

## KIC 003547523

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003547523-01	OBS	No	1.286558	131.774714	21.4	6.273	9.4	10.8	2.12	7543	1.13	17010.03
003547523-02	OBS	No	170.081357	281.456755	154.3	3.405	10.3	4.6	2.12	7543	2.97	25.26
003547523-03	OBS	No	4.289079	131.505412	36.0	6.831	8.0	7.9	2.12	7543	1.58	3415.54
003547523-04	OBS	No	64.515001	141.389924	133.7	5.114	7.9	7.7	2.12	7543	2.73	91.99
003547523-05	OBS	No	48.272360	144.778101	148.8	2.948	8.6	8.6	2.12	7543	2.87	135.42
003547523-06	OBS	No	67.256610	149.491828	257.1	3.132	7.8	8.1	2.12	7543	3.90	87.02
003547523-07	OBS	No	213.723127	282.236258	225.9	3.273	8.3	7.3	2.12	7543	3.67	18.63
003547523-08	OBS	No	226.517683	180.912141	209.7	5.031	7.4	7.7	2.12	7543	3.39	17.24
003547523-09	OBS	No	93.778528	135.848958	265.1	2.254	7.6	8.4	2.12	7543	3.67	55.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003547523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003547523-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003547523-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
003547523-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
003547523-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003547523-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—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.

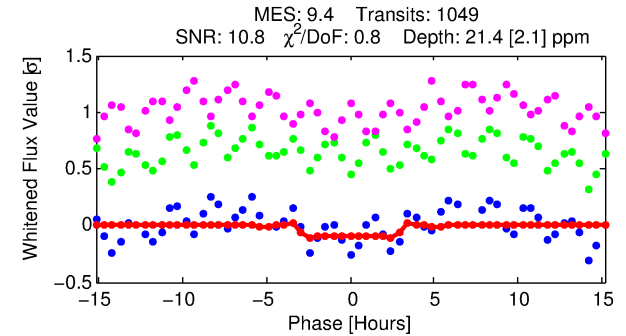
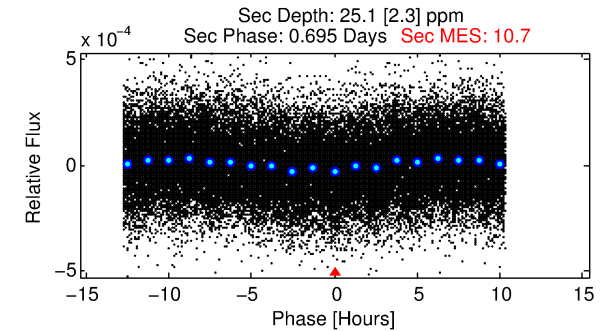
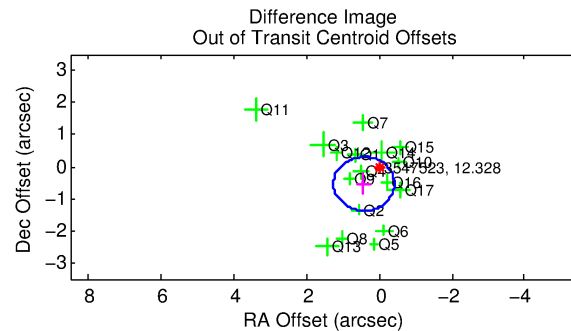
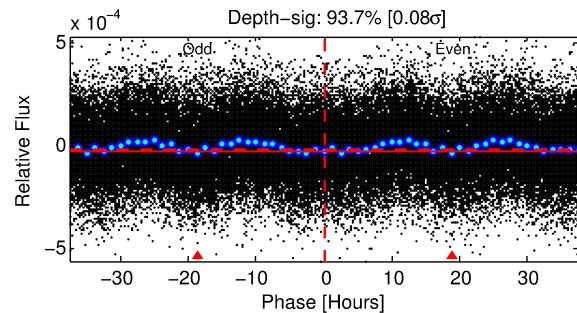
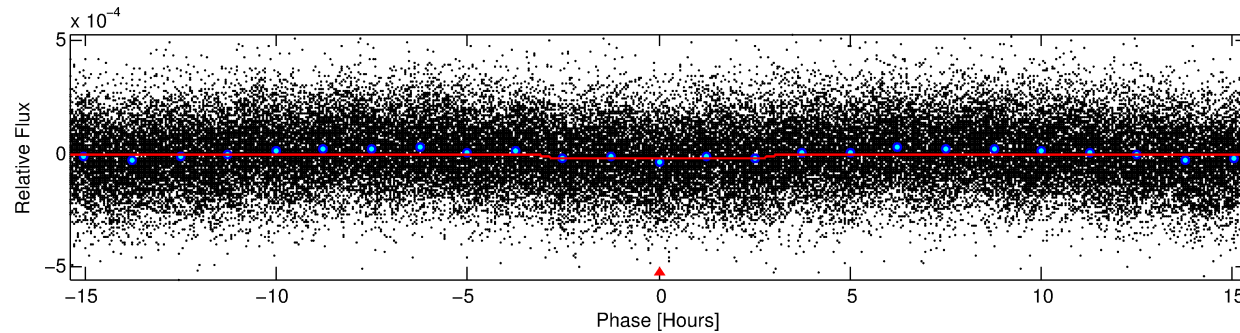
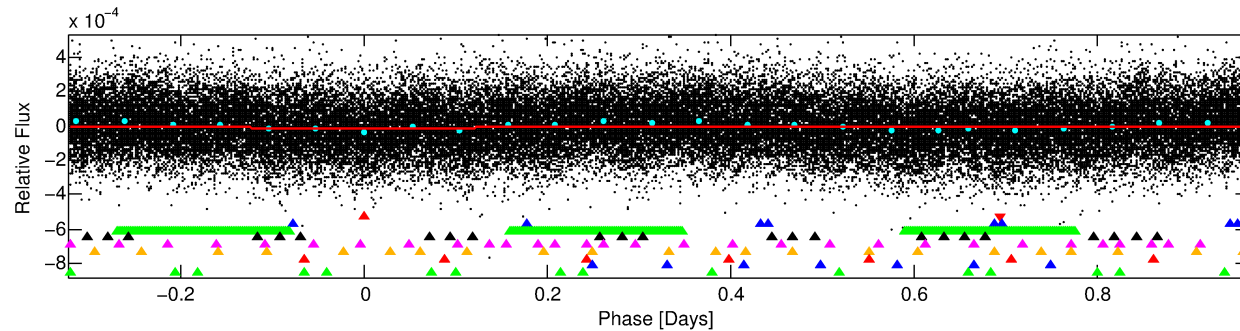
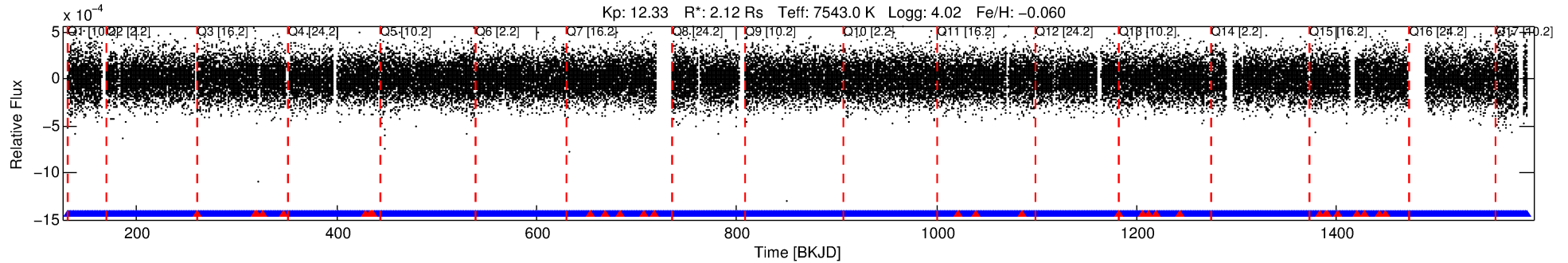
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003547523-01

No Significant Match Found

# DV One-Page Summary

KIC: 3547523 Candidate: 1 of 9 Period: 1.287 d



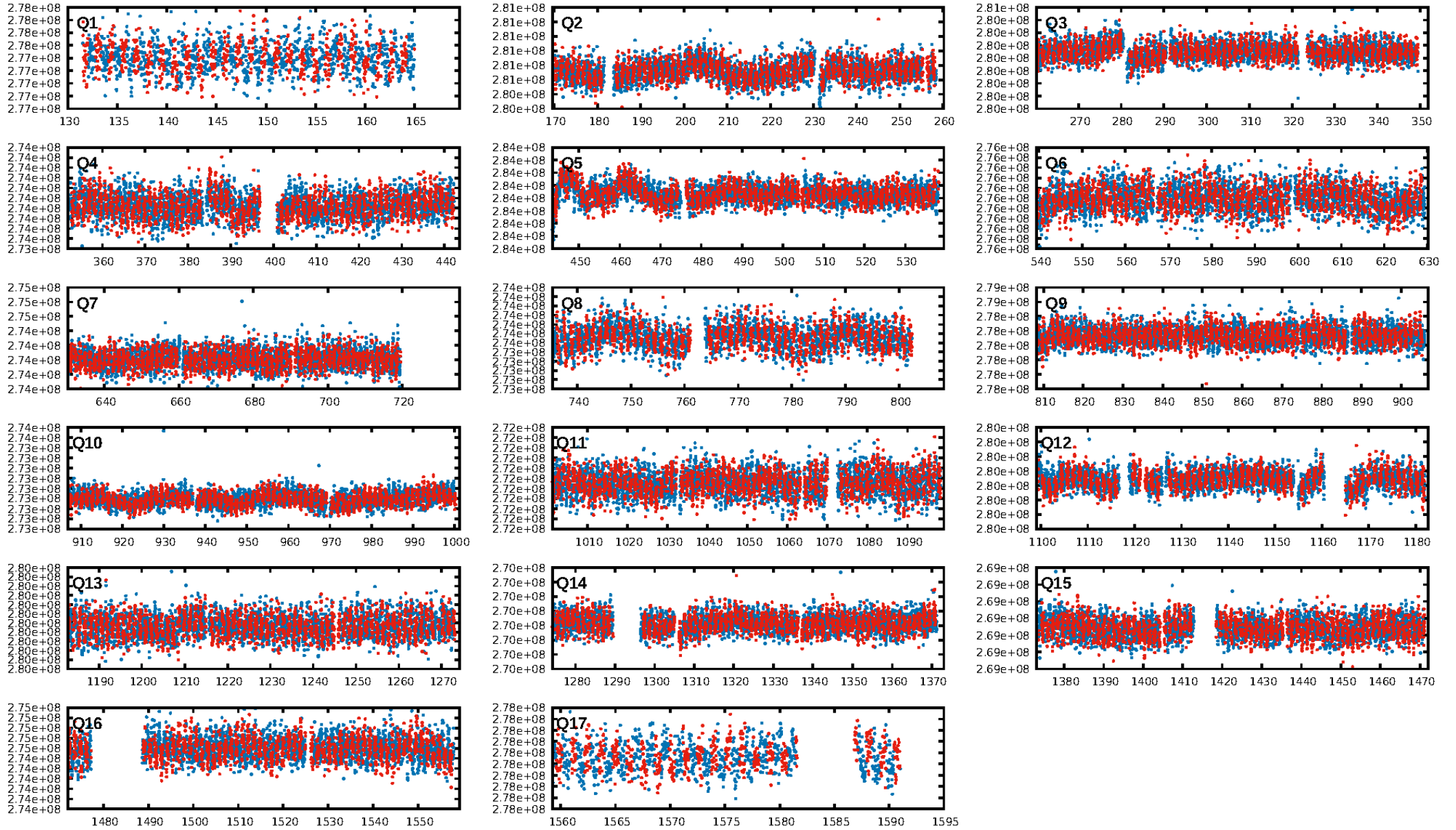
## DV Fit Results:

Period = 1.28656 [0.00001] d  
Epoch = 131.7747 [0.0038] BKJD  
Rp/R\* = 0.0049 [0.0011]  
a/R\* = 1.17 [0.45]  
b = 0.90 [0.30]  
Seff = 17010.04 [6327.03]  
Teff = 2912 [271] K  
Rp = 1.13 [0.38] Re  
a = 0.0276 [0.0061] AU  
Ag = 8.24 [4.56] [1.59 $\sigma$ ]  
Teffp = 7628 [901] K [5.02 $\sigma$ ]

## DV Diagnostic Results:

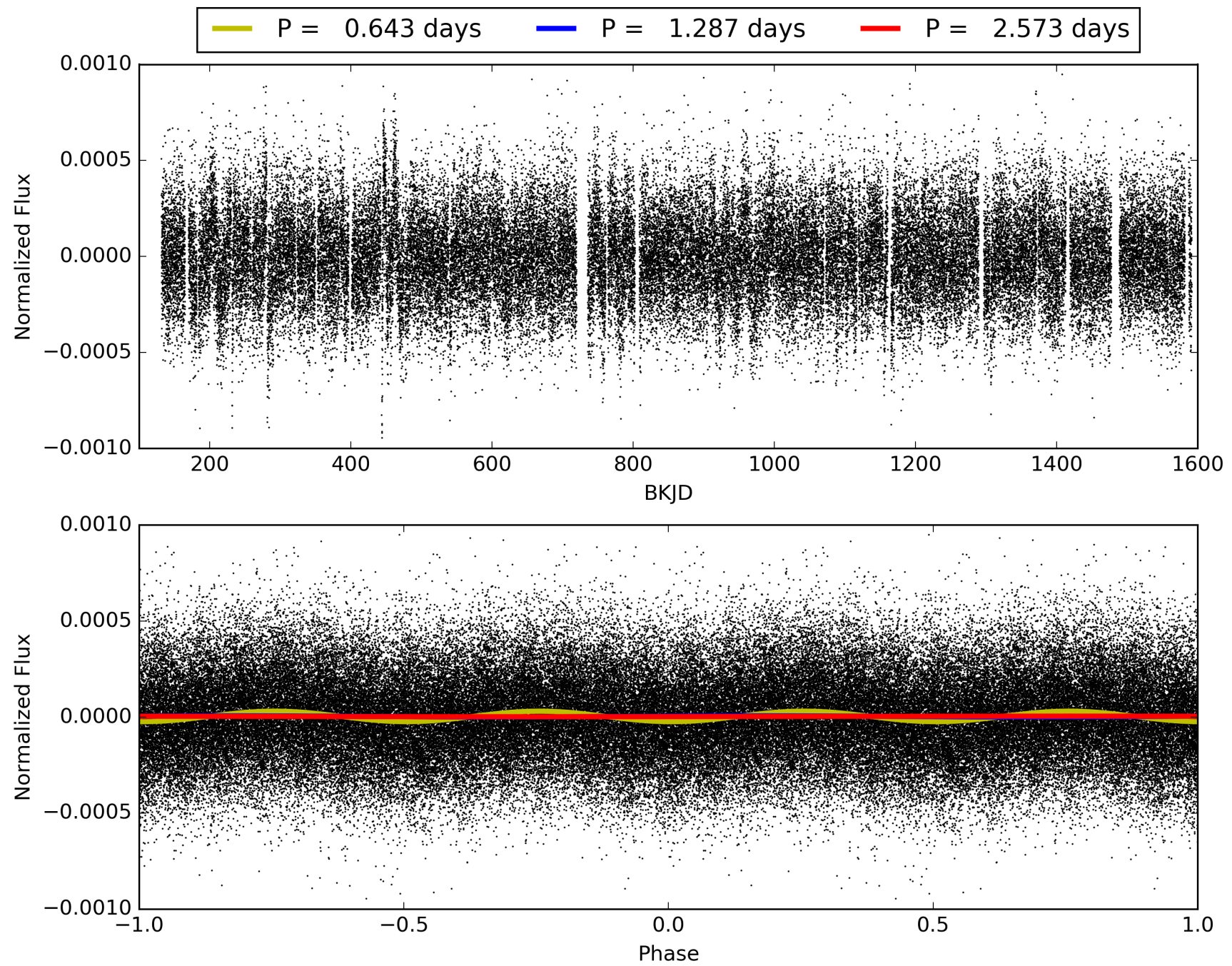
ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [7.77 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.11e-14  
RollingBand-fgt: 0.97 [972/1002]  
GhostDiagnostic-chr: 1.348  
Centroid-sig: 24.3%  
Centroid-so: 0.544 arcsec [0.92 $\sigma$ ]  
OotOffset-rm: 0.684 arcsec [2.45 $\sigma$ ]  
KicOffset-rm: 0.695 arcsec [2.61 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 003547523-01, PDC Light Curves





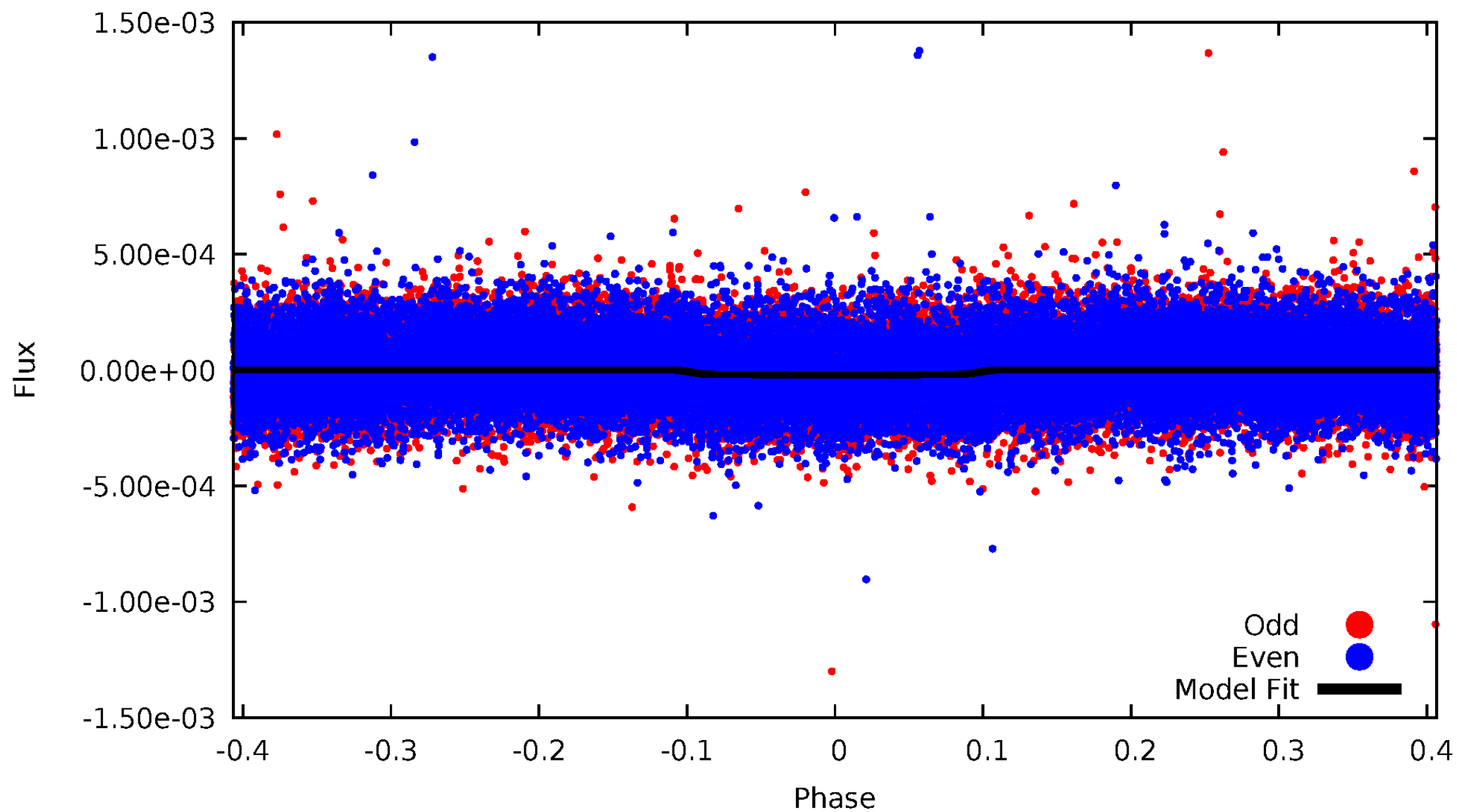
TCE 003547523-01





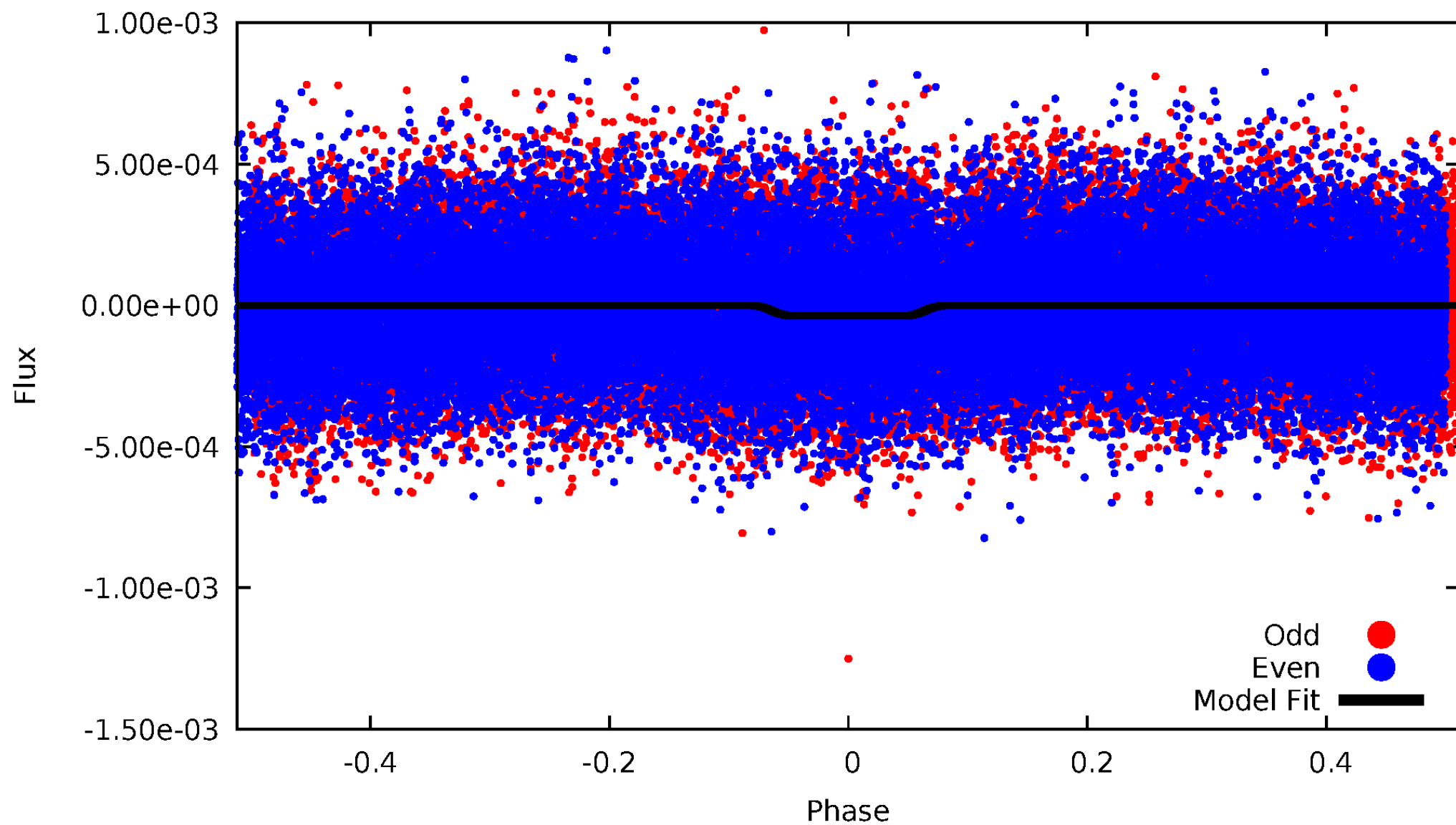
# DV Odd/Even

TCE 003547523-01

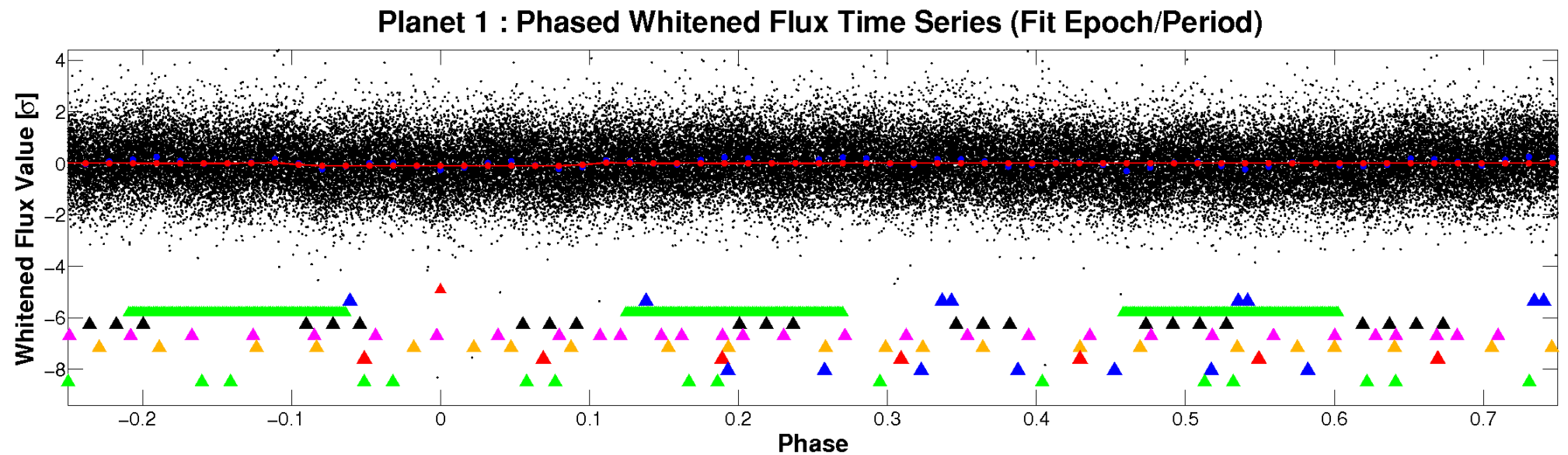
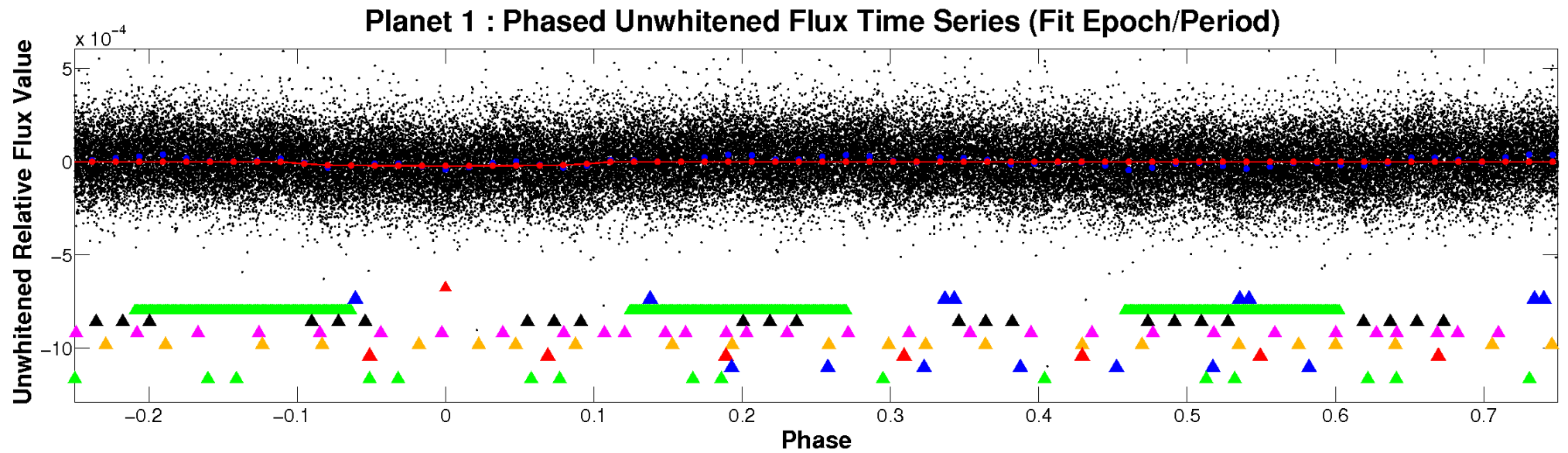


# ALT Odd/Even

TCE 003547523-01



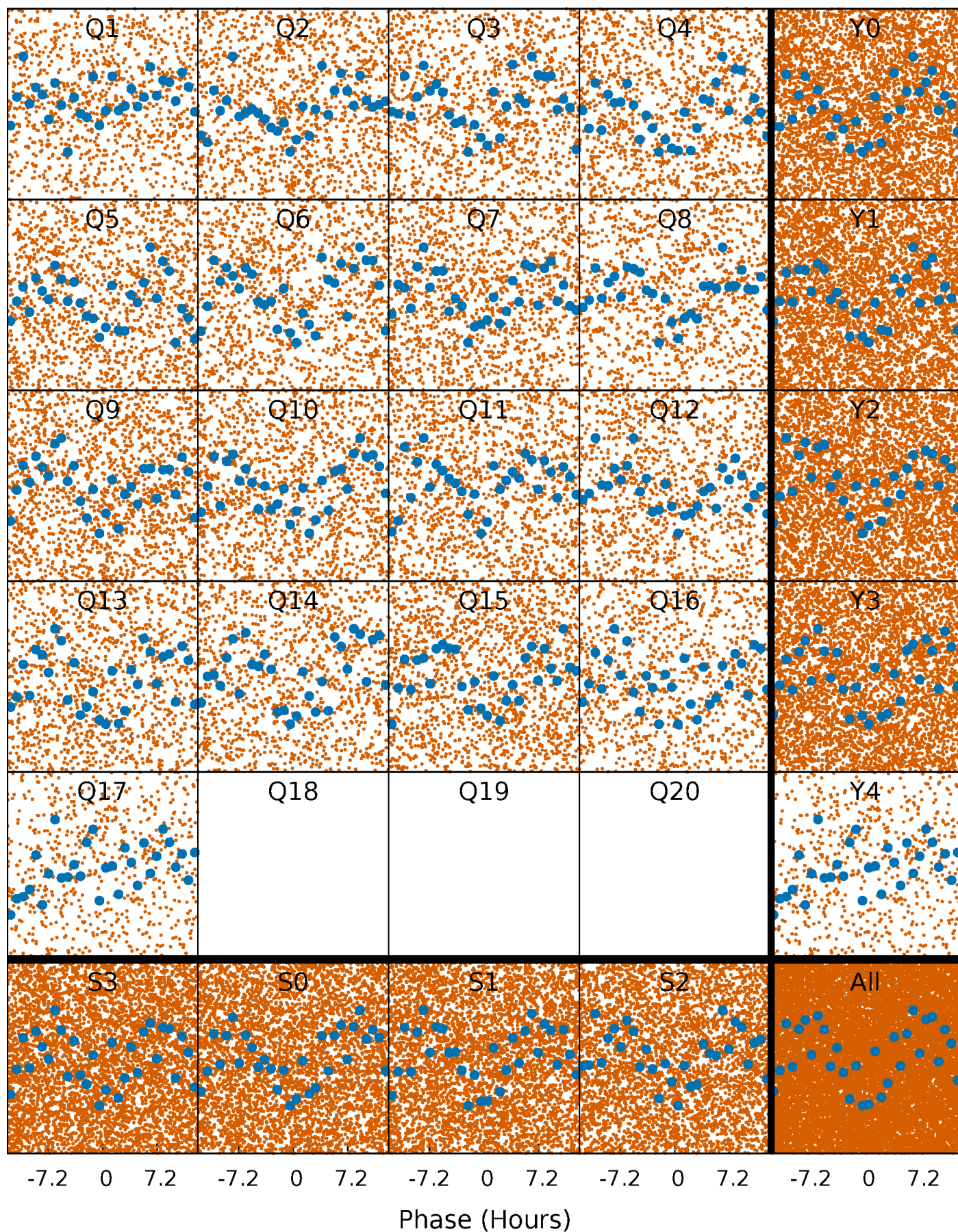
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

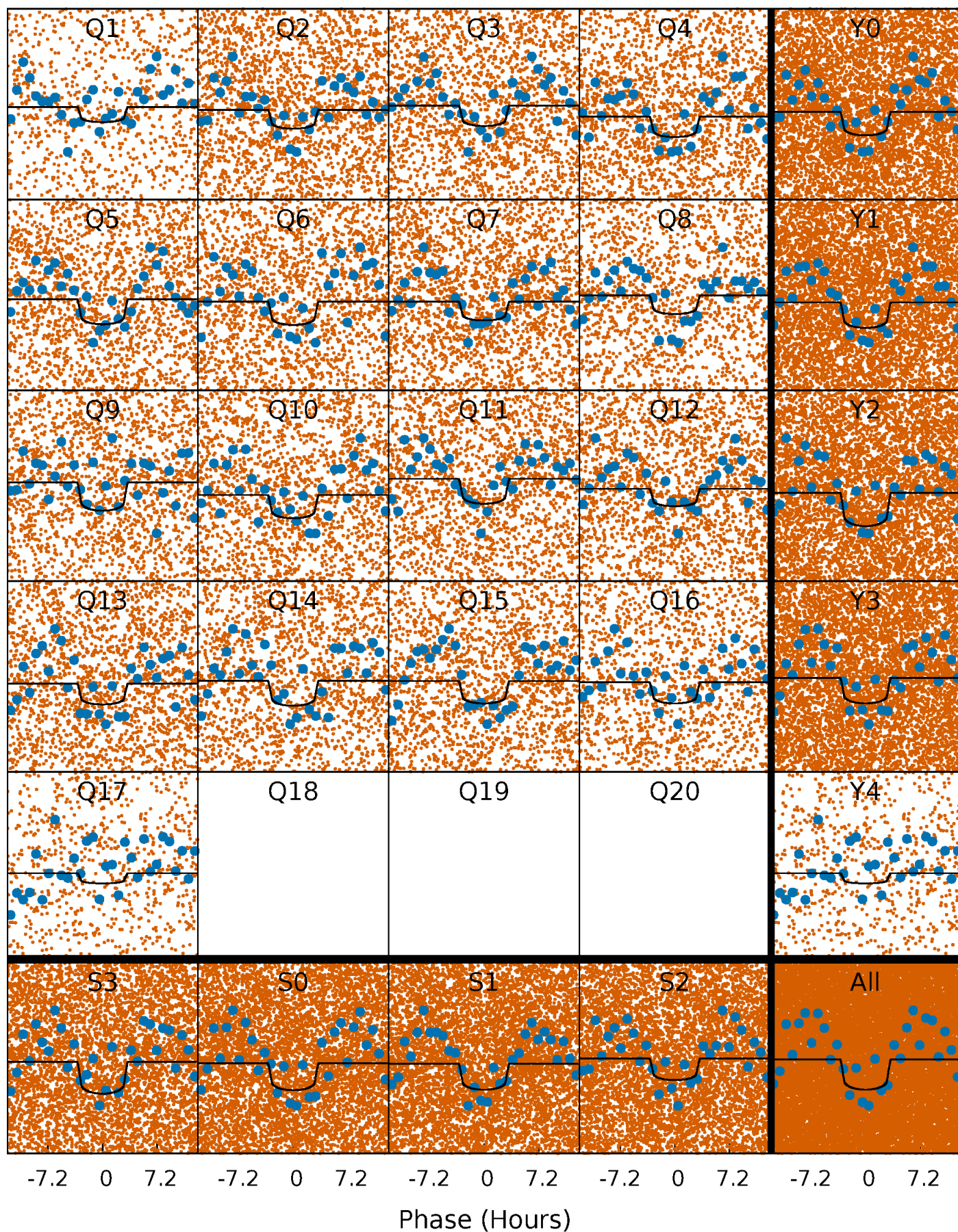
TCE 003547523-01 P= 1.286558 Days  $T_0=131.774714$  (BKJD)





# DV Quarter-Phased Transit Curves

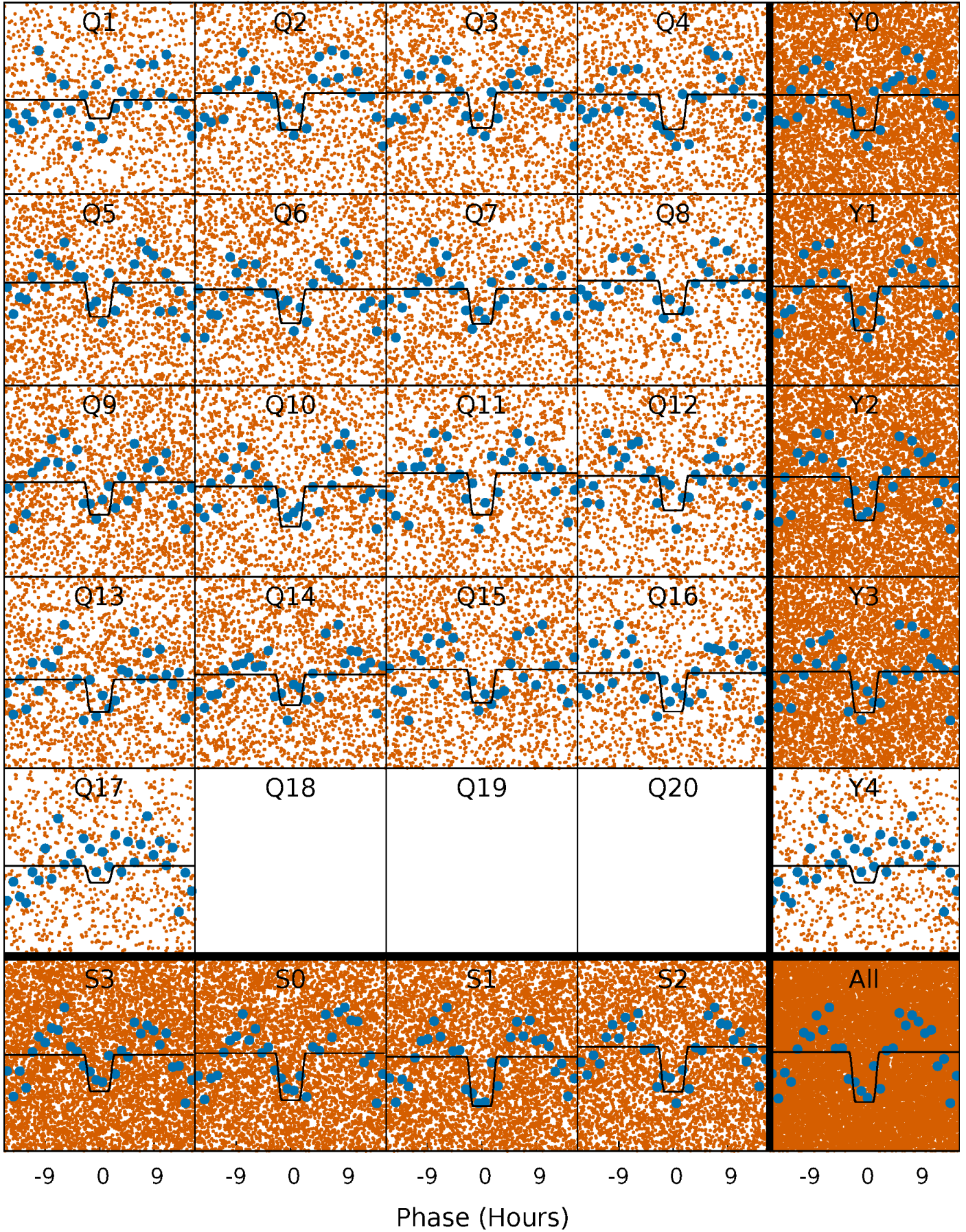
TCE 003547523-01 P= 1.286558 Days  $T_0=131.774714$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 003547523-01 P= 1.286597 Days  $T_0=131.750152$  (BKJD)

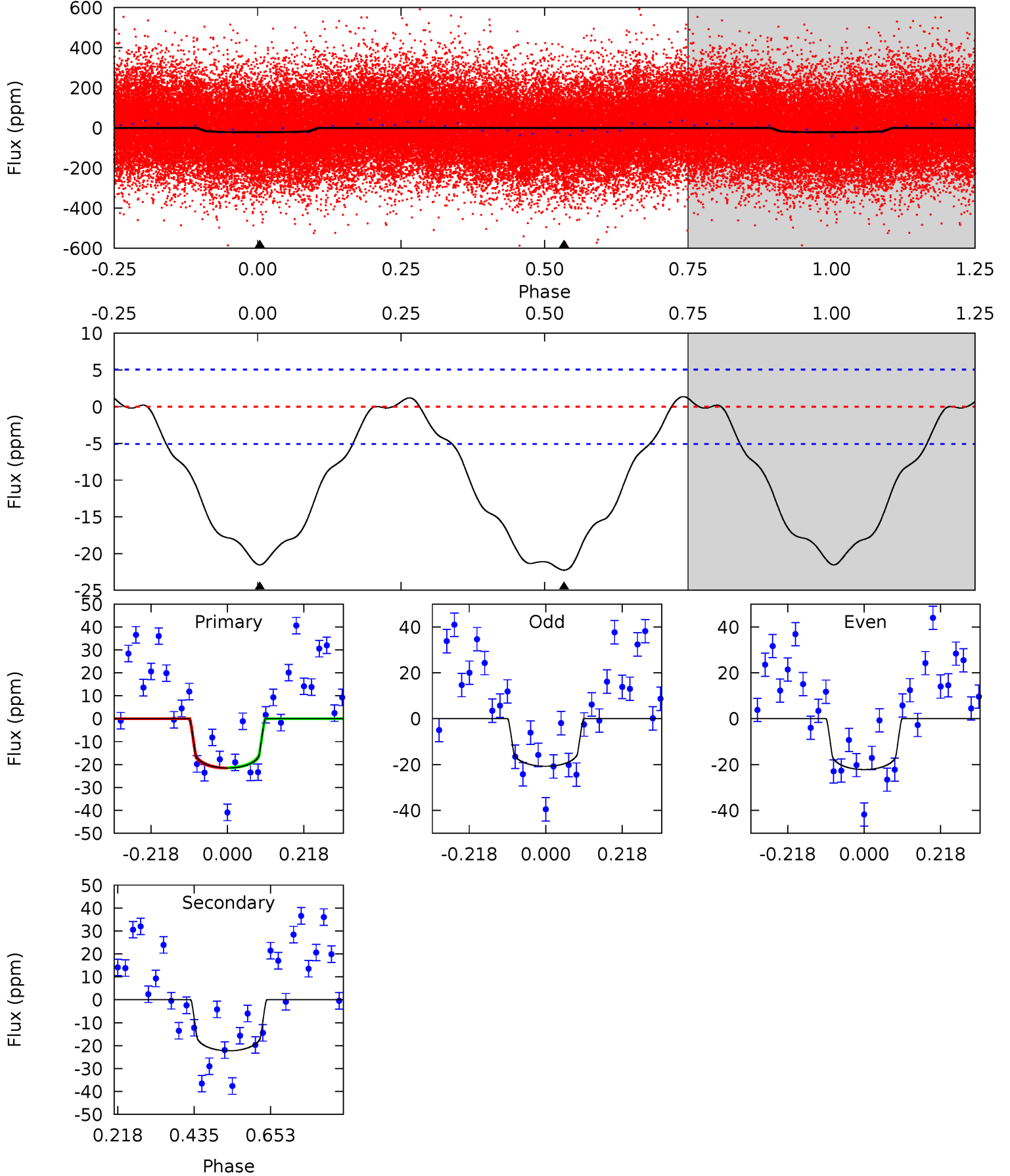




# DV Model-Shift Uniqueness Test

003547523-01, P = 1.286558 Days, E = 130.488156 Days

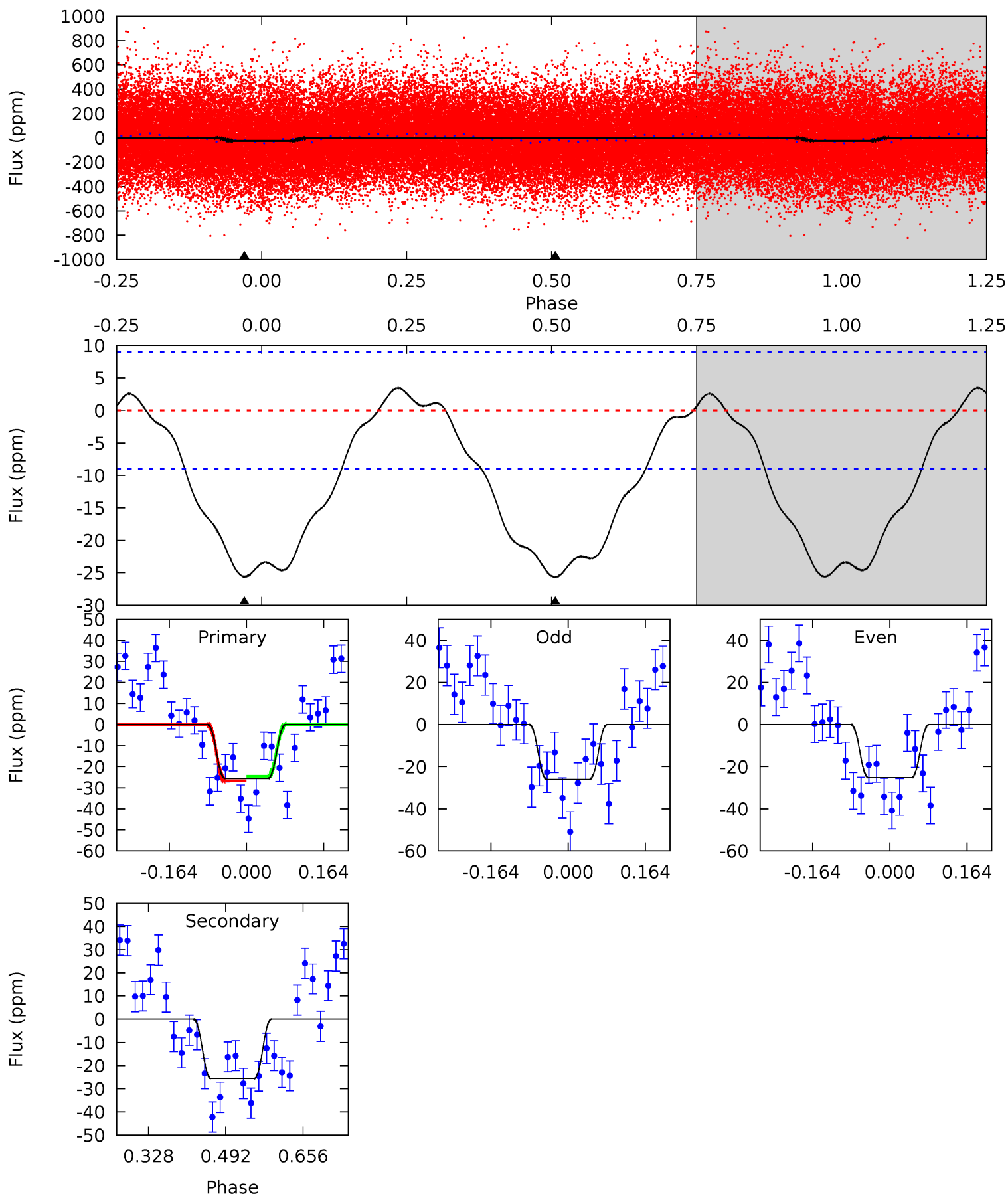
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.7	19.3	0	0	4.40	1.23	1.18	18.7	18.7	19.3	19.3	0.62	0.98	0.06	0.07



# Alt Model-Shift Uniqueness Test

003547523-01, P = 1.286597 Days, E = 130.463555 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
12.7	12.8	0	0	4.46	1.39	1.41	12.7	12.7	12.8	12.8	0.18	0.95	0.12	0.51



### Stellar Parameters For KIC 003547523

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7543^{+235}_{-314}$	$4.017^{+0.187}_{-0.153}$	$-0.060^{+0.200}_{-0.300}$	$2.115^{+0.533}_{-0.533}$	$1.695^{+0.212}_{-0.282}$	$0.252^{+0.261}_{-0.110}$
	+3%/-4%	+5%/-4%	+333%/-500%	+25%/-25%	+13%/-17%	+103%/-44%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003547523-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-22 \pm 1$	$1.13^{+0.33}_{-0.28}$	$4048^{+294}_{-285}$	$7211^{+1209}_{-786}$	$7.223^{+5.567}_{-2.671}$
Alt.	$-26 \pm 2$	$1.38^{+0.32}_{-0.30}$	$4043^{+280}_{-300}$	$6689^{+835}_{-620}$	$5.596^{+3.416}_{-1.875}$

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



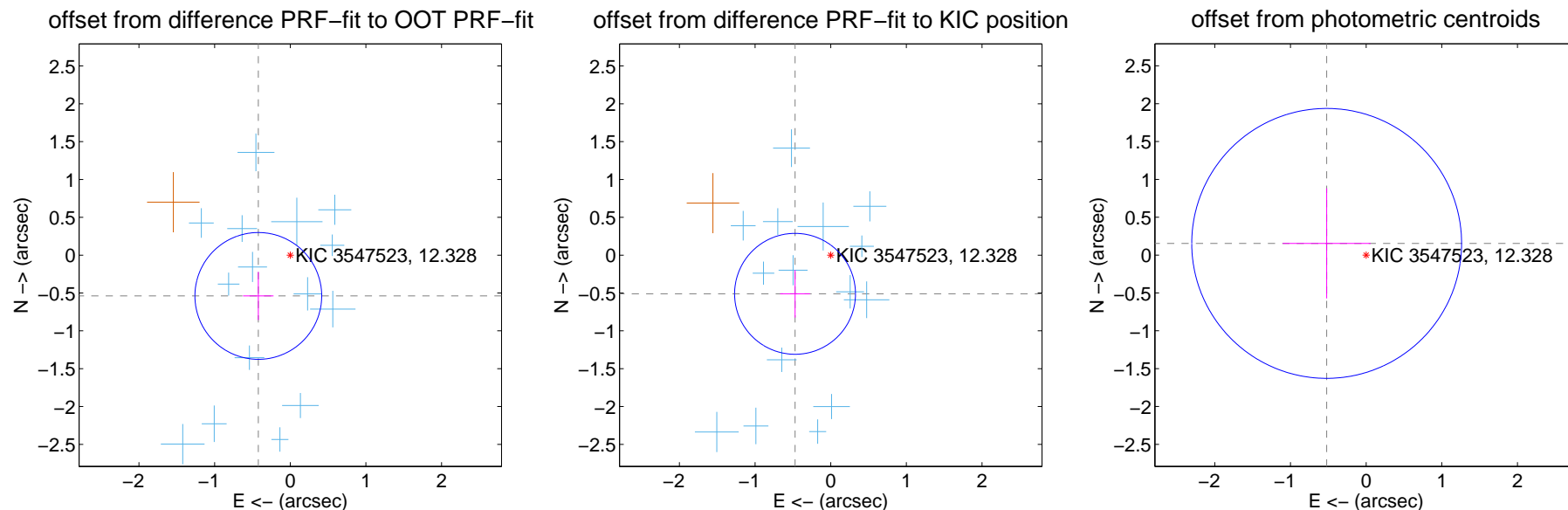
## DV Centroid Data

Supplemental centroid analysis for 003547523-01. Kepler magnitude: 12.33. Transit SNR 10.79

There are 16 quarters with good PRF difference image offsets

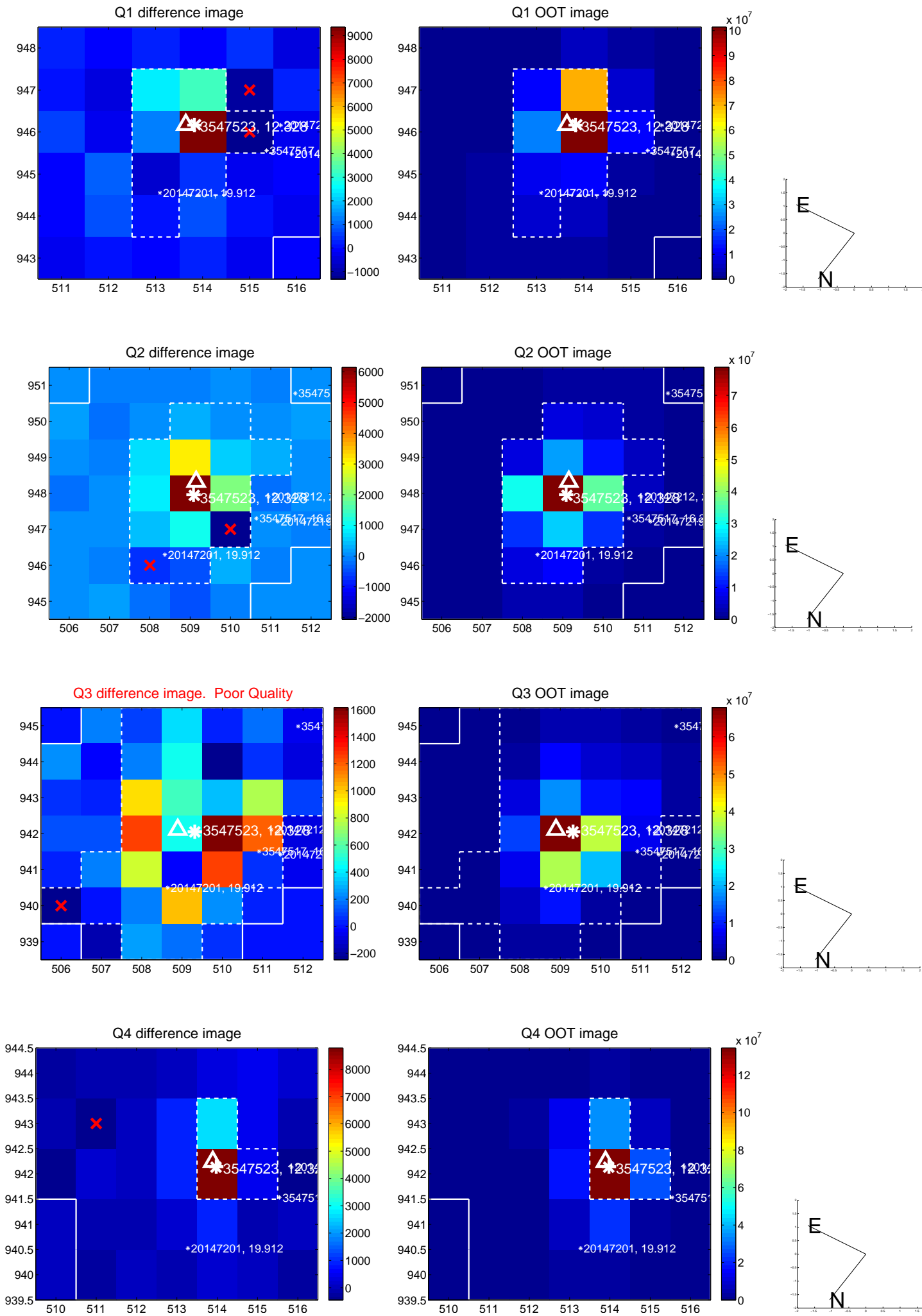
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.684 \pm 0.279$	2.45	$0.422 \pm 0.202$	$-0.539 \pm 0.318$
PRF-fit source offset from KIC position	$0.695 \pm 0.266$	2.61	$0.472 \pm 0.197$	$-0.511 \pm 0.314$
photometric centroid source offset	$0.54 \pm 0.59$	0.92	$0.52 \pm 0.58$	$0.15 \pm 0.73$

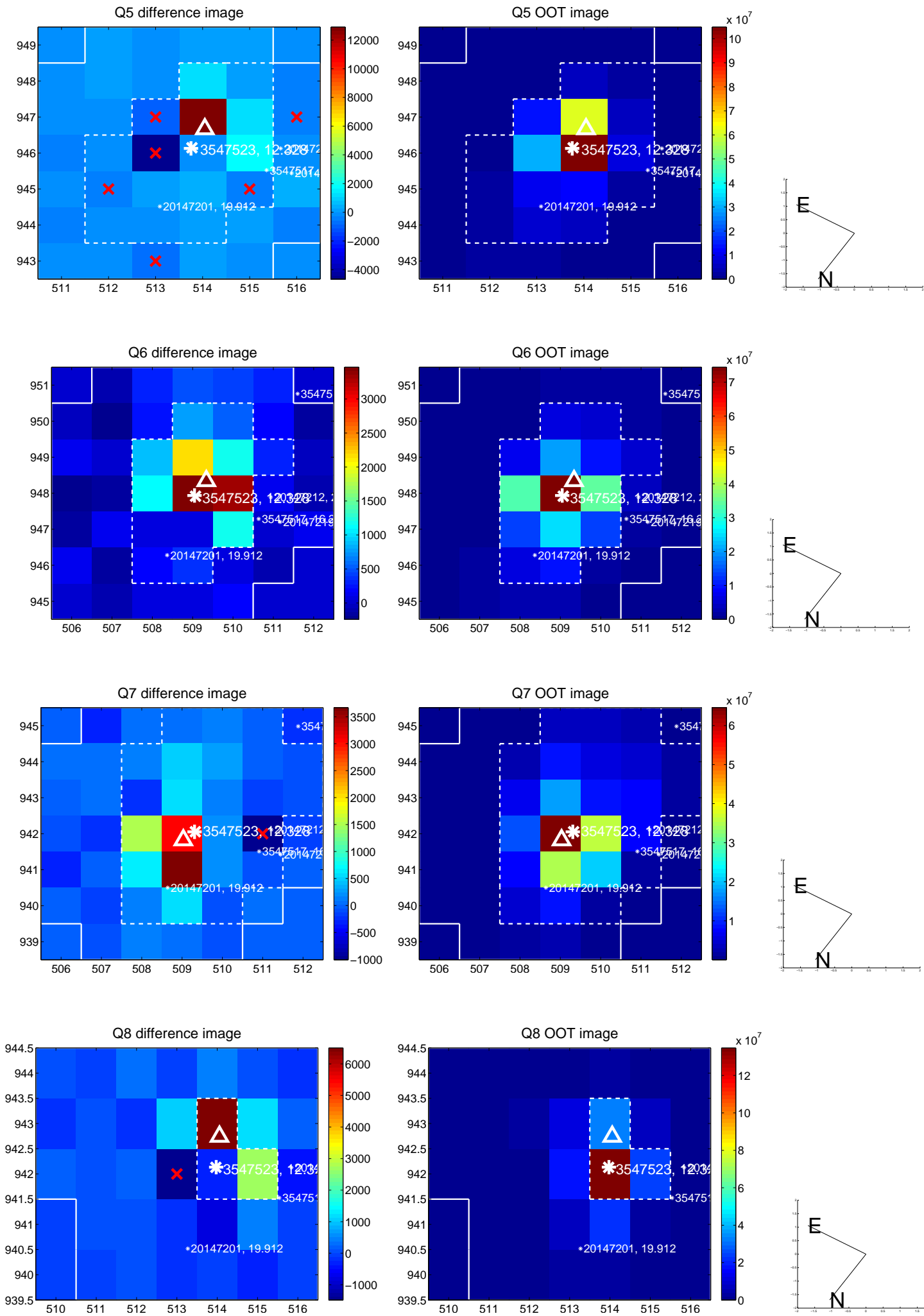


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

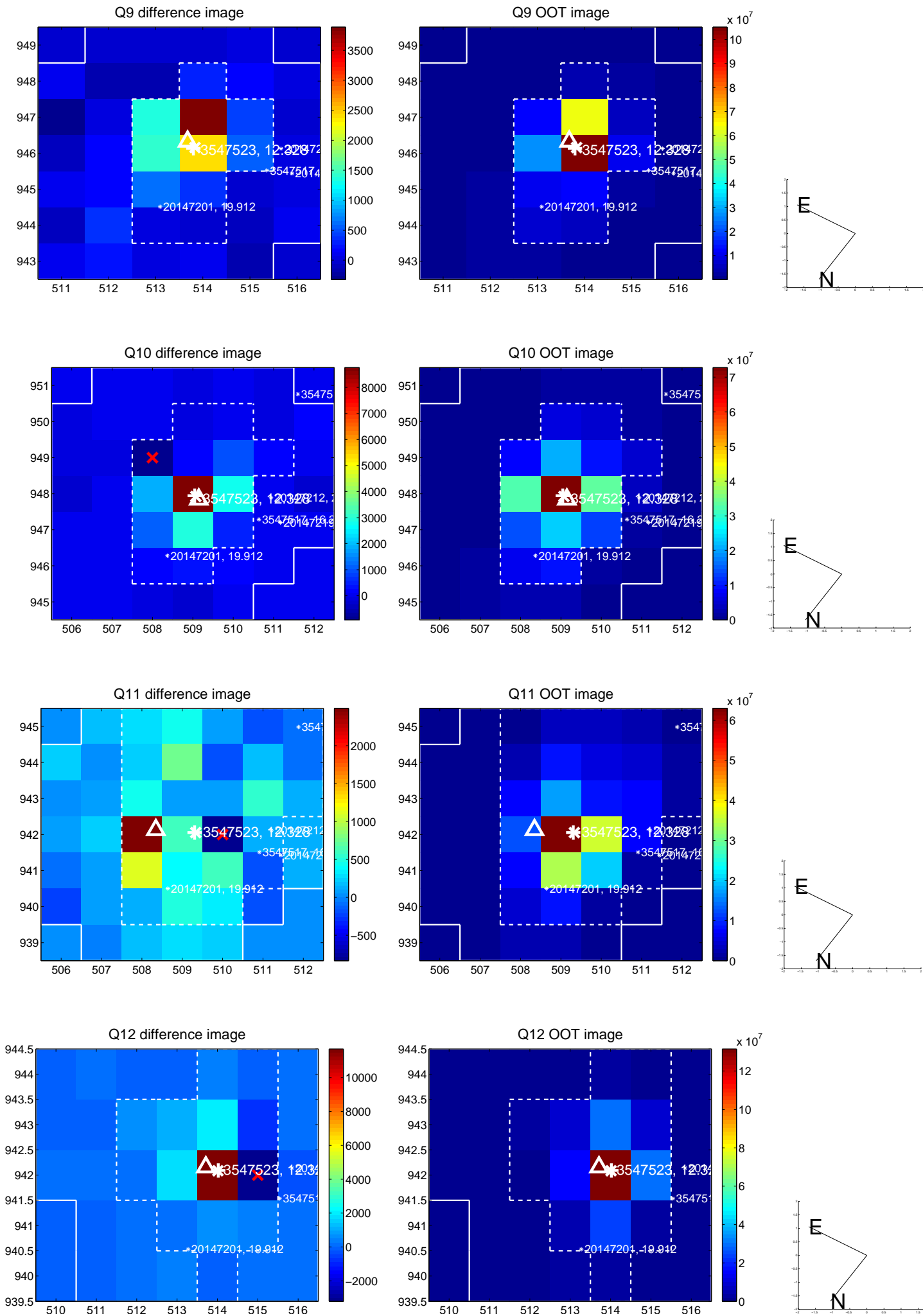


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

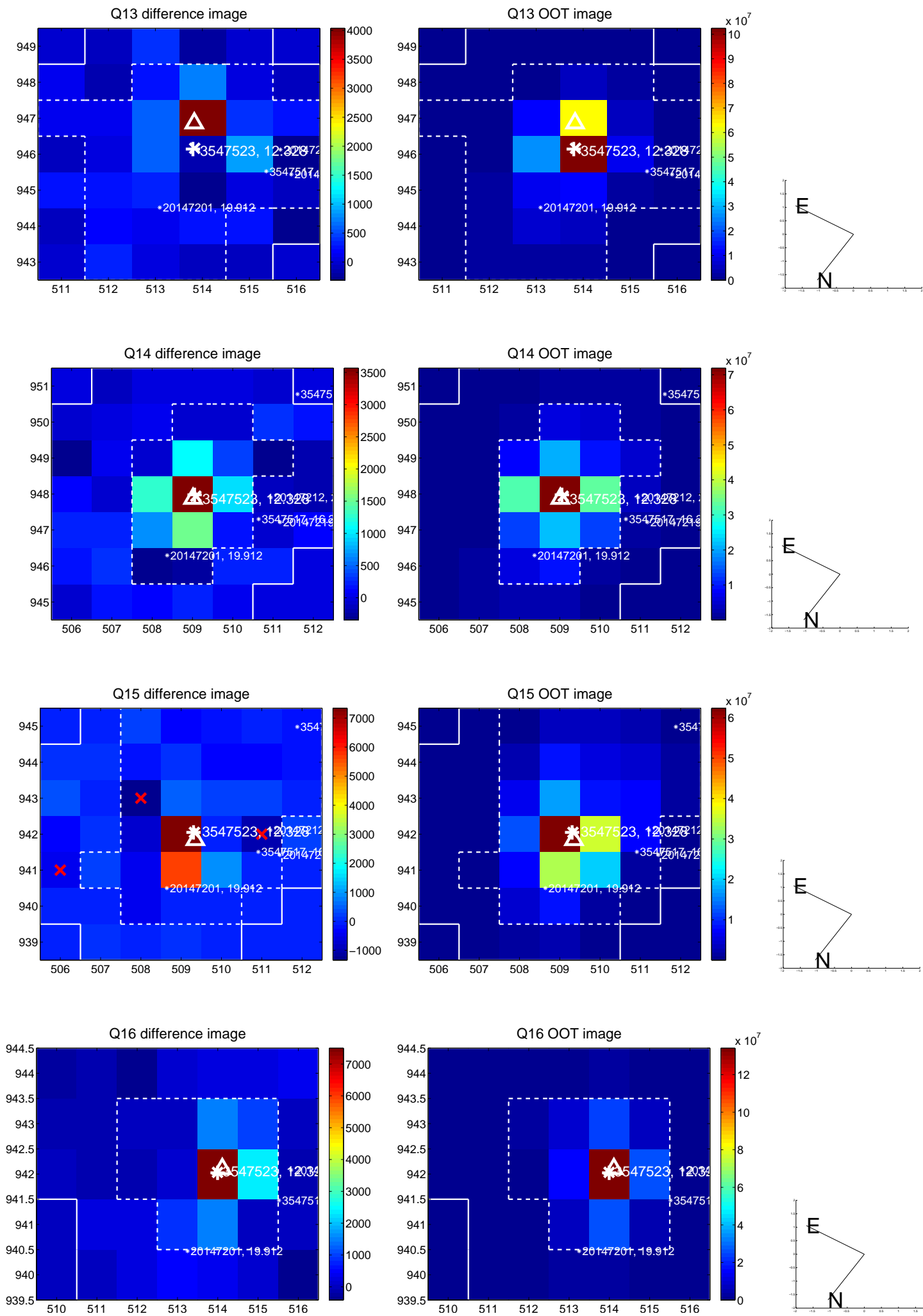




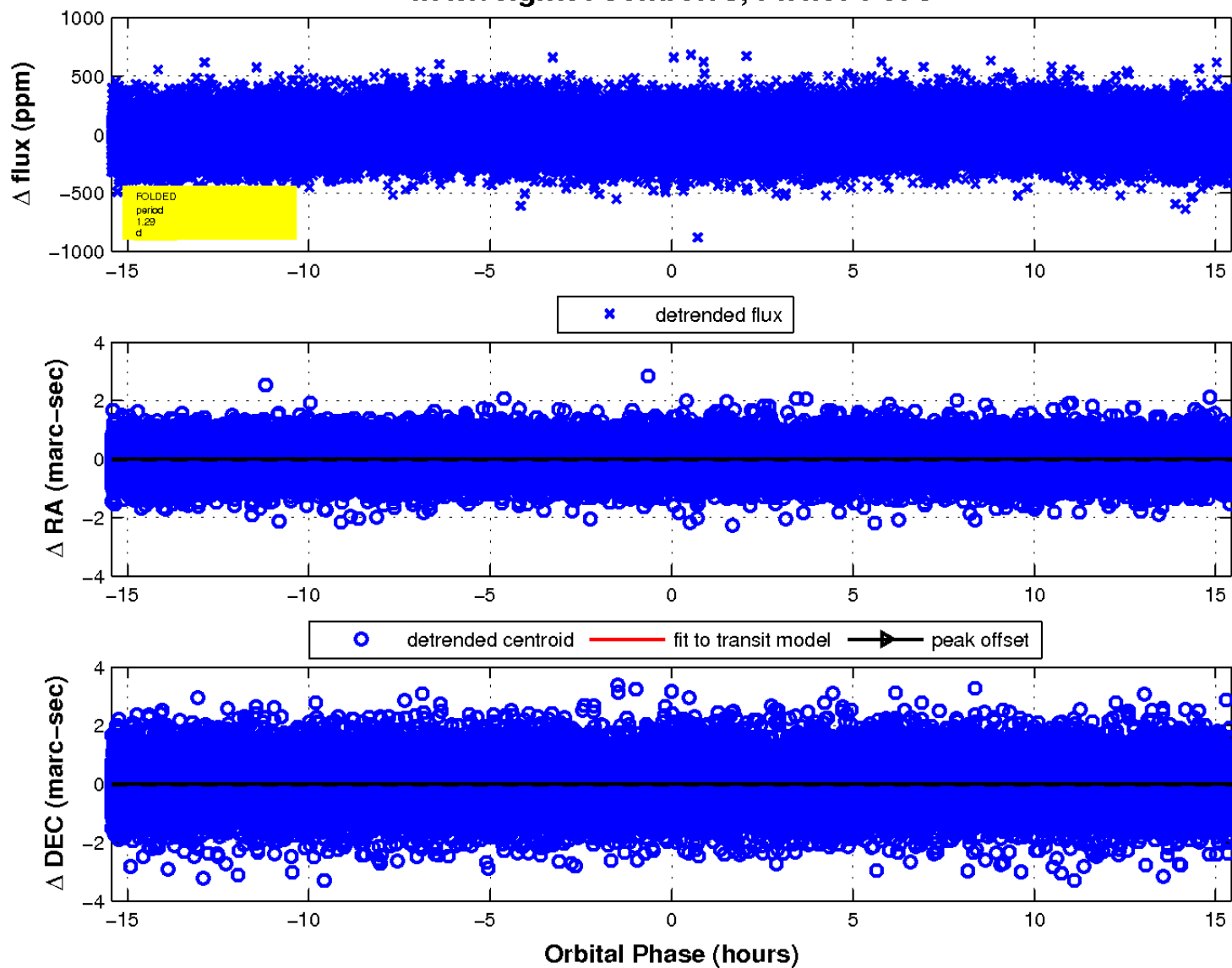
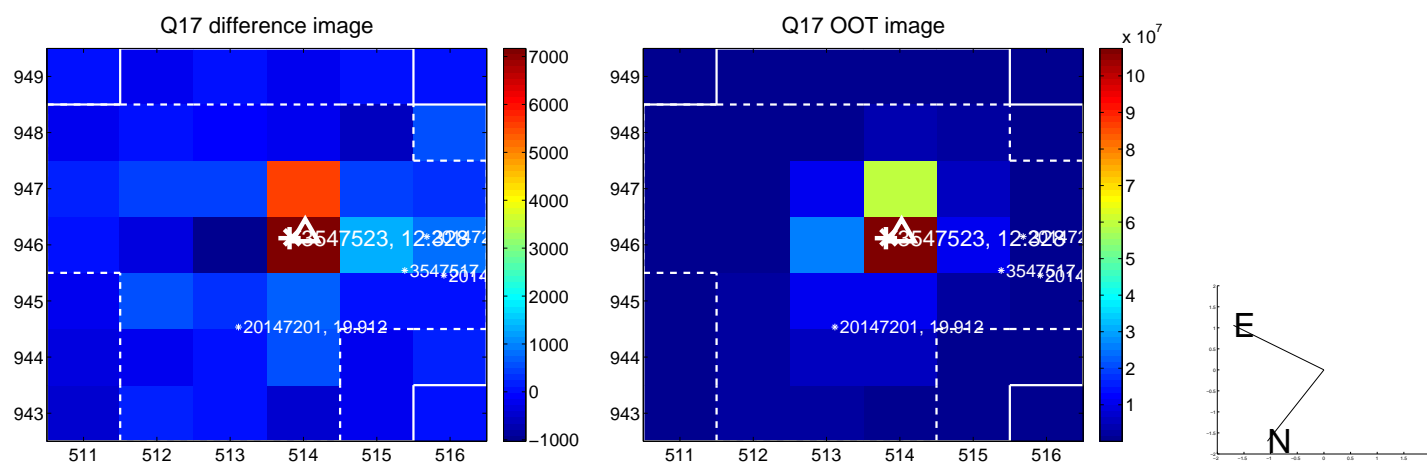
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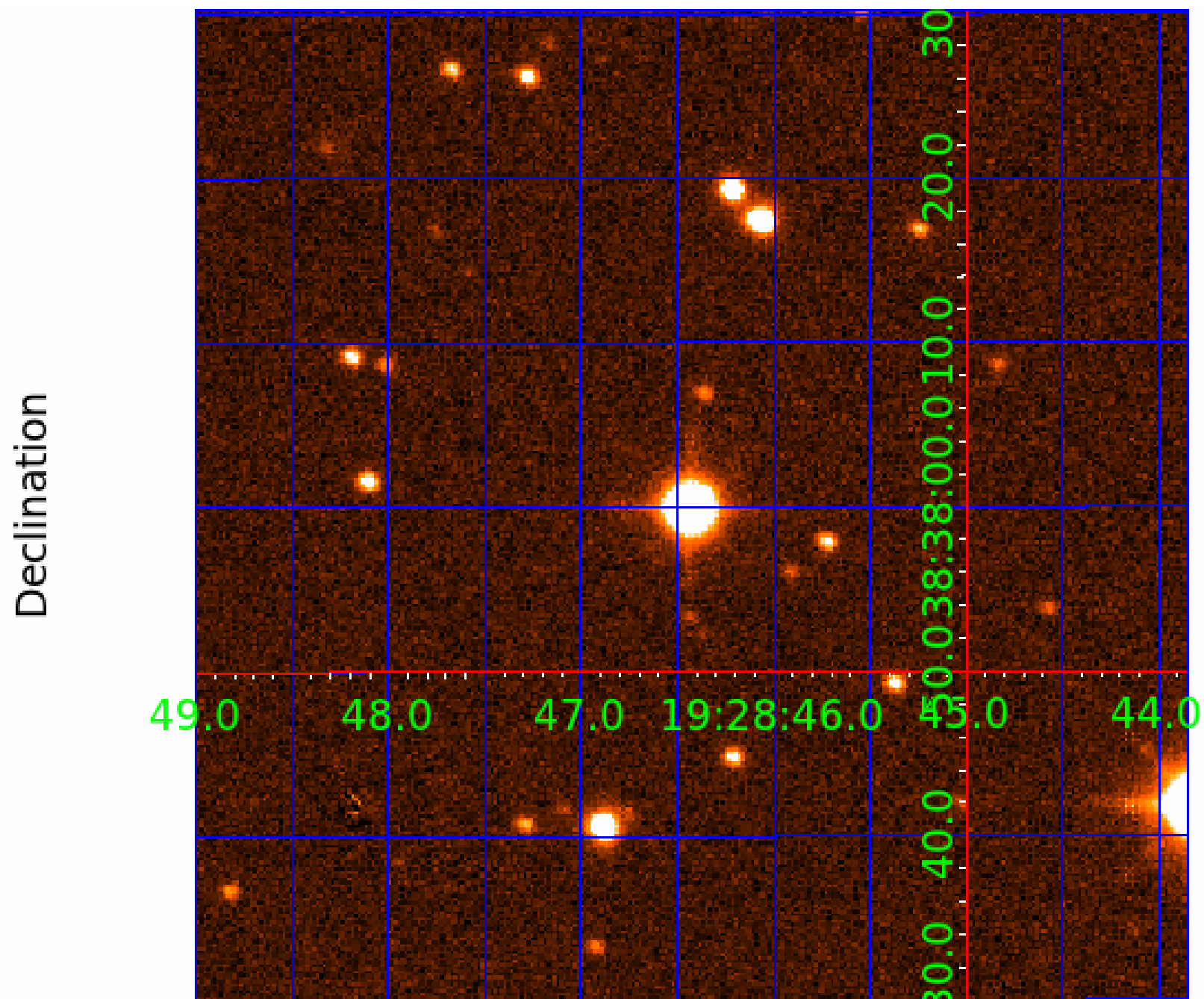
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



## KIC 003547523

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003547523-01	OBS	No	1.286558	131.774714	21.4	6.273	9.4	10.8	2.12	7543	1.13	17010.03
003547523-02	OBS	No	170.081357	281.456755	154.3	3.405	10.3	4.6	2.12	7543	2.97	25.26
003547523-03	OBS	No	4.289079	131.505412	36.0	6.831	8.0	7.9	2.12	7543	1.58	3415.54
003547523-04	OBS	No	64.515001	141.389924	133.7	5.114	7.9	7.7	2.12	7543	2.73	91.99
003547523-05	OBS	No	48.272360	144.778101	148.8	2.948	8.6	8.6	2.12	7543	2.87	135.42
003547523-06	OBS	No	67.256610	149.491828	257.1	3.132	7.8	8.1	2.12	7543	3.90	87.02
003547523-07	OBS	No	213.723127	282.236258	225.9	3.273	8.3	7.3	2.12	7543	3.67	18.63
003547523-08	OBS	No	226.517683	180.912141	209.7	5.031	7.4	7.7	2.12	7543	3.39	17.24
003547523-09	OBS	No	93.778528	135.848958	265.1	2.254	7.6	8.4	2.12	7543	3.67	55.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003547523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003547523-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003547523-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
003547523-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
003547523-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003547523-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—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.

