

# KIC 010647493

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010647493-01	OBS	No	1.141142	132.194872	154.2	7.566	10.8	8.9	1.80	7103	2.40	12005.45
010647493-03	OBS	No	49.698235	156.727559	4627.7	2.766	12.3	12.9	1.80	7103	17.81	78.35
010647493-04	OBS	No	62.175731	144.131668	5533.1	4.204	13.2	12.7	1.80	7103	23.91	58.12
010647493-05	OBS	No	47.295890	172.780042	3082.5	1.419	13.2	8.5	1.80	7103	10.21	83.70
010647493-06	OBS	No	30.722216	148.538281	127.5	3.000	11.5	-1.0	1.80	7103	2.06	148.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010647493-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010647493-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010647493-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
010647493-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV
010647493-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

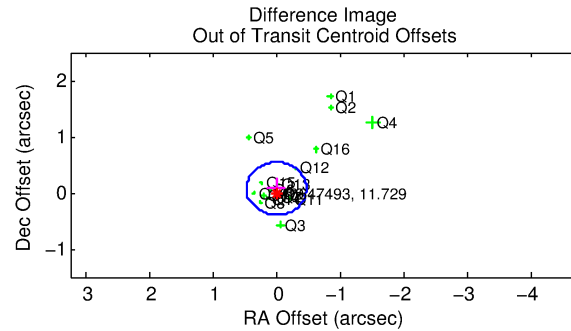
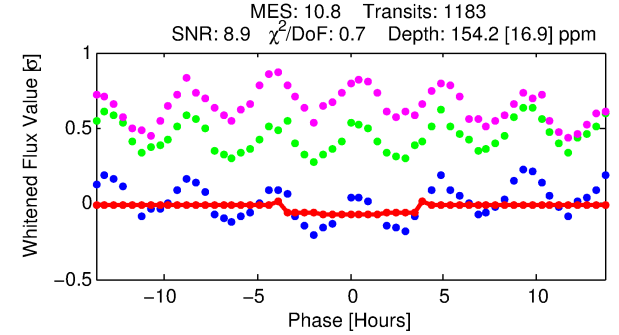
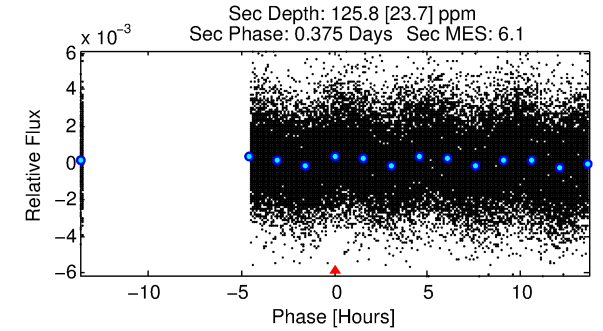
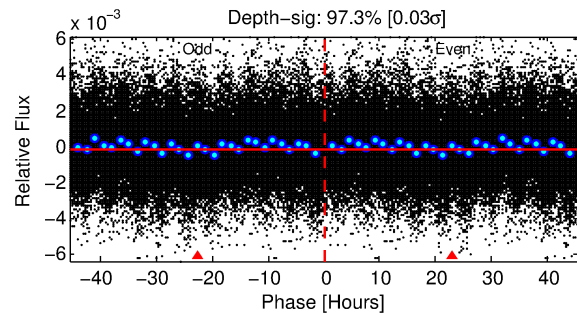
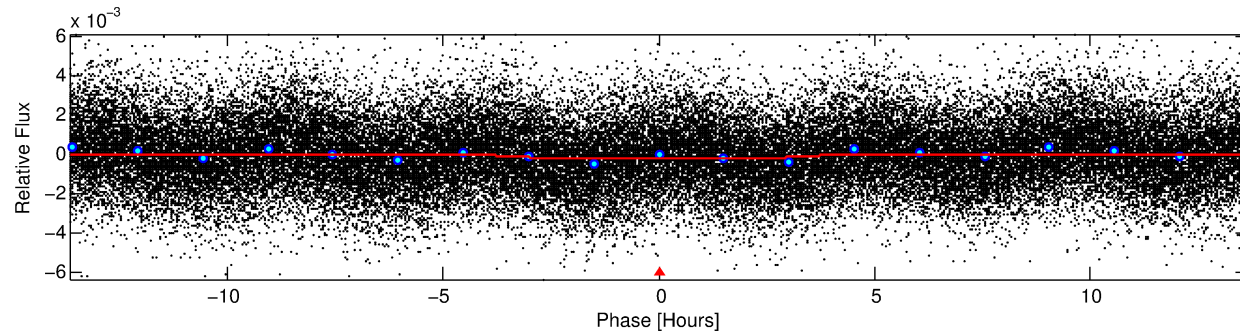
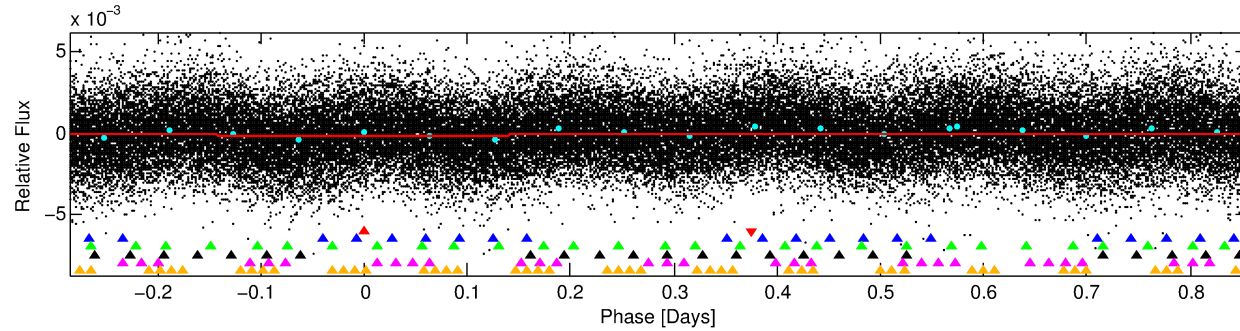
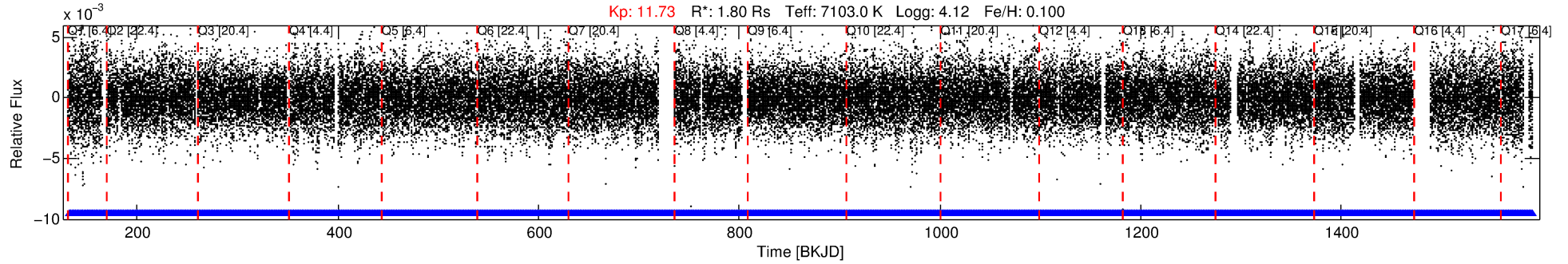
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010647493-01

No Significant Match Found

# DV One-Page Summary

KIC: 10647493 Candidate: 1 of 6 Period: 1.141 d



## DV Fit Results:

Period = 1.14114 [0.00002] d  
Epoch = 132.1949 [0.0037] BKJD  
Rp/R\* = 0.0122 [0.0037]  
a/R\* = 1.18 [0.60]  
b = 0.71 [1.26]  
Seff = 12005.45 [5010.43]  
Teff = 2669 [278] K  
Rp = 2.40 [1.05] Re  
a = 0.0248 [0.0065] AU  
Ag = 7.42 [5.41] [1.19 $\sigma$ ]  
Teffp = 6810 [1117] K [3.60 $\sigma$ ]

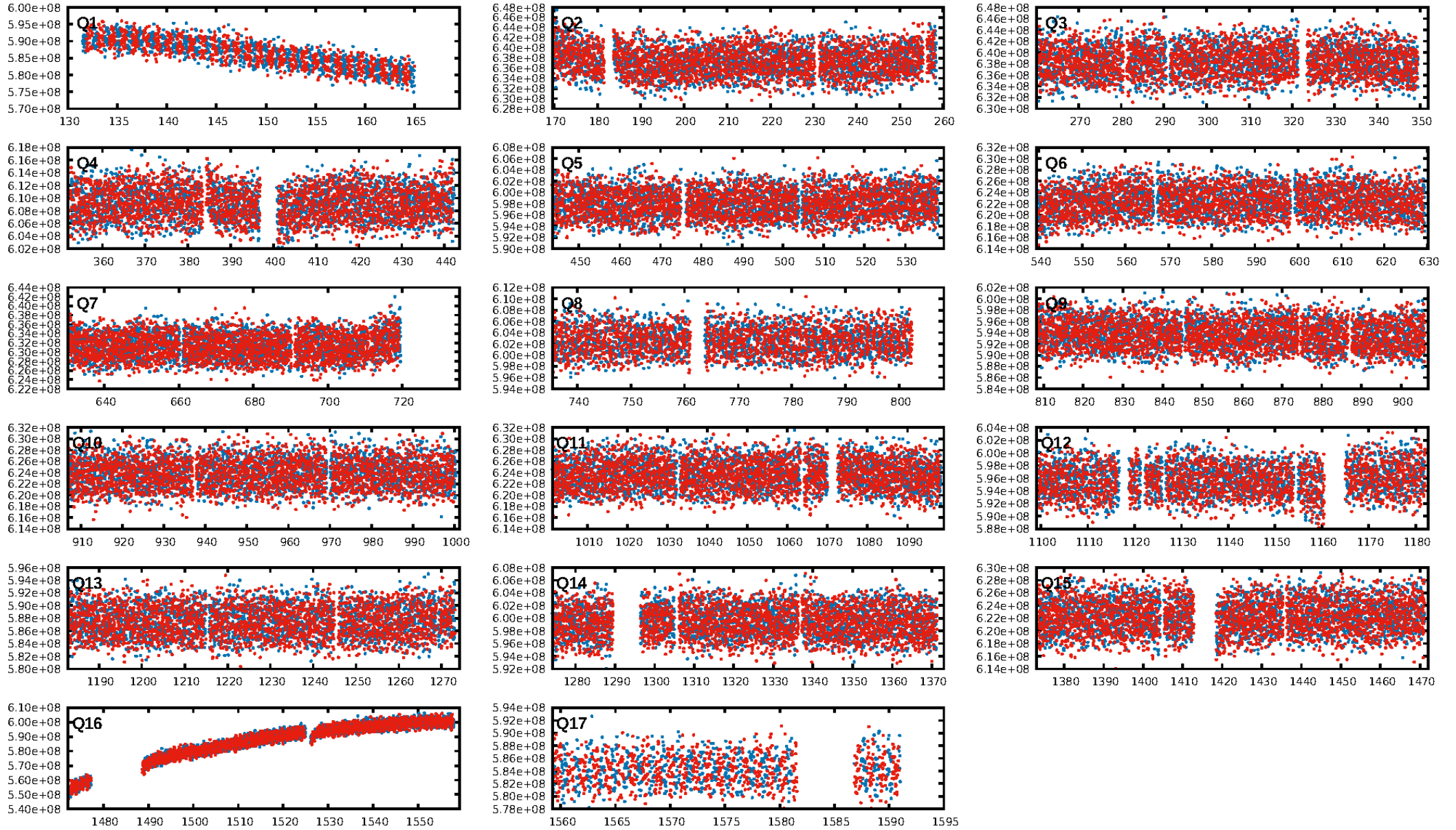
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [87.23 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1130/1130]  
GhostDiagnostic-chr: 1.34  
Centroid-sig: N/A  
Centroid-so: 0.141 arcsec [2.53 $\sigma$ ]  
OotOffset-rm: 0.075 arcsec [0.47 $\sigma$ ]  
KicOffset-rm: 0.163 arcsec [1.60 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.88 [15/17]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:23:39 Z

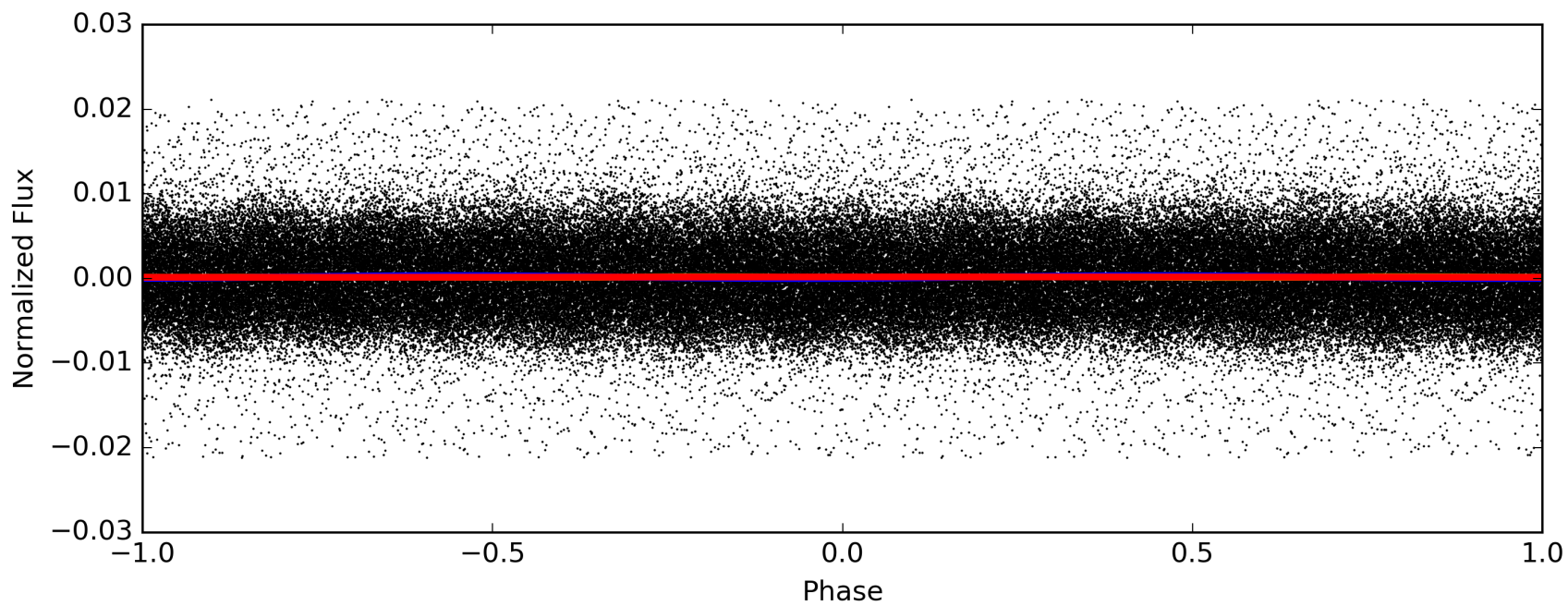
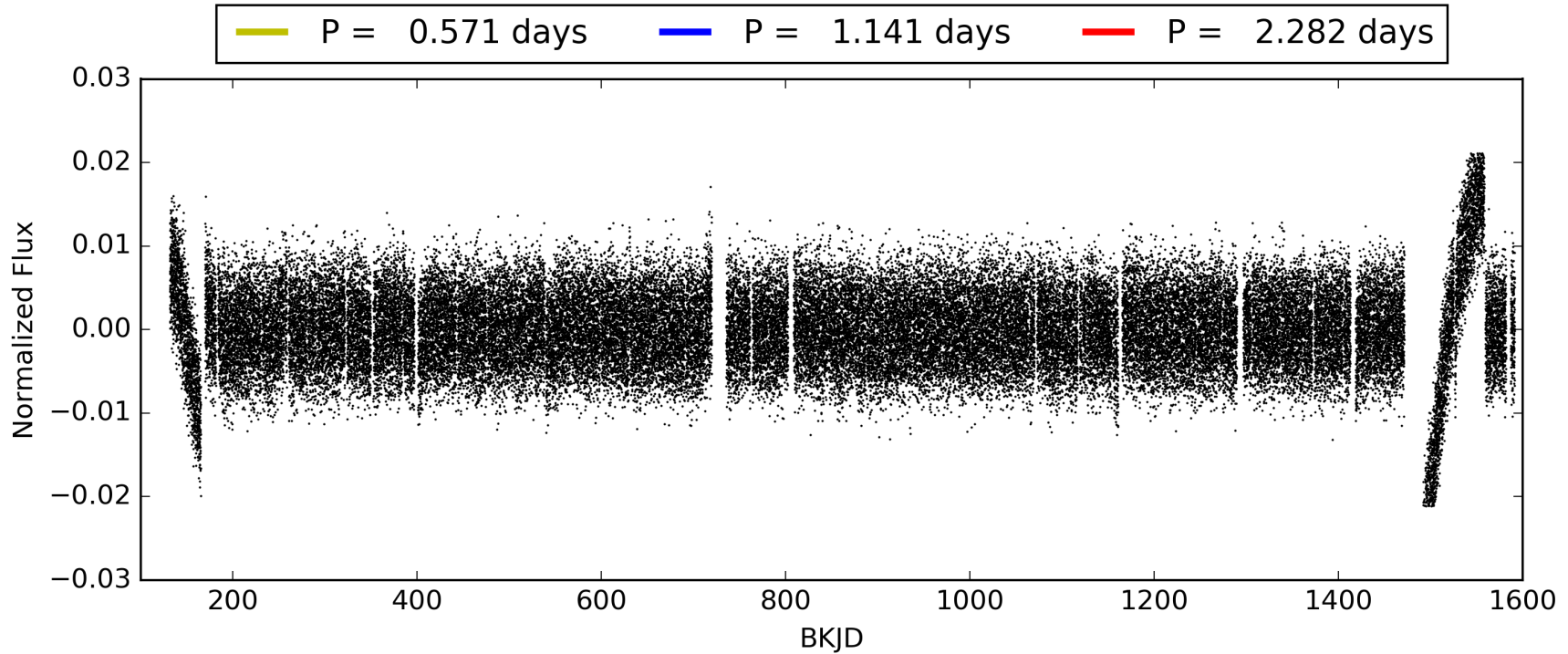
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010647493-01, PDC Light Curves





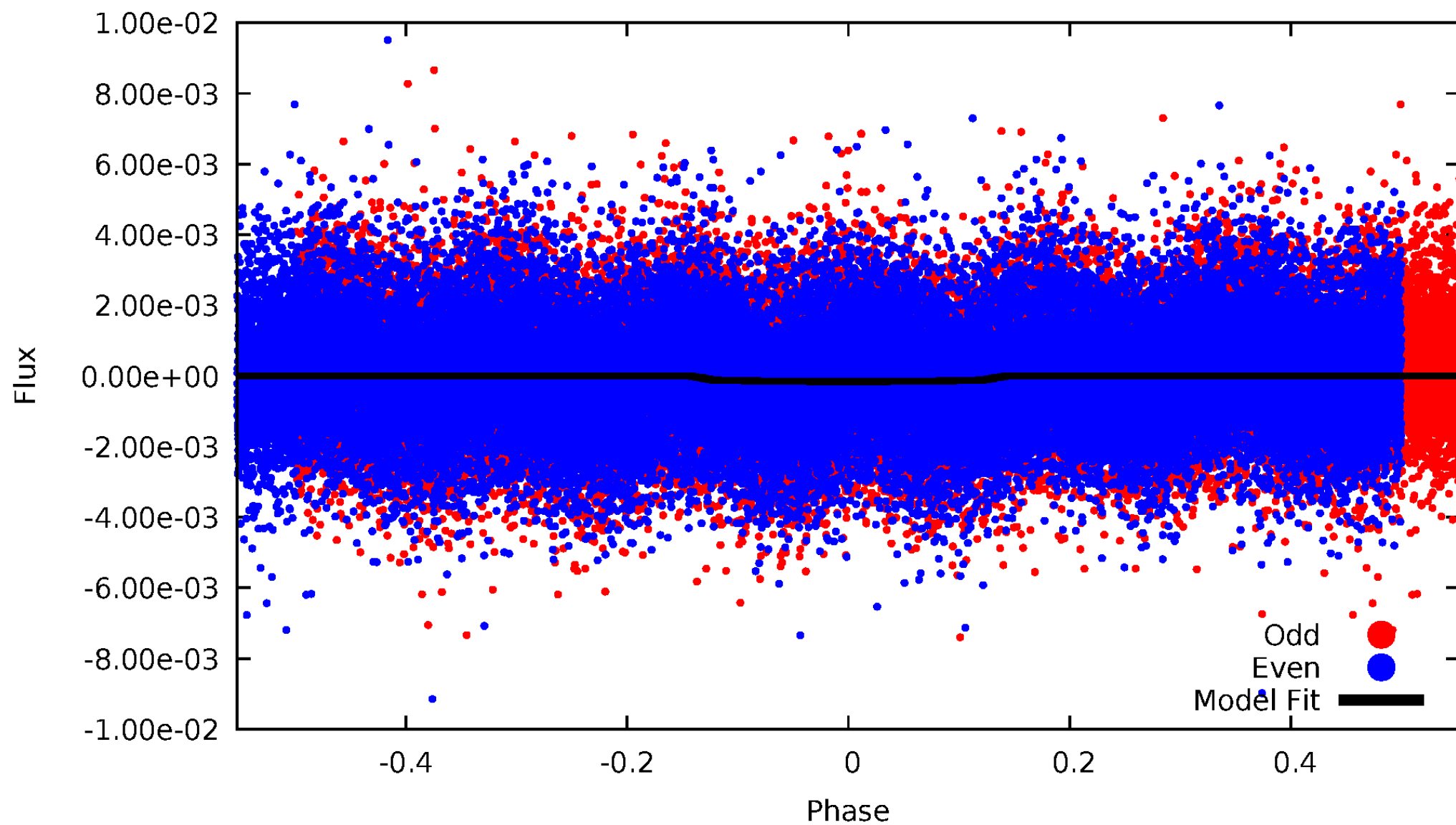
TCE 010647493-01





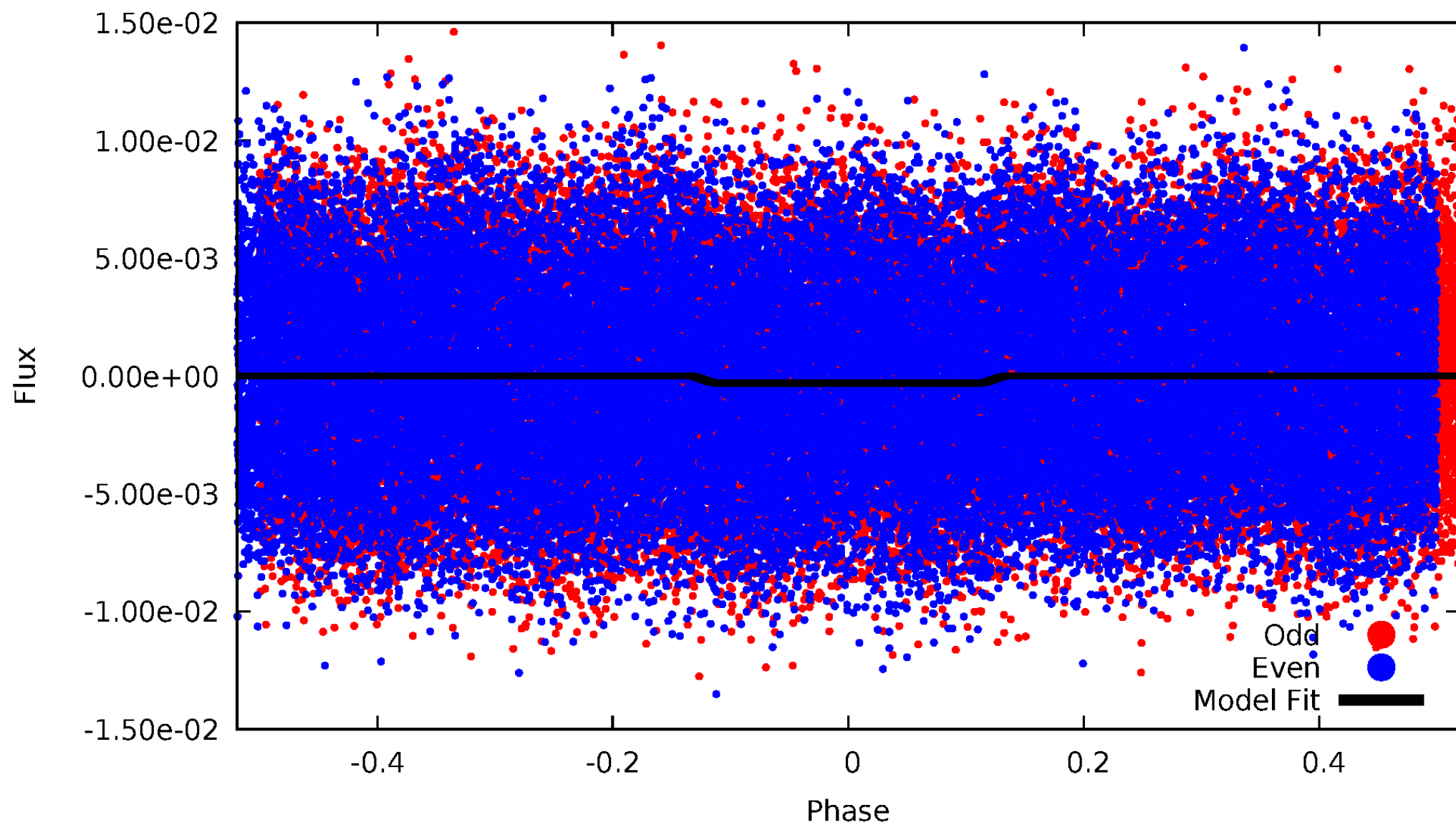
# DV Odd/Even

TCE 010647493-01

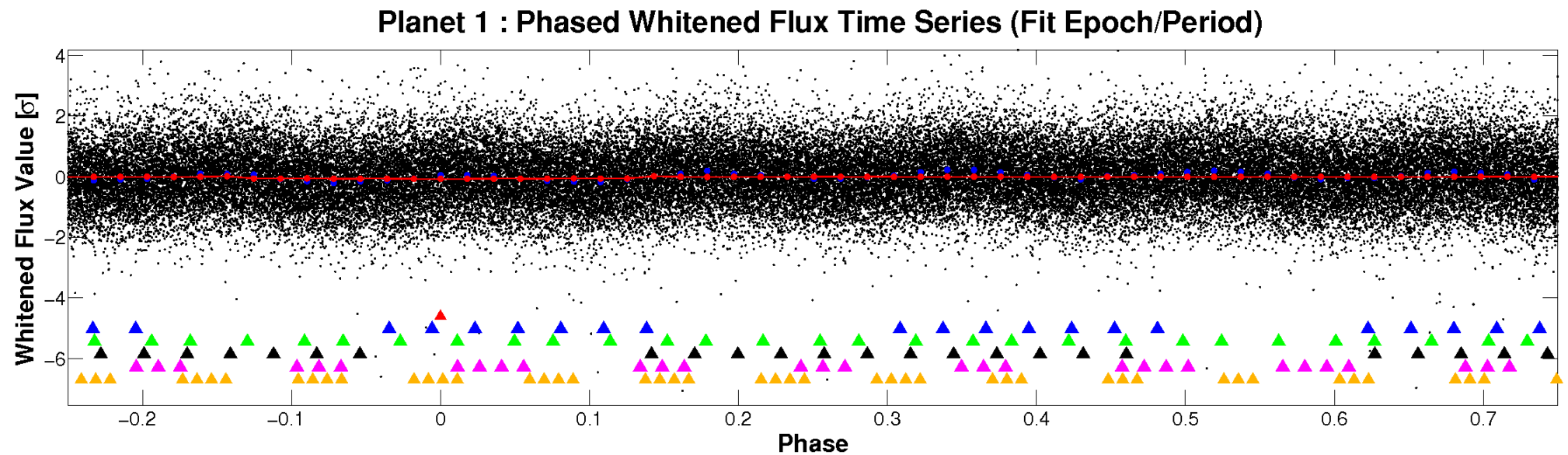
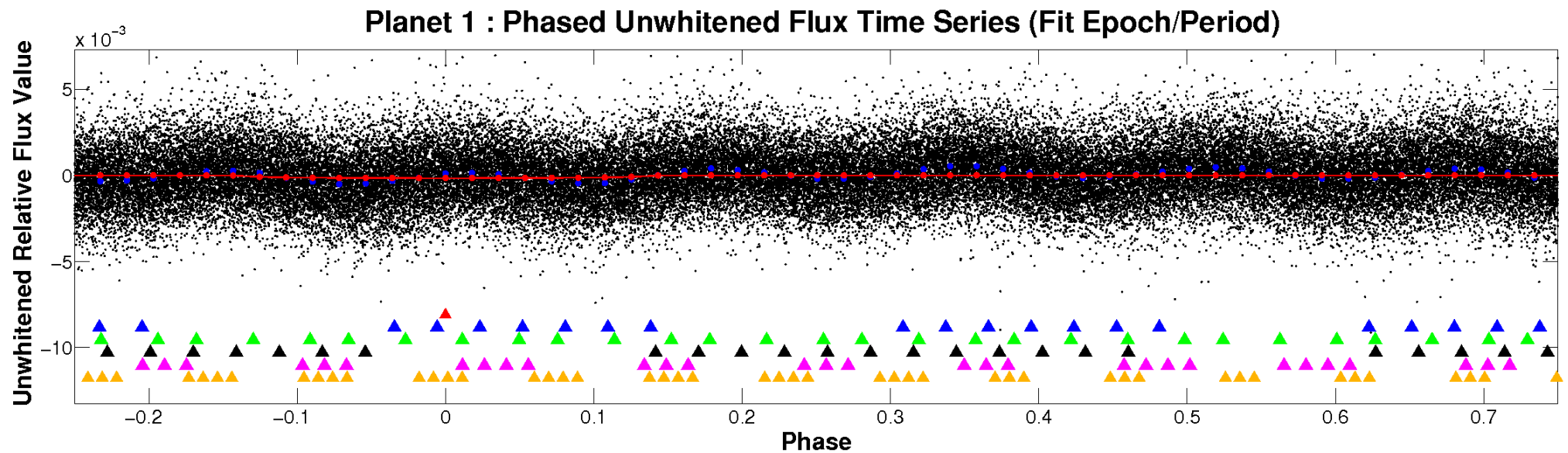


# ALT Odd/Even

TCE 010647493-01



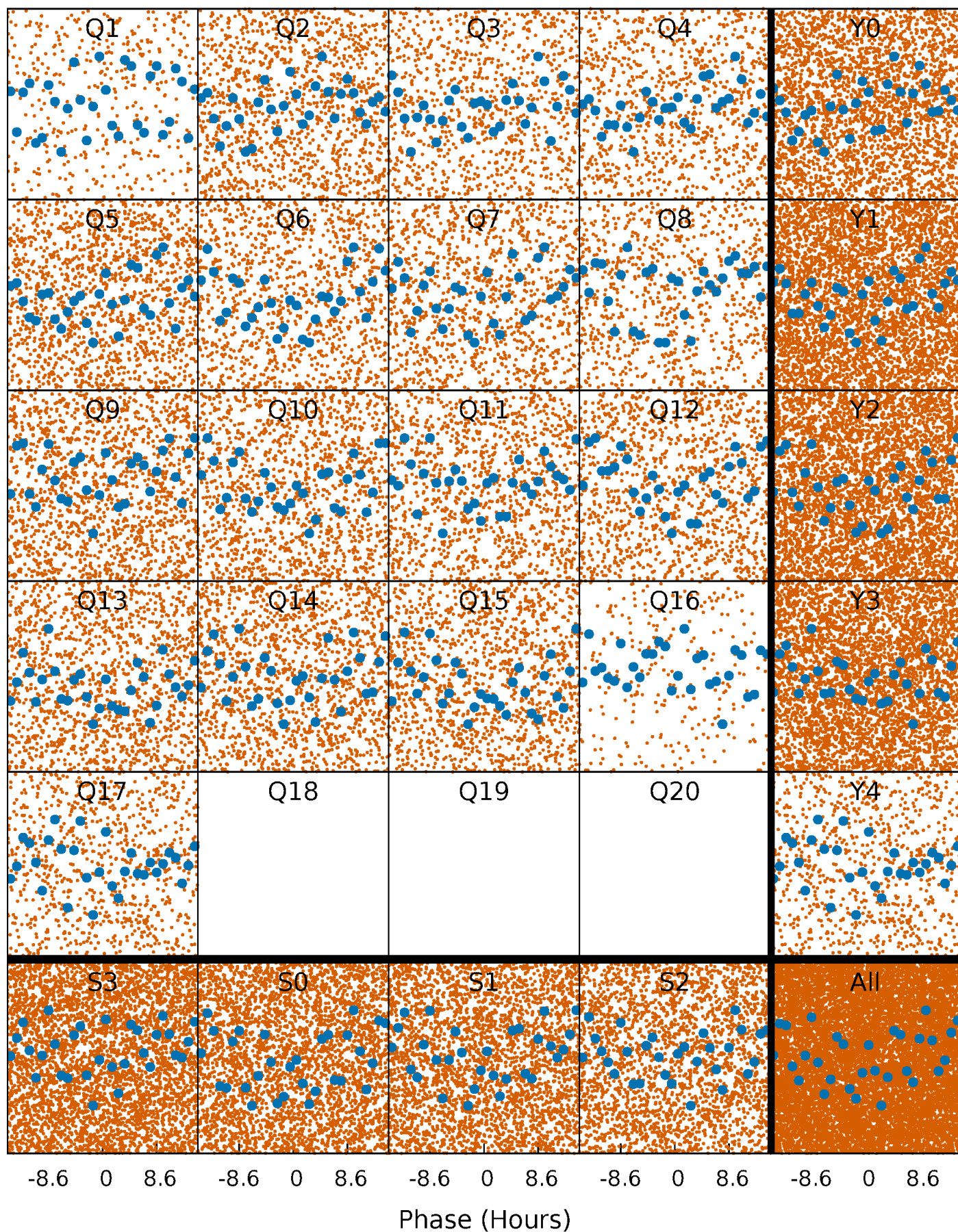
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

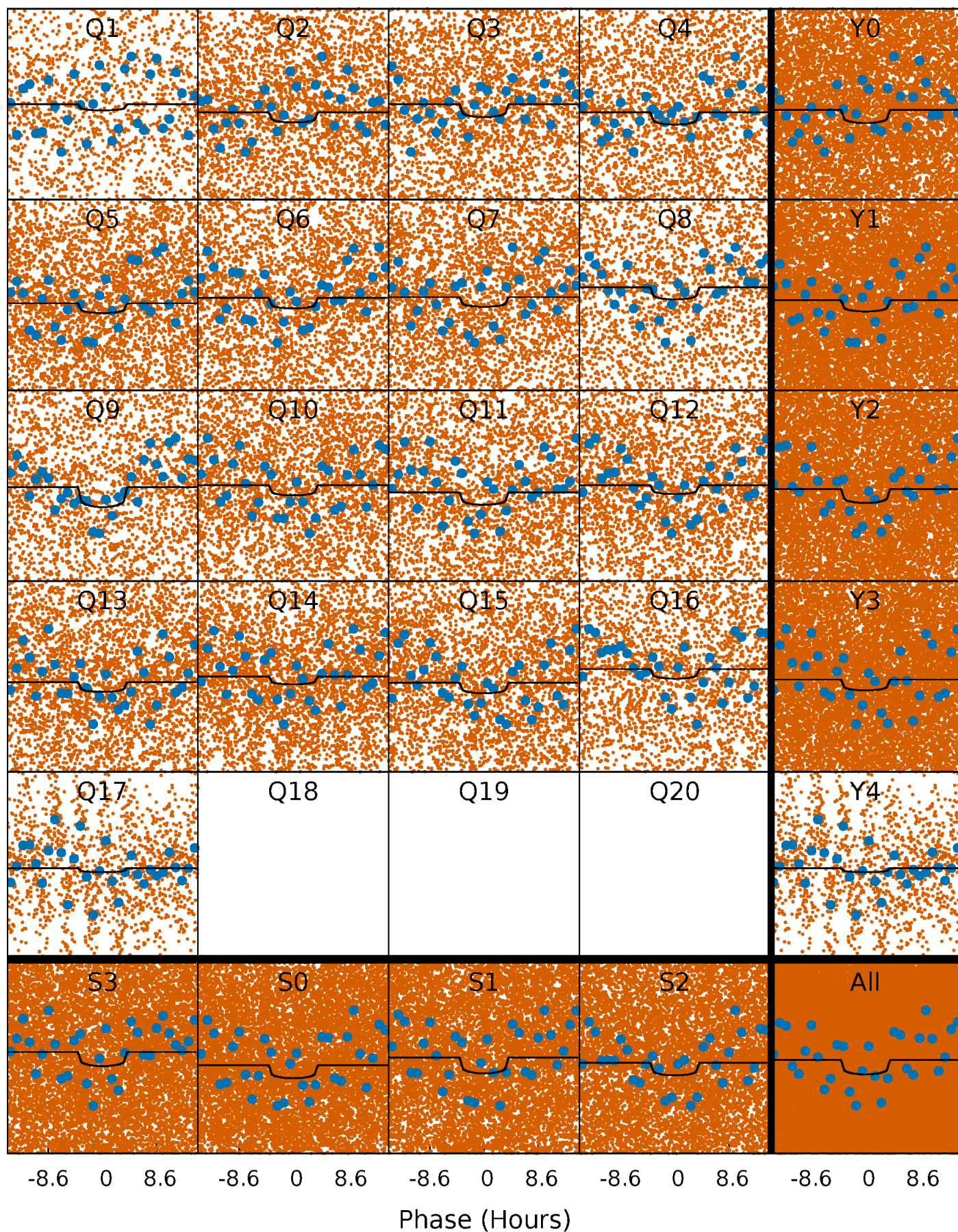
TCE 010647493-01 P= 1.141142 Days  $T_0=132.194872$  (BKJD)





# DV Quarter-Phased Transit Curves

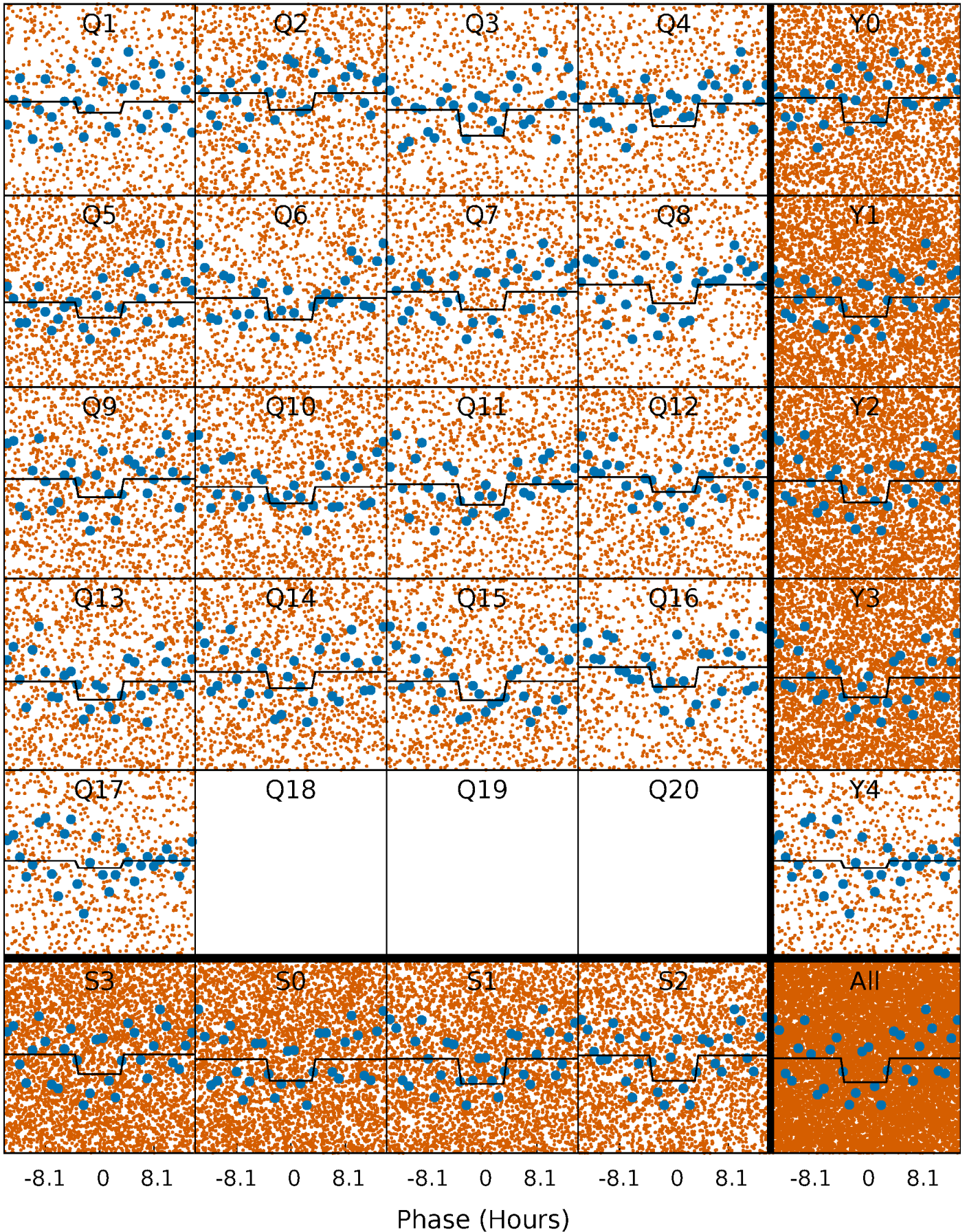
TCE 010647493-01 P= 1.141142 Days  $T_0=132.194872$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 010647493-01 P= 1.141180 Days  $T_0=132.186889$  (BKJD)

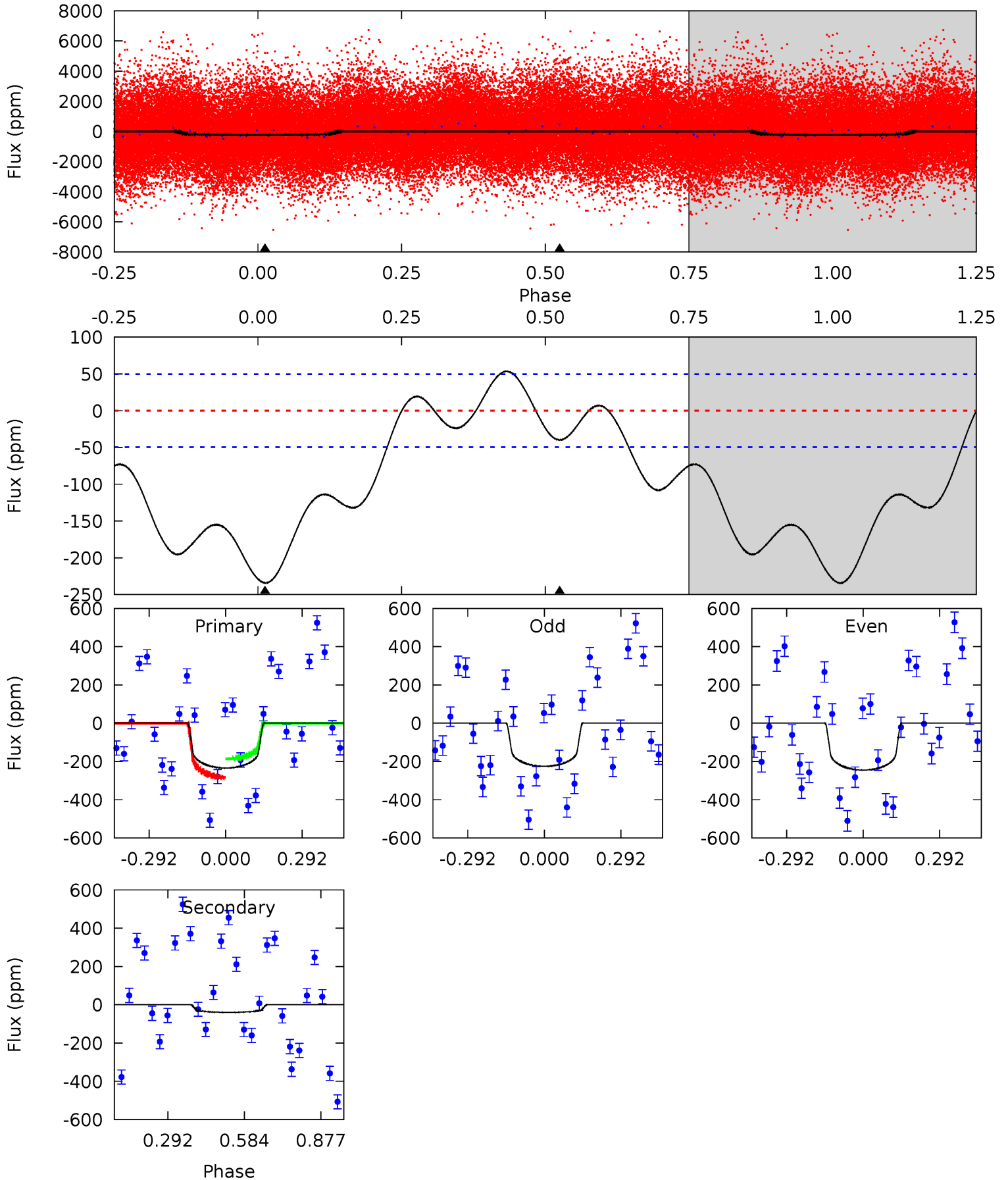




# DV Model-Shift Uniqueness Test

010647493-01, P = 1.141142 Days, E = 131.053730 Days

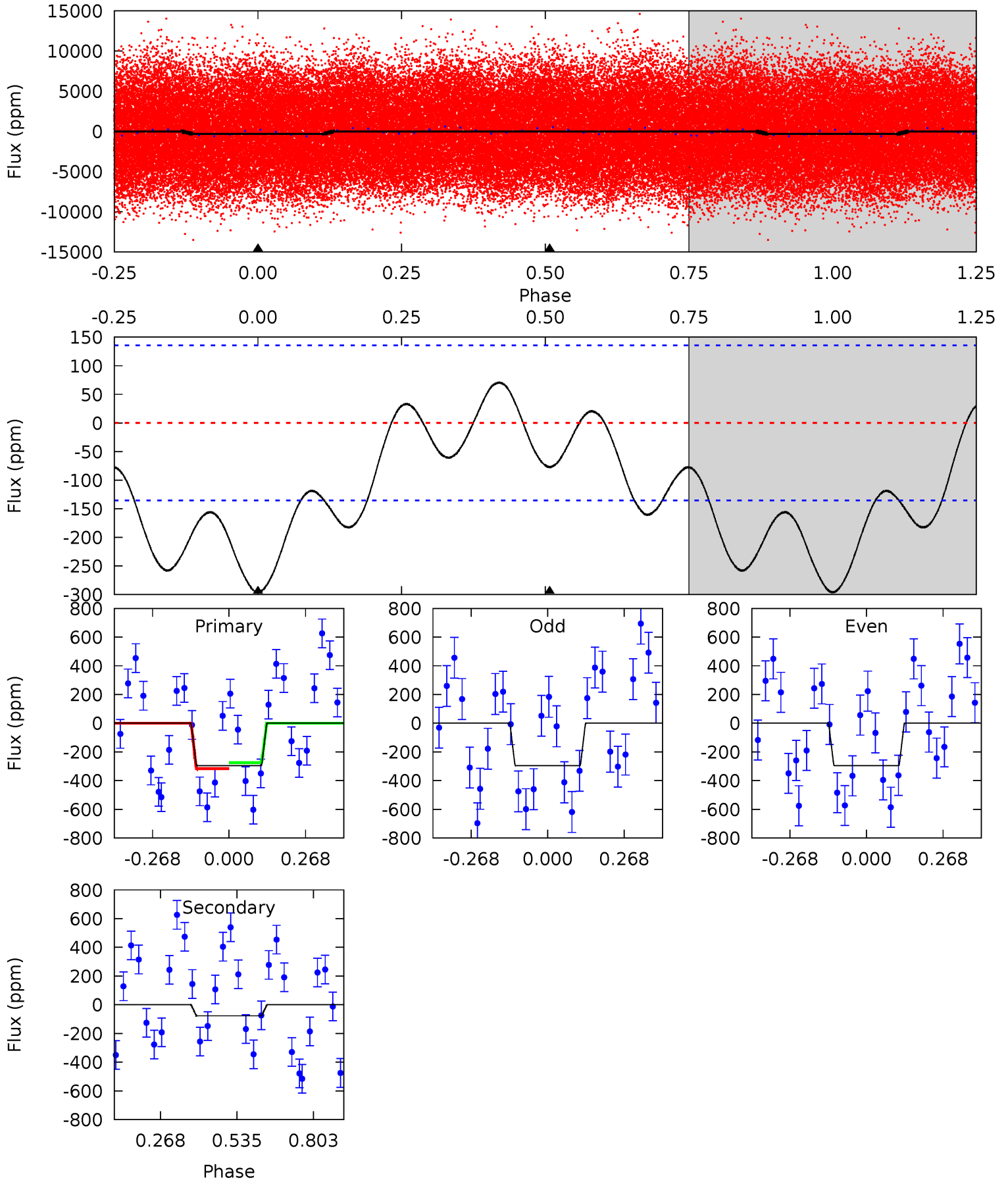
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.5	3.47	0	0	4.33	1.05	3.76	20.5	20.5	3.47	3.47	0.88	0.97	0.19	4.19



