

# KIC 009111849

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009111849-01	OBS	2042.01	63.073086	191.255585	636.8	5.503	35.4	36.2	6.35	6234	17.84	318.32
009111849-02	OBS	No	0.879308	131.635994	290.7	1.500	8.5	-1.0	6.35	6234	10.84	94872.03
009111849-03	OBS	No	1.419233	131.903611	19.1	9.134	8.3	8.7	6.35	6234	2.77	50109.64
009111849-04	OBS	No	55.896078	184.095431	329.3	2.264	11.0	10.8	6.35	6234	12.11	373.95
009111849-05	OBS	No	88.224588	219.286101	366.2	2.176	9.6	10.6	6.35	6234	13.81	203.49
009111849-06	OBS	No	46.648185	141.719773	221.1	3.438	10.1	9.2	6.35	6234	11.02	475.93
009111849-07	OBS	No	43.779139	132.854579	271.3	2.527	9.1	8.9	6.35	6234	12.31	517.97
009111849-08	OBS	No	61.217340	159.721819	272.7	2.190	8.4	8.4	6.35	6234	11.82	331.25
009111849-09	OBS	No	139.780377	232.656851	366.1	2.500	8.3	-1.0	6.35	6234	12.13	110.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009111849-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009111849-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS
009111849-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009111849-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
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009111849-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009111849-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
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**Notes:** OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.

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

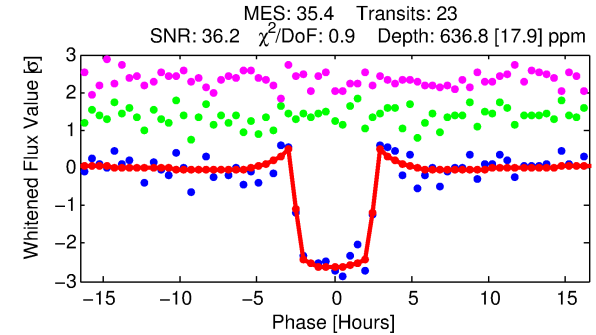
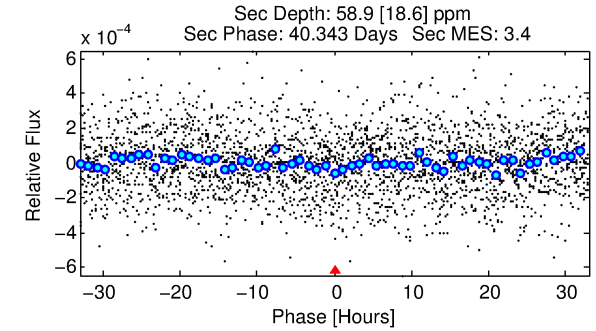
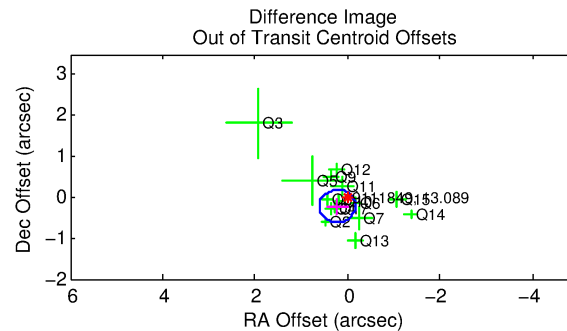
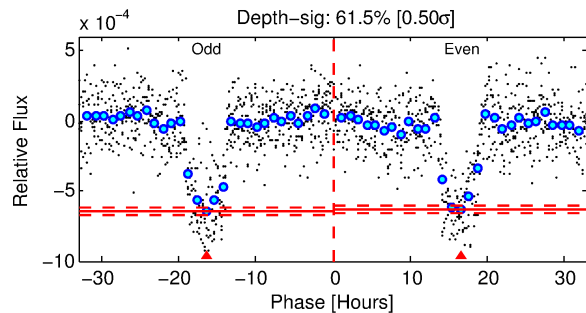
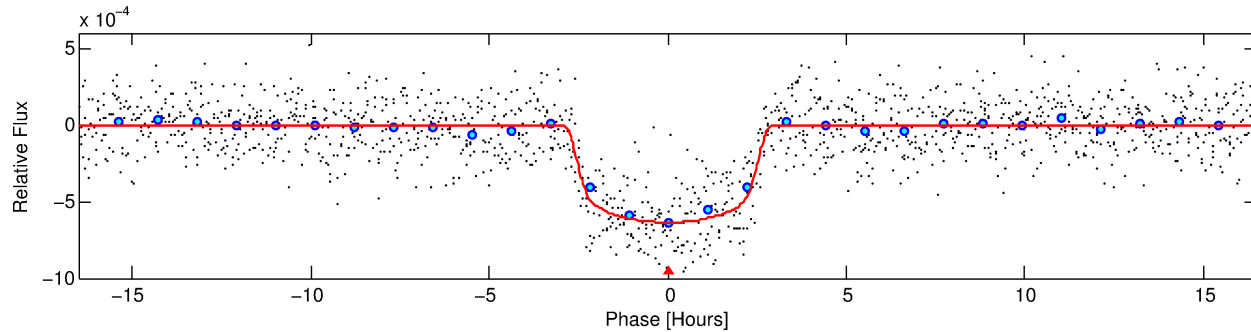
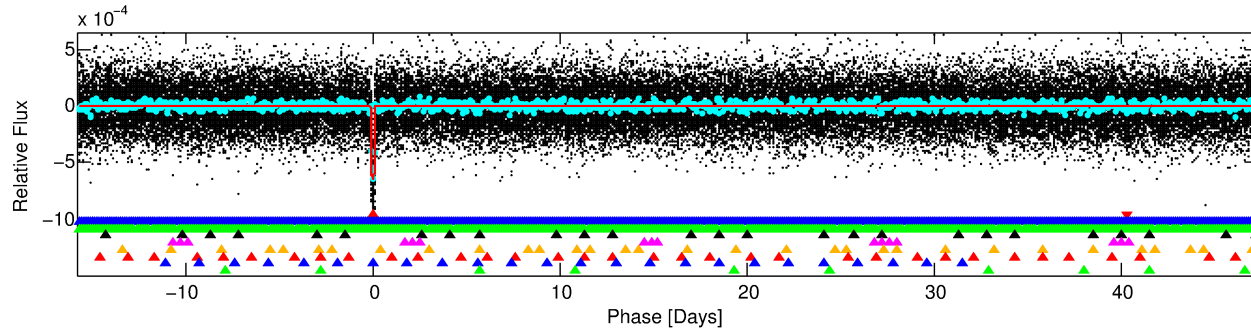
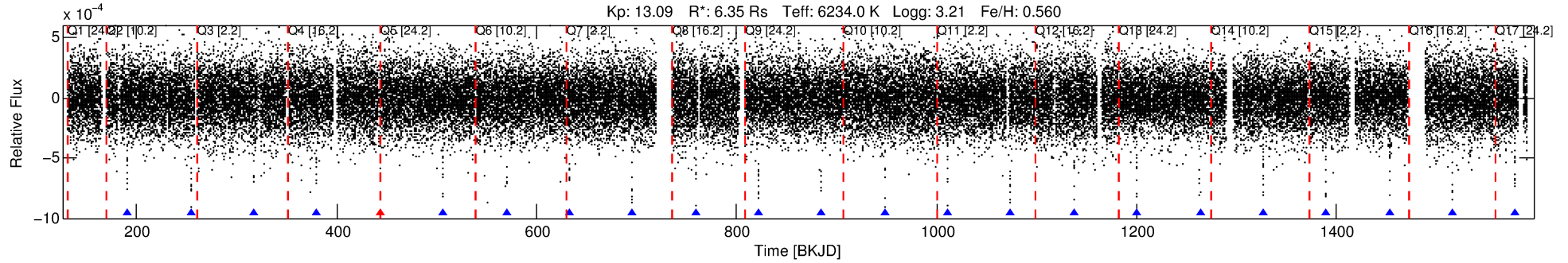
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009111849-01

No Significant Match Found

# DV One-Page Summary

KIC: 9111849 Candidate: 1 of 9 Period: 63.073 d  
KOI: K02042.01 Corr: 0.972



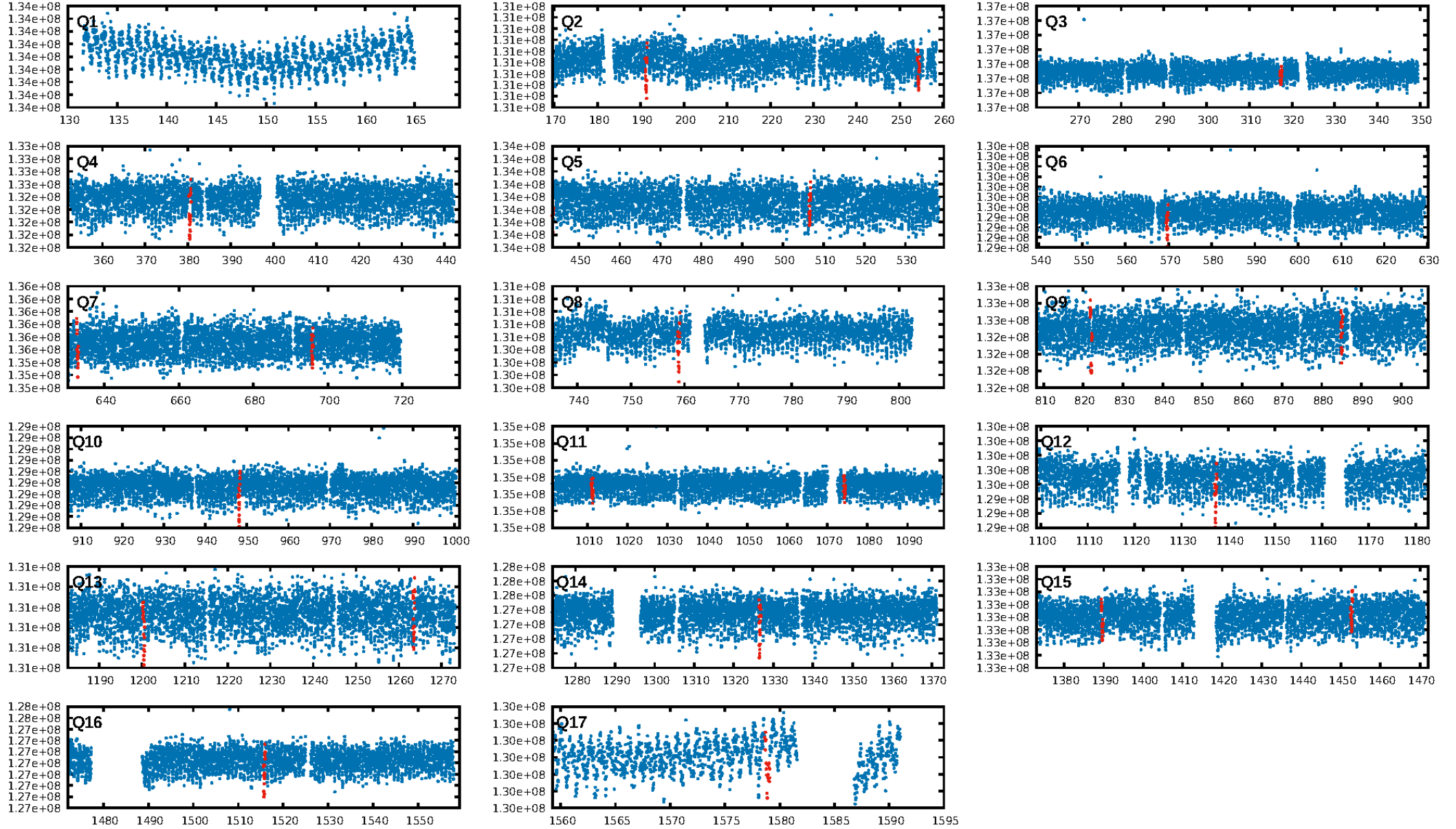
## DV Fit Results:

Period = 63.07309 [0.00018] d  
Epoch = 191.2556 [0.0023] BKJD  
Rp/R\* = 0.0257 [0.0018]  
a/R\* = 54.99 [17.84]  
b = 0.81 [0.14]  
Seff = 318.32 [248.18]  
Teq = 1077 [210] K  
Rp = 17.84 [9.01] Re  
a = 0.4143 [0.2008] AU  
Ag = 17.45 [14.86] [1.11 $\sigma$ ]  
Teffp = 3404 [296] K [6.41 $\sigma$ ]

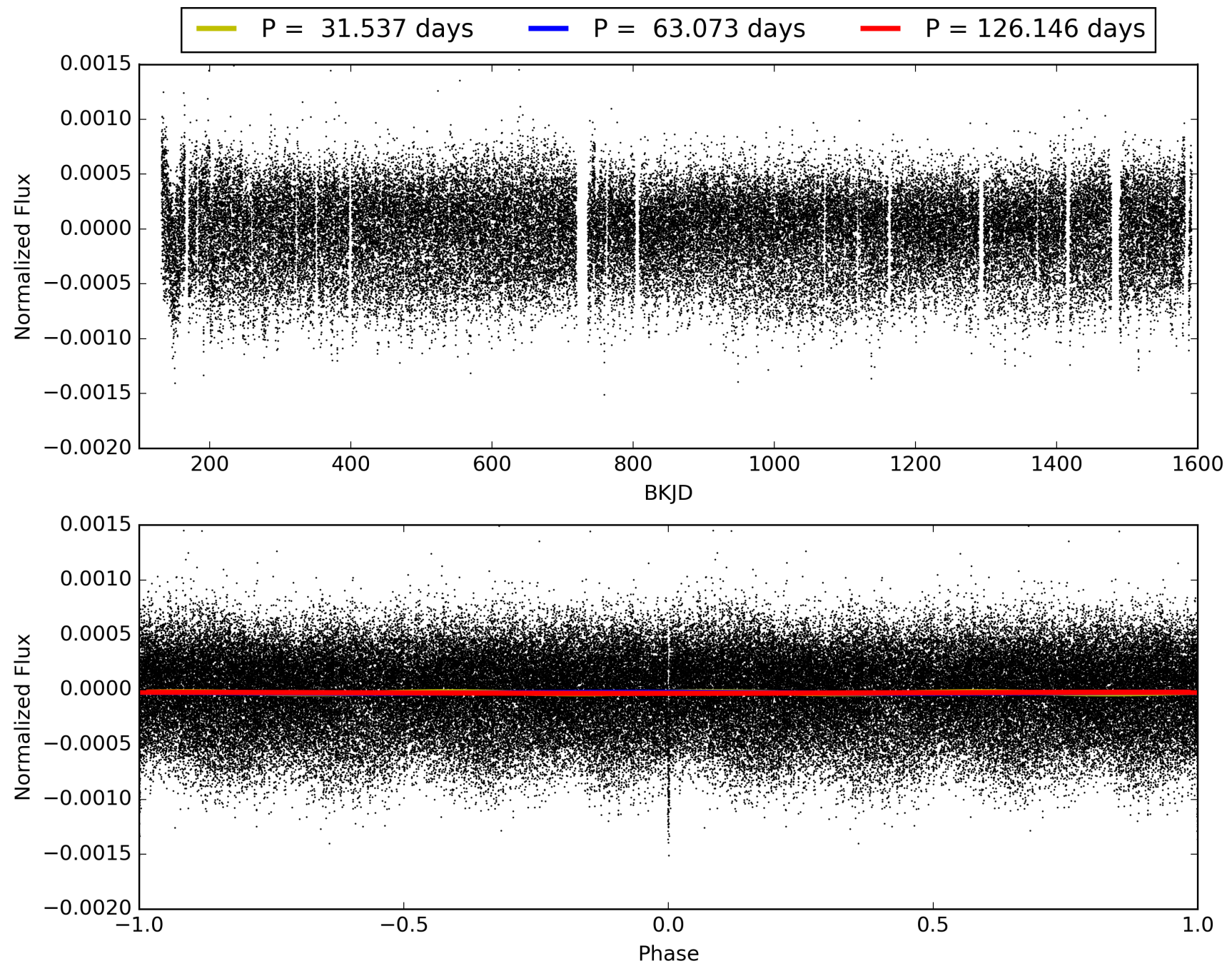
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.52 $\sigma$ ]  
LongPeriod-sig: 100.0% [102.01 $\sigma$ ]  
ModelChiSquare2-sig: 5.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.95 [21/22]  
GhostDiagnostic-chr: 6.693  
Centroid-sig: 59.9%  
Centroid-so: 0.273 arcsec [1.16 $\sigma$ ]  
OotOffset-rm: 0.313 arcsec [2.38 $\sigma$ ]  
KicOffset-rm: 0.248 arcsec [1.92 $\sigma$ ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 0.93 [14/15]  
DiffImageOverlap-fno: 0.00 [0/15]

# TCE 009111849-01, PDC Light Curves



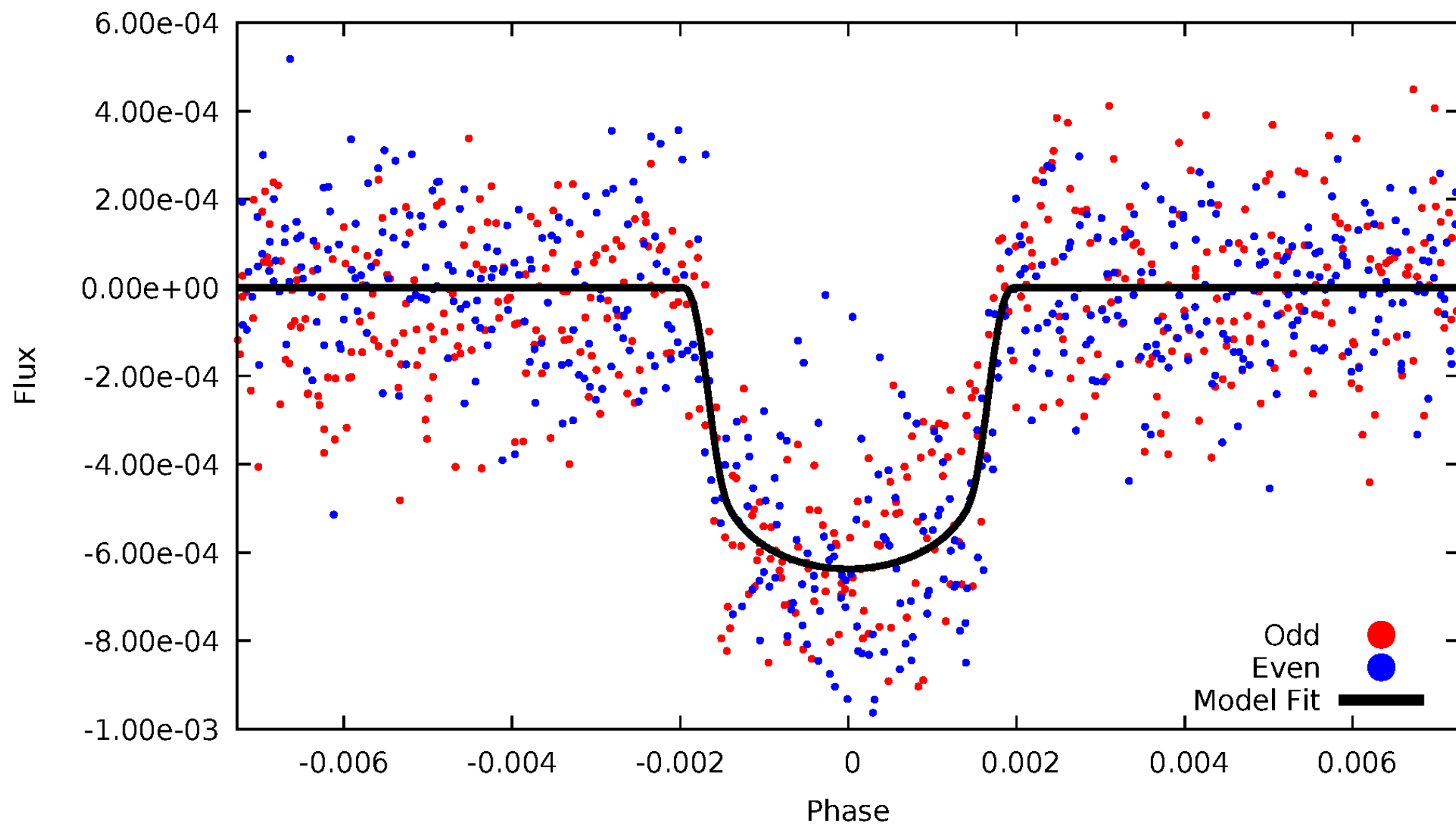
TCE 009111849-01





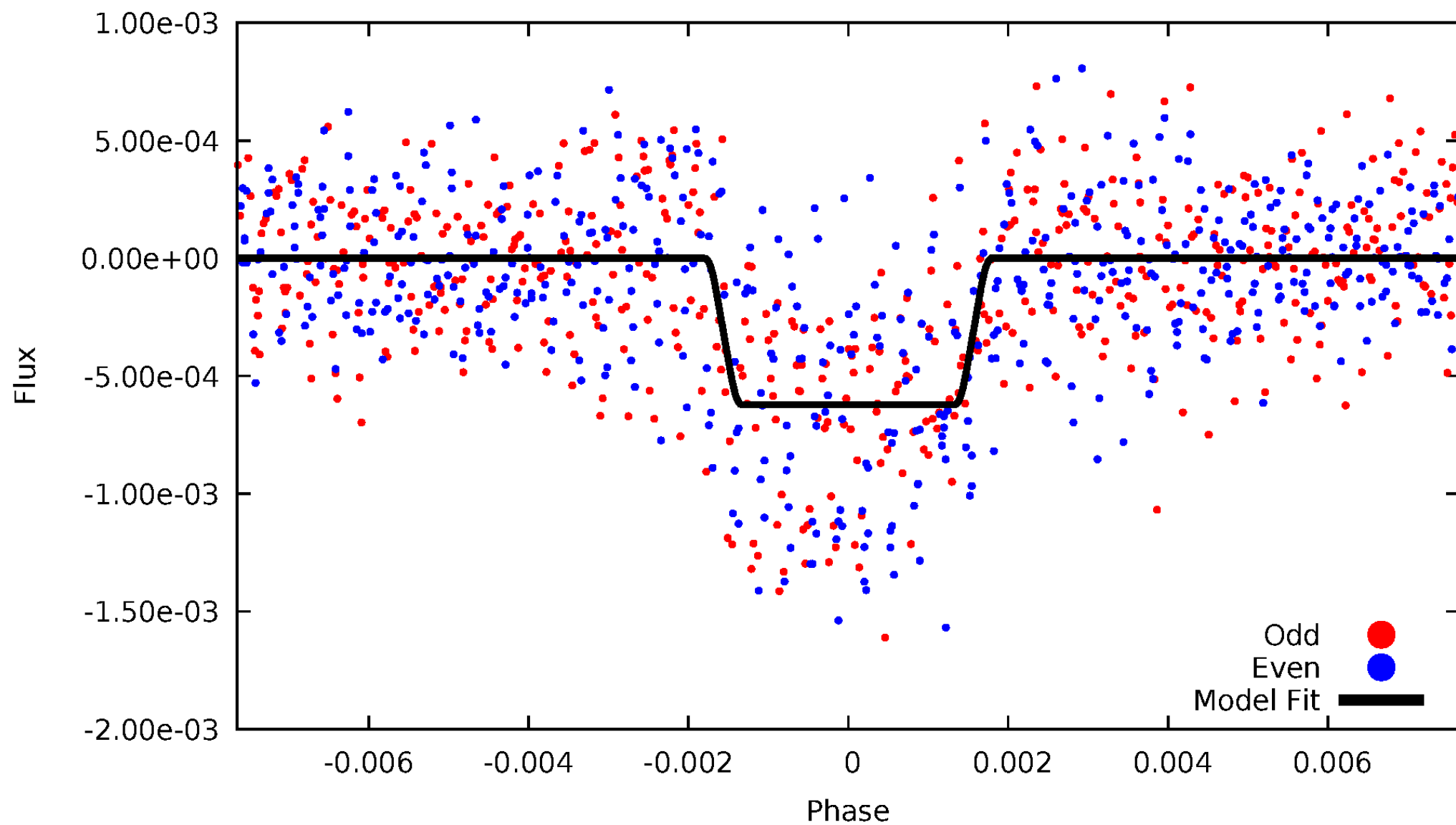
# DV Odd/Even

TCE 009111849-01



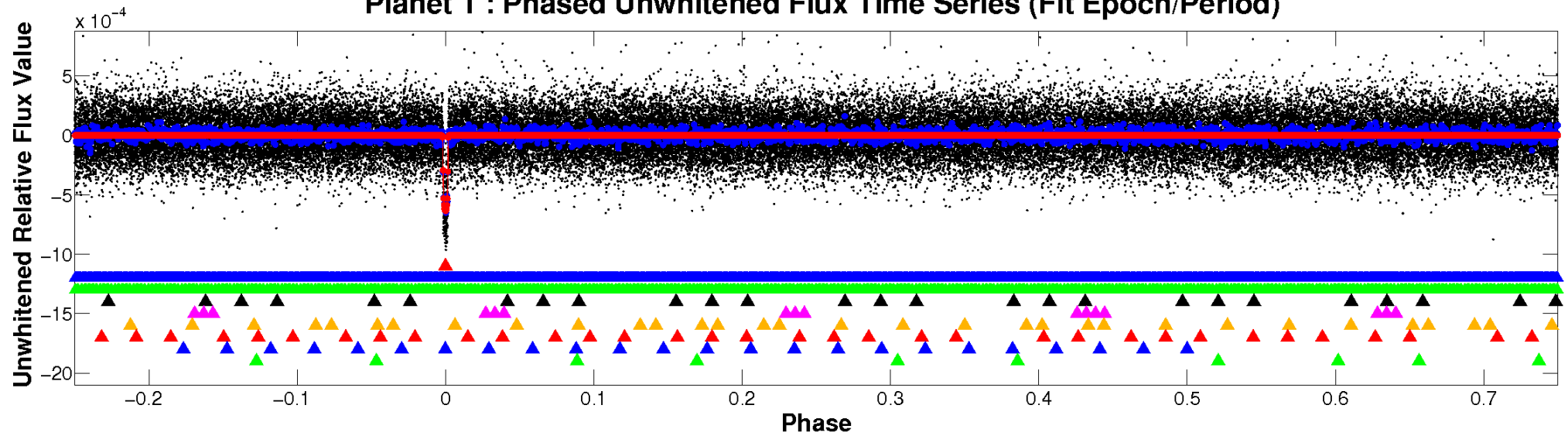
# ALT Odd/Even

TCE 009111849-01

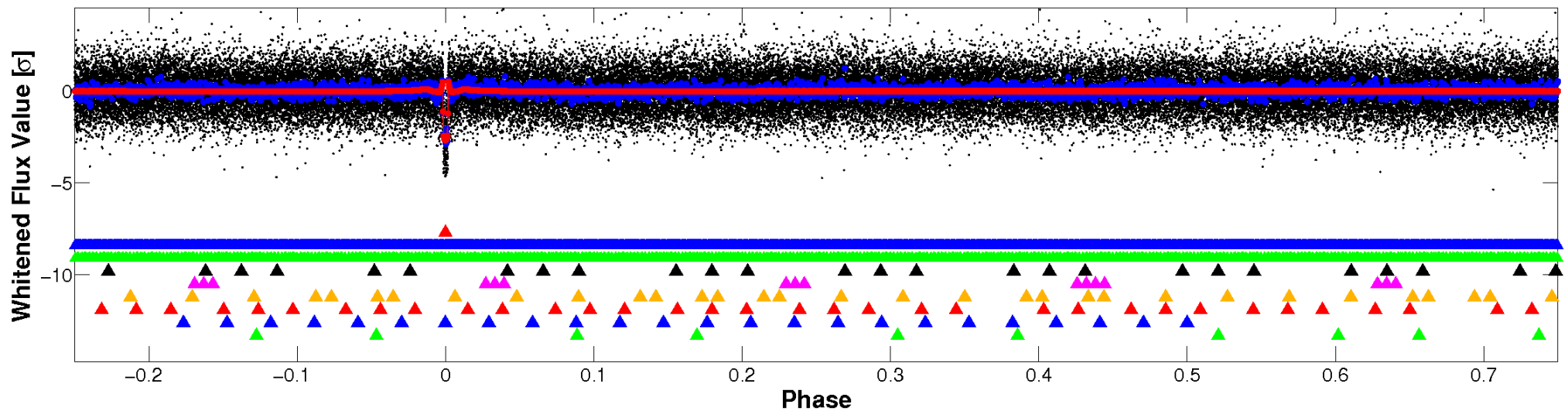


# Non-Whitened Vs. Whitened Light Curve

Planet 1 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

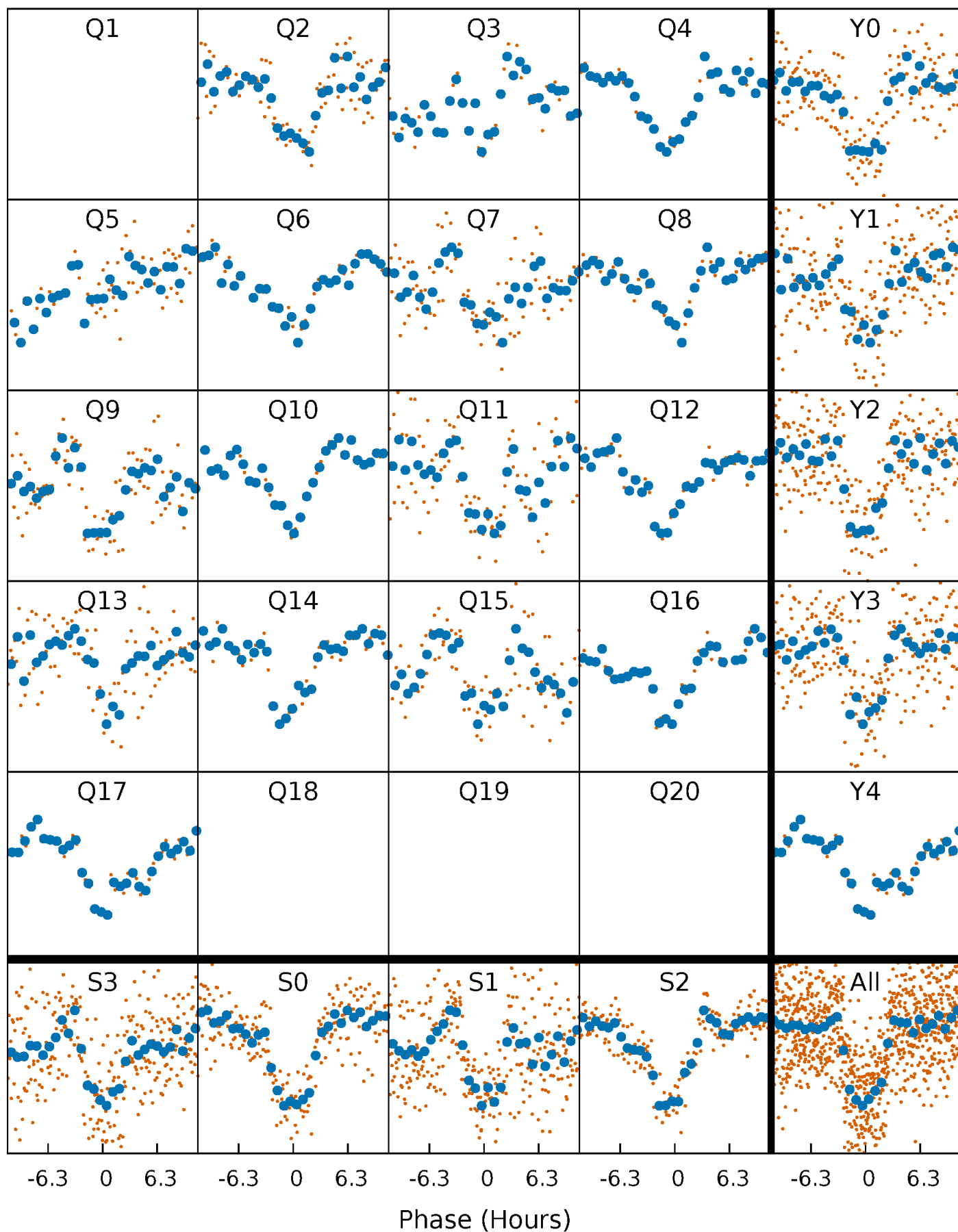


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

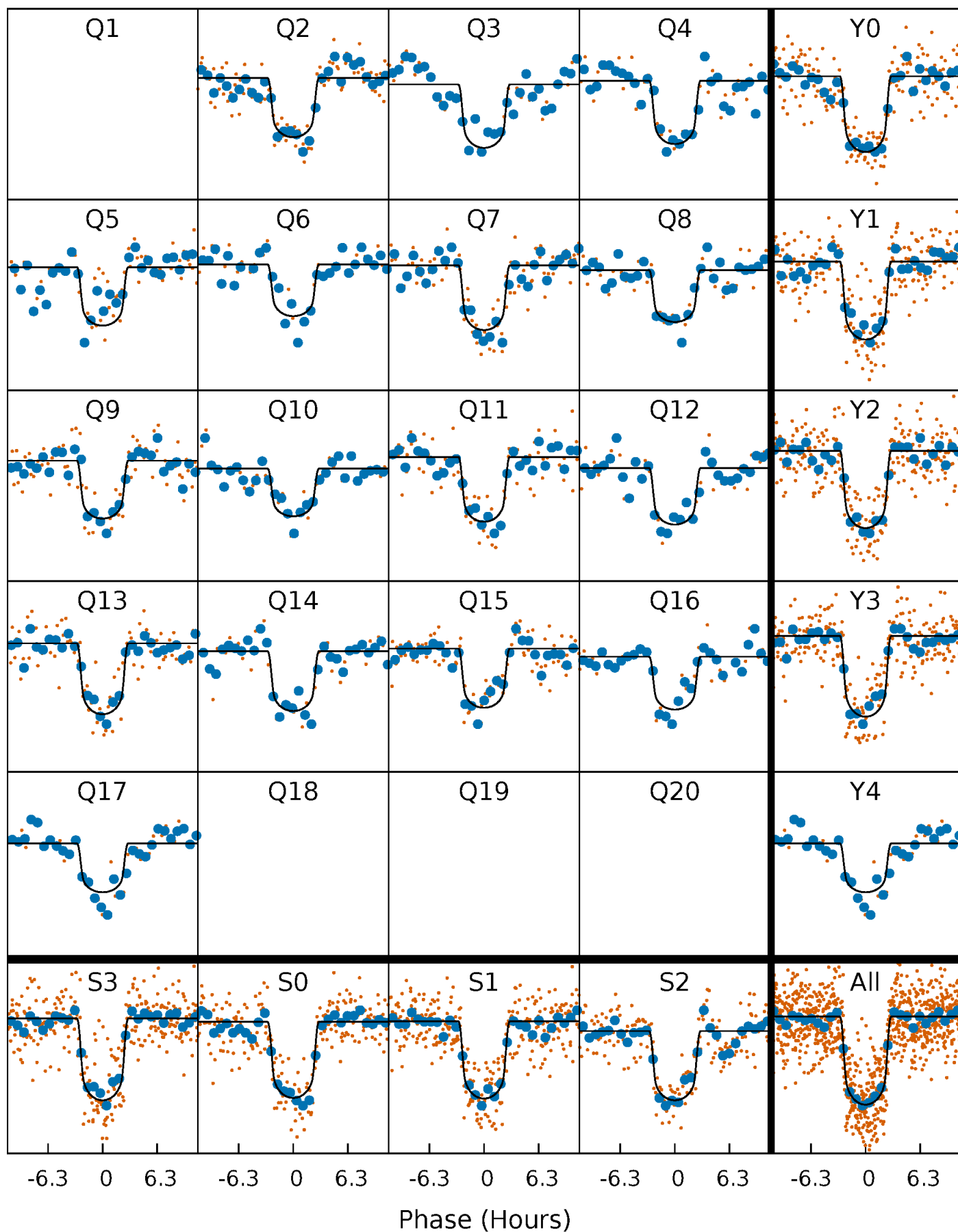
TCE 009111849-01   P= 63.073086 Days    $T_0=191.255585$  (BKJD)





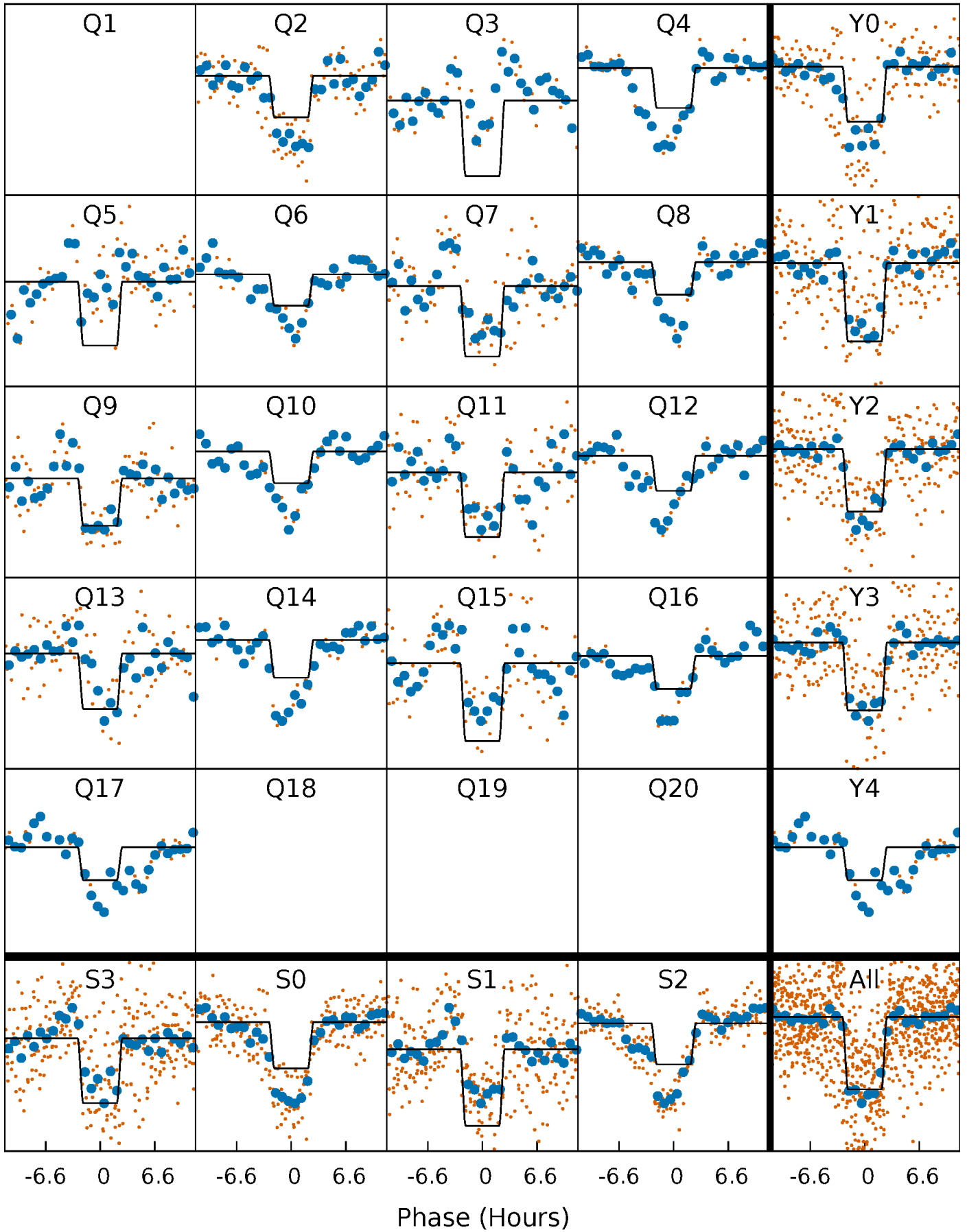
# DV Quarter-Phased Transit Curves

TCE 009111849-01 P= 63.073086 Days  $T_0=191.255585$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

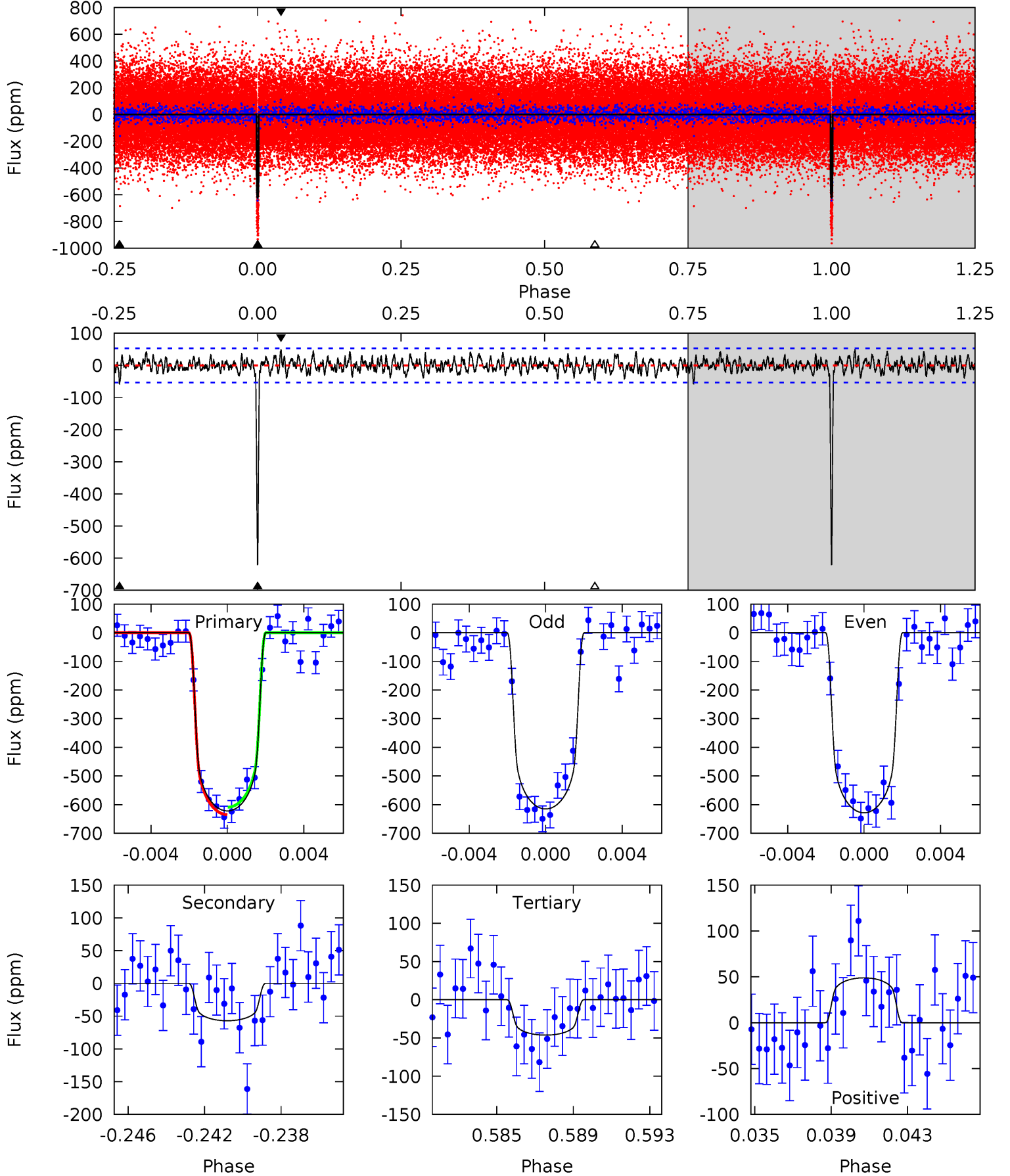
TCE 009111849-01 P= 63.071983 Days  $T_0=191.266557$  (BKJD)



# DV Model-Shift Uniqueness Test

009111849-01,  $P = 63.073086$  Days,  $E = 128.182499$  Days

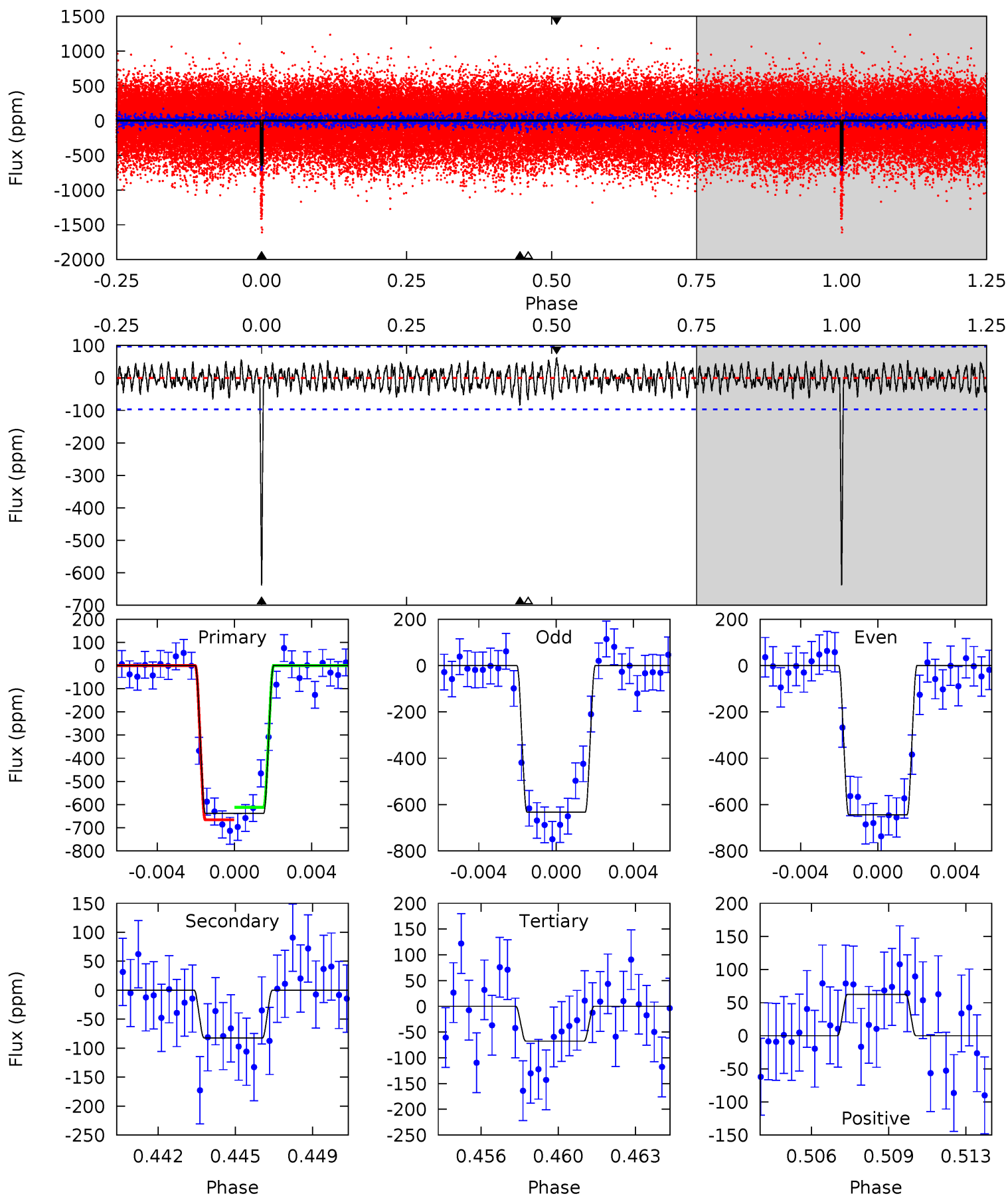
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
61.0	5.59	4.54	4.79	5.20	2.89	1.54	56.4	56.2	1.06	0.80	0.66	1.02	0.07	1.25



# Alt Model-Shift Uniqueness Test

009111849-01,  $P = 63.071983$  Days,  $E = 128.194574$  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
34.5	4.45	3.65	3.38	5.22	2.92	1.30	30.9	31.1	0.80	1.07	0.32	1.26	0.09	1.46





### Stellar Parameters For KIC 009111849

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6234^{+74}_{-74}$	$3.209^{+0.458}_{-0.122}$	$0.560^{+0.050}_{-0.100}$	$6.354^{+1.590}_{-3.180}$	$2.382^{+0.277}_{-0.514}$	$0.013^{+0.056}_{-0.005}$
	+1%/-1%	+14%/-4%	+9%/-18%	+25%/-50%	+12%/-22%	+431%/-35%
Source	SPE90	FLK73	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009111849-01 / KOI 2042.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-57 \pm 10$	$16.73^{+3.03}_{-4.38}$	$1467^{+107}_{-189}$	$3766^{+155}_{-160}$	$20^{+14}_{-7}$
Alt.	$-82 \pm 18$	$16.09^{+3.01}_{-4.17}$	$1462^{+112}_{-175}$	$4067^{+182}_{-215}$	$30^{+21}_{-10}$

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

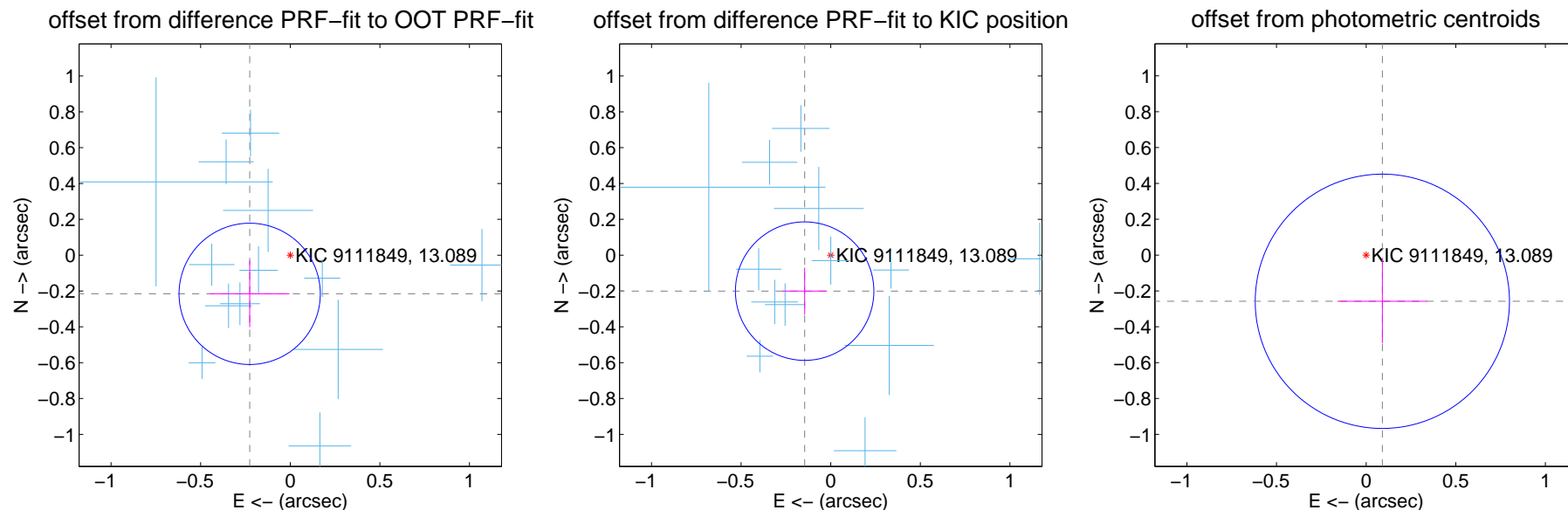
## DV Centroid Data

Supplemental centroid analysis for 009111849-01. Kepler magnitude: 13.09. Transit SNR 36.20

There are 14 quarters with good PRF difference image offsets

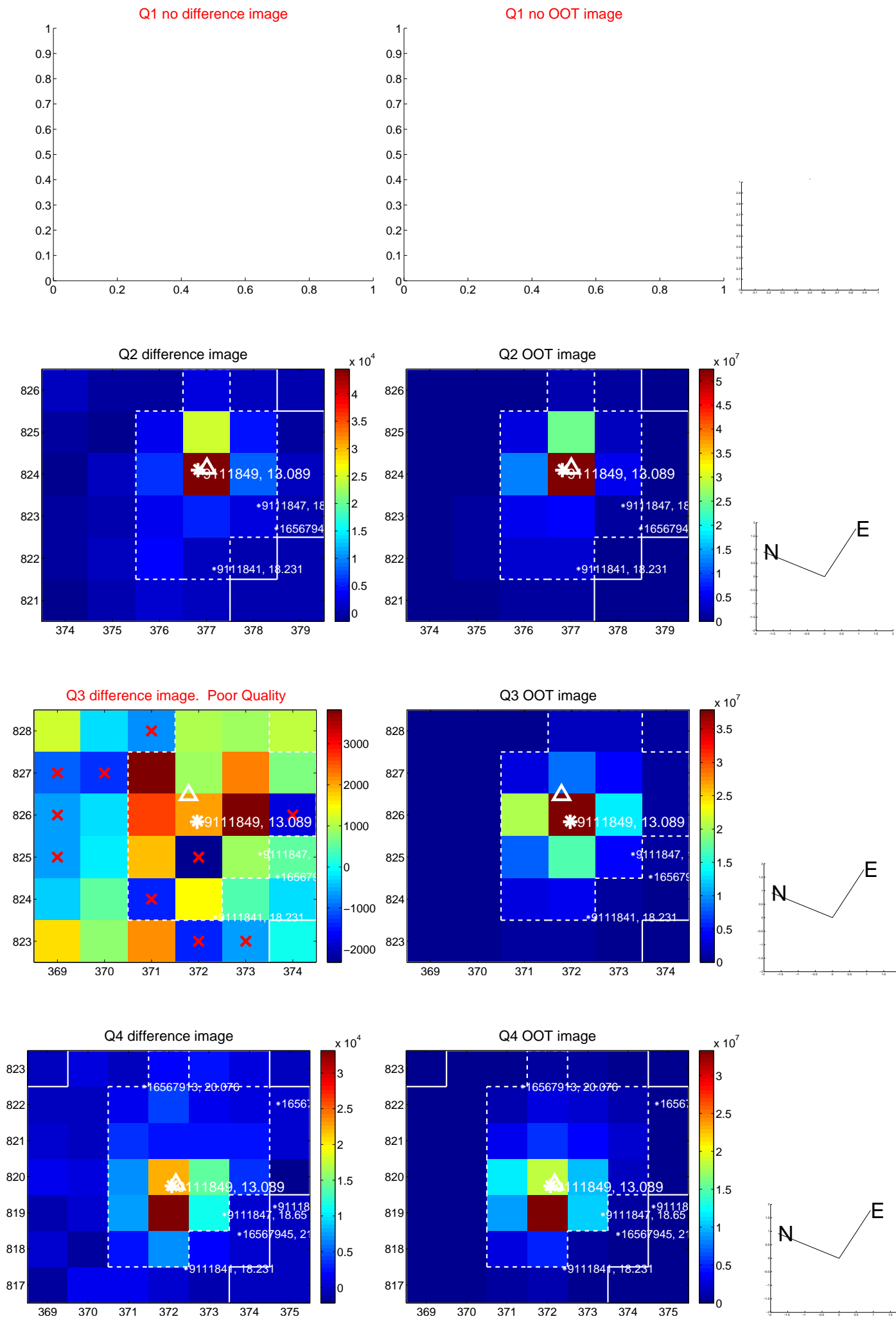
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.313 \pm 0.131$	2.38	$0.226 \pm 0.222$	$-0.216 \pm 0.186$
PRF-fit source offset from KIC position	$0.248 \pm 0.129$	1.92	$0.145 \pm 0.125$	$-0.201 \pm 0.131$
photometric centroid source offset	$0.27 \pm 0.24$	1.16	$-0.09 \pm 0.25$	$-0.26 \pm 0.23$

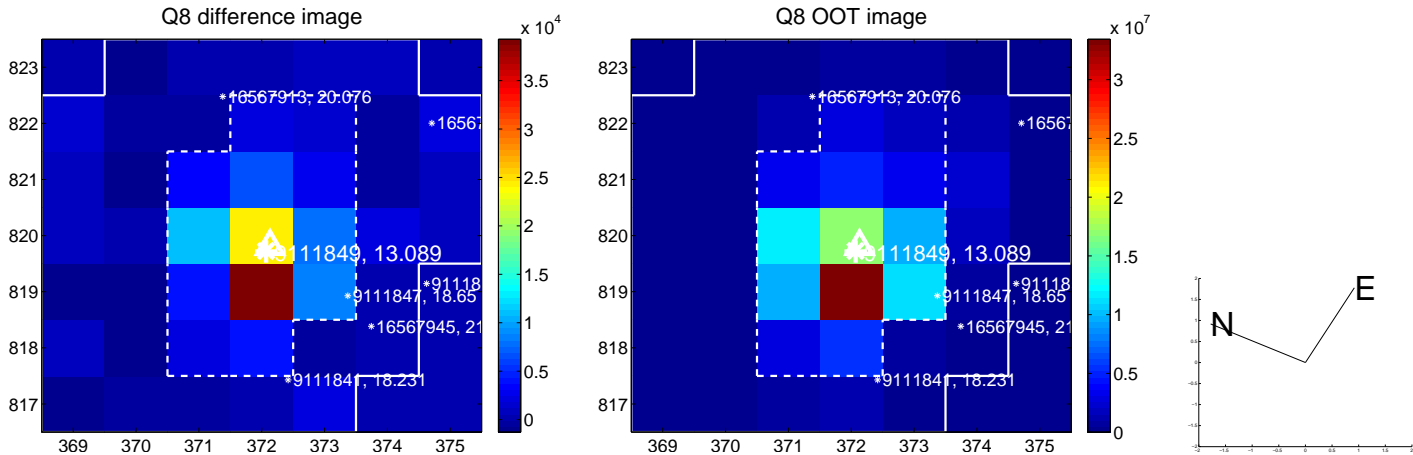
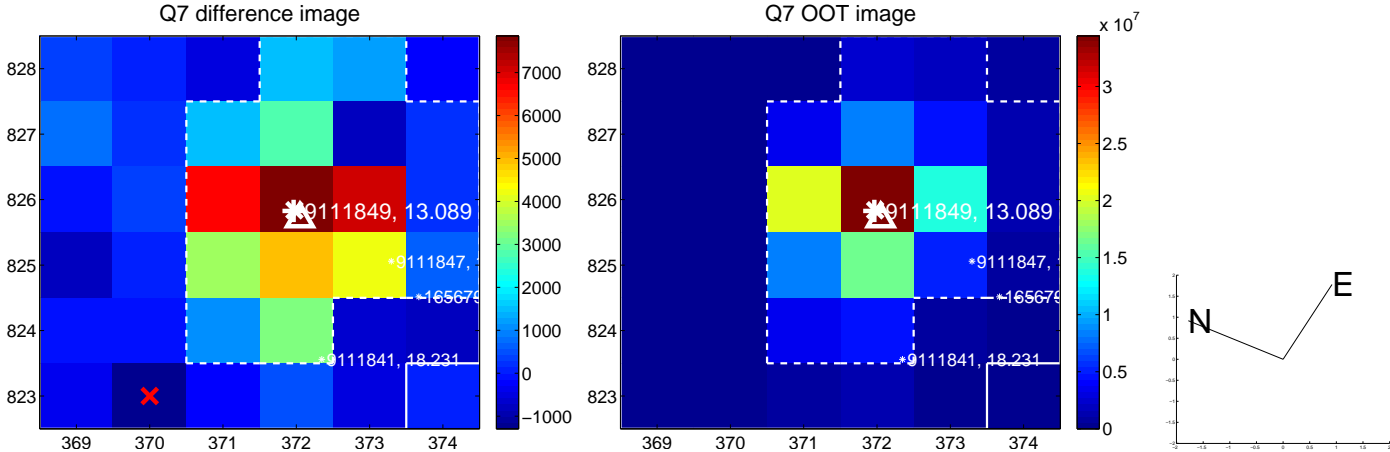
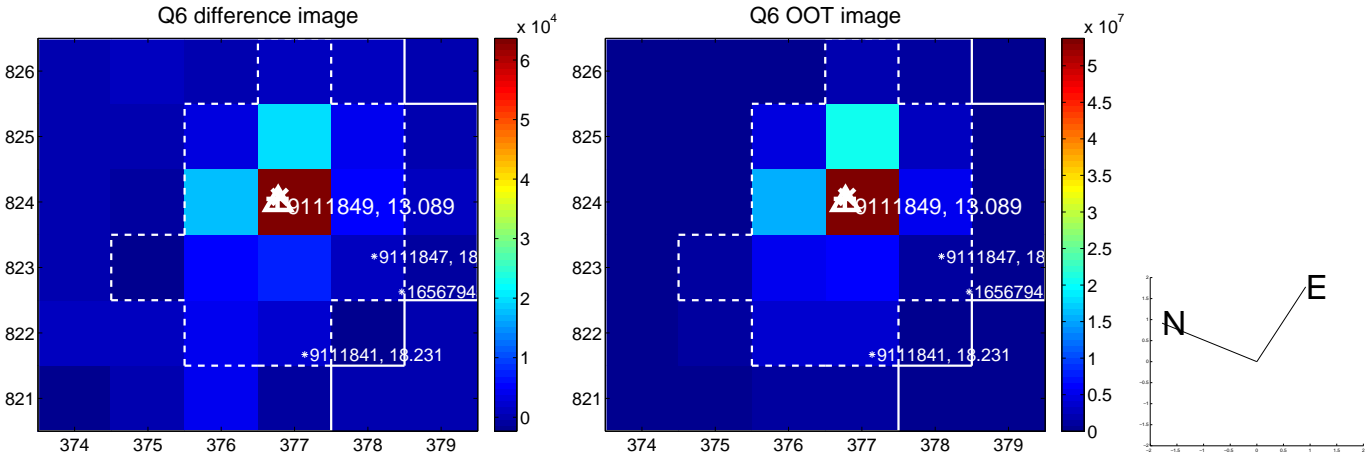
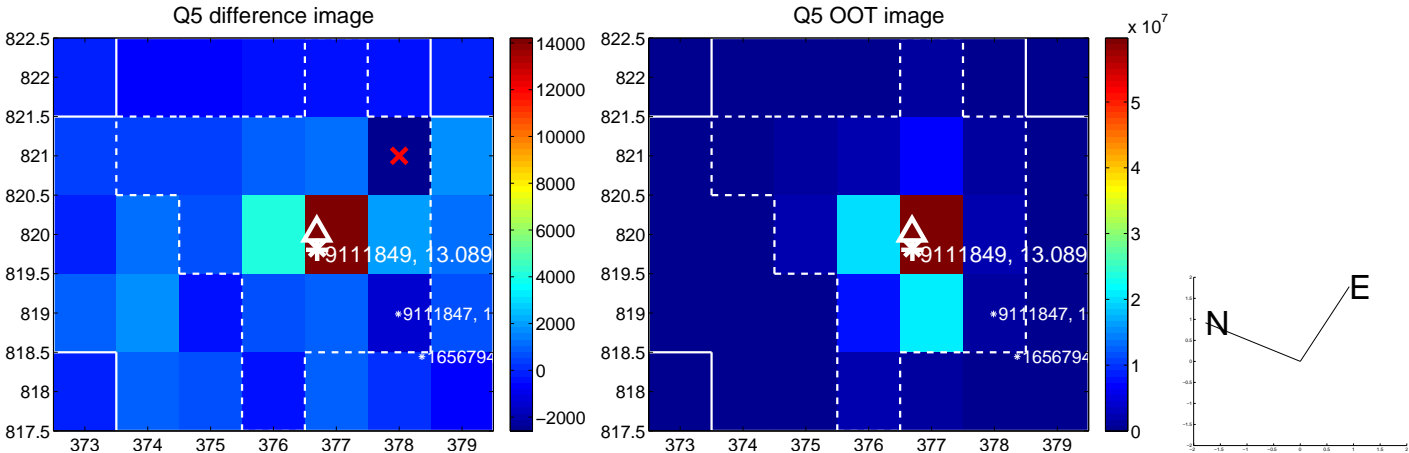


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

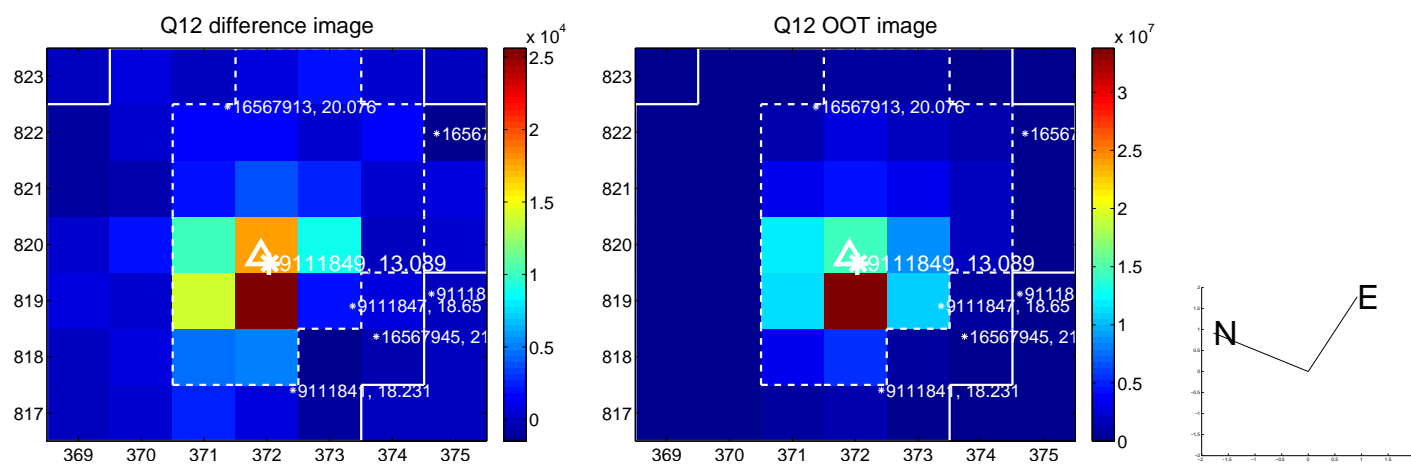
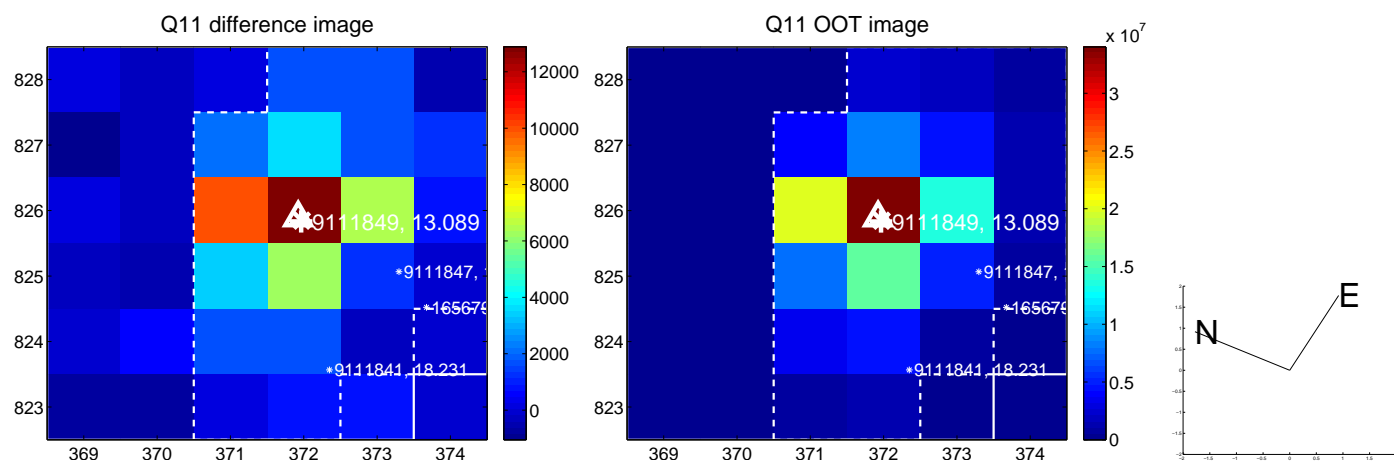
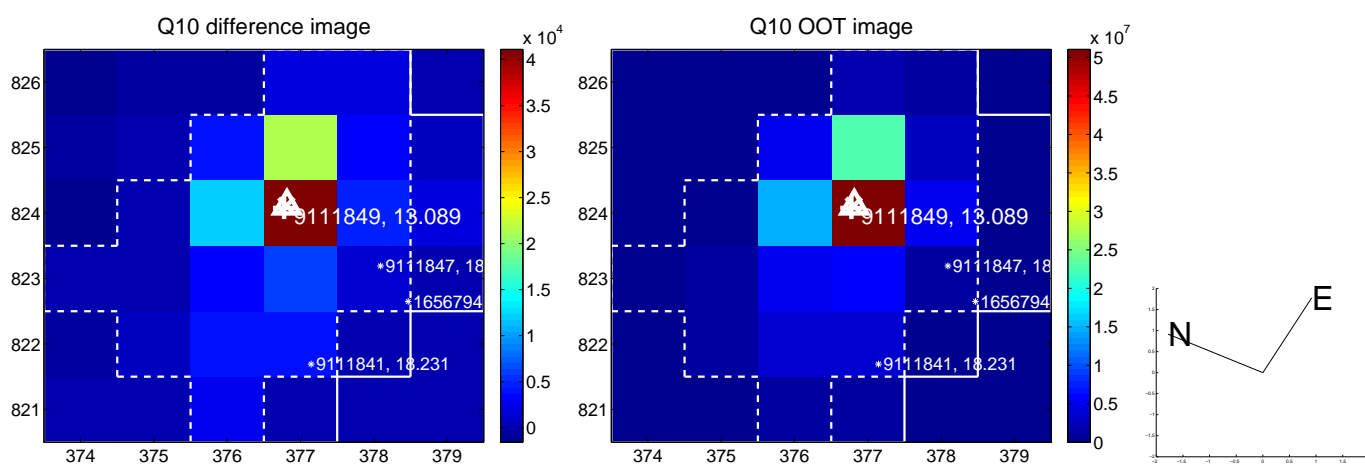
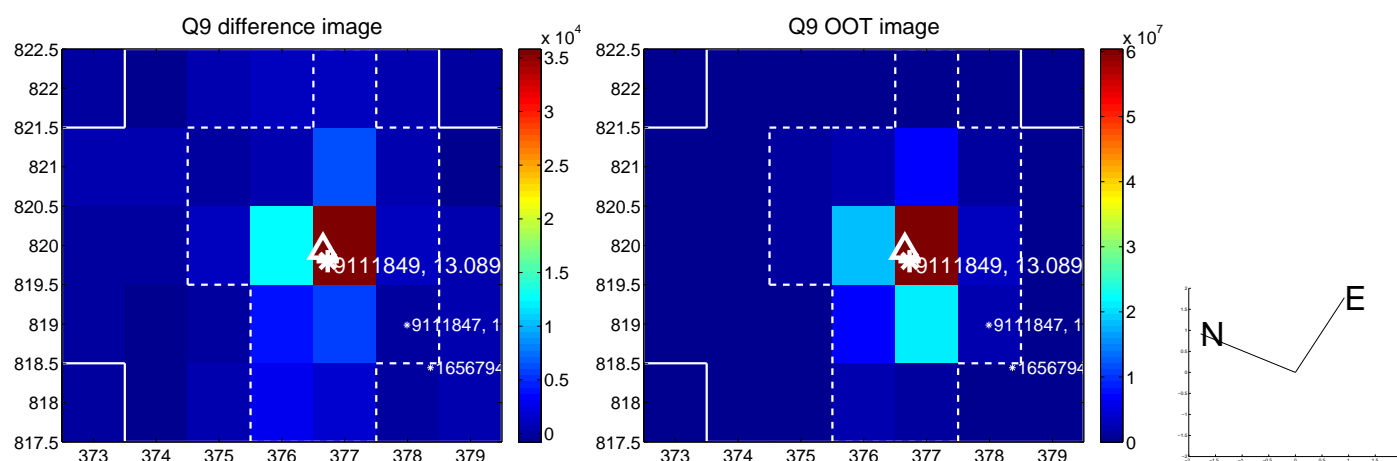


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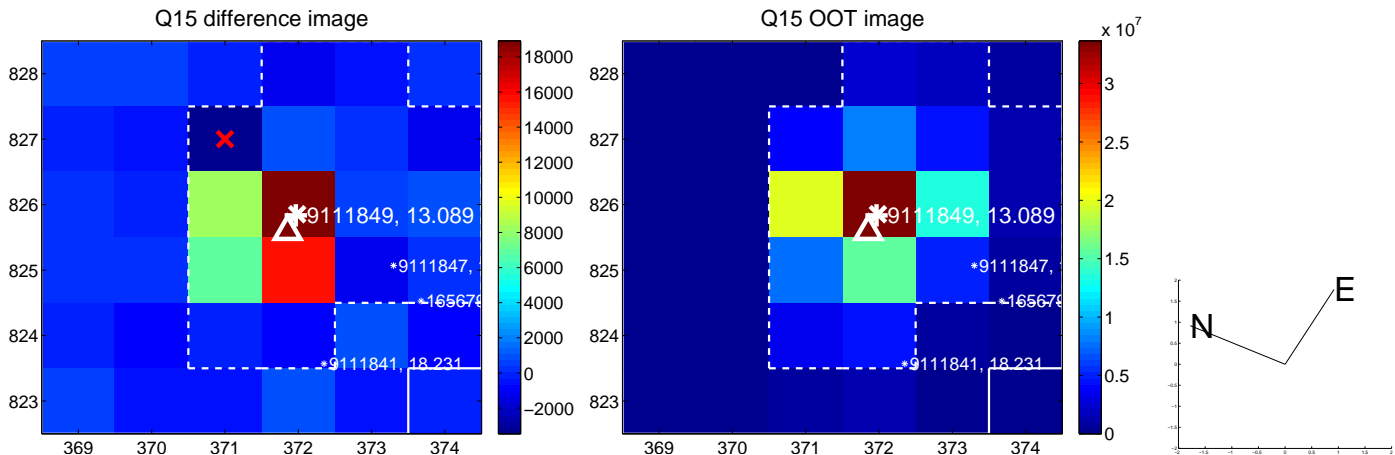
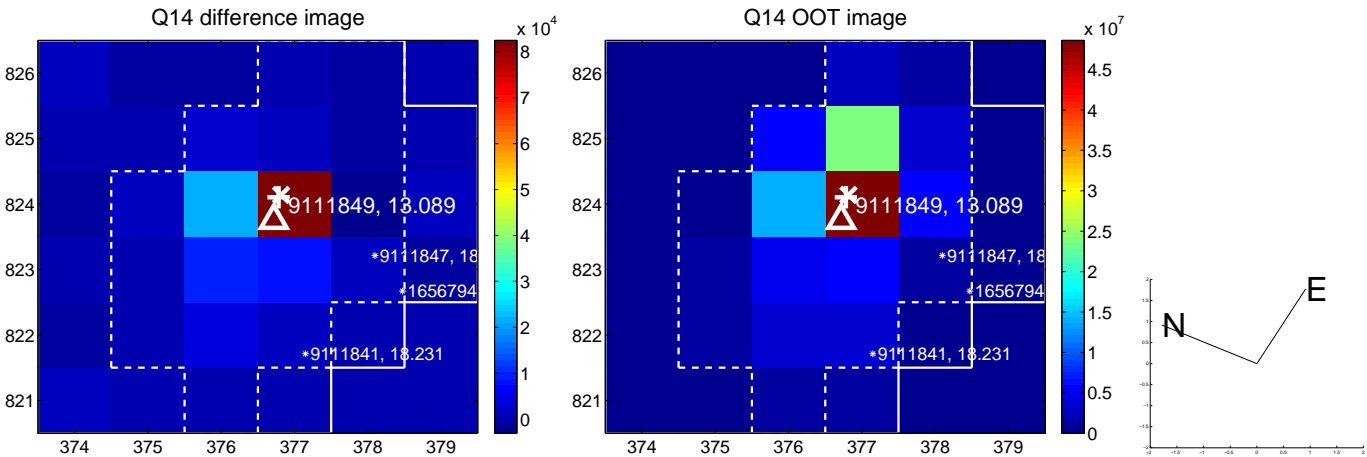
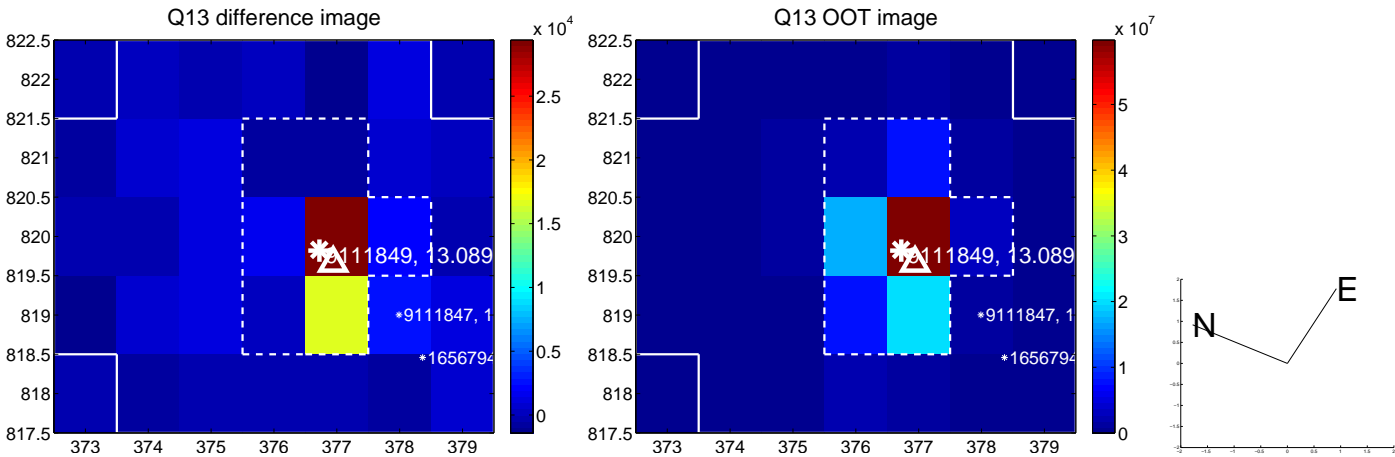




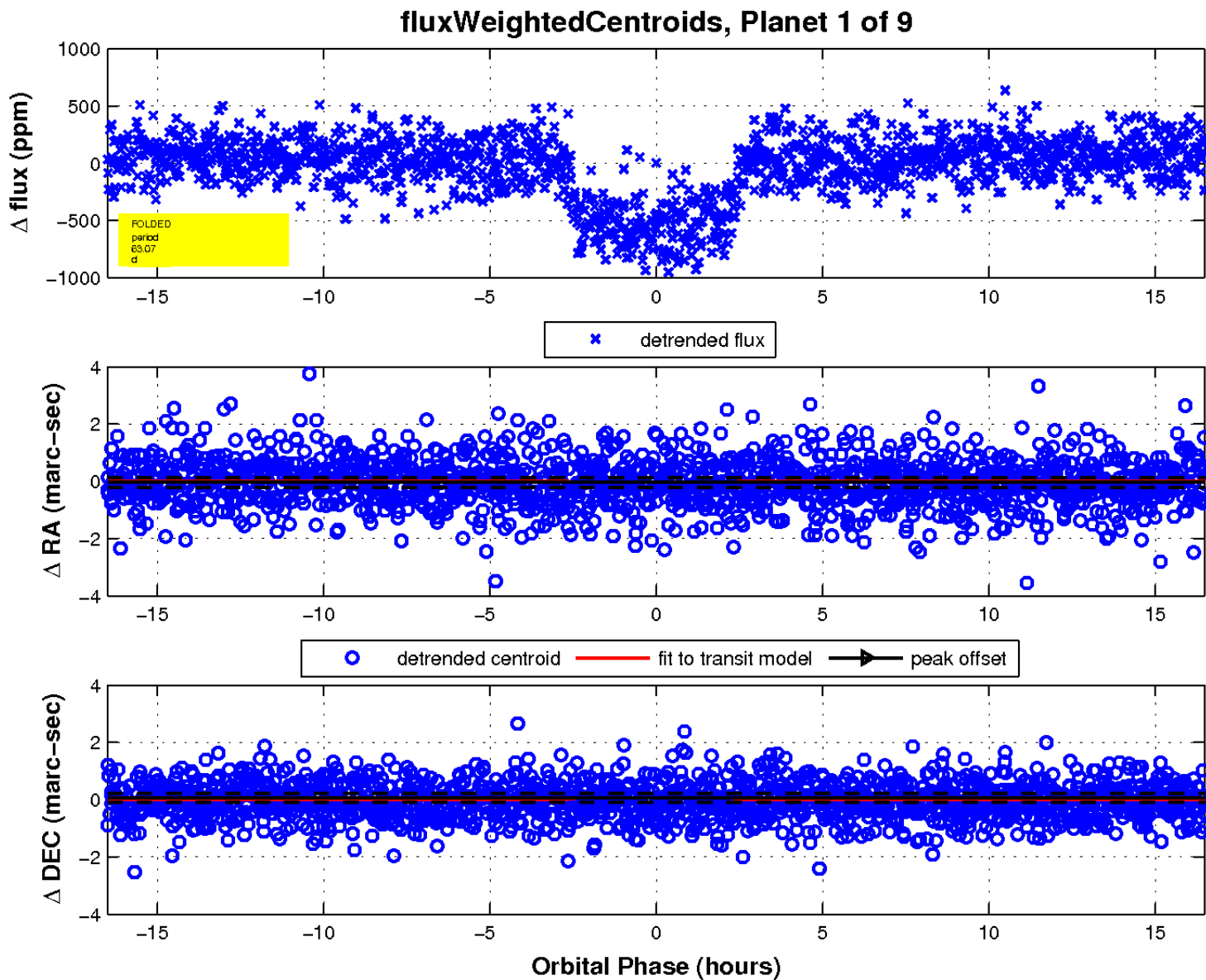
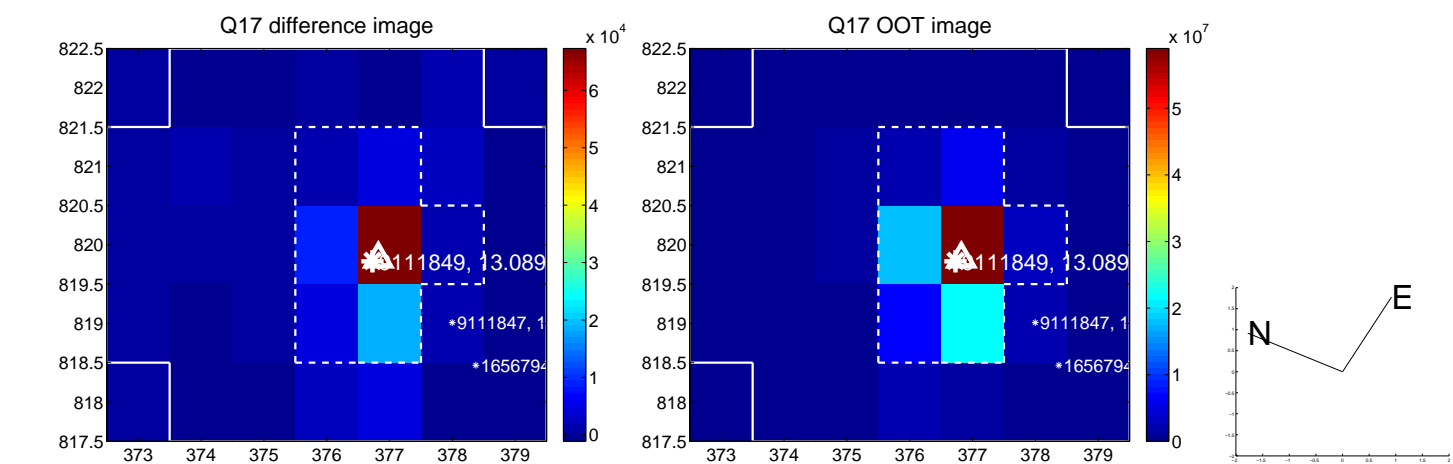
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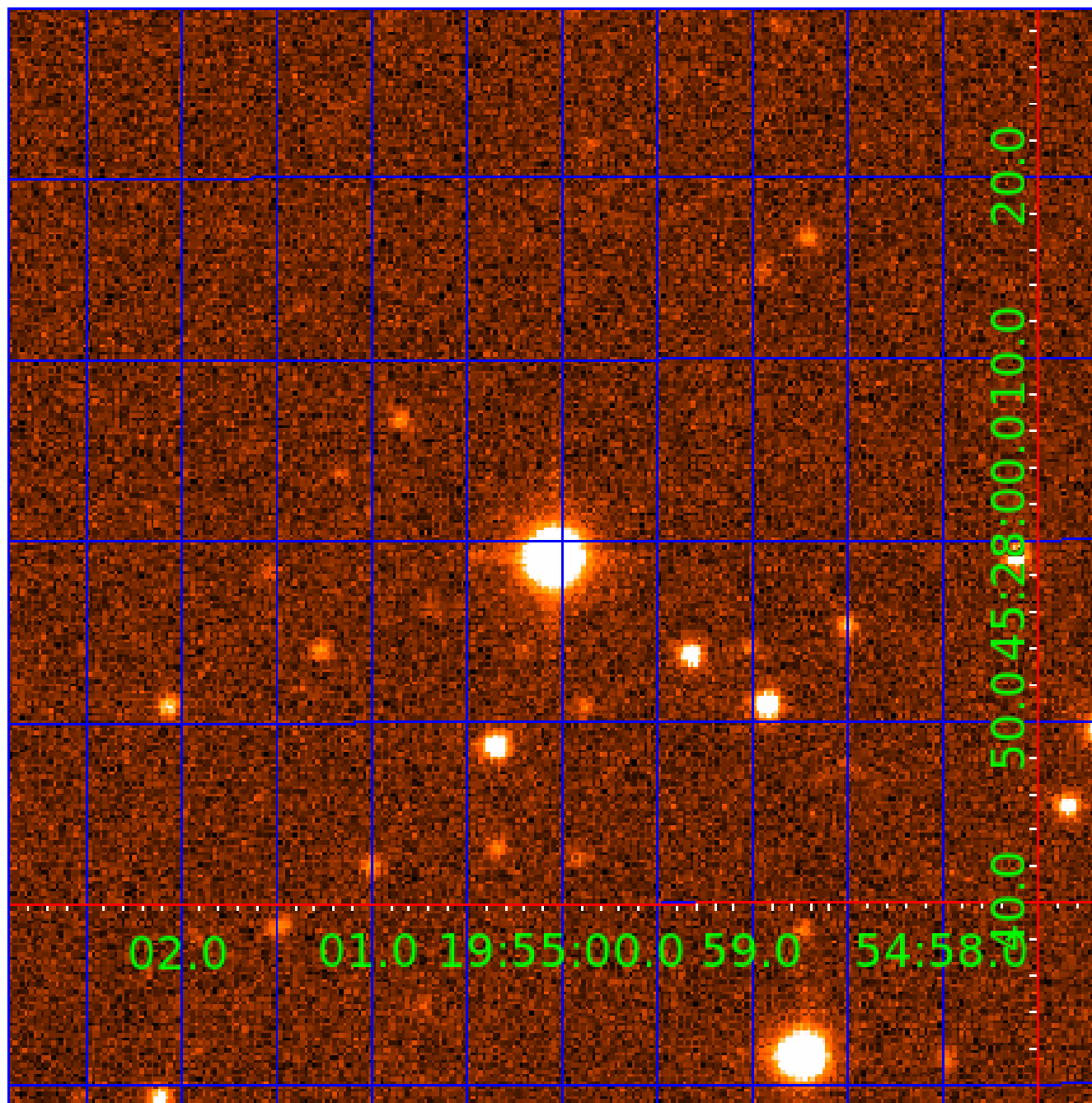


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UKIRT Image

Declination





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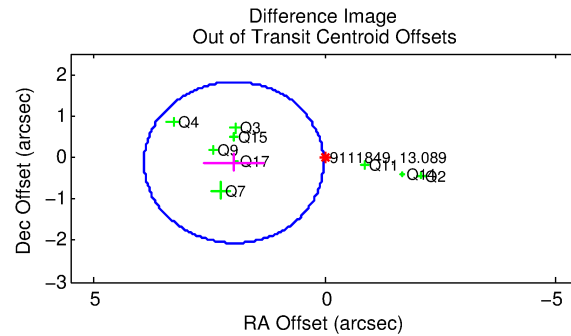
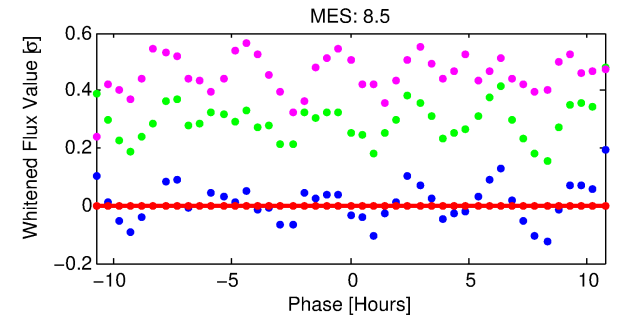
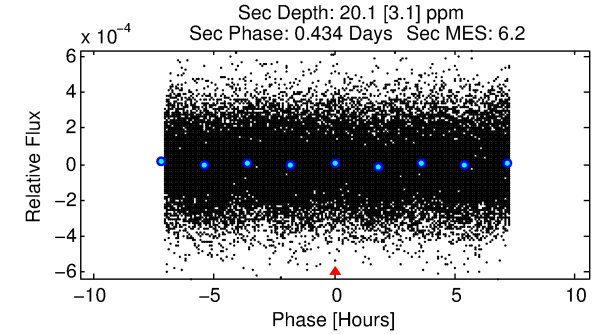
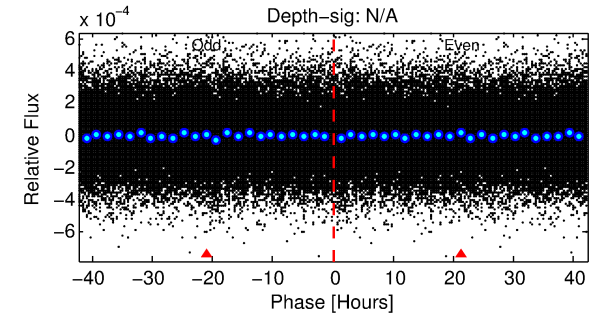
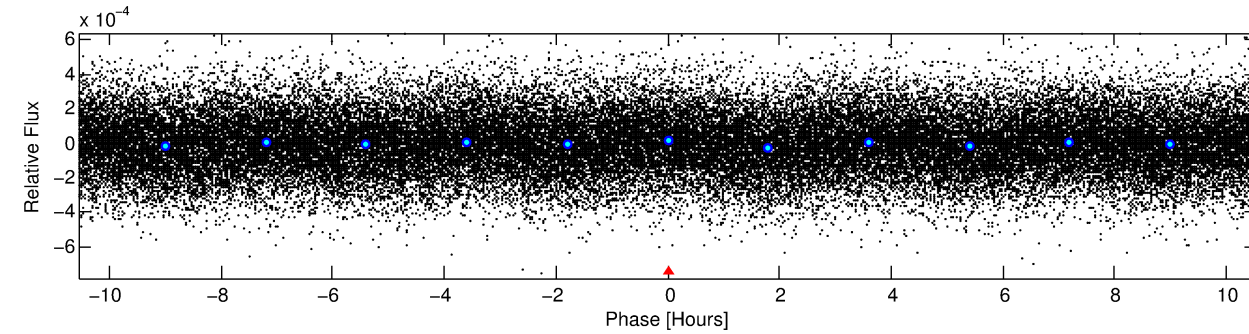
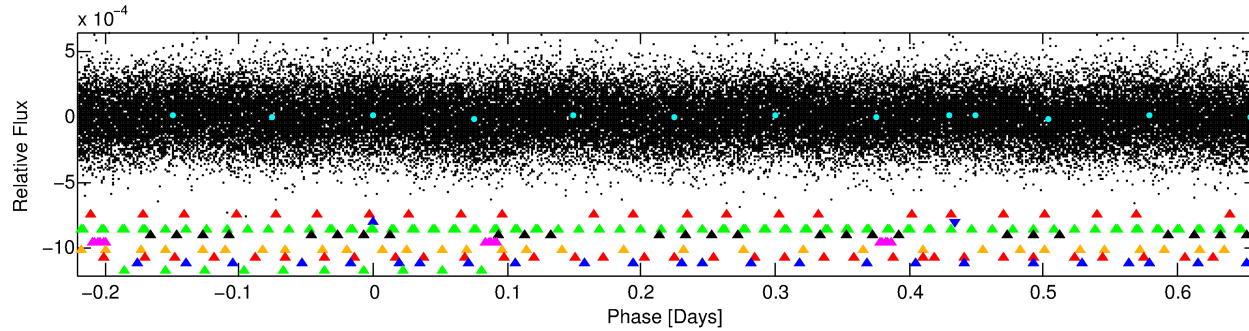
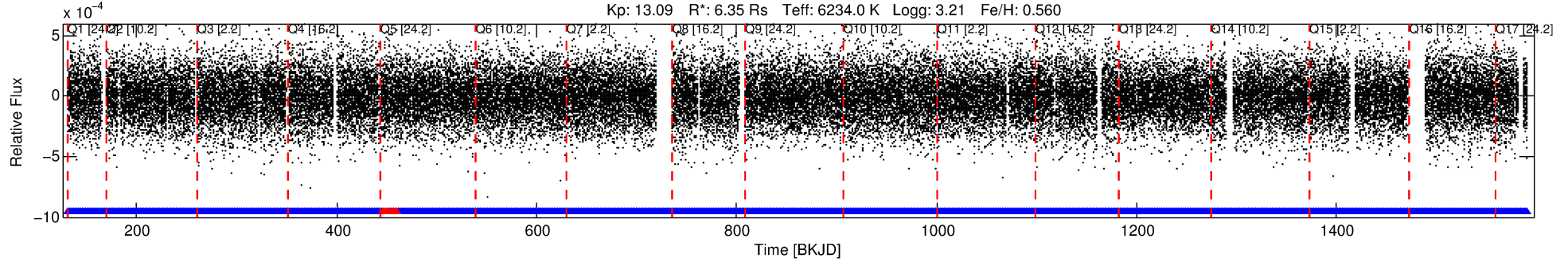
Ephemeris Match Information For 009111849-02

