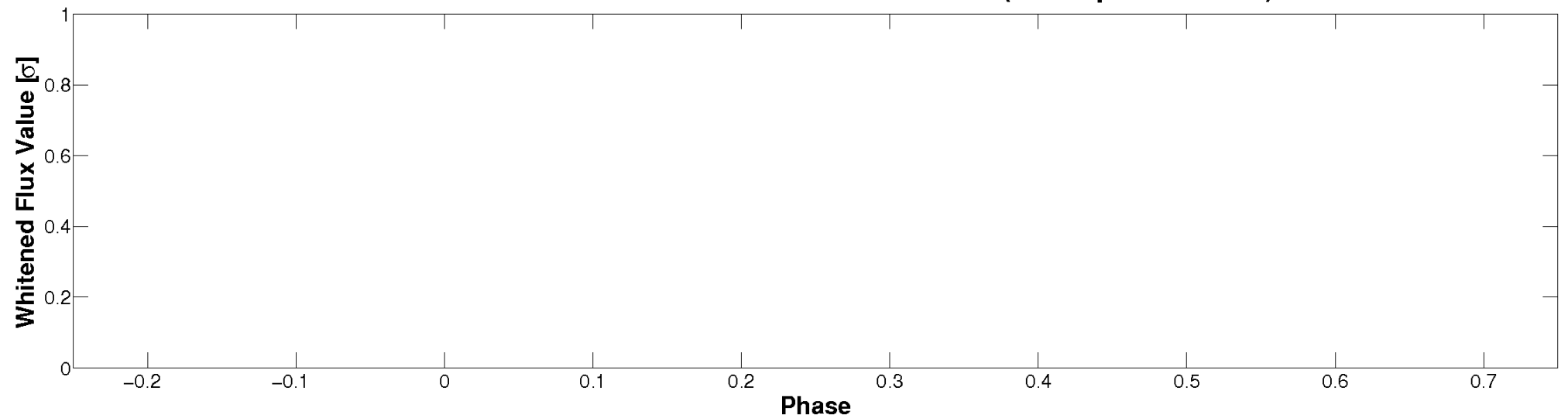


# Non-Whitened Vs. Whitened Light Curve

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

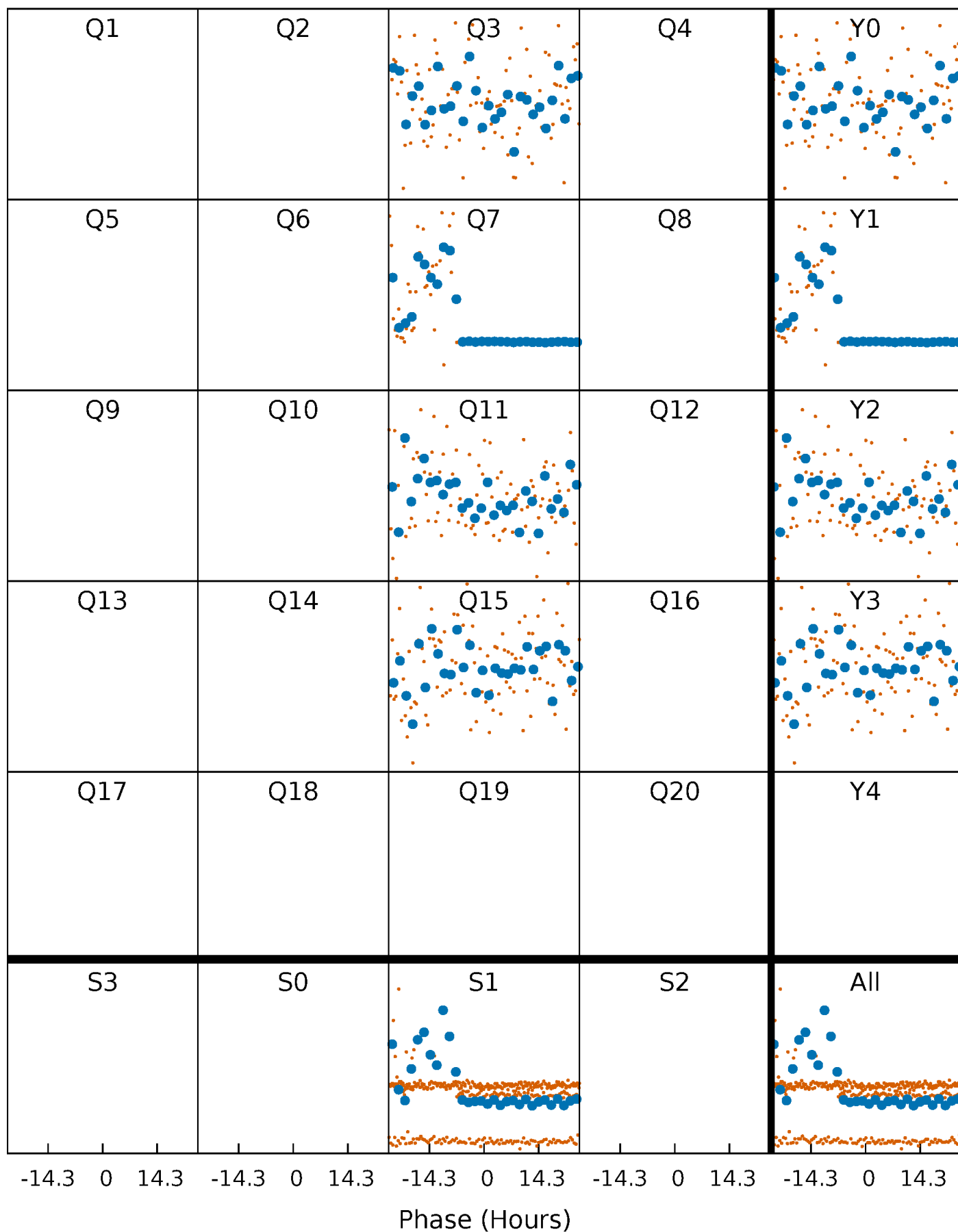


**Planet 1 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

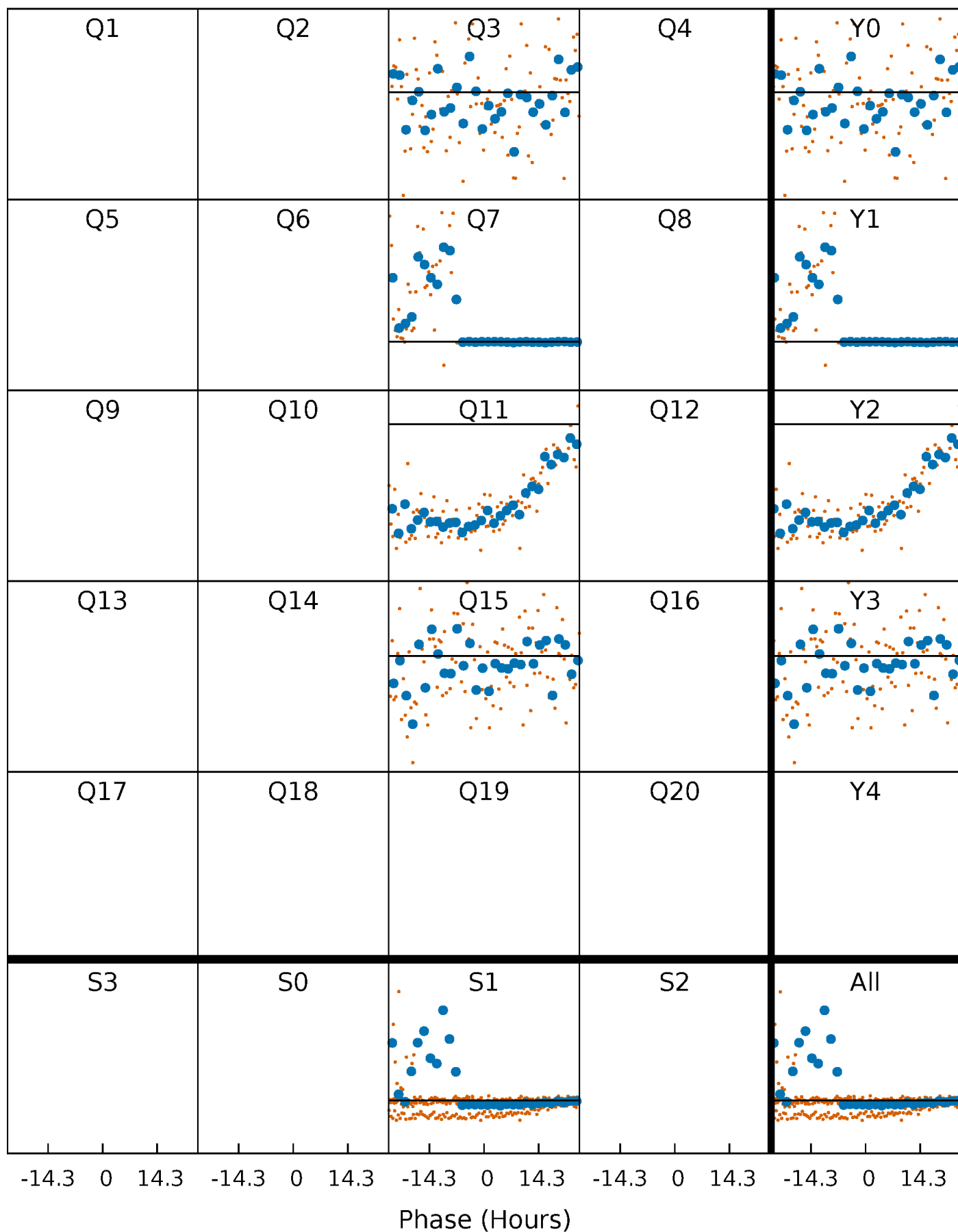
TCE 007889496-01 P=370.896359 Days  $T_0=264.642448$  (BKJD)





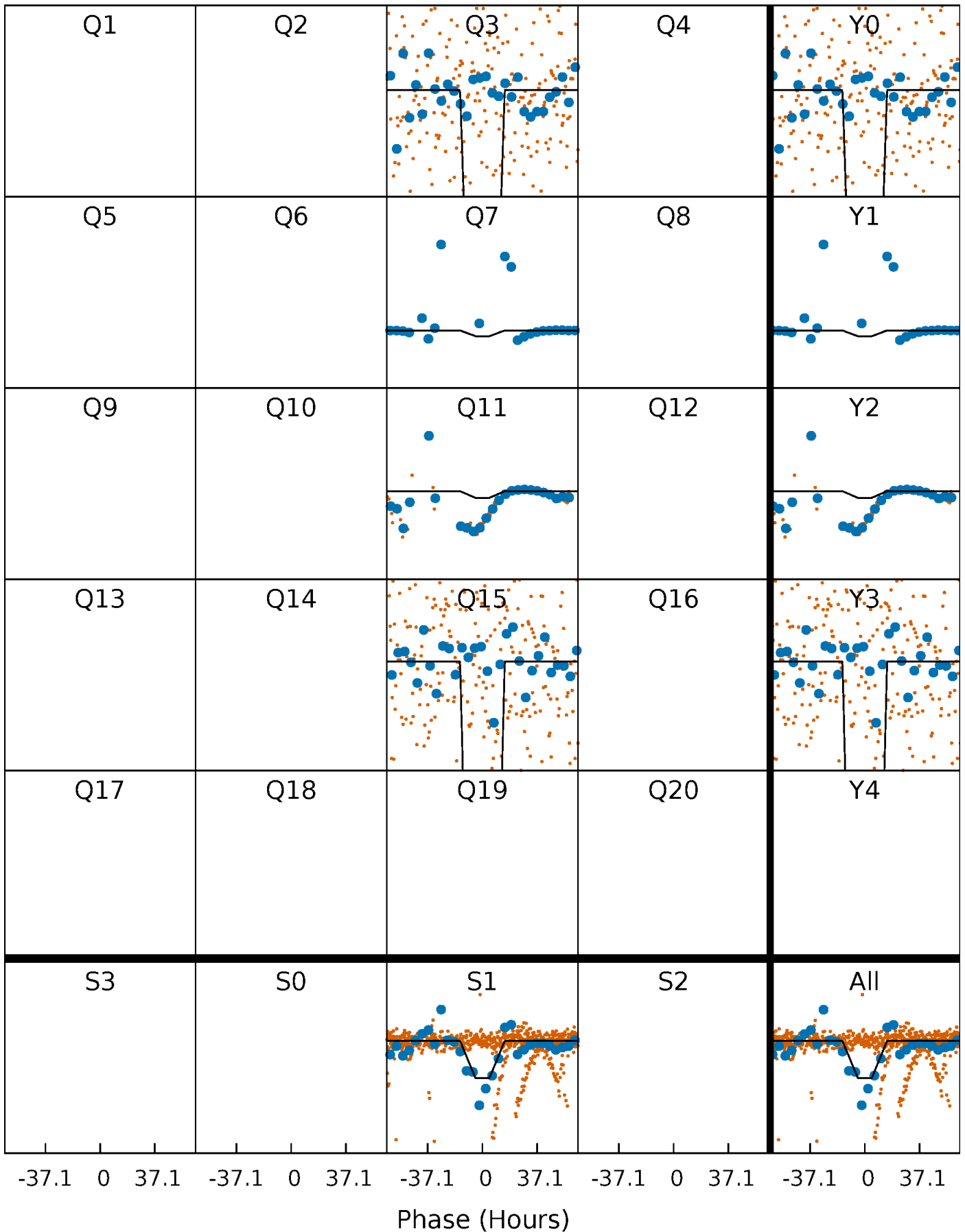
# DV Quarter-Phased Transit Curves

TCE 007889496-01 P=370.896359 Days  $T_0=264.642448$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

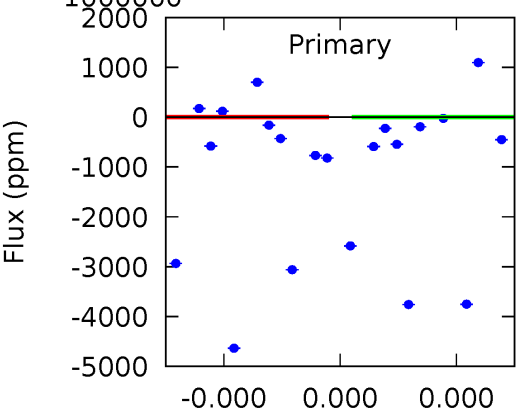
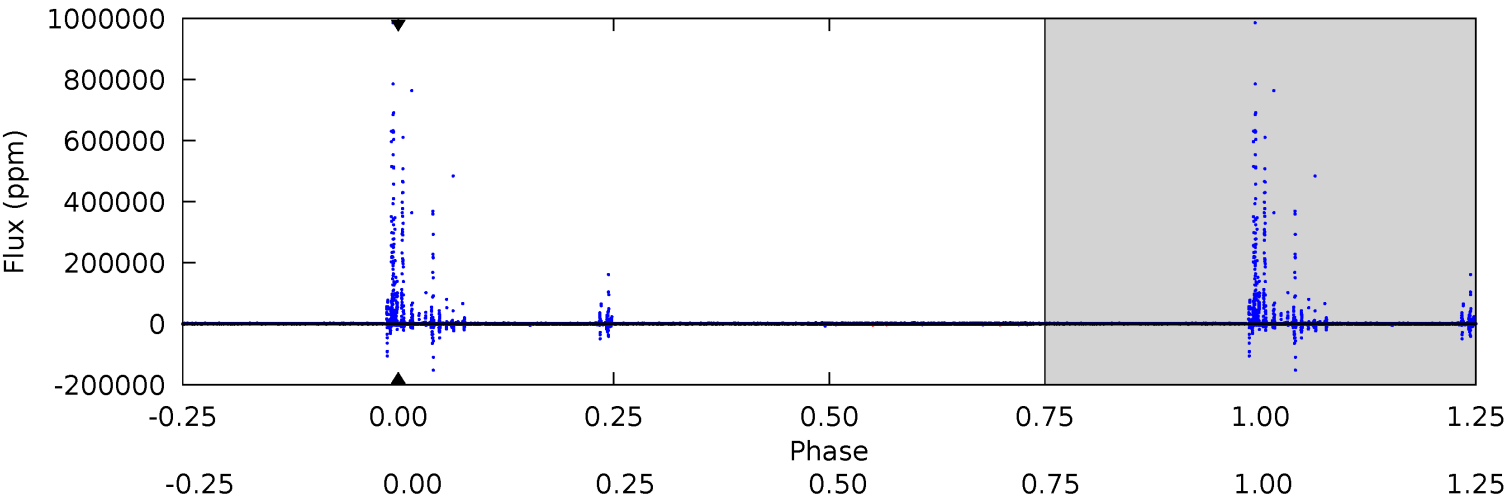
TCE 007889496-01 P=370.896359 Days  $T_0=263.470313$  (BKJD)



DV Model-Shift Uniqueness Test

007889496-01, P = 370.896359 Days, E = 264.642448 Days

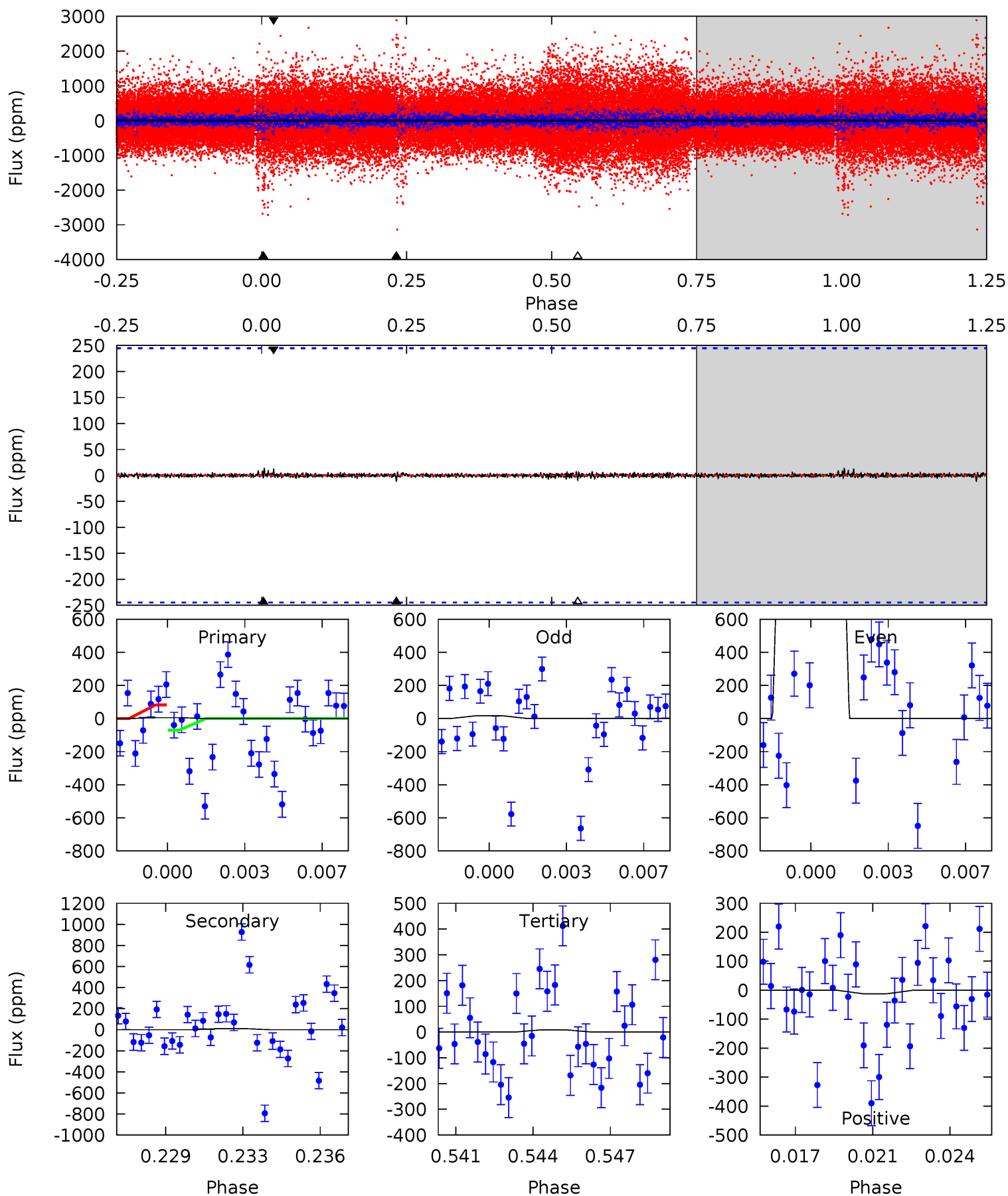
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

007889496-01, P = 370.896359 Days, E = 263.470313 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
0.11	0.23	0.19	0.26	5.23	2.93	0.04	-0.08	-0.15	0.04	-0.03	60.1	368.2	0.55	0



### Stellar Parameters For KIC 007889496

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5763^{+161}_{-202}$	$4.527^{+0.046}_{-0.184}$	$0.020^{+0.250}_{-0.300}$	$0.904^{+0.241}_{-0.086}$	$1.002^{+0.102}_{-0.125}$	$1.913^{+0.463}_{-0.911}$
	+3%/-4%	+1%/-4%	+1250%/-1500%	+27%/-10%	+10%/-12%	+24%/-48%
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 007889496-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$10.51^{+9.14}_{-6.89}$	$343^{+21}_{-17}$	$4837^{+11619}_{-16971}$	$24104^{+1155397}_{-620970}$
Alt.	$-11 \pm 47$	$9.21^{+9.02}_{-5.69}$	$341^{+23}_{-14}$	$1957^{+755}_{-4375}$	$38^{+659}_{-318}$

$T_{max}$  = 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

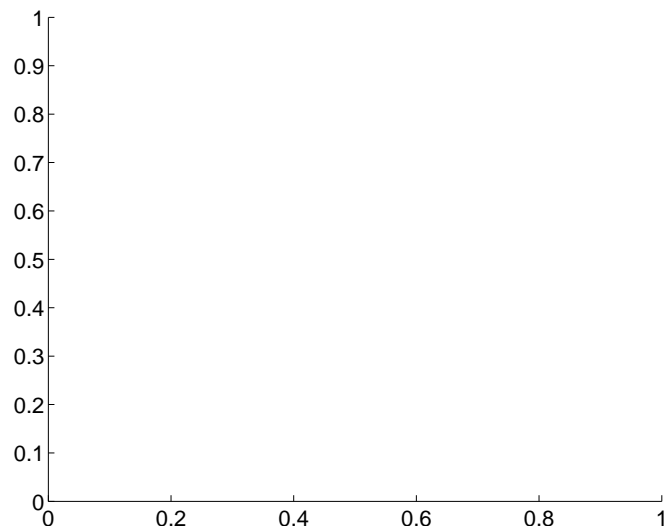
Supplemental centroid analysis for 007889496-01. Kepler magnitude: 15.39. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

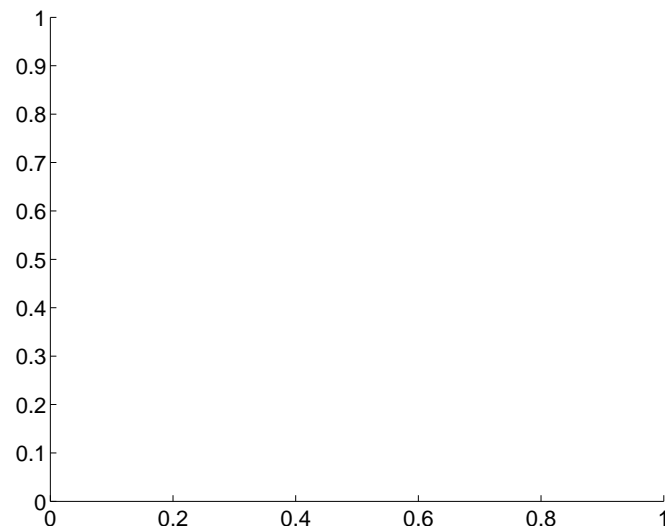
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	$2.93 \pm 1.16$	2.53	$-2.52 \pm 1.17$	$-1.51 \pm 1.12$

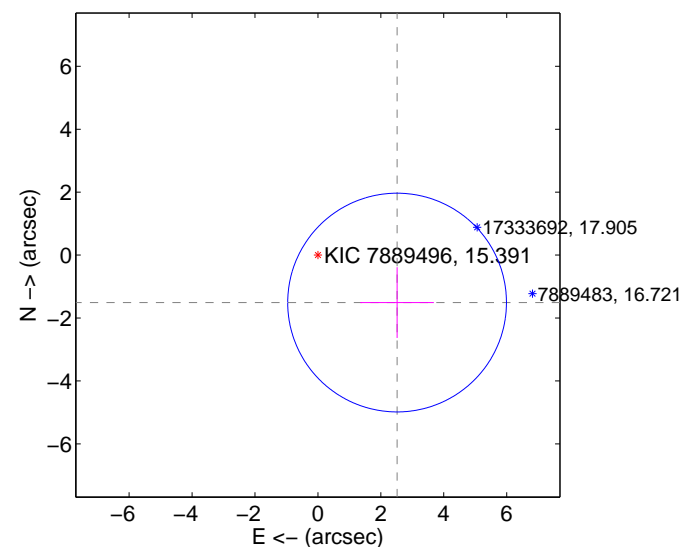
There is no PRF-fit offset from OOT-fit



There is no PRF-fit offset from KIC

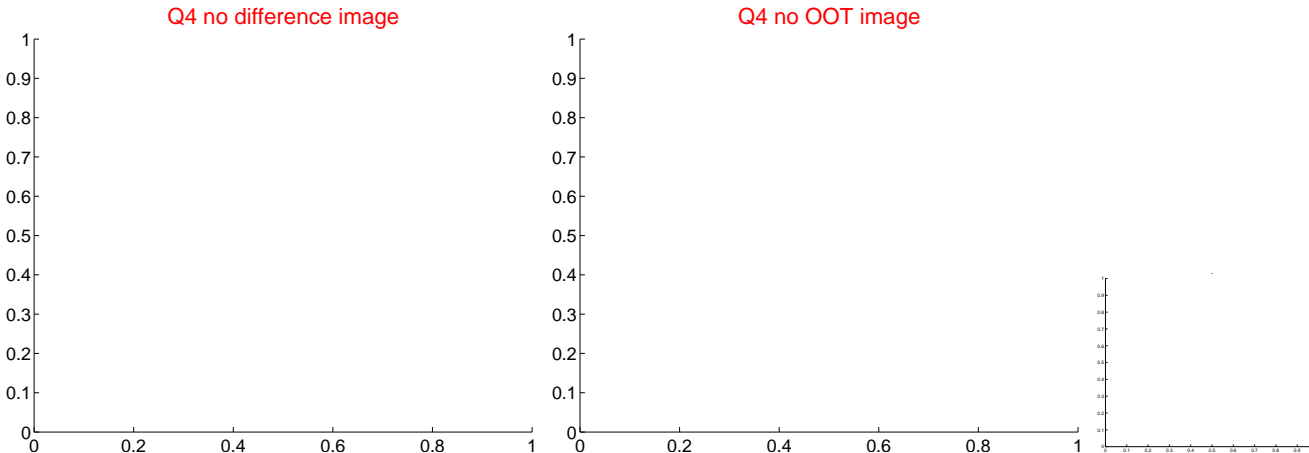
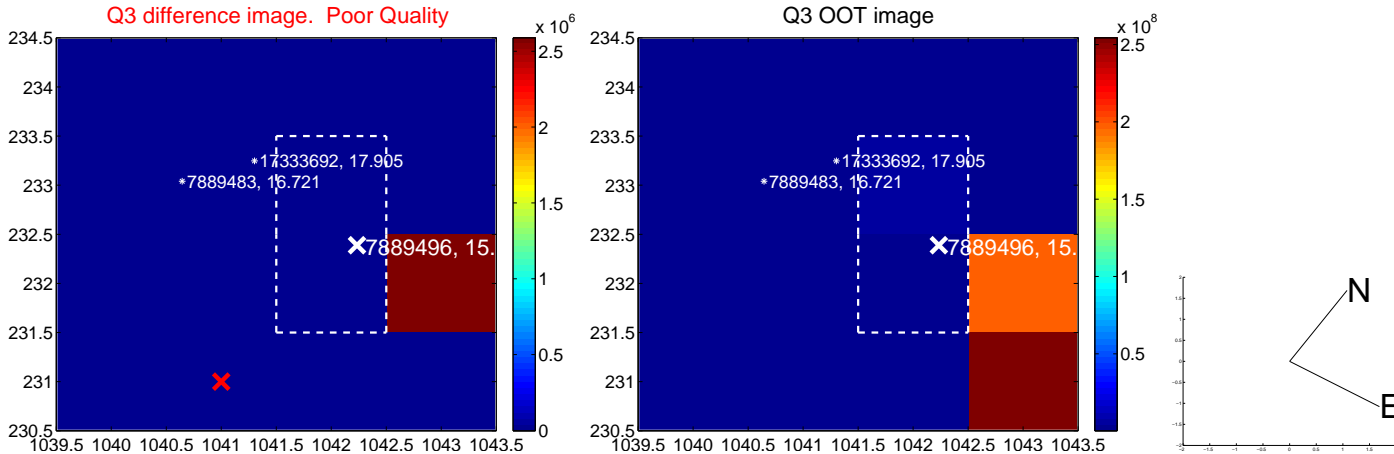
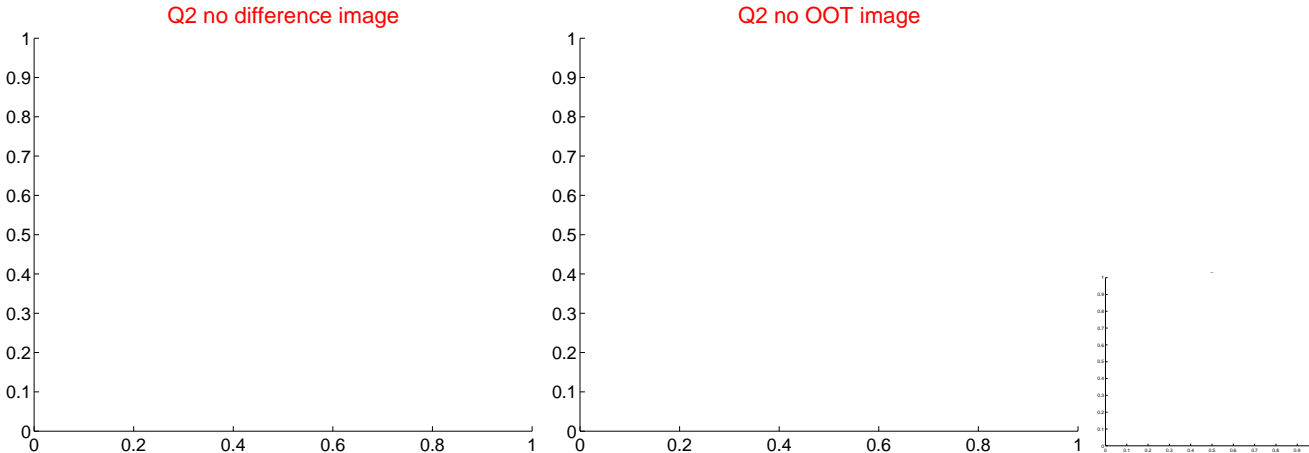
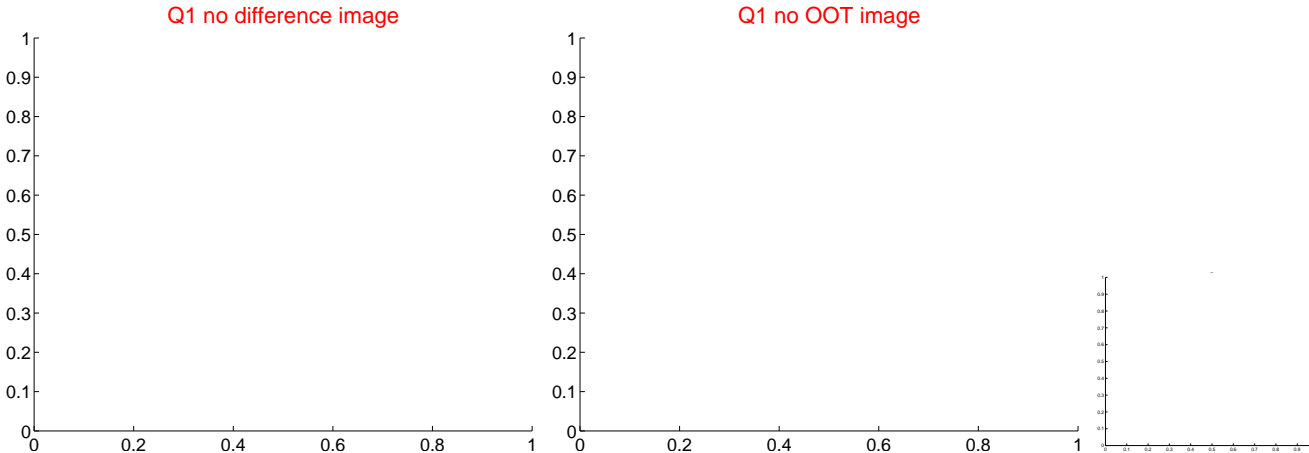


