

# KIC 009362445

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009362445-01	OBS	No	4.091769	133.015592	16.3	11.087	9.6	3.7	3.69	6086	1.75	5090.84
009362445-02	OBS	No	1.363982	132.803304	34.9	4.994	8.9	10.2	3.69	6086	2.57	22025.52
009362445-03	OBS	No	231.240118	296.369113	193.5	46.611	7.9	5.1	3.69	6086	5.43	23.47
009362445-04	OBS	No	247.164354	282.345640	276.2	9.224	7.3	6.0	3.69	6086	6.55	21.48
009362445-05	OBS	No	8.180312	131.616567	147.3	5.000	7.7	-1.0	3.69	6086	4.48	2021.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009362445-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009362445-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
009362445-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009362445-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT
009362445-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS—HALO_GHOST

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

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

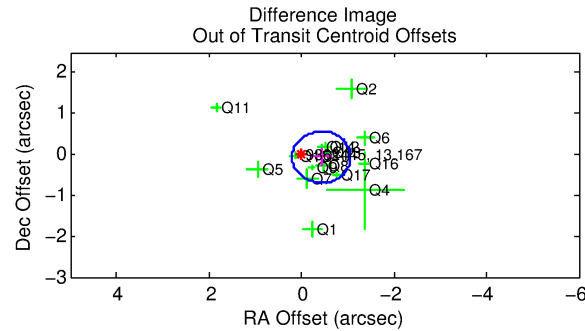
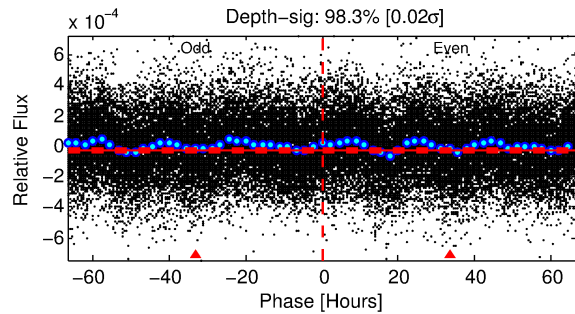
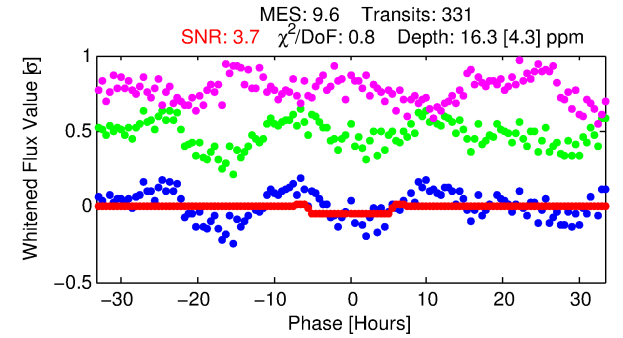
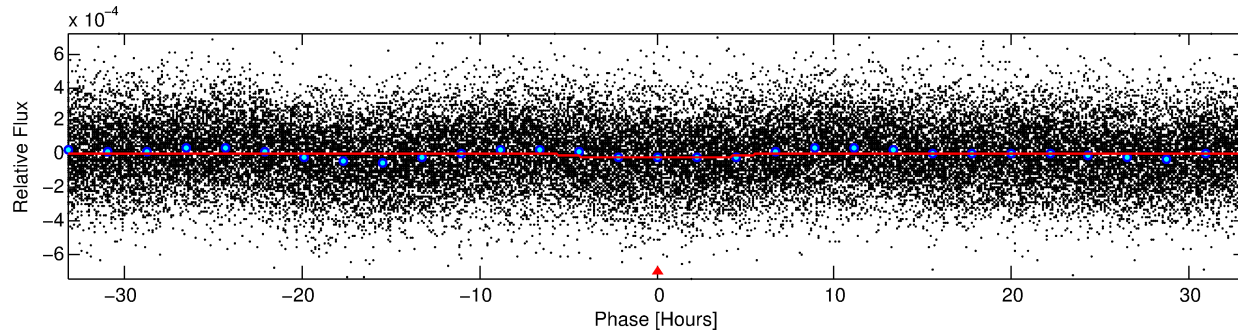
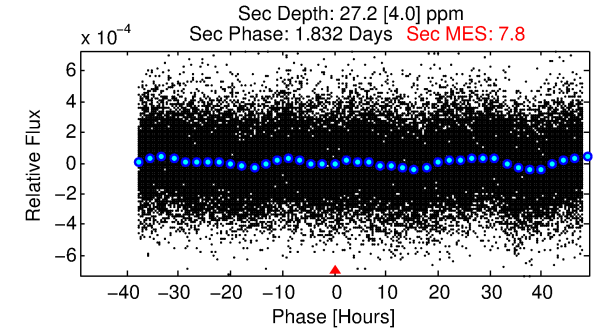
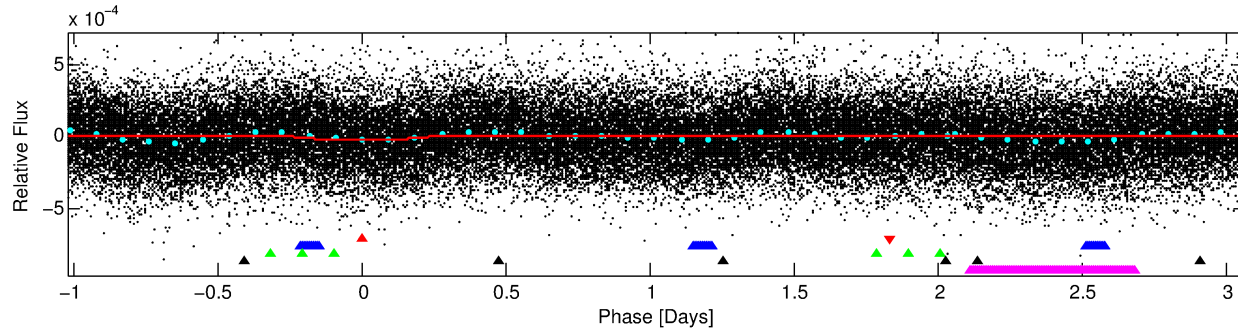
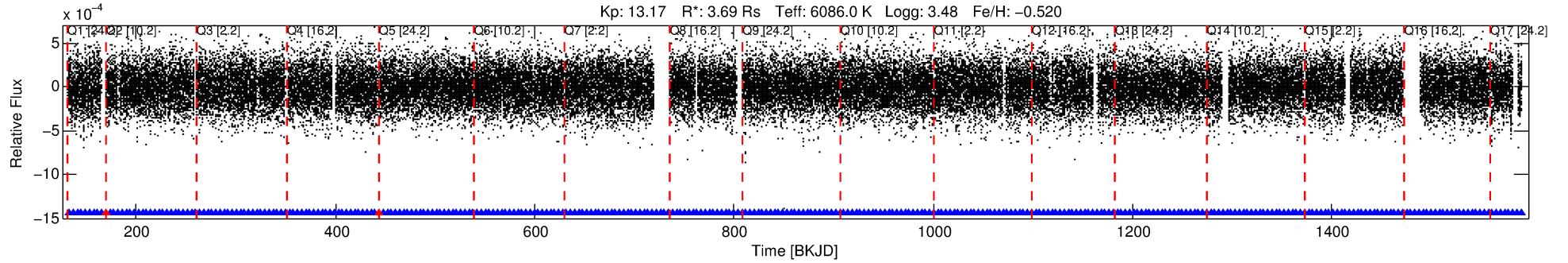
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009362445-01

No Significant Match Found

# DV One-Page Summary

KIC: 9362445 Candidate: 1 of 5 Period: 4.092 d



## DV Fit Results:

Period = 4.09177 [0.00011] d  
Epoch = 133.0156 [0.0178] BKJD  
Rp/R\* = 0.0043 [0.0016]  
a/R\* = 1.57 [1.85]  
b = 0.90 [0.42]  
Seff = 5090.84 [3411.58]  
Teq = 2154 [361] K  
Rp = 1.74 [1.04] Re  
a = 0.0573 [0.0242] AU  
Ag = 16.13 [16.25] [0.93σ]  
**Teffp = 6673 [1301] K [3.35σ]**

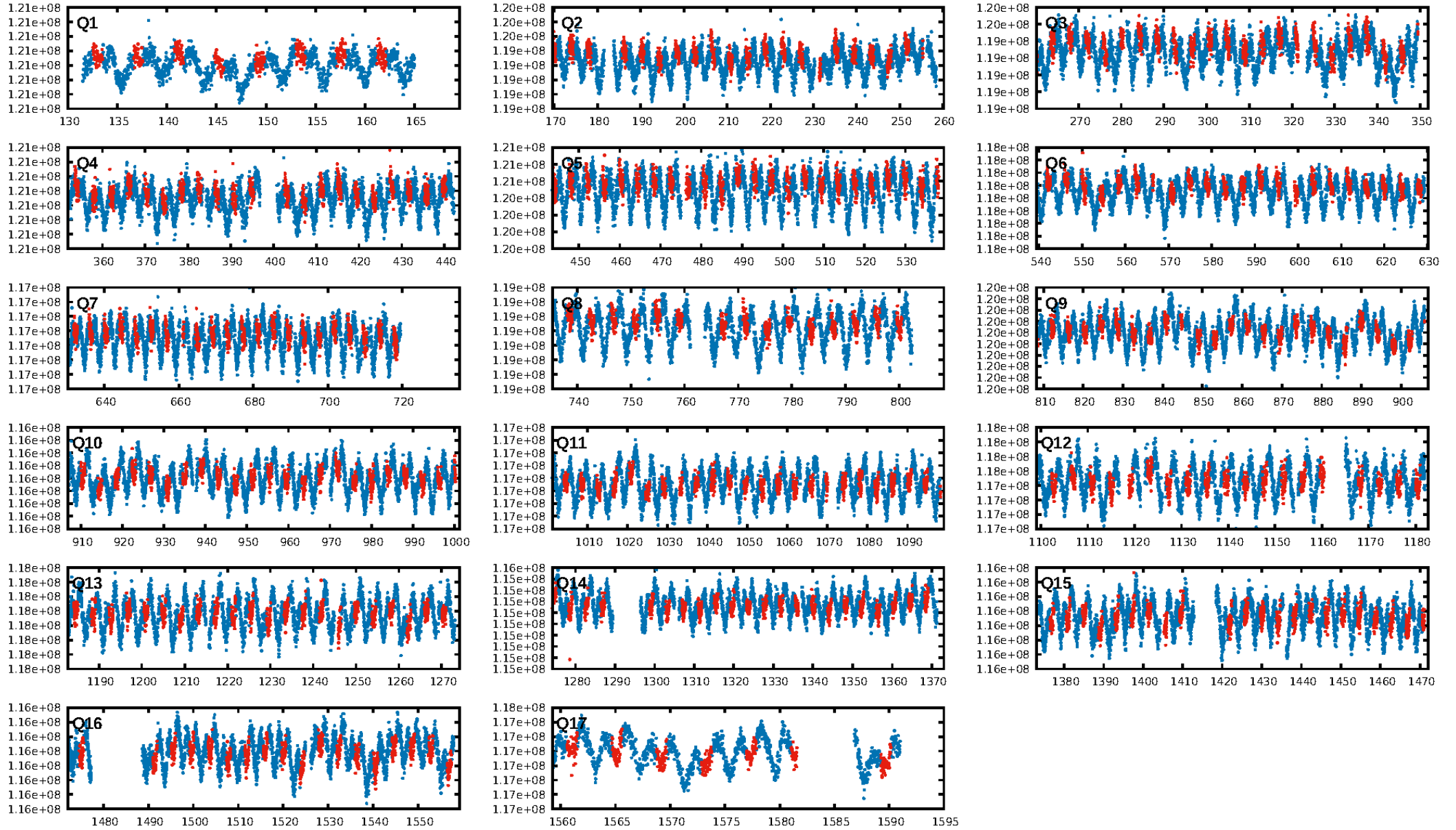
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.38σ]  
LongPeriod-sig: 100.0% [8.07σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.18e-18  
RollingBand-fgt: 0.99 [314/316]  
GhostDiagnostic-chr: 1.848  
Centroid-sig: 91.0%  
Centroid-so: 0.554 arcsec [0.26σ]  
OotOffset-rm: 0.434 arcsec [2.06σ]  
KicOffset-rm: 0.407 arcsec [1.93σ]  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.81 [13/16]  
DiffImageOverlap-fno: 0.00 [0/17]

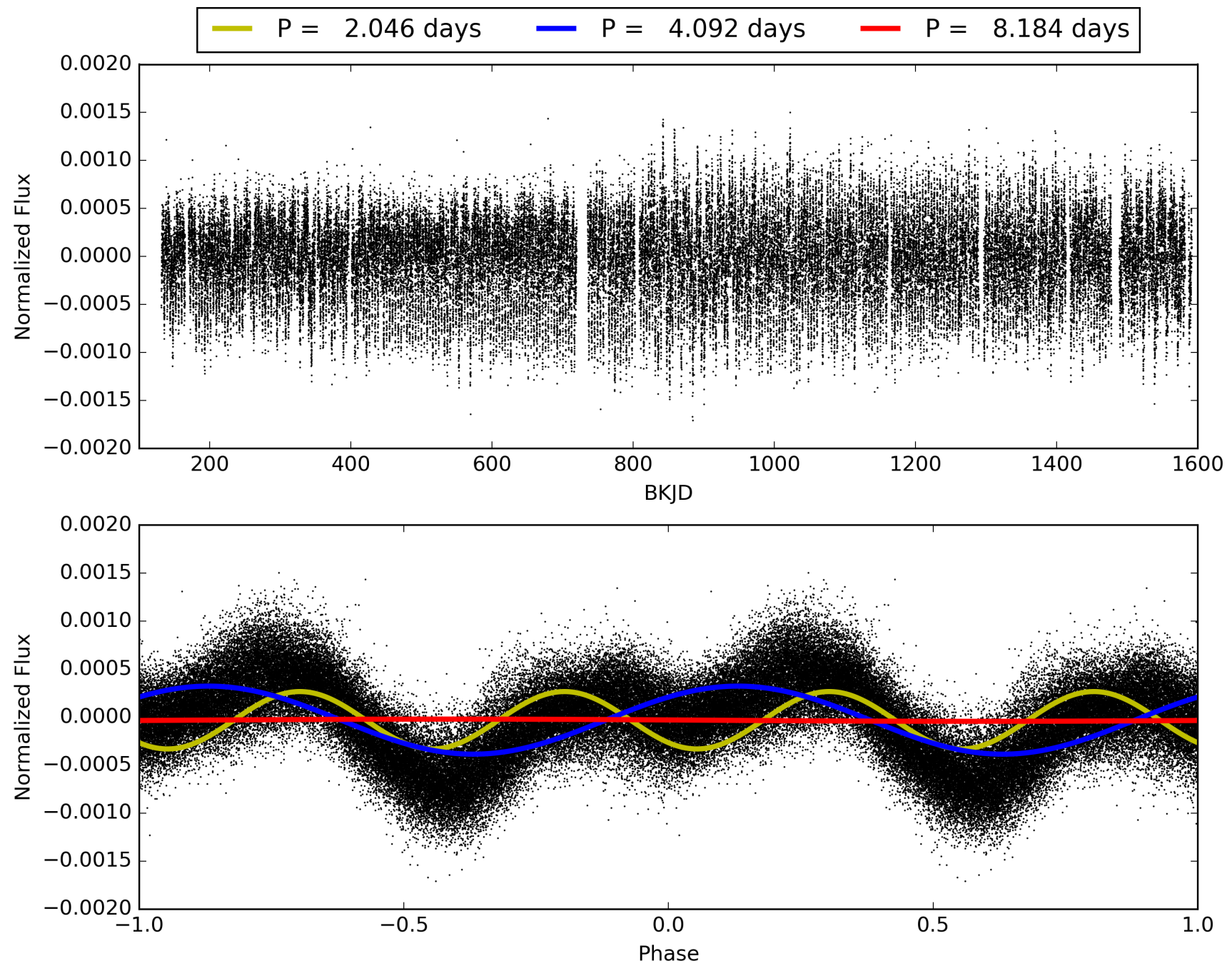
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:44:23 Z

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

# TCE 009362445-01, PDC Light Curves



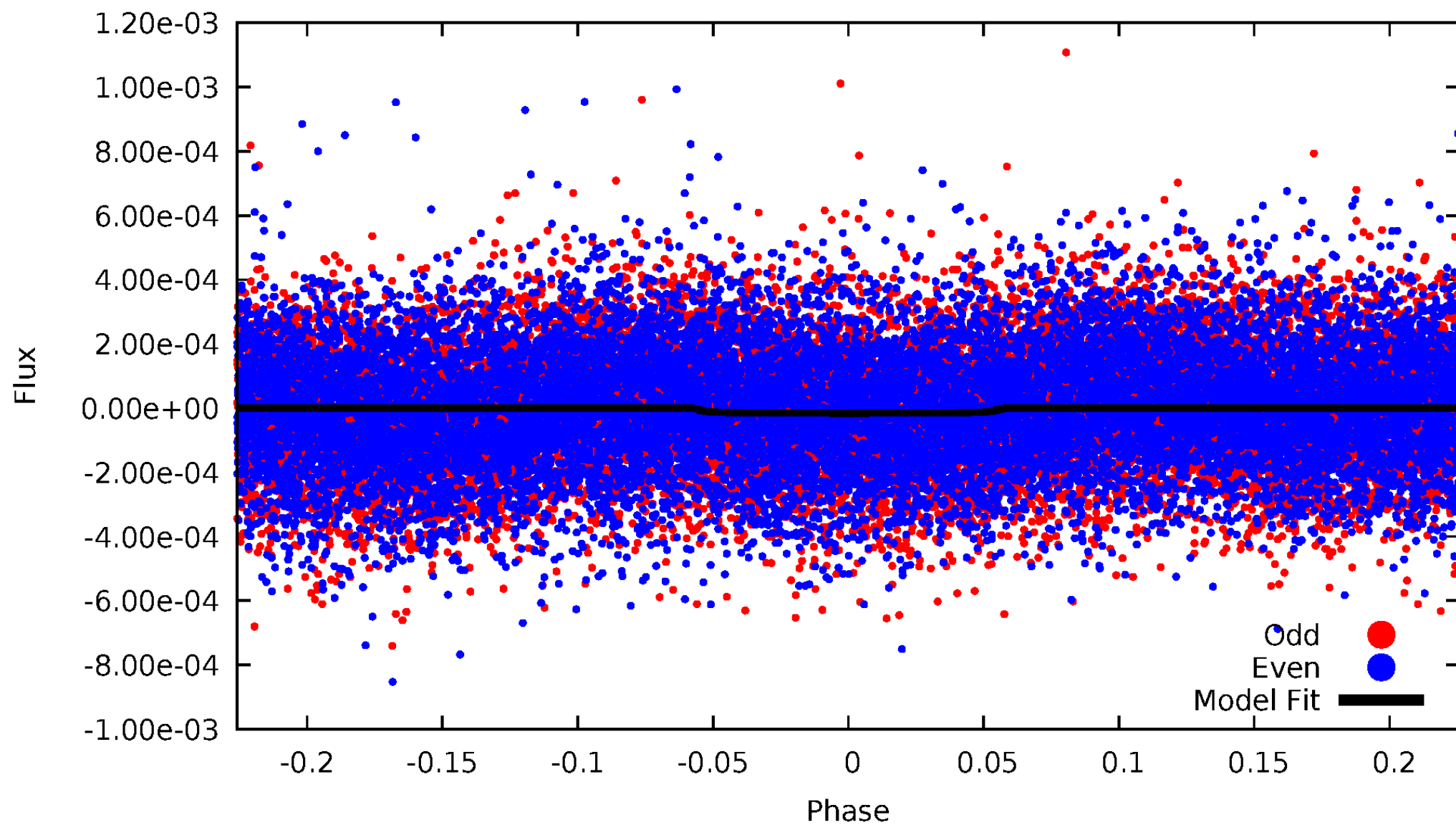
TCE 009362445-01





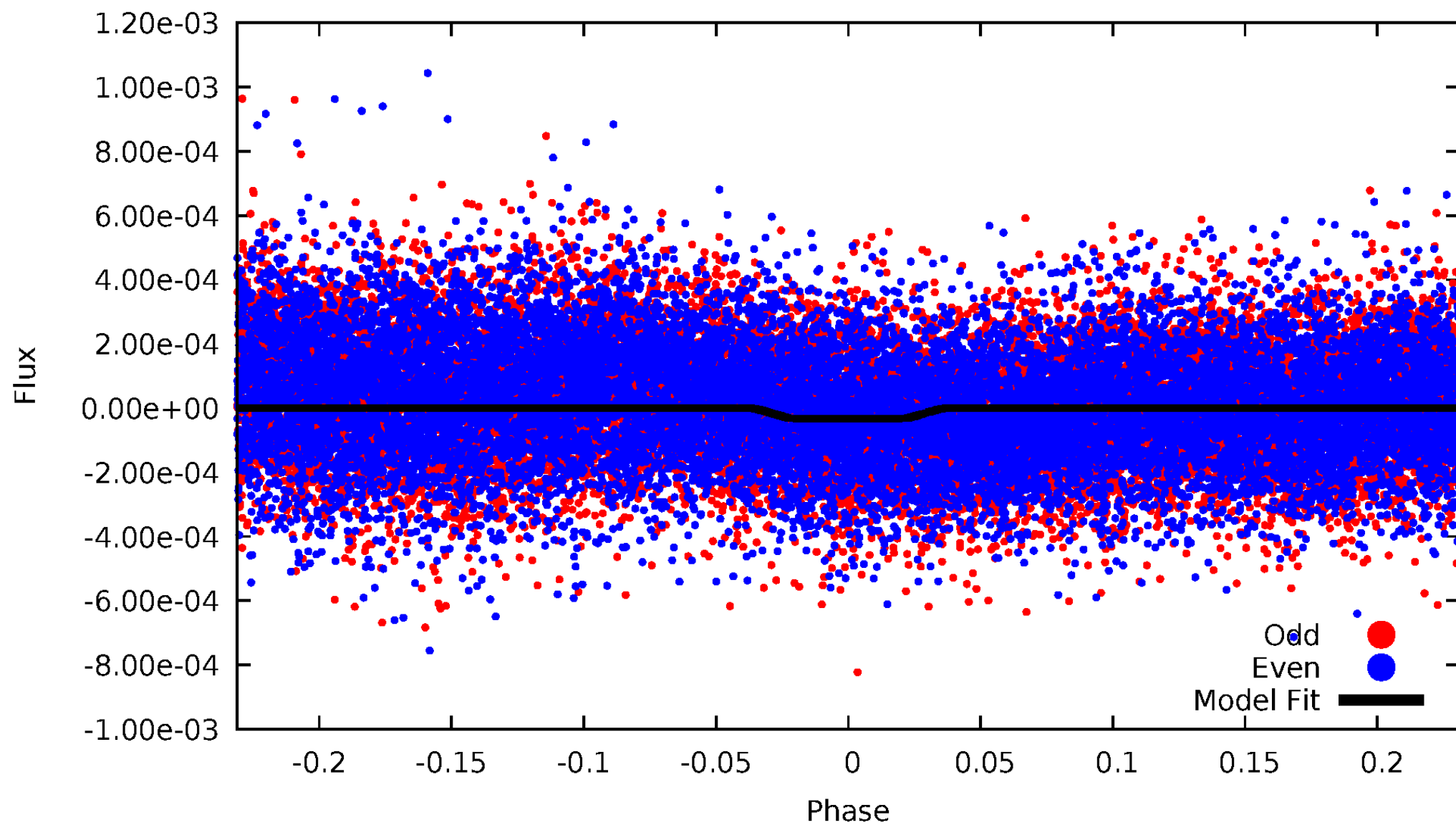
# DV Odd/Even

TCE 009362445-01

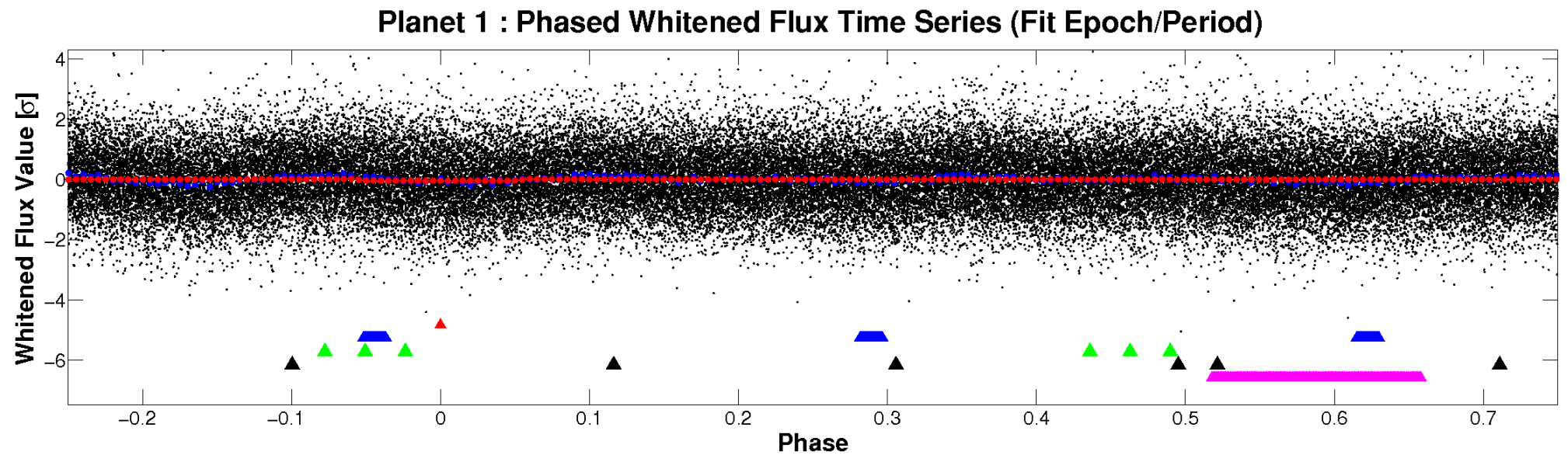
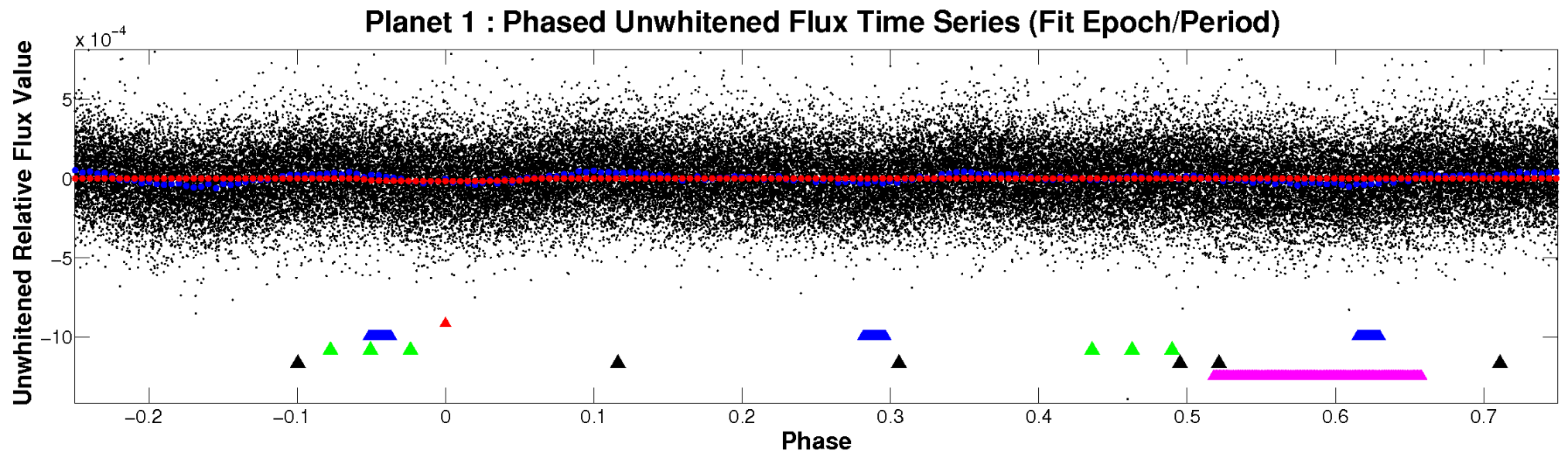


# ALT Odd/Even

TCE 009362445-01

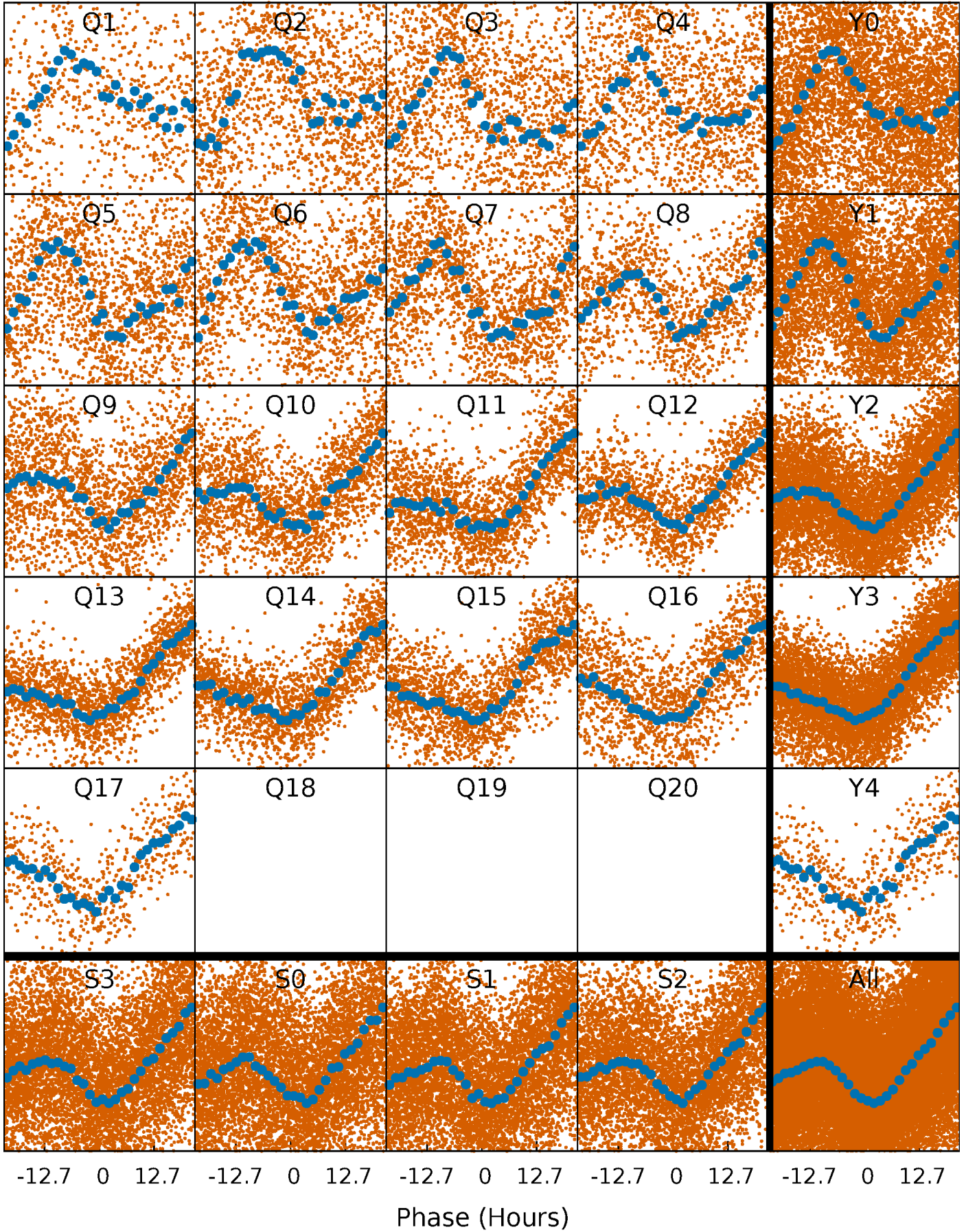


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

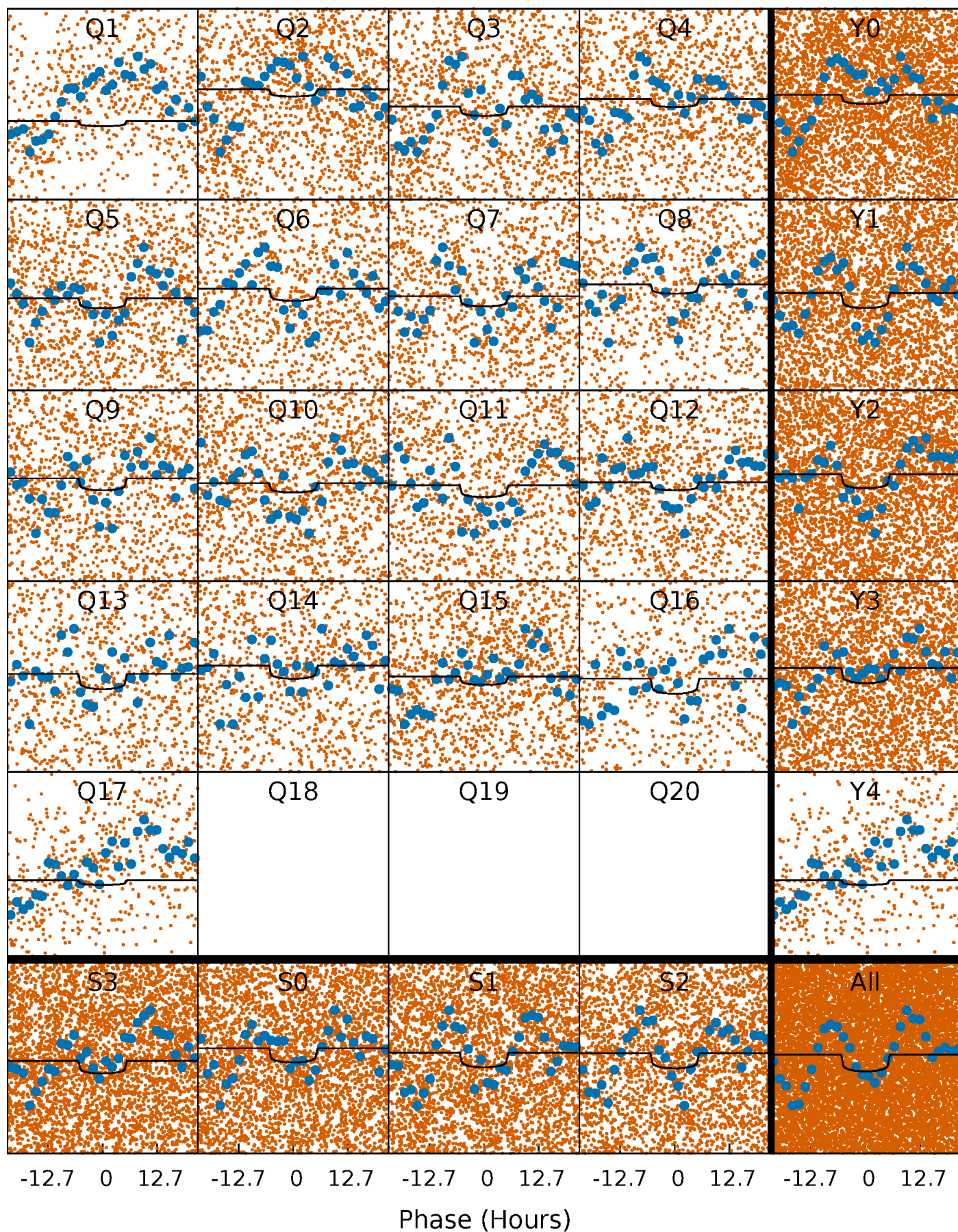
TCE 009362445-01   P= 4.091769 Days    $T_0=133.015592$  (BKJD)





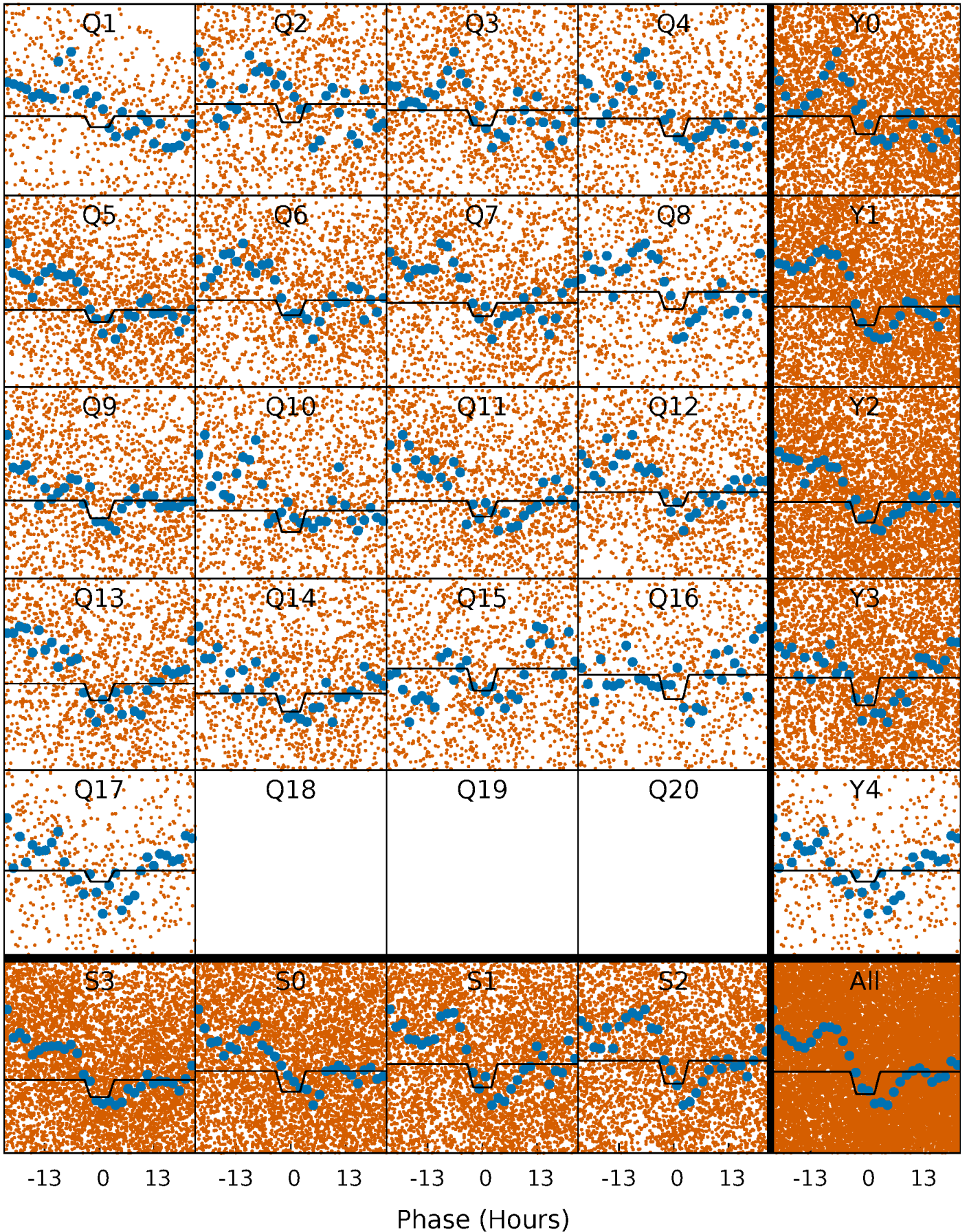
# DV Quarter-Phased Transit Curves

TCE 009362445-01 P= 4.091769 Days  $T_0=133.015592$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009362445-01   P= 4.091701 Days    $T_0=132.985387$  (BKJD)

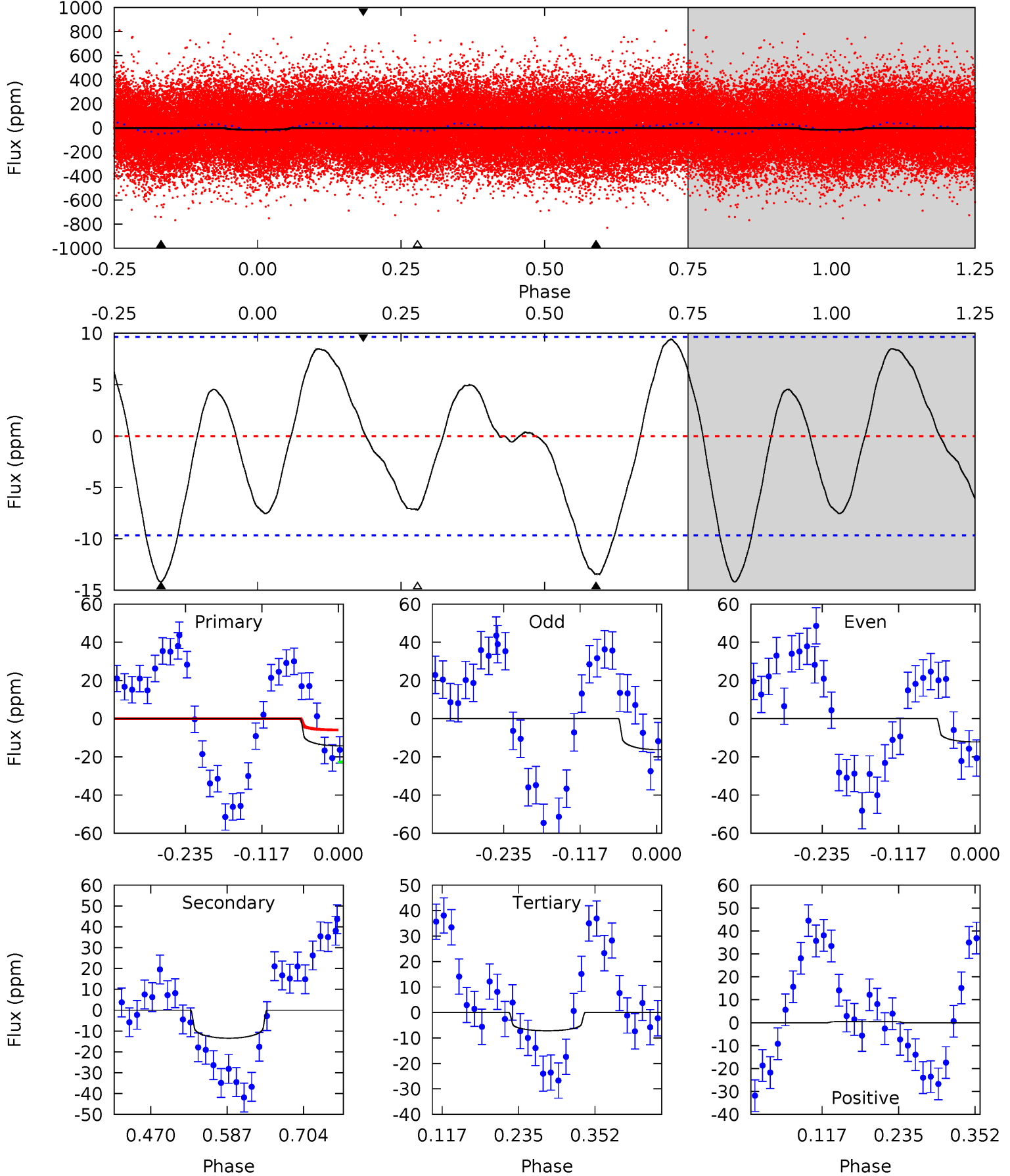




# DV Model-Shift Uniqueness Test

009362445-01, P = 4.091769 Days, E = 128.923823 Days

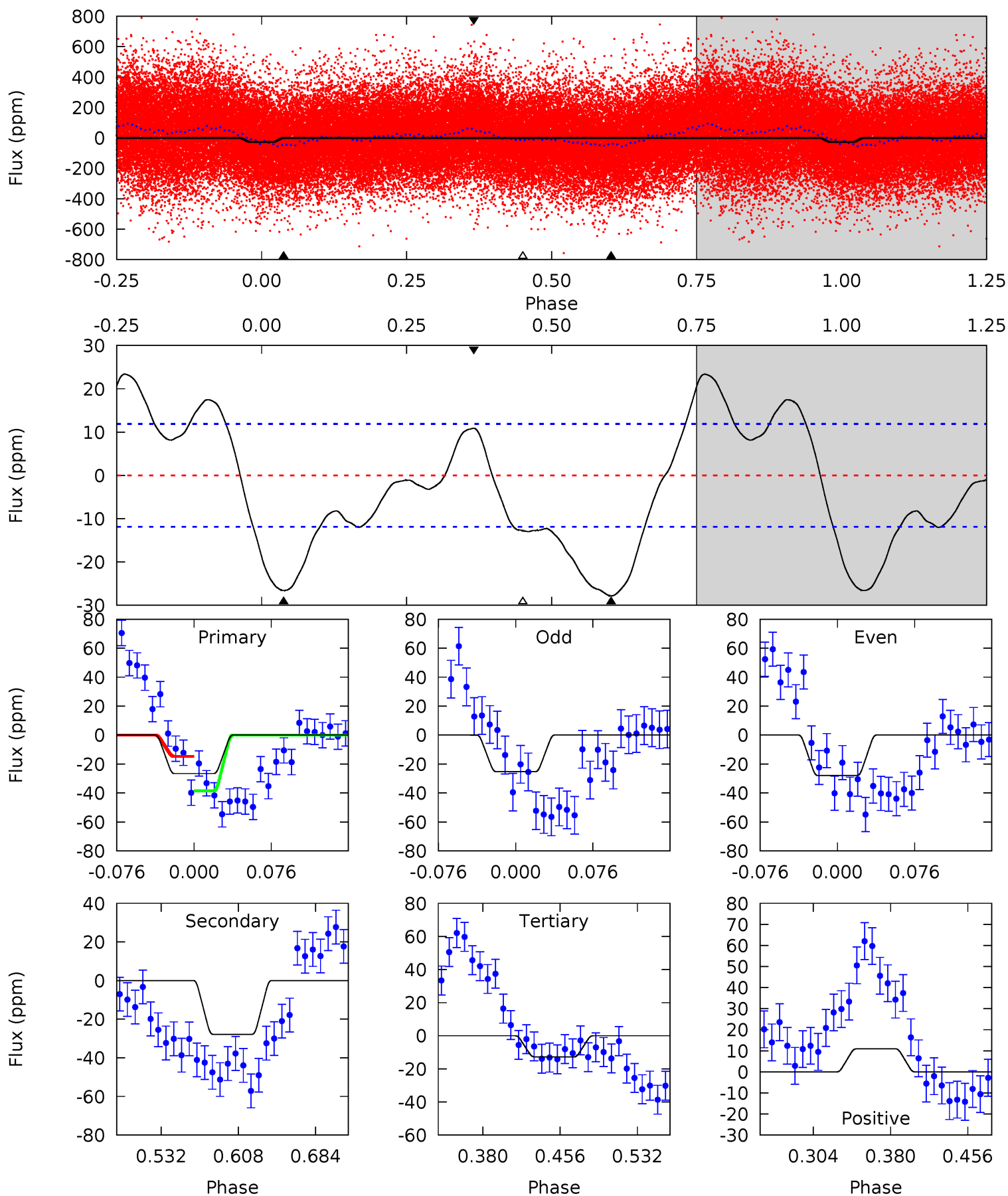
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.66	6.31	3.37	0.24	4.53	1.57	2.22	3.29	6.42	2.94	6.07	0.94	0.92	0.40	3.86



# Alt Model-Shift Uniqueness Test

009362445-01, P = 4.091701 Days, E = 128.893686 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	10.8	4.97	4.24	4.62	1.77	4.31	5.36	6.10	5.84	6.57	0.52	1.02	0.46	4.54





### Stellar Parameters For KIC 009362445

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6086^{+202}_{-220}$	$3.480^{+0.376}_{-0.094}$	$-0.520^{+0.350}_{-0.300}$	$3.687^{+0.682}_{-1.705}$	$1.496^{+0.187}_{-0.437}$	$0.042^{+0.130}_{-0.016}$
	+3%/-4%	+11%/-3%	+67%/-58%	+18%/-46%	+12%/-29%	+308%/-38%
Source	PHO1	FLK73	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 009362445-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-13 \pm 2$	$1.60^{+0.74}_{-0.63}$	$2939^{+214}_{-307}$	$5579^{+1413}_{-807}$	$9.384^{+16.827}_{-4.954}$
Alt.	$-28 \pm 3$	$2.12^{+0.75}_{-0.74}$	$2942^{+212}_{-376}$	$5785^{+1111}_{-689}$	$11^{+14}_{-5}$

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

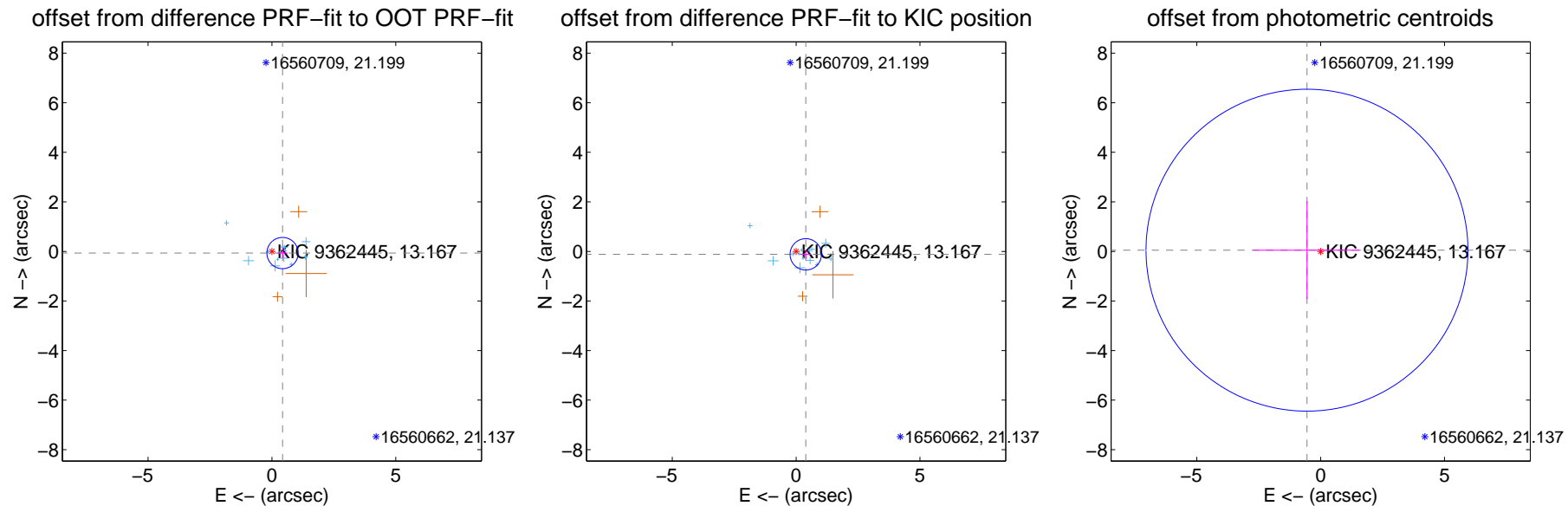
## DV Centroid Data

Supplemental centroid analysis for 009362445-01. Kepler magnitude: 13.17. Transit SNR 3.72