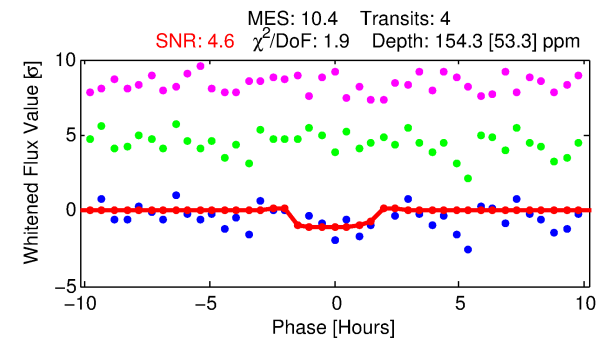
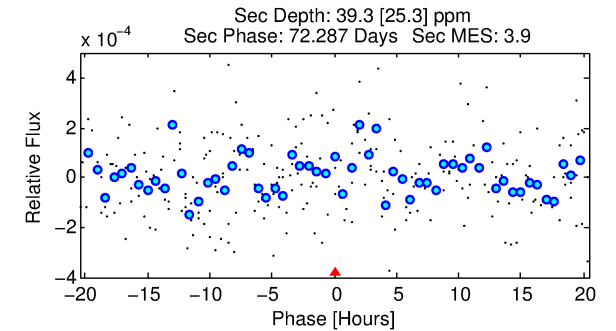
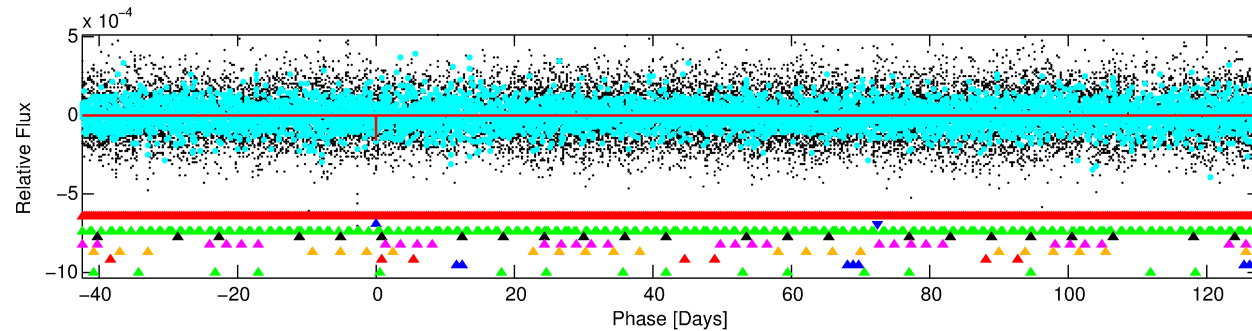
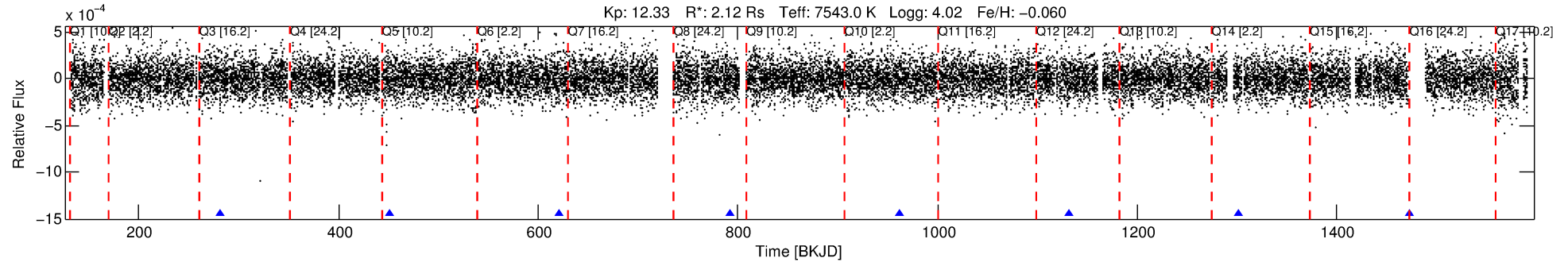
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003547523-02

No Significant Match Found

# DV One-Page Summary

KIC: 3547523 Candidate: 2 of 9 Period: 170.081 d

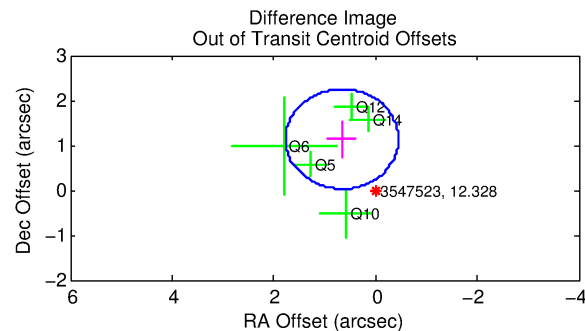
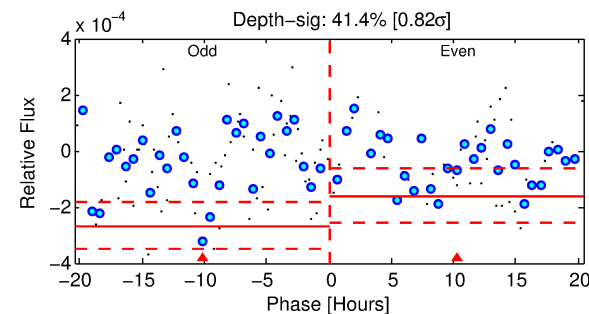
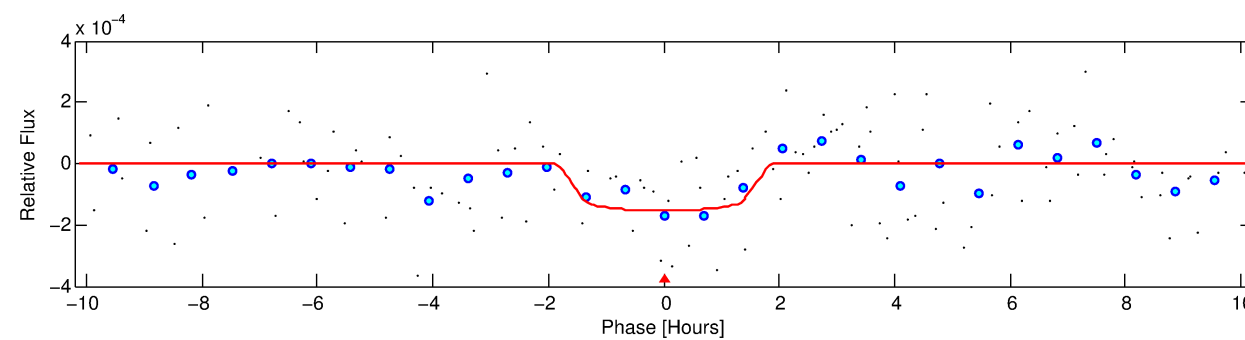


## DV Fit Results:

Period = 170.08136 [0.00438] d  
Epoch = 281.4568 [0.0200] BKJD  
Rp/R\* = 0.0129 [0.0185]  
a/R\* = 204.41 [1883.14]  
b = 0.86 [2.80]  
Seff = 25.26 [9.40]  
Teq = 572 [53] K  
Rp = 2.97 [4.34] Re  
a = 0.7167 [0.1584] AU  
Ag = 1262.60 [3747.52] [0.34σ]  
Teffp = 5268 [3891] K [1.21σ]

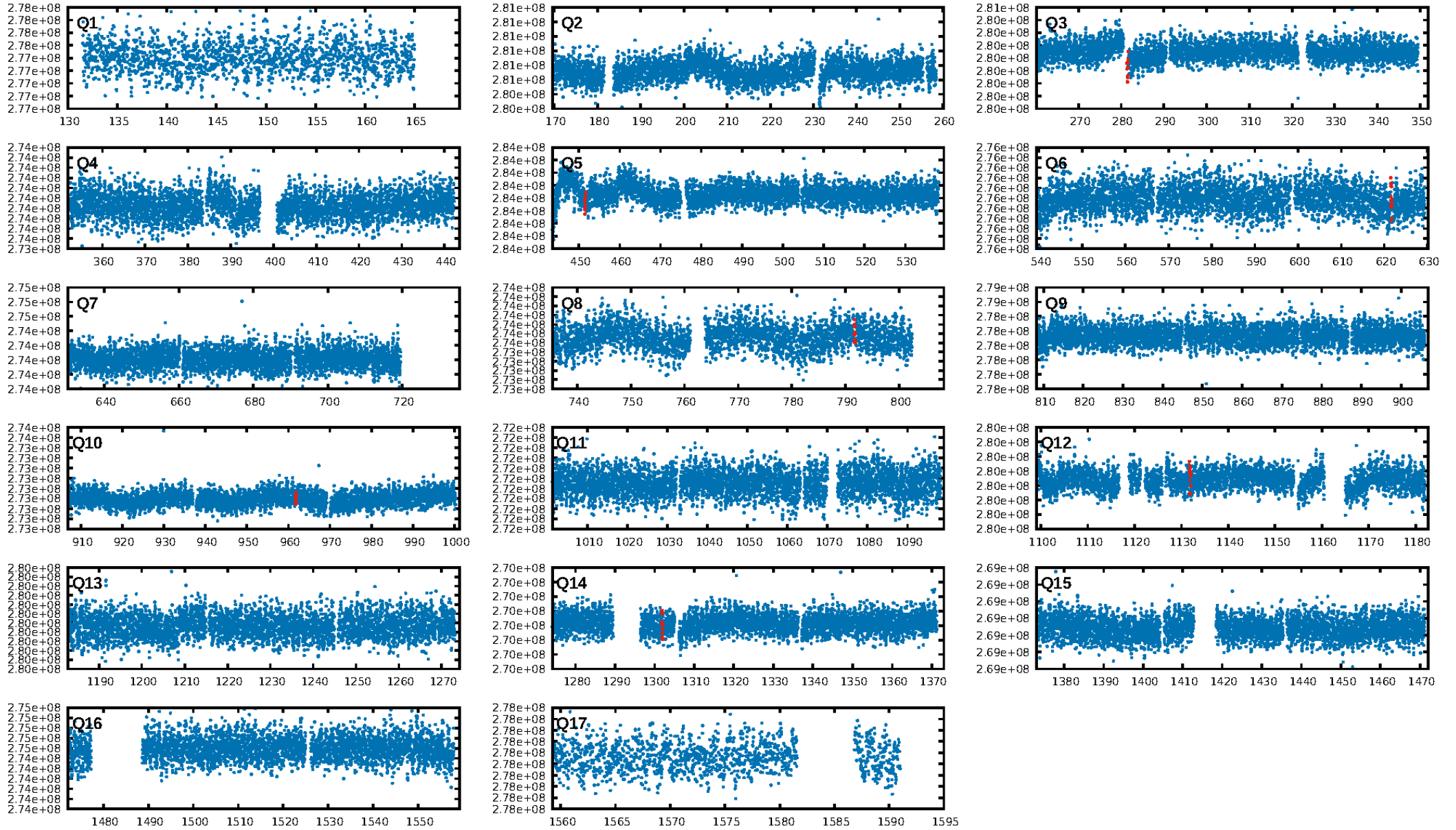
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [448.45σ]  
LongPeriod-sig: 100.0% [221.77σ]  
ModelChiSquare2-sig: 0.0%  
a/R\* = 204.41 [1883.14]  
Bootstrap-pfa: 1.43e-23  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.782  
Centroid-sig: 32.2%  
Centroid-so: 1.471 arcsec [1.10σ]  
OotOffset-rm: 1.314 arcsec [3.55σ]  
KicOffset-rm: 1.365 arcsec [3.75σ]  
OotOffset-st: 3/0/1/1 [5]  
KicOffset-st: 3/0/1/1 [5]  
DiffImageQuality-fgm: 0.60 [3/5]  
DiffImageOverlap-fno: 0.17 [1/6]

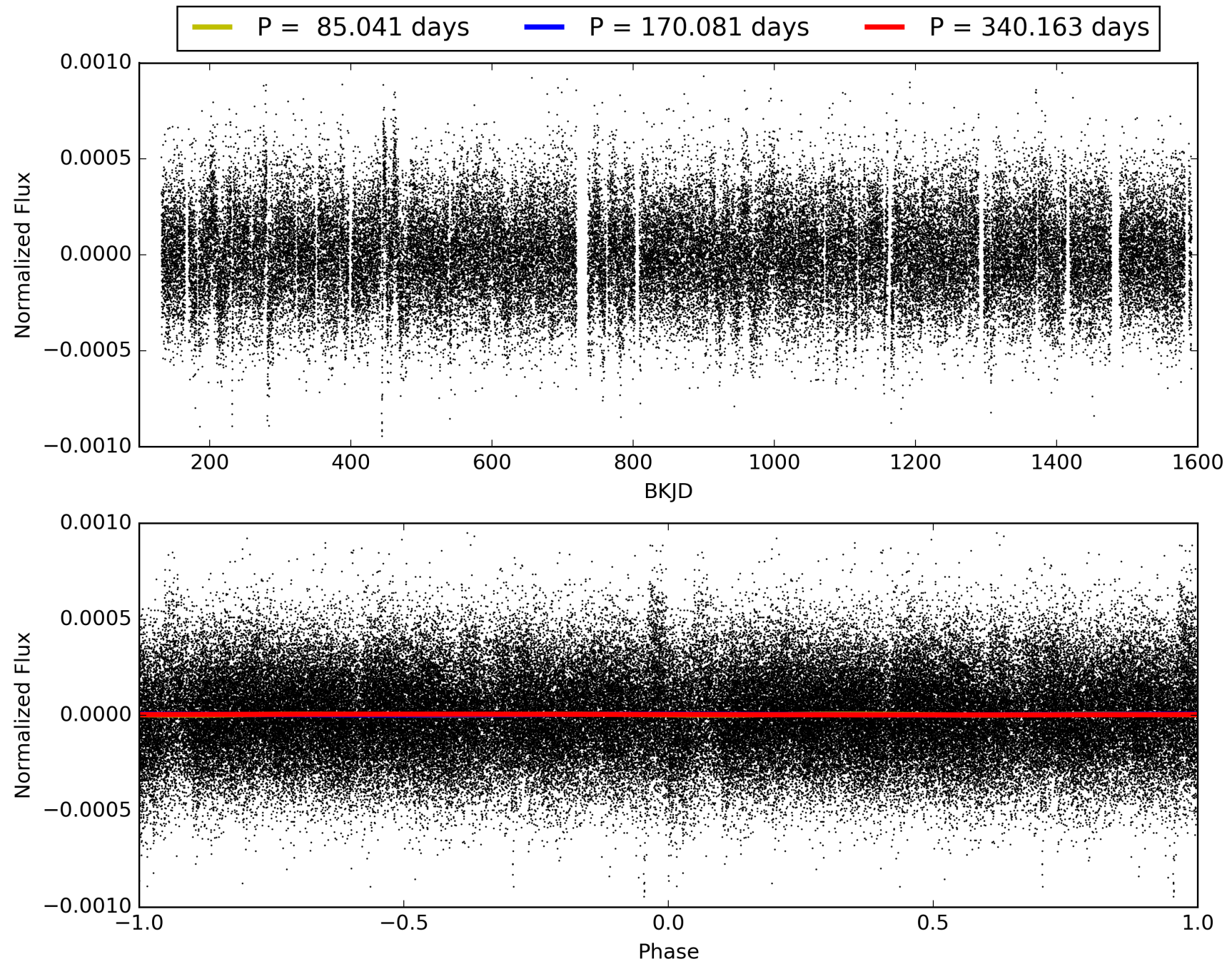




# TCE 003547523-02, PDC Light Curves

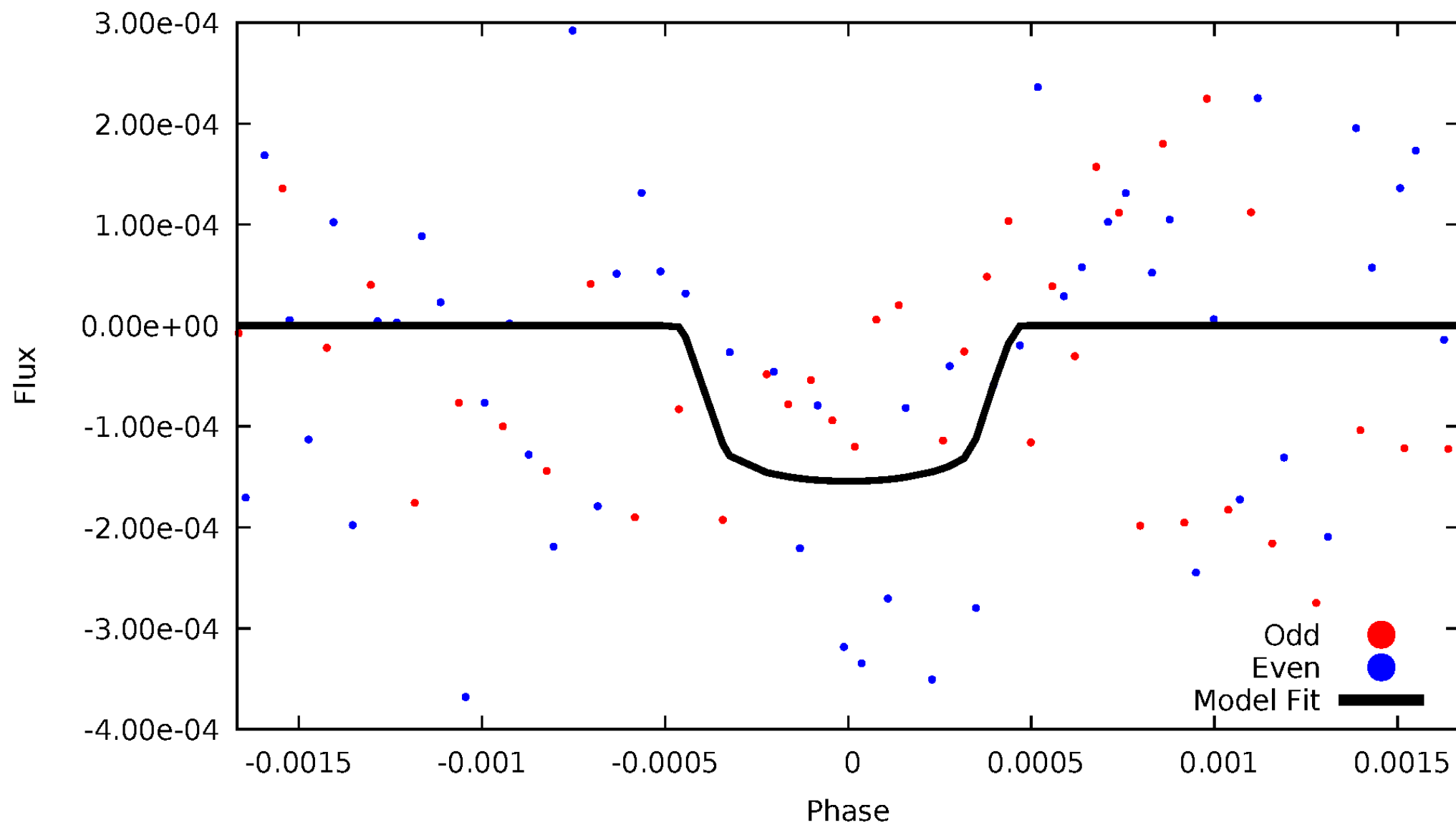


TCE 003547523-02



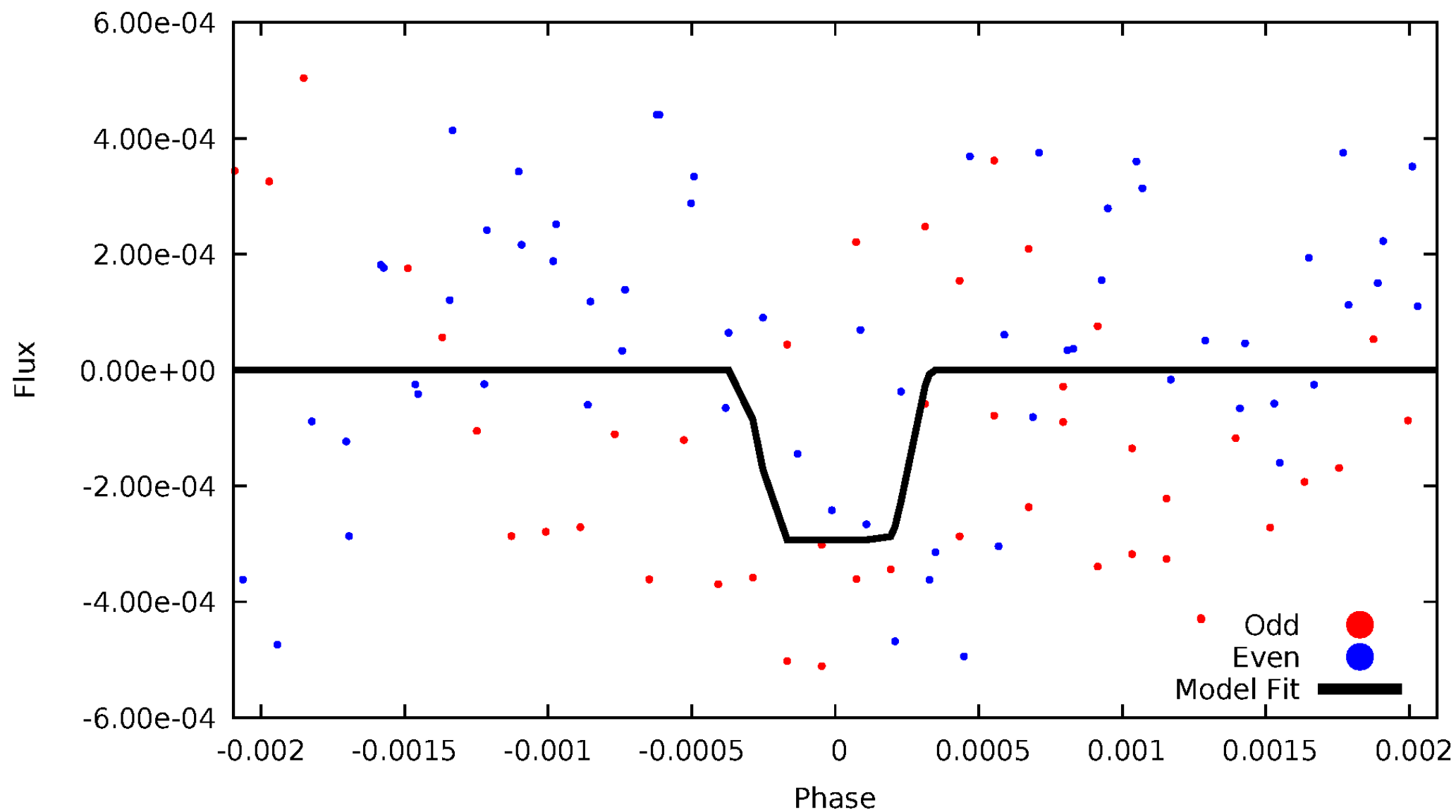
# DV Odd/Even

TCE 003547523-02



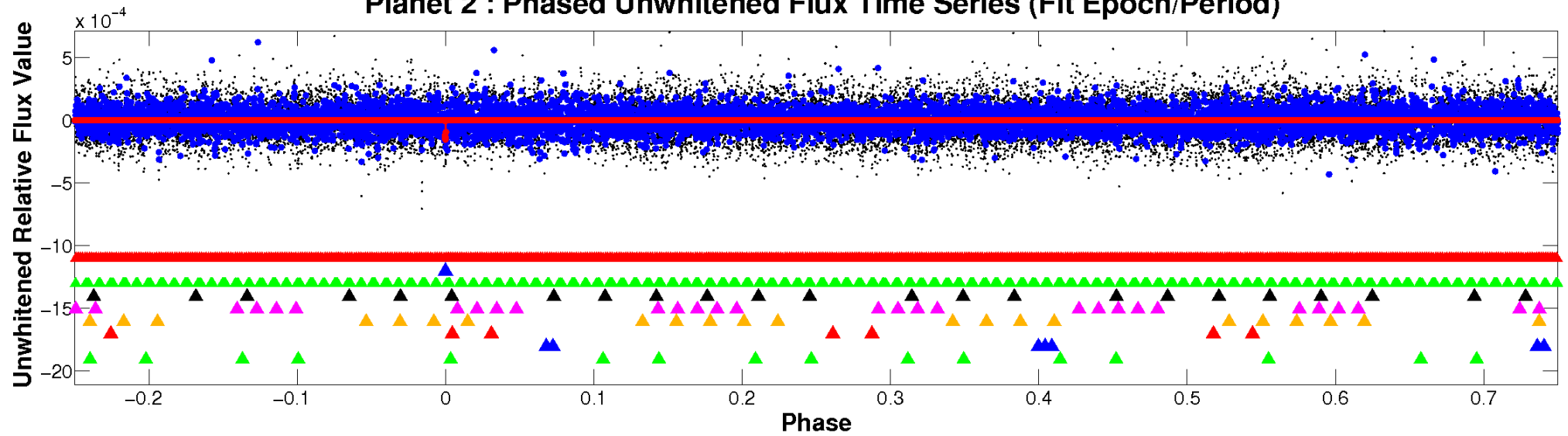
# ALT Odd/Even

TCE 003547523-02

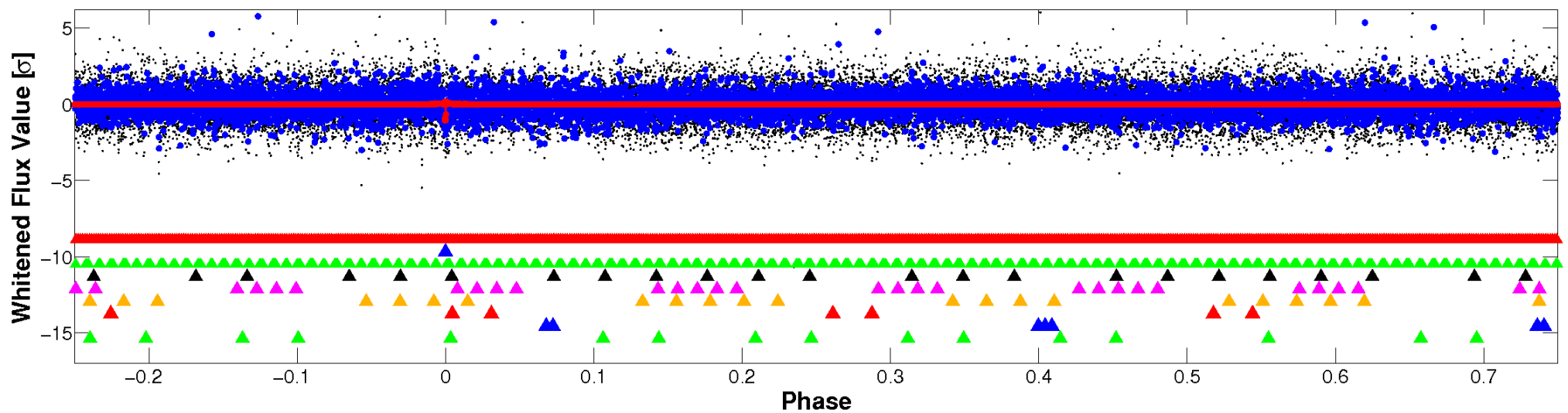


# Non-Whitened Vs. Whitened Light Curve

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

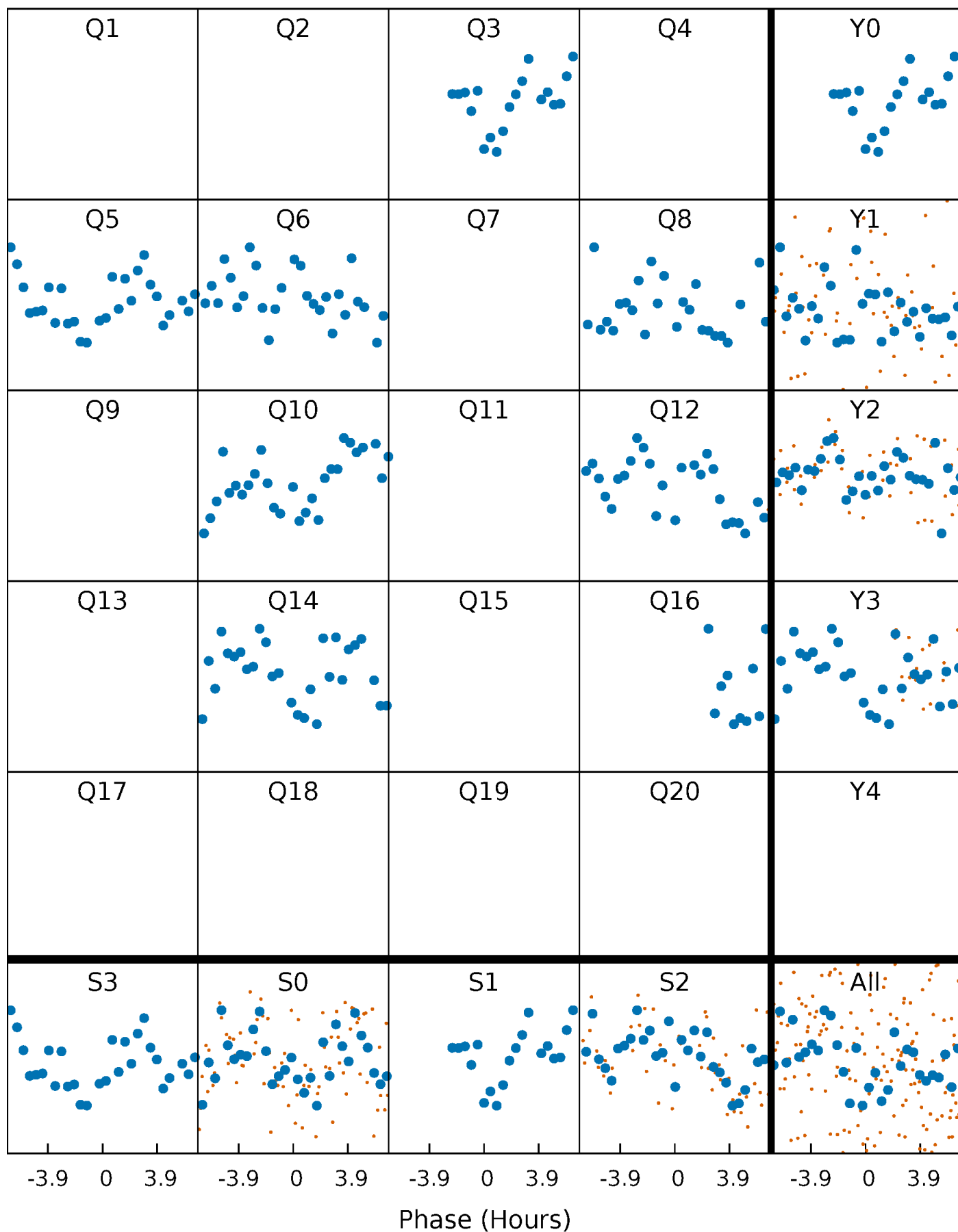


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

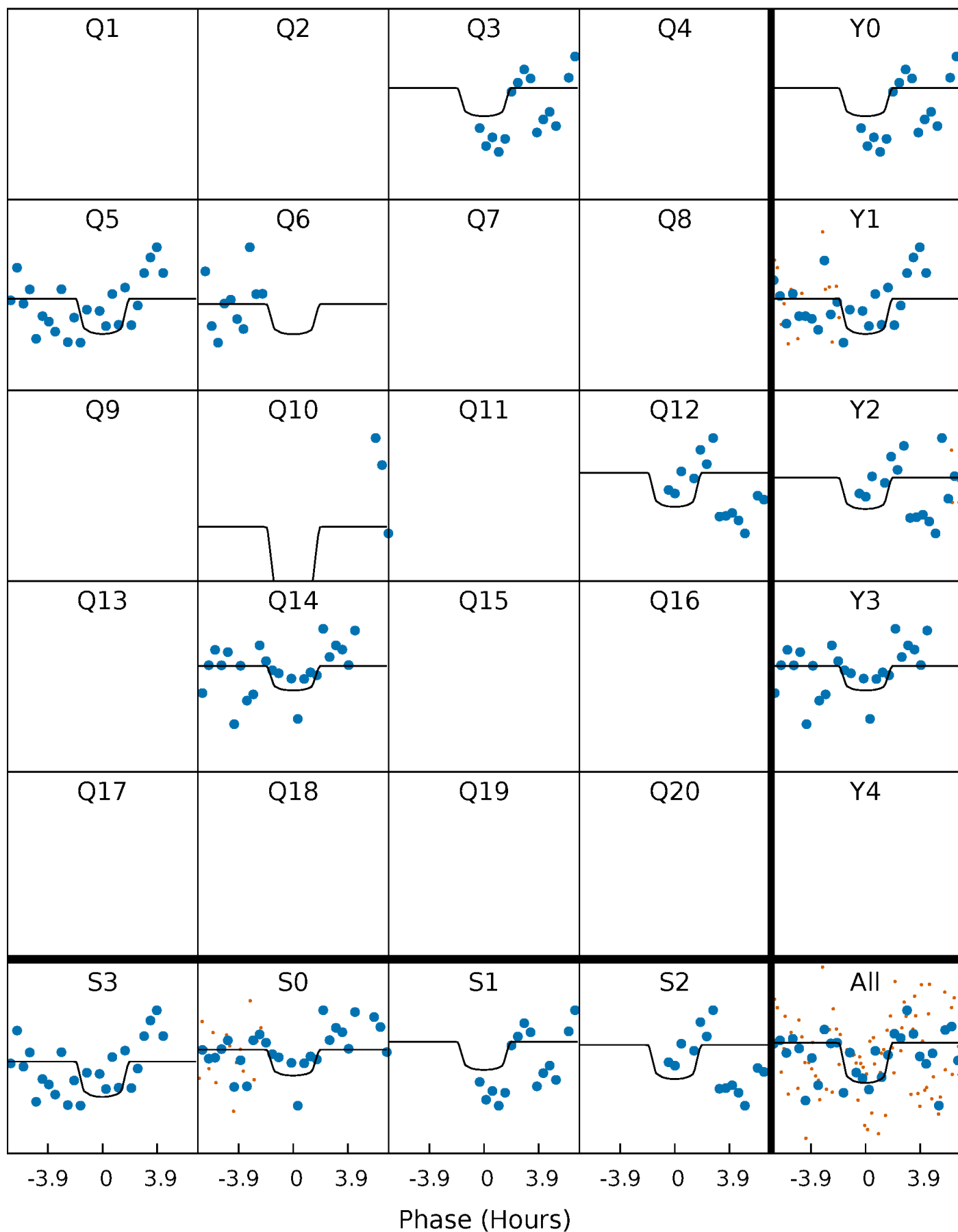
TCE 003547523-02 P=170.081357 Days  $T_0=281.456755$  (BKJD)





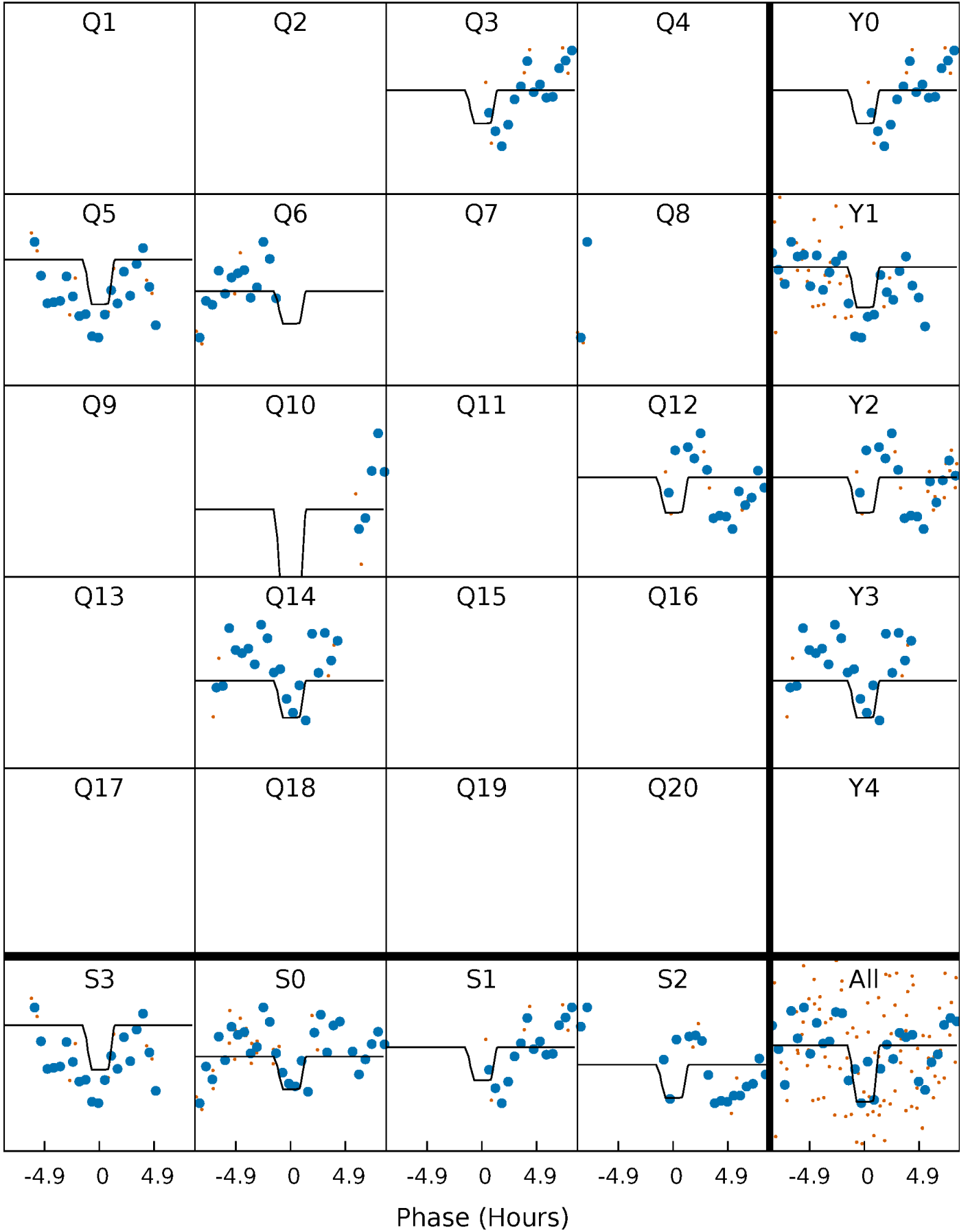
# DV Quarter-Phased Transit Curves

TCE 003547523-02 P=170.081357 Days  $T_0=281.456755$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

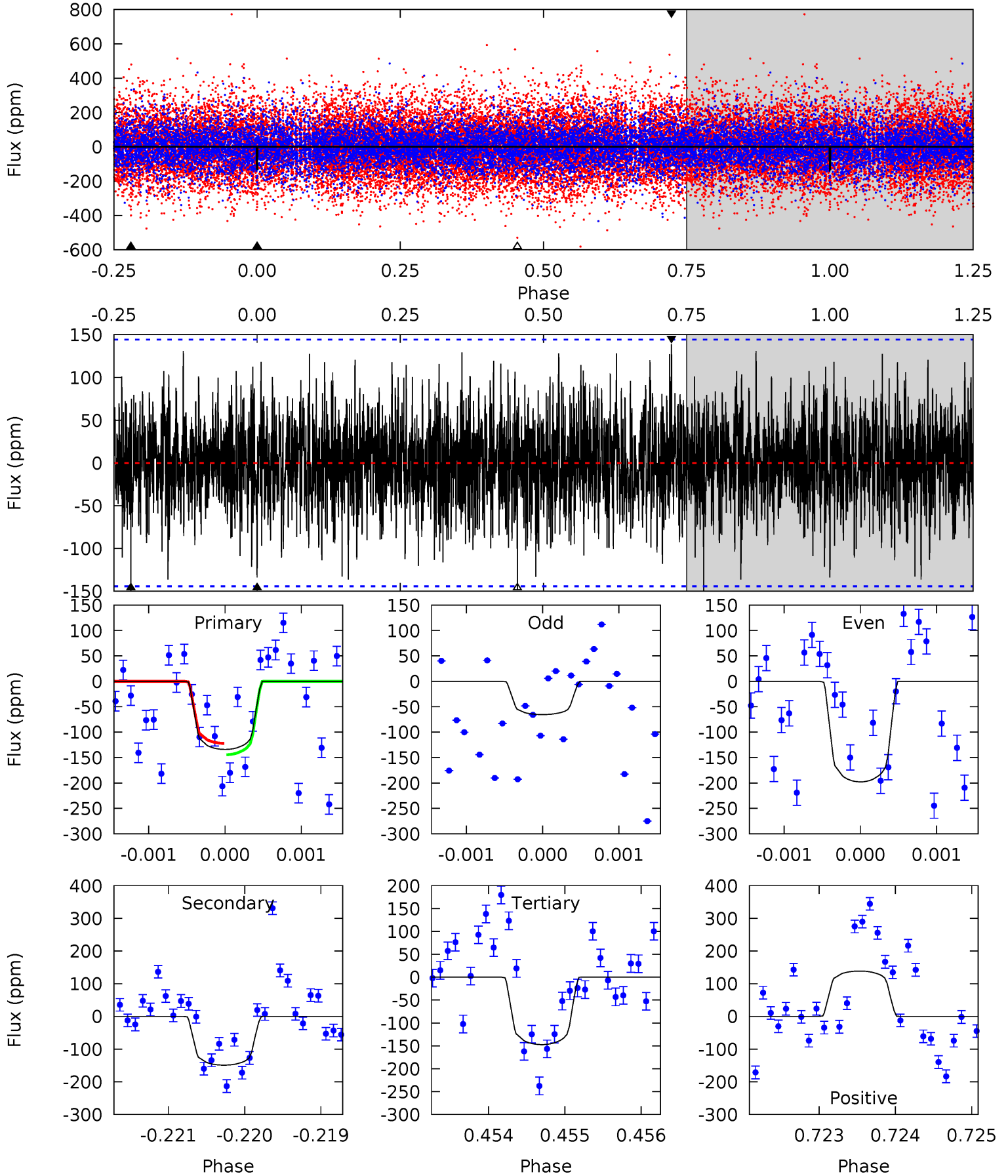
TCE 003547523-02 P=170.088953 Days  $T_0=281.419292$  (BKJD)



# DV Model-Shift Uniqueness Test

003547523-02, P = 170.081357 Days, E = 111.375398 Days

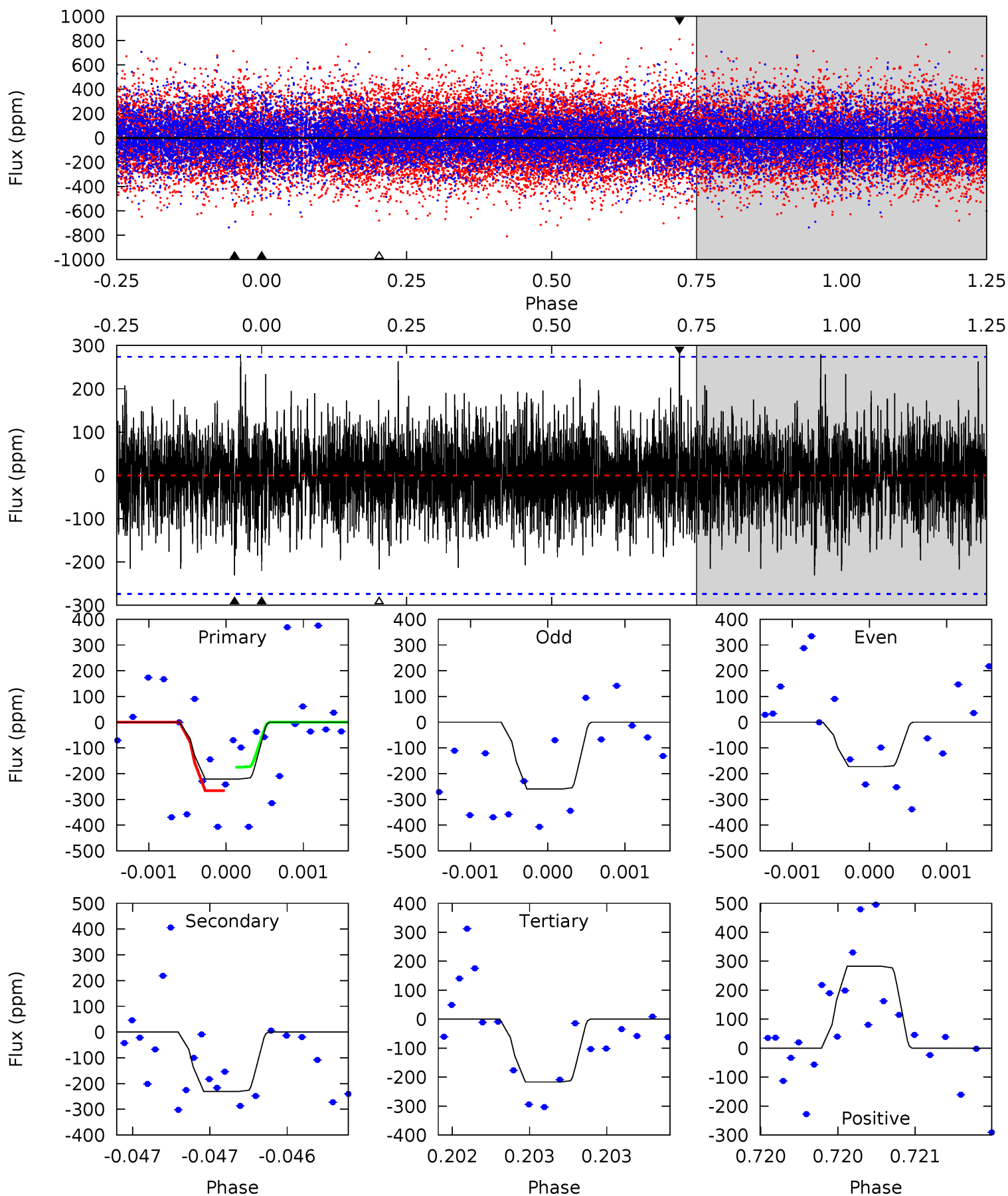
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.07	5.64	5.57	5.25	5.46	3.30	1.58	-0.51	-0.18	0.07	0.39	2.49	1.44	0.48	0.42



# Alt Model-Shift Uniqueness Test

003547523-02, P = 170.088953 Days, E = 111.330339 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.46	4.66	4.38	5.72	5.54	3.42	1.37	0.08	-1.26	0.28	-1.05	0.87	1.13	0.55	0.91



### Stellar Parameters For KIC 003547523

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7543^{+235}_{-314}$	$4.017^{+0.187}_{-0.153}$	$-0.060^{+0.200}_{-0.300}$	$2.115^{+0.533}_{-0.533}$	$1.695^{+0.212}_{-0.282}$	$0.252^{+0.261}_{-0.110}$
	+3%/-4%	+5%/-4%	+333%/-500%	+25%/-25%	+13%/-17%	+103%/-44%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003547523-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-149 \pm 26$	$4.12^{+3.51}_{-2.61}$	$796^{+63}_{-55}$	$6088^{+5331}_{-1460}$	$2483^{+14575}_{-1775}$
Alt.	$-231 \pm 49$	$4.81^{+4.05}_{-3.12}$	$798^{+57}_{-59}$	$6267^{+6160}_{-1470}$	$2823^{+20961}_{-2009}$

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

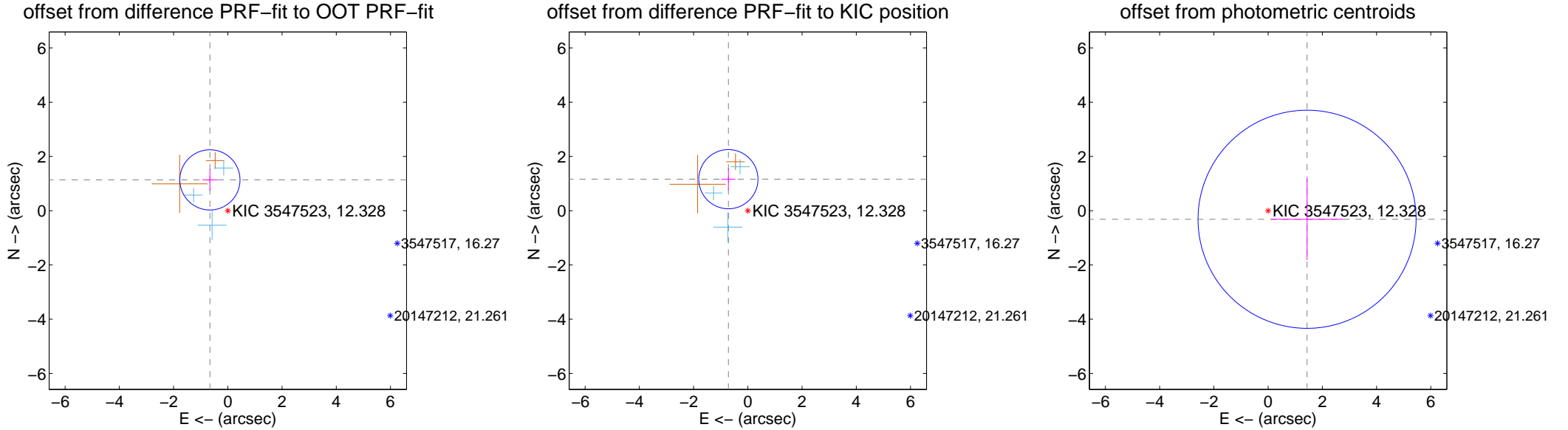
## DV Centroid Data

Supplemental centroid analysis for 003547523-02. Kepler magnitude: 12.33. Transit SNR 4.62

There are 3 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b>1.314 <math>\pm</math> 0.370</b>	<b>3.55</b>	0.660 $\pm$ 0.281	1.136 $\pm$ 0.396
PRF-fit source offset from KIC position	<b>1.365 <math>\pm</math> 0.364</b>	<b>3.75</b>	0.717 $\pm$ 0.261	1.162 $\pm$ 0.396
photometric centroid source offset	1.47 $\pm$ 1.34	1.10	-1.44 $\pm$ 1.33	-0.32 $\pm$ 1.50



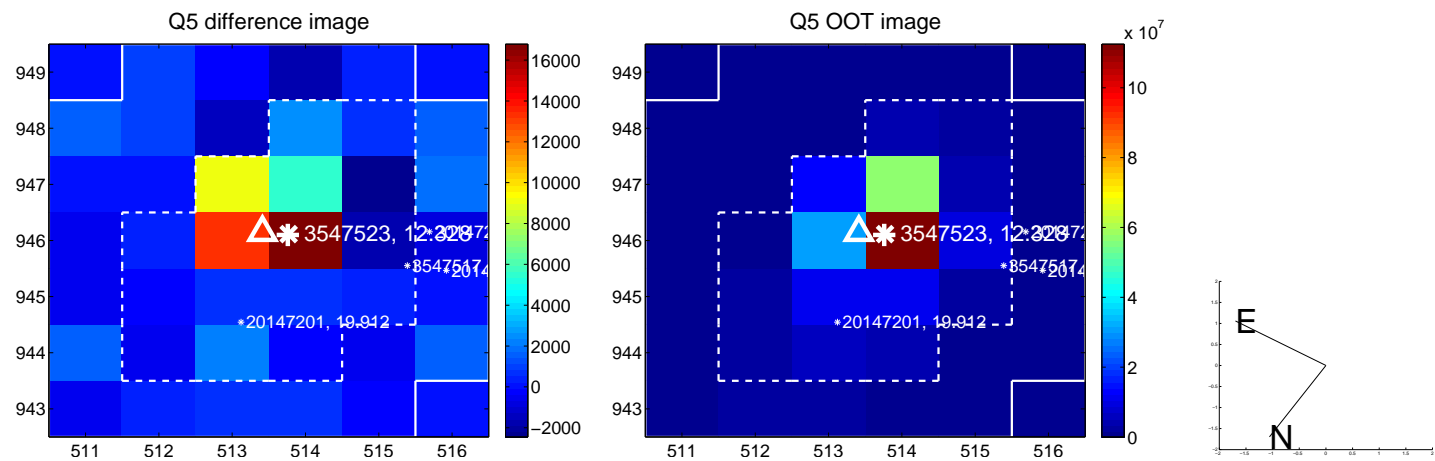
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



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



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



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

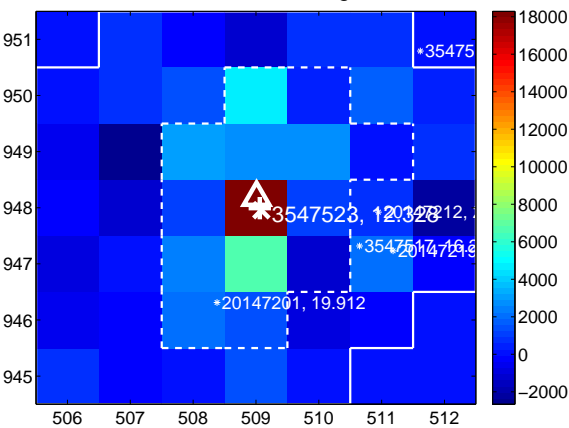
Q9 no difference image



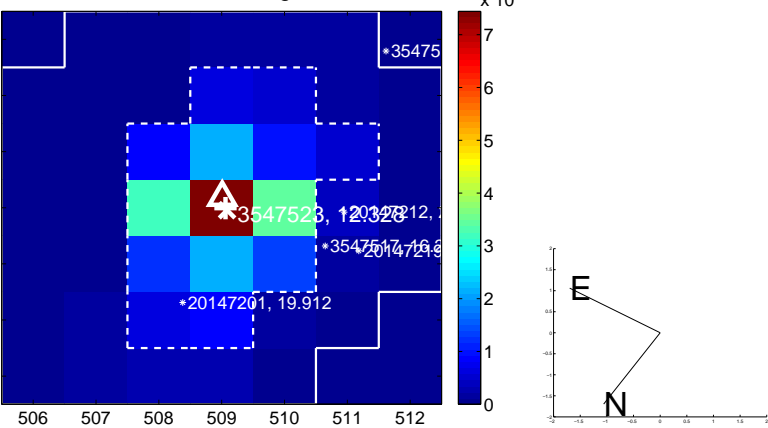
Q9 no OOT image



Q10 difference image



Q10 OOT image



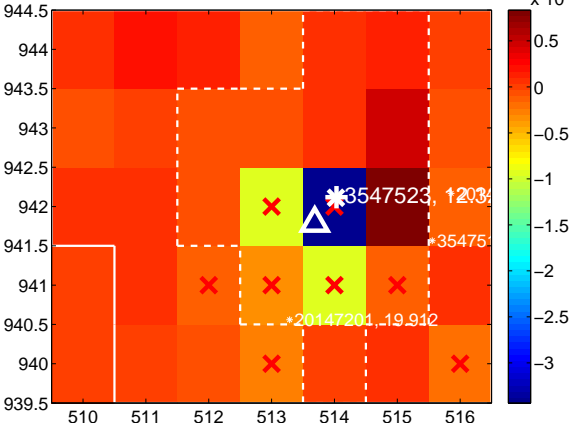
Q11 no difference image



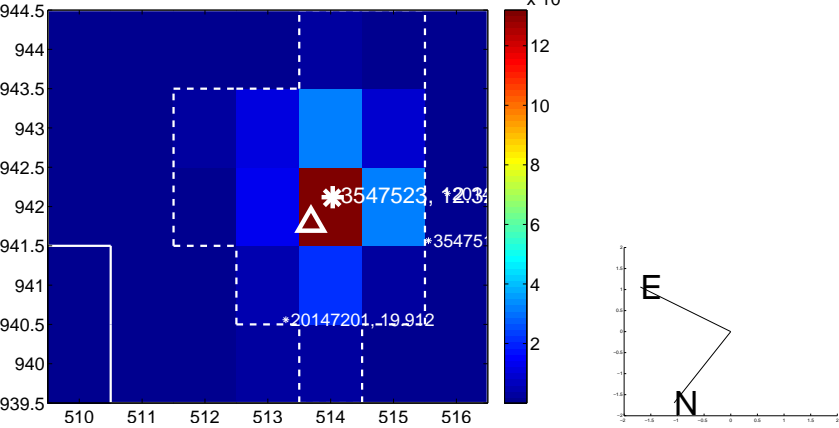
Q11 no OOT image



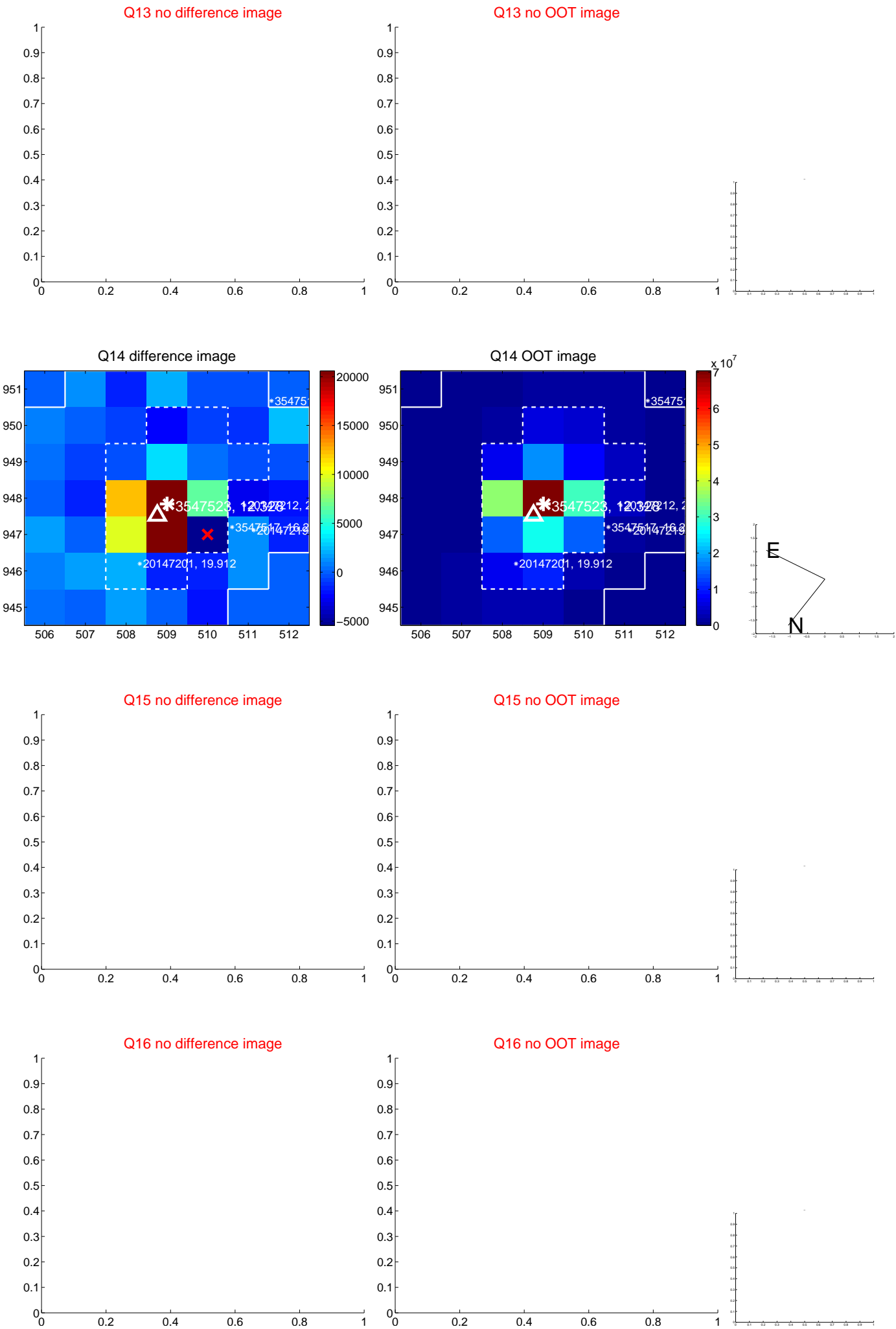
Q12 difference image. Poor Quality



Q12 OOT image

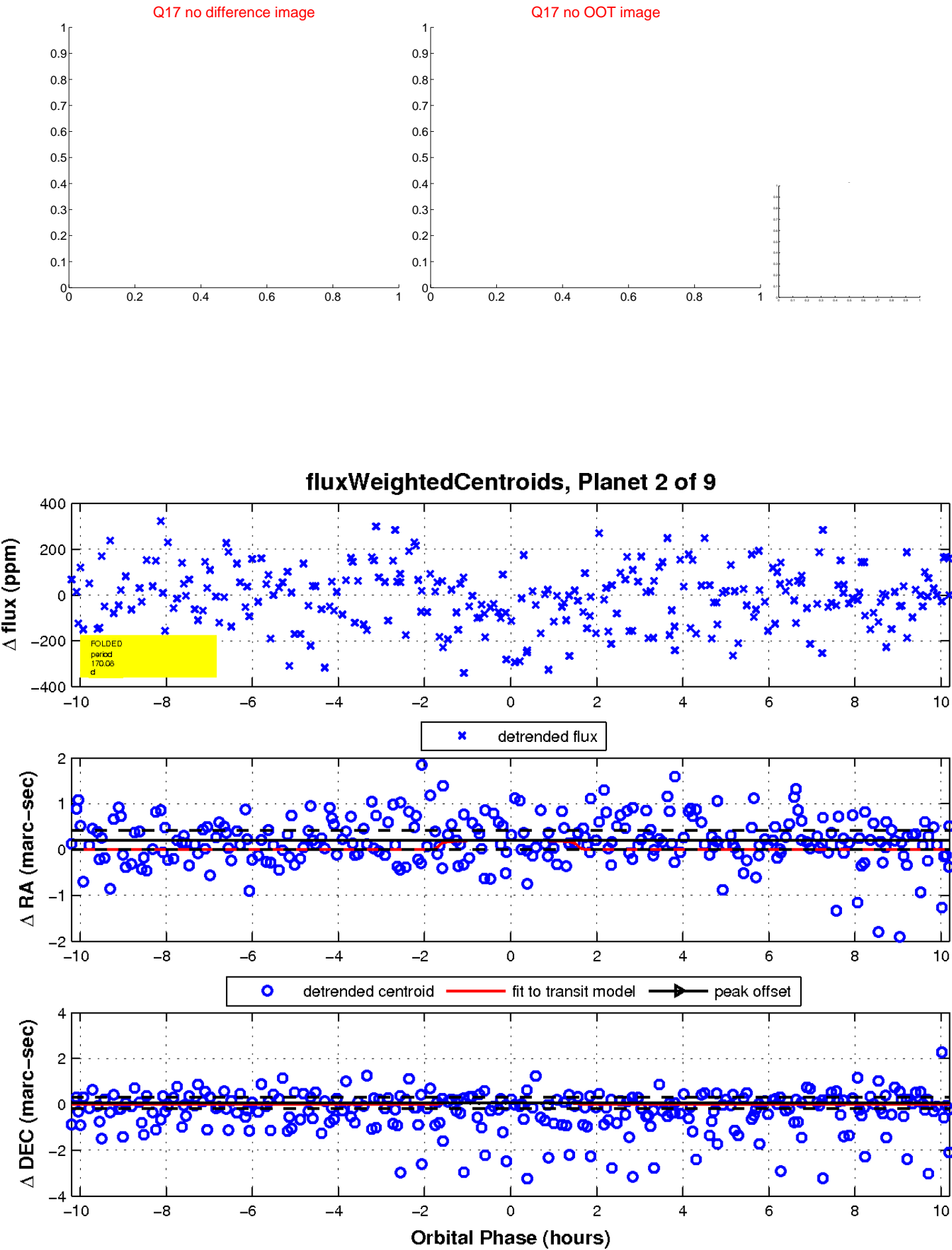


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

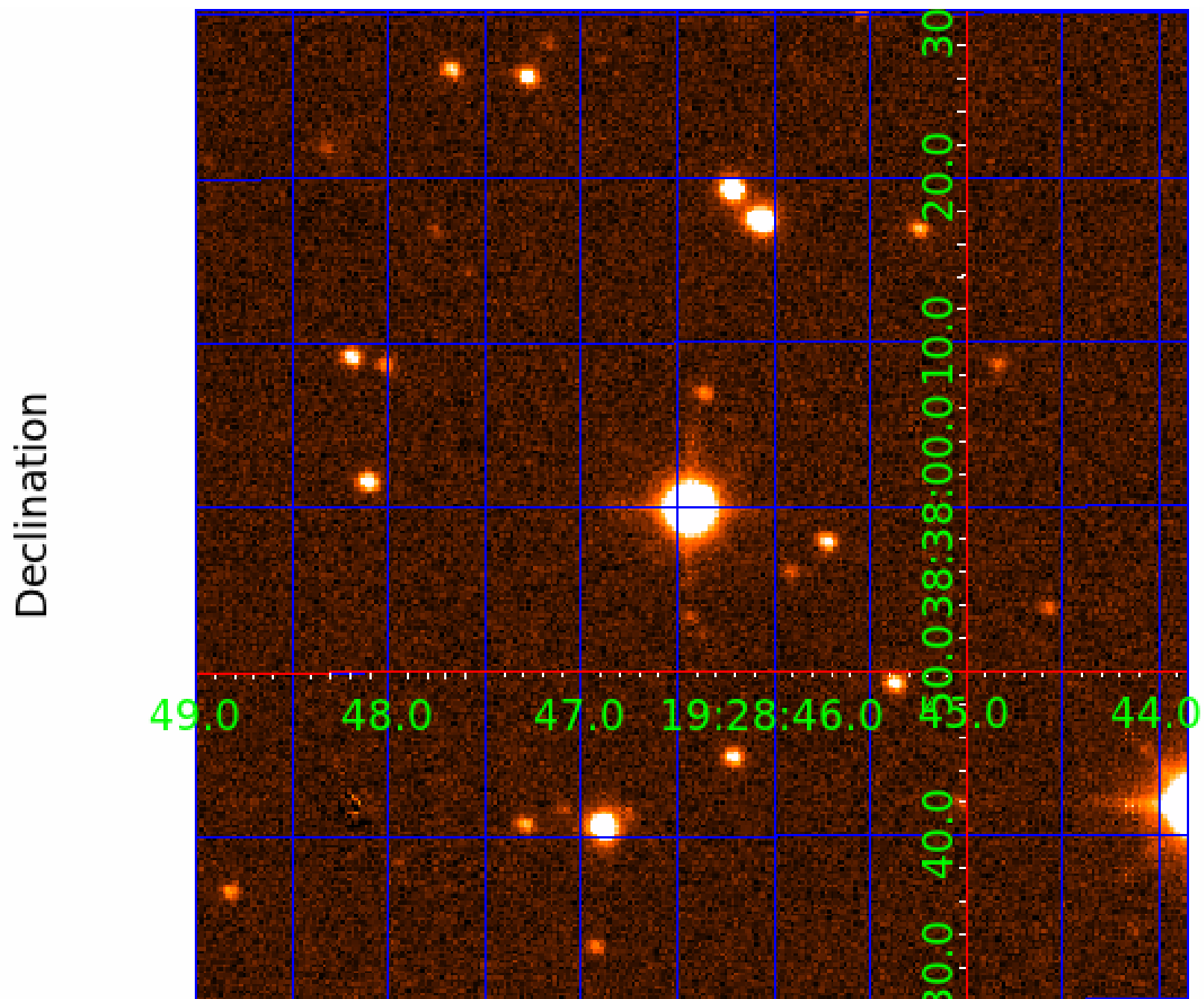




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



## KIC 003547523

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003547523-01	OBS	No	1.286558	131.774714	21.4	6.273	9.4	10.8	2.12	7543	1.13	17010.03
003547523-02	OBS	No	170.081357	281.456755	154.3	3.405	10.3	4.6	2.12	7543	2.97	25.26
003547523-03	OBS	No	4.289079	131.505412	36.0	6.831	8.0	7.9	2.12	7543	1.58	3415.54
003547523-04	OBS	No	64.515001	141.389924	133.7	5.114	7.9	7.7	2.12	7543	2.73	91.99
003547523-05	OBS	No	48.272360	144.778101	148.8	2.948	8.6	8.6	2.12	7543	2.87	135.42
003547523-06	OBS	No	67.256610	149.491828	257.1	3.132	7.8	8.1	2.12	7543	3.90	87.02
003547523-07	OBS	No	213.723127	282.236258	225.9	3.273	8.3	7.3	2.12	7543	3.67	18.63
003547523-08	OBS	No	226.517683	180.912141	209.7	5.031	7.4	7.7	2.12	7543	3.39	17.24
003547523-09	OBS	No	93.778528	135.848958	265.1	2.254	7.6	8.4	2.12	7543	3.67	55.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003547523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003547523-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003547523-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
003547523-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
003547523-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003547523-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—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.

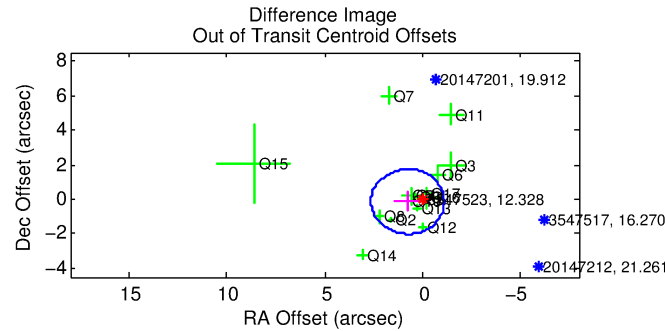
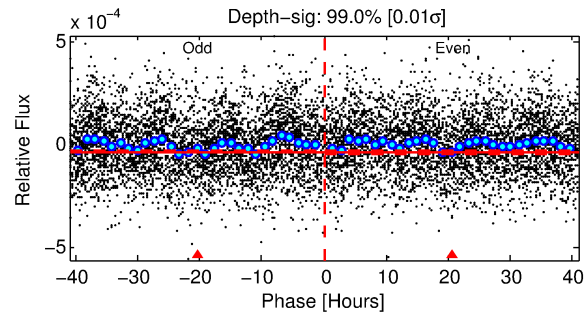
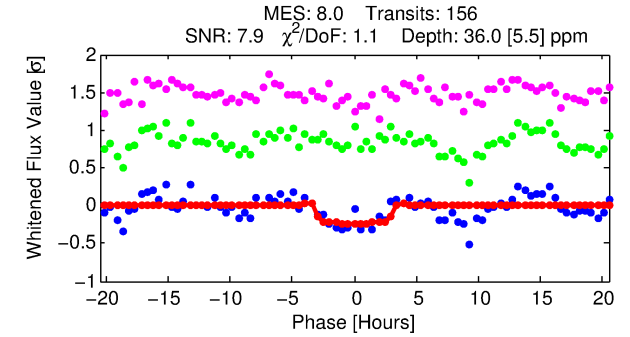
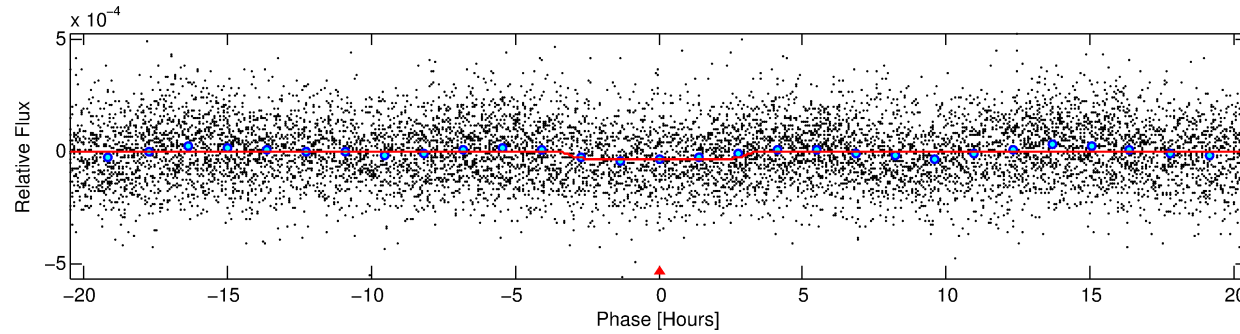
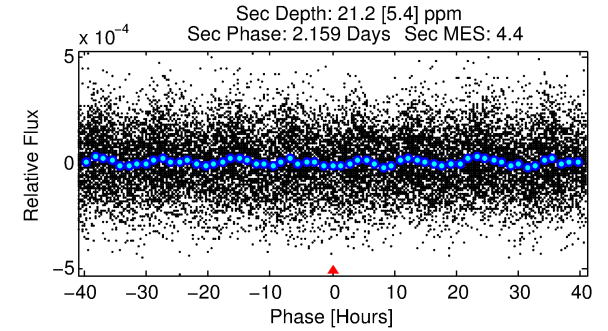
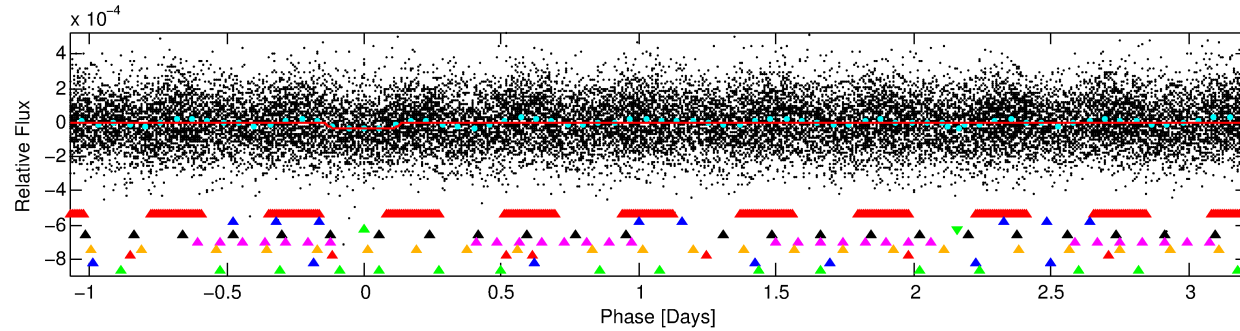
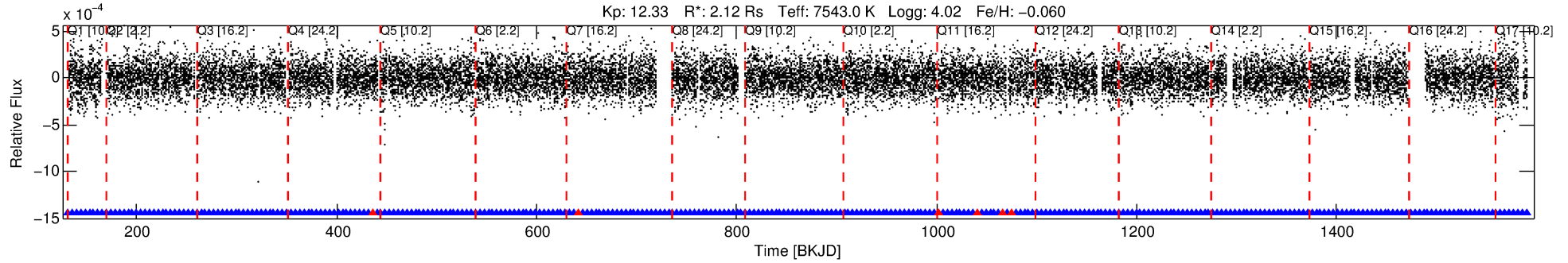
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003547523-03

No Significant Match Found

# DV One-Page Summary

KIC: 3547523 Candidate: 3 of 9 Period: 4.289 d



## DV Fit Results:

Period = 4.28908 [0.00007] d  
Epoch = 131.5054 [0.0112] BKJD  
Rp/R\* = 0.0068 [0.0010]  
a/R\* = 1.70 [0.91]  
b = 0.96 [0.06]  
Seff = 3415.54 [1270.44]  
Teff = 1949 [181] K  
Rp = 1.58 [0.46] Re  
a = 0.0616 [0.0136] AU  
Ag = 17.82 [9.05] [1.86σ]  
Teffp = 6192 [648] K [6.31σ]

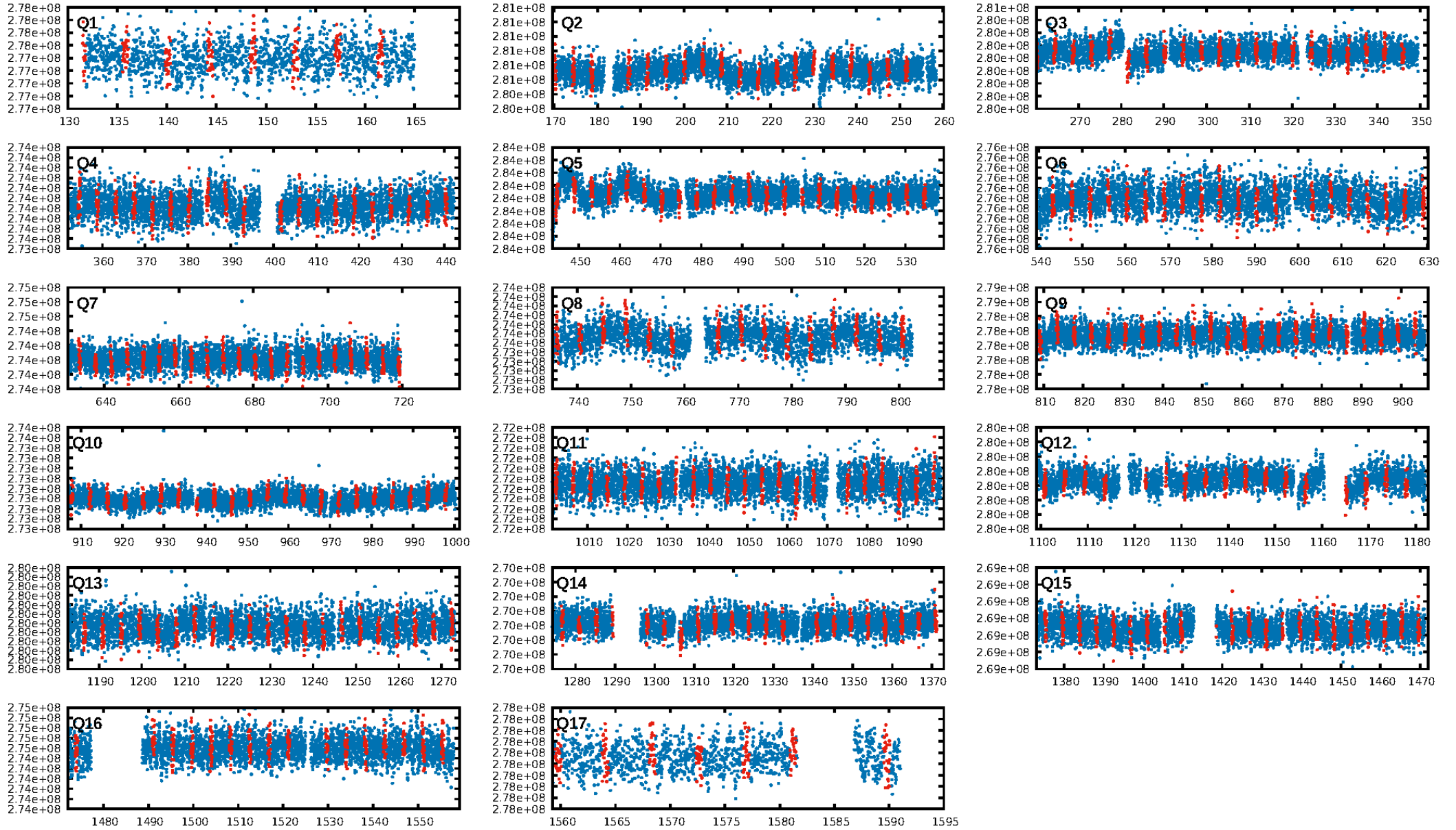
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.77σ]  
LongPeriod-sig: 100.0% [141.89σ]  
ModelChiSquare2-sig: 14.5%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 2.03e-11**  
RollingBand-fgt: 0.96 [141/147]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.769 arcsec [1.23σ]  
KicOffset-rm: 0.811 arcsec [1.36σ]  
OotOffset-st: 4/4/4/4 [16]  
KicOffset-st: 4/4/4/4 [16]  
DiffImageQuality-fgm: 0.38 [6/16]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:34:07 Z

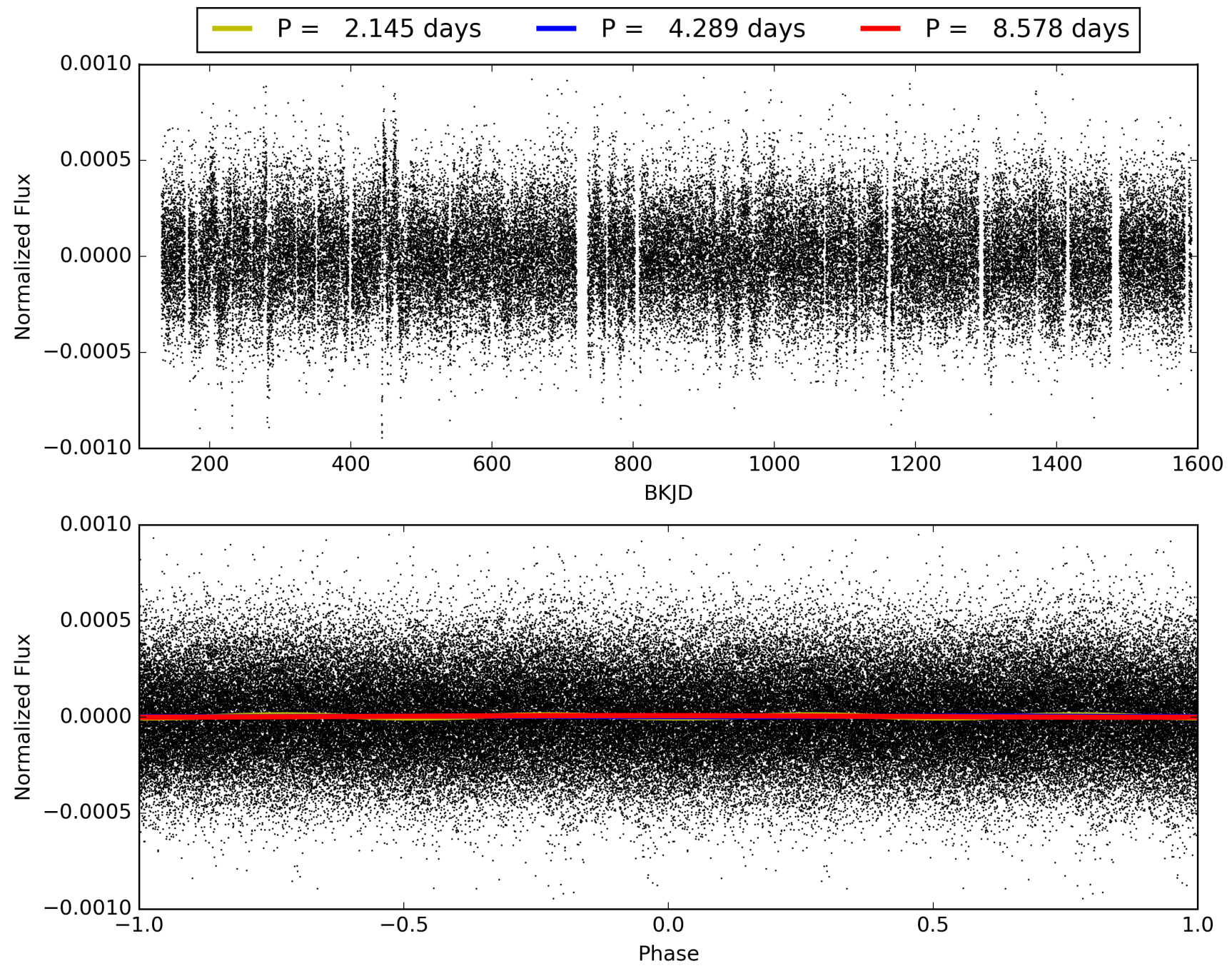
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003547523-03, PDC Light Curves





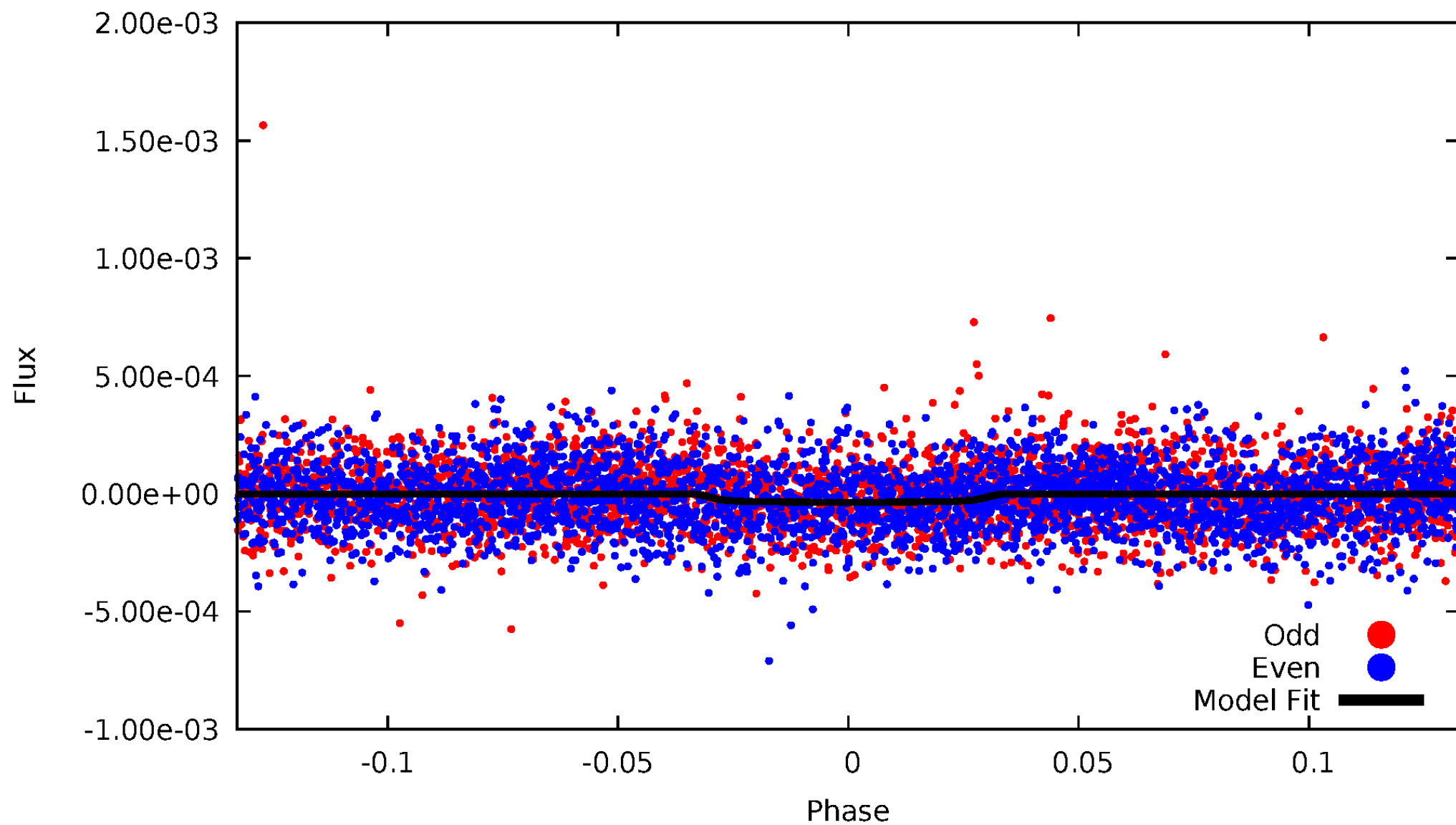
TCE 003547523-03





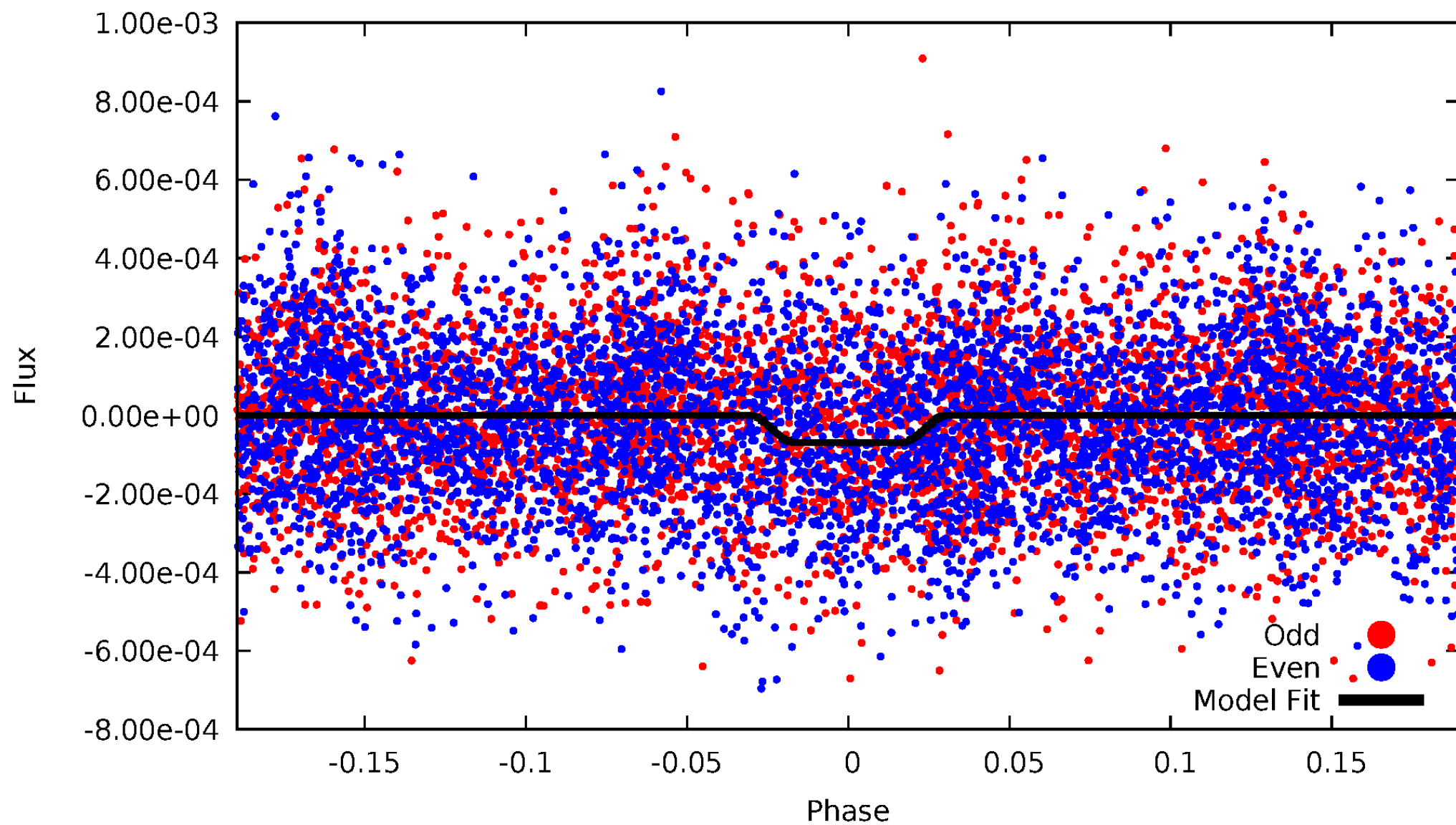
# DV Odd/Even

TCE 003547523-03



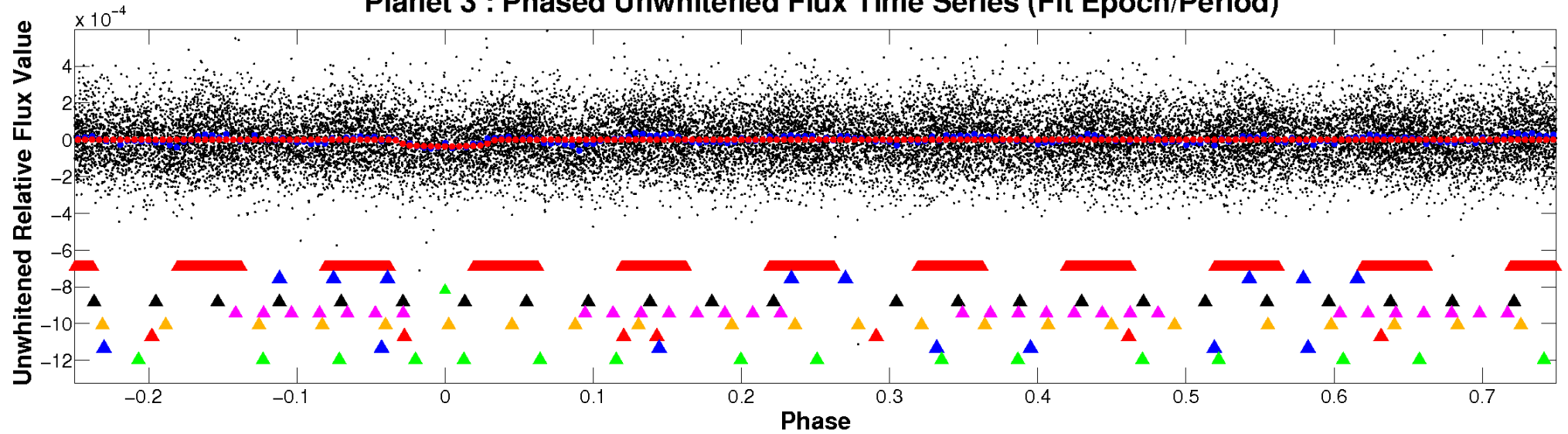
# ALT Odd/Even

TCE 003547523-03

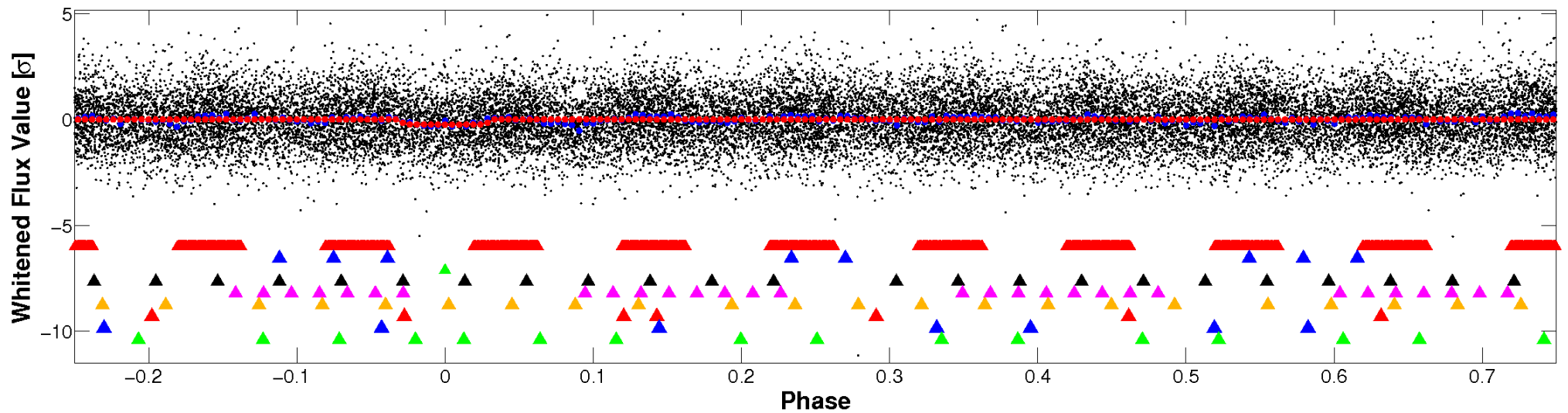


# Non-Whitened Vs. Whitened Light Curve

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

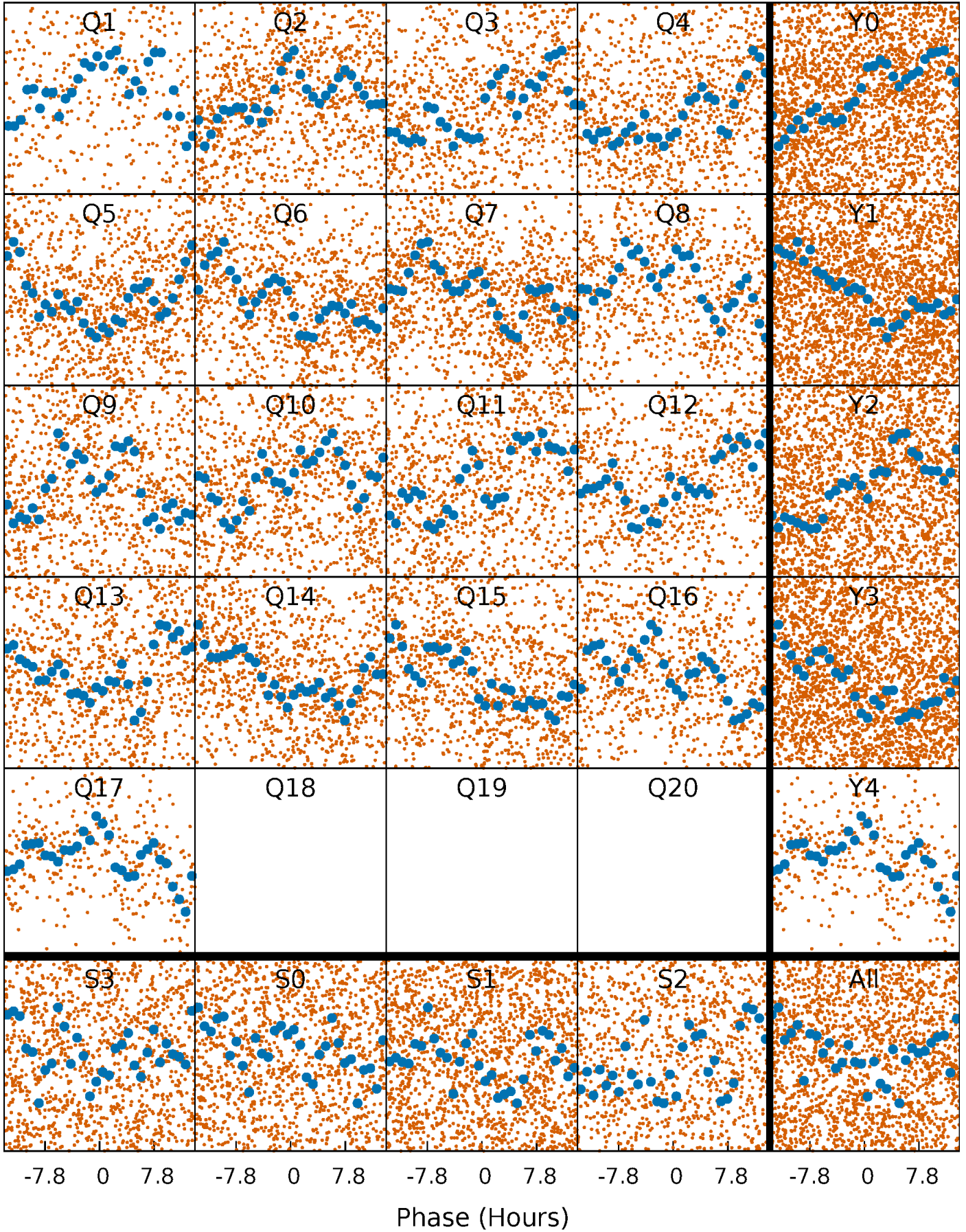


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

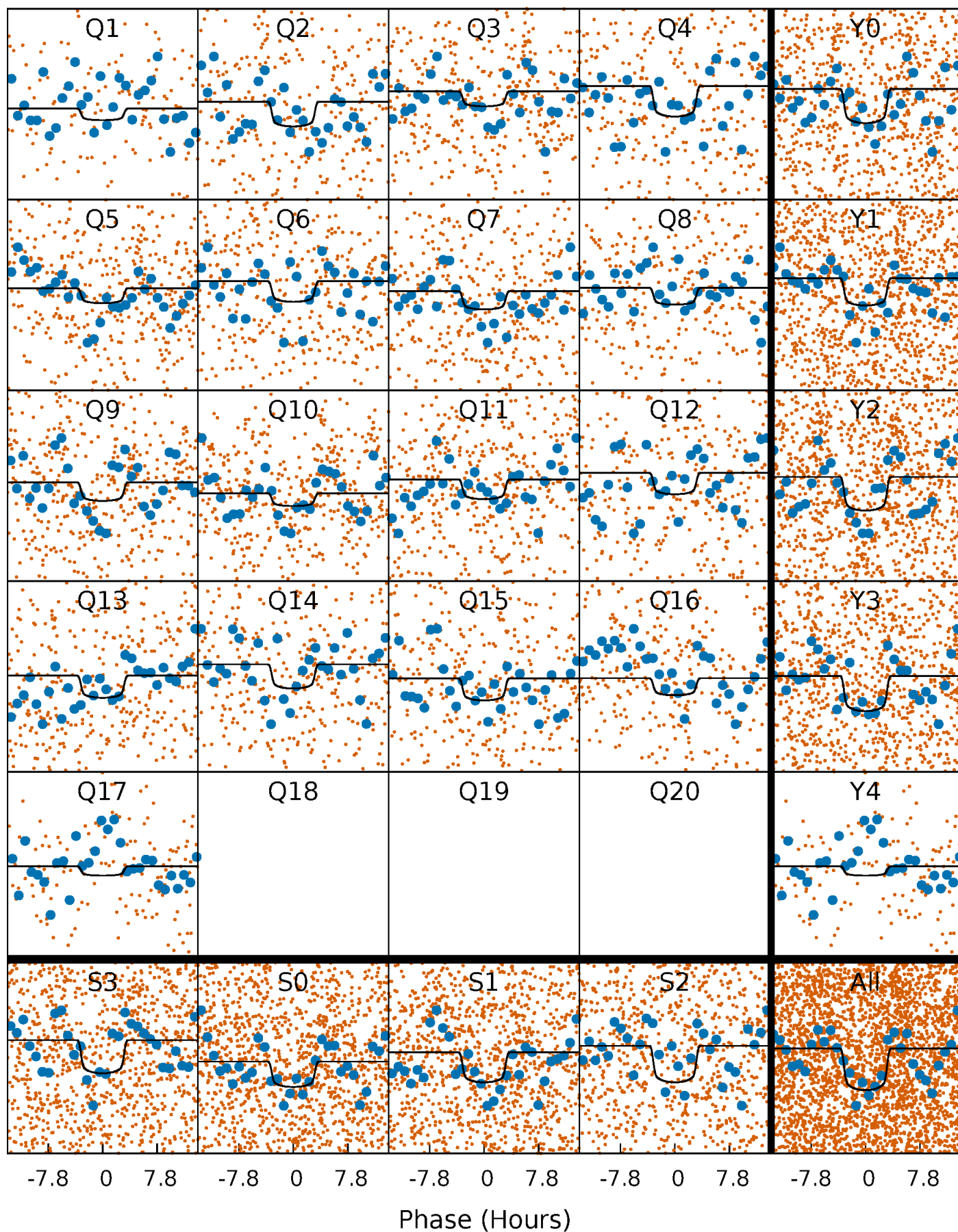
TCE 003547523-03   P= 4.289079 Days    $T_0=131.505412$  (BKJD)





