

# KIC 007534011

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007534011-01	OBS	No	509.528935	357.786047	100.4	14.663	8.6	8.4	1.93	5594	2.17	1.85
007534011-02	OBS	No	507.359846	360.900167	68.0	33.855	7.8	5.3	1.93	5594	1.69	1.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007534011-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—INCONSISTENT_TRANS—CENT_SATURATED
007534011-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED

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

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

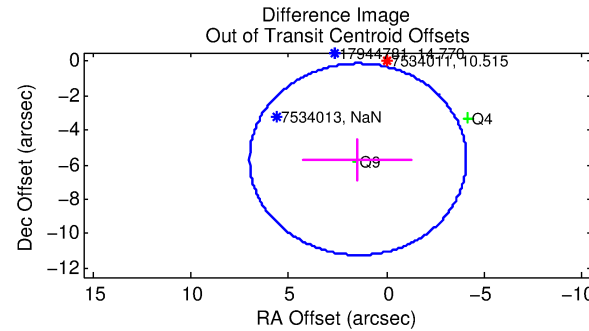
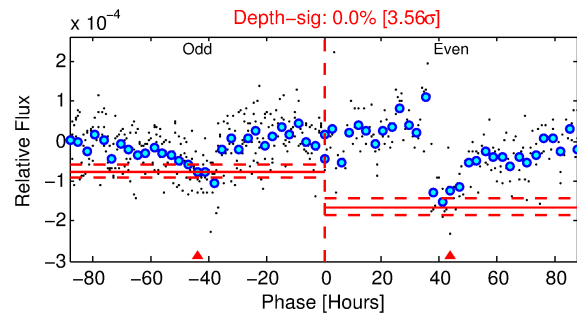
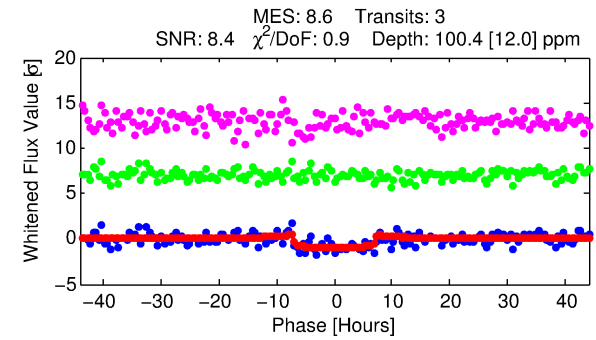
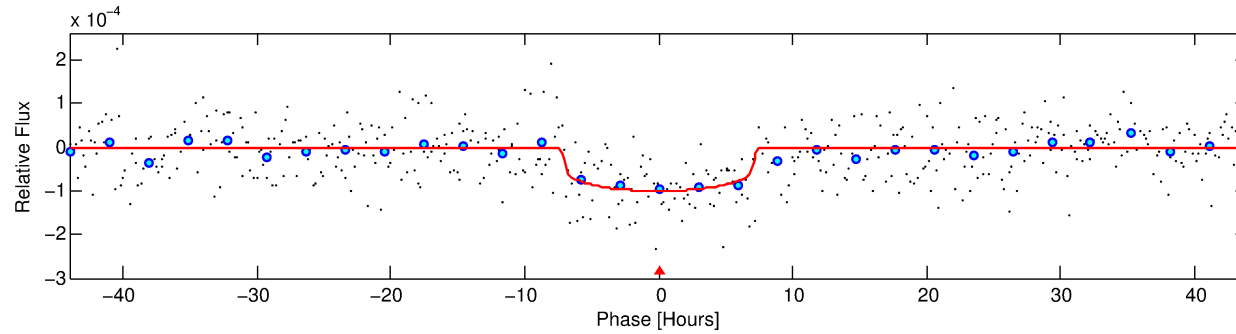
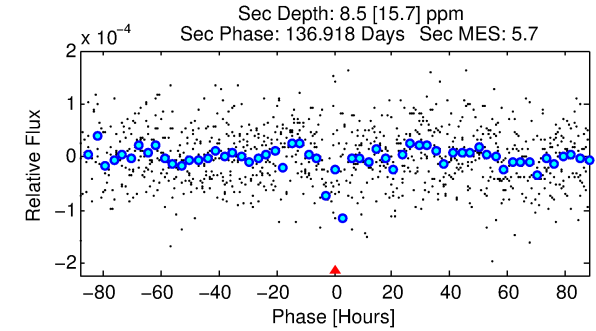
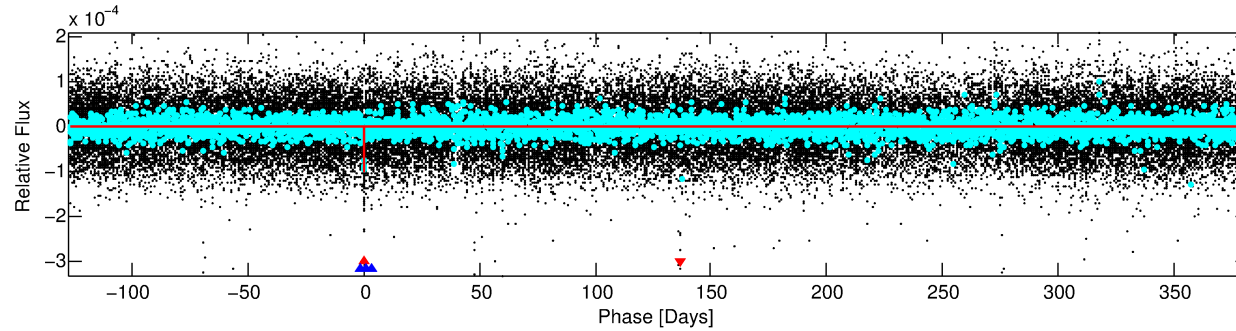
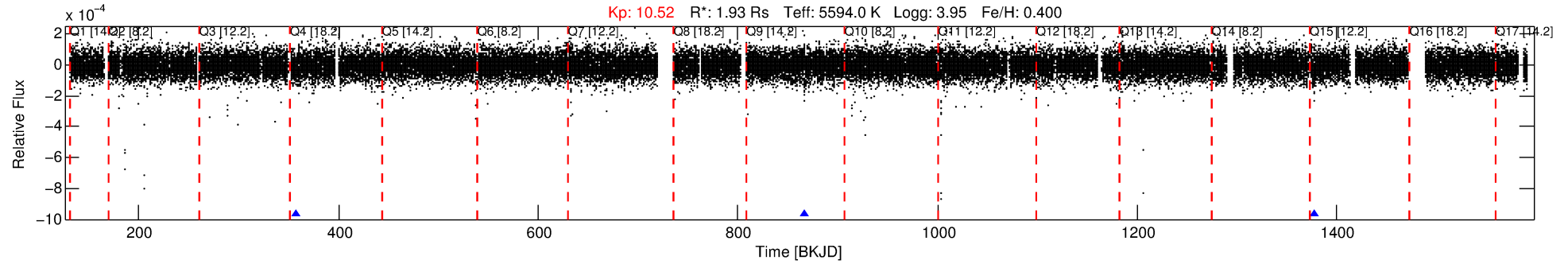
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007534011-01

No Significant Match Found

# DV One-Page Summary

KIC: 7534011 Candidate: 1 of 2 Period: 509.529 d



## DV Fit Results:

Period = 509.52894 [0.01238] d  
Epoch = 357.7860 [0.0151] BKJD  
Rp/R\* = 0.0103 [0.0035]  
a/R\* = 159.36 [225.26]  
b = 0.81 [0.60]  
Seff = 1.85 [0.14]  
Teq = 297 [6] K  
Rp = 2.17 [0.75] Re  
a = 1.3303 [0.0348] AU  
Ag = 1753.24 [3465.30] [0.51σ]  
Teffp = 2976 [1471] K [1.82σ]

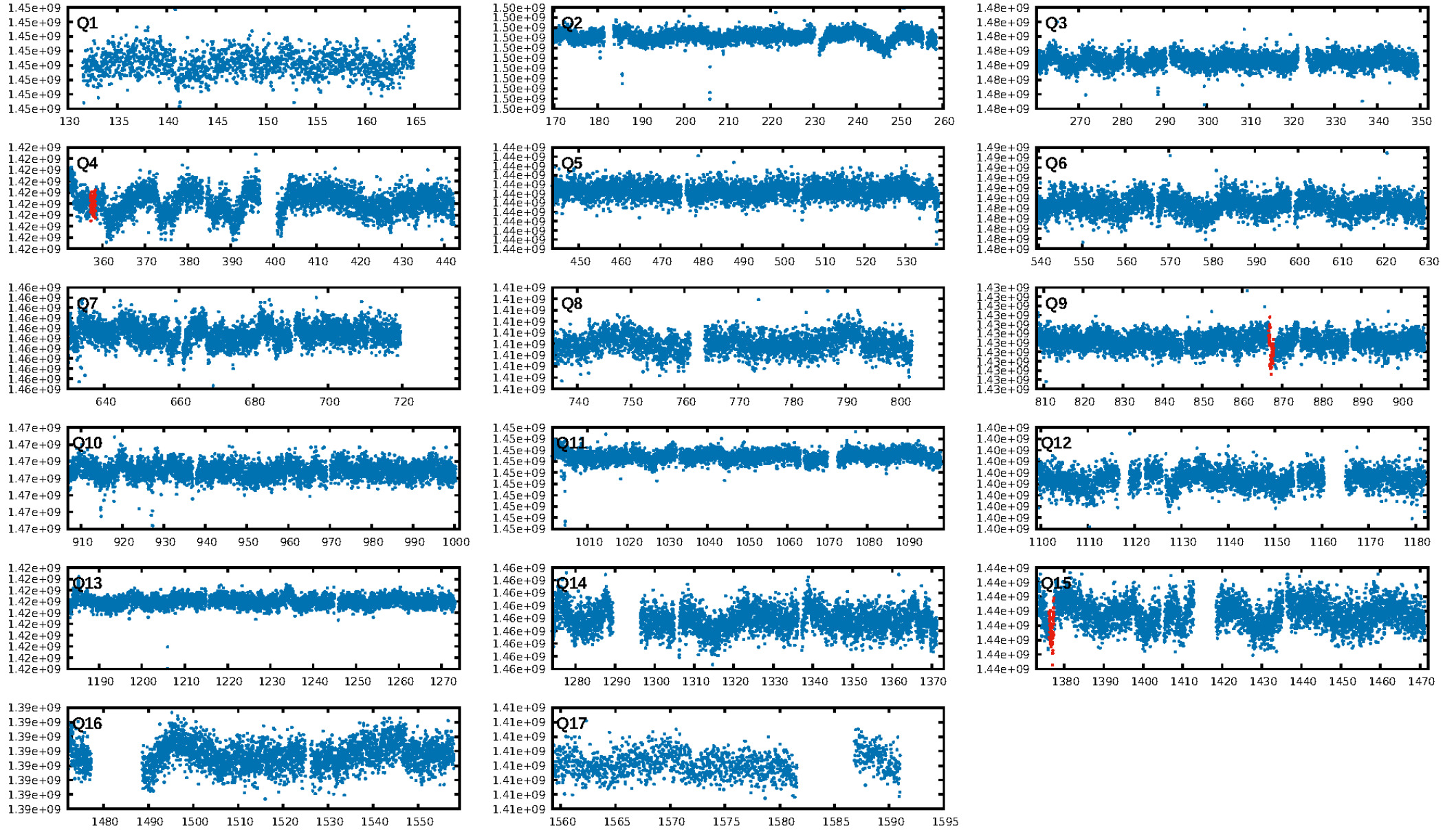
## DV Diagnostic Results:

ShortPeriod-sig: 84.2% [1.41σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 4.0%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 7.13e-09**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 3.731  
**Centroid-sig: 0.0%**  
Centroid-so: 4.009 arcsec [2.91σ]  
**OotOffset-rm: 5.877 arcsec [3.18σ]**  
KicOffset-rm: 6.541 arcsec [2.68σ]  
OotOffset-st: 0/0/1/1 [2]  
KicOffset-st: 0/0/1/1 [2]  
DiffImageQuality-fgm: 0.50 [1/2]  
DiffImageOverlap-fno: 0.33 [1/3]

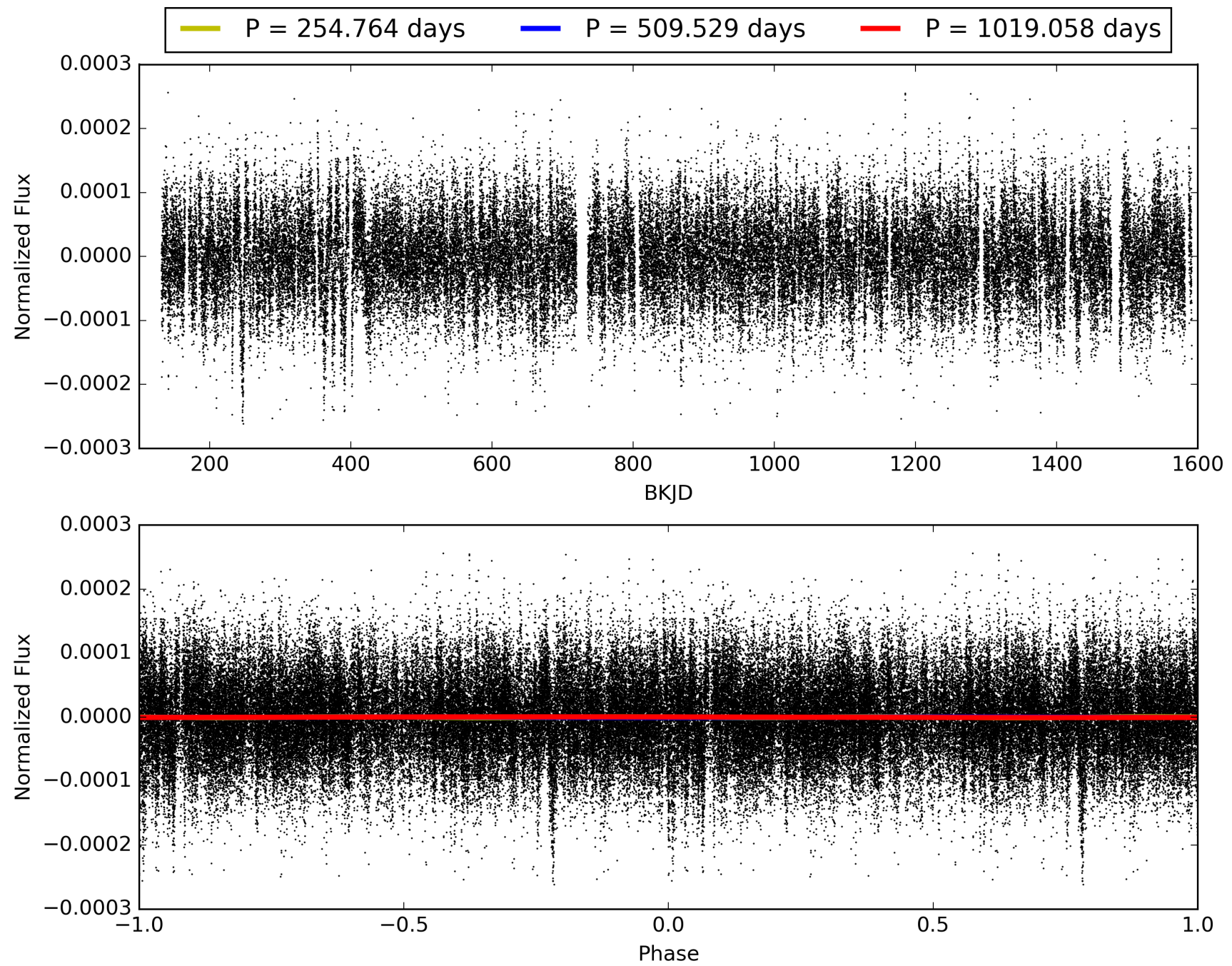
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:30:00 Z