There are 13 quarters with good PRF difference image offsets

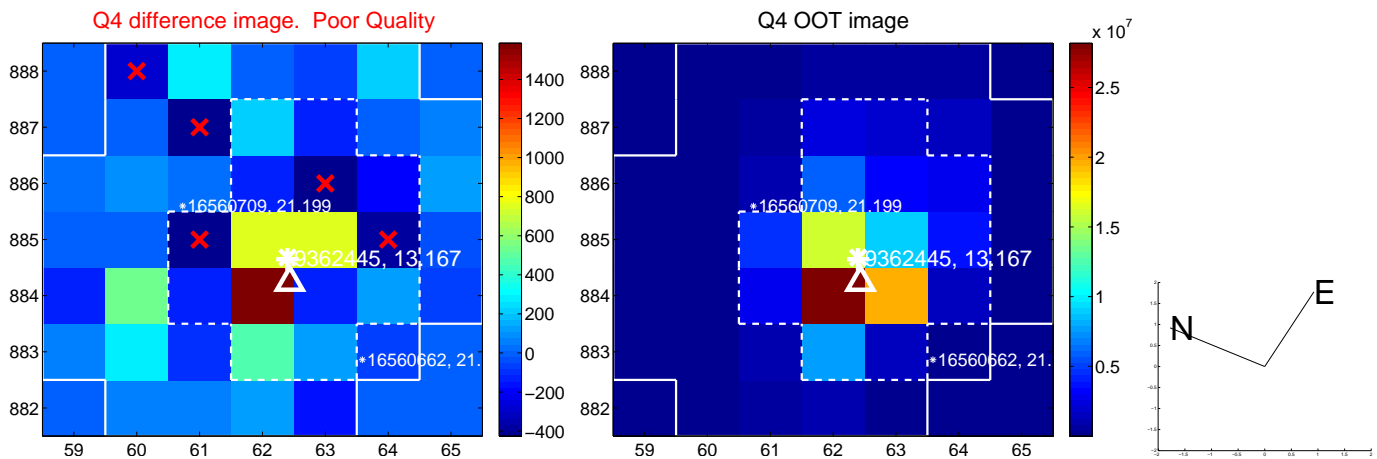
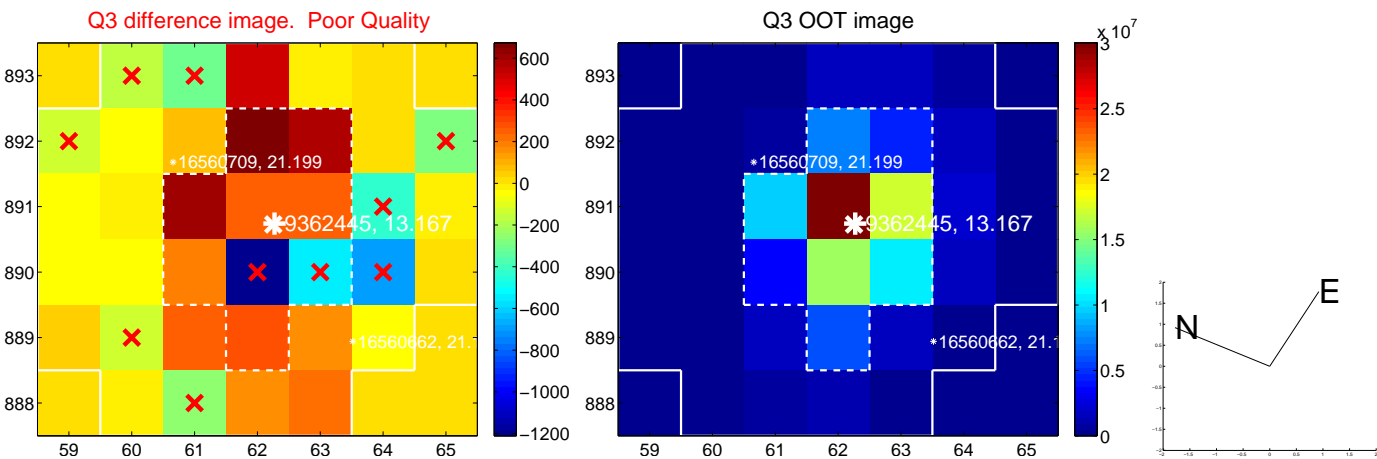
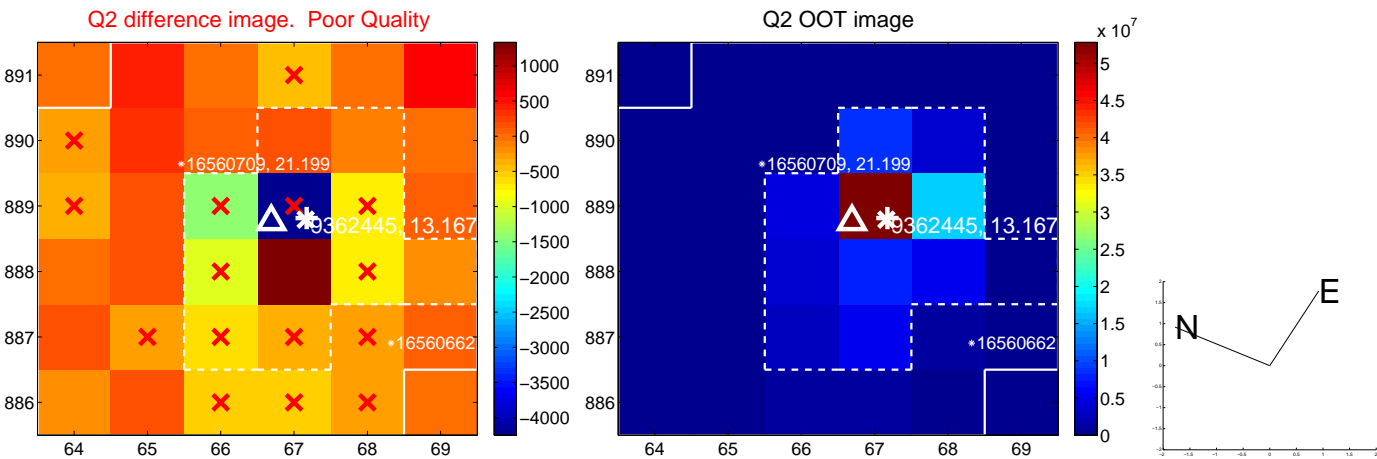
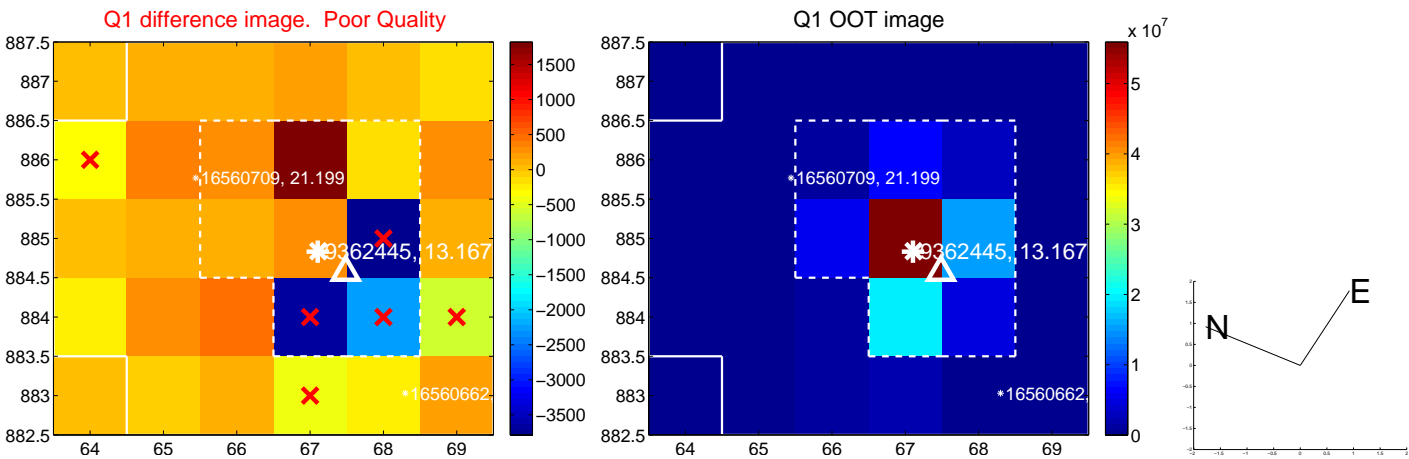
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.434 \pm 0.210$	2.06	$-0.428 \pm 0.204$	$-0.066 \pm 0.203$
PRF-fit source offset from KIC position	$0.407 \pm 0.211$	1.93	$-0.389 \pm 0.206$	$-0.118 \pm 0.193$
photometric centroid source offset	$0.55 \pm 2.16$	0.26	$0.55 \pm 2.17$	$0.05 \pm 1.97$

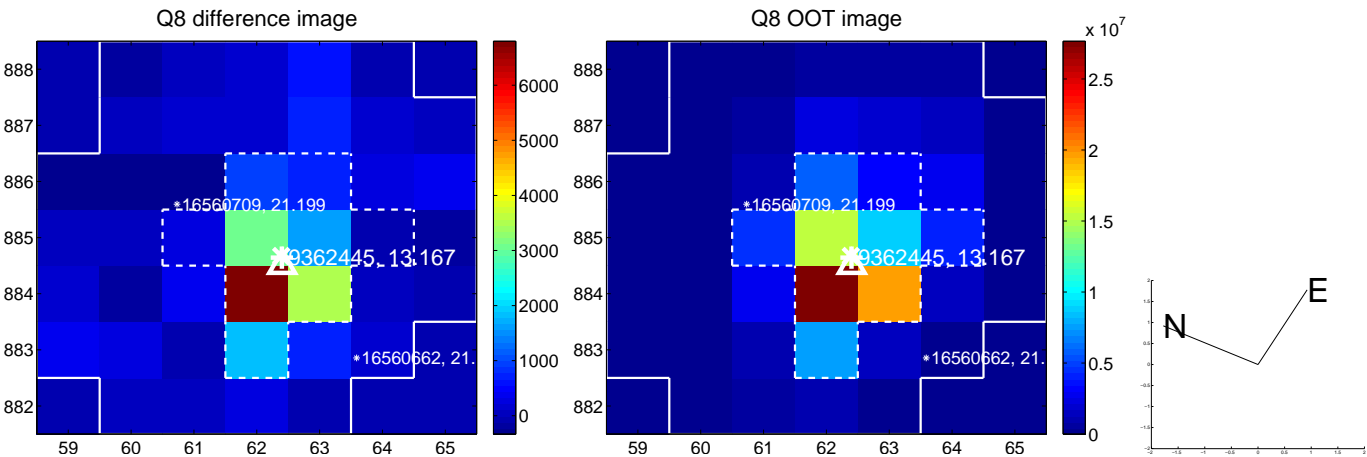
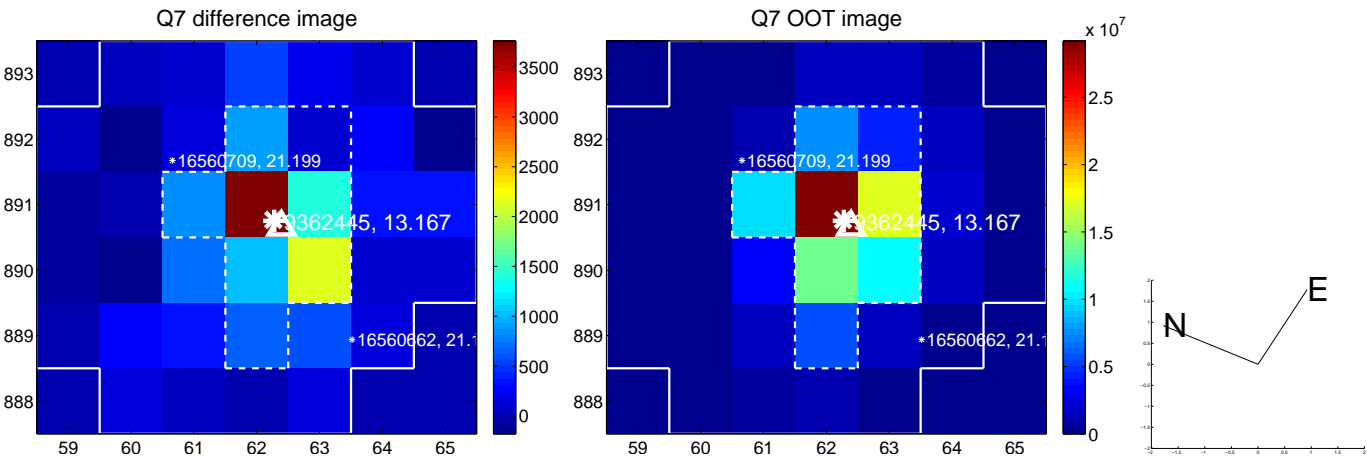
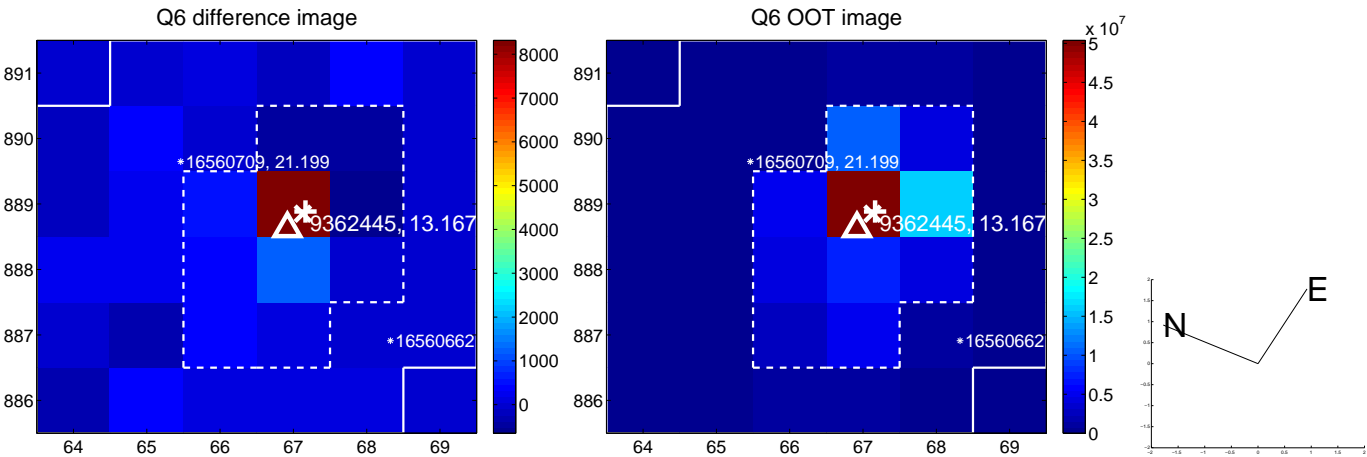
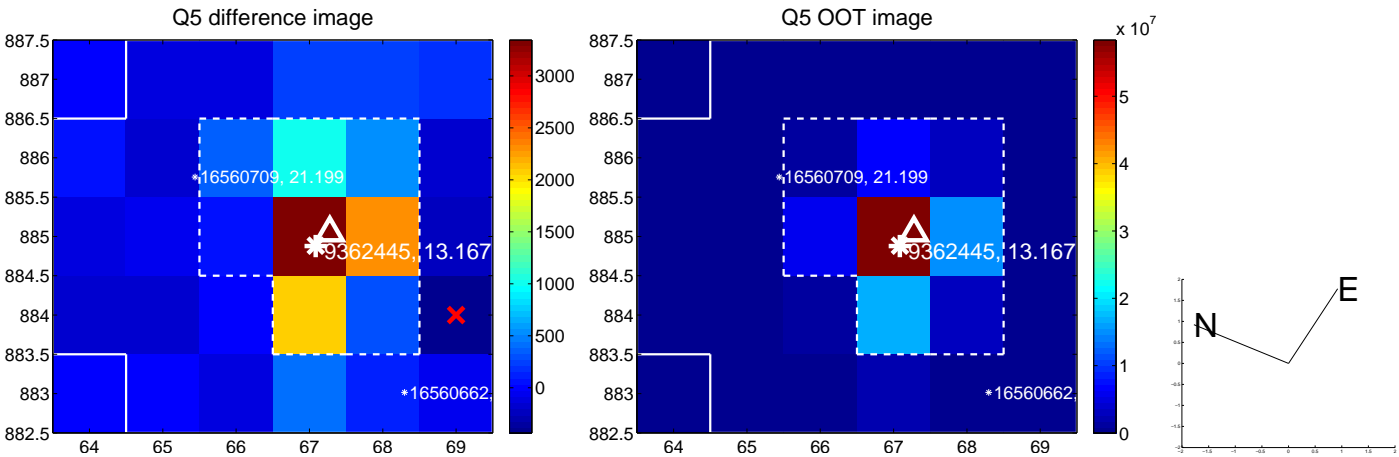


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

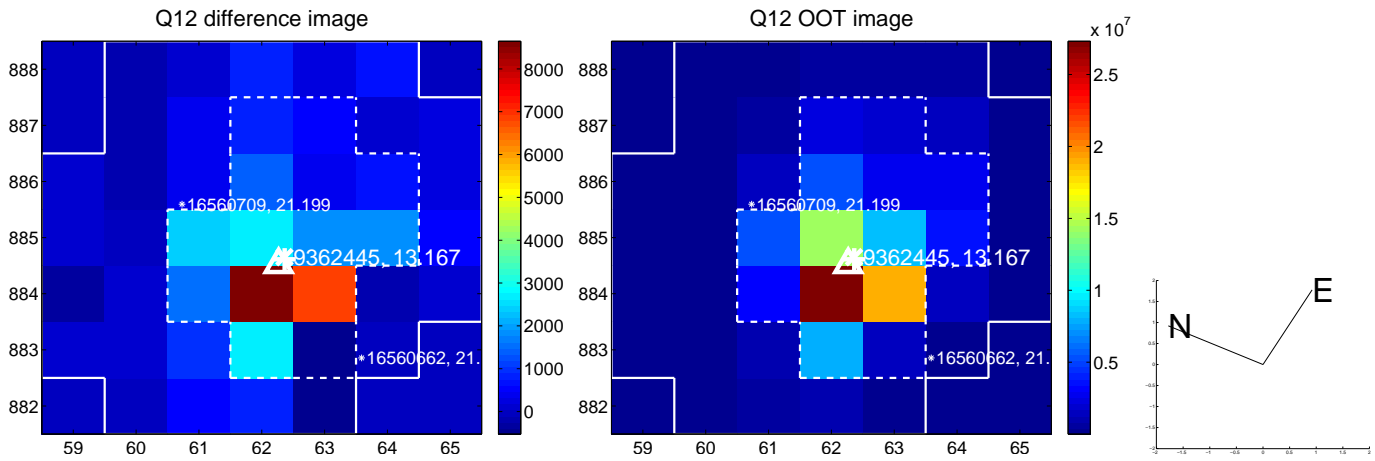
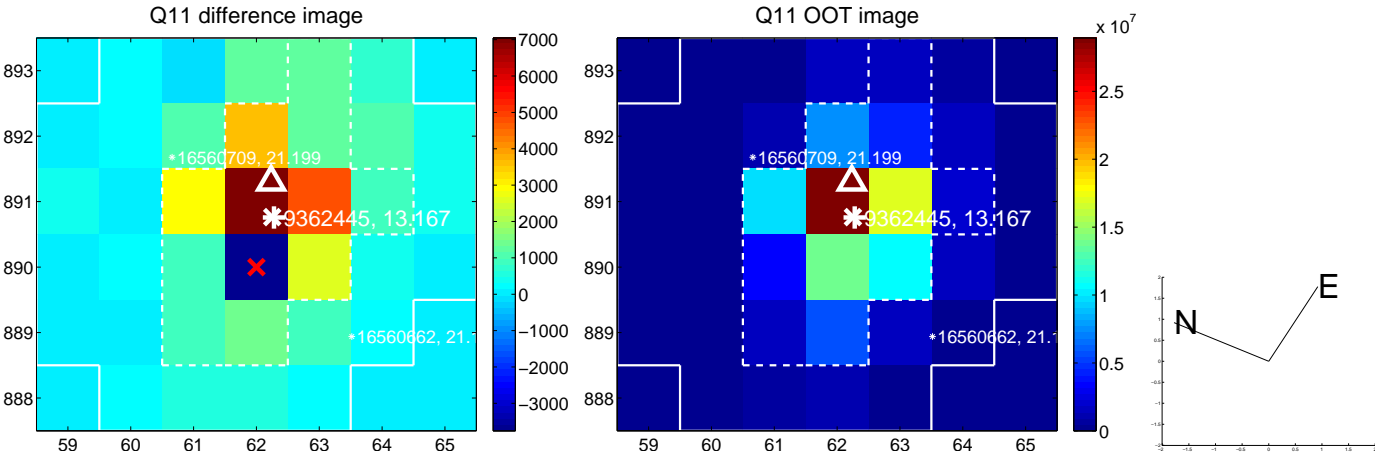
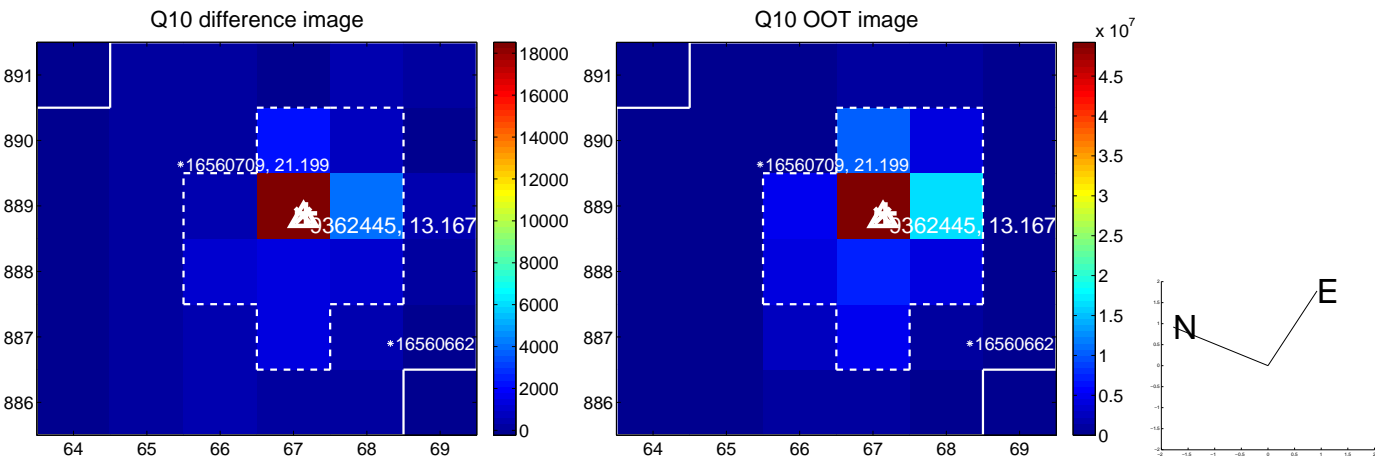
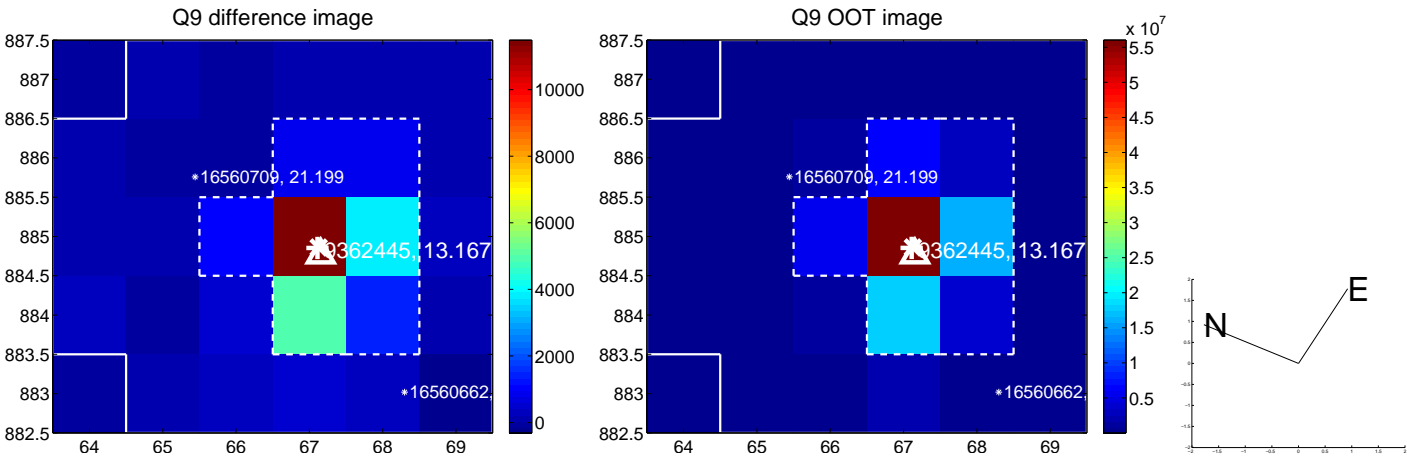


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

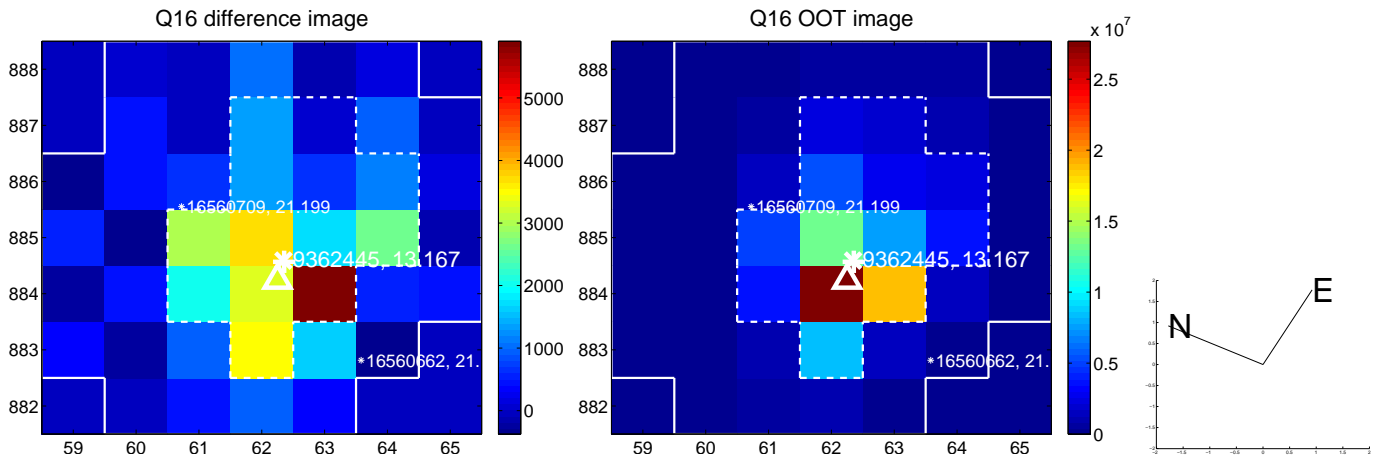
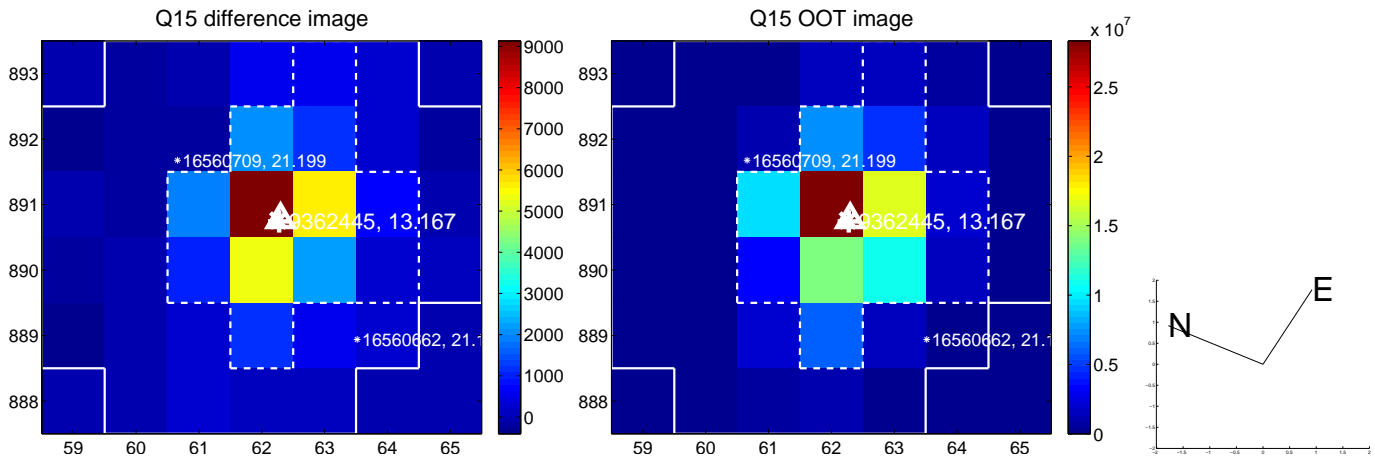
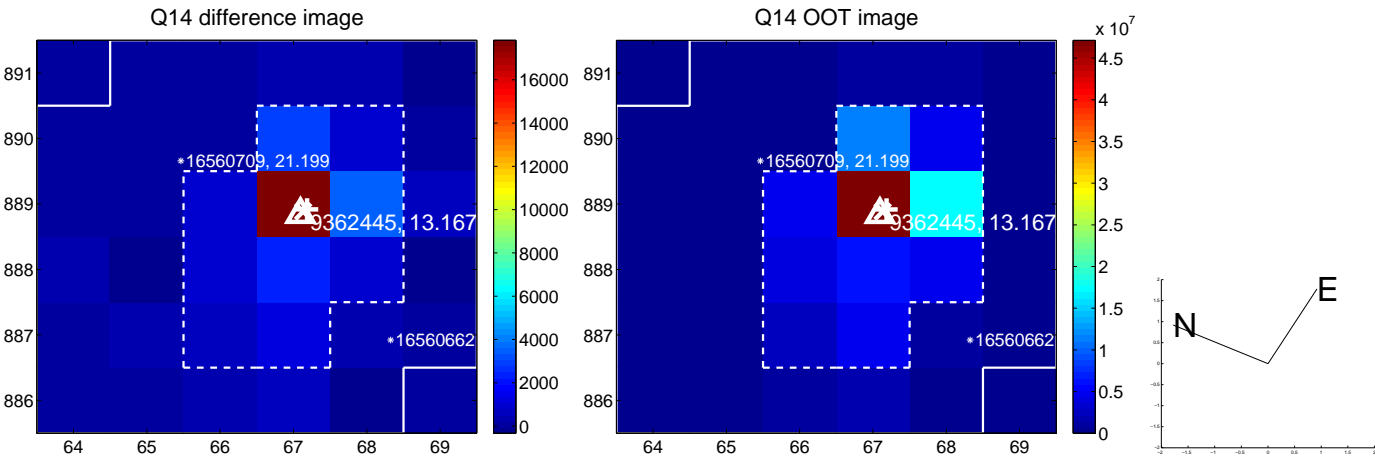
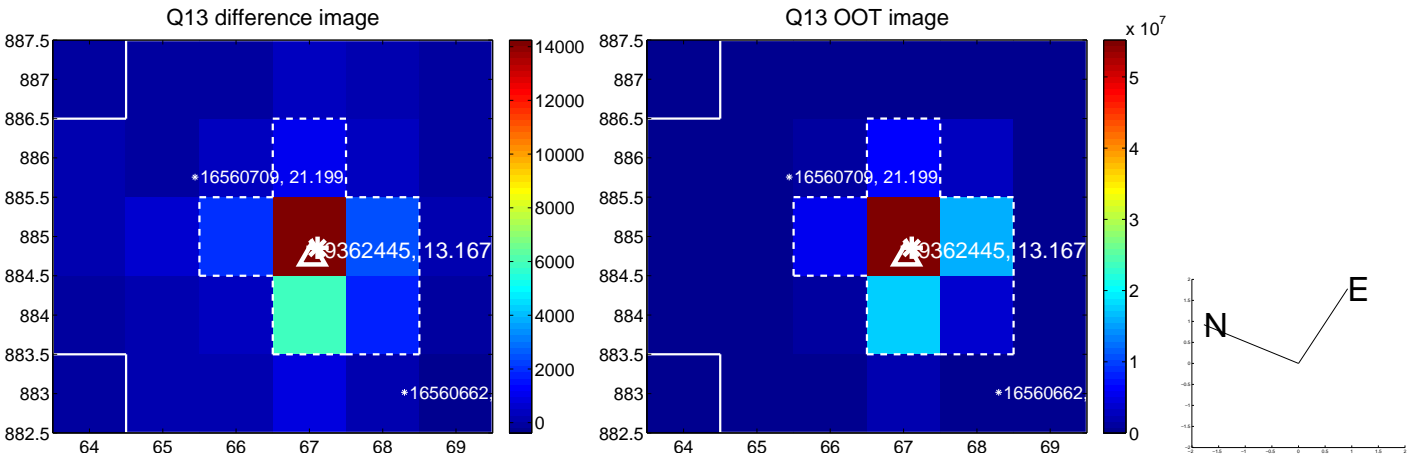




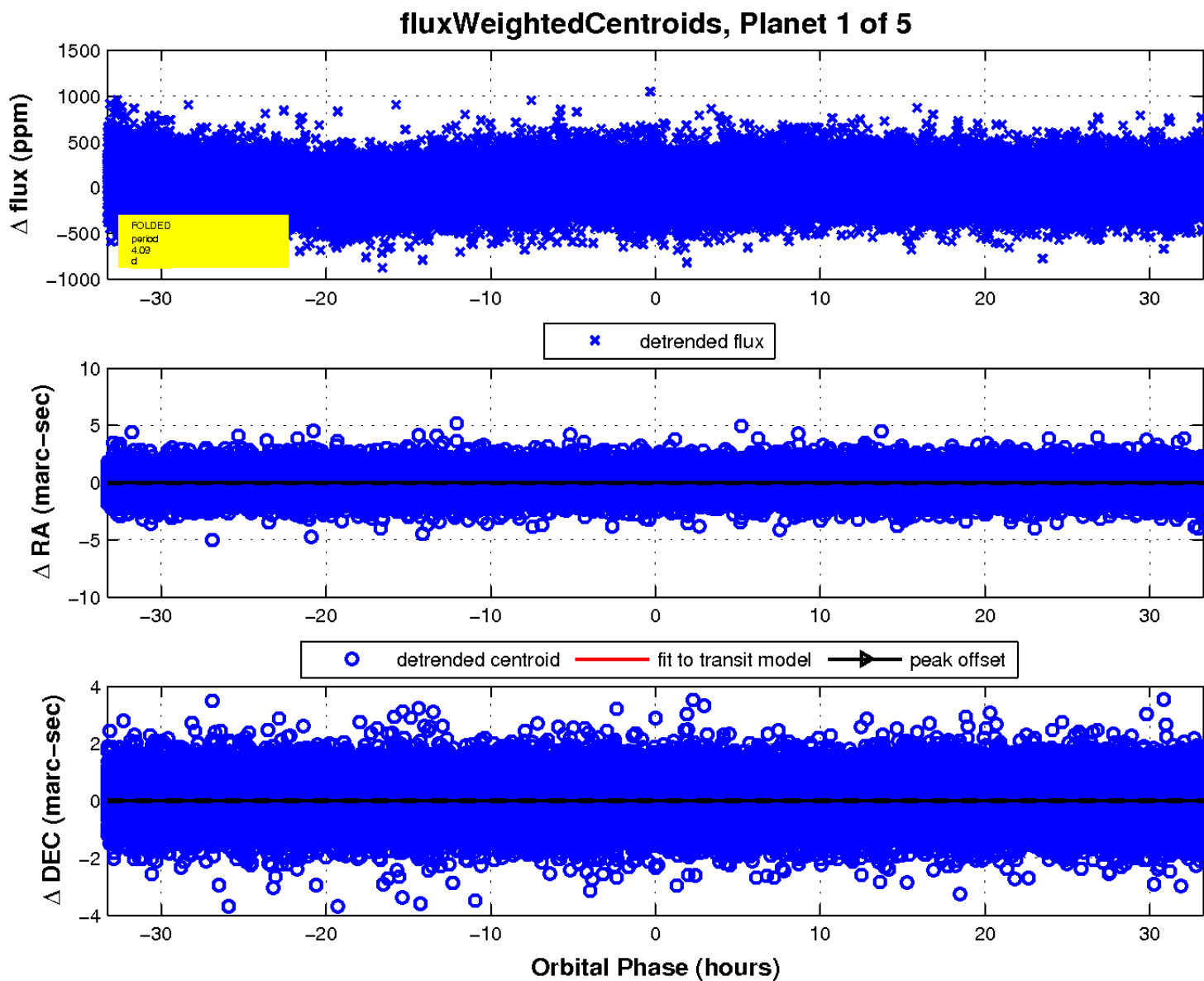
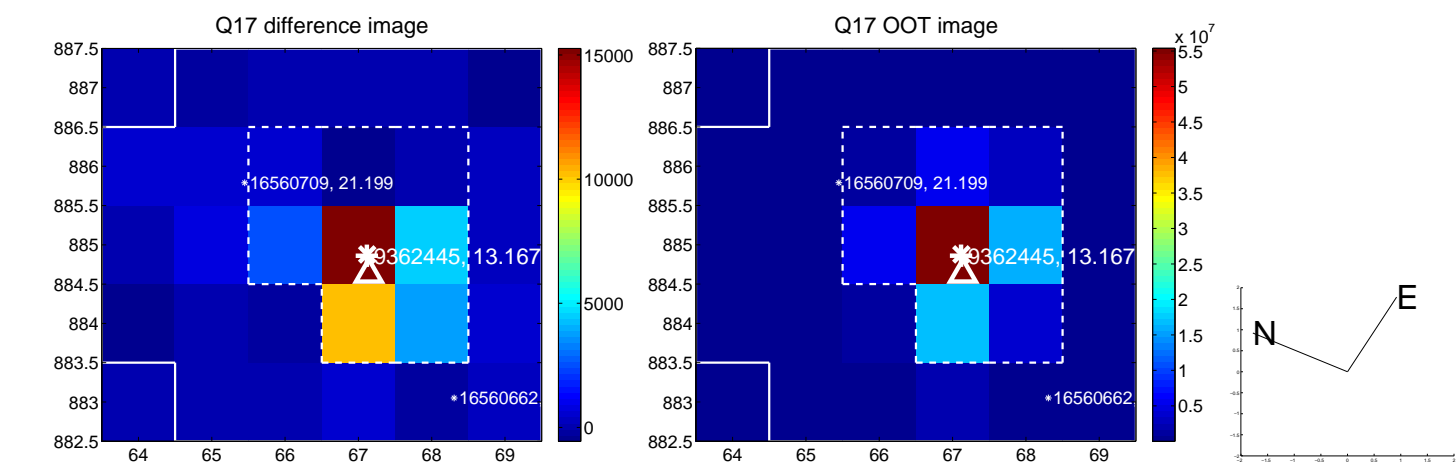
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

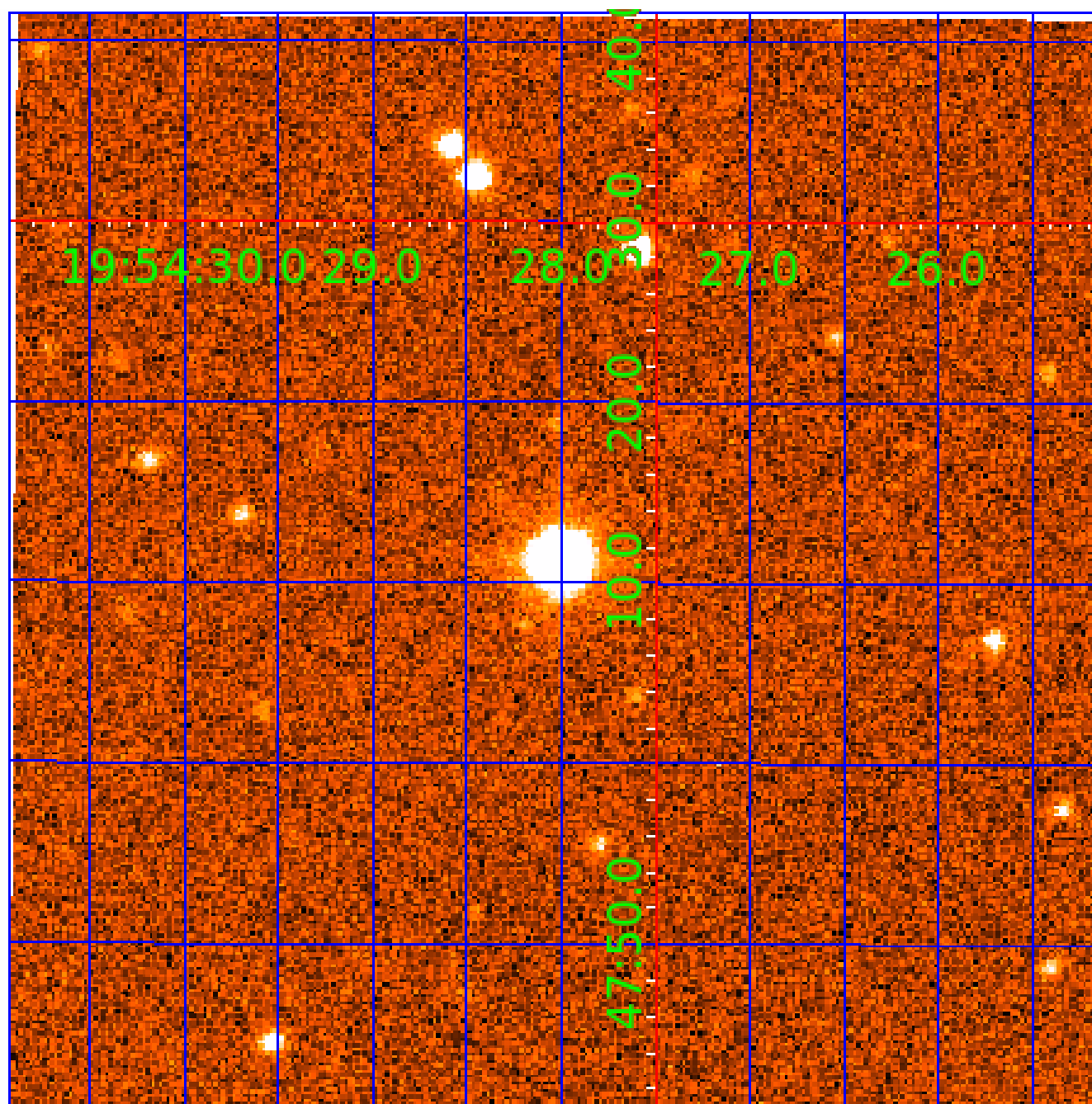


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 009362445

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009362445-01	OBS	No	4.091769	133.015592	16.3	11.087	9.6	3.7	3.69	6086	1.75	5090.84
009362445-02	OBS	No	1.363982	132.803304	34.9	4.994	8.9	10.2	3.69	6086	2.57	22025.52
009362445-03	OBS	No	231.240118	296.369113	193.5	46.611	7.9	5.1	3.69	6086	5.43	23.47
009362445-04	OBS	No	247.164354	282.345640	276.2	9.224	7.3	6.0	3.69	6086	6.55	21.48
009362445-05	OBS	No	8.180312	131.616567	147.3	5.000	7.7	-1.0	3.69	6086	4.48	2021.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009362445-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009362445-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
009362445-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009362445-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT
009362445-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS—HALO_GHOST

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

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

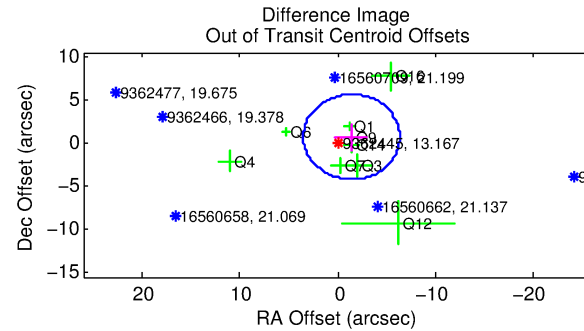
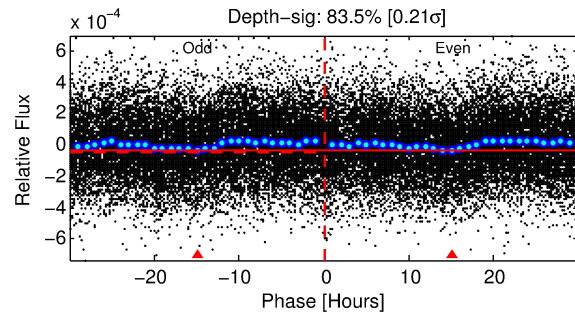
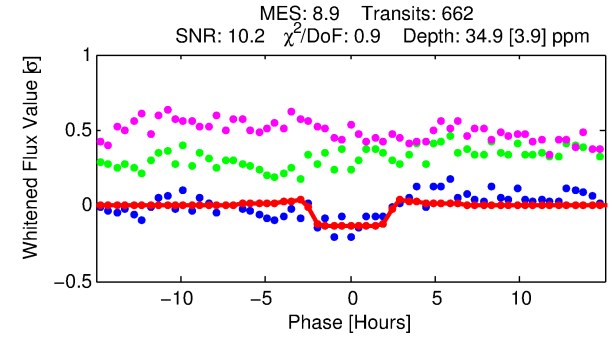
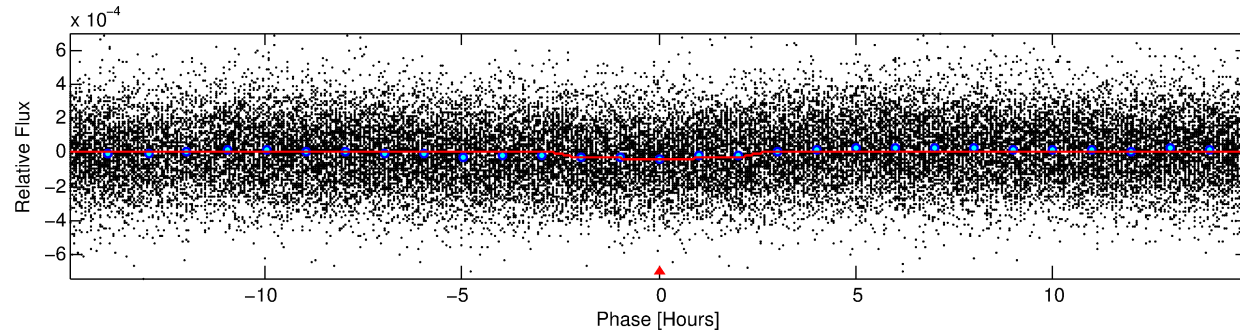
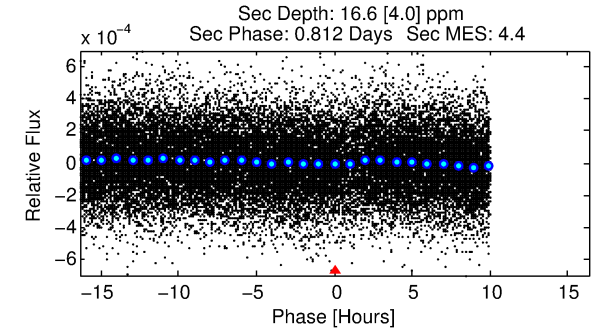
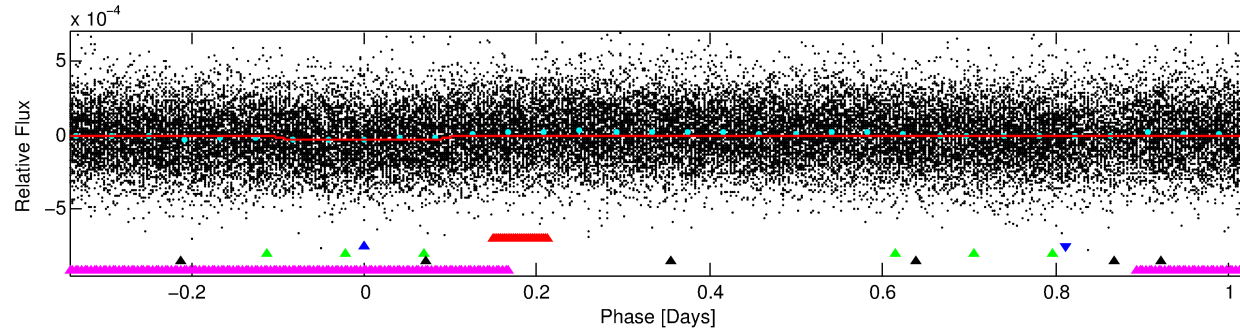
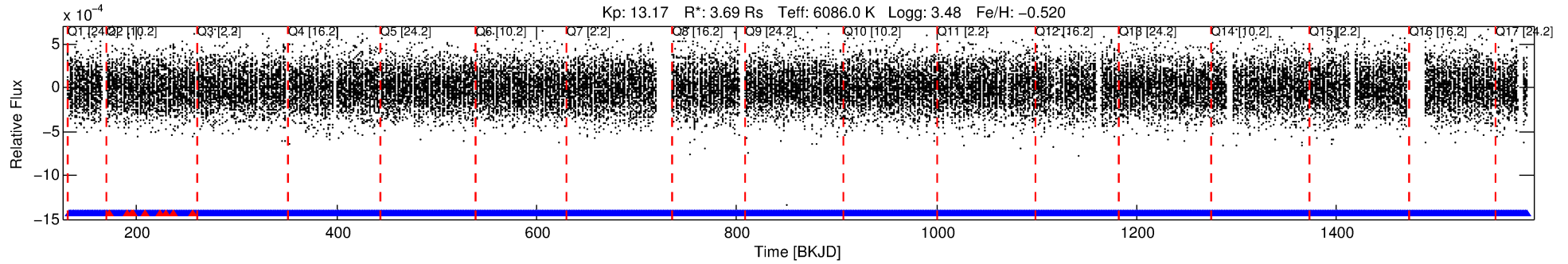
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009362445-02

No Significant Match Found

# DV One-Page Summary

KIC: 9362445 Candidate: 2 of 5 Period: 1.364 d



## DV Fit Results:

Period = 1.36398 [0.00001] d  
Epoch = 132.8033 [0.0043] BKJD  
Rp/R\* = 0.0064 [0.0023]  
a/R\* = 1.31 [1.07]  
b = 0.91 [0.39]  
Seff = 22025.52 [14760.20]  
Teq = 3106 [520] K  
Rp = 2.57 [1.50] Re  
a = 0.0275 [0.0116] AU  
Ag = 1.05 [1.04] [0.05σ]  
Teffp = 4860 [929] K [1.65σ]

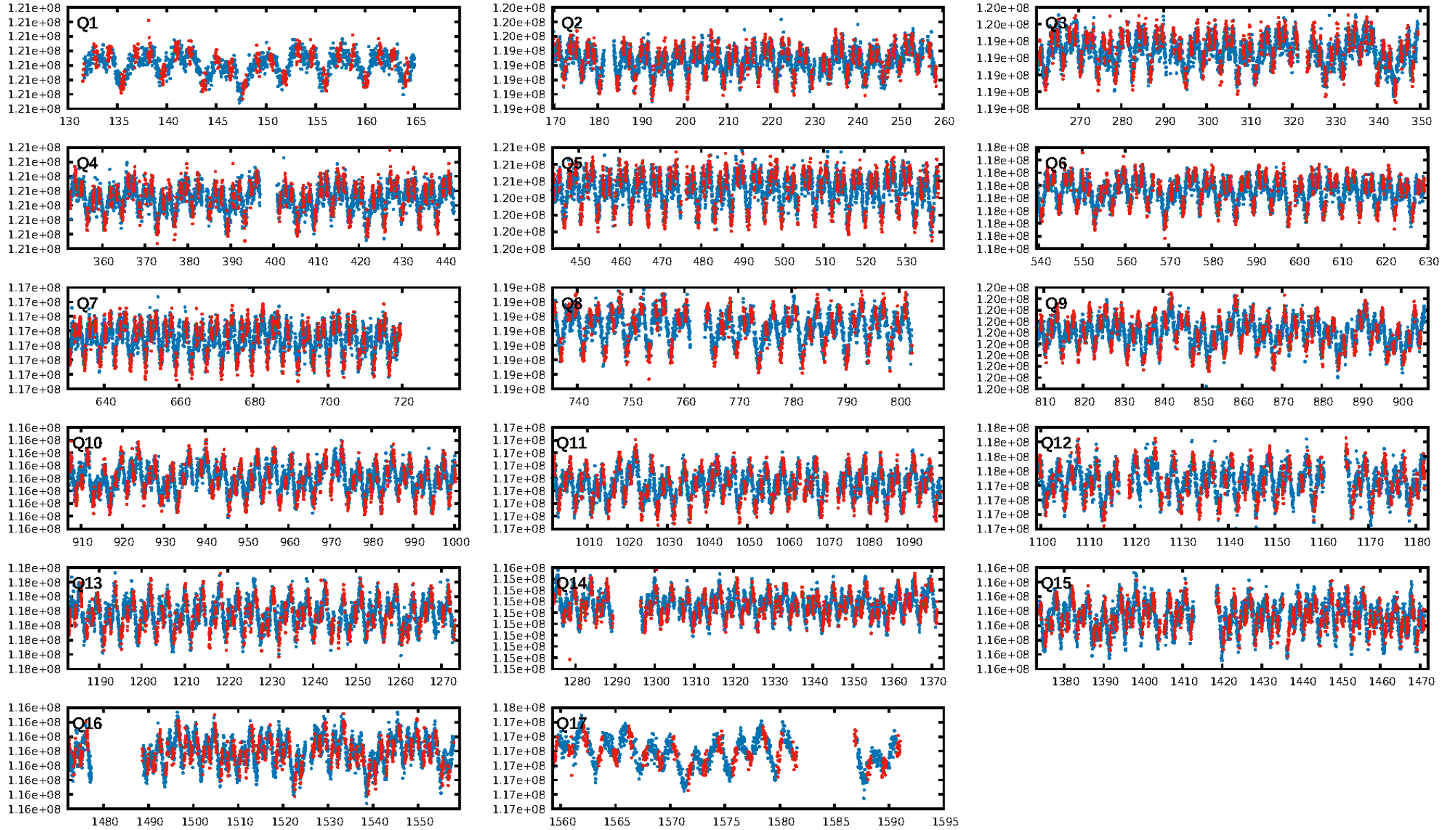
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [5.38σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 3.11e-15  
RollingBand-fgt: 0.99 [622/631]  
GhostDiagnostic-chr: 13.18  
Centroid-sig: 49.3%  
Centroid-so: 0.775 arcsec [0.96σ]  
OotOffset-rm: 1.582 arcsec [0.96σ]  
KicOffset-rm: 1.562 arcsec [1.15σ]  
OotOffset-st: 2/2/3/2 [9]  
KicOffset-st: 2/2/3/2 [9]  
DiffImageQuality-fgm: 0.22 [2/9]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:44:35 Z

