

# KIC 010534150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010534150-01	OBS	No	1.016745	131.941789	15.3	4.401	8.3	7.8	1.23	6795	0.61	7107.84
010534150-02	OBS	No	317.750860	294.183308	421.5	3.926	9.0	8.8	1.23	6795	4.19	3.35
010534150-03	OBS	No	134.067274	184.783524	280.6	4.375	8.4	7.7	1.23	6795	2.35	10.59
010534150-04	OBS	No	42.312760	159.779899	139.1	2.752	7.4	8.0	1.23	6795	1.69	49.29
010534150-05	OBS	No	72.530383	202.289924	187.1	4.756	7.3	8.1	1.23	6795	1.99	24.02

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010534150-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010534150-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010534150-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
010534150-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT
010534150-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

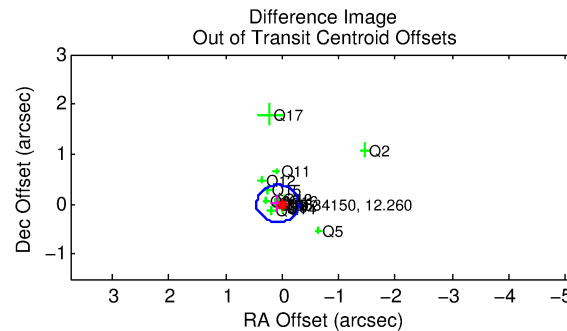
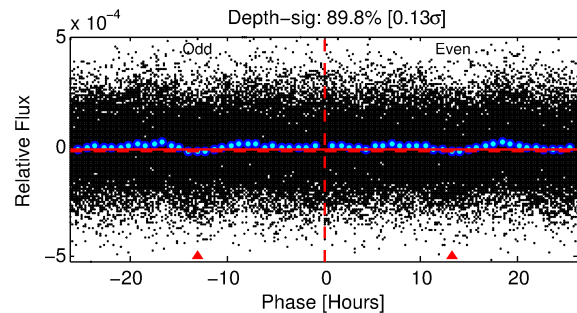
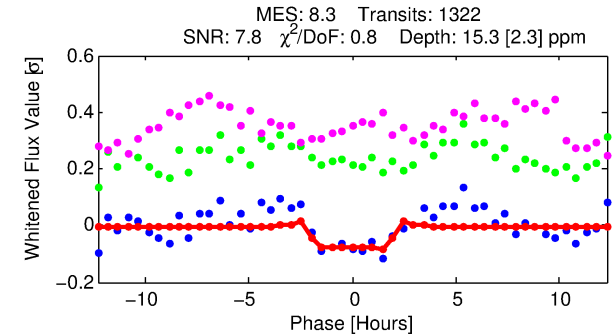
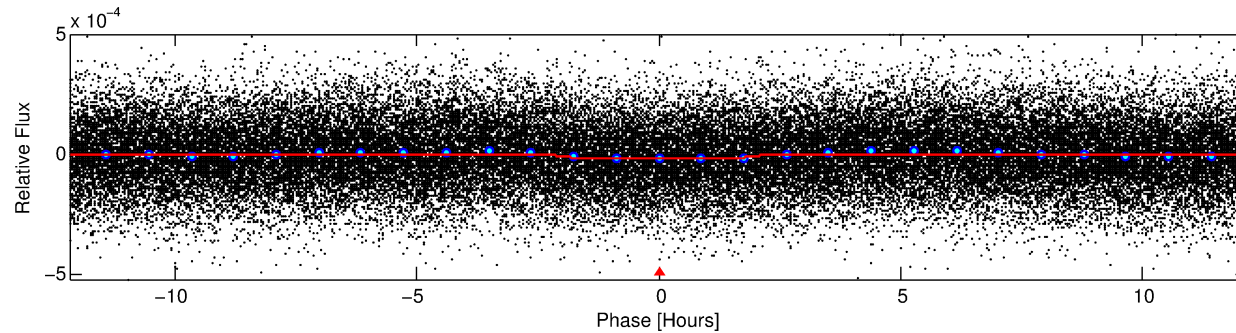
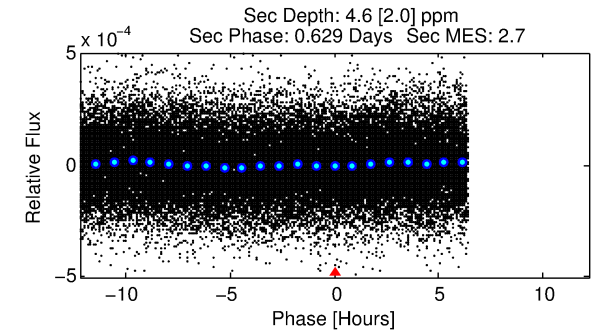
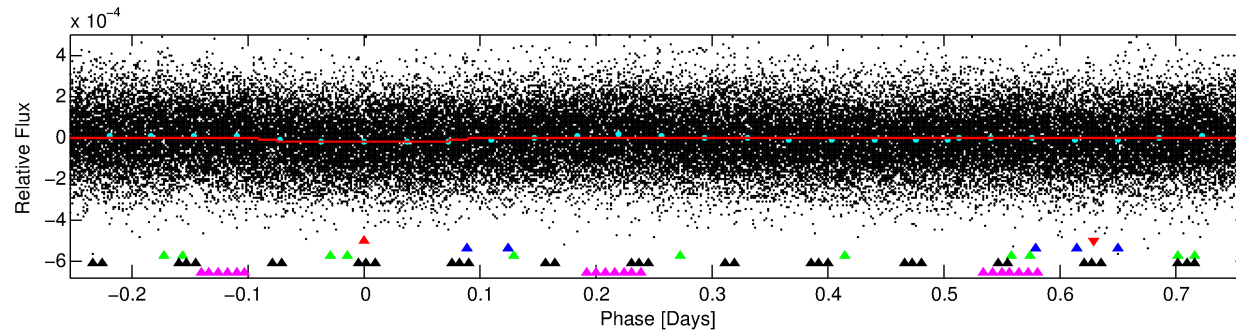
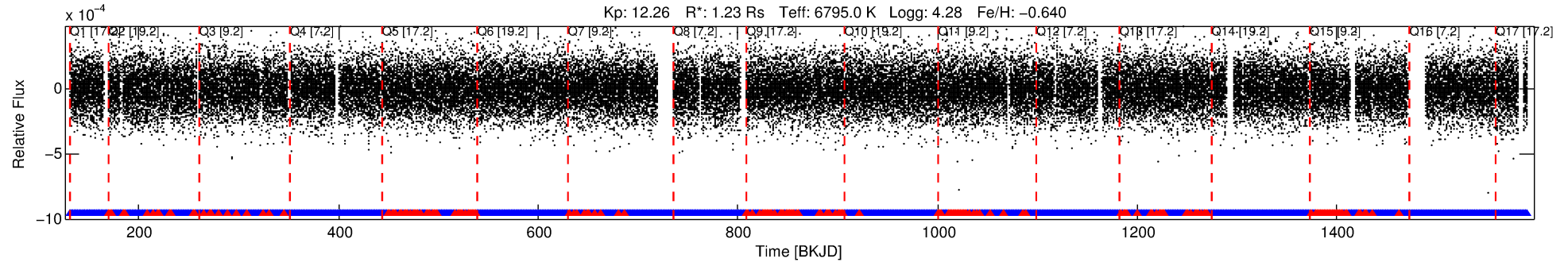
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010534150-01

No Significant Match Found

# DV One-Page Summary

KIC: 10534150 Candidate: 1 of 5 Period: 1.017 d



## DV Fit Results:

Period = 1.01675 [0.00002] d  
Epoch = 131.9418 [0.0044] BKJD  
Rp/R\* = 0.0045 [0.0009]  
a/R\* = 1.09 [0.21]  
b = 0.97 [0.08]  
Seff = 7107.84 [2530.40]  
Teq = 2341 [208] K  
Rp = 0.61 [0.20] Re  
a = 0.0201 [0.0044] AU  
Ag = 2.79 [1.87] [0.96σ]  
Teffp = 4679 [718] K [3.13σ]

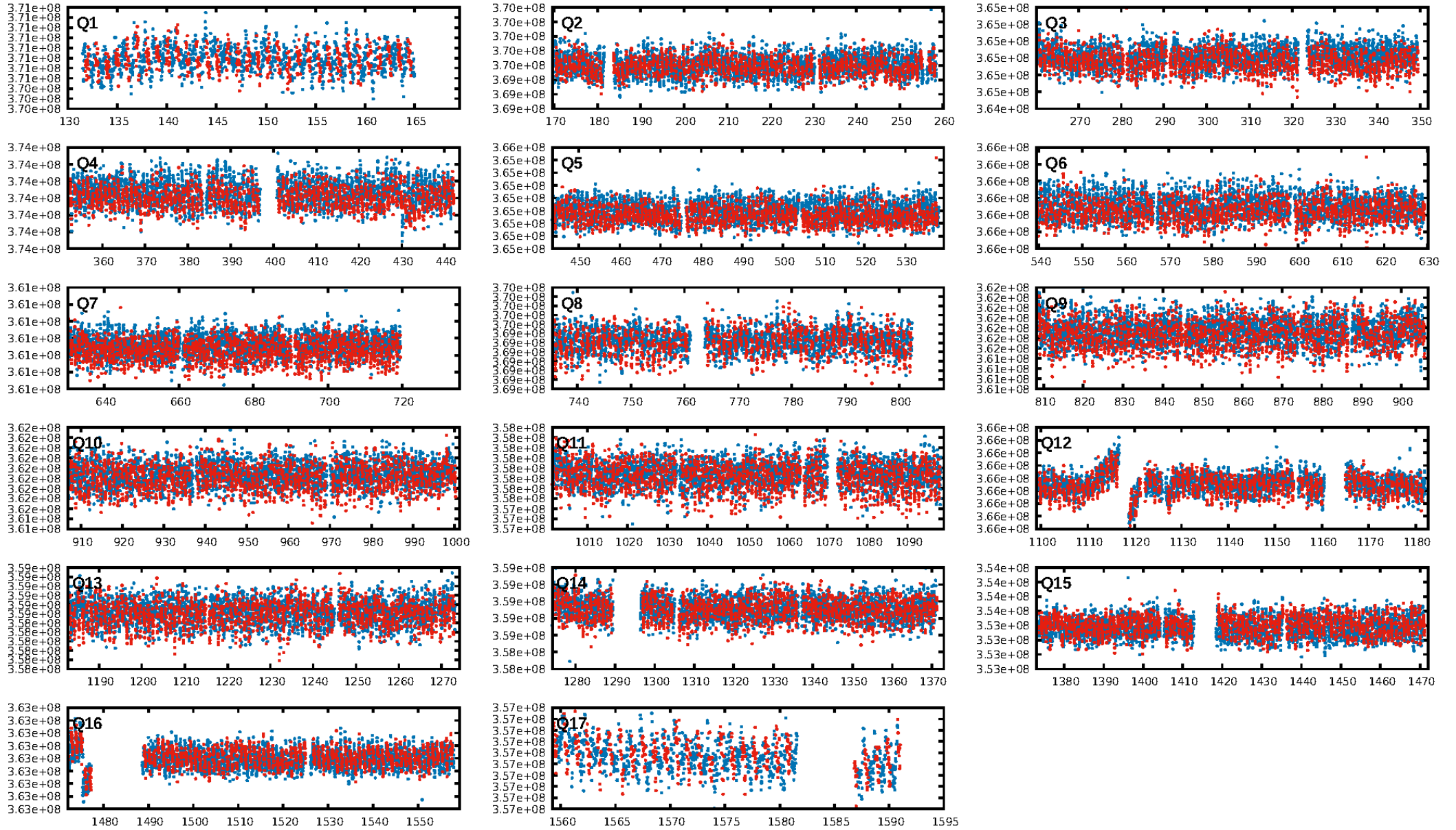
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [190.94σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 7.98e-12**  
RollingBand-fgt: 0.84 [1055/1262]  
GhostDiagnostic-chr: 2.224  
Centroid-sig: 2.5%  
Centroid-so: 1.213 arcsec [1.90σ]  
OotOffset-rm: 0.081 arcsec [0.66σ]  
KicOffset-rm: 0.098 arcsec [0.75σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:08:18 Z

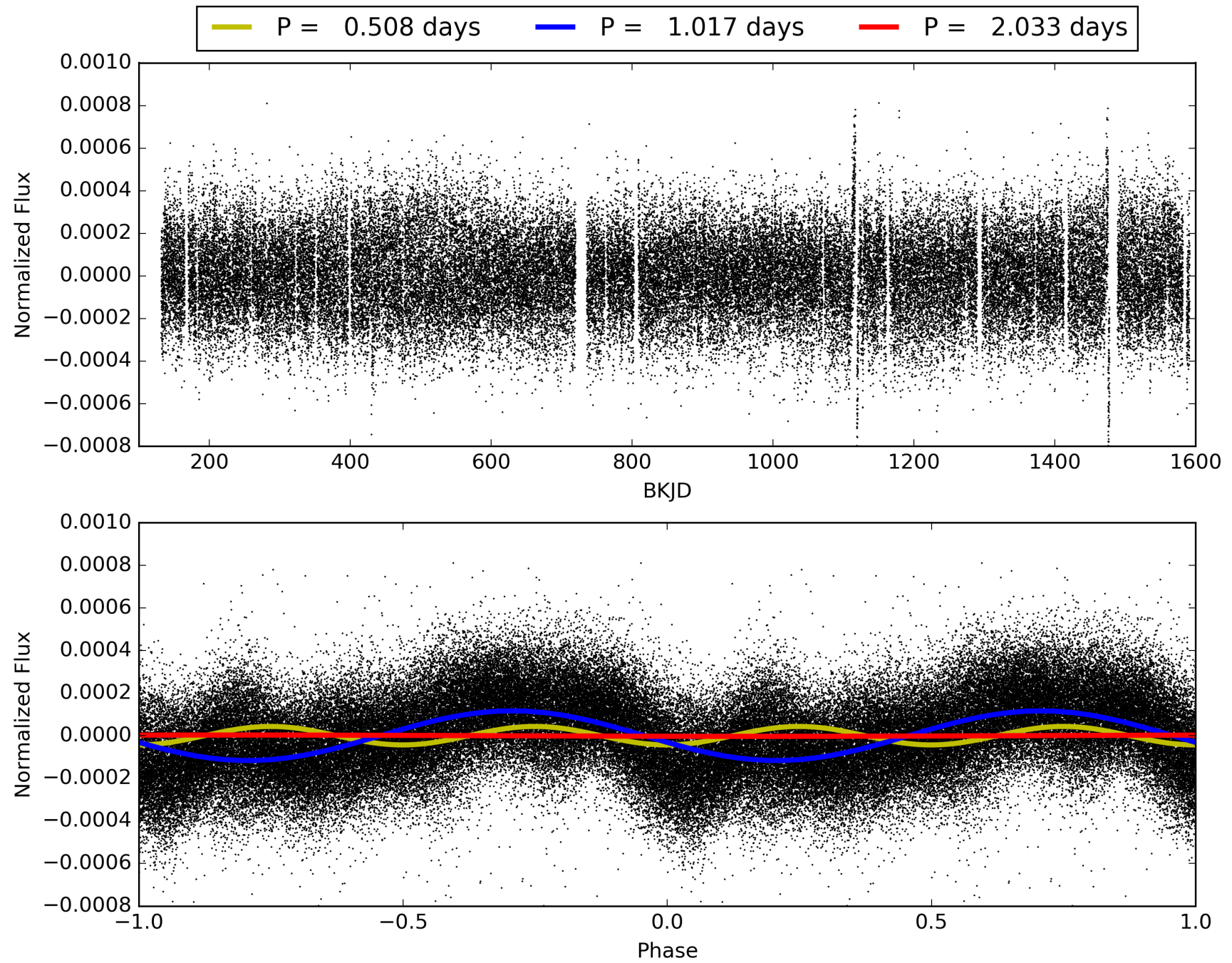
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010534150-01, PDC Light Curves





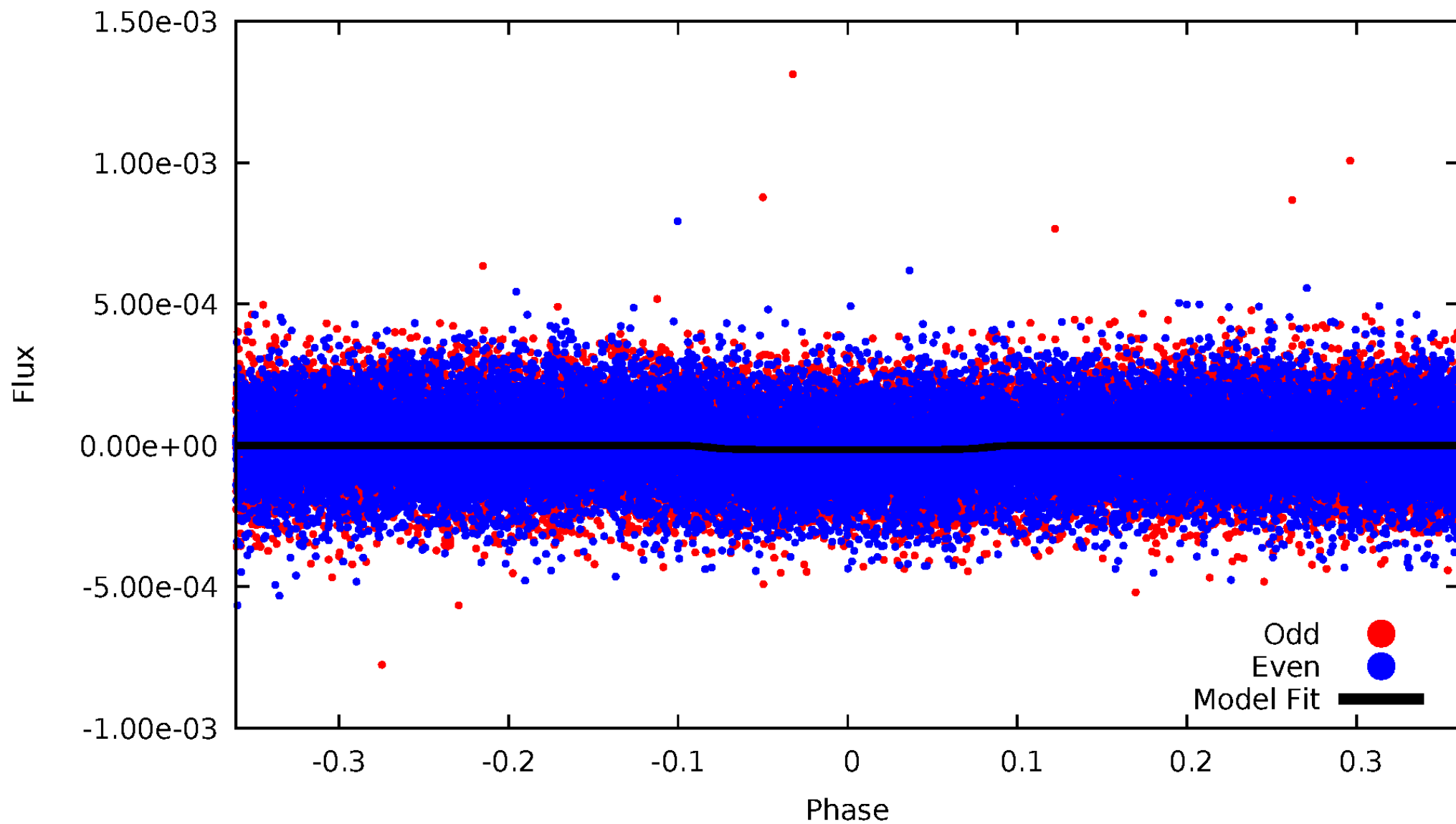
# TCE 010534150-01





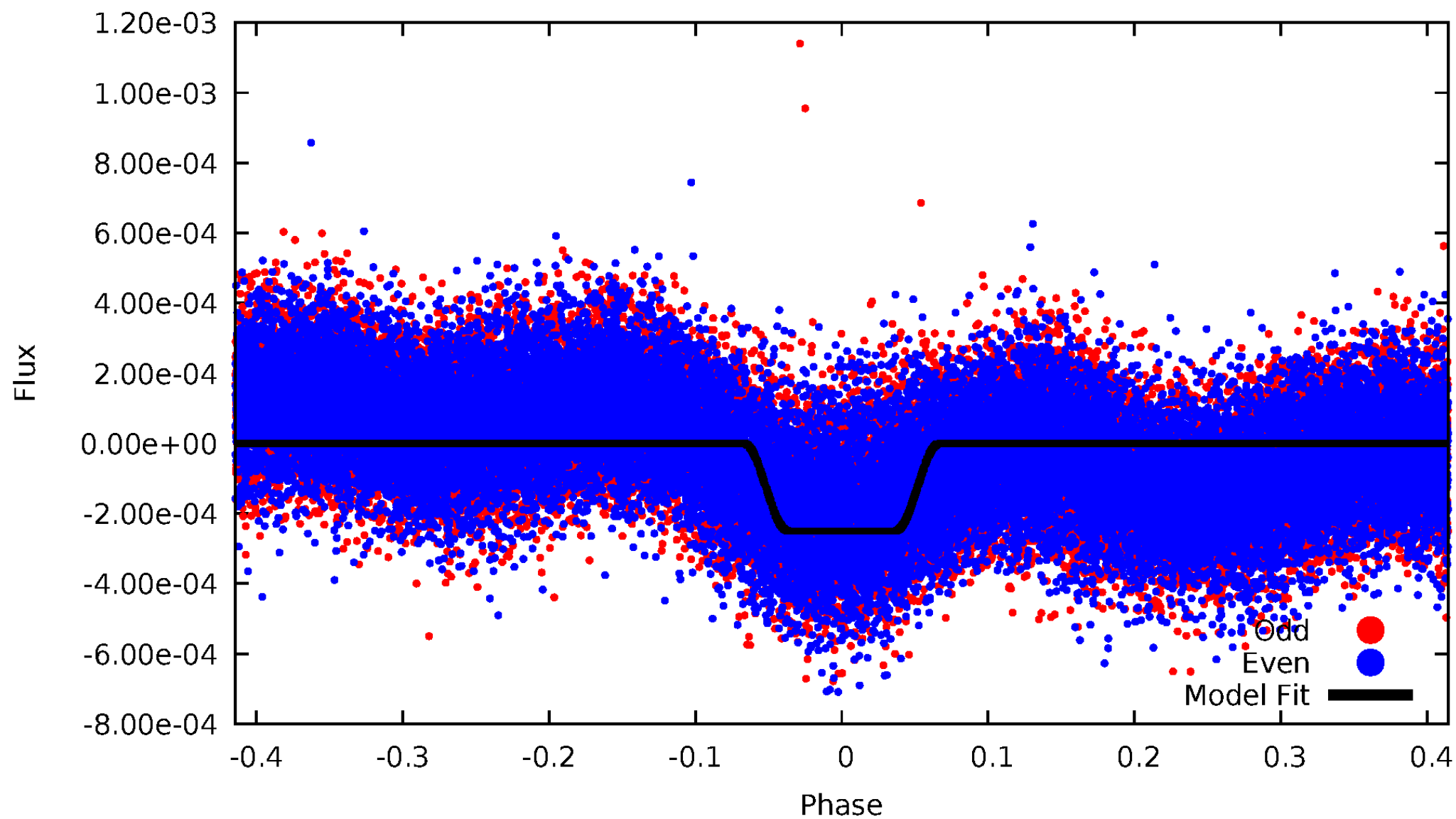
# DV Odd/Even

TCE 010534150-01

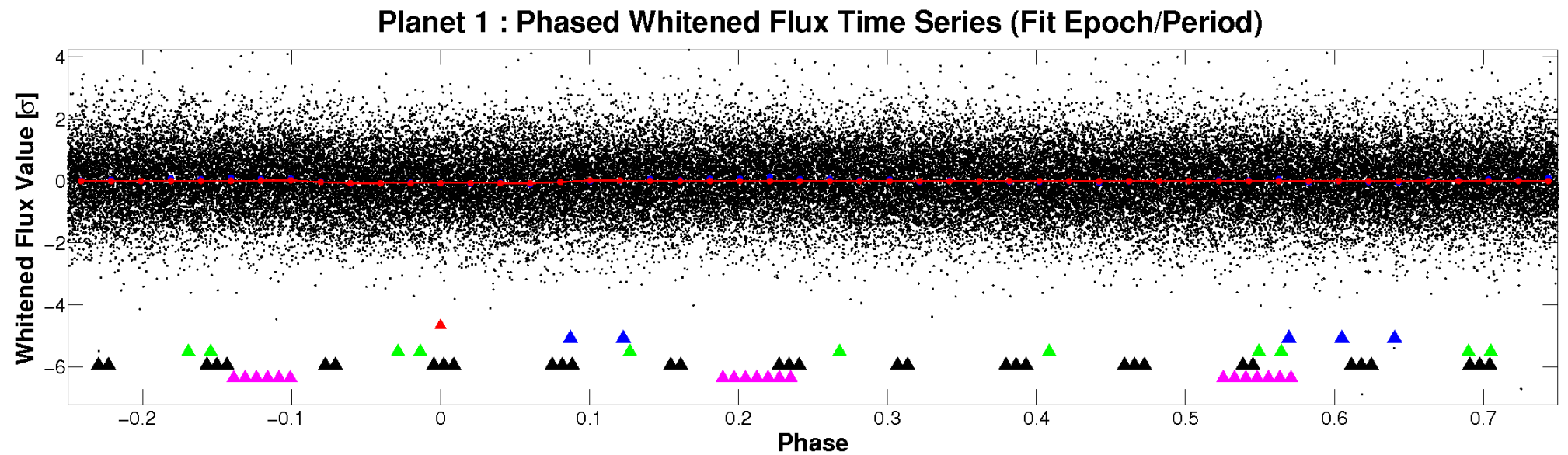
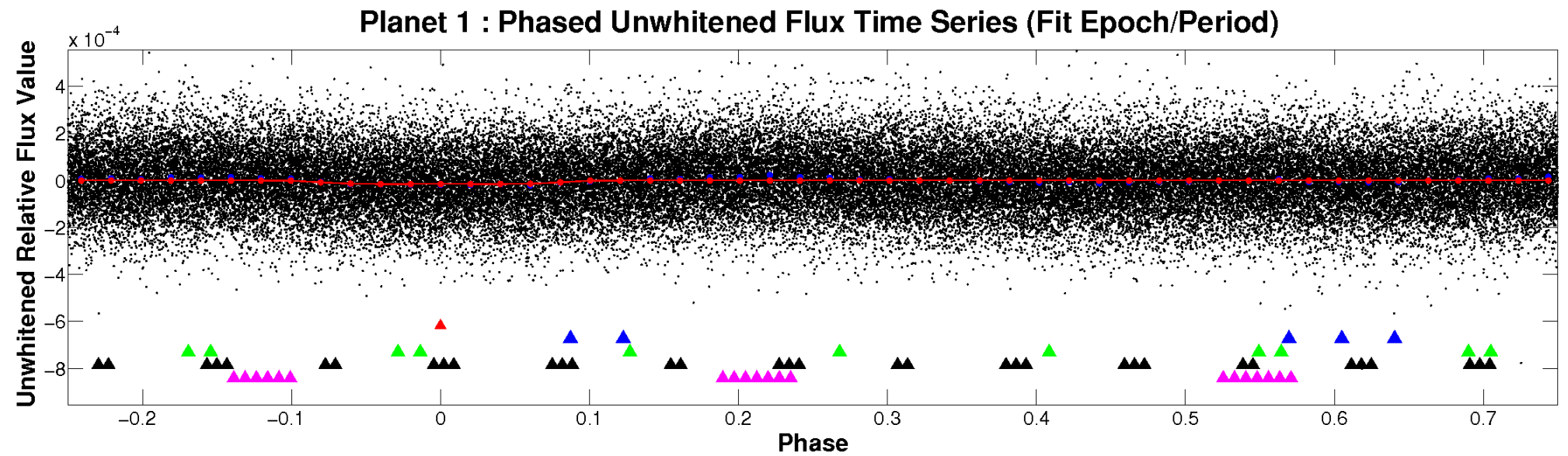


# ALT Odd/Even

TCE 010534150-01



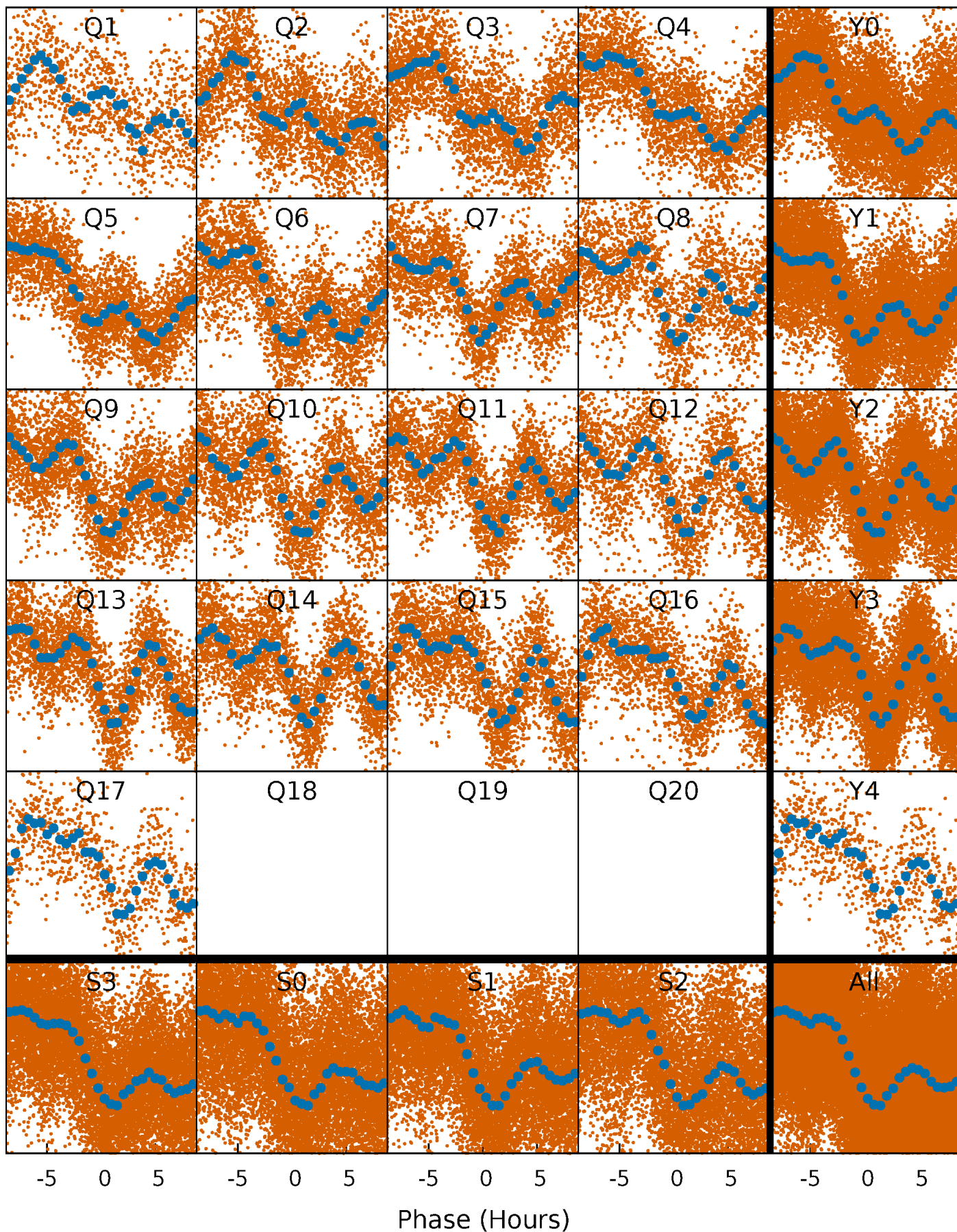
# Non-Whitened Vs. Whitened Light Curve





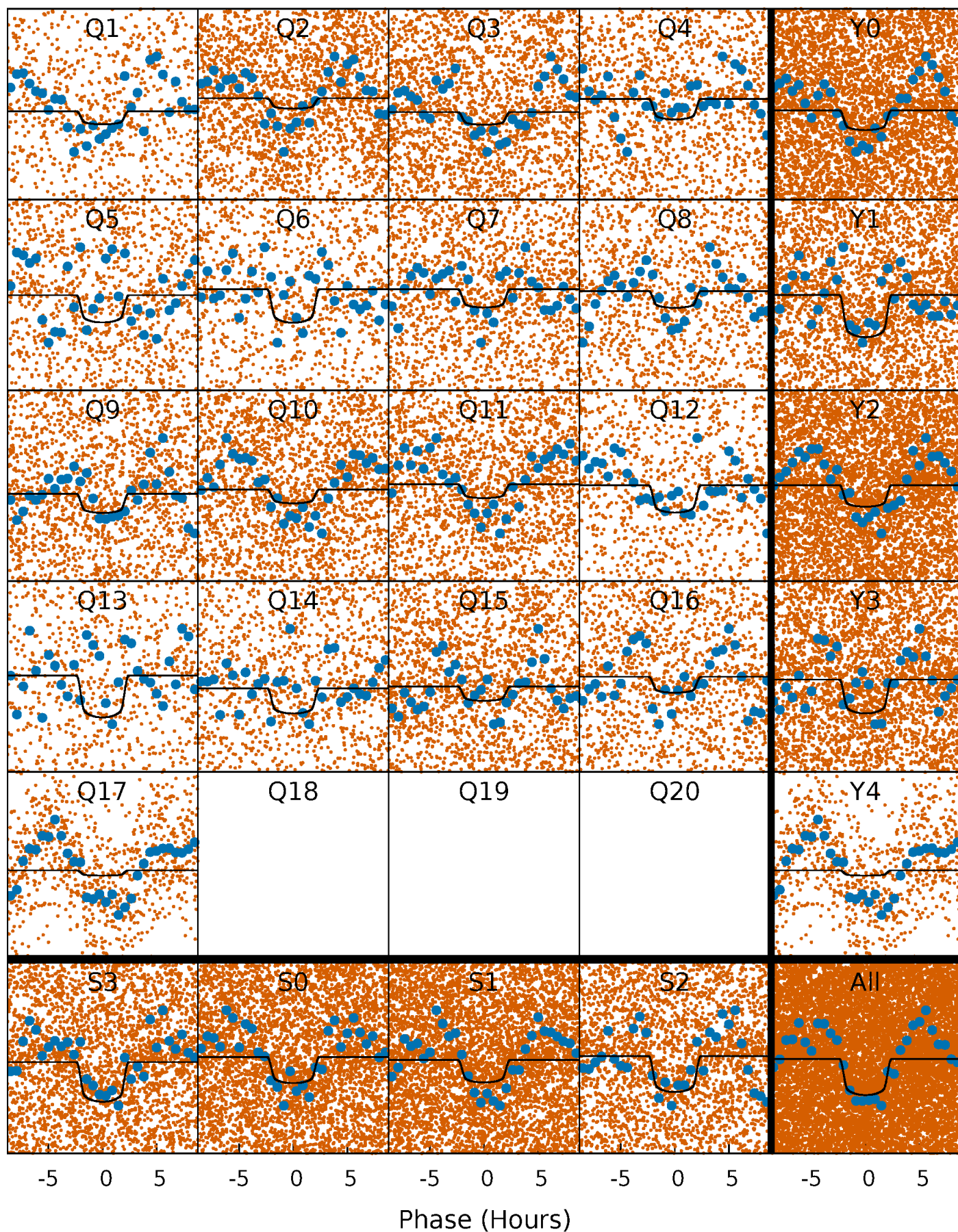
# PDC Quarter-Phased Transit Curves

TCE 010534150-01 P= 1.016745 Days  $T_0=131.941789$  (BKJD)



# DV Quarter-Phased Transit Curves

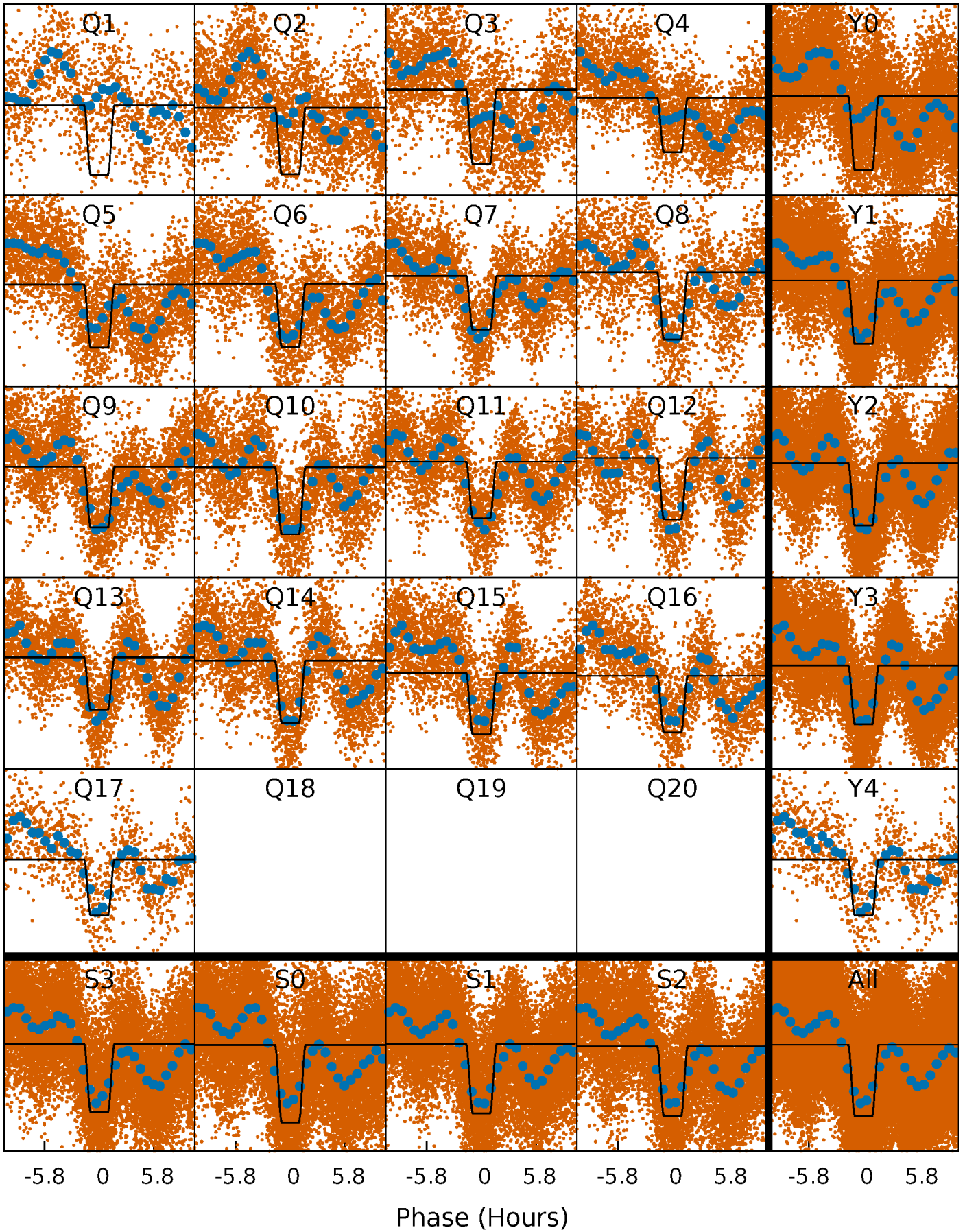
TCE 010534150-01 P= 1.016745 Days  $T_0=131.941789$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 010534150-01 P= 1.016830 Days  $T_0=131.903719$  (BKJD)

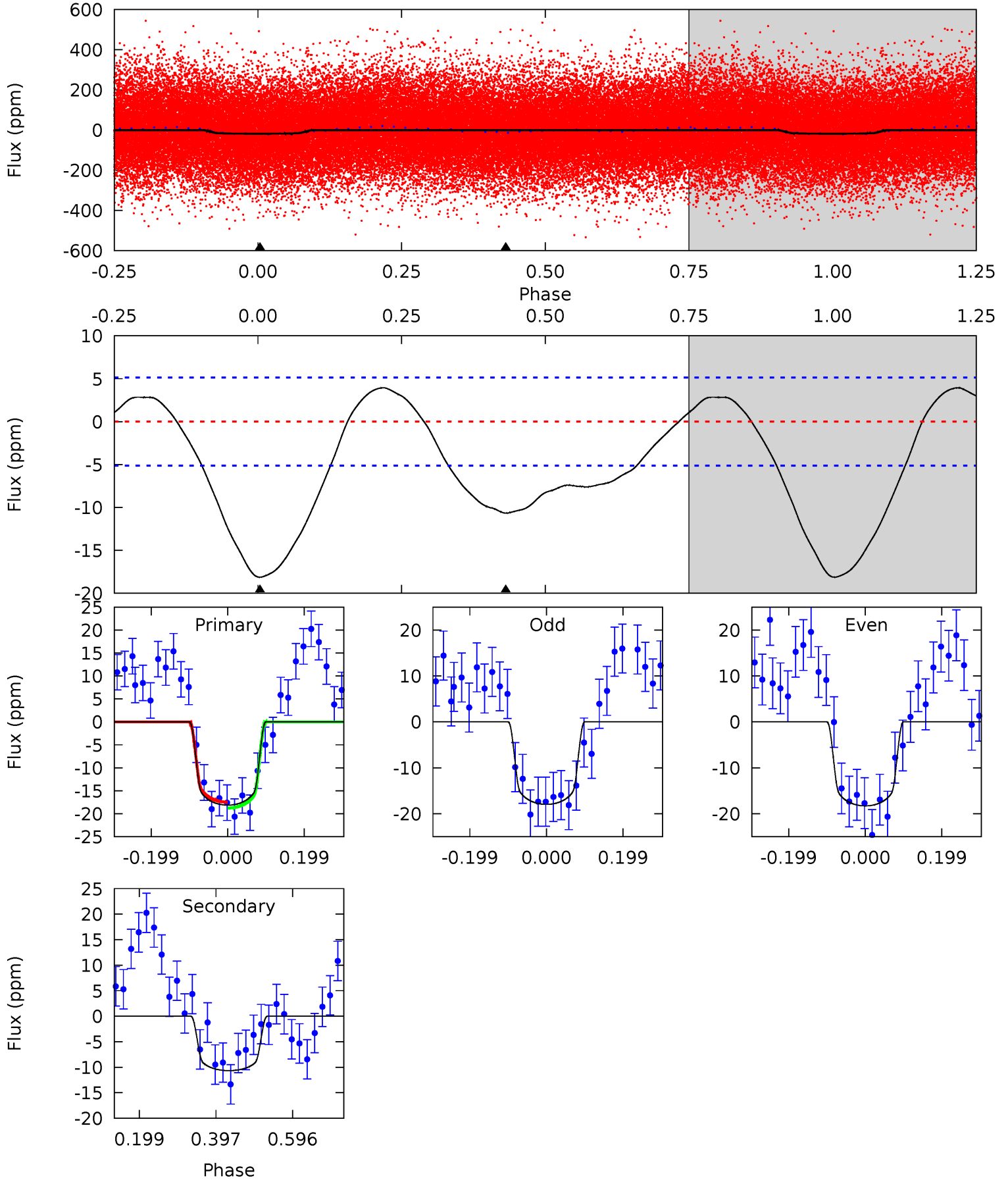




# DV Model-Shift Uniqueness Test

010534150-01, P = 1.016745 Days, E = 130.925044 Days

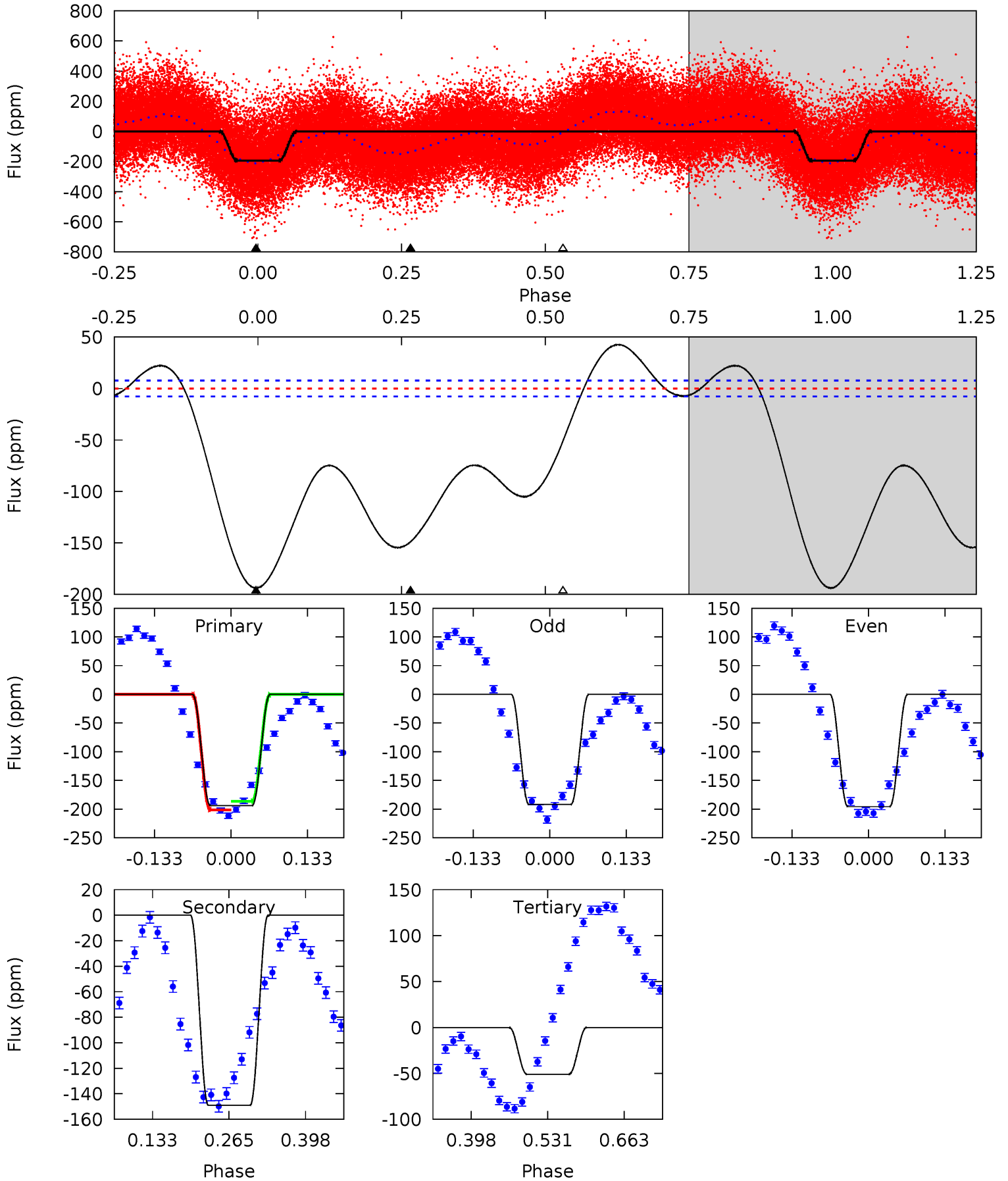
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.6	9.17	0	0	4.42	1.29	2.90	15.6	15.6	9.17	9.17	0.14	0.96	0.18	0.55



# Alt Model-Shift Uniqueness Test

010534150-01, P = 1.016830 Days, E = 130.886889 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
113.0	86.8	29.7	0	4.51	1.50	28.9	83.3	113.0	57.2	86.8	1.09	0.95	0.18	4.20



### Stellar Parameters For KIC 010534150

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6795^{+212}_{-282}$	$4.282^{+0.139}_{-0.170}$	$-0.640^{+0.300}_{-0.350}$	$1.229^{+0.325}_{-0.216}$	$1.053^{+0.145}_{-0.118}$	$0.798^{+0.543}_{-0.375}$
	+3%/-4%	+3%/-4%	+47%/-55%	+26%/-18%	+14%/-11%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010534150-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-11 \pm 1$	$0.62^{+0.15}_{-0.14}$	$3257^{+246}_{-195}$	$5612^{+712}_{-496}$	$6.117^{+4.311}_{-2.180}$
Alt.	$-149 \pm 2$	$2.13^{+0.34}_{-0.26}$	$3280^{+227}_{-211}$	$5866^{+259}_{-241}$	$7.239^{+2.062}_{-1.648}$

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



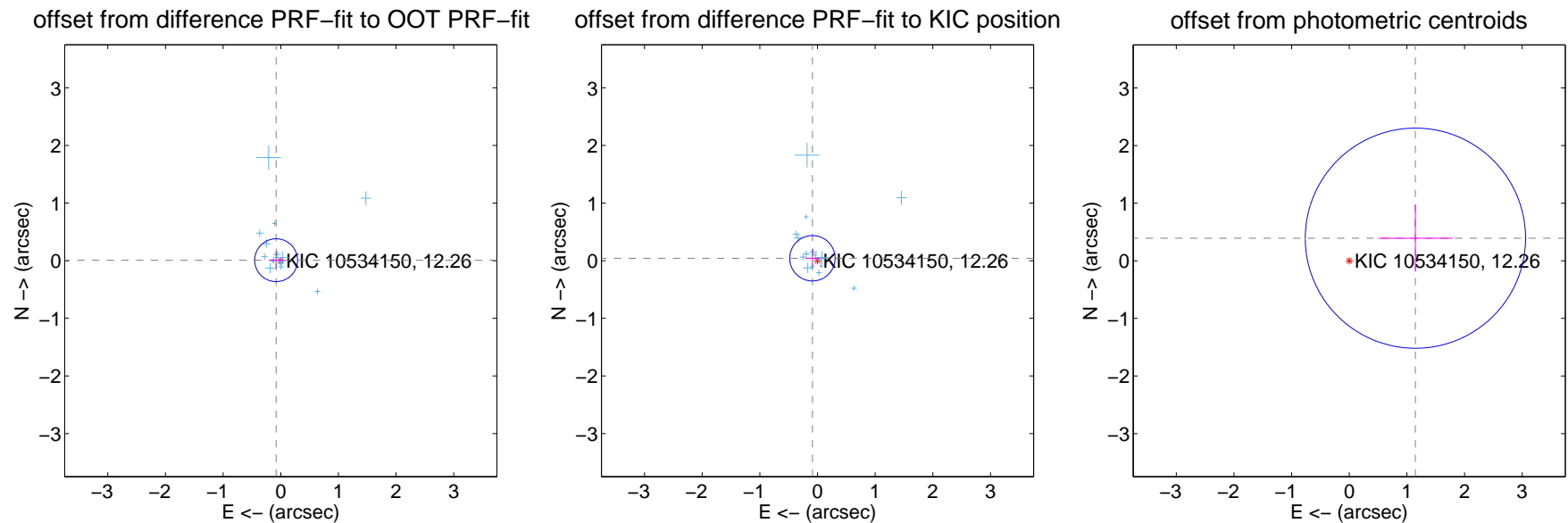
## DV Centroid Data

Supplemental centroid analysis for 010534150-01. Kepler magnitude: 12.26. Transit SNR 7.78

There are 16 quarters with good PRF difference image offsets

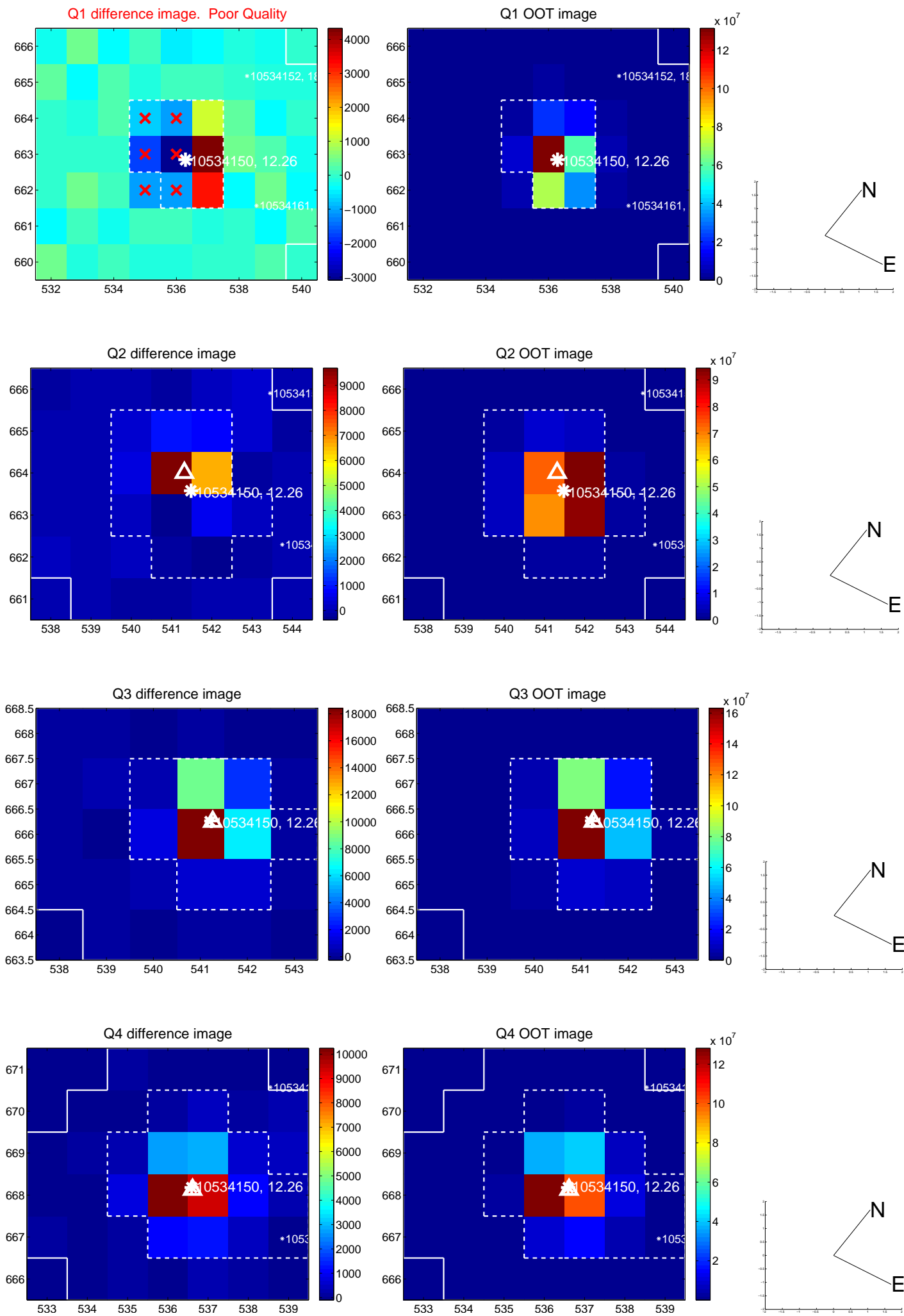
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.081 \pm 0.124$	0.66	$0.081 \pm 0.126$	$0.009 \pm 0.148$
PRF-fit source offset from KIC position	$0.098 \pm 0.131$	0.75	$0.089 \pm 0.128$	$0.042 \pm 0.157$
photometric centroid source offset	$1.21 \pm 0.64$	1.90	$-1.15 \pm 0.64$	$0.39 \pm 0.58$