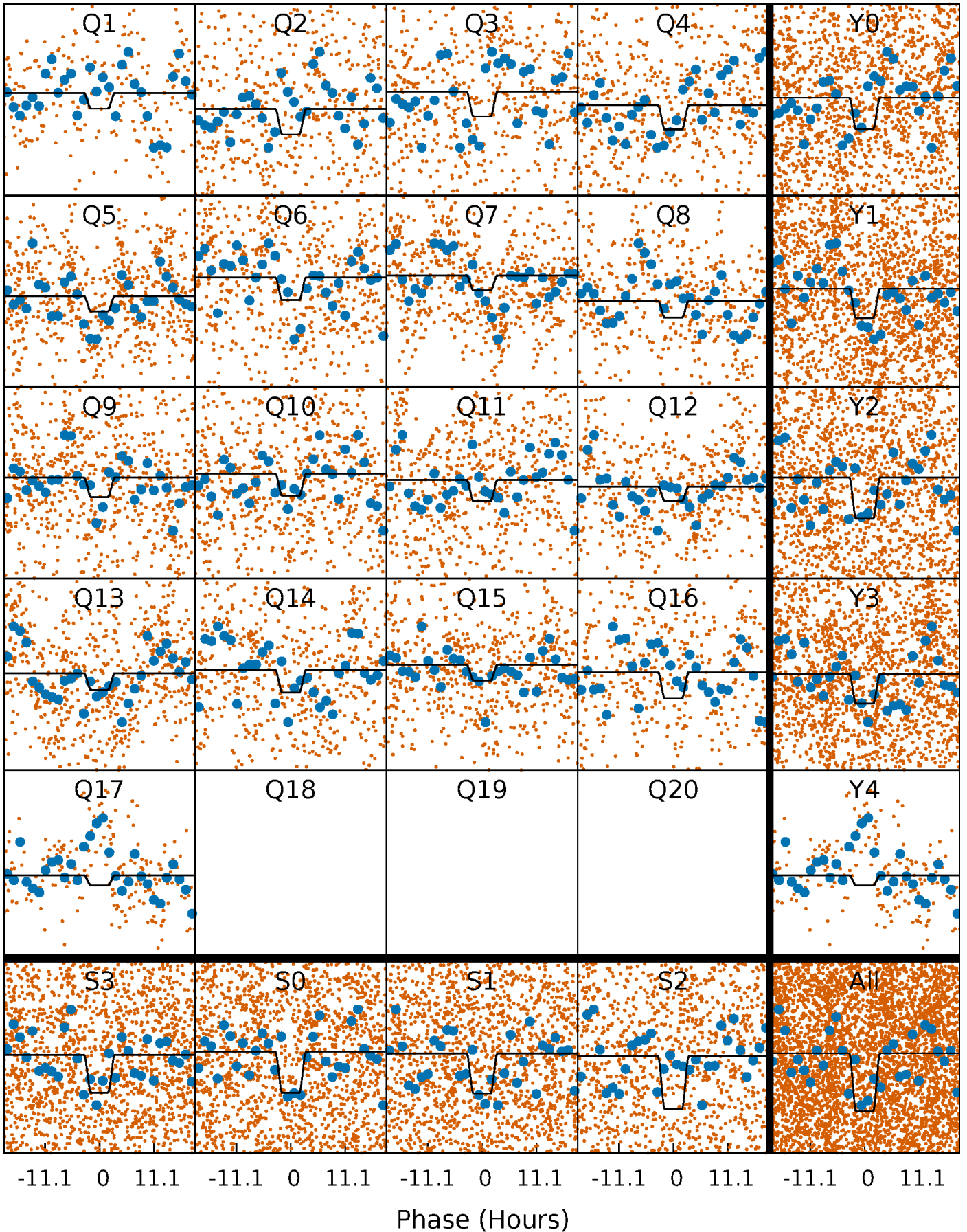
# DV Quarter-Phased Transit Curves

TCE 003547523-03 P= 4.289079 Days  $T_0=131.505412$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003547523-03 P= 4.288852 Days  $T_0=131.564043$  (BKJD)

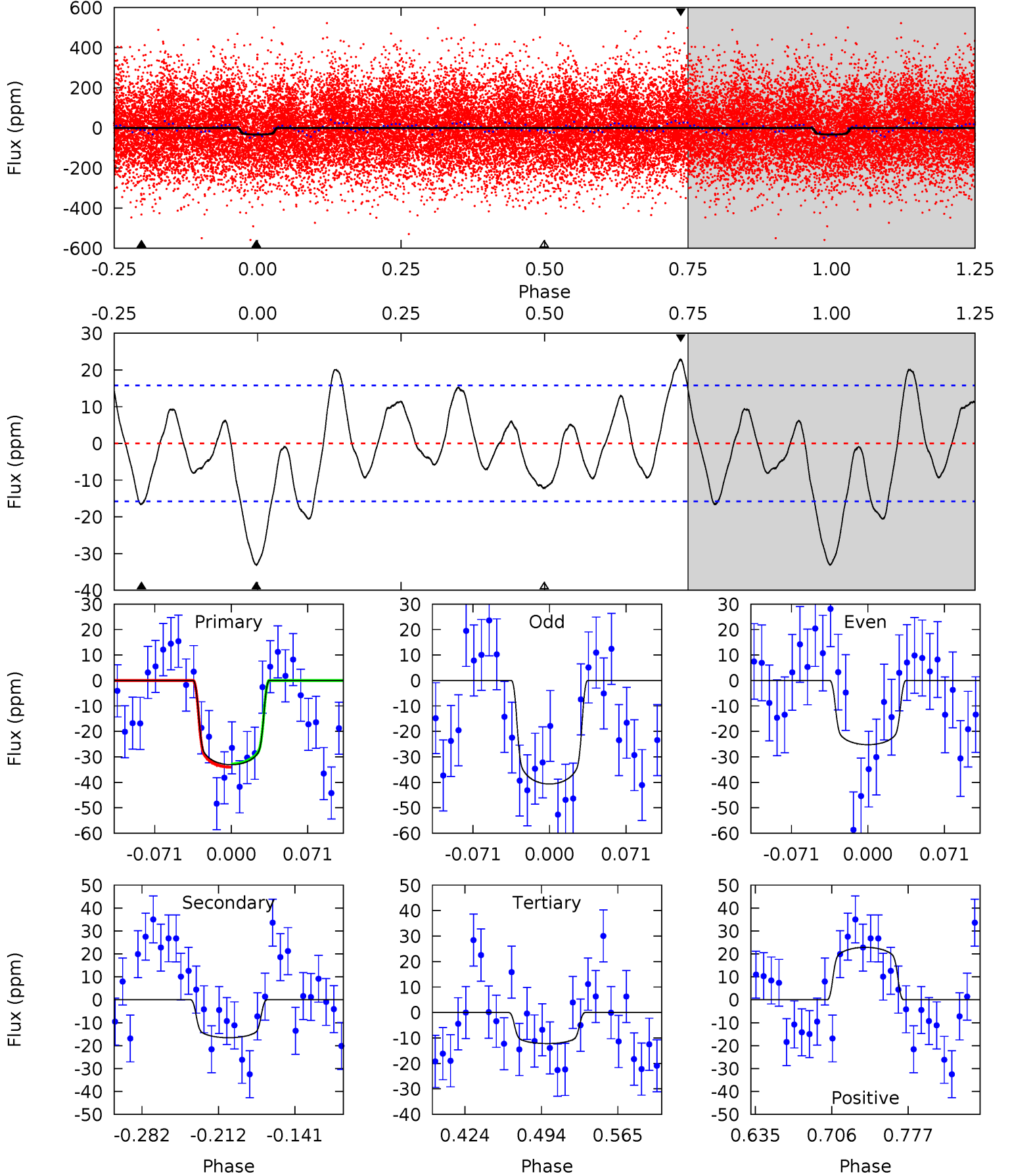




# DV Model-Shift Uniqueness Test

003547523-03, P = 4.289079 Days, E = 131.505412 Days

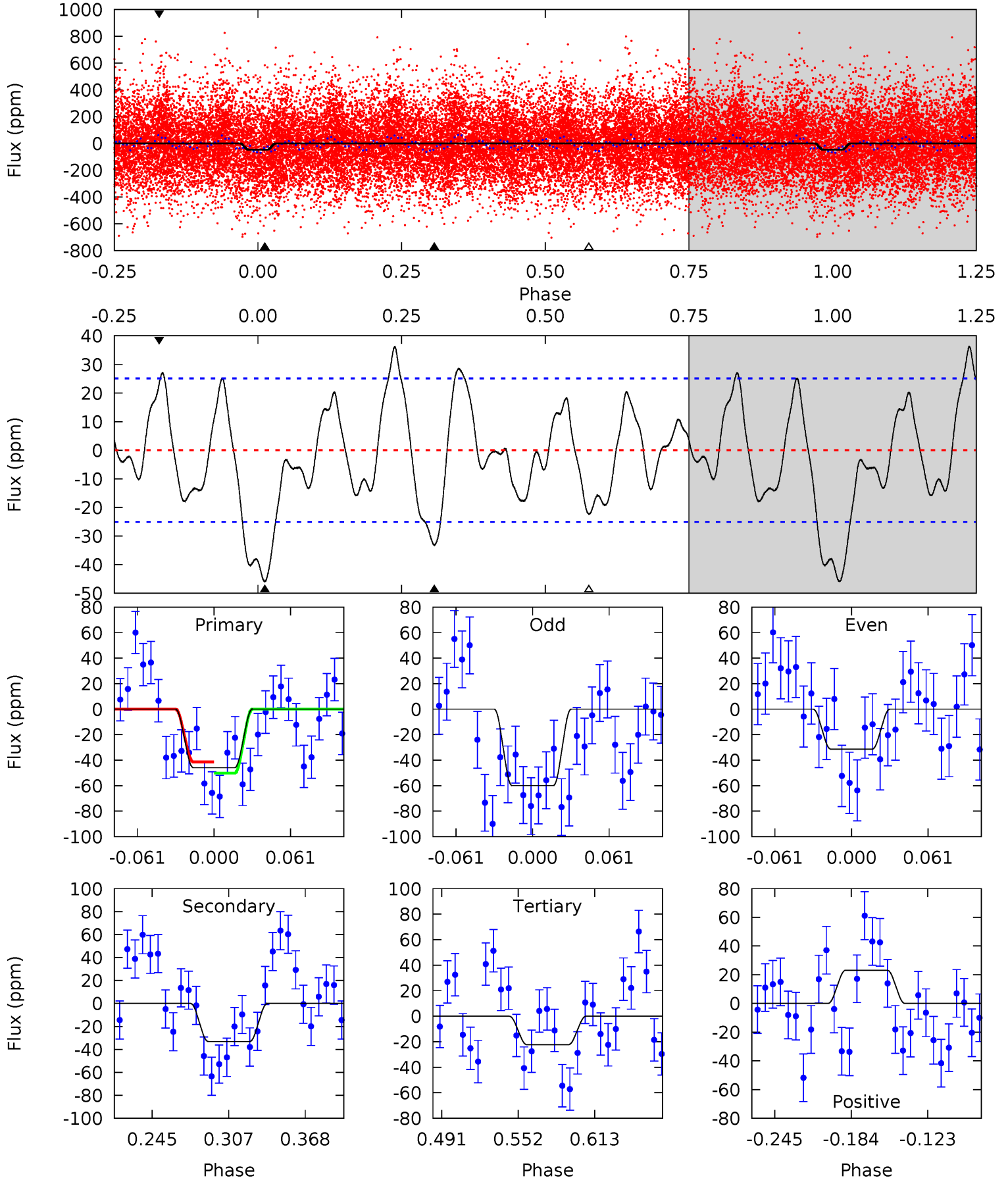
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.72	4.86	3.58	6.71	4.64	1.81	2.79	6.14	3.01	1.28	-1.85	2.28	0.64	0.41	0.19



# Alt Model-Shift Uniqueness Test

003547523-03, P = 4.28852 Days, E = 131.564043 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.53	6.16	4.16	4.31	4.67	1.87	2.50	4.37	4.22	2.00	1.85	2.66	0.86	0.44	0.82



### Stellar Parameters For KIC 003547523

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7543^{+235}_{-314}$	$4.017^{+0.187}_{-0.153}$	$-0.060^{+0.200}_{-0.300}$	$2.115^{+0.533}_{-0.533}$	$1.695^{+0.212}_{-0.282}$	$0.252^{+0.261}_{-0.110}$
	+3%/-4%	+5%/-4%	+333%/-500%	+25%/-25%	+13%/-17%	+103%/-44%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003547523-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-17 \pm 3$	$1.56^{+0.30}_{-0.31}$	$2704^{+197}_{-199}$	$5703^{+567}_{-477}$	$14^{+9}_{-4}$
Alt.	$-33 \pm 5$	$1.92^{+0.31}_{-0.32}$	$2712^{+185}_{-202}$	$6105^{+509}_{-398}$	$19^{+9}_{-6}$

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

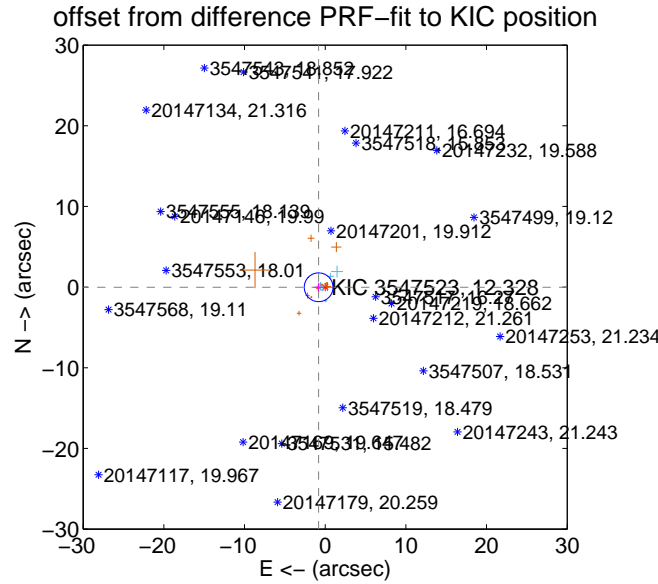
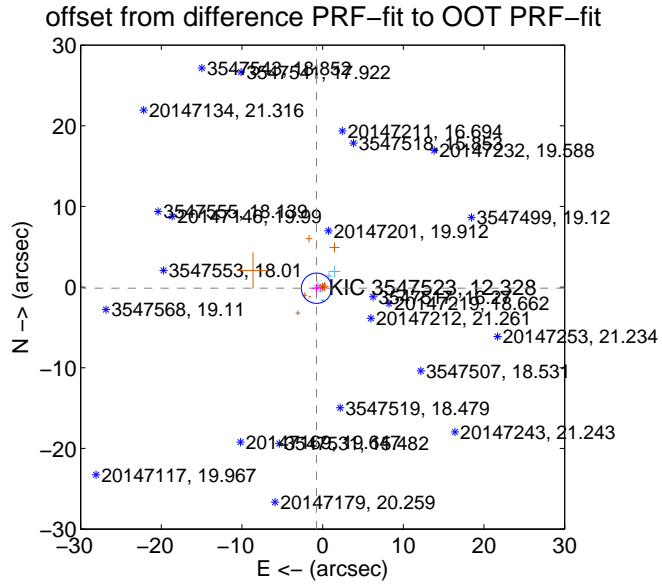
## DV Centroid Data

Supplemental centroid analysis for 003547523-03. Kepler magnitude: 12.33. Transit SNR 7.95

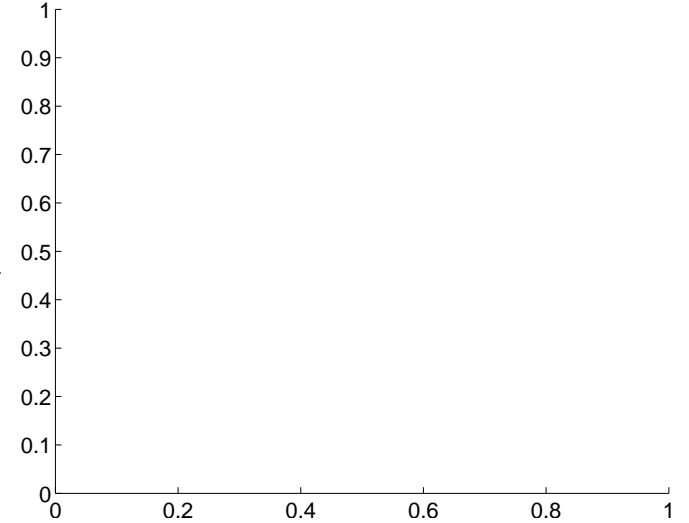
There are 6 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.769 \pm 0.626$	1.23	$0.756 \pm 0.614$	$-0.139 \pm 0.546$
PRF-fit source offset from KIC position	$0.811 \pm 0.594$	1.36	$0.810 \pm 0.592$	$-0.021 \pm 0.574$
photometric centroid source offset	—	—	—	—

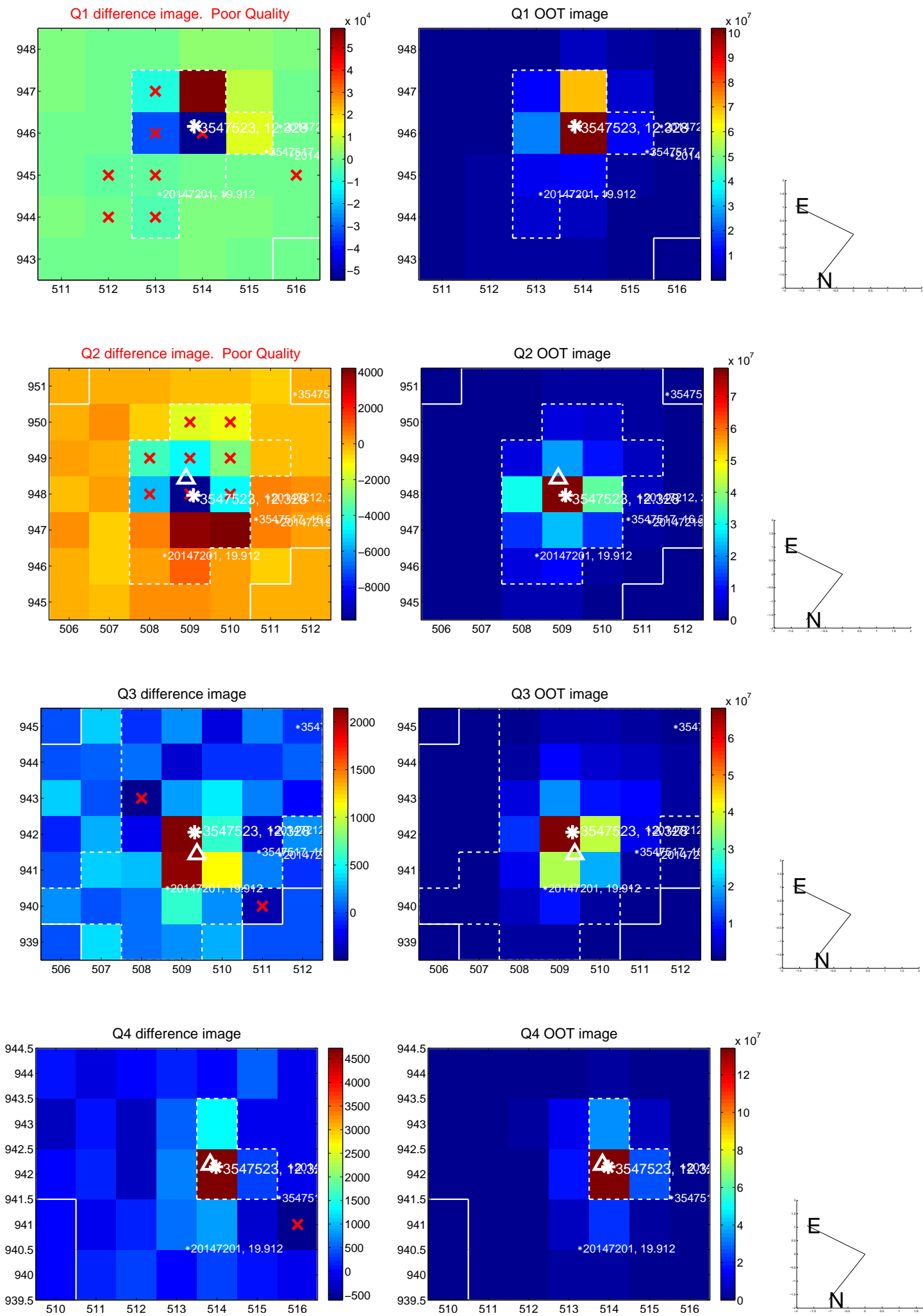


There are no photometric centroids

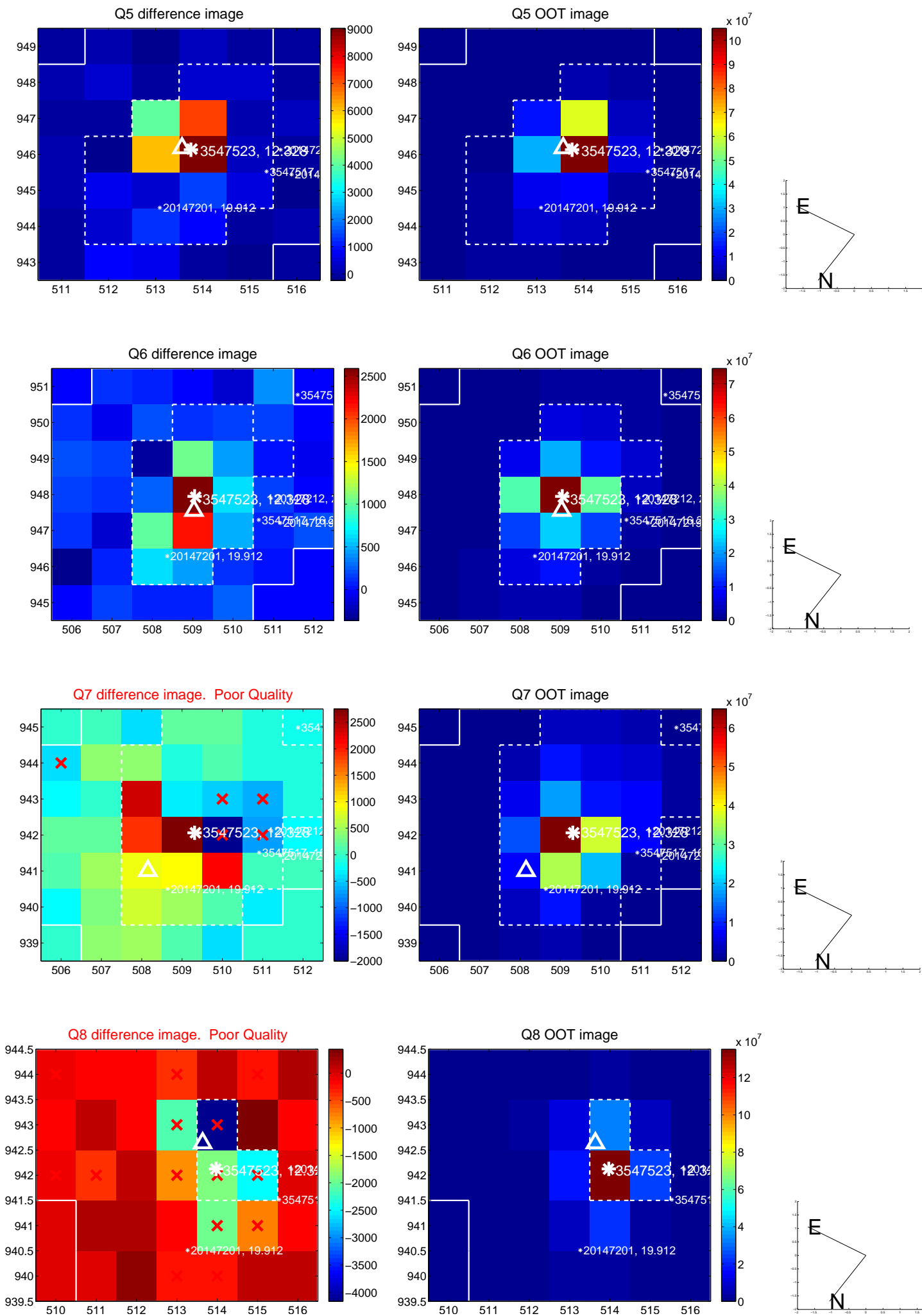


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

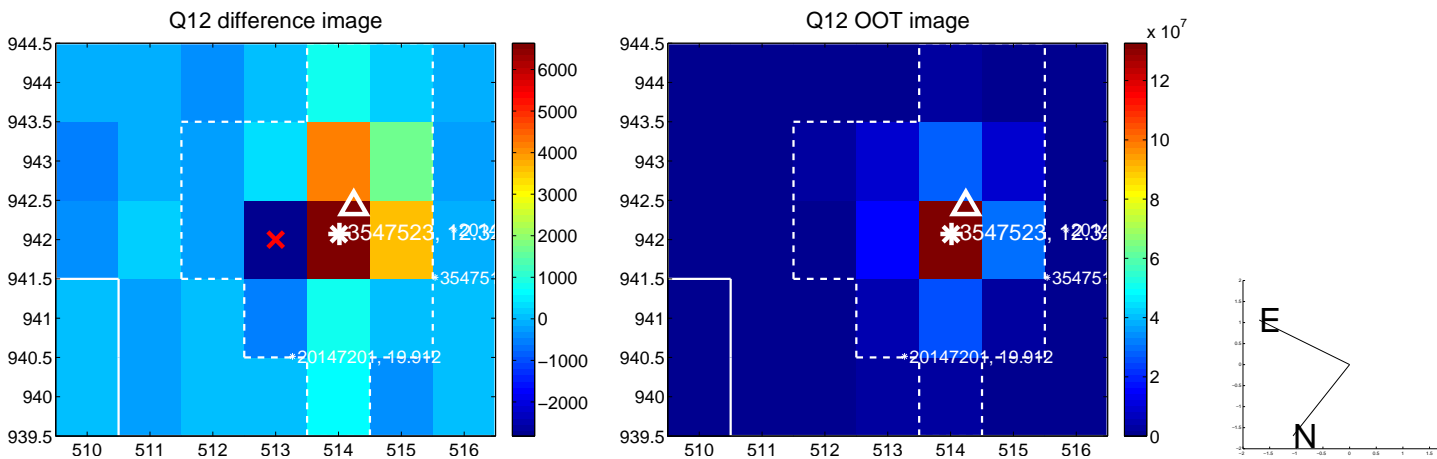
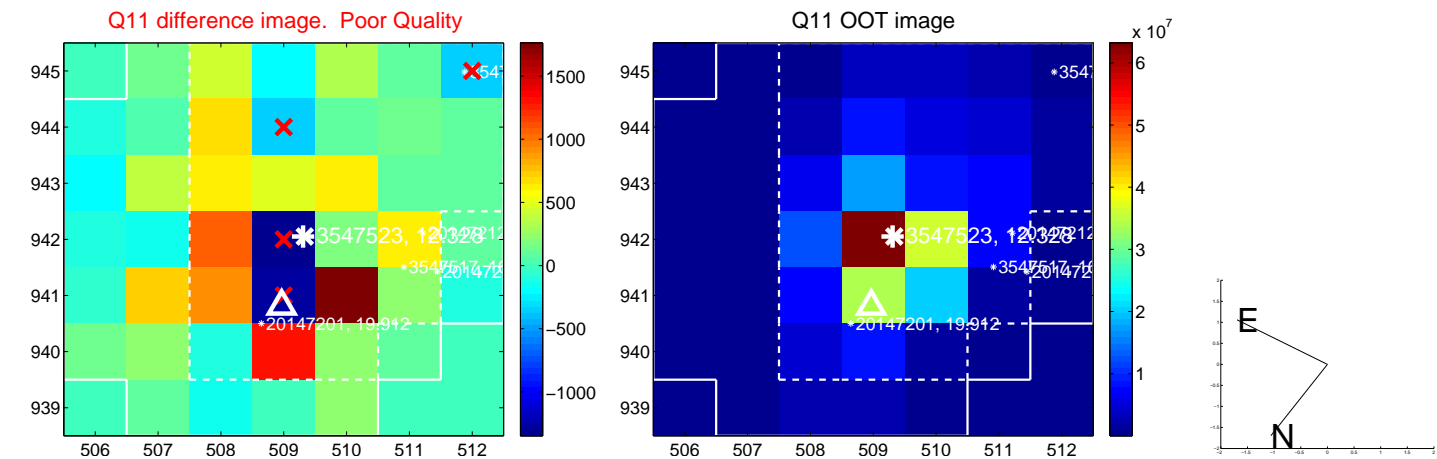
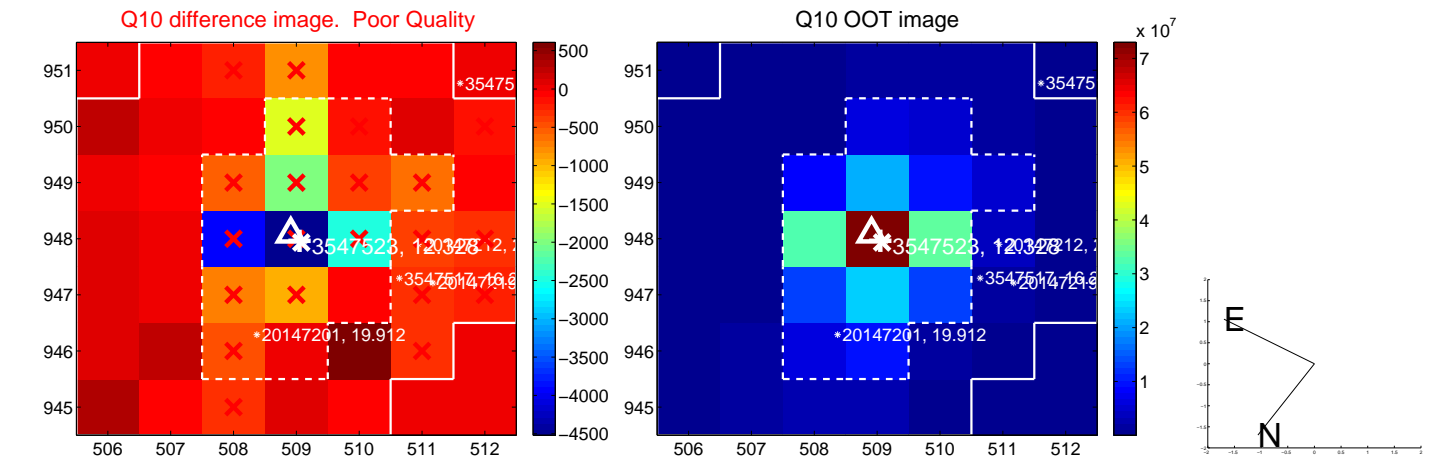
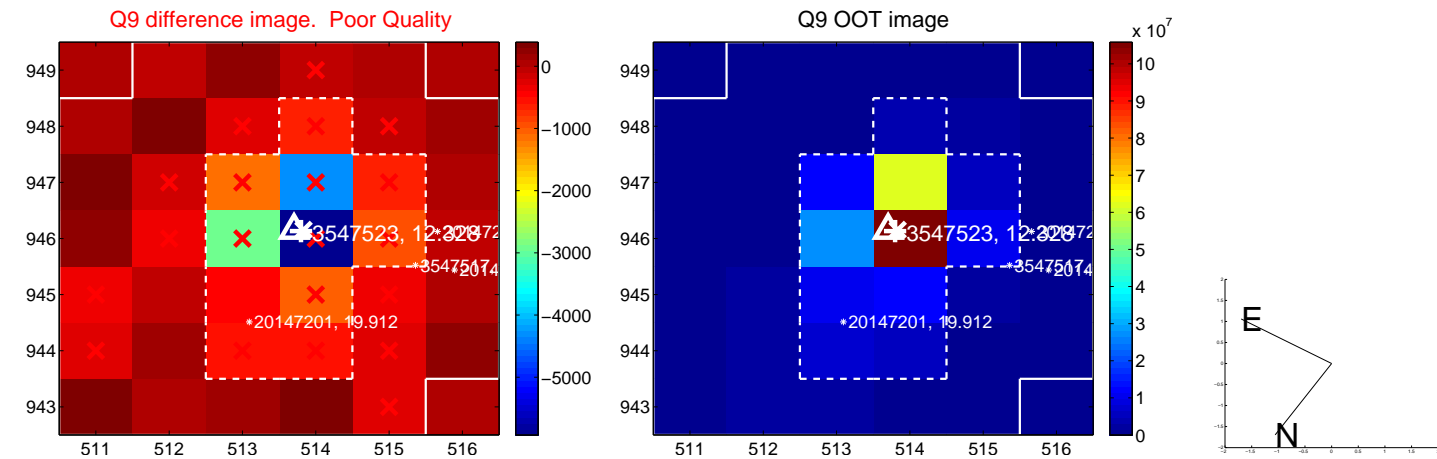


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

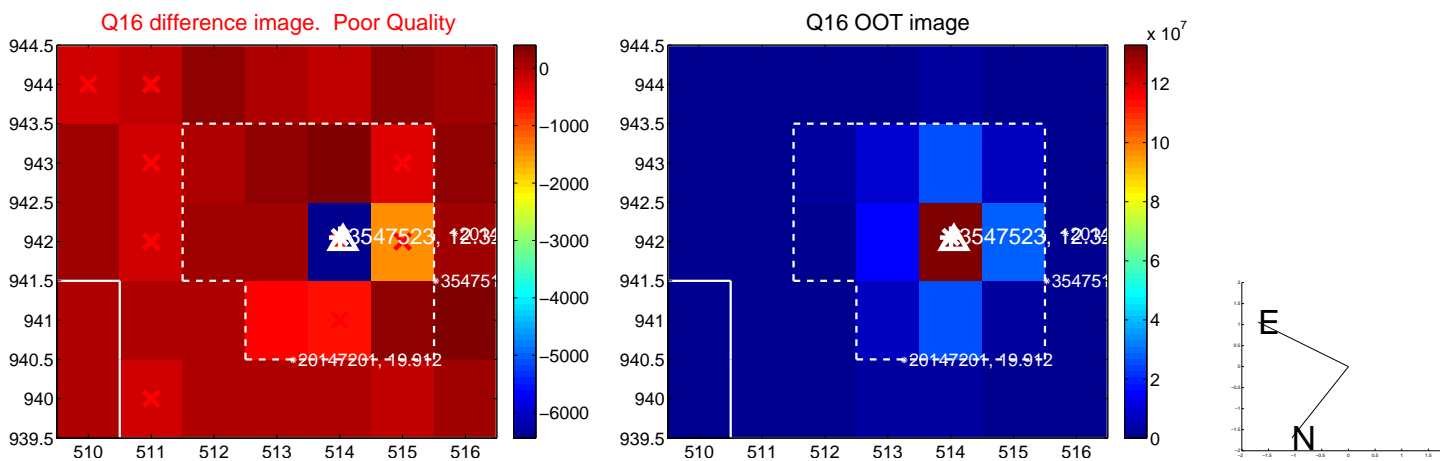
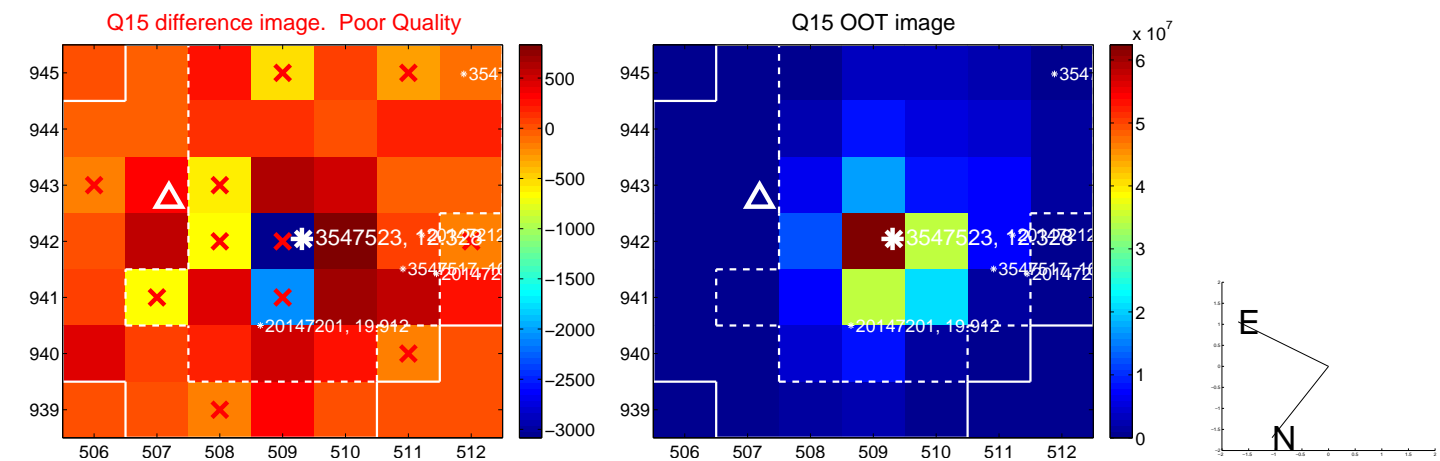
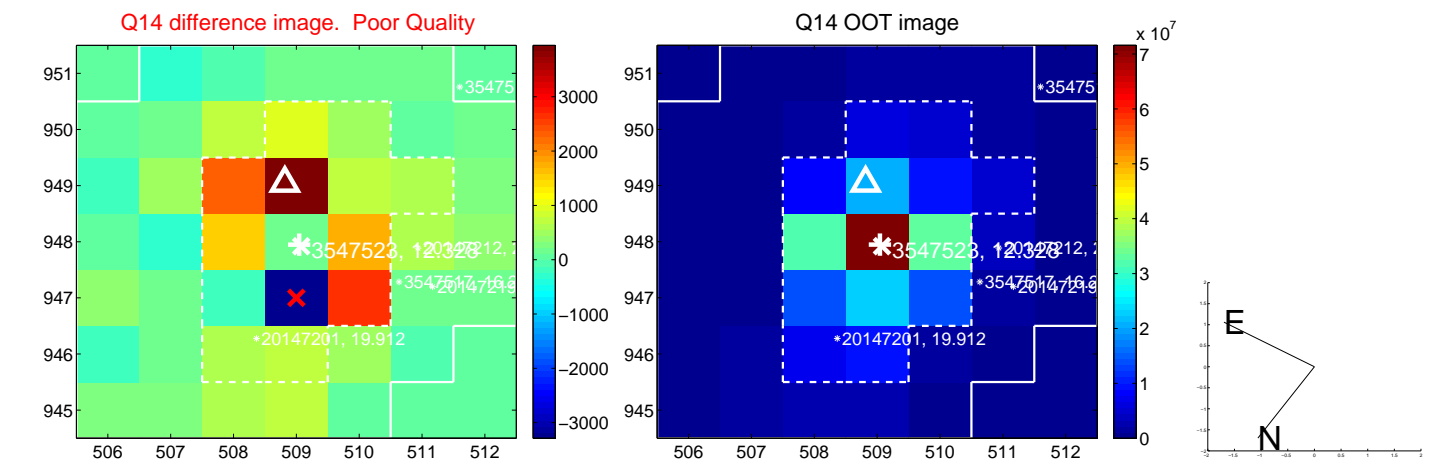
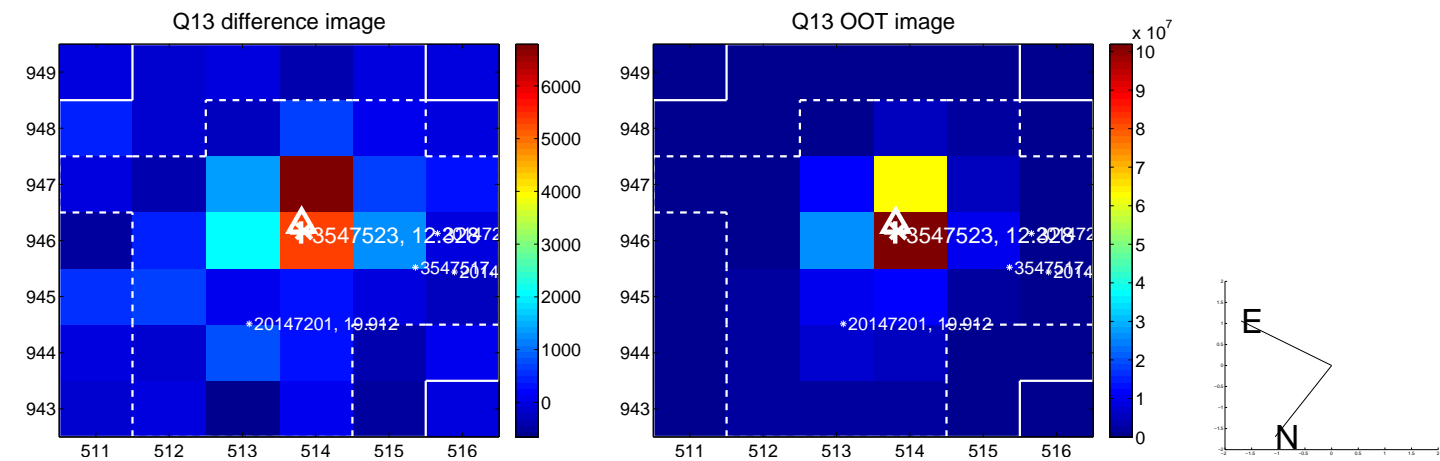




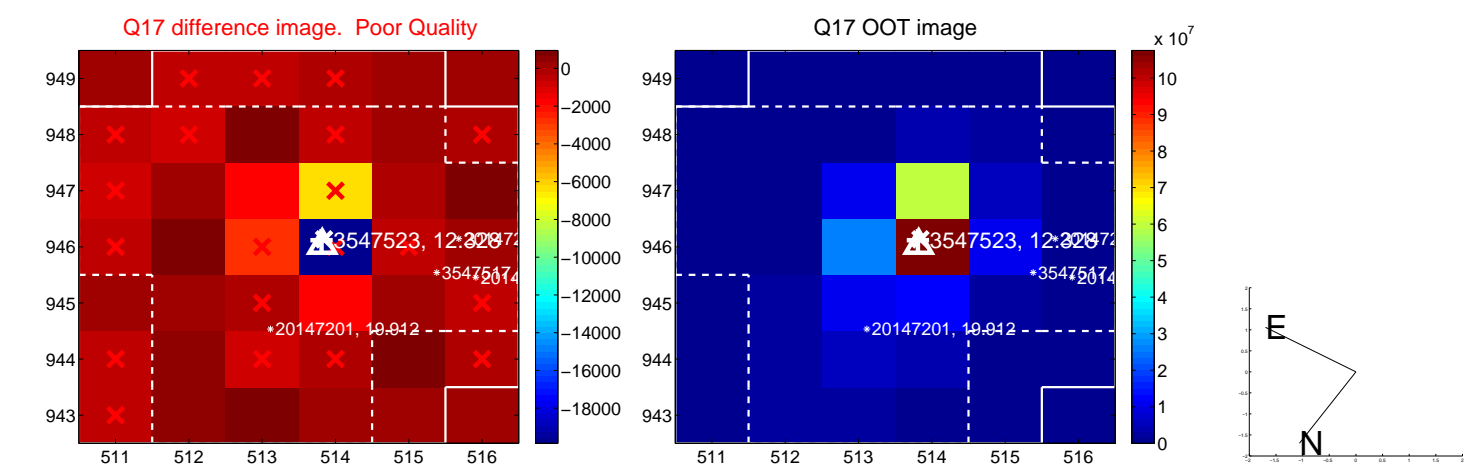
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

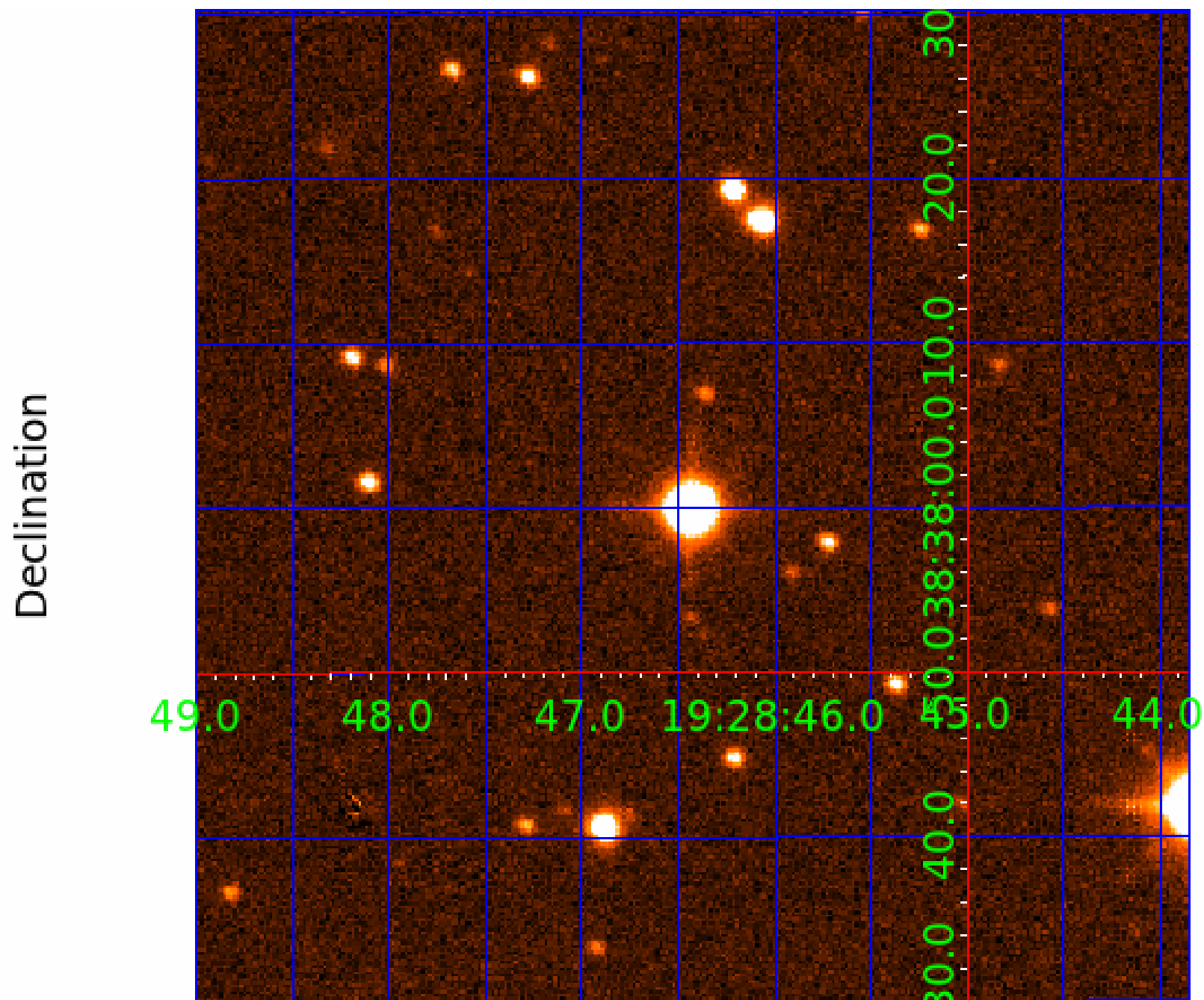


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image



## KIC 003547523

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003547523-01	OBS	No	1.286558	131.774714	21.4	6.273	9.4	10.8	2.12	7543	1.13	17010.03
003547523-02	OBS	No	170.081357	281.456755	154.3	3.405	10.3	4.6	2.12	7543	2.97	25.26
003547523-03	OBS	No	4.289079	131.505412	36.0	6.831	8.0	7.9	2.12	7543	1.58	3415.54
003547523-04	OBS	No	64.515001	141.389924	133.7	5.114	7.9	7.7	2.12	7543	2.73	91.99
003547523-05	OBS	No	48.272360	144.778101	148.8	2.948	8.6	8.6	2.12	7543	2.87	135.42
003547523-06	OBS	No	67.256610	149.491828	257.1	3.132	7.8	8.1	2.12	7543	3.90	87.02
003547523-07	OBS	No	213.723127	282.236258	225.9	3.273	8.3	7.3	2.12	7543	3.67	18.63
003547523-08	OBS	No	226.517683	180.912141	209.7	5.031	7.4	7.7	2.12	7543	3.39	17.24
003547523-09	OBS	No	93.778528	135.848958	265.1	2.254	7.6	8.4	2.12	7543	3.67	55.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003547523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003547523-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003547523-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
003547523-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
003547523-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003547523-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—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.

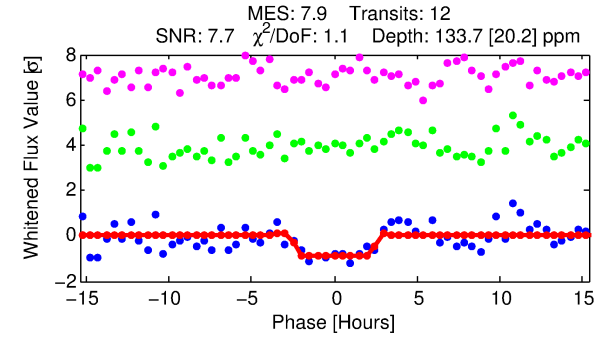
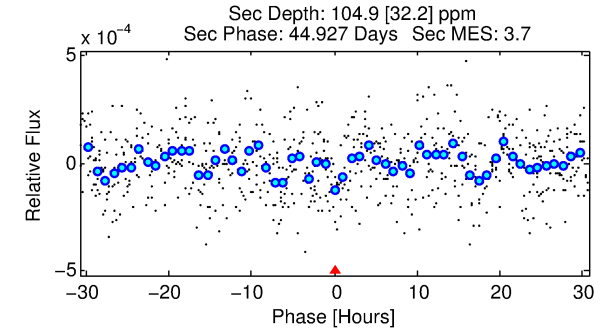
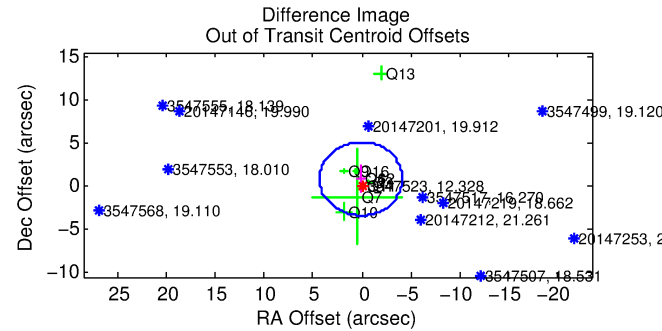
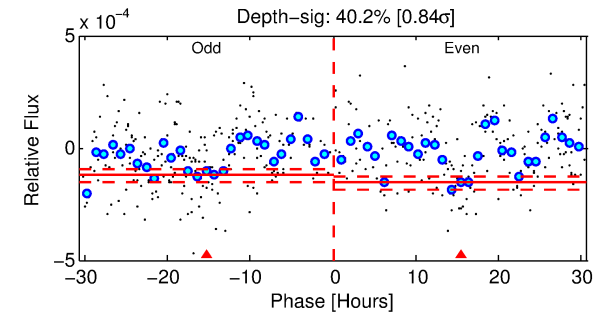
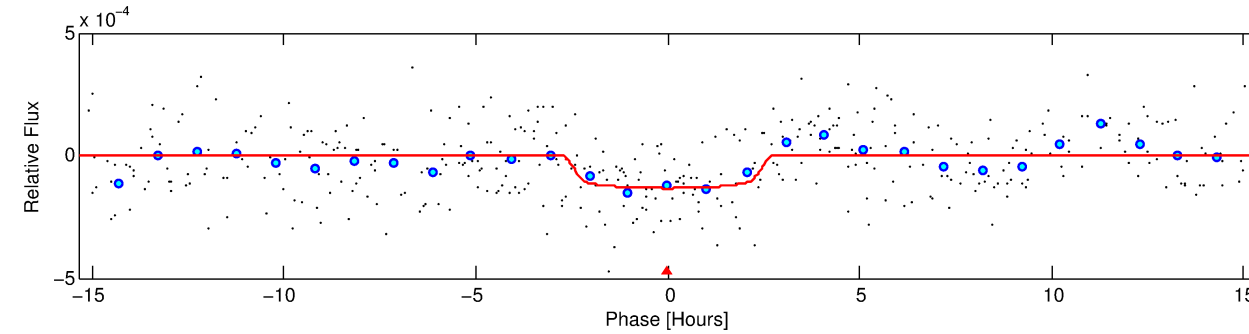
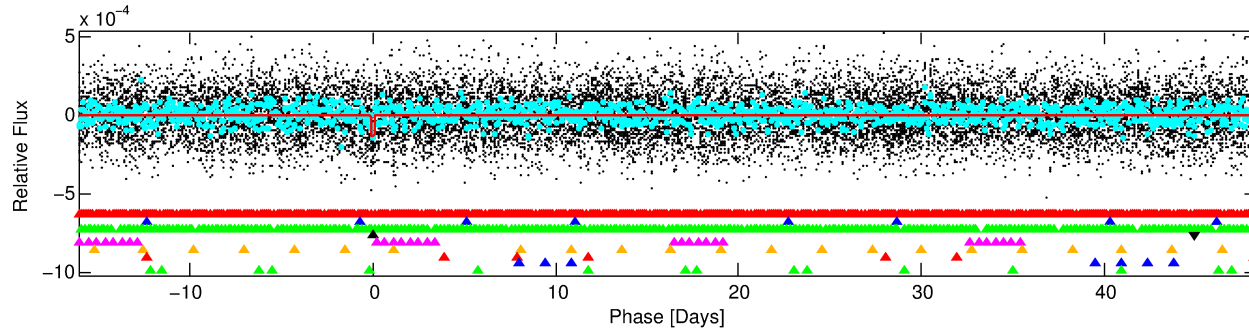
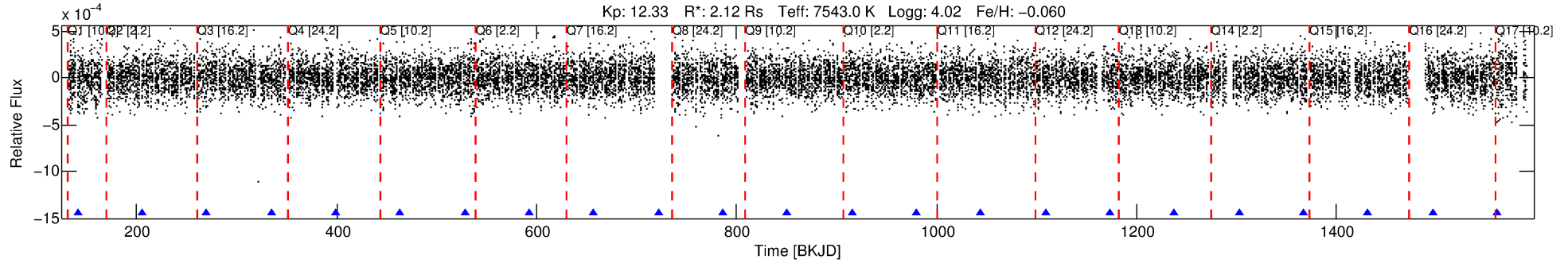
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003547523-04

No Significant Match Found

# DV One-Page Summary

KIC: 3547523 Candidate: 4 of 9 Period: 64.515 d



## DV Fit Results:

Period = 64.51500 [0.00094] d  
Epoch = 141.3899 [0.0123] BKJD  
Rp/R\* = 0.0118 [0.0059]  
a/R\* = 54.58 [174.56]  
b = 0.84 [1.14]  
Seff = 91.99 [34.22]  
Teq = 790 [73] K  
Rp = 2.73 [1.53] Re  
a = 0.3756 [0.0830] AU  
Ag = 1088.77 [1196.40] [0.91 $\sigma$ ]  
Teff = 7013 [1859] K [3.34 $\sigma$ ]

## DV Diagnostic Results:

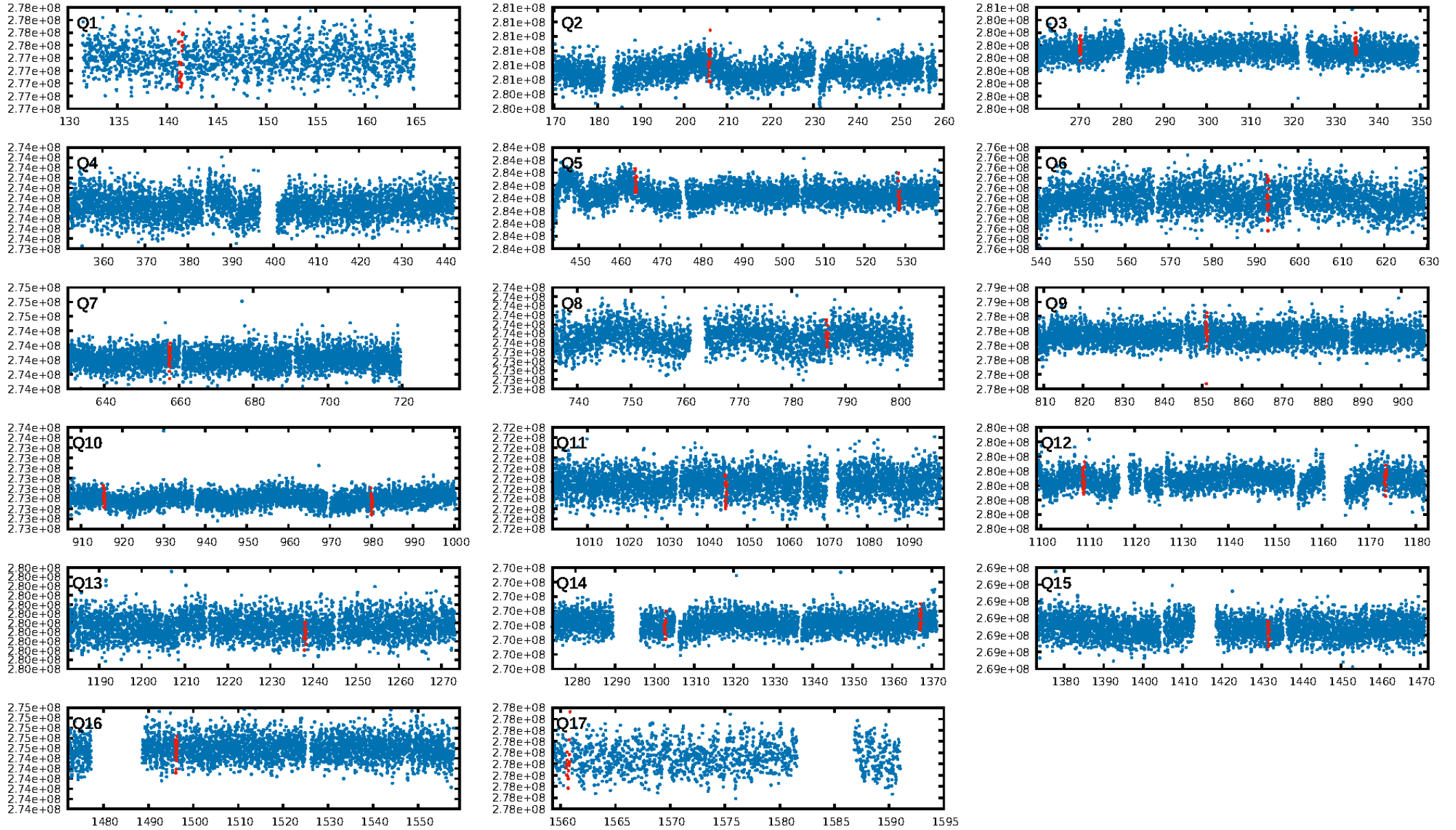
ShortPeriod-sig: 100.0% [66.04 $\sigma$ ]  
LongPeriod-sig: 100.0% [10.97 $\sigma$ ]  
ModelChiSquare2-sig: 76.8%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 6.73e-09**  
RollingBand-fgt: 1.00 [10/10]  
**GhostDiagnostic-chr: -0.04303**  
Centroid-sig: 18.7%  
Centroid-so: 0.821 arcsec [1.02 $\sigma$ ]  
OotOffset-rm: 0.868 arcsec [0.61 $\sigma$ ]  
KicOffset-rm: 0.875 arcsec [0.63 $\sigma$ ]  
OotOffset-st: 2/3/2/2 [9]  
KicOffset-st: 2/3/2/2 [9]  
DiffImageQuality-fgm: 0.44 [4/9]  
DiffImageOverlap-fno: 0.13 [2/15]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:34:13 Z

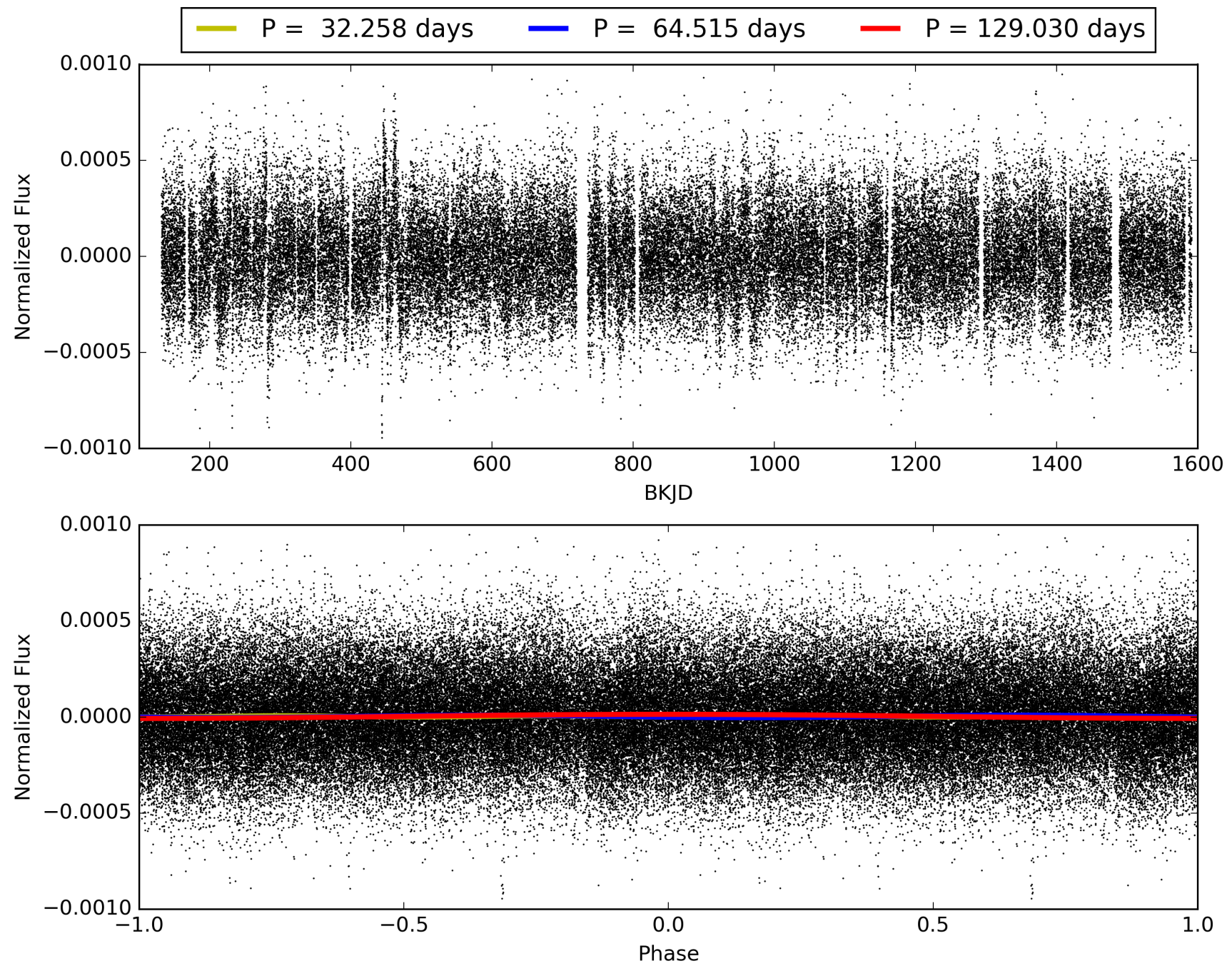
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 003547523-04, PDC Light Curves

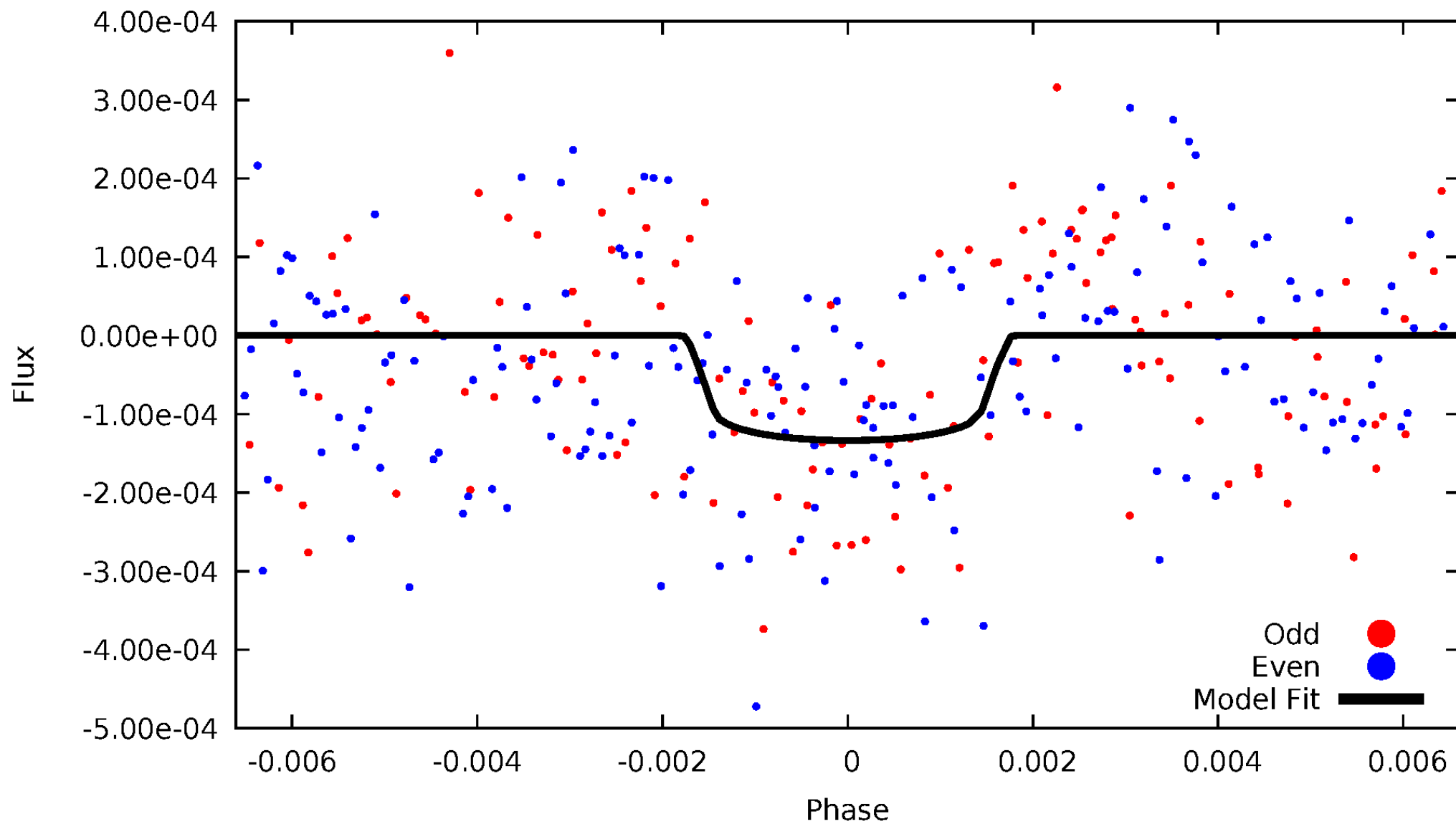


TCE 003547523-04



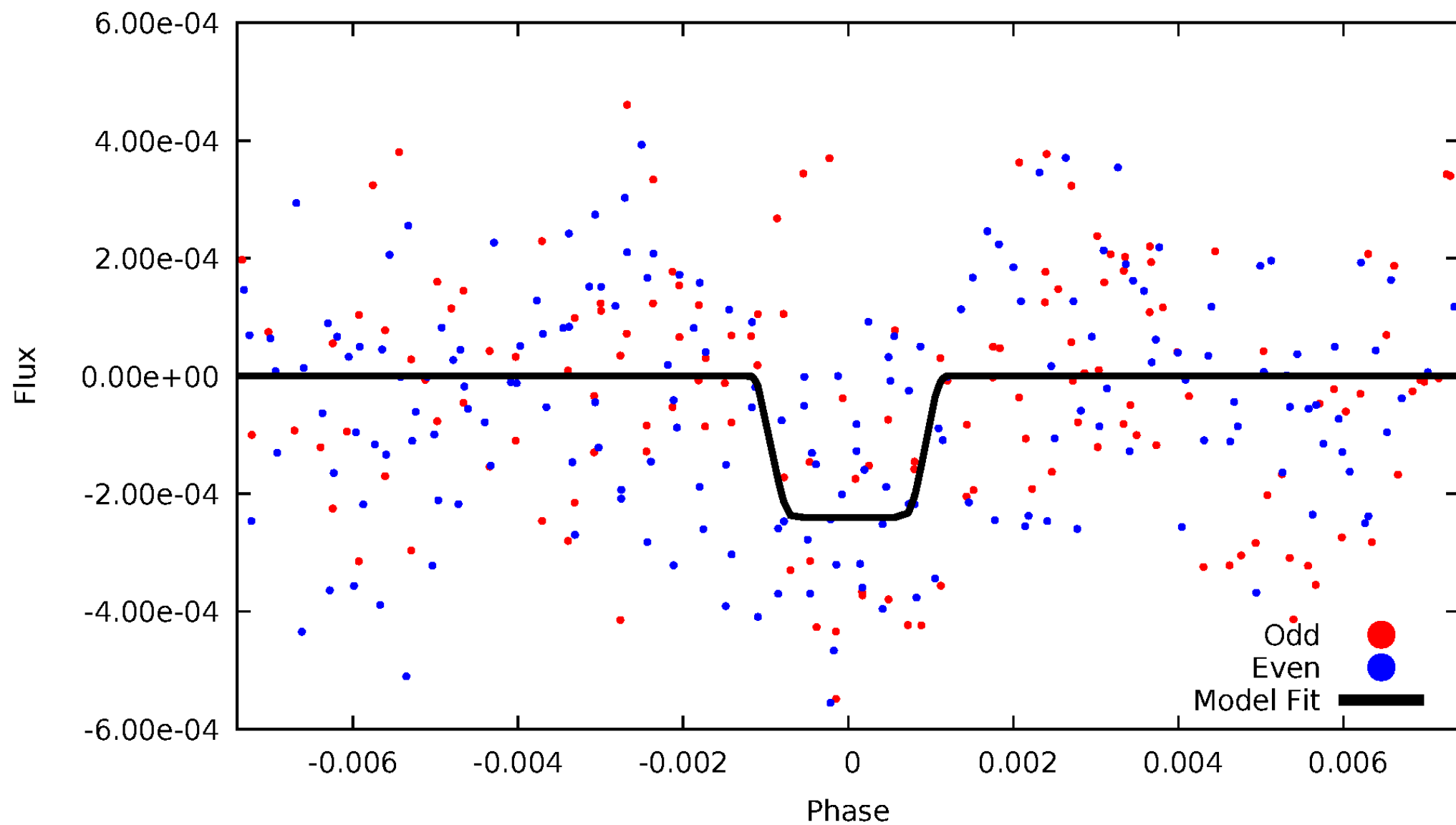
# DV Odd/Even

TCE 003547523-04



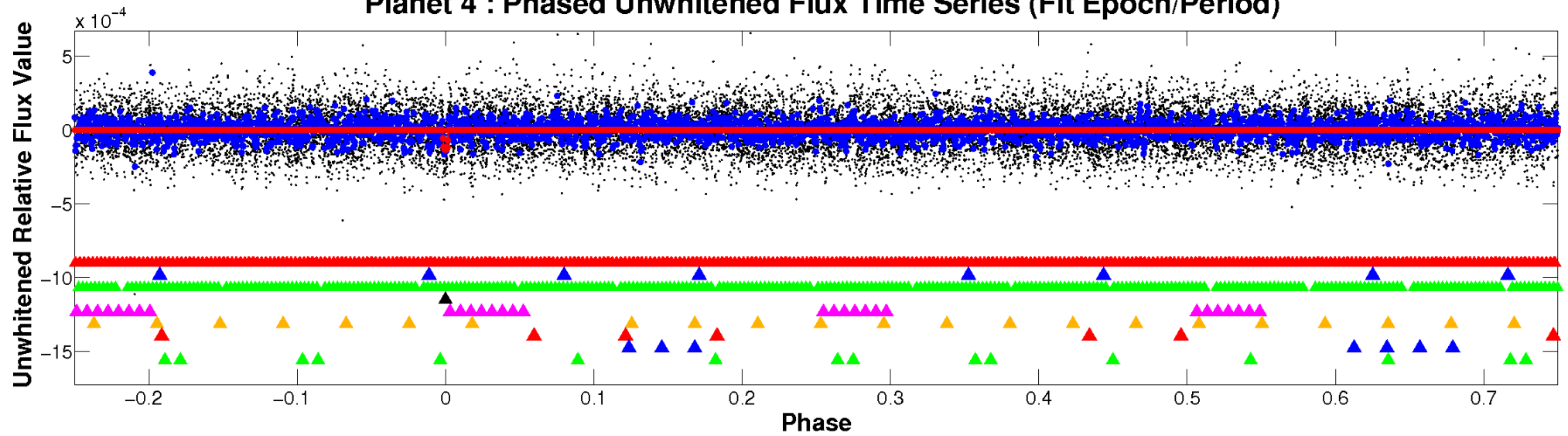
# ALT Odd/Even

TCE 003547523-04

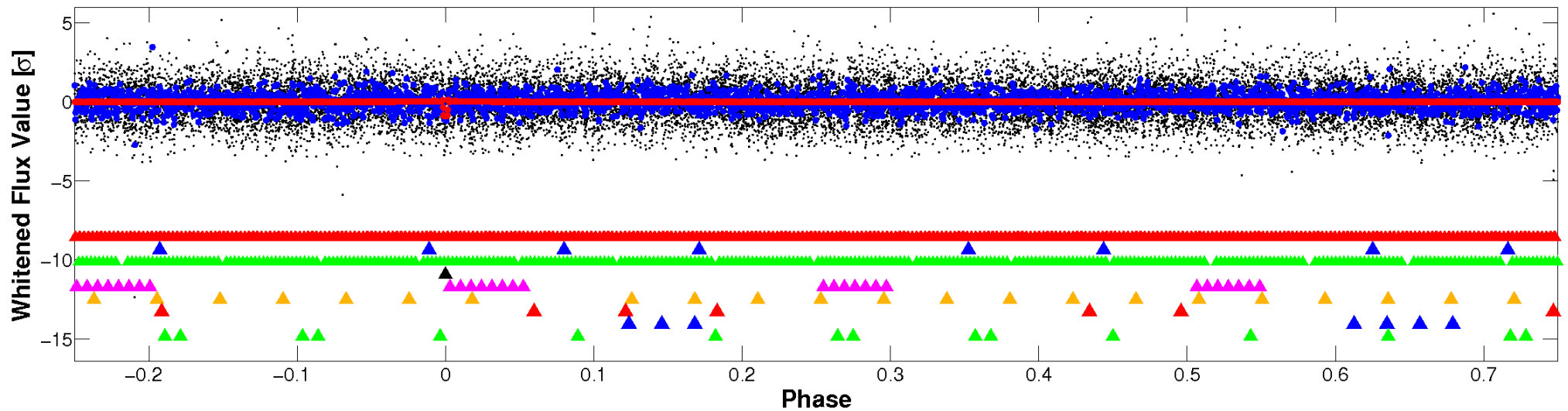


# Non-Whitened Vs. Whitened Light Curve

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

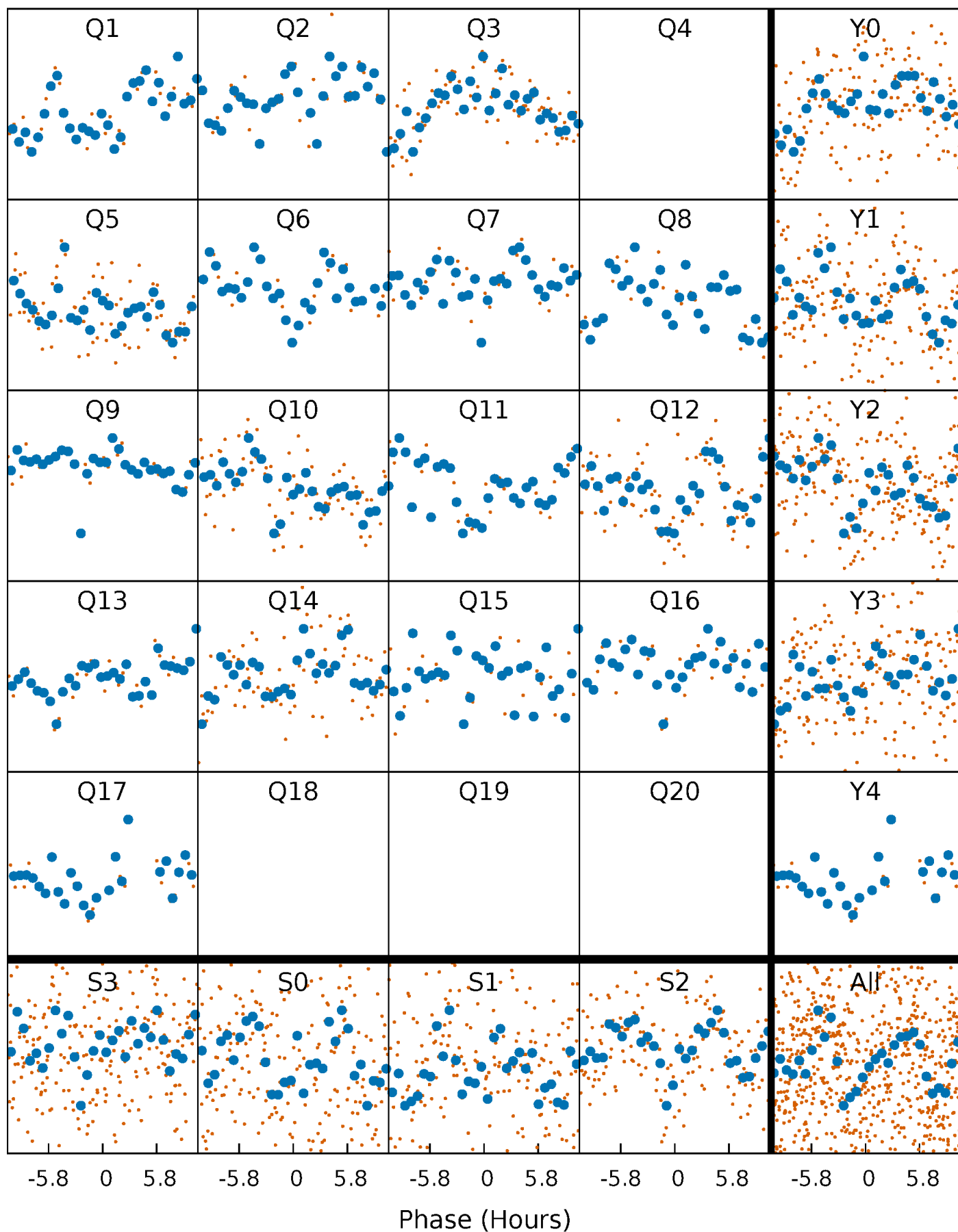


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

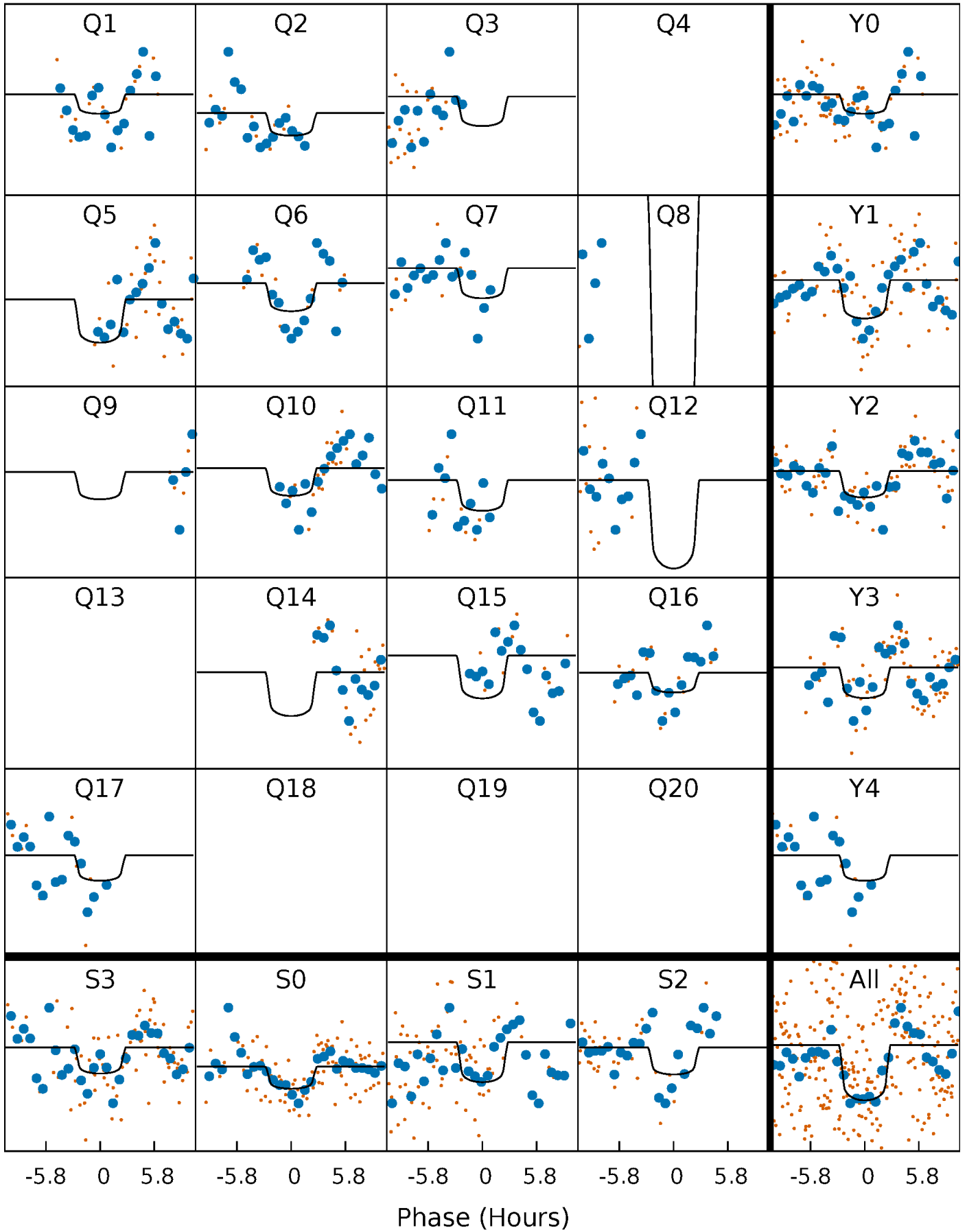
TCE 003547523-04     $P = 64.515001$  Days     $T_0 = 141.389924$  (BKJD)





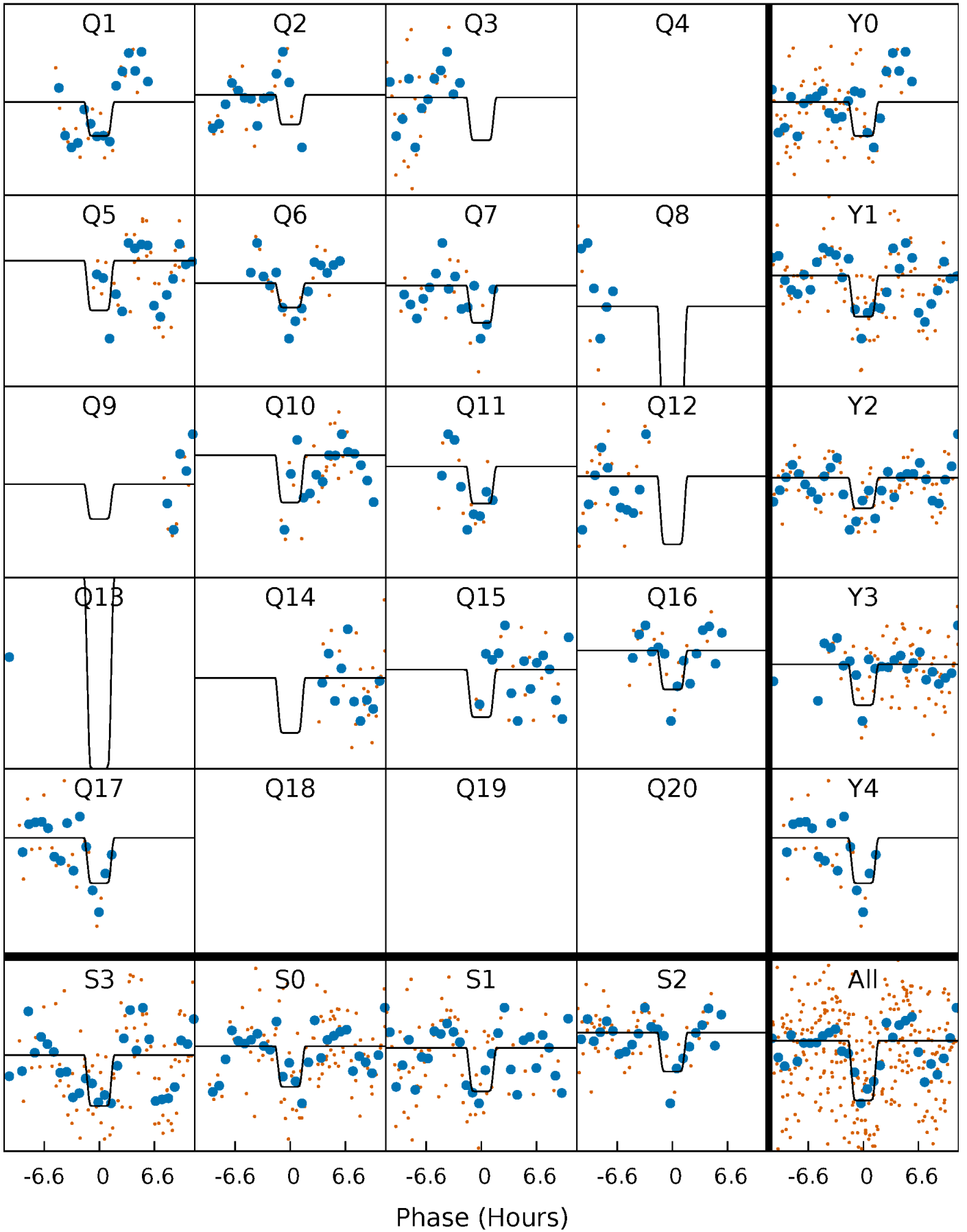
# DV Quarter-Phased Transit Curves

TCE 003547523-04   P= 64.515001 Days    $T_0=141.389924$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