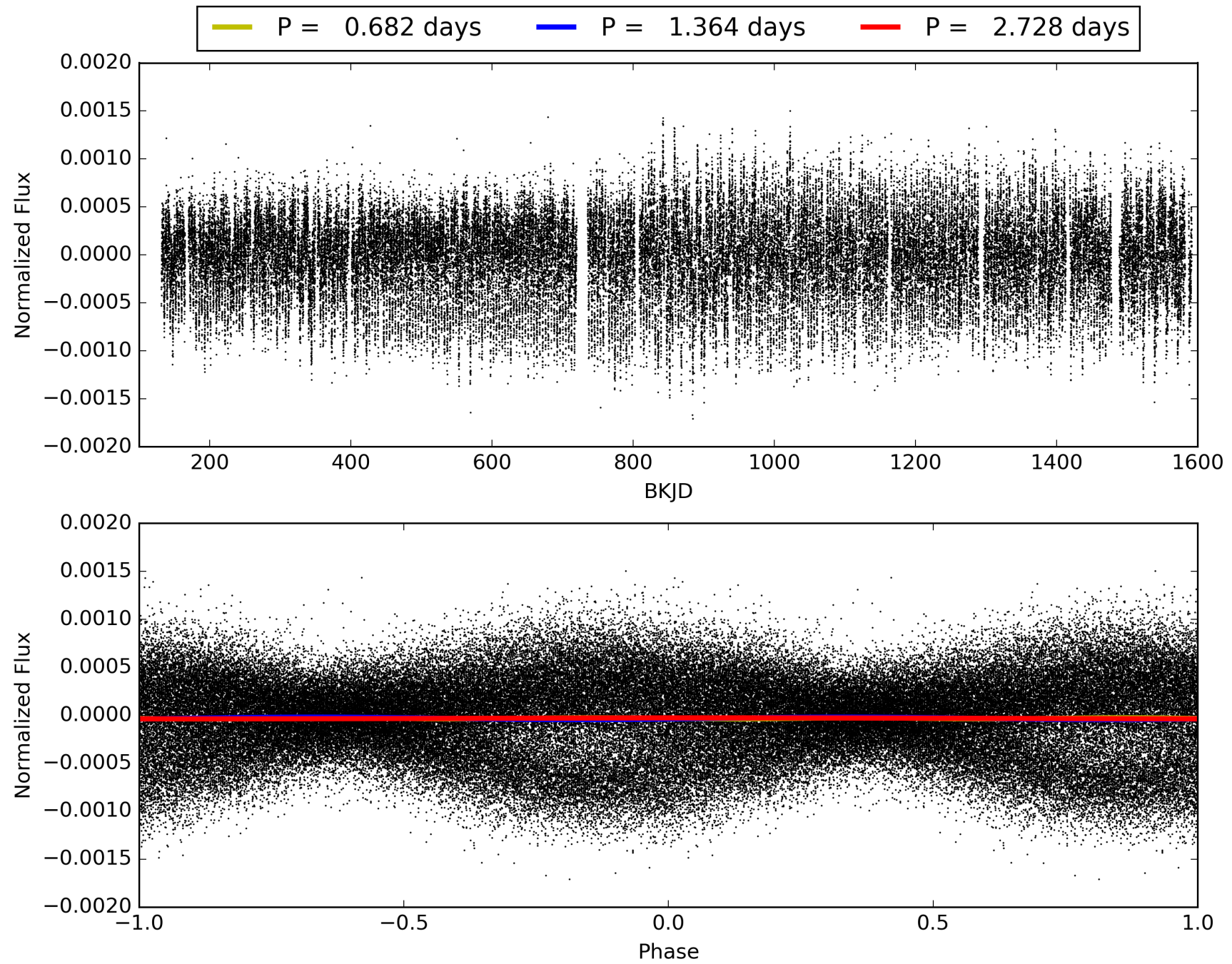
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009362445-02, PDC Light Curves



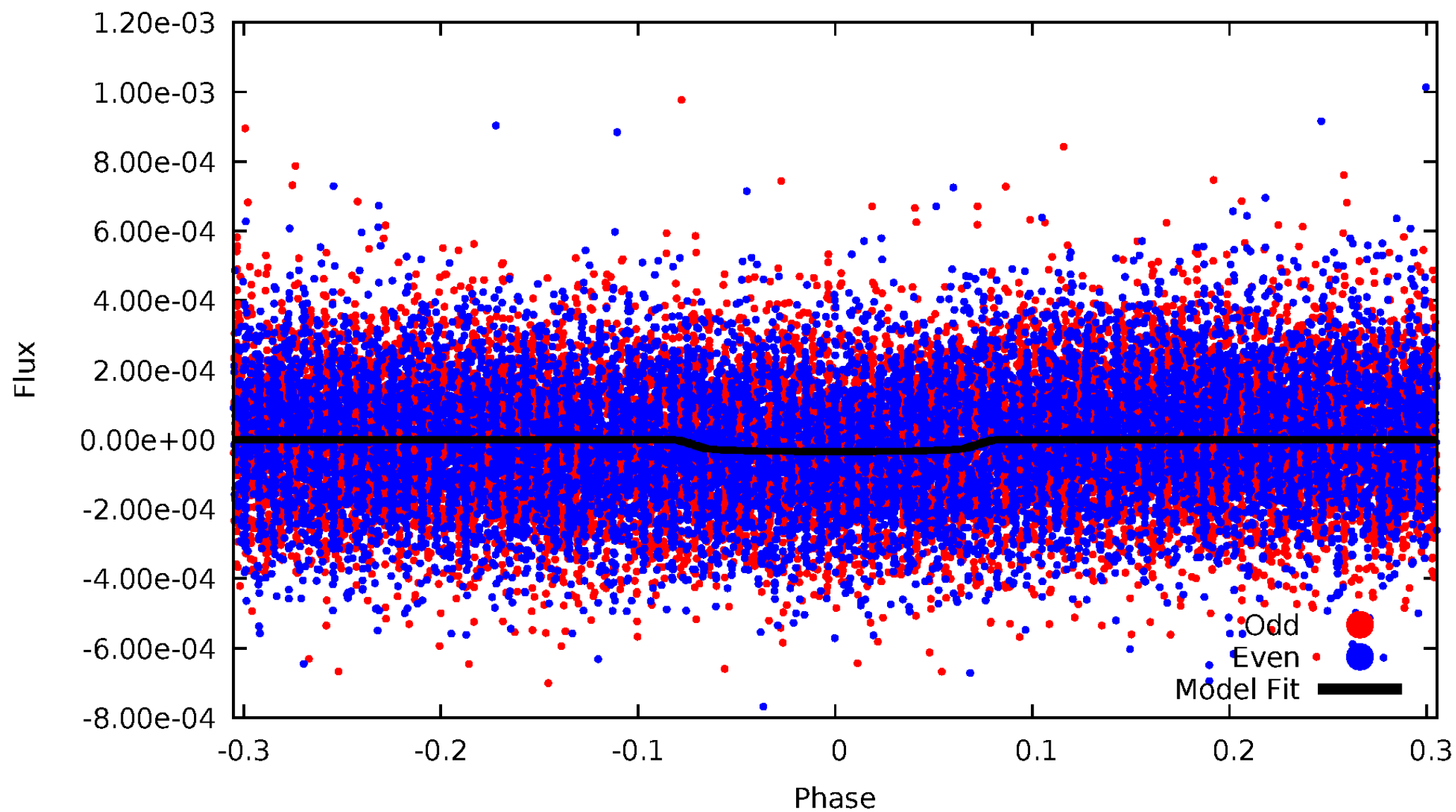


TCE 009362445-02



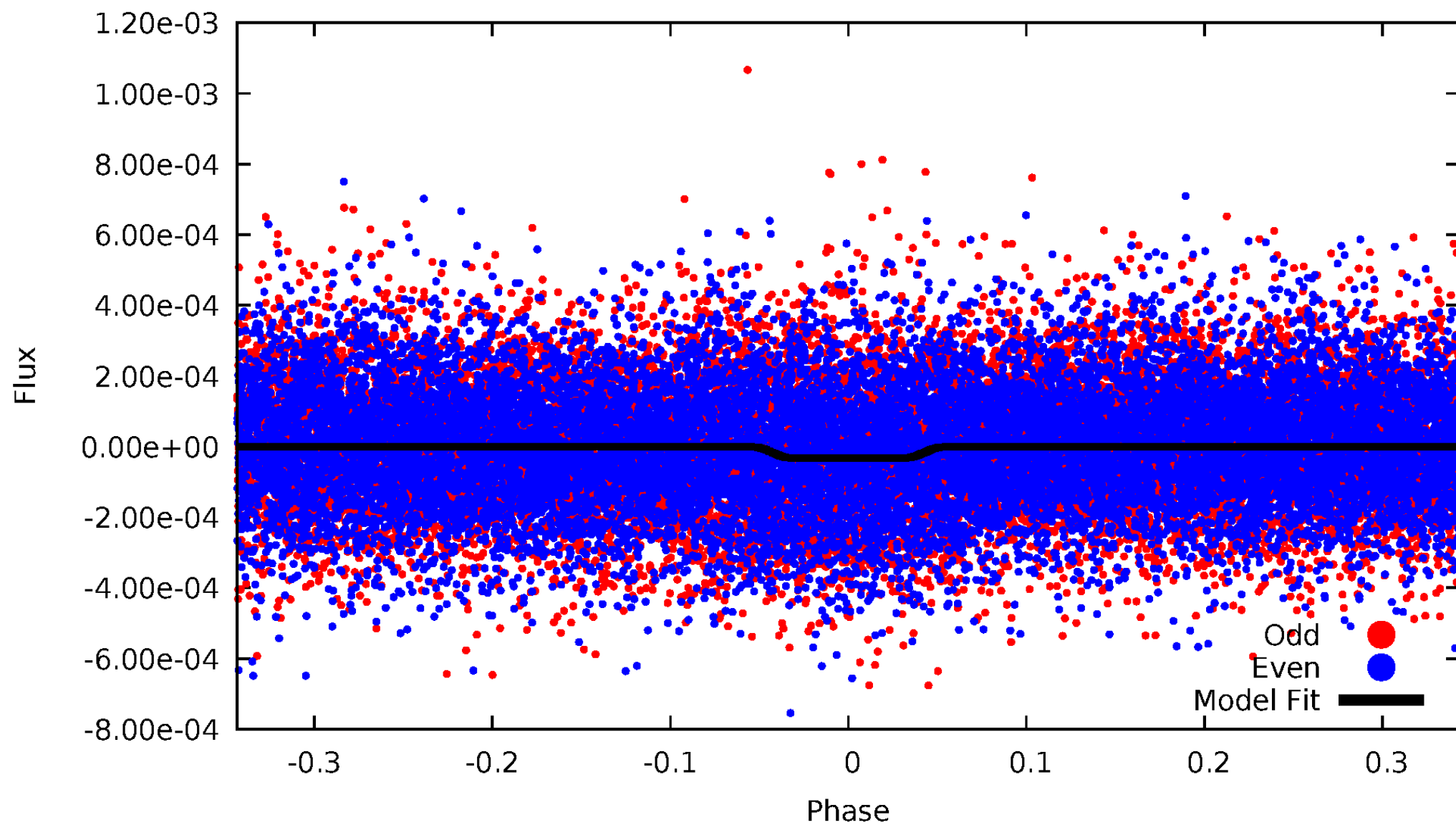
# DV Odd/Even

TCE 009362445-02



# ALT Odd/Even

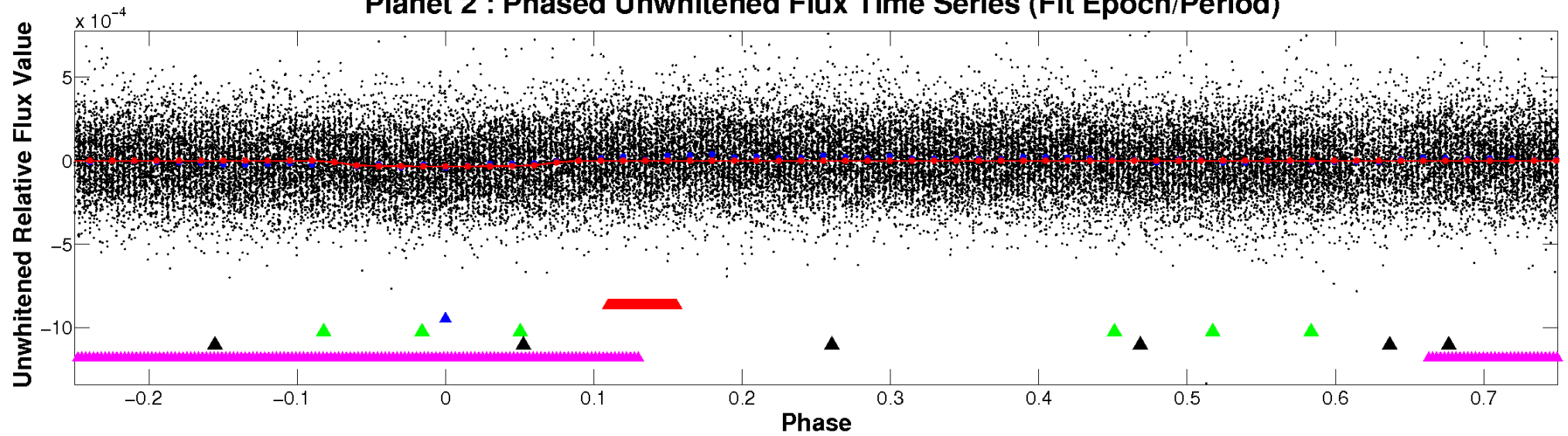
TCE 009362445-02



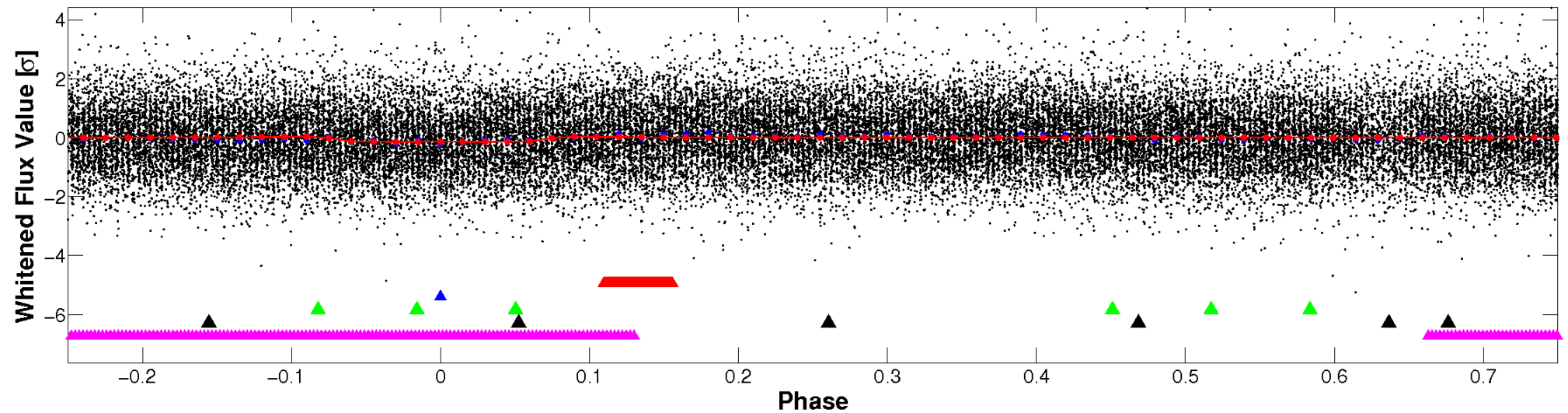


# Non-Whitened Vs. Whitened Light Curve

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

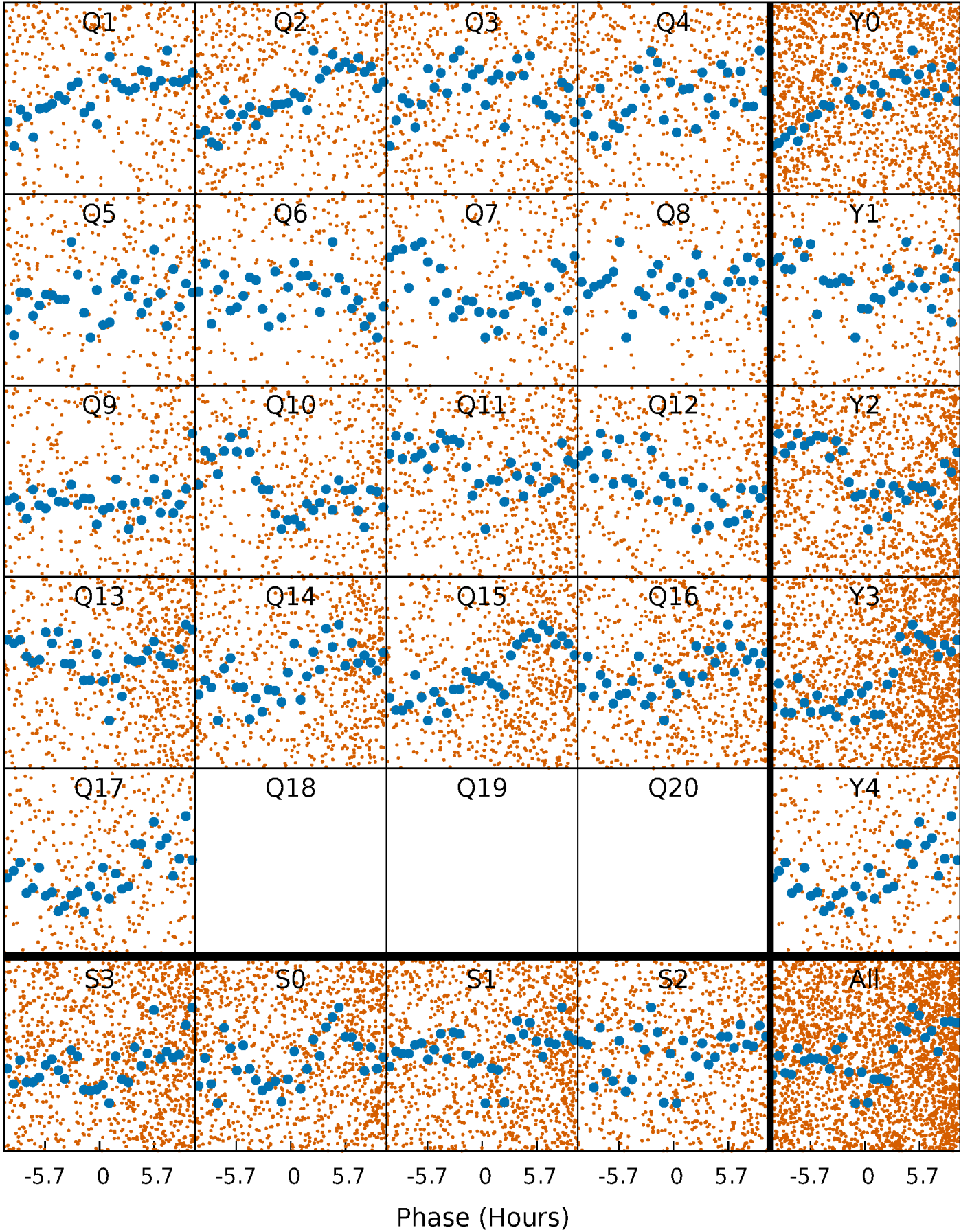


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

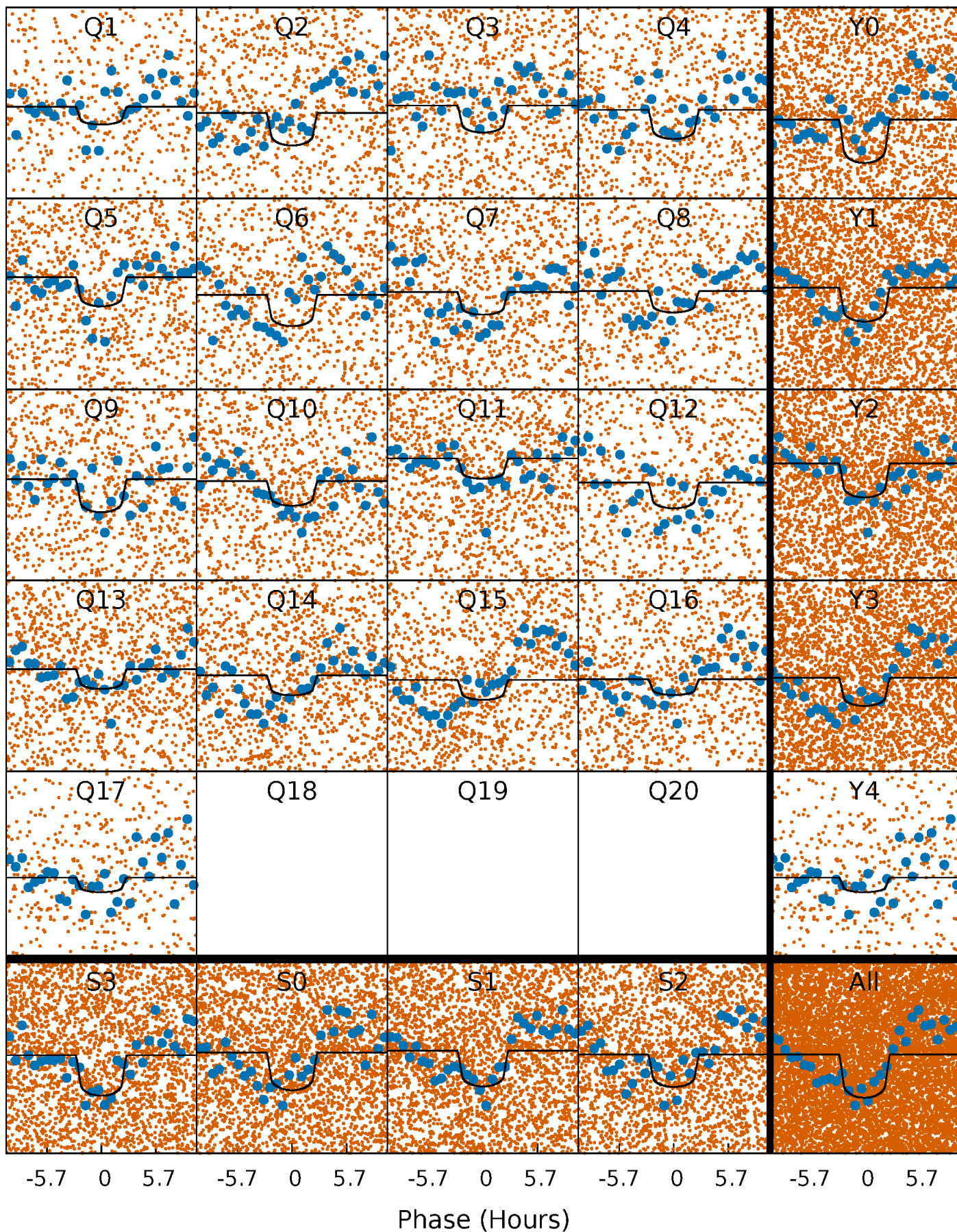
TCE 009362445-02     $P = 1.363982$  Days     $T_0 = 132.803304$  (BKJD)





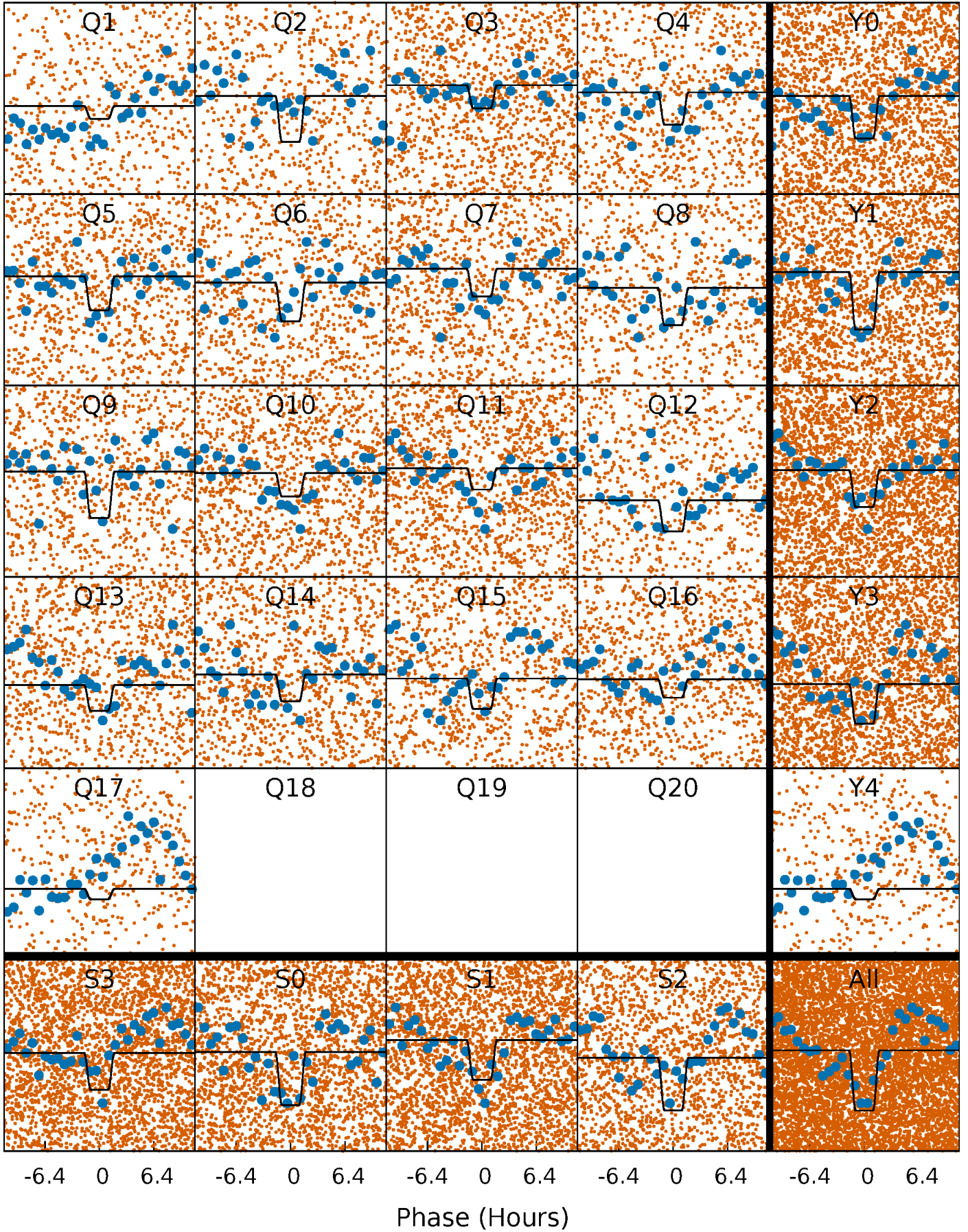
# DV Quarter-Phased Transit Curves

TCE 009362445-02   P= 1.363982 Days    $T_0=132.803304$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009362445-02   P= 1.364034 Days    $T_0=132.773928$  (BKJD)

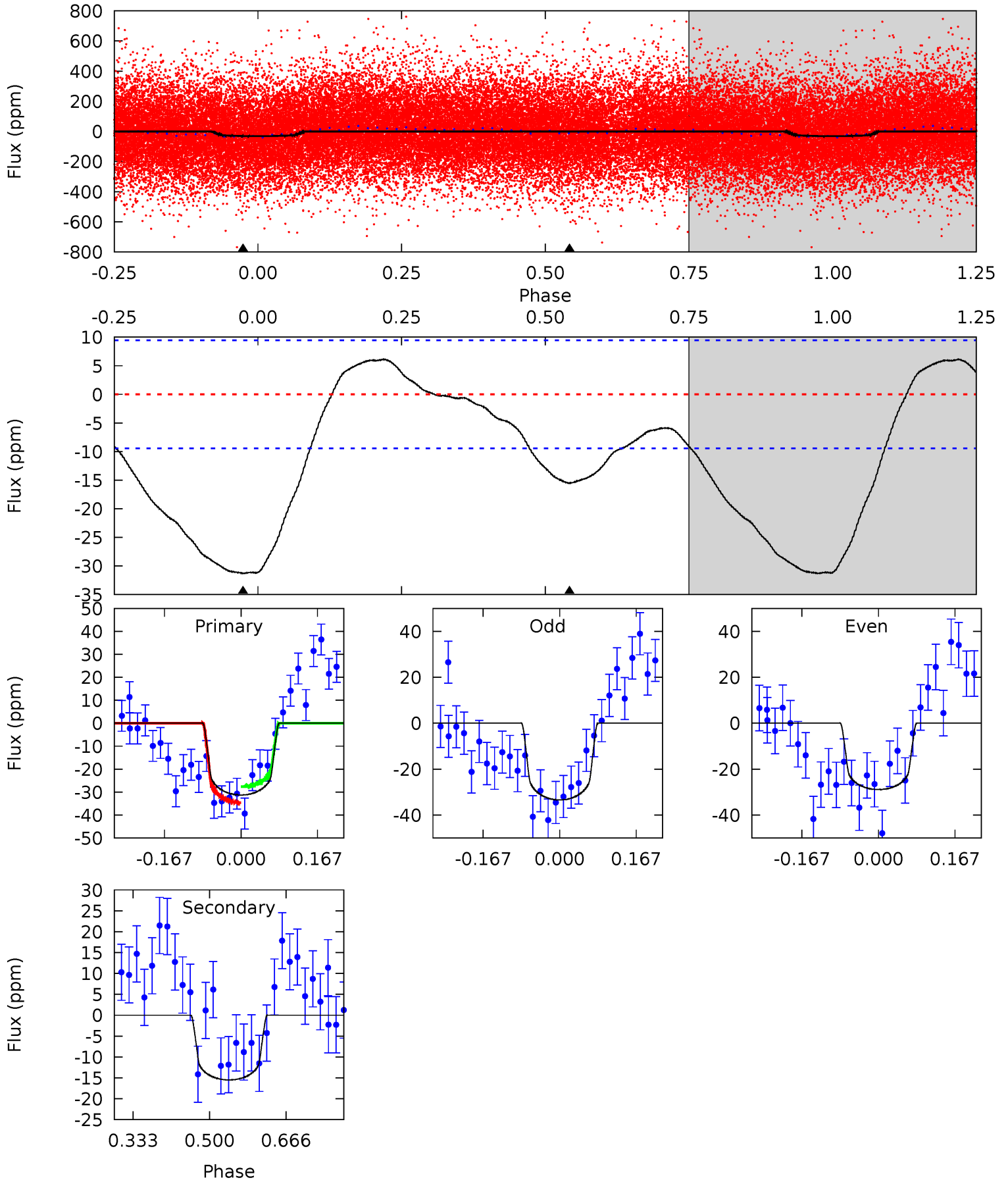




# DV Model-Shift Uniqueness Test

009362445-02, P = 1.363982 Days, E = 131.439322 Days

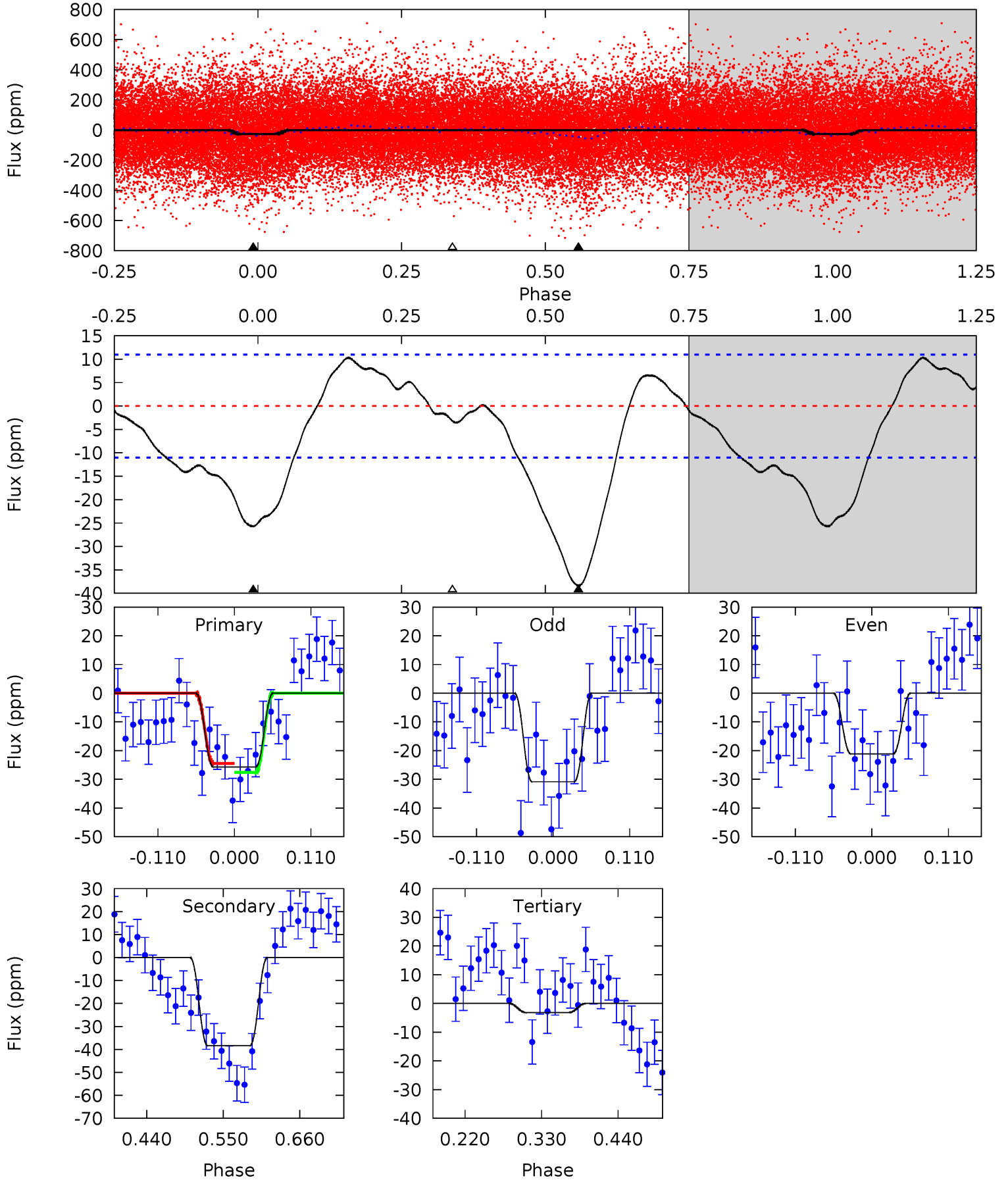
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.8	7.31	0	0	4.46	1.38	3.16	14.8	14.8	7.31	7.31	1.07	1.01	0.16	1.64



# Alt Model-Shift Uniqueness Test

009362445-02, P = 1.364034 Days, E = 131.409894 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	15.9	1.32	0	4.54	1.60	2.61	9.31	10.6	14.5	15.9	2.01	0.97	0.21	0.64





### Stellar Parameters For KIC 009362445

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6086^{+202}_{-220}$	$3.480^{+0.376}_{-0.094}$	$-0.520^{+0.350}_{-0.300}$	$3.687^{+0.682}_{-1.705}$	$1.496^{+0.187}_{-0.437}$	$0.042^{+0.130}_{-0.016}$
	+3%/-4%	+11%/-3%	+67%/-58%	+18%/-46%	+12%/-29%	+308%/-38%
Source	PHO1	FLK73	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 009362445-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-16 \pm 2$	$2.35^{+0.97}_{-0.95}$	$4221^{+272}_{-456}$	$4558^{+1214}_{-766}$	$1.184^{+1.942}_{-0.613}$
Alt.	$-38 \pm 2$	$2.02^{+0.97}_{-0.84}$	$4216^{+300}_{-445}$	$6223^{+2260}_{-1030}$	$3.823^{+7.120}_{-2.033}$

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

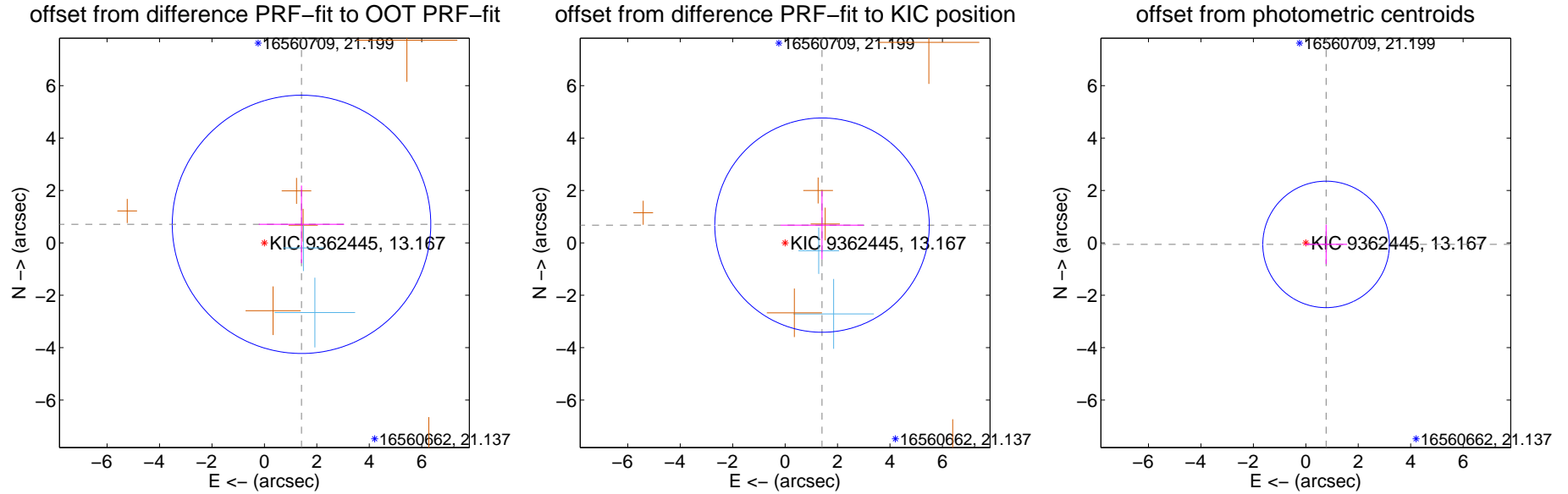
## DV Centroid Data

Supplemental centroid analysis for 009362445-02. Kepler magnitude: 13.17. Transit SNR 10.22

There are 2 quarters with good PRF difference image offsets

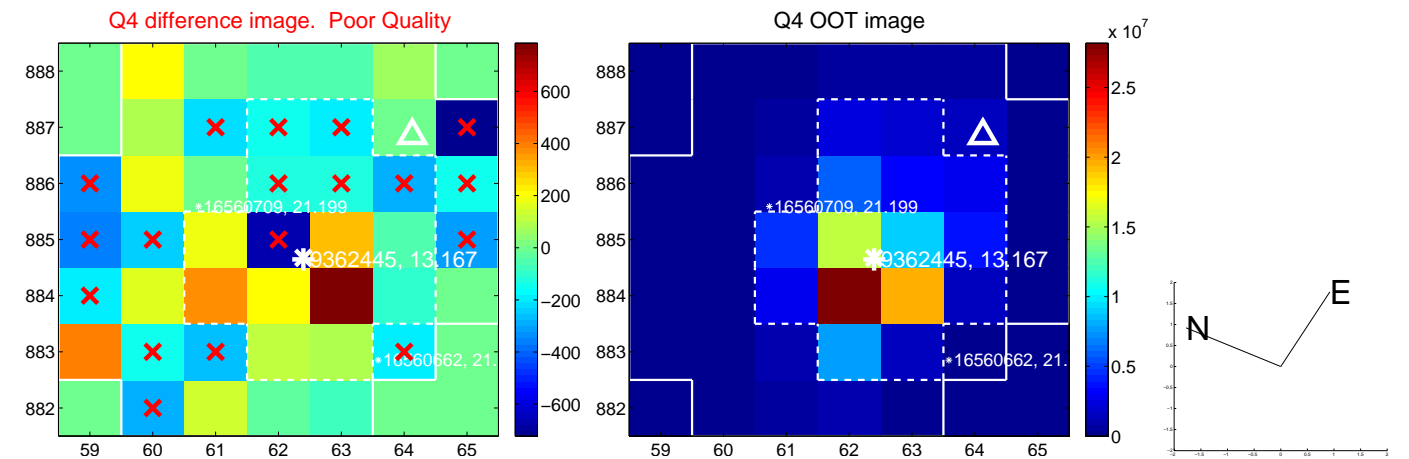
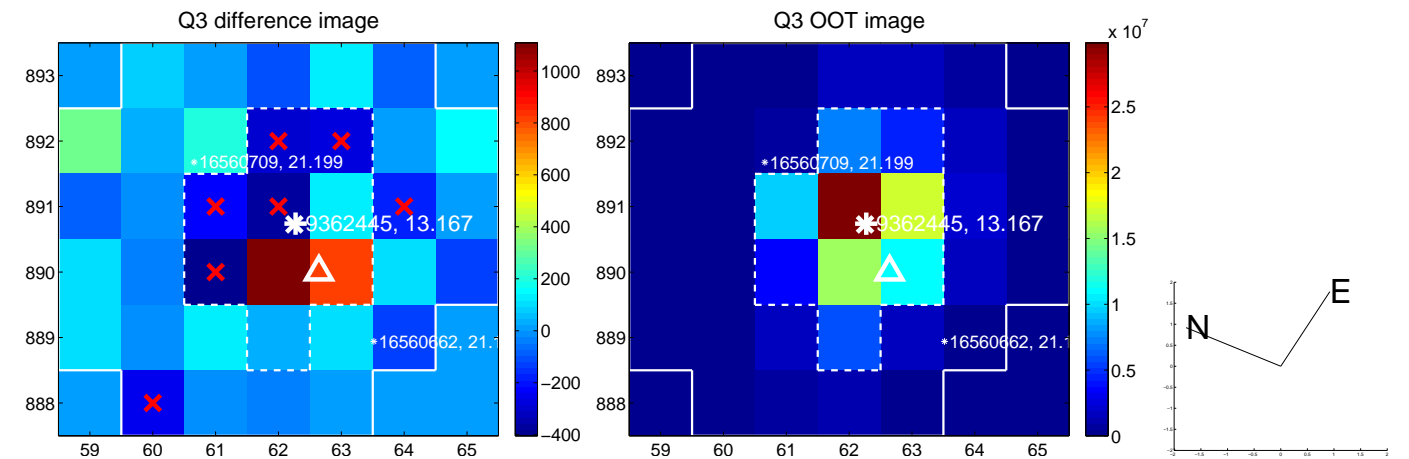
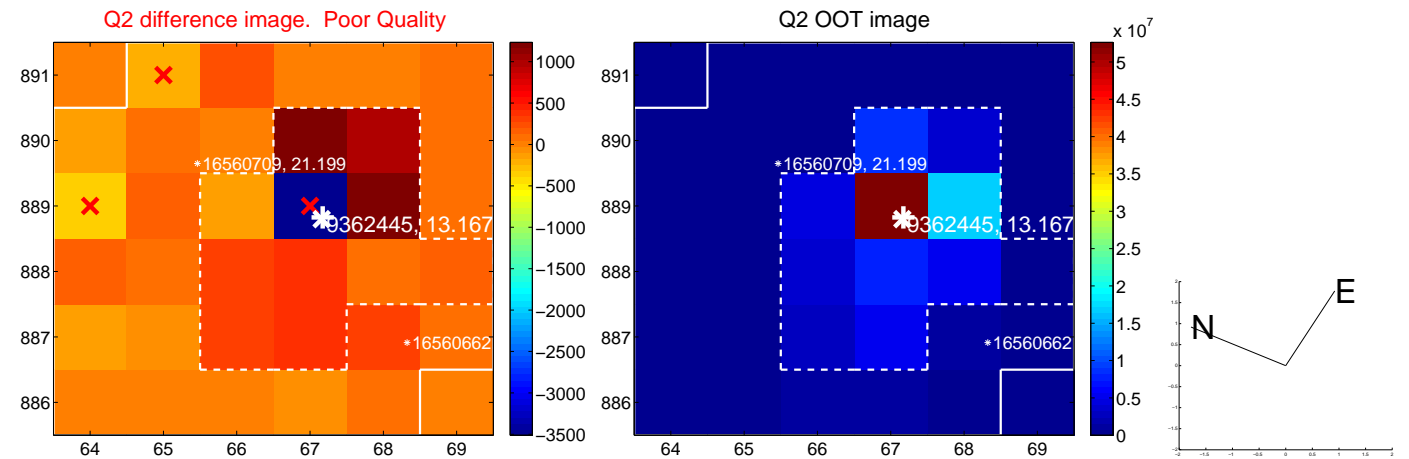
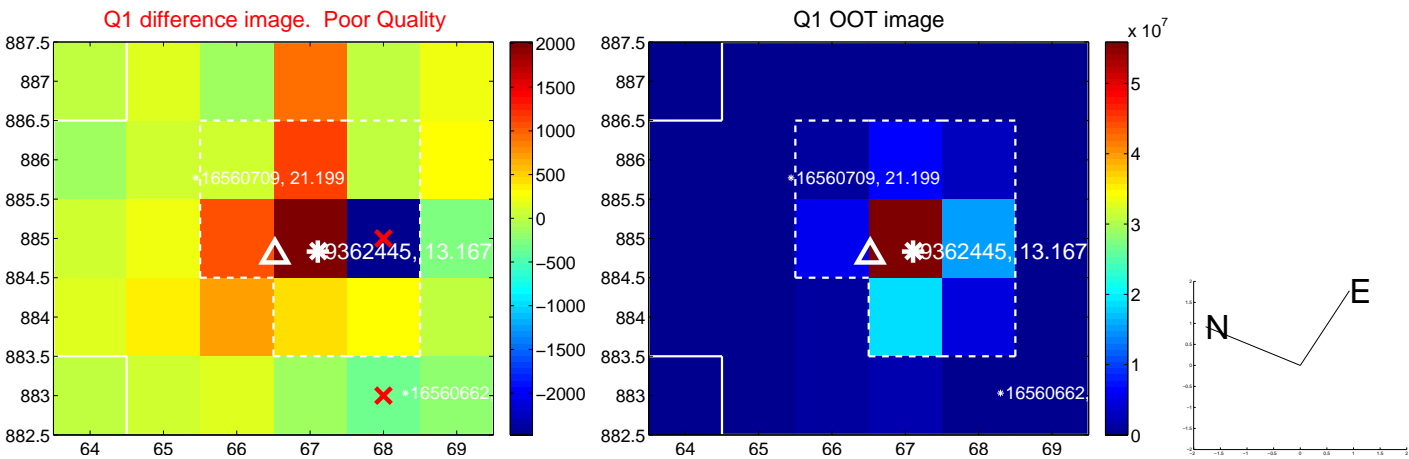
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.582 \pm 1.643$	0.96	$-1.415 \pm 1.628$	$0.707 \pm 1.480$
PRF-fit source offset from KIC position	$1.562 \pm 1.363$	1.15	$-1.408 \pm 1.585$	$0.677 \pm 1.305$
photometric centroid source offset	$0.78 \pm 0.80$	0.96	$-0.77 \pm 0.80$	$-0.06 \pm 0.75$

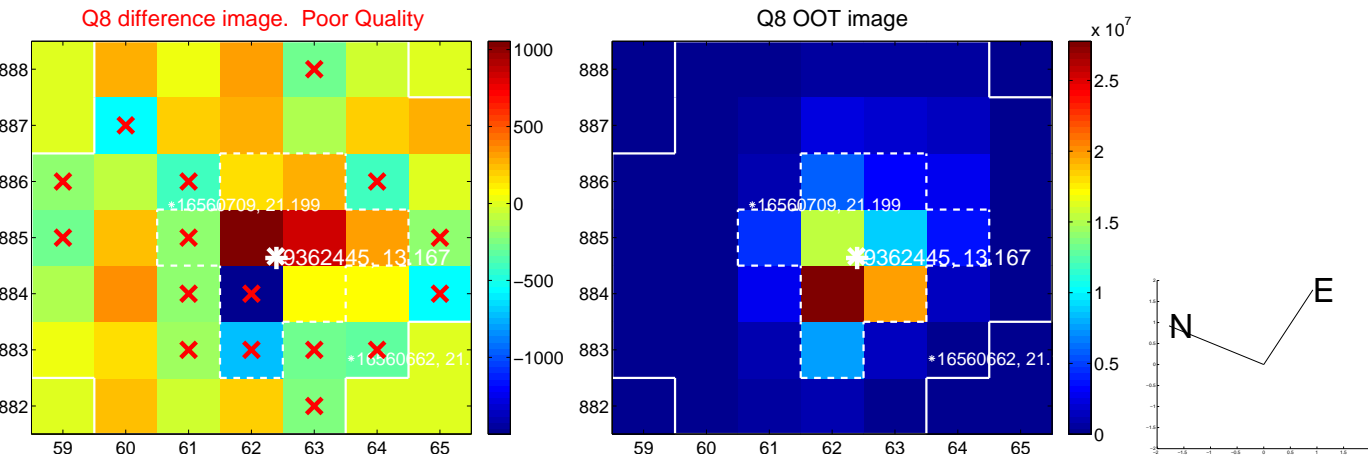
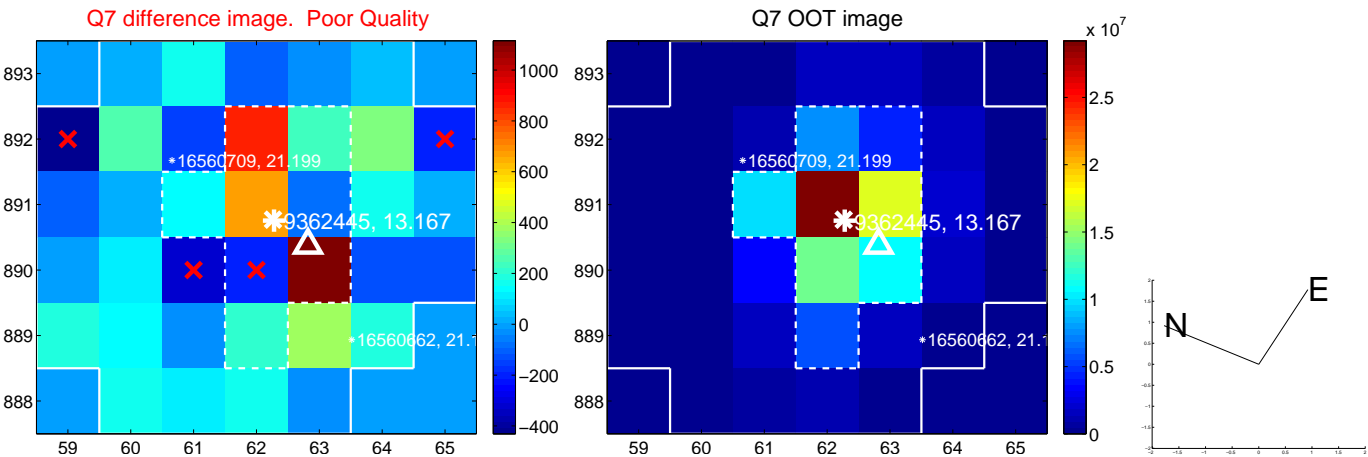
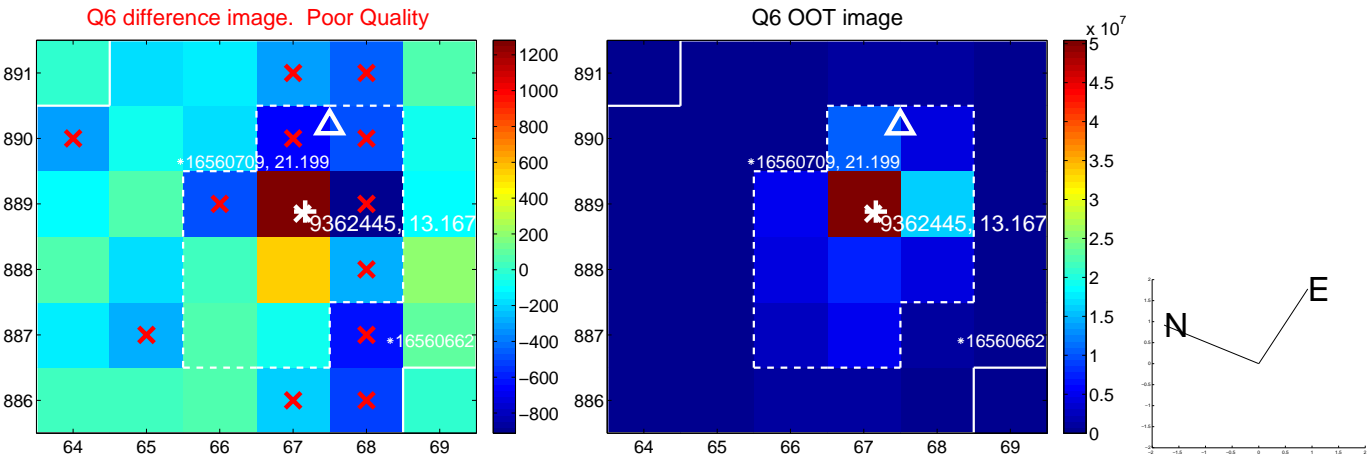
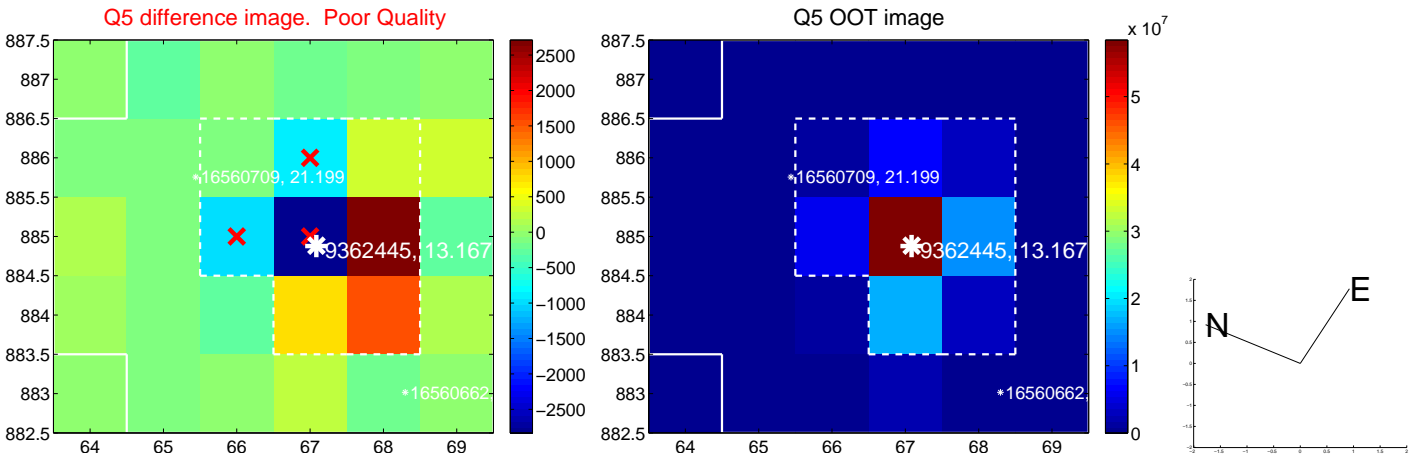