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

# TCE 007534011-01, PDC Light Curves

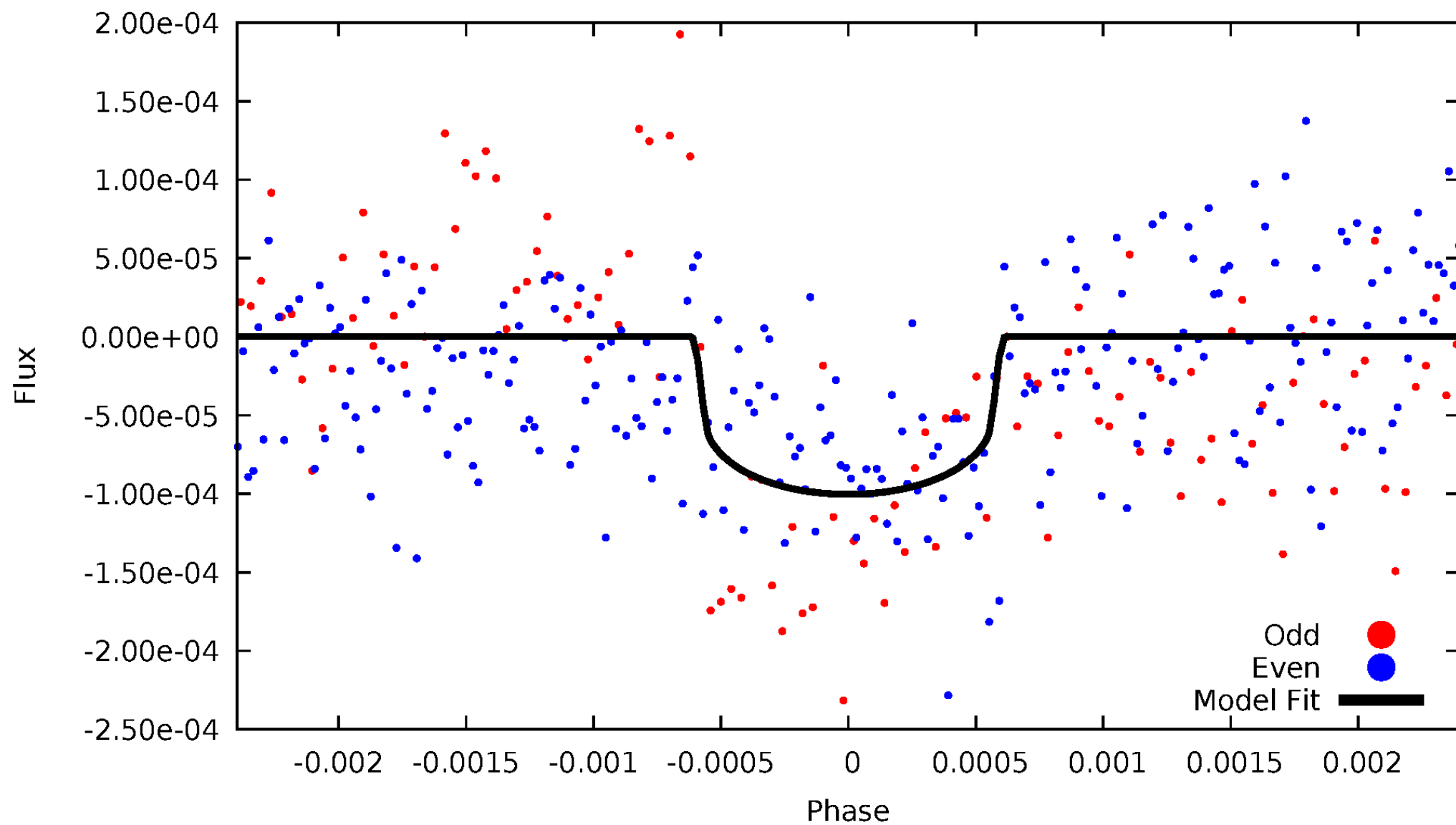


TCE 007534011-01



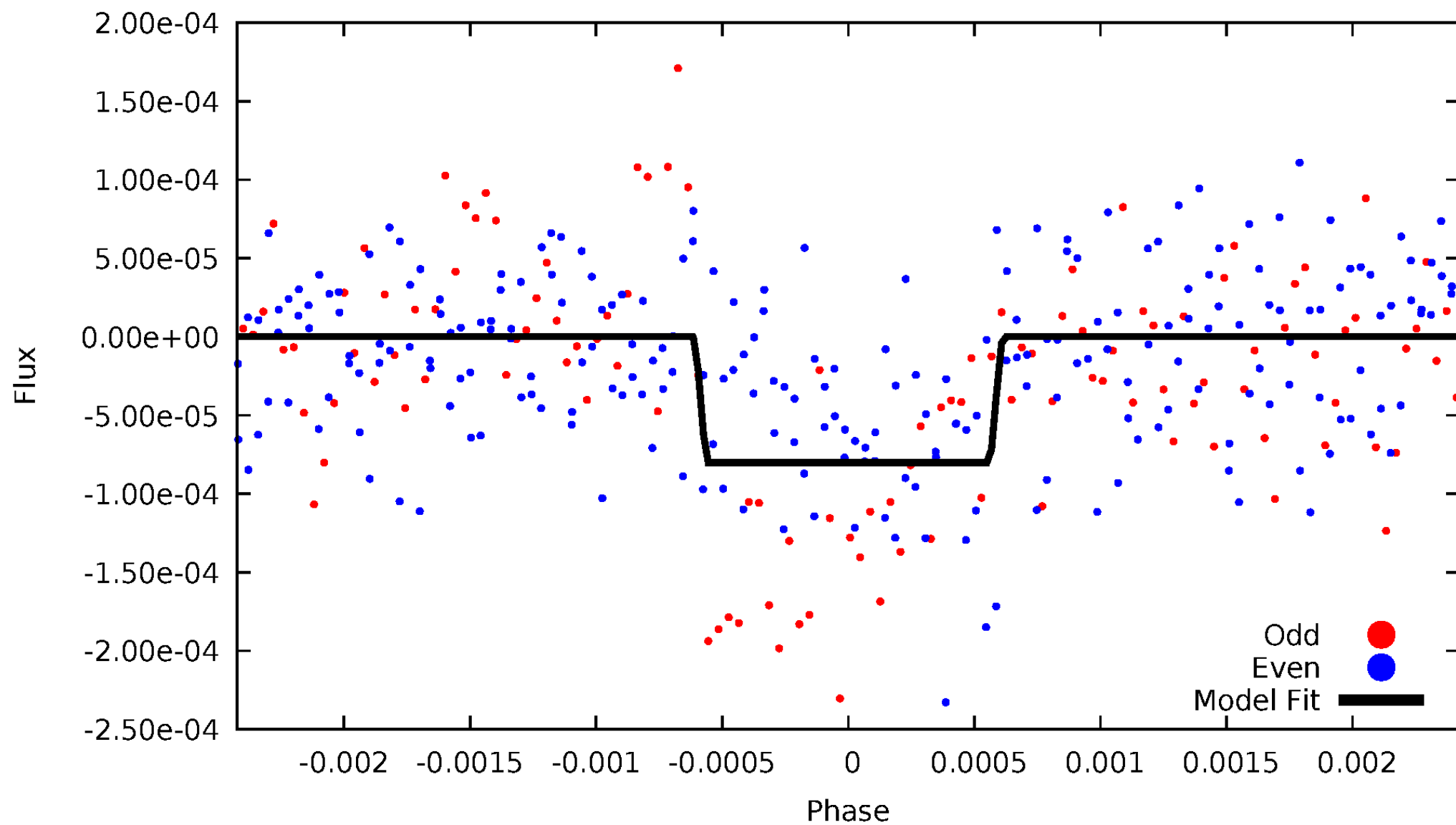
# DV Odd/Even

TCE 007534011-01

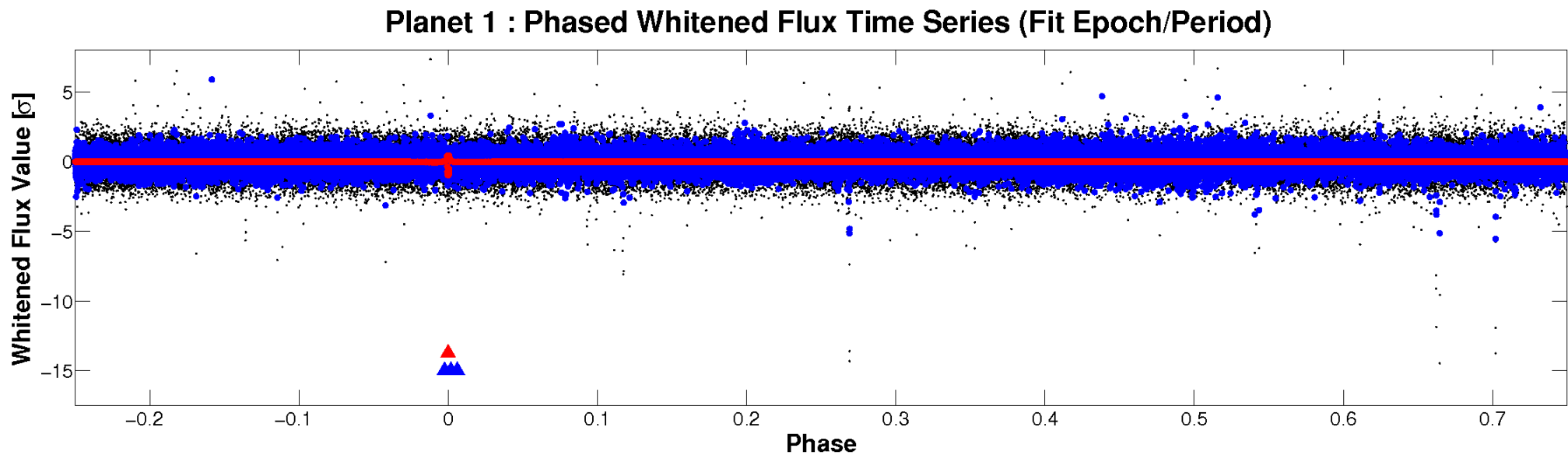
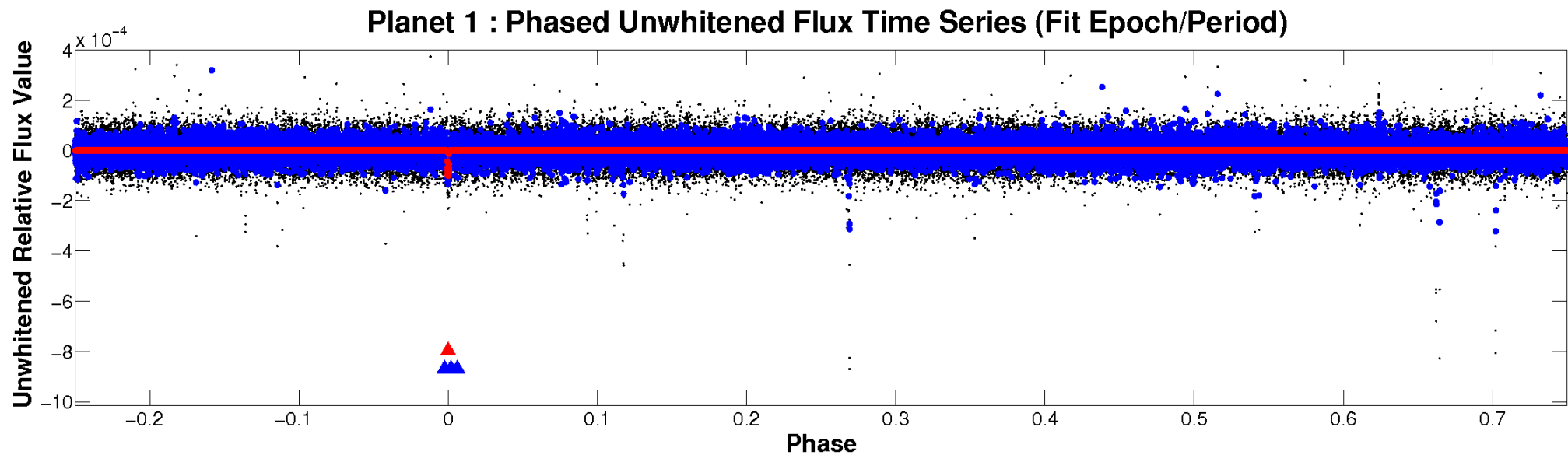


# ALT Odd/Even

TCE 007534011-01



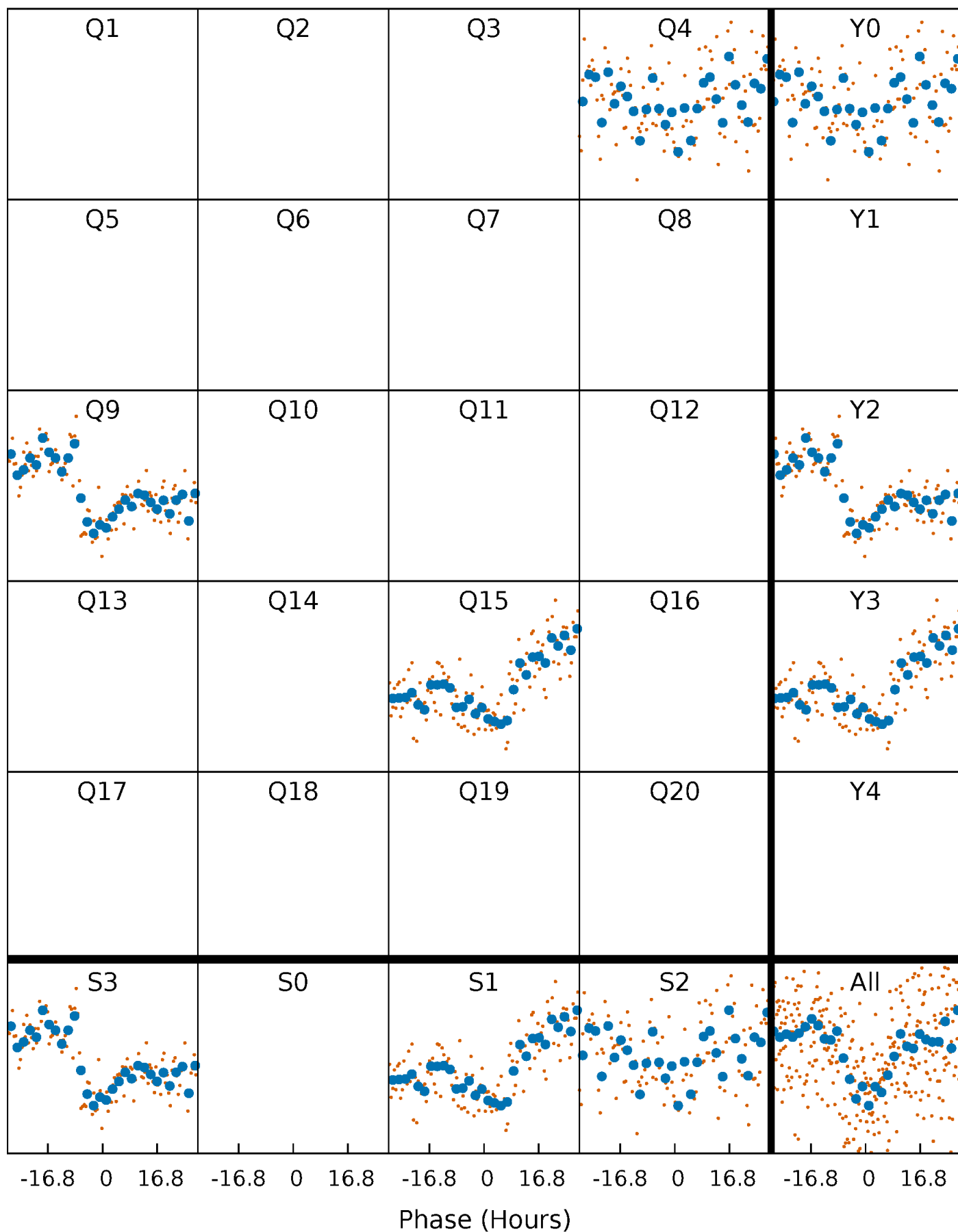
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