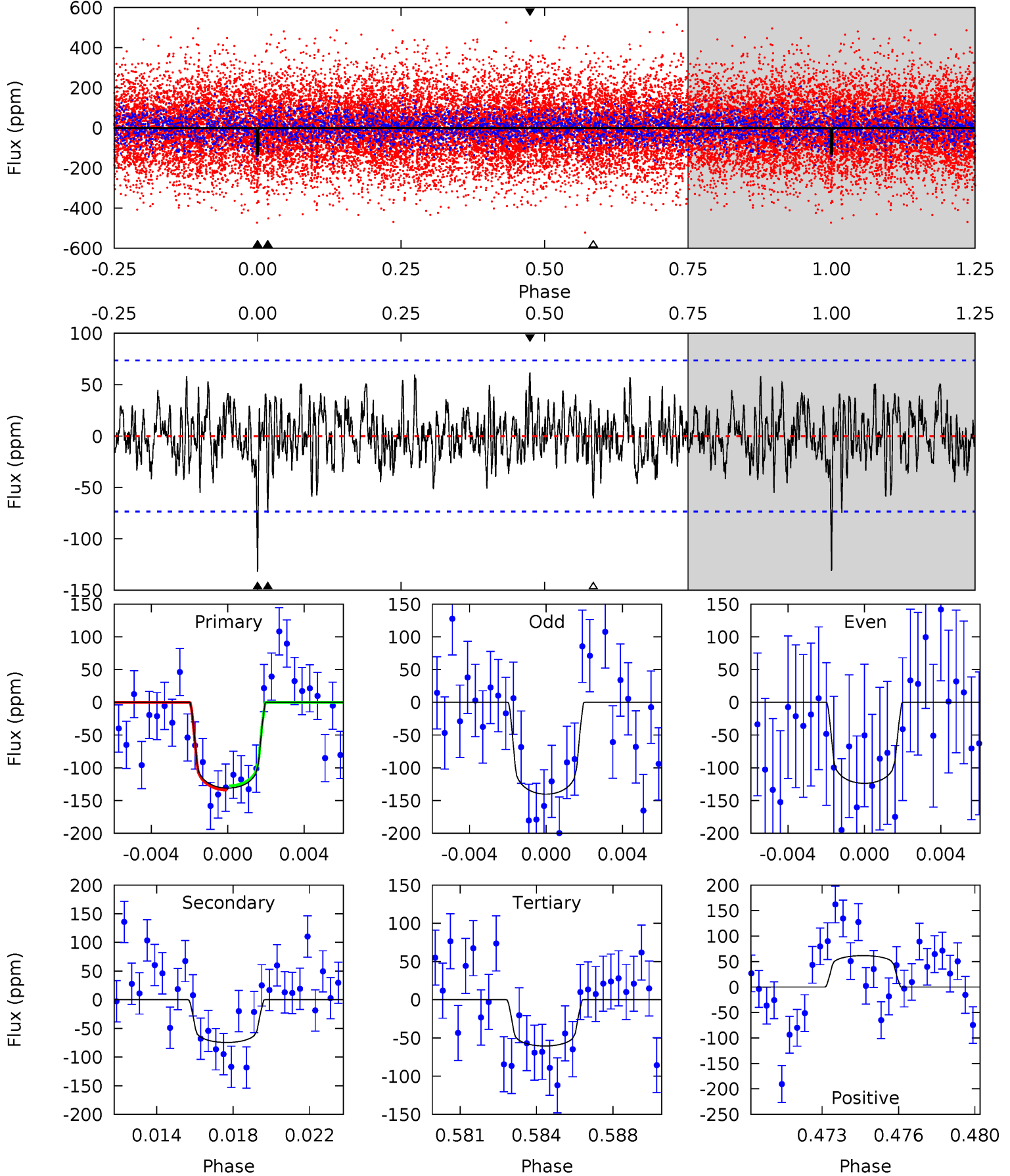
TCE 003547523-04     $P = 64.511389$  Days     $T_0 = 141.416896$  (BKJD)



# DV Model-Shift Uniqueness Test

003547523-04, P = 64.515001 Days, E = 76.874923 Days

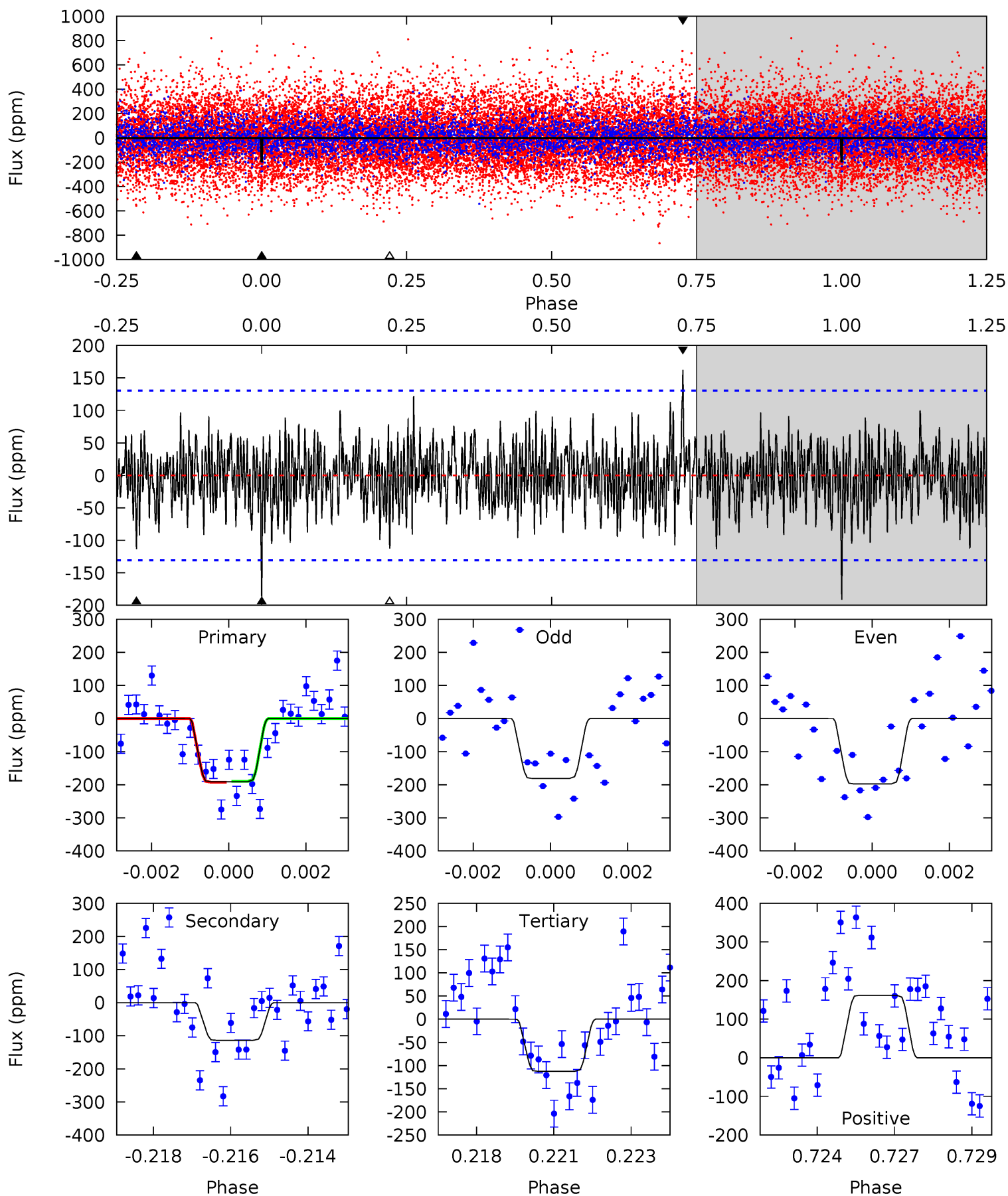
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.30	5.29	4.30	4.38	5.22	2.91	1.45	5.01	4.93	1.00	0.92	0.58	0.95	0.32	0.22



# Alt Model-Shift Uniqueness Test

003547523-04, P = 64.511389 Days, E = 76.905507 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.75	4.62	4.56	6.57	5.30	3.05	1.57	3.19	1.18	0.05	-1.95	0.34	0.85	0.46	0.04



### Stellar Parameters For KIC 003547523

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7543^{+235}_{-314}$	$4.017^{+0.187}_{-0.153}$	$-0.060^{+0.200}_{-0.300}$	$2.115^{+0.533}_{-0.533}$	$1.695^{+0.212}_{-0.282}$	$0.252^{+0.261}_{-0.110}$
	+3%/-4%	+5%/-4%	+333%/-500%	+25%/-25%	+13%/-17%	+103%/-44%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003547523-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-75 \pm 14$	$2.65^{+1.49}_{-1.25}$	$1096^{+75}_{-76}$	$6344^{+2693}_{-1201}$	$808^{+2005}_{-477}$
Alt.	$-114 \pm 25$	$3.52^{+1.47}_{-1.44}$	$1097^{+89}_{-78}$	$6147^{+2116}_{-927}$	$697^{+1395}_{-365}$

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

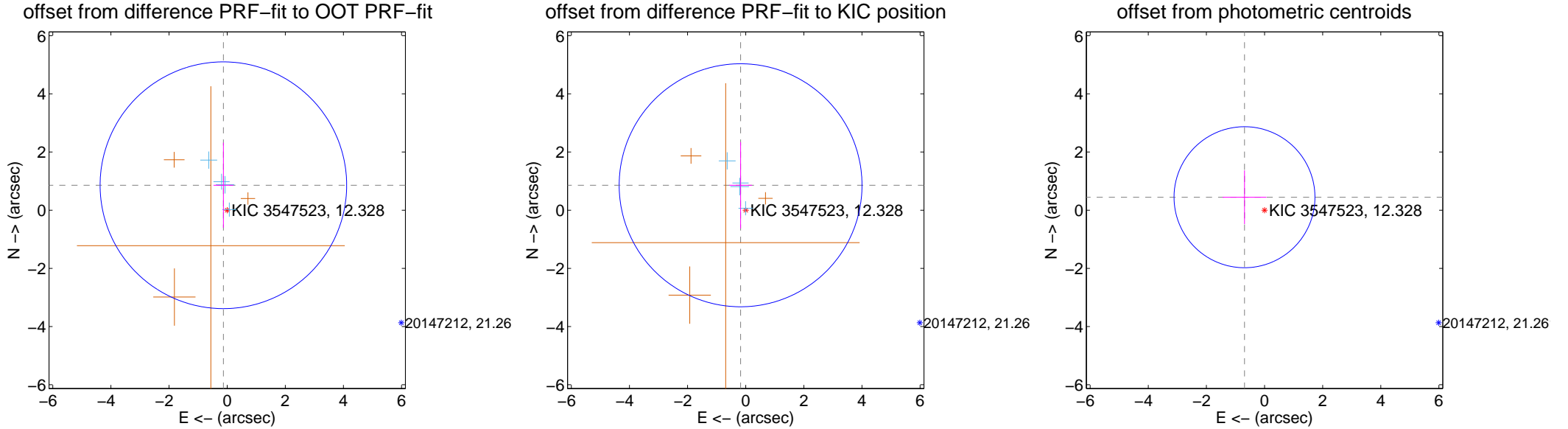
## DV Centroid Data

Supplemental centroid analysis for 003547523-04. Kepler magnitude: 12.33. Transit SNR 7.72

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

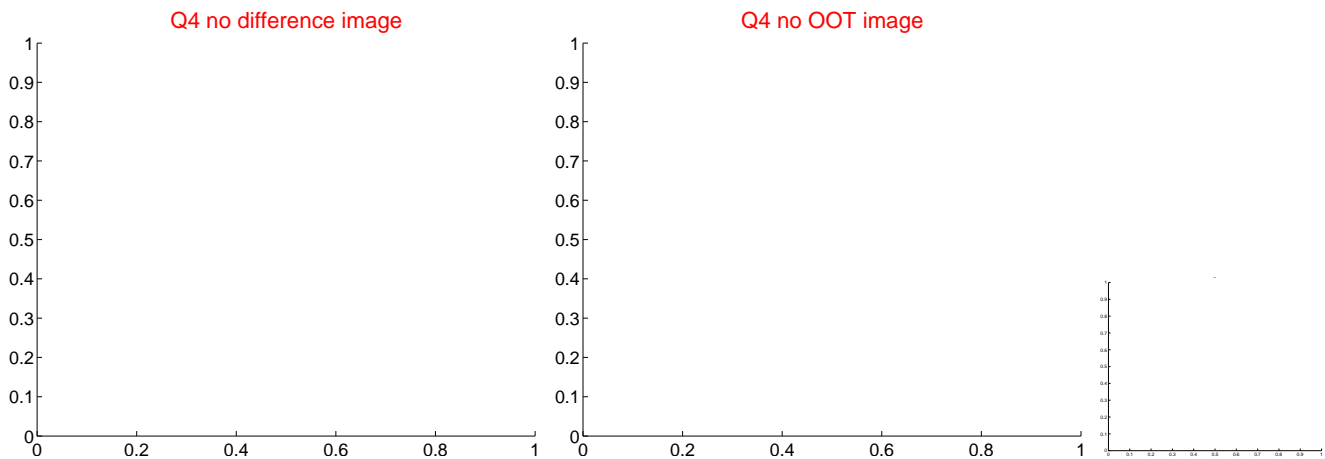
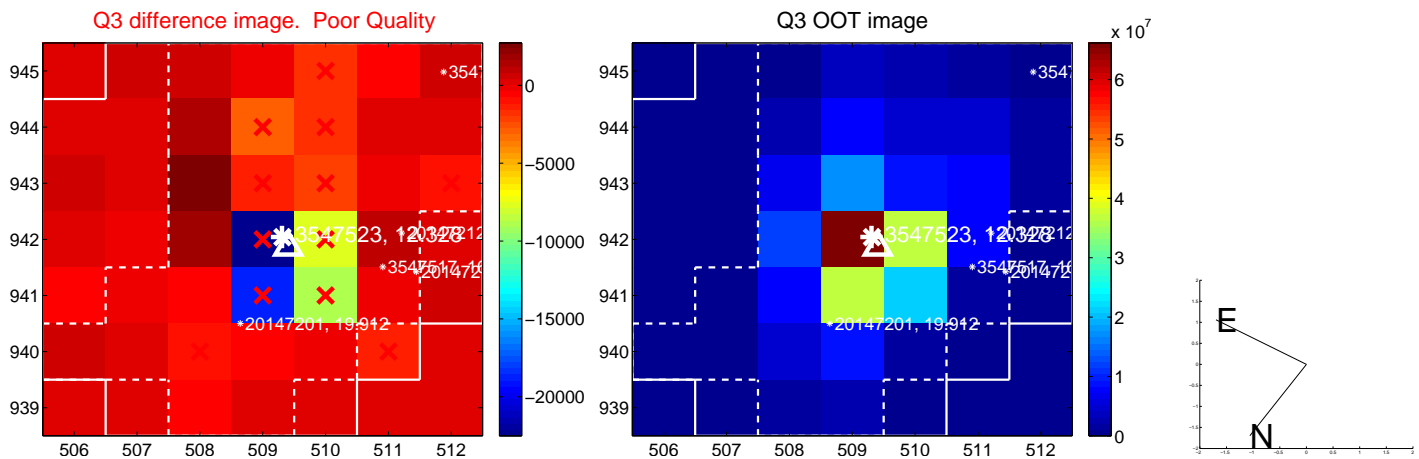
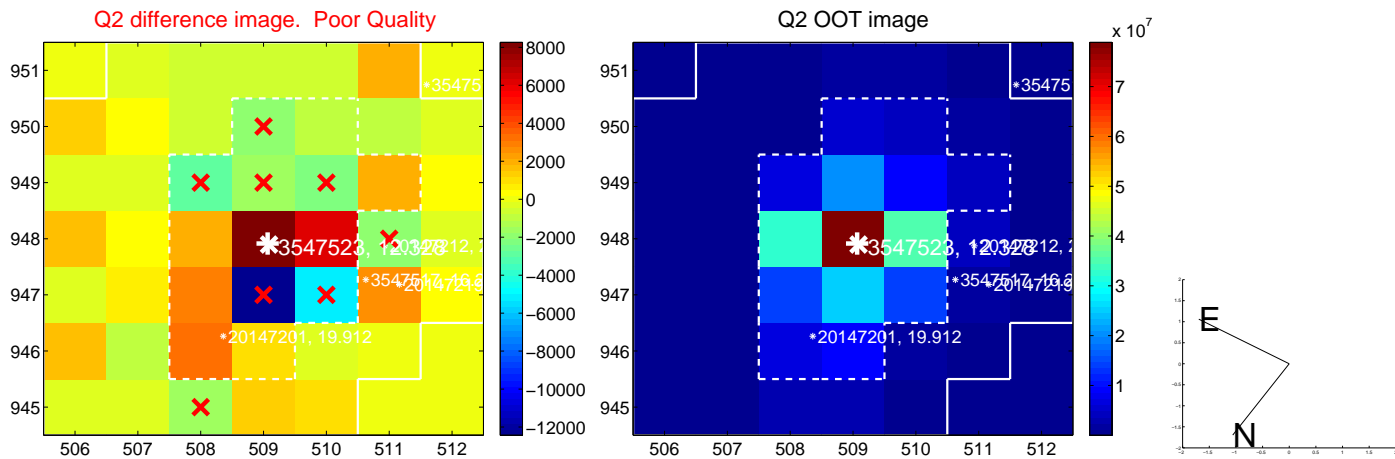
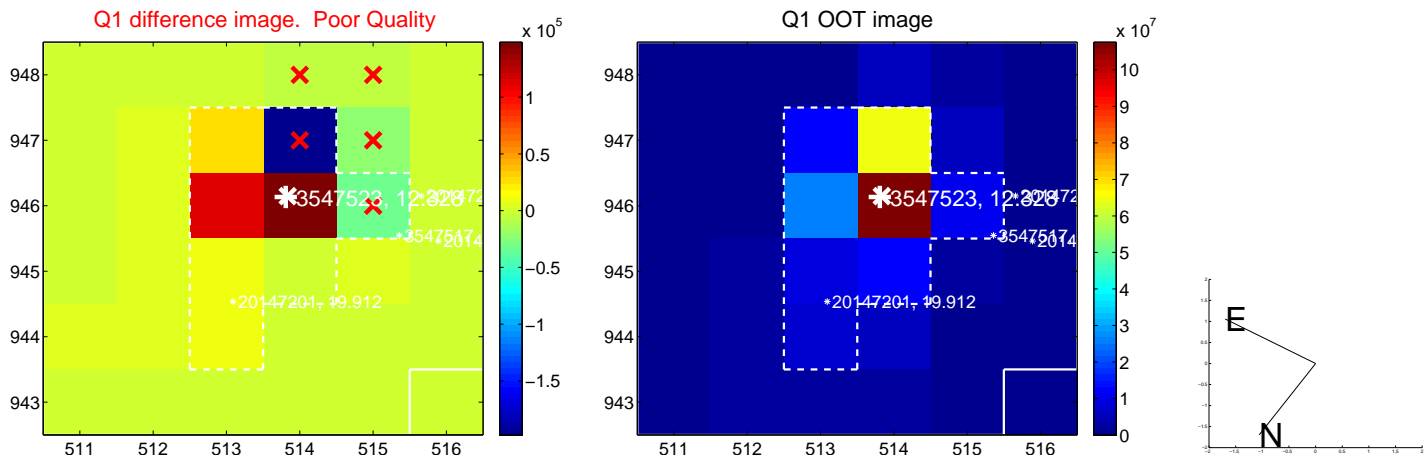
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.868 \pm 1.414$	0.61	$0.130 \pm 0.340$	$0.858 \pm 1.464$
PRF-fit source offset from KIC position	$0.875 \pm 1.392$	0.63	$0.177 \pm 0.389$	$0.857 \pm 1.482$
photometric centroid source offset	$0.82 \pm 0.81$	1.02	$0.69 \pm 0.75$	$0.45 \pm 0.92$



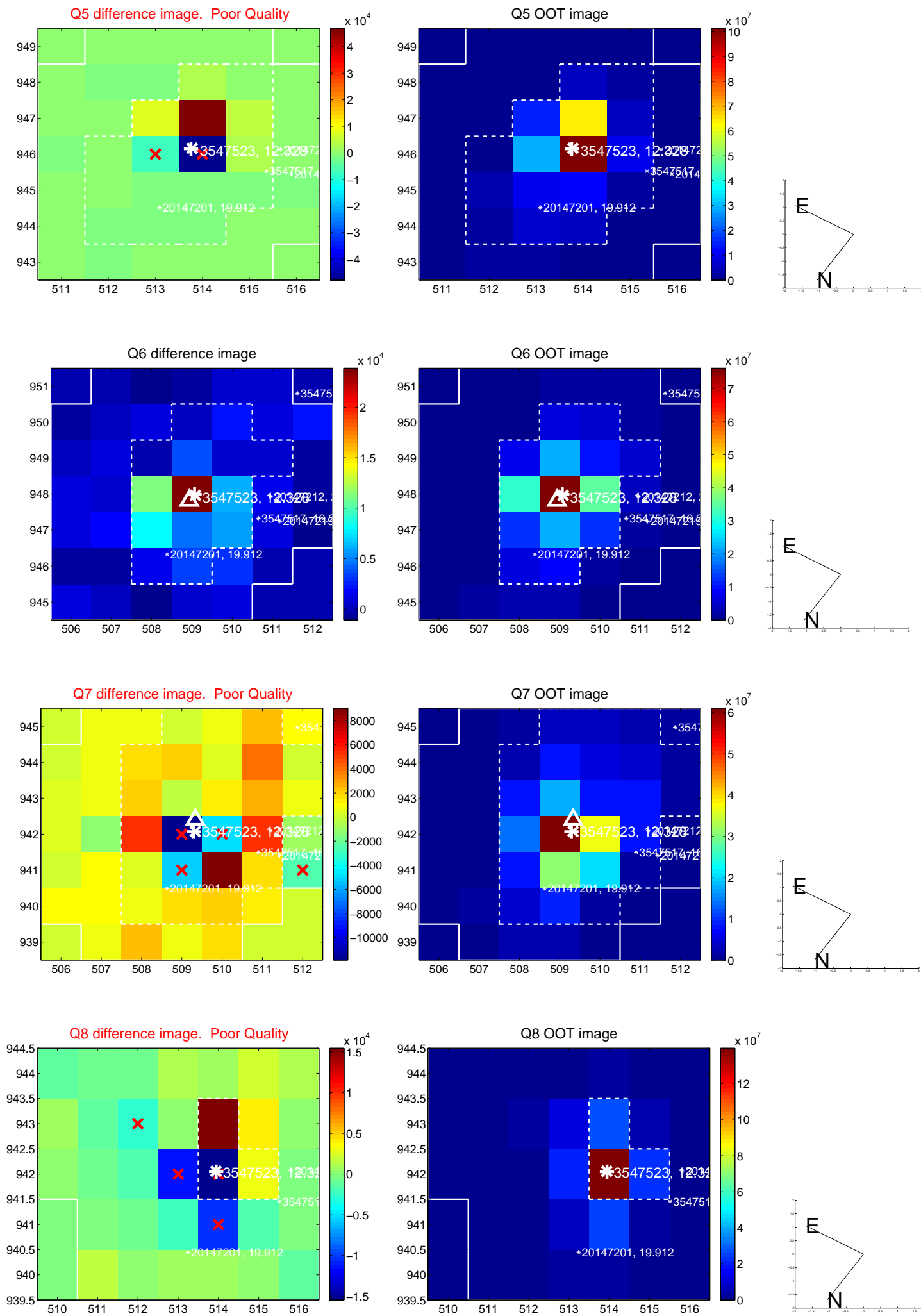
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



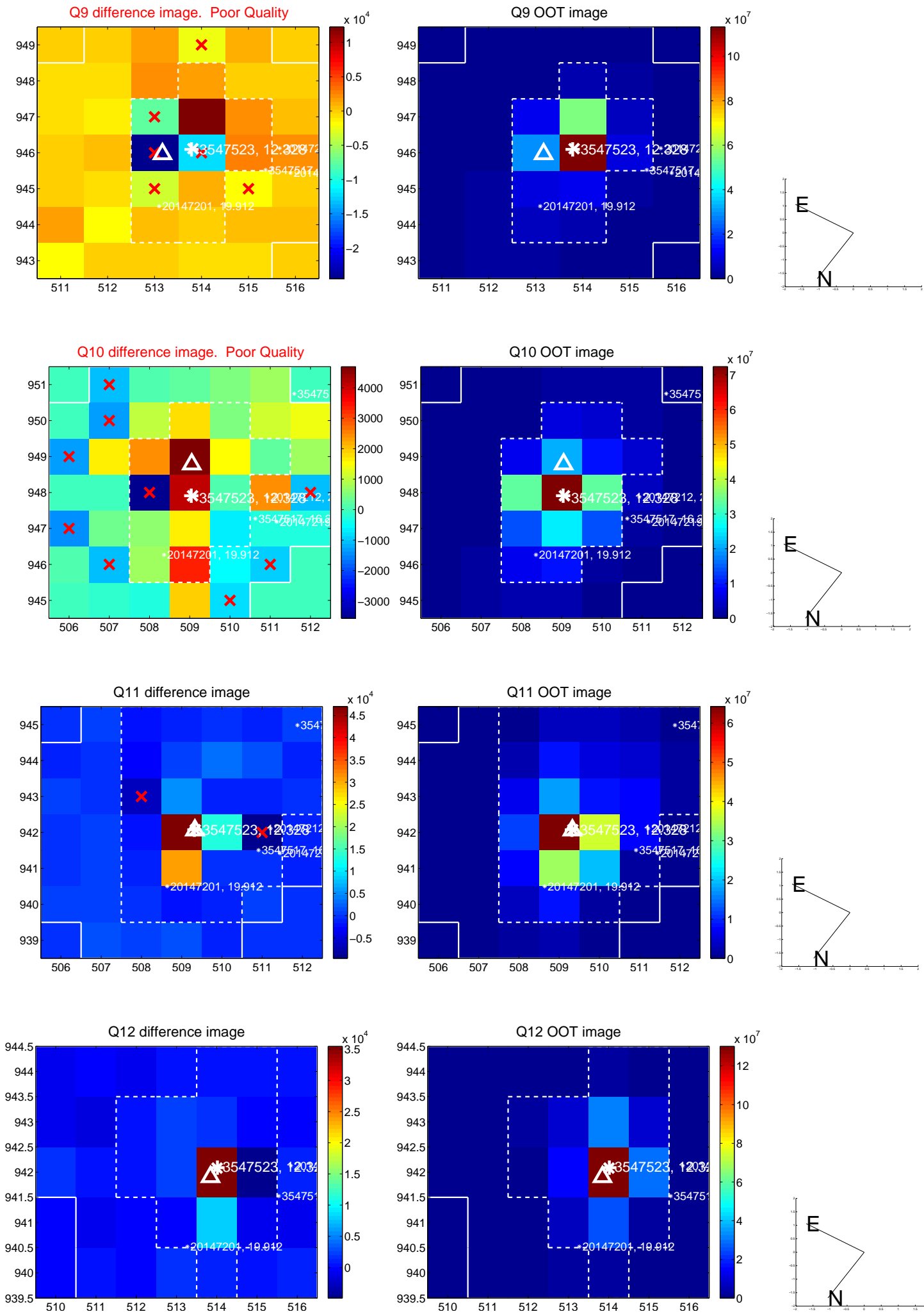
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



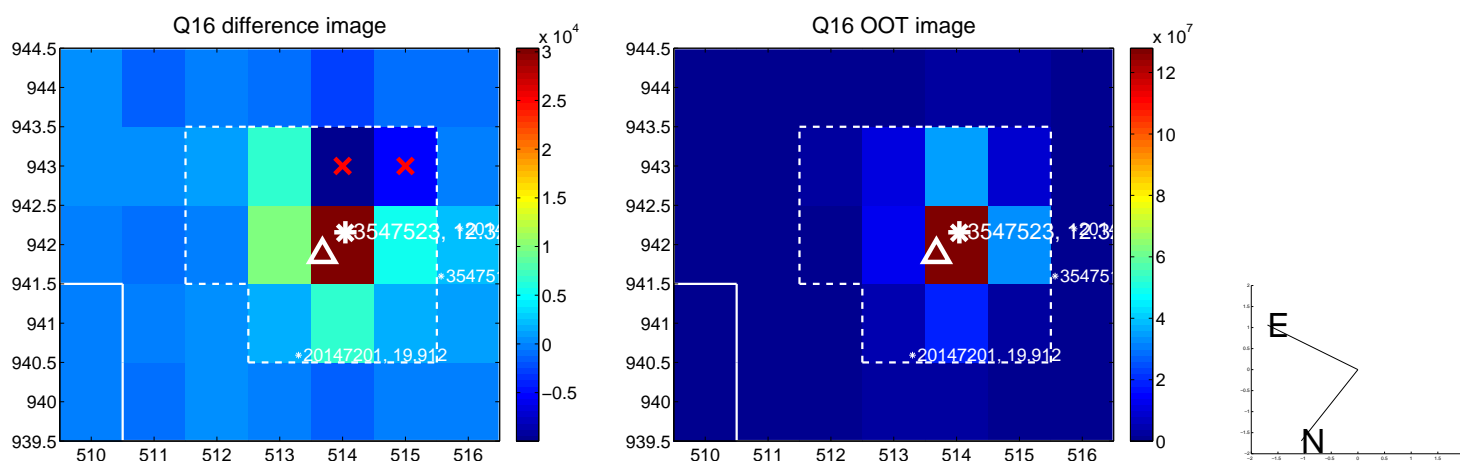
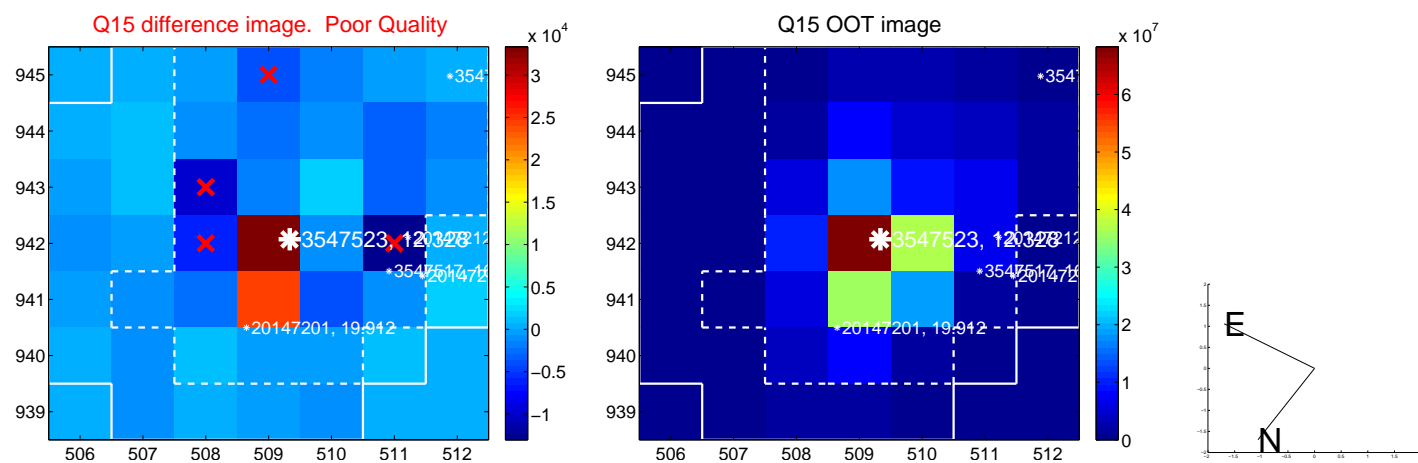
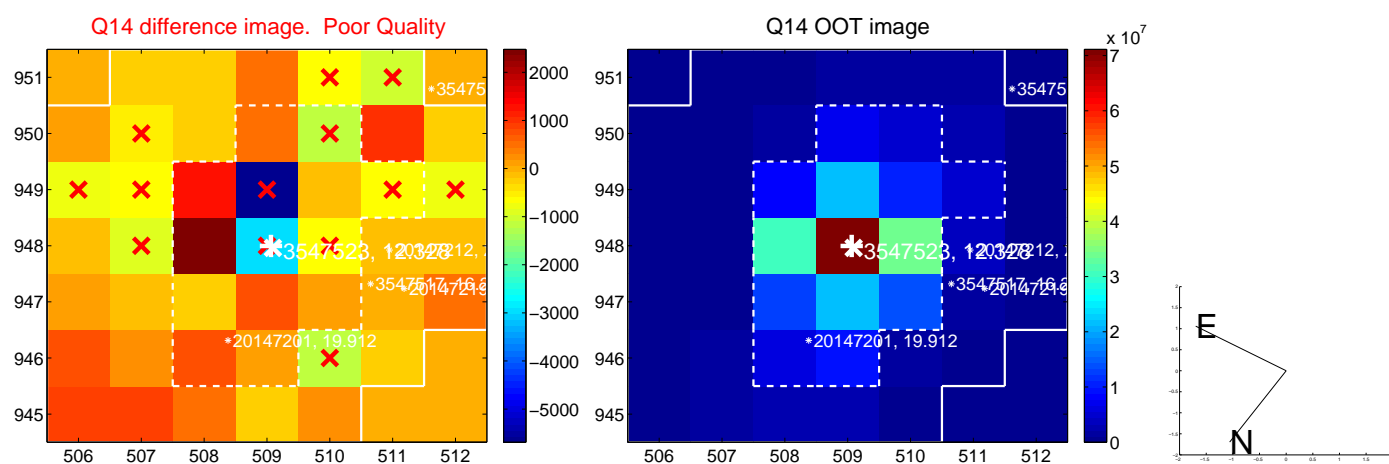
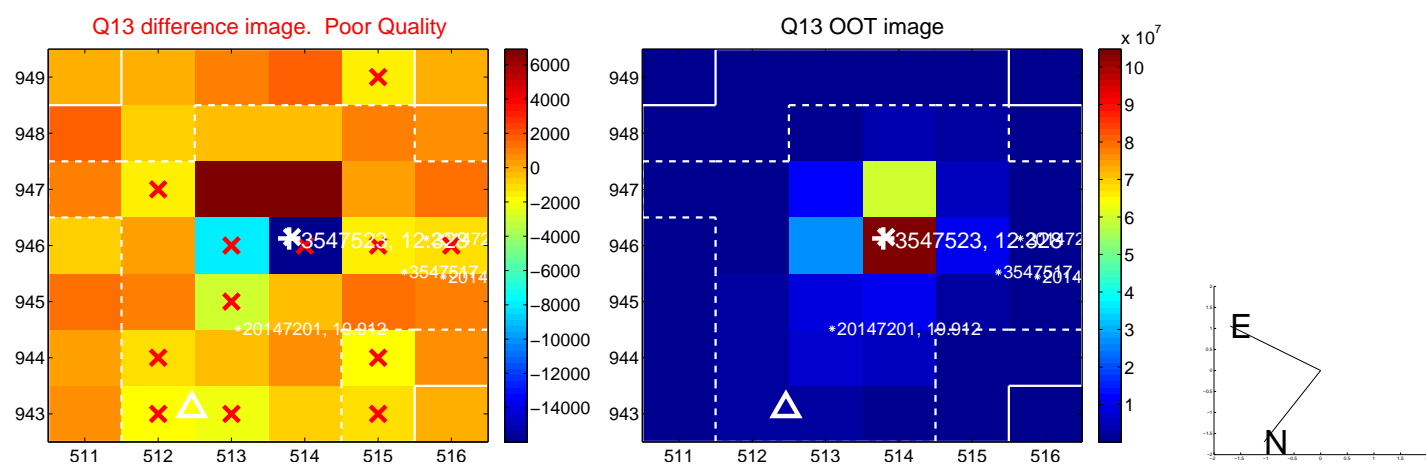
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



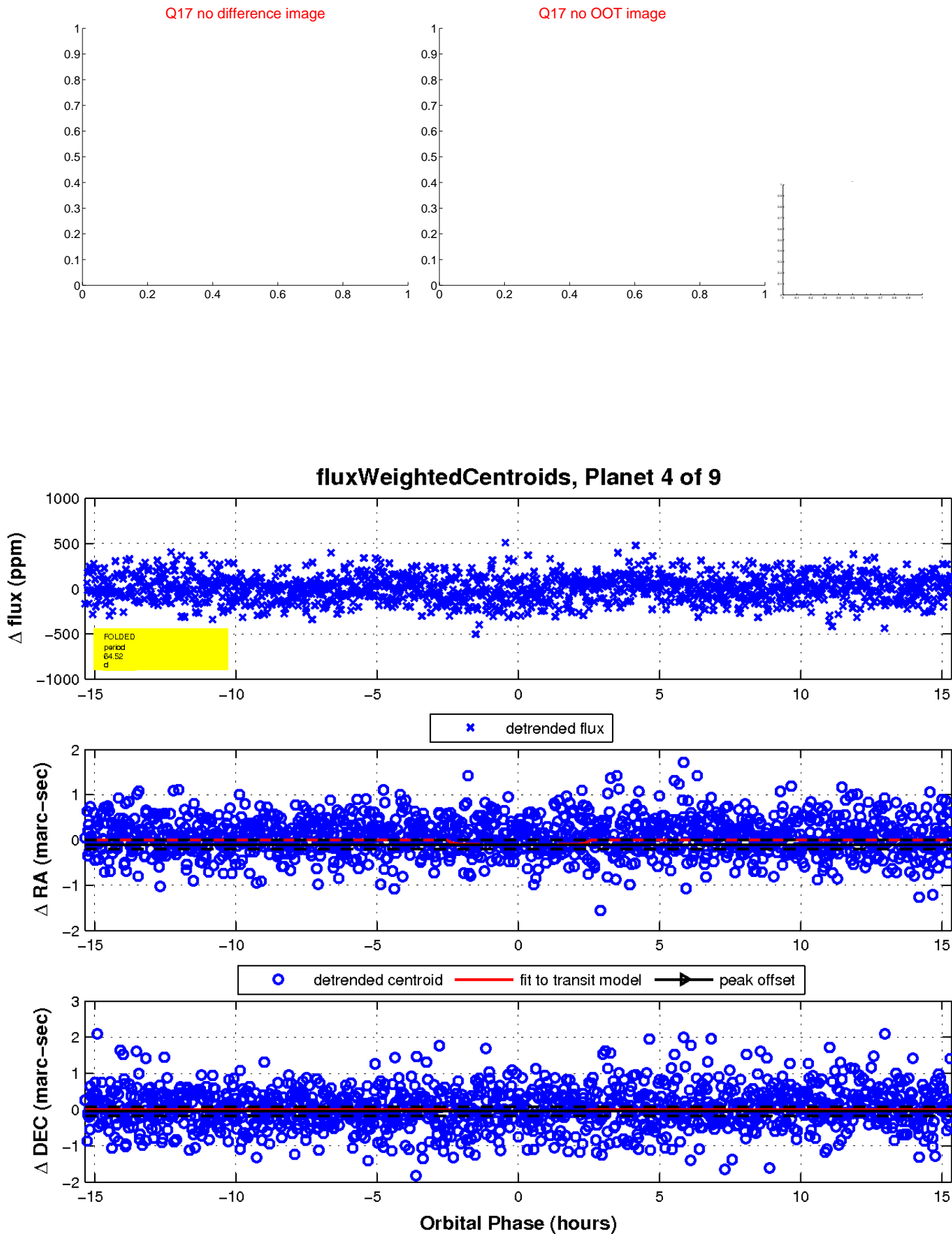
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



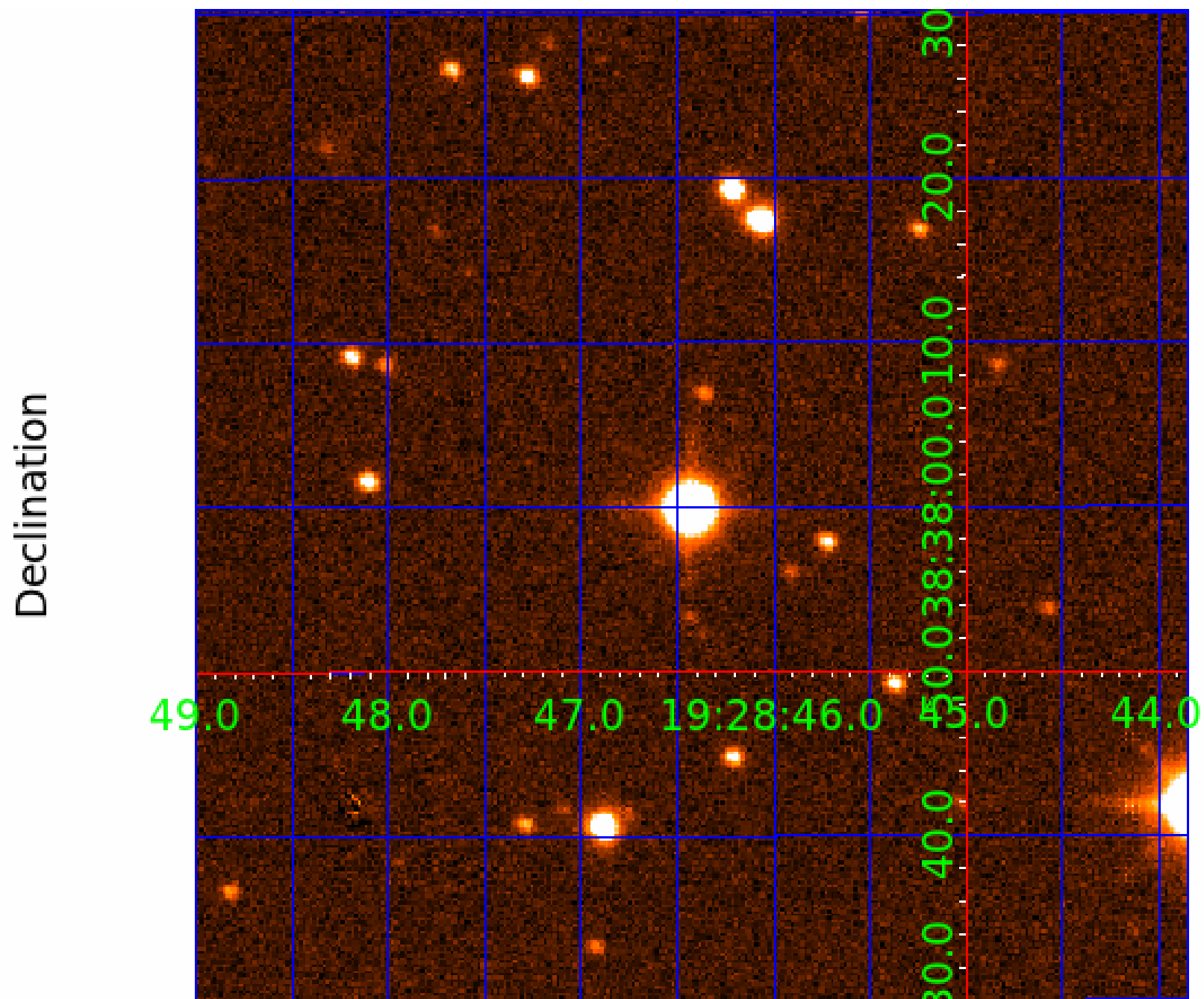
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





## KIC 003547523

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003547523-01	OBS	No	1.286558	131.774714	21.4	6.273	9.4	10.8	2.12	7543	1.13	17010.03
003547523-02	OBS	No	170.081357	281.456755	154.3	3.405	10.3	4.6	2.12	7543	2.97	25.26
003547523-03	OBS	No	4.289079	131.505412	36.0	6.831	8.0	7.9	2.12	7543	1.58	3415.54
003547523-04	OBS	No	64.515001	141.389924	133.7	5.114	7.9	7.7	2.12	7543	2.73	91.99
003547523-05	OBS	No	48.272360	144.778101	148.8	2.948	8.6	8.6	2.12	7543	2.87	135.42
003547523-06	OBS	No	67.256610	149.491828	257.1	3.132	7.8	8.1	2.12	7543	3.90	87.02
003547523-07	OBS	No	213.723127	282.236258	225.9	3.273	8.3	7.3	2.12	7543	3.67	18.63
003547523-08	OBS	No	226.517683	180.912141	209.7	5.031	7.4	7.7	2.12	7543	3.39	17.24
003547523-09	OBS	No	93.778528	135.848958	265.1	2.254	7.6	8.4	2.12	7543	3.67	55.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003547523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003547523-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003547523-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
003547523-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
003547523-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003547523-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—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.

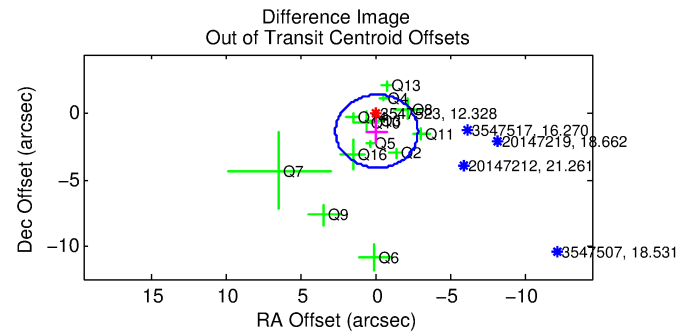
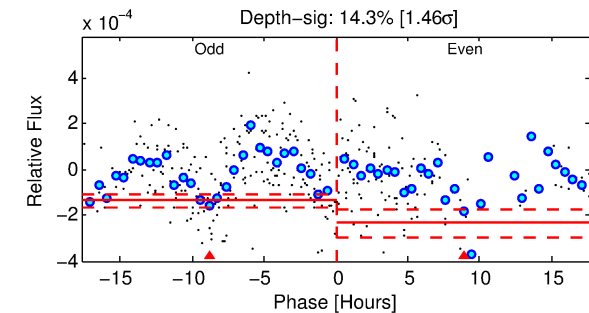
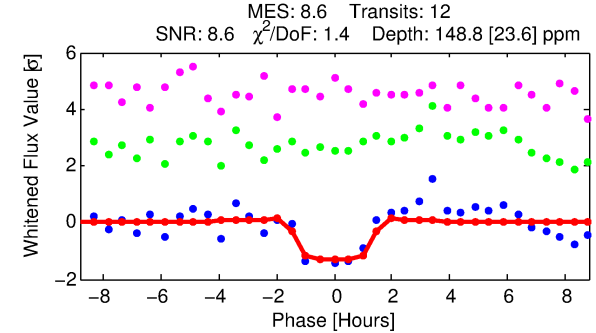
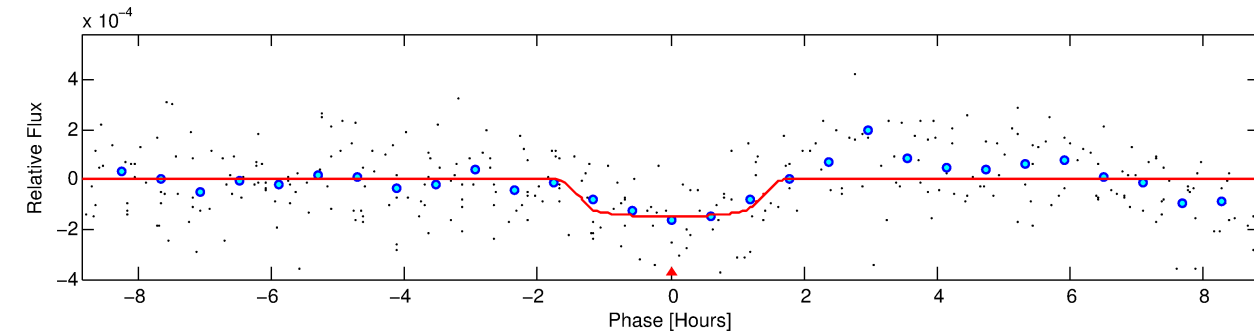
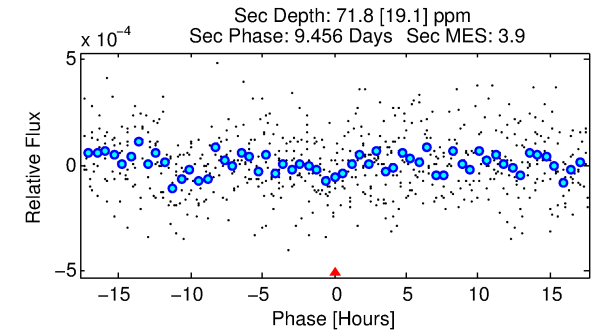
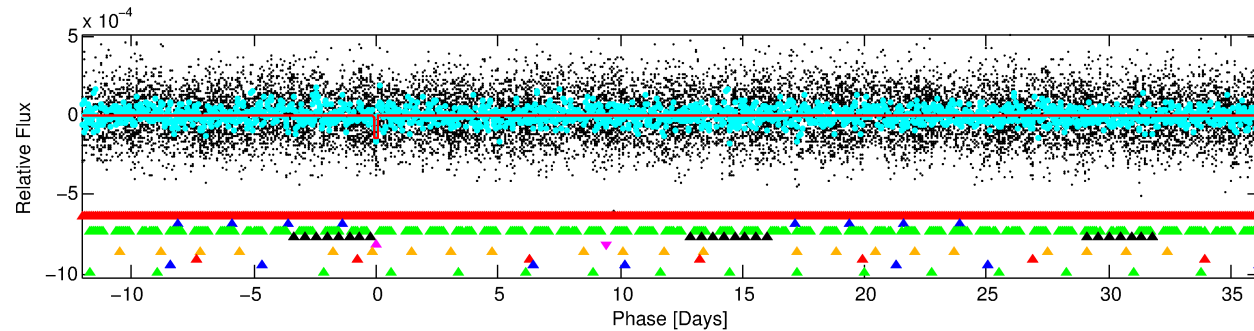
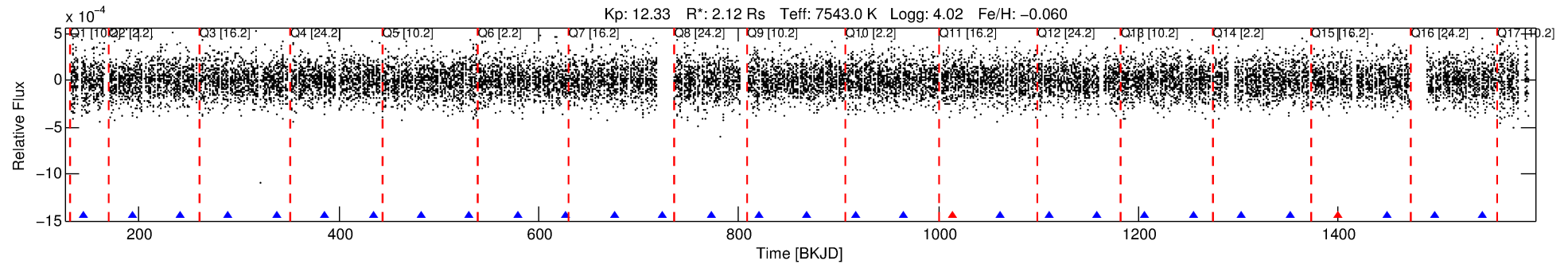
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003547523-05

No Significant Match Found

# DV One-Page Summary

KIC: 3547523 Candidate: 5 of 9 Period: 48.272 d



## DV Fit Results:

Period = 48.27236 [0.00061] d  
Epoch = 144.7781 [0.0106] BKJD  
Rp/R\* = 0.0124 [0.0138]  
a/R\* = 73.09 [521.60]  
b = 0.83 [2.75]  
Seff = 135.42 [50.37]  
Teq = 870 [81] K  
Rp = 2.87 [3.26] Re  
a = 0.3095 [0.0684] AU  
Ag = 459.09 [1034.15] [0.44σ]  
Teffp = 6225 [3477] K [1.54σ]

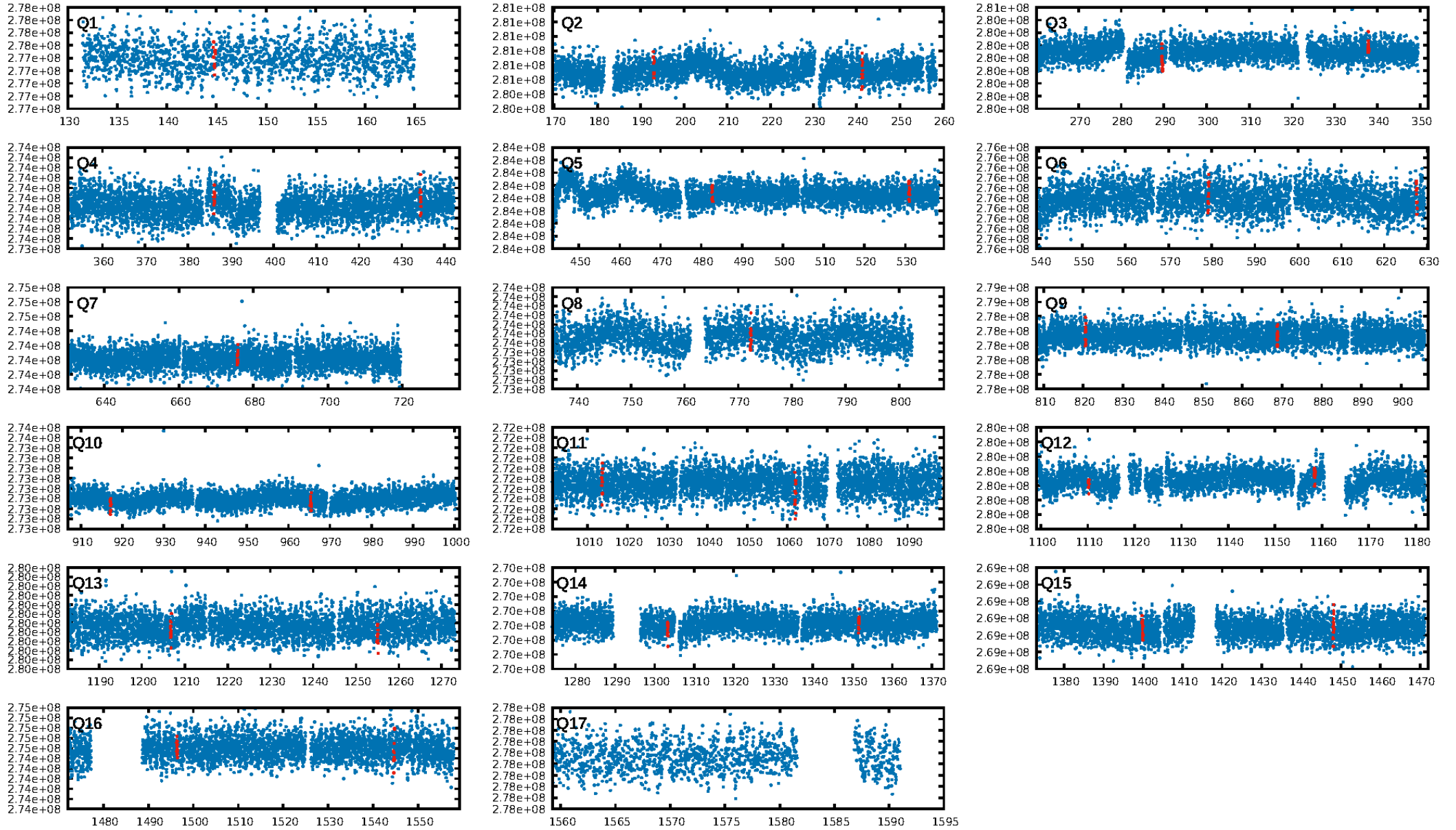
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [141.89σ]  
LongPeriod-sig: 100.0% [66.04σ]  
ModelChiSquare2-sig: 13.0%  
ModelChiSquareGof-sig: 95.7%  
**Bootstrap-pfa: 2.00e-10**  
RollingBand-fgt: 0.83 [10/12]  
GhostDiagnostic-chr: 1.166  
Centroid-sig: 0.8%  
Centroid-so: 1.265 arcsec [1.72σ]  
OotOffset-rm: 1.326 arcsec [1.44σ]  
OotOffset-st: 4/3/3/3 [13]  
KicOffset-rm: 1.267 arcsec [1.24σ]  
KicOffset-st: 4/3/3/3 [13]  
DiffImageQuality-fgm: 0.38 [5/13]  
DiffImageOverlap-fno: 0.44 [7/16]

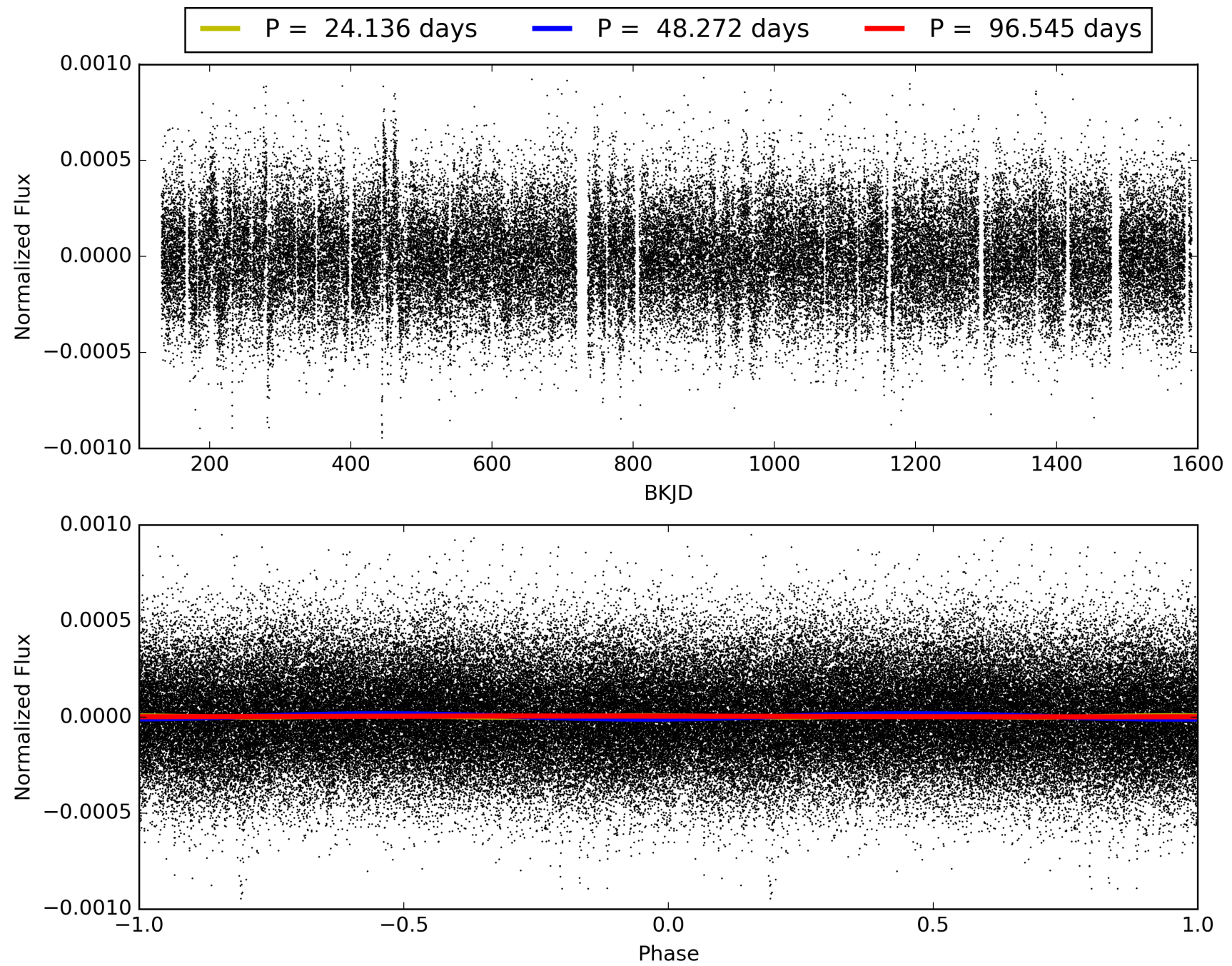
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003547523-05, PDC Light Curves

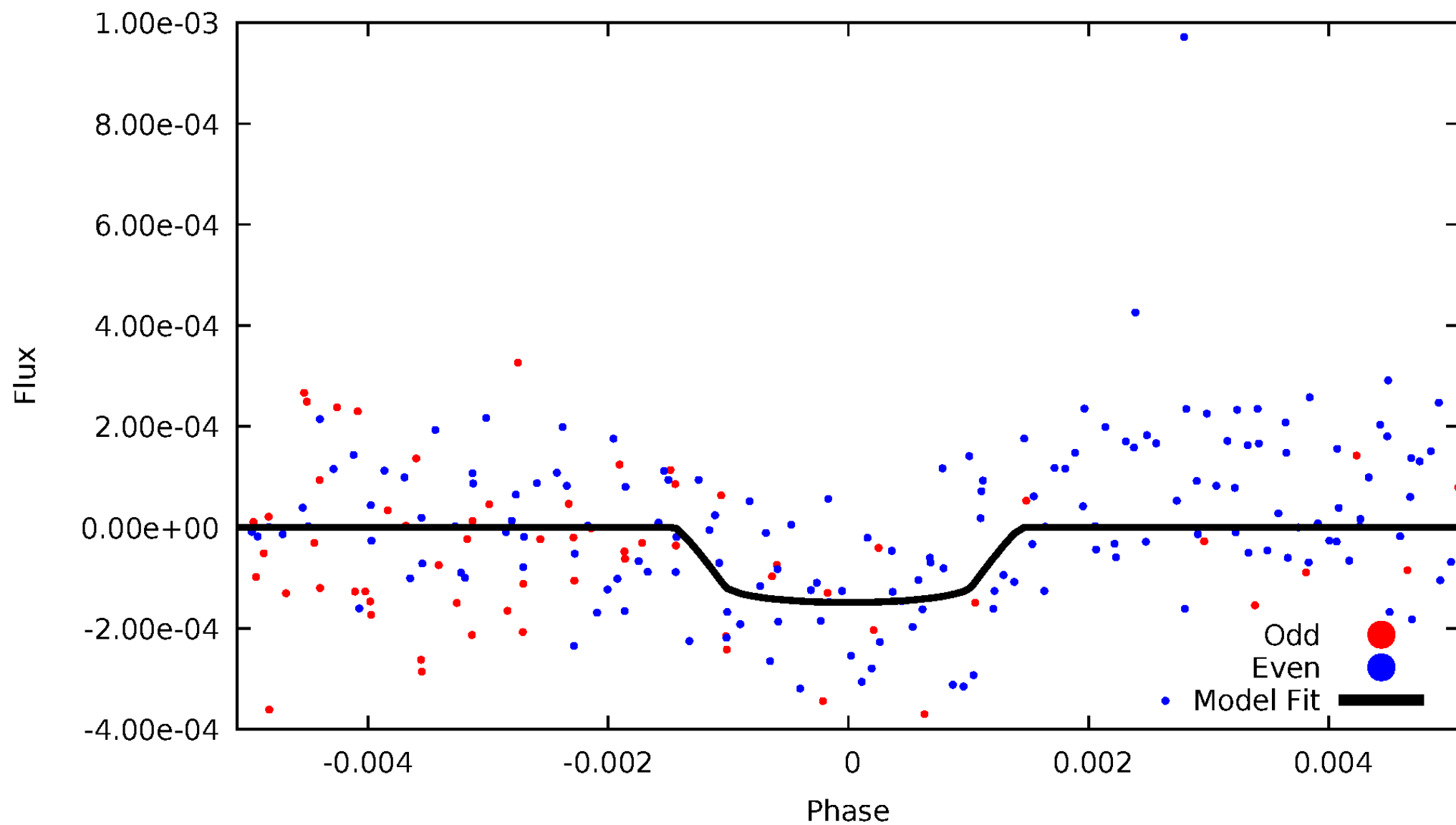


TCE 003547523-05



# DV Odd/Even

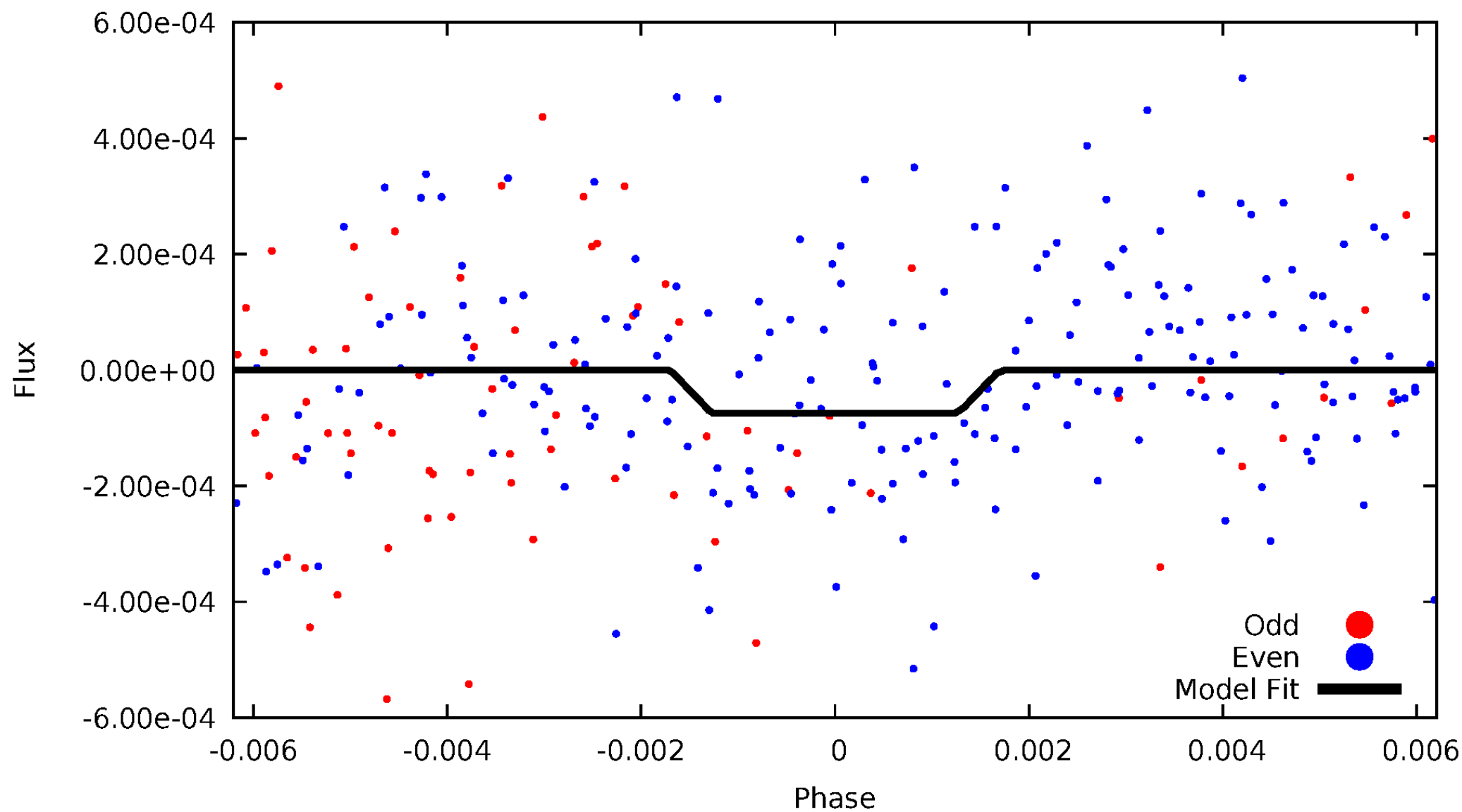
TCE 003547523-05





# ALT Odd/Even

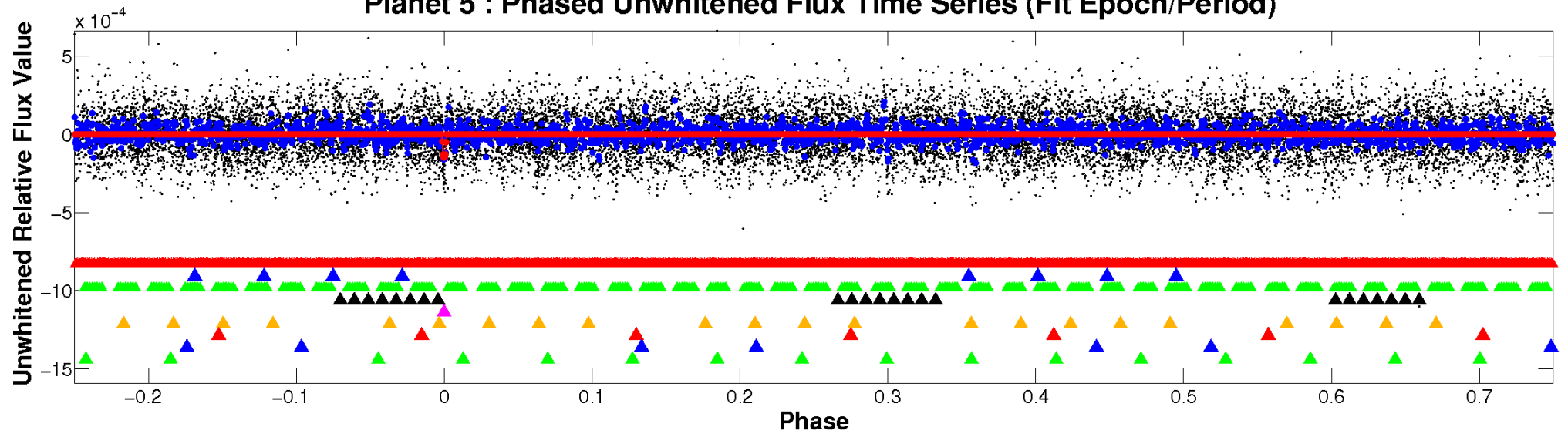
TCE 003547523-05



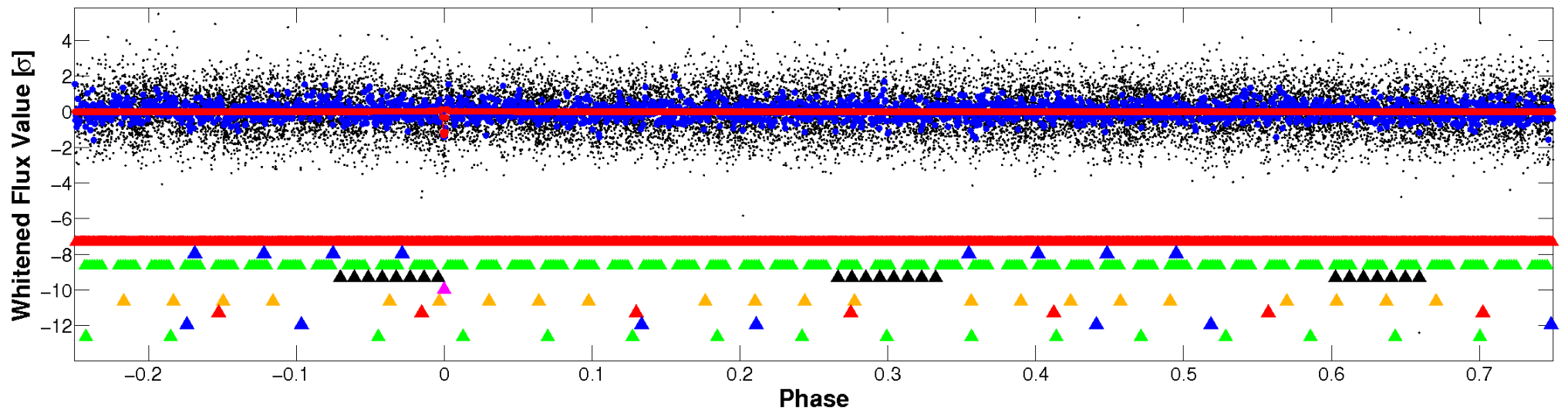


# Non-Whitened Vs. Whitened Light Curve

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

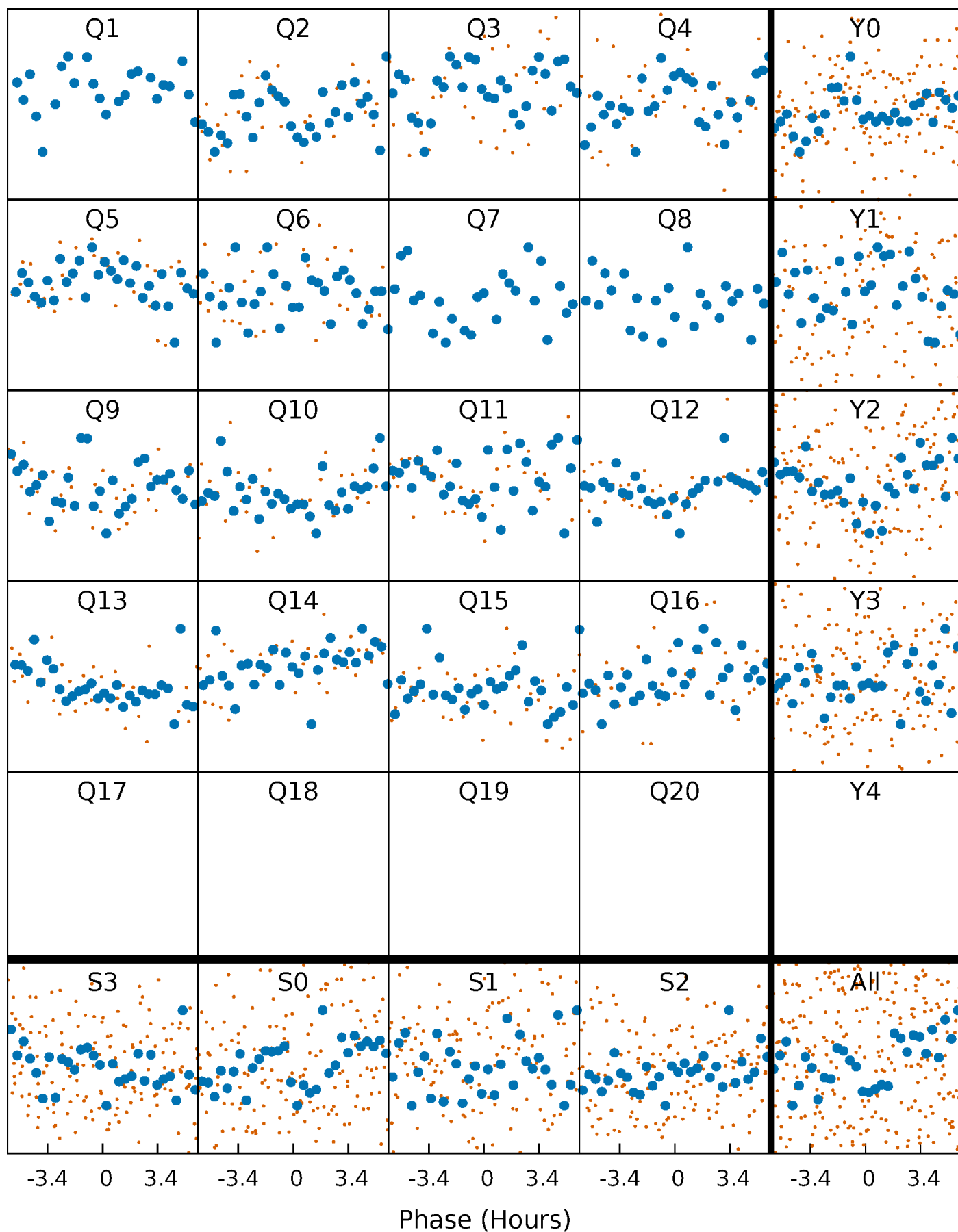


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



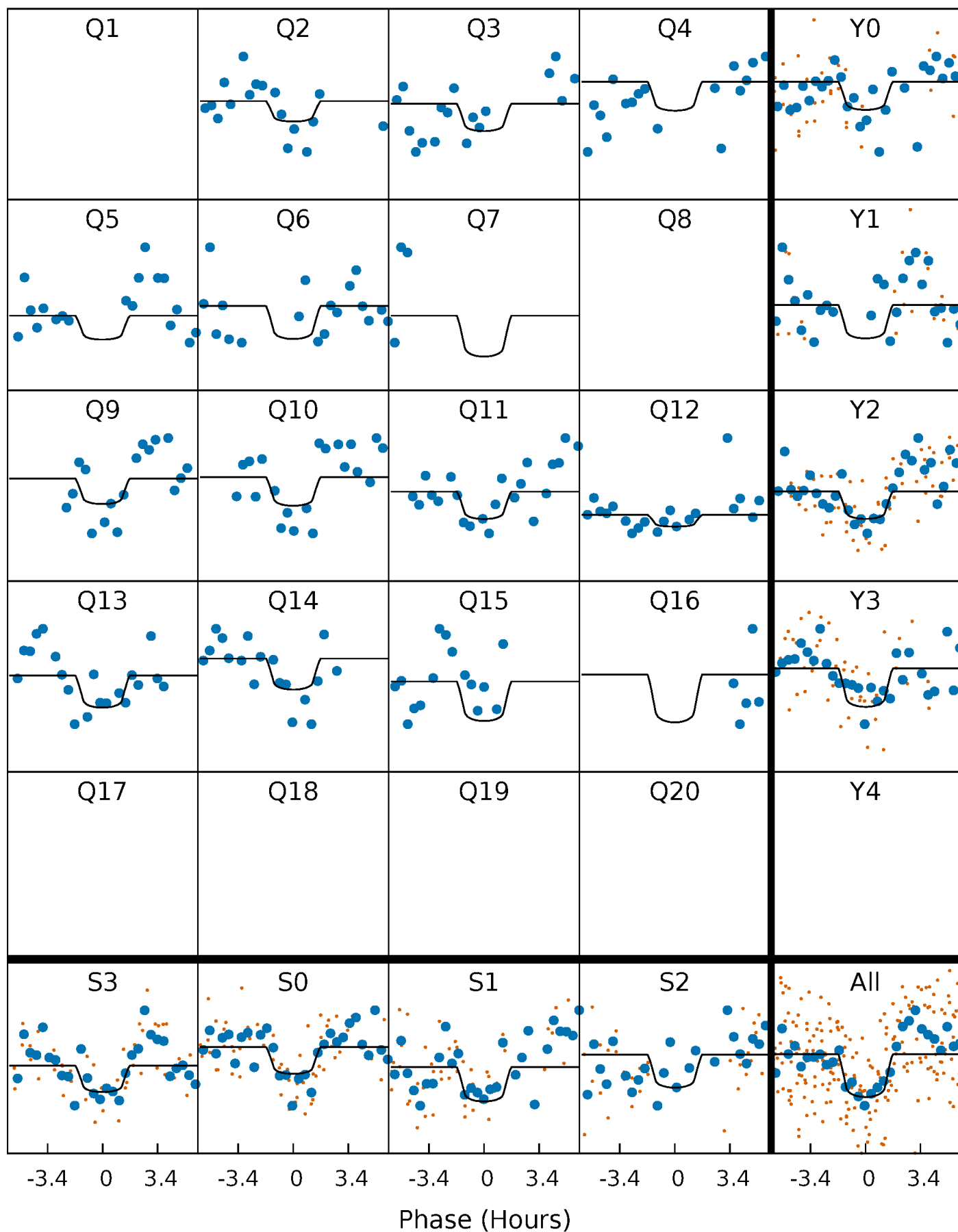
# PDC Quarter-Phased Transit Curves

TCE 003547523-05     $P = 48.272360$  Days     $T_0 = 144.778101$  (BKJD)



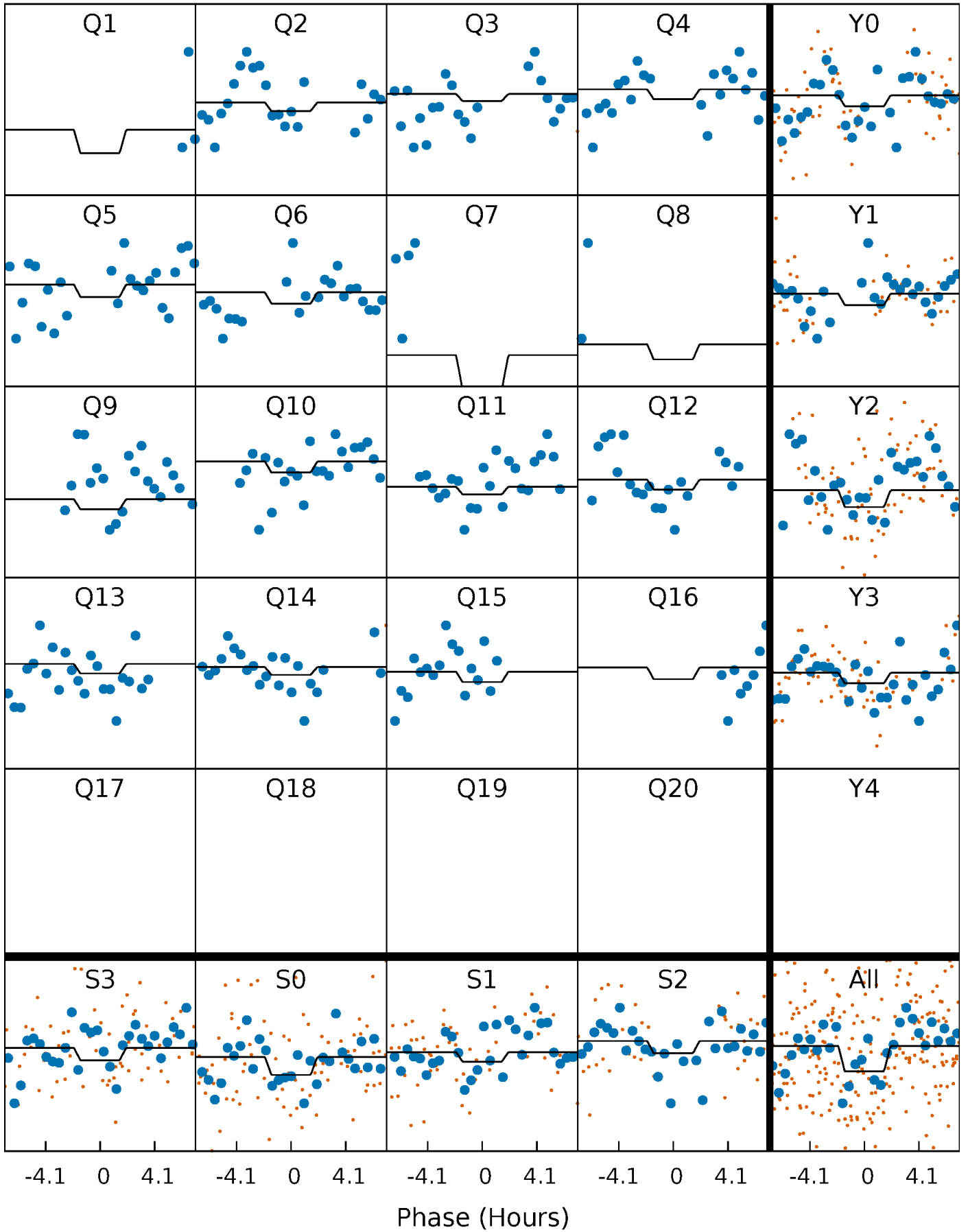
# DV Quarter-Phased Transit Curves

TCE 003547523-05   P= 48.272360 Days    $T_0=144.778101$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

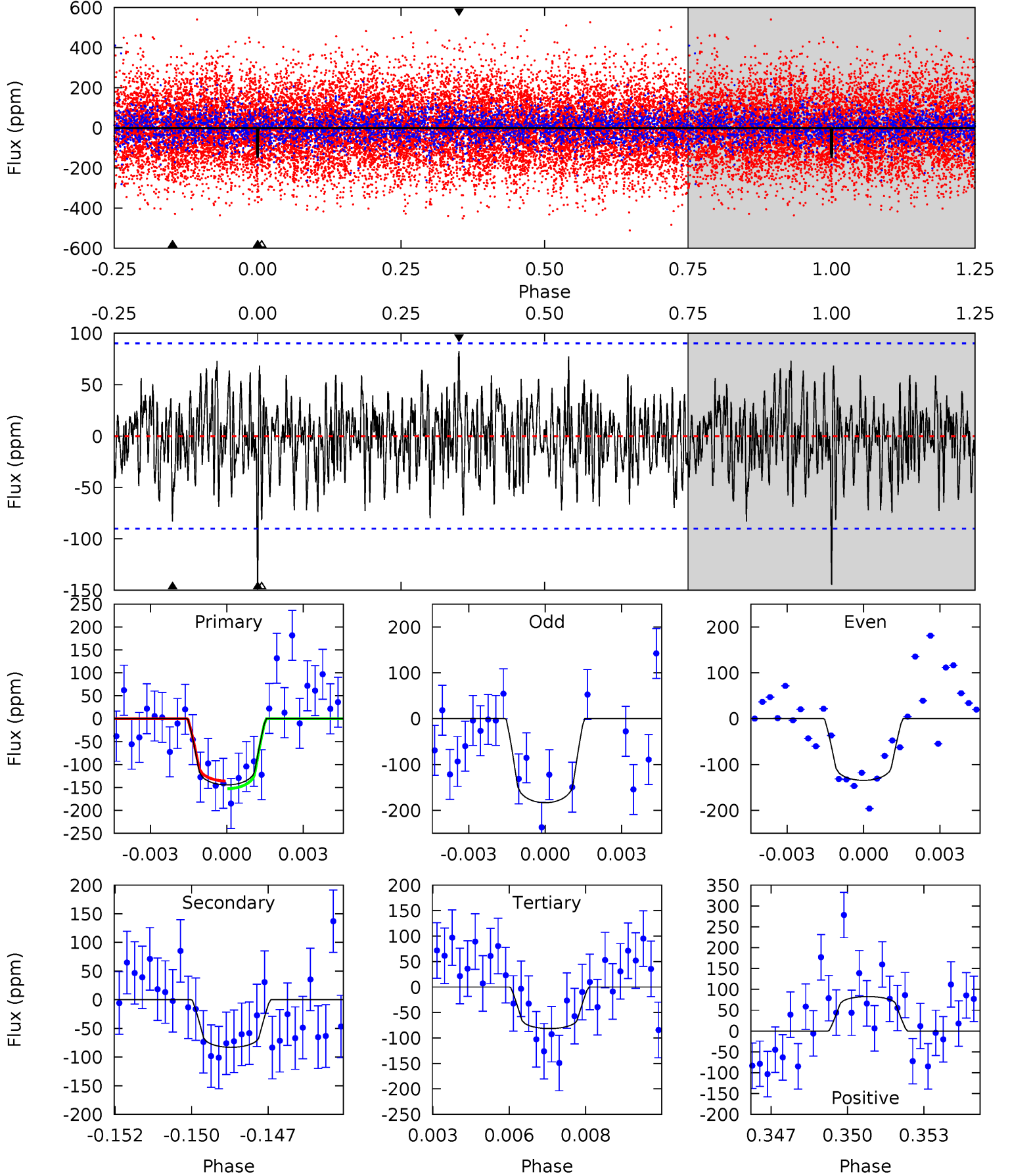
TCE 003547523-05     $P = 48.271228$  Days     $T_0 = 144.812502$  (BKJD)