offset from photometric centroids



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

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



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





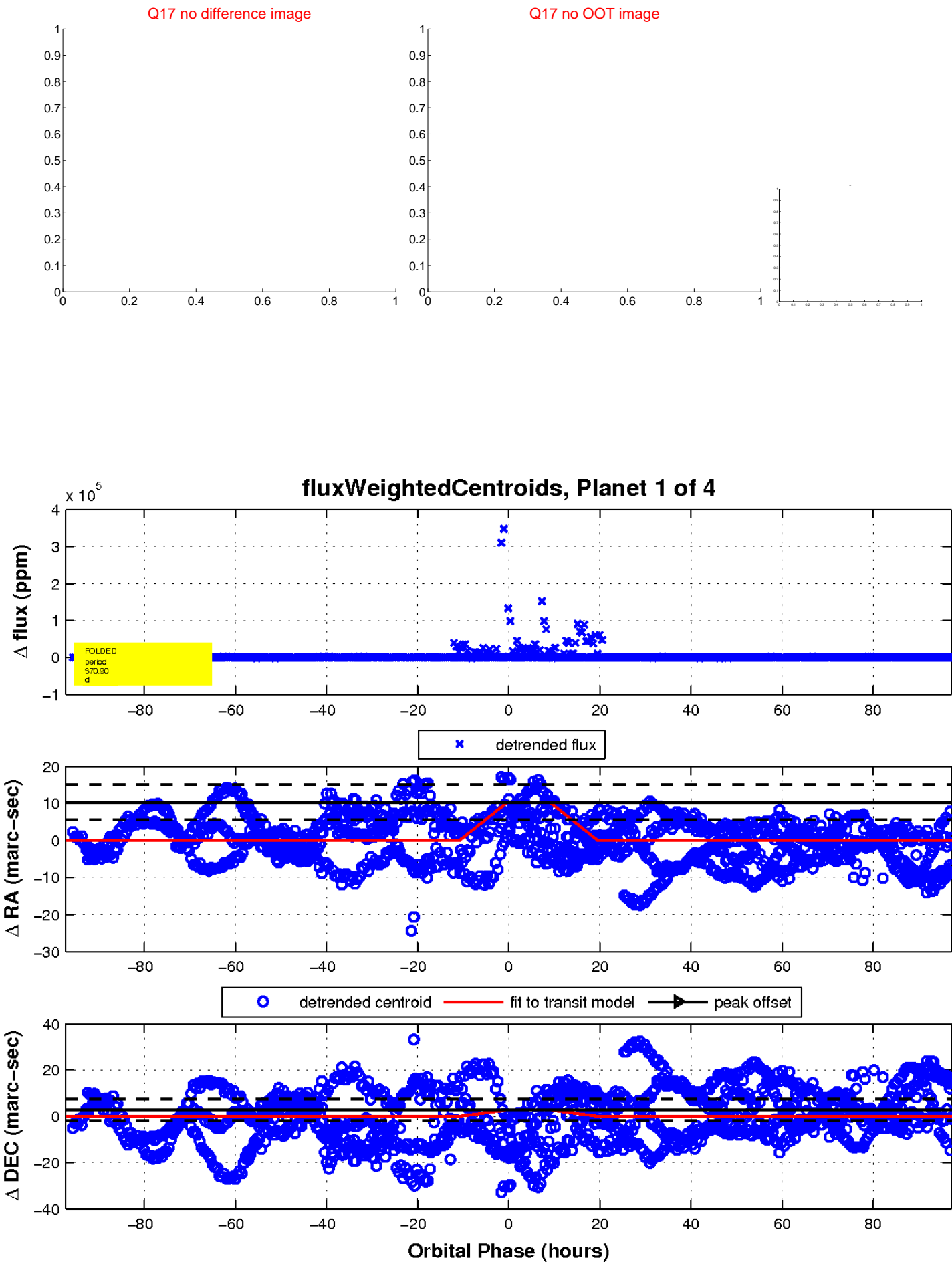
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



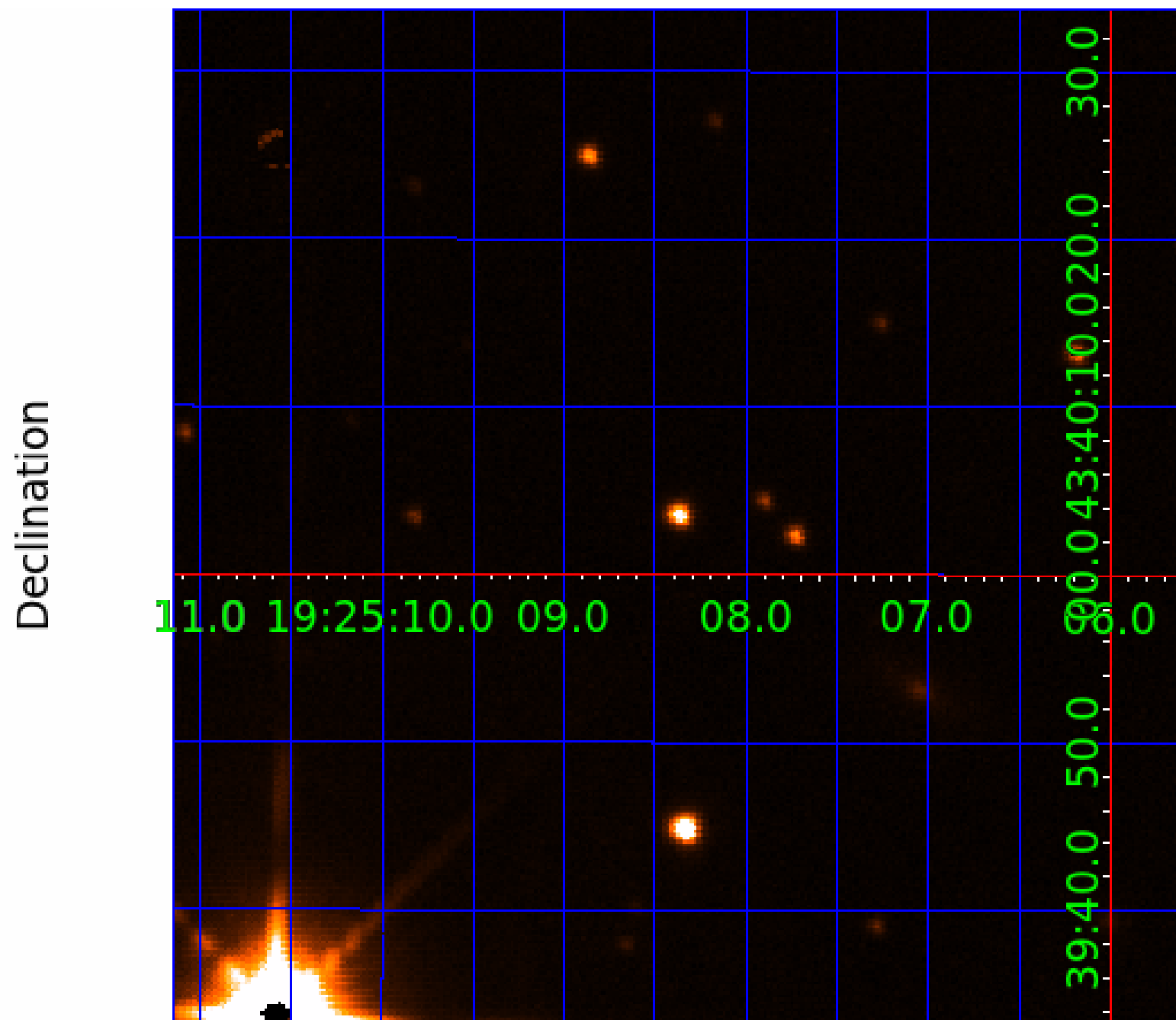
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 007889496

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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007889496-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007889496-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_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—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
007889496-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

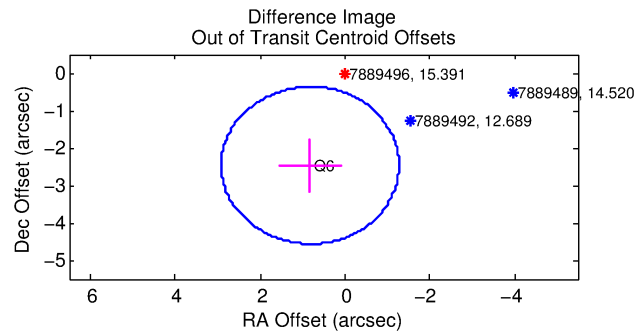
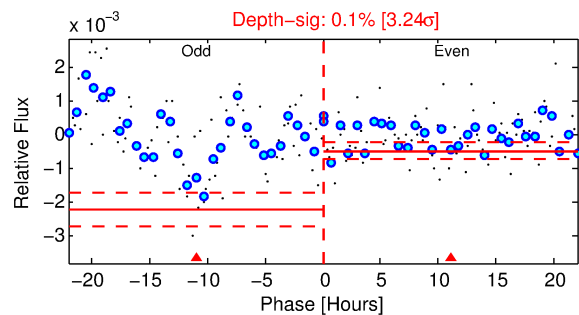
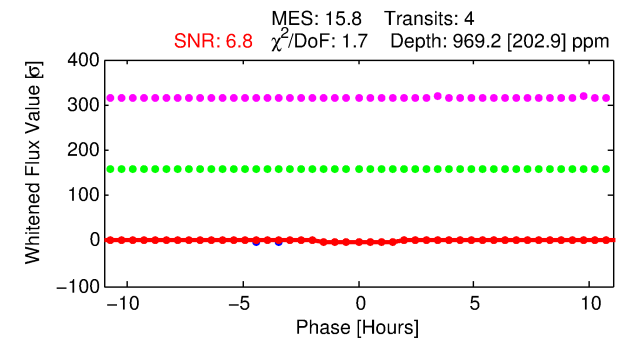
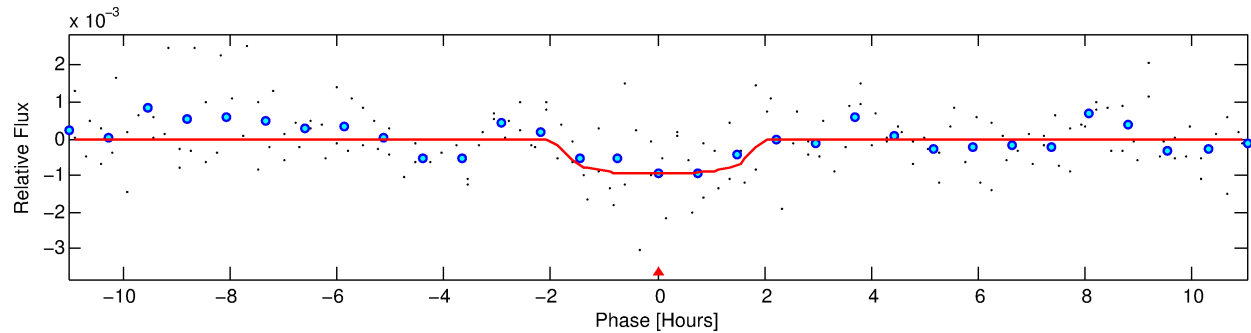
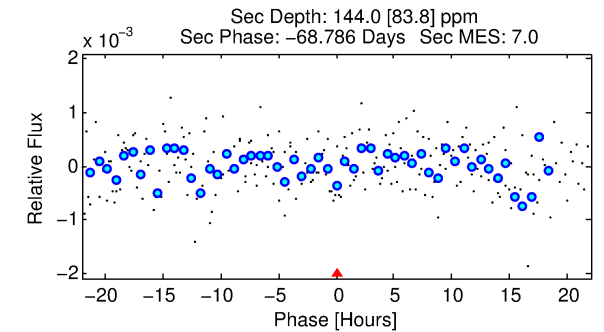
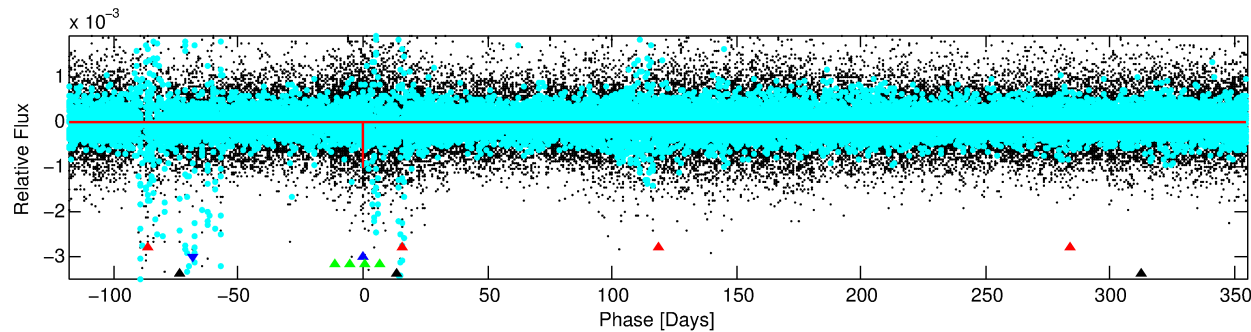
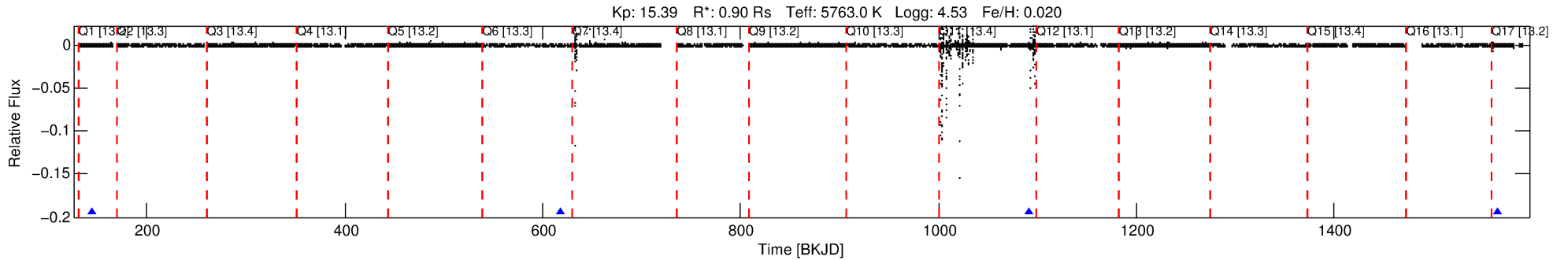
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007889496-02

No Significant Match Found

# DV One-Page Summary

KIC: 7889496 Candidate: 2 of 4 Period: 473.623 d



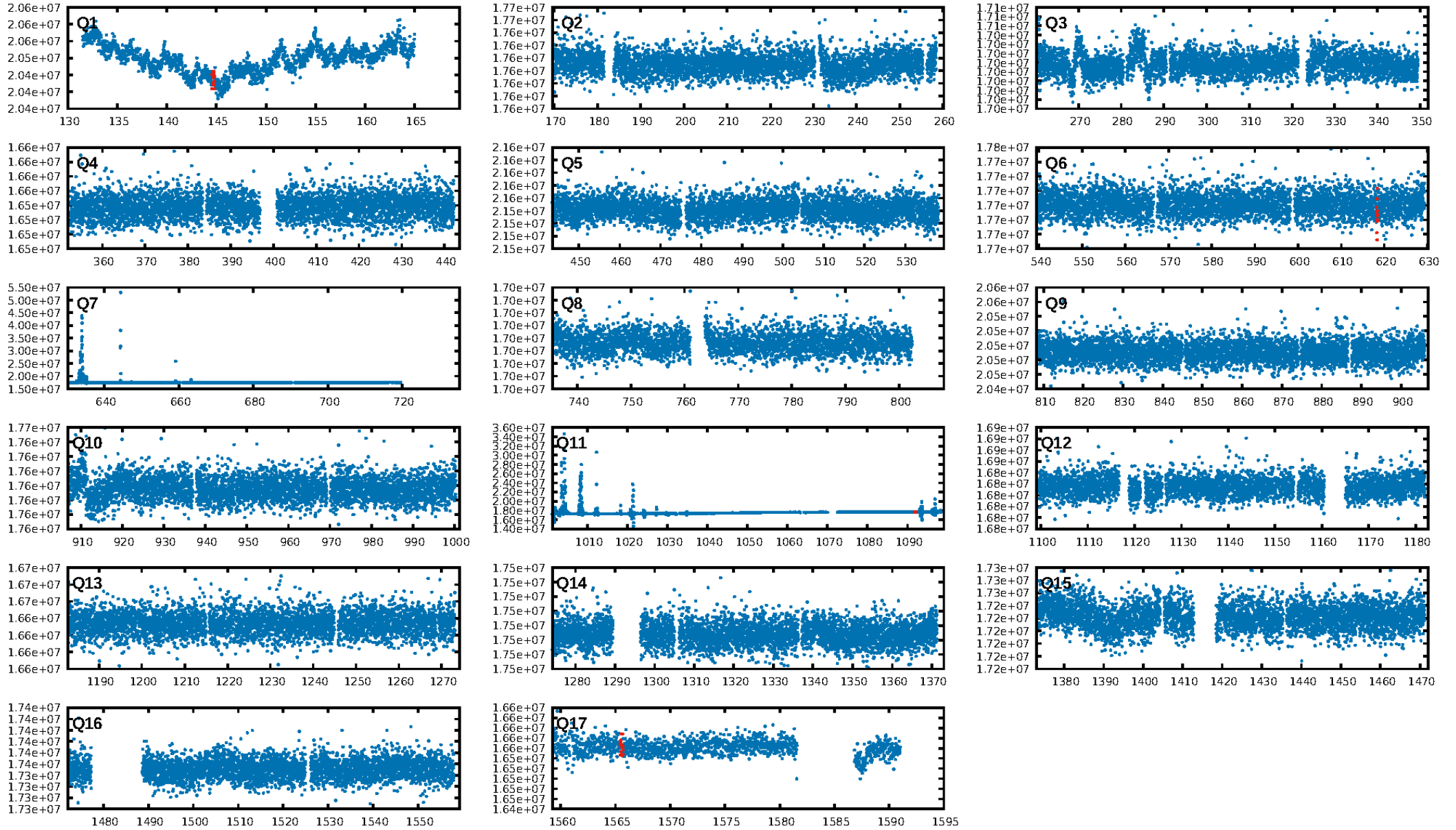
## DV Fit Results:

Period = 473.62260 [0.00791] d  
Epoch = 144.6982 [0.0149] BKJD  
Rp/R\* = 0.0284 [0.1243]  
a/R\* = 977.79 [18534.51]  
b = 0.26 [67.62]  
Seff = 0.57 [0.21]  
Teq = 222 [20] K  
Rp = 2.81 [12.28] Re  
a = 1.1906 [0.2703] AU  
Ag = 14255.55 [124941.96] [0.11 $\sigma$ ]  
Teffp = 3743 [8196] K [0.43 $\sigma$ ]

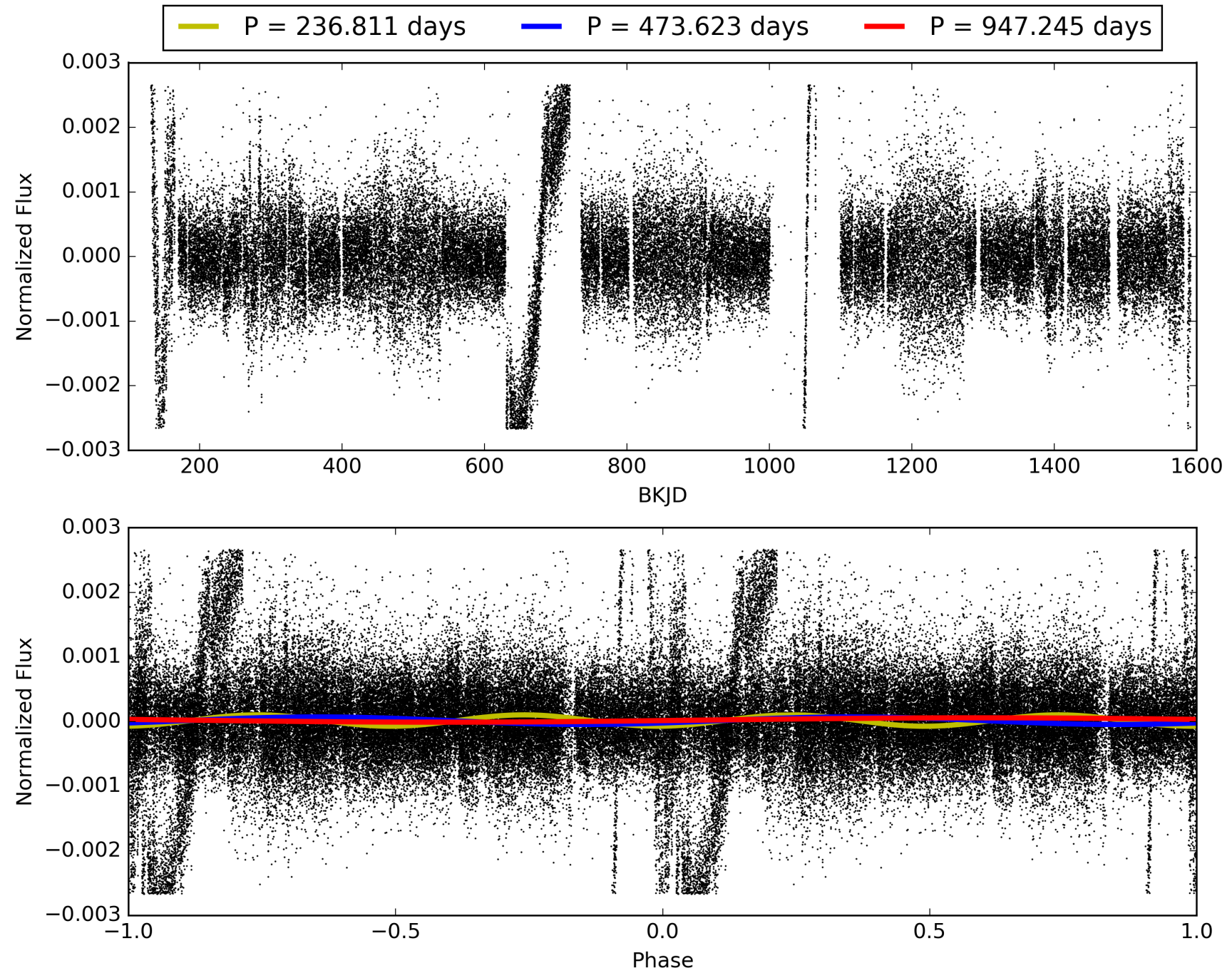
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [189.21 $\sigma$ ]  
LongPeriod-sig: 100.0% [37.19 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 1.8%  
Bootstrap-pfa: 8.52e-09  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: -4.511  
Centroid-sig: 82.1%  
Centroid-so: 0.501 arcsec [0.44 $\sigma$ ]  
OotOffset-rm: 2.597 arcsec [3.71 $\sigma$ ]  
KicOffset-rm: 2.664 arcsec [3.82 $\sigma$ ]  
OotOffset-st: 1/0/0/0 [1]  
KicOffset-st: 1/0/0/0 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [4/4]

