

# KIC 009569838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009569838-01	OBS	No	2.831767	132.552789	19.4	20.136	8.4	8.7	1.78	6771	0.90	3507.98
009569838-02	OBS	No	37.424710	159.410322	186.5	10.964	21.6	15.0	1.78	6771	2.77	112.27
009569838-03	OBS	No	193.920337	202.089180	350.7	3.695	20.8	17.7	1.78	6771	3.36	12.52
009569838-05	OBS	No	4.511901	132.177940	93.8	4.437	15.3	15.7	1.78	6771	1.90	1885.04
009569838-06	OBS	No	40.924036	145.228300	205.6	3.445	13.0	13.2	1.78	6771	2.81	99.65
009569838-07	OBS	No	29.432804	138.798788	206.7	3.101	13.1	12.9	1.78	6771	2.96	154.65
009569838-08	OBS	No	67.676565	174.057774	309.1	4.570	12.1	12.0	1.78	6771	3.80	50.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009569838-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009569838-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009569838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

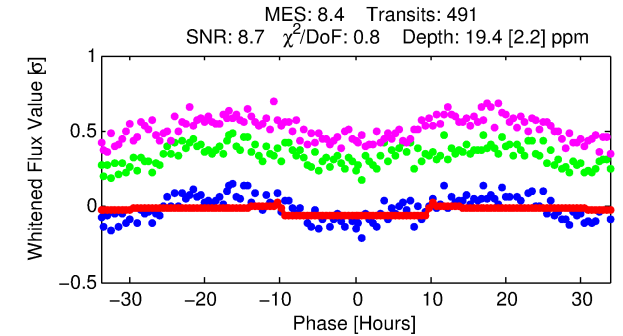
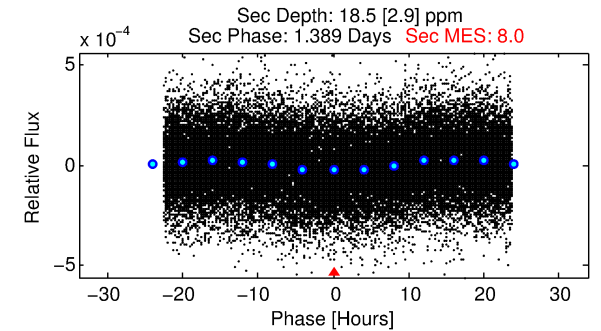
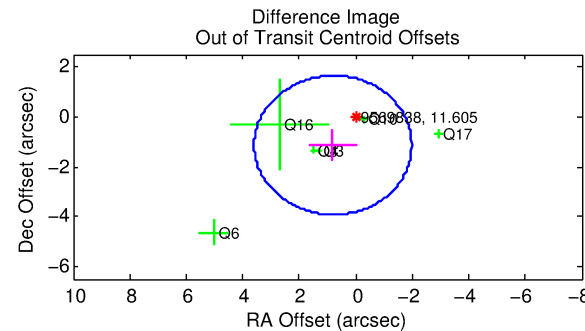
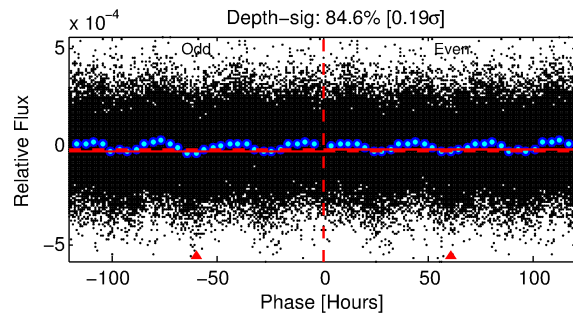
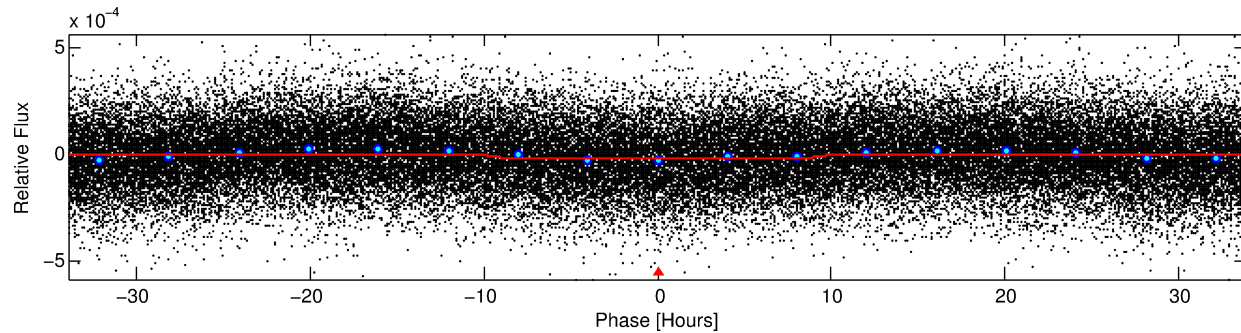
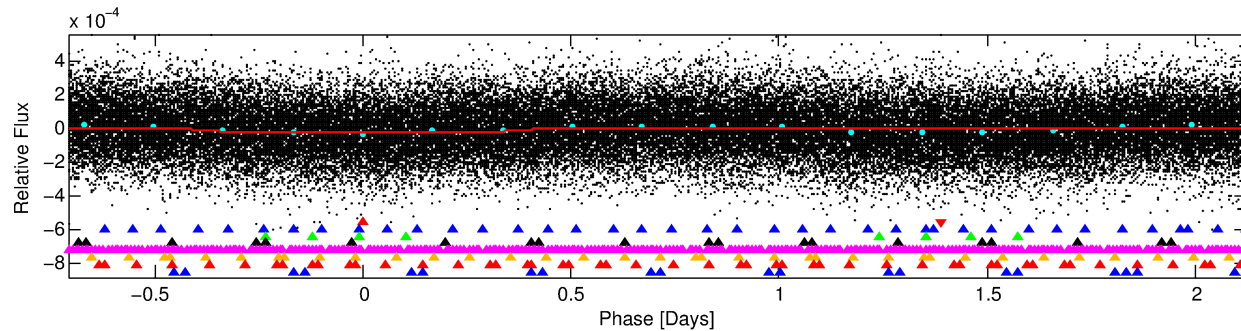
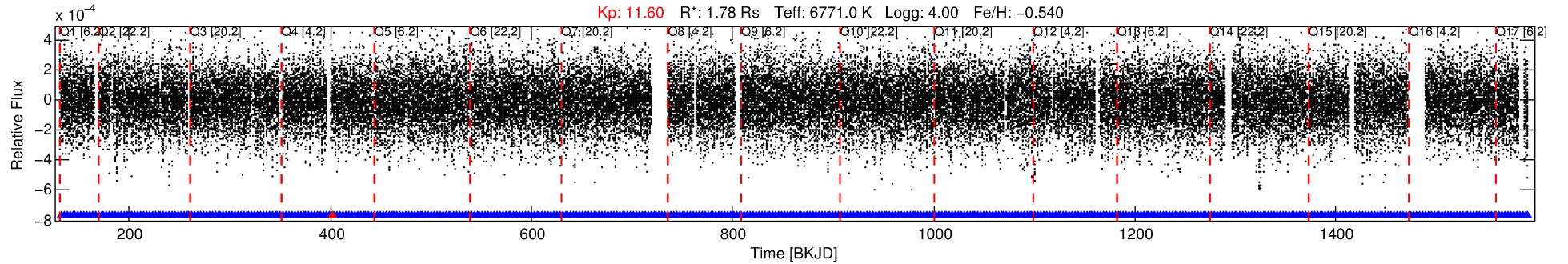
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009569838-01

No Significant Match Found

# DV One-Page Summary

KIC: 9569838 Candidate: 1 of 8 Period: 2.832 d



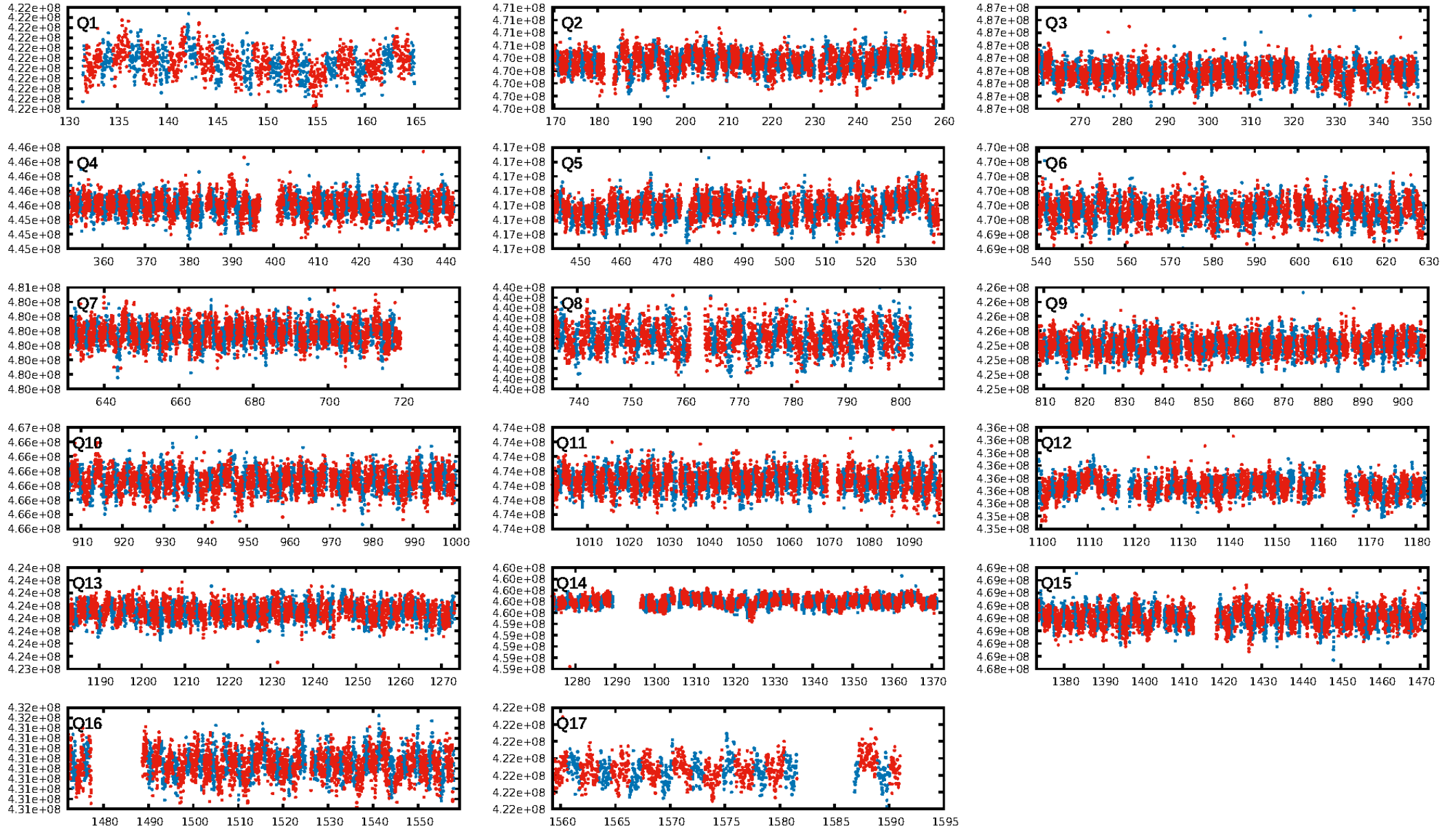
## DV Fit Results:

Period = 2.83177 [0.00005] d  
Epoch = 132.5528 [0.0088] BKJD  
 $R_p/R^* = 0.0047$  [0.0006]  
 $a/R^* = 1.06$  [0.08]  
 $b = 0.89$  [0.16]  
 $\text{Seff} = 3507.98$  [2073.38]  
 $\text{Teq} = 1962$  [290] K  
 $R_p = 0.90$  [0.35]  $R_e$   
 $a = 0.0411$  [0.0146] AU  
 $A_g = 21.16$  [13.50] [1.49 $\sigma$ ]  
 $T_{\text{eff}} = 6507$  [530] K [7.53 $\sigma$ ]

## DV Diagnostic Results:

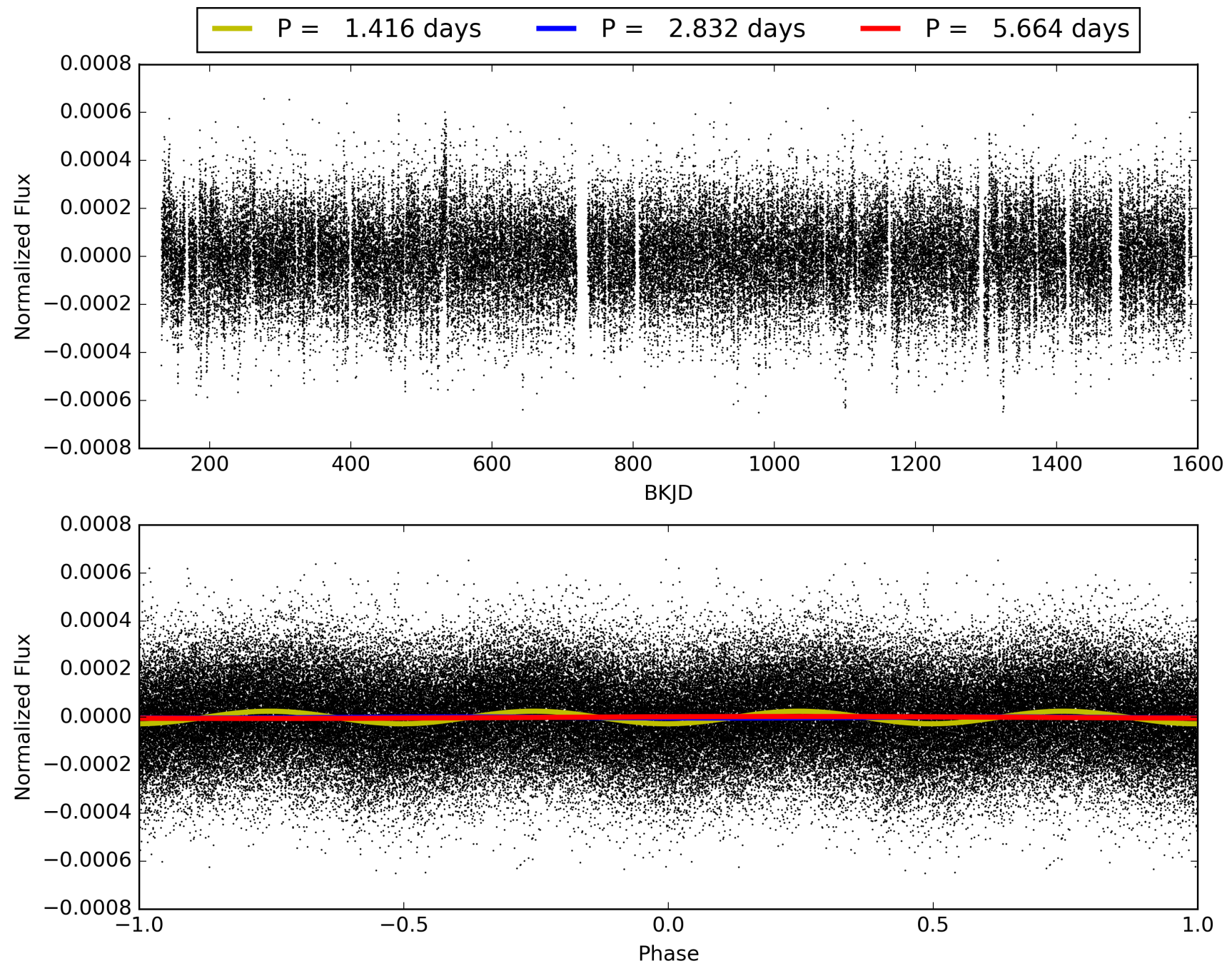
ShortPeriod-sig: N/A  
LongPeriod-sig: 94.9% [1.96 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [468/469]  
GhostDiagnostic-chr: 3.284  
Centroid-sig: 16.2%  
Centroid-so: 0.609 arcsec [1.15 $\sigma$ ]  
OotOffset-rm: 1.394 arcsec [1.50 $\sigma$ ]  
OotOffset-st: 2/1/2/1 [6]  
KicOffset-rm: 1.428 arcsec [1.56 $\sigma$ ]  
KicOffset-st: 2/1/2/1 [6]  
DiffImageQuality-fgm: 0.67 [4/6]  
DiffImageOverlap-fno: 1.00 [17/17]

# TCE 009569838-01, PDC Light Curves





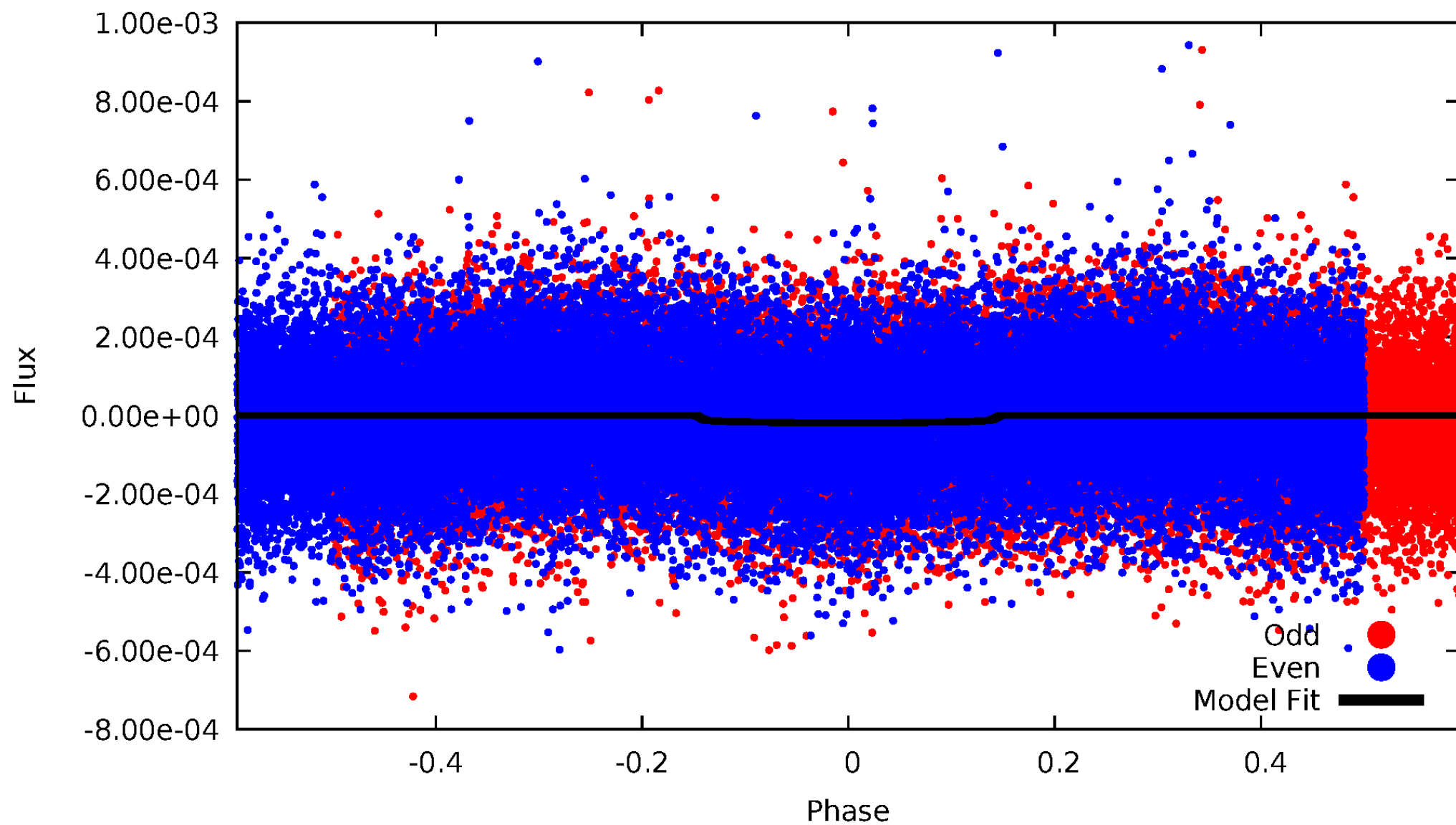
TCE 009569838-01





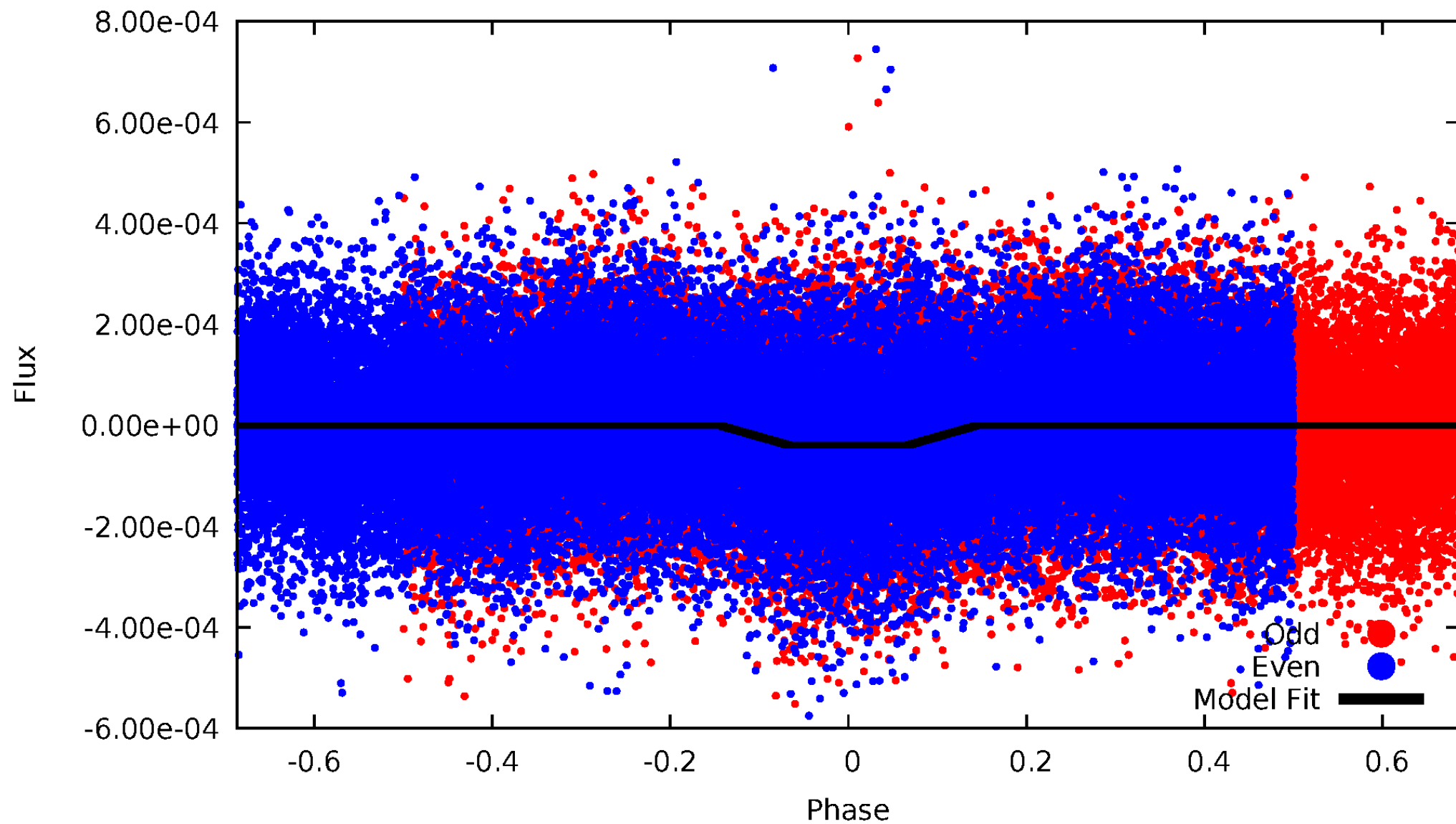
# DV Odd/Even

TCE 009569838-01

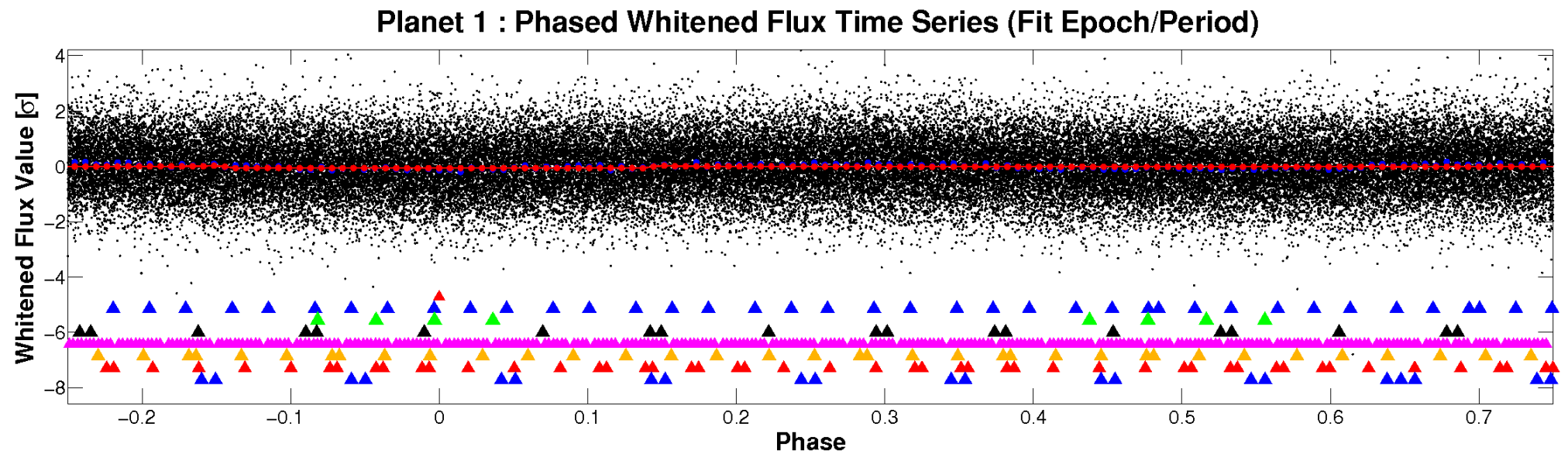
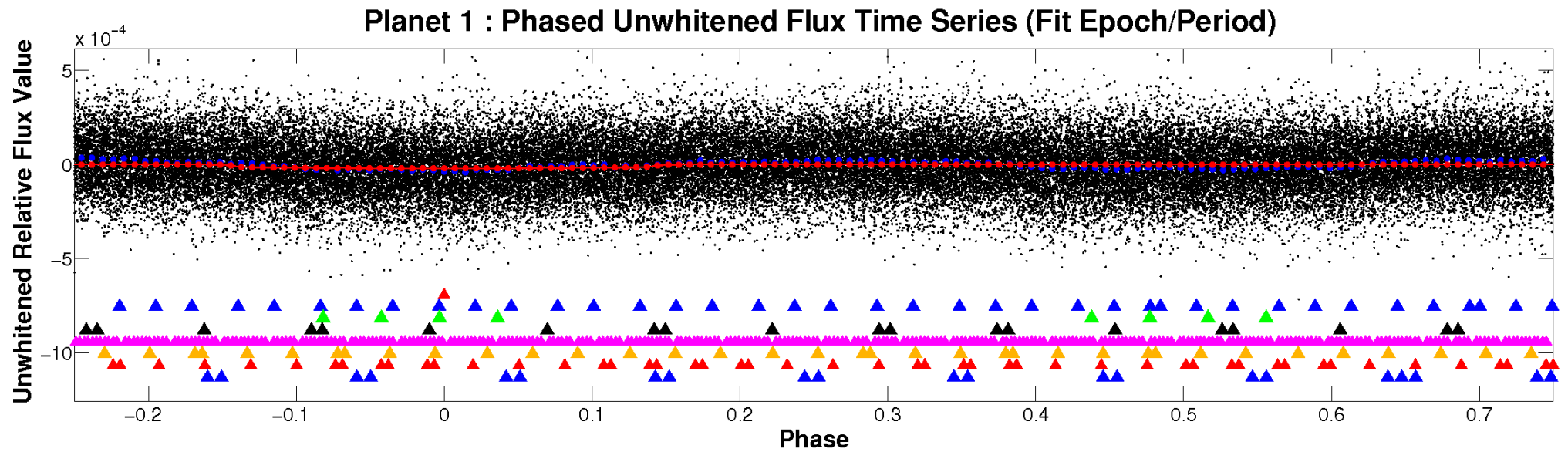


# ALT Odd/Even

TCE 009569838-01



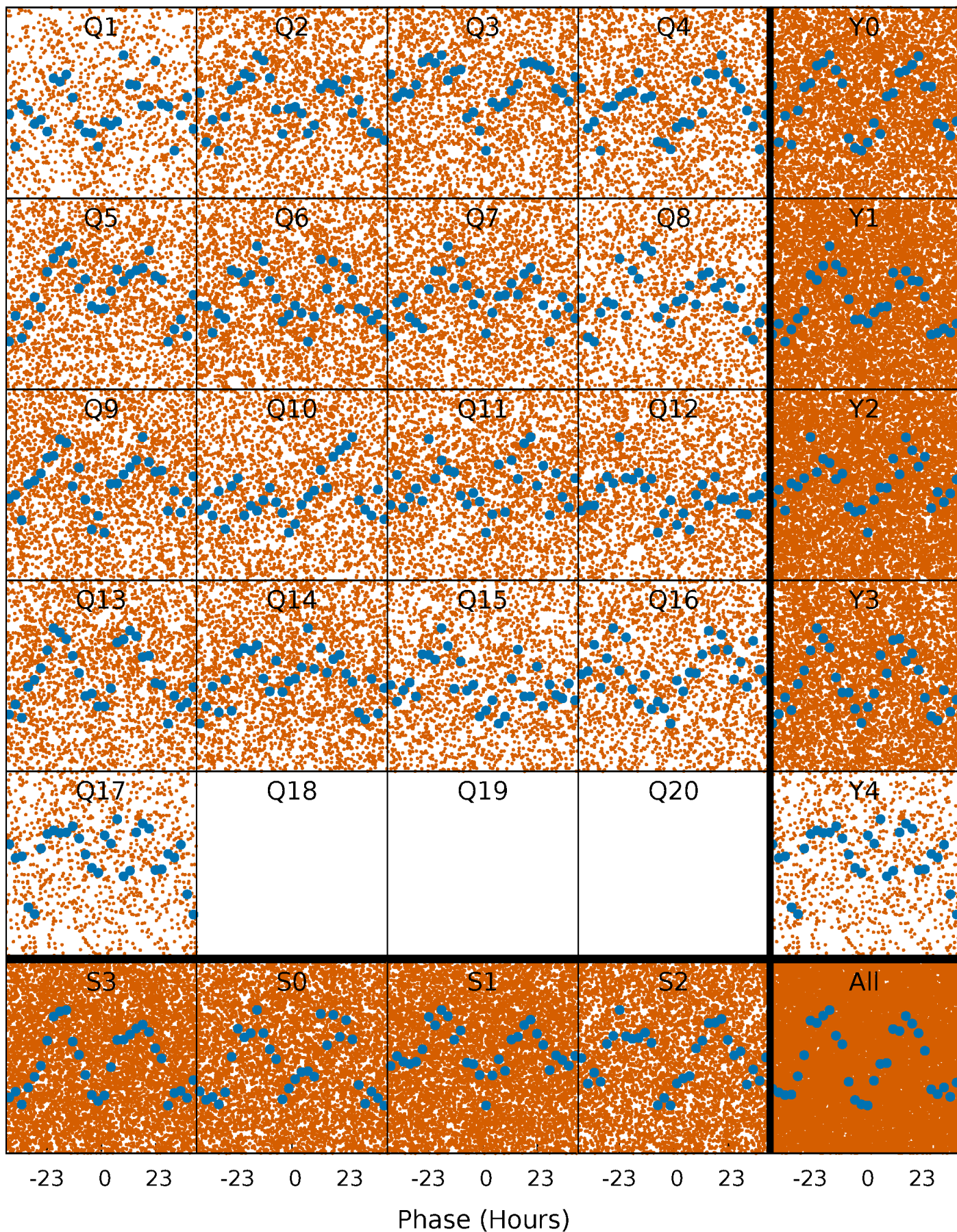
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

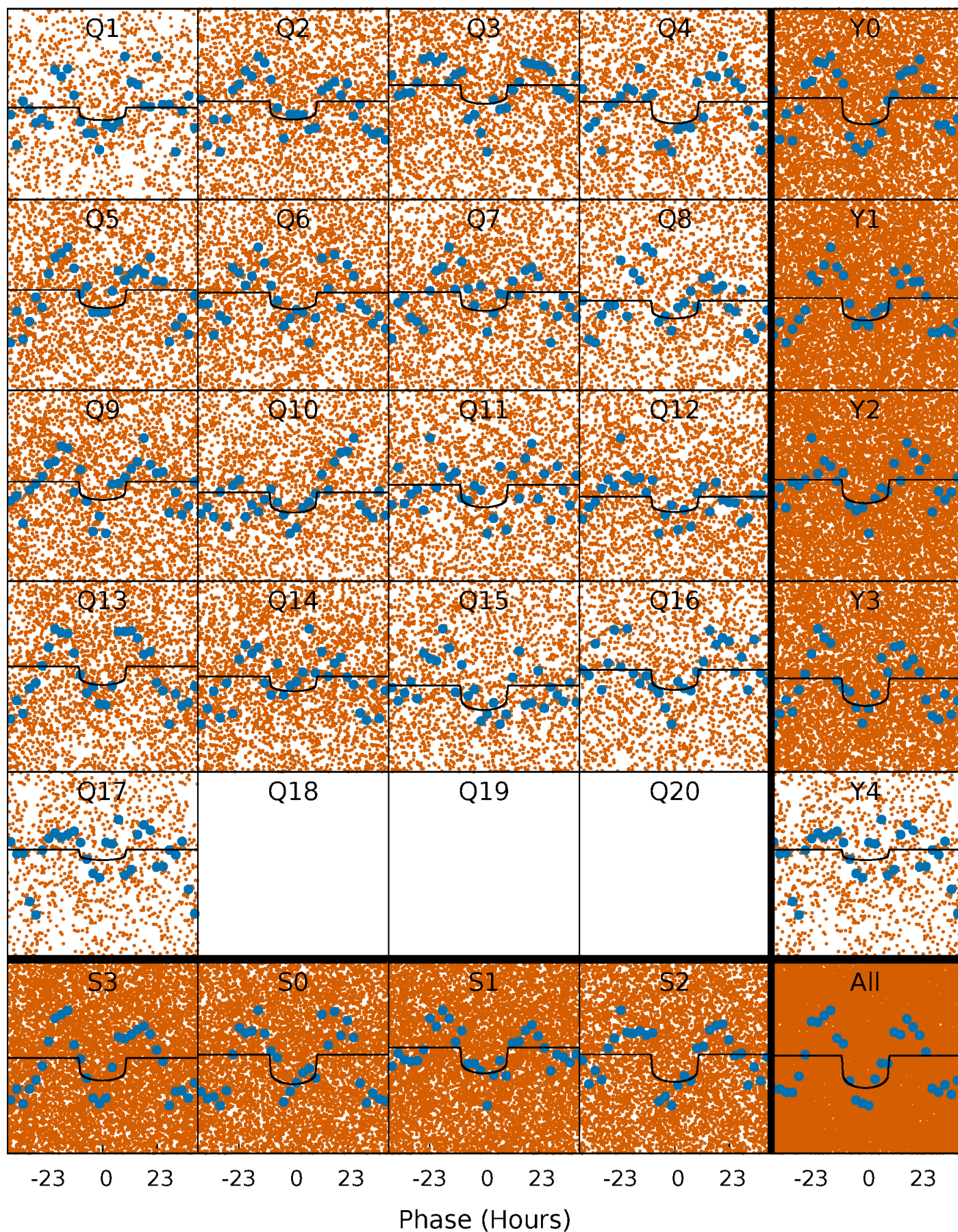
TCE 009569838-01 P= 2.831767 Days  $T_0=132.552789$  (BKJD)





# DV Quarter-Phased Transit Curves

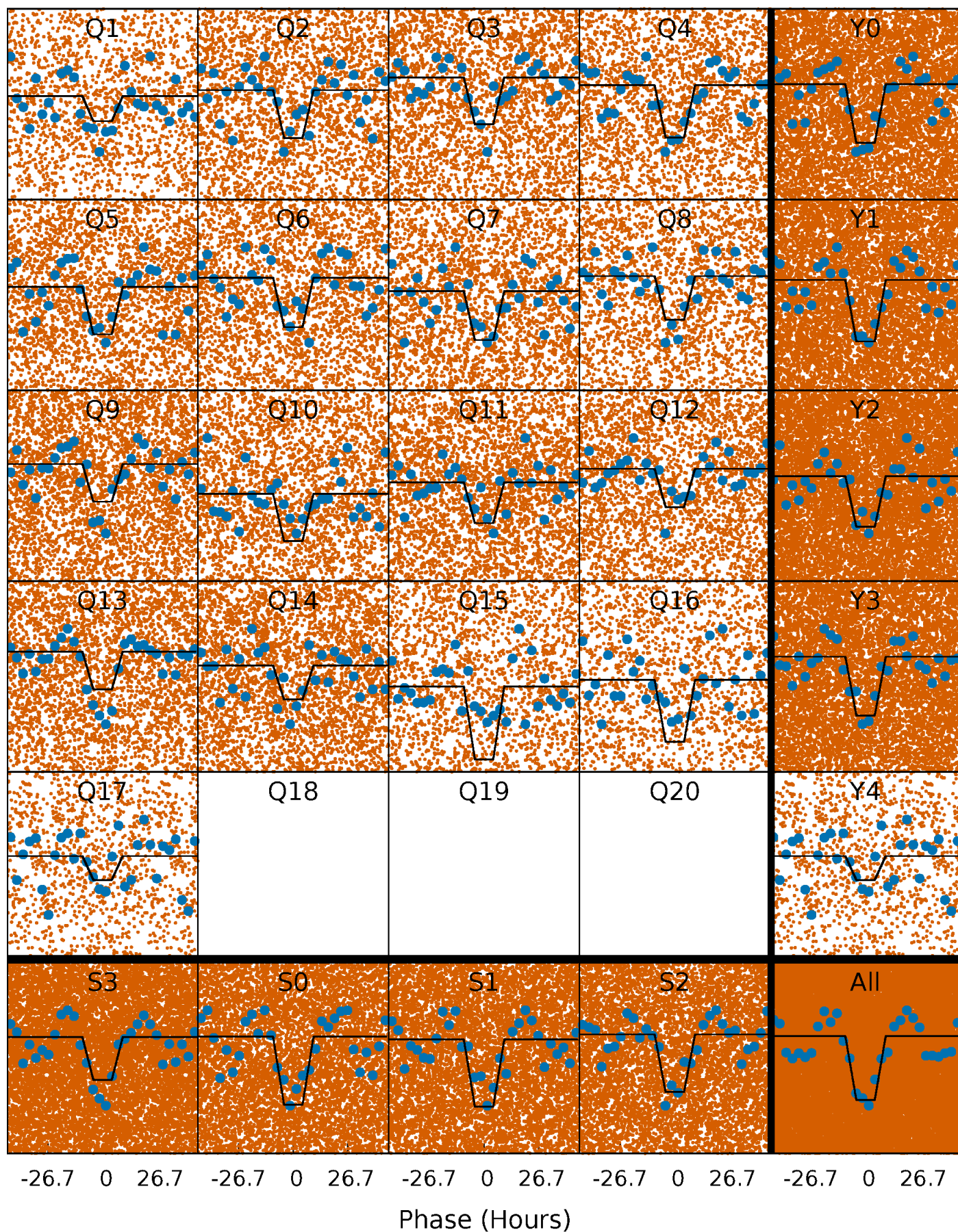
TCE 009569838-01 P= 2.831767 Days  $T_0=132.552789$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 009569838-01 P= 2.831593 Days  $T_0=132.546553$  (BKJD)

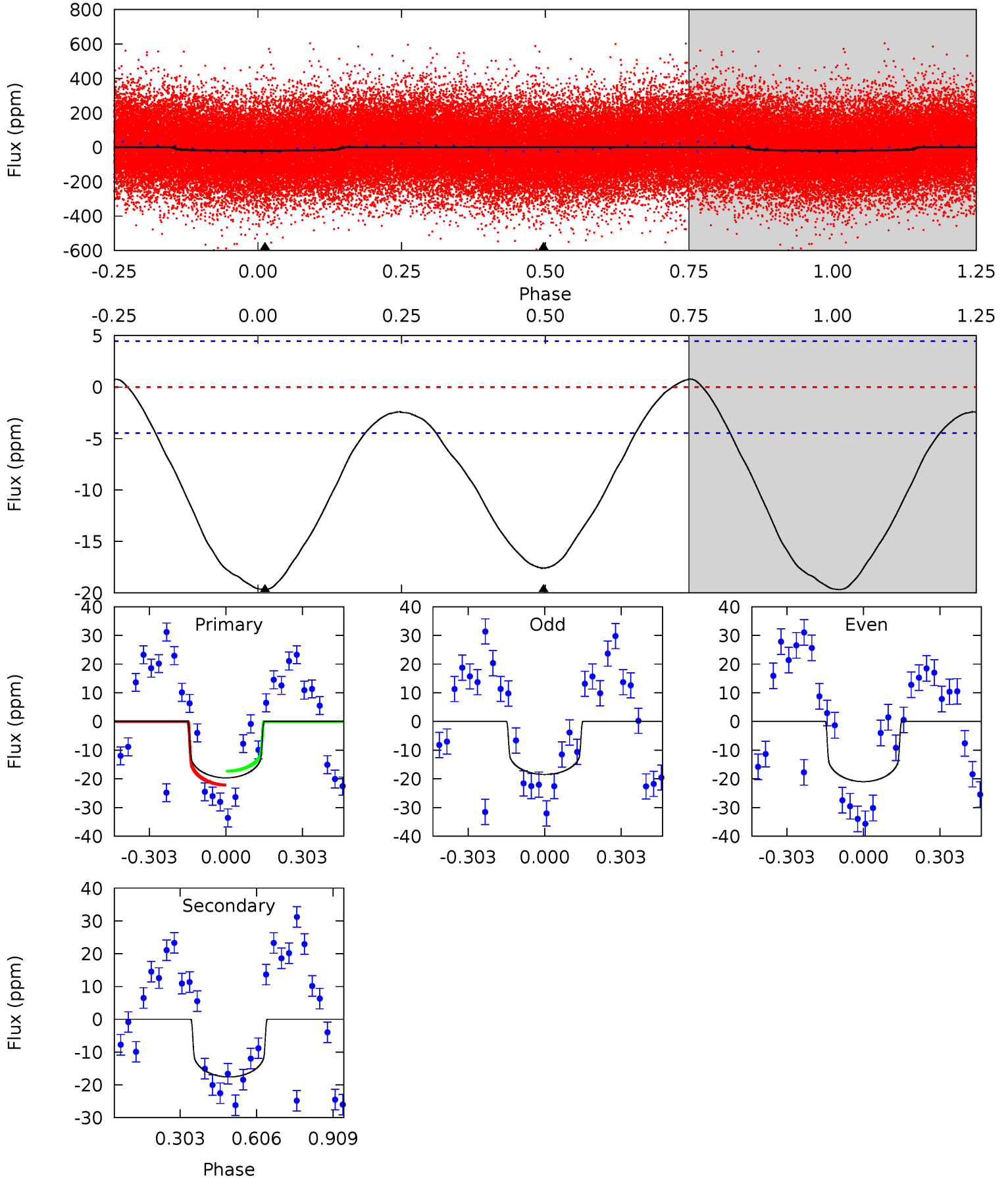




# DV Model-Shift Uniqueness Test

009569838-01, P = 2.831767 Days, E = 129.721022 Days

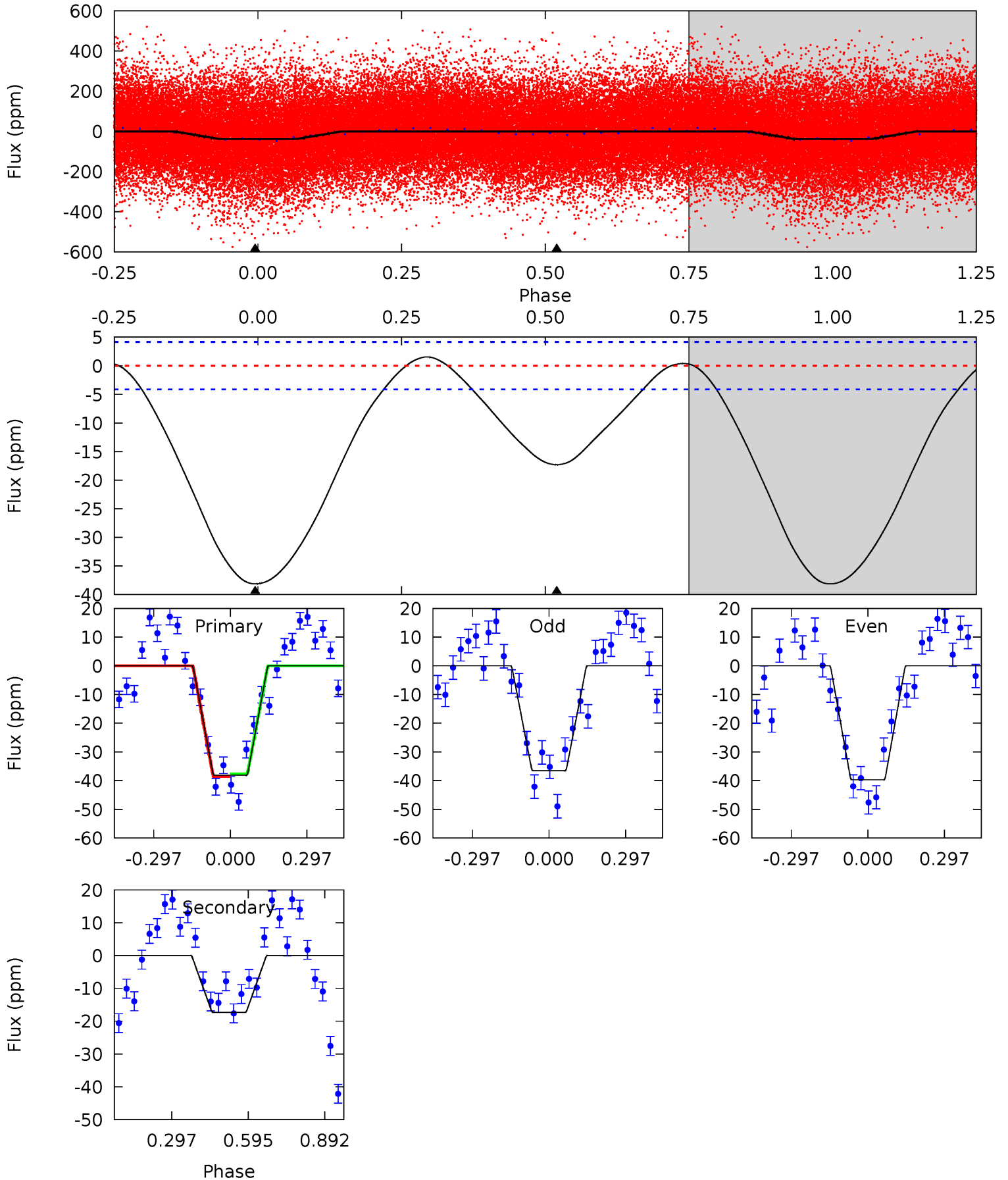
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.1	17.1	0	0	4.33	1.03	1.34	19.1	19.1	17.1	17.1	1.21	0.94	0.04	2.36



# Alt Model-Shift Uniqueness Test

009569838-01, P = 2.831593 Days, E = 129.714960 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
39.8	18.0	0	0	4.33	1.04	1.55	39.8	39.8	18.0	18.0	1.67	1.09	0.04	0.48



### Stellar Parameters For KIC 009569838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6771^{+214}_{-262}$	$4.003^{+0.336}_{-0.144}$	$-0.540^{+0.250}_{-0.300}$	$1.776^{+0.433}_{-0.649}$	$1.157^{+0.189}_{-0.170}$	$0.291^{+0.708}_{-0.119}$
	+3%/-4%	+8%/-4%	+46%/-56%	+24%/-37%	+16%/-15%	+243%/-41%
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 009569838-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-18 \pm 1$	$0.86^{+0.19}_{-0.18}$	$2678^{+219}_{-255}$	$6414^{+521}_{-460}$	$23^{+13}_{-8}$
Alt.	$-17 \pm 1$	$1.17^{+0.22}_{-0.24}$	$2678^{+221}_{-266}$	$5457^{+308}_{-256}$	$12^{+6}_{-3}$

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



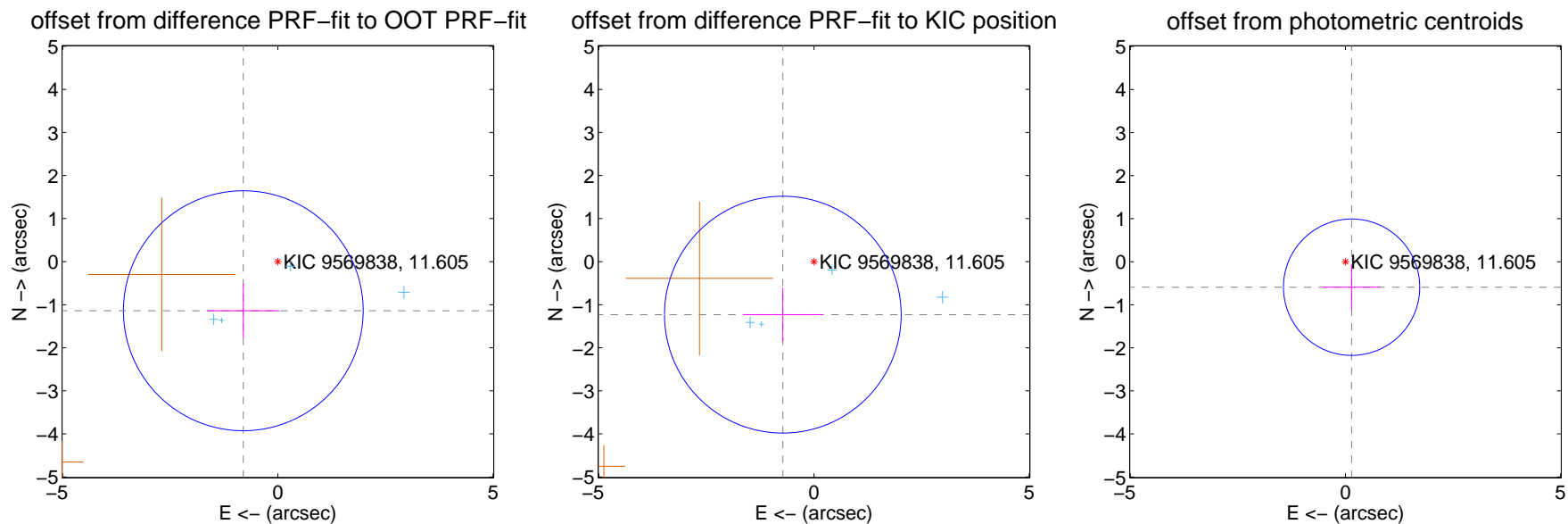
## DV Centroid Data

Supplemental centroid analysis for 009569838-01. **Kepler magnitude: 11.61.** Transit SNR 8.72

There are 4 quarters with good PRF difference image offsets

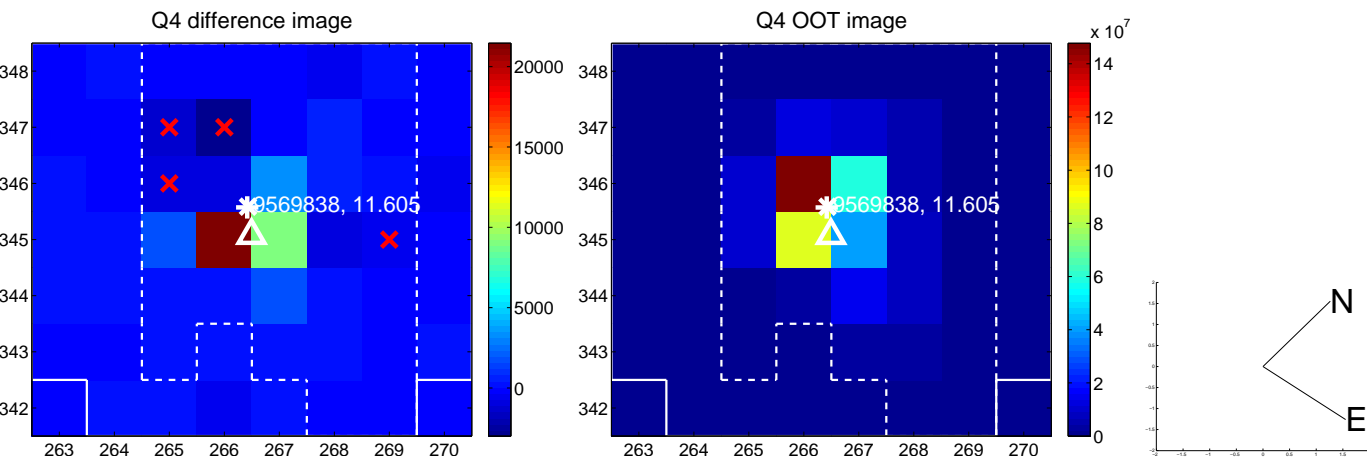
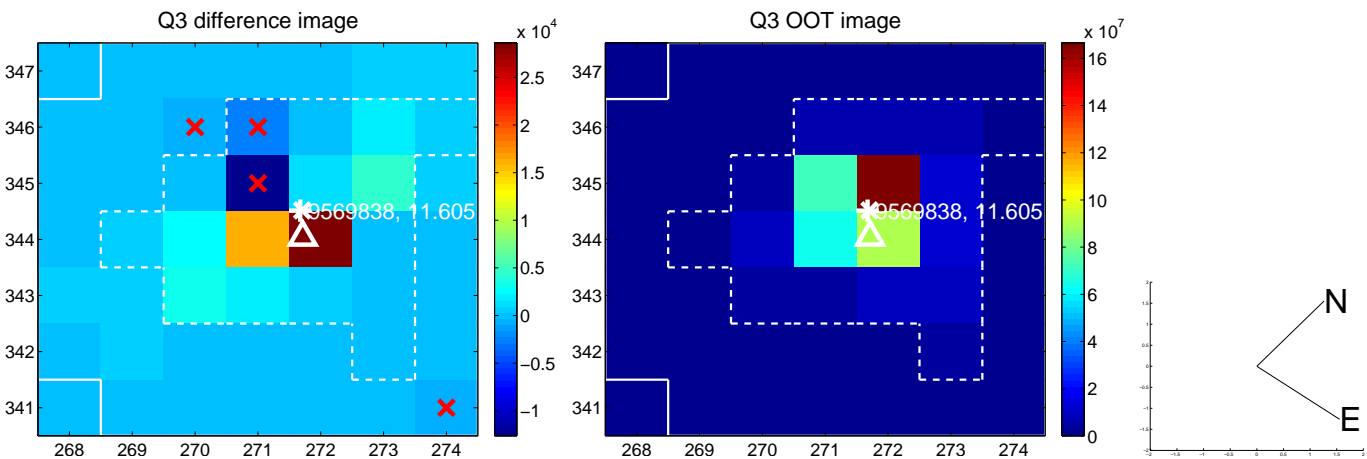
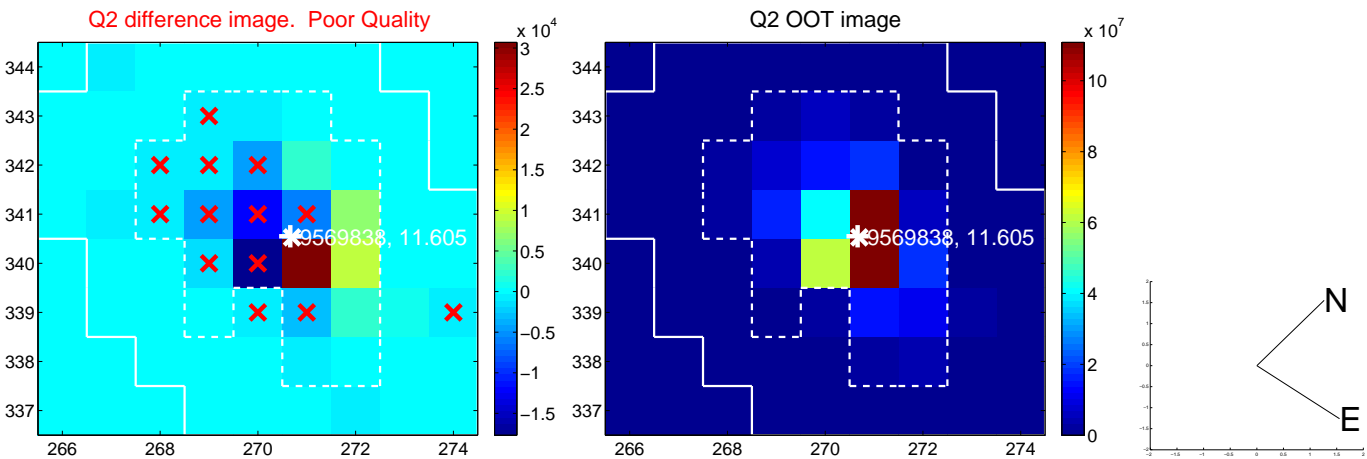
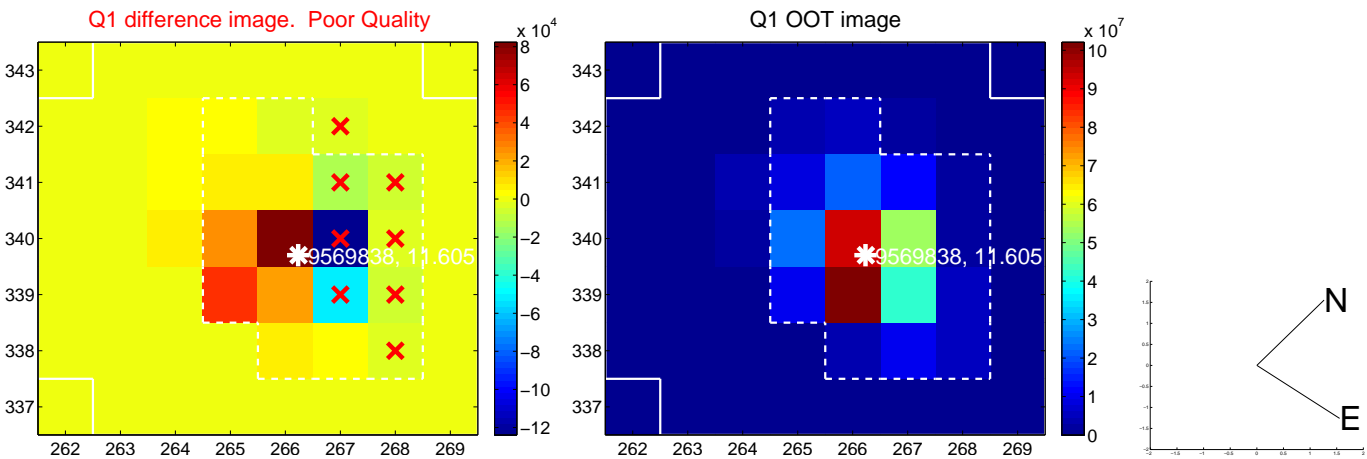
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.394 \pm 0.929$	1.50	$0.803 \pm 0.843$	$-1.140 \pm 0.634$
PRF-fit source offset from KIC position	$1.428 \pm 0.917$	1.56	$0.723 \pm 0.920$	$-1.231 \pm 0.624$
photometric centroid source offset	$0.61 \pm 0.53$	1.15	$-0.14 \pm 0.66$	$-0.59 \pm 0.52$

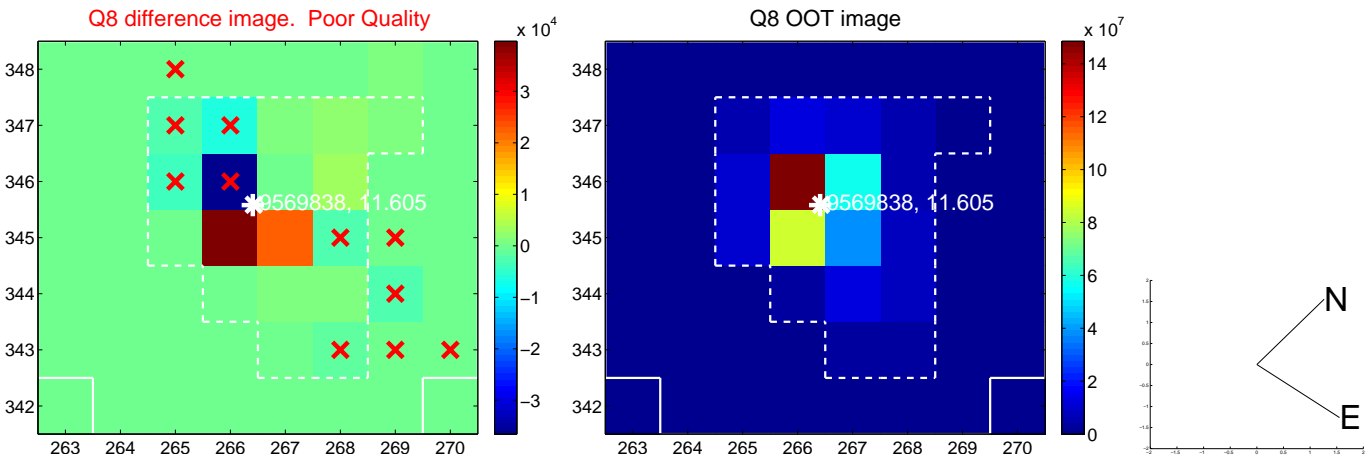
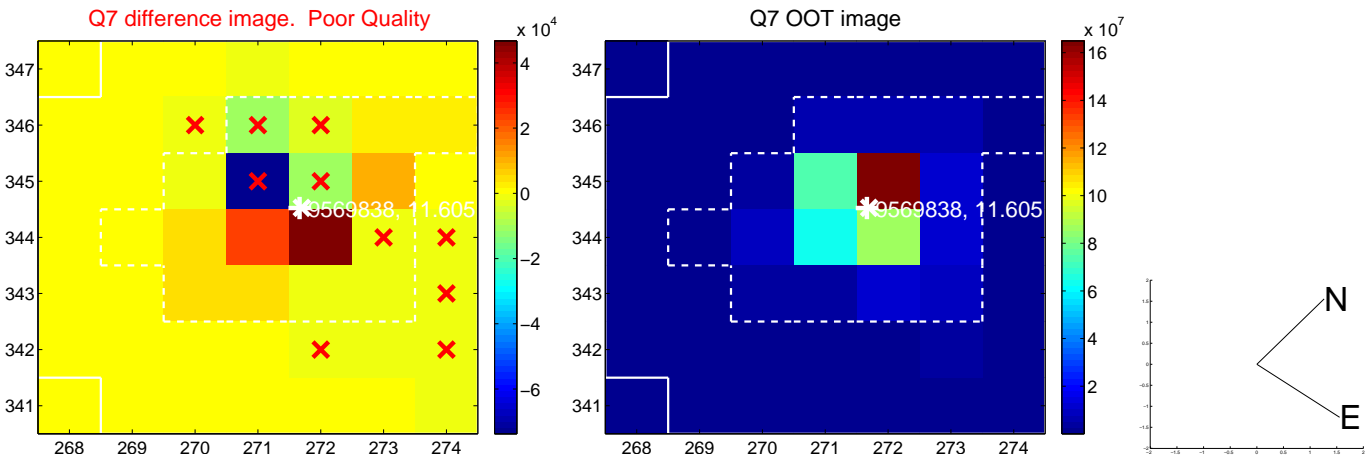
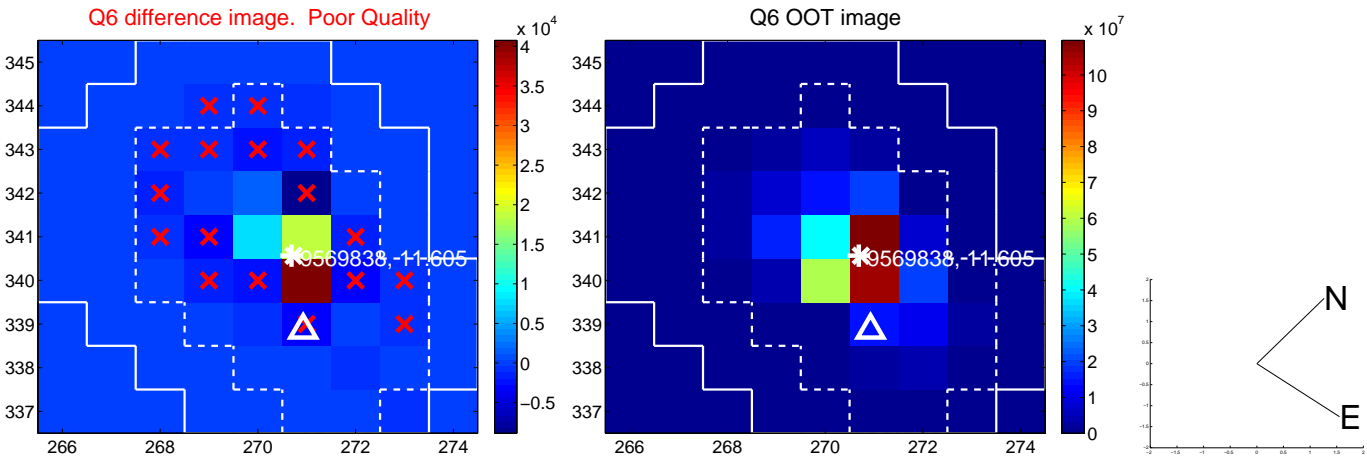
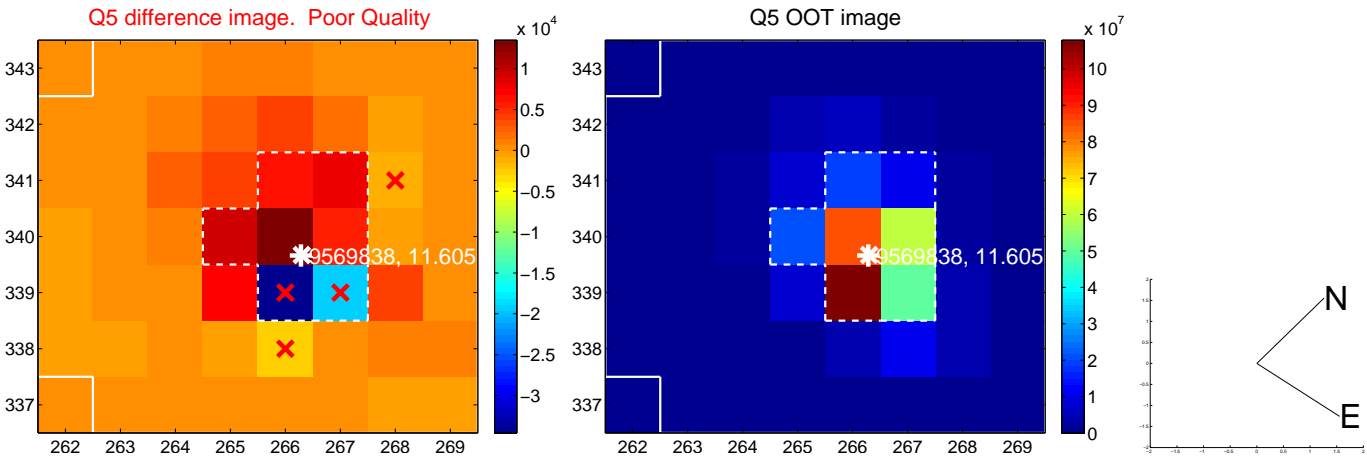


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

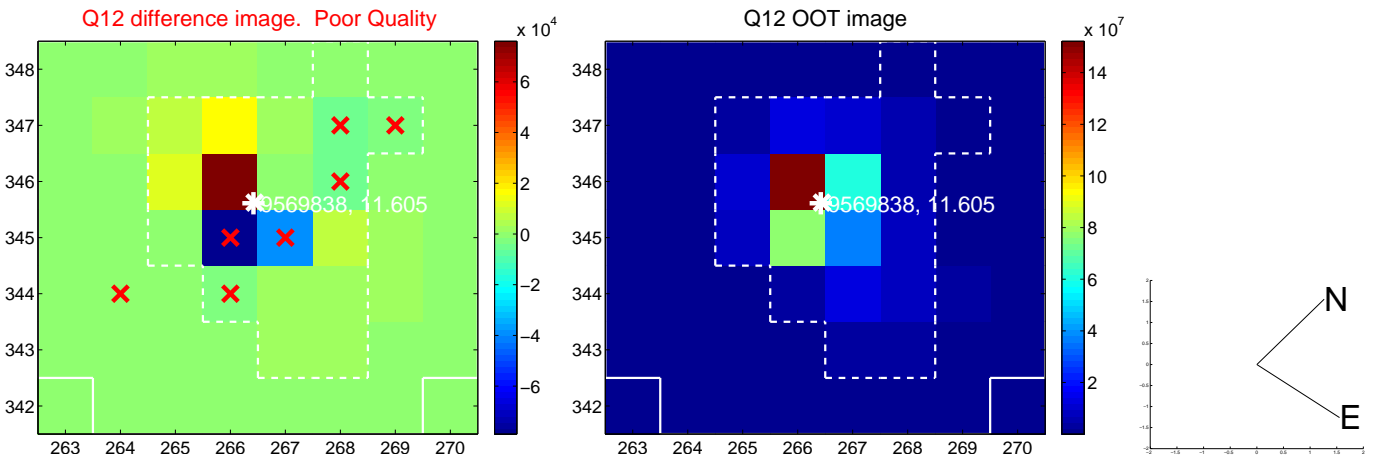
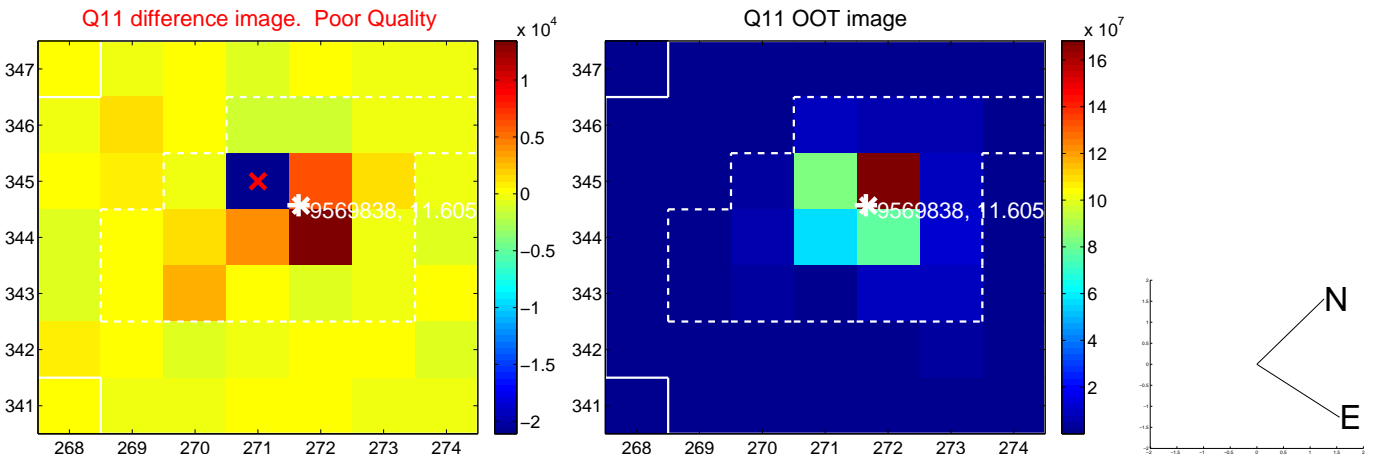
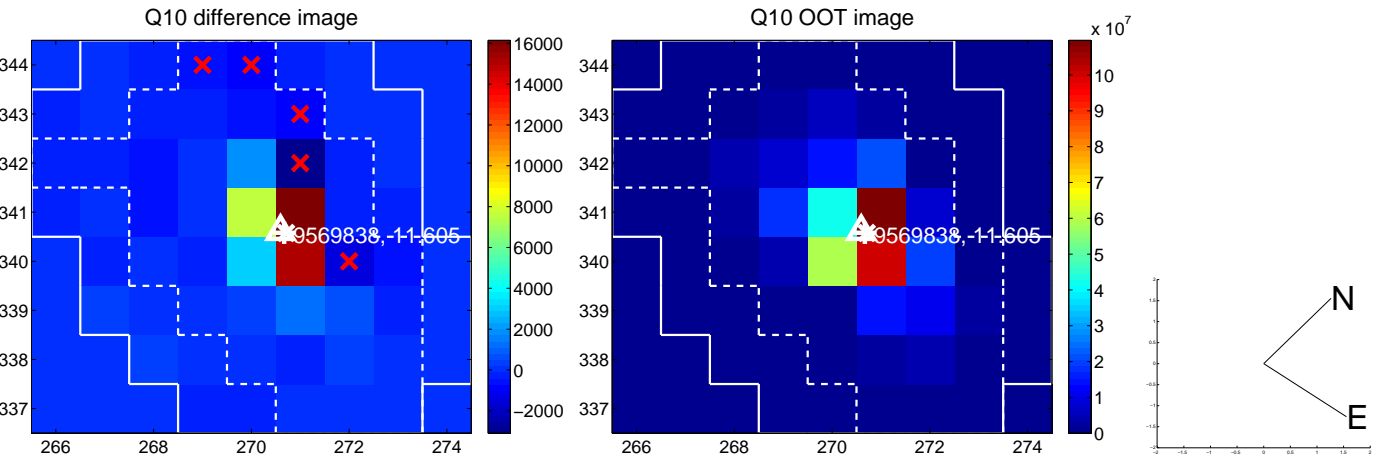
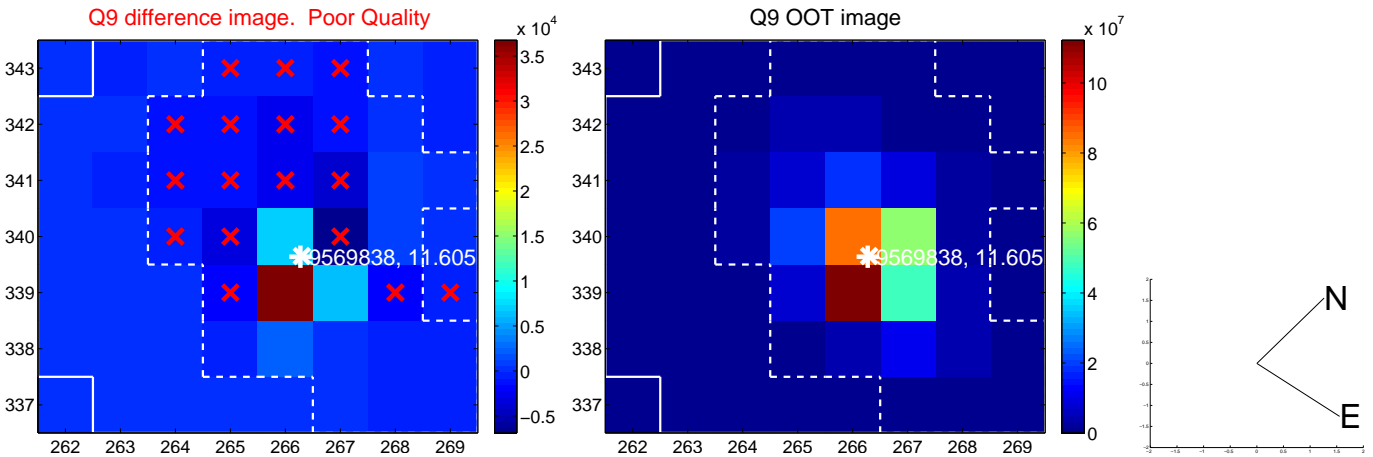