# DV Model-Shift Uniqueness Test

003547523-05, P = 48.272360 Days, E = 96.505741 Days

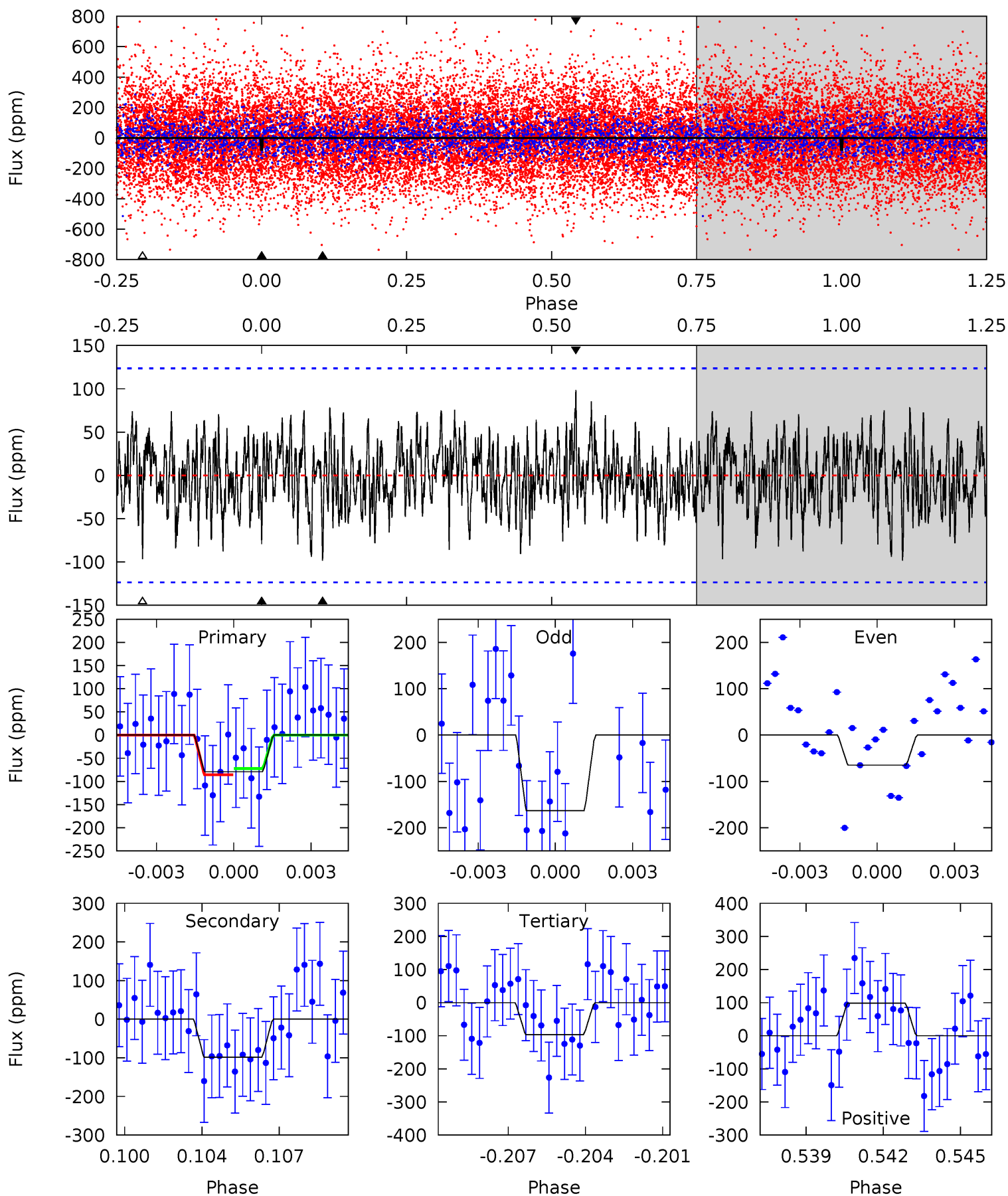
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.44	4.84	4.77	4.83	5.26	2.99	1.61	3.68	3.62	0.08	0.02	1.14	1.02	0.36	0.49



# Alt Model-Shift Uniqueness Test

003547523-05, P = 48.271228 Days, E = 96.541274 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
3.35	4.16	4.10	4.17	5.23	2.93	1.35	-0.74	-0.82	0.07	-0.01	1.49	0.87	0.50	0.28





### Stellar Parameters For KIC 003547523

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7543^{+235}_{-314}$	$4.017^{+0.187}_{-0.153}$	$-0.060^{+0.200}_{-0.300}$	$2.115^{+0.533}_{-0.533}$	$1.695^{+0.212}_{-0.282}$	$0.252^{+0.261}_{-0.110}$
	+3%/-4%	+5%/-4%	+333%/-500%	+25%/-25%	+13%/-17%	+103%/-44%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003547523-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-83 \pm 17$	$3.52^{+3.13}_{-2.39}$	$1207^{+86}_{-82}$	$5576^{+6096}_{-1227}$	$336^{+3240}_{-241}$
Alt.	$-98 \pm 24$	$3.12^{+2.70}_{-2.00}$	$1210^{+85}_{-90}$	$6216^{+5920}_{-1527}$	$496^{+3545}_{-352}$

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

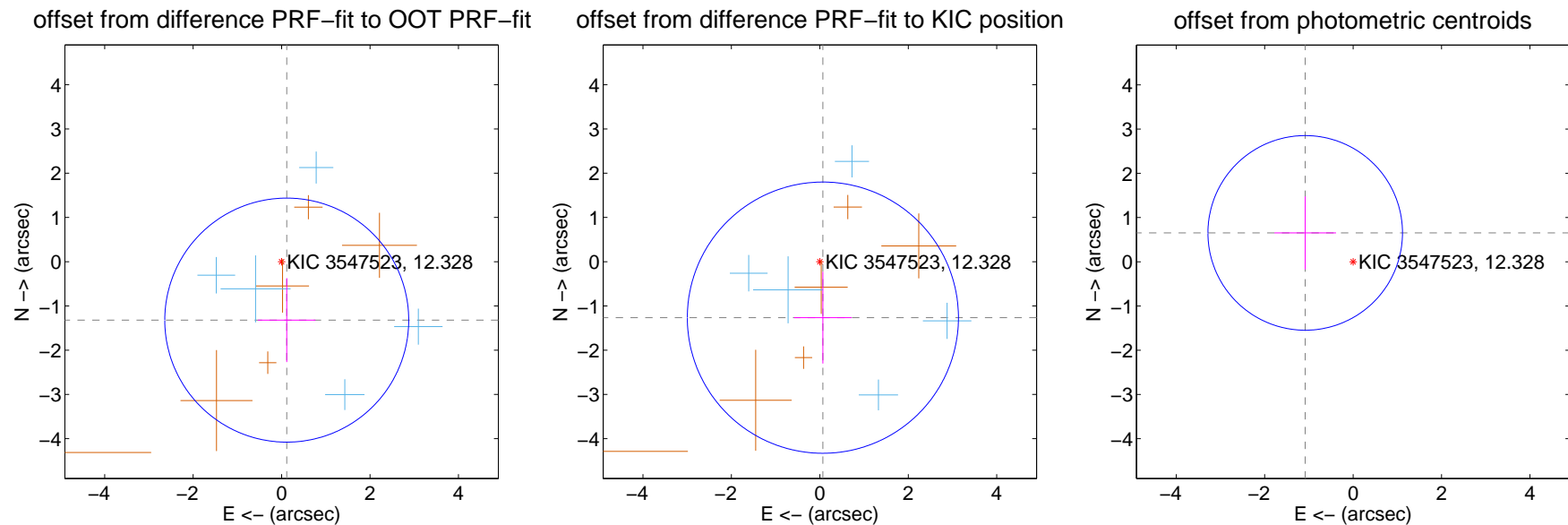
## DV Centroid Data

Supplemental centroid analysis for 003547523-05. Kepler magnitude: 12.33. Transit SNR 8.63

There are 5 quarters with good PRF difference image offsets

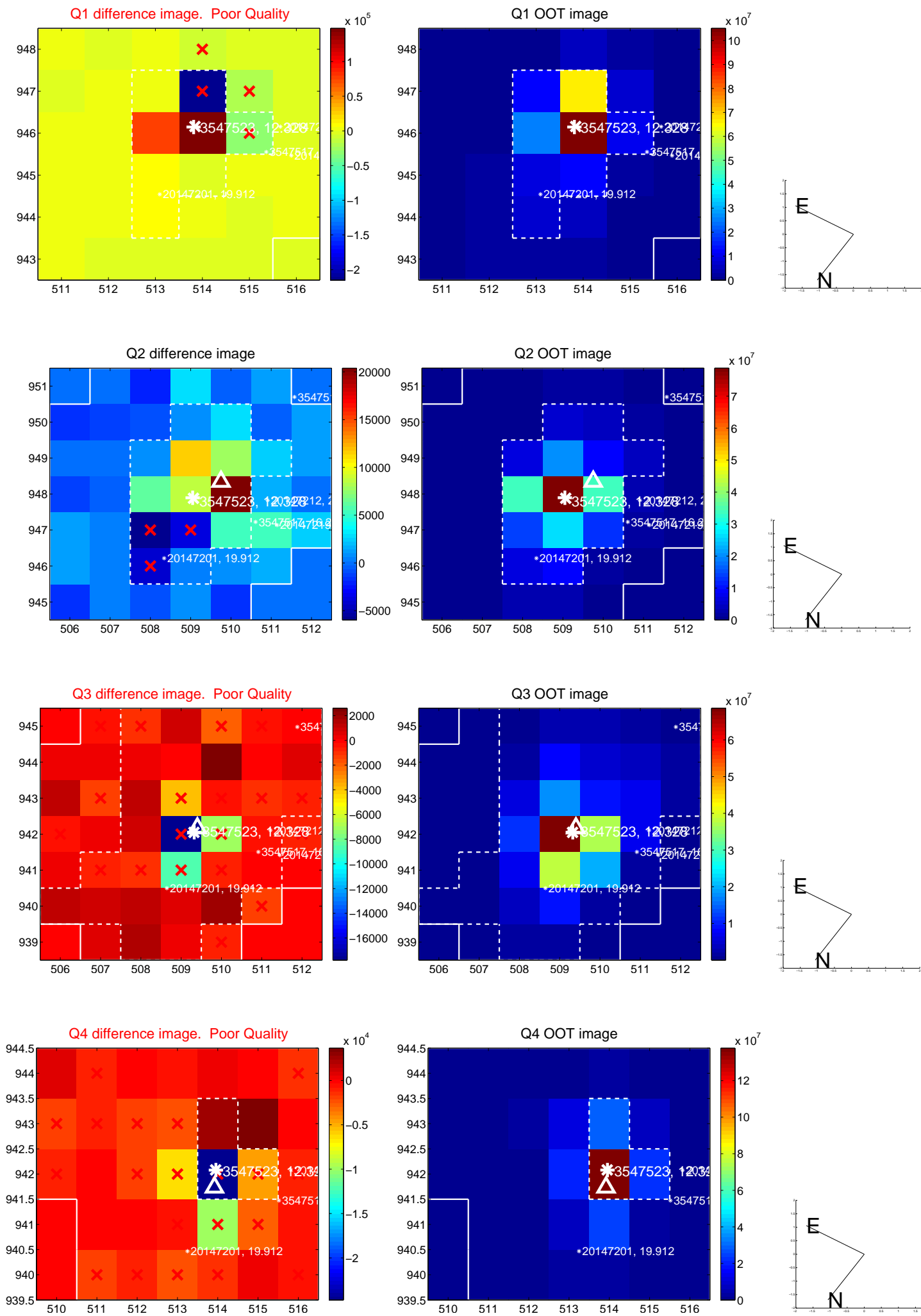
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.326 \pm 0.920$	1.44	$-0.117 \pm 0.650$	$-1.321 \pm 0.949$
PRF-fit source offset from KIC position	$1.267 \pm 1.022$	1.24	$-0.069 \pm 0.652$	$-1.265 \pm 1.037$
photometric centroid source offset	$1.27 \pm 0.73$	1.72	$1.08 \pm 0.70$	$0.65 \pm 0.83$

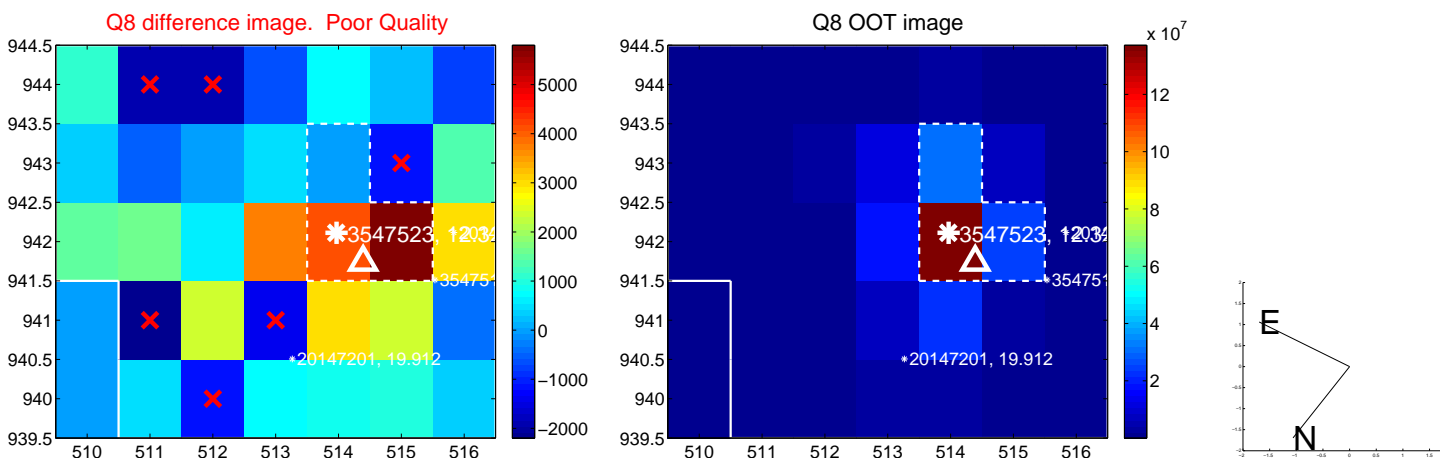
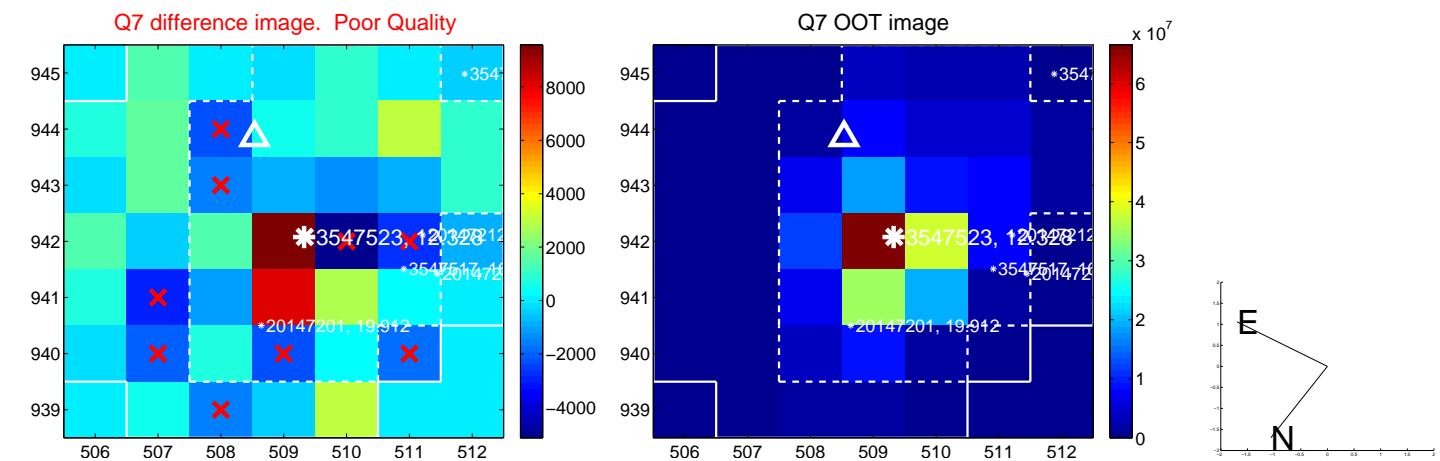
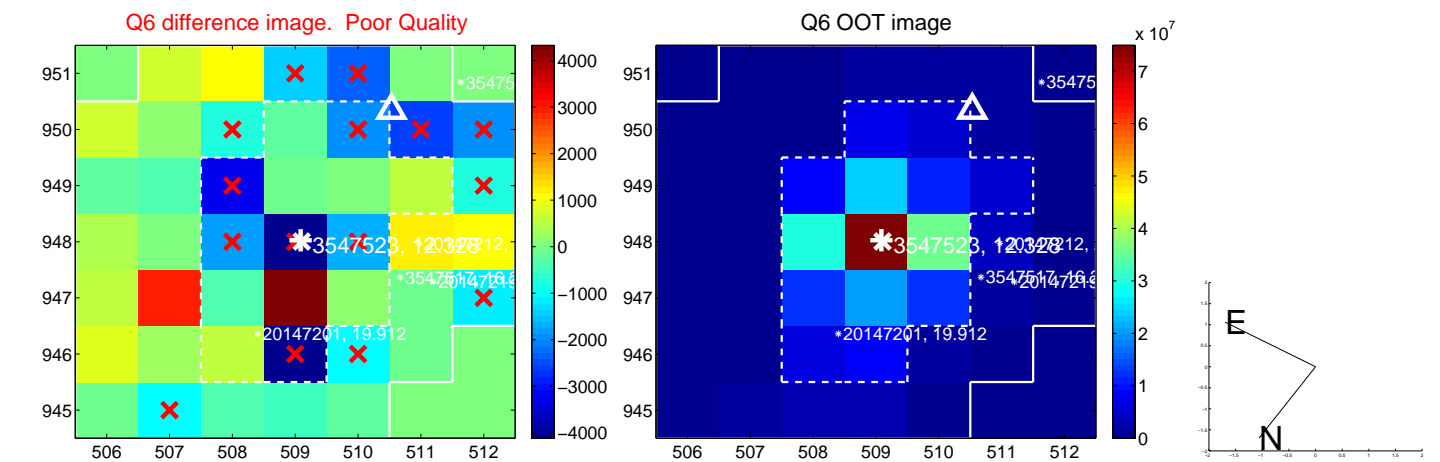
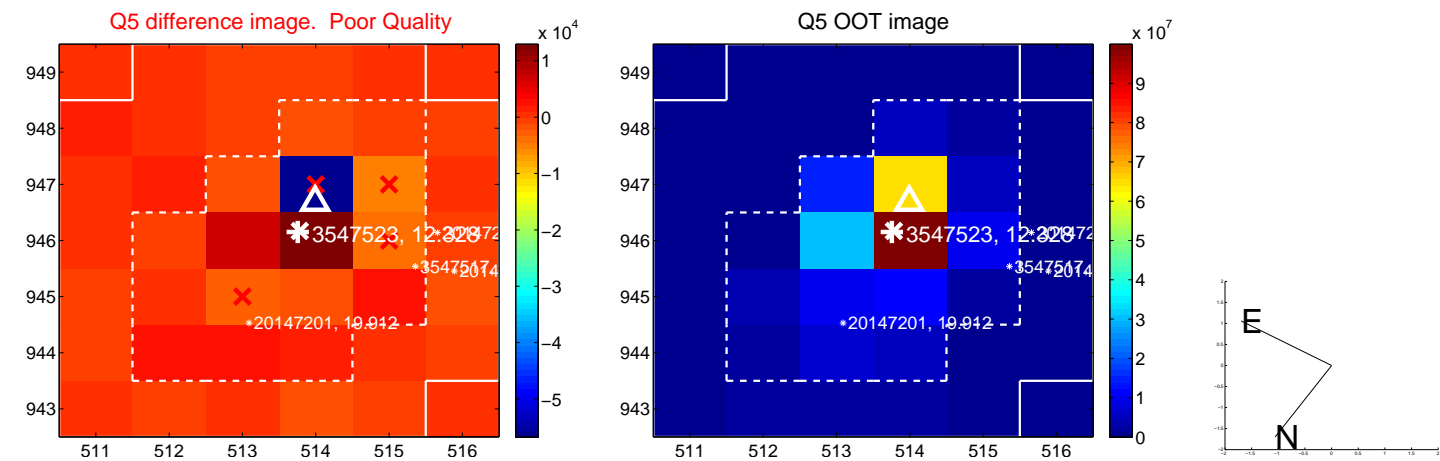


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

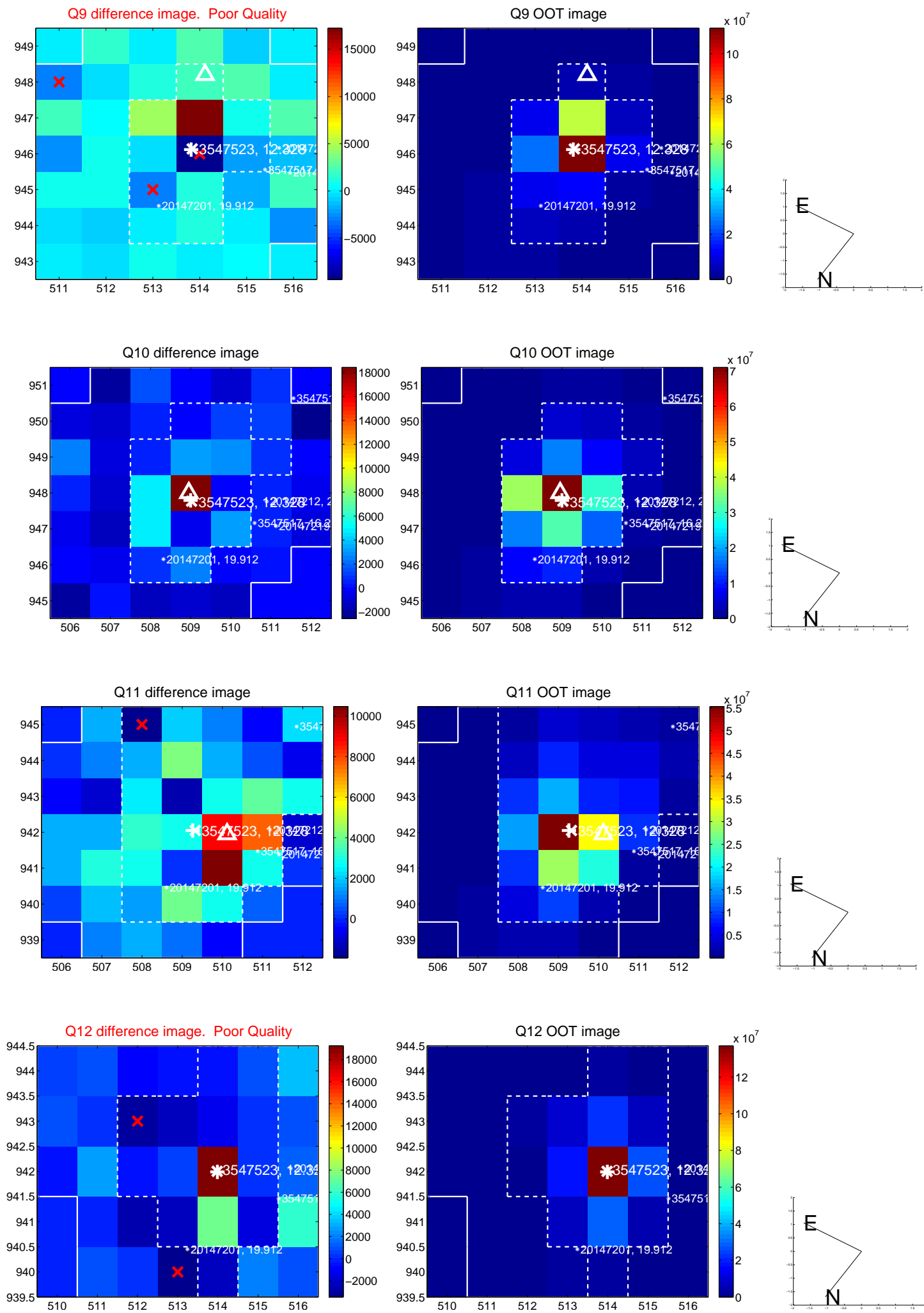
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



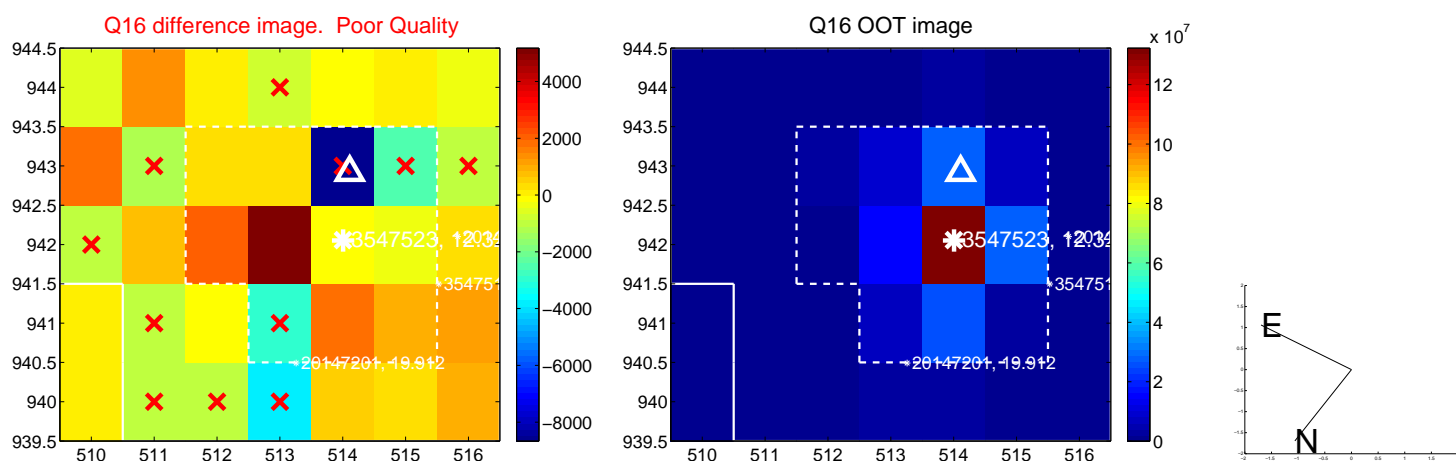
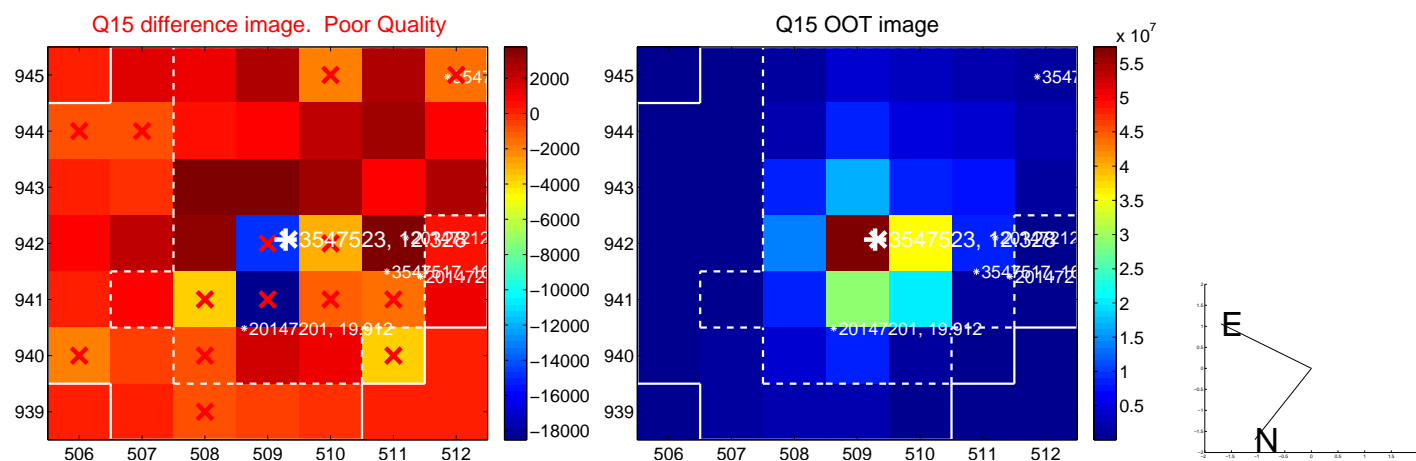
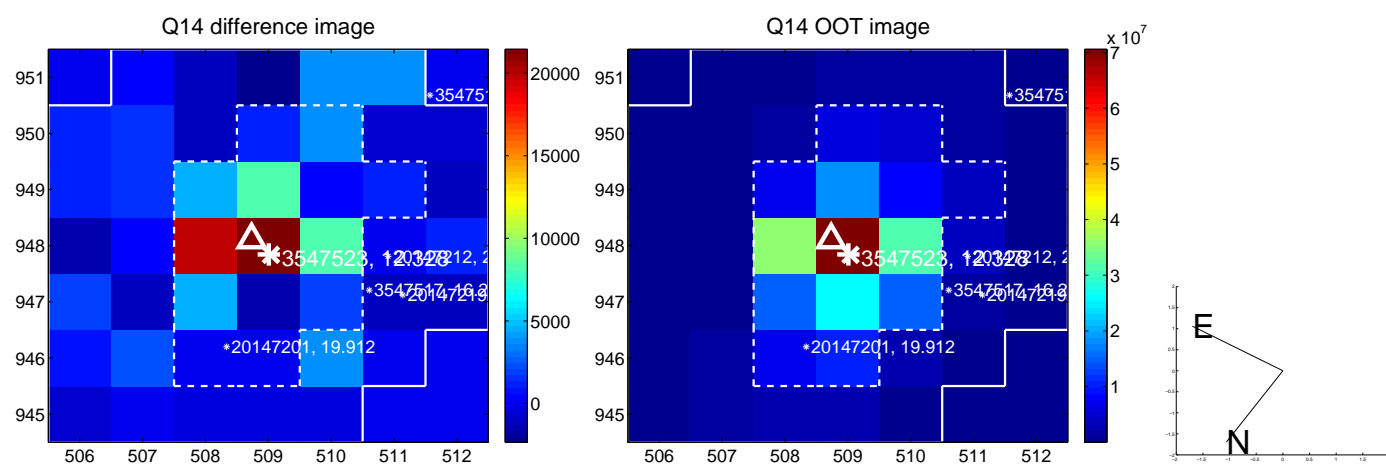
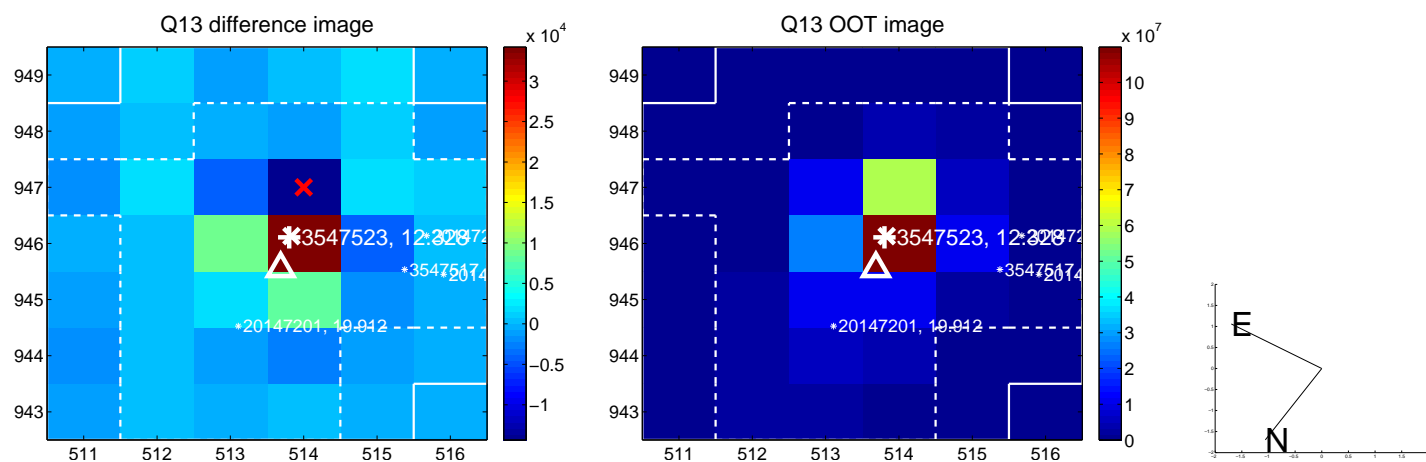
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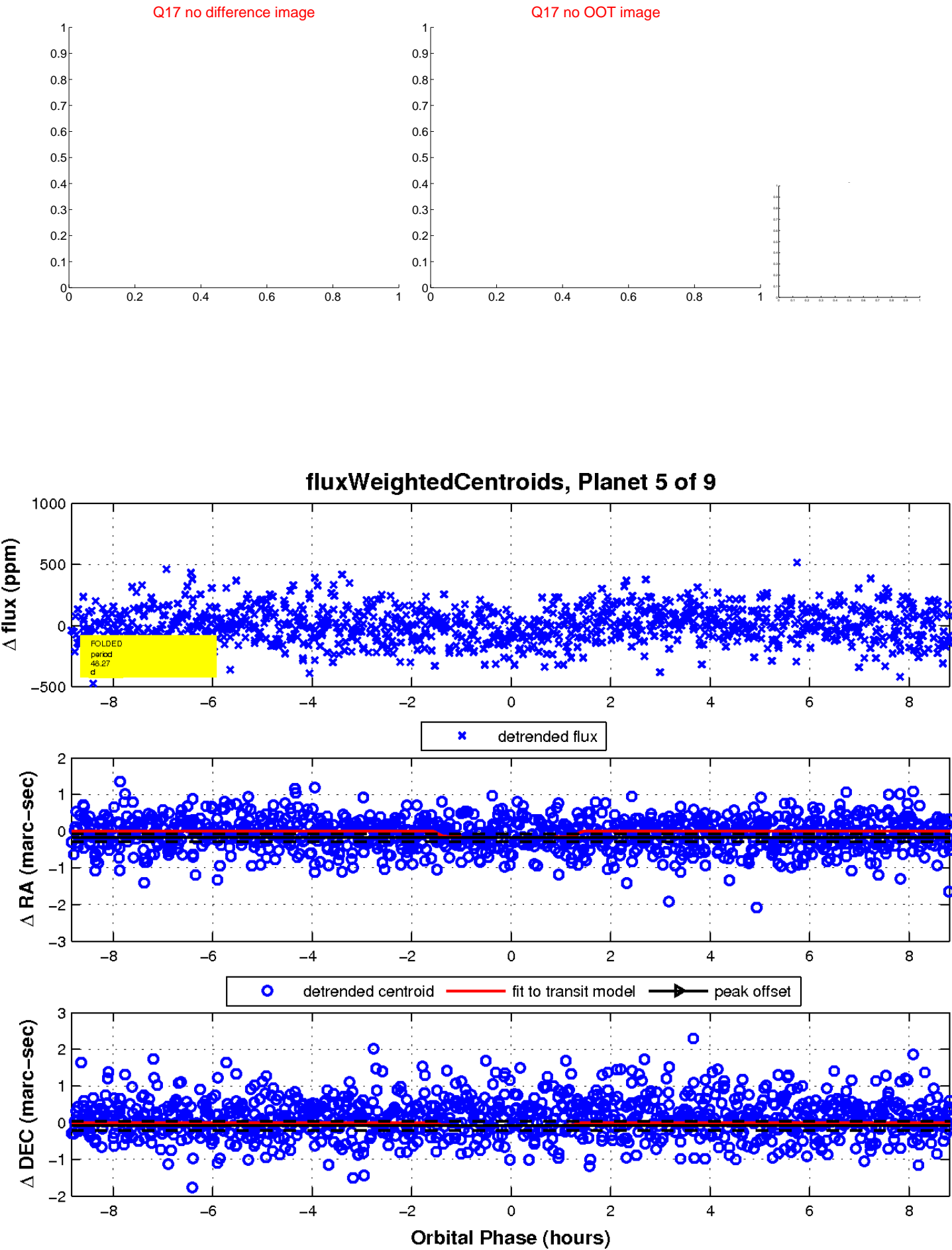


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UKIRT Image



## KIC 003547523

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003547523-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
003547523-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003547523-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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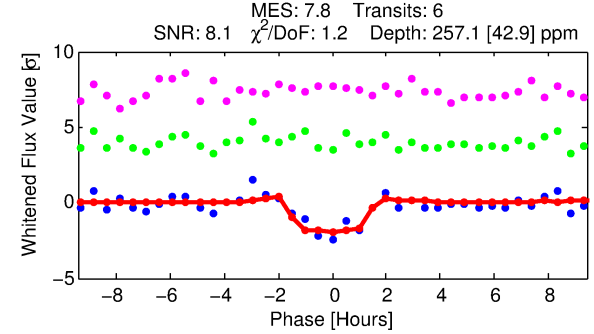
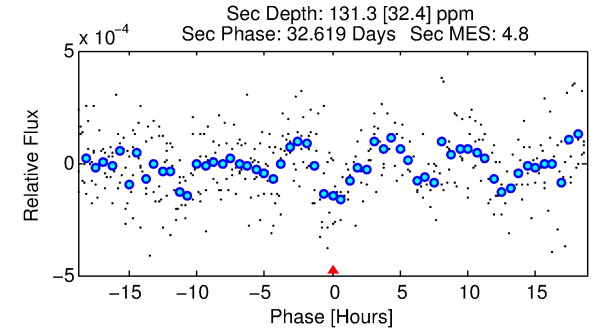
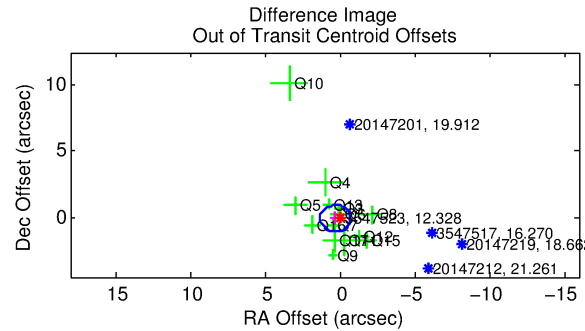
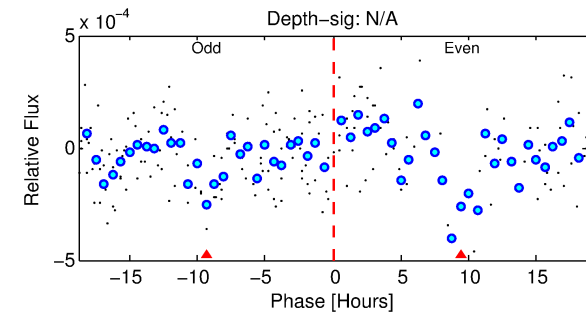
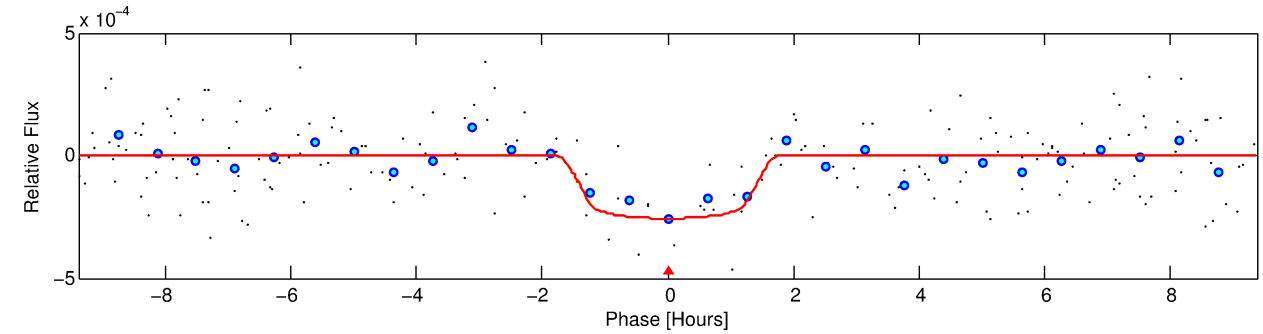
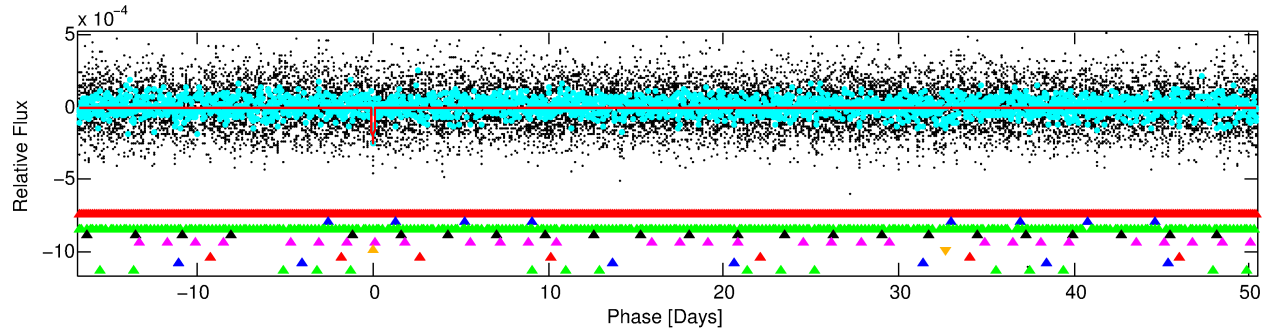
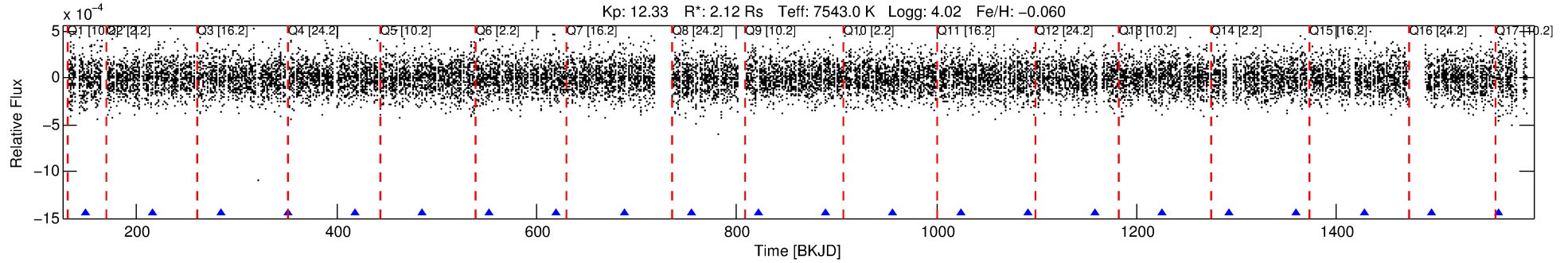
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003547523-06

No Significant Match Found

# DV One-Page Summary

KIC: 3547523 Candidate: 6 of 9 Period: 67.257 d



## DV Fit Results:

Period = 67.25661 [0.00071] d  
Epoch = 149.4918 [0.0101] BKJD  
Rp/R\* = 0.0169 [0.0074]  
a/R\* = 80.78 [222.40]  
b = 0.89 [0.64]  
Seff = 87.02 [32.37]  
Teq = 779 [72] K  
Rp = 3.90 [1.97] Re  
a = 0.3861 [0.0853] AU  
Ag = 709.38 [689.11] [1.03 $\sigma$ ]  
Teffp = 6214 [1441] K [3.77 $\sigma$ ]

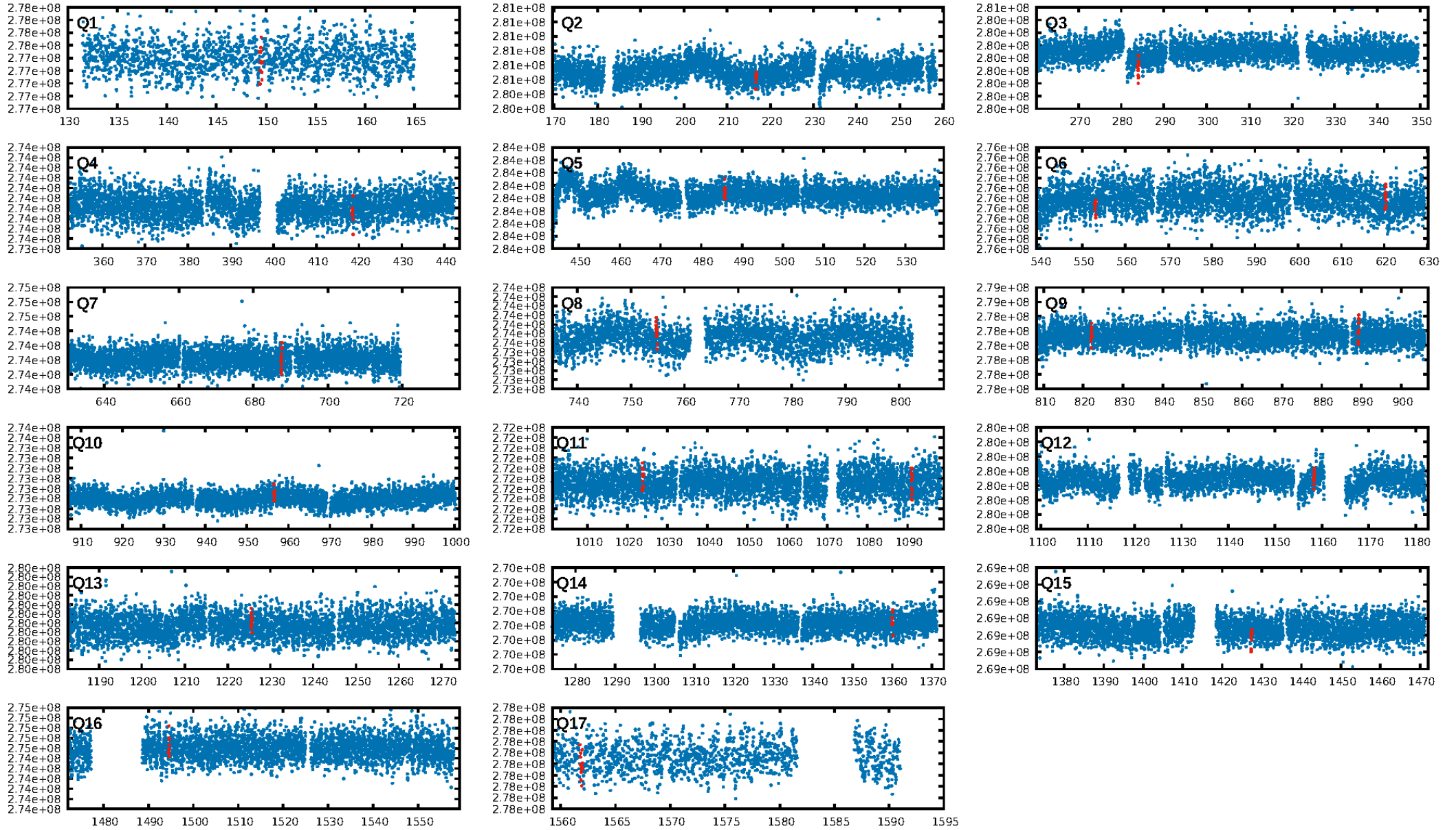
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [10.97 $\sigma$ ]  
LongPeriod-sig: 100.0% [164.95 $\sigma$ ]  
ModelChiSquare2-sig: 22.6%  
ModelChiSquareGof-sig: 99.9%  
**Bootstrap-pfa: 6.52e-09**  
RollingBand-fgt: 1.00 [5/5]  
**GhostDiagnostic-chr: 0.6287**  
Centroid-sig: 0.8%  
Centroid-so: 0.928 arcsec [1.76 $\sigma$ ]  
OotOffset-rm: 0.282 arcsec [0.84 $\sigma$ ]  
OotOffset-st: 2/4/4/4 [14]  
KicOffset-rm: 0.332 arcsec [0.88 $\sigma$ ]  
KicOffset-st: 2/4/4/4 [14]  
DiffImageQuality-fgm: 0.43 [6/14]  
DiffImageOverlap-fno: 0.19 [3/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:34:22 Z

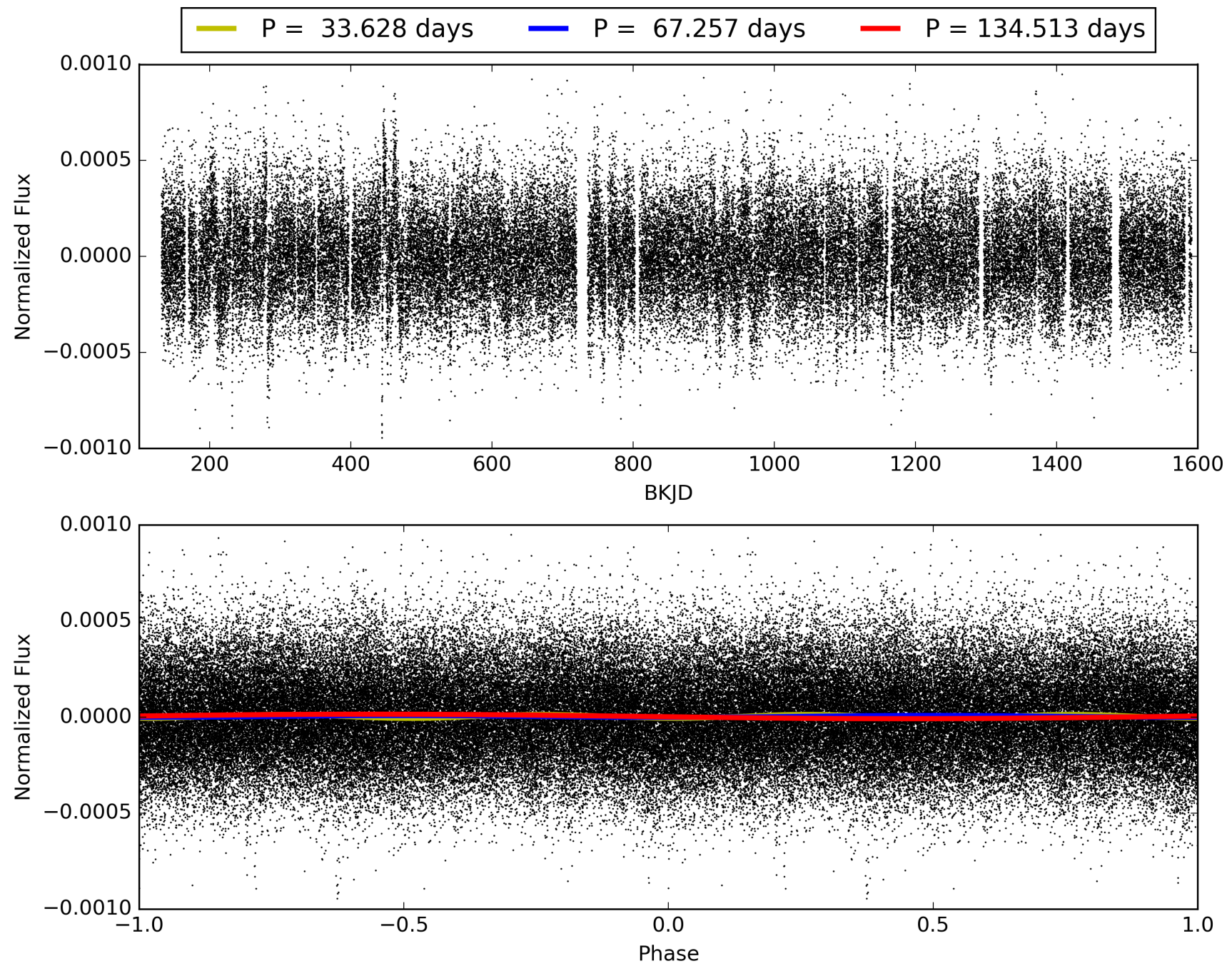
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003547523-06, PDC Light Curves





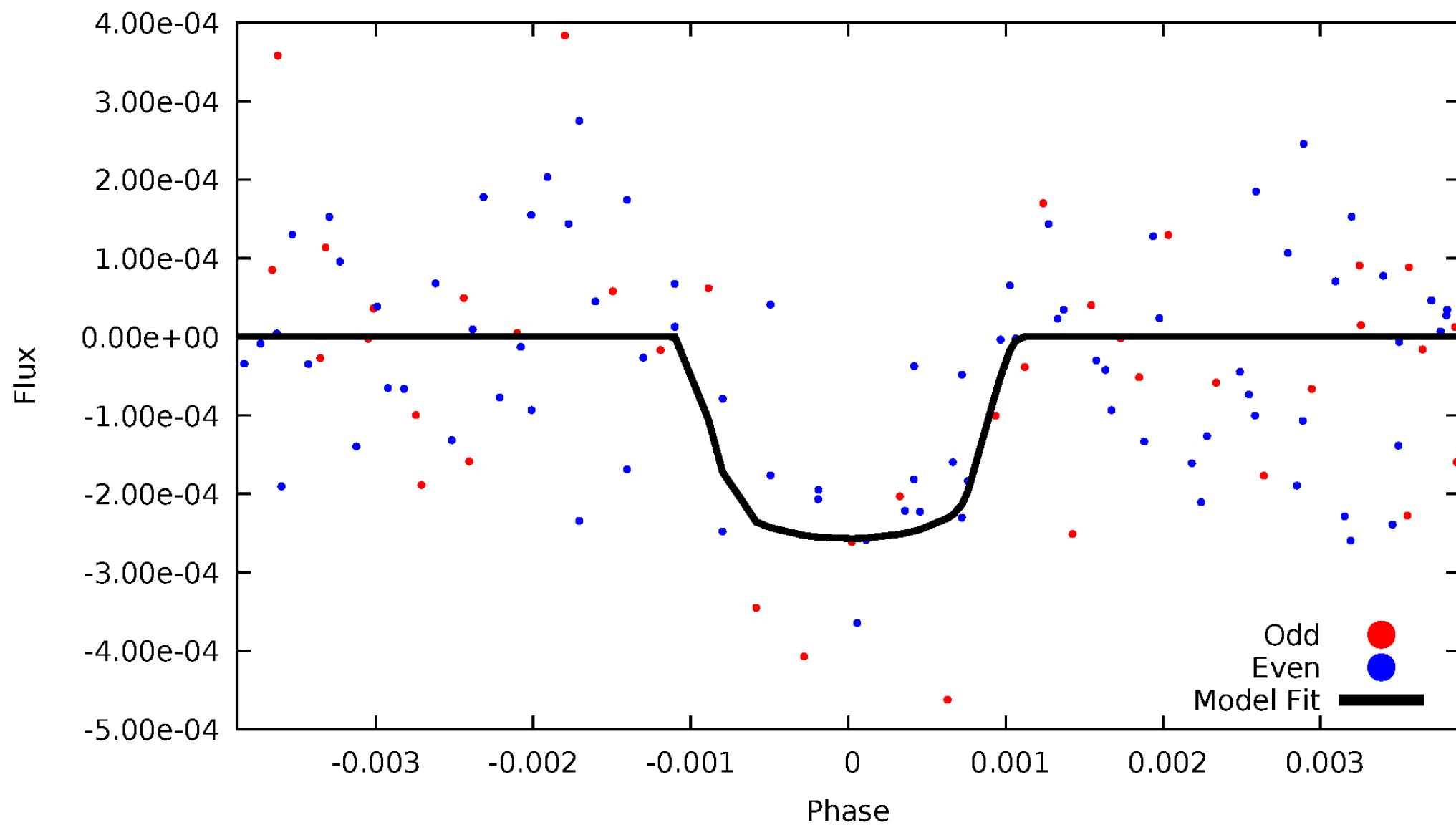
TCE 003547523-06





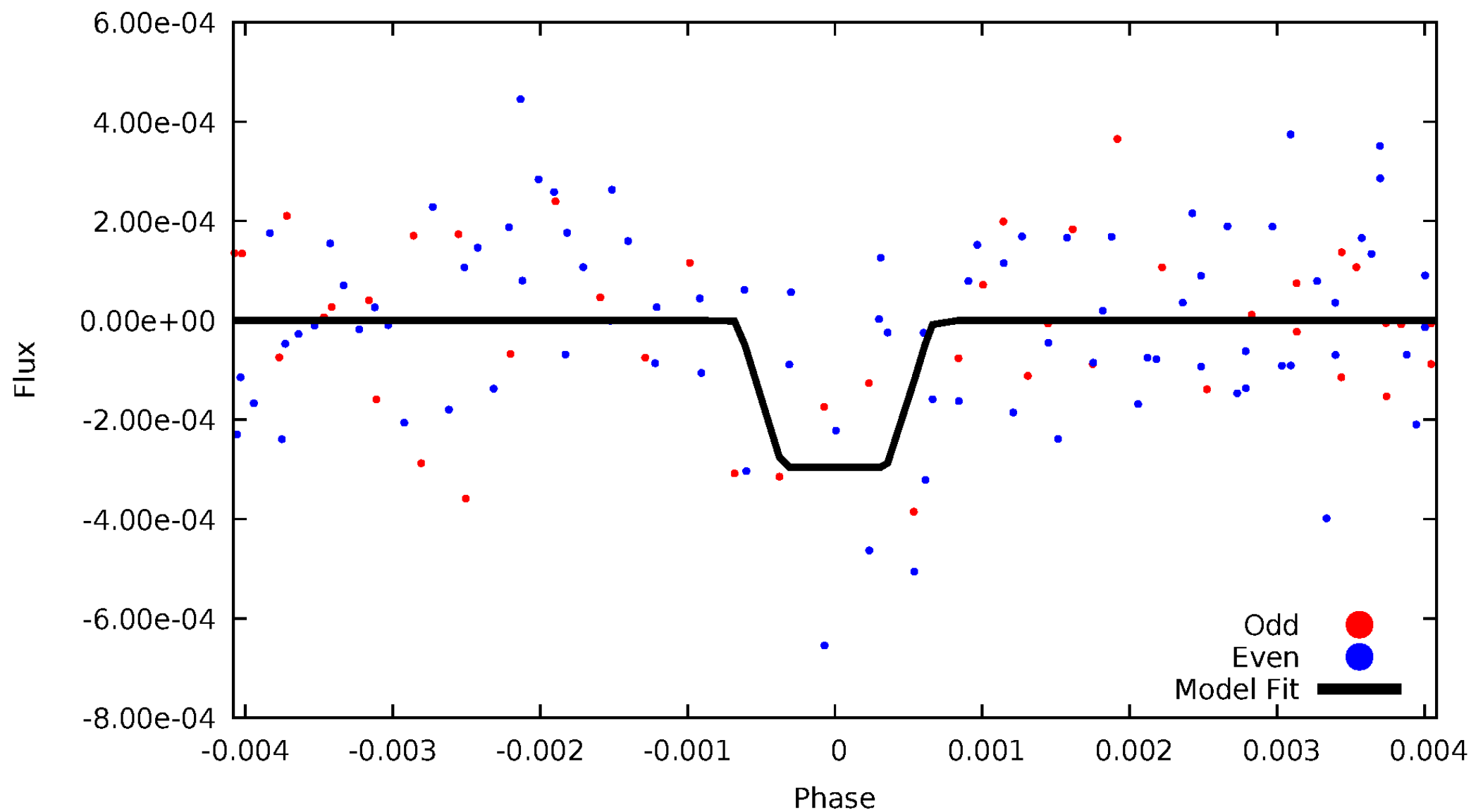
# DV Odd/Even

TCE 003547523-06



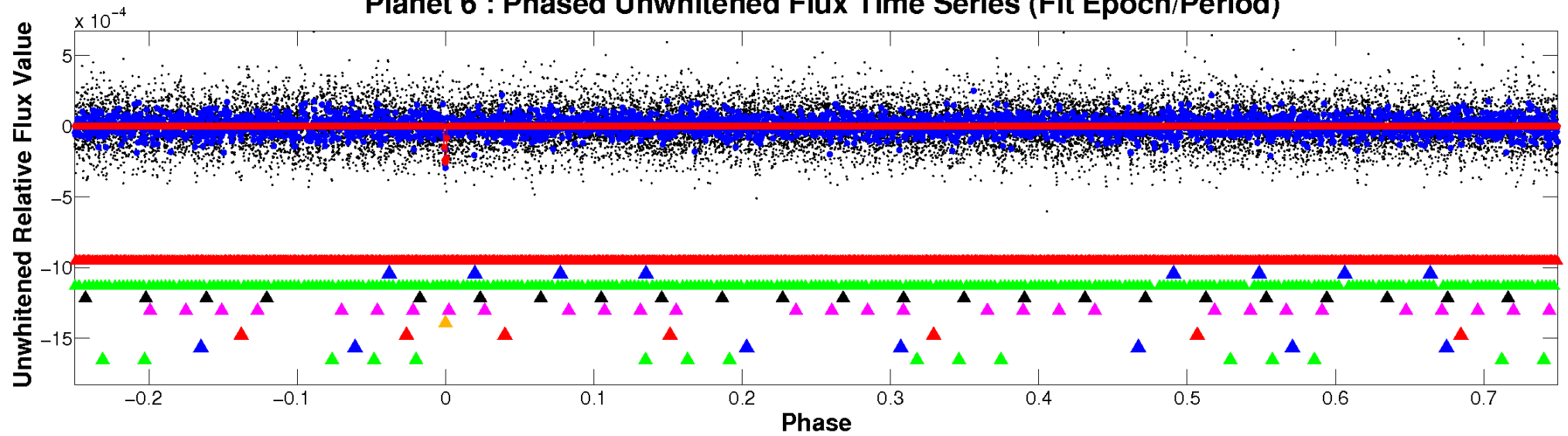
# ALT Odd/Even

TCE 003547523-06

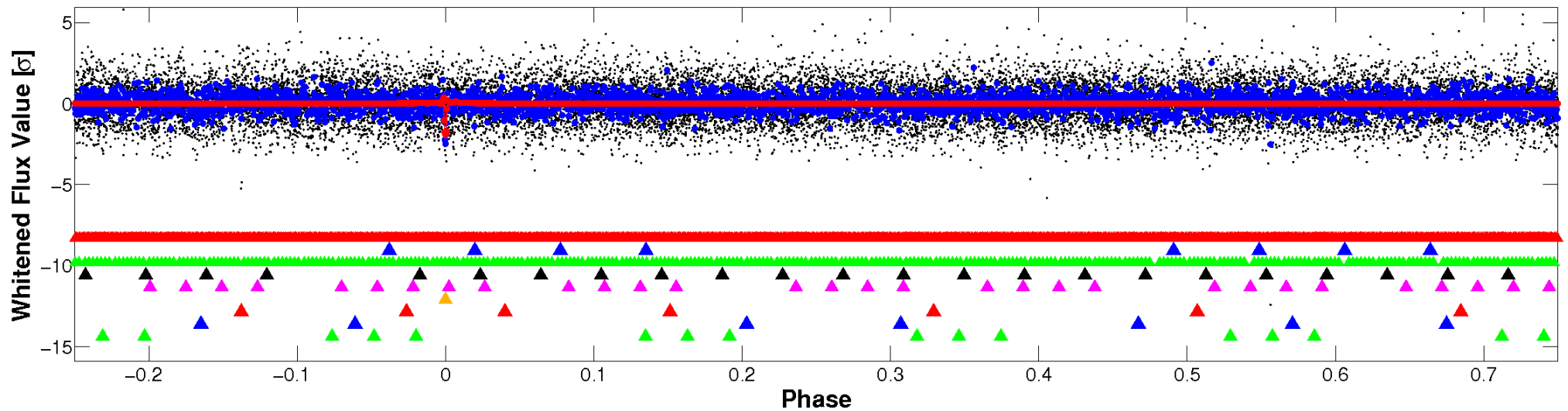


# Non-Whitened Vs. Whitened Light Curve

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

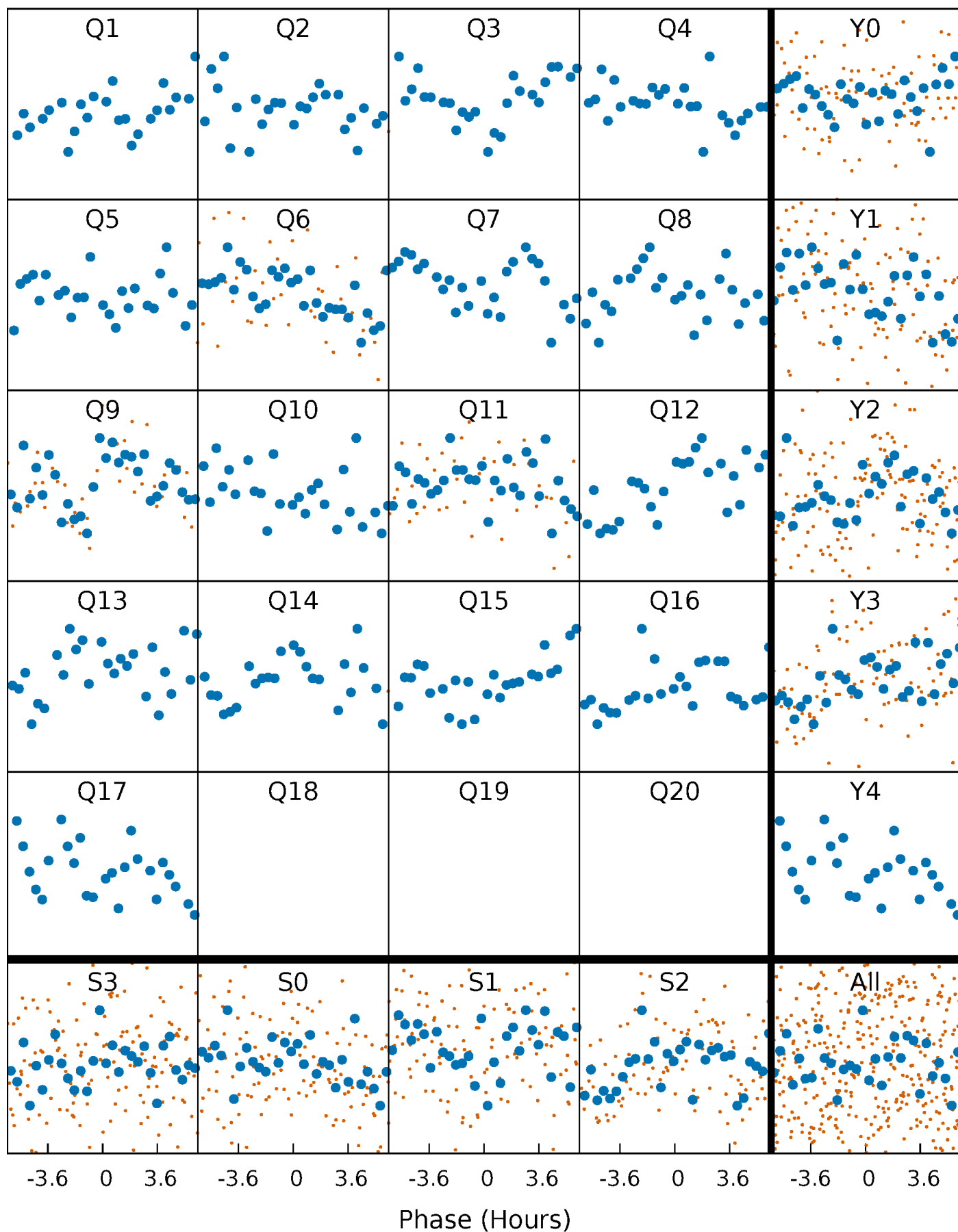


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



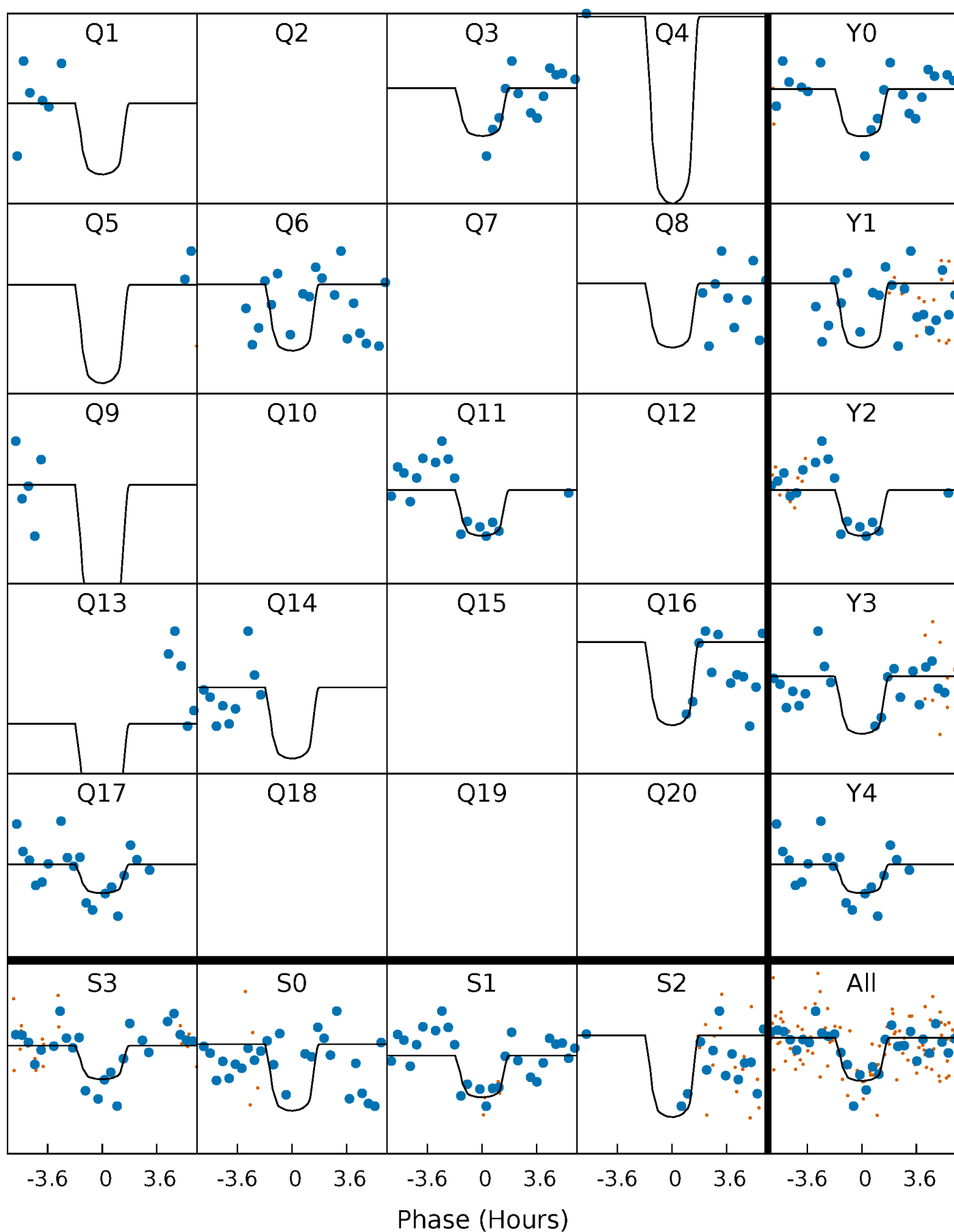
# PDC Quarter-Phased Transit Curves

TCE 003547523-06 P= 67.256610 Days  $T_0=149.491828$  (BKJD)



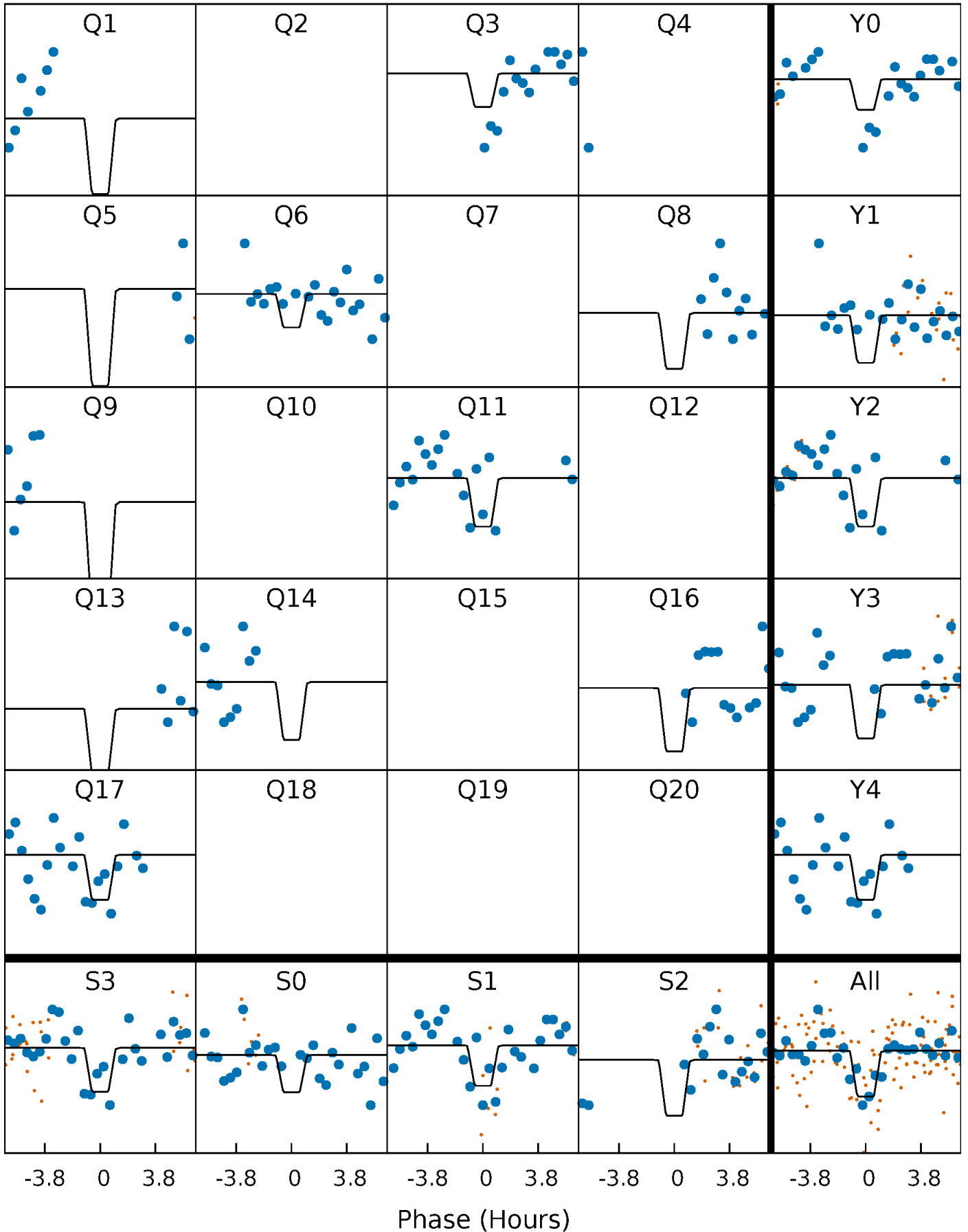
# DV Quarter-Phased Transit Curves

TCE 003547523-06 P= 67.256610 Days  $T_0=149.491828$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003547523-06 P= 67.256505 Days  $T_0=149.500489$  (BKJD)

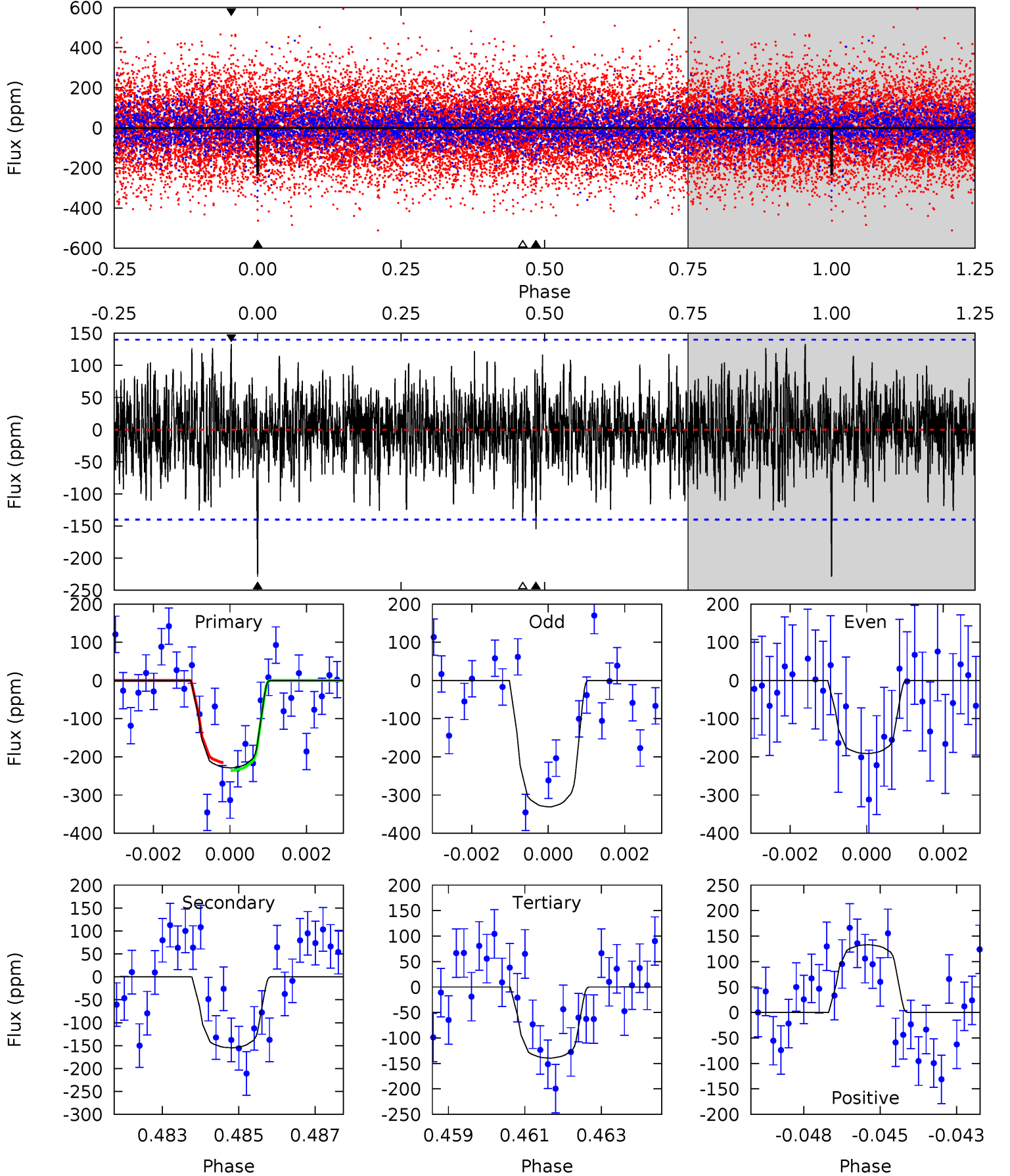




# DV Model-Shift Uniqueness Test

003547523-06, P = 67.256610 Days, E = 82.235218 Days

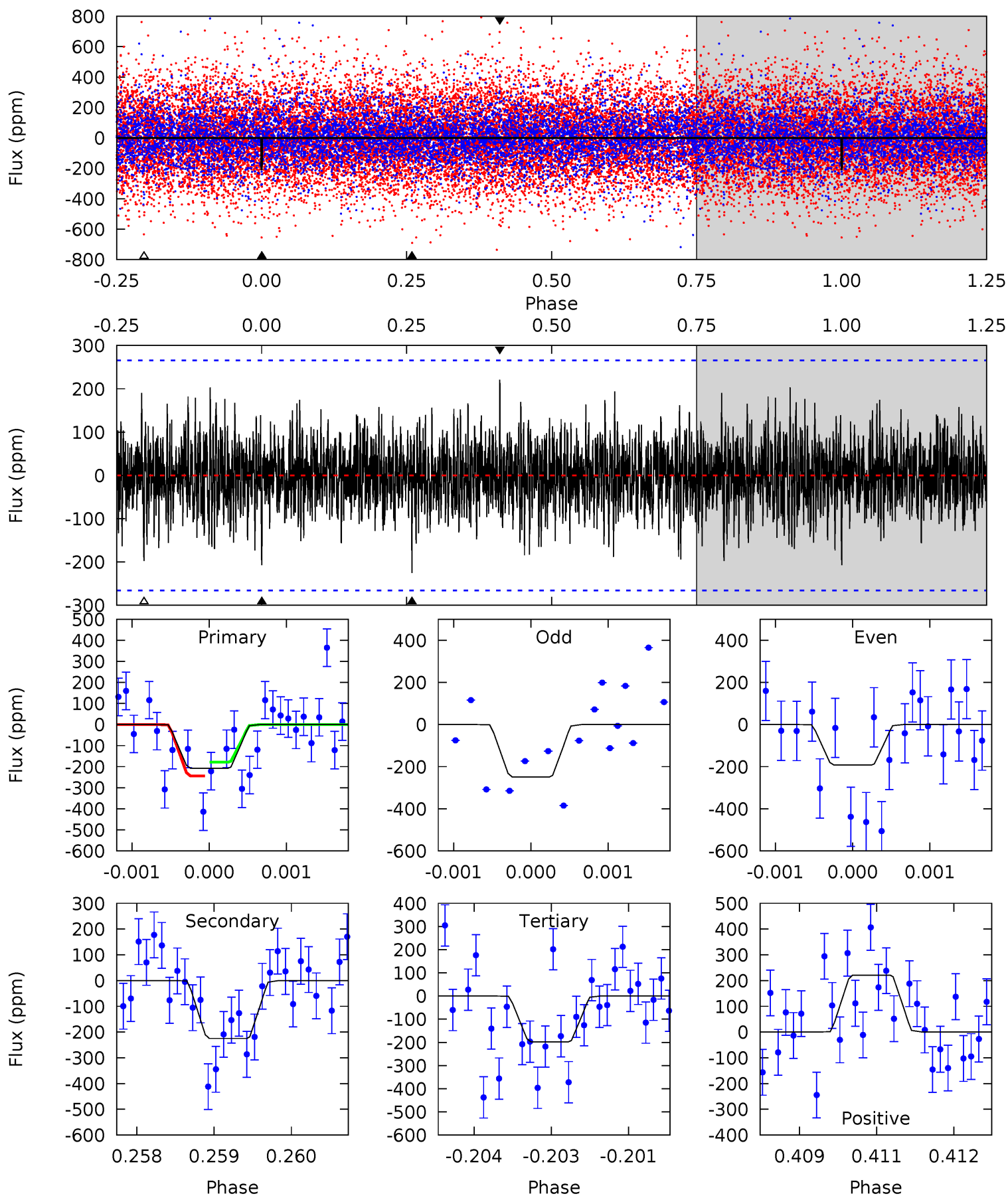
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.68	5.87	5.29	5.05	5.31	3.07	1.54	3.39	3.64	0.58	0.83	2.38	0.96	0.37	0.38



# Alt Model-Shift Uniqueness Test

003547523-06, P = 67.256505 Days, E = 82.243984 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.22	4.58	4.02	4.50	5.41	3.22	1.19	0.20	-0.28	0.56	0.08	0.50	3.99	0.50	0.65



### Stellar Parameters For KIC 003547523

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7543^{+235}_{-314}$	$4.017^{+0.187}_{-0.153}$	$-0.060^{+0.200}_{-0.300}$	$2.115^{+0.533}_{-0.533}$	$1.695^{+0.212}_{-0.282}$	$0.252^{+0.261}_{-0.110}$
	+3%/-4%	+5%/-4%	+333%/-500%	+25%/-25%	+13%/-17%	+103%/-44%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003547523-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-155 \pm 26$	$3.92^{+1.90}_{-1.70}$	$1080^{+84}_{-74}$	$6263^{+2413}_{-985}$	$826^{+1791}_{-463}$
Alt.	$-225 \pm 49$	$3.87^{+1.89}_{-1.57}$	$1081^{+76}_{-75}$	$6864^{+2781}_{-1193}$	$1152^{+2406}_{-627}$

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

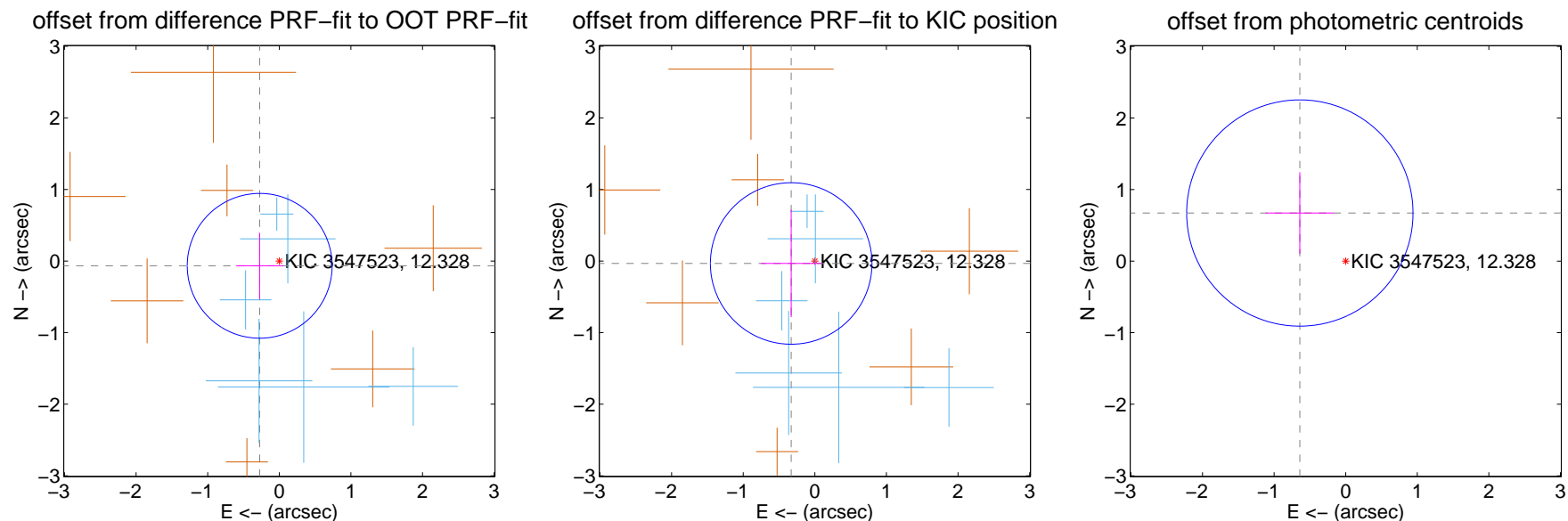
## DV Centroid Data

Supplemental centroid analysis for 003547523-06. Kepler magnitude: 12.33. Transit SNR 8.08

There are 6 quarters with good PRF difference image offsets

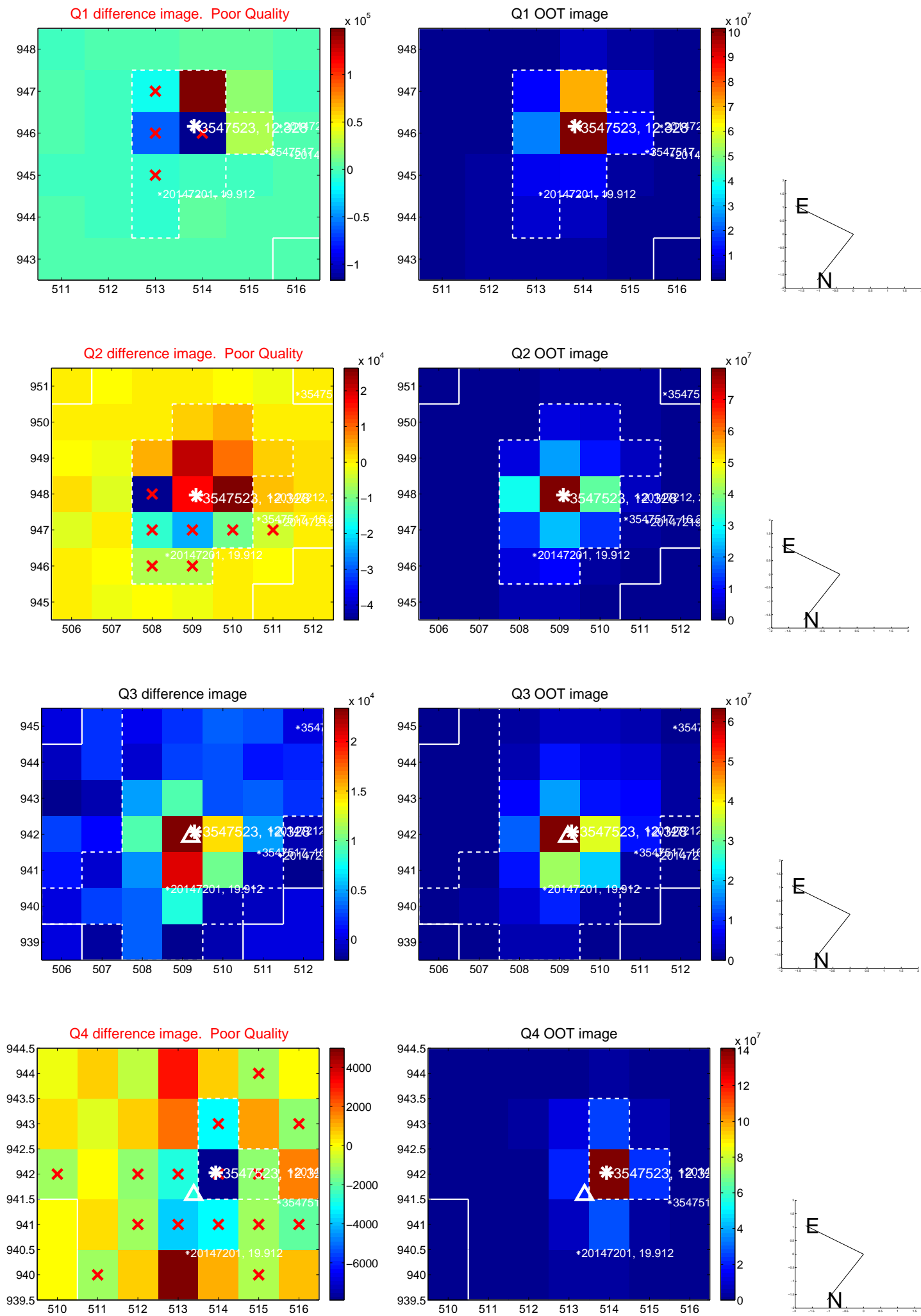
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.282 \pm 0.337$	0.84	$0.274 \pm 0.328$	$-0.067 \pm 0.461$
PRF-fit source offset from KIC position	$0.332 \pm 0.376$	0.88	$0.330 \pm 0.422$	$-0.034 \pm 0.750$
photometric centroid source offset	$0.93 \pm 0.53$	1.76	$0.64 \pm 0.48$	$0.67 \pm 0.57$