No Significant Match Found

# DV One-Page Summary

KIC: 9111849 Candidate: 2 of 9 Period: 0.879 d  
KOI: K02042 Corr: No Ephemeris Match

Kp: 13.09 R\*: 6.35 Rs Teff: 6234.0 K Logg: 3.21 Fe/H: 0.560



## TPS TCE Results:

Period = 0.87931 d  
Epoch = 131.6360 BKJD

DV fit results are unavailable

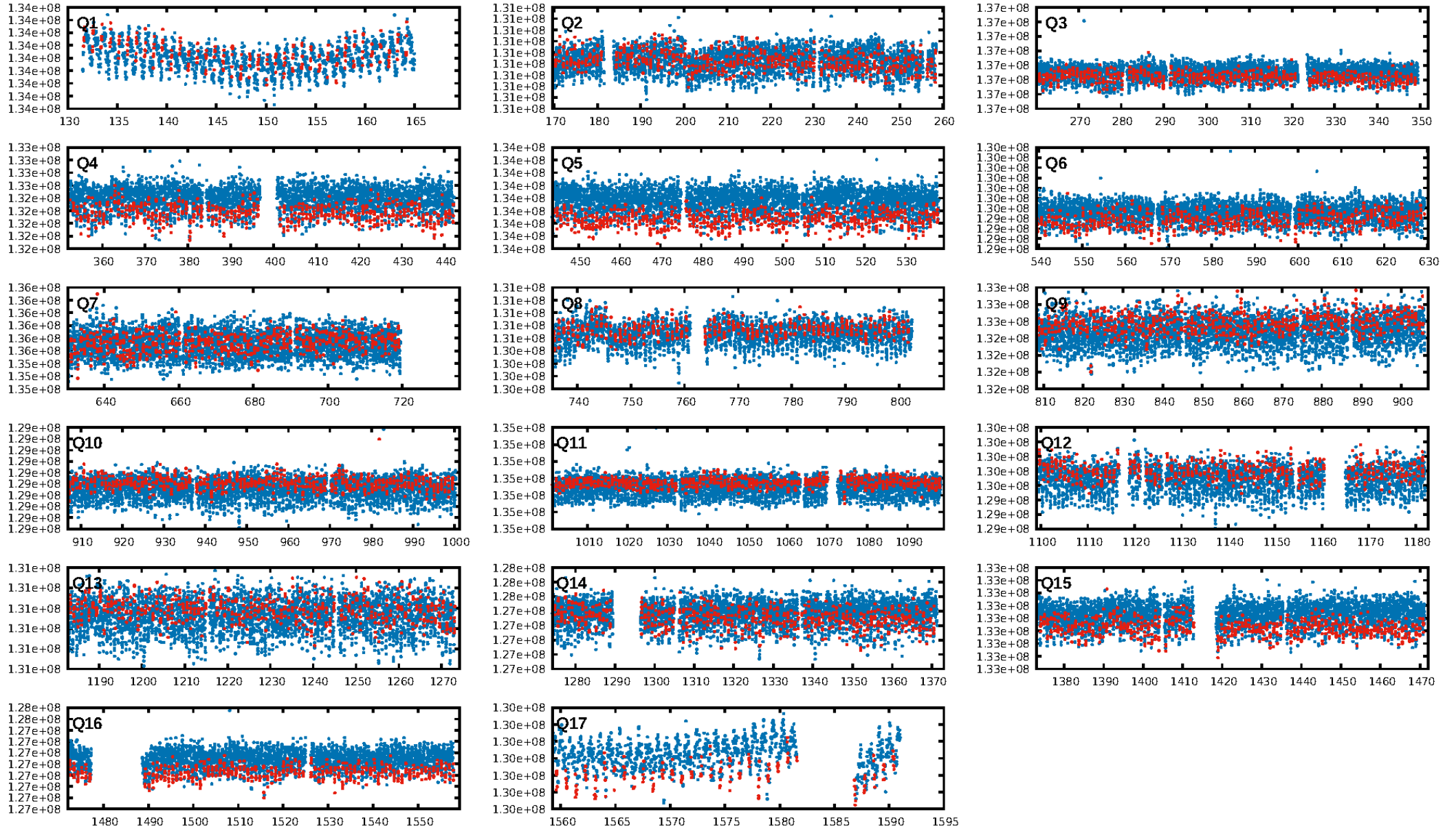
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 83.8% [1.40σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [1451/1461]  
GhostDiagnostic-chr: 1.424  
Centroid-sig: 27.8%  
Centroid-so: 0.315 arcsec [2.22σ]  
OotOffset-rm: 1.965 arcsec [3.04σ]  
OotOffset-st: 2/4/1/2 [9]  
KicOffset-rm: 1.936 arcsec [2.96σ]  
KicOffset-st: 2/4/1/2 [9]  
DiffImageQuality-fgm: 0.67 [6/9]  
DiffImageOverlap-fno: 0.94 [16/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:44:36 Z

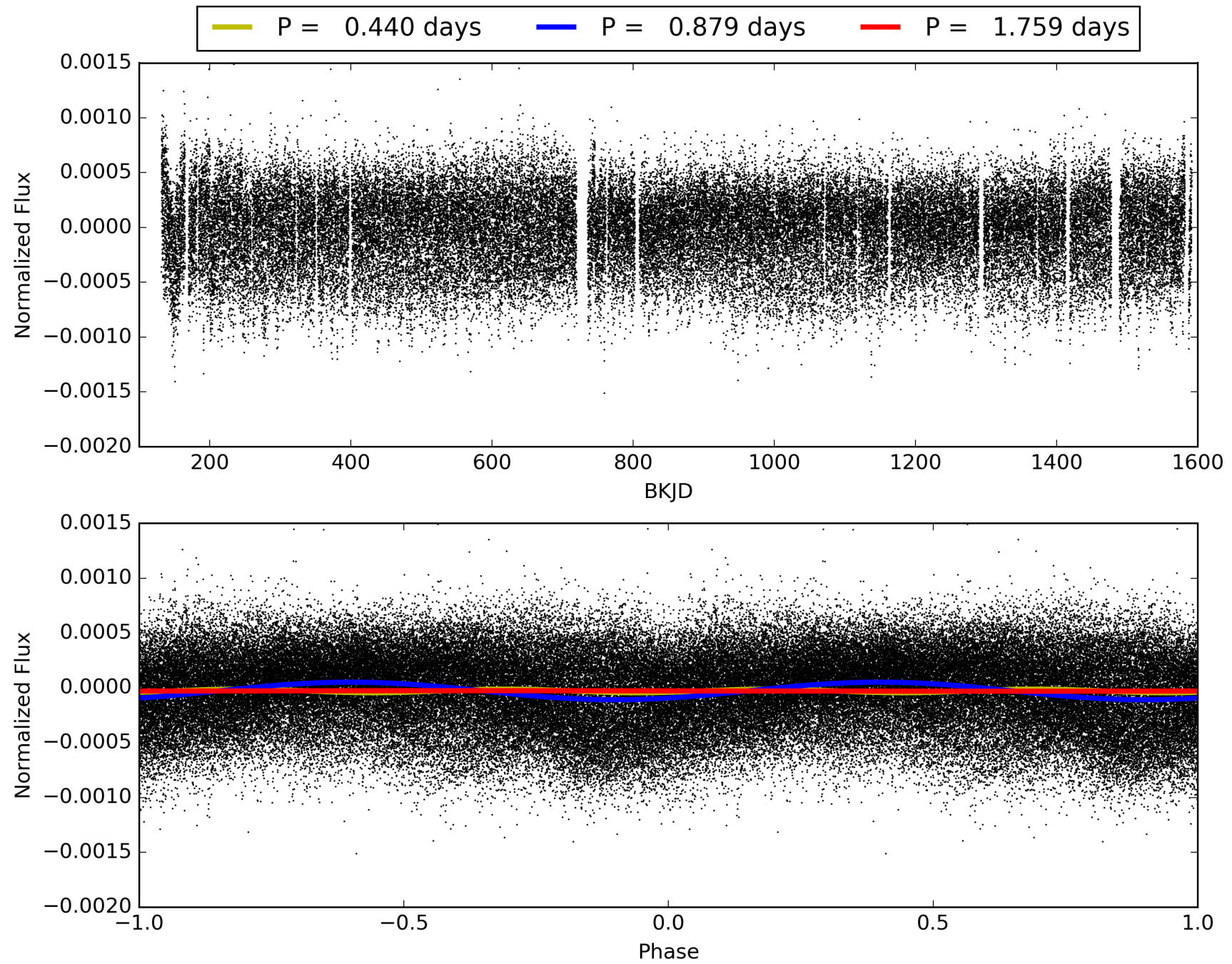
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009111849-02, PDC Light Curves



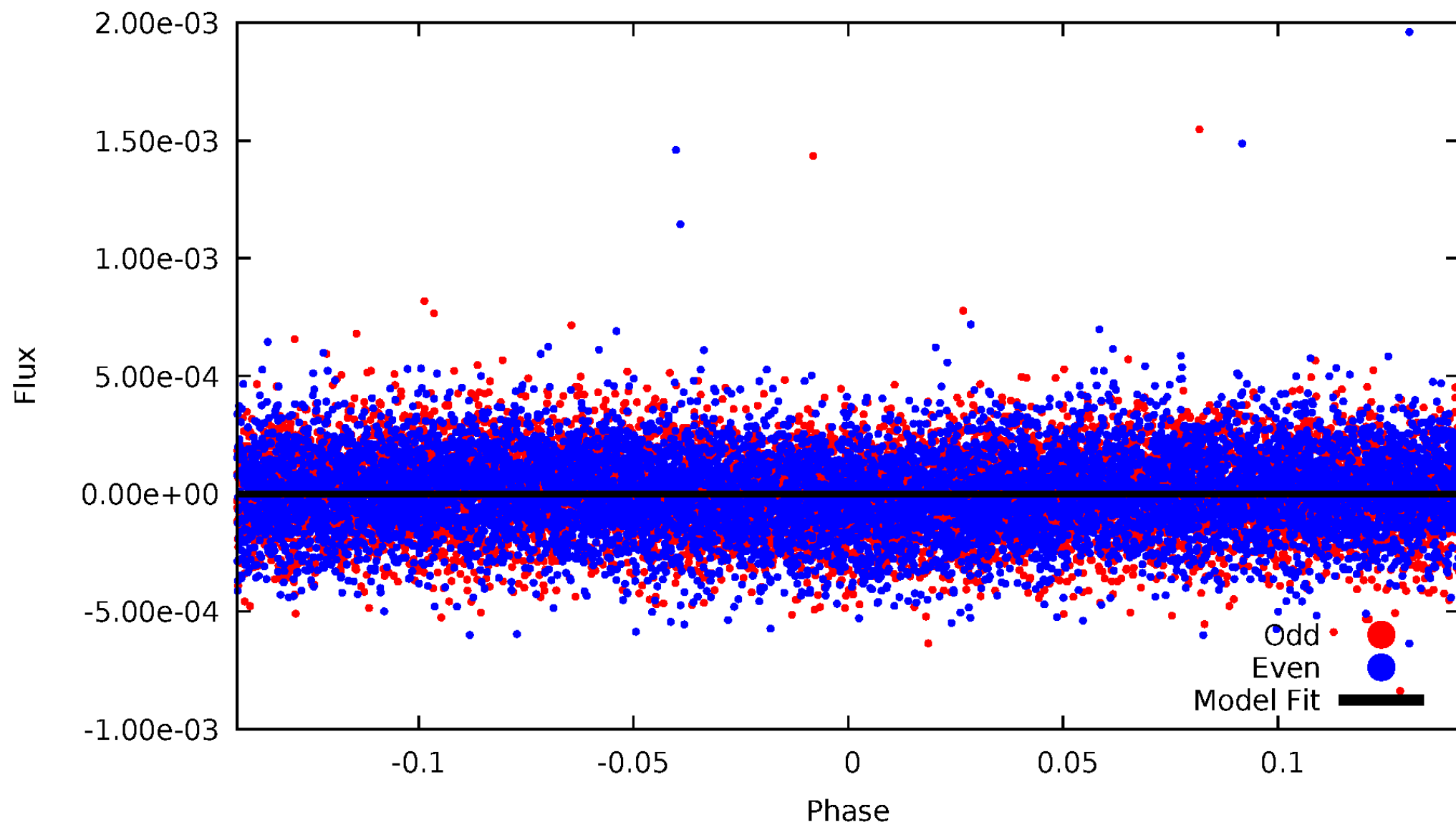


TCE 009111849-02



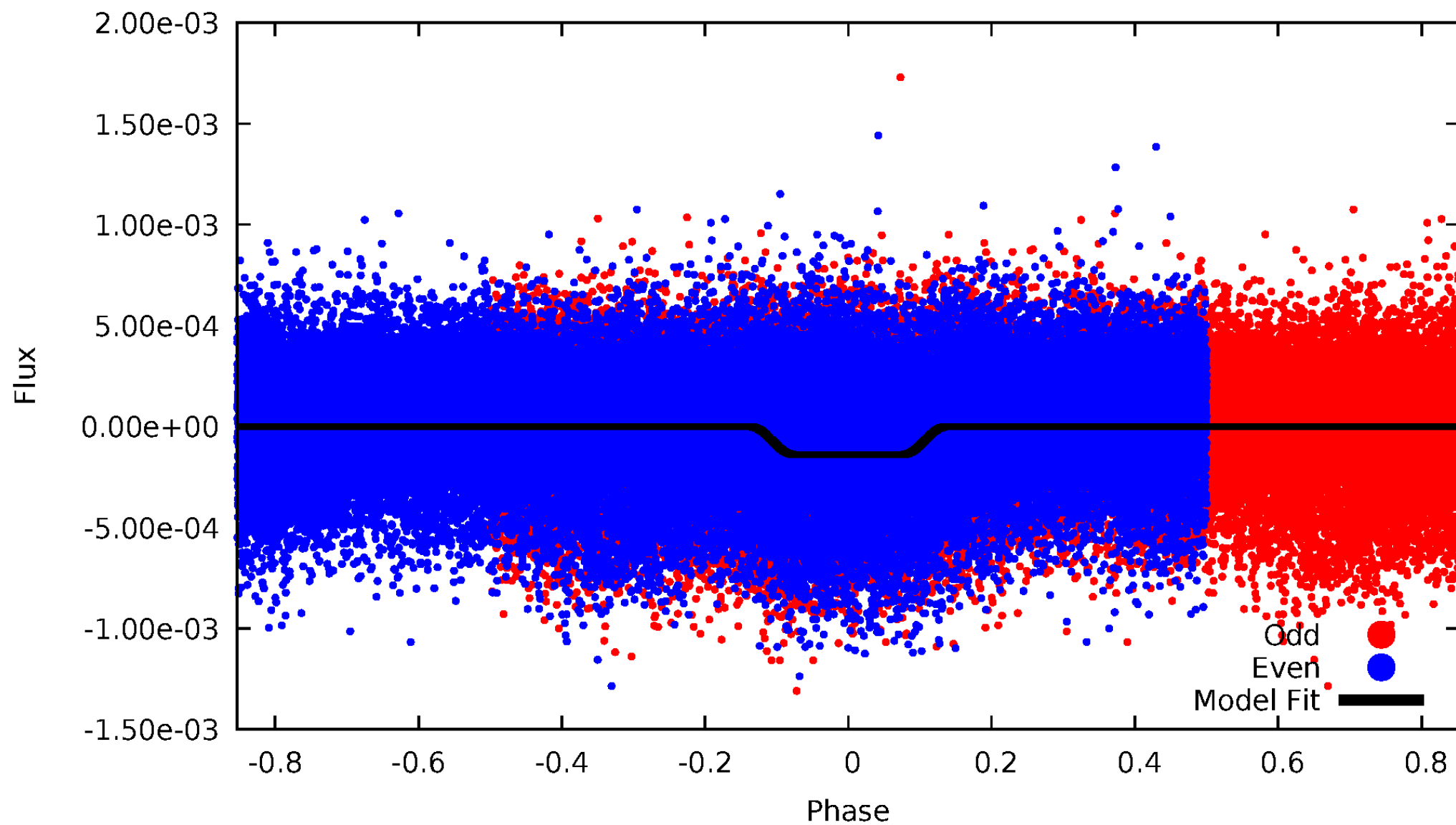
# DV Odd/Even

TCE 009111849-02



# ALT Odd/Even

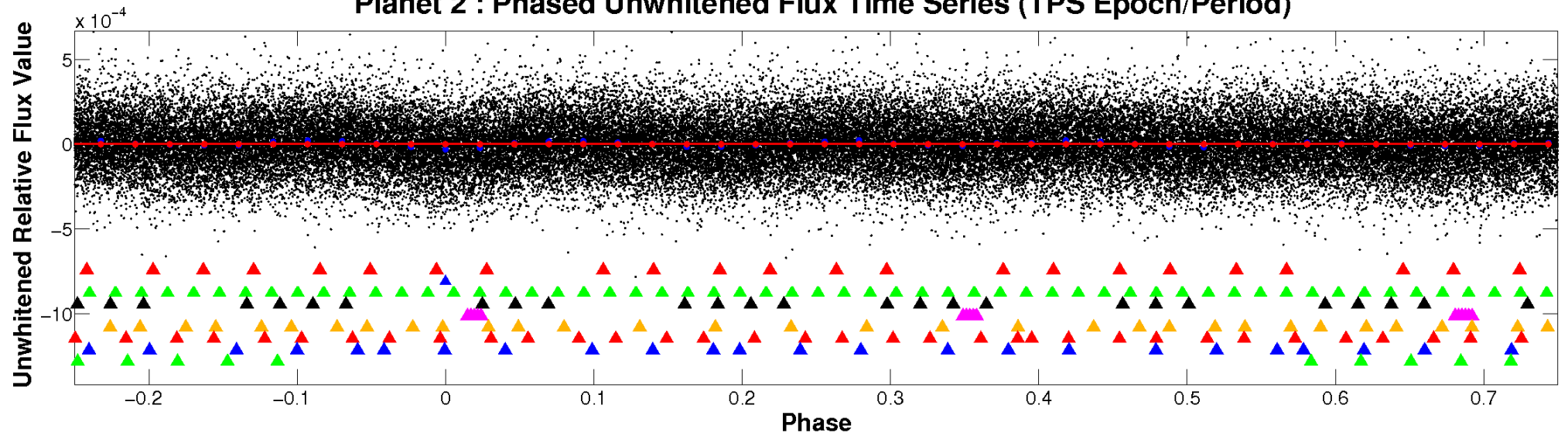
TCE 009111849-02



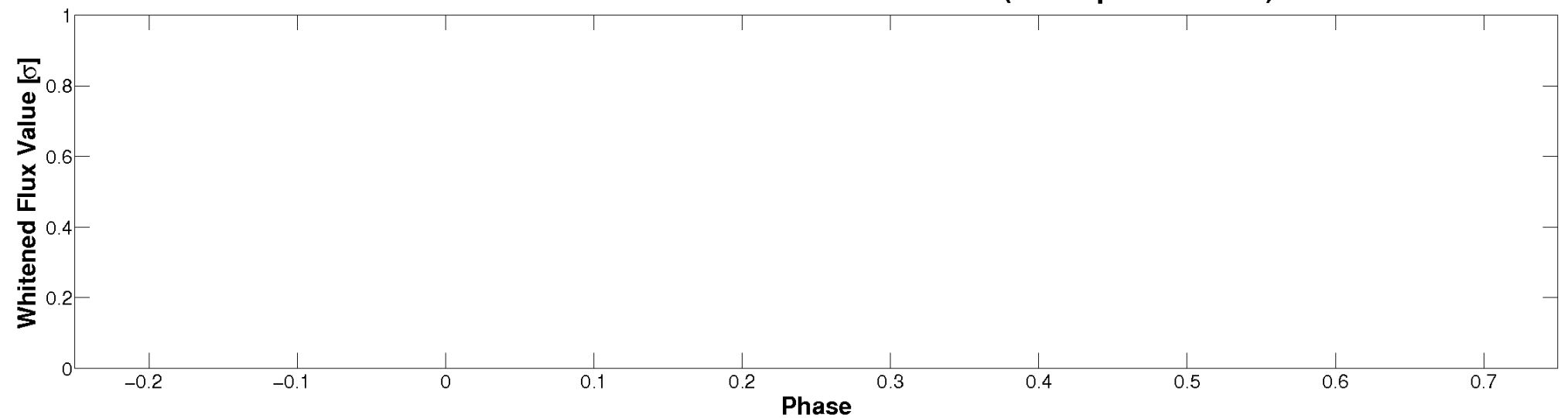


# Non-Whitened Vs. Whitened Light Curve

**Planet 2 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

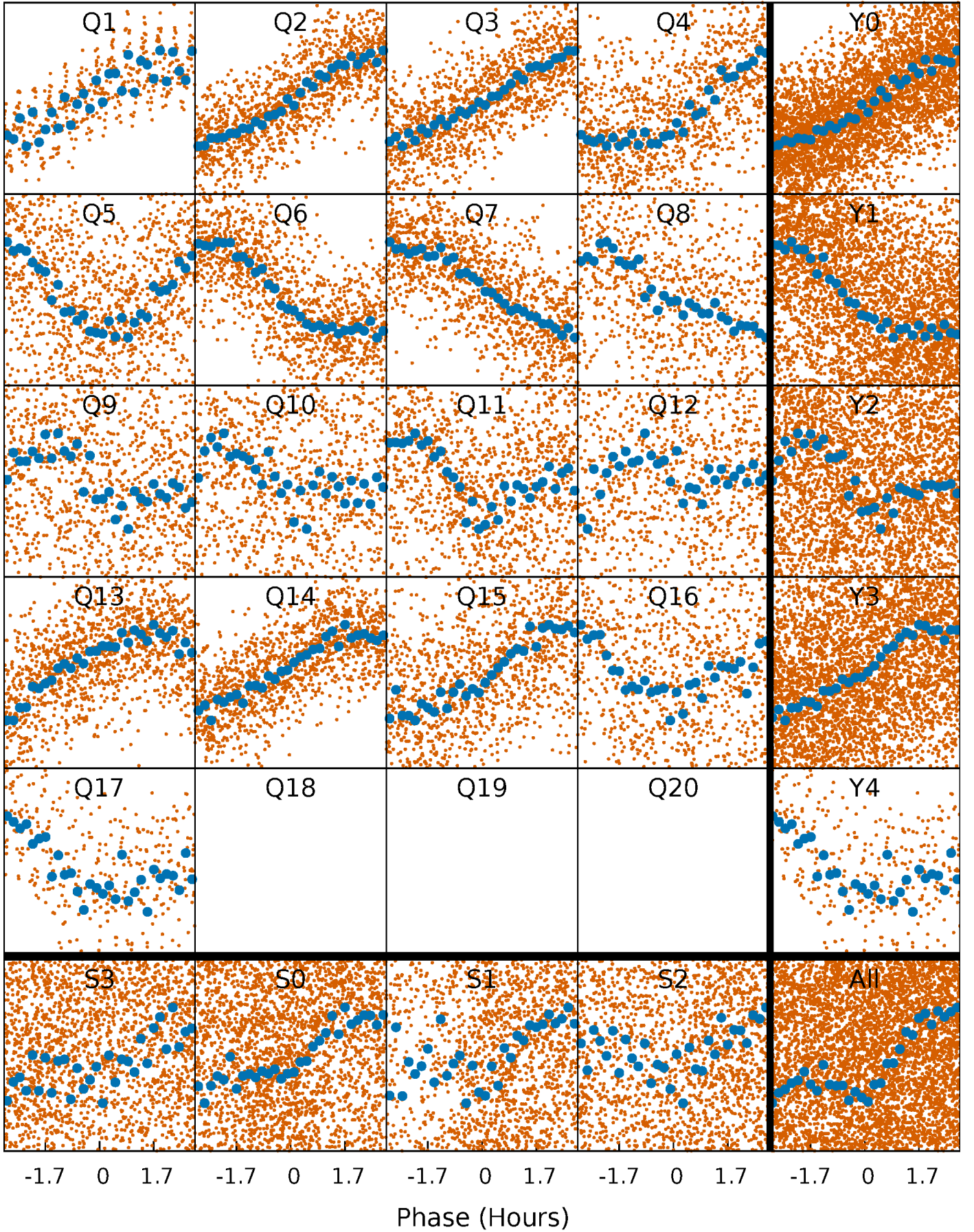


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



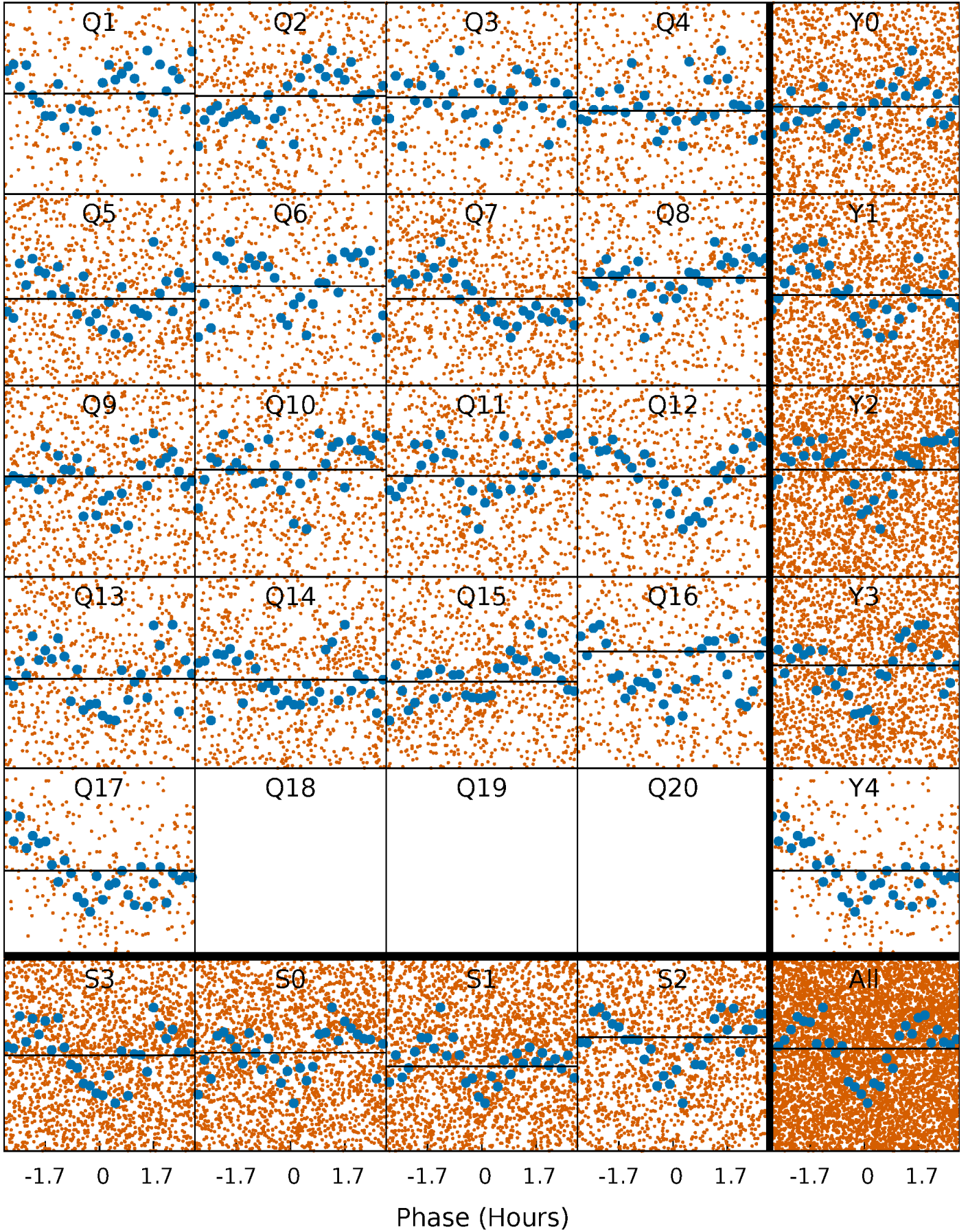
# PDC Quarter-Phased Transit Curves

TCE 009111849-02   P= 0.879308 Days    $T_0=131.635994$  (BKJD)



# DV Quarter-Phased Transit Curves

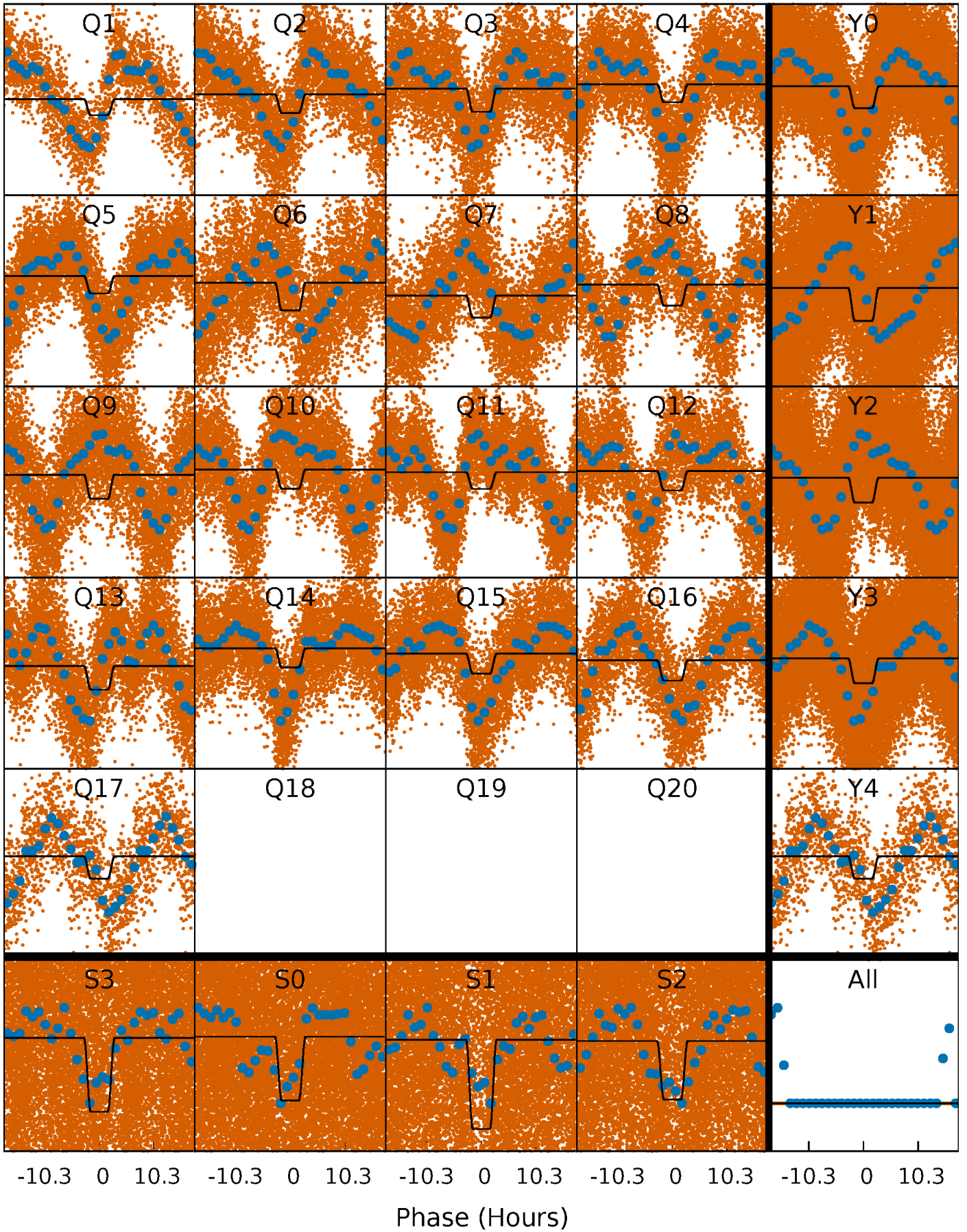
TCE 009111849-02   P= 0.879308 Days    $T_0=131.635994$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

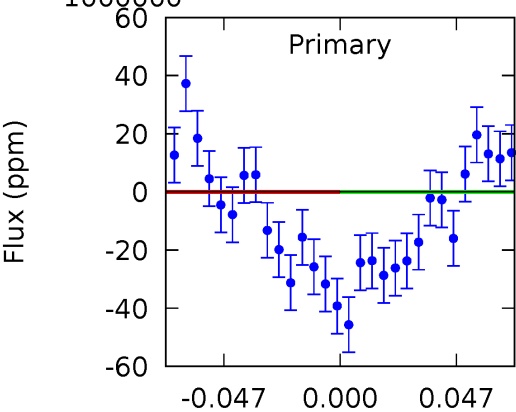
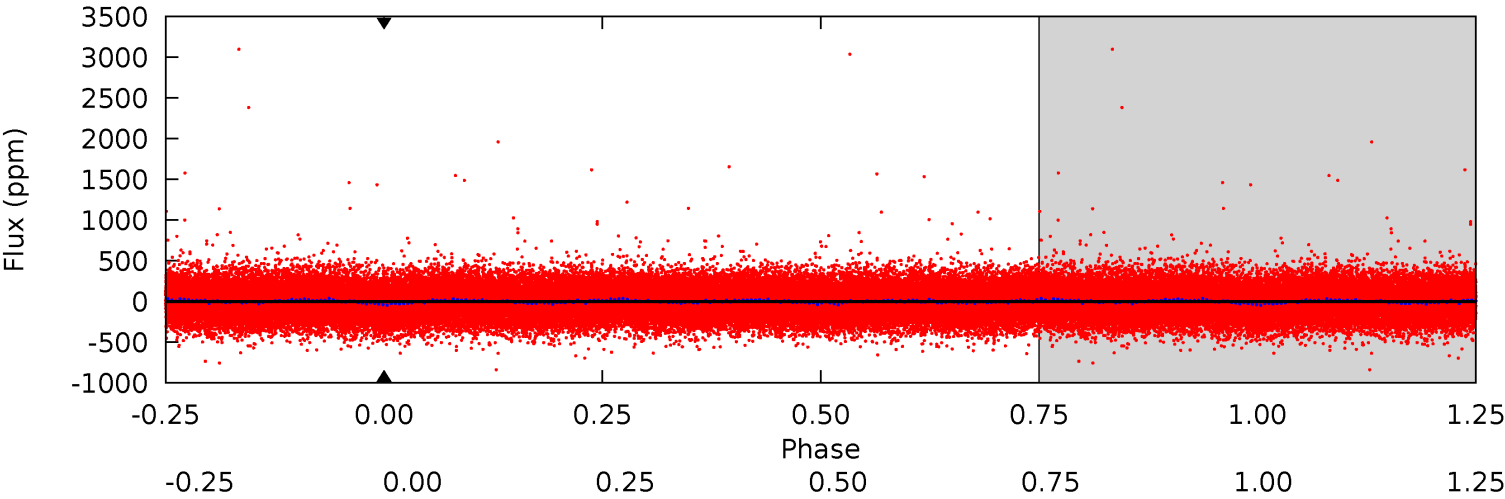
TCE 009111849-02   P= 0.879308 Days    $T_0=131.564724$  (BKJD)



# DV Model-Shift Uniqueness Test

009111849-02, P = 0.879308 Days, E = 130.756686 Days

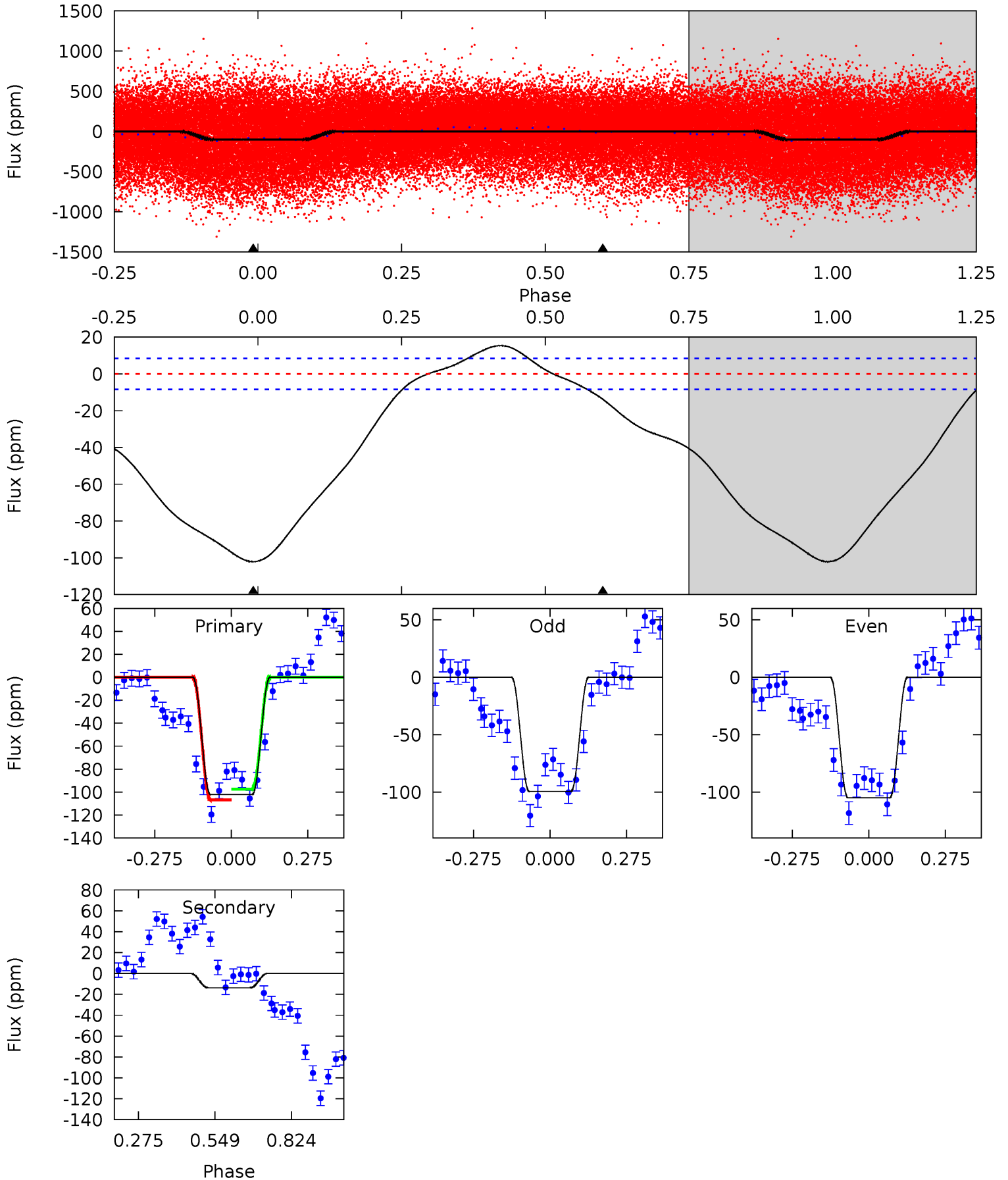
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

009111849-02, P = 0.879308 Days, E = 130.685416 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
52.8	7.11	0	0	4.35	1.09	2.20	52.8	52.8	7.11	7.11	1.45	0.81	0.13	1.99



### Stellar Parameters For KIC 009111849

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6234^{+74}_{-74}$	$3.209^{+0.458}_{-0.122}$	$0.560^{+0.050}_{-0.100}$	$6.354^{+1.590}_{-3.180}$	$2.382^{+0.277}_{-0.514}$	$0.013^{+0.056}_{-0.005}$
	+1%/-1%	+14%/-4%	+9%/-18%	+25%/-50%	+12%/-22%	+431%/-35%
Source	SPE90	FLK73	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009111849-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$43.25^{+56.72}_{-30.16}$	$6073^{+445}_{-727}$	$-5879^{+31587}_{-20809}$	$-0.250^{+26.387}_{-32.301}$
Alt.	$-14 \pm 2$	$42.13^{+52.33}_{-28.86}$	$6074^{+422}_{-785}$	$-4991^{+688}_{-340}$	$0.002^{+0.022}_{-0.002}$

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



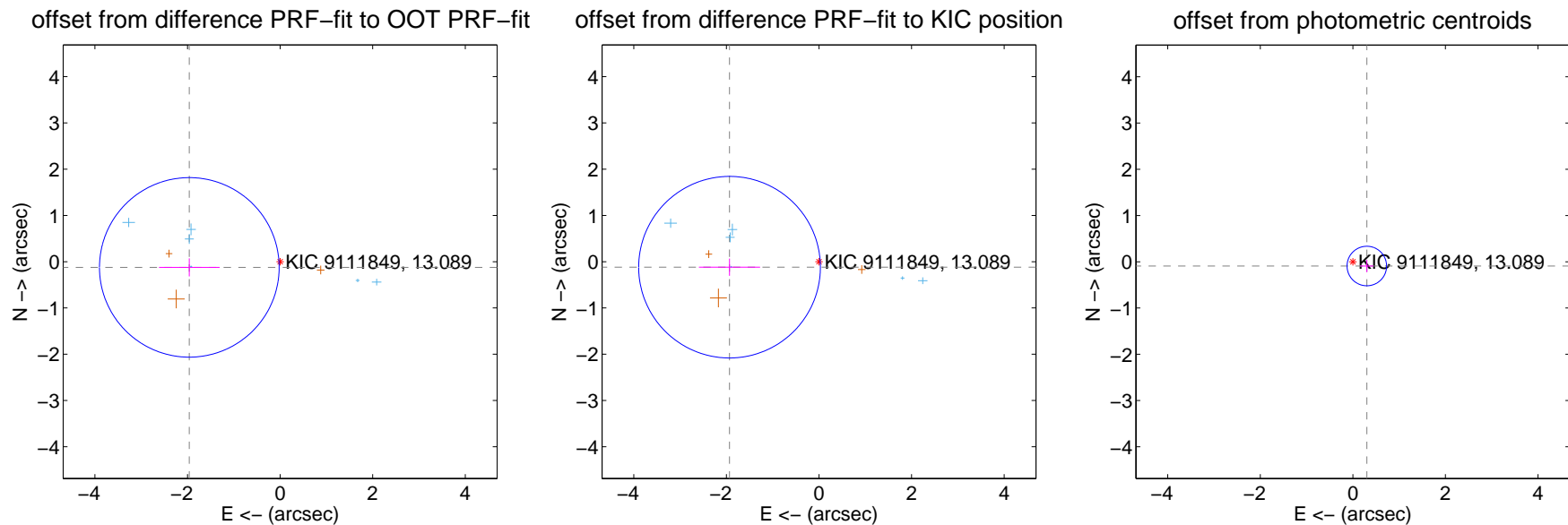
## DV Centroid Data

Supplemental centroid analysis for 009111849-02. Kepler magnitude: 13.09. Transit SNR -1.00

There are 6 quarters with good PRF difference image offsets

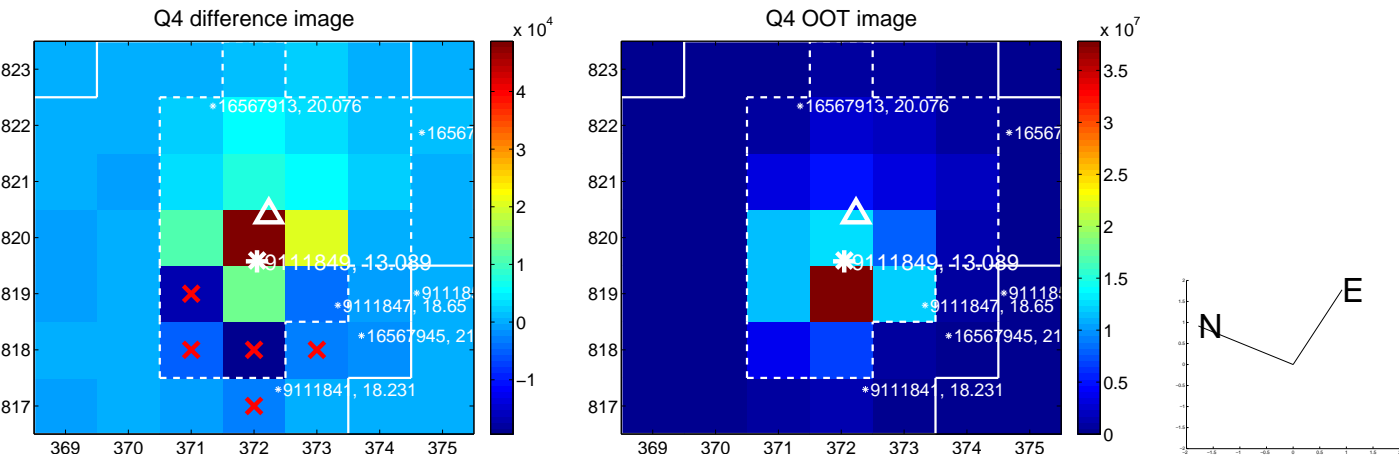
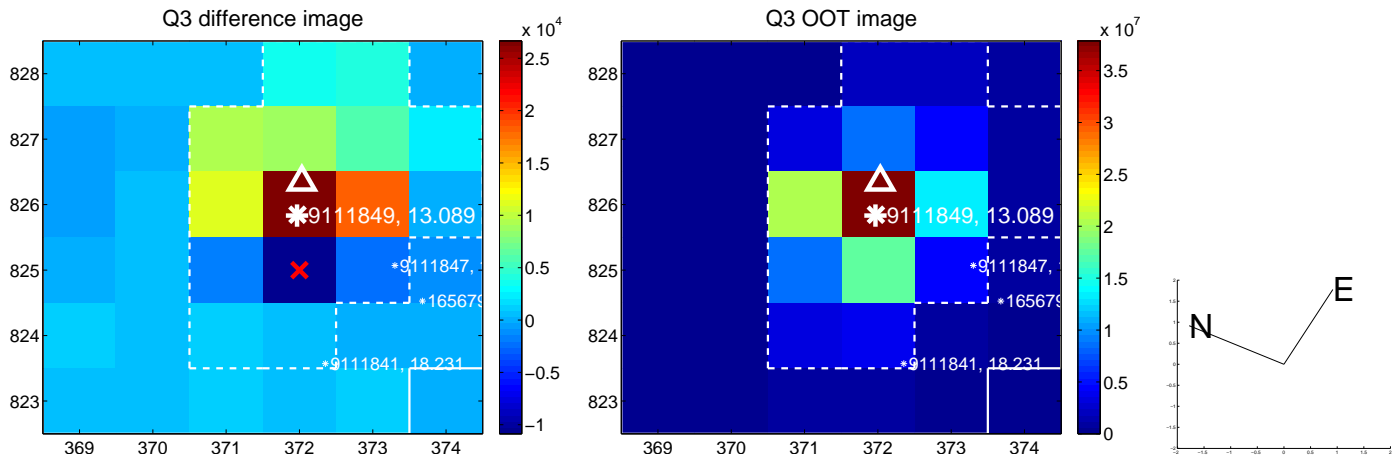
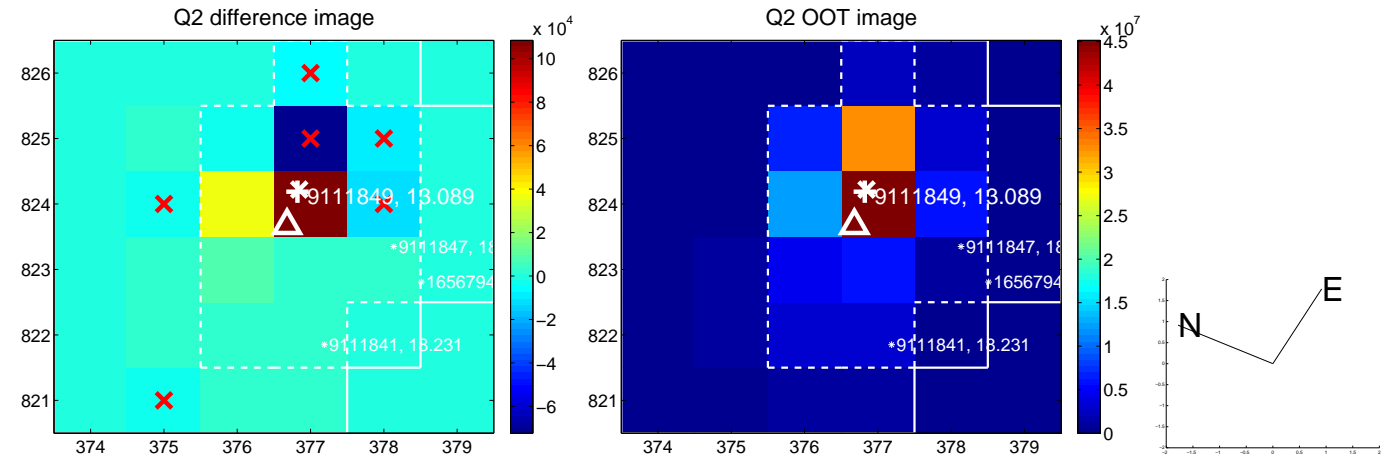
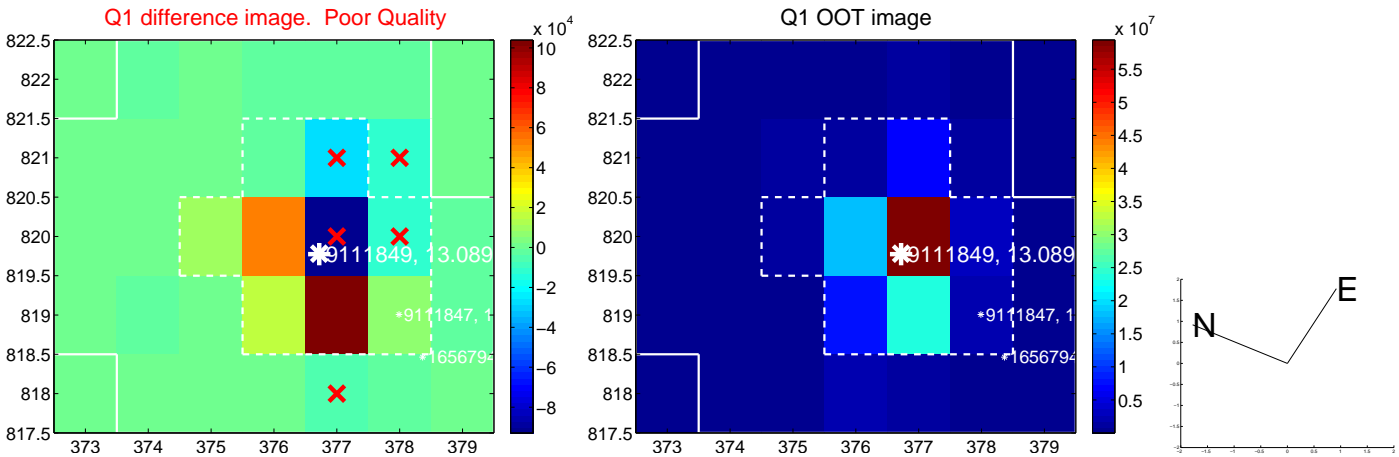
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.965 \pm 0.647$	3.04	$1.961 \pm 0.655$	$-0.123 \pm 0.196$
PRF-fit source offset from KIC position	$1.936 \pm 0.654$	2.96	$1.932 \pm 0.661$	$-0.119 \pm 0.187$
photometric centroid source offset	$0.32 \pm 0.14$	2.22	$-0.30 \pm 0.14$	$-0.09 \pm 0.13$

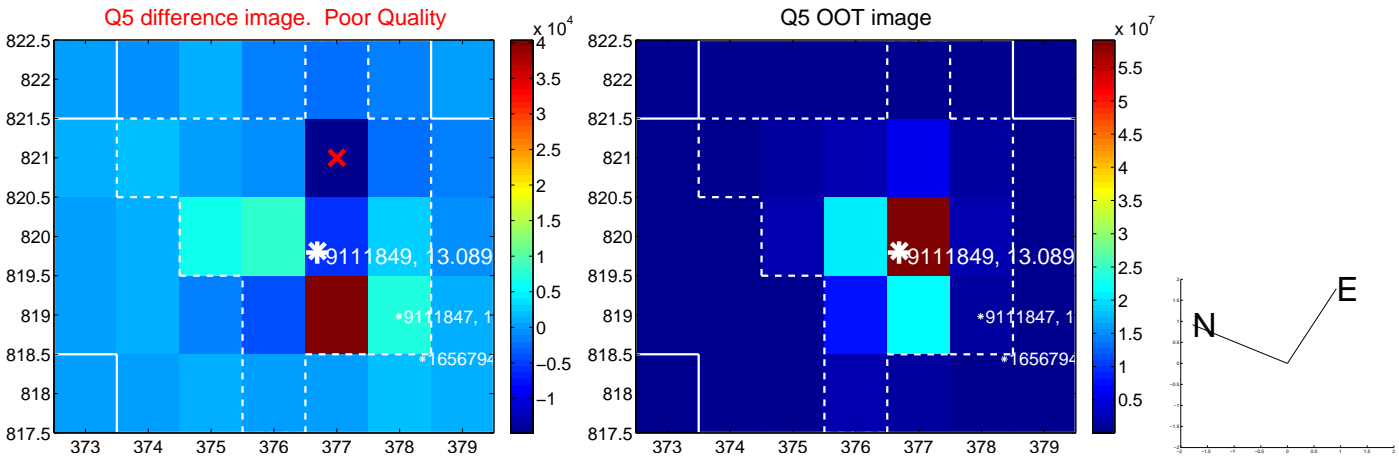


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

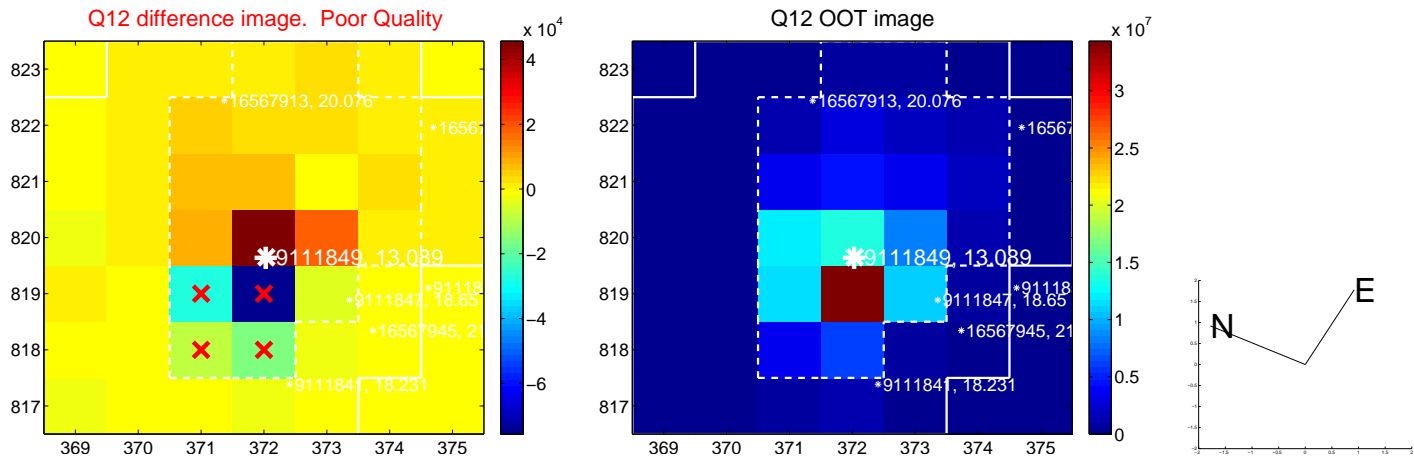
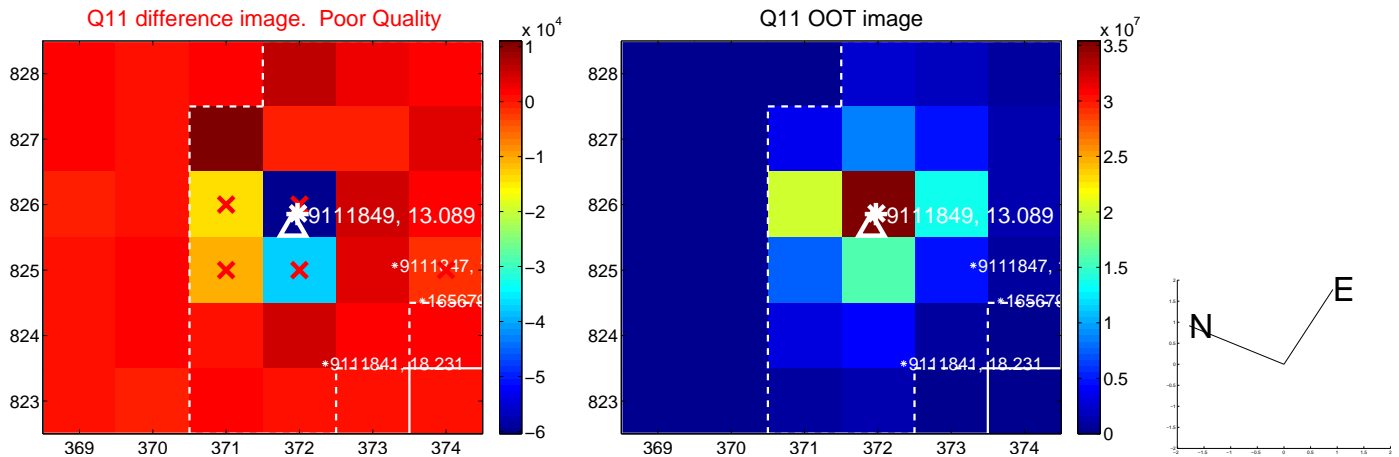
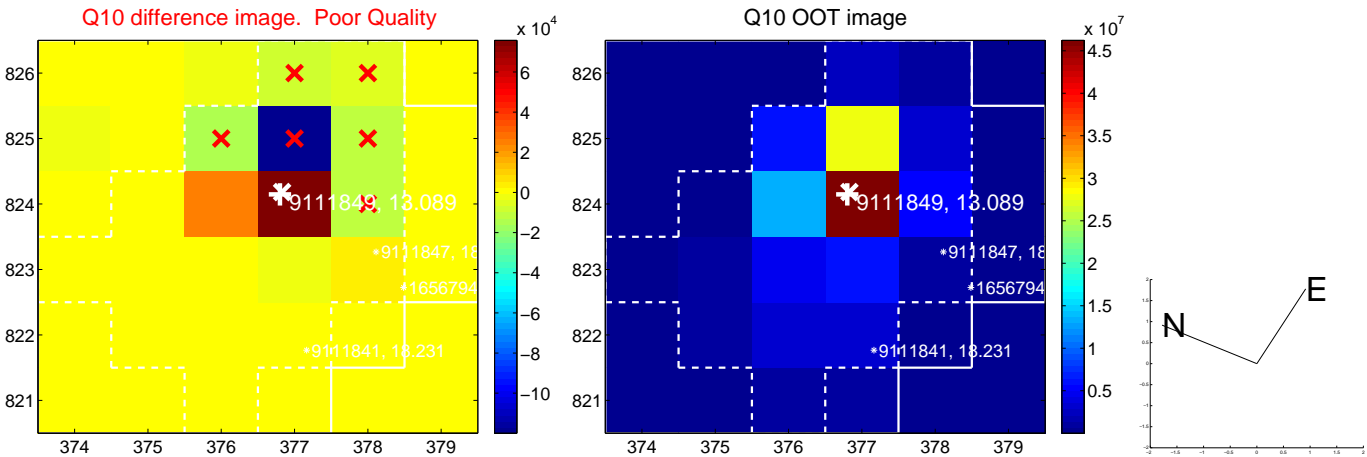
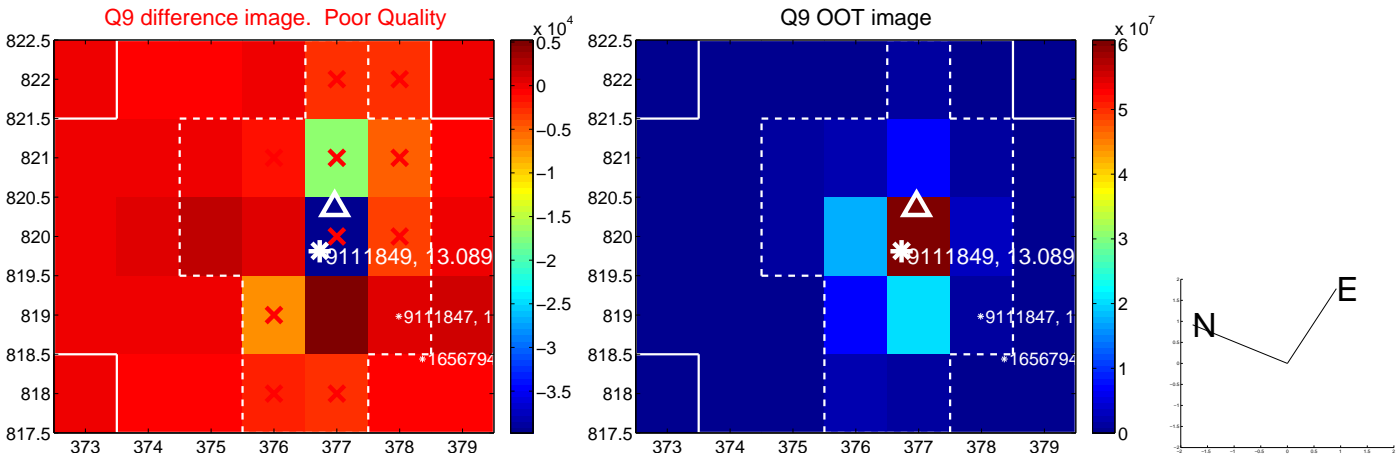
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



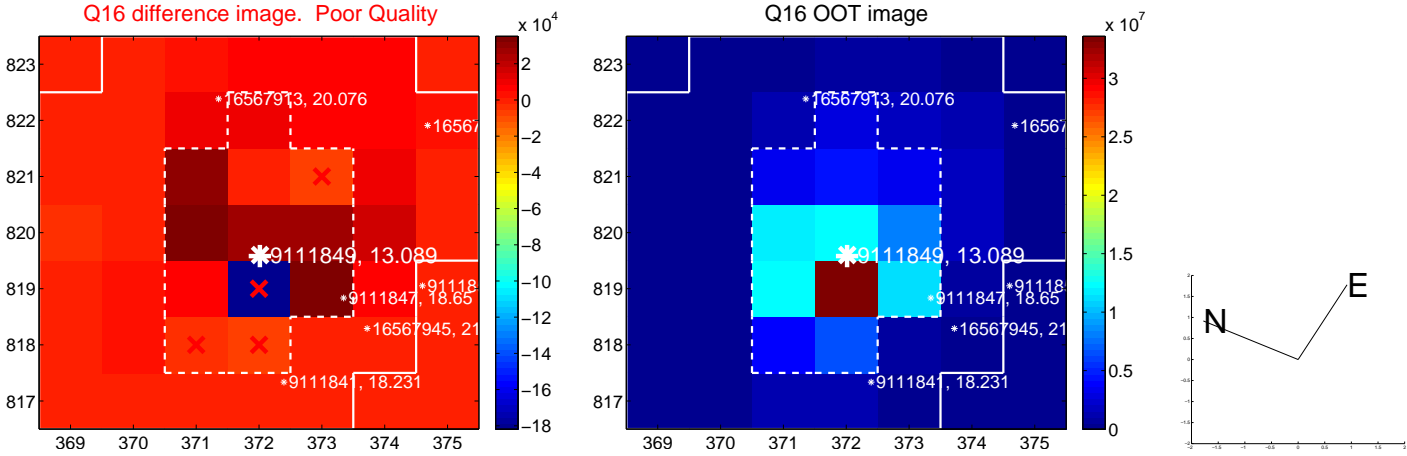
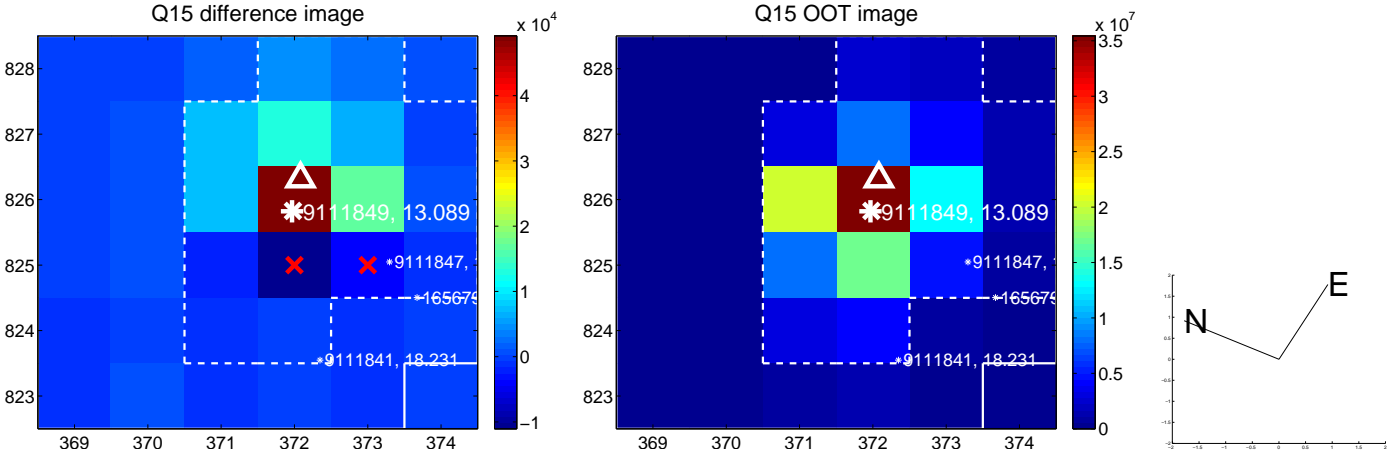
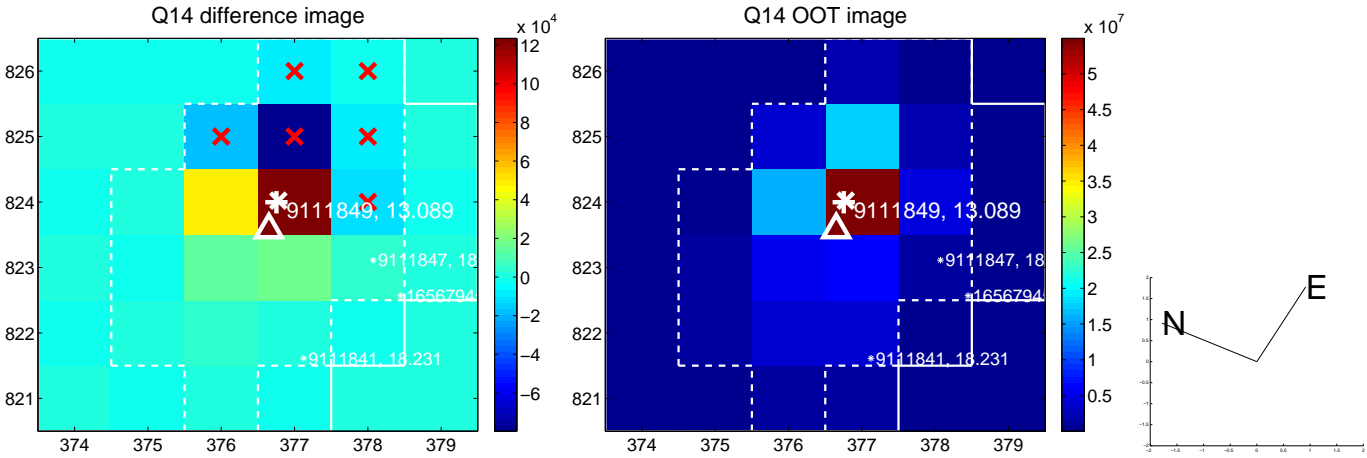
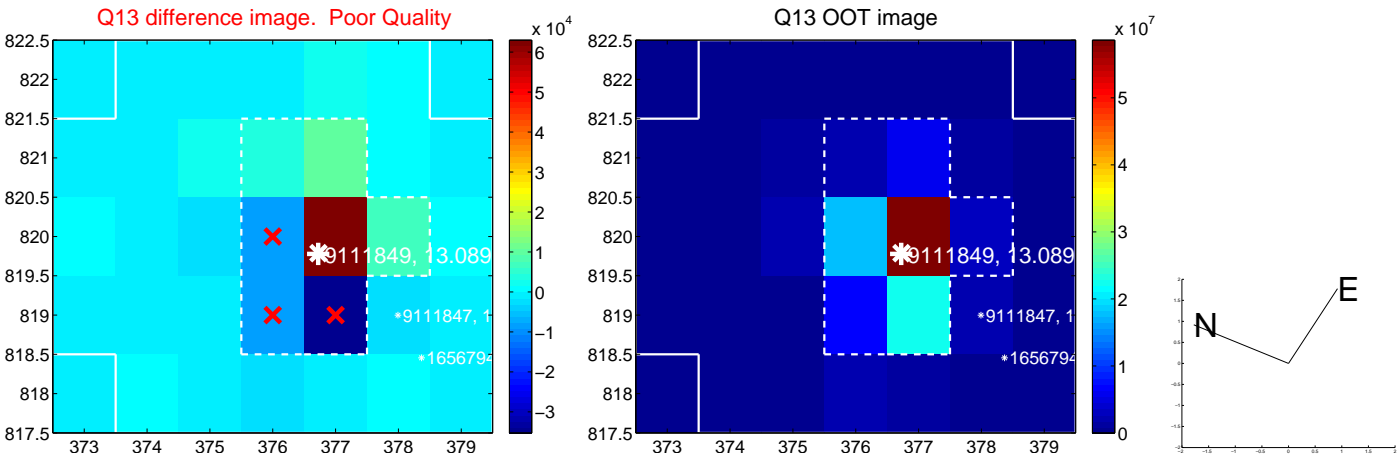
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



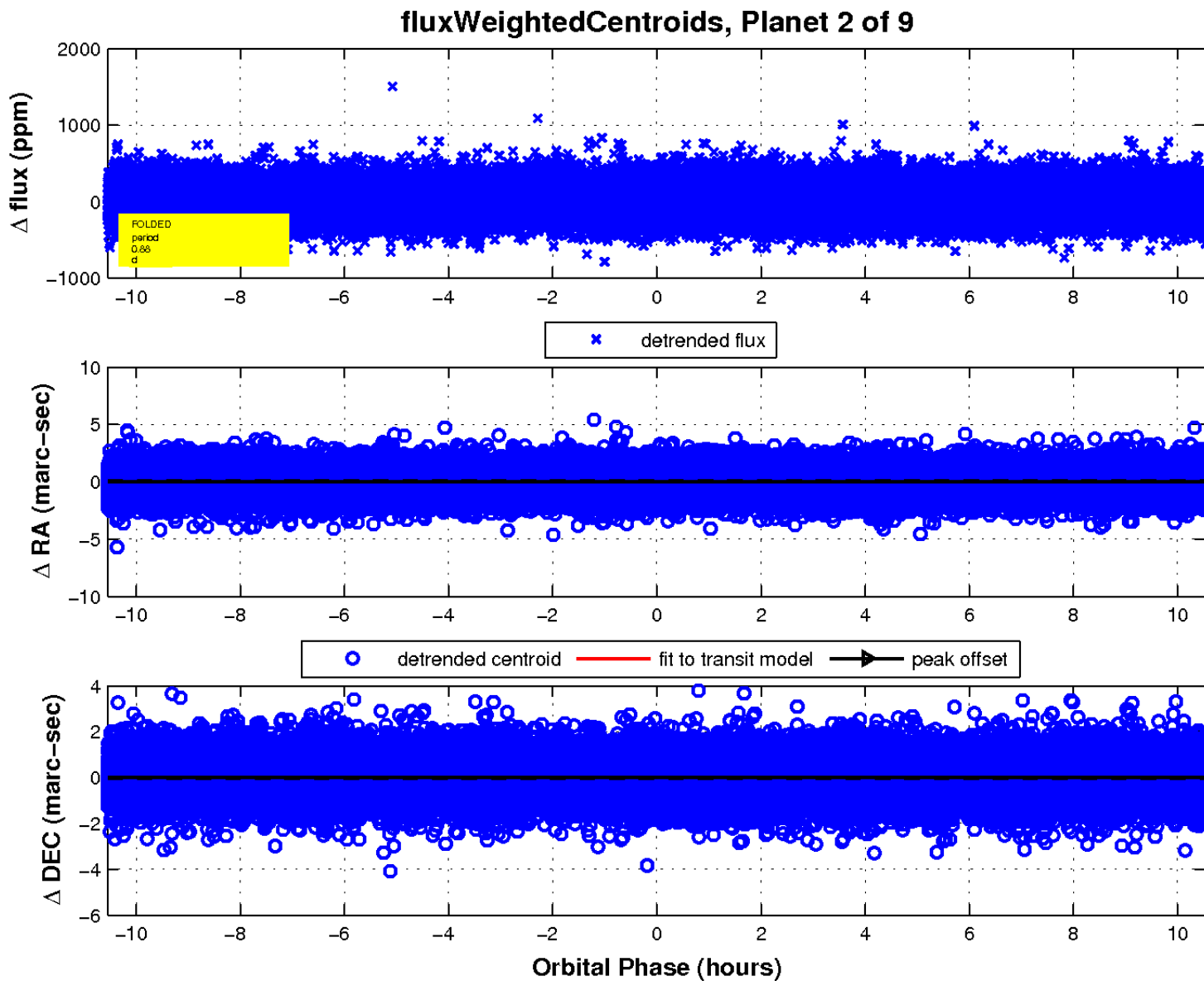
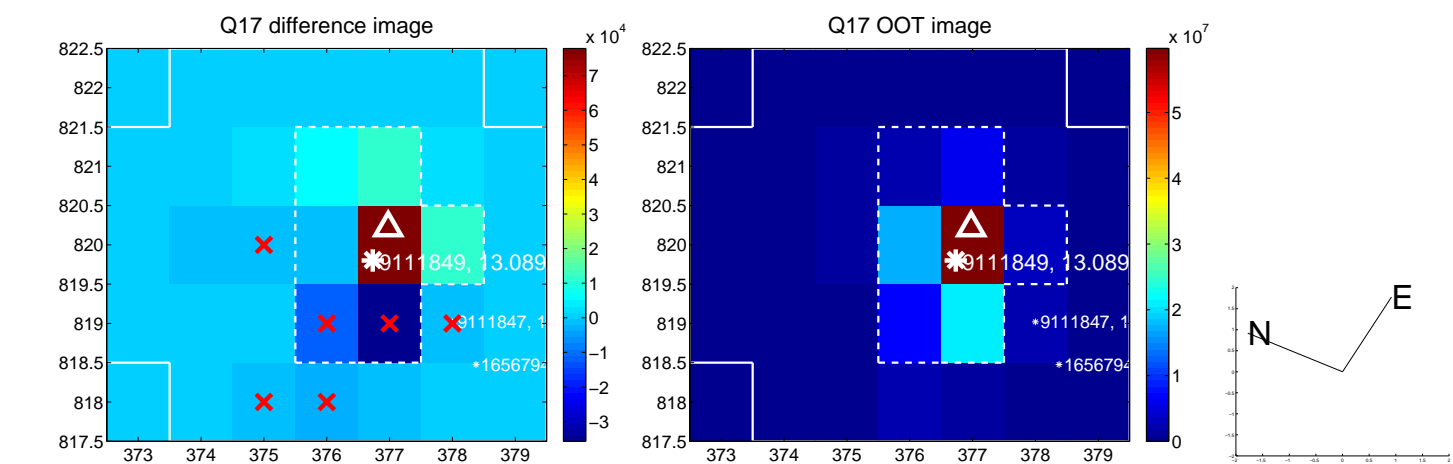
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

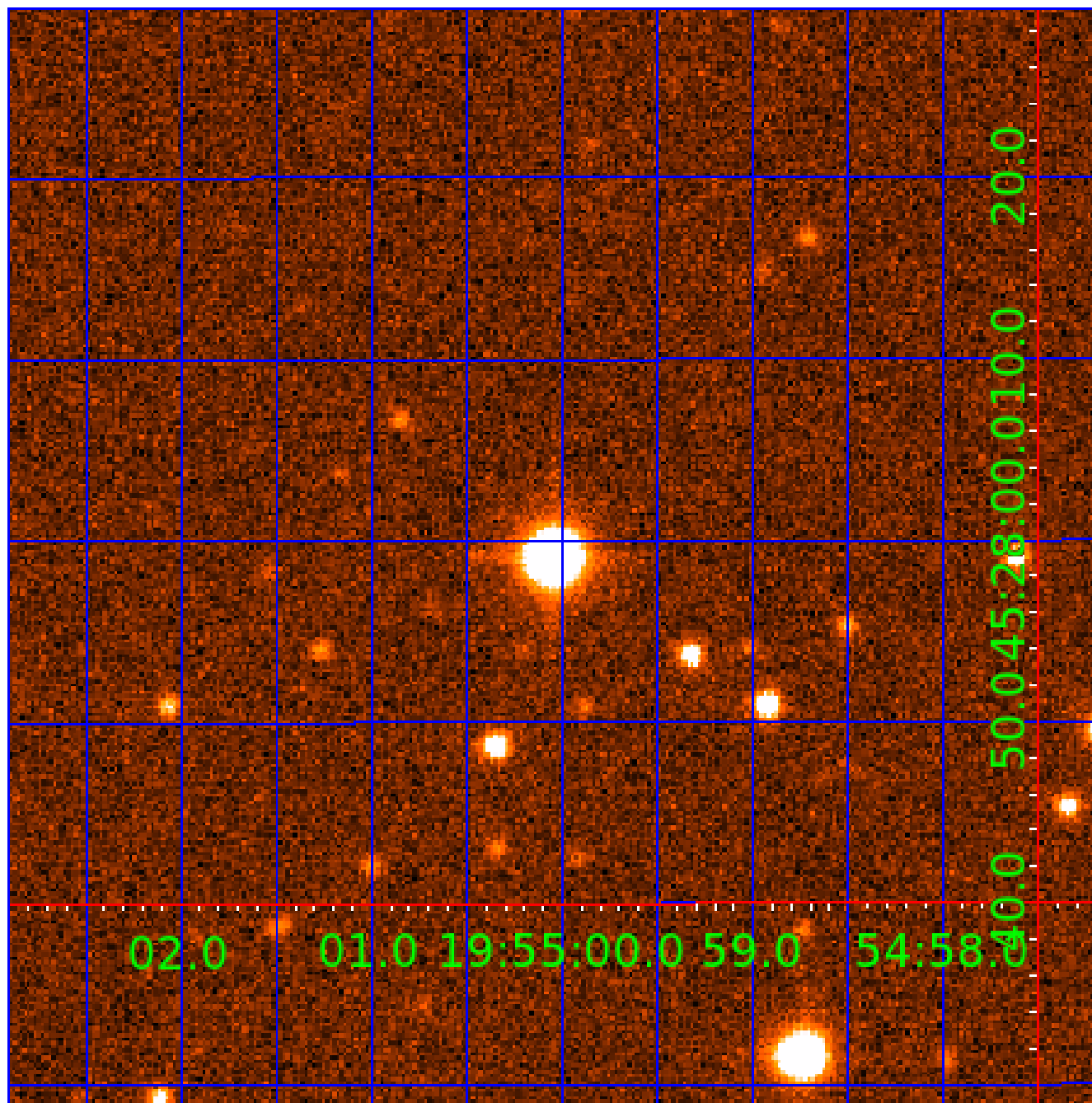


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009111849

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009111849-01	OBS	2042.01	63.073086	191.255585	636.8	5.503	35.4	36.2	6.35	6234	17.84	318.32
009111849-02	OBS	No	0.879308	131.635994	290.7	1.500	8.5	-1.0	6.35	6234	10.84	94872.03
009111849-03	OBS	No	1.419233	131.903611	19.1	9.134	8.3	8.7	6.35	6234	2.77	50109.64
009111849-04	OBS	No	55.896078	184.095431	329.3	2.264	11.0	10.8	6.35	6234	12.11	373.95
009111849-05	OBS	No	88.224588	219.286101	366.2	2.176	9.6	10.6	6.35	6234	13.81	203.49
009111849-06	OBS	No	46.648185	141.719773	221.1	3.438	10.1	9.2	6.35	6234	11.02	475.93
009111849-07	OBS	No	43.779139	132.854579	271.3	2.527	9.1	8.9	6.35	6234	12.31	517.97
009111849-08	OBS	No	61.217340	159.721819	272.7	2.190	8.4	8.4	6.35	6234	11.82	331.25
009111849-09	OBS	No	139.780377	232.656851	366.1	2.500	8.3	-1.0	6.35	6234	12.13	110.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009111849-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009111849-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS
009111849-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009111849-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009111849-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009111849-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

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

Ephemeris Match Information For 009111849-03

No Significant Match Found

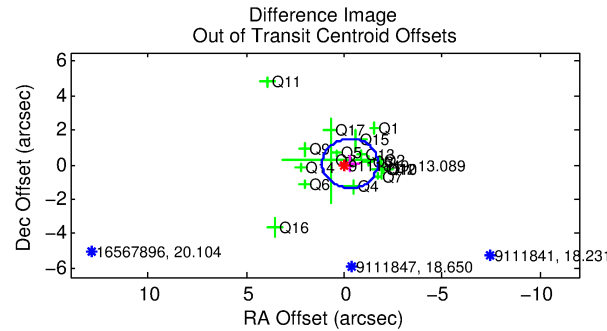
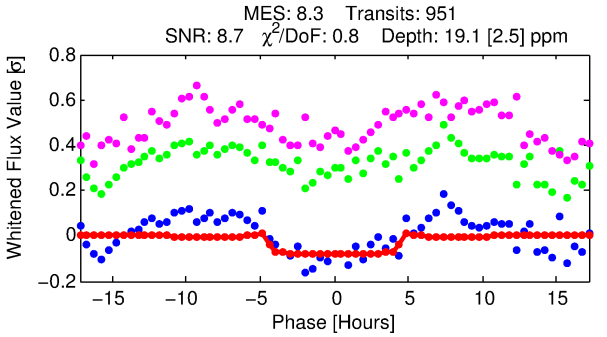
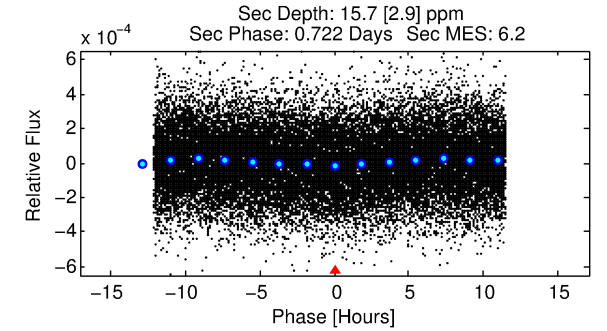
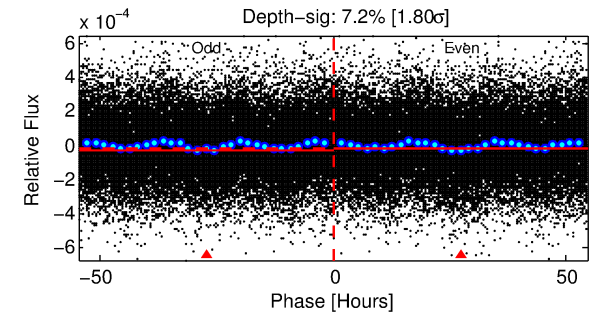
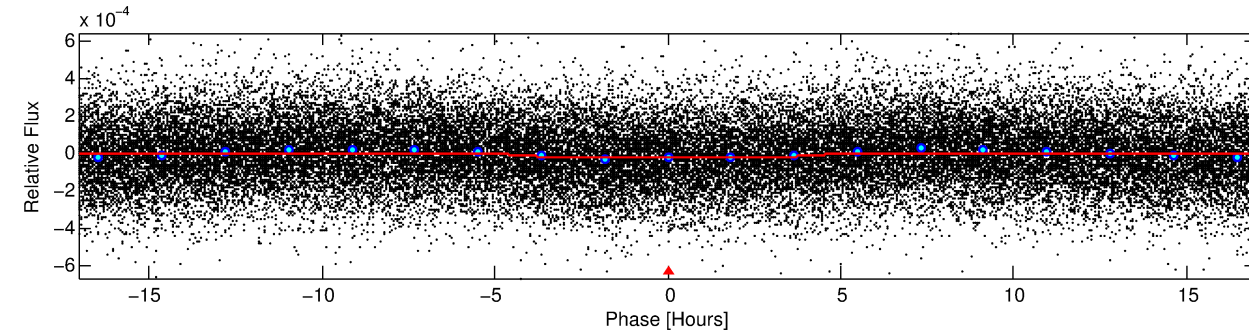
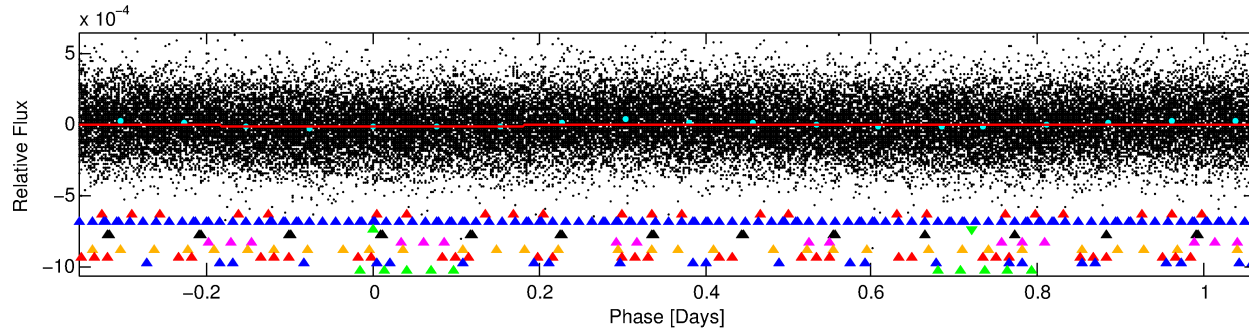
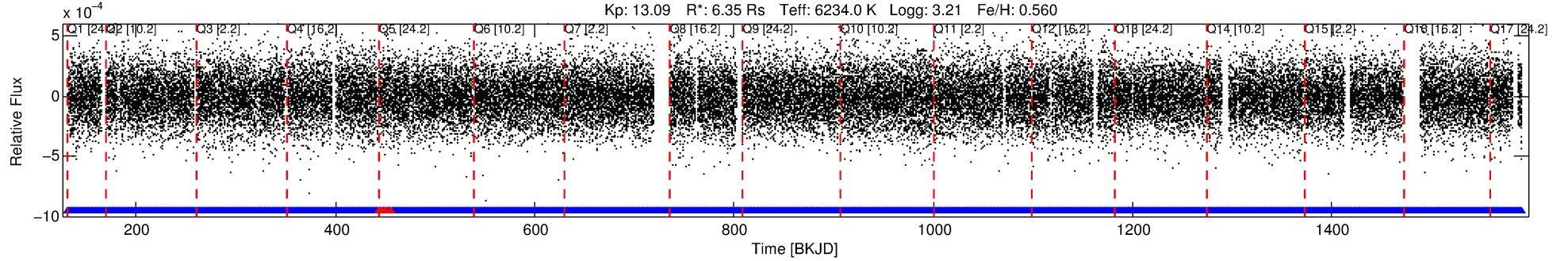


# DV One-Page Summary

KIC: 9111849 Candidate: 3 of 9 Period: 1.419 d

KOI: K02042 Corr: No Ephemeris Match

Kp: 13.09 R\*: 6.35 Rs Teff: 6234.0 K Logg: 3.21 Fe/H: 0.560



## DV Fit Results:

Period = 1.41923 [0.00003] d  
Epoch = 131.9036 [0.0083] BKJD  
Rp/R\* = 0.0040 [0.0054]  
a/R\* = 1.35 [3.91]  
b = 0.02 [299.71]  
Seff = 50109.64 [39068.27]  
Teq = 3815 [744] K  
Rp = 2.77 [4.02] Re  
a = 0.0330 [0.0160] AU  
Ag = 1.23 [3.49] [0.07σ]  
Teffp = 6210 [4241] K [0.56σ]