# Alt Model-Shift Uniqueness Test

010647493-01, P = 1.141180 Days, E = 131.045709 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
9.51	2.48	0	0	4.35	1.11	1.71	9.51	9.51	2.48	2.48	0.02	0.93	0.19	0.66



### Stellar Parameters For KIC 010647493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7103^{+197}_{-338}$	$4.122^{+0.132}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.802^{+0.577}_{-0.336}$	$1.566^{+0.206}_{-0.252}$	$0.377^{+0.255}_{-0.206}$
	+3%/-5%	+3%/-5%	+200%/-350%	+32%/-19%	+13%/-16%	+68%/-55%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010647493-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-40 \pm 11$	$2.41^{+0.85}_{-0.75}$	$3730^{+297}_{-243}$	$4964^{+1019}_{-759}$	$2.269^{+2.514}_{-1.151}$
Alt.	$-77 \pm 31$	$3.44^{+0.84}_{-0.81}$	$3724^{+284}_{-238}$	$4887^{+736}_{-744}$	$2.138^{+1.859}_{-1.061}$

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



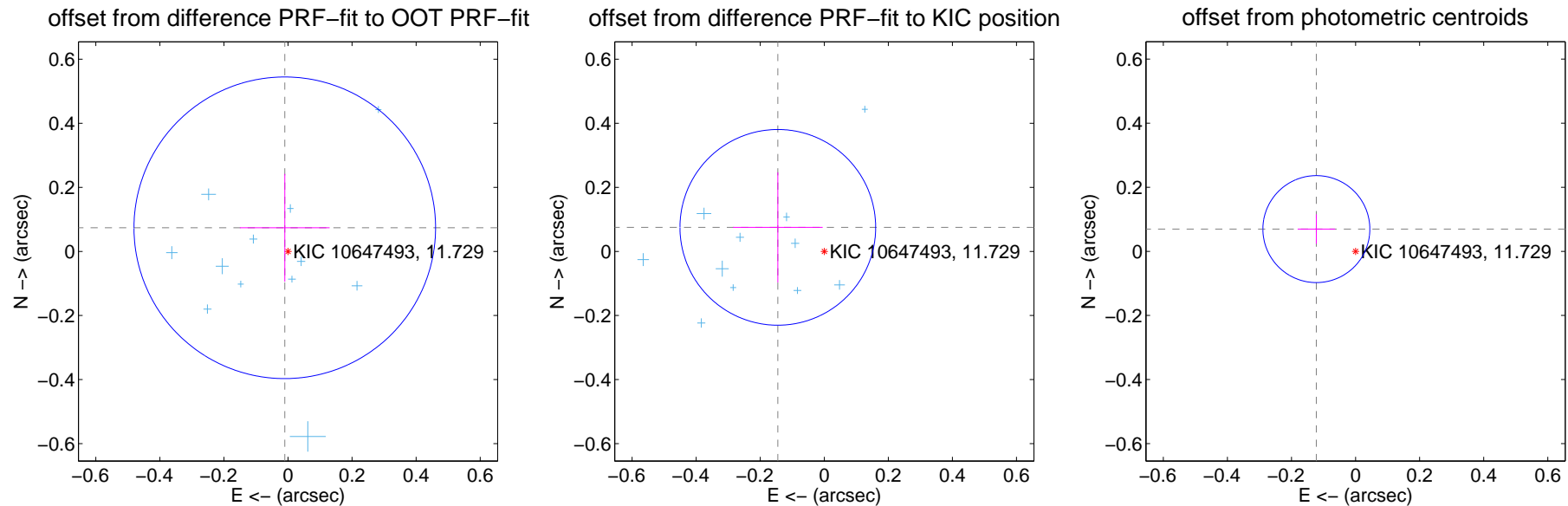
## DV Centroid Data

Supplemental centroid analysis for 010647493-01. **Kepler magnitude: 11.73.** Transit SNR 8.91

There are 15 quarters with good PRF difference image offsets

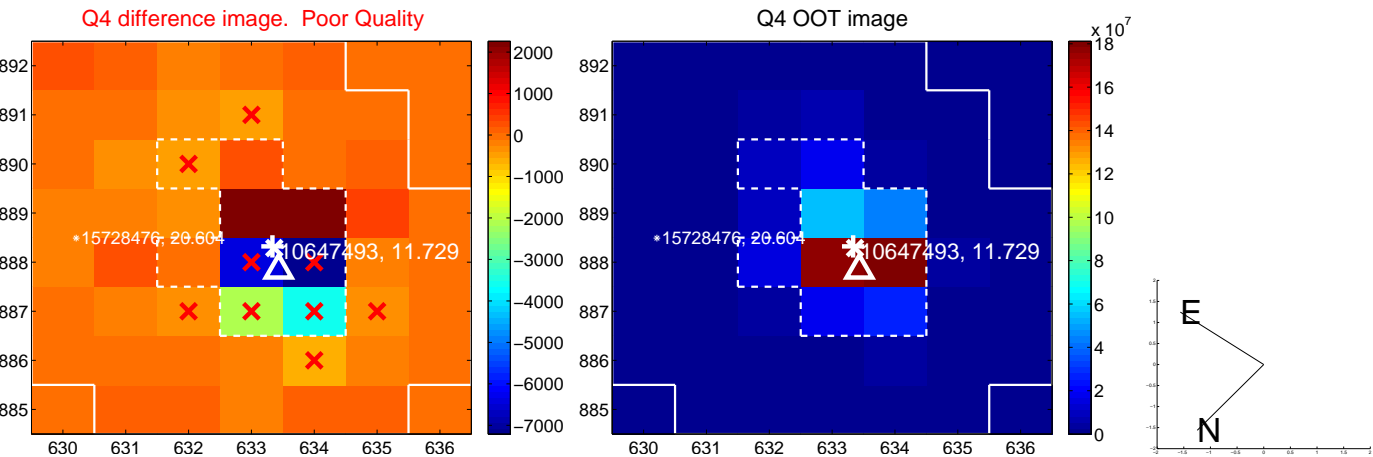
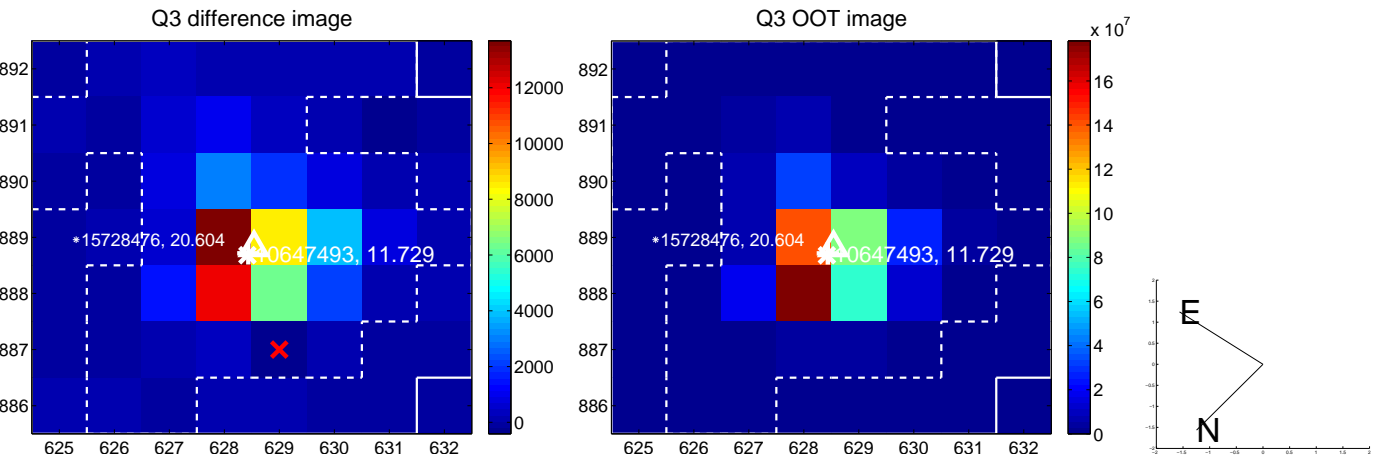
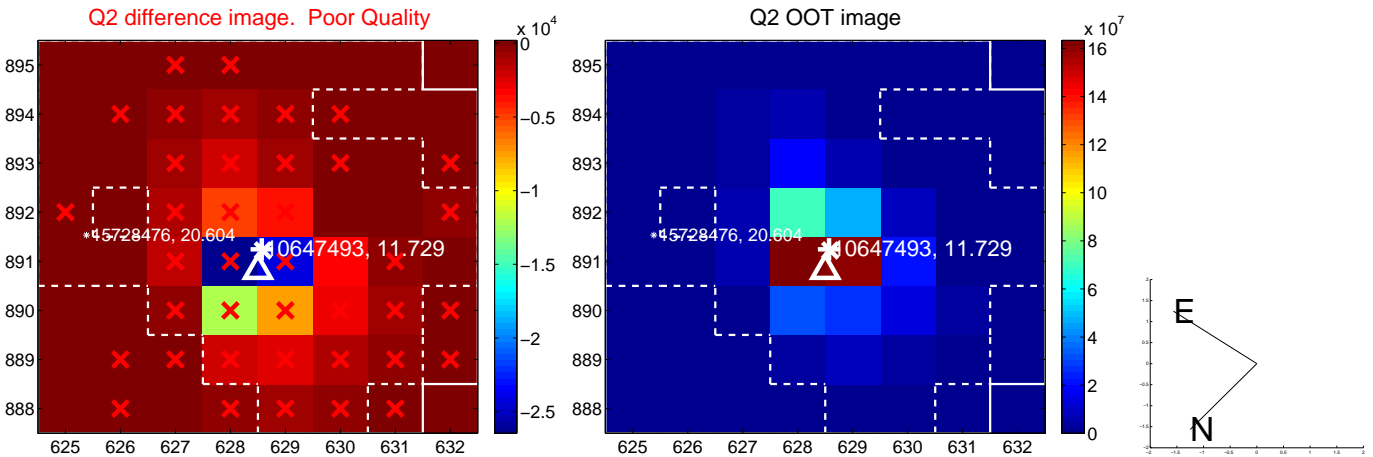
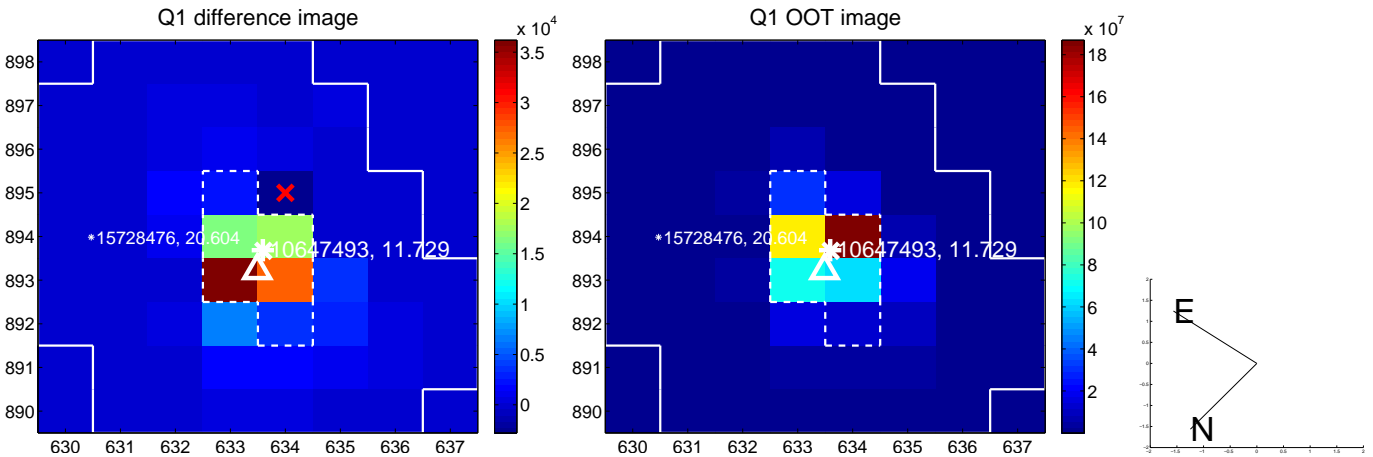
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.075 \pm 0.157$	0.47	$0.010 \pm 0.140$	$0.074 \pm 0.168$
PRF-fit source offset from KIC position	$0.163 \pm 0.102$	1.60	$0.145 \pm 0.140$	$0.075 \pm 0.172$
photometric centroid source offset	$0.14 \pm 0.06$	2.53	$0.12 \pm 0.06$	$0.07 \pm 0.05$

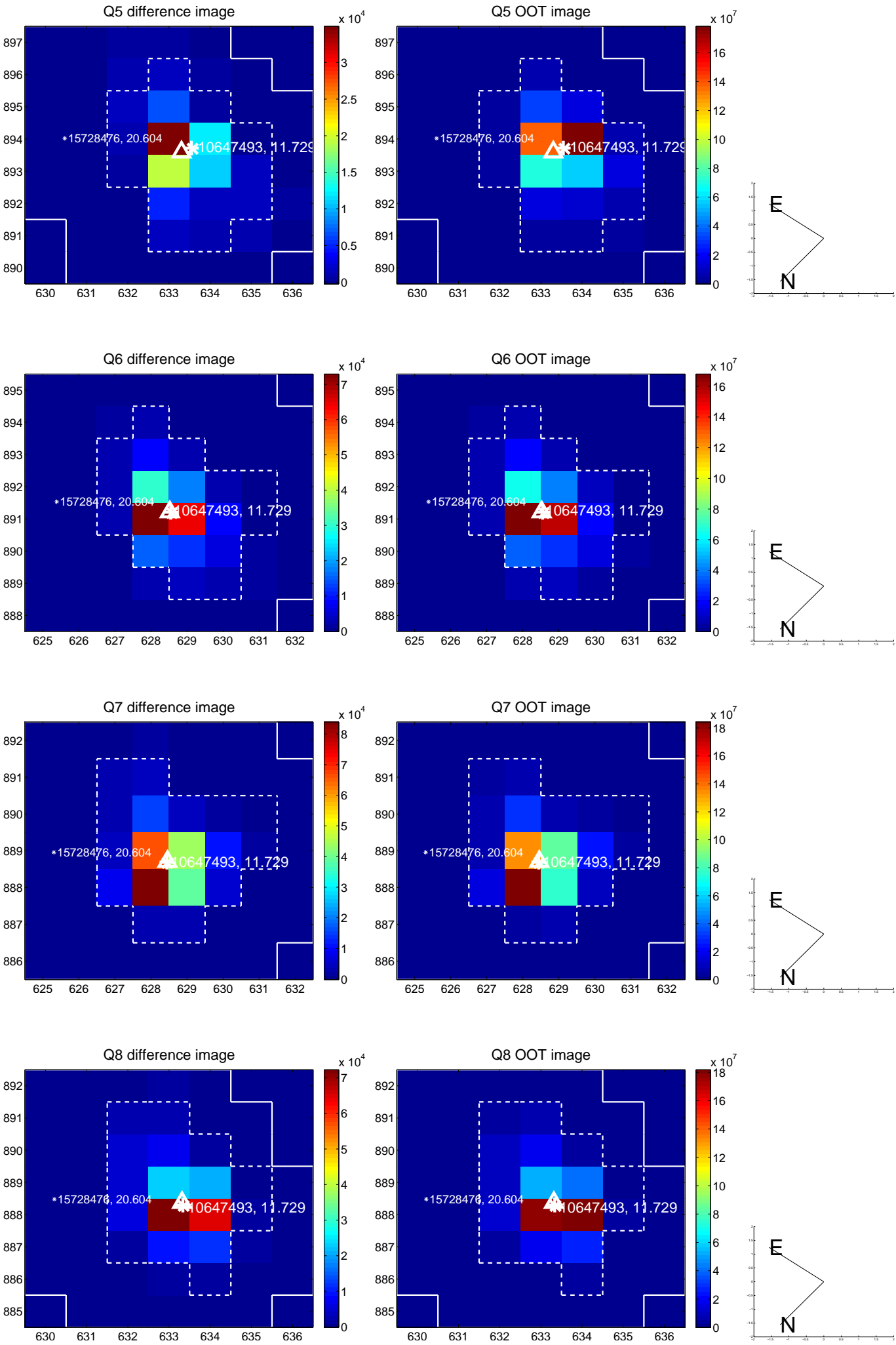


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

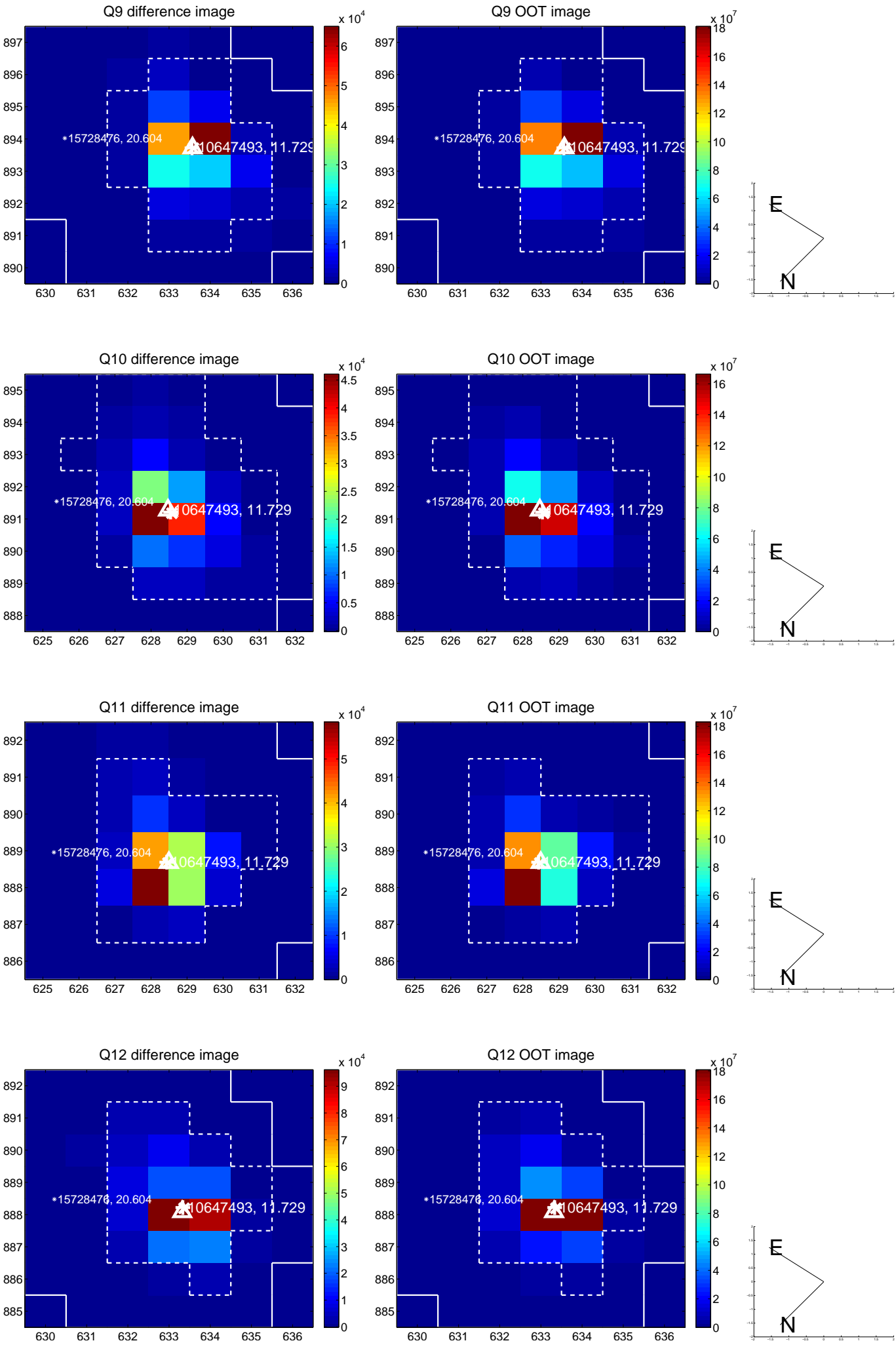


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

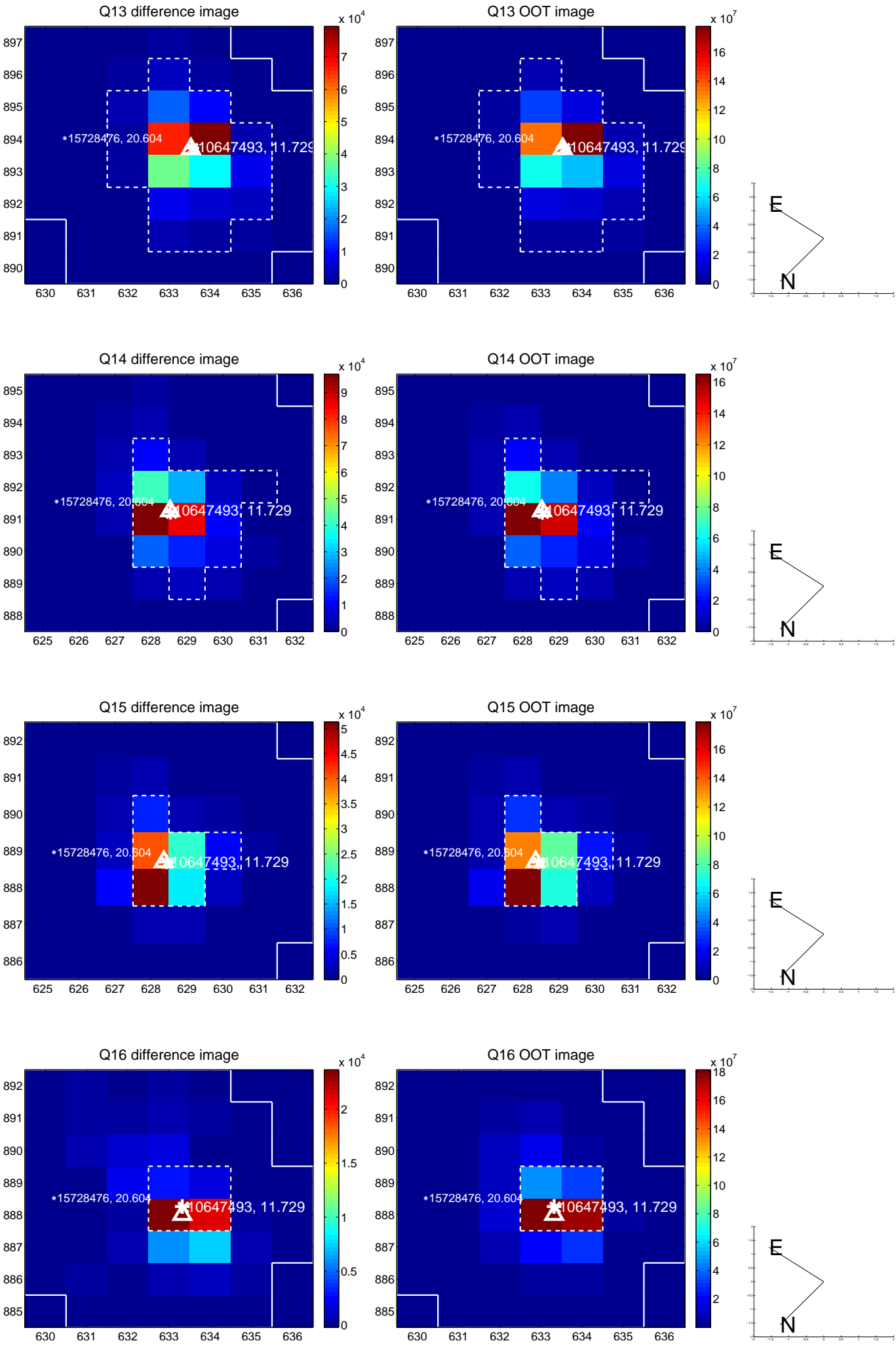




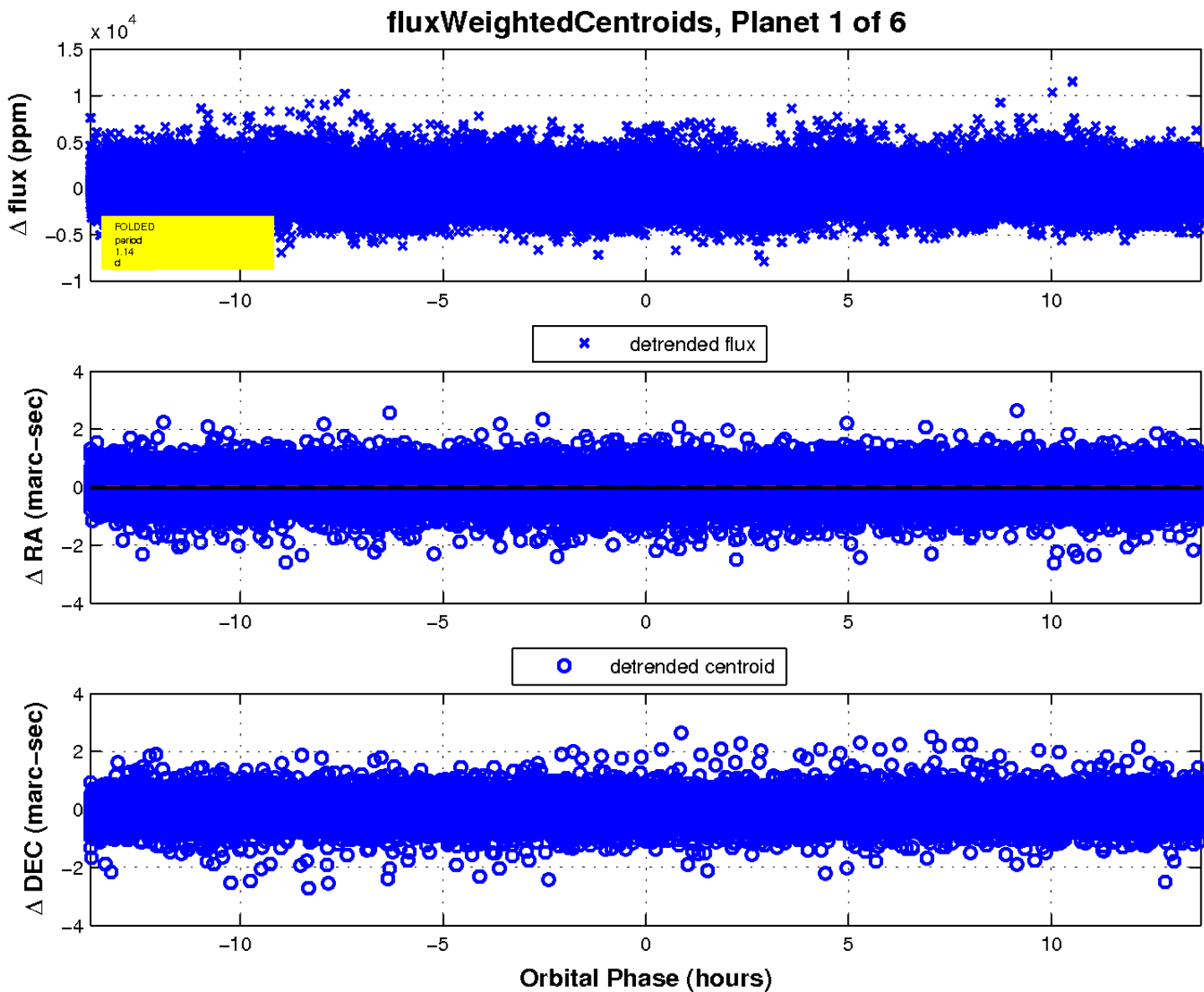
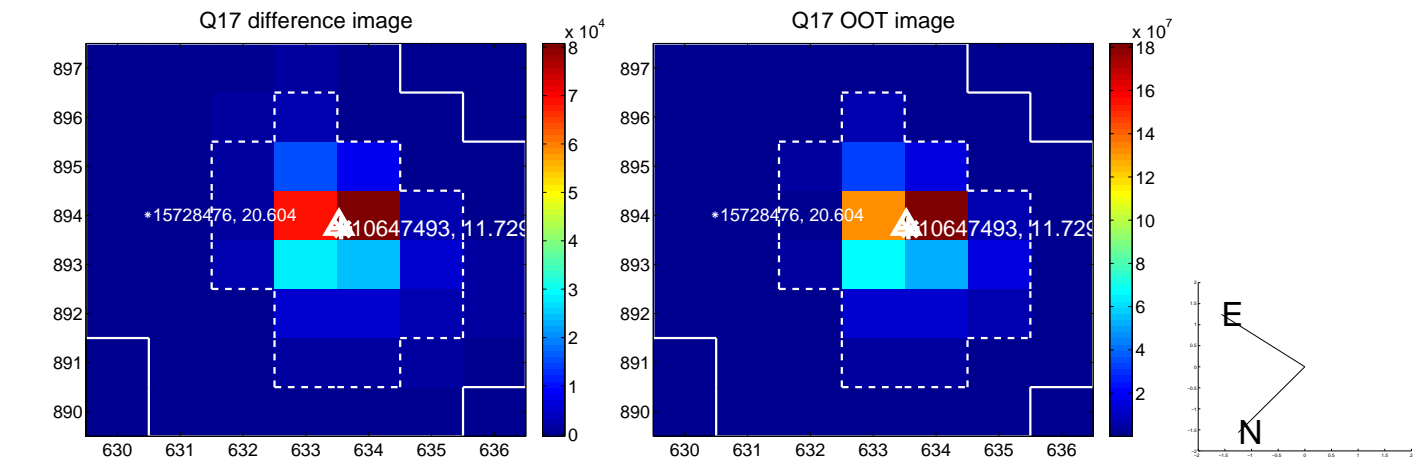
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white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

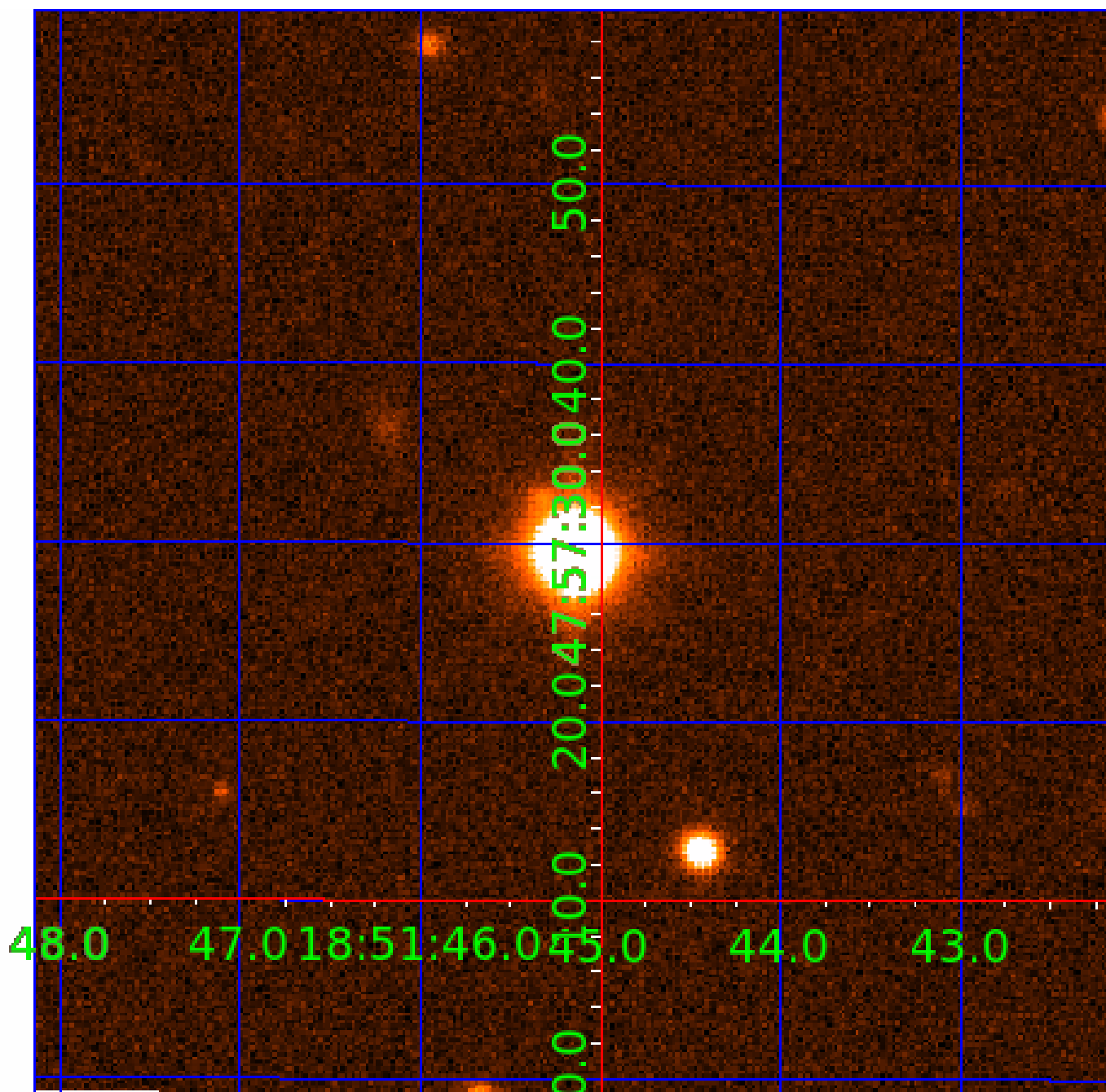


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010647493

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010647493-01	OBS	No	1.141142	132.194872	154.2	7.566	10.8	8.9	1.80	7103	2.40	12005.45
010647493-03	OBS	No	49.698235	156.727559	4627.7	2.766	12.3	12.9	1.80	7103	17.81	78.35
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010647493-05	OBS	No	47.295890	172.780042	3082.5	1.419	13.2	8.5	1.80	7103	10.21	83.70
010647493-06	OBS	No	30.722216	148.538281	127.5	3.000	11.5	-1.0	1.80	7103	2.06	148.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010647493-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010647493-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010647493-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
010647493-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV
010647493-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

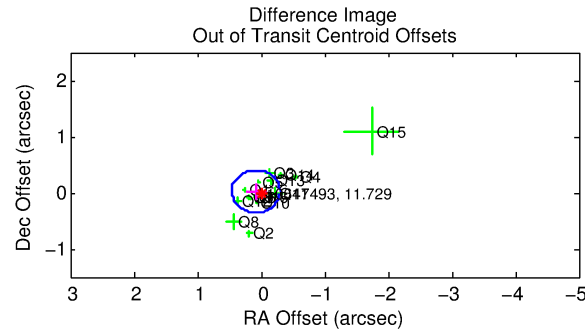
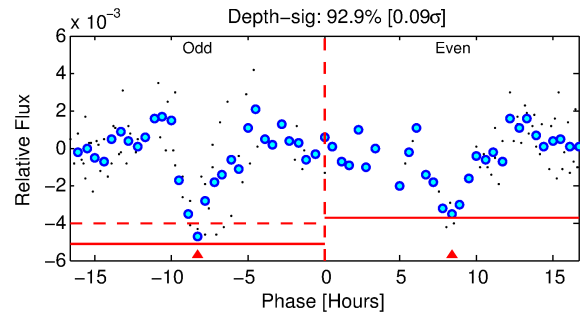
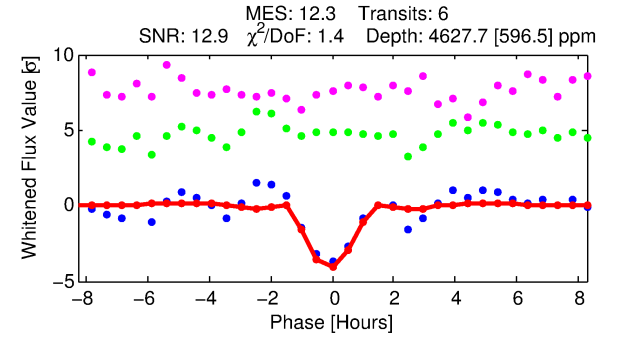
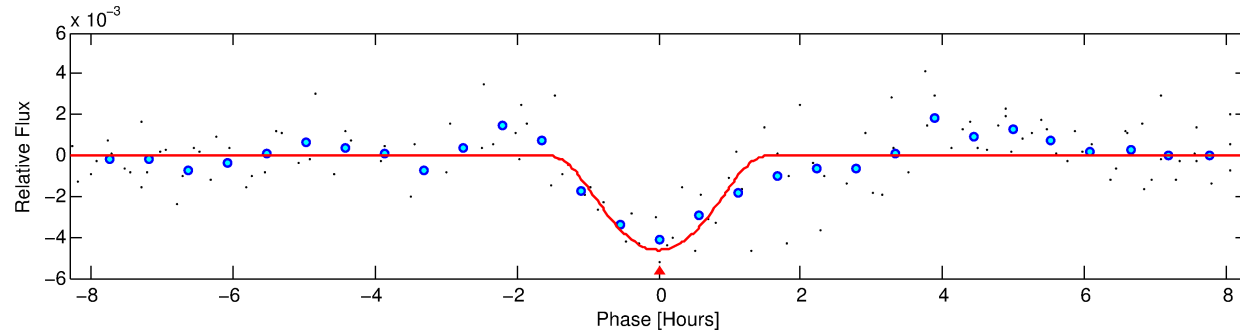
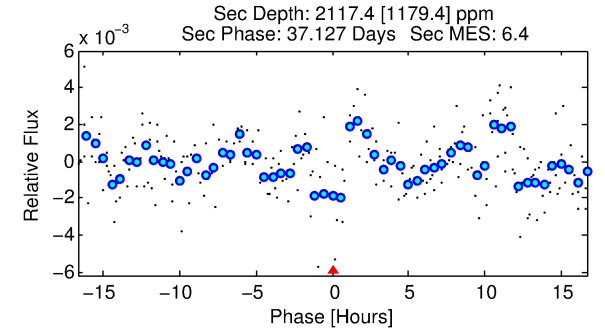
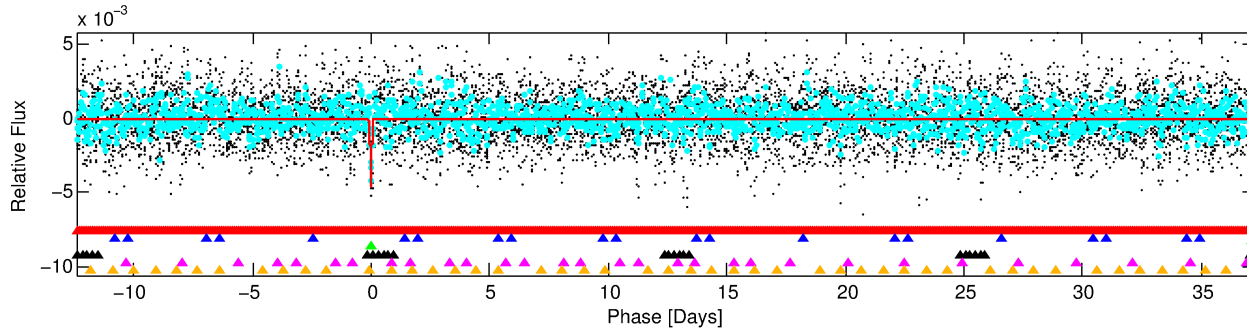
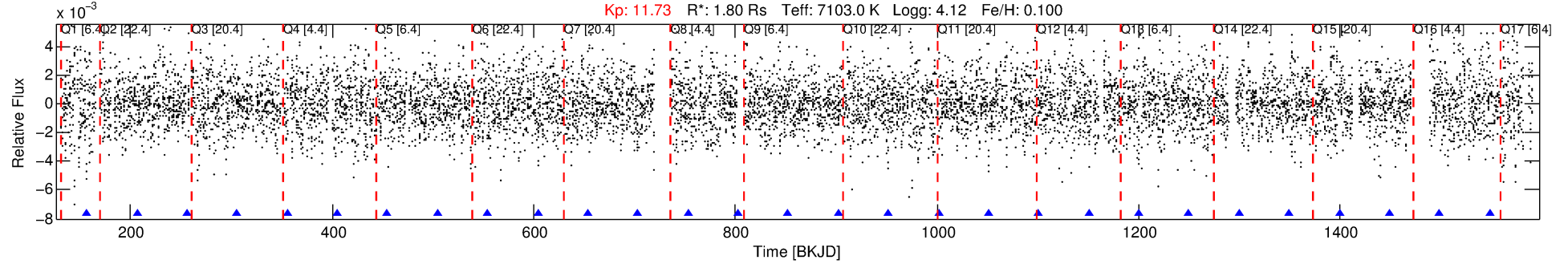
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010647493-03

No Significant Match Found

# DV One-Page Summary

KIC: 10647493 Candidate: 3 of 6 Period: 49.698 d



## DV Fit Results:

Period = 49.69823 [0.00045] d  
Epoch = 156.7276 [0.0047] BKJD  
Rp/R\* = 0.0906 [0.1561]  
a/R\* = 69.71 [40.17]  
b = 0.97 [0.28]  
Seff = 78.35 [32.70]  
Teq = 759 [79] K  
Rp = 17.81 [31.22] Re  
a = 0.3074 [0.0806] AU  
Ag = 347.03 [1218.26] [0.28σ]  
Teffp = 5063 [4425] K [0.97σ]

## DV Diagnostic Results:

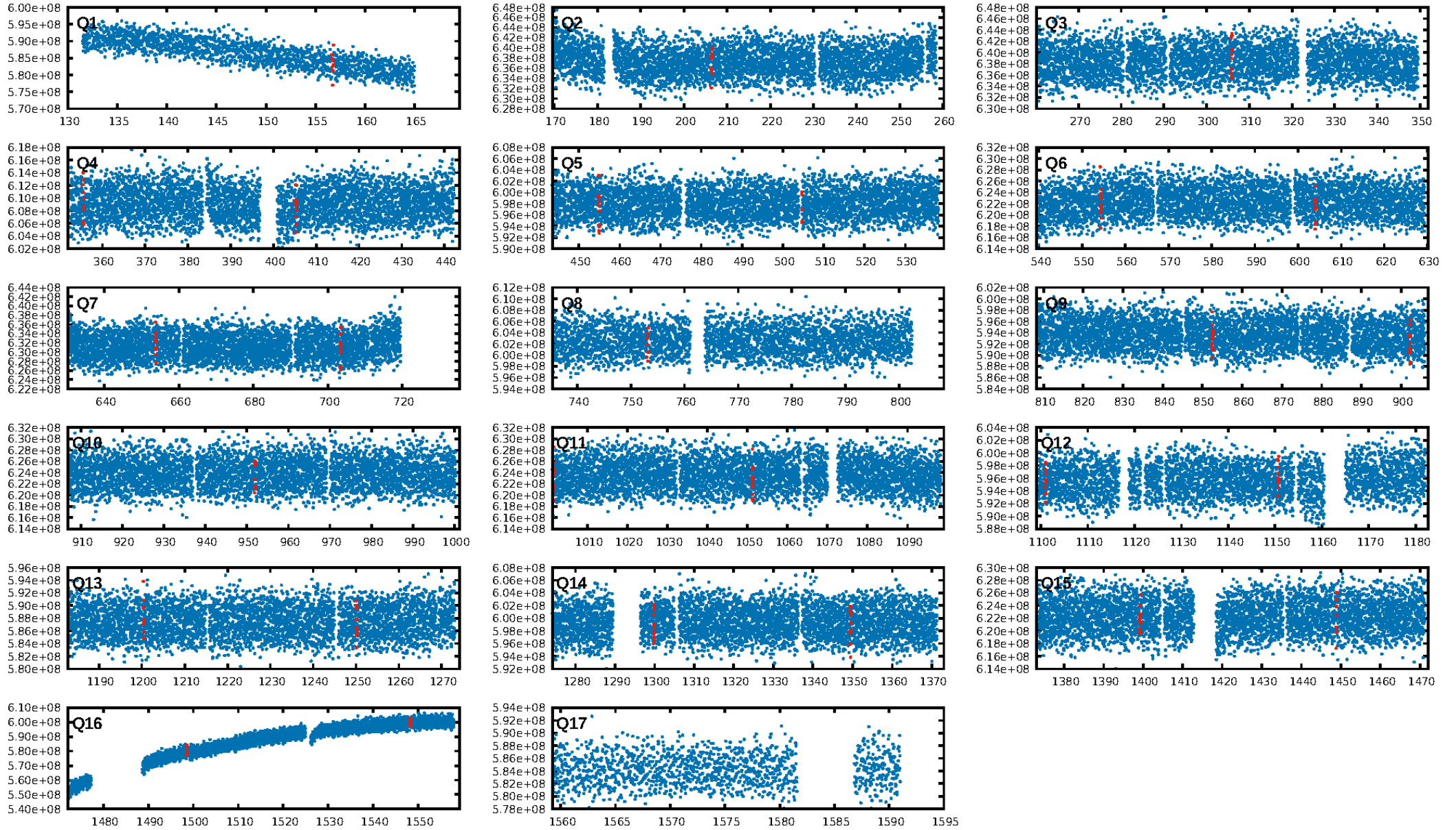
ShortPeriod-sig: 100.0% [18.55σ]  
LongPeriod-sig: 100.0% [59.51σ]  
ModelChiSquare2-sig: 13.3%  
ModelChiSquareGof-sig: 98.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 3.482  
Centroid-sig: N/A  
Centroid-so: 0.087 arcsec [4.30σ]  
OotOffset-rm: 0.084 arcsec [0.67σ]  
KicOffset-rm: 0.229 arcsec [1.47σ]  
OotOffset-st: 4/3/4/4 [15]  
KicOffset-st: 4/3/4/4 [15]  
DiffImageQuality-fgm: 0.60 [9/15]  
DiffImageOverlap-fno: 0.25 [4/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:23:53 Z

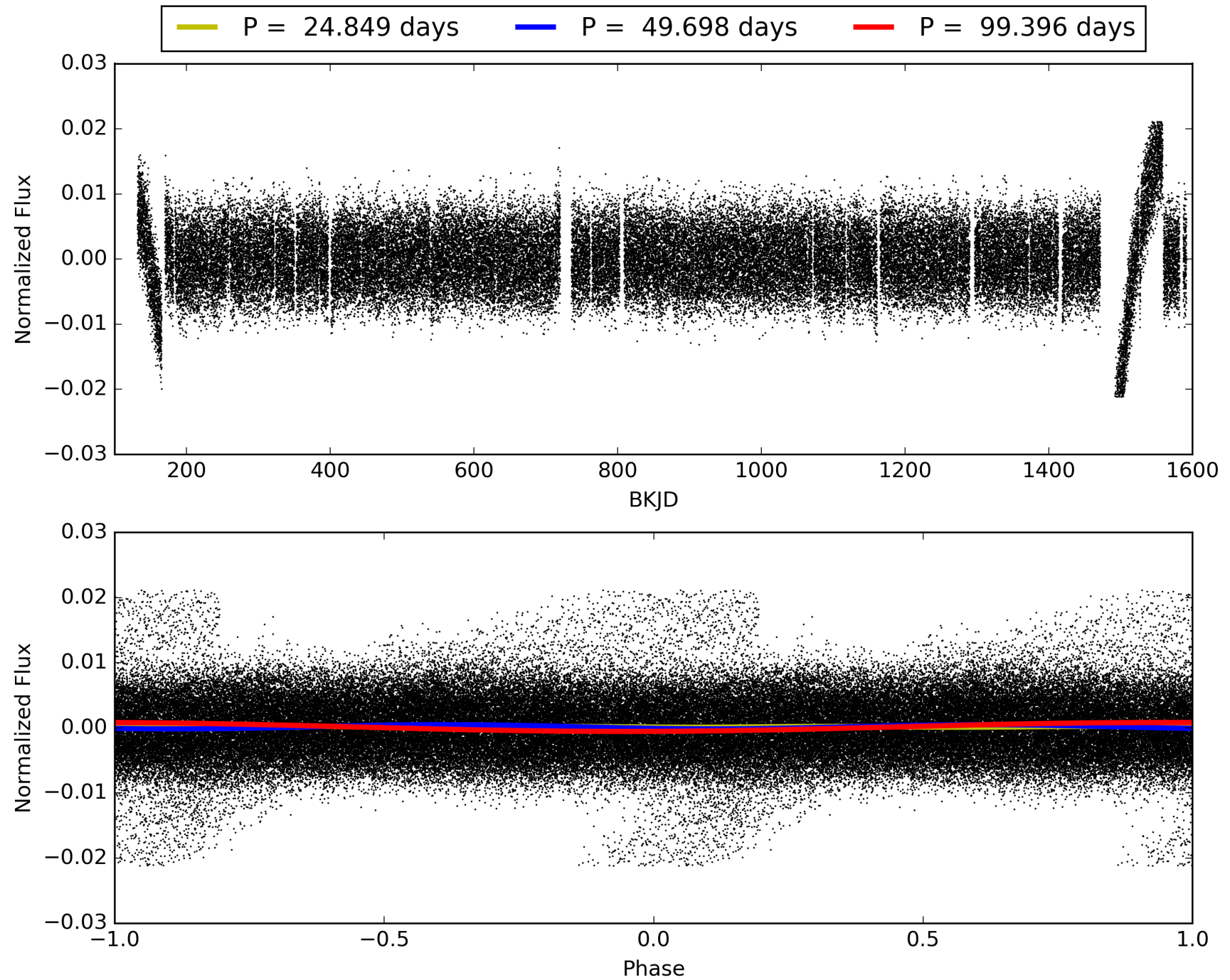
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 010647493-03, PDC Light Curves