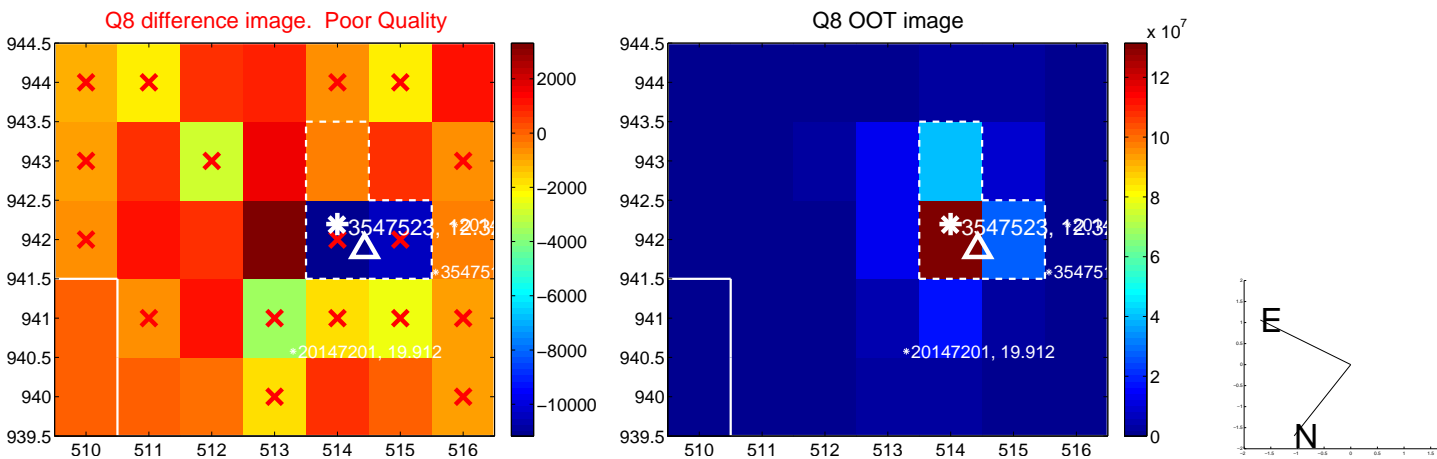
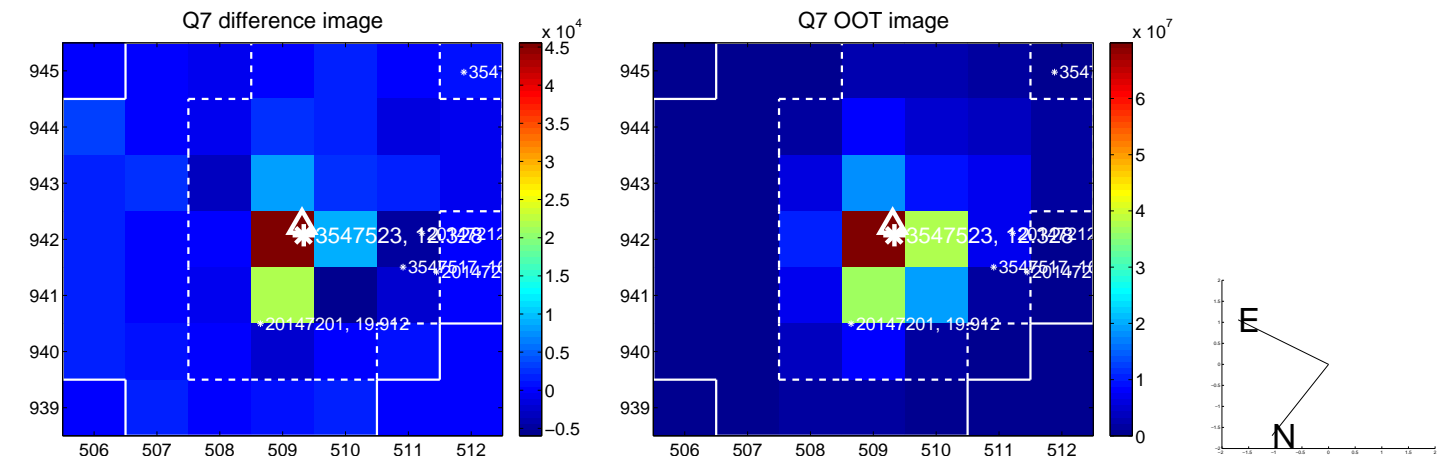
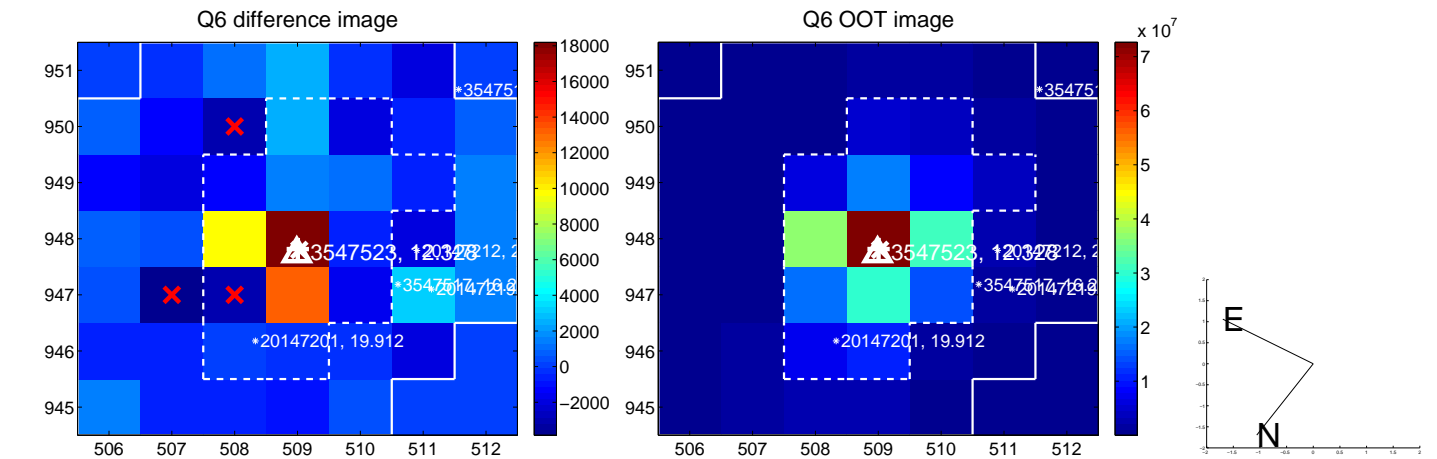
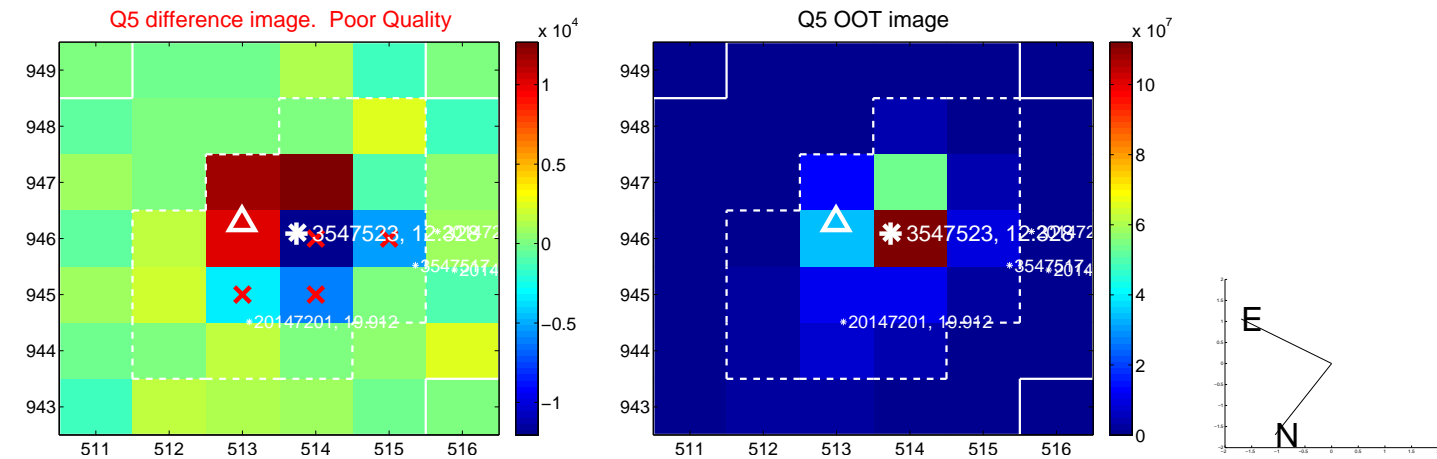


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

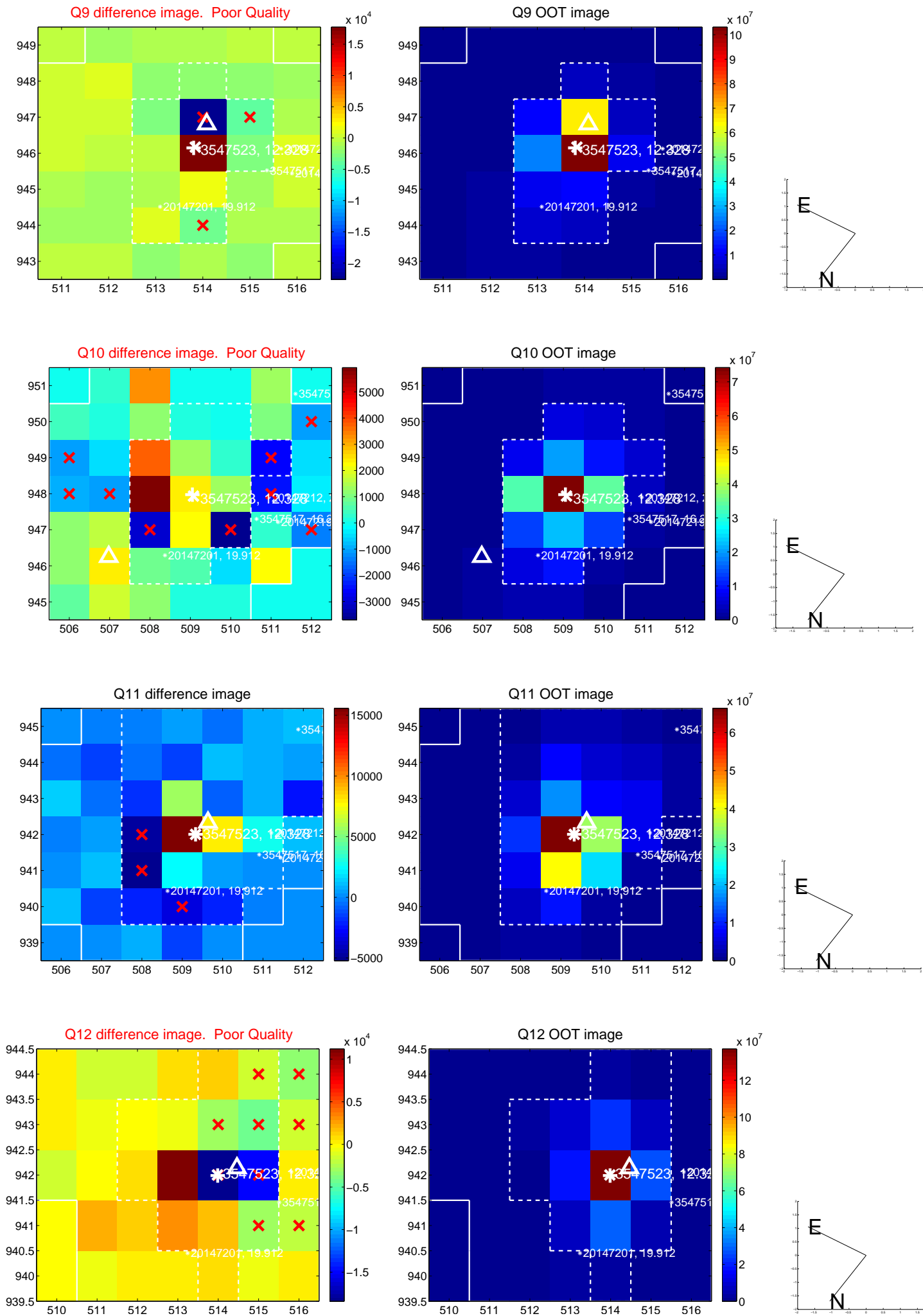


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

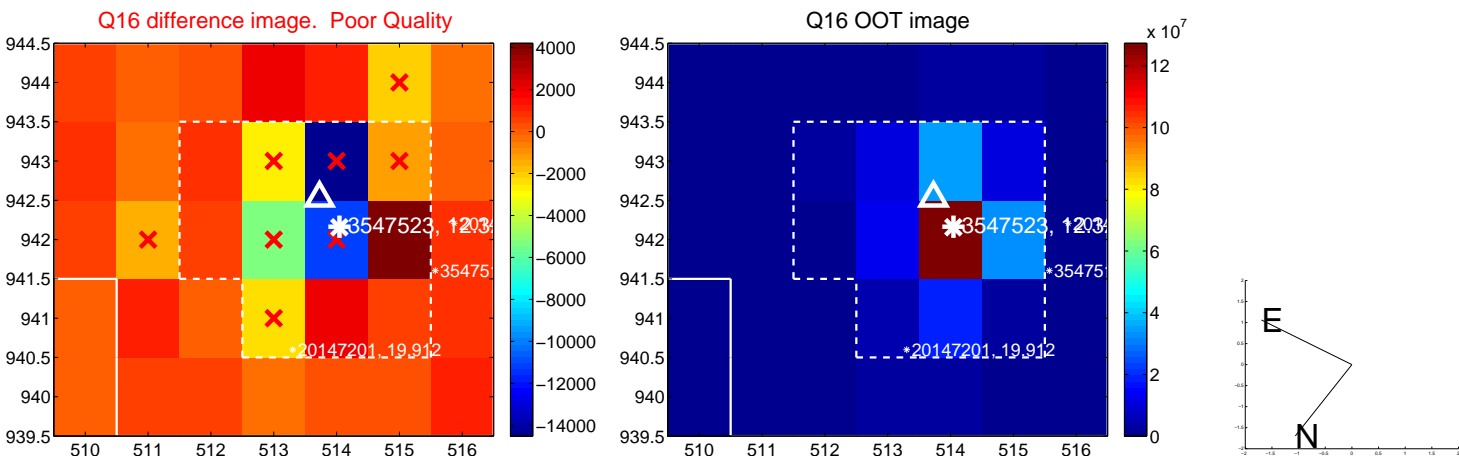
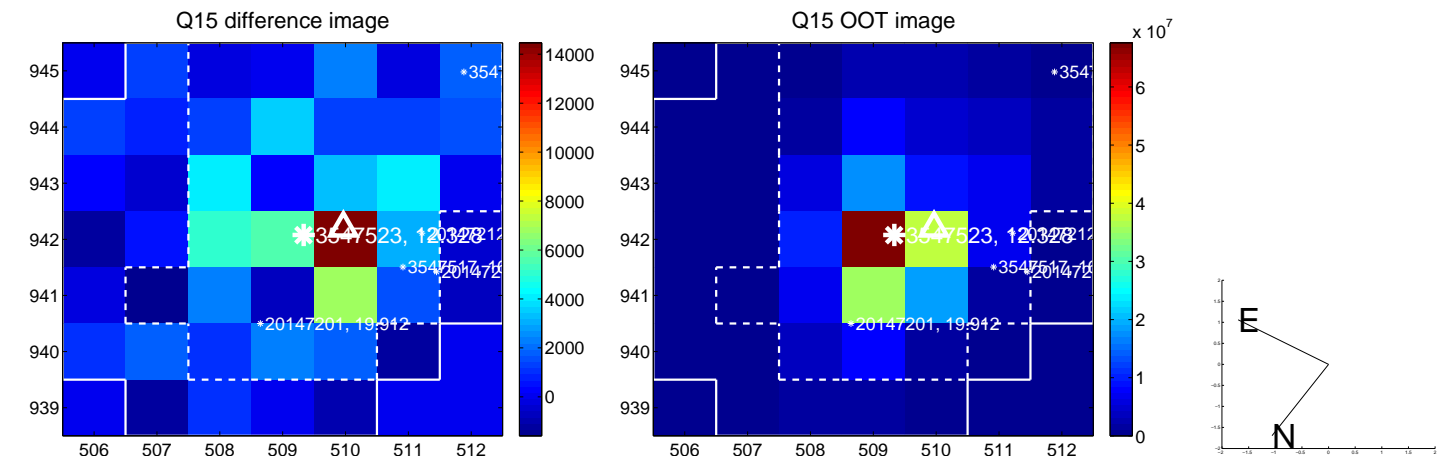
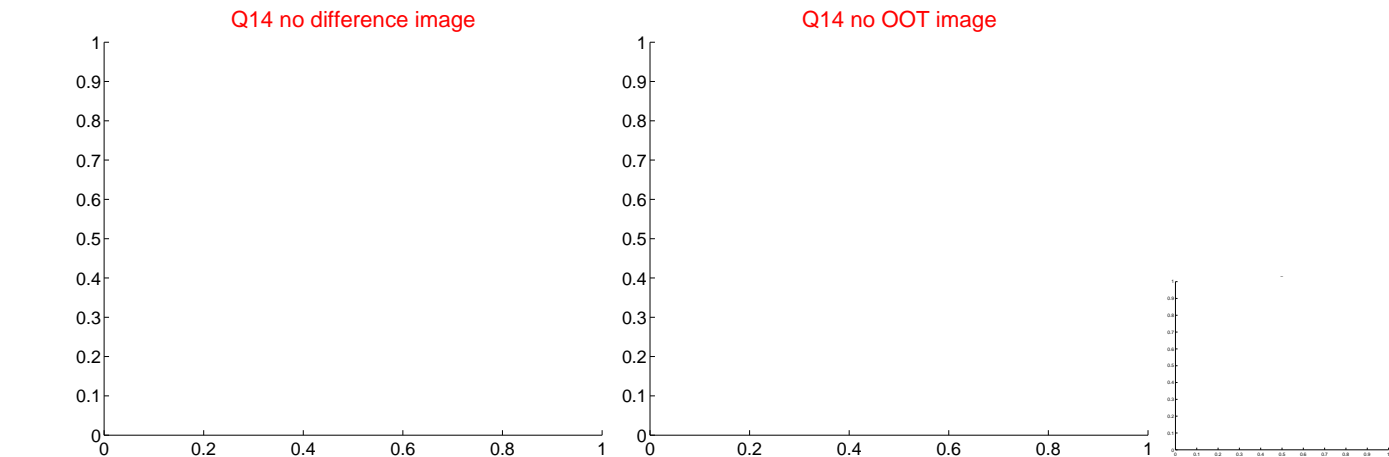
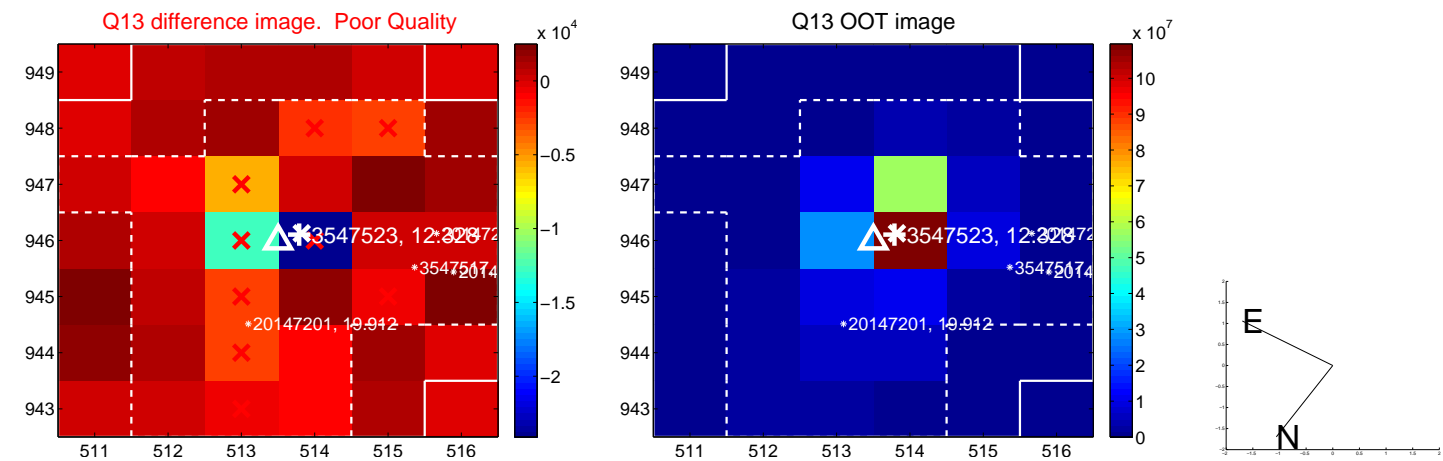




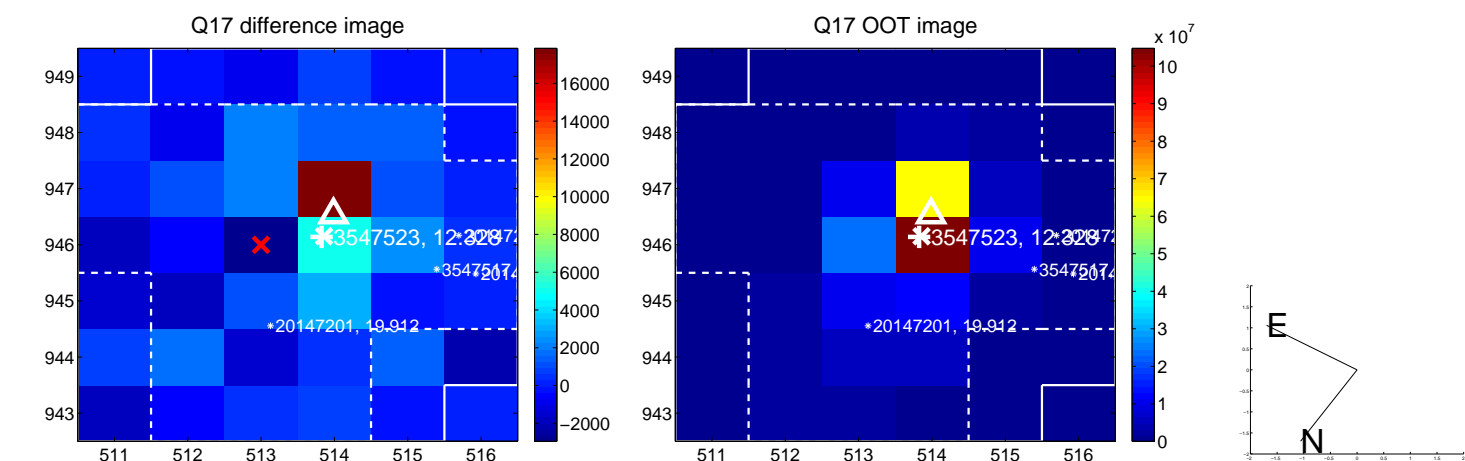
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



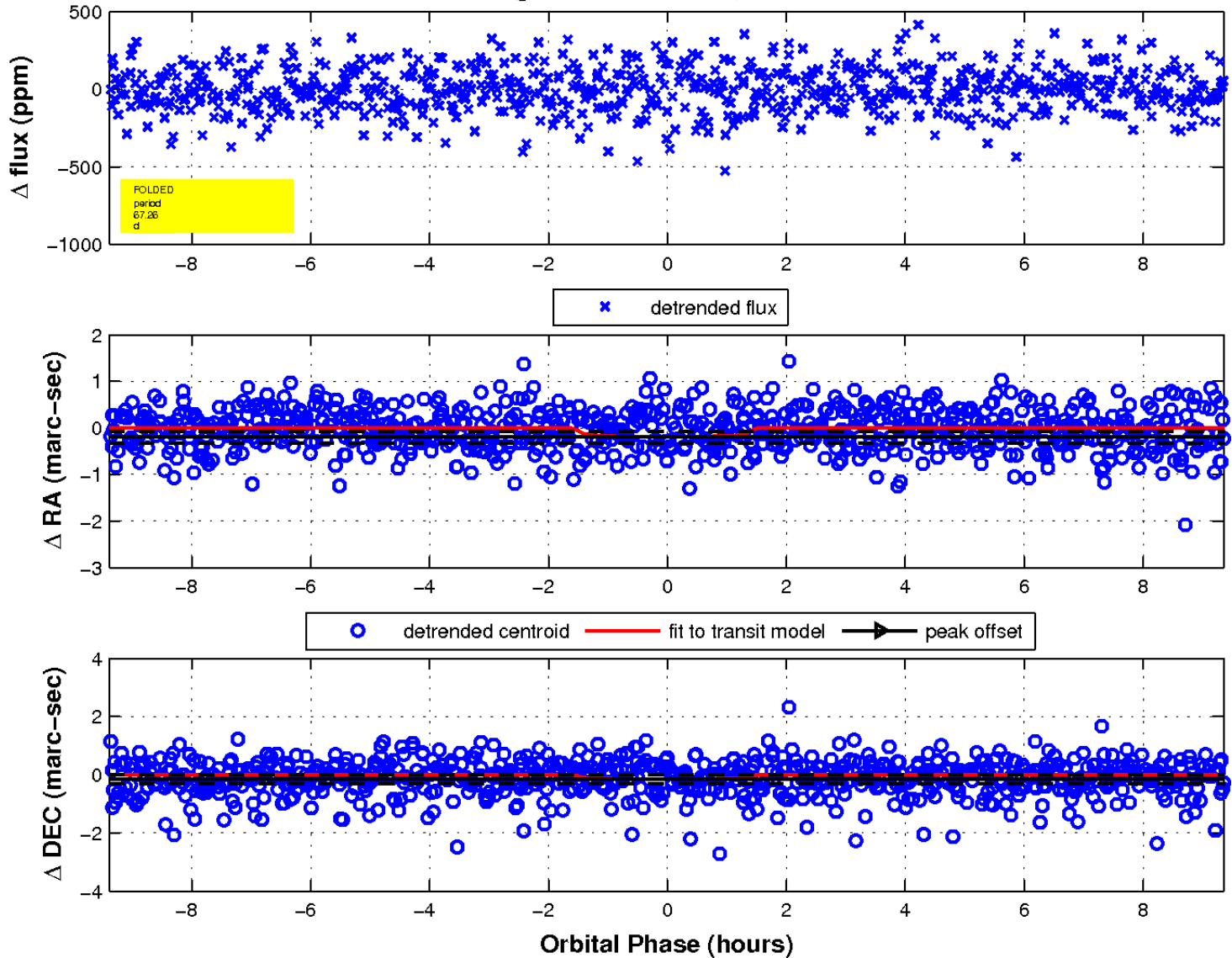
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 6 of 9



UKIRT Image



## KIC 003547523

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003547523-01	OBS	No	1.286558	131.774714	21.4	6.273	9.4	10.8	2.12	7543	1.13	17010.03
003547523-02	OBS	No	170.081357	281.456755	154.3	3.405	10.3	4.6	2.12	7543	2.97	25.26
003547523-03	OBS	No	4.289079	131.505412	36.0	6.831	8.0	7.9	2.12	7543	1.58	3415.54
003547523-04	OBS	No	64.515001	141.389924	133.7	5.114	7.9	7.7	2.12	7543	2.73	91.99
003547523-05	OBS	No	48.272360	144.778101	148.8	2.948	8.6	8.6	2.12	7543	2.87	135.42
003547523-06	OBS	No	67.256610	149.491828	257.1	3.132	7.8	8.1	2.12	7543	3.90	87.02
003547523-07	OBS	No	213.723127	282.236258	225.9	3.273	8.3	7.3	2.12	7543	3.67	18.63
003547523-08	OBS	No	226.517683	180.912141	209.7	5.031	7.4	7.7	2.12	7543	3.39	17.24
003547523-09	OBS	No	93.778528	135.848958	265.1	2.254	7.6	8.4	2.12	7543	3.67	55.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003547523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003547523-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003547523-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
003547523-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
003547523-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003547523-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—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.

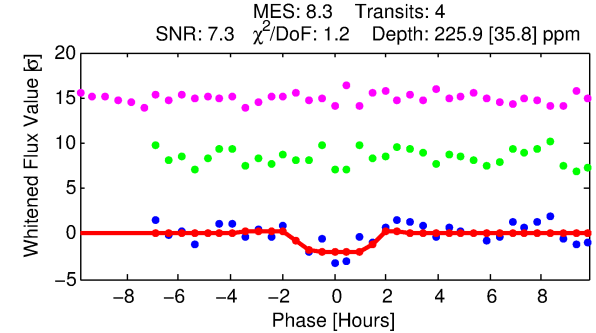
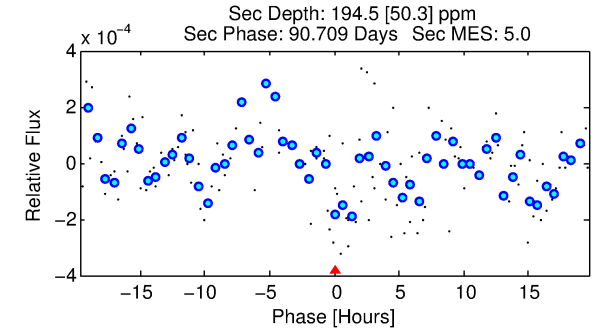
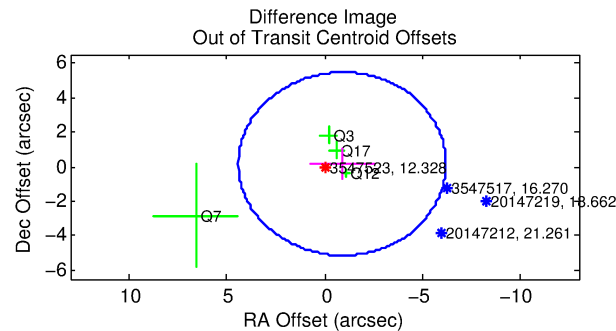
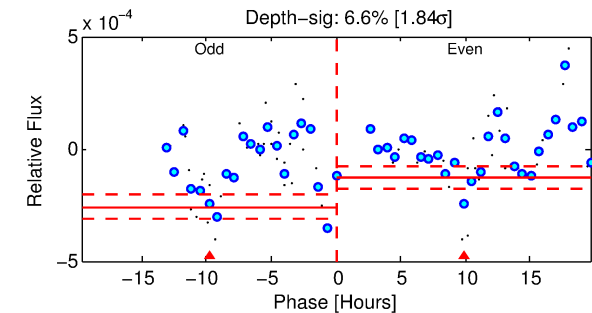
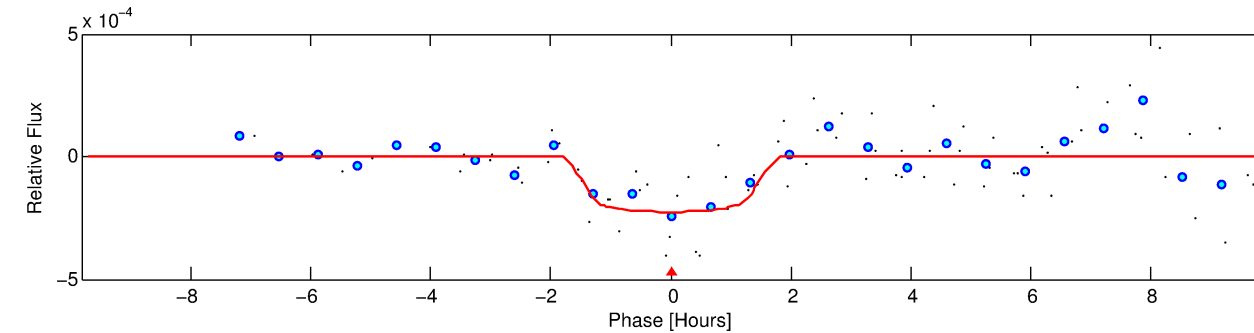
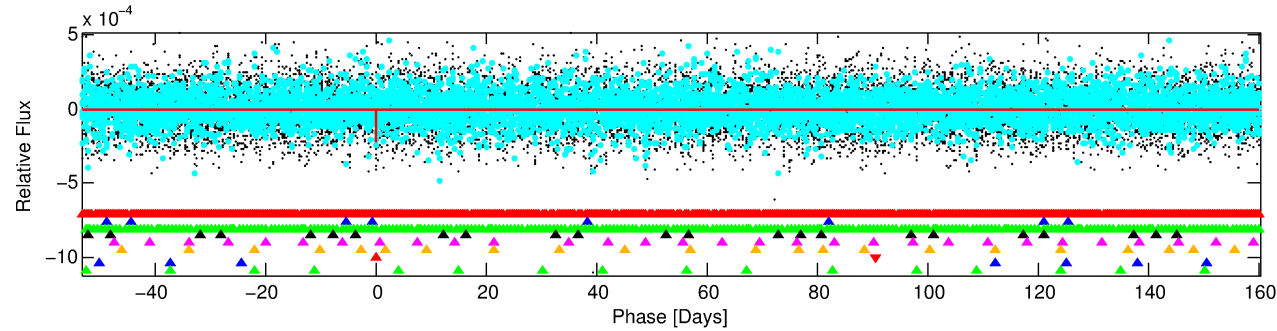
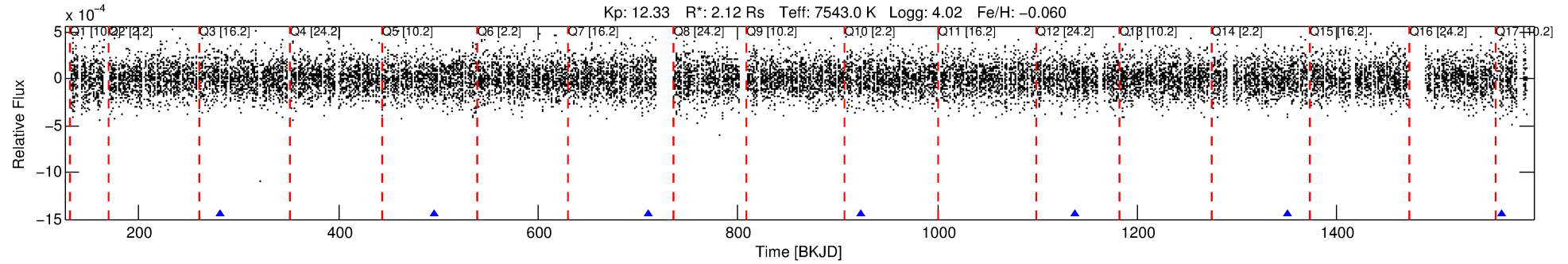
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003547523-07

No Significant Match Found

# DV One-Page Summary

KIC: 3547523 Candidate: 7 of 9 Period: 213.723 d



## DV Fit Results:

Period = 213.72313 [0.00552] d  
Epoch = 282.2363 [0.0276] BKJD  
Rp/R\* = 0.0159 [0.0109]  
a/R\* = 236.57 [1070.35]  
b = 0.90 [0.98]  
Seff = 18.63 [6.93]  
Teq = 530 [49] K  
Rp = 3.67 [2.69] Re  
a = 0.8346 [0.1844] AU  
Ag = 5522.05 [7937.58] [0.70 $\sigma$ ]  
Teffp = 7060 [2486] K [2.63 $\sigma$ ]

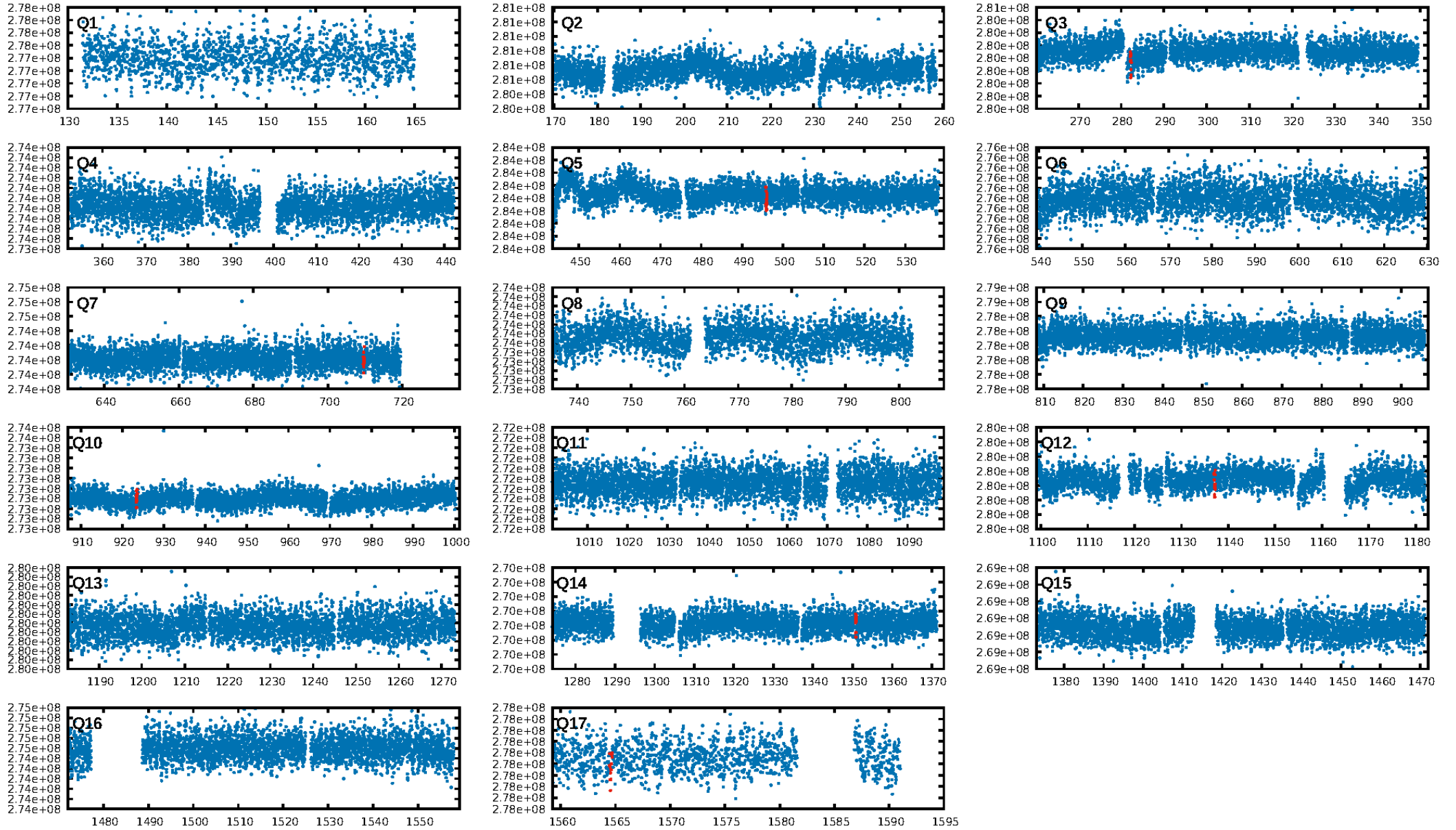
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [221.77 $\sigma$ ]  
LongPeriod-sig: 100.0% [51.16 $\sigma$ ]  
ModelChiSquare2-sig: 32.2%  
ModelChiSquareGof-sig: 95.3%  
**Bootstrap-pfa: 5.57e-10**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.234  
Centroid-sig: 5.0%  
Centroid-so: 1.577 arcsec [1.38 $\sigma$ ]  
OotOffset-rm: 0.916 arcsec [0.52 $\sigma$ ]  
KicOffset-rm: 0.910 arcsec [0.77 $\sigma$ ]  
OotOffset-st: 0/2/1/1 [4]  
KicOffset-st: 0/2/1/1 [4]  
DiffImageQuality-fgm: 0.75 [3/4]  
DiffImageOverlap-fno: 0.29 [2/7]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:34:28 Z

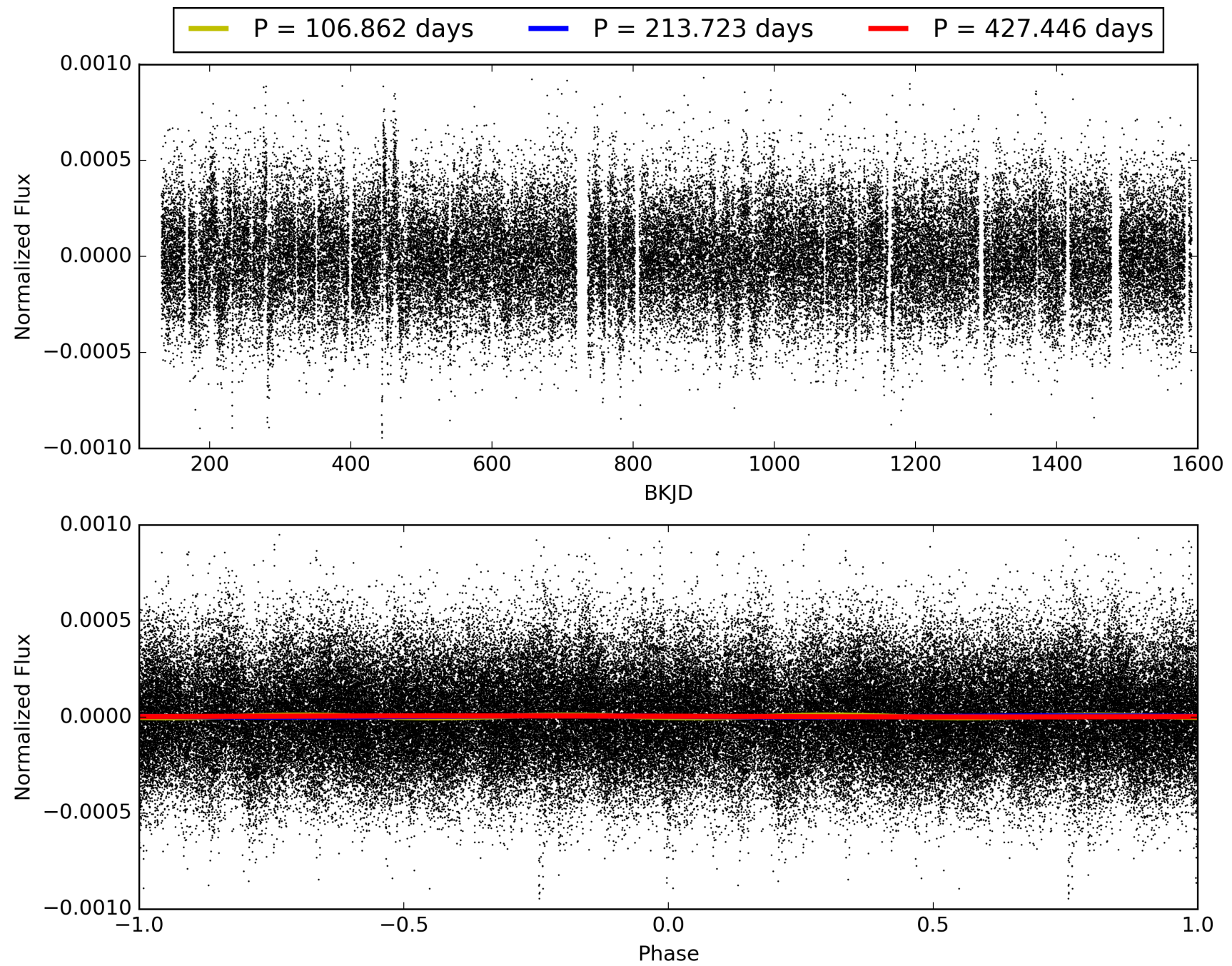
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003547523-07, PDC Light Curves



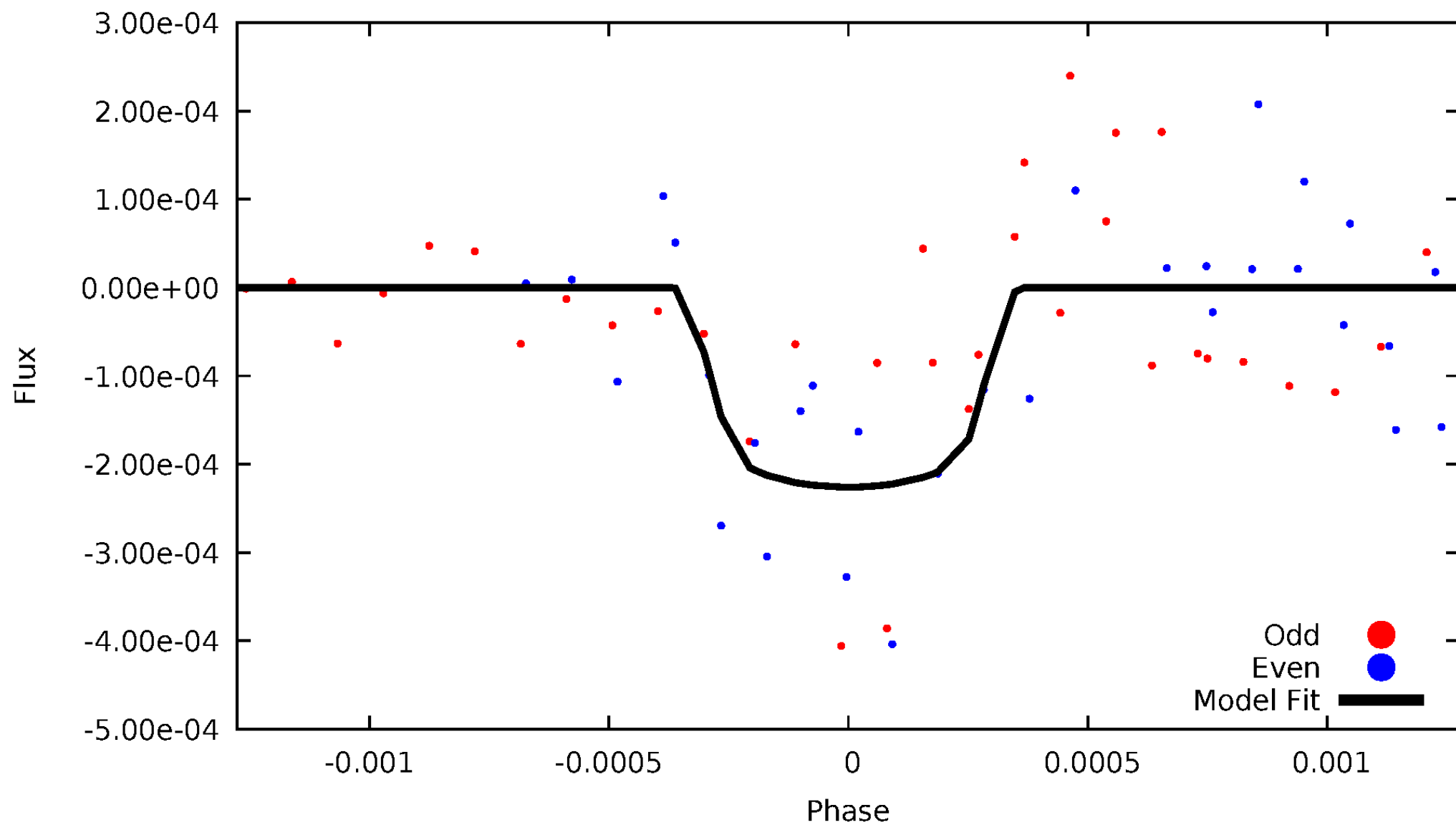


TCE 003547523-07



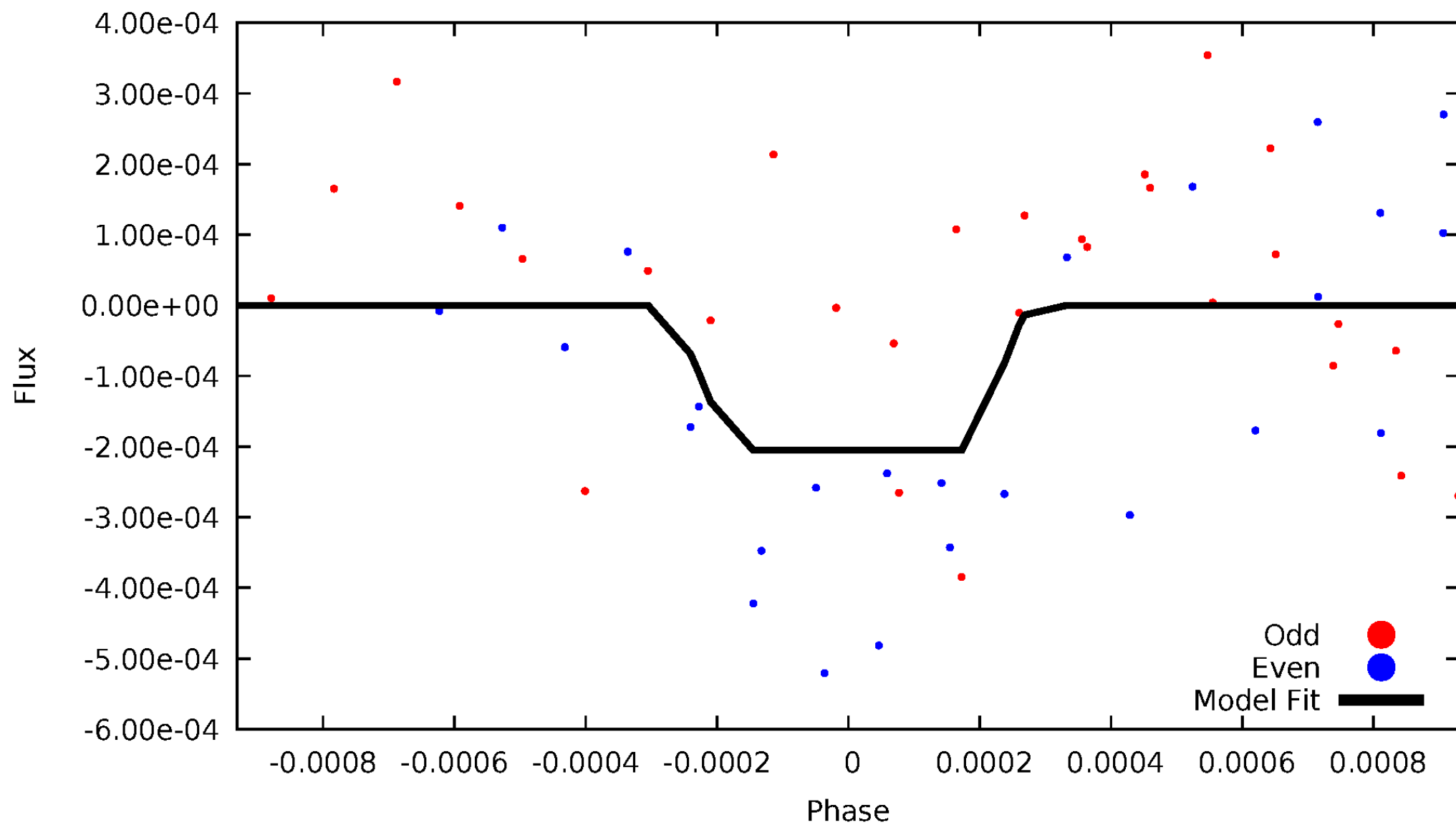
# DV Odd/Even

TCE 003547523-07

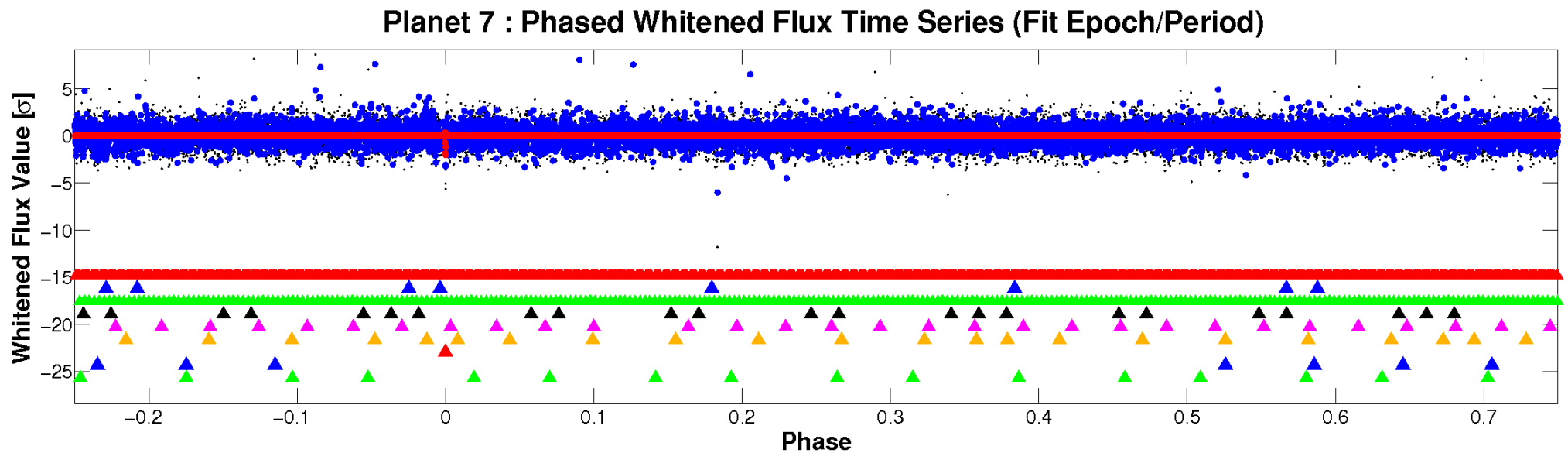
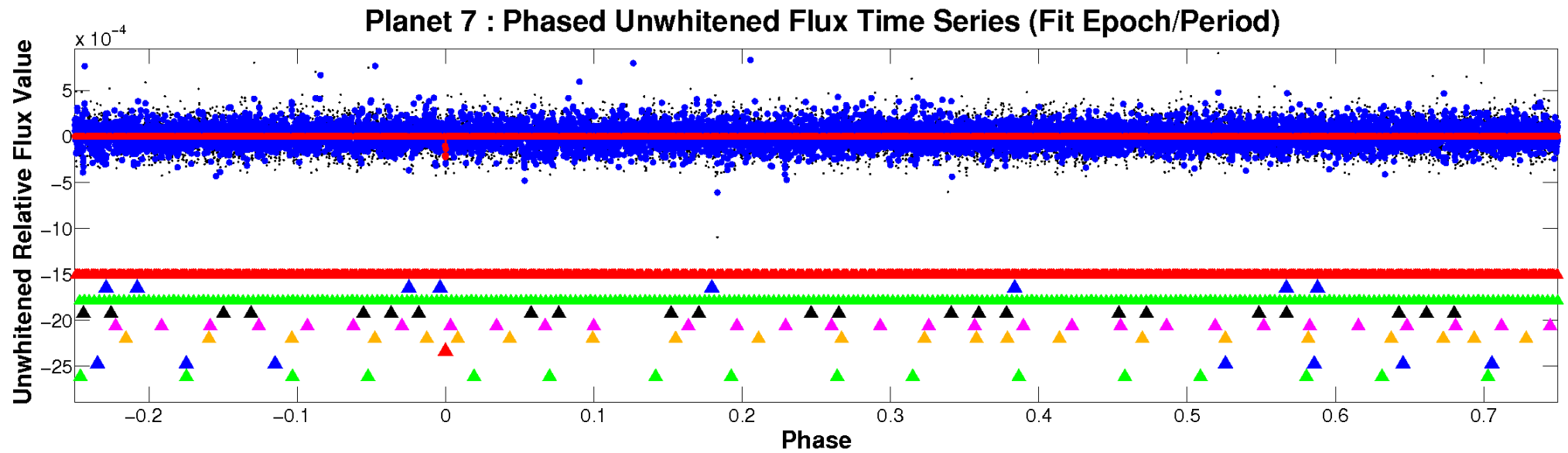


# ALT Odd/Even

TCE 003547523-07

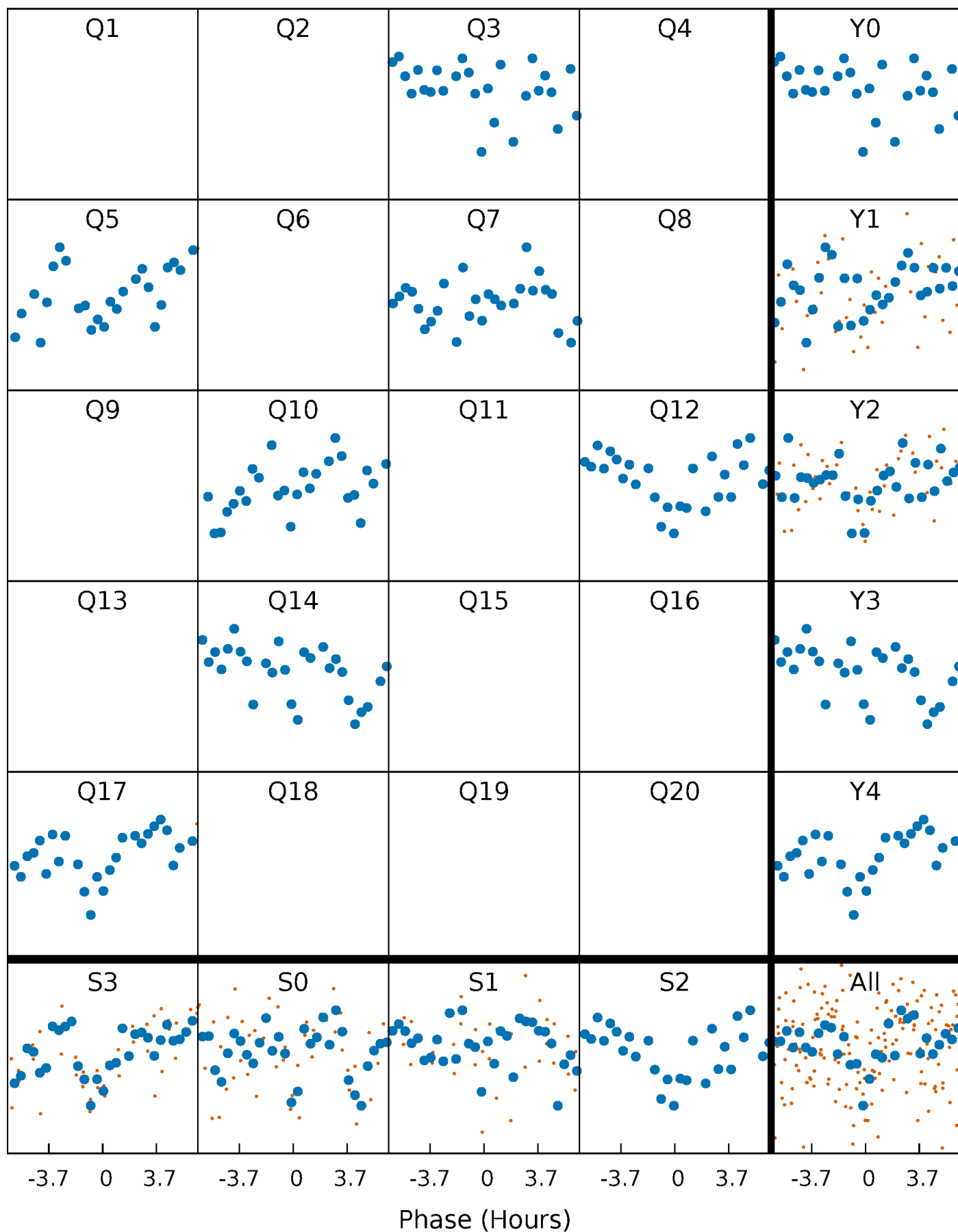


# Non-Whitened Vs. Whitened Light Curve



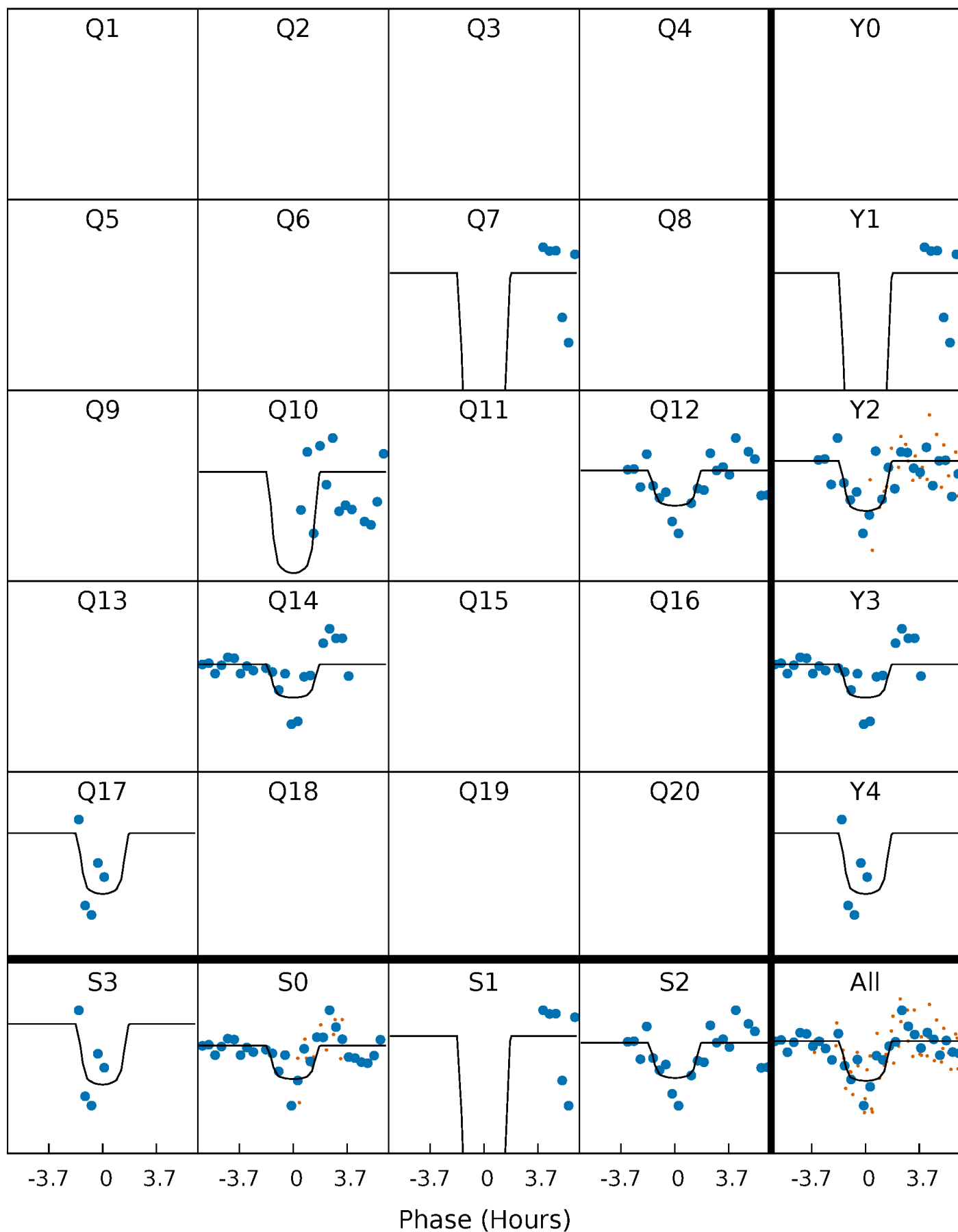
# PDC Quarter-Phased Transit Curves

TCE 003547523-07     $P=213.723127$  Days     $T_0=282.236258$  (BKJD)



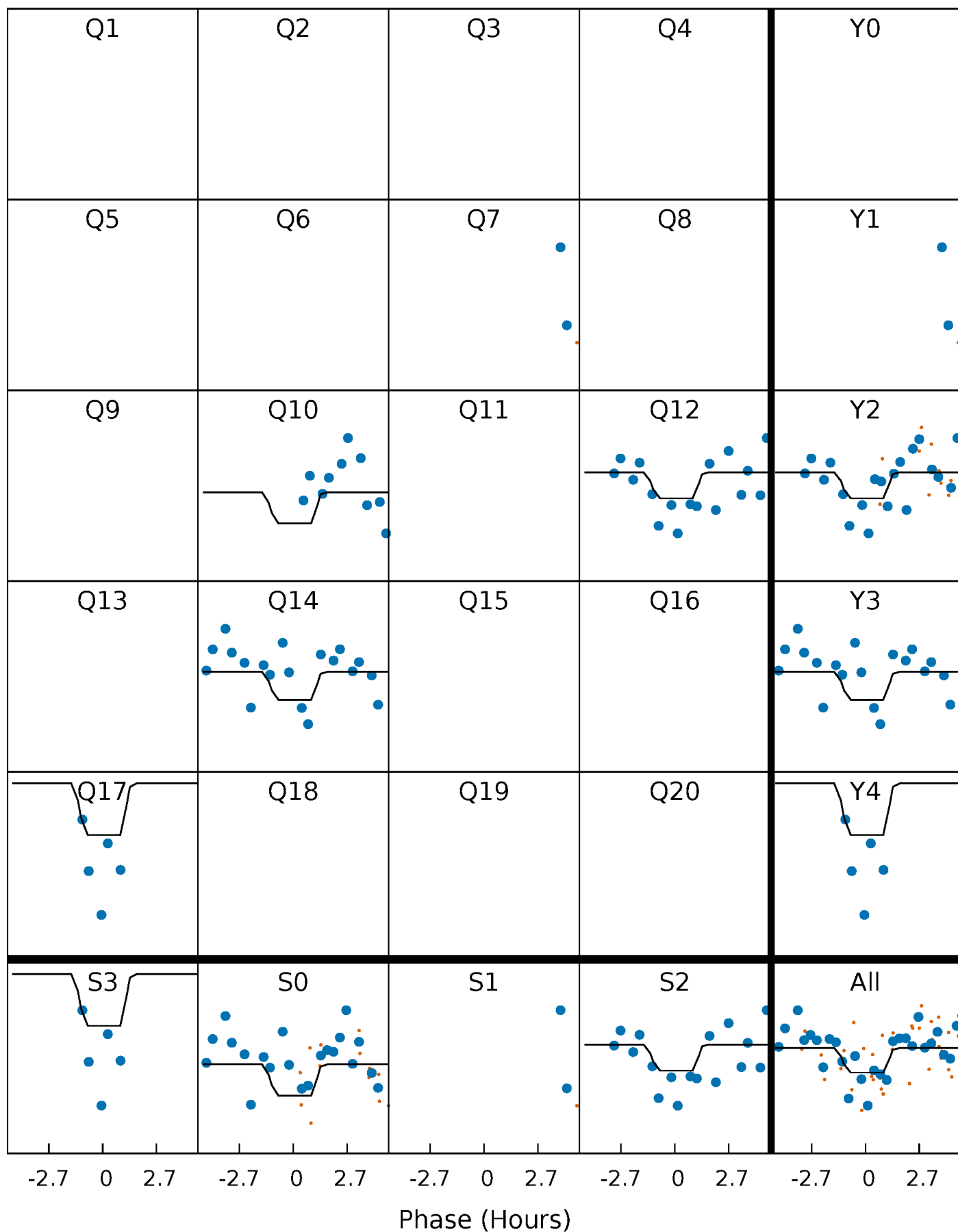
# DV Quarter-Phased Transit Curves

TCE 003547523-07     $P=213.723127$  Days     $T_0=282.236258$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003547523-07 P=213.714242 Days  $T_0=282.261045$  (BKJD)

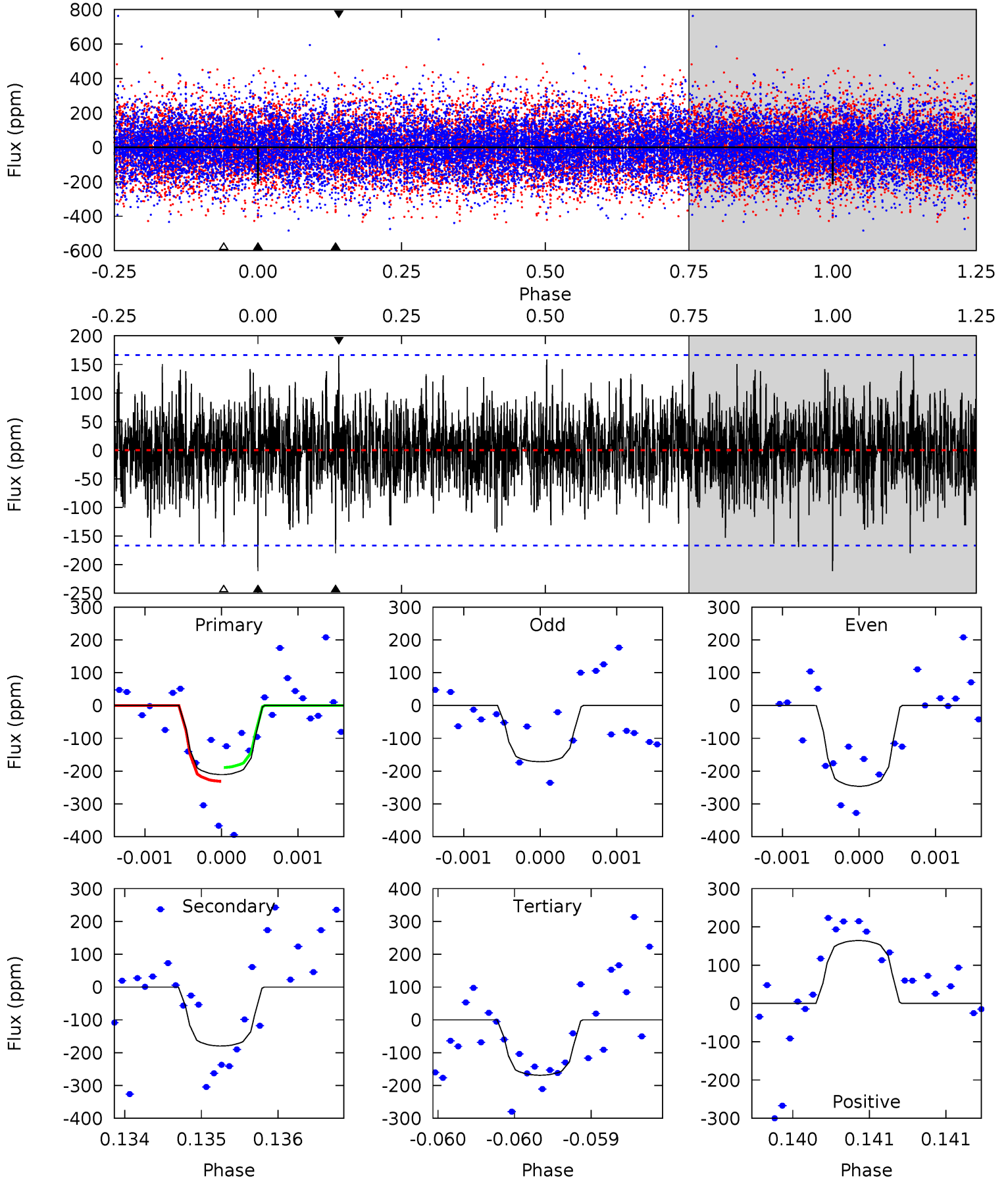




# DV Model-Shift Uniqueness Test

003547523-07, P = 213.723127 Days, E = 68.513131 Days

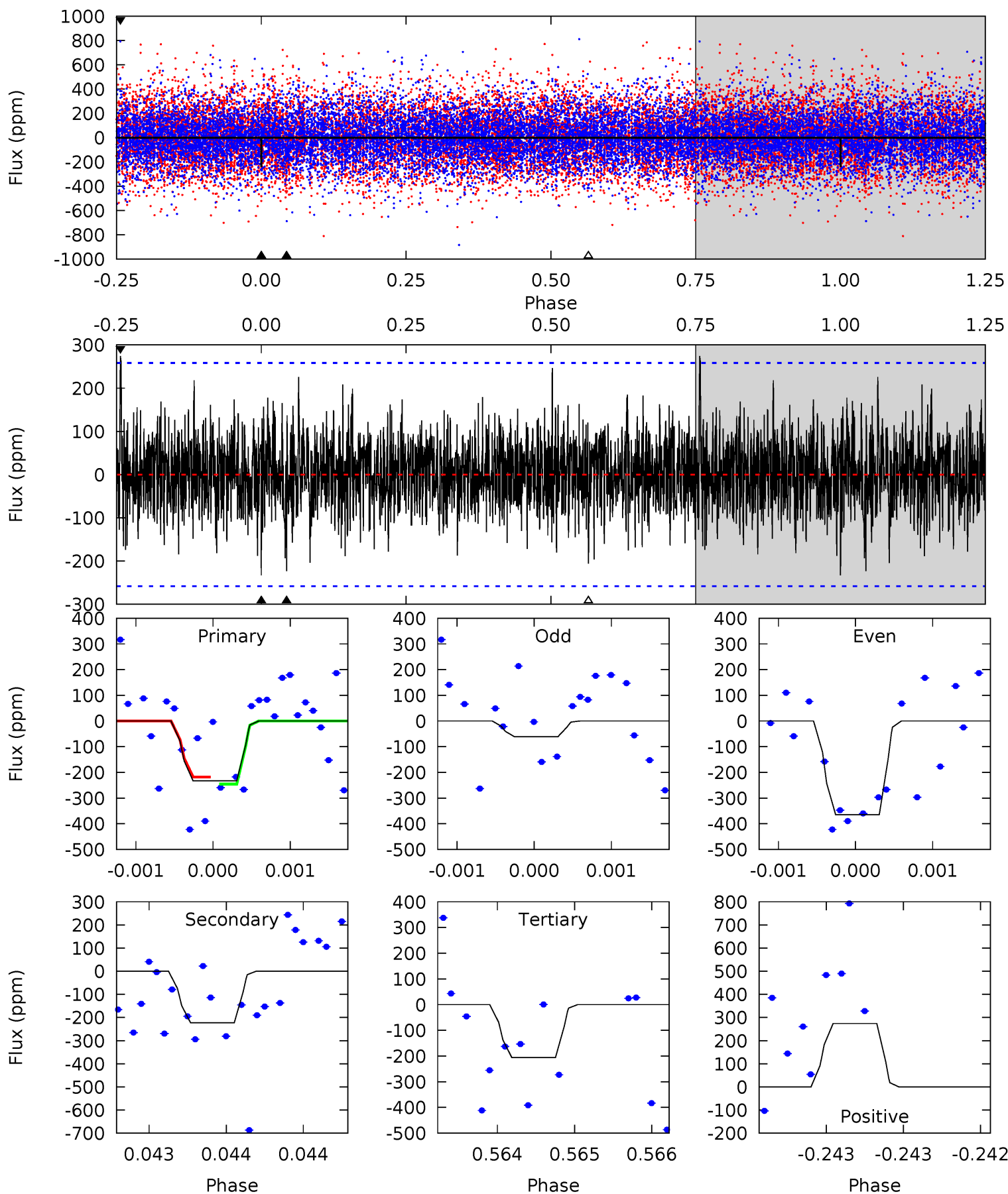
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.00	5.97	5.61	5.46	5.53	3.41	1.55	1.39	1.54	0.36	0.51	1.24	0.86	0.44	0.70



# Alt Model-Shift Uniqueness Test

003547523-07, P = 213.714242 Days, E = 68.546803 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
5.01	4.79	4.43	5.89	5.55	3.45	1.34	0.59	-0.88	0.37	-1.10	3.27	0.87	0.54	0.29



### Stellar Parameters For KIC 003547523

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7543^{+235}_{-314}$	$4.017^{+0.187}_{-0.153}$	$-0.060^{+0.200}_{-0.300}$	$2.115^{+0.533}_{-0.533}$	$1.695^{+0.212}_{-0.282}$	$0.252^{+0.261}_{-0.110}$
	+3%/-4%	+5%/-4%	+333%/-500%	+25%/-25%	+13%/-17%	+103%/-44%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003547523-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-180 \pm 30$	$3.72^{+2.75}_{-2.17}$	$735^{+57}_{-56}$	$6676^{+5039}_{-1484}$	$4877^{+22685}_{-3154}$
Alt.	$-223 \pm 47$	$3.46^{+2.63}_{-1.98}$	$739^{+50}_{-57}$	$7305^{+6028}_{-1758}$	$6701^{+27475}_{-4475}$

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

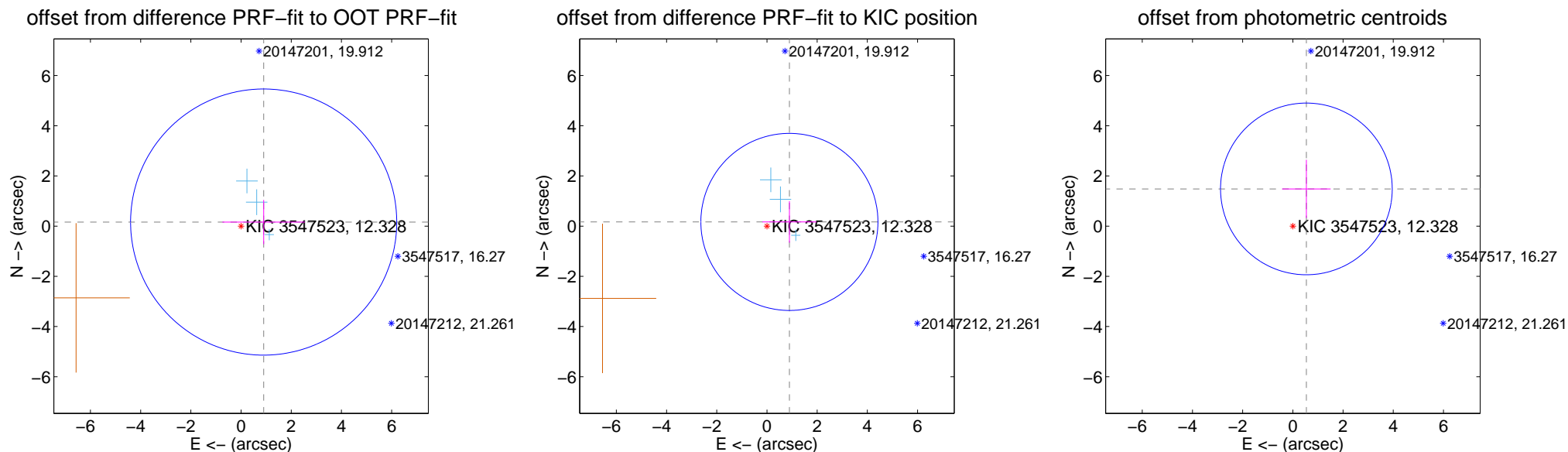
## DV Centroid Data

Supplemental centroid analysis for 003547523-07. Kepler magnitude: 12.33. Transit SNR 7.35

There are 3 quarters with good PRF difference image offsets

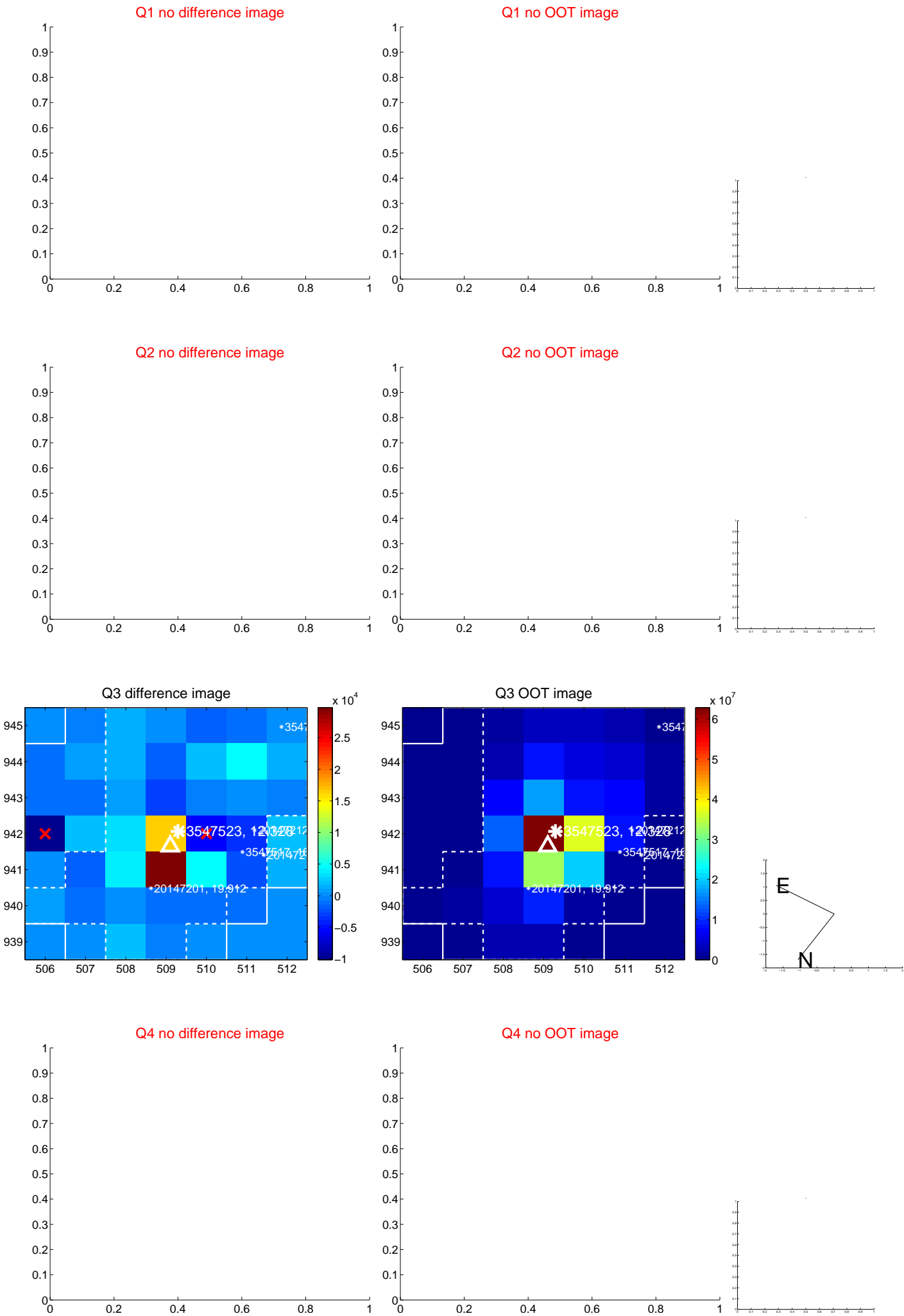
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.916 \pm 1.767$	0.52	$-0.901 \pm 1.643$	$0.162 \pm 0.880$
PRF-fit source offset from KIC position	$0.910 \pm 1.176$	0.77	$-0.894 \pm 1.081$	$0.168 \pm 0.826$
photometric centroid source offset	$1.58 \pm 1.14$	1.38	$-0.54 \pm 0.97$	$1.48 \pm 1.16$

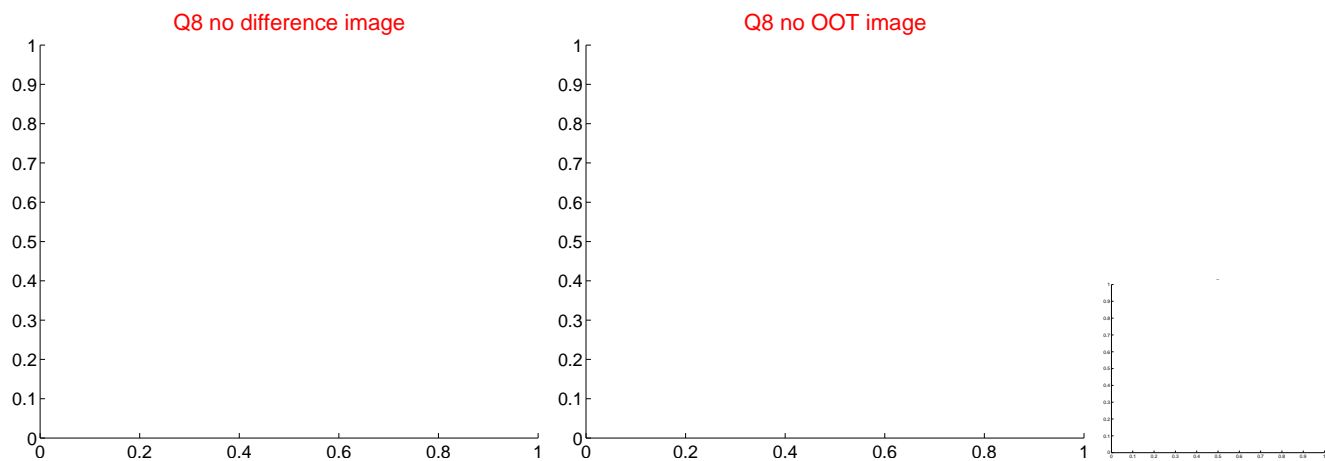
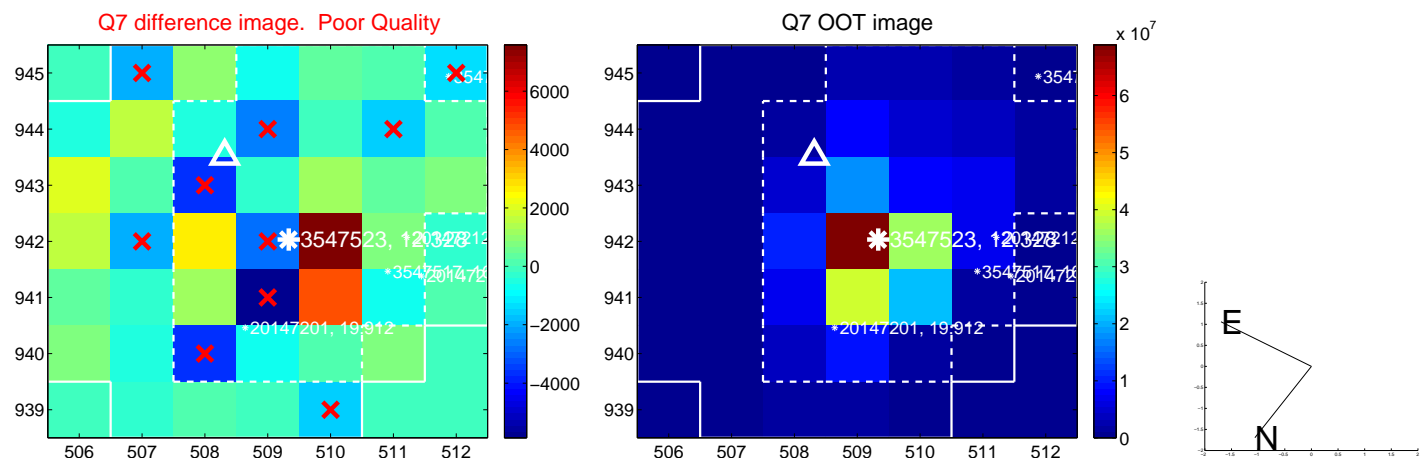
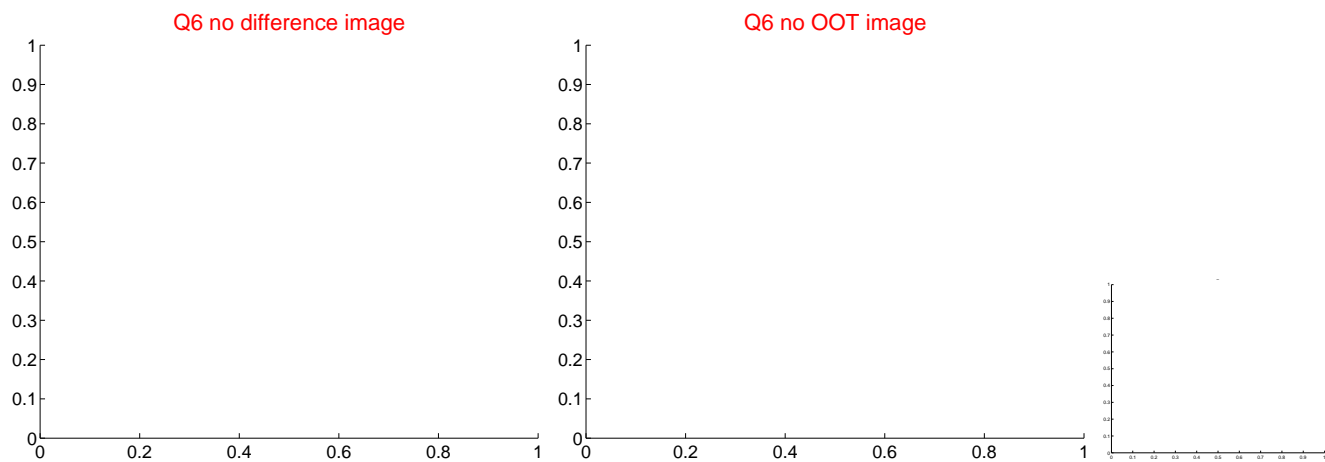
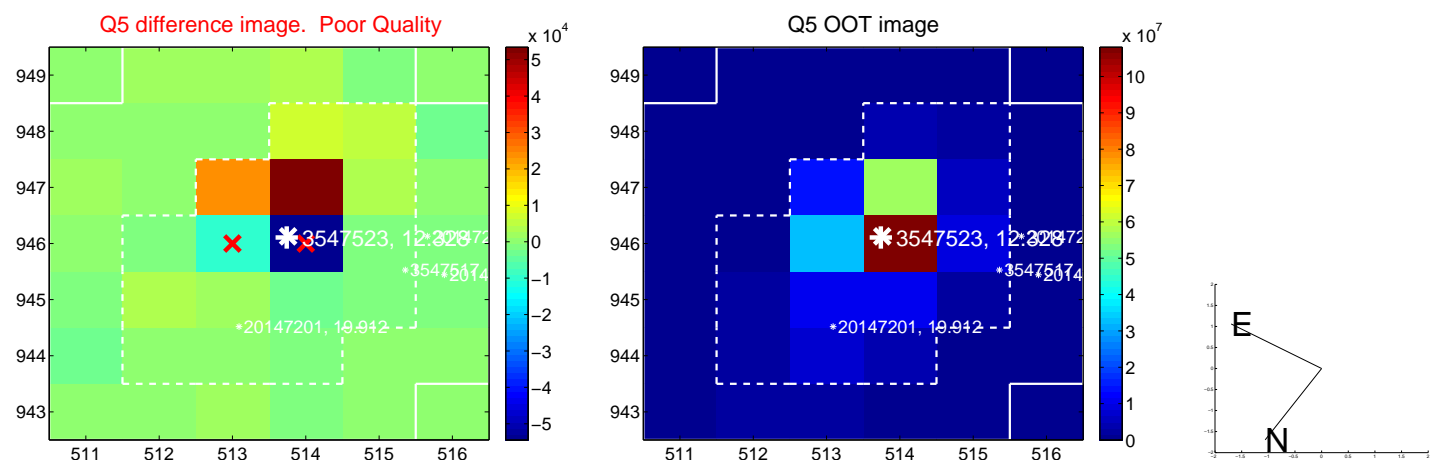