# TCE 007889496-02, PDC Light Curves



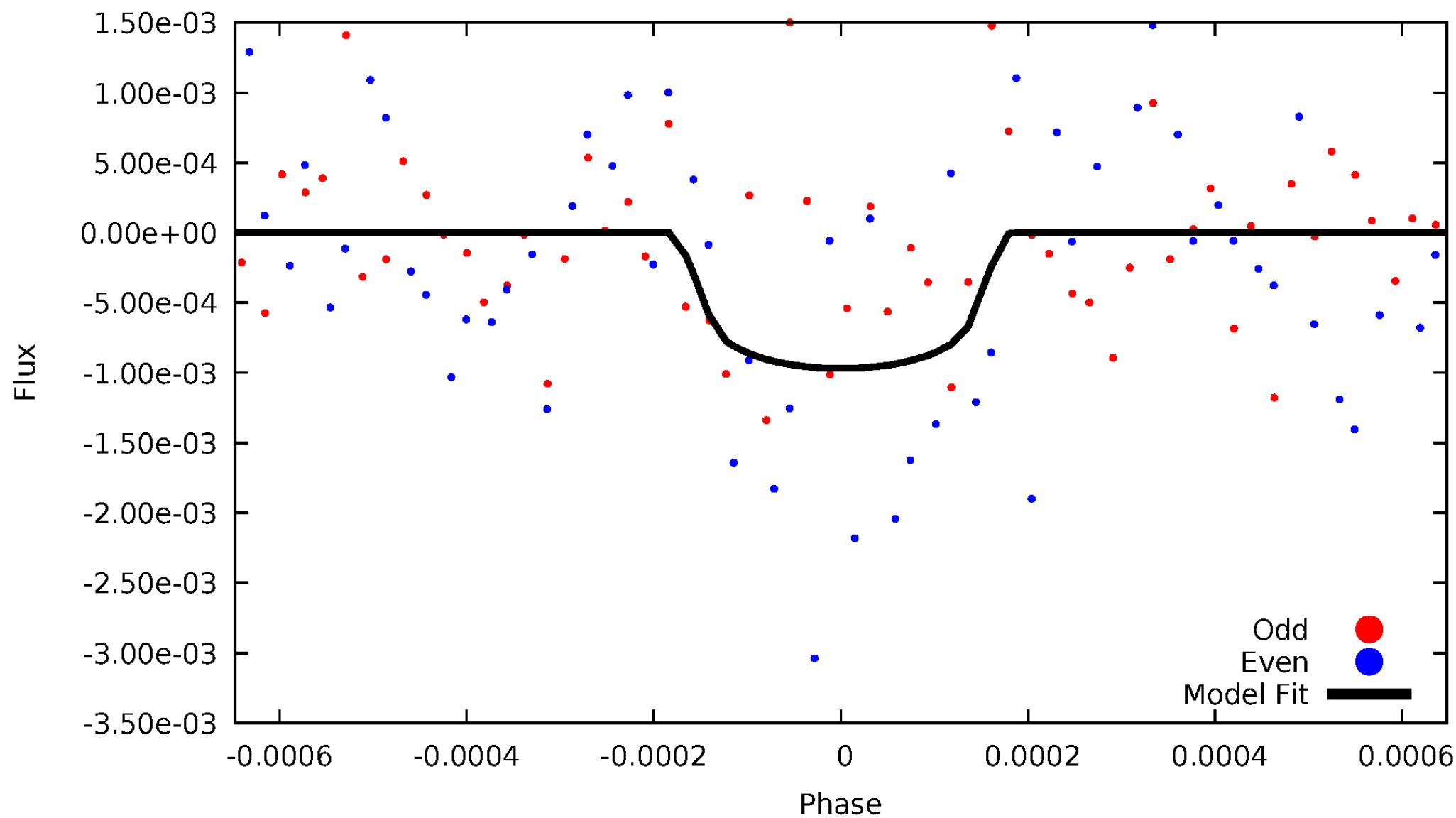
TCE 007889496-02





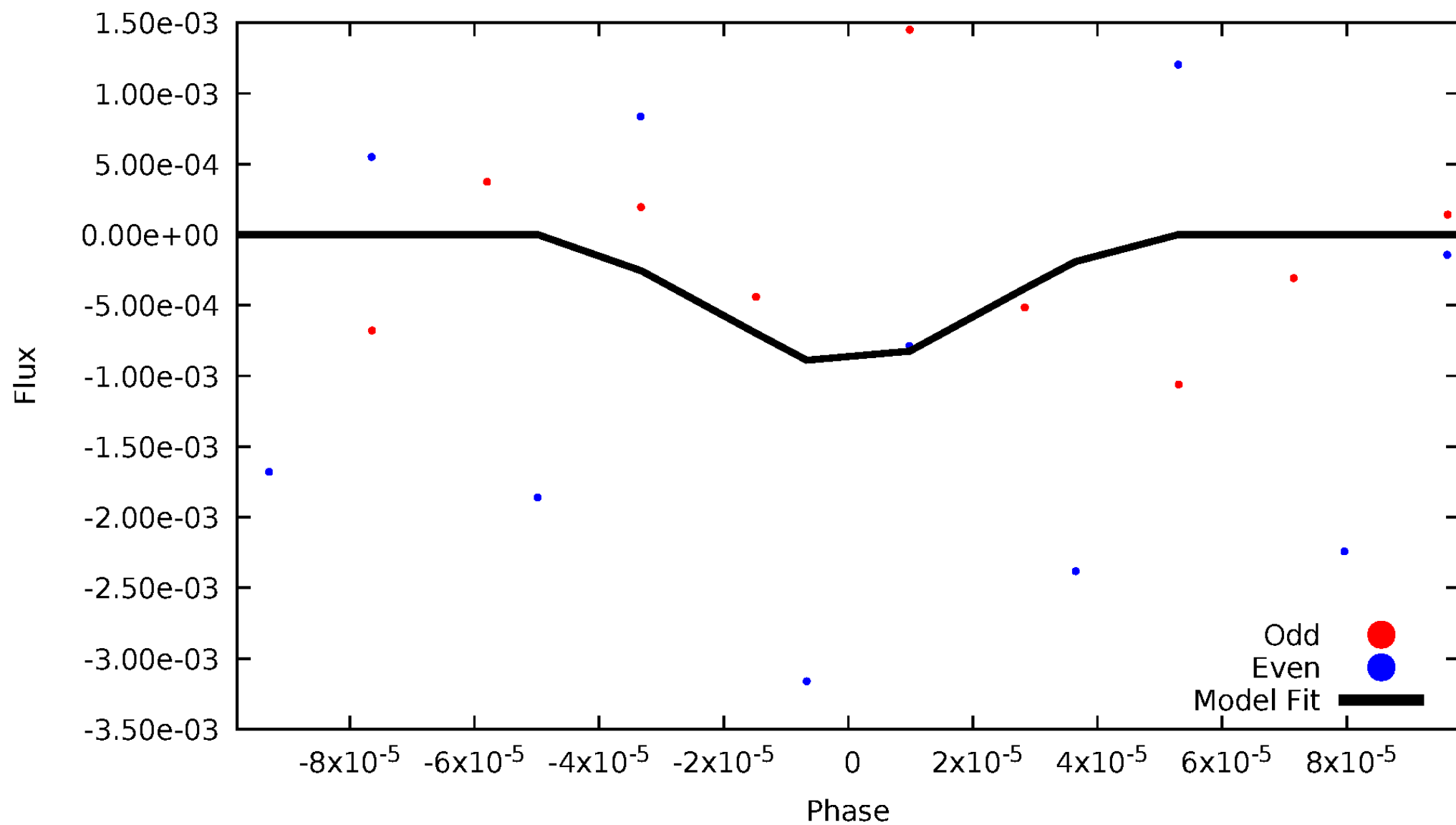
# DV Odd/Even

TCE 007889496-02



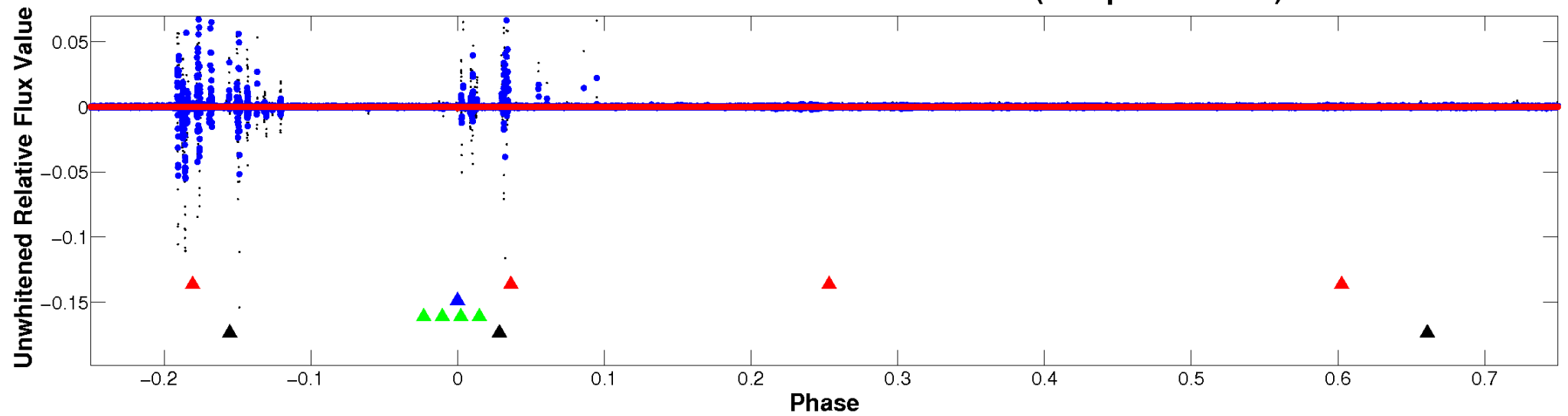
# ALT Odd/Even

TCE 007889496-02

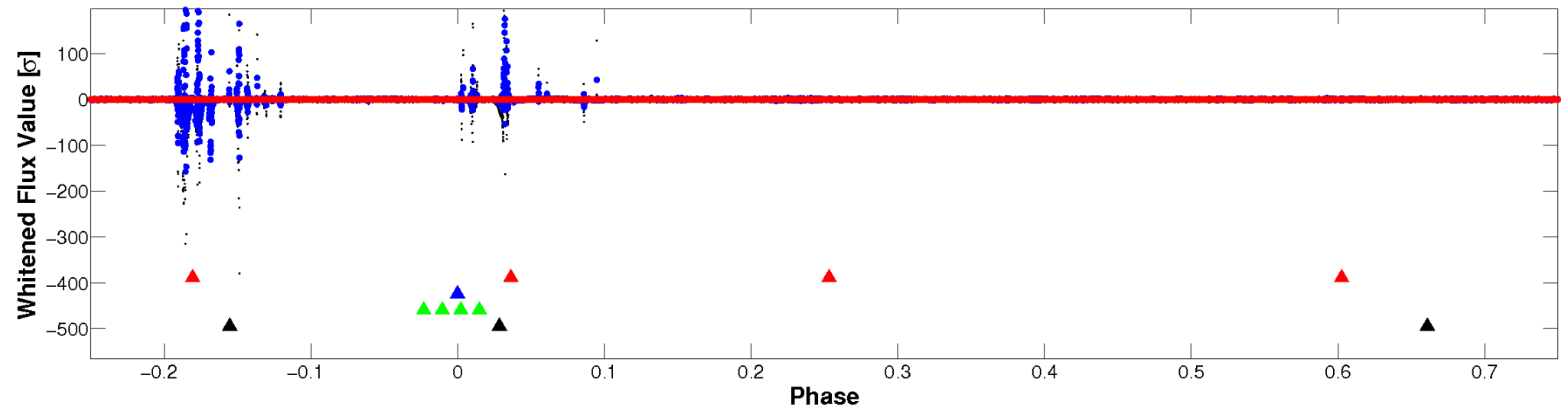


# Non-Whitened Vs. Whitened Light Curve

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

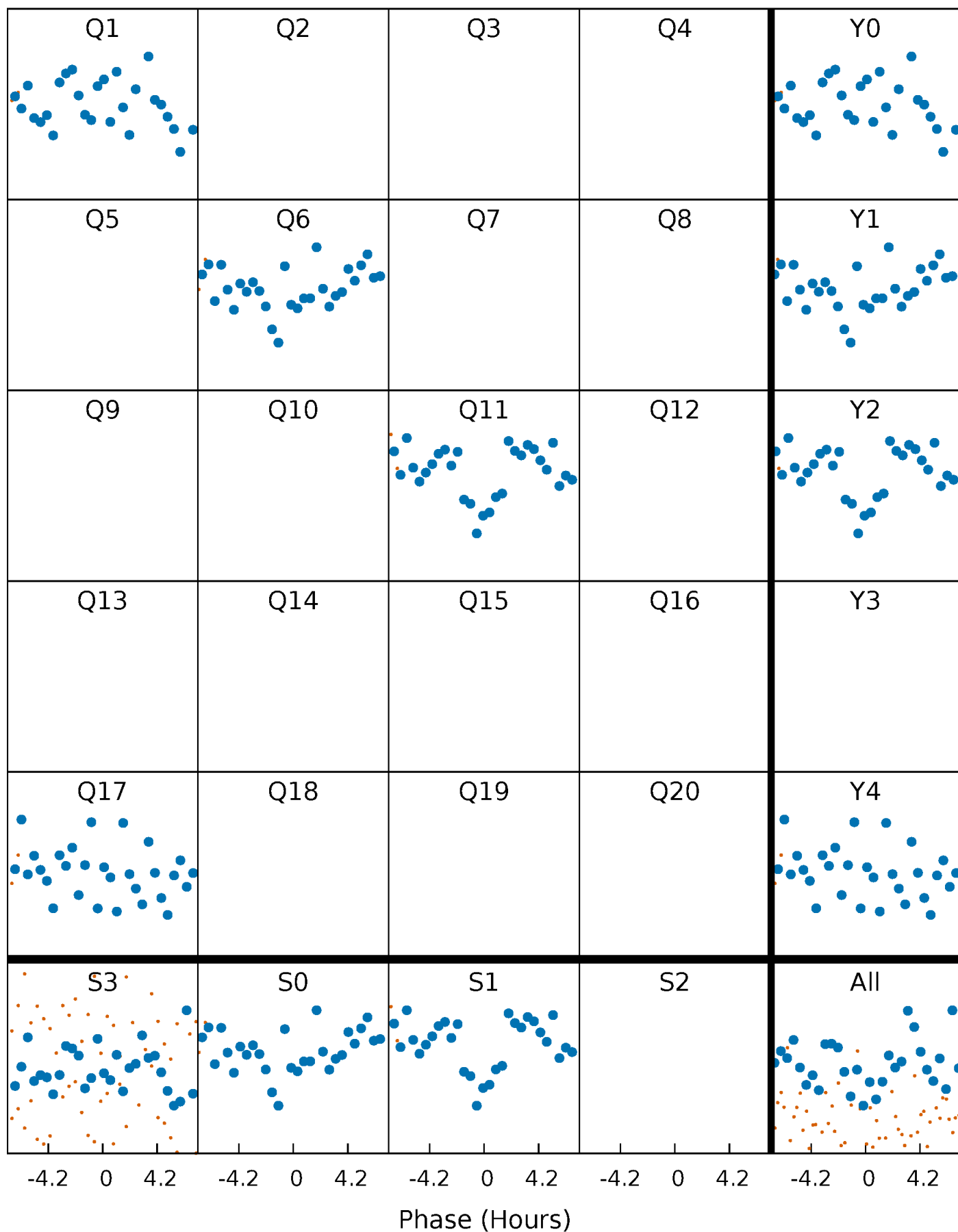


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



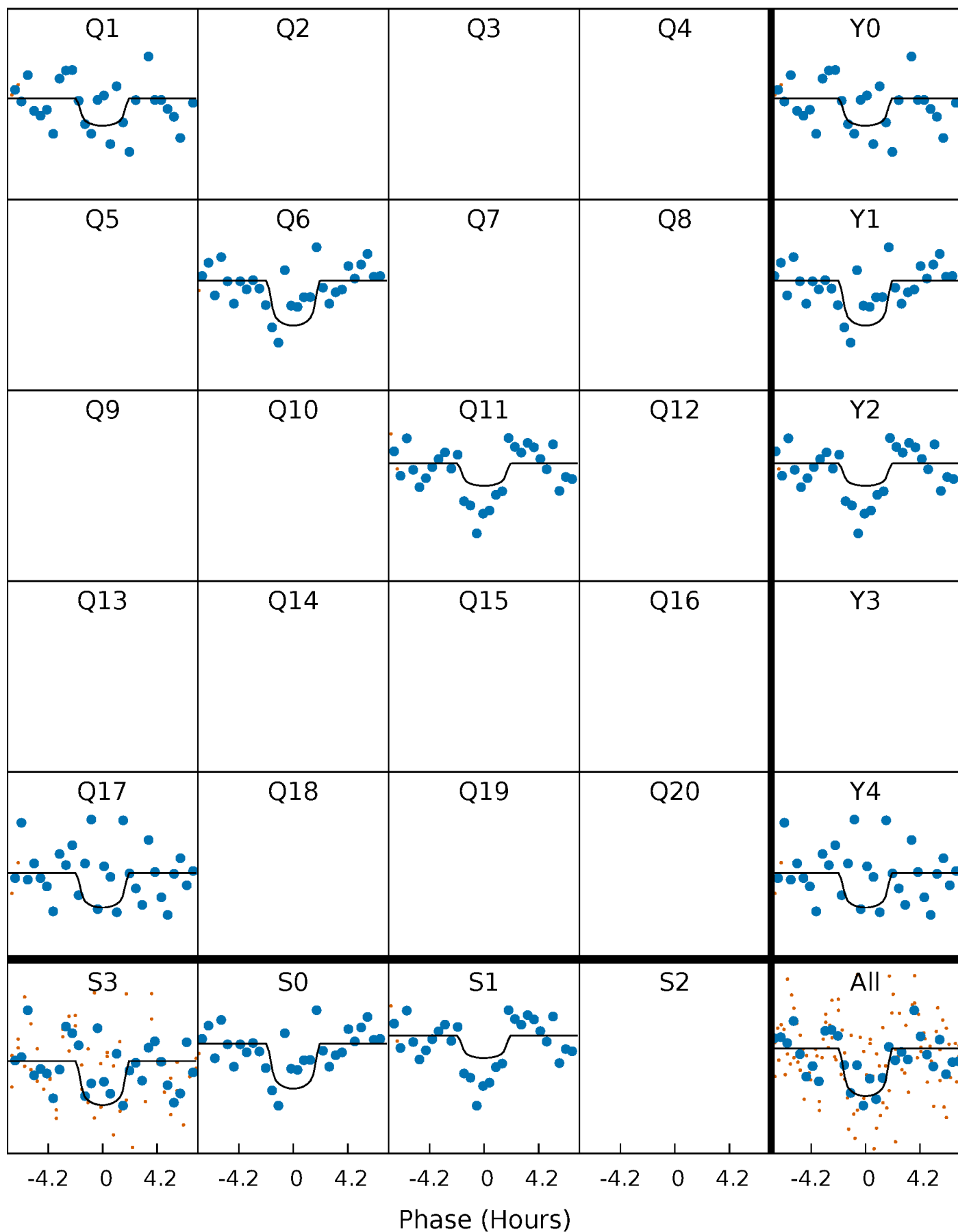
# PDC Quarter-Phased Transit Curves

TCE 007889496-02     $P=473.622603$  Days     $T_0=144.698188$  (BKJD)



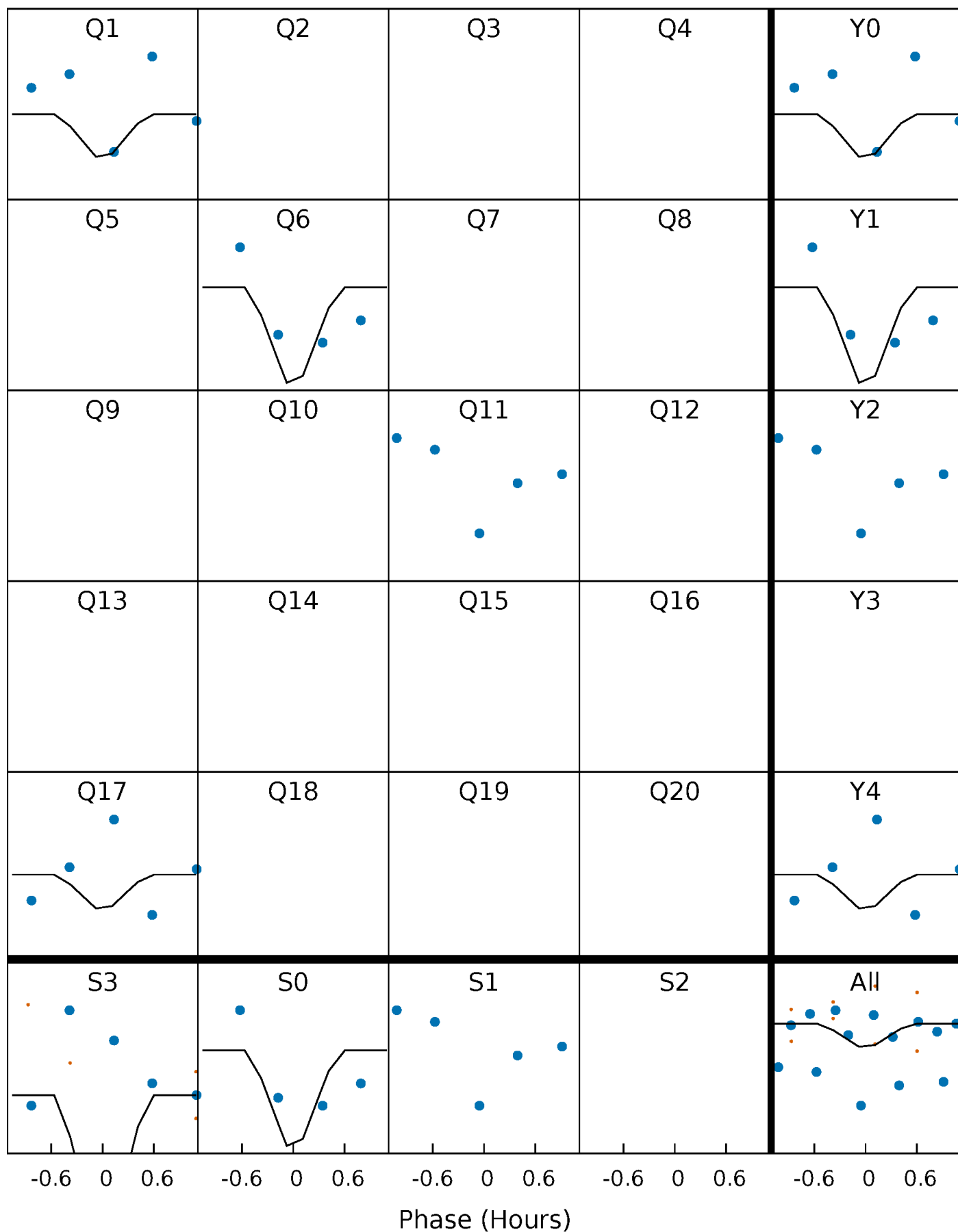
# DV Quarter-Phased Transit Curves

TCE 007889496-02     $P=473.622603$  Days     $T_0=144.698188$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

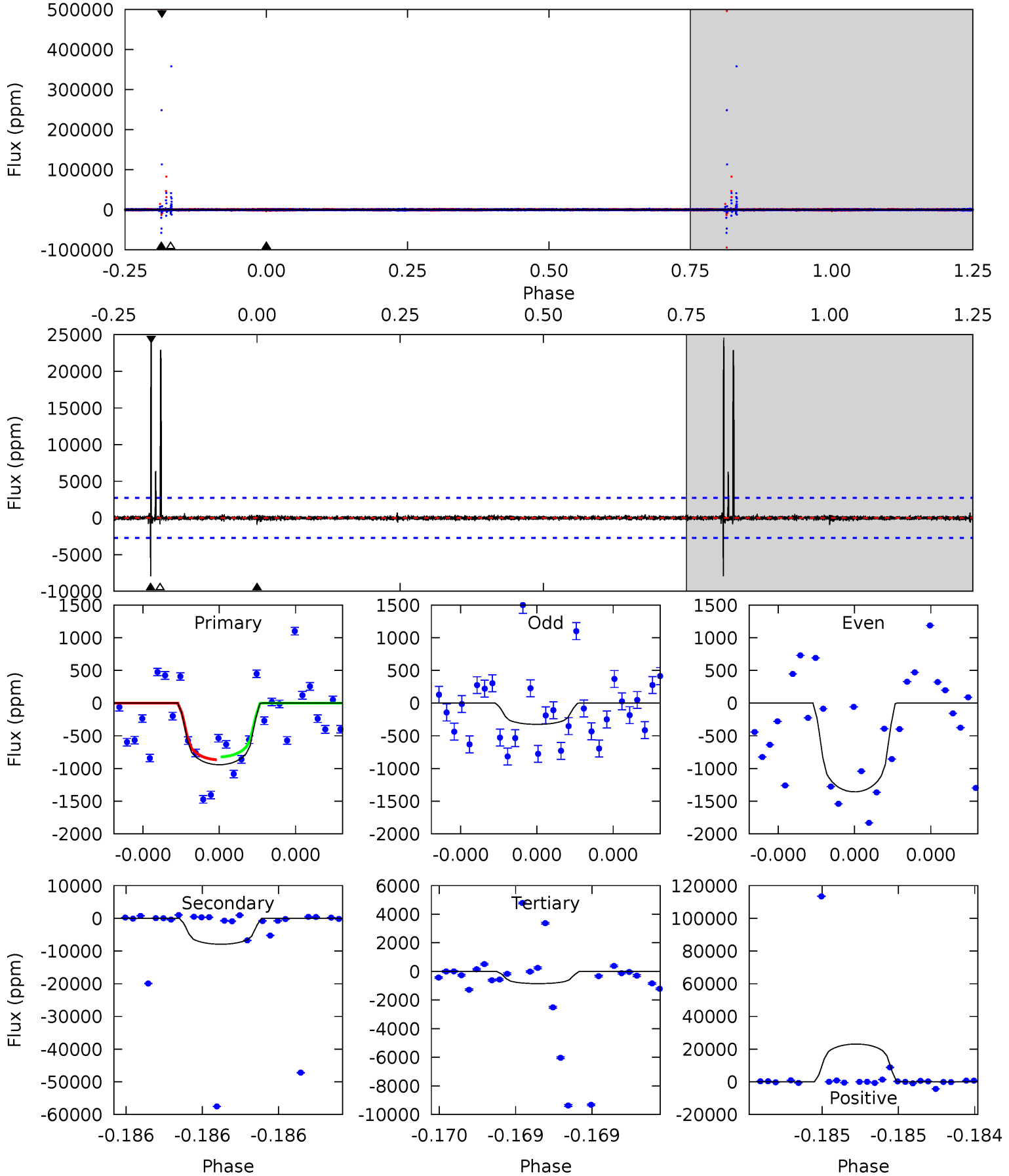
TCE 007889496-02 P=473.602242 Days  $T_0=144.728762$  (BKJD)



# DV Model-Shift Uniqueness Test

007889496-02, P = 473.622603 Days, E = 144.698188 Days

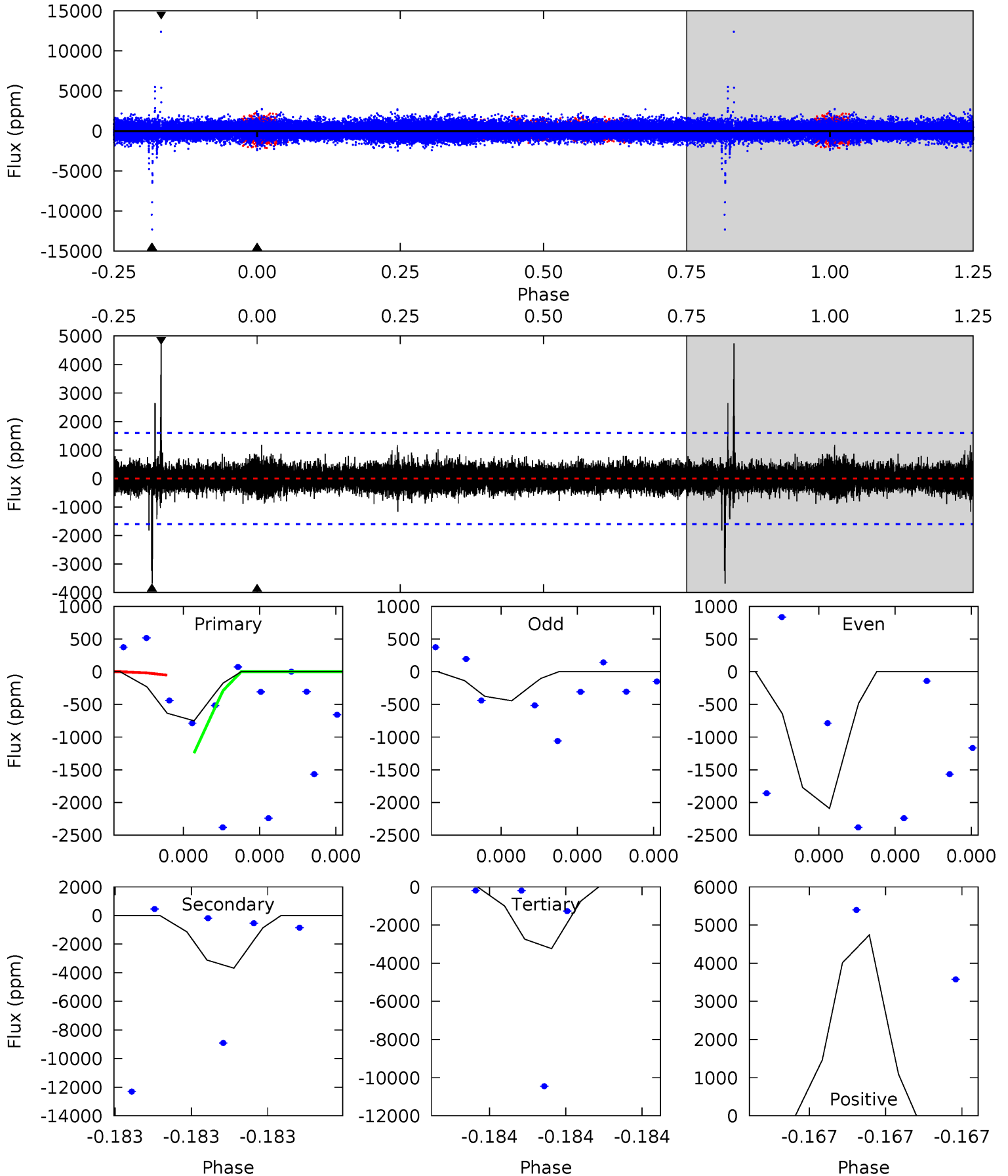
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.95	16.4	1.76	47.7	5.64	3.59	1.23	0.19	-45.8	14.6	-31.3	0.50	1.38	0.76	0.07



# Alt Model-Shift Uniqueness Test

007889496-02, P = 473.602242 Days, E = 144.728762 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
2.77	13.6	12.0	17.5	5.91	3.98	0.84	-9.18	-14.7	1.64	-3.92	2.83	1.32	0.56	0





### Stellar Parameters For KIC 007889496

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5763^{+161}_{-202}$	$4.527^{+0.046}_{-0.184}$	$0.020^{+0.250}_{-0.300}$	$0.904^{+0.241}_{-0.086}$	$1.002^{+0.102}_{-0.125}$	$1.913^{+0.463}_{-0.911}$
	+3%/-4%	+1%/-4%	+1250%/-1500%	+27%/-10%	+10%/-12%	+24%/-48%
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 007889496-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-7927 \pm 484$	$10.27^{+10.61}_{-7.00}$	$316^{+18}_{-15}$	$5510^{+5022}_{-1396}$	$58621^{+489379}_{-44401}$
Alt.	$-3679 \pm 271$	$10.75^{+10.83}_{-7.58}$	$317^{+21}_{-15}$	$4556^{+4008}_{-970}$	$24977^{+265446}_{-18896}$

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

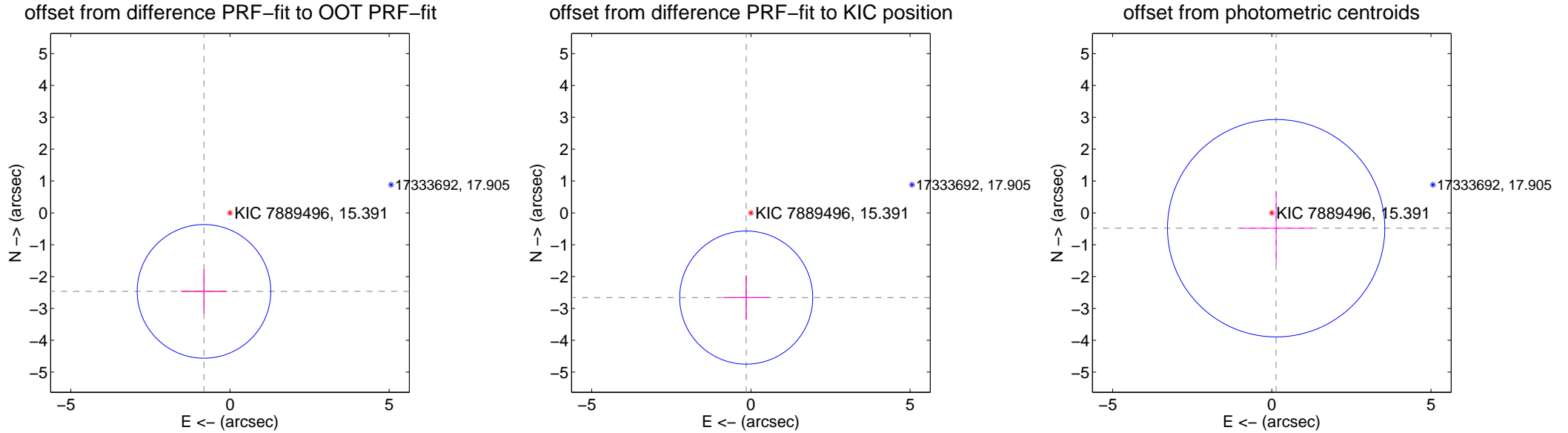
## DV Centroid Data

Supplemental centroid analysis for 007889496-02. Kepler magnitude: 15.39. Transit SNR 6.85

There are 0 quarters with good PRF difference image offsets

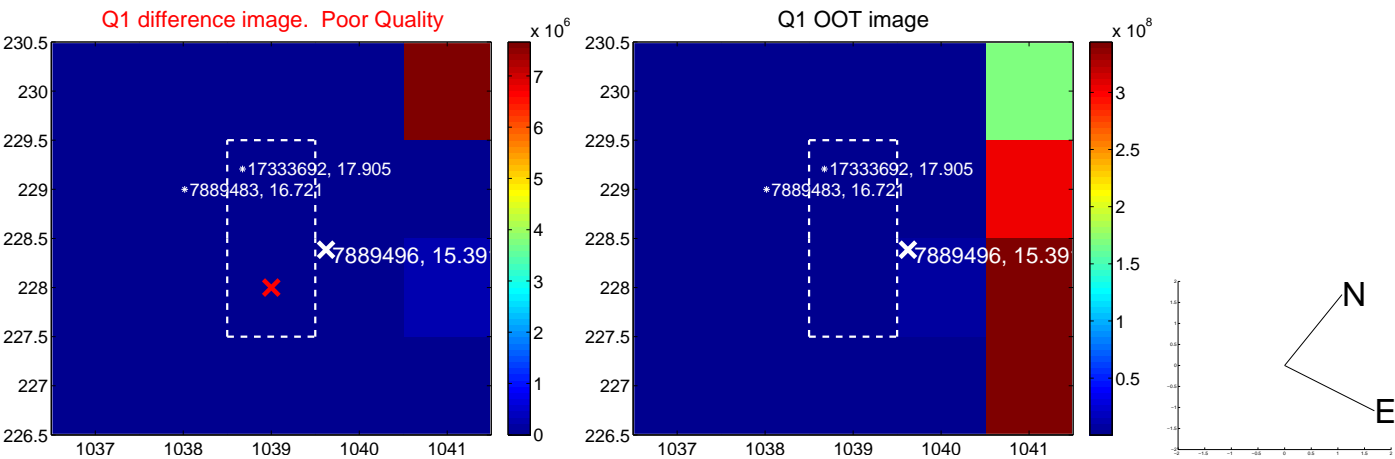
The direct PRF centroid is offset from the target star catalog position by about 0.70 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.597 \pm 0.699$	3.71	$0.816 \pm 0.725$	$-2.465 \pm 0.697$
PRF-fit source offset from KIC position	$2.664 \pm 0.697$	3.82	$0.147 \pm 0.725$	$-2.660 \pm 0.697$
photometric centroid source offset	$0.50 \pm 1.14$	0.44	$-0.14 \pm 1.14$	$-0.48 \pm 1.14$