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

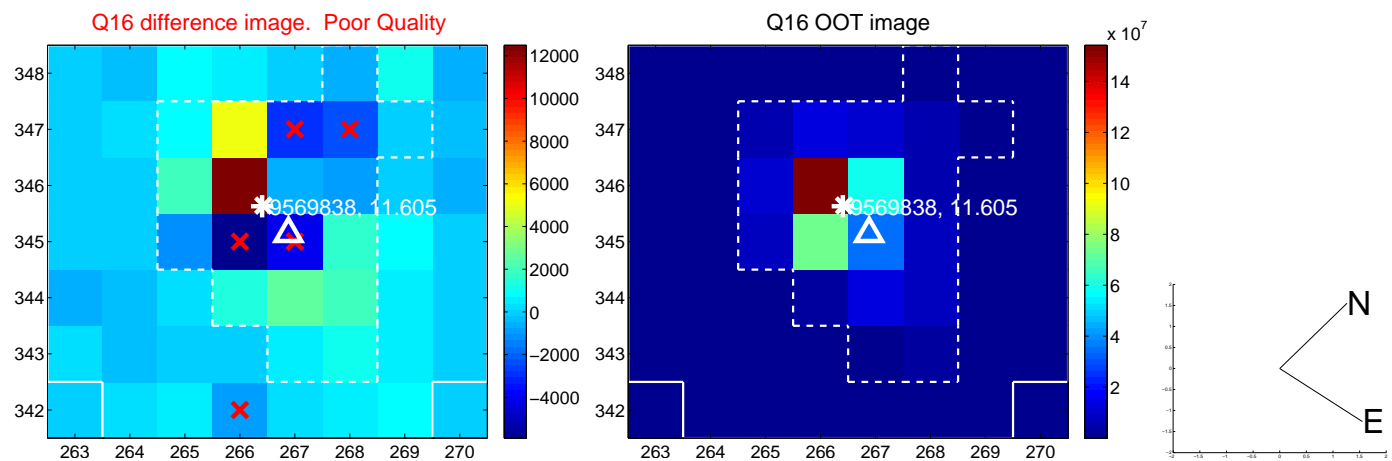
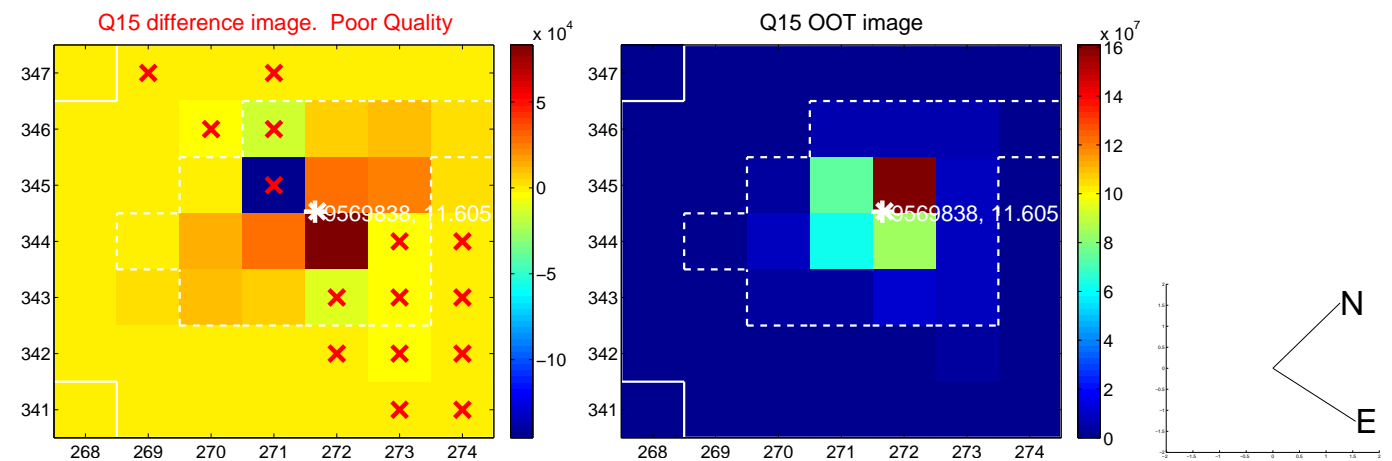
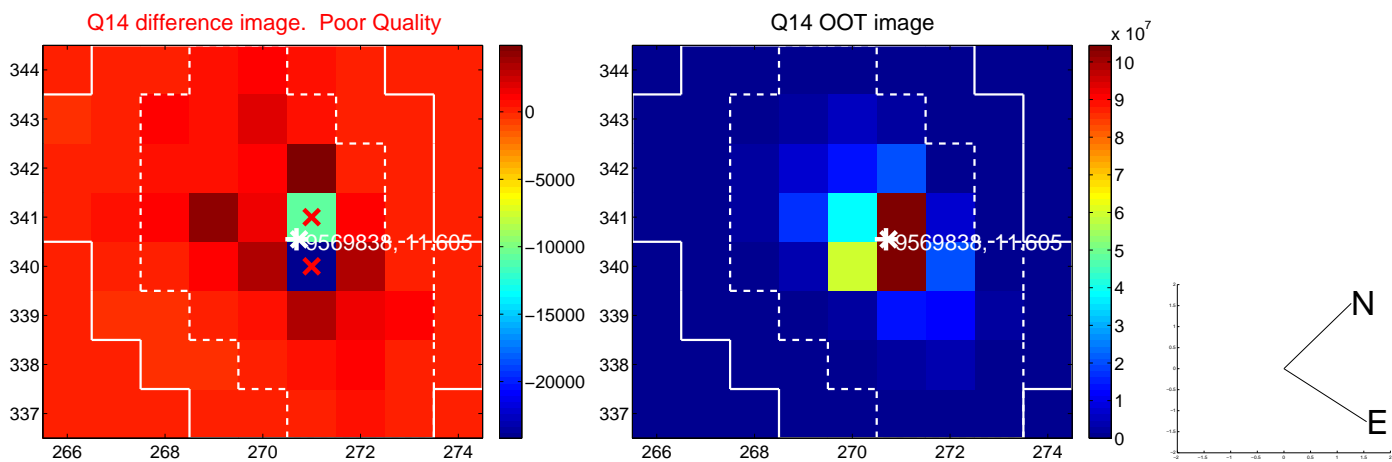
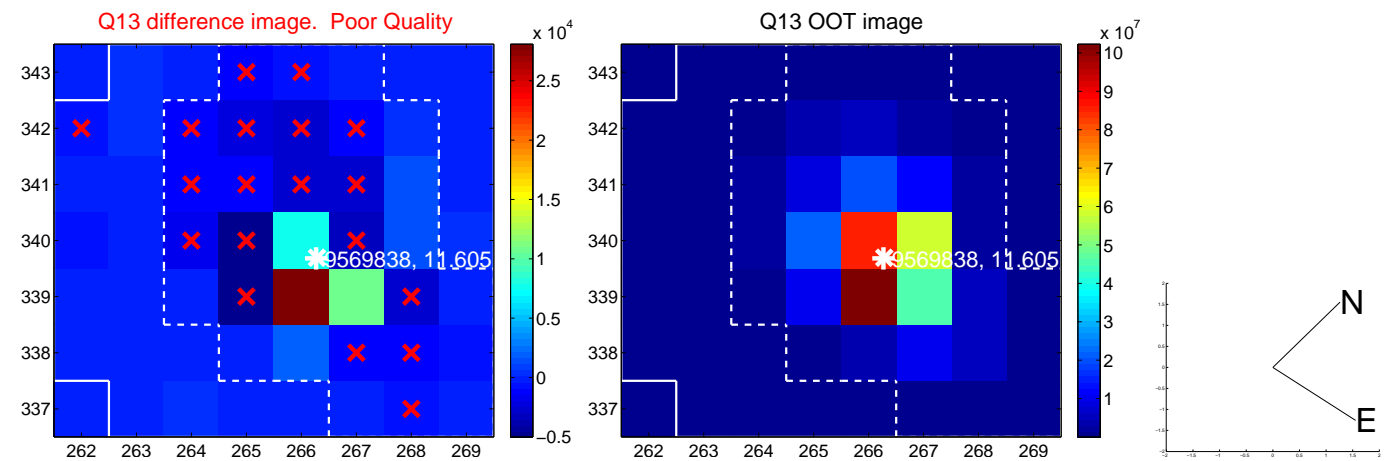




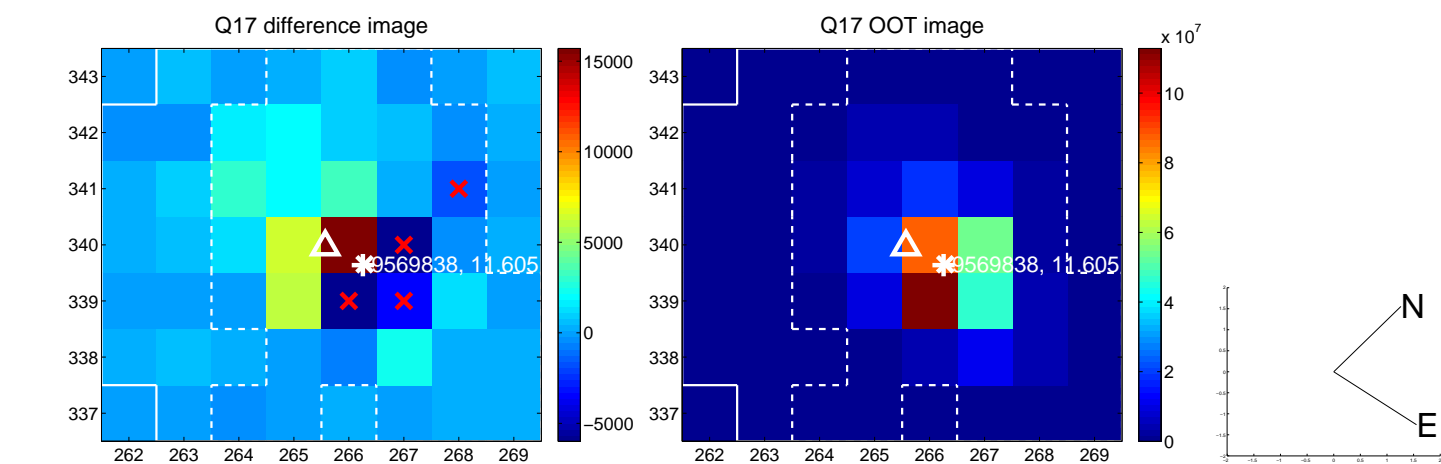
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



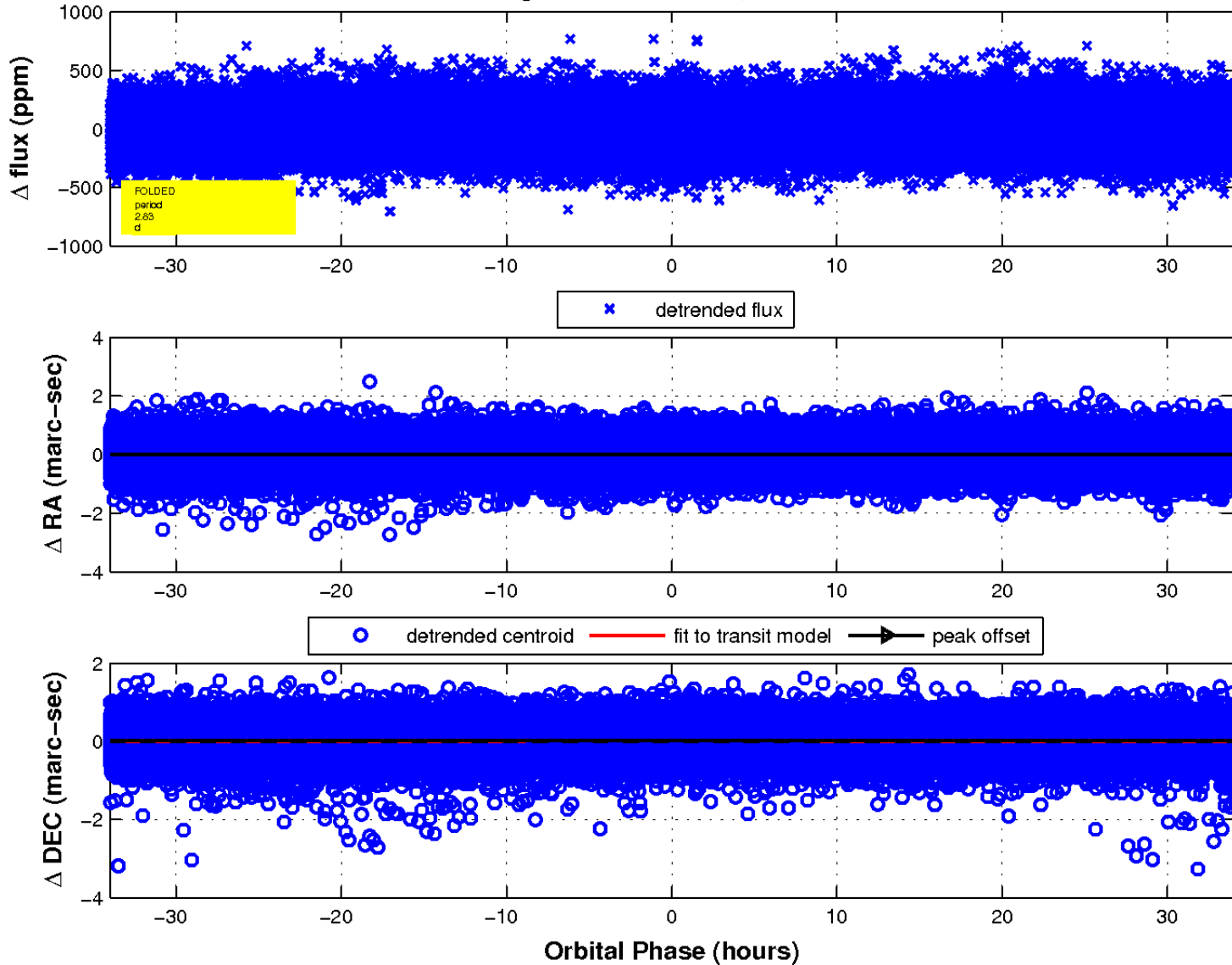
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

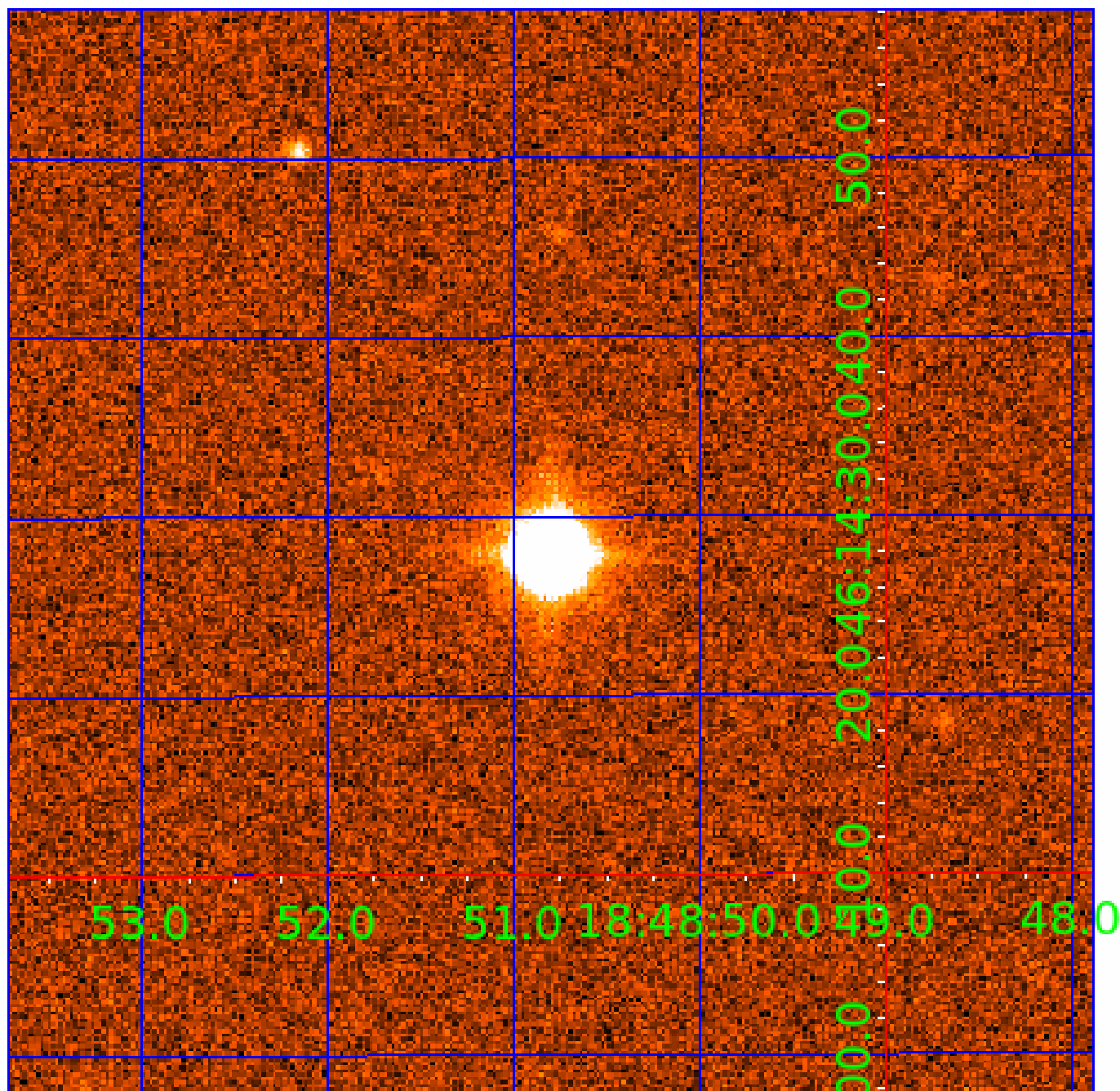


fluxWeightedCentroids, Planet 1 of 8



UKIRT Image

Declination



# KIC 009569838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009569838-01	OBS	No	2.831767	132.552789	19.4	20.136	8.4	8.7	1.78	6771	0.90	3507.98
009569838-02	OBS	No	37.424710	159.410322	186.5	10.964	21.6	15.0	1.78	6771	2.77	112.27
009569838-03	OBS	No	193.920337	202.089180	350.7	3.695	20.8	17.7	1.78	6771	3.36	12.52
009569838-05	OBS	No	4.511901	132.177940	93.8	4.437	15.3	15.7	1.78	6771	1.90	1885.04
009569838-06	OBS	No	40.924036	145.228300	205.6	3.445	13.0	13.2	1.78	6771	2.81	99.65
009569838-07	OBS	No	29.432804	138.798788	206.7	3.101	13.1	12.9	1.78	6771	2.96	154.65
009569838-08	OBS	No	67.676565	174.057774	309.1	4.570	12.1	12.0	1.78	6771	3.80	50.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009569838-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009569838-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009569838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

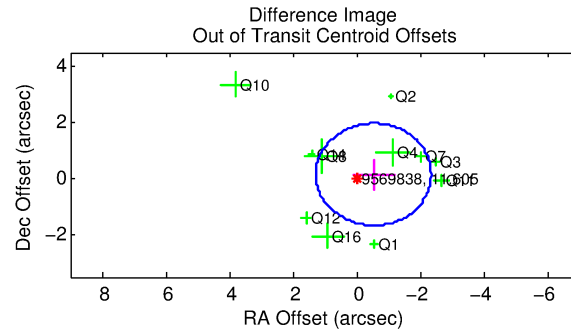
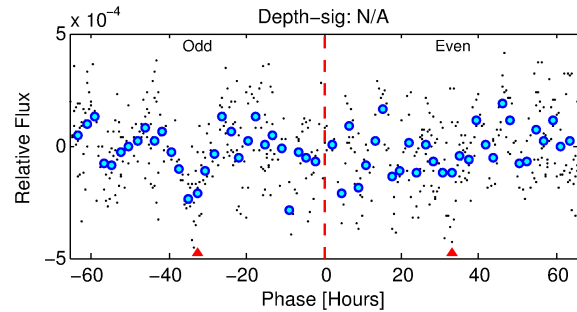
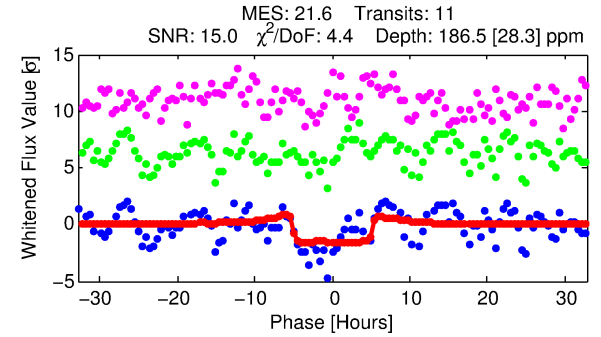
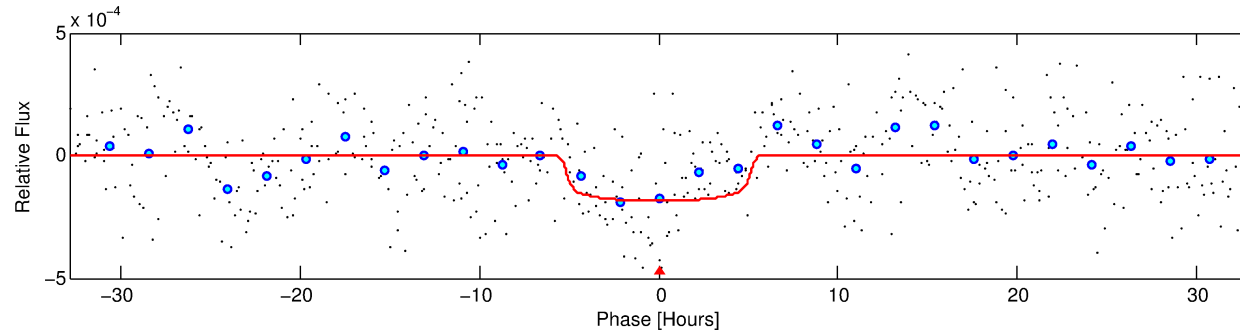
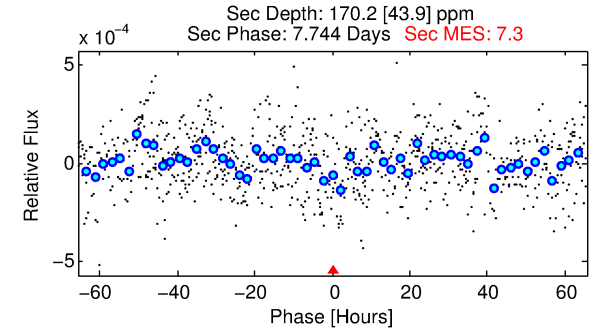
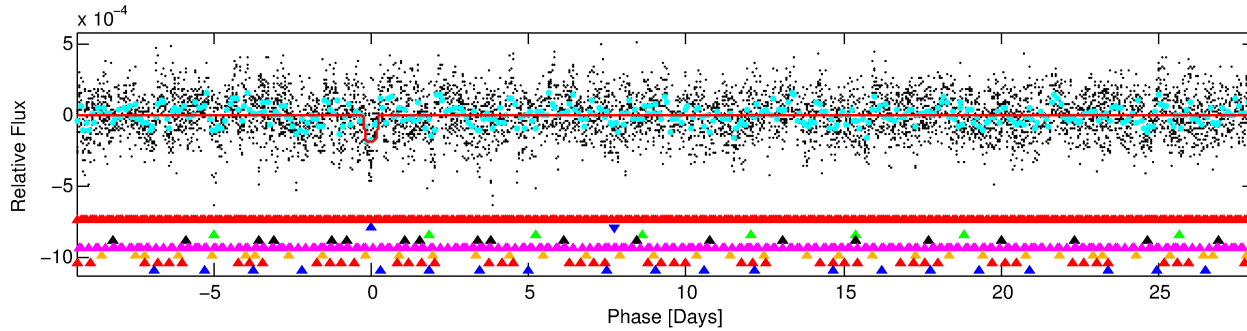
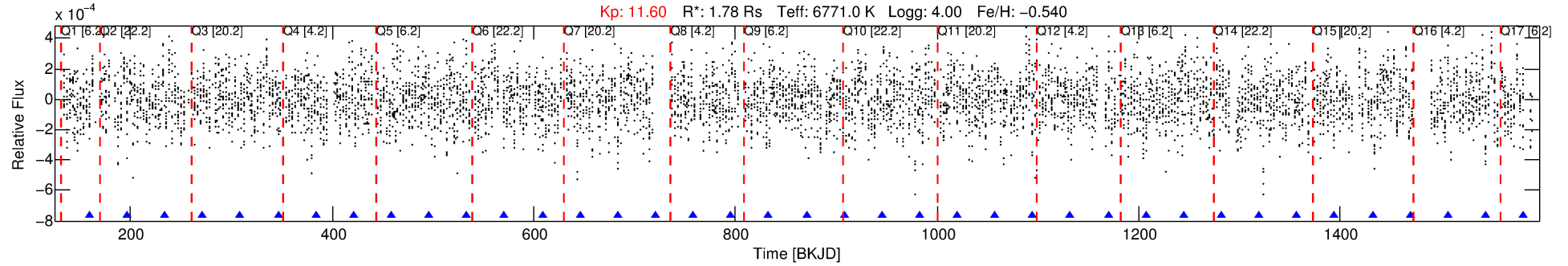
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009569838-02

No Significant Match Found

# DV One-Page Summary

KIC: 9569838 Candidate: 2 of 8 Period: 37.425 d



## DV Fit Results:

Period = 37.42471 [0.00111] d  
Epoch = 159.4103 [0.0249] BKJD  
Rp/R\* = 0.0143 [0.0028]  
a/R\* = 13.44 [13.85]  
b = 0.87 [0.28]  
Seff = 112.27 [66.36]  
Teq = 830 [123] K  
Rp = 2.77 [1.15] Re  
a = 0.2300 [0.0816] AU  
Ag = 644.05 [476.24] [1.35σ]  
Teffp = 6465 [801] K [6.96σ]

## DV Diagnostic Results:

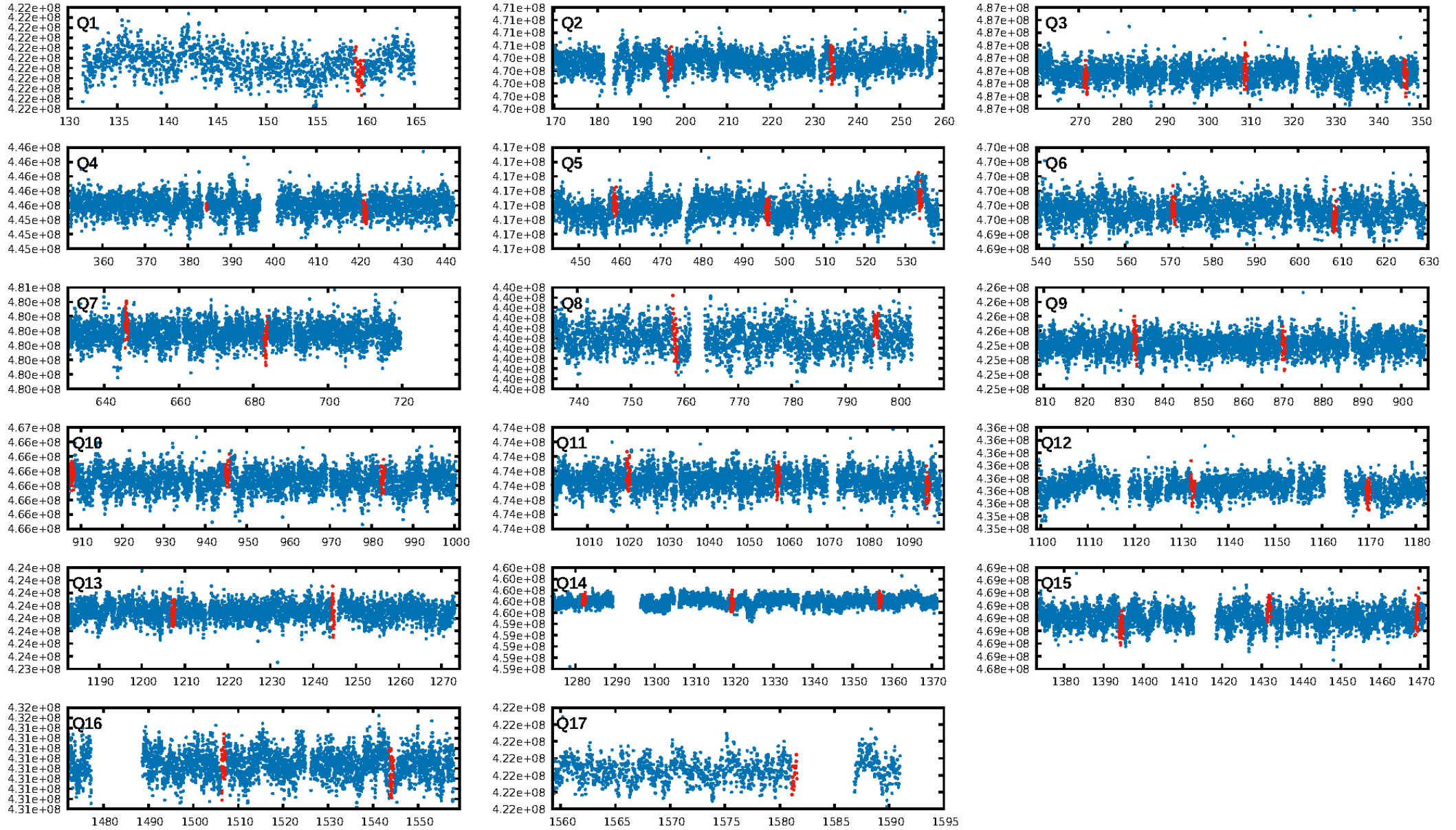
ShortPeriod-sig: 100.0% [16.83σ]  
LongPeriod-sig: 100.0% [7.31σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: 0.583  
Centroid-sig: 0.3%  
Centroid-so: 0.603 arcsec [2.12σ]  
OotOffset-rm: 0.556 arcsec [0.92σ]  
OotOffset-st: 3/3/4/1 [11]  
KicOffset-rm: 0.653 arcsec [1.15σ]  
KicOffset-st: 3/3/4/1 [11]  
DiffImageQuality-fgm: 0.55 [6/11]  
DiffImageOverlap-fno: 0.06 [1/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:20:49 Z

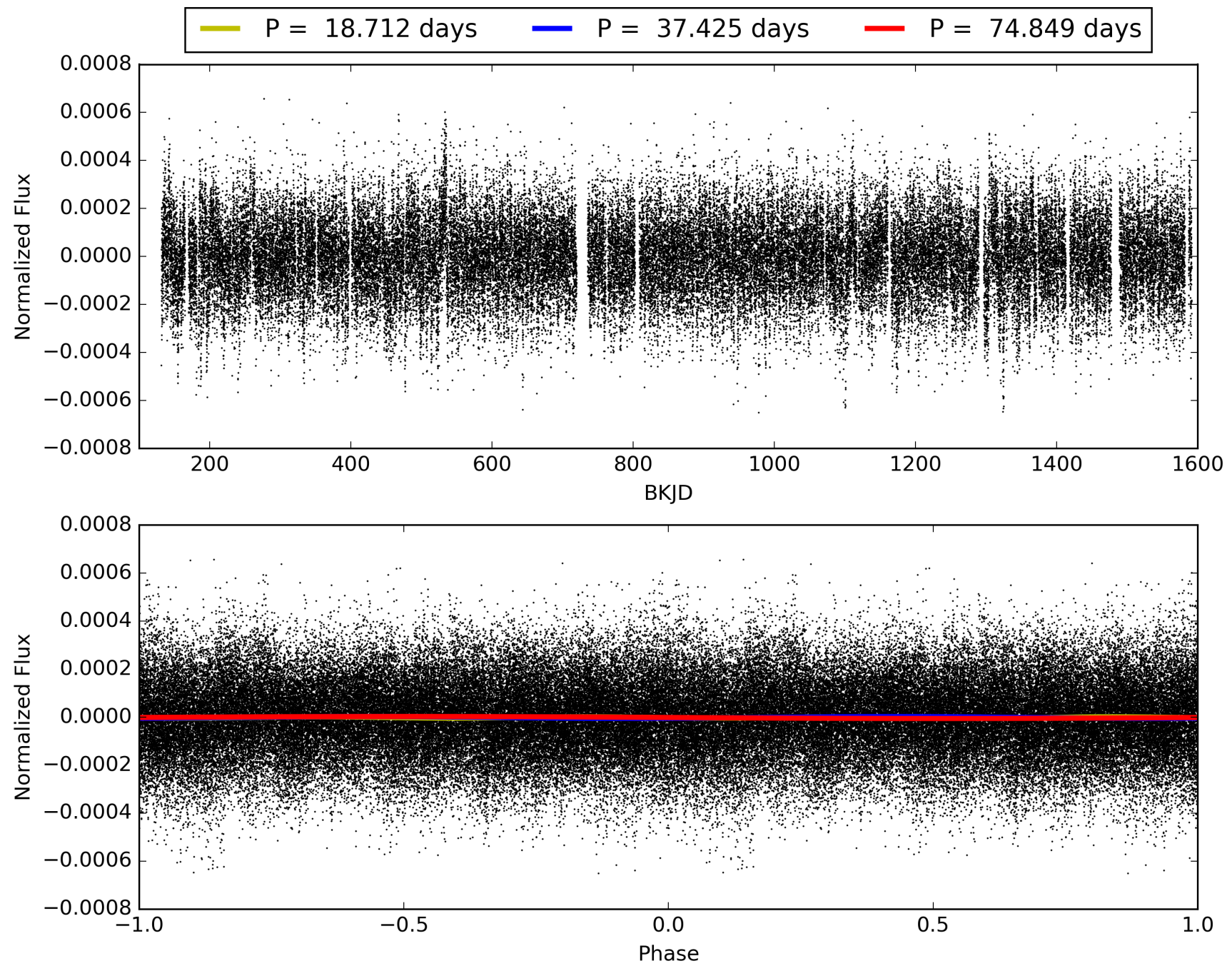
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 009569838-02, PDC Light Curves

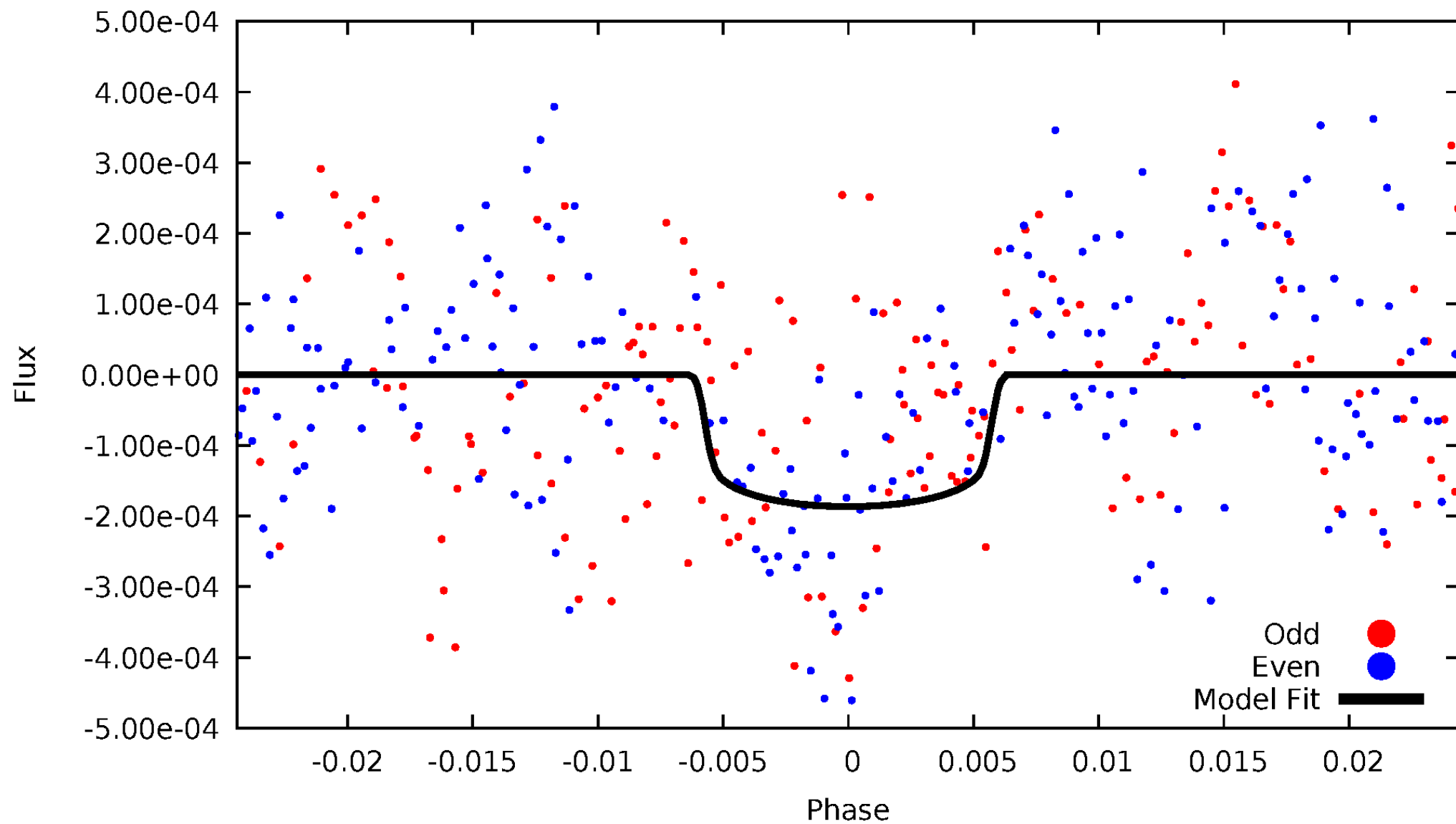


TCE 009569838-02



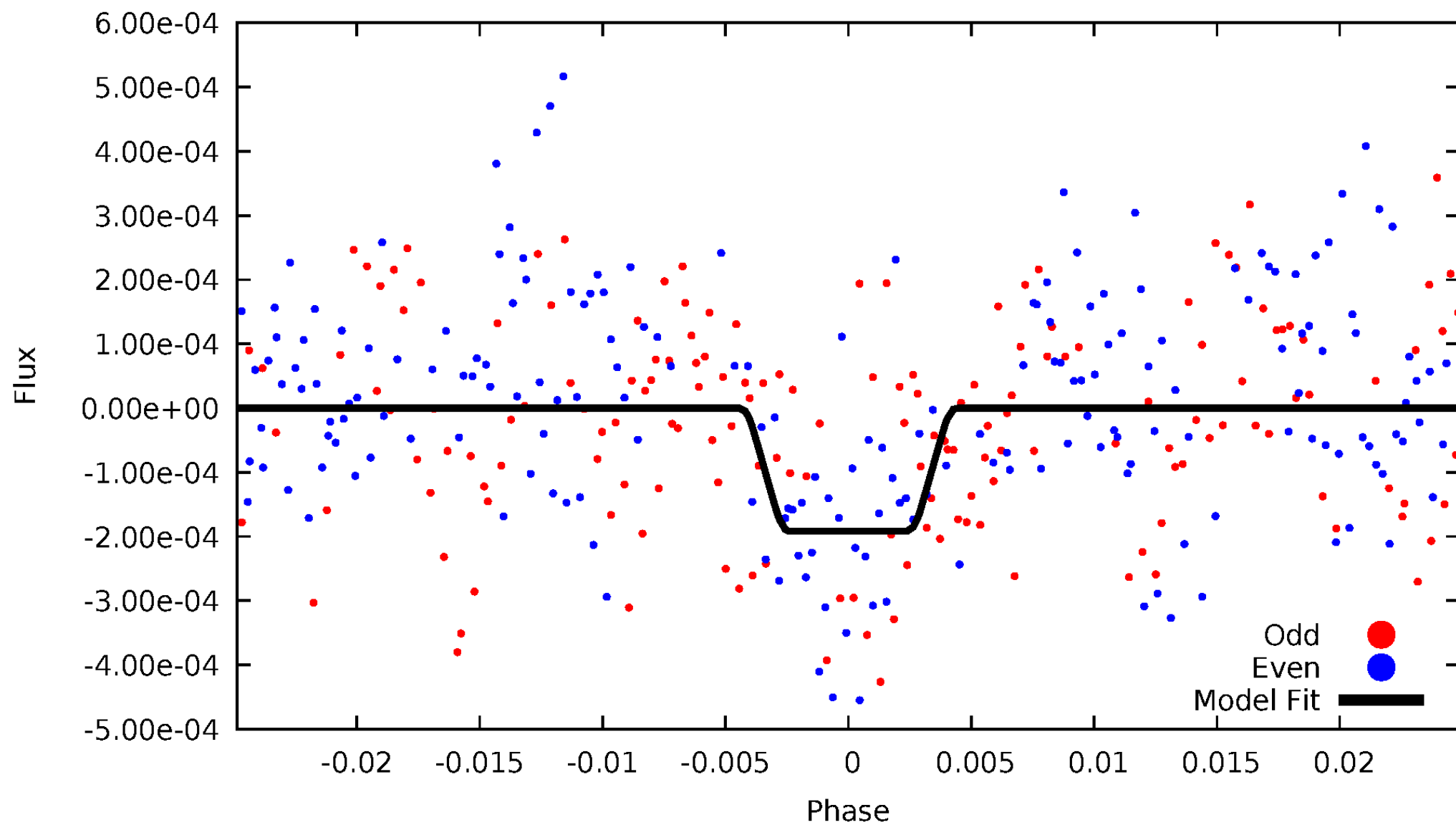
# DV Odd/Even

TCE 009569838-02



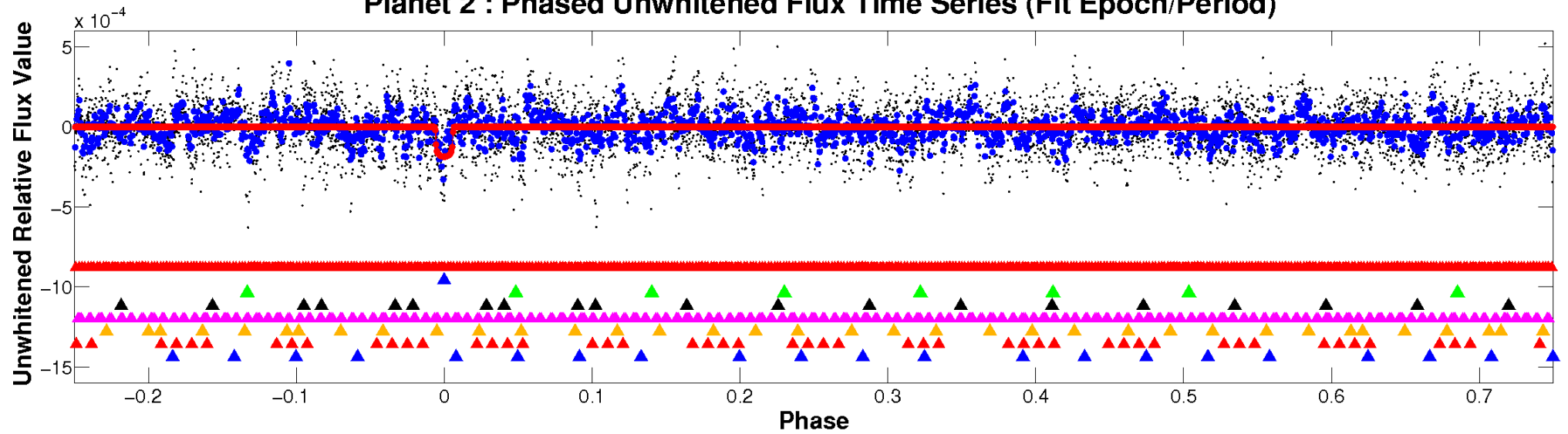
# ALT Odd/Even

TCE 009569838-02

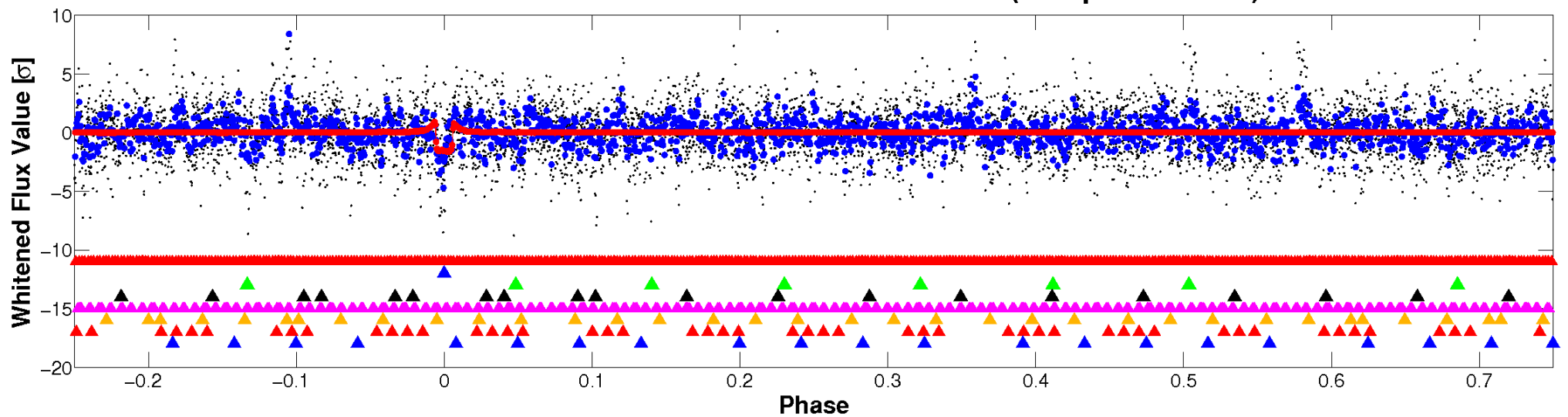


# Non-Whitened Vs. Whitened Light Curve

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

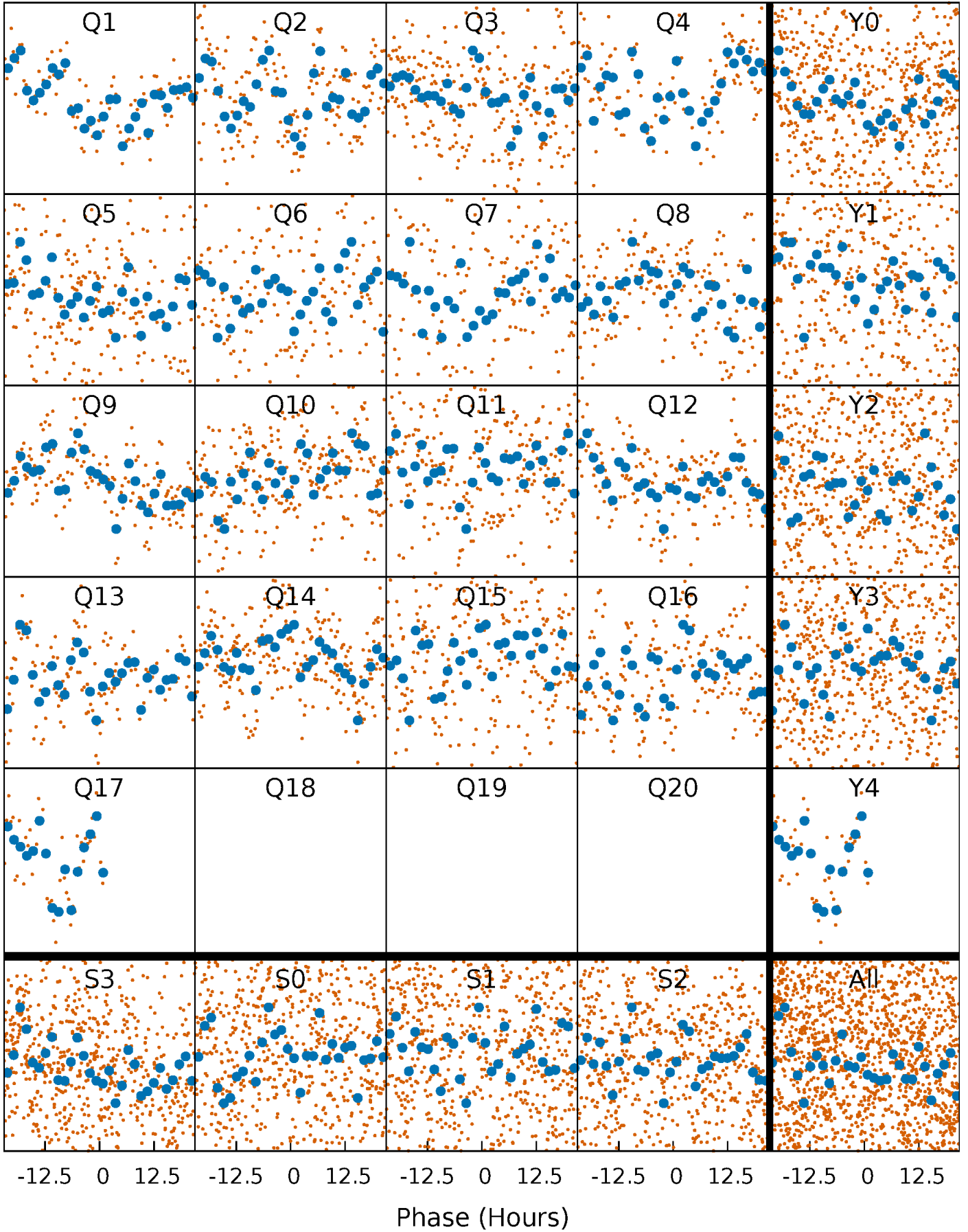


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

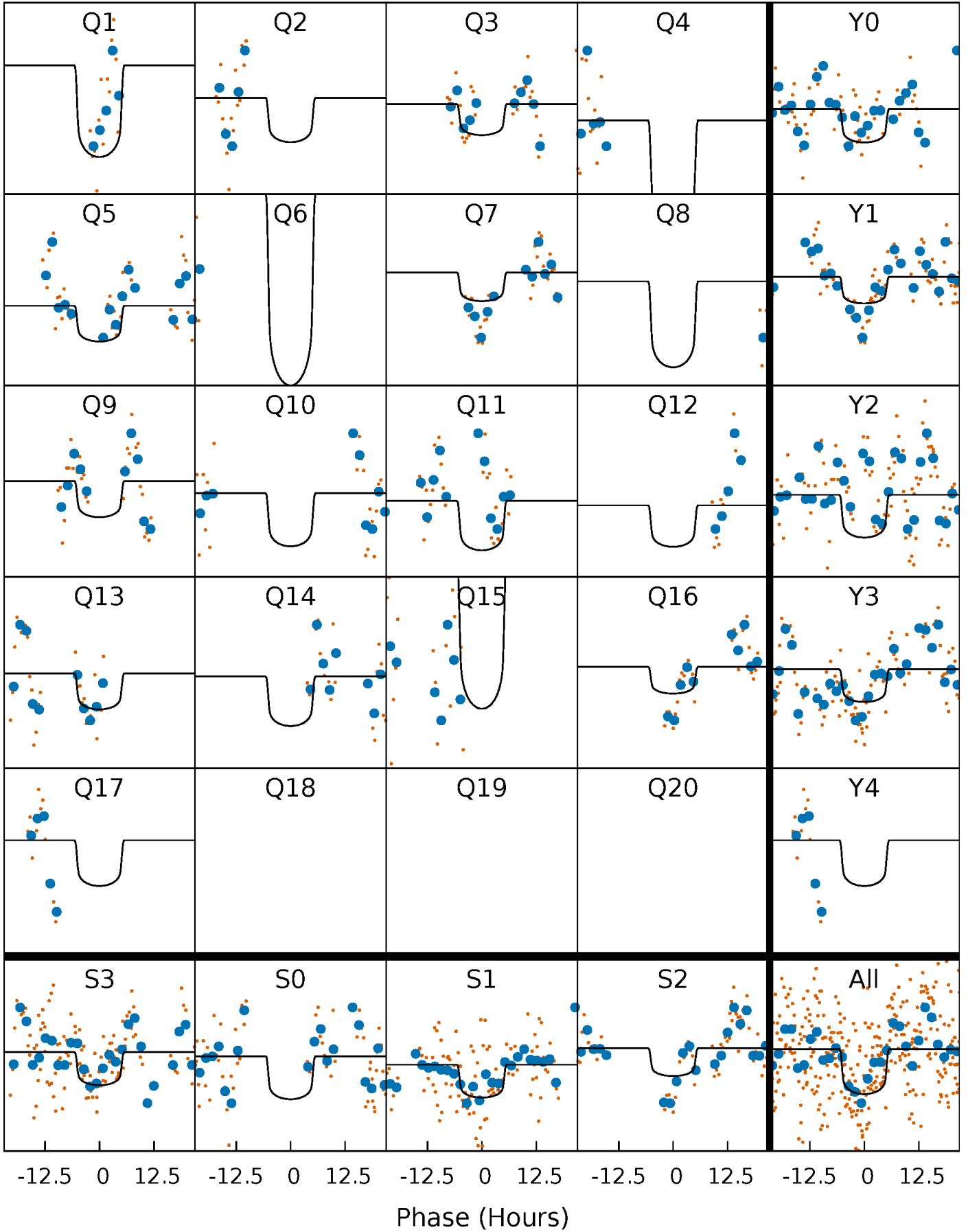
TCE 009569838-02   P= 37.424710 Days    $T_0=159.410322$  (BKJD)





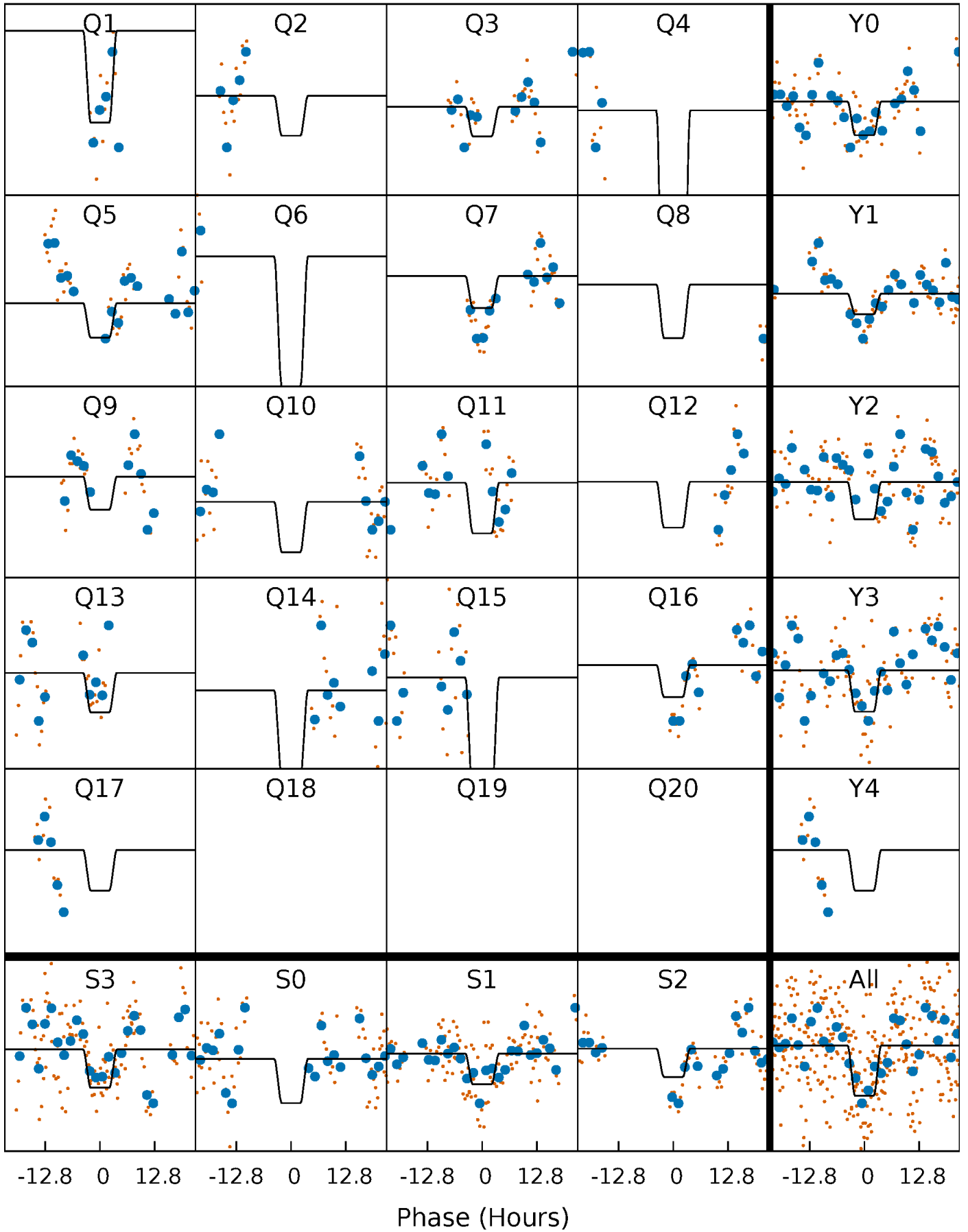
# DV Quarter-Phased Transit Curves

TCE 009569838-02   P= 37.424710 Days    $T_0=159.410322$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

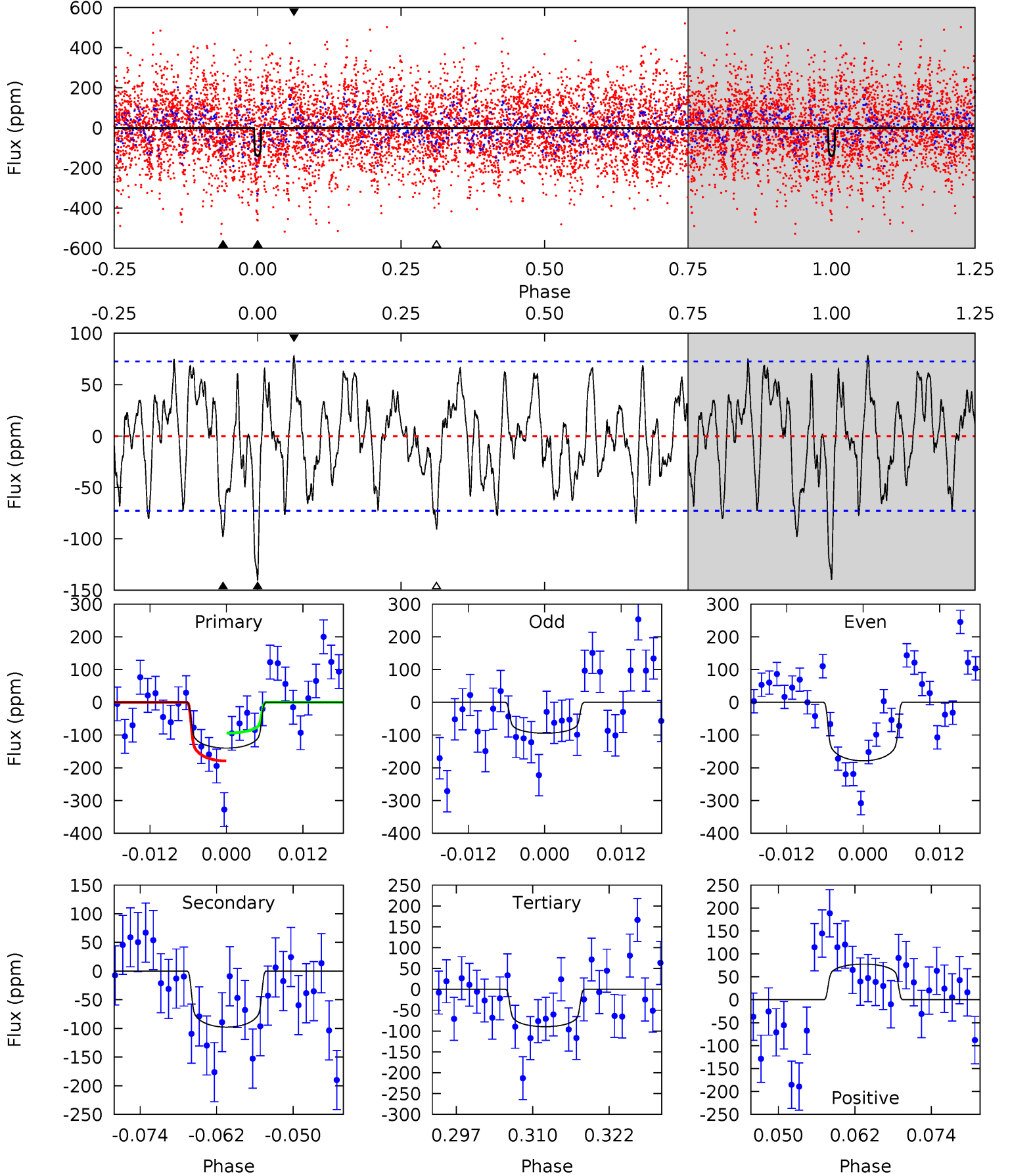
TCE 009569838-02 P= 37.423164 Days  $T_0=159.419813$  (BKJD)



# DV Model-Shift Uniqueness Test

009569838-02, P = 37.424710 Days, E = 121.985612 Days

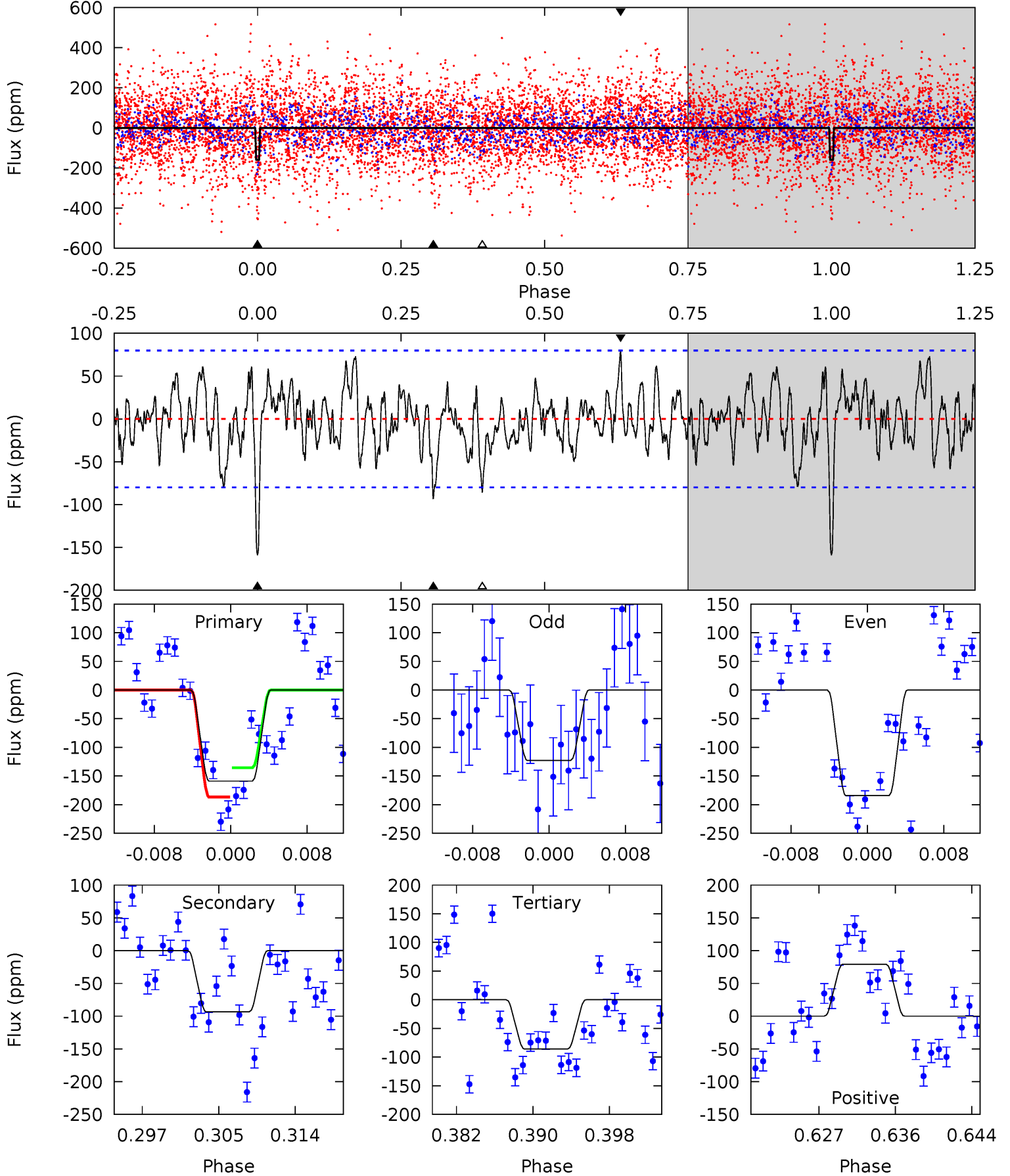
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.61	6.72	6.16	5.35	4.99	2.50	2.38	3.45	4.26	0.56	1.37	2.90	1.40	0.36	2.94



# Alt Model-Shift Uniqueness Test

009569838-02,  $P = 37.423164$  Days,  $E = 121.996649$  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
10.1	5.91	5.44	5.01	5.06	2.63	1.74	4.63	5.05	0.47	0.89	1.94	1.55	0.33	1.62





### Stellar Parameters For KIC 009569838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6771^{+214}_{-262}$	$4.003^{+0.336}_{-0.144}$	$-0.540^{+0.250}_{-0.300}$	$1.776^{+0.433}_{-0.649}$	$1.157^{+0.189}_{-0.170}$	$0.291^{+0.708}_{-0.119}$
	+3%/-4%	+8%/-4%	+46%/-56%	+24%/-37%	+16%/-15%	+243%/-41%
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 009569838-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-98 \pm 15$	$2.63^{+0.66}_{-0.65}$	$1134^{+88}_{-115}$	$5613^{+610}_{-500}$	$413^{+318}_{-156}$
Alt.	$-93 \pm 16$	$2.57^{+0.72}_{-0.75}$	$1142^{+87}_{-111}$	$5667^{+728}_{-541}$	$420^{+388}_{-176}$

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

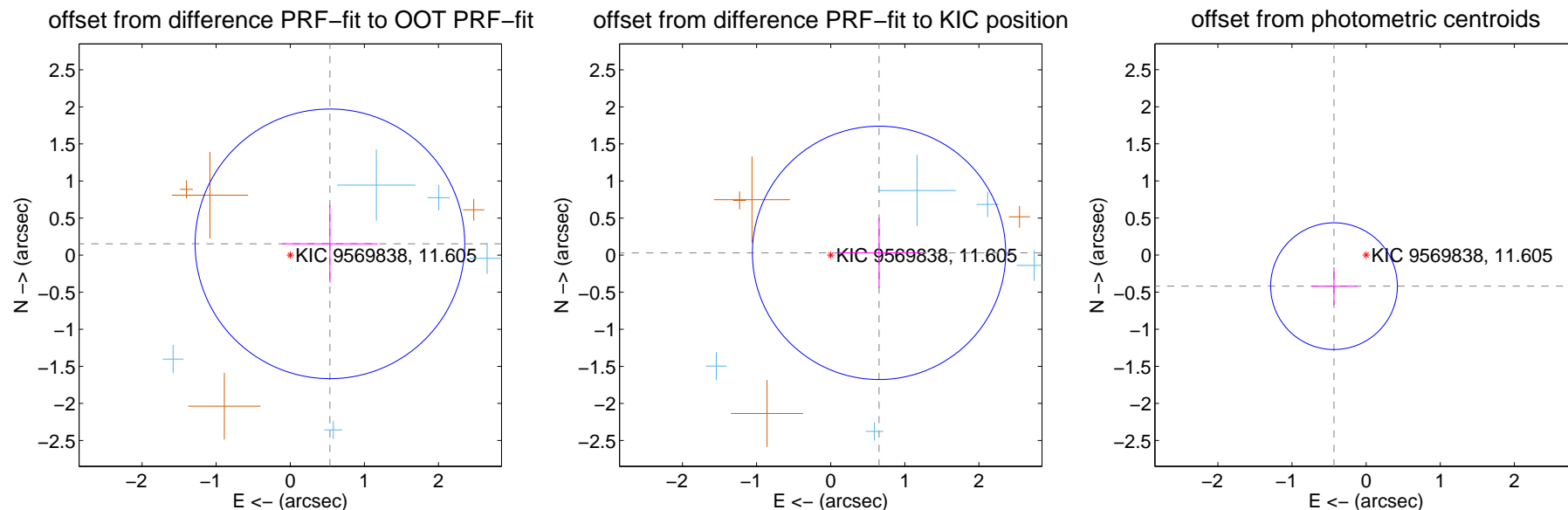
## DV Centroid Data

Supplemental centroid analysis for 009569838-02. **Kepler magnitude: 11.61.** Transit SNR 15.00

There are 6 quarters with good PRF difference image offsets

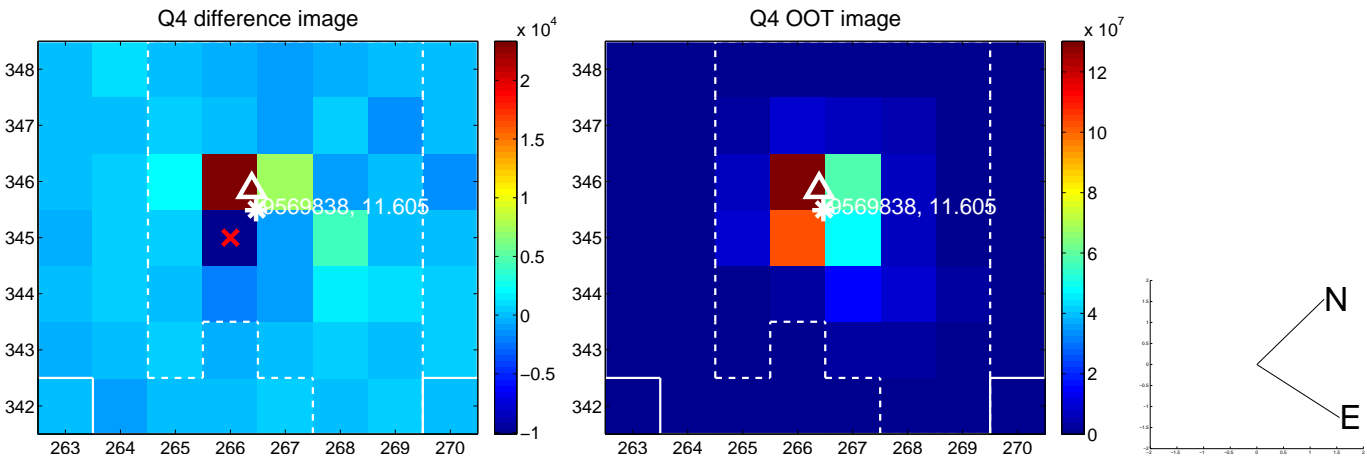
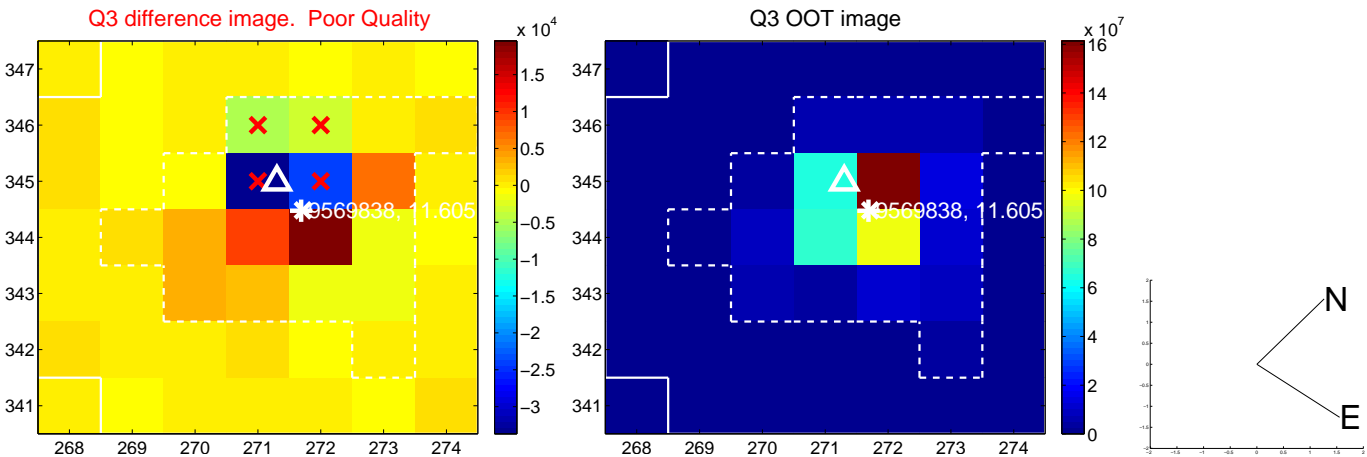
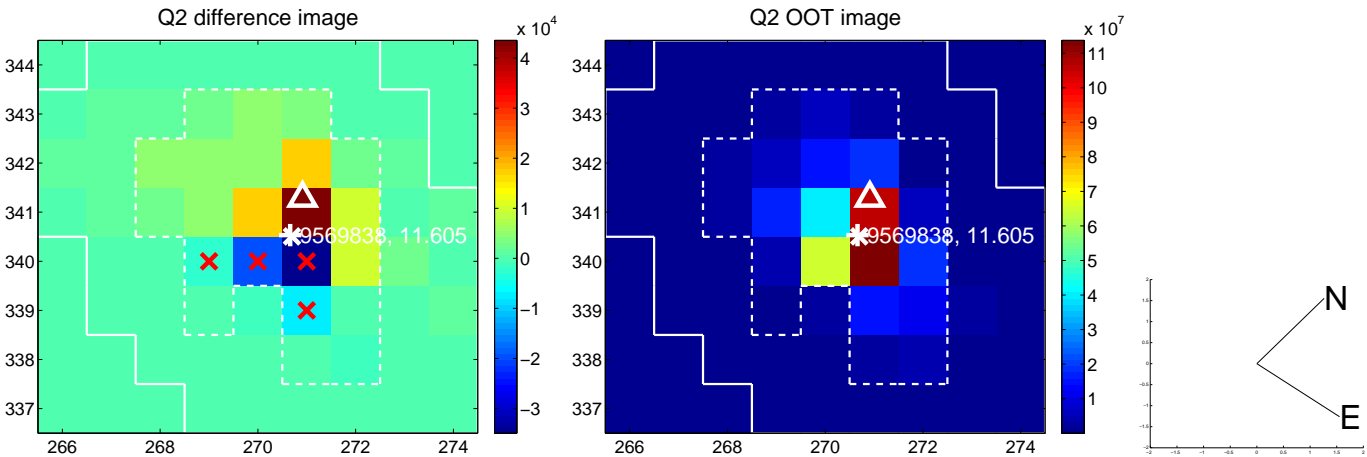
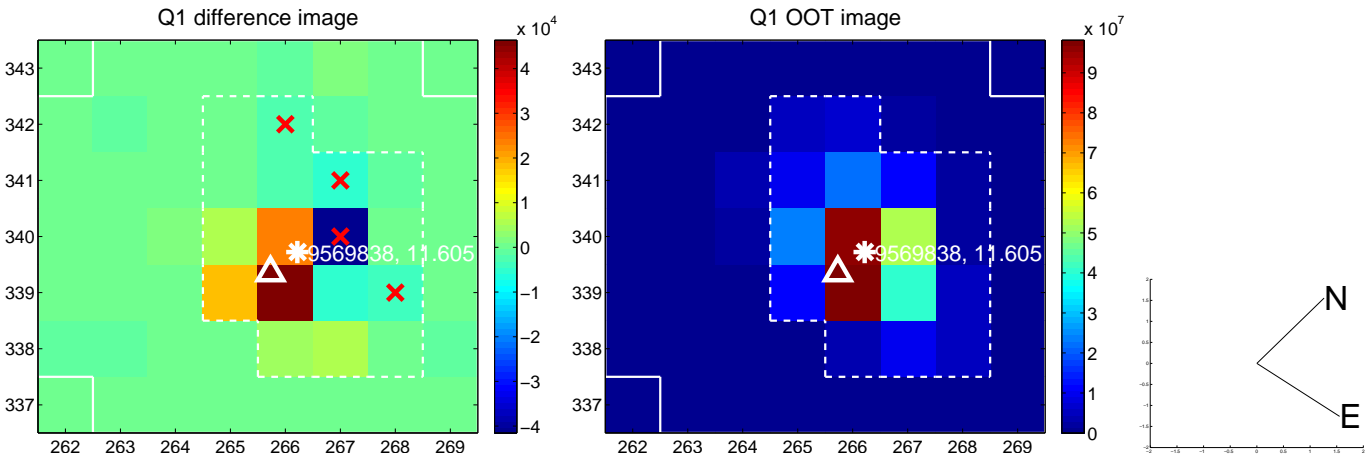
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.556 \pm 0.606$	0.92	$-0.535 \pm 0.645$	$0.153 \pm 0.521$
PRF-fit source offset from KIC position	$0.653 \pm 0.569$	1.15	$-0.652 \pm 0.571$	$0.031 \pm 0.471$
photometric centroid source offset	$0.60 \pm 0.28$	2.12	$0.43 \pm 0.31$	$-0.42 \pm 0.25$