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

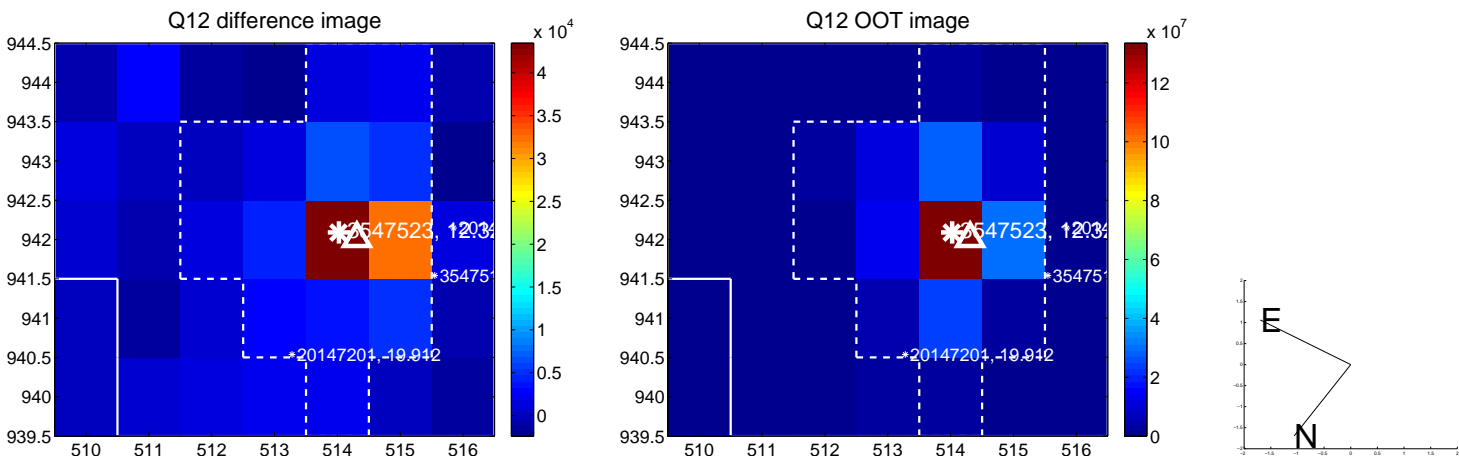
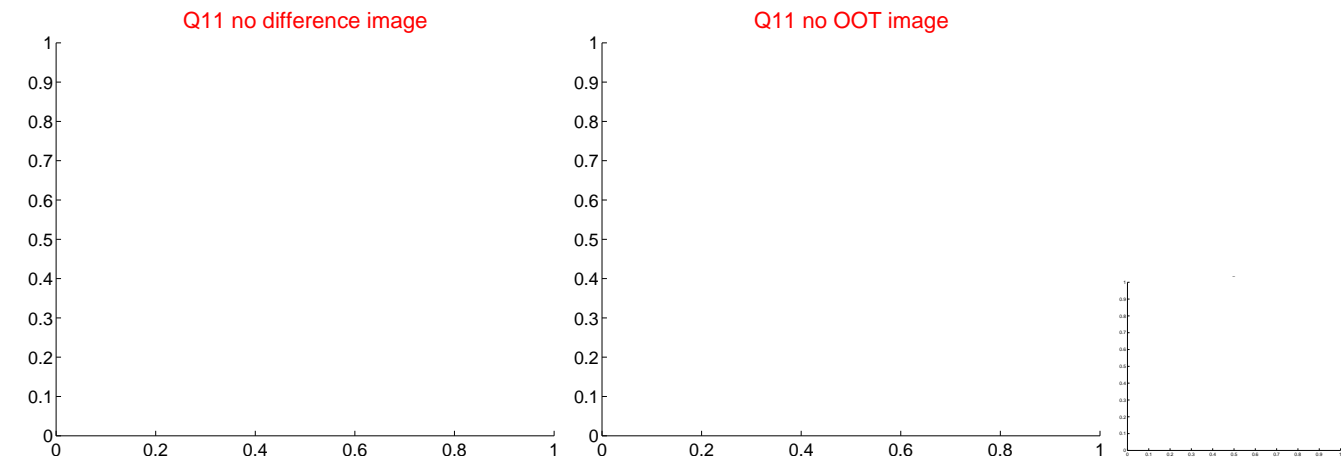
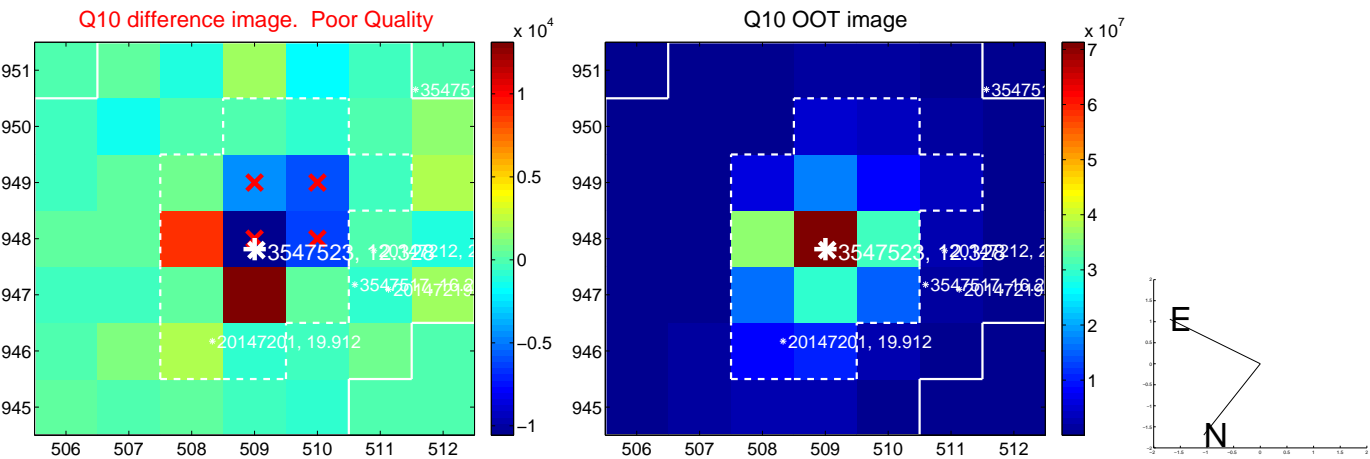
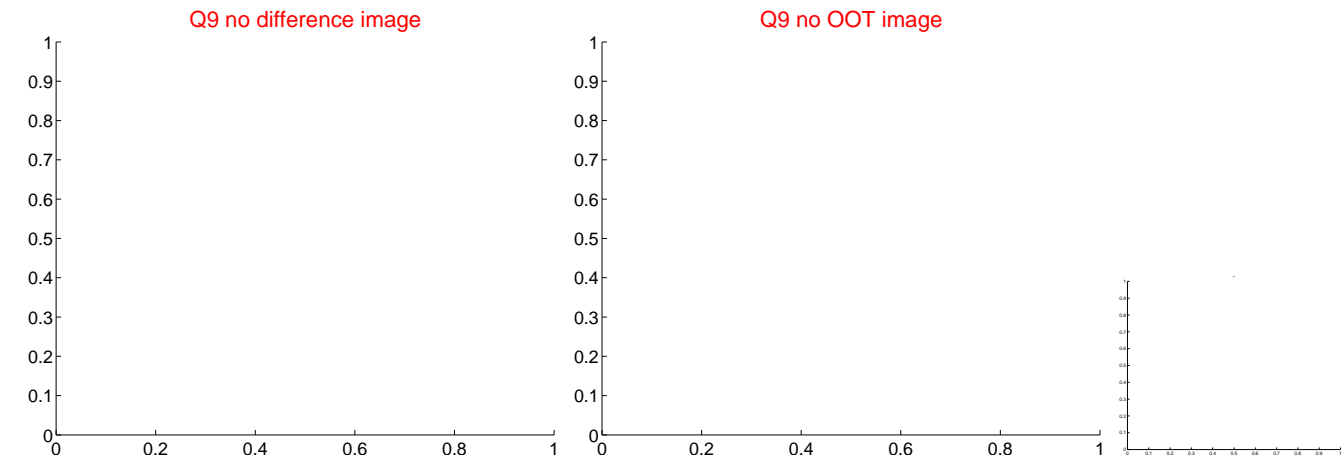
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

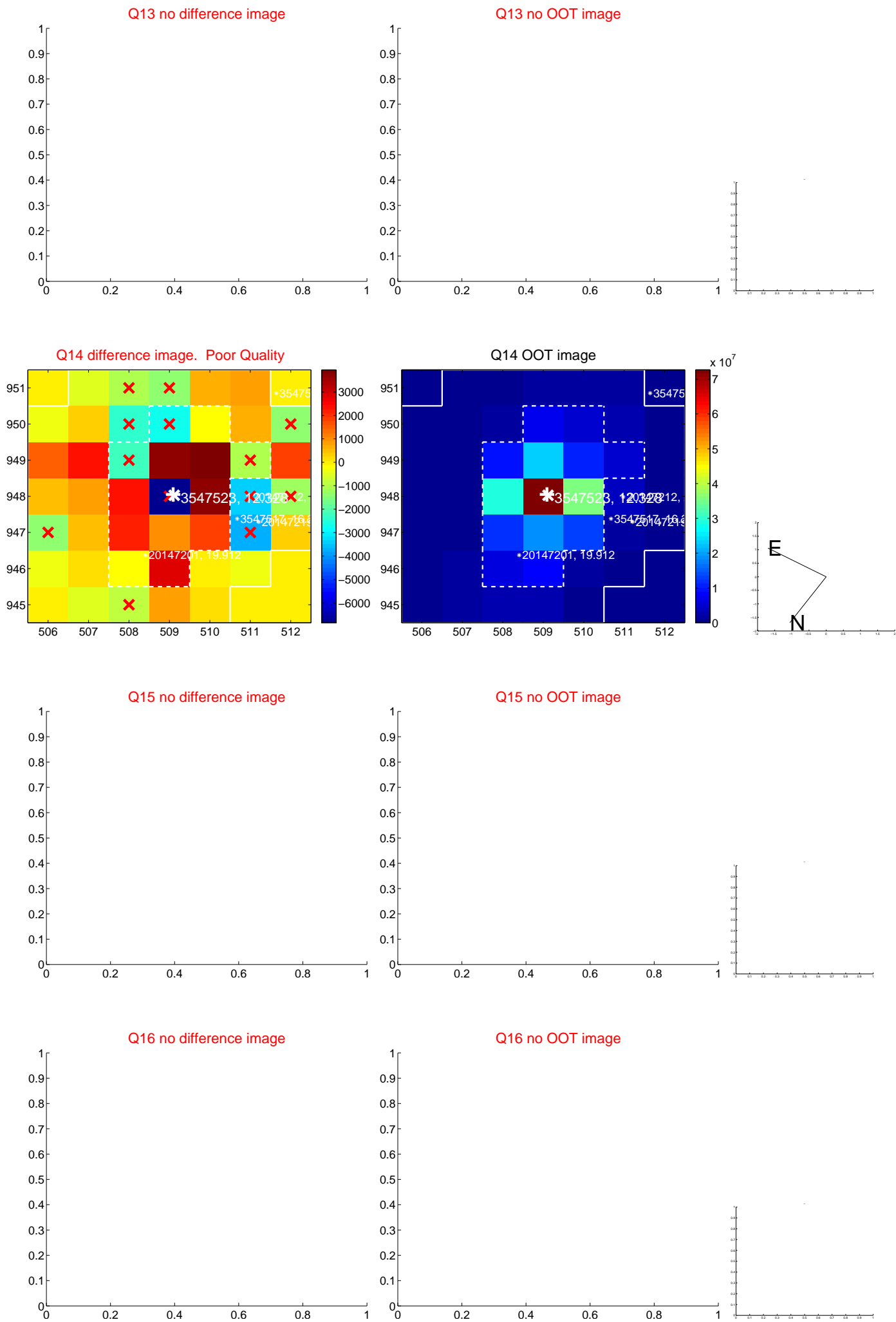


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

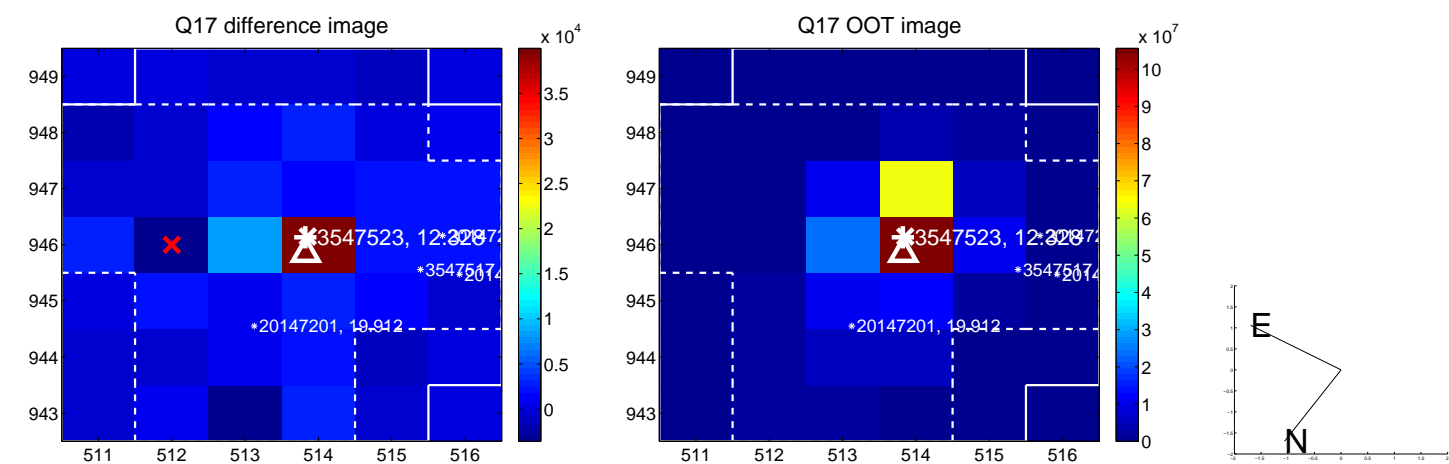




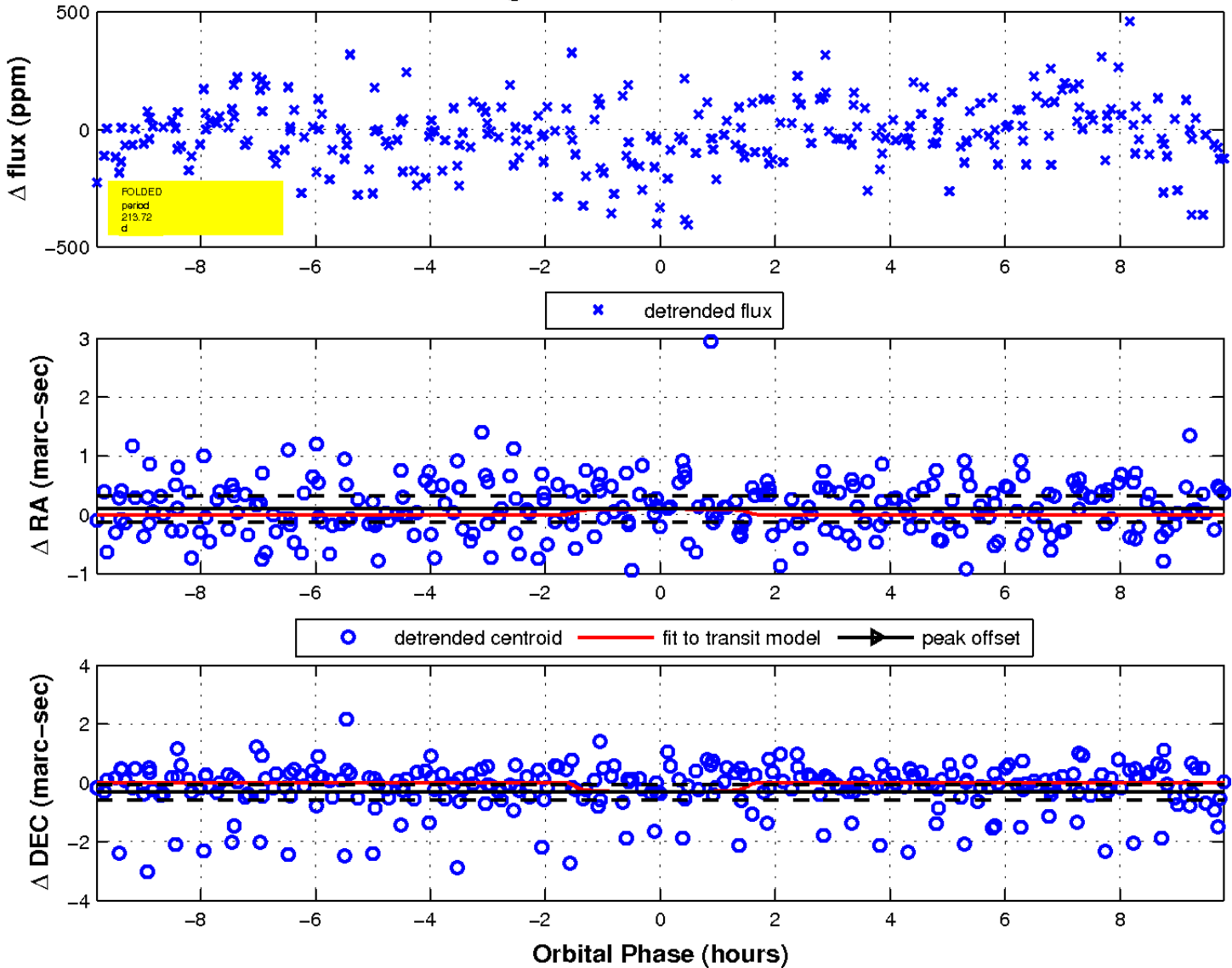
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



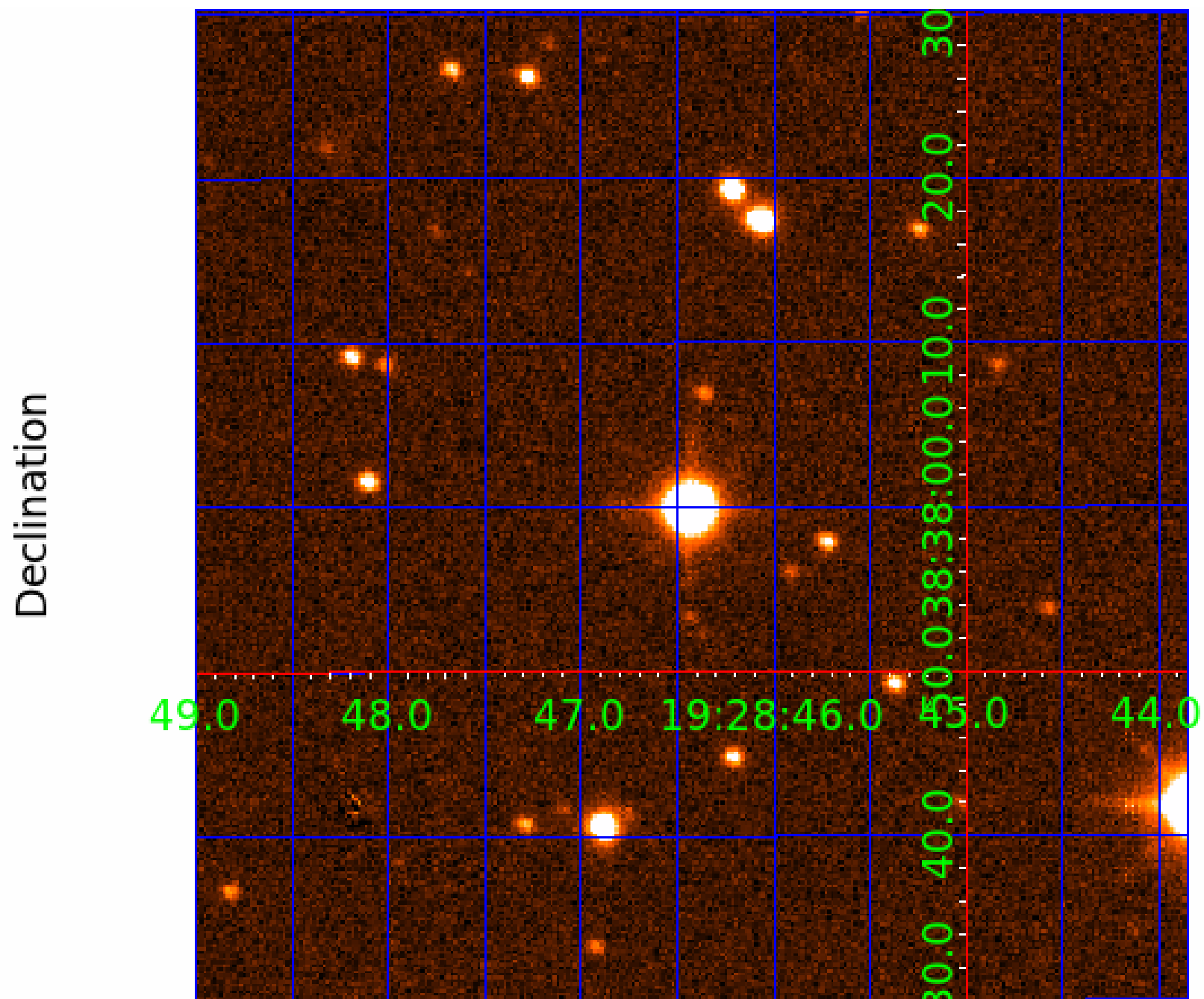
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 7 of 9



UKIRT Image



# KIC 003547523

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003547523-01	OBS	No	1.286558	131.774714	21.4	6.273	9.4	10.8	2.12	7543	1.13	17010.03
003547523-02	OBS	No	170.081357	281.456755	154.3	3.405	10.3	4.6	2.12	7543	2.97	25.26
003547523-03	OBS	No	4.289079	131.505412	36.0	6.831	8.0	7.9	2.12	7543	1.58	3415.54
003547523-04	OBS	No	64.515001	141.389924	133.7	5.114	7.9	7.7	2.12	7543	2.73	91.99
003547523-05	OBS	No	48.272360	144.778101	148.8	2.948	8.6	8.6	2.12	7543	2.87	135.42
003547523-06	OBS	No	67.256610	149.491828	257.1	3.132	7.8	8.1	2.12	7543	3.90	87.02
003547523-07	OBS	No	213.723127	282.236258	225.9	3.273	8.3	7.3	2.12	7543	3.67	18.63
003547523-08	OBS	No	226.517683	180.912141	209.7	5.031	7.4	7.7	2.12	7543	3.39	17.24
003547523-09	OBS	No	93.778528	135.848958	265.1	2.254	7.6	8.4	2.12	7543	3.67	55.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003547523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003547523-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003547523-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
003547523-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
003547523-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003547523-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—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.

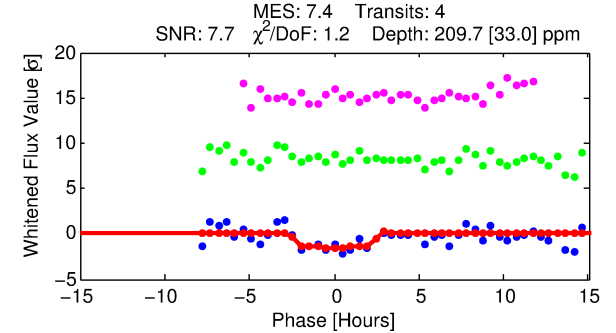
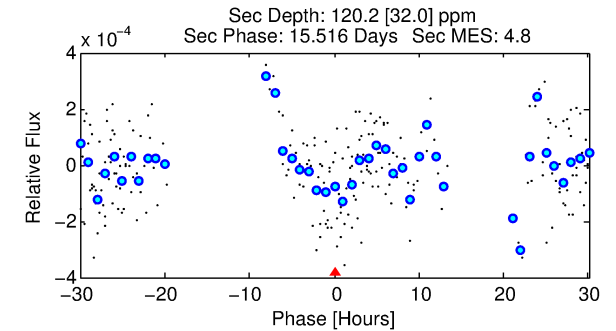
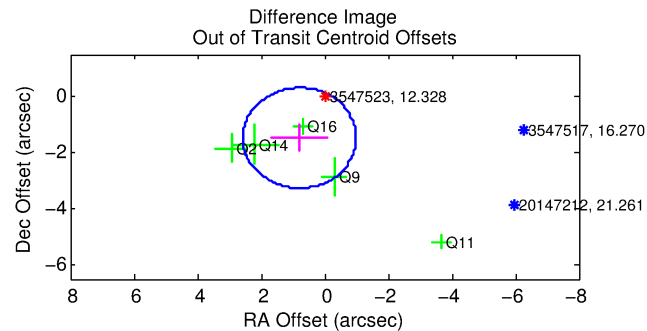
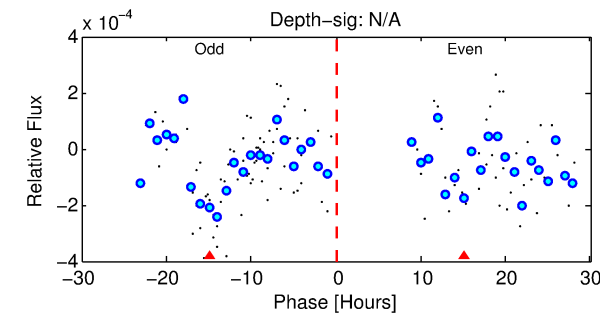
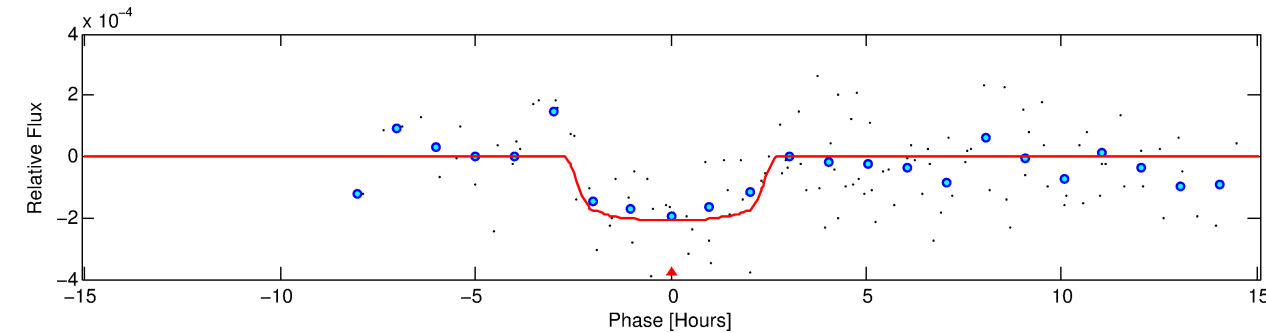
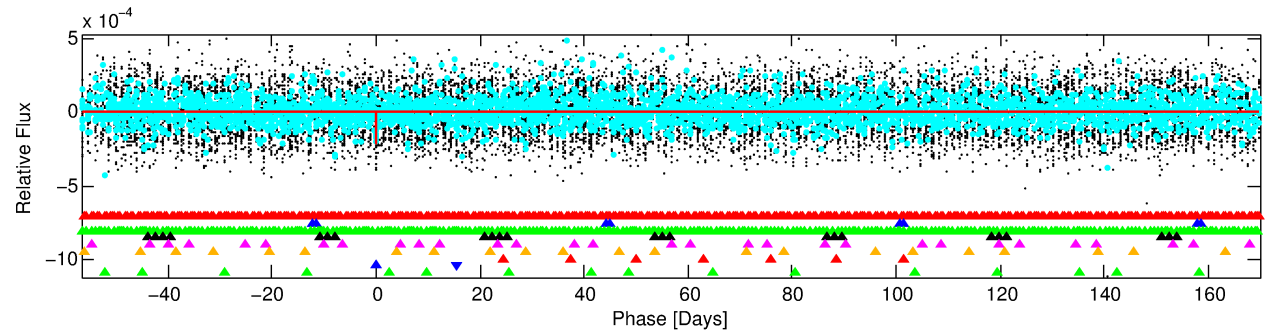
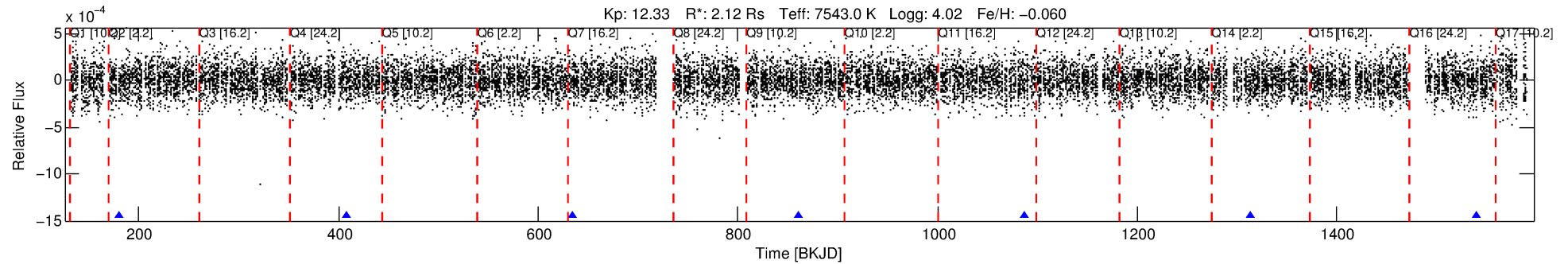
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003547523-08

No Significant Match Found

# DV One-Page Summary

KIC: 3547523 Candidate: 8 of 9 Period: 226.518 d



## DV Fit Results:

Period = 226.51768 [0.00367] d  
Epoch = 180.9121 [0.0171] BKJD  
Rp/R\* = 0.0147 [0.0192]  
a/R\* = 210.07 [1775.47]  
b = 0.81 [3.62]  
Seff = 17.24 [6.41]  
Teq = 520 [48] K  
Rp = 3.39 [4.52] Re  
a = 0.8676 [0.1917] AU  
Ag = 4341.97 [11529.07] [0.38σ]  
Teffp = 6521 [4303] K [1.39σ]

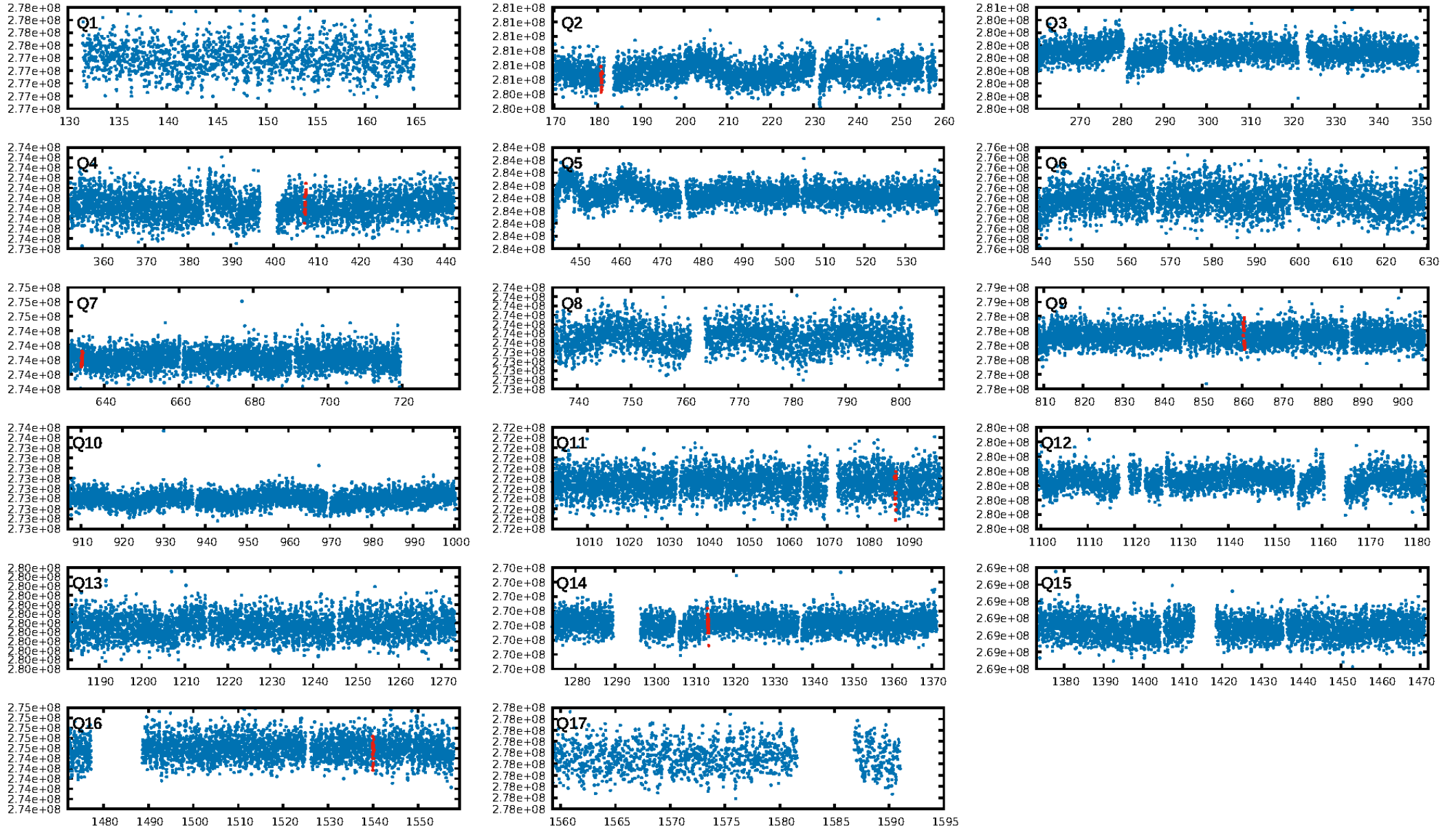
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [51.16σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 25.7%  
ModelChiSquareGof-sig: 98.5%  
**Bootstrap-pfa: 2.23e-08**  
RollingBand-fgt: 1.00 [4/4]  
**GhostDiagnostic-chr: 0.32**  
Centroid-sig: 94.4%  
Centroid-so: 0.022 arcsec [0.03σ]  
OotOffset-rm: 1.678 arcsec [2.82σ]  
OotOffset-st: 2/1/1/1 [5]  
KicOffset-rm: 1.661 arcsec [2.71σ]  
KicOffset-st: 2/1/1/1 [5]  
DiffImageQuality-fgm: 0.40 [2/5]  
DiffImageOverlap-fno: 0.33 [2/6]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:34:33 Z

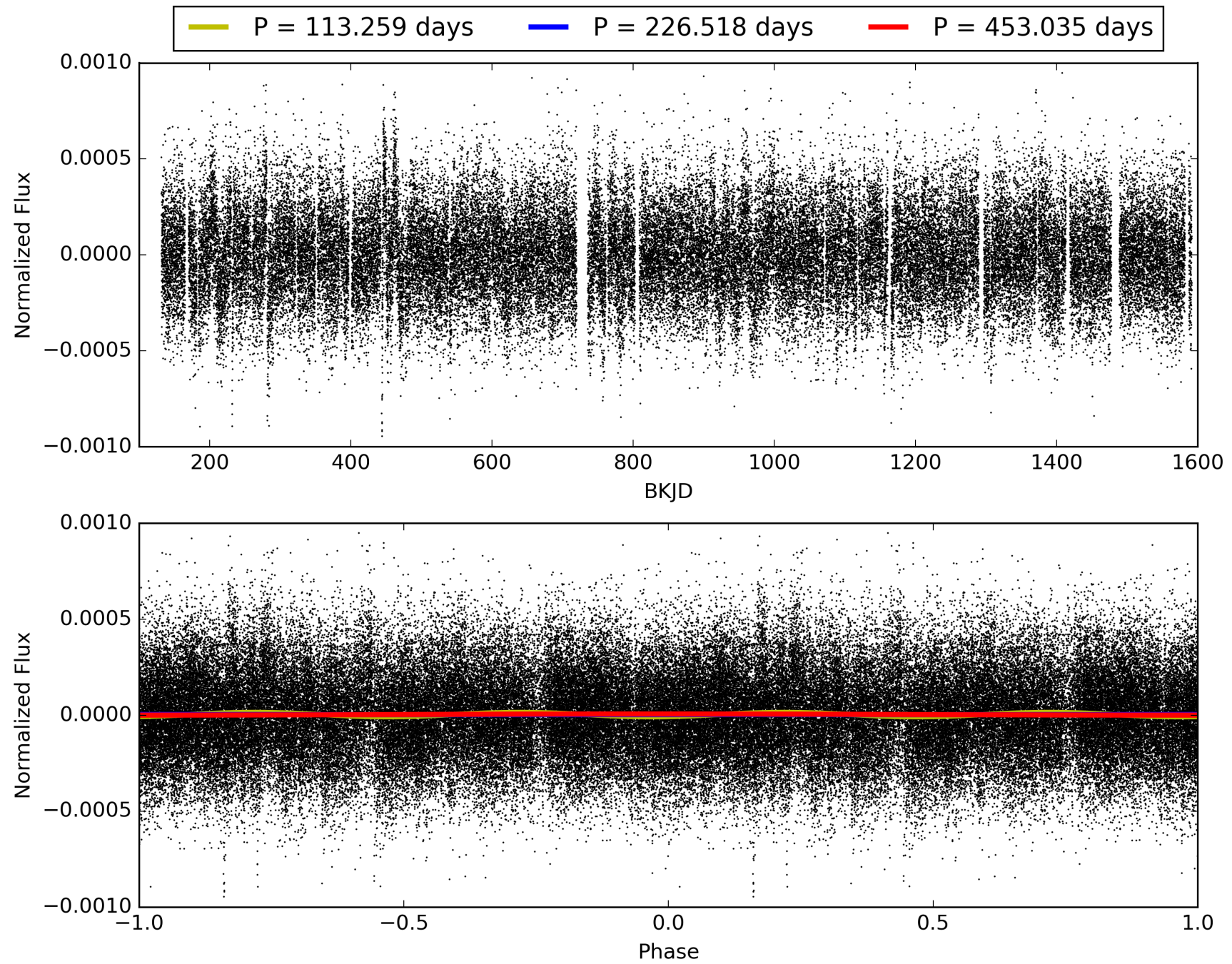
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003547523-08, PDC Light Curves





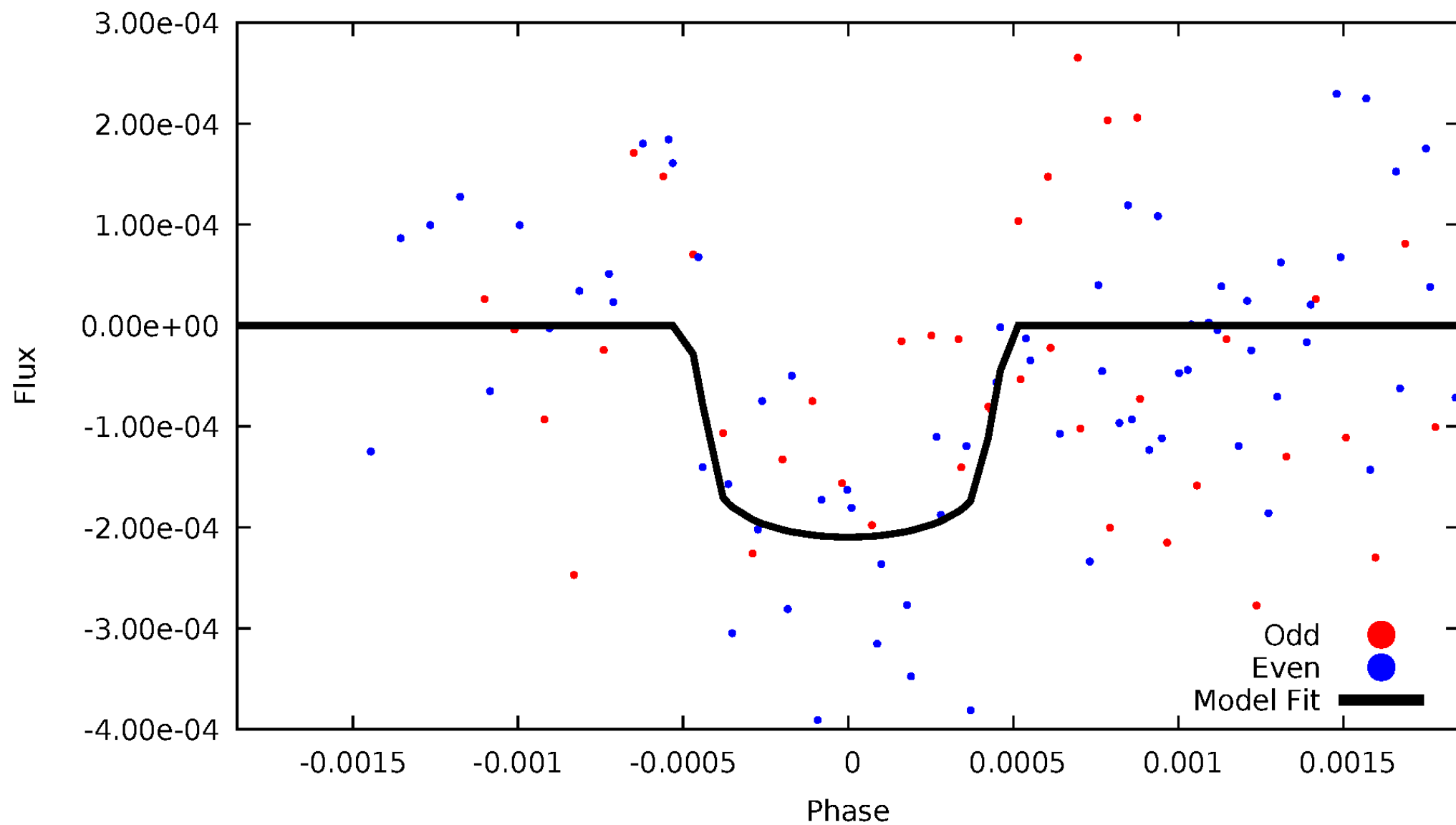
TCE 003547523-08





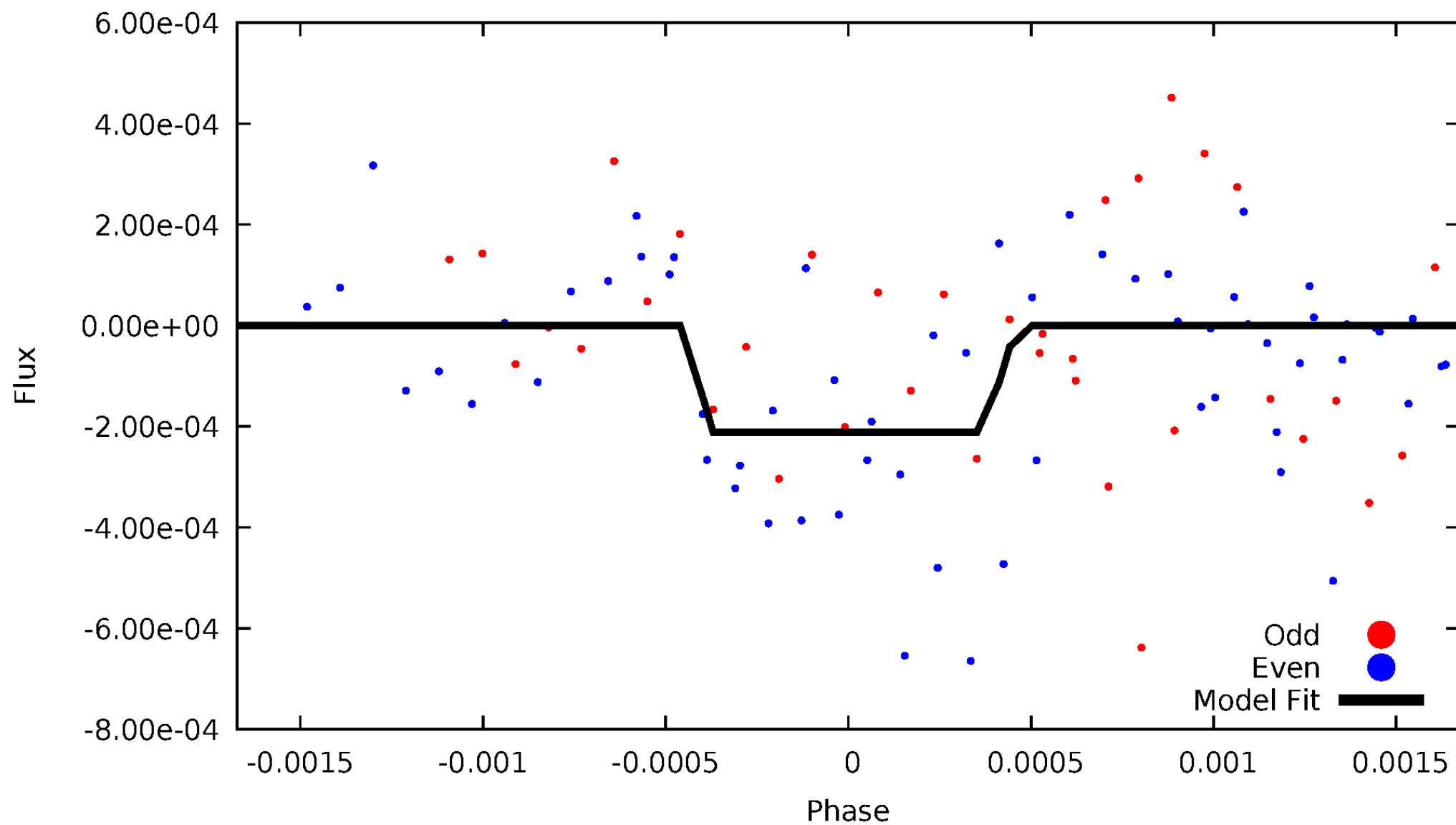
# DV Odd/Even

TCE 003547523-08



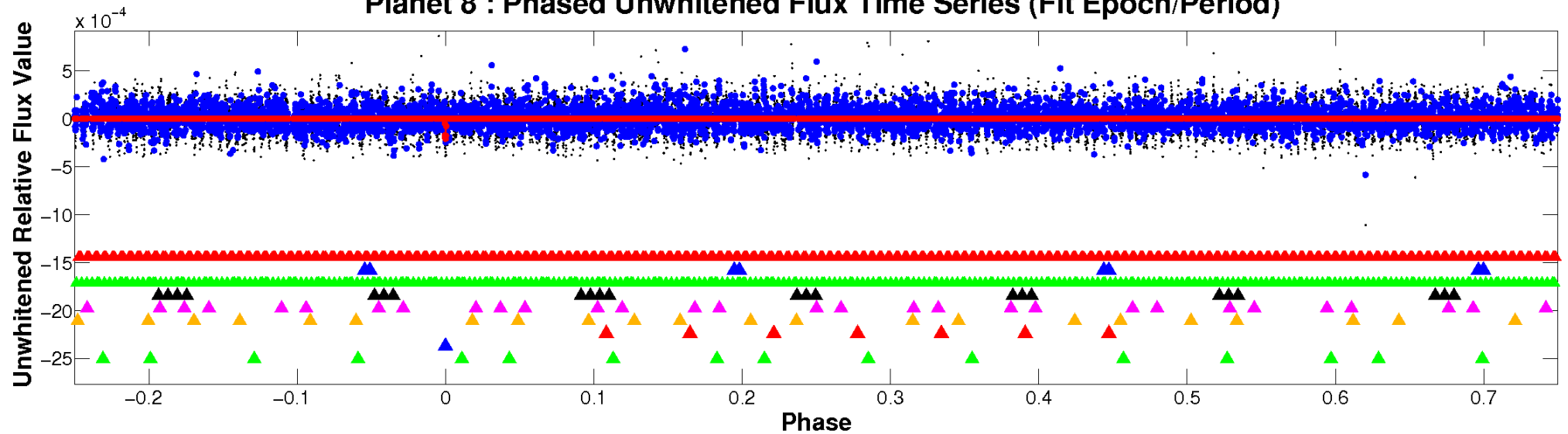
# ALT Odd/Even

TCE 003547523-08

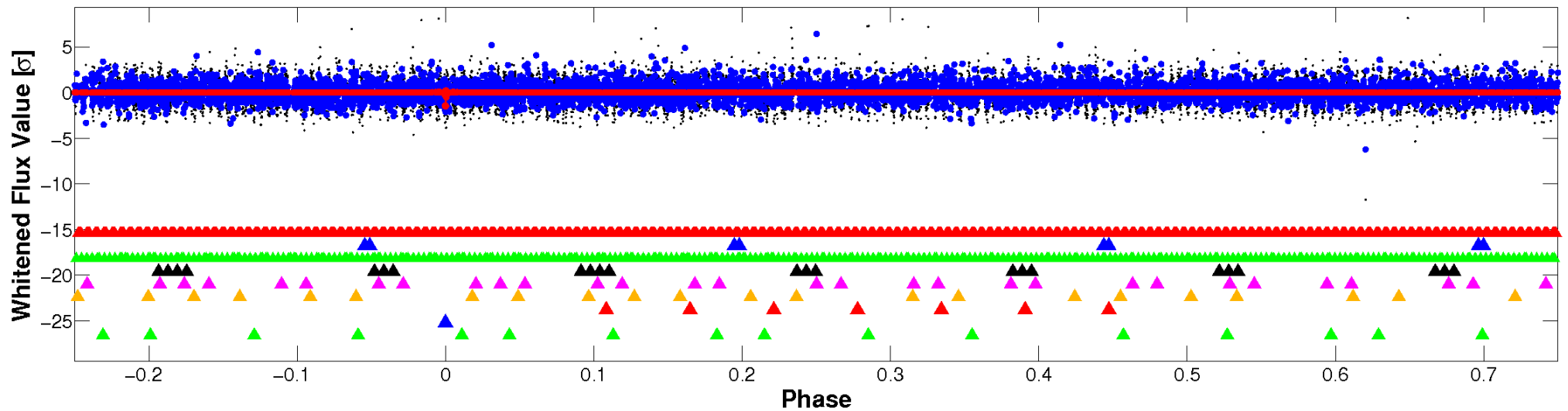


# Non-Whitened Vs. Whitened Light Curve

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

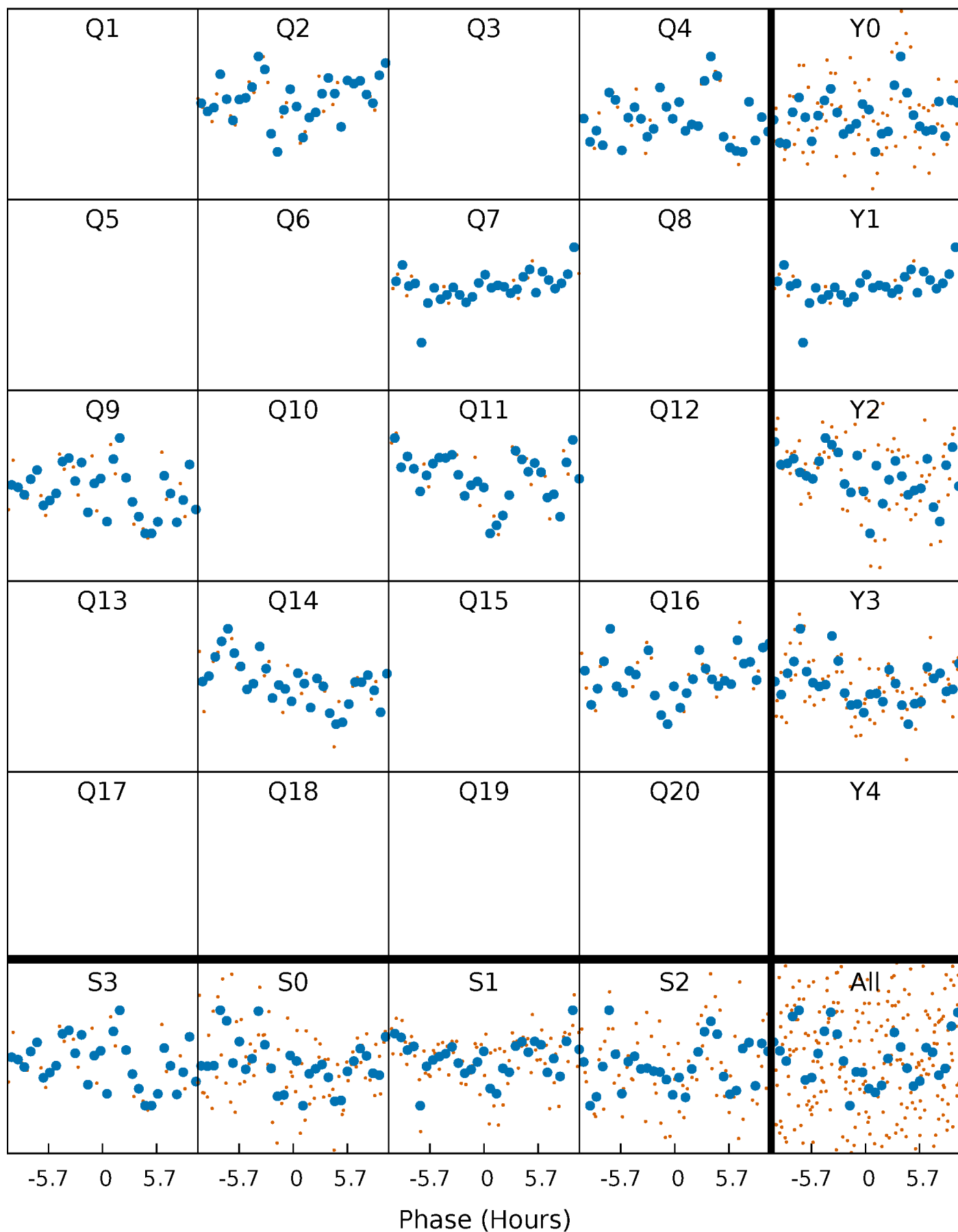


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



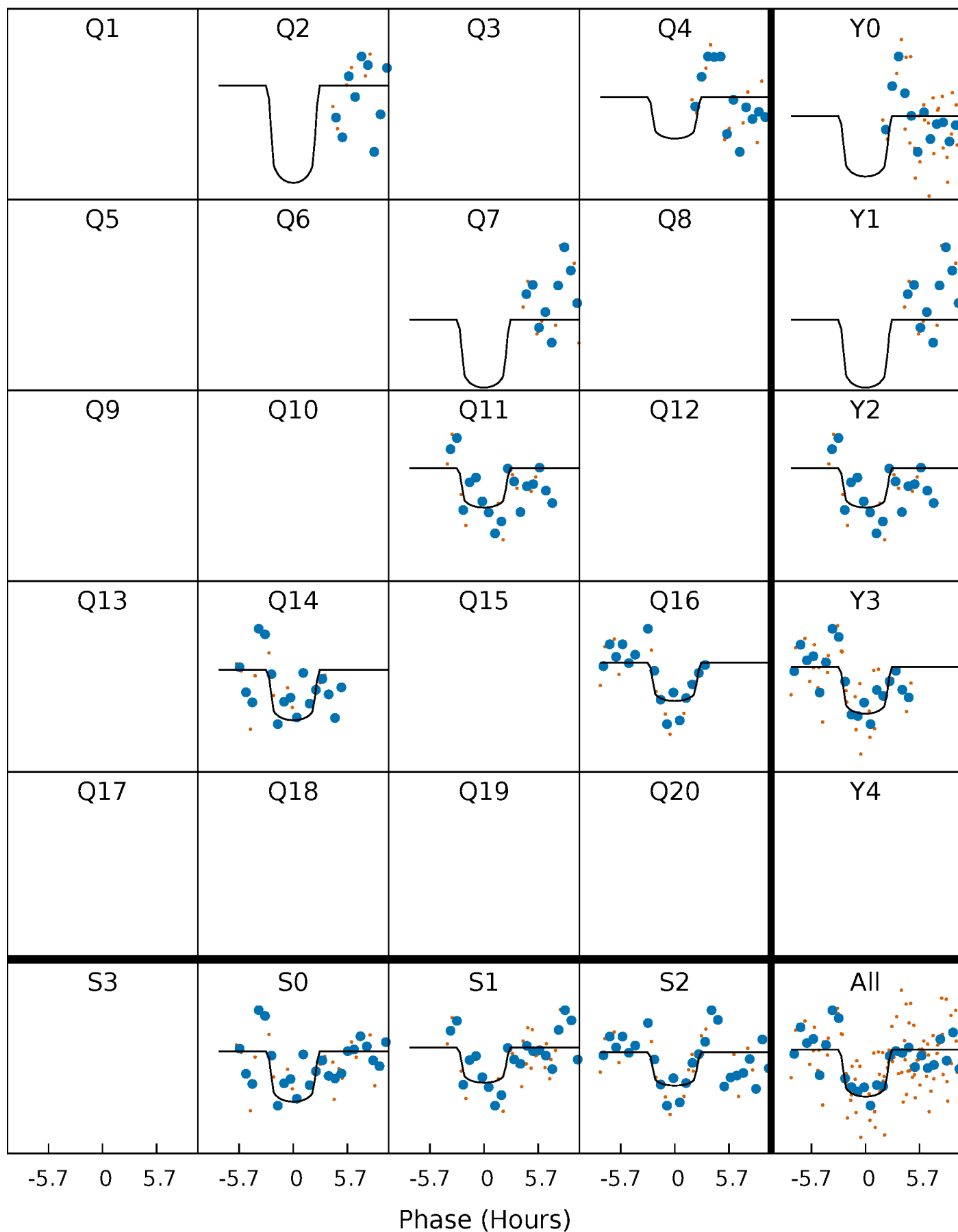
# PDC Quarter-Phased Transit Curves

TCE 003547523-08 P=226.517683 Days  $T_0=180.912141$  (BKJD)



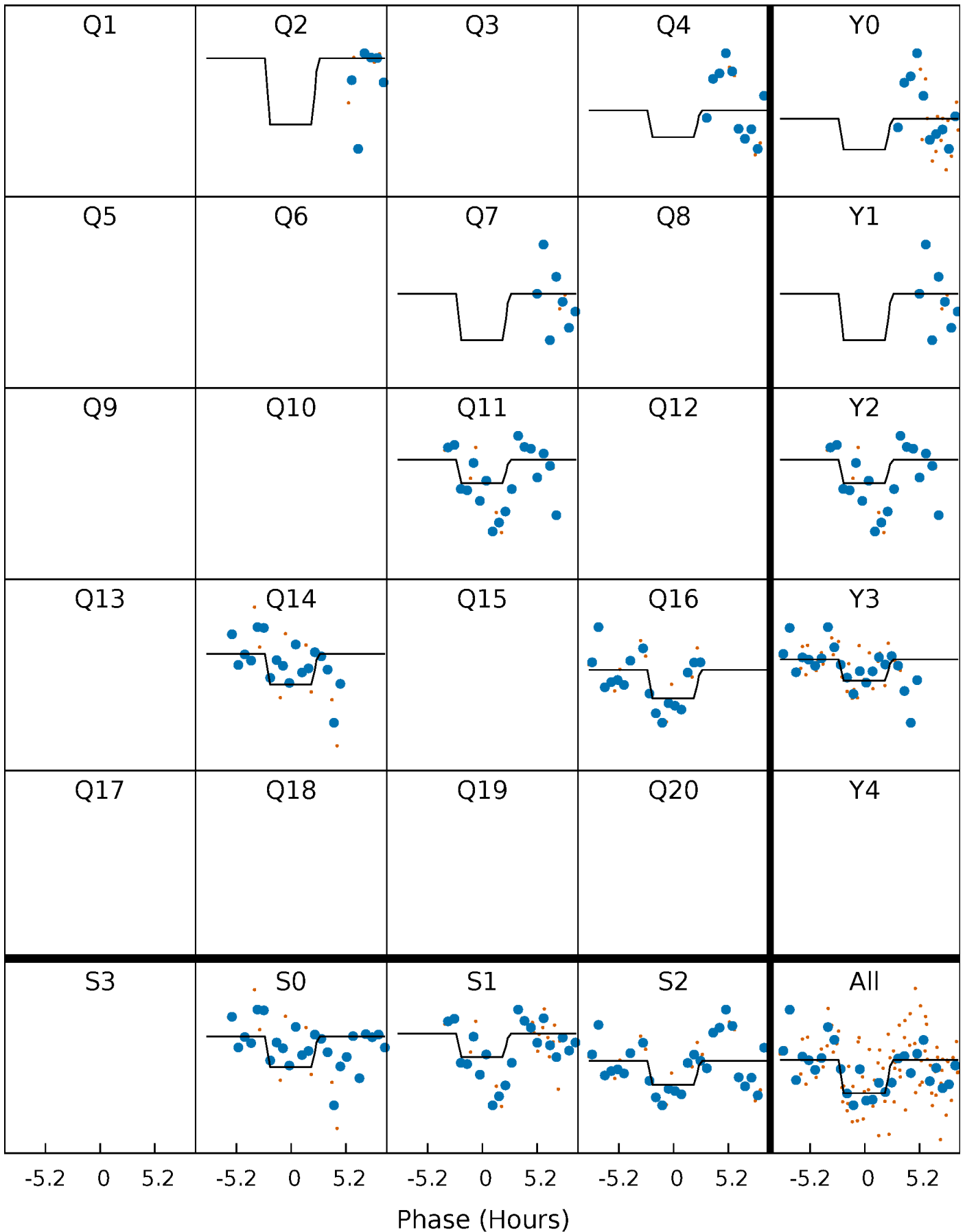
# DV Quarter-Phased Transit Curves

TCE 003547523-08     $P=226.517683$  Days     $T_0=180.912141$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

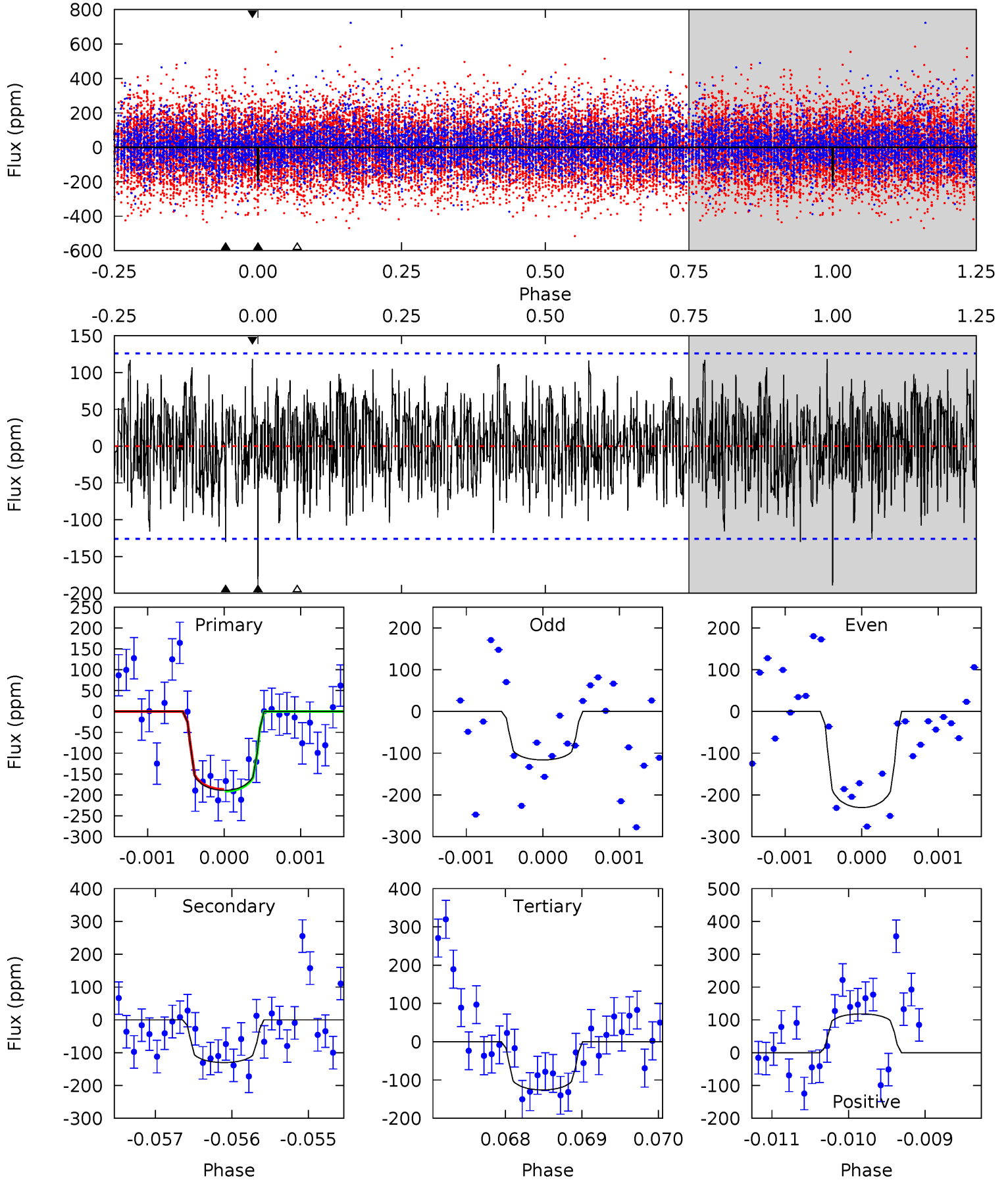
TCE 003547523-08     $P=226.527885$  Days     $T_0=180.858927$  (BKJD)



# DV Model-Shift Uniqueness Test

003547523-08, P = 226.517683 Days, E = 180.912141 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.18	5.63	5.45	5.11	5.45	3.29	1.68	2.73	3.07	0.18	0.52	2.38	0.91	0.38	0.09

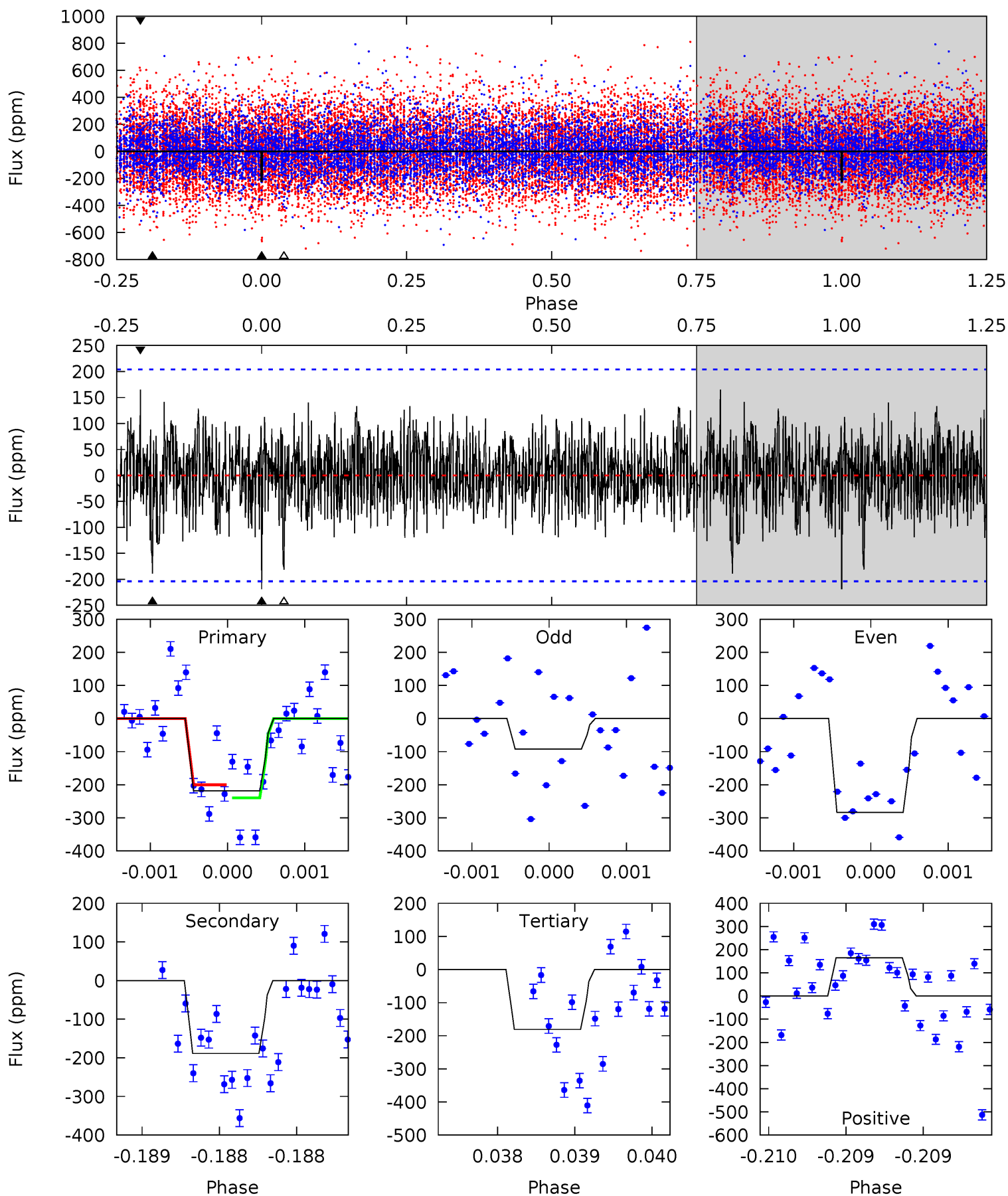




# Alt Model-Shift Uniqueness Test

003547523-08, P = 226.527885 Days, E = 180.858927 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
5.88	5.08	4.87	4.44	5.48	3.34	1.21	1.01	1.44	0.21	0.64	2.43	1.02	0.43	0.53



### Stellar Parameters For KIC 003547523

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7543^{+235}_{-314}$	$4.017^{+0.187}_{-0.153}$	$-0.060^{+0.200}_{-0.300}$	$2.115^{+0.533}_{-0.533}$	$1.695^{+0.212}_{-0.282}$	$0.252^{+0.261}_{-0.110}$
	+3%/-4%	+5%/-4%	+333%/-500%	+25%/-25%	+13%/-17%	+103%/-44%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003547523-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-130 \pm 23$	$4.50^{+3.93}_{-2.89}$	$722^{+51}_{-53}$	$5548^{+4589}_{-1241}$	$2531^{+17857}_{-1789}$
Alt.	$-189 \pm 37$	$4.72^{+4.32}_{-2.89}$	$717^{+56}_{-49}$	$5945^{+4495}_{-1394}$	$3451^{+18726}_{-2491}$

$T_{max}$  = 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

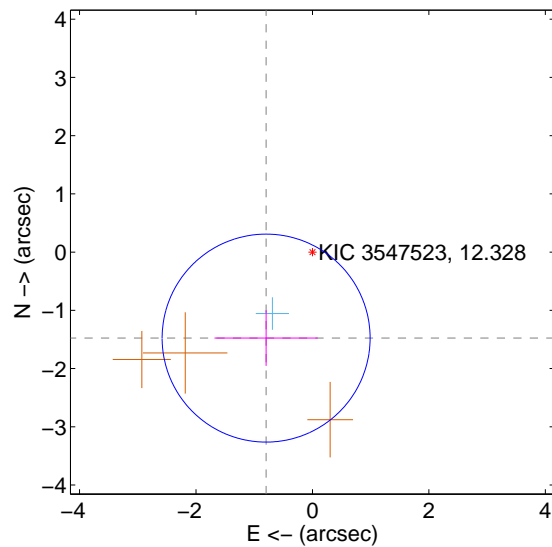
Supplemental centroid analysis for 003547523-08. Kepler magnitude: 12.33. Transit SNR 7.74

There are 2 quarters with good PRF difference image offsets

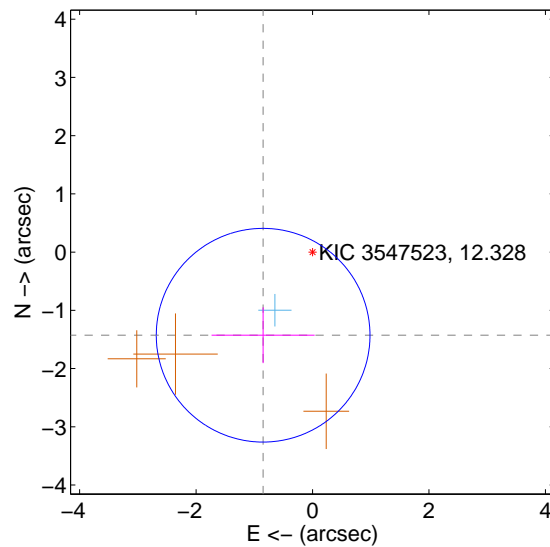
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.678 \pm 0.595$	2.82	$0.796 \pm 0.888$	$-1.477 \pm 0.478$
PRF-fit source offset from KIC position	$1.661 \pm 0.612$	2.71	$0.848 \pm 0.885$	$-1.428 \pm 0.479$
photometric centroid source offset	$0.02 \pm 0.85$	0.03	$0.02 \pm 0.84$	$-0.01 \pm 0.94$

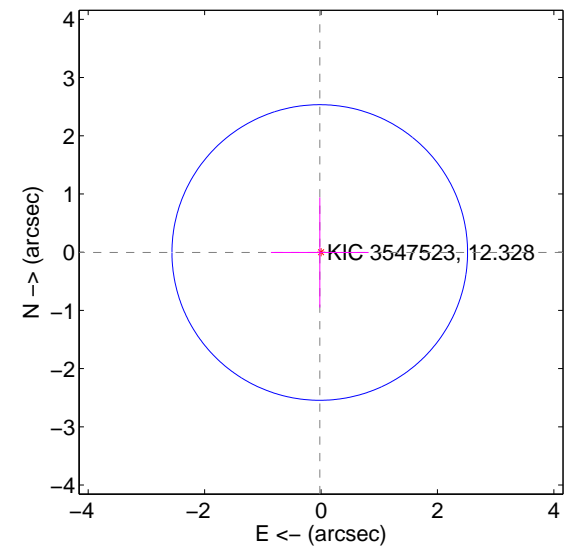
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

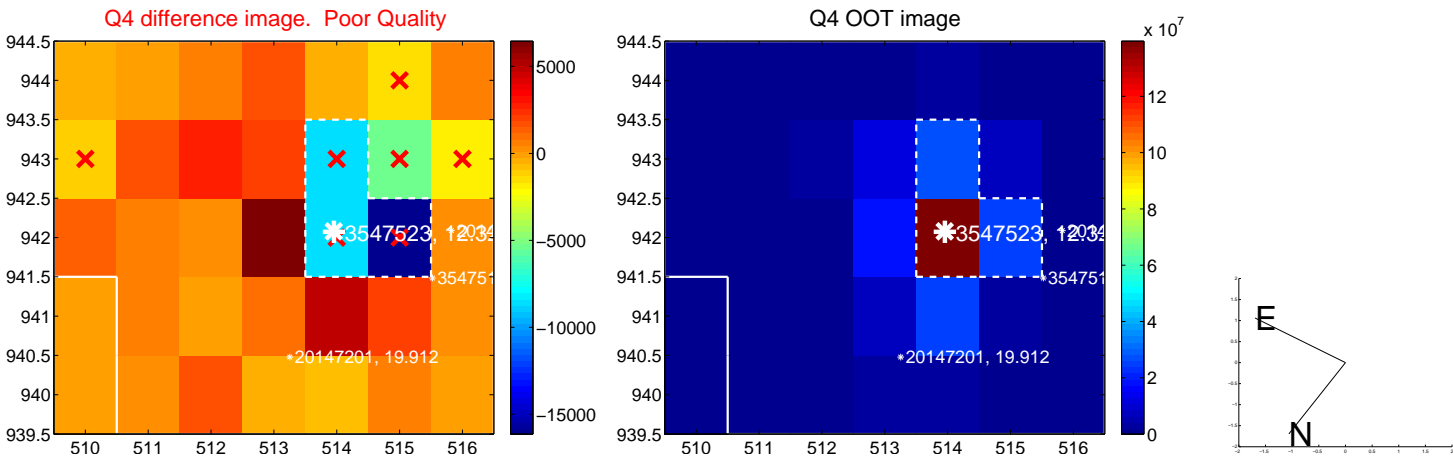
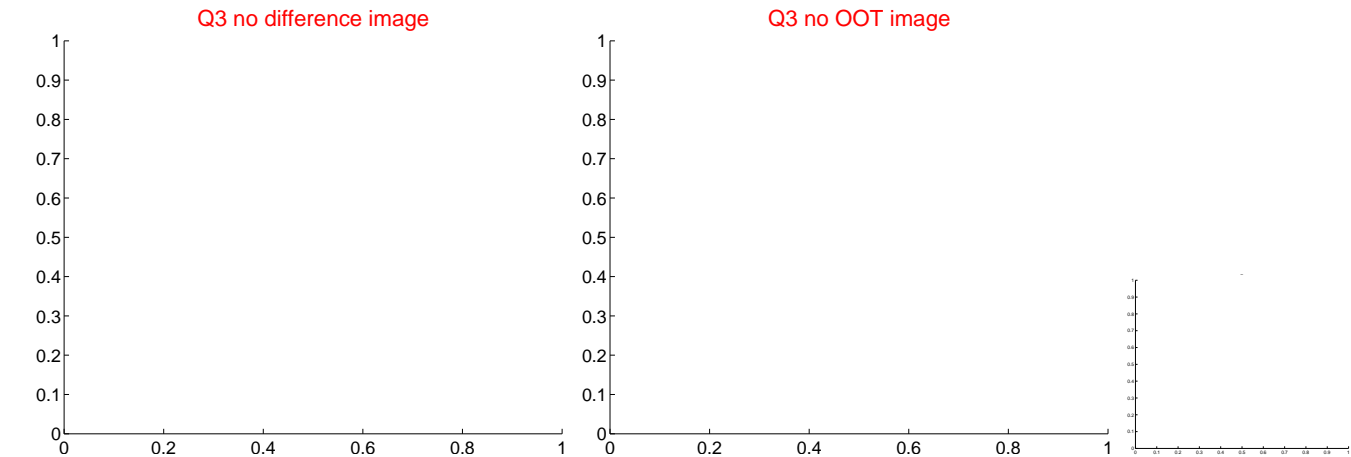
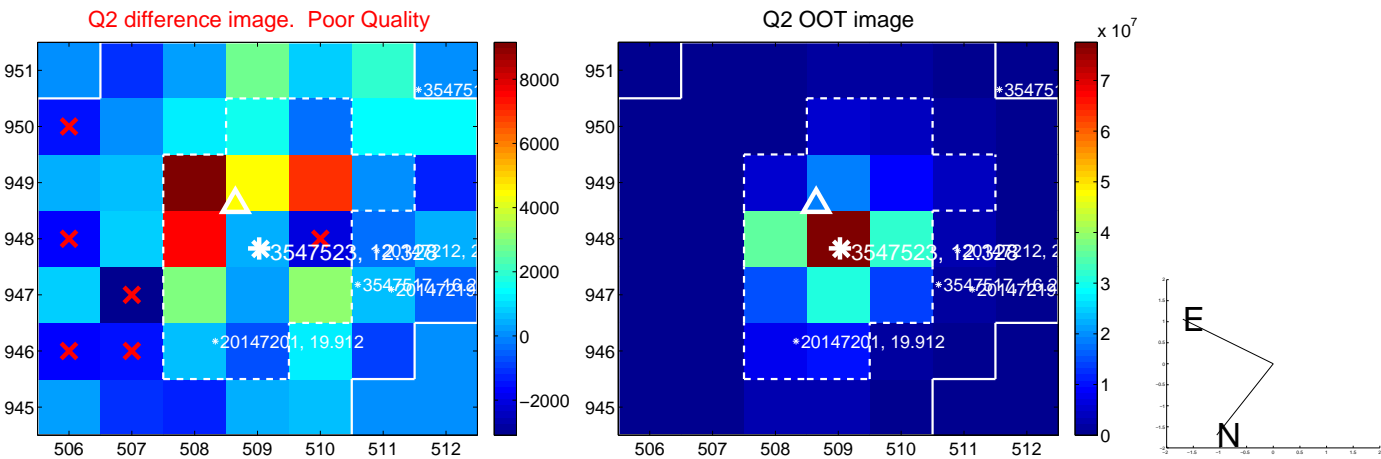
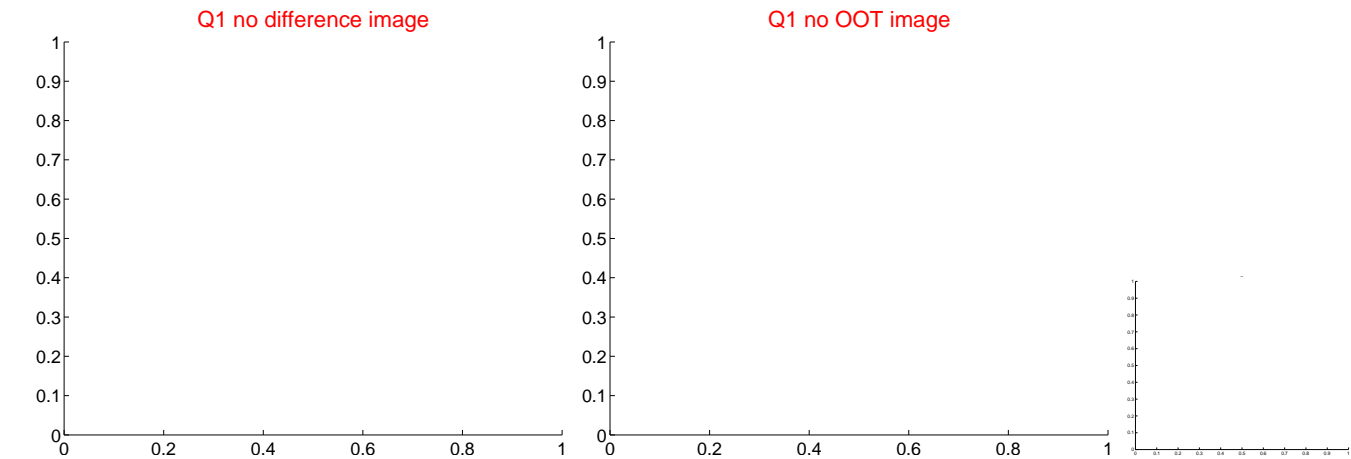


offset from photometric centroids



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.