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

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



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

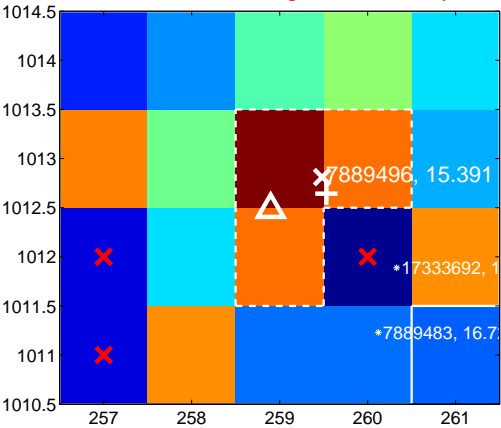
Q5 no difference image



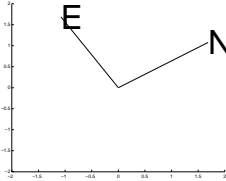
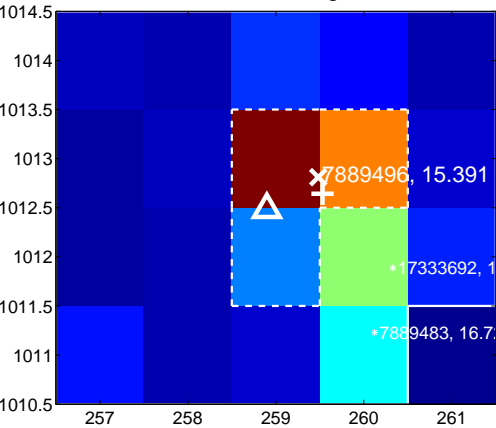
Q5 no OOT image



Q6 difference image. Poor Quality



Q6 OOT image



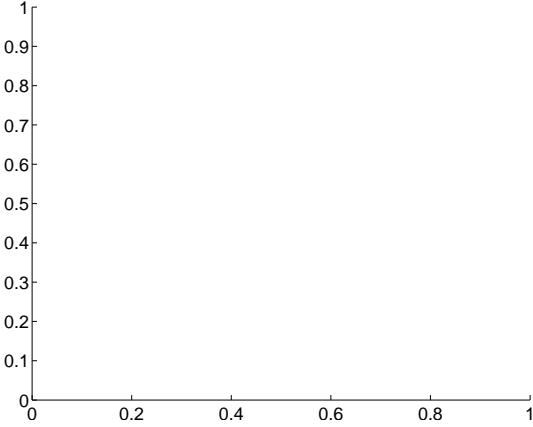
Q7 no difference image



Q7 no OOT image



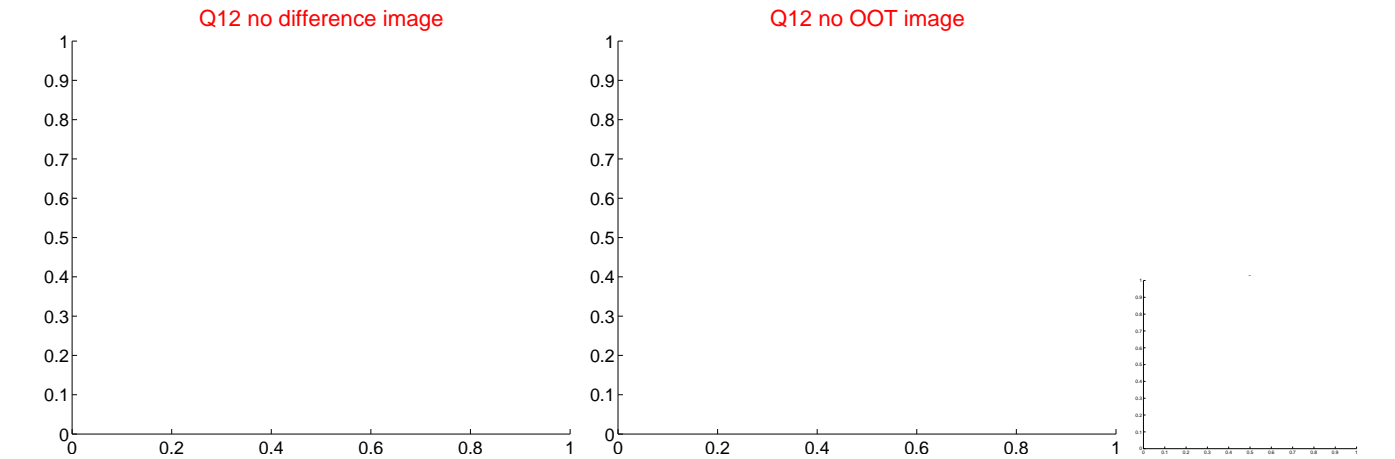
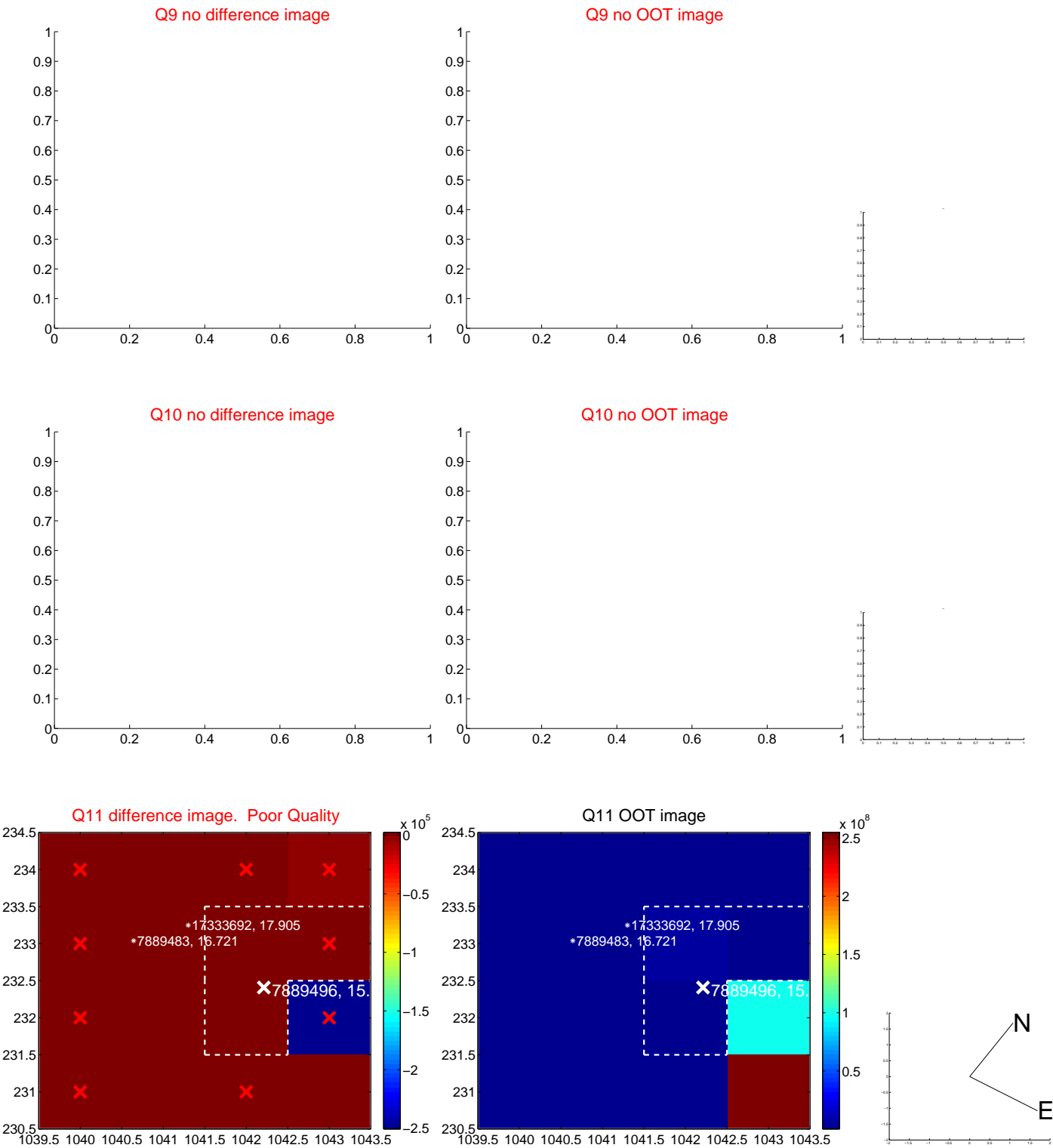
Q8 no difference image



Q8 no OOT image



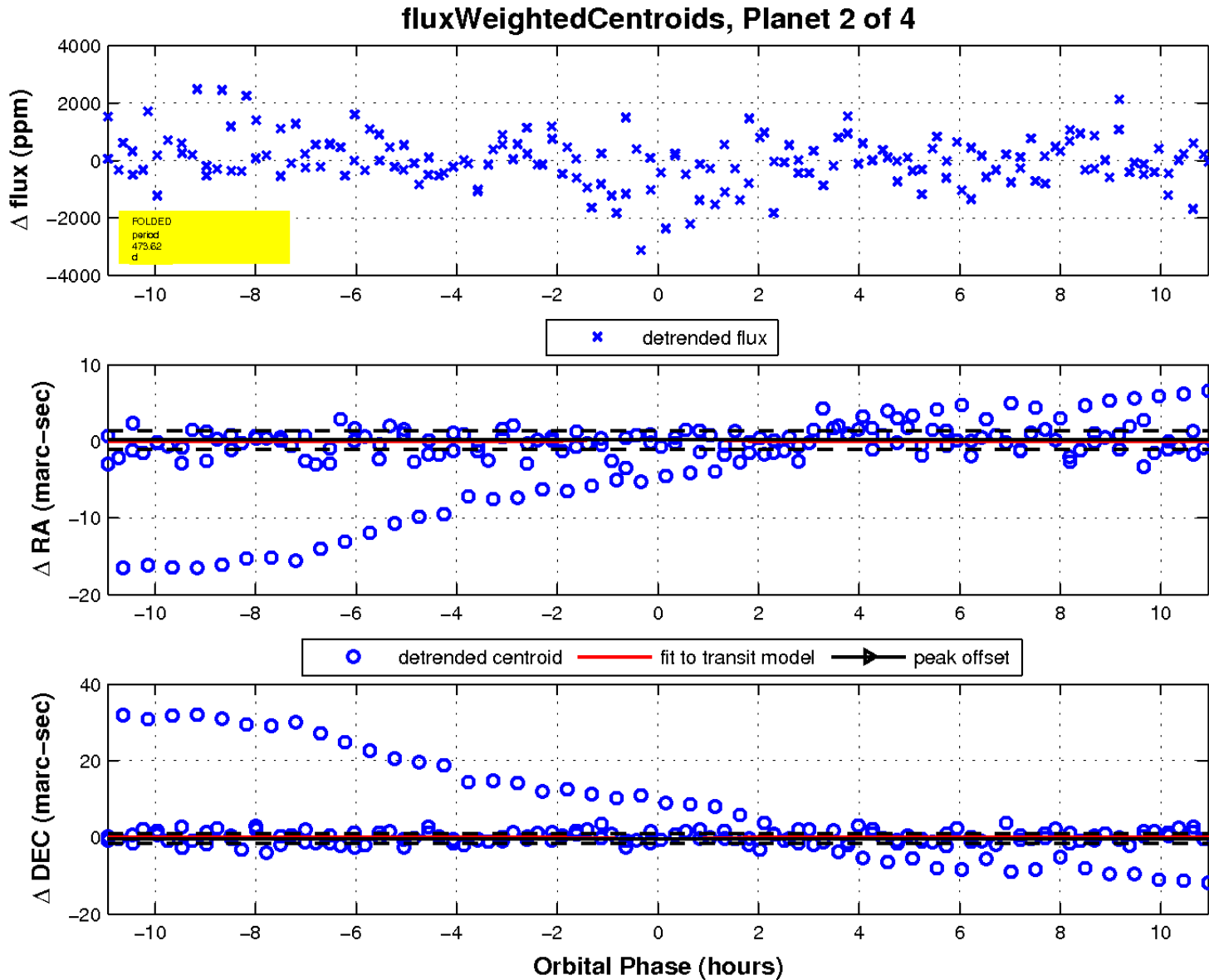
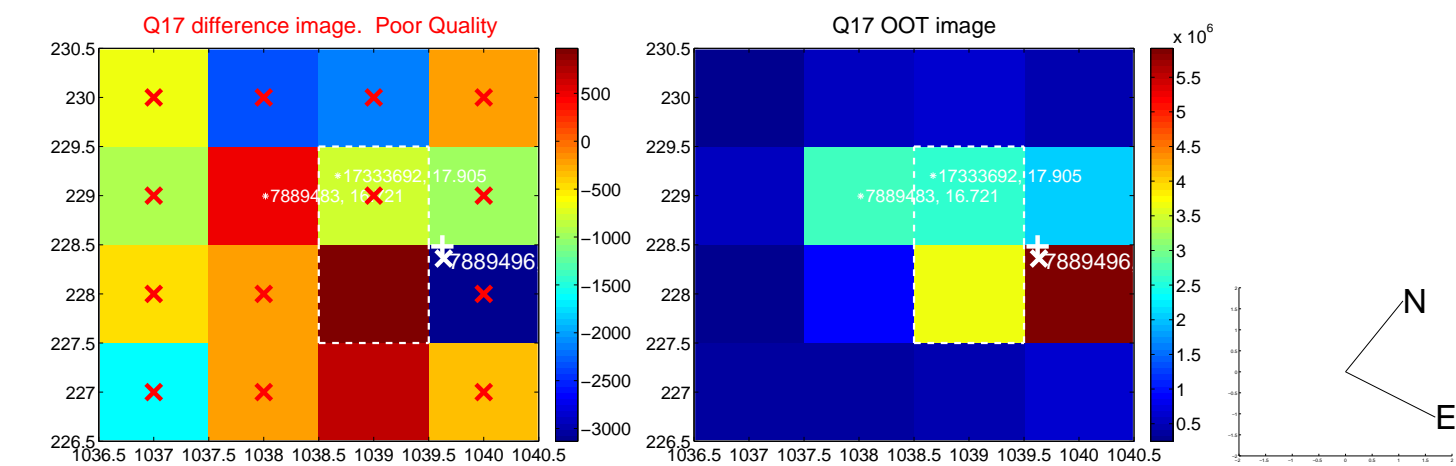
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



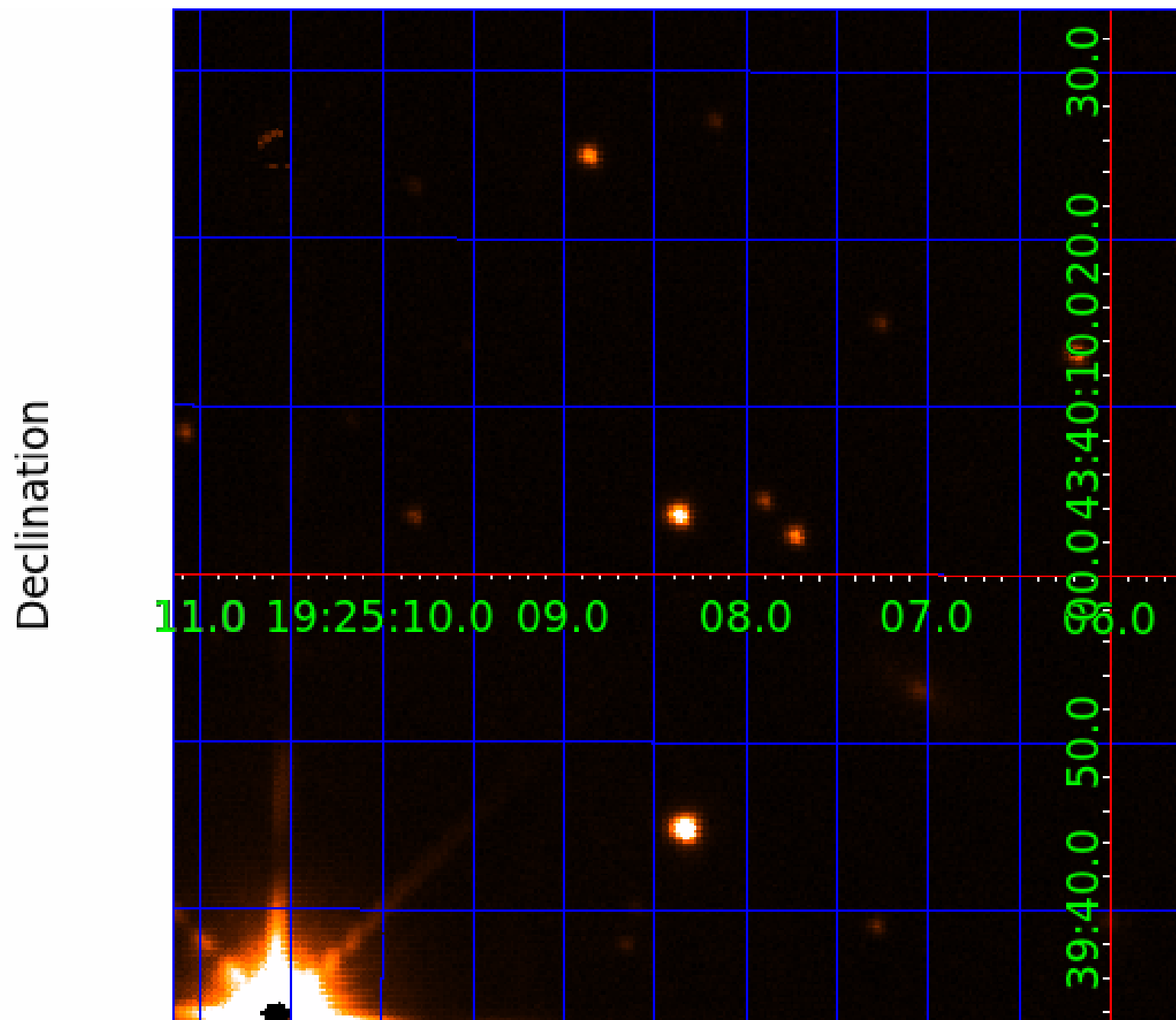
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 007889496

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007889496-01	OBS	No	370.896359	264.642448	5935.8	12.500	39.7	-1.0	0.90	5763	6.89	0.79
007889496-02	OBS	No	473.622603	144.698188	969.2	3.679	15.8	6.8	0.90	5763	2.81	0.57
007889496-03	OBS	No	479.610898	133.793175	406.6	1.183	18.0	1.6	0.90	5763	2.12	0.56
007889496-04	OBS	No	560.662830	457.763430	7634.9	5.000	28.9	-1.0	0.90	5763	7.82	0.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007889496-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
007889496-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007889496-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_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—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
007889496-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

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

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

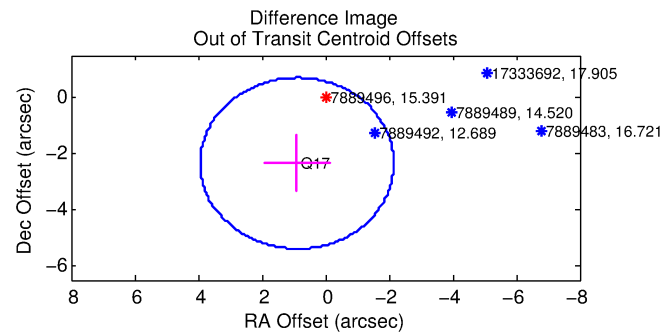
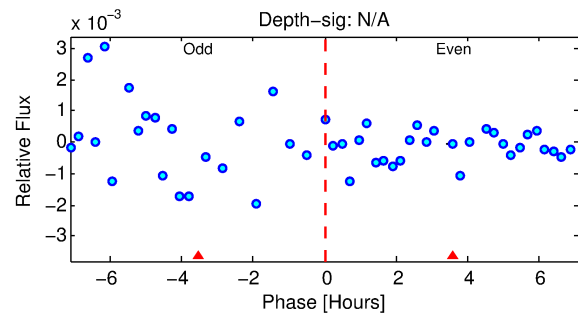
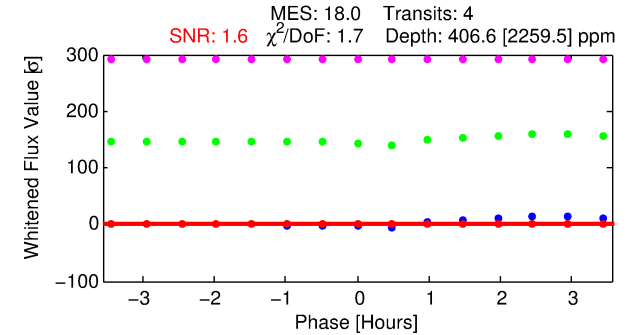
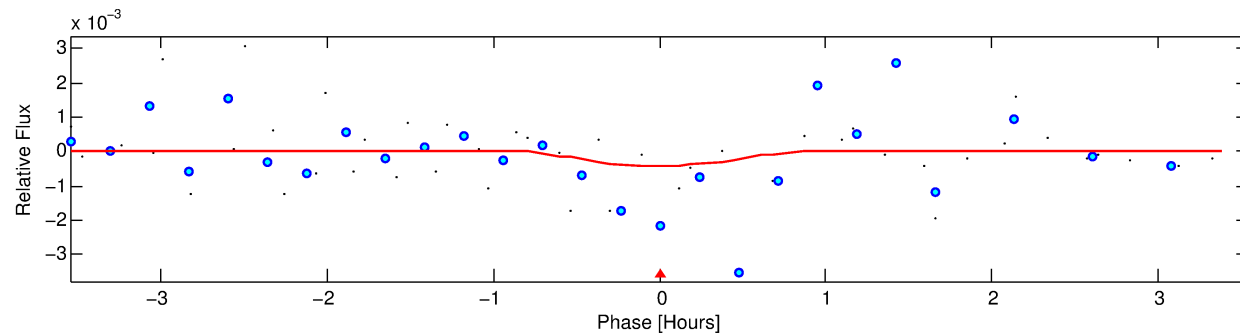
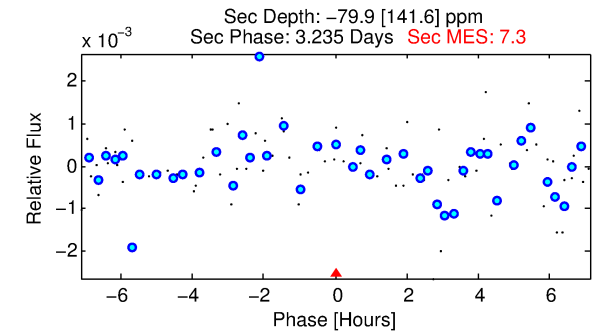
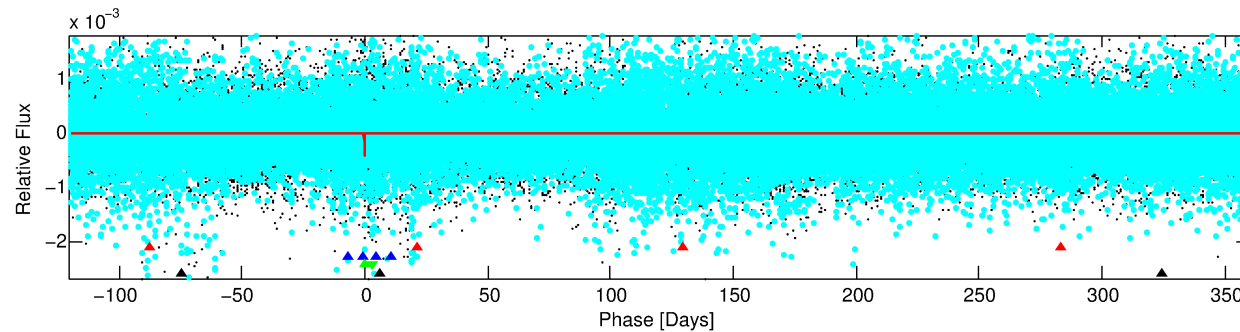
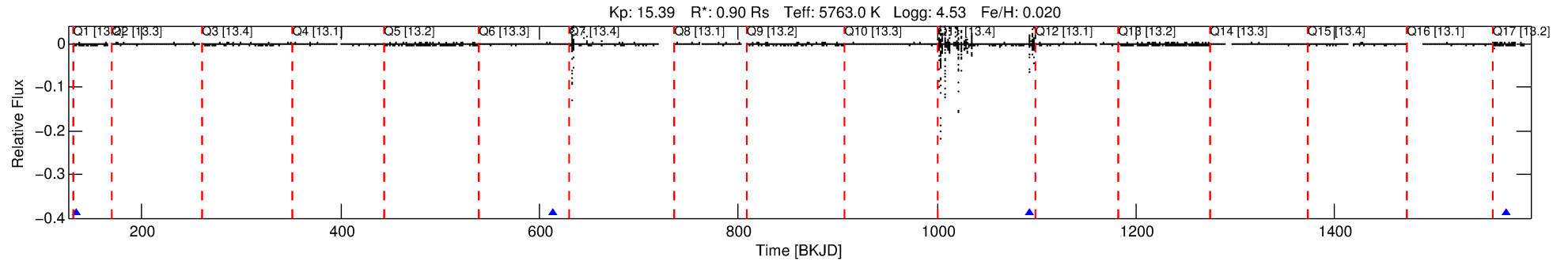
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007889496-03

No Significant Match Found

# DV One-Page Summary

KIC: 7889496 Candidate: 3 of 4 Period: 479.611 d



## DV Fit Results:

Period = 479.61090 [0.09927] d  
Epoch = 133.7932 [0.1591] BKJD  
Rp/R\* = 0.0215 [0.7865]  
a/R\* = 1687.94 [279331.63]  
b = 0.86 [49.68]  
Seff = 0.56 [0.20]  
Teq = 221 [20] K  
Rp = 2.12 [77.59] Re  
a = 1.2006 [0.2725] AU  
Ag = N/A  
Teffp = N/A

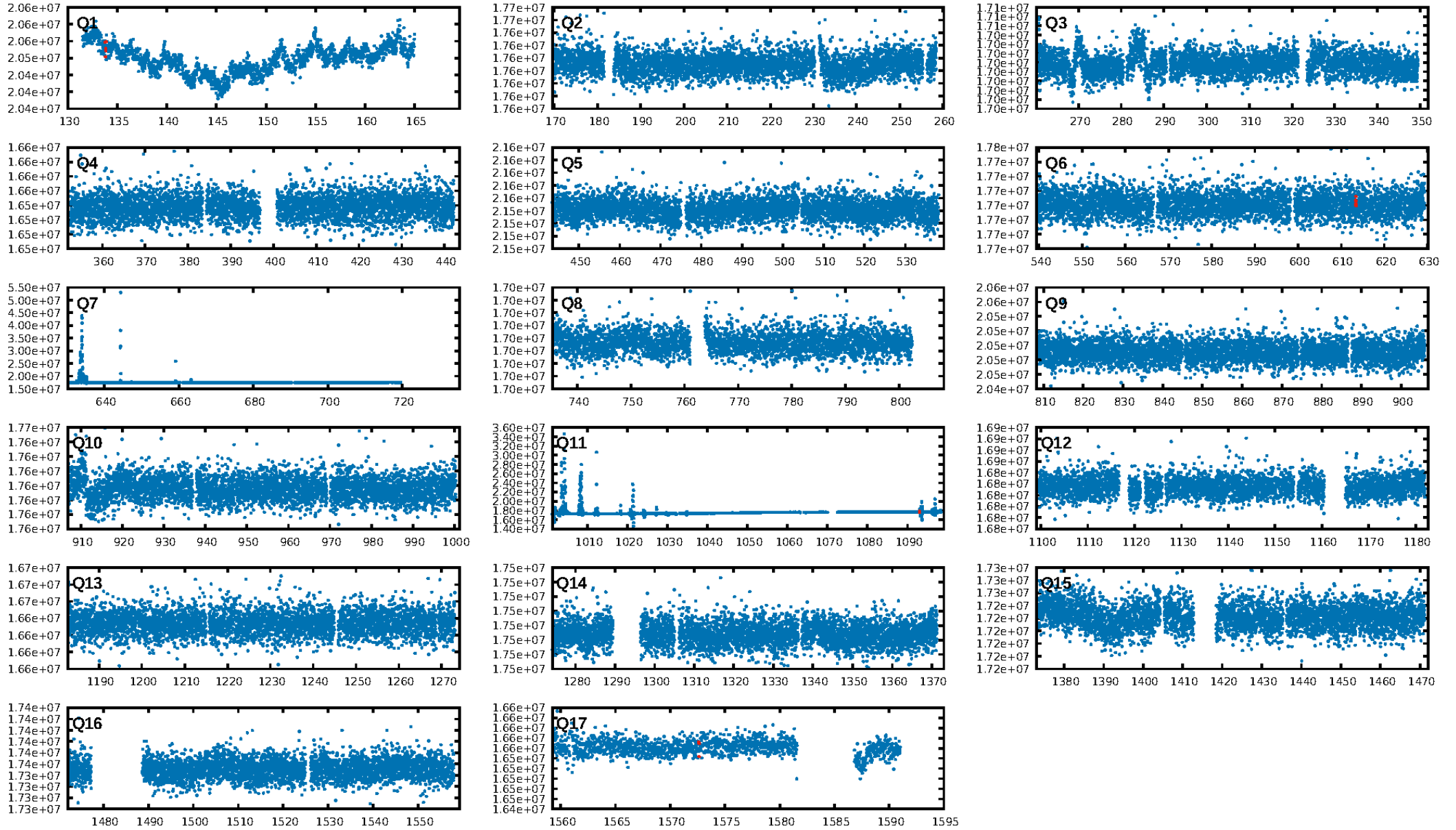
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [37.19σ]  
LongPeriod-sig: 100.0% [378.59σ]  
ModelChiSquare2-sig: 28.6%  
ModelChiSquareGof-sig: 74.6%  
Bootstrap-pfa: 5.02e-09  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 0.0715  
Centroid-sig: 67.3%  
Centroid-so: 2.861 arcsec [0.59σ]  
OotOffset-rm: 2.509 arcsec [2.47σ]  
KicOffset-rm: 2.045 arcsec [2.02σ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [4/4]