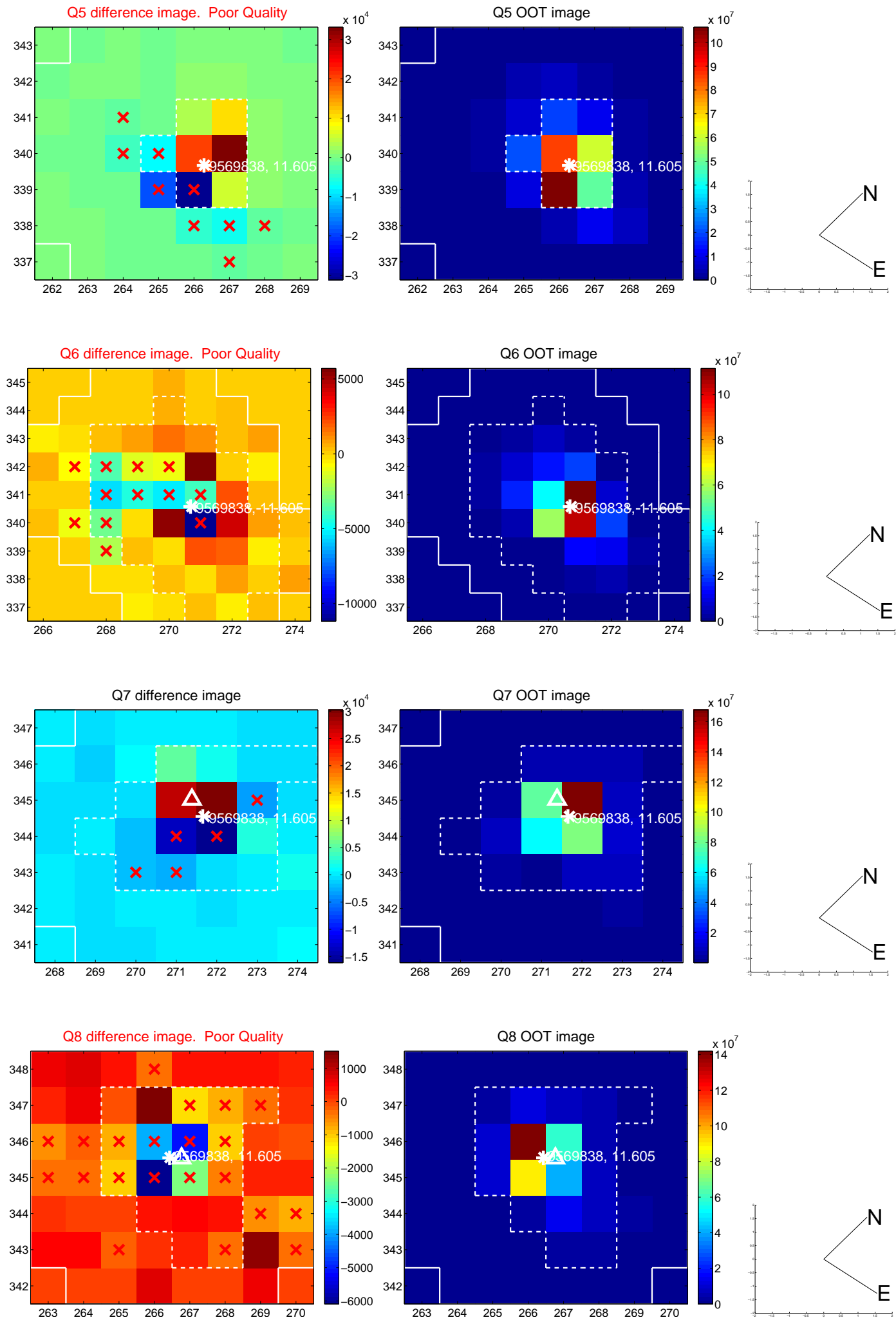


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

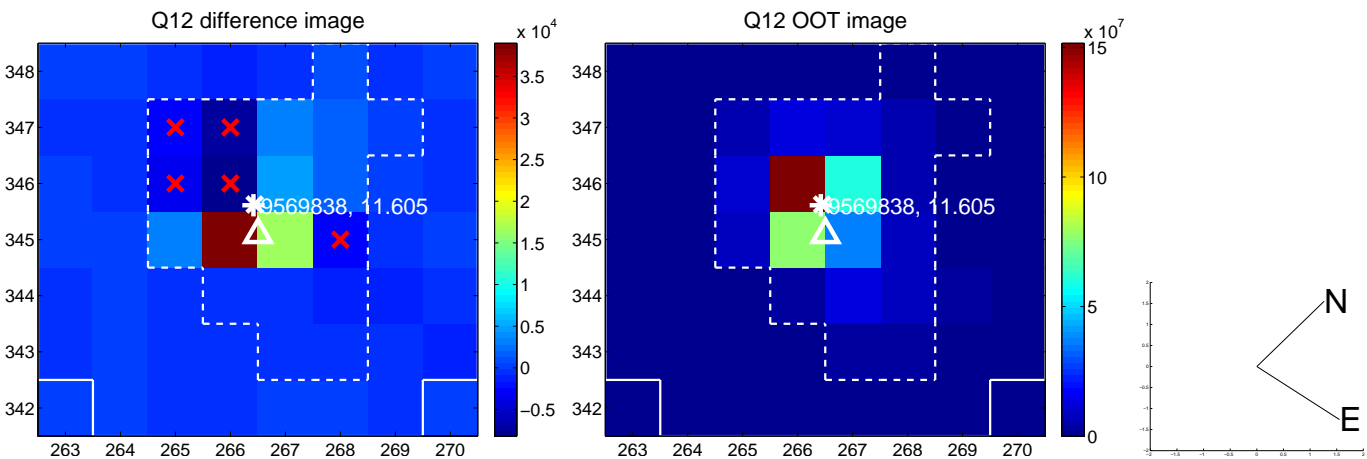
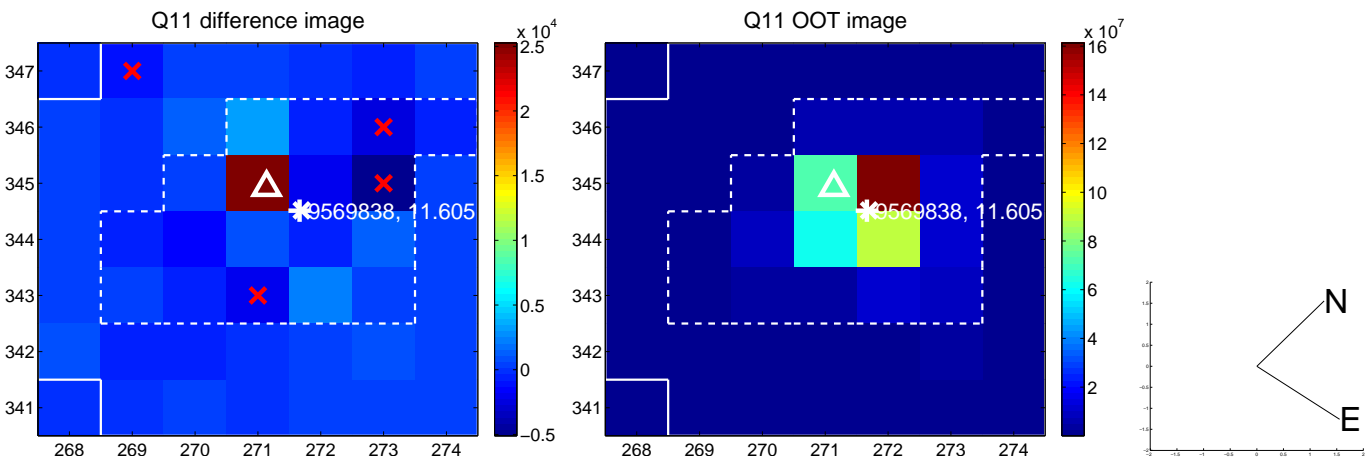
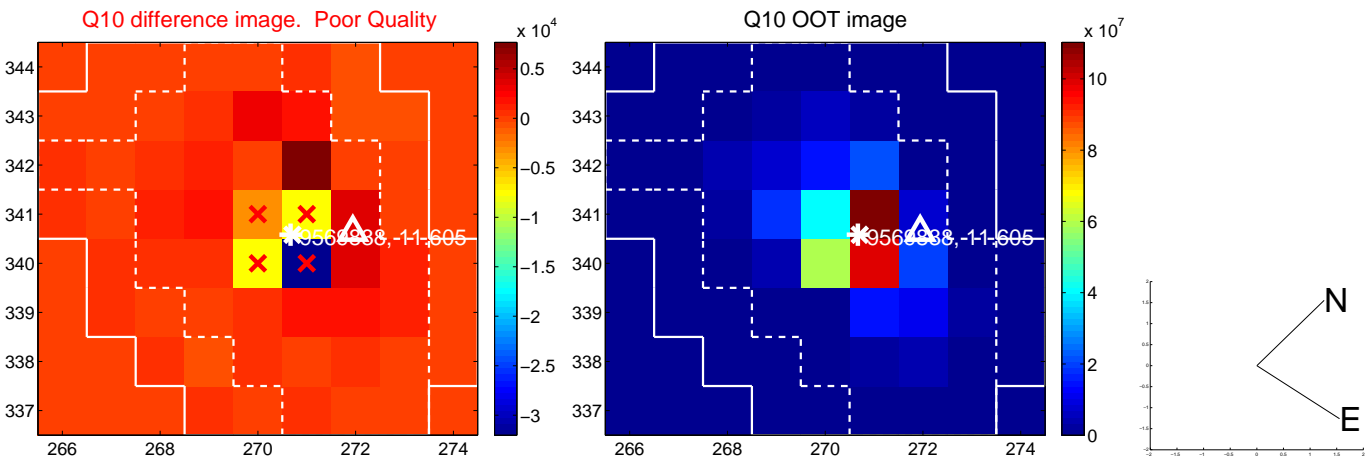
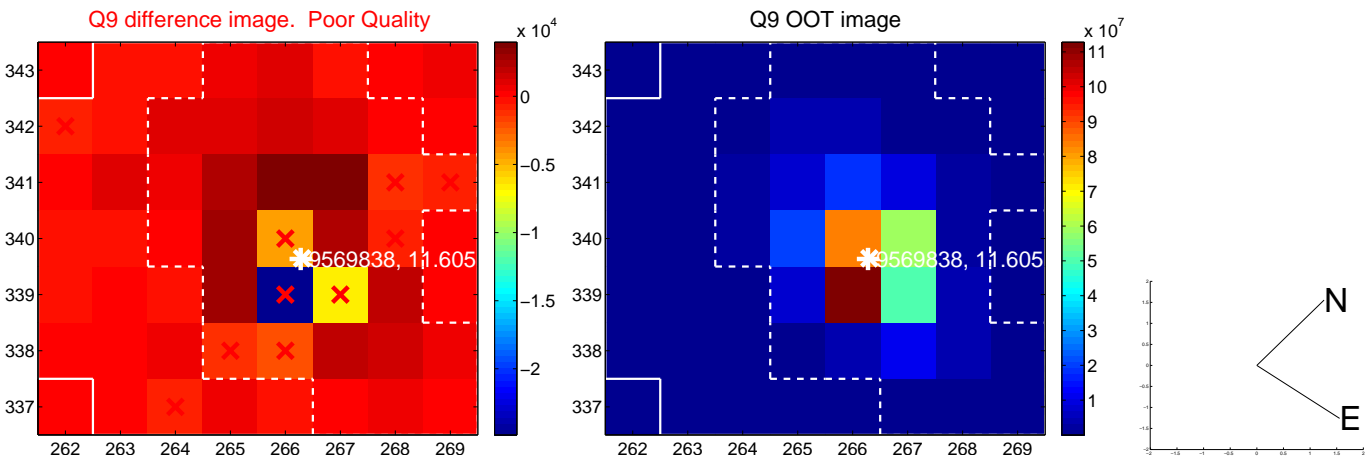


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

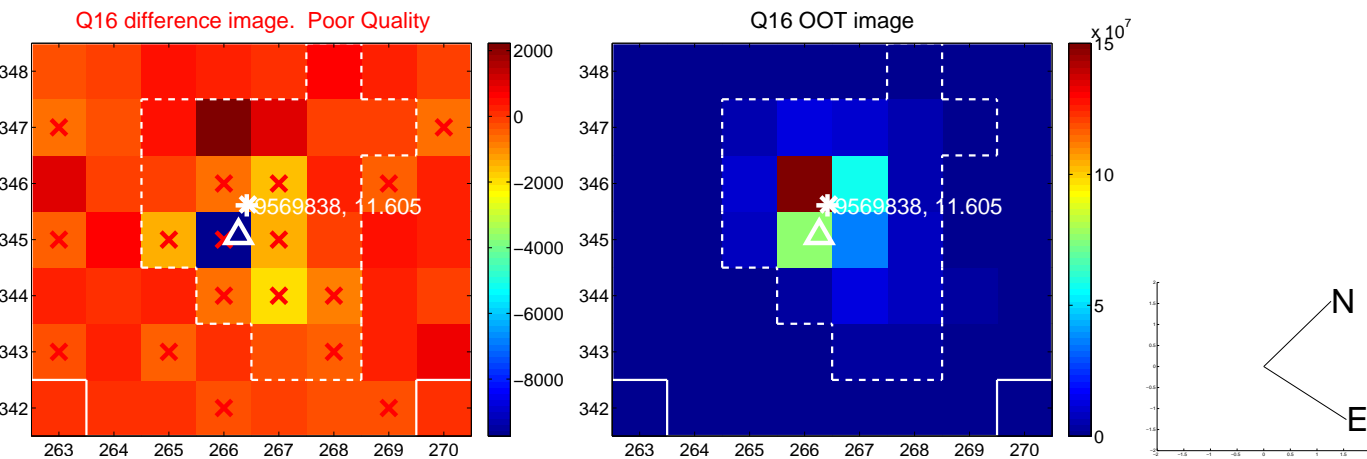
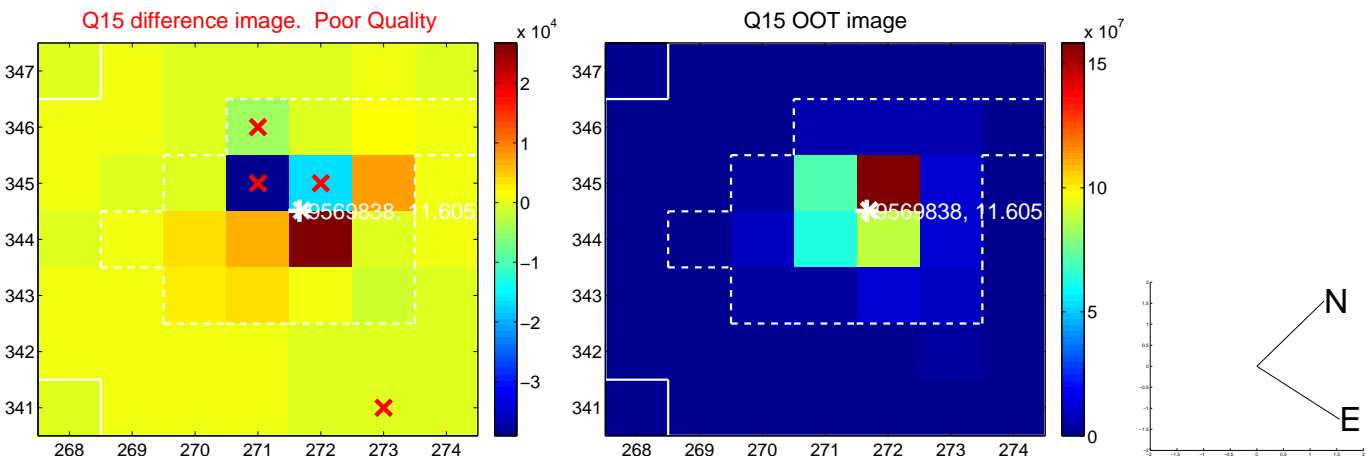
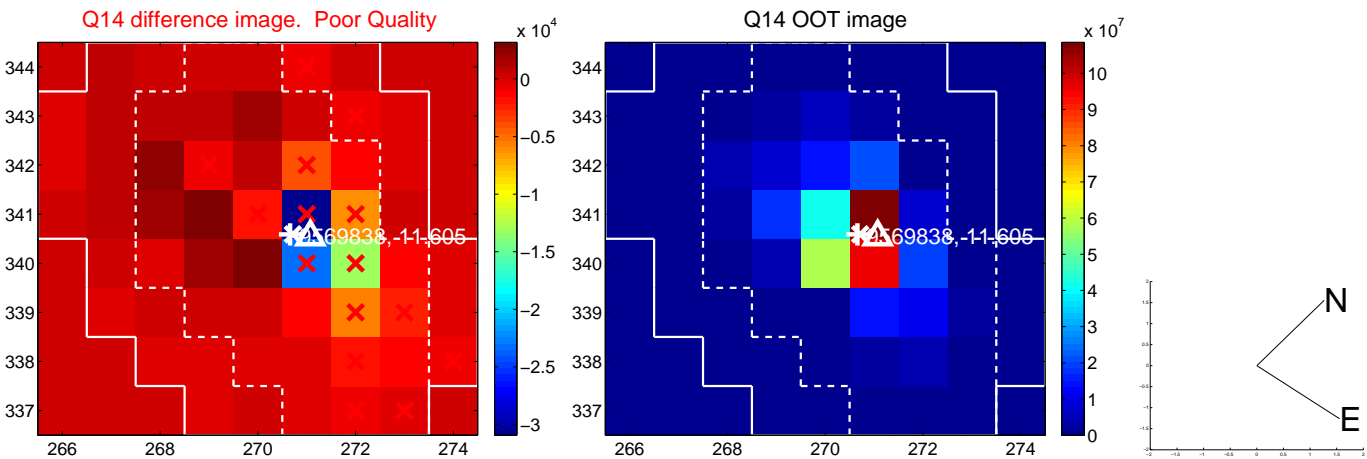
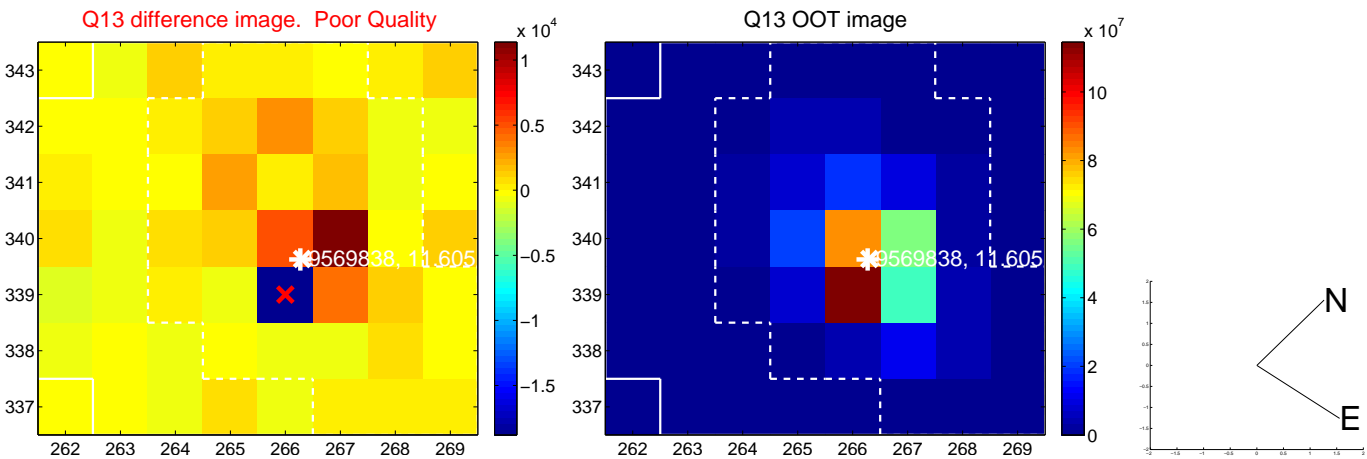




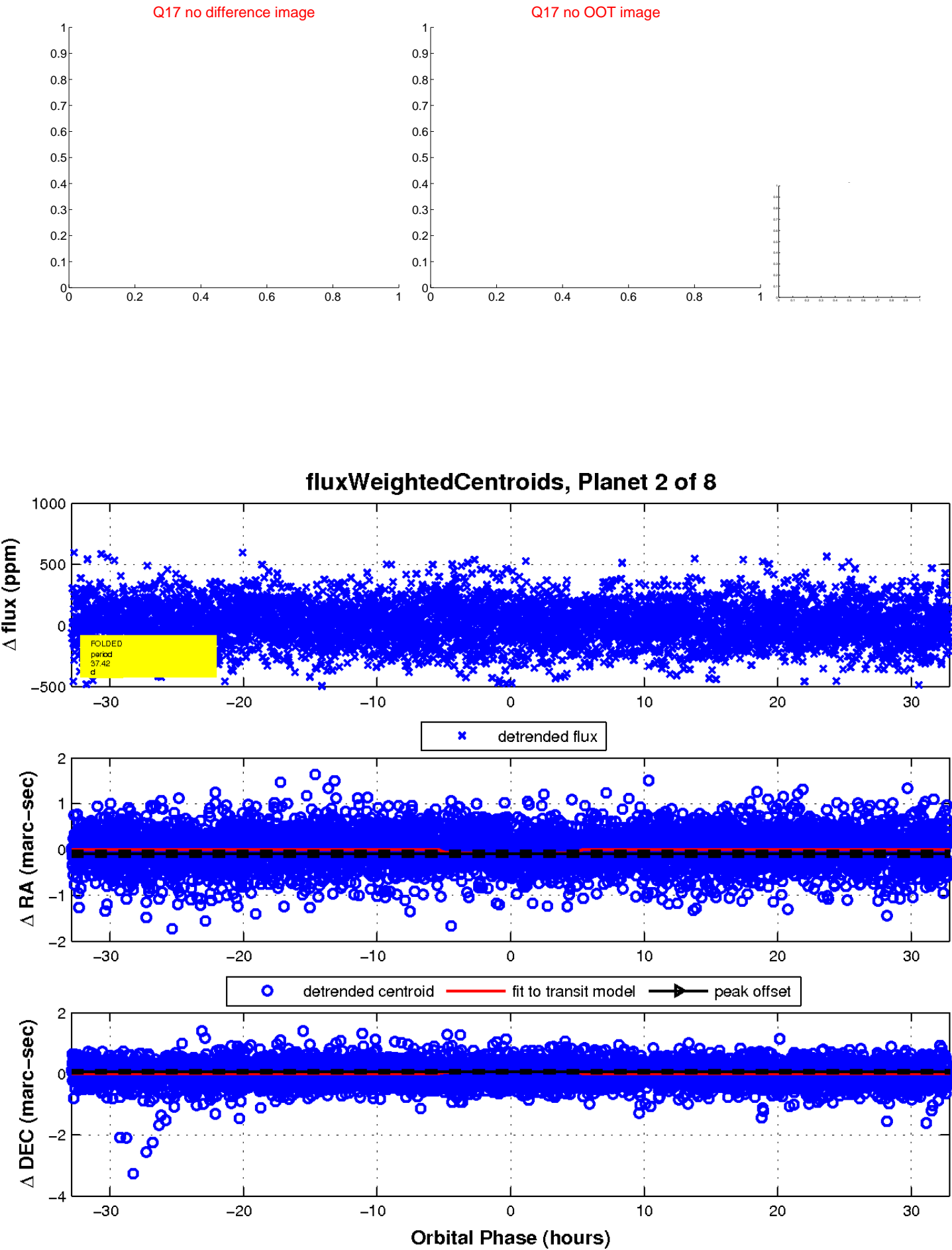
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

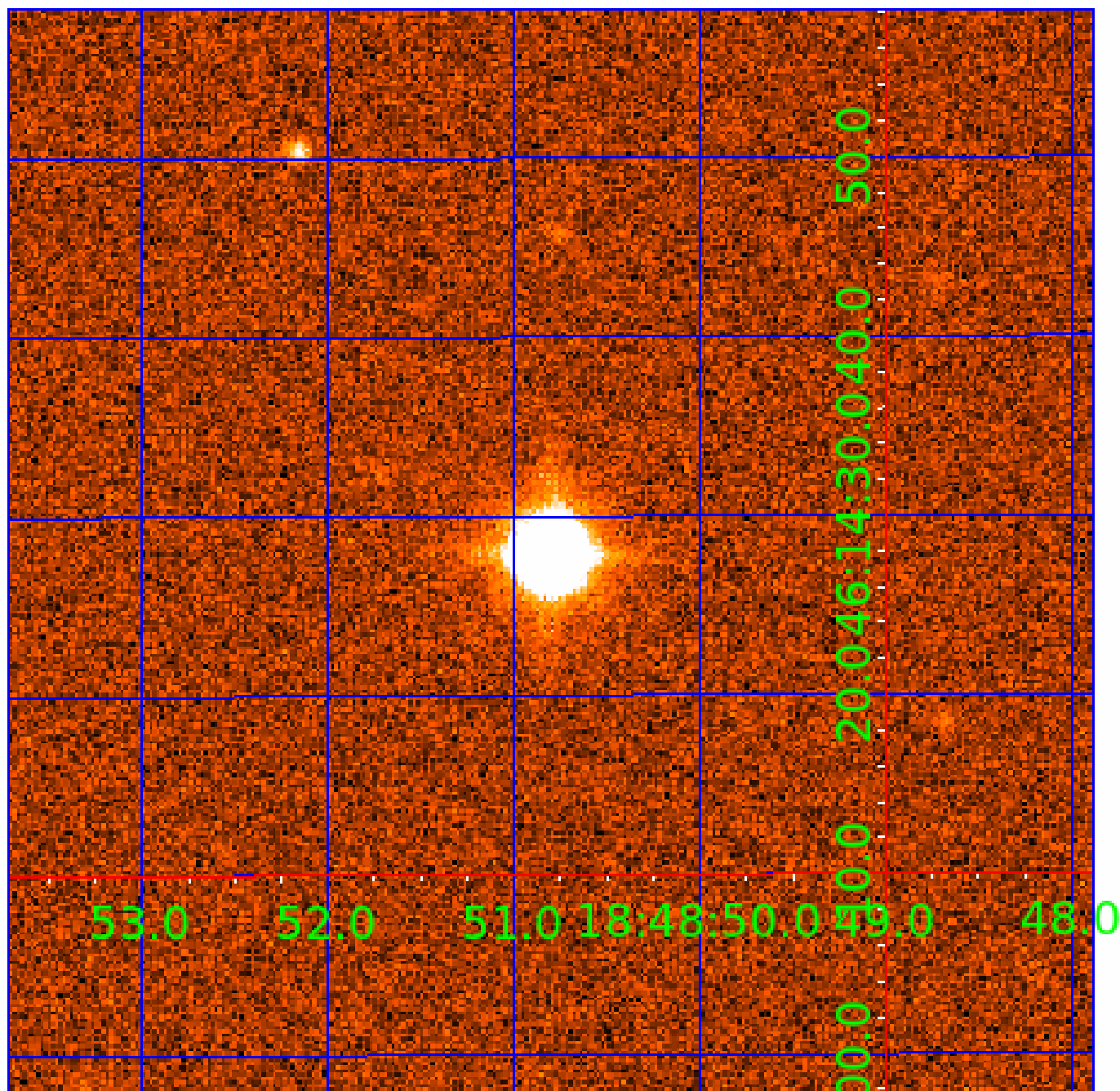


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009569838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009569838-01	OBS	No	2.831767	132.552789	19.4	20.136	8.4	8.7	1.78	6771	0.90	3507.98
009569838-02	OBS	No	37.424710	159.410322	186.5	10.964	21.6	15.0	1.78	6771	2.77	112.27
009569838-03	OBS	No	193.920337	202.089180	350.7	3.695	20.8	17.7	1.78	6771	3.36	12.52
009569838-05	OBS	No	4.511901	132.177940	93.8	4.437	15.3	15.7	1.78	6771	1.90	1885.04
009569838-06	OBS	No	40.924036	145.228300	205.6	3.445	13.0	13.2	1.78	6771	2.81	99.65
009569838-07	OBS	No	29.432804	138.798788	206.7	3.101	13.1	12.9	1.78	6771	2.96	154.65
009569838-08	OBS	No	67.676565	174.057774	309.1	4.570	12.1	12.0	1.78	6771	3.80	50.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009569838-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009569838-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009569838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

**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.

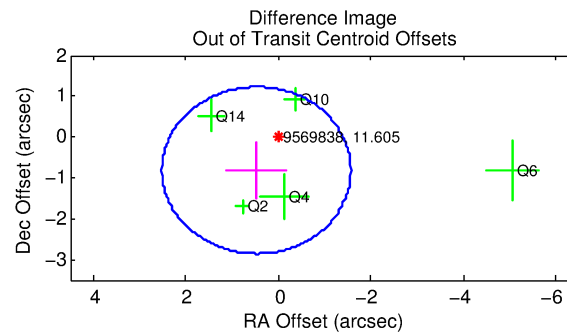
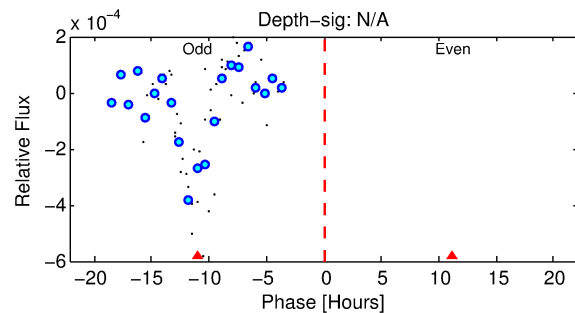
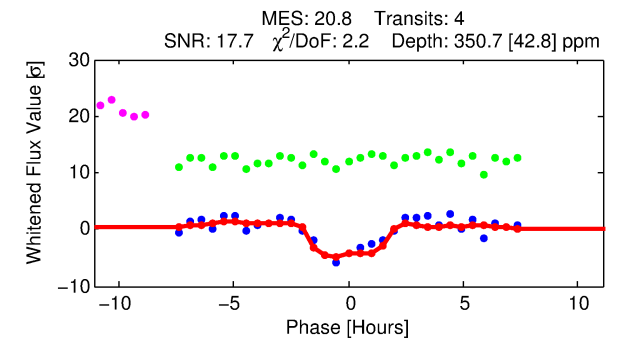
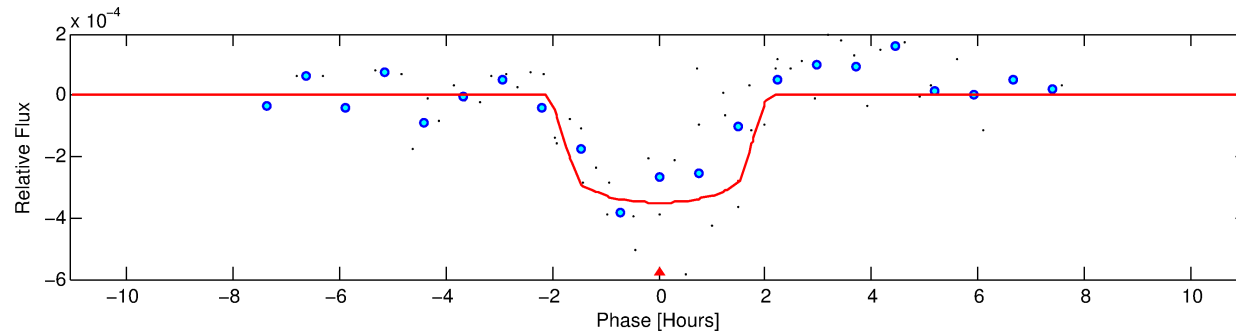
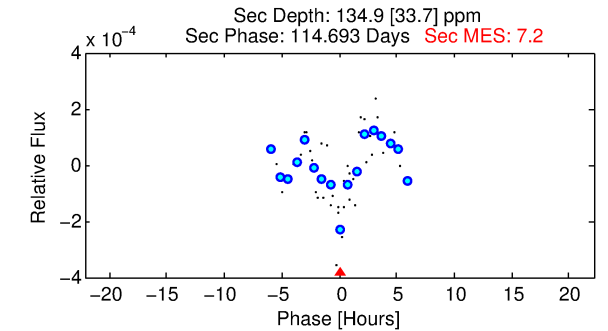
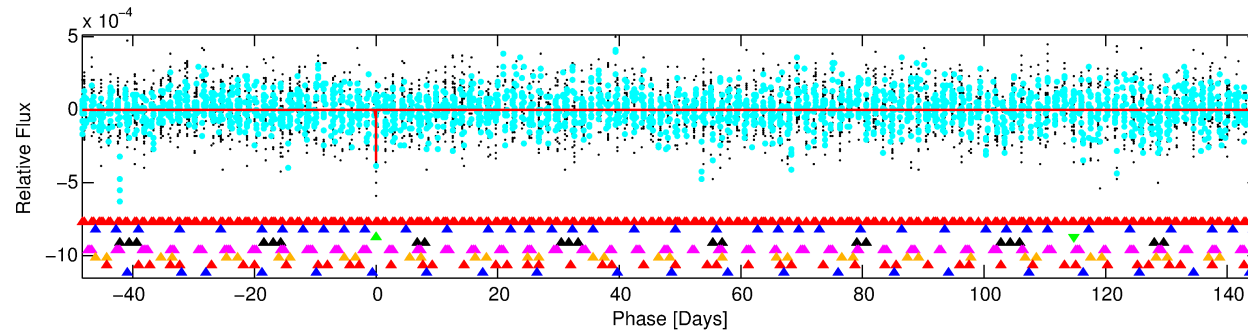
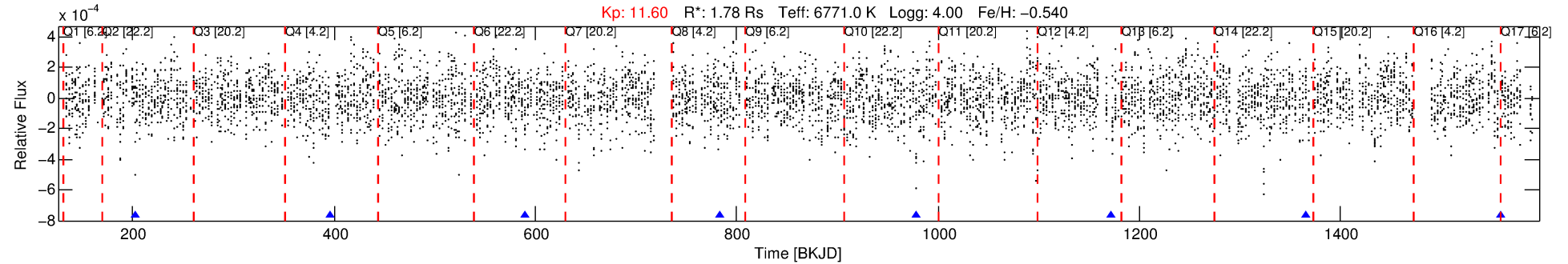
Ephemeris Match Information For 009569838-03

No Significant Match Found



# DV One-Page Summary

KIC: 9569838 Candidate: 3 of 8 Period: 193.920 d



## DV Fit Results:

Period = 193.92034 [0.00199] d  
Epoch = 202.0892 [0.0068] BKJD  
Rp/R\* = 0.0173 [0.0198]  
a/R\* = 404.08 [2522.51]  
b = 0.14 [44.82]  
Seff = 12.52 [7.40]  
Teq = 480 [71] K  
Rp = 3.36 [4.03] Re  
a = 0.6888 [0.2444] AU  
Ag = 3118.04 [7381.80] [0.42] $\sigma$   
Teffp = 5542 [3191] K [1.59] $\sigma$

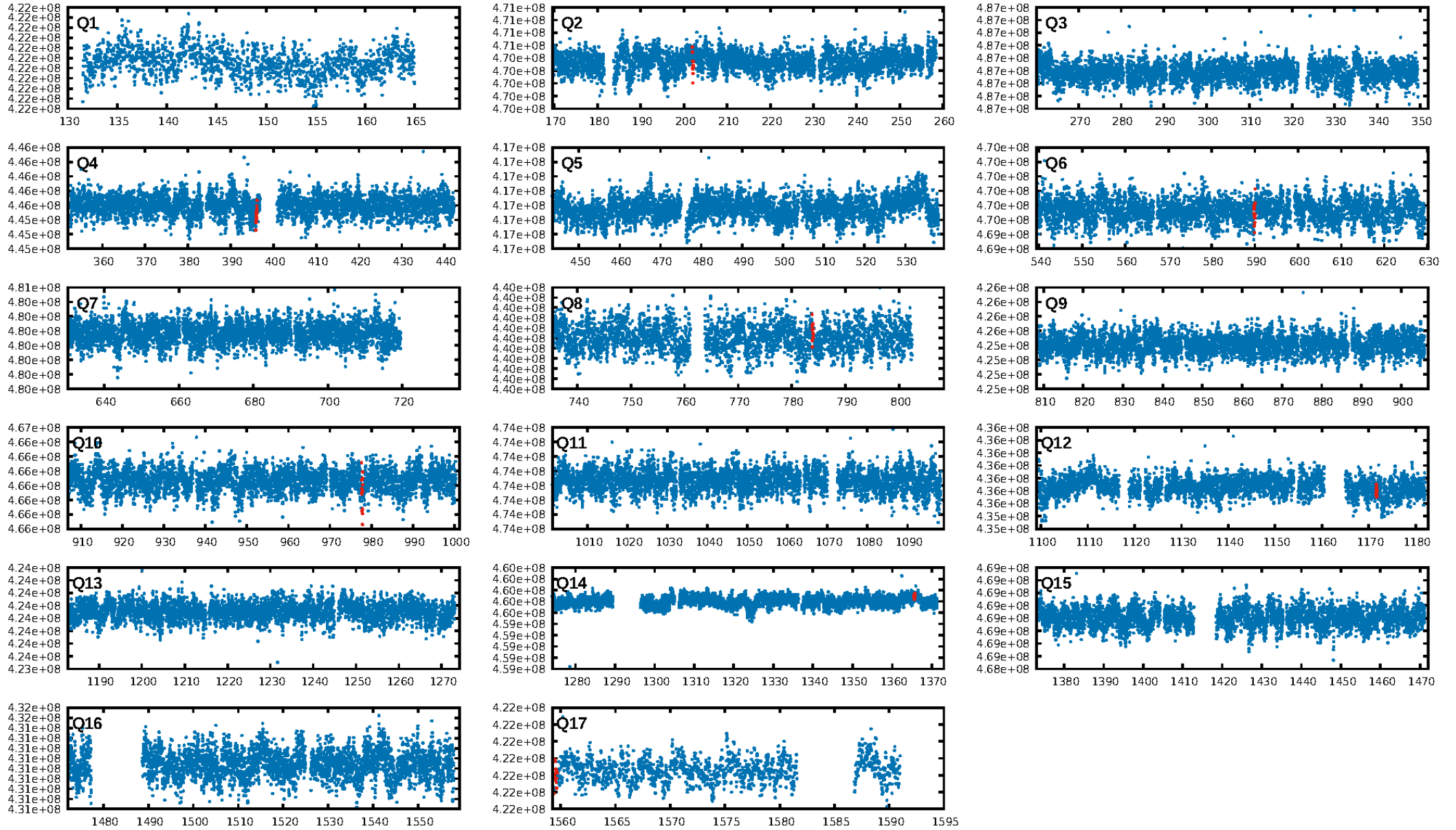
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [593.56] $\sigma$   
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 7.2%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 2.679  
Centroid-sig: 1.0%  
Centroid-so: 0.917 arcsec [1.73] $\sigma$   
OotOffset-rm: 0.944 arcsec [1.39] $\sigma$   
OotOffset-st: 4/0/1/0 [5]  
KicOffset-rm: 0.926 arcsec [1.38] $\sigma$   
KicOffset-st: 4/0/1/0 [5]  
DiffImageQuality-fgm: 0.80 [4/5]  
DiffImageOverlap-fno: 0.67 [4/6]

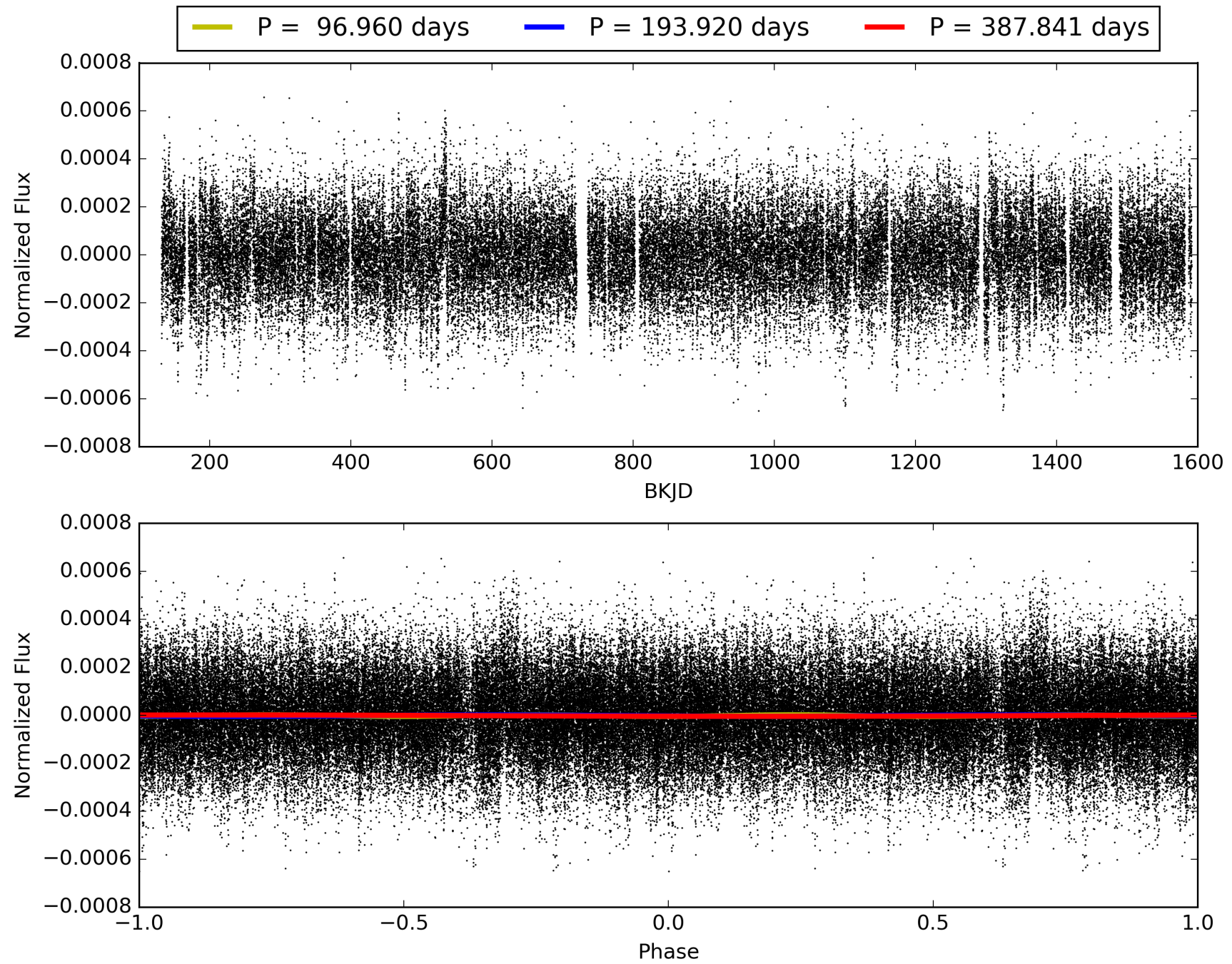
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:20:52 Z

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

# TCE 009569838-03, PDC Light Curves

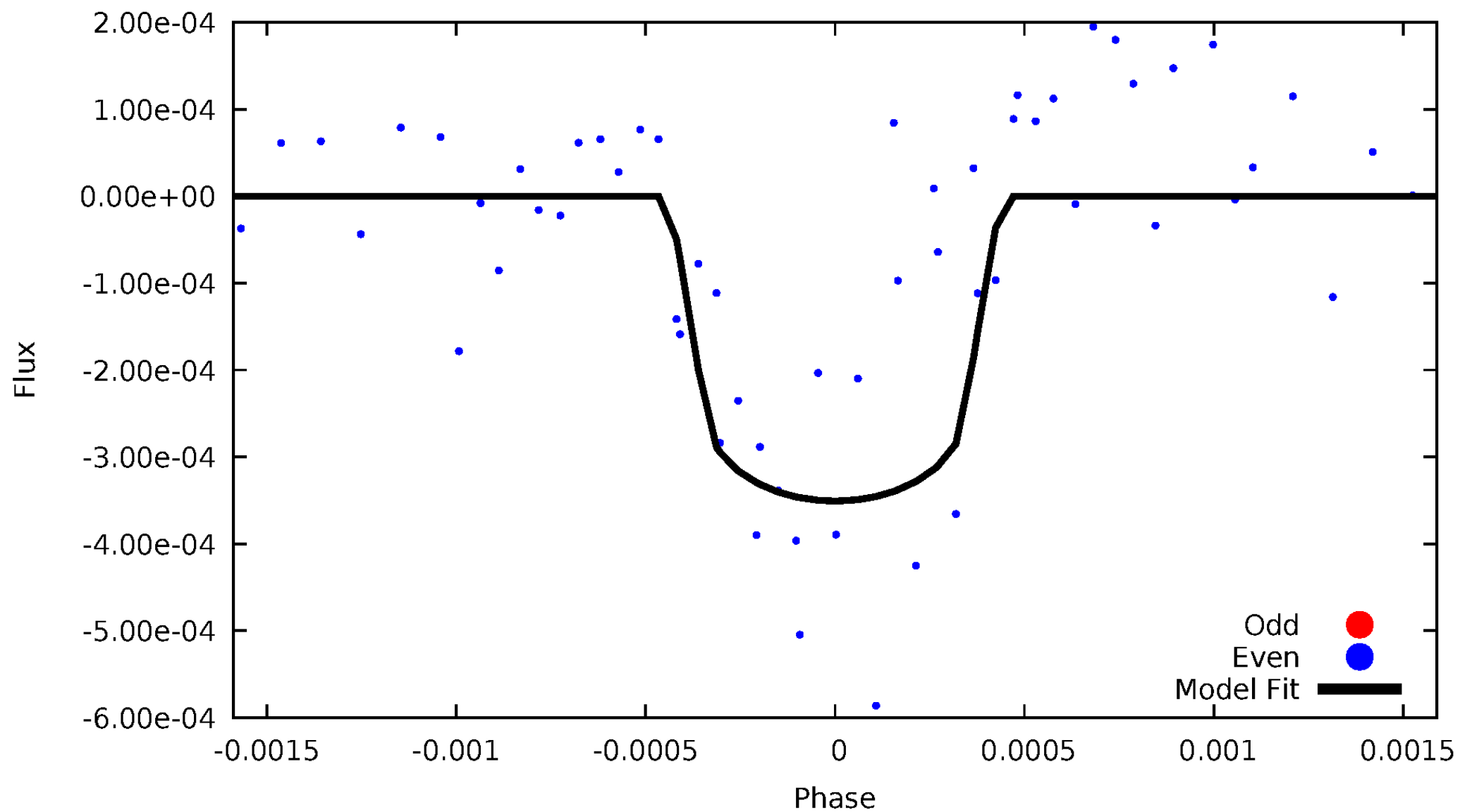


TCE 009569838-03



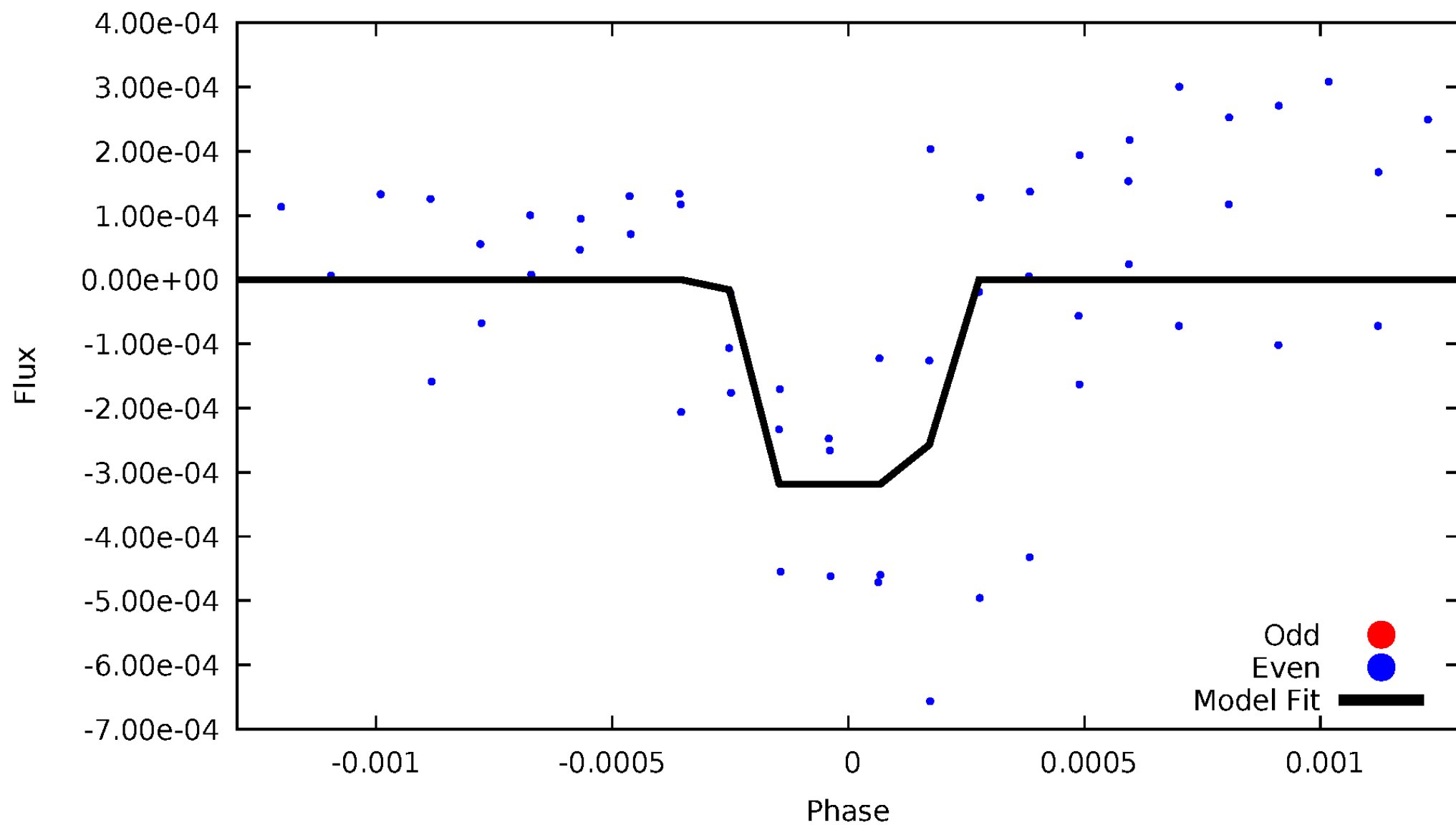
# DV Odd/Even

TCE 009569838-03



# ALT Odd/Even

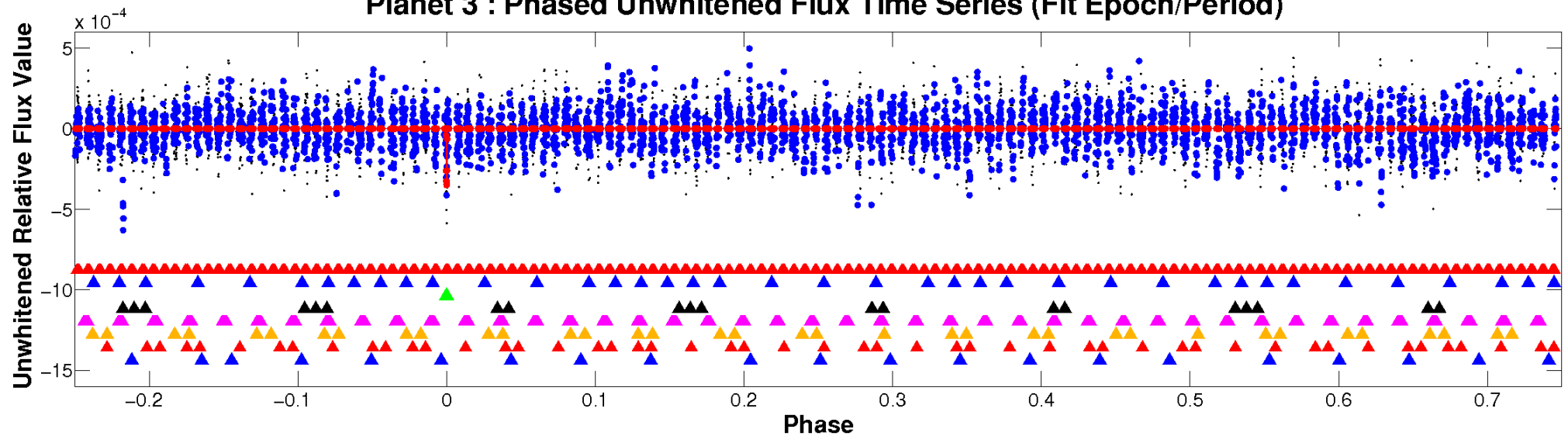
TCE 009569838-03



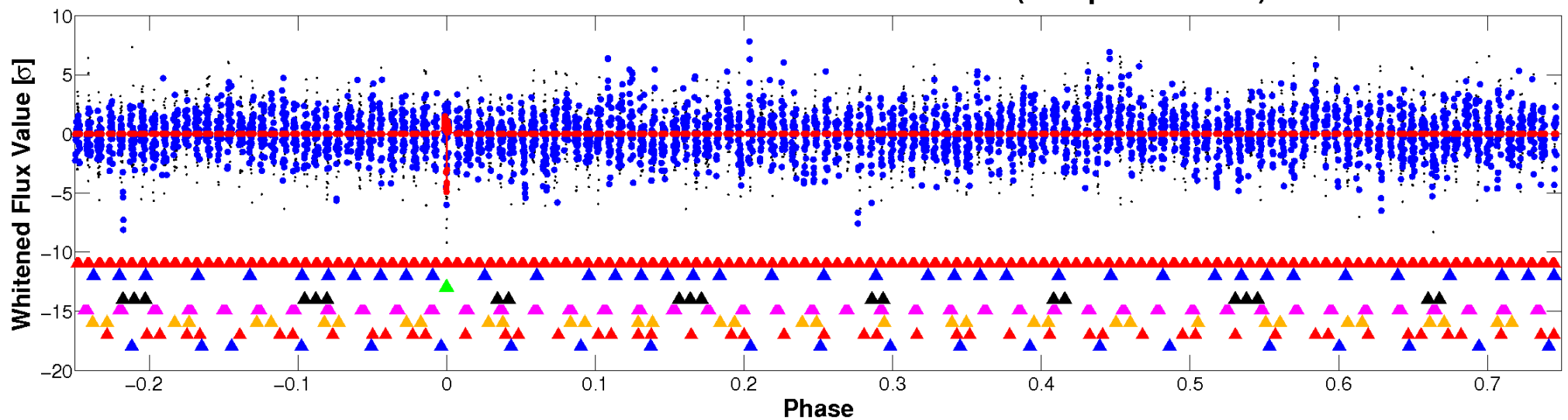


# Non-Whitened Vs. Whitened Light Curve

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



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



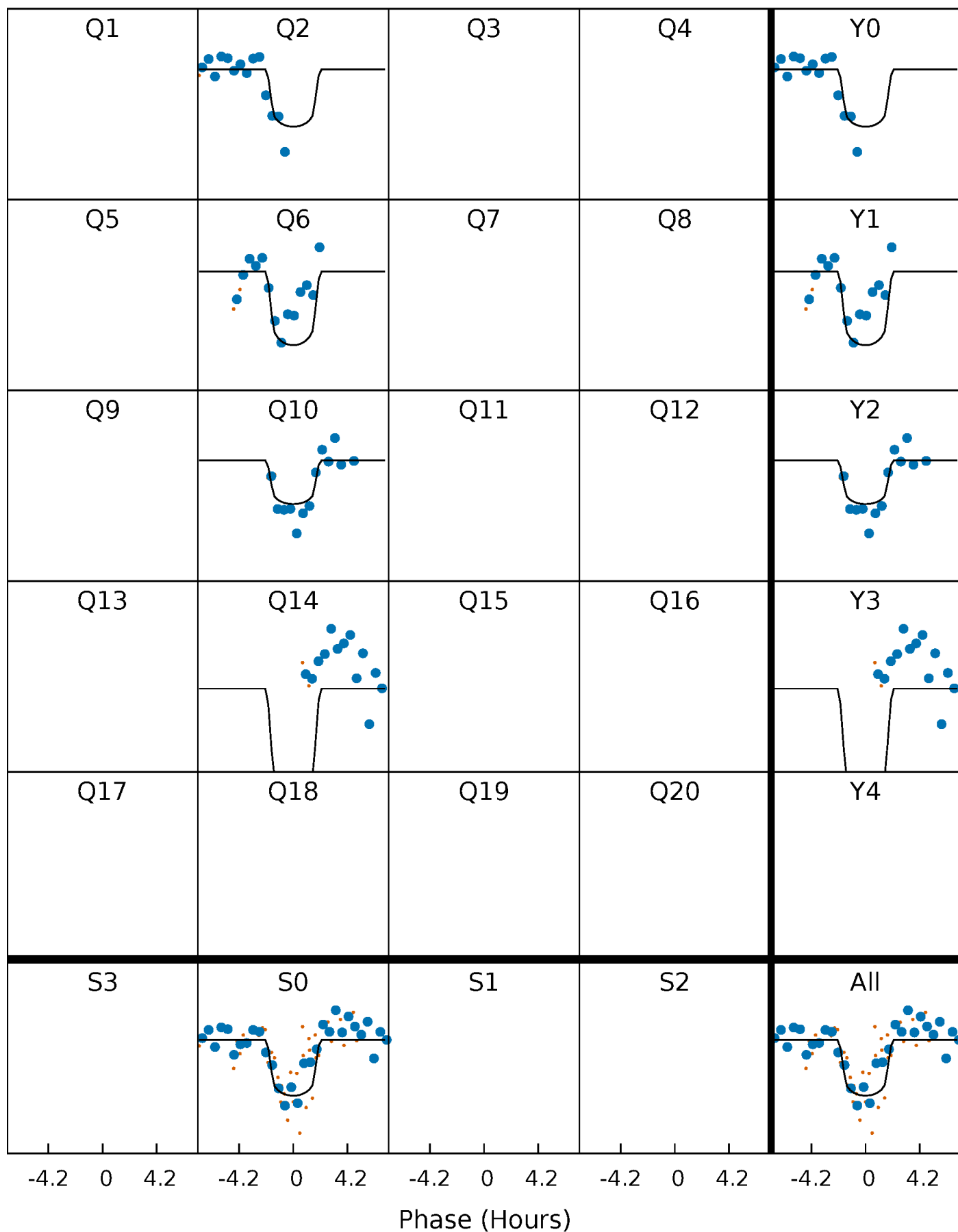
# PDC Quarter-Phased Transit Curves

TCE 009569838-03     $P=193.920337$  Days     $T_0=202.089180$  (BKJD)



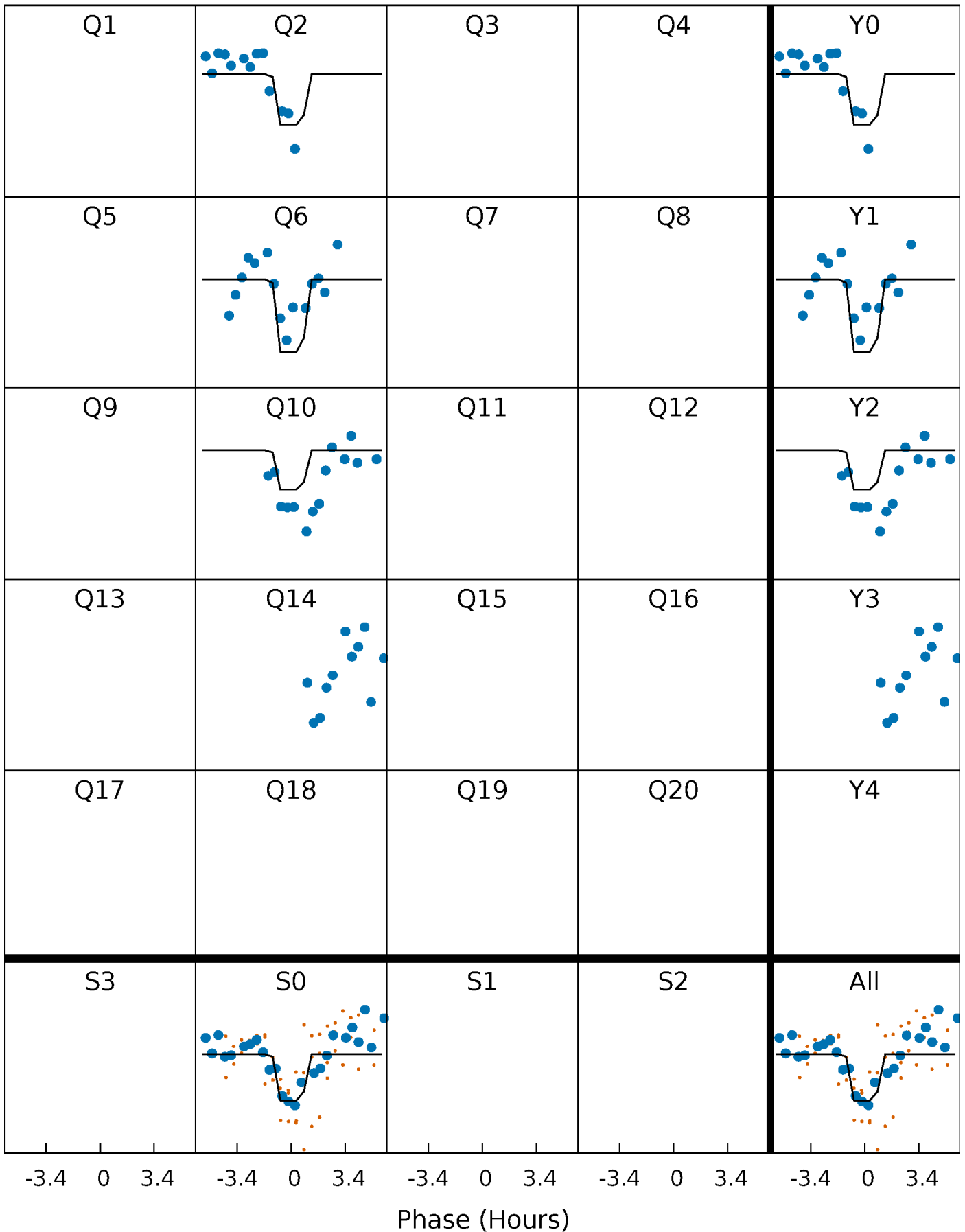
# DV Quarter-Phased Transit Curves

TCE 009569838-03 P=193.920337 Days  $T_0=202.089180$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

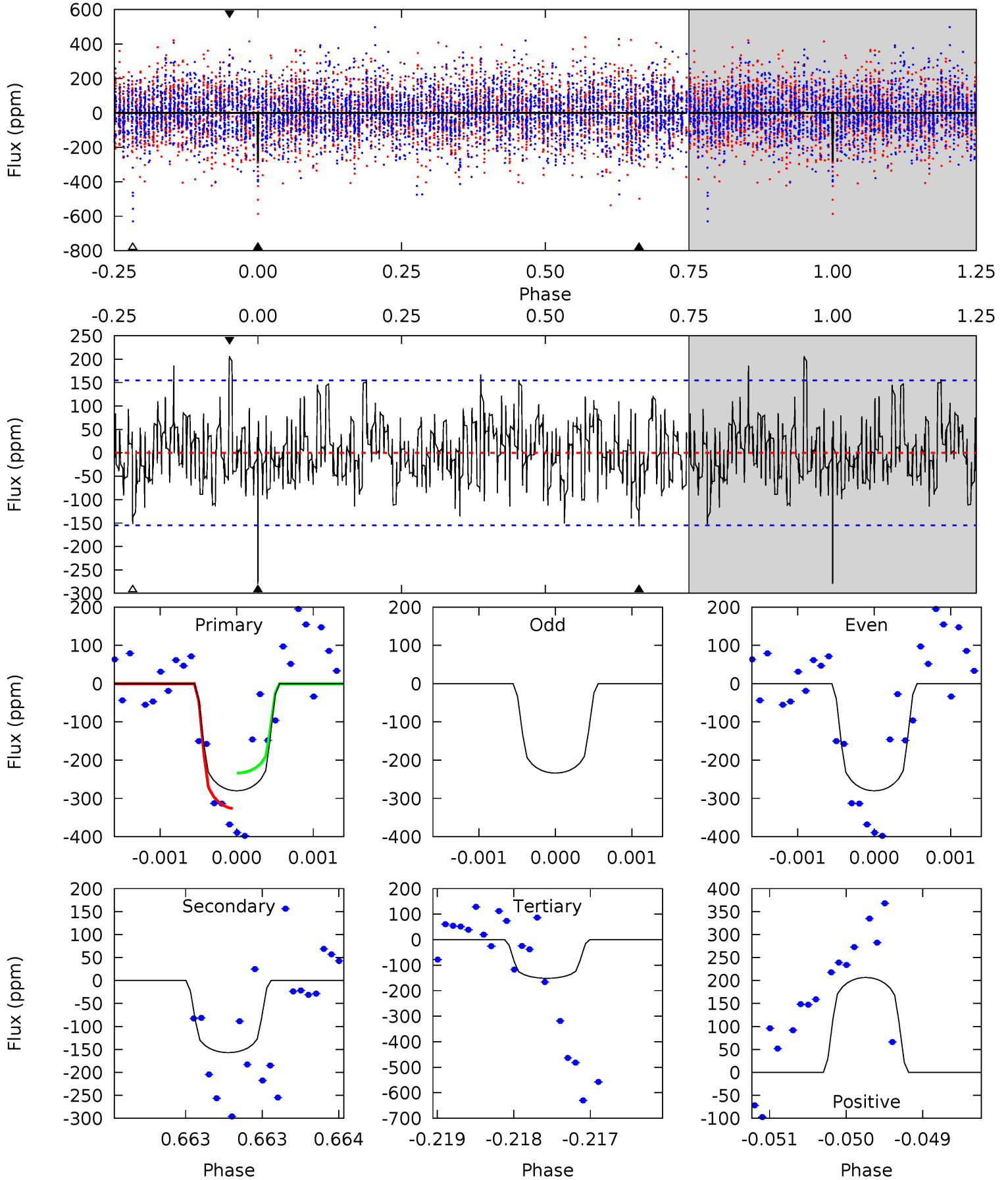
TCE 009569838-03 P=193.924802 Days  $T_0=202.058763$  (BKJD)



# DV Model-Shift Uniqueness Test

009569838-03, P = 193.920337 Days, E = 8.168843 Days

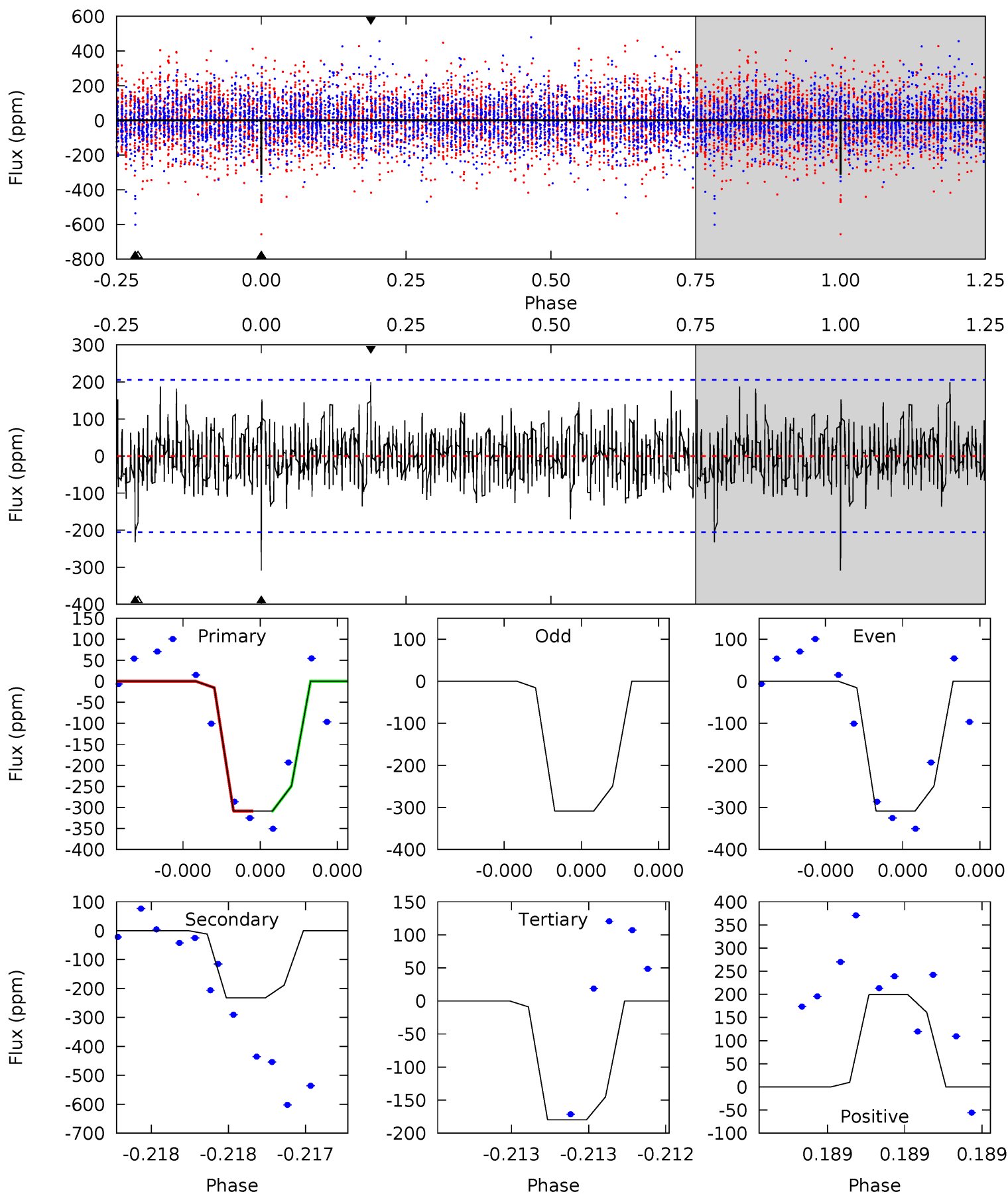
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.92	5.56	5.37	7.32	5.48	3.34	1.87	4.55	2.60	0.19	-1.75	0.95	0.81	0.42	1.64



# Alt Model-Shift Uniqueness Test

009569838-03, P = 193.924802 Days, E = 8.133961 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.41	6.33	4.90	5.43	5.60	3.52	1.38	3.52	2.98	1.44	0.91	0.00	1.07	0.39	0.00





### Stellar Parameters For KIC 009569838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$\rho_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6771^{+214}_{-262}$	$4.003^{+0.336}_{-0.144}$	$-0.540^{+0.250}_{-0.300}$	$1.776^{+0.433}_{-0.649}$	$1.157^{+0.189}_{-0.170}$	$0.291^{+0.708}_{-0.119}$
	+3%/-4%	+8%/-4%	+46%/-56%	+24%/-37%	+16%/-15%	+243%/-41%
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 009569838-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-157 \pm 28$	$4.19^{+3.08}_{-2.68}$	$656^{+52}_{-59}$	$5012^{+3338}_{-968}$	$2235^{+14285}_{-1484}$
Alt.	$-232 \pm 37$	$4.09^{+3.55}_{-2.57}$	$658^{+53}_{-67}$	$5622^{+4335}_{-1257}$	$3723^{+22120}_{-2671}$