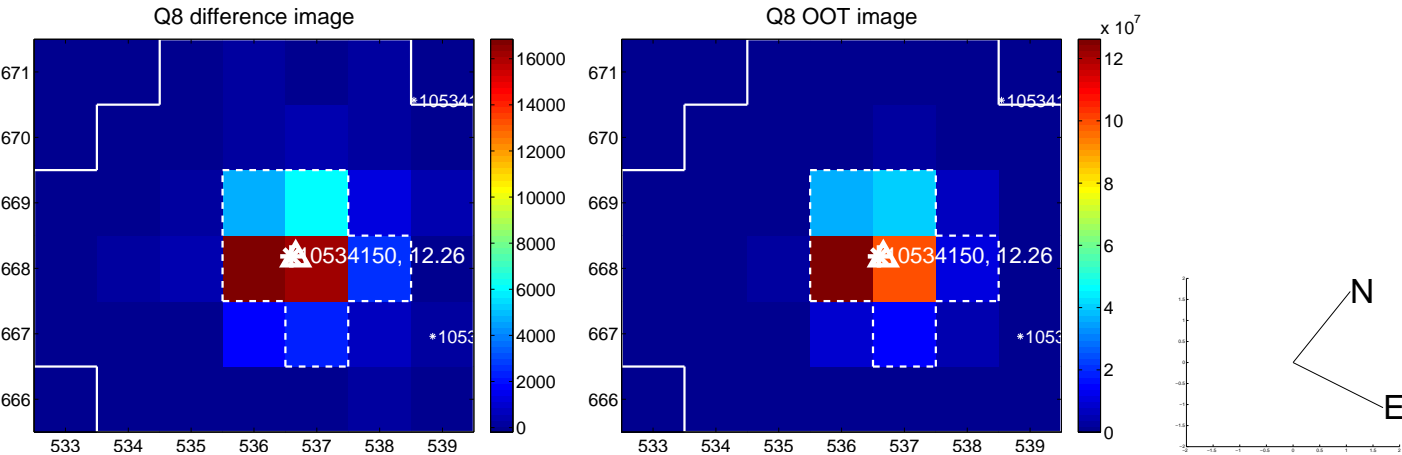
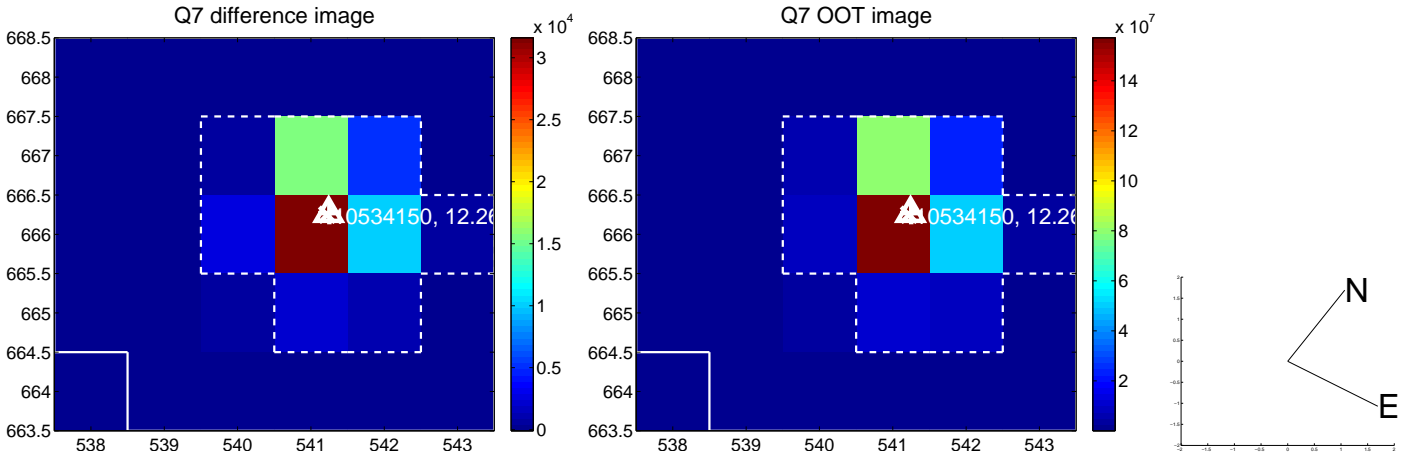
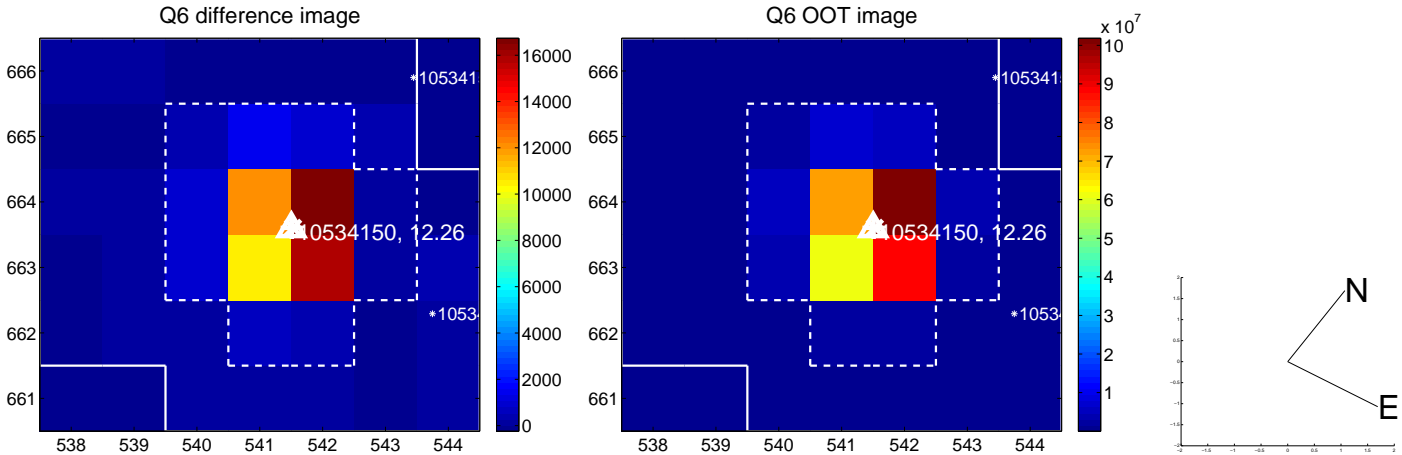
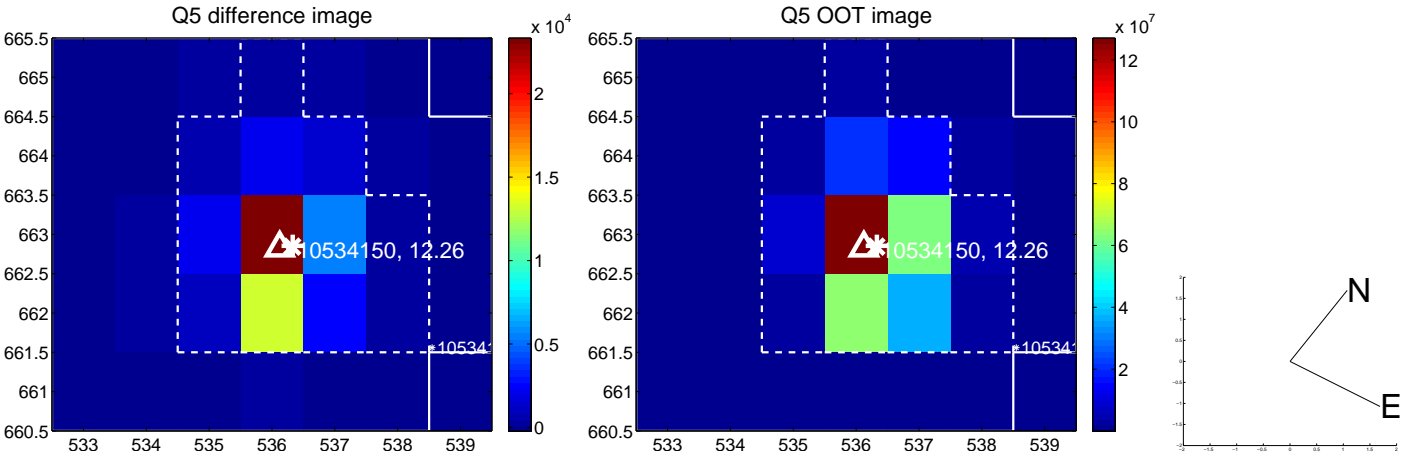


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

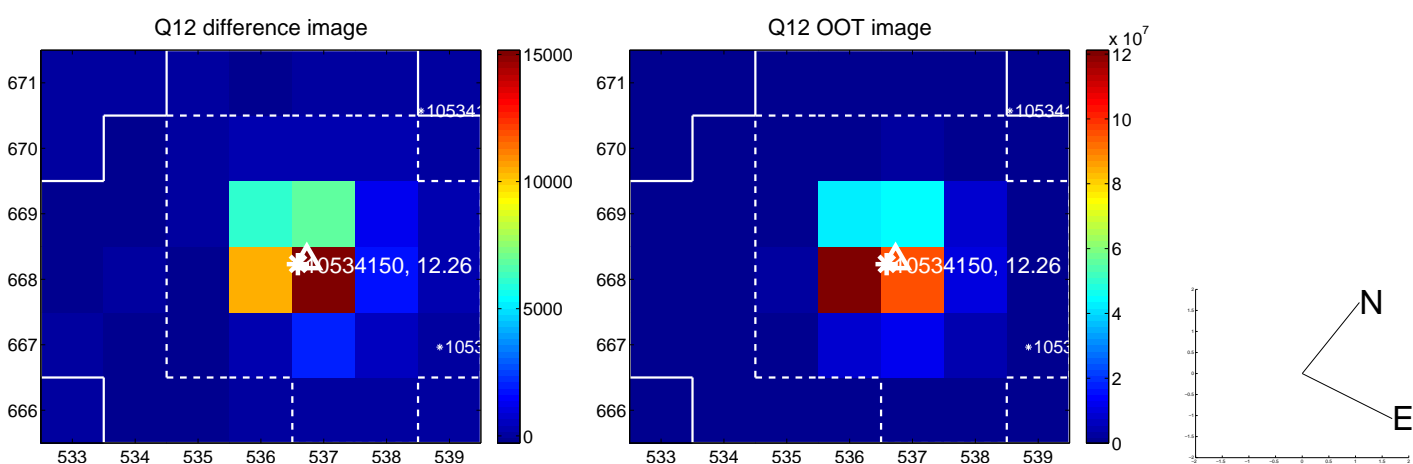
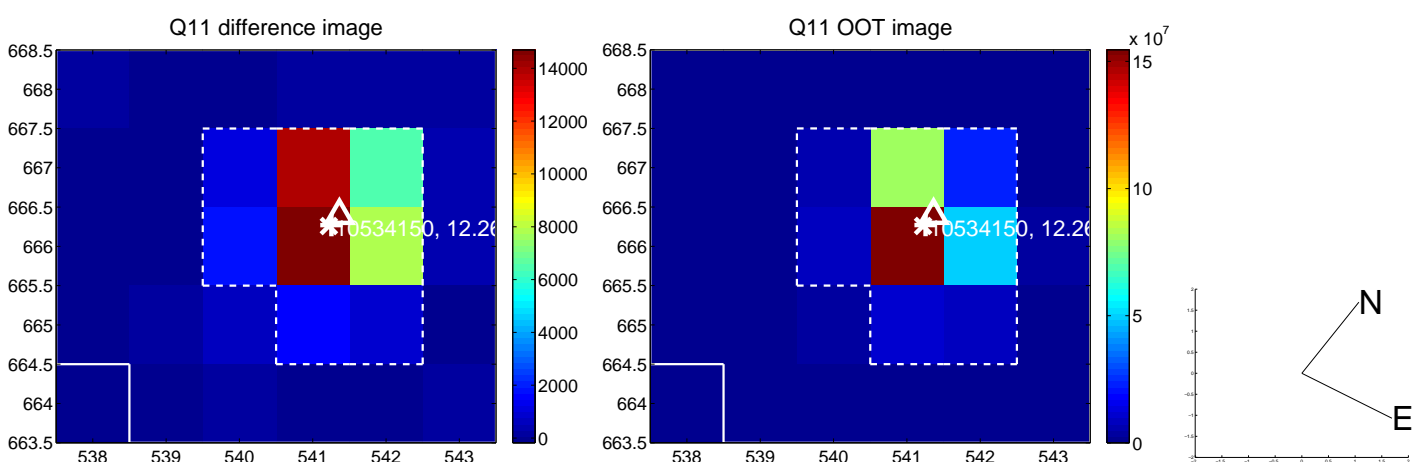
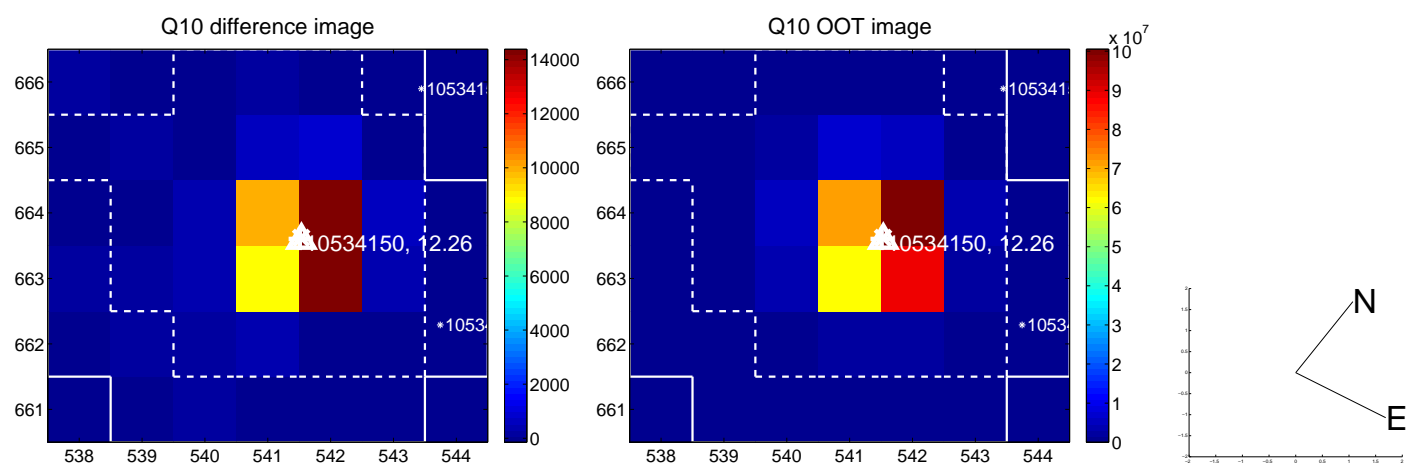
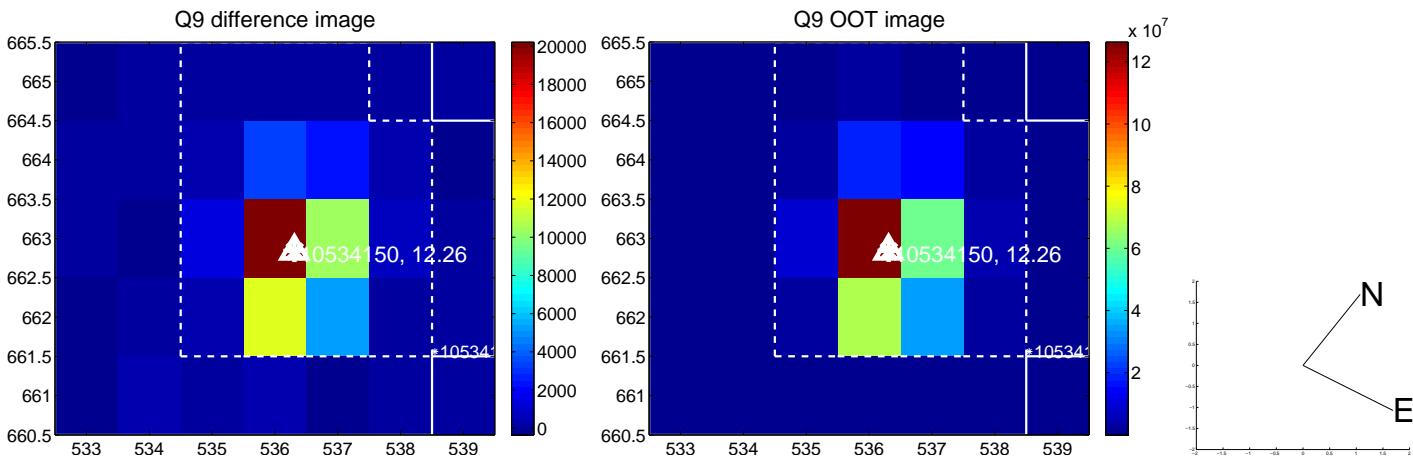


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

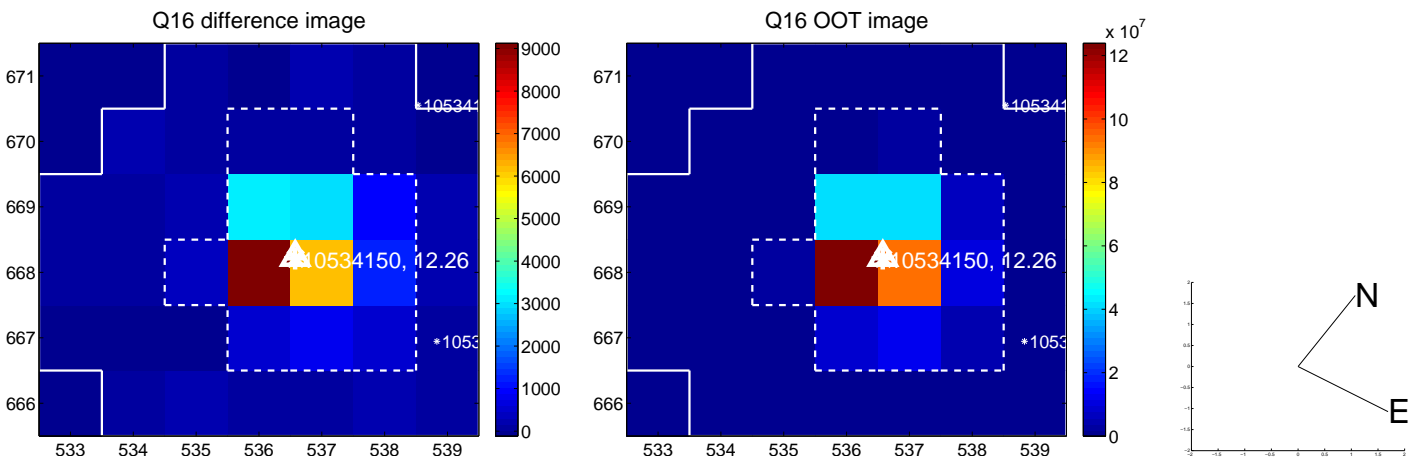
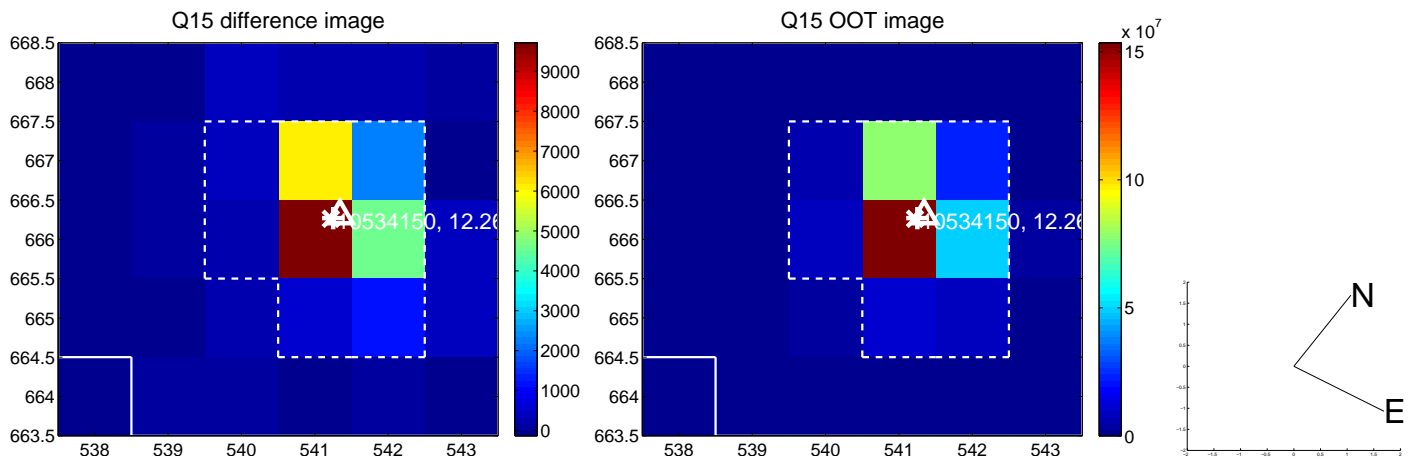
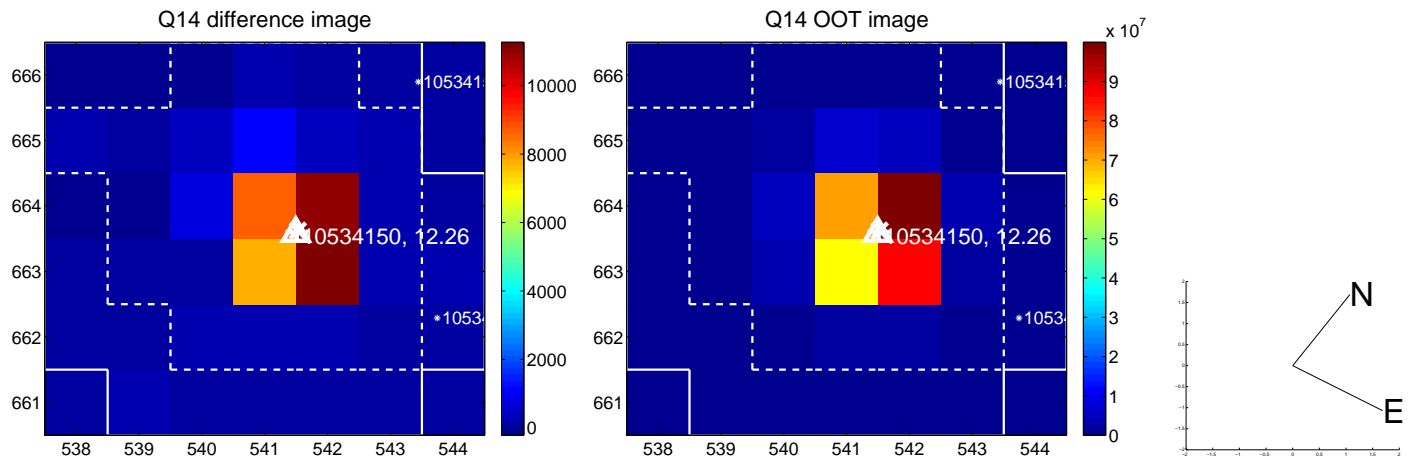
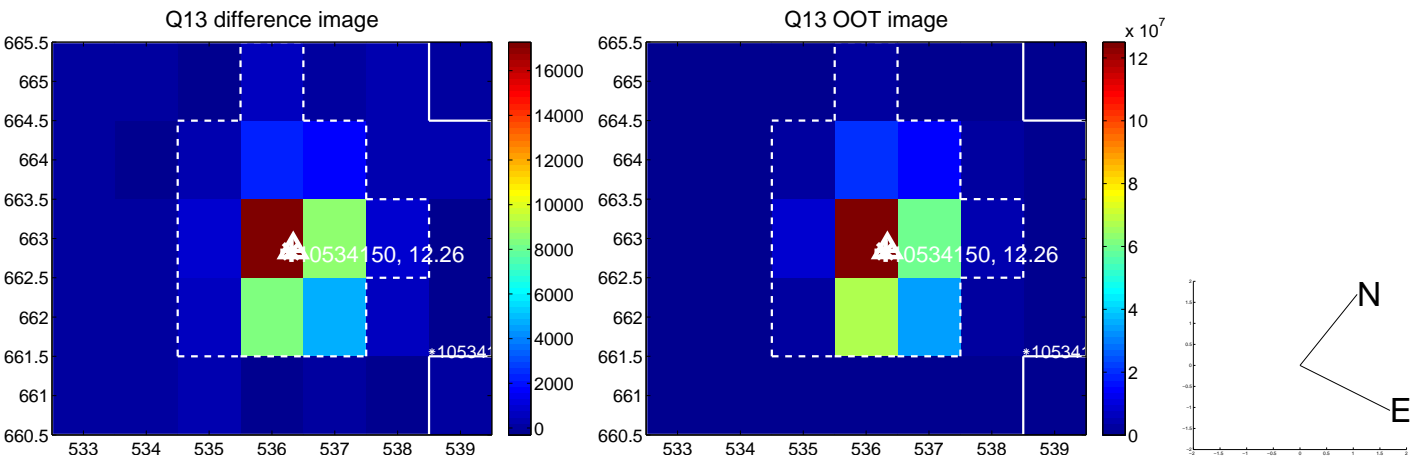




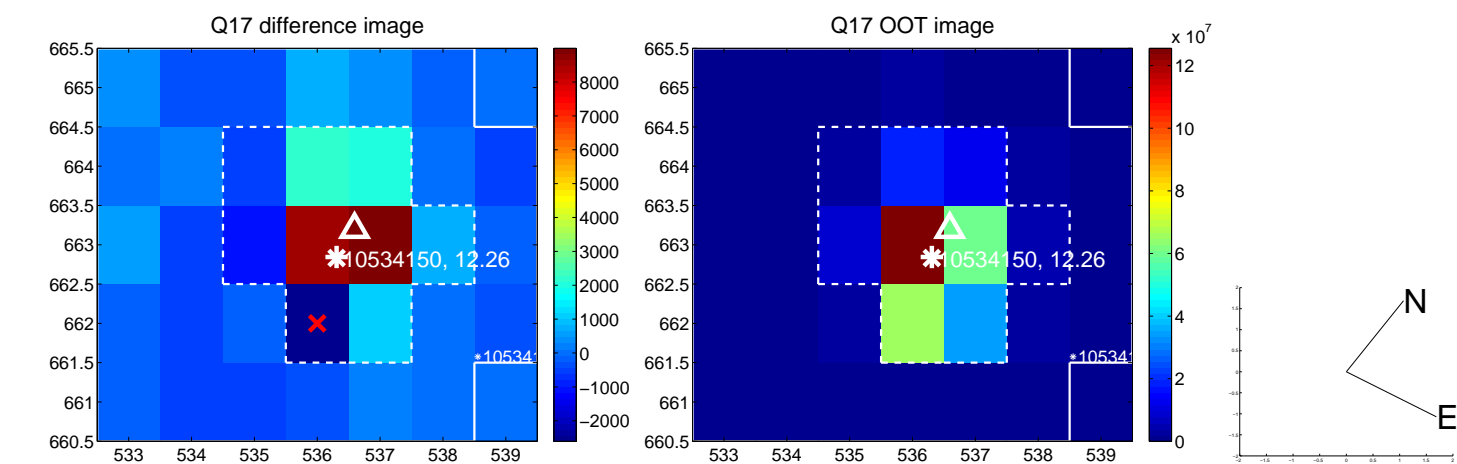
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



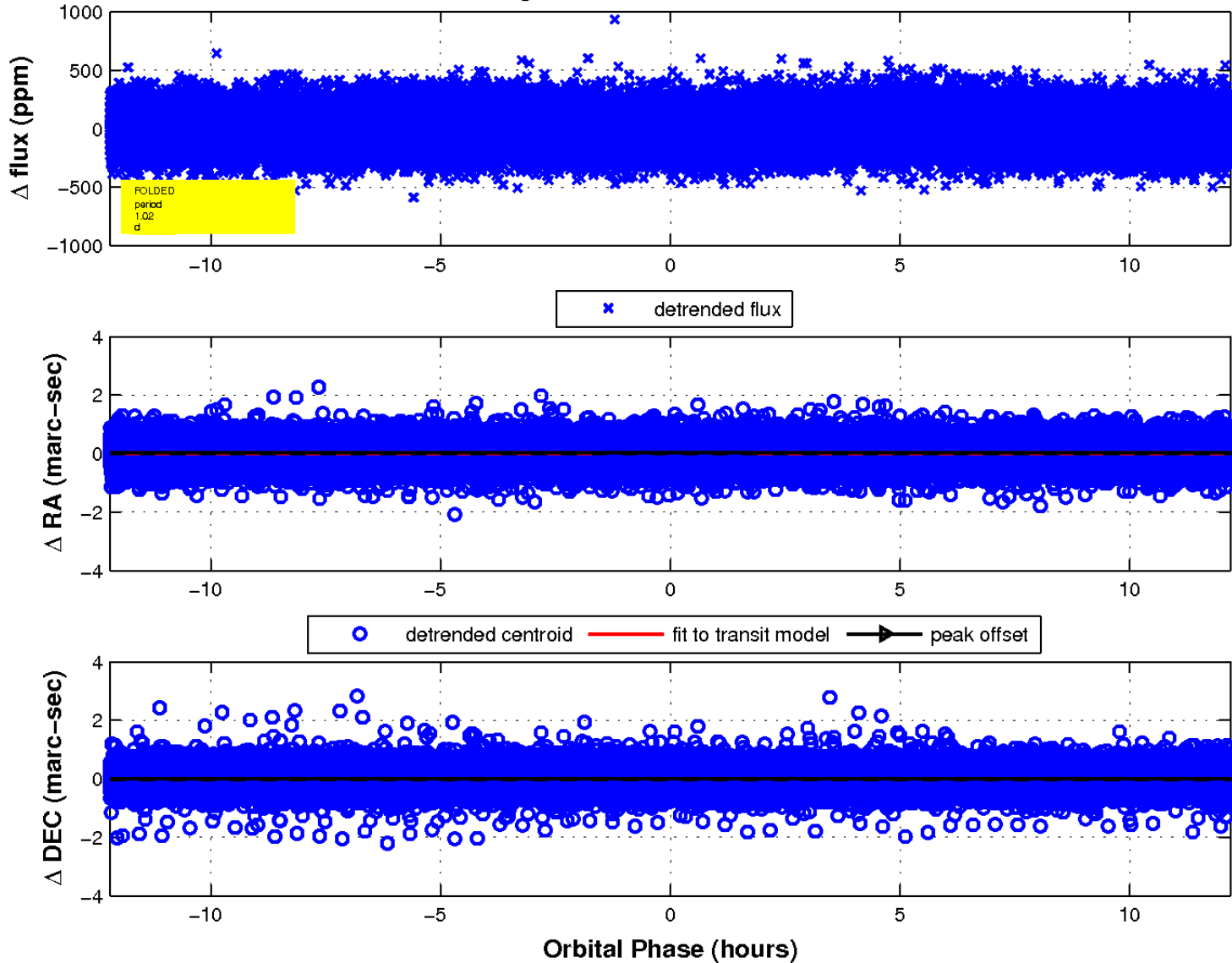
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



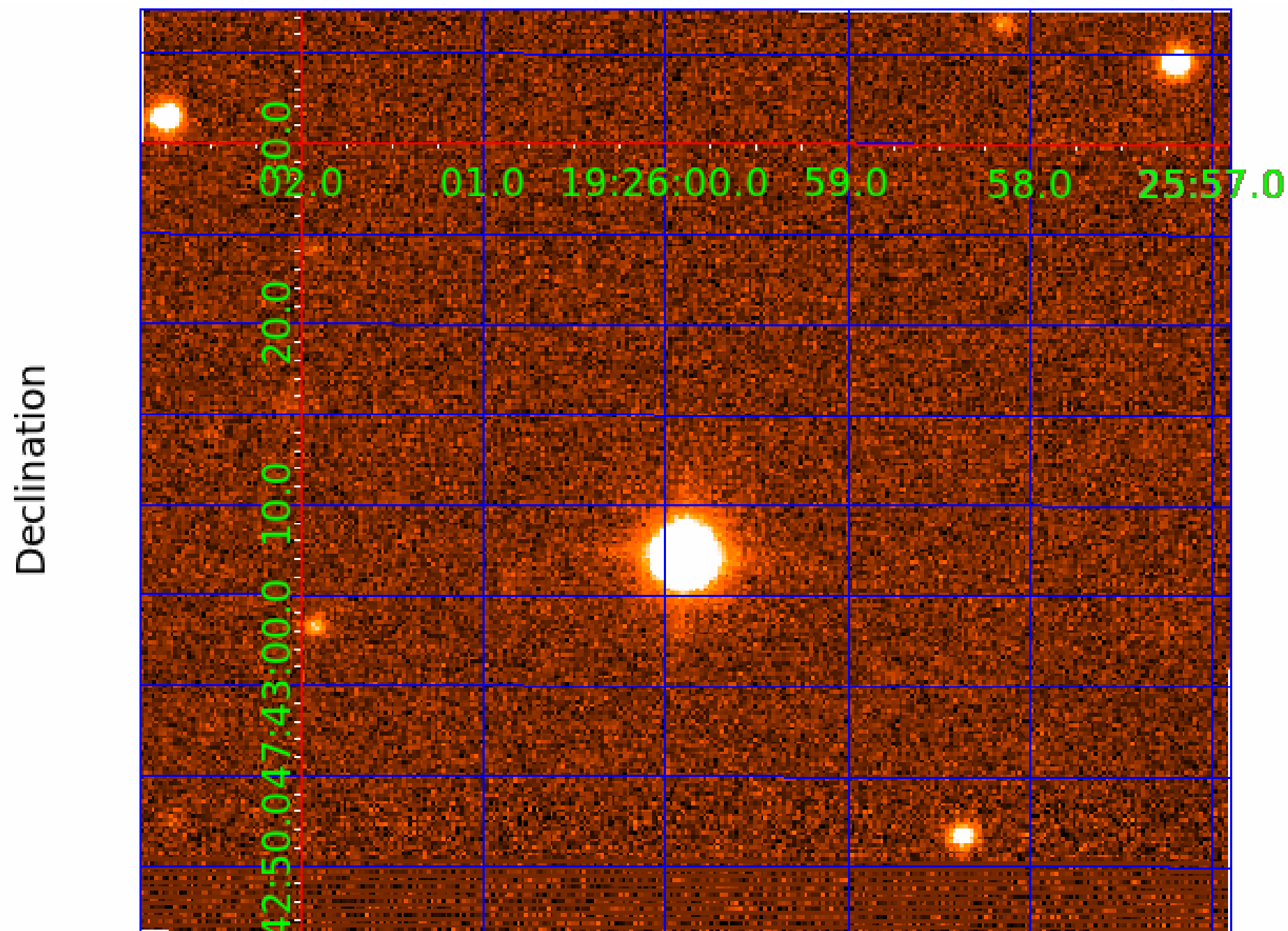
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\Delta$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 1 of 5



UKIRT Image



# KIC 010534150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010534150-01	OBS	No	1.016745	131.941789	15.3	4.401	8.3	7.8	1.23	6795	0.61	7107.84
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010534150-04	OBS	No	42.312760	159.779899	139.1	2.752	7.4	8.0	1.23	6795	1.69	49.29
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010534150-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010534150-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010534150-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
010534150-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT
010534150-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**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.

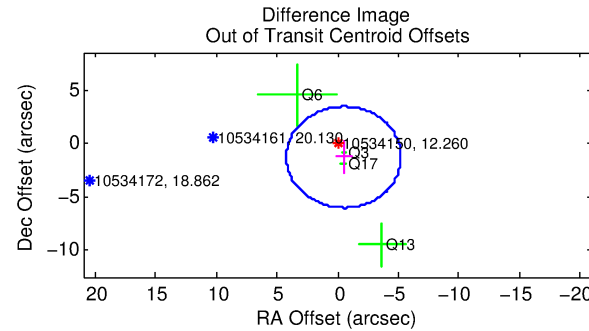
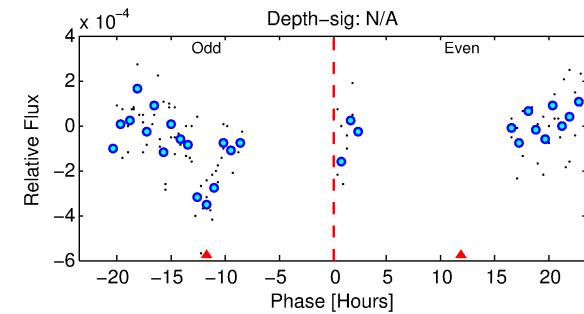
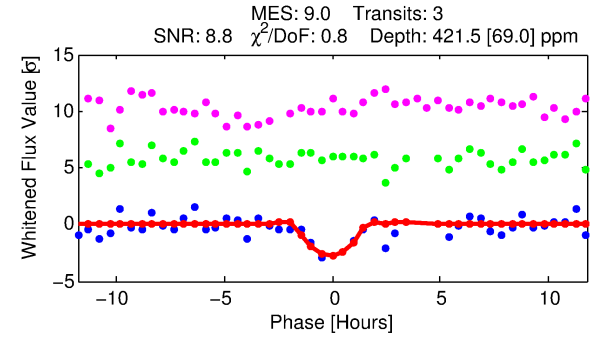
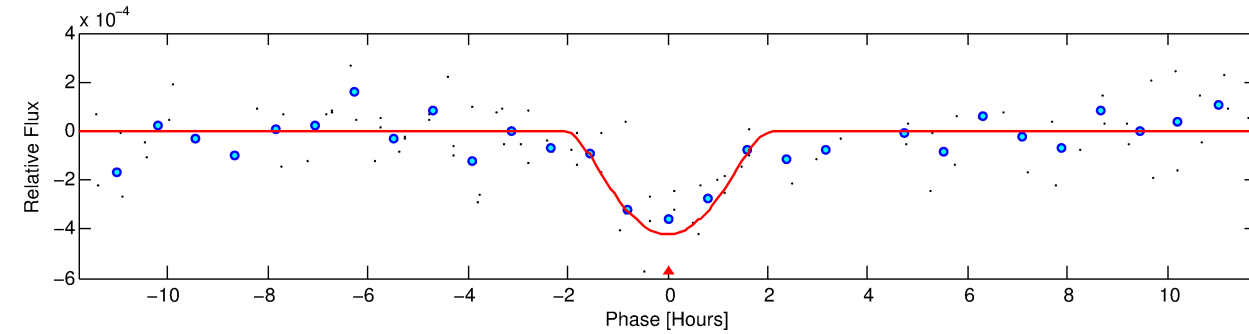
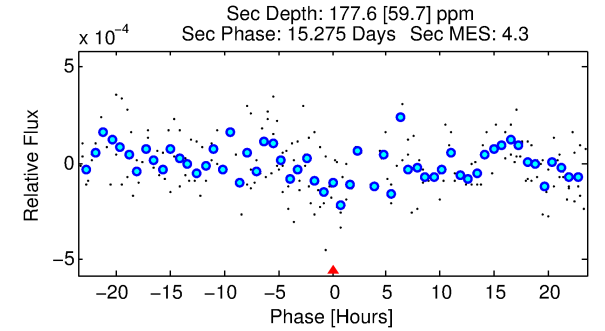
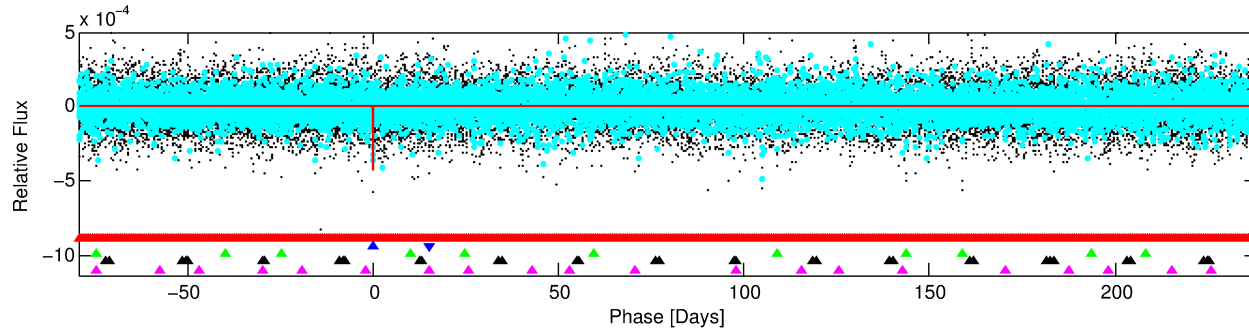
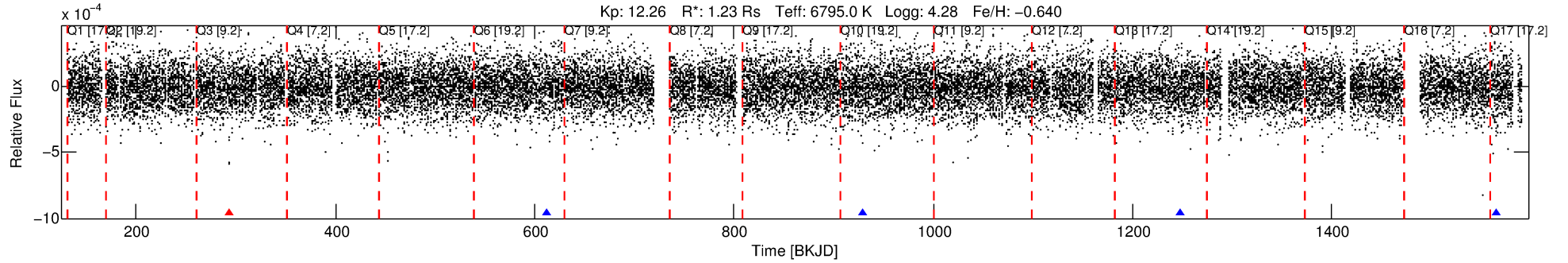
## Ephemeris Match Information For 010534150-02

No Significant Match Found



# DV One-Page Summary

KIC: 10534150 Candidate: 2 of 5 Period: 317.751 d



## DV Fit Results:

Period = 317.75086 [0.00291] d  
Epoch = 294.1833 [0.0075] BKJD  
Rp/R\* = 0.0313 [0.0581]  
a/R\* = 173.78 [108.61]  
b = 0.99 [0.10]  
Seff = 3.35 [1.19]  
Teq = 345 [31] K  
Rp = 4.19 [7.87] Re  
a = 0.9278 [0.2035] AU  
Ag = 4782.20 [17898.62] [0.27σ]  
Teffp = 4436 [4140] K [0.99σ]

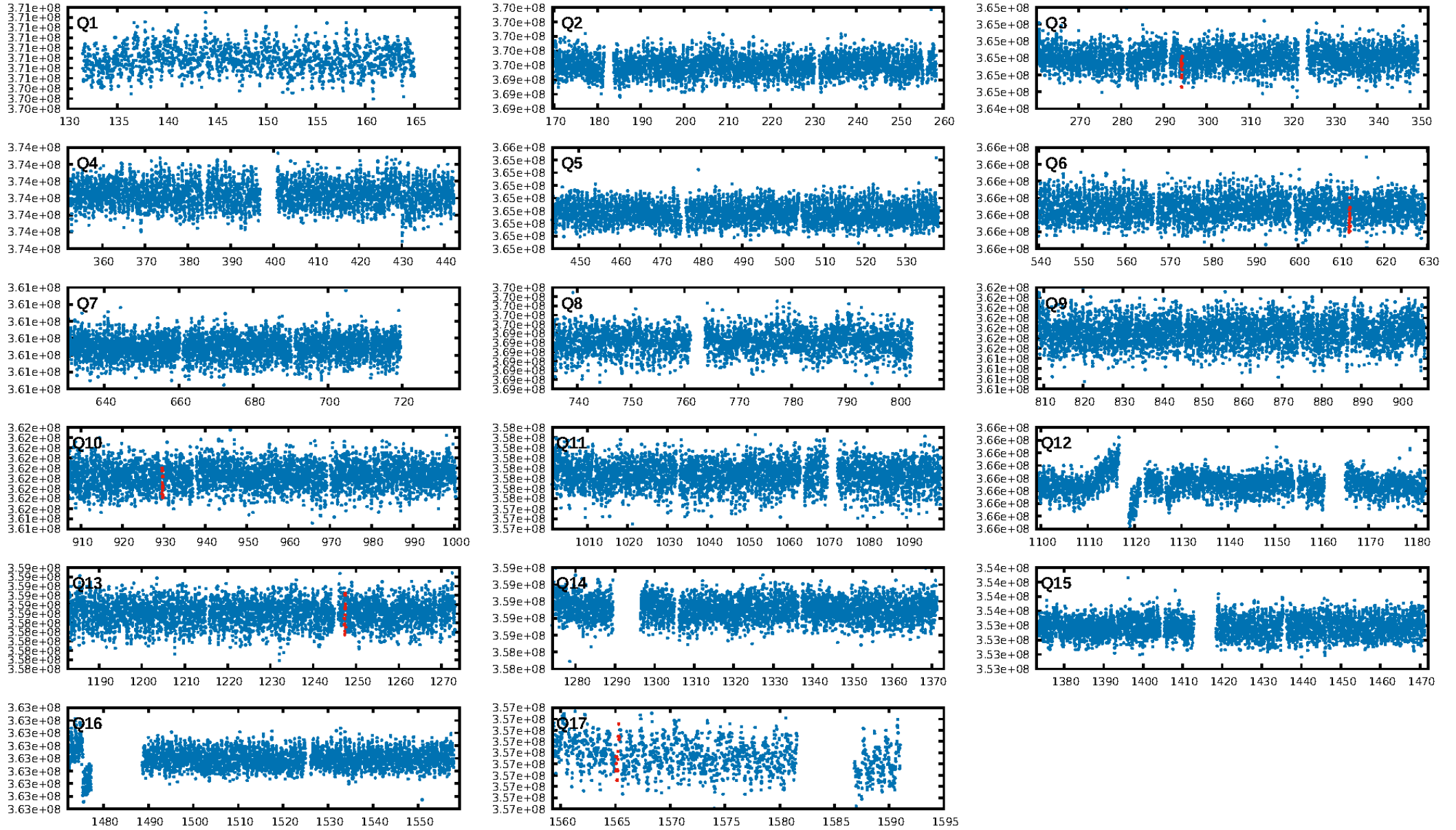
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [749.91σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 12.9%  
ModelChiSquareGof-sig: 98.5%  
**Bootstrap-pfa: 4.37e-12**  
**RollingBand-fgt: 0.50 [1/2]**  
GhostDiagnostic-chr: 1.963  
Centroid-sig: 1.3%  
Centroid-so: 0.873 arcsec [1.85σ]  
OotOffset-rm: 1.388 arcsec [0.88σ]  
KicOffset-rm: 1.298 arcsec [0.34σ]  
OotOffset-st: 1/1/0/2 [4]  
KicOffset-st: 1/1/0/2 [4]  
DiffImageQuality-fgm: 0.50 [2/4]  
DiffImageOverlap-fno: 0.00 [0/4]

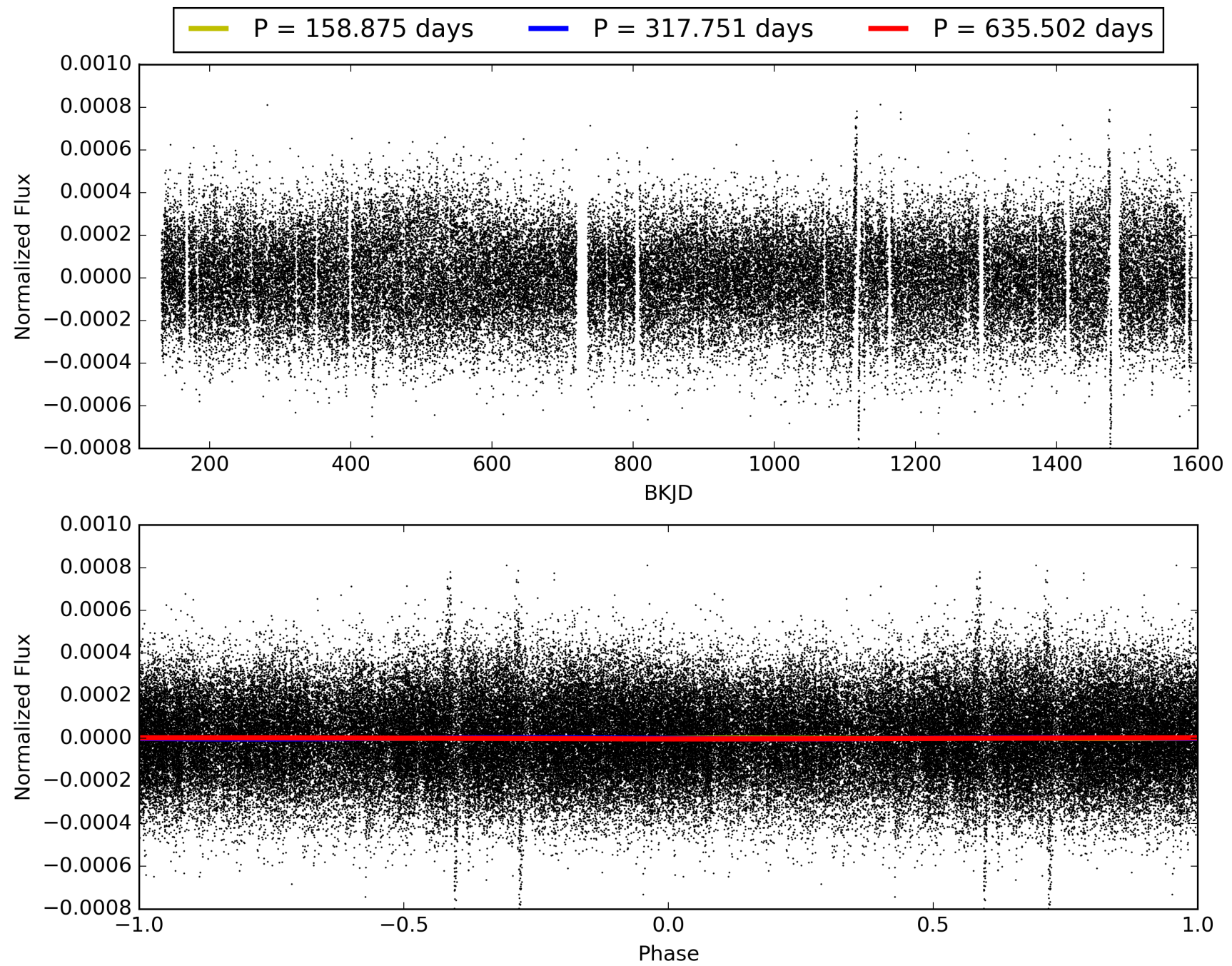
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:08:32 Z