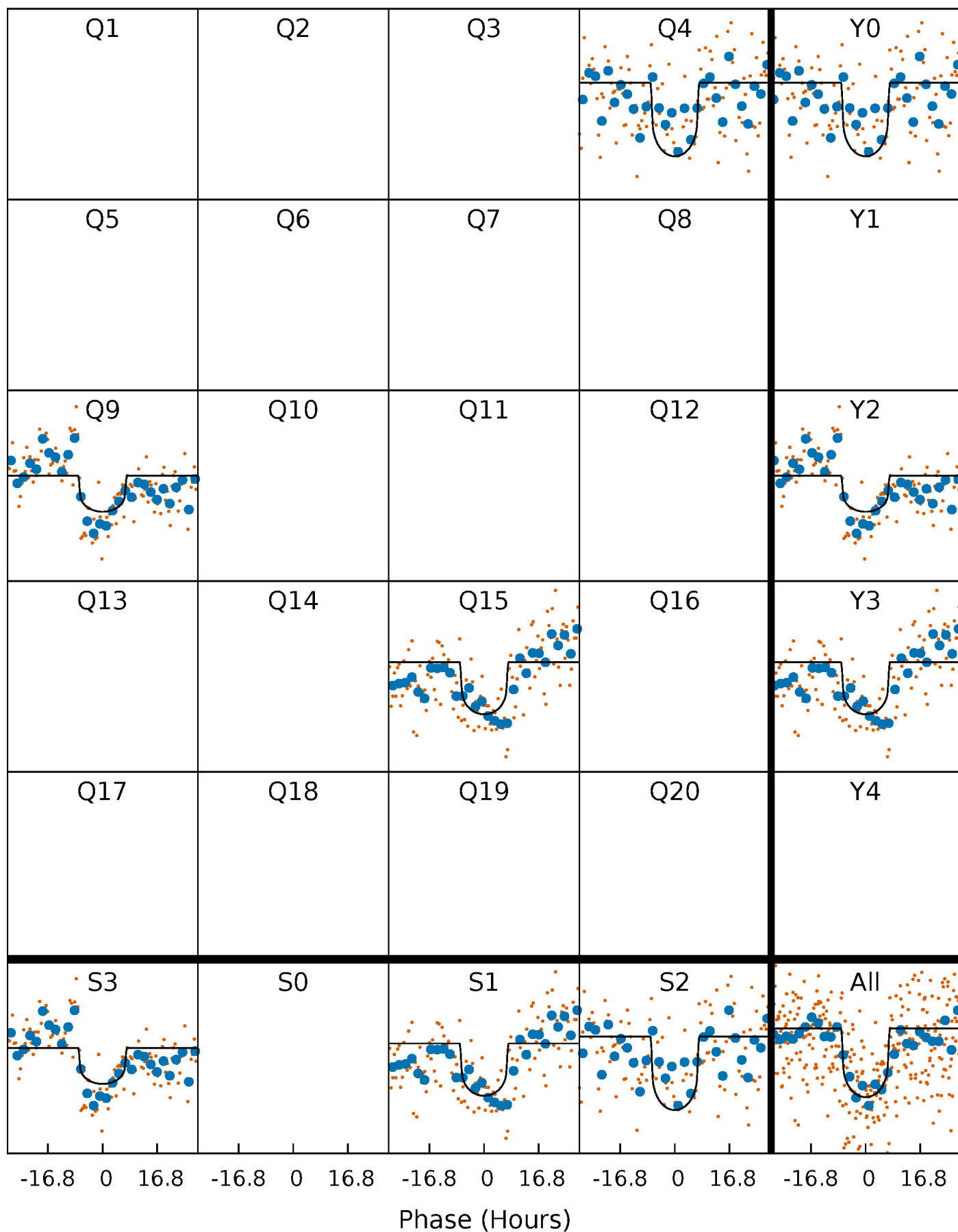
TCE 007534011-01 P=509.528935 Days  $T_0=357.786046$  (BKJD)





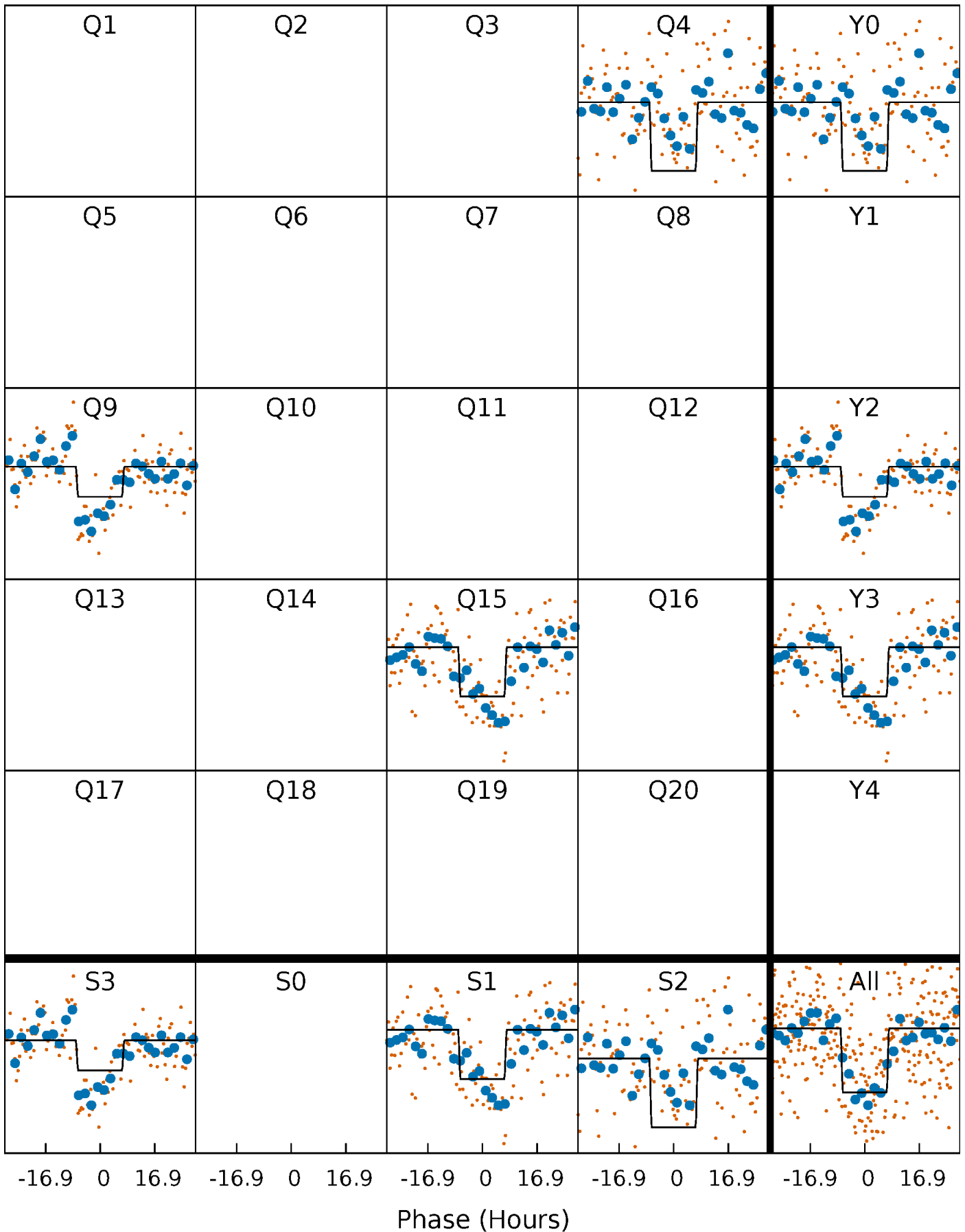
# DV Quarter-Phased Transit Curves

TCE 007534011-01 P=509.528935 Days  $T_0=357.786046$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

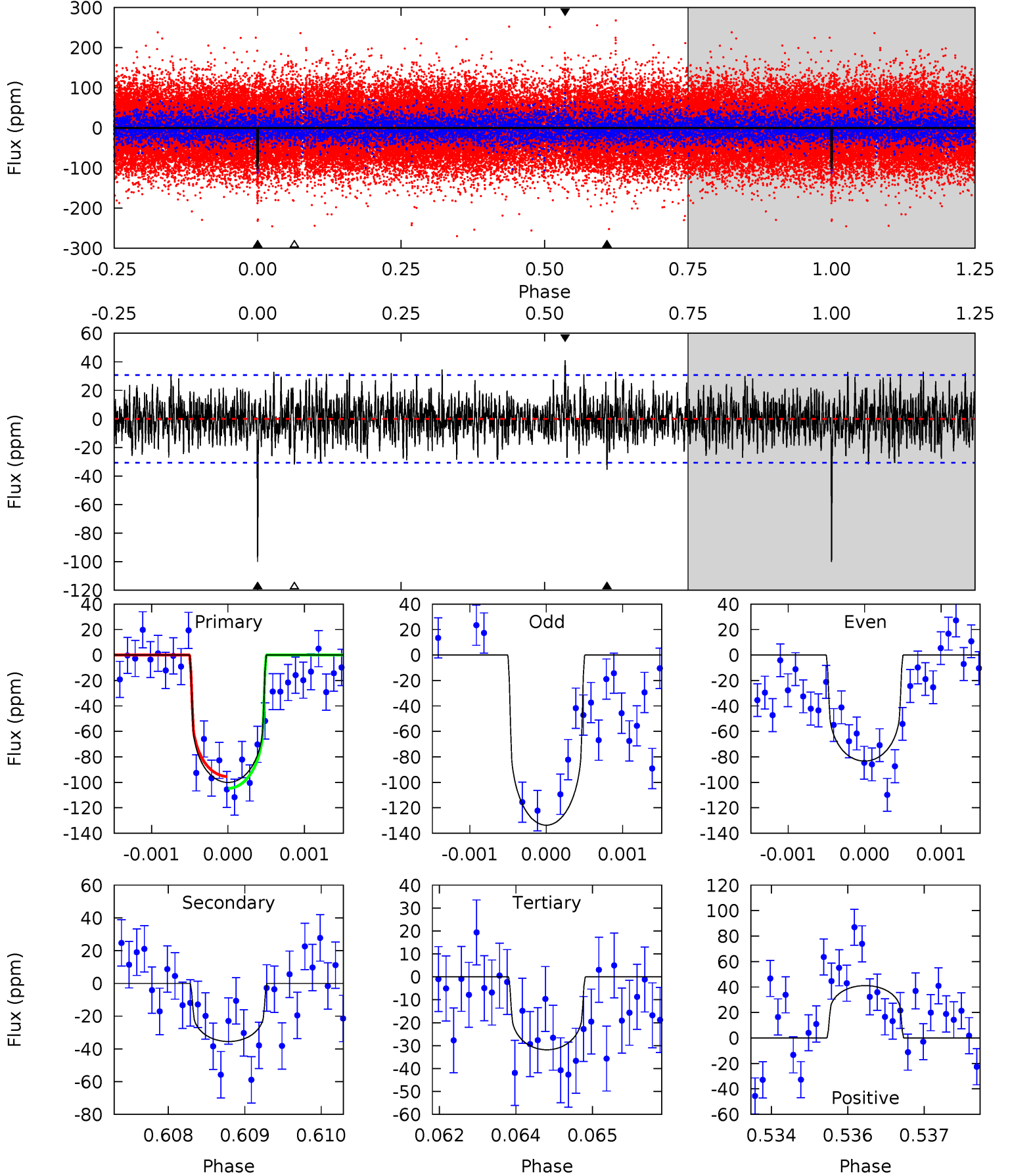
TCE 007534011-01 P=509.524441 Days  $T_0=357.798126$  (BKJD)



# DV Model-Shift Uniqueness Test

007534011-01, P = 509.528935 Days, E = 357.786046 Days

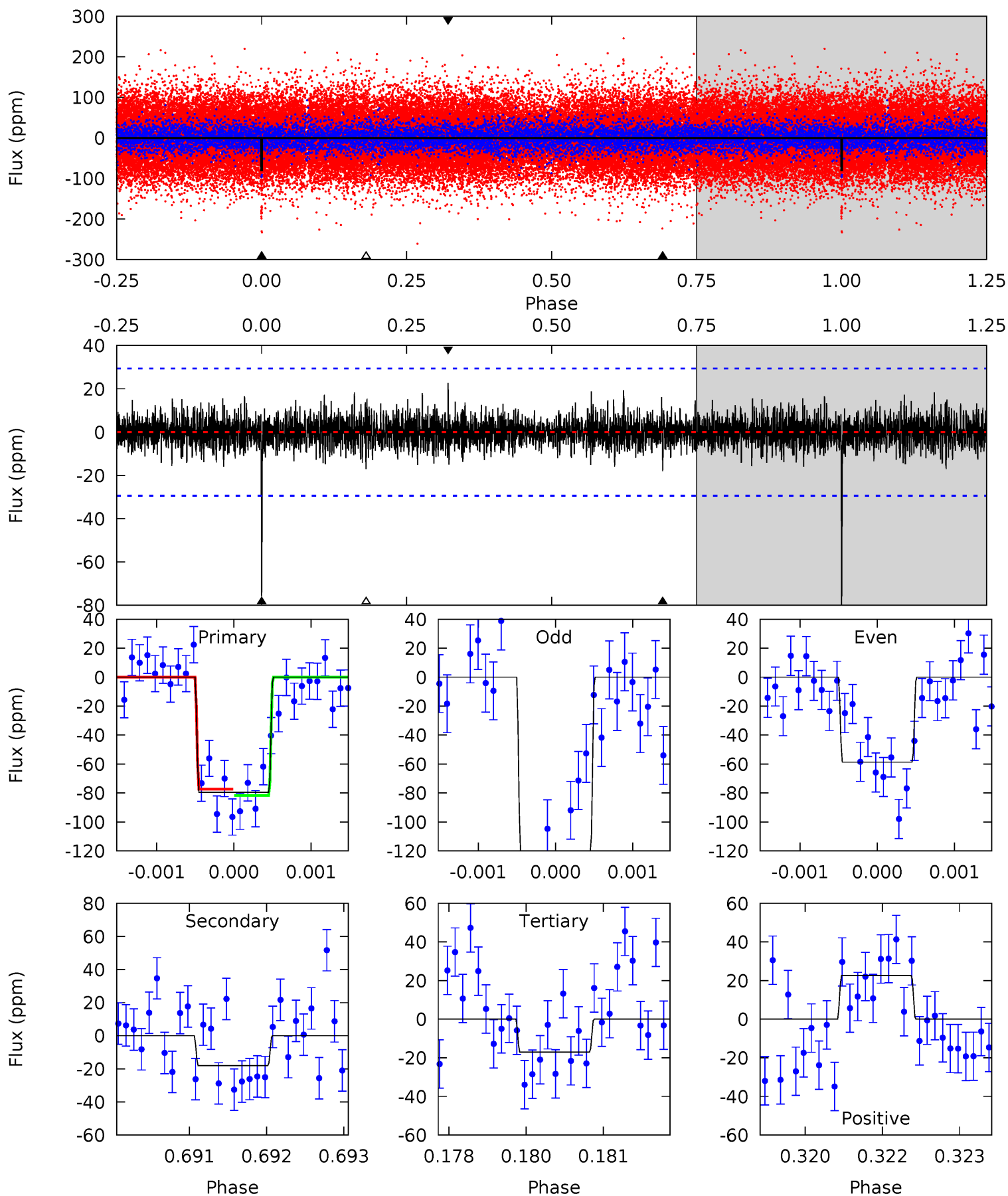
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.7	6.27	5.62	7.26	5.42	3.23	1.84	12.1	10.4	0.65	-0.99	4.17	0.95	0.29	0.82



# Alt Model-Shift Uniqueness Test

007534011-01, P = 509.524441 Days, E = 357.798126 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
14.7	3.33	3.14	4.17	5.42	3.23	0.92	11.5	10.5	0.19	-0.84	5.40	0.86	0.22	0.40



### Stellar Parameters For KIC 007534011

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5594^{+99}_{-88}$	$3.948^{+0.013}_{-0.012}$	$0.400^{+0.050}_{-0.150}$	$1.933^{+0.070}_{-0.064}$	$1.208^{+0.163}_{-0.054}$	$0.236^{+0.014}_{-0.012}$
	+2%/-2%	+0%/-0%	+12%/-37%	+4%/-3%	+13%/-4%	+6%/-5%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007534011-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-35 \pm 6$	$2.17^{+0.72}_{-0.78}$	$416^{+8}_{-7}$	$4447^{+923}_{-476}$	$7310^{+10462}_{-3315}$
Alt.	$-18 \pm 5$	$1.88^{+0.79}_{-0.74}$	$416^{+8}_{-7}$	$4124^{+878}_{-507}$	$4850^{+8421}_{-2563}$