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

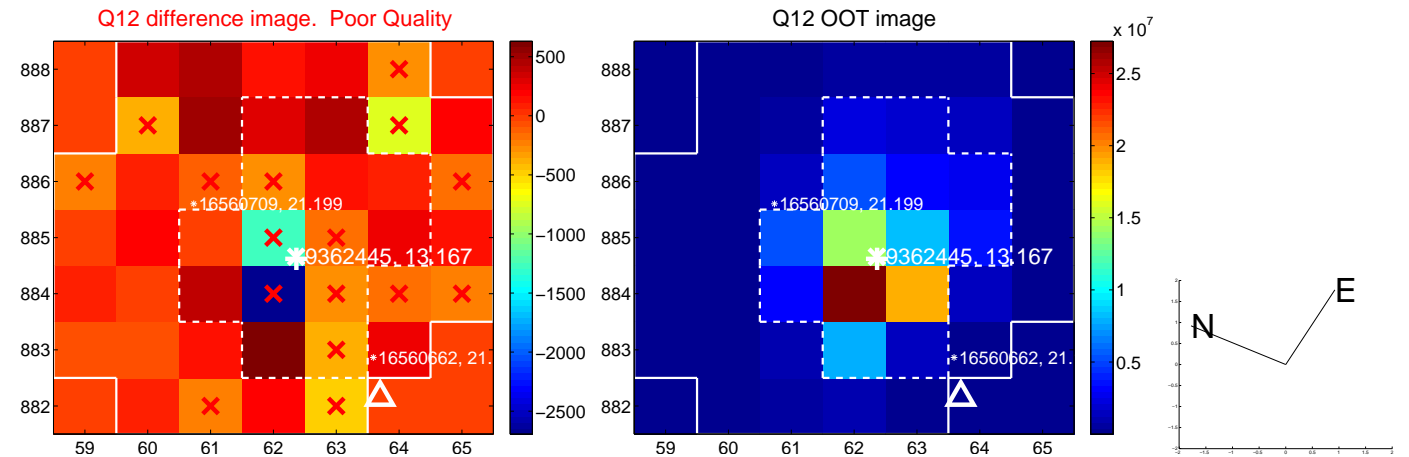
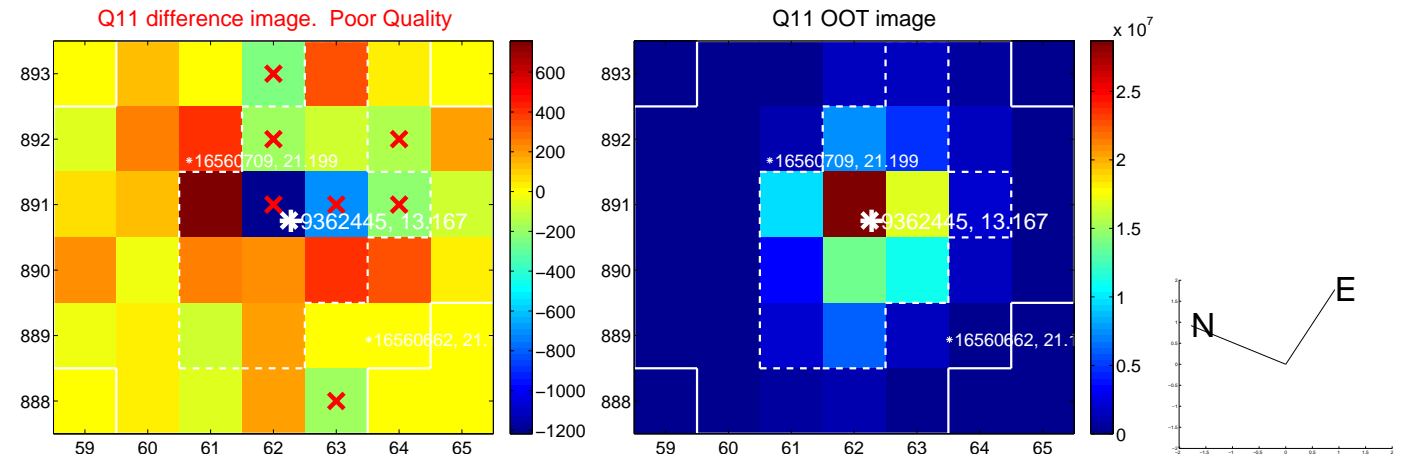
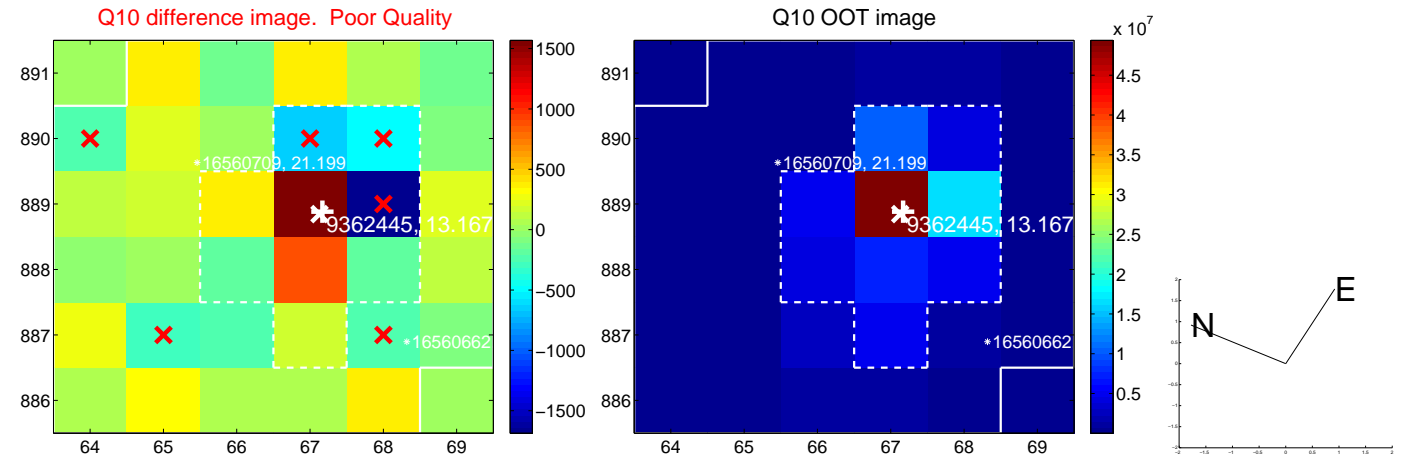
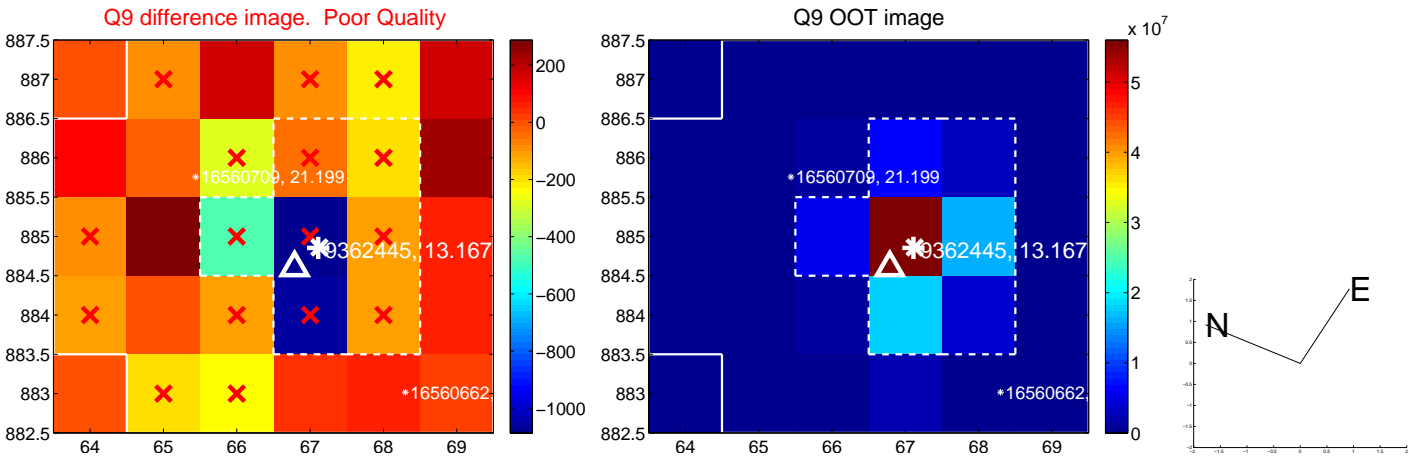
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

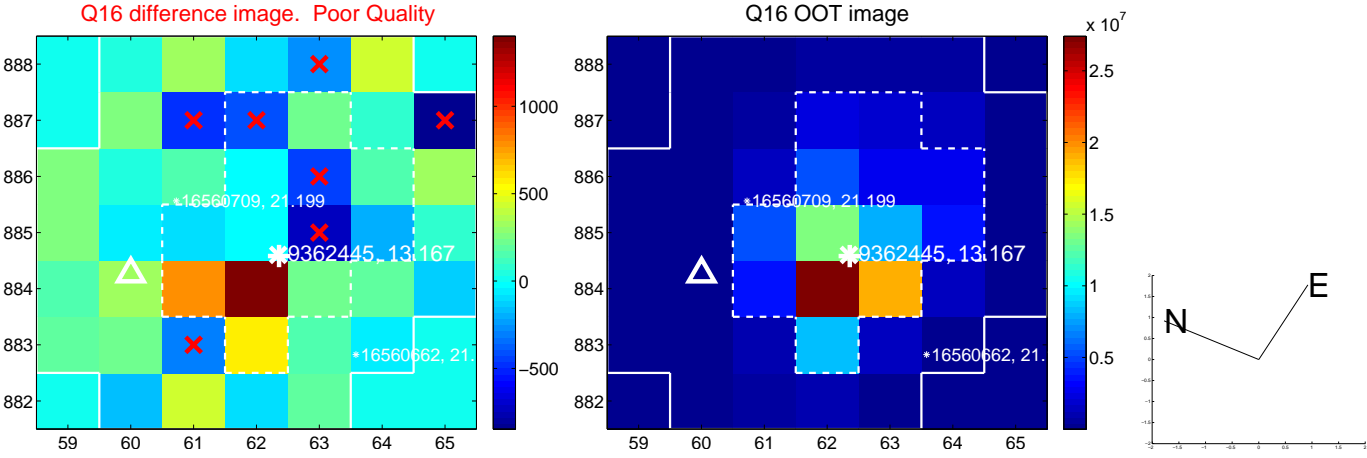
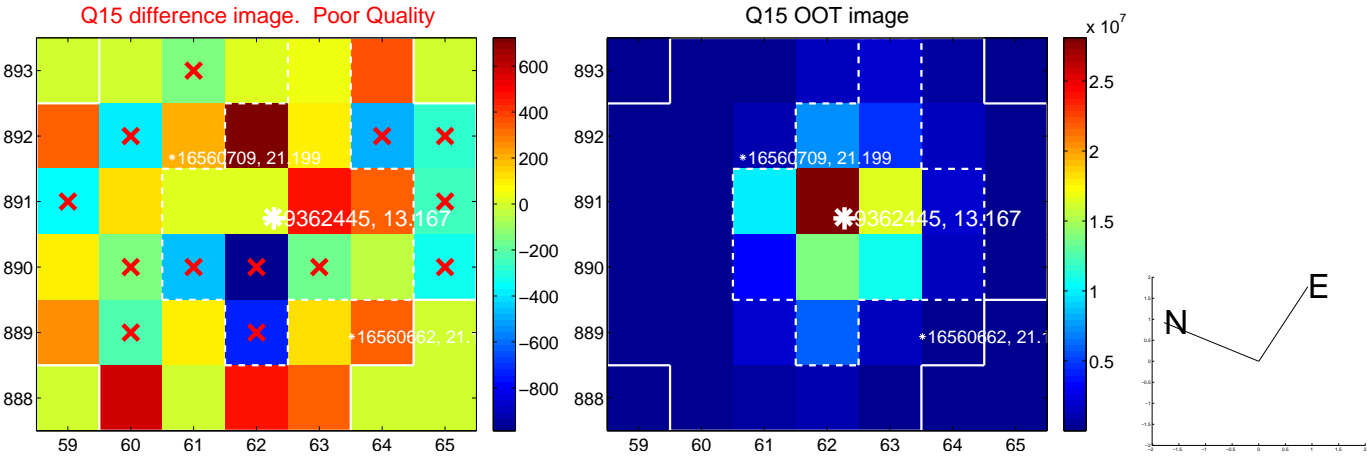
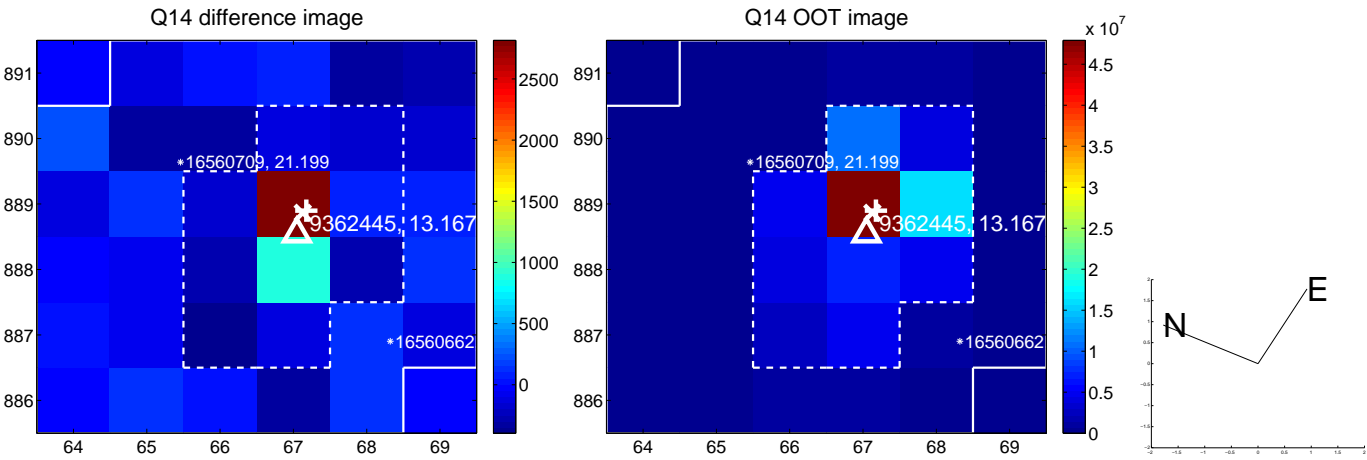
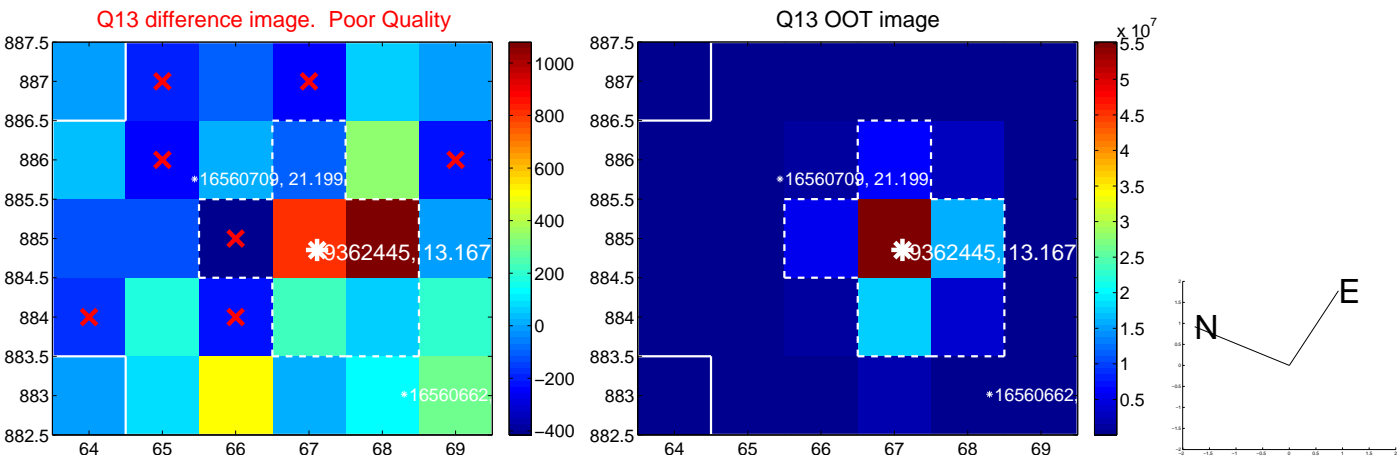


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

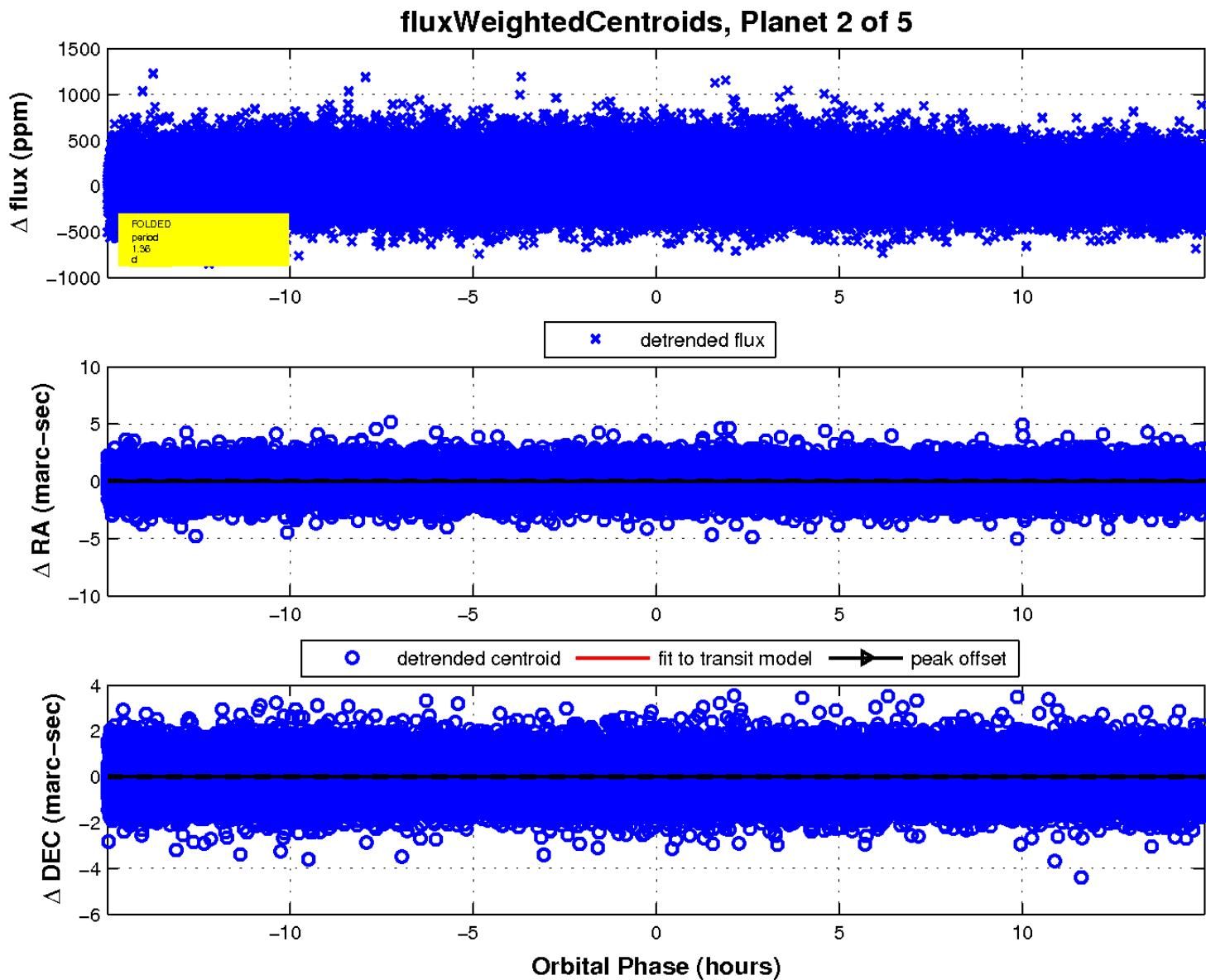
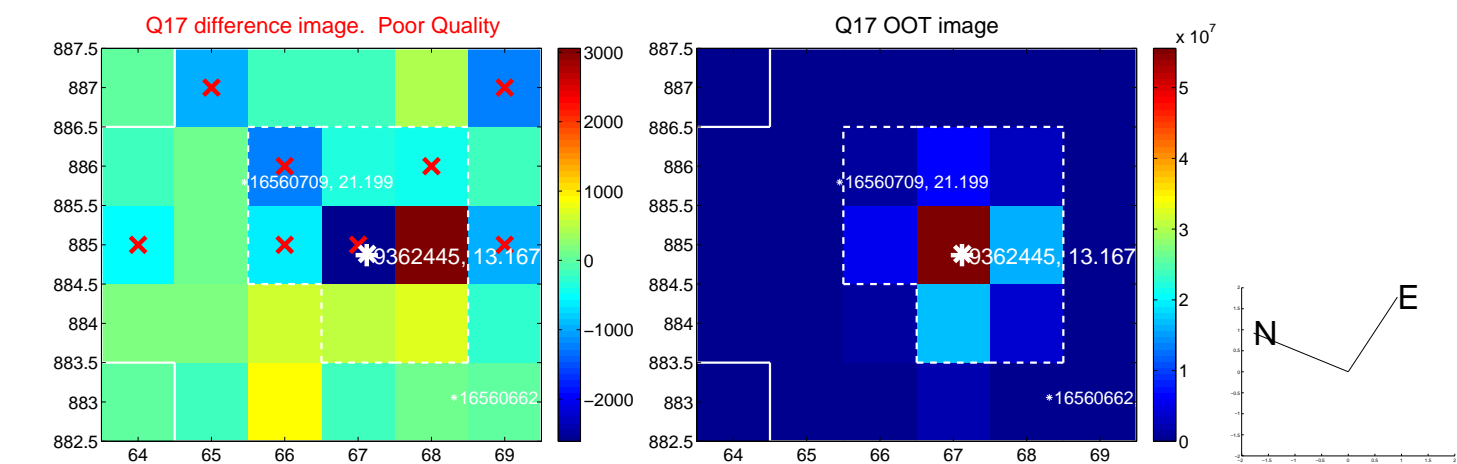




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

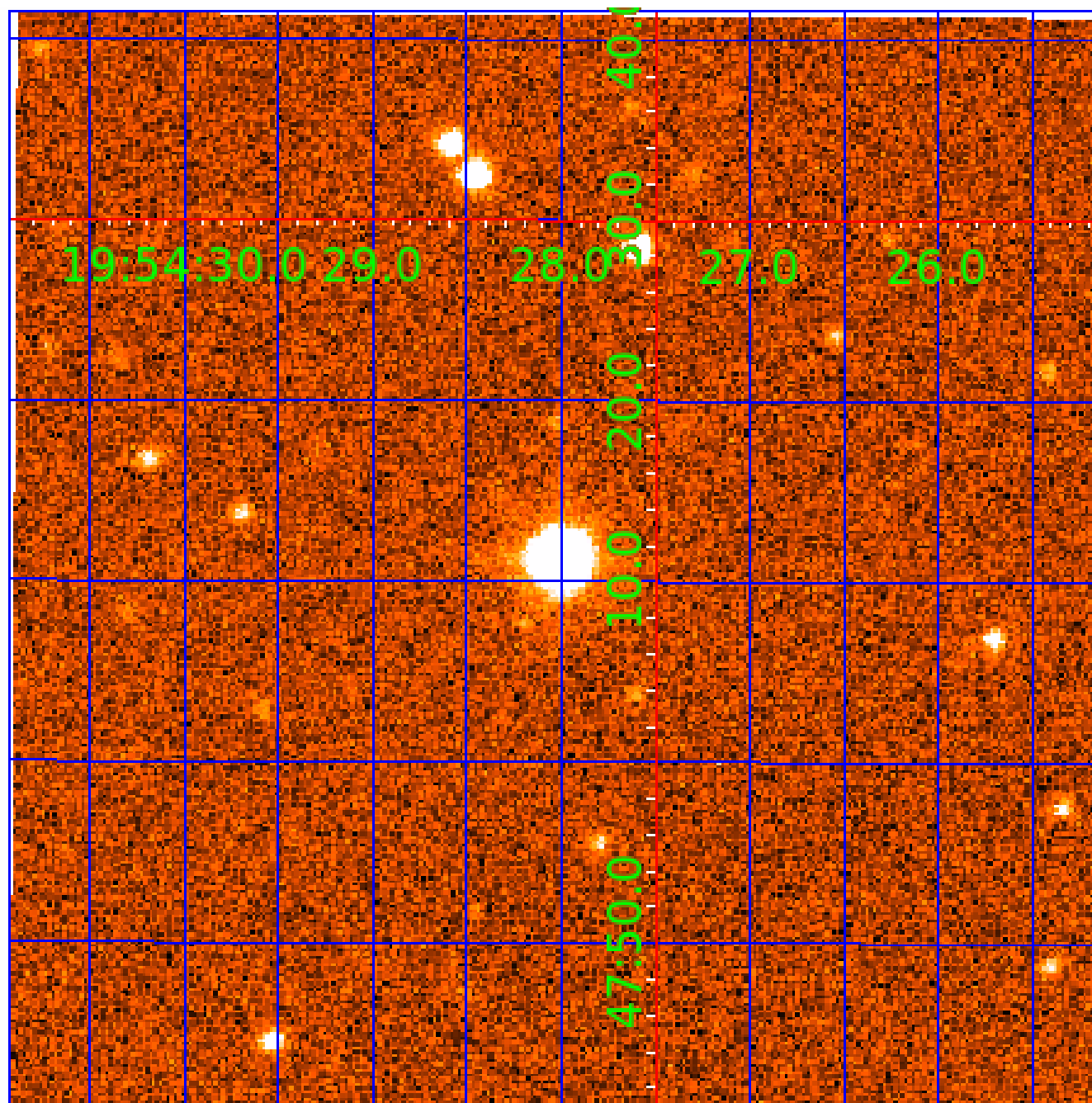


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009362445

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009362445-01	OBS	No	4.091769	133.015592	16.3	11.087	9.6	3.7	3.69	6086	1.75	5090.84
009362445-02	OBS	No	1.363982	132.803304	34.9	4.994	8.9	10.2	3.69	6086	2.57	22025.52
009362445-03	OBS	No	231.240118	296.369113	193.5	46.611	7.9	5.1	3.69	6086	5.43	23.47
009362445-04	OBS	No	247.164354	282.345640	276.2	9.224	7.3	6.0	3.69	6086	6.55	21.48
009362445-05	OBS	No	8.180312	131.616567	147.3	5.000	7.7	-1.0	3.69	6086	4.48	2021.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009362445-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009362445-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
009362445-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009362445-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT
009362445-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS—HALO_GHOST

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

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

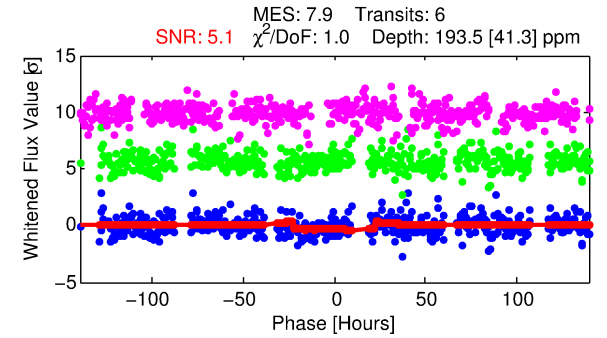
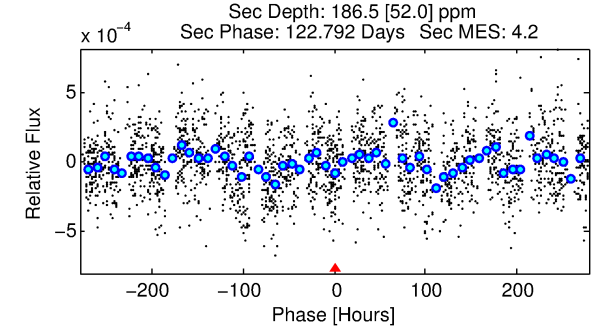
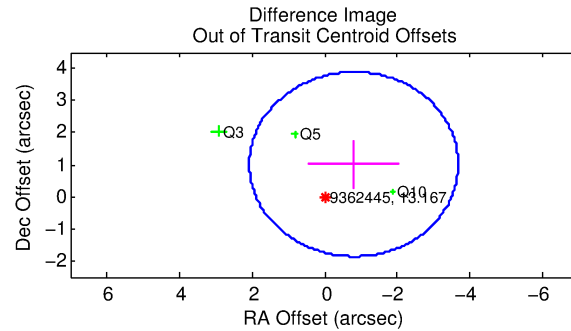
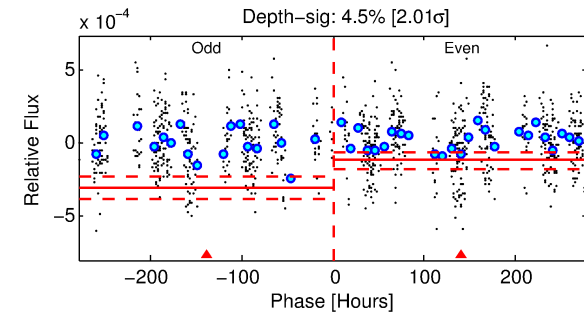
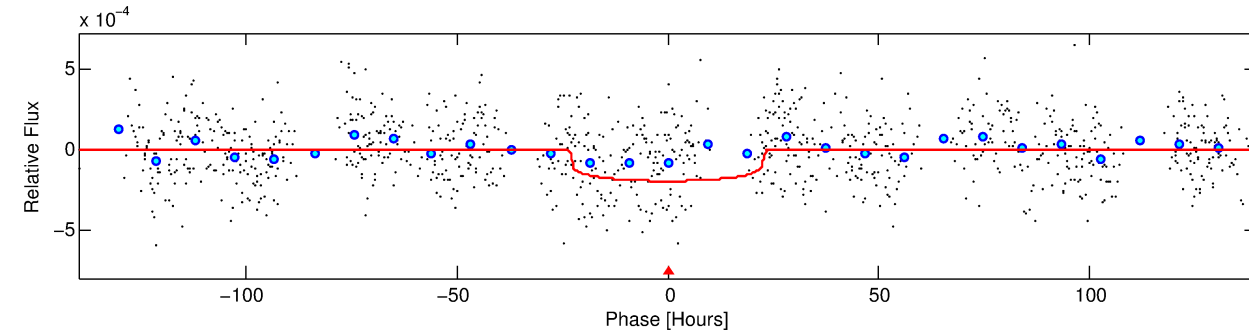
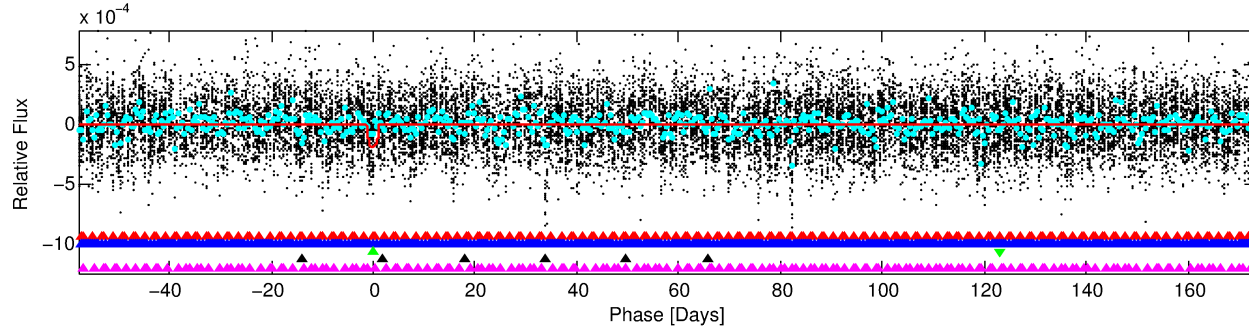
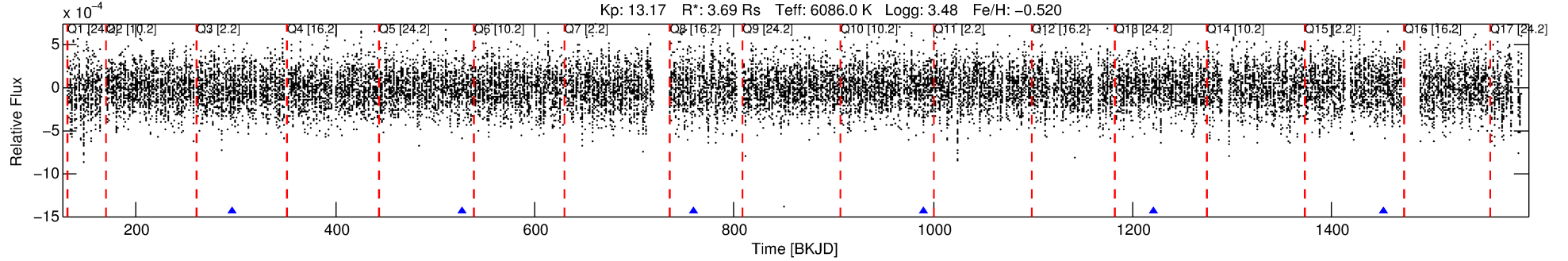
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009362445-03

No Significant Match Found

# DV One-Page Summary

KIC: 9362445 Candidate: 3 of 5 Period: 231.240 d



## DV Fit Results:

Period = 231.24012 [0.01782] d  
Epoch = 296.3691 [0.0598] BKJD  
Rp/R\* = 0.0135 [0.0025]  
a/R\* = 29.13 [21.77]  
b = 0.66 [0.64]  
Seff = 23.47 [15.73]  
Teq = 561 [94] K  
Rp = 5.43 [2.71] Re  
a = 0.8437 [0.3563] AU  
Ag = 2473.06 [1990.62] [1.24 $\sigma$ ]  
Teffp = 6120 [750] K [7.35 $\sigma$ ]

## DV Diagnostic Results:

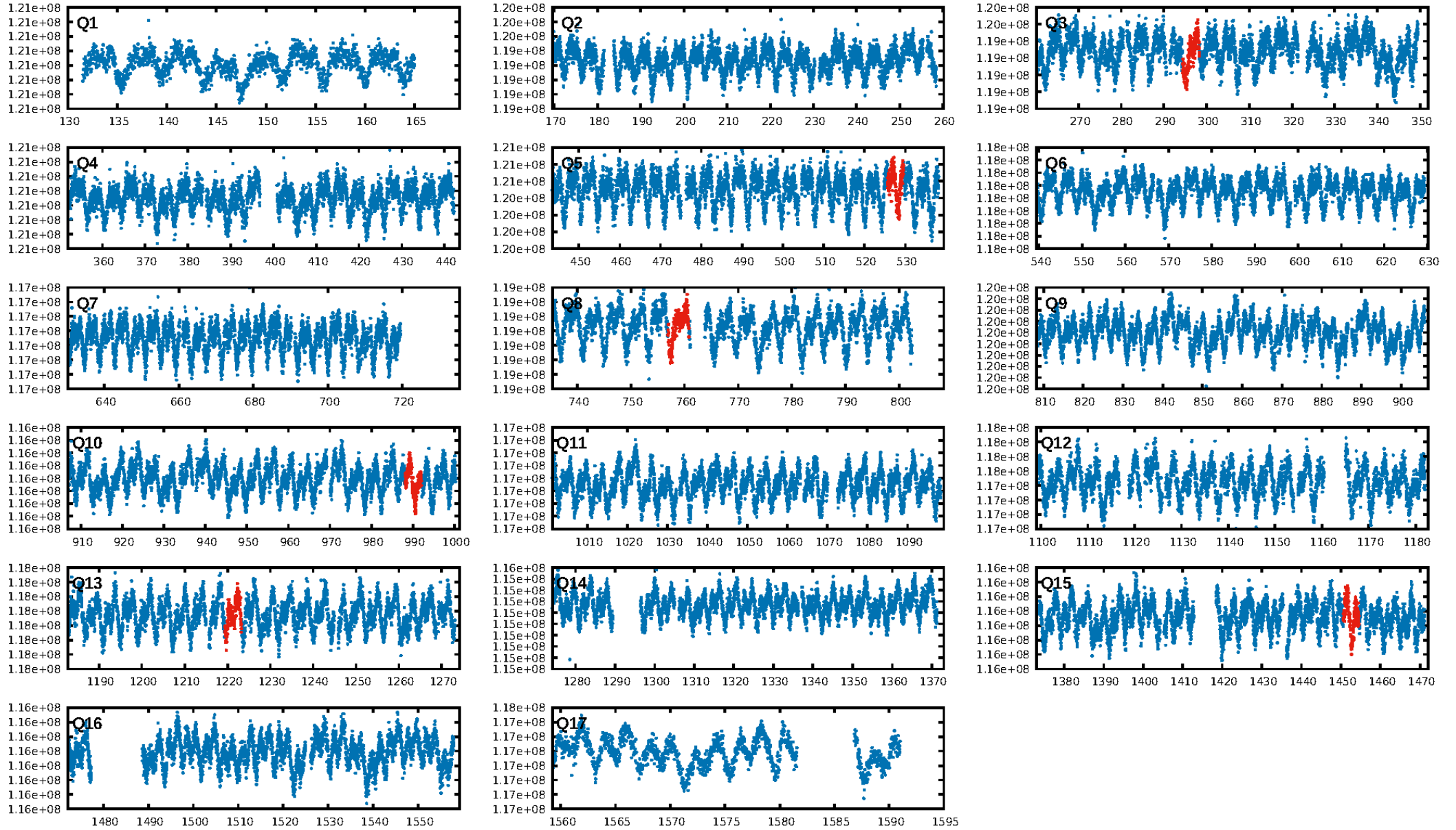
ShortPeriod-sig: 100.0% [114.20 $\sigma$ ]  
LongPeriod-sig: 100.0% [8.04 $\sigma$ ]  
ModelChiSquare2-sig: 15.3%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 6.91e-10**  
RollingBand-fgt: 1.00 [6/6]  
**GhostDiagnostic-chr: 0.4788**  
Centroid-sig: 27.3%  
Centroid-so: 0.637 arcsec [0.94 $\sigma$ ]  
OotOffset-rm: 1.292 arcsec [1.35 $\sigma$ ]  
KicOffset-rm: 1.118 arcsec [1.20 $\sigma$ ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 0.00 [0/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:44:44 Z

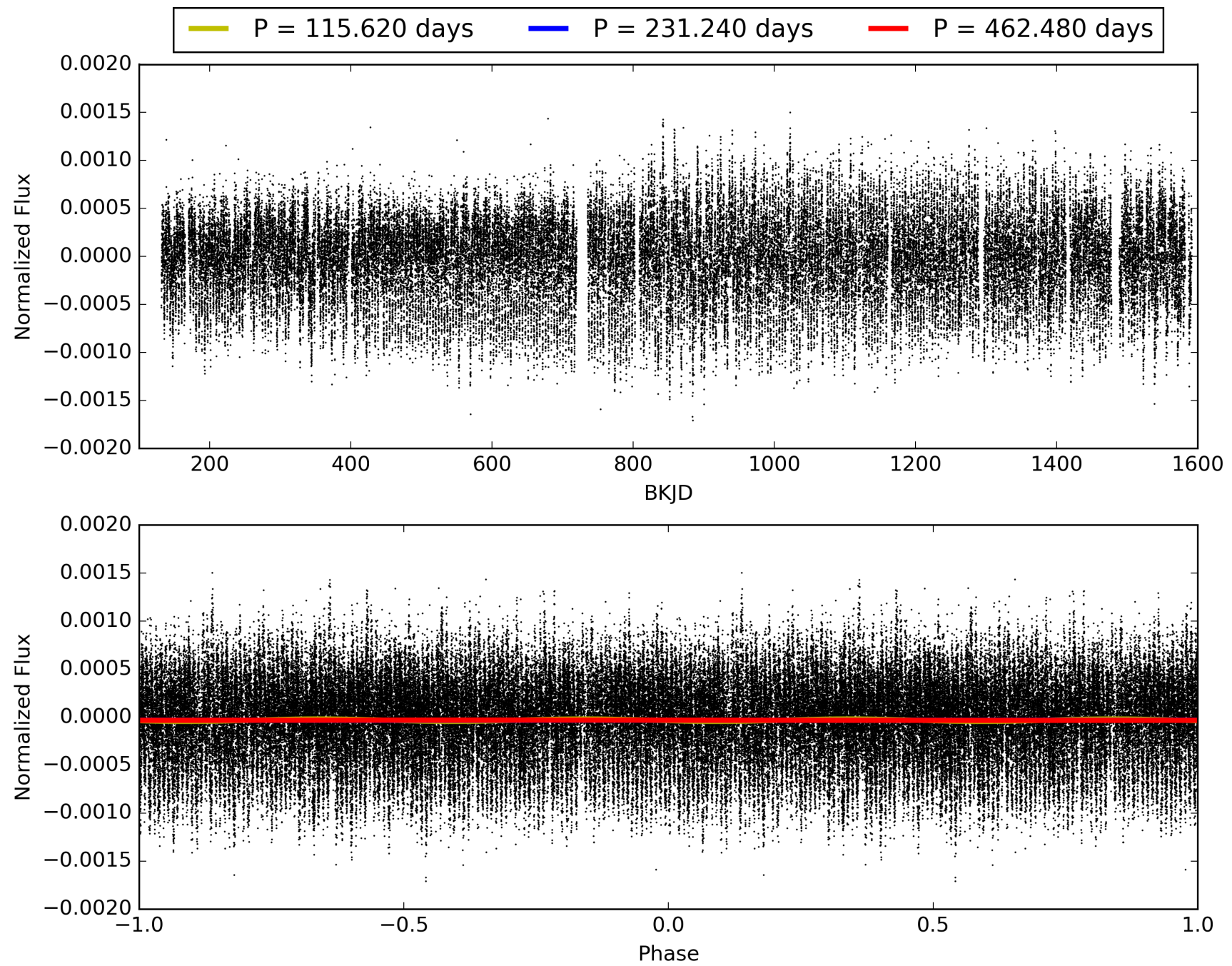
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 009362445-03, PDC Light Curves