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

# TCE 010534150-02, PDC Light Curves

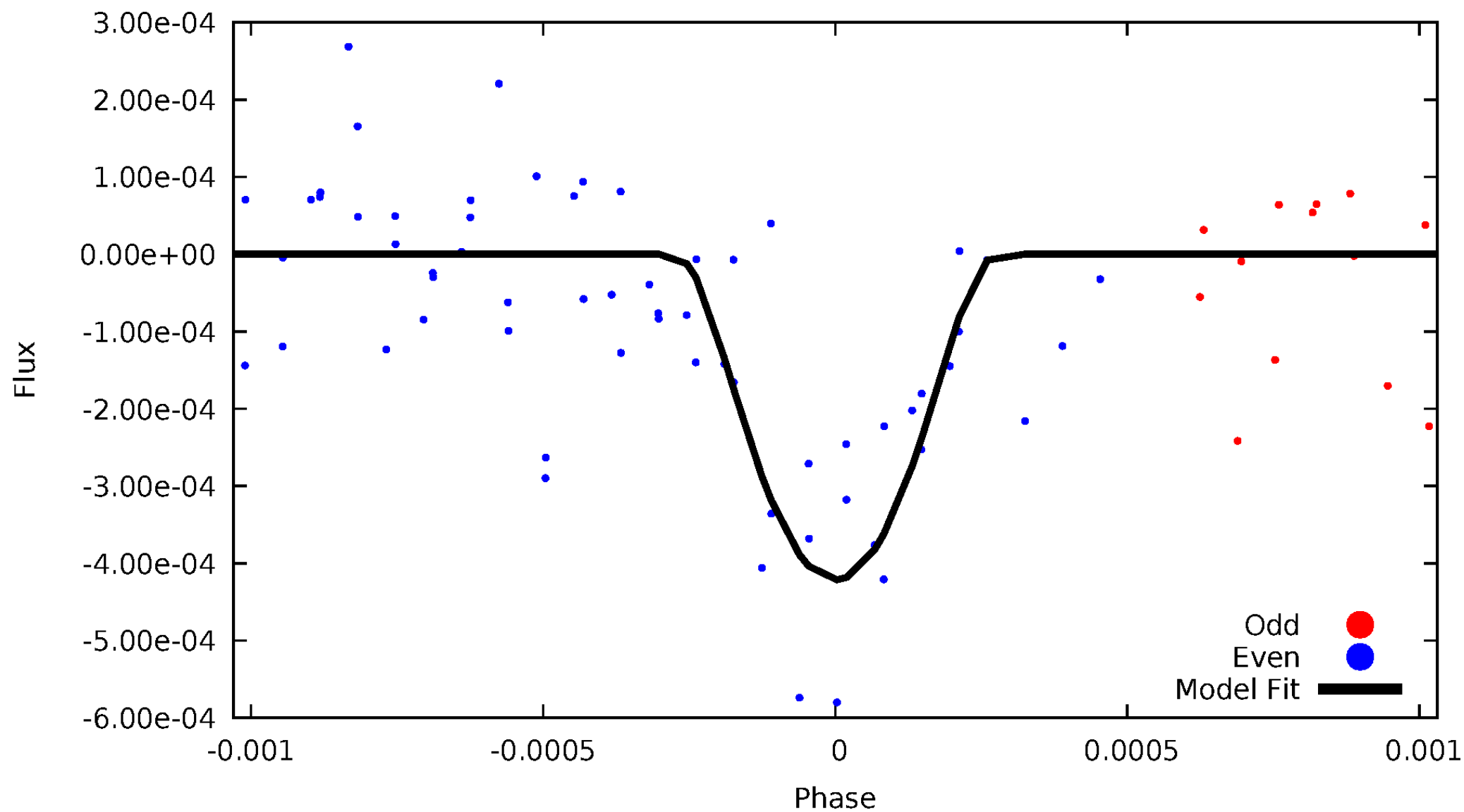


TCE 010534150-02



# DV Odd/Even

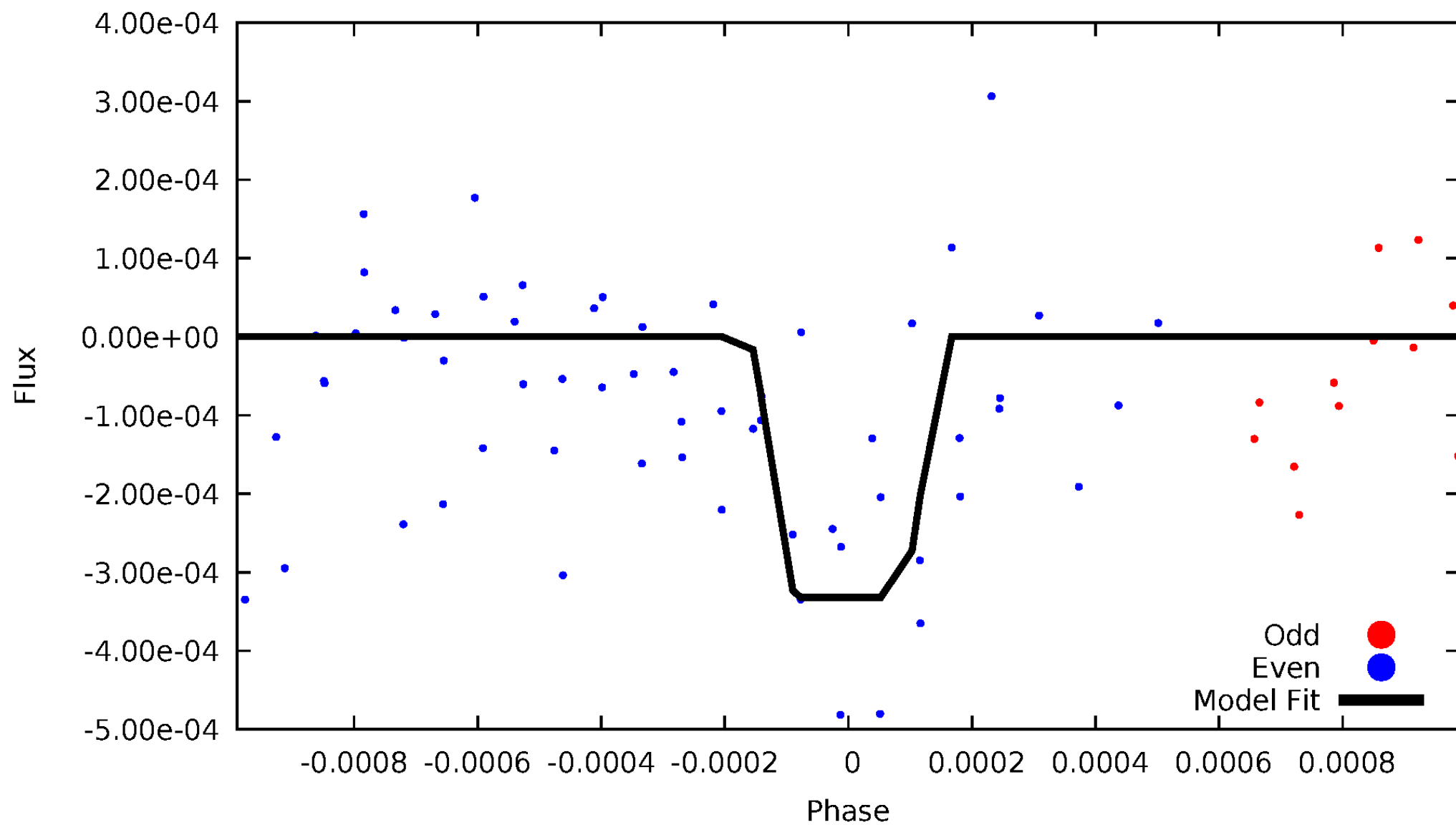
TCE 010534150-02





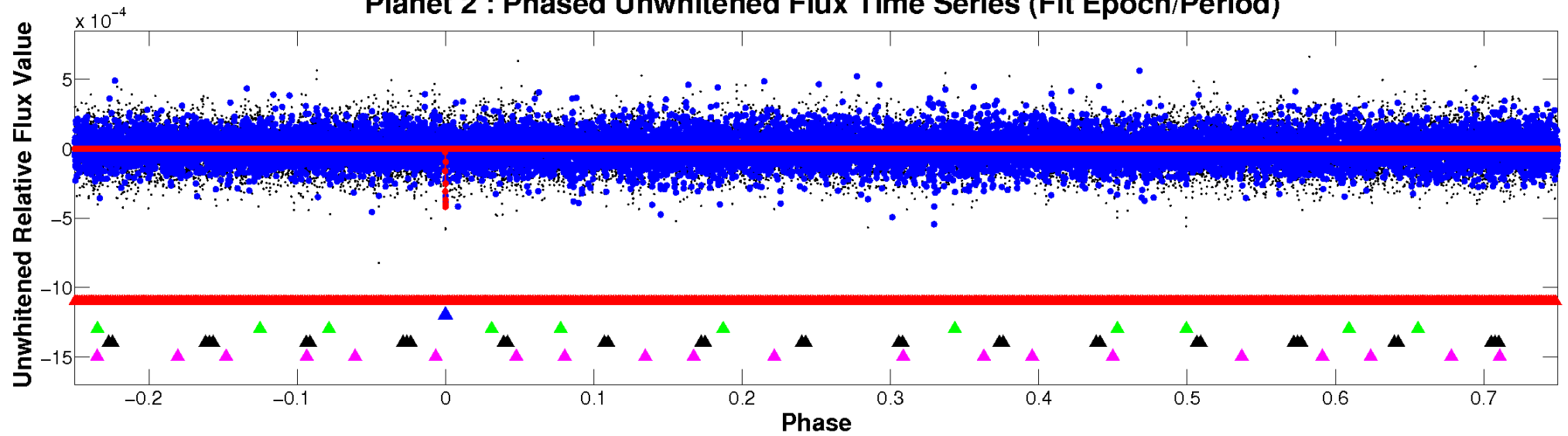
# ALT Odd/Even

TCE 010534150-02

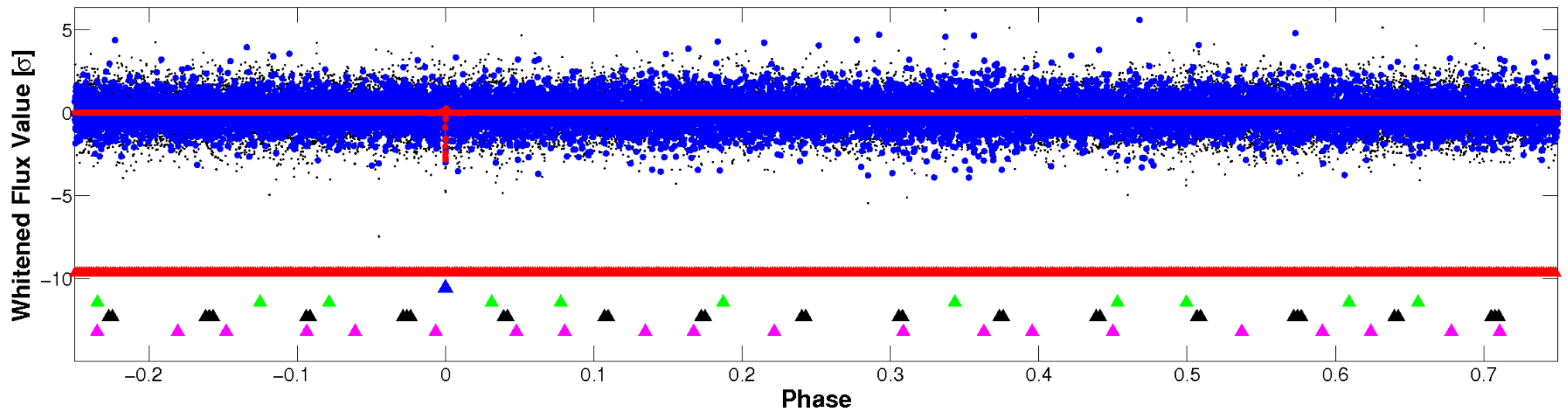


# Non-Whitened Vs. Whitened Light Curve

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

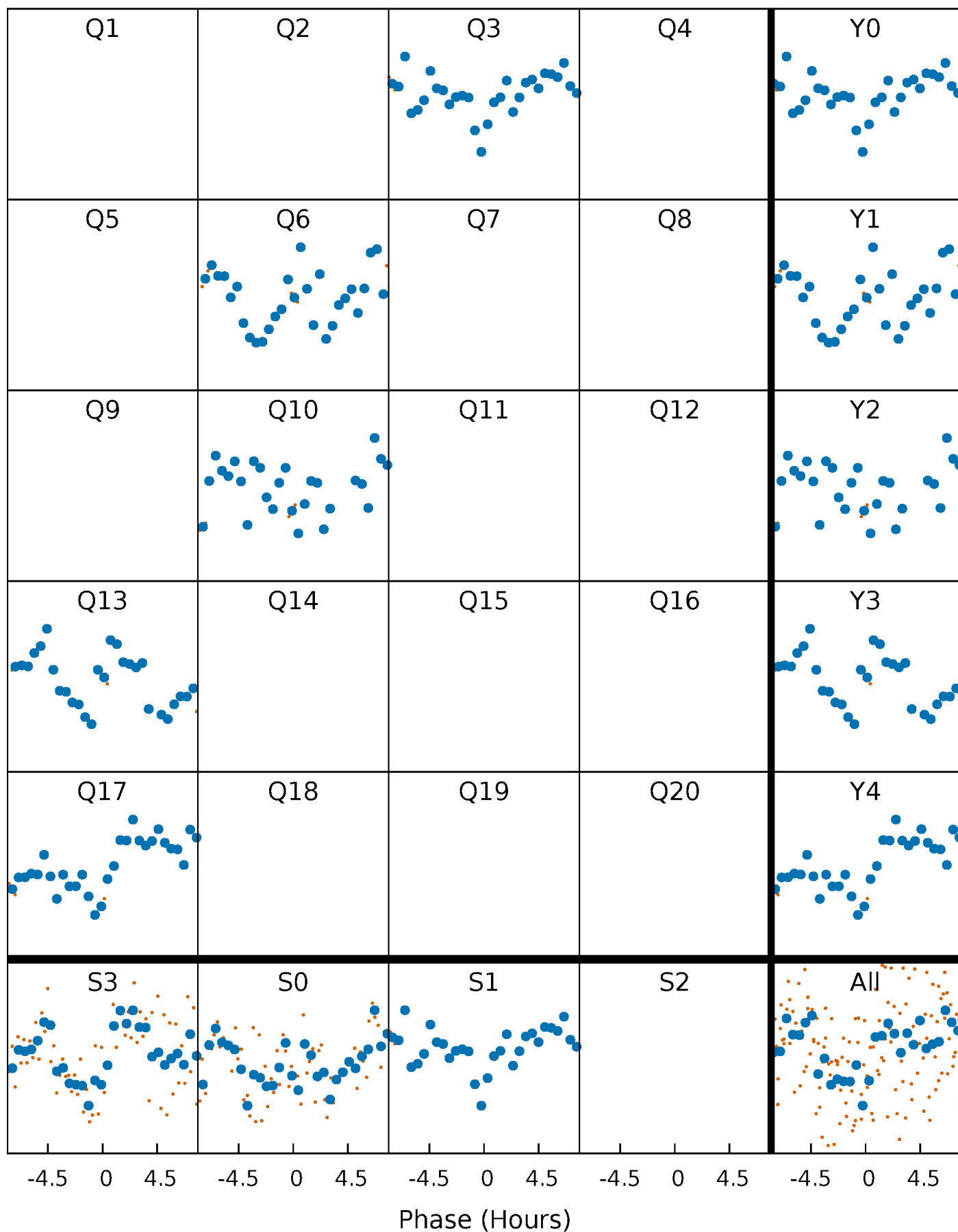


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



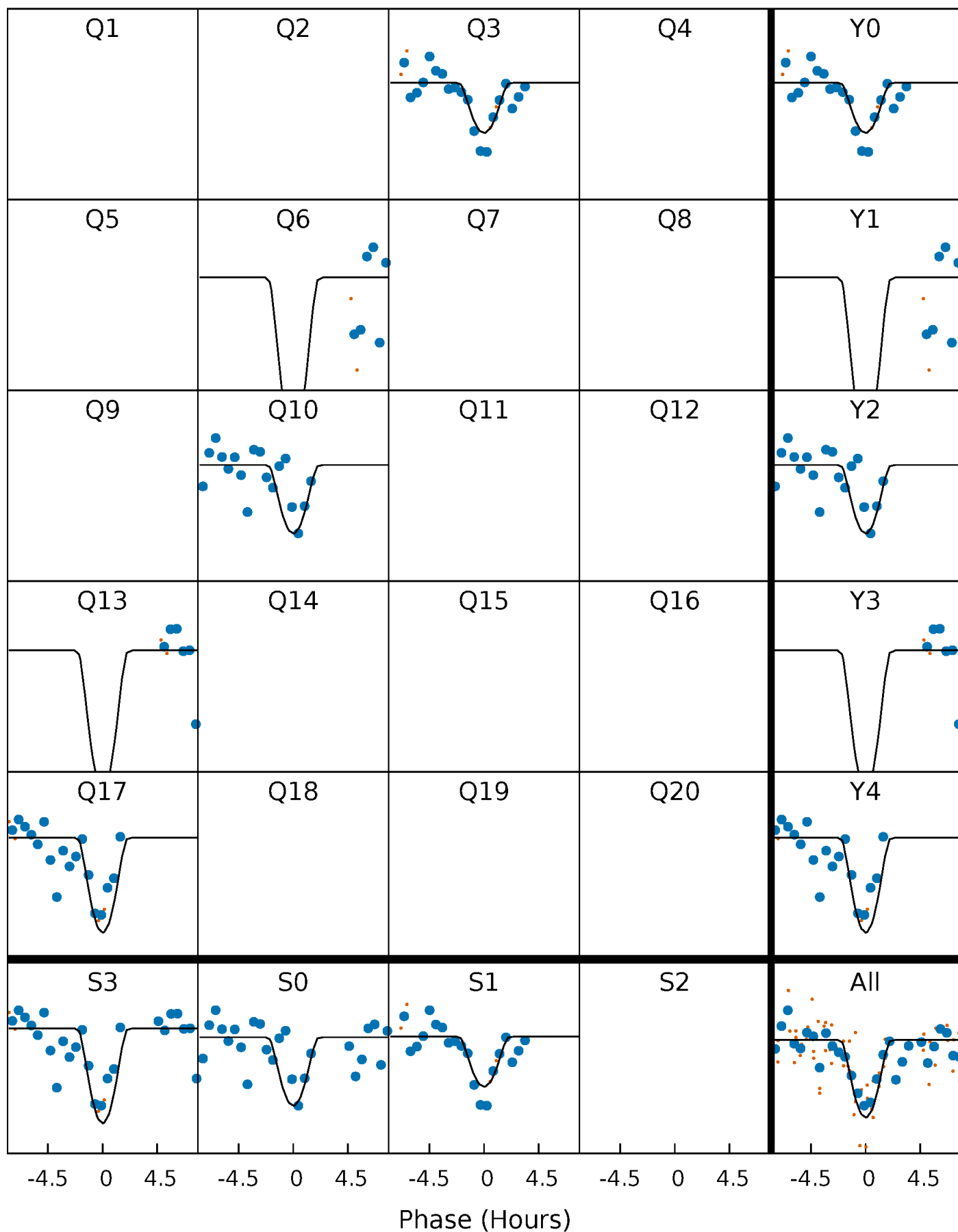
# PDC Quarter-Phased Transit Curves

TCE 010534150-02     $P=317.750860$  Days     $T_0=294.183308$  (BKJD)



# DV Quarter-Phased Transit Curves

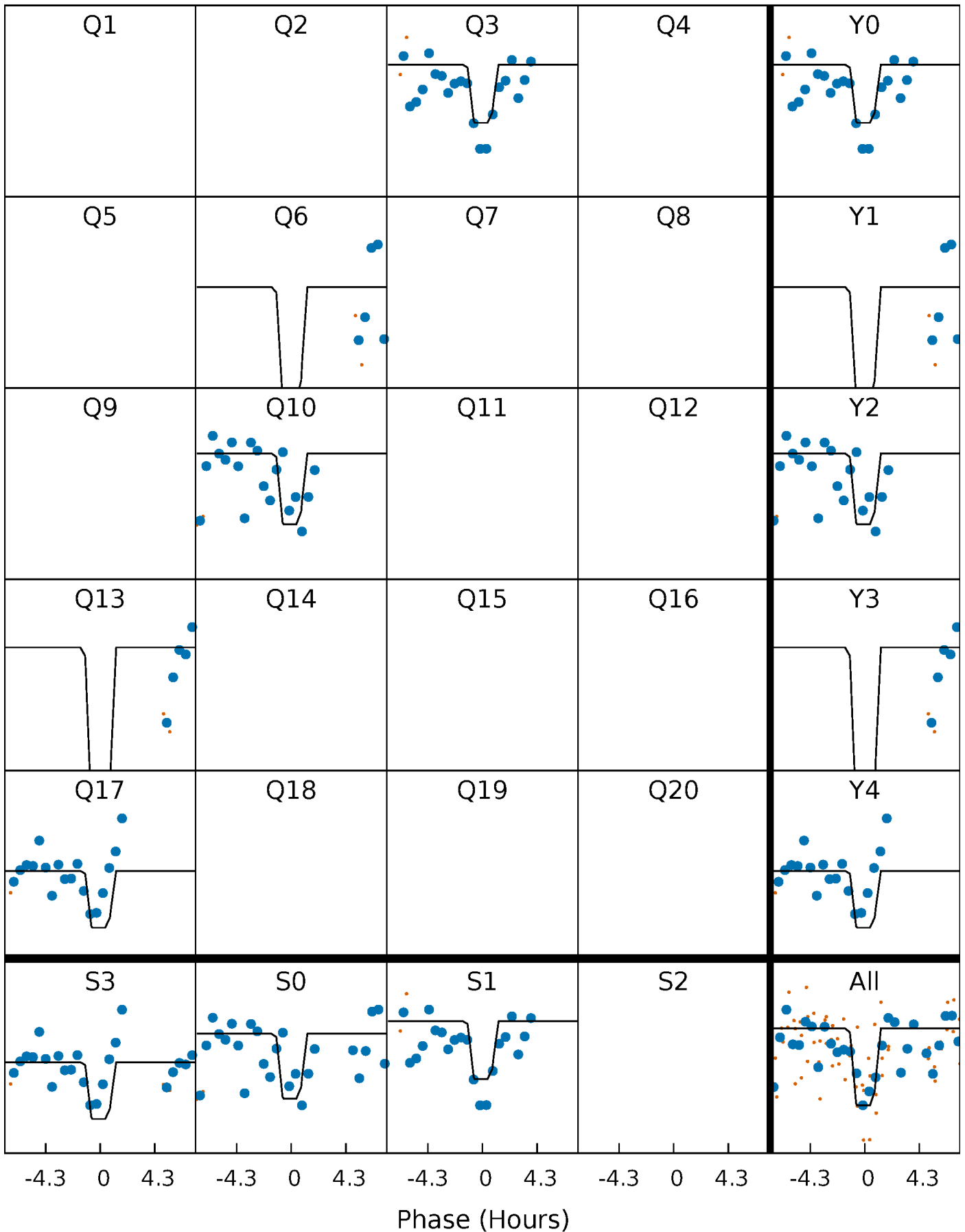
TCE 010534150-02 P=317.750860 Days  $T_0=294.183308$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

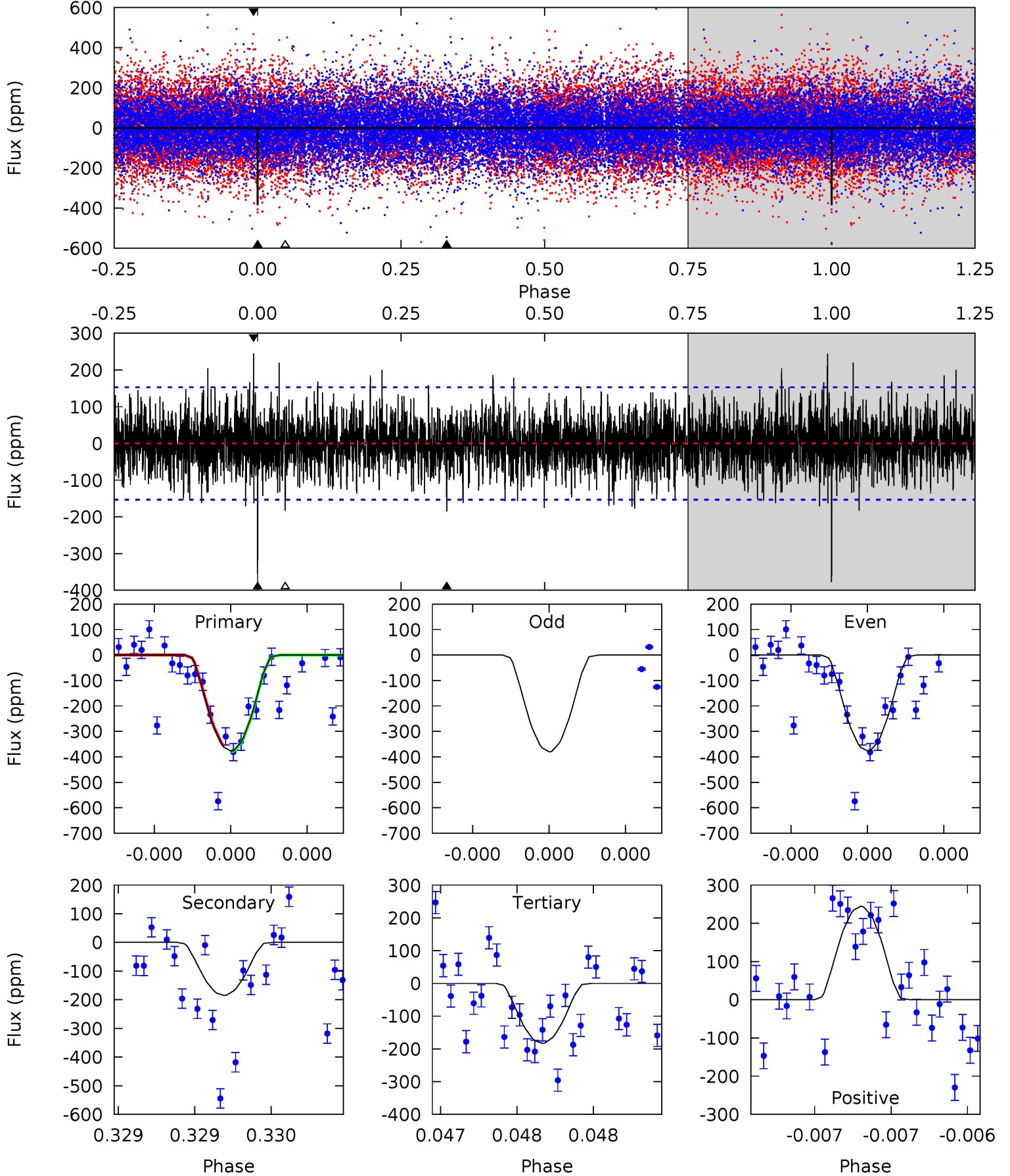
TCE 010534150-02 P=317.753176 Days  $T_0=294.167874$  (BKJD)



# DV Model-Shift Uniqueness Test

010534150-02, P = 317.750860 Days, E = 294.183308 Days

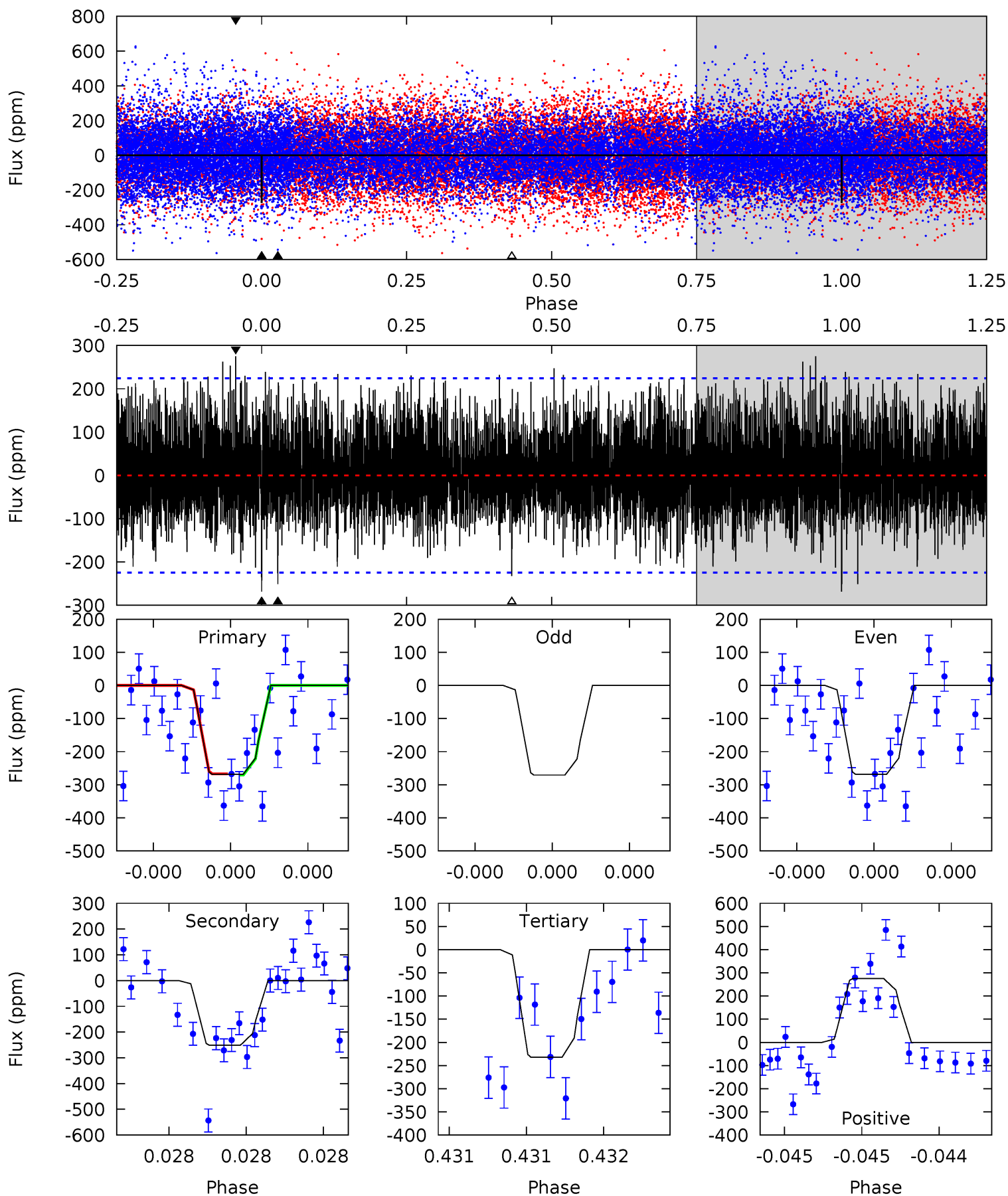
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	6.74	6.66	8.92	5.57	3.48	1.93	7.09	4.83	0.07	-2.19	0.07	1.10	0.39	0.41



# Alt Model-Shift Uniqueness Test

010534150-02, P = 317.753176 Days, E = 294.167874 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
6.76	6.32	5.85	6.92	5.65	3.60	1.93	0.91	-0.16	0.47	-0.60	0.03	1.31	0.51	0.05



### Stellar Parameters For KIC 010534150

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6795^{+212}_{-282}$	$4.282^{+0.139}_{-0.170}$	$-0.640^{+0.300}_{-0.350}$	$1.229^{+0.325}_{-0.216}$	$1.053^{+0.145}_{-0.118}$	$0.798^{+0.543}_{-0.375}$
	+3%/-4%	+3%/-4%	+47%/-55%	+26%/-18%	+14%/-11%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010534150-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-185 \pm 27$	$6.84^{+6.95}_{-4.33}$	$484^{+33}_{-32}$	$3821^{+1967}_{-709}$	$1785^{+11643}_{-1335}$
Alt.	$-251 \pm 40$	$6.59^{+6.79}_{-4.39}$	$480^{+32}_{-29}$	$4130^{+2557}_{-877}$	$2673^{+21922}_{-2027}$

$T_{\text{max}}$  = 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

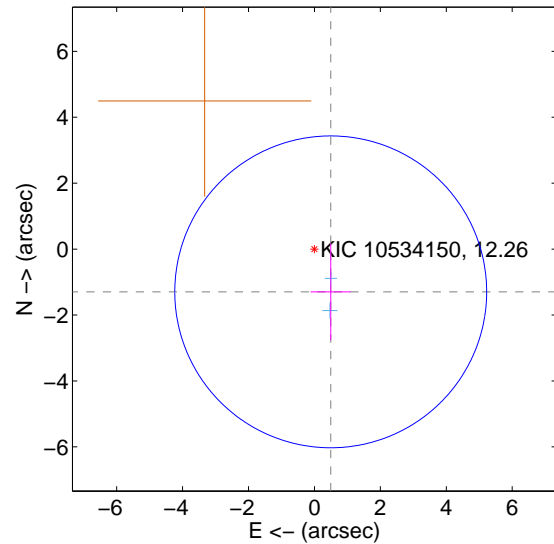
Supplemental centroid analysis for 010534150-02. Kepler magnitude: 12.26. Transit SNR 8.80

There are 2 quarters with good PRF difference image offsets

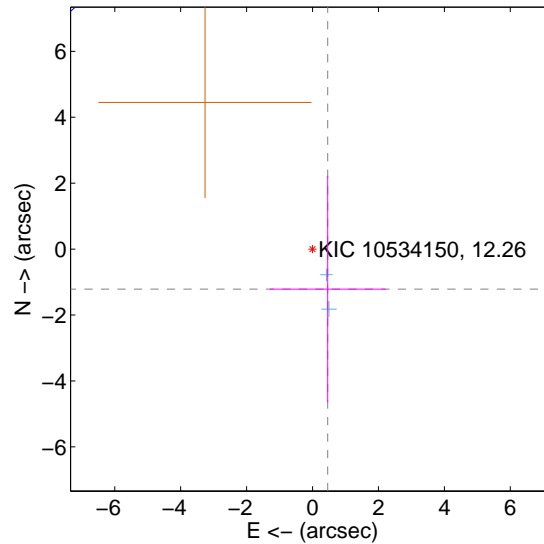
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.388 \pm 1.577$	0.88	$-0.494 \pm 0.610$	$-1.297 \pm 1.467$
PRF-fit source offset from KIC position	$1.298 \pm 3.827$	0.34	$-0.462 \pm 1.758$	$-1.213 \pm 3.430$
photometric centroid source offset	$0.87 \pm 0.47$	1.85	$-0.45 \pm 0.52$	$-0.75 \pm 0.45$

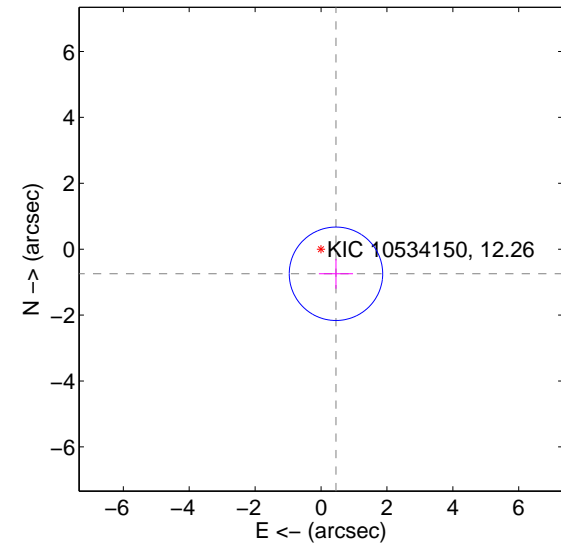
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

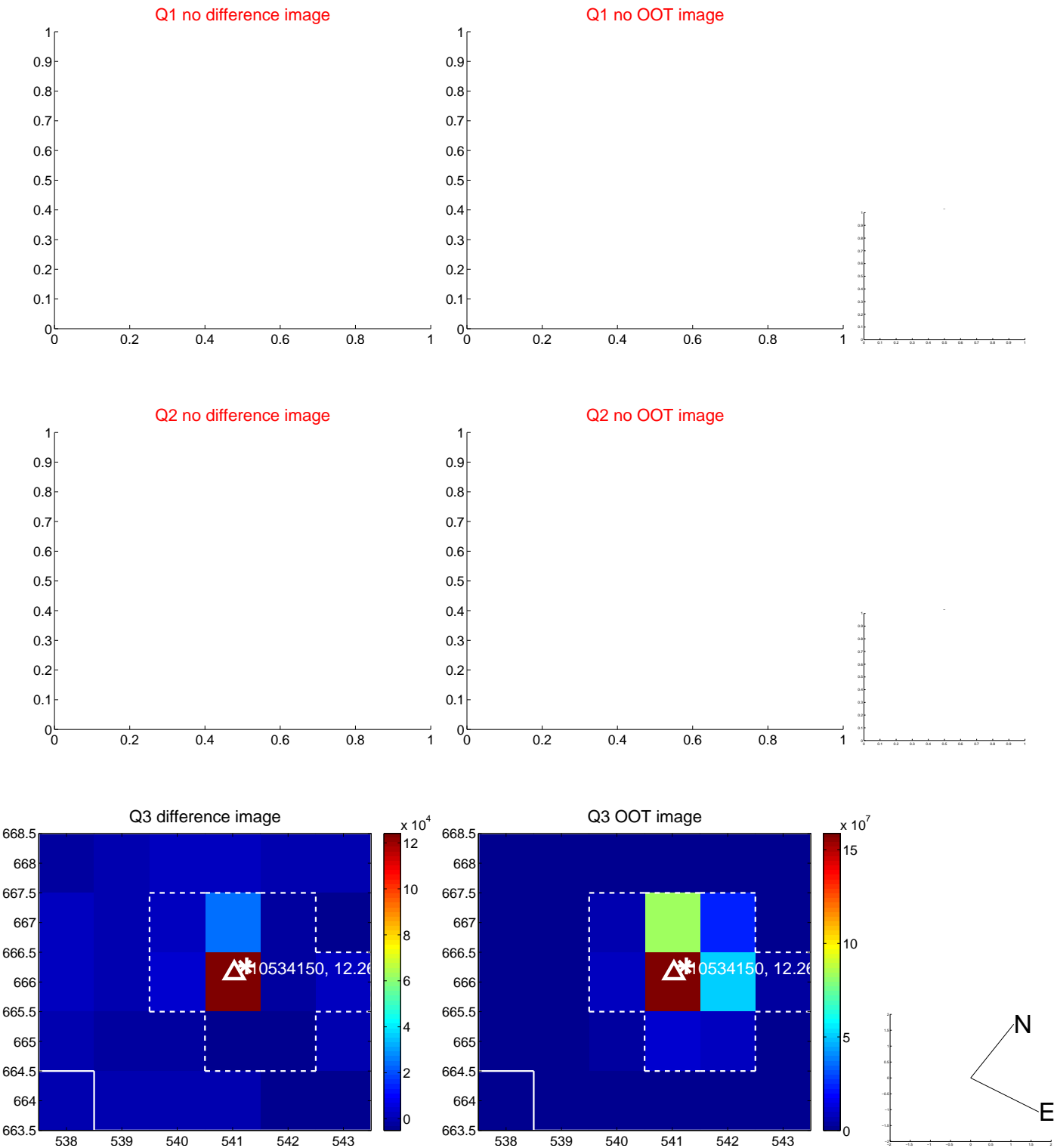


offset from photometric centroids

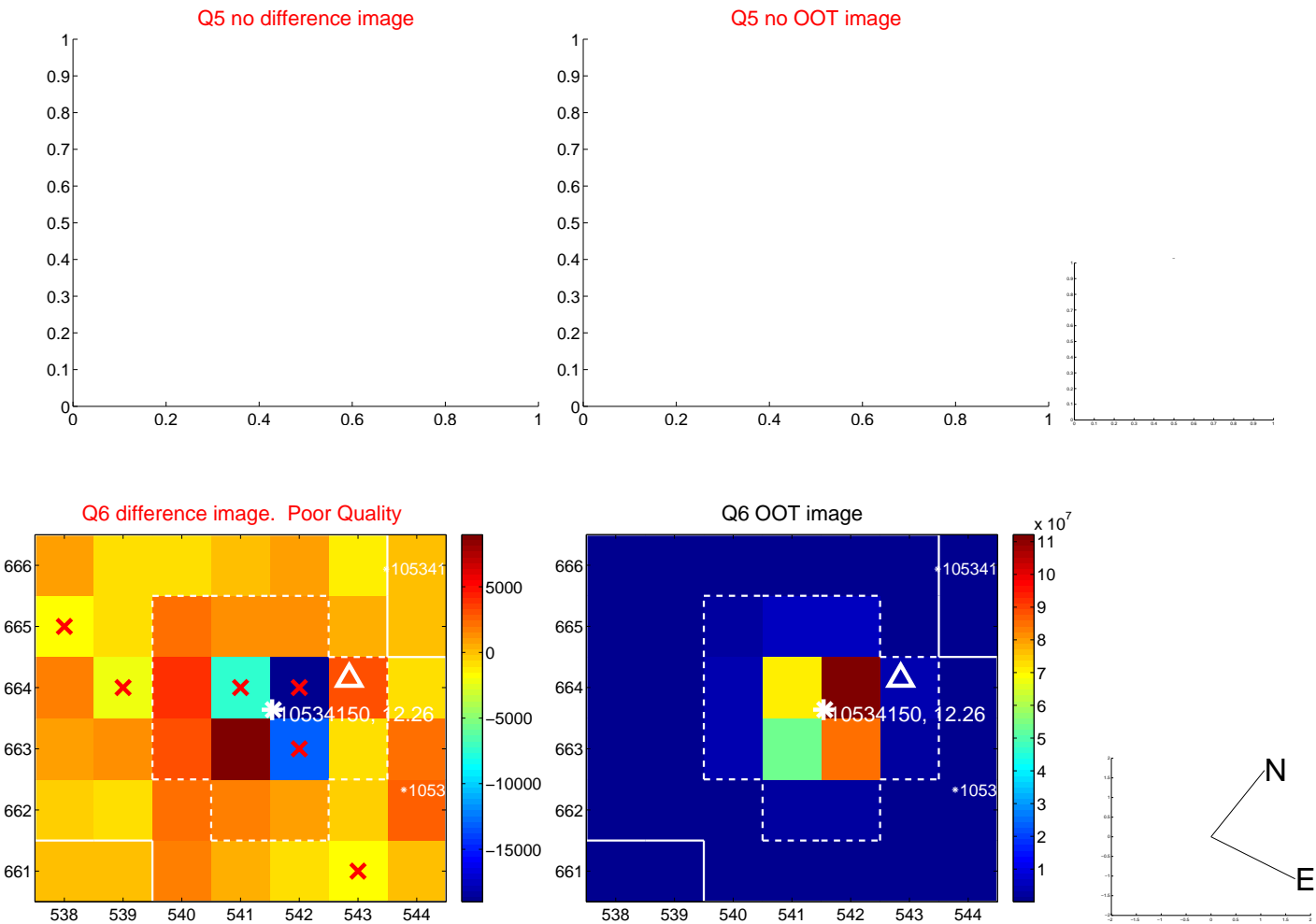


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

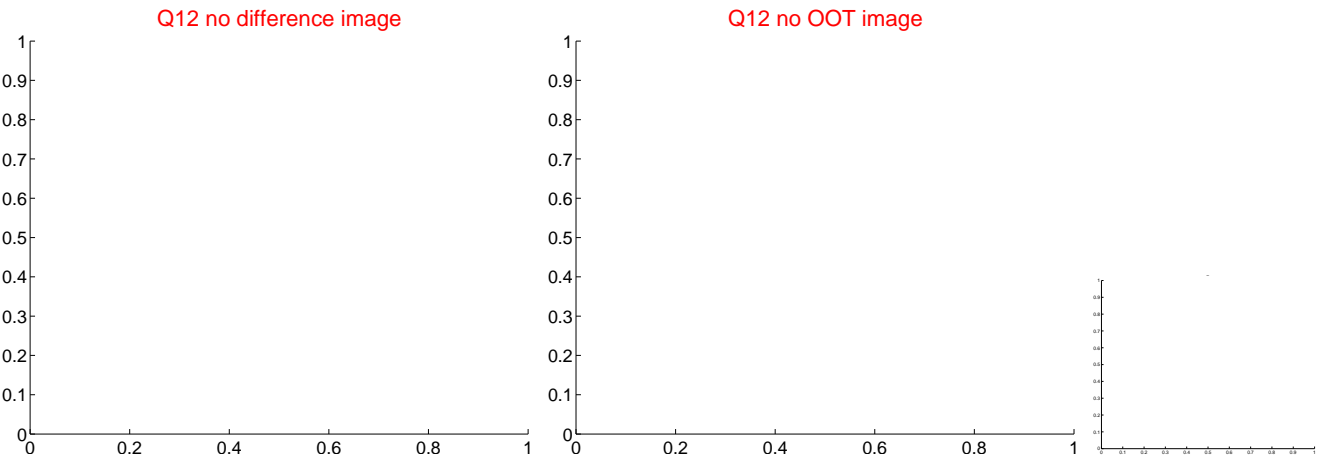
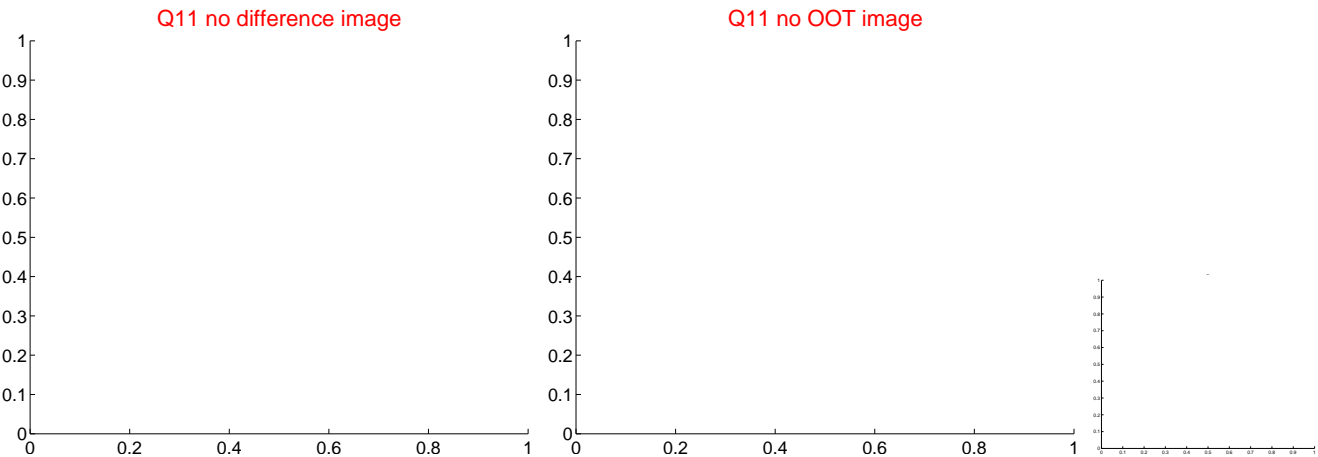
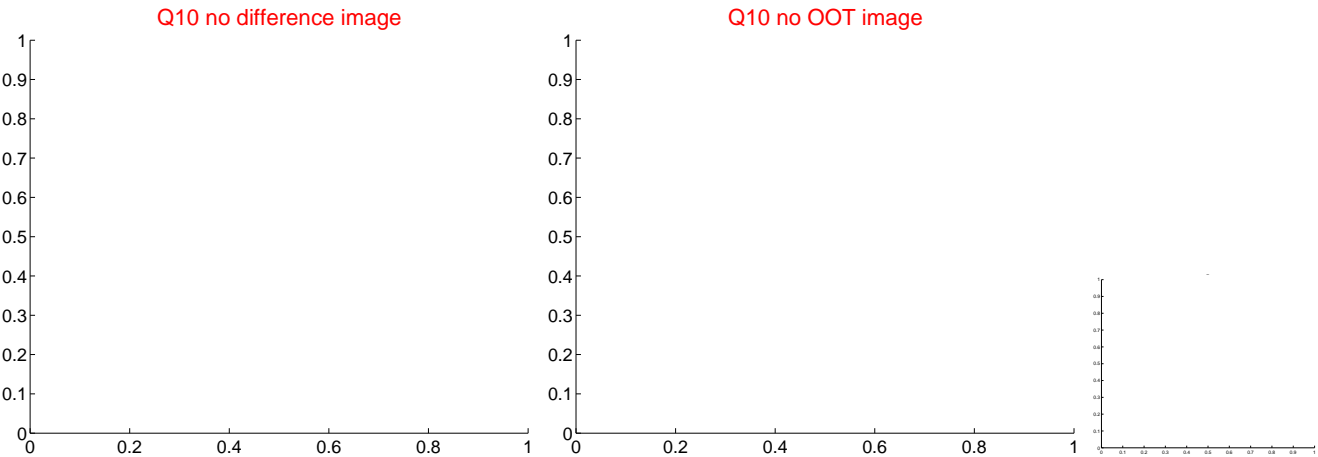
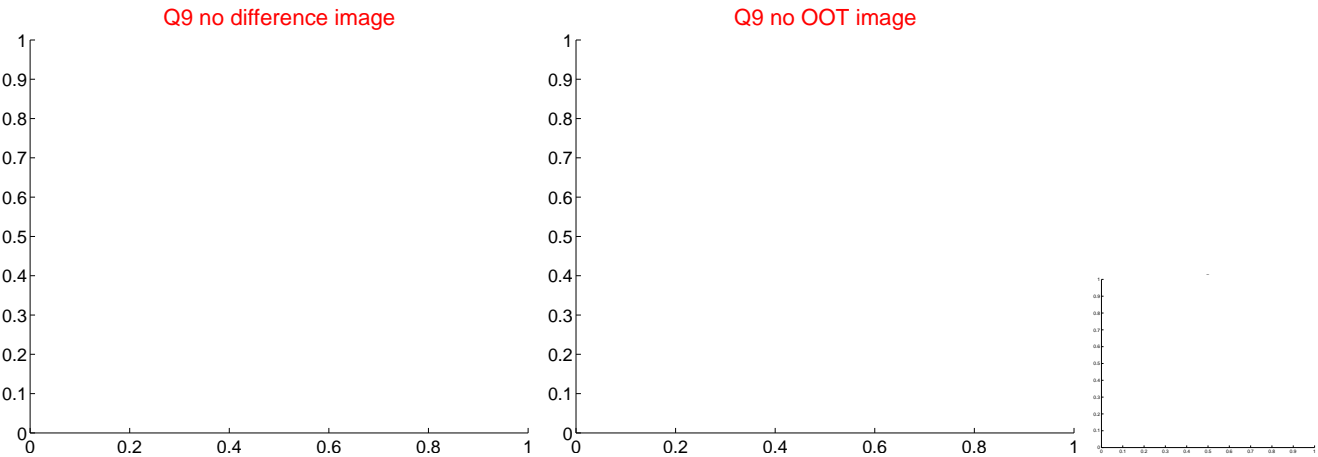
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