$T_{\text{max}}$  = 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

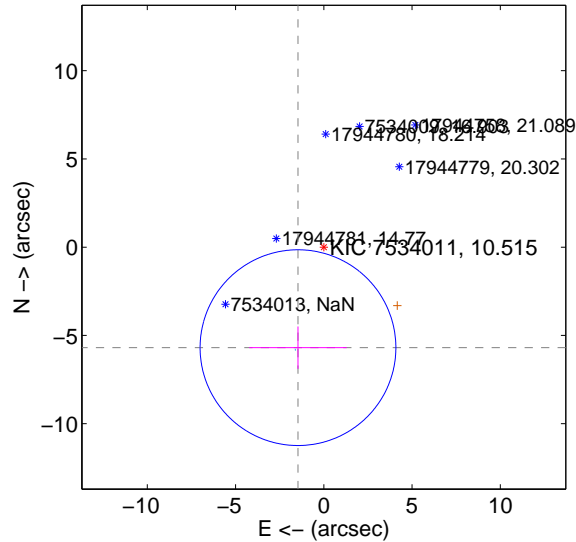
Supplemental centroid analysis for 007534011-01. **Kepler magnitude: 10.52.** Transit SNR 8.41

**There are 1 quarters with good PRF difference image offsets**

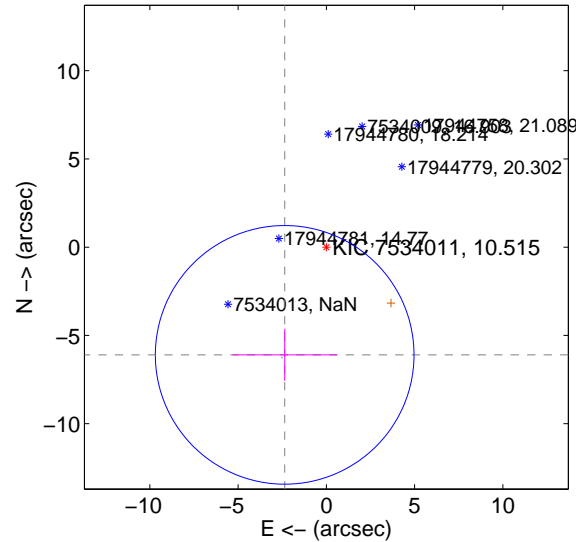
The direct PRF centroid is offset from the target star catalog position by about 1.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>5.877 \pm 1.848</math></b>	<b>3.18</b>	$1.463 \pm 2.763$	$-5.692 \pm 1.199$
PRF-fit source offset from KIC position	$6.541 \pm 2.442$	2.68	$2.360 \pm 2.957$	$-6.100 \pm 1.475$
photometric centroid source offset	$4.01 \pm 1.38$	2.91	$-1.37 \pm 1.57$	$-3.77 \pm 1.35$

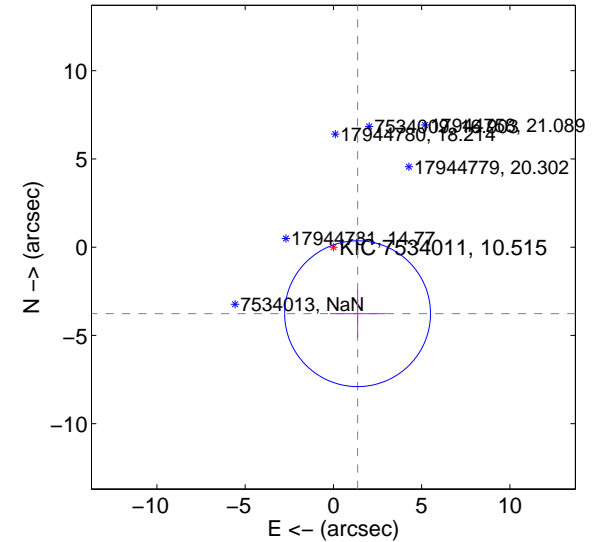
offset from difference PRF-fit to OOT PRF-fit



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.

Q1 no difference image



Q1 no OOT image



Q2 no difference image



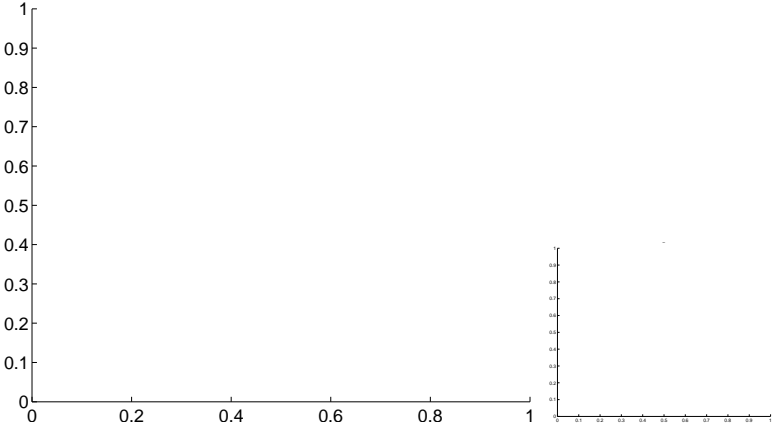
Q2 no OOT image



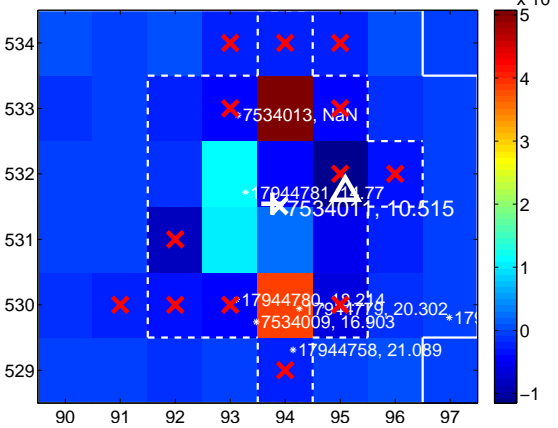
Q3 no difference image



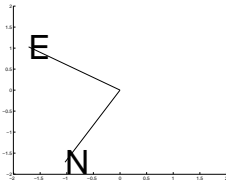
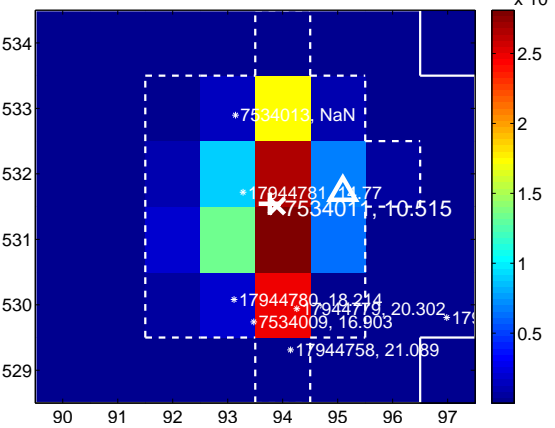
Q3 no OOT image



Q4 difference image. Poor Quality



Q4 OOT image

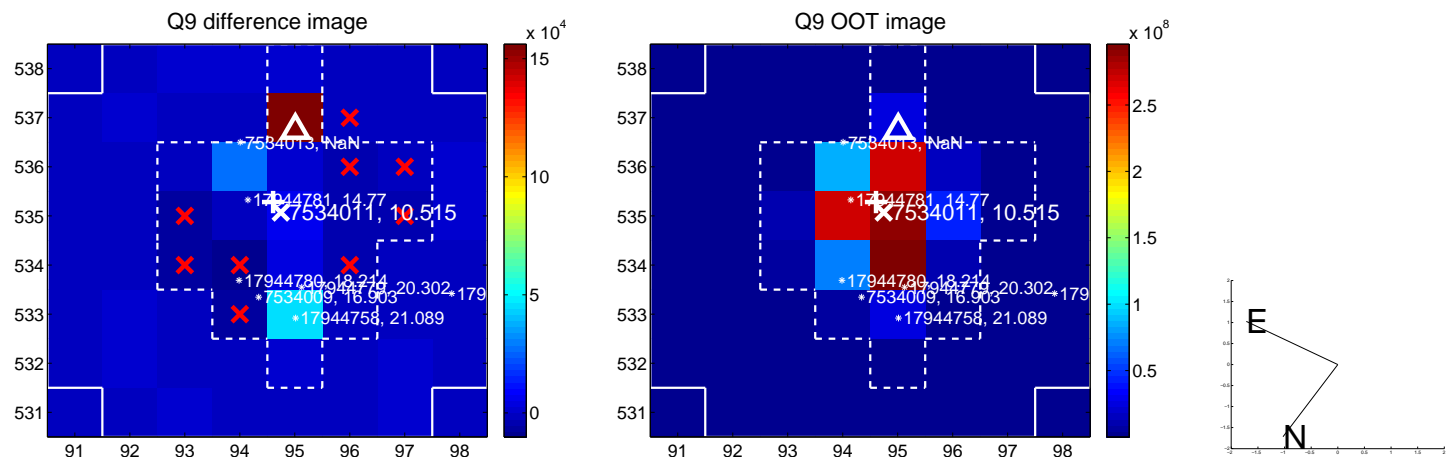




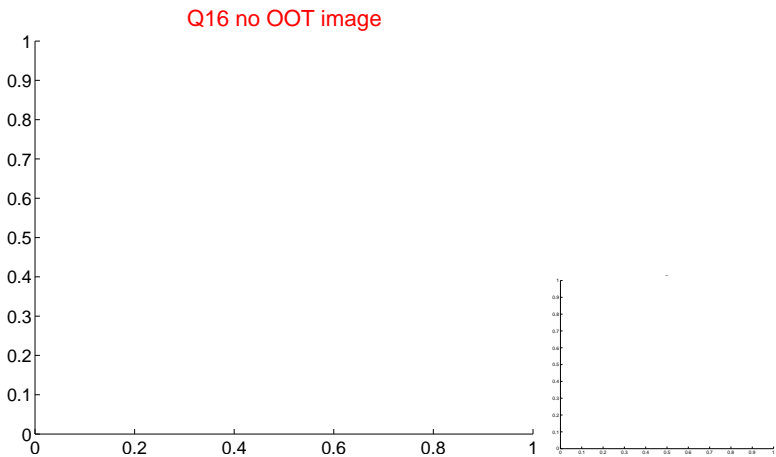
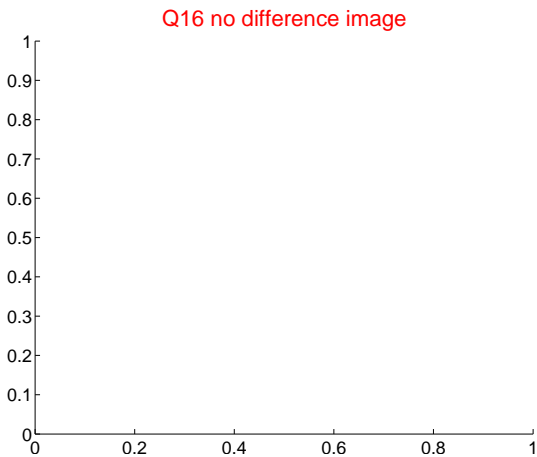
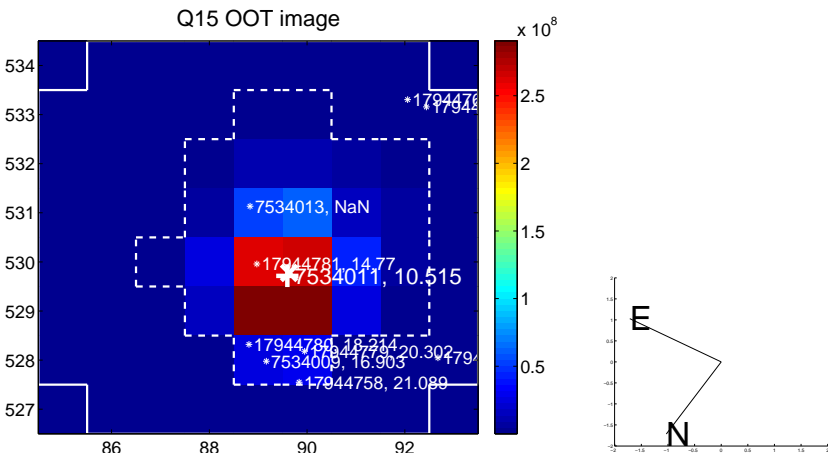
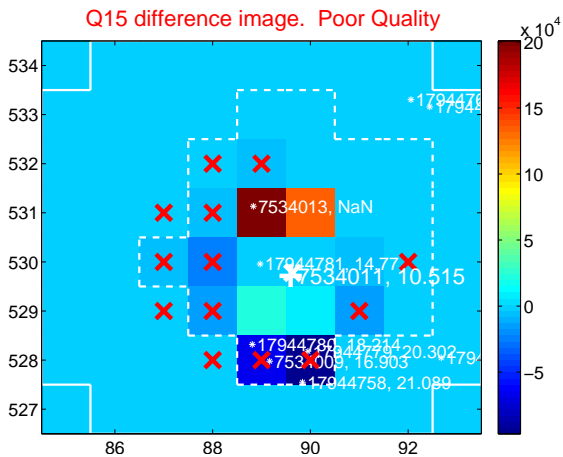
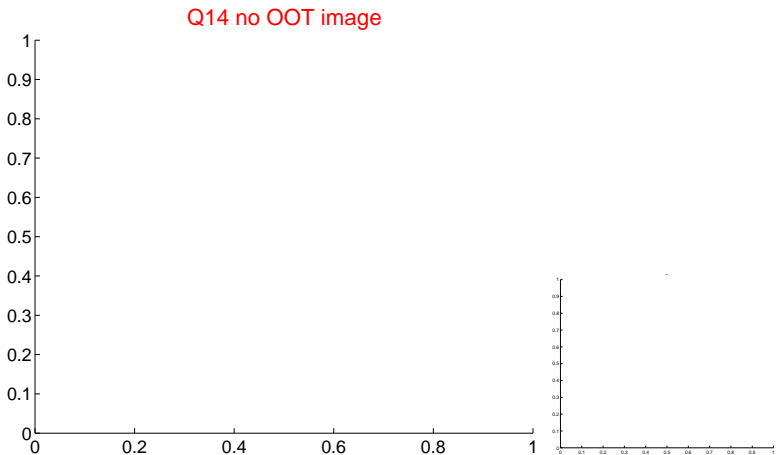
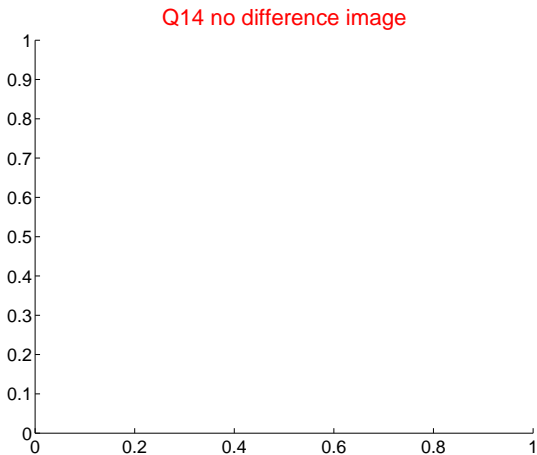
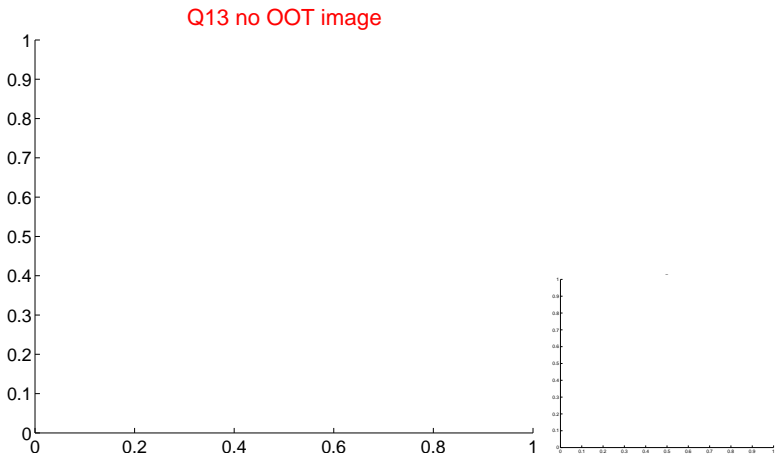
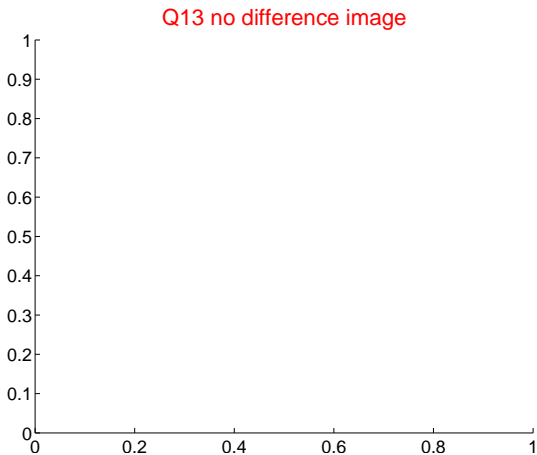
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