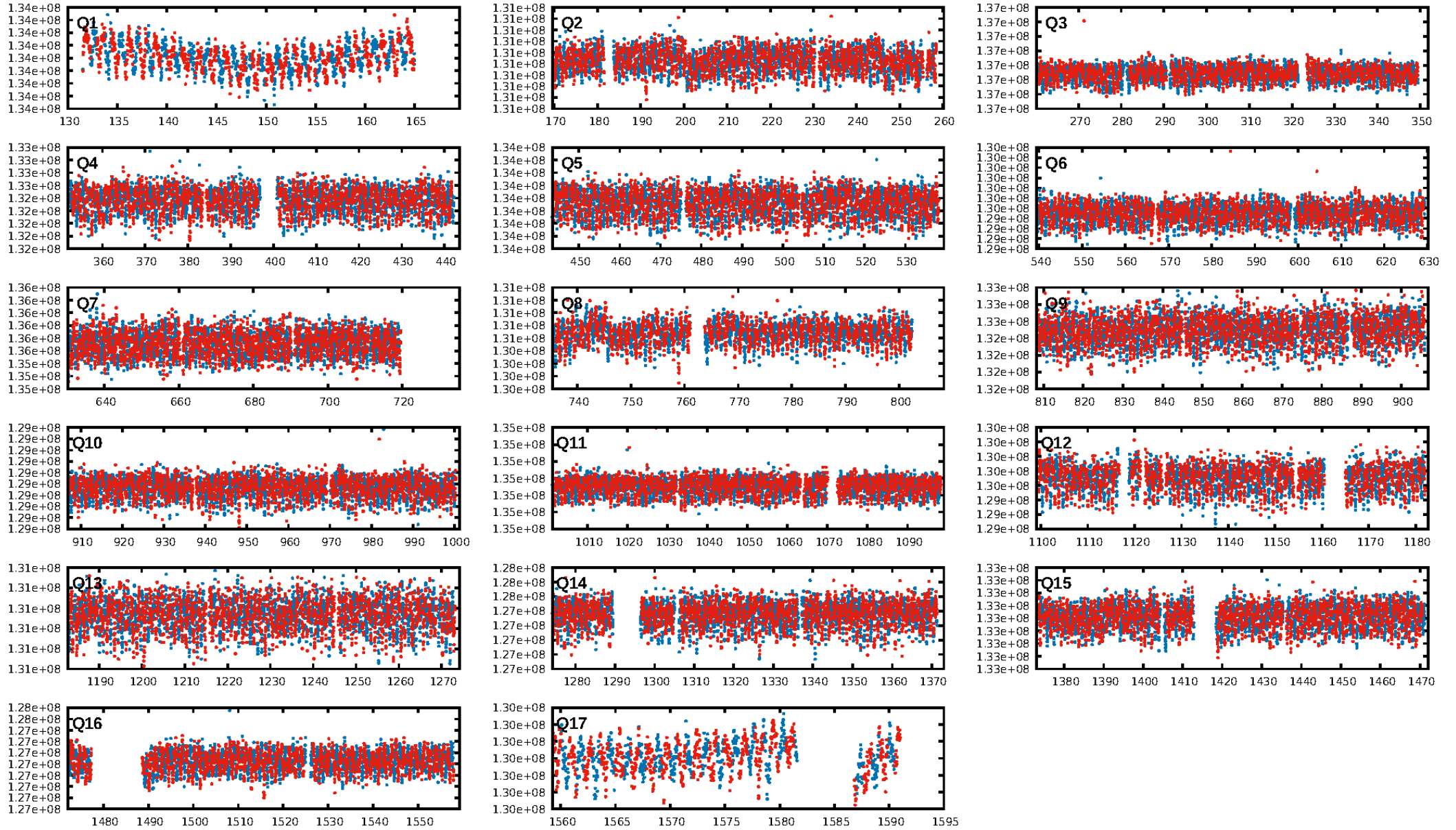
## DV Diagnostic Results:

ShortPeriod-sig: 83.8% [1.40σ]  
LongPeriod-sig: 100.0% [107.27σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.99 [903/908]  
GhostDiagnostic-chr: 19.03  
Centroid-sig: 65.7%  
Centroid-so: 0.453 arcsec [0.43σ]  
OotOffset-rm: 0.305 arcsec [0.64σ]  
KicOffset-rm: 0.382 arcsec [0.81σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.76 [13/17]  
DiffImageOverlap-fno: 0.00 [0/17]

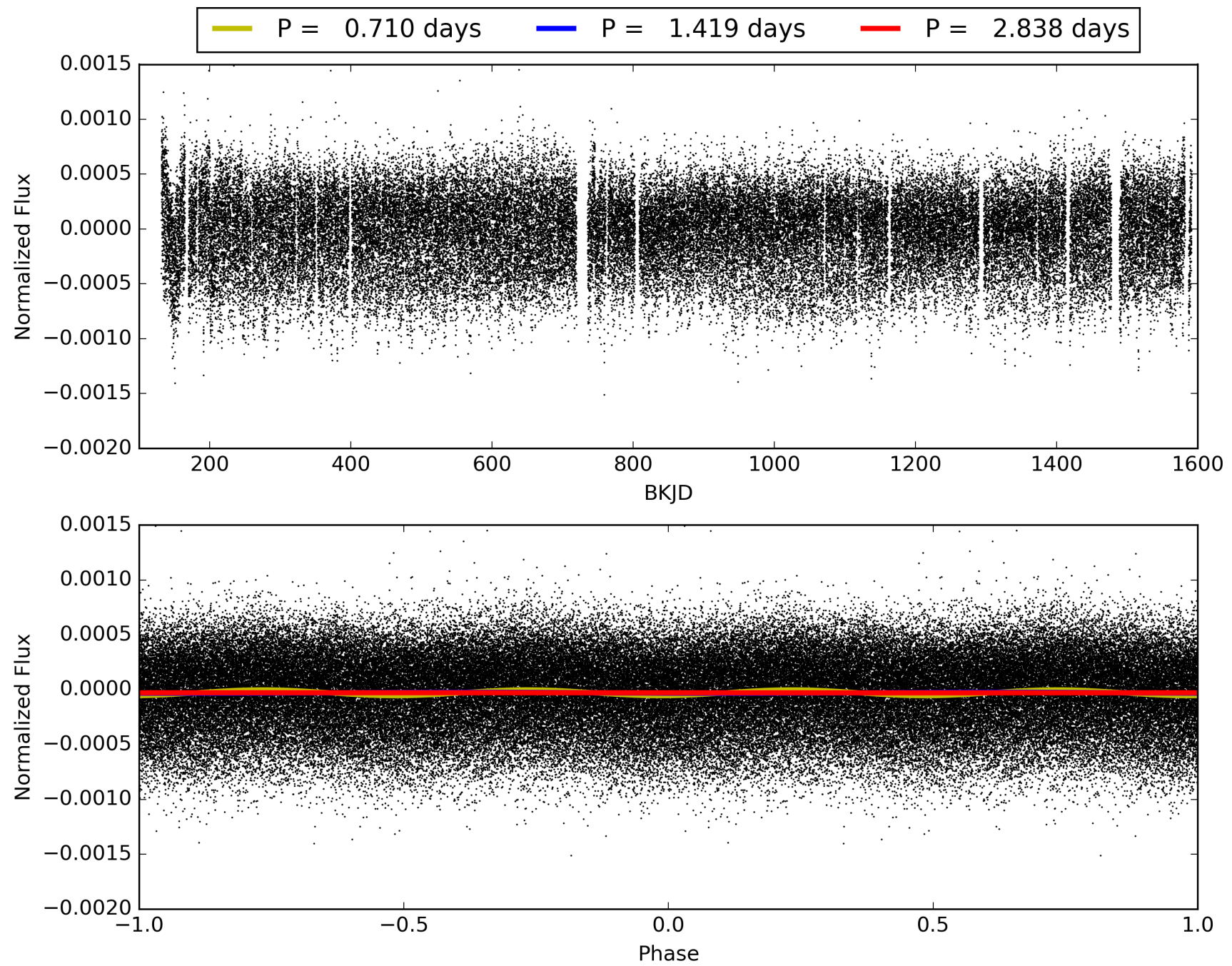
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:44:52 Z

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

# TCE 009111849-03, PDC Light Curves



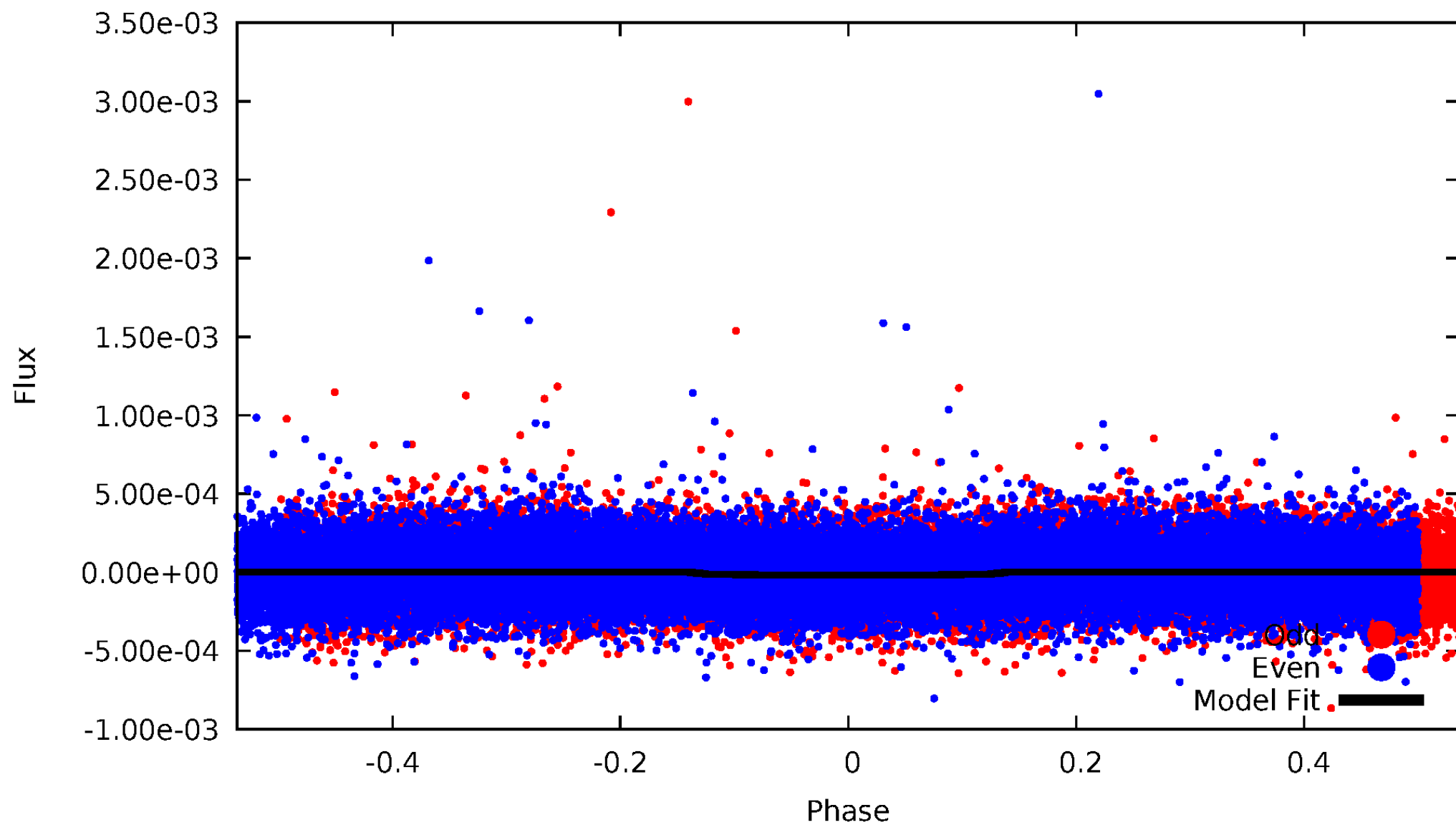
TCE 009111849-03





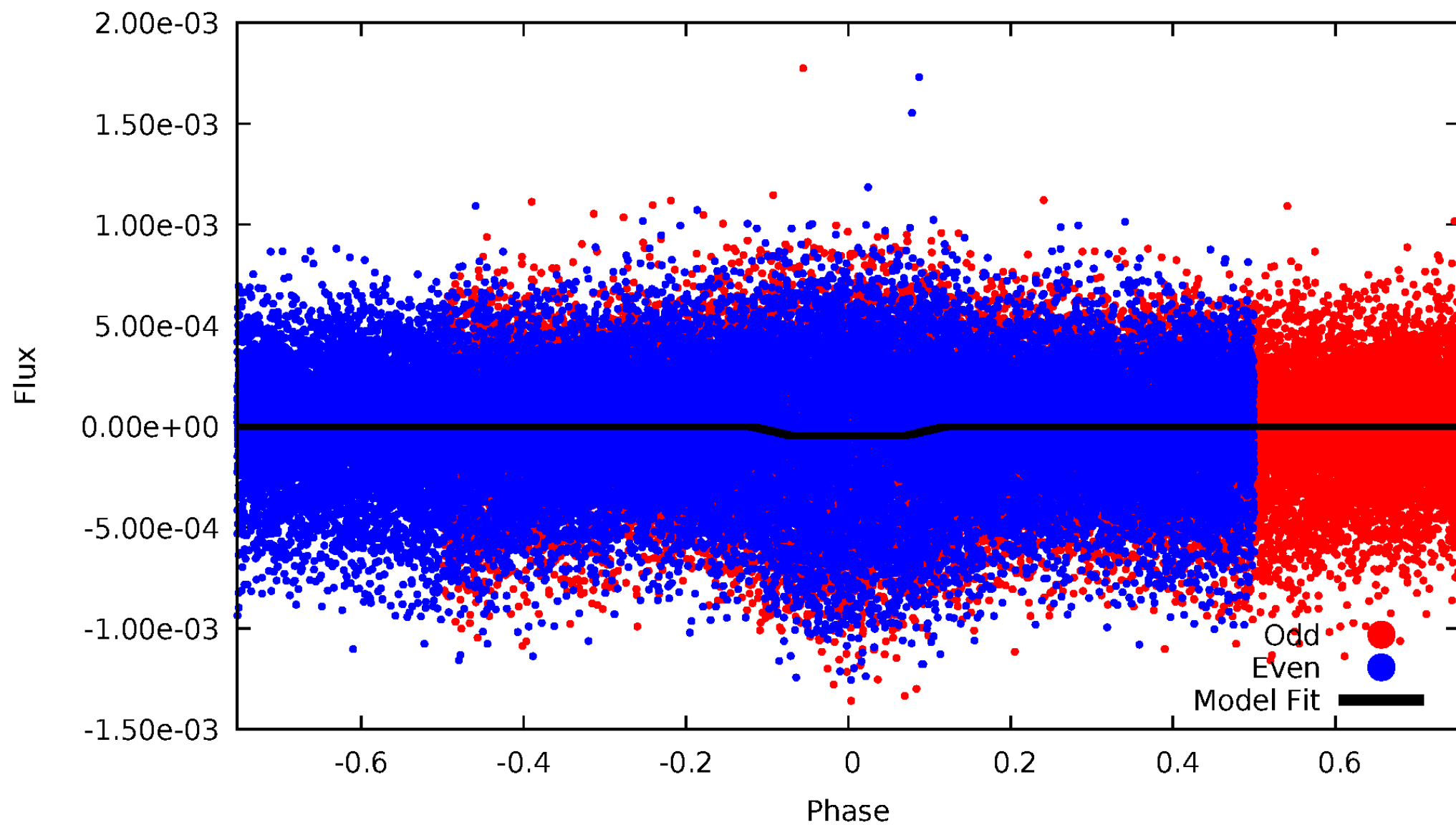
# DV Odd/Even

TCE 009111849-03



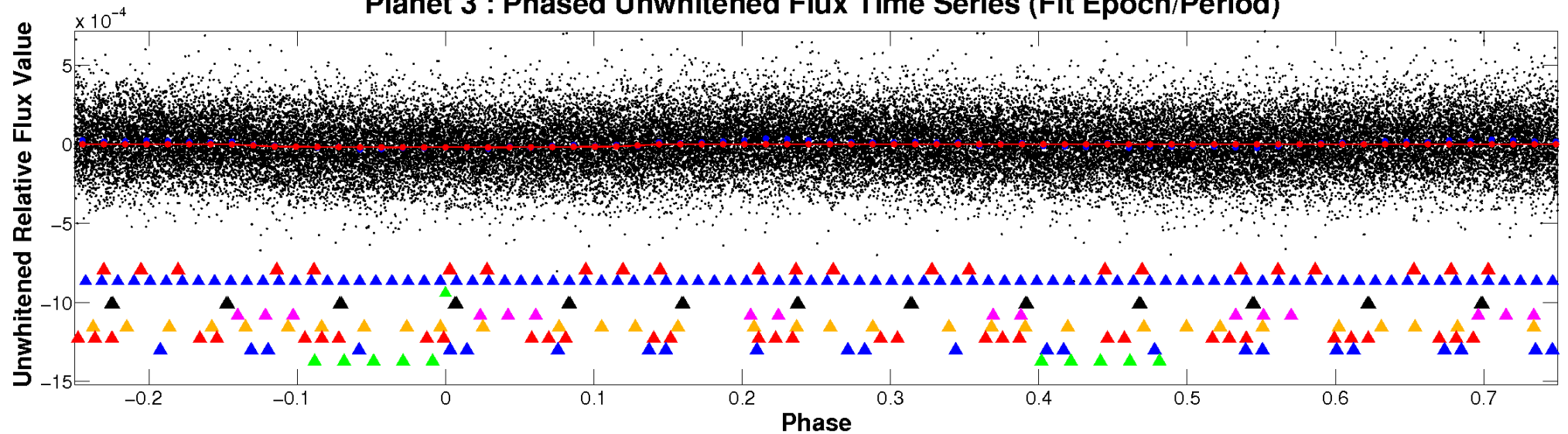
# ALT Odd/Even

TCE 009111849-03

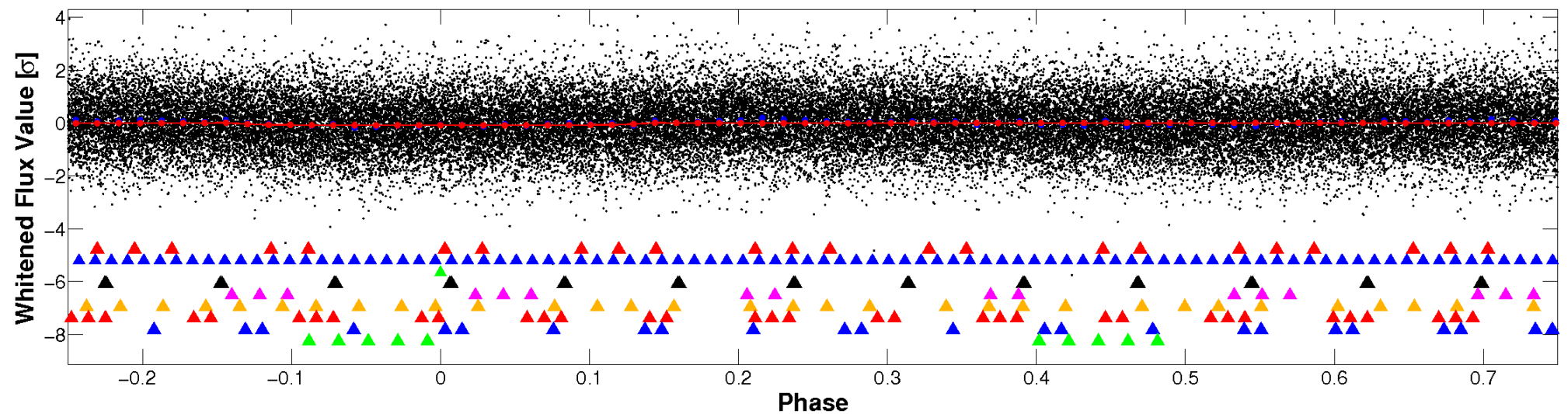


# Non-Whitened Vs. Whitened Light Curve

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

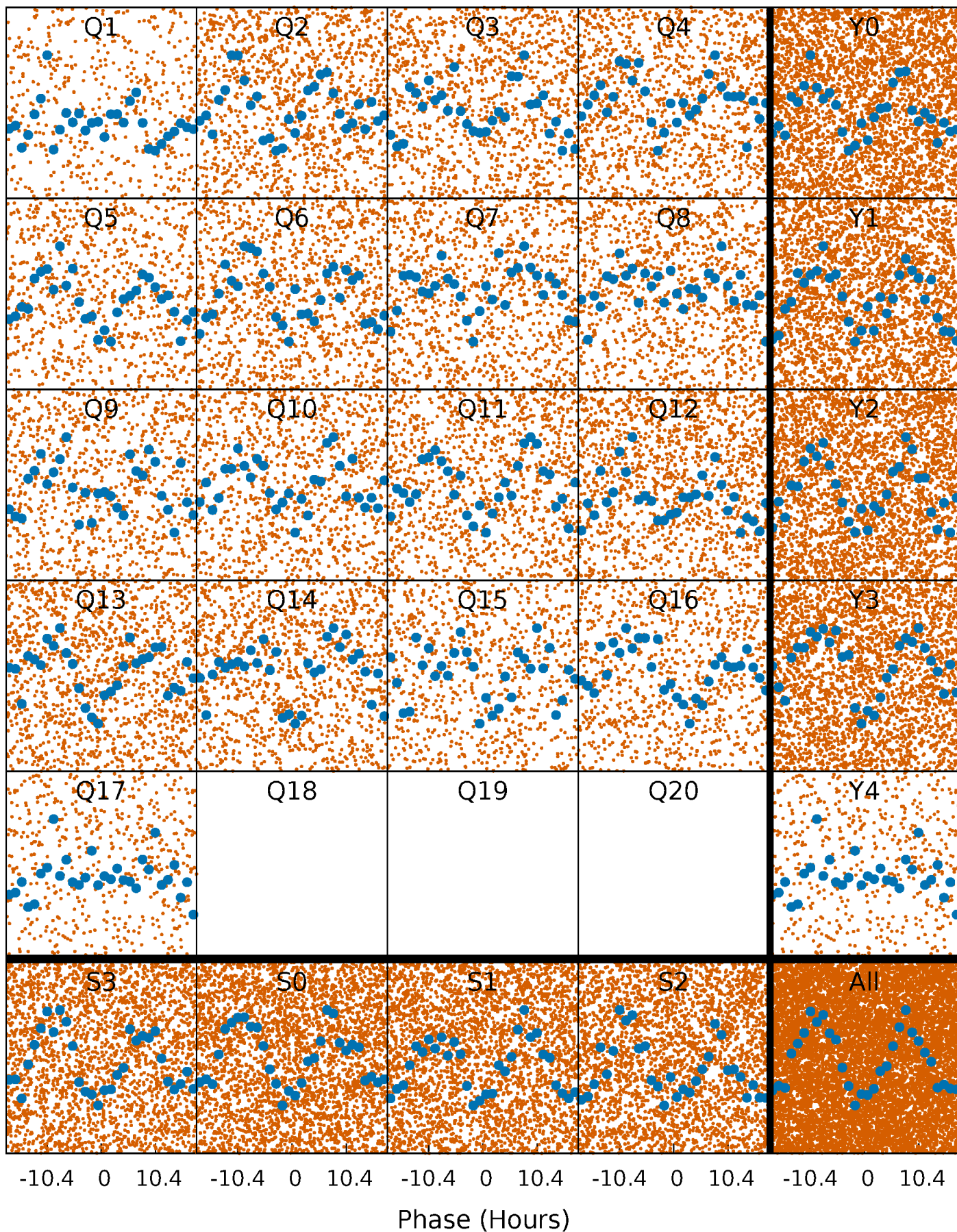


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

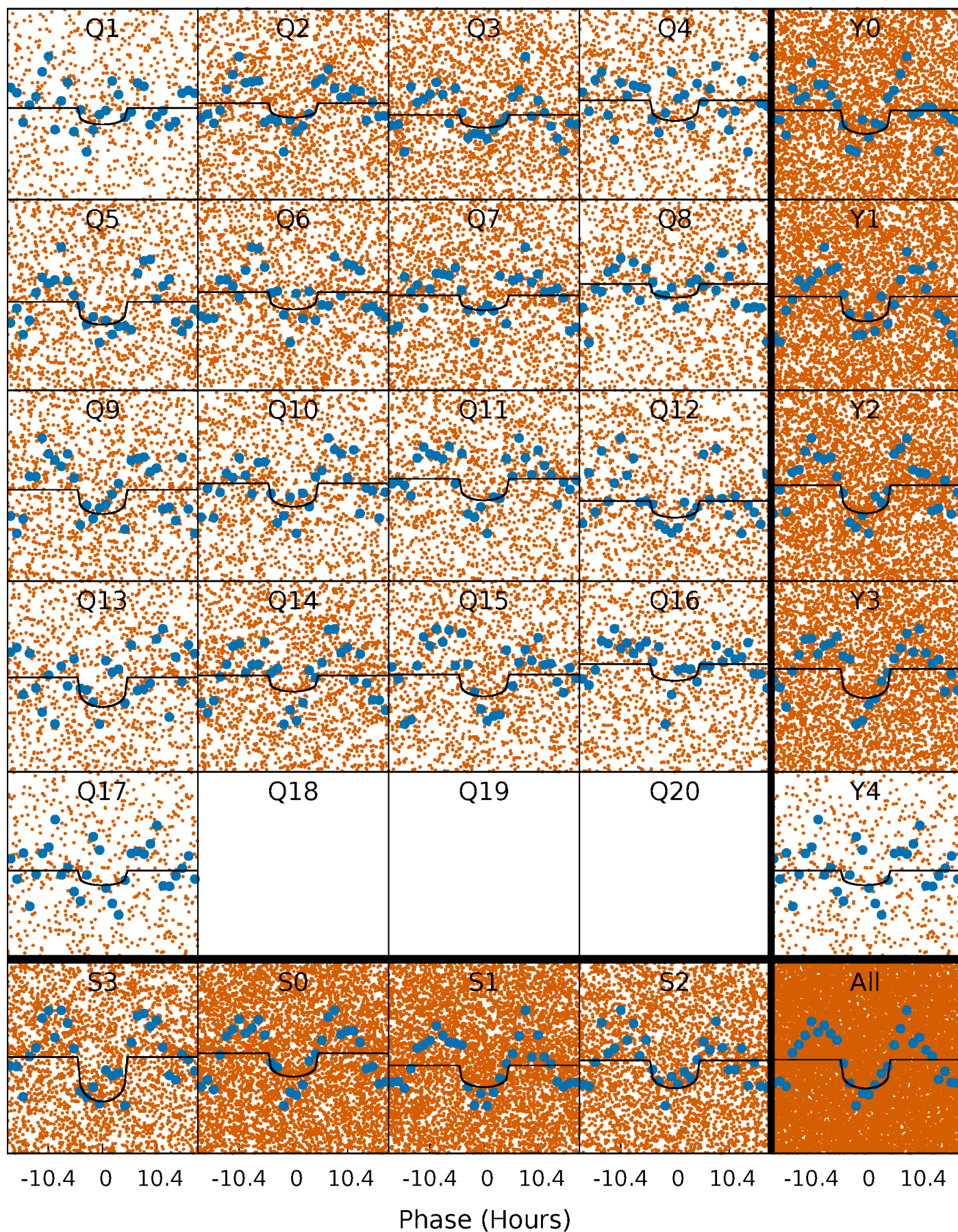
TCE 009111849-03 P= 1.419233 Days  $T_0=131.903612$  (BKJD)





# DV Quarter-Phased Transit Curves

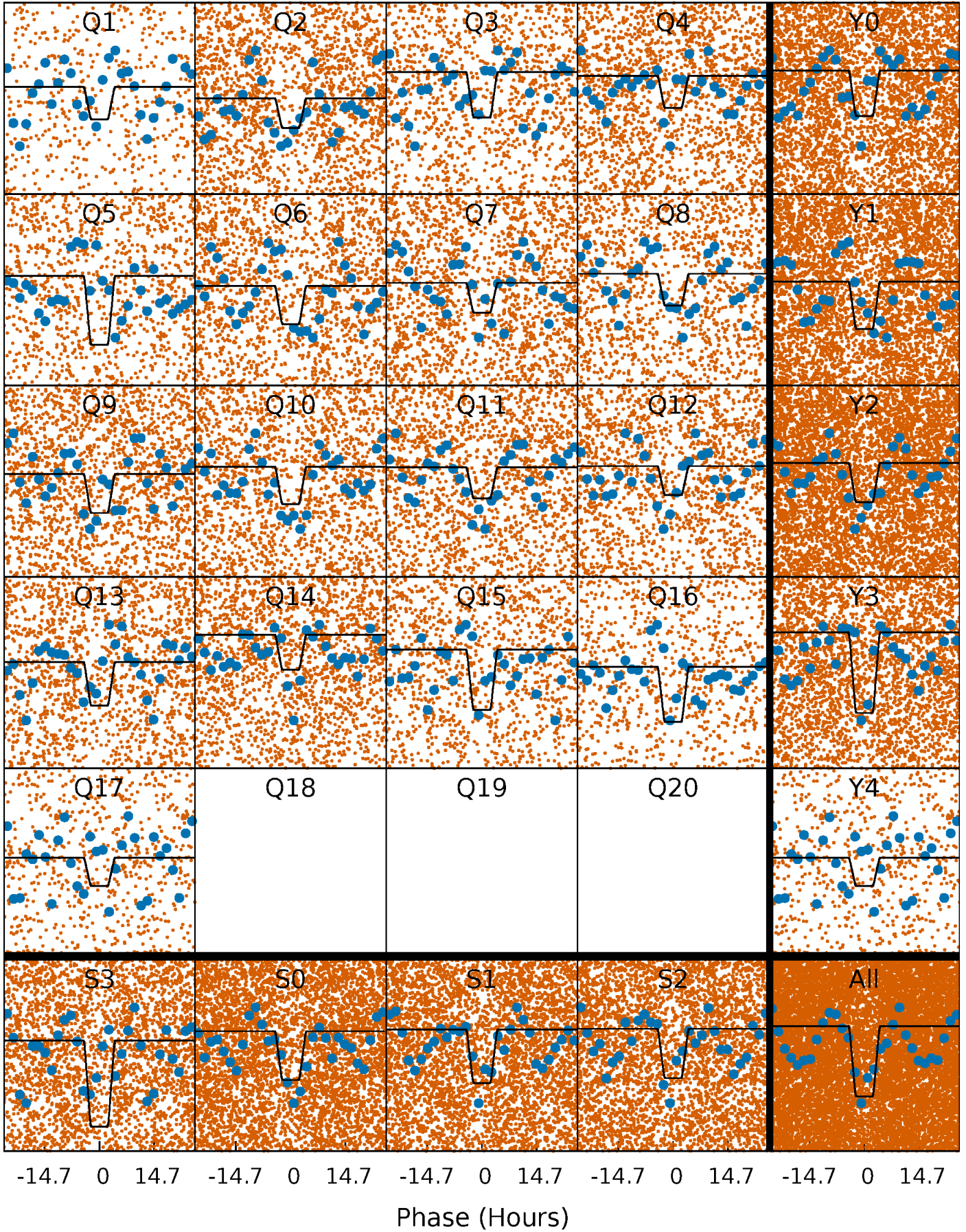
TCE 009111849-03 P= 1.419233 Days  $T_0=131.903612$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

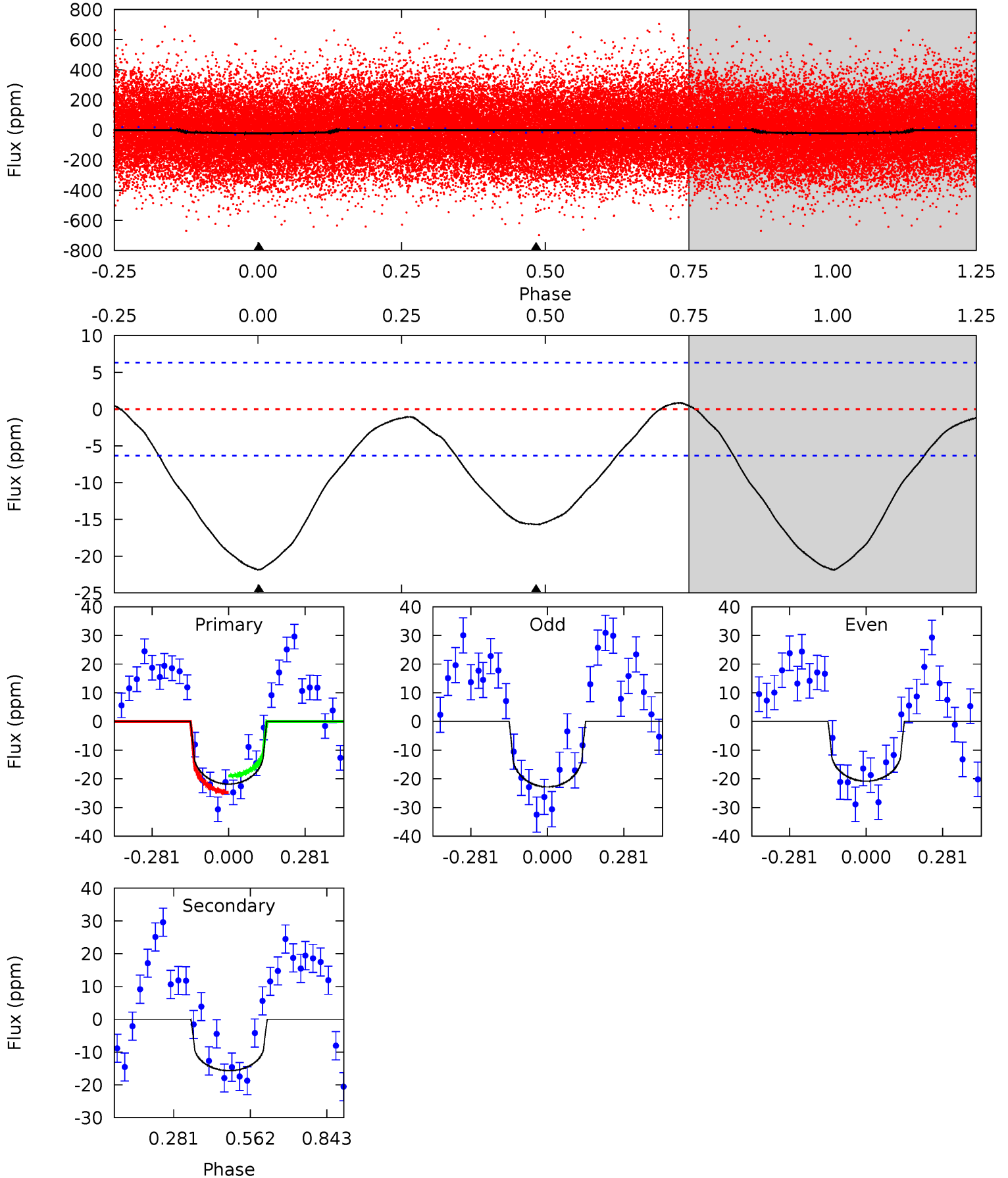
TCE 009111849-03 P= 1.419308 Days  $T_0=131.817865$  (BKJD)



# DV Model-Shift Uniqueness Test

009111849-03, P = 1.419233 Days, E = 130.484379 Days

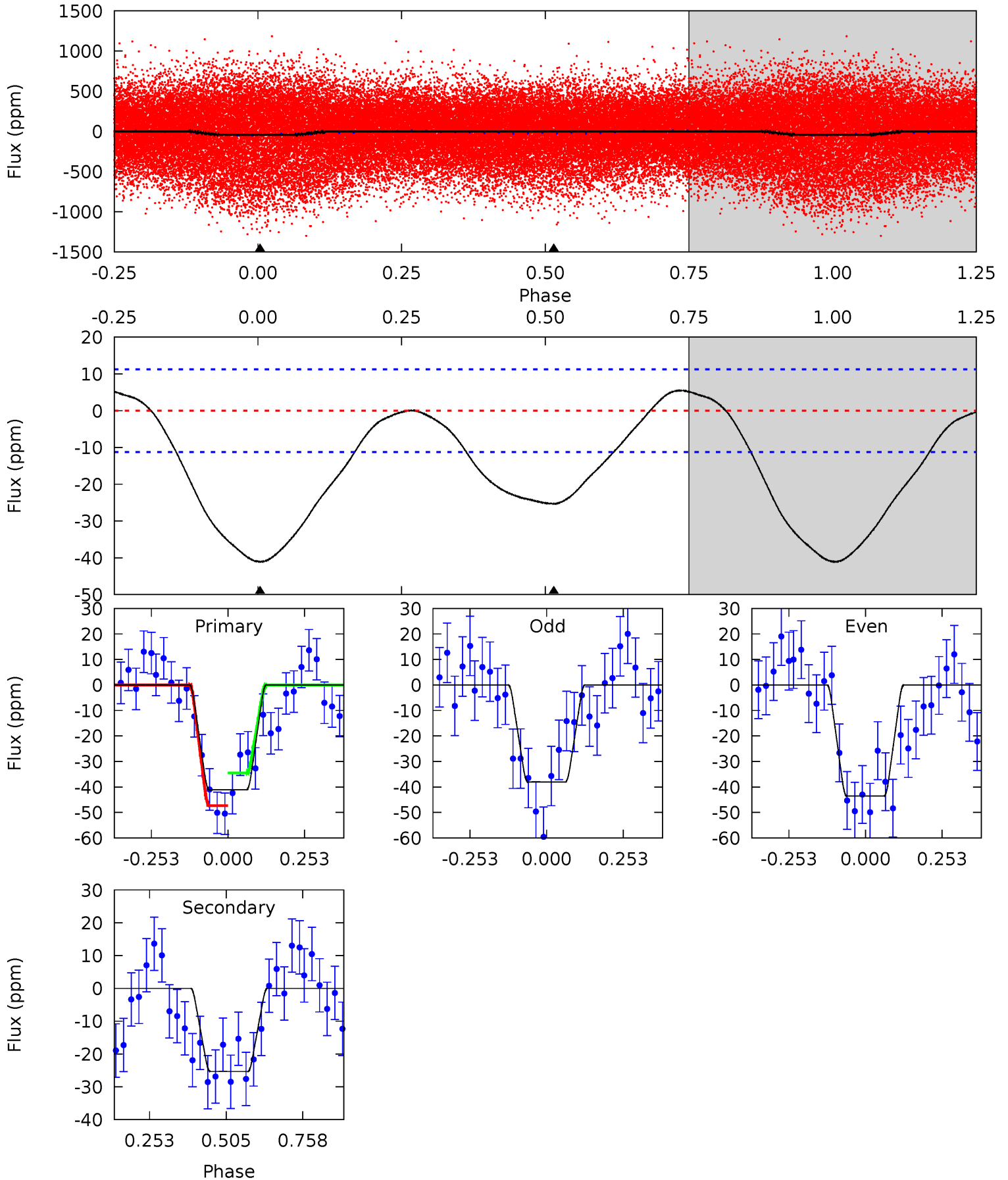
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.0	10.7	0	0	4.34	1.08	0.64	15.0	15.0	10.7	10.7	0.68	1.01	0.04	2.06



# Alt Model-Shift Uniqueness Test

009111849-03, P = 1.419308 Days, E = 130.398557 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.9	9.83	0	0	4.37	1.14	0.99	15.9	15.9	9.83	9.83	1.06	21.5	0.12	2.05



### Stellar Parameters For KIC 009111849

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6234^{+74}_{-74}$	$3.209^{+0.458}_{-0.122}$	$0.560^{+0.050}_{-0.100}$	$6.354^{+1.590}_{-3.180}$	$2.382^{+0.277}_{-0.514}$	$0.013^{+0.056}_{-0.005}$
	+1%/-1%	+14%/-4%	+9%/-18%	+25%/-50%	+12%/-22%	+431%/-35%
Source	SPE90	FLK73	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009111849-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-16 \pm 1$	$3.69^{+3.42}_{-2.52}$	$5237^{+336}_{-669}$	$4427^{+4641}_{-8173}$	$0.654^{+5.512}_{-0.468}$
Alt.	$-25 \pm 3$	$4.51^{+3.73}_{-2.91}$	$5236^{+334}_{-634}$	$4629^{+4488}_{-8204}$	$0.742^{+5.151}_{-0.524}$

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

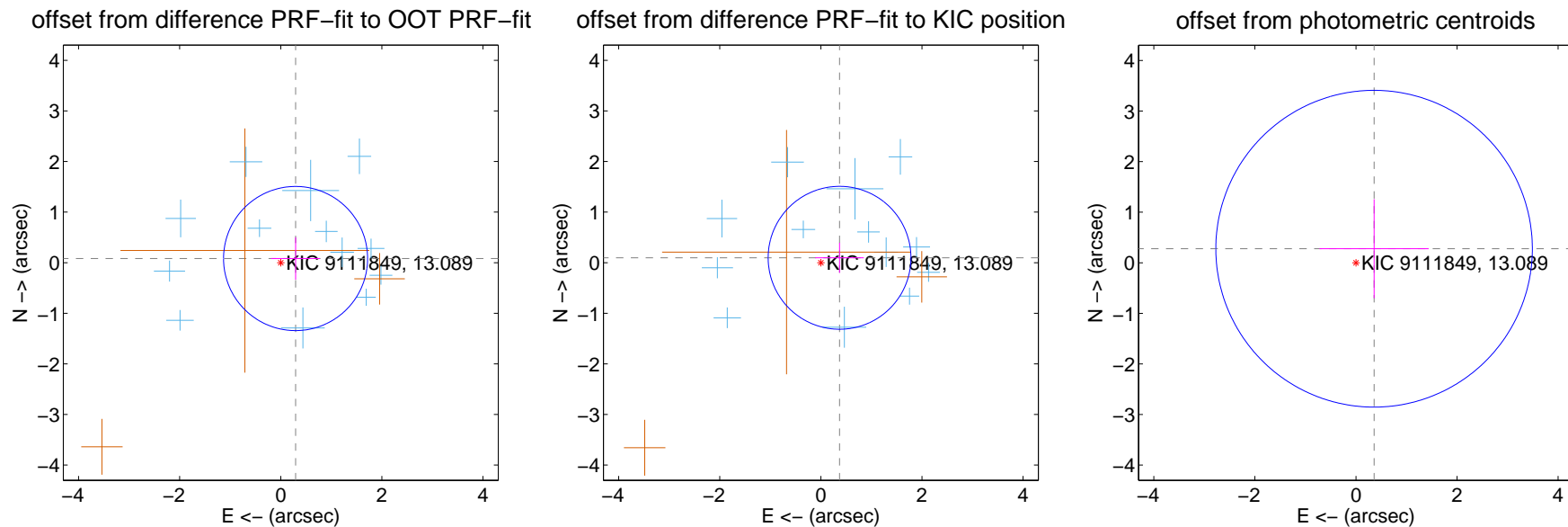
## DV Centroid Data

Supplemental centroid analysis for 009111849-03. Kepler magnitude: 13.09. Transit SNR 8.72

There are 13 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.305 \pm 0.475$	0.64	$-0.293 \pm 0.483$	$0.082 \pm 0.418$
PRF-fit source offset from KIC position	$0.382 \pm 0.471$	0.81	$-0.370 \pm 0.480$	$0.097 \pm 0.297$
photometric centroid source offset	$0.45 \pm 1.04$	0.43	$-0.36 \pm 1.08$	$0.28 \pm 0.98$

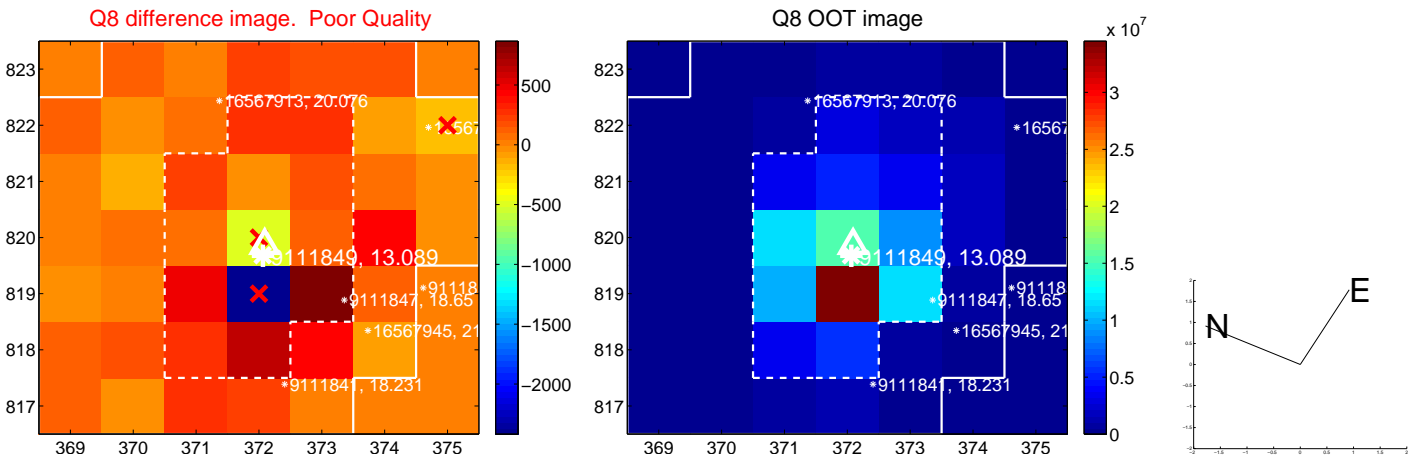
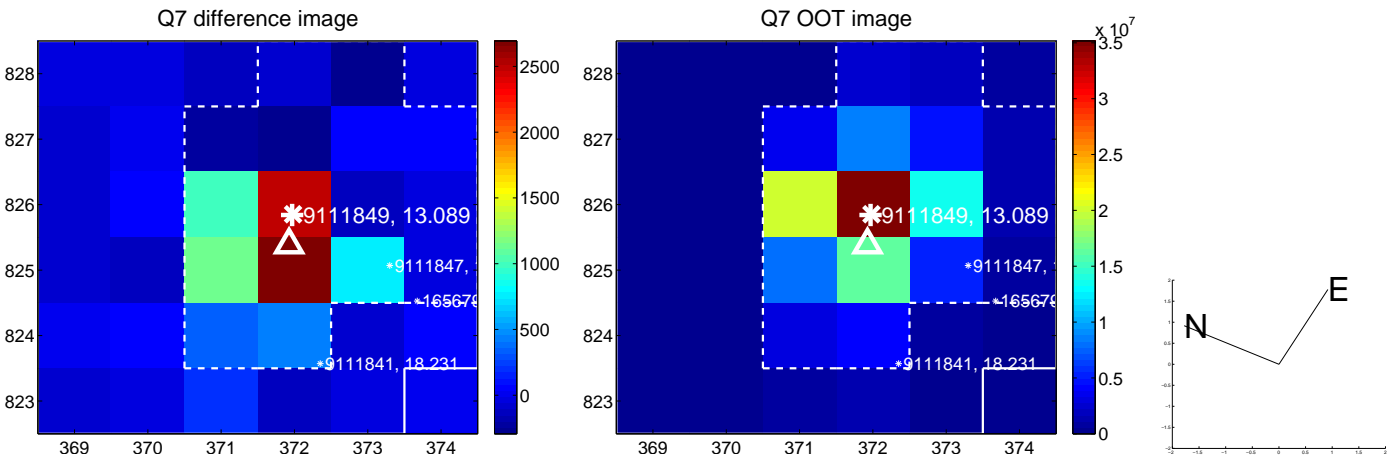
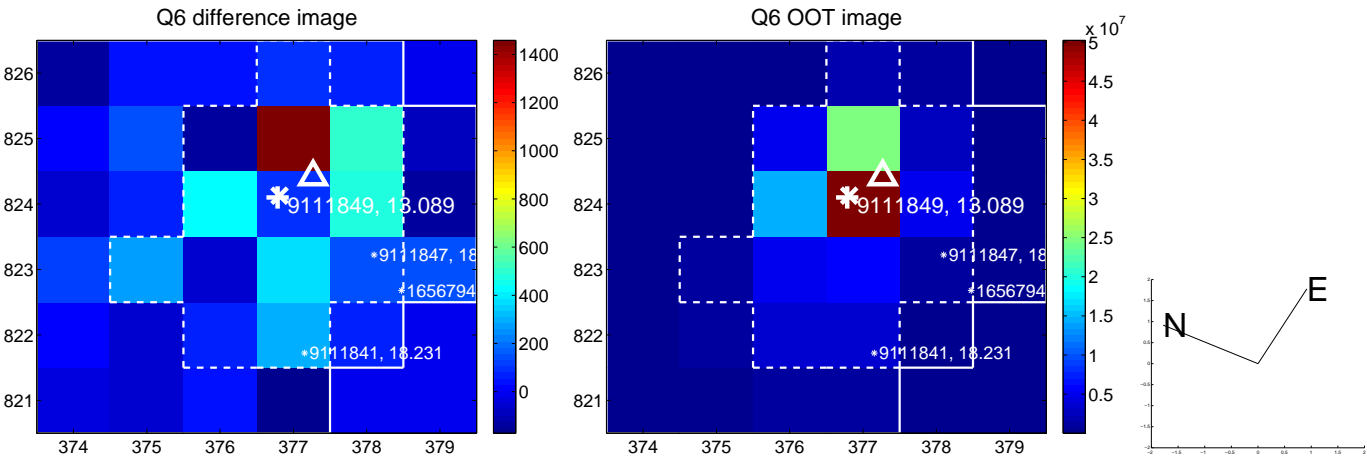
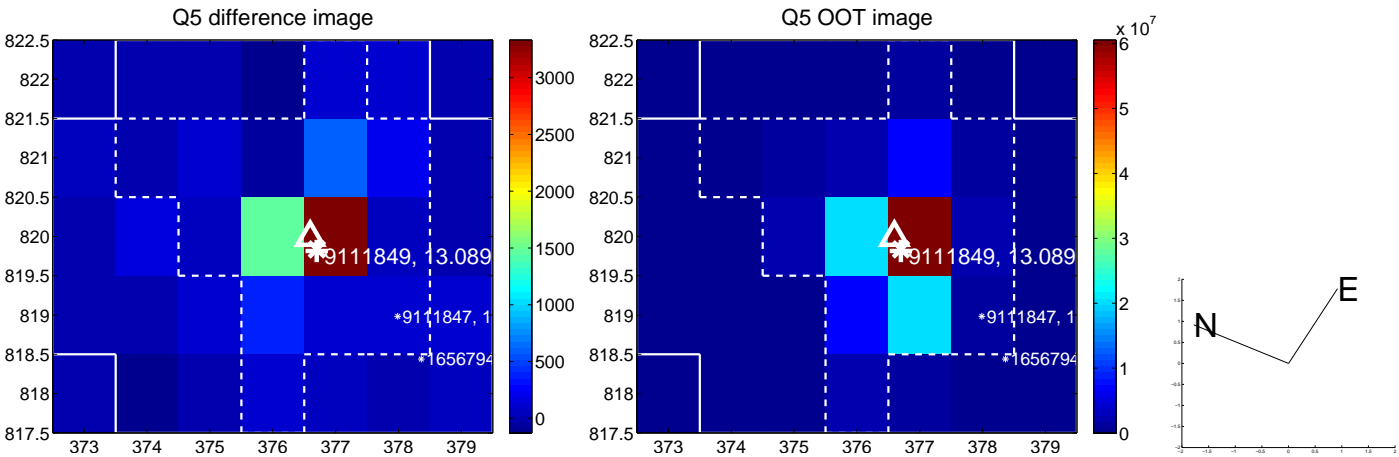


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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





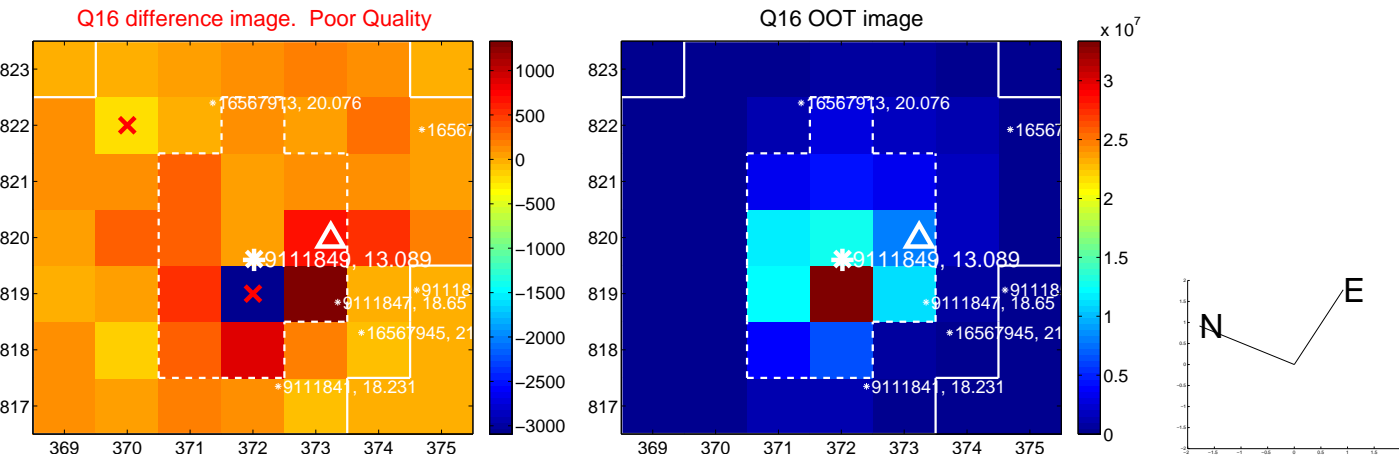
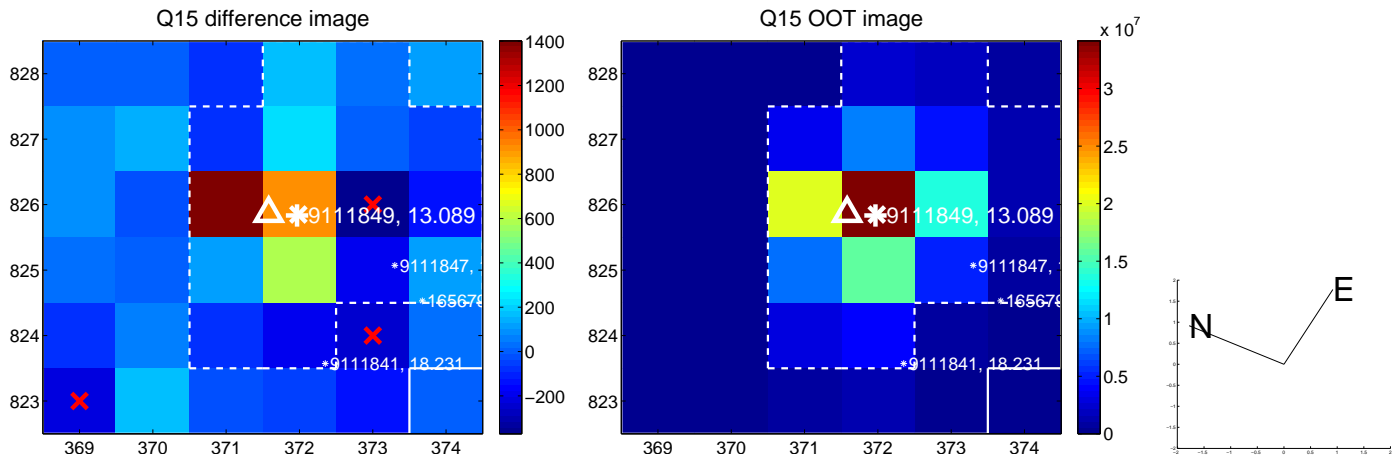
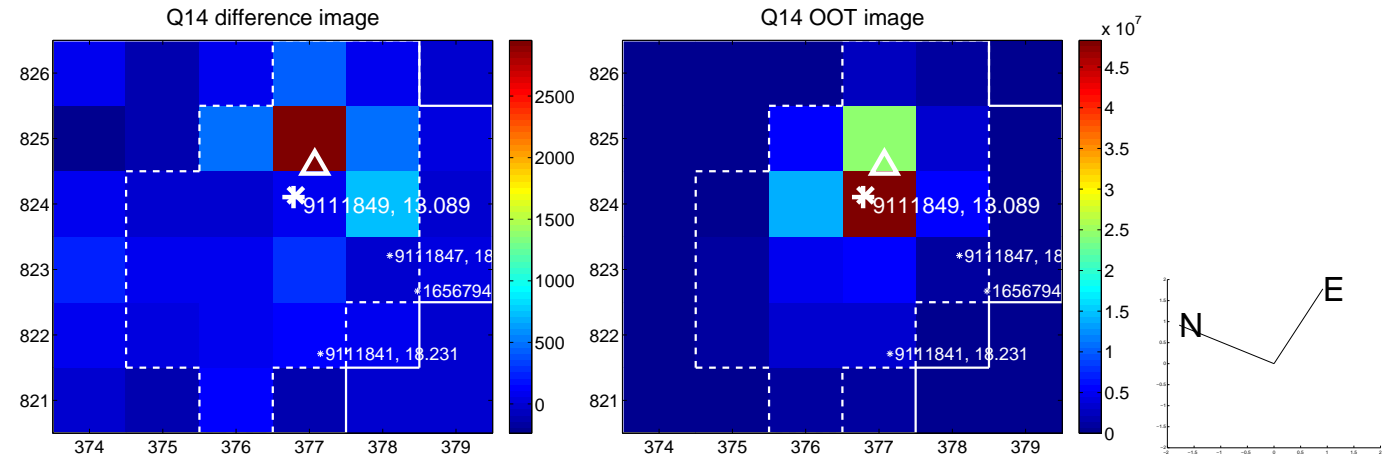
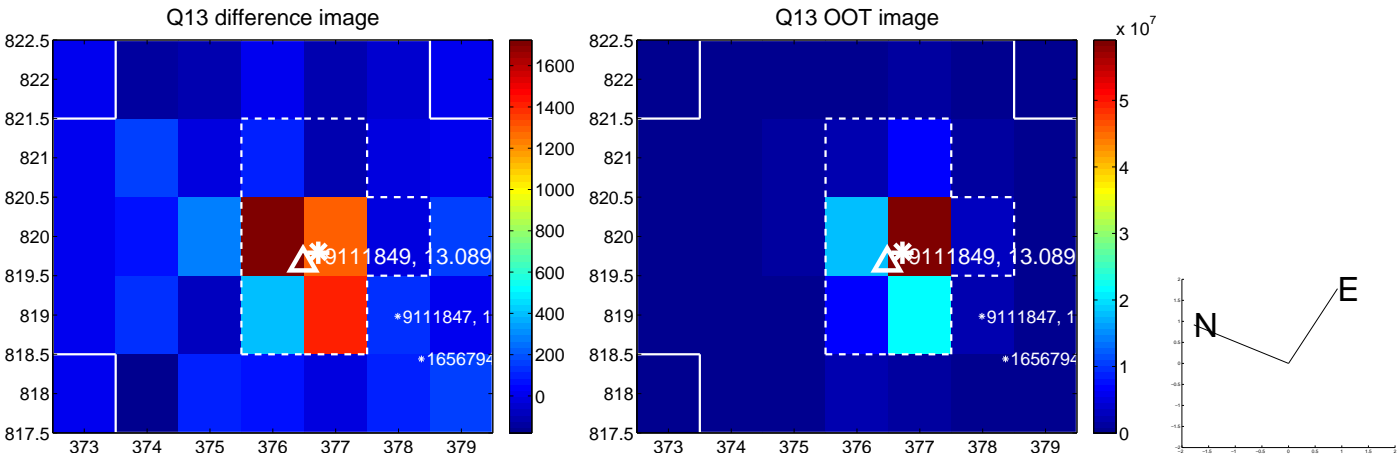
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



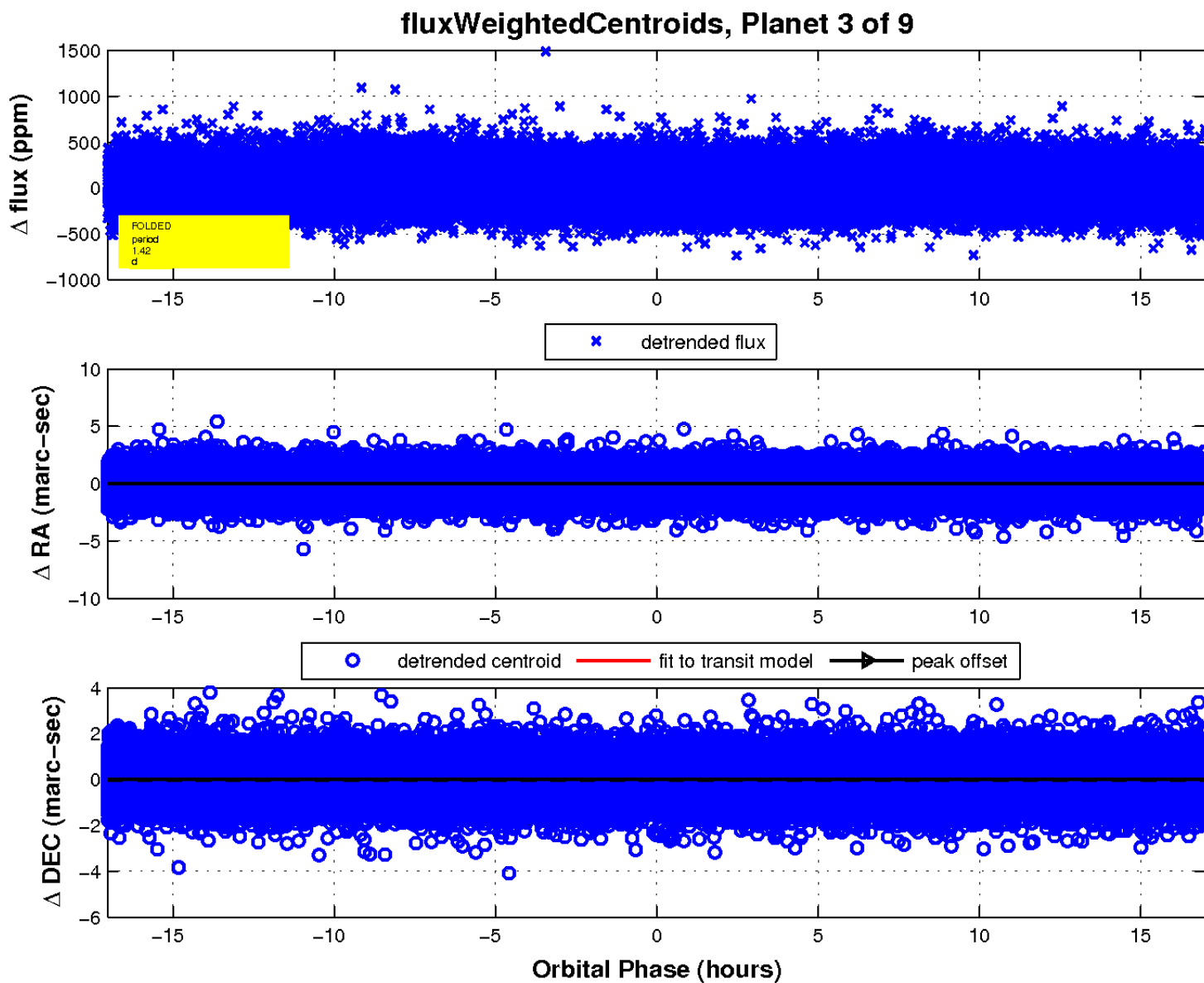
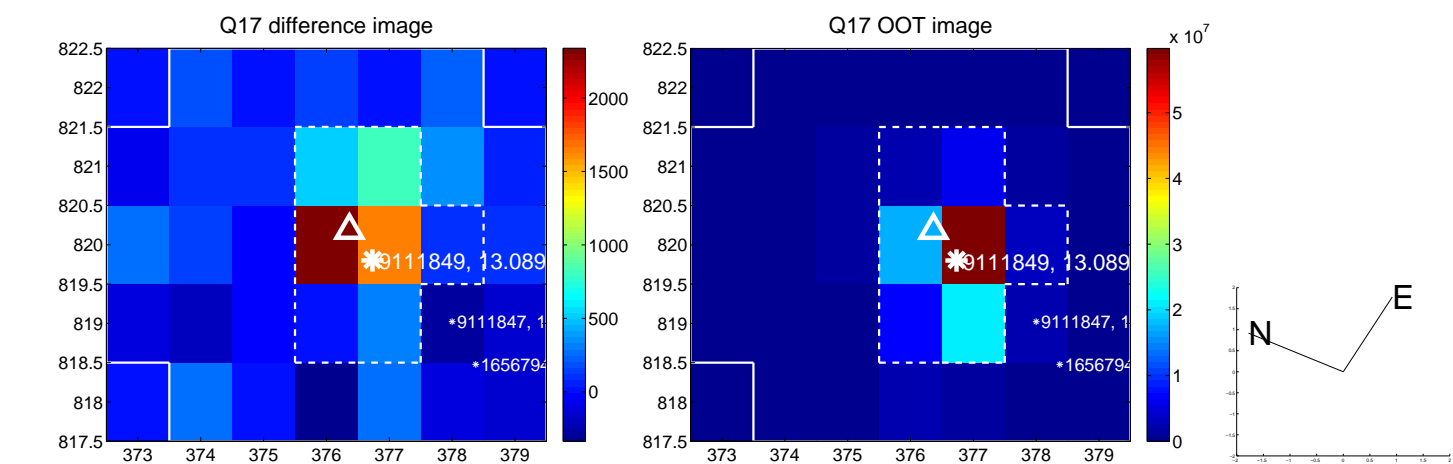




white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

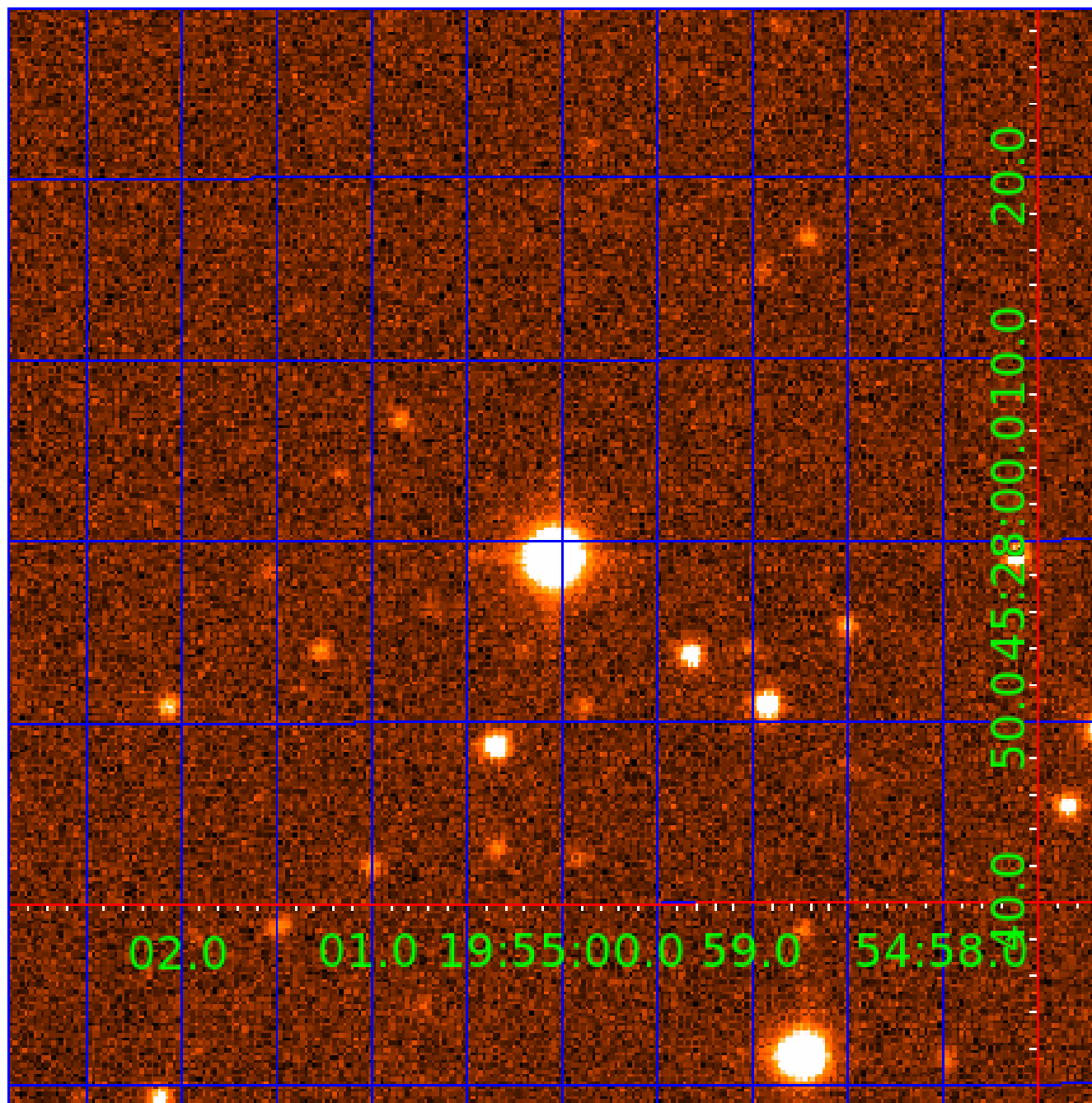


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009111849

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009111849-01	OBS	2042.01	63.073086	191.255585	636.8	5.503	35.4	36.2	6.35	6234	17.84	318.32
009111849-02	OBS	No	0.879308	131.635994	290.7	1.500	8.5	-1.0	6.35	6234	10.84	94872.03
009111849-03	OBS	No	1.419233	131.903611	19.1	9.134	8.3	8.7	6.35	6234	2.77	50109.64
009111849-04	OBS	No	55.896078	184.095431	329.3	2.264	11.0	10.8	6.35	6234	12.11	373.95
009111849-05	OBS	No	88.224588	219.286101	366.2	2.176	9.6	10.6	6.35	6234	13.81	203.49
009111849-06	OBS	No	46.648185	141.719773	221.1	3.438	10.1	9.2	6.35	6234	11.02	475.93
009111849-07	OBS	No	43.779139	132.854579	271.3	2.527	9.1	8.9	6.35	6234	12.31	517.97
009111849-08	OBS	No	61.217340	159.721819	272.7	2.190	8.4	8.4	6.35	6234	11.82	331.25
009111849-09	OBS	No	139.780377	232.656851	366.1	2.500	8.3	-1.0	6.35	6234	12.13	110.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009111849-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009111849-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS
009111849-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009111849-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009111849-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009111849-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

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

Ephemeris Match Information For 009111849-04

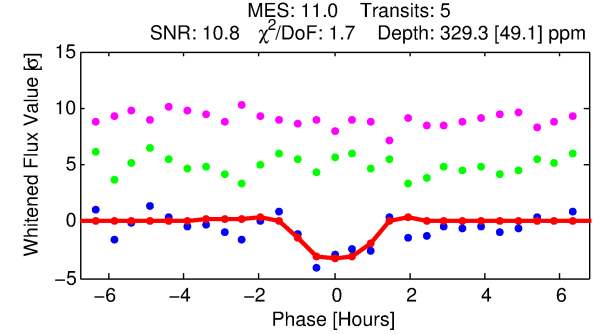
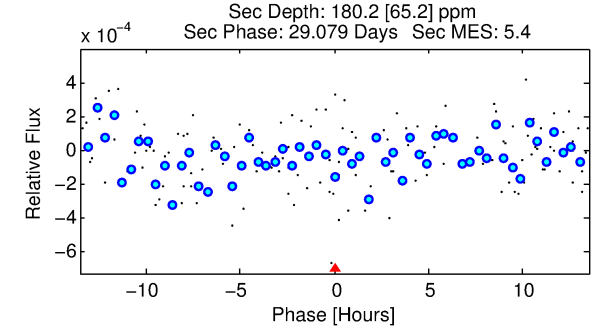
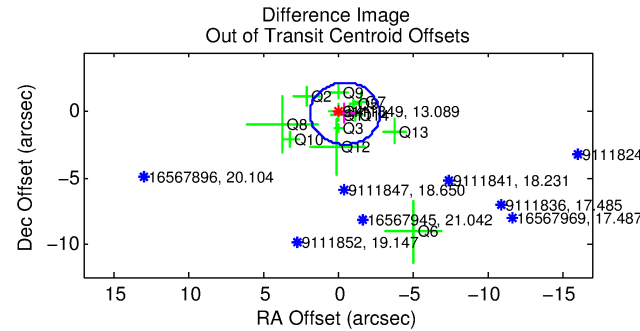
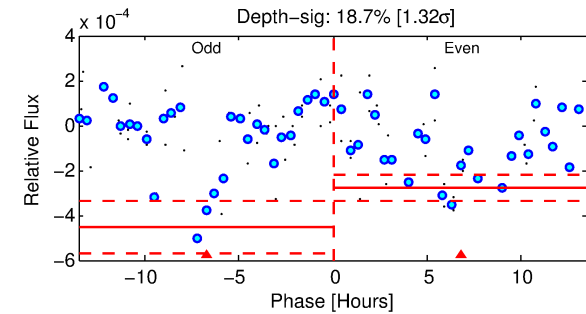
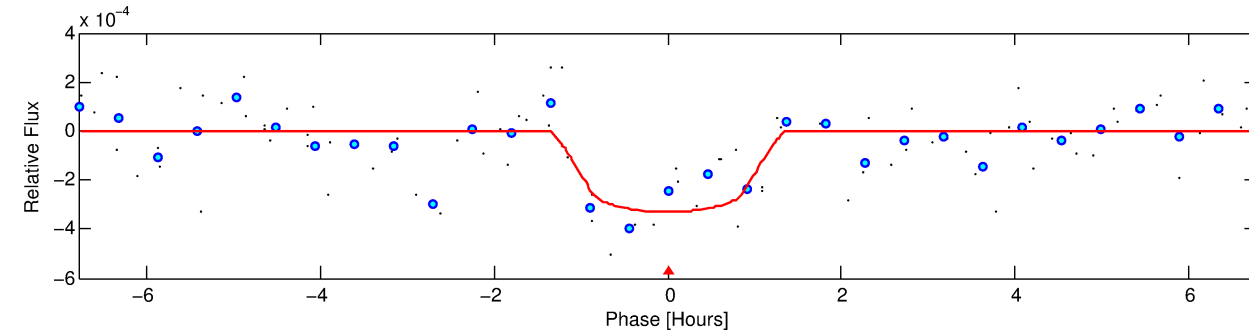
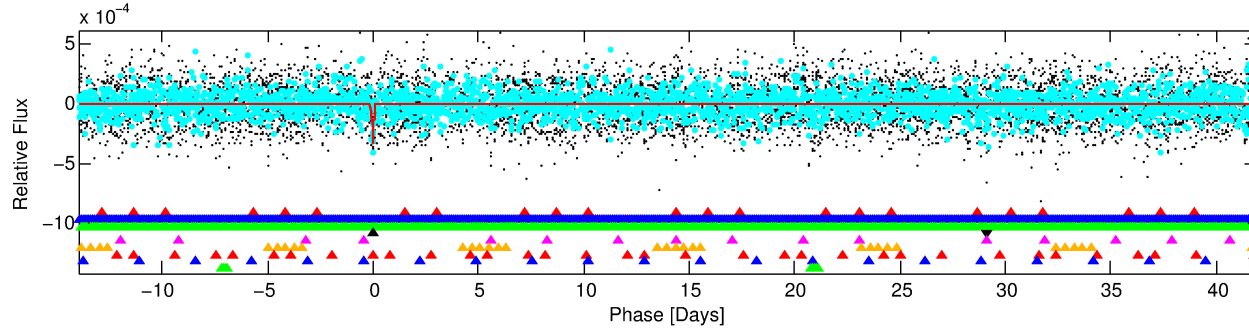
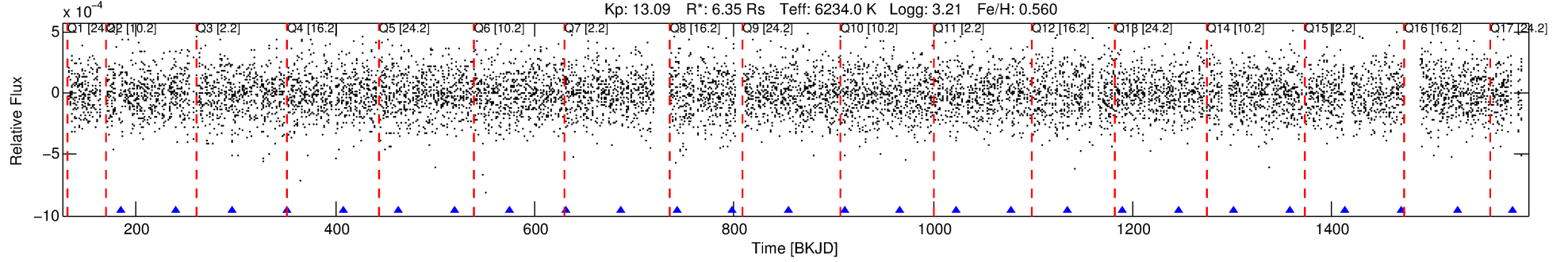
No Significant Match Found

# DV One-Page Summary

KIC: 9111849 Candidate: 4 of 9 Period: 55.896 d

KOI: K02042 Corr: No Ephemeris Match

Kp: 13.09 R\*: 6.35 Rs Teff: 6234.0 K Logg: 3.21 Fe/H: 0.560



## DV Fit Results:

Period = 55.89608 [0.00087] d  
Epoch = 184.0954 [0.0079] BKJD  
Rp/R\* = 0.0175 [0.0478]  
a/R\* = 151.53 [2012.17]  
b = 0.62 [13.07]  
Seff = 373.95 [291.56]  
Teq = 1121 [219] K  
Rp = 12.11 [33.72] Re  
a = 0.3822 [0.1852] AU  
Ag = 98.72 [547.34] [0.18σ]  
Teffp = 5465 [7500] K [0.58σ]

## DV Diagnostic Results:

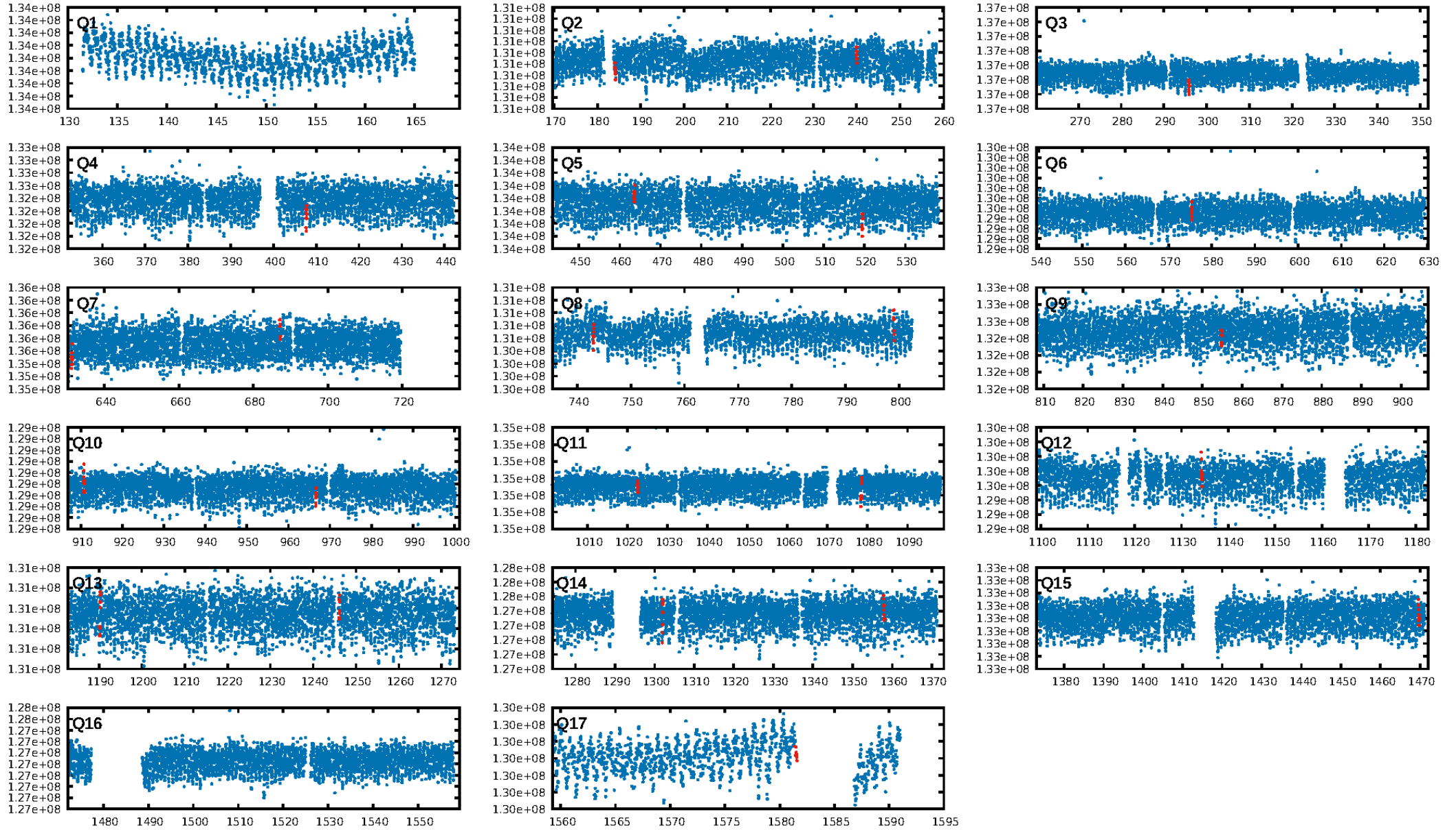
ShortPeriod-sig: 100.0% [53.92σ]  
LongPeriod-sig: 100.0% [40.55σ]  
ModelChiSquare2-sig: 2.5%  
ModelChiSquareGof-sig: 90.7%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -6.781  
Centroid-sig: 43.3%  
Centroid-so: 0.847 arcsec [1.17σ]  
OotOffset-rm: 0.486 arcsec [0.62σ]  
KicOffset-rm: 0.568 arcsec [0.76σ]  
OotOffset-st: 4/3/3/3 [13]  
KicOffset-st: 4/3/3/3 [13]  
DiffImageQuality-fgm: 0.38 [5/13]  
DiffImageOverlap-fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:45:02 Z

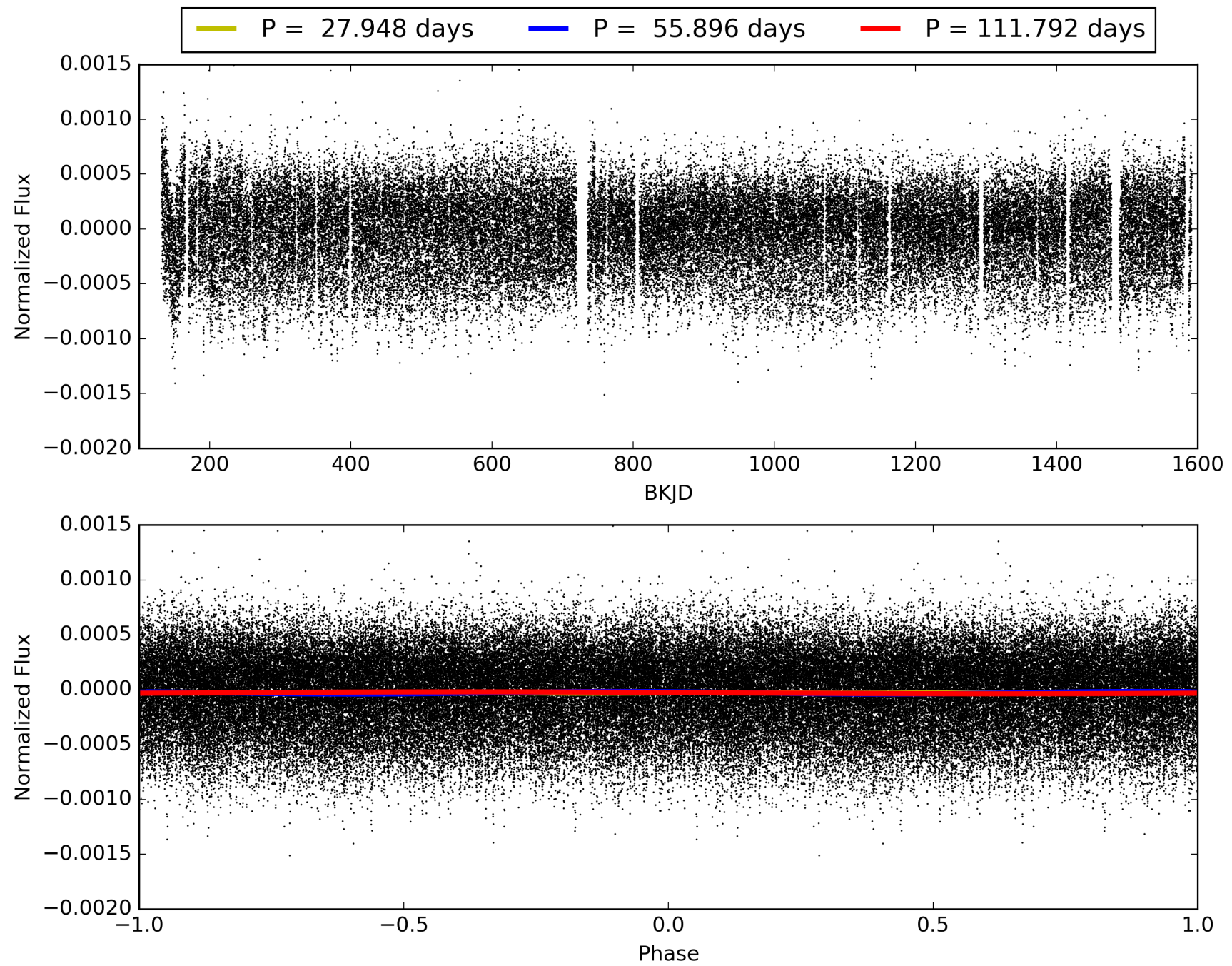
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 009111849-04, PDC Light Curves