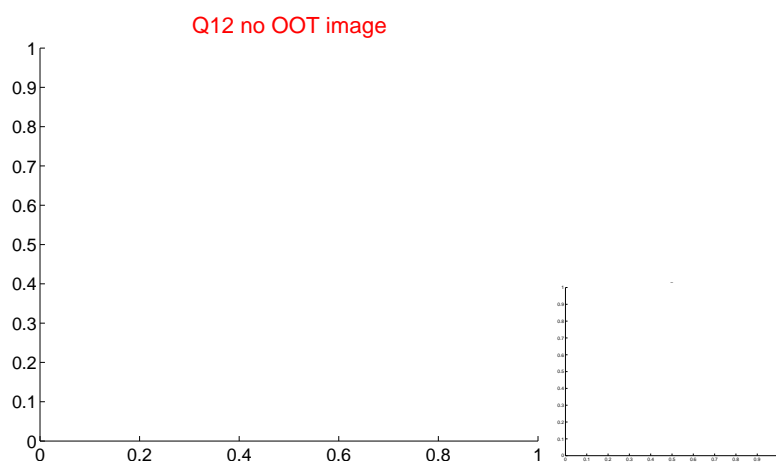
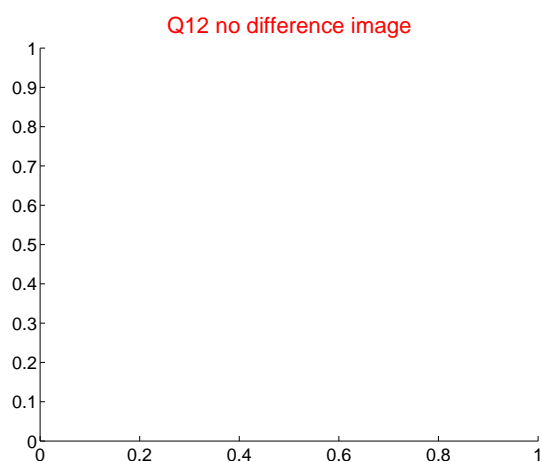
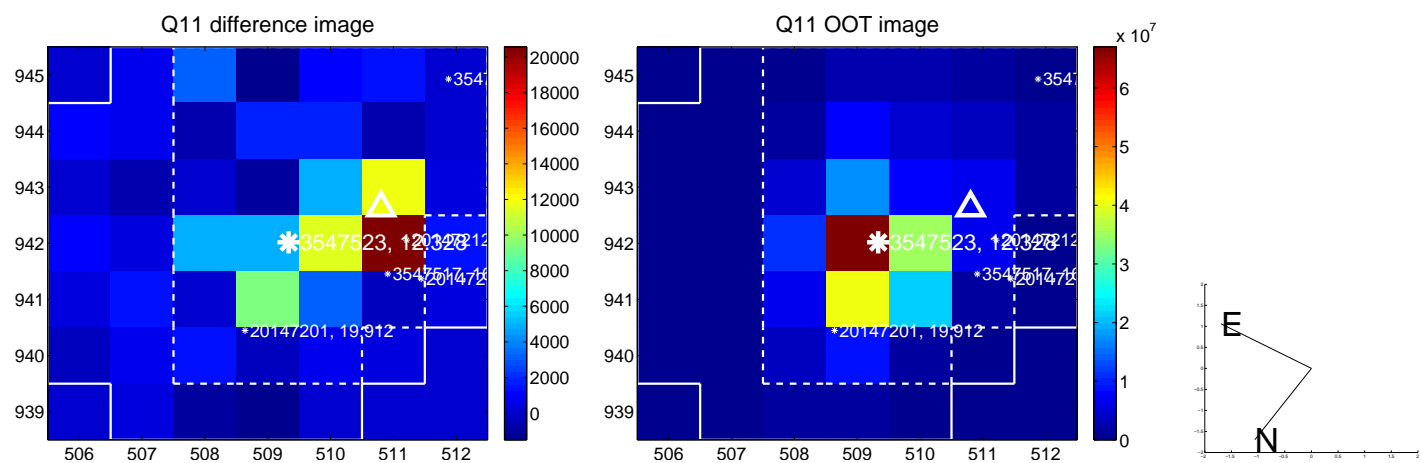
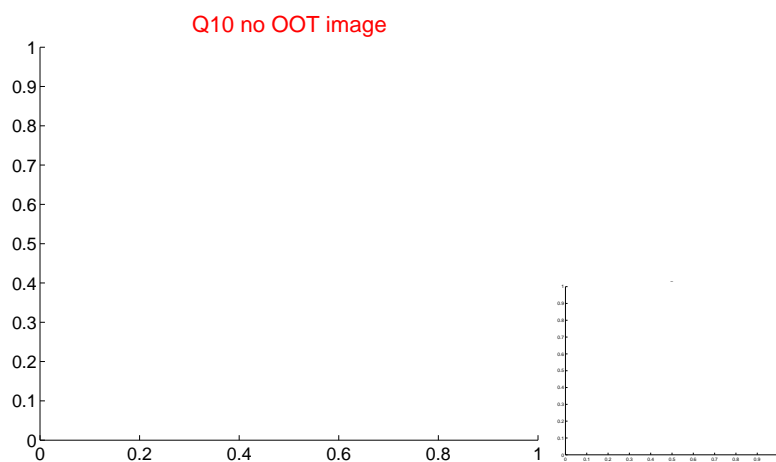
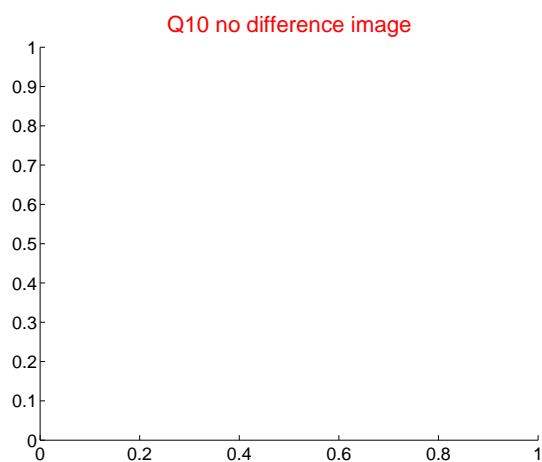
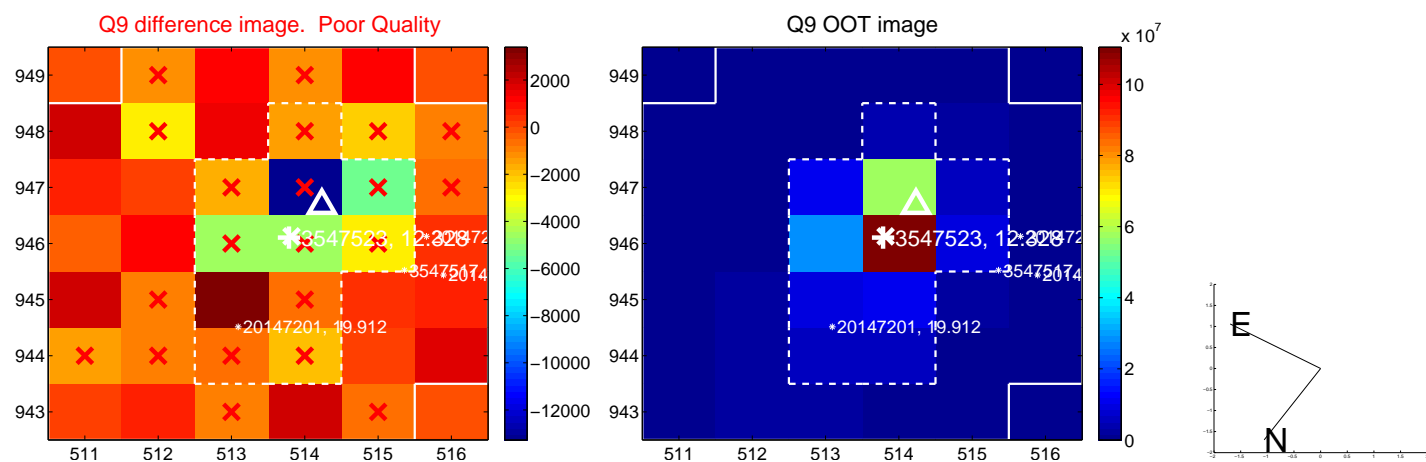
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

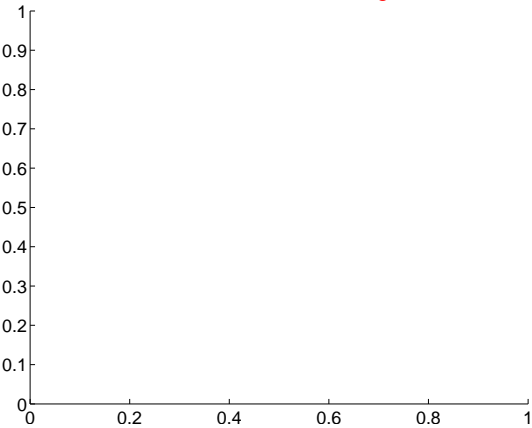


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

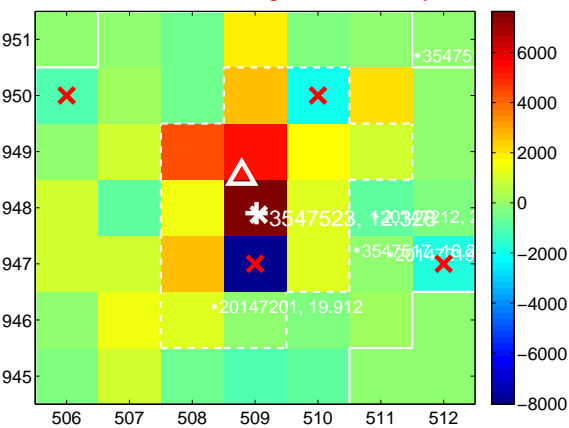
Q13 no difference image



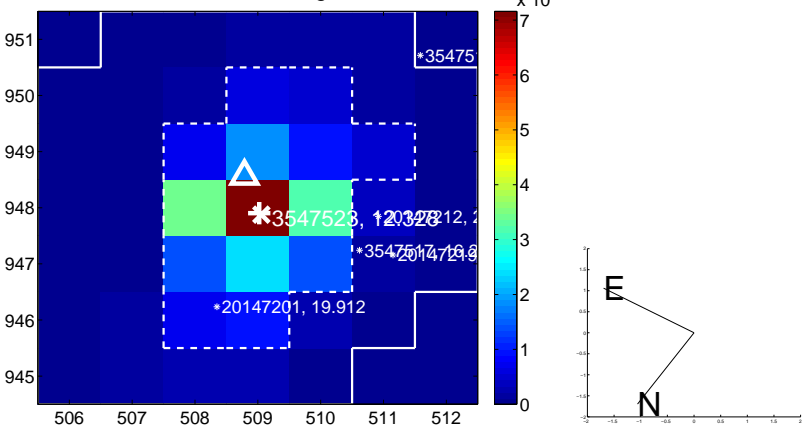
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



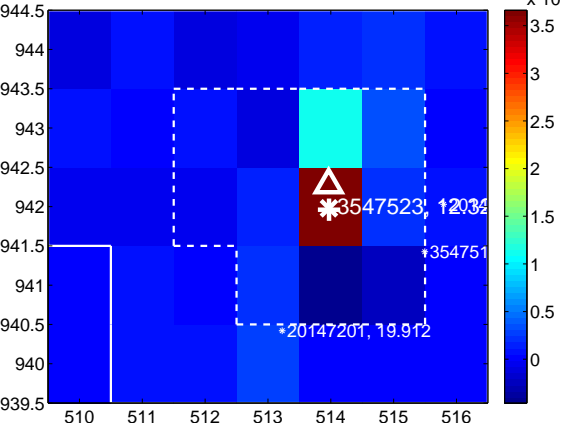
Q15 no difference image



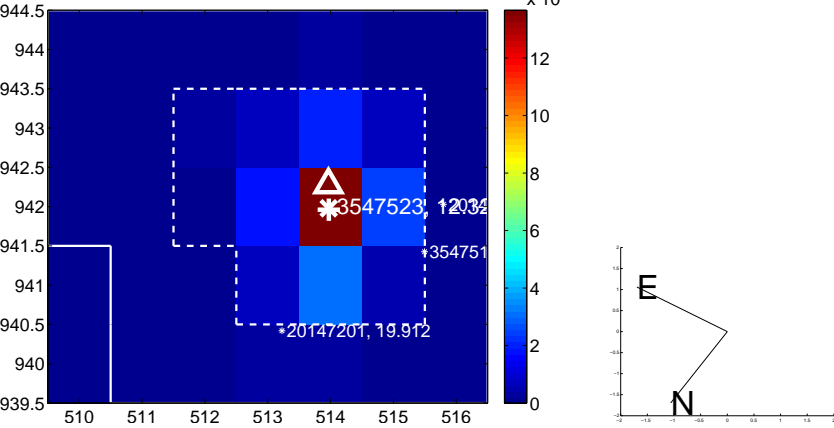
Q15 no OOT image



Q16 difference image

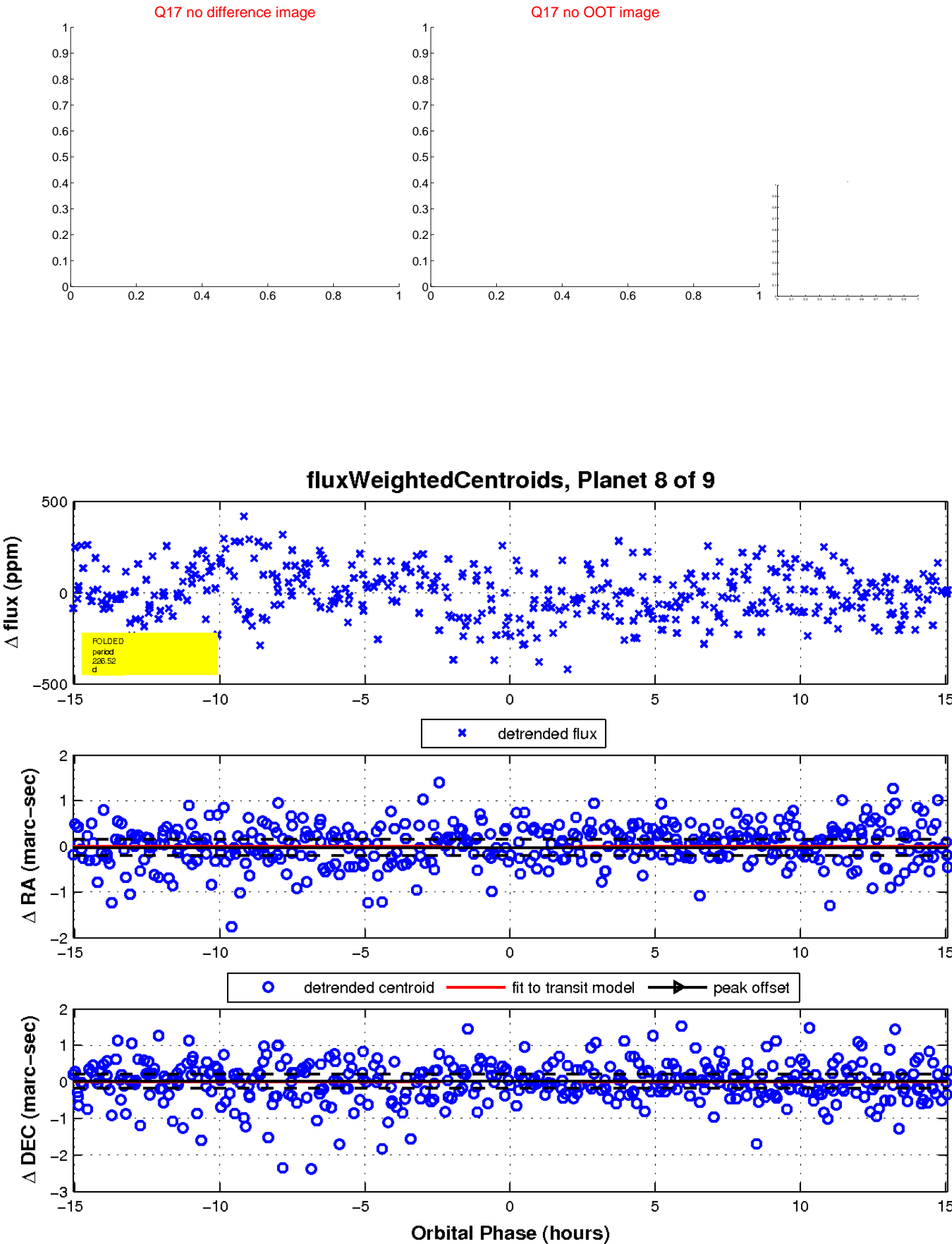


Q16 OOT image

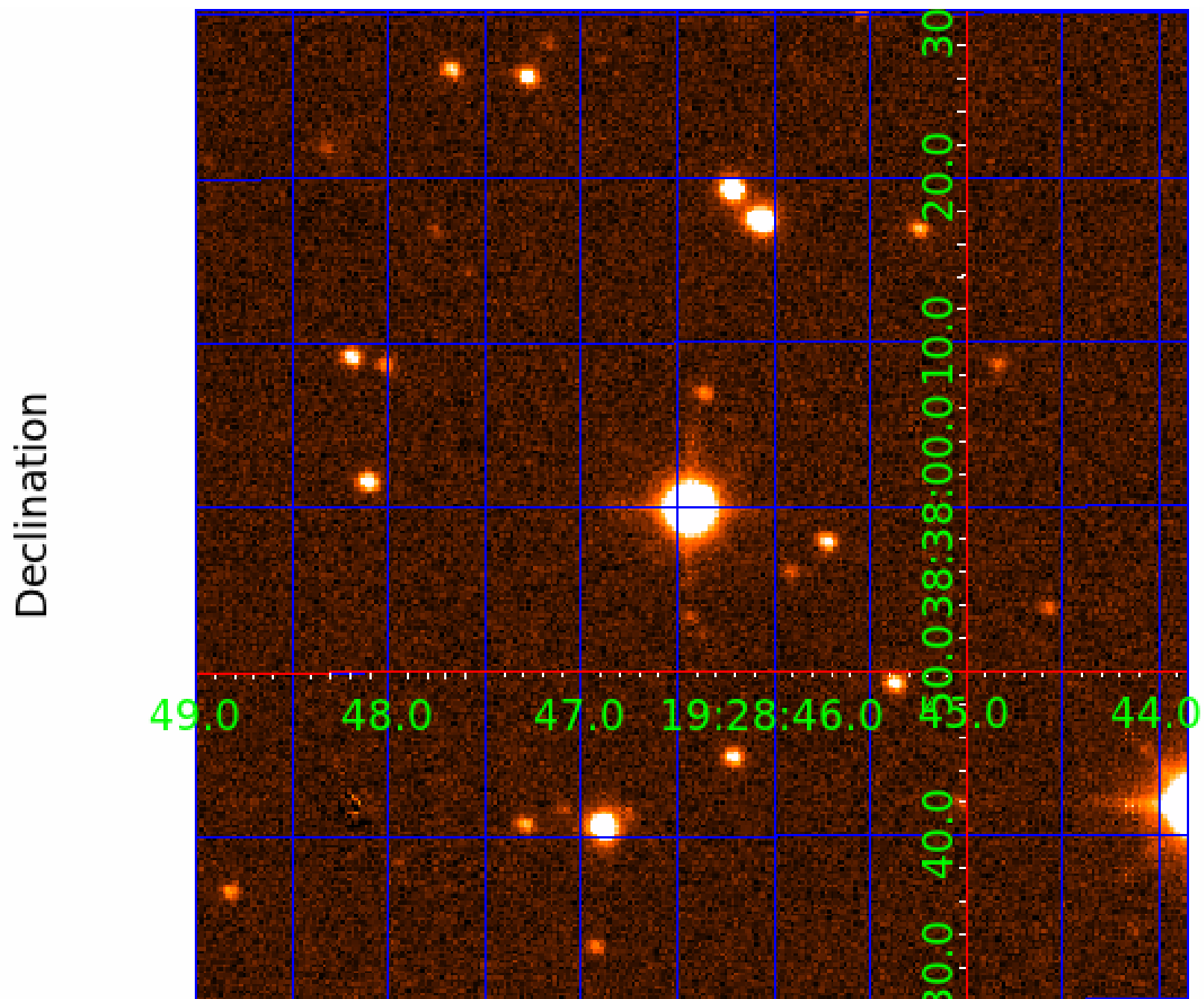




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image



# KIC 003547523

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003547523-01	OBS	No	1.286558	131.774714	21.4	6.273	9.4	10.8	2.12	7543	1.13	17010.03
003547523-02	OBS	No	170.081357	281.456755	154.3	3.405	10.3	4.6	2.12	7543	2.97	25.26
003547523-03	OBS	No	4.289079	131.505412	36.0	6.831	8.0	7.9	2.12	7543	1.58	3415.54
003547523-04	OBS	No	64.515001	141.389924	133.7	5.114	7.9	7.7	2.12	7543	2.73	91.99
003547523-05	OBS	No	48.272360	144.778101	148.8	2.948	8.6	8.6	2.12	7543	2.87	135.42
003547523-06	OBS	No	67.256610	149.491828	257.1	3.132	7.8	8.1	2.12	7543	3.90	87.02
003547523-07	OBS	No	213.723127	282.236258	225.9	3.273	8.3	7.3	2.12	7543	3.67	18.63
003547523-08	OBS	No	226.517683	180.912141	209.7	5.031	7.4	7.7	2.12	7543	3.39	17.24
003547523-09	OBS	No	93.778528	135.848958	265.1	2.254	7.6	8.4	2.12	7543	3.67	55.87

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003547523-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003547523-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS
003547523-03	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
003547523-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT—HALO_GHOST
003547523-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003547523-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
003547523-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—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.

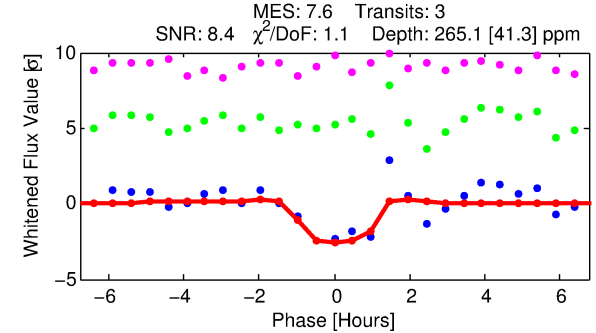
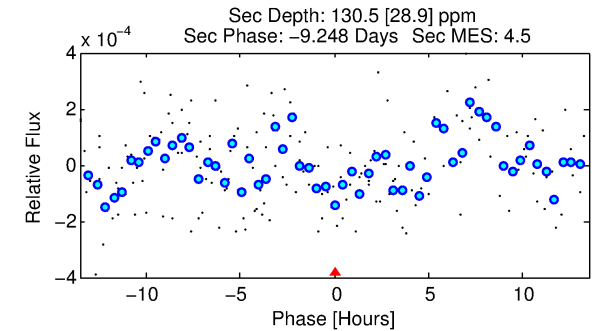
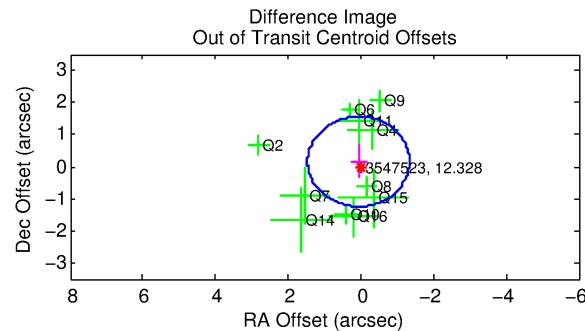
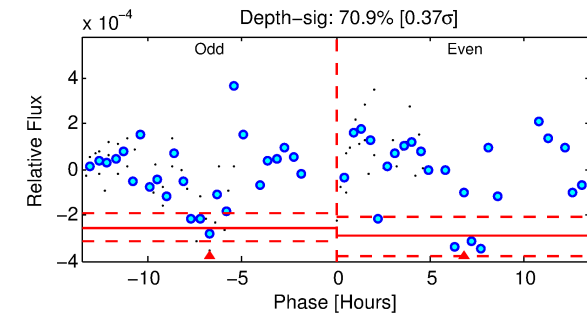
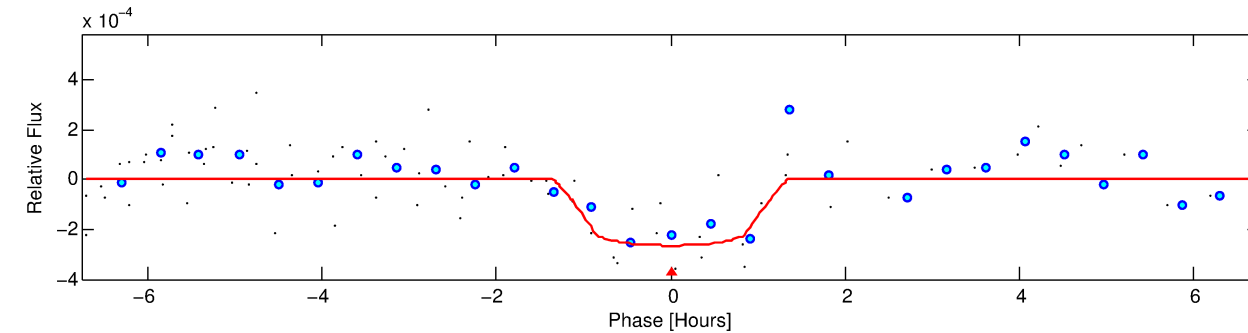
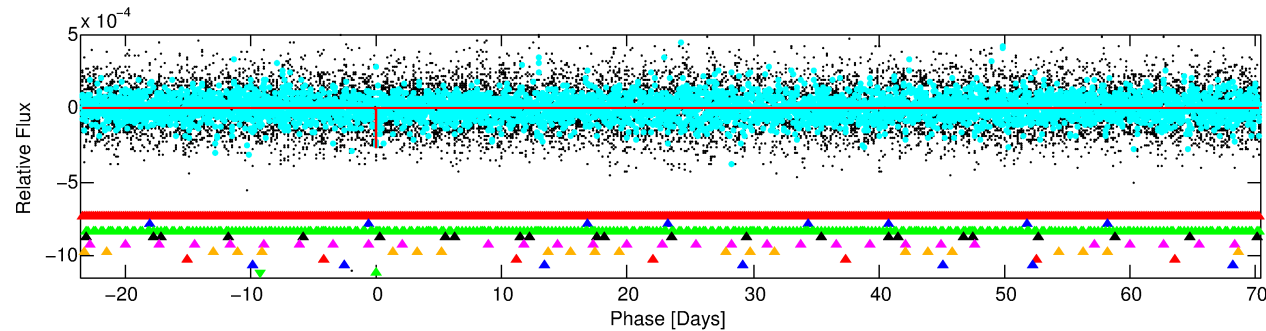
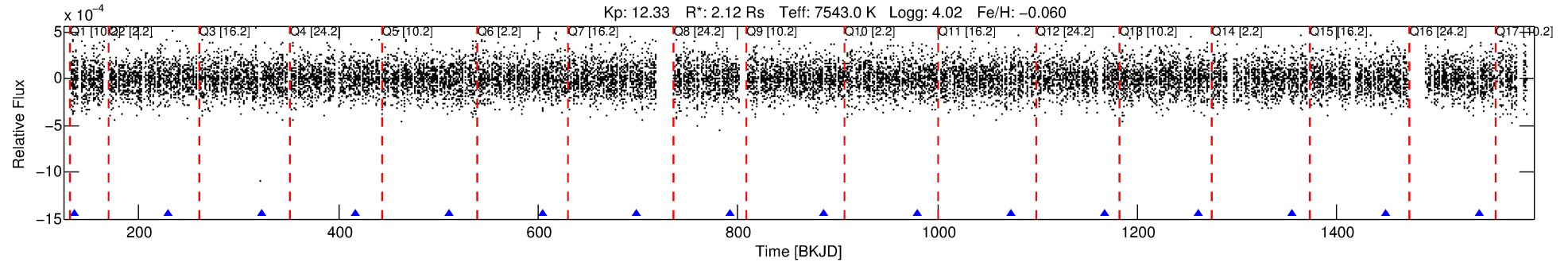
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003547523-09

No Significant Match Found

# DV One-Page Summary

KIC: 3547523 Candidate: 9 of 9 Period: 93.779 d



## DV Fit Results:

Period = 93.77853 [0.00109] d  
Epoch = 135.8490 [0.0103] BKJD  
Rp/R\* = 0.0159 [0.0196]  
a/R\* = 243.50 [1890.72]  
b = 0.67 [6.49]  
Seff = 55.87 [20.78]  
Teq = 697 [65] K  
Rp = 3.67 [4.62] Re  
a = 0.4819 [0.1065] AU  
Ag = 1237.17 [3093.76] [0.40 $\sigma$ ]  
Teffp = 6392 [3970] K [1.43 $\sigma$ ]

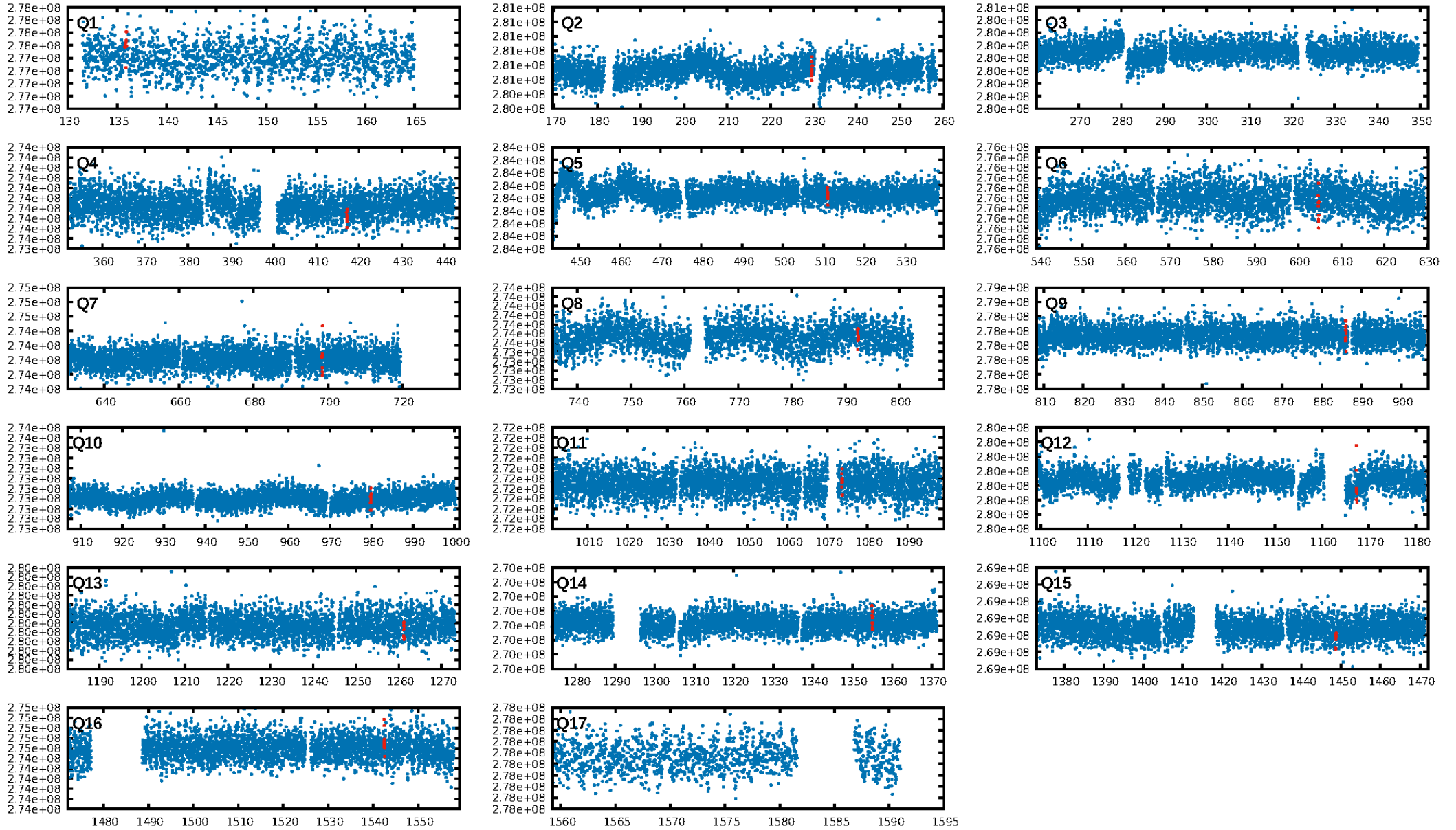
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [164.95 $\sigma$ ]  
LongPeriod-sig: 100.0% [448.45 $\sigma$ ]  
ModelChiSquare2-sig: 77.1%  
ModelChiSquareGof-sig: 83.8%  
**Bootstrap-pfa: 1.48e-08**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.6  
Centroid-sig: 0.8%  
Centroid-so: 1.083 arcsec [1.61 $\sigma$ ]  
OotOffset-rm: 0.171 arcsec [0.37 $\sigma$ ]  
KicOffset-rm: 0.497 arcsec [0.99 $\sigma$ ]  
OotOffset-st: 4/3/3/1 [11]  
KicOffset-st: 4/3/3/1 [11]  
DiffImageQuality-fgm: 0.55 [6/11]  
DiffImageOverlap-fno: 0.20 [3/15]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 06:34:38 Z

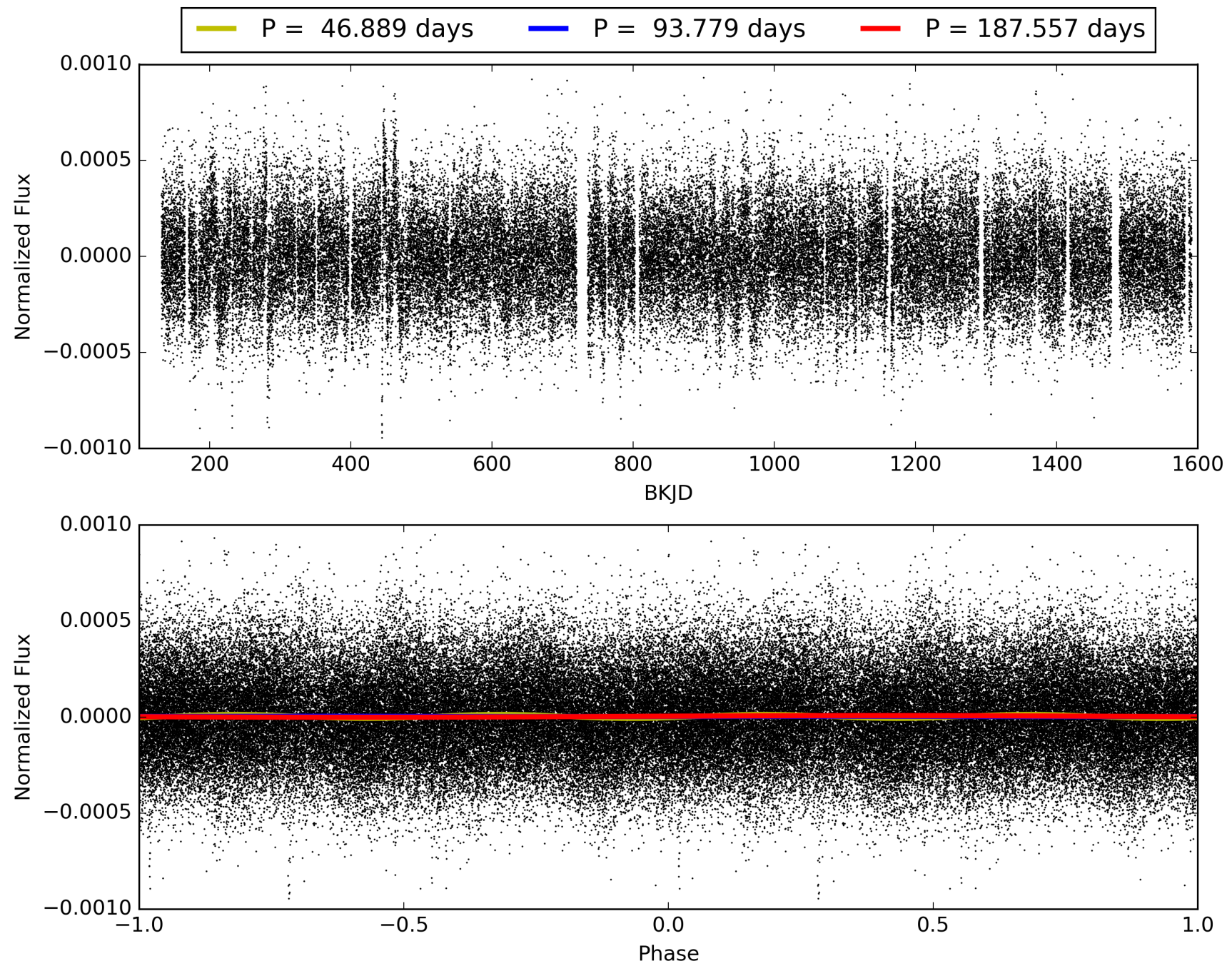
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003547523-09, PDC Light Curves



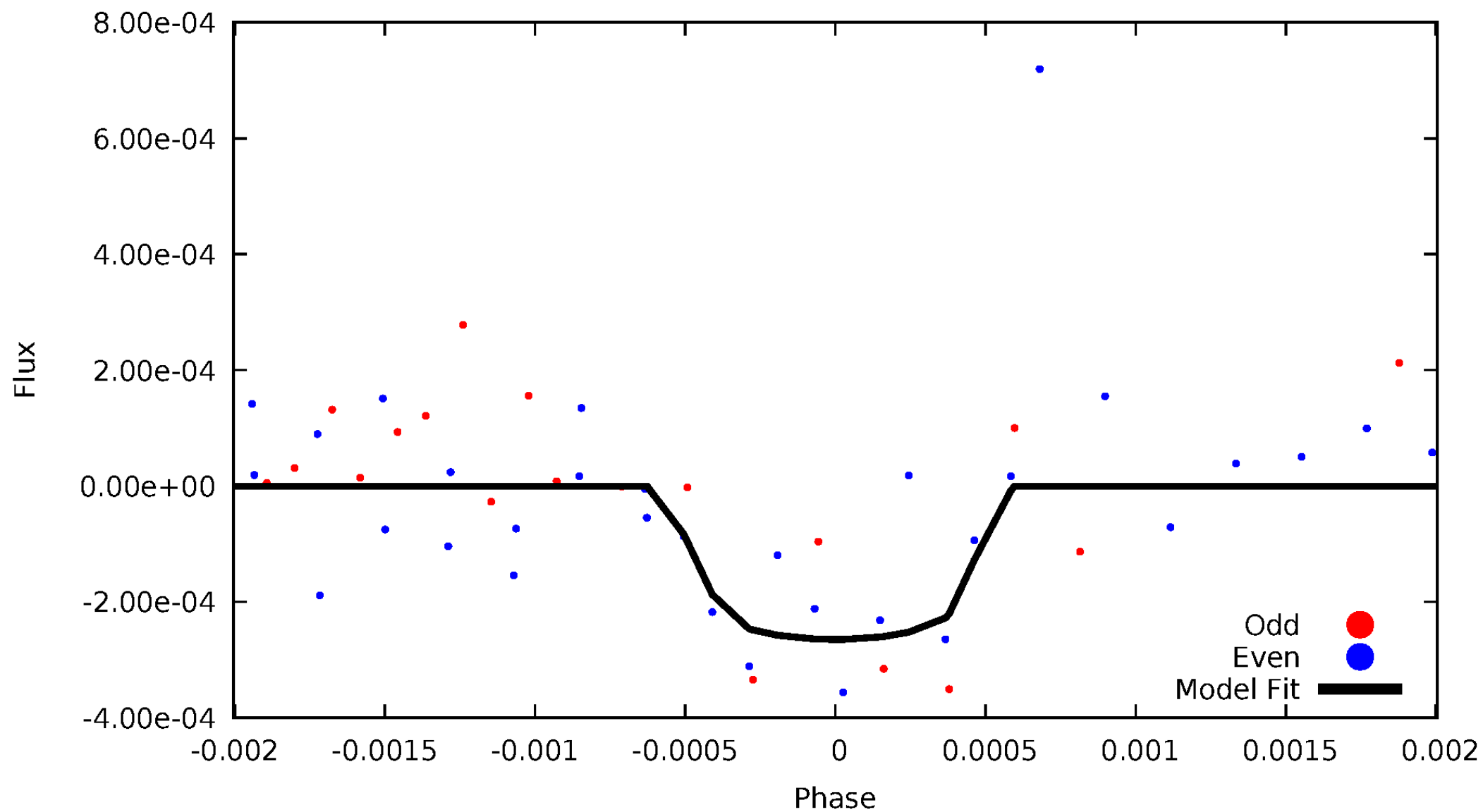


TCE 003547523-09



# DV Odd/Even

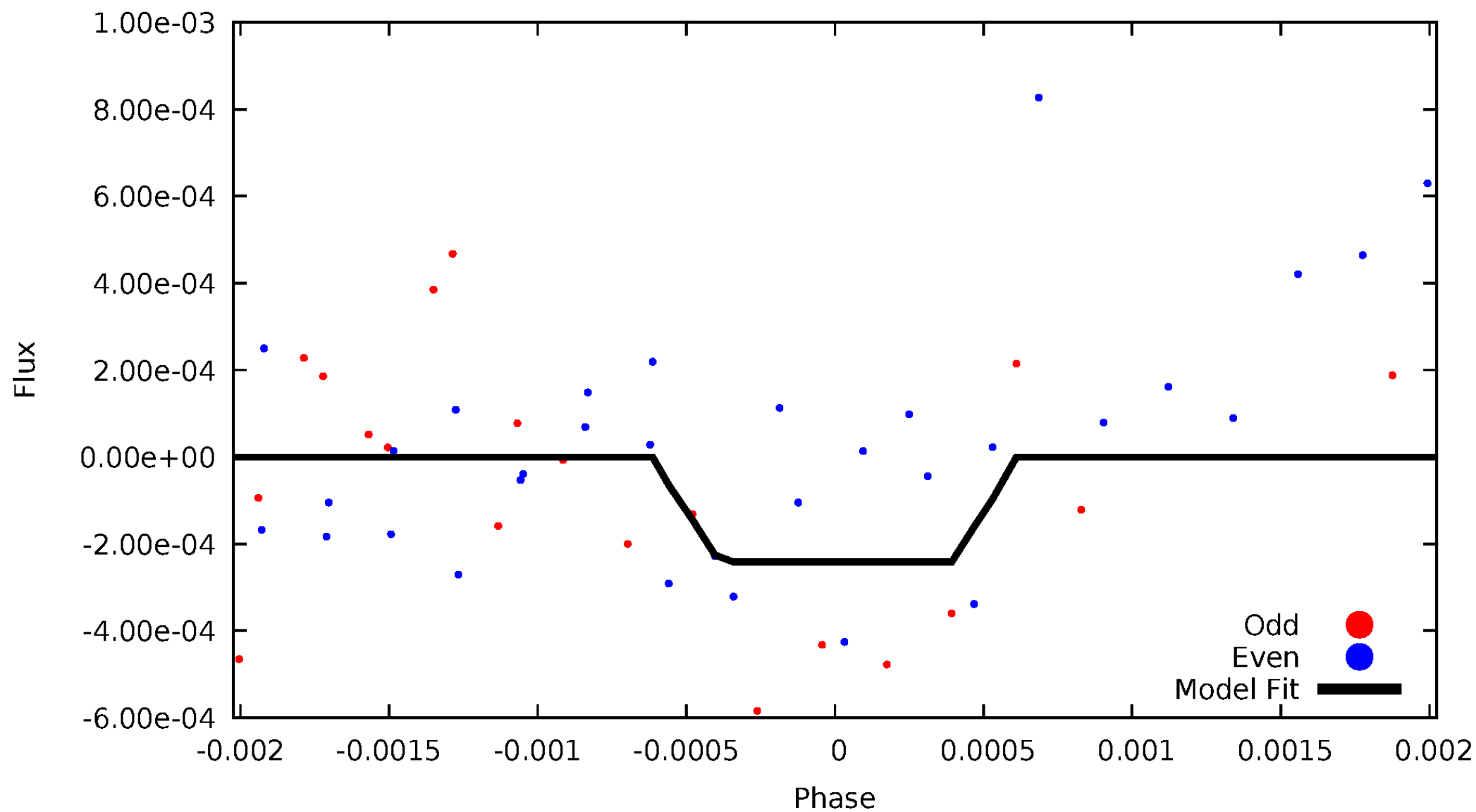
TCE 003547523-09



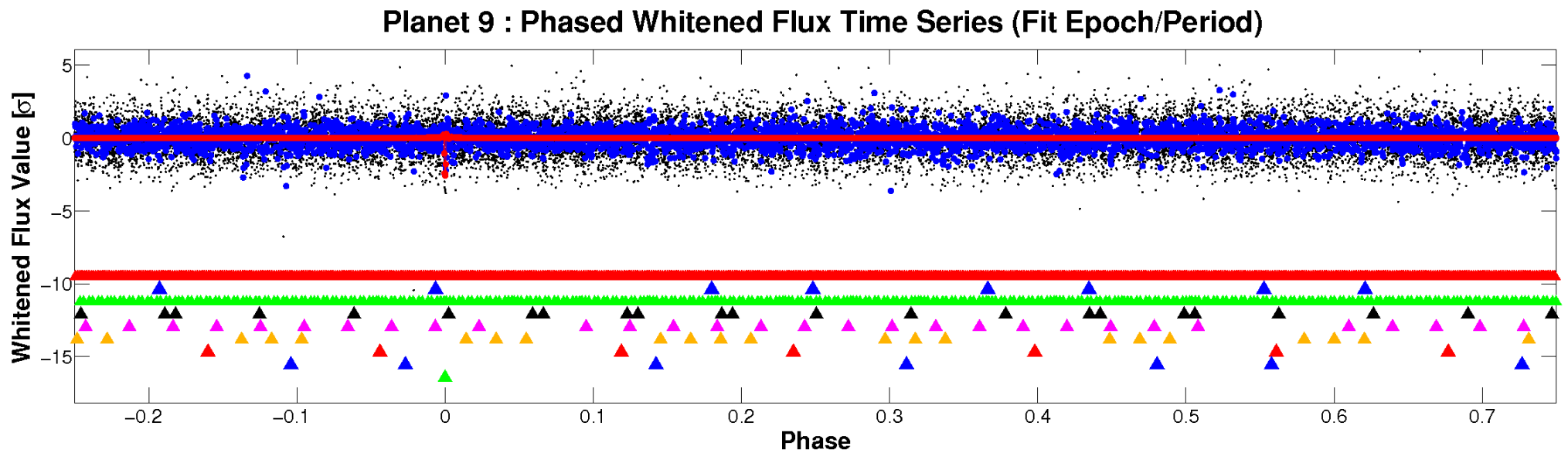
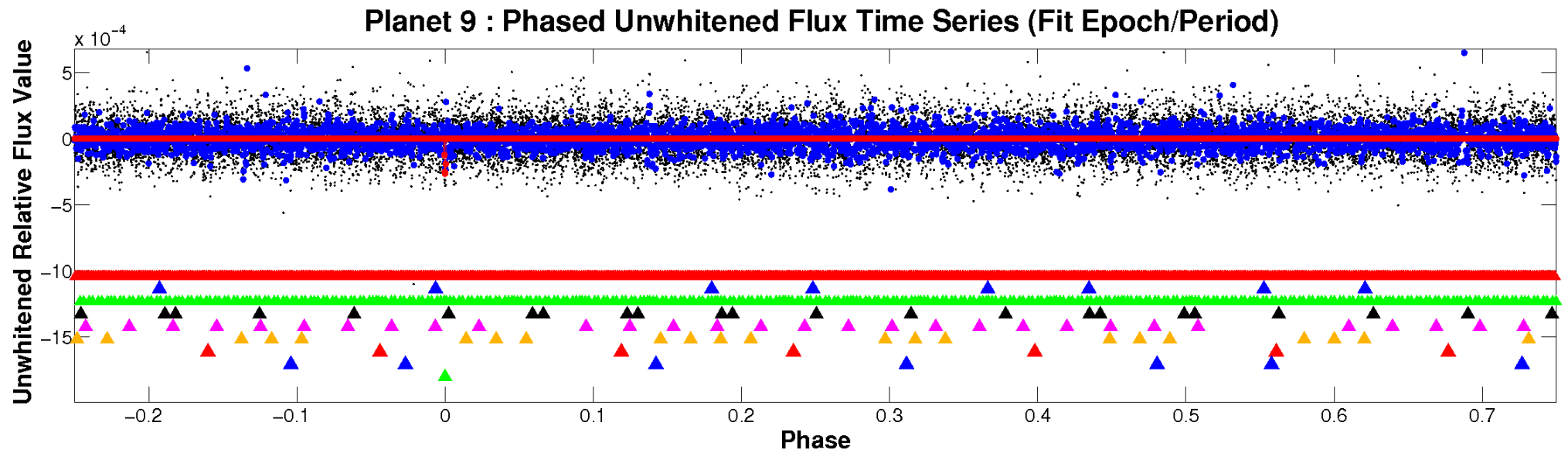


# ALT Odd/Even

TCE 003547523-09

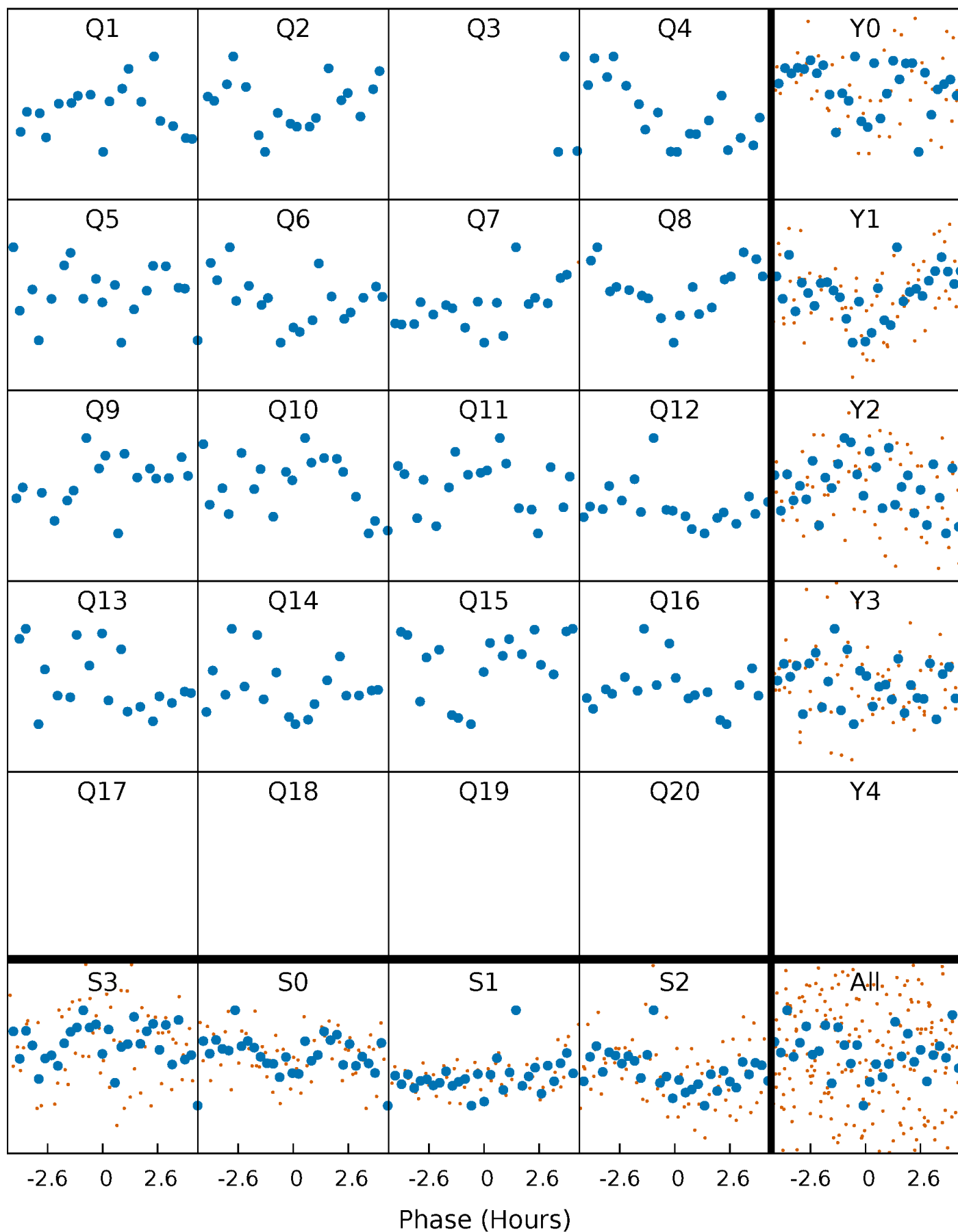


# Non-Whitened Vs. Whitened Light Curve



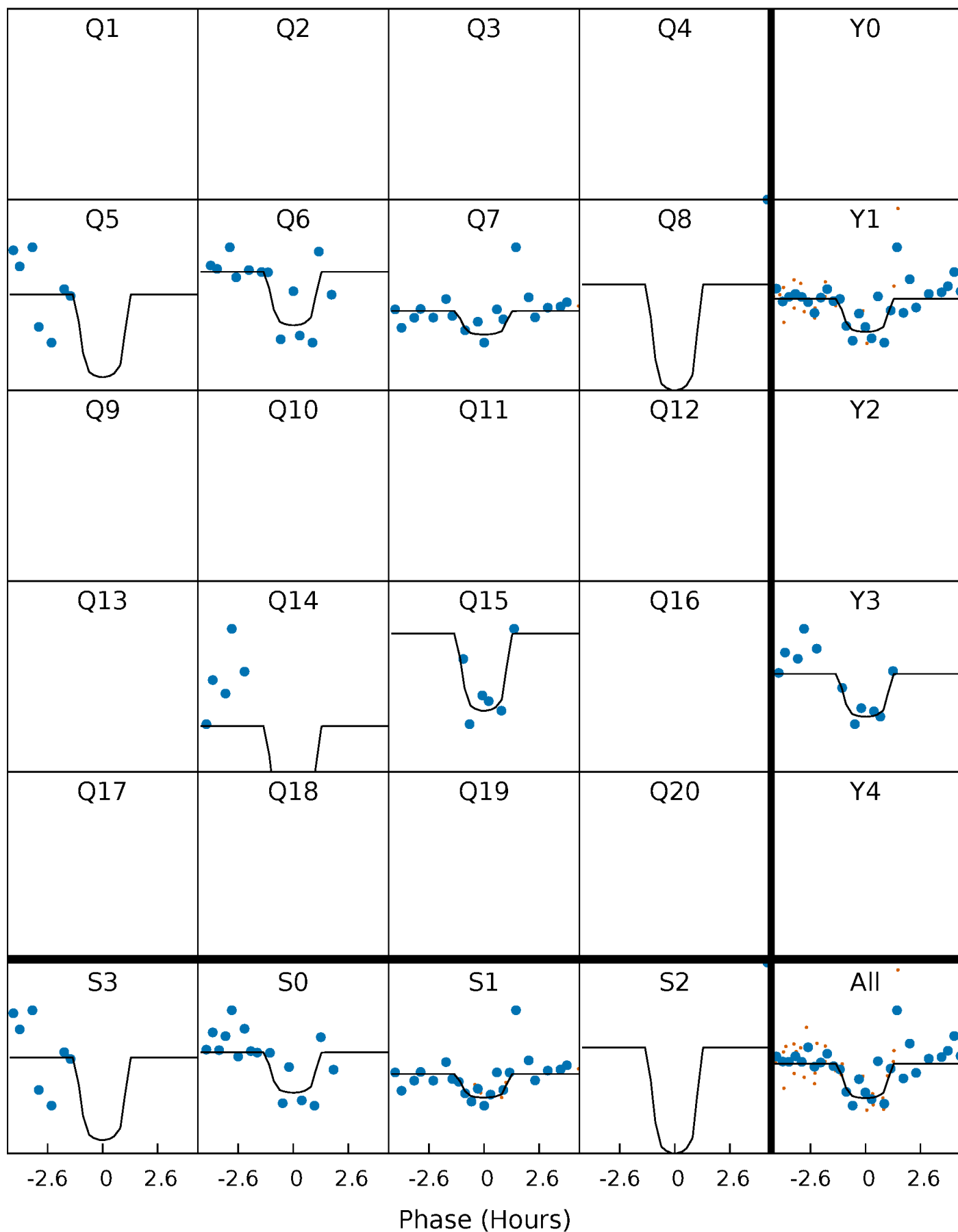
# PDC Quarter-Phased Transit Curves

TCE 003547523-09 P= 93.778528 Days  $T_0=135.848958$  (BKJD)



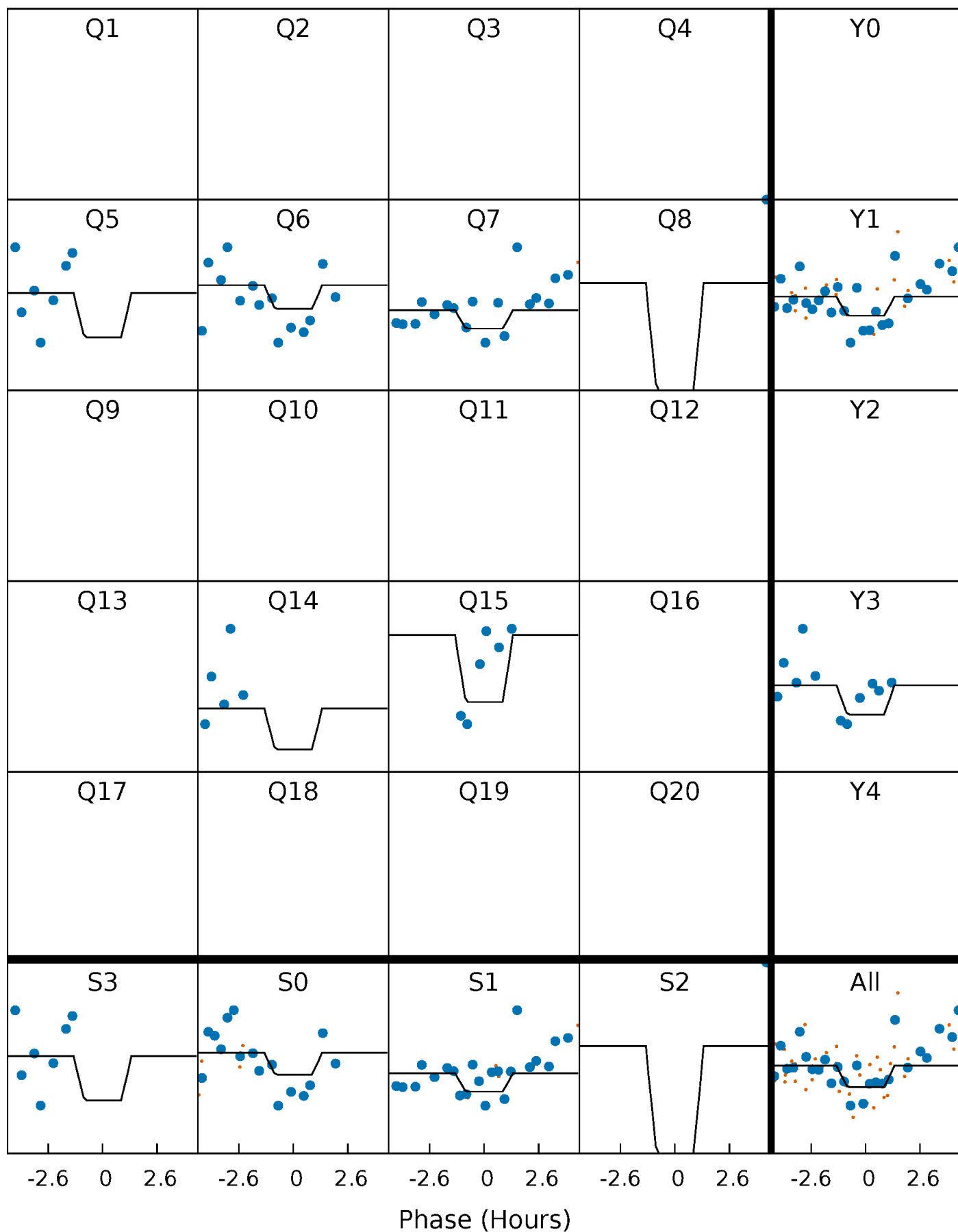
# DV Quarter-Phased Transit Curves

TCE 003547523-09     $P = 93.778528$  Days     $T_0 = 135.848958$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

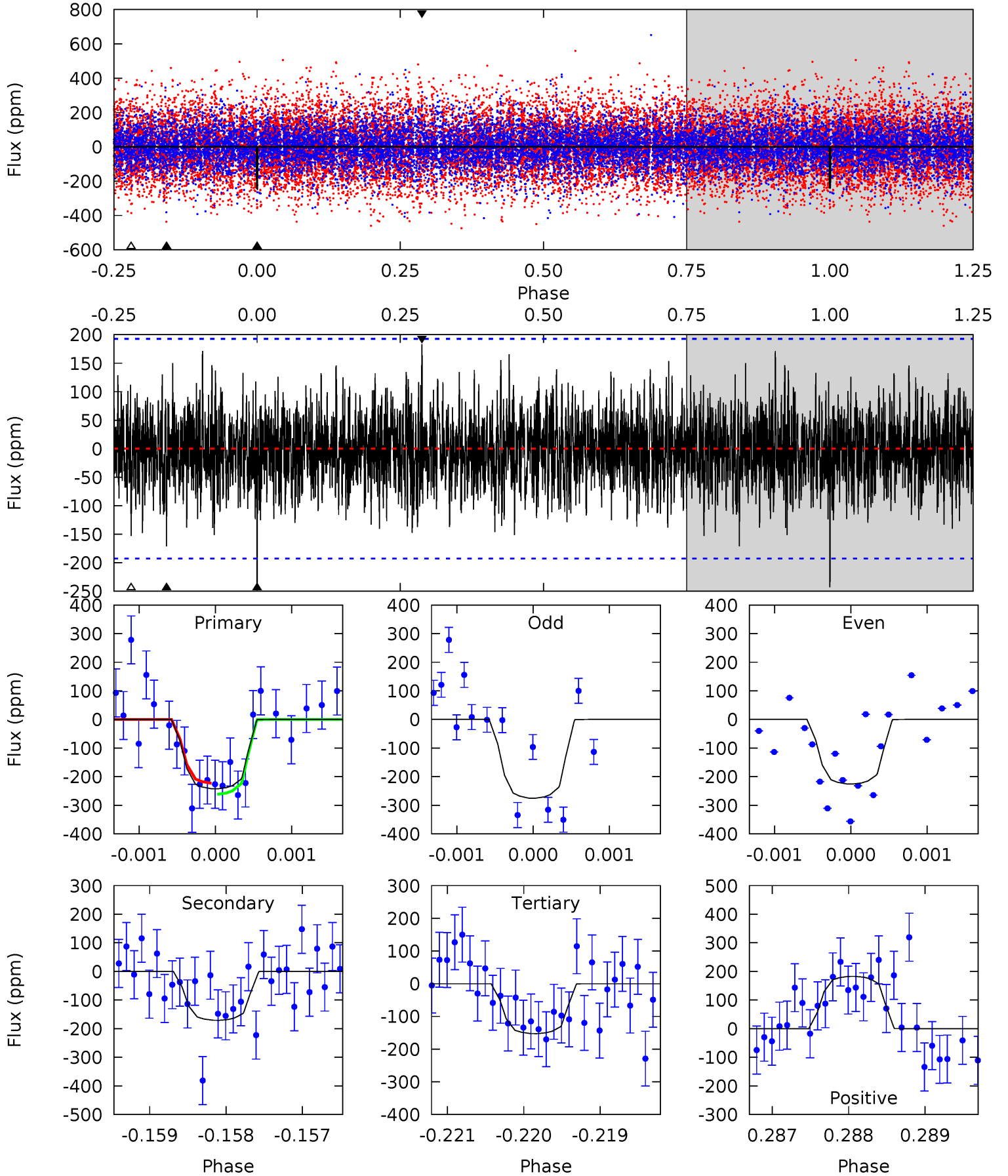
TCE 003547523-09 P= 93.779233 Days  $T_0=135.844189$  (BKJD)



# DV Model-Shift Uniqueness Test

003547523-09, P = 93.778528 Days, E = 42.070430 Days

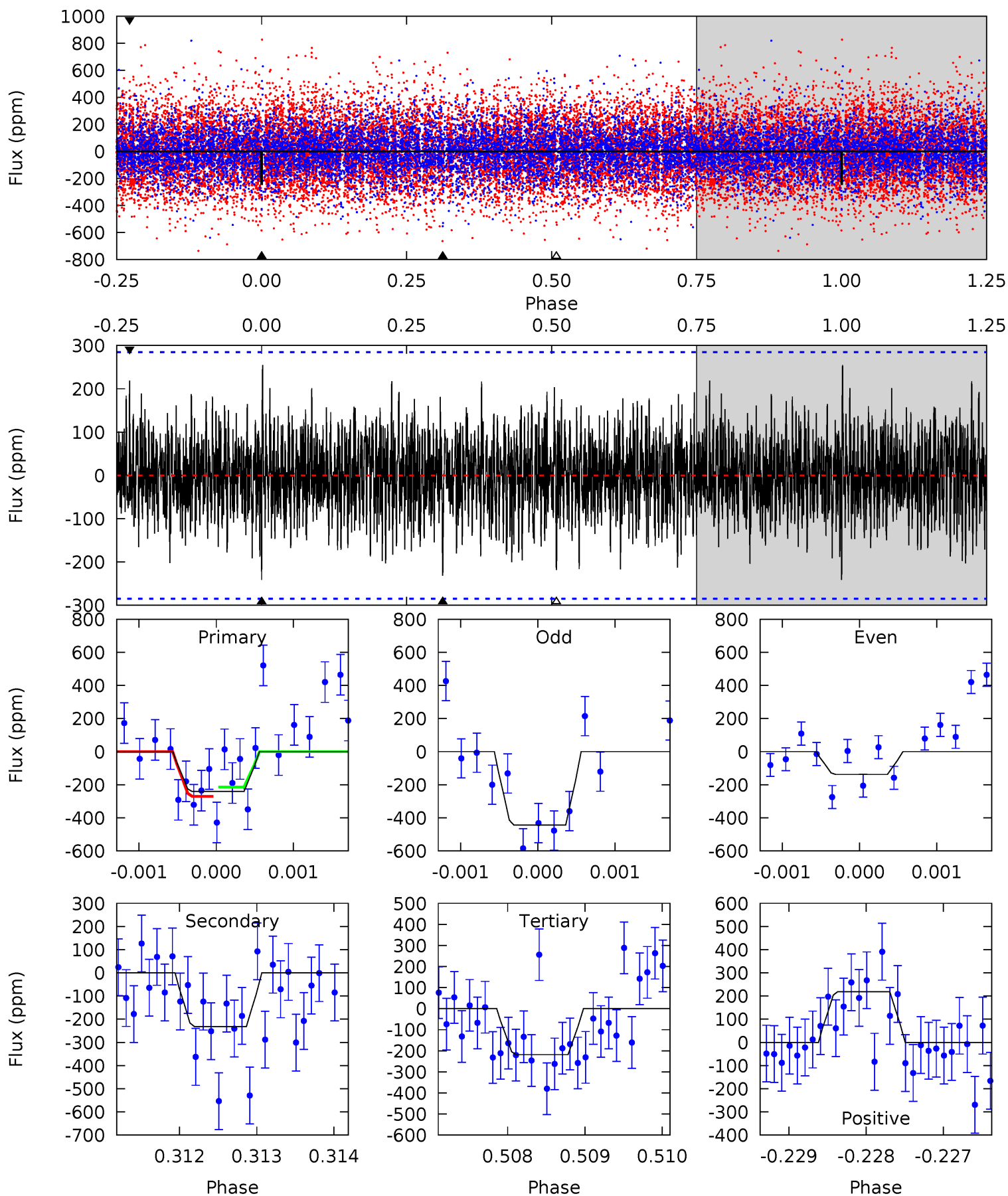
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.85	4.82	4.31	5.17	5.44	3.27	1.42	2.54	1.68	0.51	-0.34	0.64	0.90	0.43	0.54



# Alt Model-Shift Uniqueness Test

003547523-09, P = 93.779233 Days, E = 42.064956 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.60	4.42	4.17	4.17	5.44	3.27	1.35	0.43	0.43	0.25	0.24	2.64	1.58	0.51	0.53





### Stellar Parameters For KIC 003547523

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$7543^{+235}_{-314}$	$4.017^{+0.187}_{-0.153}$	$-0.060^{+0.200}_{-0.300}$	$2.115^{+0.533}_{-0.533}$	$1.695^{+0.212}_{-0.282}$	$0.252^{+0.261}_{-0.110}$
	+3%/-4%	+5%/-4%	+333%/-500%	+25%/-25%	+13%/-17%	+103%/-44%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 003547523-09 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-171 \pm 35$	$5.05^{+4.40}_{-3.35}$	$972^{+67}_{-71}$	$5666^{+4804}_{-1281}$	$836^{+6648}_{-590}$
Alt.	$-232 \pm 52$	$4.51^{+4.07}_{-2.84}$	$968^{+71}_{-73}$	$6356^{+6279}_{-1533}$	$1396^{+9415}_{-1002}$

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

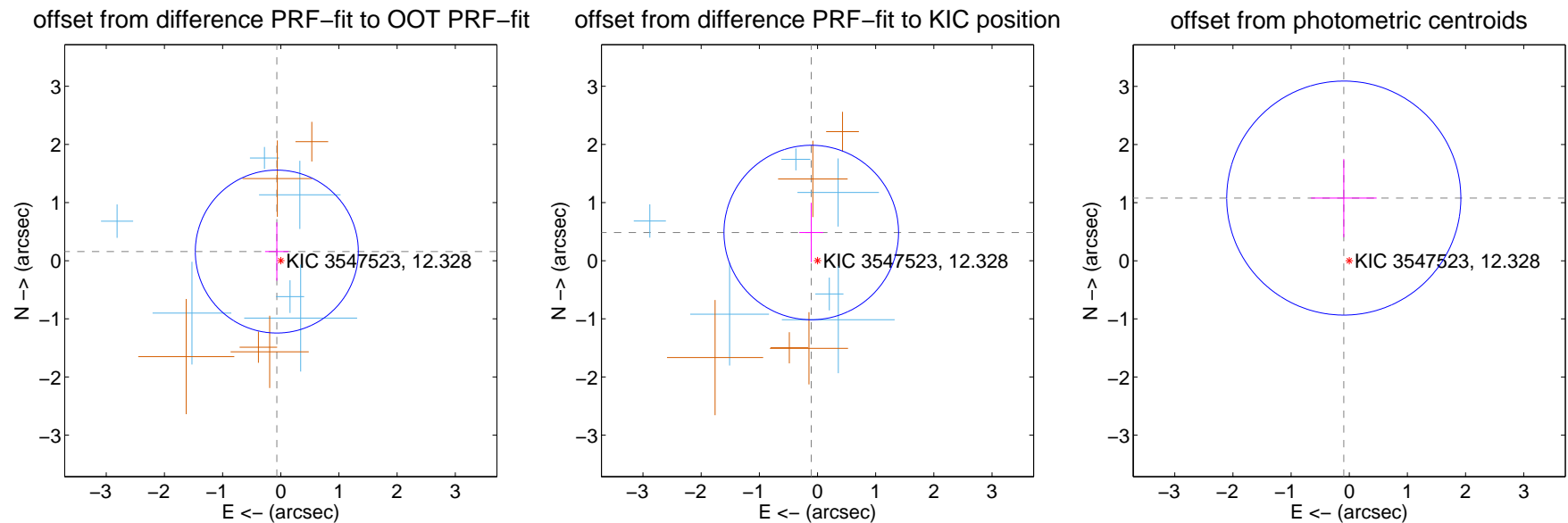
## DV Centroid Data

Supplemental centroid analysis for 003547523-09. Kepler magnitude: 12.33. Transit SNR 8.37

There are 6 quarters with good PRF difference image offsets

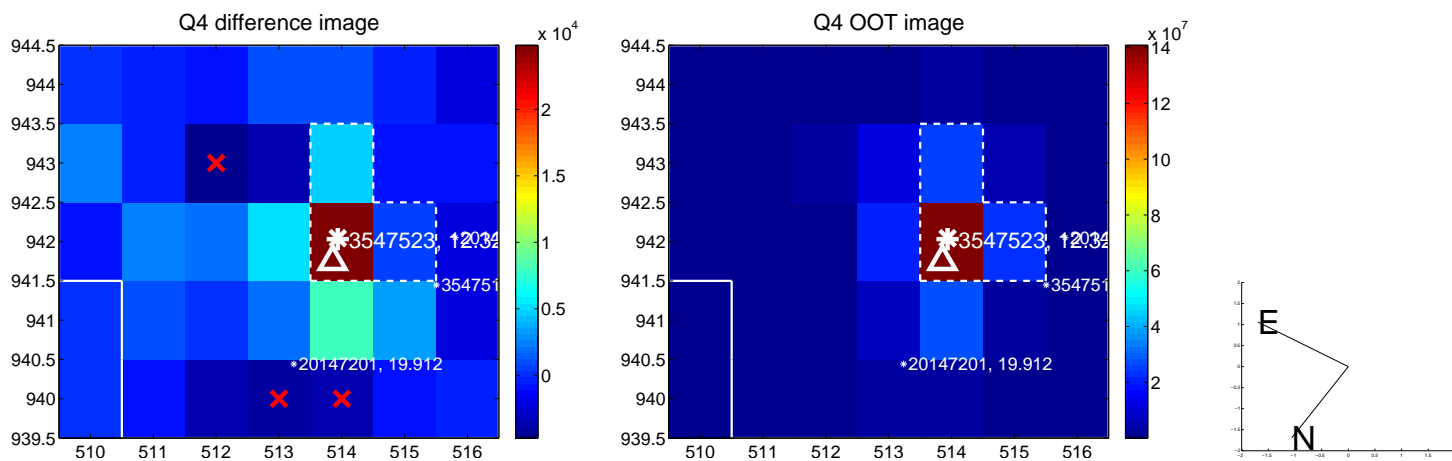
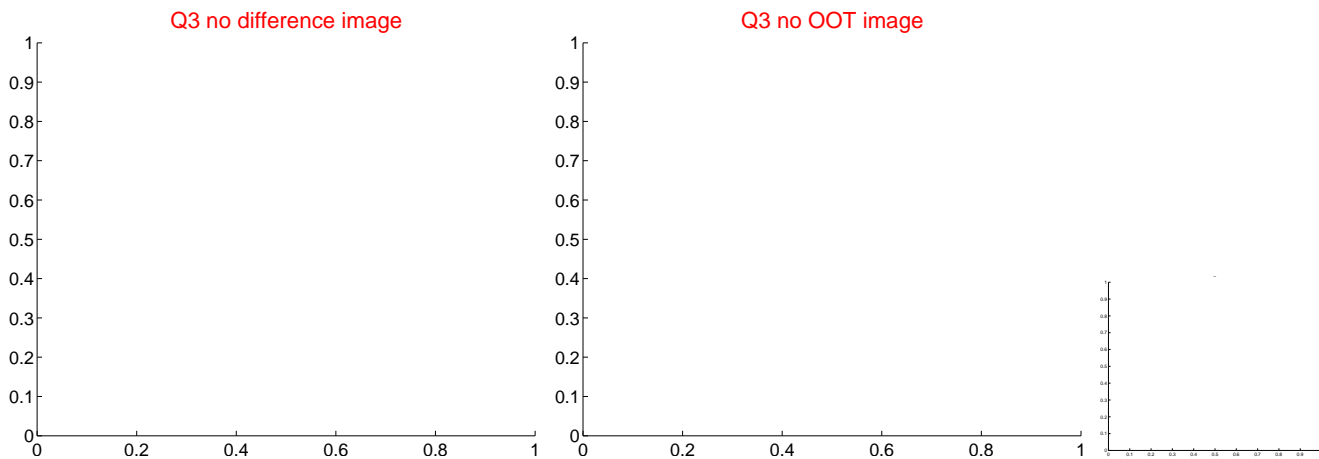
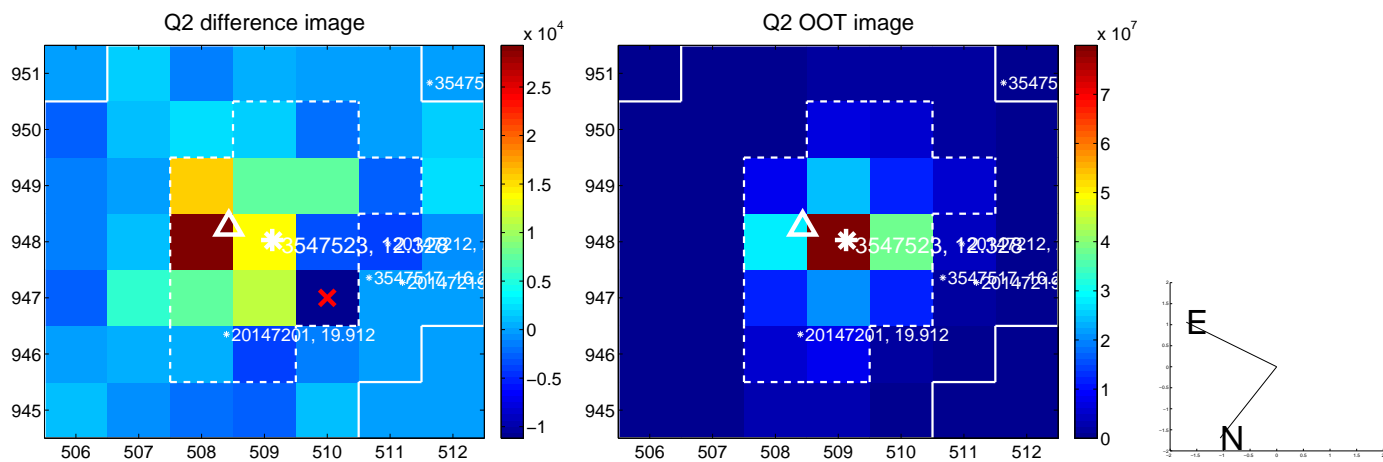
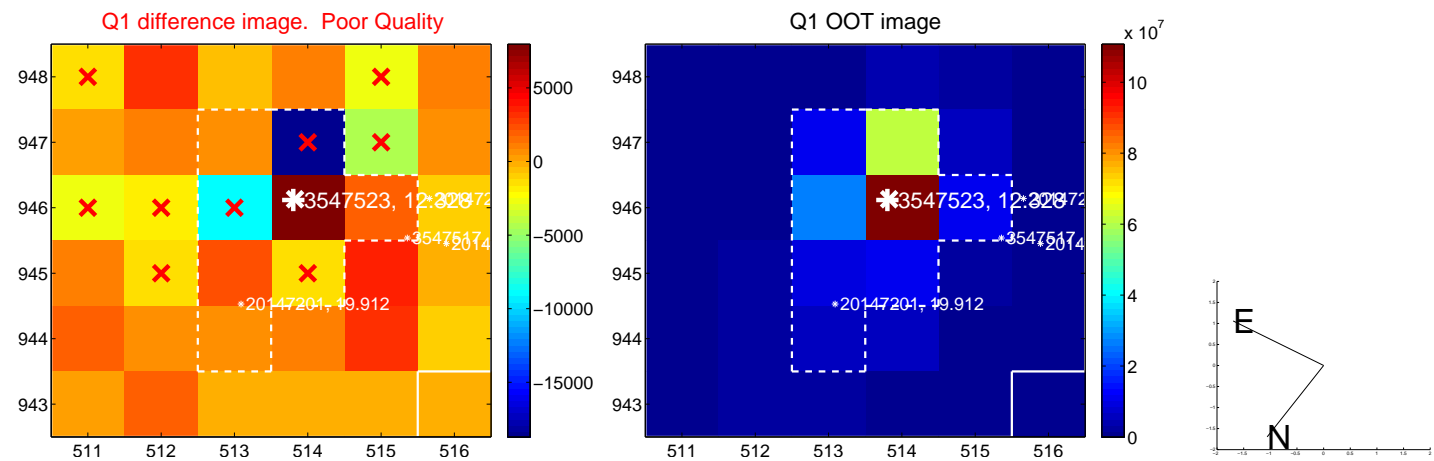
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.171 \pm 0.467$	0.37	$0.068 \pm 0.202$	$0.157 \pm 0.501$
PRF-fit source offset from KIC position	$0.497 \pm 0.500$	0.99	$0.107 \pm 0.206$	$0.485 \pm 0.510$
photometric centroid source offset	$1.08 \pm 0.67$	1.61	$0.09 \pm 0.56$	$1.08 \pm 0.67$

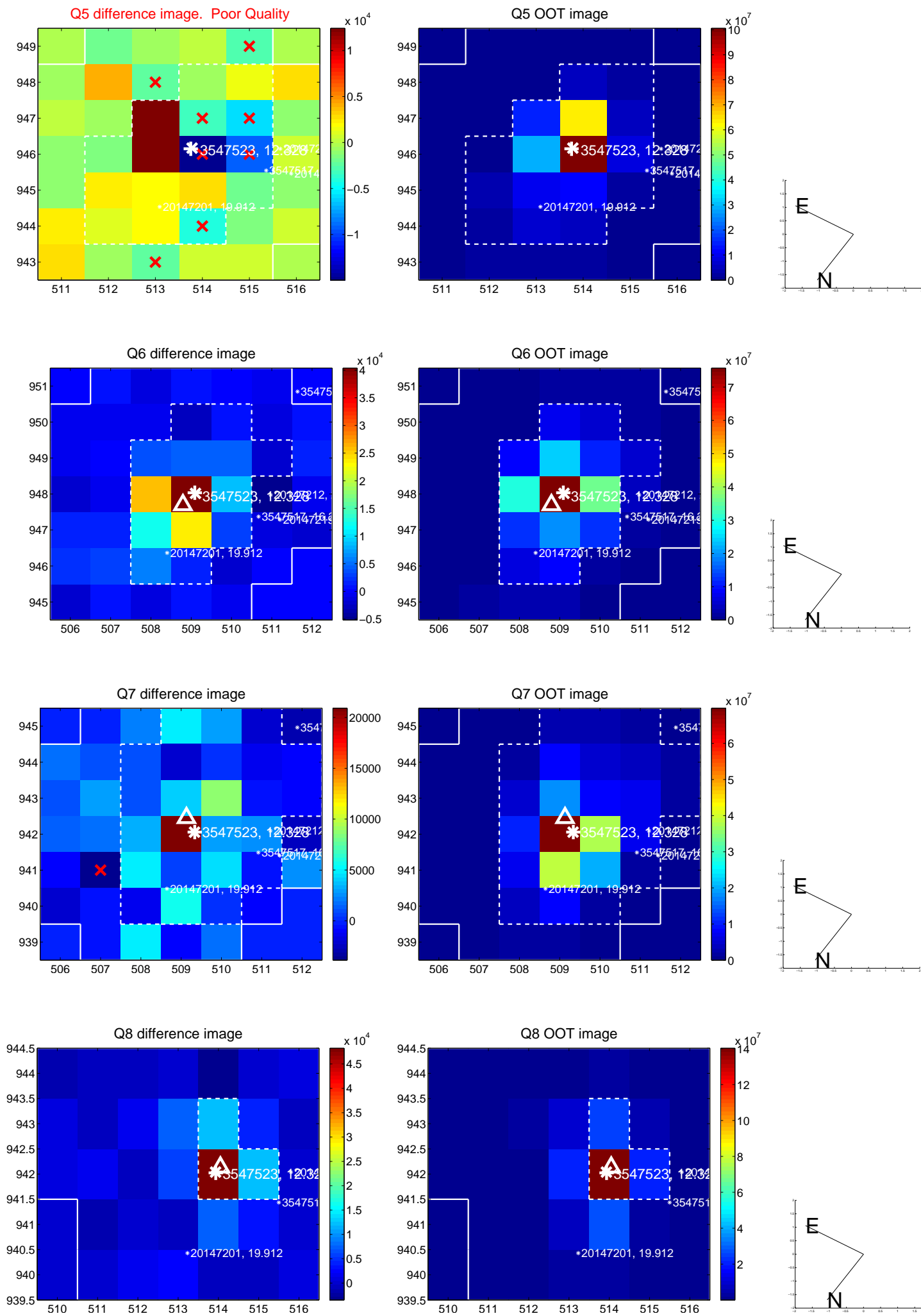


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

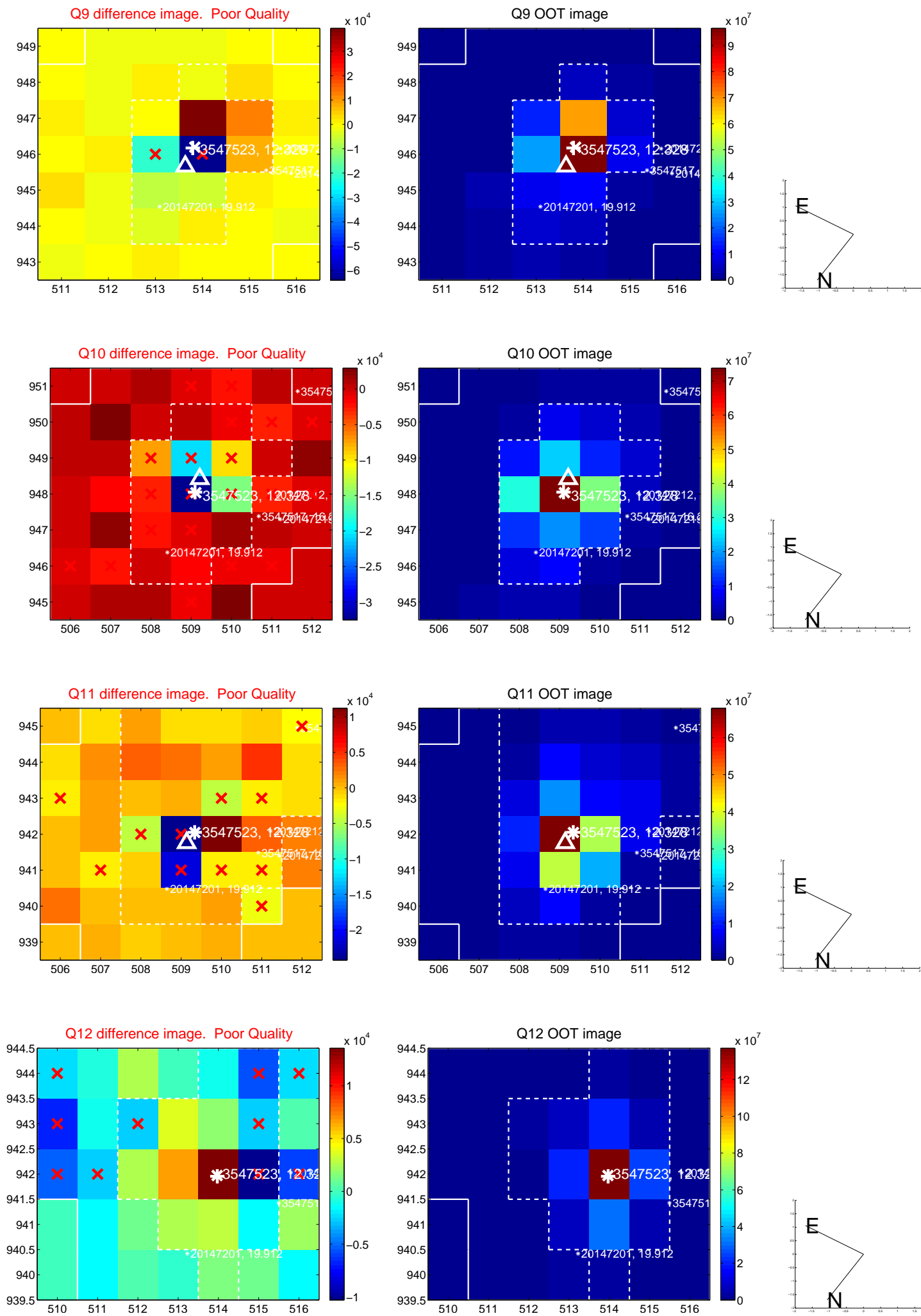
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



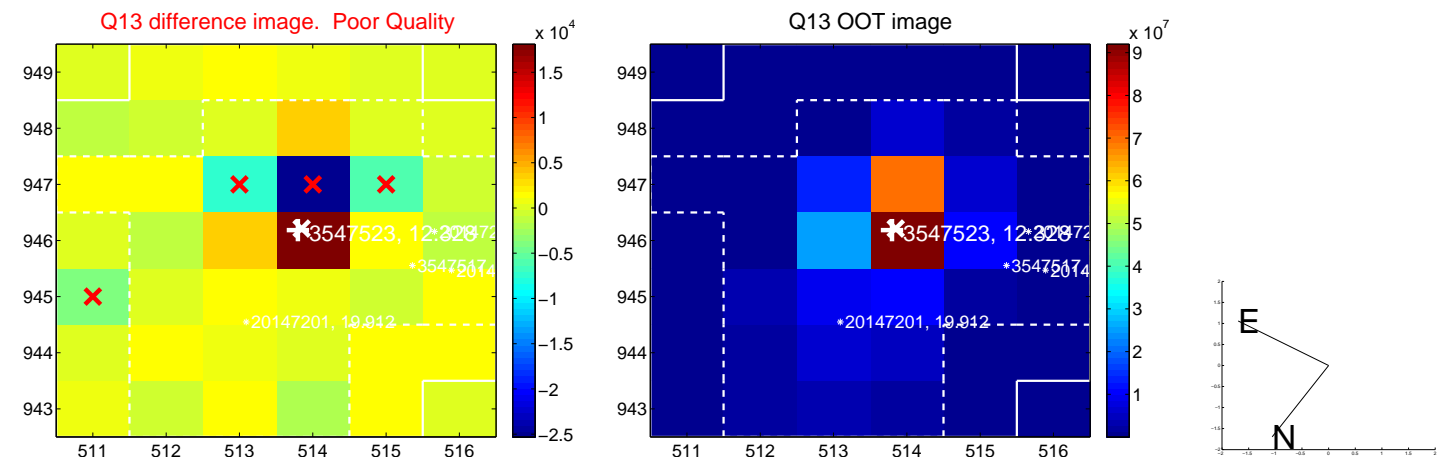
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



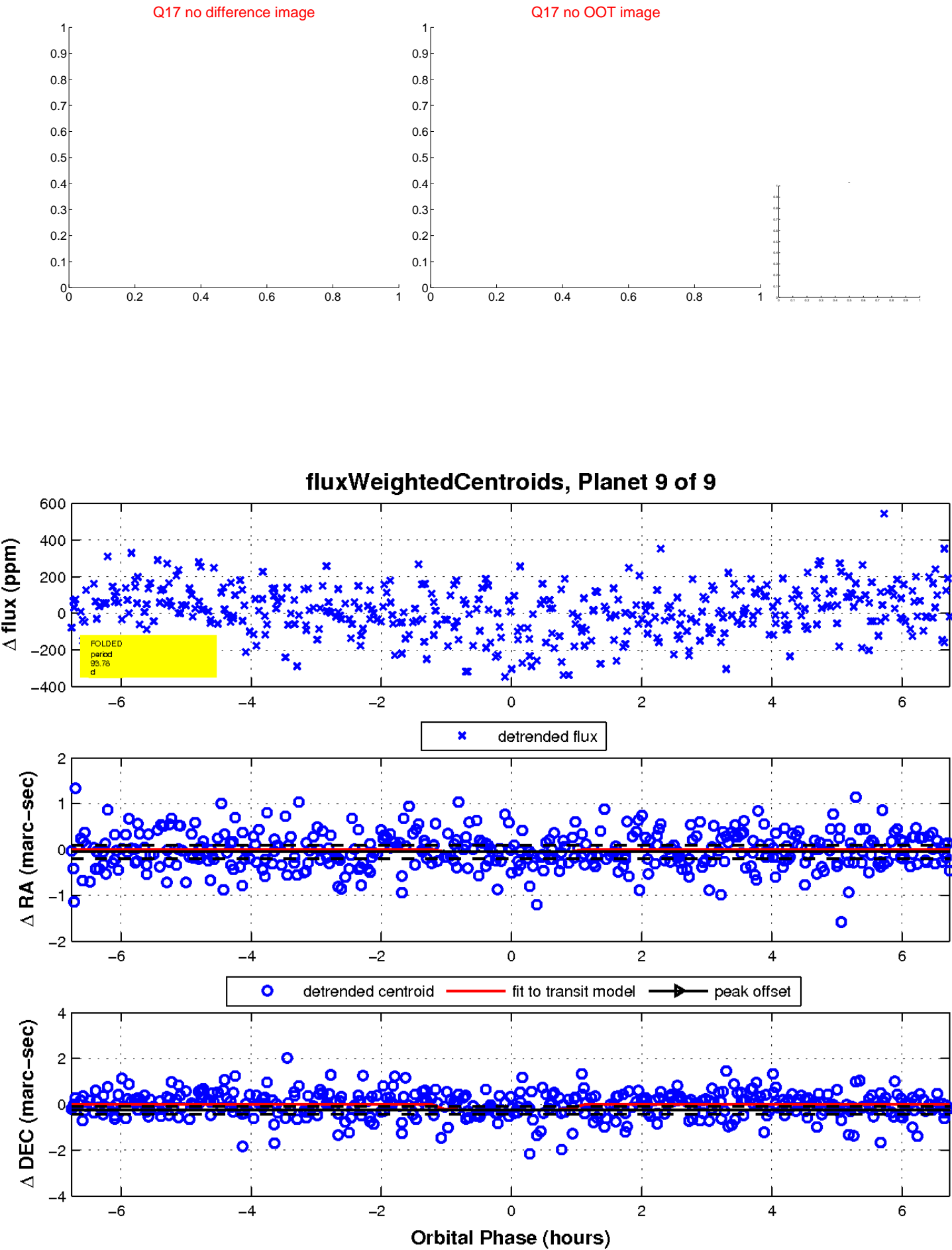
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