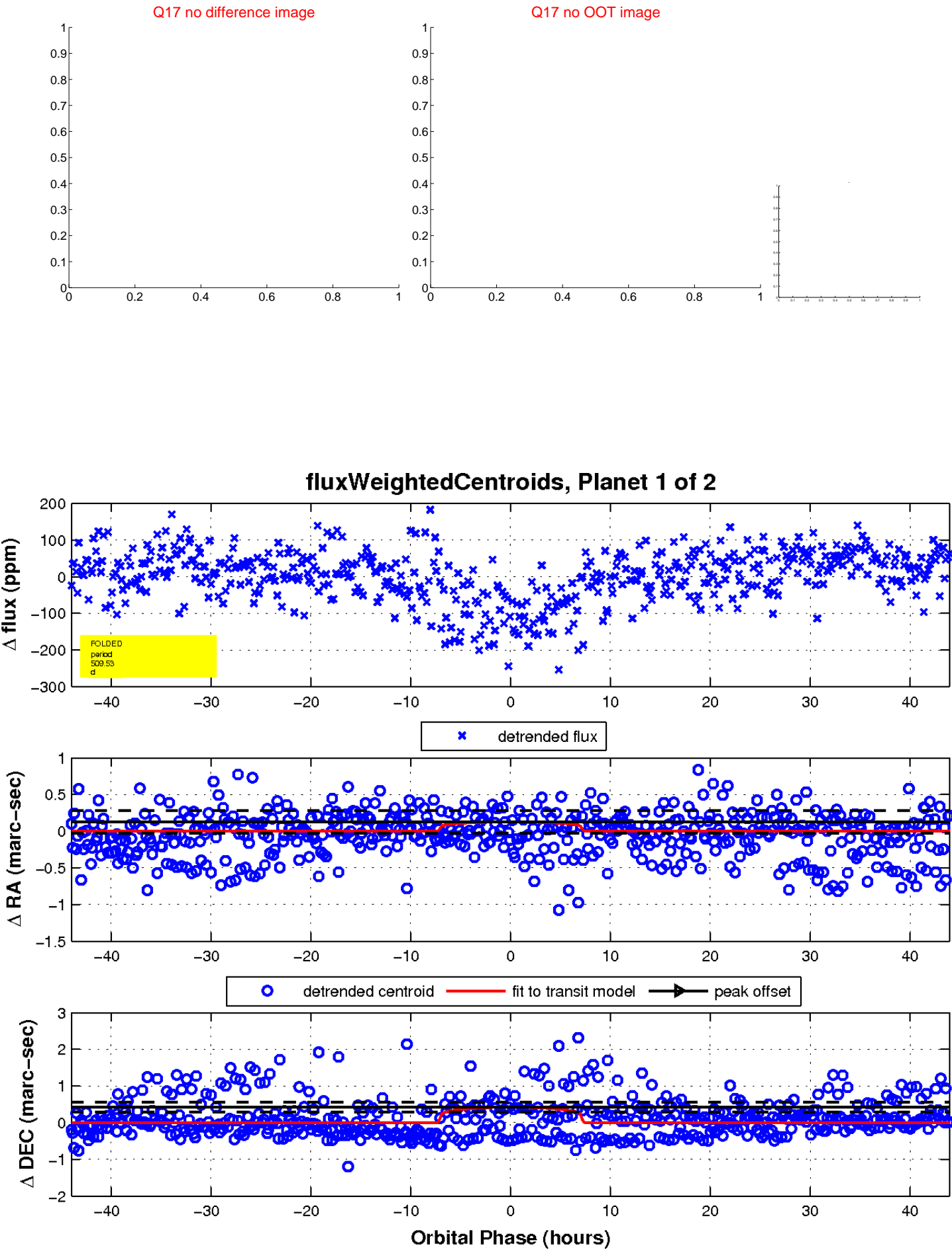
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

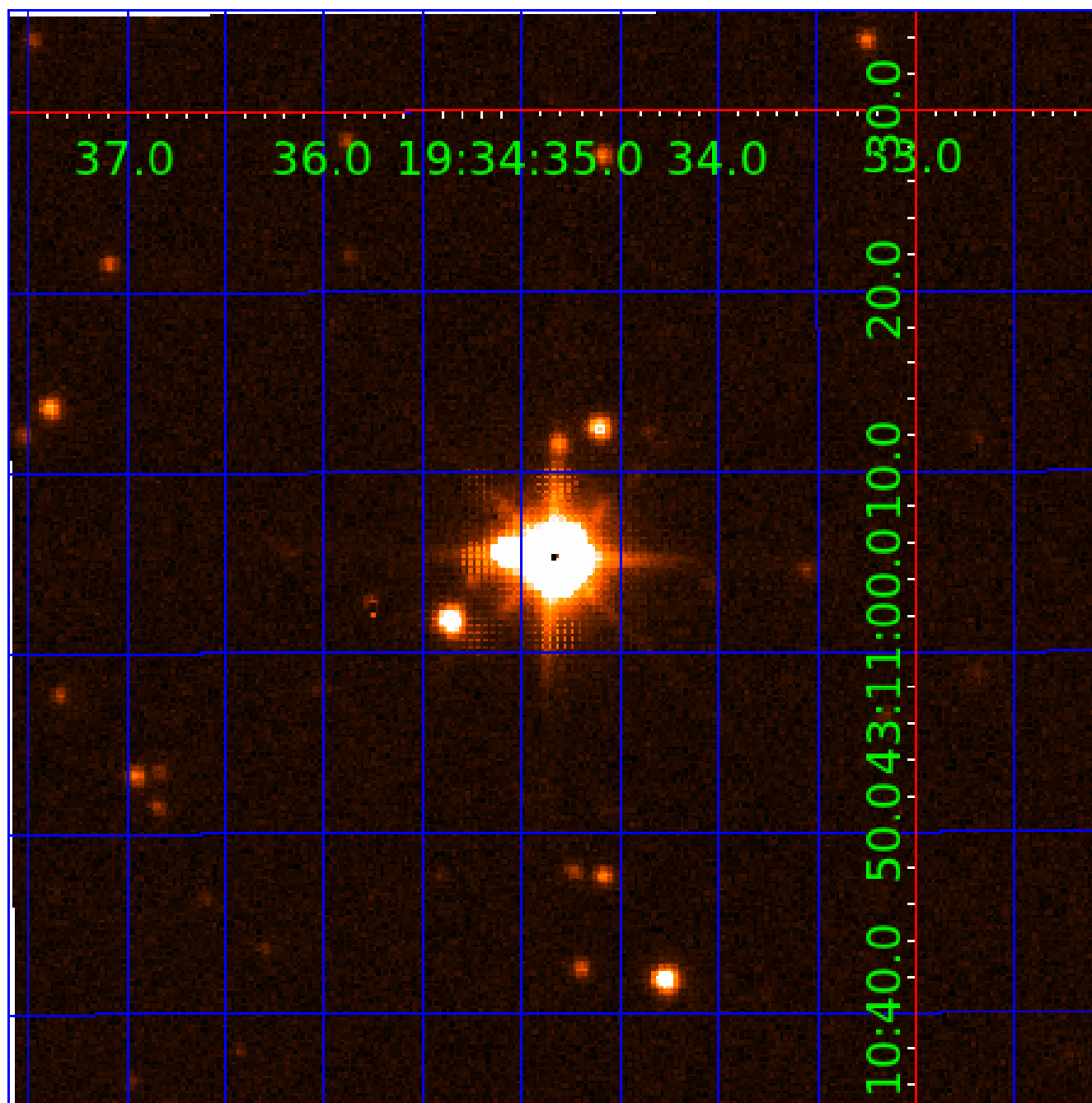


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 007534011

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007534011-01	OBS	No	509.528935	357.786047	100.4	14.663	8.6	8.4	1.93	5594	2.17	1.85
007534011-02	OBS	No	507.359846	360.900167	68.0	33.855	7.8	5.3	1.93	5594	1.69	1.86

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007534011-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL—INCONSISTENT_TRANS—CENT_SATURATED
007534011-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED

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

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

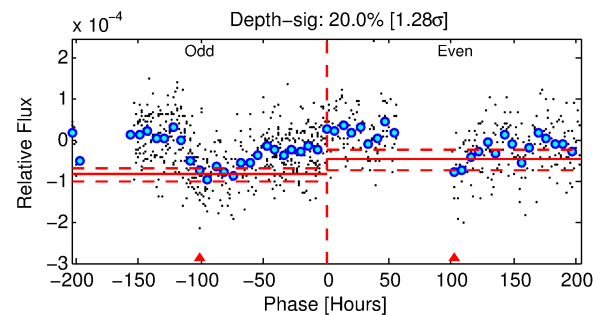
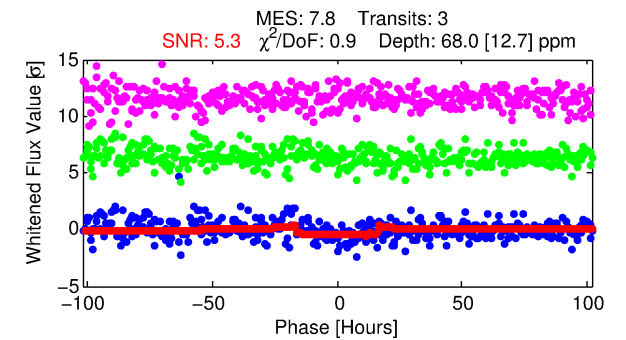
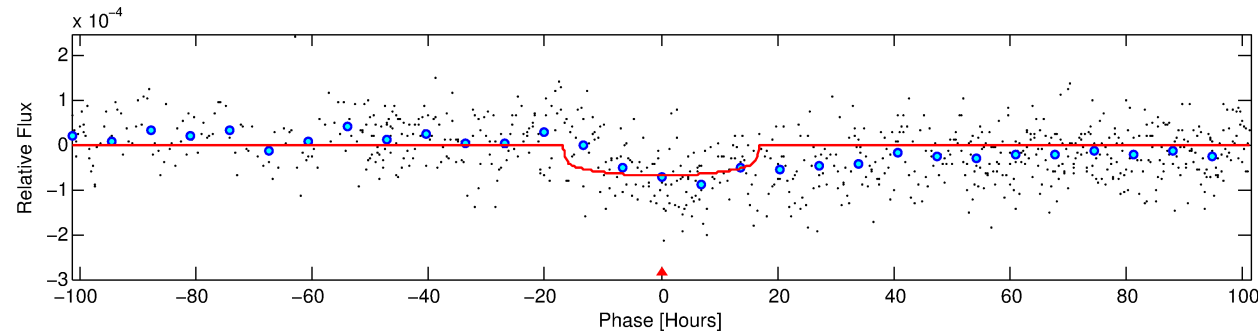
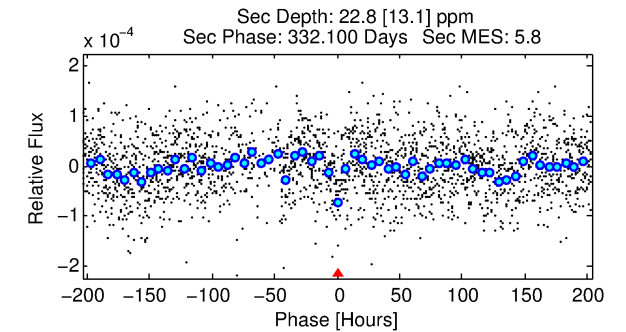
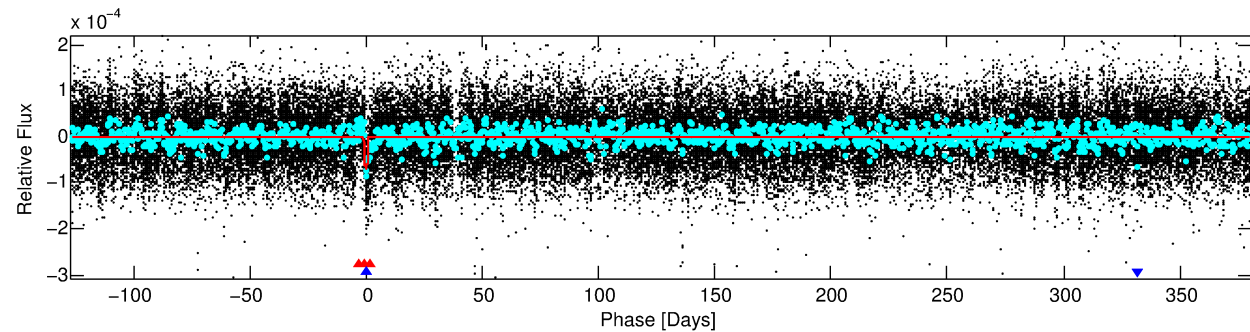
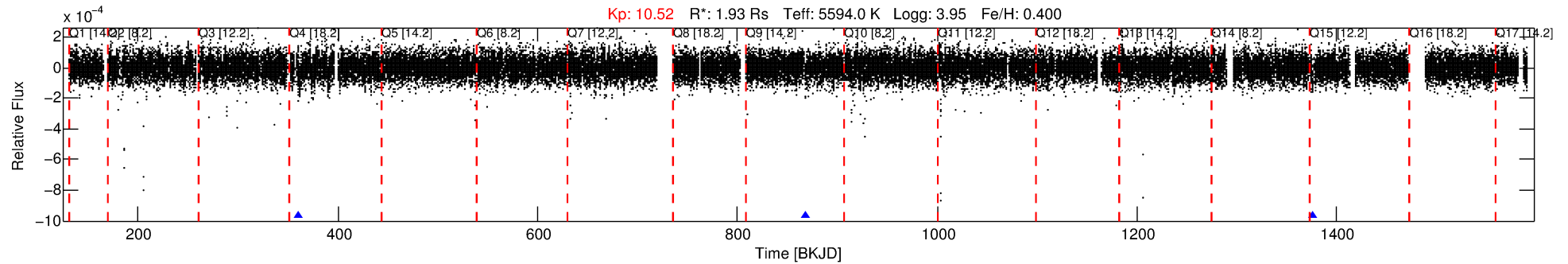
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007534011-02

No Significant Match Found

# DV One-Page Summary

KIC: 7534011 Candidate: 2 of 2 Period: 507.360 d



## DV Fit Results:

Period = 507.35985 [0.02521] d  
Epoch = 360.9002 [0.0271] BKJD  
Rp/R\* = 0.0080 [0.0024]  
a/R\* = 85.80 [96.13]  
b = 0.67 [0.92]  
Seff = 1.86 [0.14]  
Teq = 298 [6] K  
Rp = 1.69 [0.51] Re  
a = 1.3266 [0.0347] AU  
Ag = 7774.79 [6465.24] [1.20σ]  
Teffp = 4325 [902] K [4.47σ]