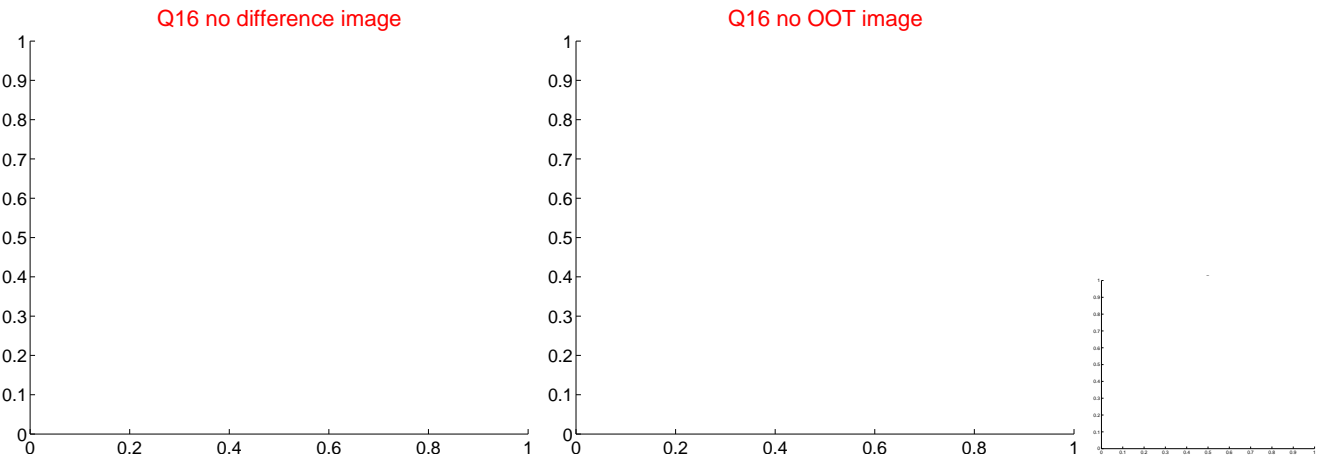
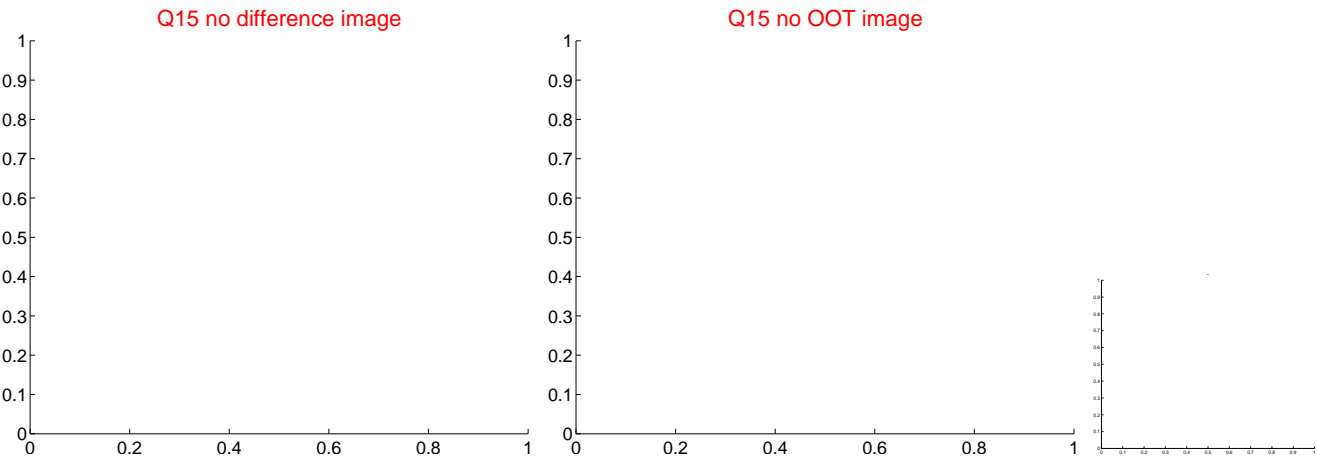
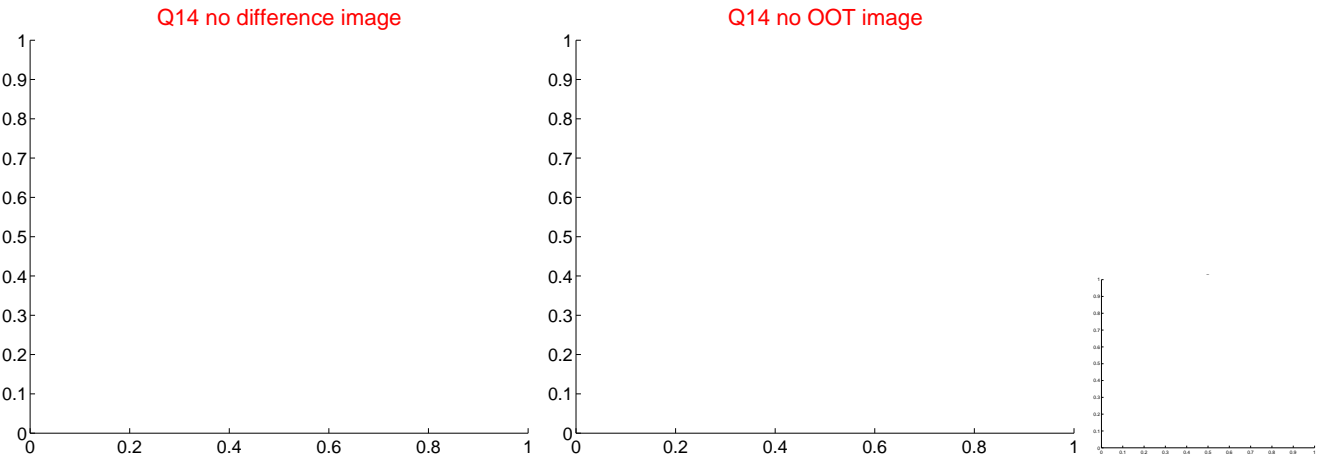
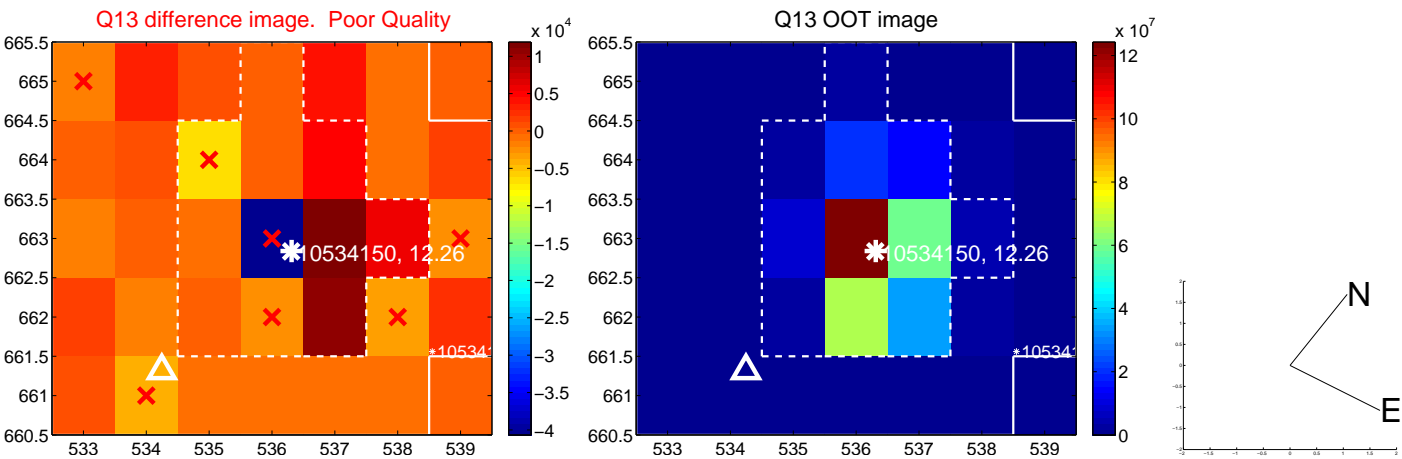
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

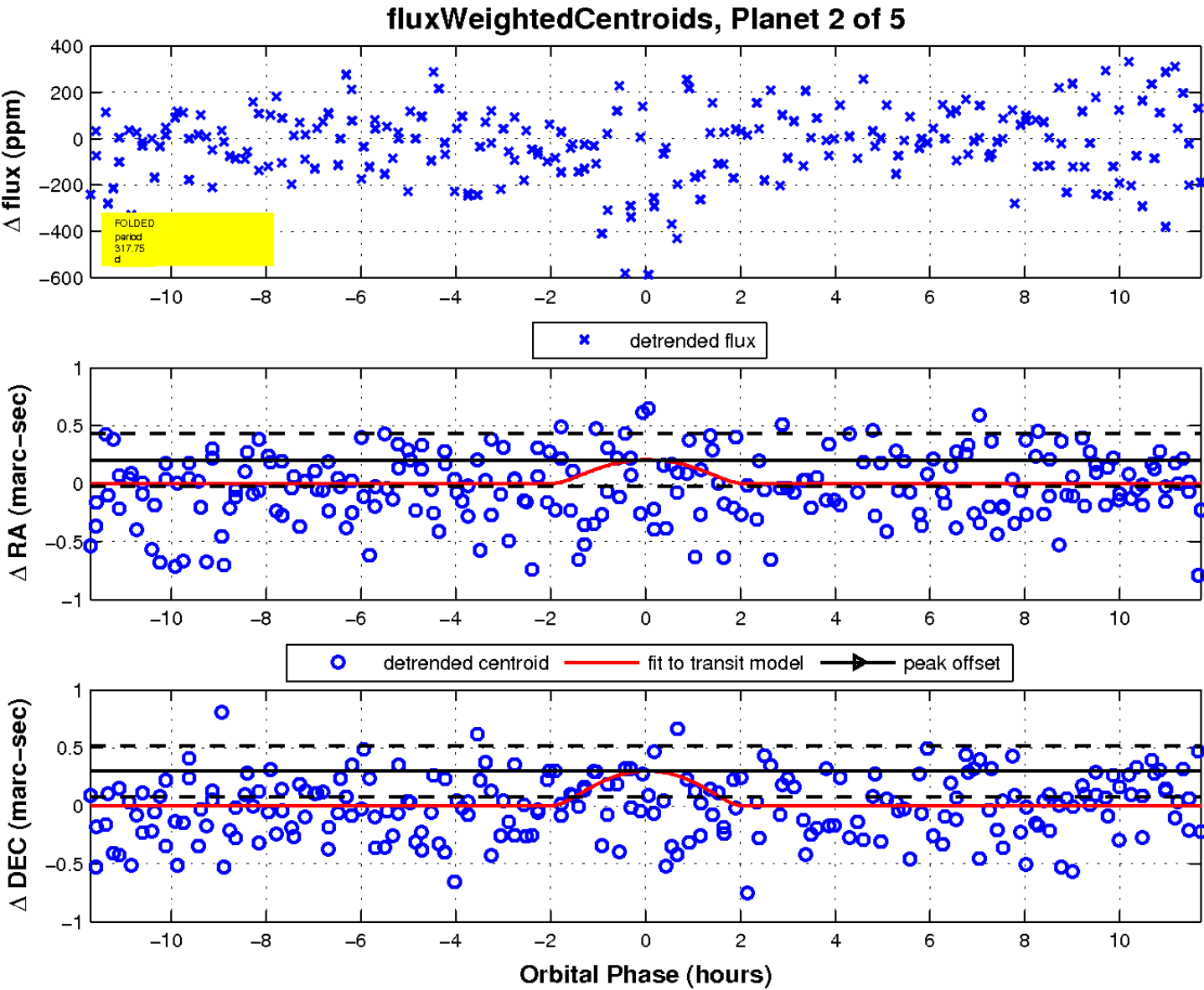
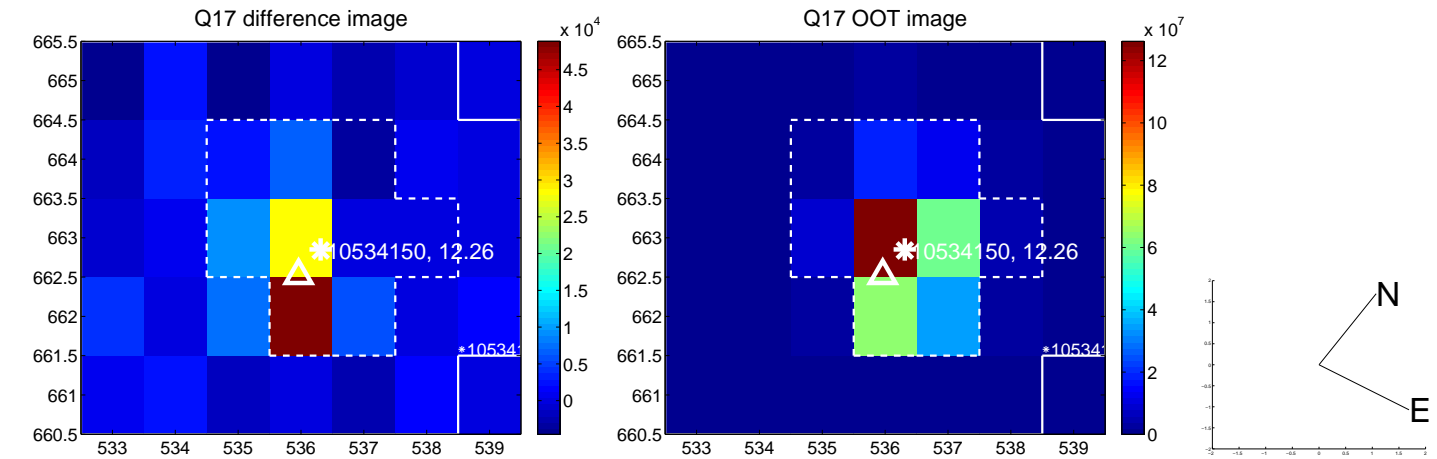


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

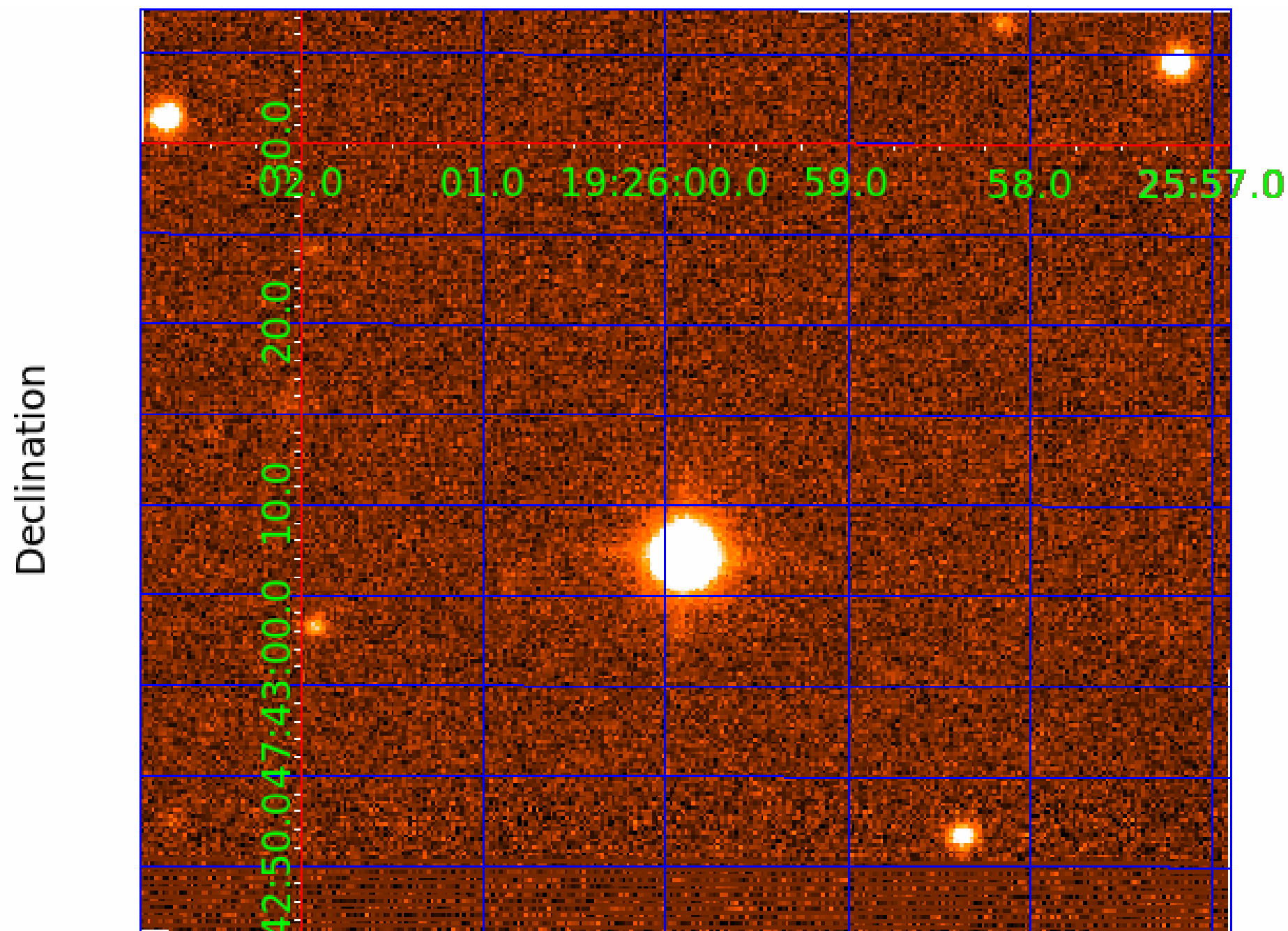




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



# KIC 010534150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010534150-01	OBS	No	1.016745	131.941789	15.3	4.401	8.3	7.8	1.23	6795	0.61	7107.84
010534150-02	OBS	No	317.750860	294.183308	421.5	3.926	9.0	8.8	1.23	6795	4.19	3.35
010534150-03	OBS	No	134.067274	184.783524	280.6	4.375	8.4	7.7	1.23	6795	2.35	10.59
010534150-04	OBS	No	42.312760	159.779899	139.1	2.752	7.4	8.0	1.23	6795	1.69	49.29
010534150-05	OBS	No	72.530383	202.289924	187.1	4.756	7.3	8.1	1.23	6795	1.99	24.02

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010534150-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010534150-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010534150-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
010534150-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT
010534150-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

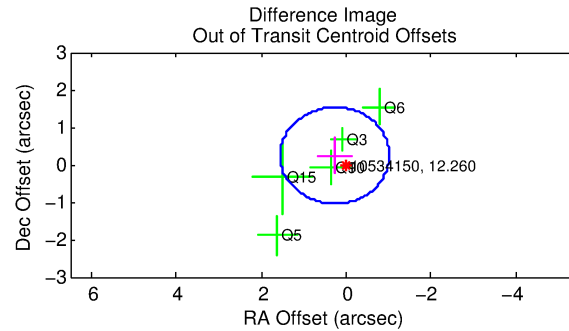
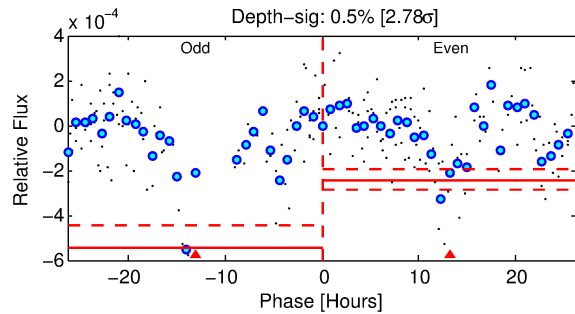
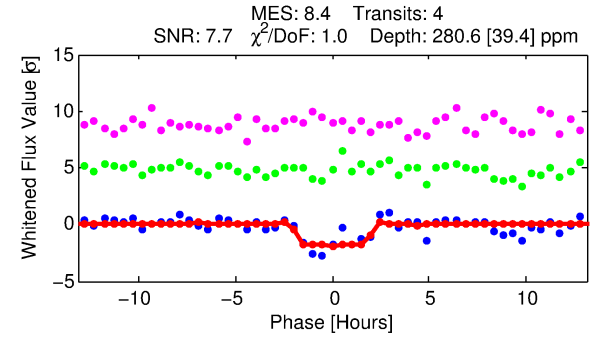
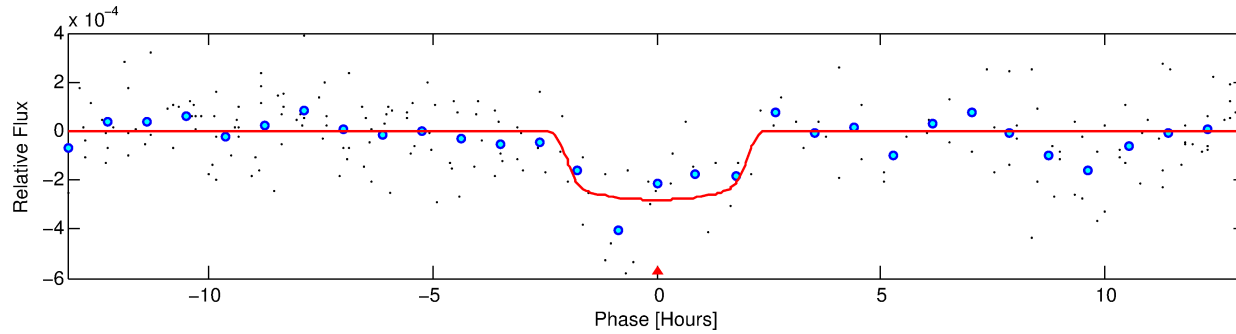
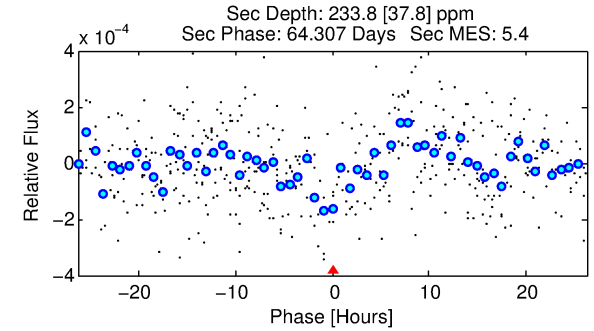
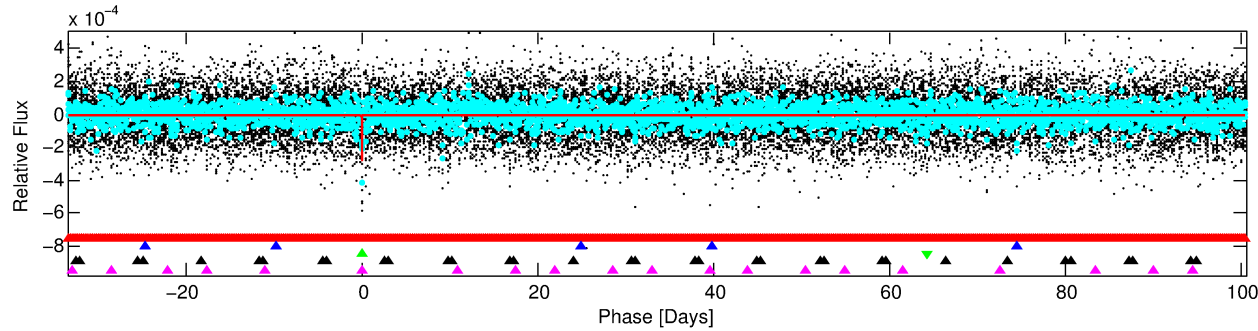
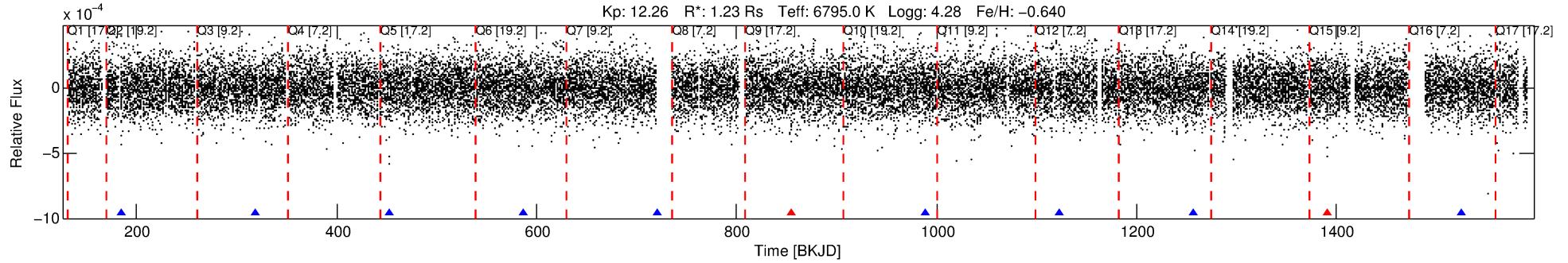
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010534150-03

No Significant Match Found

# DV One-Page Summary

KIC: 10534150 Candidate: 3 of 5 Period: 134.067 d



## DV Fit Results:

Period = 134.06727 [0.00270] d  
Epoch = 184.7835 [0.0129] BKJD  
Rp/R\* = 0.0175 [0.0062]  
a/R\* = 122.25 [252.02]  
b = 0.87 [0.56]  
Seff = 10.59 [3.77]  
Teq = 460 [41] K  
Rp = 2.35 [1.04] Re  
a = 0.5219 [0.1145] AU  
Ag = 6330.58 [5001.45] [1.27σ]  
Teffp = 6344 [1179] K [4.99σ]

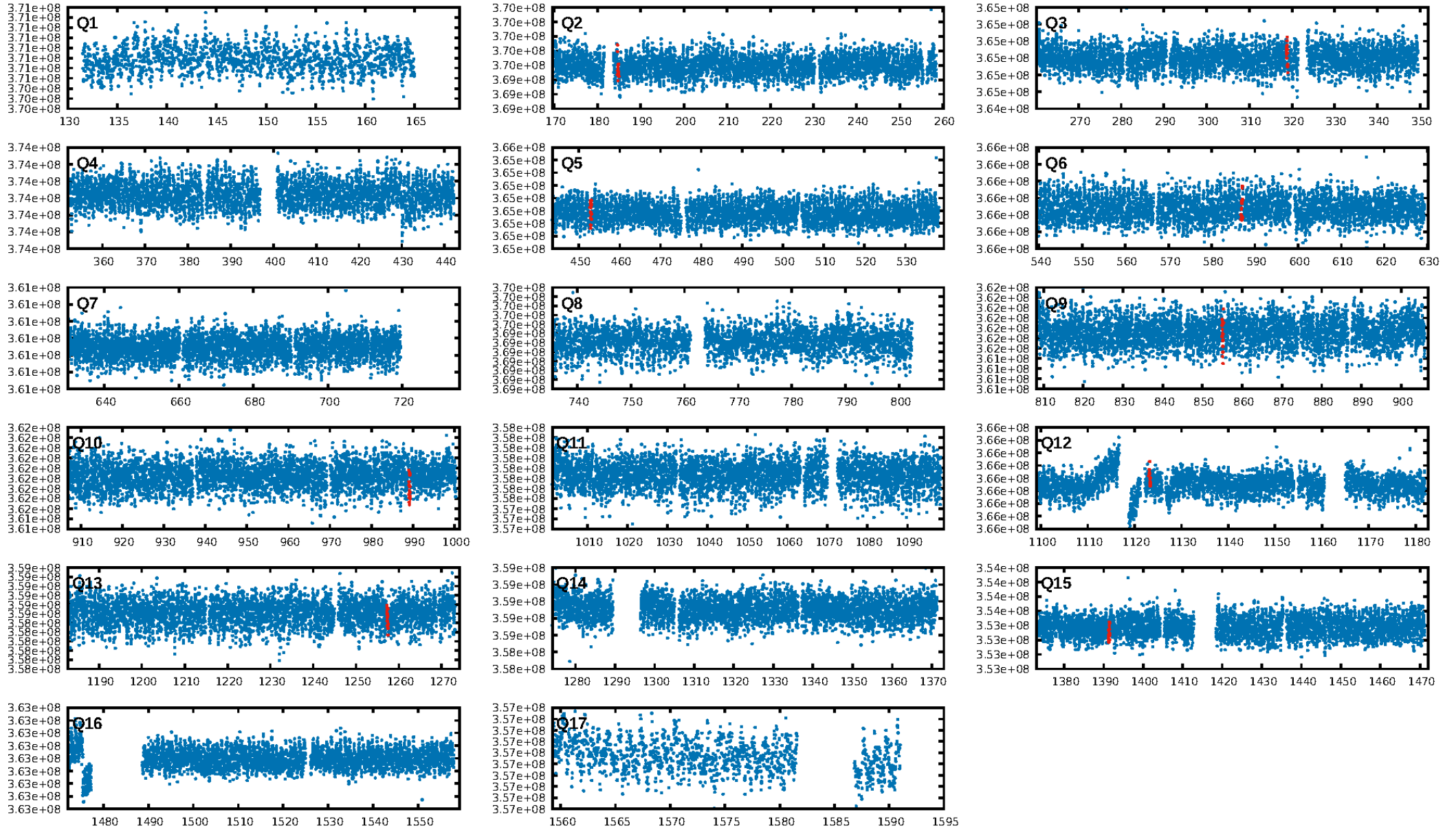
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [228.54σ]  
LongPeriod-sig: 100.0% [749.91σ]  
ModelChiSquare2-sig: 14.0%  
ModelChiSquareGof-sig: 99.6%  
**Bootstrap-pfa: 3.09e-11**  
**RollingBand-fgt: 0.50 [2/4]**  
GhostDiagnostic-chr: -2.064  
Centroid-sig: 2.5%  
Centroid-so: 0.635 arcsec [1.41σ]  
OotOffset-rm: 0.358 arcsec [0.83σ]  
OotOffset-st: 2/2/0/2 [6]  
KicOffset-rm: 0.361 arcsec [0.84σ]  
KicOffset-st: 2/2/0/2 [6]  
DiffImageQuality-fgm: 0.67 [4/6]  
DiffImageOverlap-fno: 0.00 [0/7]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:08:38 Z

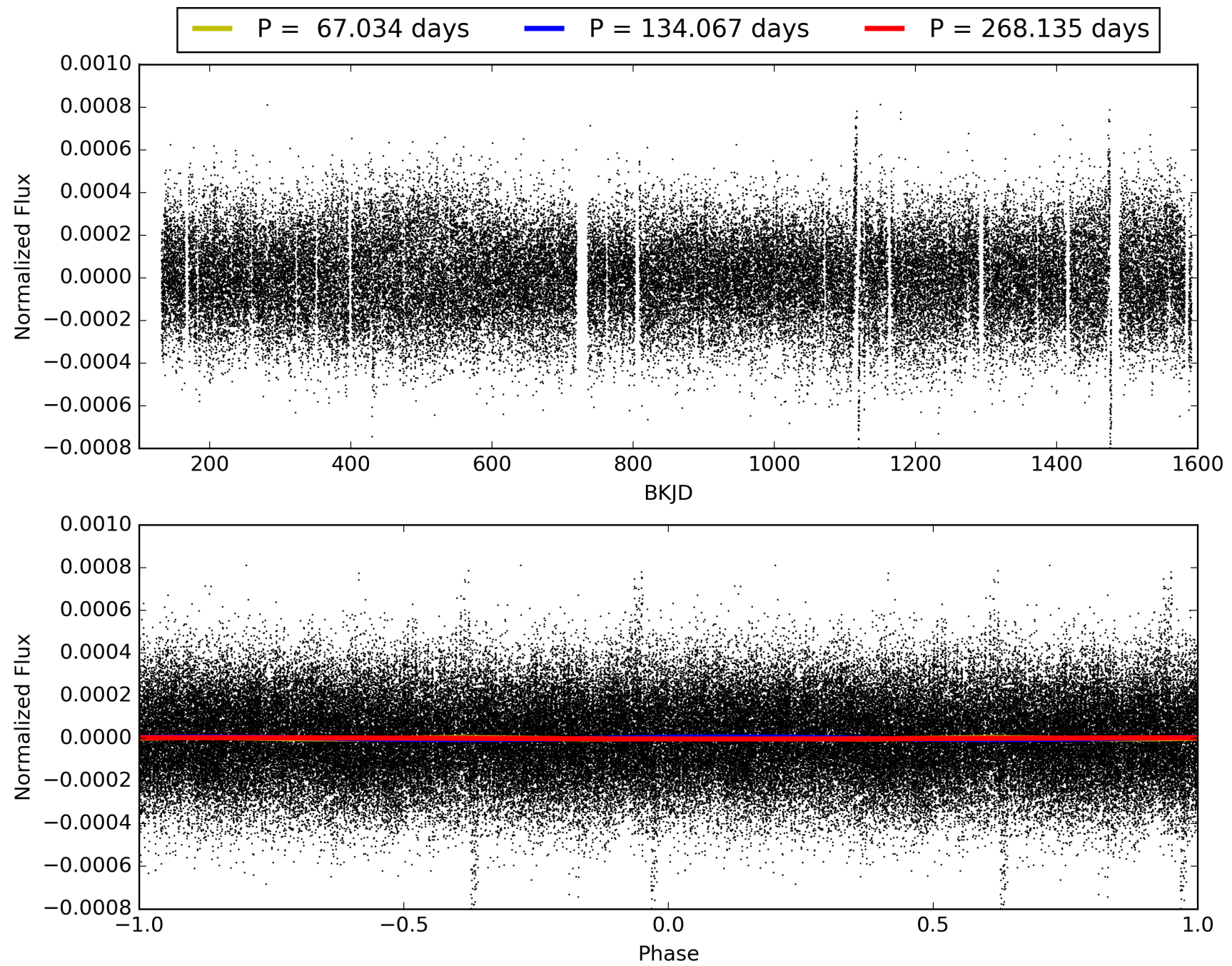
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010534150-03, PDC Light Curves





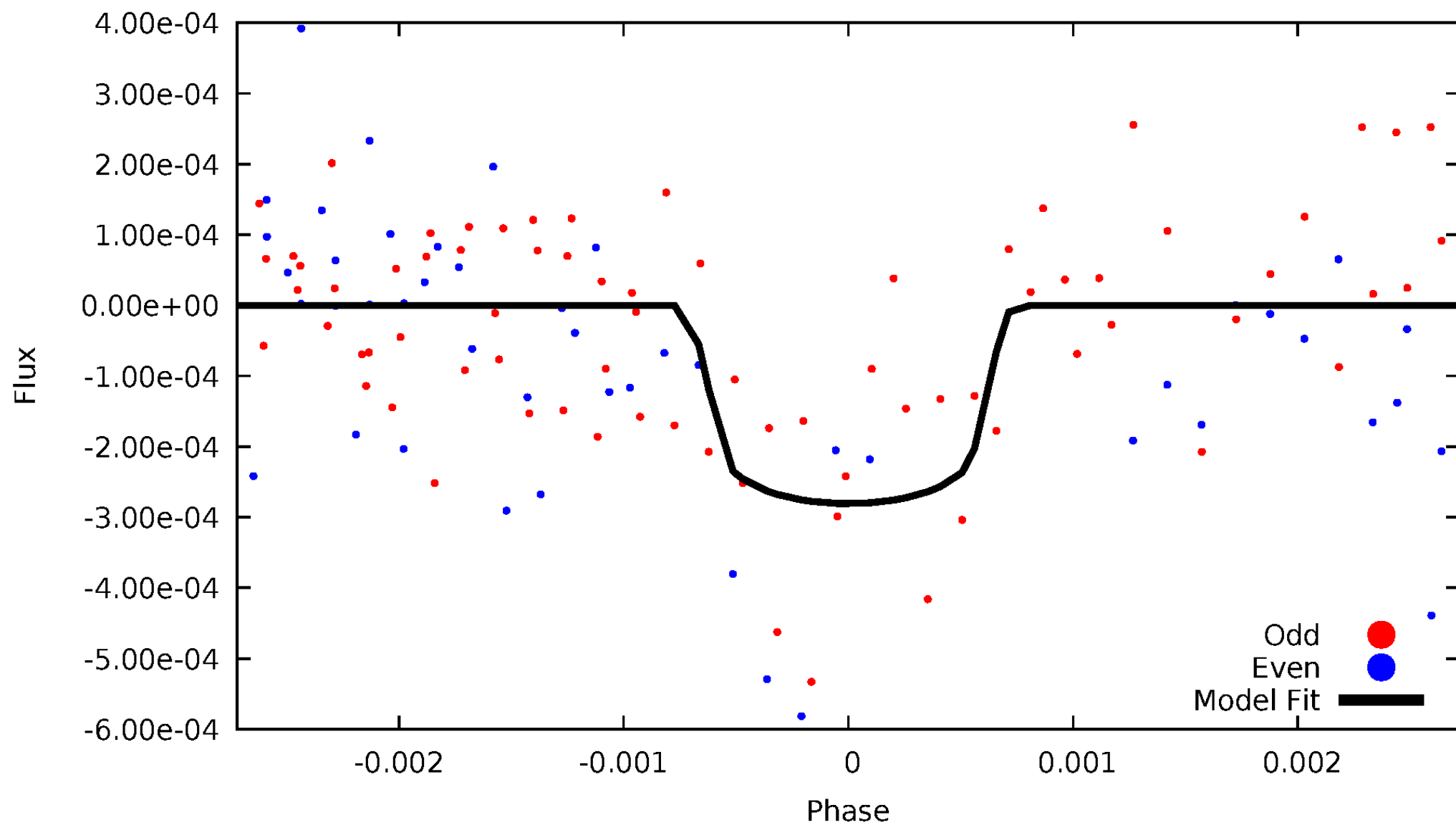
TCE 010534150-03





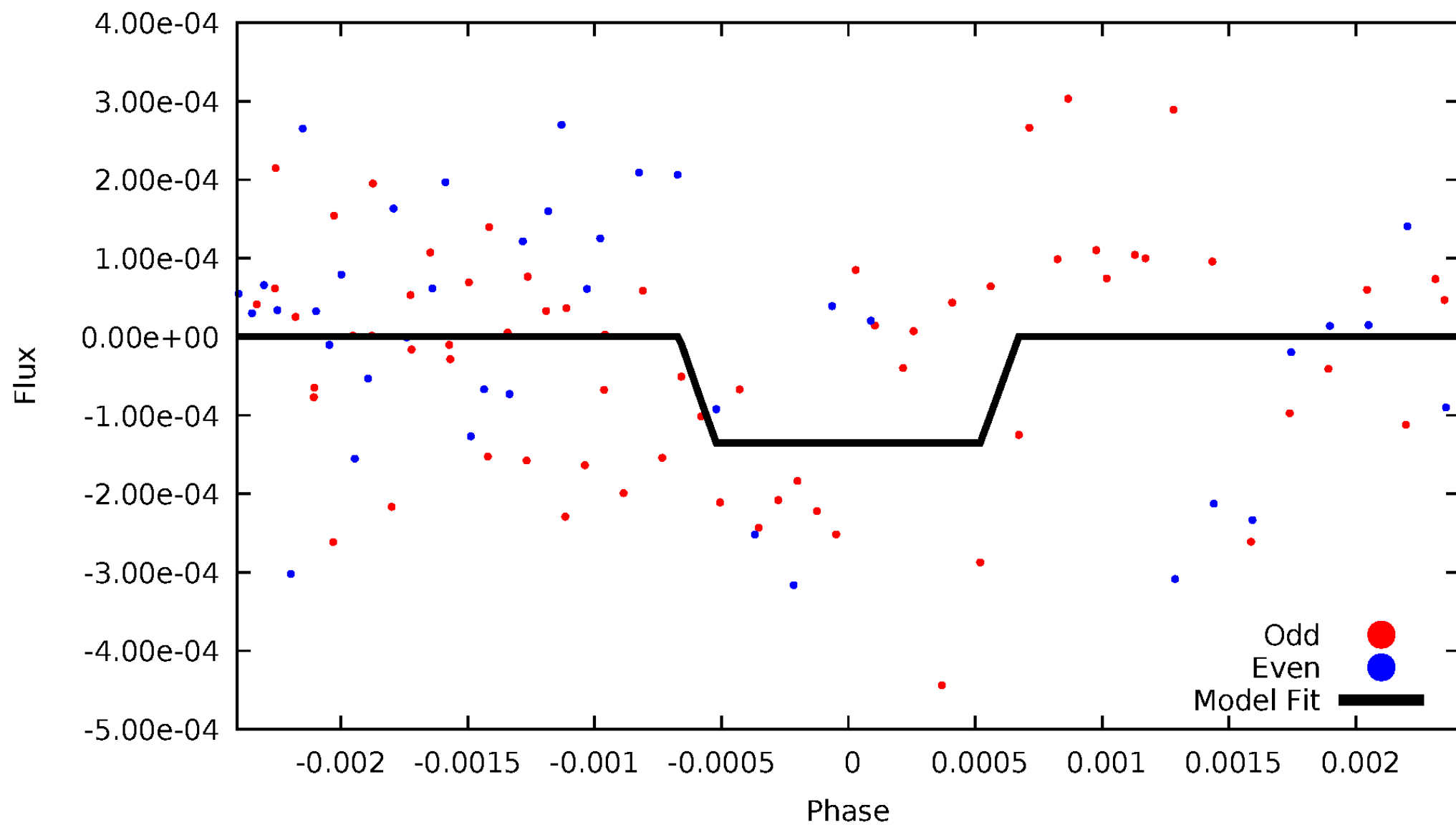
# DV Odd/Even

TCE 010534150-03



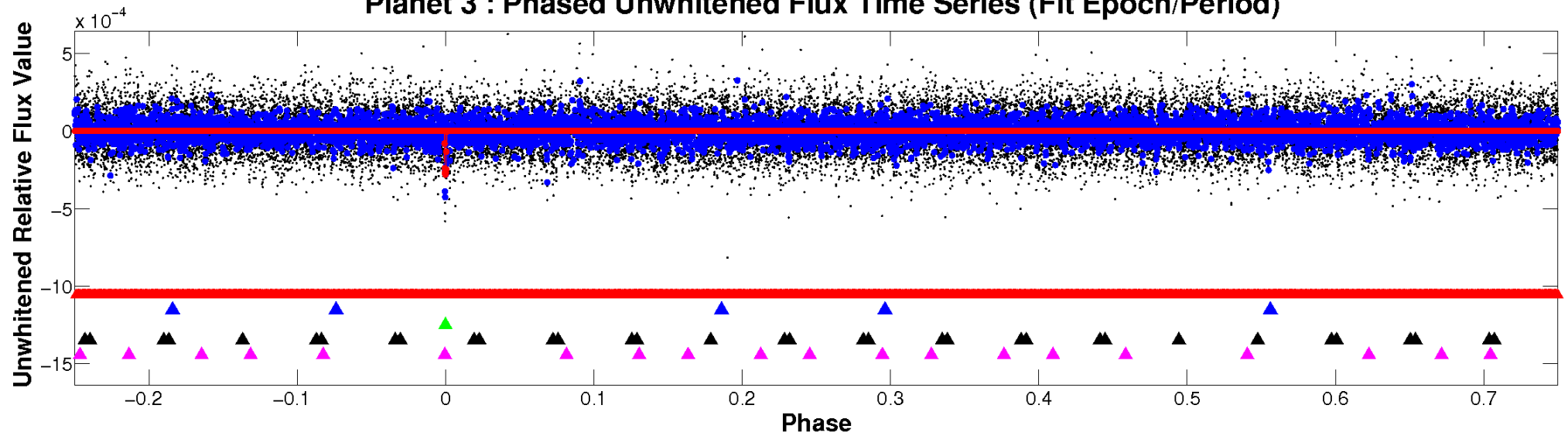
# ALT Odd/Even

TCE 010534150-03

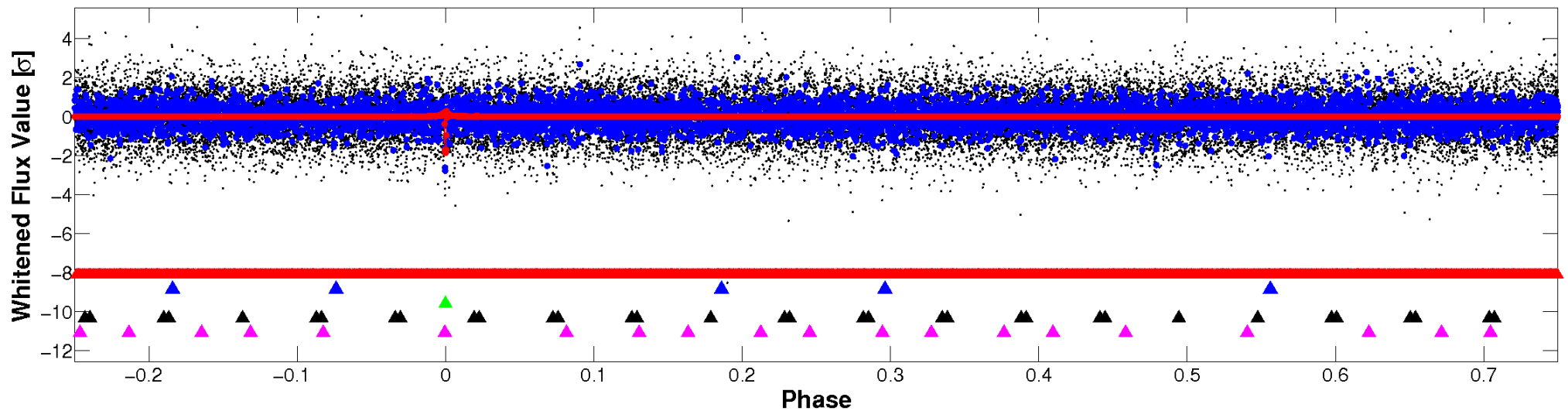


# Non-Whitened Vs. Whitened Light Curve

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

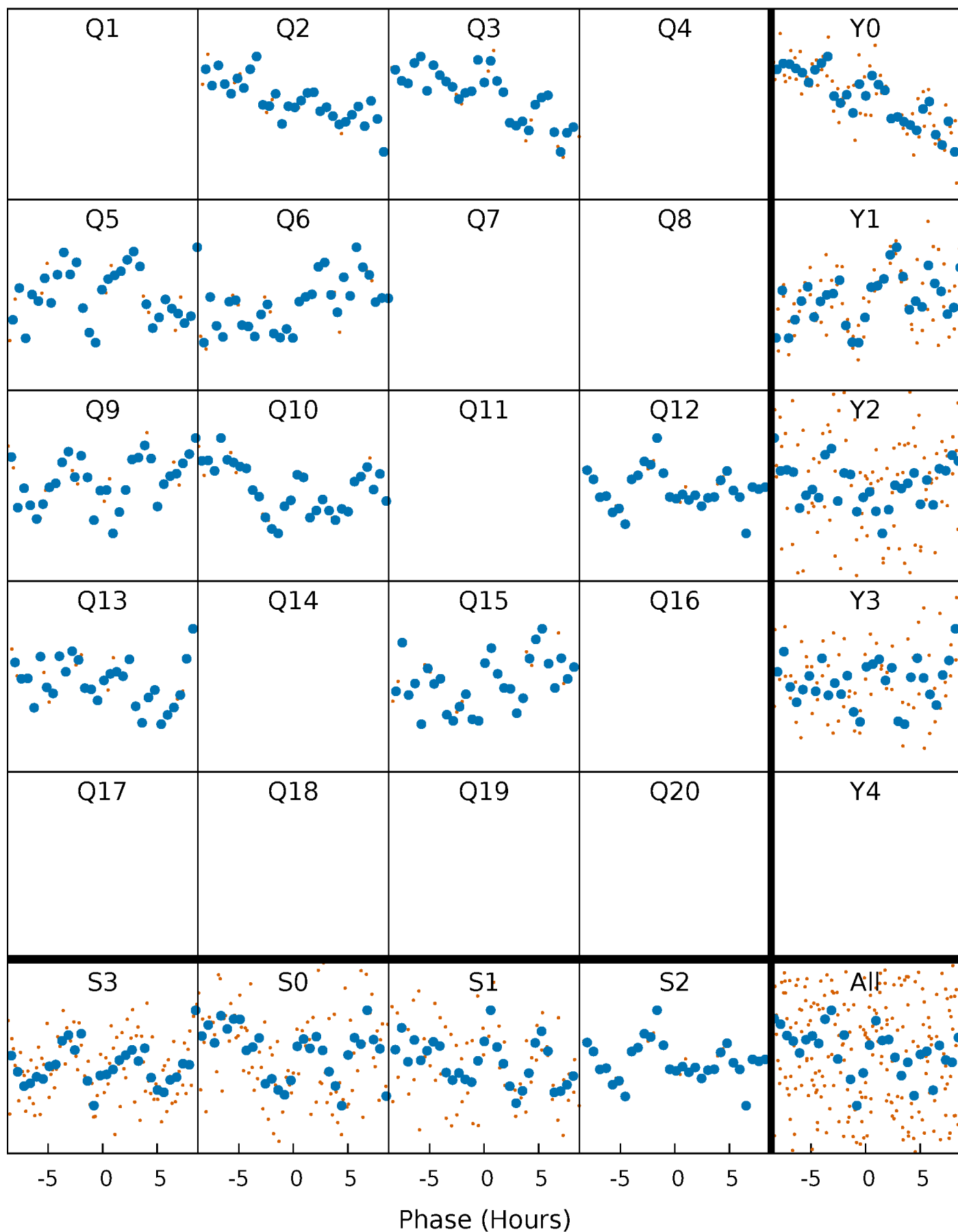


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



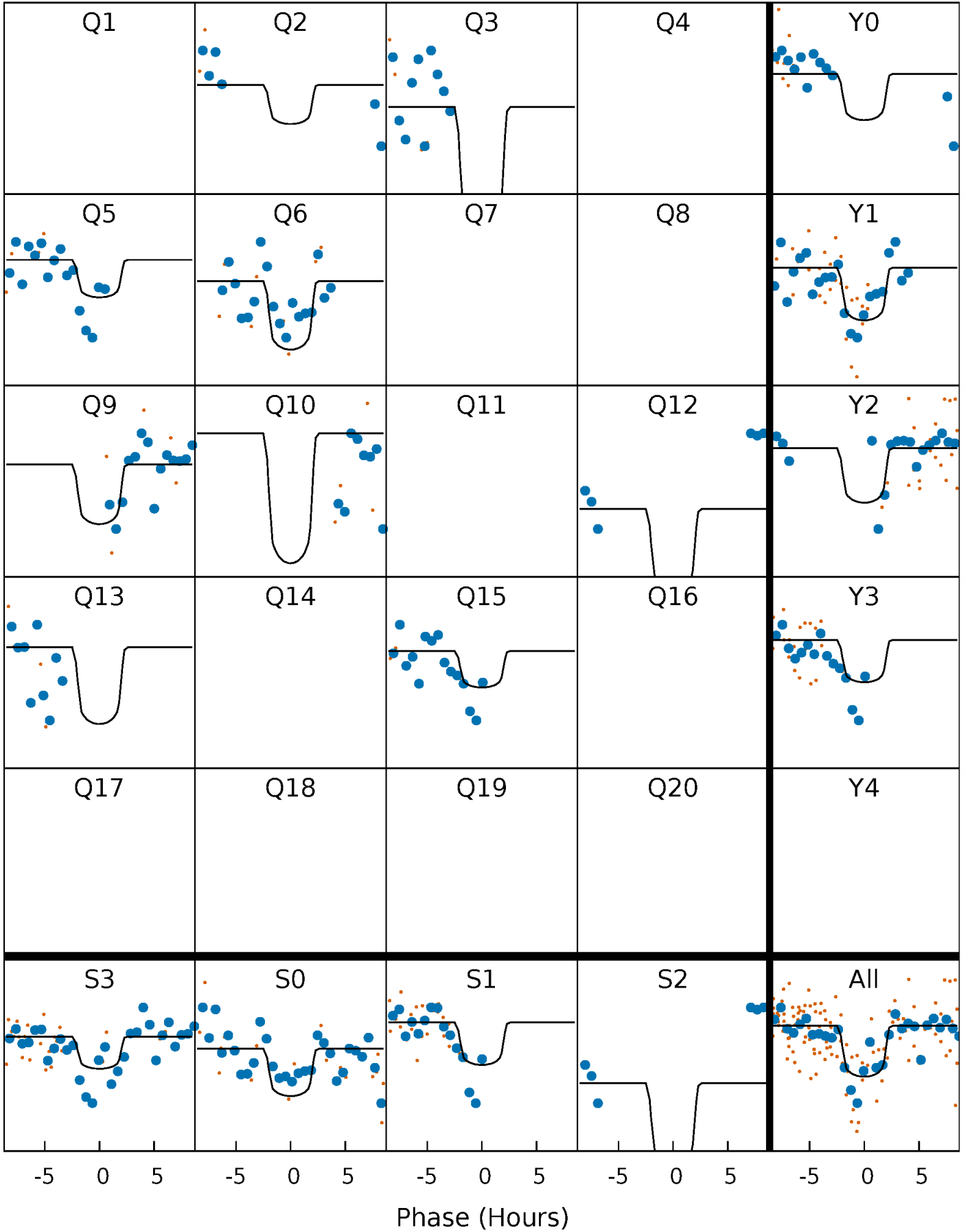
# PDC Quarter-Phased Transit Curves

TCE 010534150-03     $P=134.067273$  Days     $T_0=184.783524$  (BKJD)



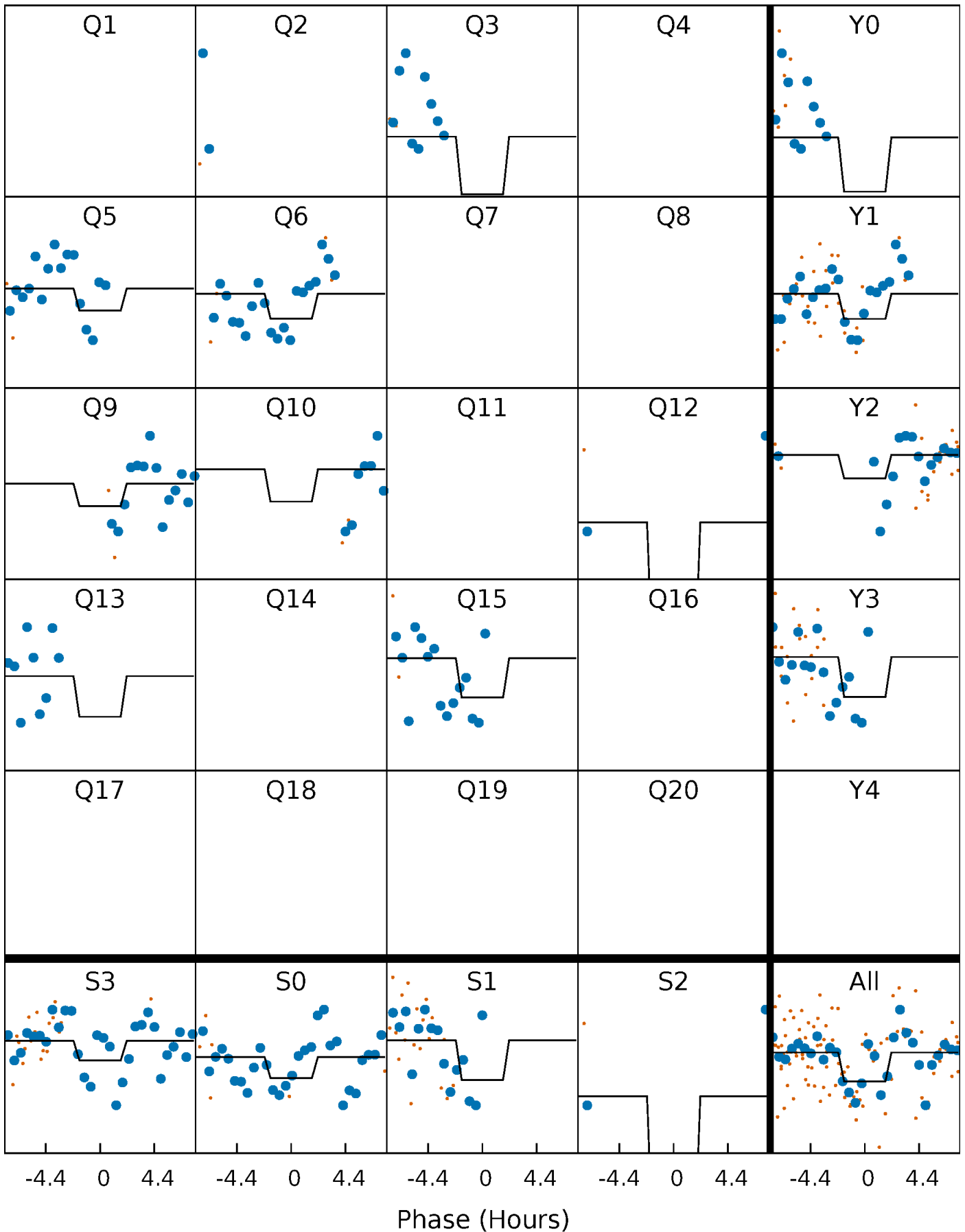
# DV Quarter-Phased Transit Curves

TCE 010534150-03     $P=134.067273$  Days     $T_0=184.783524$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010534150-03 P=134.066360 Days  $T_0=184.786268$  (BKJD)