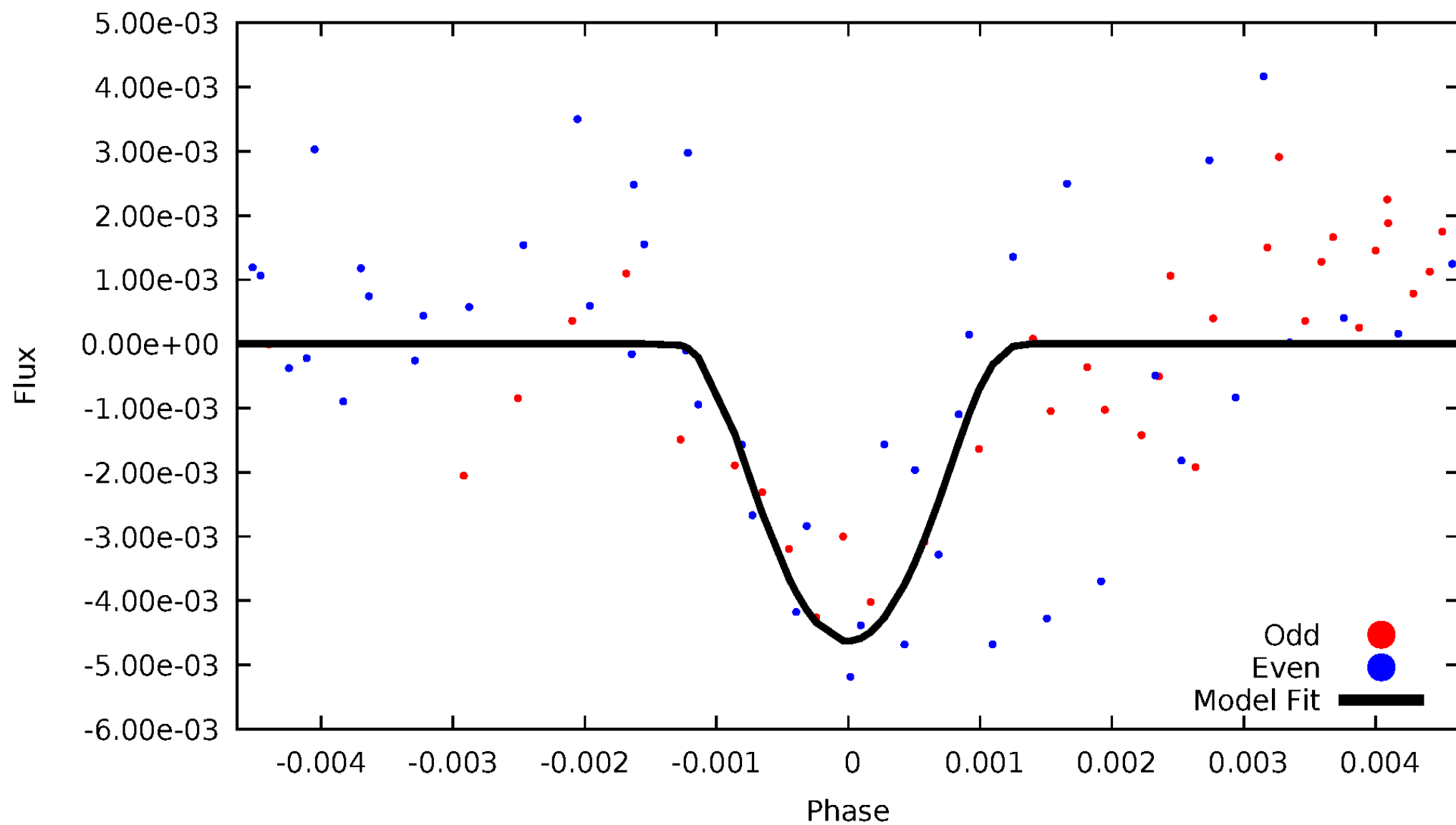


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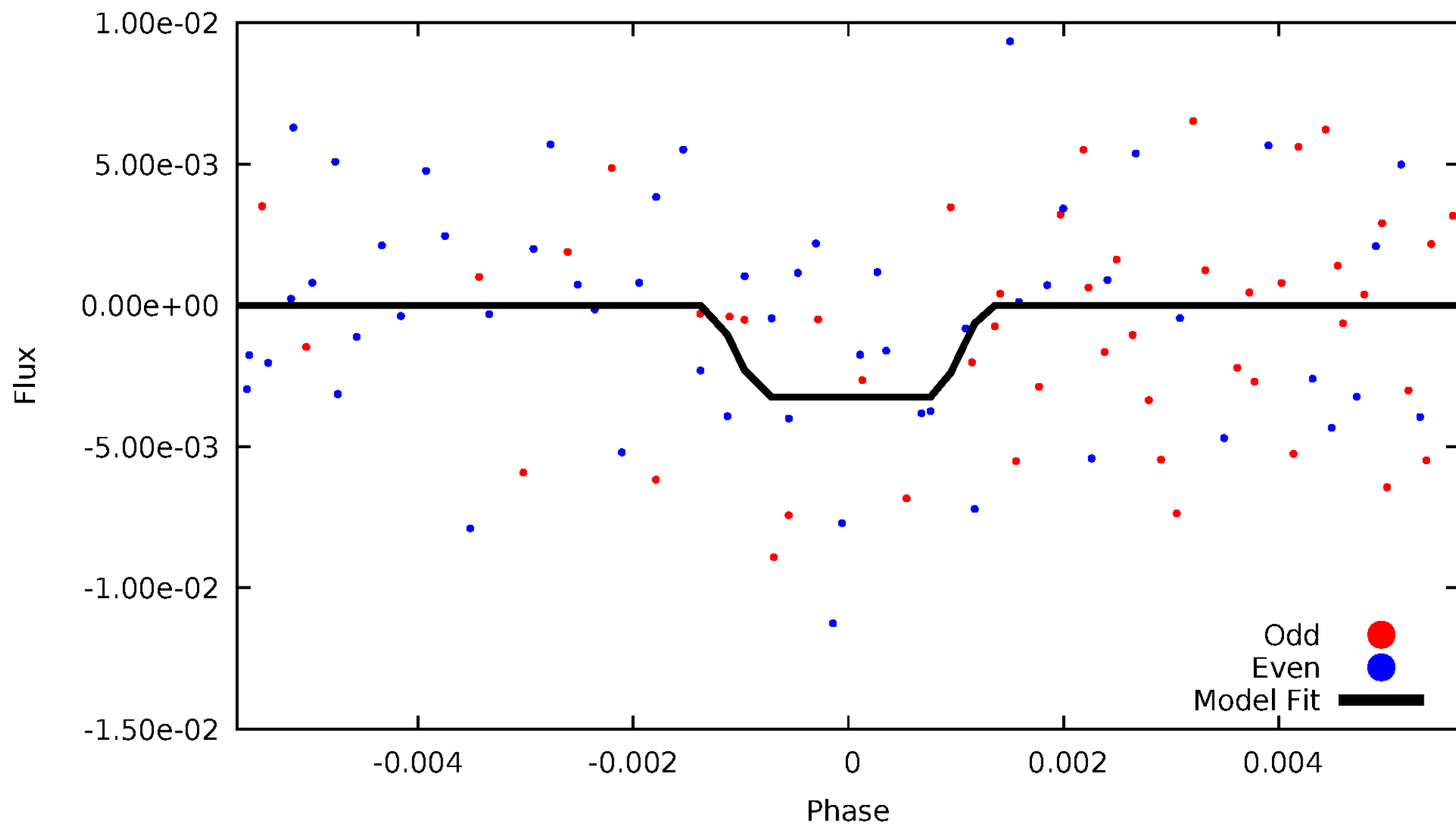
# DV Odd/Even

TCE 010647493-03



# ALT Odd/Even

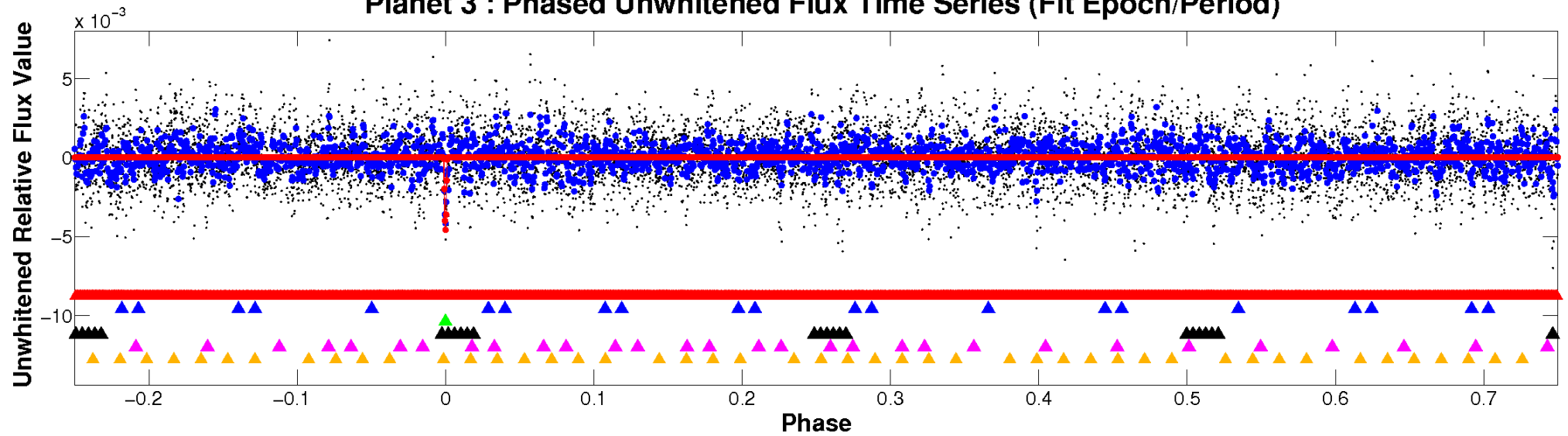
TCE 010647493-03



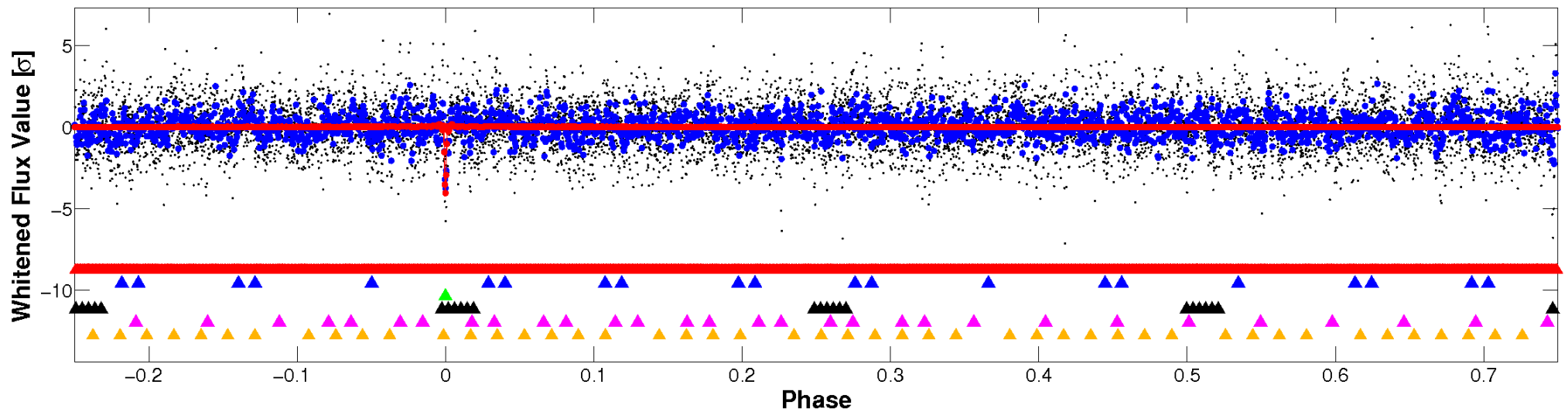


# Non-Whitened Vs. Whitened Light Curve

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

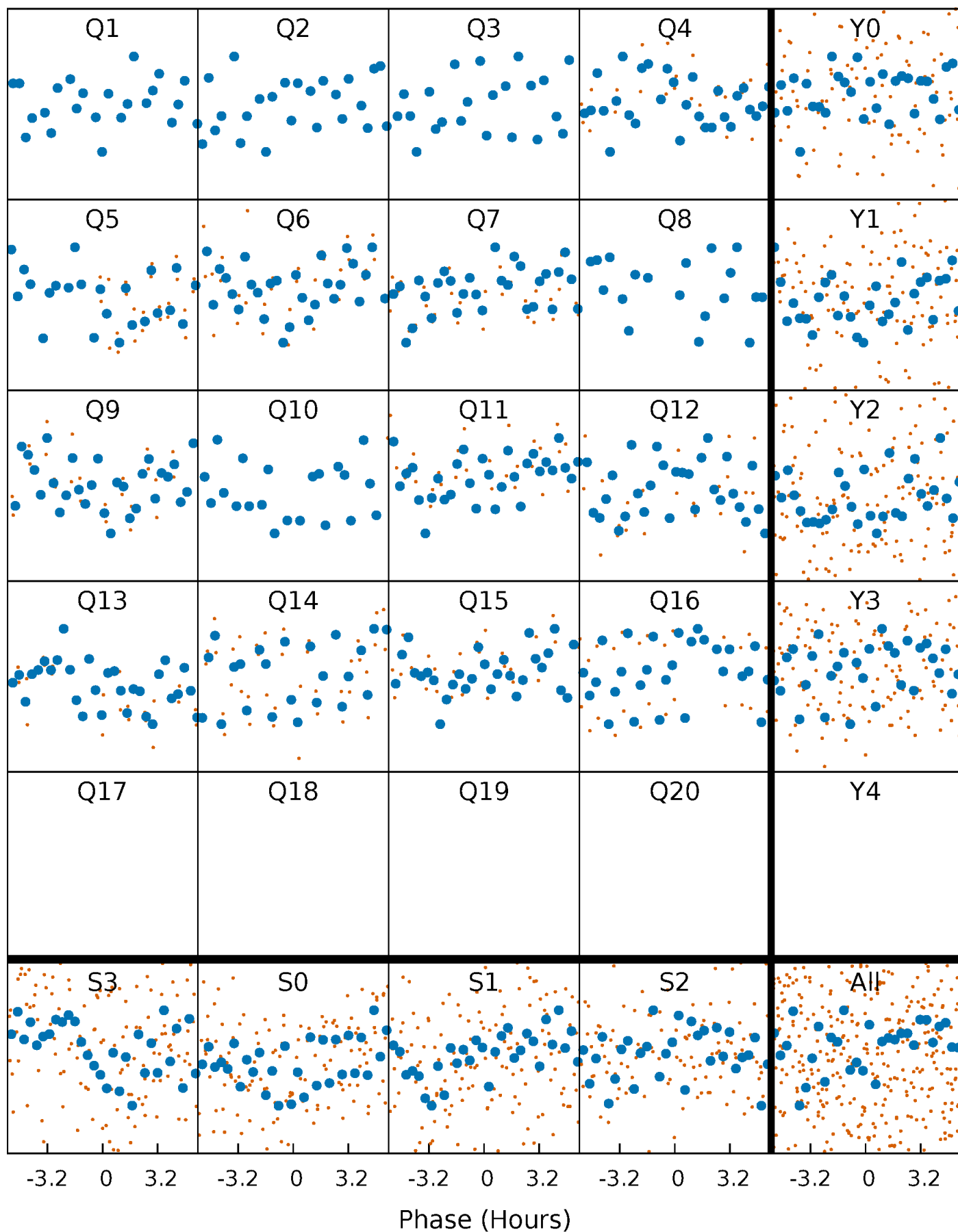


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



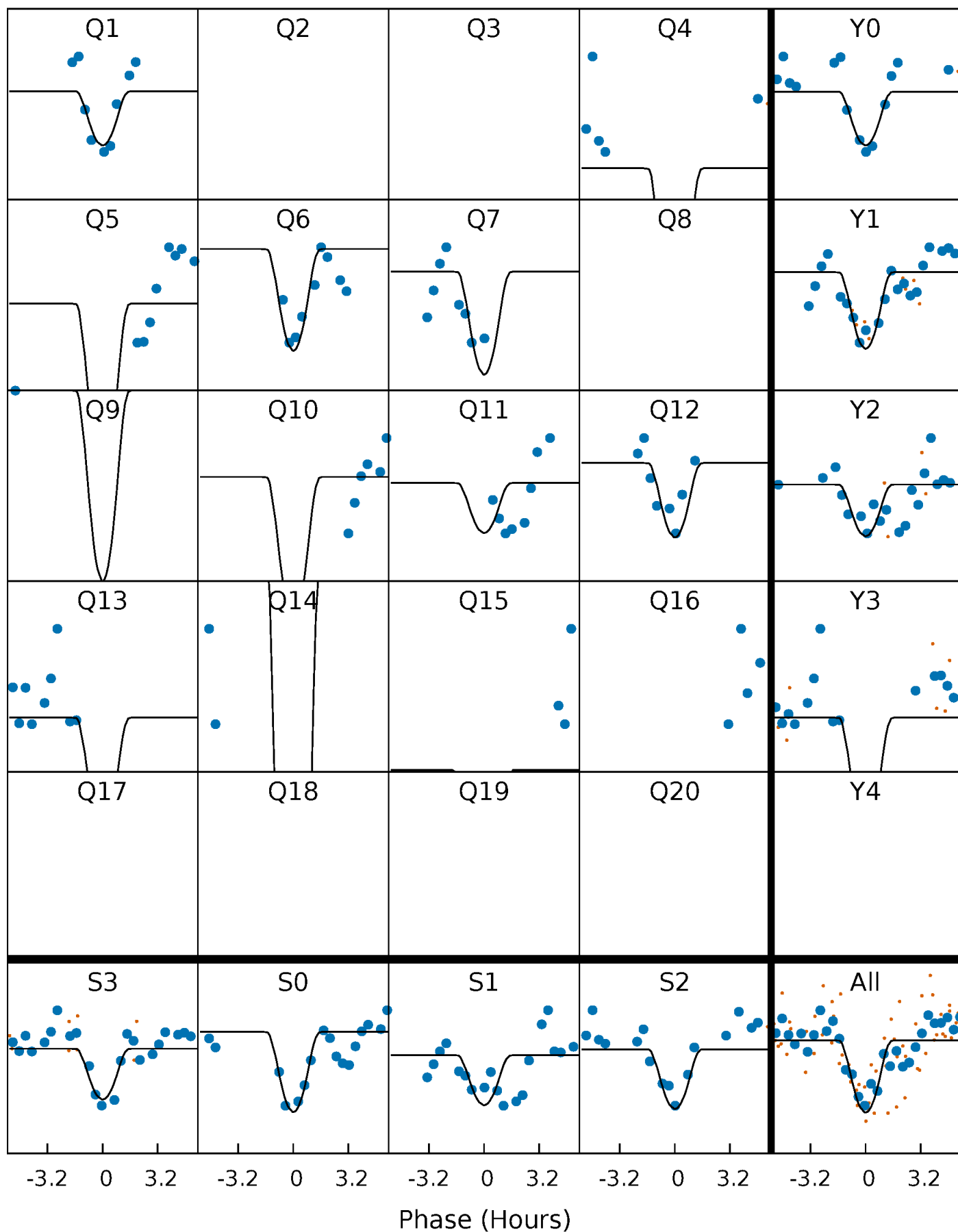
# PDC Quarter-Phased Transit Curves

TCE 010647493-03 P= 49.698235 Days  $T_0=156.727559$  (BKJD)



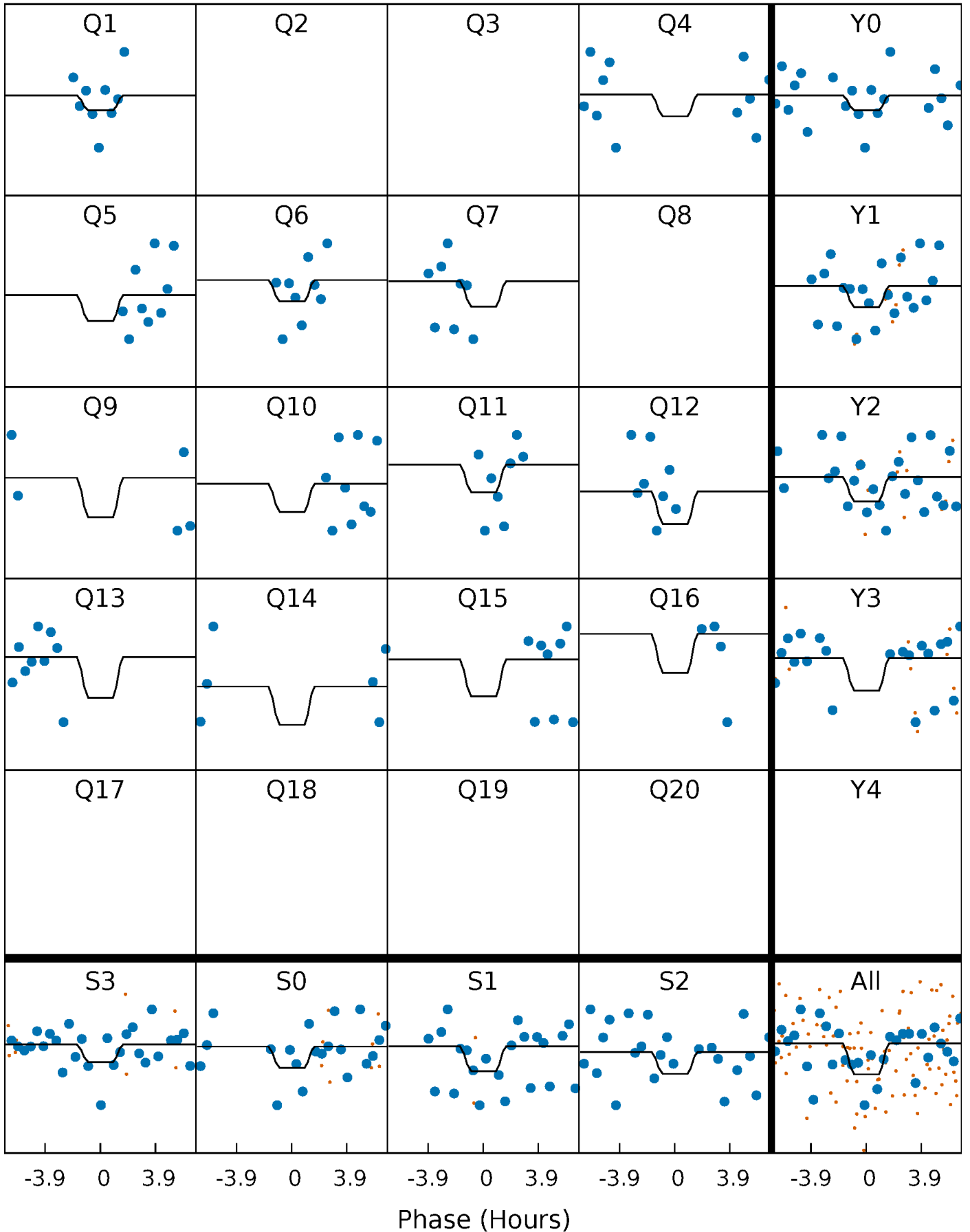
# DV Quarter-Phased Transit Curves

TCE 010647493-03     $P = 49.698235$  Days     $T_0 = 156.727559$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010647493-03     $P = 49.699850$  Days     $T_0 = 156.735380$  (BKJD)

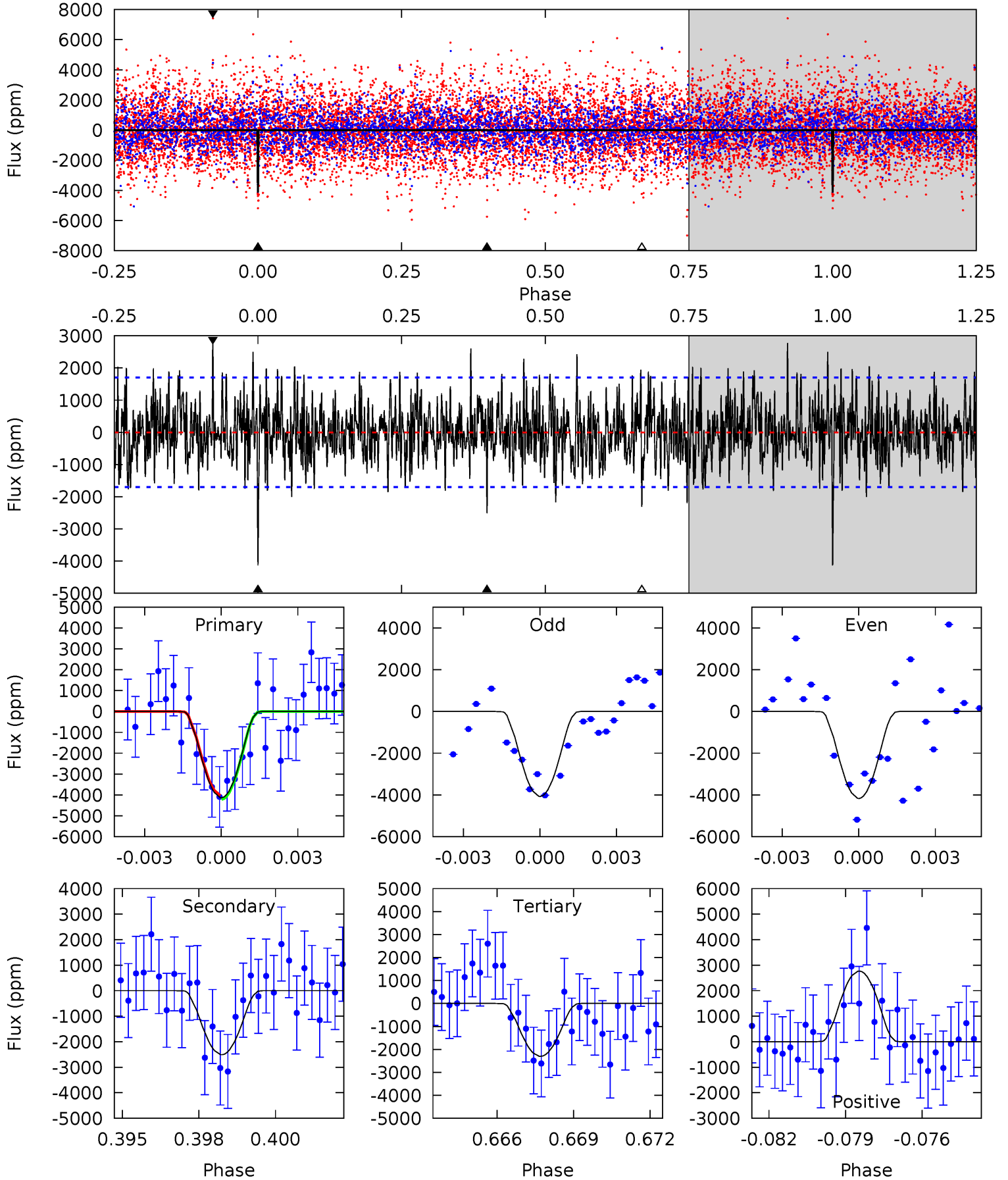




# DV Model-Shift Uniqueness Test

010647493-03,  $P = 49.698235$  Days,  $E = 107.029324$  Days

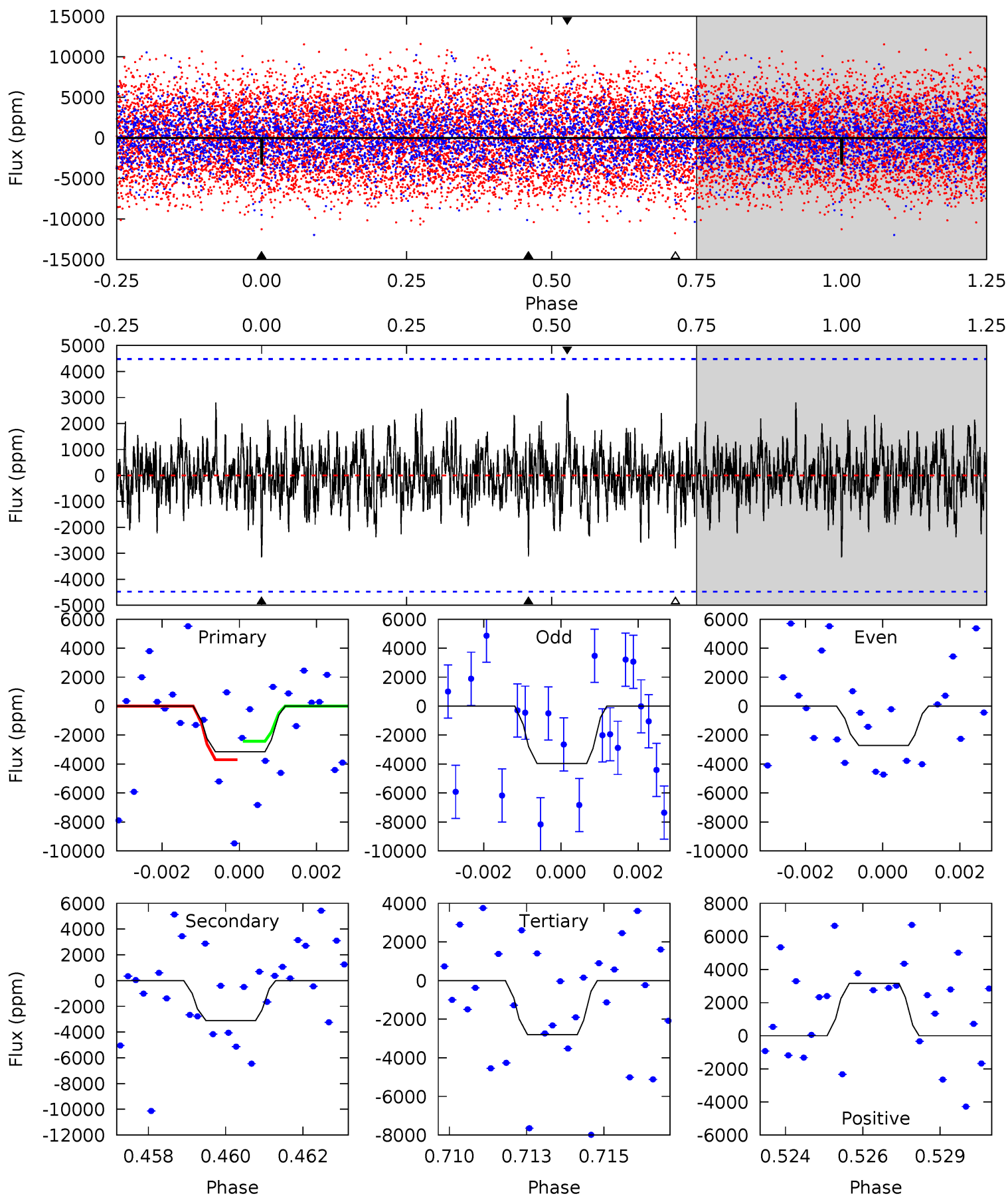
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.8	7.78	7.15	8.59	5.28	3.01	2.31	5.66	4.22	0.63	-0.81	0.14	1.08	0.40	0.29



# Alt Model-Shift Uniqueness Test

010647493-03, P = 49.699850 Days, E = 107.035530 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
3.73	3.68	3.33	3.74	5.30	3.05	0.98	0.41	-0.01	0.36	-0.06	0.73	0.92	0.50	0.75



### Stellar Parameters For KIC 010647493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7103^{+197}_{-338}$	$4.122^{+0.132}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.802^{+0.577}_{-0.336}$	$1.566^{+0.206}_{-0.252}$	$0.377^{+0.255}_{-0.206}$
	+3%/-5%	+3%/-5%	+200%/-350%	+32%/-19%	+13%/-16%	+68%/-55%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010647493-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2509 \pm 323$	$30.71^{+26.93}_{-20.51}$	$1059^{+90}_{-68}$	$4273^{+2579}_{-854}$	$133^{+1144}_{-95}$
Alt.	$-3111 \pm 844$	$26.35^{+26.37}_{-18.37}$	$1056^{+86}_{-68}$	$4670^{+3742}_{-1057}$	$234^{+2221}_{-181}$

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

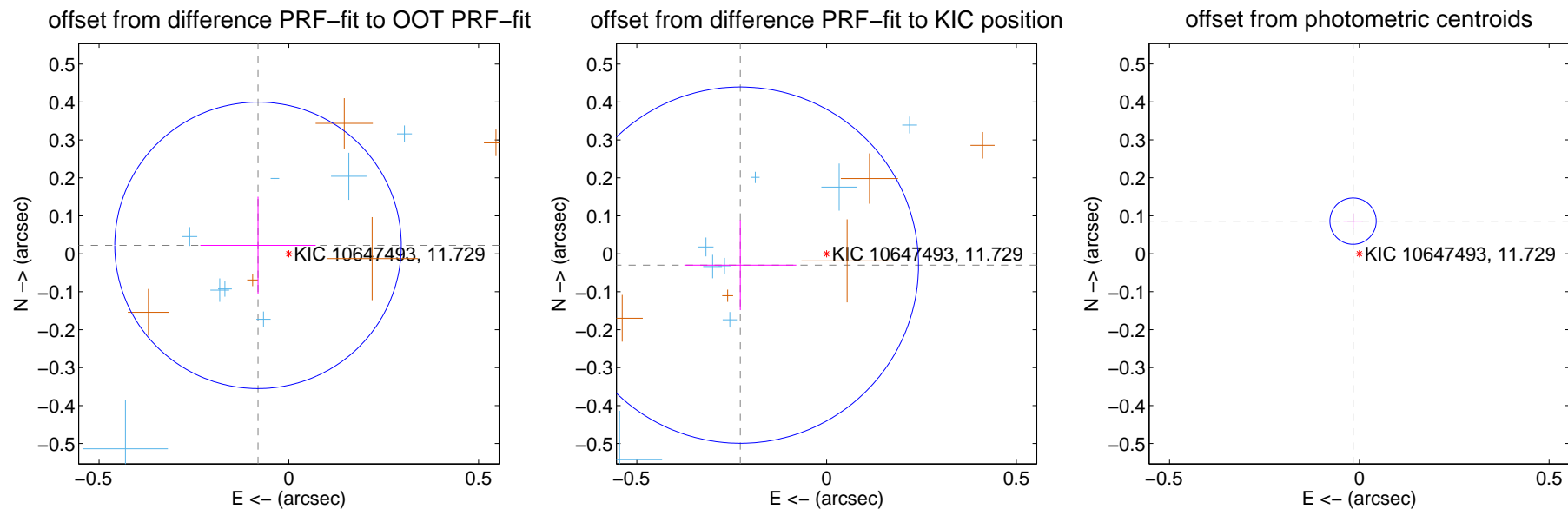
## DV Centroid Data

Supplemental centroid analysis for 010647493-03. **Kepler magnitude: 11.73.** Transit SNR 12.88

There are 9 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

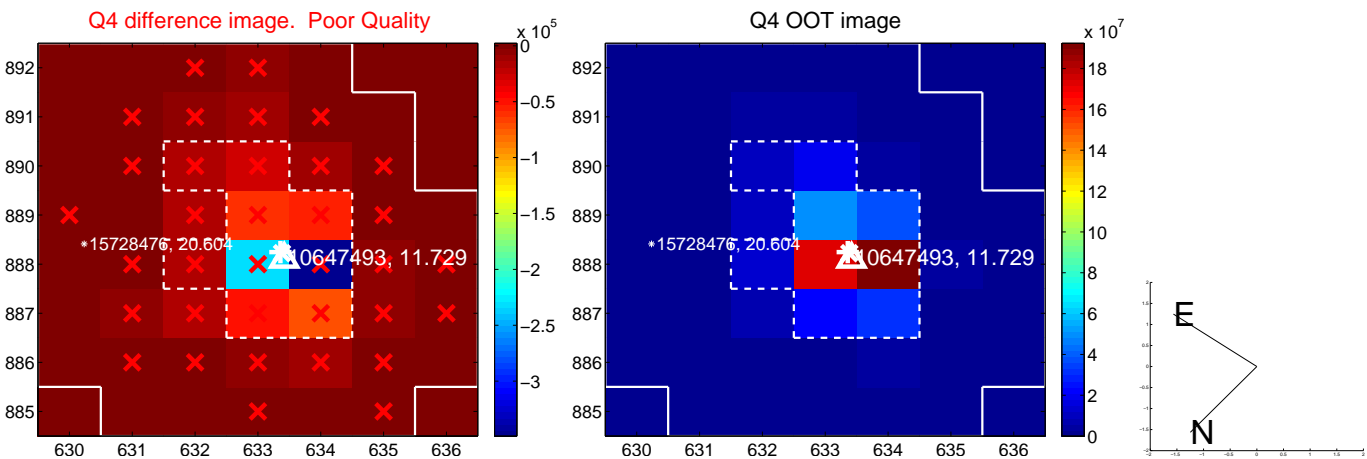
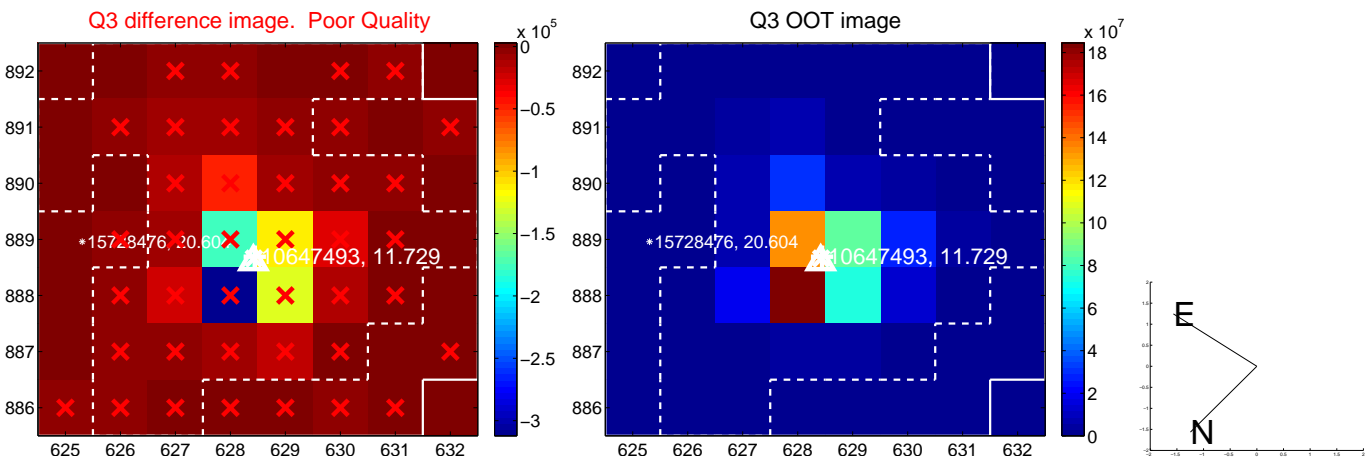
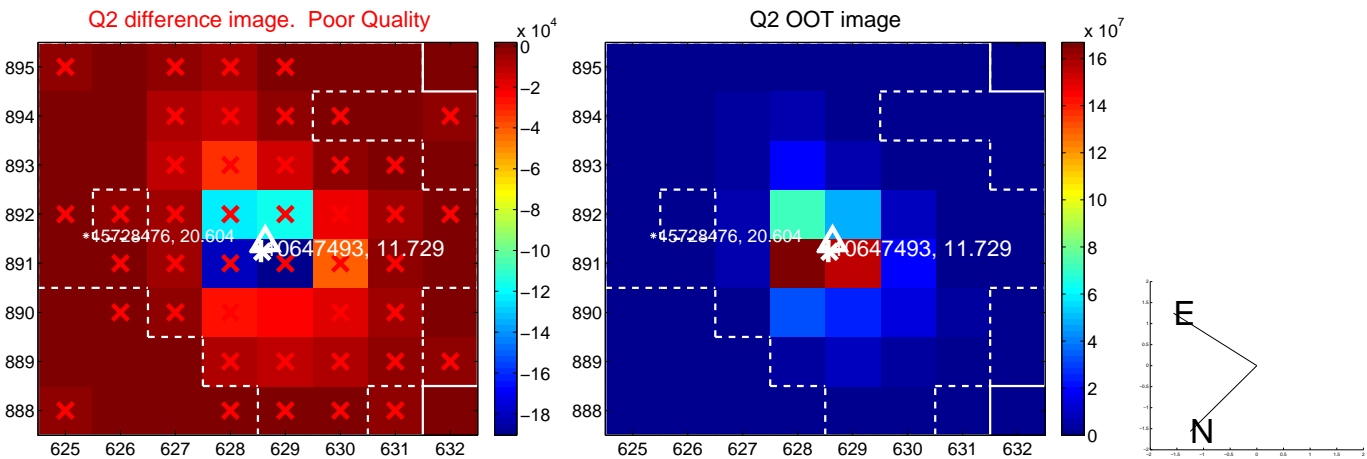
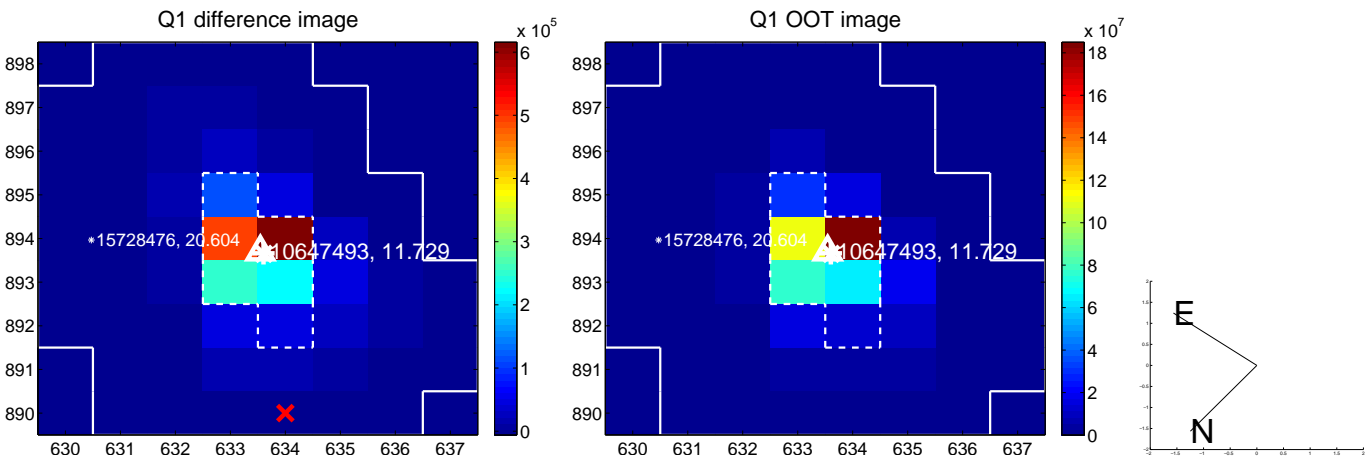
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.084 \pm 0.126$	0.67	$0.081 \pm 0.152$	$0.022 \pm 0.128$
PRF-fit source offset from KIC position	$0.229 \pm 0.156$	1.47	$0.227 \pm 0.147$	$-0.030 \pm 0.119$
photometric centroid source offset	<b><math>0.09 \pm 0.02</math></b>	<b>4.30</b>	$0.02 \pm 0.03$	$0.09 \pm 0.02$



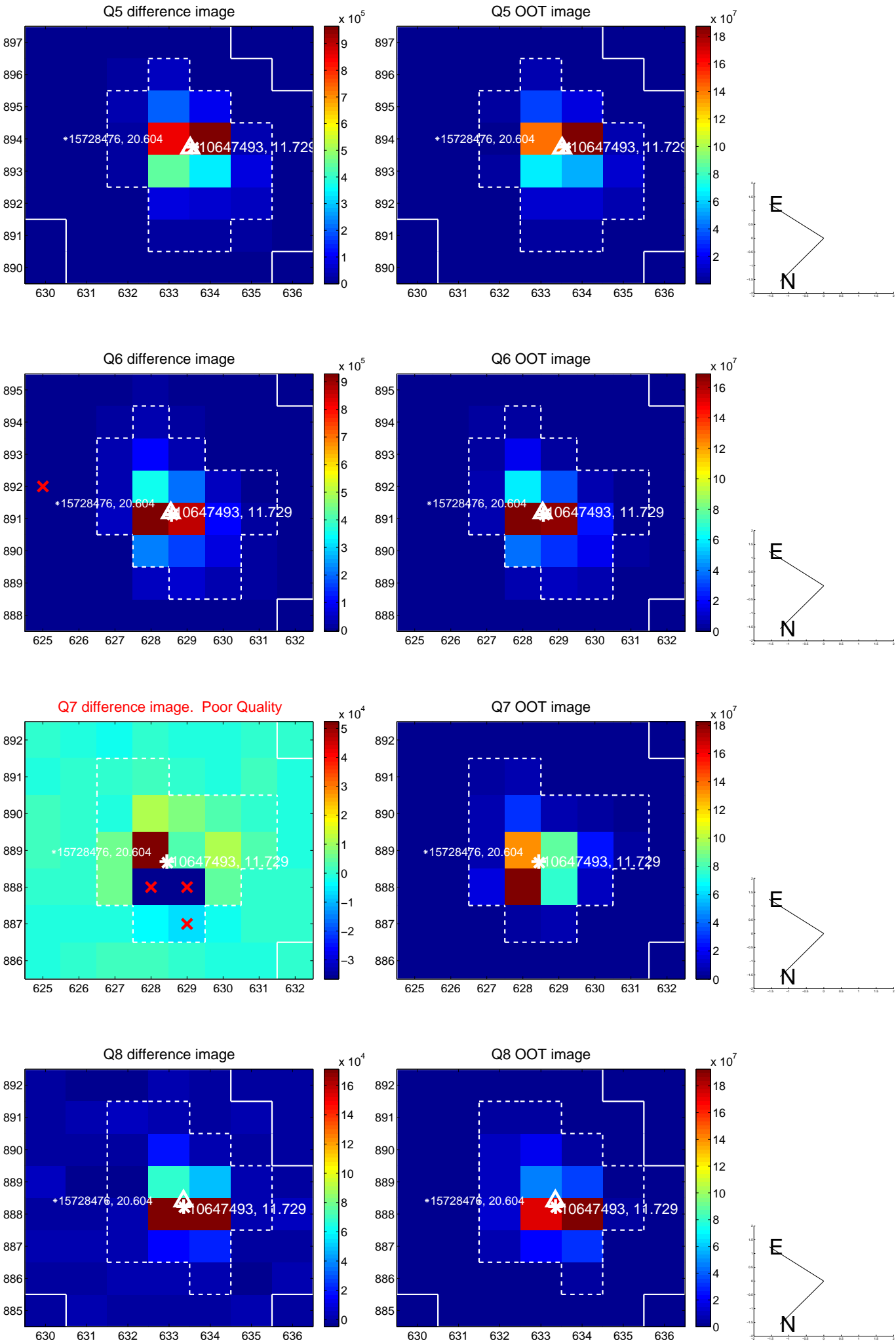
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