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

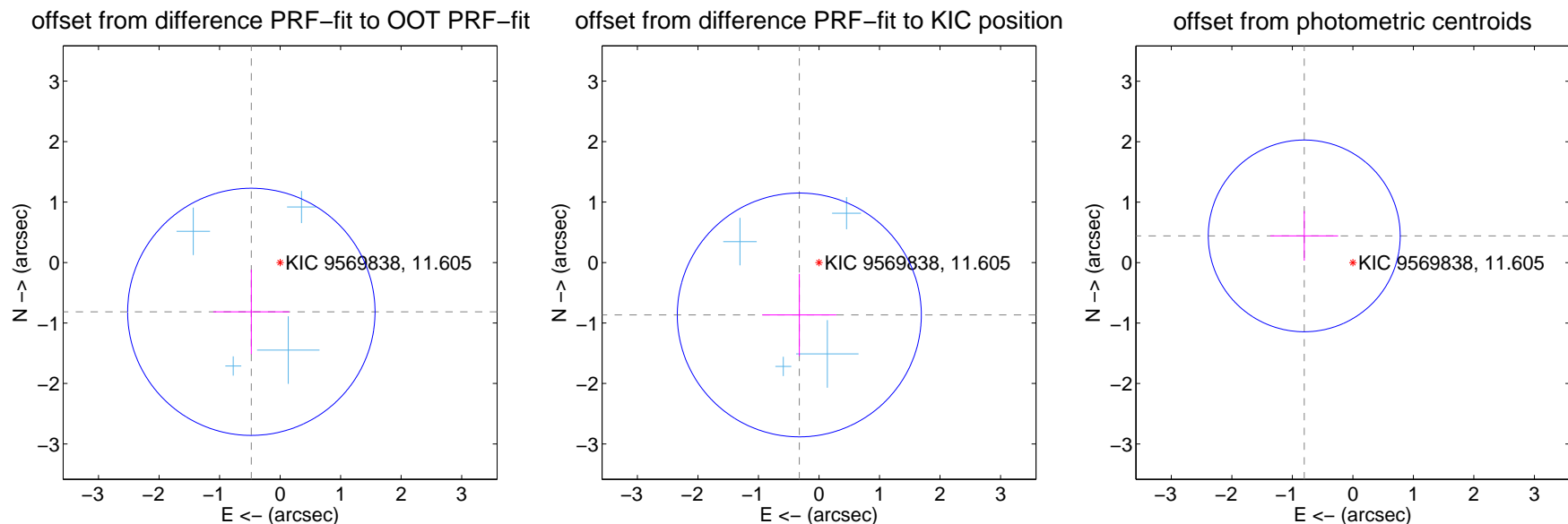
## DV Centroid Data

Supplemental centroid analysis for 009569838-03. **Kepler magnitude: 11.61.** Transit SNR 17.66

There are 4 quarters with good PRF difference image offsets

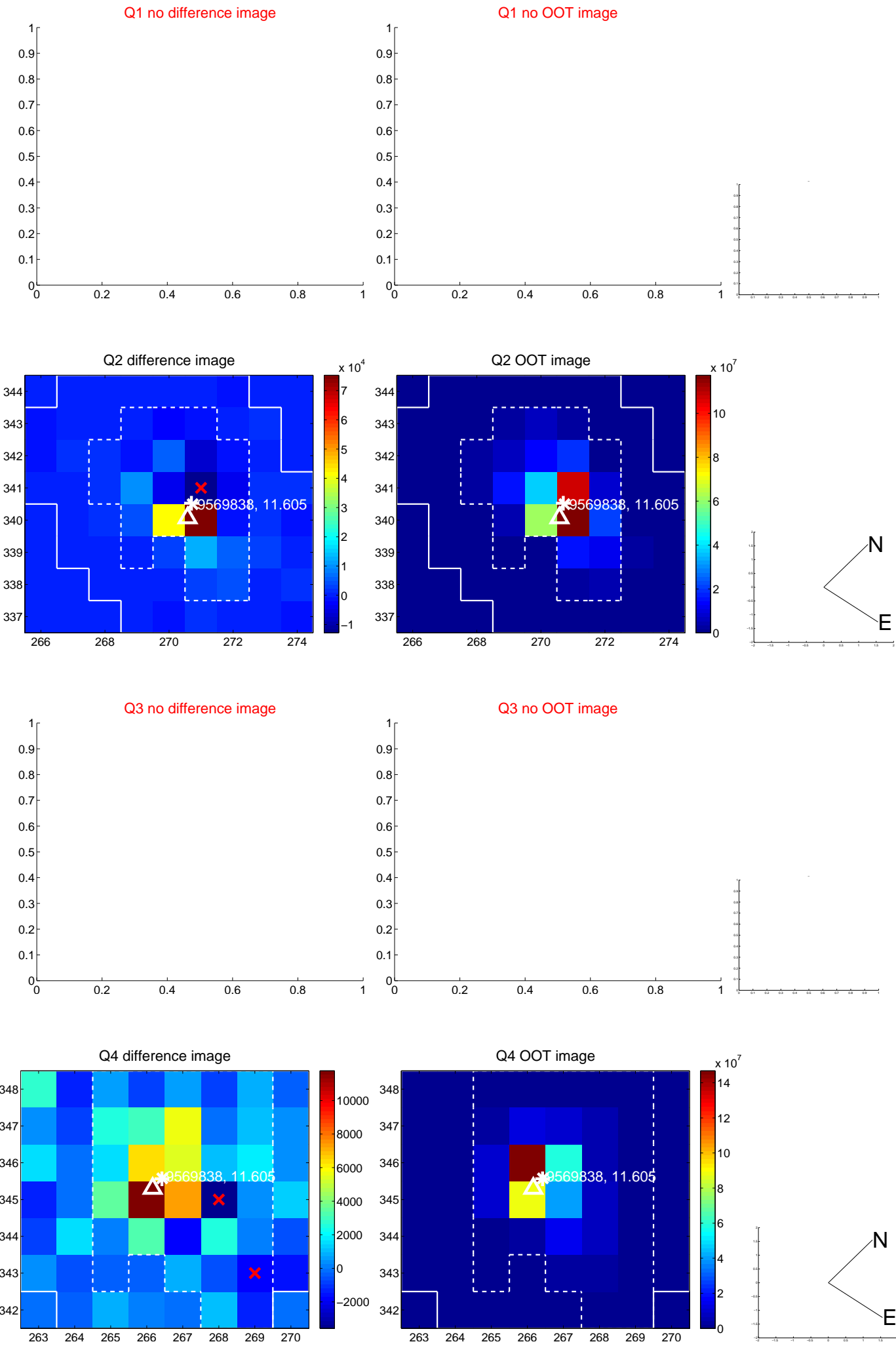
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.944 \pm 0.681$	1.39	$0.475 \pm 0.628$	$-0.815 \pm 0.698$
PRF-fit source offset from KIC position	$0.926 \pm 0.672$	1.38	$0.325 \pm 0.613$	$-0.867 \pm 0.680$
photometric centroid source offset	$0.92 \pm 0.53$	1.73	$0.80 \pm 0.56$	$0.44 \pm 0.41$

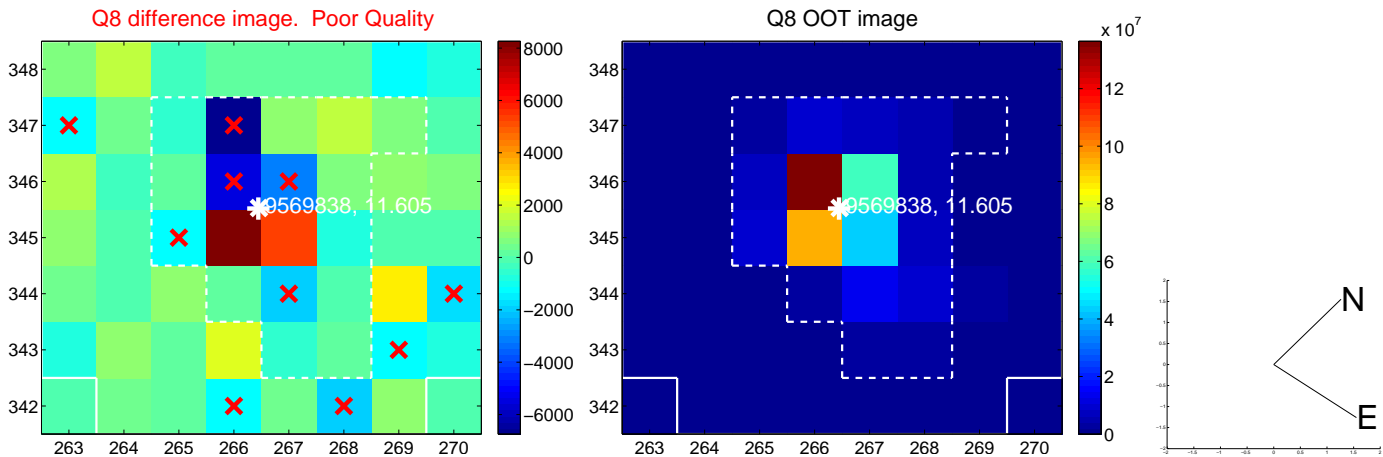
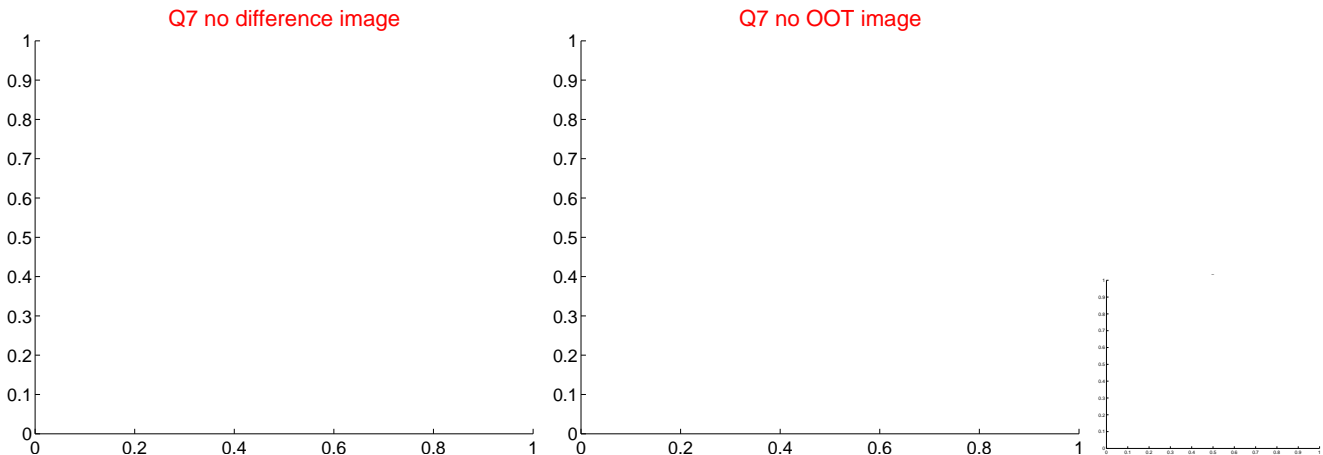
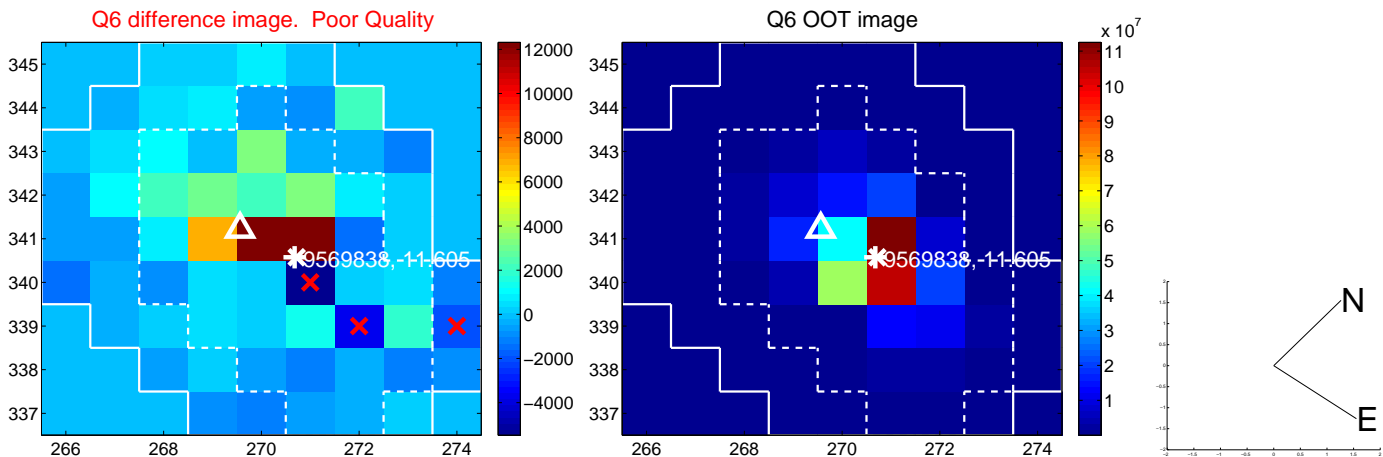
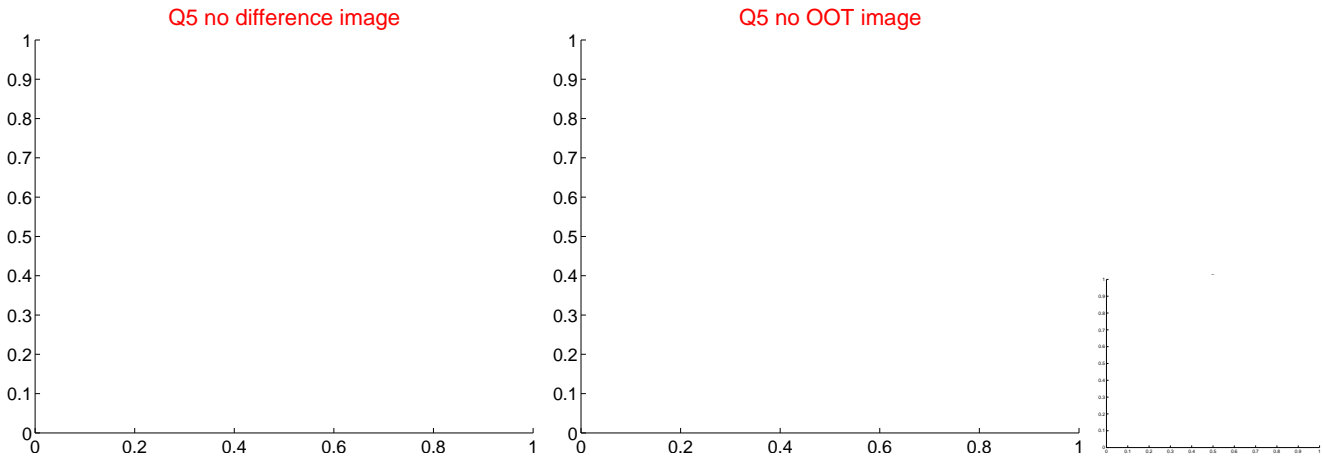


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

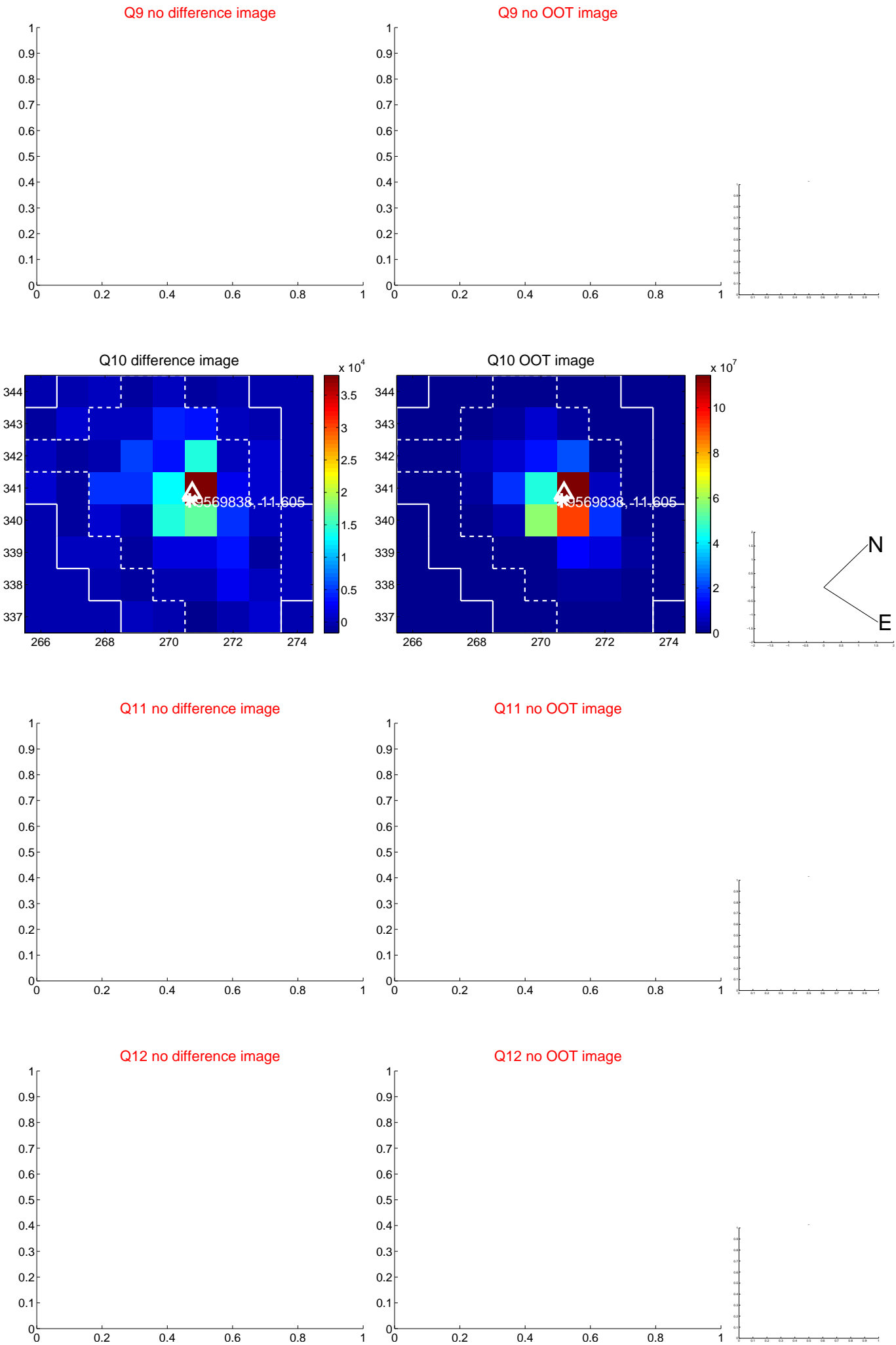
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



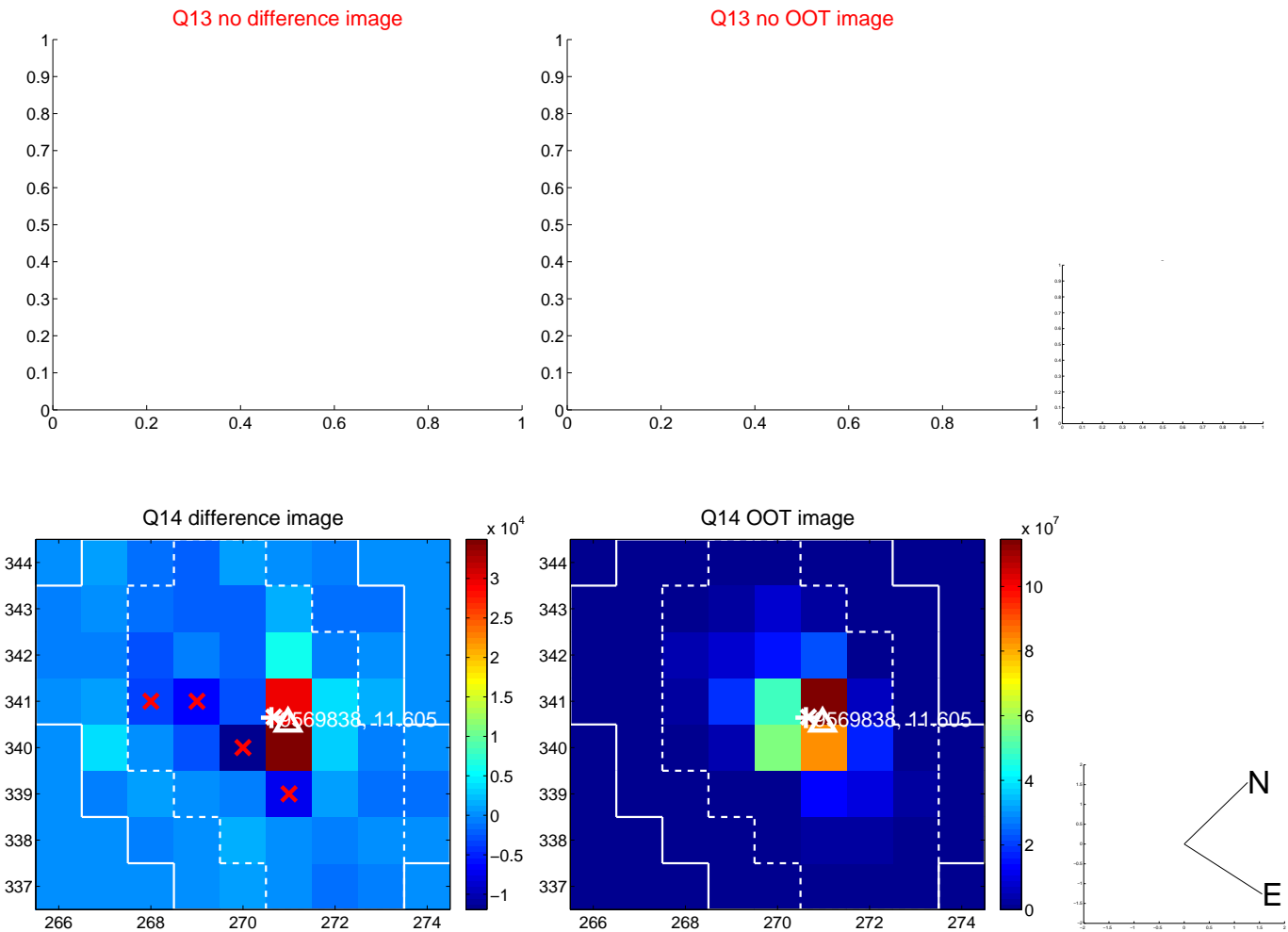
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

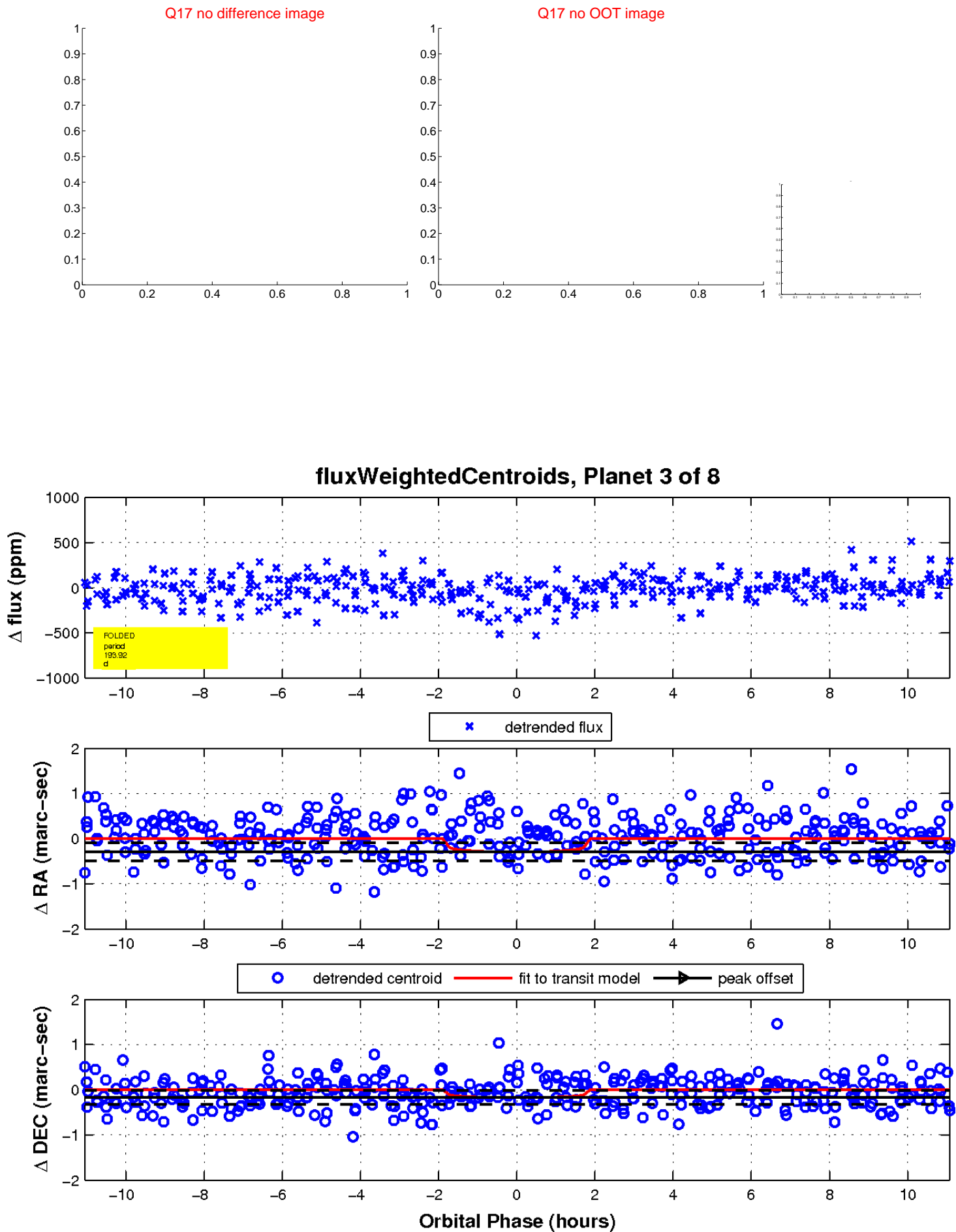


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



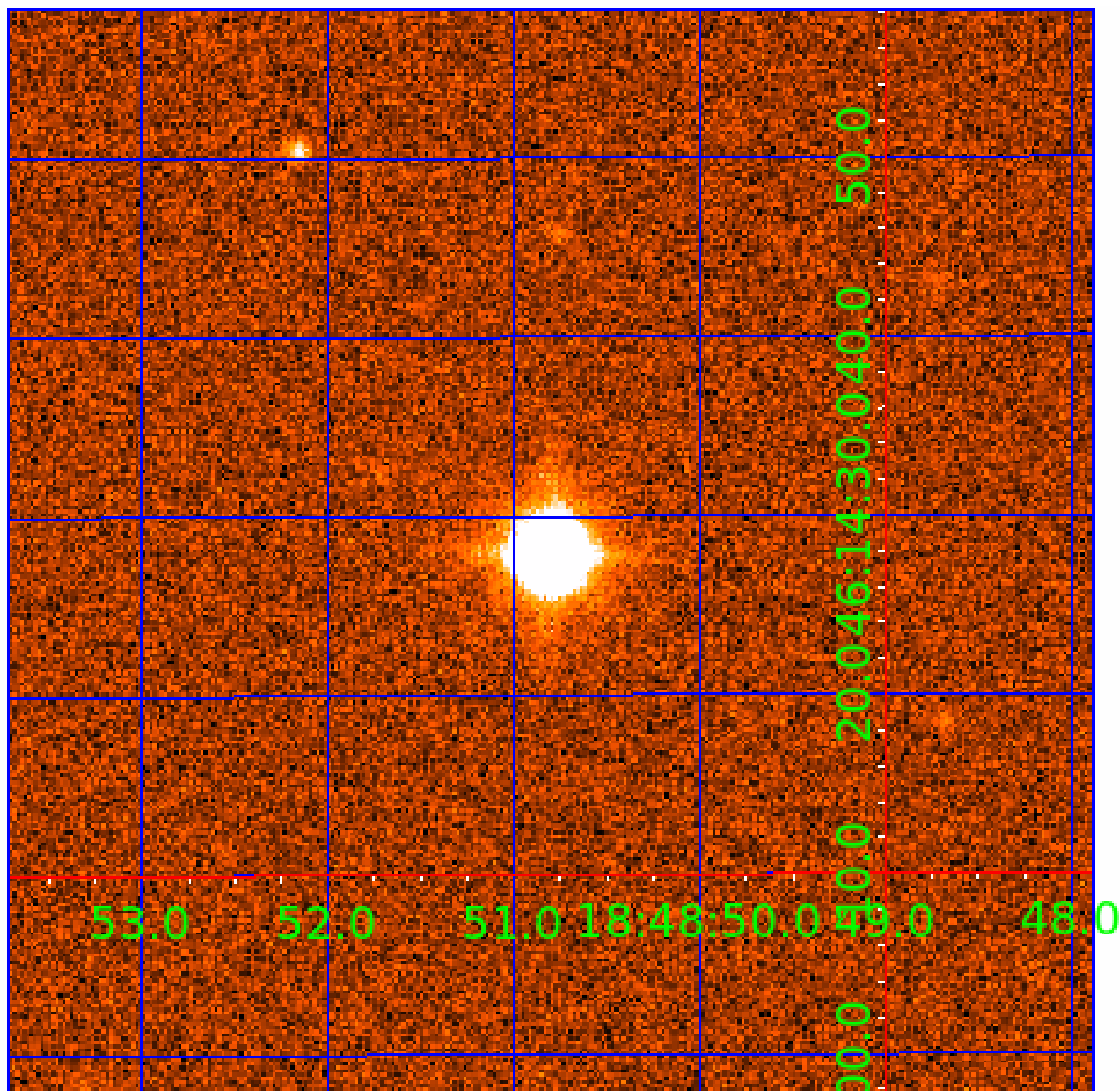


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009569838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009569838-01	OBS	No	2.831767	132.552789	19.4	20.136	8.4	8.7	1.78	6771	0.90	3507.98
009569838-02	OBS	No	37.424710	159.410322	186.5	10.964	21.6	15.0	1.78	6771	2.77	112.27
009569838-03	OBS	No	193.920337	202.089180	350.7	3.695	20.8	17.7	1.78	6771	3.36	12.52
009569838-05	OBS	No	4.511901	132.177940	93.8	4.437	15.3	15.7	1.78	6771	1.90	1885.04
009569838-06	OBS	No	40.924036	145.228300	205.6	3.445	13.0	13.2	1.78	6771	2.81	99.65
009569838-07	OBS	No	29.432804	138.798788	206.7	3.101	13.1	12.9	1.78	6771	2.96	154.65
009569838-08	OBS	No	67.676565	174.057774	309.1	4.570	12.1	12.0	1.78	6771	3.80	50.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009569838-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009569838-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009569838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

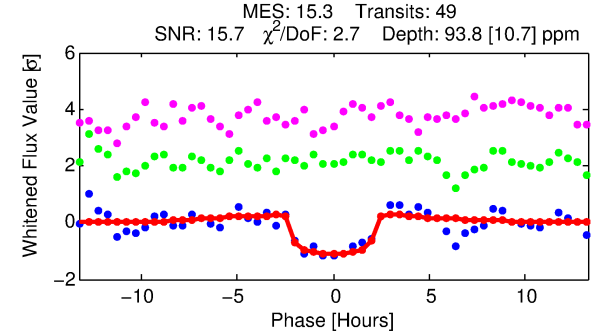
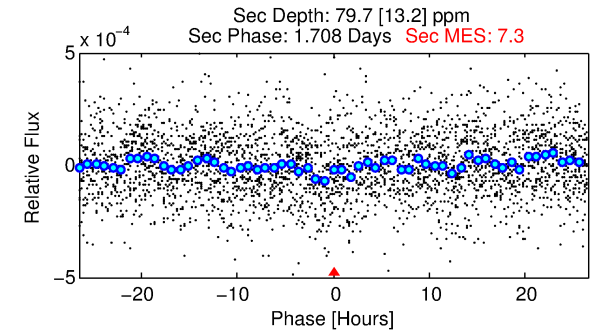
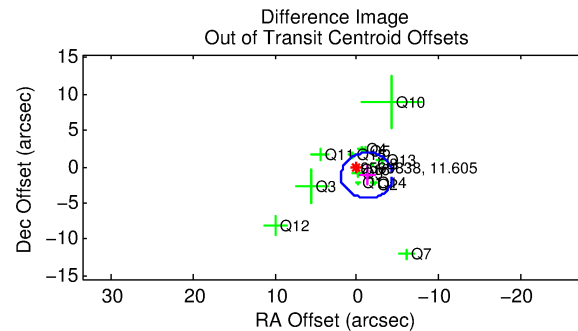
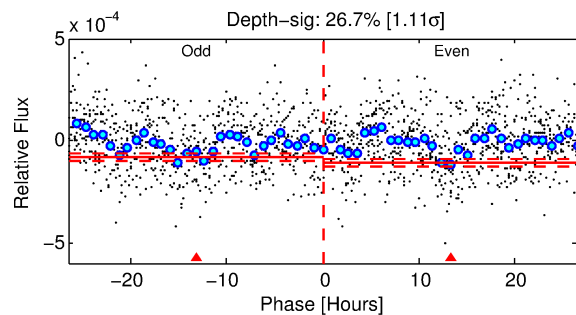
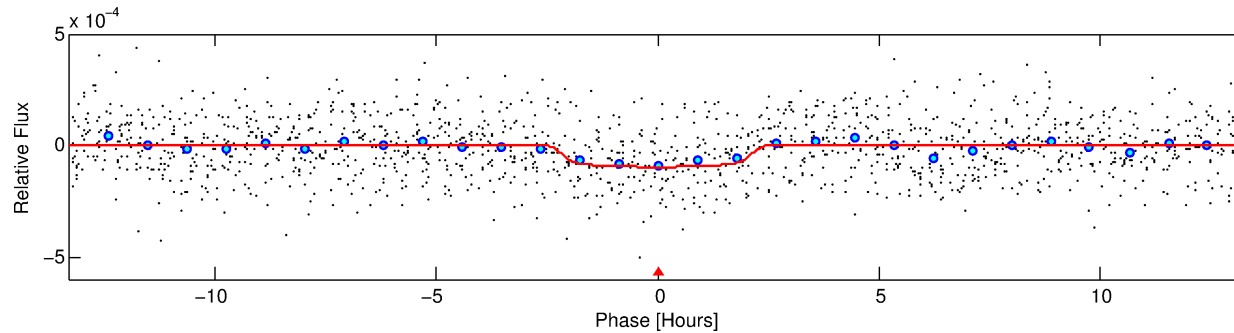
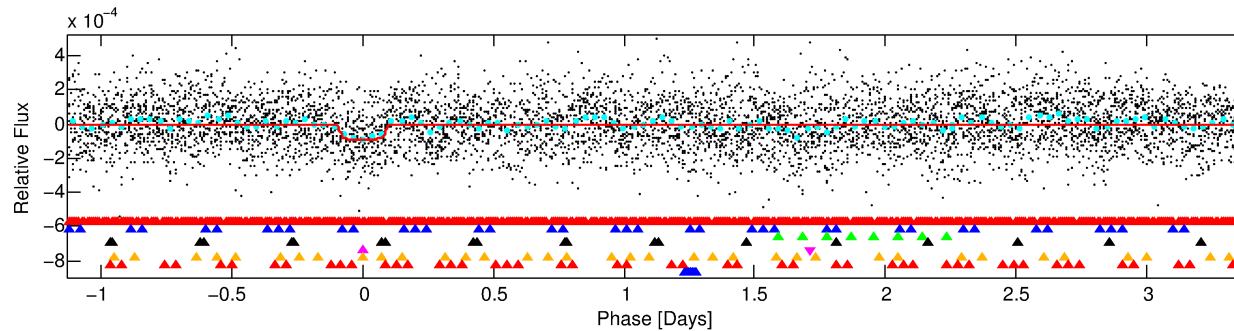
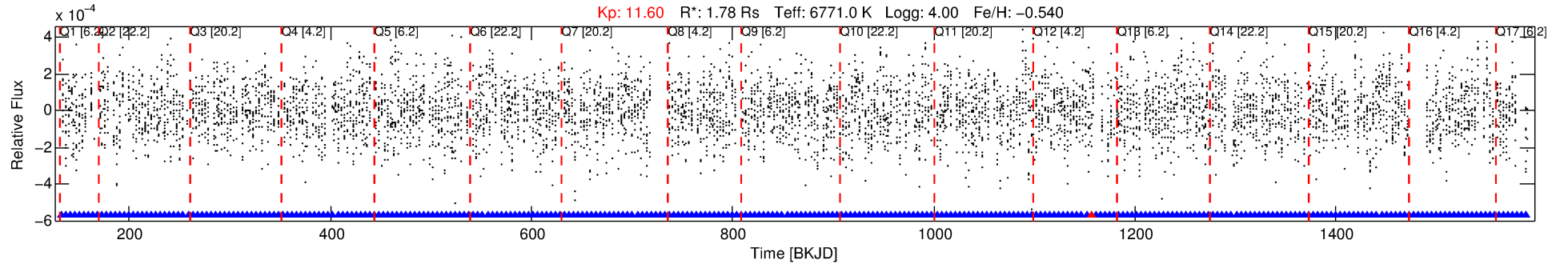
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009569838-05

No Significant Match Found

# DV One-Page Summary

KIC: 9569838 Candidate: 5 of 8 Period: 4.512 d



## DV Fit Results:

Period = 4.51190 [0.00004] d  
Epoch = 132.1779 [0.0064] BKJD  
Rp/R\* = 0.0098 [0.0064]  
a/R\* = 4.88 [18.01]  
b = 0.80 [1.76]  
Seff = 1885.04 [1114.15]  
Teq = 1680 [248] K  
Rp = 1.90 [1.42] Re  
a = 0.0561 [0.0199] AU  
Ag = 38.40 [55.27] [0.68 $\sigma$ ]  
Teffp = 6467 [2151] K [2.21 $\sigma$ ]

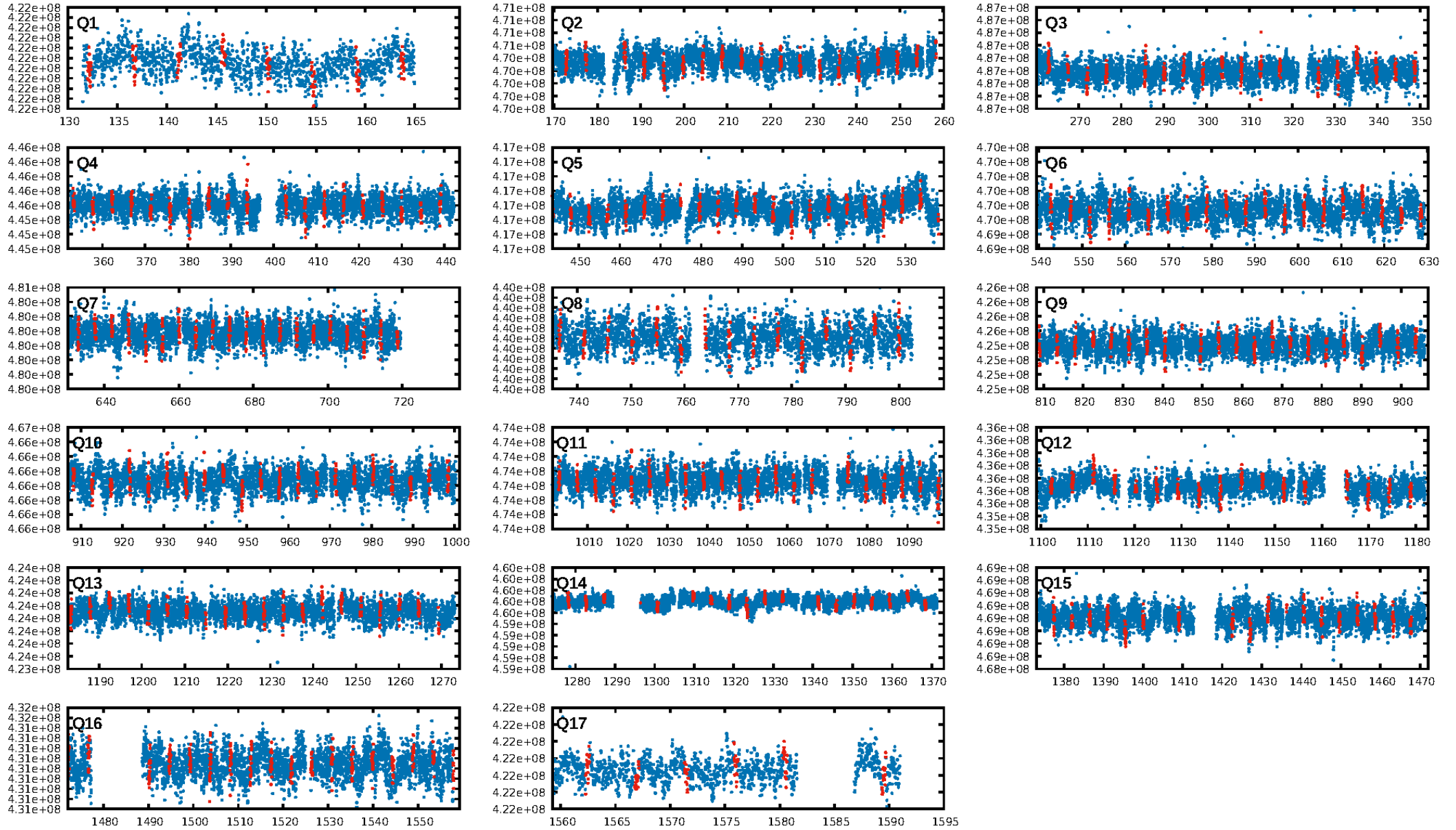
## DV Diagnostic Results:

ShortPeriod-sig: 94.9% [1.96 $\sigma$ ]  
LongPeriod-sig: 100.0% [110.48 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 29.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.98 [45/46]  
GhostDiagnostic-chr: 3.297  
Centroid-sig: 81.0%  
Centroid-so: 0.070 arcsec [0.25 $\sigma$ ]  
OotOffset-rm: 1.701 arcsec [1.62 $\sigma$ ]  
KicOffset-rm: 1.793 arcsec [1.85 $\sigma$ ]  
OotOffset-st: 3/4/4/4 [15]  
KicOffset-st: 3/4/4/4 [15]  
DiffImageQuality-fgm: 0.40 [6/15]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:20:59 Z

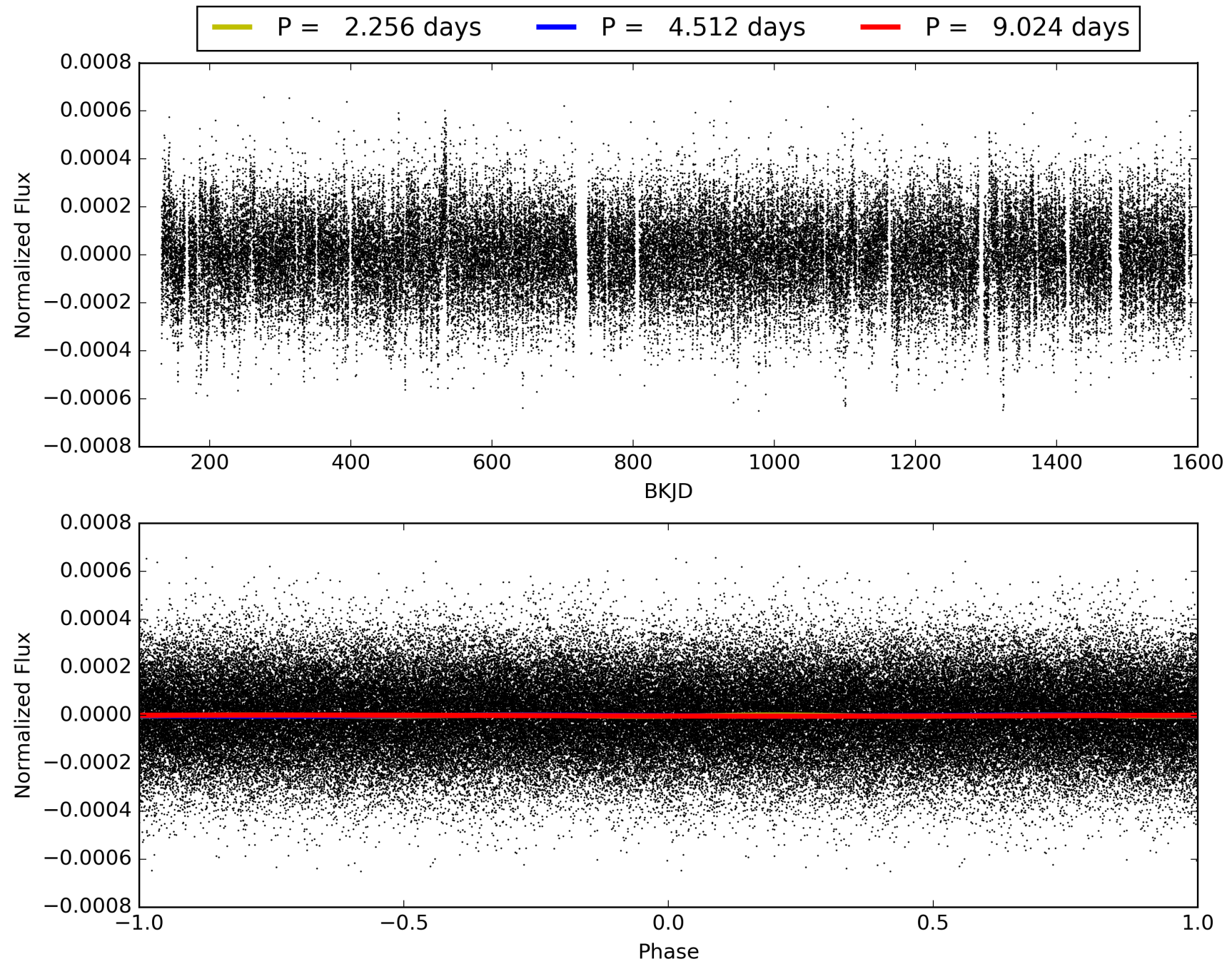
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009569838-05, PDC Light Curves





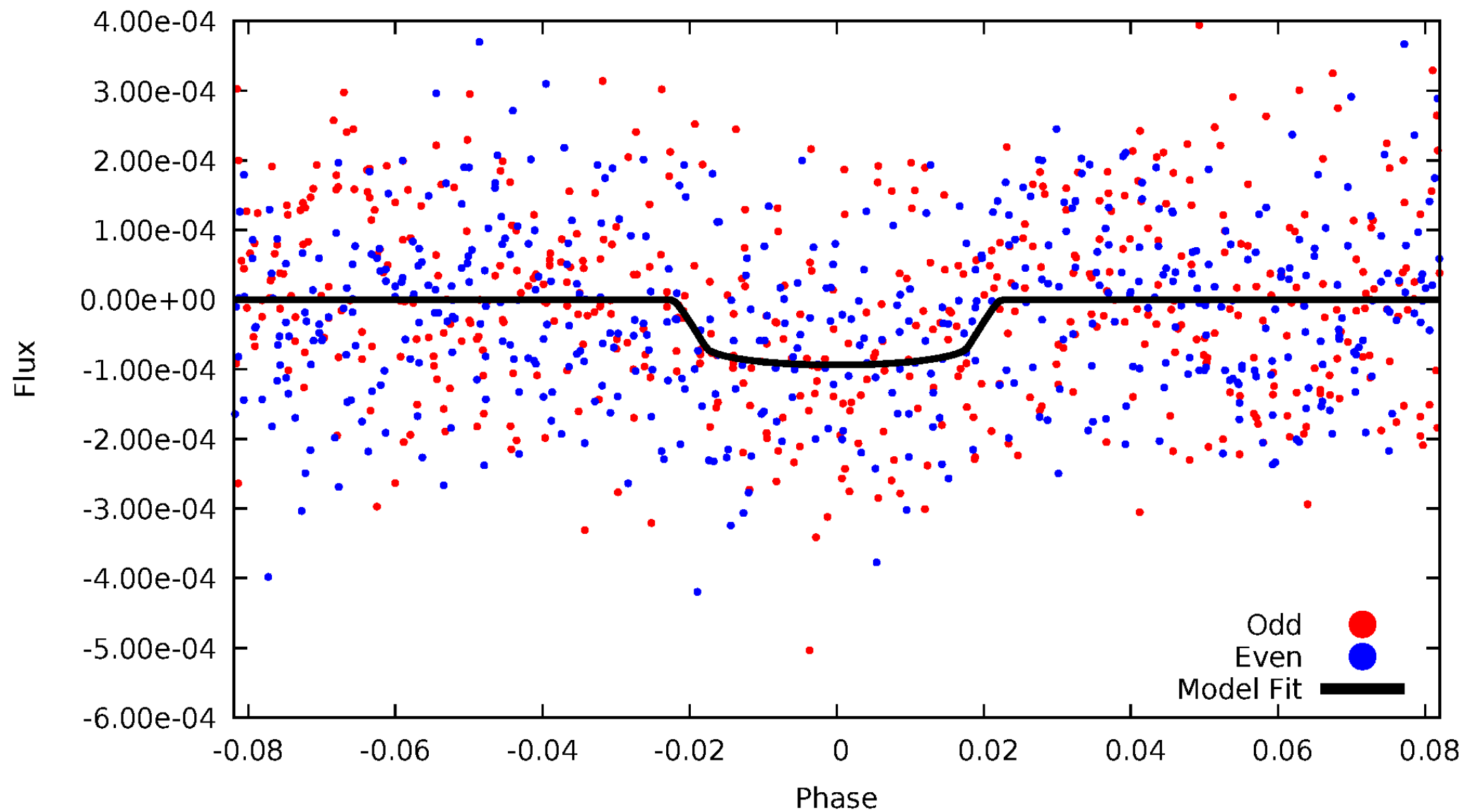
TCE 009569838-05





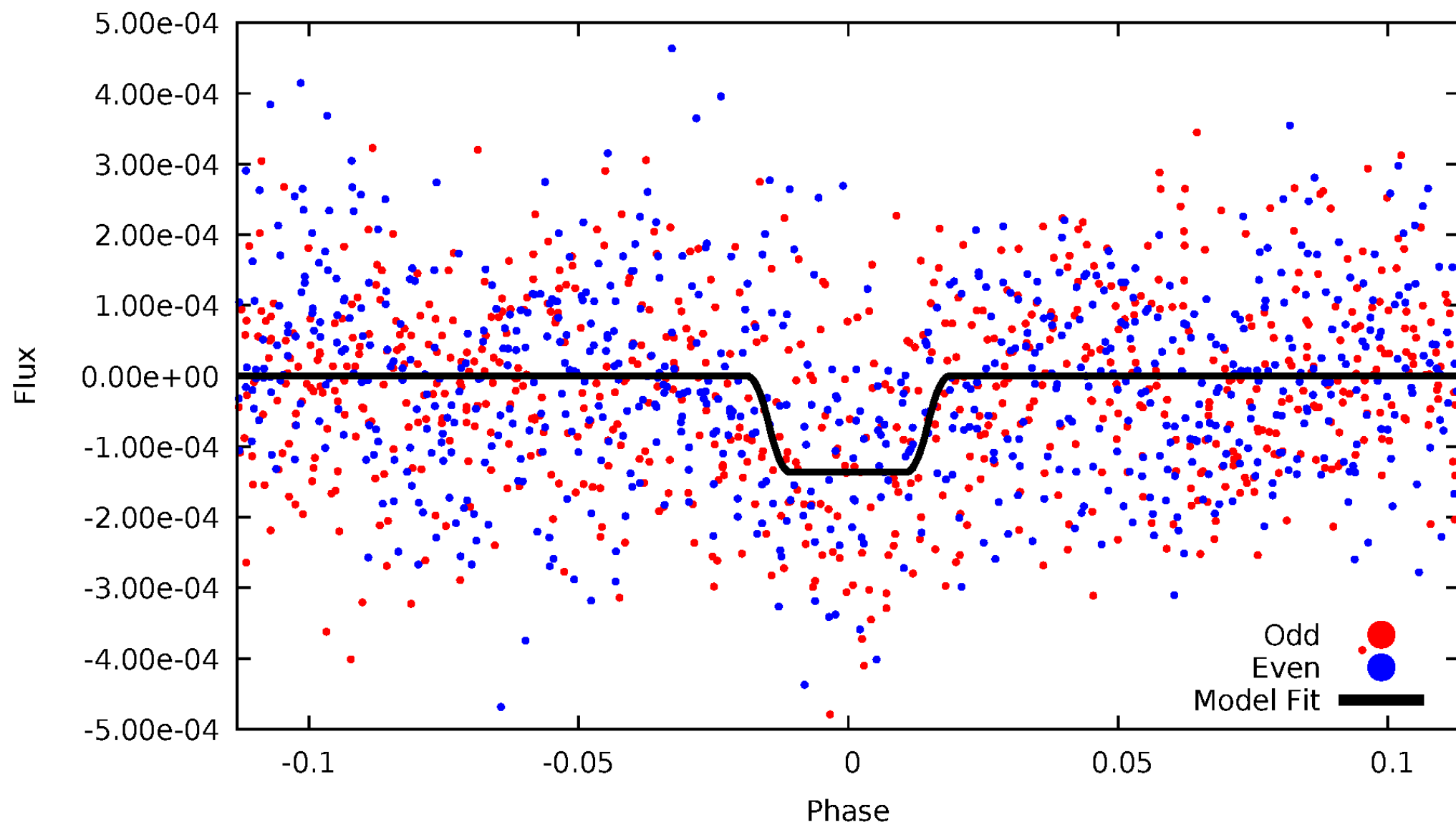
# DV Odd/Even

TCE 009569838-05



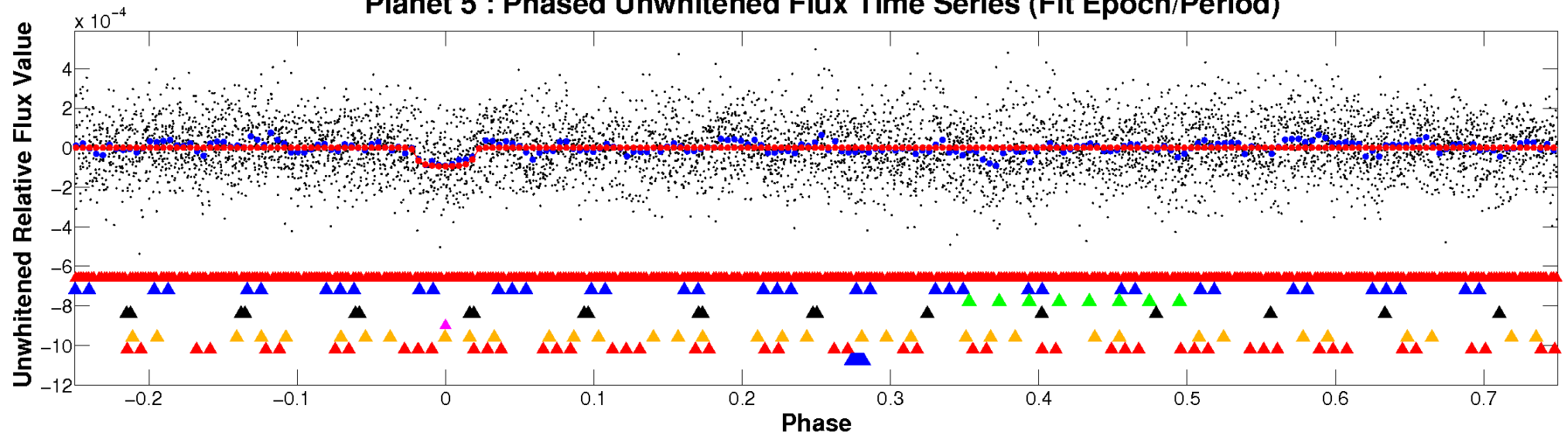
# ALT Odd/Even

TCE 009569838-05

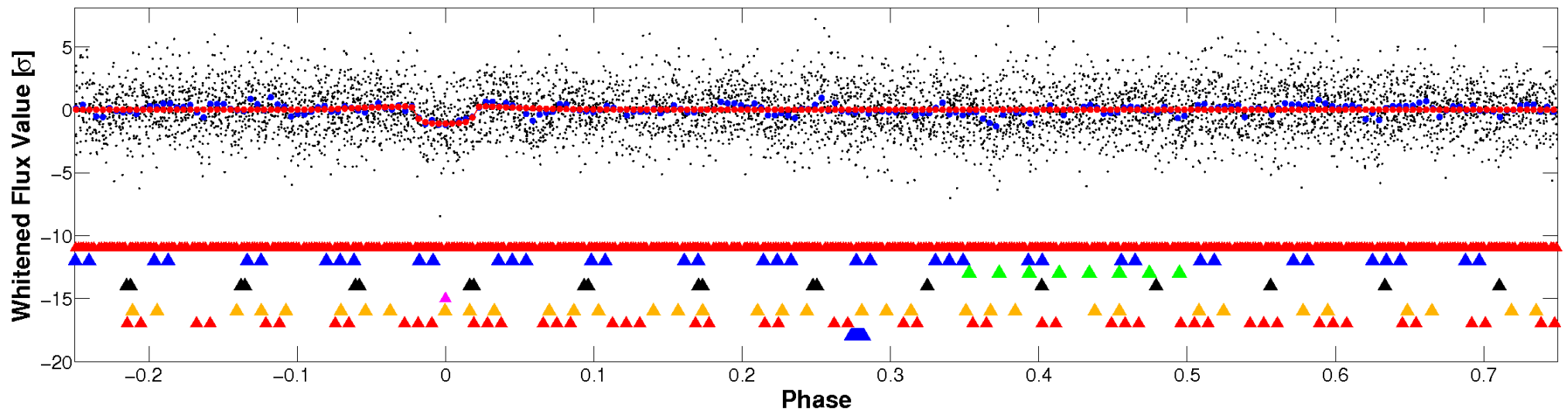


# Non-Whitened Vs. Whitened Light Curve

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

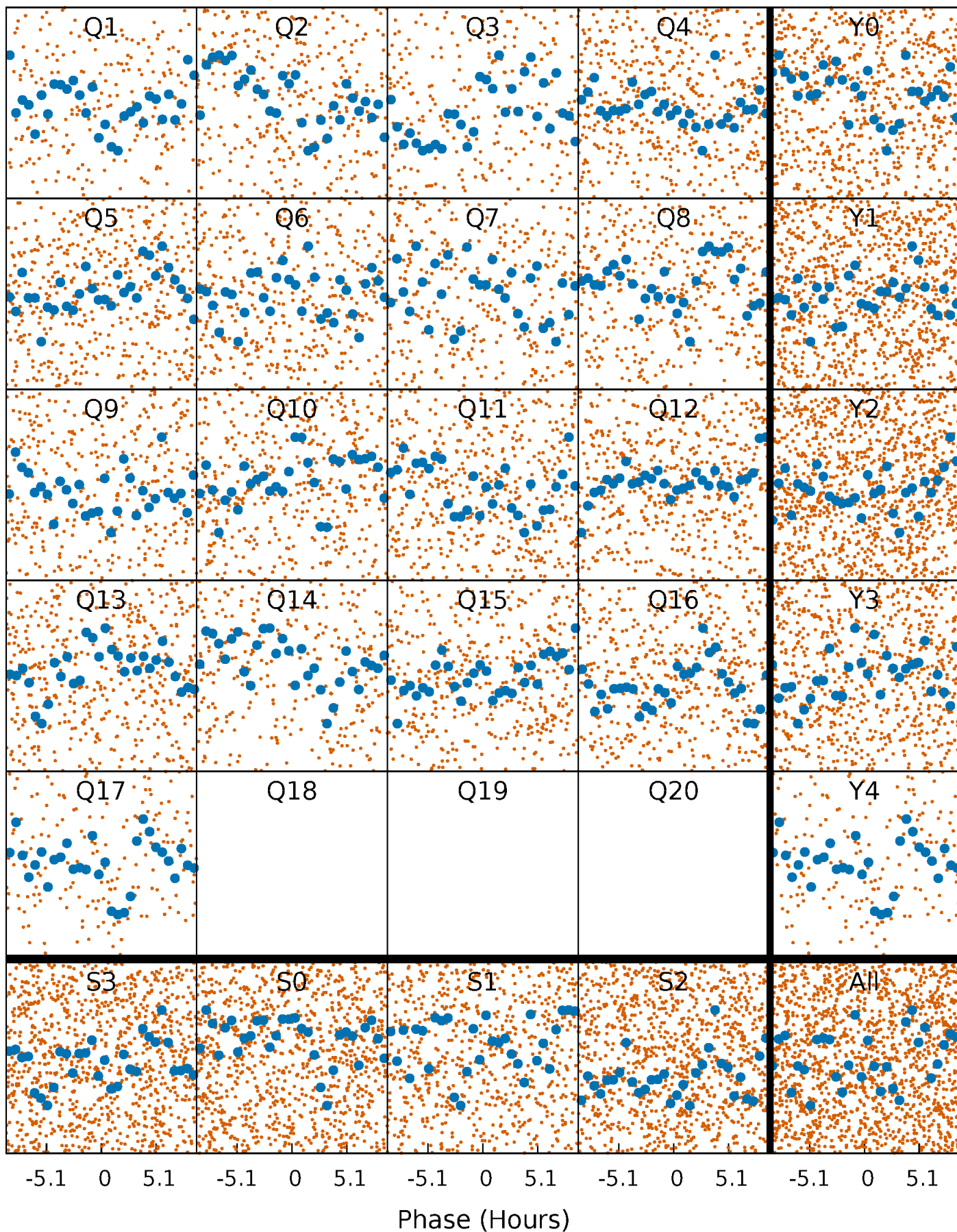


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



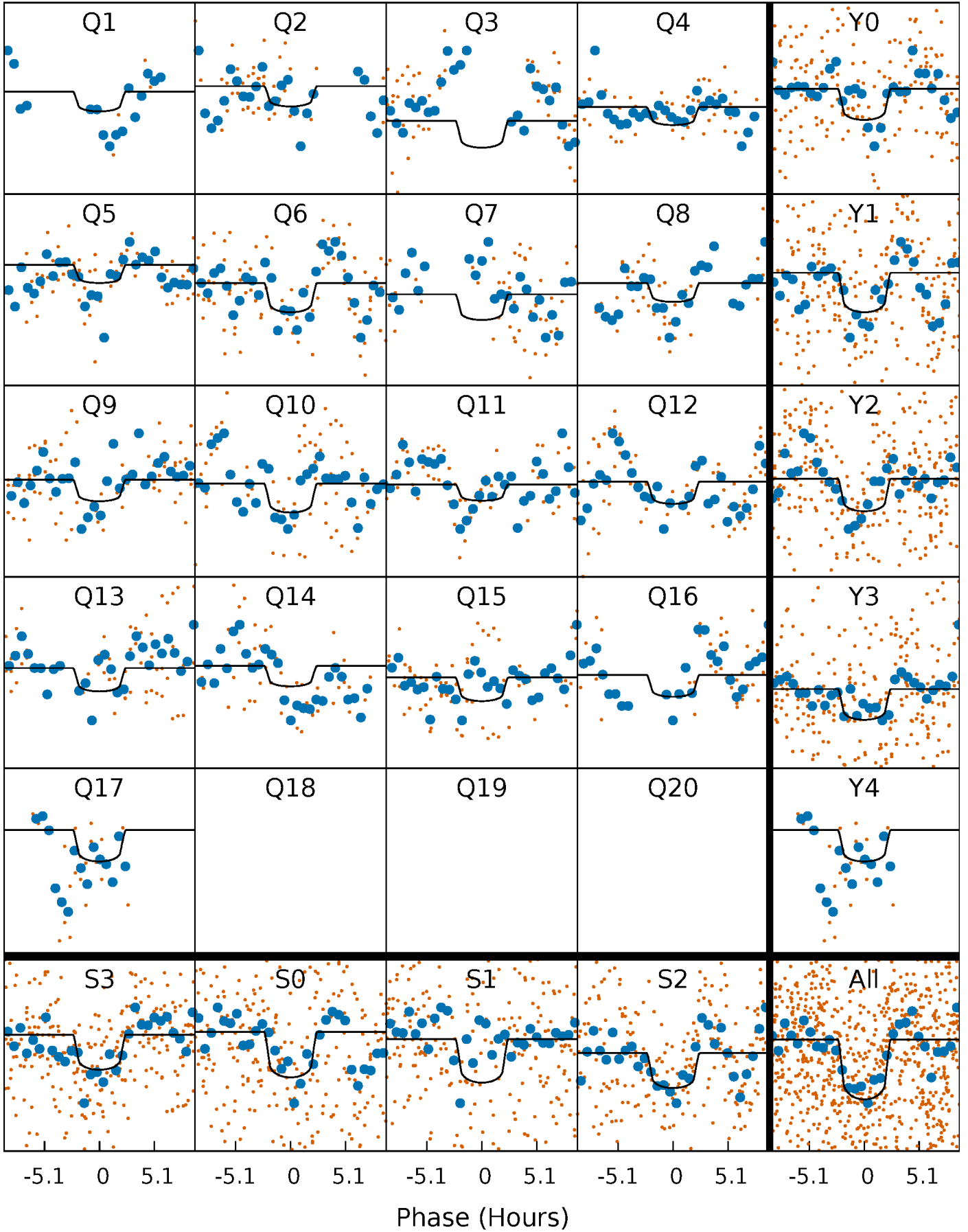
# PDC Quarter-Phased Transit Curves

TCE 009569838-05   P= 4.511901 Days    $T_0=132.177940$  (BKJD)



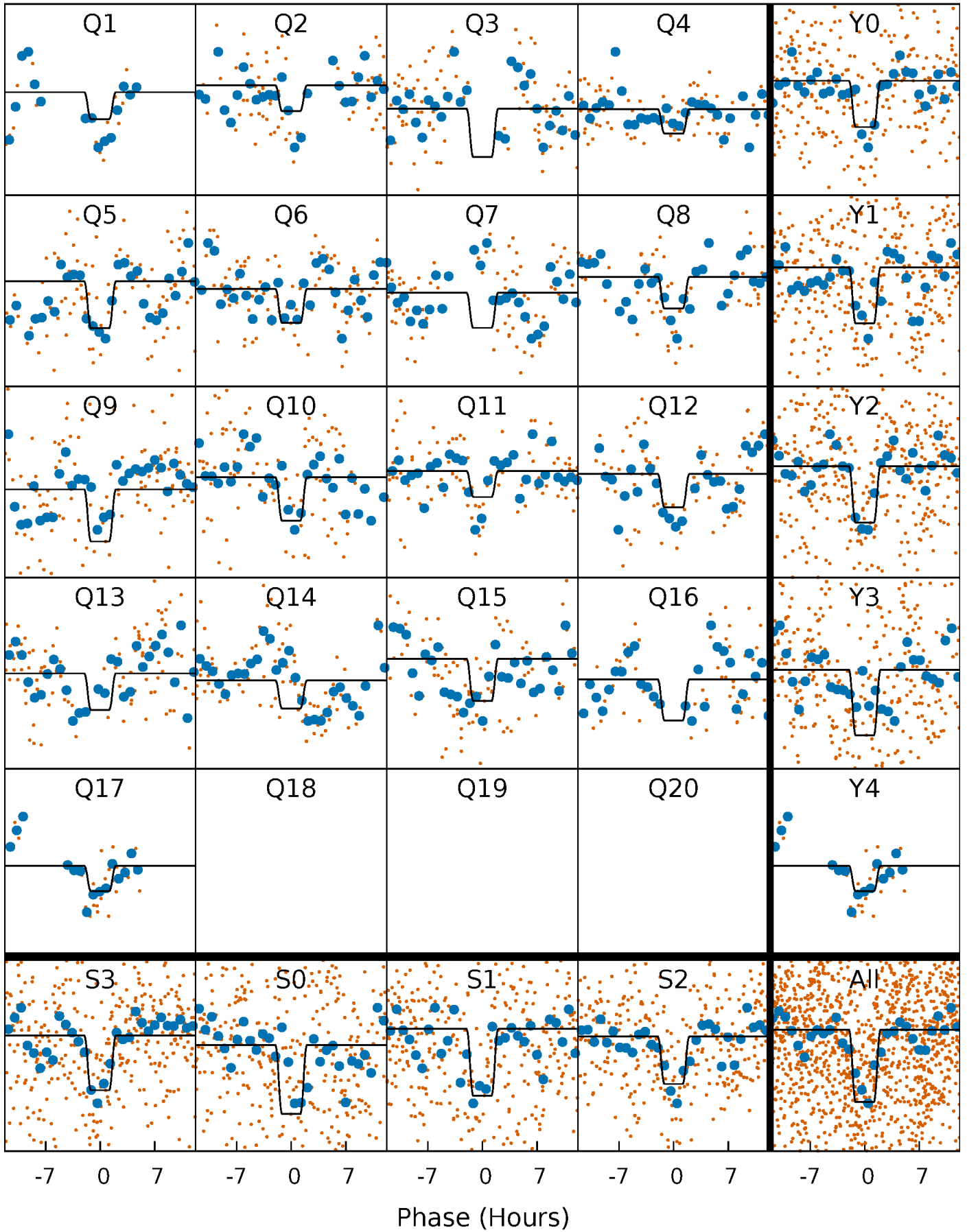
# DV Quarter-Phased Transit Curves

TCE 009569838-05   P= 4.511901 Days    $T_0=132.177940$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009569838-05   P= 4.511479 Days    $T_0=132.213369$  (BKJD)

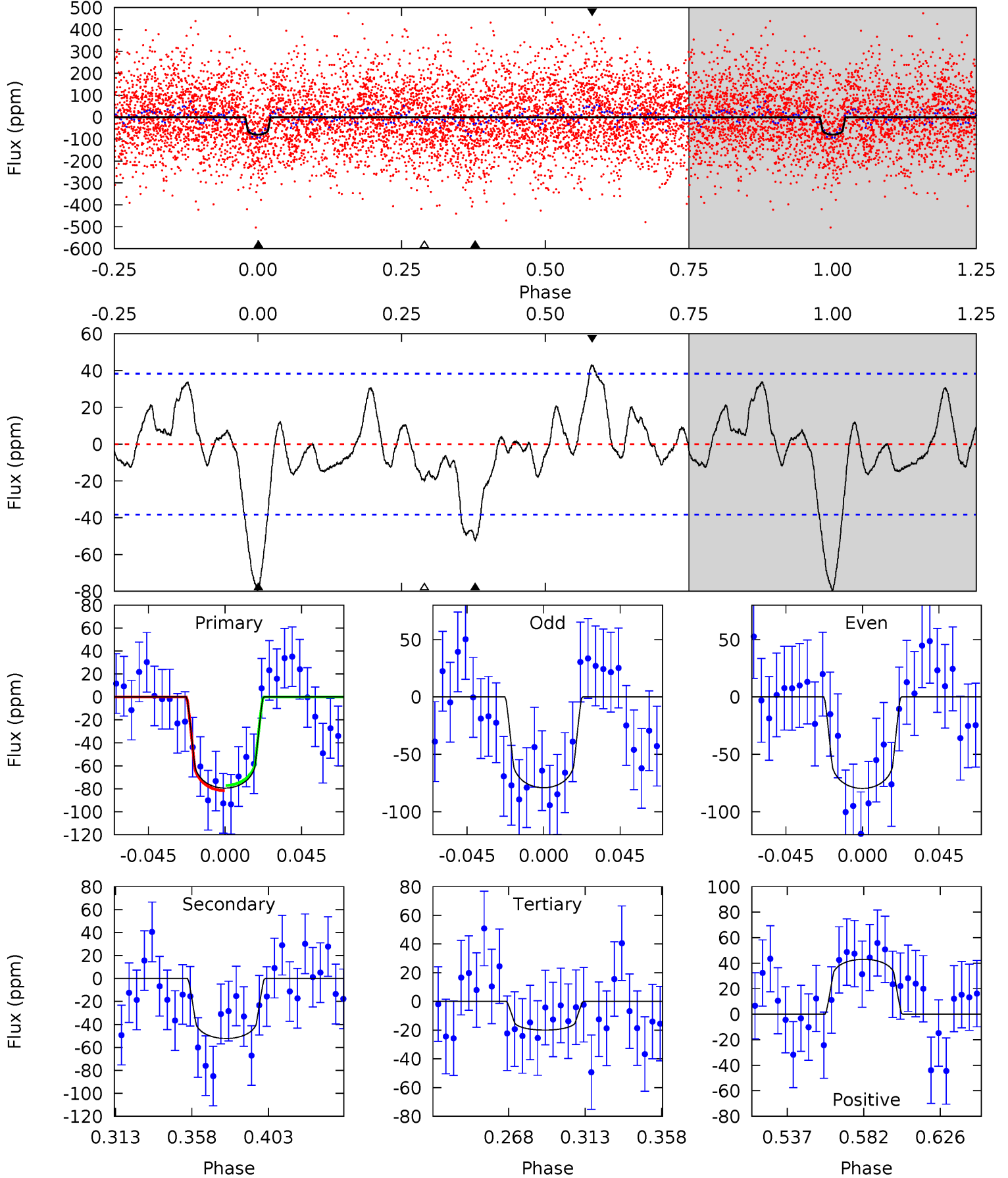




# DV Model-Shift Uniqueness Test

009569838-05, P = 4.511901 Days, E = 132.177940 Days

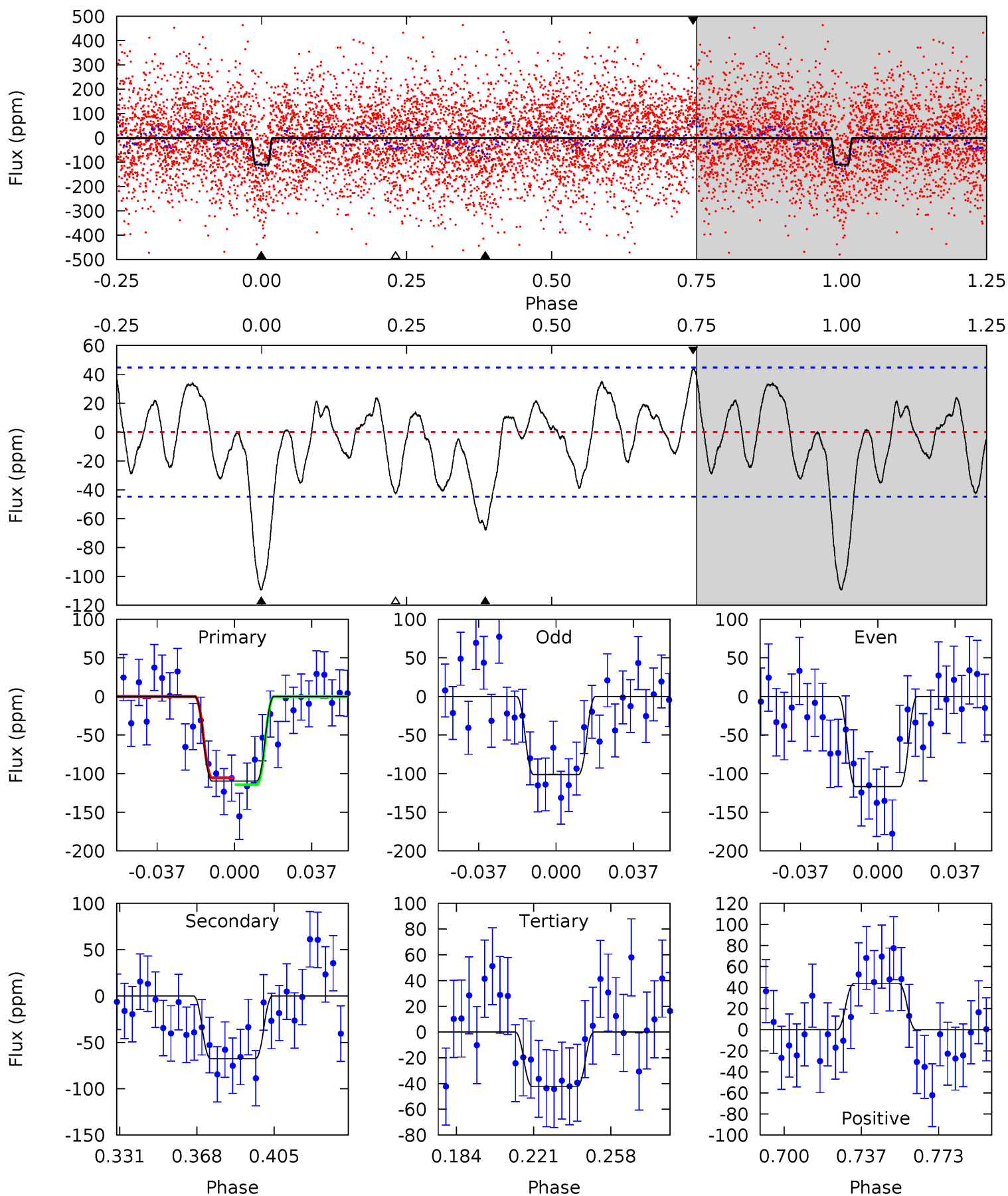
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.80	6.45	2.46	5.31	4.73	2.01	1.71	7.34	4.49	3.98	1.14	0.04	0.80	0.35	0.27