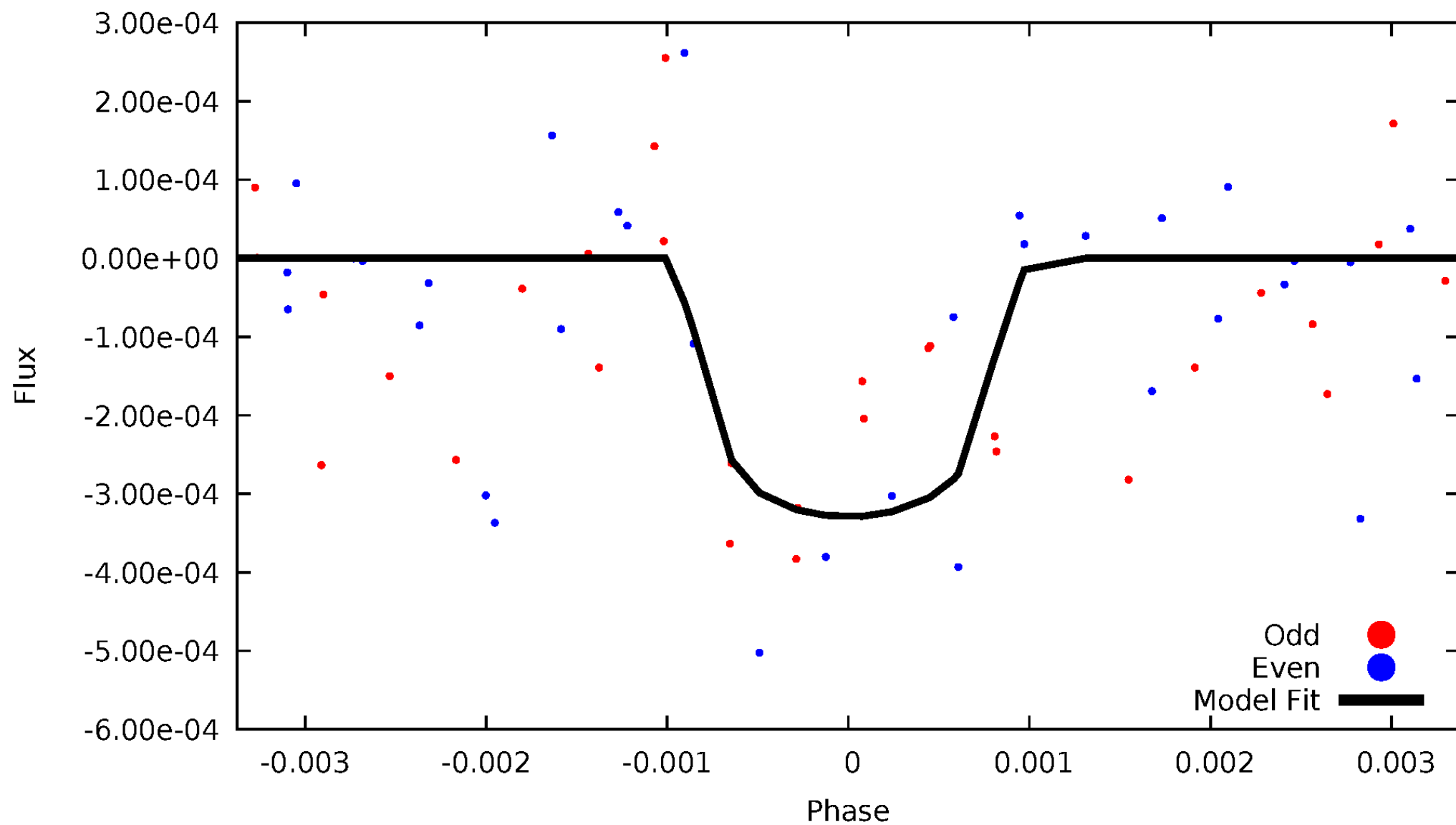


# TCE 009111849-04



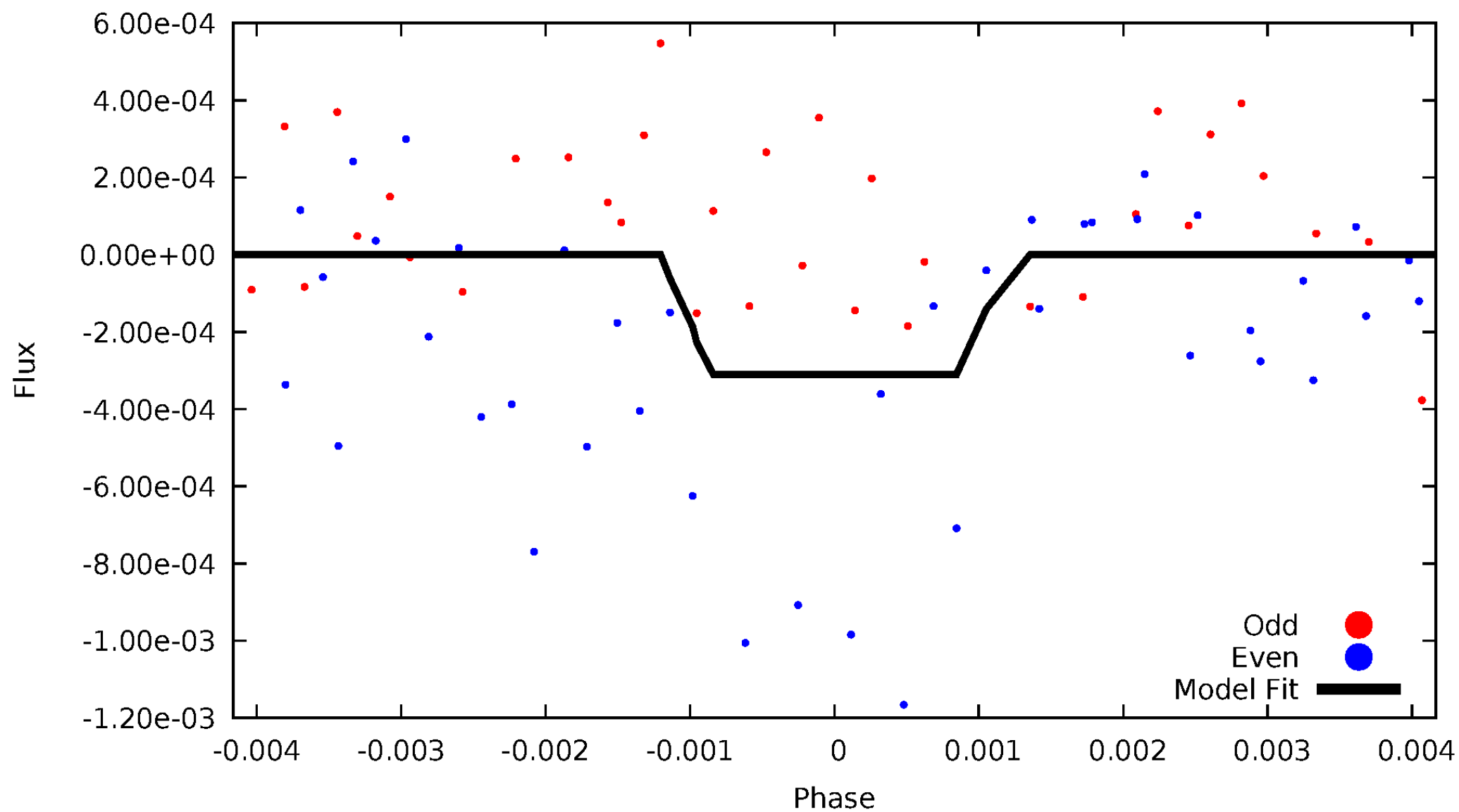
# DV Odd/Even

TCE 009111849-04



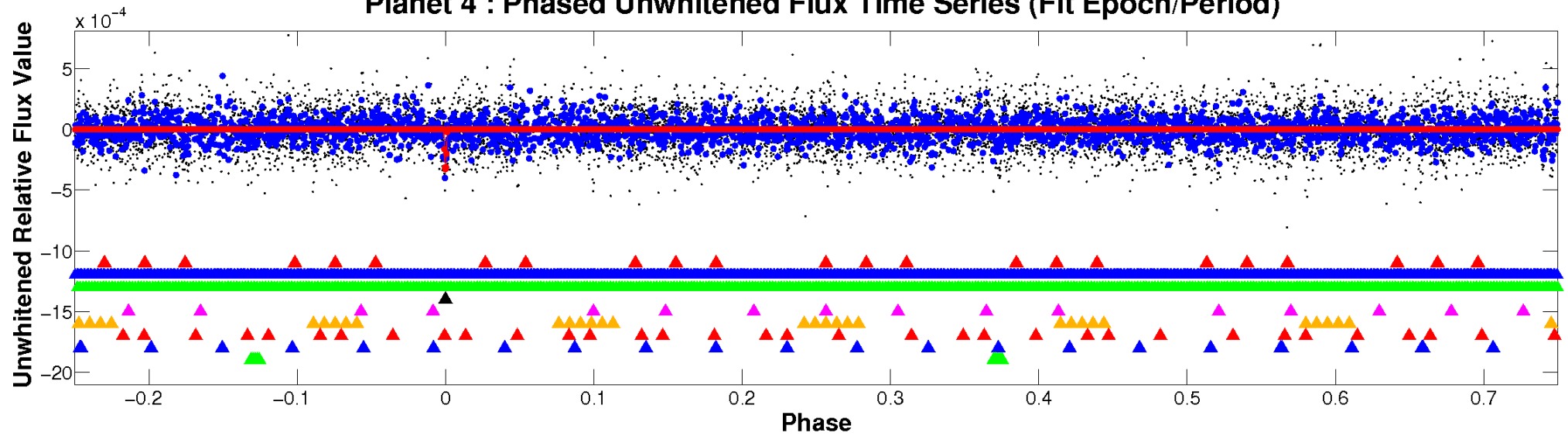
# ALT Odd/Even

TCE 009111849-04

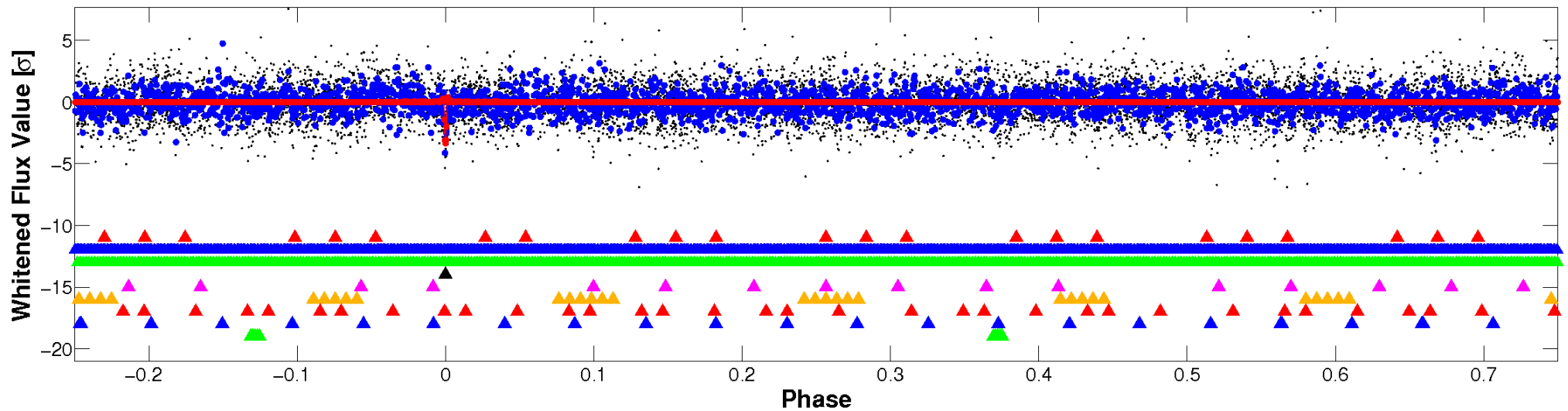


# Non-Whitened Vs. Whitened Light Curve

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

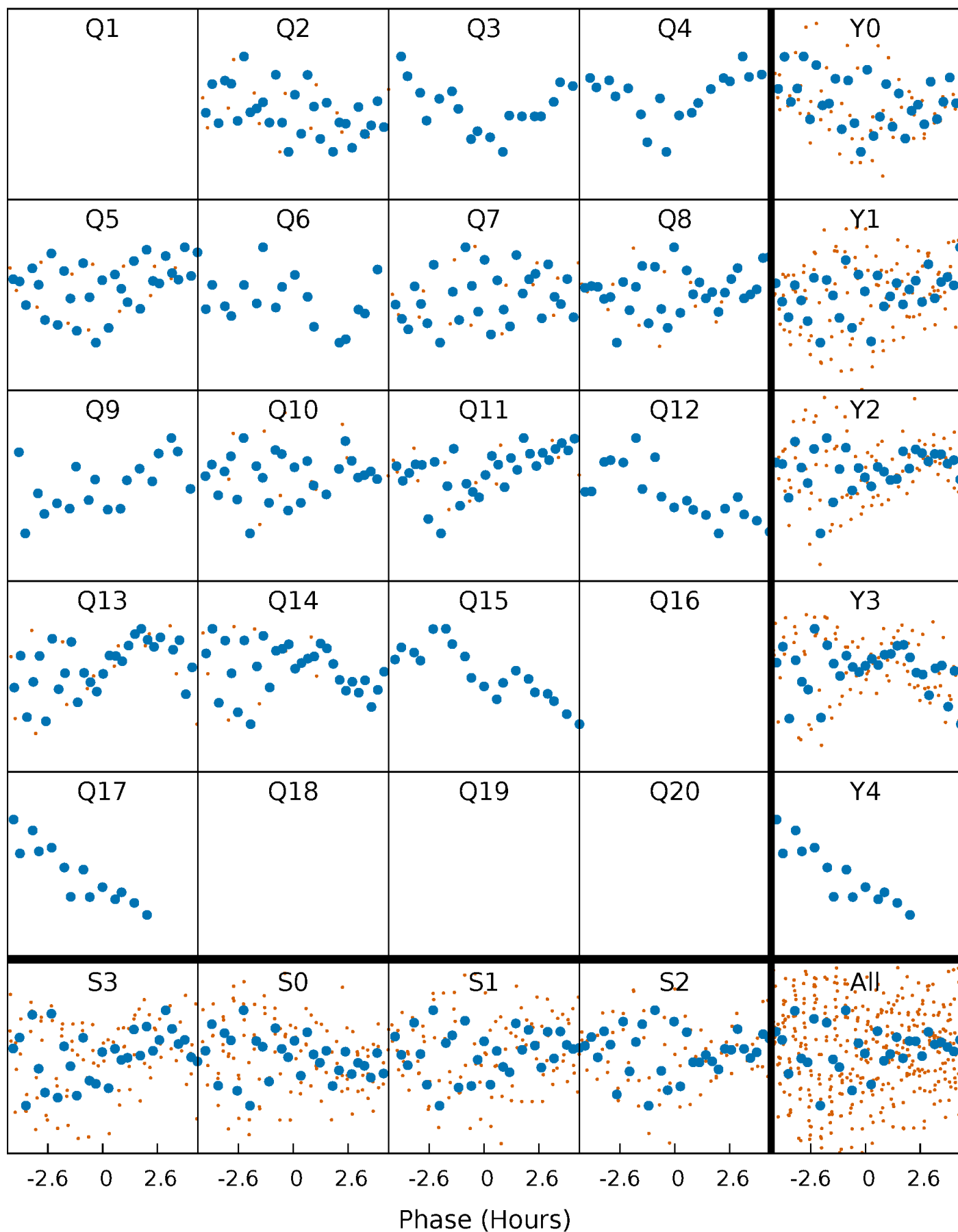


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

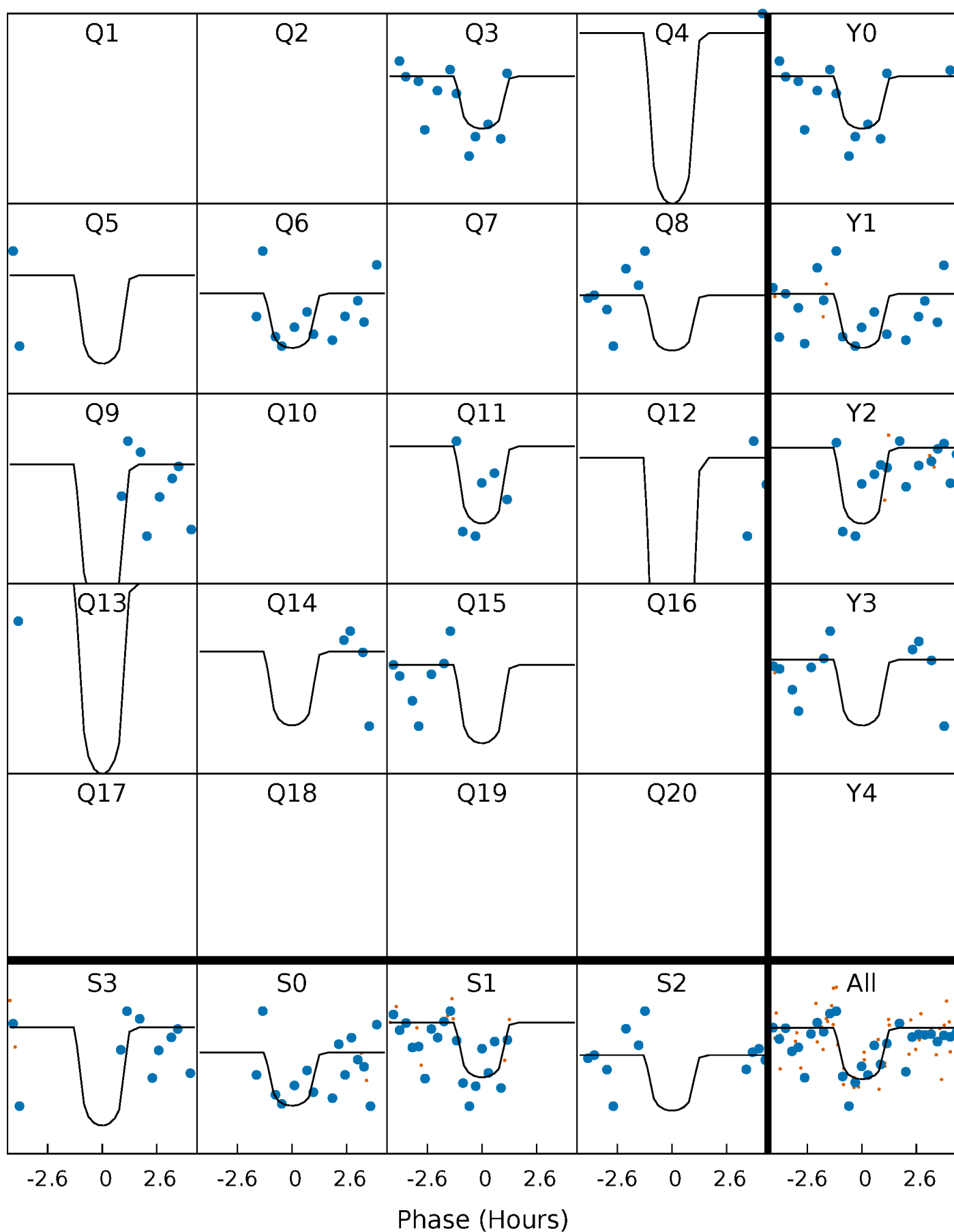
TCE 009111849-04 P= 55.896078 Days  $T_0=184.095431$  (BKJD)





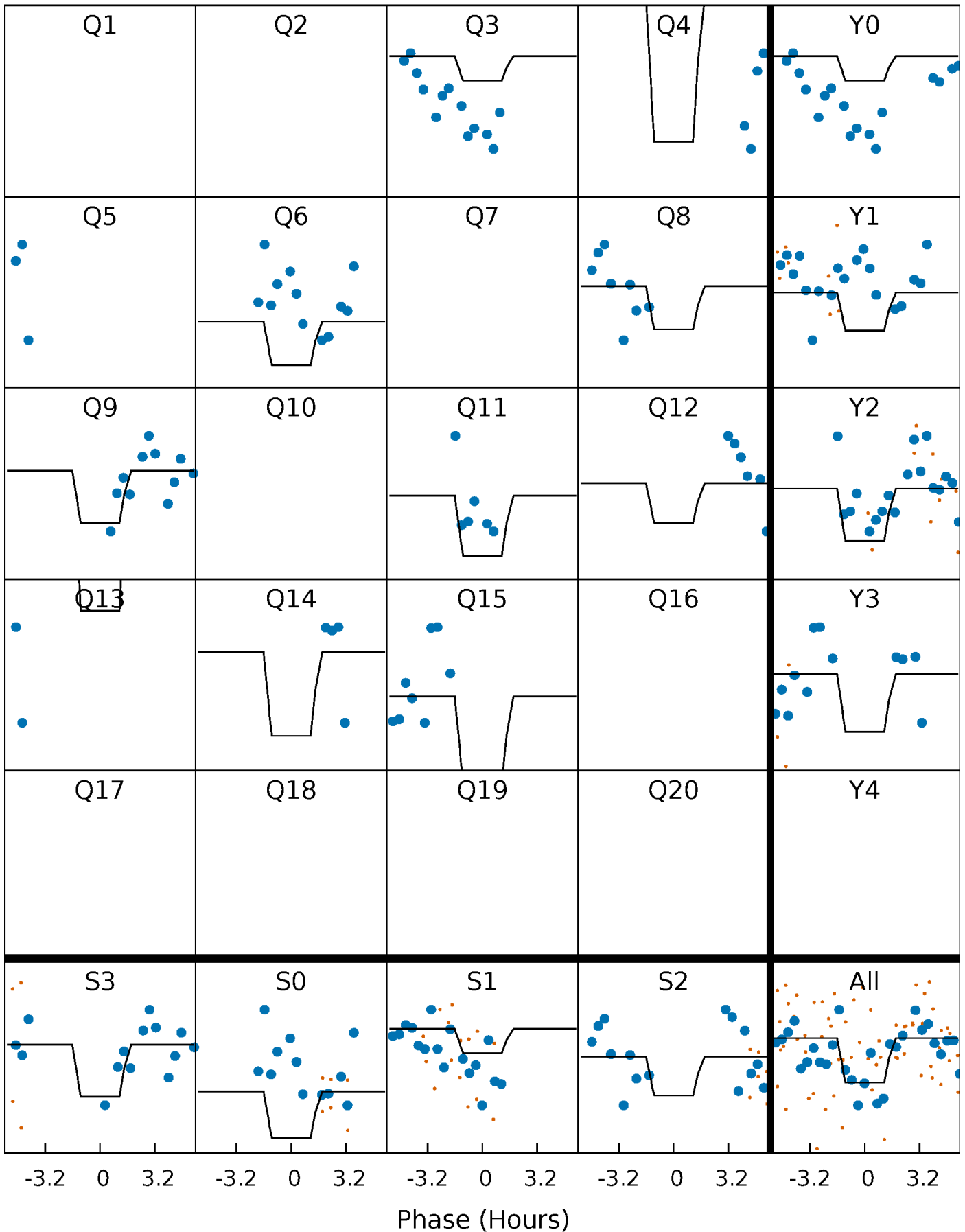
# DV Quarter-Phased Transit Curves

TCE 009111849-04 P= 55.896078 Days  $T_0=184.095431$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

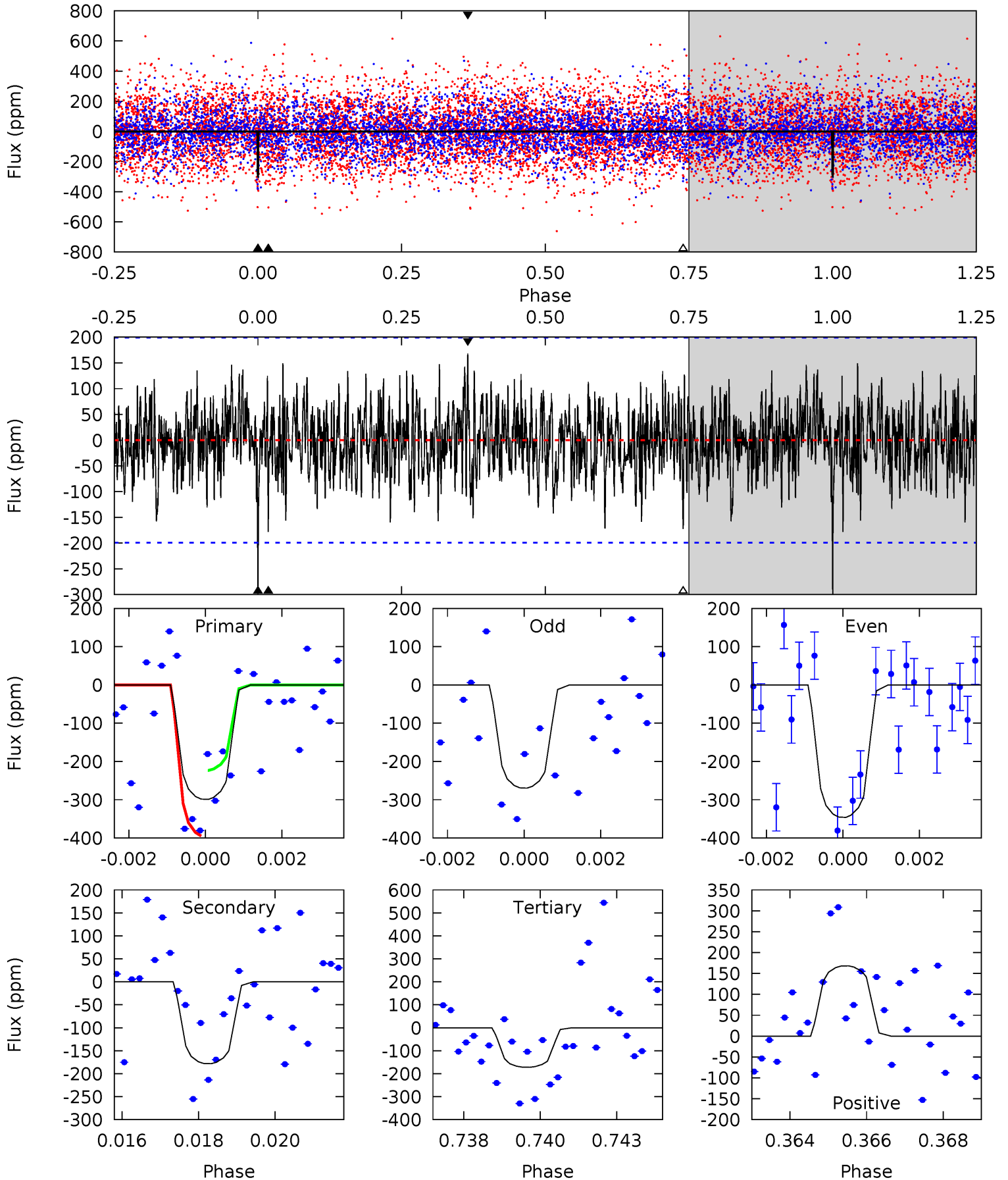
TCE 009111849-04 P= 55.896819 Days  $T_0=184.101060$  (BKJD)



# DV Model-Shift Uniqueness Test

009111849-04, P = 55.896078 Days, E = 128.199353 Days

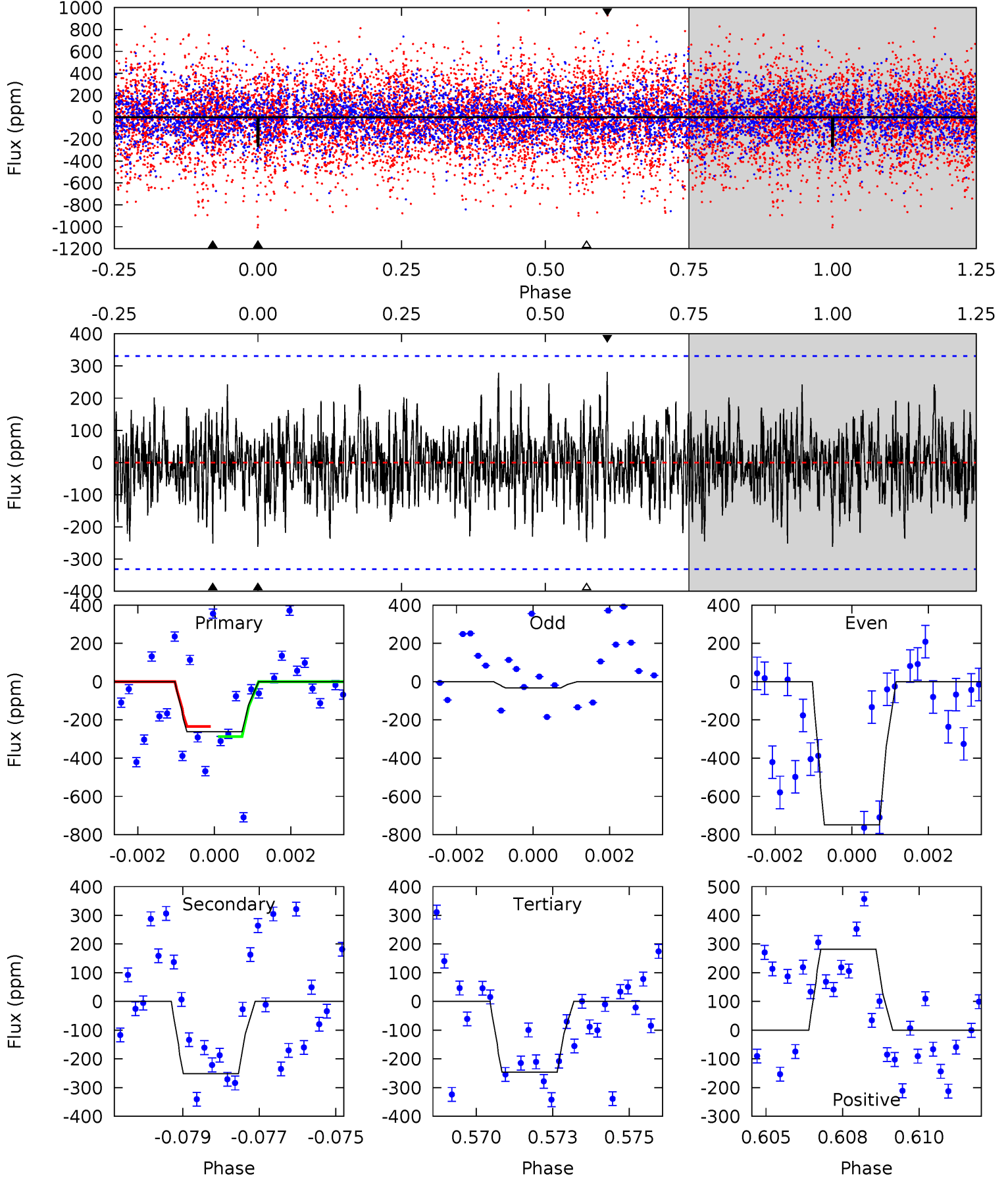
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.97	4.75	4.59	4.48	5.31	3.06	1.42	3.38	3.49	0.16	0.27	1.02	0.96	0.36	2.22



# Alt Model-Shift Uniqueness Test

009111849-04, P = 55.896819 Days, E = 128.204241 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.18	4.02	3.94	4.50	5.30	3.04	1.28	0.24	-0.33	0.08	-0.49	5.83	1.57	0.52	0.43



### Stellar Parameters For KIC 009111849

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6234^{+74}_{-74}$	$3.209^{+0.458}_{-0.122}$	$0.560^{+0.050}_{-0.100}$	$6.354^{+1.590}_{-3.180}$	$2.382^{+0.277}_{-0.514}$	$0.013^{+0.056}_{-0.005}$
	+1%/-1%	+14%/-4%	+9%/-18%	+25%/-50%	+12%/-22%	+431%/-35%
Source	SPE90	FLK73	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009111849-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-178 \pm 38$	$24.40^{+26.86}_{-16.52}$	$1535^{+108}_{-187}$	$3926^{+2636}_{-774}$	$23^{+224}_{-18}$
Alt.	$-251 \pm 62$	$23.80^{+26.61}_{-16.84}$	$1519^{+114}_{-186}$	$4170^{+3158}_{-855}$	$34^{+366}_{-26}$

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

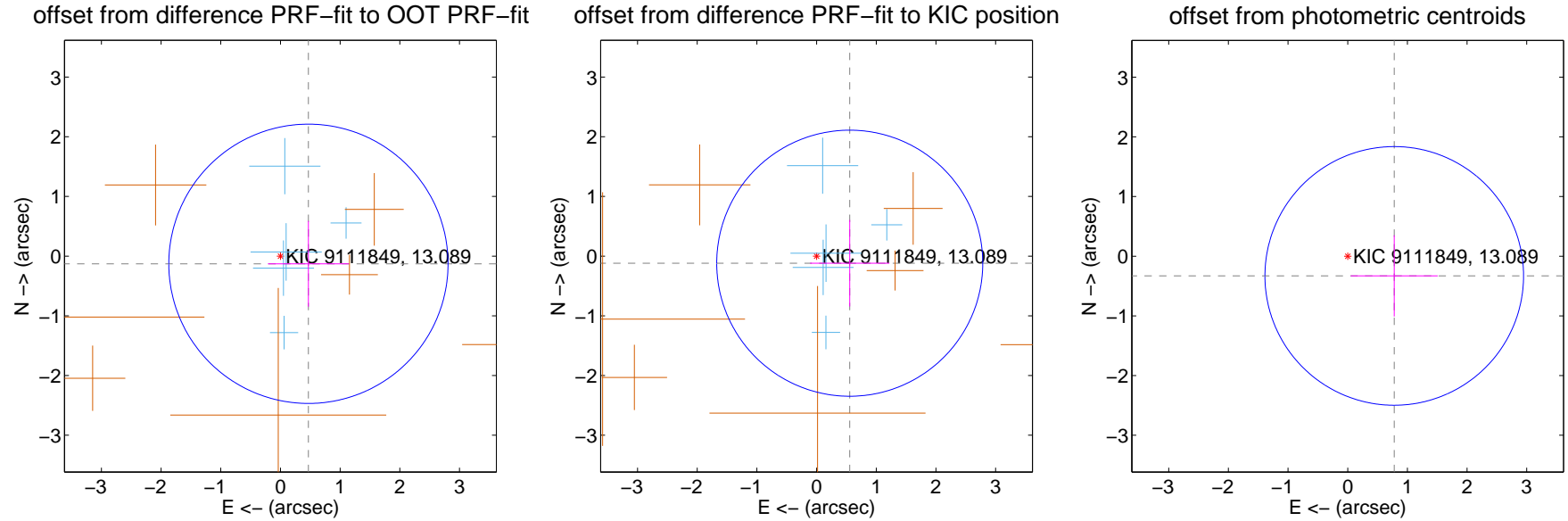
## DV Centroid Data

Supplemental centroid analysis for 009111849-04. Kepler magnitude: 13.09. Transit SNR 10.77

There are 5 quarters with good PRF difference image offsets

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

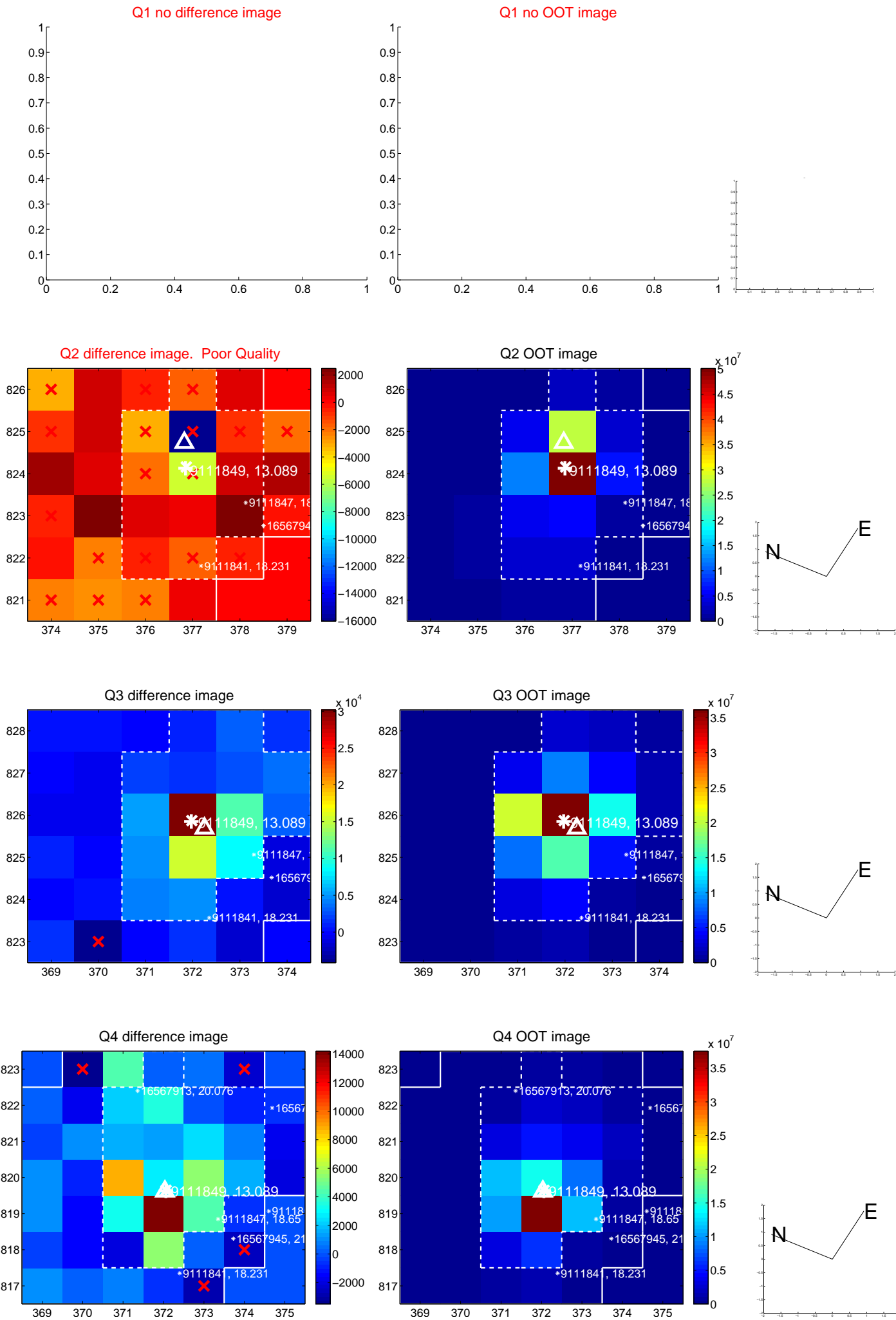
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.486 \pm 0.780$	0.62	$-0.469 \pm 0.679$	$-0.128 \pm 0.718$
PRF-fit source offset from KIC position	$0.568 \pm 0.743$	0.76	$-0.555 \pm 0.665$	$-0.119 \pm 0.725$
photometric centroid source offset	$0.85 \pm 0.72$	1.17	$-0.78 \pm 0.73$	$-0.33 \pm 0.68$



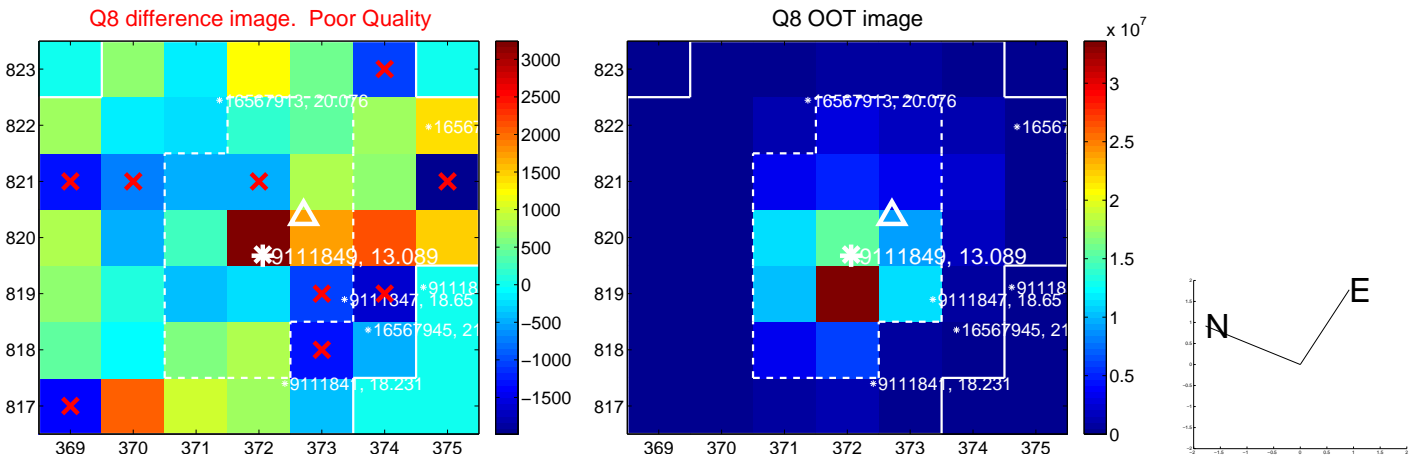
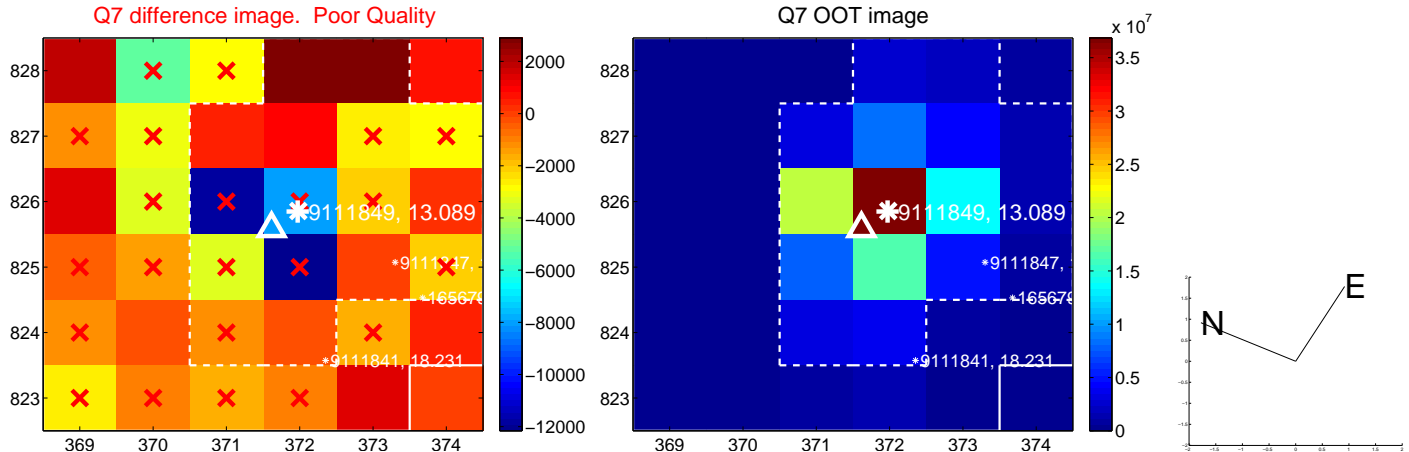
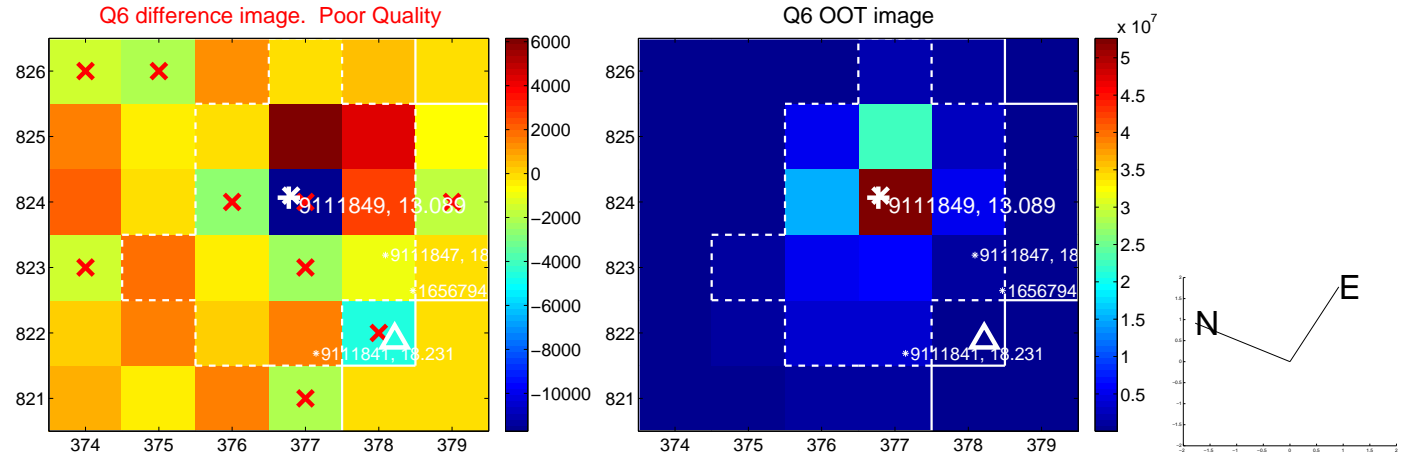
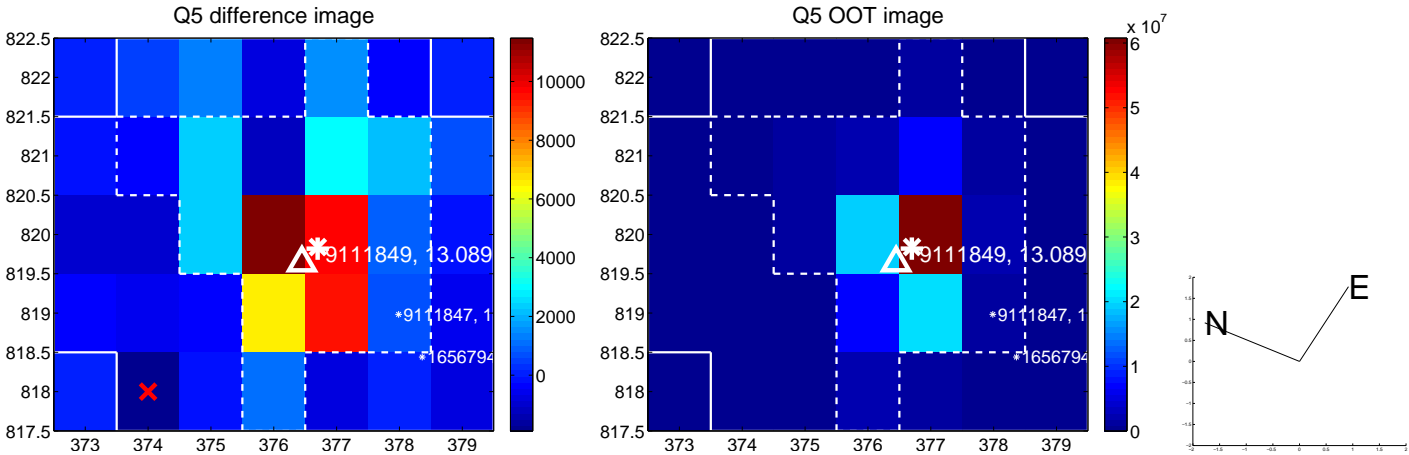
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



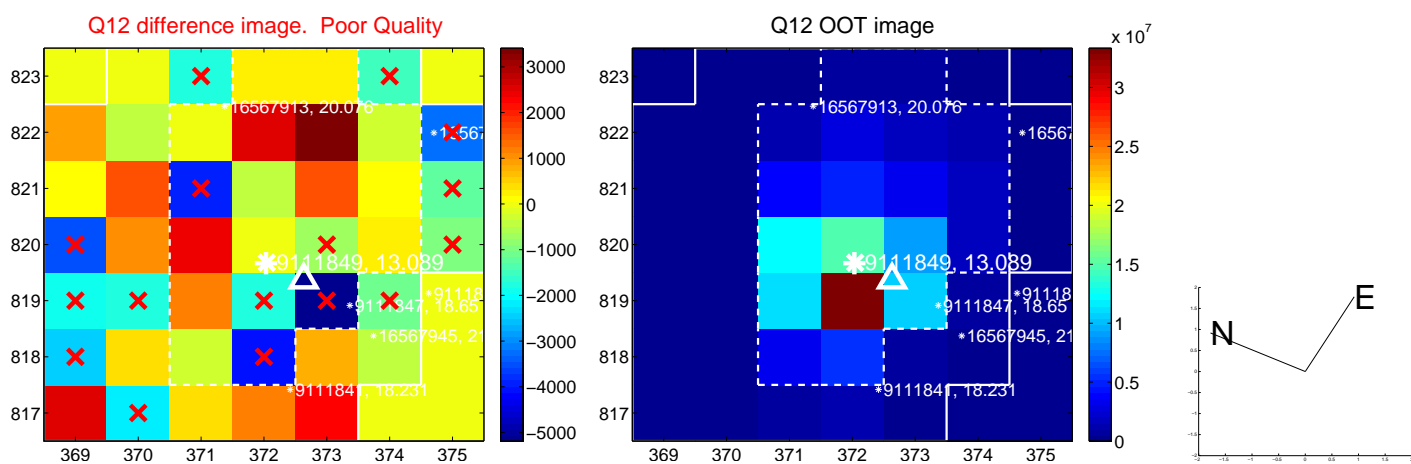
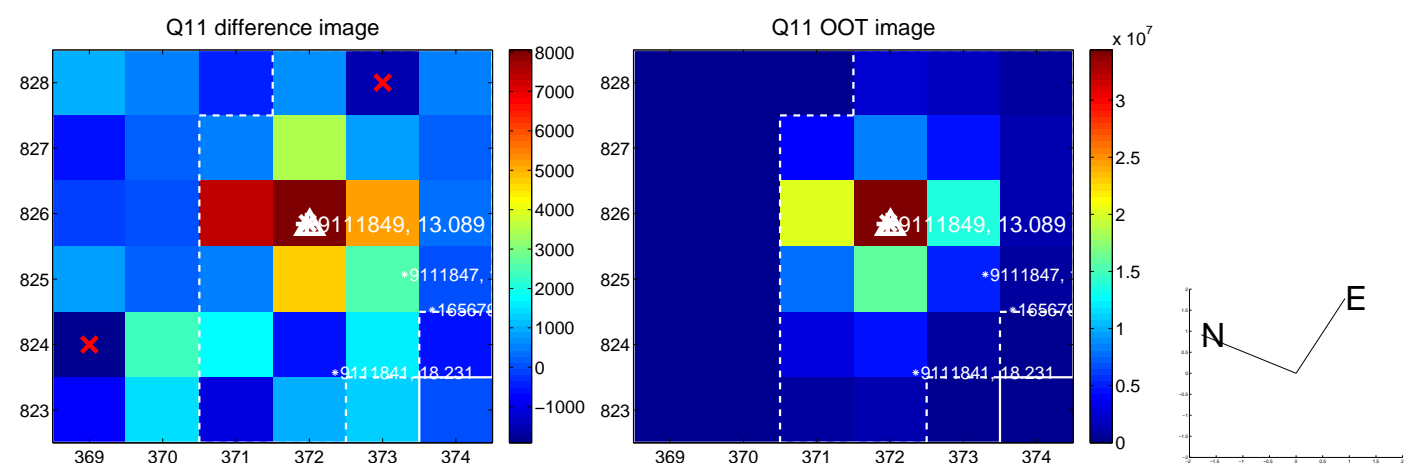
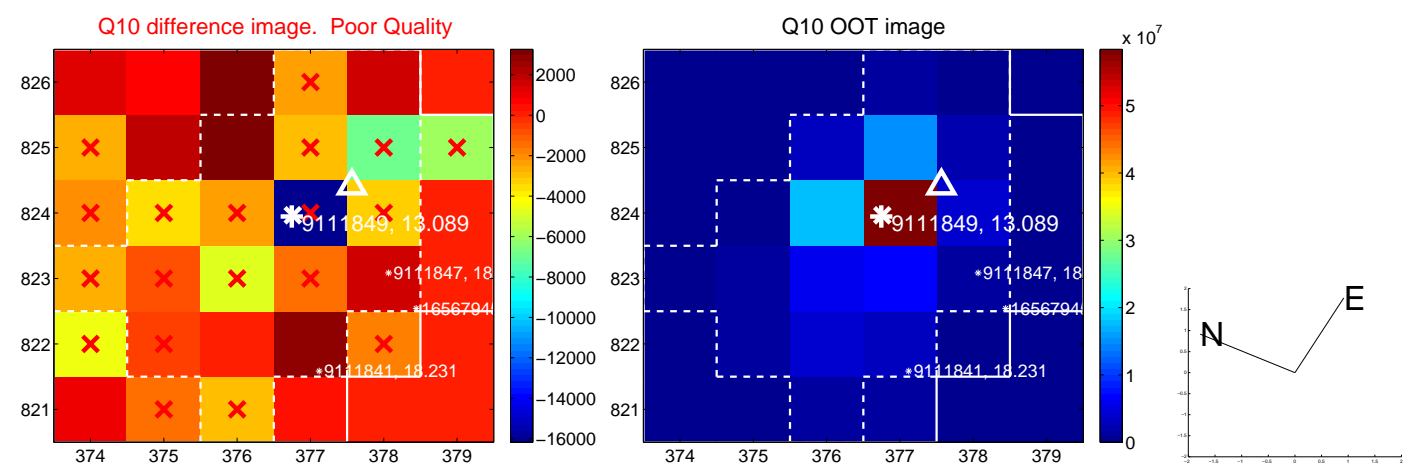
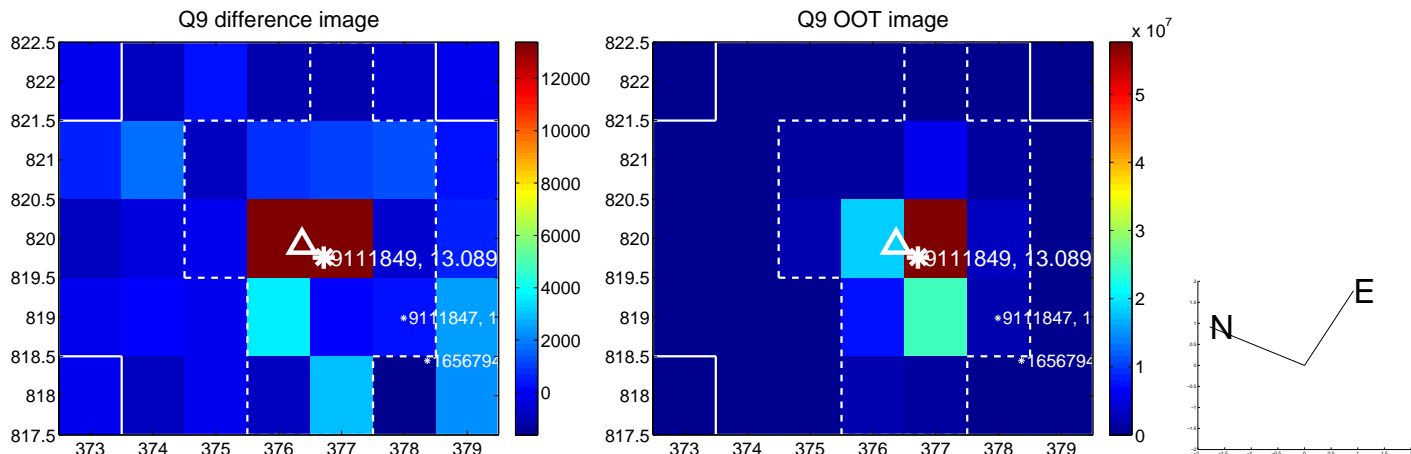
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



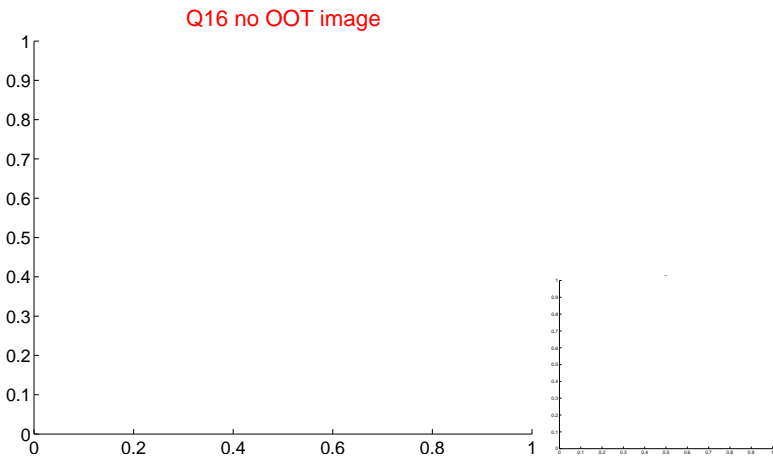
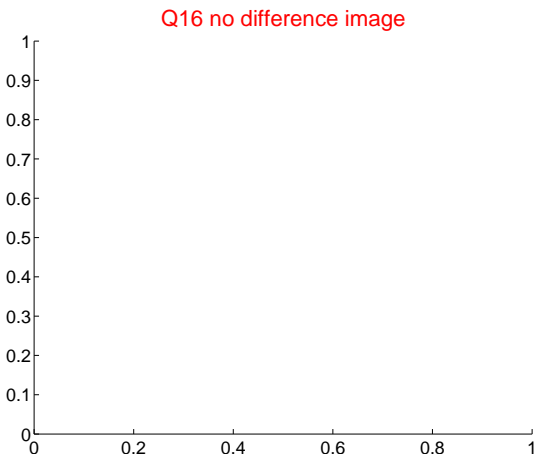
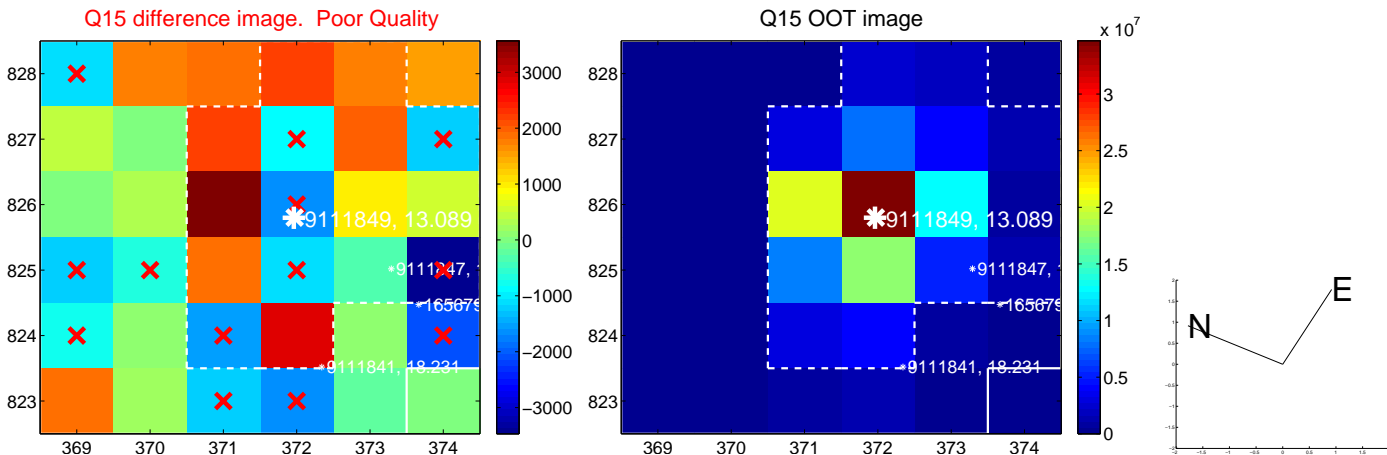
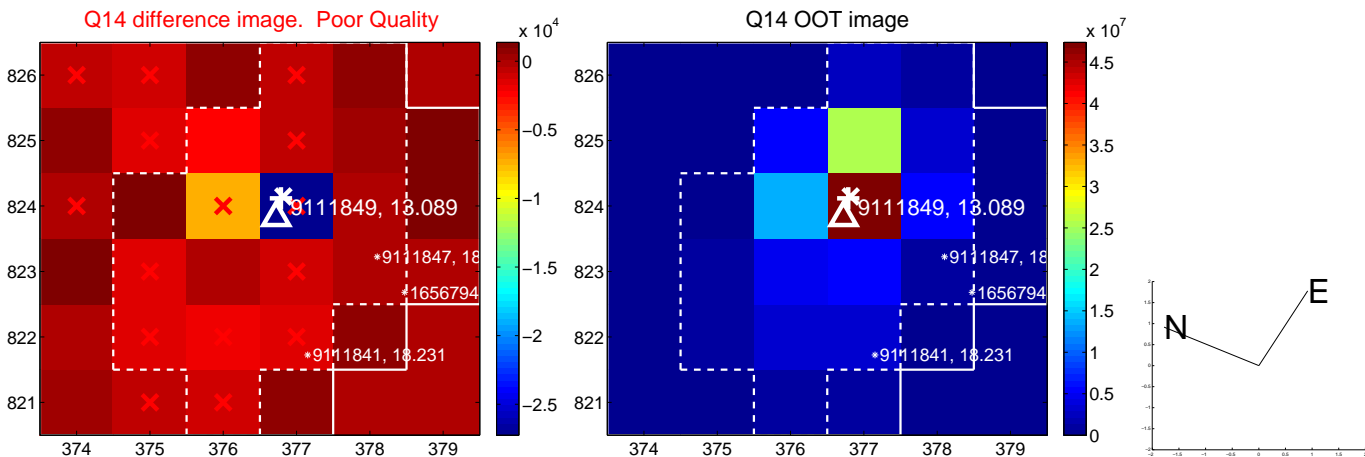
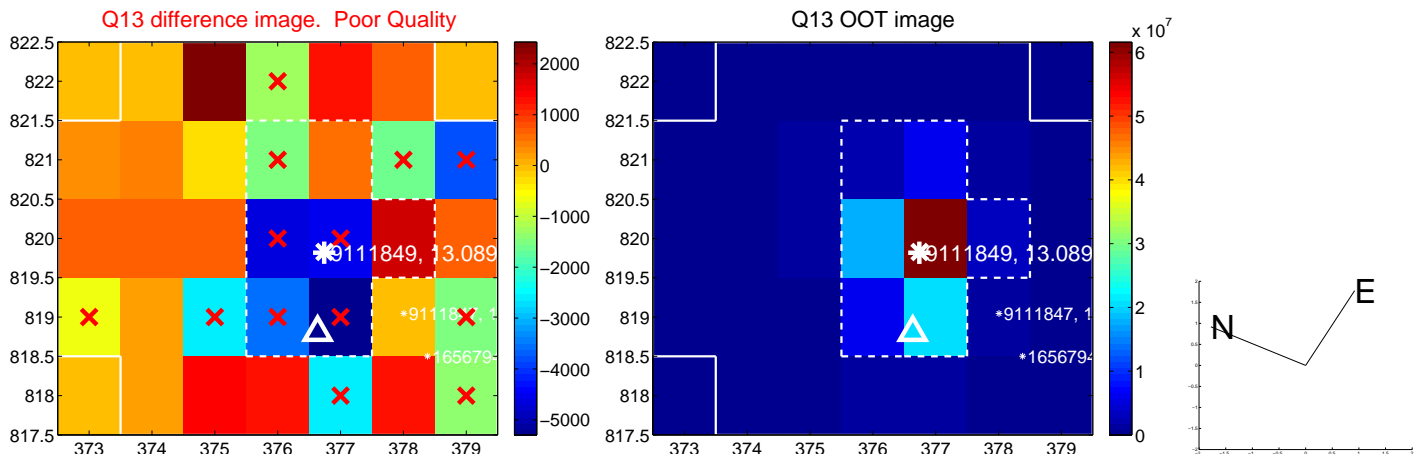
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



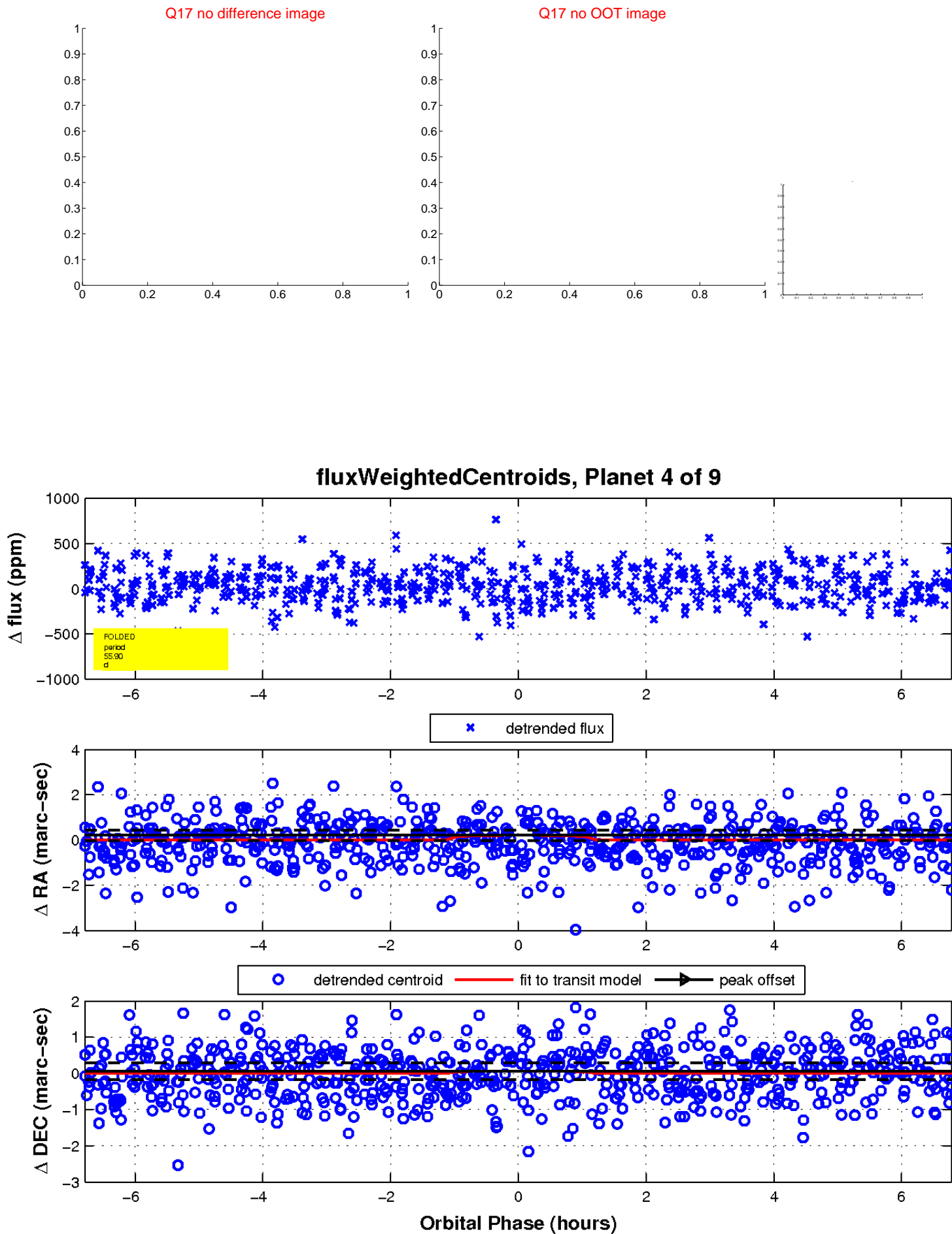
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

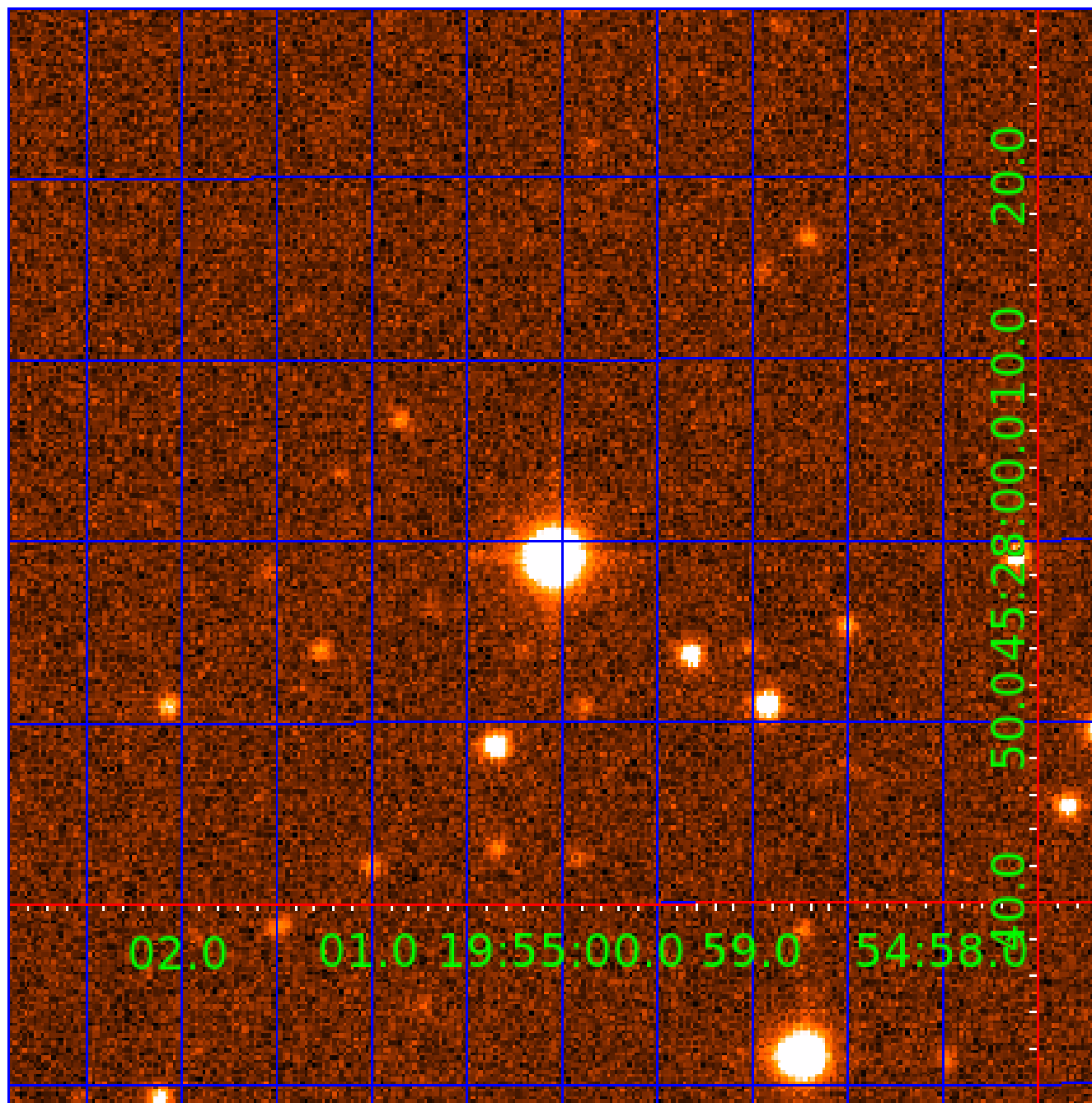


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 009111849

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009111849-01	OBS	2042.01	63.073086	191.255585	636.8	5.503	35.4	36.2	6.35	6234	17.84	318.32
009111849-02	OBS	No	0.879308	131.635994	290.7	1.500	8.5	-1.0	6.35	6234	10.84	94872.03
009111849-03	OBS	No	1.419233	131.903611	19.1	9.134	8.3	8.7	6.35	6234	2.77	50109.64
009111849-04	OBS	No	55.896078	184.095431	329.3	2.264	11.0	10.8	6.35	6234	12.11	373.95
009111849-05	OBS	No	88.224588	219.286101	366.2	2.176	9.6	10.6	6.35	6234	13.81	203.49
009111849-06	OBS	No	46.648185	141.719773	221.1	3.438	10.1	9.2	6.35	6234	11.02	475.93
009111849-07	OBS	No	43.779139	132.854579	271.3	2.527	9.1	8.9	6.35	6234	12.31	517.97
009111849-08	OBS	No	61.217340	159.721819	272.7	2.190	8.4	8.4	6.35	6234	11.82	331.25
009111849-09	OBS	No	139.780377	232.656851	366.1	2.500	8.3	-1.0	6.35	6234	12.13	110.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009111849-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009111849-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS
009111849-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009111849-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009111849-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009111849-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

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

Ephemeris Match Information For 009111849-05

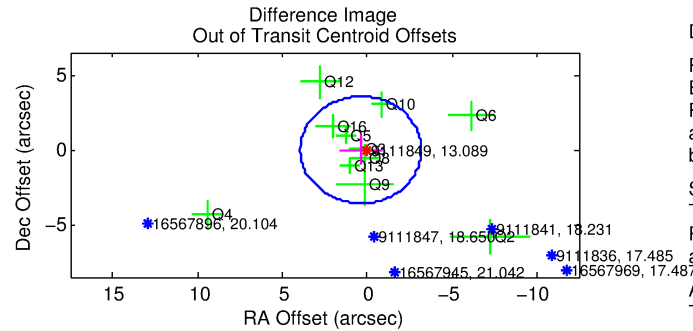
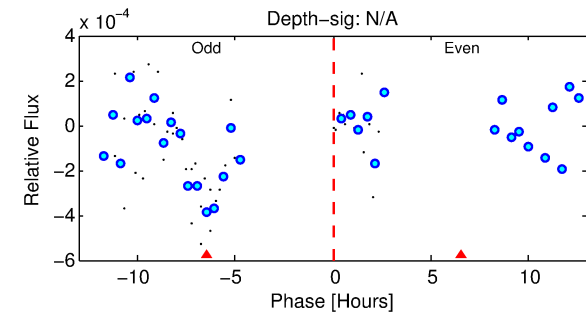
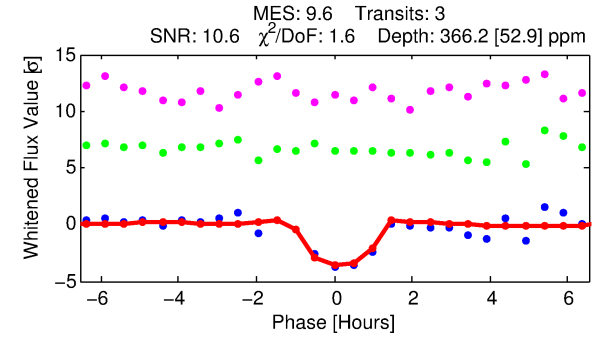
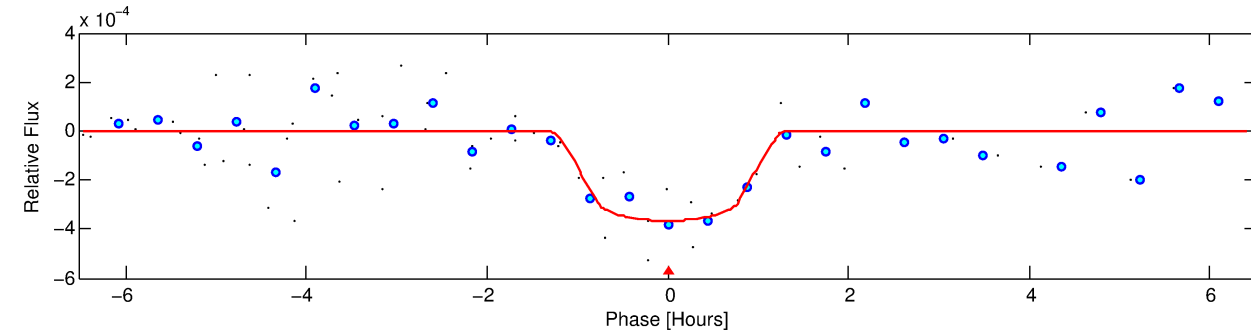
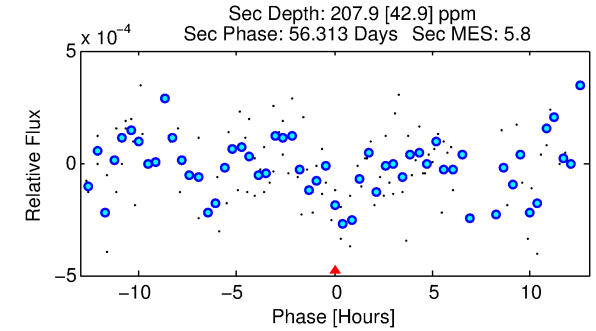
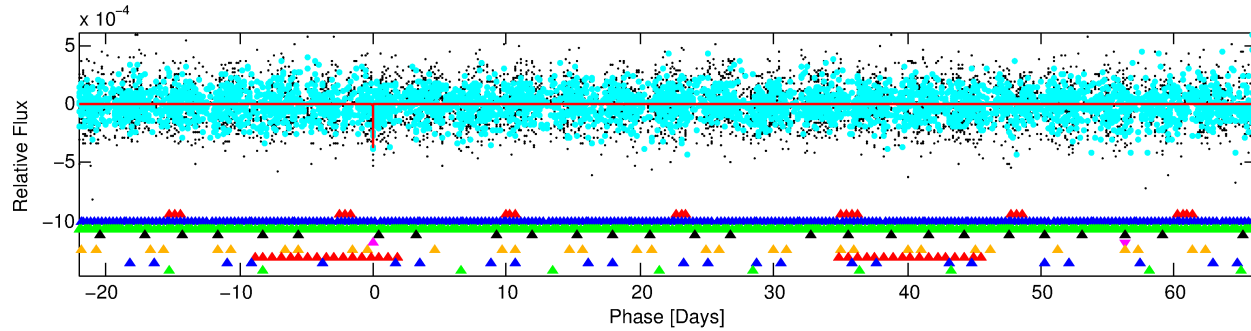
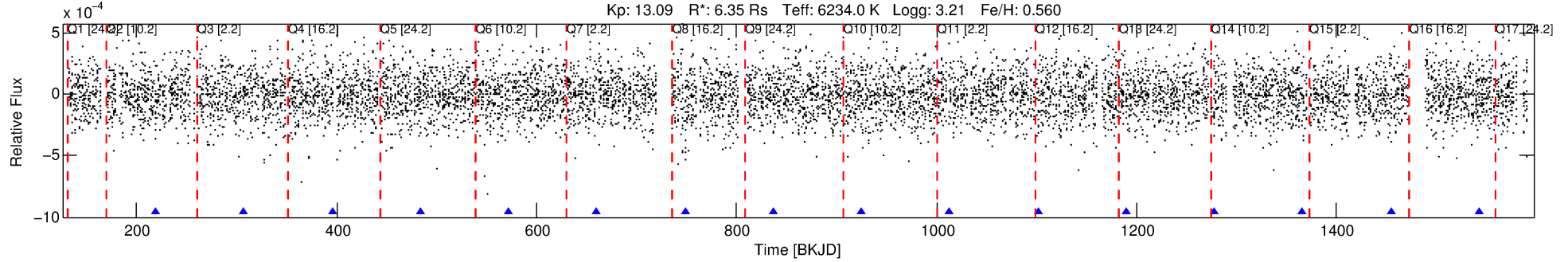
No Significant Match Found

# DV One-Page Summary

KIC: 9111849 Candidate: 5 of 9 Period: 88.225 d

KOI: K02042 Corr: No Ephemeris Match

Kp: 13.09 R\*: 6.35 Rs Teff: 6234.0 K Logg: 3.21 Fe/H: 0.560



## DV Fit Results:

Period = 88.22459 [0.00091] d  
Epoch = 219.2861 [0.0080] BKJD  
Rp/R\* = 0.0199 [0.0154]  
a/R\* = 175.76 [663.08]  
b = 0.85 [1.28]  
Seff = 203.49 [158.65]  
Teq = 963 [188] K  
Rp = 13.82 [12.74] Re  
a = 0.5181 [0.2511] AU  
Ag = 160.90 [280.84] [0.57σ]  
Teff = 5303 [2072] K [2.09σ]

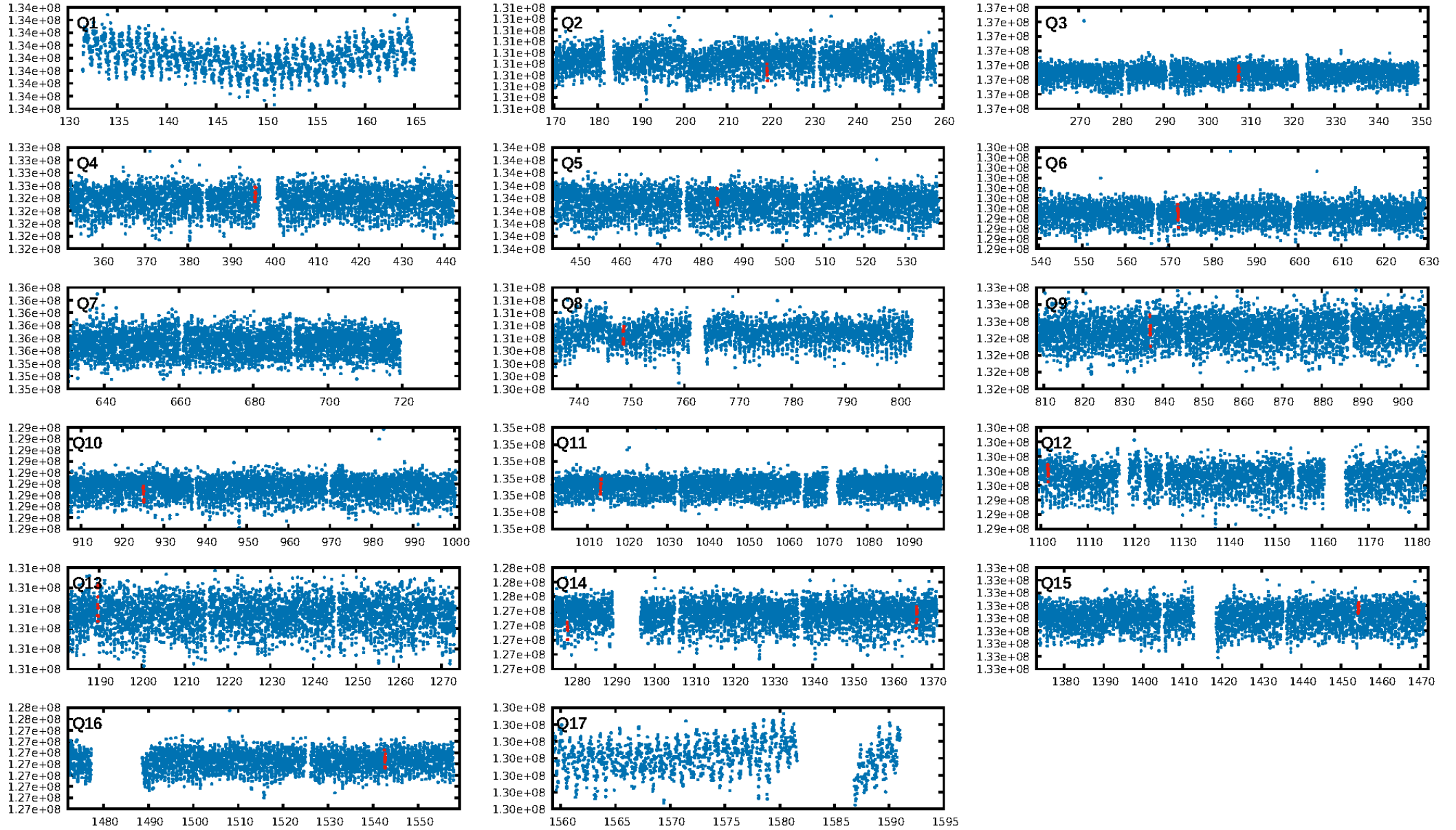
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [102.01σ]  
LongPeriod-sig: 100.0% [373.32σ]  
ModelChiSquare2-sig: 6.8%  
ModelChiSquareGof-sig: 86.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 1.202  
Centroid-sig: 52.4%  
Centroid-so: 0.397 arcsec [0.47σ]  
OotOffset-rm: 0.374 arcsec [0.31σ]  
KicOffset-rm: 0.299 arcsec [0.24σ]  
OotOffset-st: 3/1/4/3 [11]  
KicOffset-st: 3/1/4/3 [11]  
DiffImageQuality-fgm: 0.27 [3/11]  
DiffImageOverlap-fno: 0.00 [0/14]

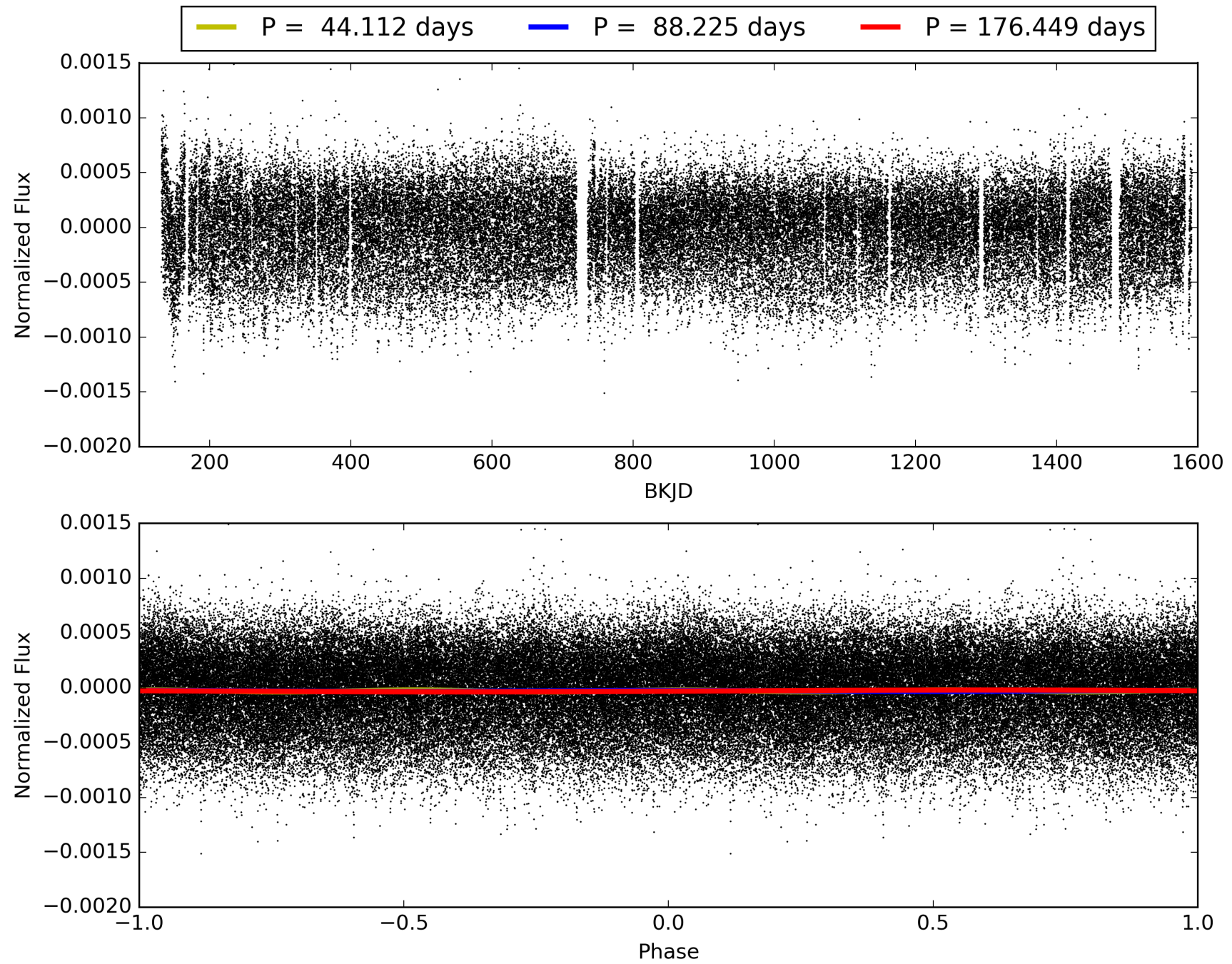
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:45:06 Z