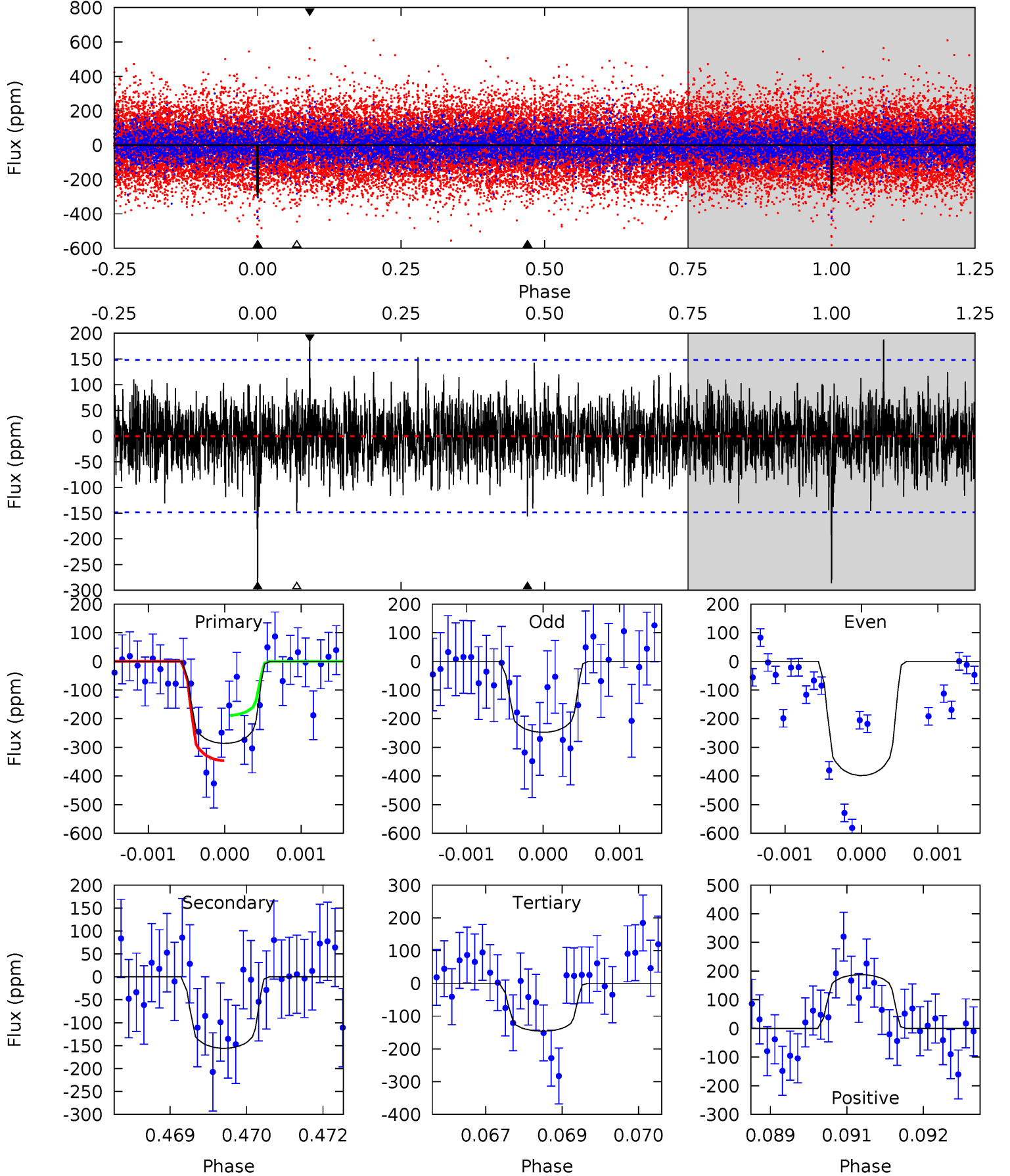




# DV Model-Shift Uniqueness Test

010534150-03, P = 134.067273 Days, E = 50.716251 Days

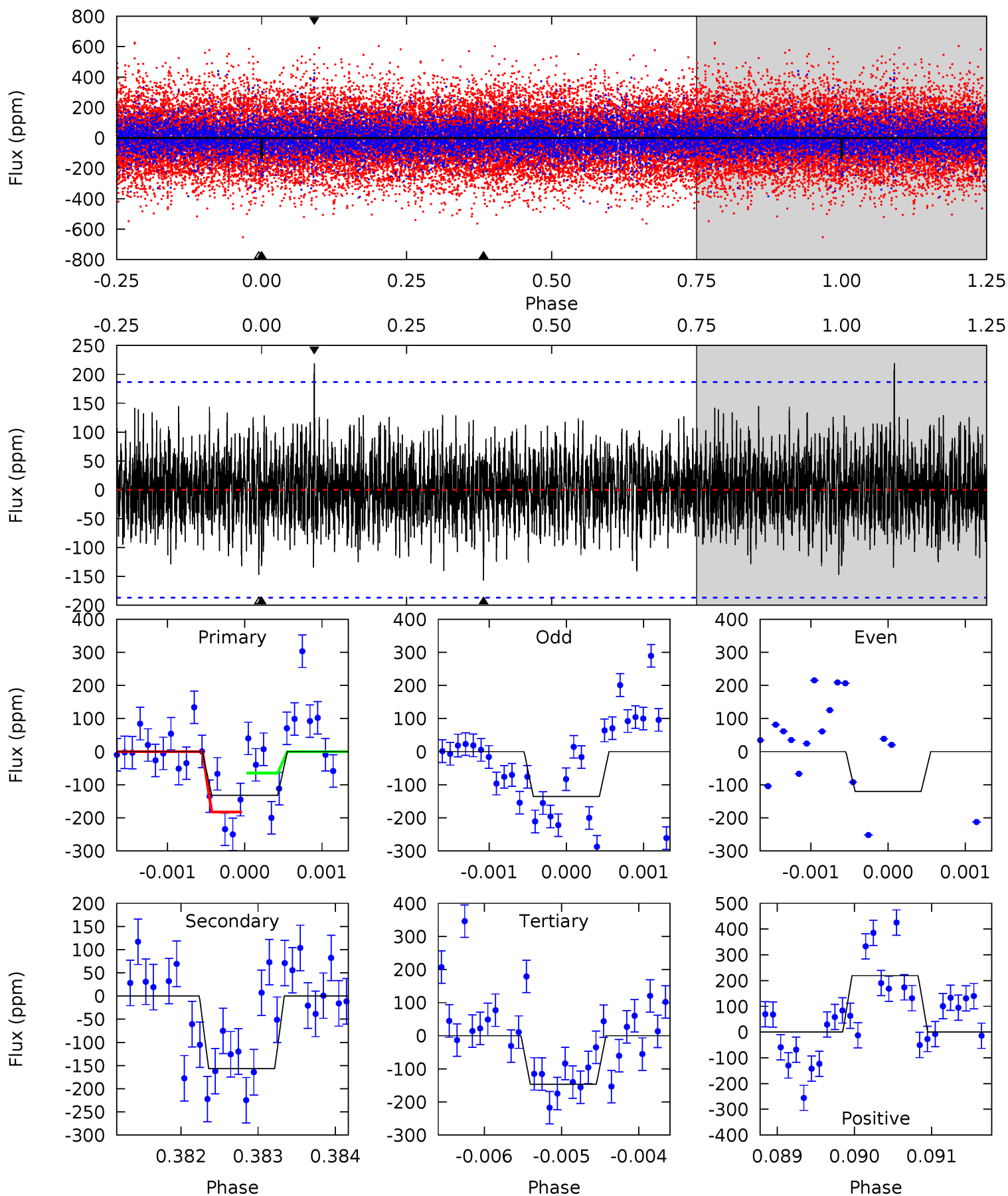
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.4	5.67	5.31	6.83	5.39	3.20	1.48	5.11	3.59	0.37	-1.15	2.31	0.94	0.40	2.82



# Alt Model-Shift Uniqueness Test

010534150-03, P = 134.066360 Days, E = 50.719908 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.83	4.55	4.26	6.35	5.42	3.23	1.25	-0.43	-2.52	0.30	-1.80	0.20	1.29	0.58	1.67



### Stellar Parameters For KIC 010534150

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6795^{+212}_{-282}$	$4.282^{+0.139}_{-0.170}$	$-0.640^{+0.300}_{-0.350}$	$1.229^{+0.325}_{-0.216}$	$1.053^{+0.145}_{-0.118}$	$0.798^{+0.543}_{-0.375}$
	+3%/-4%	+3%/-4%	+47%/-55%	+26%/-18%	+14%/-11%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010534150-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-156 \pm 27$	$2.36^{+0.91}_{-0.81}$	$644^{+44}_{-43}$	$5738^{+1335}_{-814}$	$4146^{+5624}_{-2086}$
Alt.	$-157 \pm 34$	$1.58^{+0.85}_{-0.74}$	$643^{+47}_{-41}$	$6988^{+3875}_{-1375}$	$9530^{+24586}_{-5641}$

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

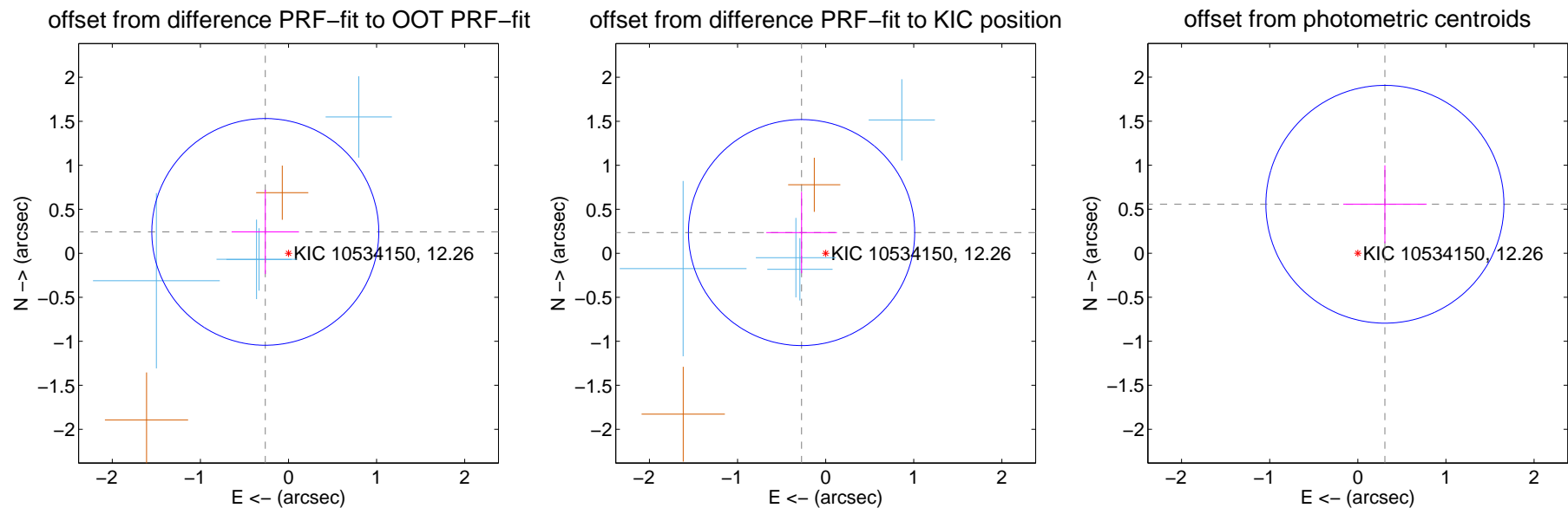
## DV Centroid Data

Supplemental centroid analysis for 010534150-03. Kepler magnitude: 12.26. Transit SNR 7.67

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

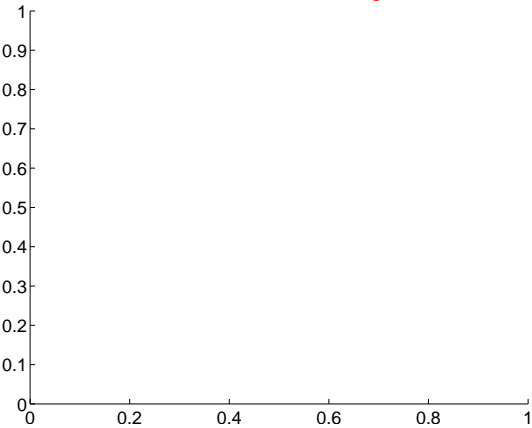
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.358 \pm 0.429$	0.83	$0.263 \pm 0.383$	$0.243 \pm 0.478$
PRF-fit source offset from KIC position	$0.361 \pm 0.428$	0.84	$0.273 \pm 0.401$	$0.235 \pm 0.462$
photometric centroid source offset	$0.64 \pm 0.45$	1.41	$-0.31 \pm 0.47$	$0.56 \pm 0.44$



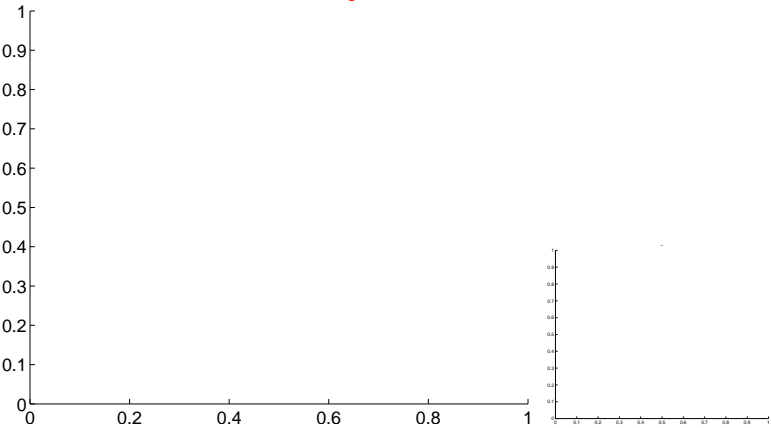
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

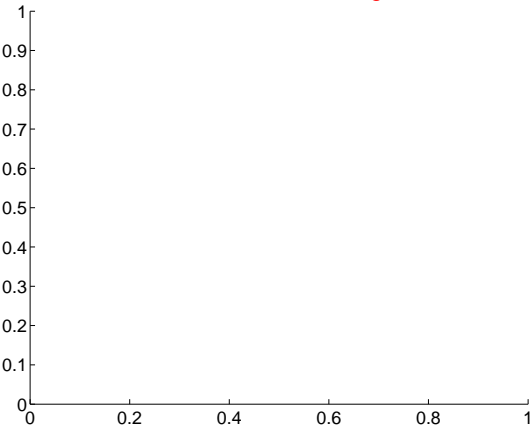
Q1 no difference image



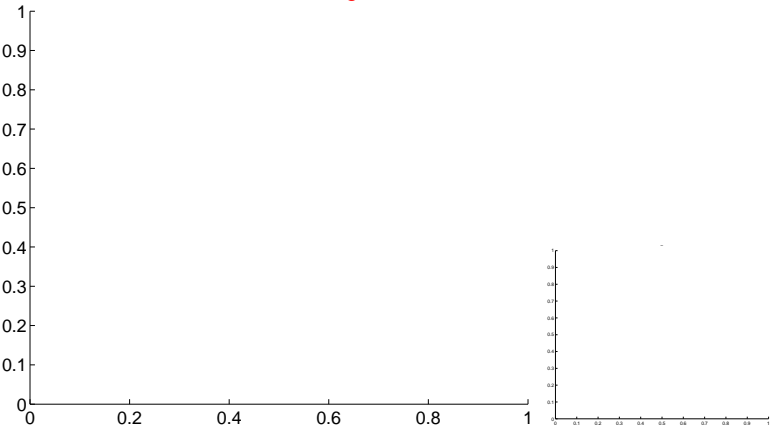
Q1 no OOT image



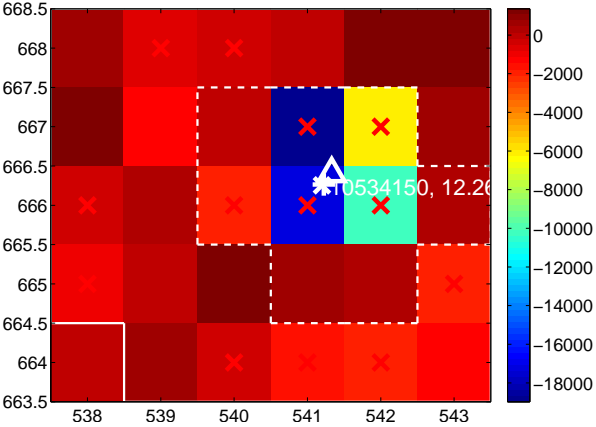
Q2 no difference image



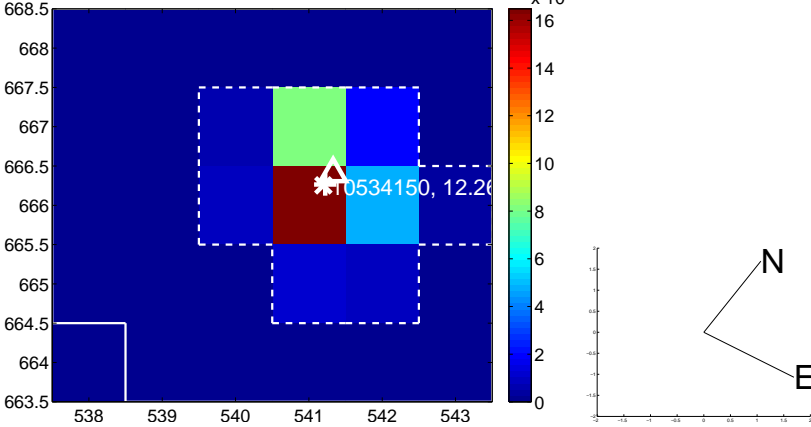
Q2 no OOT image



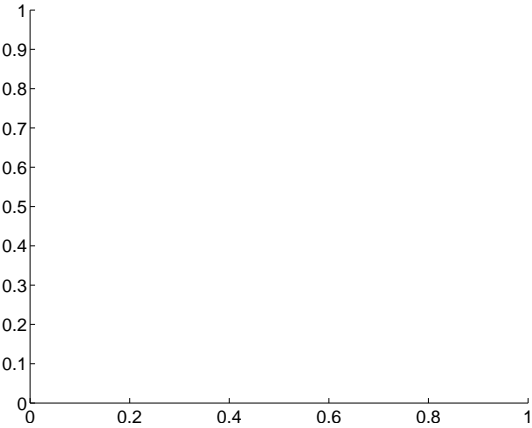
Q3 difference image. Poor Quality



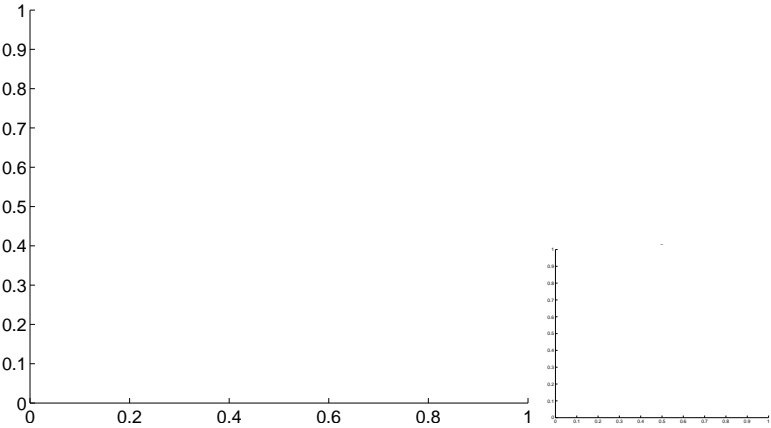
Q3 OOT image



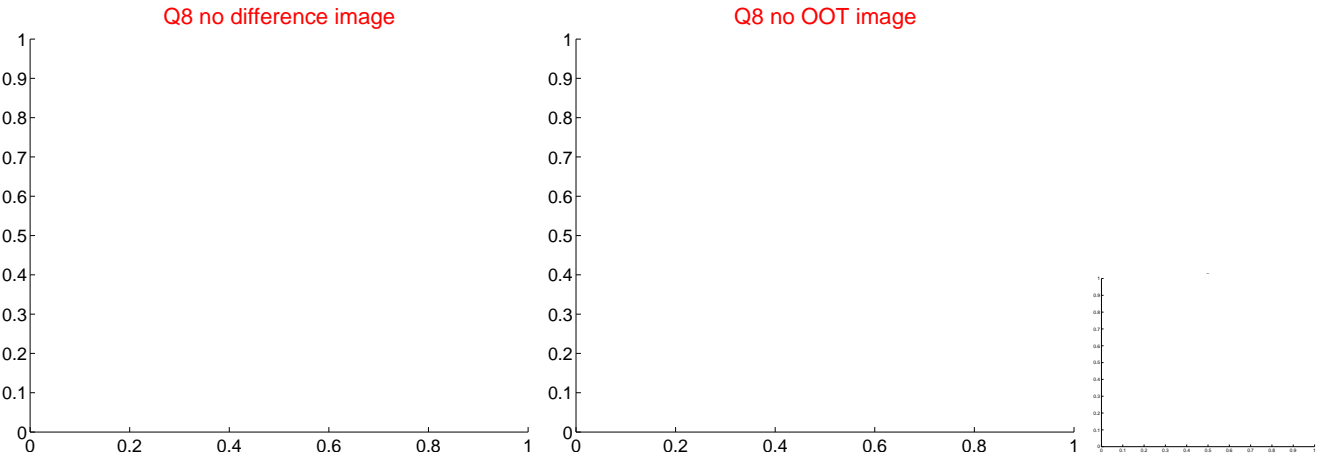
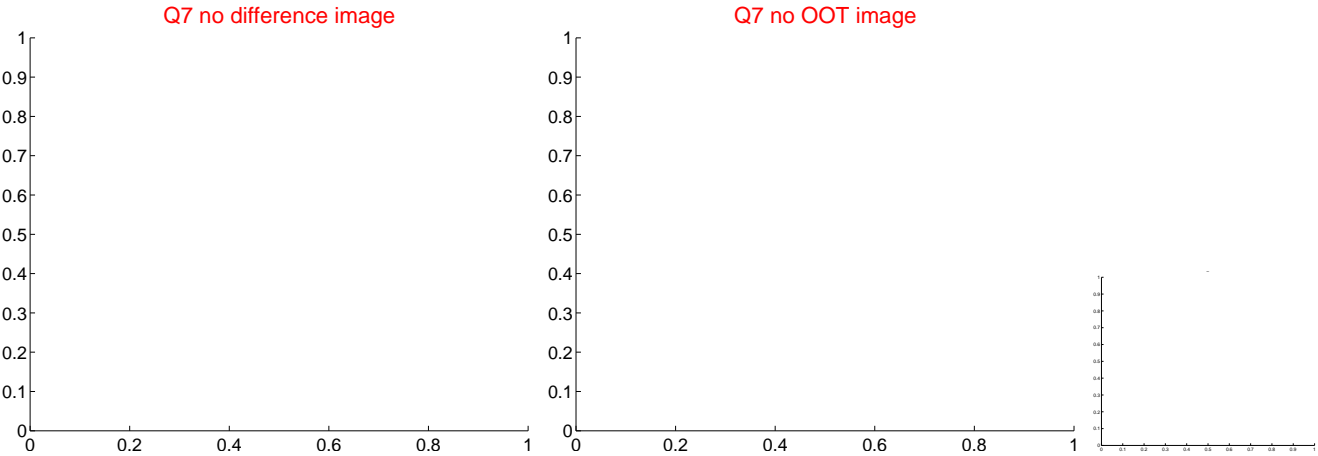
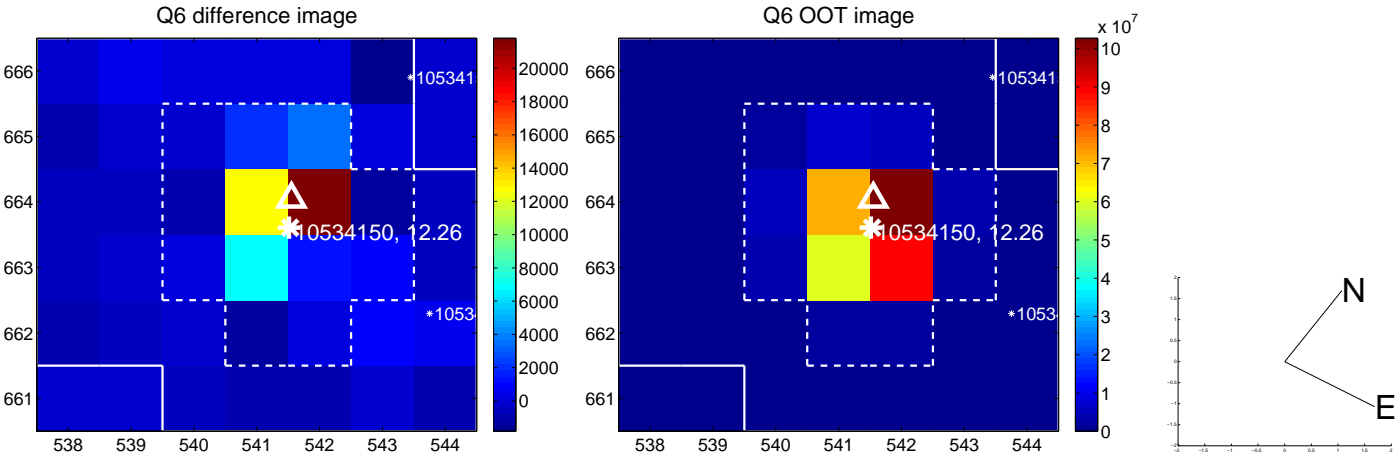
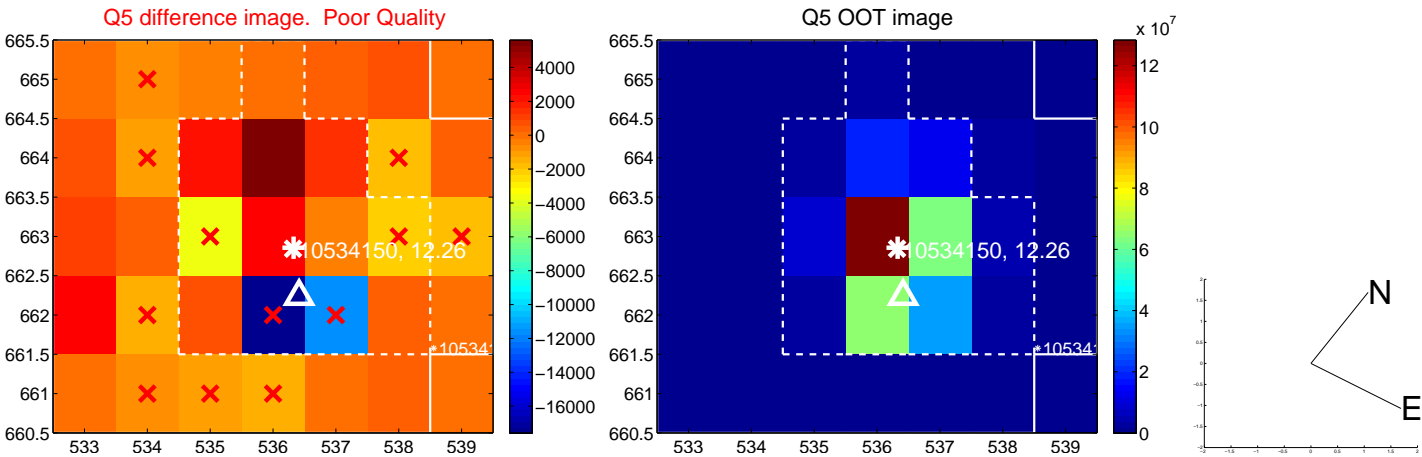
Q4 no difference image



Q4 no OOT image

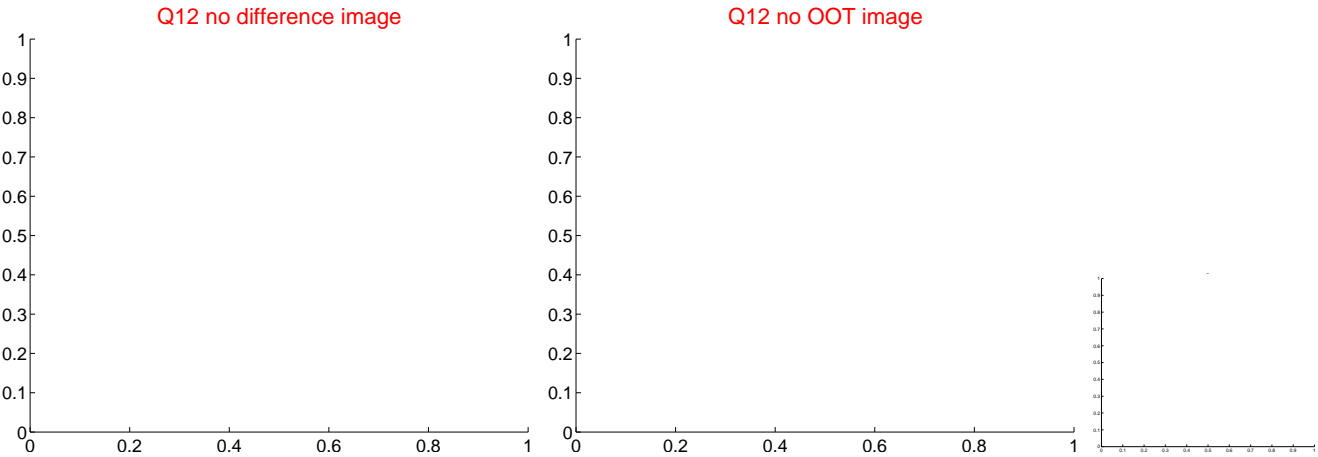
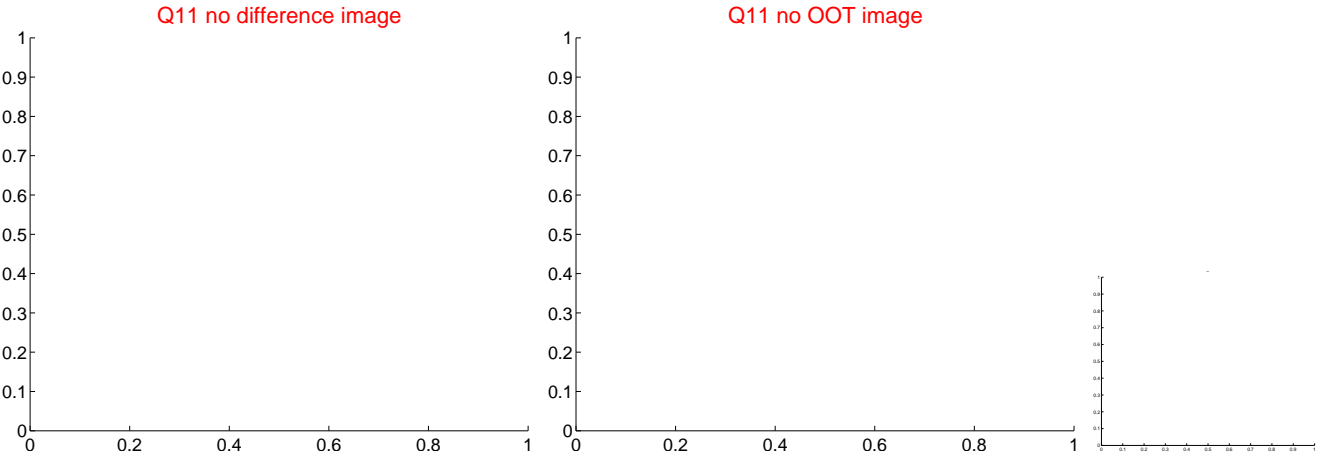
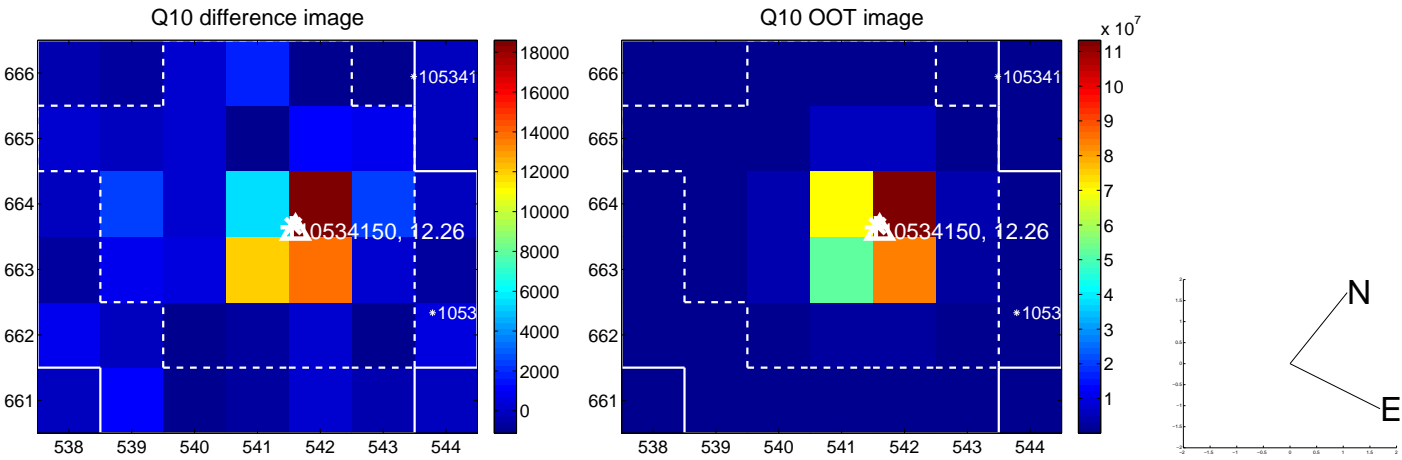
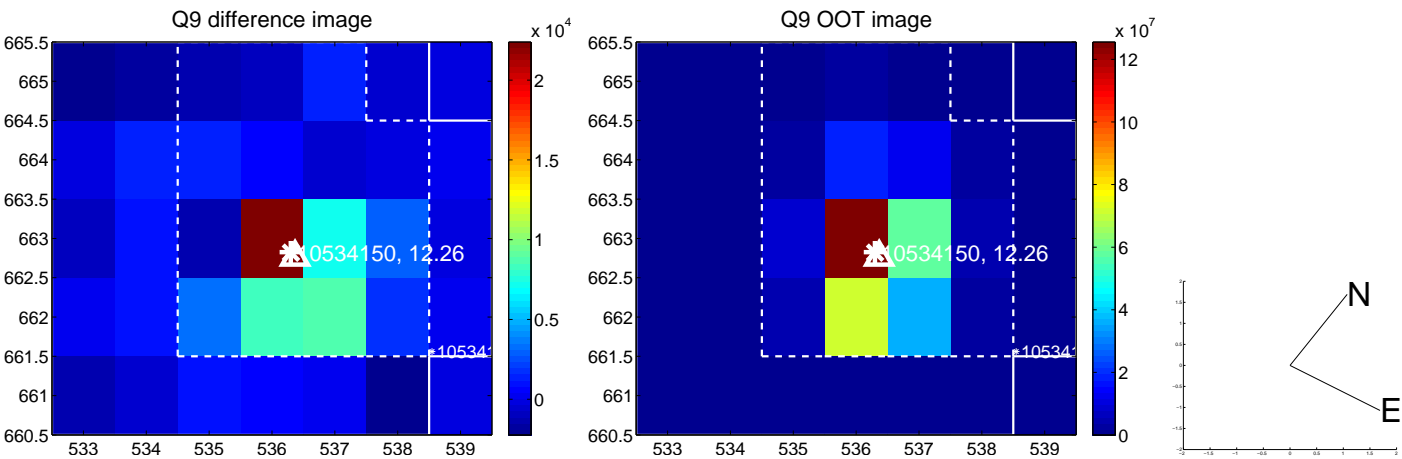


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

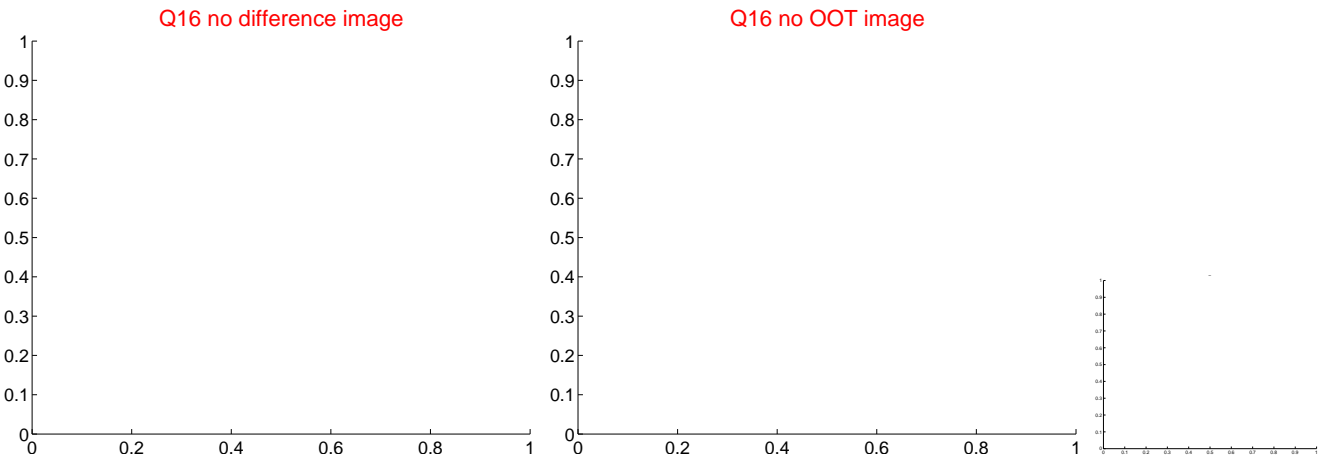
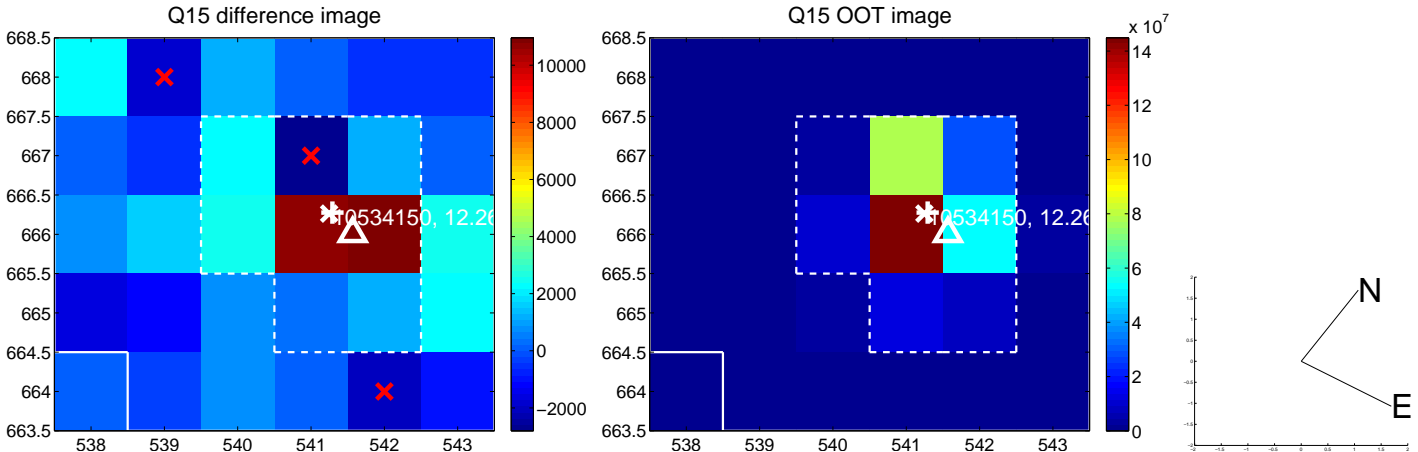
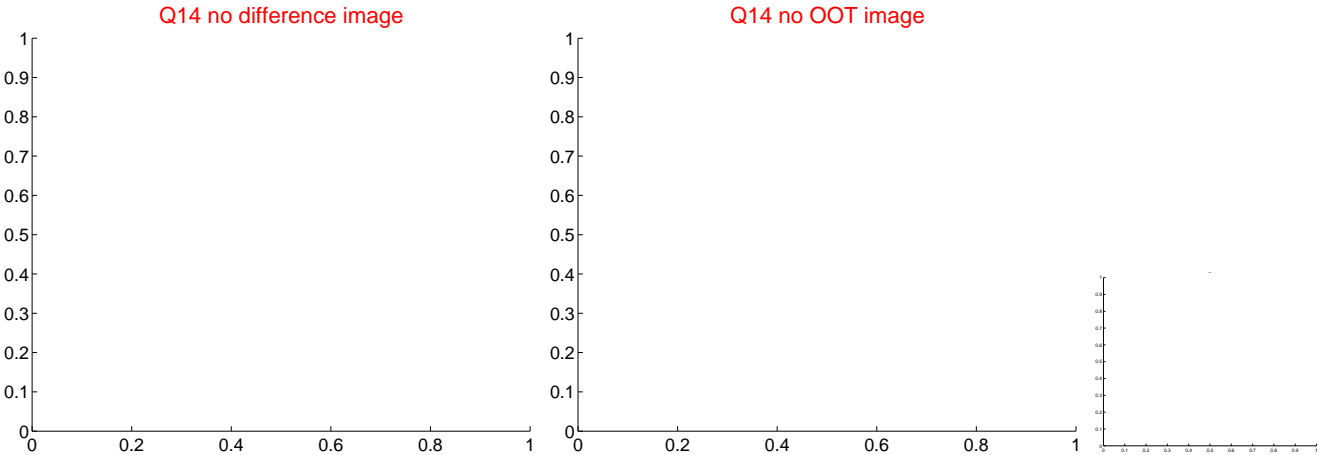
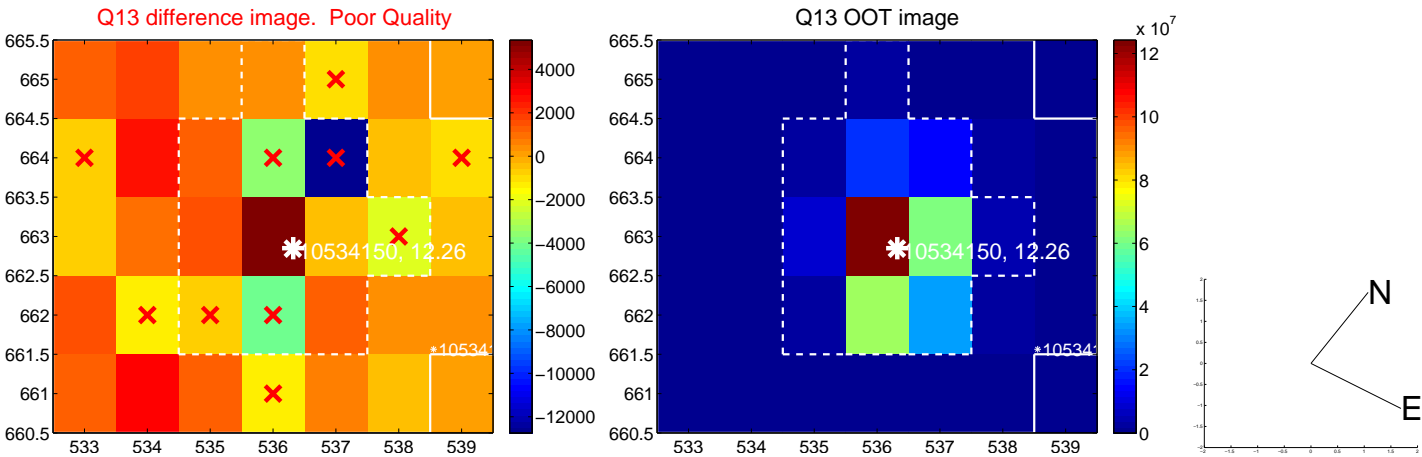




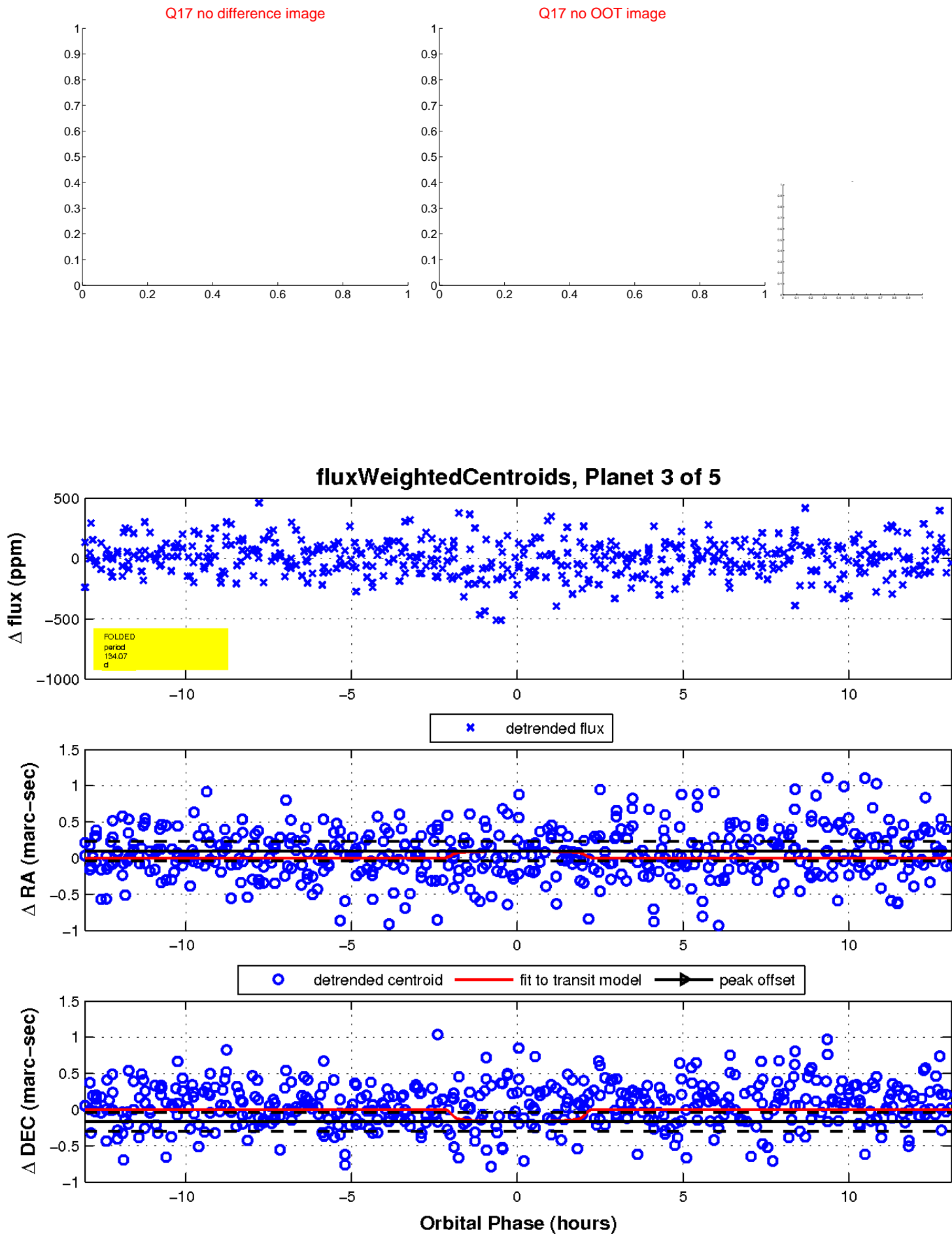
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



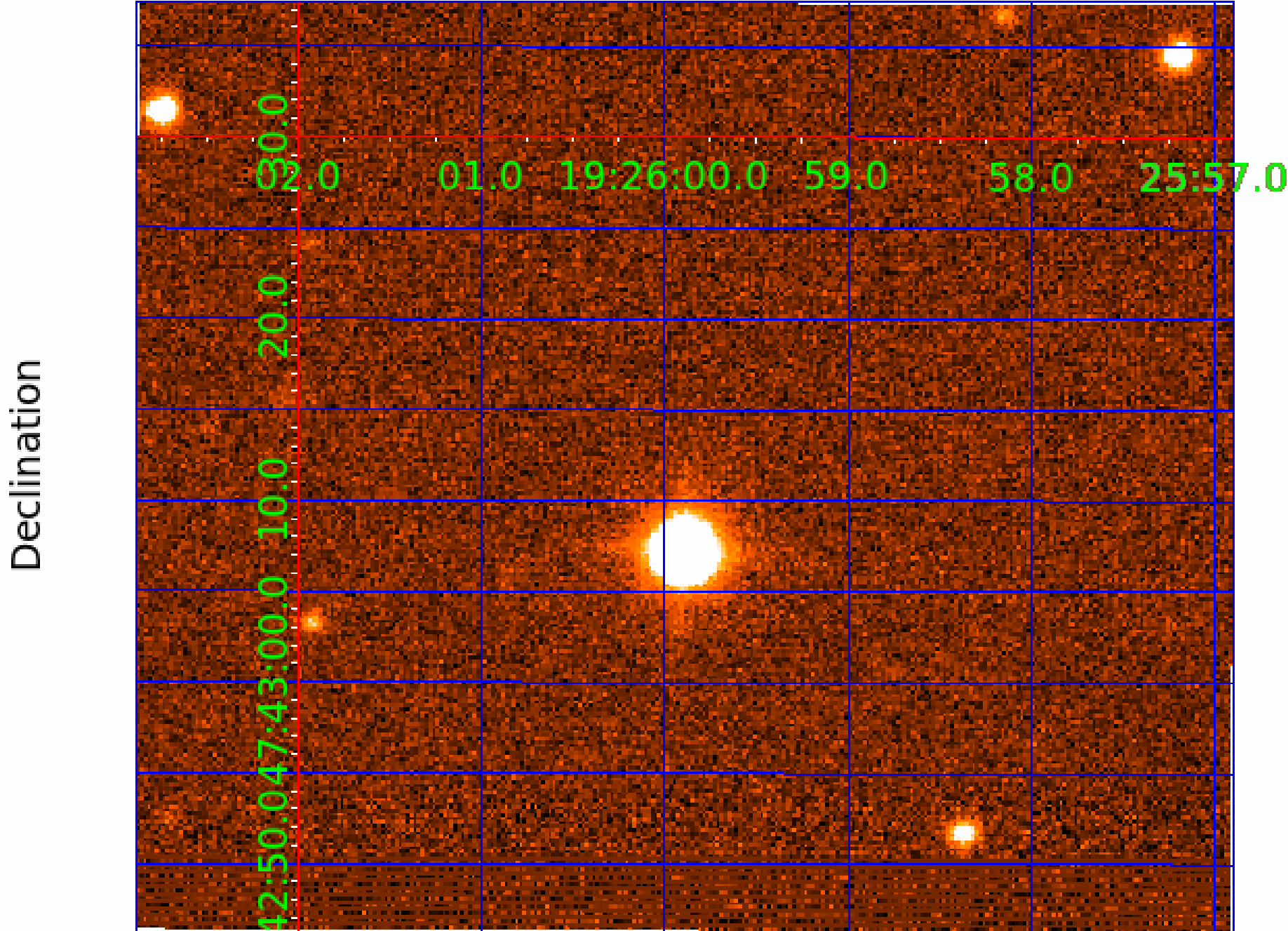
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



UKIRT Image



# KIC 010534150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010534150-01	OBS	No	1.016745	131.941789	15.3	4.401	8.3	7.8	1.23	6795	0.61	7107.84
010534150-02	OBS	No	317.750860	294.183308	421.5	3.926	9.0	8.8	1.23	6795	4.19	3.35
010534150-03	OBS	No	134.067274	184.783524	280.6	4.375	8.4	7.7	1.23	6795	2.35	10.59
010534150-04	OBS	No	42.312760	159.779899	139.1	2.752	7.4	8.0	1.23	6795	1.69	49.29
010534150-05	OBS	No	72.530383	202.289924	187.1	4.756	7.3	8.1	1.23	6795	1.99	24.02

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010534150-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010534150-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010534150-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
010534150-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT
010534150-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