# Alt Model-Shift Uniqueness Test

009569838-05, P = 4.511479 Days, E = 132.213369 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
11.7	7.21	4.51	4.67	4.77	2.09	2.05	7.16	7.00	2.71	2.54	0.82	0.81	0.29	0.48



### Stellar Parameters For KIC 009569838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6771^{+214}_{-262}$	$4.003^{+0.336}_{-0.144}$	$-0.540^{+0.250}_{-0.300}$	$1.776^{+0.433}_{-0.649}$	$1.157^{+0.189}_{-0.170}$	$0.291^{+0.708}_{-0.119}$
	+3%/-4%	+8%/-4%	+46%/-56%	+24%/-37%	+16%/-15%	+243%/-41%
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 009569838-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-52 \pm 8$	$1.79^{+1.29}_{-1.03}$	$2309^{+195}_{-236}$	$5767^{+3457}_{-1151}$	$29^{+135}_{-19}$
Alt.	$-68 \pm 9$	$2.19^{+1.28}_{-1.08}$	$2301^{+180}_{-235}$	$5590^{+2181}_{-951}$	$24^{+71}_{-14}$

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

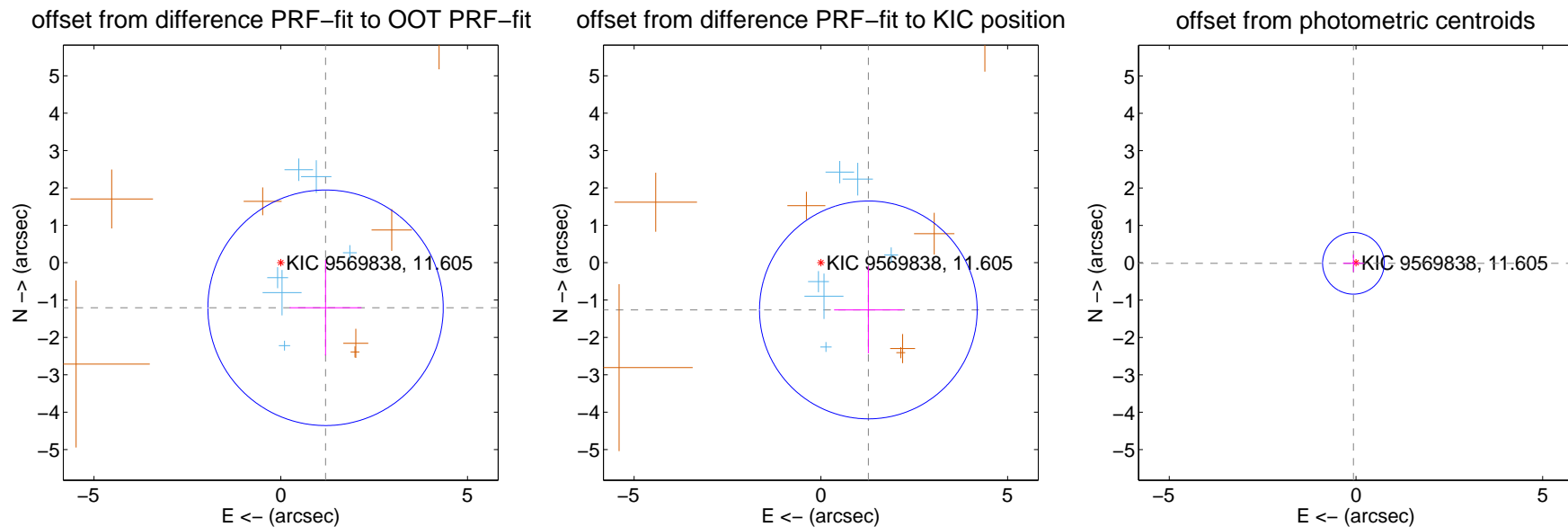
## DV Centroid Data

Supplemental centroid analysis for 009569838-05. **Kepler magnitude: 11.61.** Transit SNR 15.69

There are 6 quarters with good PRF difference image offsets

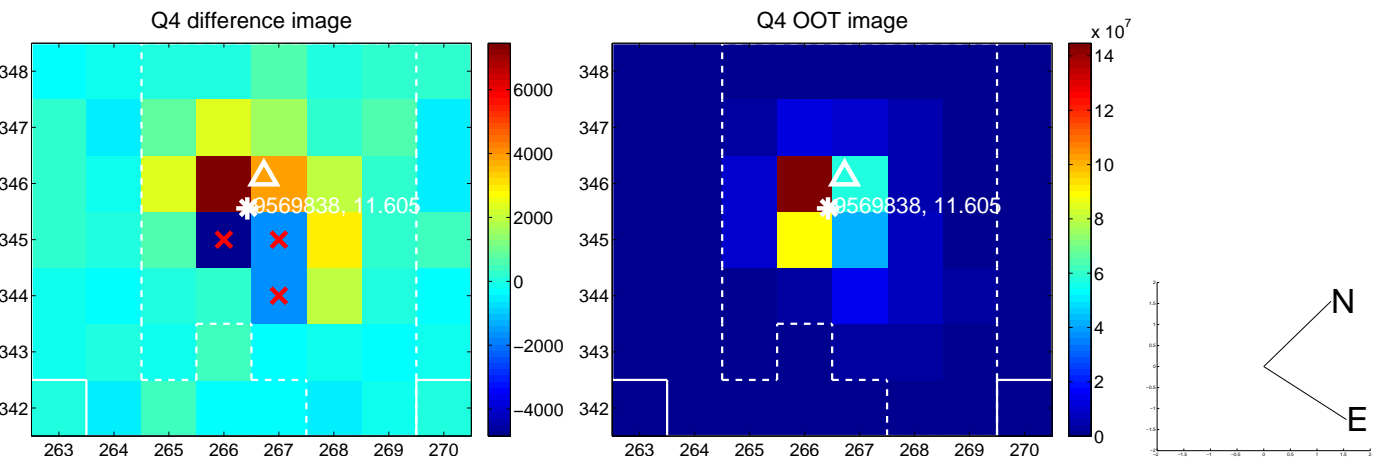
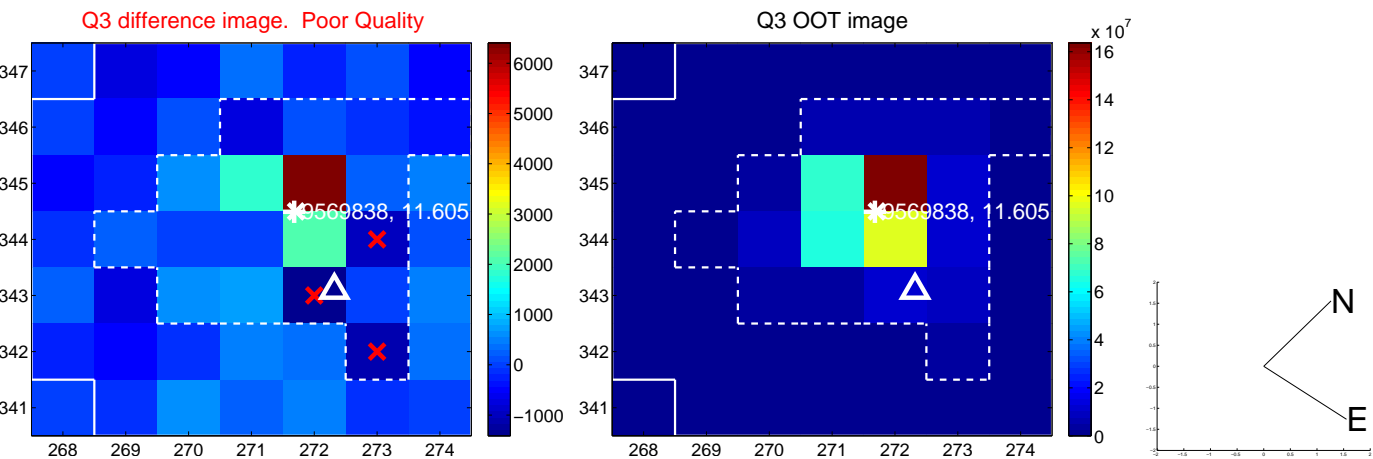
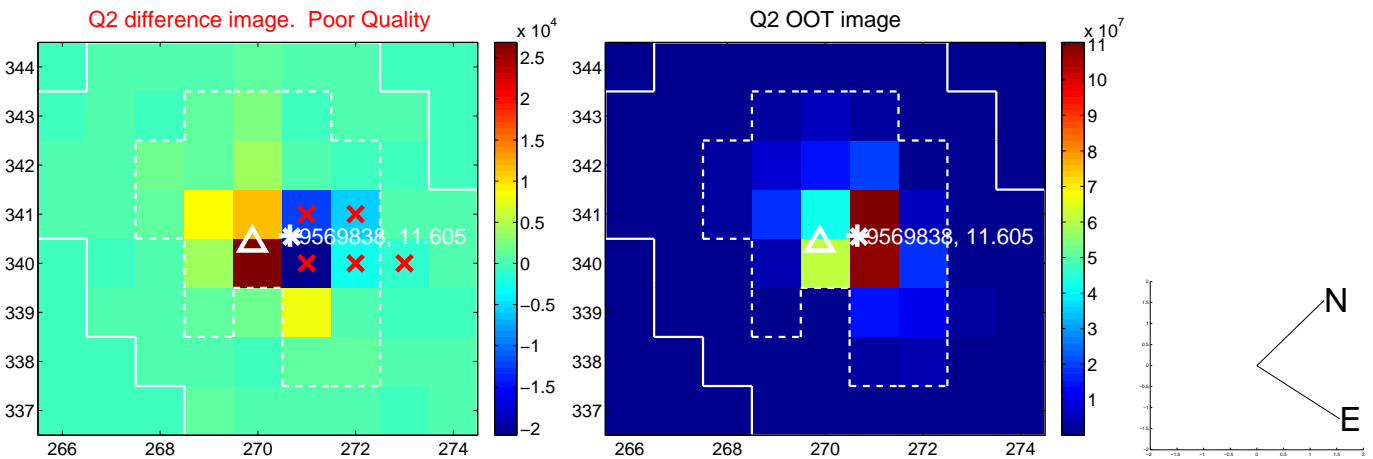
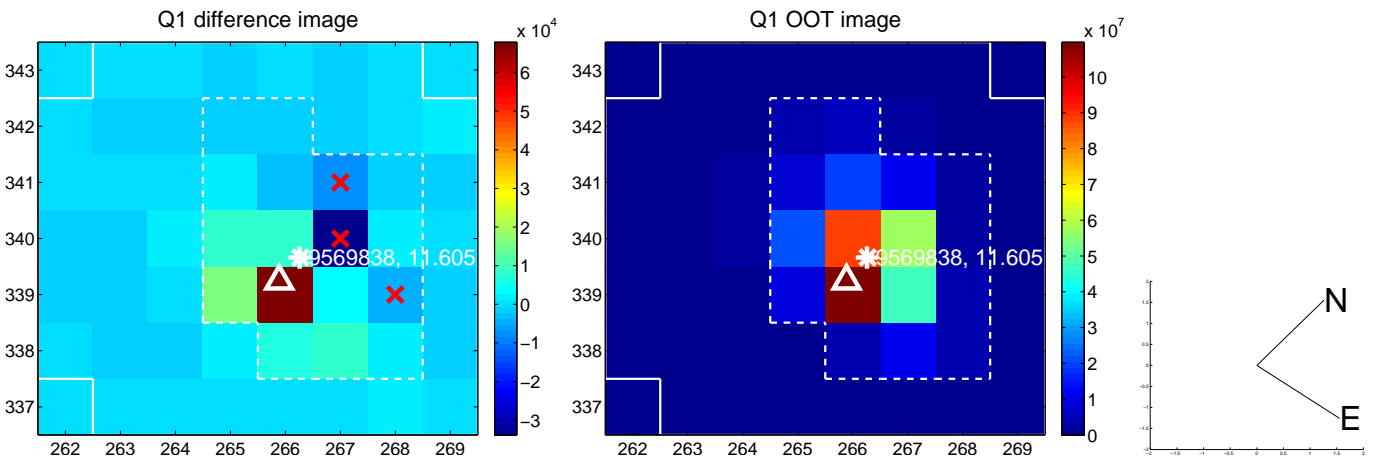
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.701 \pm 1.050$	1.62	$-1.200 \pm 0.961$	$-1.206 \pm 1.275$
PRF-fit source offset from KIC position	$1.793 \pm 0.971$	1.85	$-1.271 \pm 0.917$	$-1.264 \pm 1.163$
photometric centroid source offset	$0.07 \pm 0.28$	0.25	$0.07 \pm 0.28$	$-0.01 \pm 0.23$

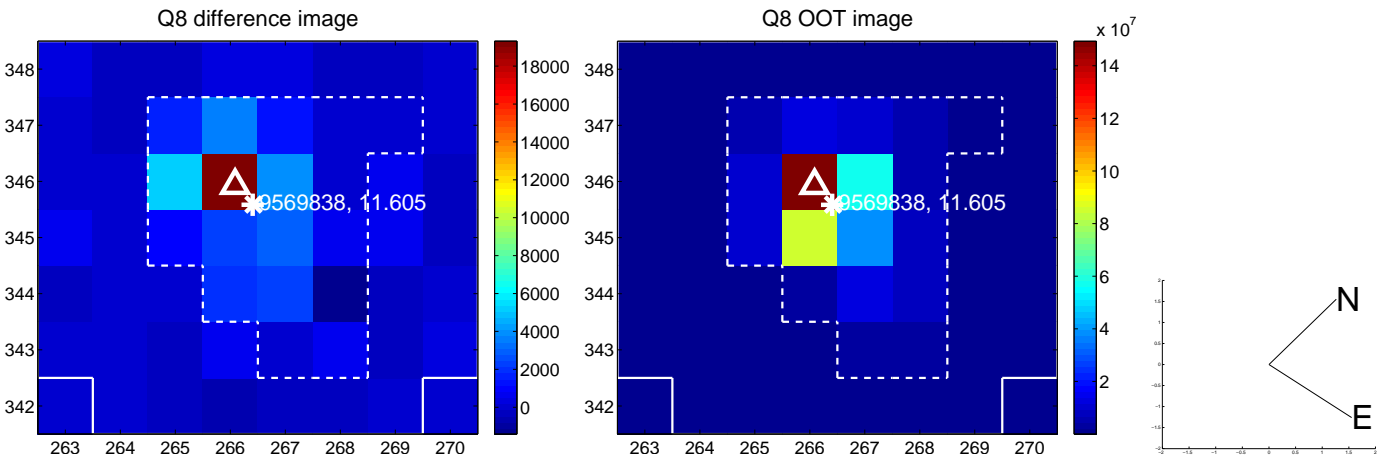
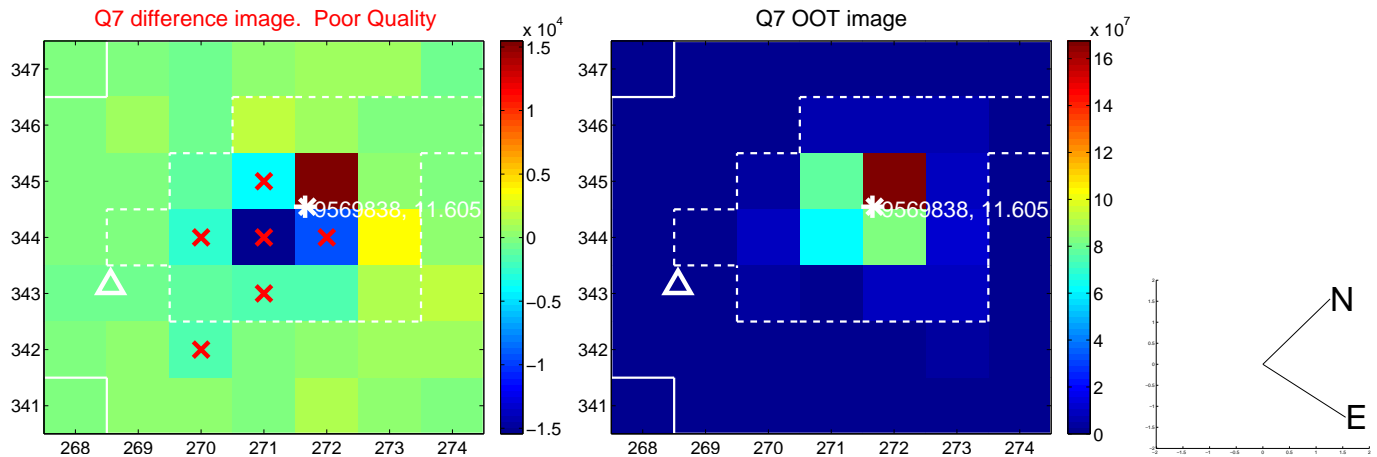
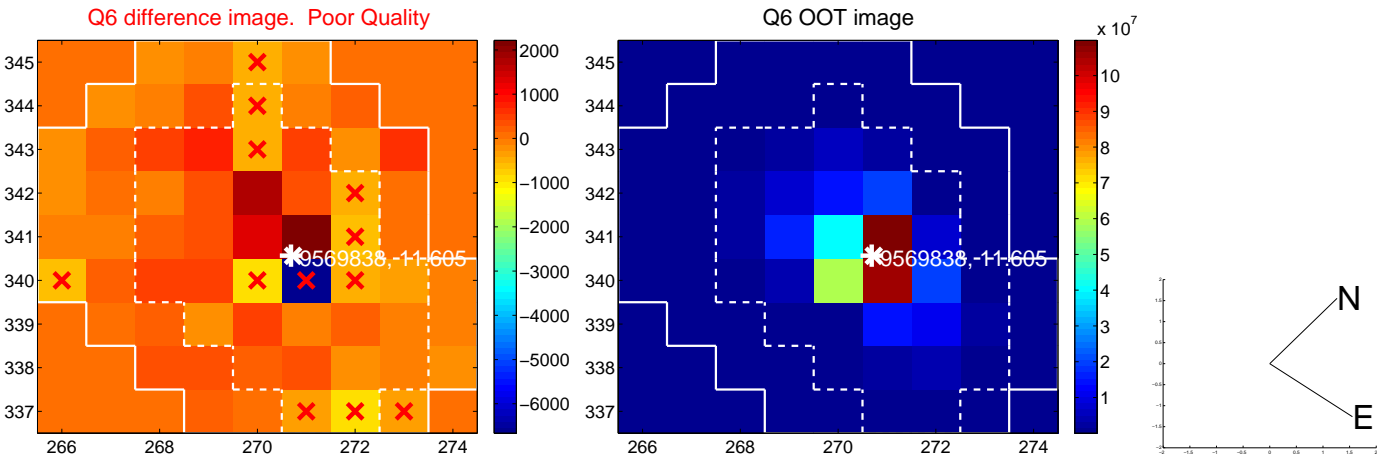
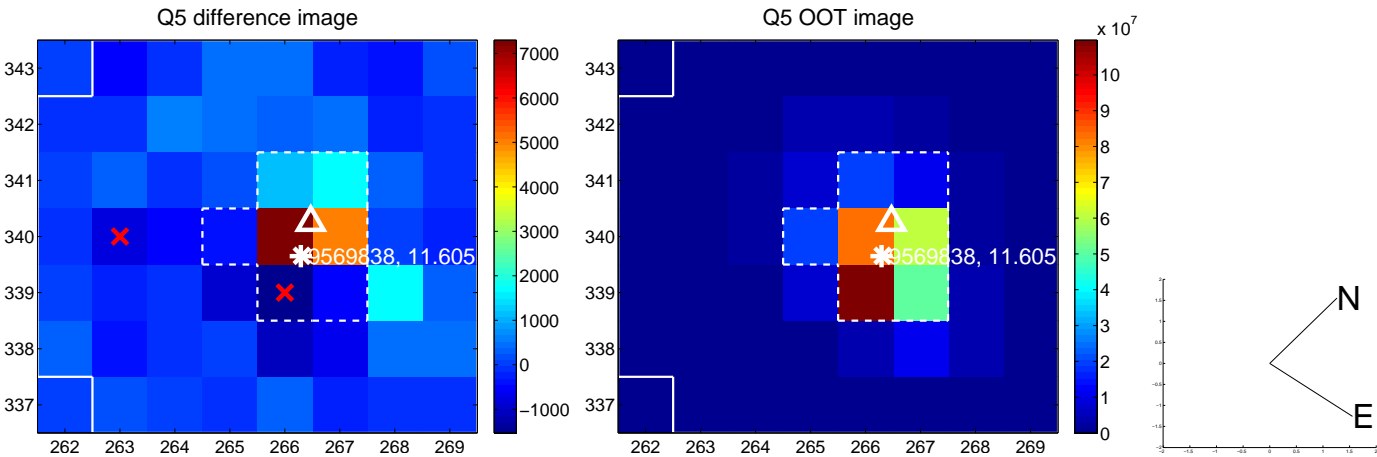


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

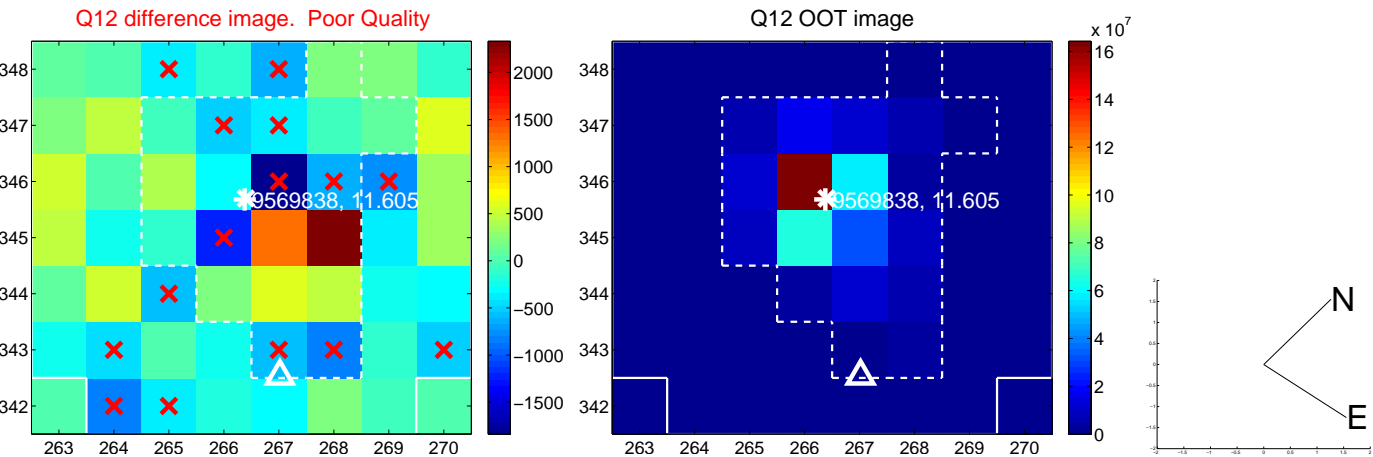
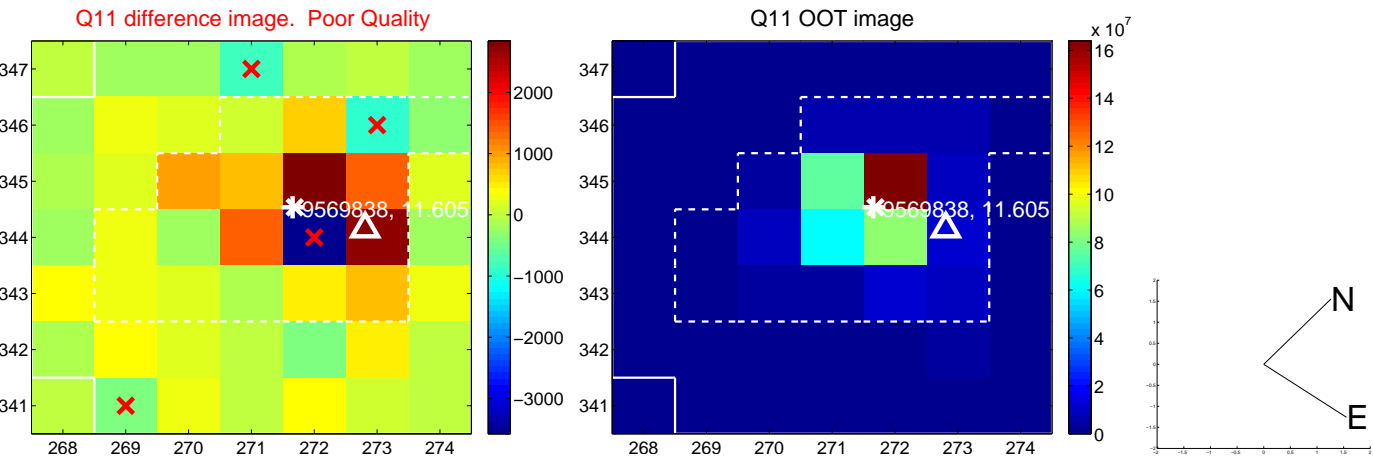
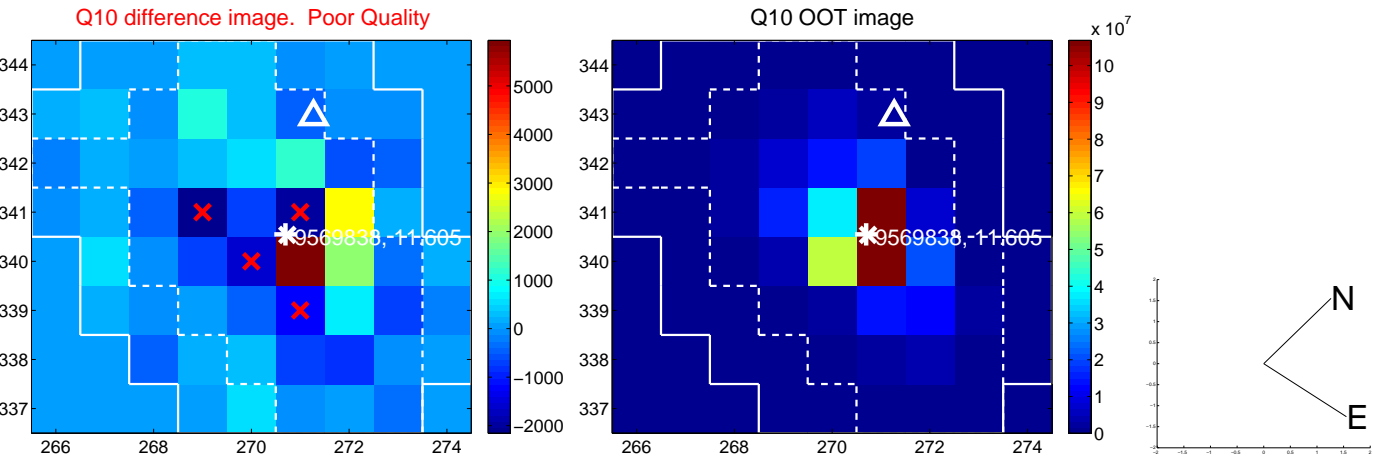
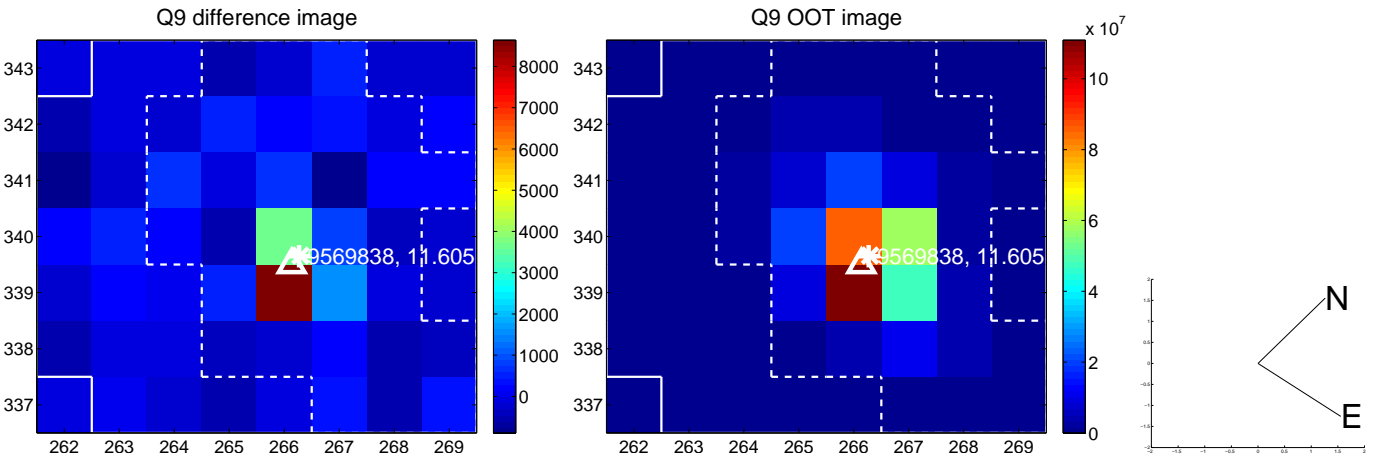


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

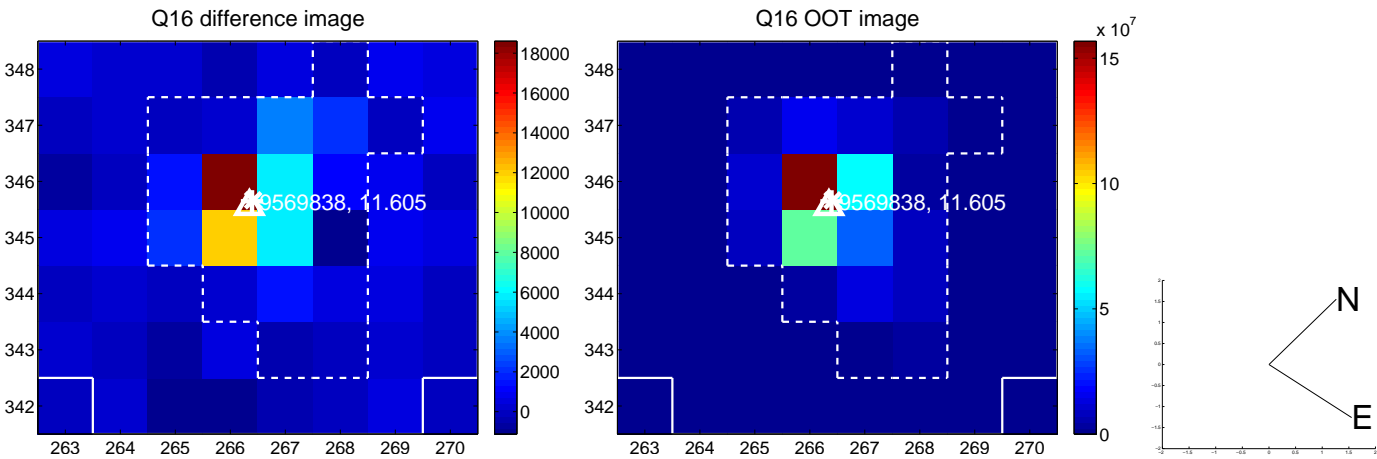
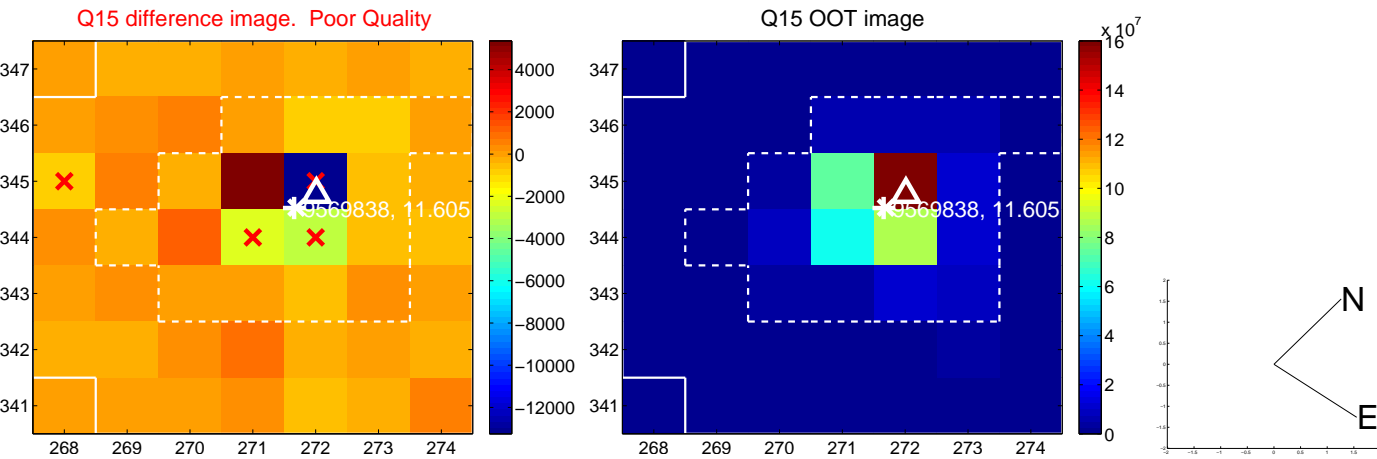
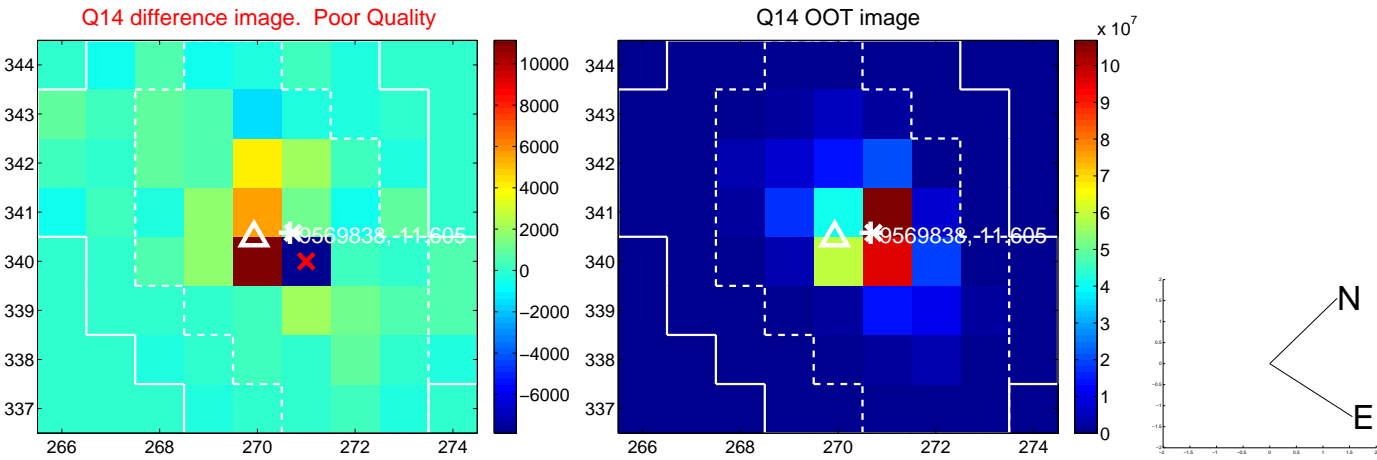
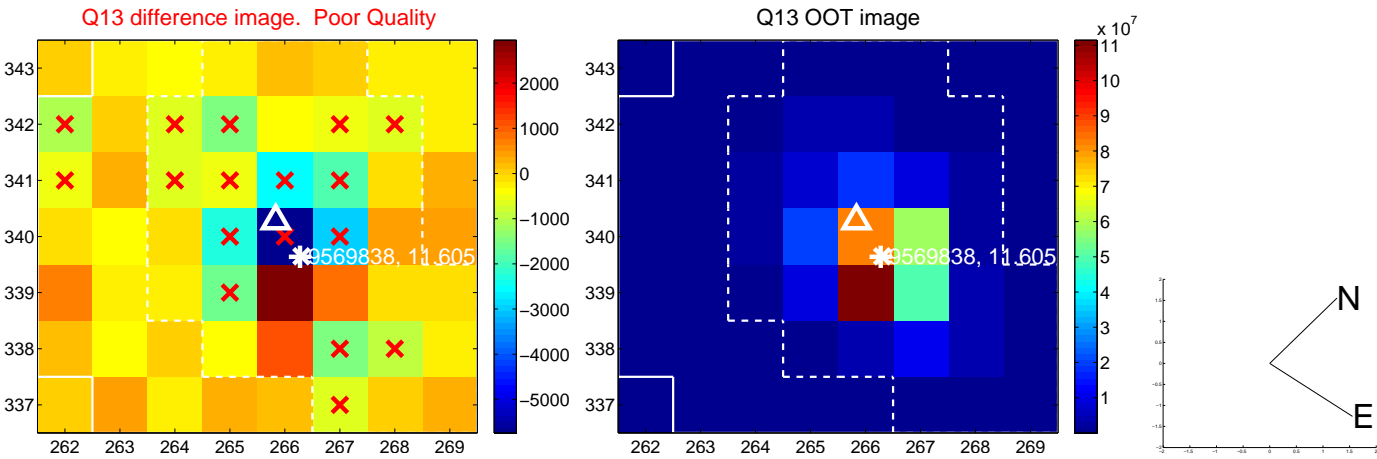




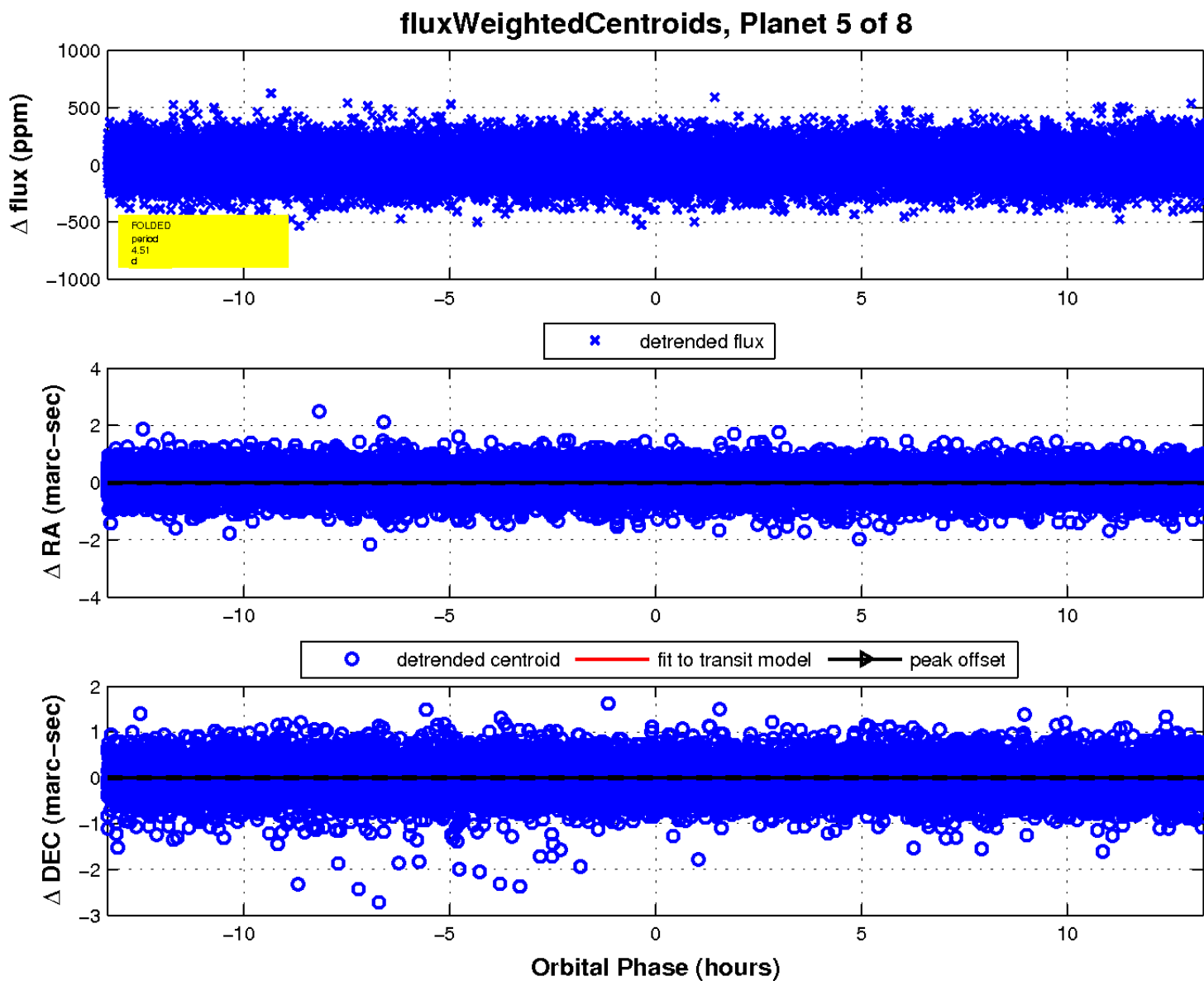
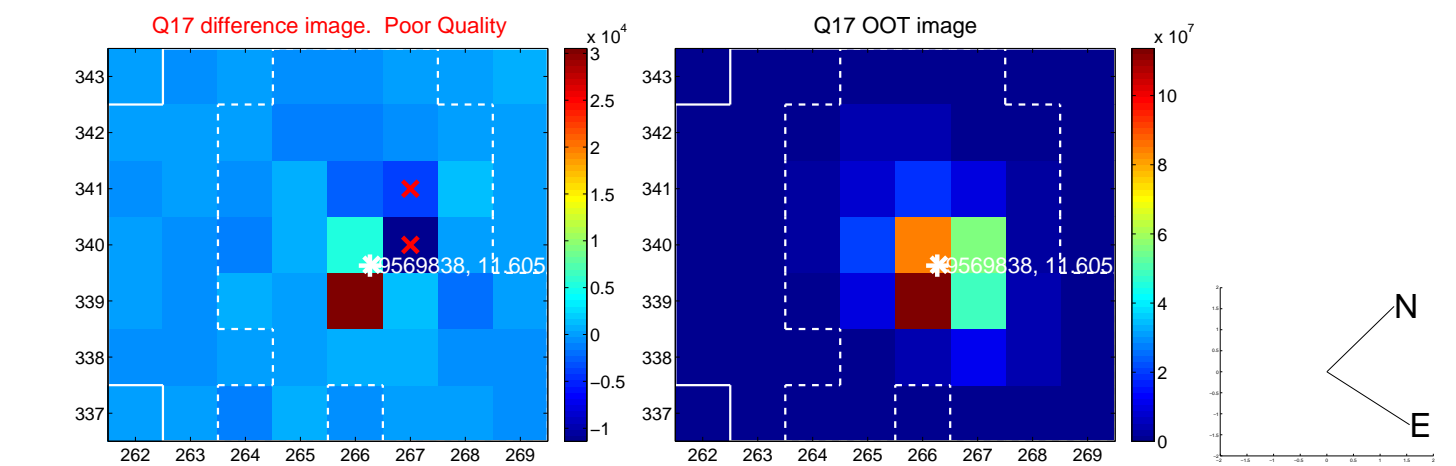
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

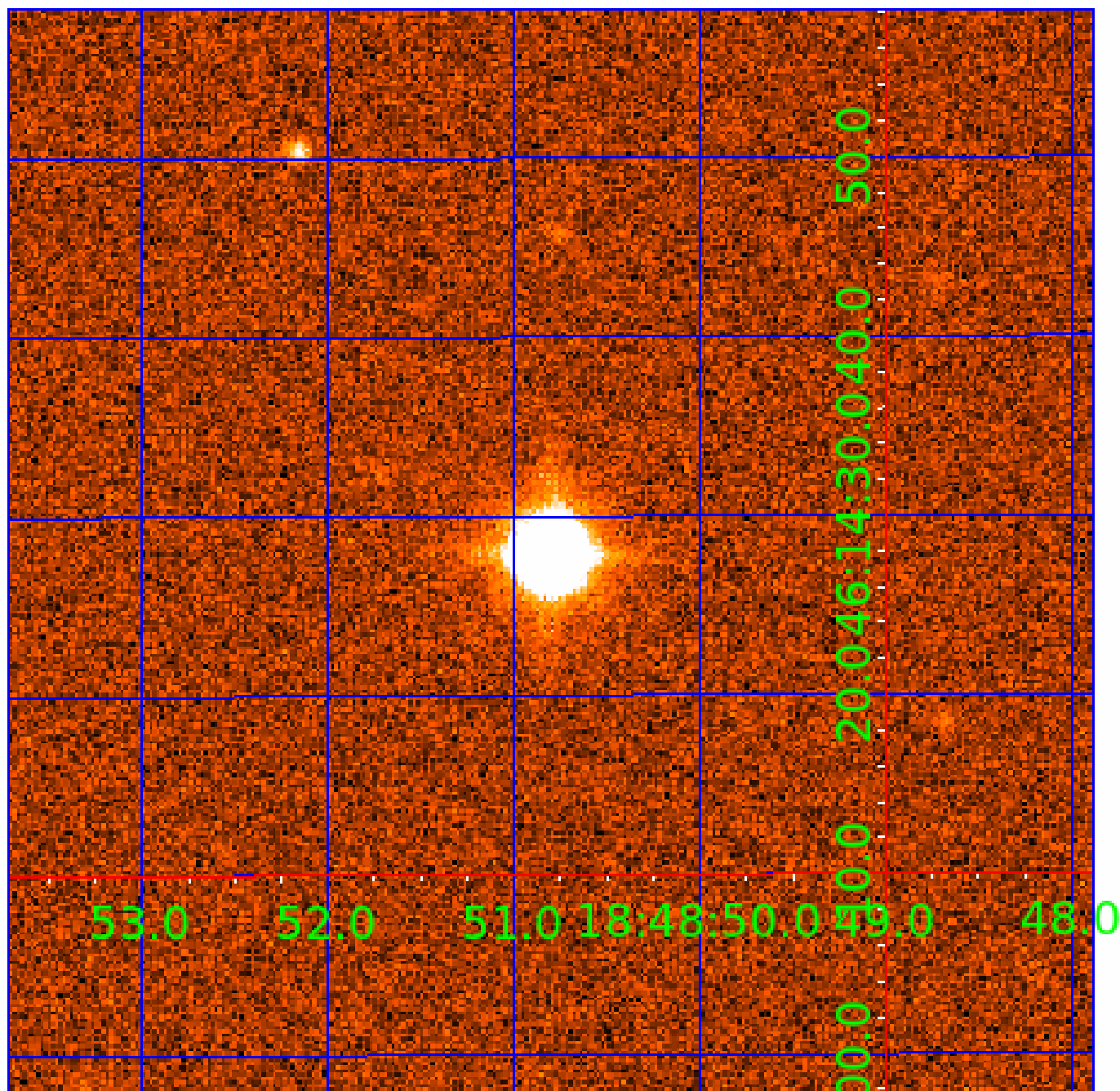


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009569838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009569838-01	OBS	No	2.831767	132.552789	19.4	20.136	8.4	8.7	1.78	6771	0.90	3507.98
009569838-02	OBS	No	37.424710	159.410322	186.5	10.964	21.6	15.0	1.78	6771	2.77	112.27
009569838-03	OBS	No	193.920337	202.089180	350.7	3.695	20.8	17.7	1.78	6771	3.36	12.52
009569838-05	OBS	No	4.511901	132.177940	93.8	4.437	15.3	15.7	1.78	6771	1.90	1885.04
009569838-06	OBS	No	40.924036	145.228300	205.6	3.445	13.0	13.2	1.78	6771	2.81	99.65
009569838-07	OBS	No	29.432804	138.798788	206.7	3.101	13.1	12.9	1.78	6771	2.96	154.65
009569838-08	OBS	No	67.676565	174.057774	309.1	4.570	12.1	12.0	1.78	6771	3.80	50.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009569838-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009569838-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009569838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

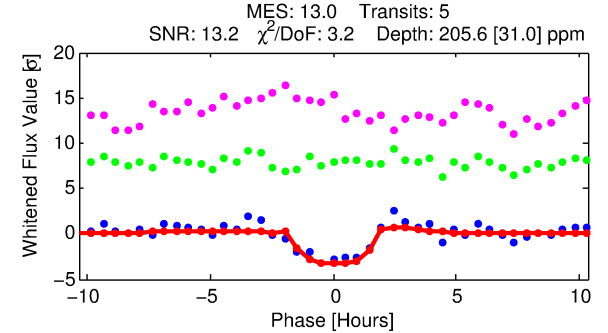
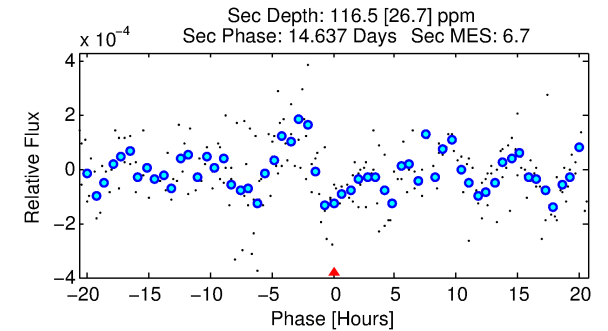
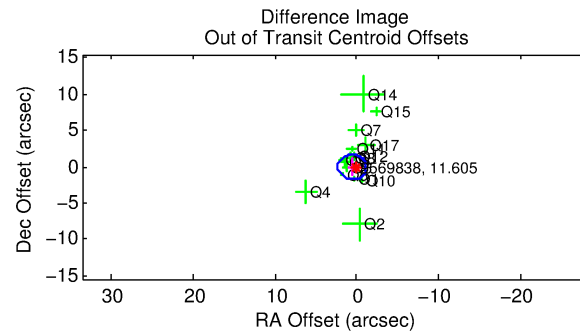
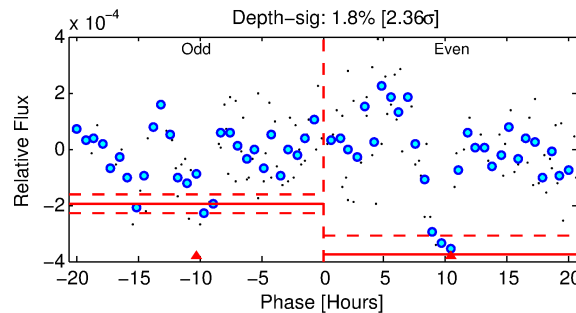
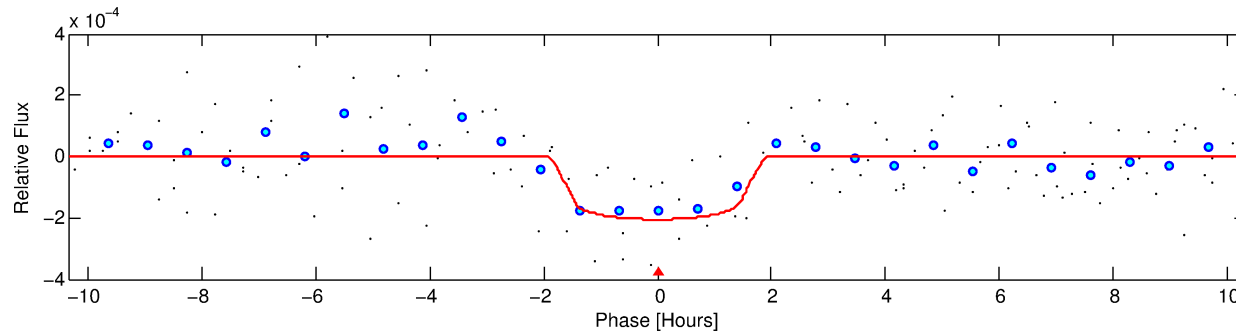
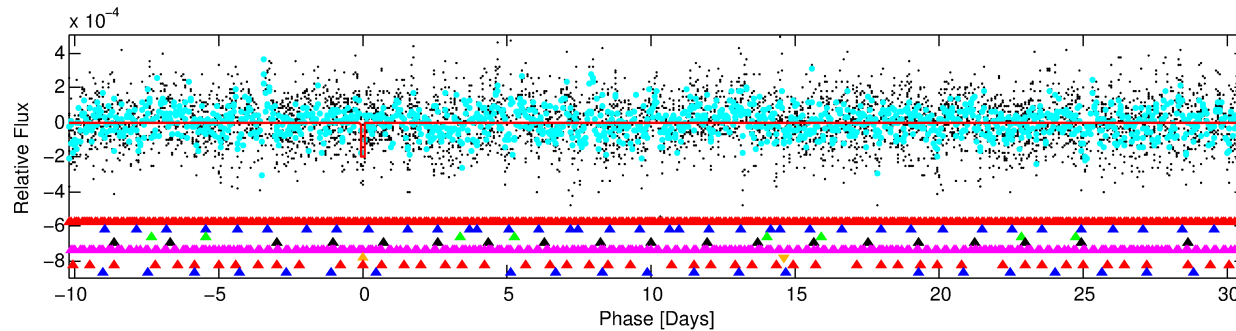
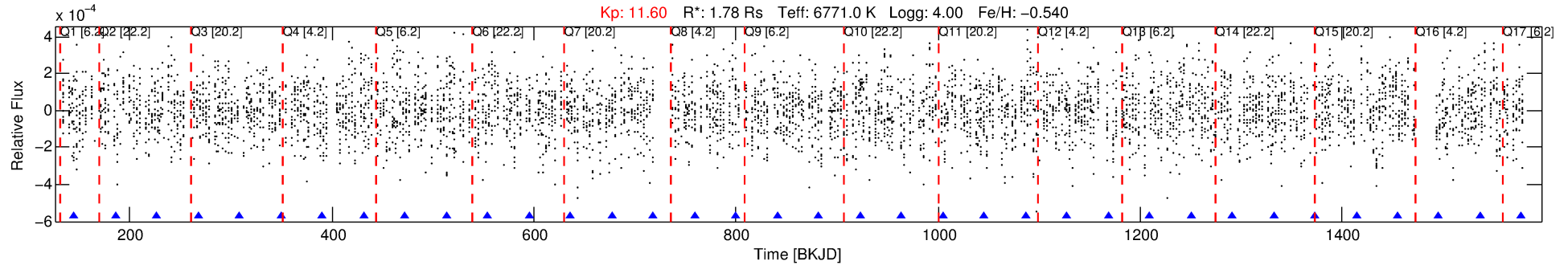
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009569838-06

No Significant Match Found

# DV One-Page Summary

KIC: 9569838 Candidate: 6 of 8 Period: 40.924 d



## DV Fit Results:

Period = 40.92404 [0.00067] d  
Epoch = 145.2283 [0.0077] BKJD  
Rp/R\* = 0.0145 [0.0129]  
a/R\* = 57.35 [293.63]  
b = 0.79 [2.42]  
Seff = 99.65 [58.90]  
Teq = 806 [119] K  
Rp = 2.80 [2.70] Re  
a = 0.2441 [0.0866] AU  
Ag = 485.43 [915.99] [0.53σ]  
Teffp = 5847 [2639] K [1.91σ]

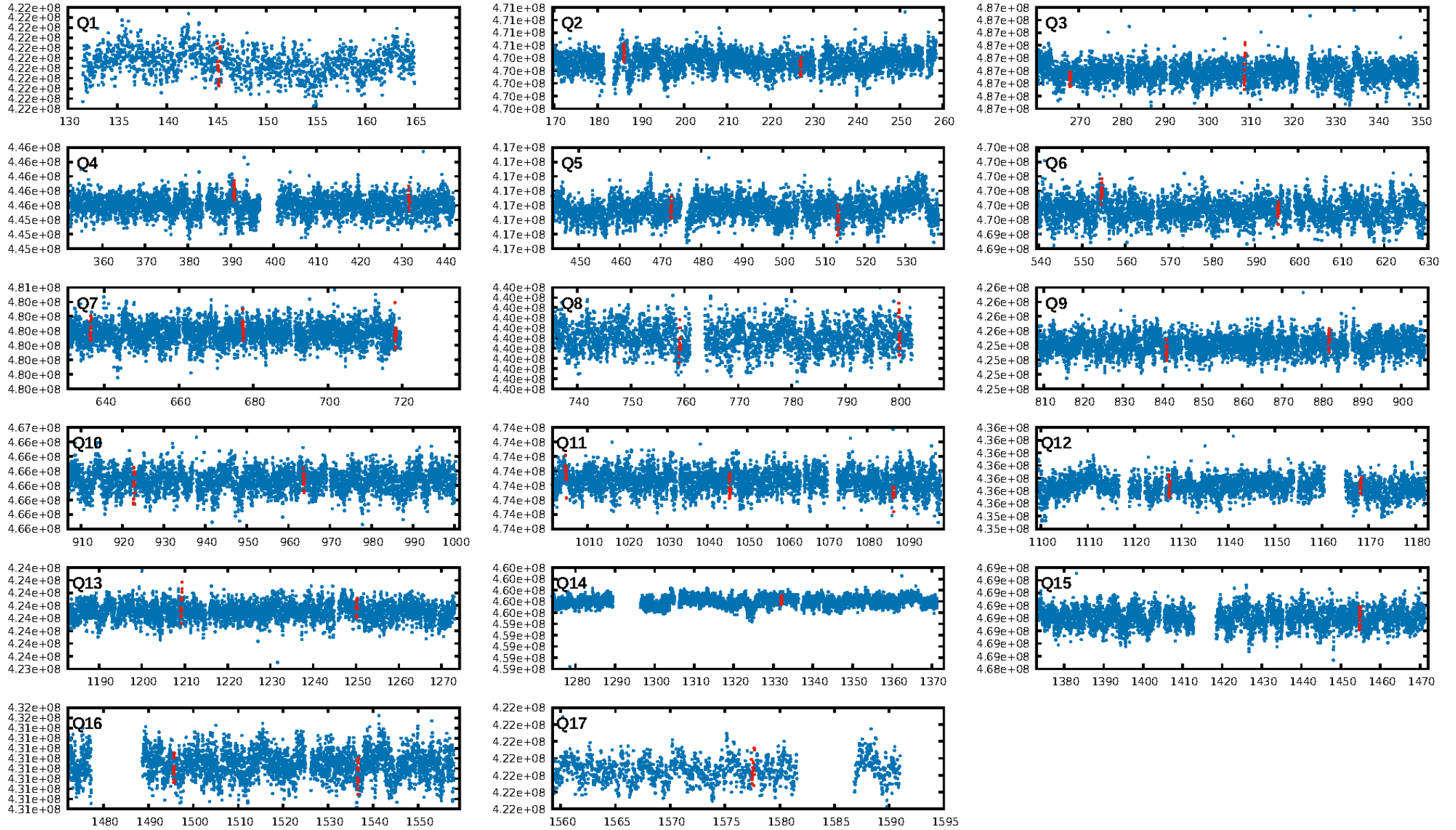
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.31σ]  
LongPeriod-sig: 100.0% [112.20σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.22  
Centroid-sig: 1.4%  
Centroid-so: 0.838 arcsec [2.05σ]  
OotOffset-rm: 0.594 arcsec [1.04σ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-rm: 0.496 arcsec [0.81σ]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 0.40 [6/15]  
DiffImageOverlap-fno: 0.65 [11/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:21:03 Z

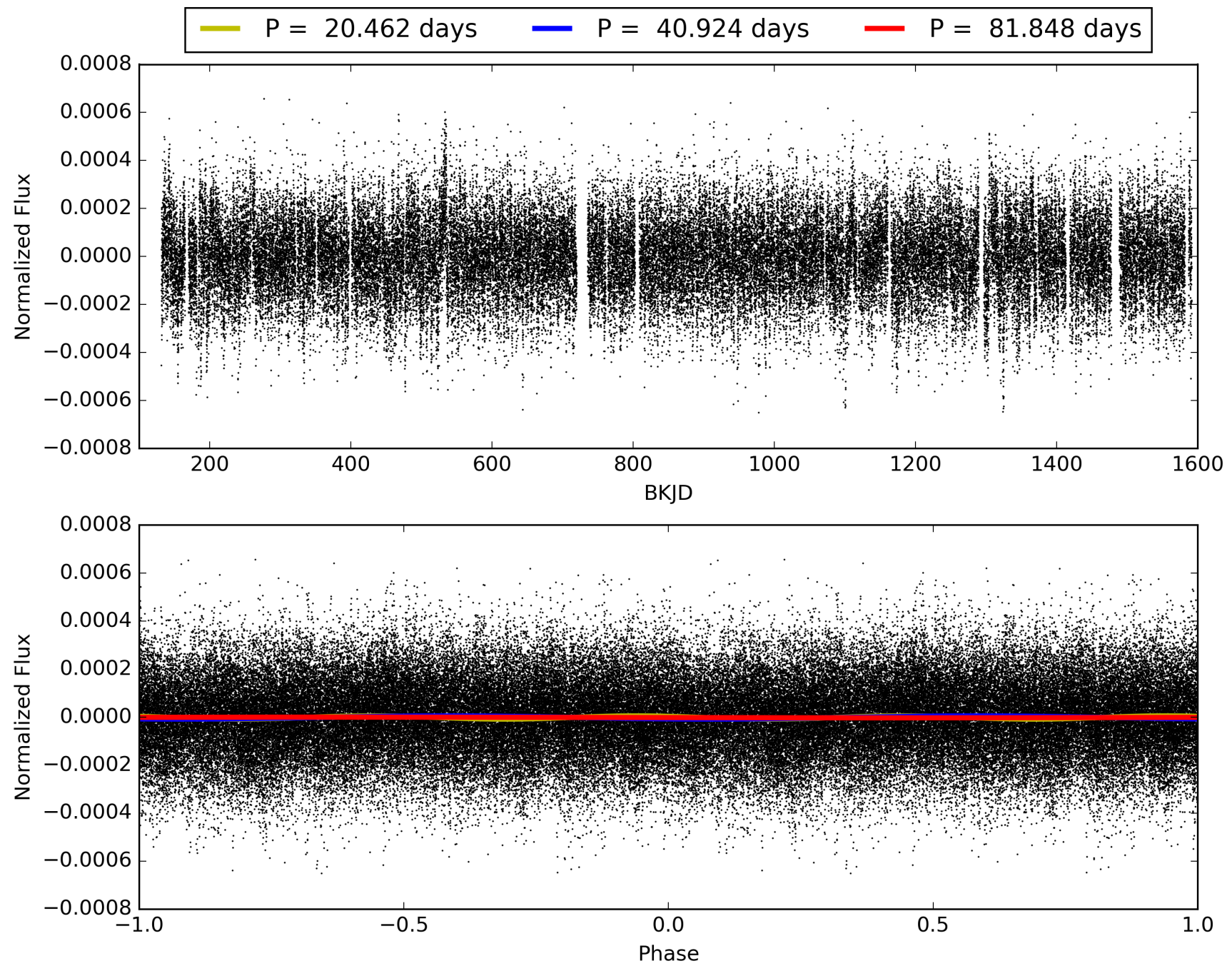
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009569838-06, PDC Light Curves



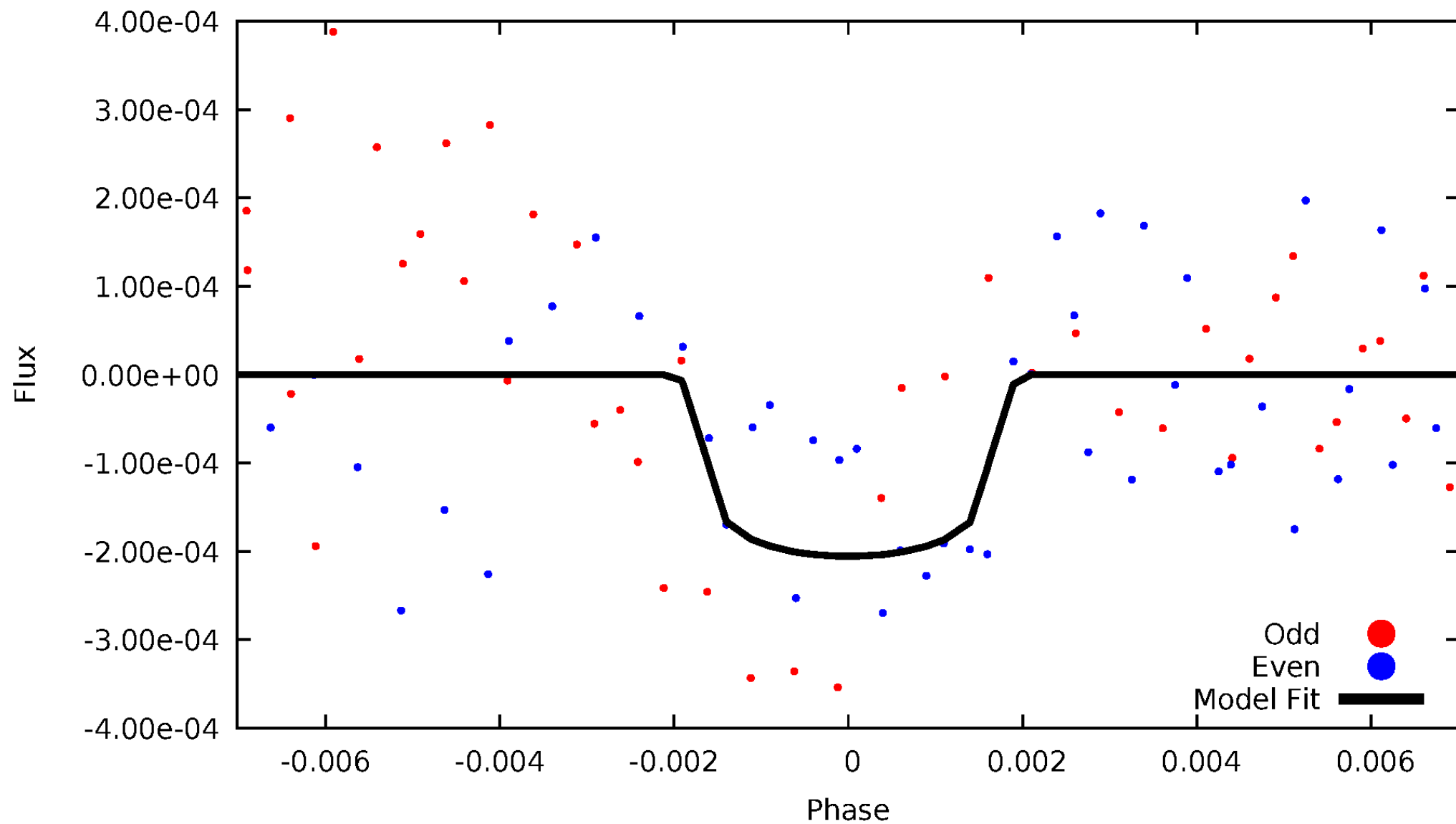


TCE 009569838-06



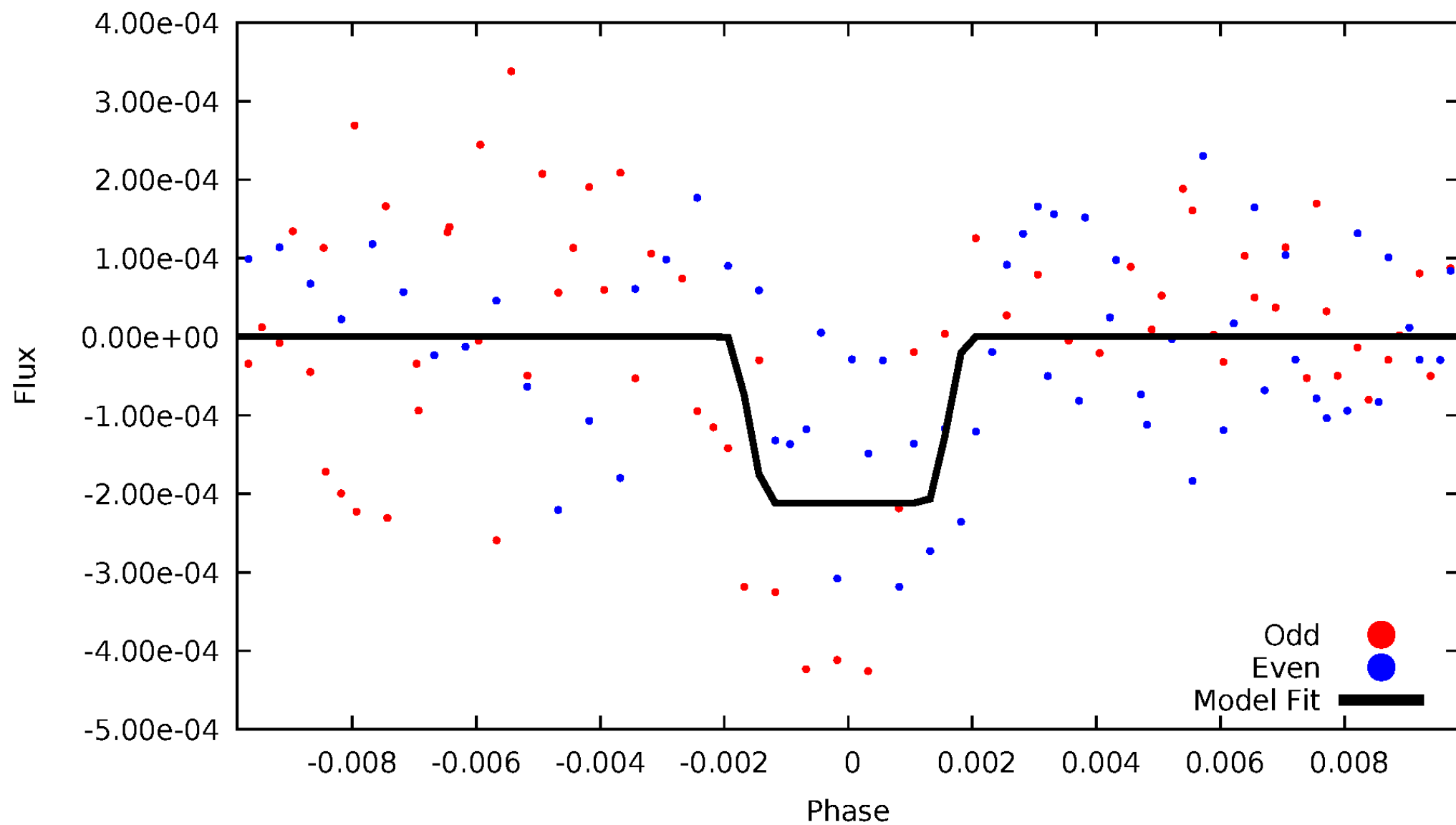
# DV Odd/Even

TCE 009569838-06



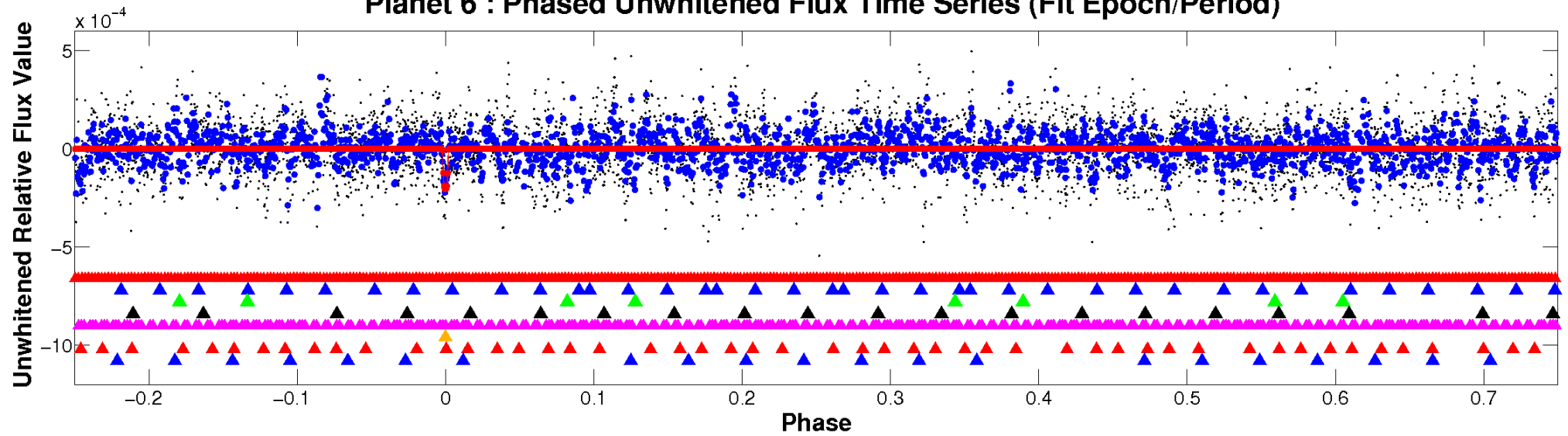
# ALT Odd/Even

TCE 009569838-06

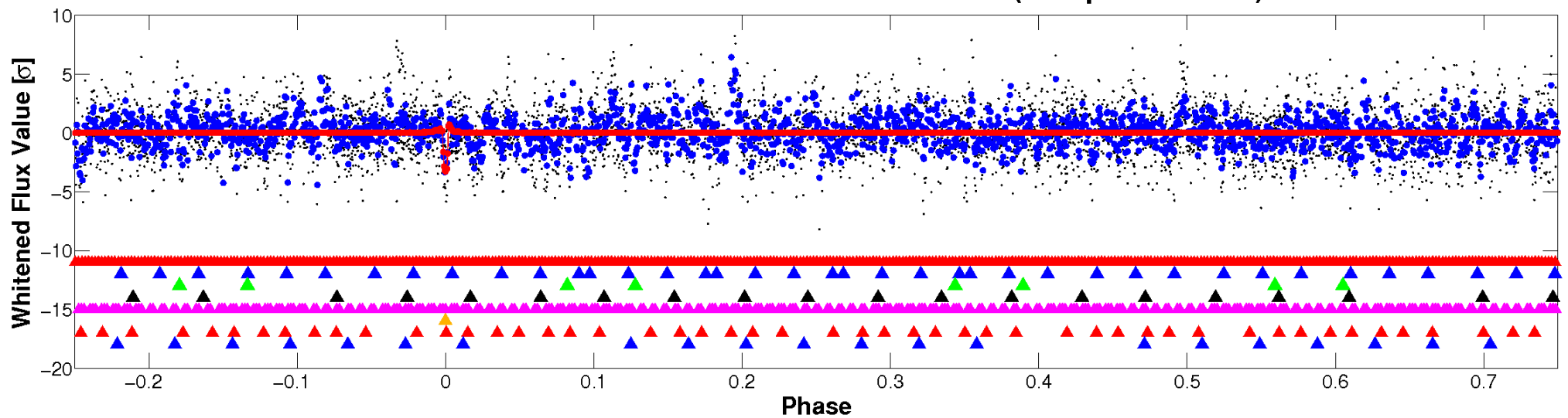


# Non-Whitened Vs. Whitened Light Curve

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

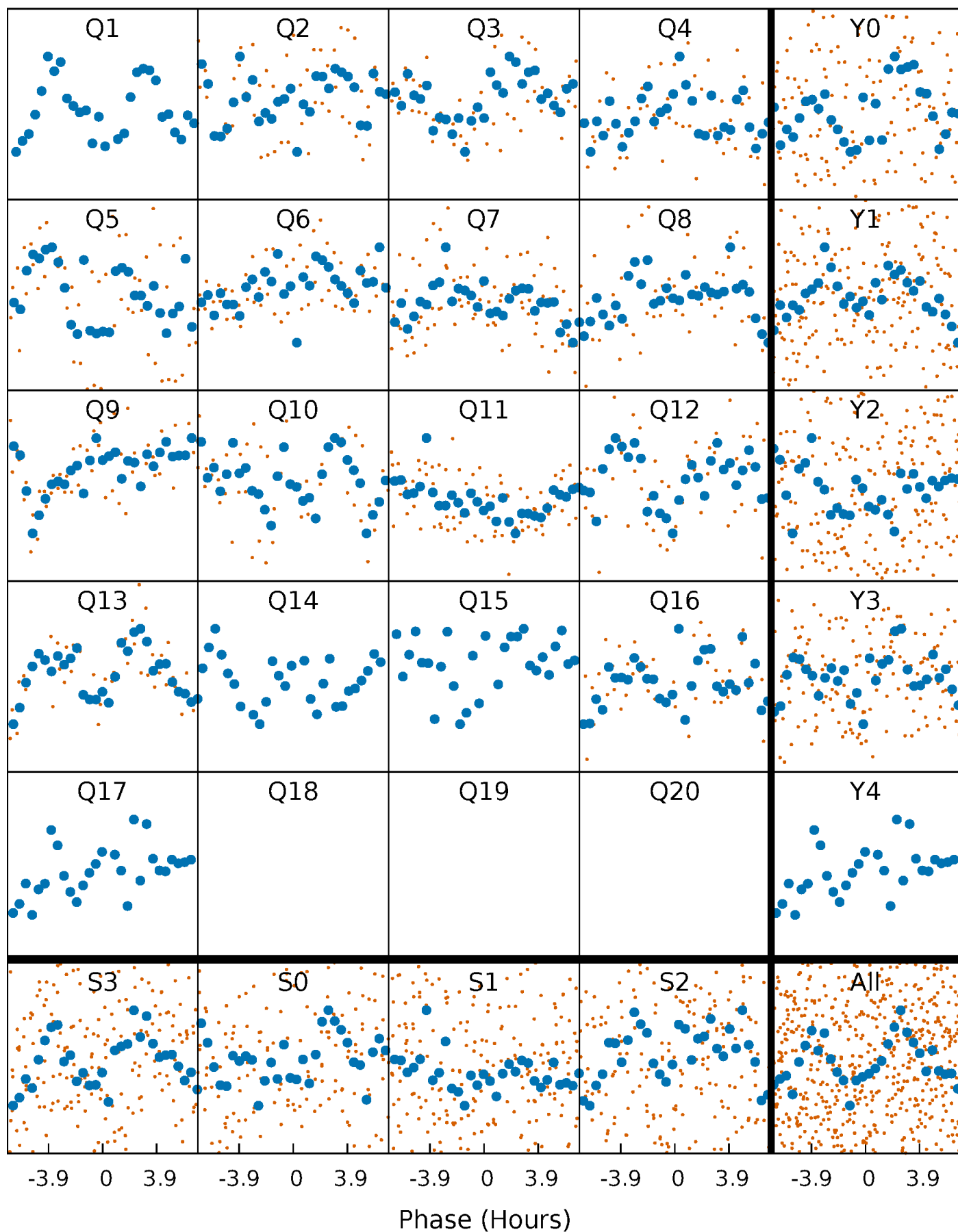


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



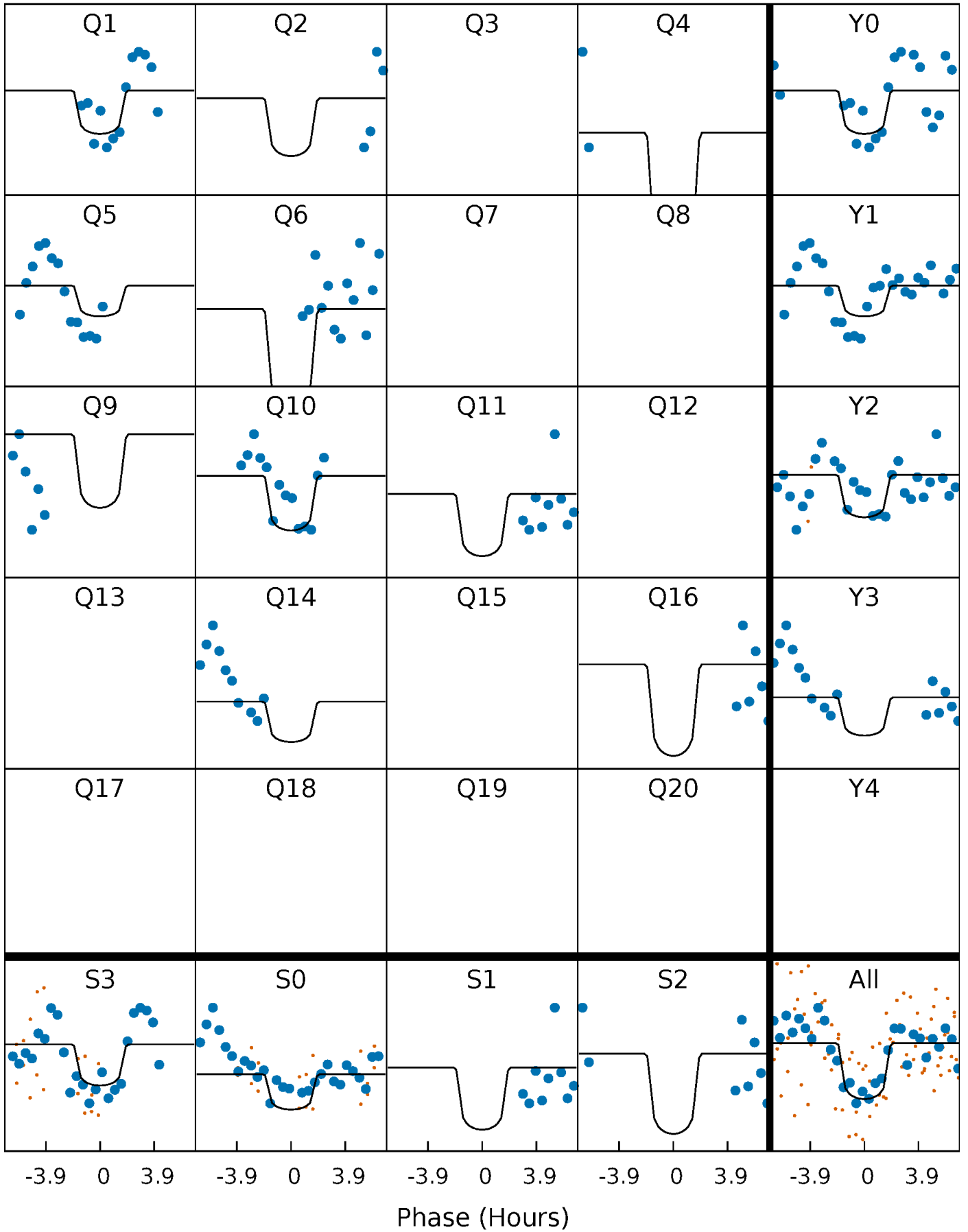
# PDC Quarter-Phased Transit Curves

TCE 009569838-06 P= 40.924036 Days  $T_0=145.228300$  (BKJD)