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

# TCE 009111849-05, PDC Light Curves

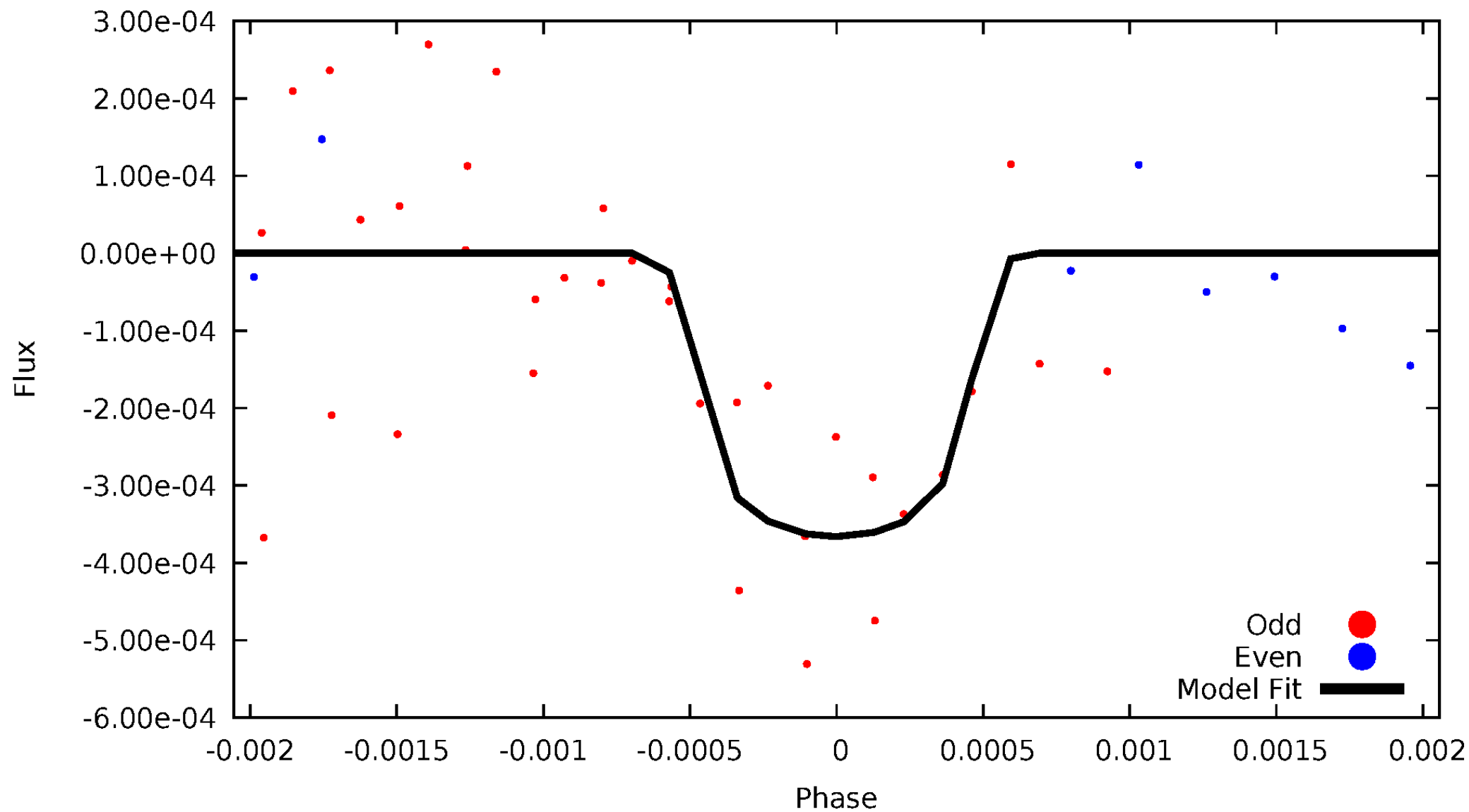


TCE 009111849-05



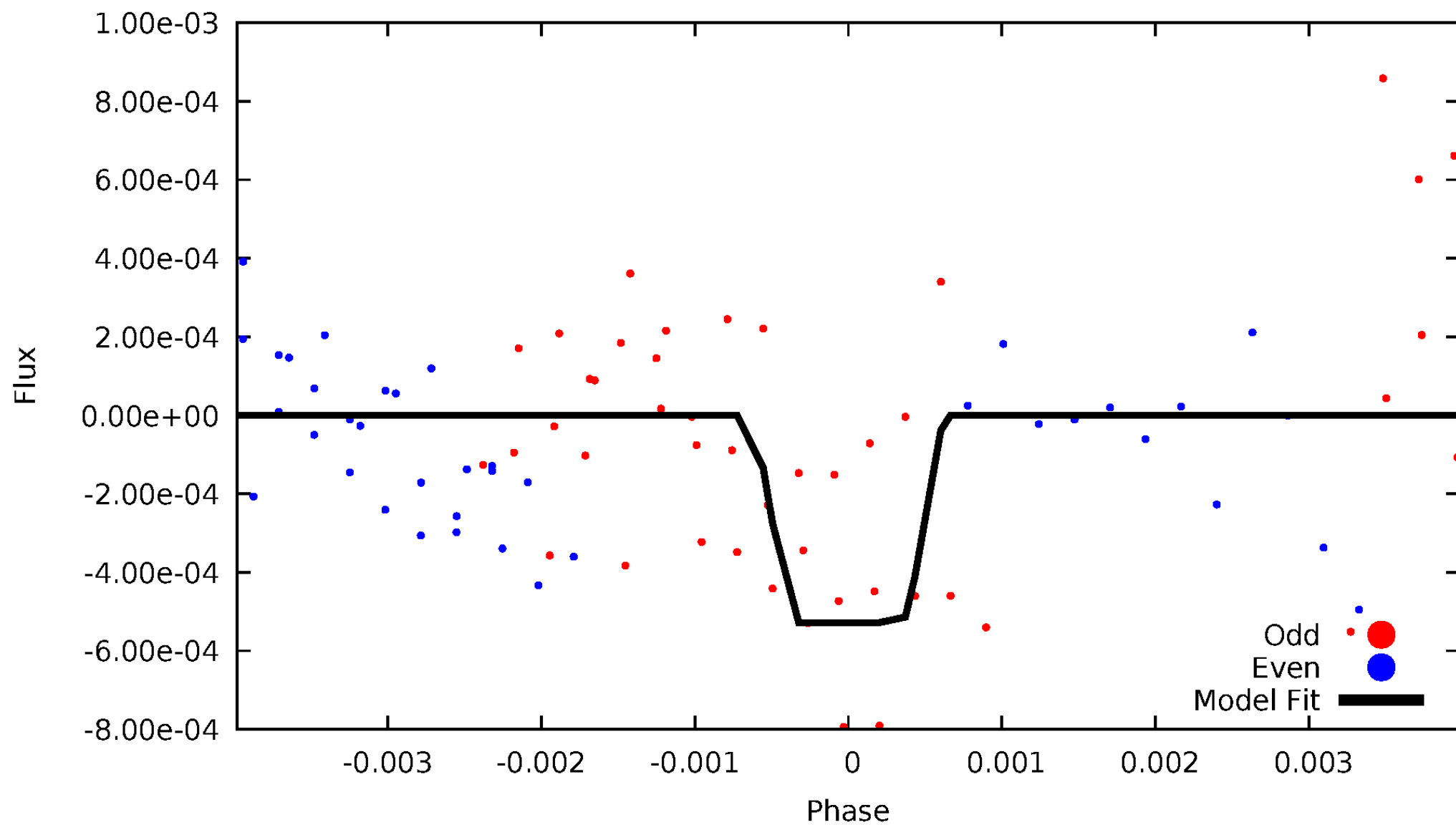
# DV Odd/Even

TCE 009111849-05



# ALT Odd/Even

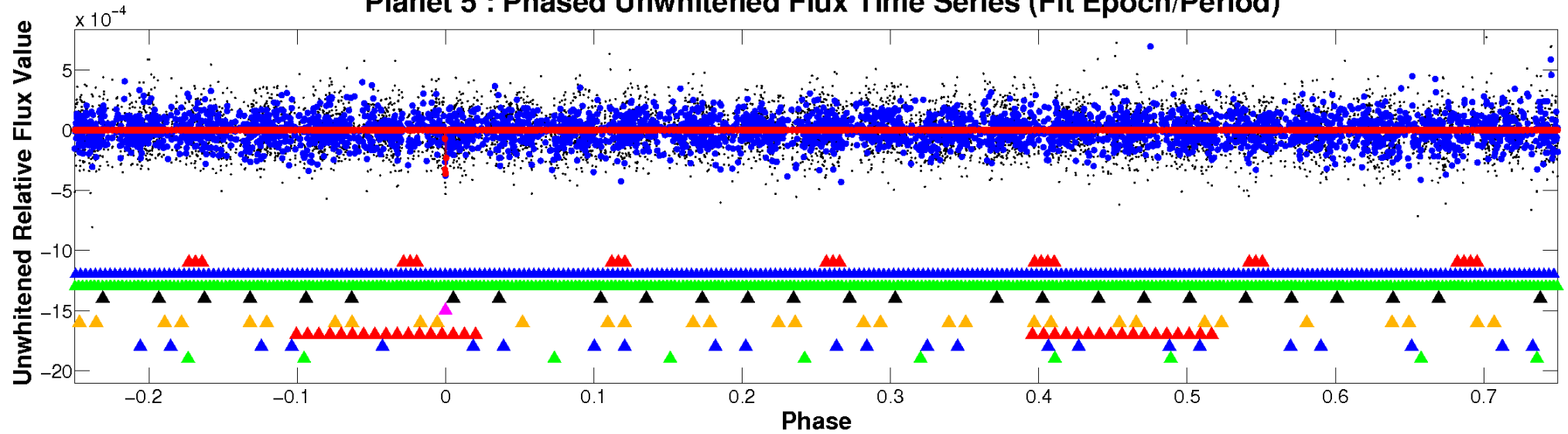
TCE 009111849-05



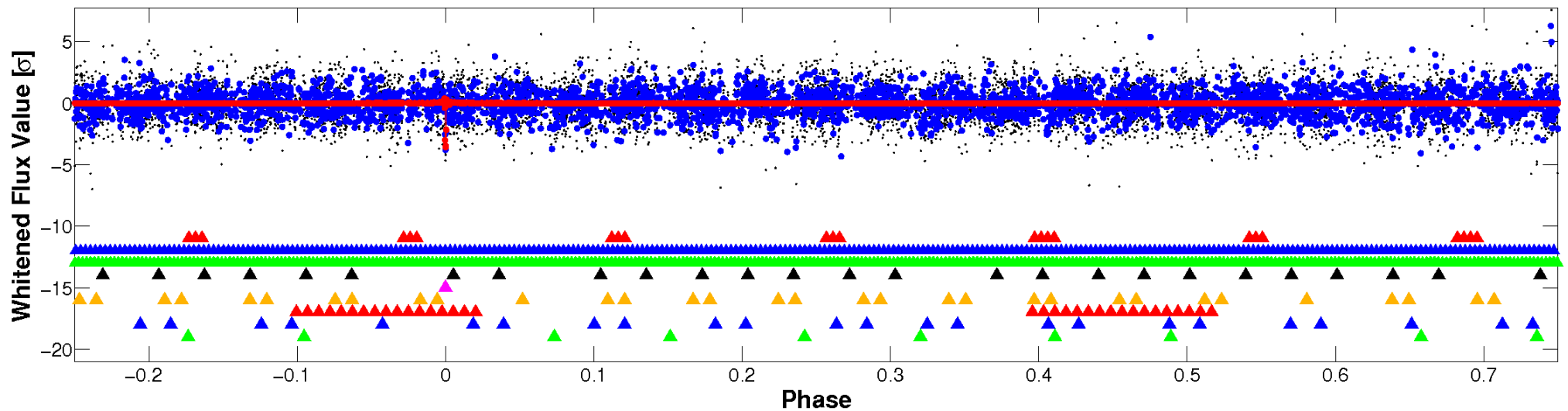


# Non-Whitened Vs. Whitened Light Curve

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

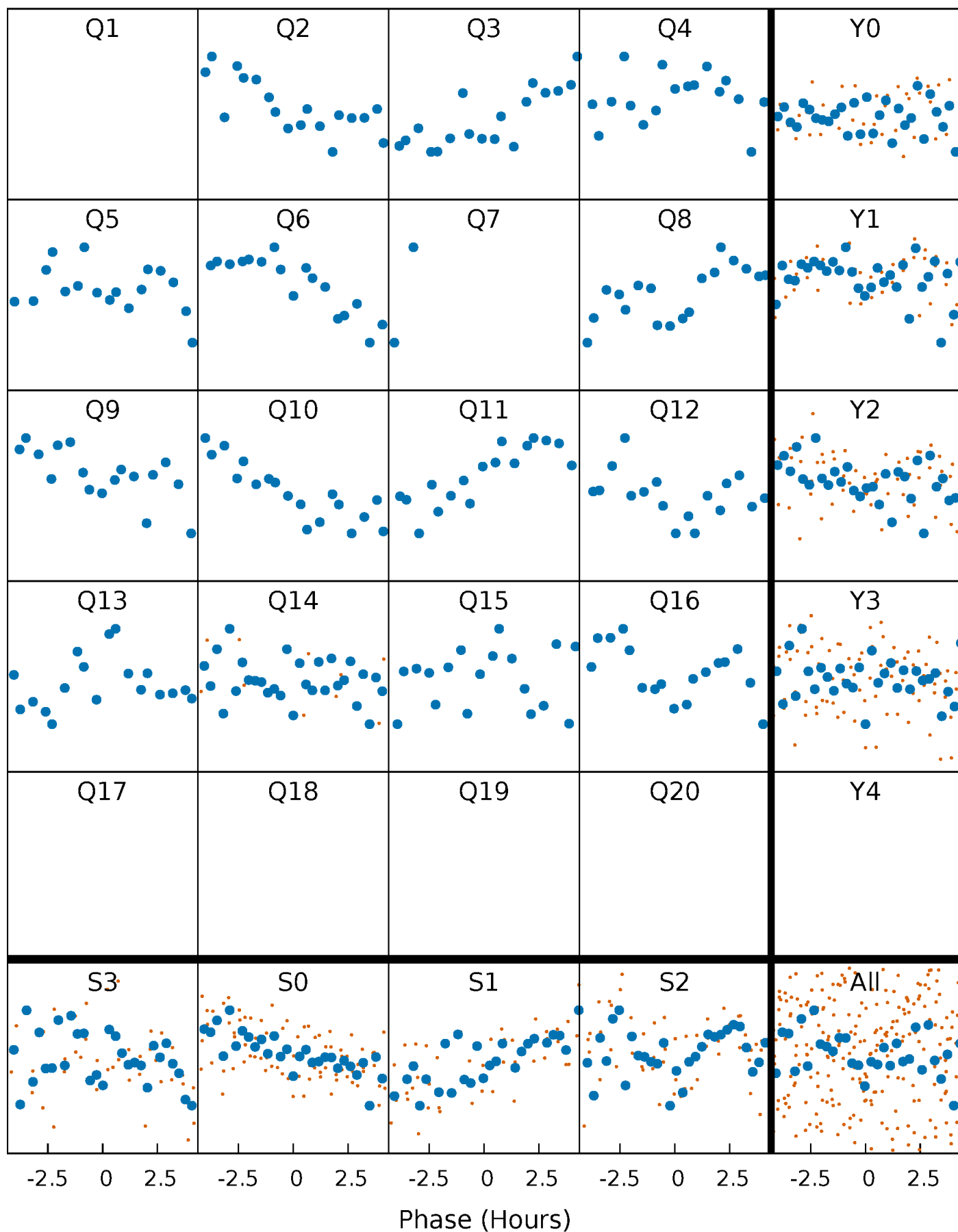


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



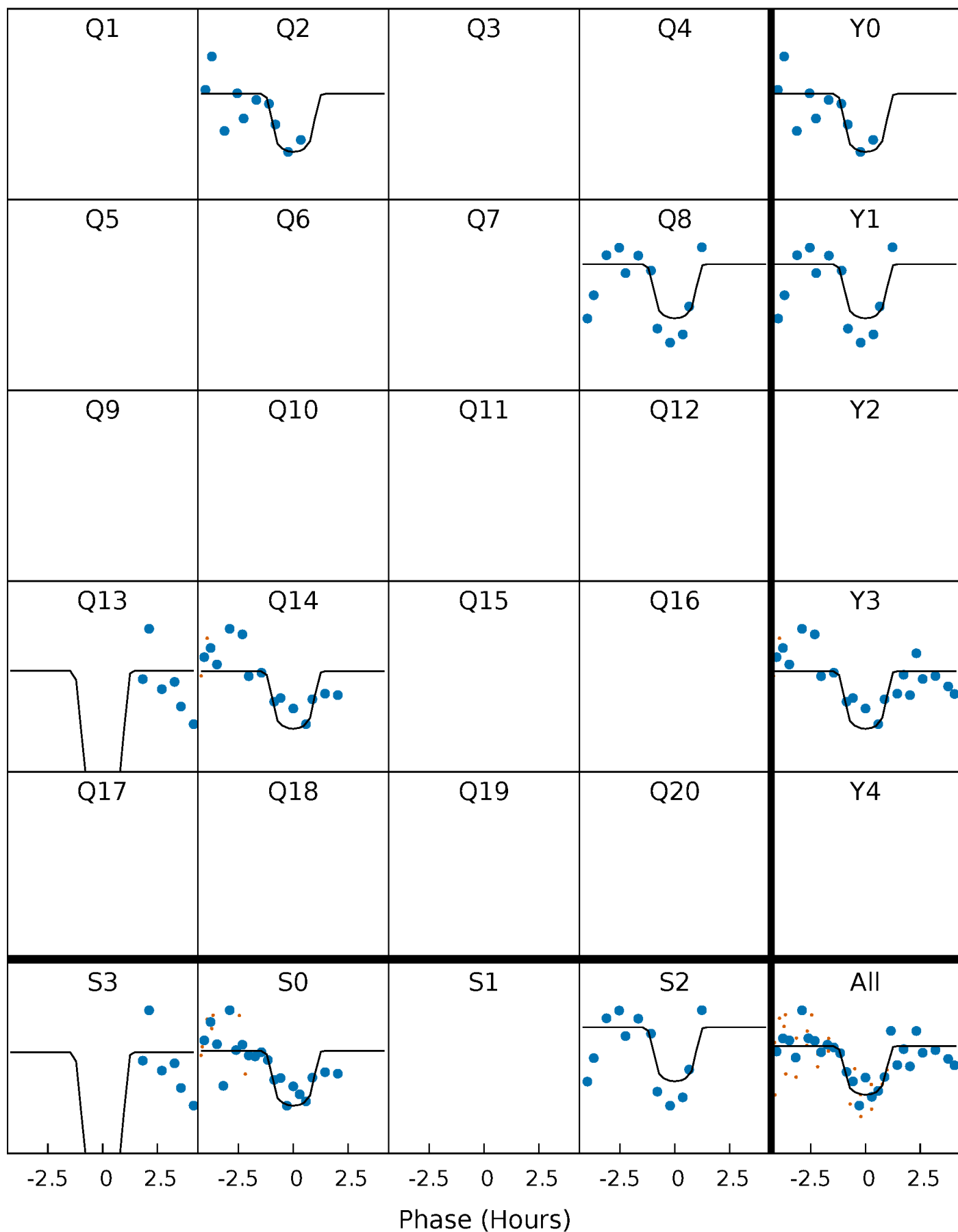
# PDC Quarter-Phased Transit Curves

TCE 009111849-05   P= 88.224588 Days    $T_0=219.286101$  (BKJD)



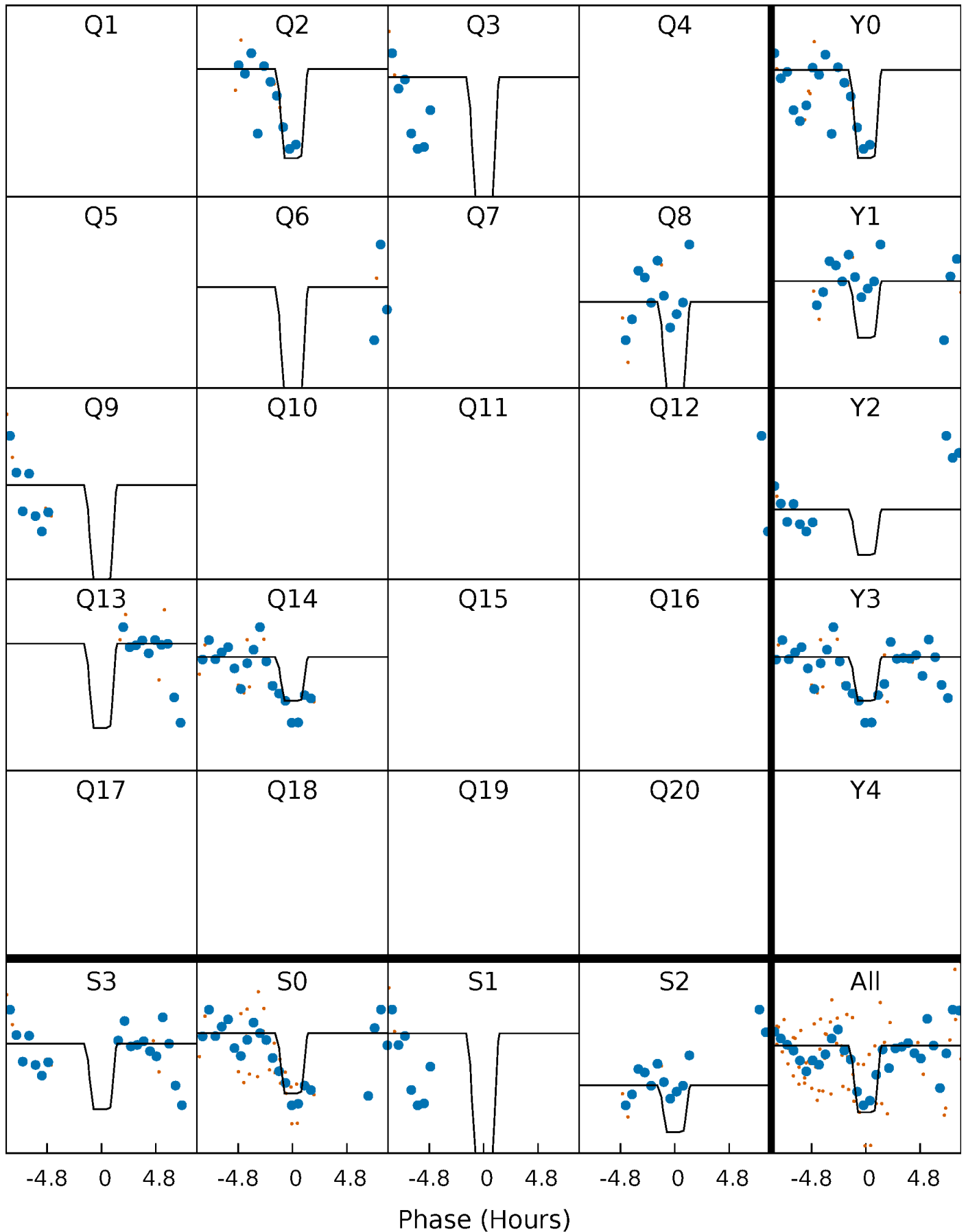
# DV Quarter-Phased Transit Curves

TCE 009111849-05   P= 88.224588 Days    $T_0=219.286101$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

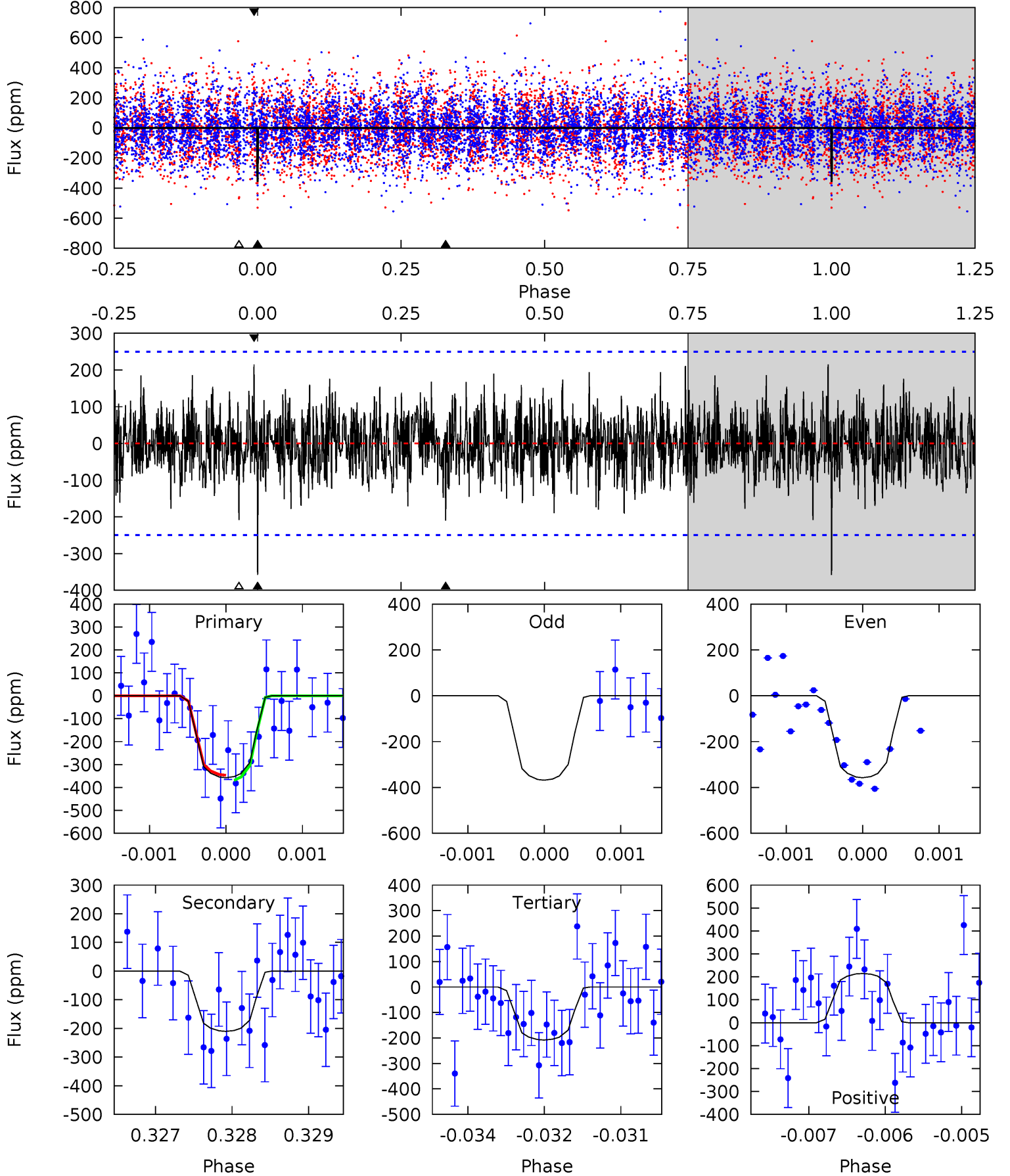
TCE 009111849-05   P= 88.225120 Days    $T_0=219.282105$  (BKJD)



# DV Model-Shift Uniqueness Test

009111849-05, P = 88.224588 Days, E = 131.061513 Days

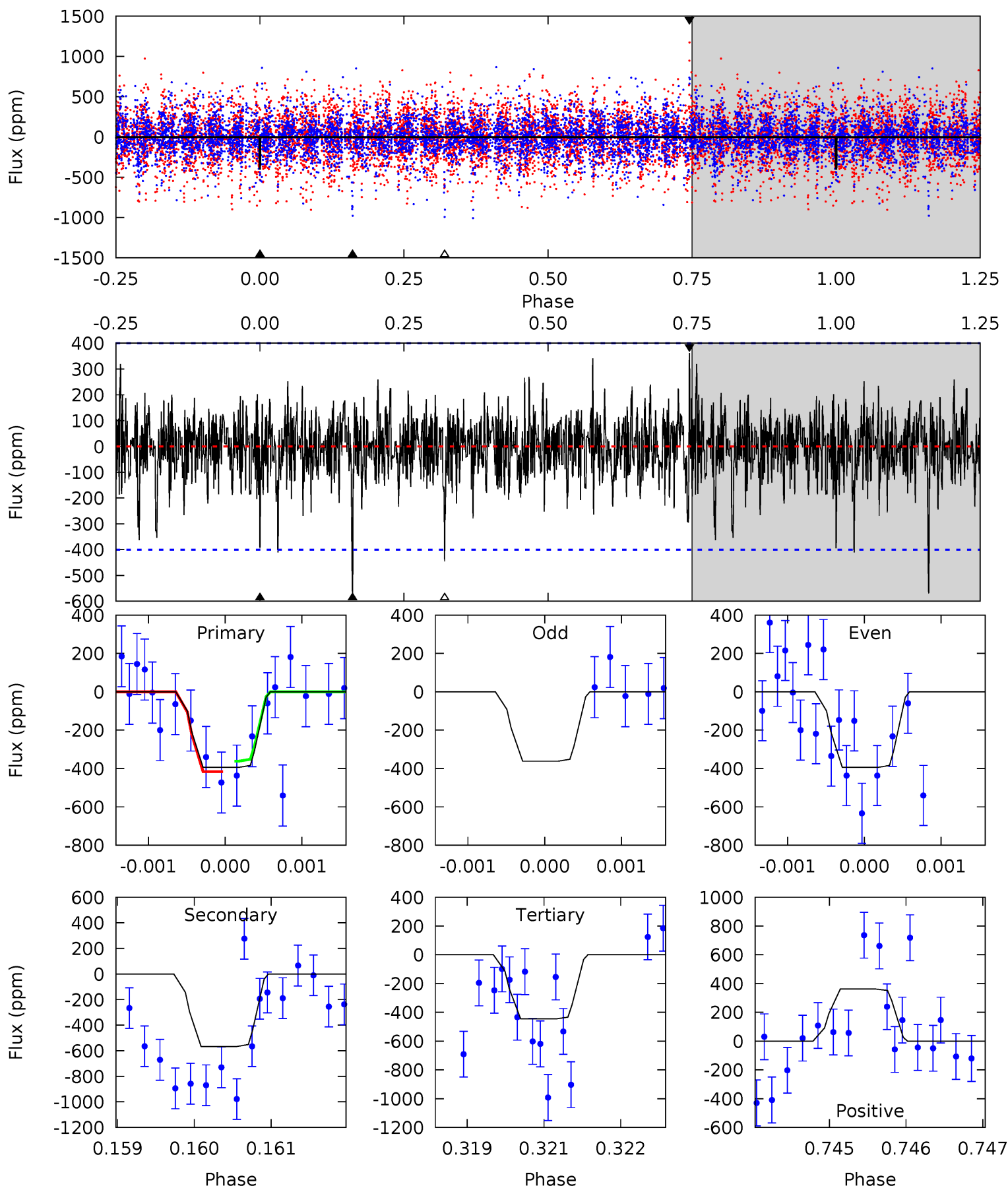
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.77	4.57	4.52	4.66	5.43	3.25	1.33	3.25	3.11	0.05	-0.09	0.13	1.16	0.37	0.23



# Alt Model-Shift Uniqueness Test

009111849-05, P = 88.225120 Days, E = 131.056985 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.35	7.69	6.04	4.91	5.43	3.26	1.27	-0.69	0.44	1.65	2.78	0.24	0.93	0.39	0.37





### Stellar Parameters For KIC 009111849

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6234^{+74}_{-74}$	$3.209^{+0.458}_{-0.122}$	$0.560^{+0.050}_{-0.100}$	$6.354^{+1.590}_{-3.180}$	$2.382^{+0.277}_{-0.514}$	$0.013^{+0.056}_{-0.005}$
	+1%/-1%	+14%/-4%	+9%/-18%	+25%/-50%	+12%/-22%	+431%/-35%
Source	SPE90	FLK73	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009111849-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-210 \pm 46$	$13.76^{+9.62}_{-8.03}$	$1315^{+91}_{-157}$	$5163^{+2657}_{-982}$	$163^{+731}_{-110}$
Alt.	$-567 \pm 74$	$15.13^{+11.08}_{-8.69}$	$1315^{+88}_{-165}$	$6101^{+3977}_{-1212}$	$348^{+1679}_{-229}$

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

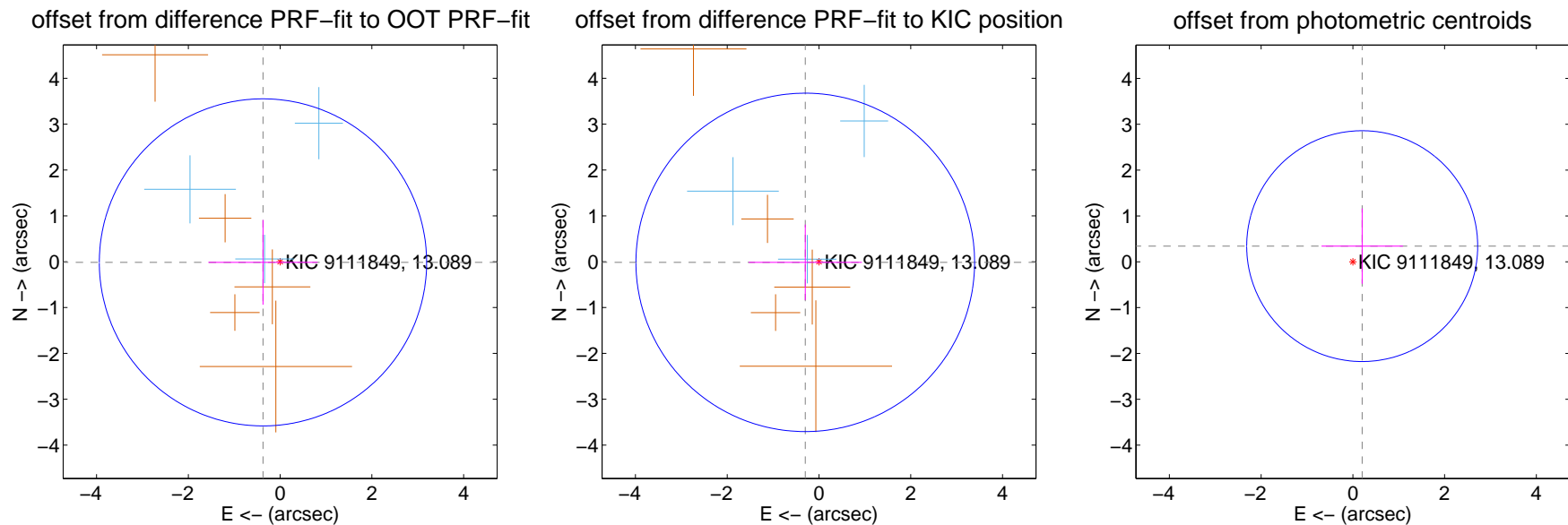
## DV Centroid Data

Supplemental centroid analysis for 009111849-05. Kepler magnitude: 13.09. Transit SNR 10.62

There are 3 quarters with good PRF difference image offsets

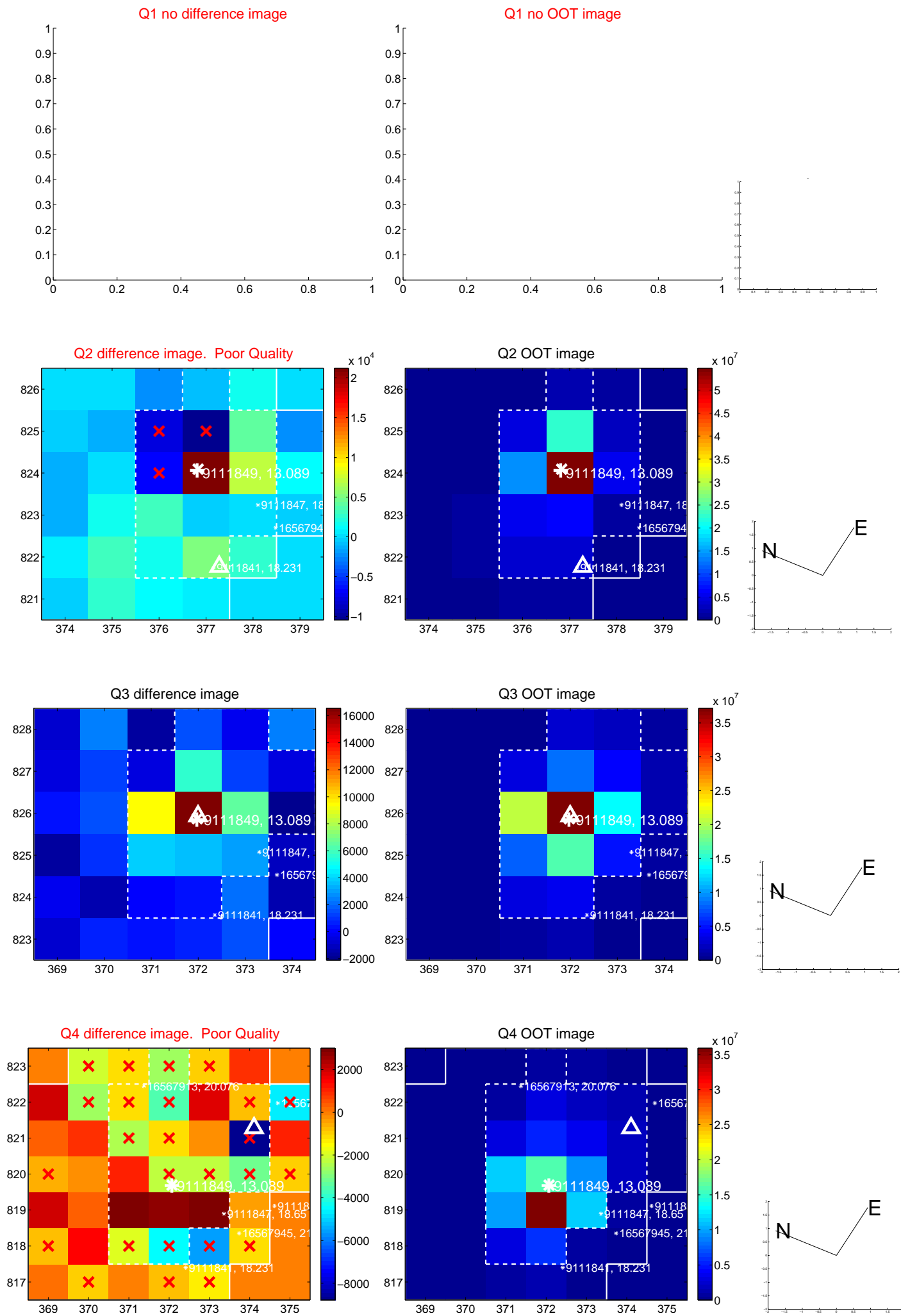
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.374 \pm 1.189$	0.31	$0.373 \pm 1.191$	$-0.015 \pm 0.924$
PRF-fit source offset from KIC position	$0.299 \pm 1.230$	0.24	$0.299 \pm 1.233$	$-0.015 \pm 0.824$
photometric centroid source offset	$0.40 \pm 0.84$	0.47	$-0.20 \pm 0.89$	$0.34 \pm 0.82$

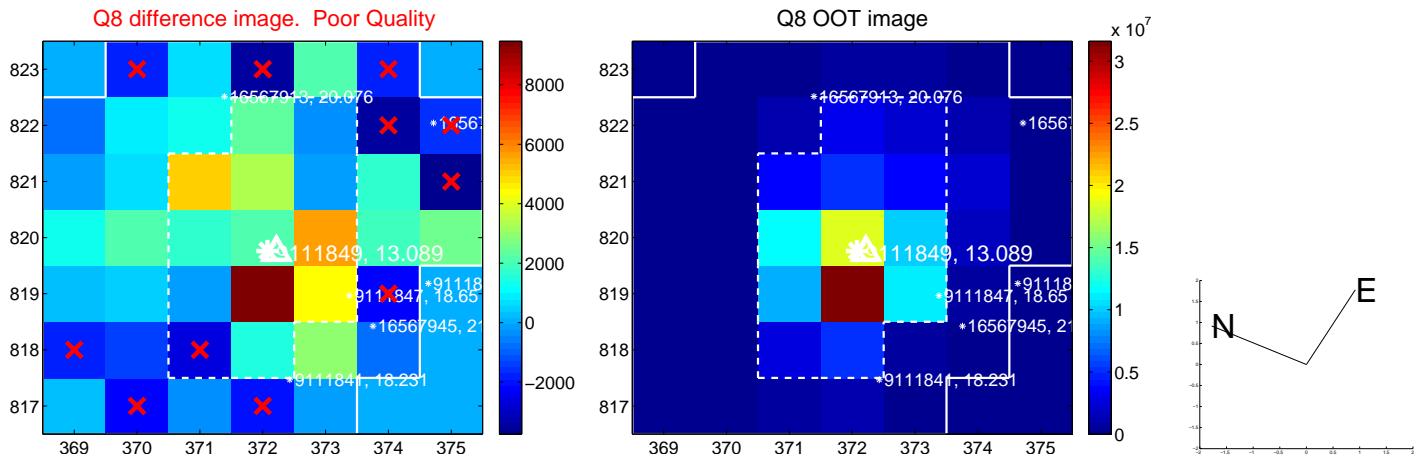
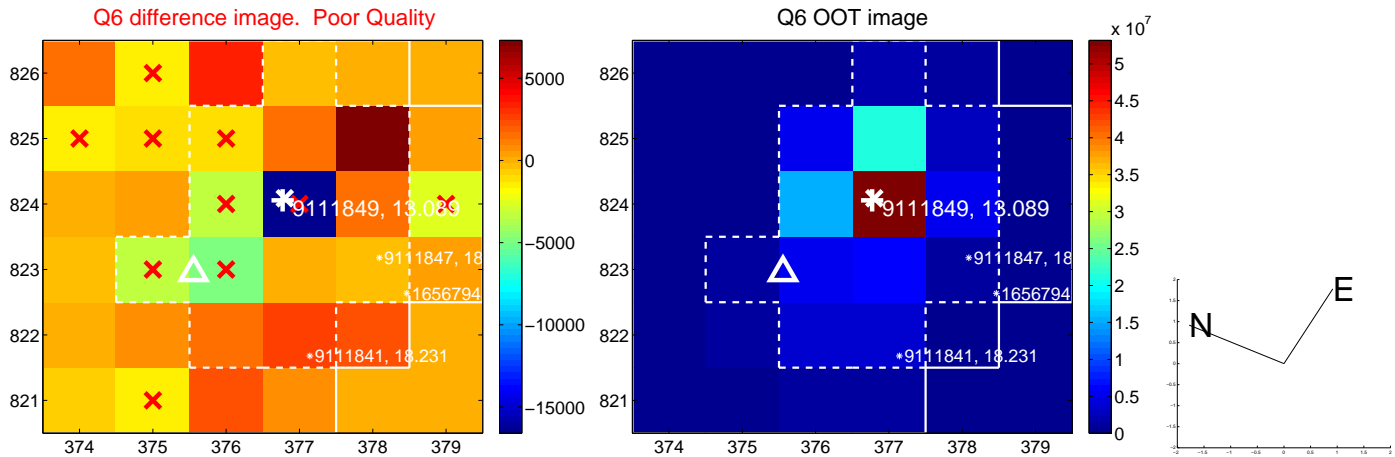
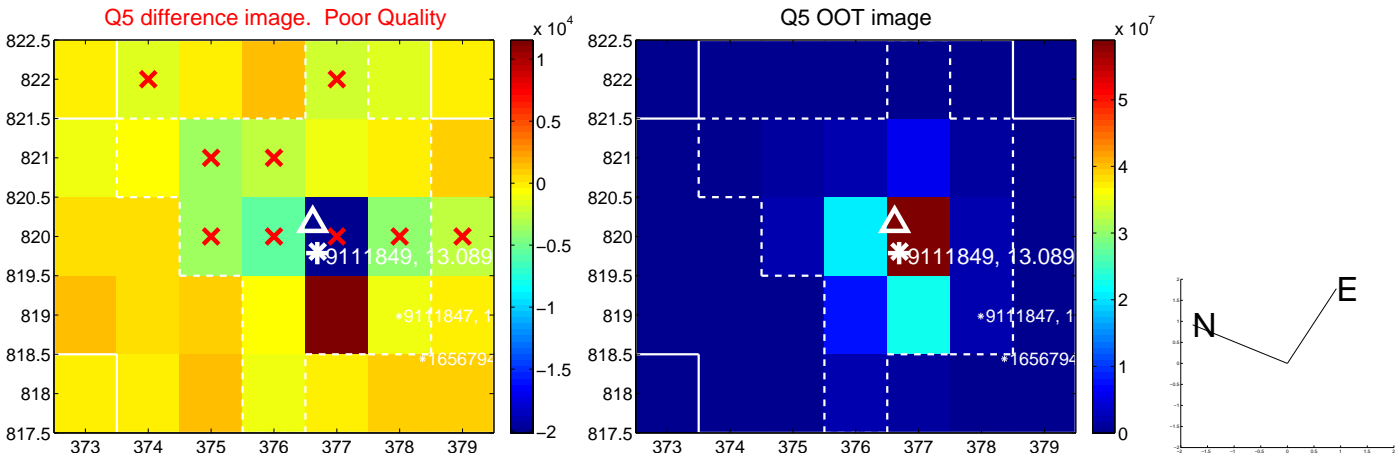


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

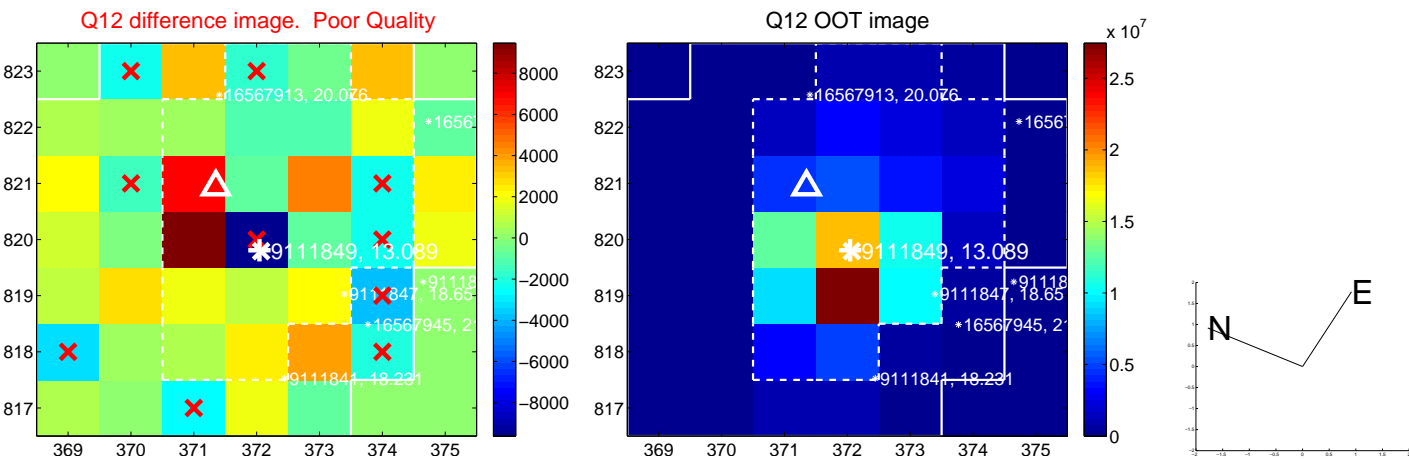
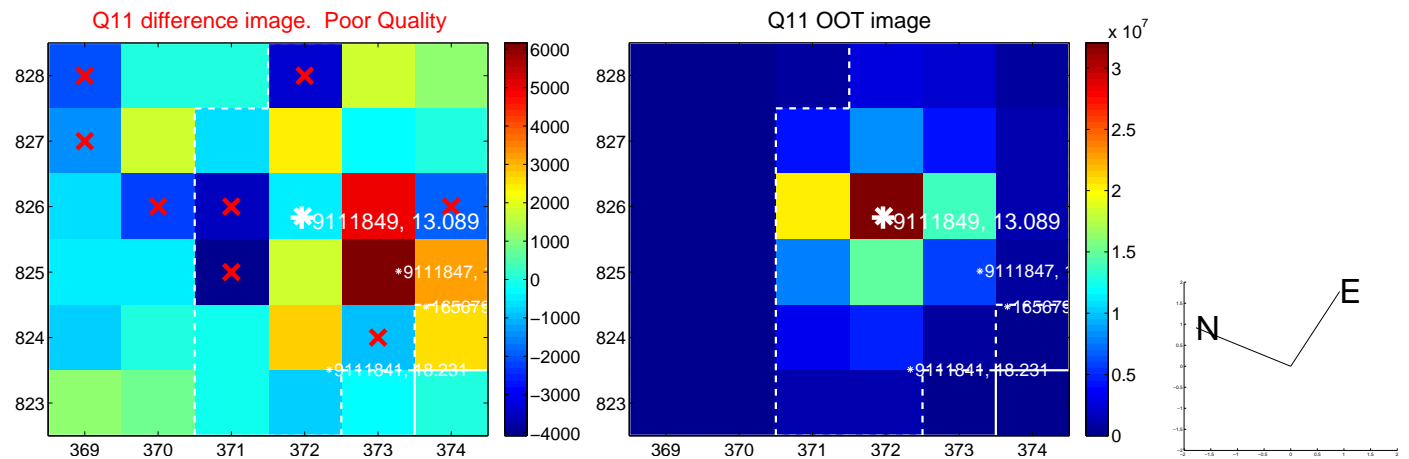
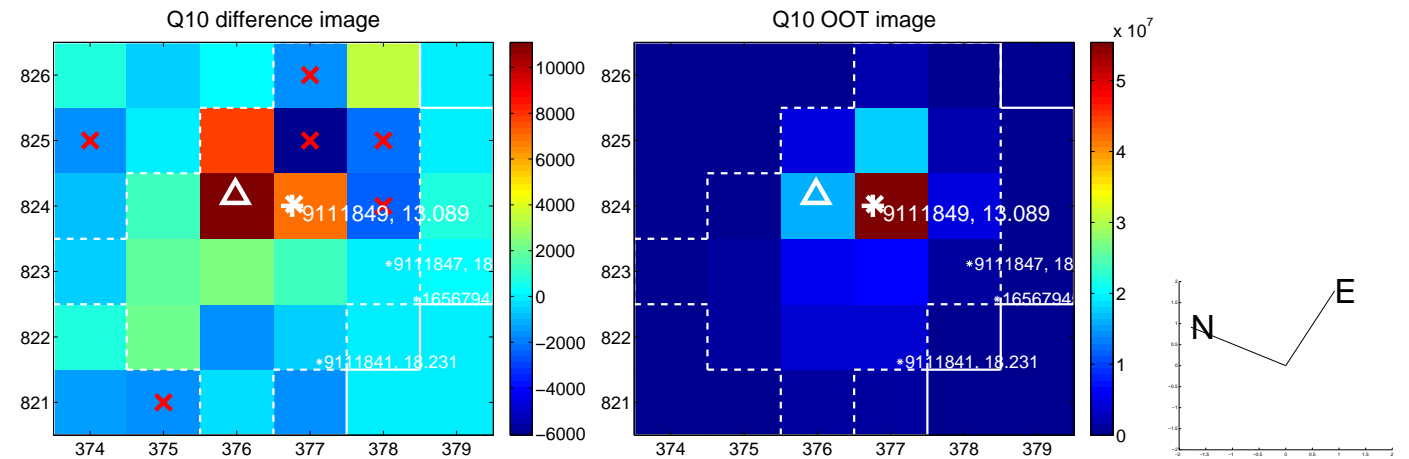
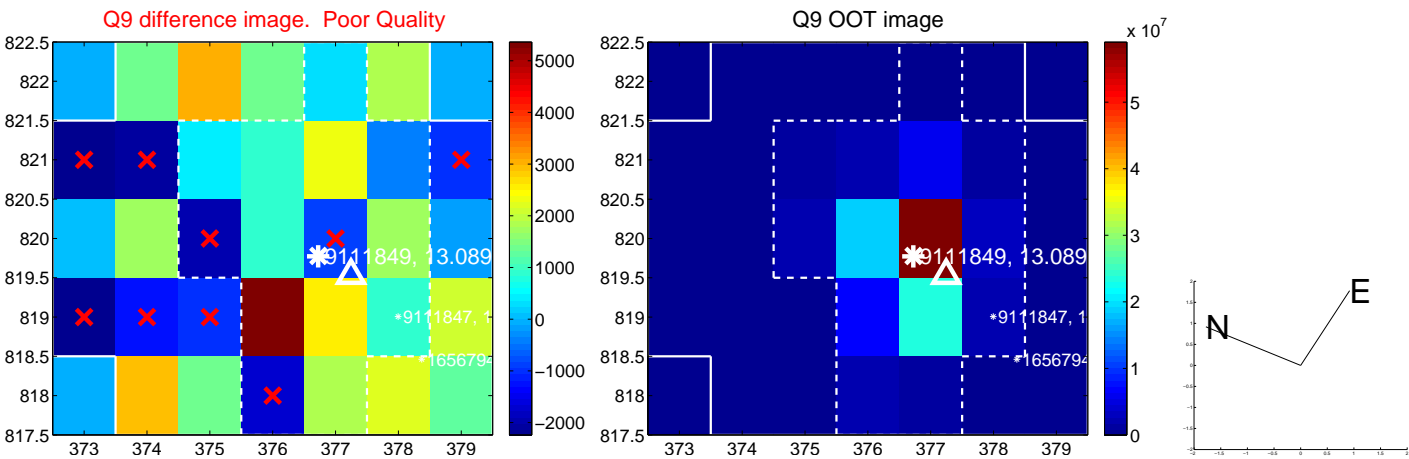
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



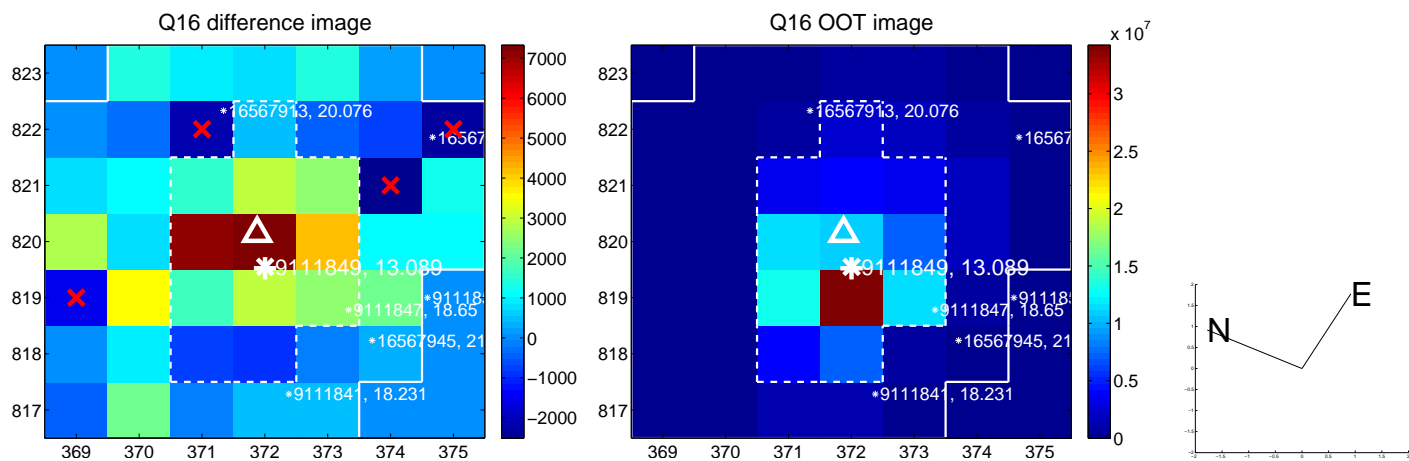
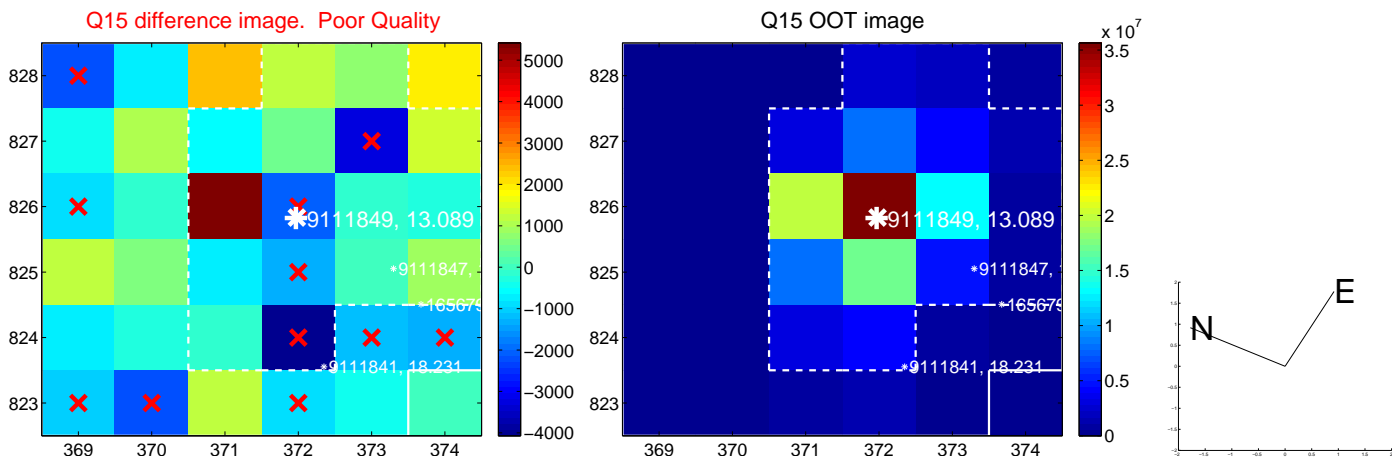
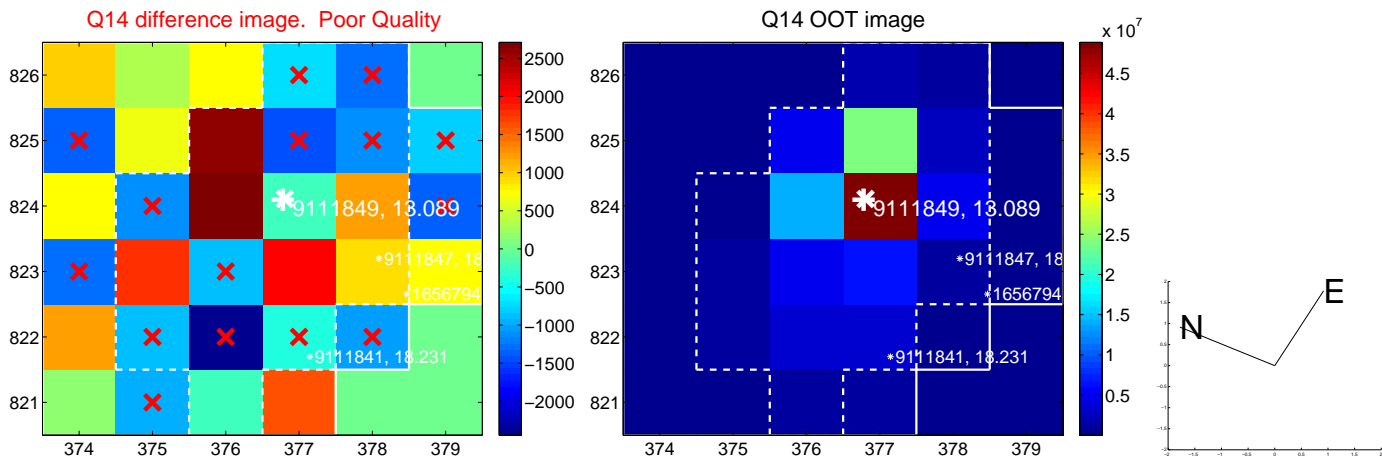
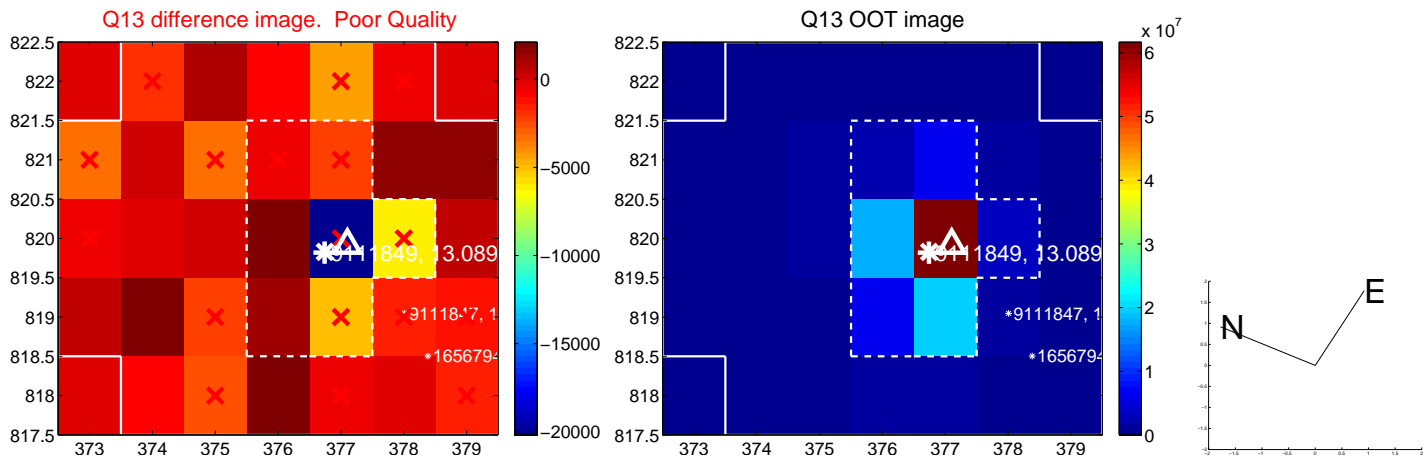
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

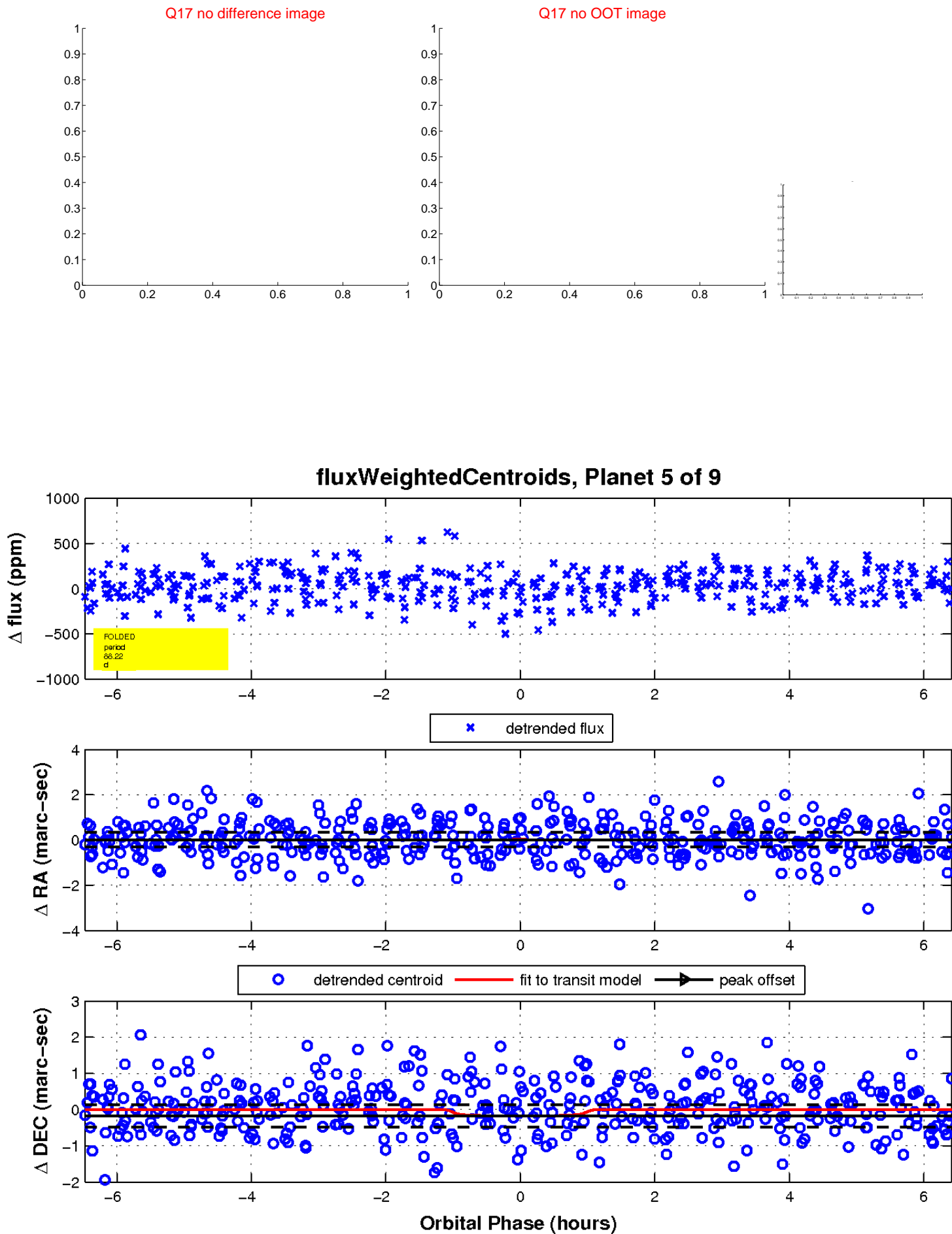


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



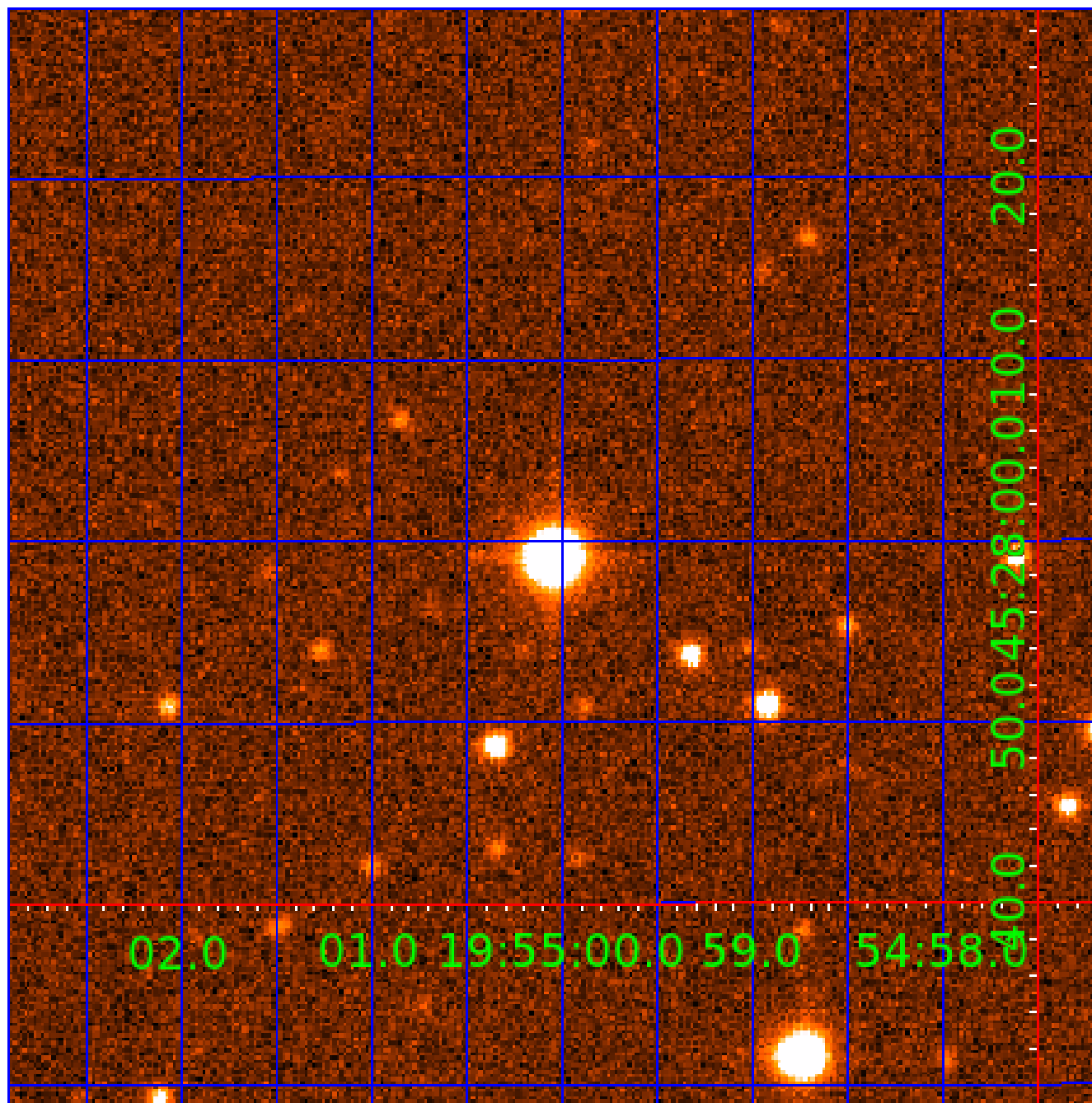


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination



# KIC 009111849

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009111849-01	OBS	2042.01	63.073086	191.255585	636.8	5.503	35.4	36.2	6.35	6234	17.84	318.32
009111849-02	OBS	No	0.879308	131.635994	290.7	1.500	8.5	-1.0	6.35	6234	10.84	94872.03
009111849-03	OBS	No	1.419233	131.903611	19.1	9.134	8.3	8.7	6.35	6234	2.77	50109.64
009111849-04	OBS	No	55.896078	184.095431	329.3	2.264	11.0	10.8	6.35	6234	12.11	373.95
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009111849-06	OBS	No	46.648185	141.719773	221.1	3.438	10.1	9.2	6.35	6234	11.02	475.93
009111849-07	OBS	No	43.779139	132.854579	271.3	2.527	9.1	8.9	6.35	6234	12.31	517.97
009111849-08	OBS	No	61.217340	159.721819	272.7	2.190	8.4	8.4	6.35	6234	11.82	331.25
009111849-09	OBS	No	139.780377	232.656851	366.1	2.500	8.3	-1.0	6.35	6234	12.13	110.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009111849-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009111849-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS
009111849-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009111849-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009111849-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009111849-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

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

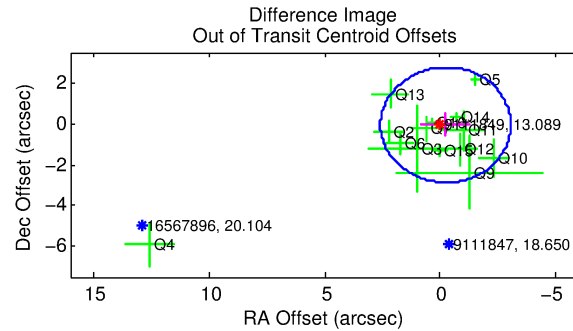
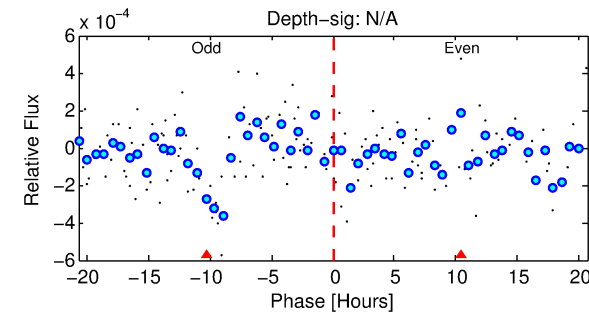
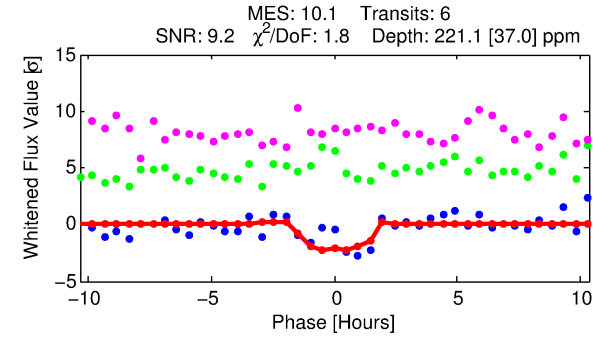
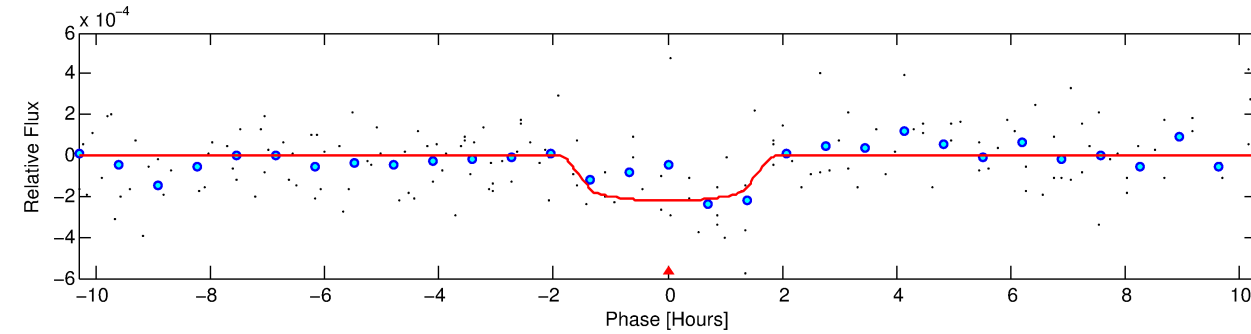
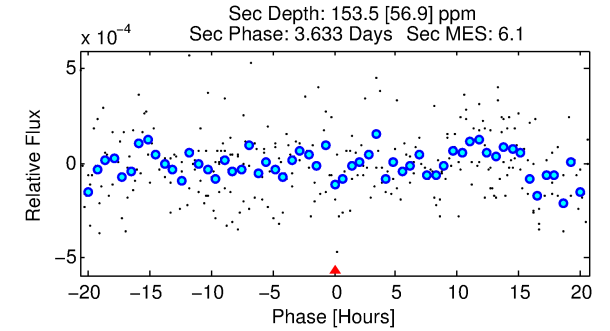
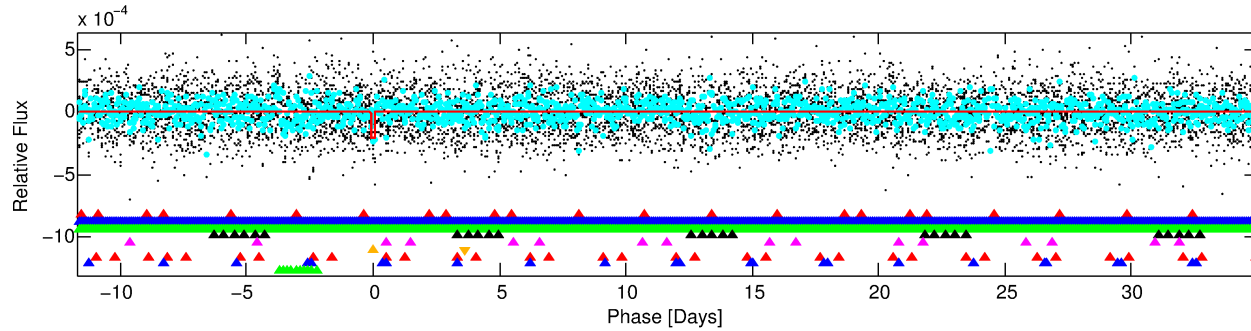
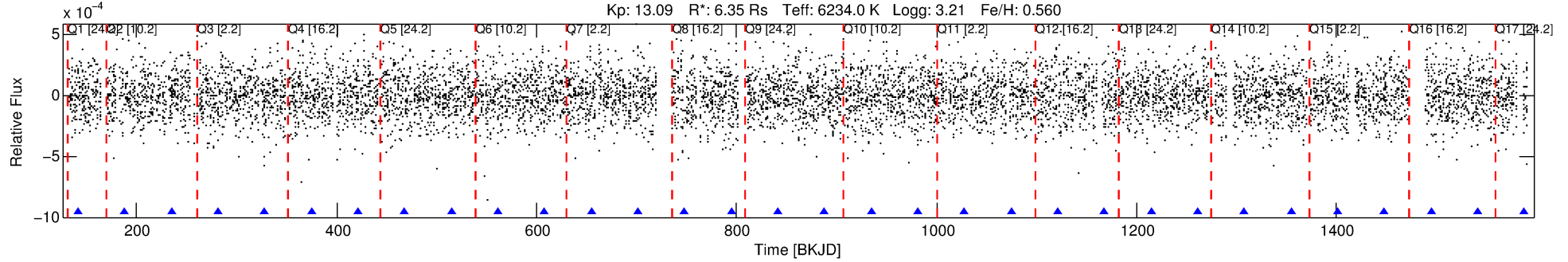
Ephemeris Match Information For 009111849-06

No Significant Match Found

# DV One-Page Summary

KIC: 9111849 Candidate: 6 of 9 Period: 46.648 d  
KOI: K02042 Corr: No Ephemeris Match

Kp: 13.09 R\*: 6.35 Rs Teff: 6234.0 K Logg: 3.21 Fe/H: 0.560



## DV Fit Results:

Period = 46.64819 [0.00068] d  
Epoch = 141.7198 [0.0137] BKJD  
Rp/R\* = 0.0159 [0.0085]  
a/R\* = 51.22 [136.62]  
b = 0.89 [0.64]  
Seff = 475.93 [371.06]  
Teq = 1191 [232] K  
Rp = 11.02 [8.07] Re  
a = 0.3388 [0.1642] AU  
Ag = 79.76 [109.55] [0.72σ]  
Teff = 5503 [1558] K [2.74σ]

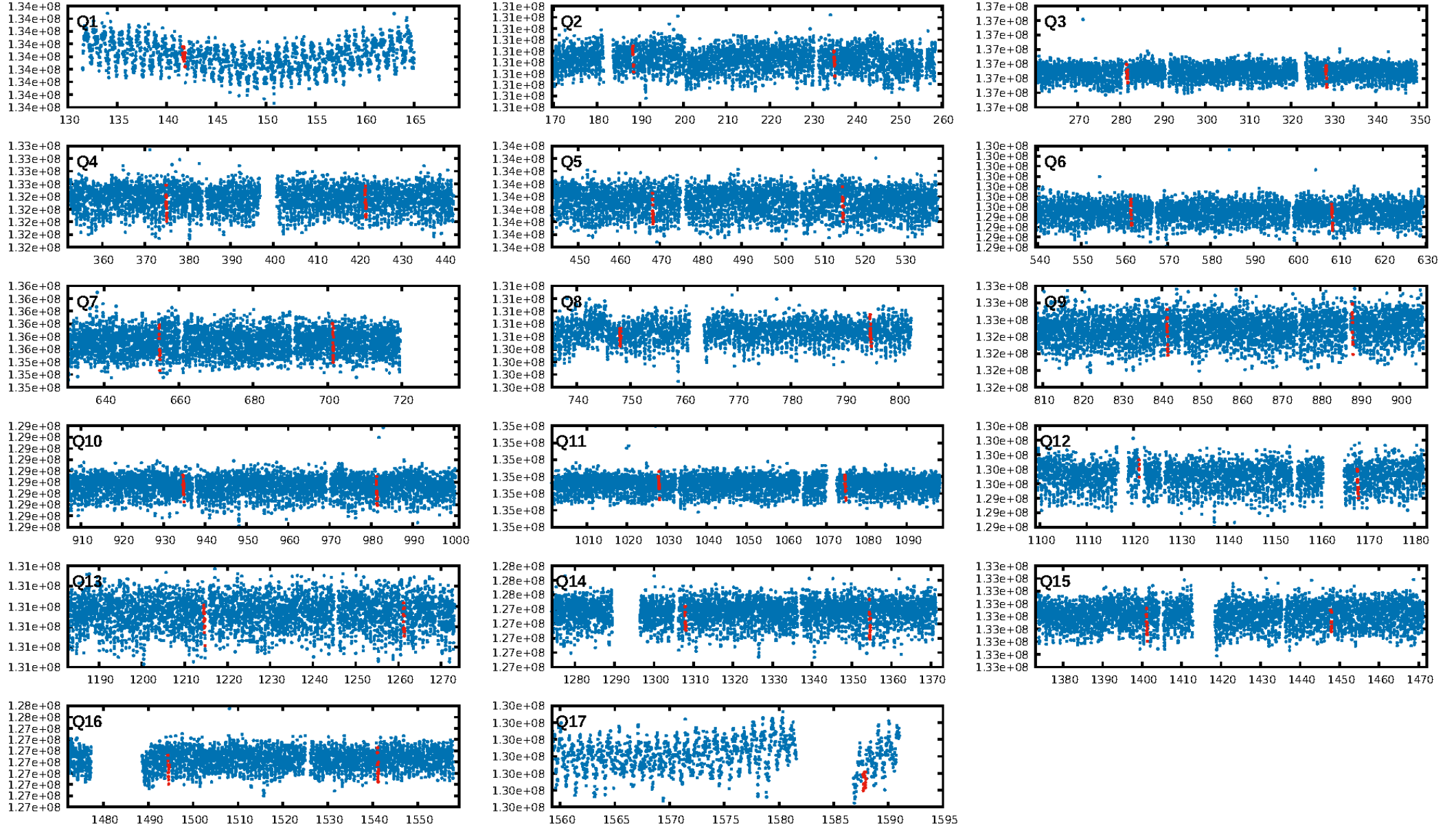
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [16.14σ]  
LongPeriod-sig: 100.0% [53.92σ]  
ModelChiSquare2-sig: 0.5%  
ModelChiSquareGof-sig: 66.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: 0.4622  
Centroid-sig: 5.3%  
Centroid-so: 1.602 arcsec [2.06σ]  
OotOffset-rm: 0.241 arcsec [0.26σ]  
KicOffset-rm: 0.335 arcsec [0.37σ]  
OotOffset-st: 4/4/3/3 [14]  
KicOffset-st: 4/4/3/3 [14]  
DiffImageQuality-fgm: 0.57 [8/14]  
DiffImageOverlap-fno: 0.00 [0/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:45:10 Z

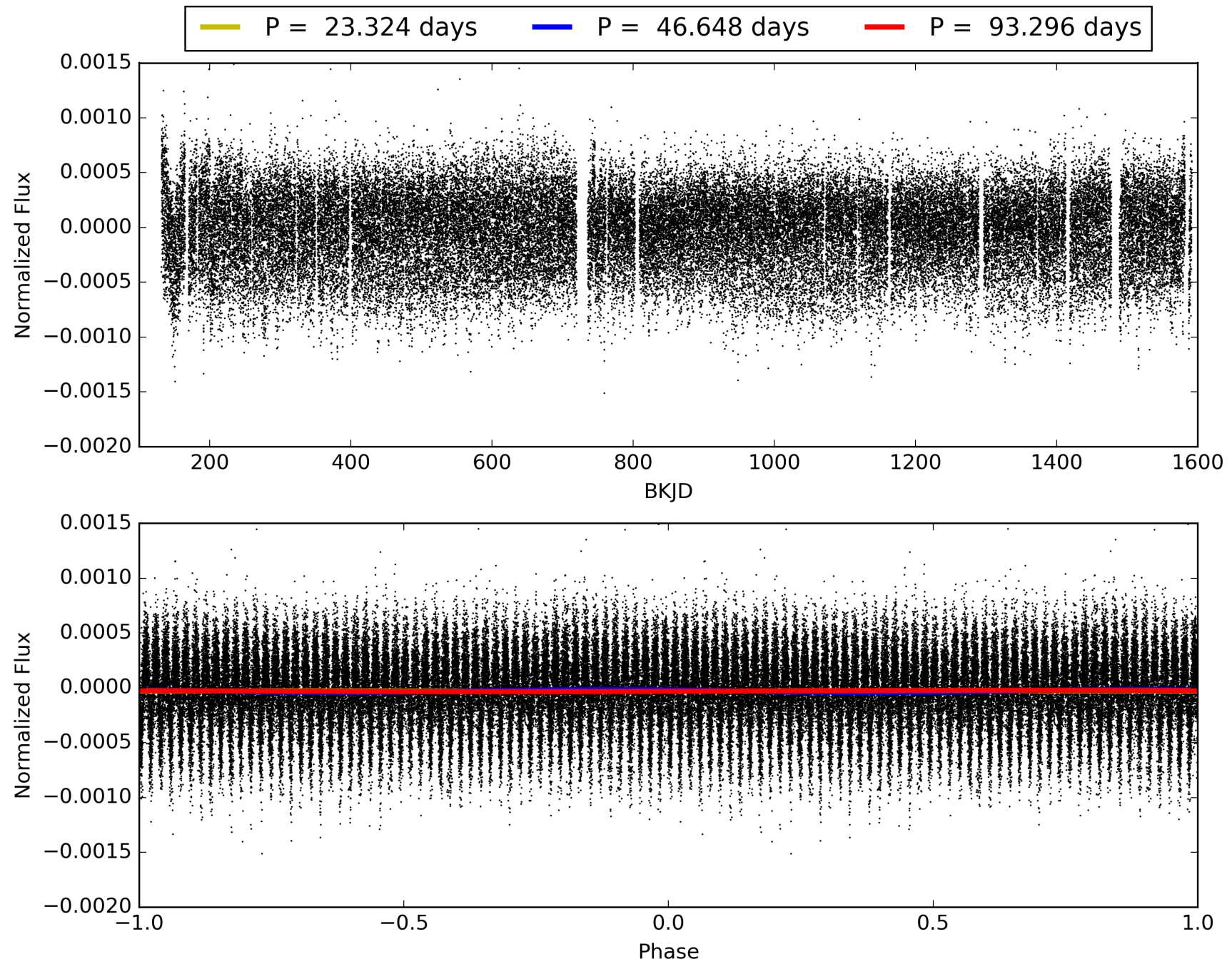
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009111849-06, PDC Light Curves





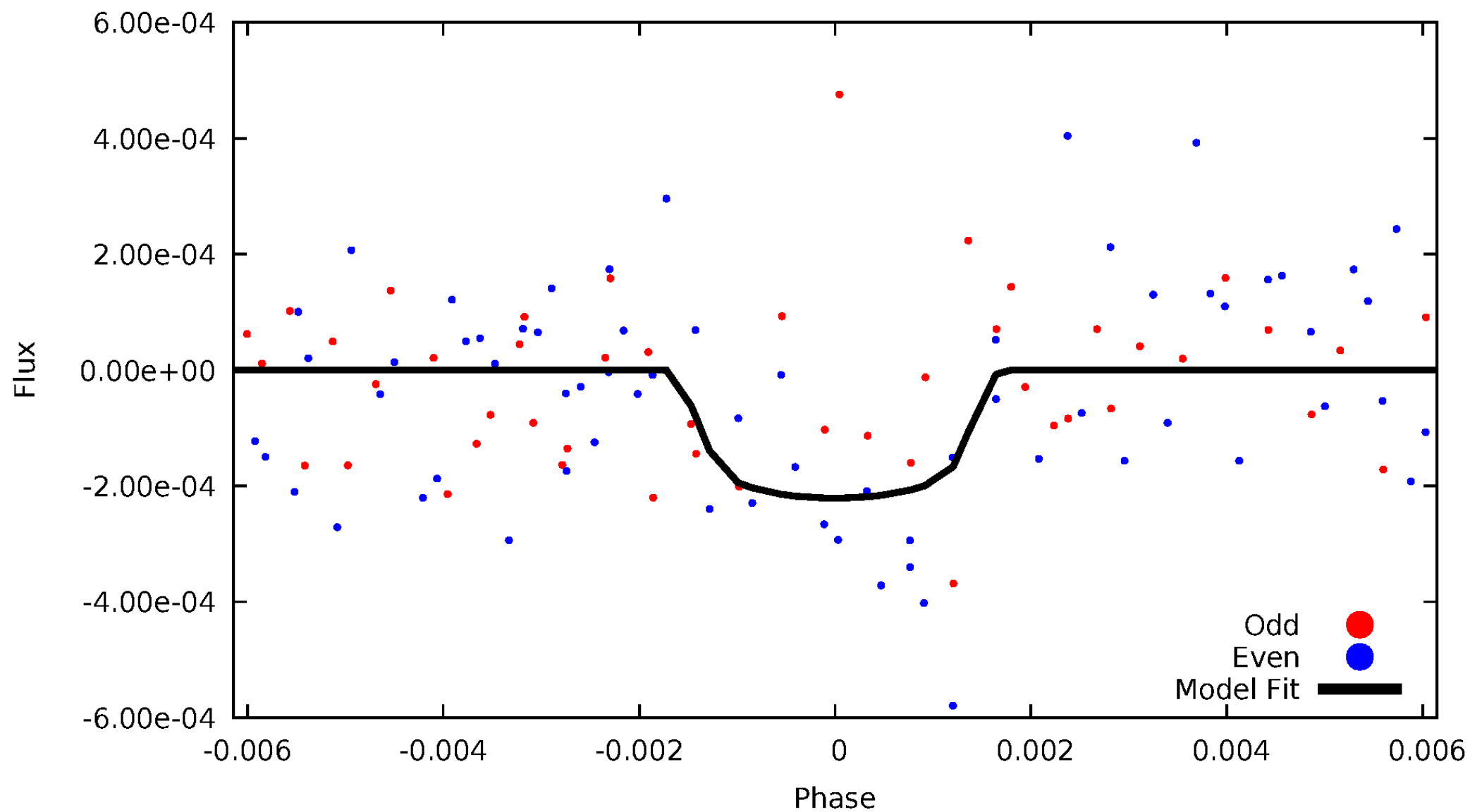
TCE 009111849-06





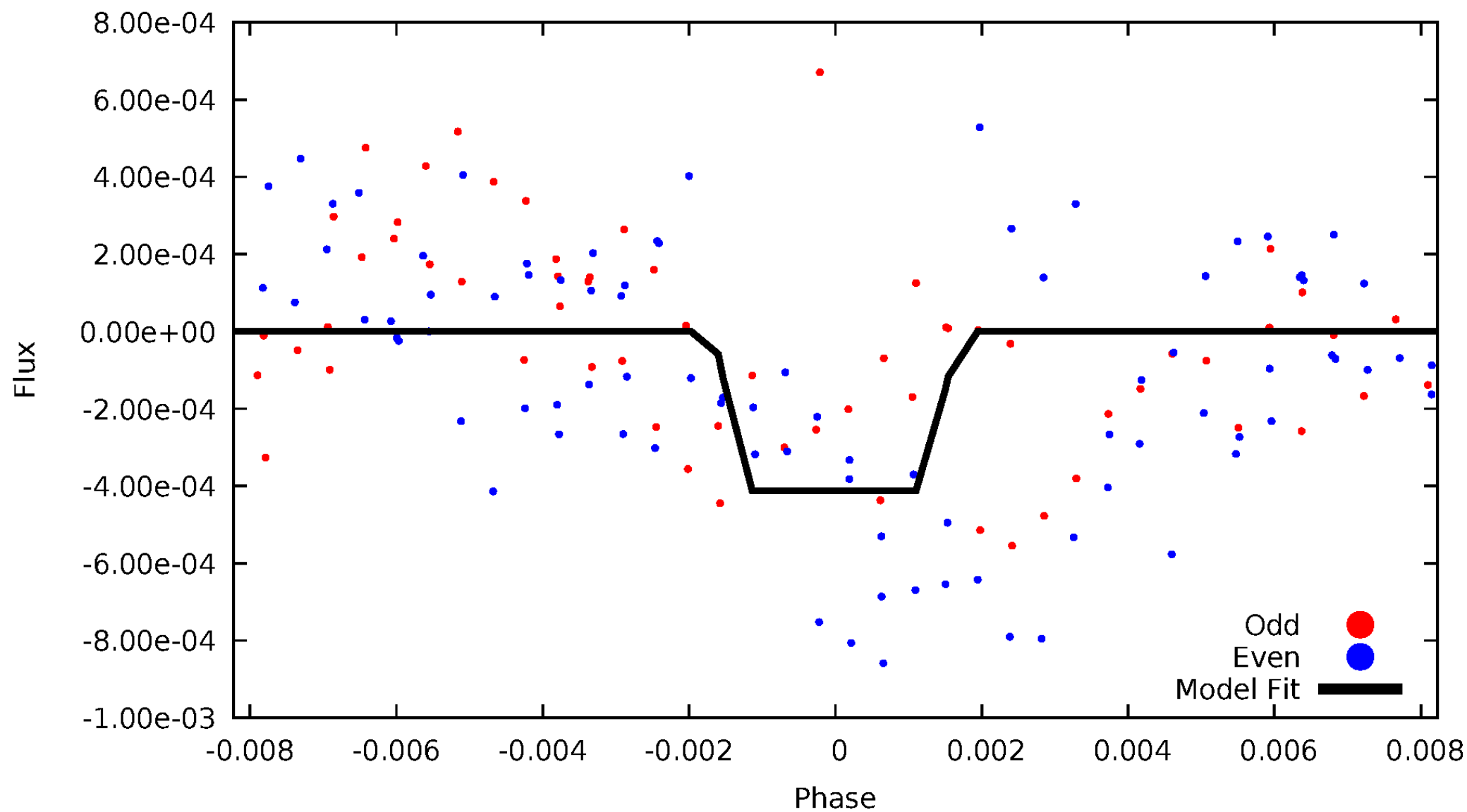
# DV Odd/Even

TCE 009111849-06



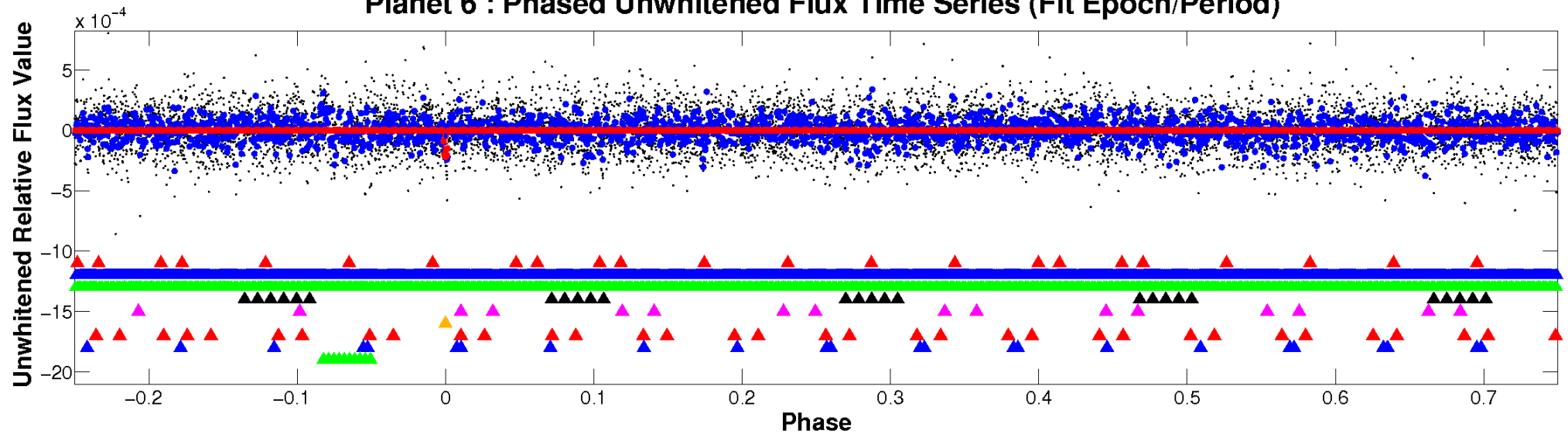
# ALT Odd/Even

TCE 009111849-06

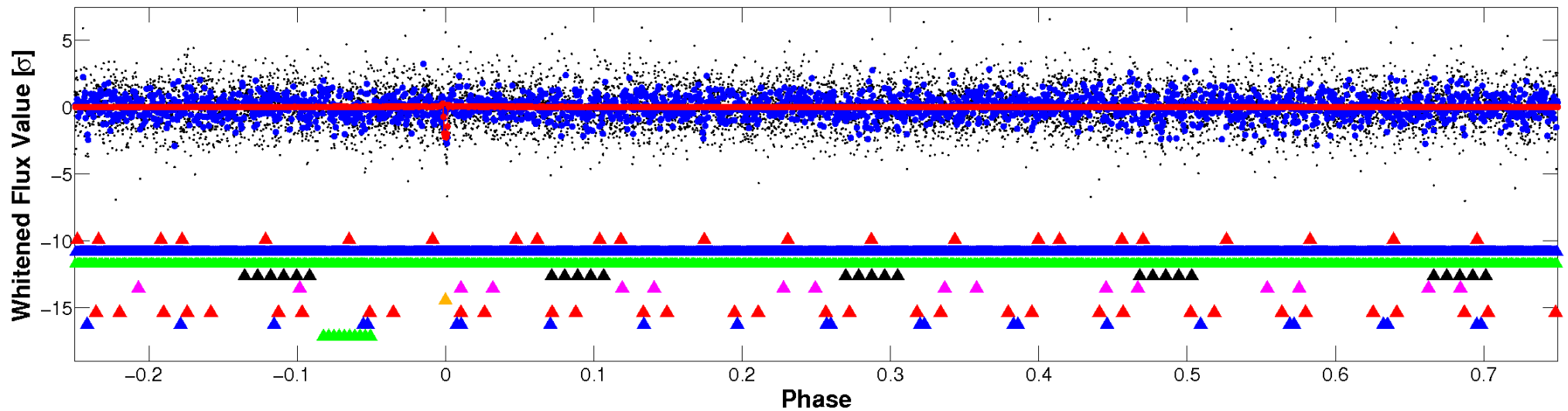


# Non-Whitened Vs. Whitened Light Curve

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

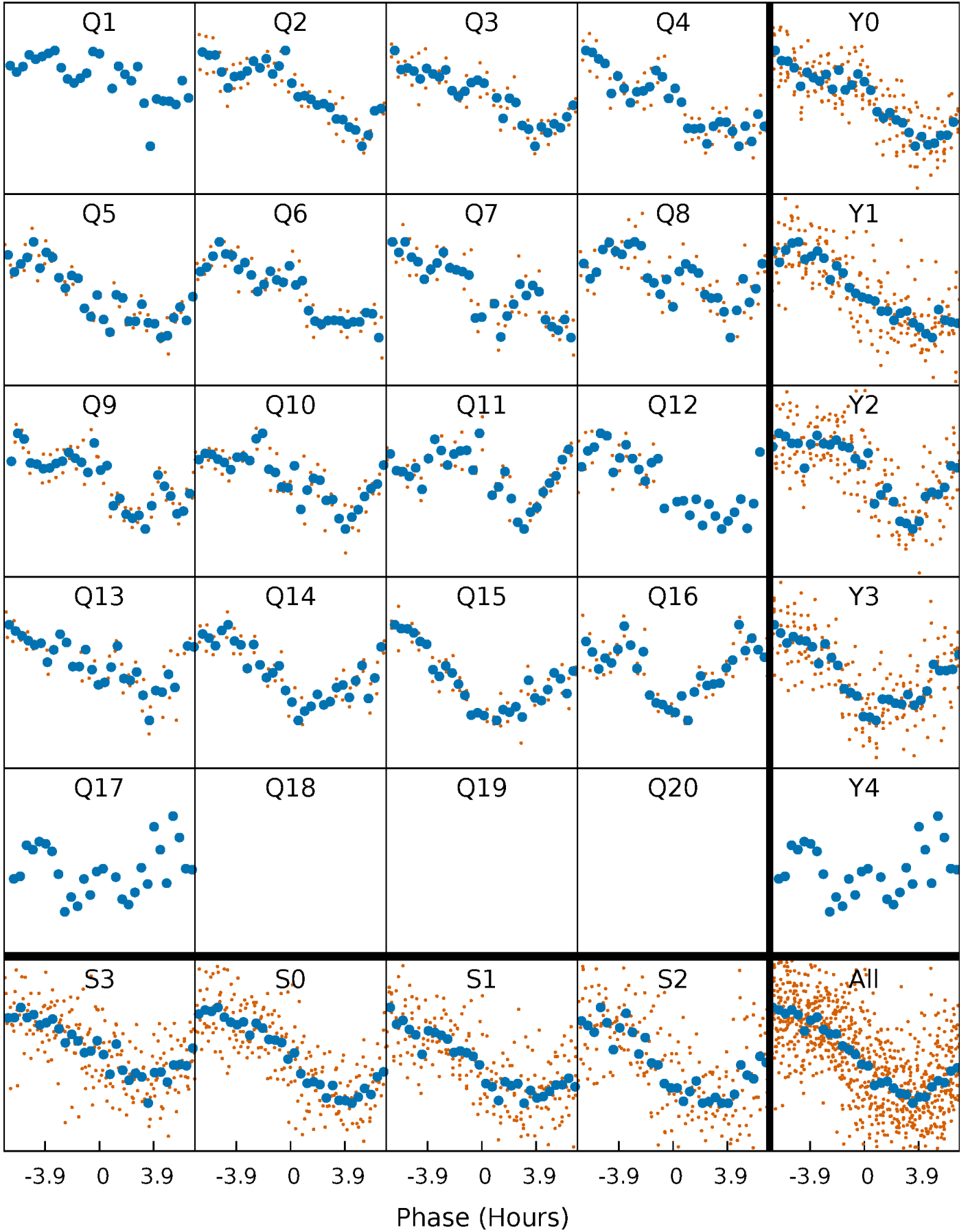


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



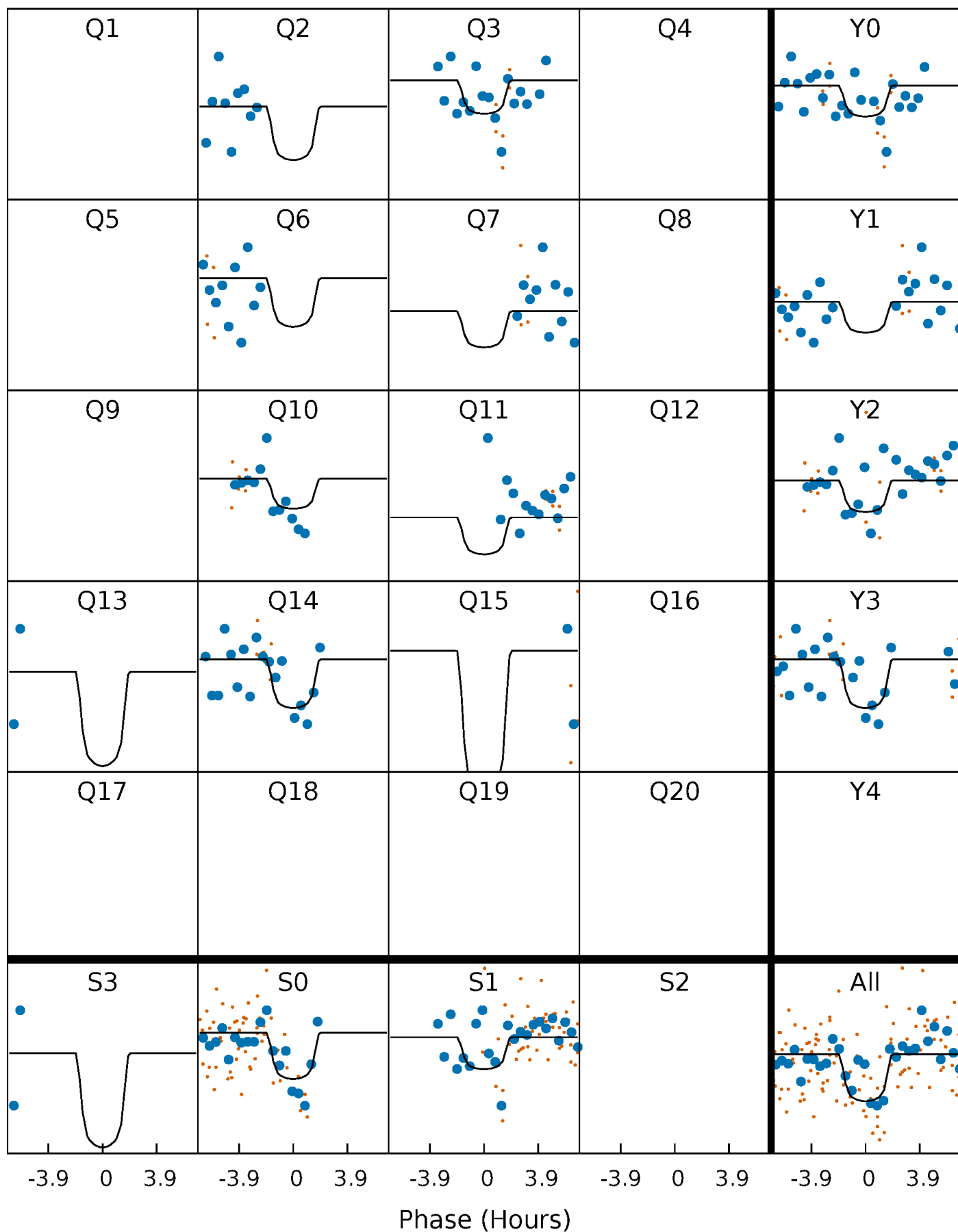
# PDC Quarter-Phased Transit Curves

TCE 009111849-06     $P = 46.648185$  Days     $T_0 = 141.719773$  (BKJD)