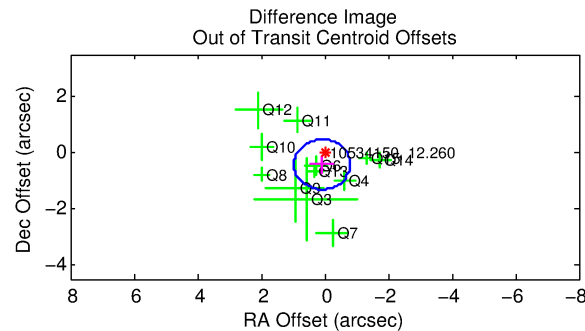
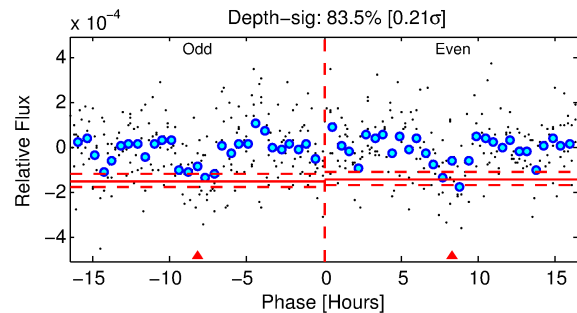
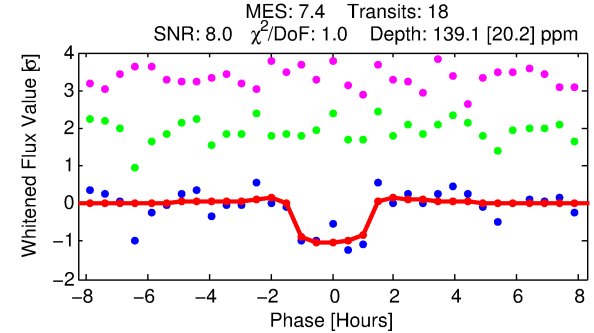
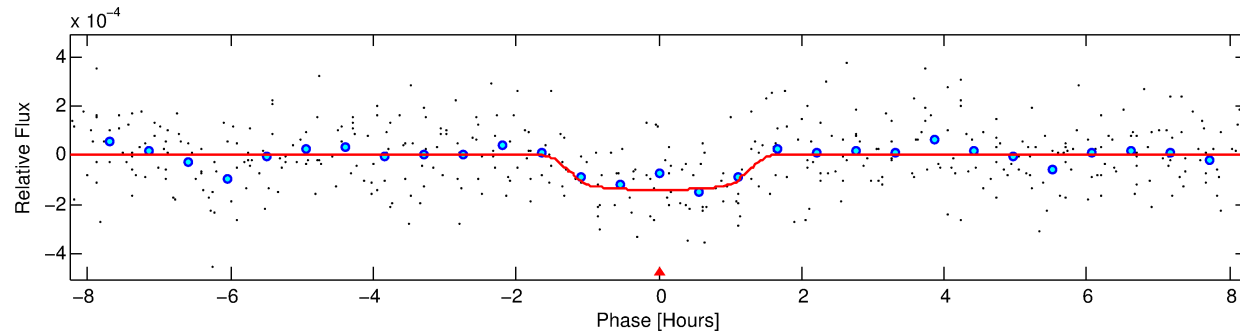
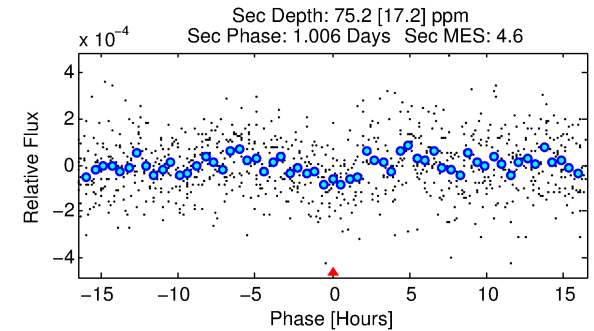
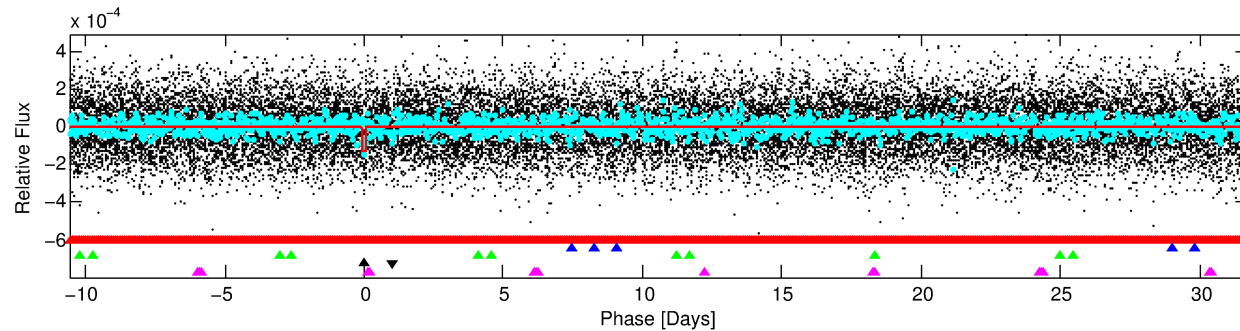
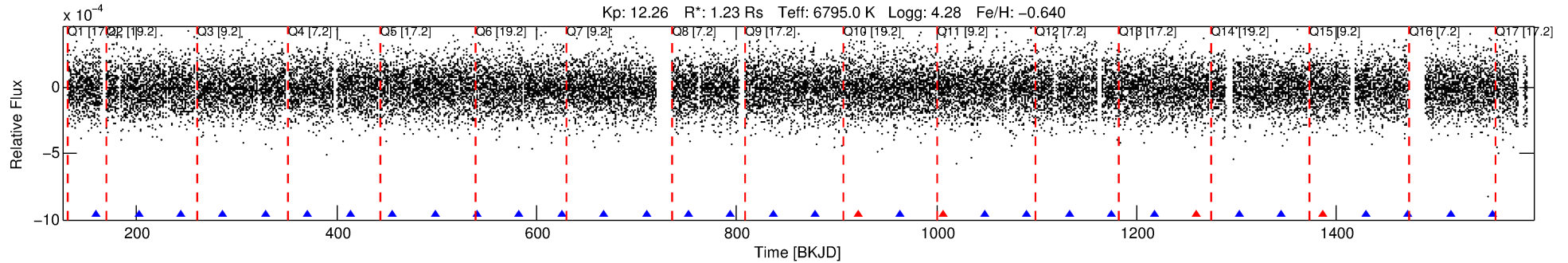
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010534150-04

No Significant Match Found

# DV One-Page Summary

KIC: 10534150 Candidate: 4 of 5 Period: 42.313 d



## DV Fit Results:

Period = 42.31276 [0.00043] d  
Epoch = 159.7799 [0.0076] BKJD  
Rp/R\* = 0.0126 [0.0068]  
a/R\* = 54.47 [177.11]  
b = 0.90 [0.69]  
Seff = 49.29 [17.55]  
Teff = 676 [60] K  
Rp = 1.69 [1.01] Re  
a = 0.2419 [0.0531] AU  
Ag = 850.20 [974.99] [0.87σ]  
Teffp = 5641 [1572] K [3.16σ]

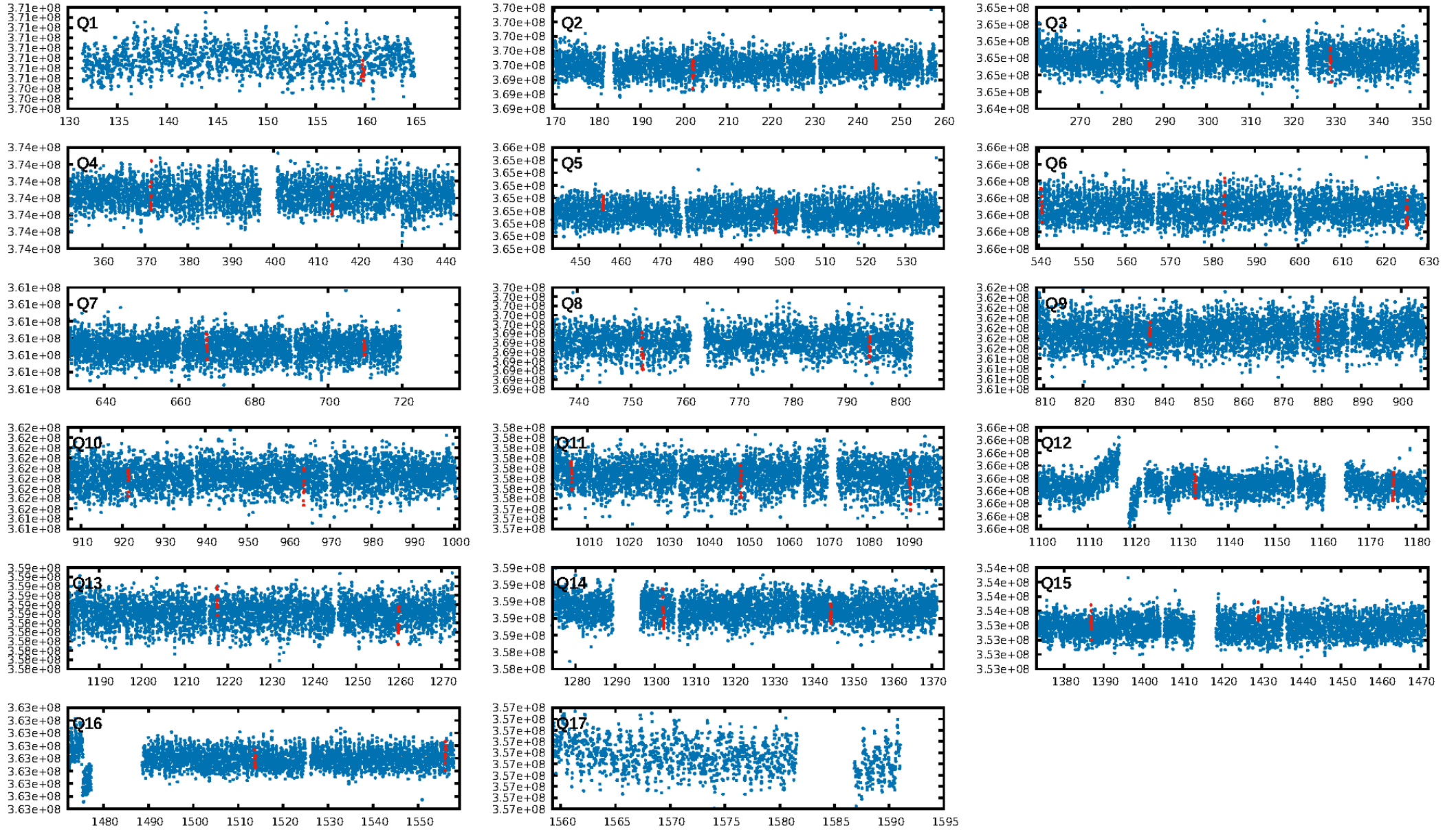
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [190.94σ]  
LongPeriod-sig: 100.0% [131.99σ]  
ModelChiSquare2-sig: 62.5%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 3.68e-09**  
**RollingBand-fgt: 0.76 [13/17]**  
GhostDiagnostic-chr: -60.02  
Centroid-sig: 12.4%  
Centroid-so: 0.728 arcsec [1.30σ]  
OotOffset-rm: 0.434 arcsec [1.47σ]  
KicOffset-rm: 0.442 arcsec [1.30σ]  
OotOffset-st: 3/4/3/2 [12]  
KicOffset-st: 3/4/3/2 [12]  
DiffImageQuality-fgm: 0.58 [7/12]  
DiffImageOverlap-fno: 0.31 [5/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:08:42 Z

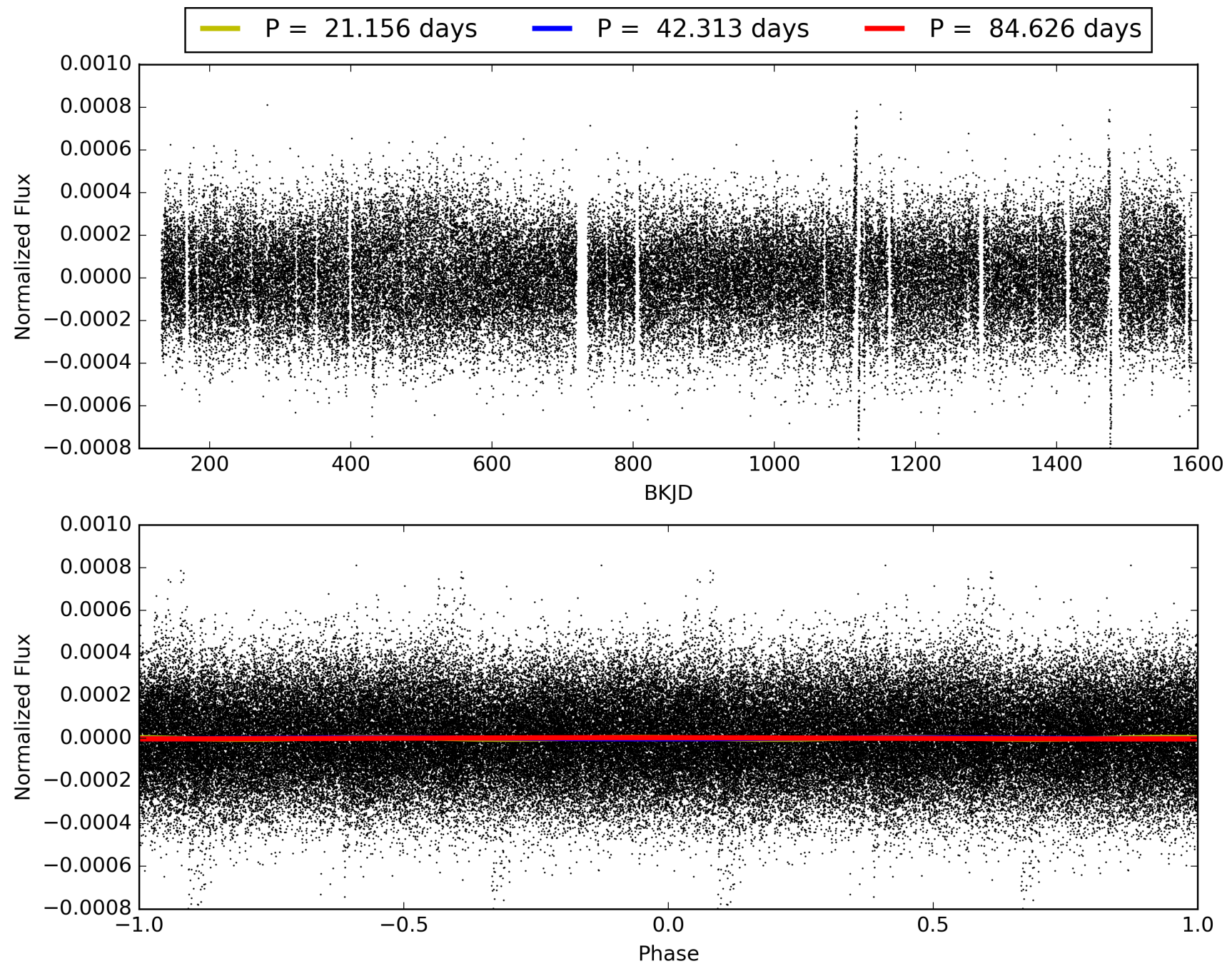
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010534150-04, PDC Light Curves



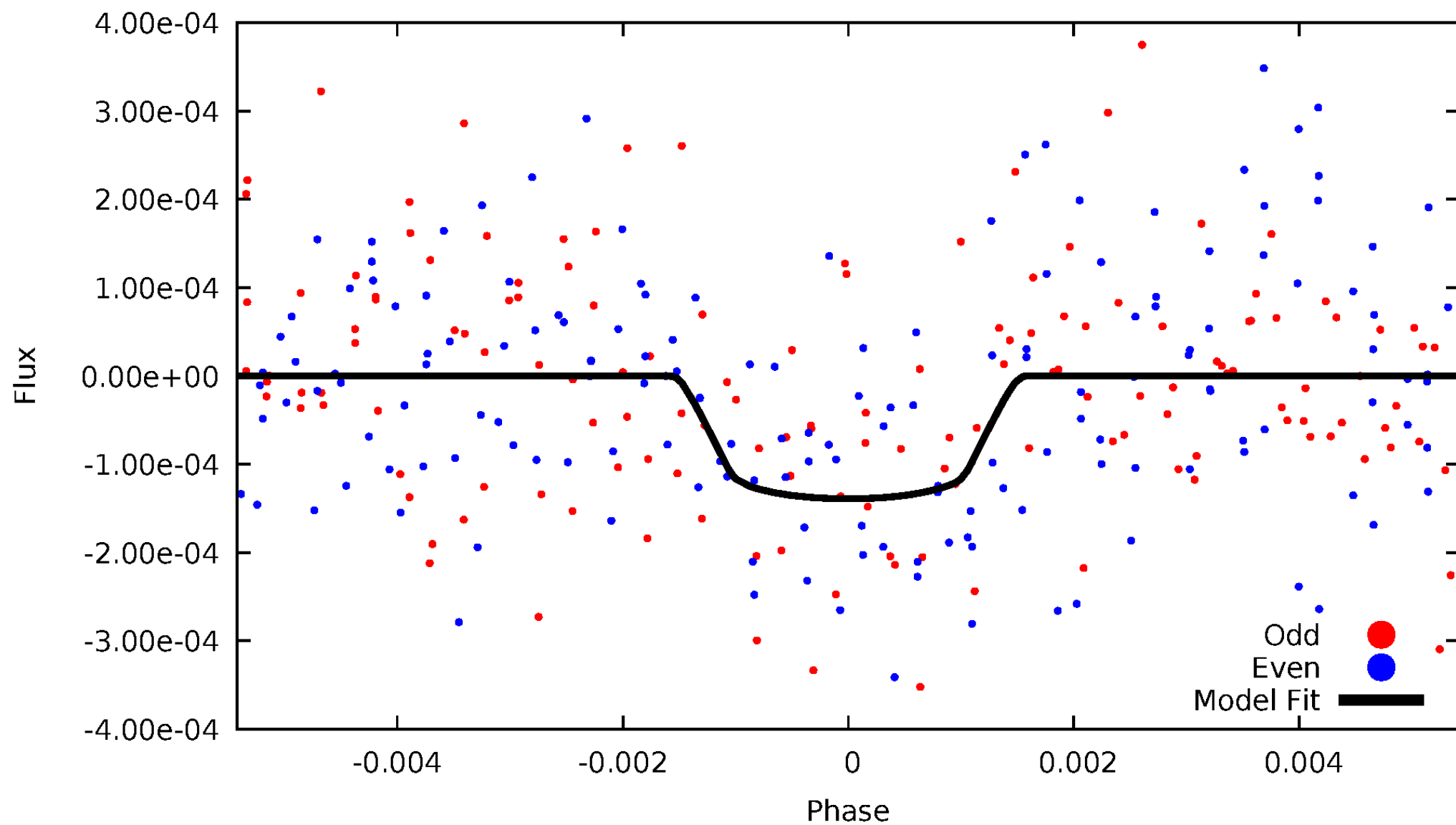


TCE 010534150-04



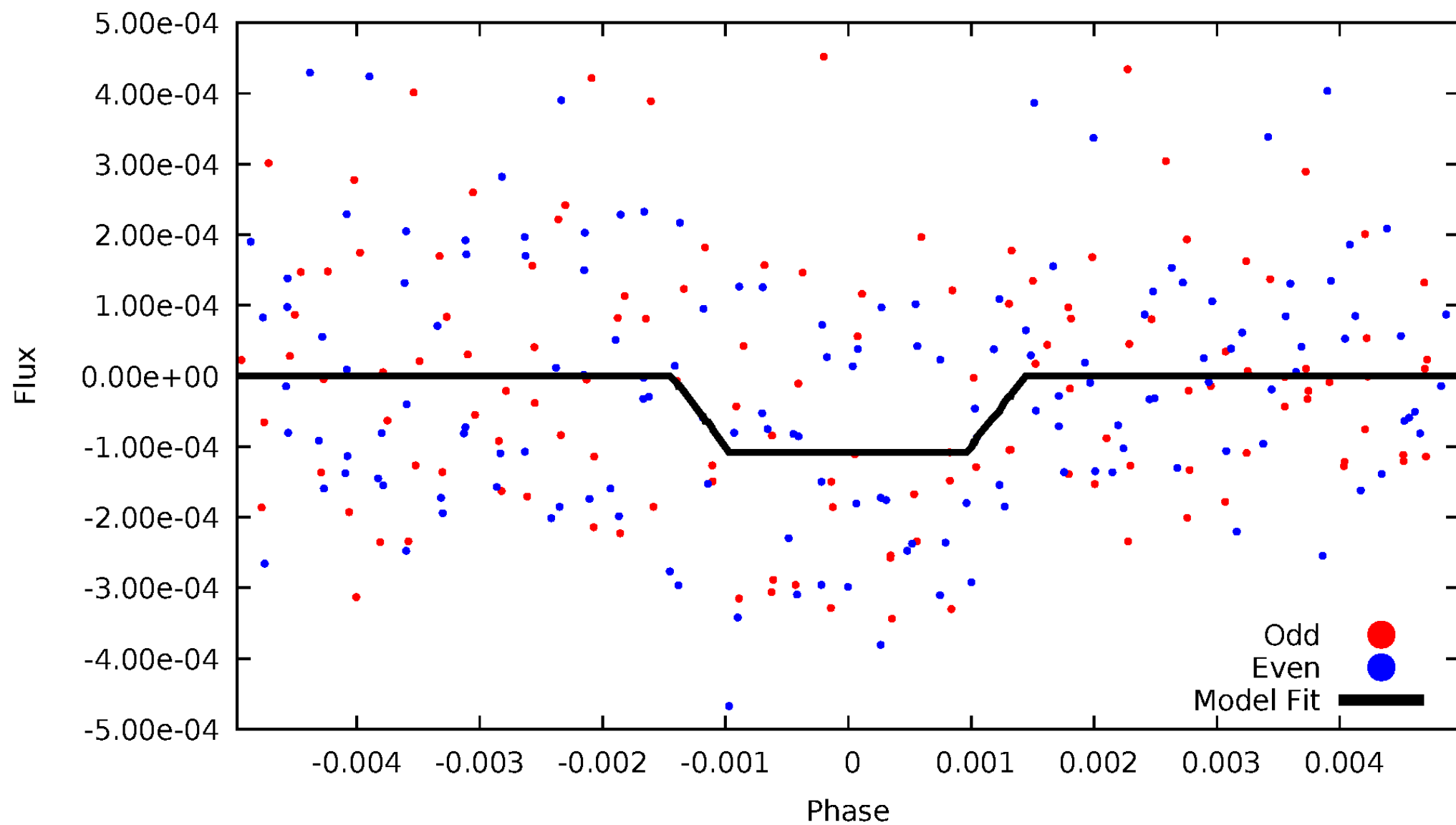
# DV Odd/Even

TCE 010534150-04



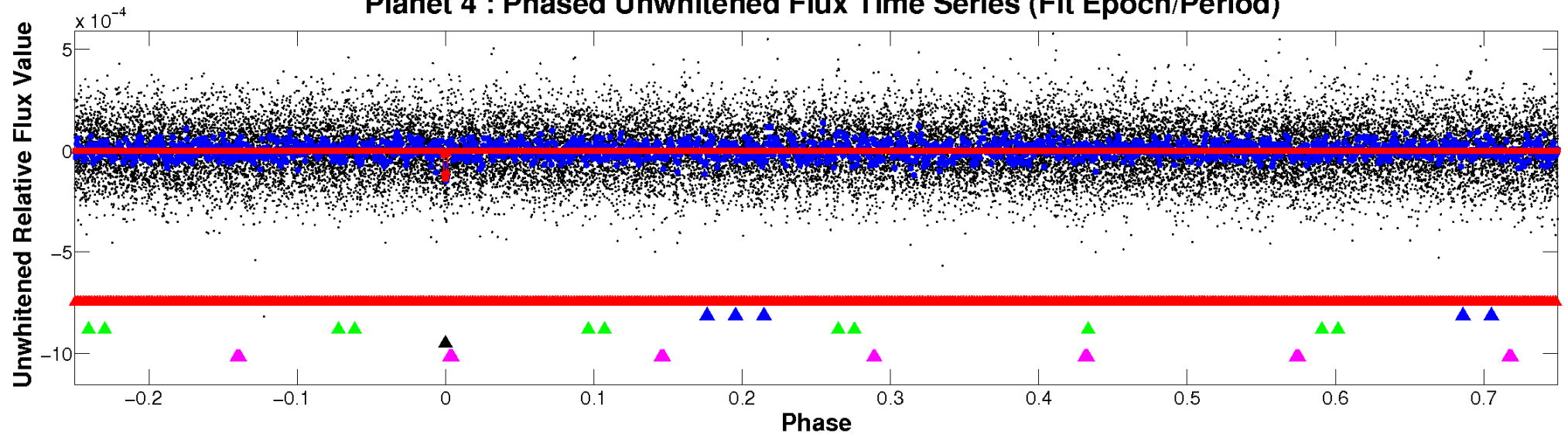
# ALT Odd/Even

TCE 010534150-04

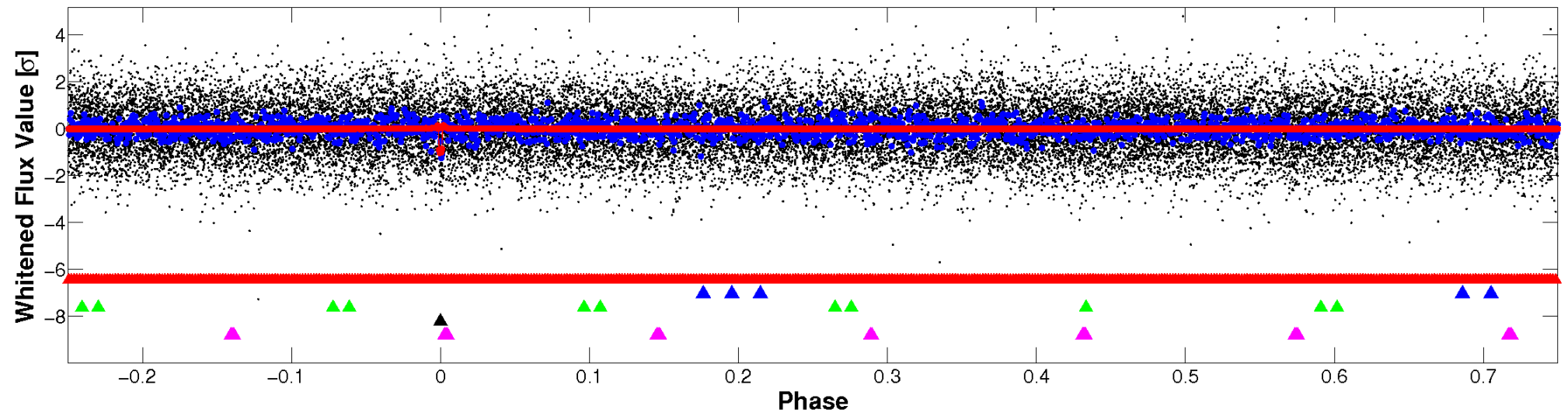


# Non-Whitened Vs. Whitened Light Curve

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

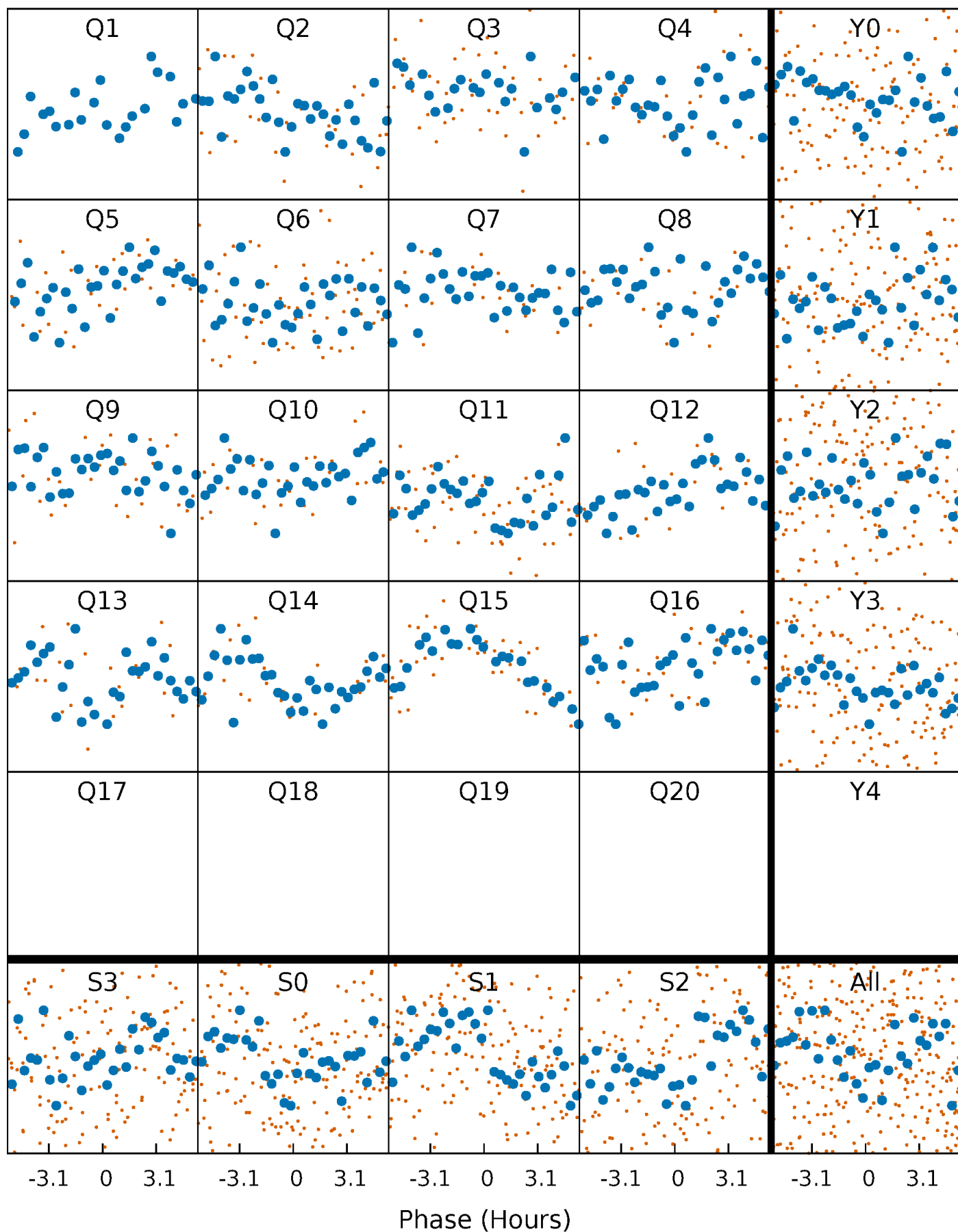


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



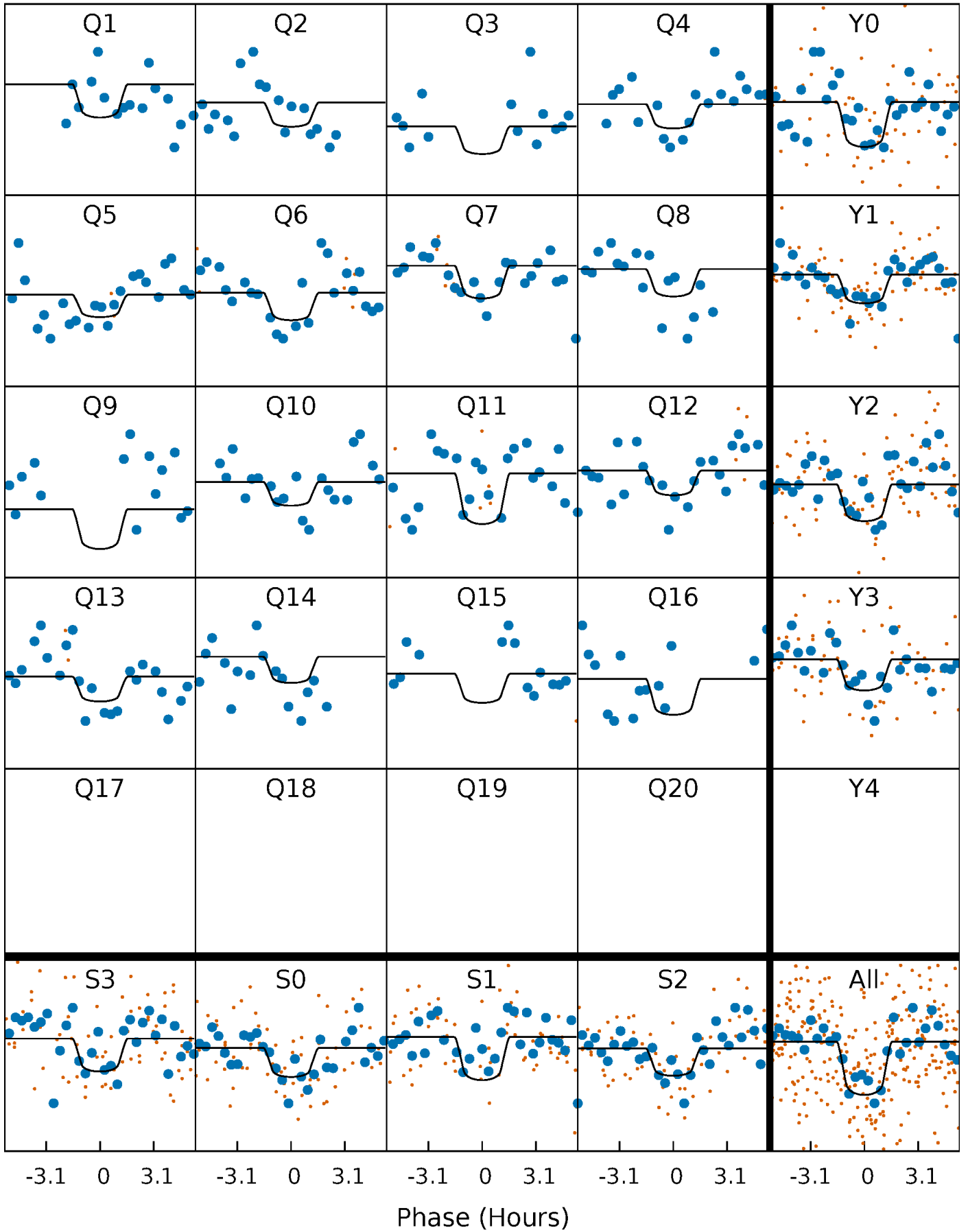
# PDC Quarter-Phased Transit Curves

TCE 010534150-04 P= 42.312760 Days  $T_0=159.779899$  (BKJD)



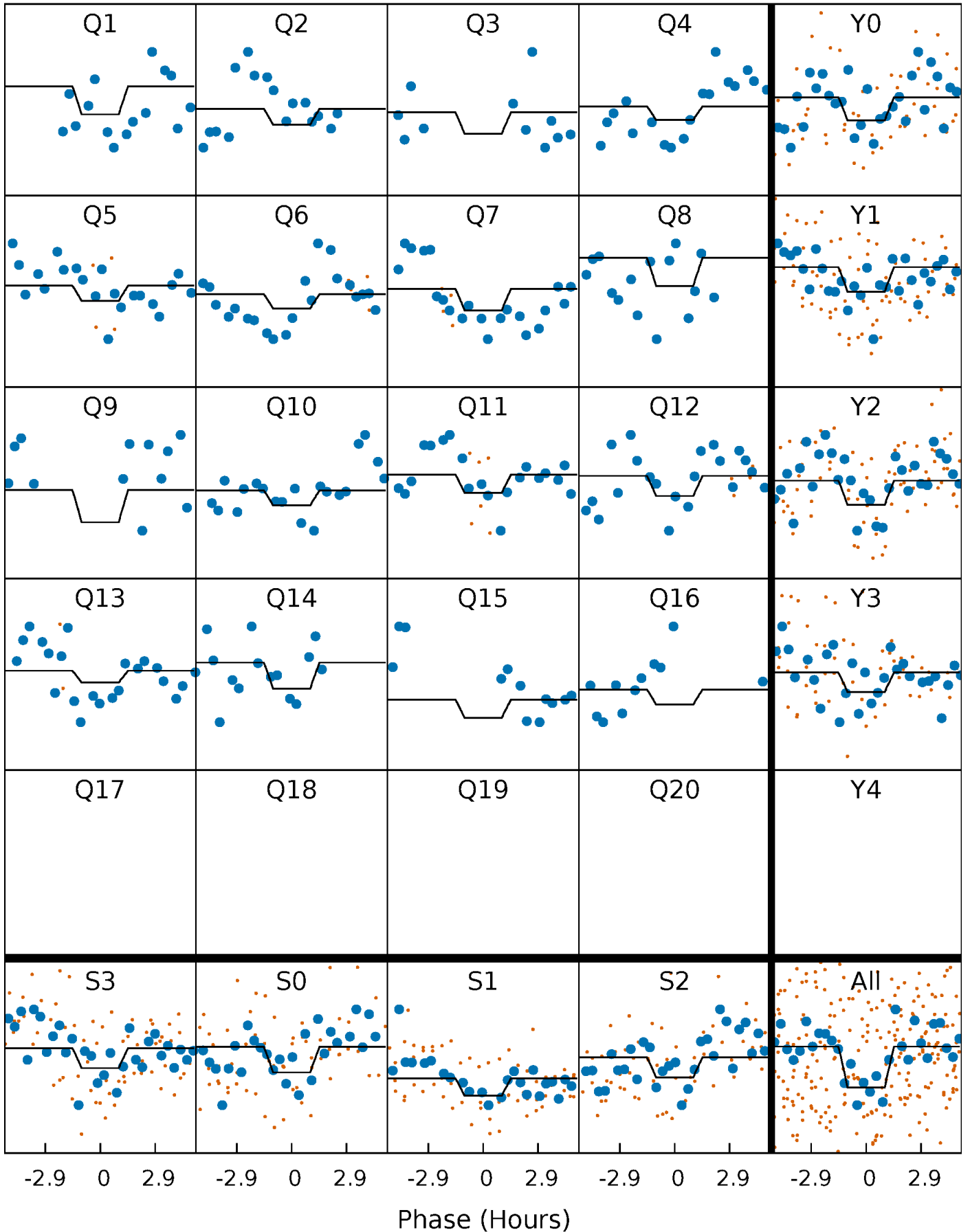
# DV Quarter-Phased Transit Curves

TCE 010534150-04 P= 42.312760 Days  $T_0=159.779899$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010534150-04     $P = 42.312971$  Days     $T_0 = 159.780123$  (BKJD)

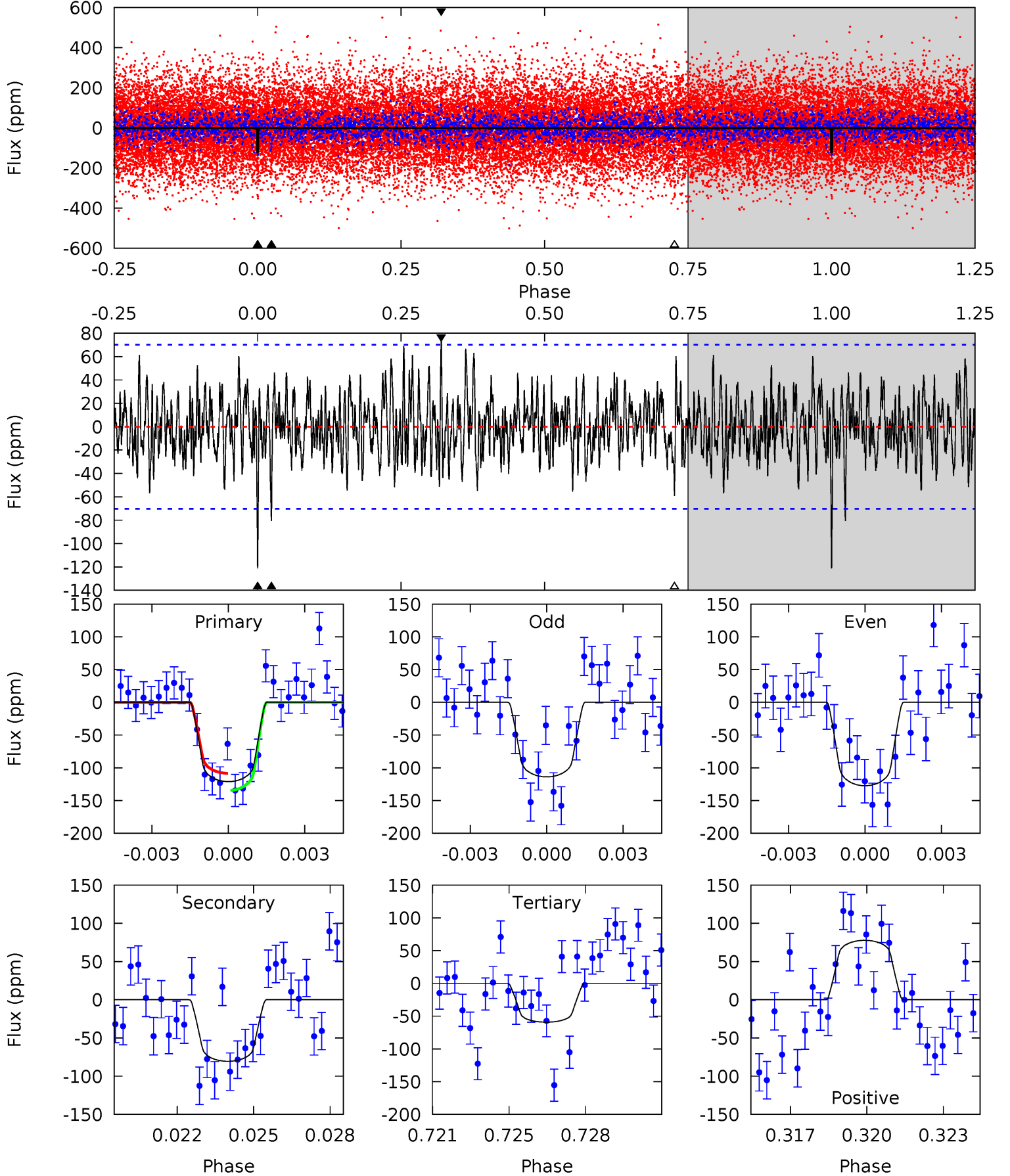




# DV Model-Shift Uniqueness Test

010534150-04, P = 42.312760 Days, E = 117.467139 Days

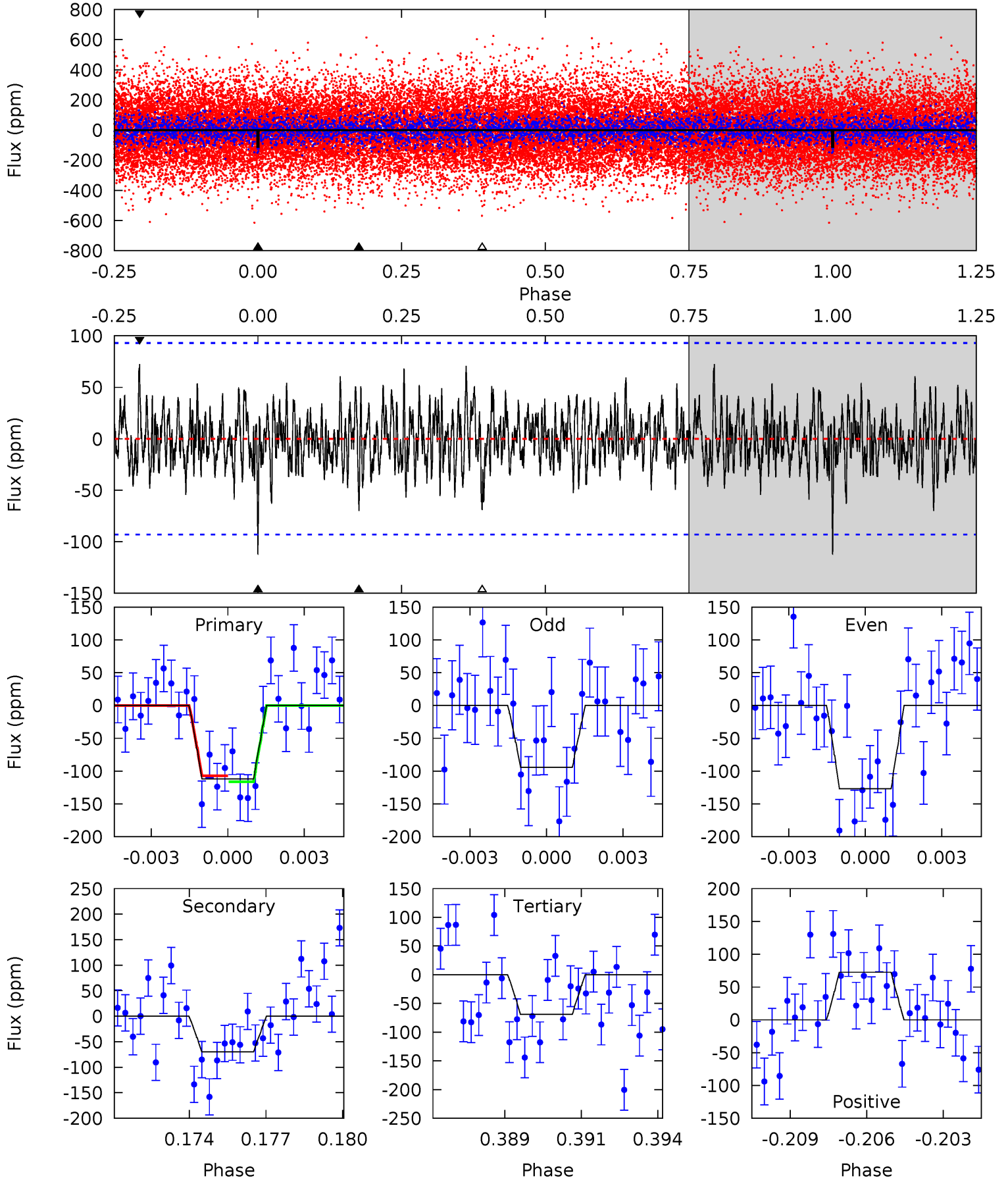
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.05	6.02	4.43	5.81	5.24	2.95	1.64	4.62	3.24	1.59	0.21	0.51	0.79	0.39	0.98



# Alt Model-Shift Uniqueness Test

010534150-04, P = 42.312971 Days, E = 117.467152 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
6.32	3.96	3.91	4.10	5.26	2.98	1.25	2.41	2.22	0.05	-0.15	0.93	0.65	0.39	0.25



### Stellar Parameters For KIC 010534150

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6795^{+212}_{-282}$	$4.282^{+0.139}_{-0.170}$	$-0.640^{+0.300}_{-0.350}$	$1.229^{+0.325}_{-0.216}$	$1.053^{+0.145}_{-0.118}$	$0.798^{+0.543}_{-0.375}$
	+3%/-4%	+3%/-4%	+47%/-55%	+26%/-18%	+14%/-11%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010534150-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-81 \pm 13$	$1.77^{+0.93}_{-0.88}$	$946^{+66}_{-59}$	$5605^{+2638}_{-938}$	$834^{+2370}_{-481}$
Alt.	$-70 \pm 18$	$1.57^{+0.96}_{-0.90}$	$944^{+69}_{-56}$	$5759^{+3302}_{-1073}$	$897^{+3990}_{-546}$

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

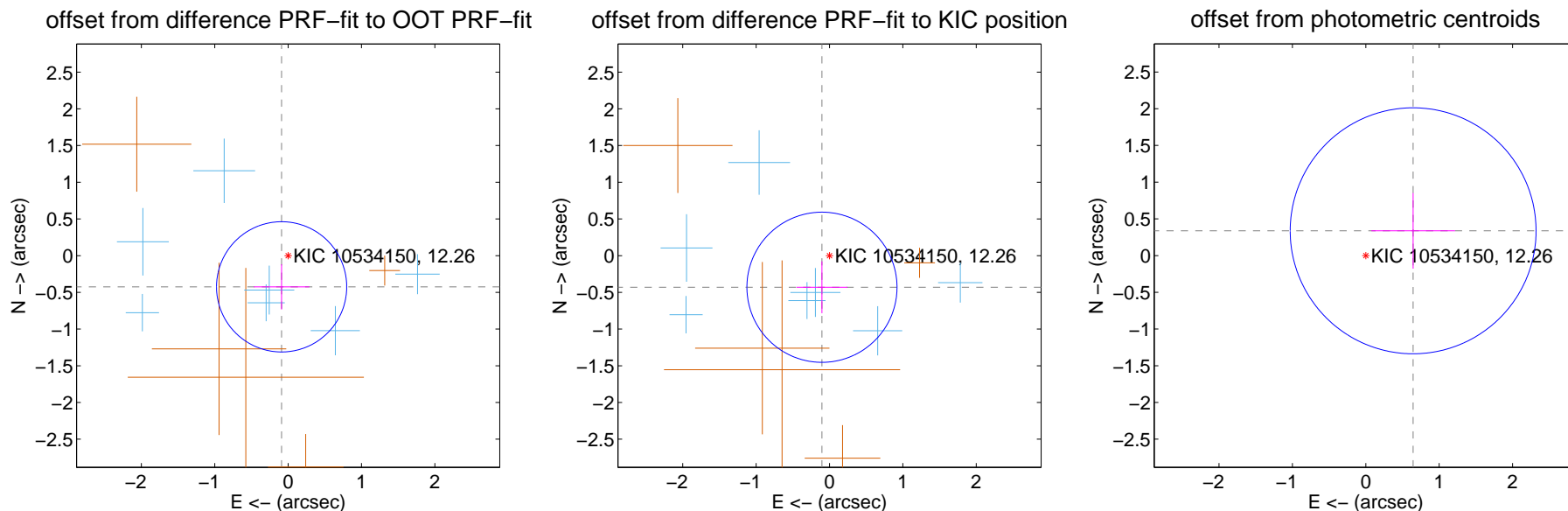
## DV Centroid Data

Supplemental centroid analysis for 010534150-04. Kepler magnitude: 12.26. Transit SNR 7.96

There are 7 quarters with good PRF difference image offsets

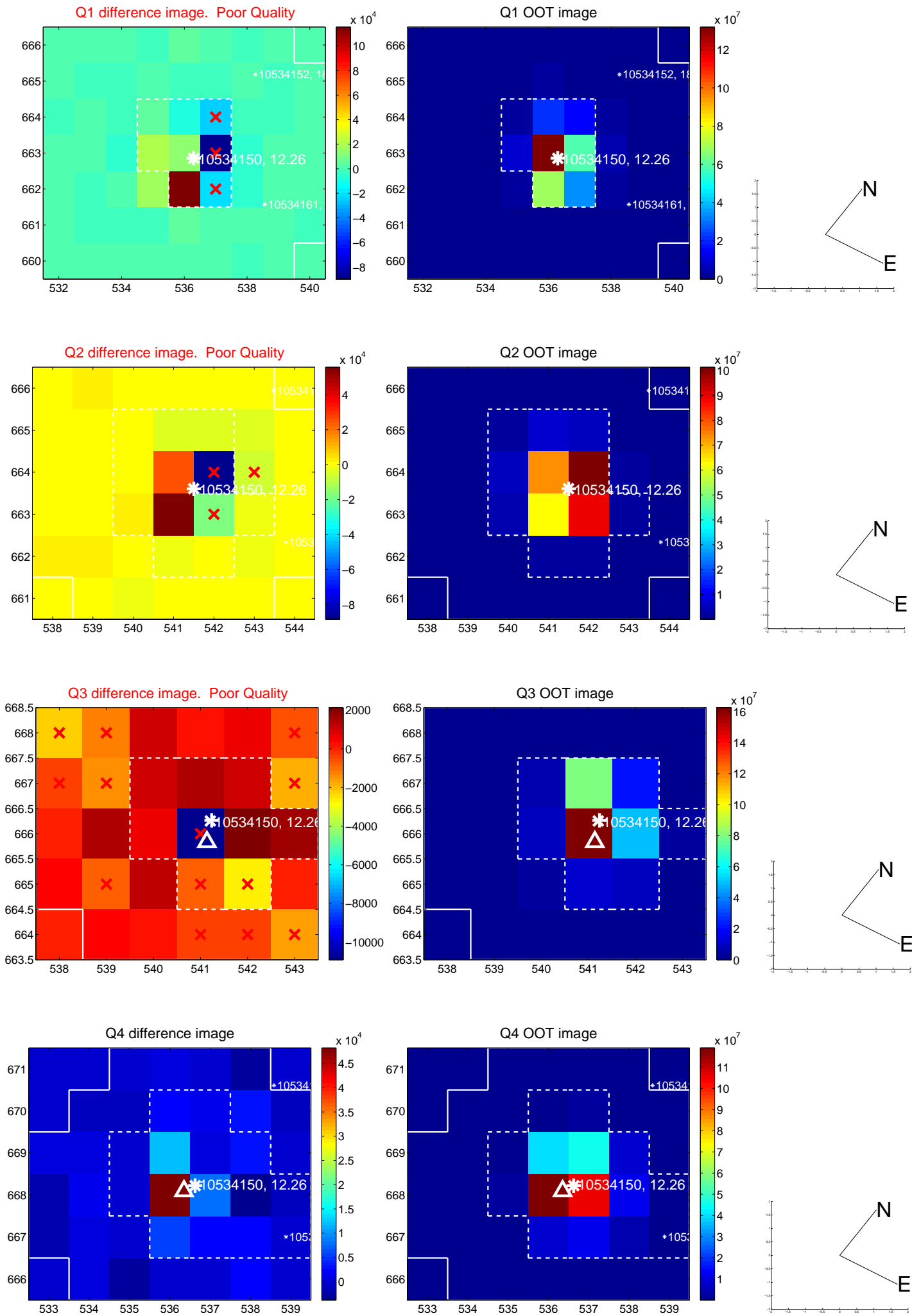
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.434 \pm 0.296$	1.47	$0.089 \pm 0.379$	$-0.425 \pm 0.308$
PRF-fit source offset from KIC position	$0.442 \pm 0.341$	1.30	$0.103 \pm 0.347$	$-0.430 \pm 0.353$
photometric centroid source offset	$0.73 \pm 0.56$	1.30	$-0.65 \pm 0.57$	$0.34 \pm 0.52$