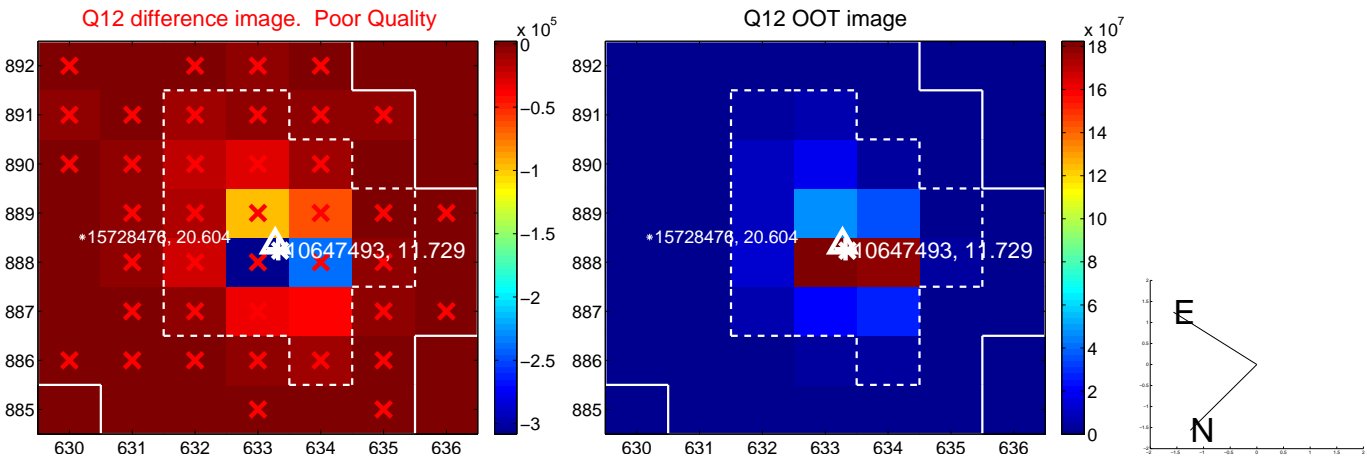
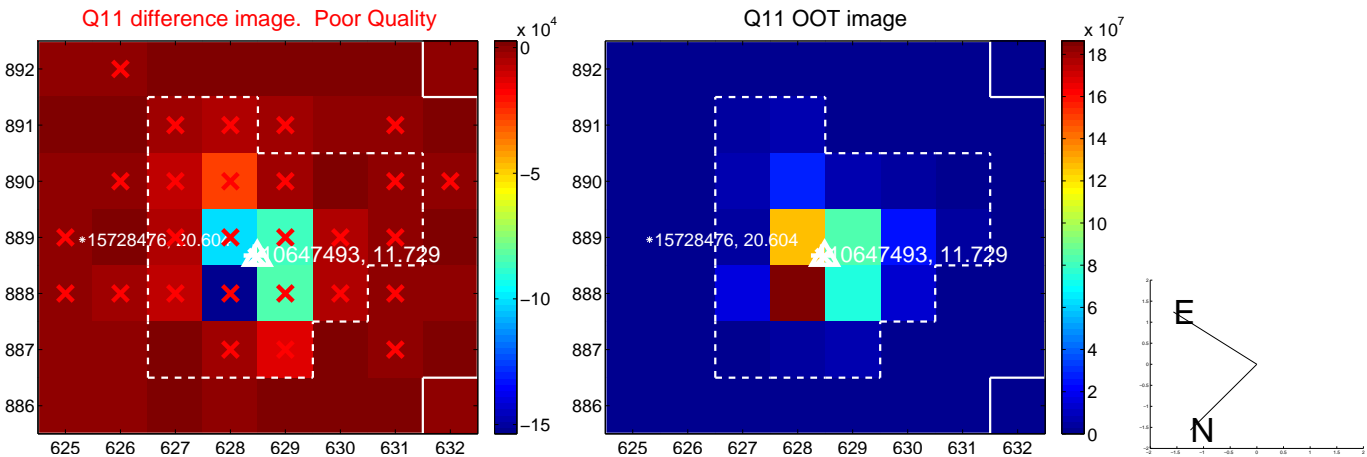
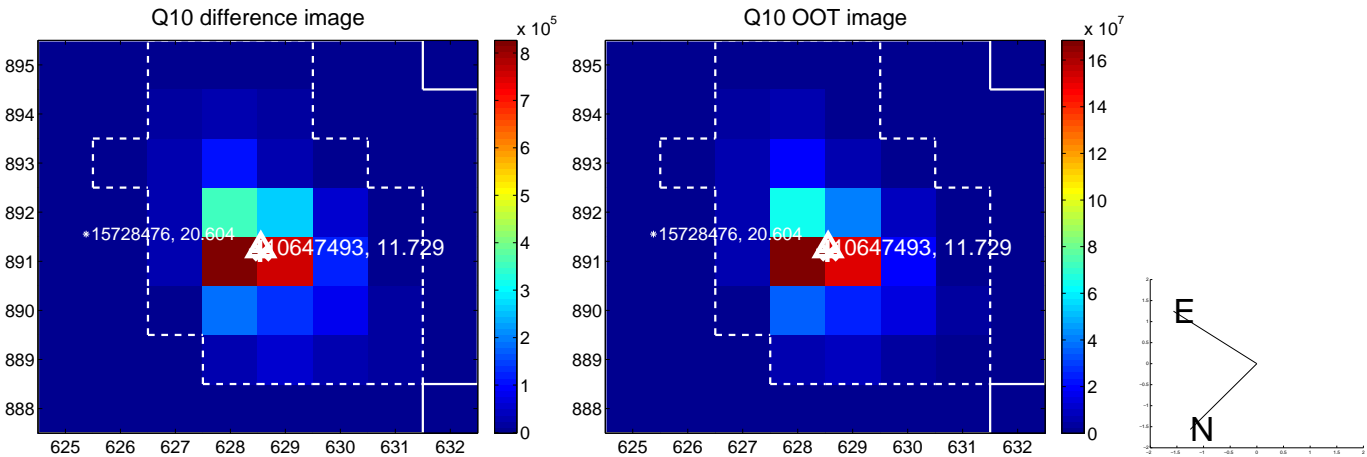
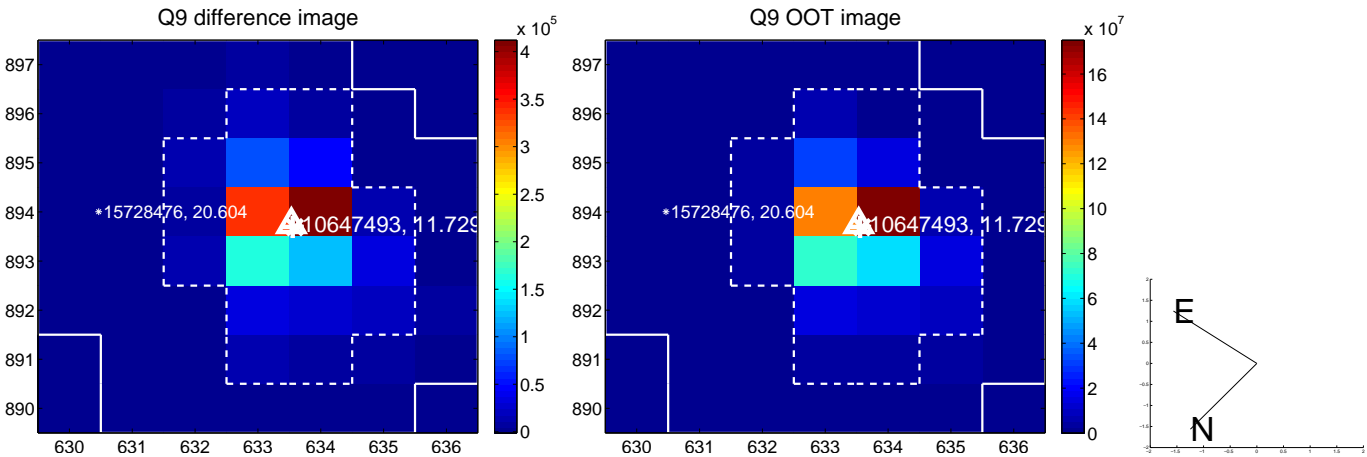
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



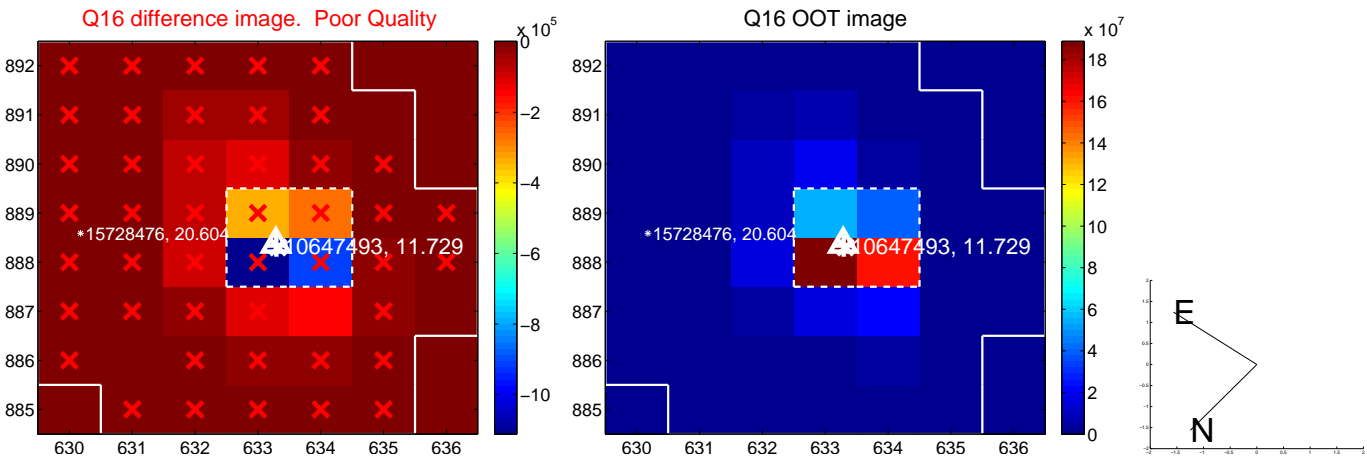
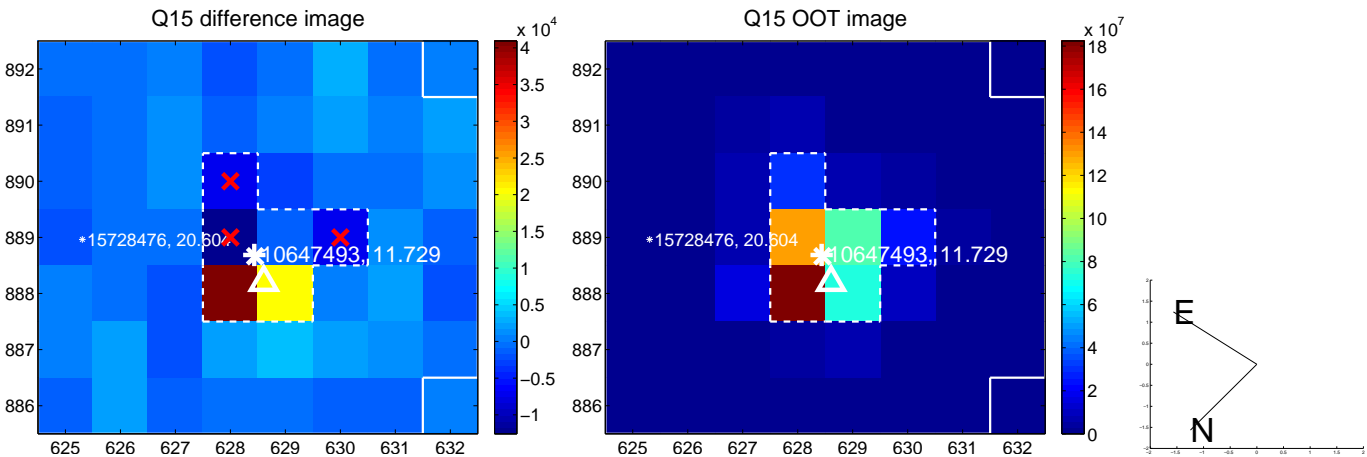
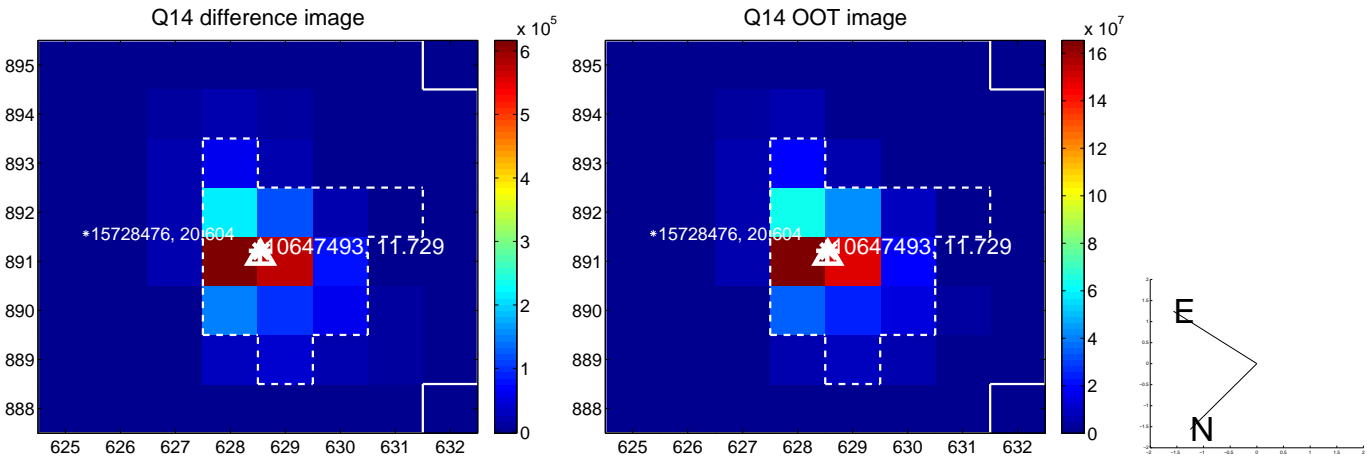
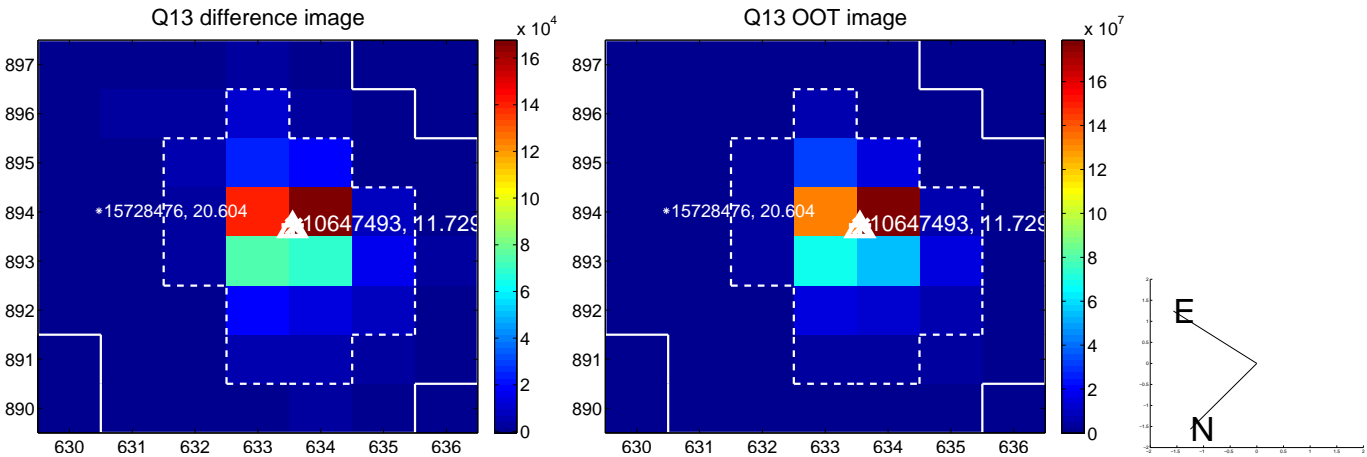
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



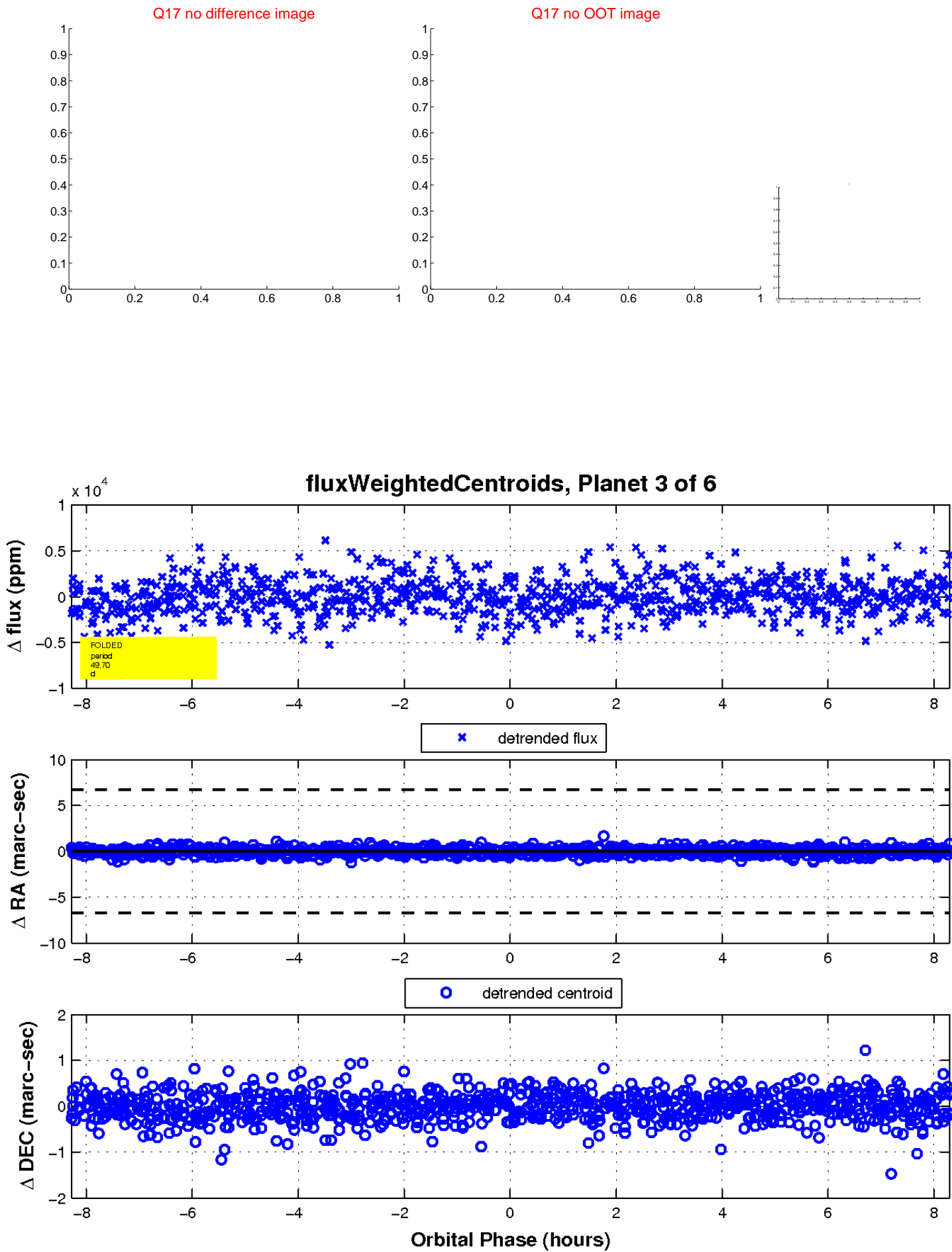
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



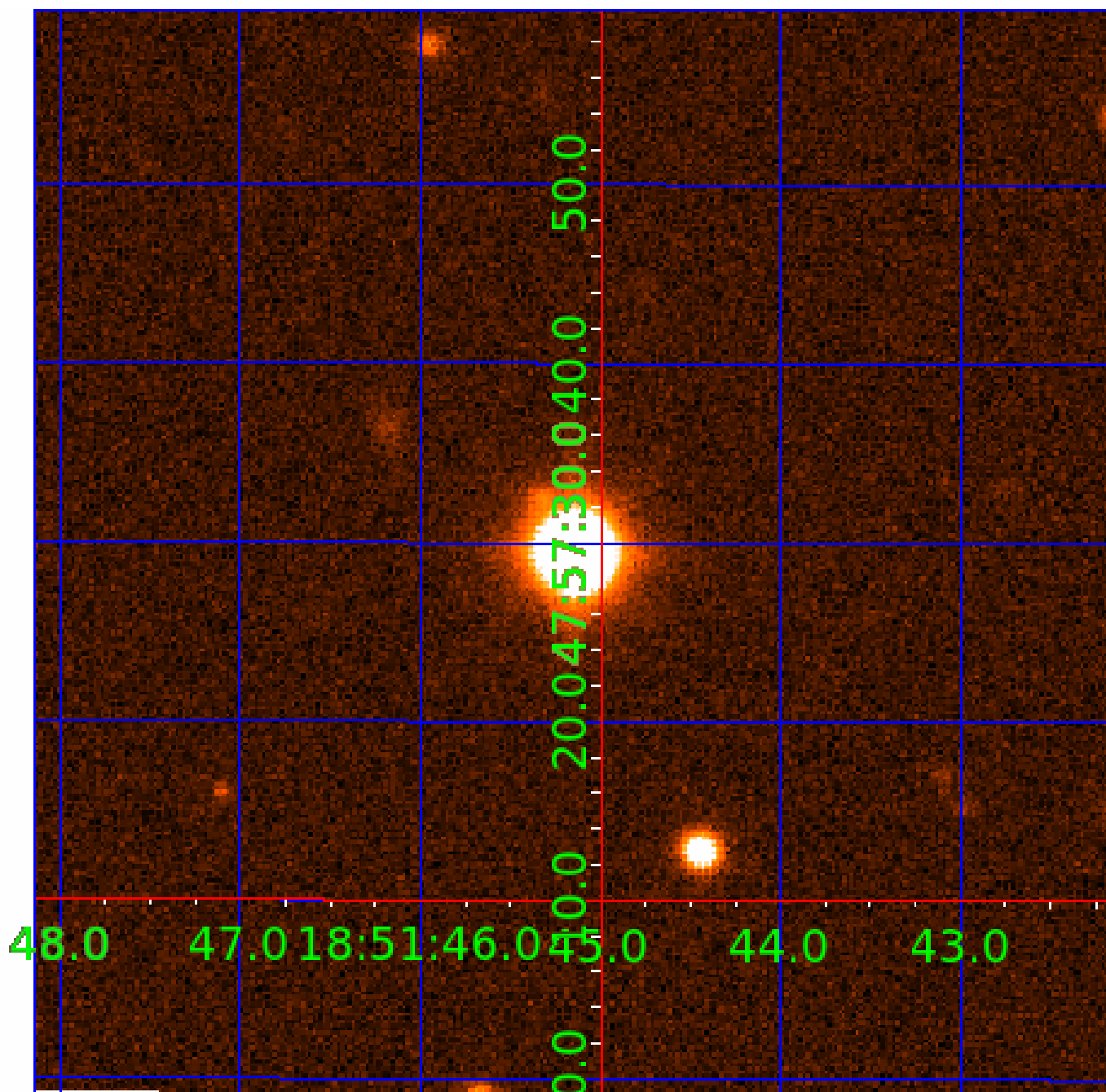
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 010647493

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010647493-01	OBS	No	1.141142	132.194872	154.2	7.566	10.8	8.9	1.80	7103	2.40	12005.45
010647493-03	OBS	No	49.698235	156.727559	4627.7	2.766	12.3	12.9	1.80	7103	17.81	78.35
010647493-04	OBS	No	62.175731	144.131668	5533.1	4.204	13.2	12.7	1.80	7103	23.91	58.12
010647493-05	OBS	No	47.295890	172.780042	3082.5	1.419	13.2	8.5	1.80	7103	10.21	83.70
010647493-06	OBS	No	30.722216	148.538281	127.5	3.000	11.5	-1.0	1.80	7103	2.06	148.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010647493-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010647493-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010647493-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
010647493-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV
010647493-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

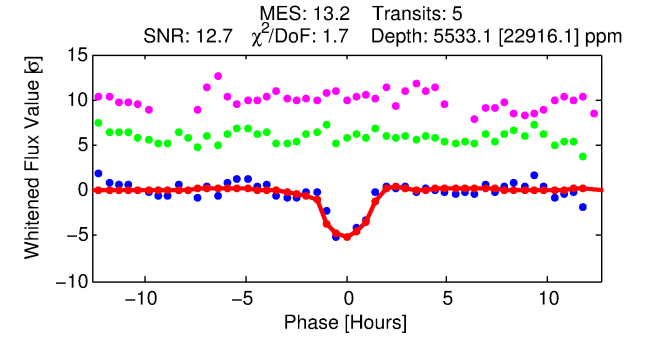
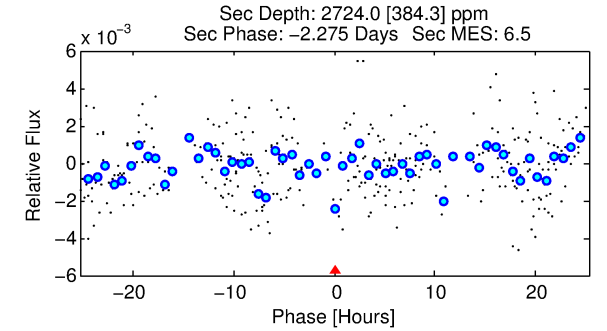
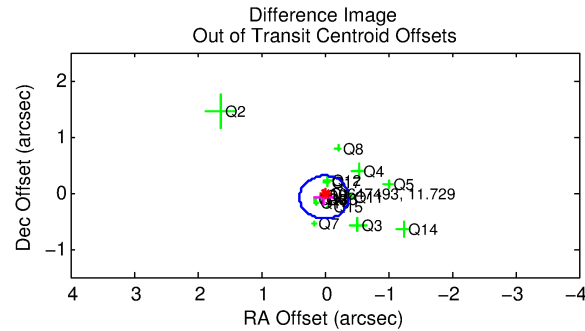
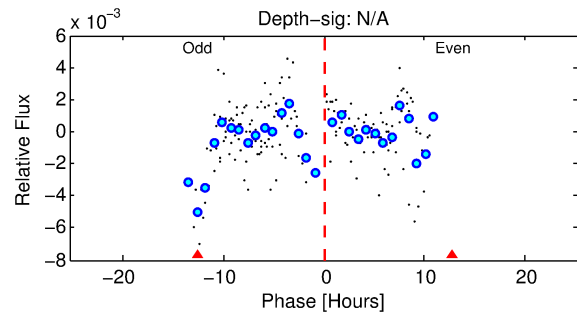
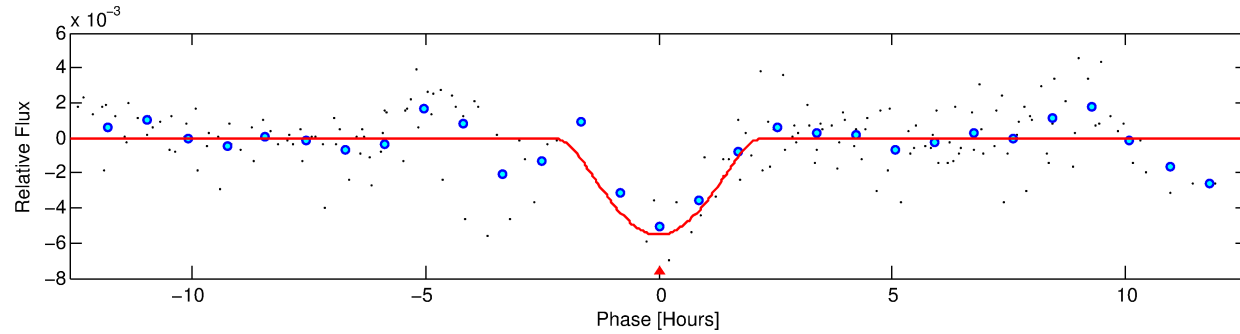
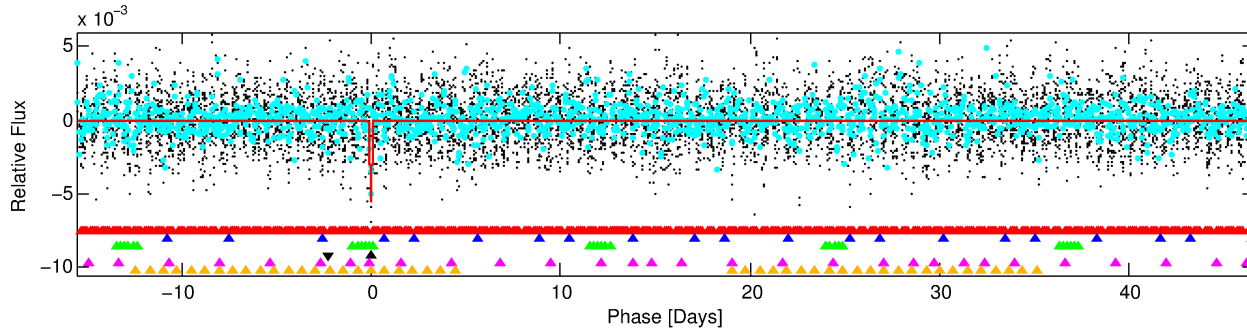
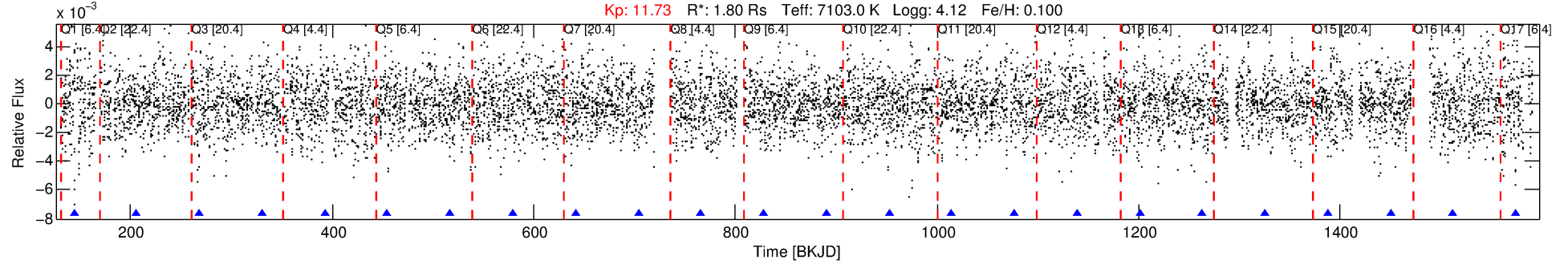
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010647493-04

No Significant Match Found

# DV One-Page Summary

KIC: 10647493 Candidate: 4 of 6 Period: 62.176 d



## DV Fit Results:

Period = 62.17573 [0.00135] d  
Epoch = 144.1317 [0.0114] BKJD  
 $R_p/R^*$  = 0.1216 [0.4721]  
 $a/R^*$  = 57.40 [39.98]  
 $b$  = 1.00 [1.01]  
 $S_{\text{eff}}$  = 58.12 [24.26]  
 $T_{\text{eq}}$  = 704 [73] K  
 $R_p$  = 23.91 [93.15]  $R_e$   
 $a$  = 0.3570 [0.0935] AU  
 $A_g$  = 333.98 [2596.87] [0.13 $\sigma$ ]  
 $T_{\text{eff}}$  = 4654 [9038] K [0.44 $\sigma$ ]

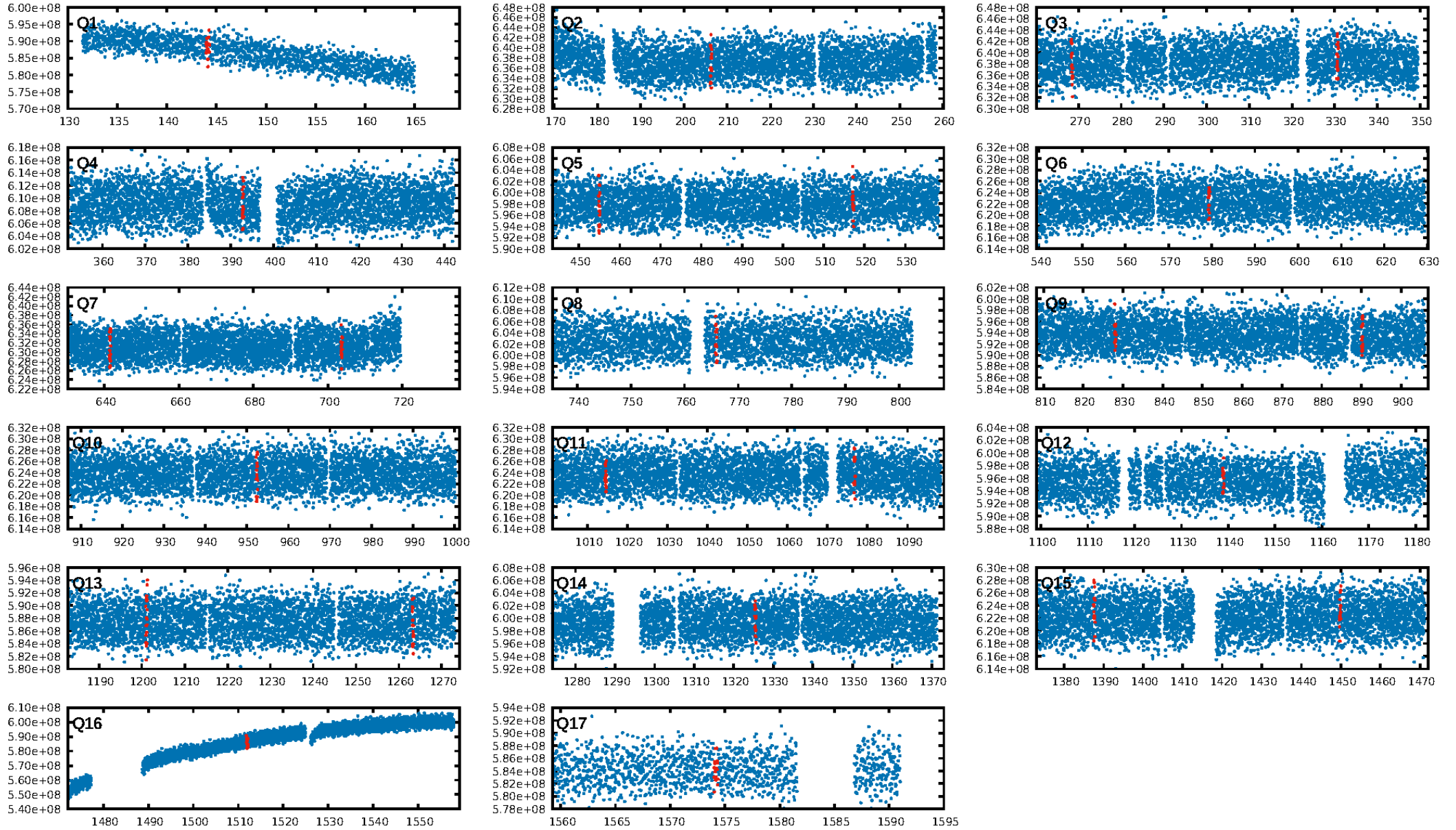
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [59.51 $\sigma$ ]  
LongPeriod-sig: 100.0% [36.30 $\sigma$ ]  
ModelChiSquare2-sig: 4.2%  
ModelChiSquareGof-sig: 98.4%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -0.1321  
Centroid-sig: N/A  
Centroid-so: 0.068 arcsec [4.39 $\sigma$ ]  
OotOffset-rm: 0.081 arcsec [0.64 $\sigma$ ]  
KicOffset-rm: 0.139 arcsec [1.21 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.65 [11/17]  
DiffImageOverlap-fno: 0.00 [0/17]

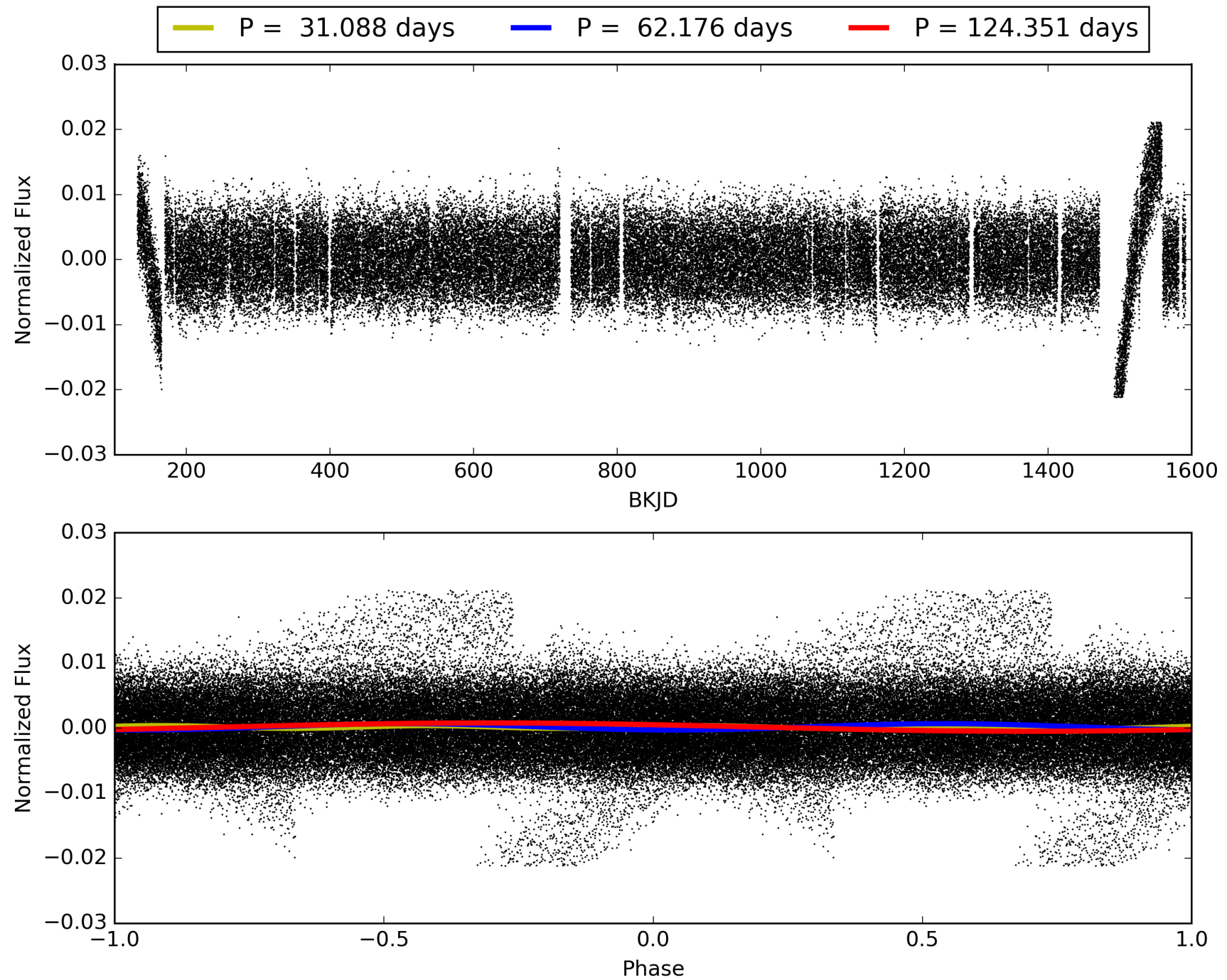
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:23:57 Z

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

# TCE 010647493-04, PDC Light Curves

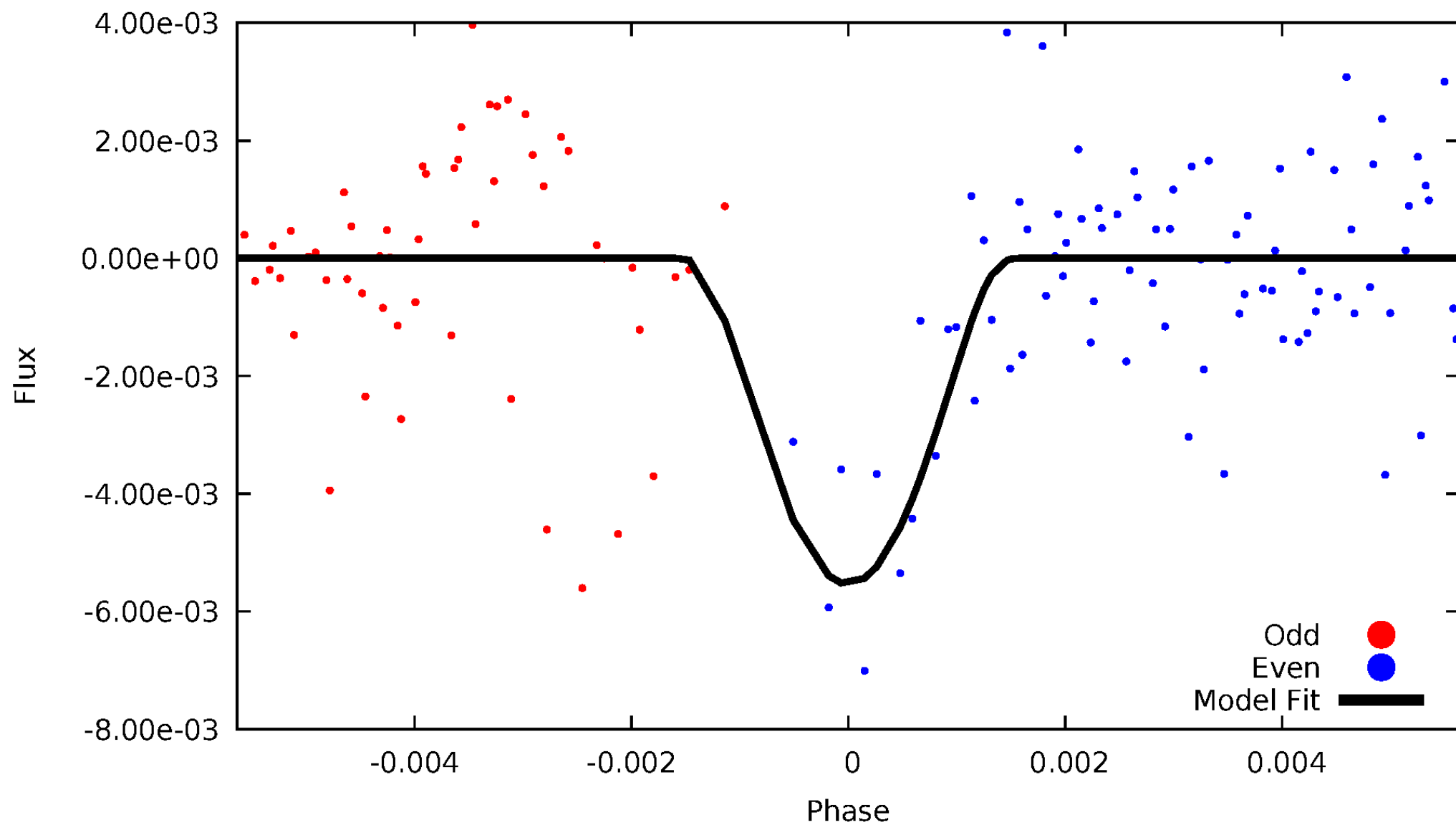


# TCE 010647493-04



# DV Odd/Even

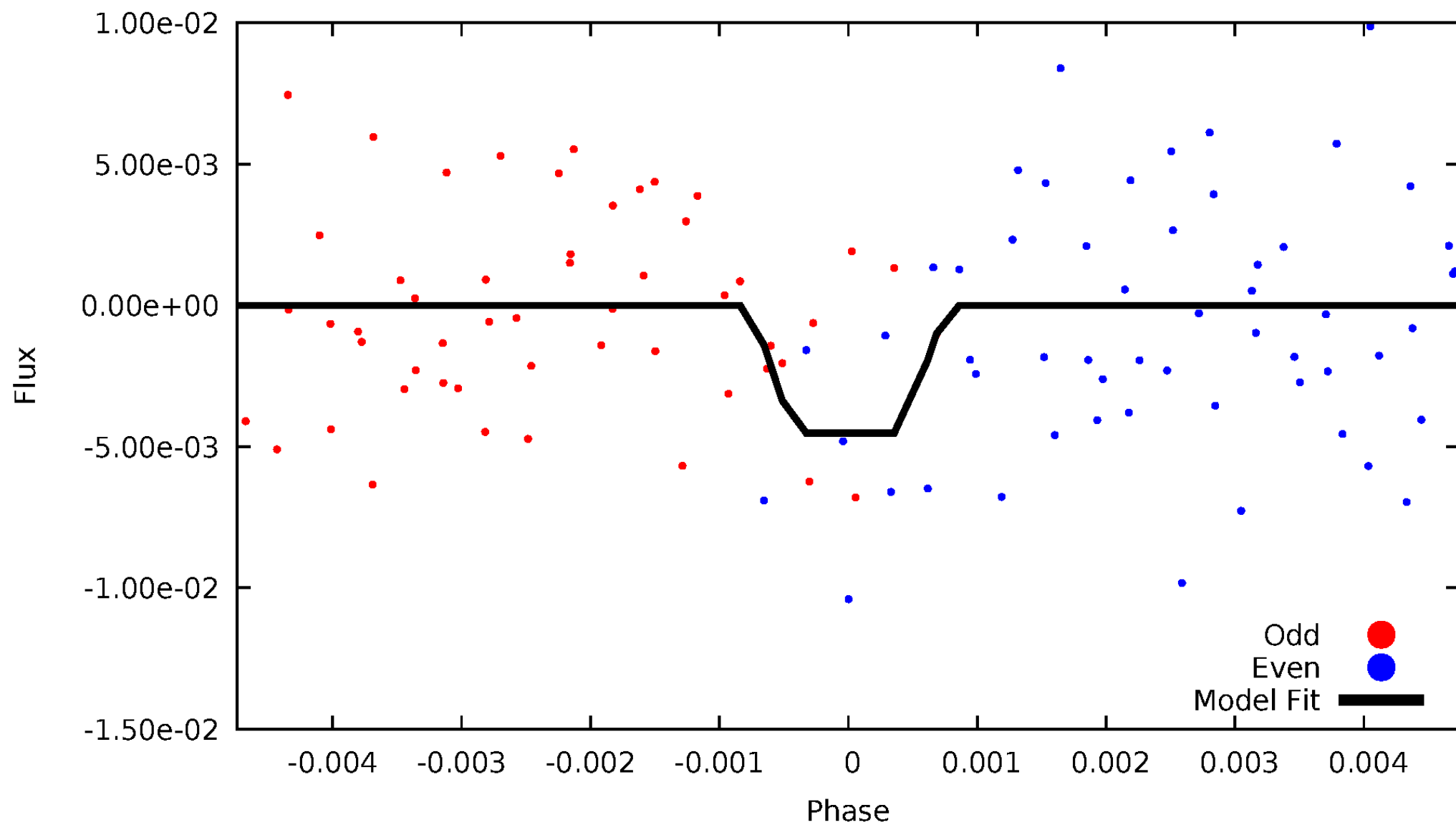
TCE 010647493-04





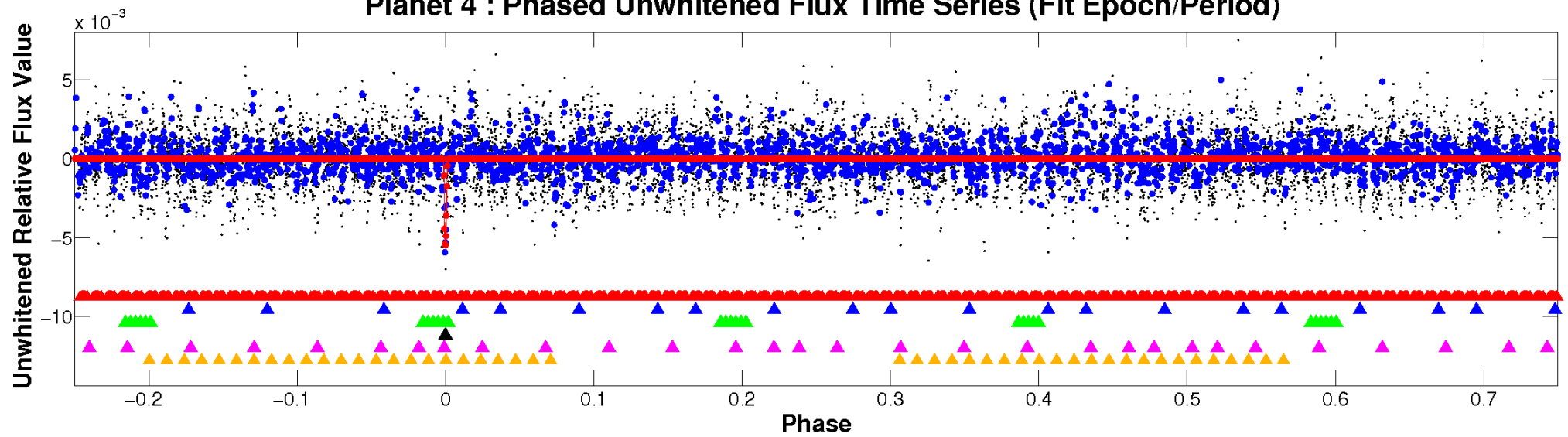
# ALT Odd/Even

TCE 010647493-04

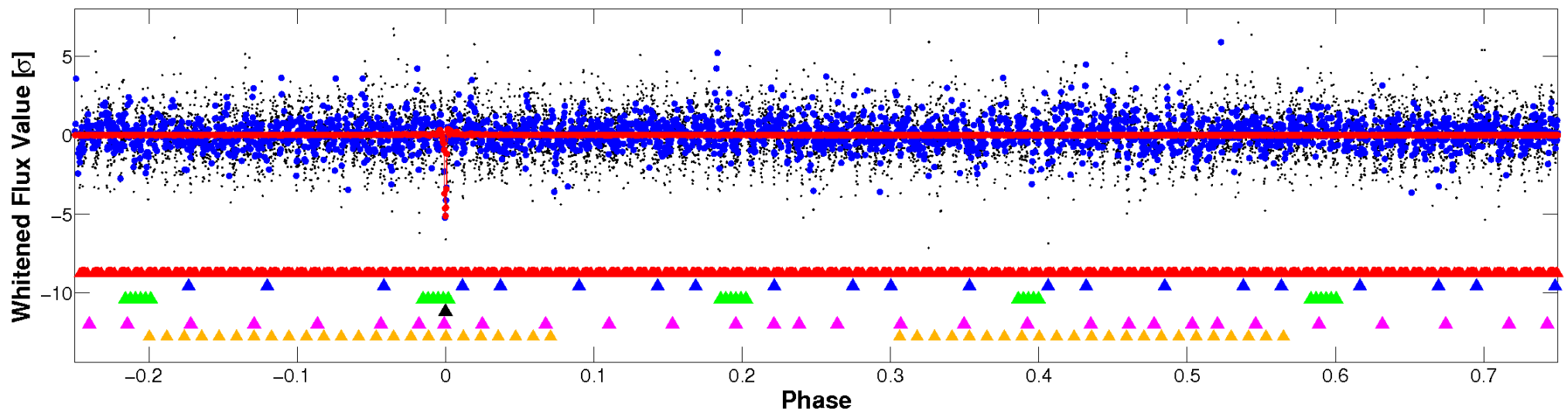


# Non-Whitened Vs. Whitened Light Curve

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

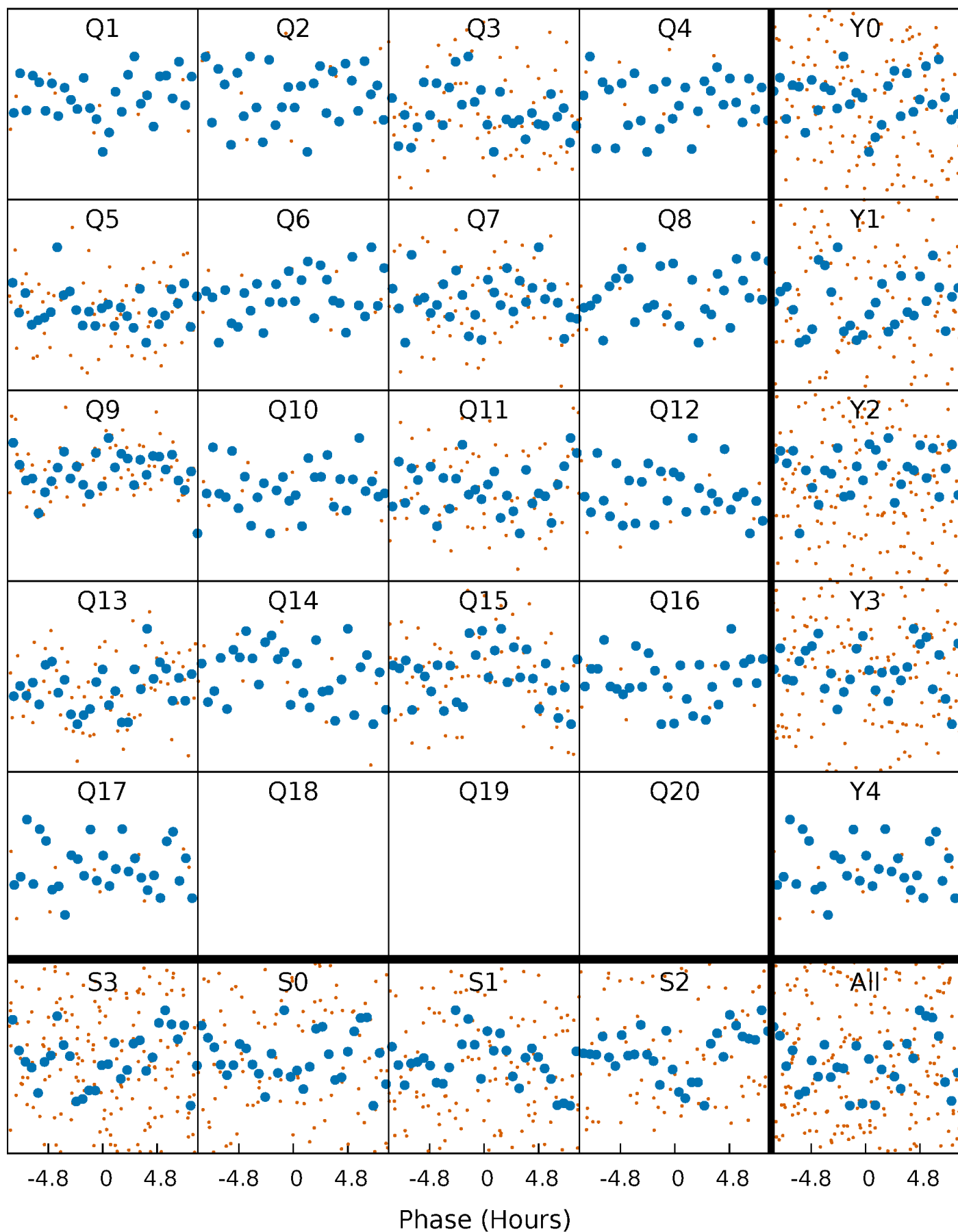


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



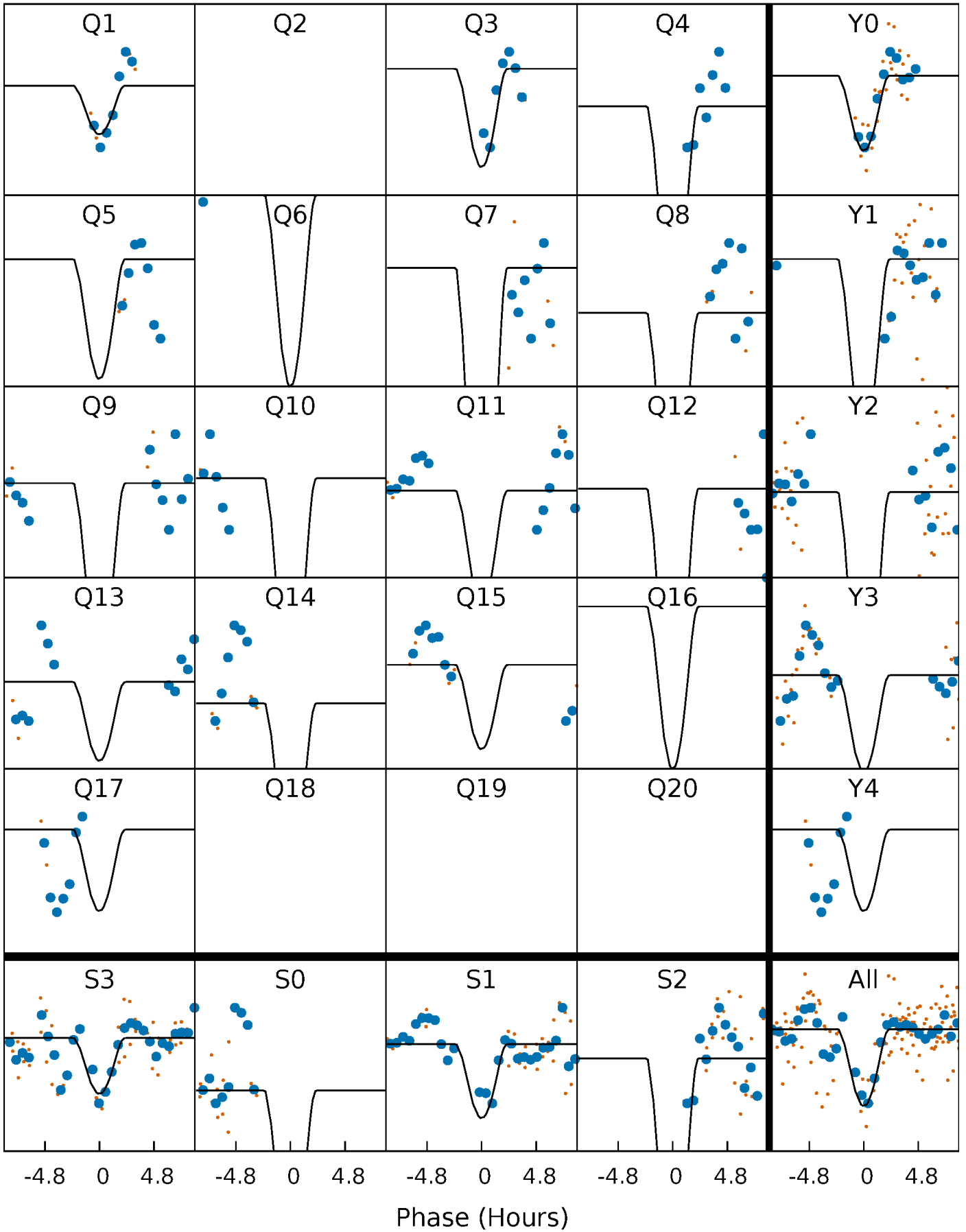
# PDC Quarter-Phased Transit Curves

TCE 010647493-04 P= 62.175731 Days  $T_0=144.131668$  (BKJD)