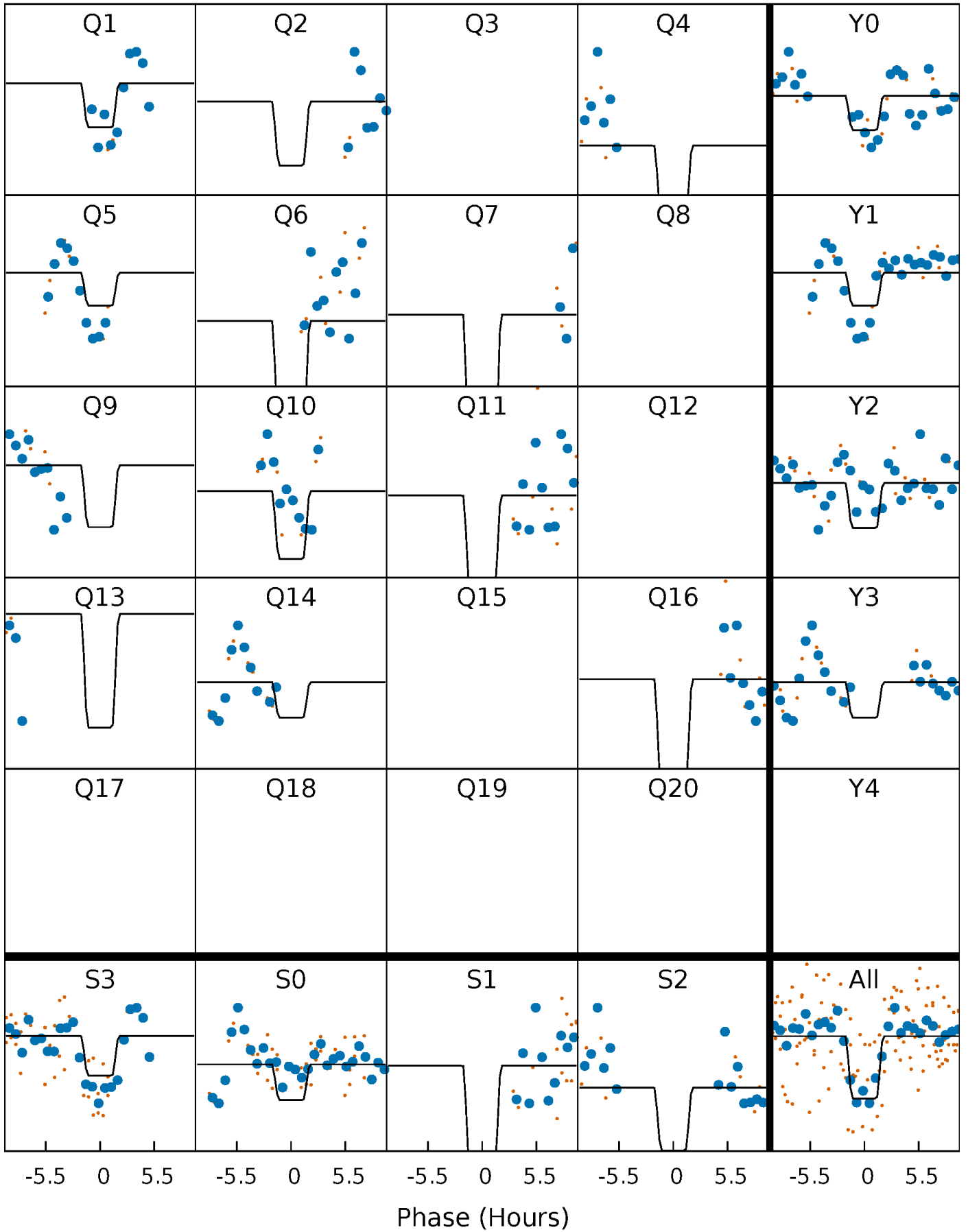
# DV Quarter-Phased Transit Curves

TCE 009569838-06 P= 40.924036 Days  $T_0=145.228300$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009569838-06 P= 40.923959 Days  $T_0=145.210969$  (BKJD)

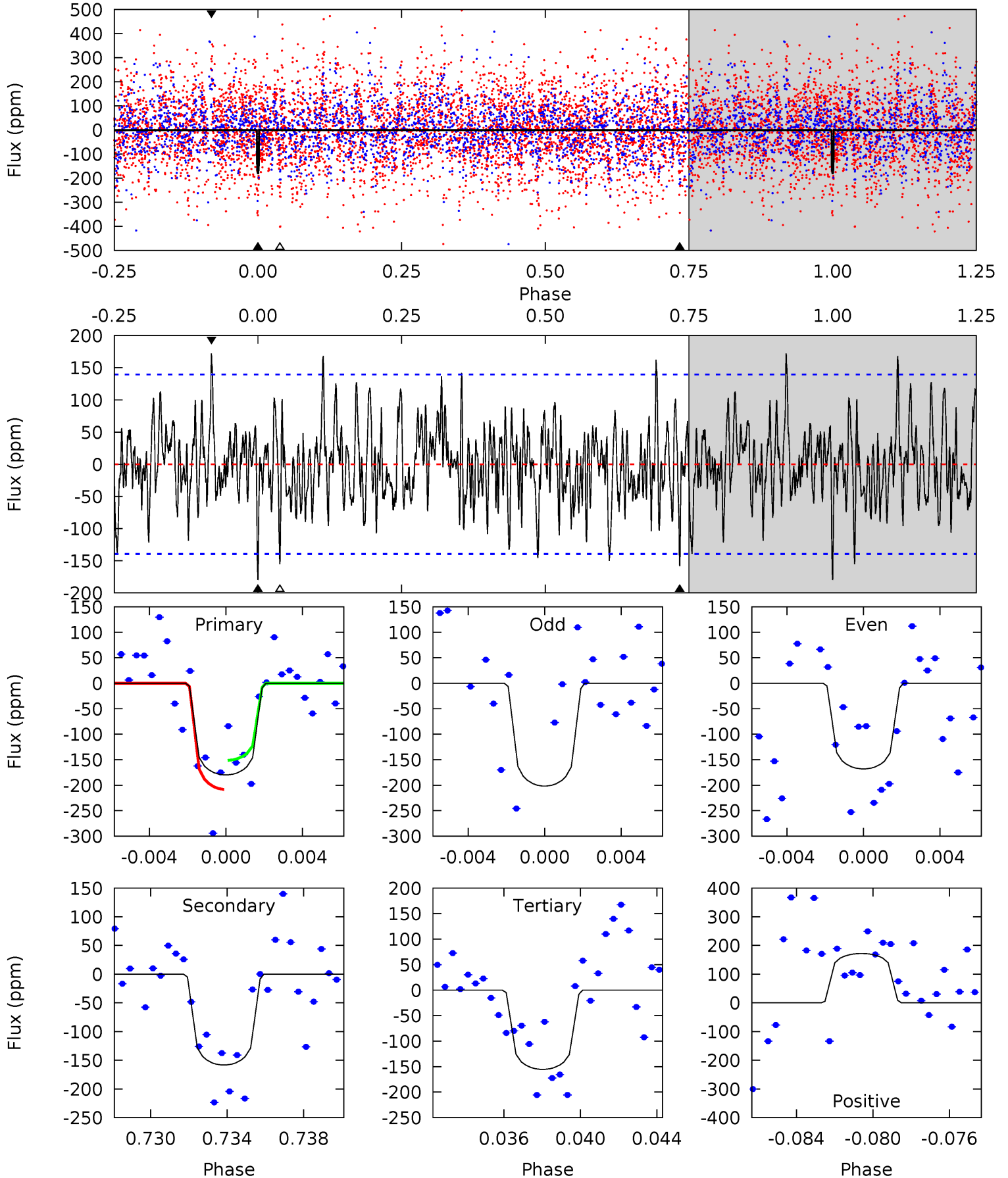




# DV Model-Shift Uniqueness Test

009569838-06, P = 40.924036 Days, E = 104.304264 Days

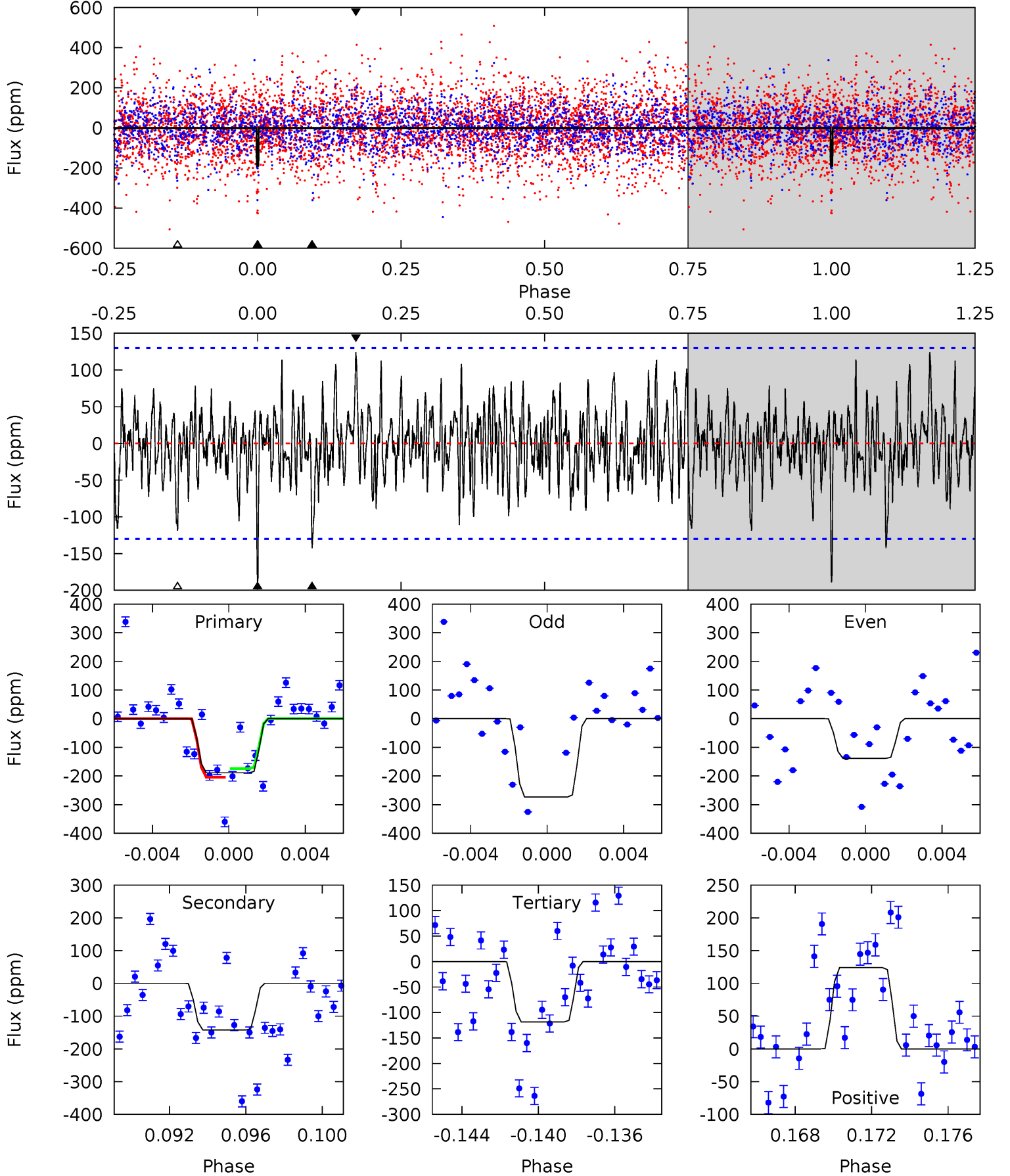
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.70	5.90	5.79	6.41	5.20	2.88	1.92	0.91	0.29	0.11	-0.51	0.59	0.94	0.49	1.06



# Alt Model-Shift Uniqueness Test

009569838-06, P = 40.923959 Days, E = 104.287010 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.55	5.69	4.74	4.96	5.20	2.88	1.59	2.81	2.59	0.95	0.73	2.66	2.44	0.40	0.60



### Stellar Parameters For KIC 009569838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6771^{+214}_{-262}$	$4.003^{+0.336}_{-0.144}$	$-0.540^{+0.250}_{-0.300}$	$1.776^{+0.433}_{-0.649}$	$1.157^{+0.189}_{-0.170}$	$0.291^{+0.708}_{-0.119}$
	+3%/-4%	+8%/-4%	+46%/-56%	+24%/-37%	+16%/-15%	+243%/-41%
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 009569838-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-158 \pm 27$	$3.11^{+2.42}_{-1.84}$	$1113^{+83}_{-110}$	$5782^{+4308}_{-1219}$	$534^{+2677}_{-370}$
Alt.	$-142 \pm 25$	$2.92^{+2.40}_{-1.75}$	$1112^{+85}_{-126}$	$5803^{+4150}_{-1327}$	$552^{+2953}_{-391}$

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

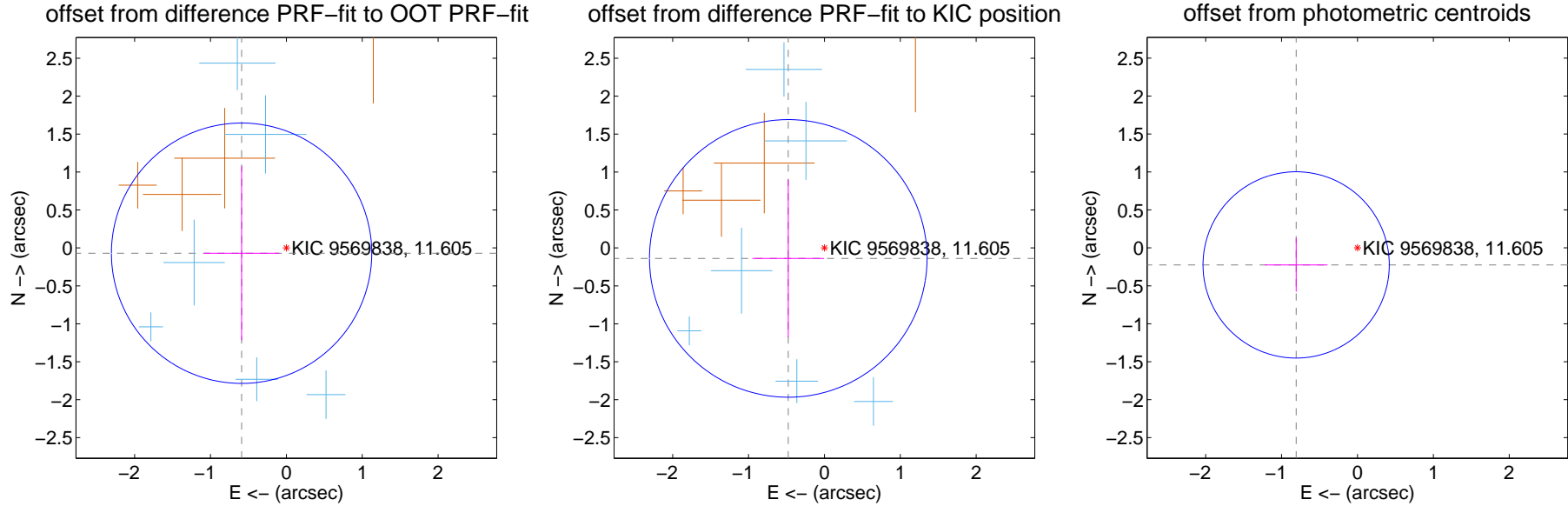
## DV Centroid Data

Supplemental centroid analysis for 009569838-06. **Kepler magnitude: 11.61.** Transit SNR 13.22

There are 6 quarters with good PRF difference image offsets

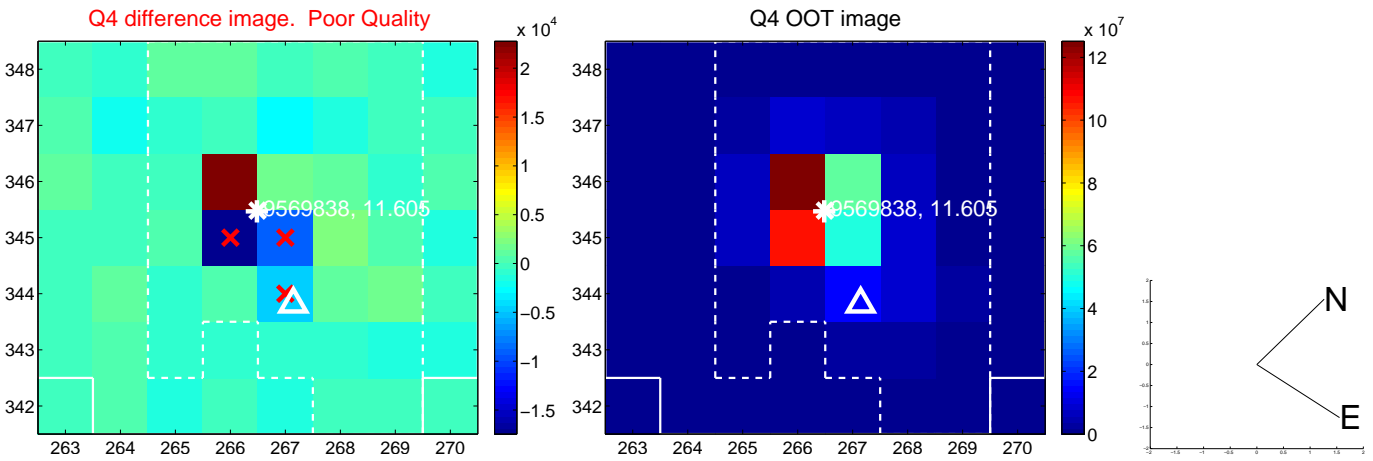
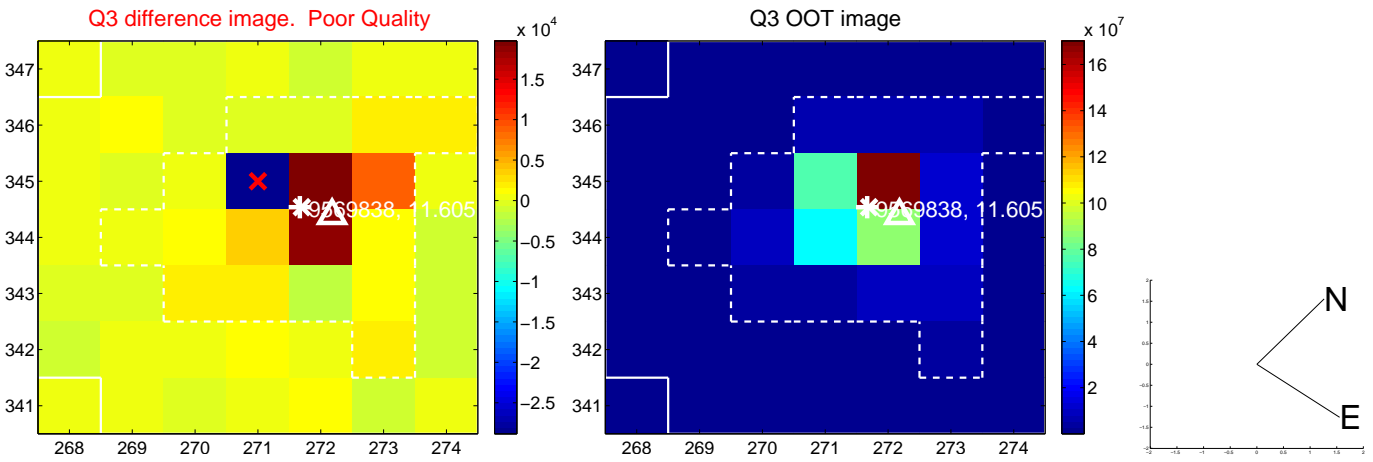
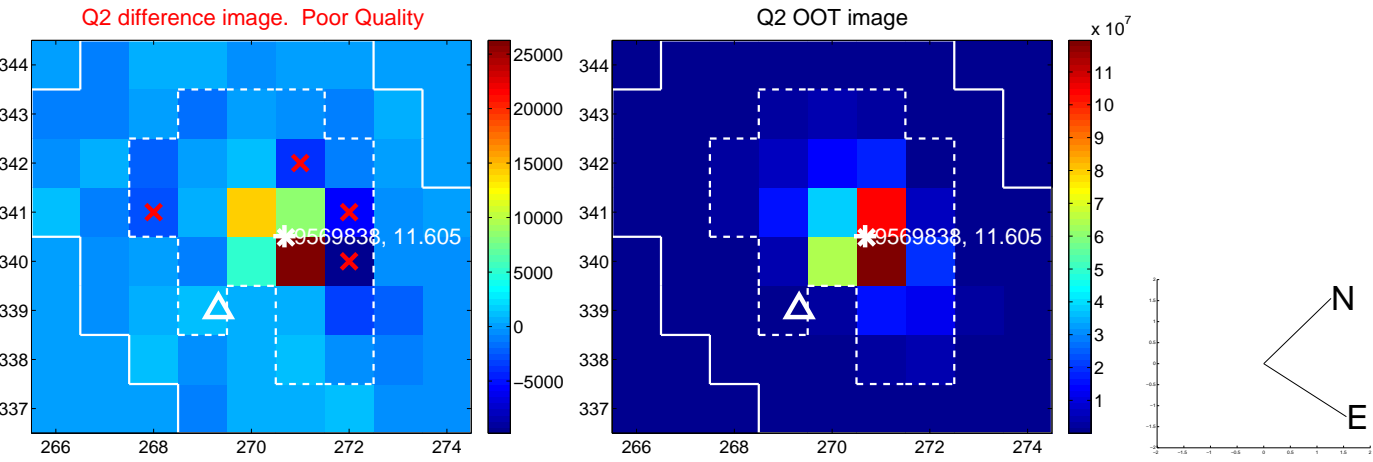
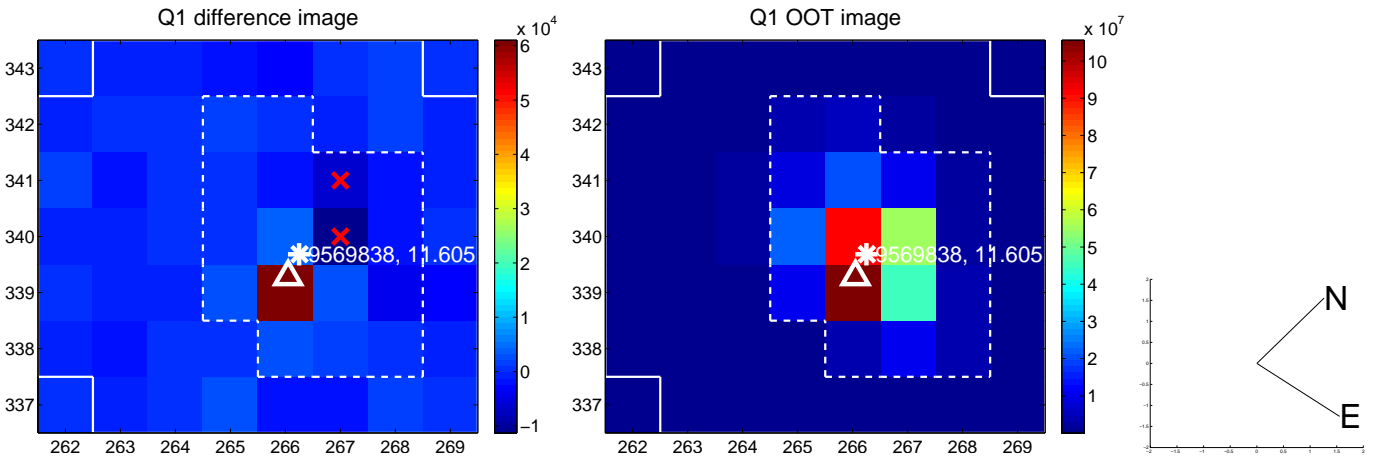
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.594 \pm 0.572$	1.04	$0.590 \pm 0.495$	$-0.070 \pm 1.146$
PRF-fit source offset from KIC position	$0.496 \pm 0.610$	0.81	$0.477 \pm 0.472$	$-0.138 \pm 1.039$
photometric centroid source offset	$0.84 \pm 0.41$	2.05	$0.81 \pm 0.41$	$-0.22 \pm 0.35$

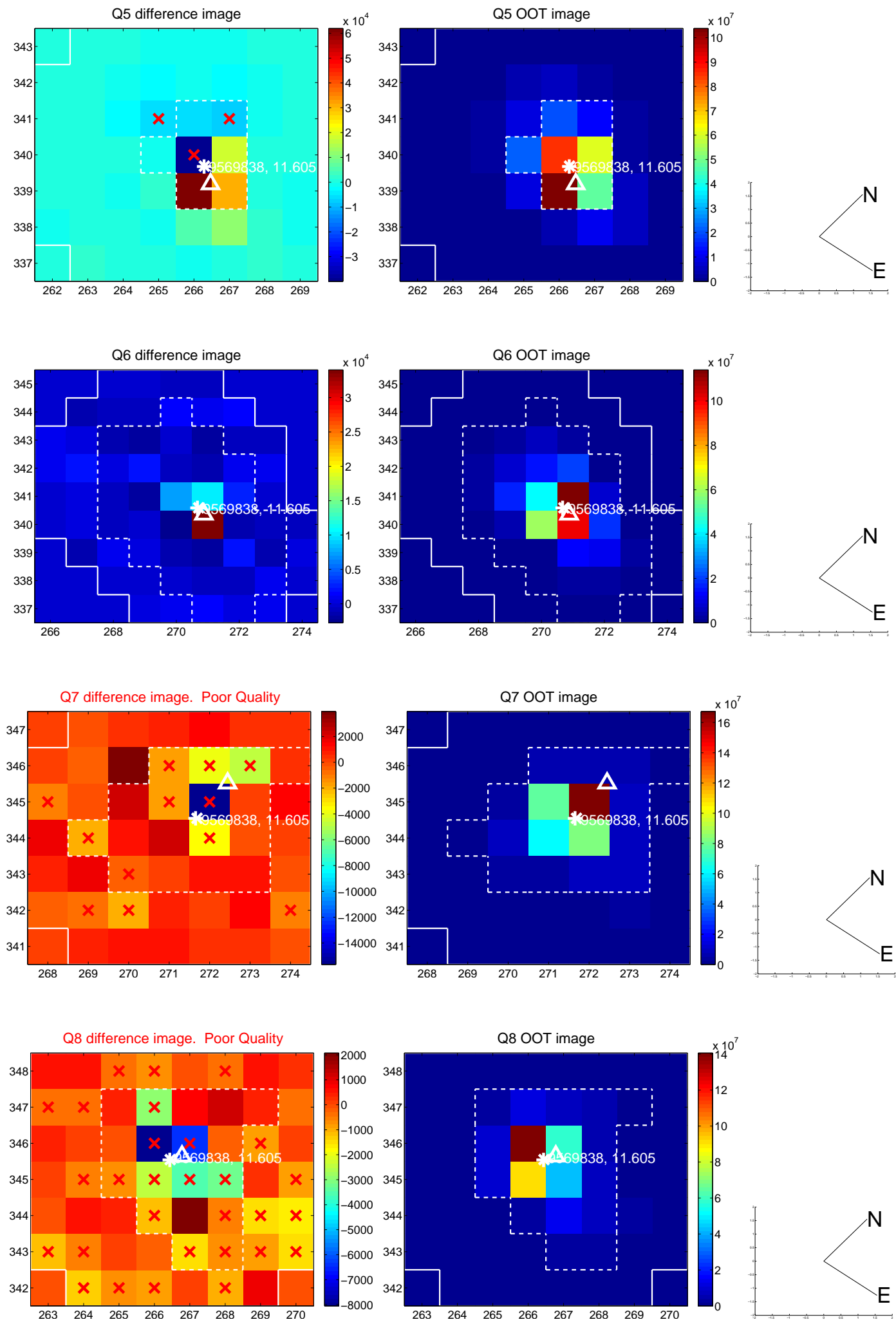


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

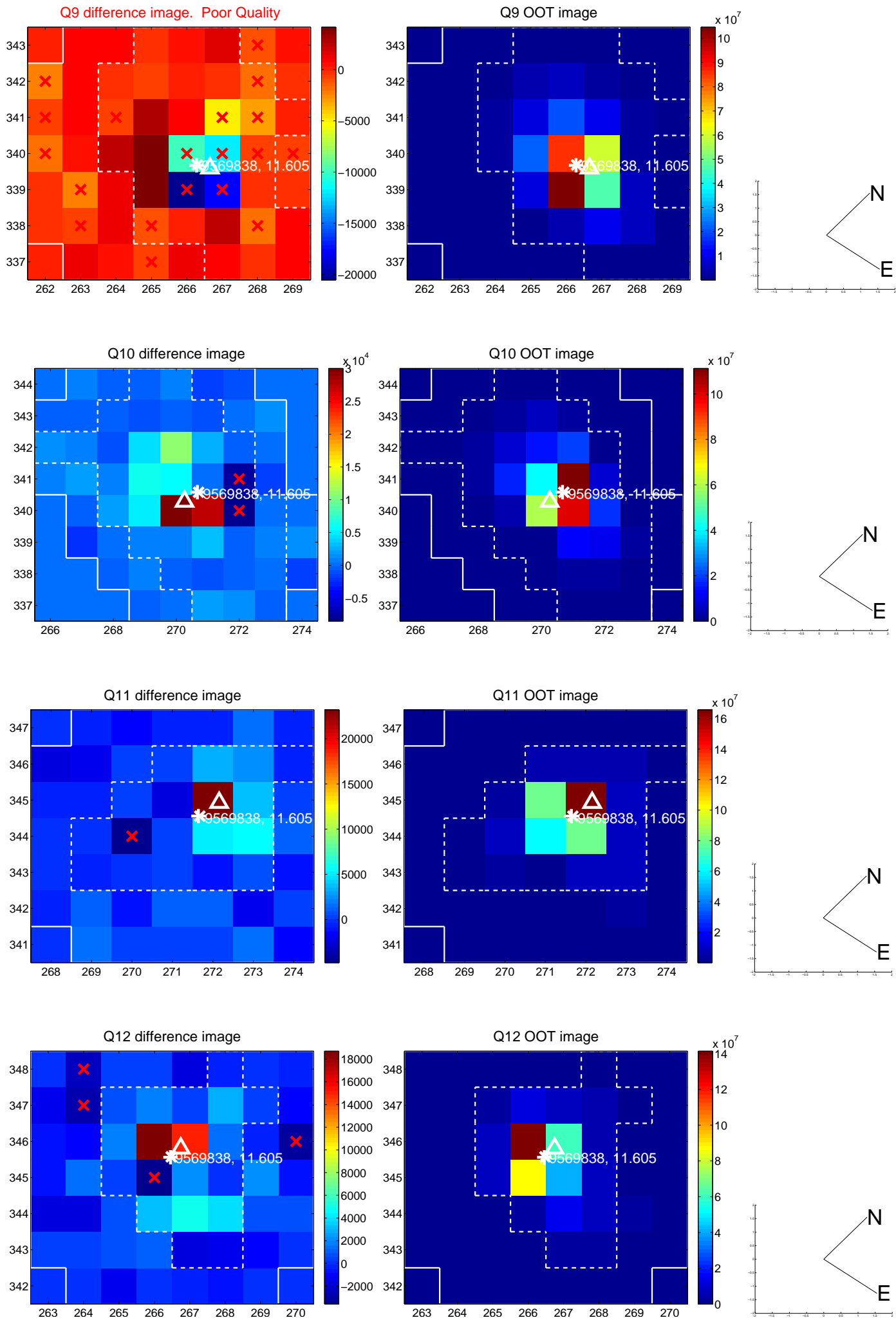
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

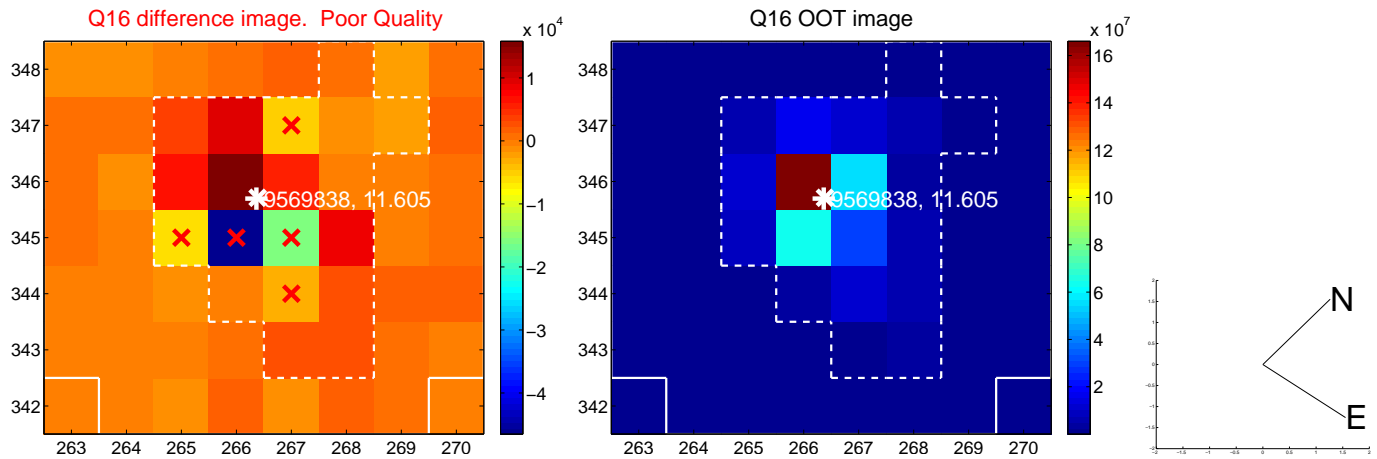
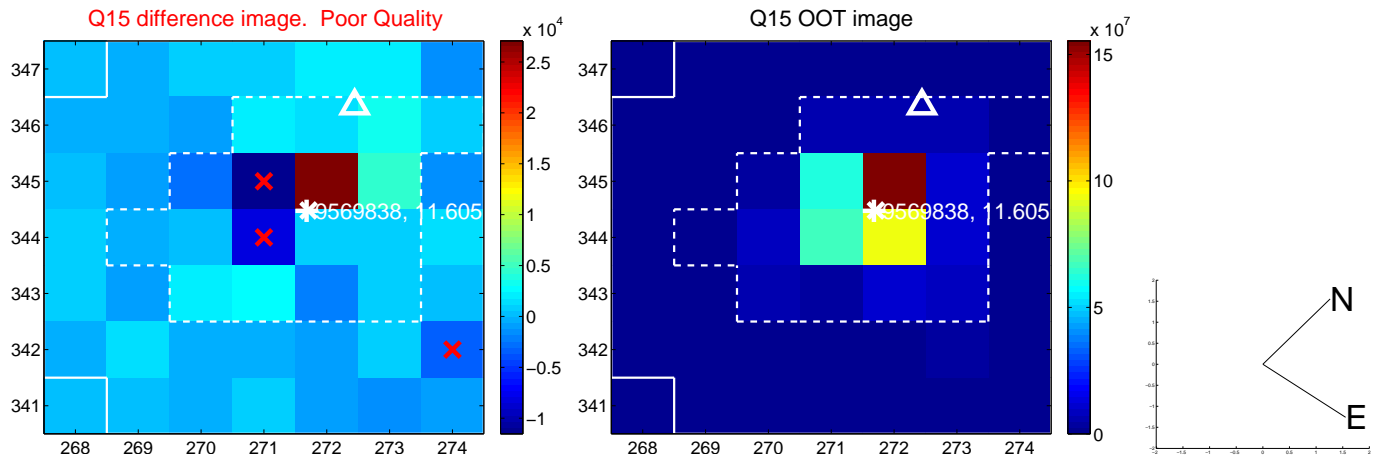
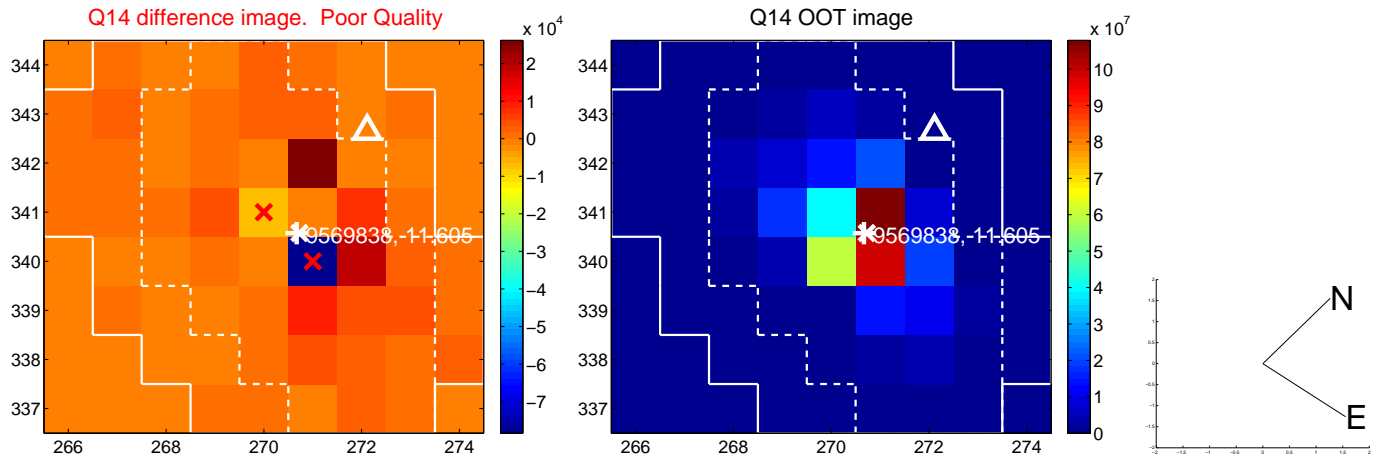
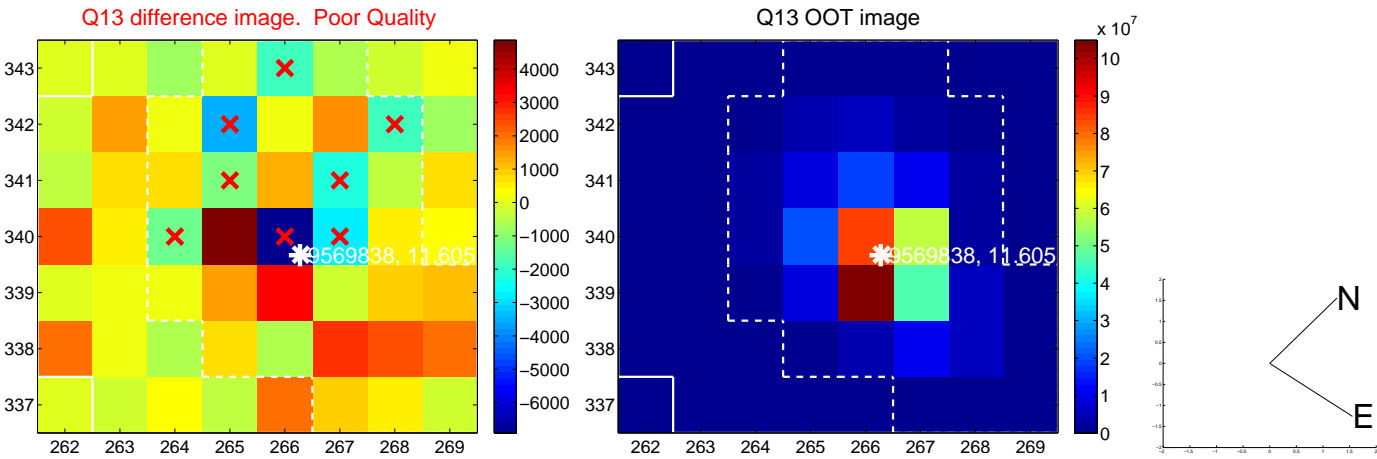


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

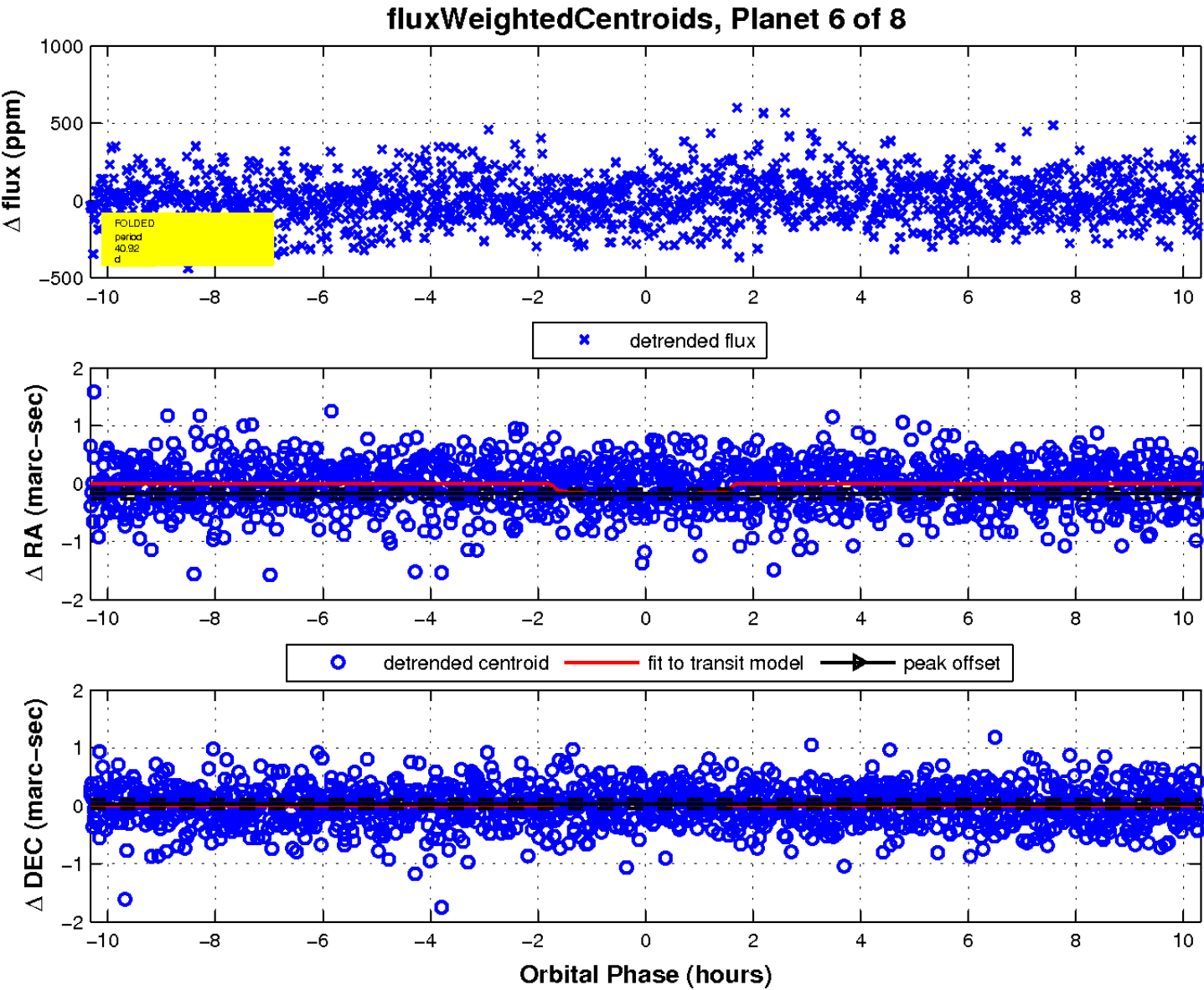
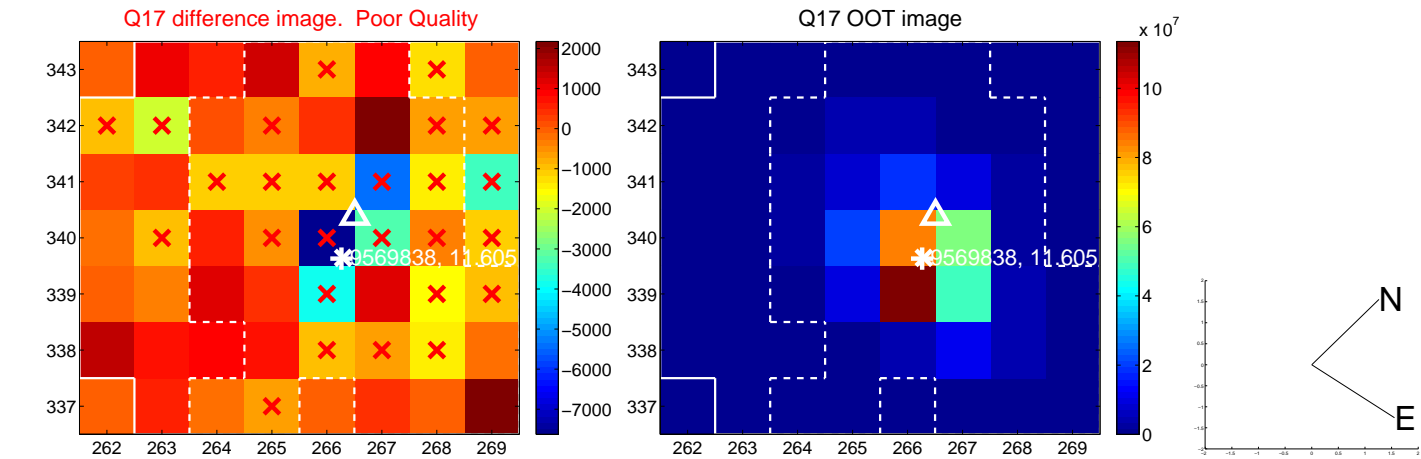




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

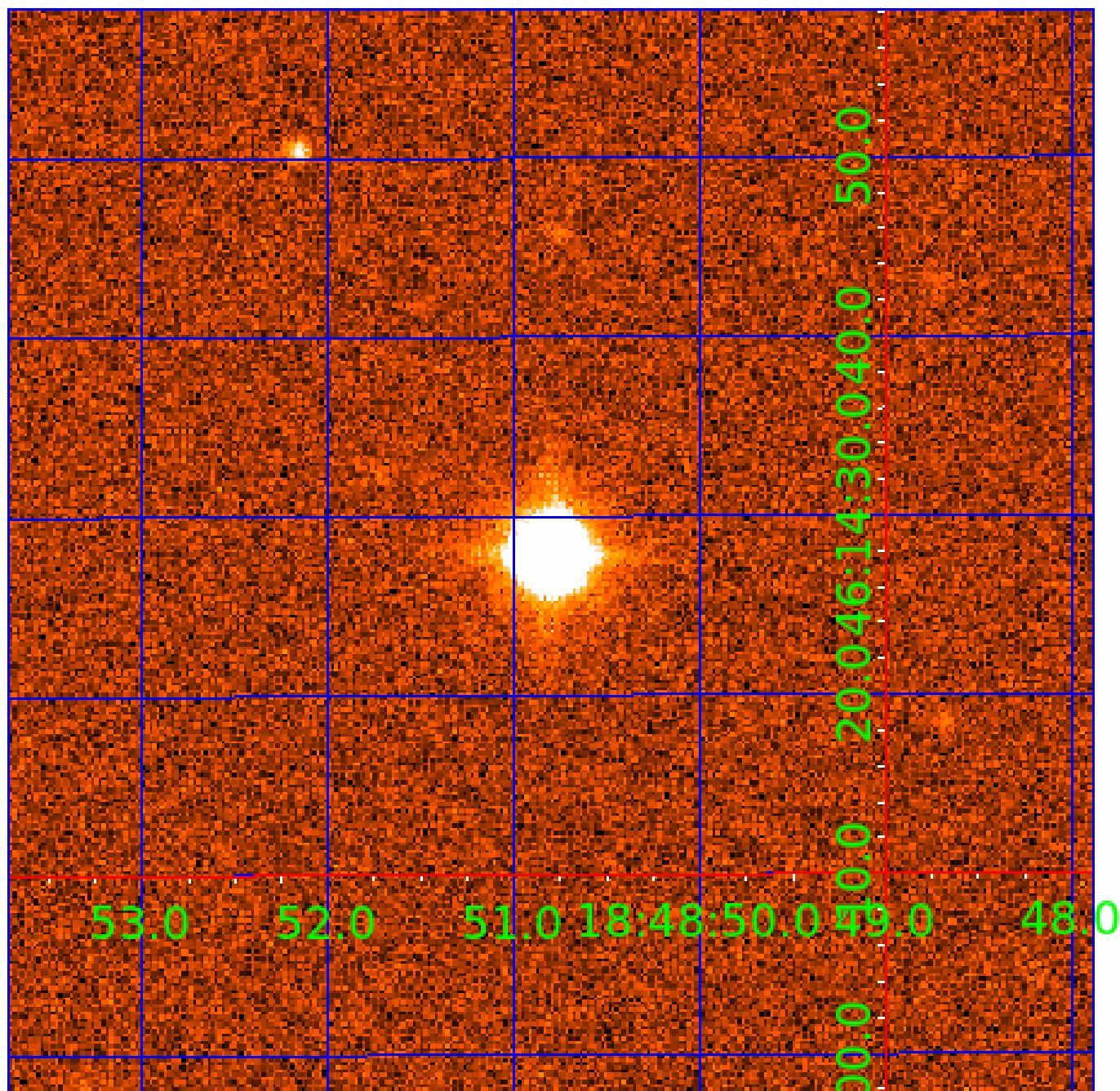


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009569838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009569838-01	OBS	No	2.831767	132.552789	19.4	20.136	8.4	8.7	1.78	6771	0.90	3507.98
009569838-02	OBS	No	37.424710	159.410322	186.5	10.964	21.6	15.0	1.78	6771	2.77	112.27
009569838-03	OBS	No	193.920337	202.089180	350.7	3.695	20.8	17.7	1.78	6771	3.36	12.52
009569838-05	OBS	No	4.511901	132.177940	93.8	4.437	15.3	15.7	1.78	6771	1.90	1885.04
009569838-06	OBS	No	40.924036	145.228300	205.6	3.445	13.0	13.2	1.78	6771	2.81	99.65
009569838-07	OBS	No	29.432804	138.798788	206.7	3.101	13.1	12.9	1.78	6771	2.96	154.65
009569838-08	OBS	No	67.676565	174.057774	309.1	4.570	12.1	12.0	1.78	6771	3.80	50.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009569838-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009569838-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009569838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

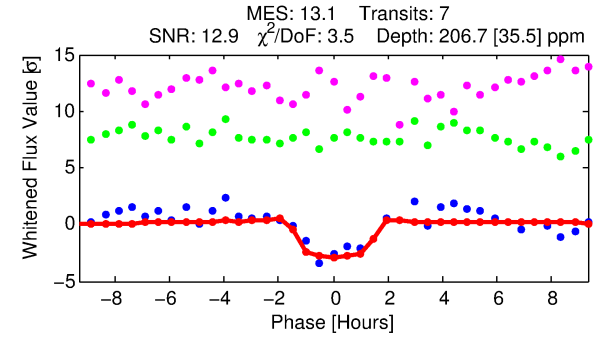
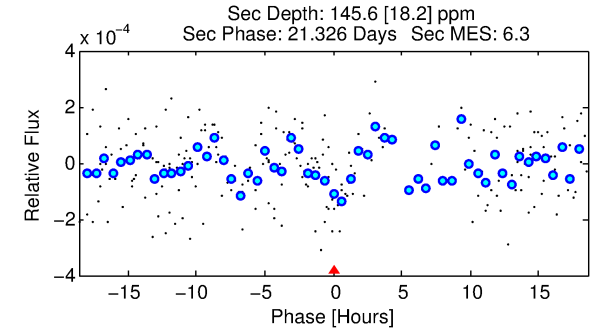
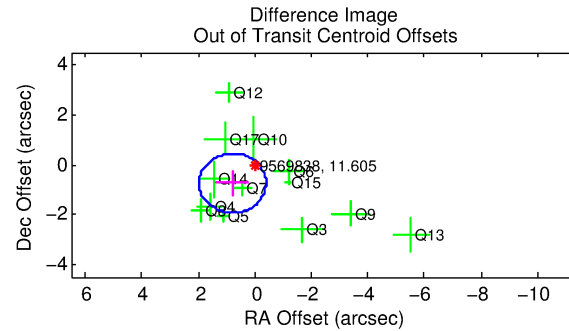
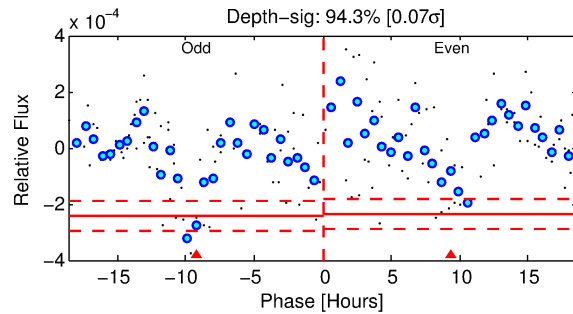
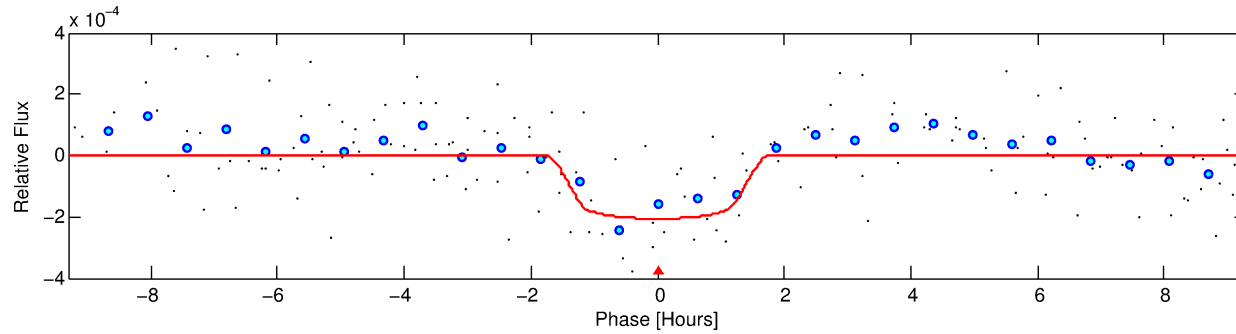
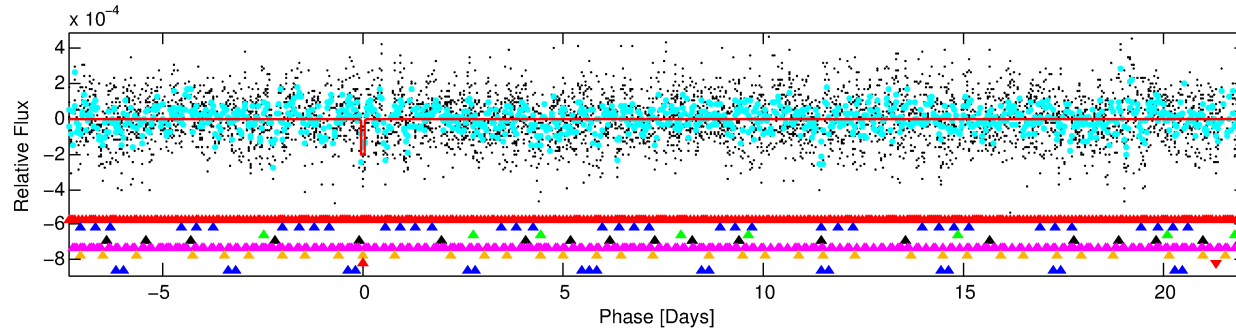
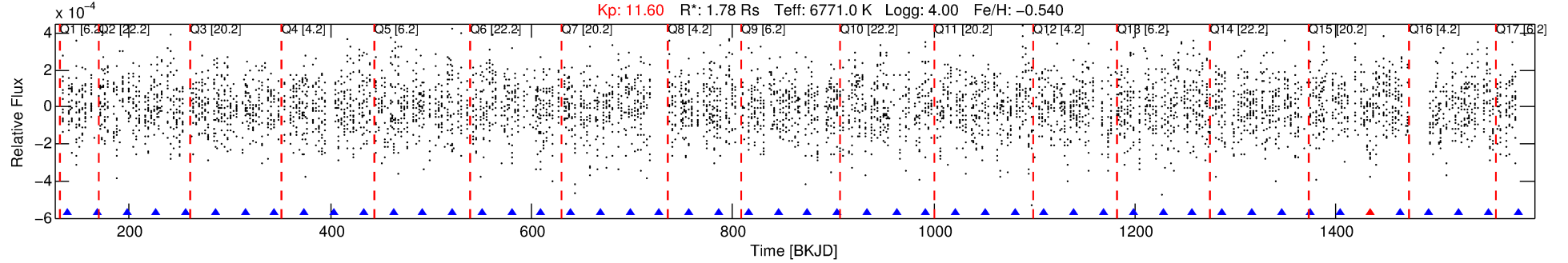
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009569838-07

No Significant Match Found

# DV One-Page Summary

KIC: 9569838 Candidate: 7 of 8 Period: 29.433 d



## DV Fit Results:

Period = 29.43280 [0.00047] d  
Epoch = 138.7988 [0.0121] BKJD  
 $R_p/R^* = 0.0153$  [0.0138]  
 $a/R^* = 34.71$  [188.42]  
 $b = 0.90$  [1.22]  
 $\text{Seff} = 154.65$  [91.41]  
 $T_{\text{eq}} = 899$  [133] K  
 $R_p = 2.96$  [2.89]  $R_e$   
 $a = 0.1960$  [0.0695] AU  
 $A_g = 350.33$  [665.75] [0.52 $\sigma$ ]  
 $T_{\text{eff}} = 6015$  [2736] K [1.87 $\sigma$ ]

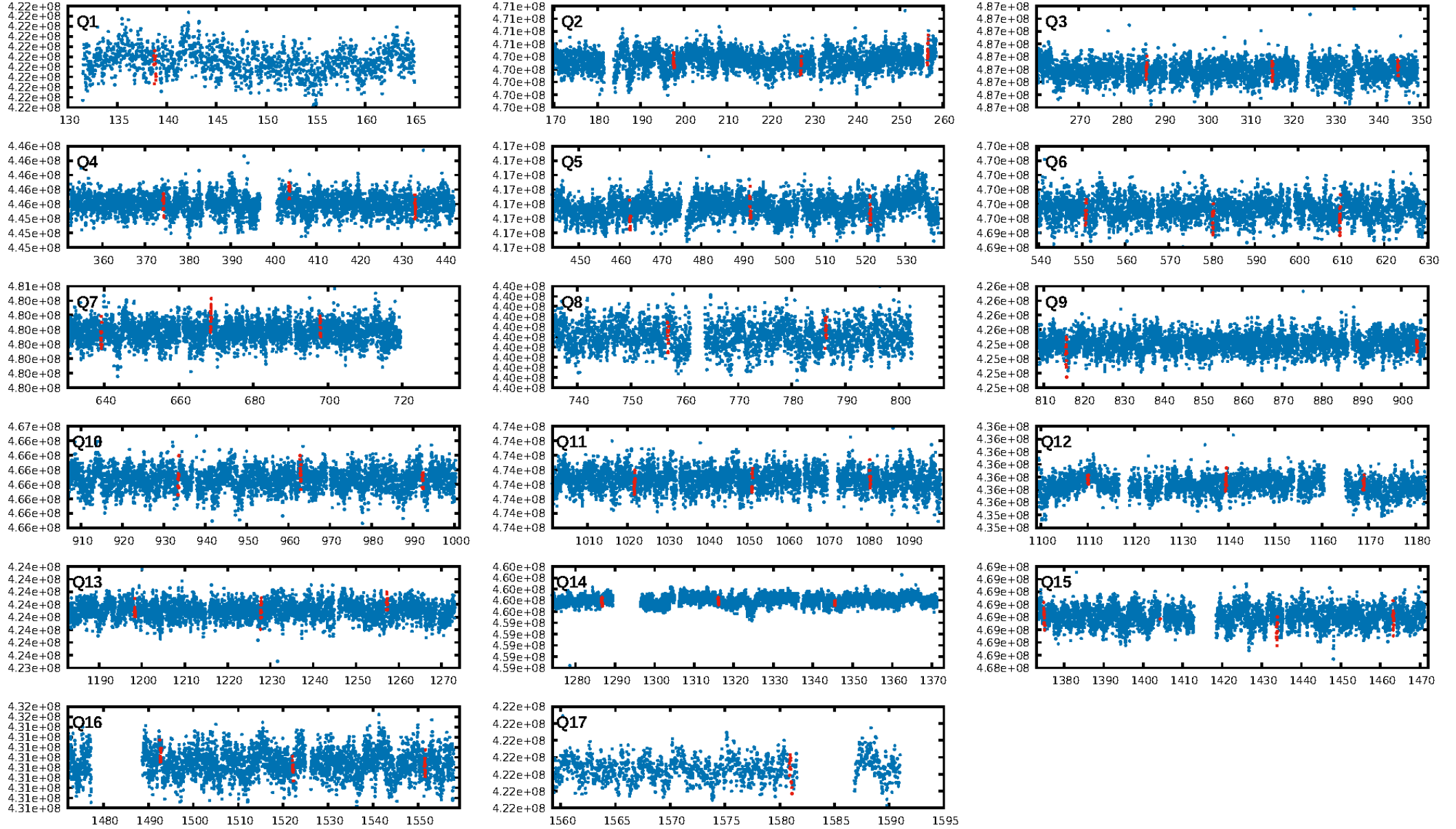
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [110.48 $\sigma$ ]  
LongPeriod-sig: 100.0% [16.83 $\sigma$ ]  
**ModelChiSquare2-sig: 0.0%**  
ModelChiSquareGof-sig: 11.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.86 [6/7]  
GhostDiagnostic-chr: -0.09911  
Centroid-sig: 14.4%  
Centroid-so: 0.463 arcsec [1.24 $\sigma$ ]  
OotOffset-rm: 1.088 arcsec [2.75 $\sigma$ ]  
KicOffset-rm: 1.112 arcsec [2.84 $\sigma$ ]  
OotOffset-st: 3/3/3/4 [13]  
KicOffset-st: 3/3/3/4 [13]  
DiffImageQuality-fgm: 0.54 [7/13]  
DiffImageOverlap-fno: 0.76 [13/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:21:06 Z

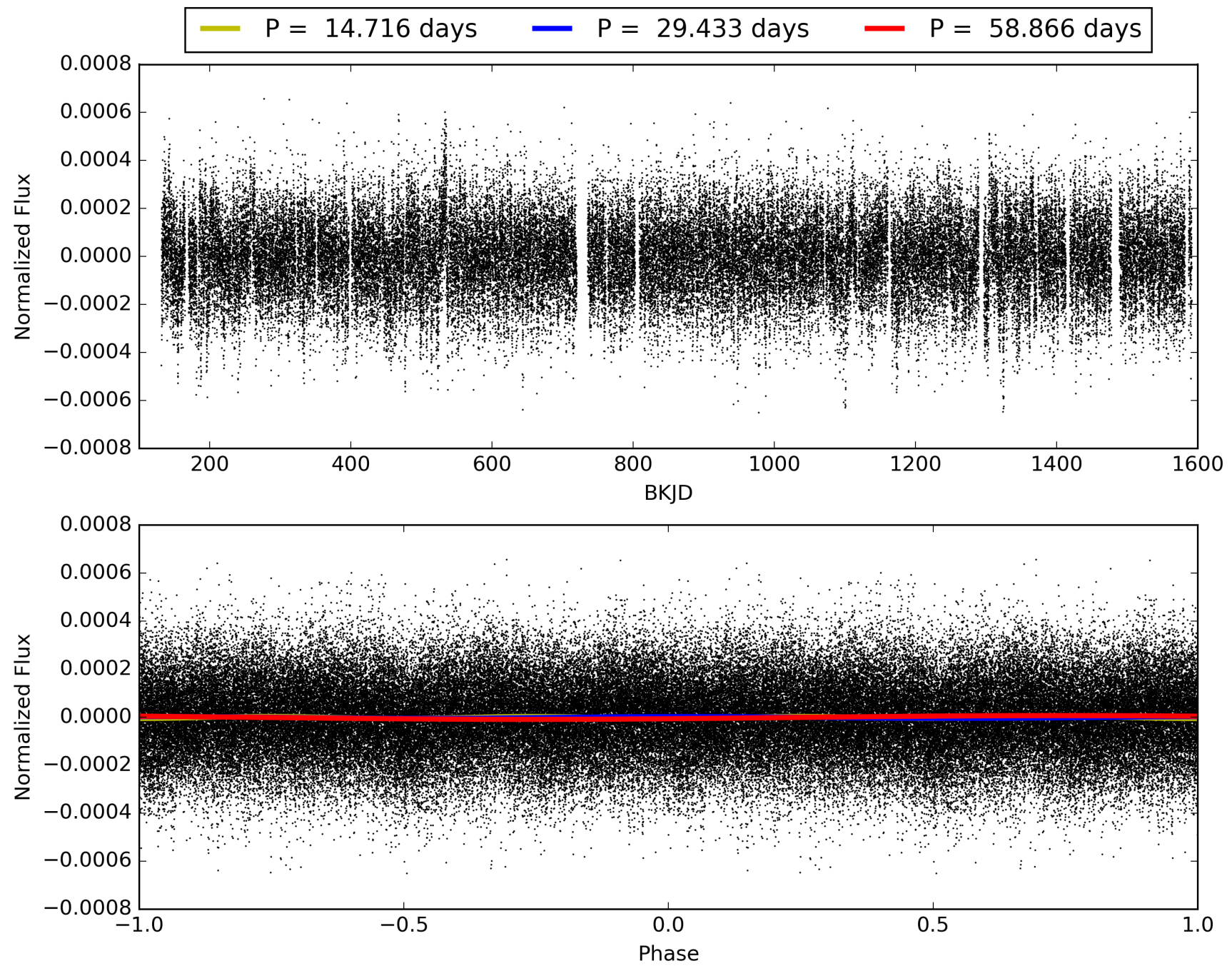
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009569838-07, PDC Light Curves