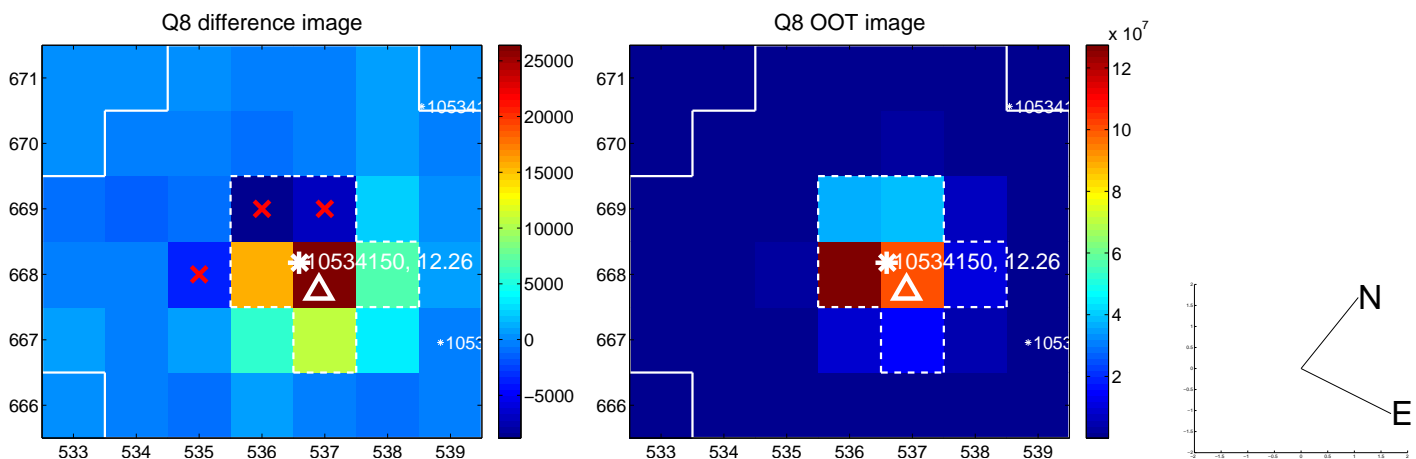
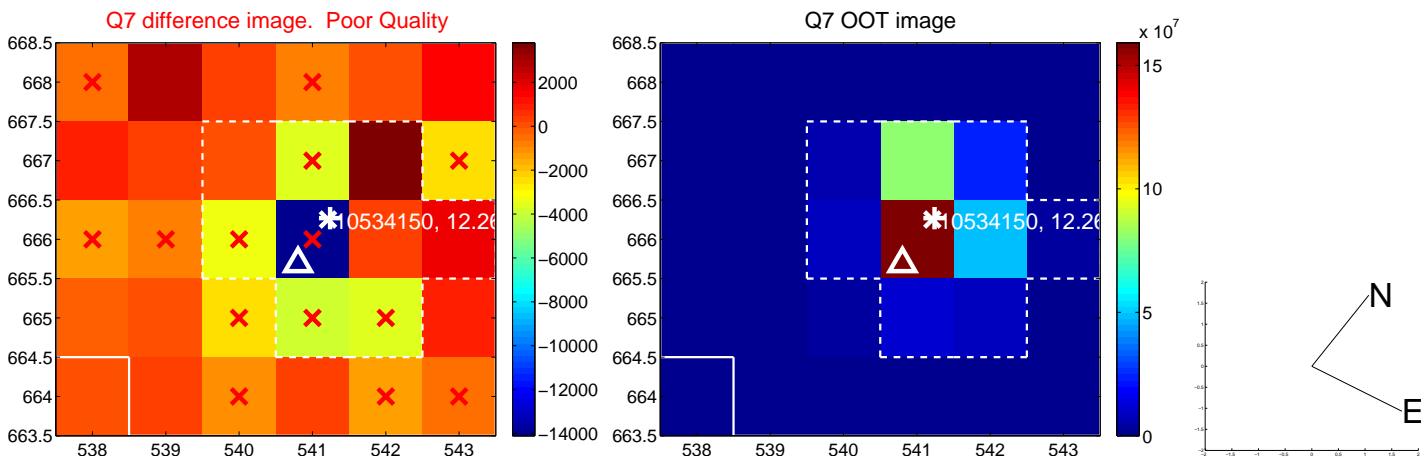
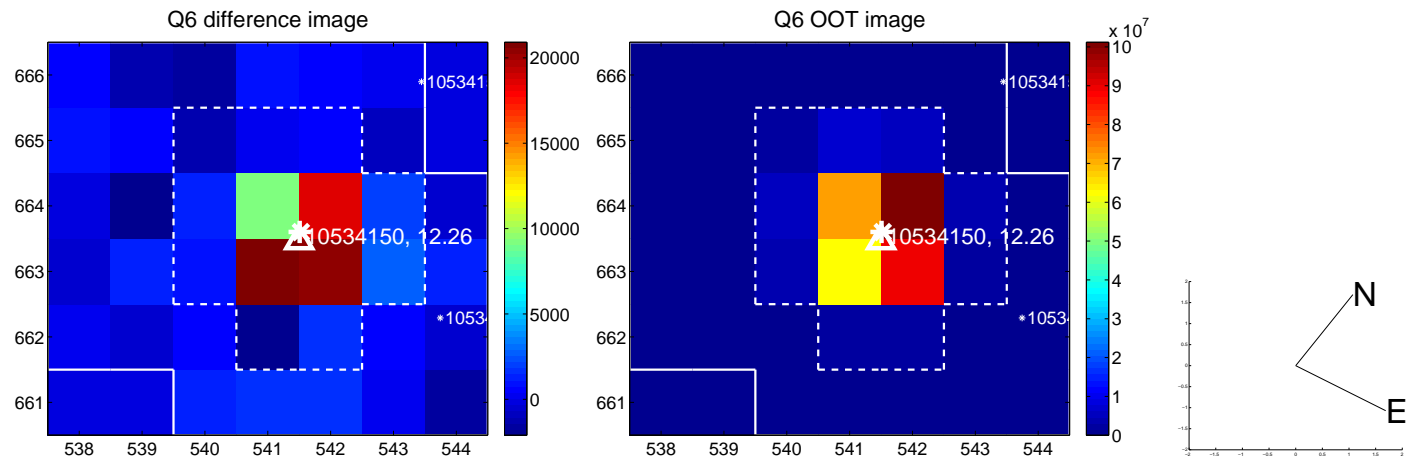
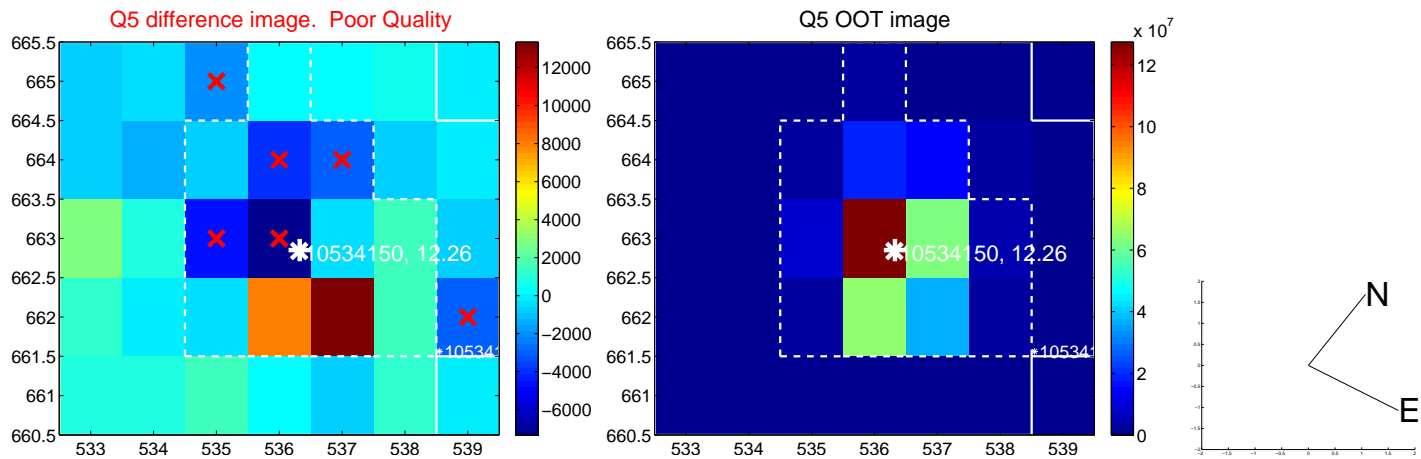


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

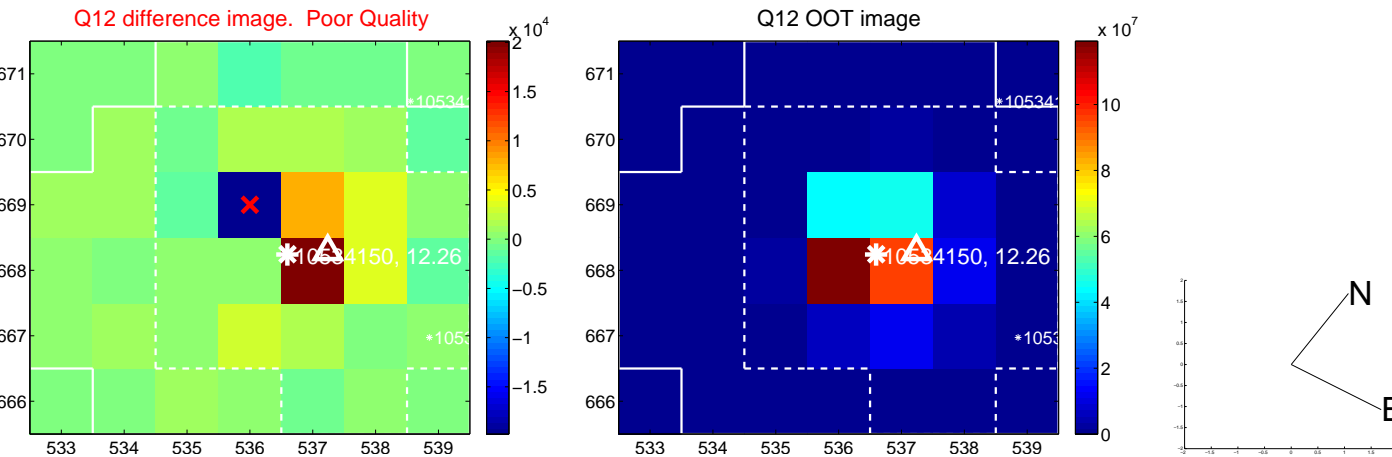
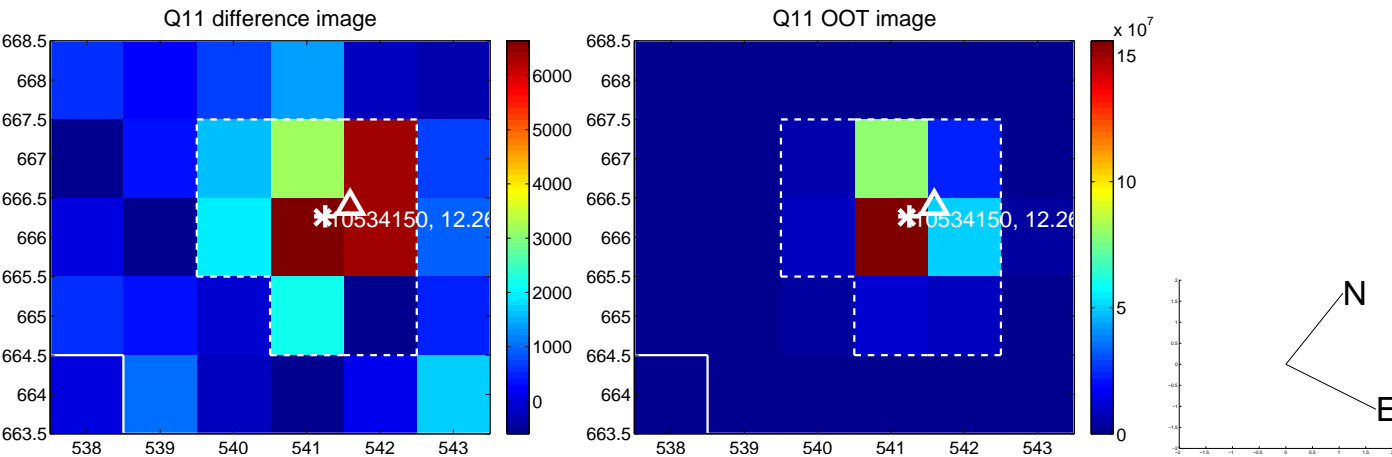
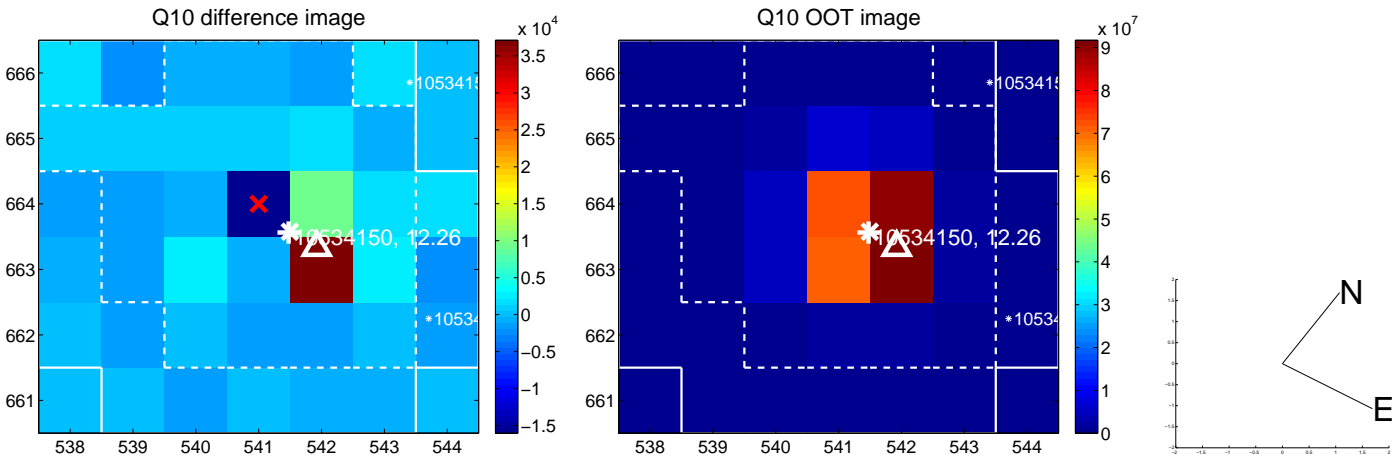
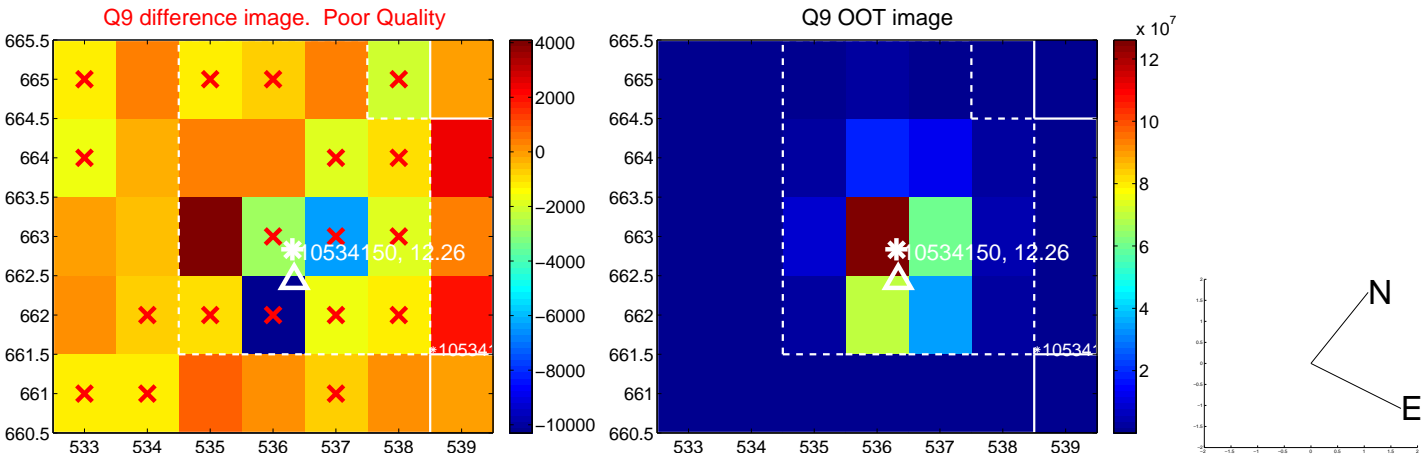
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

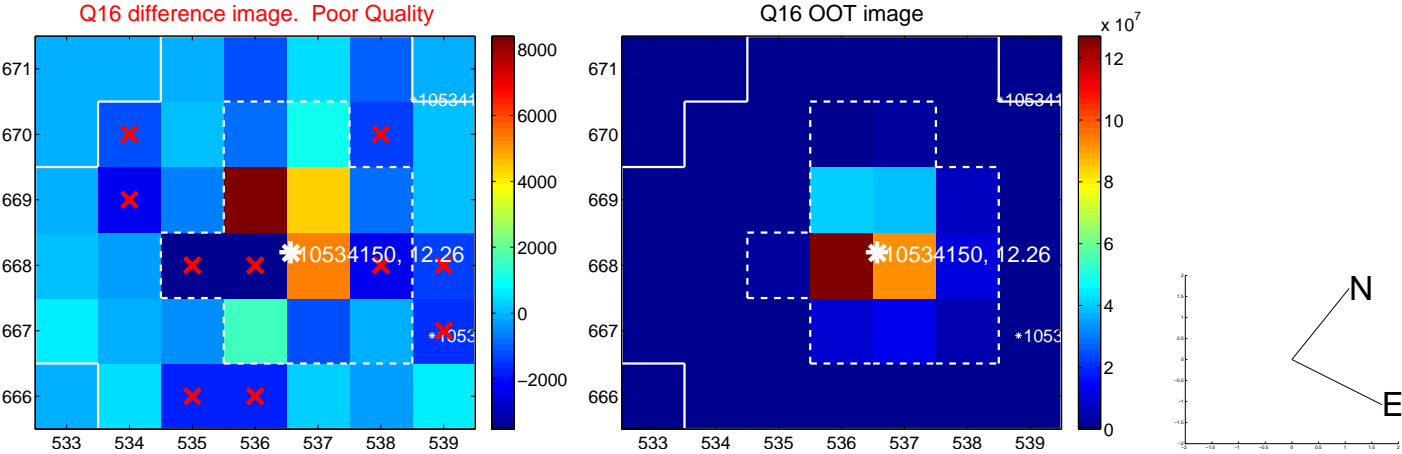
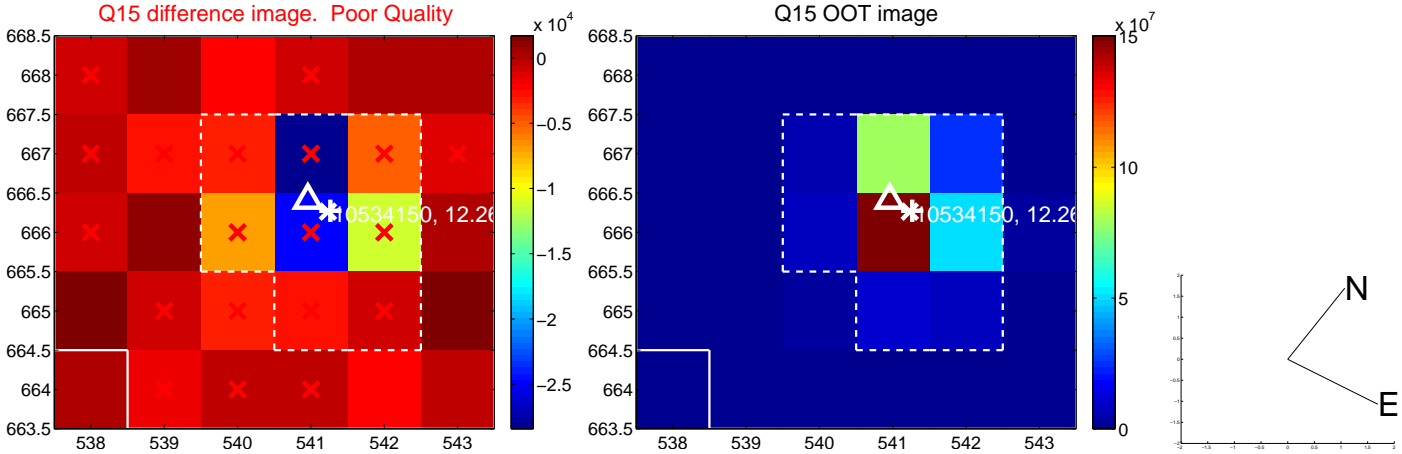
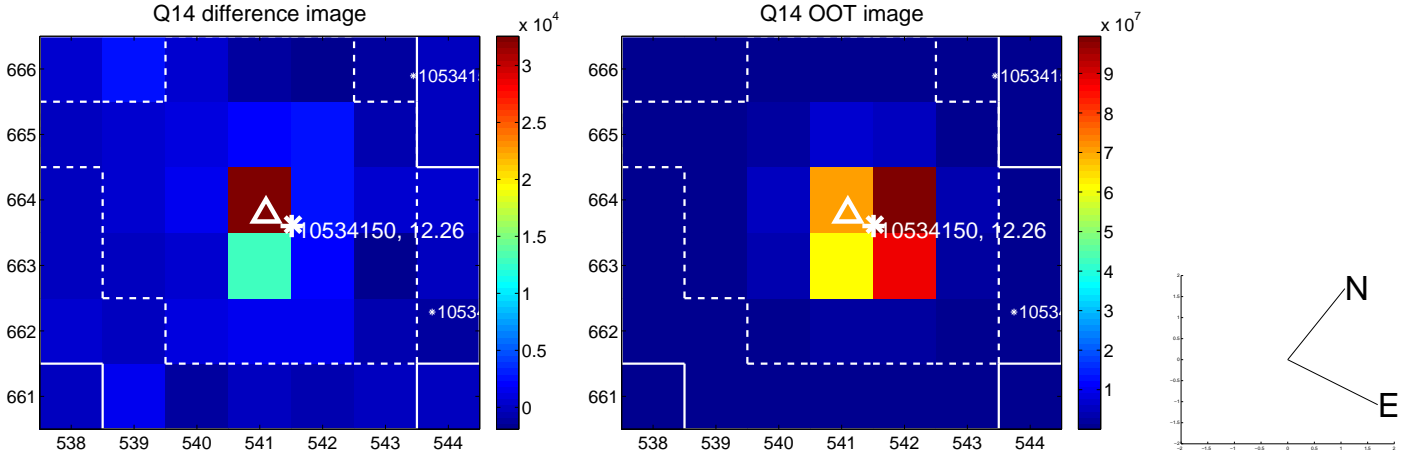
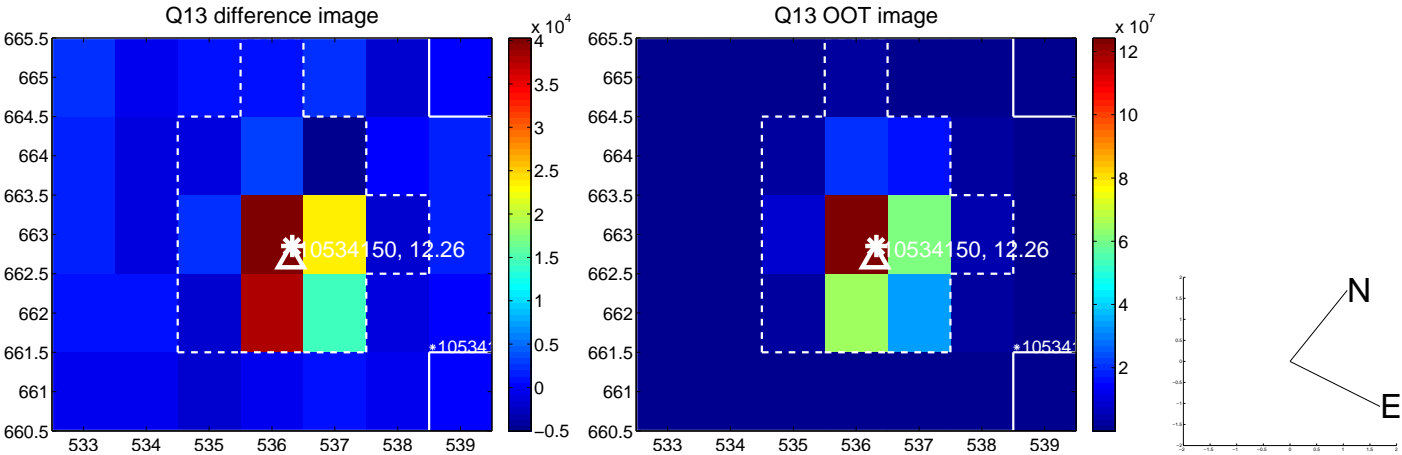


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

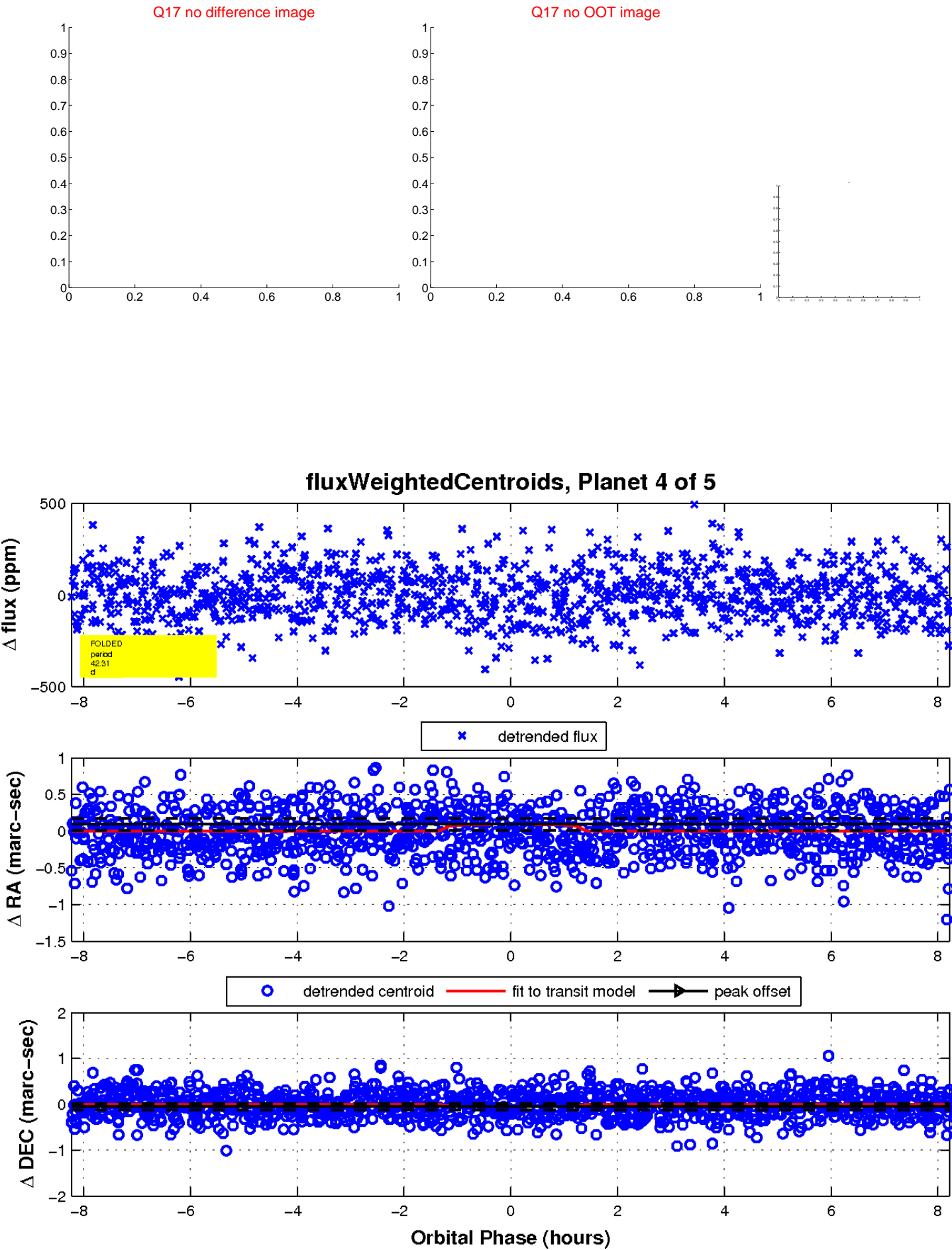




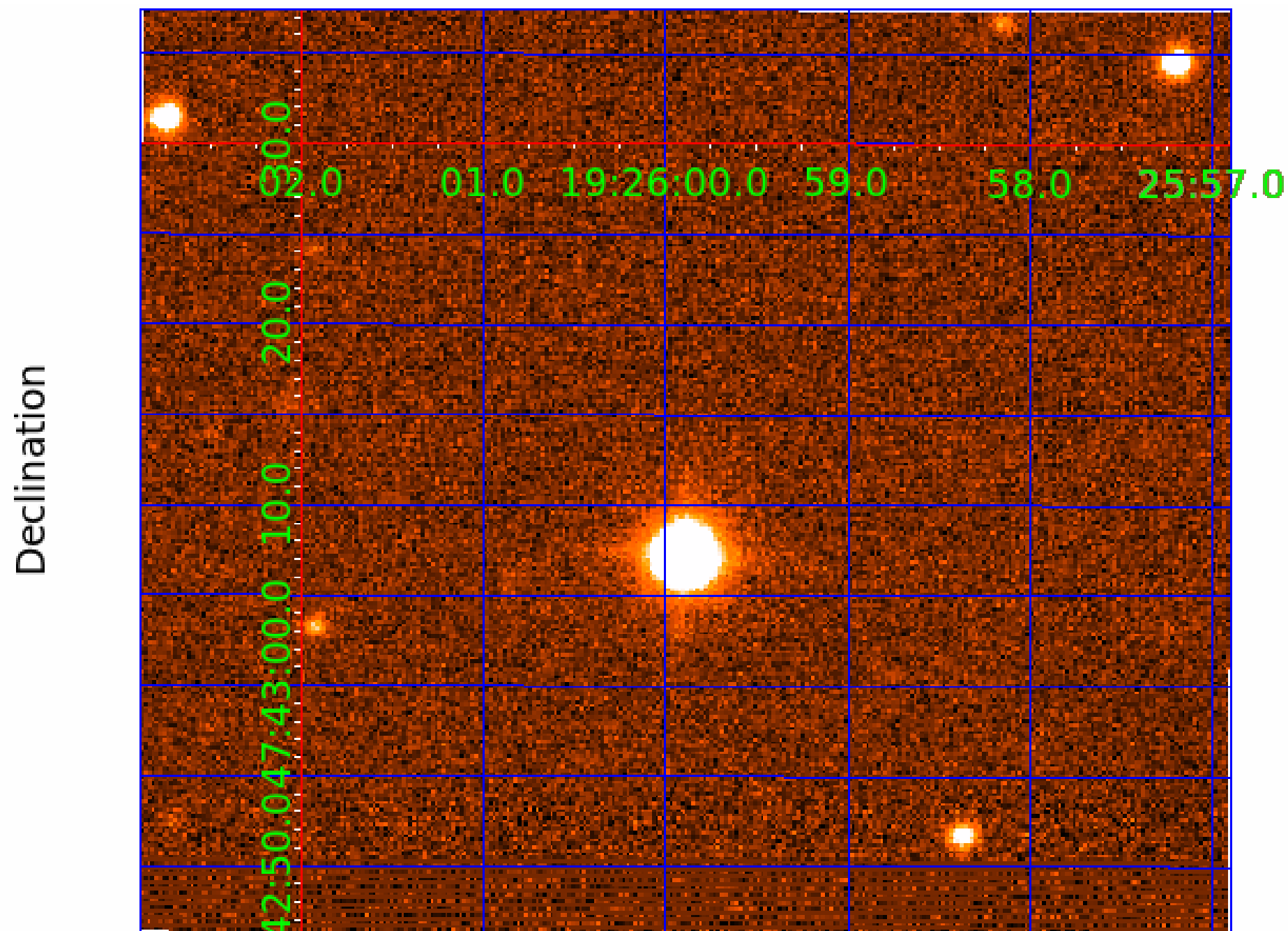
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 010534150

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010534150-01	OBS	No	1.016745	131.941789	15.3	4.401	8.3	7.8	1.23	6795	0.61	7107.84
010534150-02	OBS	No	317.750860	294.183308	421.5	3.926	9.0	8.8	1.23	6795	4.19	3.35
010534150-03	OBS	No	134.067274	184.783524	280.6	4.375	8.4	7.7	1.23	6795	2.35	10.59
010534150-04	OBS	No	42.312760	159.779899	139.1	2.752	7.4	8.0	1.23	6795	1.69	49.29
010534150-05	OBS	No	72.530383	202.289924	187.1	4.756	7.3	8.1	1.23	6795	1.99	24.02

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010534150-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010534150-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010534150-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
010534150-04	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_ALT
010534150-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

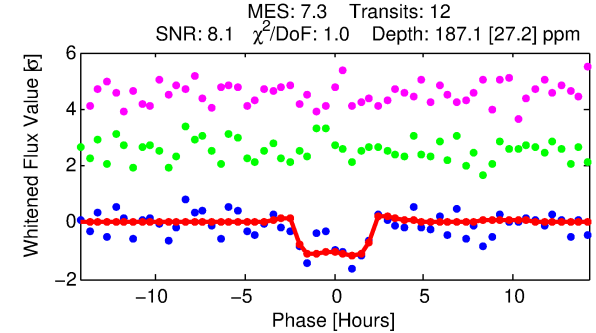
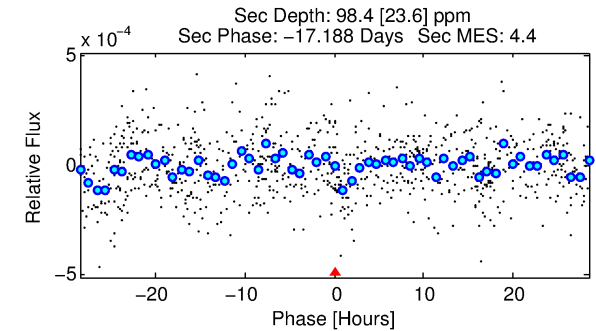
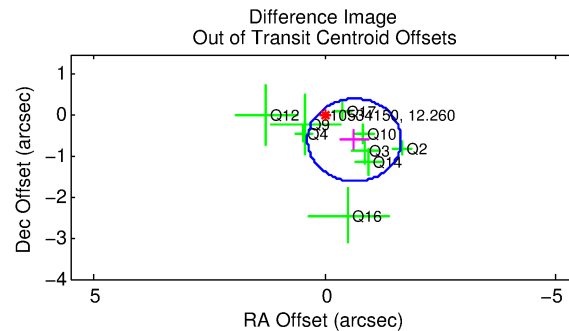
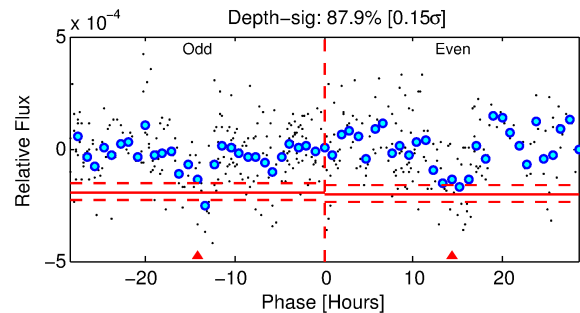
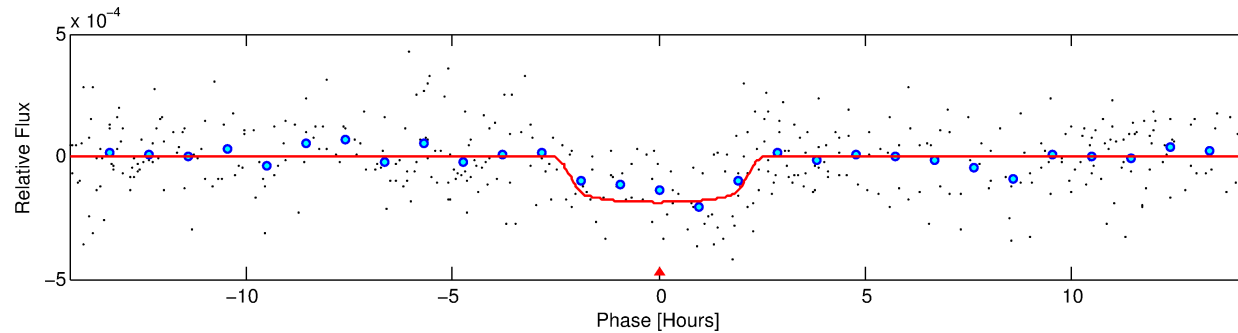
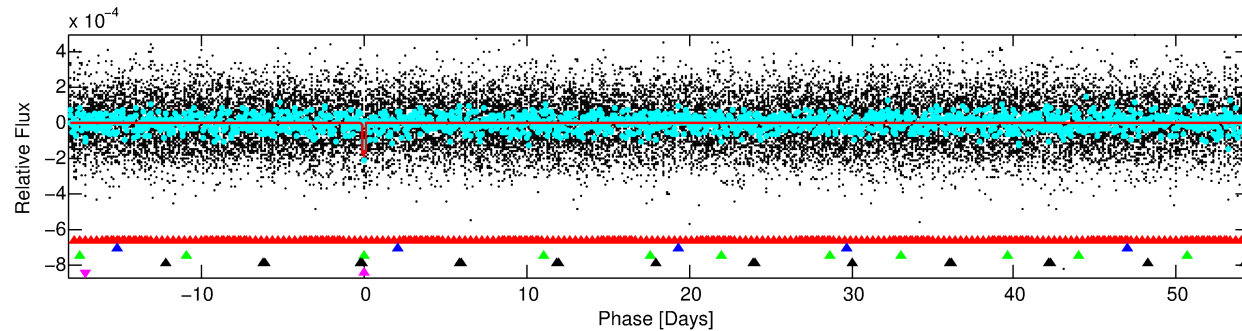
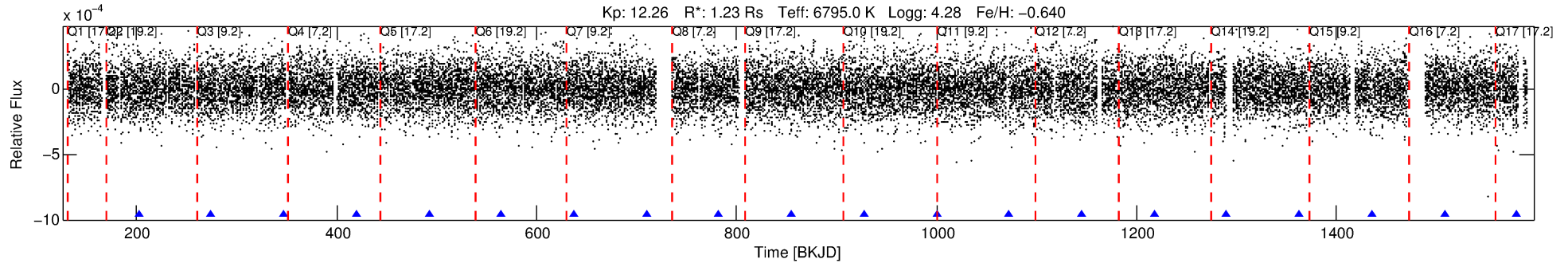
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010534150-05

No Significant Match Found

# DV One-Page Summary

KIC: 10534150 Candidate: 5 of 5 Period: 72.530 d



## DV Fit Results:

Period = 72.53038 [0.00079] d  
Epoch = 202.2899 [0.0091] BKJD  
Rp/R\* = 0.0148 [0.0029]  
a/R\* = 50.37 [50.81]  
b = 0.92 [0.17]  
Seff = 24.02 [8.55]  
Teq = 565 [50] K  
Rp = 1.99 [0.65] Re  
a = 0.3465 [0.0760] AU  
Ag = 1648.03 [910.99] [1.81σ]  
Teffp = 5561 [672] K [7.41σ]

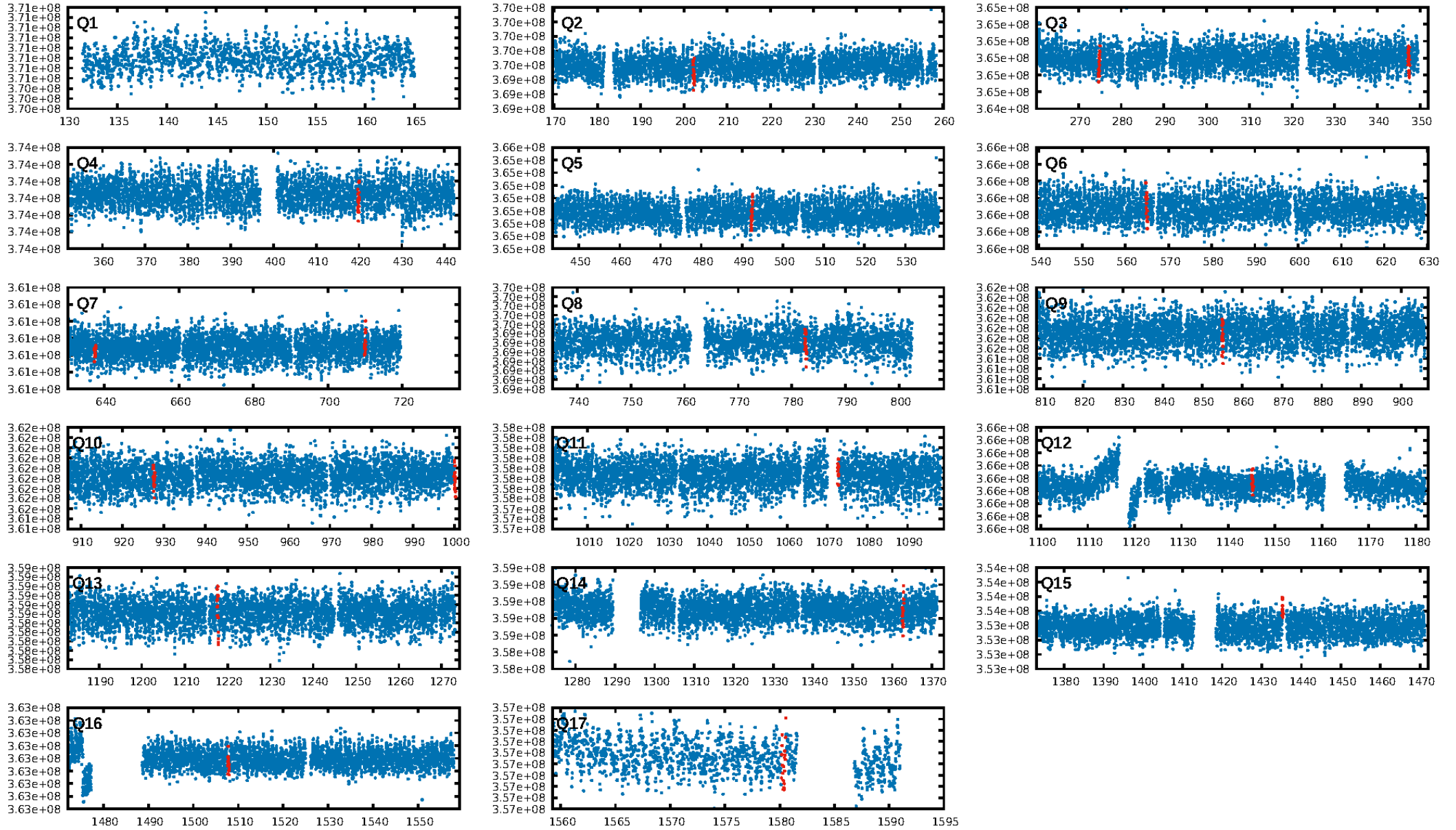
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [131.99σ]  
LongPeriod-sig: 100.0% [228.54σ]  
ModelChiSquare2-sig: 85.4%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.70e-09**  
RollingBand-fgt: 1.00 [11/11]  
GhostDiagnostic-chr: 1.777  
Centroid-sig: 3.8%  
Centroid-so: 0.503 arcsec [1.24σ]  
OotOffset-rm: 0.877 arcsec [2.60σ]  
KicOffset-rm: 0.905 arcsec [2.76σ]  
OotOffset-st: 3/1/3/2 [9]  
KicOffset-st: 3/1/3/2 [9]  
DiffImageQuality-fgm: 0.78 [7/9]  
DiffImageOverlap-fno: 0.00 [0/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:08:47 Z

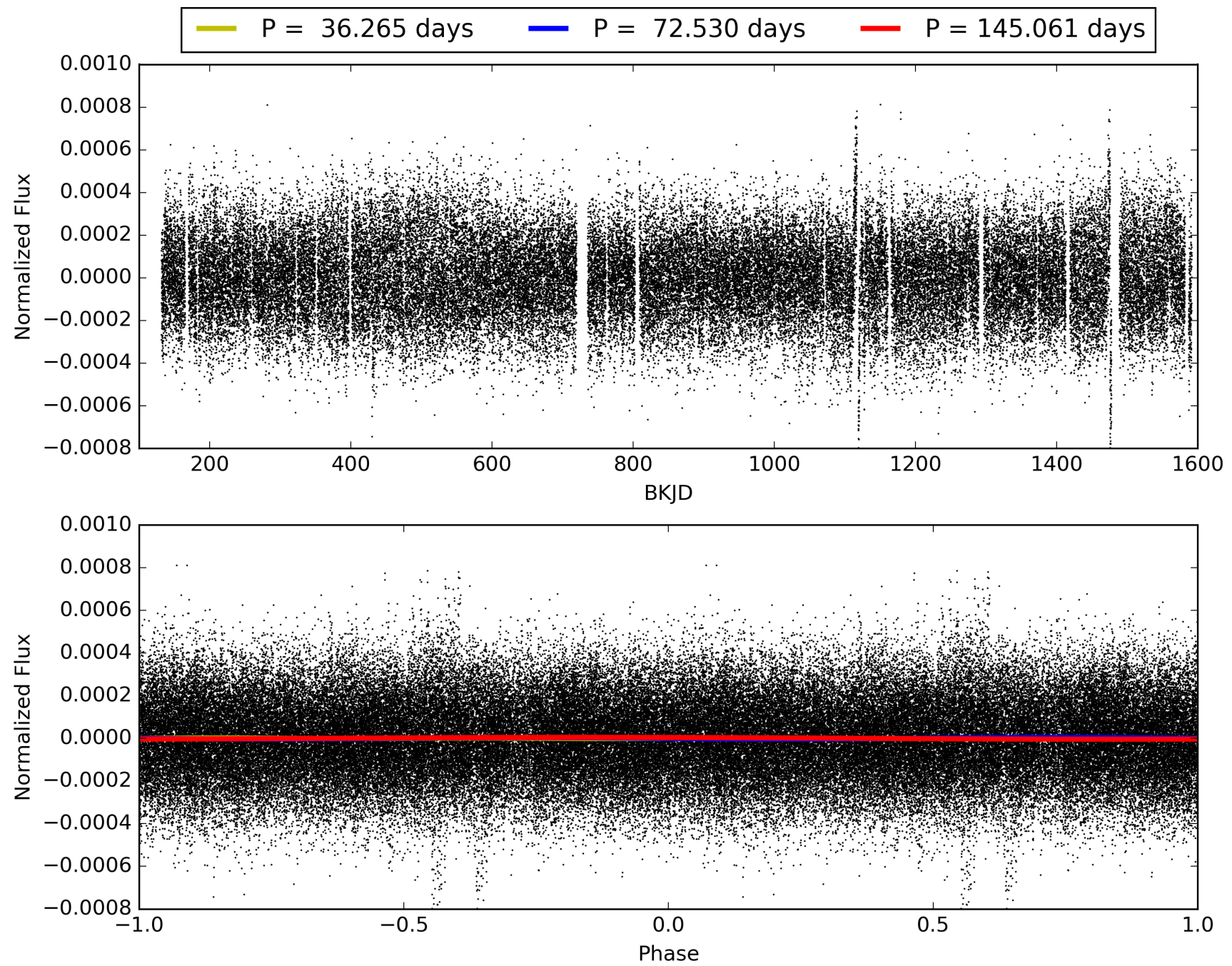
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010534150-05, PDC Light Curves





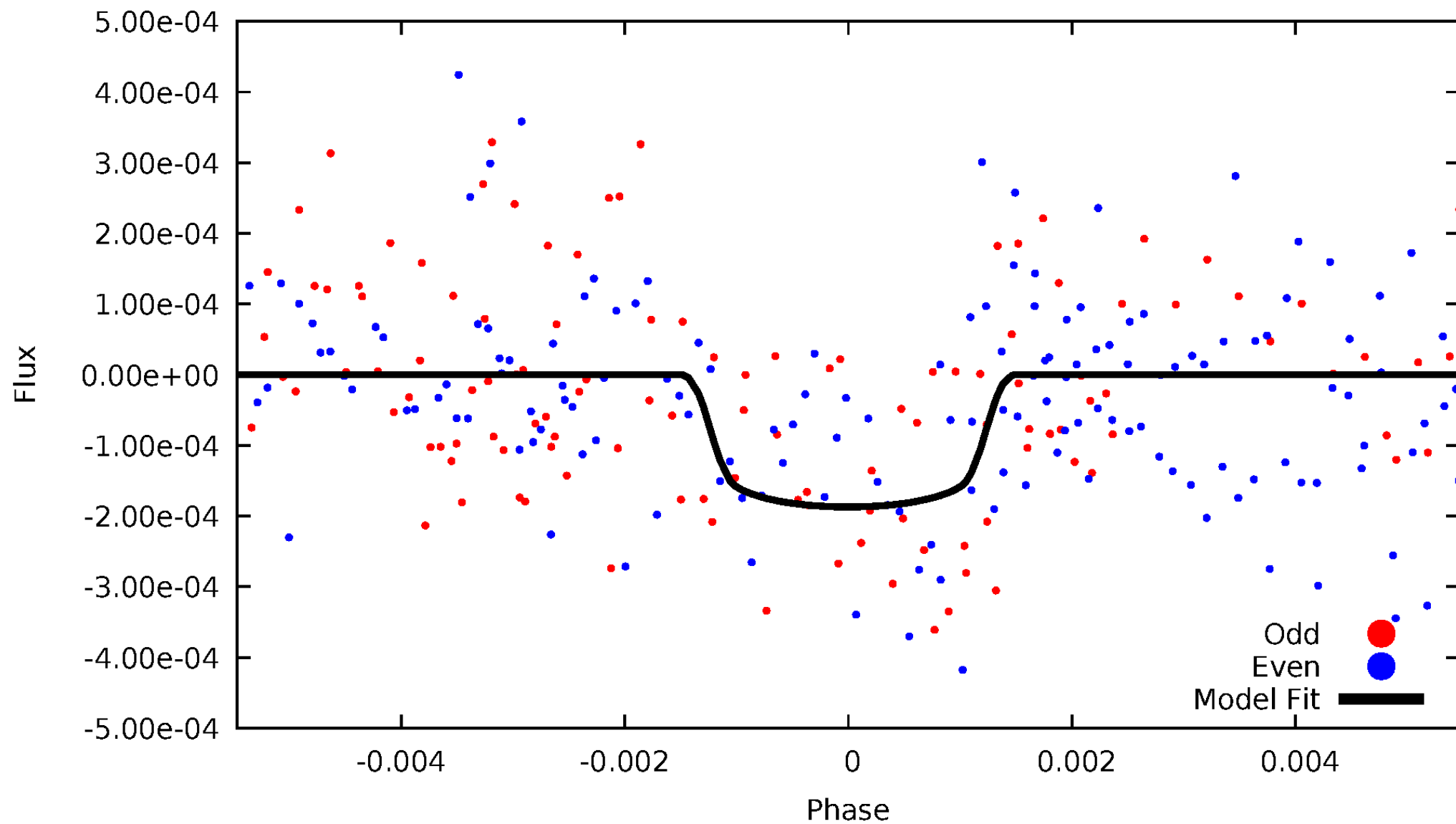
TCE 010534150-05





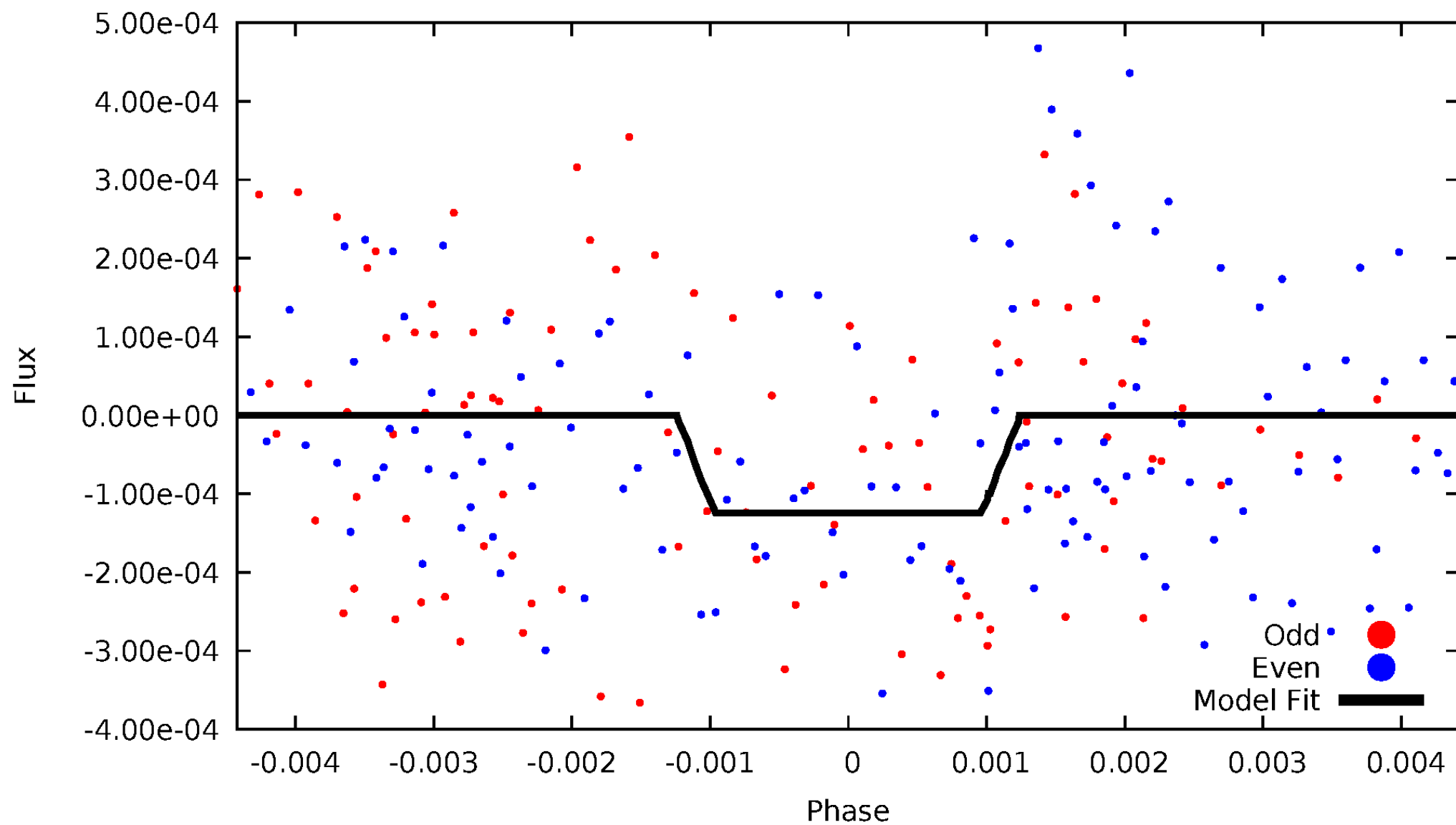
# DV Odd/Even

TCE 010534150-05

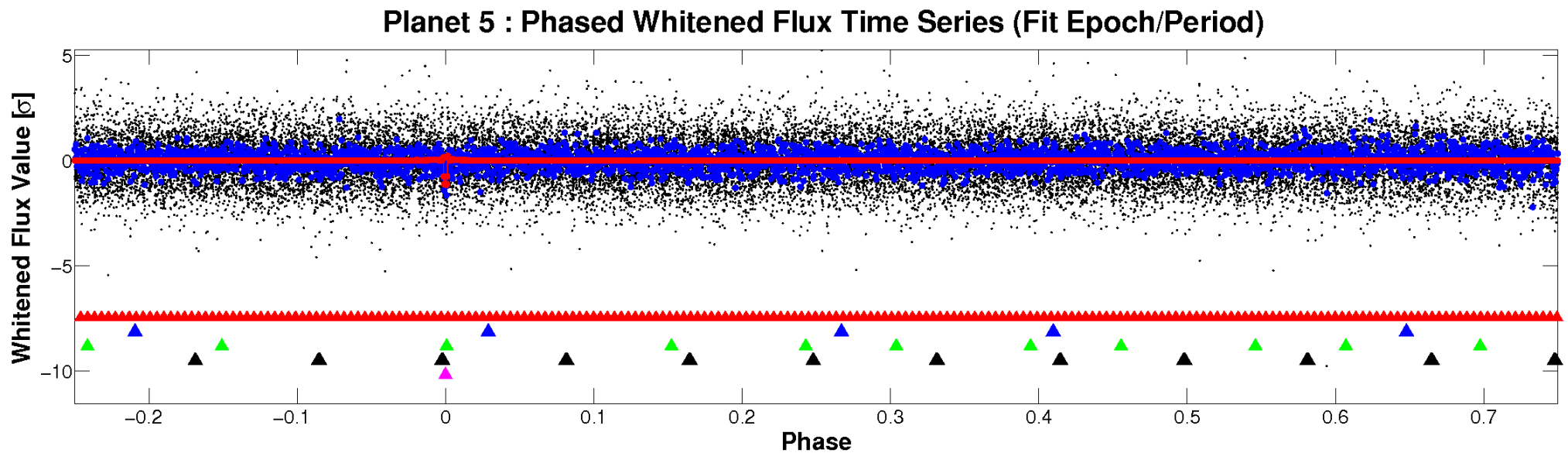
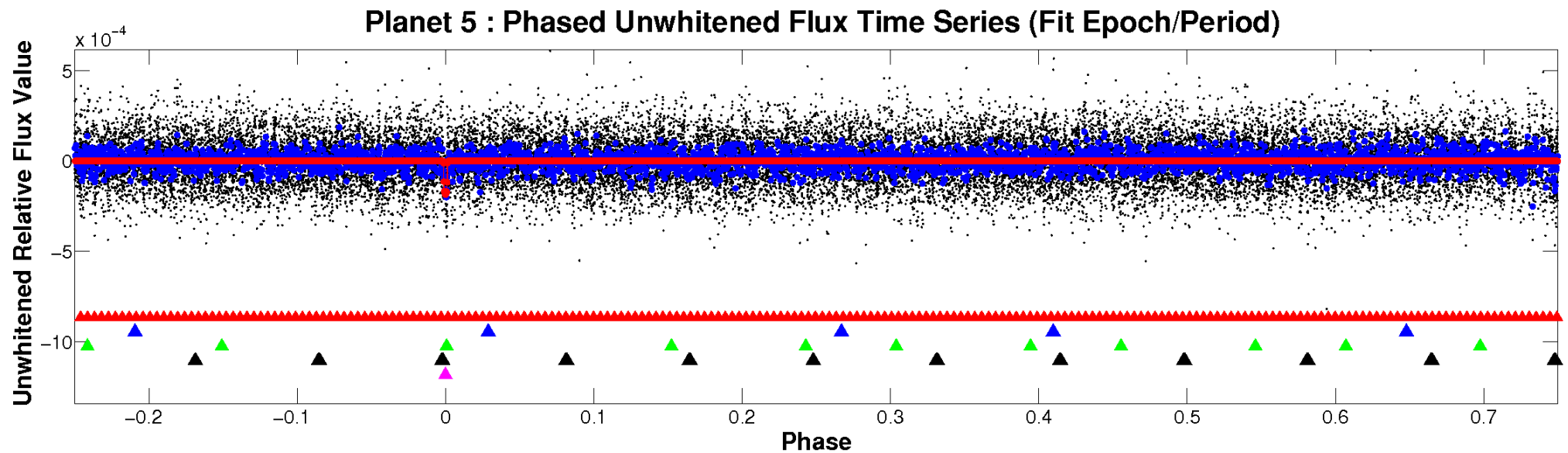