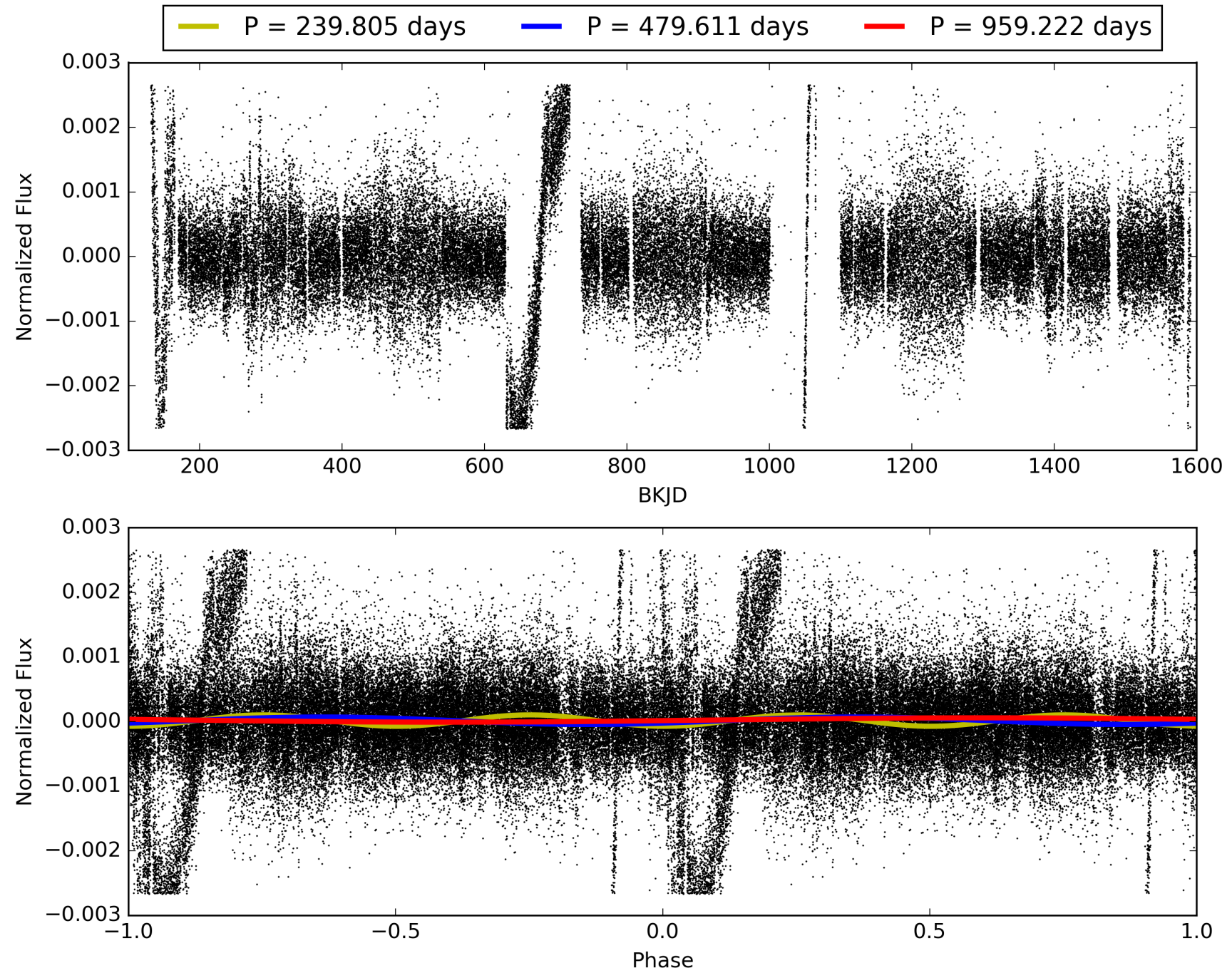
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:34:40 Z

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

# TCE 007889496-03, PDC Light Curves

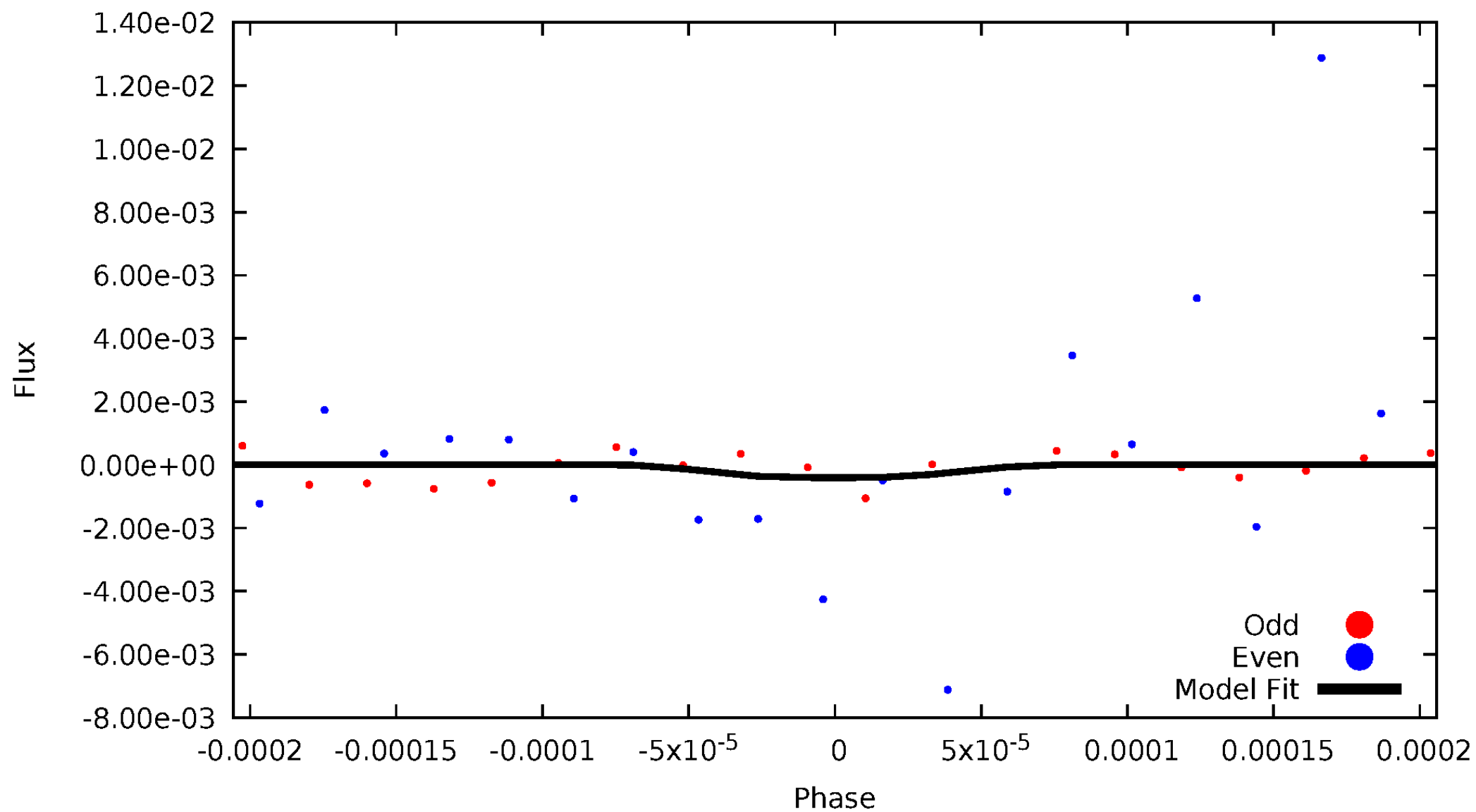


TCE 007889496-03



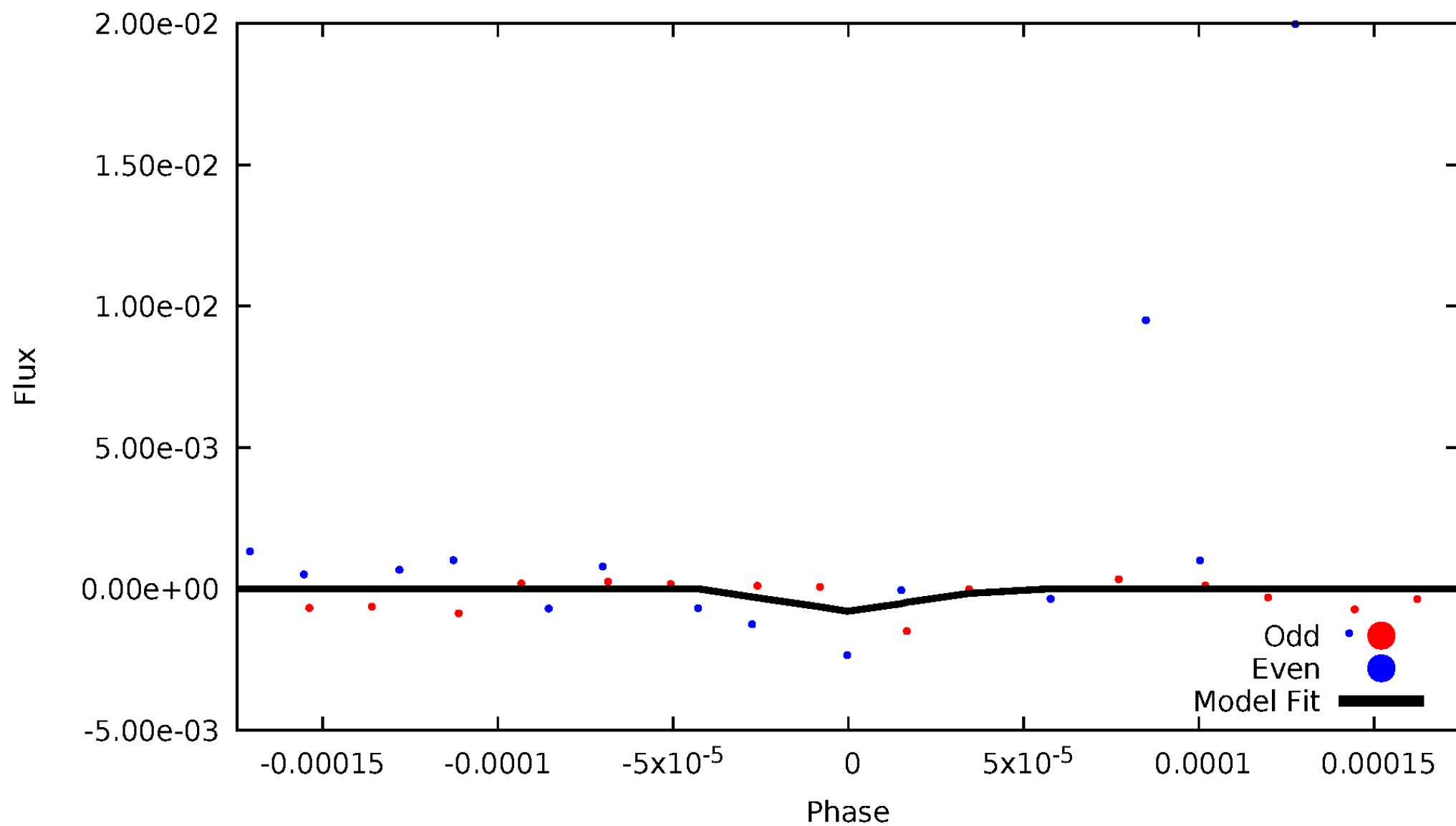
# DV Odd/Even

TCE 007889496-03



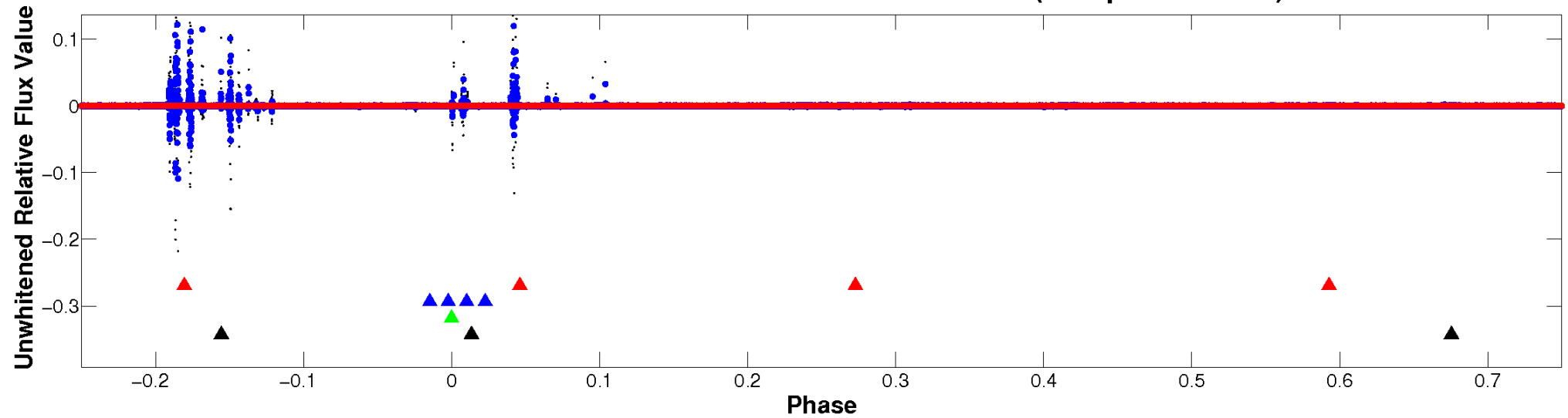
# ALT Odd/Even

TCE 007889496-03

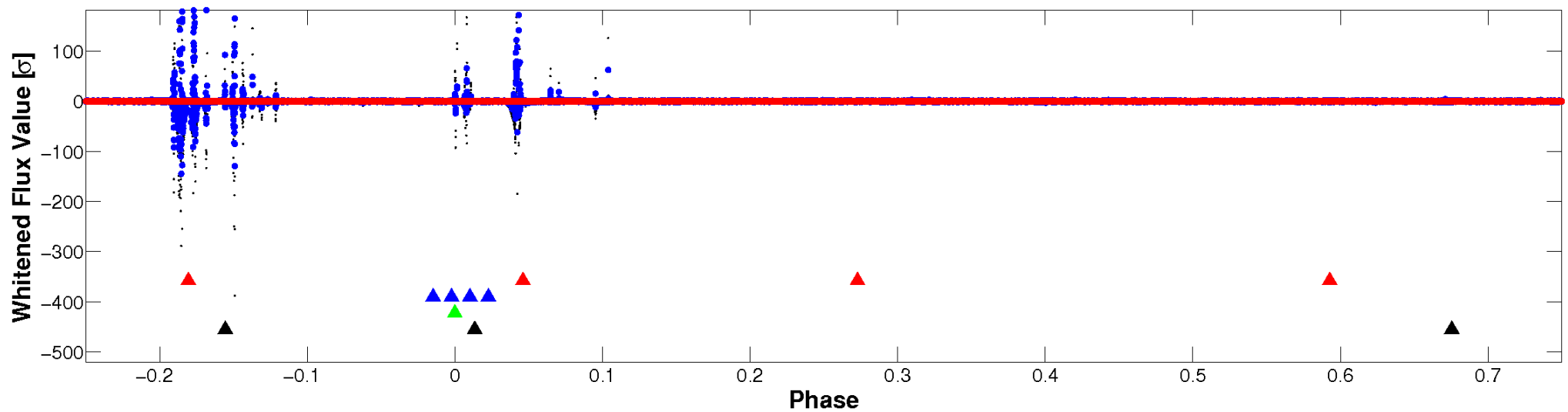


# Non-Whitened Vs. Whitened Light Curve

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

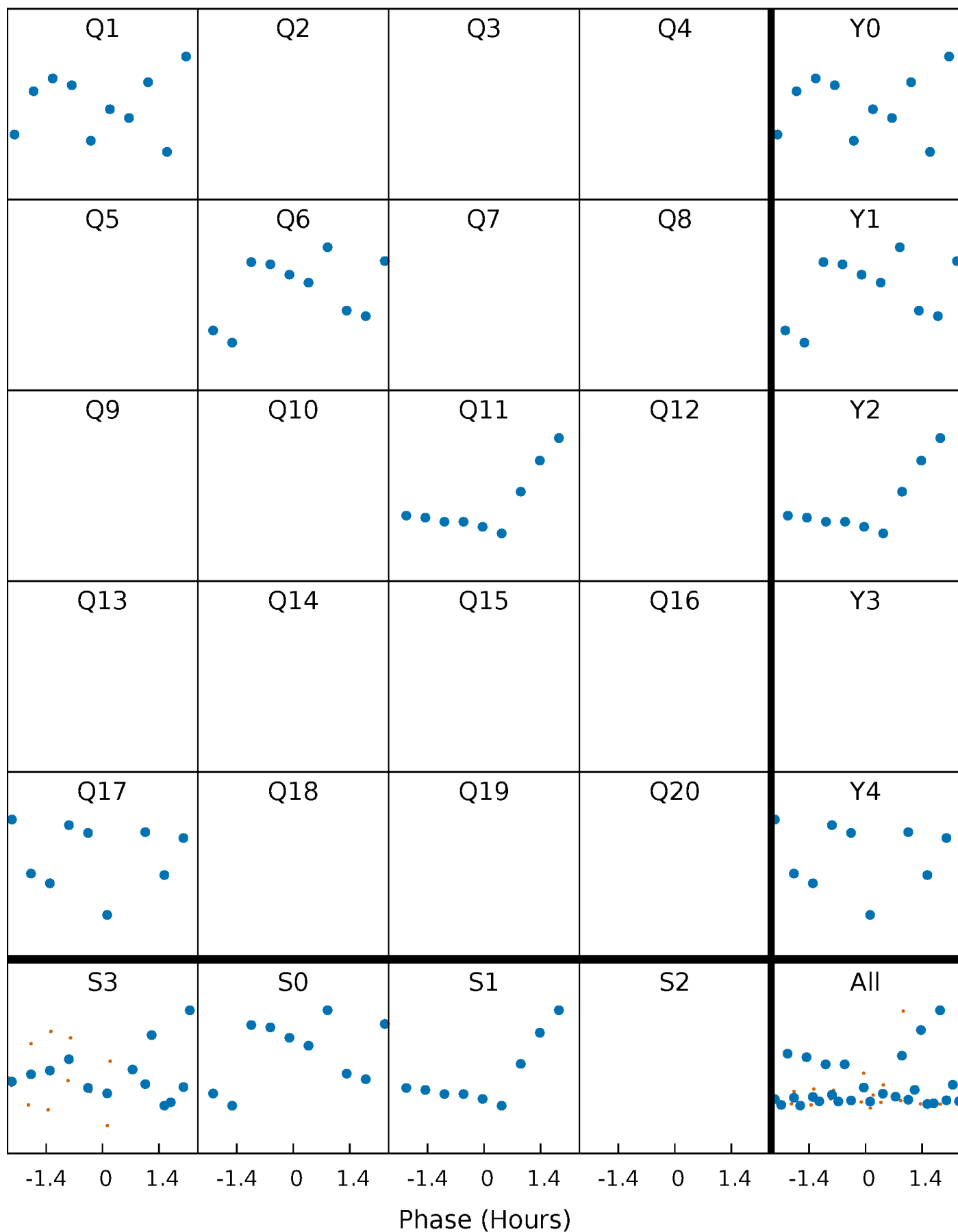


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

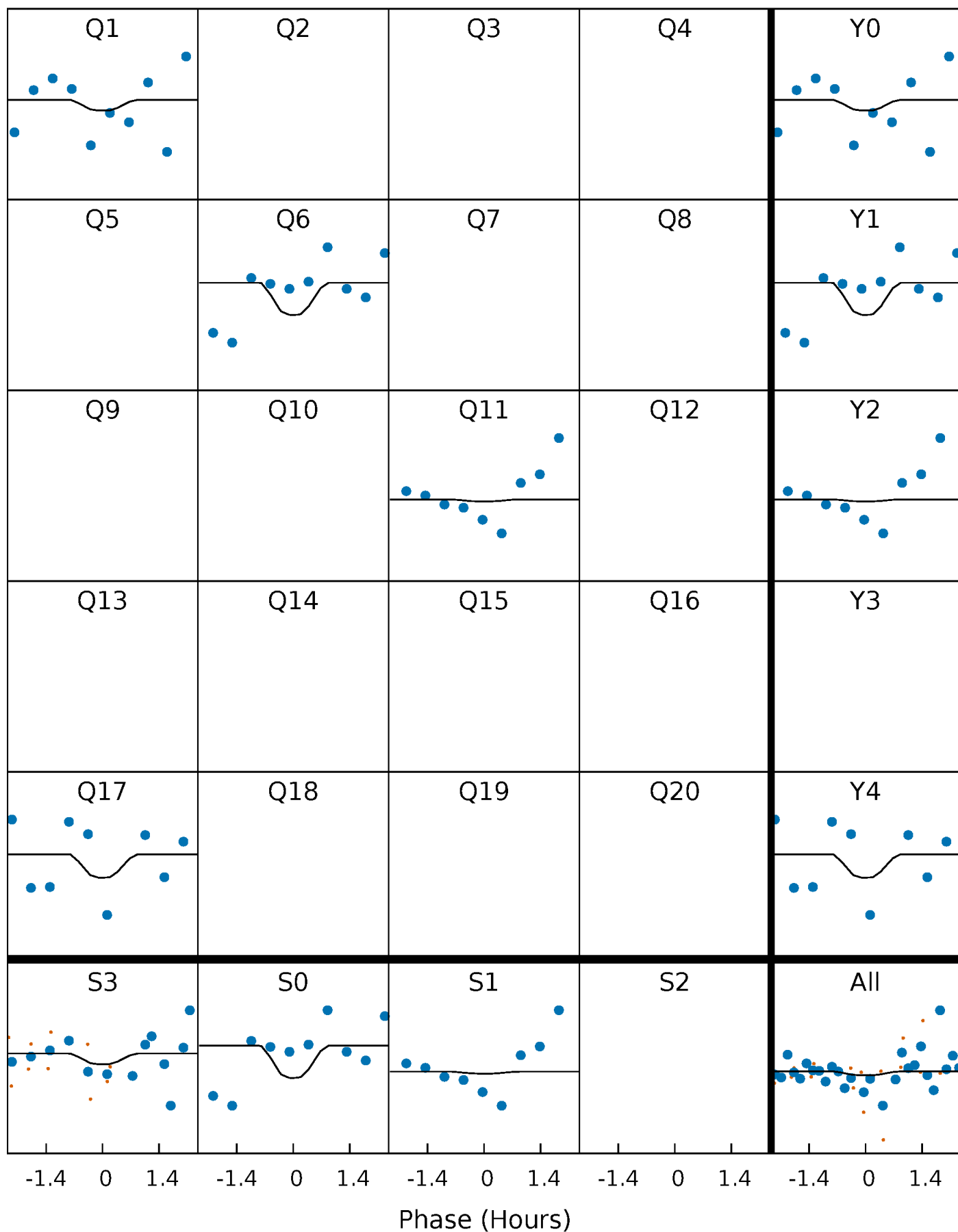
TCE 007889496-03     $P=479.610898$  Days     $T_0=133.793175$  (BKJD)





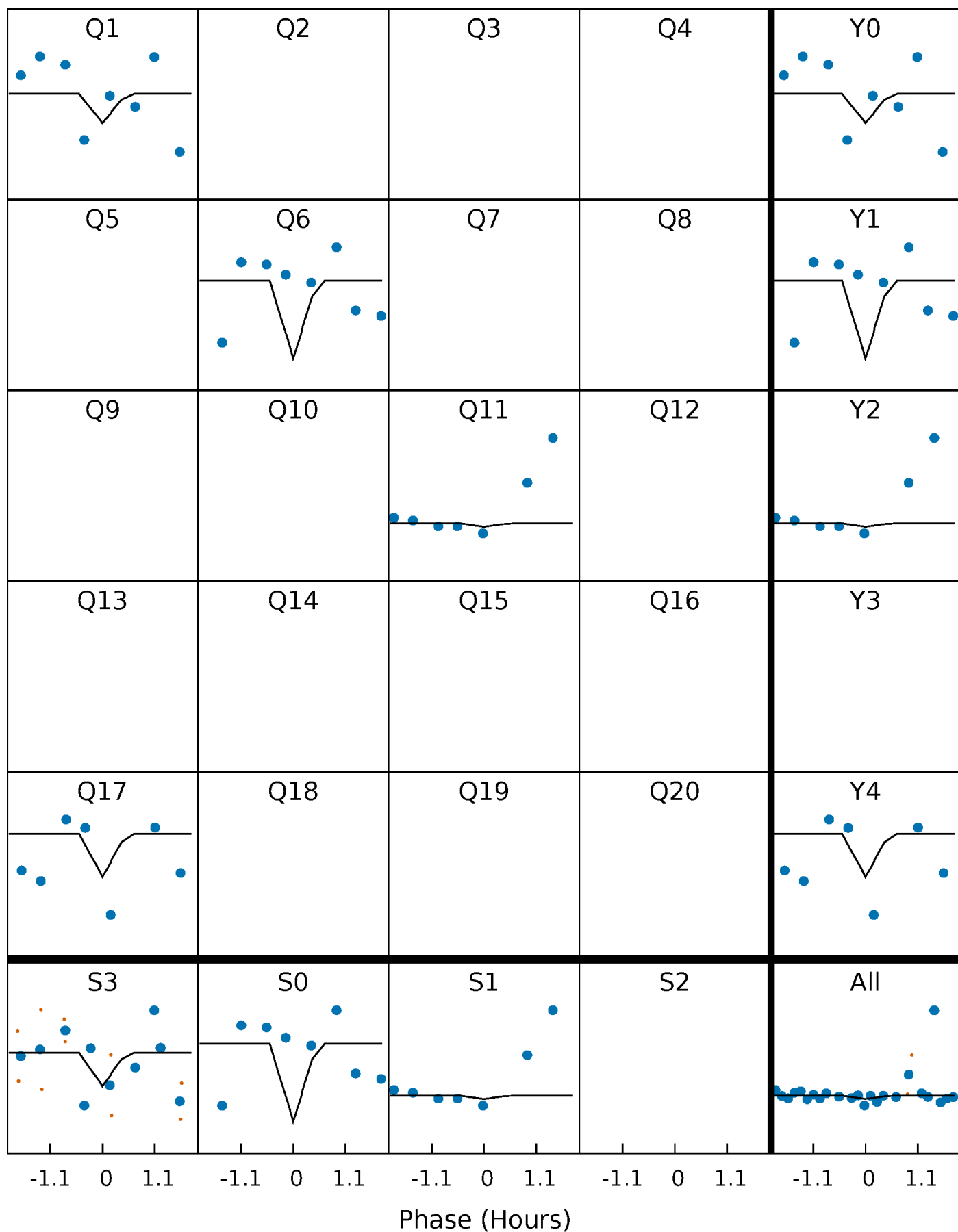
# DV Quarter-Phased Transit Curves

TCE 007889496-03     $P=479.610898$  Days     $T_0=133.793175$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

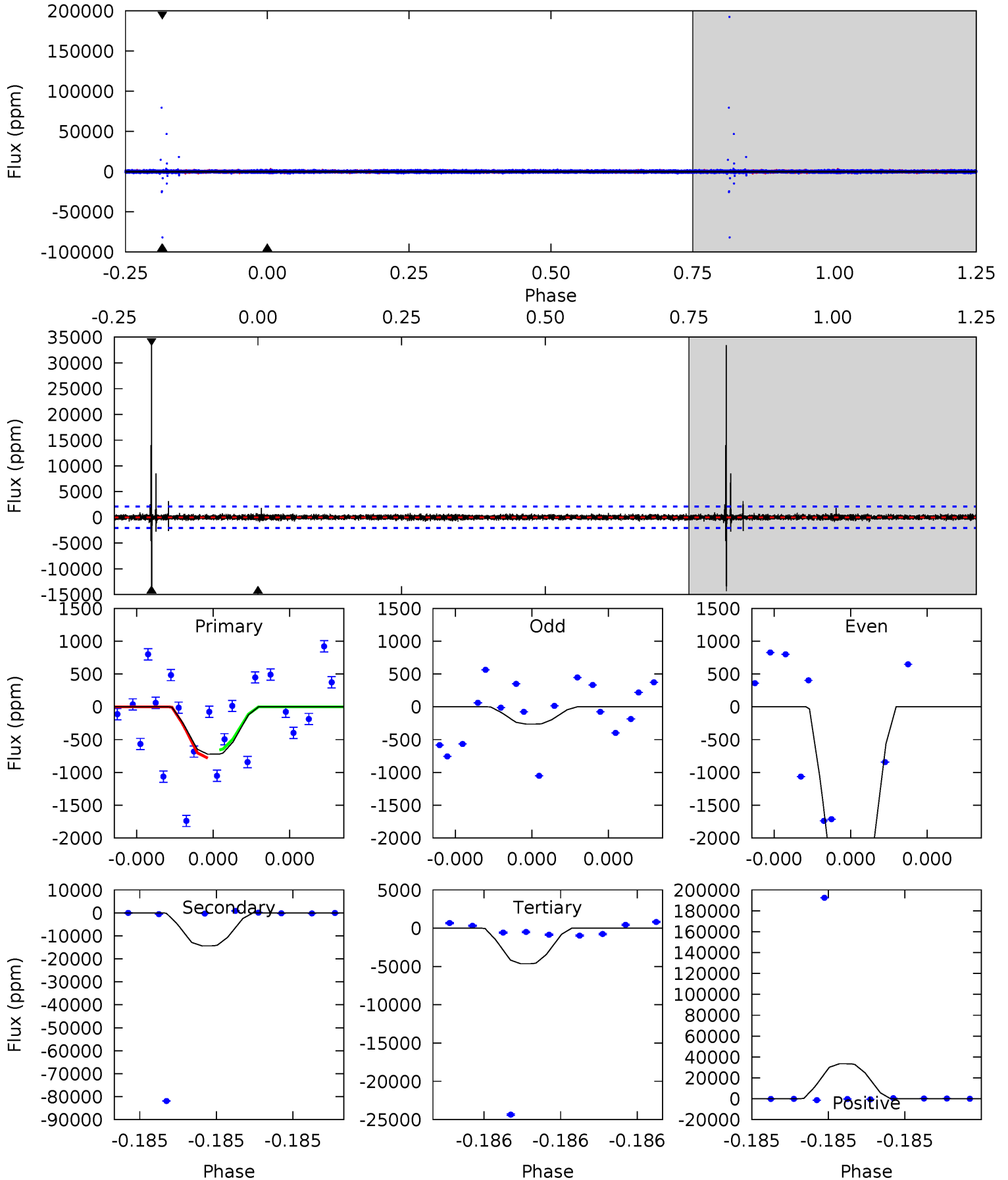
TCE 007889496-03 P=479.609709 Days  $T_0=133.793755$  (BKJD)