## DV Diagnostic Results:

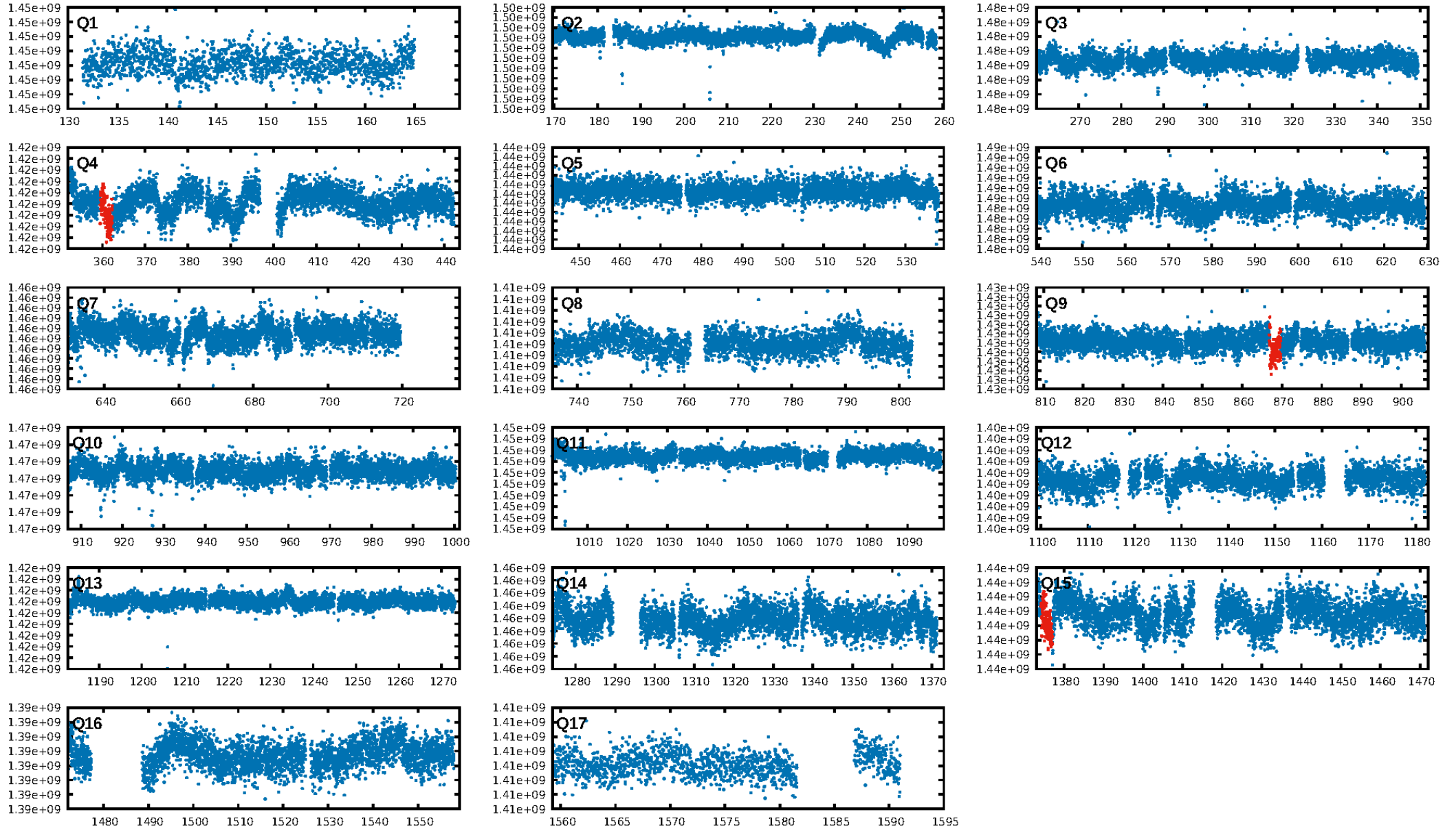
ShortPeriod-sig: N/A  
LongPeriod-sig: 84.2% [1.41σ]  
ModelChiSquare2-sig: 23.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.10e-07  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 0.9813  
Centroid-sig: 18.5%  
Centroid-so: 2.107 arcsec [1.14σ]  
OotOffset-rm: N/A  
KicOffset-rm: N/A  
OotOffset-st: 0/0/0 [0]  
KicOffset-st: 0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 0.50 [1/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 20:30:08 Z

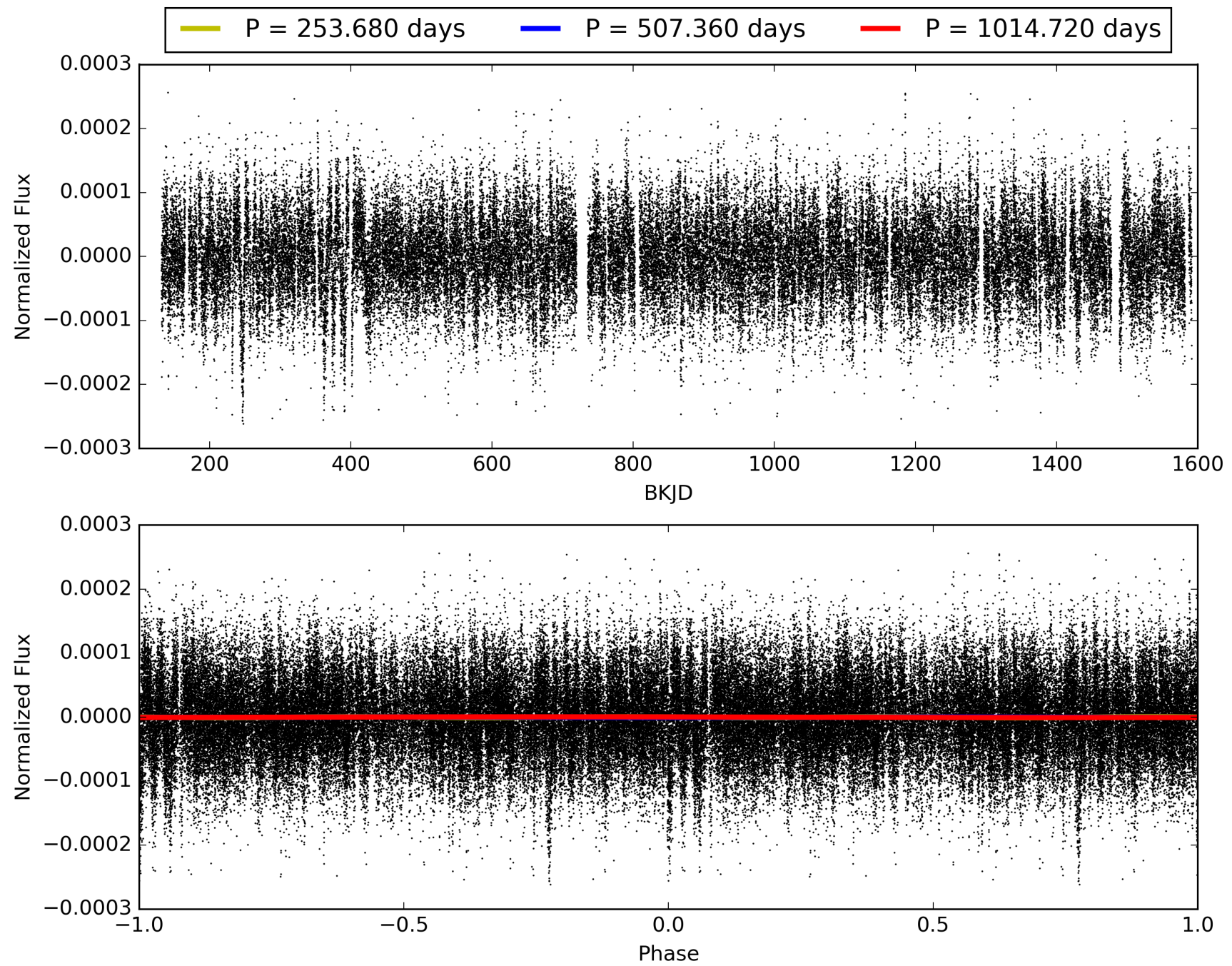
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 007534011-02, PDC Light Curves