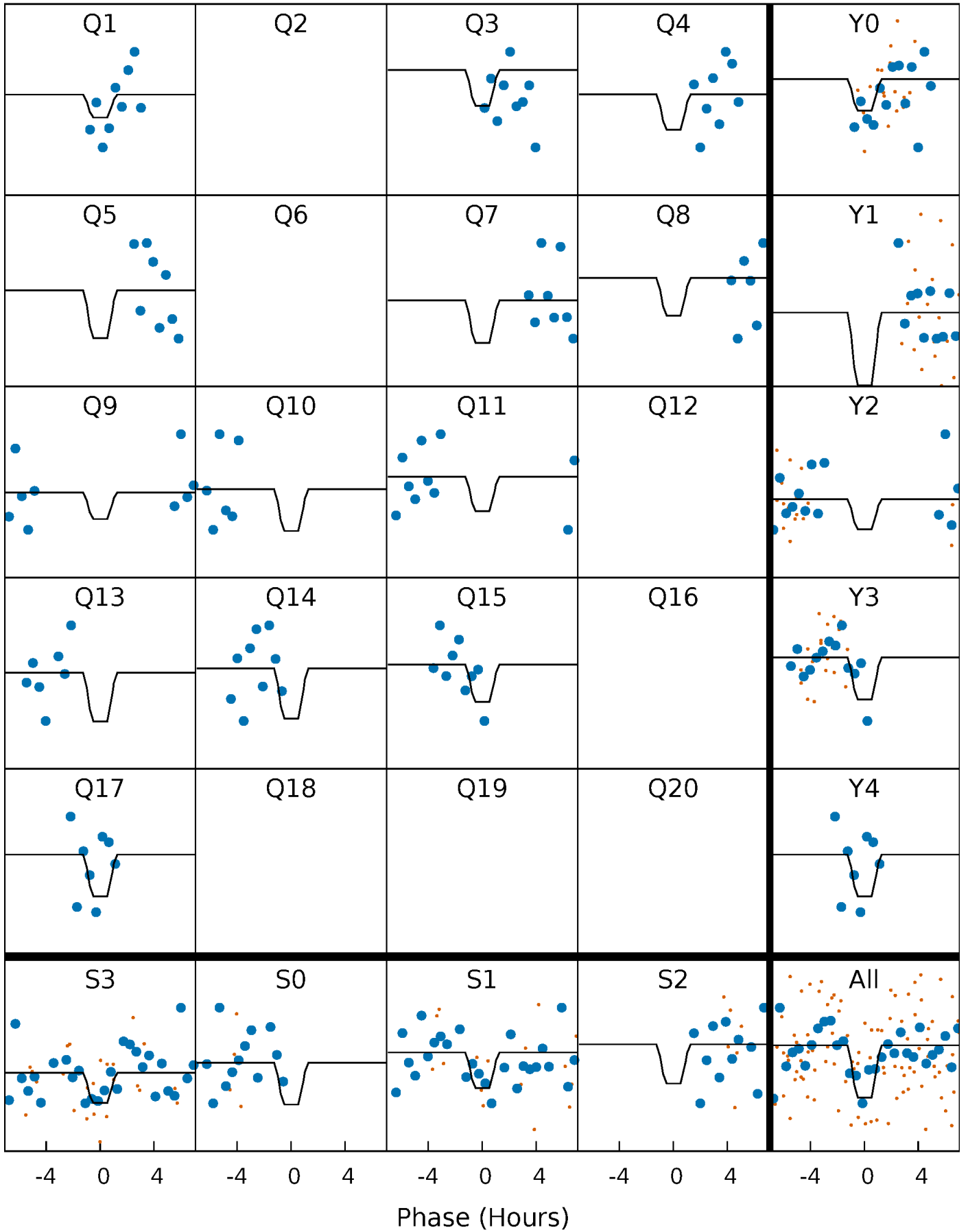
# DV Quarter-Phased Transit Curves

TCE 010647493-04   P= 62.175731 Days    $T_0=144.131668$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

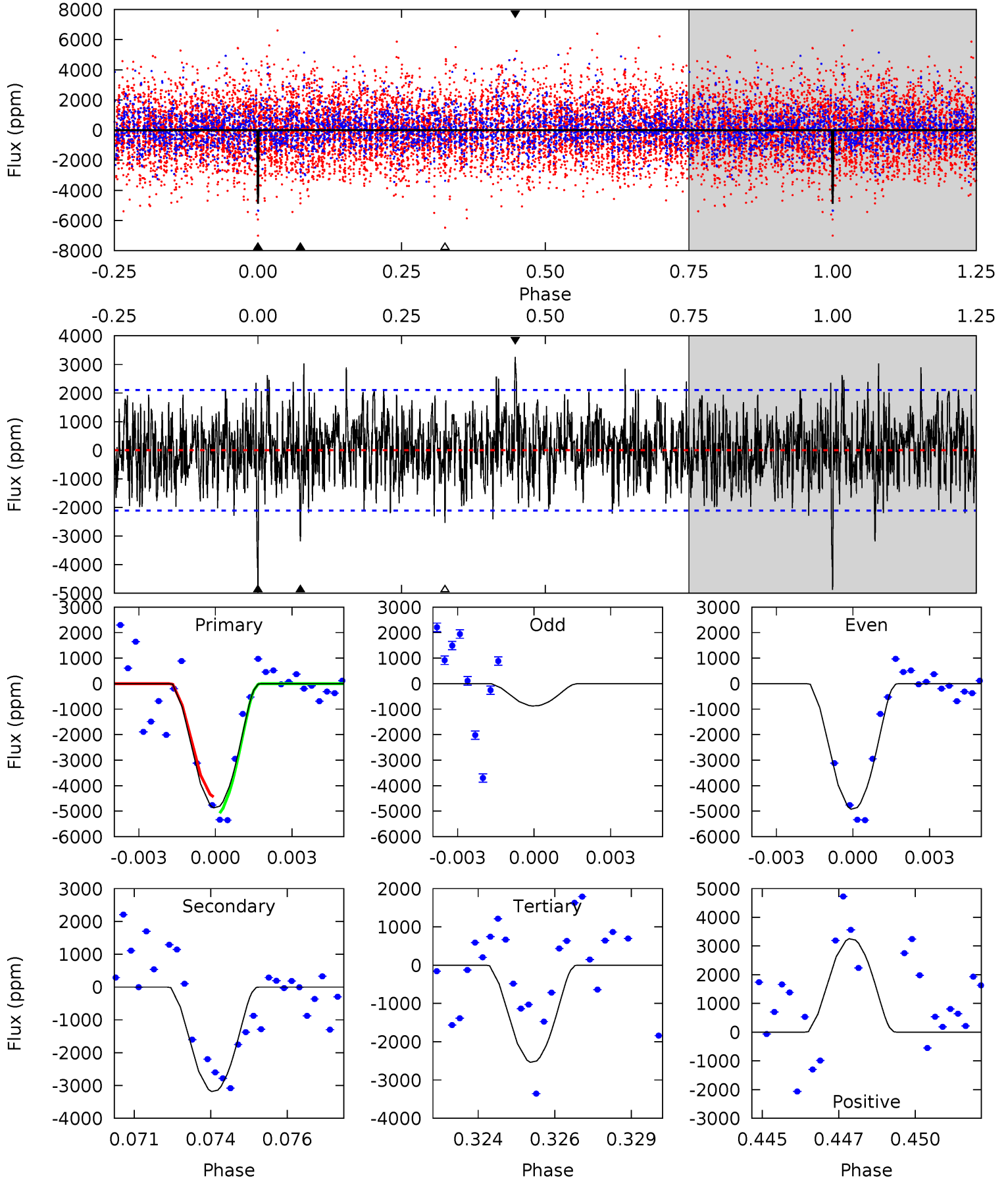
TCE 010647493-04   P= 62.170408 Days    $T_0=144.140818$  (BKJD)



# DV Model-Shift Uniqueness Test

010647493-04, P = 62.175731 Days, E = 81.955937 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
12.2	7.98	6.36	8.16	5.28	3.01	2.06	5.85	4.05	1.62	-0.17	6.79	1.08	0.40	0.63

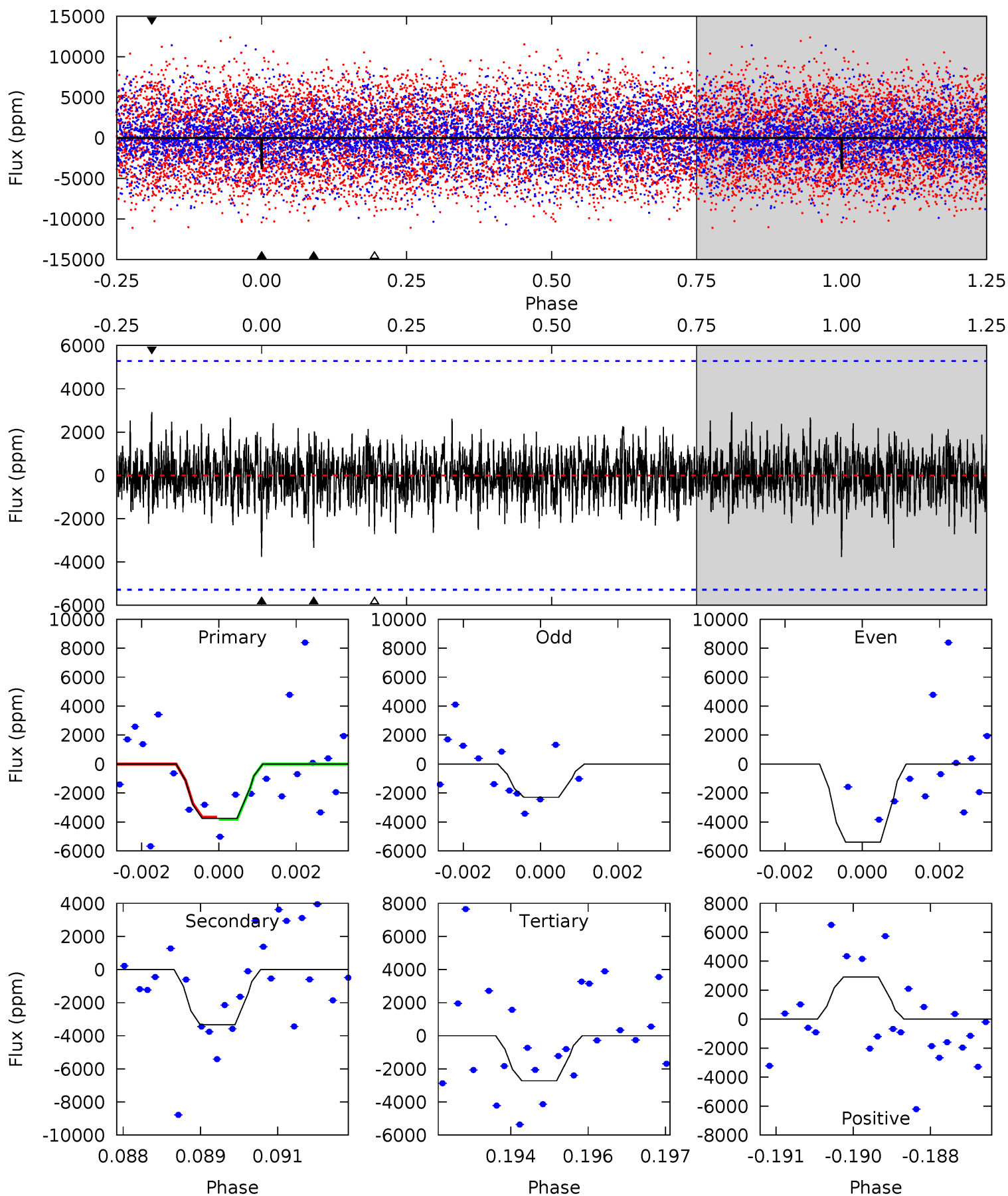




# Alt Model-Shift Uniqueness Test

010647493-04, P = 62.170408 Days, E = 81.970410 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.83	3.39	2.77	2.96	5.38	3.17	0.85	1.06	0.86	0.63	0.43	1.63	1.00	0.44	0.08



### Stellar Parameters For KIC 010647493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7103^{+197}_{-338}$	$4.122^{+0.132}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.802^{+0.577}_{-0.336}$	$1.566^{+0.206}_{-0.252}$	$0.377^{+0.255}_{-0.206}$
	+3%/-5%	+3%/-5%	+200%/-350%	+32%/-19%	+13%/-16%	+68%/-55%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010647493-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-3186 \pm 399$	$76.26^{+76.65}_{-53.64}$	$984^{+76}_{-63}$	$3256^{+1746}_{-566}$	$38^{+381}_{-28}$
Alt.	$-3335 \pm 982$	$71.30^{+76.43}_{-48.00}$	$983^{+77}_{-62}$	$3317^{+1633}_{-642}$	$42^{+364}_{-32}$

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

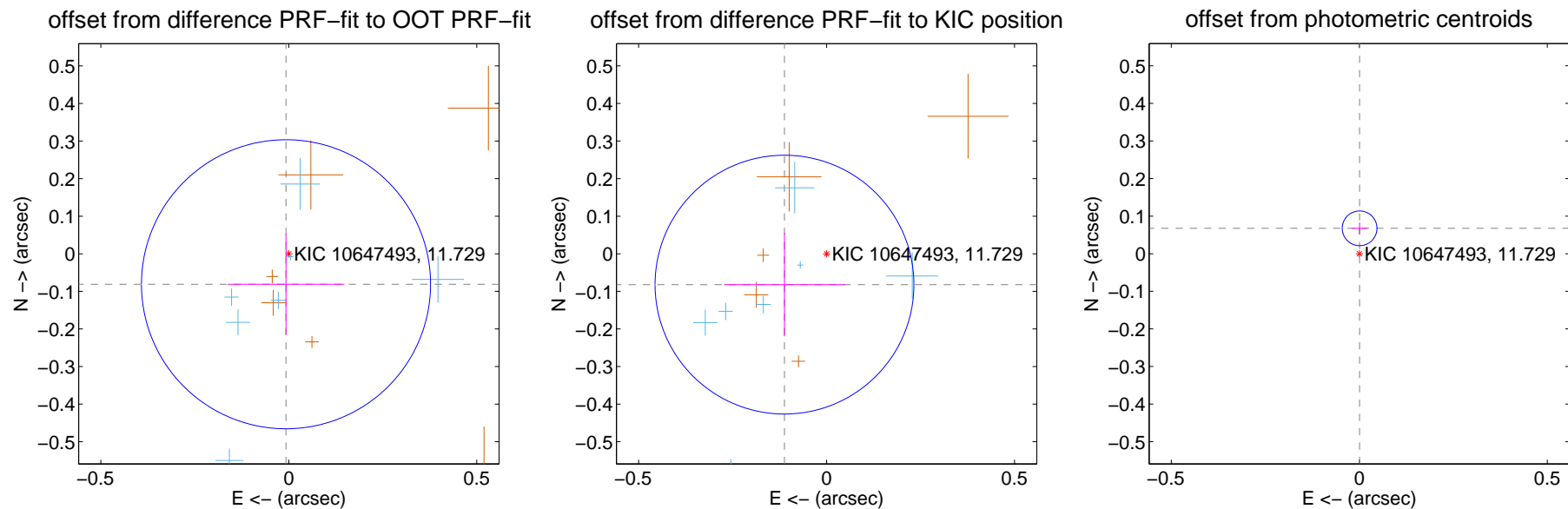
## DV Centroid Data

Supplemental centroid analysis for 010647493-04. **Kepler magnitude: 11.73.** Transit SNR 12.74

There are 11 quarters with good PRF difference image offsets

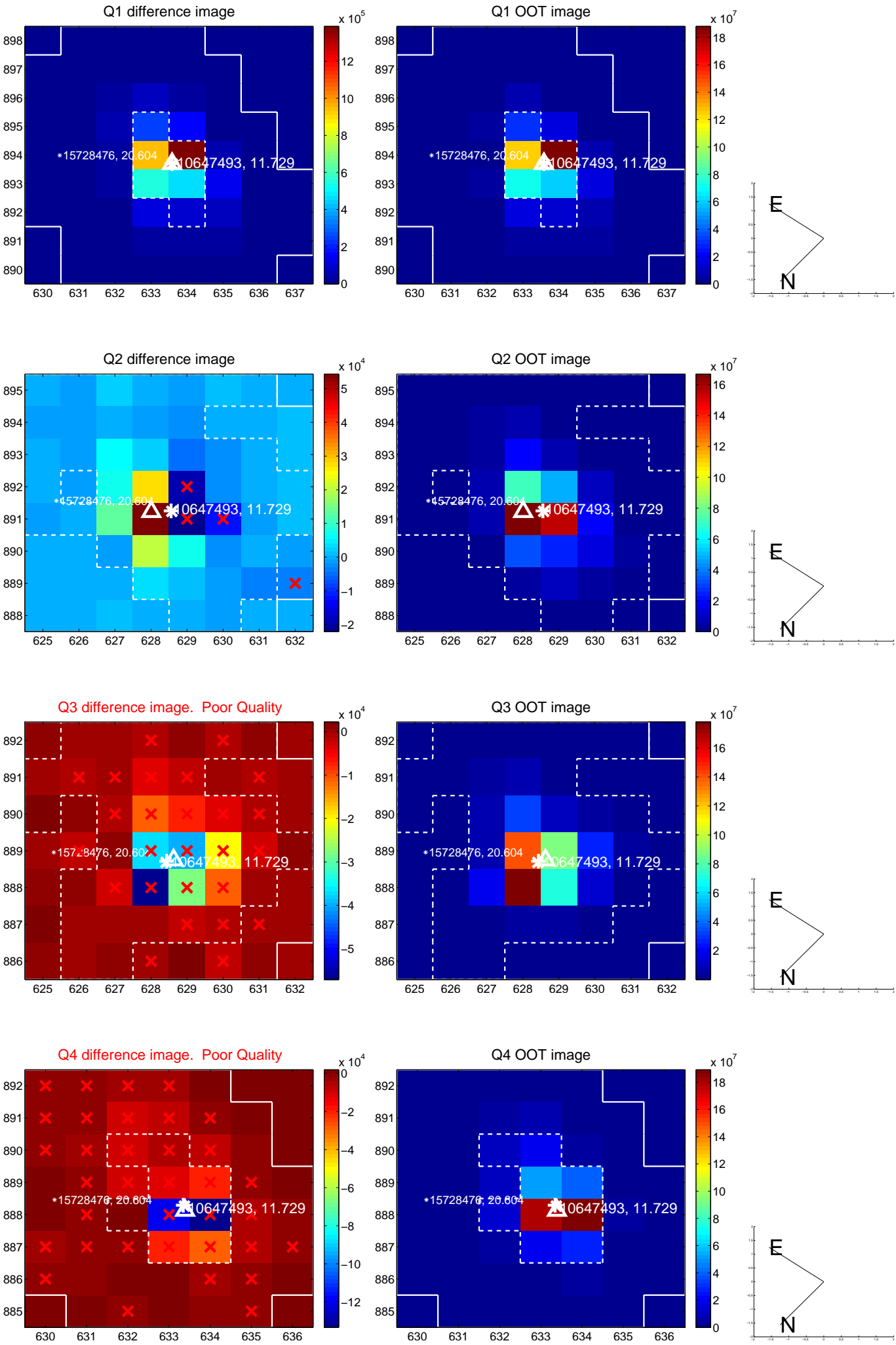
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.081 \pm 0.128$	0.64	$0.007 \pm 0.155$	$-0.081 \pm 0.134$
PRF-fit source offset from KIC position	$0.139 \pm 0.115$	1.21	$0.112 \pm 0.161$	$-0.082 \pm 0.137$
photometric centroid source offset	<b><math>0.07 \pm 0.02</math></b>	<b>4.39</b>	$-0.00 \pm 0.02$	$0.07 \pm 0.02$

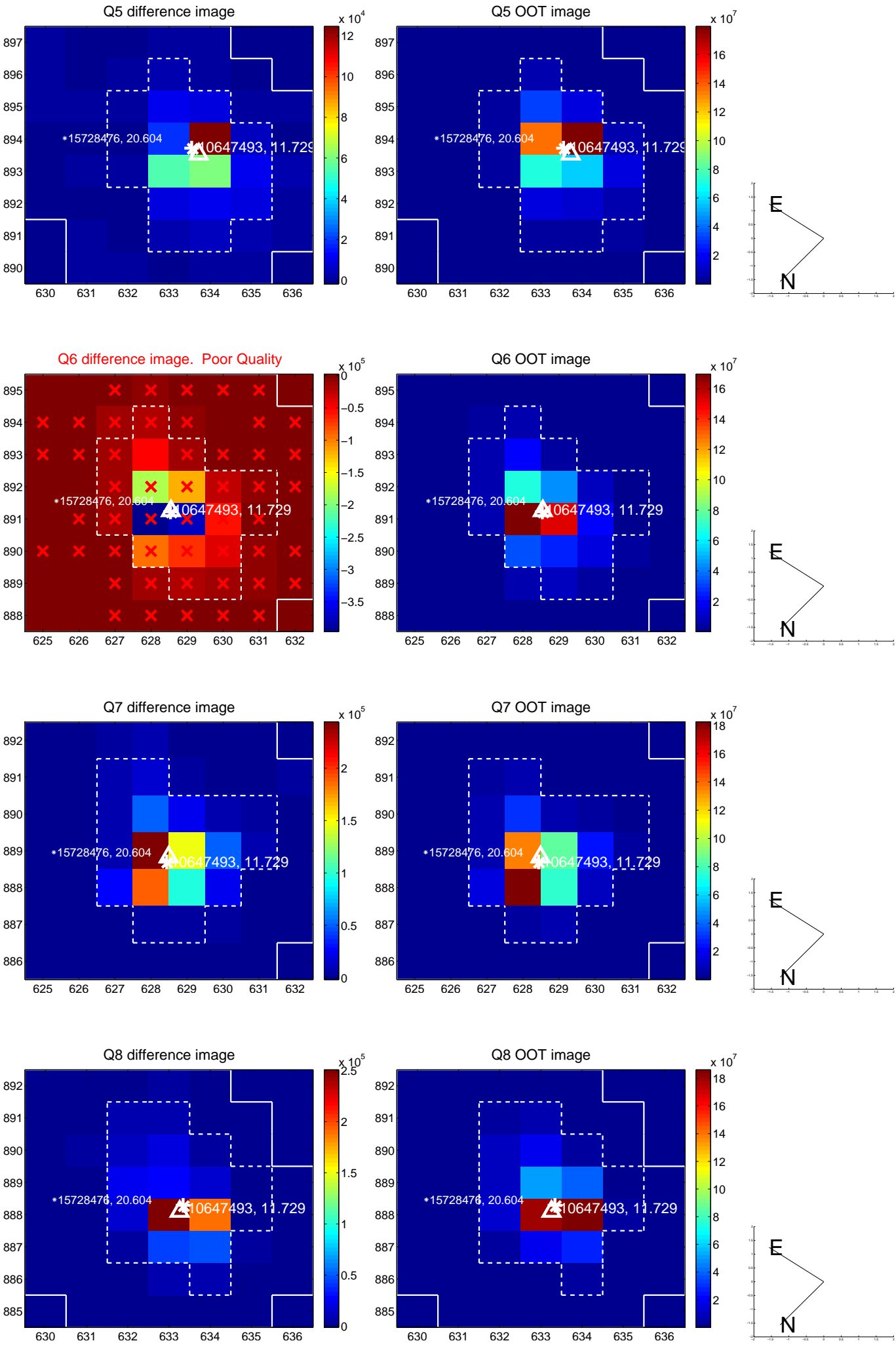


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

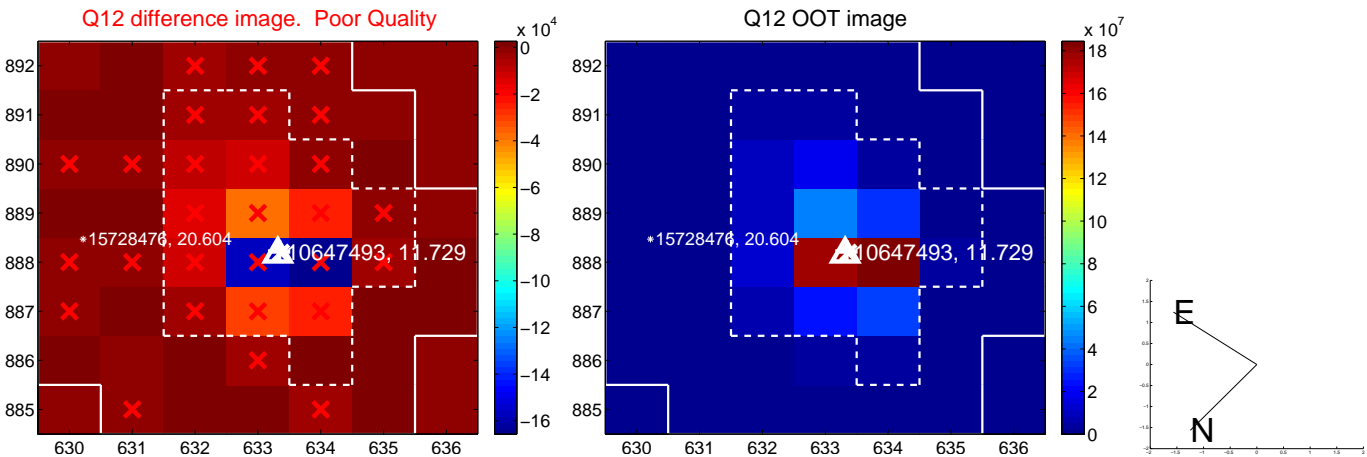
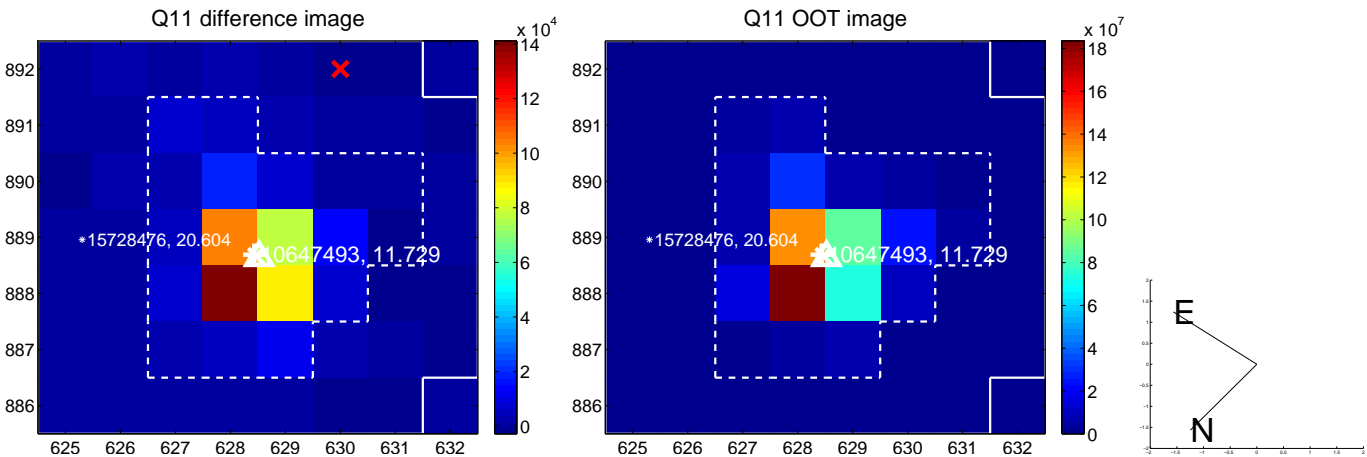
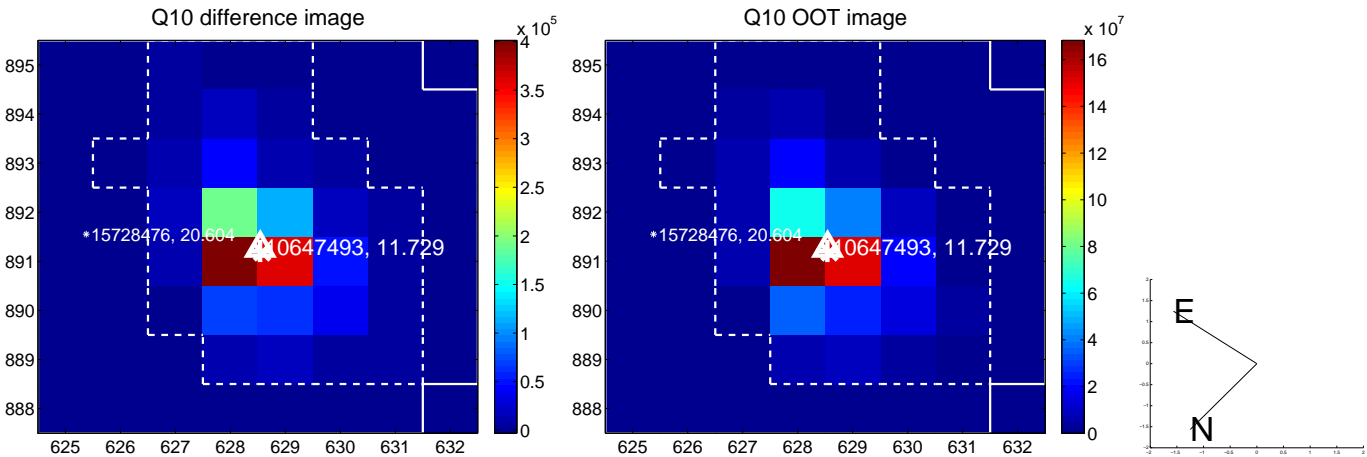
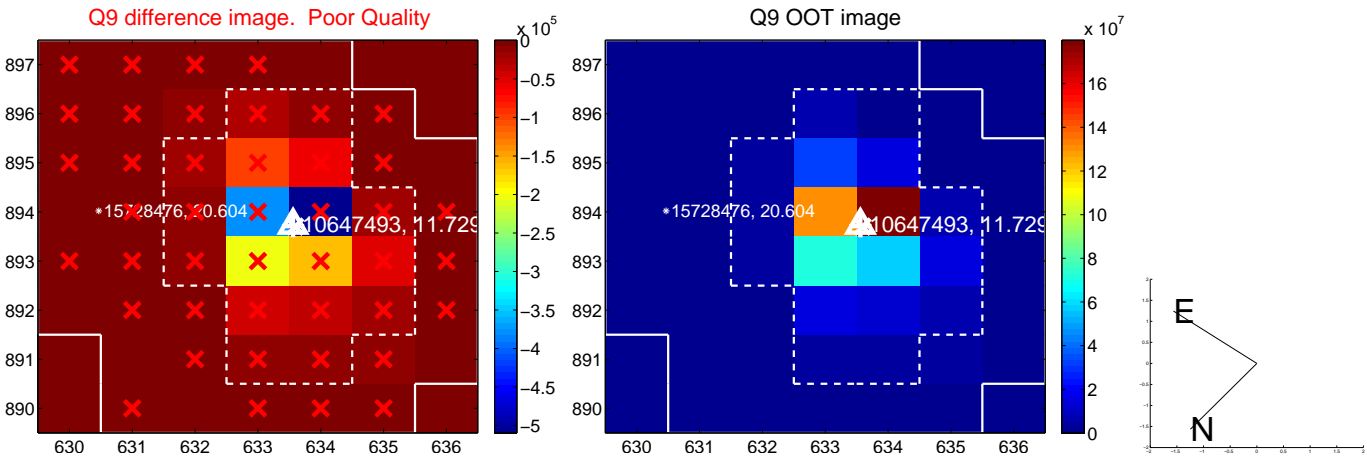
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

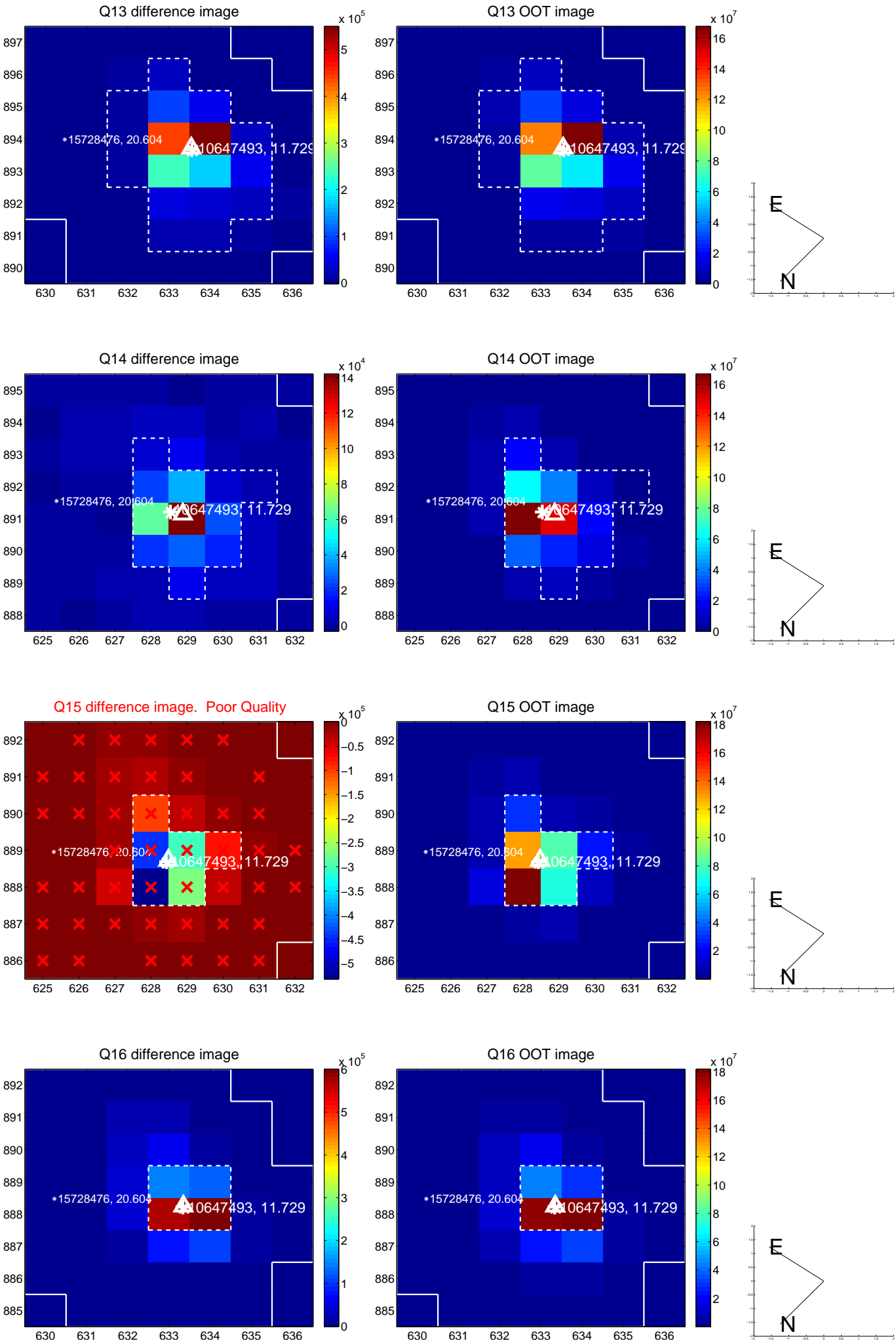


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

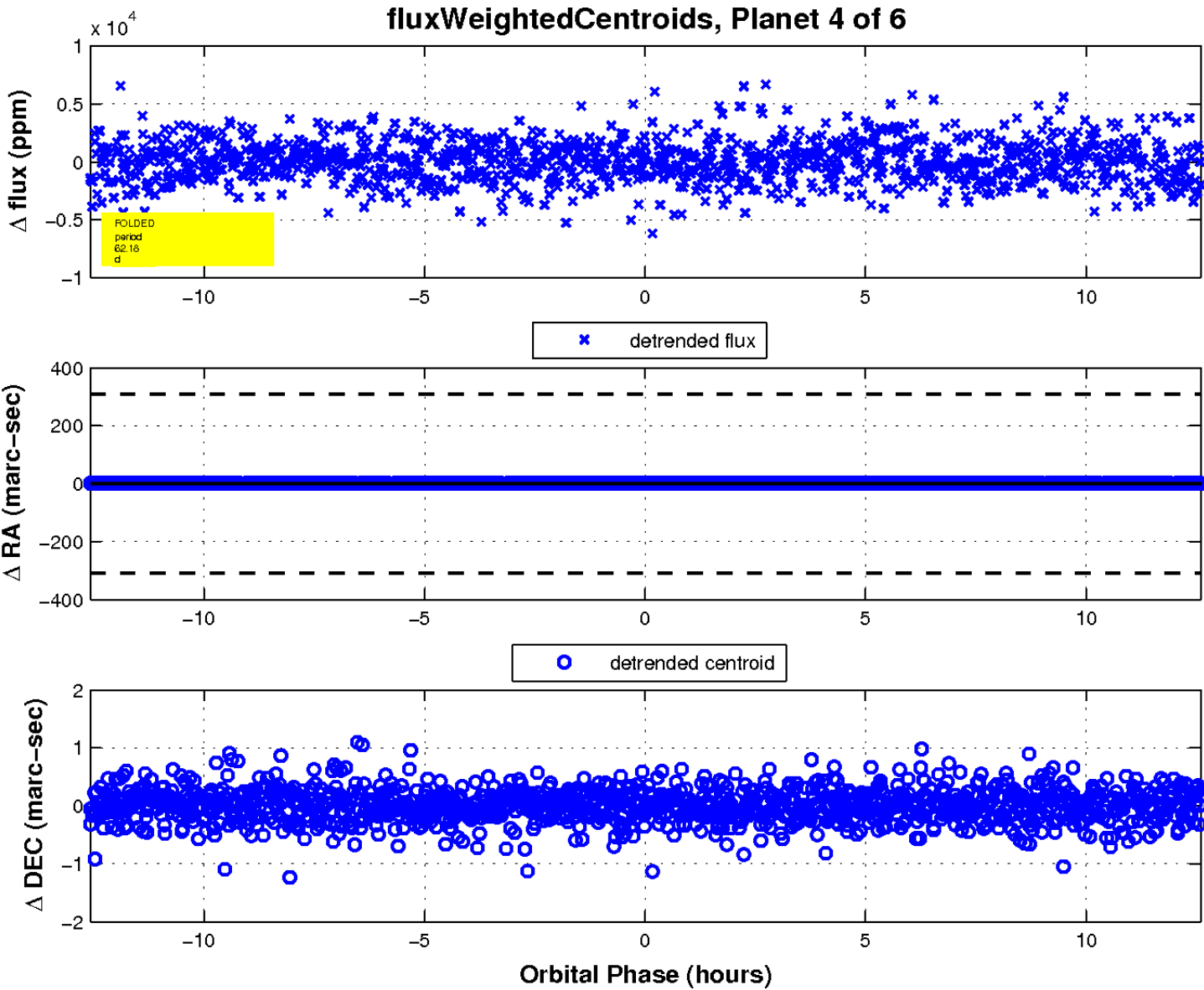
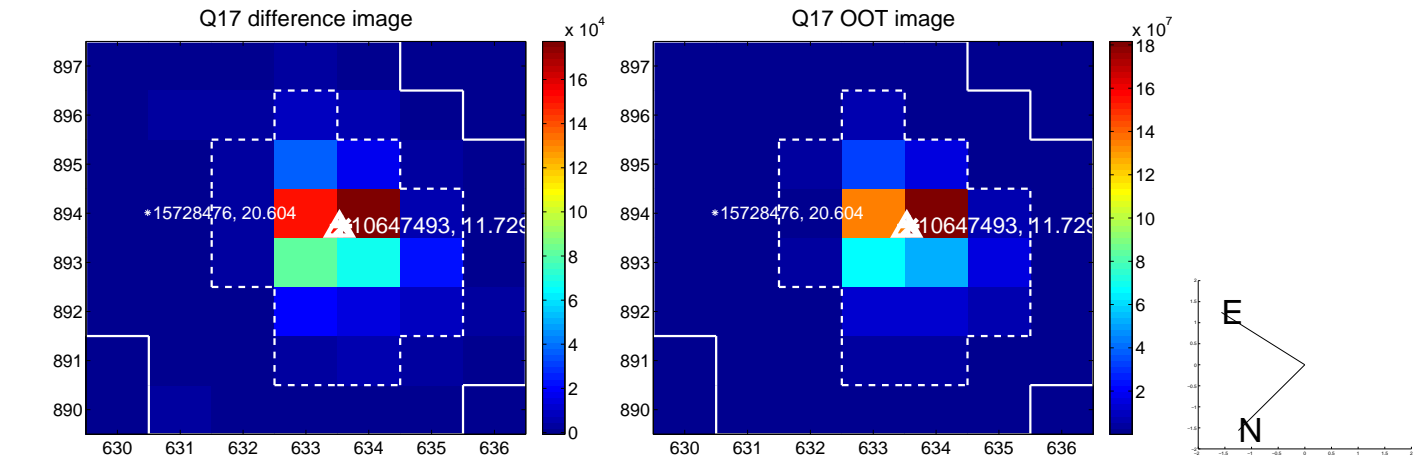




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

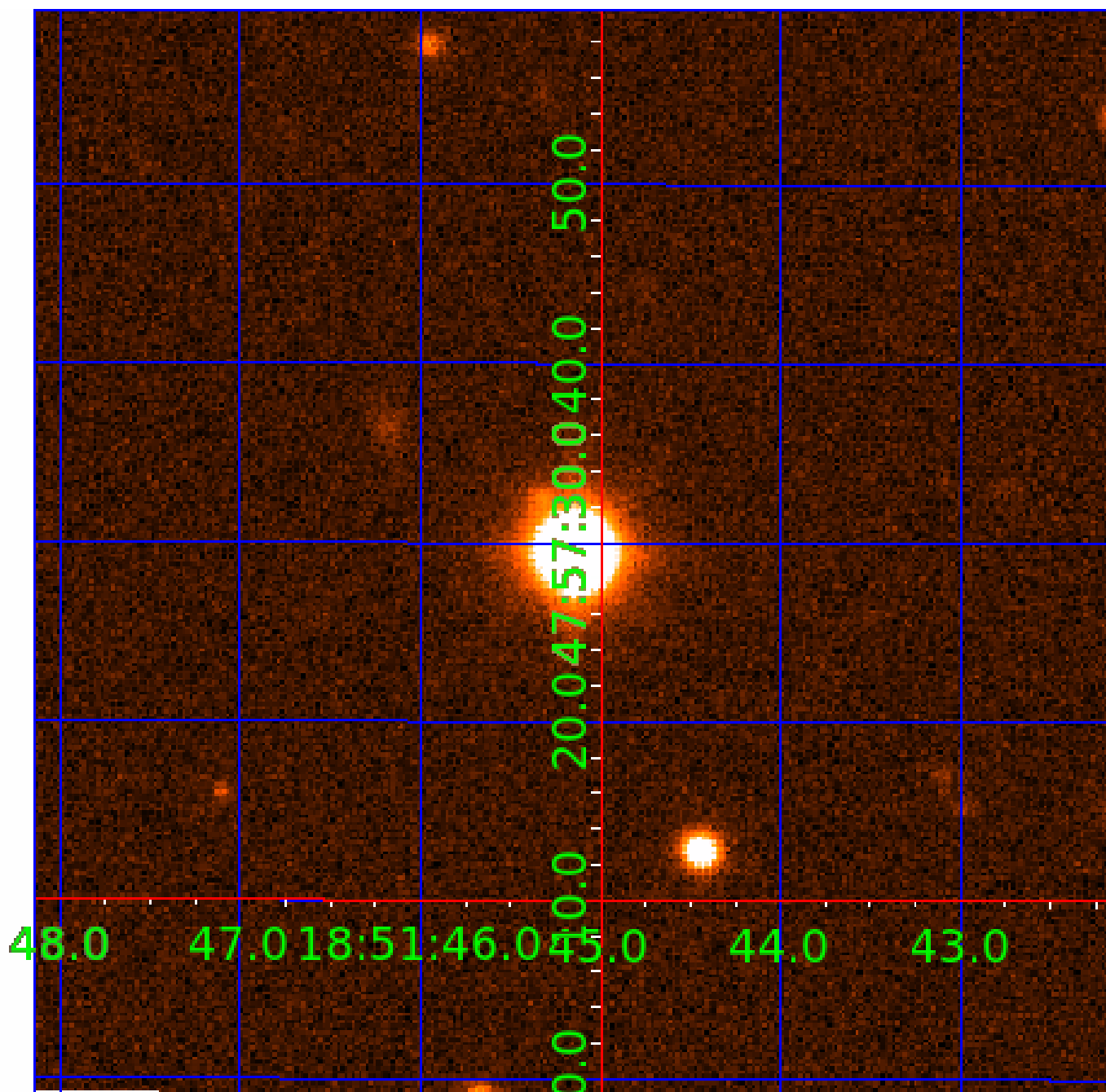


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010647493

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010647493-01	OBS	No	1.141142	132.194872	154.2	7.566	10.8	8.9	1.80	7103	2.40	12005.45
010647493-03	OBS	No	49.698235	156.727559	4627.7	2.766	12.3	12.9	1.80	7103	17.81	78.35
010647493-04	OBS	No	62.175731	144.131668	5533.1	4.204	13.2	12.7	1.80	7103	23.91	58.12
010647493-05	OBS	No	47.295890	172.780042	3082.5	1.419	13.2	8.5	1.80	7103	10.21	83.70
010647493-06	OBS	No	30.722216	148.538281	127.5	3.000	11.5	-1.0	1.80	7103	2.06	148.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010647493-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010647493-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010647493-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
010647493-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV
010647493-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