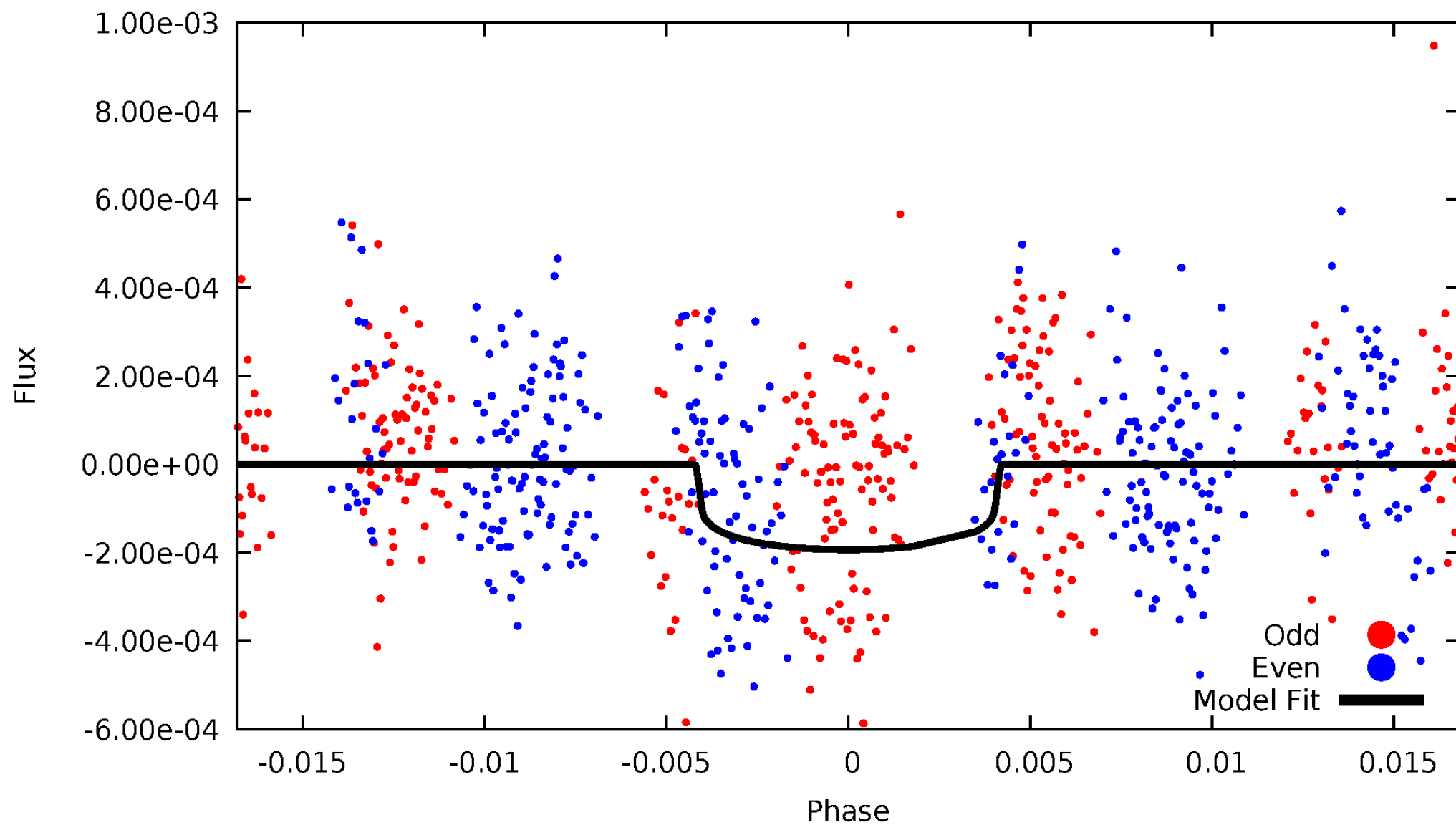


TCE 009362445-03



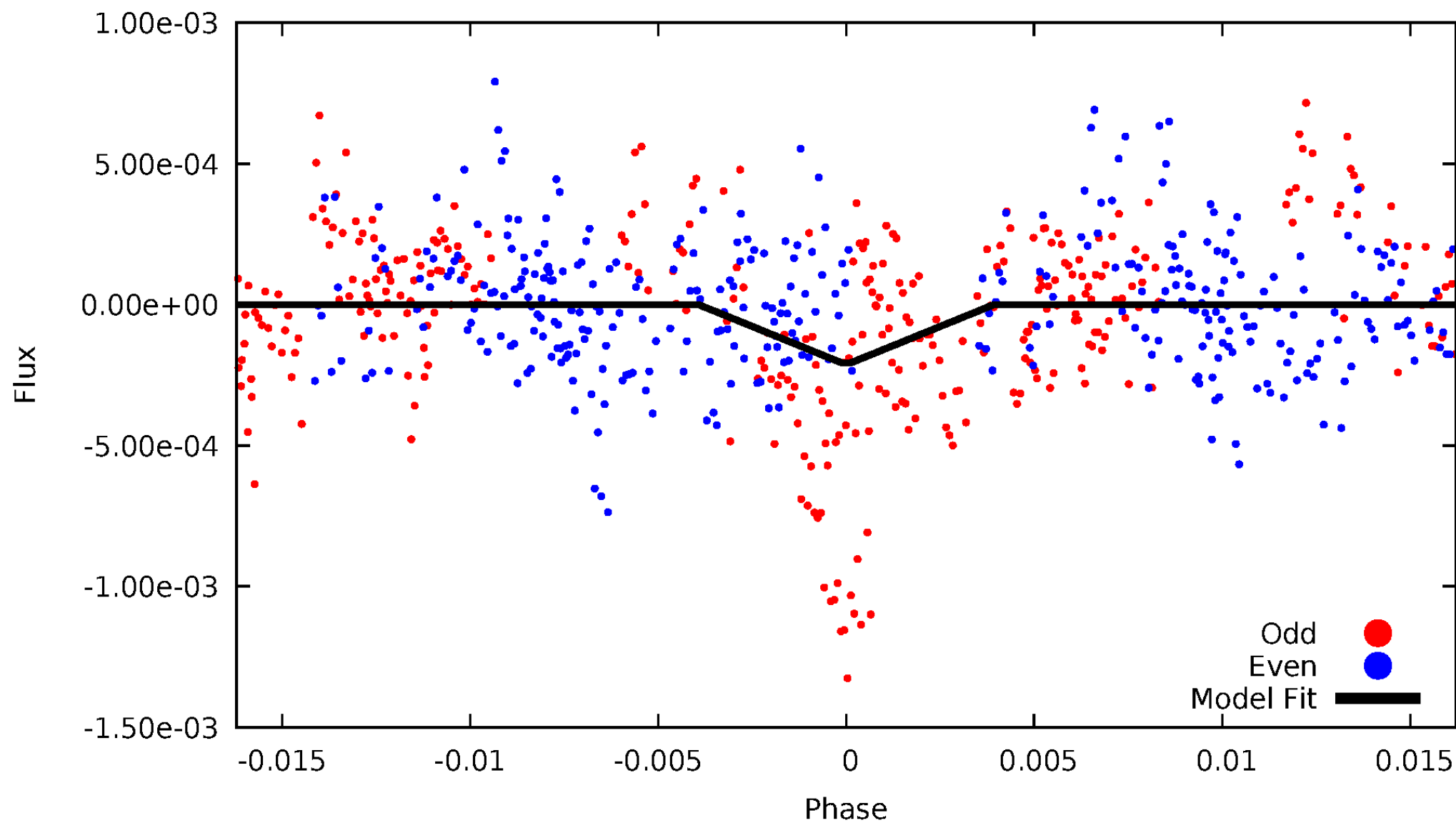
# DV Odd/Even

TCE 009362445-03



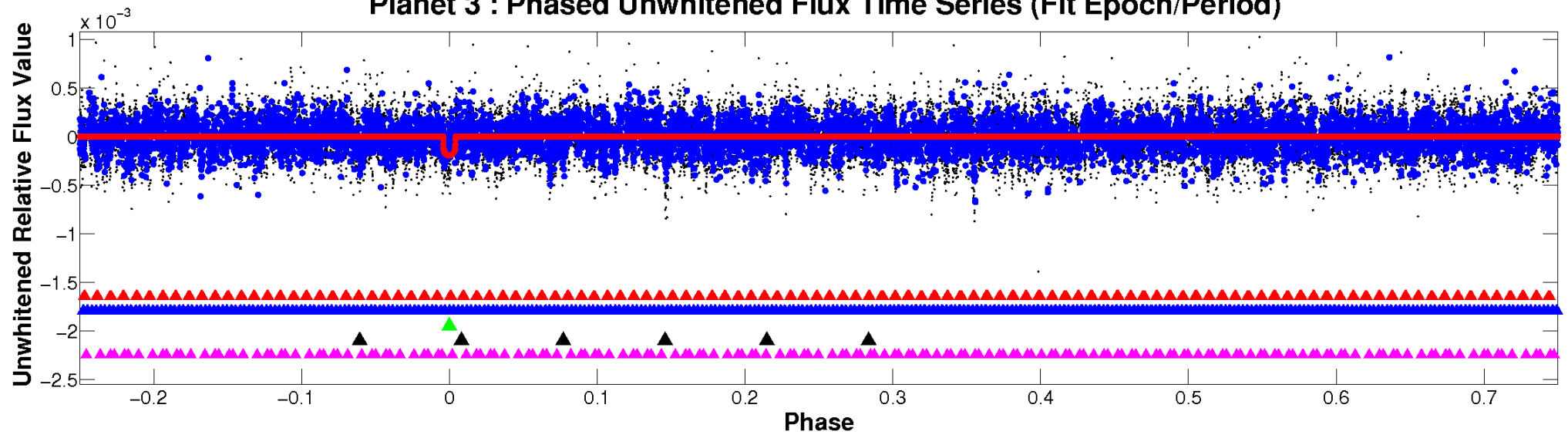
# ALT Odd/Even

TCE 009362445-03

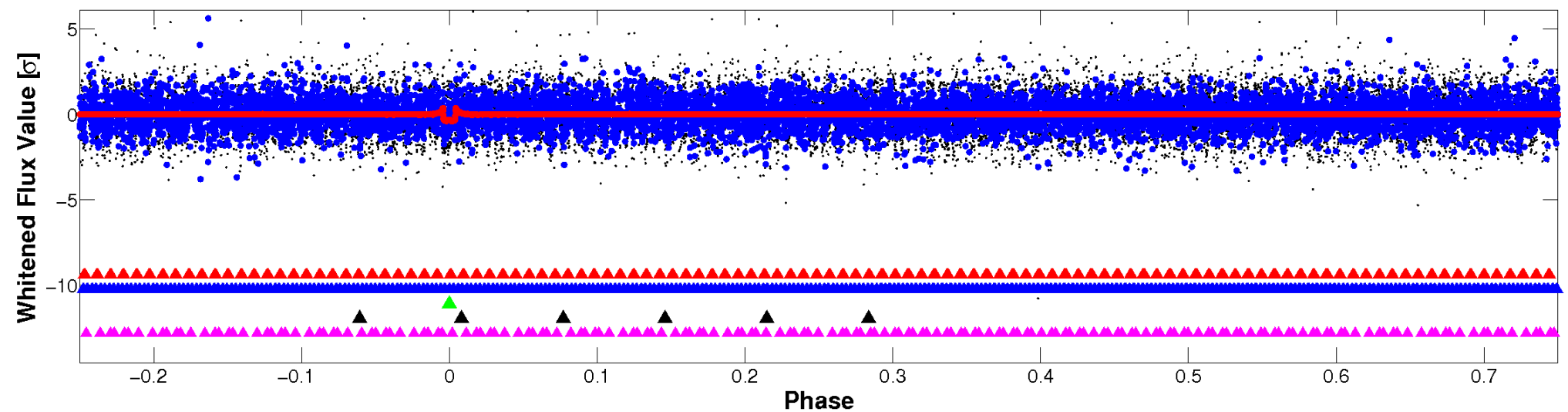


# Non-Whitened Vs. Whitened Light Curve

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



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





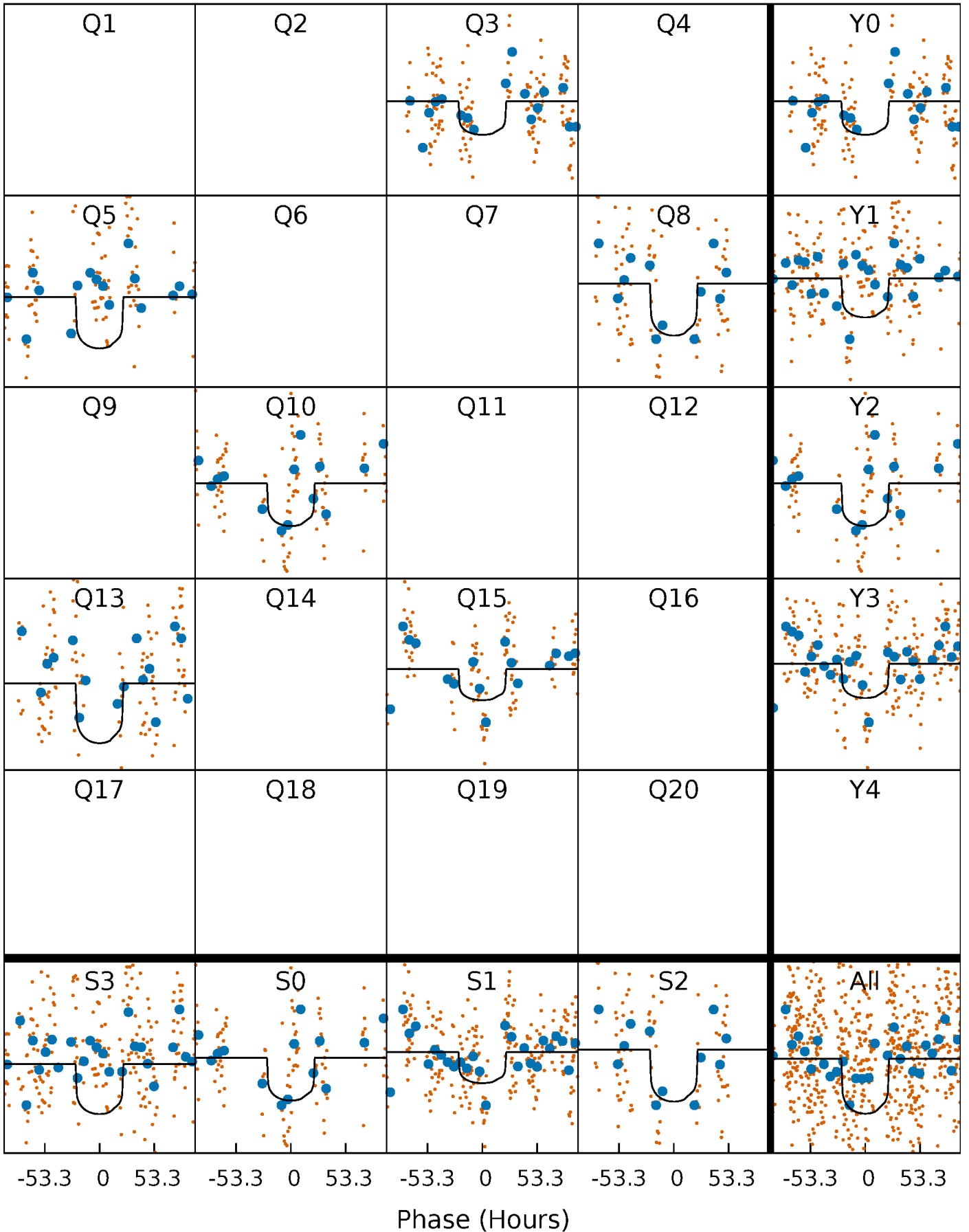
# PDC Quarter-Phased Transit Curves

TCE 009362445-03 P=231.240118 Days  $T_0=296.369114$  (BKJD)



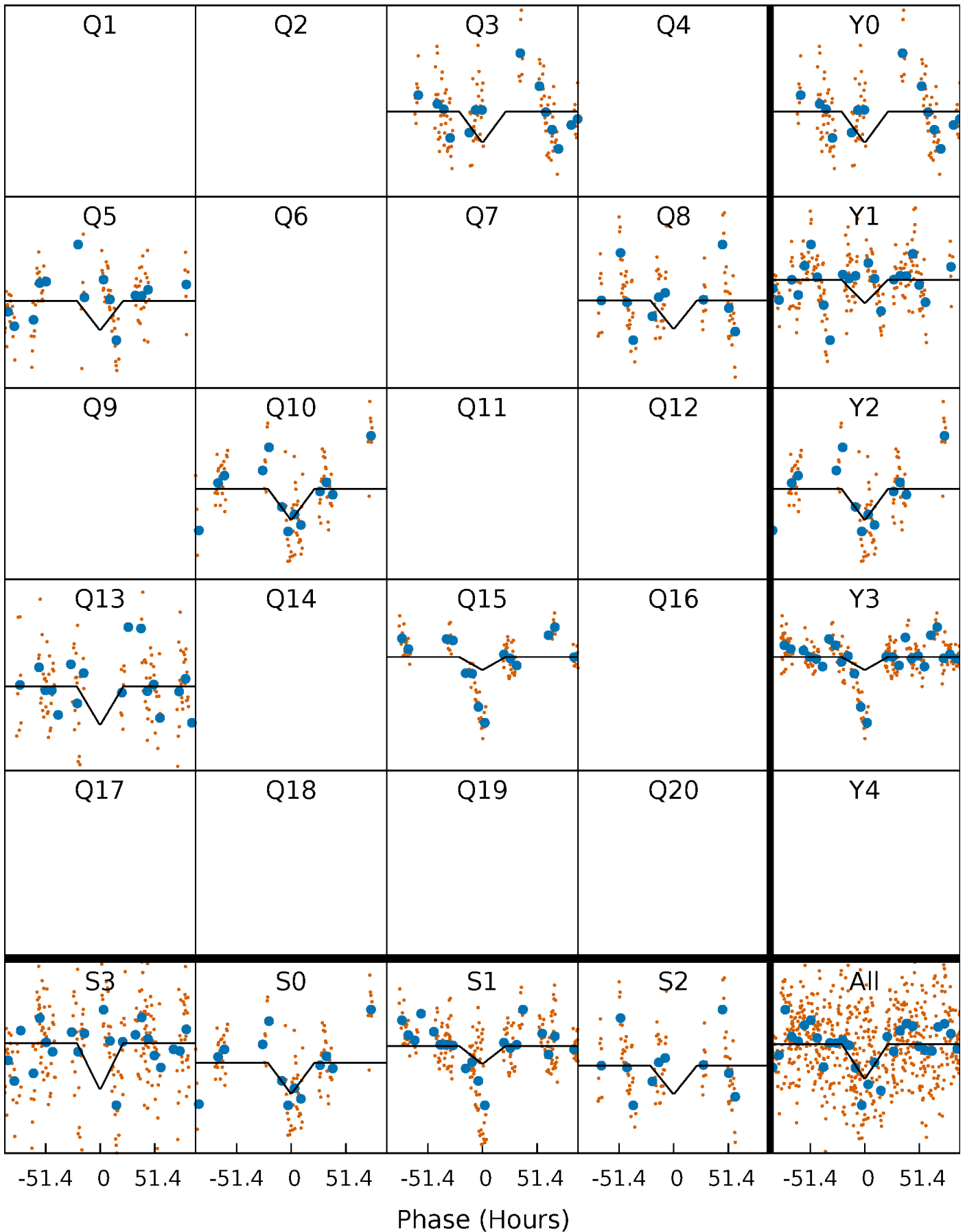
# DV Quarter-Phased Transit Curves

TCE 009362445-03 P=231.240118 Days  $T_0=296.369114$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

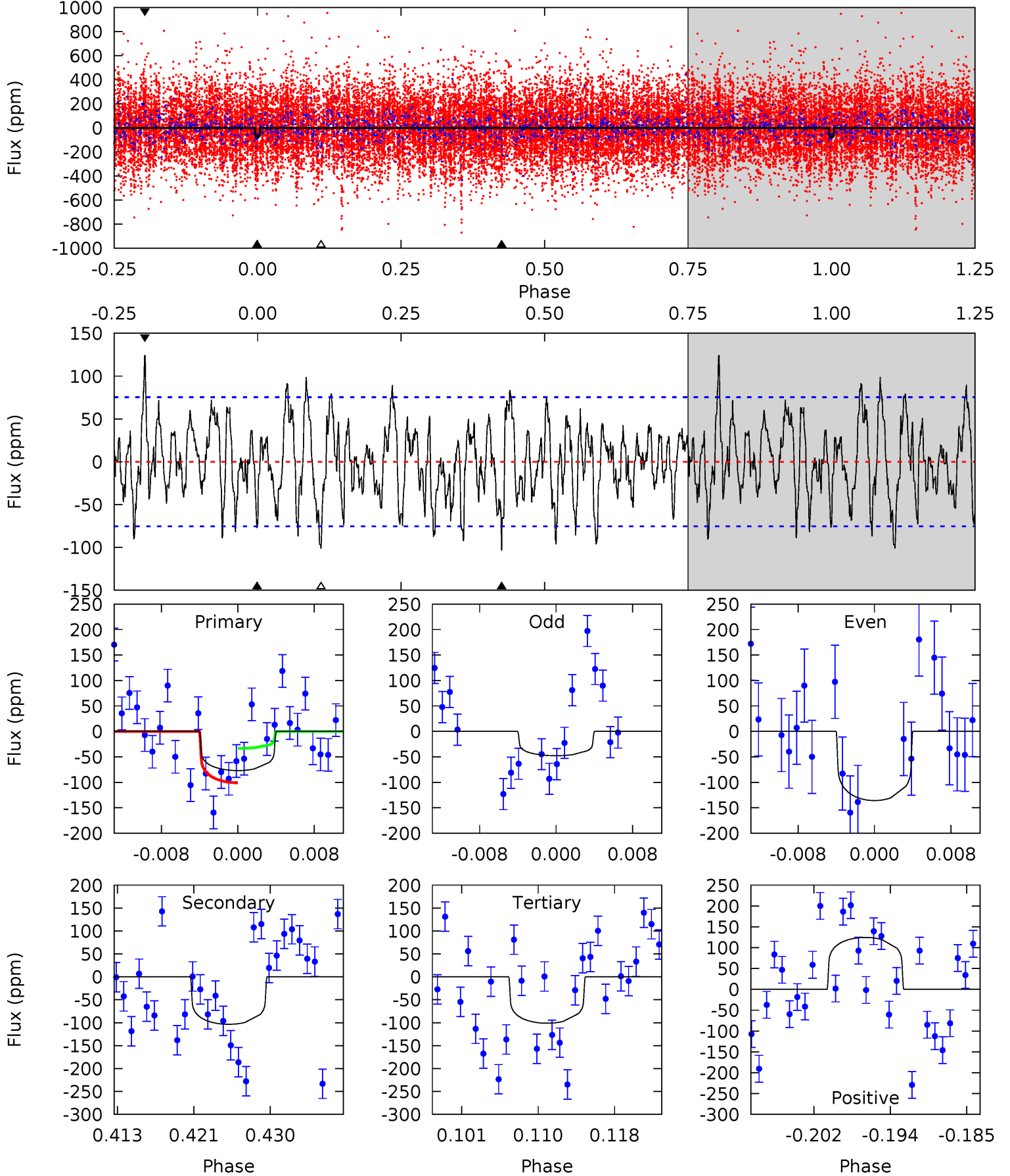
TCE 009362445-03 P=231.341955 Days  $T_0=295.947875$  (BKJD)



# DV Model-Shift Uniqueness Test

009362445-03, P = 231.240118 Days, E = 65.128996 Days

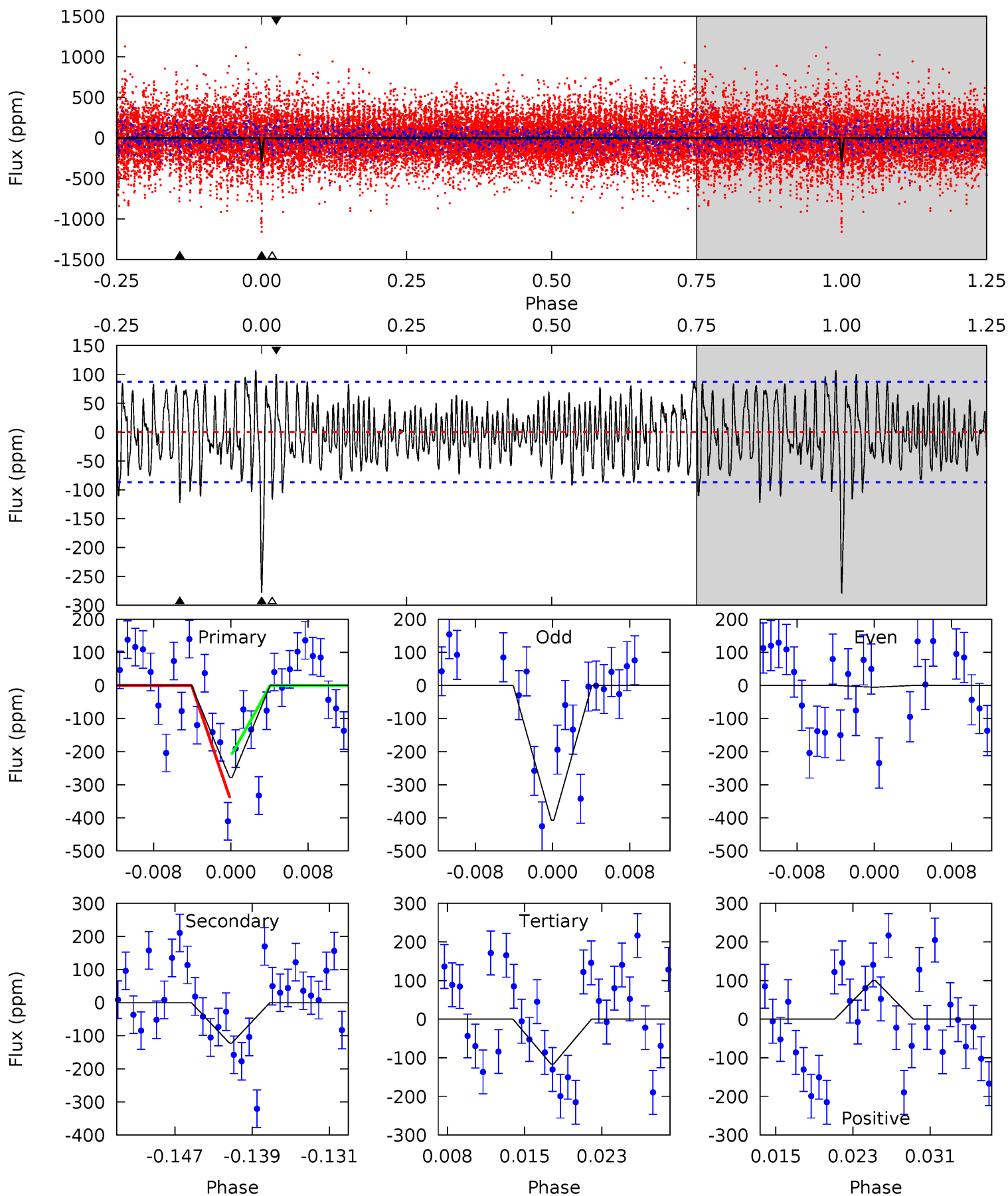
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.16	6.96	6.80	8.36	5.06	2.63	2.59	-1.64	-3.20	0.16	-1.41	2.93	0.80	0.55	2.18



# Alt Model-Shift Uniqueness Test

009362445-03, P = 231.341955 Days, E = 64.605920 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
16.2	7.13	6.80	5.86	5.08	2.66	2.37	9.45	10.4	0.33	1.27	11.5	2.51	0.28	3.78





### Stellar Parameters For KIC 009362445

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6086^{+202}_{-220}$	$3.480^{+0.376}_{-0.094}$	$-0.520^{+0.350}_{-0.300}$	$3.687^{+0.682}_{-1.705}$	$1.496^{+0.187}_{-0.437}$	$0.042^{+0.130}_{-0.016}$
	+3%/-4%	+11%/-3%	+67%/-58%	+18%/-46%	+12%/-29%	+308%/-38%
Source	PHO1	FLK73	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 009362445-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-104 \pm 15$	$5.02^{+1.39}_{-1.35}$	$765^{+53}_{-82}$	$5312^{+633}_{-419}$	$1524^{+1314}_{-528}$
Alt.	$-122 \pm 17$	$5.30^{+1.47}_{-1.44}$	$762^{+55}_{-80}$	$5386^{+561}_{-437}$	$1681^{+1334}_{-638}$

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

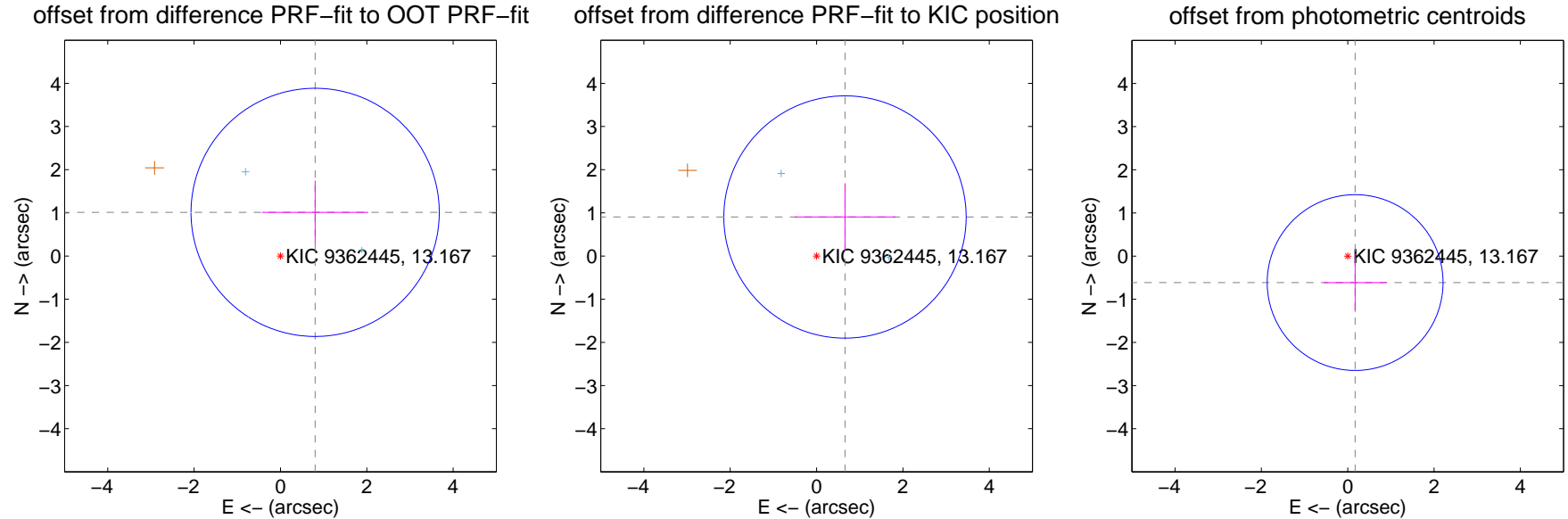
## DV Centroid Data

Supplemental centroid analysis for 009362445-03. Kepler magnitude: 13.17. Transit SNR 5.11

There are 2 quarters with good PRF difference image offsets

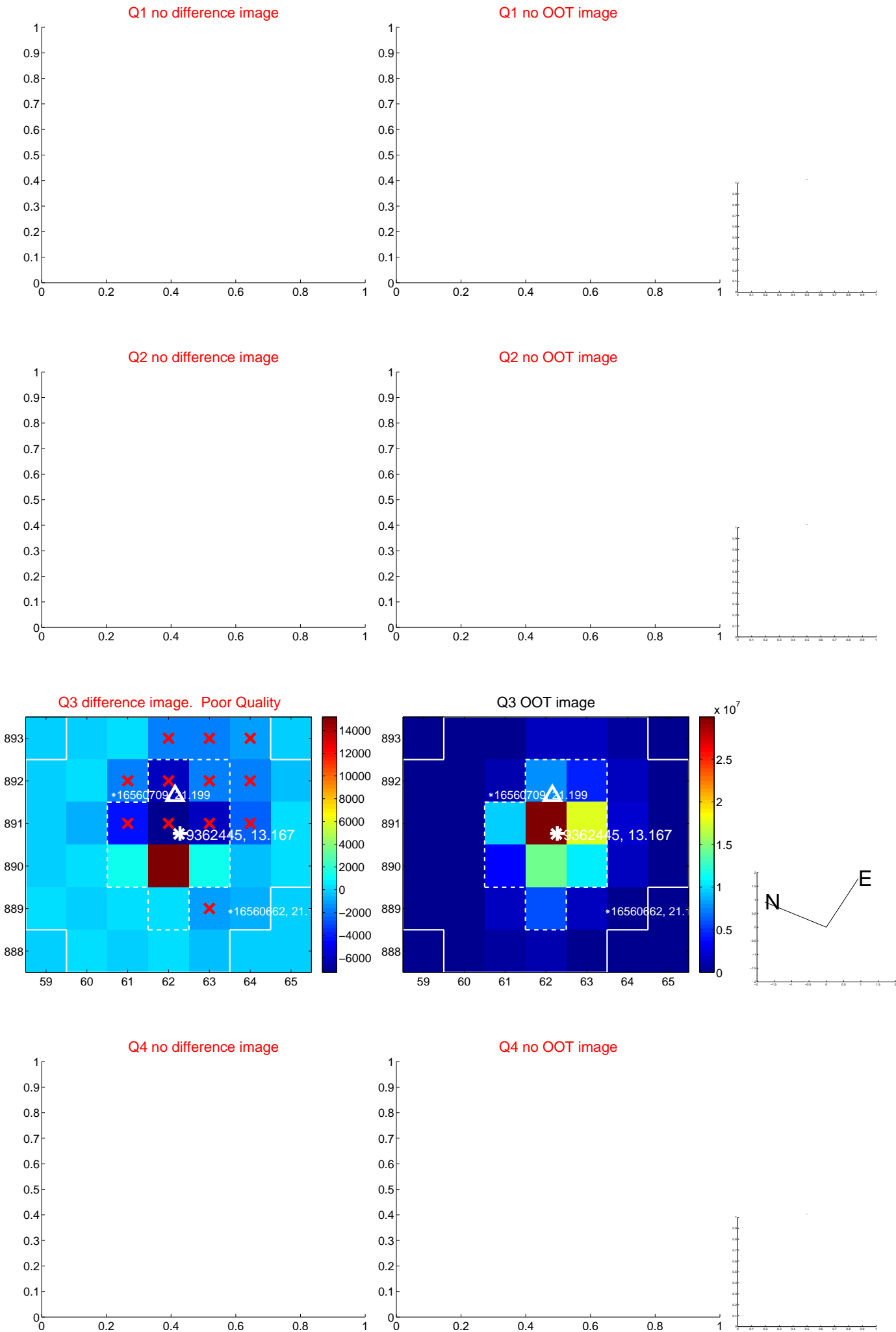
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.292 \pm 0.958$	1.35	$-0.803 \pm 1.232$	$1.011 \pm 0.734$
PRF-fit source offset from KIC position	$1.118 \pm 0.935$	1.20	$-0.658 \pm 1.173$	$0.904 \pm 0.781$
photometric centroid source offset	$0.64 \pm 0.68$	0.94	$-0.17 \pm 0.73$	$-0.61 \pm 0.67$

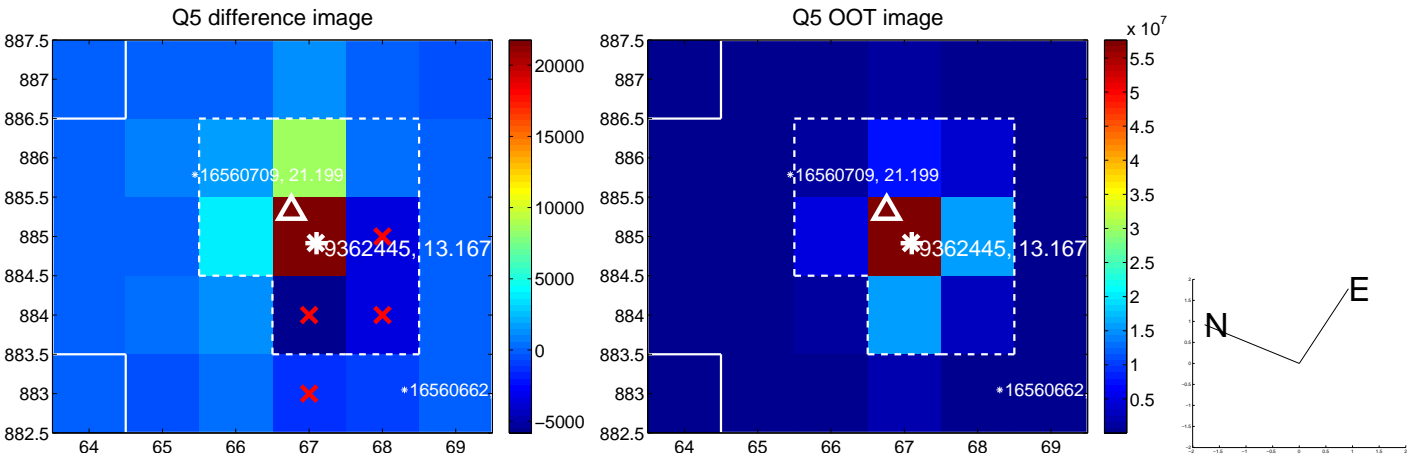


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

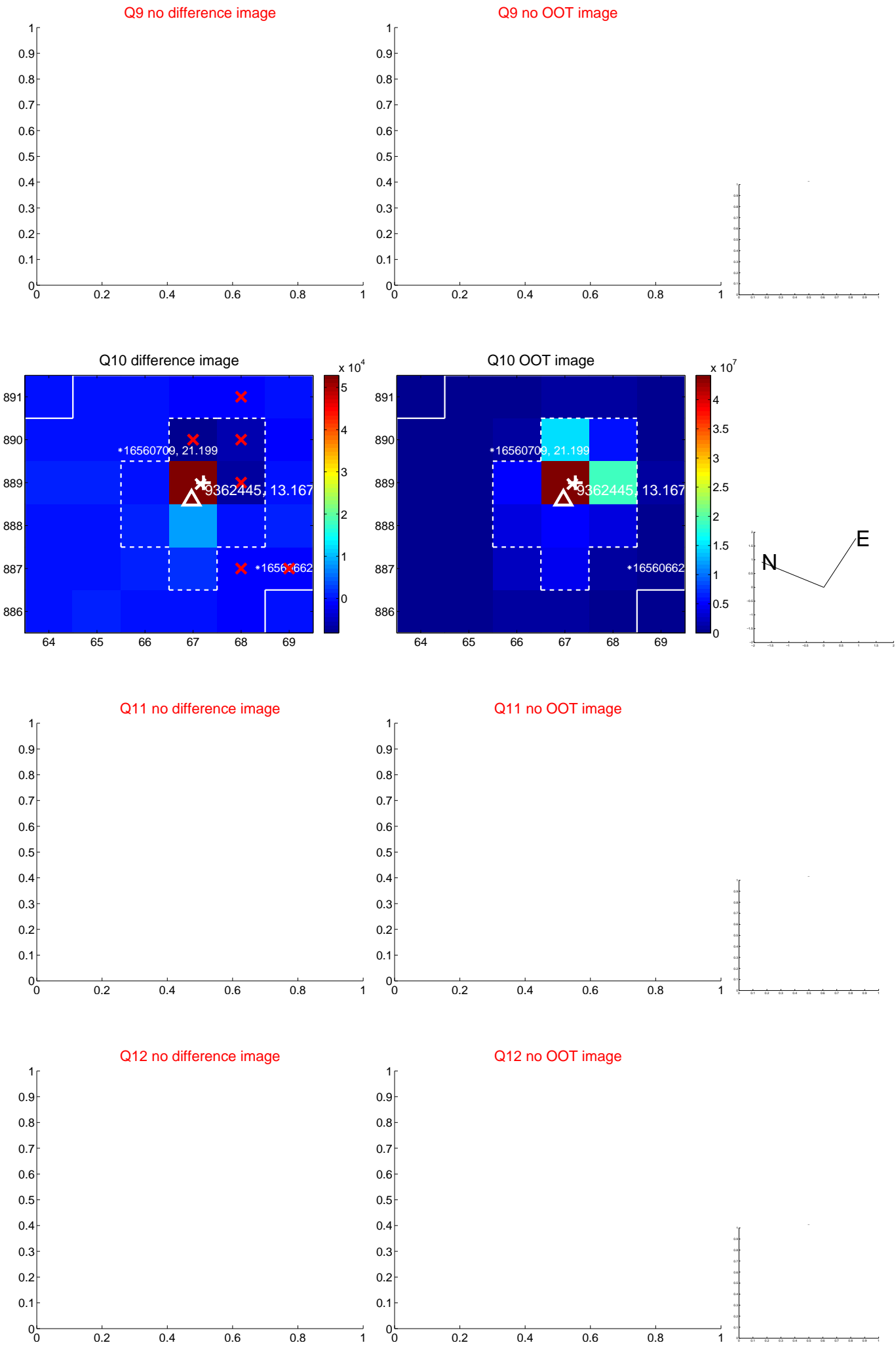
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

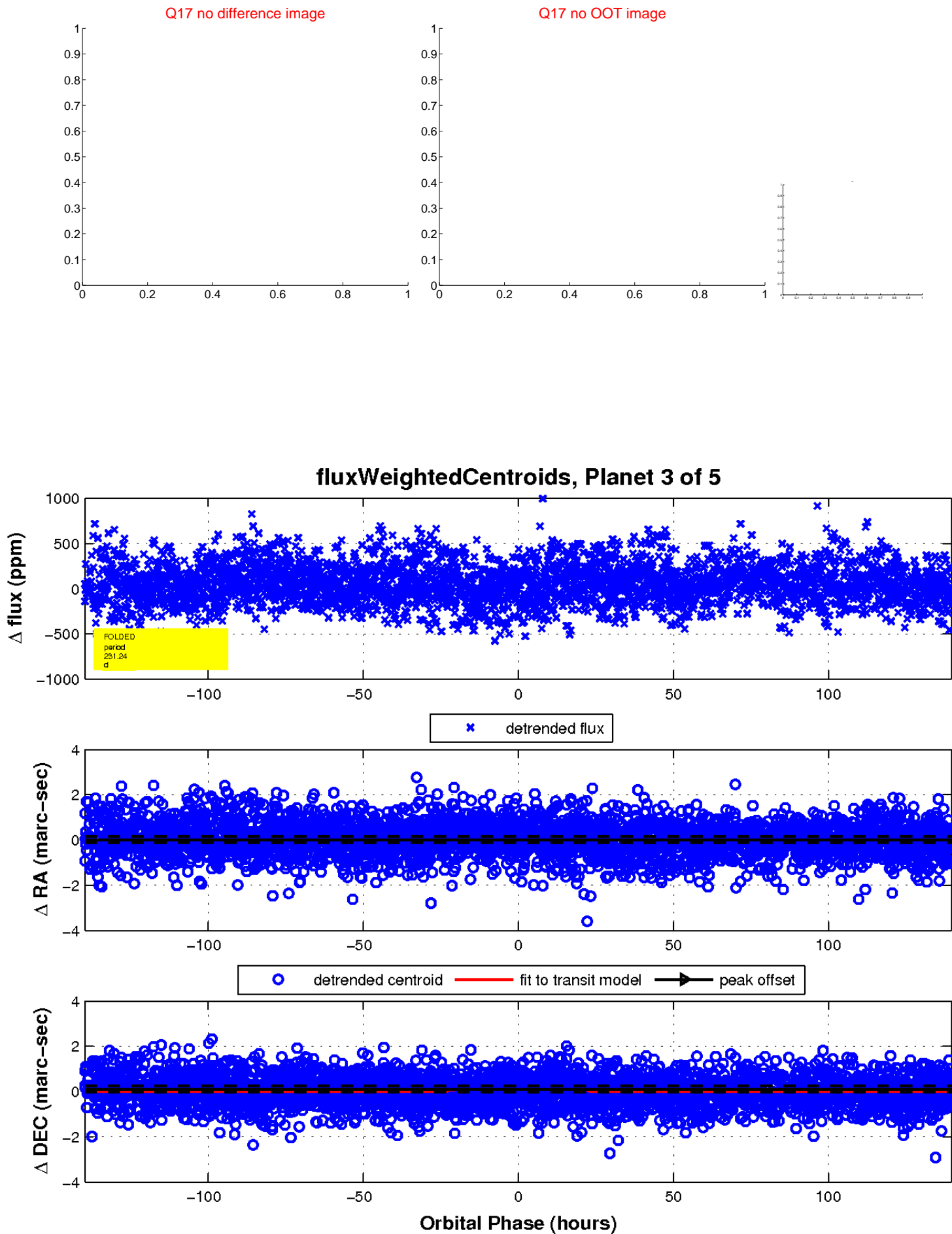




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

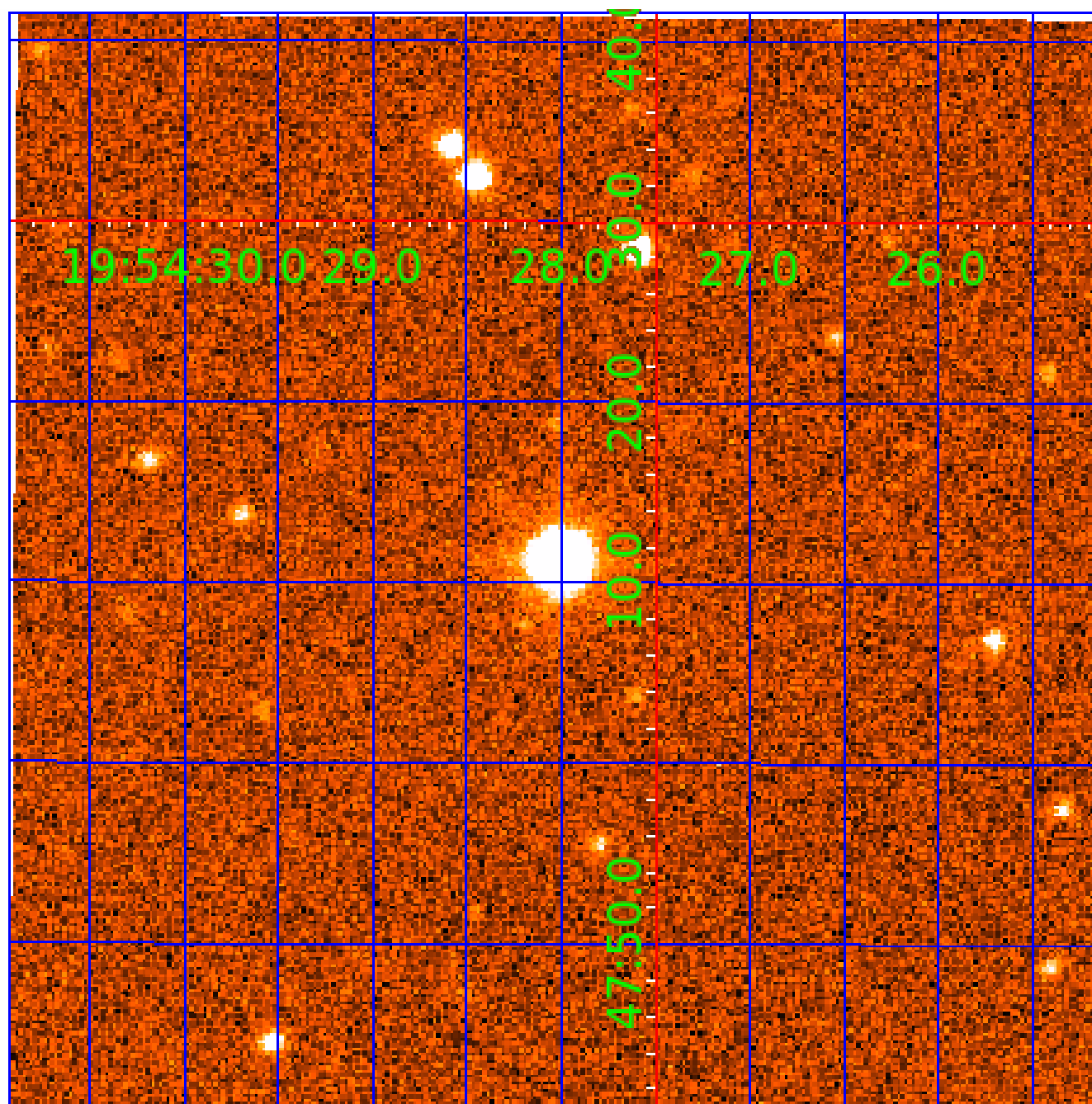


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009362445

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009362445-01	OBS	No	4.091769	133.015592	16.3	11.087	9.6	3.7	3.69	6086	1.75	5090.84
009362445-02	OBS	No	1.363982	132.803304	34.9	4.994	8.9	10.2	3.69	6086	2.57	22025.52
009362445-03	OBS	No	231.240118	296.369113	193.5	46.611	7.9	5.1	3.69	6086	5.43	23.47
009362445-04	OBS	No	247.164354	282.345640	276.2	9.224	7.3	6.0	3.69	6086	6.55	21.48
009362445-05	OBS	No	8.180312	131.616567	147.3	5.000	7.7	-1.0	3.69	6086	4.48	2021.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009362445-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009362445-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
009362445-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009362445-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT
009362445-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS—HALO_GHOST

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

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

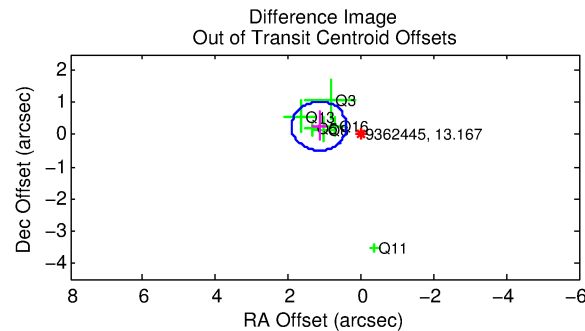
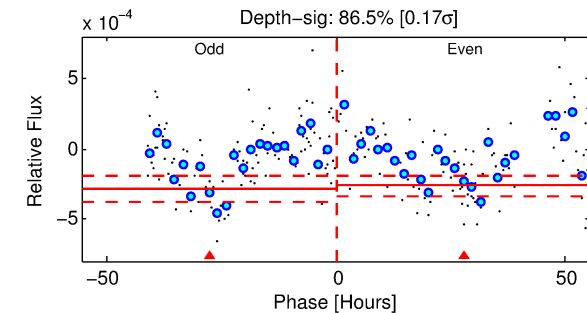
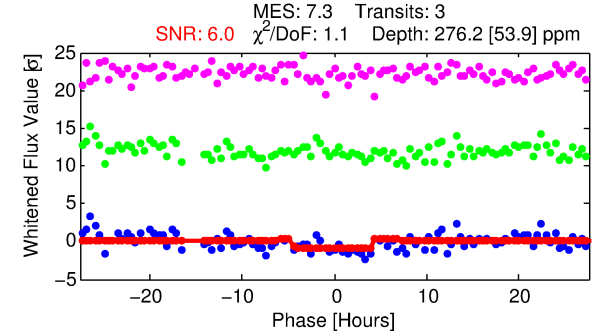
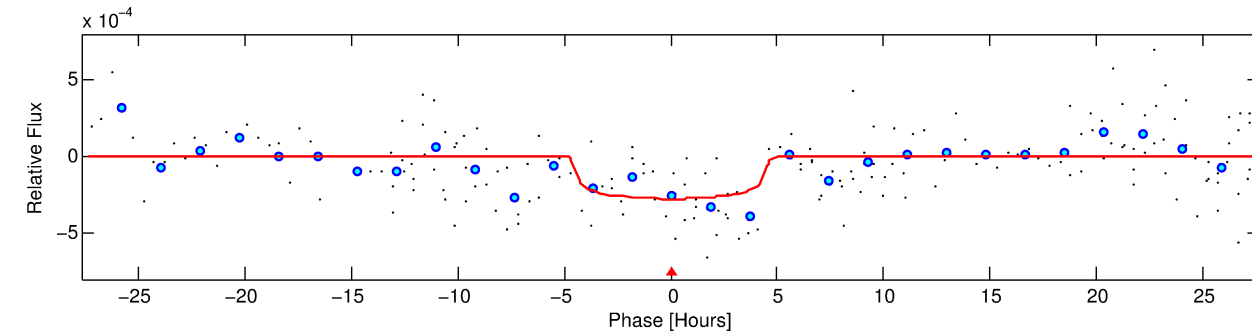
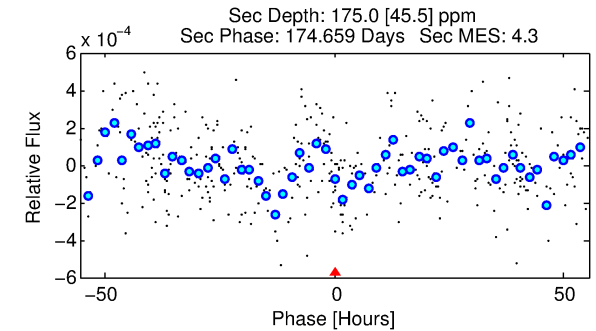
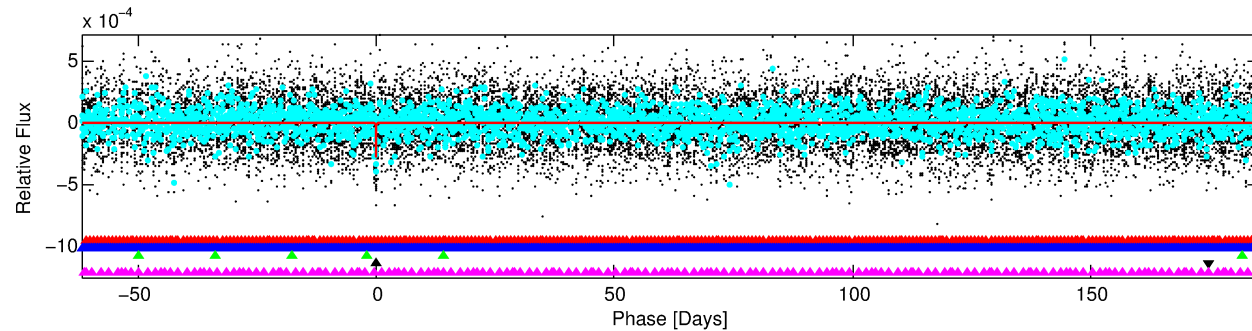
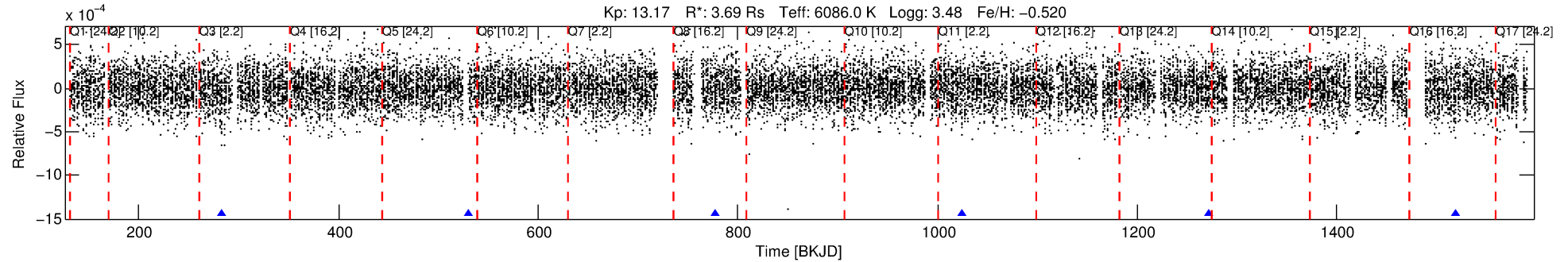
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009362445-04

No Significant Match Found

# DV One-Page Summary

KIC: 9362445 Candidate: 4 of 5 Period: 247.164 d



## DV Fit Results:

Period = 247.16435 [0.00765] d  
Epoch = 282.3456 [0.0250] BKJD  
Rp/R\* = 0.0163 [0.0085]  
a/R\* = 151.76 [396.50]  
b = 0.70 [1.96]  
Seff = 21.48 [14.39]  
Teff = 549 [92] K  
Rp = 6.55 [4.57] Re  
a = 0.8820 [0.3725] AU  
Ag = 1747.50 [2201.14] [0.79σ]  
Teffp = 5488 [1490] K [3.31σ]