# ALT Odd/Even

TCE 010534150-05

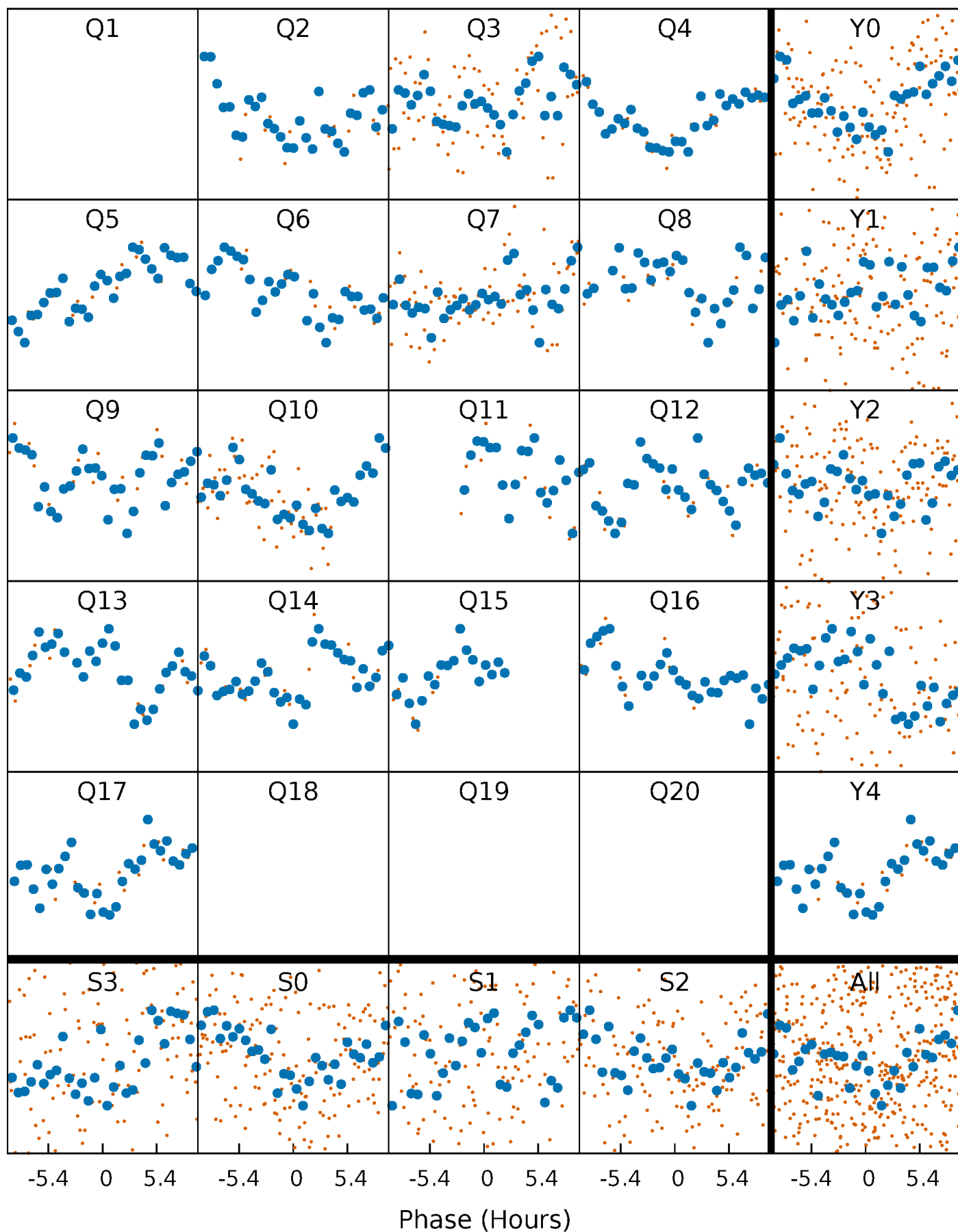


# Non-Whitened Vs. Whitened Light Curve



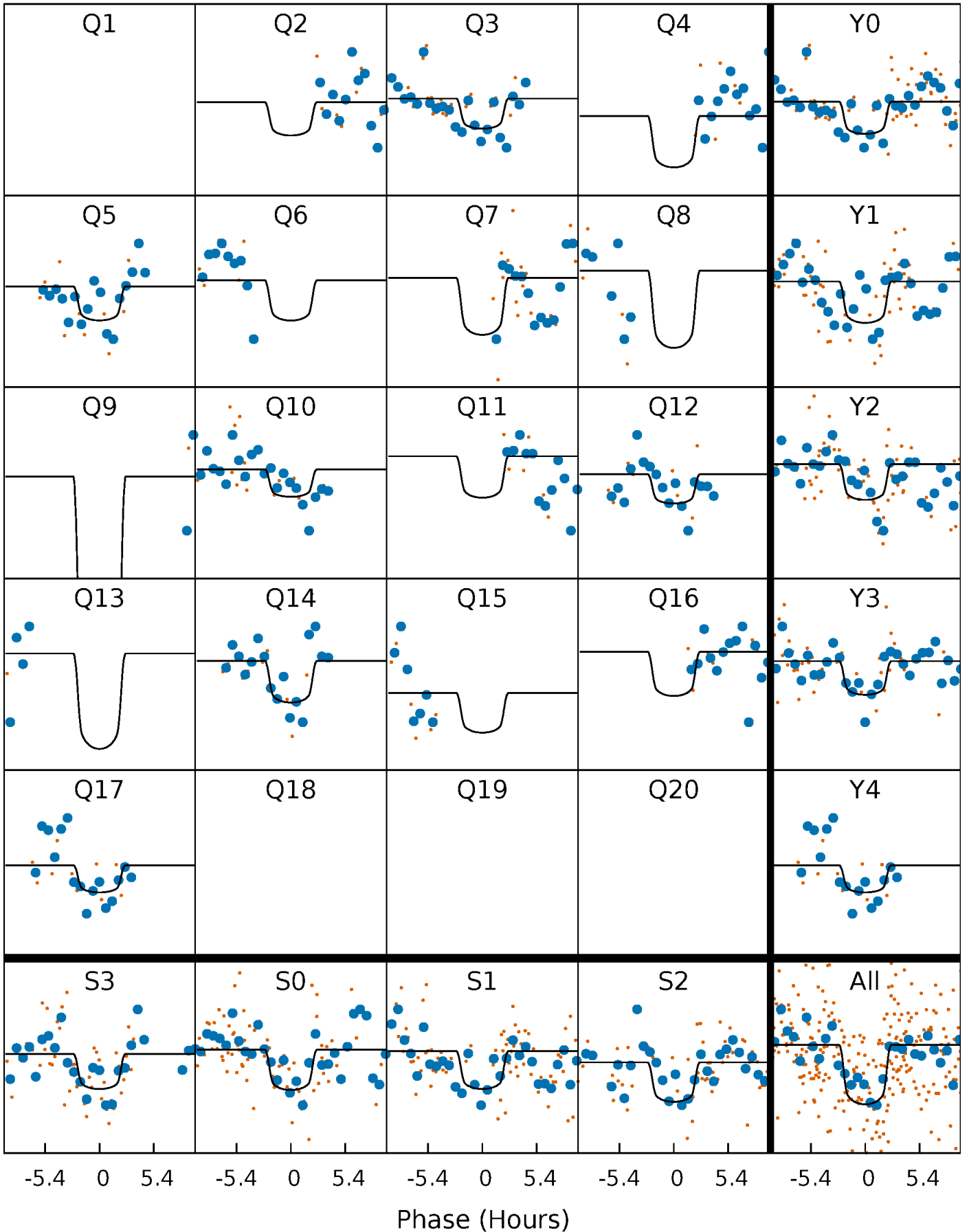
# PDC Quarter-Phased Transit Curves

TCE 010534150-05     $P = 72.530383$  Days     $T_0 = 202.289924$  (BKJD)



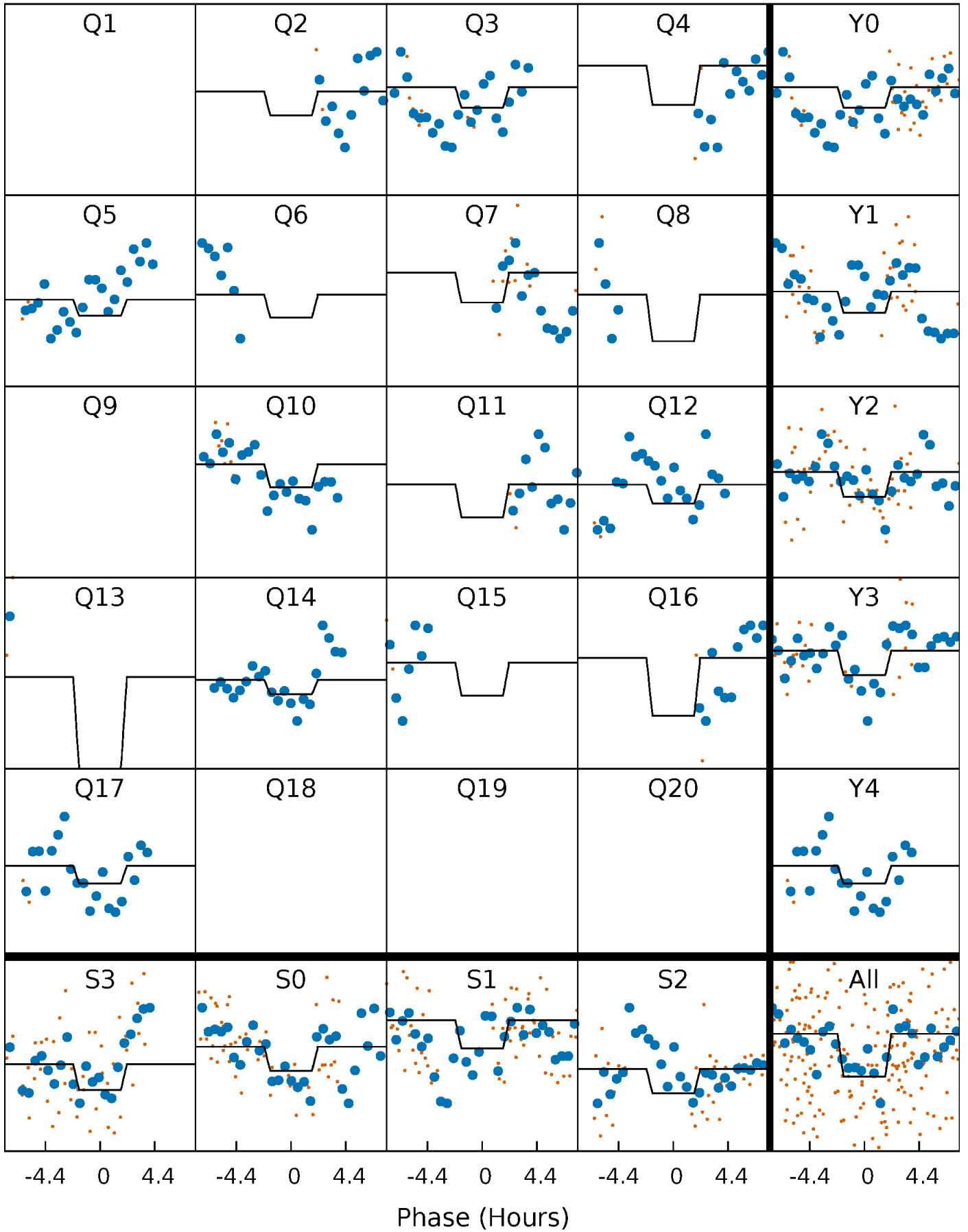
# DV Quarter-Phased Transit Curves

TCE 010534150-05   P= 72.530383 Days    $T_0=202.289924$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

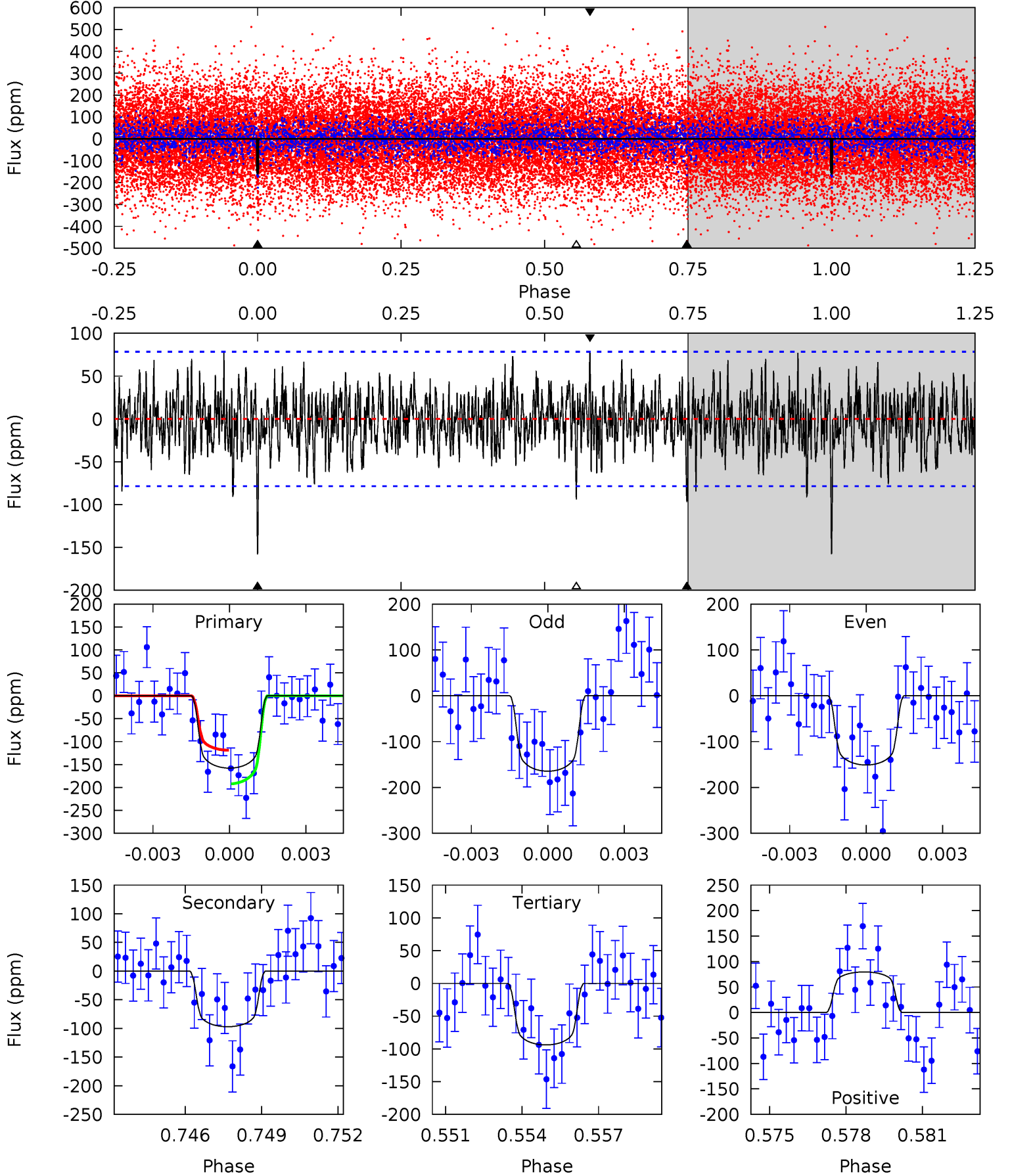
TCE 010534150-05     $P = 72.528107$  Days     $T_0 = 202.313428$  (BKJD)



# DV Model-Shift Uniqueness Test

010534150-05, P = 72.530383 Days, E = 129.759541 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
10.6	6.50	6.29	5.33	5.25	2.97	1.73	4.28	5.24	0.21	1.17	0.45	0.79	0.34	2.42

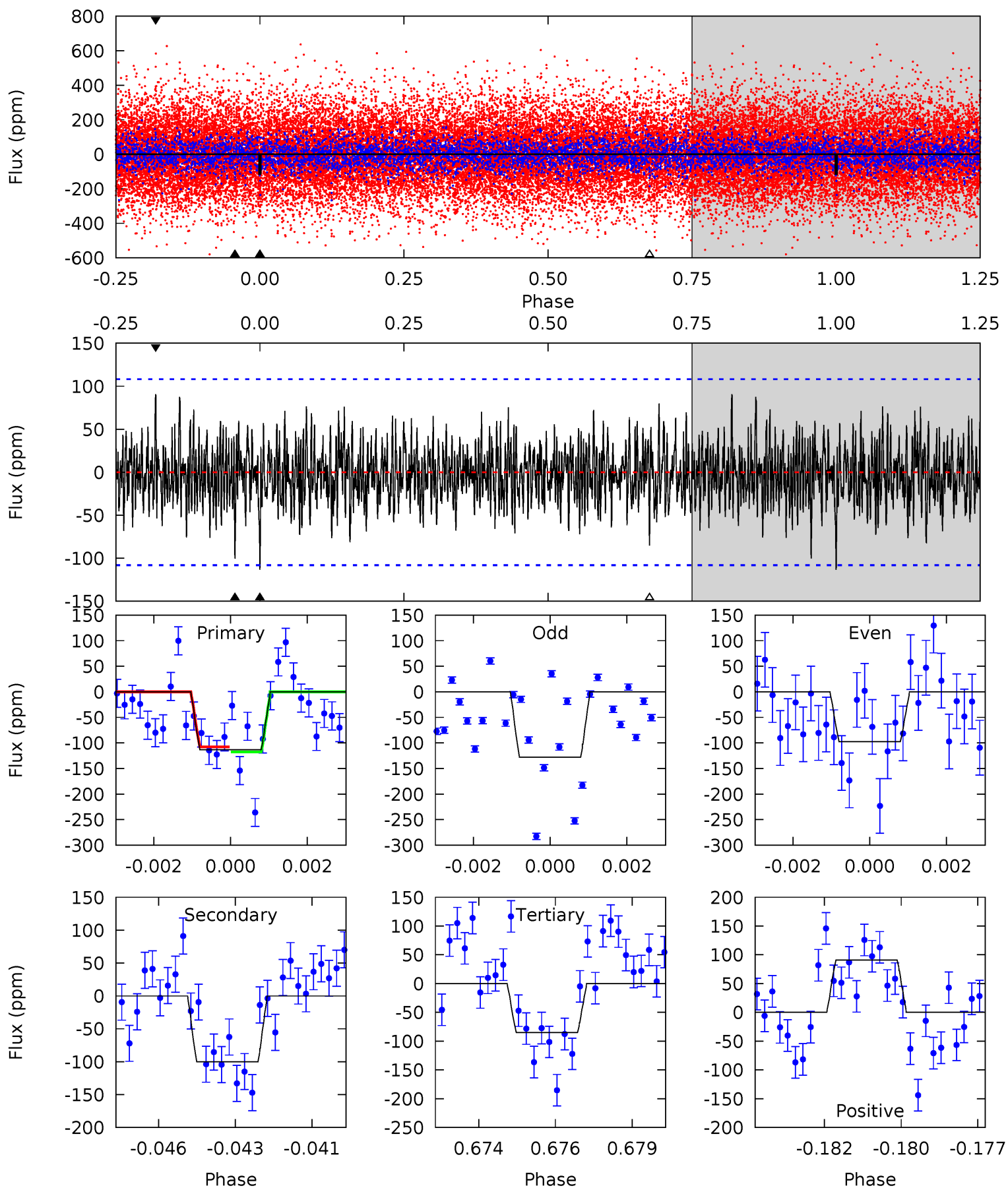




# Alt Model-Shift Uniqueness Test

010534150-05, P = 72.528107 Days, E = 129.785321 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
5.54	4.90	4.16	4.44	5.29	3.04	1.39	1.38	1.10	0.74	0.46	0.74	0.91	0.44	0.23



### Stellar Parameters For KIC 010534150

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6795^{+212}_{-282}$	$4.282^{+0.139}_{-0.170}$	$-0.640^{+0.300}_{-0.350}$	$1.229^{+0.325}_{-0.216}$	$1.053^{+0.145}_{-0.118}$	$0.798^{+0.543}_{-0.375}$
	+3%/-4%	+3%/-4%	+47%/-55%	+26%/-18%	+14%/-11%	+68%/-47%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010534150-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-97 \pm 15$	$2.02^{+0.47}_{-0.46}$	$789^{+63}_{-49}$	$5522^{+666}_{-504}$	$1586^{+1039}_{-588}$
Alt.	$-100 \pm 20$	$1.51^{+0.45}_{-0.45}$	$789^{+56}_{-50}$	$6446^{+1280}_{-813}$	$2923^{+2860}_{-1188}$

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

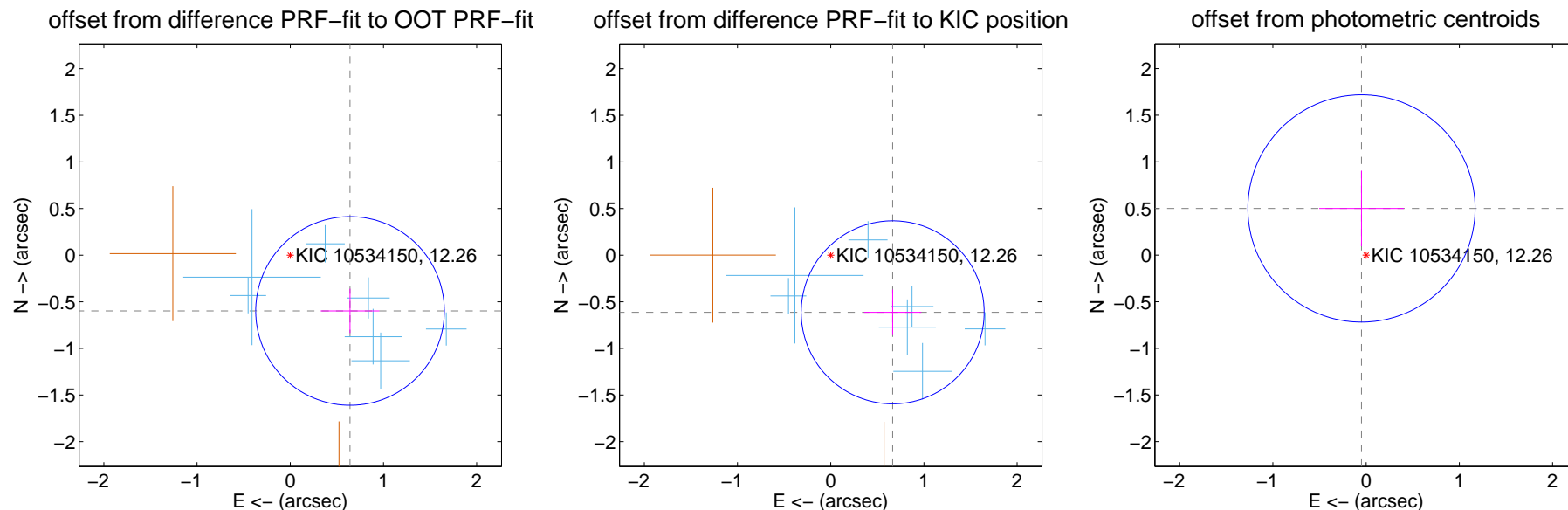
## DV Centroid Data

Supplemental centroid analysis for 010534150-05. Kepler magnitude: 12.26. Transit SNR 8.07

There are 7 quarters with good PRF difference image offsets

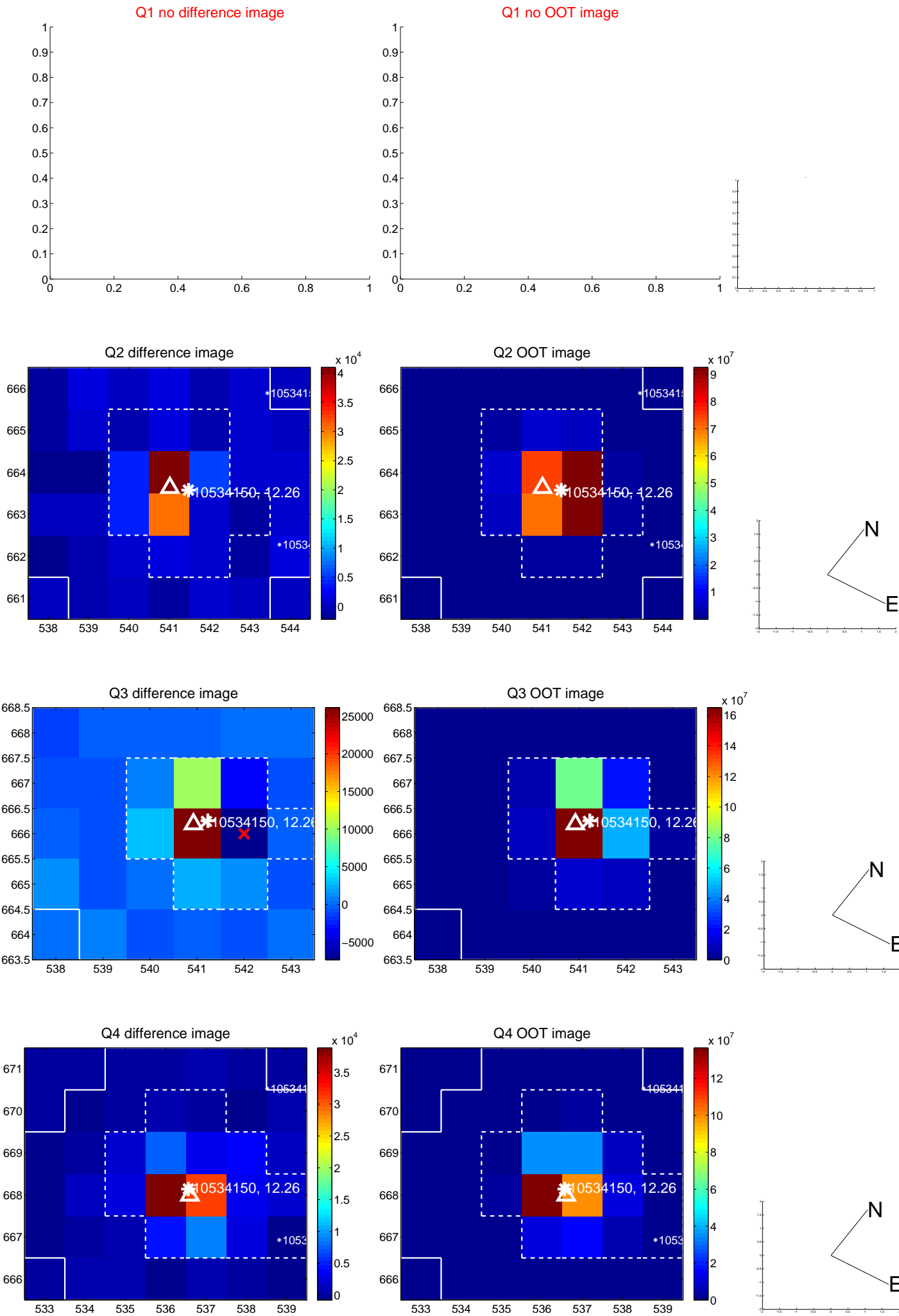
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.877 \pm 0.337$	2.60	$-0.641 \pm 0.314$	$-0.598 \pm 0.238$
PRF-fit source offset from KIC position	$0.905 \pm 0.327$	2.76	$-0.665 \pm 0.307$	$-0.613 \pm 0.244$
photometric centroid source offset	$0.50 \pm 0.41$	1.24	$0.05 \pm 0.45$	$0.50 \pm 0.41$

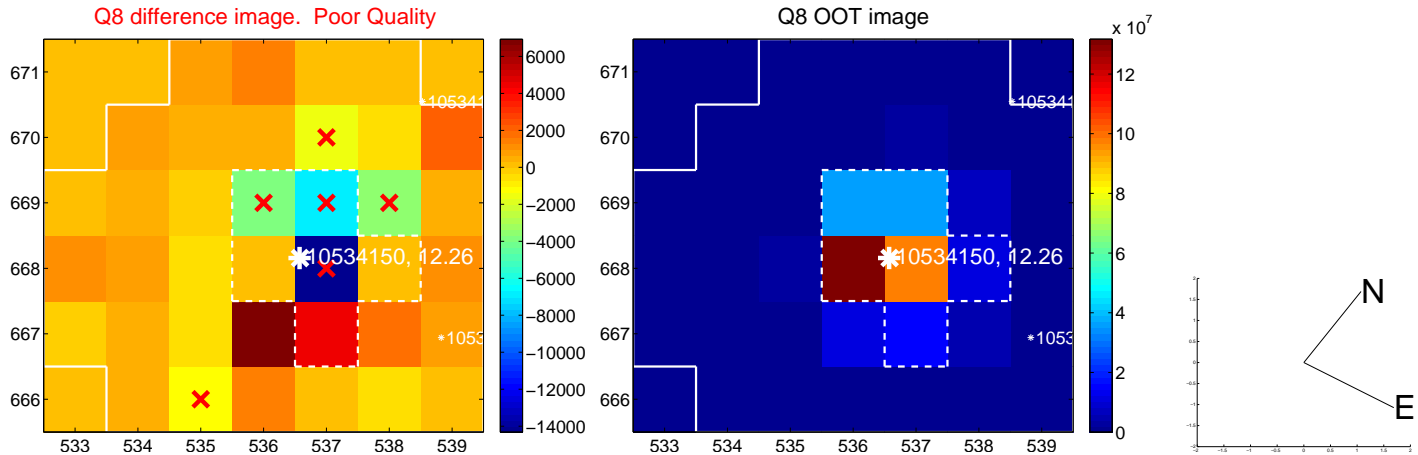
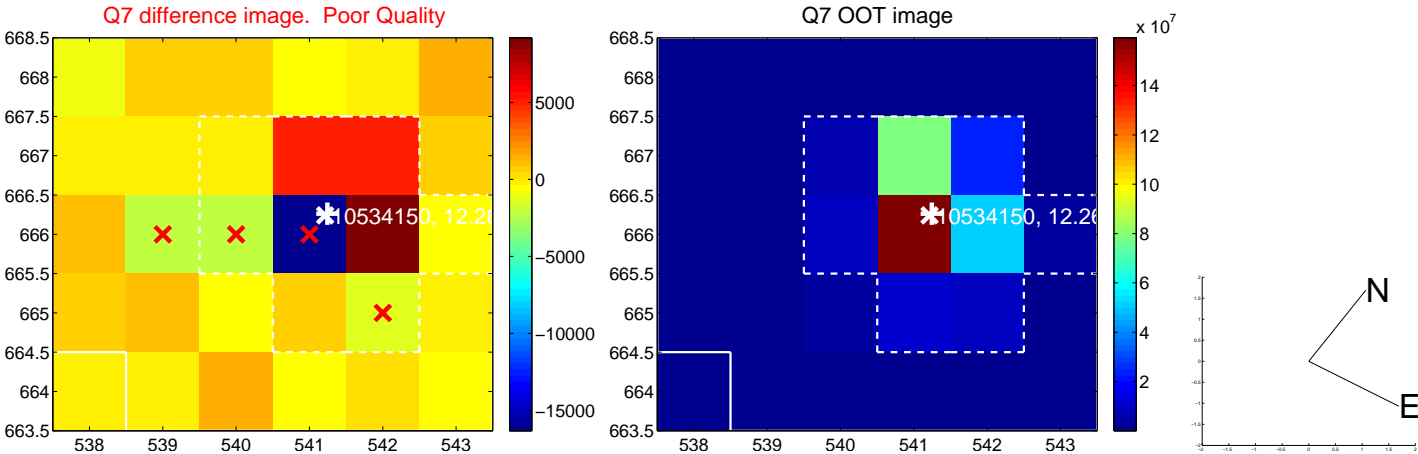
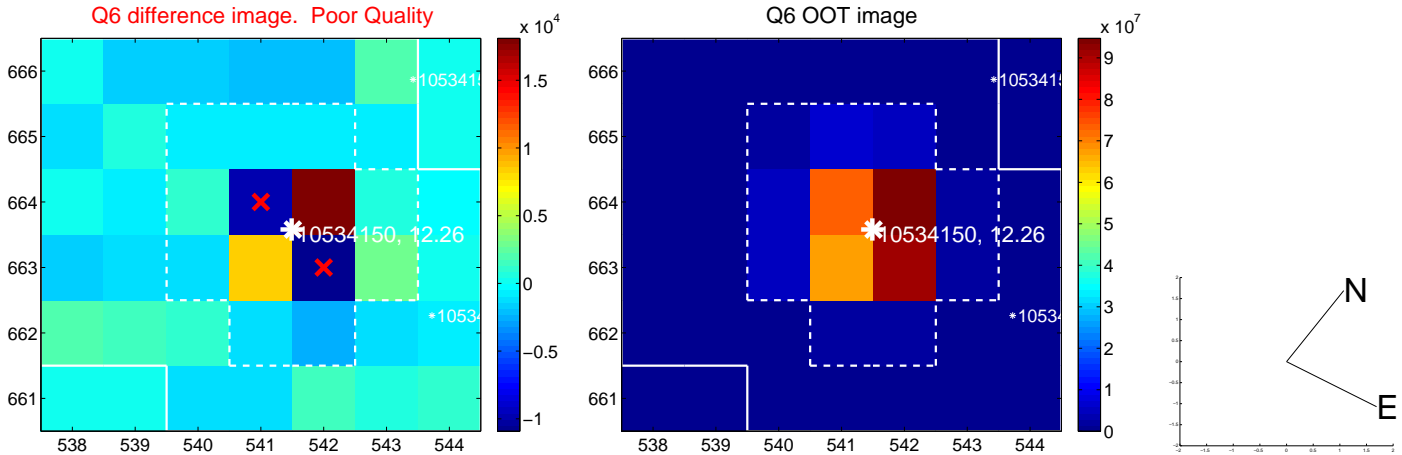
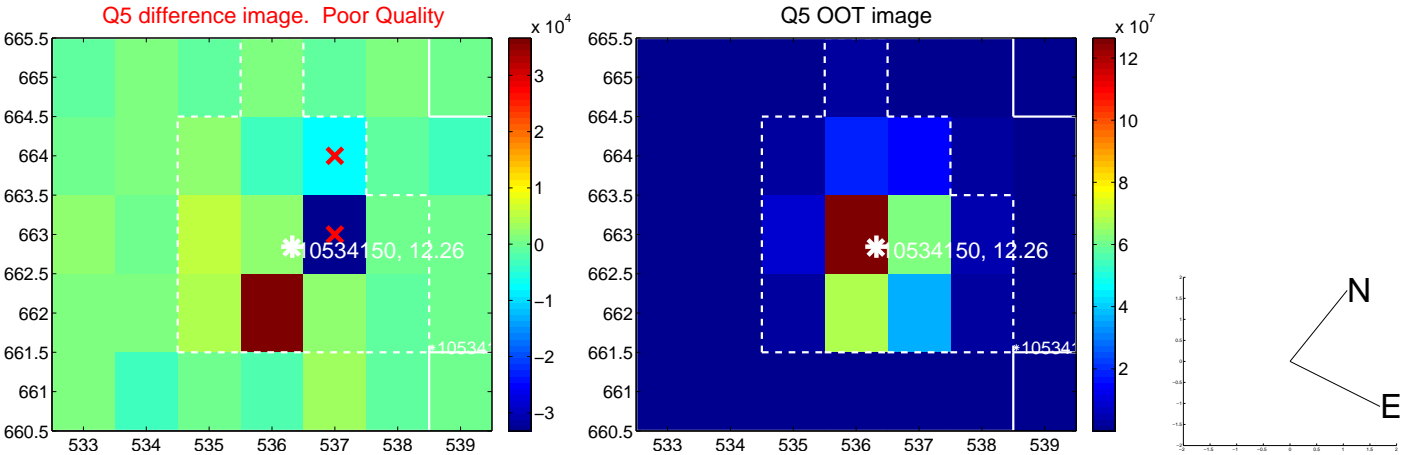


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

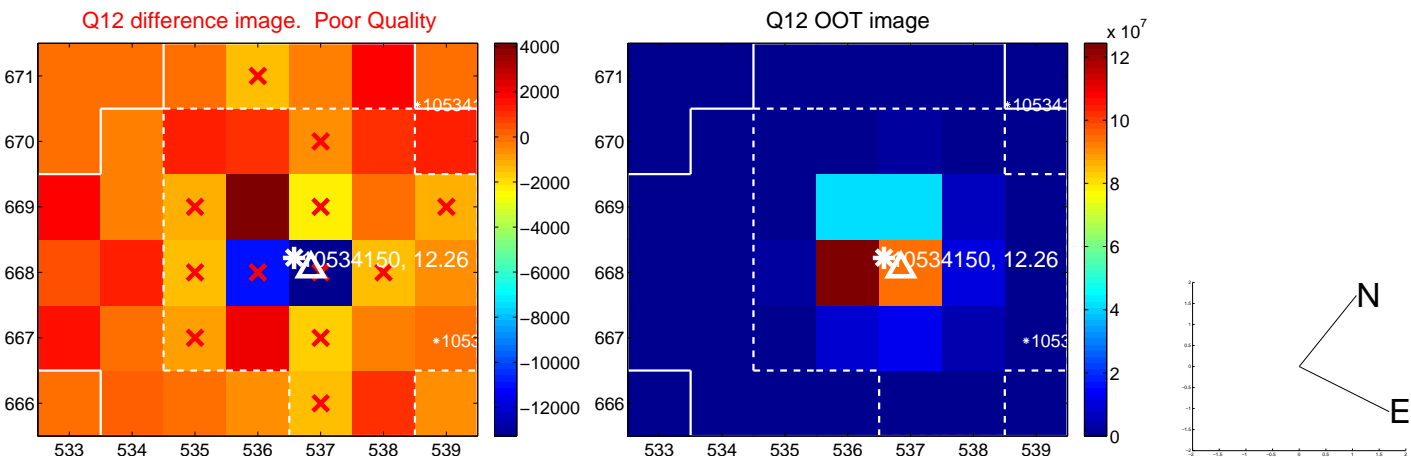
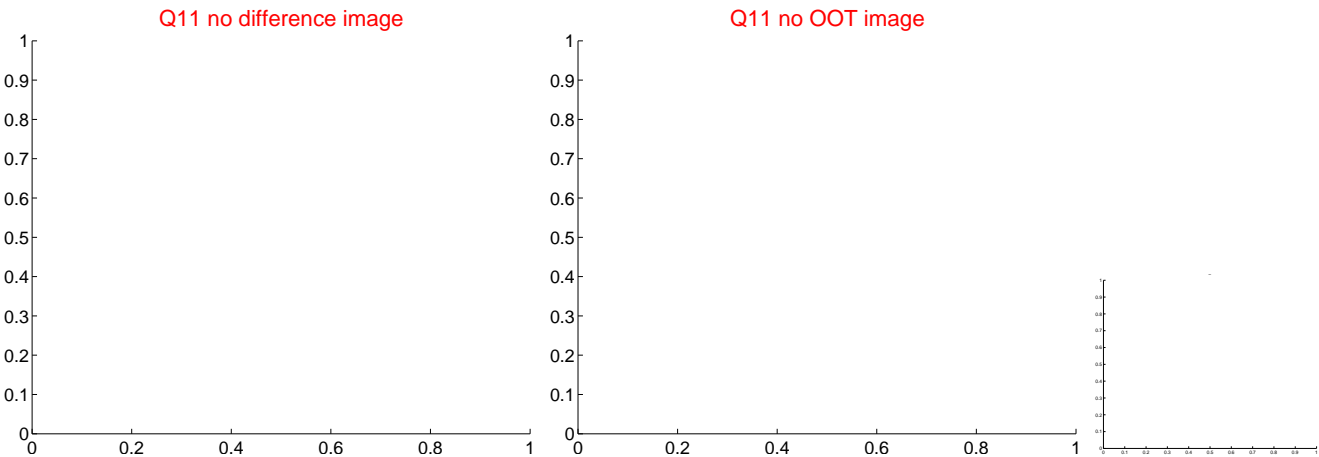
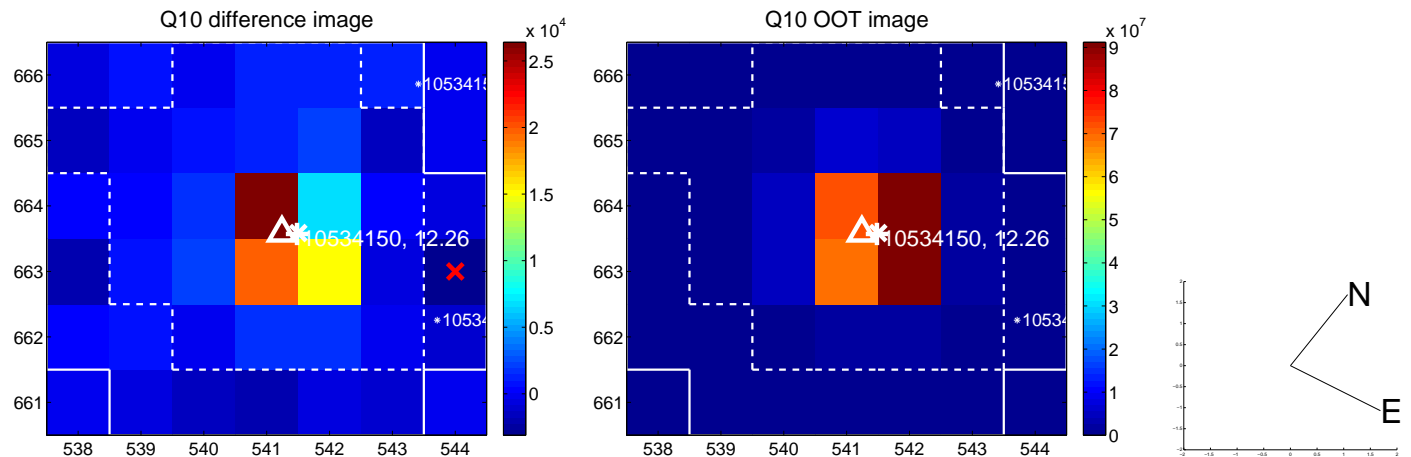
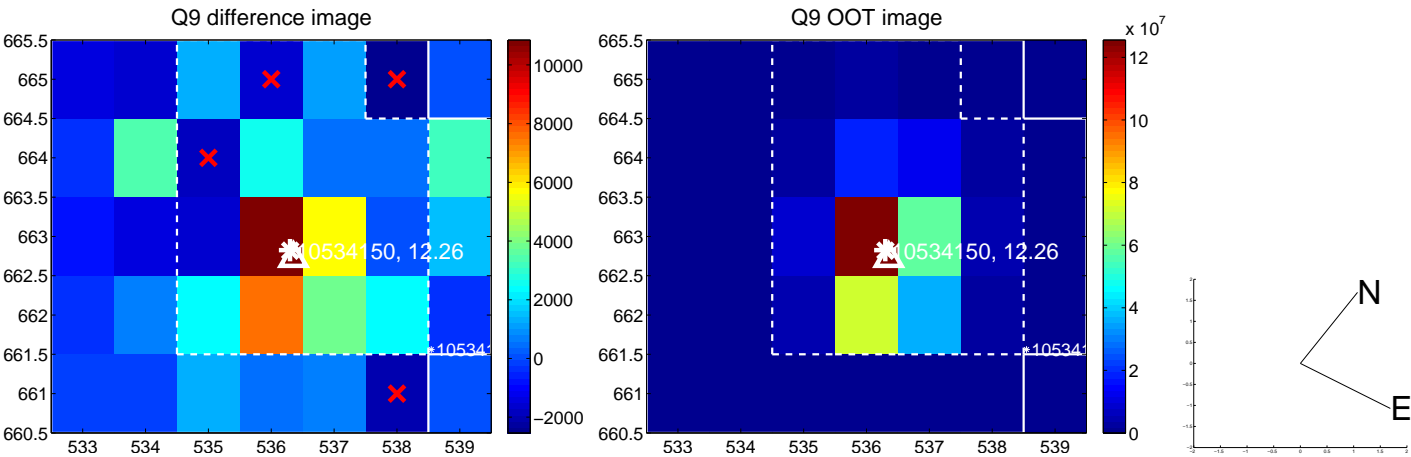
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



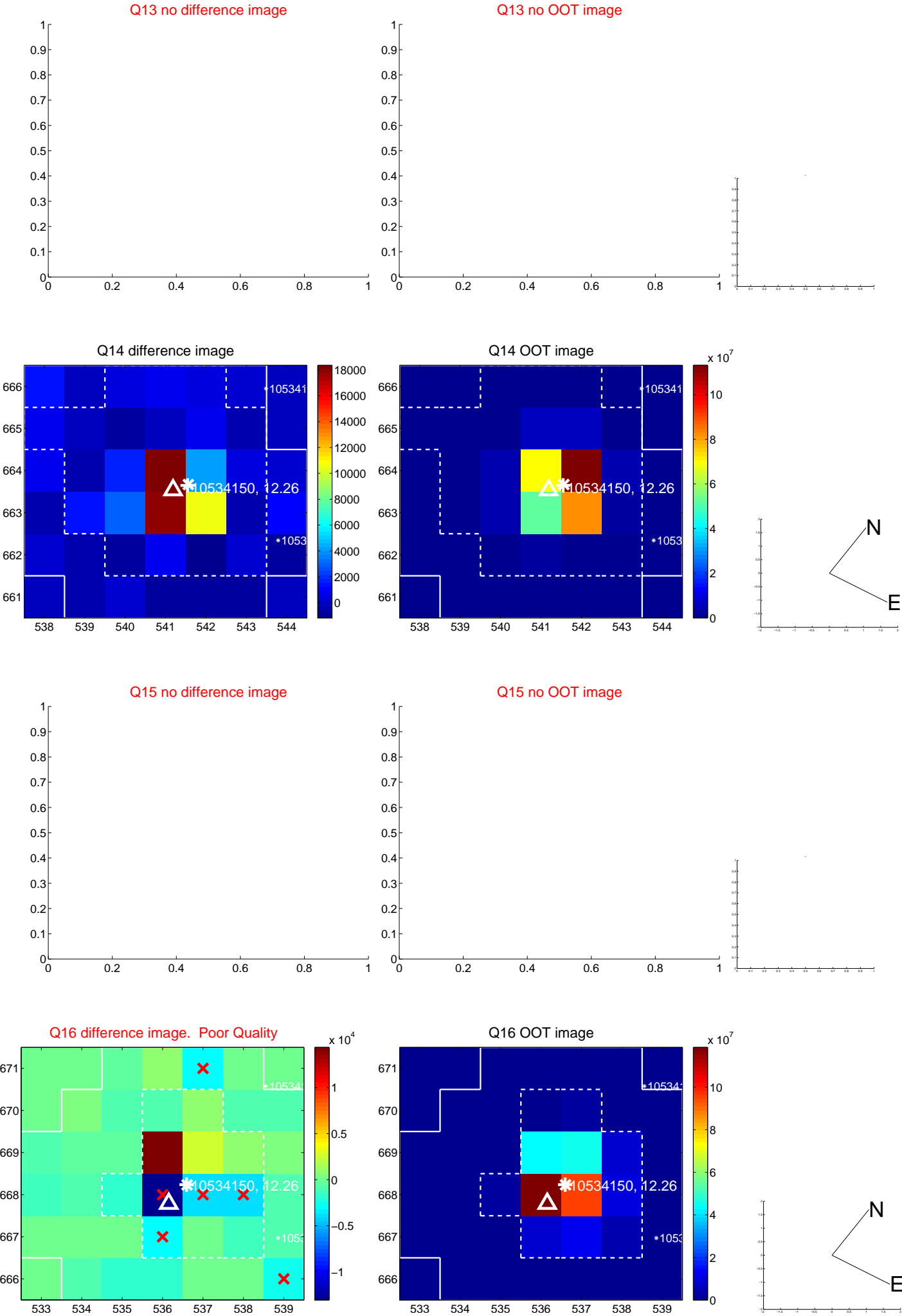
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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







UKIRT Image