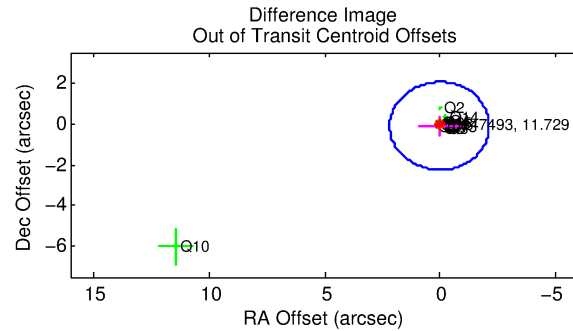
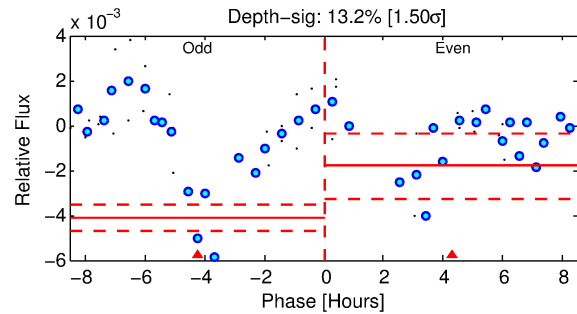
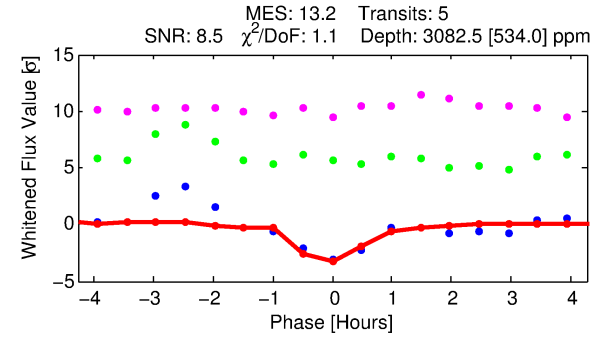
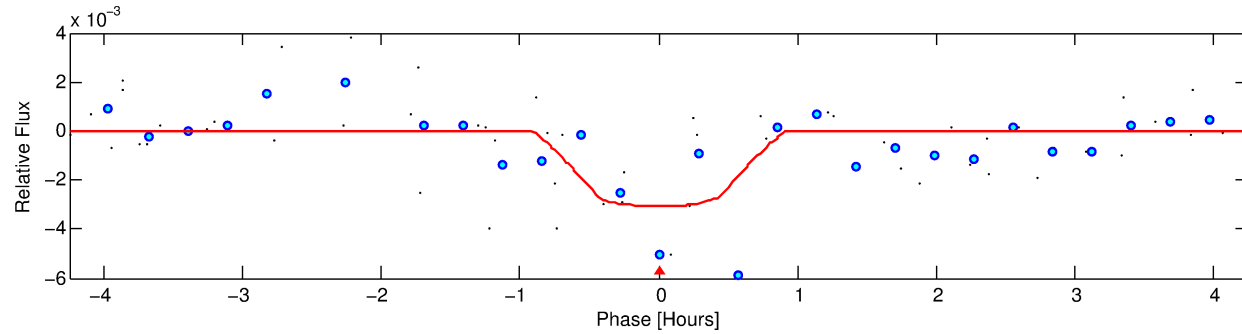
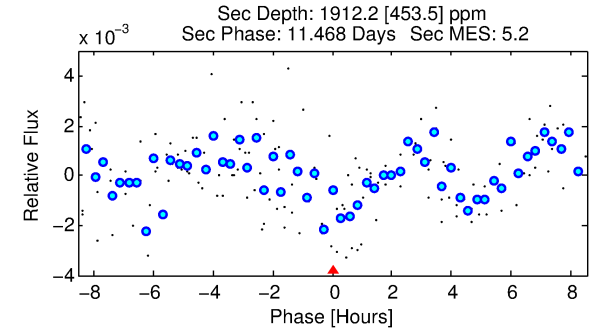
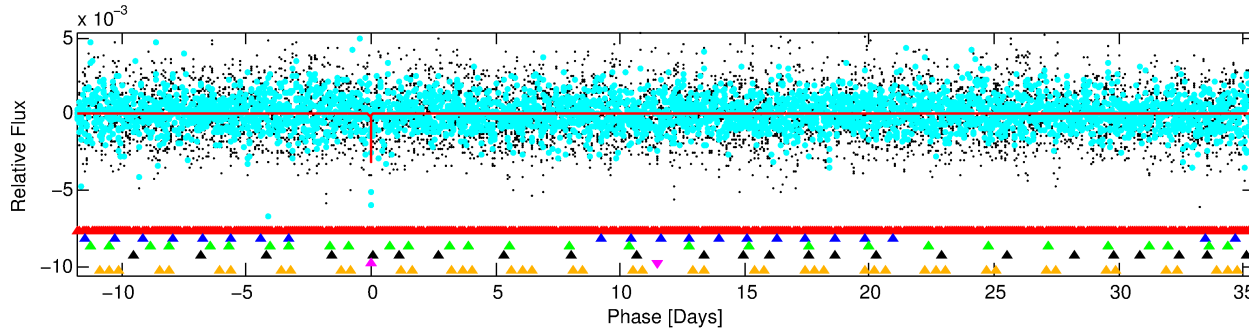
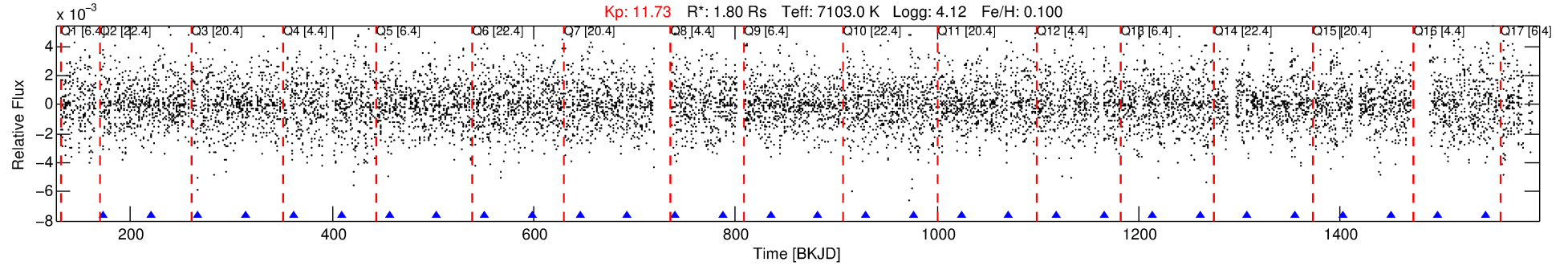
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010647493-05

No Significant Match Found

# DV One-Page Summary

KIC: 10647493 Candidate: 5 of 6 Period: 47.296 d



## DV Fit Results:

Period = 47.29589 [0.00043] d  
Epoch = 172.7800 [0.0045] BKJD  
 $R_p/R^*$  = 0.0519 [0.1784]  
 $a/R^*$  = 260.93 [5134.19]  
 $b$  = 0.24 [78.47]  
 $S_{\text{eff}}$  = 83.70 [34.93]  
 $T_{\text{eq}}$  = 771 [80] K  
 $R_p$  = 10.20 [35.23]  $R_e$   
 $a$  = 0.2975 [0.0779] AU  
 $A_g$  = 893.76 [6157.56] [0.14σ]  
 $T_{\text{eff}}$  = 6520 [11218] K [0.51σ]

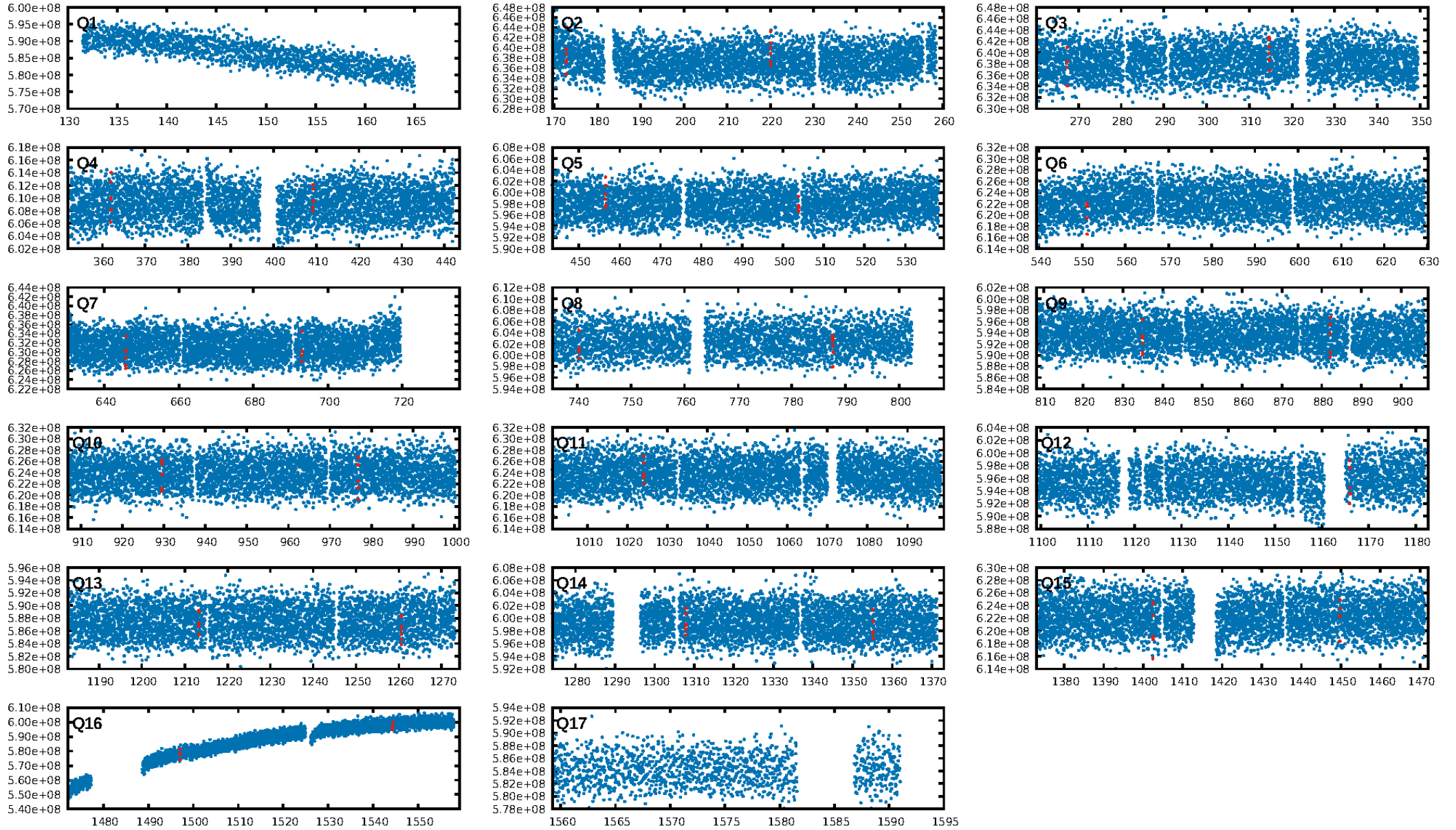
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [119.86σ]  
LongPeriod-sig: 100.0% [18.55σ]  
ModelChiSquare2-sig: 9.7%  
ModelChiSquareGof-sig: 87.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 0.7587  
Centroid-sig: N/A  
Centroid-so: 0.030 arcsec [0.81σ]  
OotOffset-rm: 0.110 arcsec [0.15σ]  
KicOffset-rm: 0.246 arcsec [0.27σ]  
OotOffset-st: 4/4/3/3 [14]  
KicOffset-st: 4/4/3/3 [14]  
DiffImageQuality-fgm: 0.64 [9/14]  
DiffImageOverlap-fno: 0.50 [7/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:24:01 Z

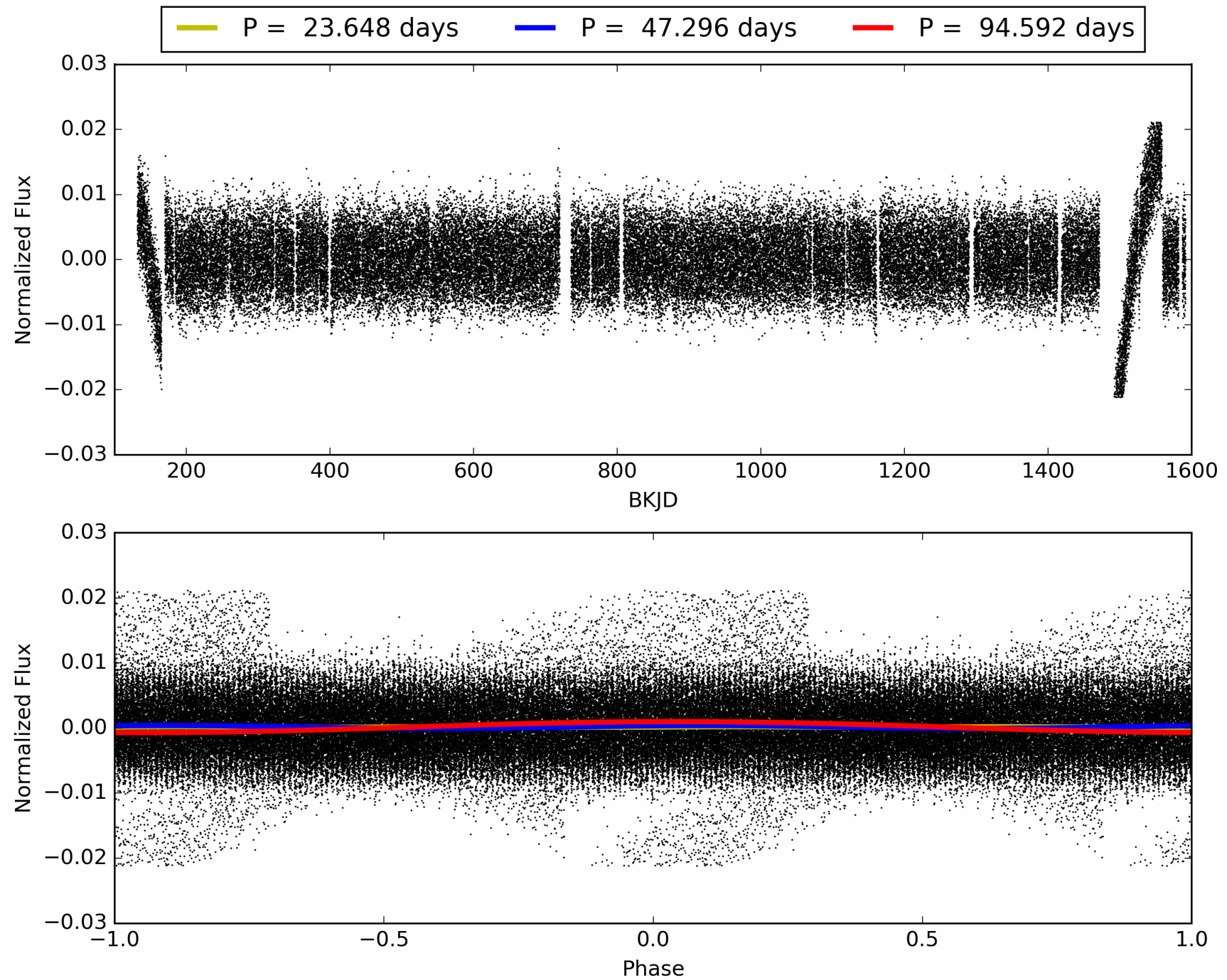
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010647493-05, PDC Light Curves



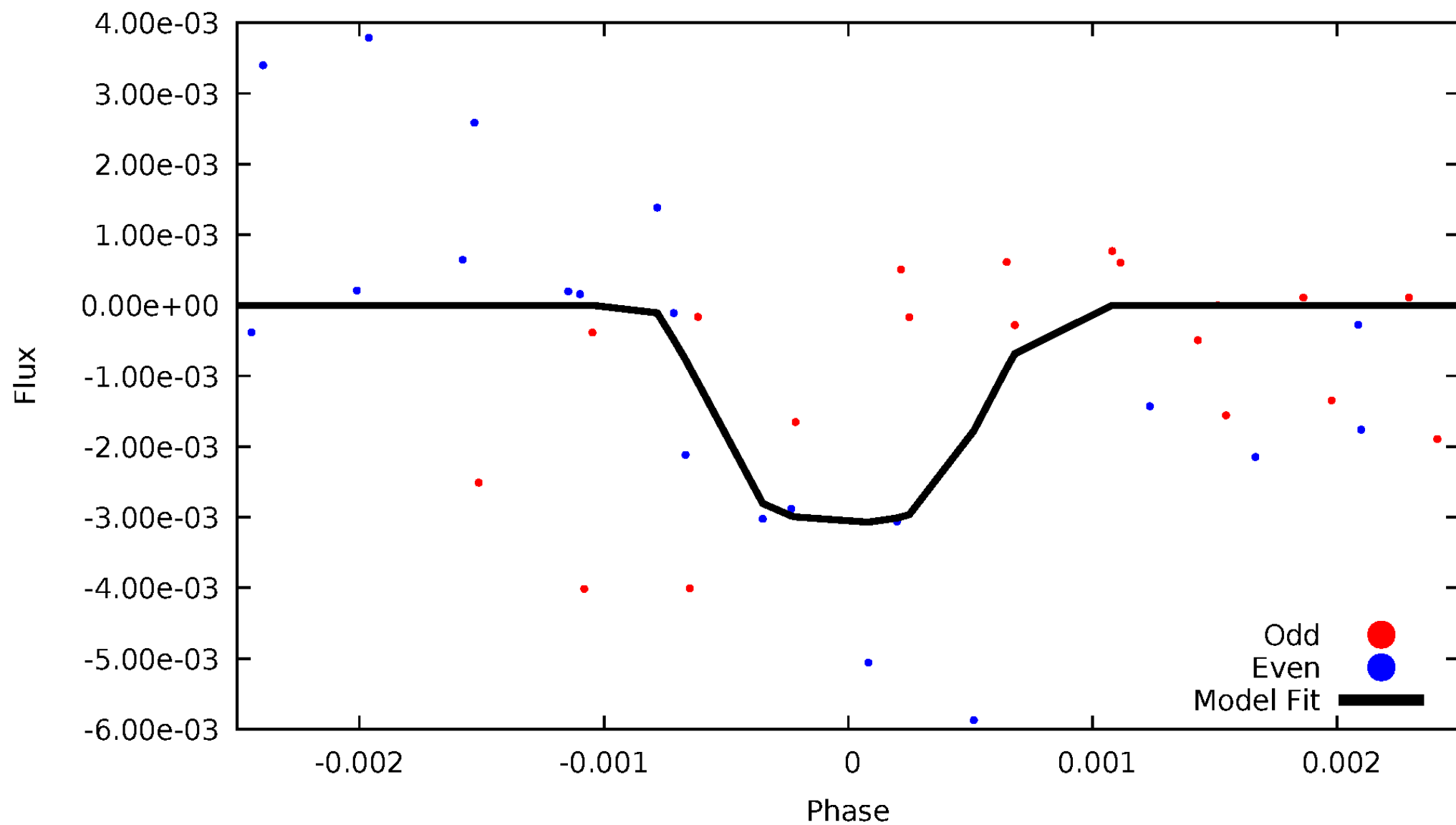


TCE 010647493-05



# DV Odd/Even

TCE 010647493-05



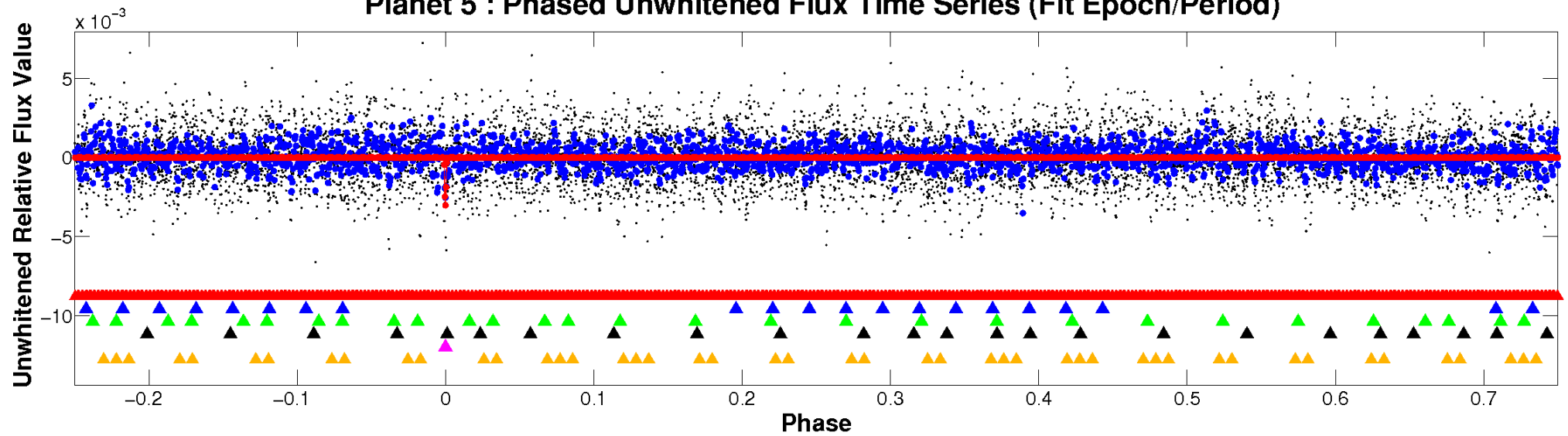


ALT Odd/Even

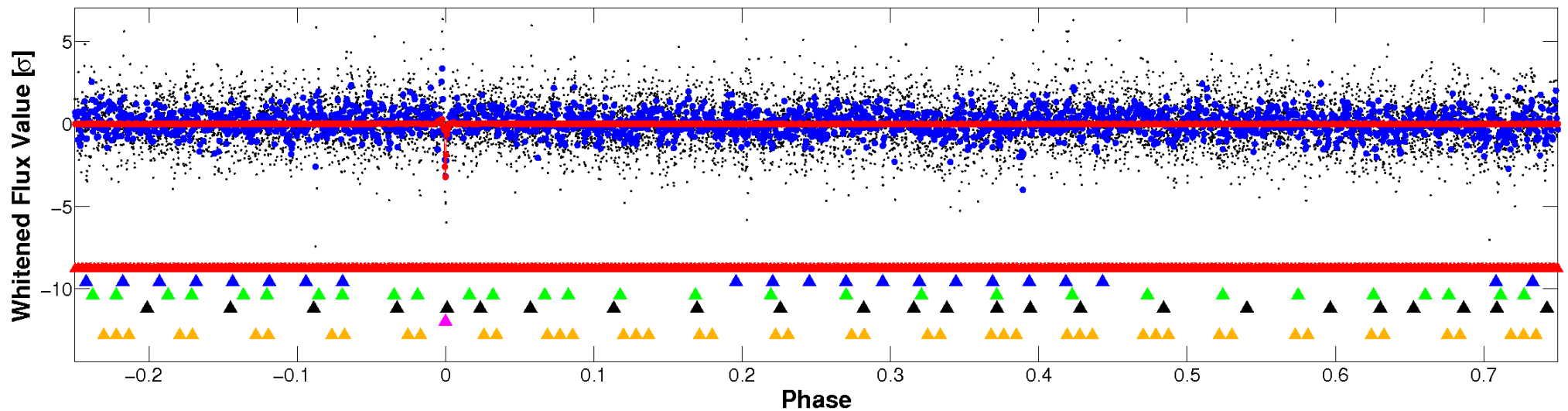
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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

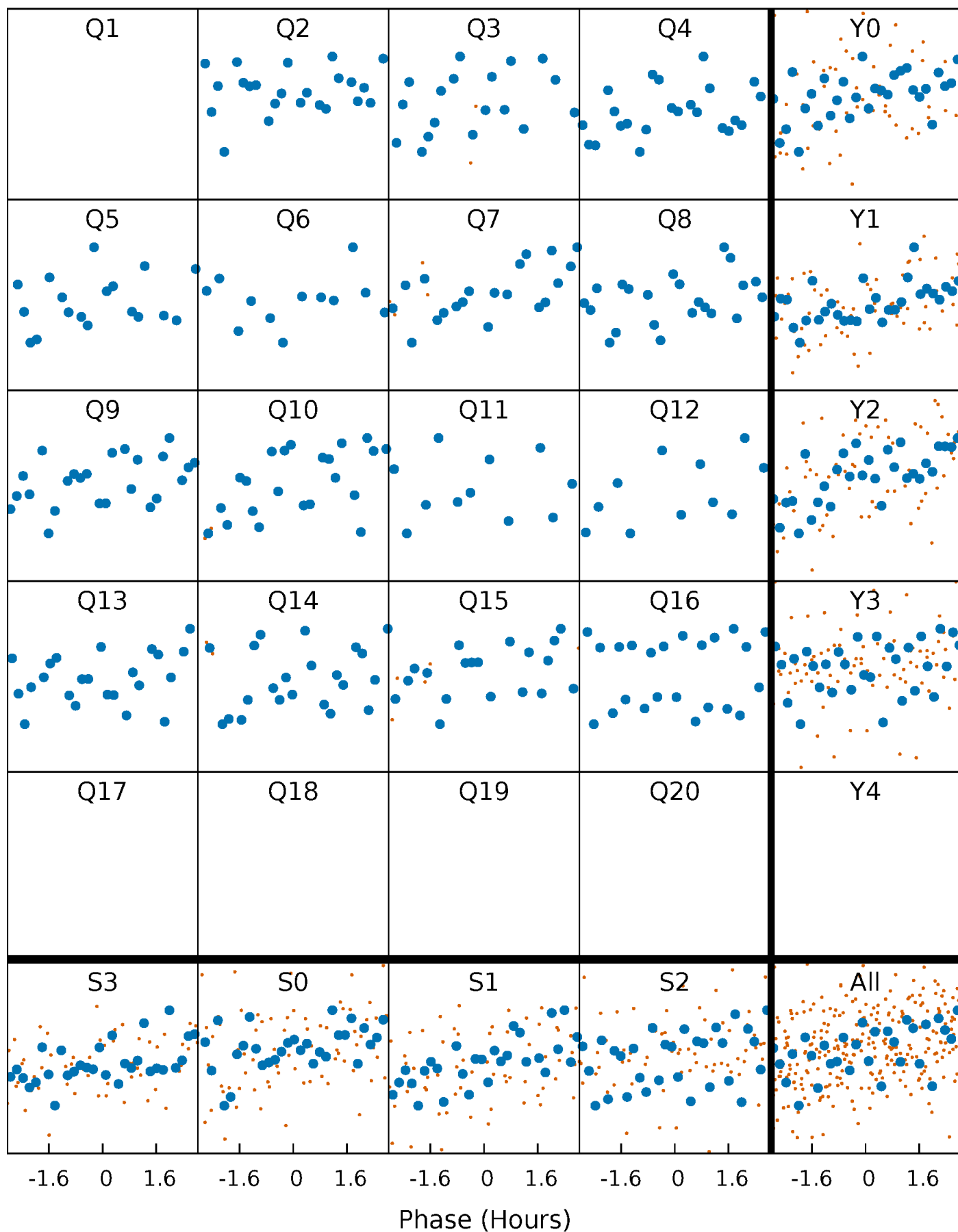


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



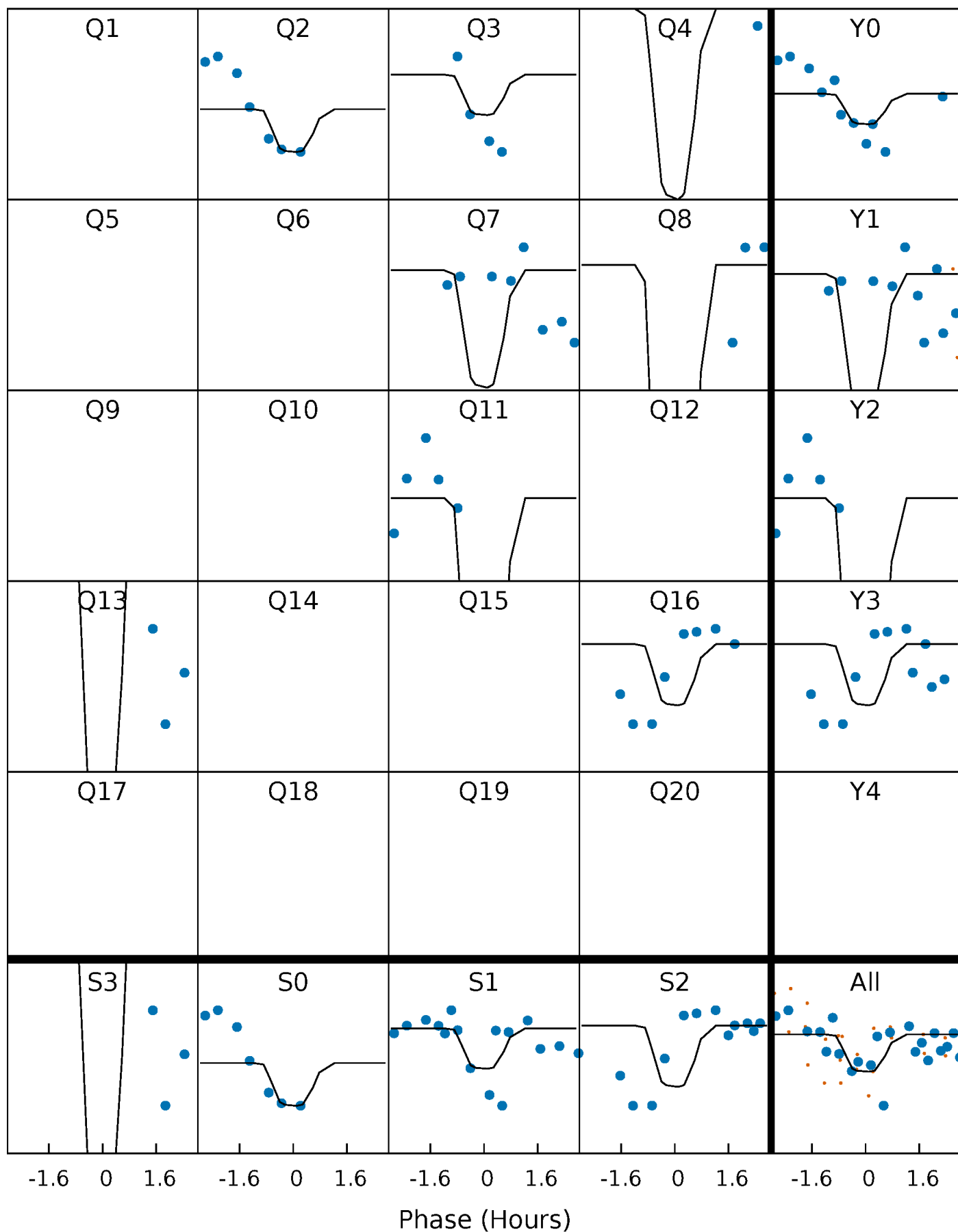
# PDC Quarter-Phased Transit Curves

TCE 010647493-05     $P = 47.295890$  Days     $T_0 = 172.780042$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 010647493-05     $P = 47.295890$  Days     $T_0 = 172.780042$  (BKJD)



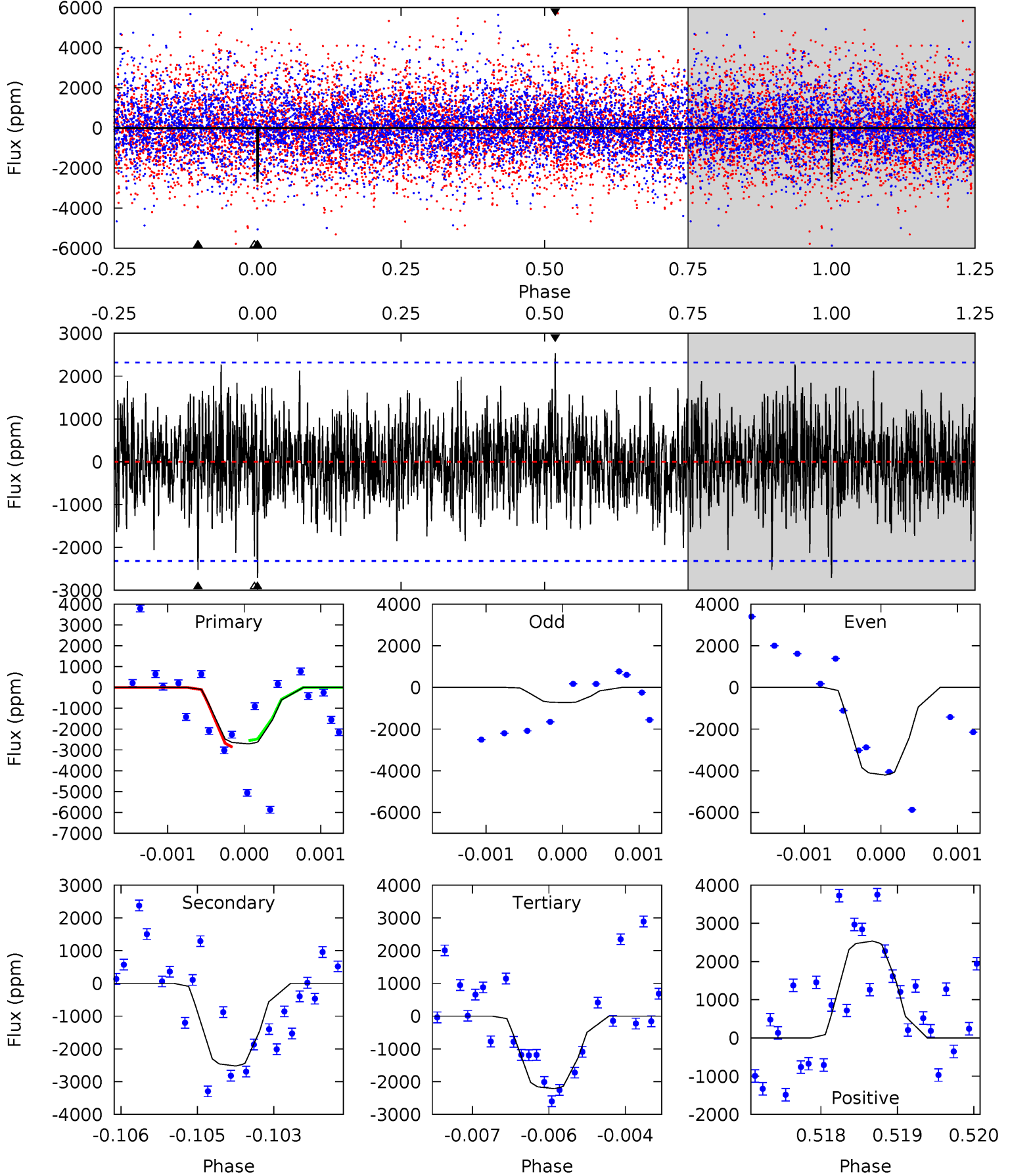


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

010647493-05, P = 47.295890 Days, E = 125.484152 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
6.31	5.88	5.16	5.91	5.39	3.20	1.57	1.15	0.41	0.72	-0.03	4.05	1.14	0.48	0.36



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 010647493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7103^{+197}_{-338}$	$4.122^{+0.132}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.802^{+0.577}_{-0.336}$	$1.566^{+0.206}_{-0.252}$	$0.377^{+0.255}_{-0.206}$
	+3%/-5%	+3%/-5%	+200%/-350%	+32%/-19%	+13%/-16%	+68%/-55%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010647493-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-2523 \pm 429$	$27.43^{+31.03}_{-18.65}$	$1078^{+84}_{-77}$	$4406^{+3407}_{-1021}$	$157^{+1492}_{-122}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

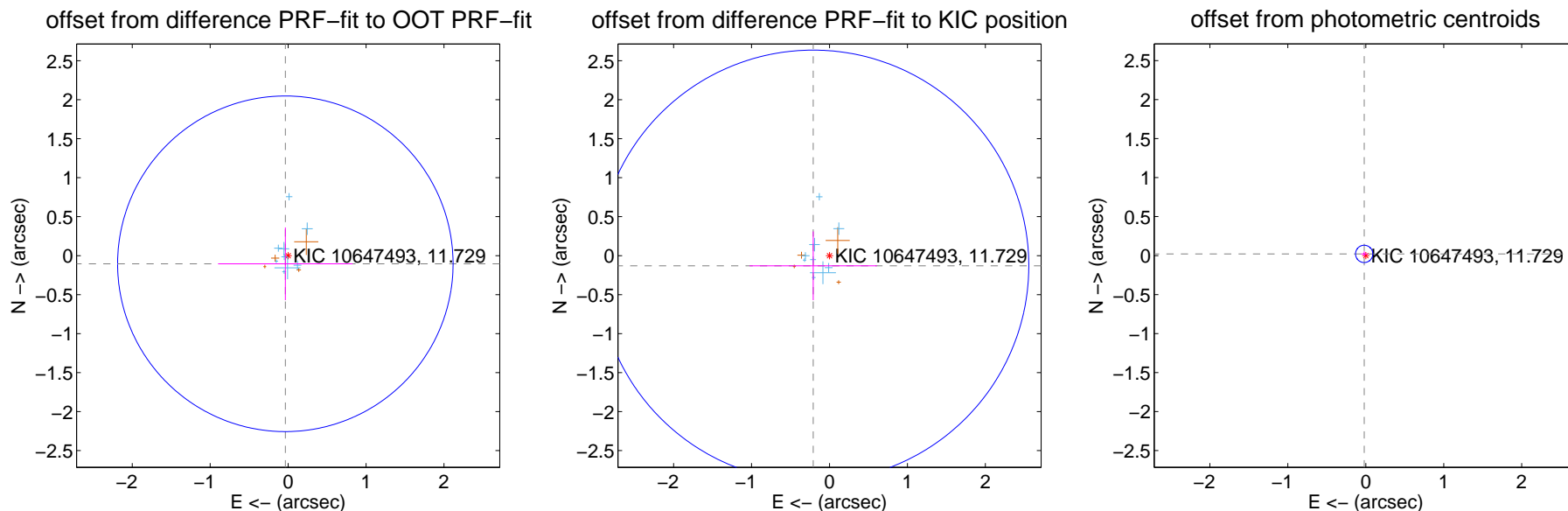
## DV Centroid Data

Supplemental centroid analysis for 010647493-05. **Kepler magnitude: 11.73.** Transit SNR 8.48

There are 9 quarters with good PRF difference image offsets

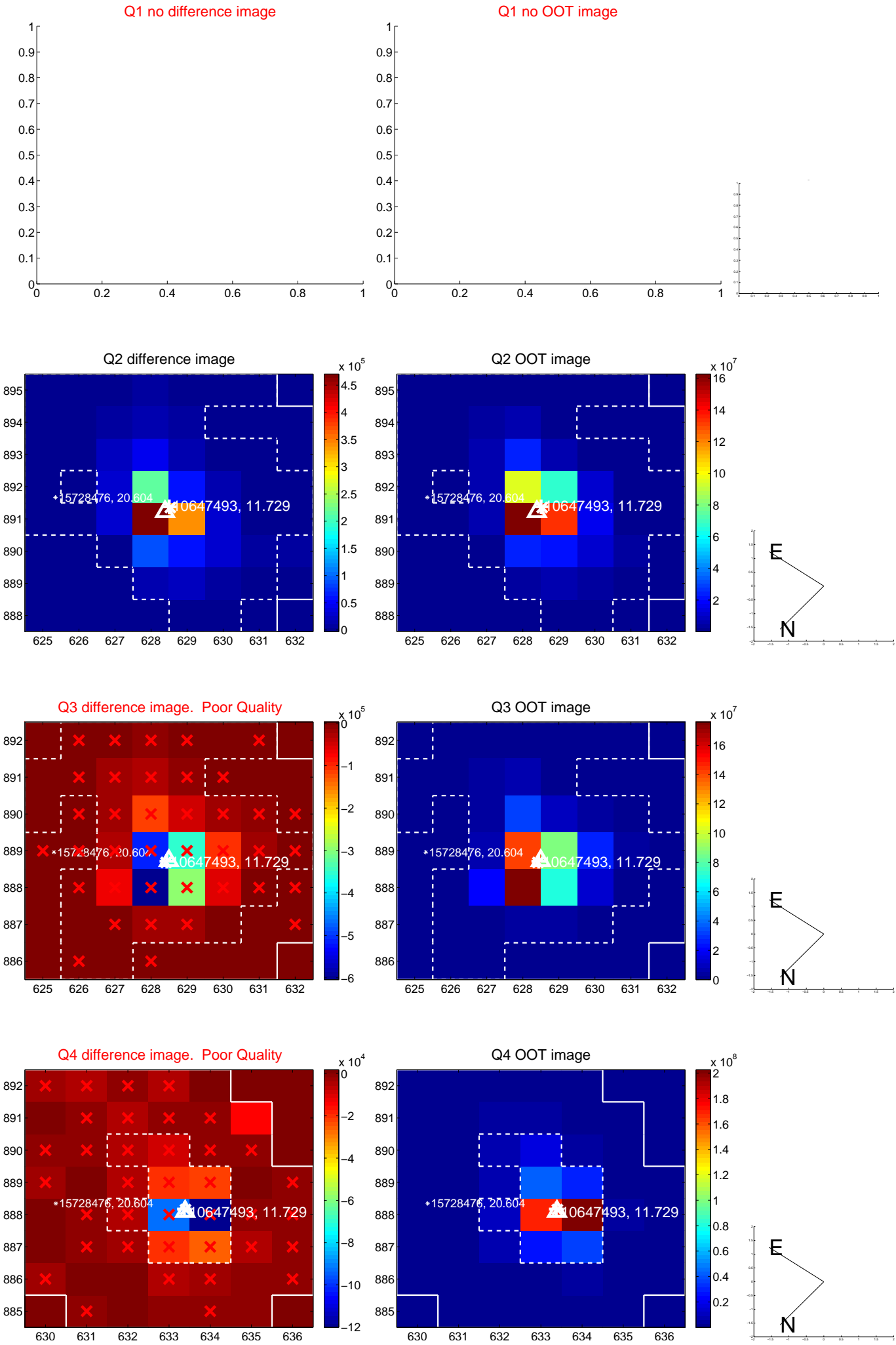
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.110 \pm 0.717$	0.15	$0.036 \pm 0.863$	$-0.104 \pm 0.467$
PRF-fit source offset from KIC position	$0.246 \pm 0.922$	0.27	$0.209 \pm 0.817$	$-0.130 \pm 0.441$
photometric centroid source offset	$0.03 \pm 0.04$	0.81	$0.02 \pm 0.04$	$0.02 \pm 0.03$

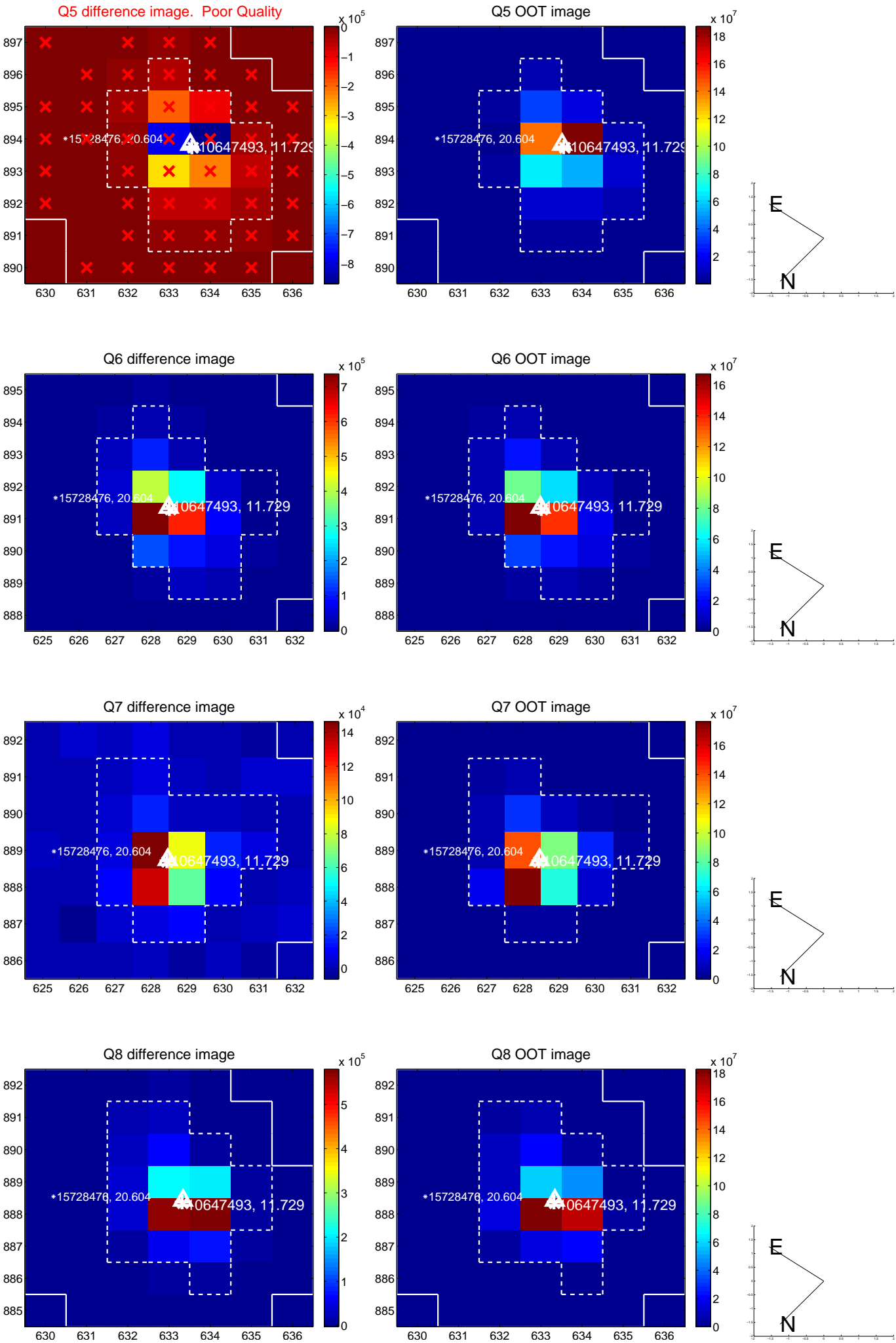


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

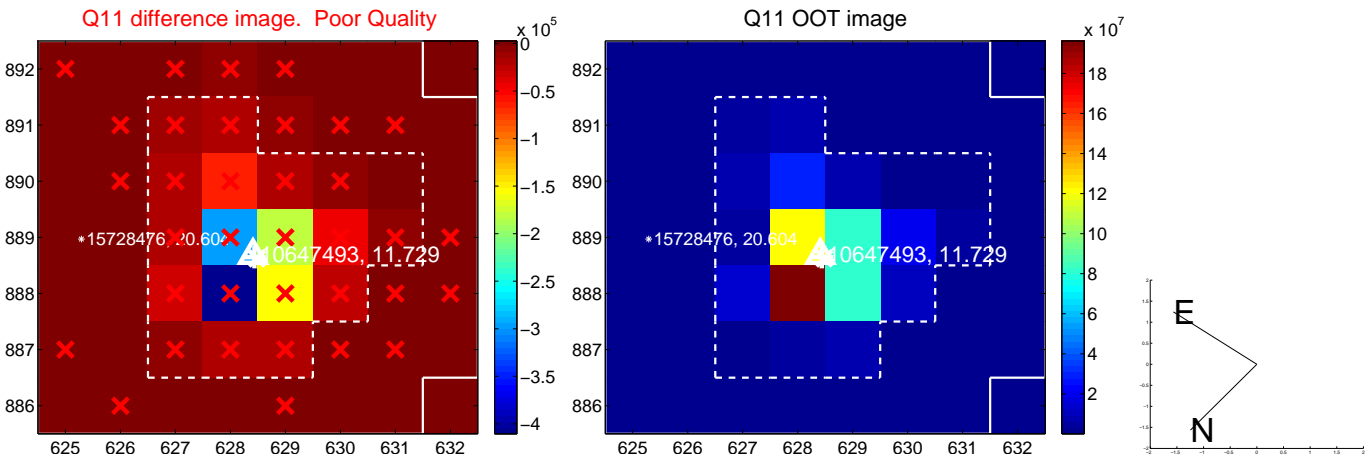
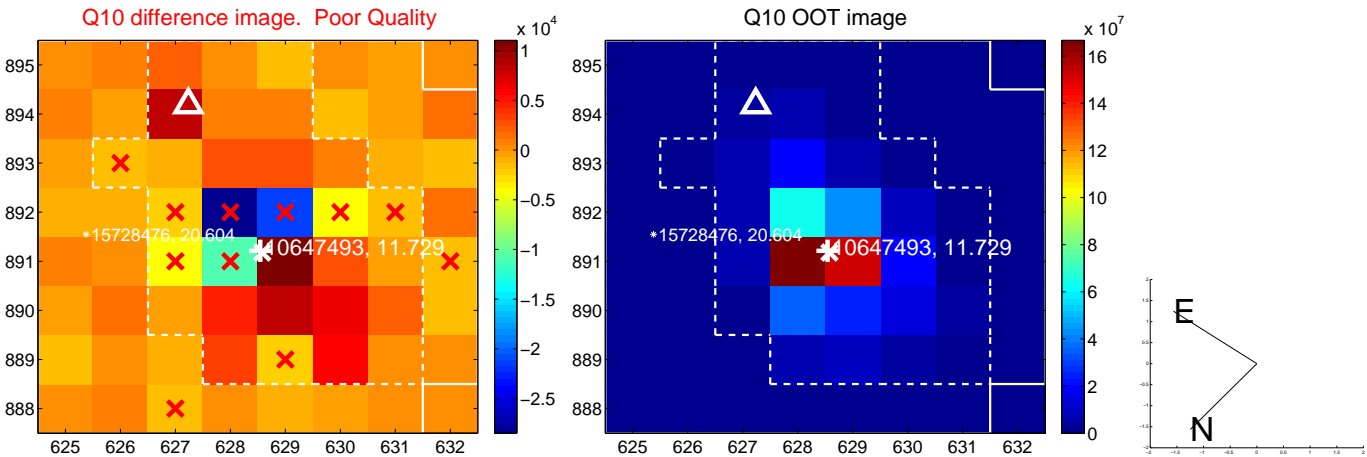
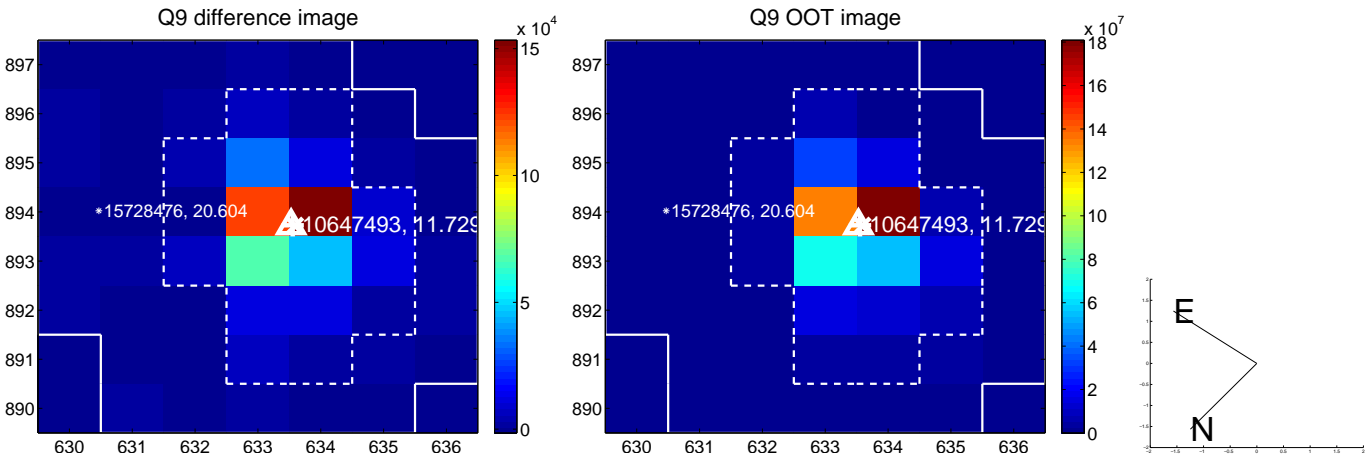