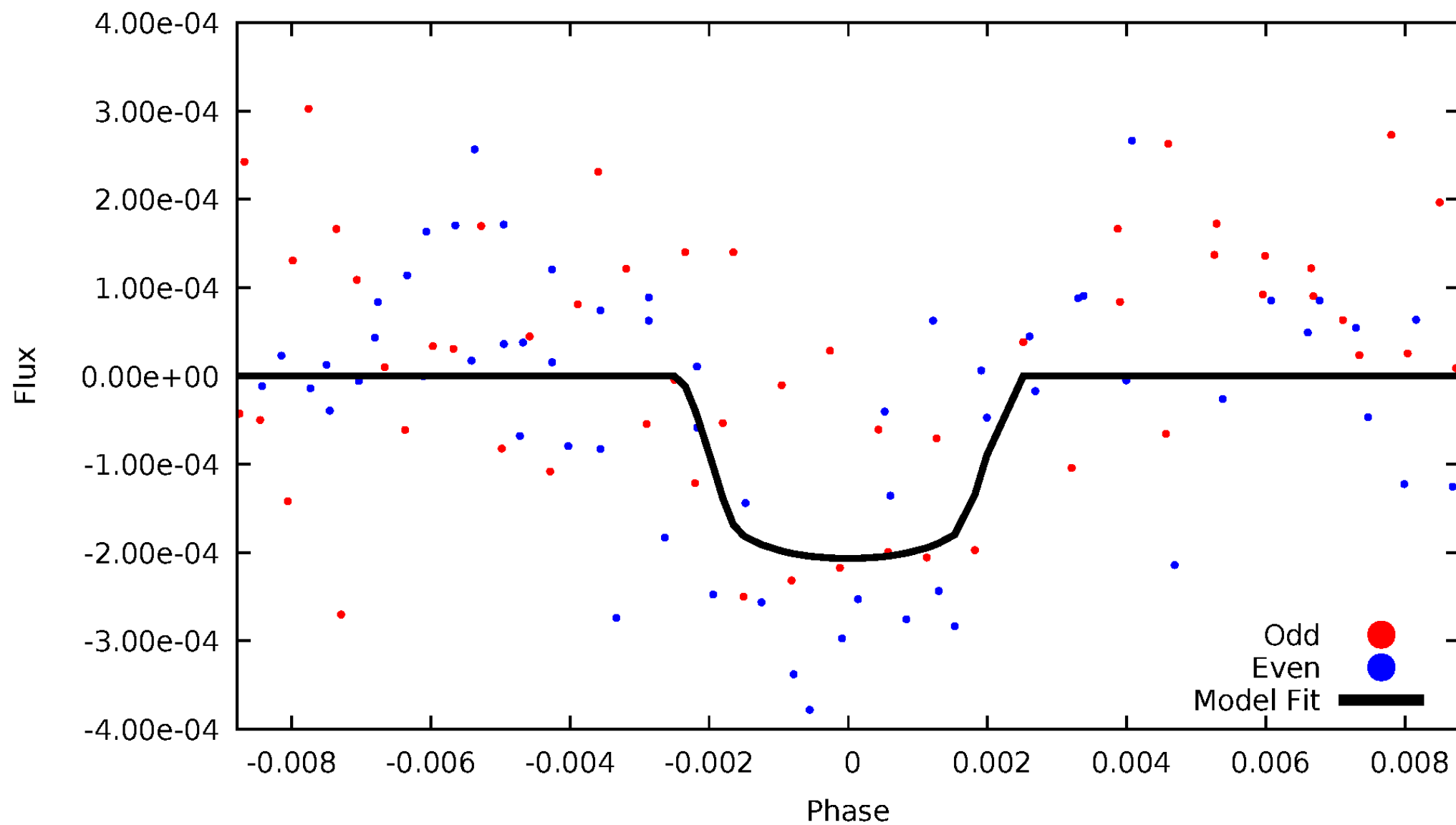
TCE 009569838-07





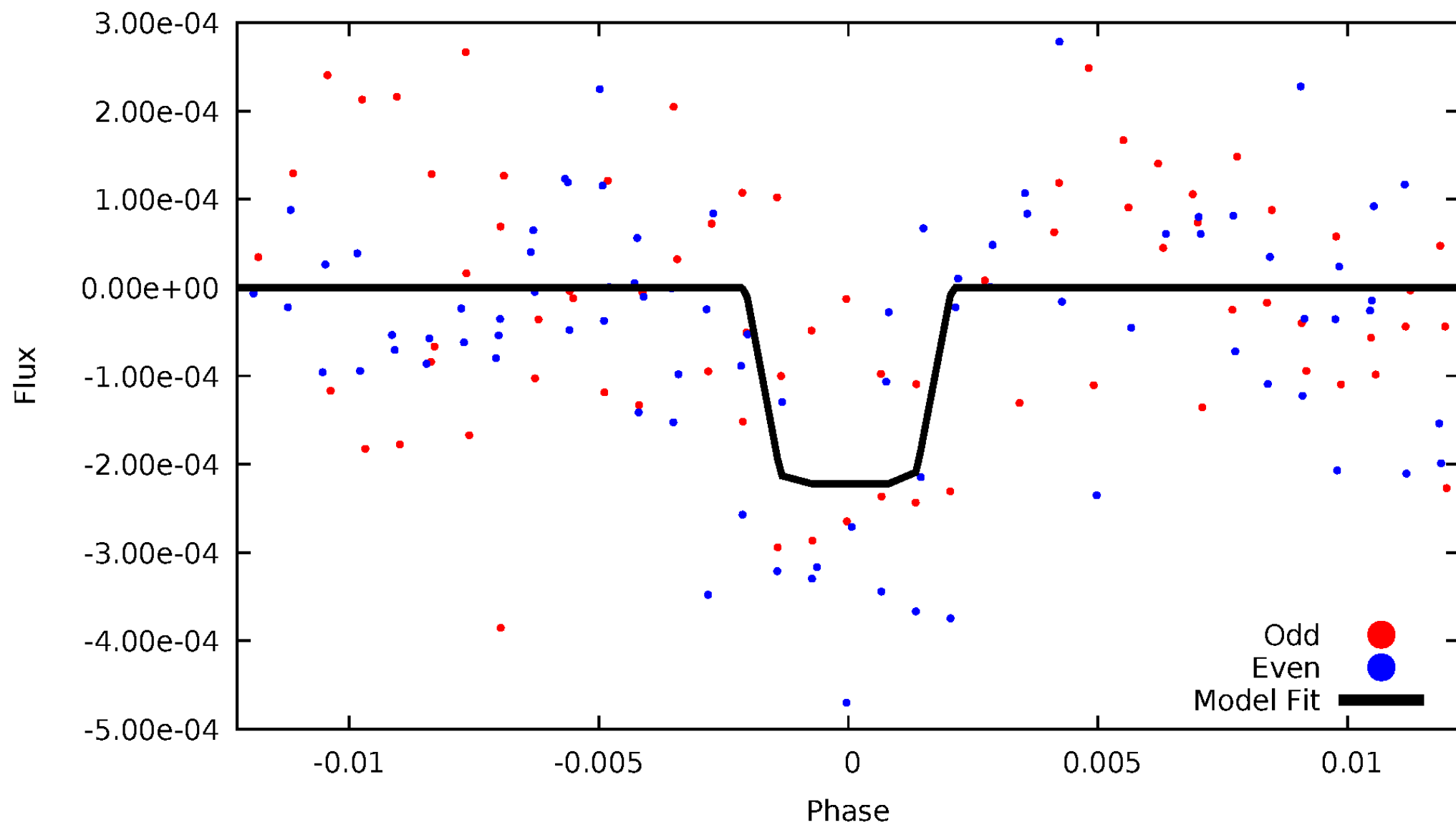
# DV Odd/Even

TCE 009569838-07

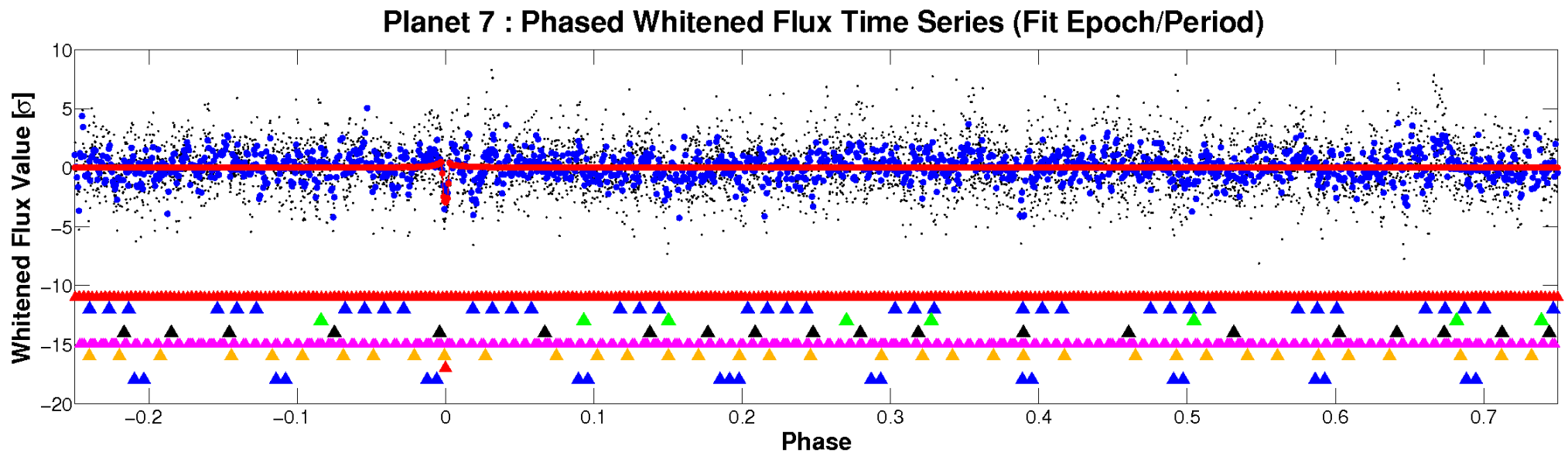
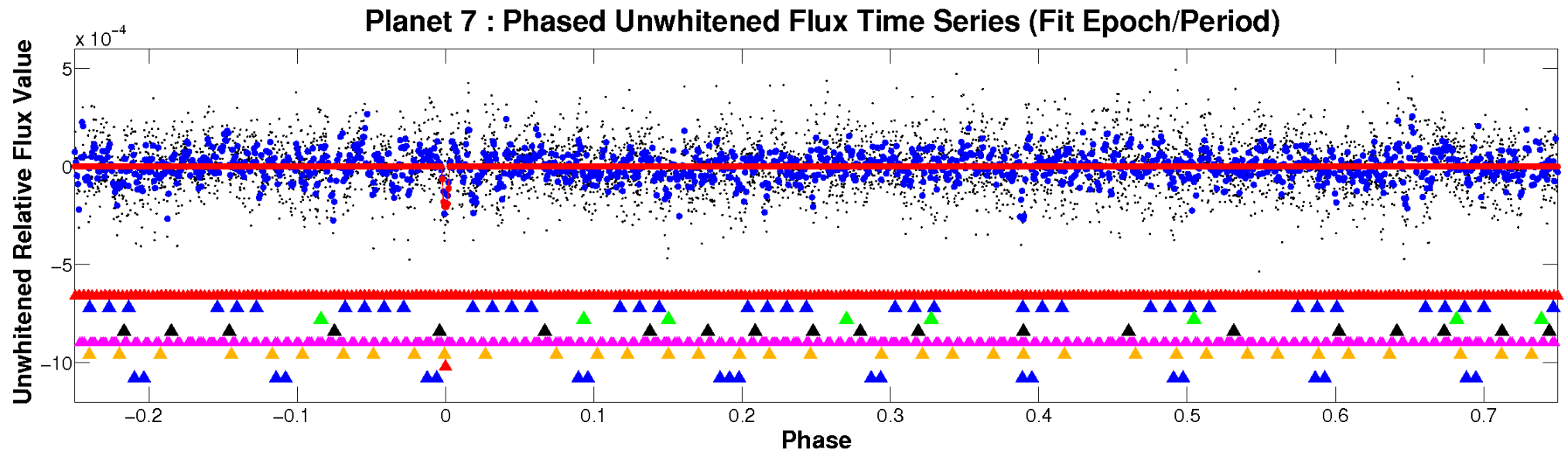


# ALT Odd/Even

TCE 009569838-07

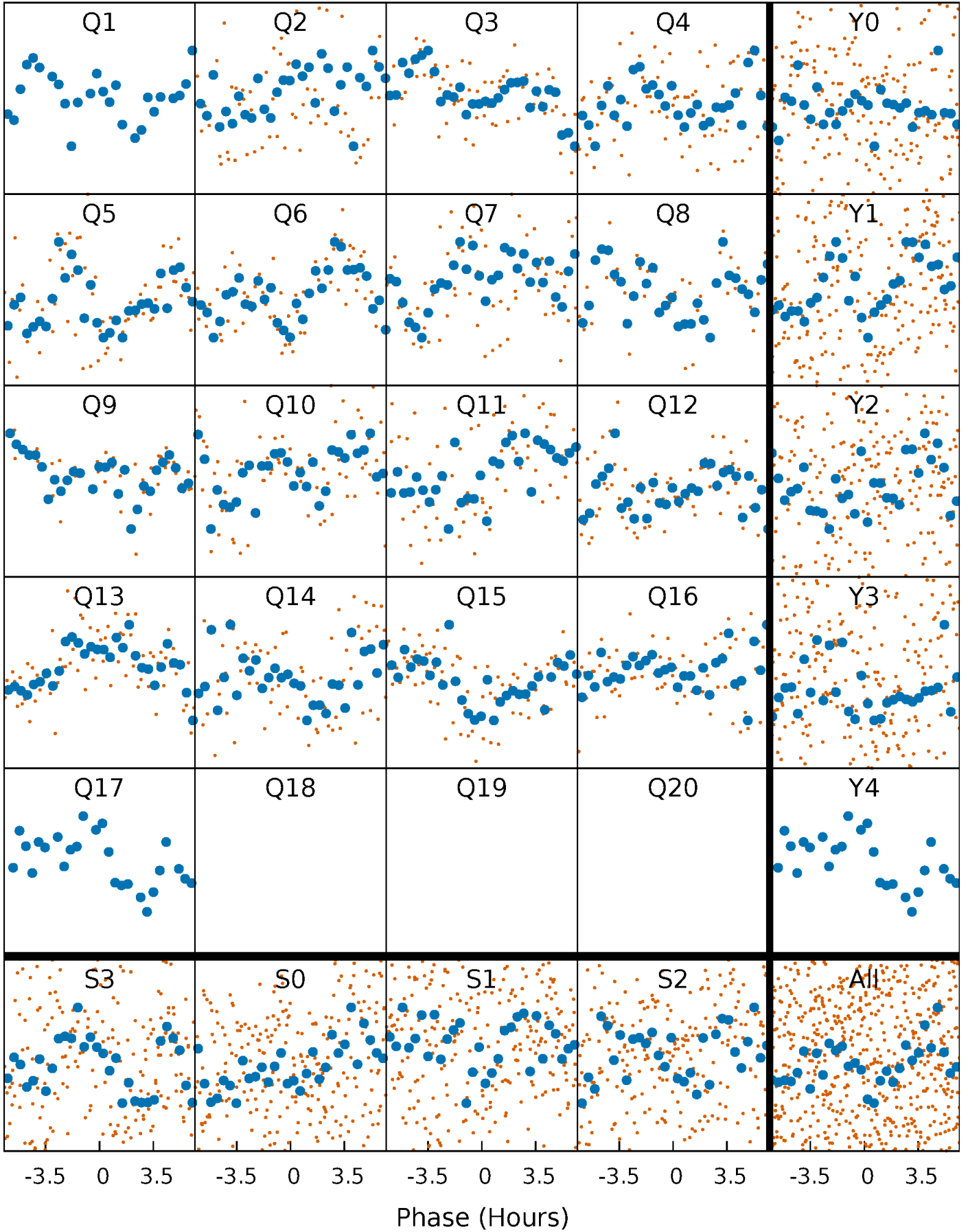


# Non-Whitened Vs. Whitened Light Curve



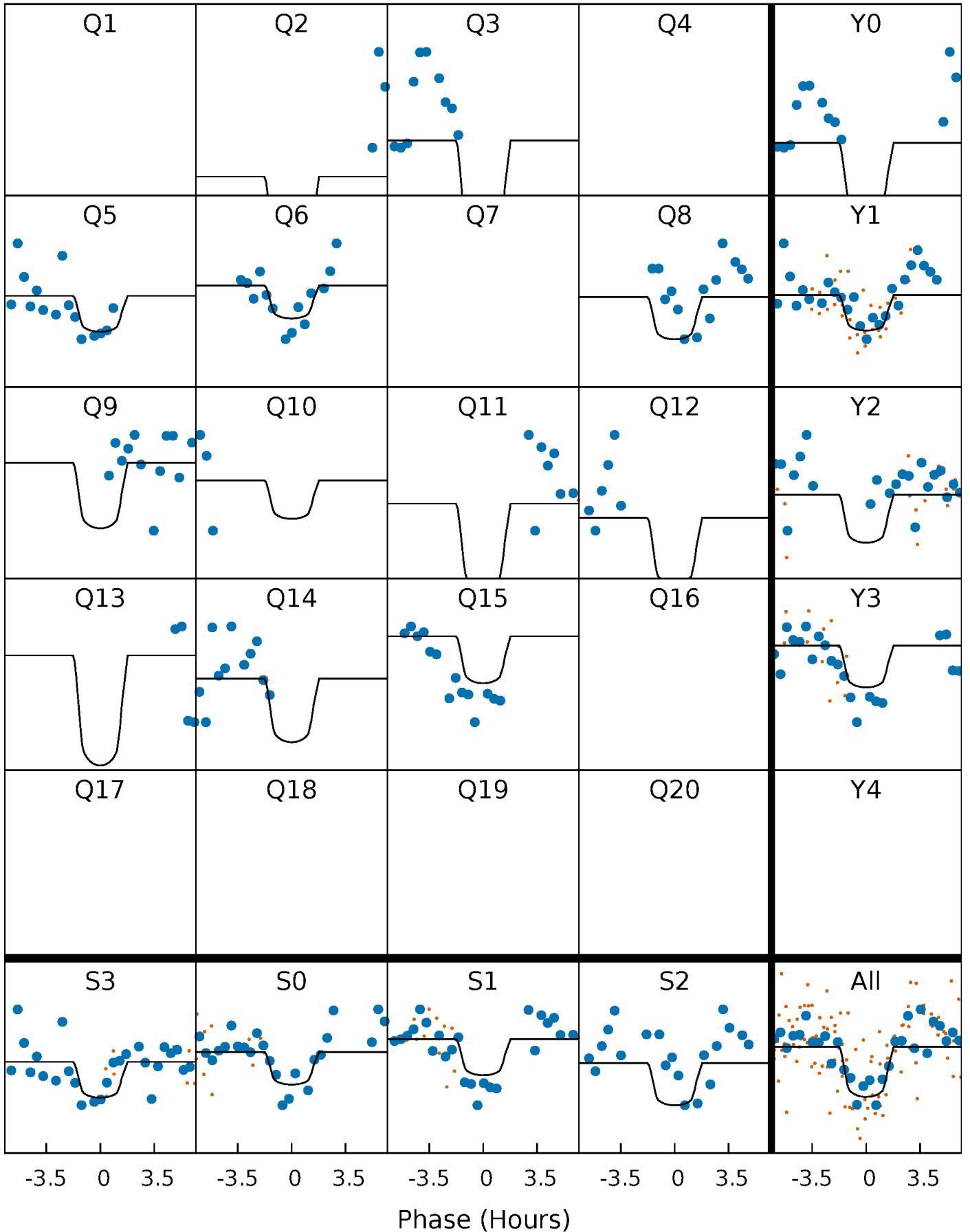
# PDC Quarter-Phased Transit Curves

TCE 009569838-07   P= 29.432804 Days    $T_0=138.798789$  (BKJD)



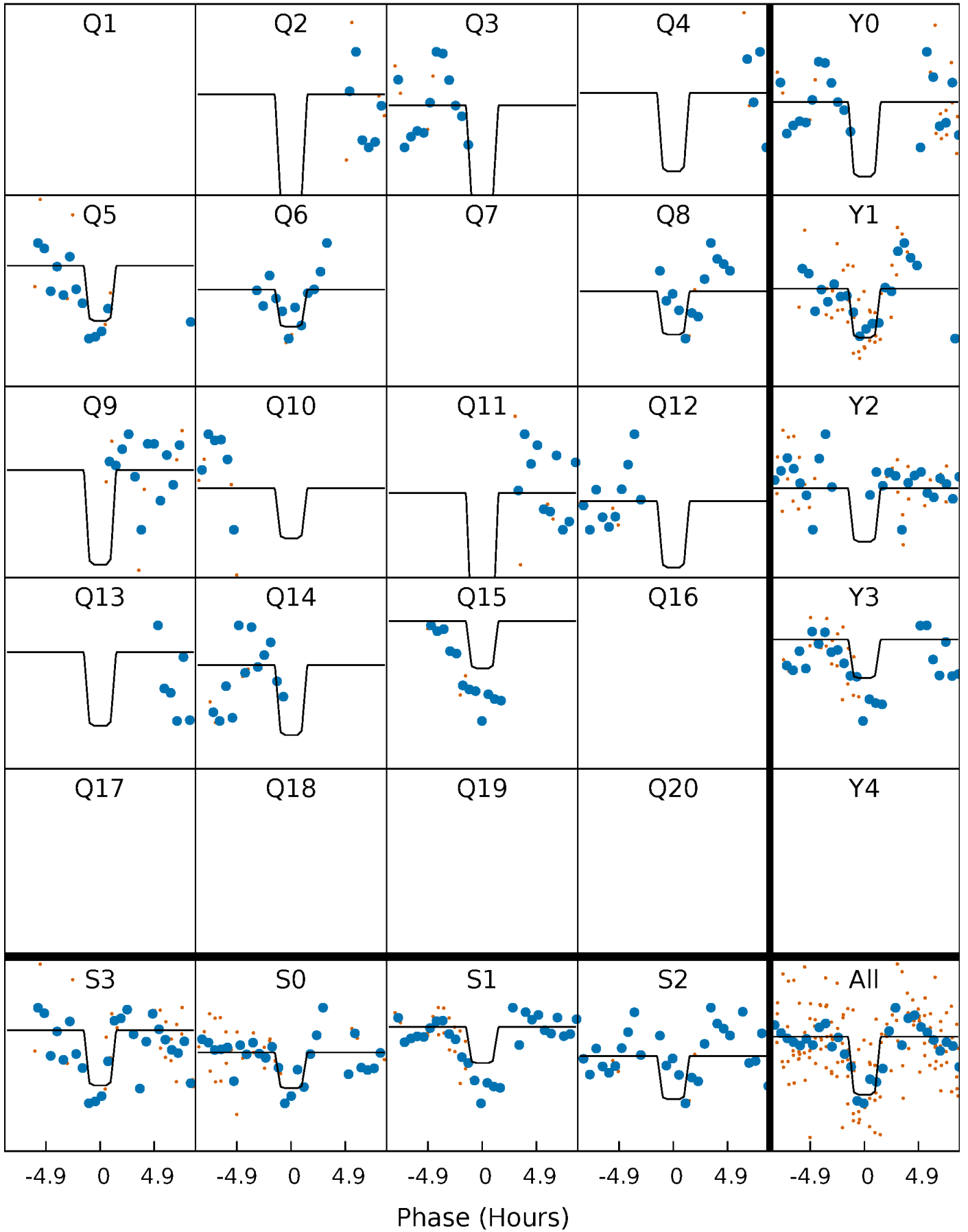
# DV Quarter-Phased Transit Curves

TCE 009569838-07   P= 29.432804 Days    $T_0=138.798789$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

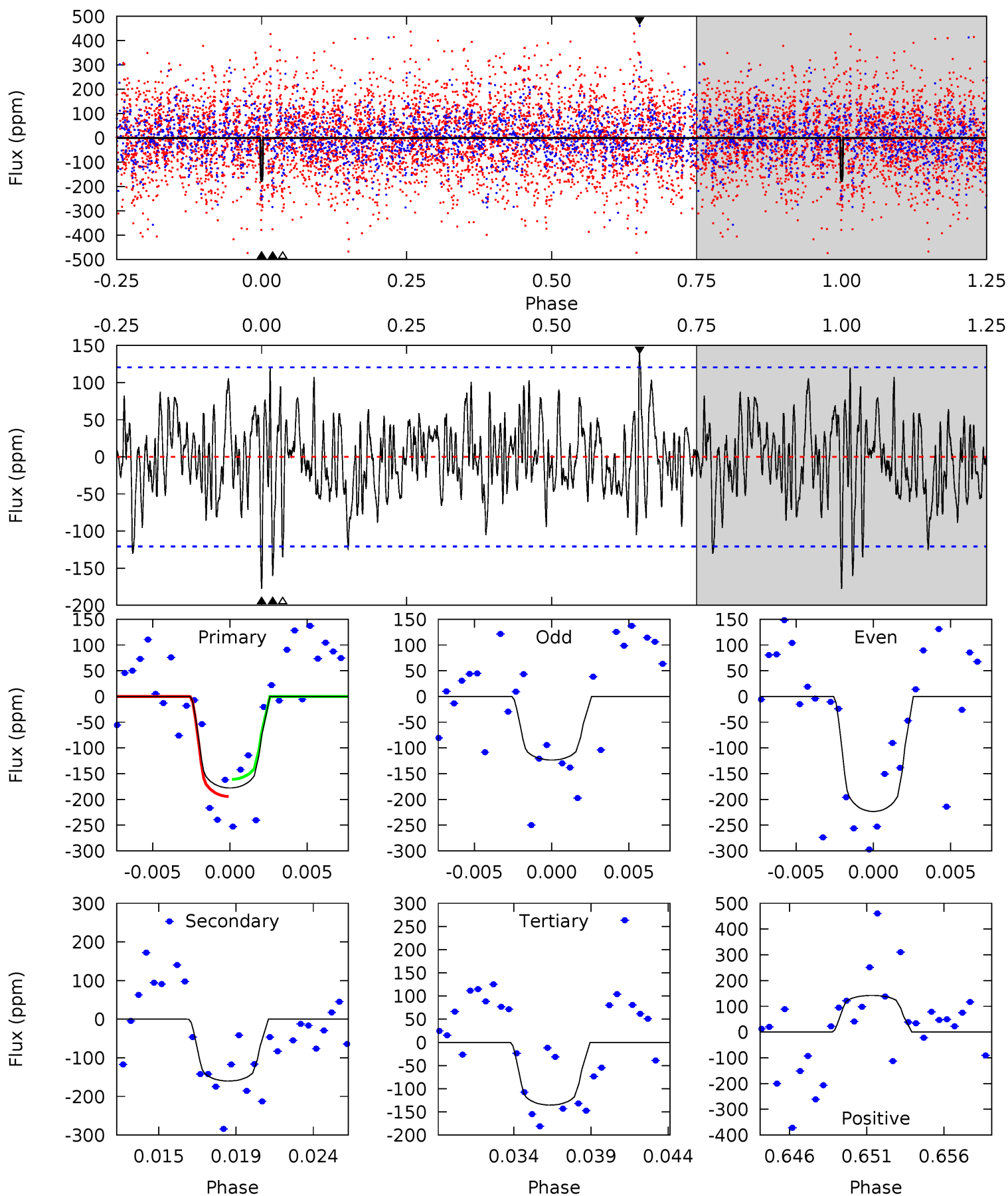
TCE 009569838-07   P= 29.432422 Days    $T_0=138.800285$  (BKJD)



# DV Model-Shift Uniqueness Test

009569838-07,  $P = 29.432804$  Days,  $E = 109.365985$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.61	6.86	5.79	6.08	5.16	2.82	1.84	1.81	1.52	1.06	0.77	2.13	1.02	0.44	0.71

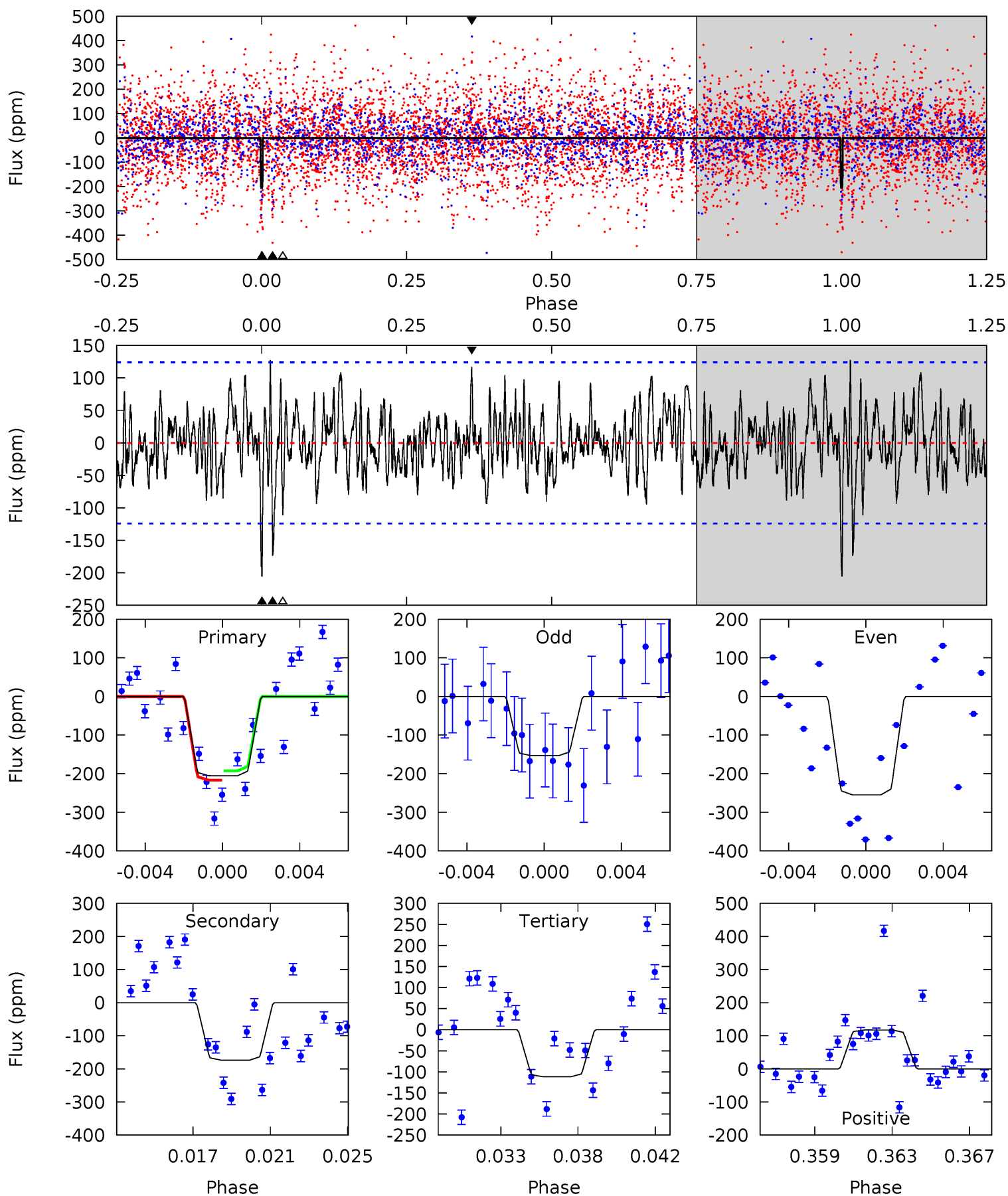




# Alt Model-Shift Uniqueness Test

009569838-07, P = 29.432422 Days, E = 109.367863 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.60	7.27	4.66	4.91	5.19	2.86	1.63	3.94	3.69	2.61	2.37	2.15	1.04	0.38	0.50



### Stellar Parameters For KIC 009569838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6771^{+214}_{-262}$	$4.003^{+0.336}_{-0.144}$	$-0.540^{+0.250}_{-0.300}$	$1.776^{+0.433}_{-0.649}$	$1.157^{+0.189}_{-0.170}$	$0.291^{+0.708}_{-0.119}$
	+3%/-4%	+8%/-4%	+46%/-56%	+24%/-37%	+16%/-15%	+243%/-41%
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 009569838-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-160 \pm 23$	$3.26^{+2.44}_{-1.92}$	$1231^{+93}_{-115}$	$5652^{+4263}_{-1125}$	$324^{+1585}_{-220}$
Alt.	$-174 \pm 24$	$3.25^{+2.35}_{-2.10}$	$1235^{+93}_{-120}$	$5795^{+4846}_{-1203}$	$351^{+2338}_{-238}$

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

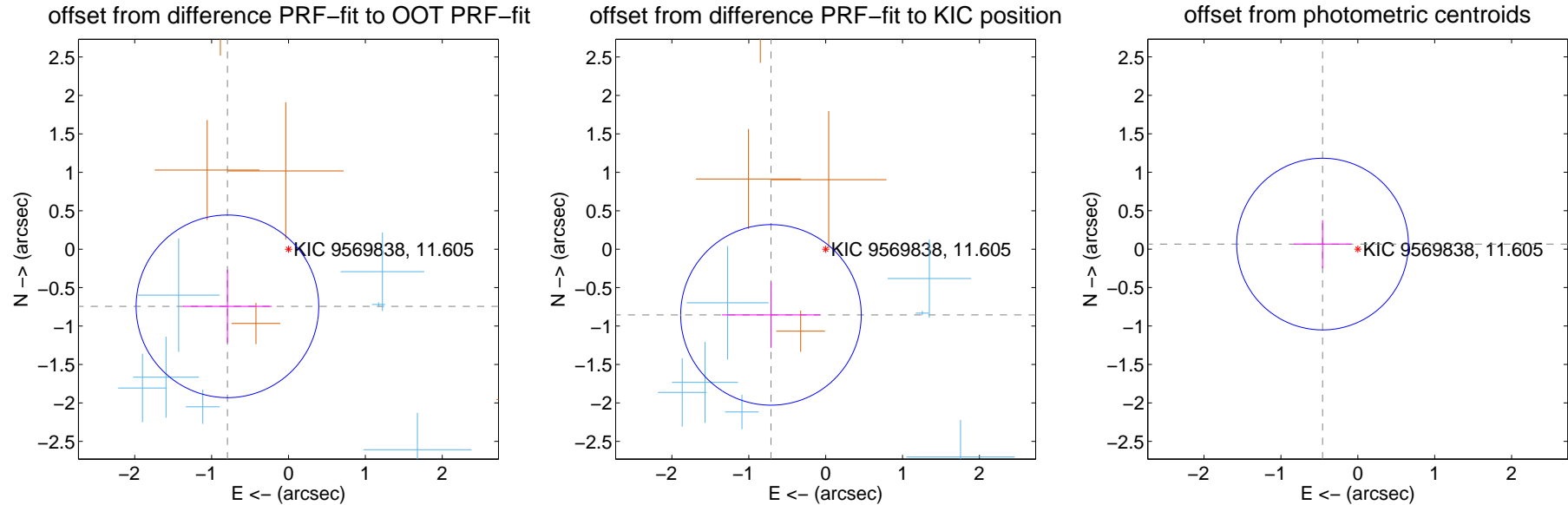
## DV Centroid Data

Supplemental centroid analysis for 009569838-07. **Kepler magnitude: 11.61.** Transit SNR 12.94

There are 7 quarters with good PRF difference image offsets

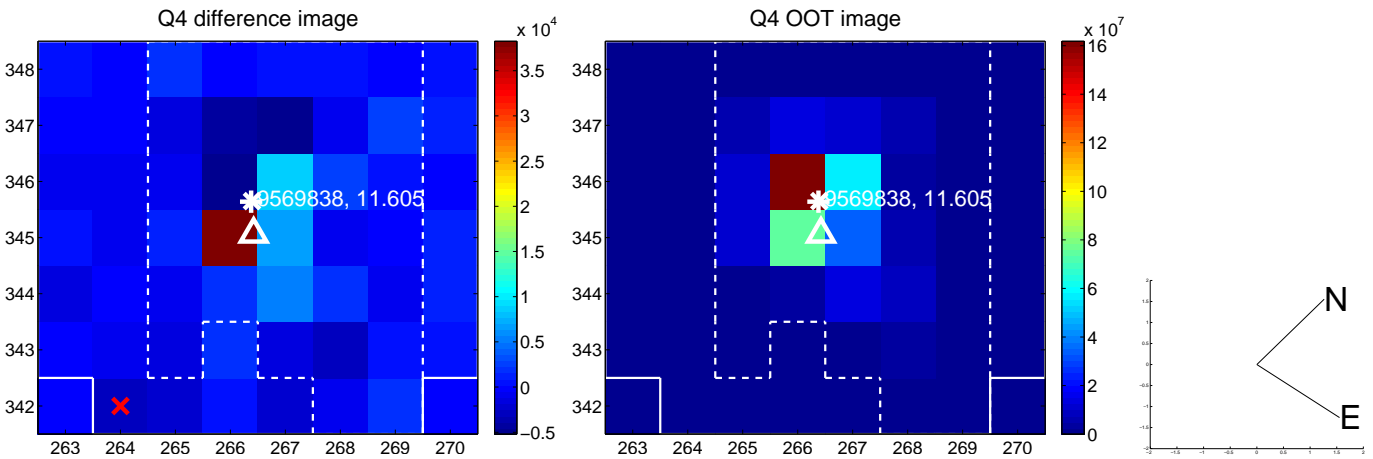
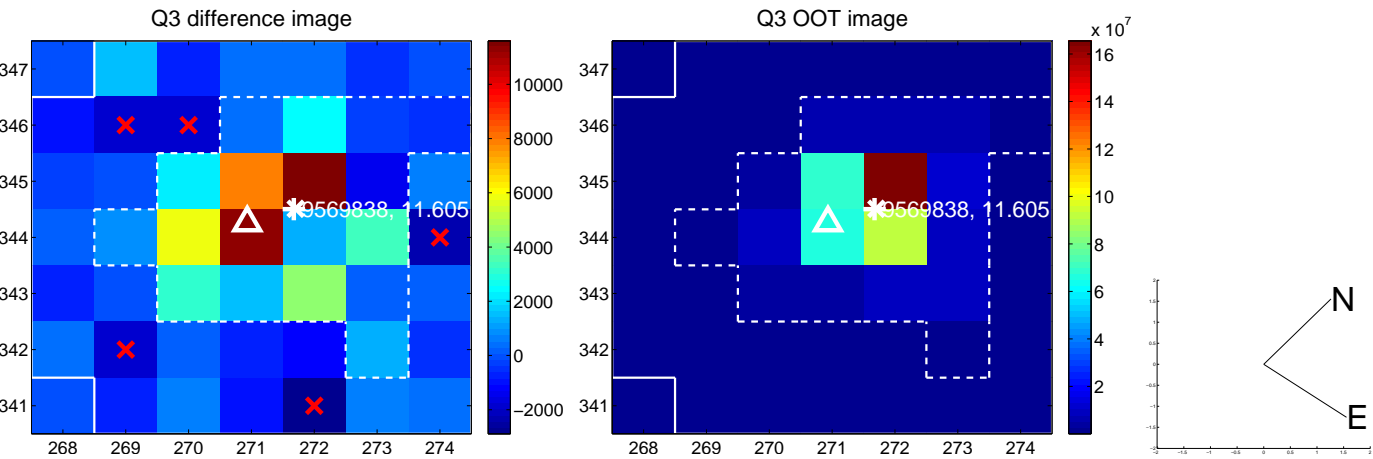
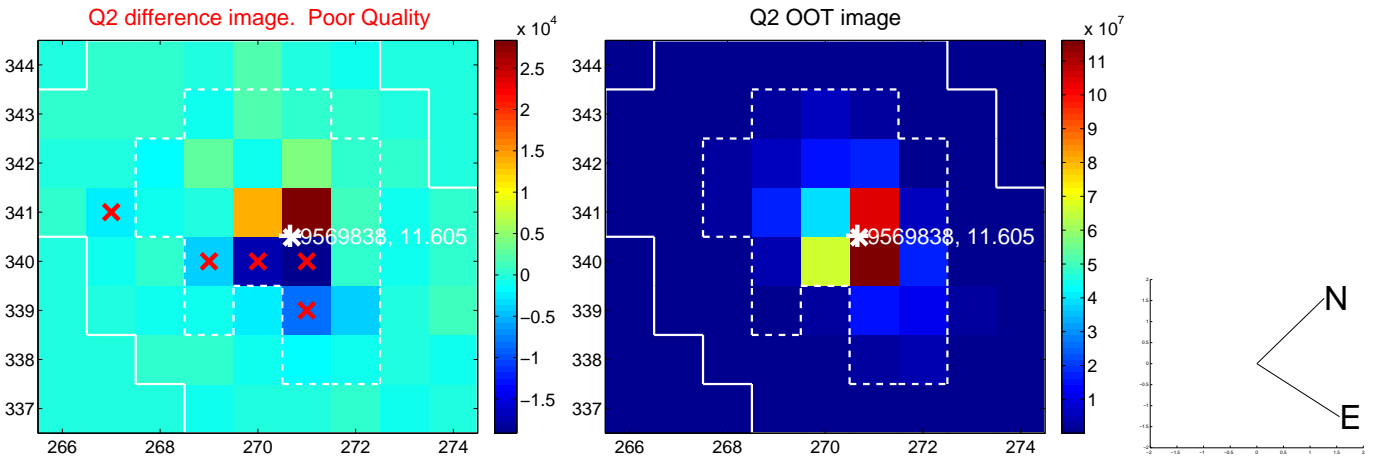
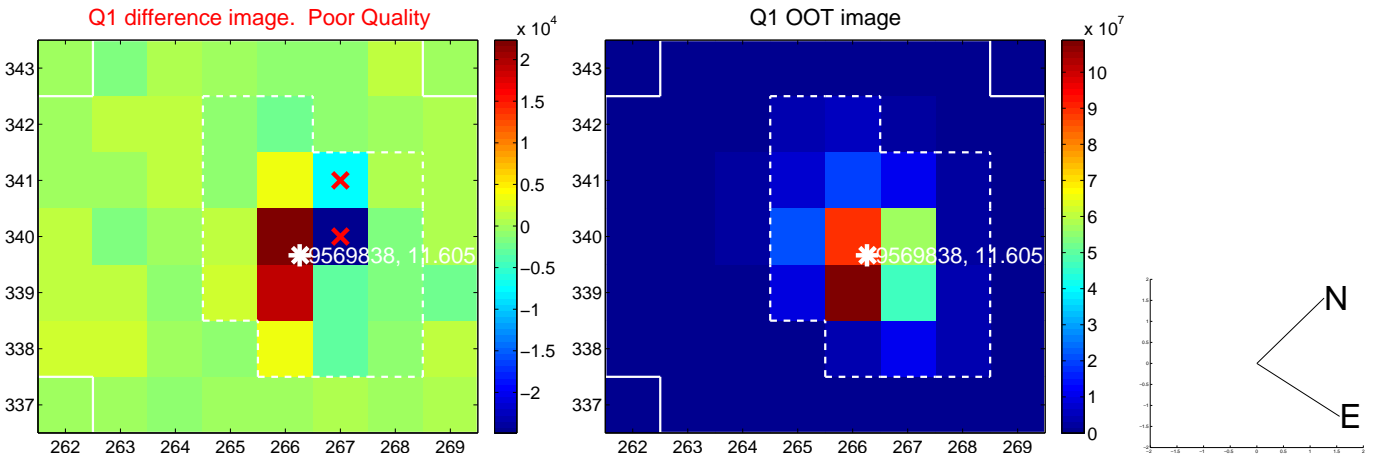
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.088 \pm 0.396$	2.75	$0.794 \pm 0.577$	$-0.743 \pm 0.476$
PRF-fit source offset from KIC position	$1.112 \pm 0.391$	2.84	$0.711 \pm 0.638$	$-0.855 \pm 0.429$
photometric centroid source offset	$0.46 \pm 0.37$	1.24	$0.46 \pm 0.37$	$0.07 \pm 0.31$

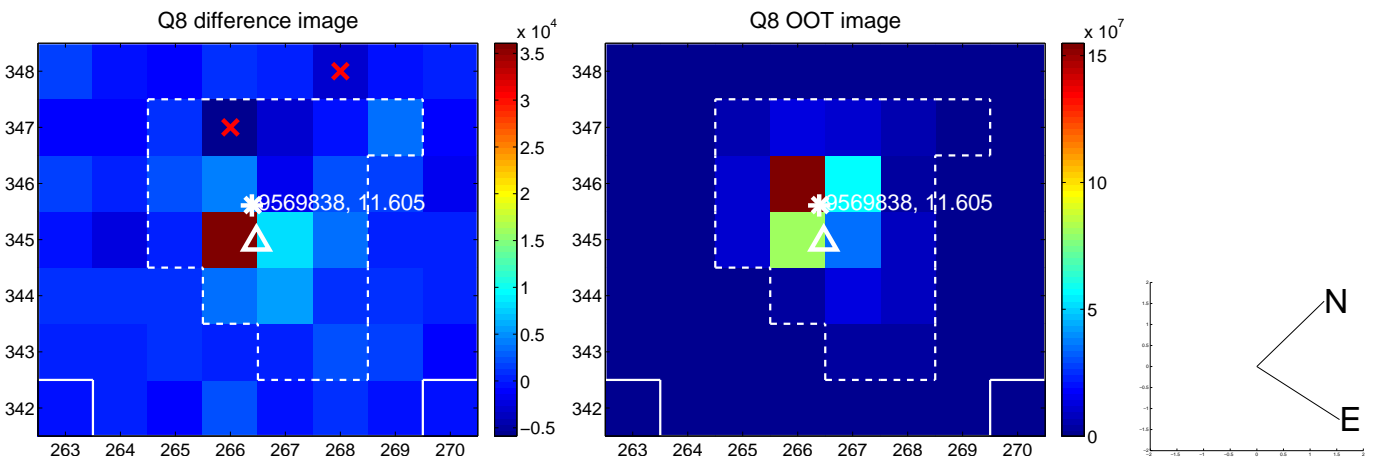
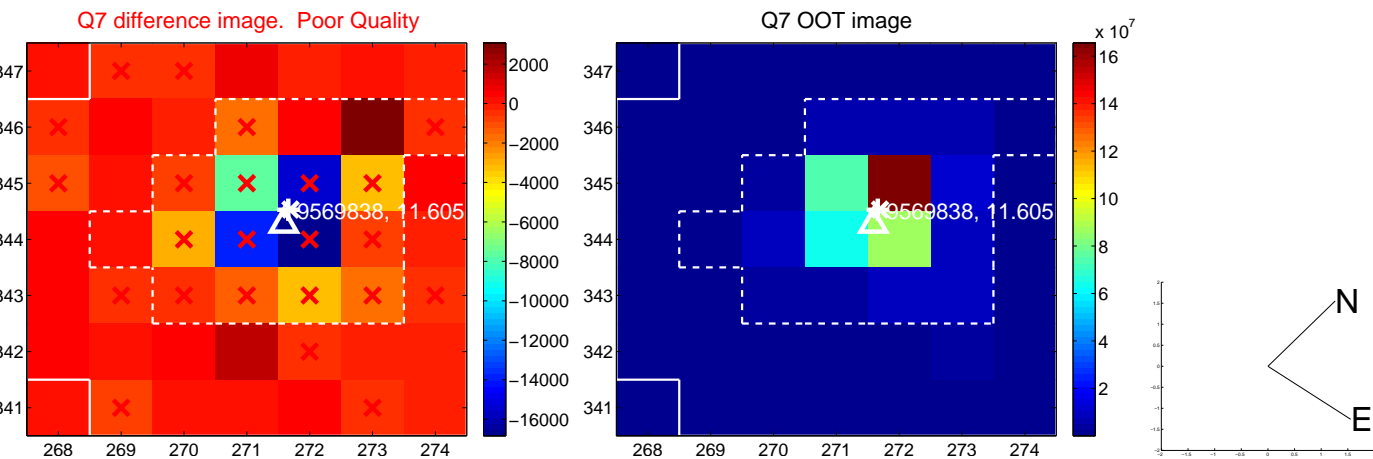
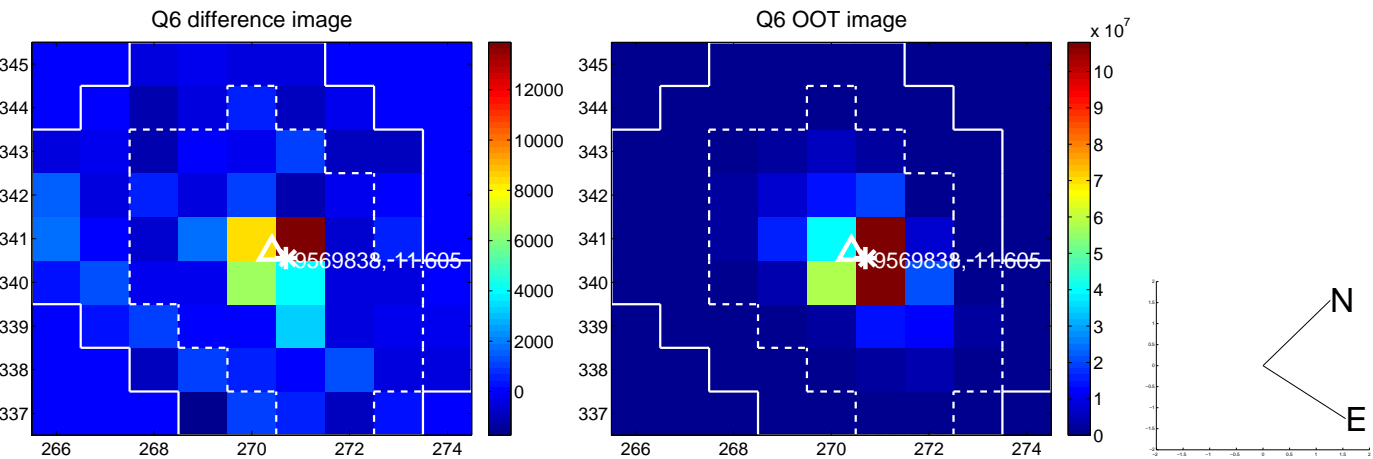
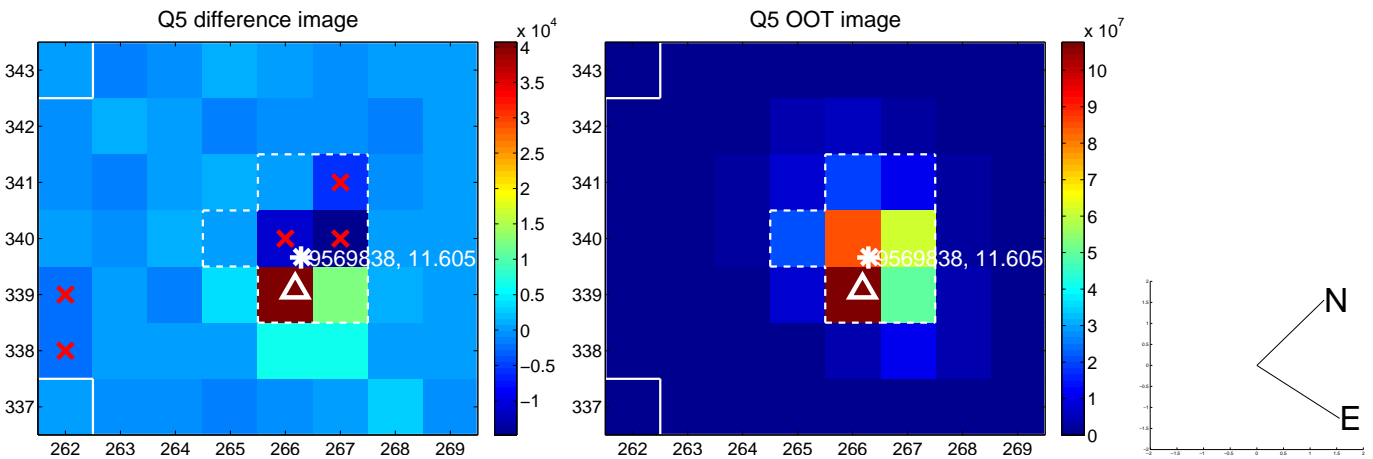


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

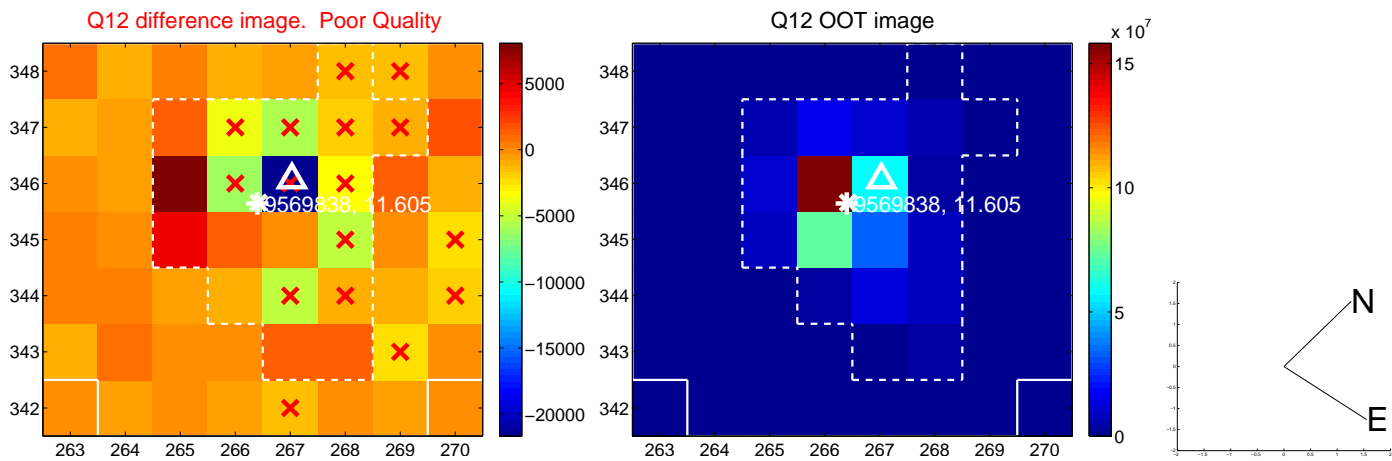
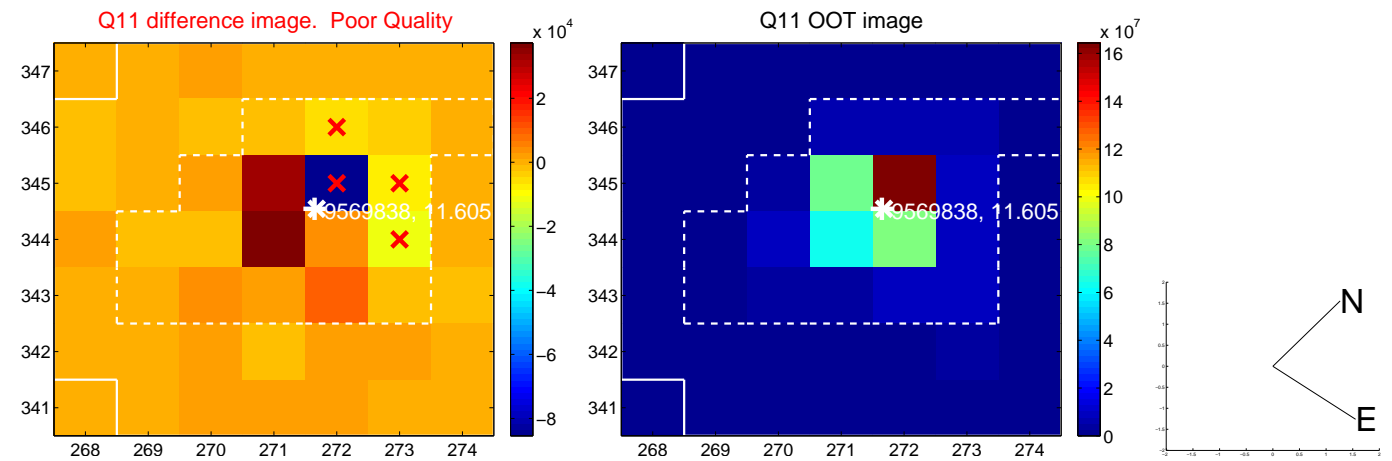
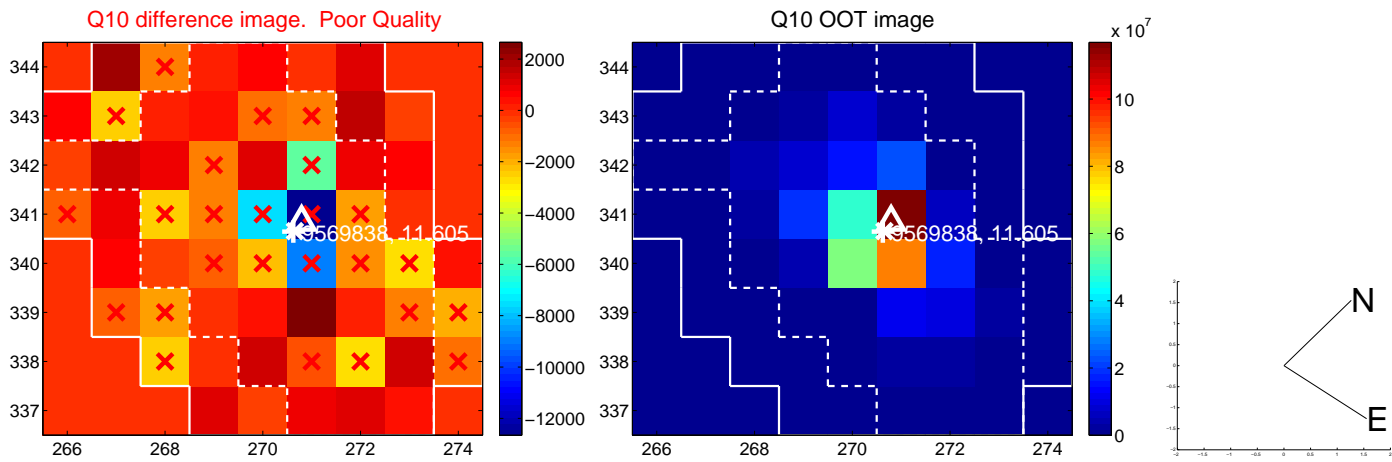
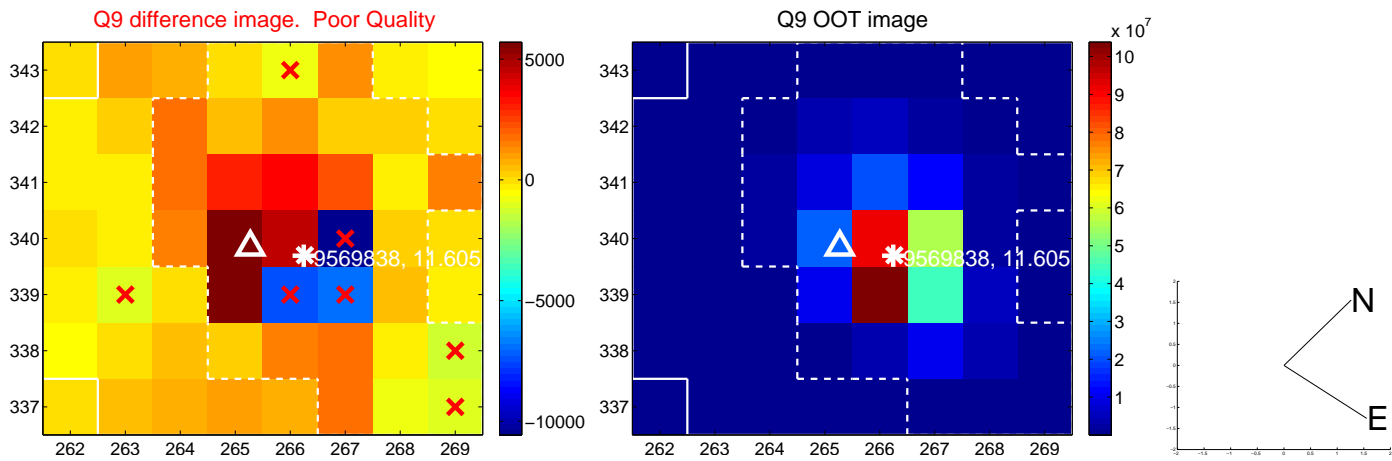
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



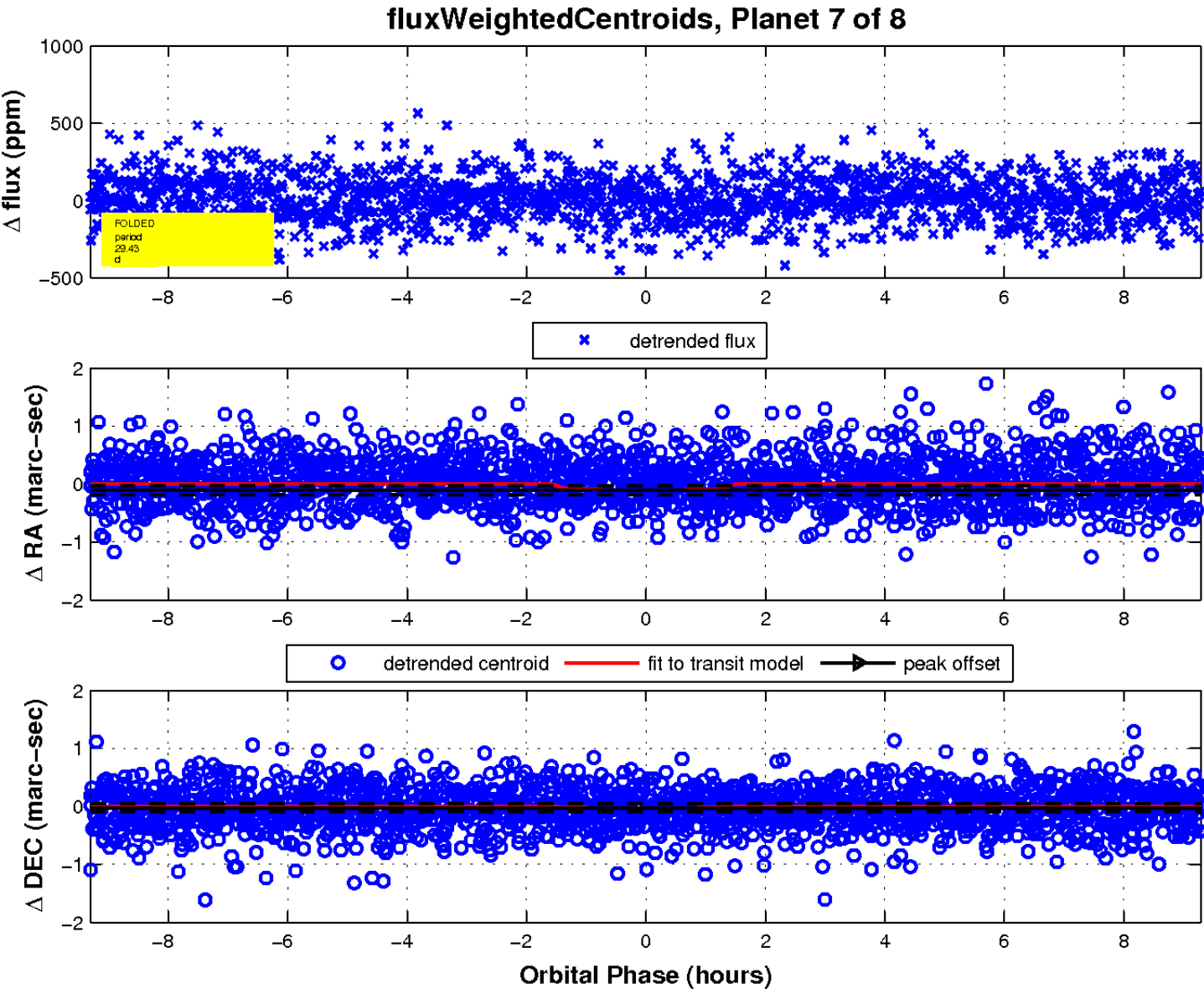
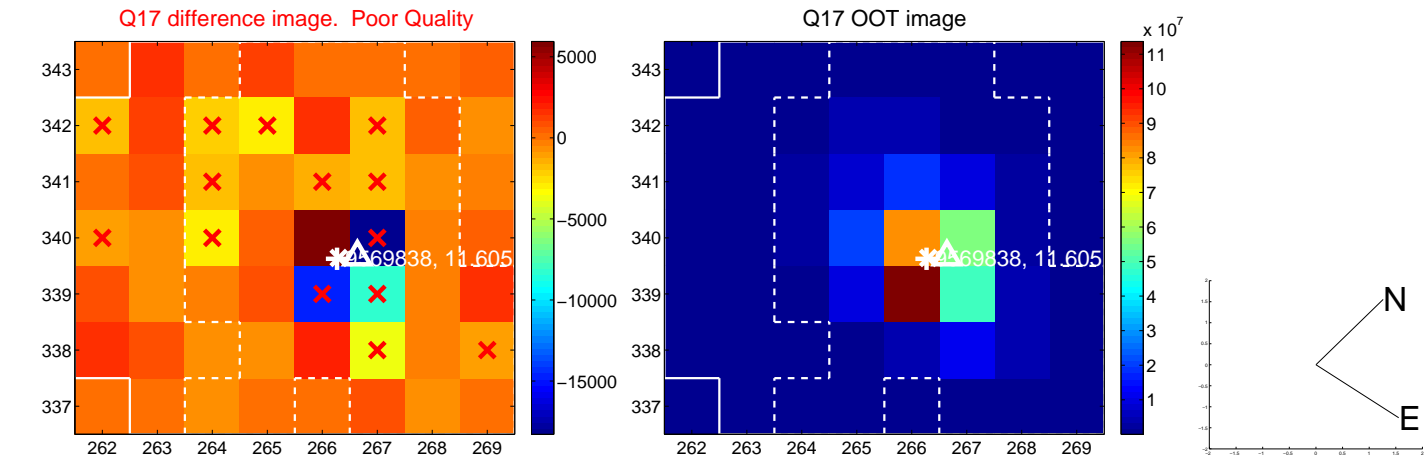
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





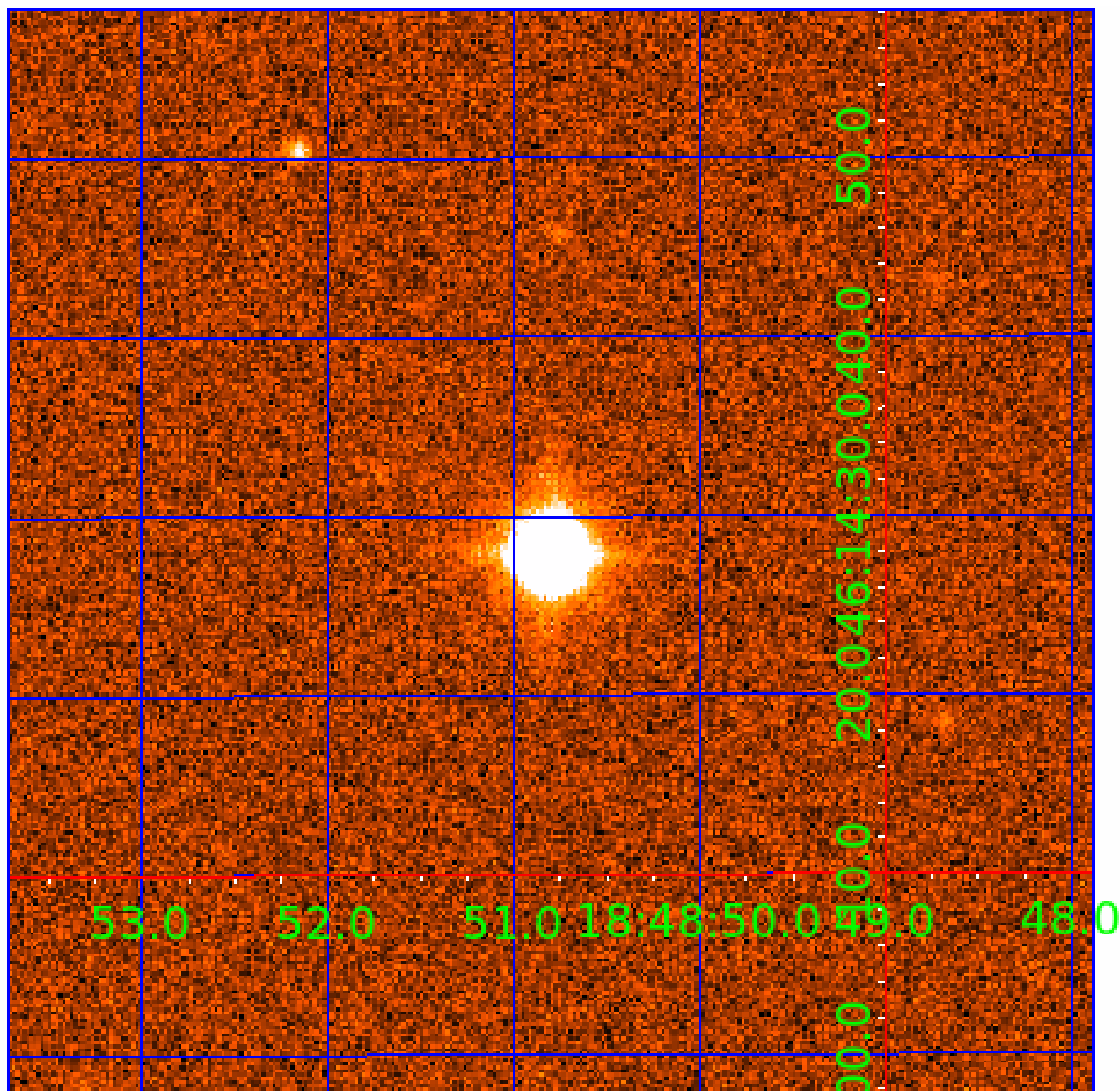


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009569838

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009569838-01	OBS	No	2.831767	132.552789	19.4	20.136	8.4	8.7	1.78	6771	0.90	3507.98
009569838-02	OBS	No	37.424710	159.410322	186.5	10.964	21.6	15.0	1.78	6771	2.77	112.27
009569838-03	OBS	No	193.920337	202.089180	350.7	3.695	20.8	17.7	1.78	6771	3.36	12.52
009569838-05	OBS	No	4.511901	132.177940	93.8	4.437	15.3	15.7	1.78	6771	1.90	1885.04
009569838-06	OBS	No	40.924036	145.228300	205.6	3.445	13.0	13.2	1.78	6771	2.81	99.65
009569838-07	OBS	No	29.432804	138.798788	206.7	3.101	13.1	12.9	1.78	6771	2.96	154.65
009569838-08	OBS	No	67.676565	174.057774	309.1	4.570	12.1	12.0	1.78	6771	3.80	50.96

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009569838-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009569838-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
009569838-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-05	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009569838-06	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
009569838-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

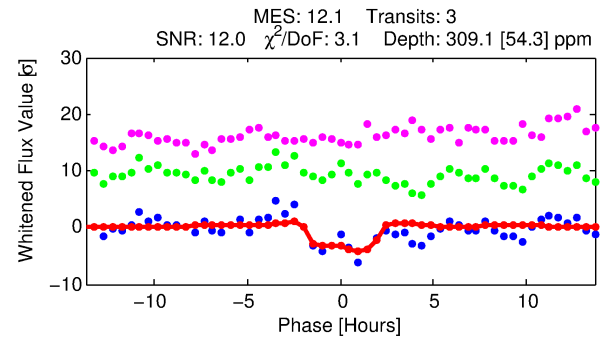
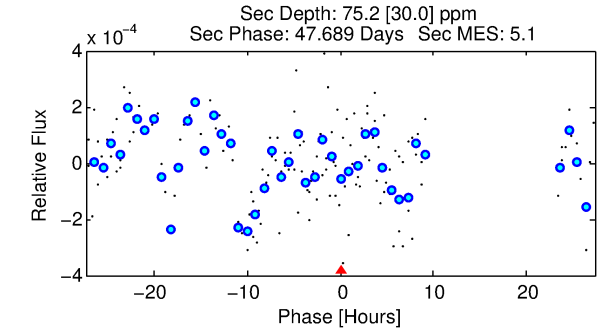
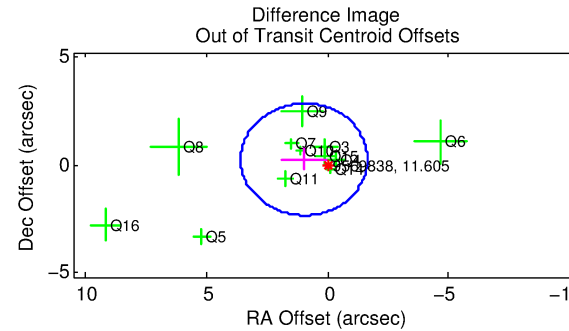
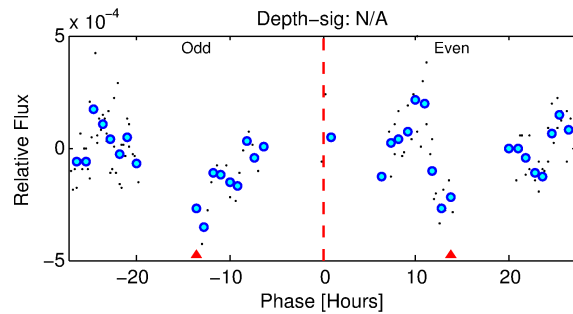
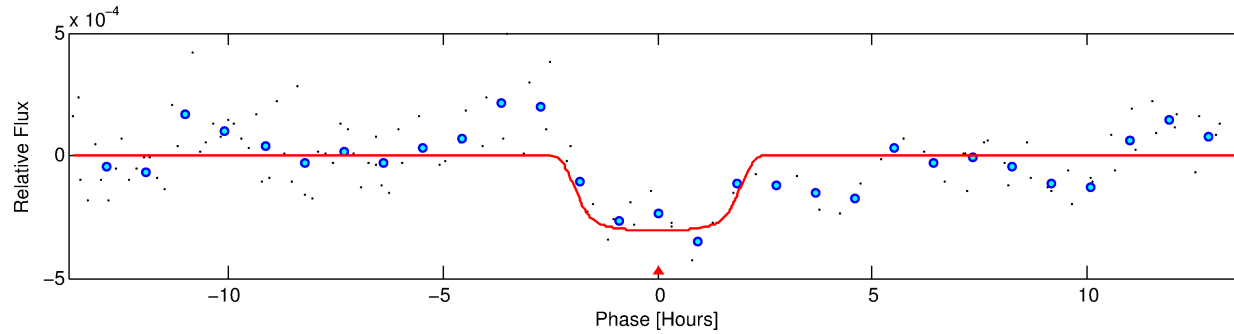
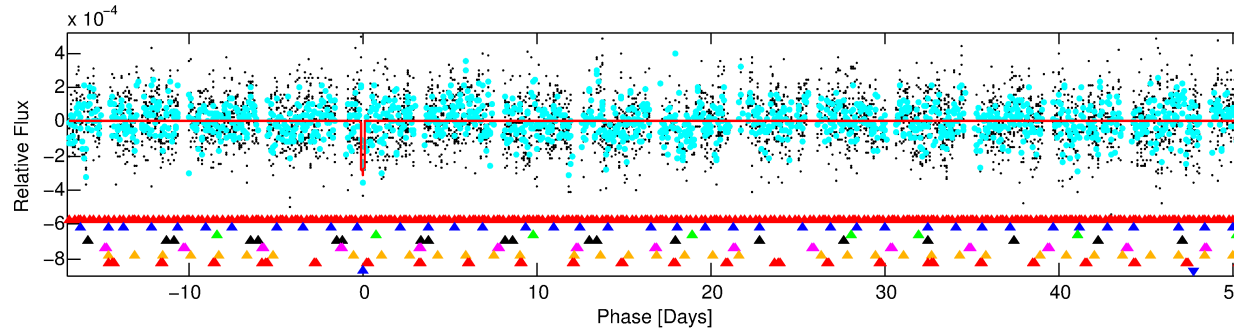
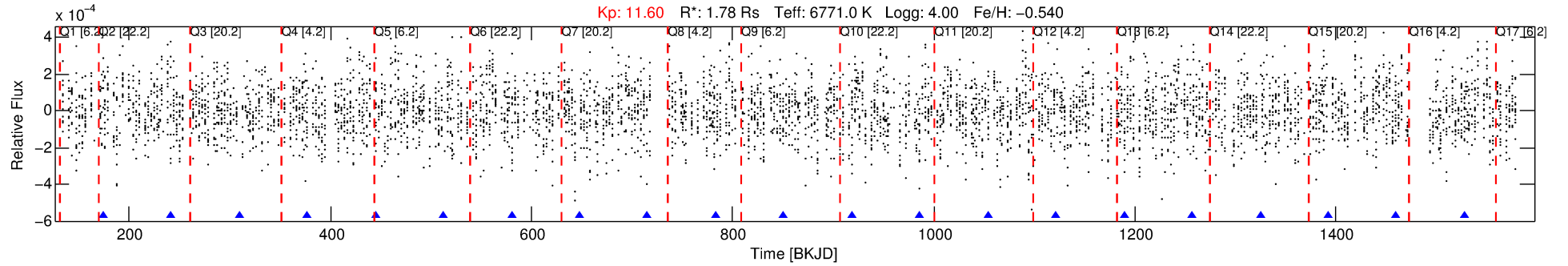
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009569838-08

No Significant Match Found

# DV One-Page Summary

KIC: 9569838 Candidate: 8 of 8 Period: 67.677 d



## DV Fit Results:

Period = 67.67657 [0.00176] d  
 Epoch = 174.0578 [0.0168] BKJD  
 Rp/R\* = 0.0196 [0.0035]  
 a/R\* = 43.87 [36.35]  
 b = 0.94 [0.10]  
 Seff = 50.96 [30.12]  
 Teq = 681 [101] K  
 Rp = 3.80 [1.54] Re  
 a = 0.3414 [0.1211] AU  
 Ag = 334.58 [261.69] [1.27σ]  
 Teffp = 4505 [627] K [6.02σ]