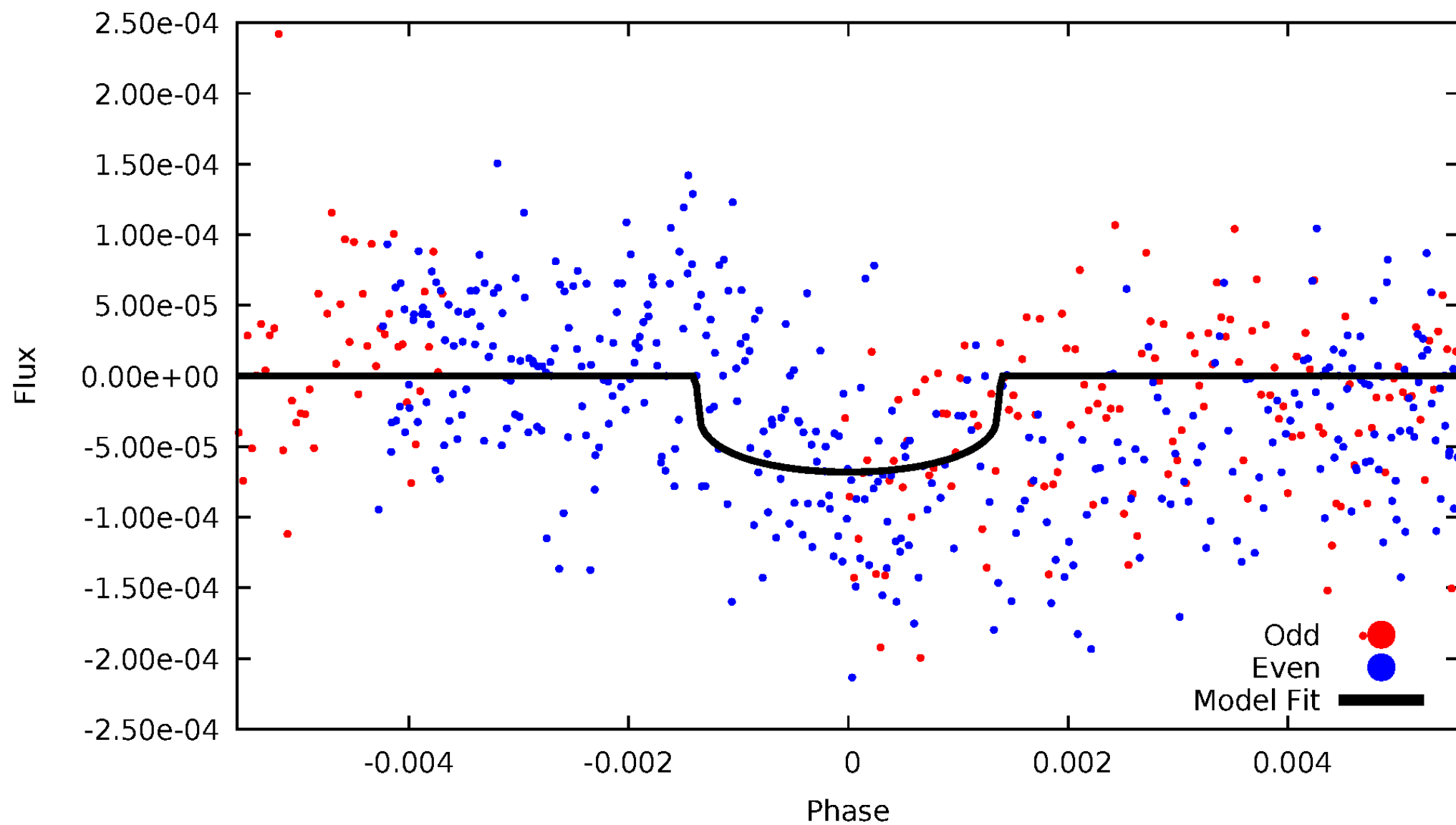


TCE 007534011-02



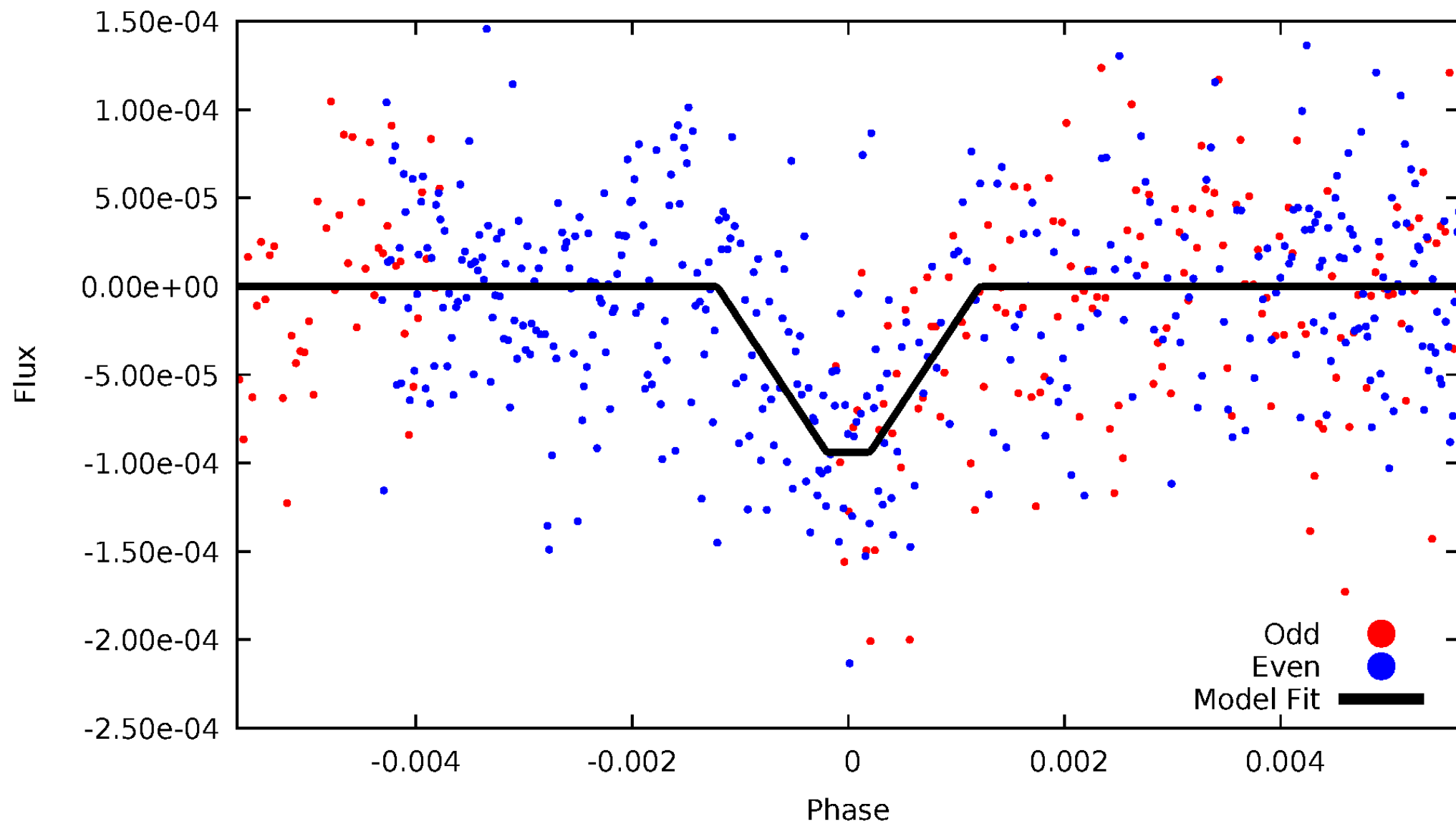
# DV Odd/Even

TCE 007534011-02



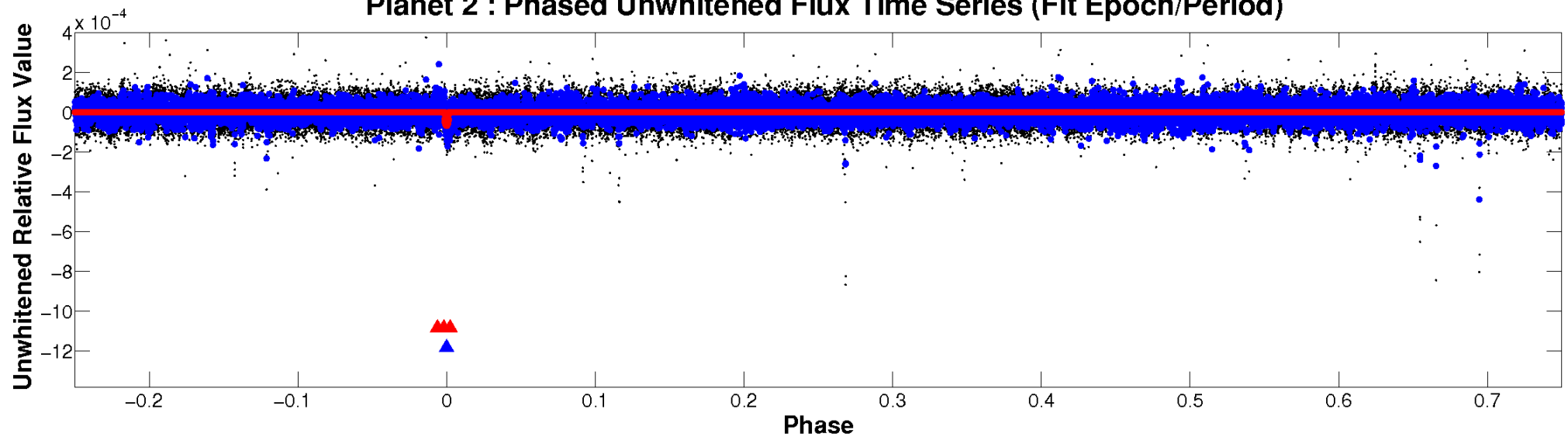
# ALT Odd/Even

TCE 007534011-02

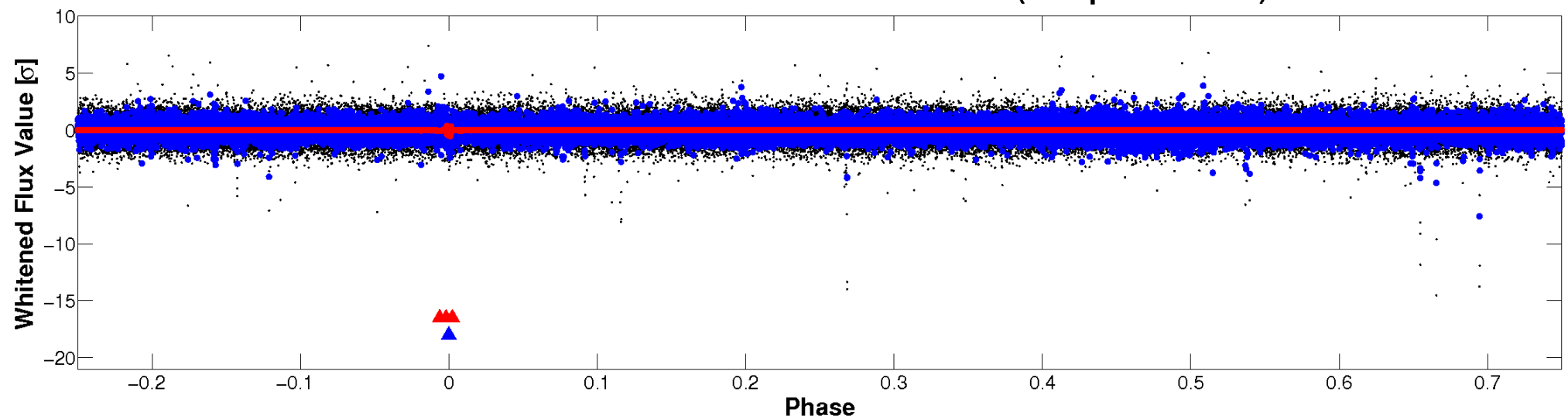


# Non-Whitened Vs. Whitened Light Curve

**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 007534011-02 P=507.359846 Days  $T_0=360.900167$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 007534011-02 P=507.359846 Days  $T_0=360.900167$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

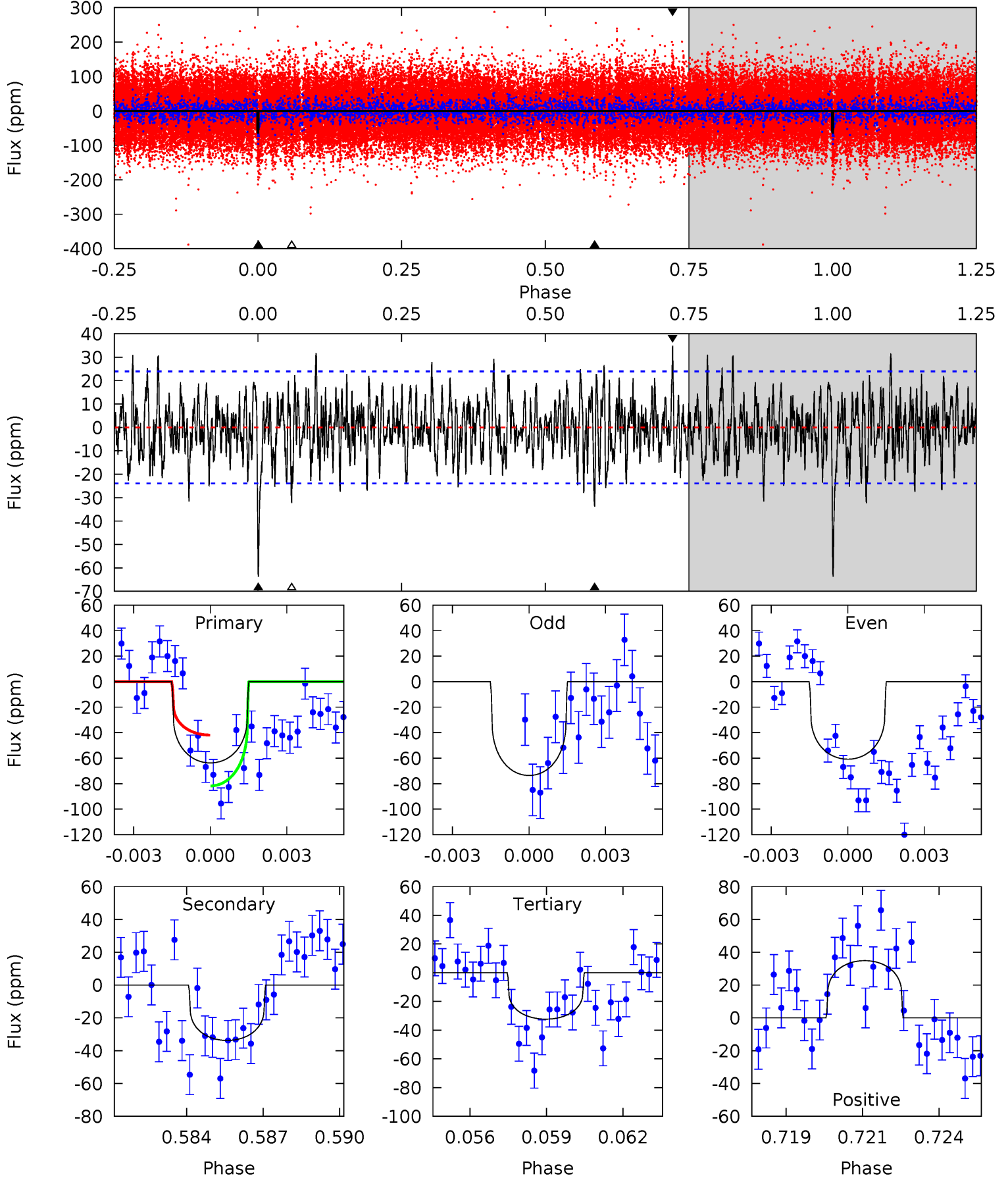
TCE 007534011-02 P=507.392539 Days  $T_0=360.912283$  (BKJD)



# DV Model-Shift Uniqueness Test

007534011-02, P = 507.359846 Days, E = 360.900167 Days

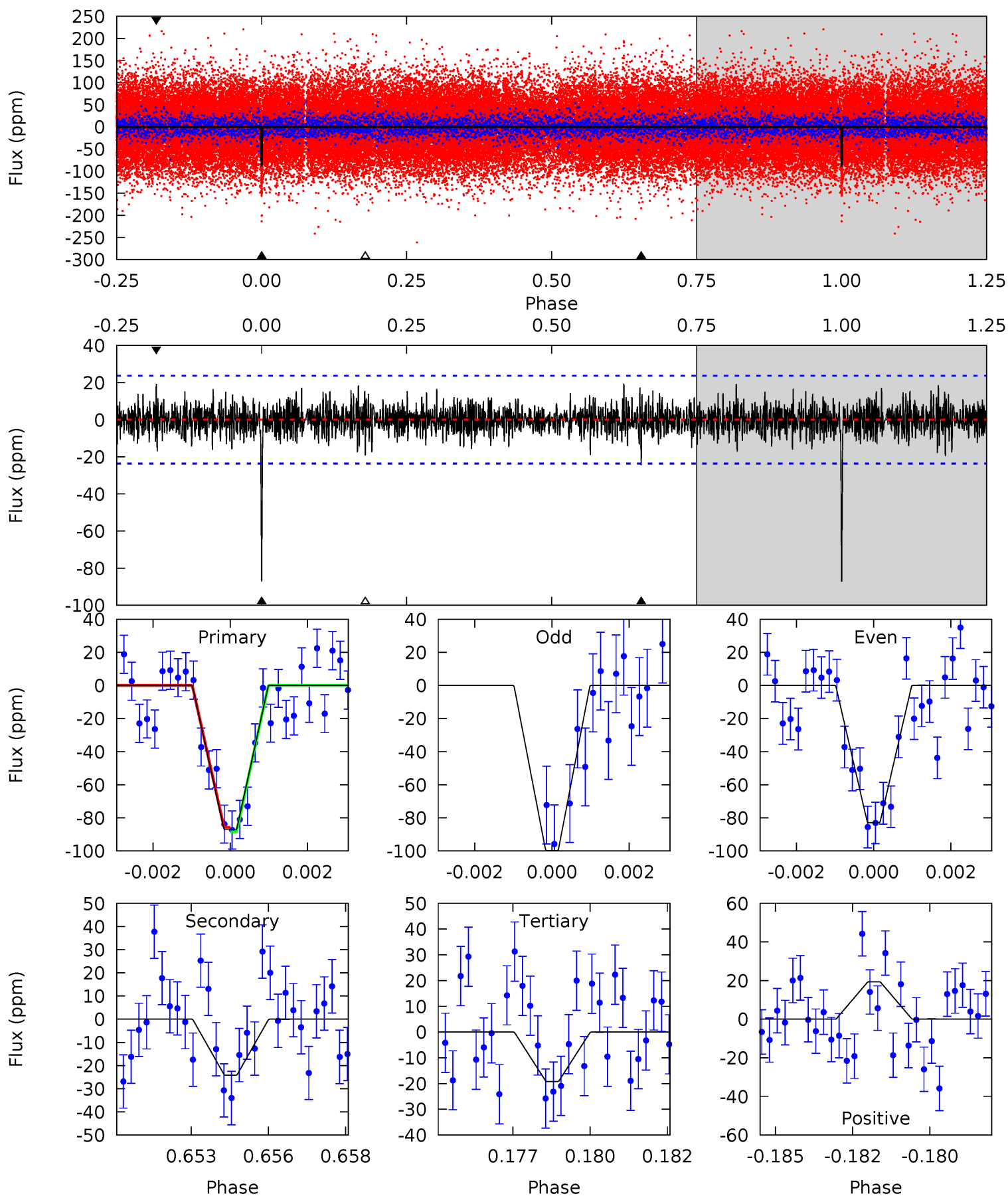
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.0	7.43	7.11	7.68	5.27	2.99	2.27	6.91	6.35	0.32	-0.24	1.17	0.90	0.35	4.37



# Alt Model-Shift Uniqueness Test

007534011-02,  $P = 507.392539$  Days,  $E = 360.912283$  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
19.5	5.39	4.29	4.31	5.29	3.03	1.25	15.2	15.2	1.10	1.08	1.63	0.93	0.18	0.29



### Stellar Parameters For KIC 007534011

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5594^{+99}_{-88}$	$3.948^{+0.013}_{-0.012}$	$0.400^{+0.050}_{-0.150}$	$1.933^{+0.070}_{-0.064}$	$1.208^{+0.163}_{-0.054}$	$0.236^{+0.014}_{-0.012}$
	+2%/-2%	+0%/-0%	+12%/-37%	+4%/-3%	+13%/-4%	+6%/-5%
Source	SPE72	AST10	SPE72	DSEP		

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

### Secondary Eclipse Parameters for KIC 007534011-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-34 \pm 5$	$1.70^{+0.50}_{-0.51}$	$416^{+7}_{-7}$	$4863^{+825}_{-501}$	$11504^{+11461}_{-4800}$
Alt.	$-24 \pm 4$	$2.02^{+0.57}_{-0.51}$	$416^{+8}_{-7}$	$4225^{+519}_{-359}$	$5654^{+4424}_{-2310}$

$T_{max}$  = 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

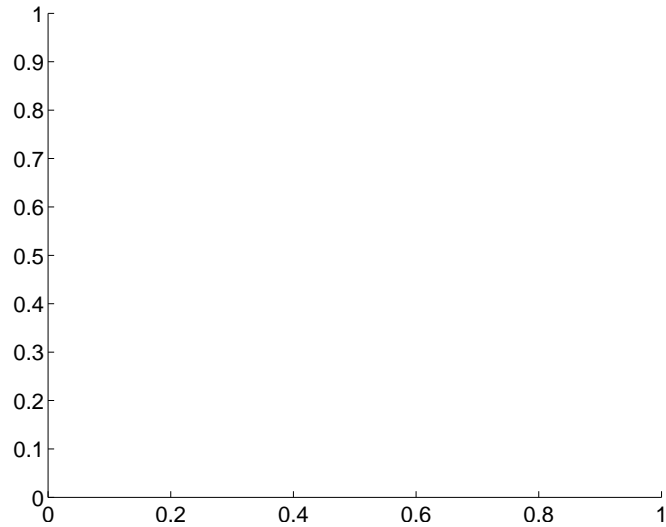
Supplemental centroid analysis for 007534011-02. **Kepler magnitude: 10.52.** Transit SNR 5.34

**There are 0 quarters with good PRF difference image offsets**

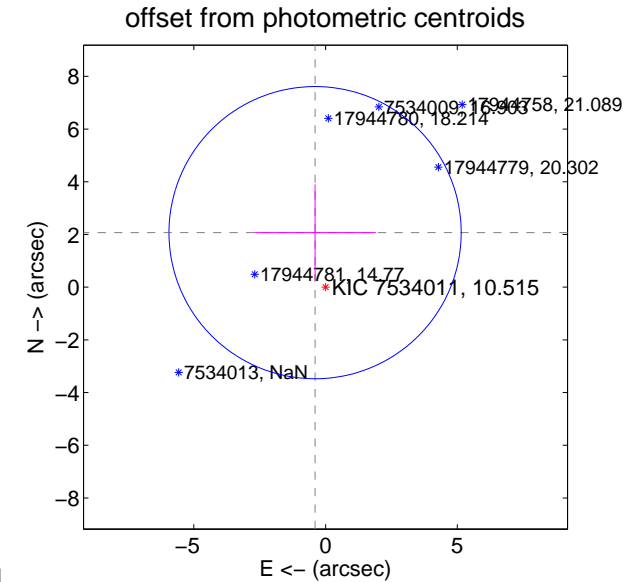
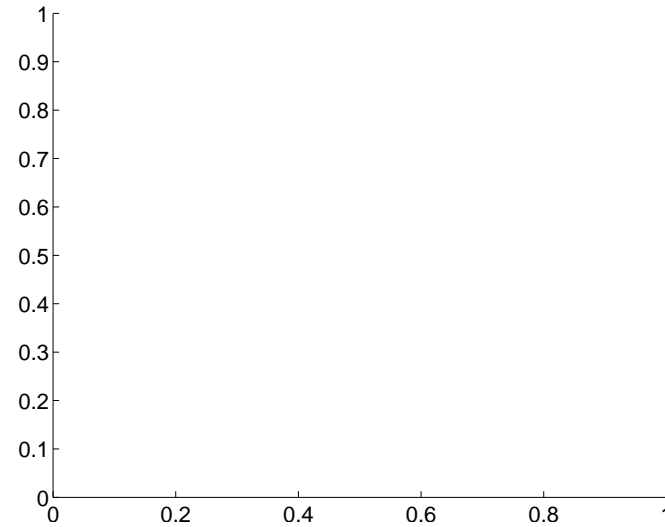
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	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	$2.11 \pm 1.85$	1.14	$0.40 \pm 2.31$	$2.07 \pm 1.83$