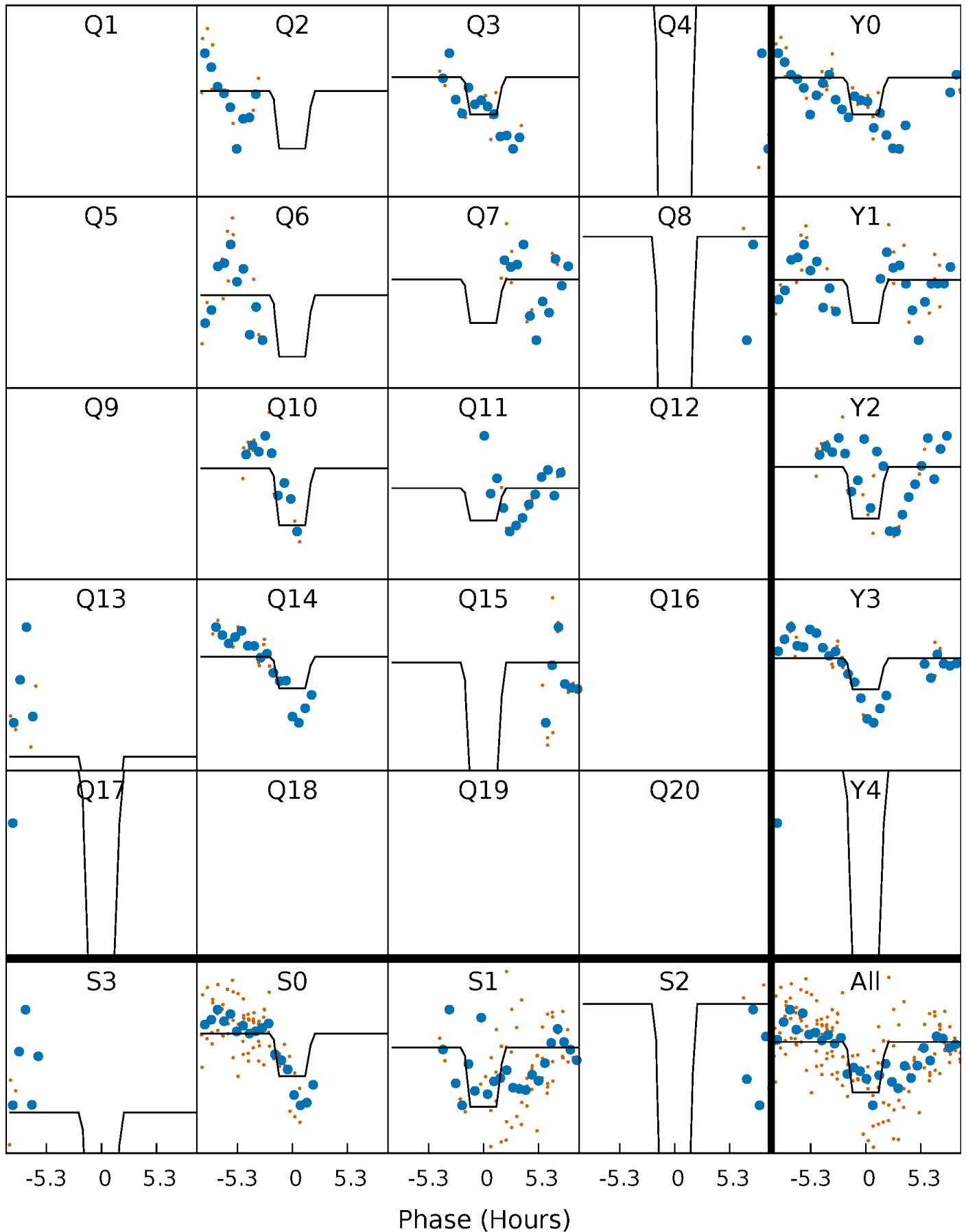
# DV Quarter-Phased Transit Curves

TCE 009111849-06 P= 46.648185 Days  $T_0=141.719773$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009111849-06 P= 46.647203 Days  $T_0=141.750448$  (BKJD)

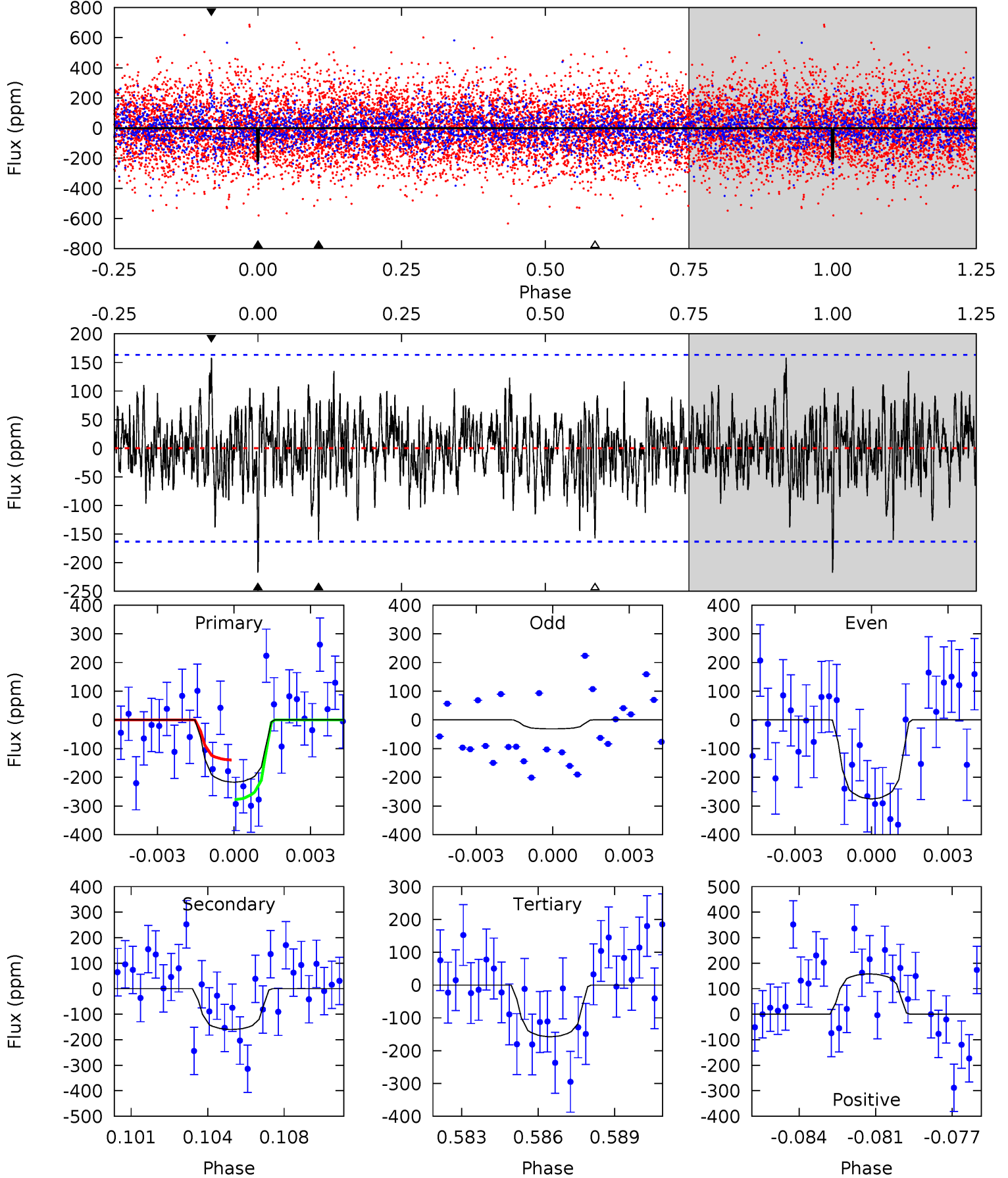




# DV Model-Shift Uniqueness Test

009111849-06, P = 46.648185 Days, E = 95.071588 Days

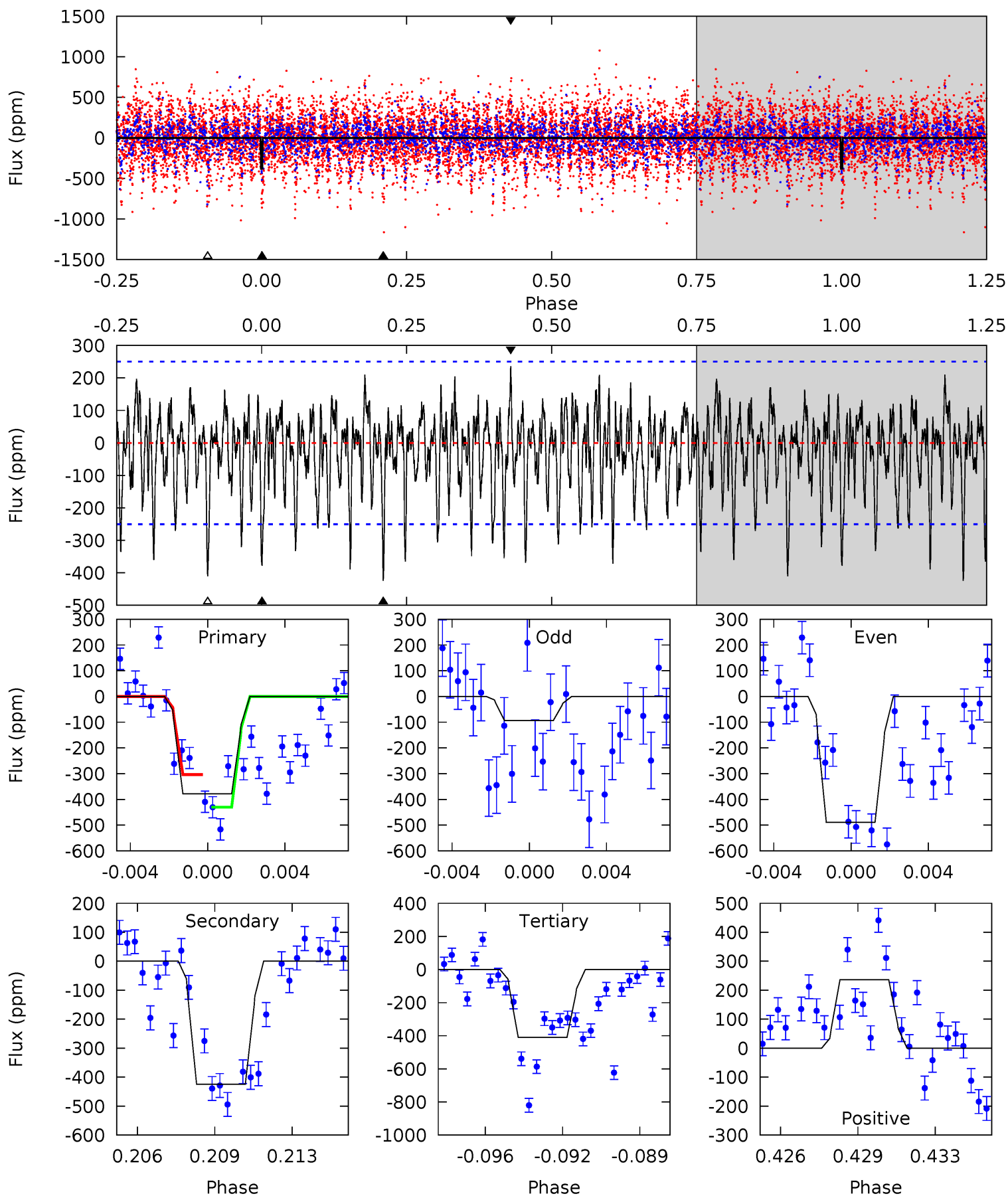
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.96	5.13	5.05	5.06	5.23	2.93	1.42	1.91	1.90	0.08	0.07	3.89	1.01	0.42	2.20



# Alt Model-Shift Uniqueness Test

009111849-06, P = 46.647203 Days, E = 95.103245 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
7.90	8.86	8.56	4.92	5.22	2.92	2.20	-0.66	2.97	0.30	3.94	4.13	1.00	0.36	0



### Stellar Parameters For KIC 009111849

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6234^{+74}_{-74}$	$3.209^{+0.458}_{-0.122}$	$0.560^{+0.050}_{-0.100}$	$6.354^{+1.590}_{-3.180}$	$2.382^{+0.277}_{-0.514}$	$0.013^{+0.056}_{-0.005}$
	+1%/-1%	+14%/-4%	+9%/-18%	+25%/-50%	+12%/-22%	+431%/-35%
Source	SPE90	FLK73	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009111849-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-160 \pm 31$	$9.92^{+5.81}_{-5.20}$	$1637^{+101}_{-207}$	$5643^{+2260}_{-953}$	$100^{+343}_{-58}$
Alt.	$-425 \pm 48$	$12.76^{+6.34}_{-5.91}$	$1628^{+110}_{-189}$	$6251^{+2252}_{-931}$	$164^{+378}_{-91}$

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

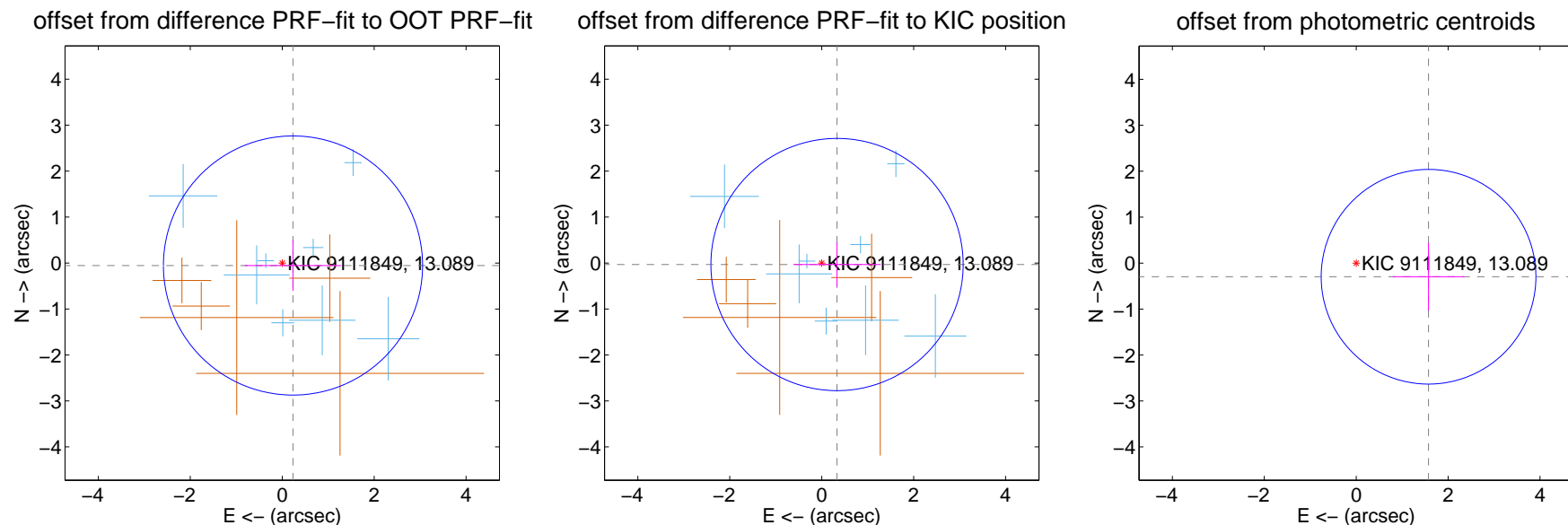
## DV Centroid Data

Supplemental centroid analysis for 009111849-06. Kepler magnitude: 13.09. Transit SNR 9.20

There are 8 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

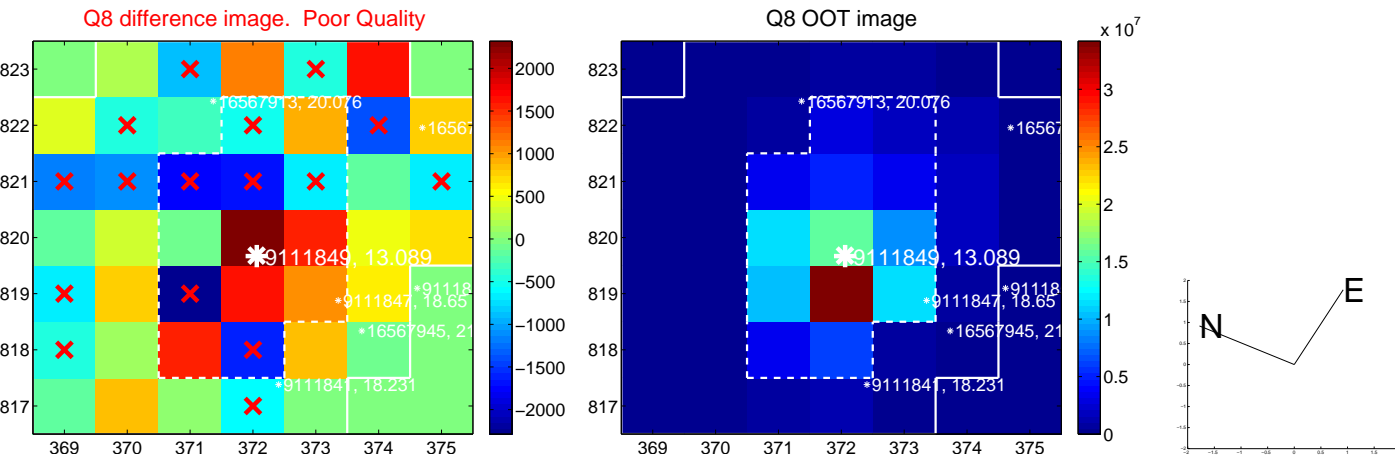
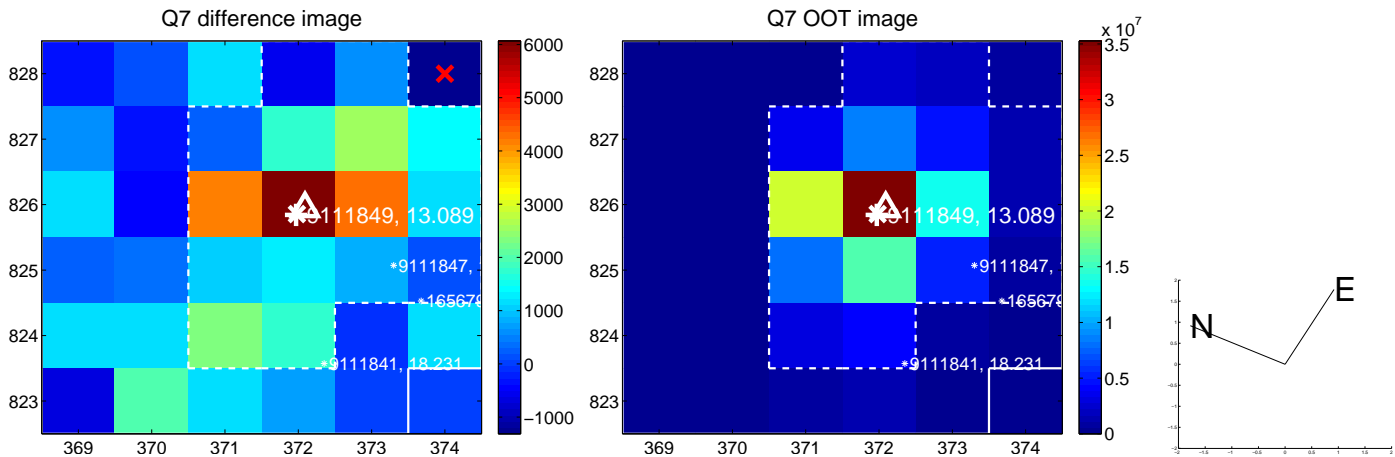
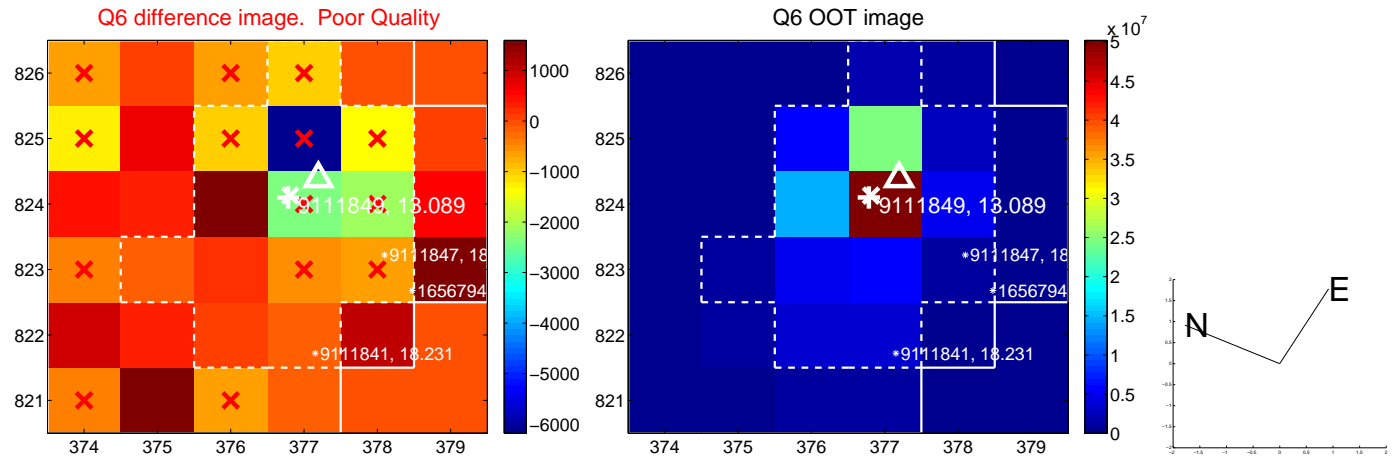
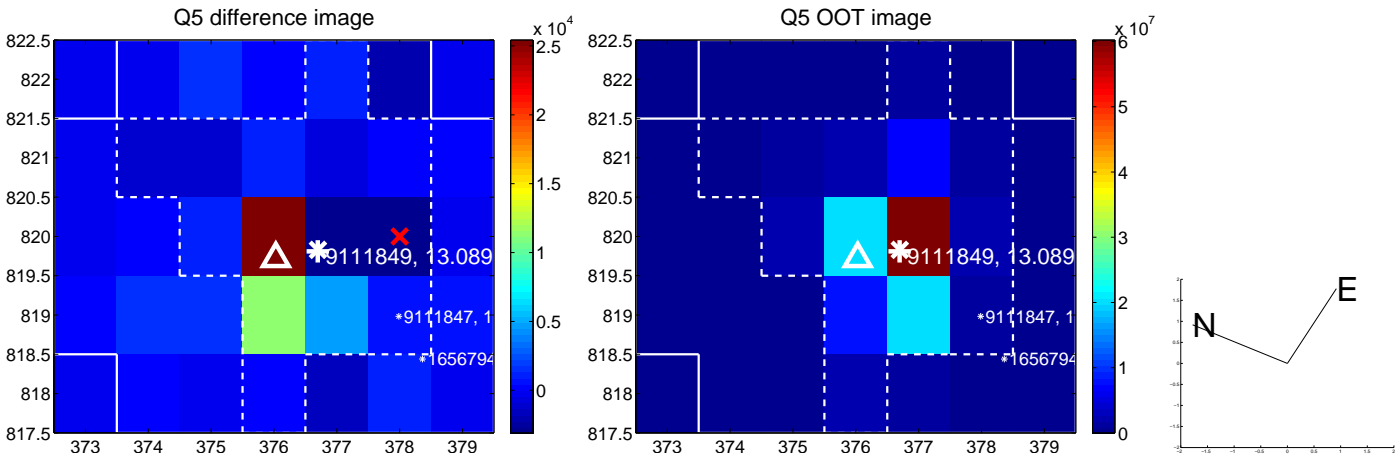
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.241 \pm 0.939$	0.26	$-0.235 \pm 1.052$	$-0.054 \pm 0.554$
PRF-fit source offset from KIC position	$0.335 \pm 0.915$	0.37	$-0.333 \pm 0.951$	$-0.033 \pm 0.485$
photometric centroid source offset	$1.60 \pm 0.78$	2.06	$-1.57 \pm 0.78$	$-0.30 \pm 0.74$



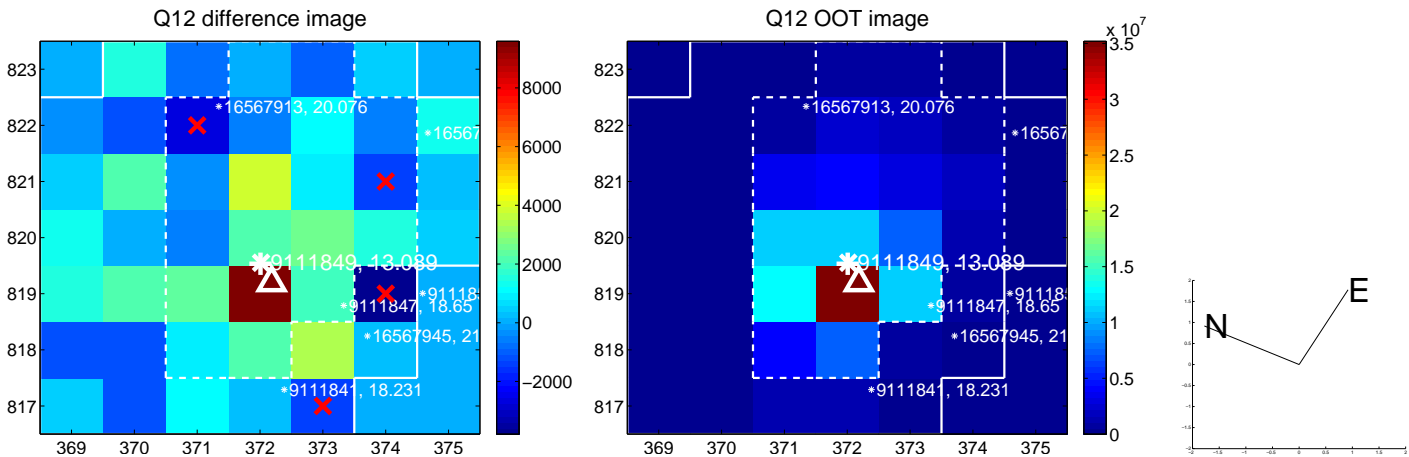
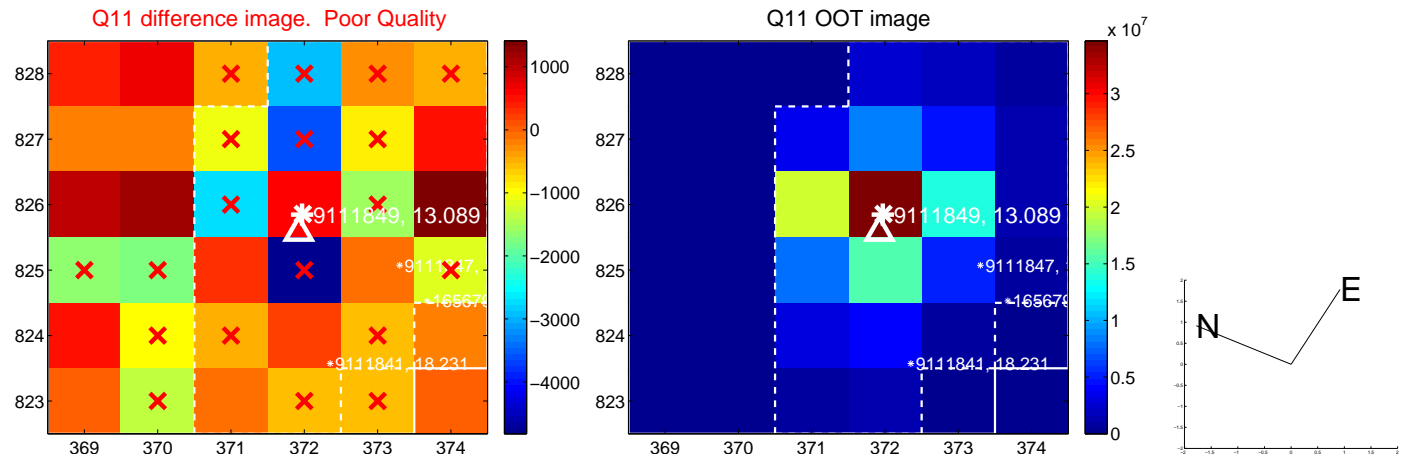
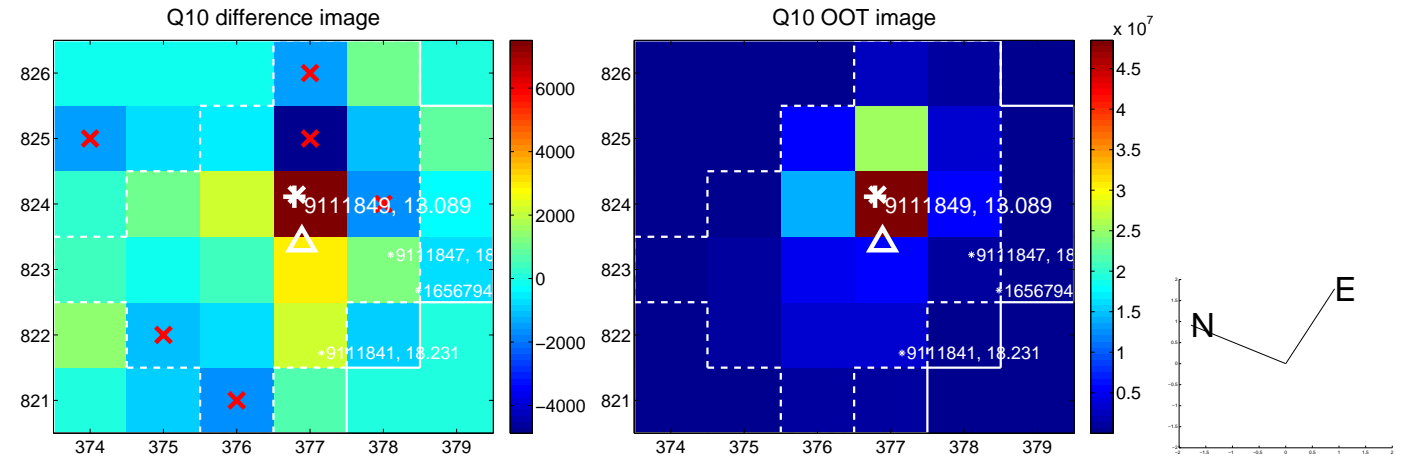
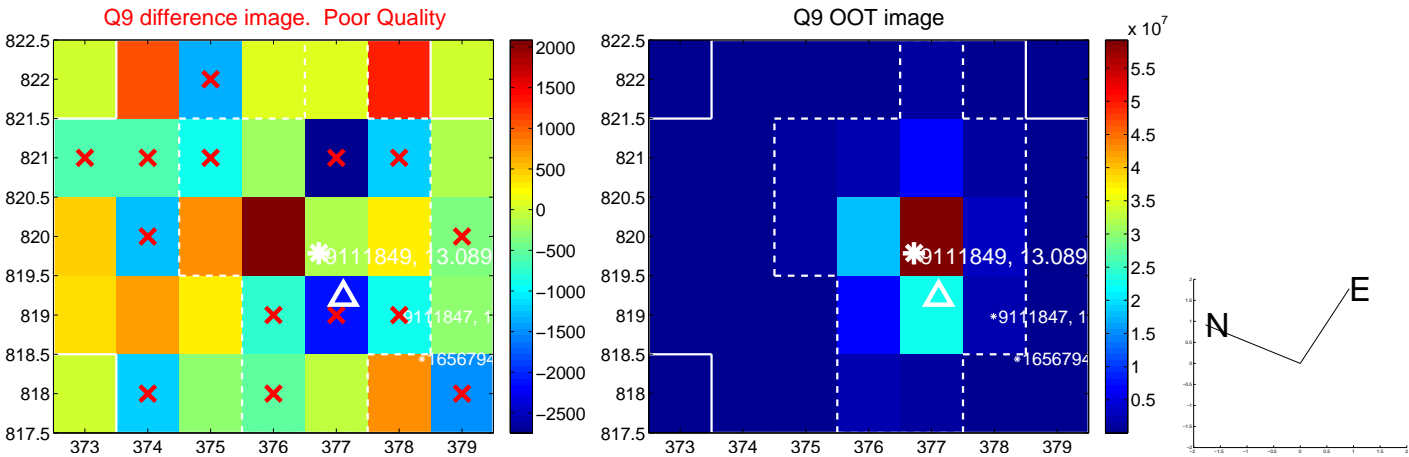
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

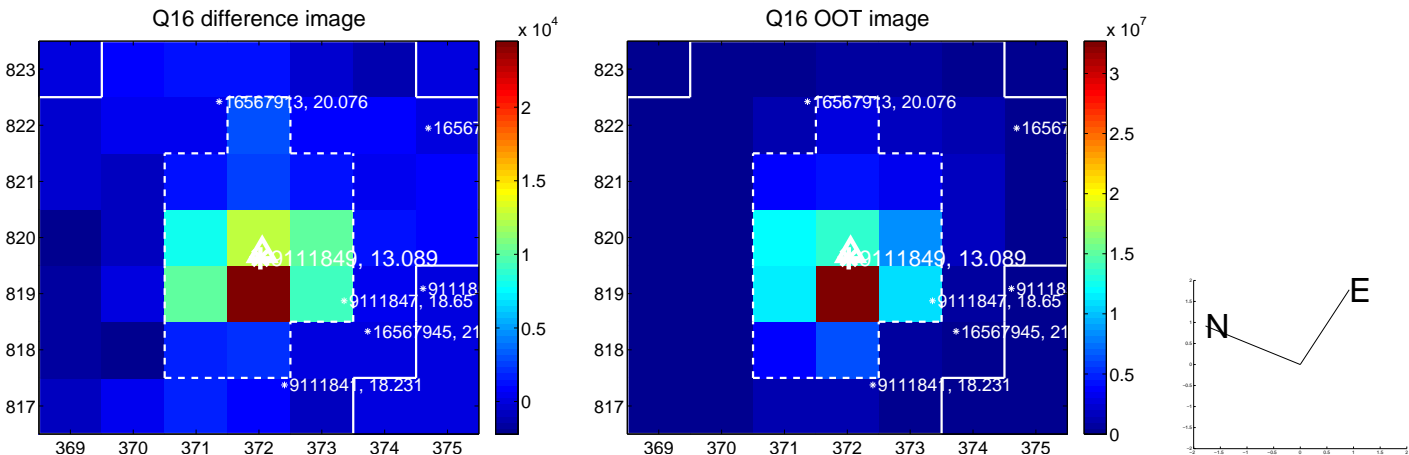
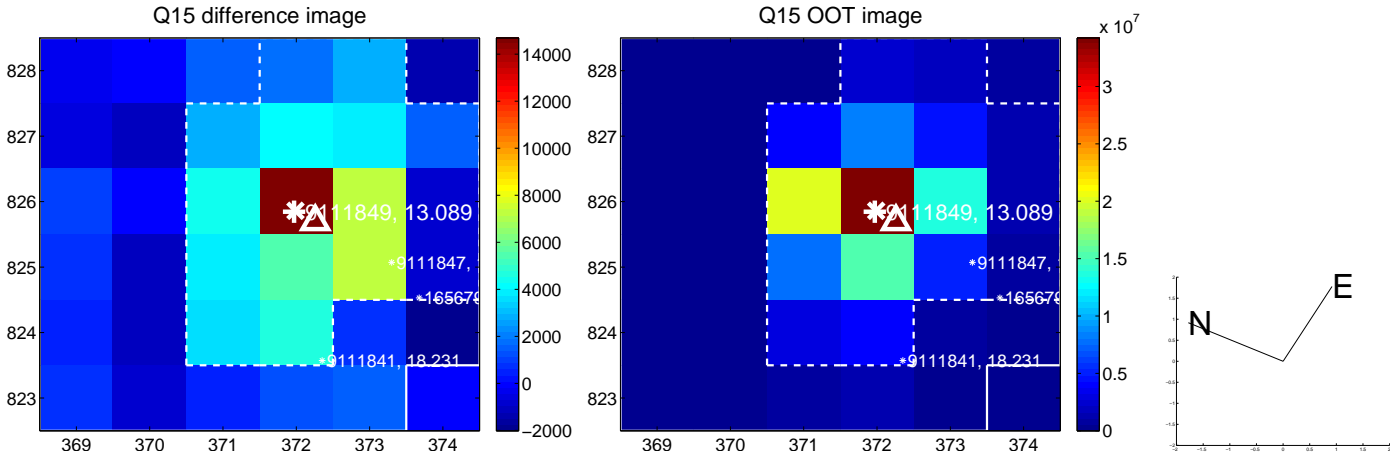
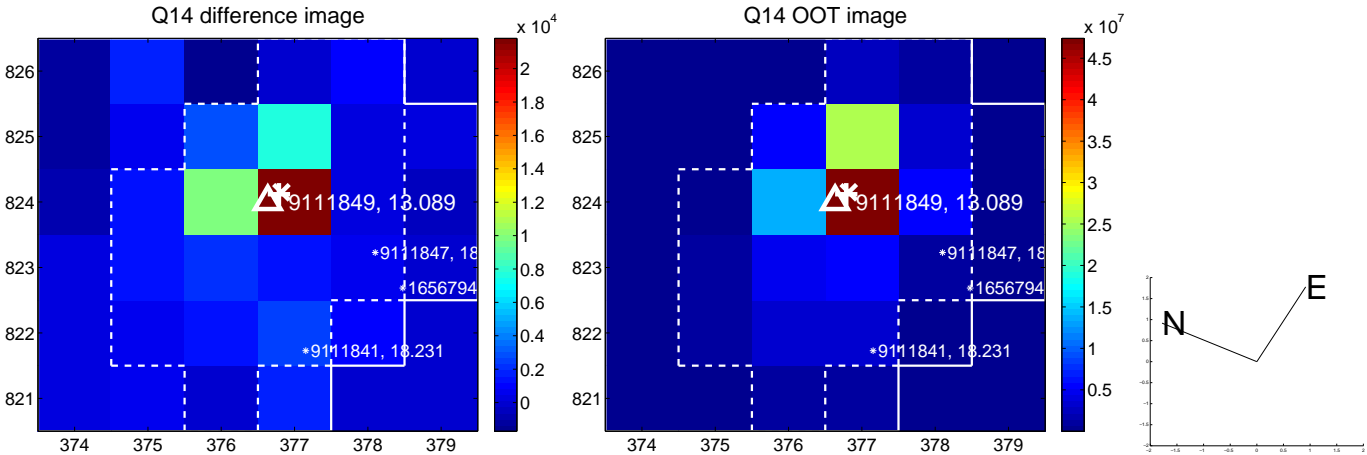
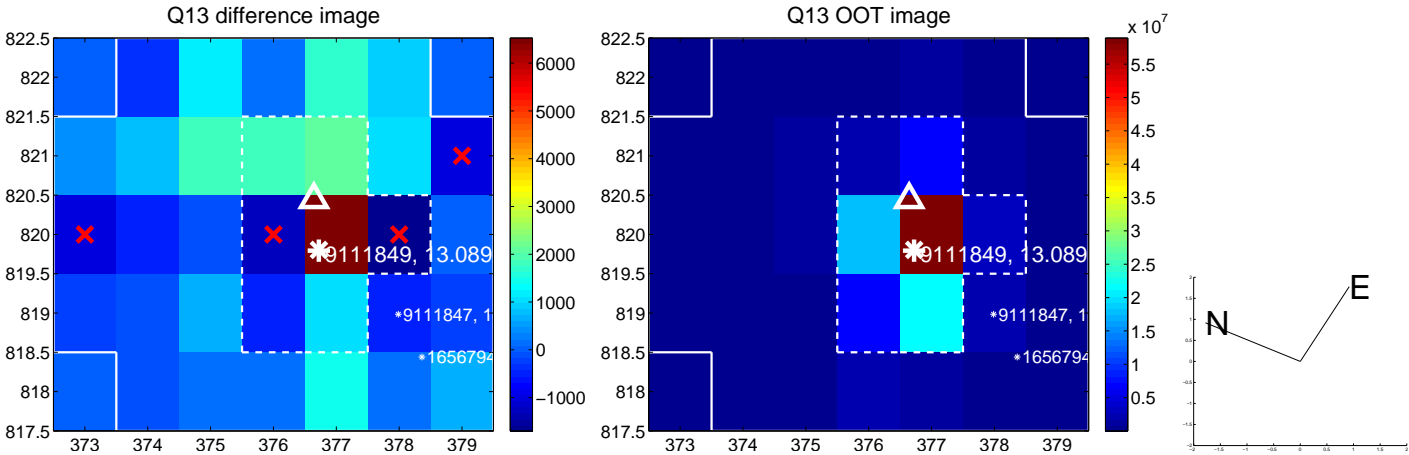


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

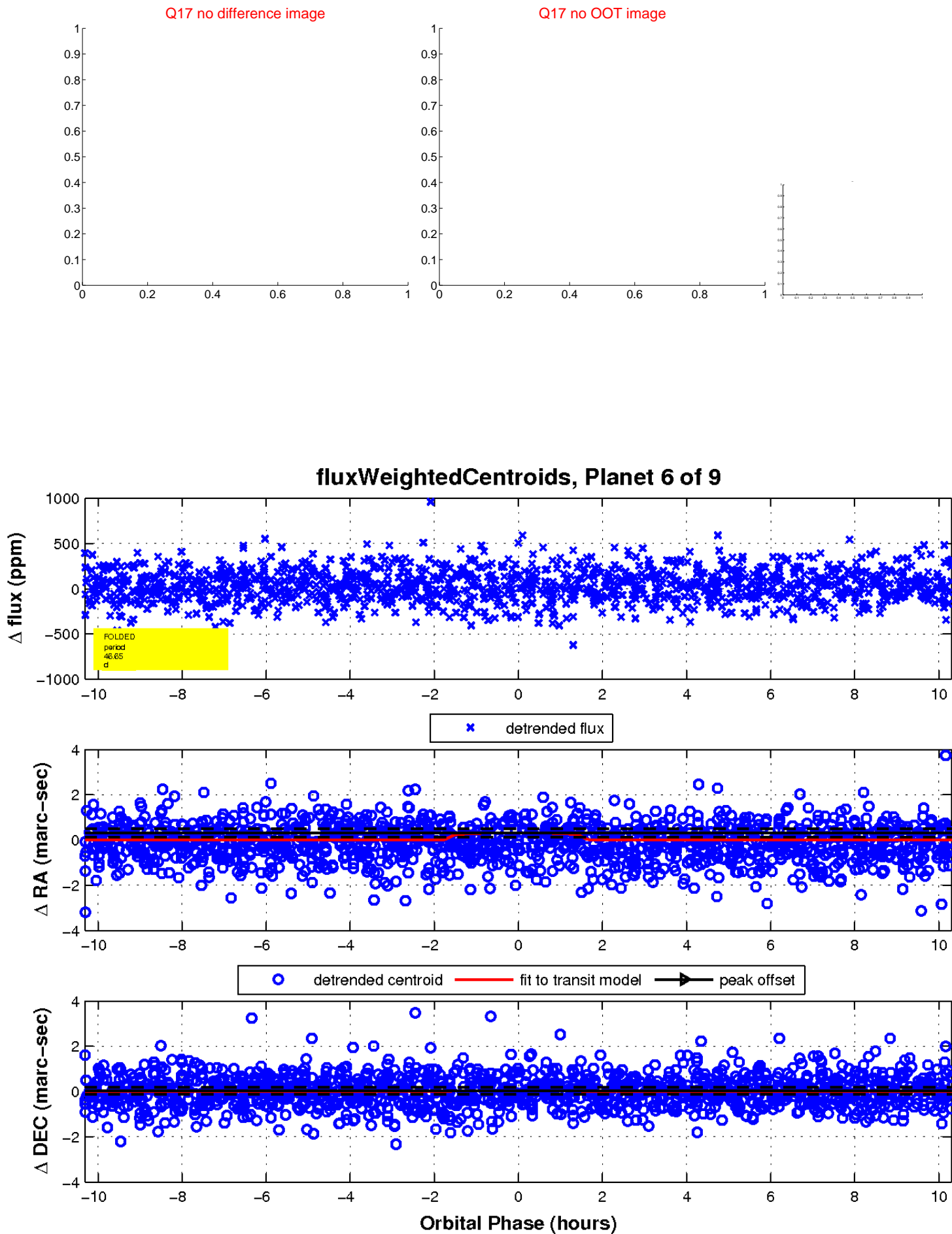




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

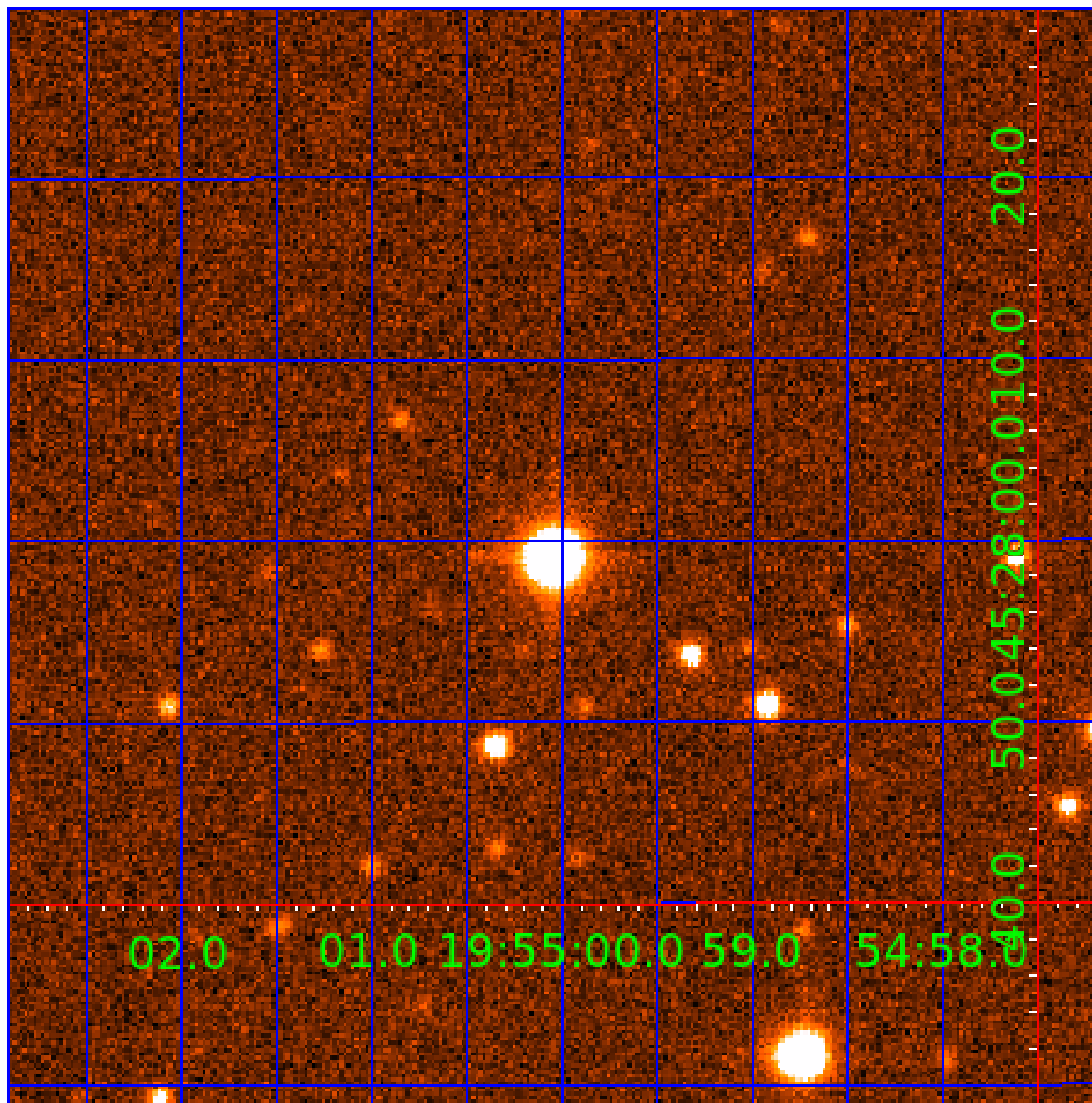


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 009111849

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009111849-01	OBS	2042.01	63.073086	191.255585	636.8	5.503	35.4	36.2	6.35	6234	17.84	318.32
009111849-02	OBS	No	0.879308	131.635994	290.7	1.500	8.5	-1.0	6.35	6234	10.84	94872.03
009111849-03	OBS	No	1.419233	131.903611	19.1	9.134	8.3	8.7	6.35	6234	2.77	50109.64
009111849-04	OBS	No	55.896078	184.095431	329.3	2.264	11.0	10.8	6.35	6234	12.11	373.95
009111849-05	OBS	No	88.224588	219.286101	366.2	2.176	9.6	10.6	6.35	6234	13.81	203.49
009111849-06	OBS	No	46.648185	141.719773	221.1	3.438	10.1	9.2	6.35	6234	11.02	475.93
009111849-07	OBS	No	43.779139	132.854579	271.3	2.527	9.1	8.9	6.35	6234	12.31	517.97
009111849-08	OBS	No	61.217340	159.721819	272.7	2.190	8.4	8.4	6.35	6234	11.82	331.25
009111849-09	OBS	No	139.780377	232.656851	366.1	2.500	8.3	-1.0	6.35	6234	12.13	110.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009111849-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009111849-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS
009111849-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009111849-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009111849-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009111849-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

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

Ephemeris Match Information For 009111849-07

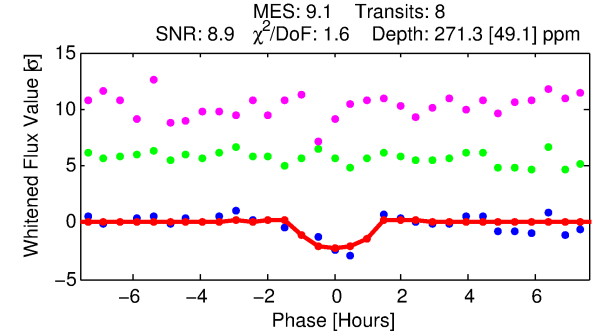
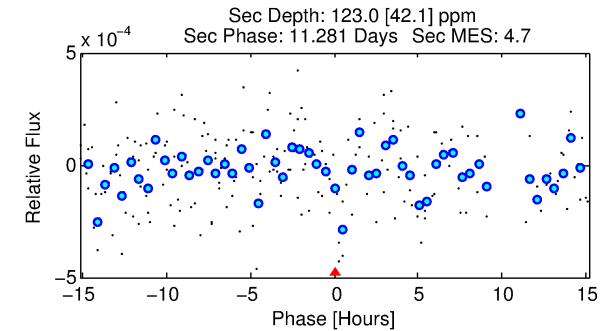
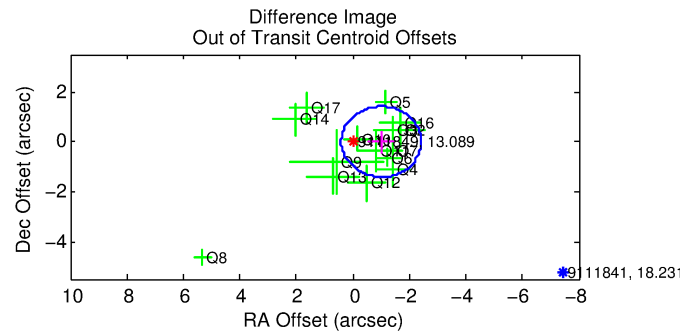
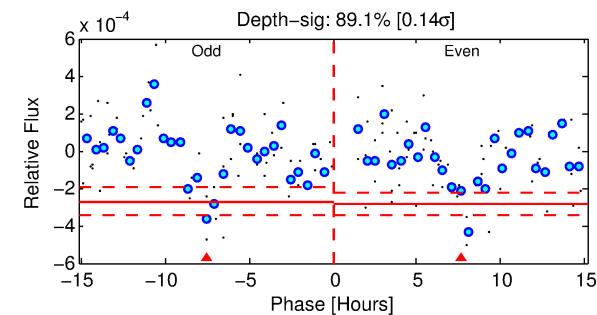
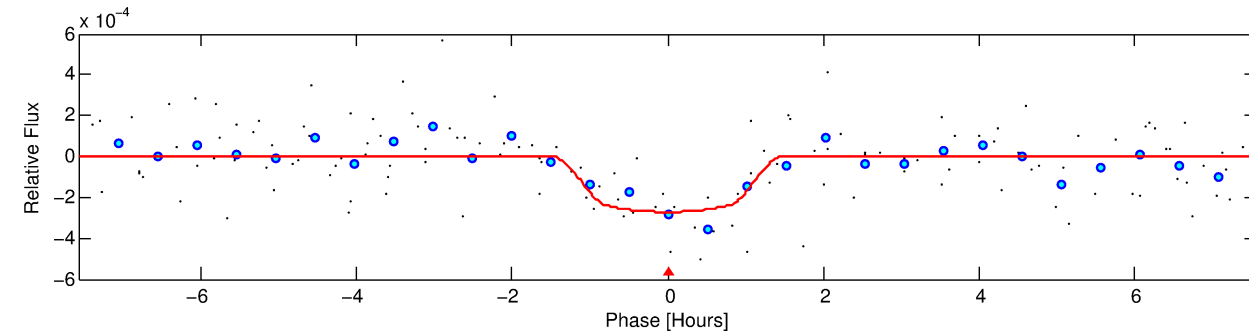
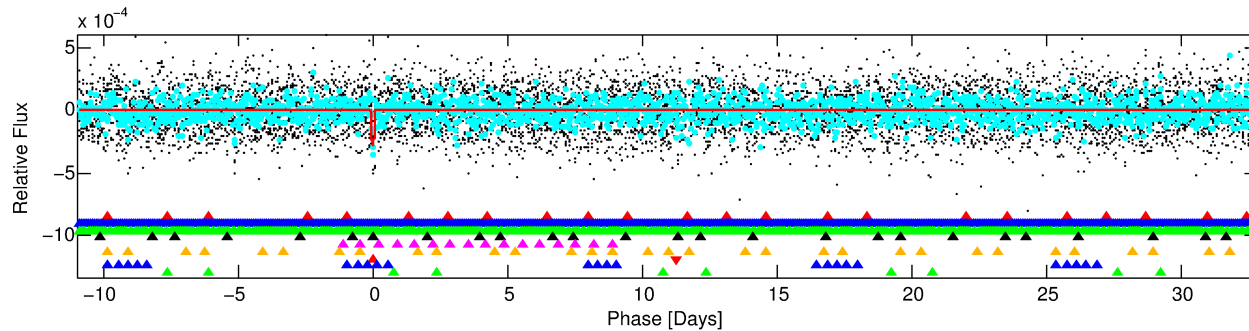
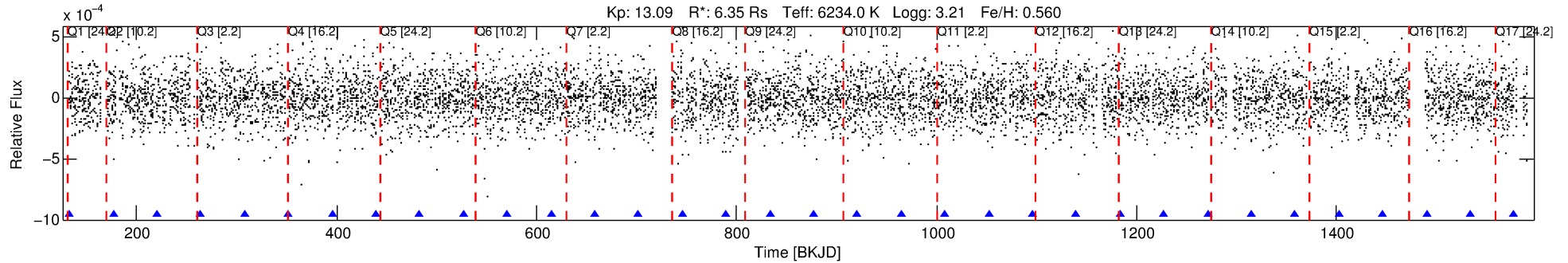
No Significant Match Found

# DV One-Page Summary

KIC: 9111849 Candidate: 7 of 9 Period: 43.779 d

KOI: K02042 Corr: No Ephemeris Match

Kp: 13.09 R\*: 6.35 Rs Teff: 6234.0 K Logg: 3.21 Fe/H: 0.560



## DV Fit Results:

Period = 43.77914 [0.00036] d  
Epoch = 132.8546 [0.0069] BKJD  
Rp/R\* = 0.0178 [0.0147]  
a/R\* = 63.73 [262.96]  
b = 0.90 [0.92]  
Seff = 517.97 [403.84]  
Teq = 1216 [237] K  
Rp = 12.31 [11.90] Re  
a = 0.3248 [0.1574] AU  
Ag = 47.08 [87.54] [0.53σ]  
Teffp = 4927 [2081] K [1.77σ]

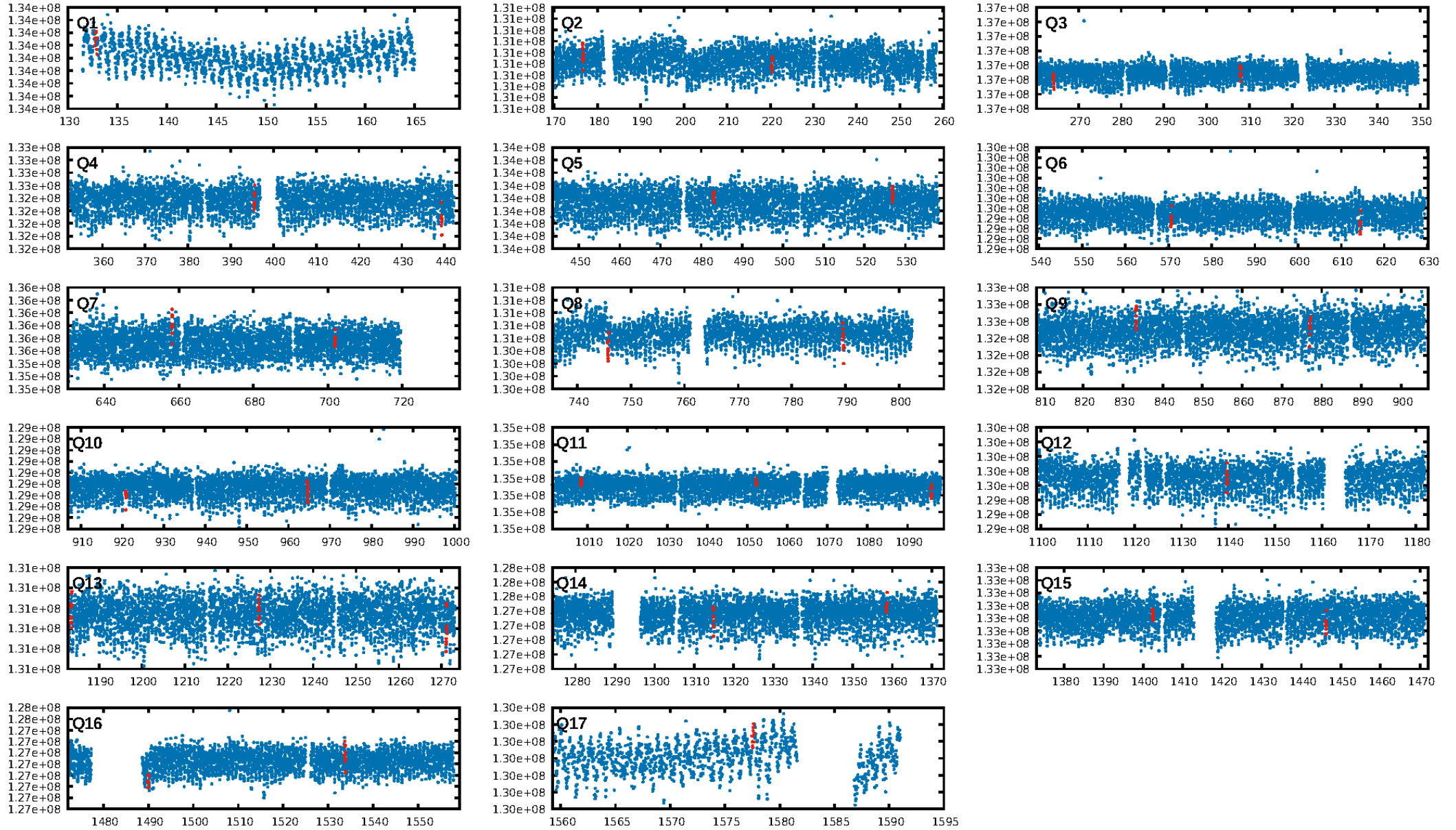
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [107.27σ]  
LongPeriod-sig: 100.0% [16.14σ]  
ModelChiSquare2-sig: 21.6%  
ModelChiSquareGof-sig: 99.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: -1.998  
Centroid-sig: 2.0%  
Centroid-so: 1.549 arcsec [2.23σ]  
OotOffset-rm: 0.998 arcsec [2.12σ]  
KicOffset-rm: 1.074 arcsec [2.14σ]  
OotOffset-st: 4/3/4/4 [15]  
KicOffset-st: 4/3/4/4 [15]  
DiffImageQuality-fgm: 0.40 [6/15]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:45:13 Z

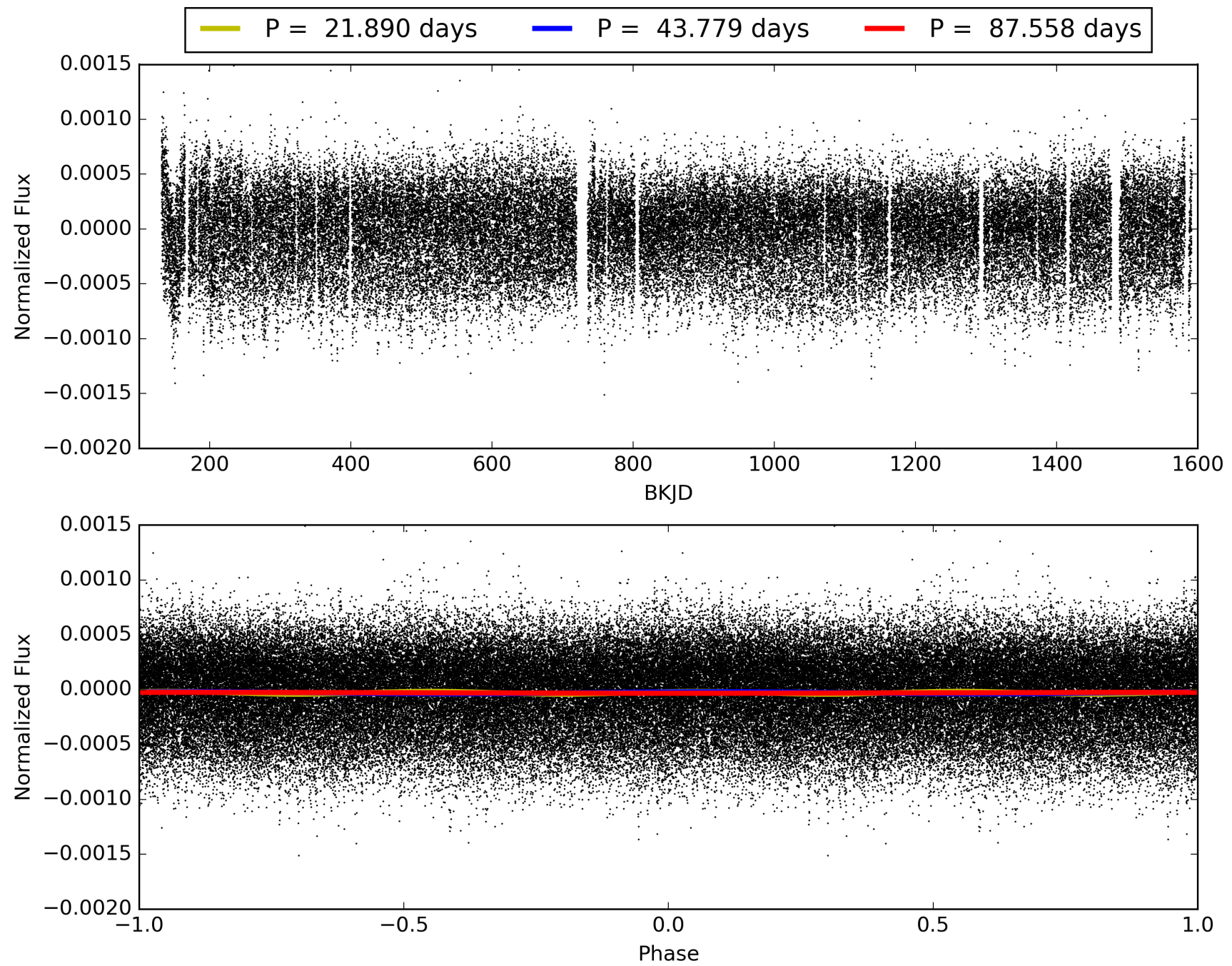
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009111849-07, PDC Light Curves





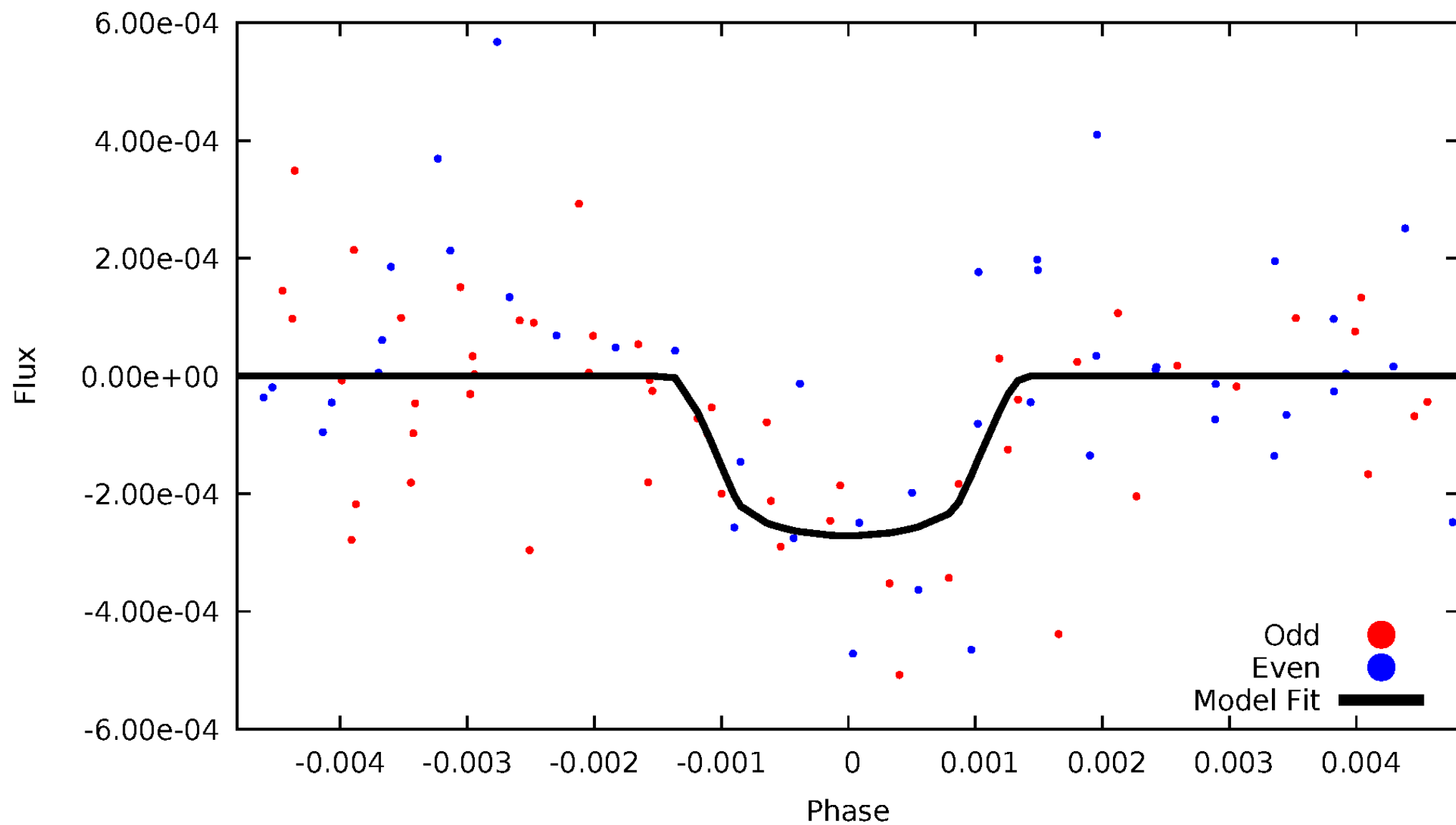
TCE 009111849-07





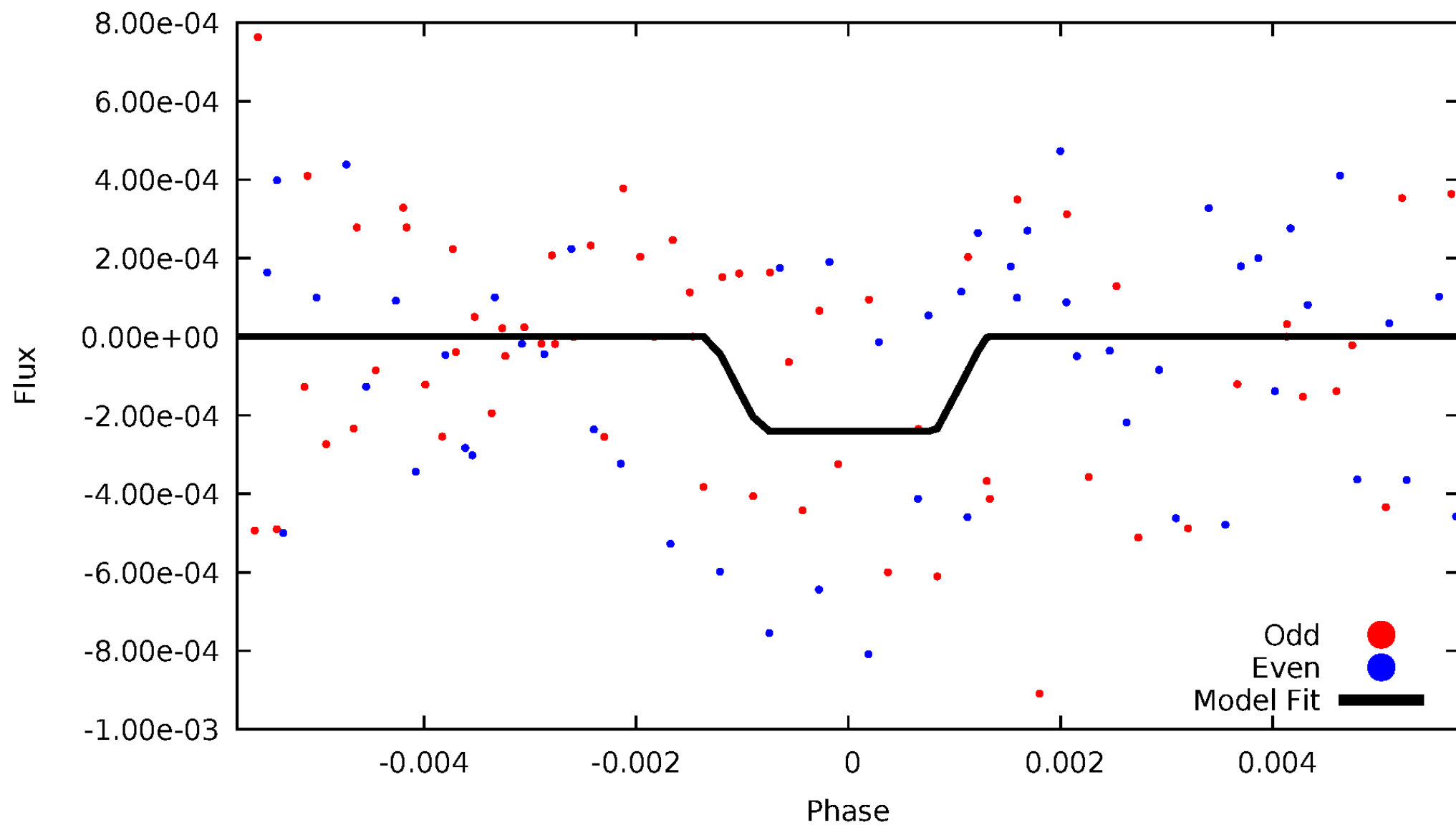
# DV Odd/Even

TCE 009111849-07



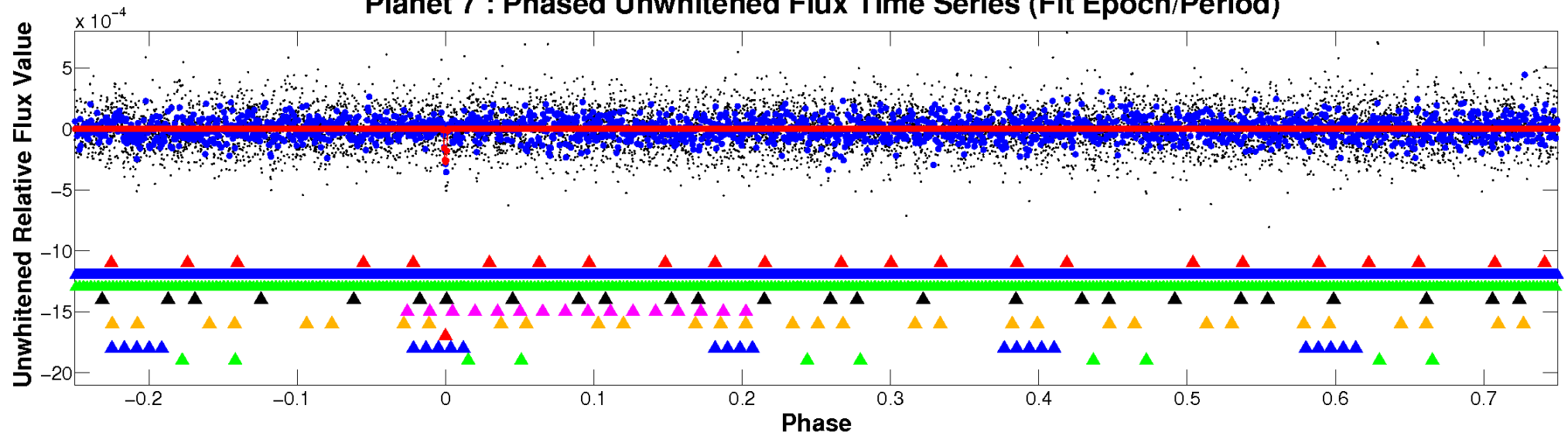
# ALT Odd/Even

TCE 009111849-07

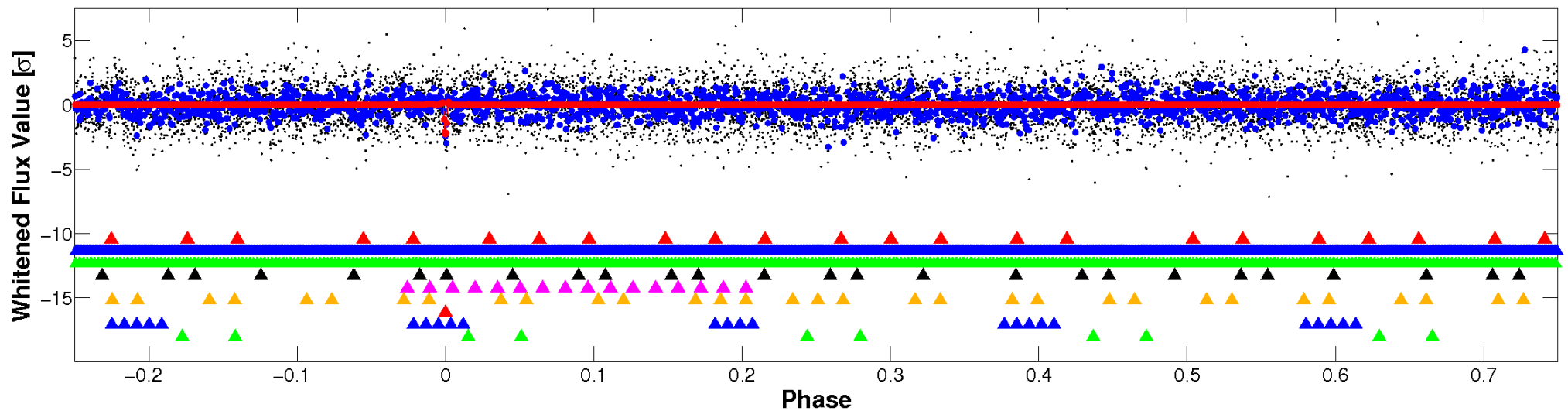


# Non-Whitened Vs. Whitened Light Curve

## Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

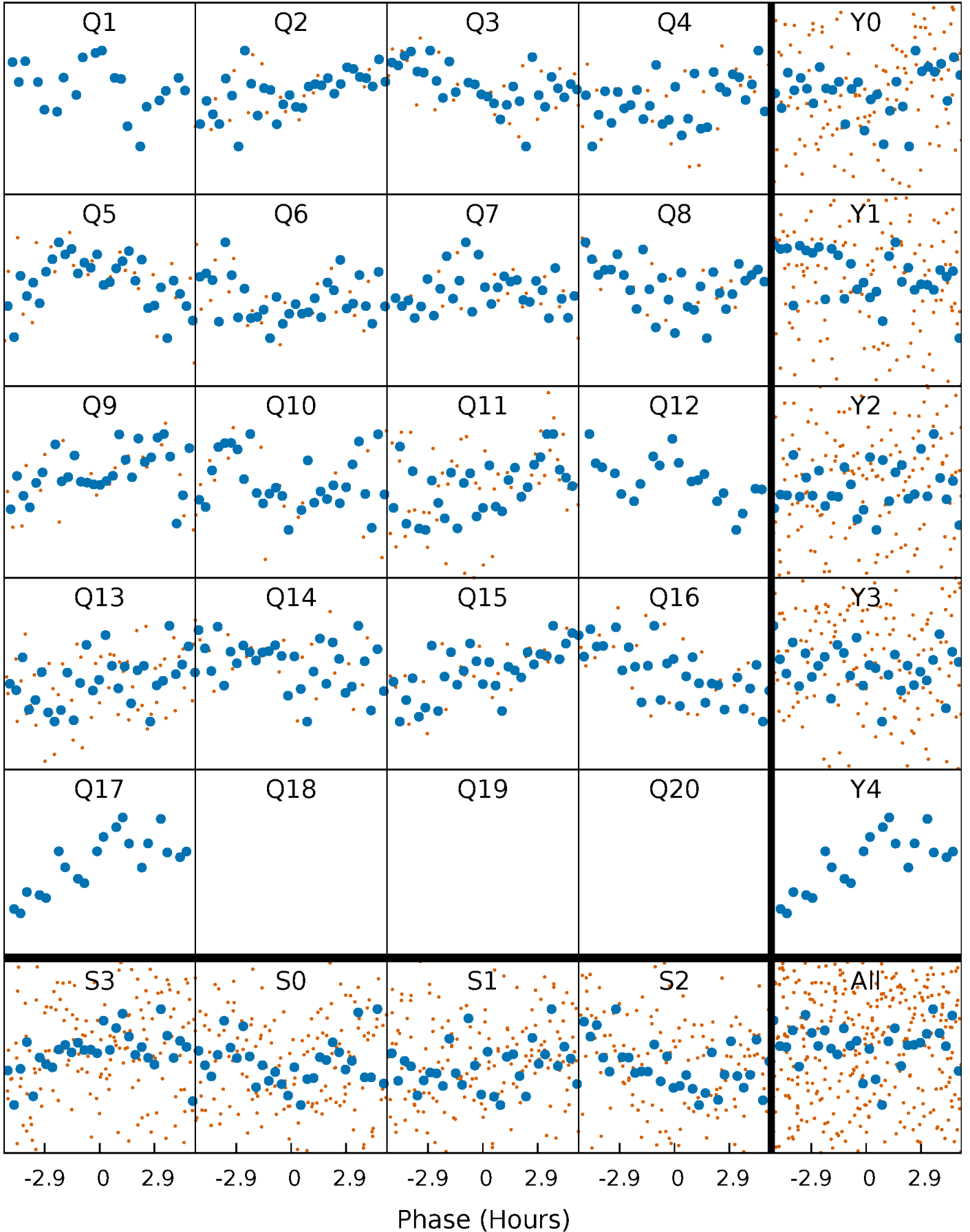


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



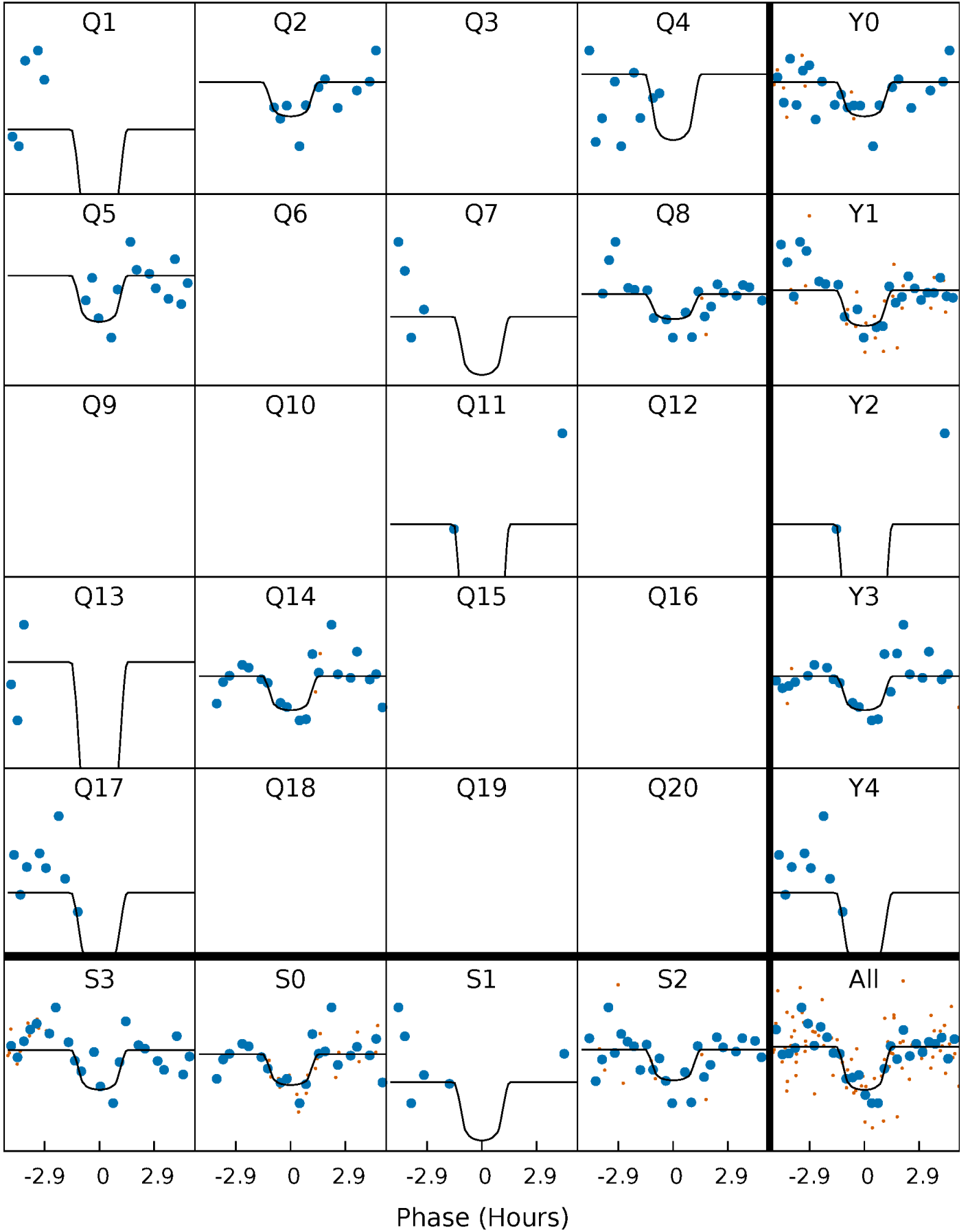
# PDC Quarter-Phased Transit Curves

TCE 009111849-07   P= 43.779139 Days    $T_0=132.854579$  (BKJD)



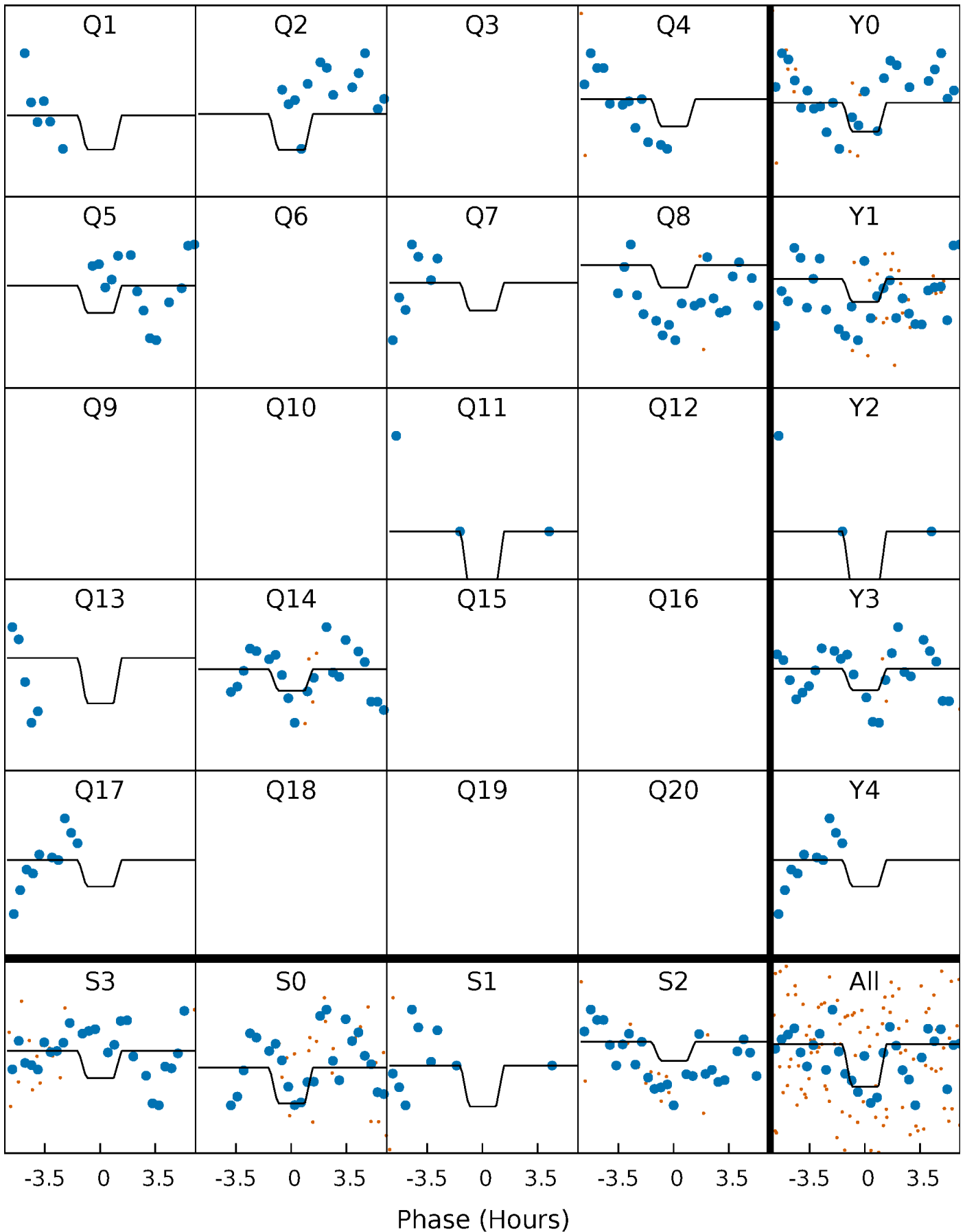
# DV Quarter-Phased Transit Curves

TCE 009111849-07   P= 43.779139 Days    $T_0=132.854579$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