# DV Model-Shift Uniqueness Test

007889496-03, P = 479.610898 Days, E = 133.793175 Days

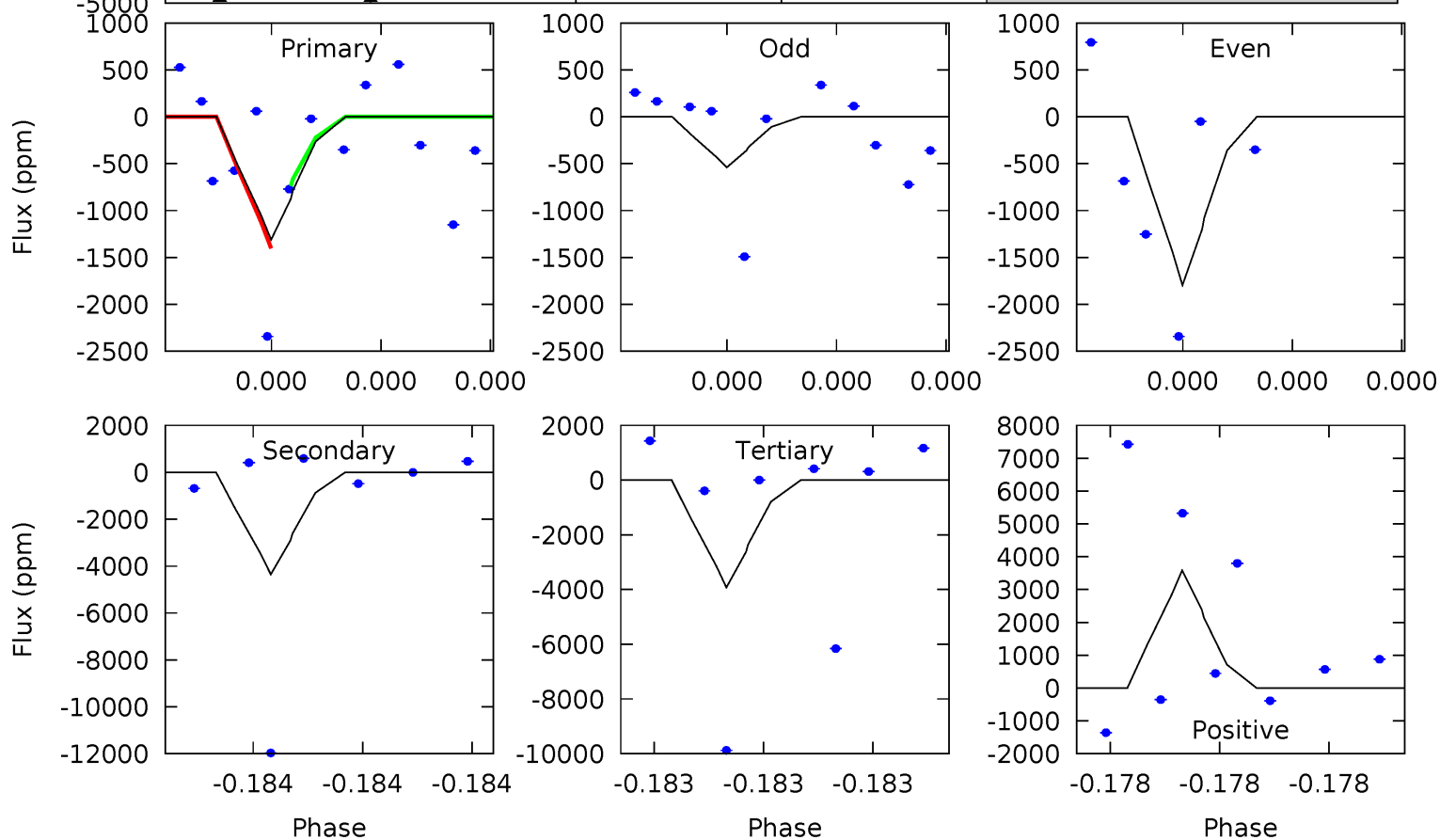
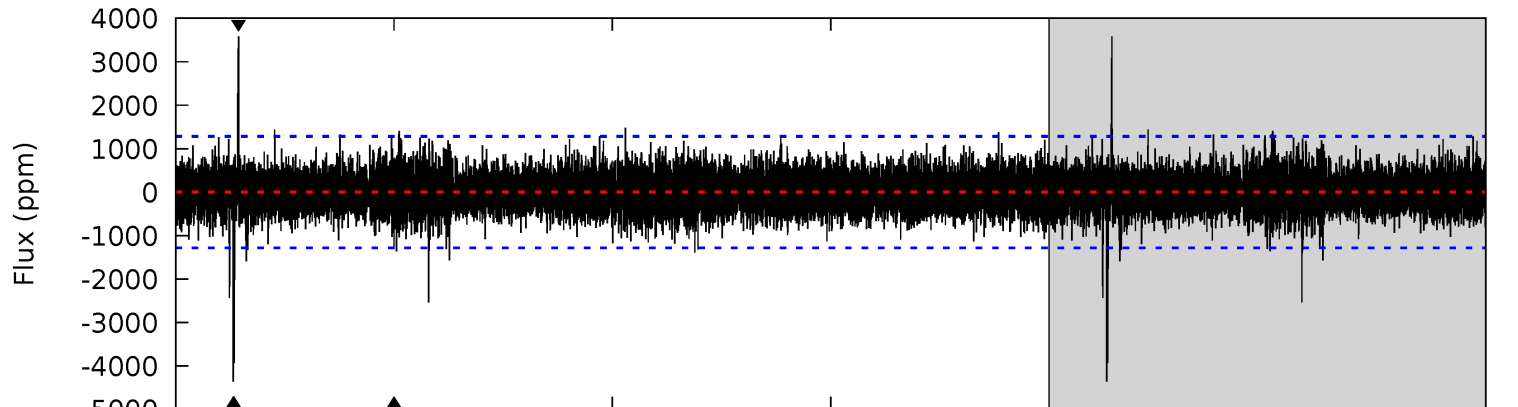
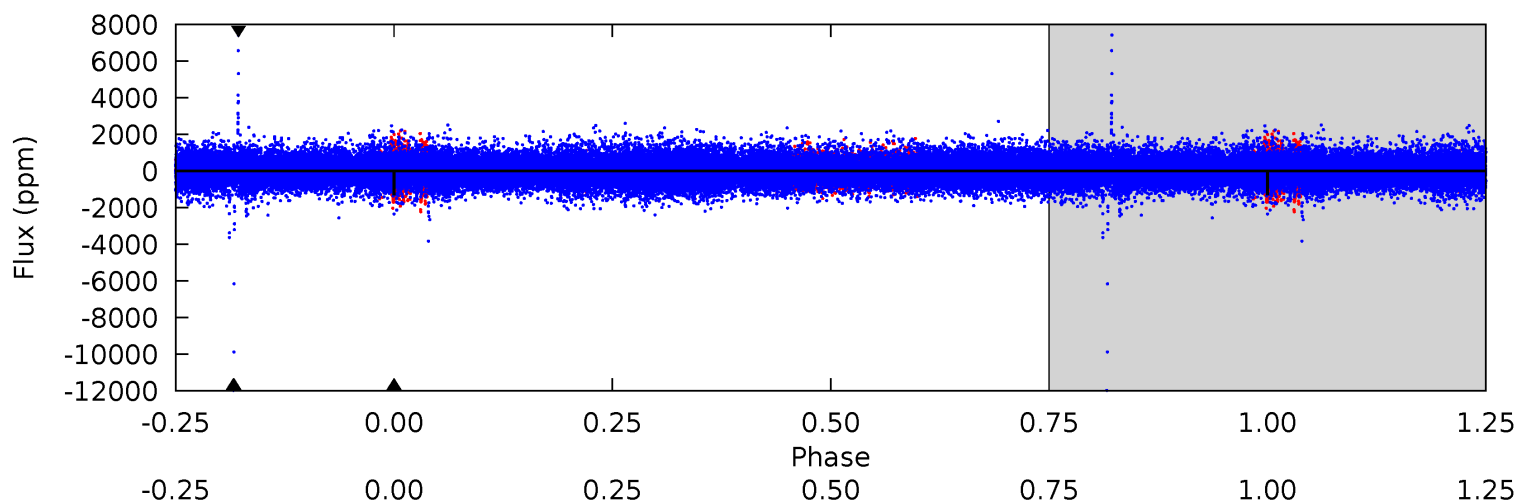
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.01	40.0	13.0	93.5	5.81	3.83	1.12	-10.9	-91.5	27.1	-53.5	1.06	2.26	0.70	0



# Alt Model-Shift Uniqueness Test

007889496-03, P = 479.609709 Days, E = 133.793755 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.01	19.9	18.0	16.4	5.87	3.93	1.50	-12.0	-10.4	1.97	3.54	1.27	0.95	0.45	1.53



### Stellar Parameters For KIC 007889496

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5763^{+161}_{-202}$	$4.527^{+0.046}_{-0.184}$	$0.020^{+0.250}_{-0.300}$	$0.904^{+0.241}_{-0.086}$	$1.002^{+0.102}_{-0.125}$	$1.913^{+0.463}_{-0.911}$
	+3%/-4%	+1%/-4%	+1250%/-1500%	+27%/-10%	+10%/-12%	+24%/-48%
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 007889496-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-14325 \pm 358$	$58.93^{+62.62}_{-43.52}$	$315^{+18}_{-16}$	$3239^{+1898}_{-593}$	$3367^{+44618}_{-2577}$
Alt.	$-4355 \pm 218$	$57.61^{+62.51}_{-41.46}$	$313^{+21}_{-14}$	$2740^{+1378}_{-444}$	$1017^{+12979}_{-781}$

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

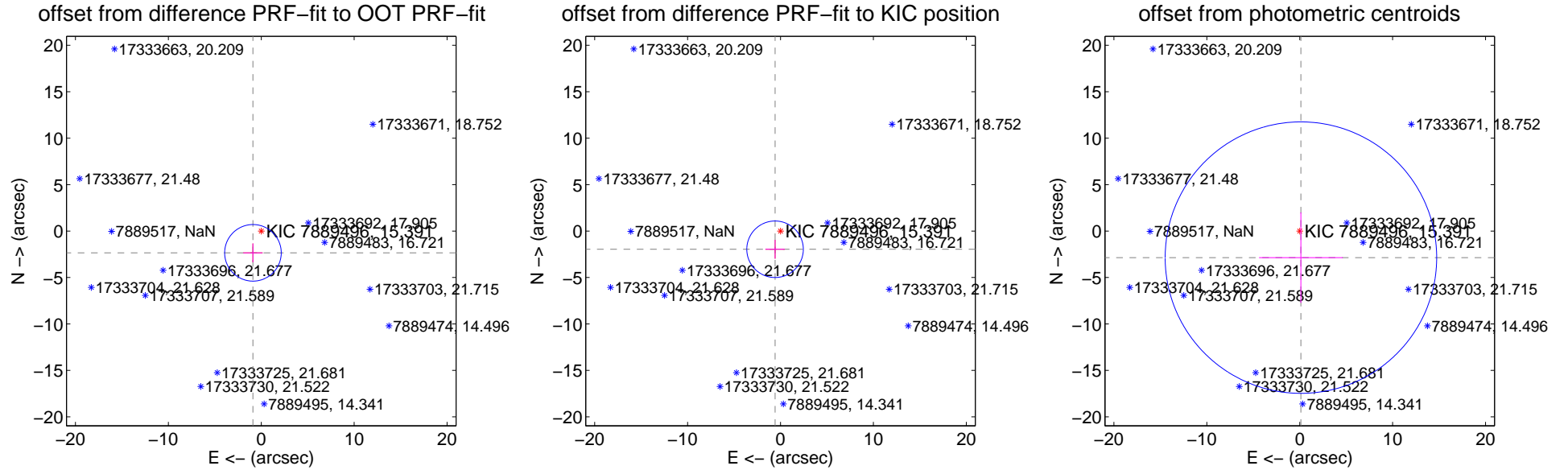
## DV Centroid Data

Supplemental centroid analysis for 007889496-03. Kepler magnitude: 15.39. Transit SNR 1.56

There are 0 quarters with good PRF difference image offsets

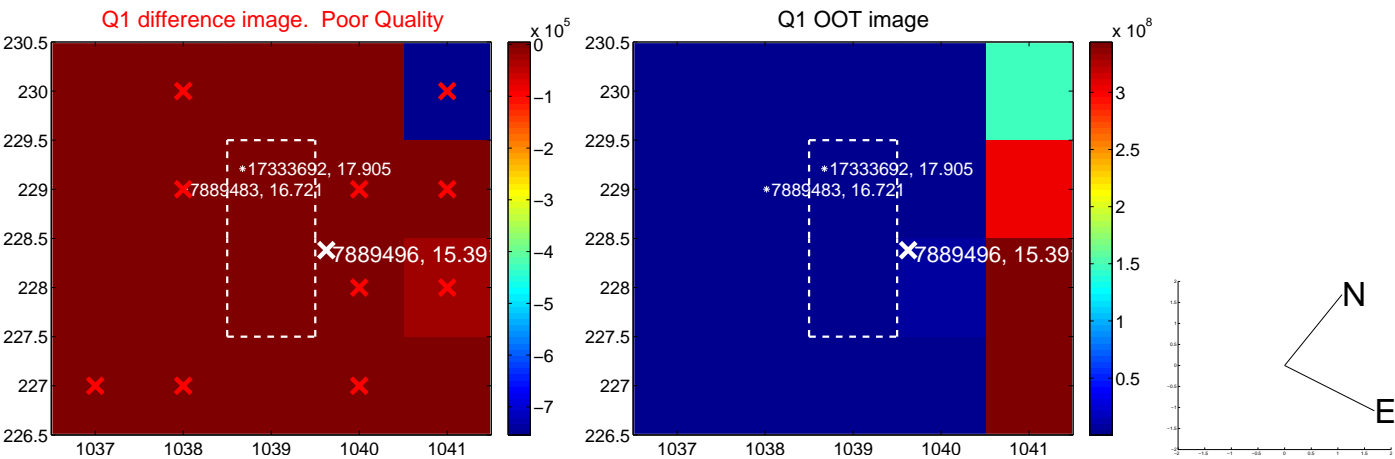
The direct PRF centroid is offset from the target star catalog position by about 0.49 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.509 \pm 1.015$	2.47	$0.895 \pm 1.041$	$-2.344 \pm 1.011$
PRF-fit source offset from KIC position	$2.045 \pm 1.014$	2.02	$0.585 \pm 1.041$	$-1.959 \pm 1.011$
photometric centroid source offset	$2.86 \pm 4.87$	0.59	$-0.13 \pm 4.51$	$-2.86 \pm 4.87$



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

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



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

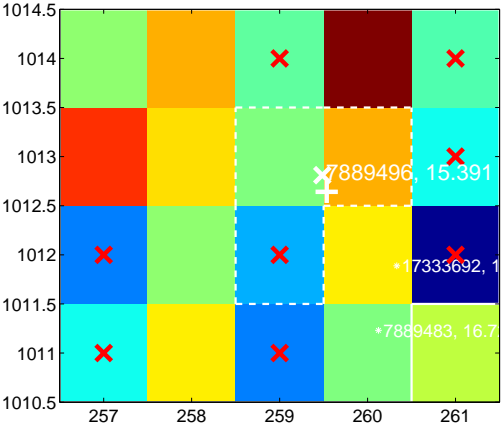
Q5 no difference image



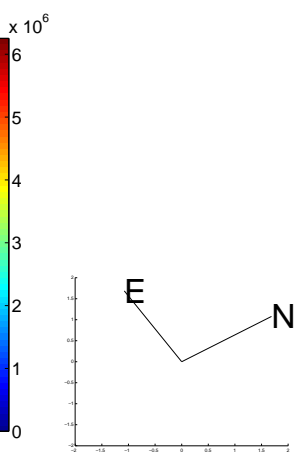
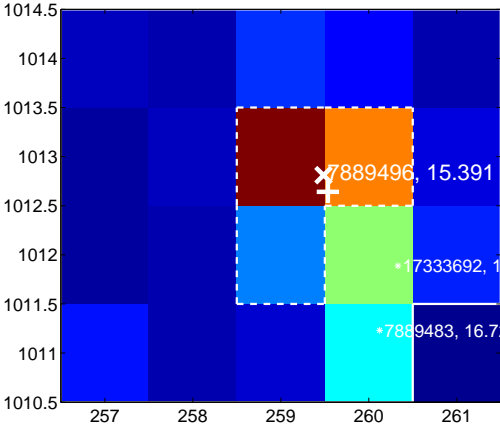
Q5 no OOT image



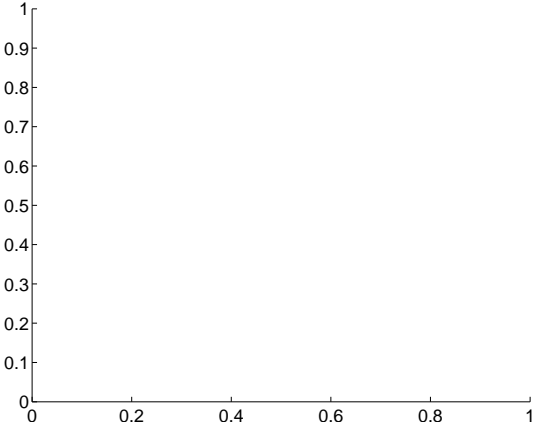
Q6 difference image. Poor Quality



Q6 OOT image



Q7 no difference image



Q7 no OOT image



Q8 no difference image

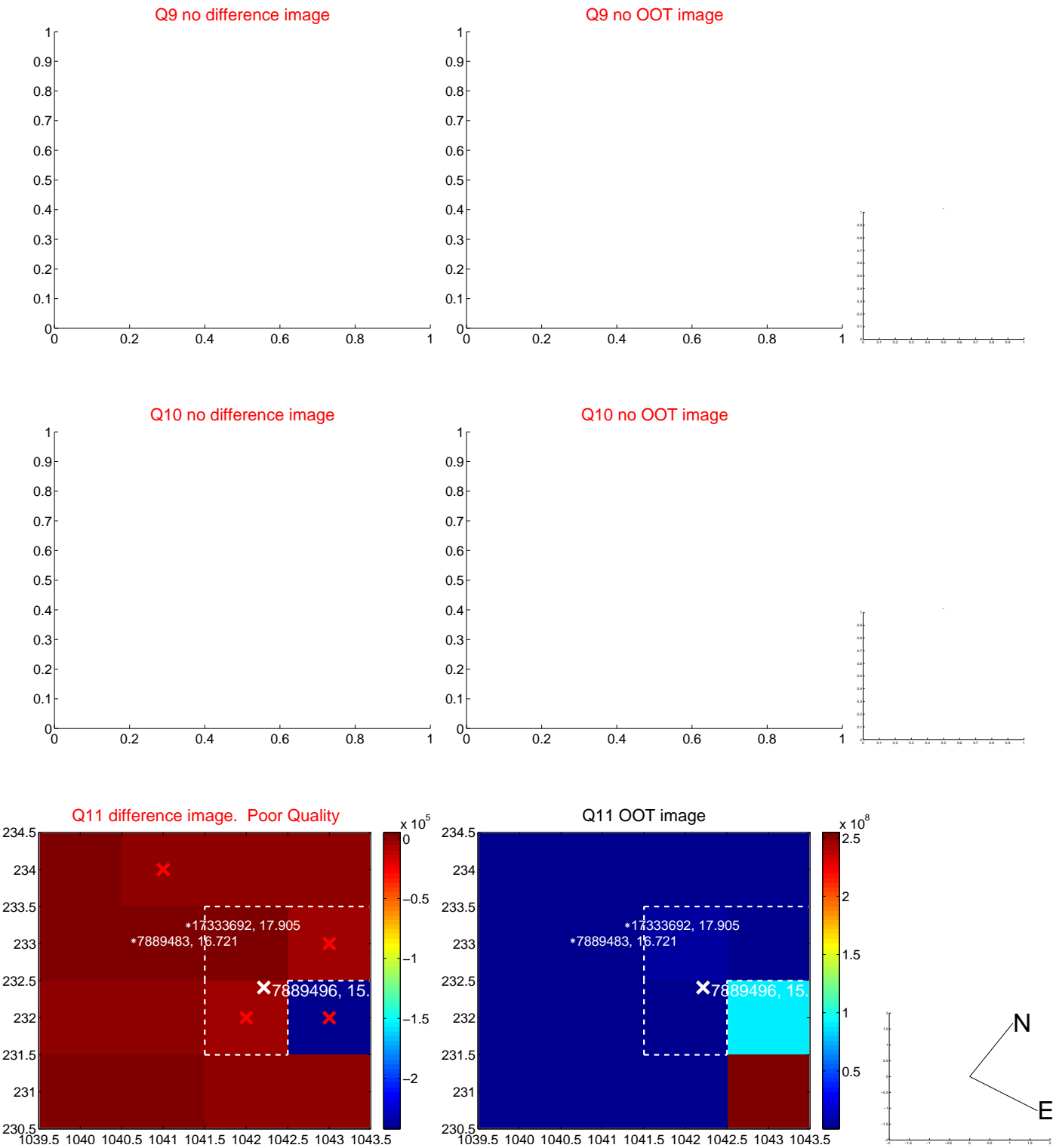


Q8 no OOT image





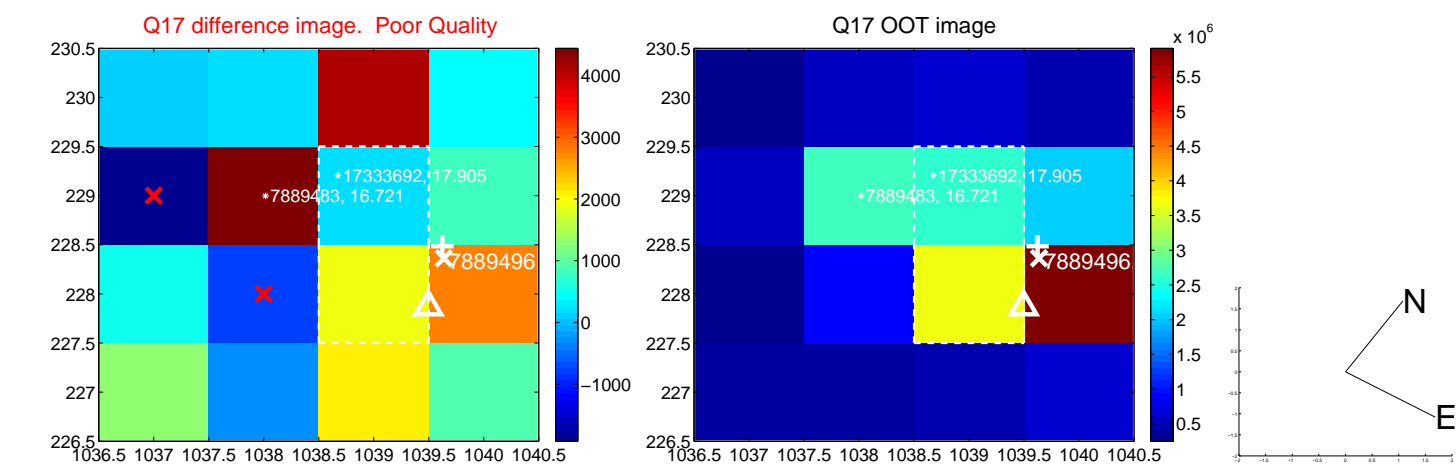
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



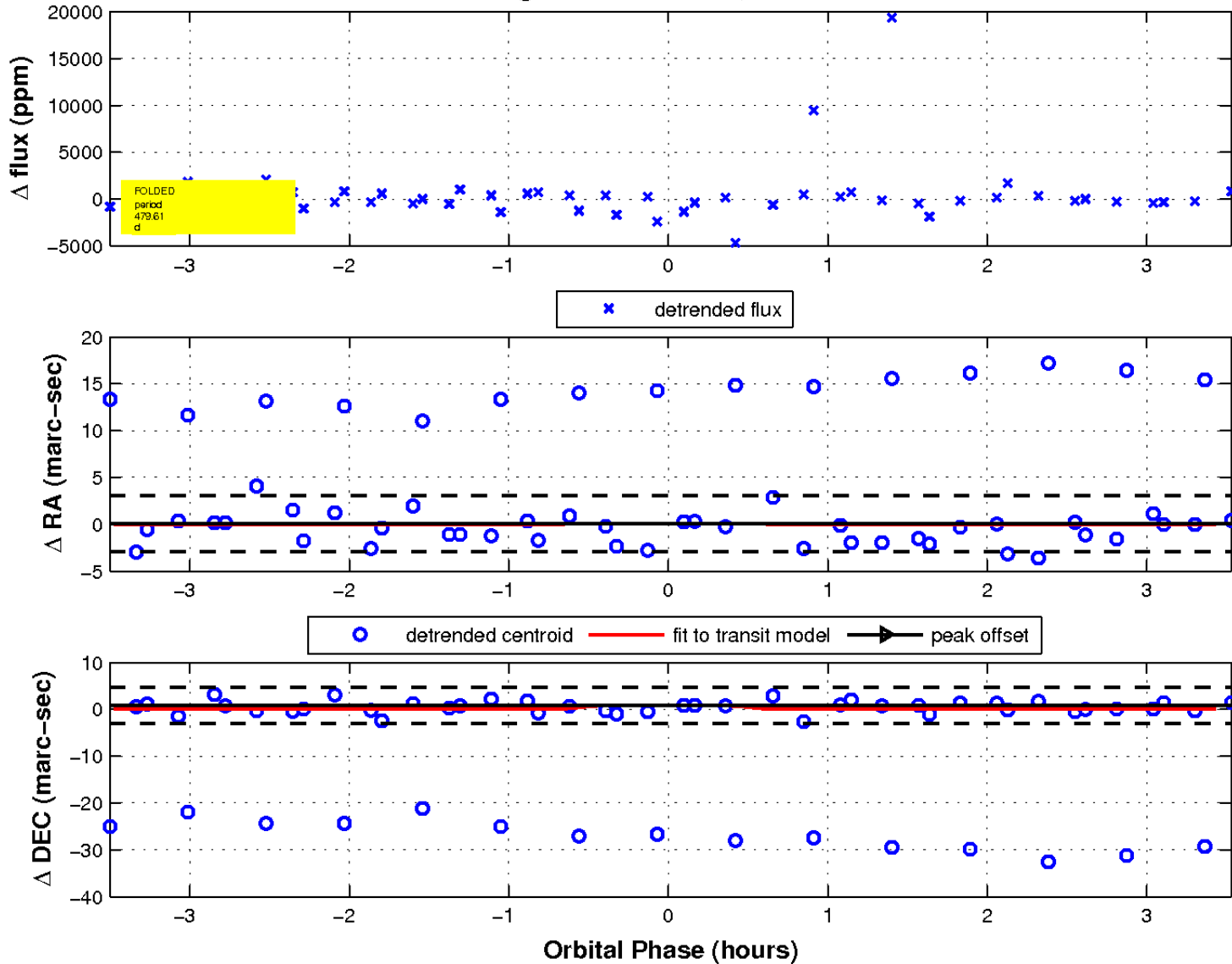
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



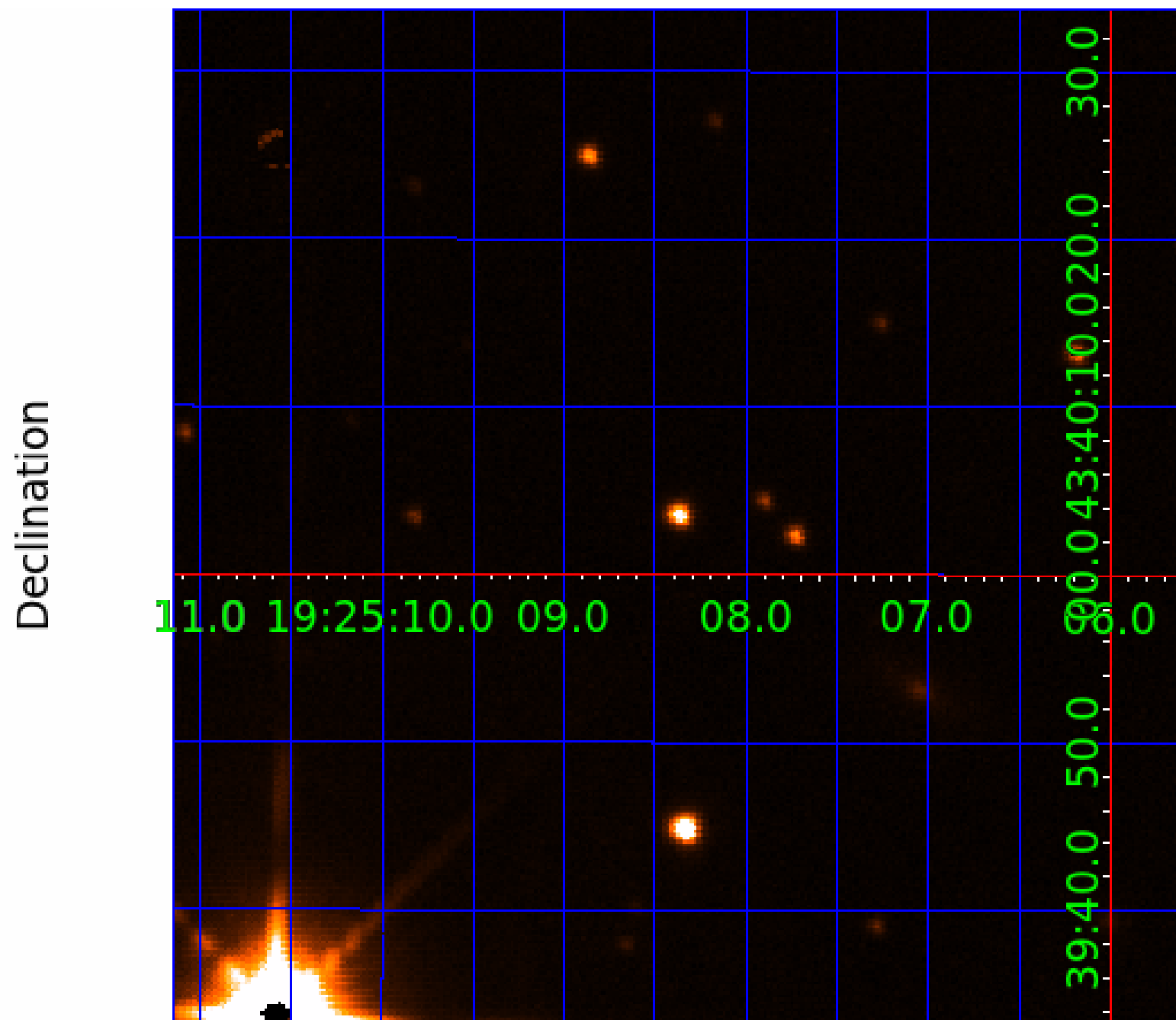
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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UKIRT Image



# KIC 007889496

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007889496-01	OBS	No	370.896359	264.642448	5935.8	12.500	39.7	-1.0	0.90	5763	6.89	0.79
007889496-02	OBS	No	473.622603	144.698188	969.2	3.679	15.8	6.8	0.90	5763	2.81	0.57
007889496-03	OBS	No	479.610898	133.793175	406.6	1.183	18.0	1.6	0.90	5763	2.12	0.56
007889496-04	OBS	No	560.662830	457.763430	7634.9	5.000	28.9	-1.0	0.90	5763	7.82	0.46

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007889496-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
007889496-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007889496-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_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—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
007889496-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS

**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.

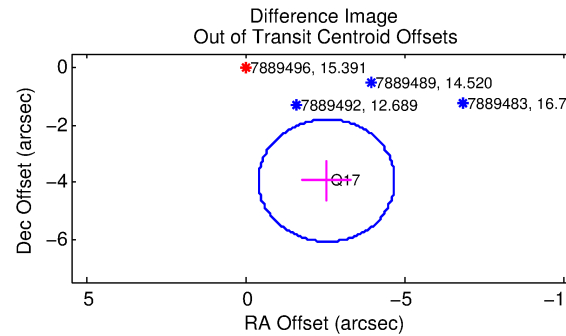
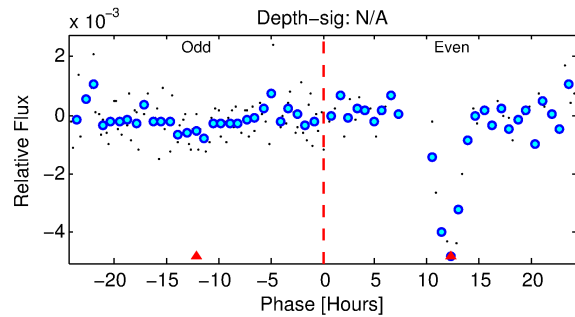
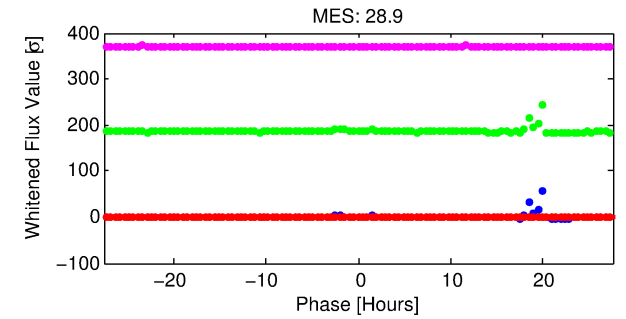
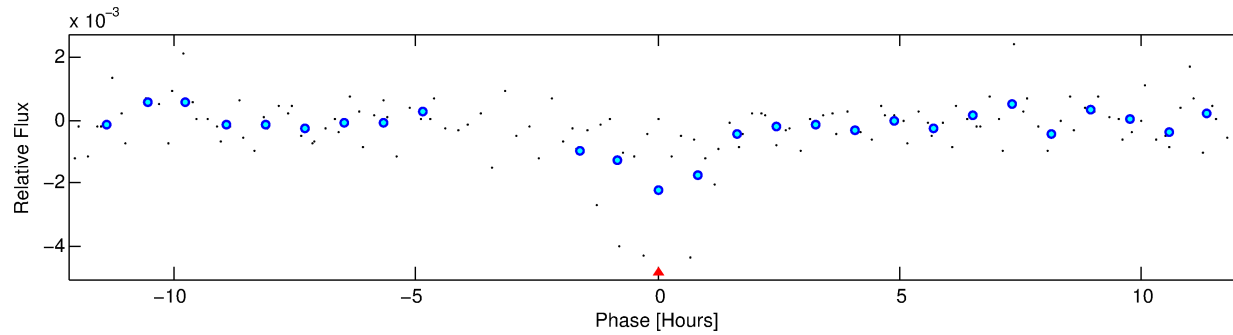
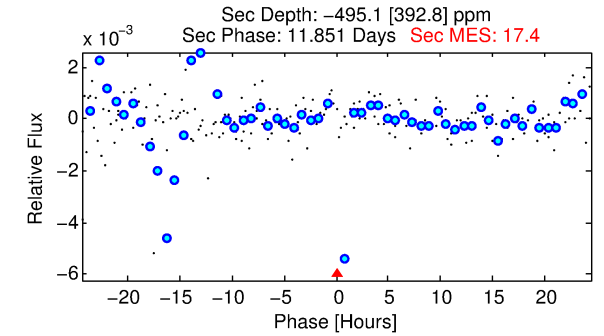
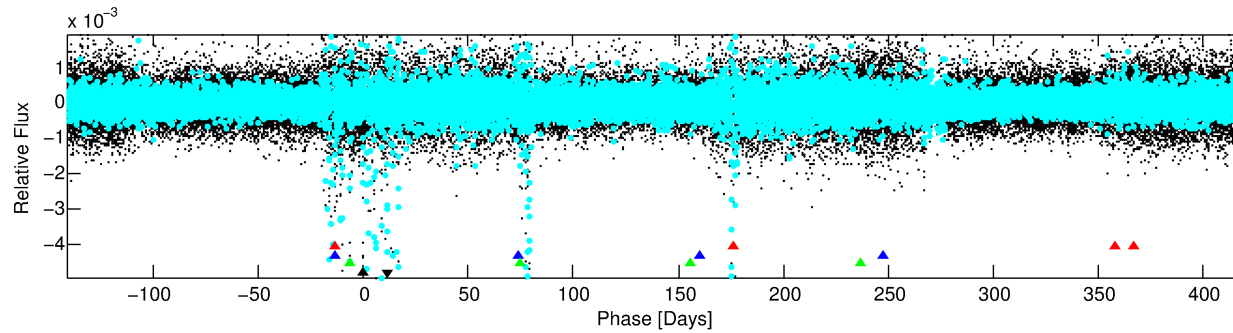
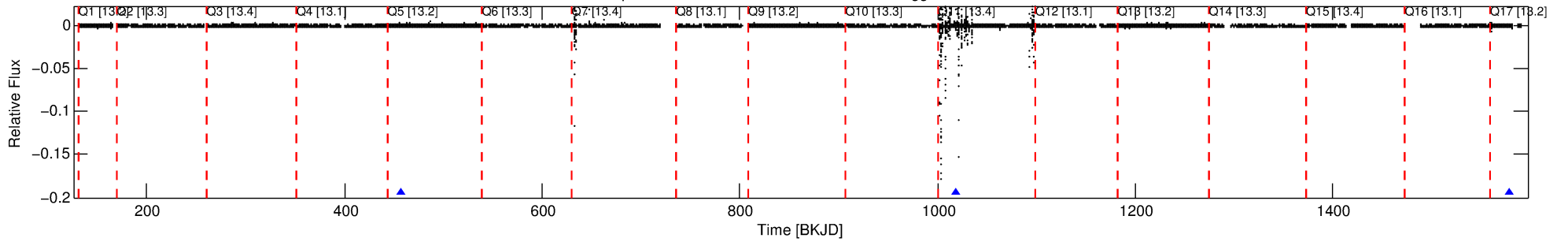
Ephemeris Match Information For 007889496-04

No Significant Match Found

# DV One-Page Summary

KIC: 7889496 Candidate: 4 of 4 Period: 560.663 d

Kp: 15.39 R\*: 0.90 Rs Teff: 5763.0 K Logg: 4.53 Fe/H: 0.020



## TPS TCE Results:

Period = 560.66283 d  
Epoch = 457.7634 BKJD

DV fit results are unavailable

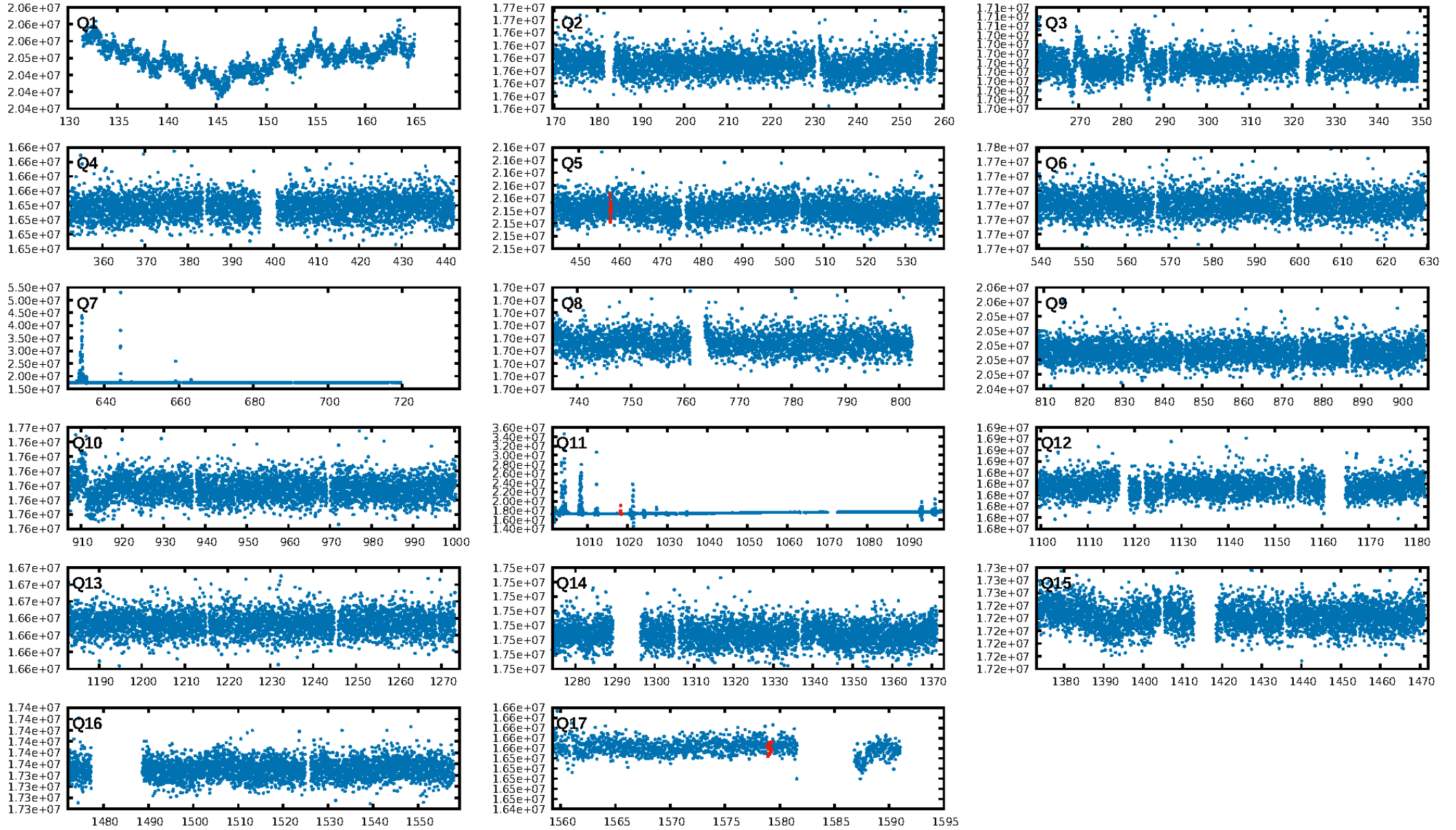
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [378.59 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.17e-08  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 2.78  
Centroid-sig: 27.7%  
Centroid-so: 1.249 arcsec [2.08 $\sigma$ ]  
OotOffset-rm: 4.690 arcsec [6.57 $\sigma$ ]  
KicOffset-rm: 4.561 arcsec [6.35 $\sigma$ ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [3/3]

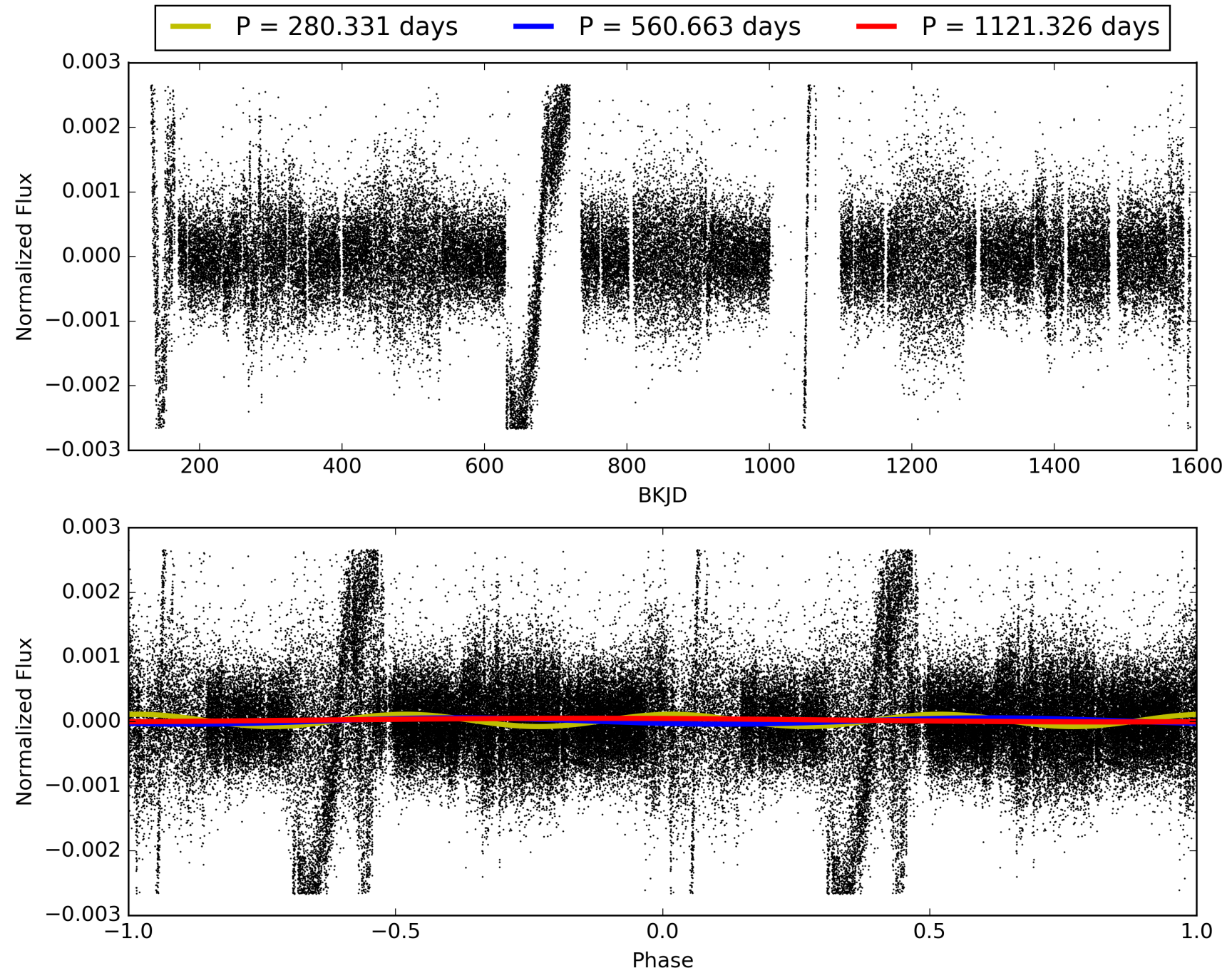
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 21:34:59 Z

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

# TCE 007889496-04, PDC Light Curves



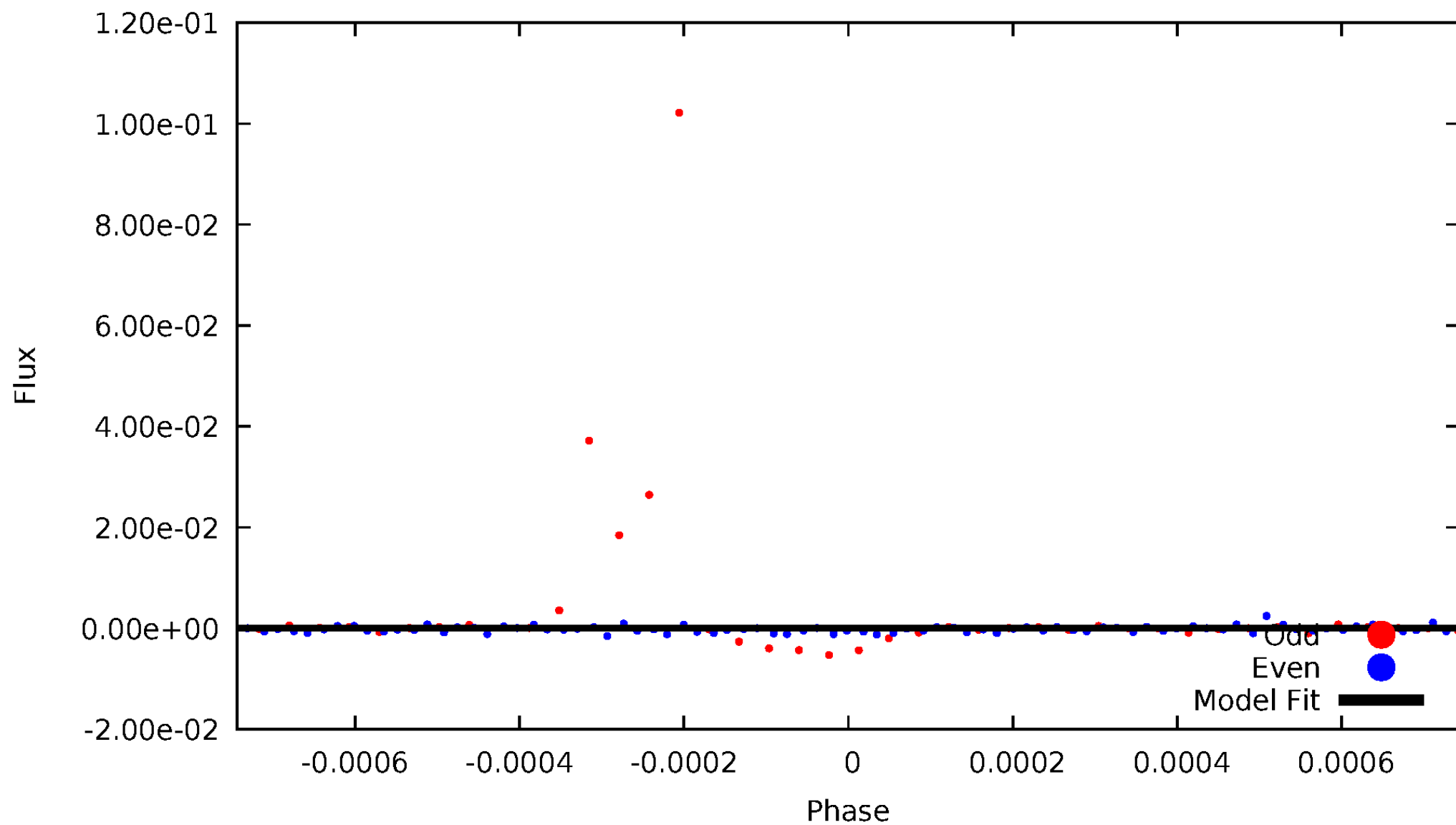
TCE 007889496-04





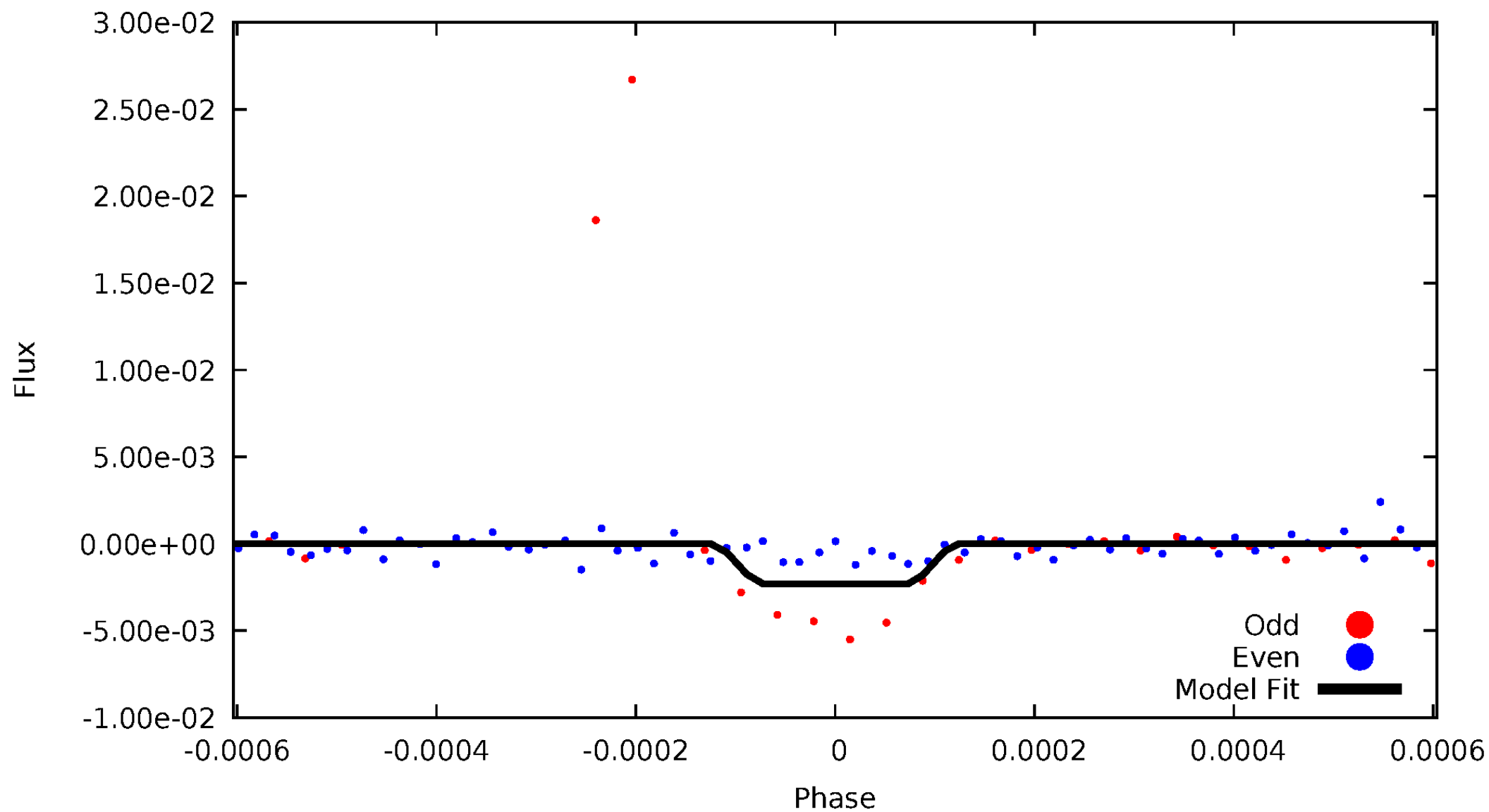
# DV Odd/Even

TCE 007889496-04



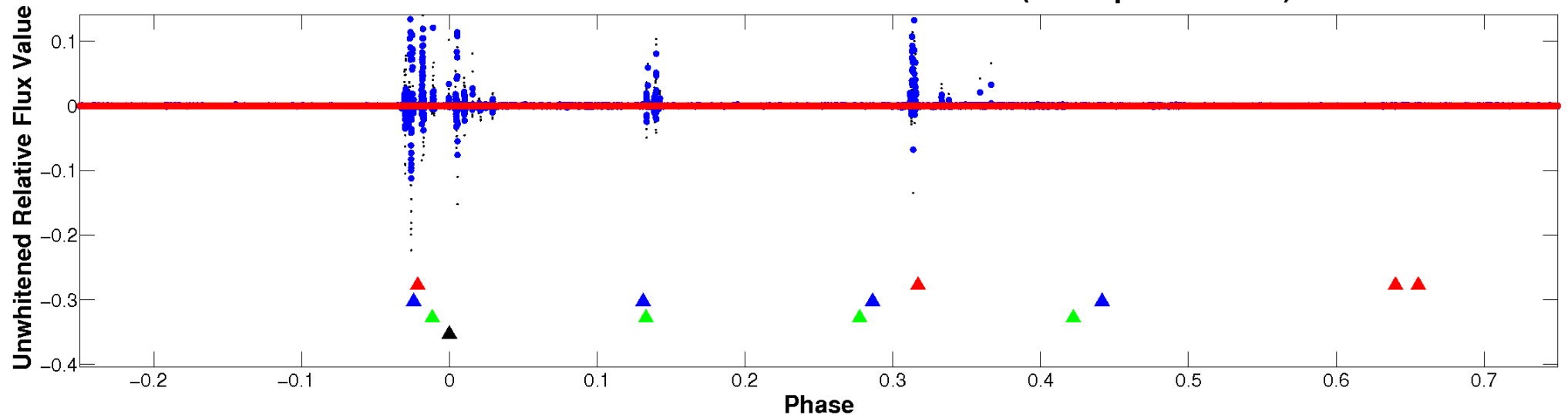
# ALT Odd/Even

TCE 007889496-04

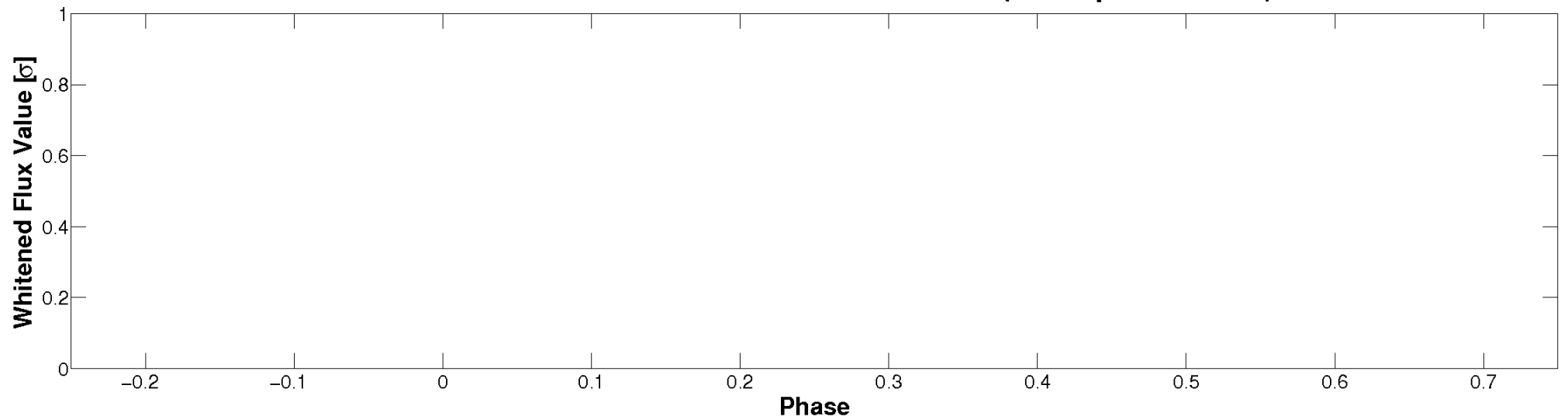


# Non-Whitened Vs. Whitened Light Curve

**Planet 4 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

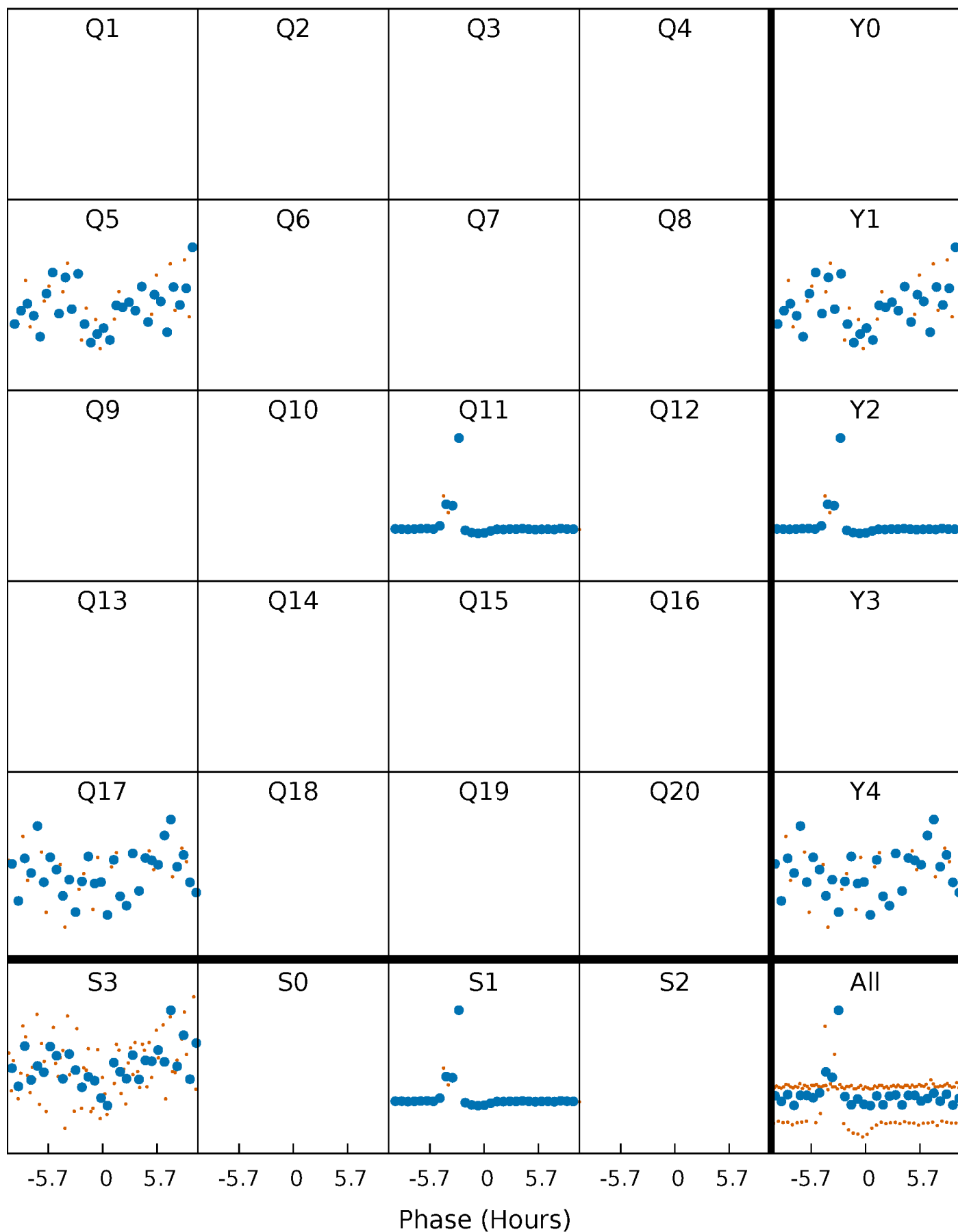


**Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



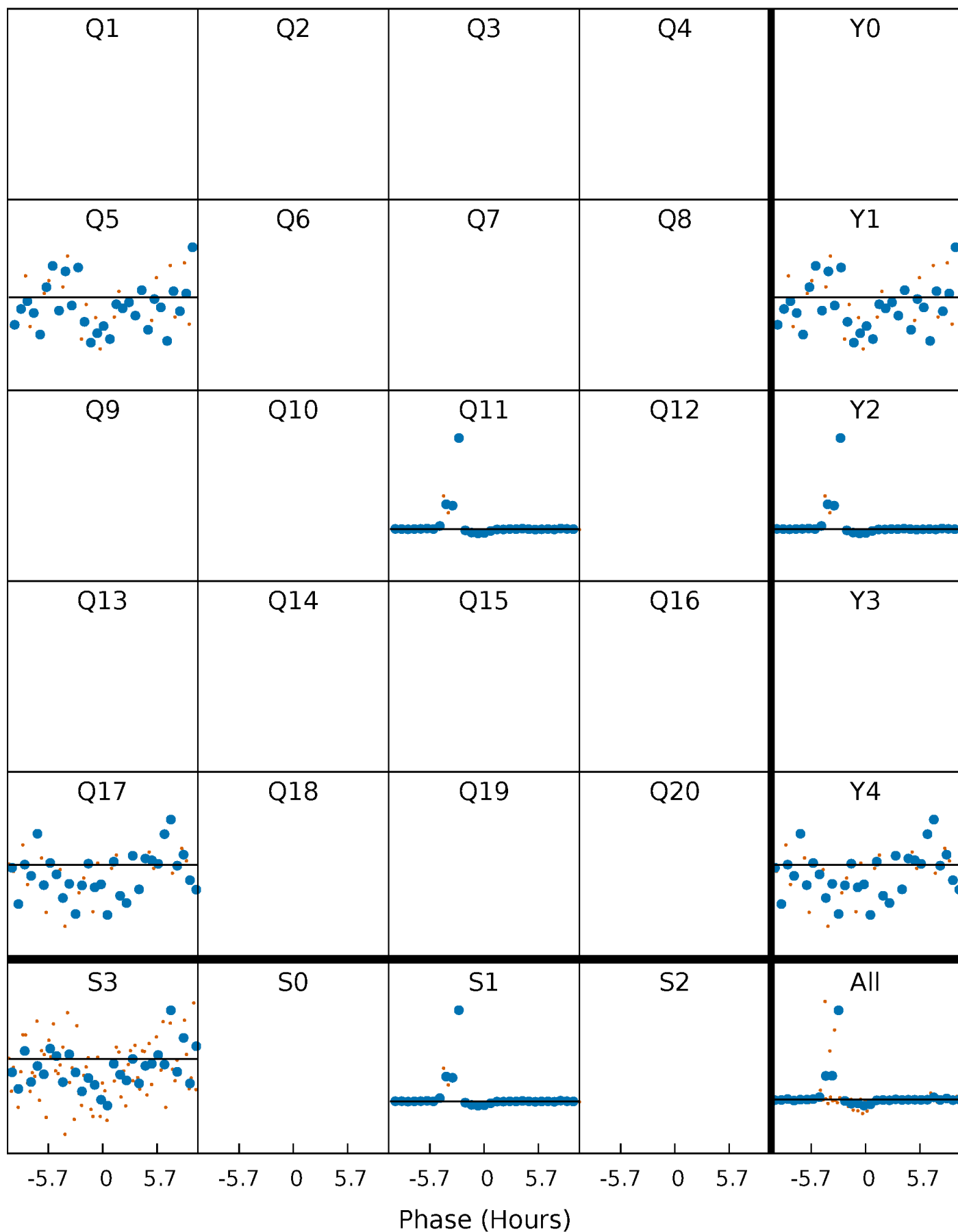
# PDC Quarter-Phased Transit Curves

TCE 007889496-04   P=560.662830 Days    $T_0=457.763429$  (BKJD)