There is no PRF-fit offset from OOT-fit

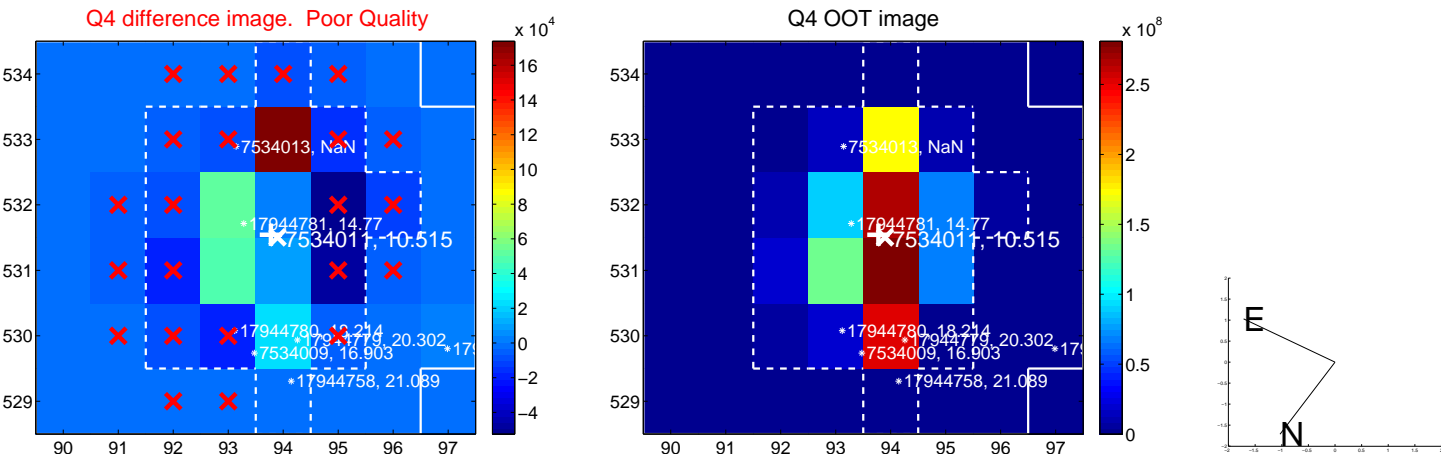


There is no PRF-fit offset from KIC

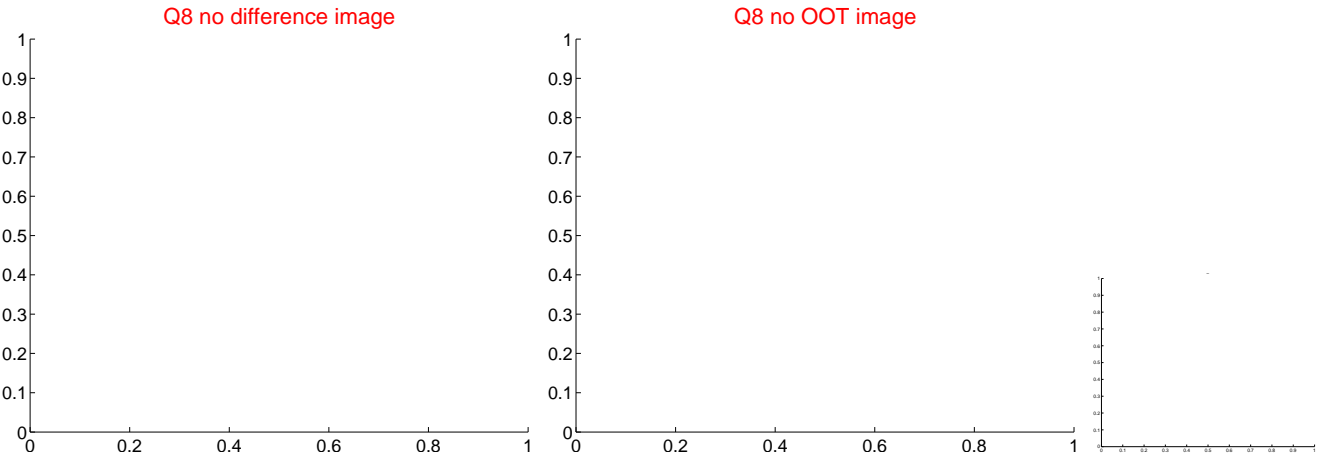
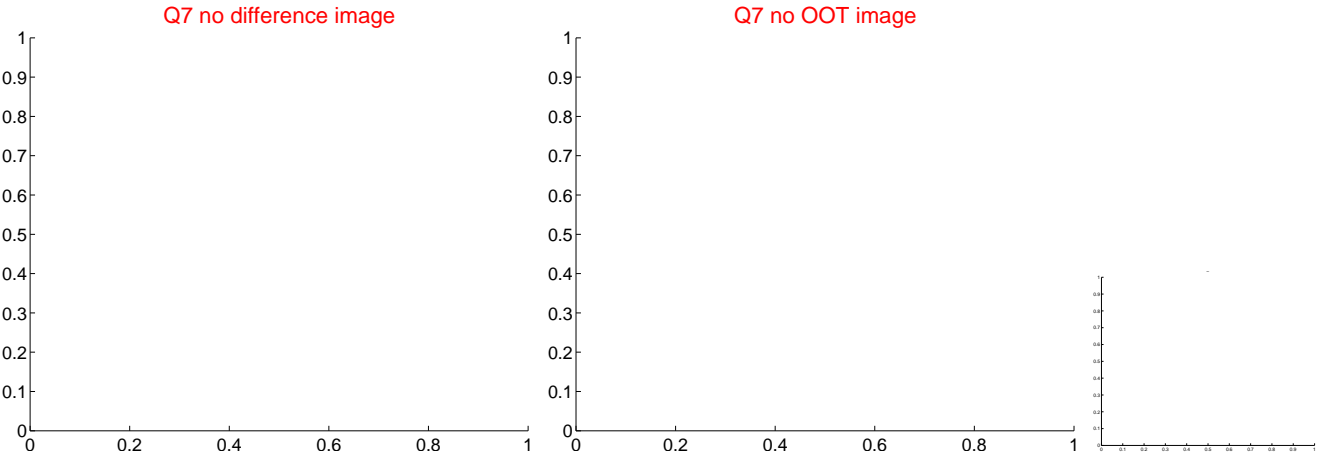
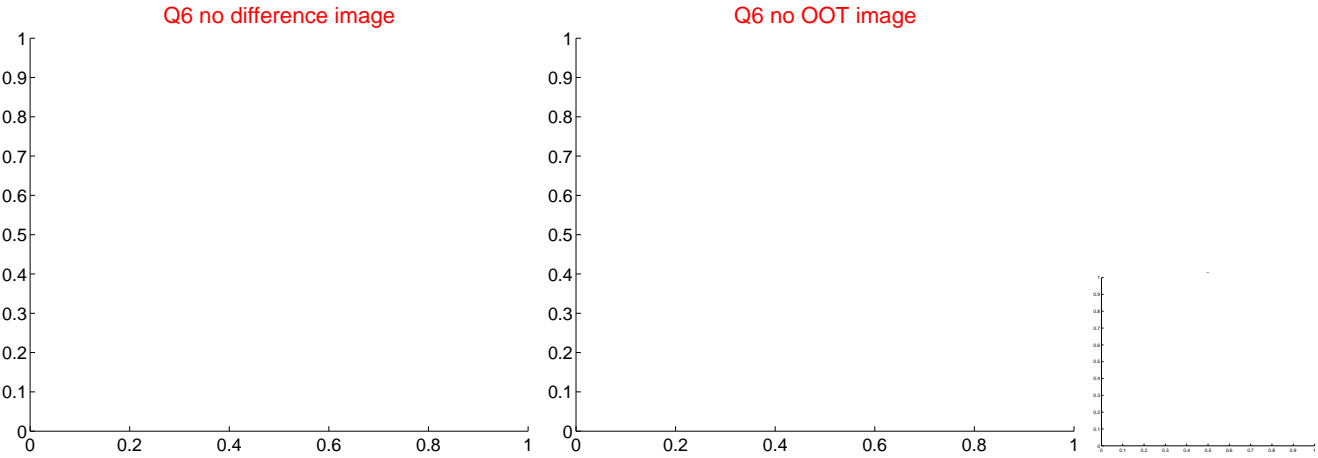
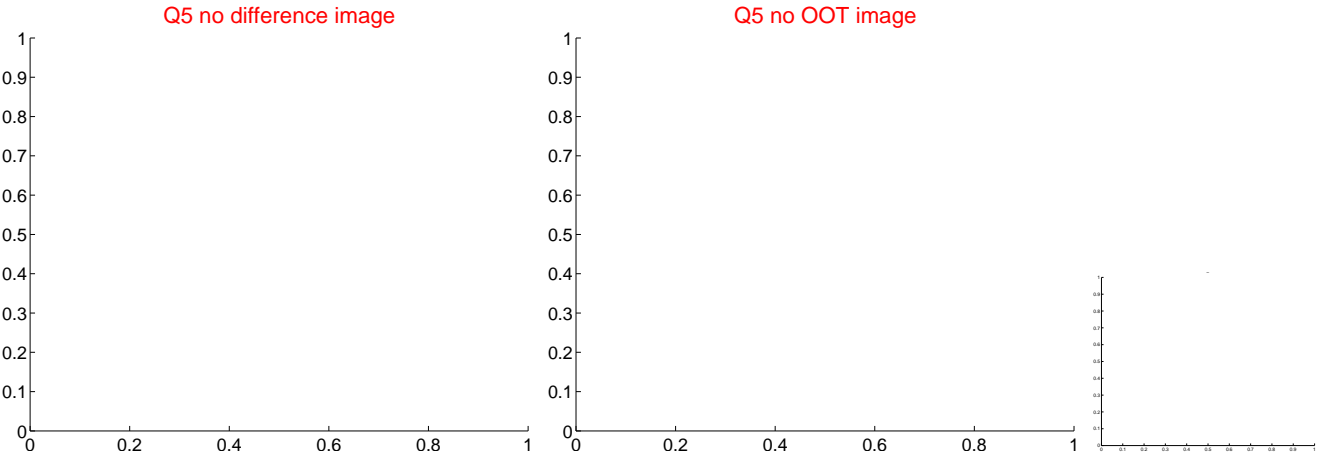


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

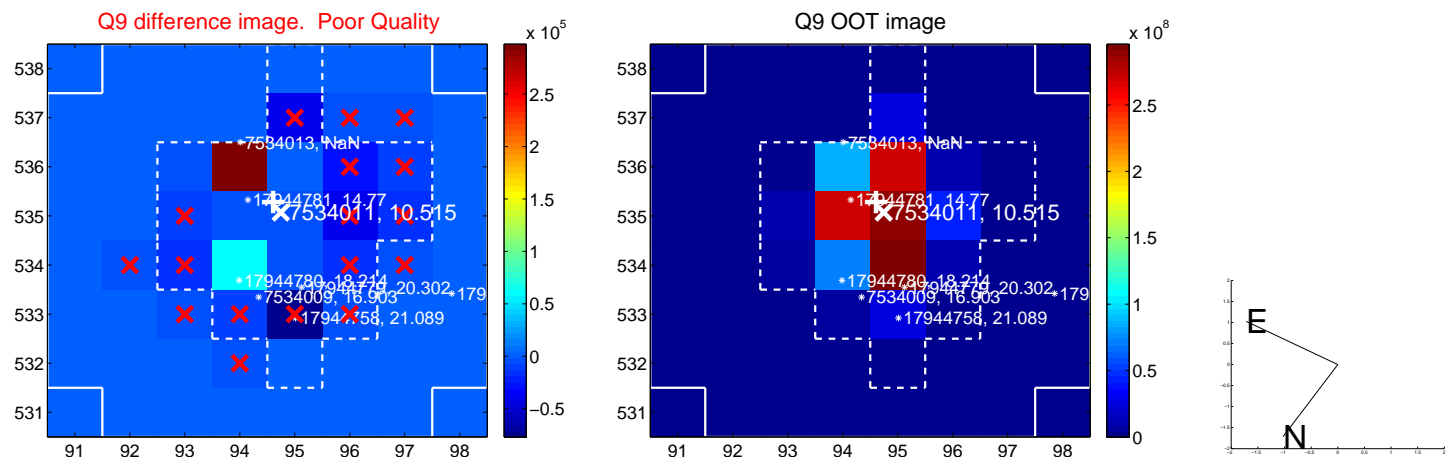


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





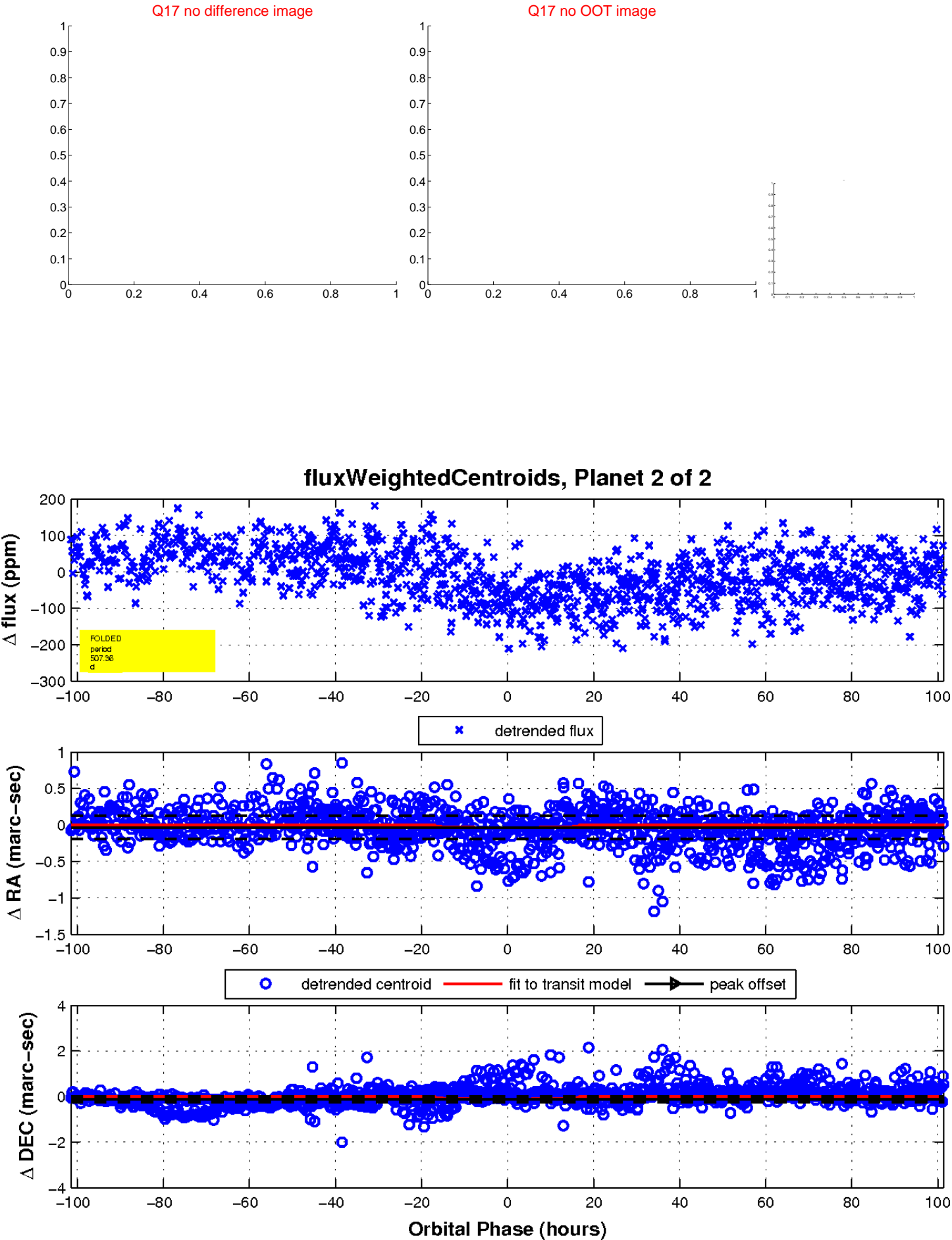
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UKIRT Image

Declination