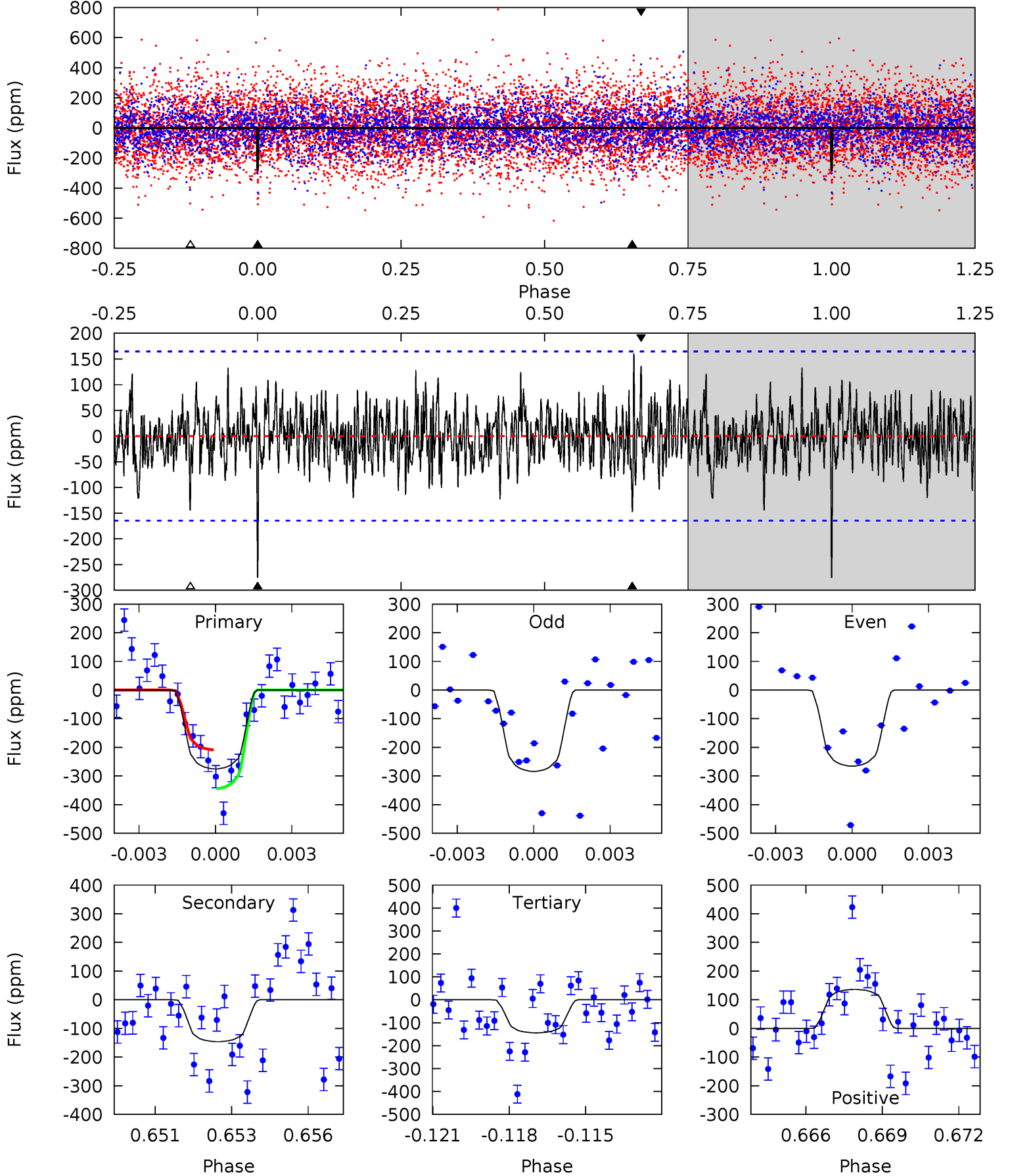
TCE 009111849-07   P= 43.779495 Days    $T_0=132.842875$  (BKJD)



# DV Model-Shift Uniqueness Test

009111849-07, P = 43.779139 Days, E = 89.075440 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
8.82	4.69	4.63	4.36	5.28	3.01	1.39	4.20	4.46	0.06	0.33	0.29	0.87	0.37	2.18

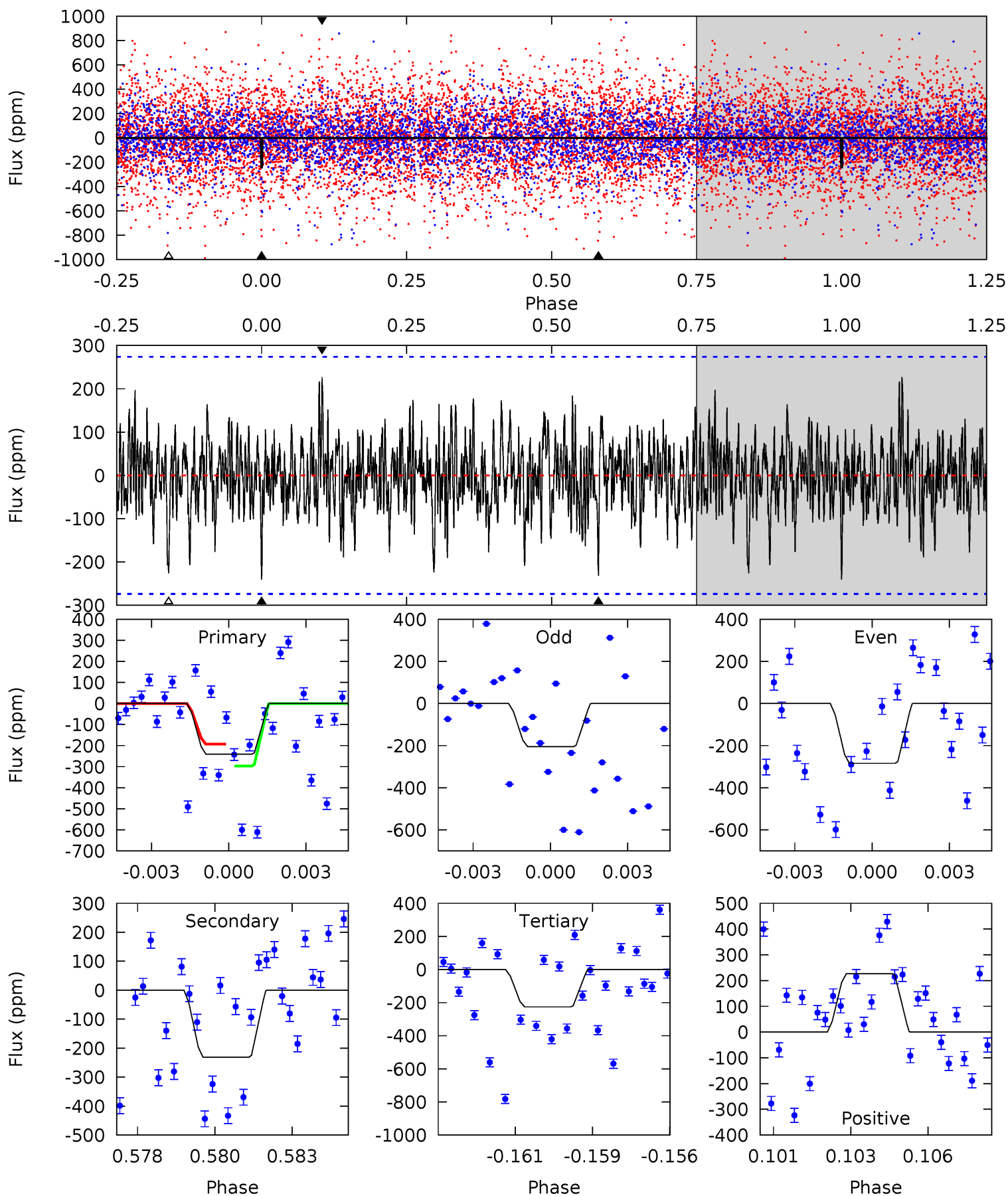




# Alt Model-Shift Uniqueness Test

009111849-07, P = 43.779495 Days, E = 89.063380 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.65	4.46	4.36	4.38	5.28	3.02	1.30	0.29	0.27	0.11	0.09	0.76	0.77	0.49	1.00



### Stellar Parameters For KIC 009111849

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6234^{+74}_{-74}$	$3.209^{+0.458}_{-0.122}$	$0.560^{+0.050}_{-0.100}$	$6.354^{+1.590}_{-3.180}$	$2.382^{+0.277}_{-0.514}$	$0.013^{+0.056}_{-0.005}$
	+1%/-1%	+14%/-4%	+9%/-18%	+25%/-50%	+12%/-22%	+431%/-35%
Source	SPE90	FLK73	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009111849-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-146 \pm 31$	$11.89^{+8.96}_{-6.97}$	$1656^{+124}_{-210}$	$5065^{+2881}_{-1017}$	$62^{+301}_{-43}$
Alt.	$-231 \pm 52$	$11.29^{+9.29}_{-7.45}$	$1661^{+109}_{-211}$	$5637^{+4914}_{-1184}$	$104^{+799}_{-73}$

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

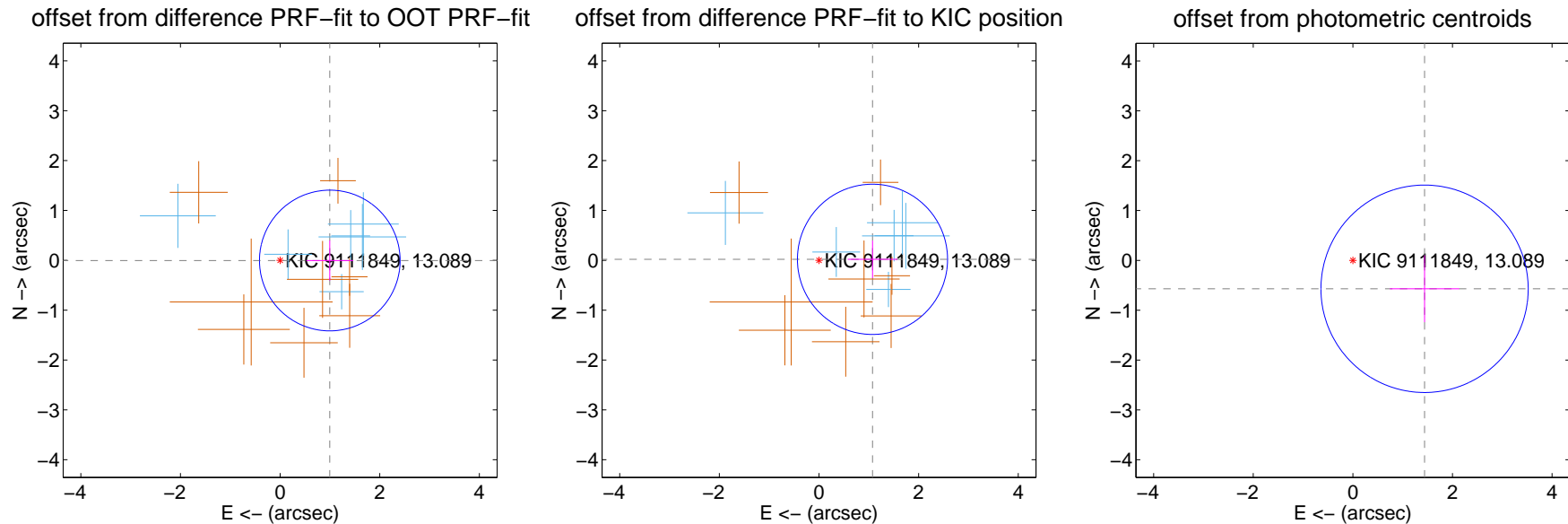
## DV Centroid Data

Supplemental centroid analysis for 009111849-07. Kepler magnitude: 13.09. Transit SNR 8.93

There are 6 quarters with good PRF difference image offsets

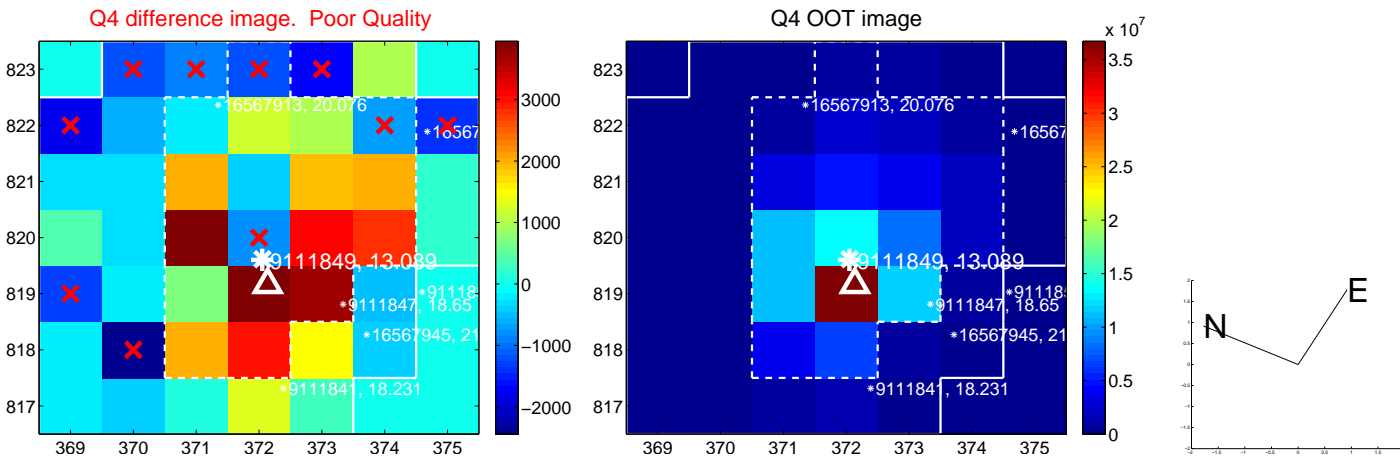
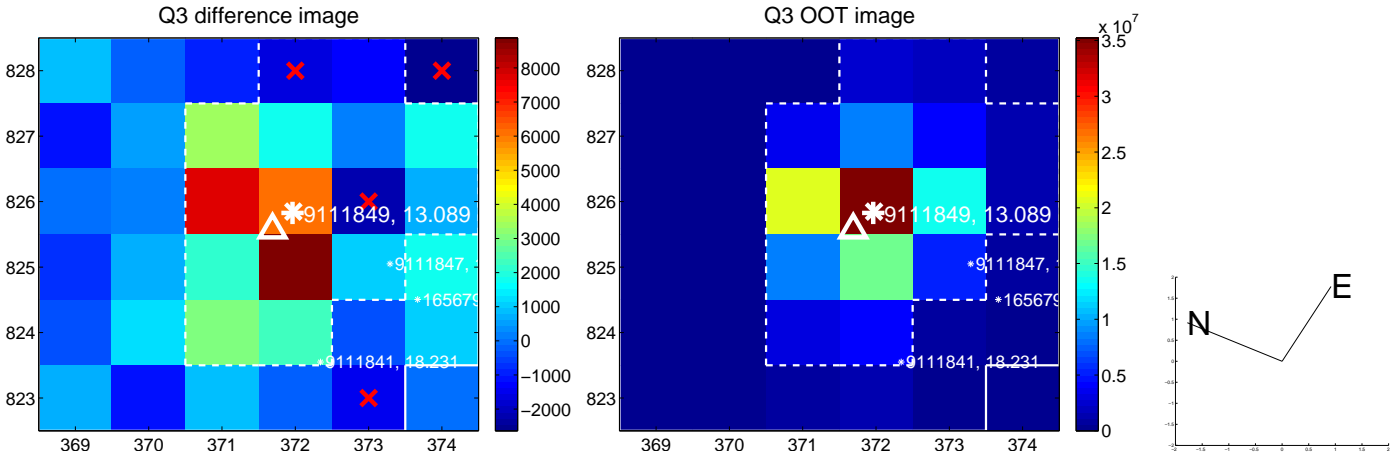
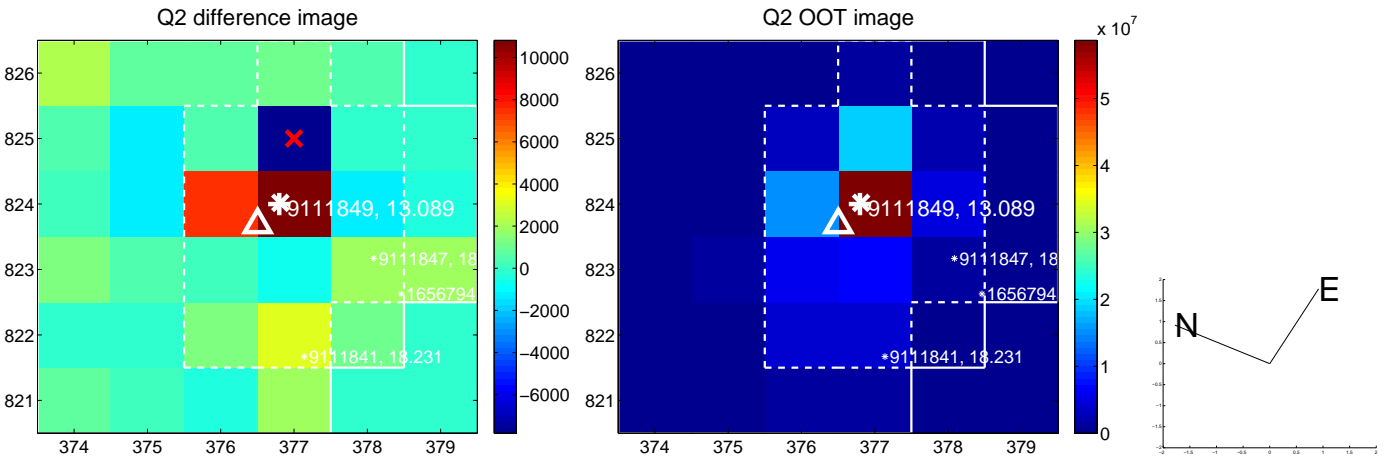
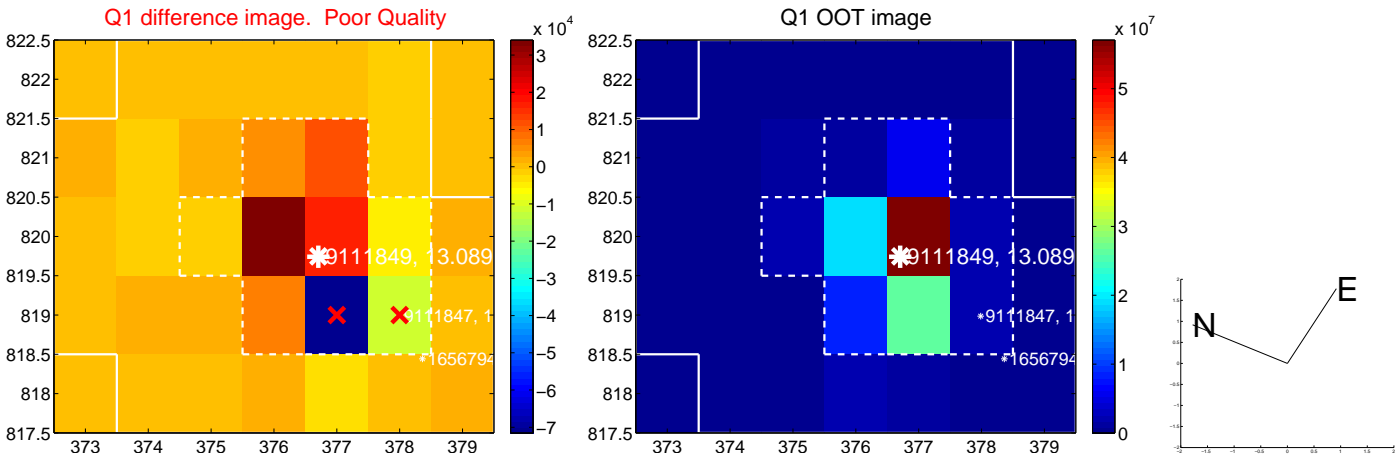
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.998 \pm 0.470$	2.12	$-0.998 \pm 0.471$	$-0.004 \pm 0.403$
PRF-fit source offset from KIC position	$1.074 \pm 0.502$	2.14	$-1.074 \pm 0.499$	$0.019 \pm 0.375$
photometric centroid source offset	$1.55 \pm 0.69$	2.23	$-1.44 \pm 0.70$	$-0.57 \pm 0.67$

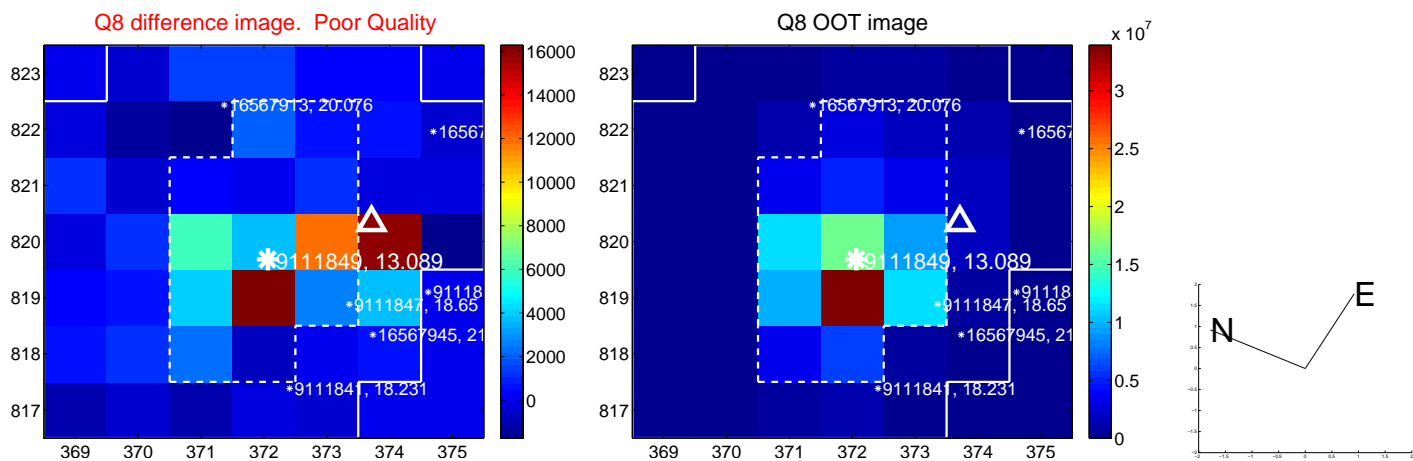
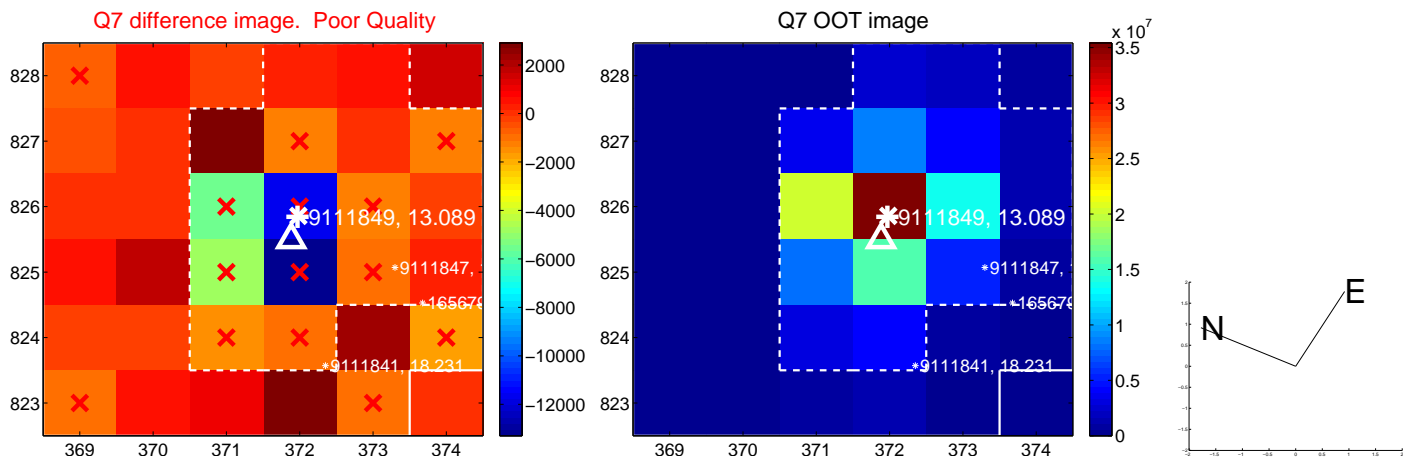
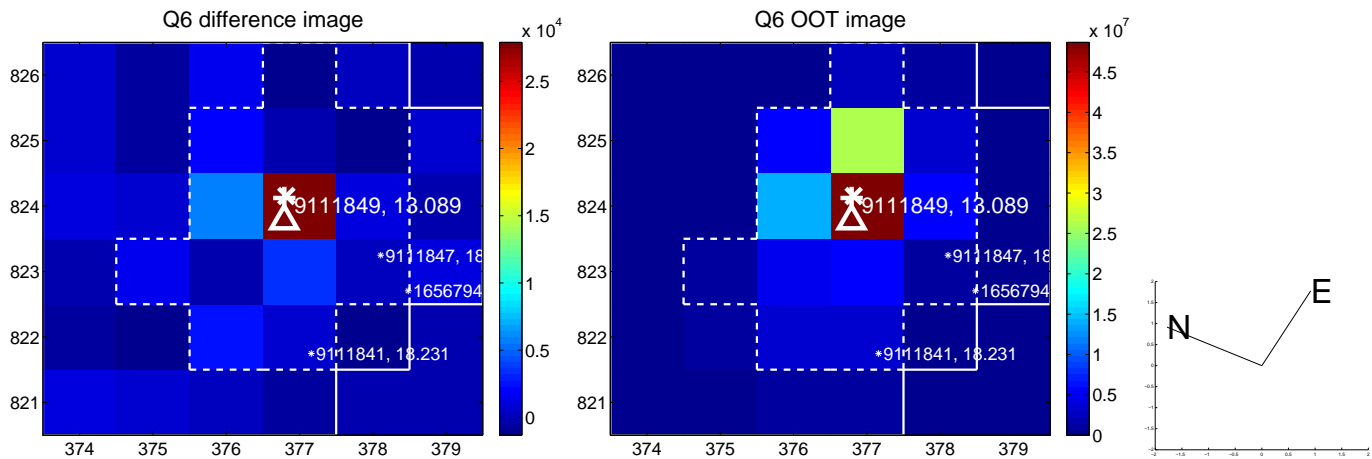
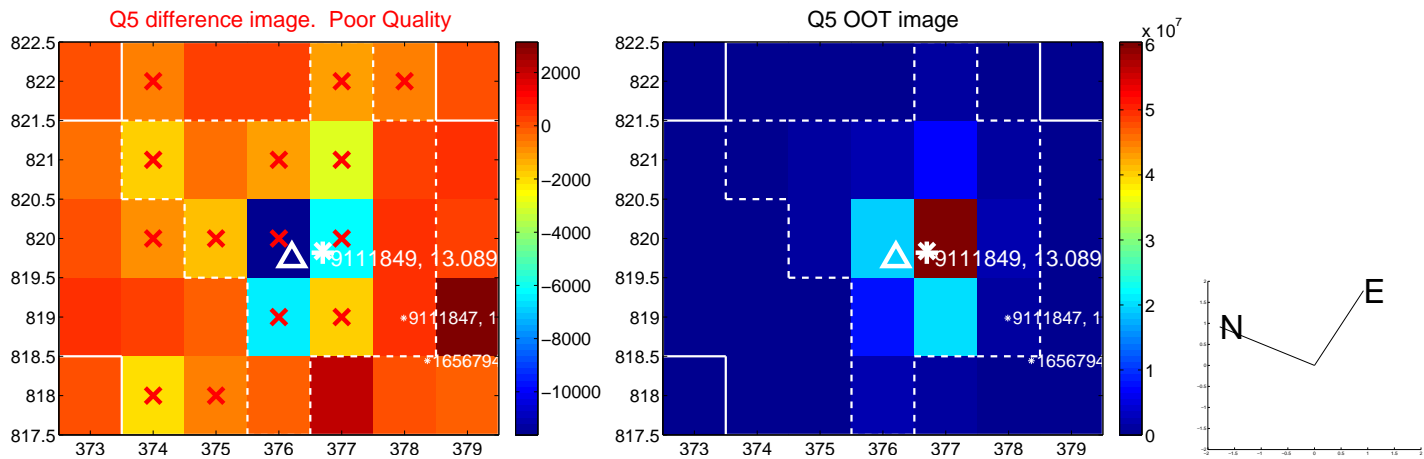


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

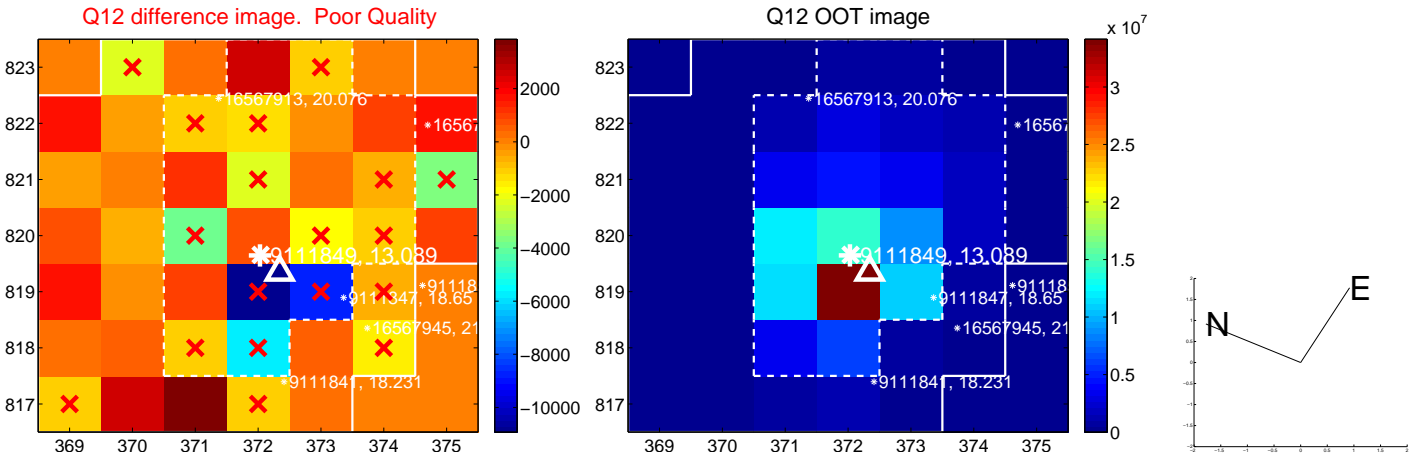
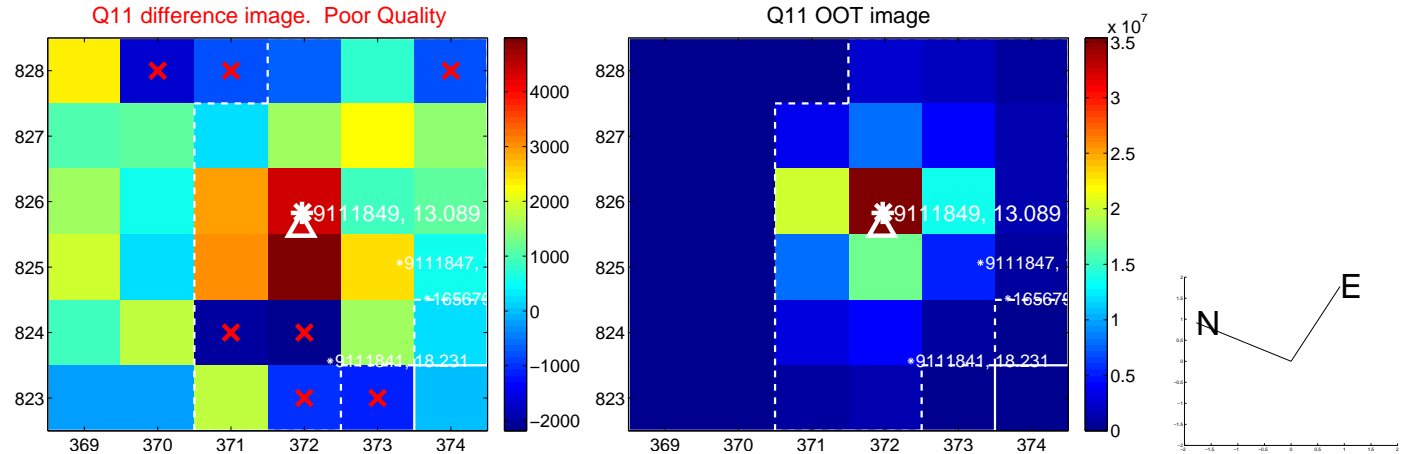
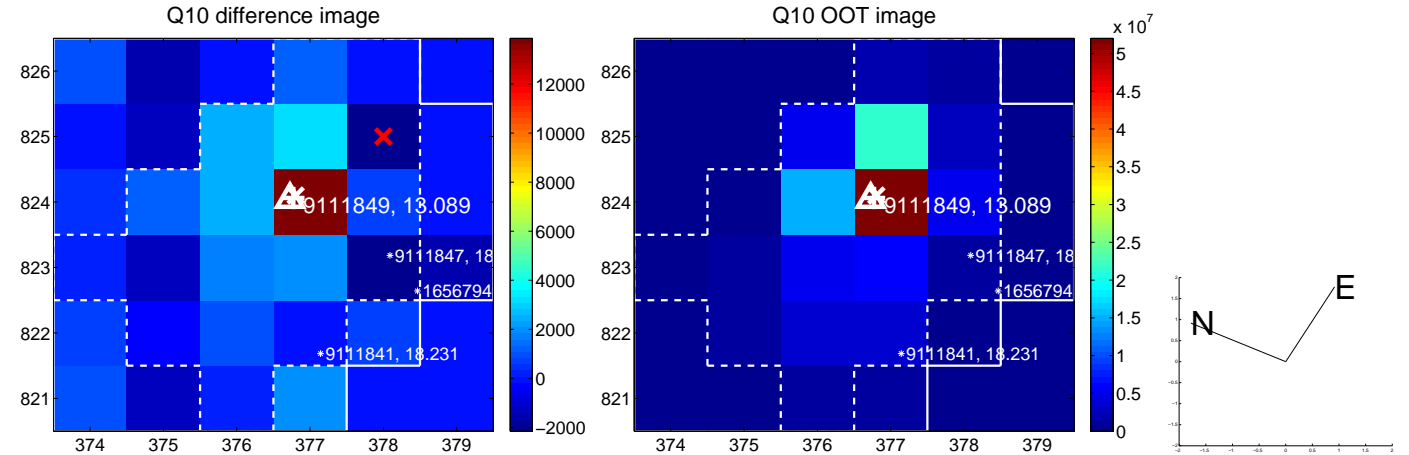
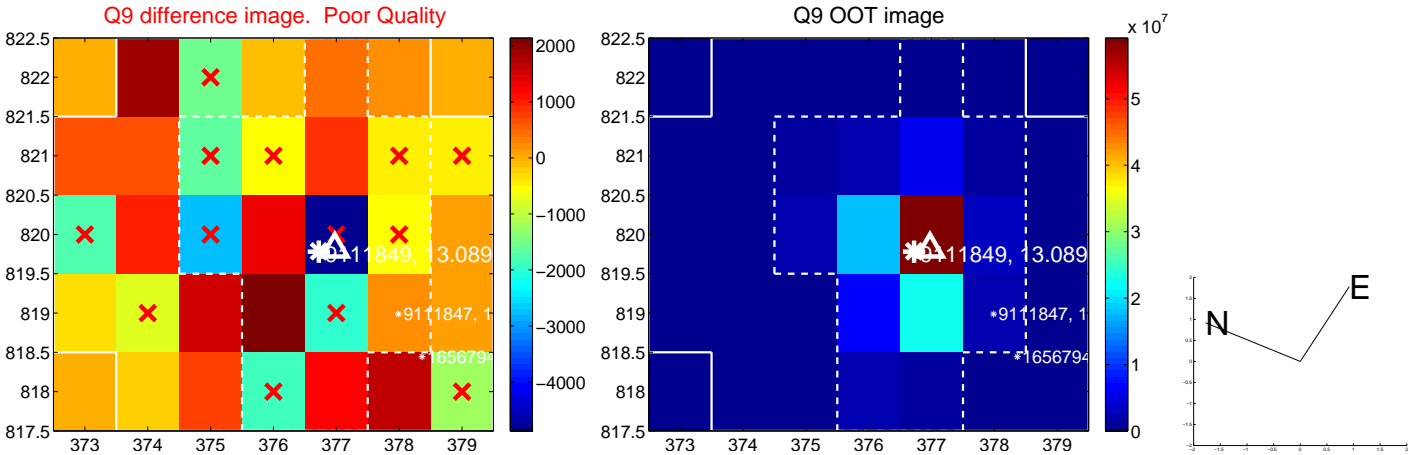
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



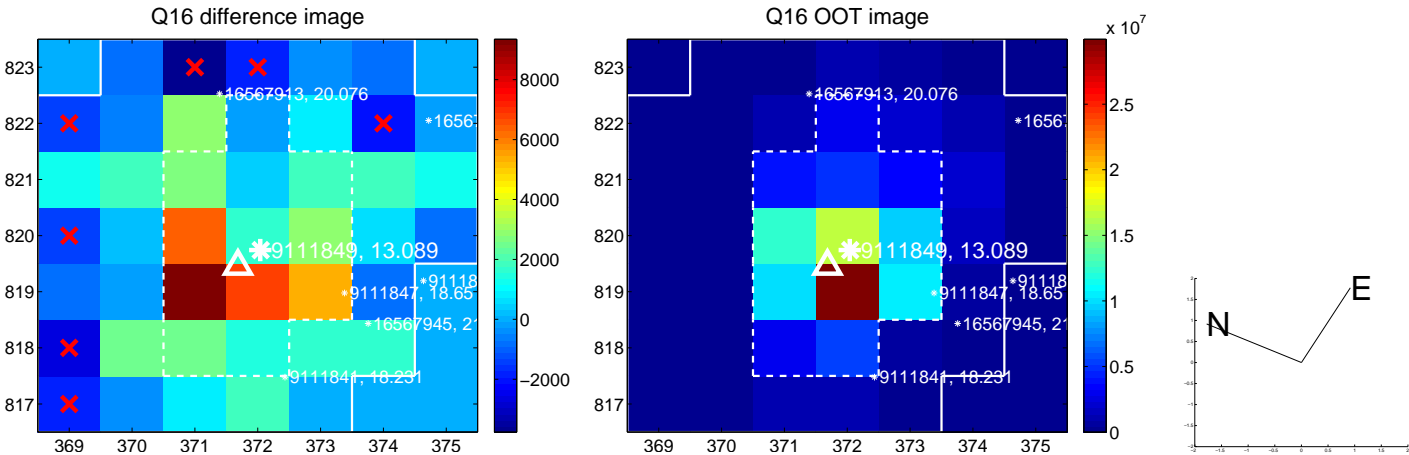
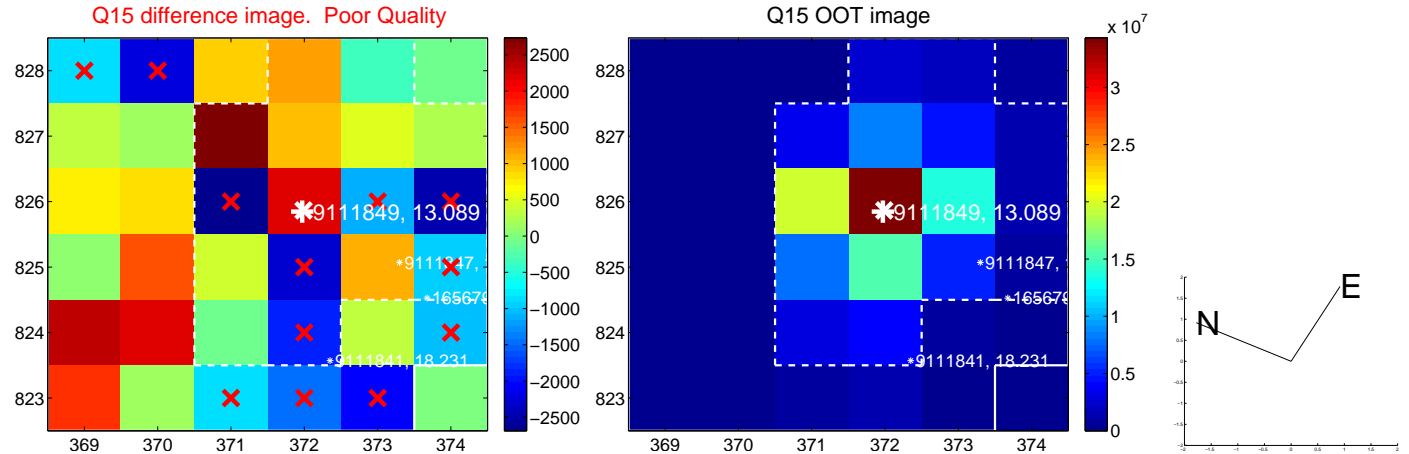
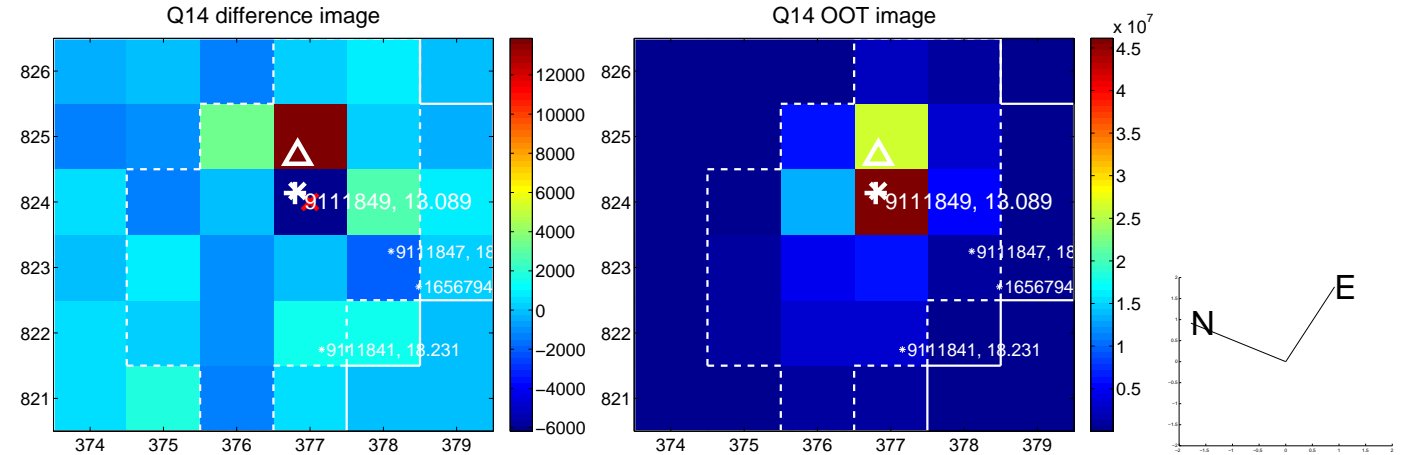
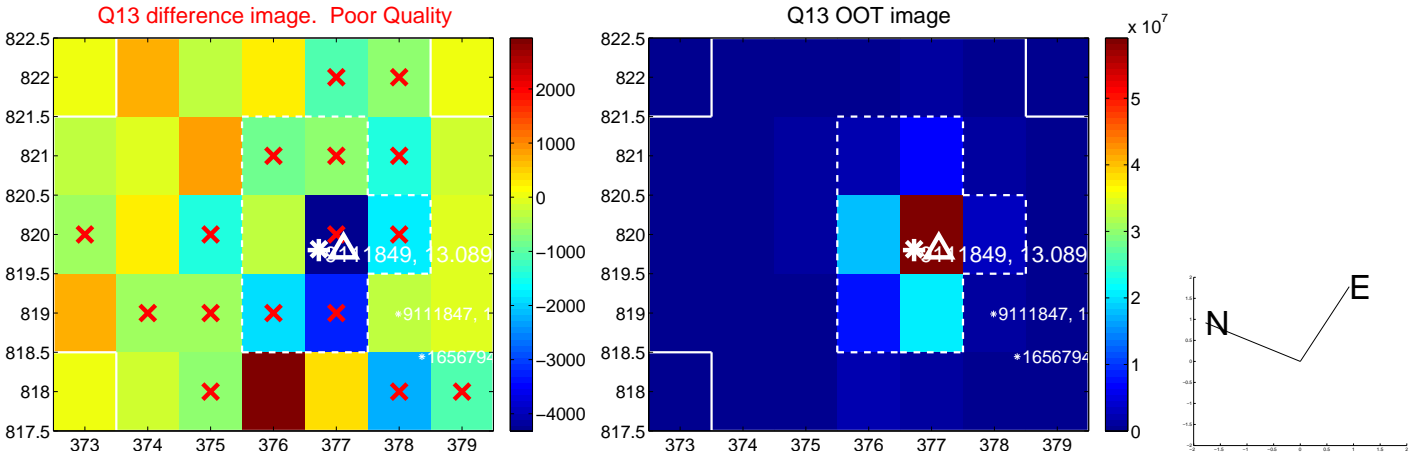
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

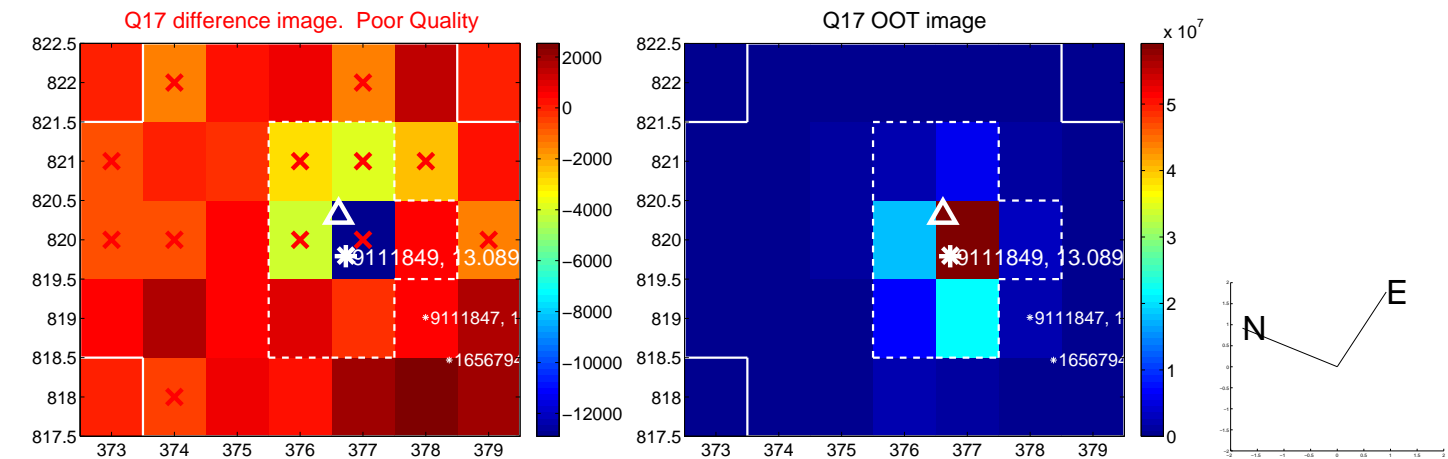


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

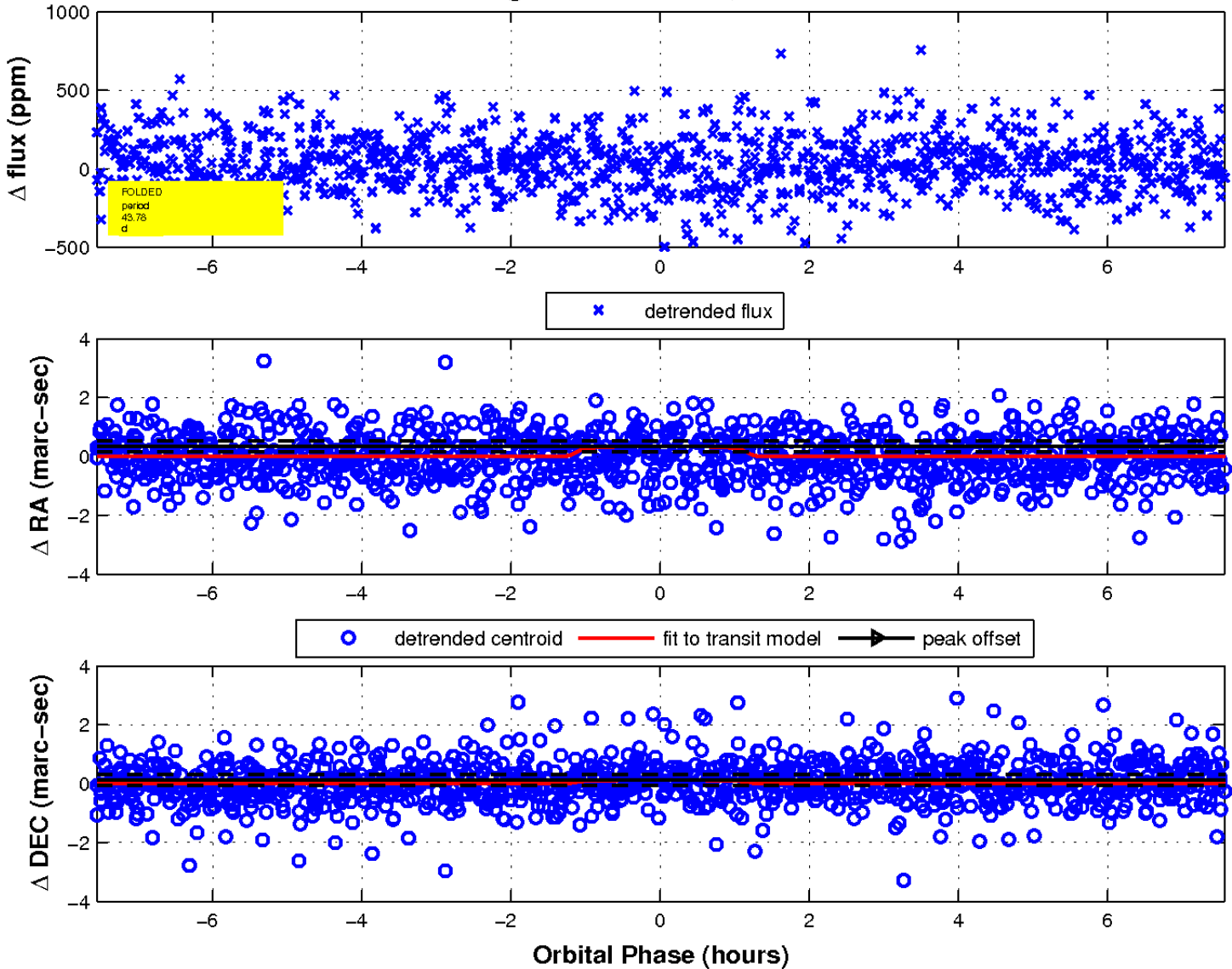




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

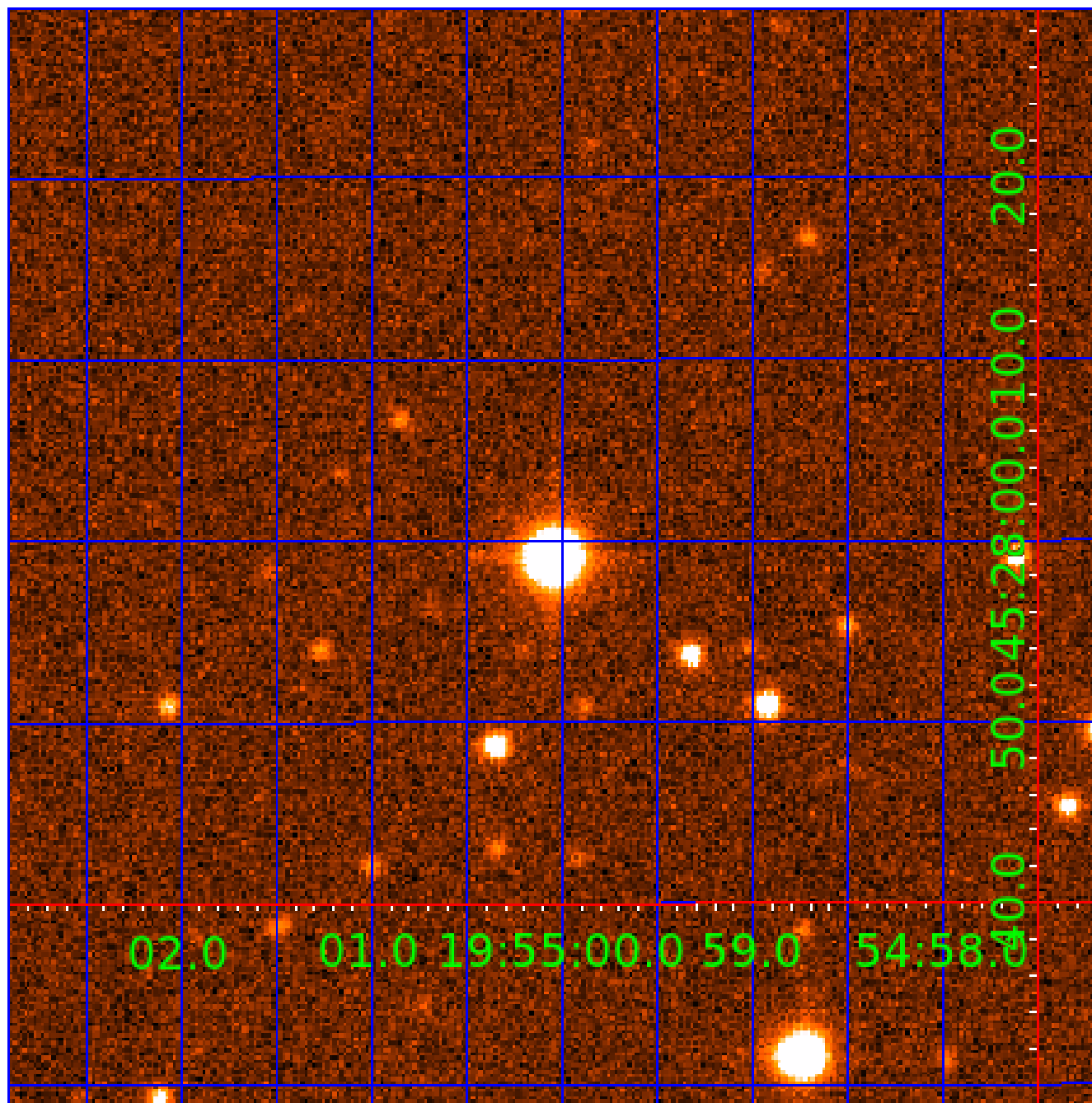


fluxWeightedCentroids, Planet 7 of 9



# UKIRT Image

Declination



# KIC 009111849

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009111849-01	OBS	2042.01	63.073086	191.255585	636.8	5.503	35.4	36.2	6.35	6234	17.84	318.32
009111849-02	OBS	No	0.879308	131.635994	290.7	1.500	8.5	-1.0	6.35	6234	10.84	94872.03
009111849-03	OBS	No	1.419233	131.903611	19.1	9.134	8.3	8.7	6.35	6234	2.77	50109.64
009111849-04	OBS	No	55.896078	184.095431	329.3	2.264	11.0	10.8	6.35	6234	12.11	373.95
009111849-05	OBS	No	88.224588	219.286101	366.2	2.176	9.6	10.6	6.35	6234	13.81	203.49
009111849-06	OBS	No	46.648185	141.719773	221.1	3.438	10.1	9.2	6.35	6234	11.02	475.93
009111849-07	OBS	No	43.779139	132.854579	271.3	2.527	9.1	8.9	6.35	6234	12.31	517.97
009111849-08	OBS	No	61.217340	159.721819	272.7	2.190	8.4	8.4	6.35	6234	11.82	331.25
009111849-09	OBS	No	139.780377	232.656851	366.1	2.500	8.3	-1.0	6.35	6234	12.13	110.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009111849-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009111849-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS
009111849-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009111849-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009111849-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009111849-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

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

Ephemeris Match Information For 009111849-08

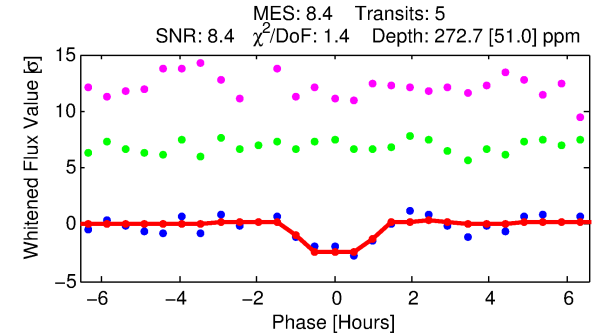
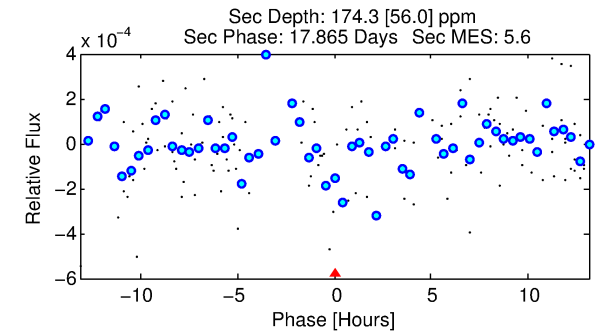
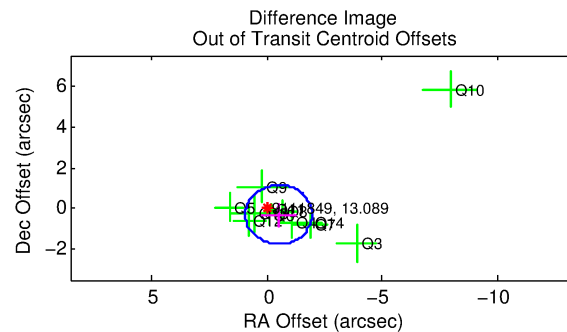
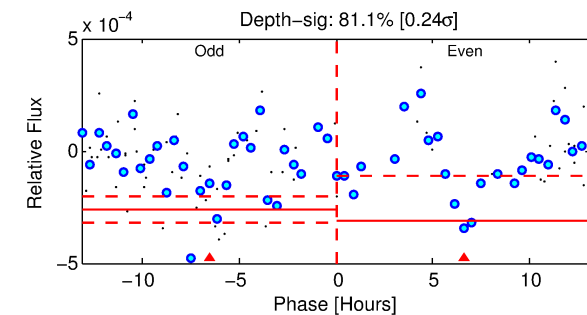
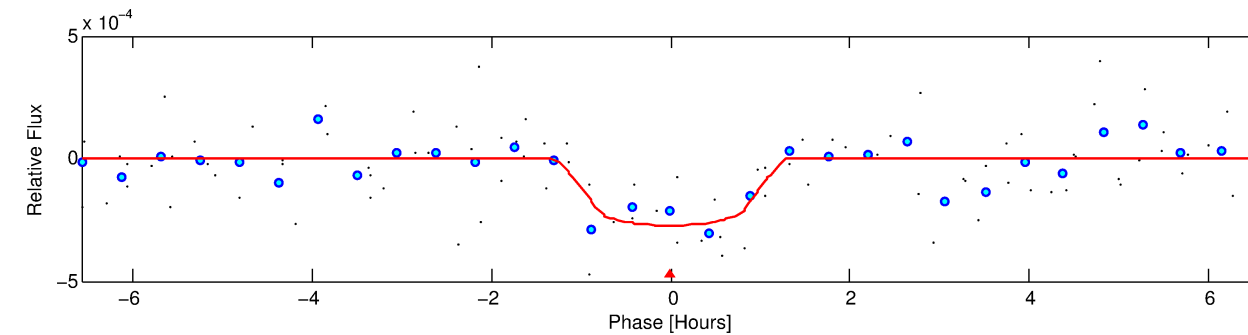
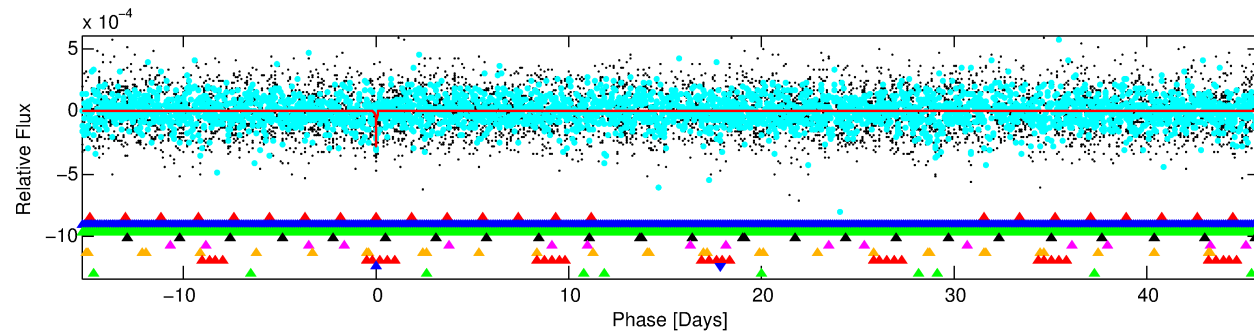
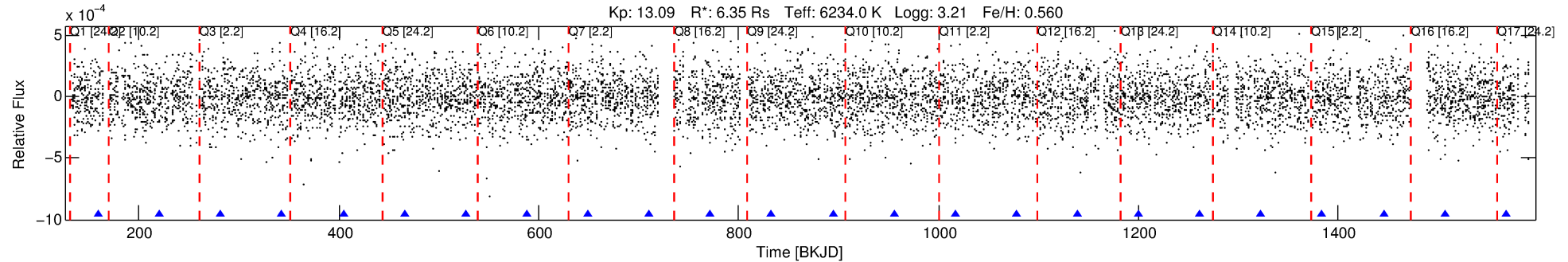
No Significant Match Found

# DV One-Page Summary

KIC: 9111849 Candidate: 8 of 9 Period: 61.217 d

KOI: K02042 Corr: No Ephemeris Match

Kp: 13.09 R\*: 6.35 Rs Teff: 6234.0 K Logg: 3.21 Fe/H: 0.560



## DV Fit Results:

Period = 61.21734 [0.00070] d  
Epoch = 159.7218 [0.0089] BKJD  
Rp/R\* = 0.0170 [0.0761]  
a/R\* = 124.92 [2782.75]  
b = 0.83 [8.38]  
Seff = 331.25 [258.26]  
Teq = 1088 [212] K  
Rp = 11.82 [53.06] Re  
a = 0.4061 [0.1968] AU  
Ag = 113.25 [1015.12] [0.11σ]  
Teffp = 5487 [12249] K [0.36σ]

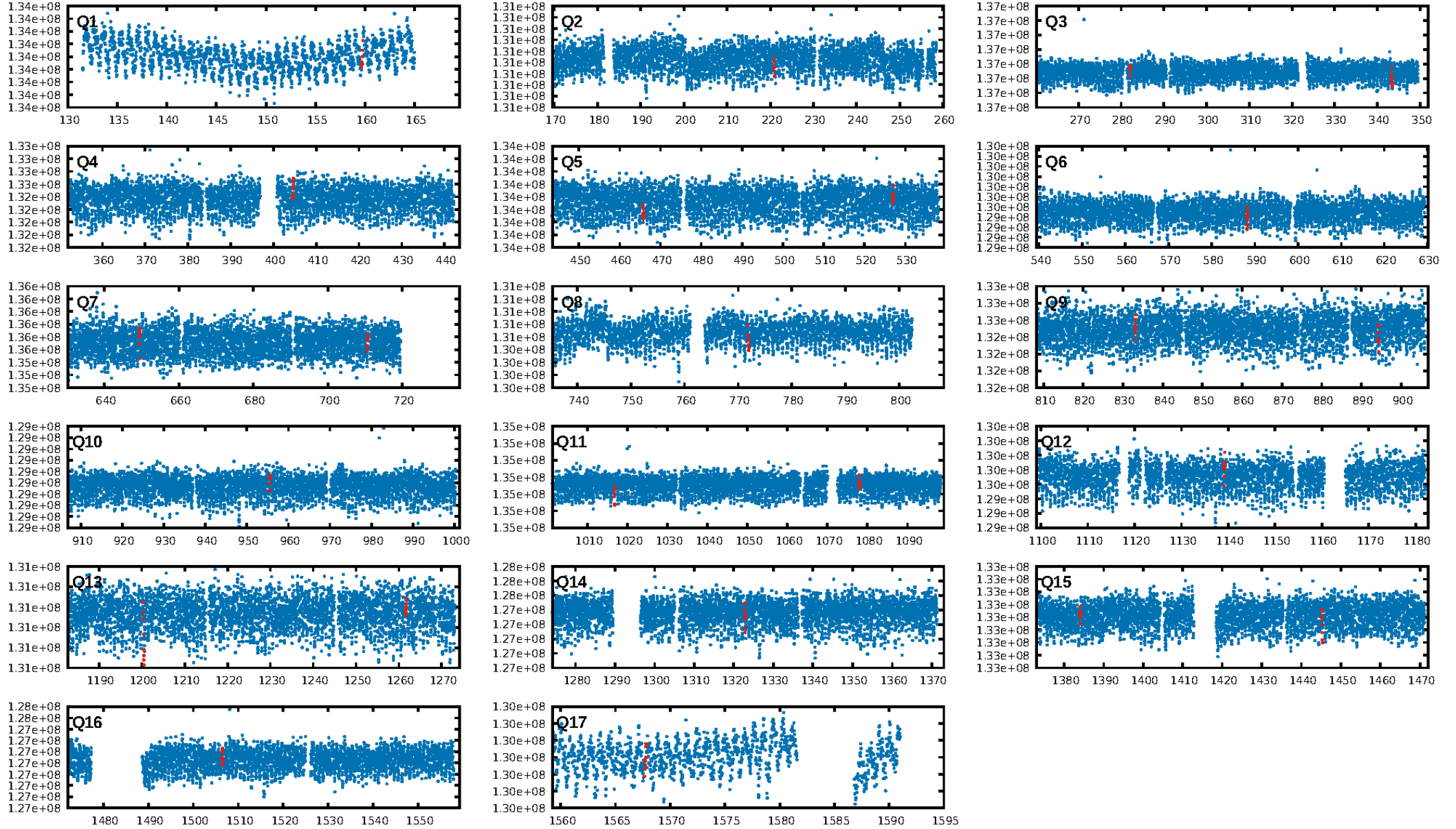
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [40.55σ]  
LongPeriod-sig: 100.0% [7.52σ]  
ModelChiSquare2-sig: 72.6%  
ModelChiSquareGof-sig: 99.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -109.8  
Centroid-sig: 48.9%  
Centroid-so: 0.366 arcsec [0.44σ]  
OotOffset-rm: 0.591 arcsec [1.23σ]  
OotOffset-st: 3/4/3/2 [12]  
KicOffset-rm: 0.673 arcsec [1.21σ]  
KicOffset-st: 3/4/3/2 [12]  
DiffImageQuality-fgm: 0.42 [5/12]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:45:17 Z

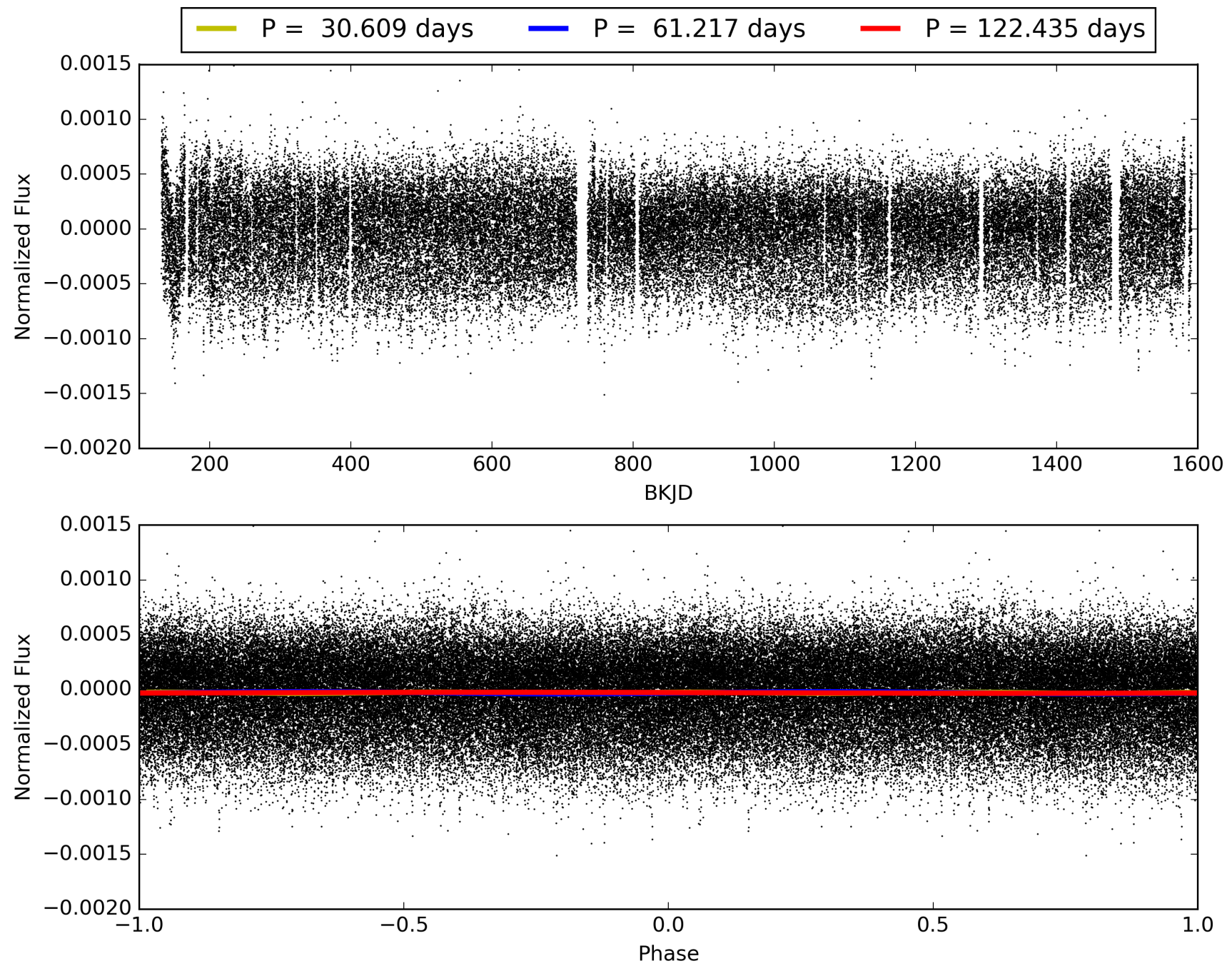
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009111849-08, PDC Light Curves



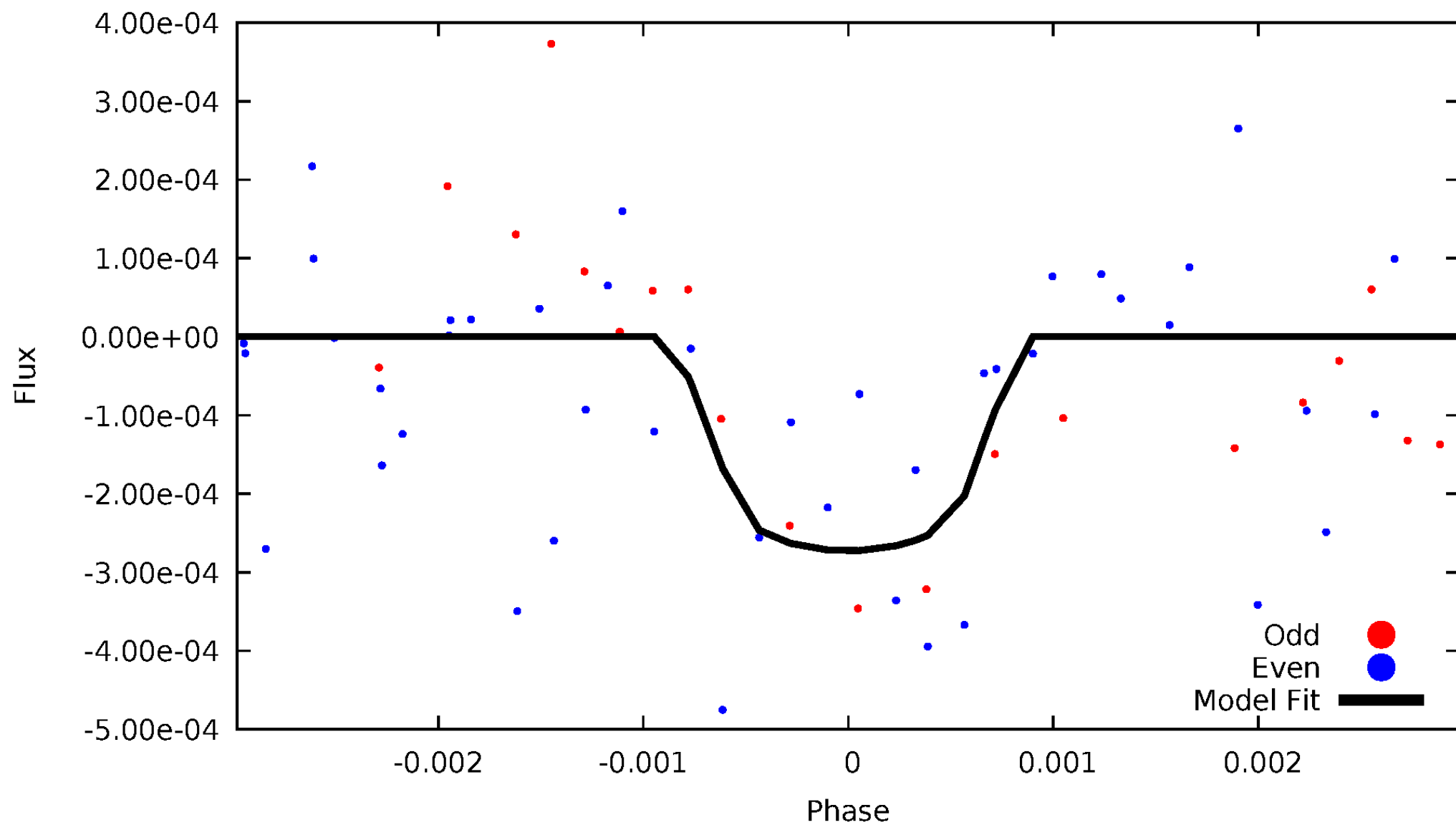


TCE 009111849-08



# DV Odd/Even

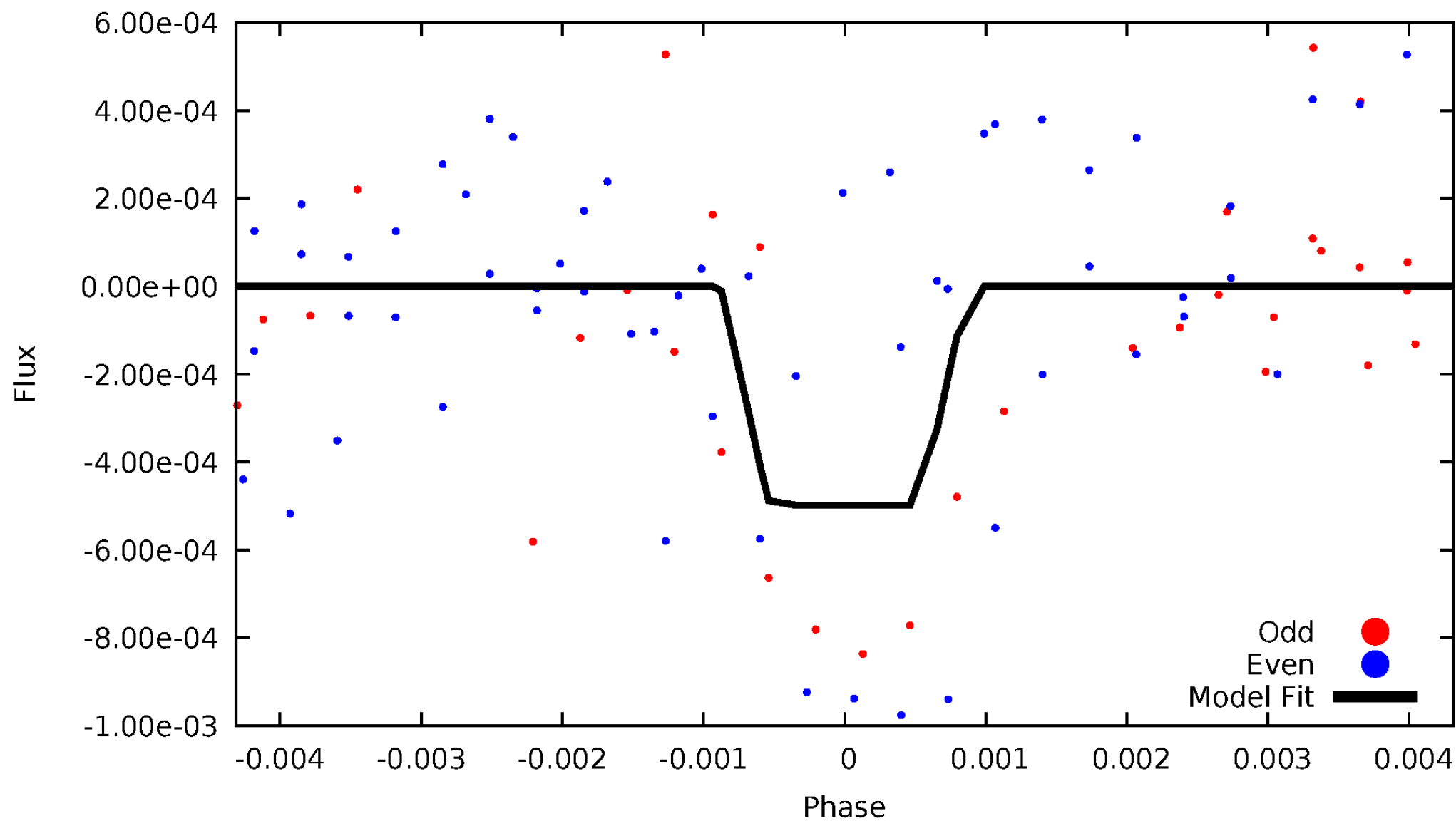
TCE 009111849-08





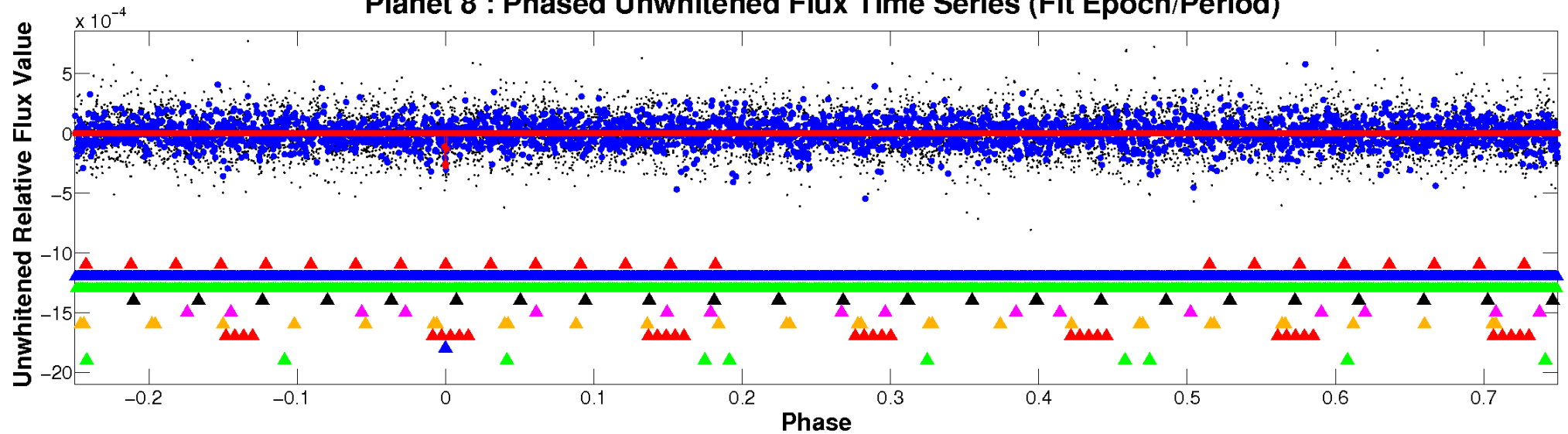
# ALT Odd/Even

TCE 009111849-08

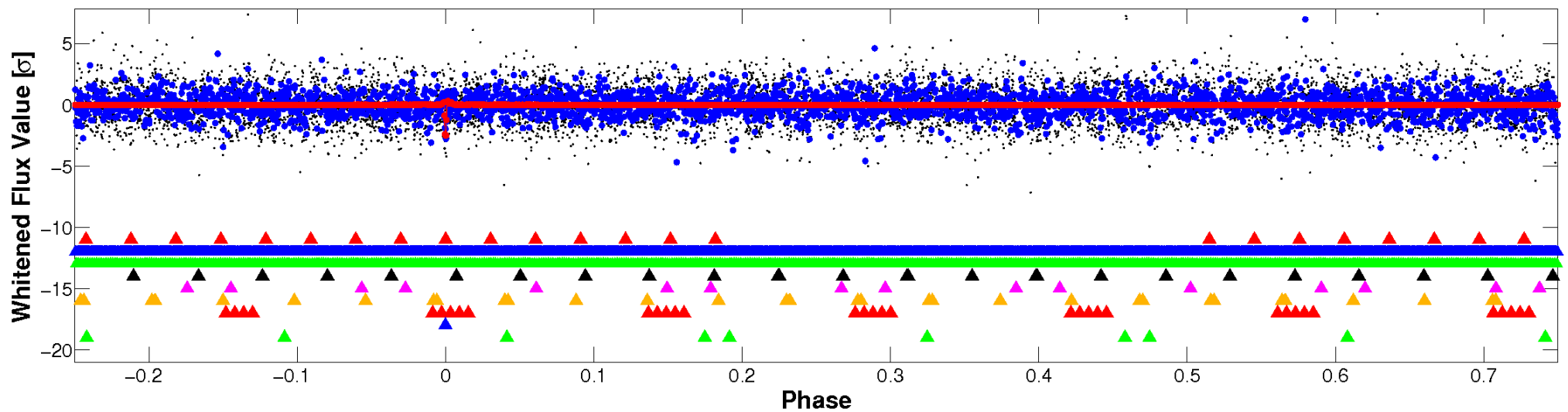


# Non-Whitened Vs. Whitened Light Curve

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

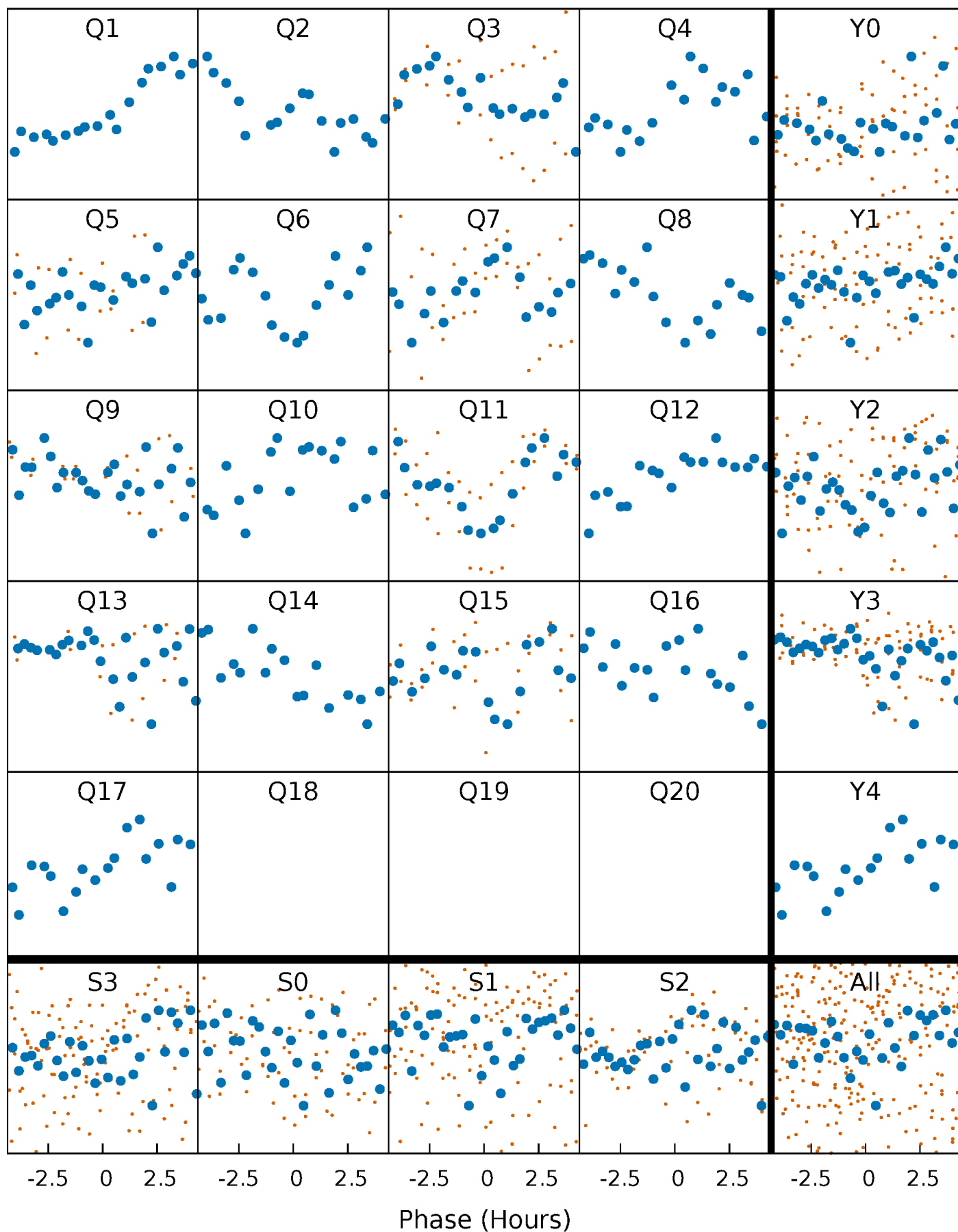


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



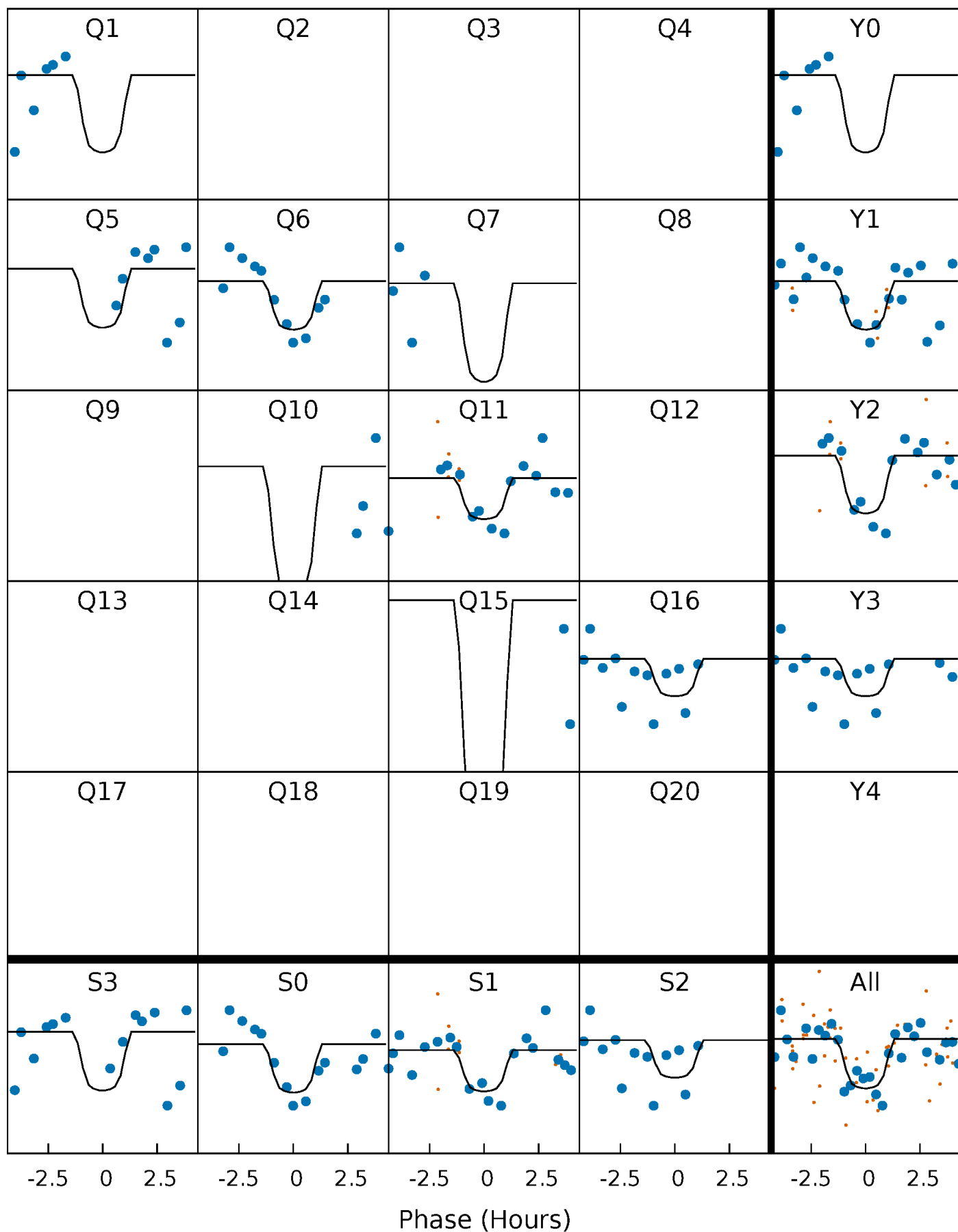
# PDC Quarter-Phased Transit Curves

TCE 009111849-08 P= 61.217340 Days  $T_0=159.721819$  (BKJD)