## DV Diagnostic Results:

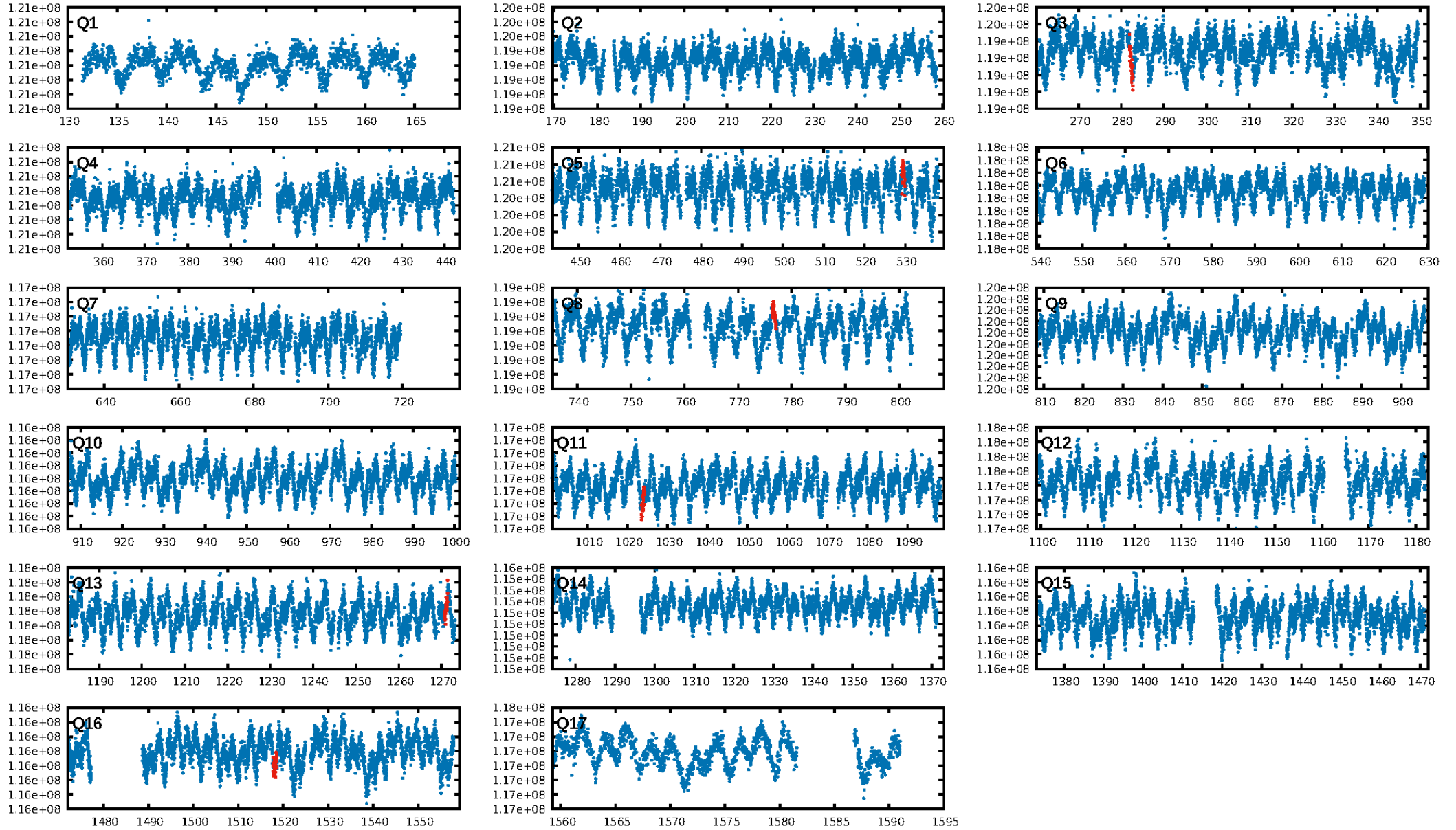
ShortPeriod-sig: 100.0% [8.04σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 4.5%  
ModelChiSquareGof-sig: 99.7%  
**Bootstrap-pfa: 1.77e-08**  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.3449**  
Centroid-sig: 0.7%  
Centroid-so: 1.592 arcsec [1.72σ]  
**OotOffset-rm: 1.184 arcsec [4.66σ]**  
OotOffset-st: 0.2/2/2 [6]  
KicOffset-rm: 1.146 arcsec [2.69σ]  
KicOffset-st: 0.2/2/2 [6]  
DiffImageQuality-fgm: 0.67 [4/6]  
DiffImageOverlap-fno: 0.00 [0/6]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:44:49 Z

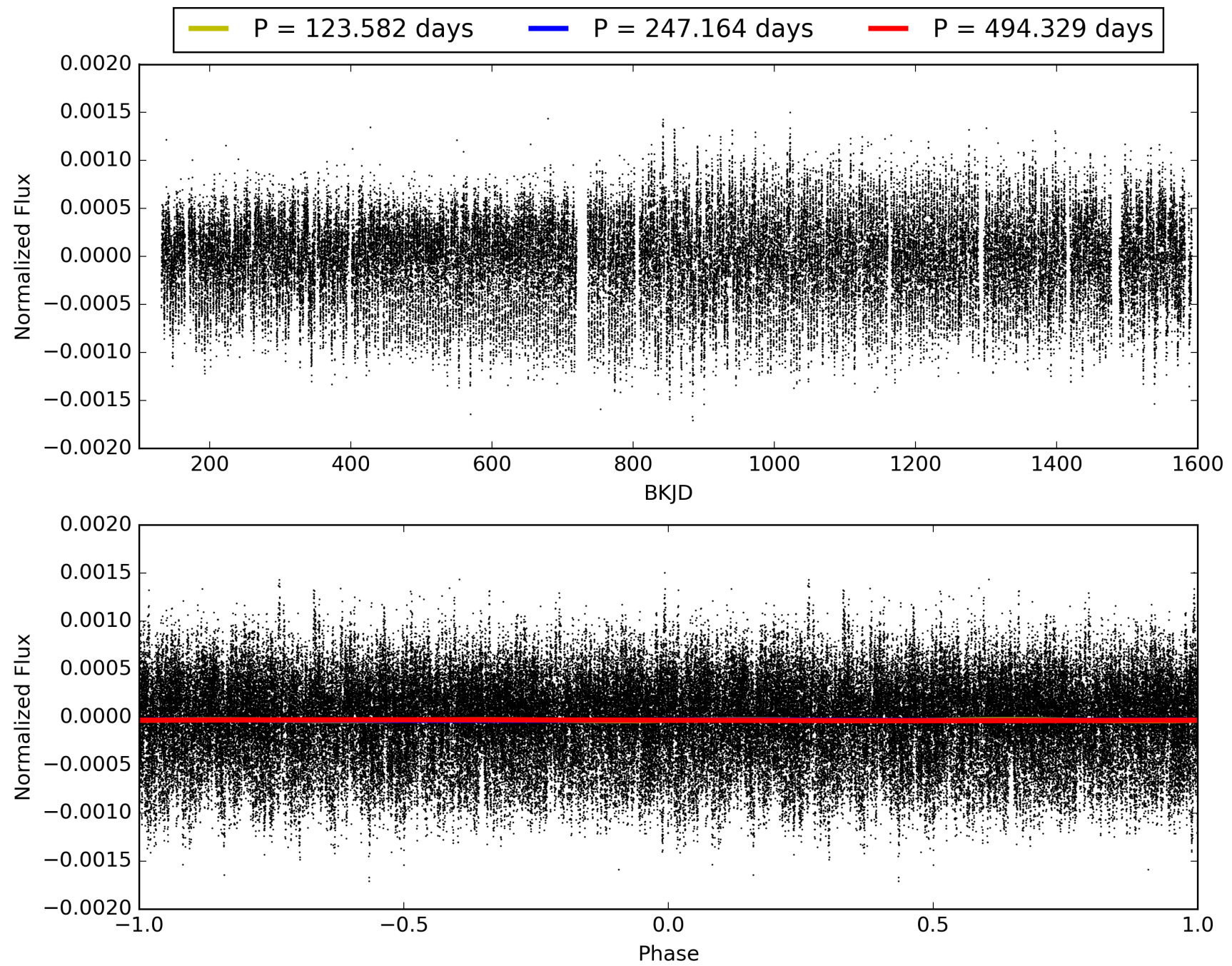
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 009362445-04, PDC Light Curves

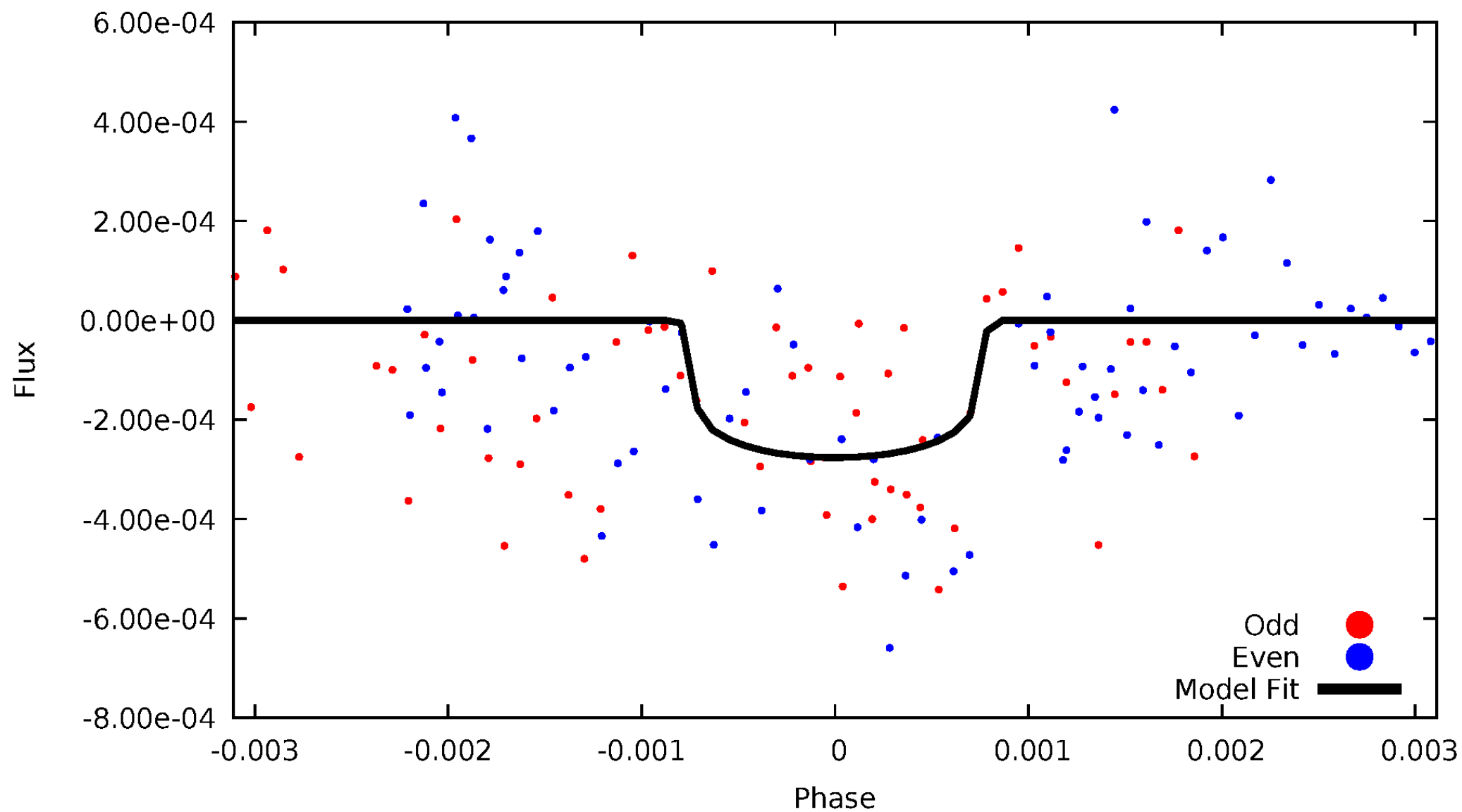


TCE 009362445-04



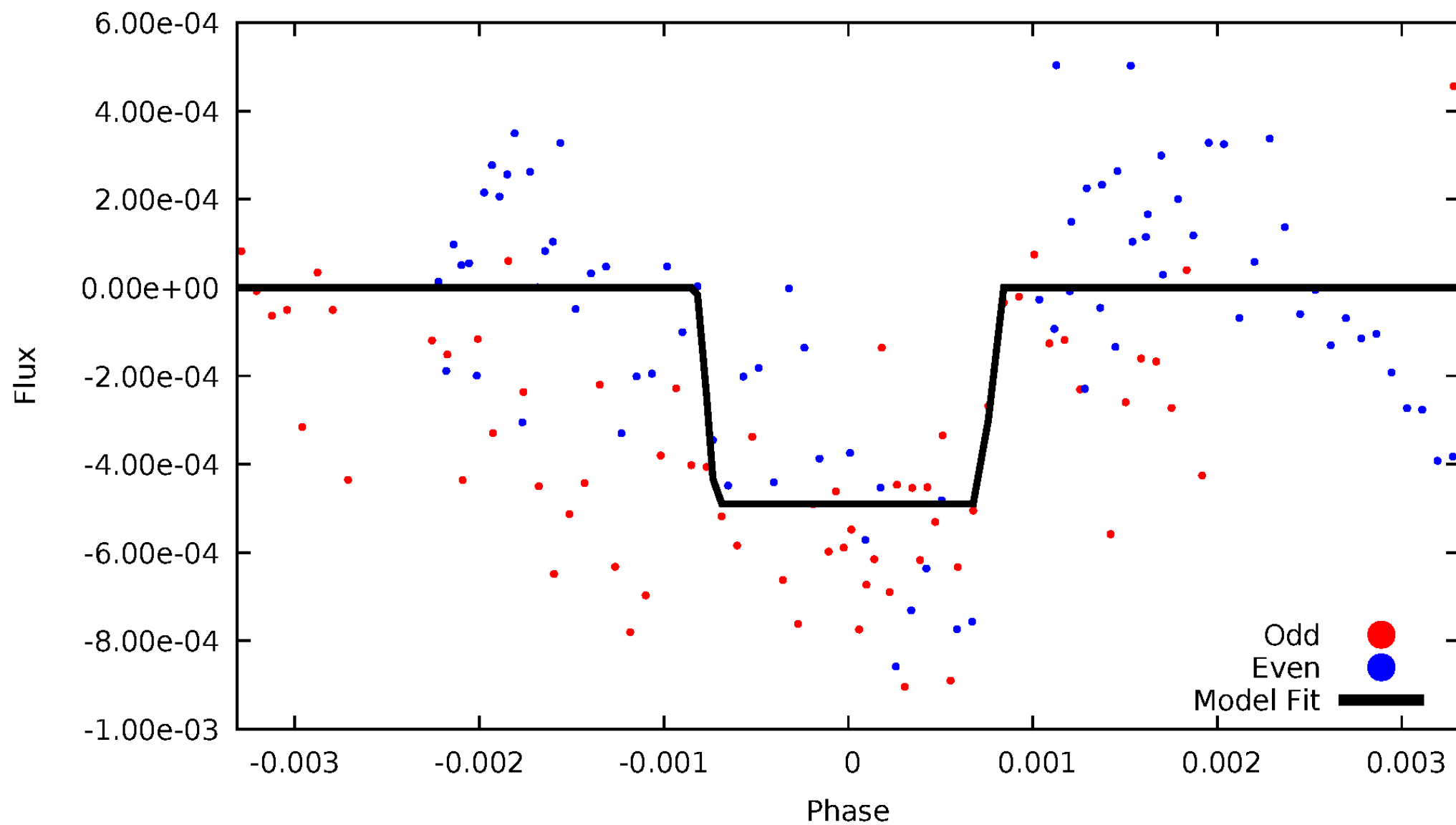
# DV Odd/Even

TCE 009362445-04



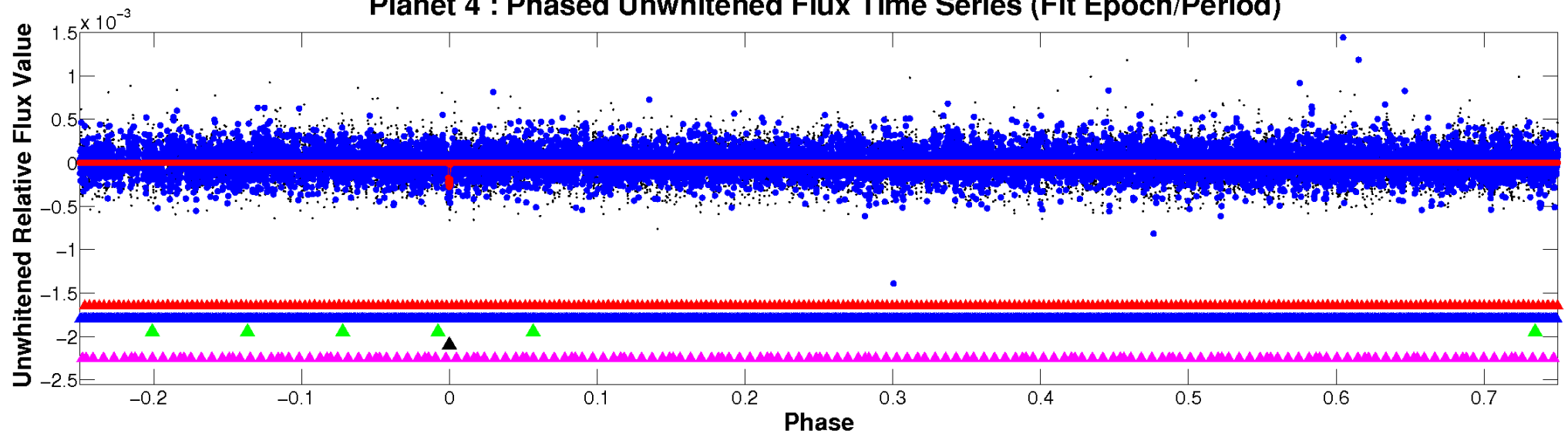
# ALT Odd/Even

TCE 009362445-04

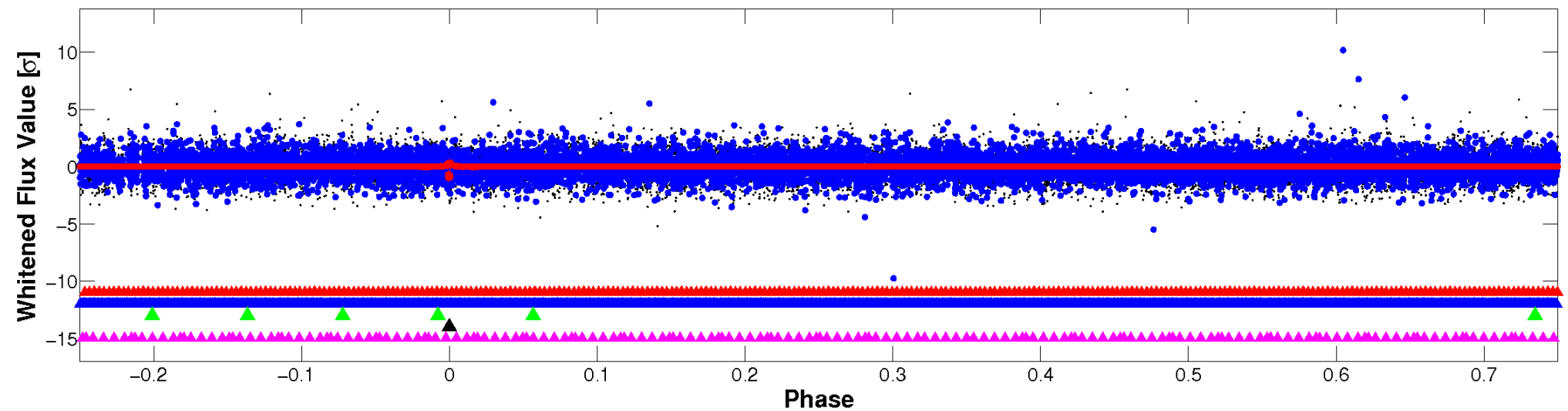


# Non-Whitened Vs. Whitened Light Curve

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



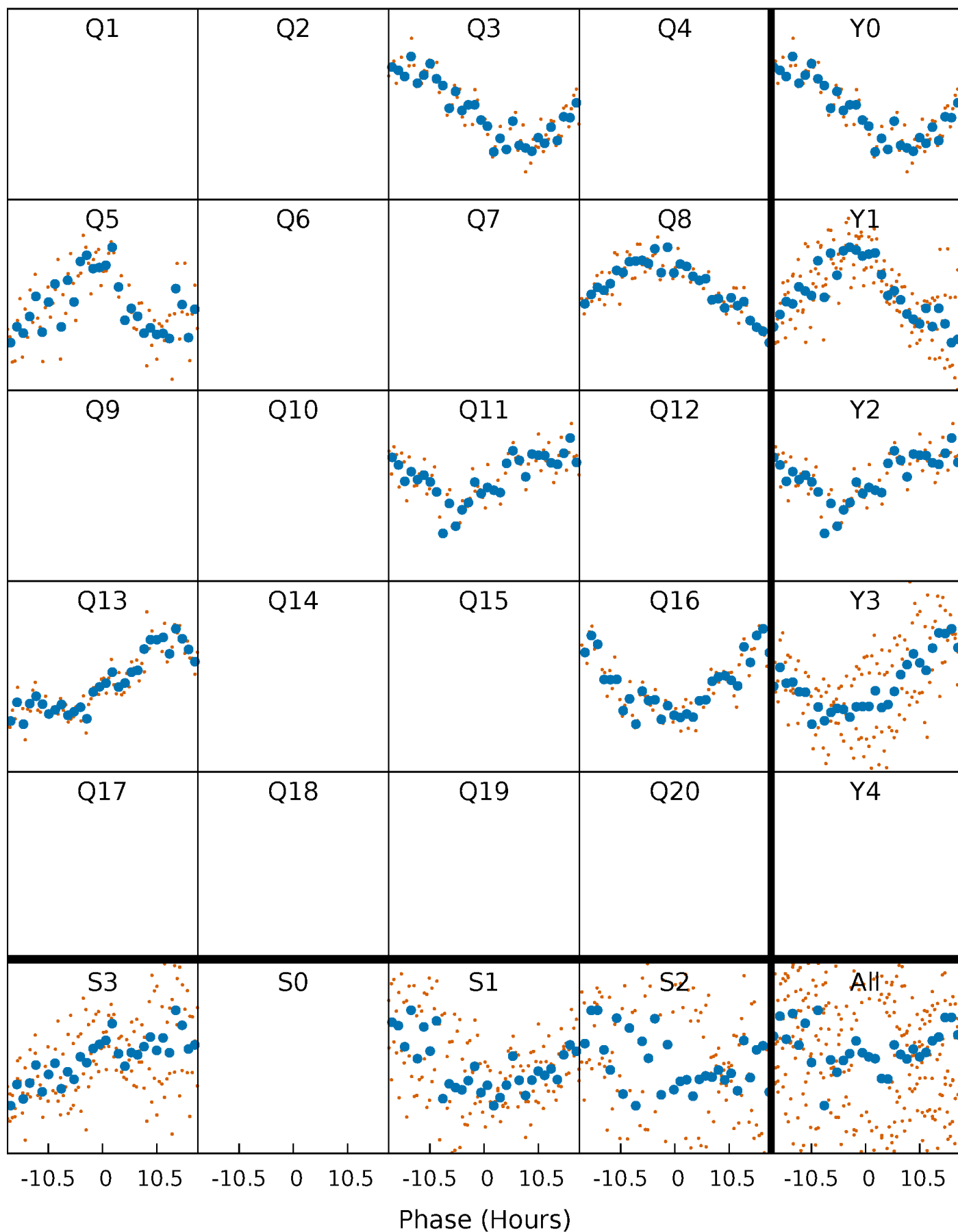
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





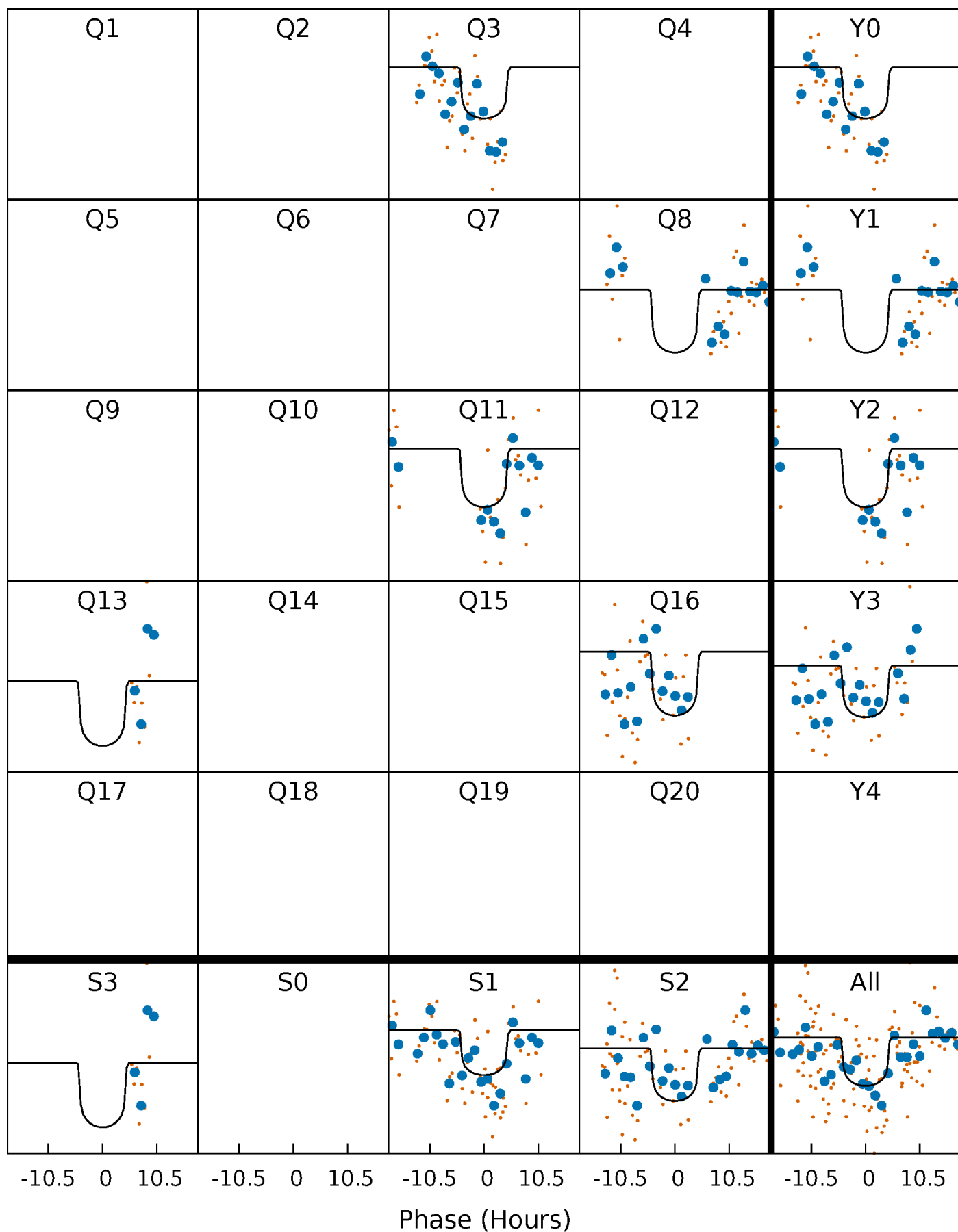
# PDC Quarter-Phased Transit Curves

TCE 009362445-04     $P=247.164354$  Days     $T_0=282.345640$  (BKJD)



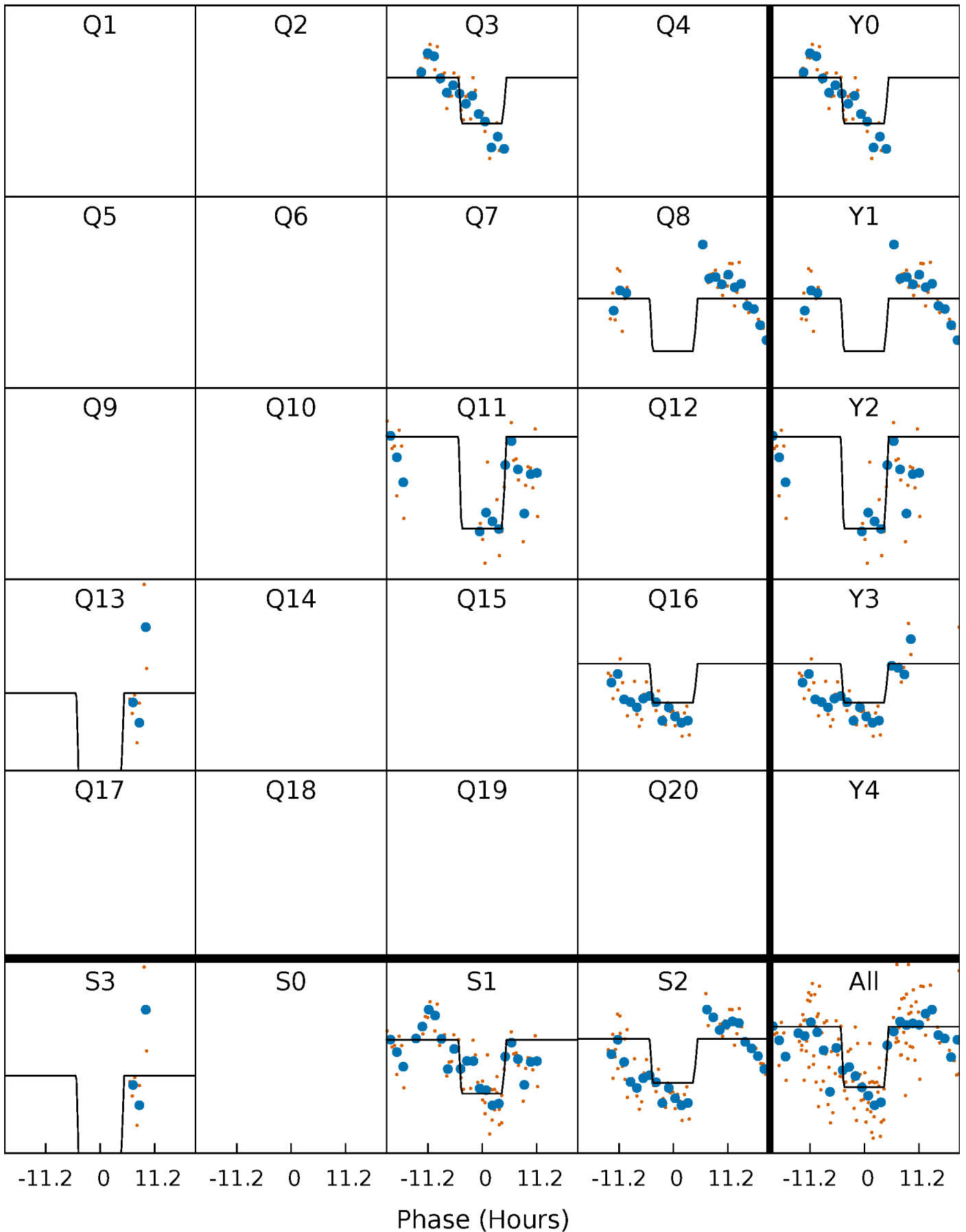
# DV Quarter-Phased Transit Curves

TCE 009362445-04     $P=247.164354$  Days     $T_0=282.345640$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

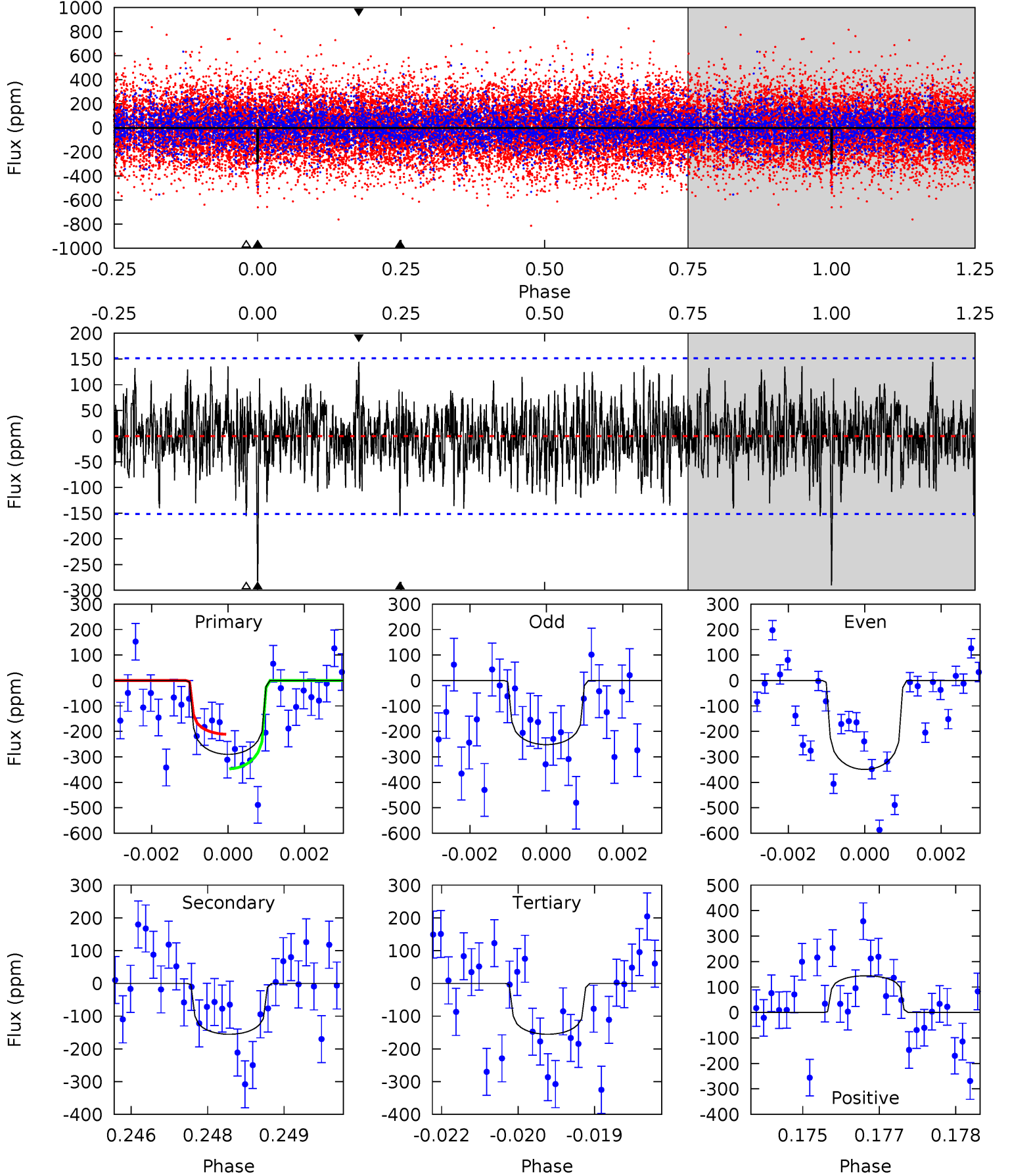
TCE 009362445-04 P=247.157531 Days  $T_0=282.351715$  (BKJD)



# DV Model-Shift Uniqueness Test

009362445-04, P = 247.164354 Days, E = 35.181286 Days

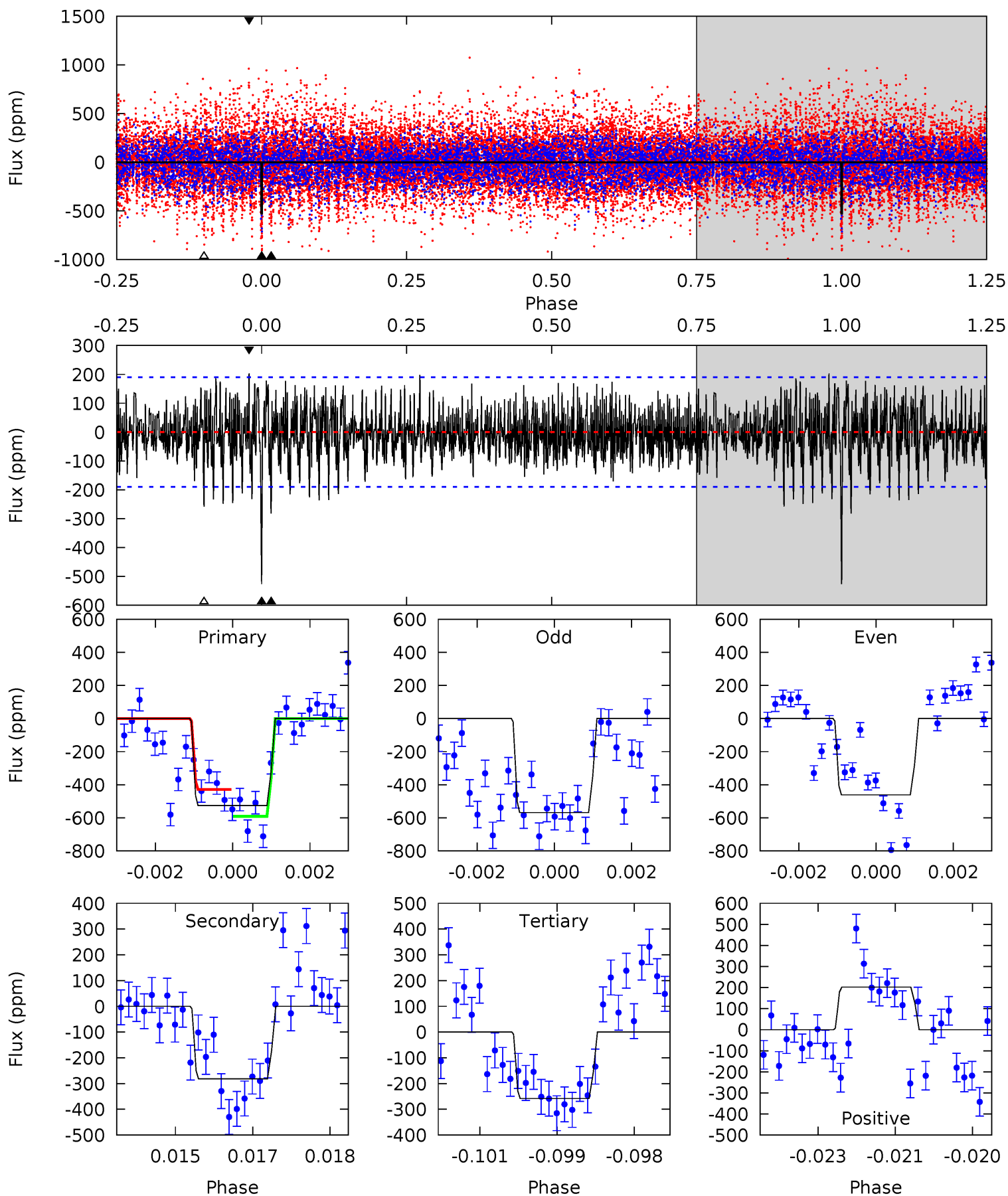
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	5.50	5.50	5.11	5.37	3.16	1.61	4.78	5.17	0.00	0.40	1.70	0.84	0.33	2.38



# Alt Model-Shift Uniqueness Test

009362445-04, P = 247.157531 Days, E = 35.194184 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.9	7.98	7.30	5.74	5.38	3.17	2.01	7.59	9.15	0.68	2.25	1.50	1.13	0.28	2.24



### Stellar Parameters For KIC 009362445

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6086^{+202}_{-220}$	$3.480^{+0.376}_{-0.094}$	$-0.520^{+0.350}_{-0.300}$	$3.687^{+0.682}_{-1.705}$	$1.496^{+0.187}_{-0.437}$	$0.042^{+0.130}_{-0.016}$
	+3%/-4%	+11%/-3%	+67%/-58%	+18%/-46%	+12%/-29%	+308%/-38%
Source	PHO1	FLK73	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 009362445-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-155 \pm 28$	$6.10^{+3.61}_{-3.12}$	$743^{+58}_{-82}$	$5236^{+2285}_{-789}$	$1681^{+5981}_{-983}$
Alt.	$-282 \pm 35$	$8.58^{+3.68}_{-3.55}$	$748^{+53}_{-77}$	$5212^{+1268}_{-634}$	$1624^{+2805}_{-816}$

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



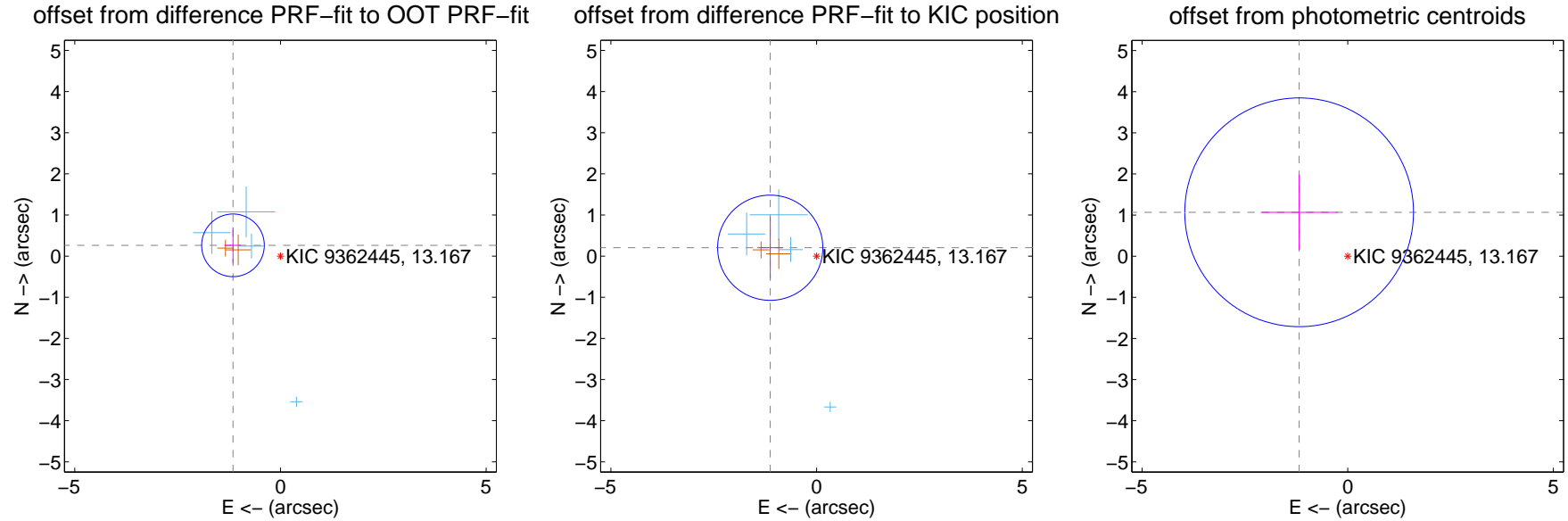
## DV Centroid Data

Supplemental centroid analysis for 009362445-04. Kepler magnitude: 13.17. Transit SNR 6.00

There are 4 quarters with good PRF difference image offsets

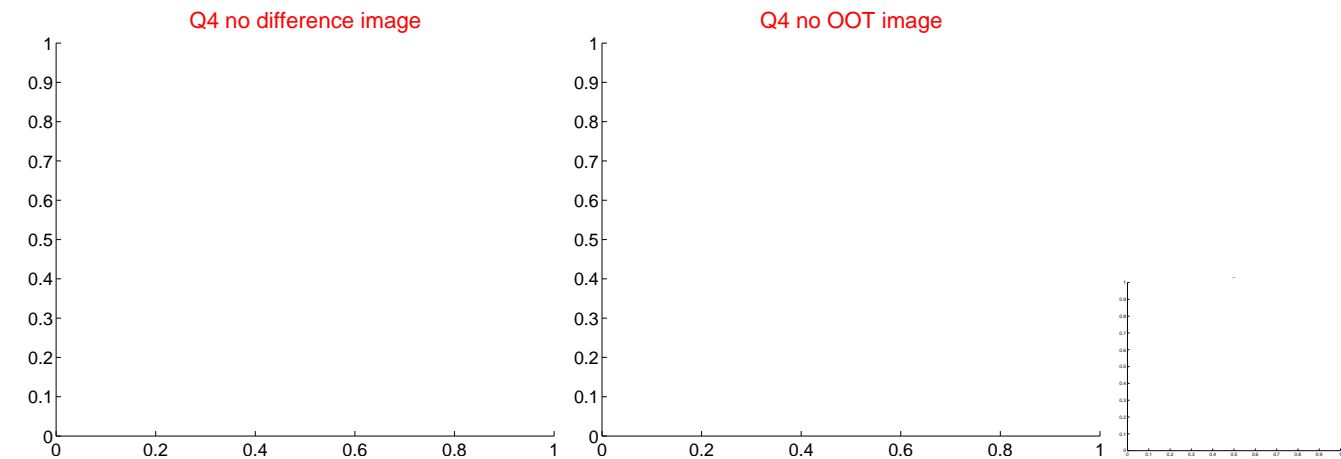
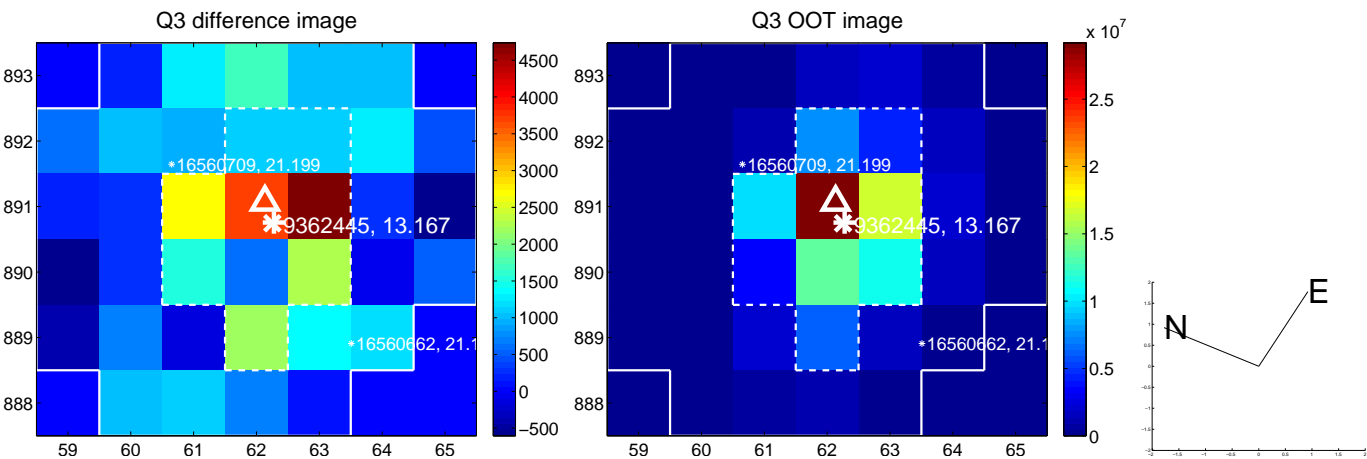
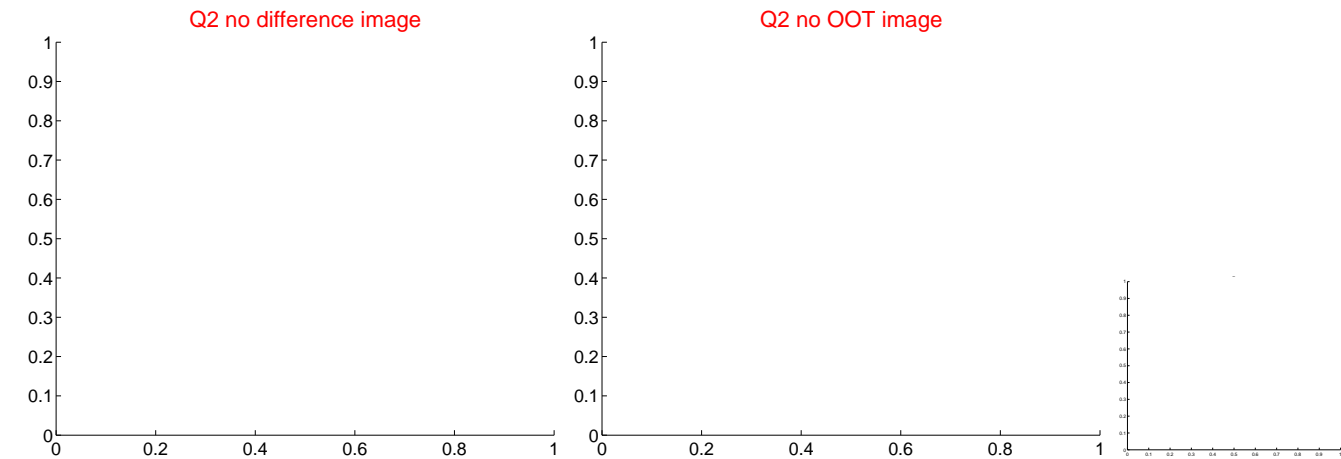
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>1.184 \pm 0.254</math></b>	<b>4.66</b>	$1.154 \pm 0.192$	$0.263 \pm 0.438$
PRF-fit source offset from KIC position	$1.146 \pm 0.426$	2.69	$1.127 \pm 0.314$	$0.204 \pm 0.742$
photometric centroid source offset	$1.59 \pm 0.93$	1.72	$1.18 \pm 0.94$	$1.07 \pm 0.91$

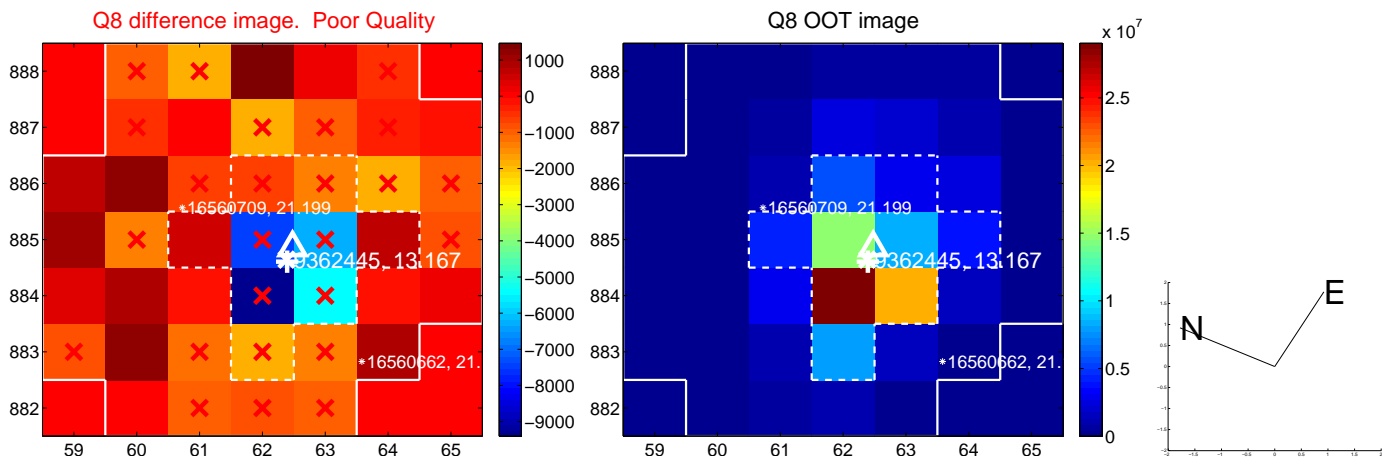
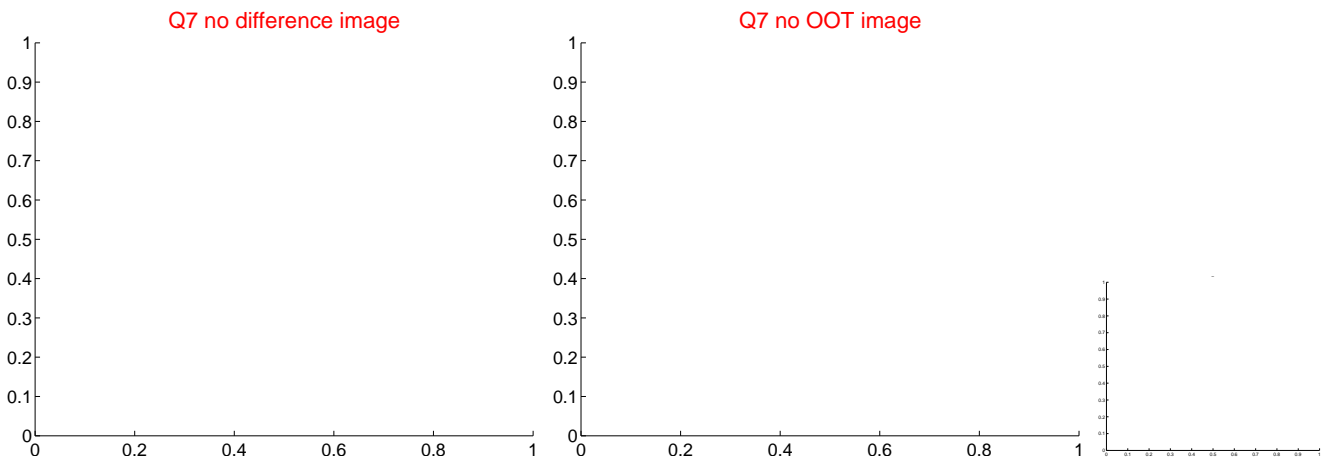
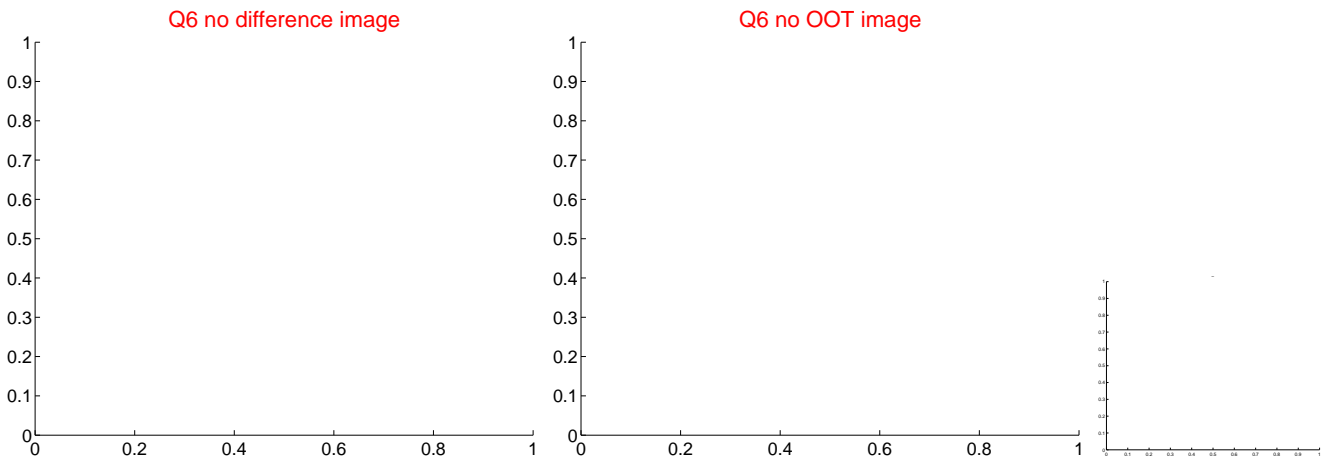
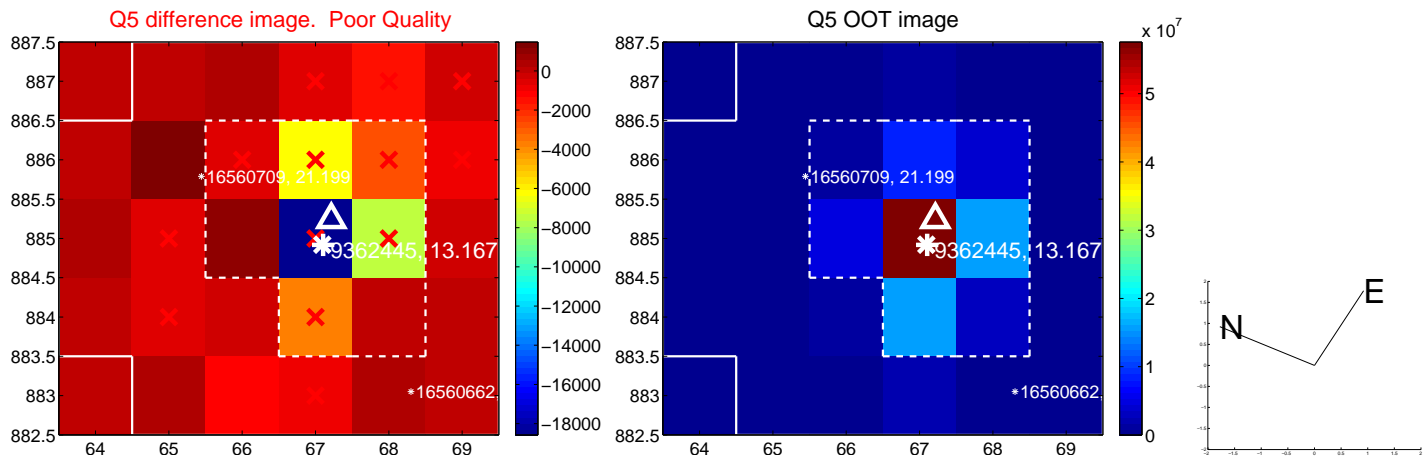