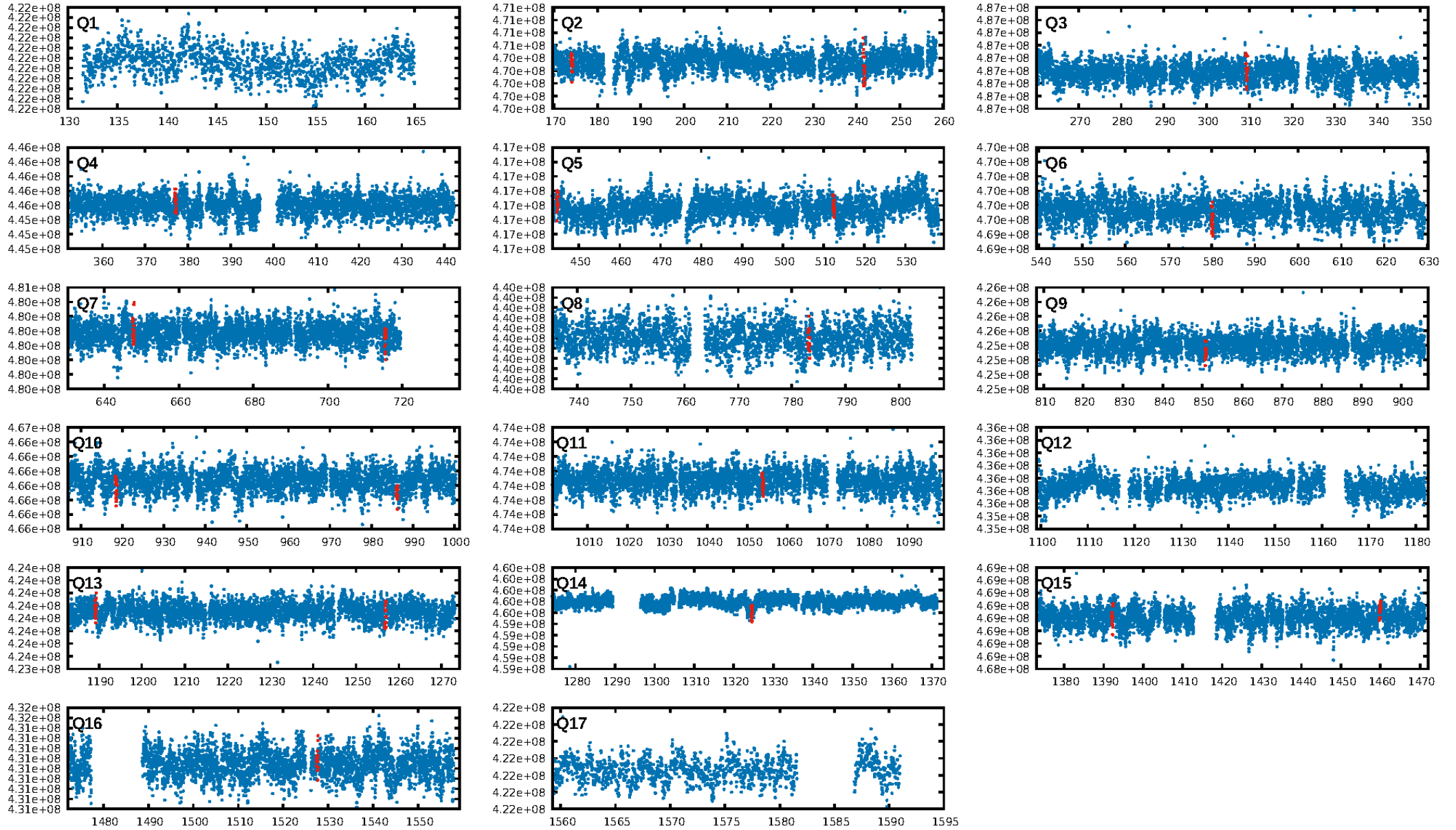
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [112.20σ]  
 LongPeriod-sig: 100.0% [20.85σ]  
 ModelChiSquare2-sig: 14.0%  
 ModelChiSquareGof-sig: 95.3%  
 Bootstrap-pfa: N/A  
 RollingBand-fgt: 1.00 [3/3]  
 GhostDiagnostic-chr: 0.3671  
 Centroid-sig: 49.3%  
 Centroid-so: 0.235 arcsec [0.86σ]  
 OutOffset-rm: 1.002 arcsec [1.15σ]  
 OutOffset-st: 3/4/3/2 [12]  
 KicOffset-rm: 0.852 arcsec [0.89σ]  
 KicOffset-st: 3/4/3/2 [12]  
 DiffImageQuality-fgm: 0.58 [7/12]  
 DiffImageOverlap-fno: 0.43 [6/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 06:21:09 Z

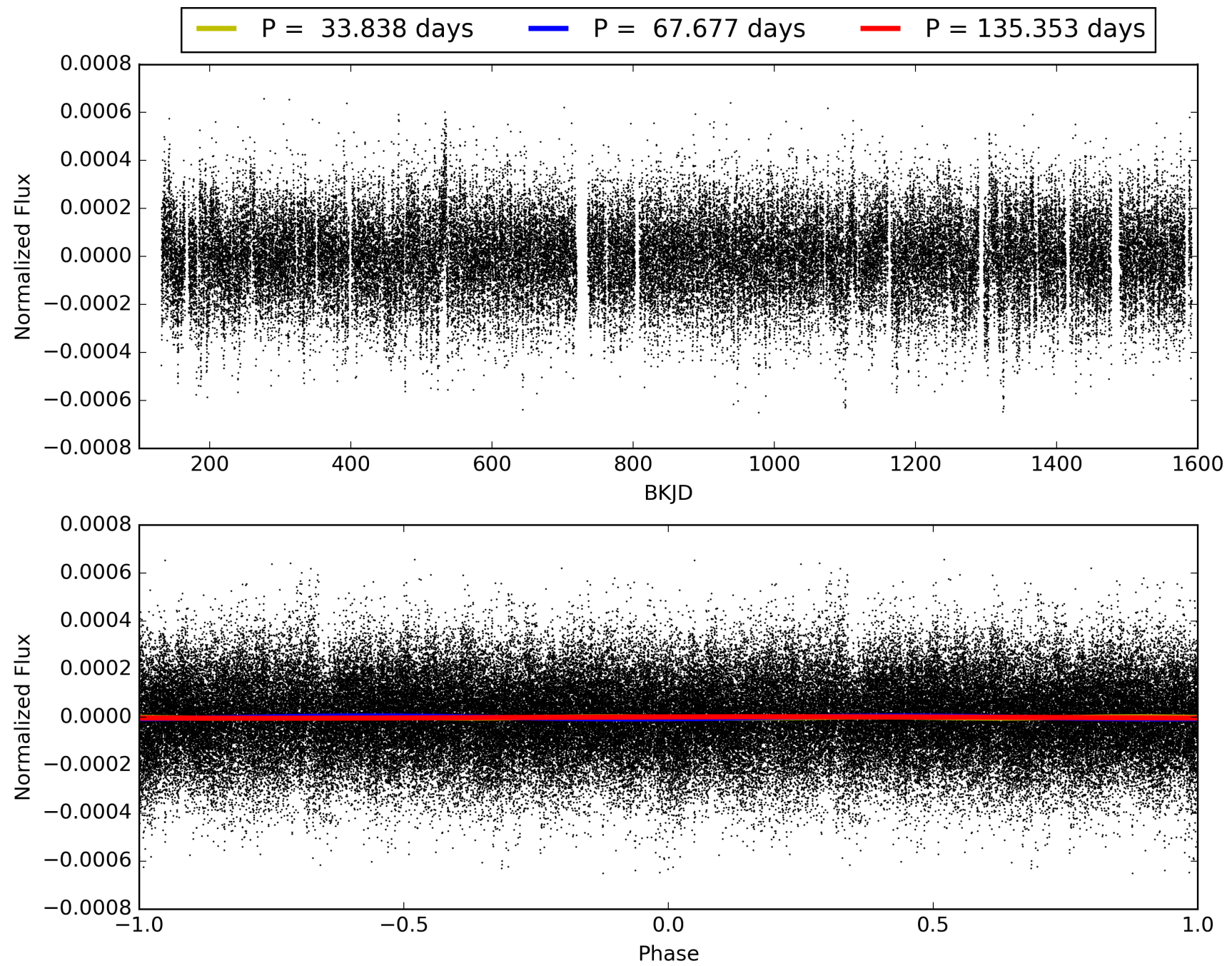
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009569838-08, PDC Light Curves



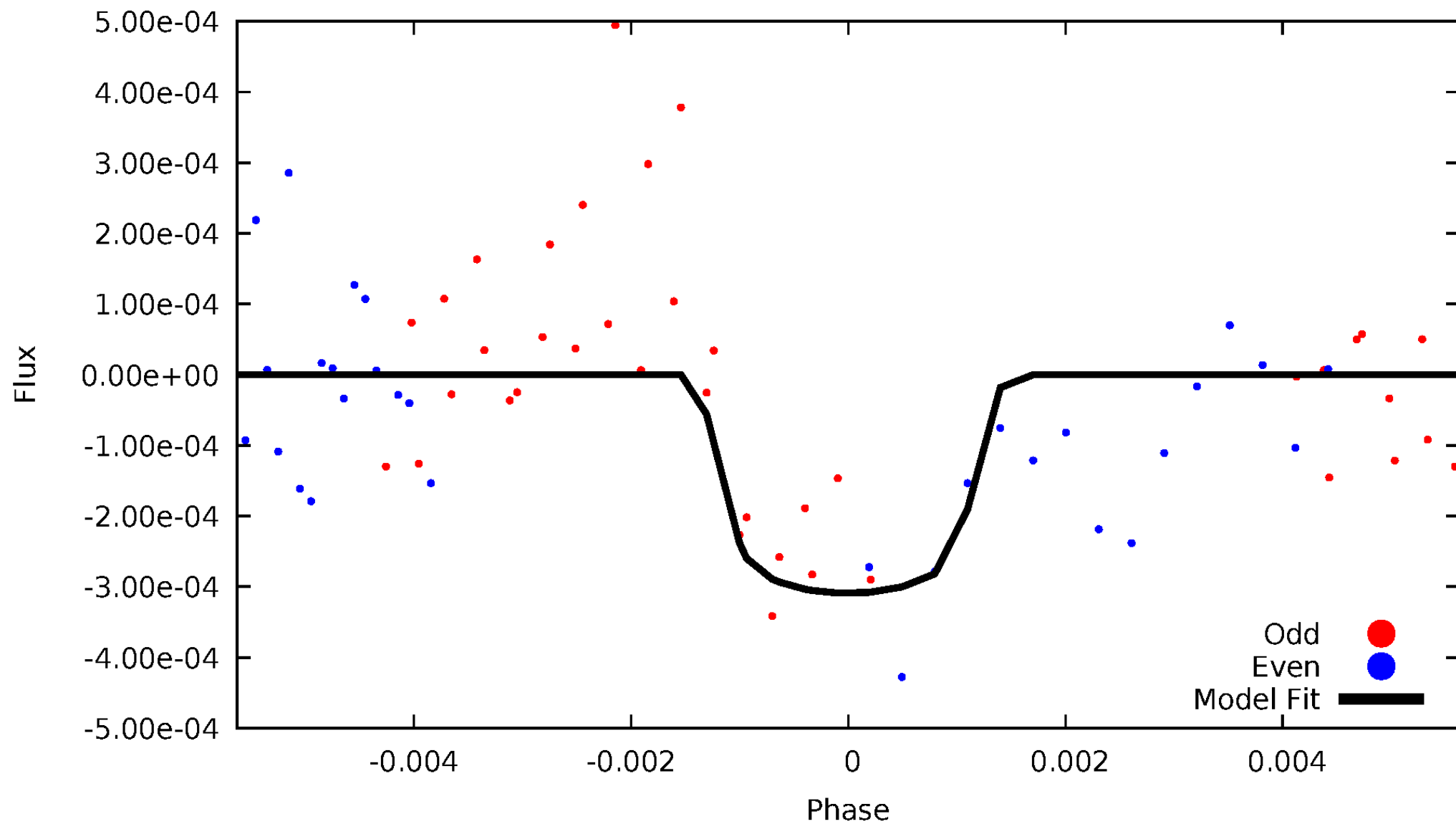


TCE 009569838-08



# DV Odd/Even

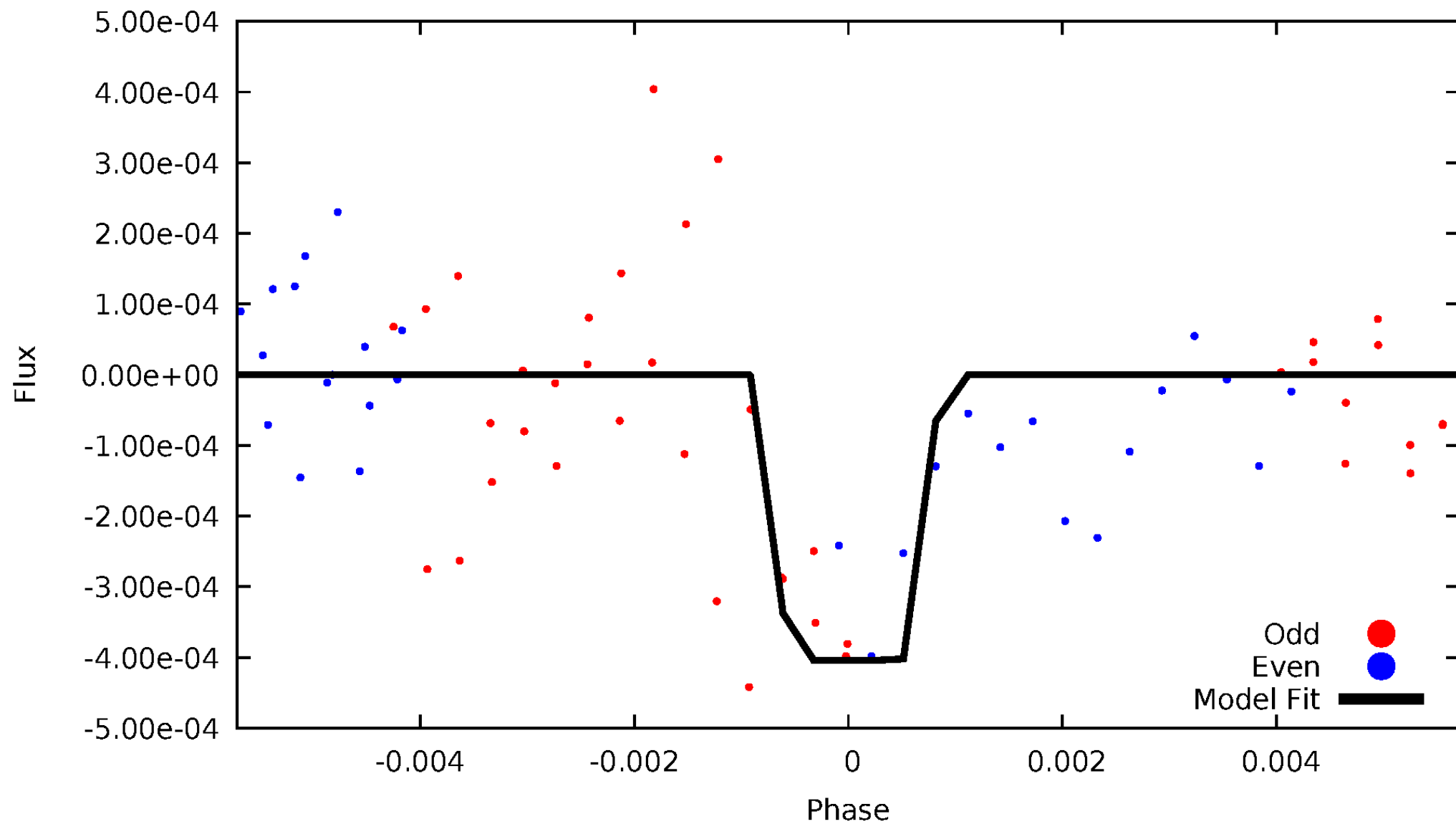
TCE 009569838-08





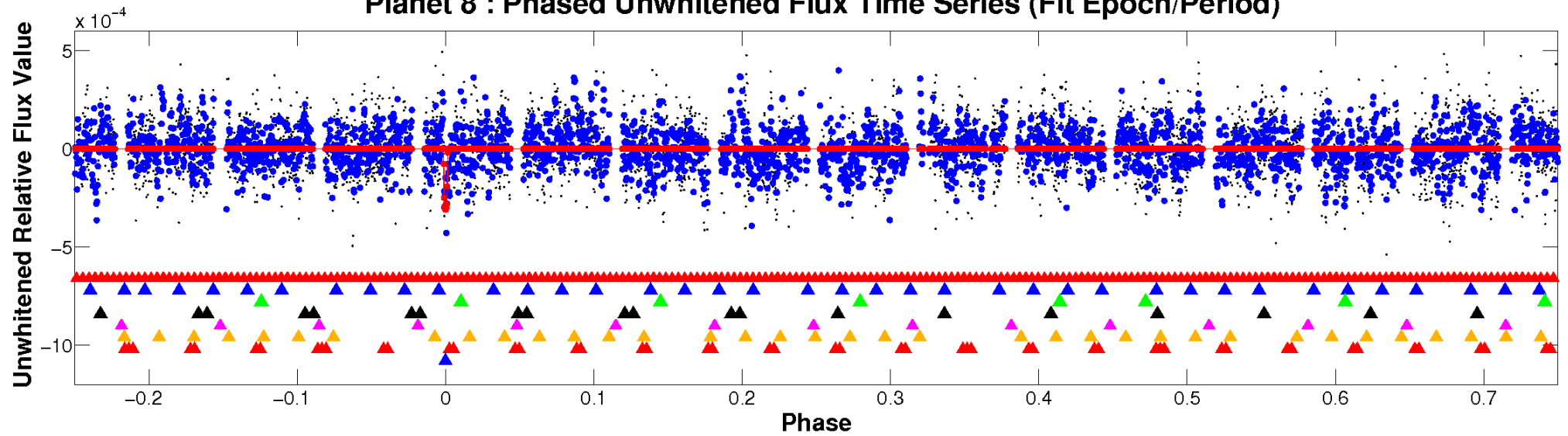
# ALT Odd/Even

TCE 009569838-08

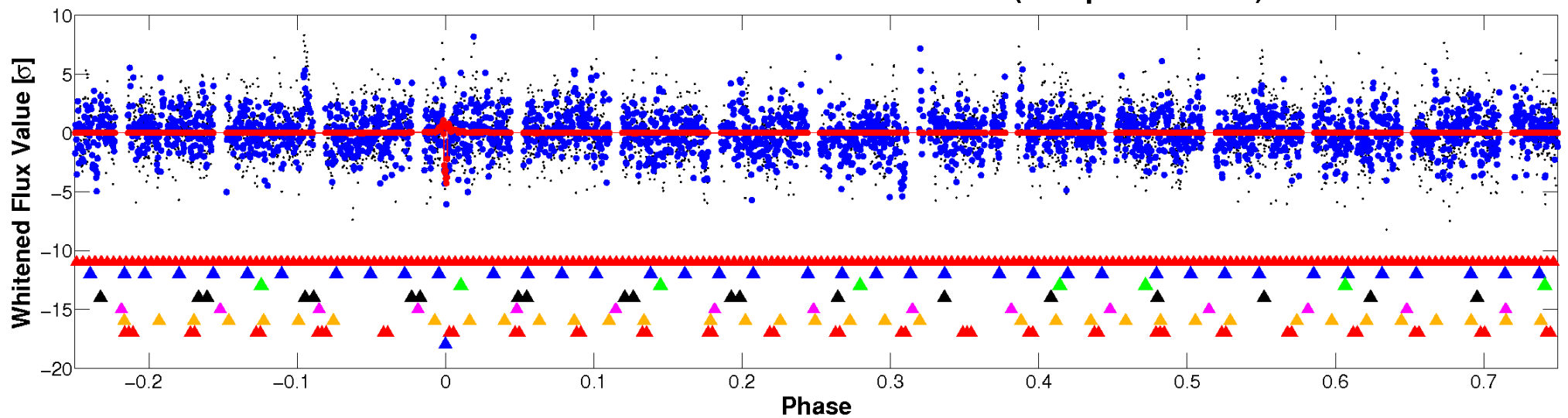


# Non-Whitened Vs. Whitened Light Curve

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

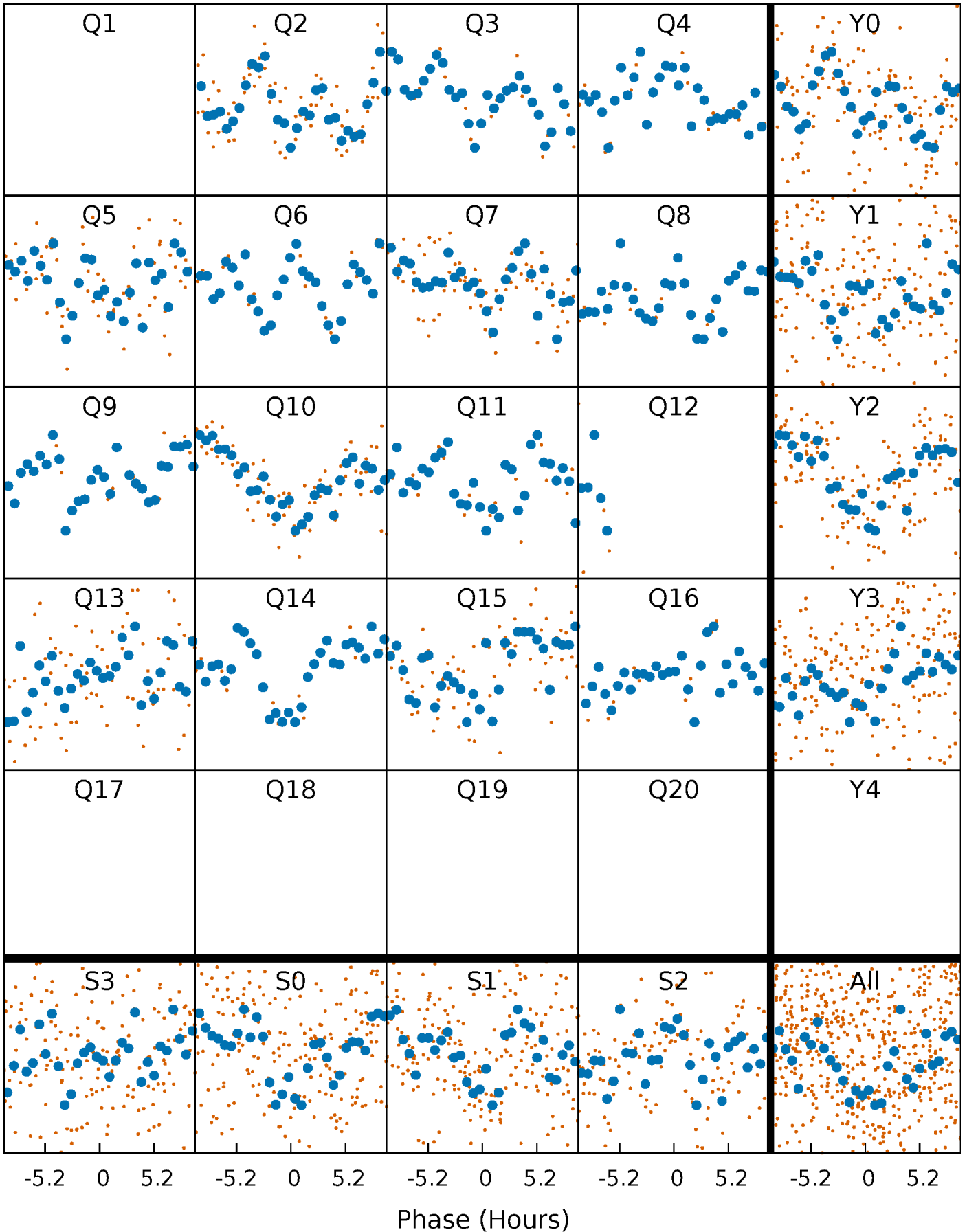


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



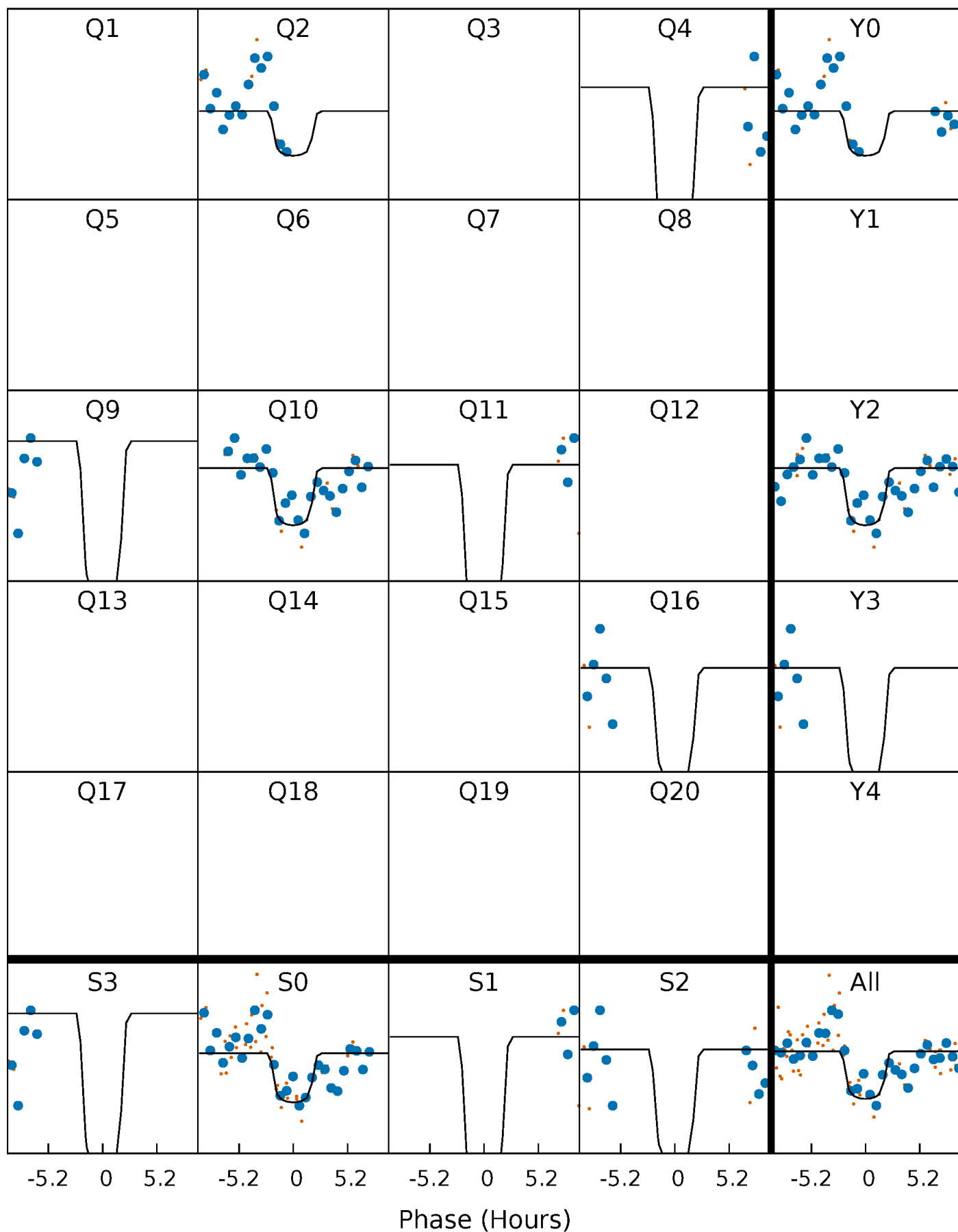
# PDC Quarter-Phased Transit Curves

TCE 009569838-08   P= 67.676565 Days    $T_0=174.057774$  (BKJD)



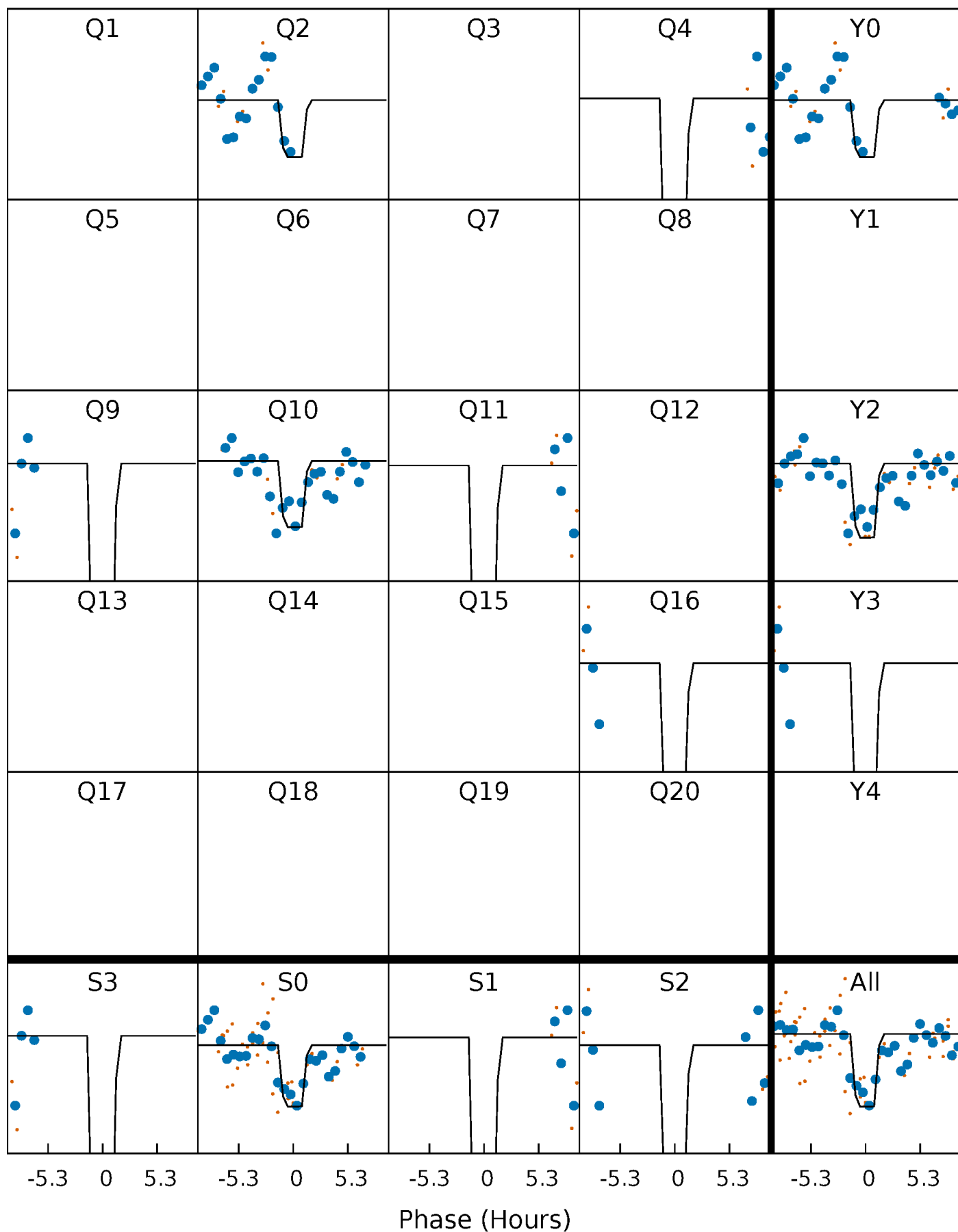
# DV Quarter-Phased Transit Curves

TCE 009569838-08 P= 67.676565 Days  $T_0=174.057774$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

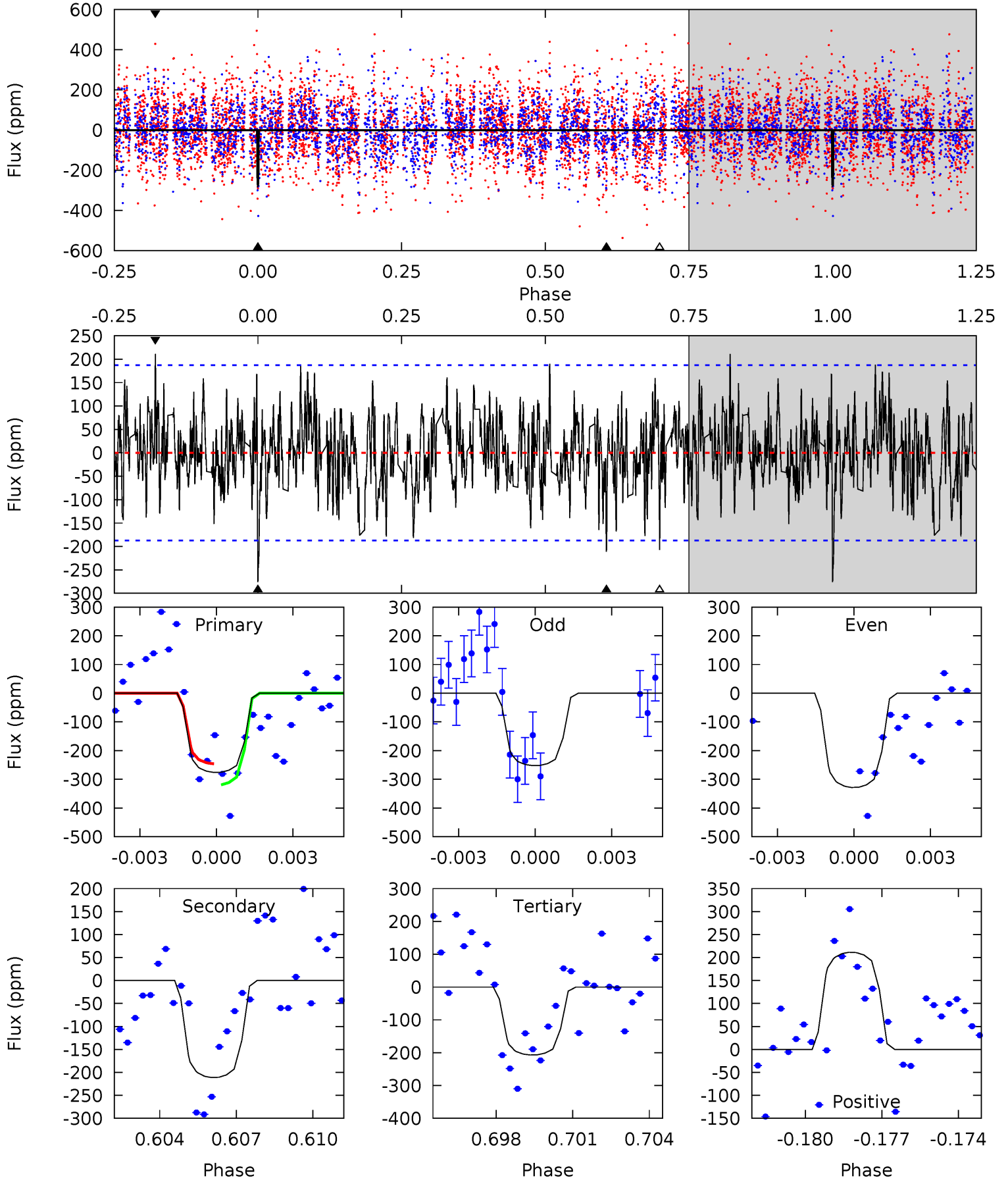
TCE 009569838-08     $P = 67.680296$  Days     $T_0 = 174.031998$  (BKJD)



# DV Model-Shift Uniqueness Test

009569838-08, P = 67.676565 Days, E = 106.381209 Days

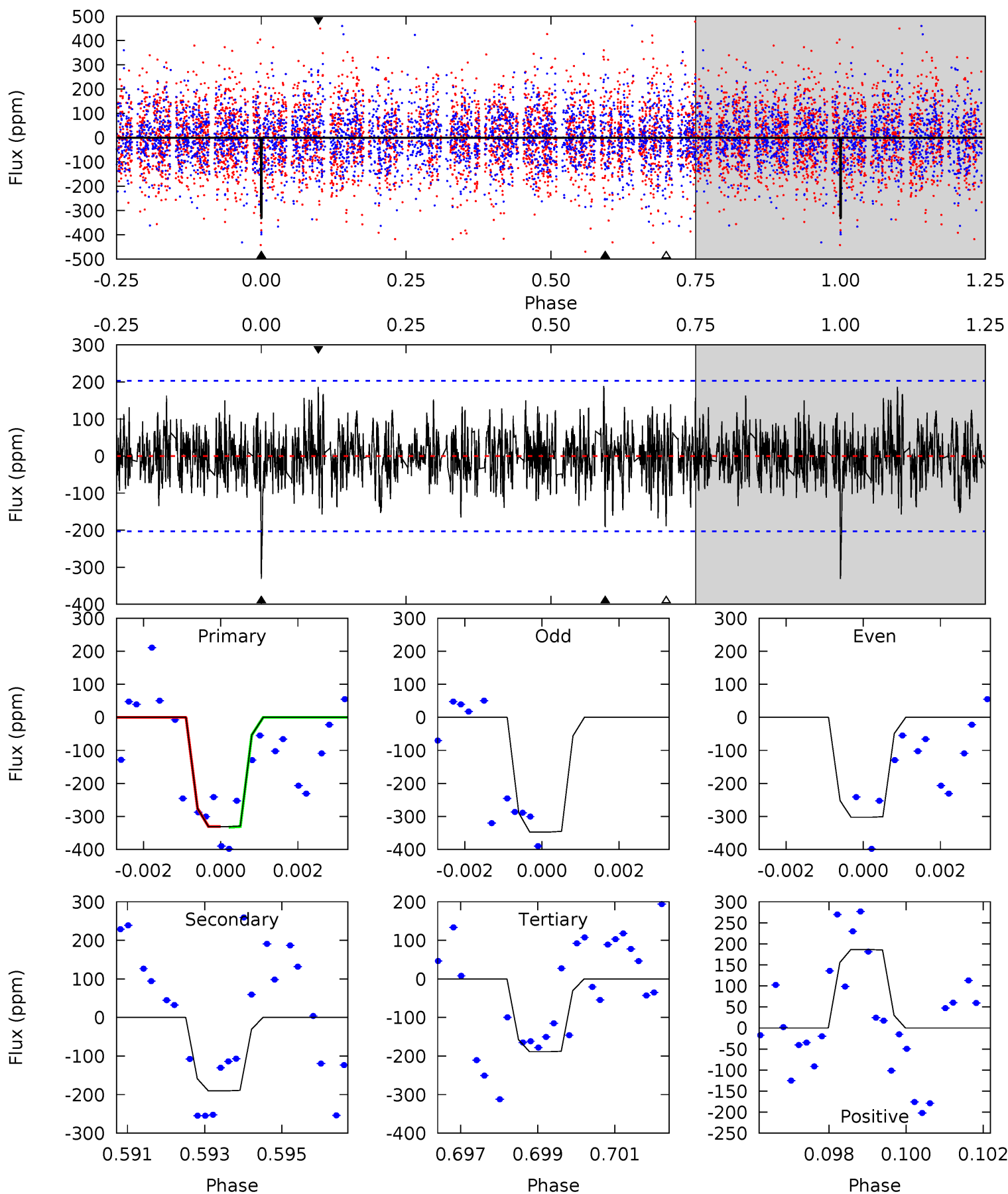
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.75	5.93	5.81	5.93	5.25	2.97	1.77	1.94	1.82	0.12	-0.00	1.02	1.09	0.43	1.02



# Alt Model-Shift Uniqueness Test

009569838-08,  $P = 67.680296$  Days,  $E = 106.351702$  Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.68	4.98	4.95	4.89	5.32	3.09	1.41	3.73	3.79	0.03	0.10	0.57	1.00	0.36	0.03





### Stellar Parameters For KIC 009569838

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6771^{+214}_{-262}$	$4.003^{+0.336}_{-0.144}$	$-0.540^{+0.250}_{-0.300}$	$1.776^{+0.433}_{-0.649}$	$1.157^{+0.189}_{-0.170}$	$0.291^{+0.708}_{-0.119}$
	+3%/-4%	+8%/-4%	+46%/-56%	+24%/-37%	+16%/-15%	+243%/-41%
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 009569838-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-211 \pm 36$	$3.69^{+0.86}_{-0.93}$	$936^{+70}_{-87}$	$5804^{+682}_{-498}$	$1043^{+773}_{-404}$
Alt.	$-190 \pm 38$	$3.77^{+0.93}_{-0.96}$	$940^{+73}_{-98}$	$5583^{+641}_{-499}$	$858^{+714}_{-332}$

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

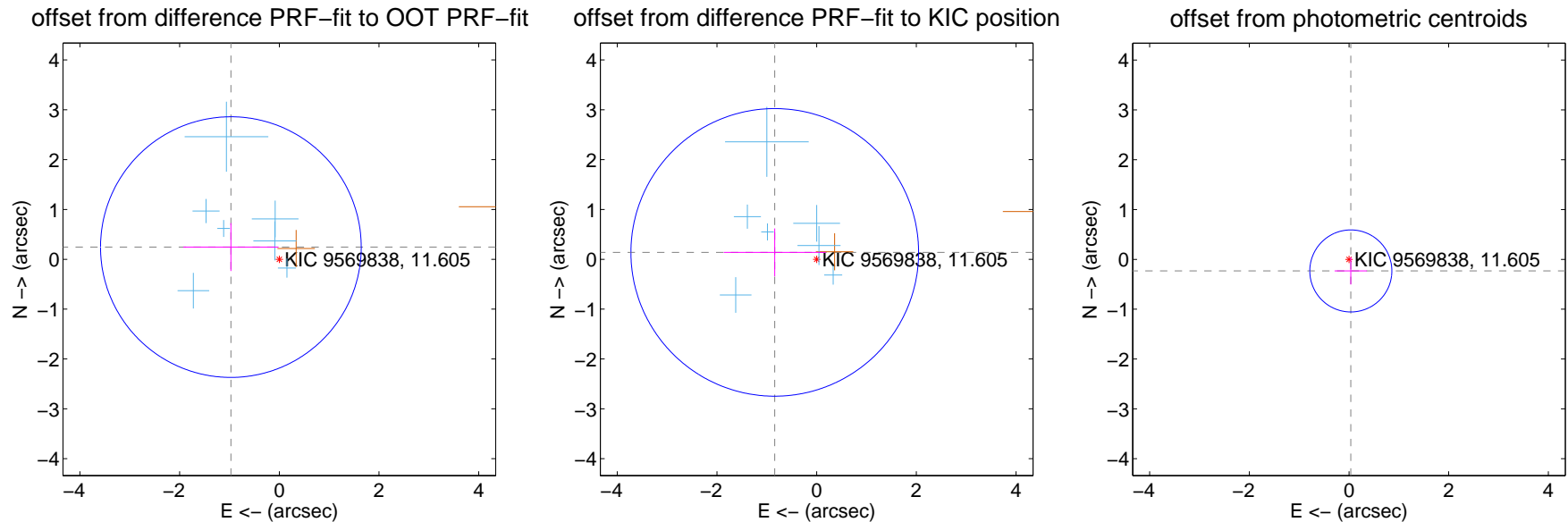
## DV Centroid Data

Supplemental centroid analysis for 009569838-08. **Kepler magnitude: 11.61.** Transit SNR 11.98

There are 7 quarters with good PRF difference image offsets

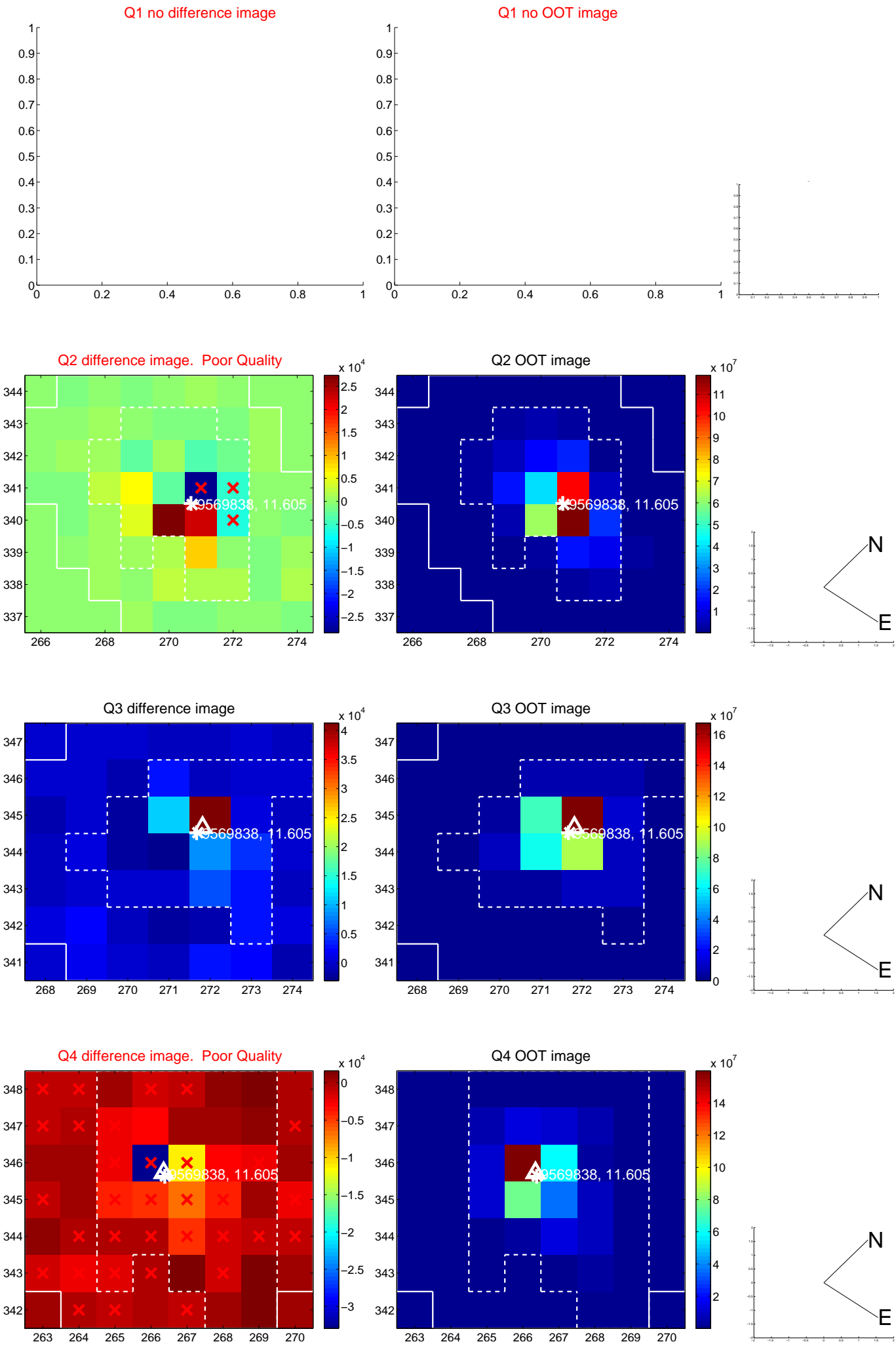
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.002 \pm 0.872$	1.15	$0.972 \pm 0.957$	$0.245 \pm 0.481$
PRF-fit source offset from KIC position	$0.852 \pm 0.962$	0.89	$0.841 \pm 1.024$	$0.139 \pm 0.481$
photometric centroid source offset	$0.23 \pm 0.27$	0.86	$-0.04 \pm 0.32$	$-0.23 \pm 0.27$

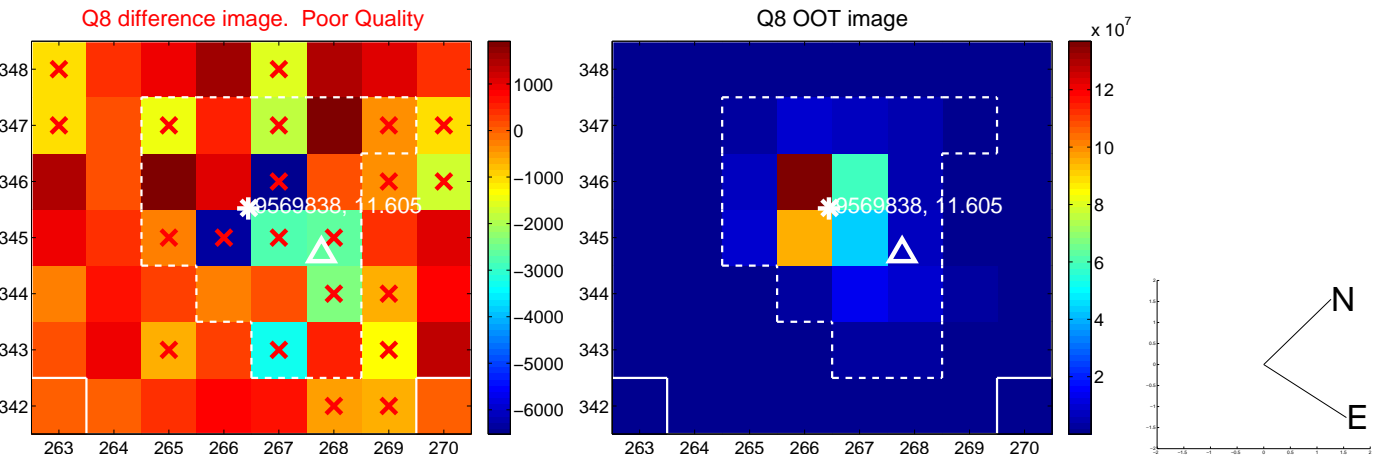
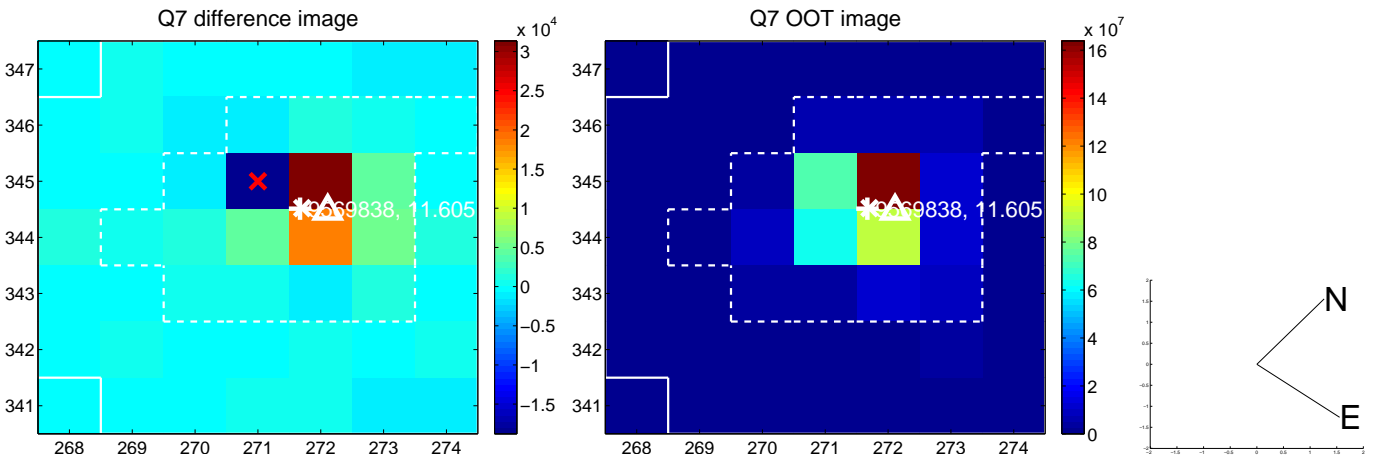
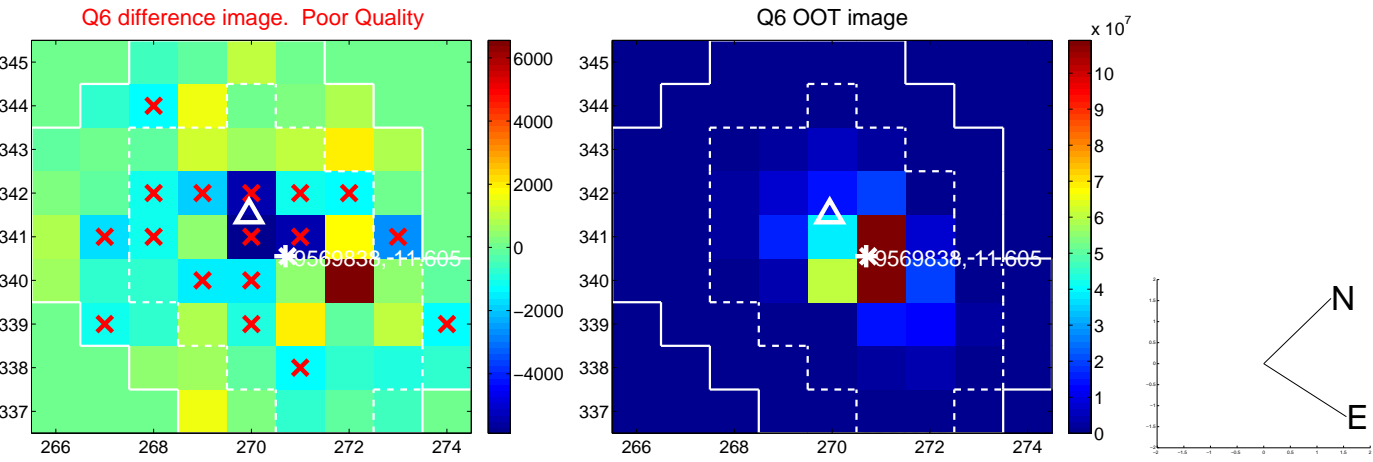
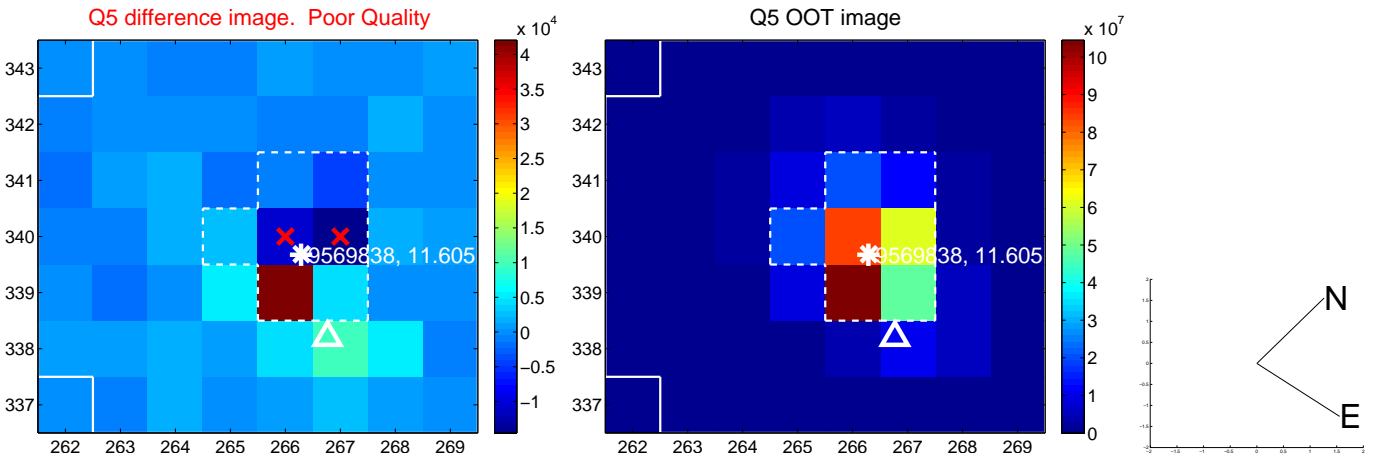


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

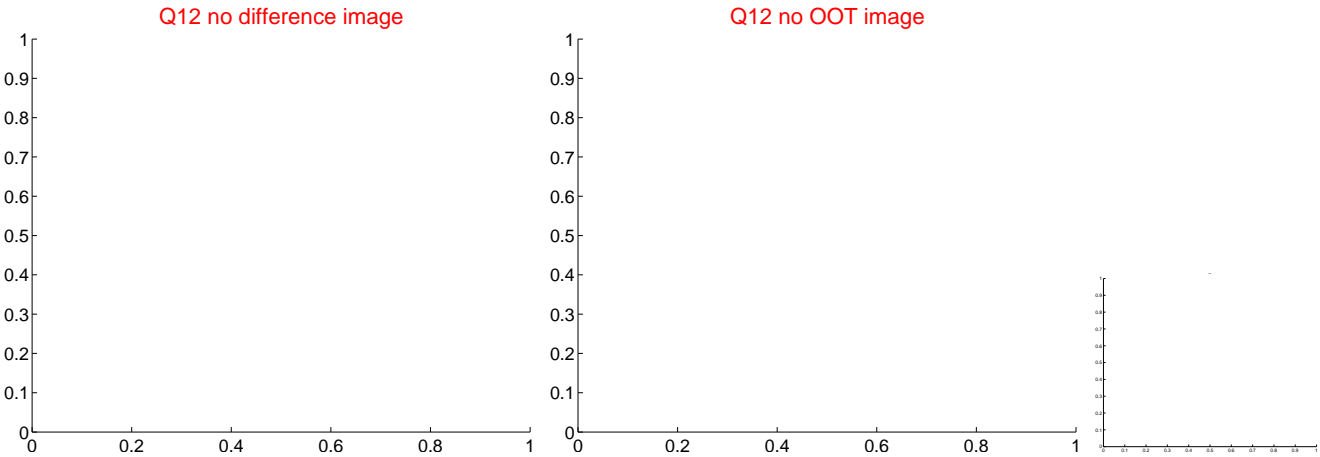
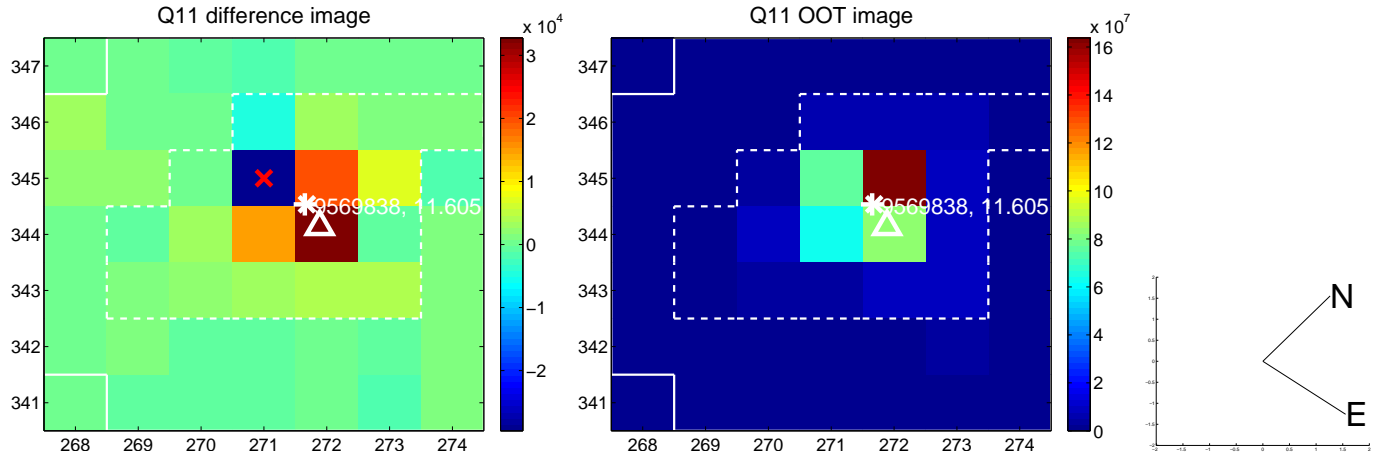
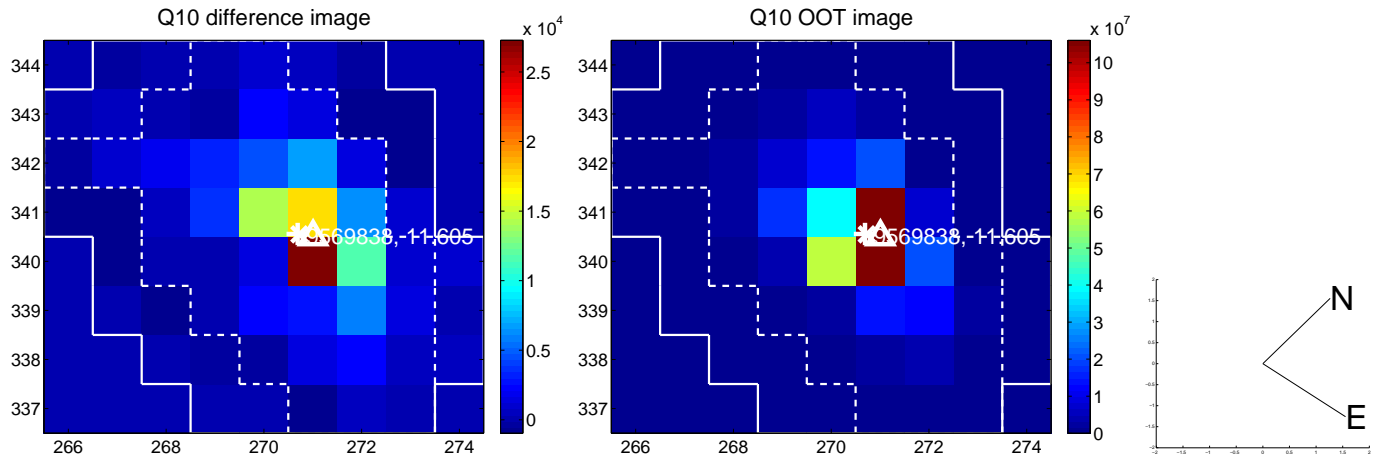
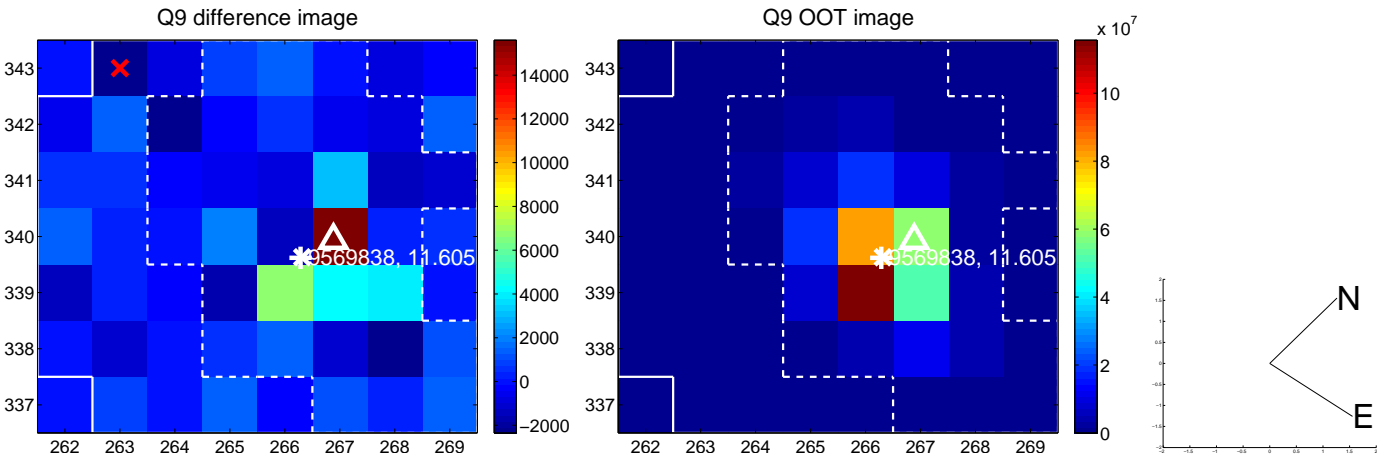
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



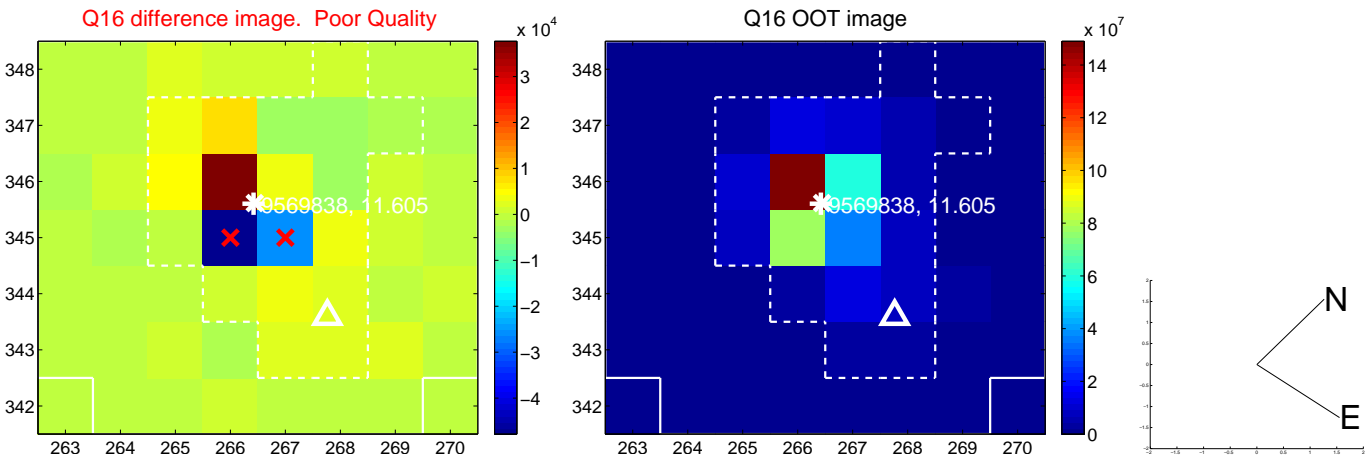
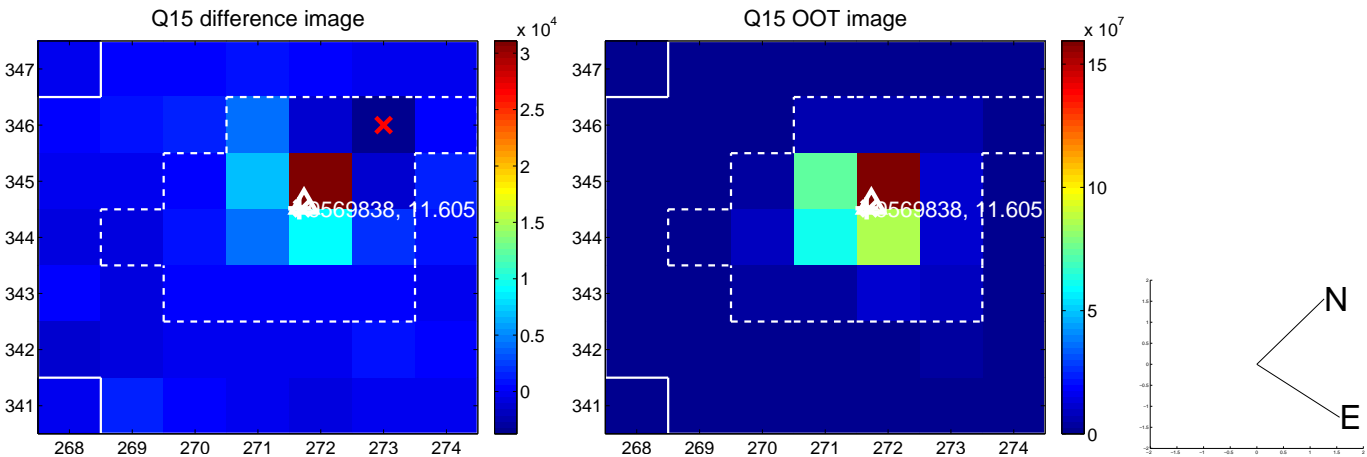
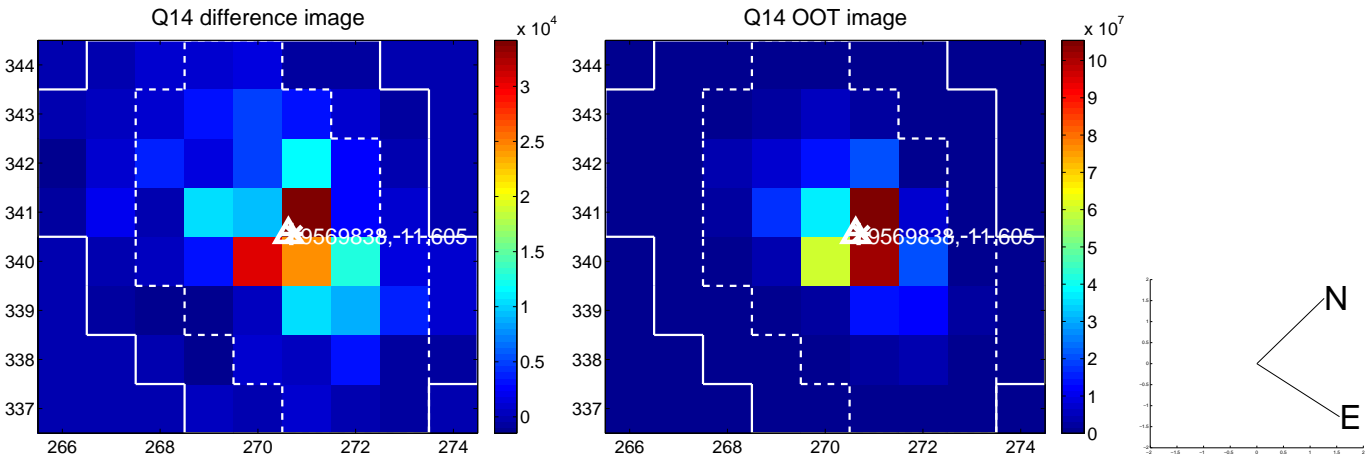
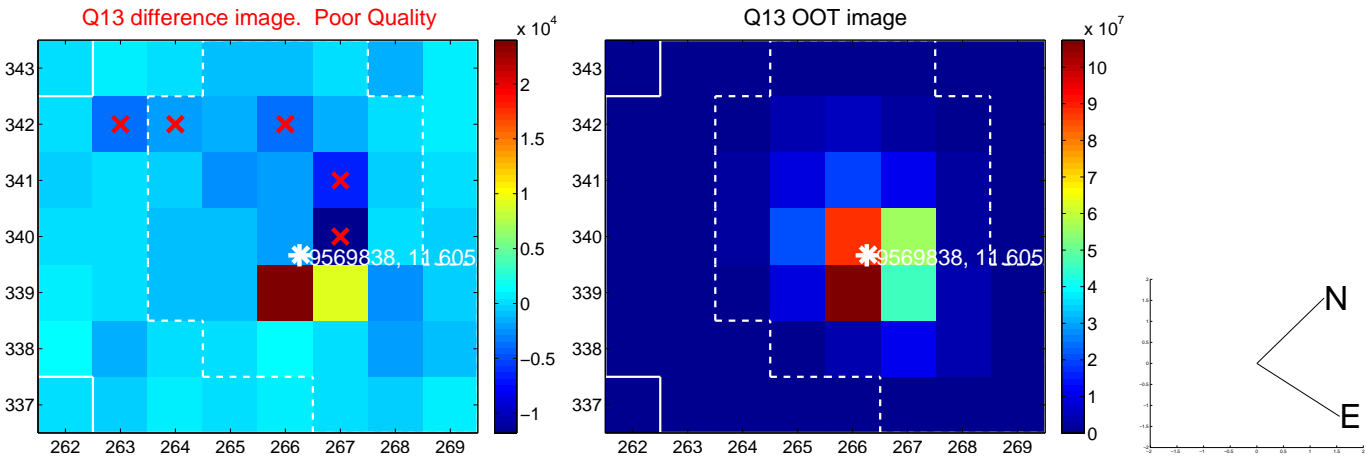
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



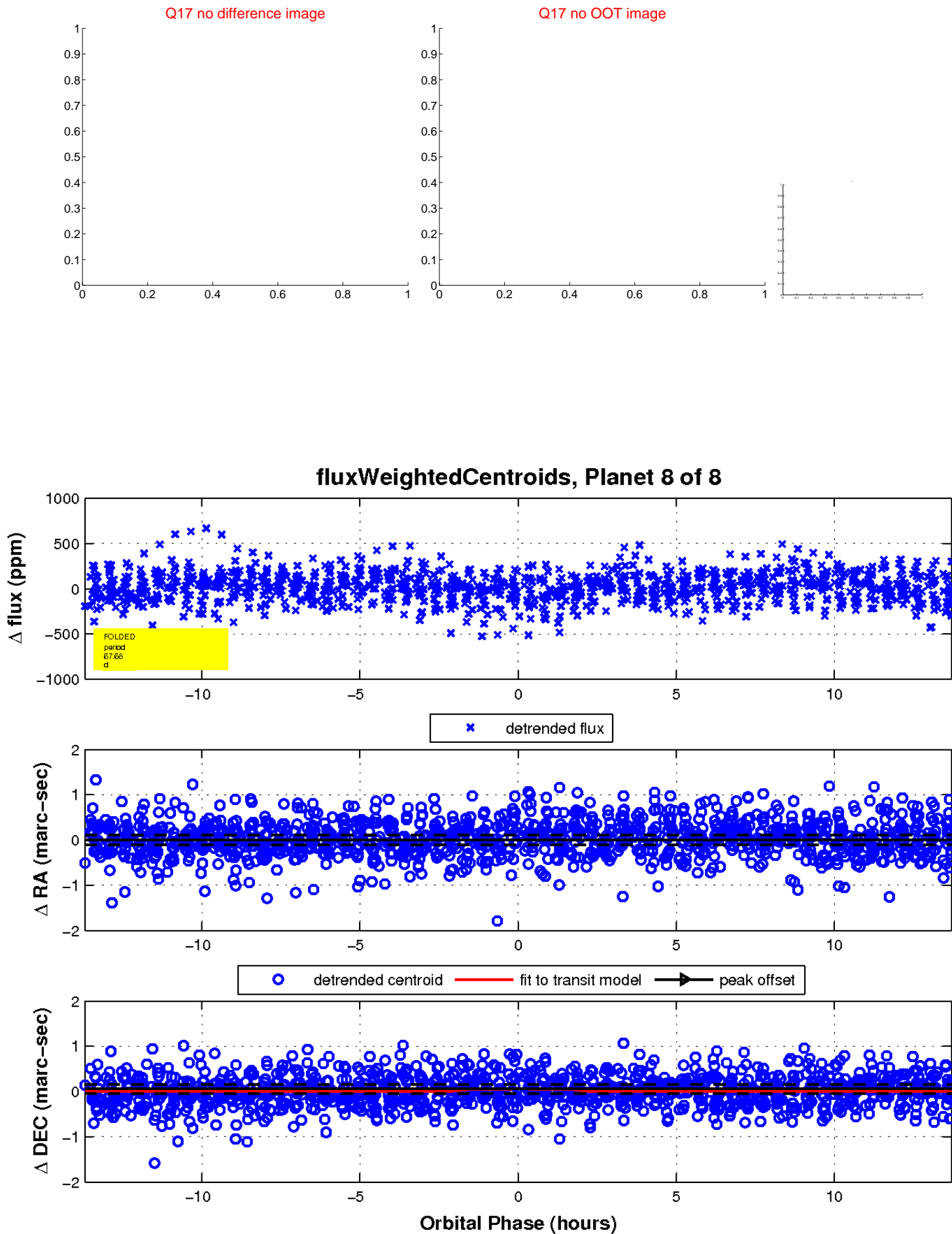
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