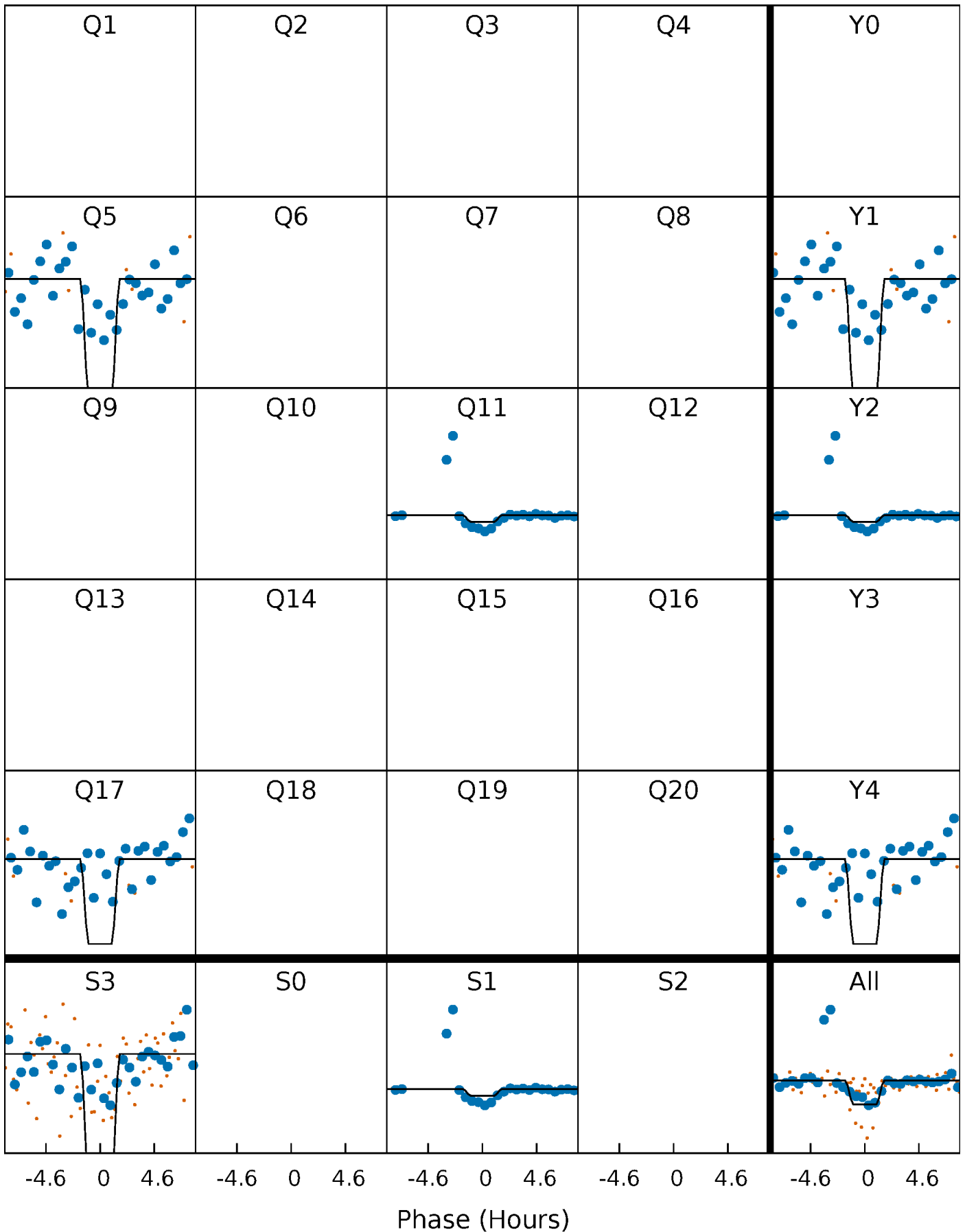
# DV Quarter-Phased Transit Curves

TCE 007889496-04     $P=560.662830$  Days     $T_0=457.763429$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

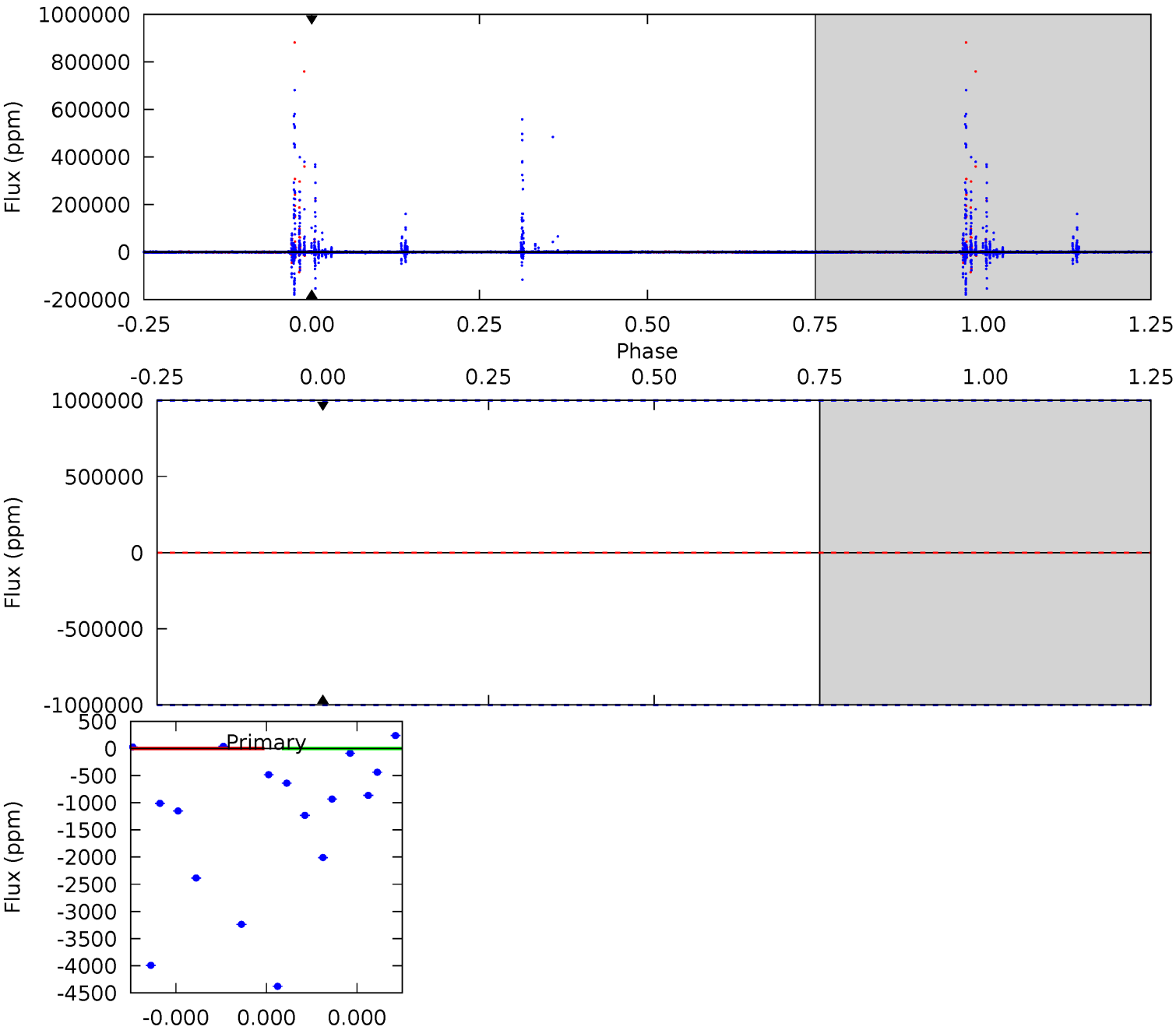
TCE 007889496-04     $P=560.662830$  Days     $T_0=457.741784$  (BKJD)



# DV Model-Shift Uniqueness Test

007889496-04, P = 560.662830 Days, E = 457.763429 Days

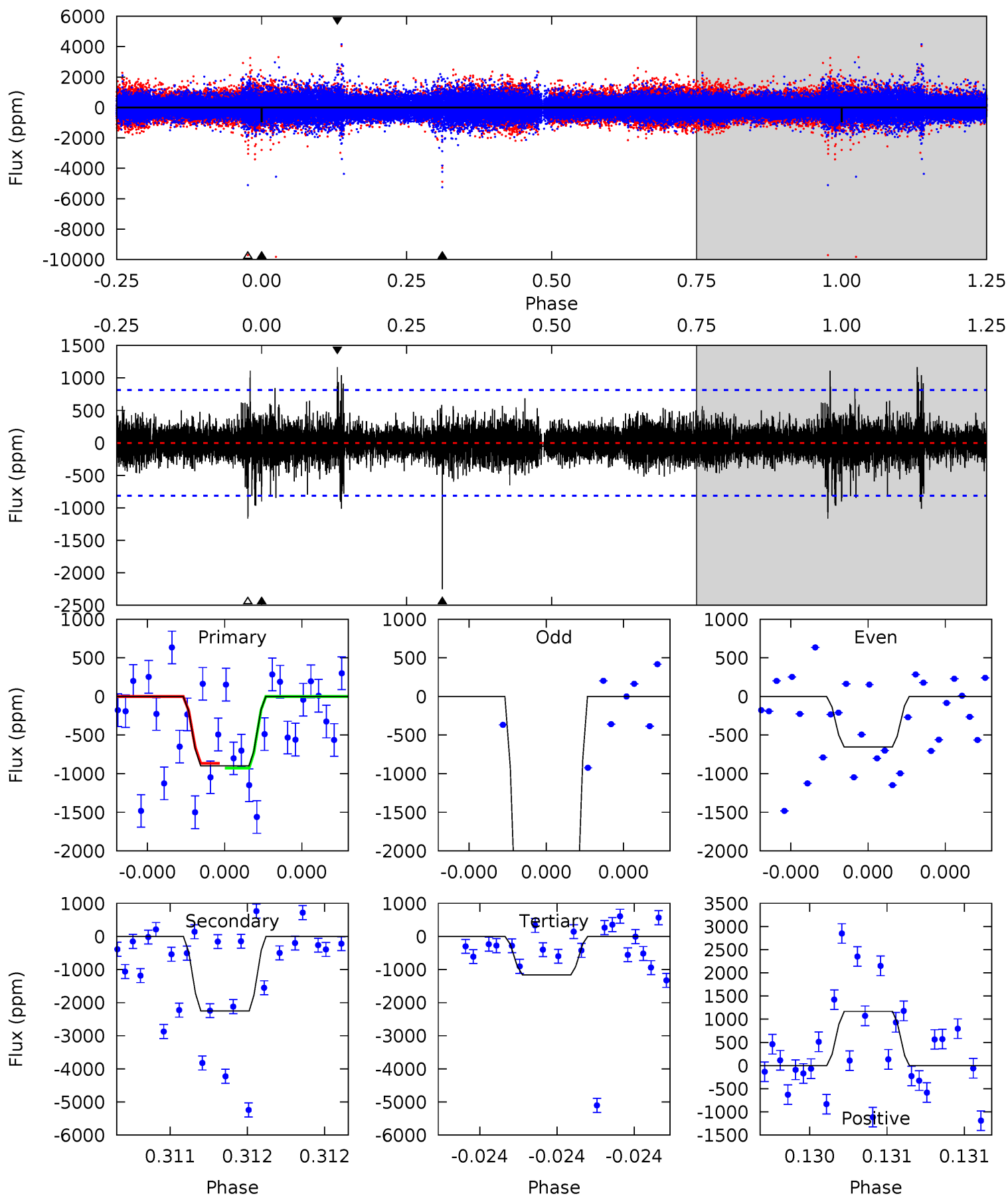
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

007889496-04, P = 560.662830 Days, E = 457.741784 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.30	15.8	8.17	8.18	5.70	3.68	1.16	-1.86	-1.87	7.62	7.61	9.90	2.24	0.34	0.21





### Stellar Parameters For KIC 007889496

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5763^{+161}_{-202}$	$4.527^{+0.046}_{-0.184}$	$0.020^{+0.250}_{-0.300}$	$0.904^{+0.241}_{-0.086}$	$1.002^{+0.102}_{-0.125}$	$1.913^{+0.463}_{-0.911}$
	+3%/-4%	+1%/-4%	+1250%/-1500%	+27%/-10%	+10%/-12%	+24%/-48%
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 007889496-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$11.73^{+8.83}_{-7.39}$	$298^{+19}_{-14}$	$-4605^{+18953}_{-8053}$	$-29849.728^{+1327141.548}_{-1084382.068}$
Alt.	$-2252 \pm 143$	$9.33^{+9.38}_{-6.42}$	$299^{+19}_{-14}$	$4395^{+3029}_{-962}$	$24715^{+219214}_{-18660}$

$T_{max}$  = 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

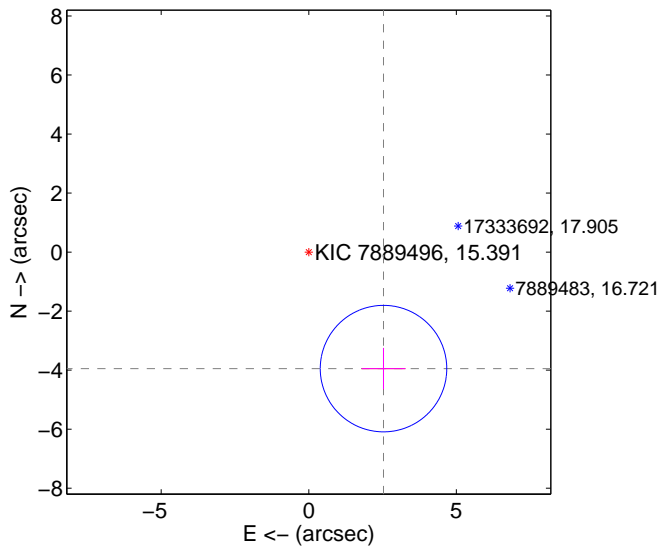
Supplemental centroid analysis for 007889496-04. Kepler magnitude: 15.39. Transit SNR -1.00

There are 0 quarters with good PRF difference image offsets

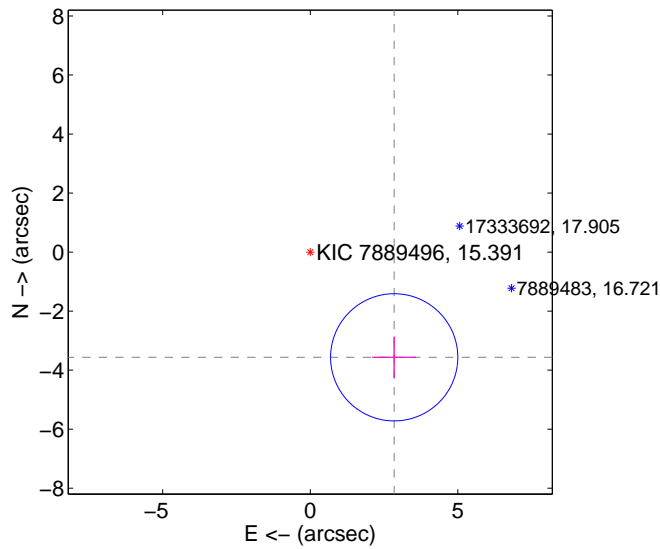
The direct PRF centroid is offset from the target star catalog position by about 0.49 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.690 \pm 0.714$	6.57	$-2.533 \pm 0.743$	$-3.948 \pm 0.702$
PRF-fit source offset from KIC position	$4.561 \pm 0.718$	6.35	$-2.844 \pm 0.743$	$-3.565 \pm 0.702$
photometric centroid source offset	$1.25 \pm 0.60$	2.08	$0.84 \pm 0.59$	$-0.93 \pm 0.61$

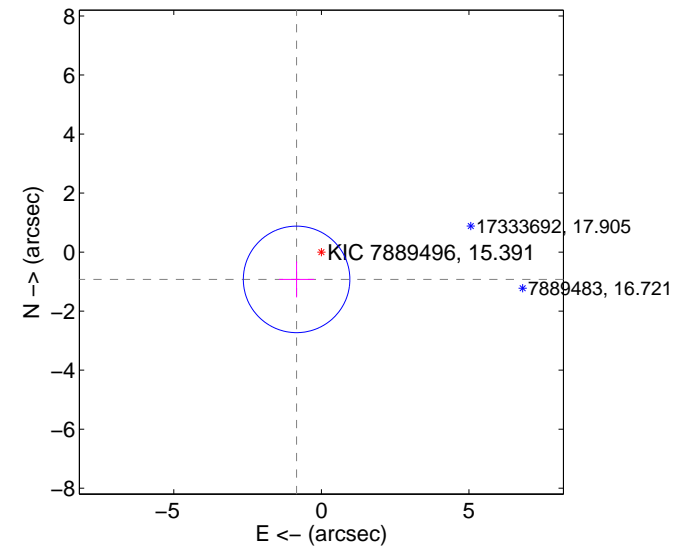
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

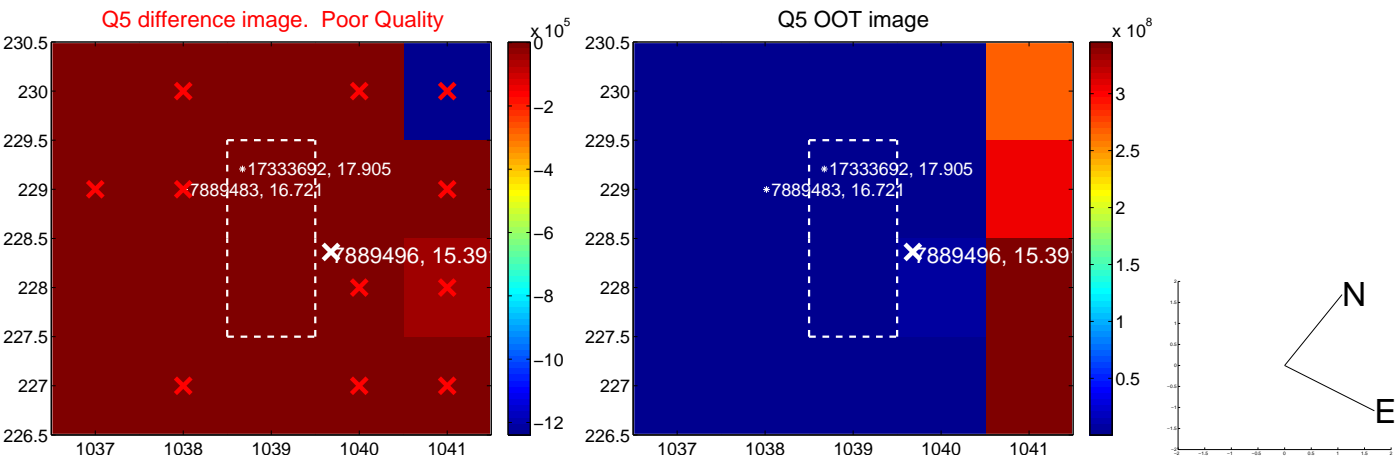


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

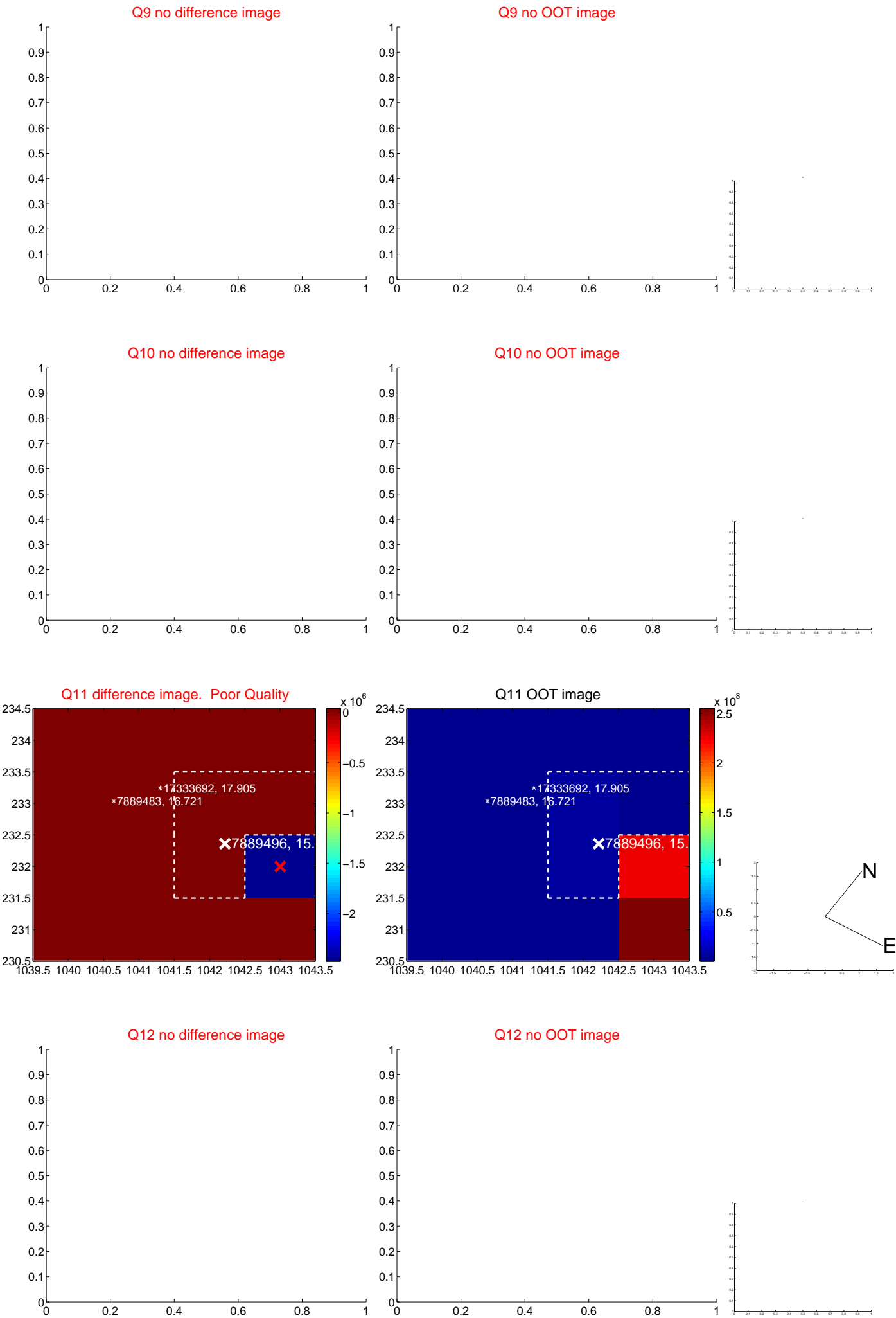
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



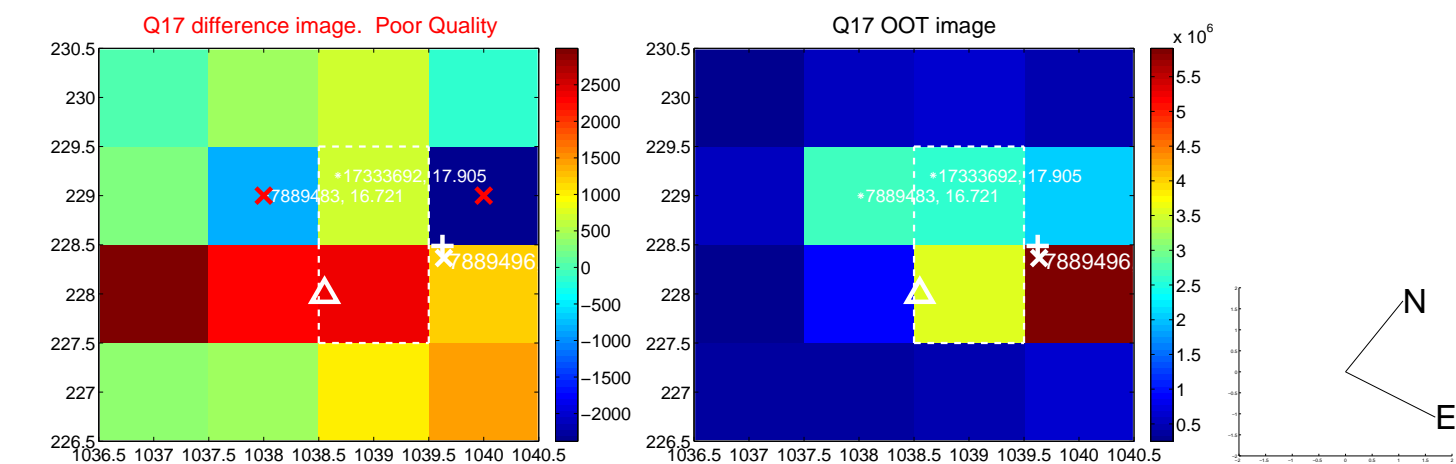
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



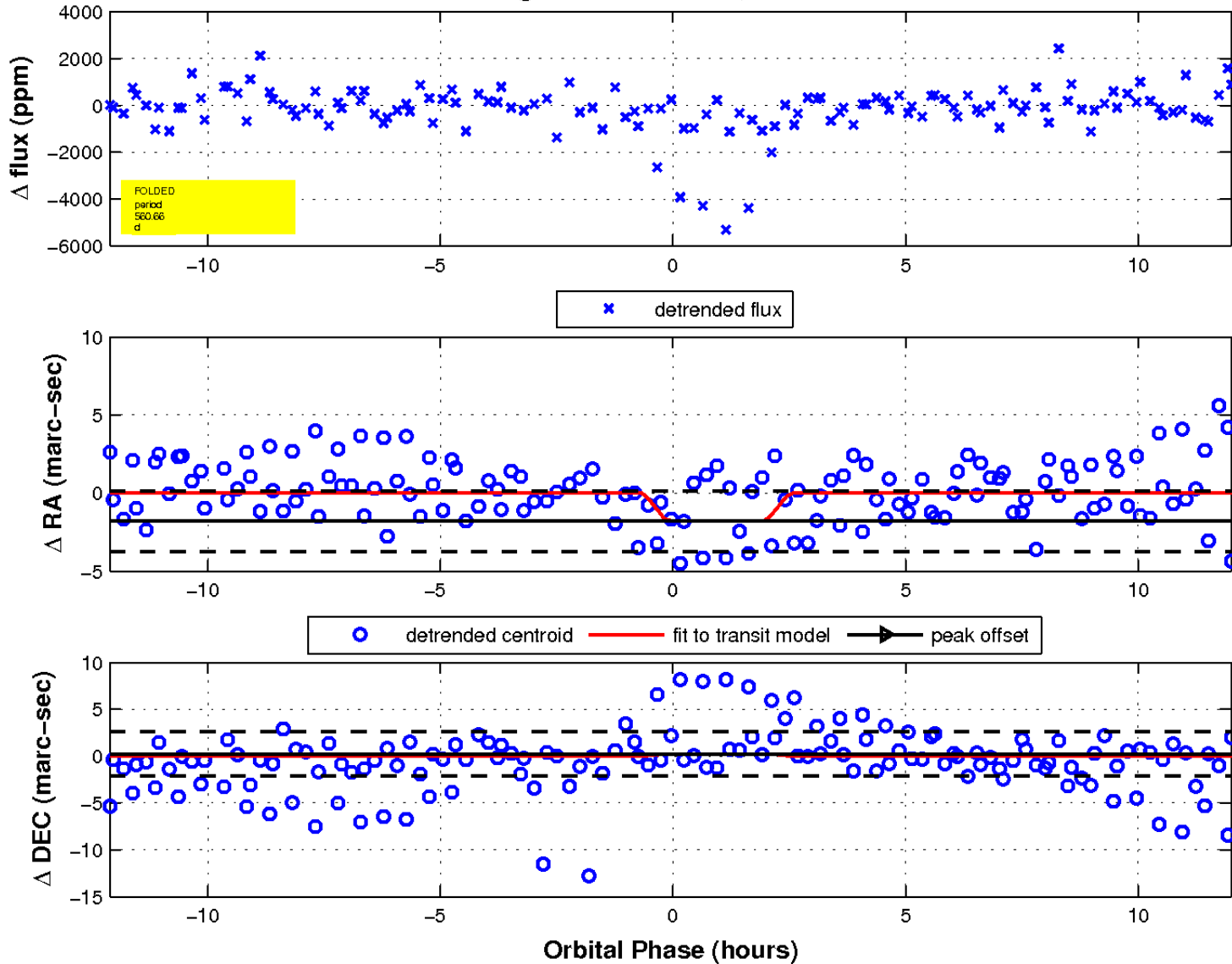
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