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

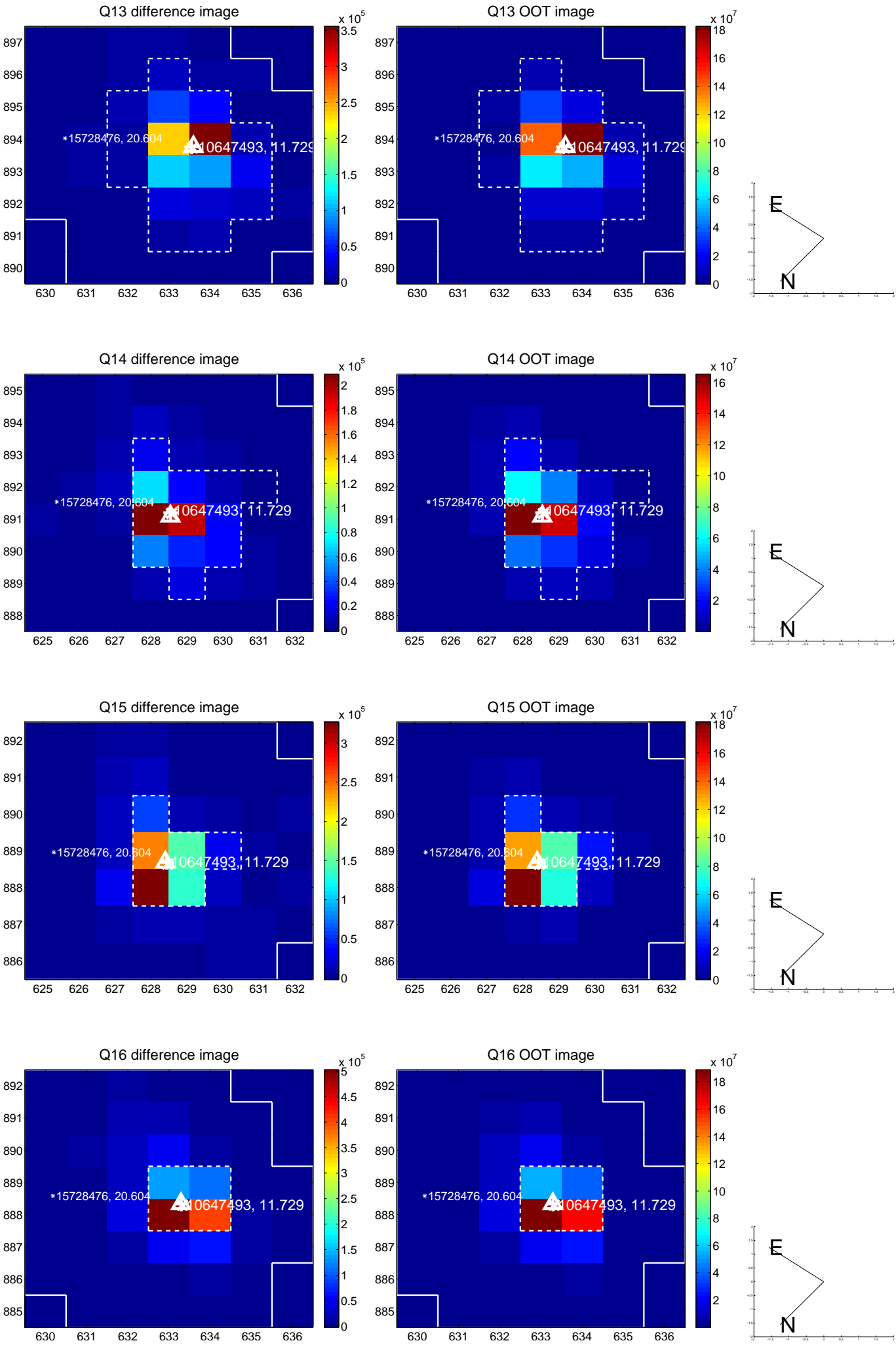




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



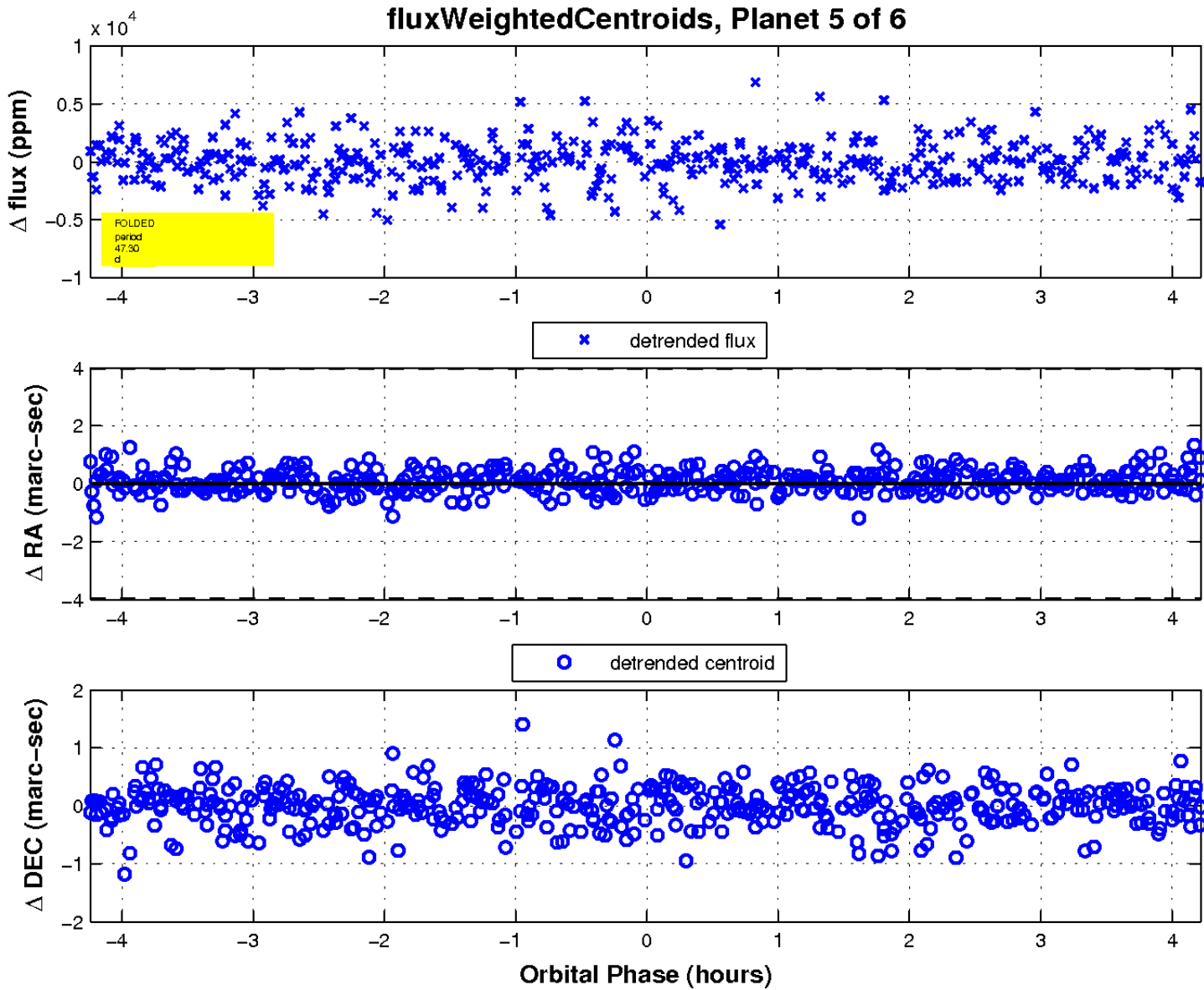
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



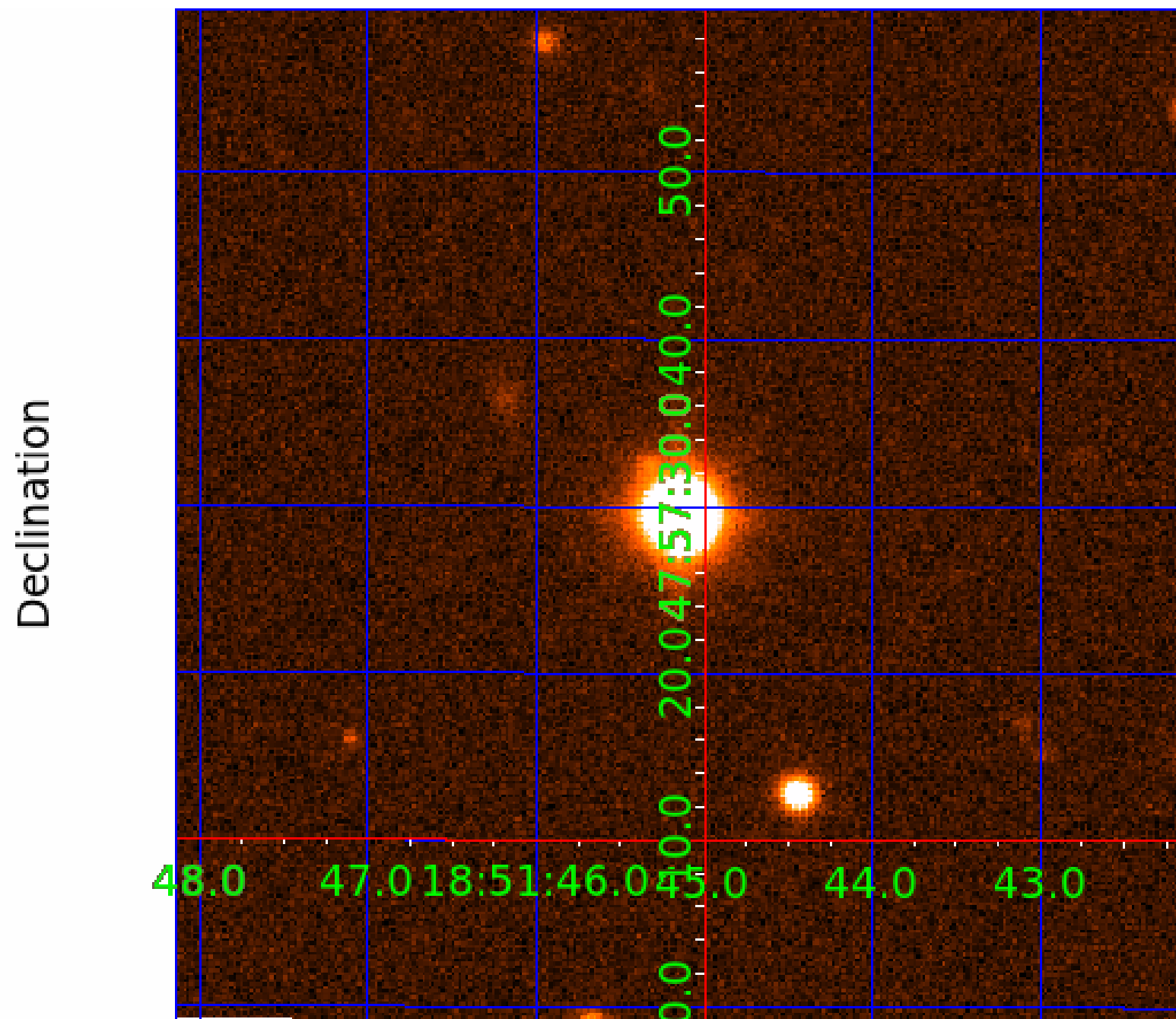
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q17 no difference image

Q17 no OOT image



UKIRT Image



# KIC 010647493

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010647493-01	OBS	No	1.141142	132.194872	154.2	7.566	10.8	8.9	1.80	7103	2.40	12005.45
010647493-03	OBS	No	49.698235	156.727559	4627.7	2.766	12.3	12.9	1.80	7103	17.81	78.35
010647493-04	OBS	No	62.175731	144.131668	5533.1	4.204	13.2	12.7	1.80	7103	23.91	58.12
010647493-05	OBS	No	47.295890	172.780042	3082.5	1.419	13.2	8.5	1.80	7103	10.21	83.70
010647493-06	OBS	No	30.722216	148.538281	127.5	3.000	11.5	-1.0	1.80	7103	2.06	148.79

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010647493-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT
010647493-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
010647493-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST
010647493-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV
010647493-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

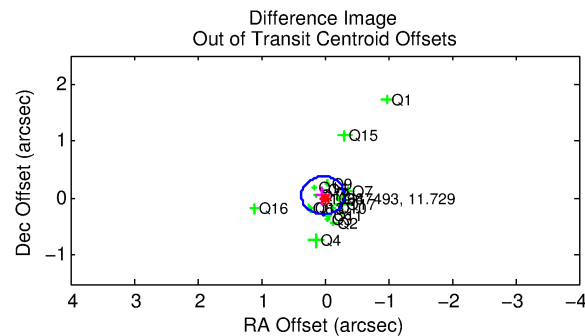
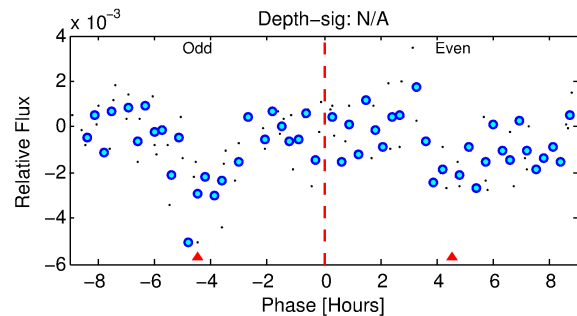
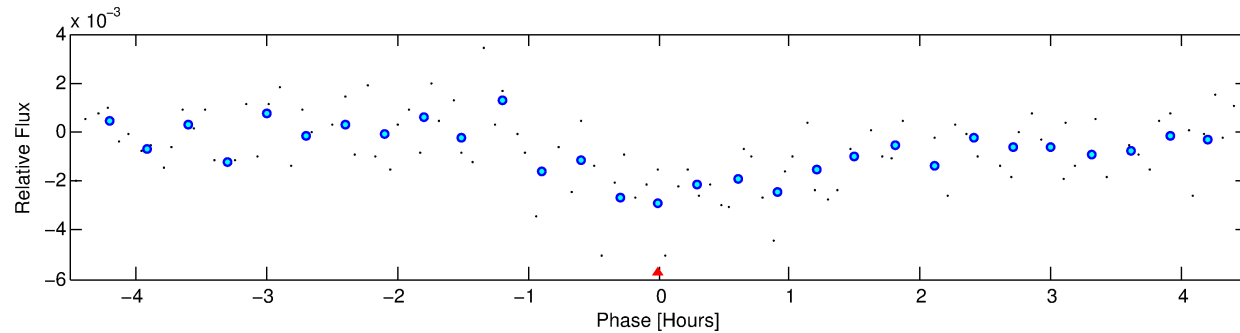
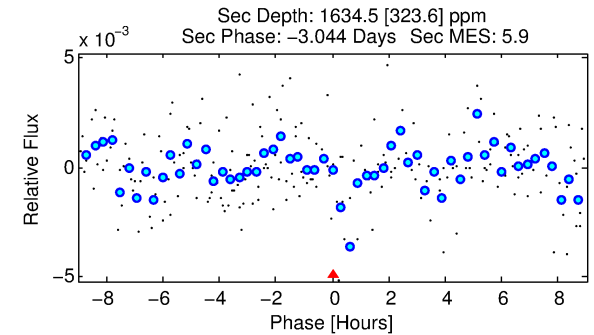
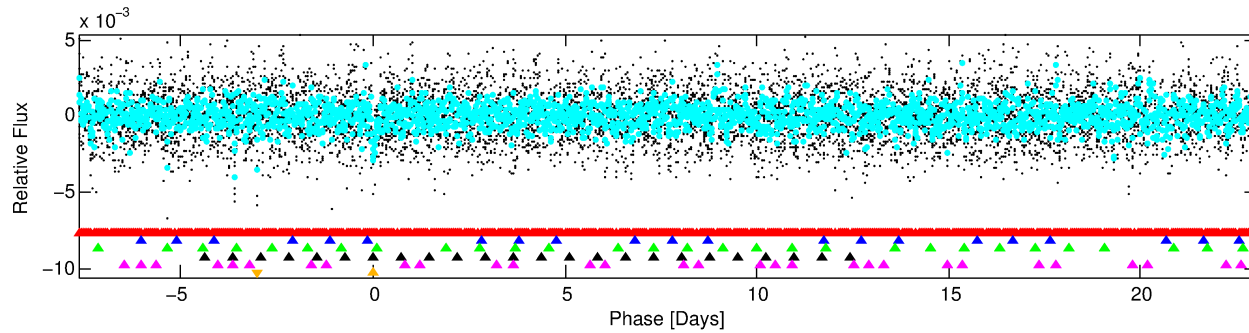
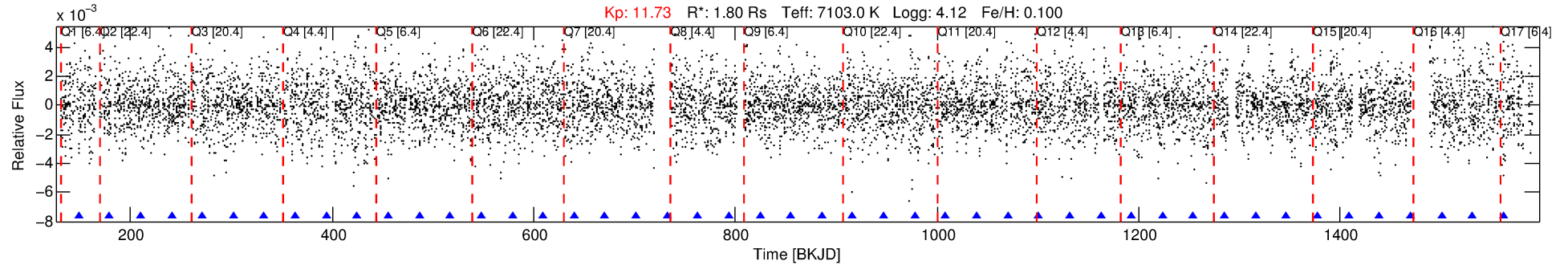
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 010647493-06

No Significant Match Found

# DV One-Page Summary

KIC: 10647493 Candidate: 6 of 6 Period: 30.722 d



## TPS TCE Results:

Period = 30.72222 d  
Epoch = 148.5383 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

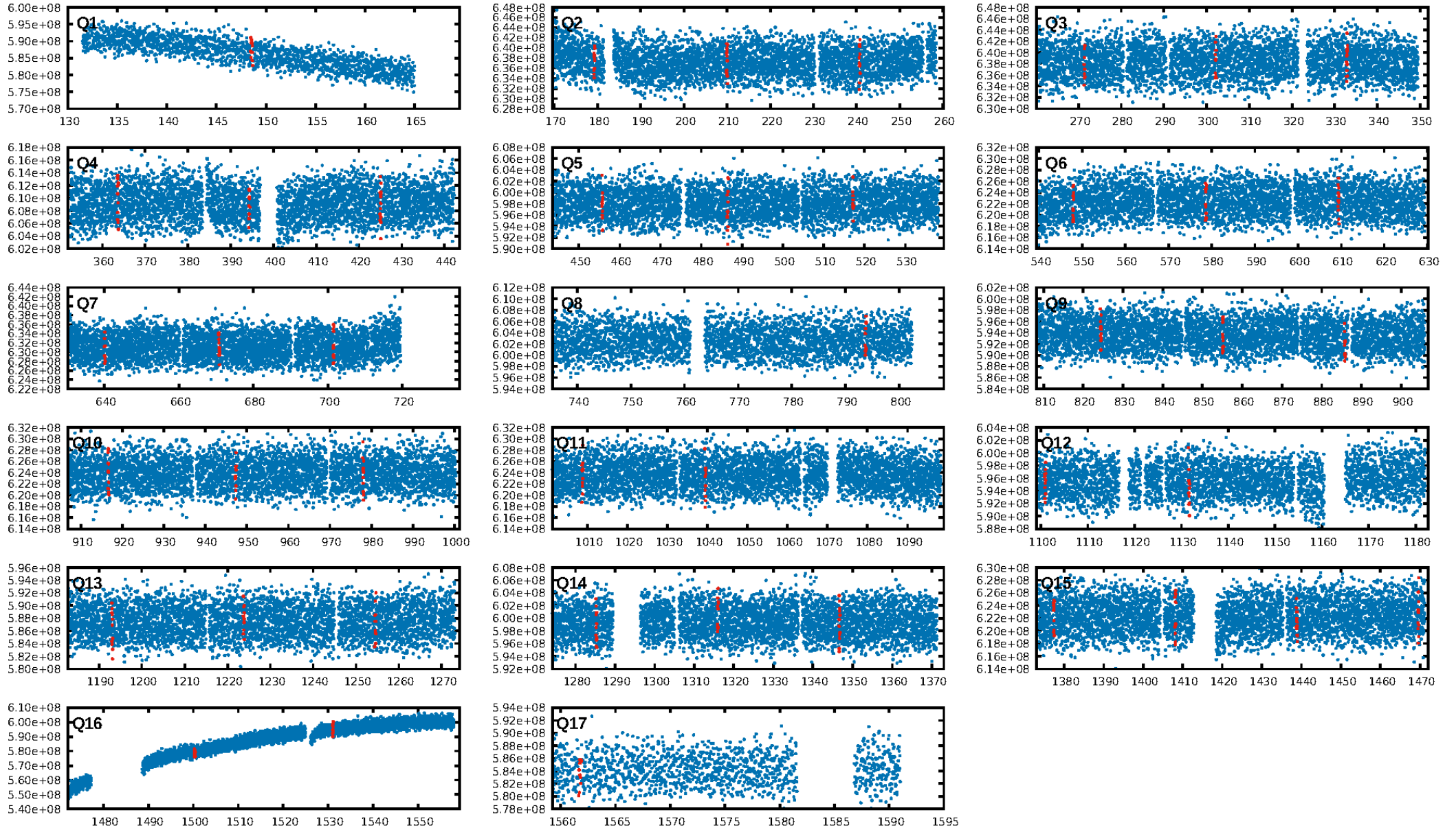
ShortPeriod-sig: 100.0% [87.23 $\sigma$ ]  
LongPeriod-sig: 100.0% [119.86 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 0.8153

Centroid-sig: N/A  
Centroid-so: 0.105 arcsec [5.56 $\sigma$ ]  
OotOffset-rm: 0.057 arcsec [0.51 $\sigma$ ]  
KicOffset-rm: 0.191 arcsec [1.75 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.53 [9/17]  
DiffImageOverlap-fno: 0.35 [6/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 09:24:04 Z

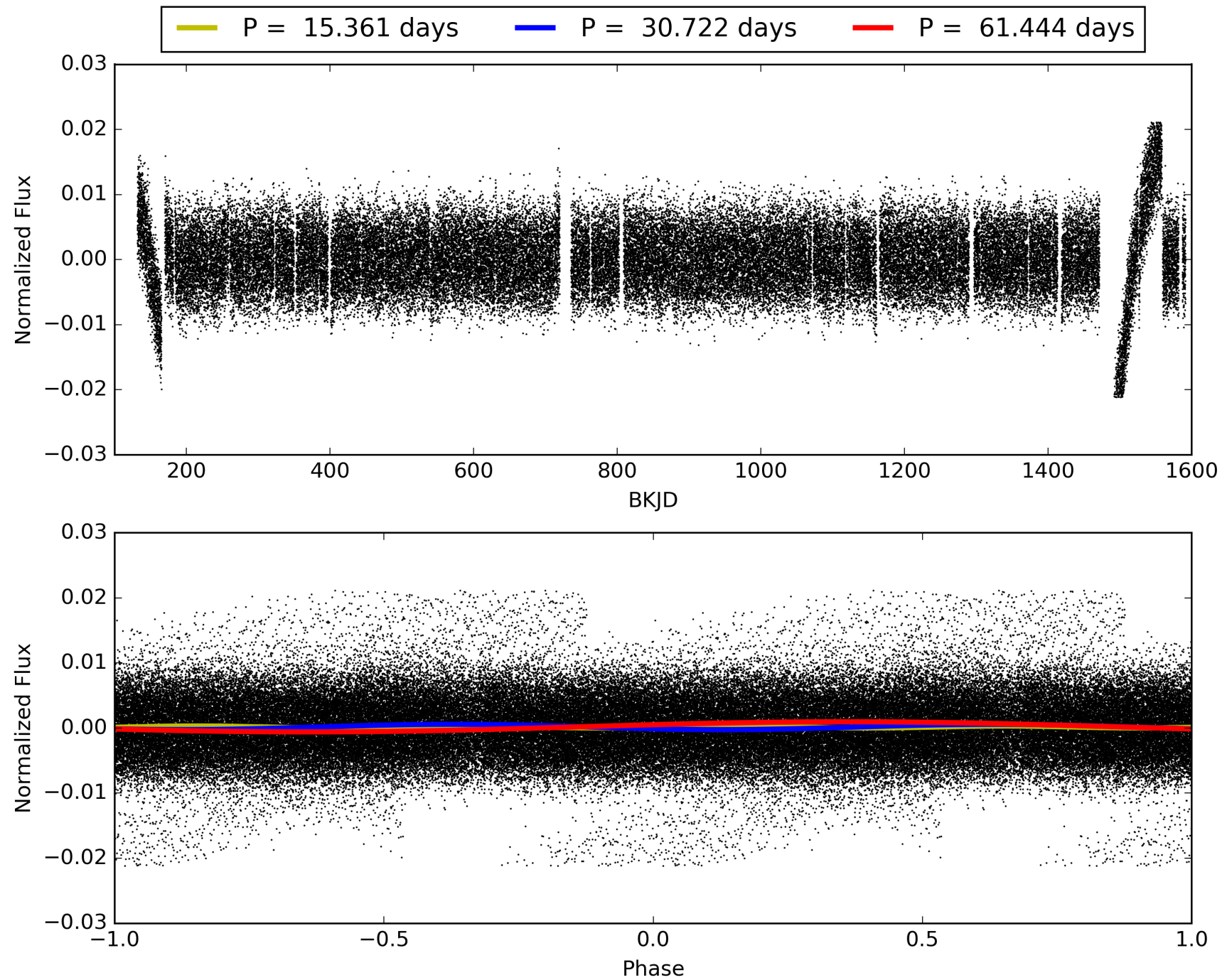
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010647493-06, PDC Light Curves



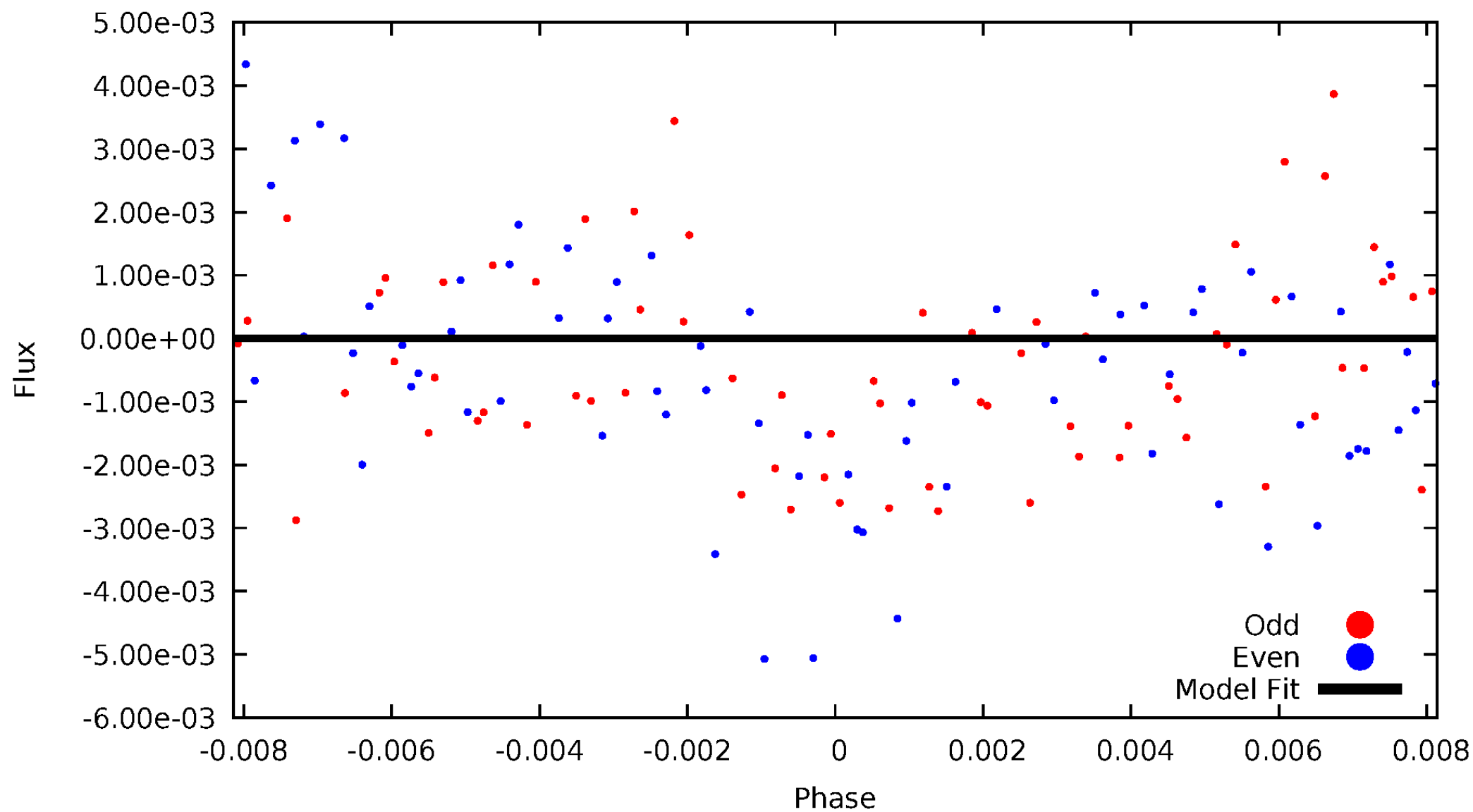


# TCE 010647493-06



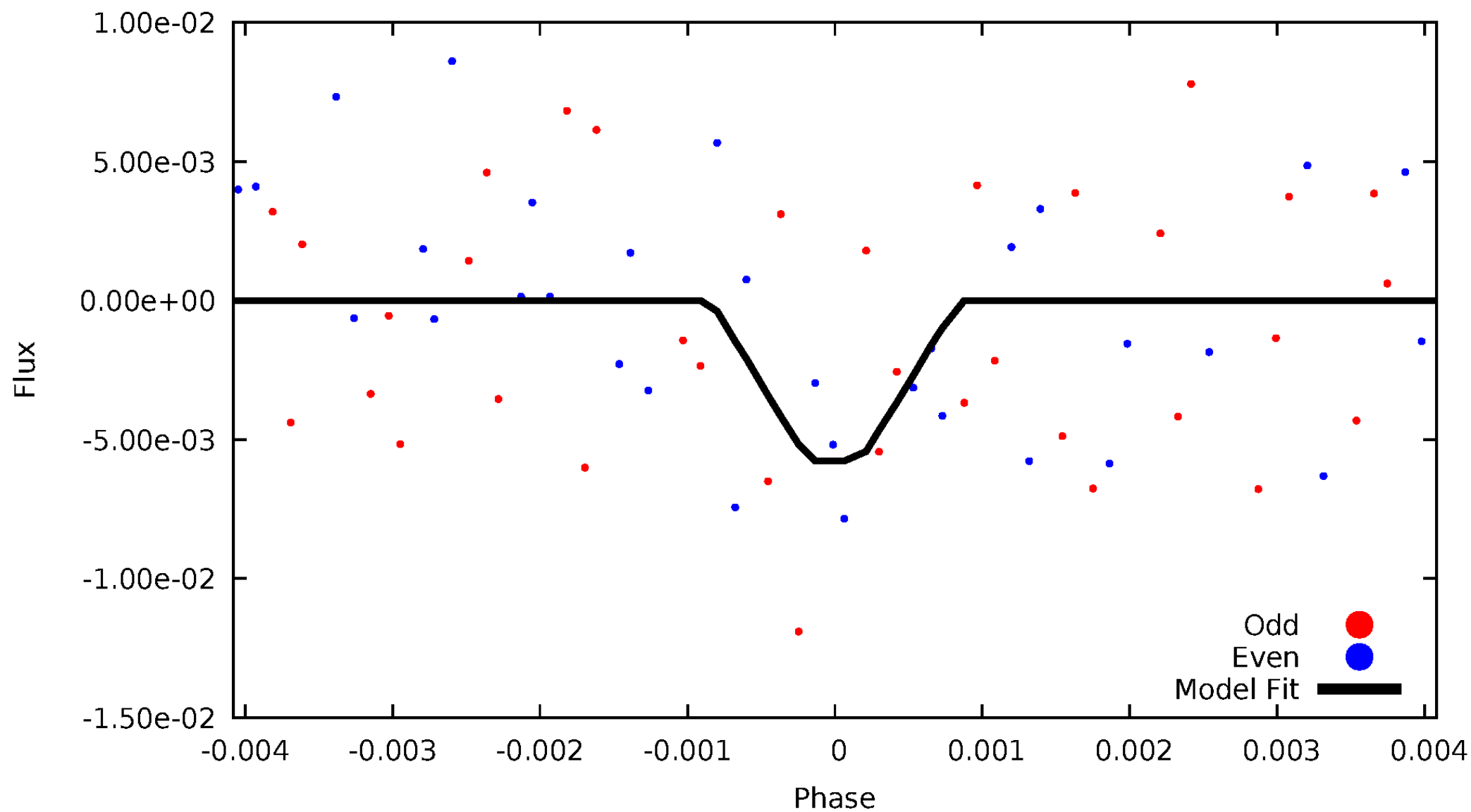
# DV Odd/Even

TCE 010647493-06



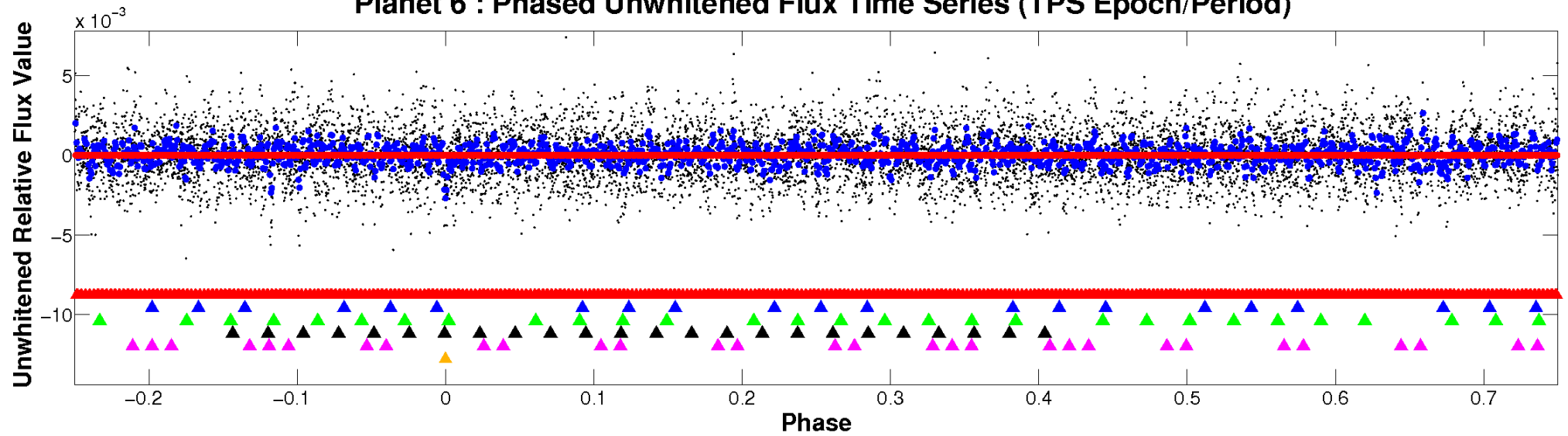
# ALT Odd/Even

TCE 010647493-06

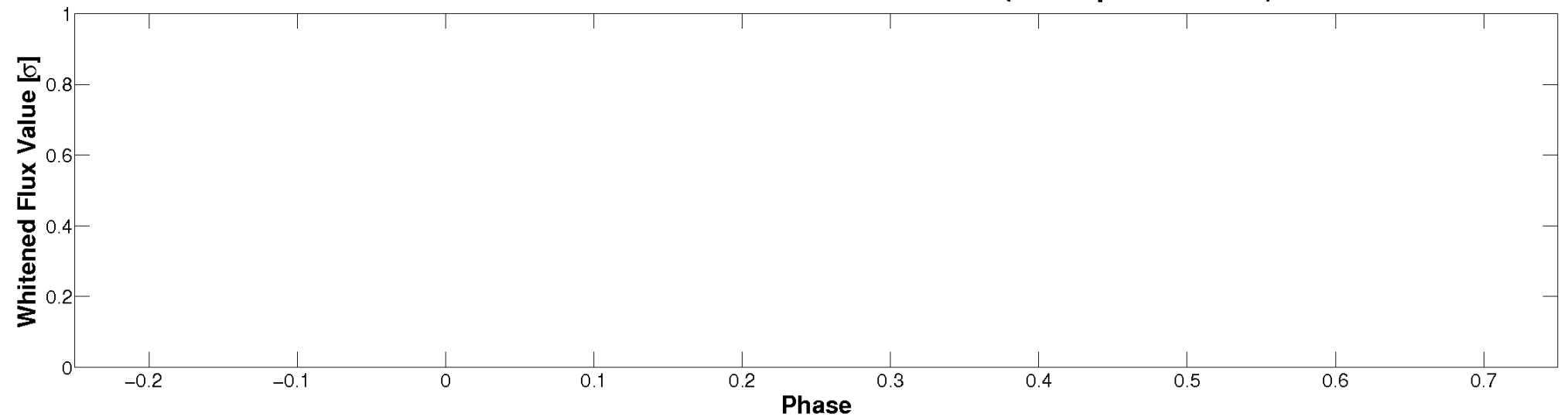


# Non-Whitened Vs. Whitened Light Curve

**Planet 6 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

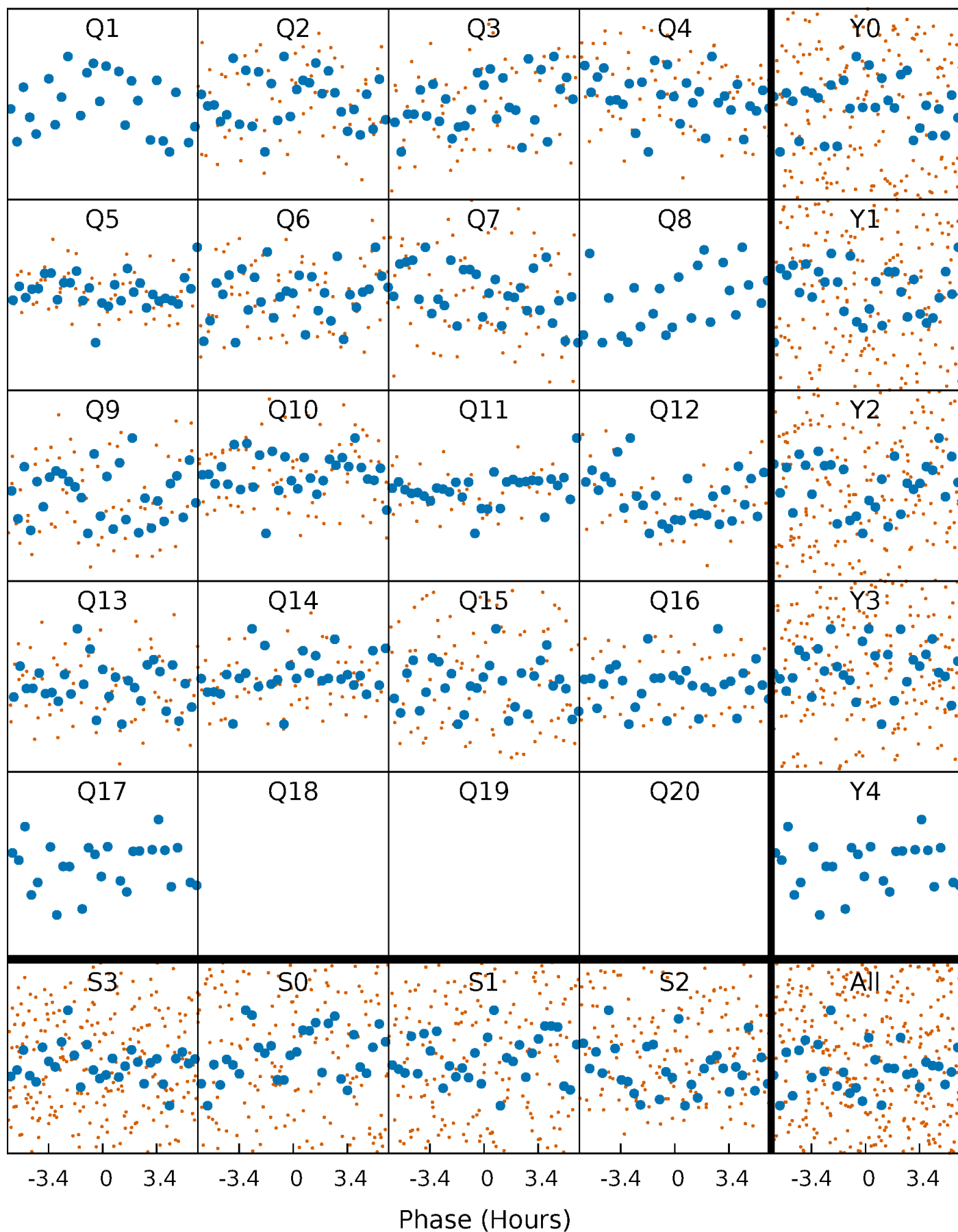


**Planet 6 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



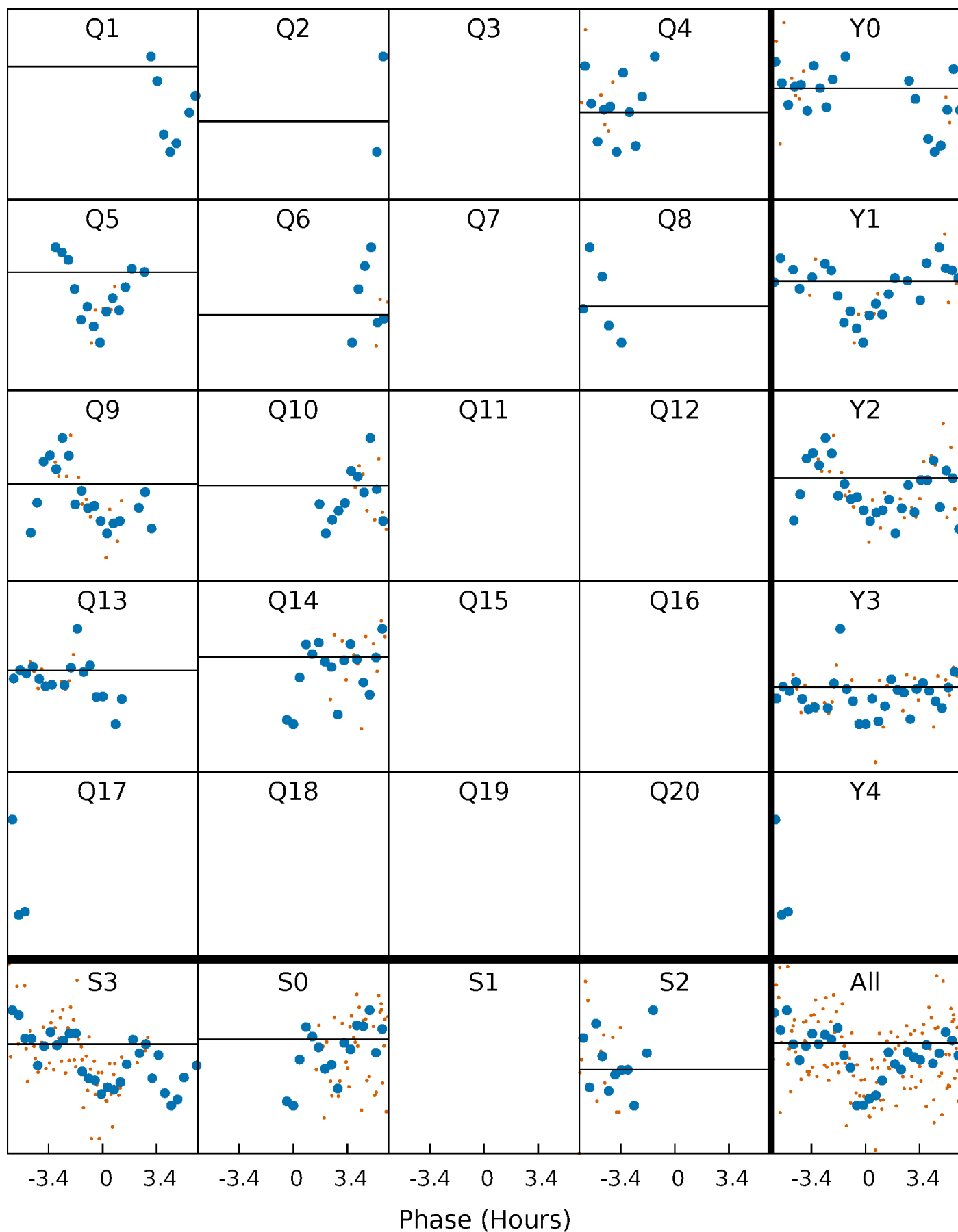
# PDC Quarter-Phased Transit Curves

TCE 010647493-06 P= 30.722216 Days  $T_0=148.538281$  (BKJD)