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

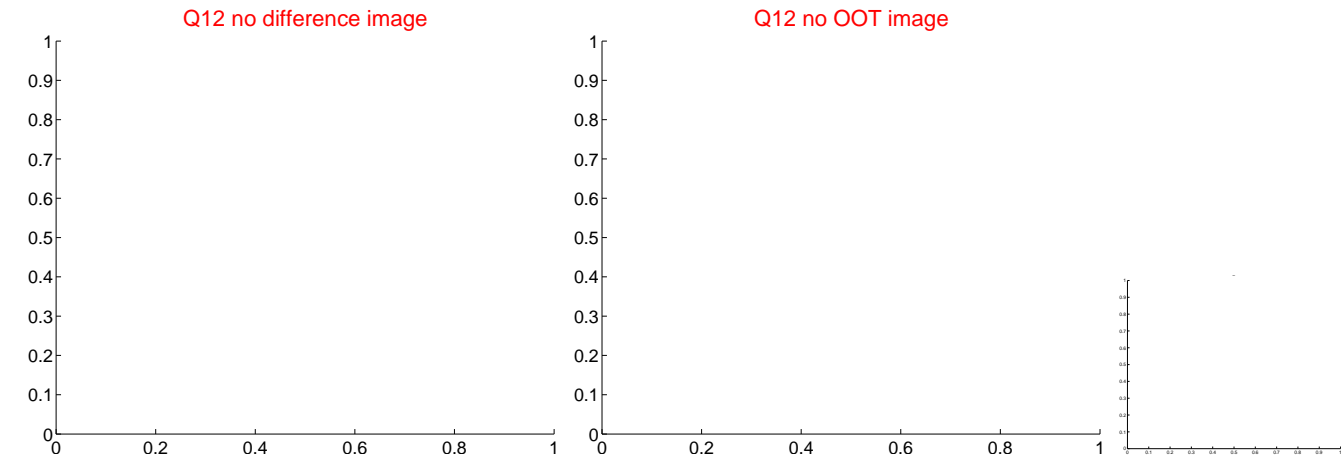
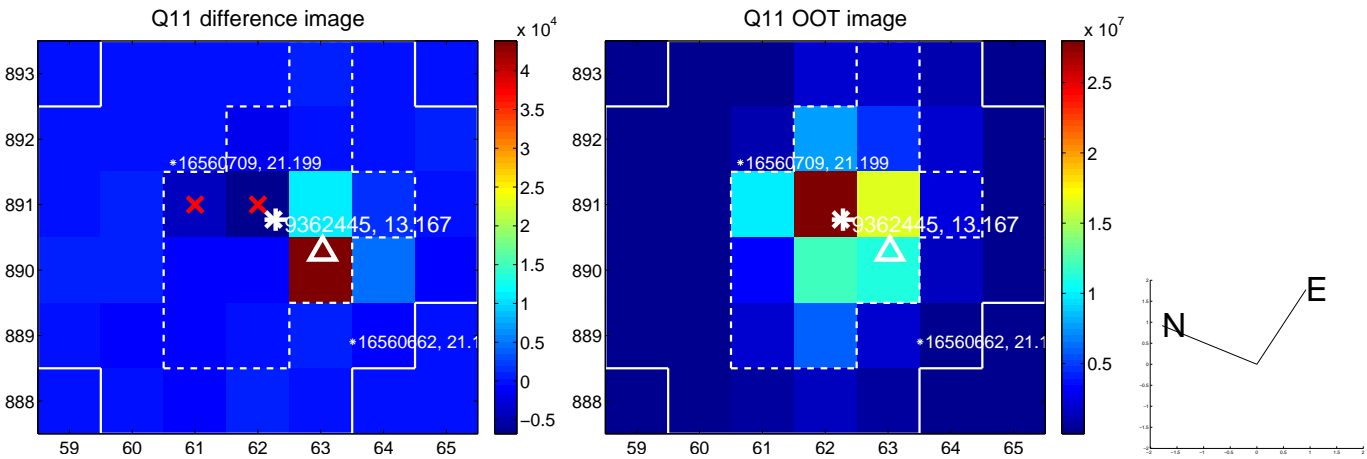
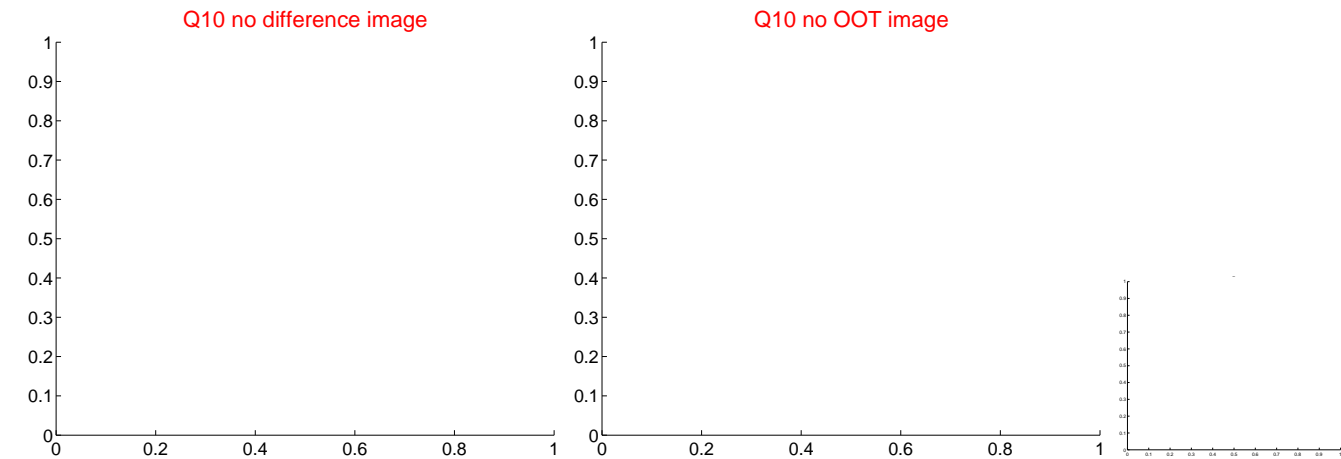
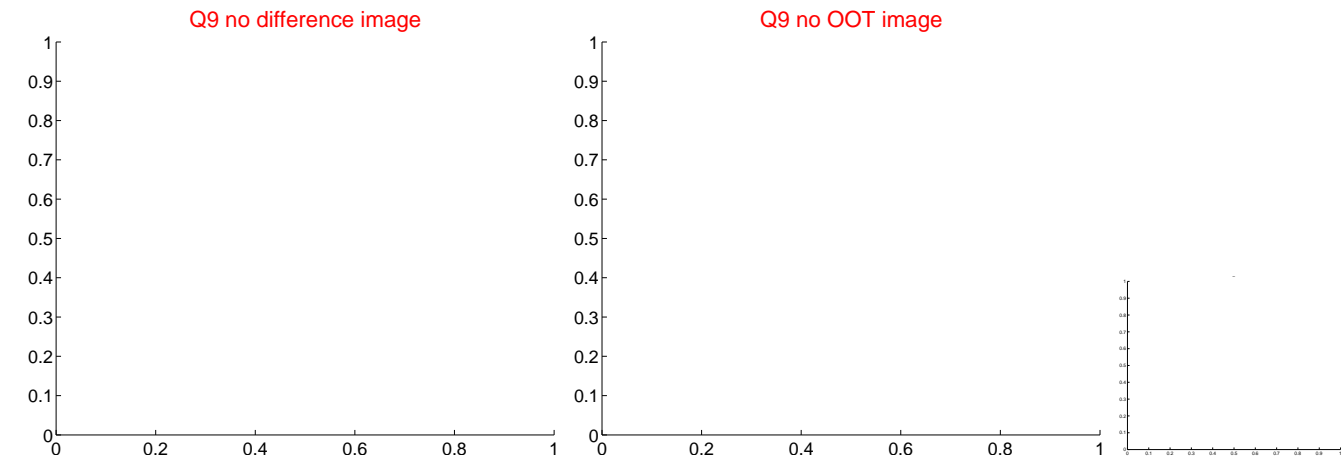
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



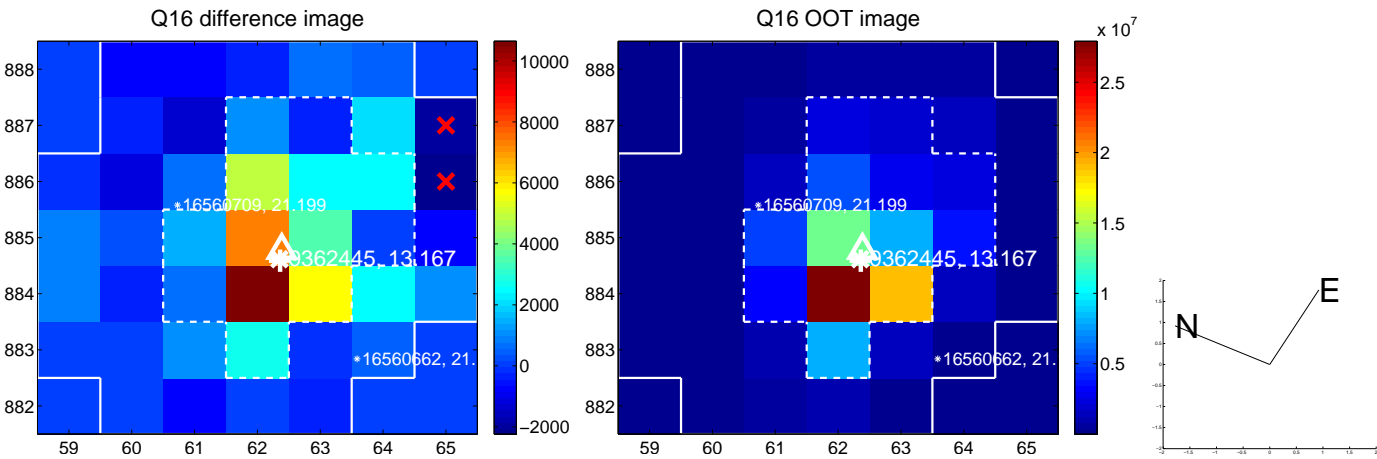
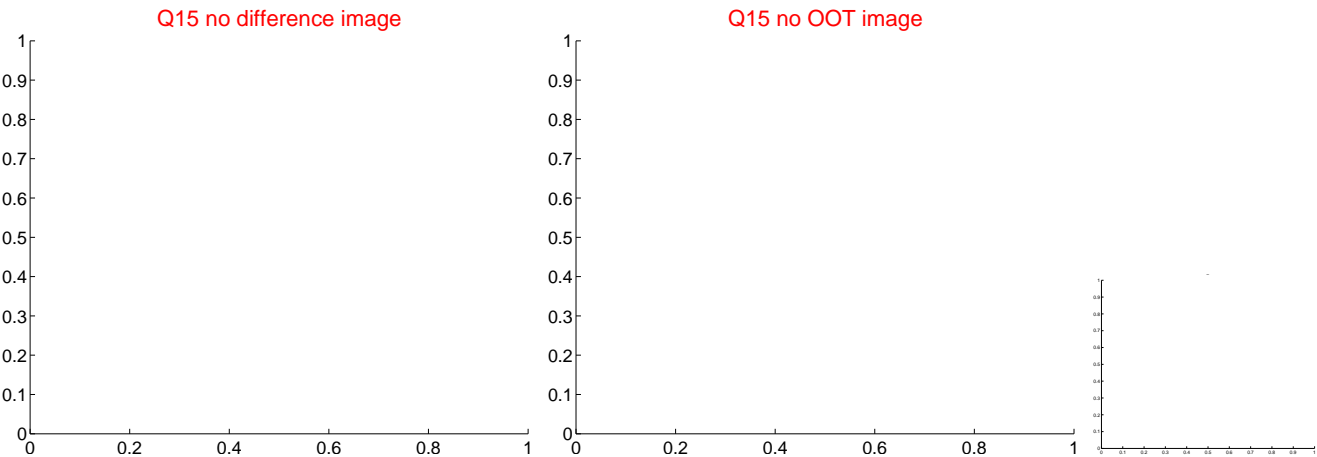
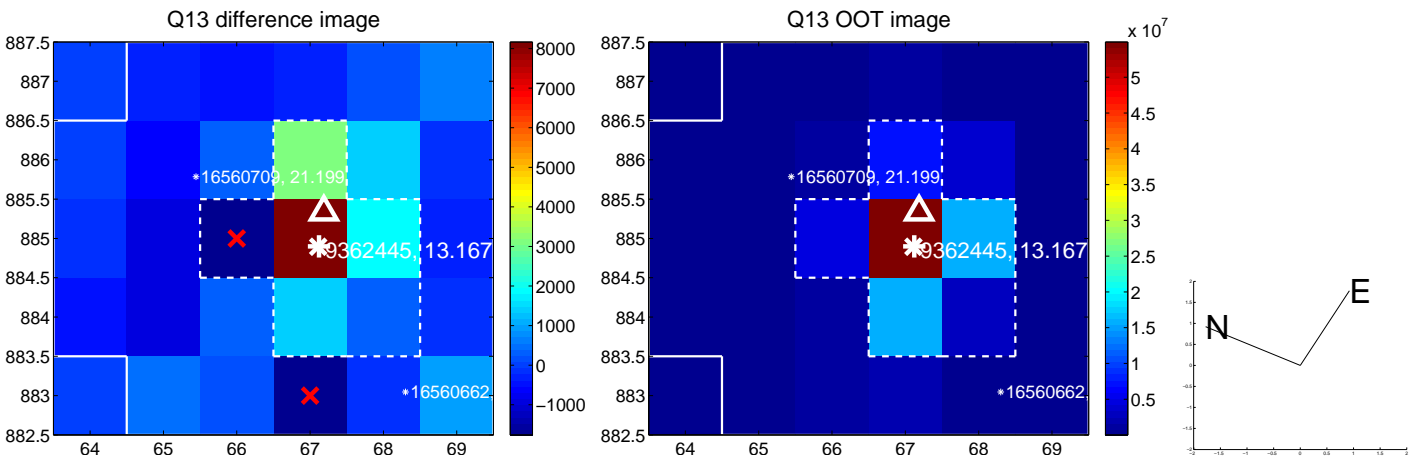
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



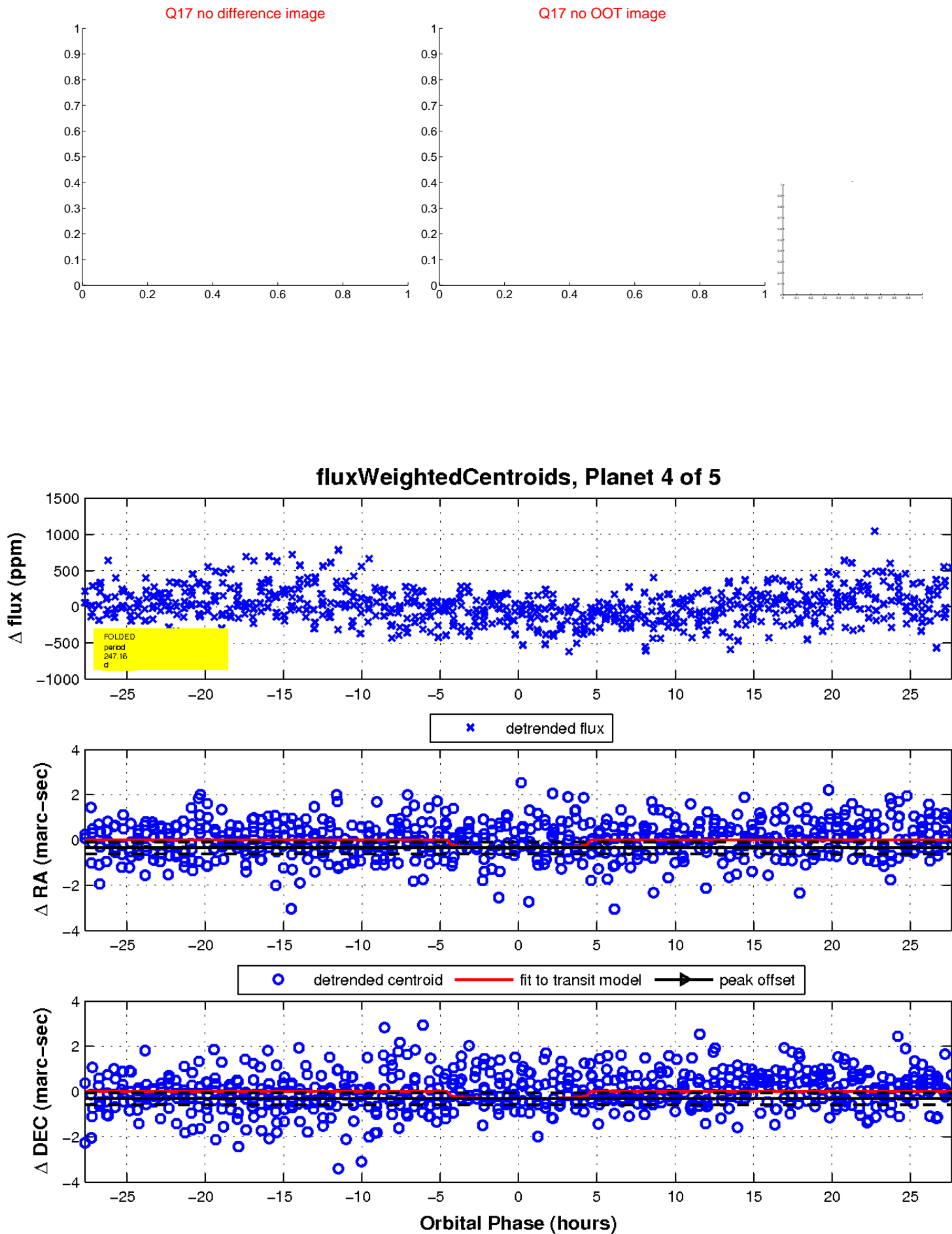
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



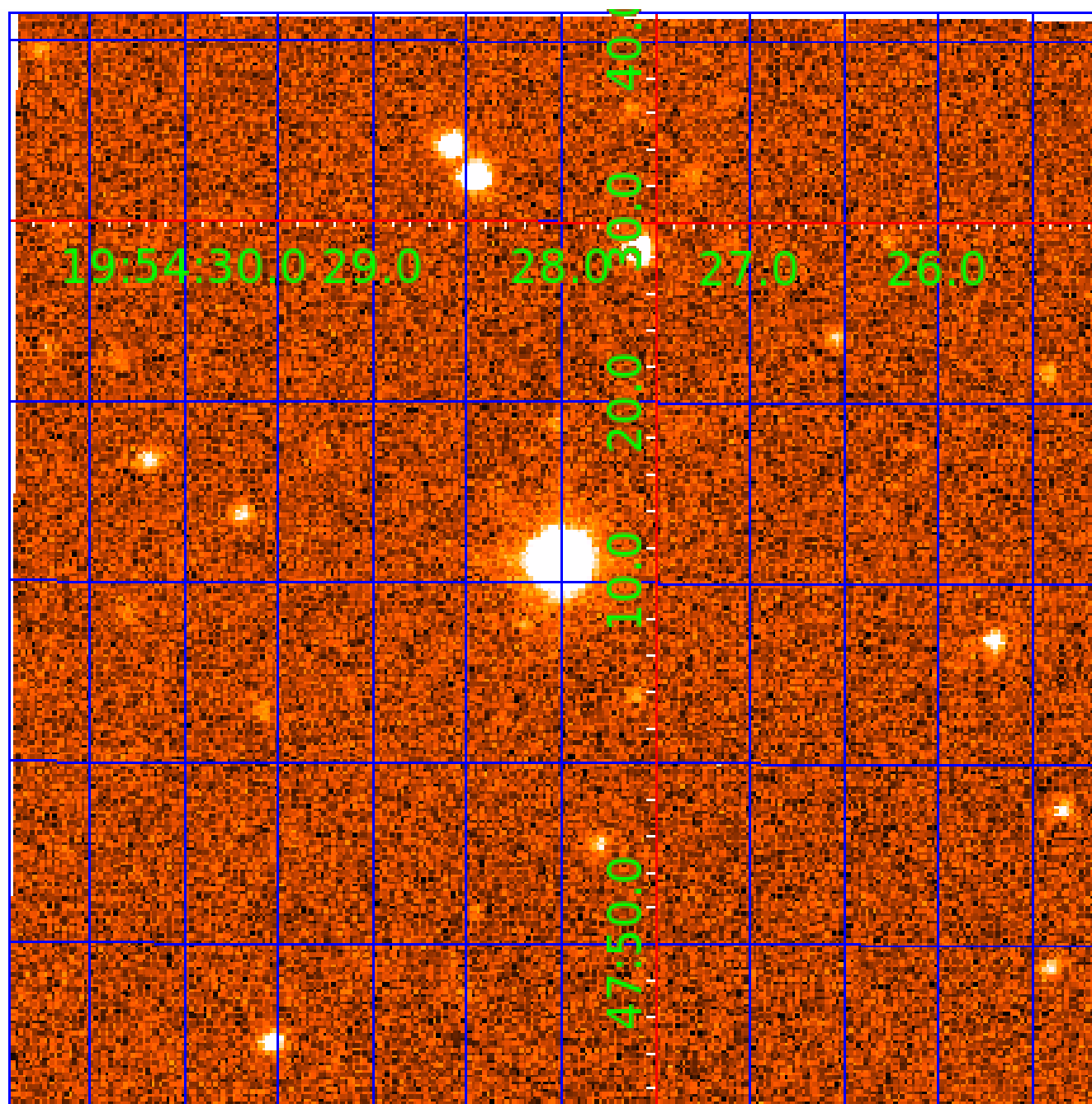
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image

Declination



# KIC 009362445

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009362445-01	OBS	No	4.091769	133.015592	16.3	11.087	9.6	3.7	3.69	6086	1.75	5090.84
009362445-02	OBS	No	1.363982	132.803304	34.9	4.994	8.9	10.2	3.69	6086	2.57	22025.52
009362445-03	OBS	No	231.240118	296.369113	193.5	46.611	7.9	5.1	3.69	6086	5.43	23.47
009362445-04	OBS	No	247.164354	282.345640	276.2	9.224	7.3	6.0	3.69	6086	6.55	21.48
009362445-05	OBS	No	8.180312	131.616567	147.3	5.000	7.7	-1.0	3.69	6086	4.48	2021.36

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009362445-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009362445-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_FEW_MEAS
009362445-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009362445-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT
009362445-05	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS—HALO_GHOST

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

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

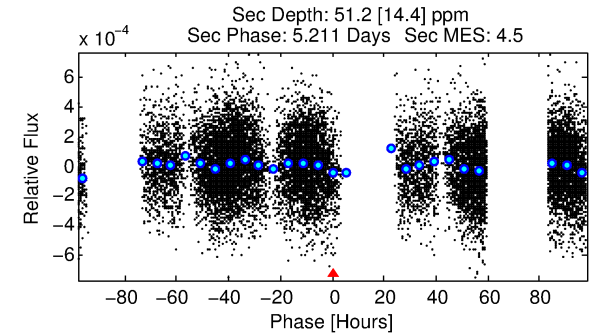
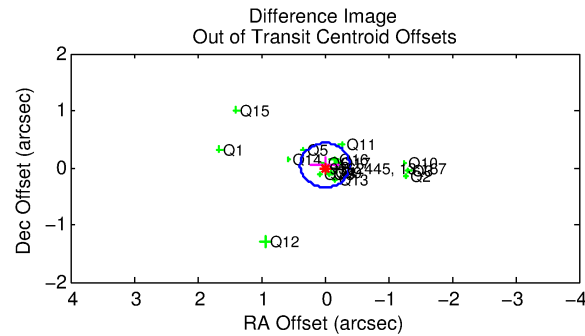
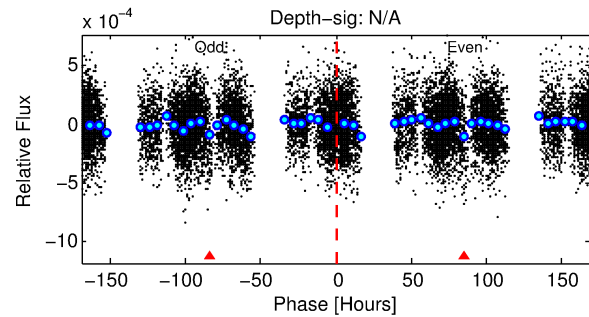
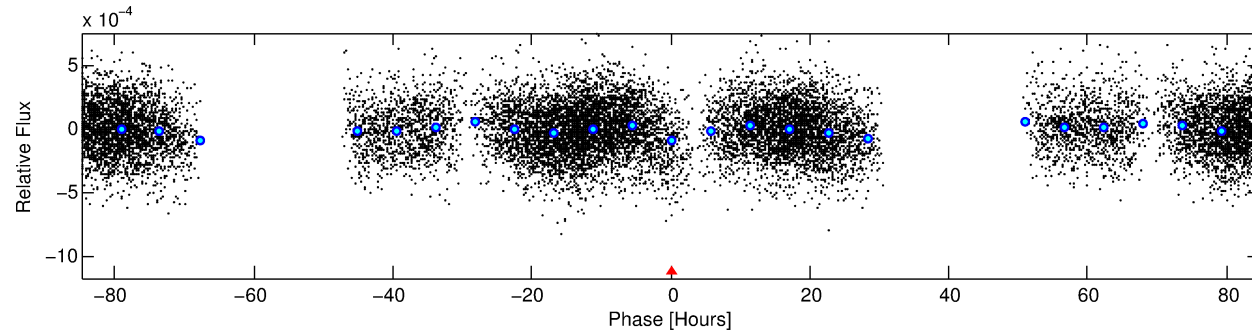
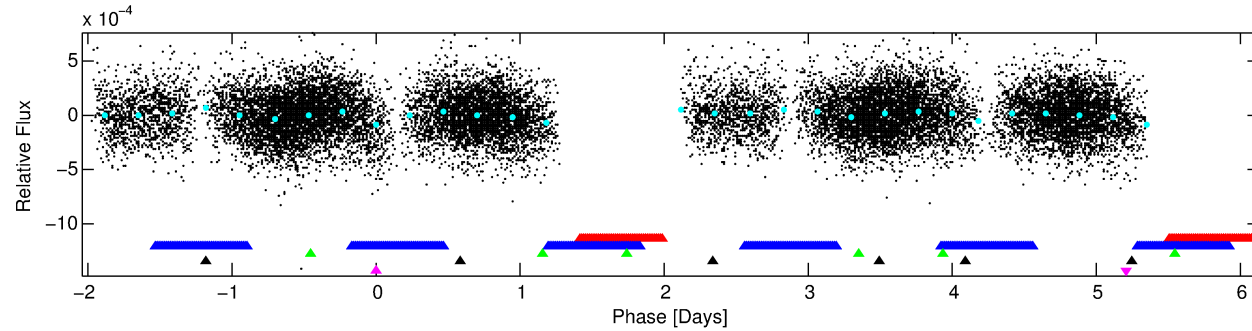
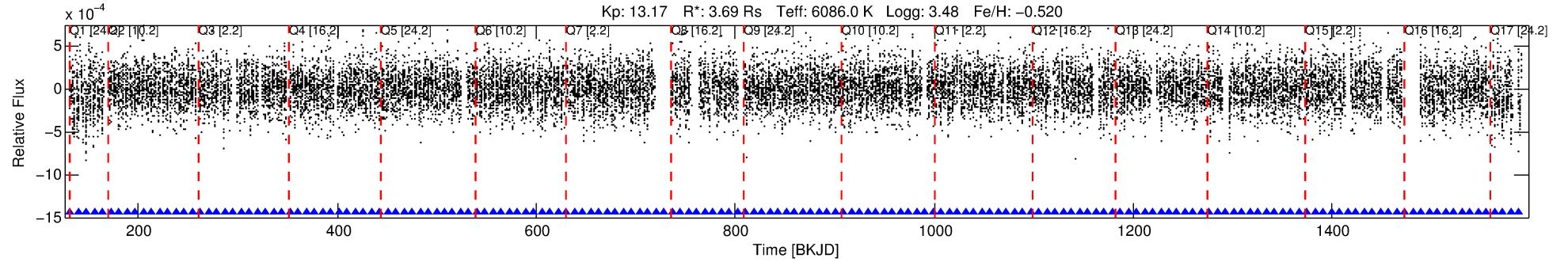
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009362445-05

No Significant Match Found

# DV One-Page Summary

KIC: 9362445 Candidate: 5 of 5 Period: 8.180 d



## TPS TCE Results:

Period = 8.18031 d  
Epoch = 131.6166 BKJD

DV fit results are unavailable

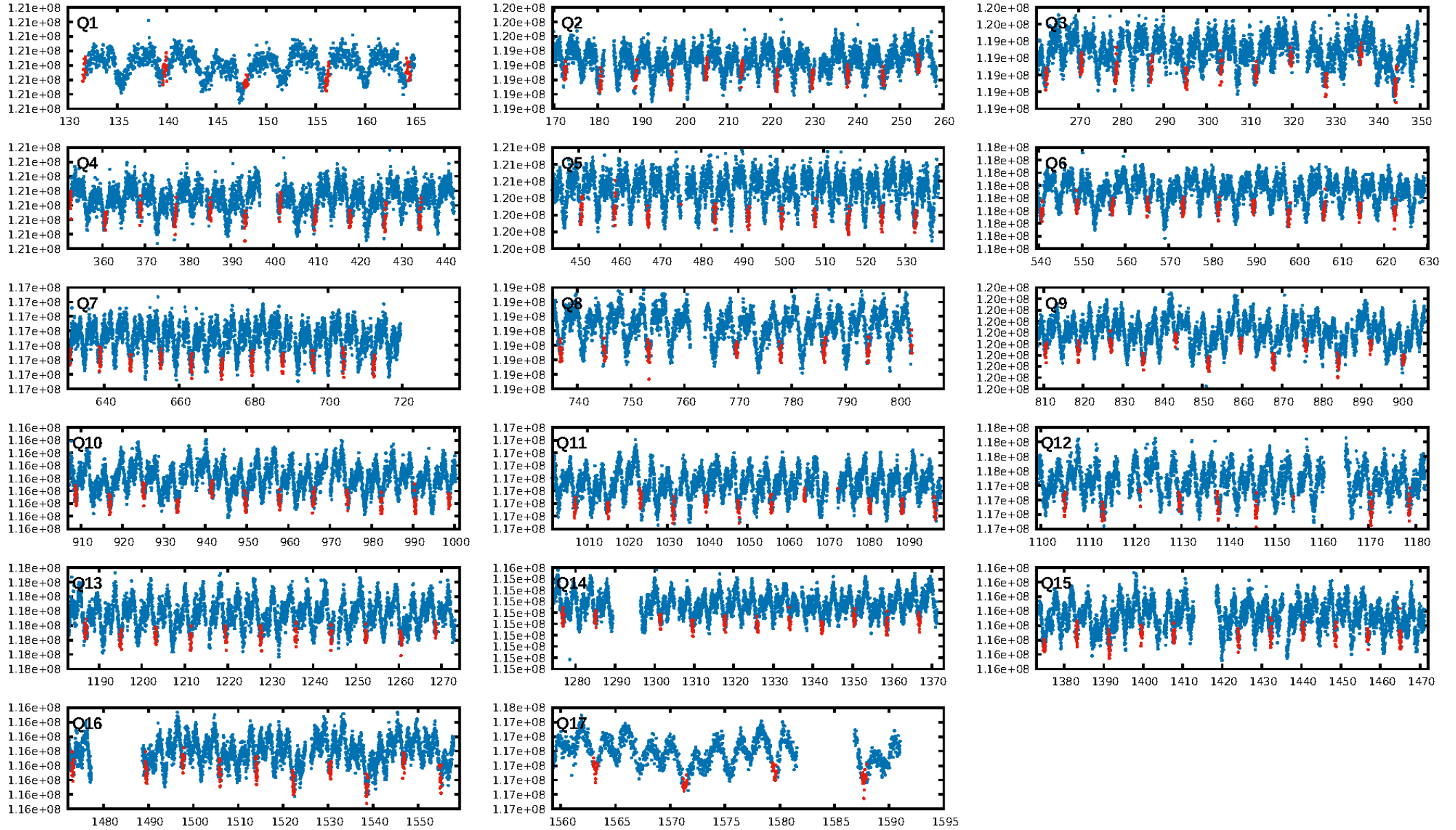
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.07σ]  
LongPeriod-sig: 100.0% [114.20σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.25e-10  
RollingBand-fgt: 1.00 [159/159]  
GhostDiagnostic-chr: 0.1849  
Centroid-sig: 0.0%  
Centroid-so: 0.511 arcsec [4.41σ]  
OotOffset-rm: 0.045 arcsec [0.35σ]  
KicOffset-rm: 0.070 arcsec [0.33σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

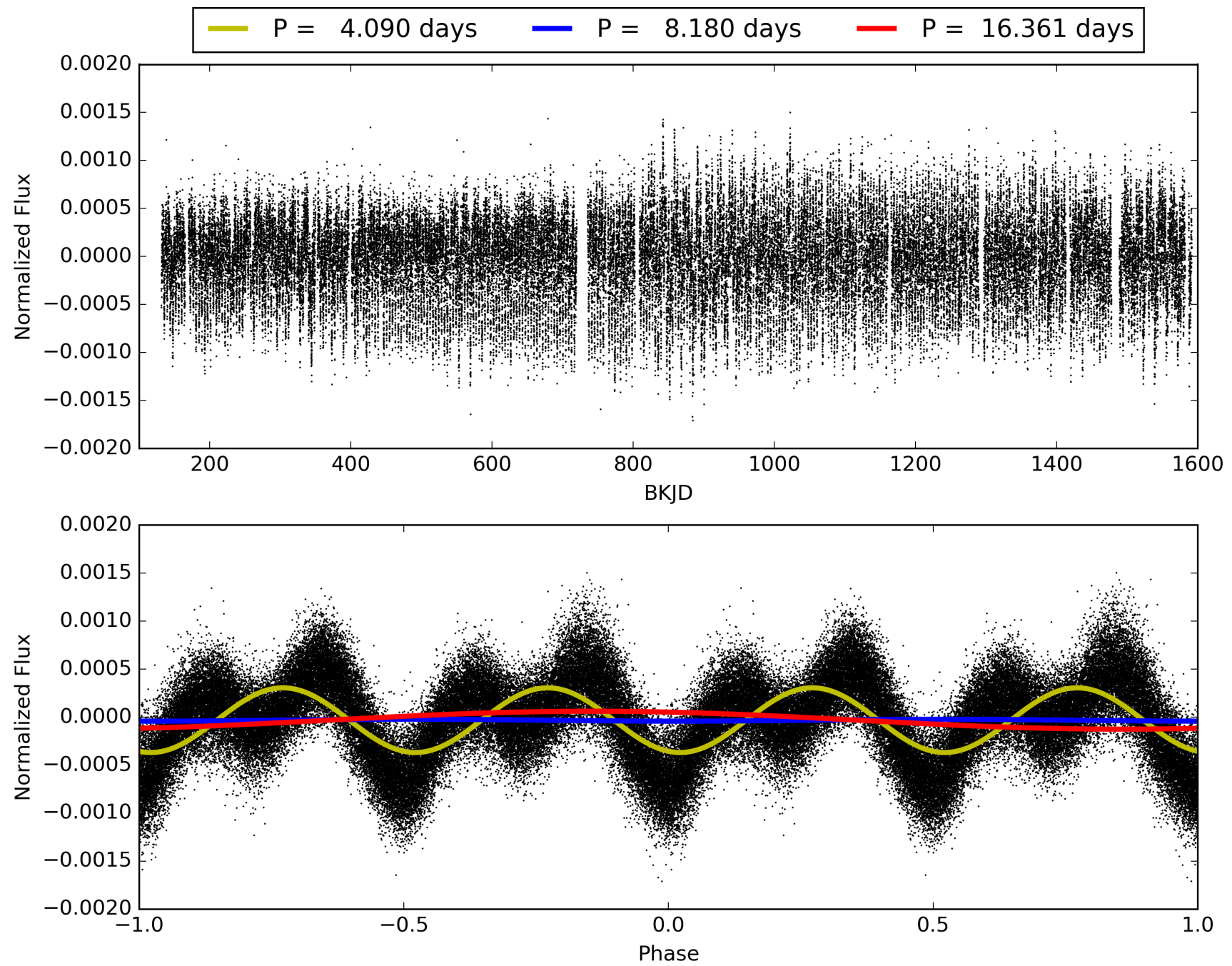
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:44:56 Z

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

# TCE 009362445-05, PDC Light Curves



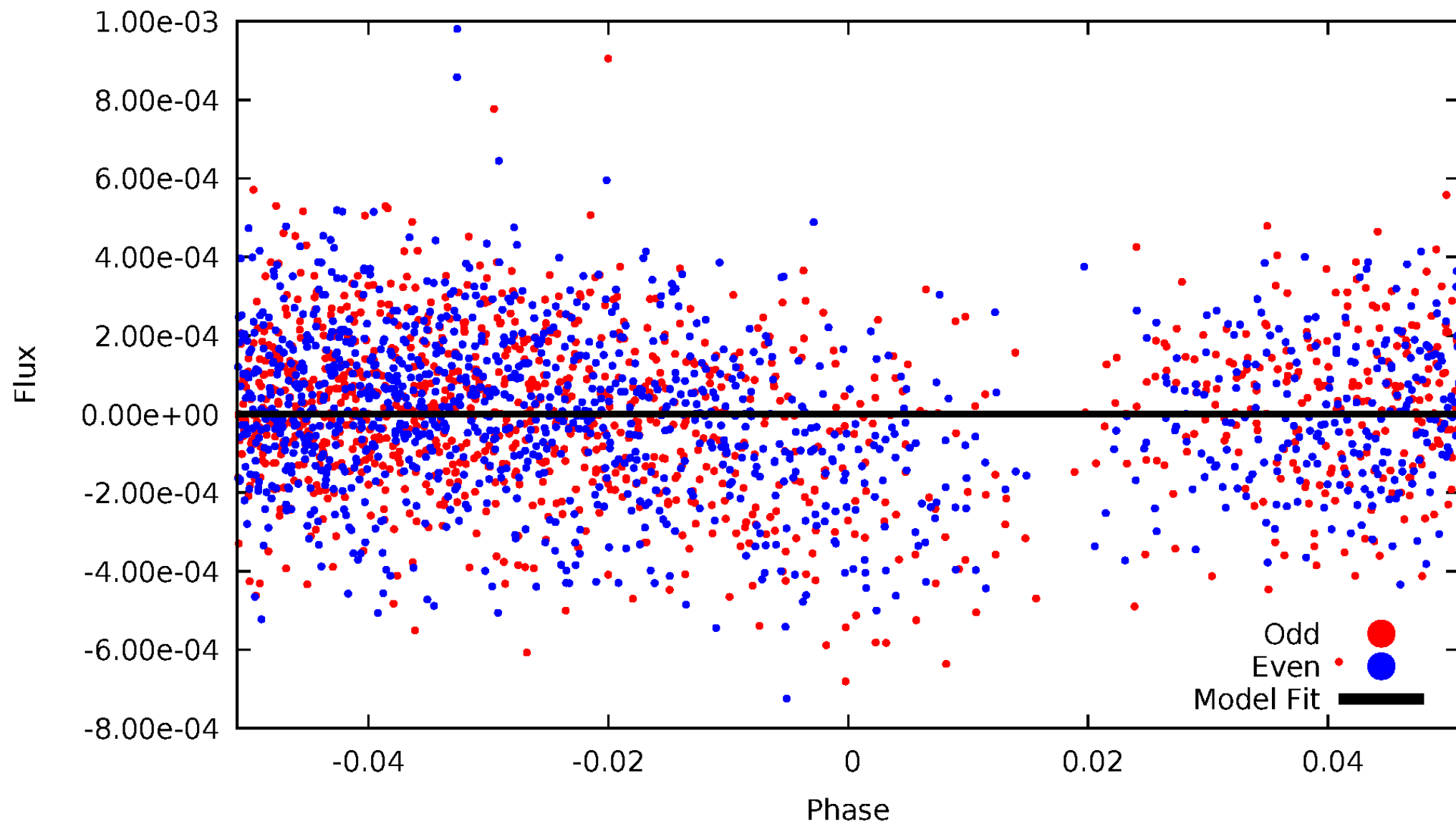
TCE 009362445-05





DV Odd/Even

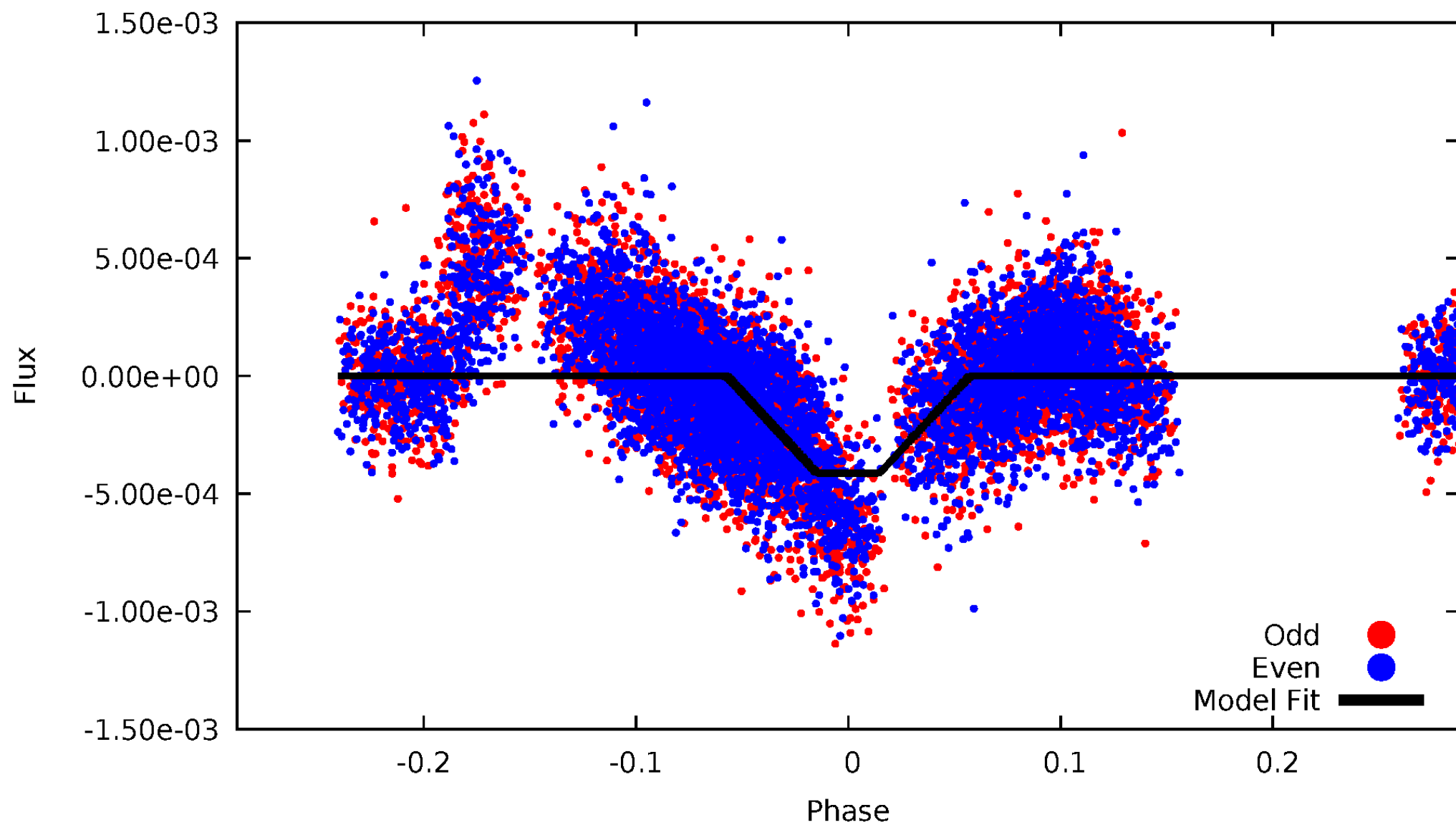
TCE 009362445-05



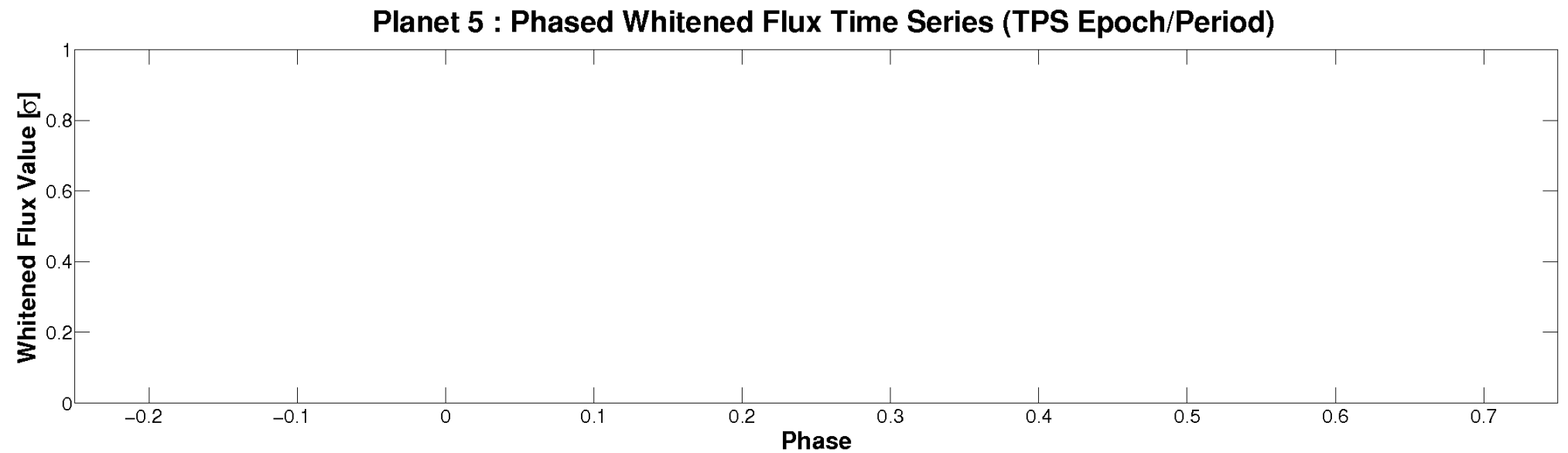
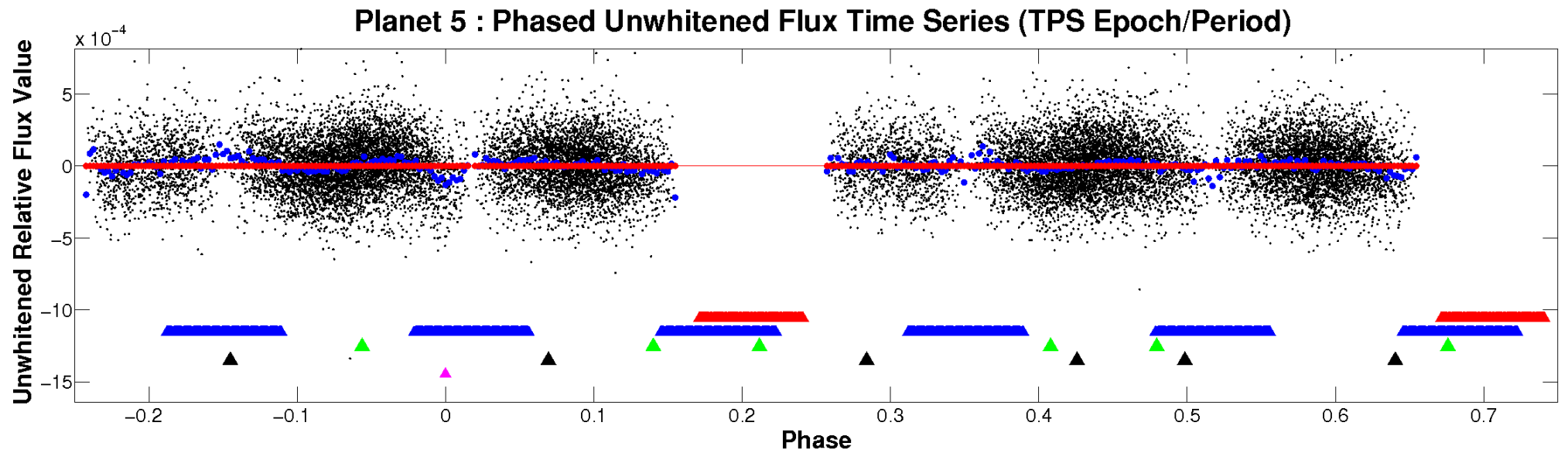