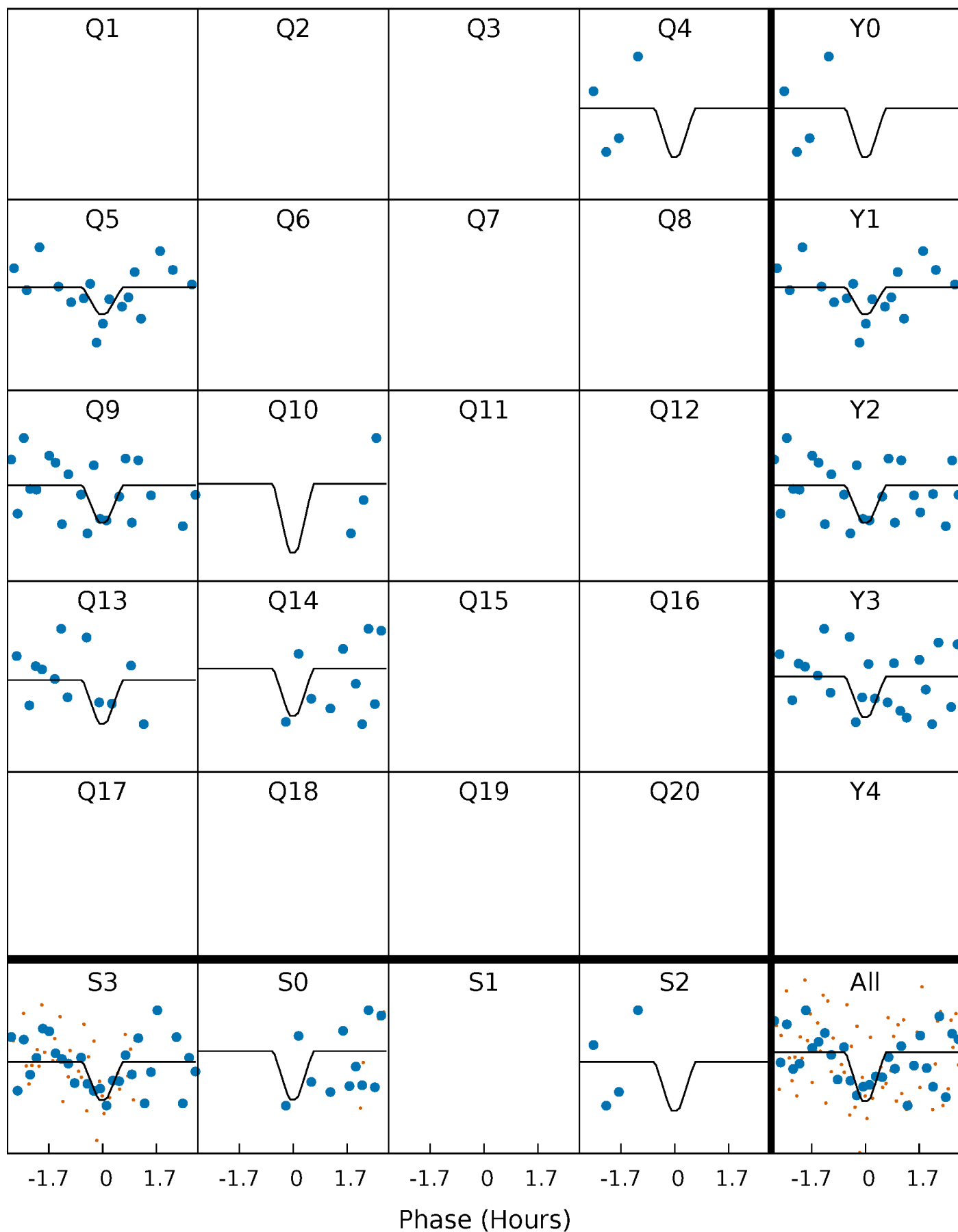
# DV Quarter-Phased Transit Curves

TCE 010647493-06 P= 30.722216 Days  $T_0=148.538281$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 010647493-06 P= 30.722216 Days  $T_0=148.527305$  (BKJD)

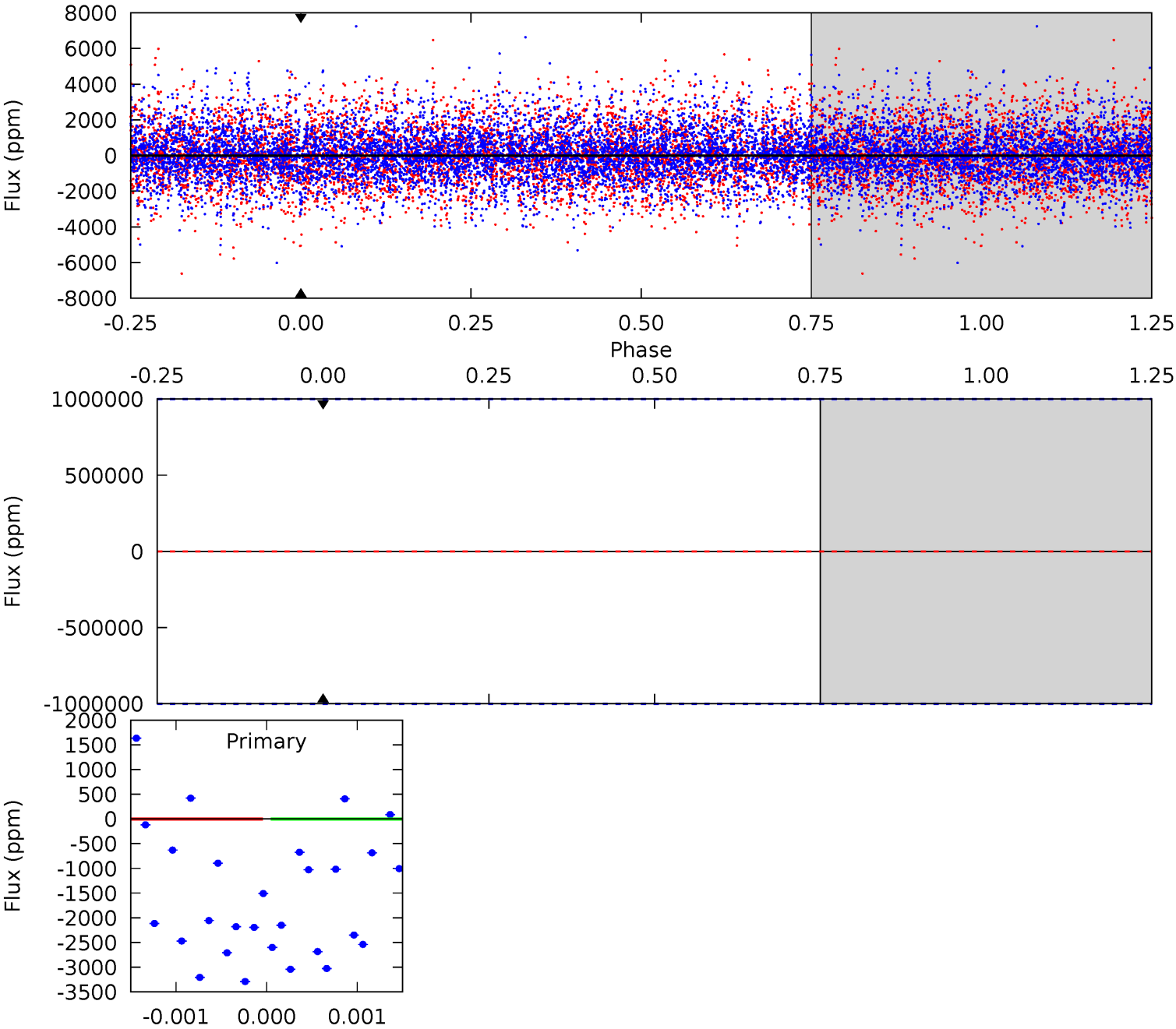




# DV Model-Shift Uniqueness Test

010647493-06, P = 30.722216 Days, E = 117.816065 Days

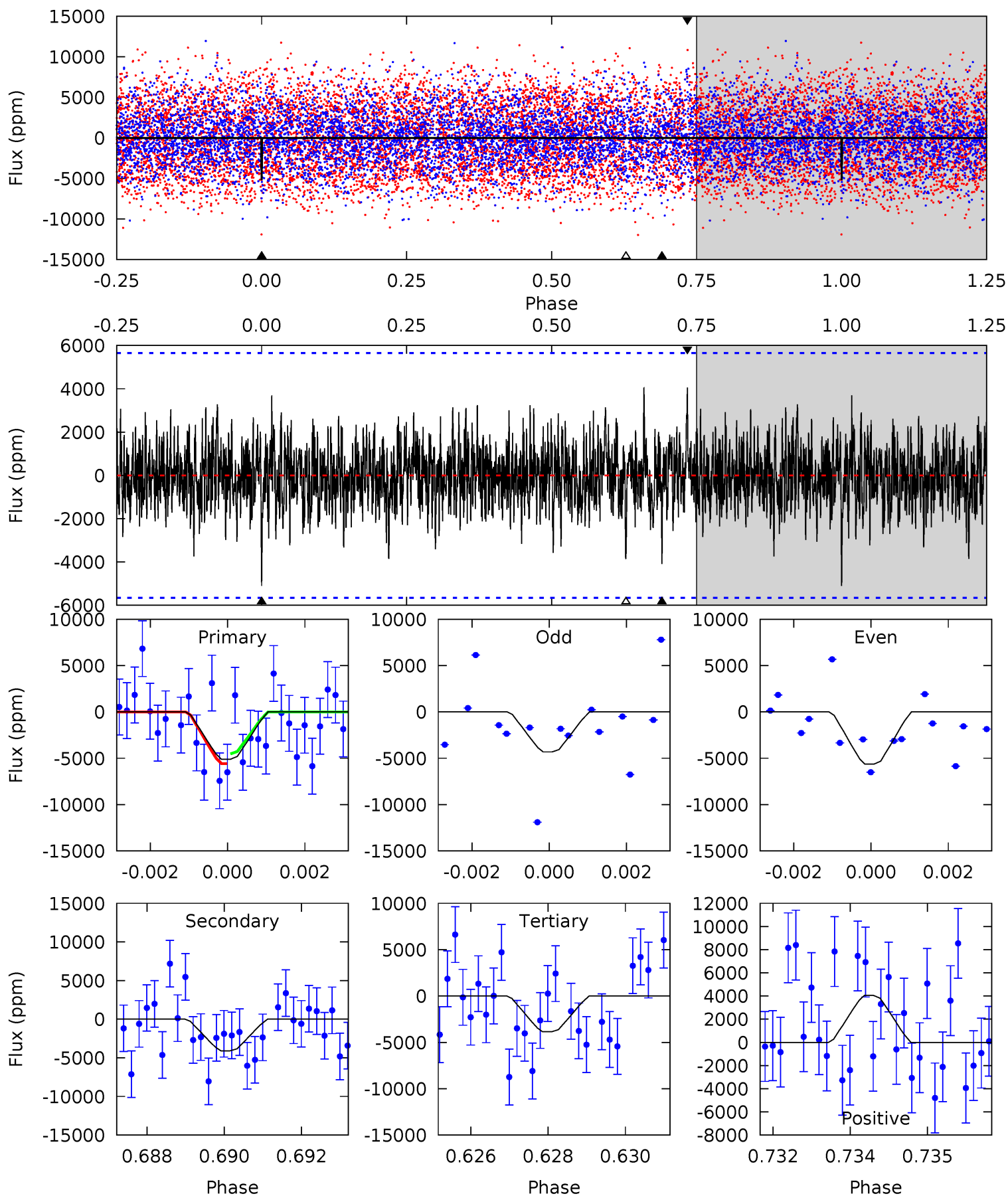
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010647493-06, P = 30.722216 Days, E = 117.805089 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
4.84	3.88	3.65	3.84	5.36	3.14	1.10	1.18	1.00	0.22	0.04	0.62	1.04	0.44	0.50



### Stellar Parameters For KIC 010647493

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7103^{+197}_{-338}$	$4.122^{+0.132}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.802^{+0.577}_{-0.336}$	$1.566^{+0.206}_{-0.252}$	$0.377^{+0.255}_{-0.206}$
	+3%/-5%	+3%/-5%	+200%/-350%	+32%/-19%	+13%/-16%	+68%/-55%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 010647493-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$14.15^{+16.26}_{-9.10}$	$1246^{+103}_{-76}$	$-4898^{+36814}_{-27212}$	$-138.899^{+21818.586}_{-19112.705}$
Alt.	$-4089 \pm 1055$	$20.11^{+18.94}_{-13.20}$	$1247^{+101}_{-76}$	$5550^{+5305}_{-1309}$	$263^{+2205}_{-194}$

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

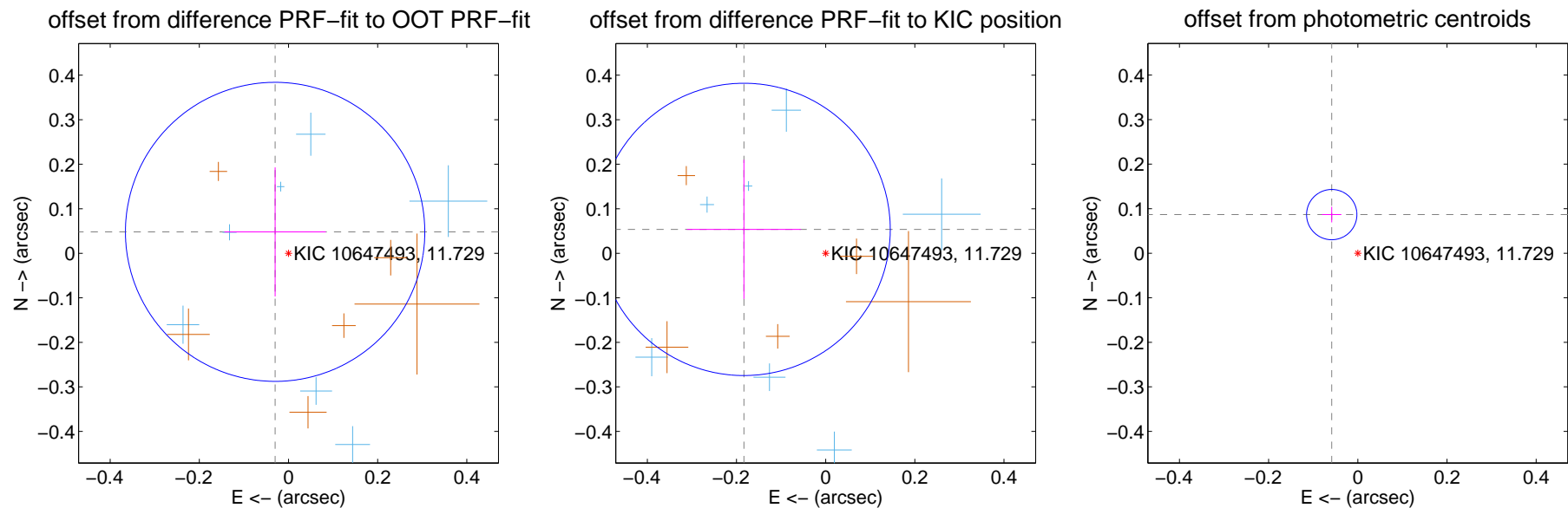
## DV Centroid Data

Supplemental centroid analysis for 010647493-06. **Kepler magnitude: 11.73.** Transit SNR -1.00

There are 9 quarters with good PRF difference image offsets

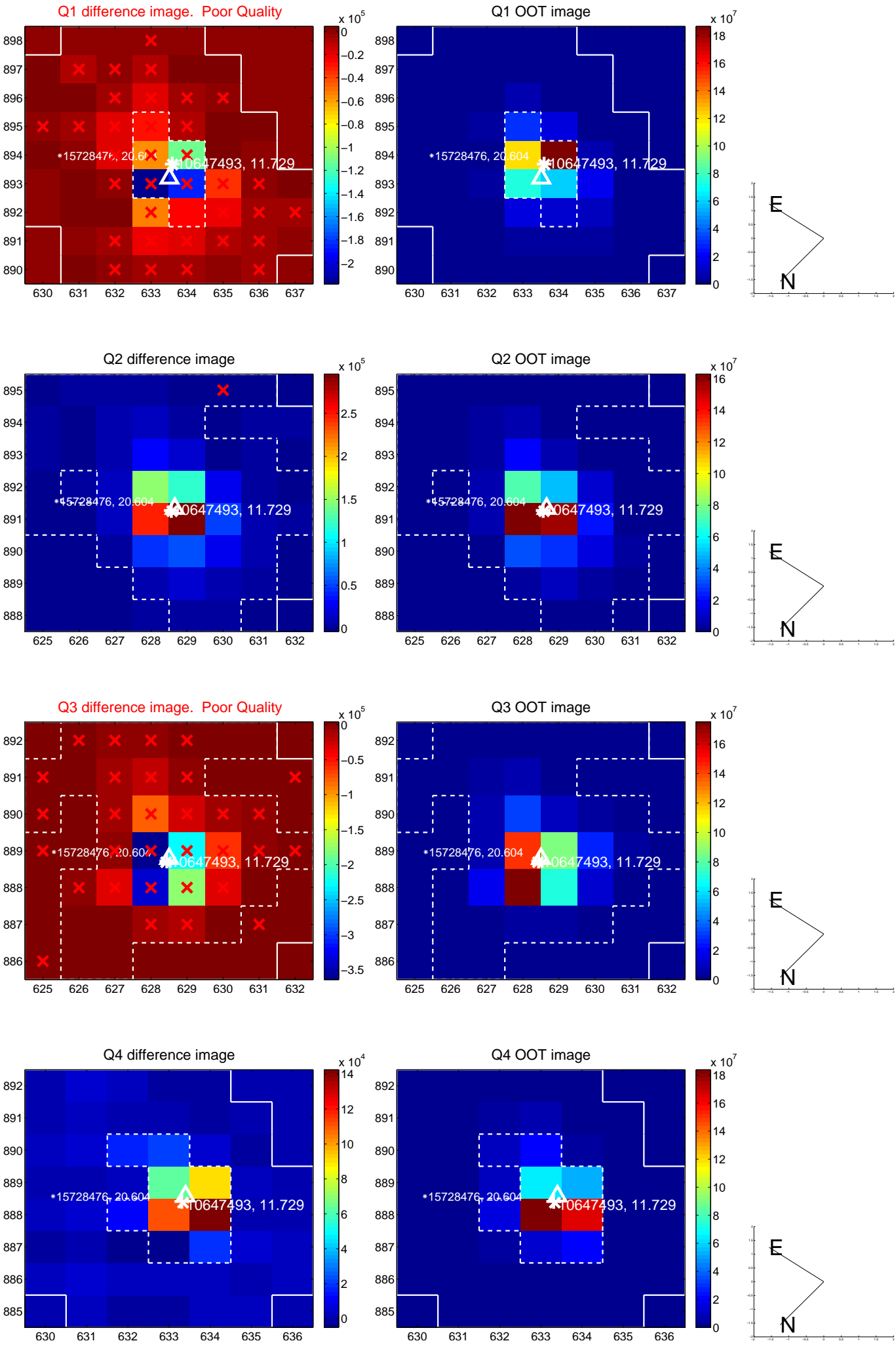
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.057 \pm 0.112$	0.51	$0.030 \pm 0.114$	$0.048 \pm 0.145$
PRF-fit source offset from KIC position	$0.191 \pm 0.109$	1.75	$0.183 \pm 0.128$	$0.054 \pm 0.156$
photometric centroid source offset	<b><math>0.10 \pm 0.02</math></b>	<b>5.56</b>	$0.06 \pm 0.02$	$0.09 \pm 0.02$

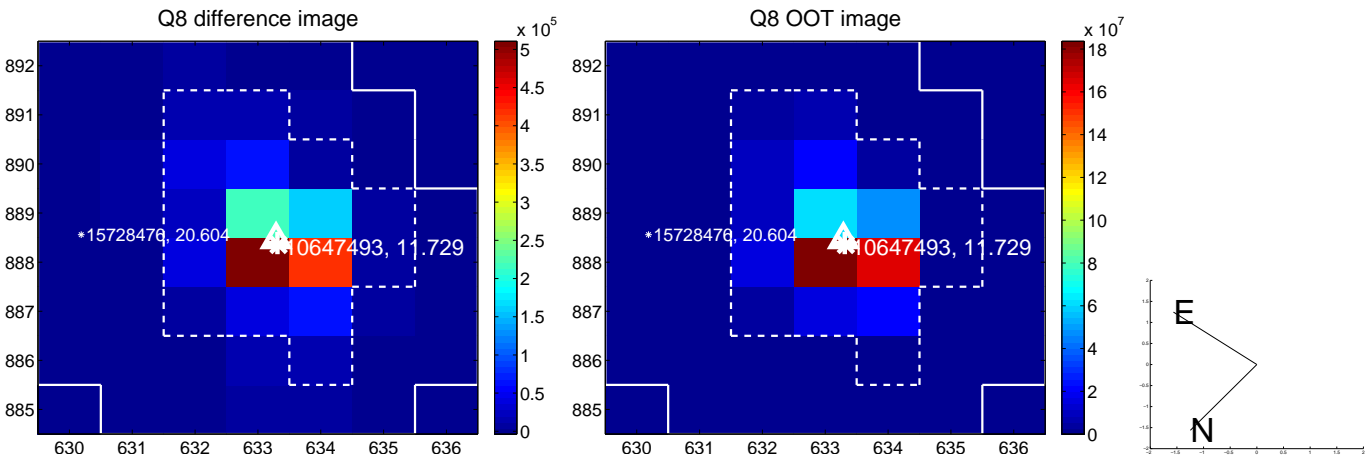
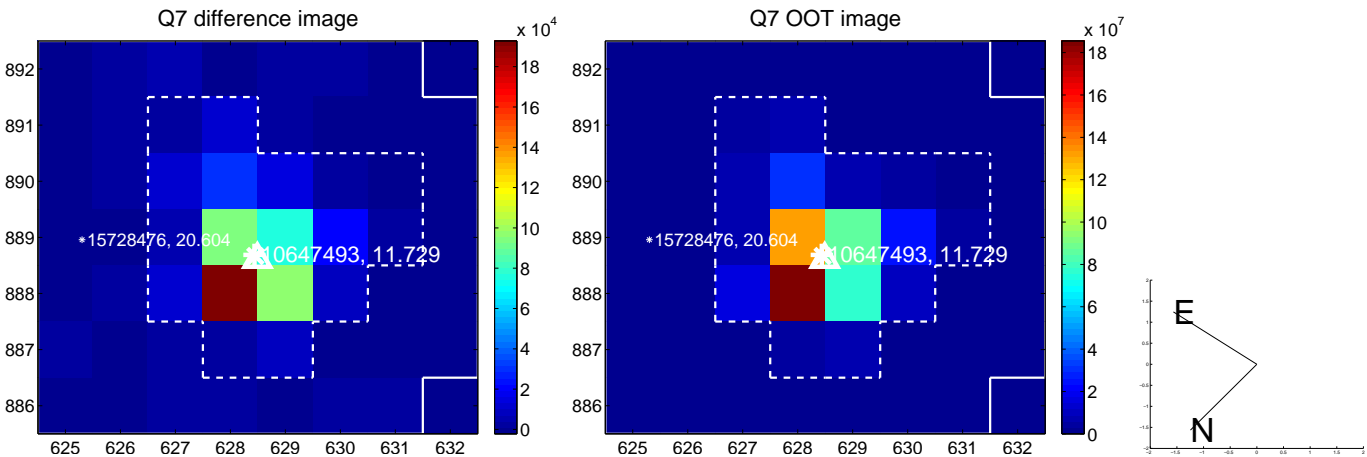
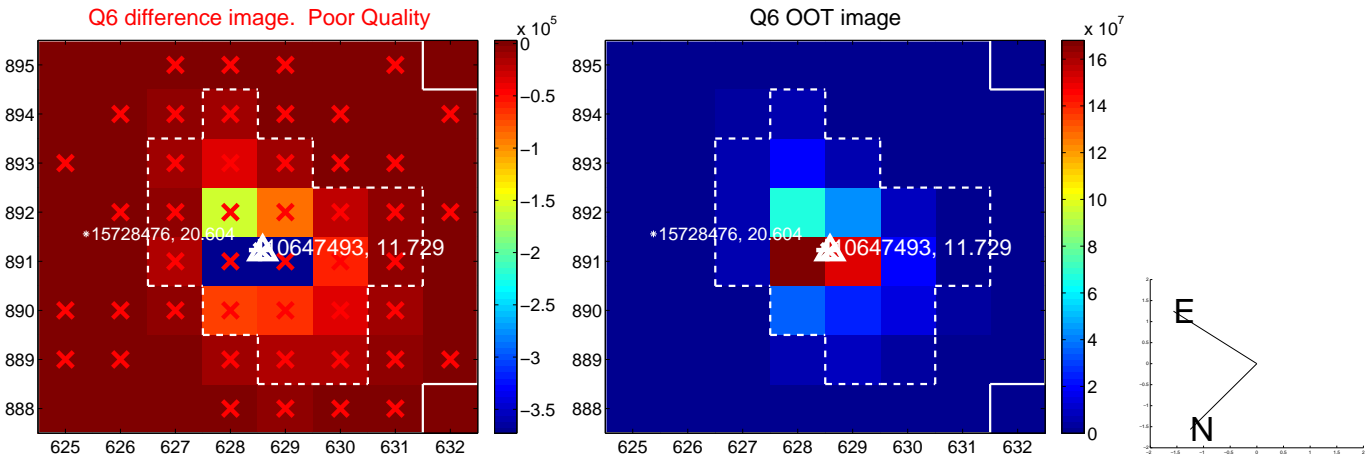
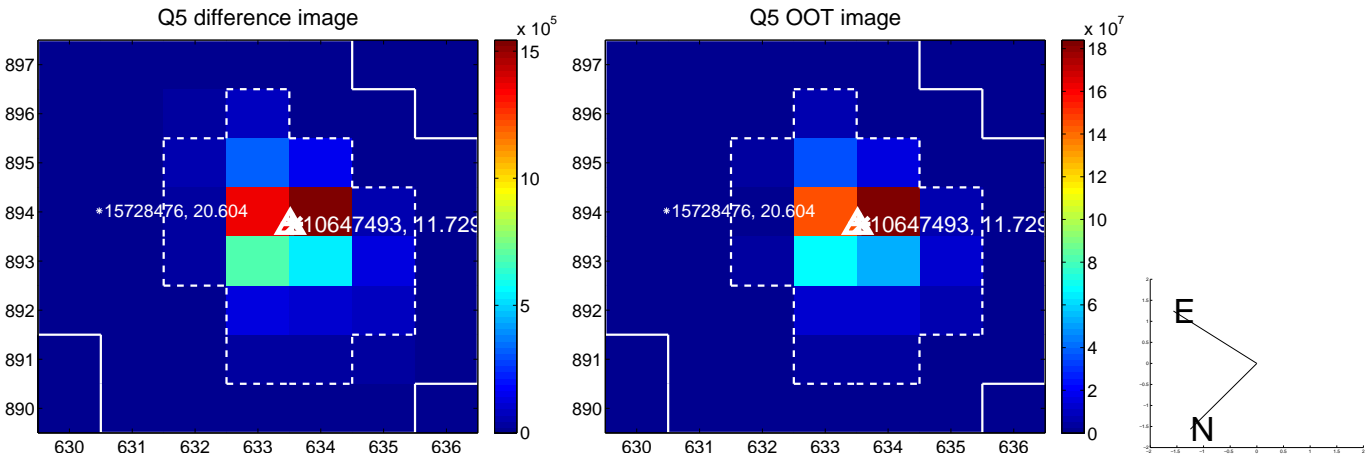


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

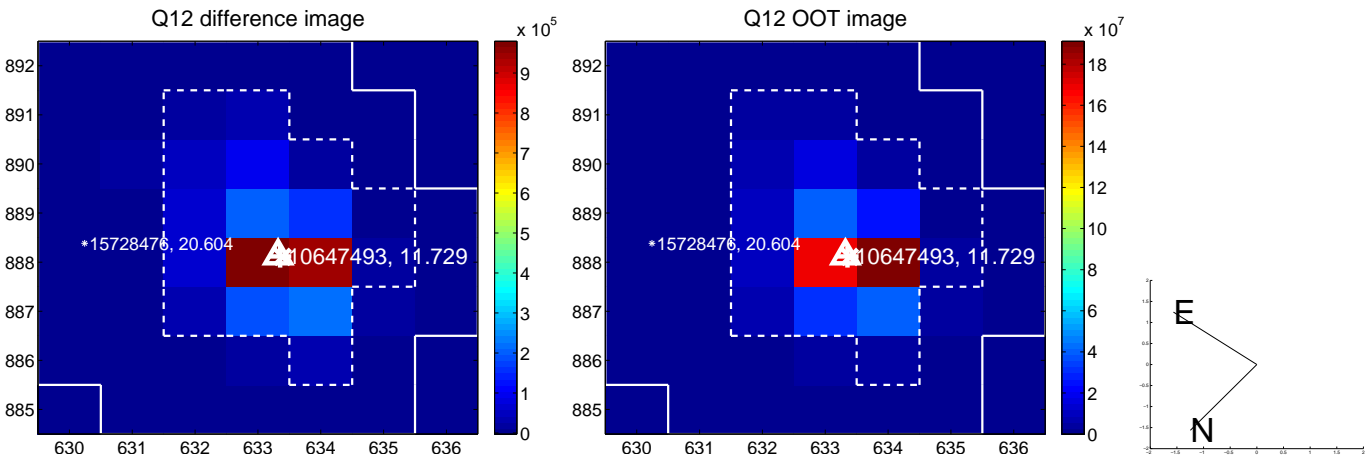
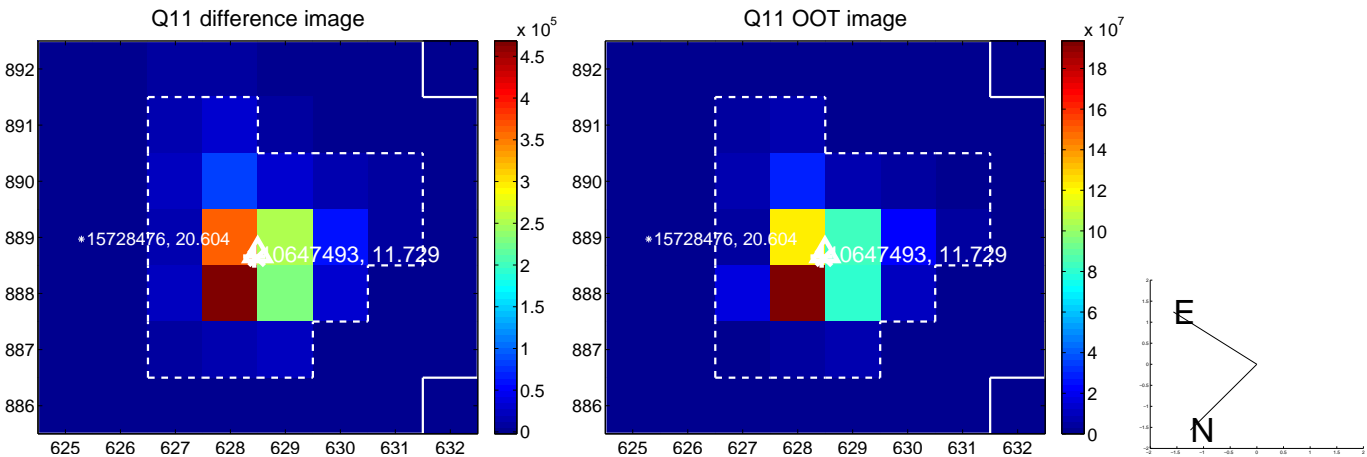
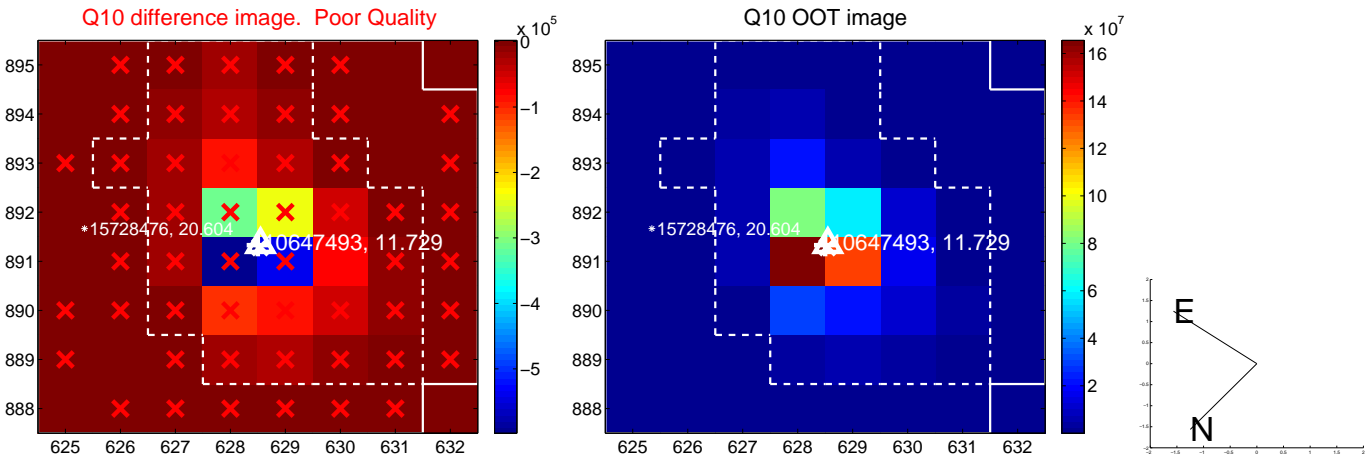
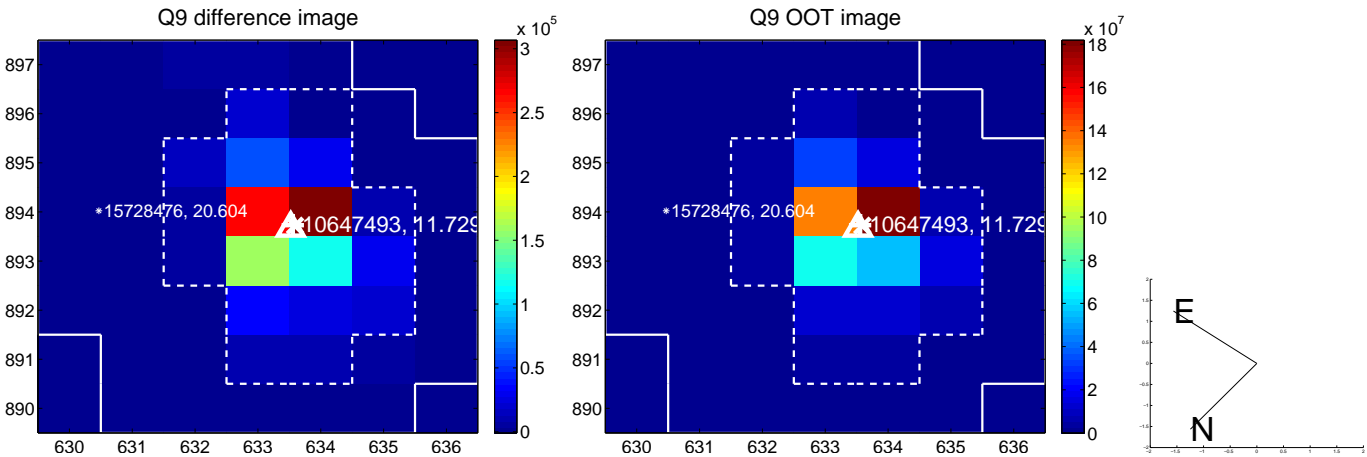
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

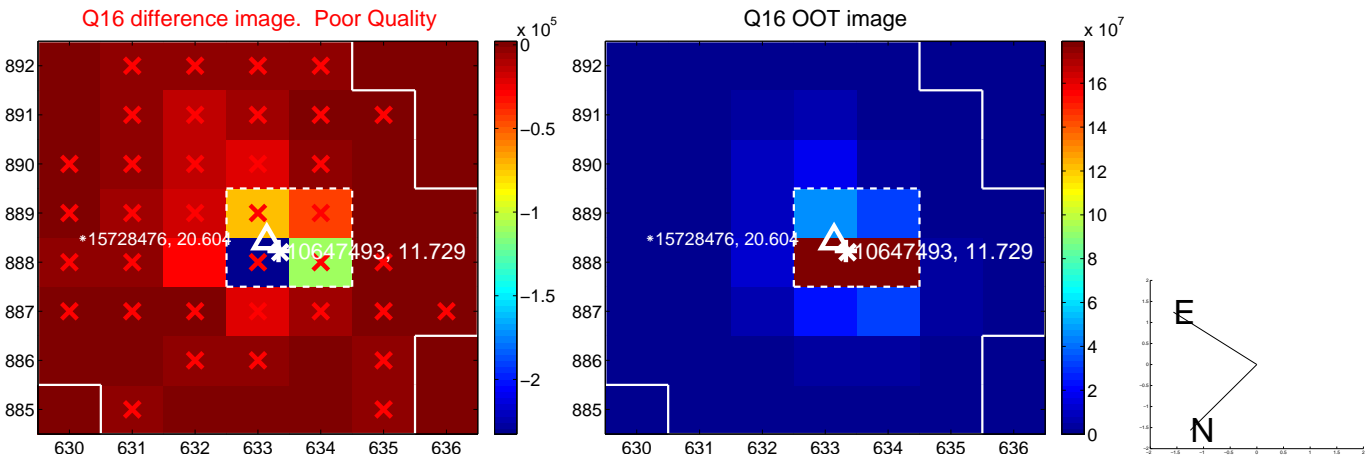
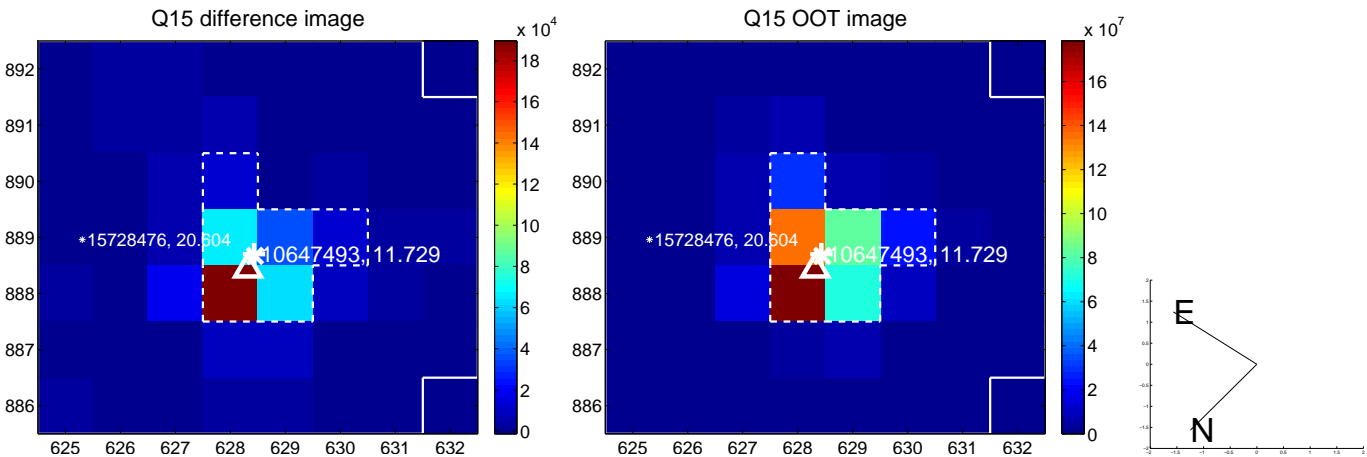
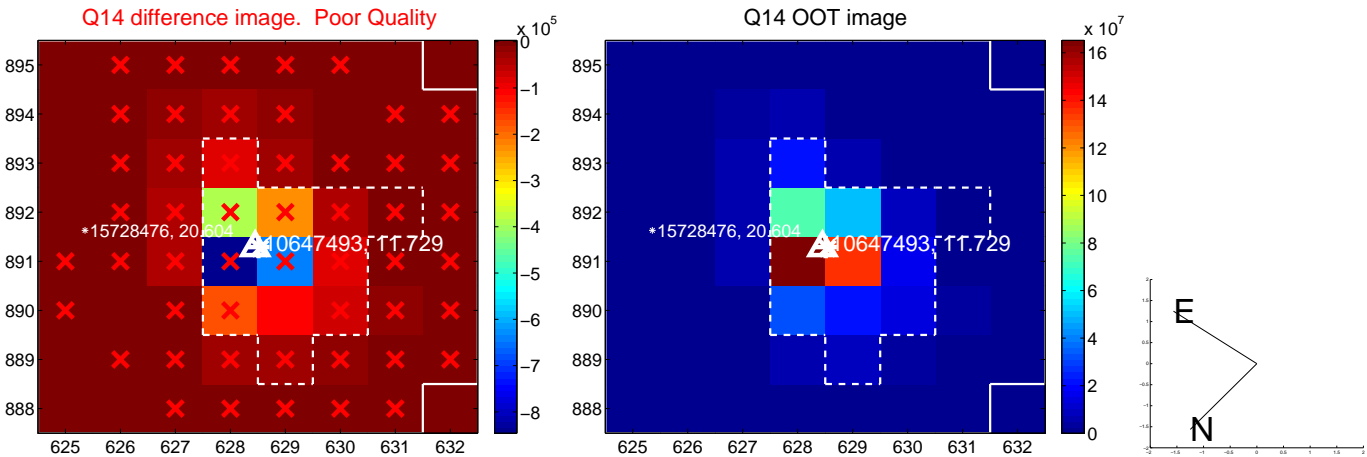
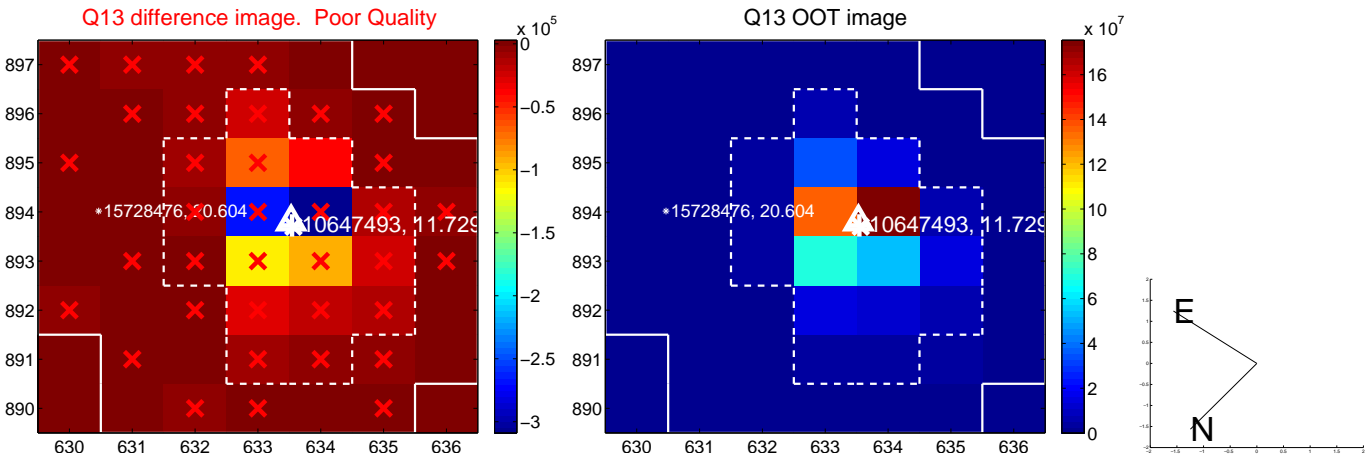


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

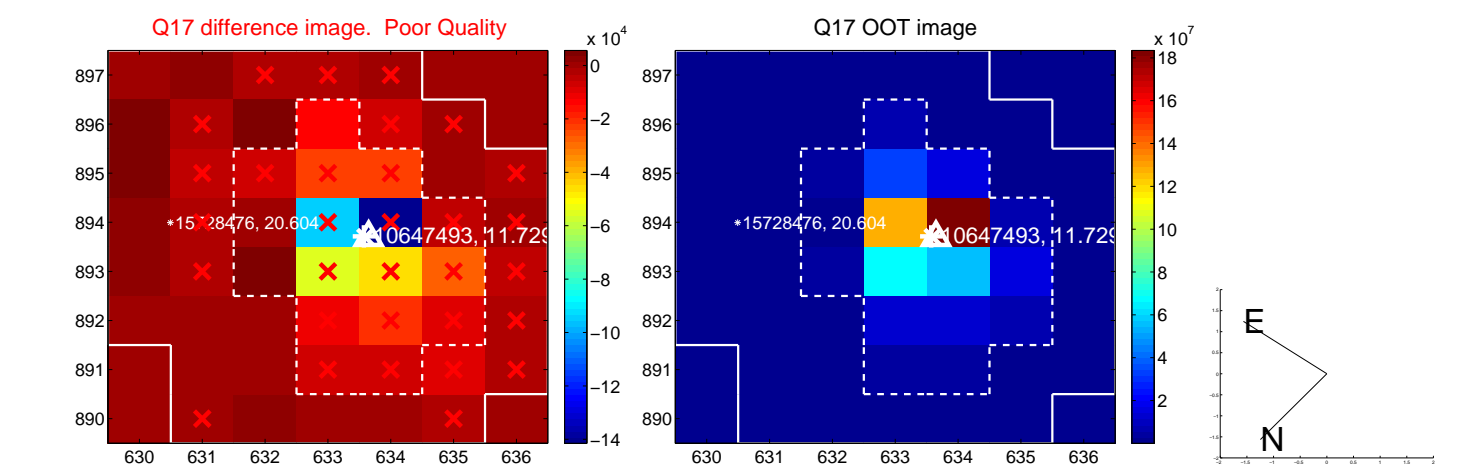




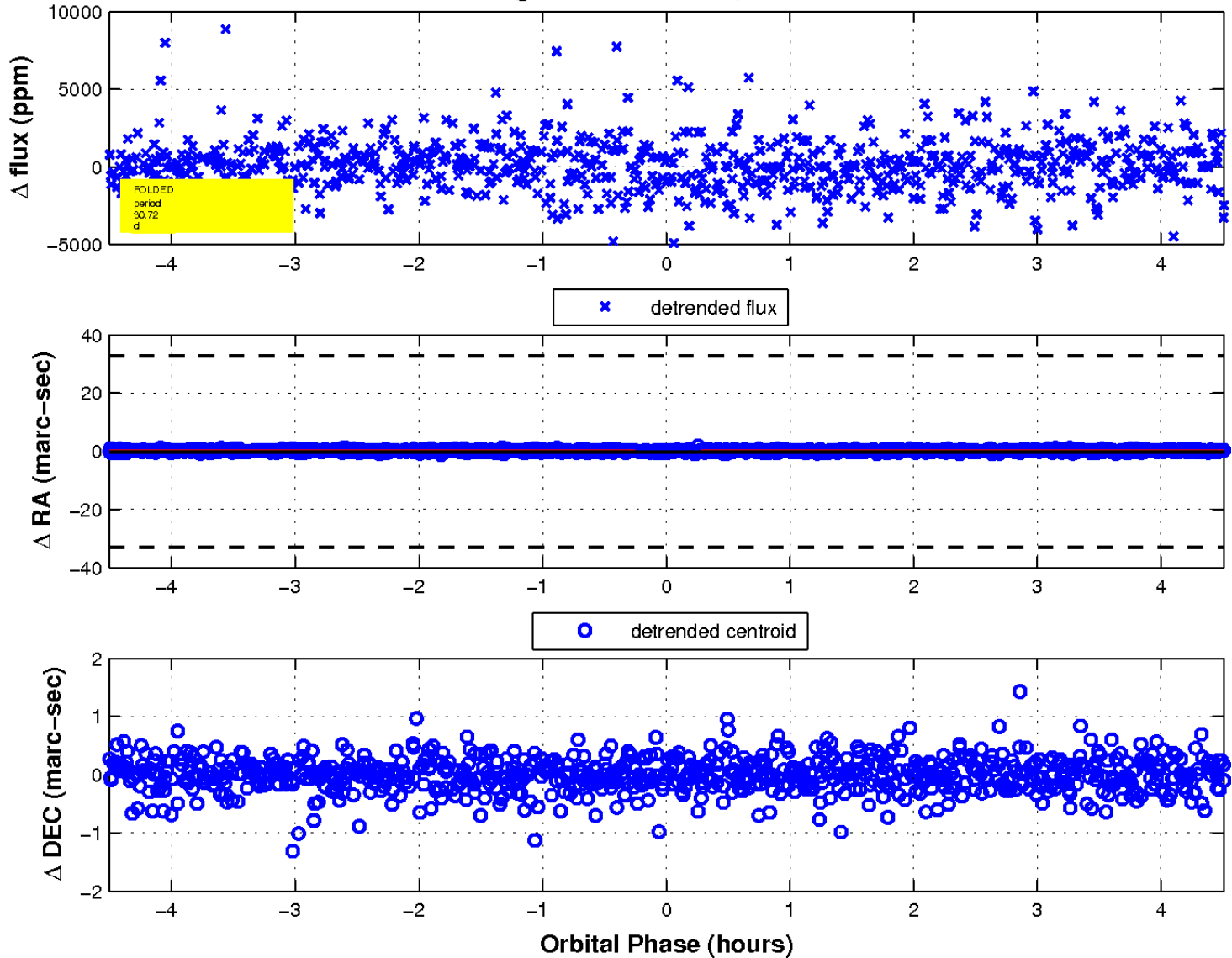
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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fluxWeightedCentroids, Planet 6 of 6



UKIRT Image

Declination