# ALT Odd/Even

TCE 009362445-05

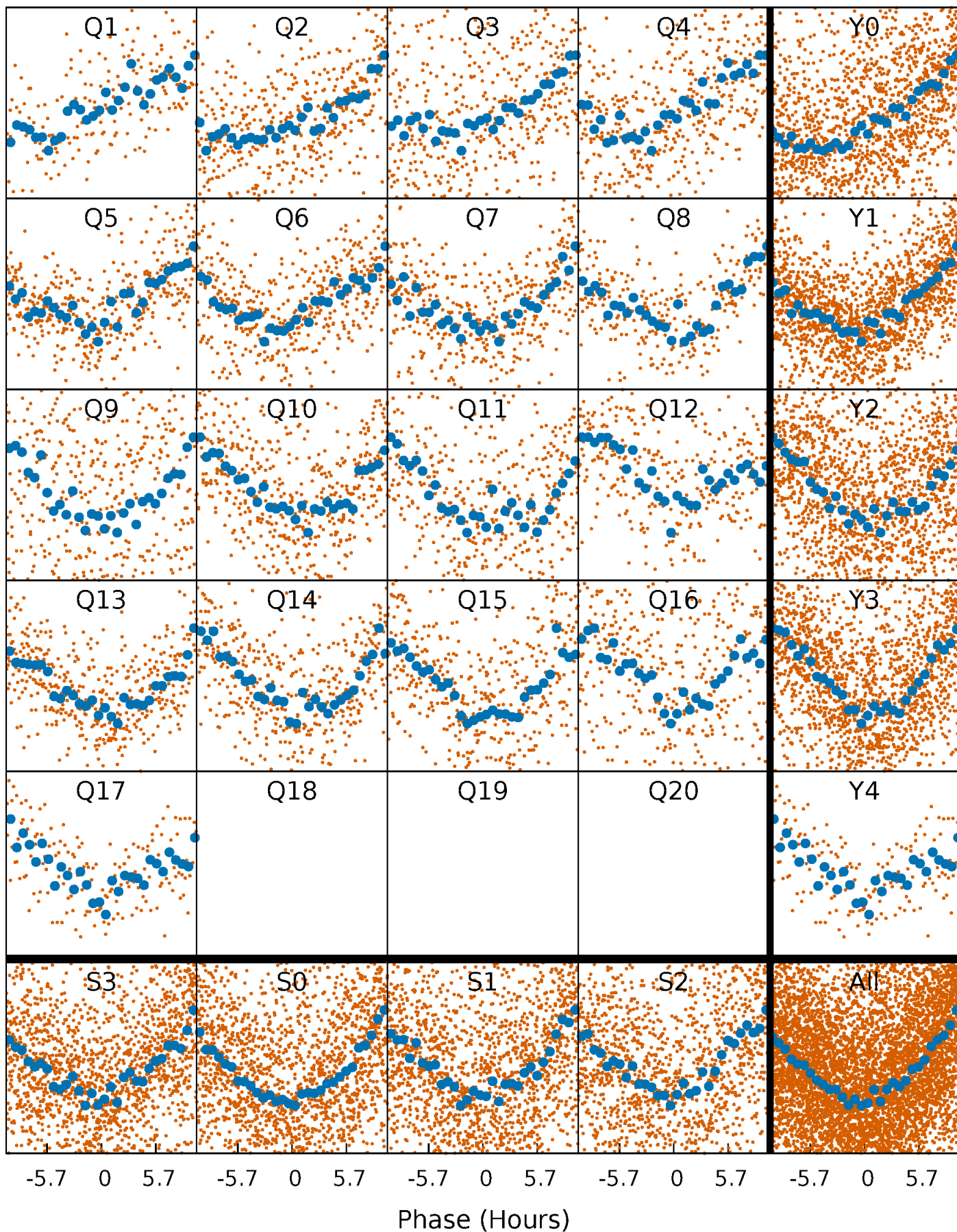


# Non-Whitened Vs. Whitened Light Curve



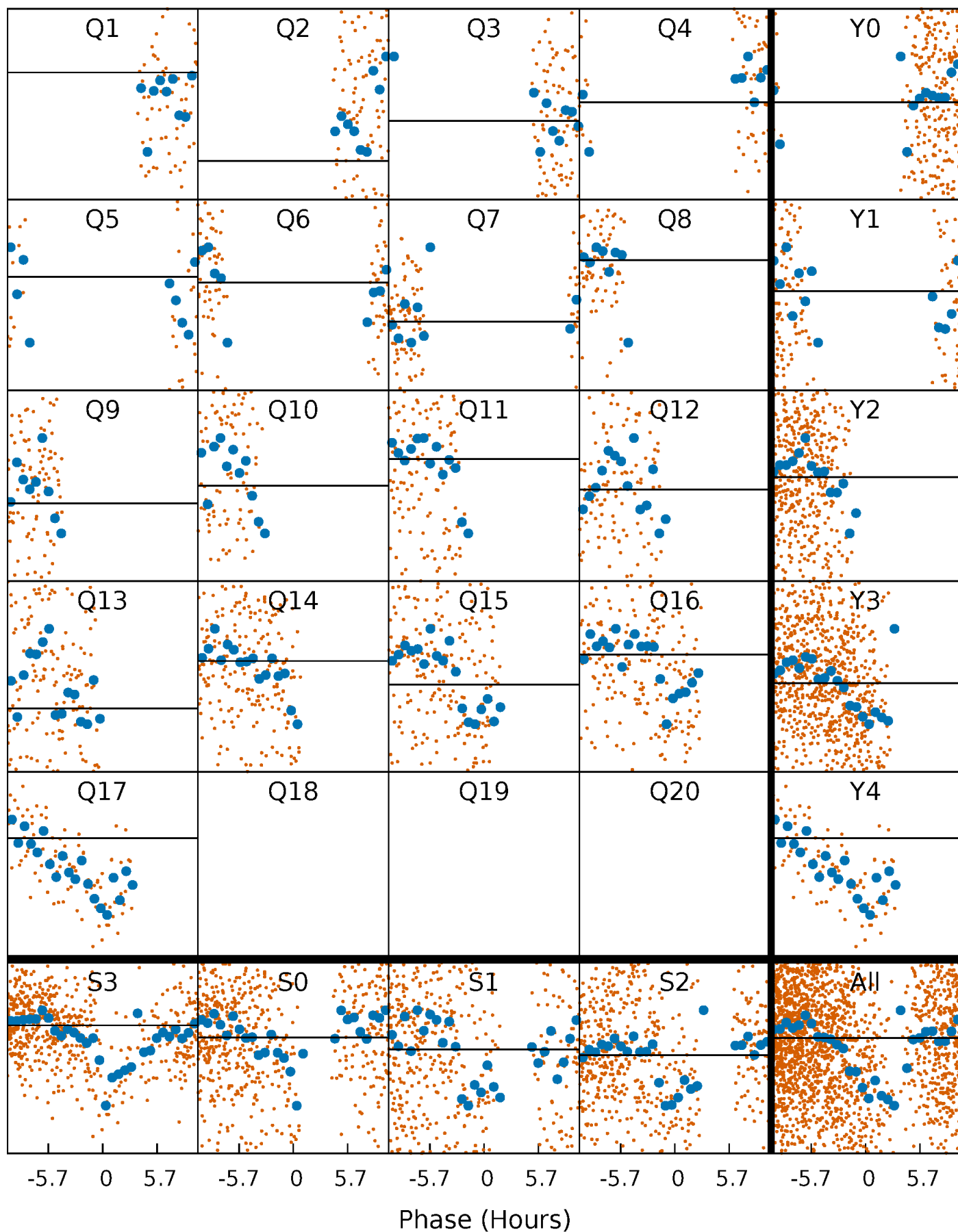
# PDC Quarter-Phased Transit Curves

TCE 009362445-05   P= 8.180312 Days    $T_0=131.616567$  (BKJD)



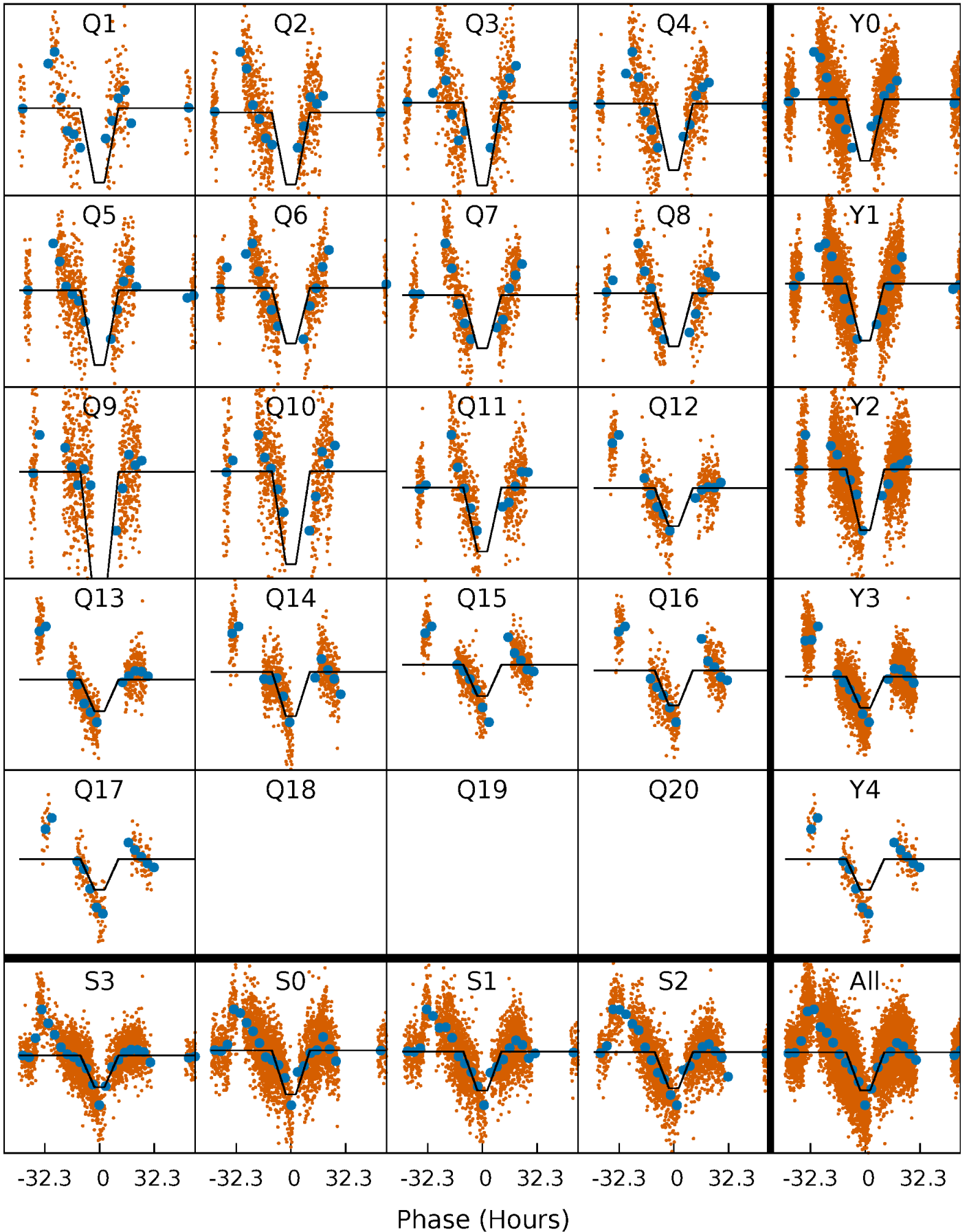
# DV Quarter-Phased Transit Curves

TCE 009362445-05     $P = 8.180312$  Days     $T_0 = 131.616567$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

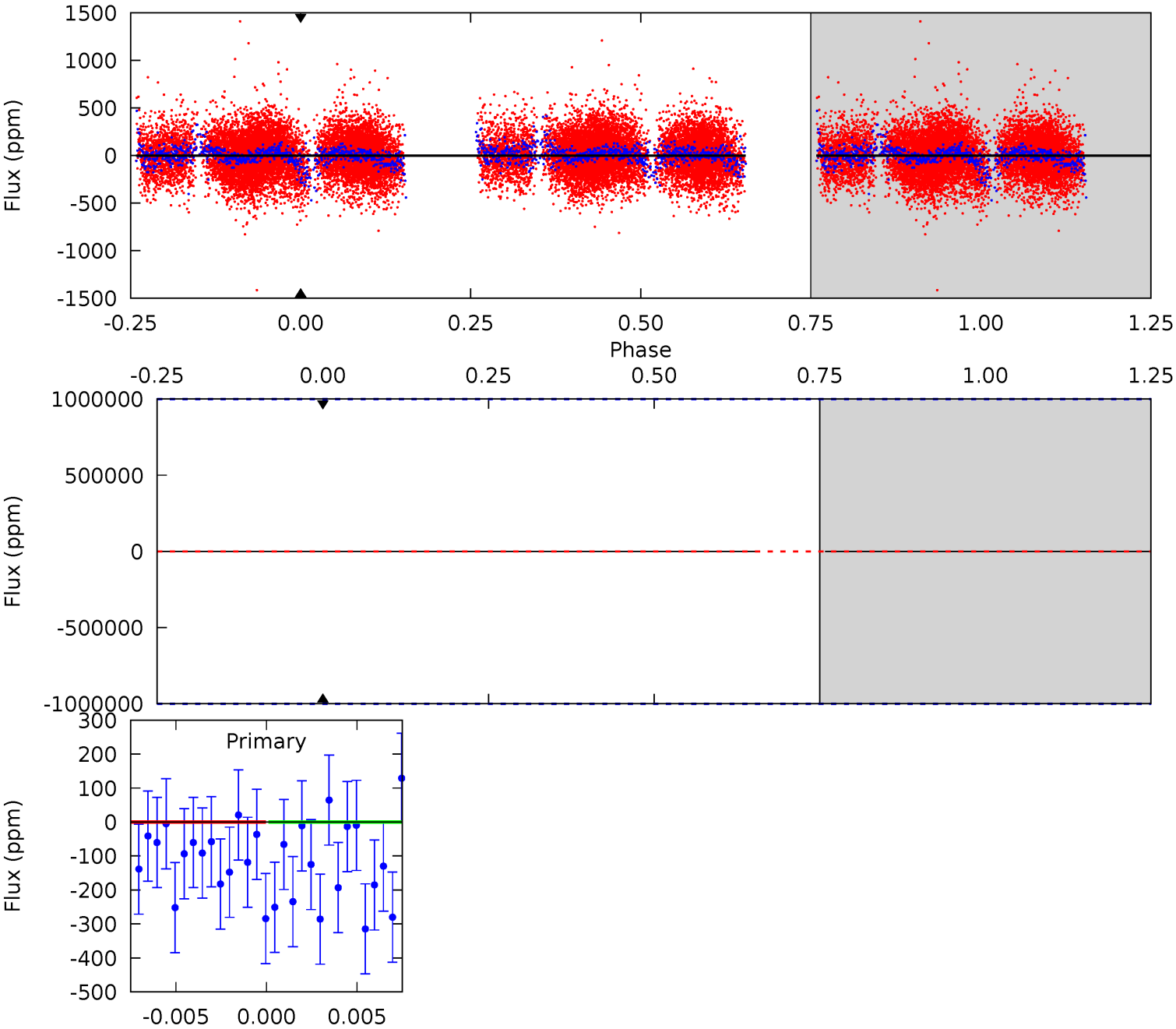
TCE 009362445-05     $P = 8.180312$  Days     $T_0 = 131.606495$  (BKJD)



DV Model-Shift Uniqueness Test

009362445-05, P = 8.180312 Days, E = 131.616567 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

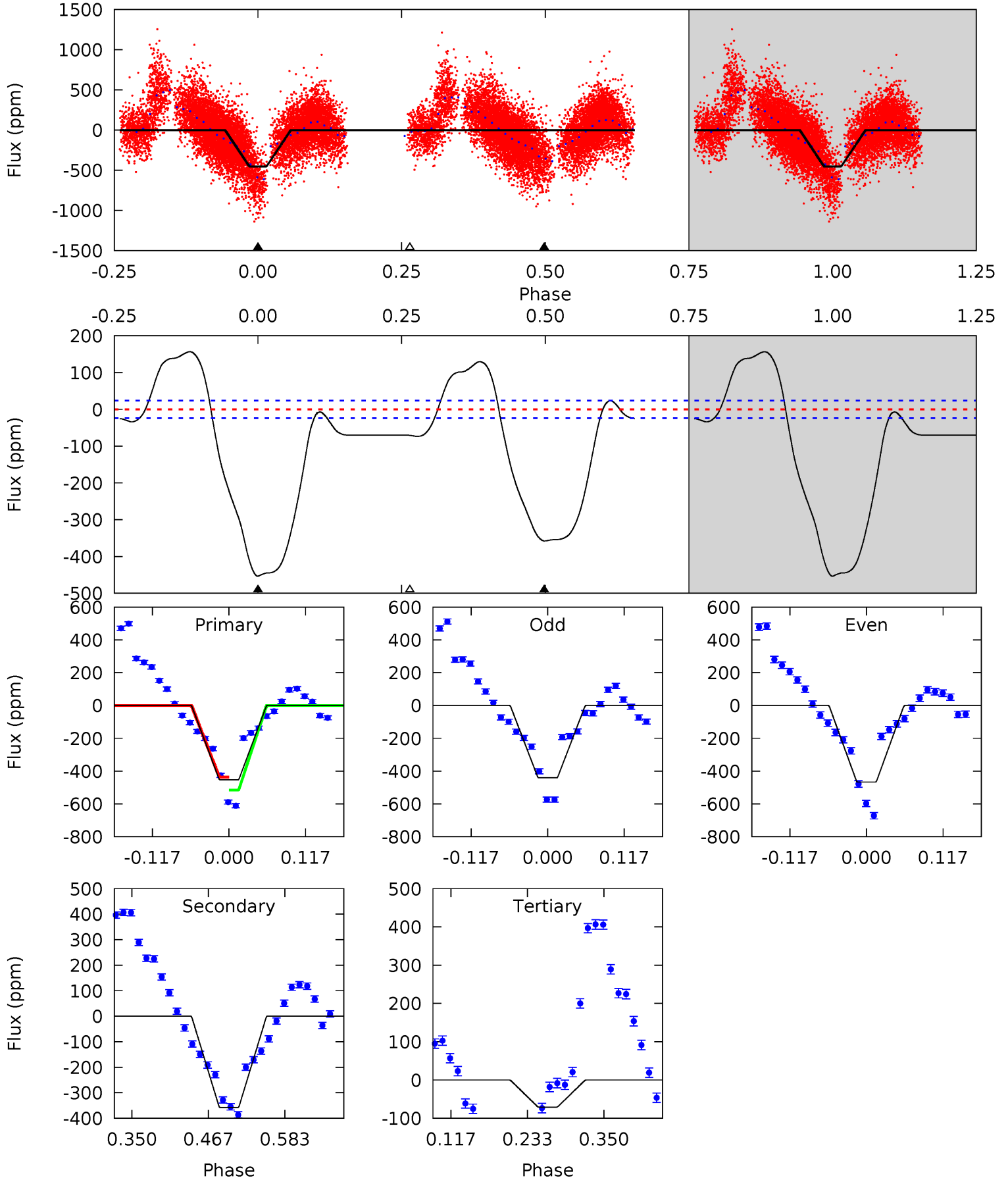




# Alt Model-Shift Uniqueness Test

009362445-05, P = 8.180312 Days, E = 131.606495 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
86.3	68.1	13.5	0	4.53	1.57	13.6	72.9	86.3	54.6	68.1	2.46	1.08	0.26	6.64



### Stellar Parameters For KIC 009362445

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	$6086^{+202}_{-220}$	$3.480^{+0.376}_{-0.094}$	$-0.520^{+0.350}_{-0.300}$	$3.687^{+0.682}_{-1.705}$	$1.496^{+0.187}_{-0.437}$	$0.042^{+0.130}_{-0.016}$
	+3%/-4%	+11%/-3%	+67%/-58%	+18%/-46%	+12%/-29%	+308%/-38%
Source	PHO1	FLK73	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 009362445-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$25.76^{+28.69}_{-18.46}$	$2329^{+168}_{-259}$	$4333^{+26759}_{-26309}$	$7.119^{+1894.830}_{-932.087}$
Alt.	$-358 \pm 5$	$27.63^{+28.27}_{-19.49}$	$2331^{+153}_{-265}$	$3438^{+1999}_{-887}$	$2.161^{+21.334}_{-1.647}$

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

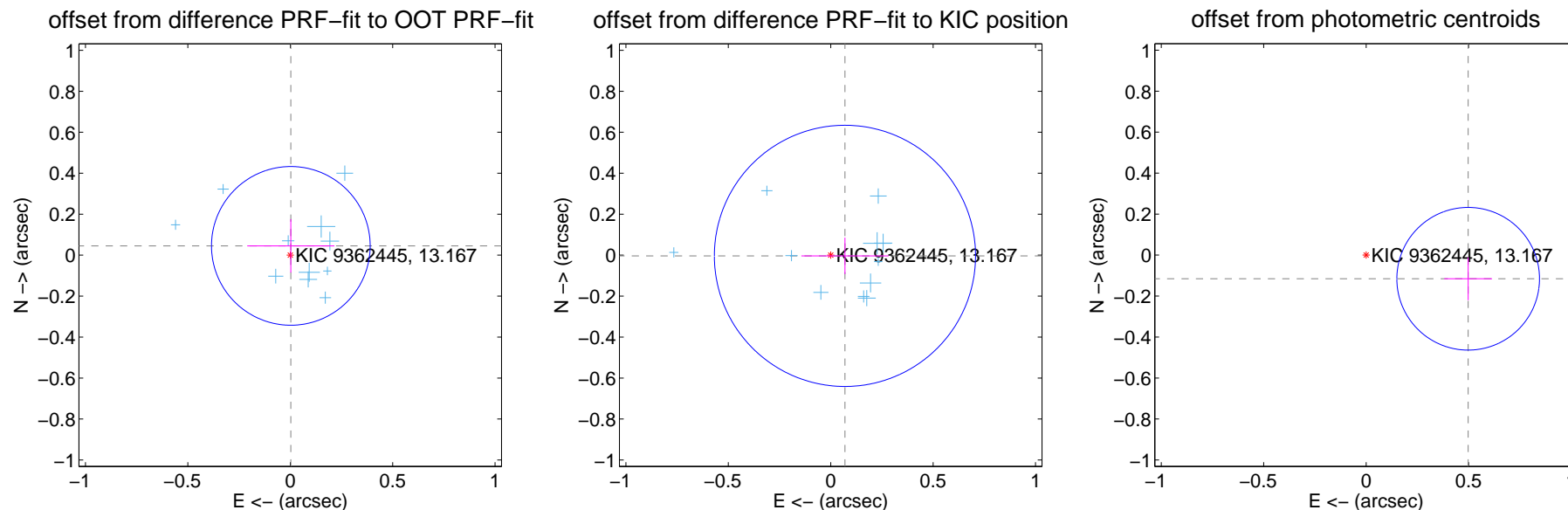
## DV Centroid Data

Supplemental centroid analysis for 009362445-05. Kepler magnitude: 13.17. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

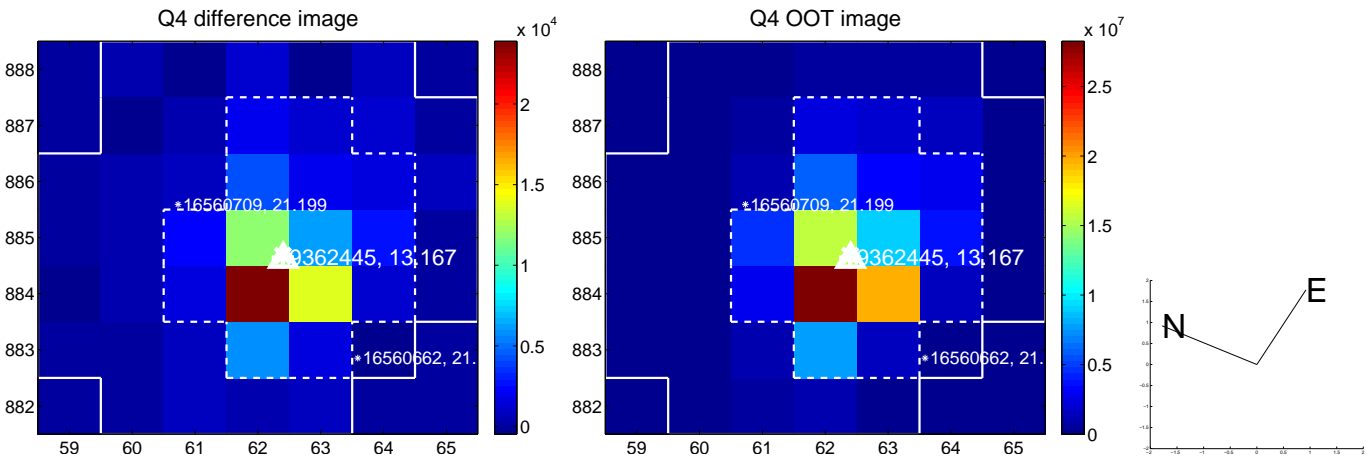
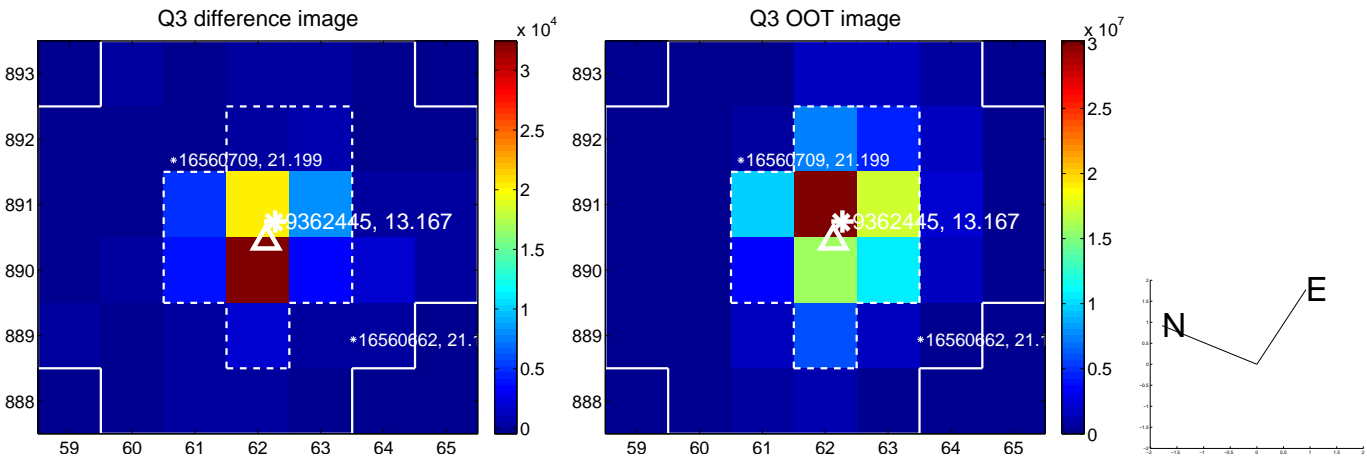
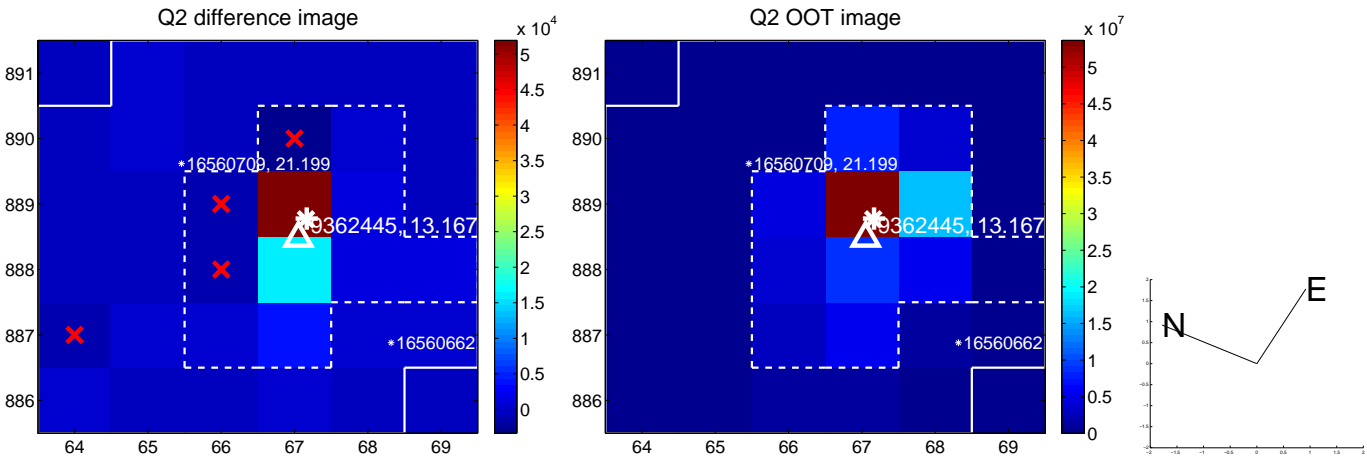
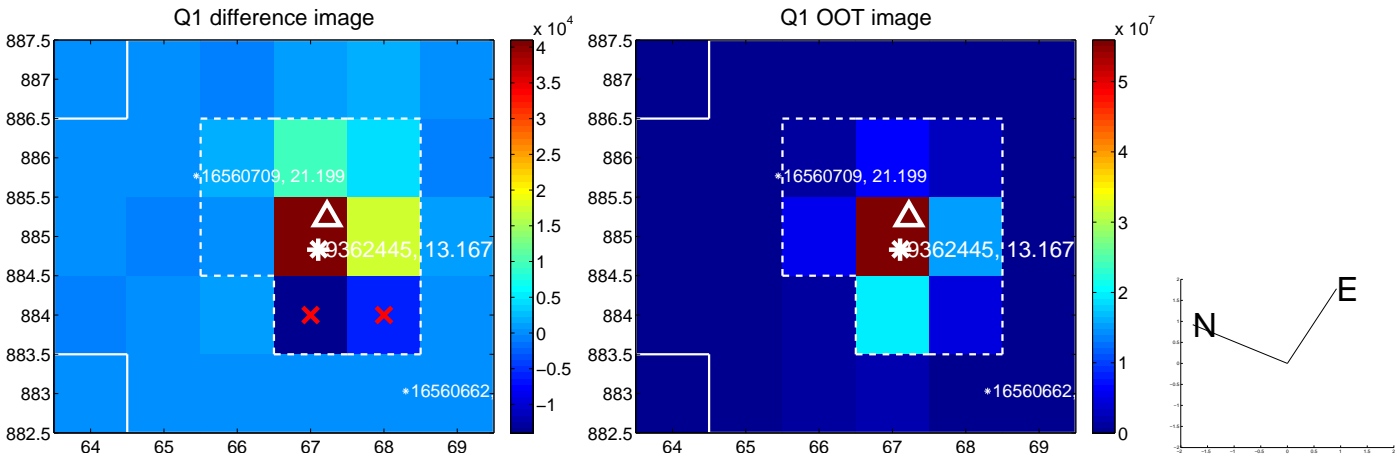
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.045 \pm 0.129$	0.35	$-0.003 \pm 0.213$	$0.045 \pm 0.131$
PRF-fit source offset from KIC position	$0.070 \pm 0.213$	0.33	$-0.069 \pm 0.213$	$-0.003 \pm 0.089$
photometric centroid source offset	$0.51 \pm 0.12$	4.41	$-0.50 \pm 0.12$	$-0.12 \pm 0.10$

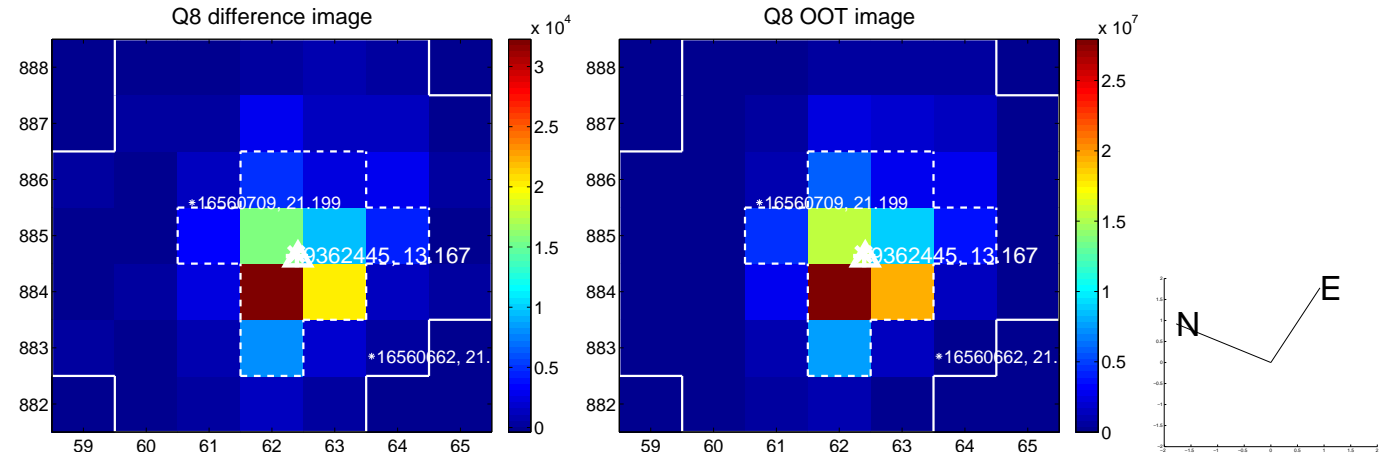
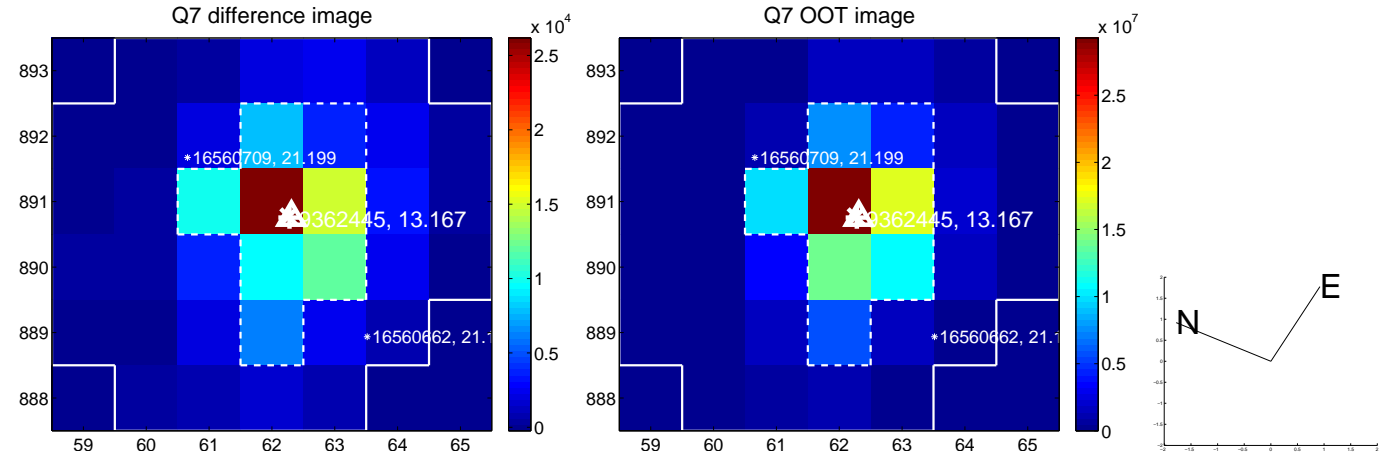
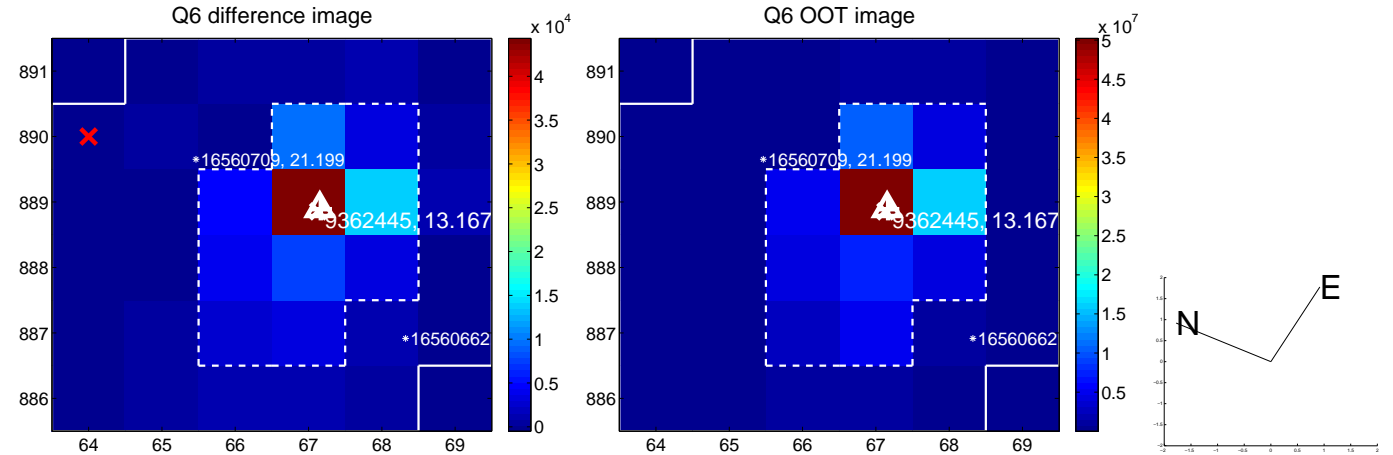
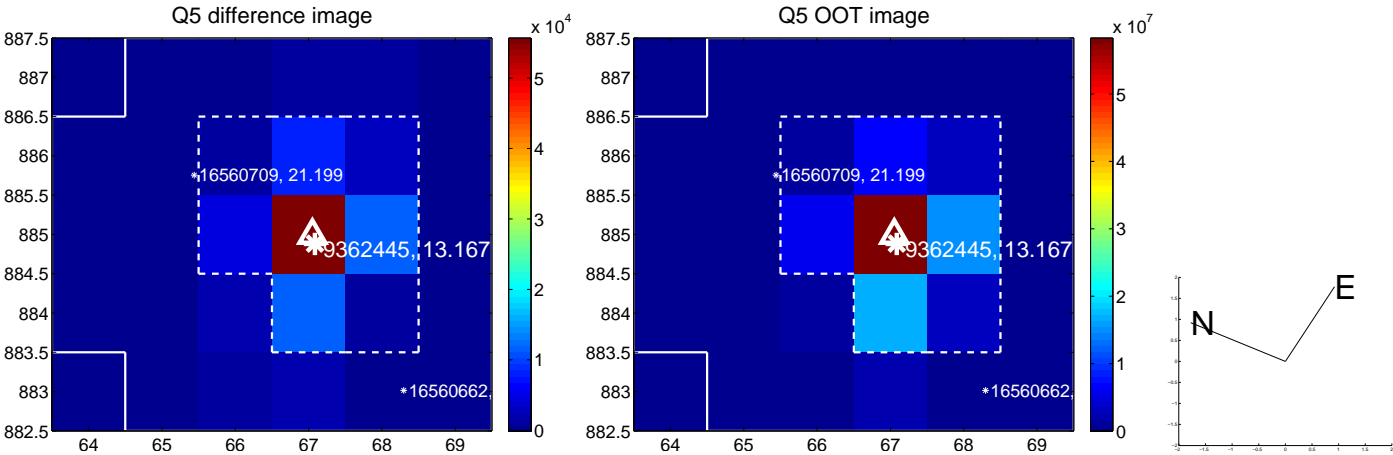


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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



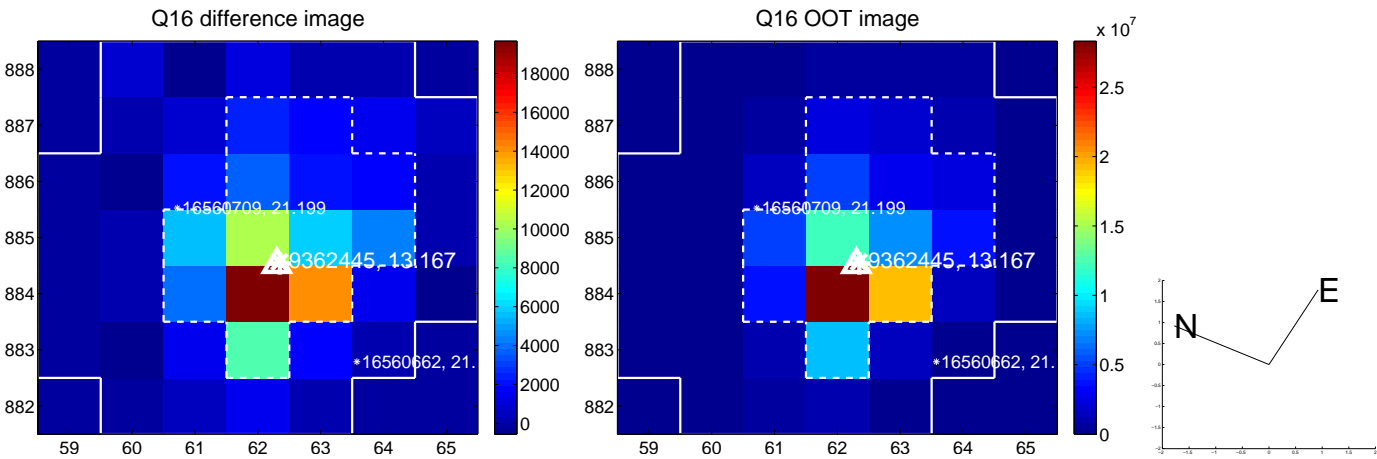
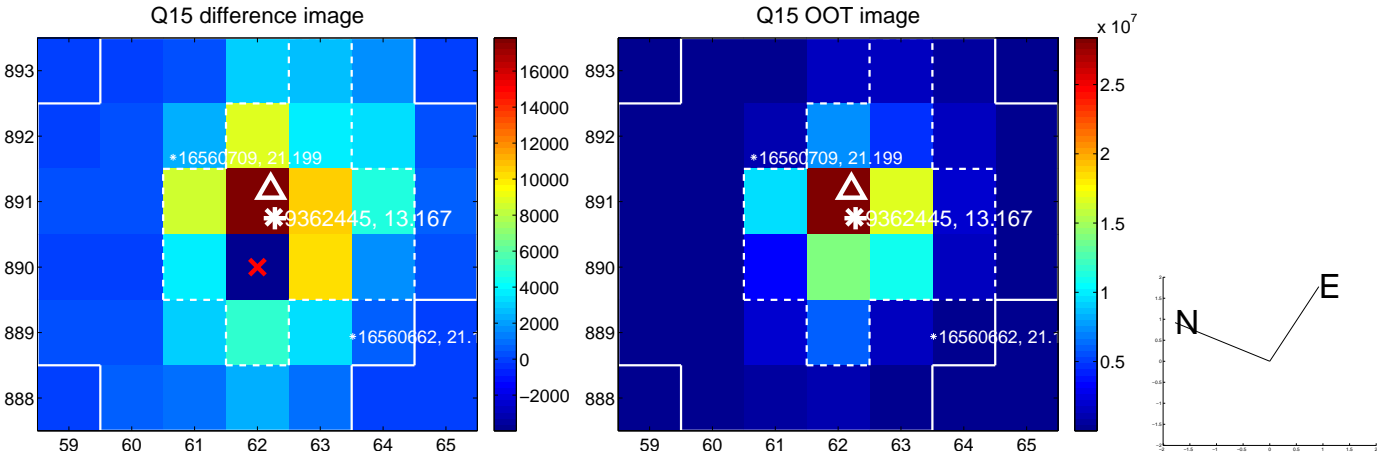
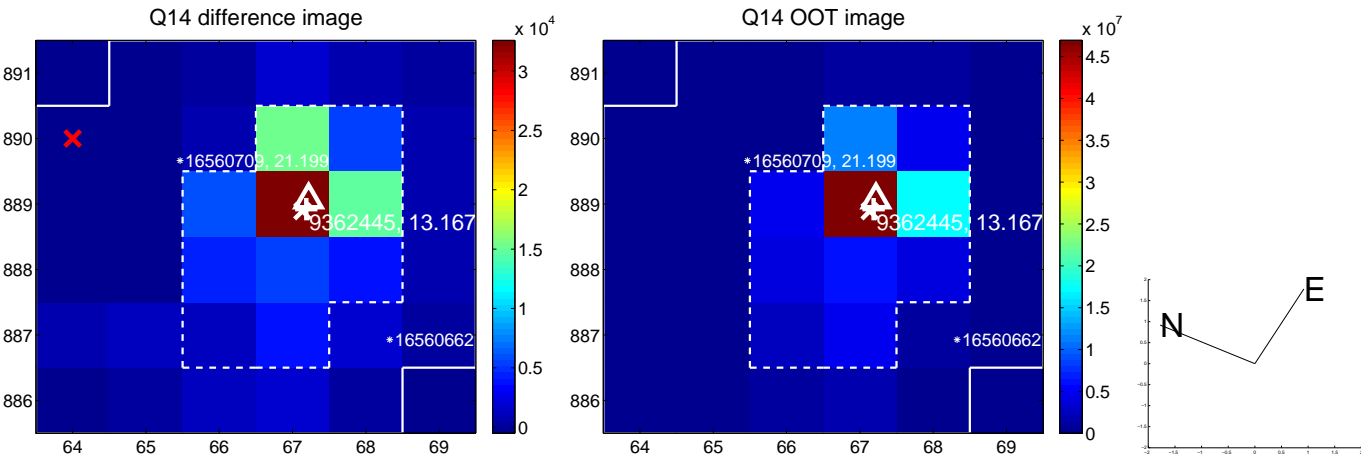
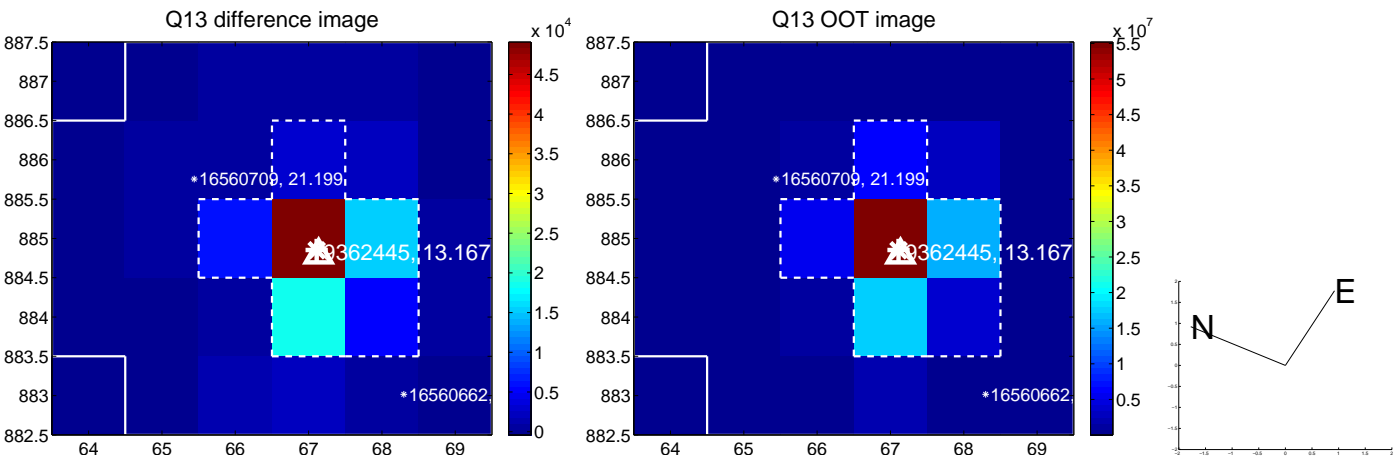
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



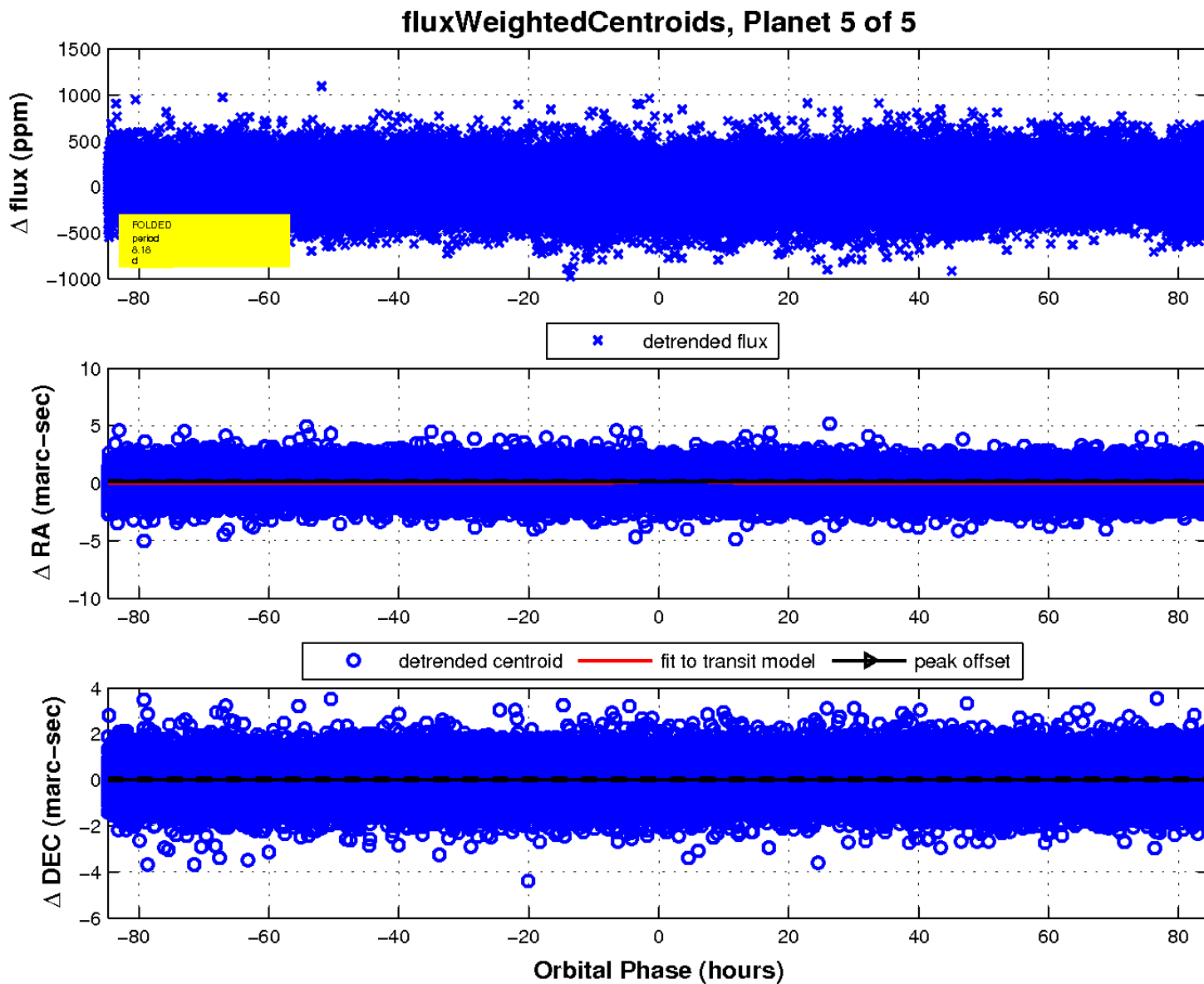
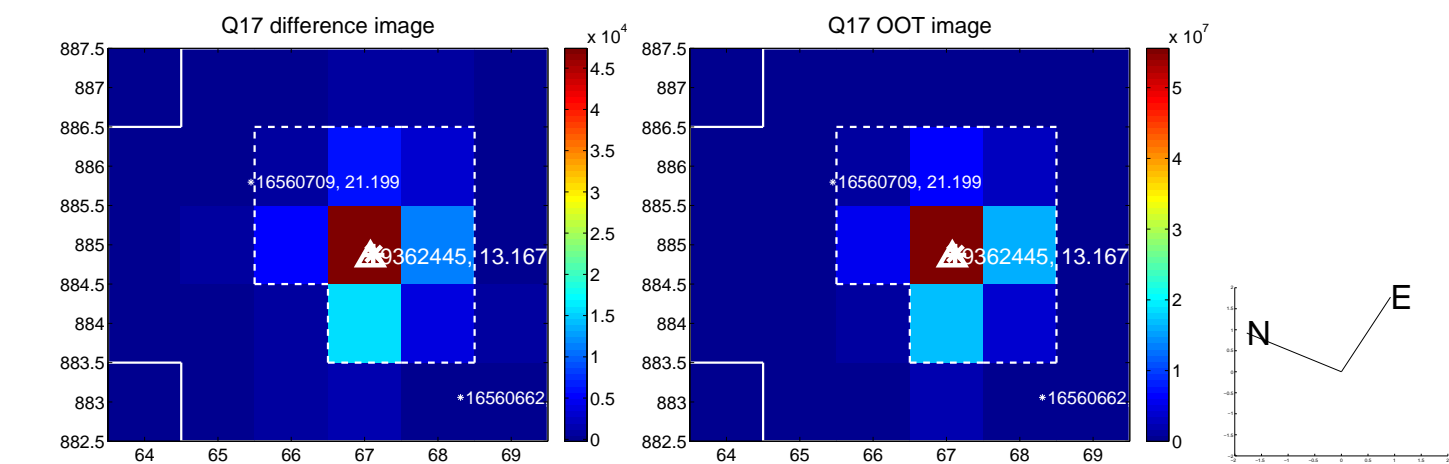




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