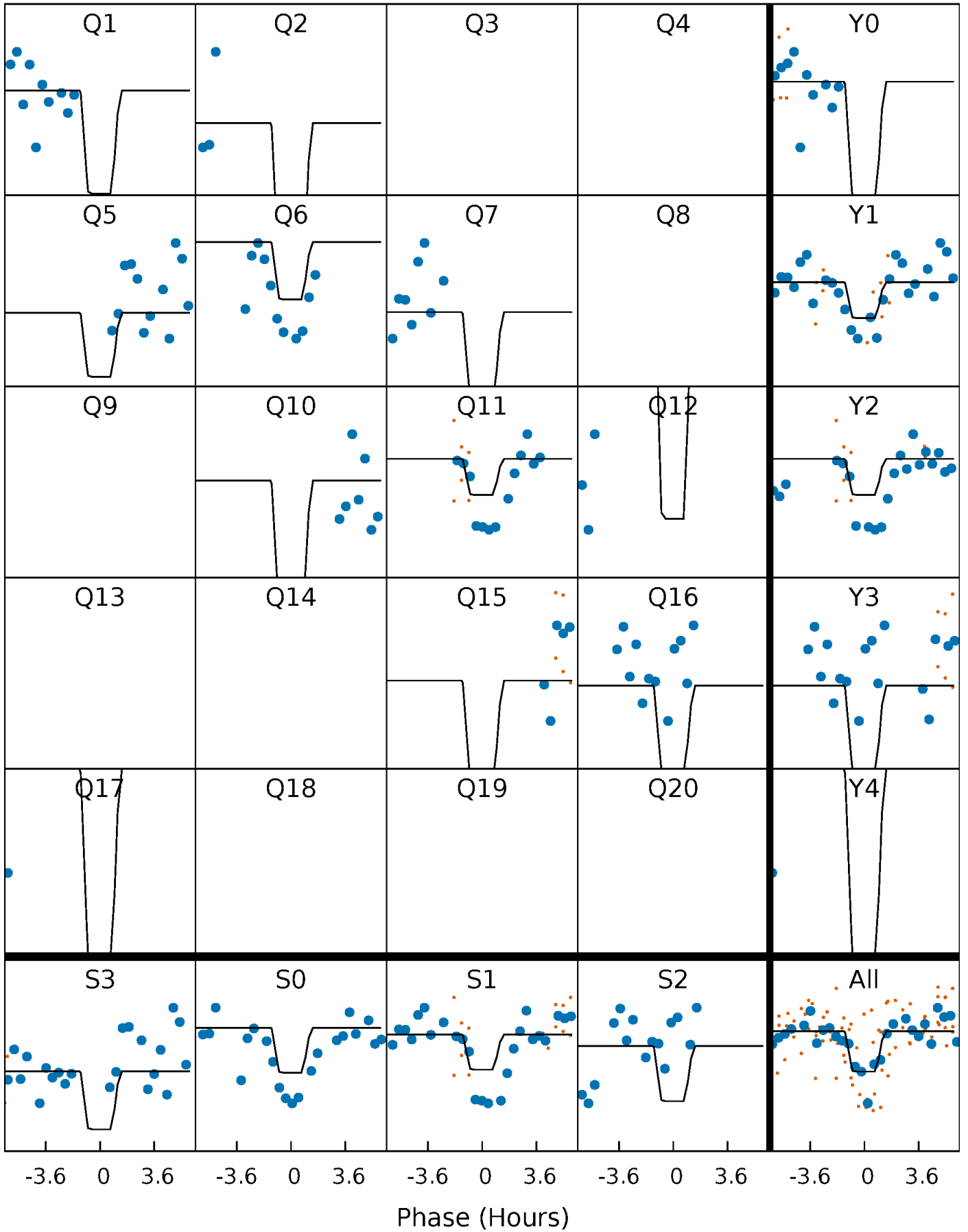
# DV Quarter-Phased Transit Curves

TCE 009111849-08 P= 61.217340 Days  $T_0=159.721819$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

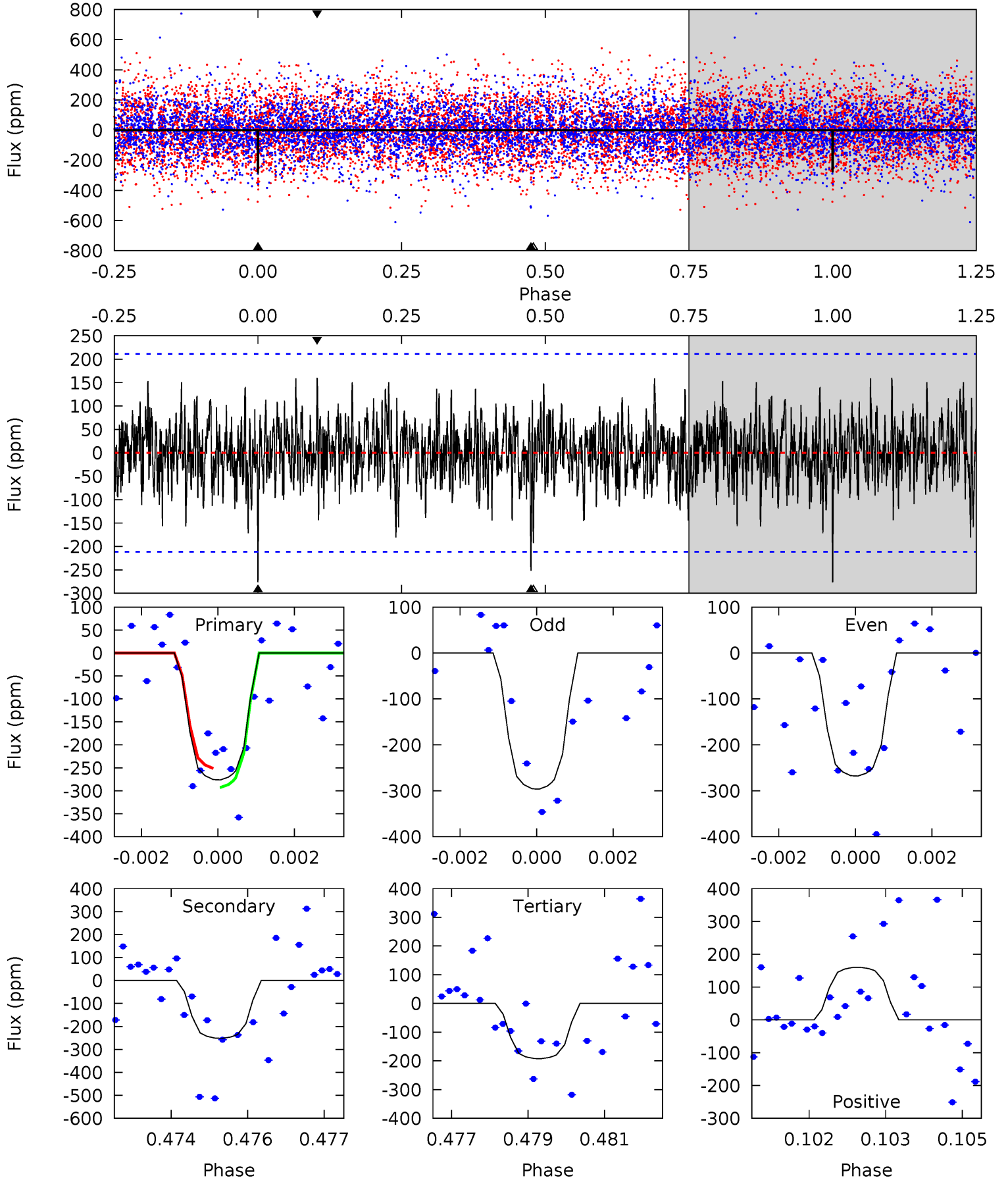
TCE 009111849-08 P= 61.216584 Days  $T_0=159.722093$  (BKJD)



# DV Model-Shift Uniqueness Test

009111849-08, P = 61.217340 Days, E = 98.504479 Days

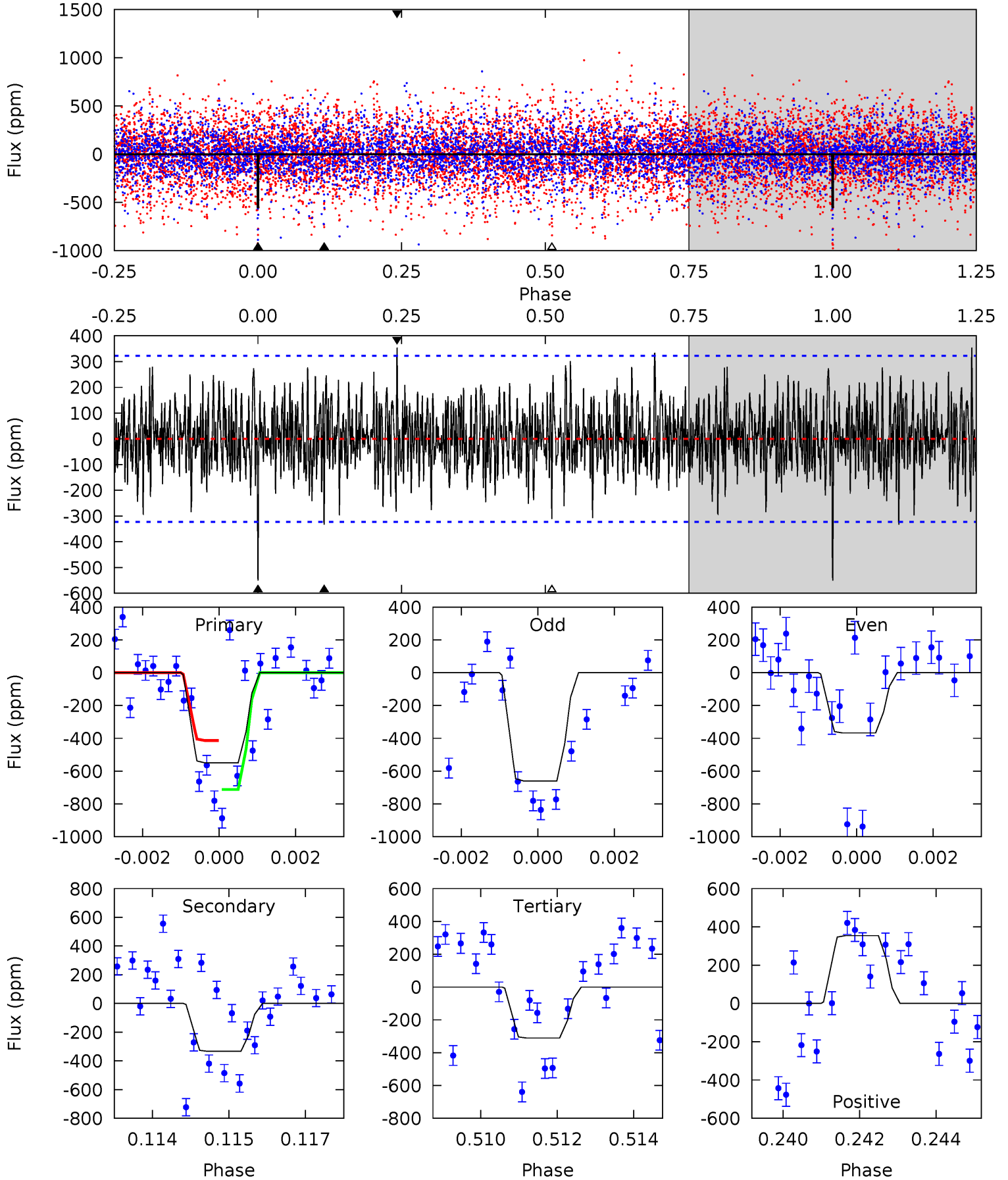
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.01	6.39	4.88	4.07	5.36	3.14	1.35	2.13	2.95	1.51	2.32	0.34	0.92	0.37	0.51



# Alt Model-Shift Uniqueness Test

009111849-08, P = 61.216584 Days, E = 98.505509 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
9.10	5.51	5.14	5.86	5.34	3.11	1.65	3.96	3.24	0.37	-0.35	2.30	0.99	0.39	2.47





### Stellar Parameters For KIC 009111849

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6234^{+74}_{-74}$	$3.209^{+0.458}_{-0.122}$	$0.560^{+0.050}_{-0.100}$	$6.354^{+1.590}_{-3.180}$	$2.382^{+0.277}_{-0.514}$	$0.013^{+0.056}_{-0.005}$
	+1%/-1%	+14%/-4%	+9%/-18%	+25%/-50%	+12%/-22%	+431%/-35%
Source	SPE90	FLK73	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009111849-08 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-252 \pm 39$	$35.32^{+39.33}_{-24.45}$	$1488^{+99}_{-186}$	$3677^{+2076}_{-730}$	$18^{+171}_{-14}$
Alt.	$-333 \pm 60$	$35.72^{+41.44}_{-24.61}$	$1479^{+101}_{-182}$	$3870^{+2221}_{-843}$	$24^{+214}_{-20}$

$T_{\text{max}}$  = 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

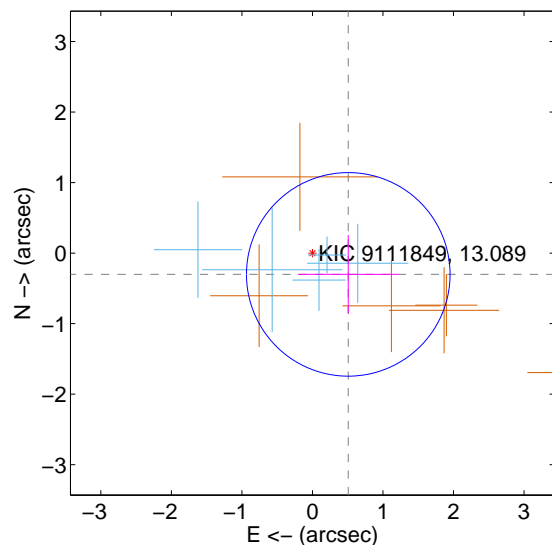
Supplemental centroid analysis for 009111849-08. Kepler magnitude: 13.09. Transit SNR 8.41

There are 5 quarters with good PRF difference image offsets

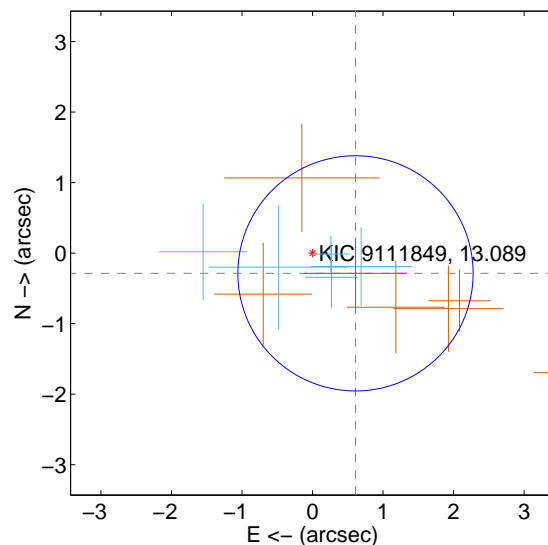
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.591 \pm 0.481$	1.23	$-0.508 \pm 0.713$	$-0.302 \pm 0.557$
PRF-fit source offset from KIC position	$0.673 \pm 0.556$	1.21	$-0.609 \pm 0.732$	$-0.287 \pm 0.503$
photometric centroid source offset	$0.37 \pm 0.83$	0.44	$0.26 \pm 0.85$	$0.26 \pm 0.81$

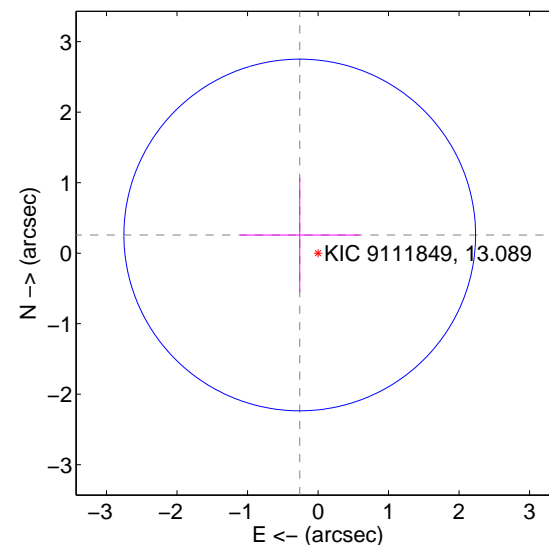
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

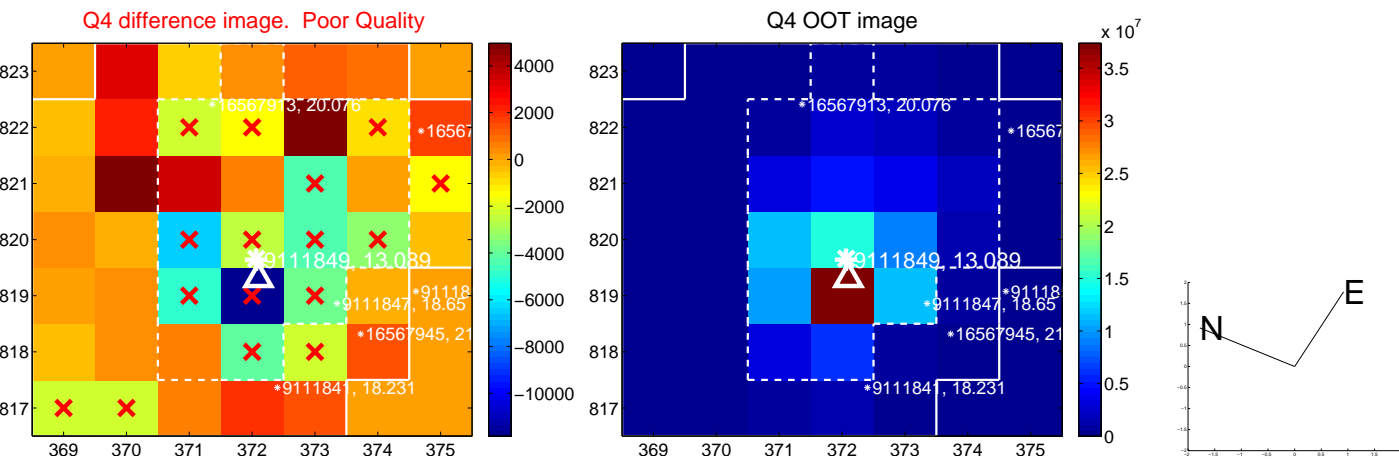
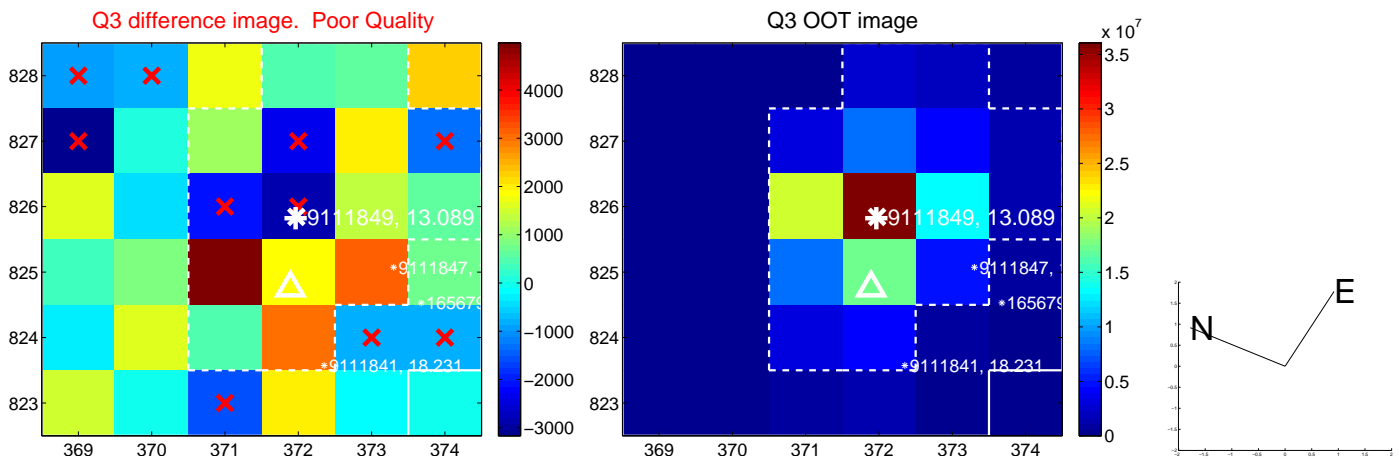
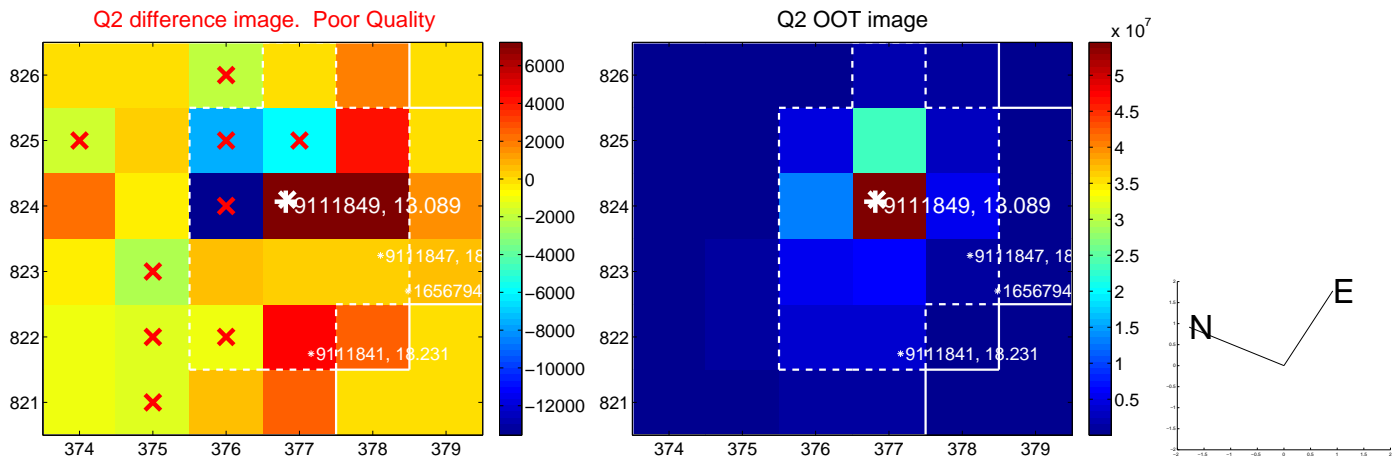
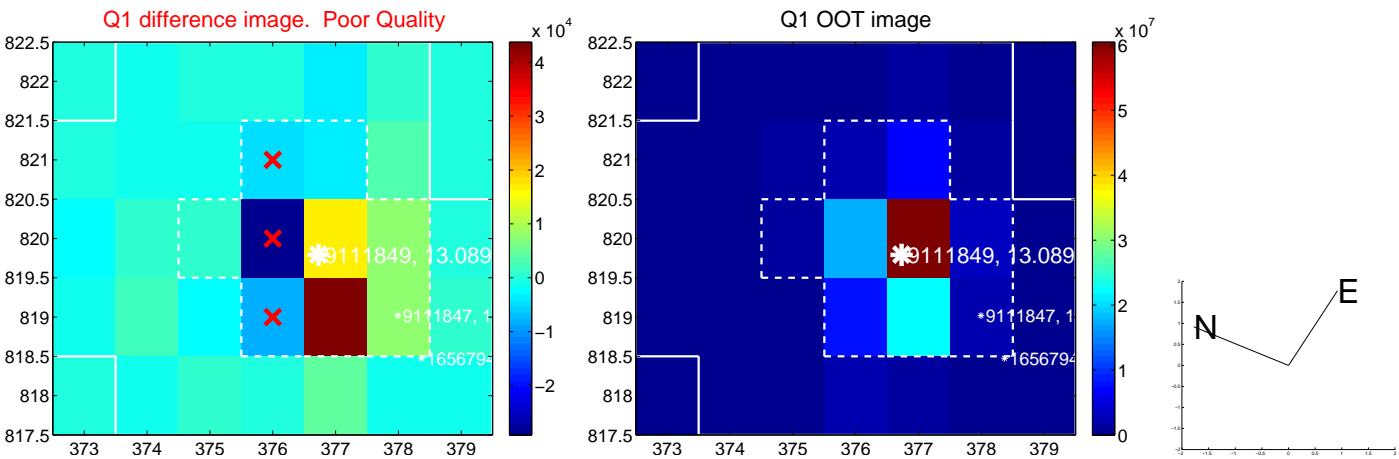


offset from photometric centroids



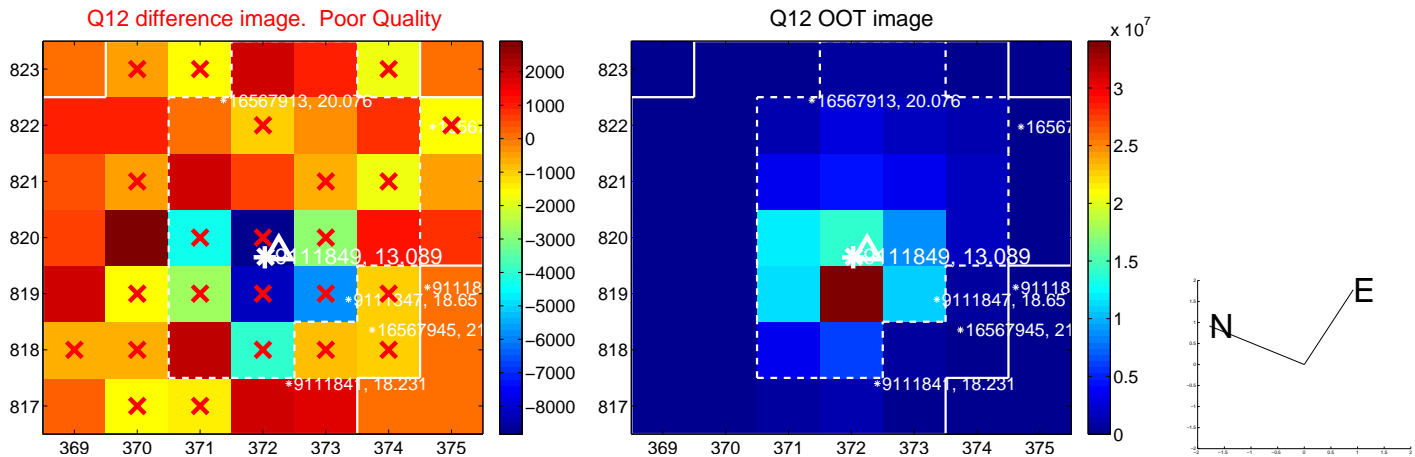
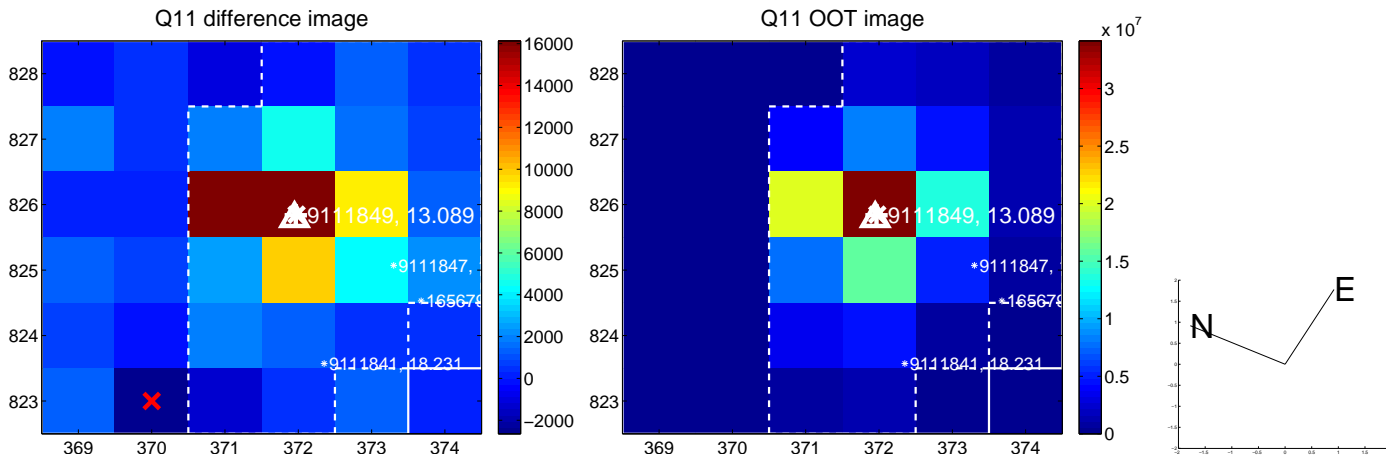
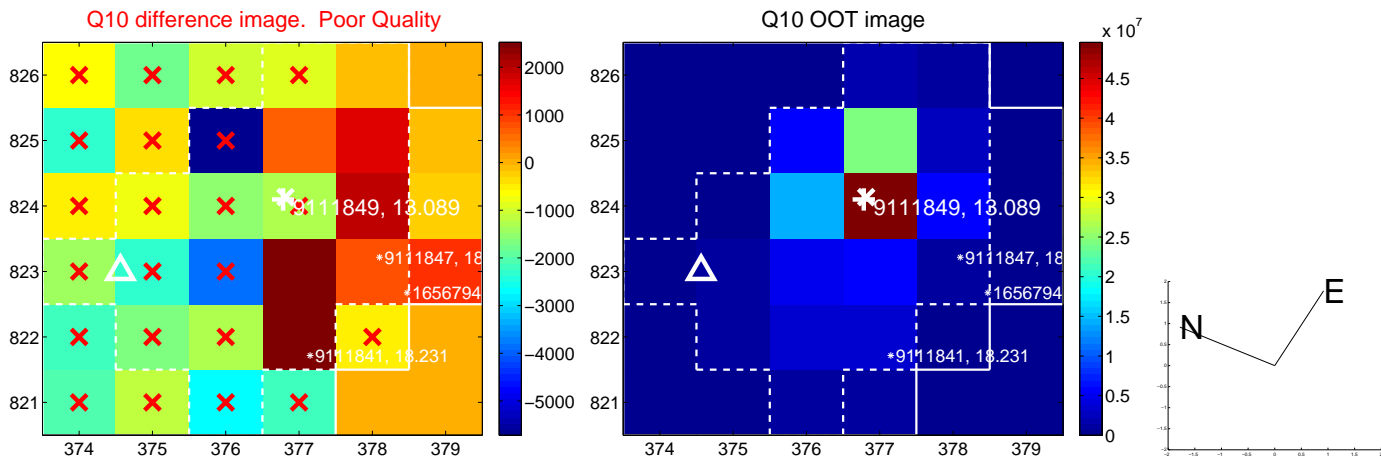
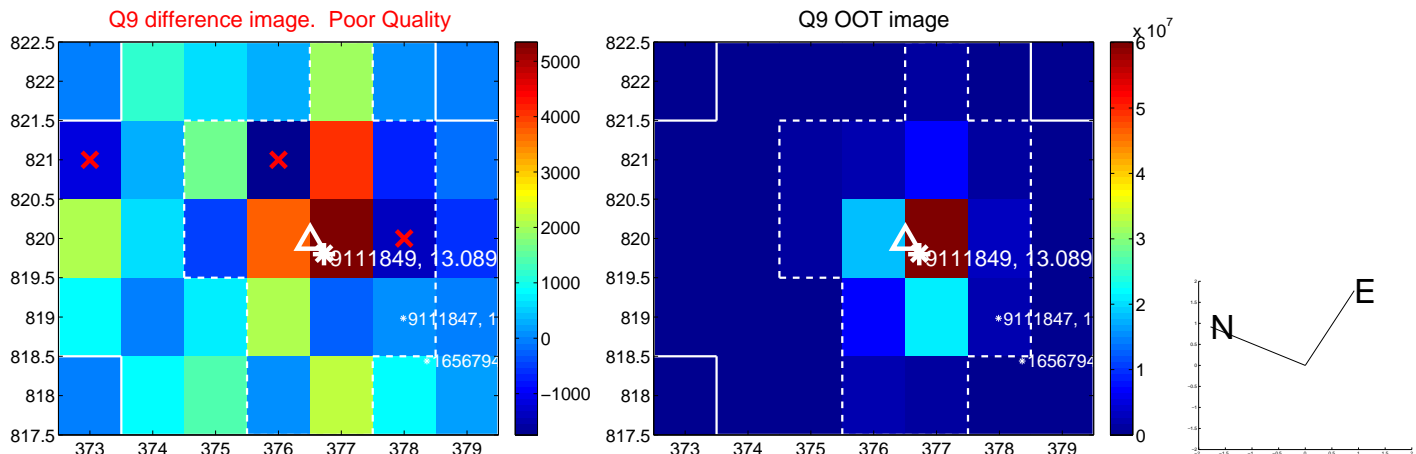
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

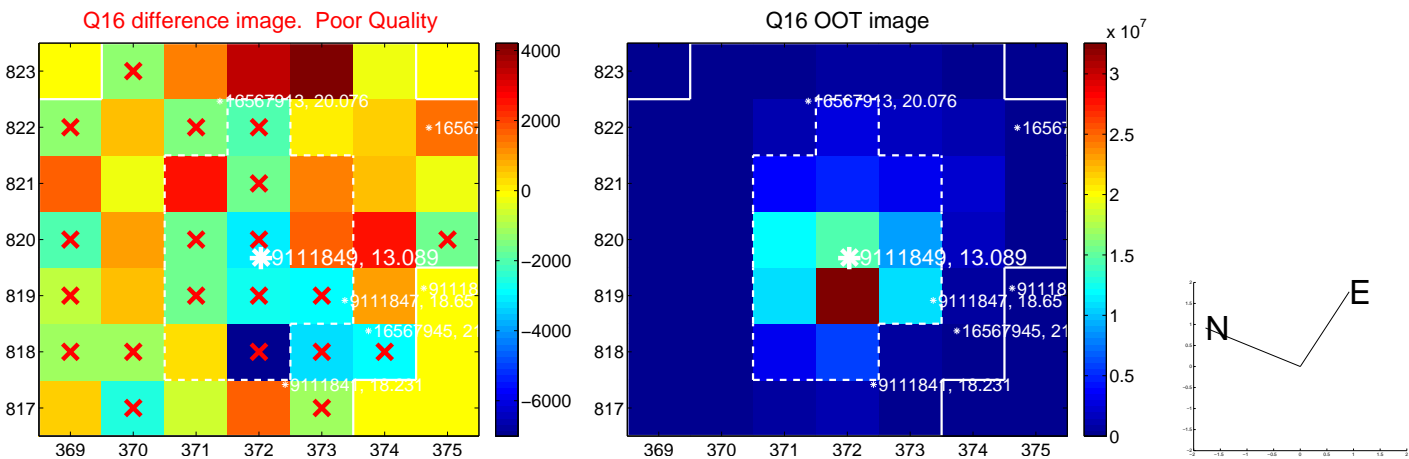
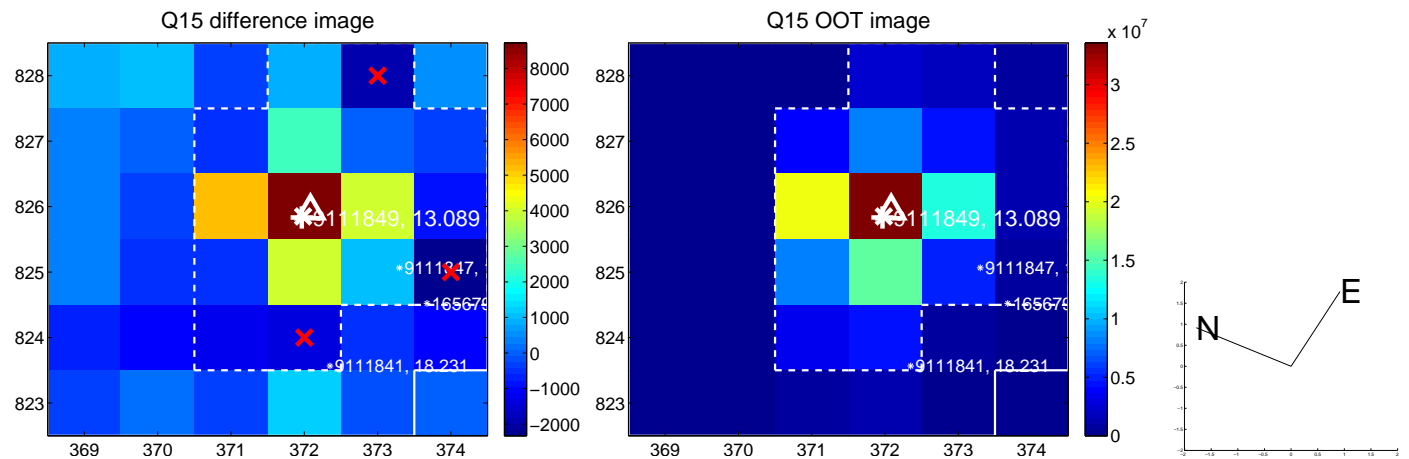
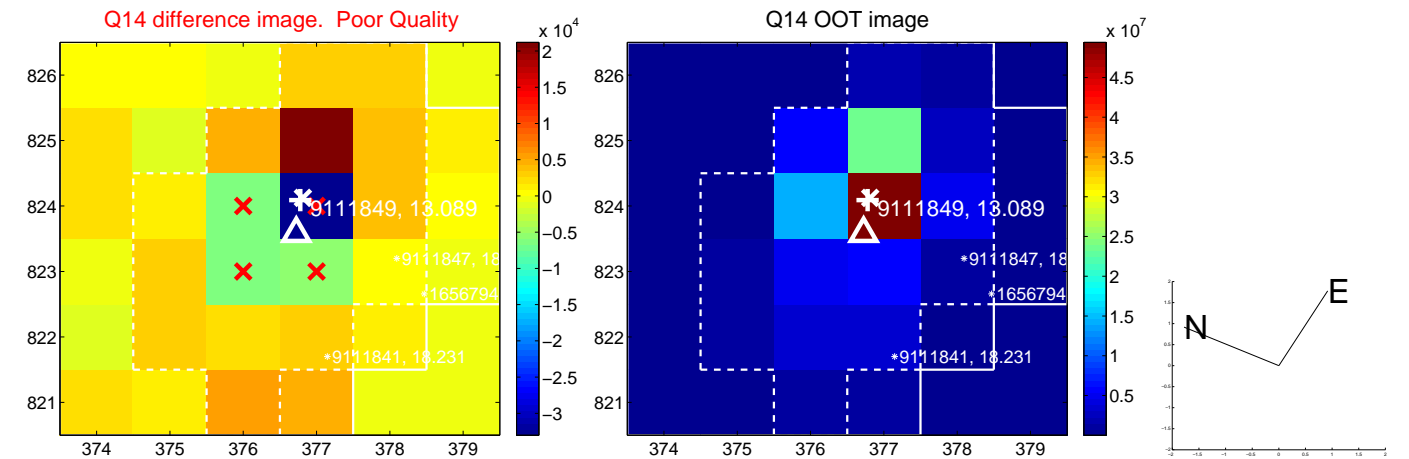
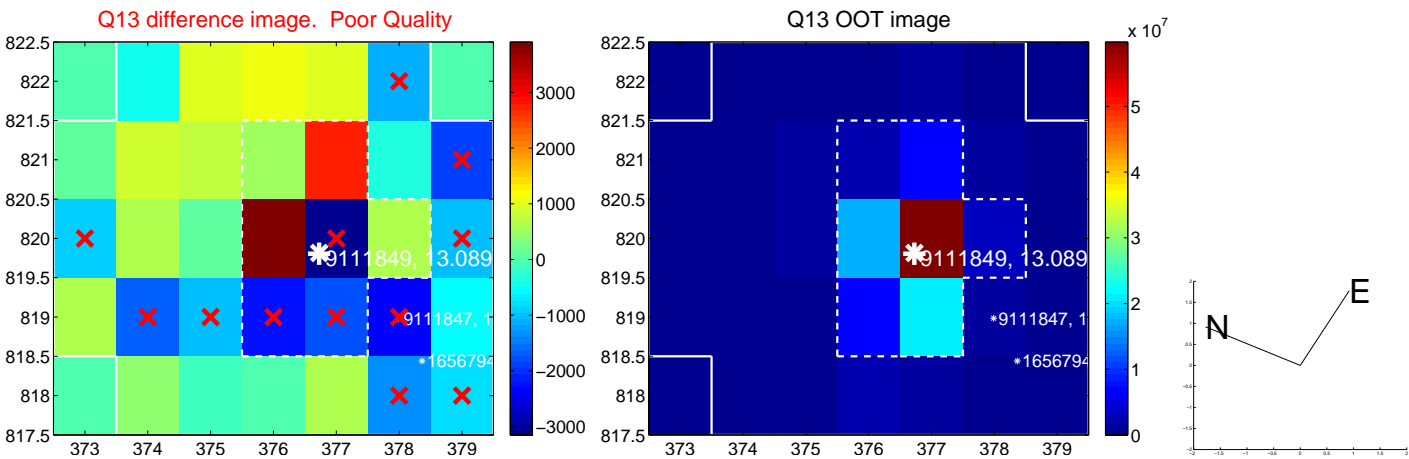




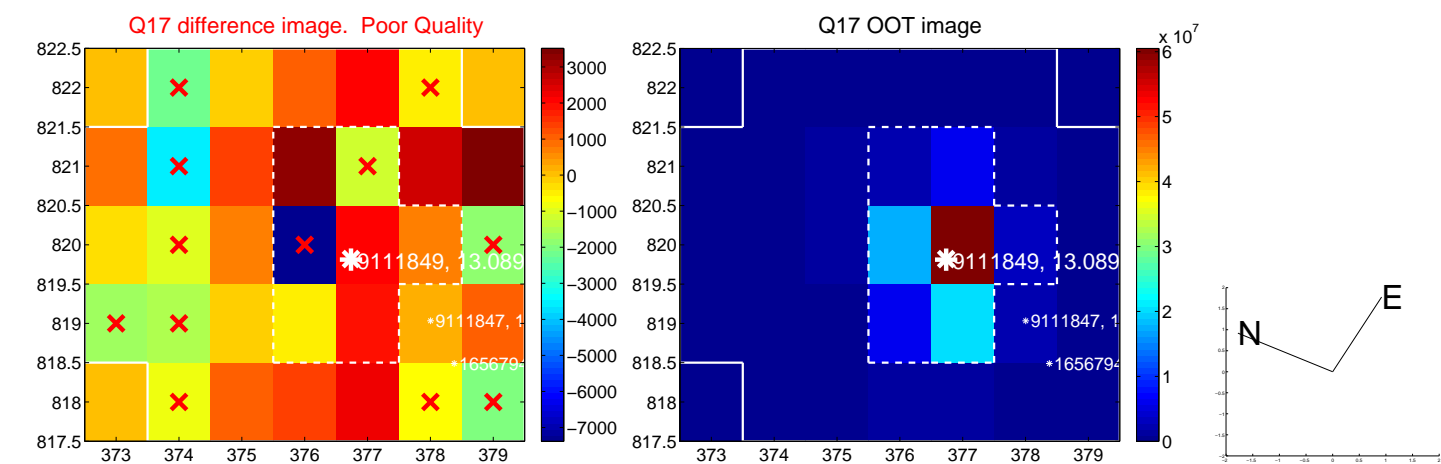
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



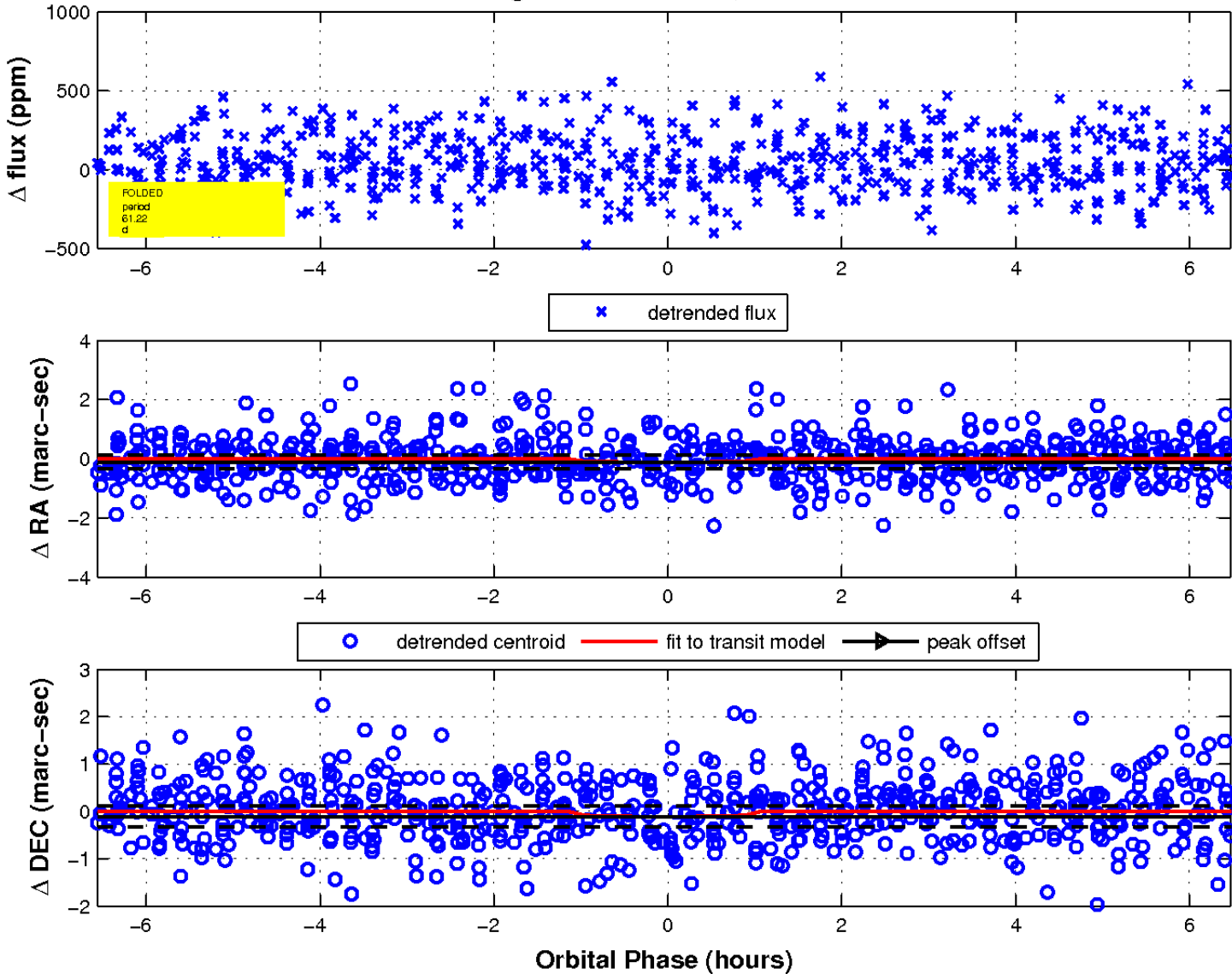
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



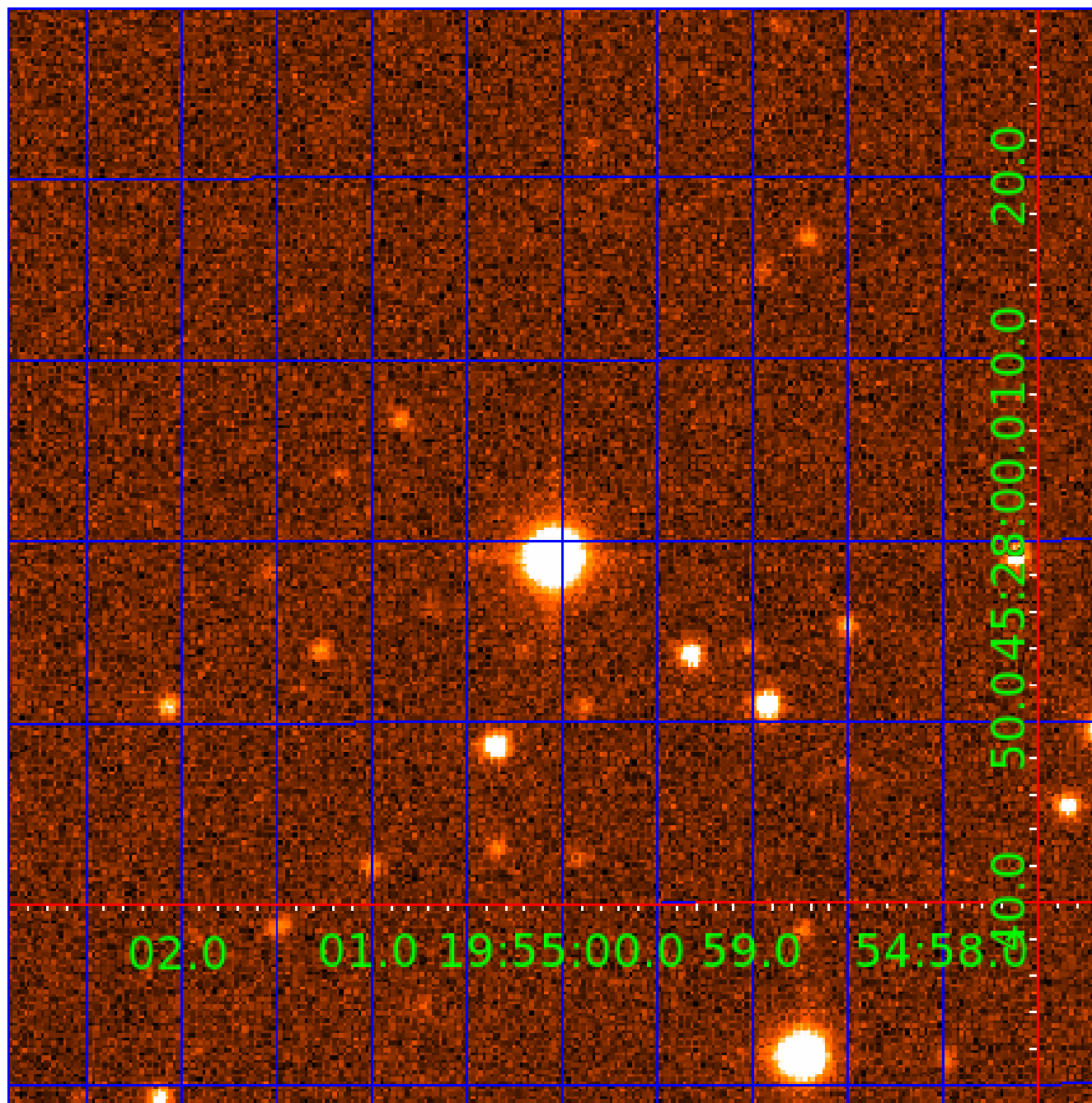
fluxWeightedCentroids, Planet 8 of 9





UKIRT Image

Declination



# KIC 009111849

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009111849-01	OBS	2042.01	63.073086	191.255585	636.8	5.503	35.4	36.2	6.35	6234	17.84	318.32
009111849-02	OBS	No	0.879308	131.635994	290.7	1.500	8.5	-1.0	6.35	6234	10.84	94872.03
009111849-03	OBS	No	1.419233	131.903611	19.1	9.134	8.3	8.7	6.35	6234	2.77	50109.64
009111849-04	OBS	No	55.896078	184.095431	329.3	2.264	11.0	10.8	6.35	6234	12.11	373.95
009111849-05	OBS	No	88.224588	219.286101	366.2	2.176	9.6	10.6	6.35	6234	13.81	203.49
009111849-06	OBS	No	46.648185	141.719773	221.1	3.438	10.1	9.2	6.35	6234	11.02	475.93
009111849-07	OBS	No	43.779139	132.854579	271.3	2.527	9.1	8.9	6.35	6234	12.31	517.97
009111849-08	OBS	No	61.217340	159.721819	272.7	2.190	8.4	8.4	6.35	6234	11.82	331.25
009111849-09	OBS	No	139.780377	232.656851	366.1	2.500	8.3	-1.0	6.35	6234	12.13	110.17

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009111849-01	OBS	PC	0.99	0	0	0	0	NO_COMMENT
009111849-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_NOFITS
009111849-03	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
009111849-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT
009111849-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009111849-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009111849-09	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS—HALO_GHOST

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

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

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

Ephemeris Match Information For 009111849-09

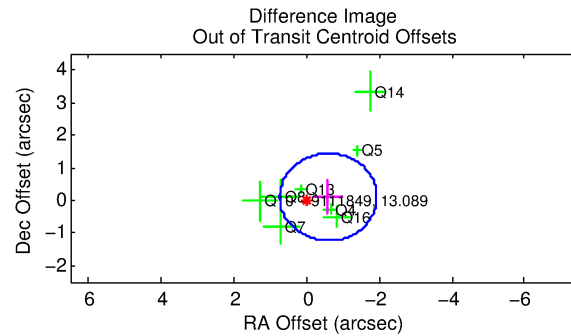
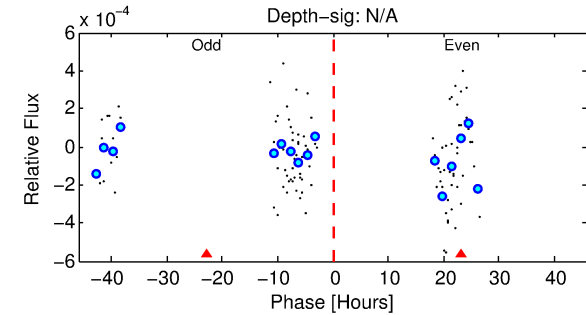
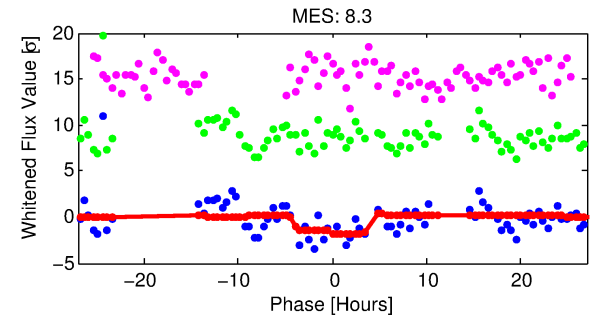
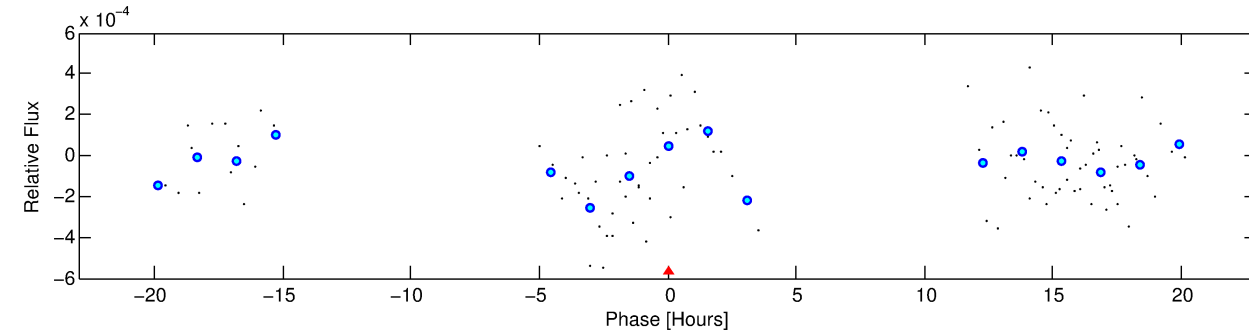
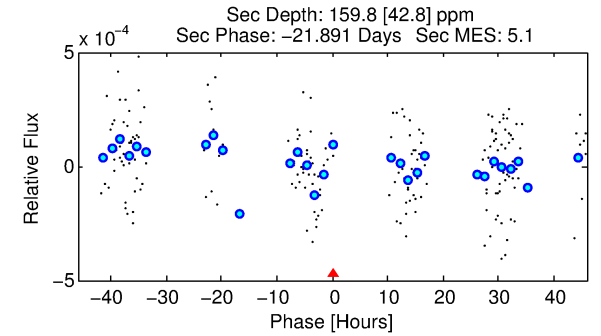
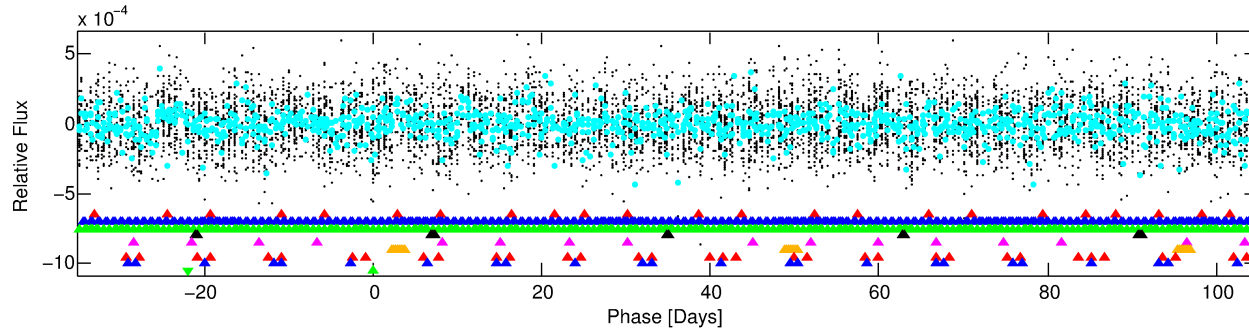
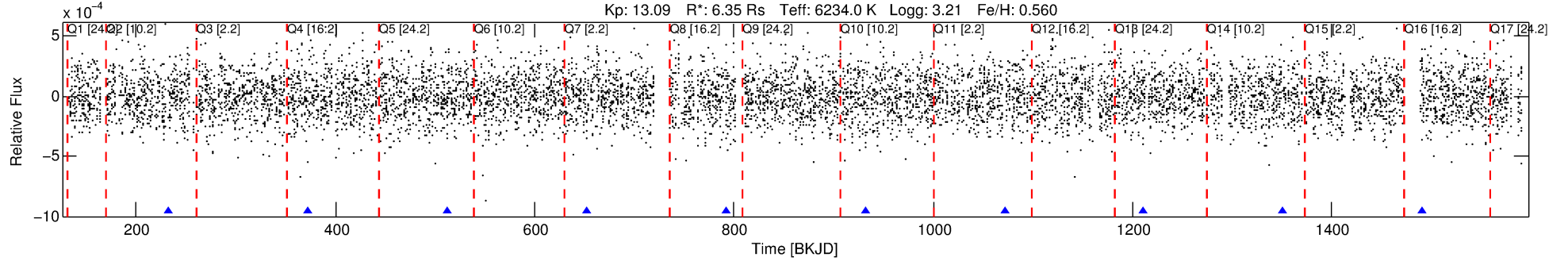
No Significant Match Found

# DV One-Page Summary

KIC: 9111849 Candidate: 9 of 9 Period: 139.780 d

KOI: K02042 Corr: No Ephemeris Match

Kp: 13.09 R\*: 6.35 Rs Teff: 6234.0 K Logg: 3.21 Fe/H: 0.560



TPS TCE Results:

Period = 139.78038 d  
Epoch = 232.6569 BKJD

DV fit results are unavailable

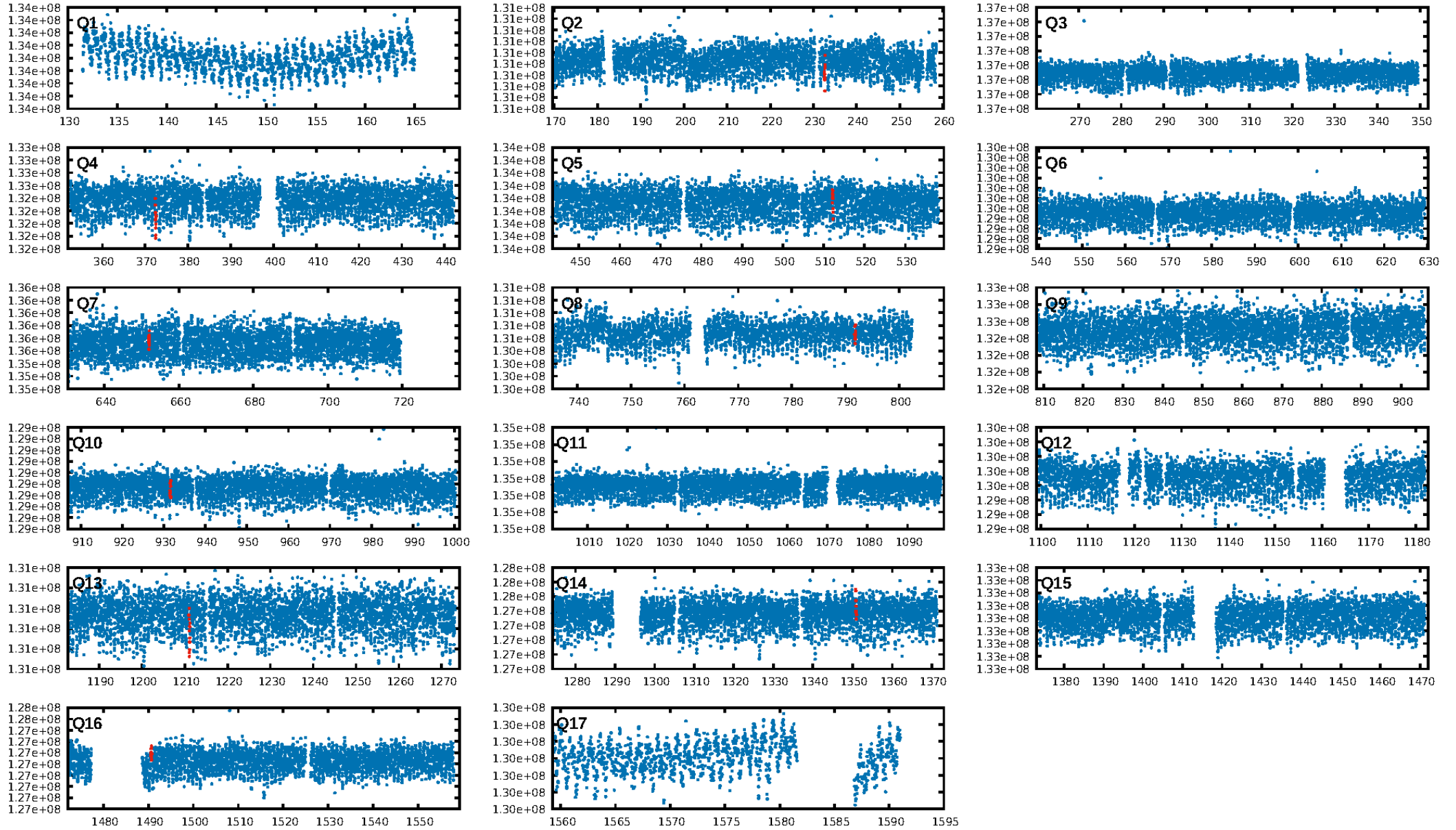
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [373.32σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: -0.004987  
Centroid-sig: 17.7%  
Centroid-so: 7.318 arcsec [0.89σ]  
OotOffset-rm: 0.607 arcsec [1.36σ]  
KicOffset-rm: 0.719 arcsec [1.46σ]  
OotOffset-st: 2/1/3/2 [8]  
KicOffset-st: 2/1/3/2 [8]  
DiffImageQuality-fgm: 0.38 [3/8]  
DiffImageOverlap-fno: 0.00 [0/8]

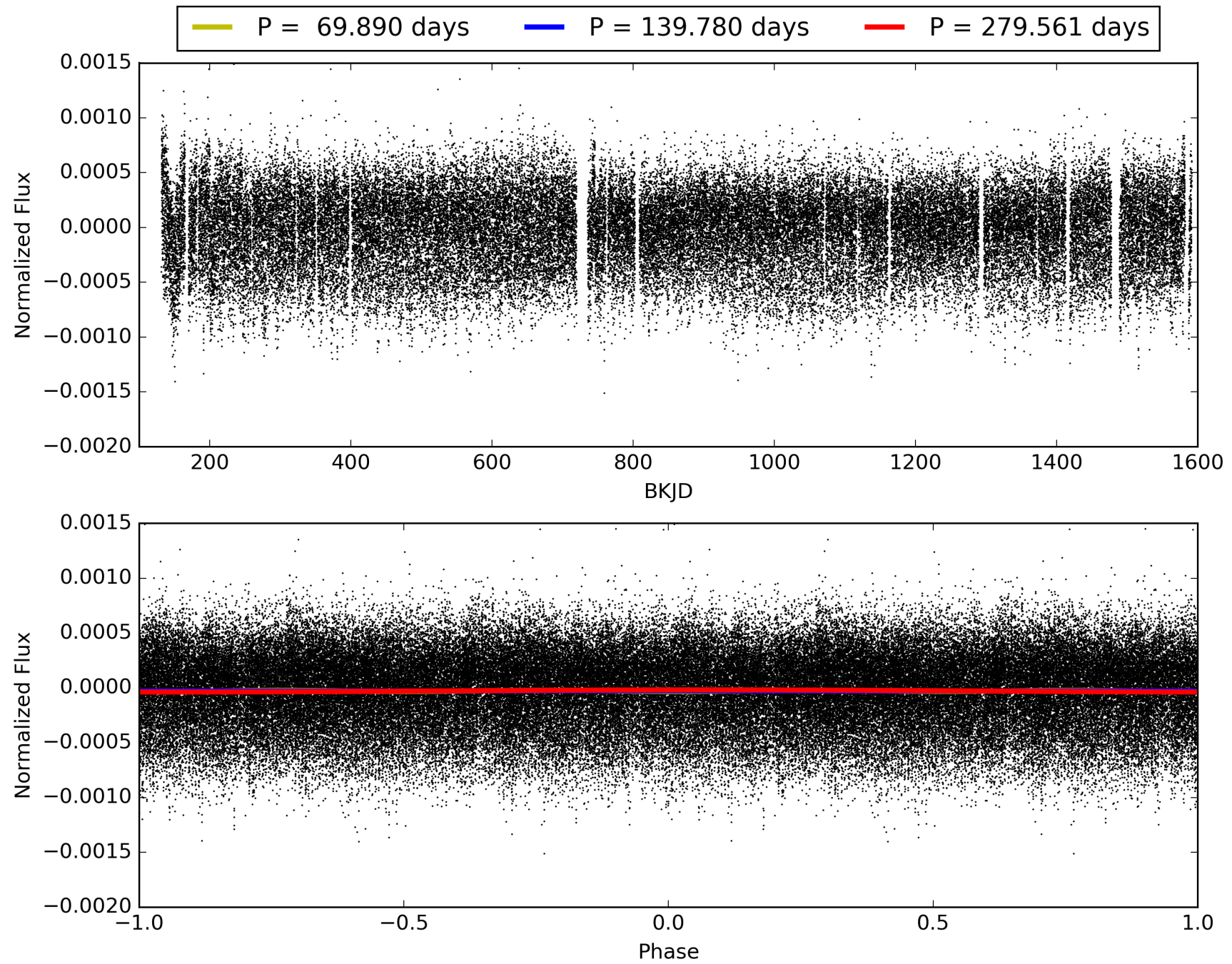
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:45:21 Z

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

# TCE 009111849-09, PDC Light Curves

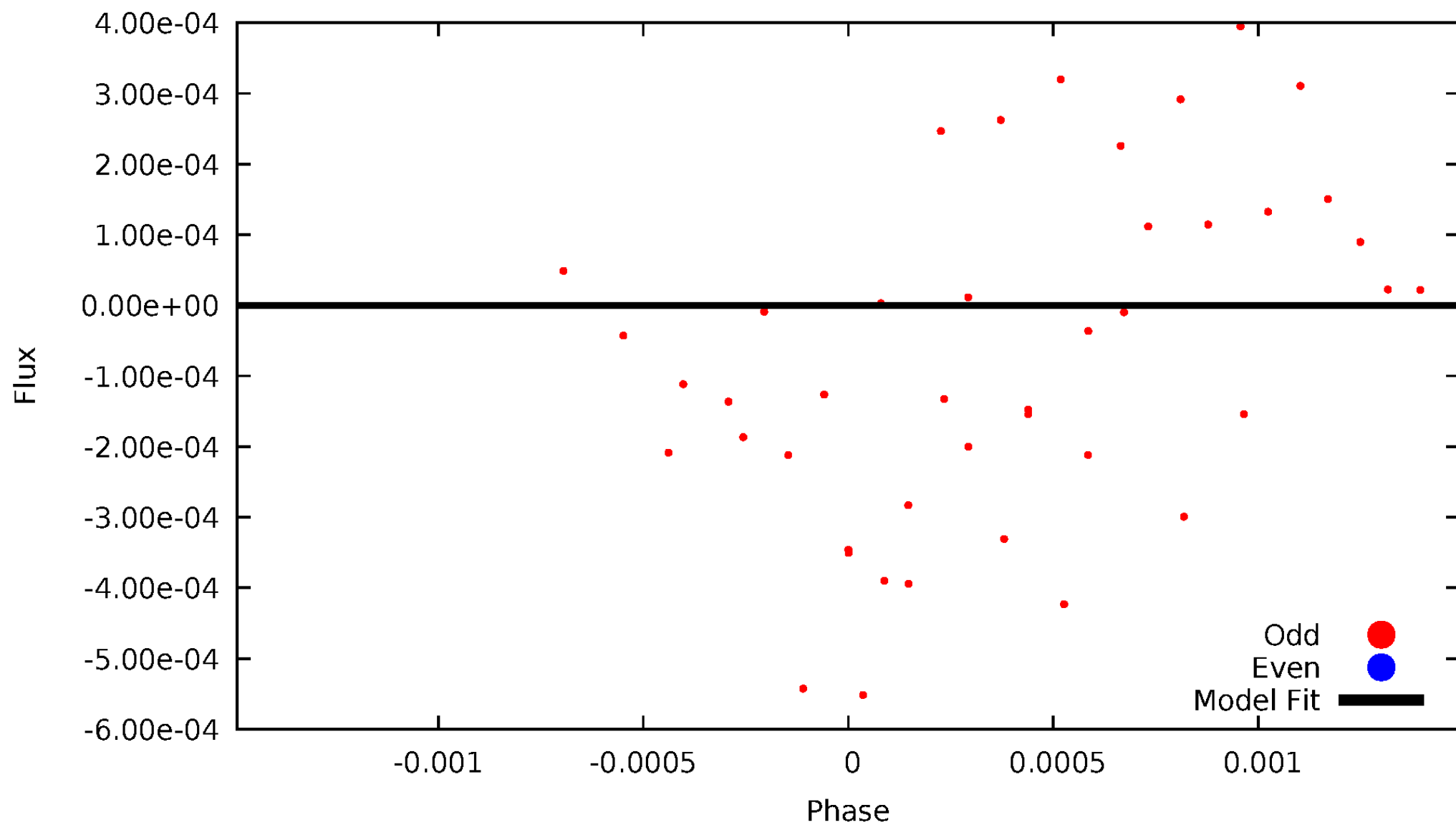


TCE 009111849-09



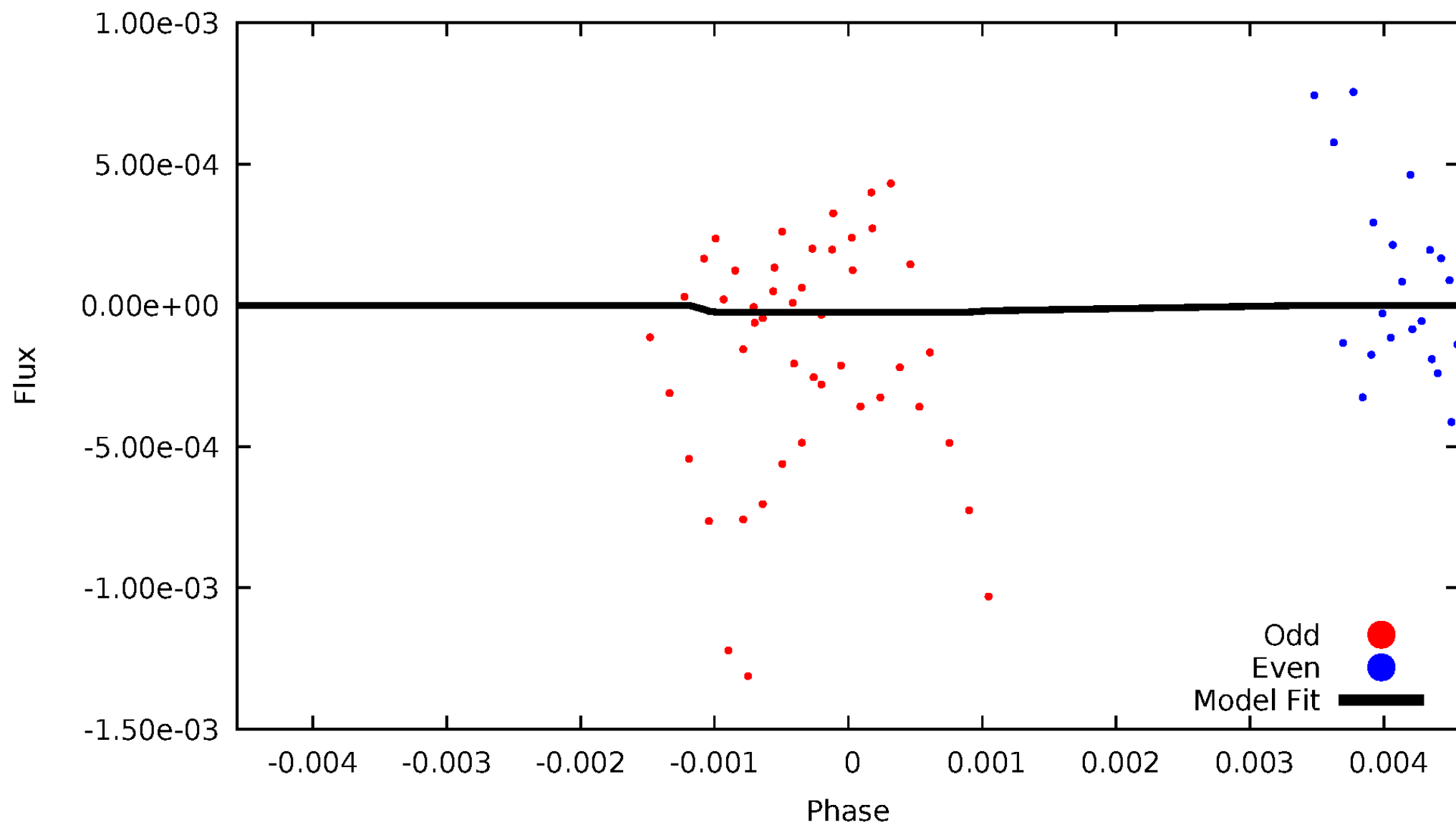
# DV Odd/Even

TCE 009111849-09



# ALT Odd/Even

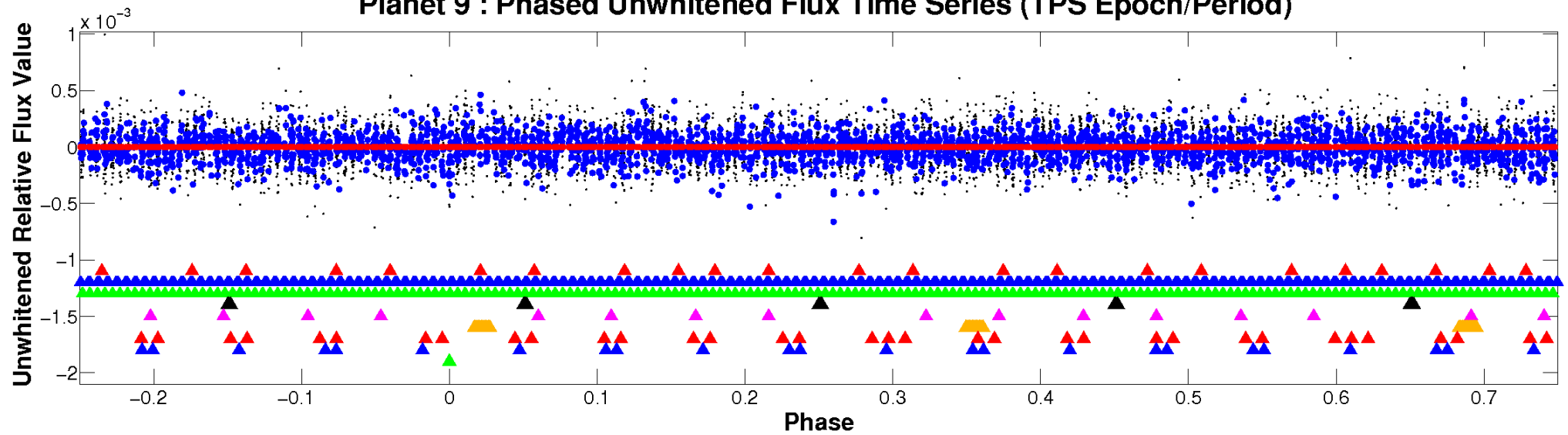
TCE 009111849-09



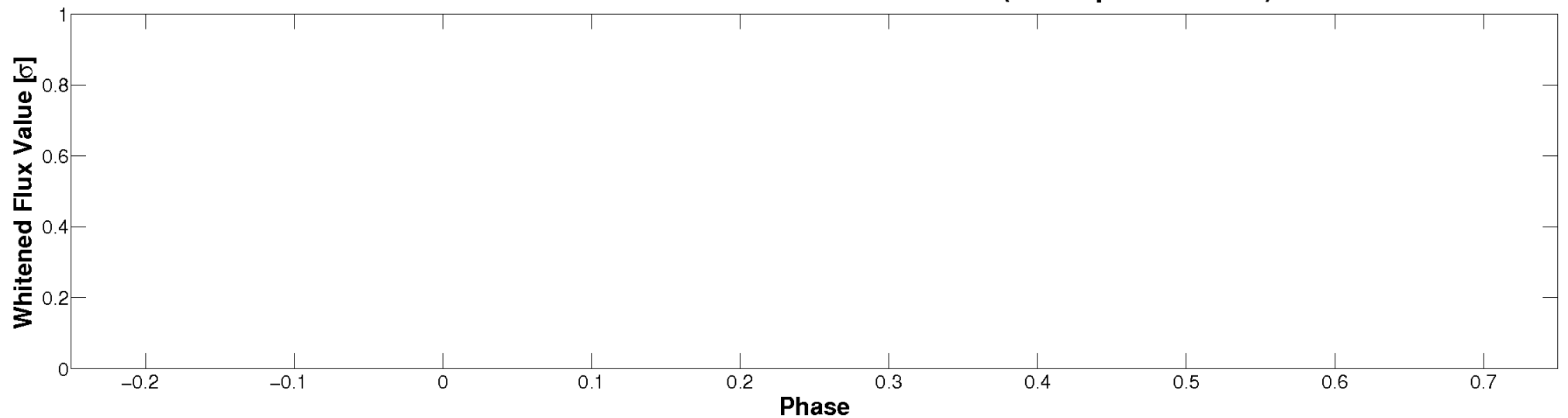


# Non-Whitened Vs. Whitened Light Curve

**Planet 9 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)**

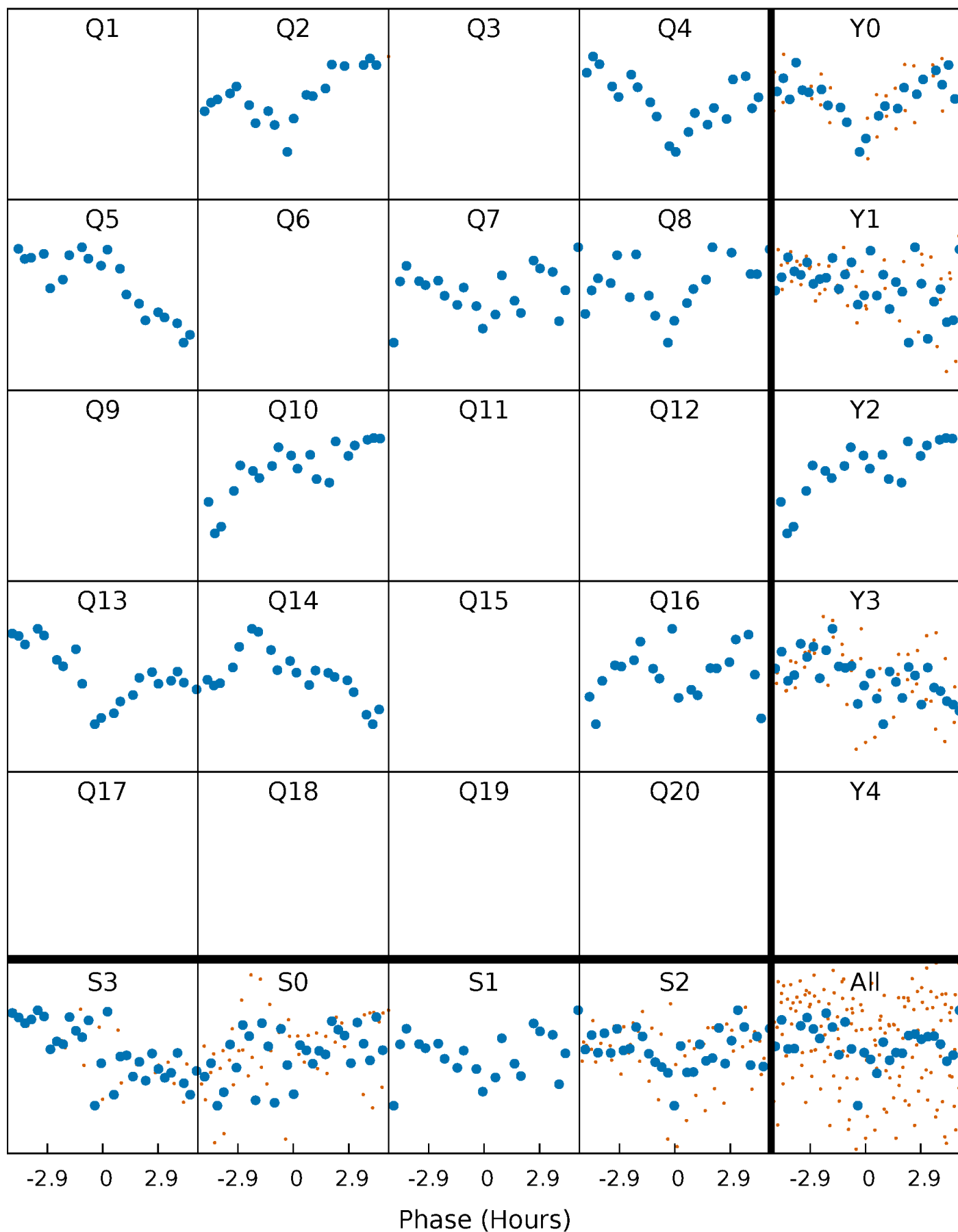


**Planet 9 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



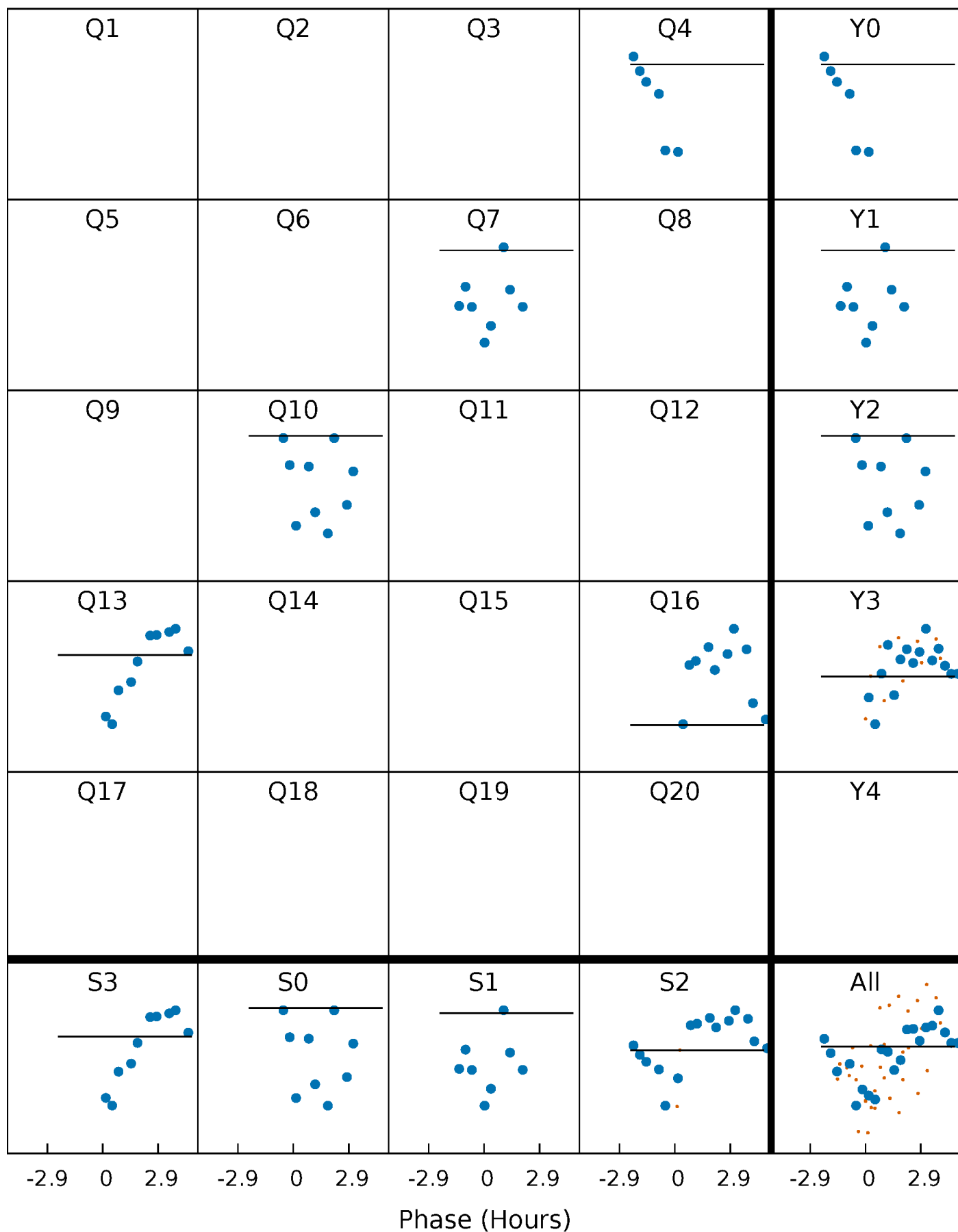
# PDC Quarter-Phased Transit Curves

TCE 009111849-09 P=139.780377 Days  $T_0=232.656851$  (BKJD)



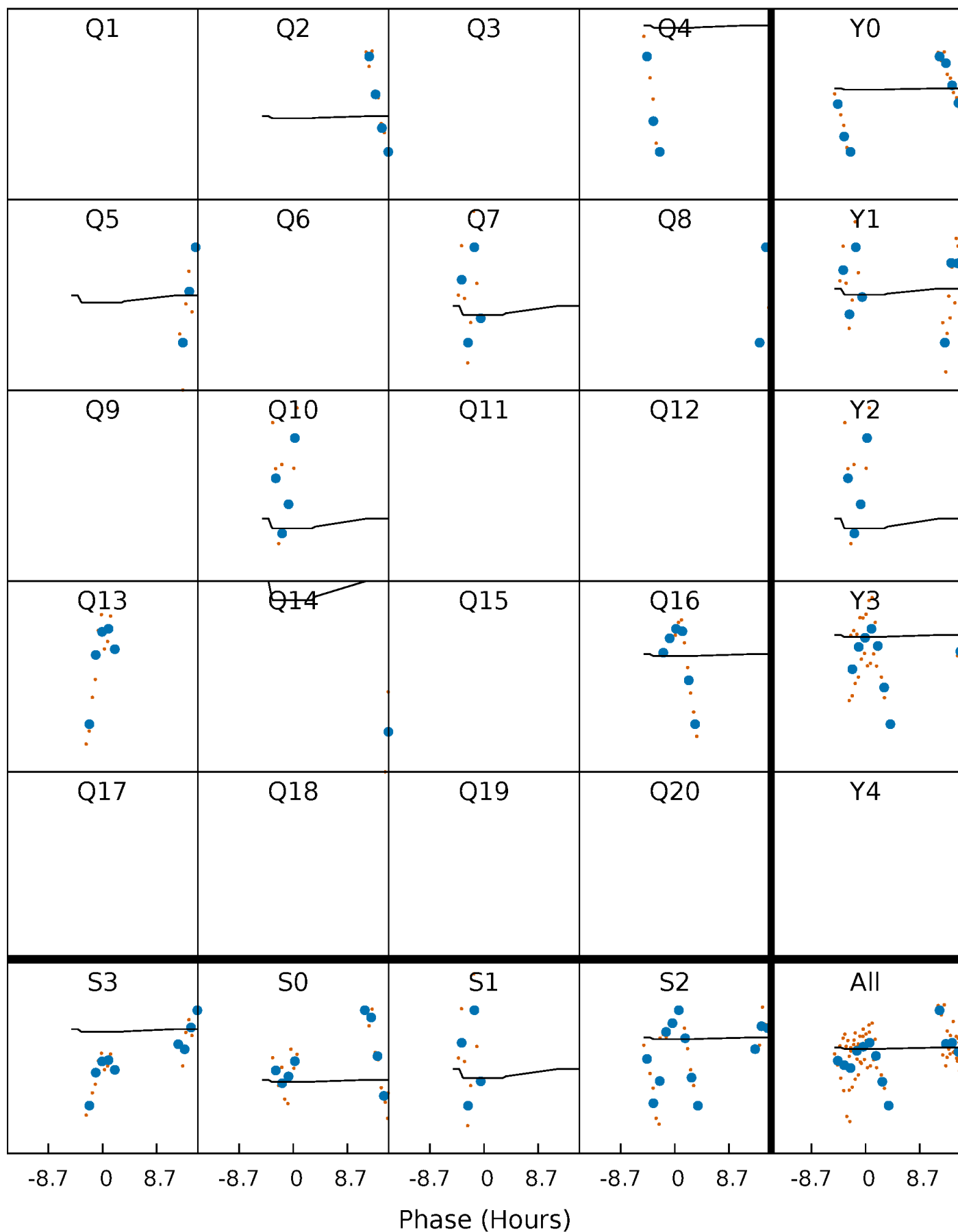
# DV Quarter-Phased Transit Curves

TCE 009111849-09 P=139.780377 Days  $T_0=232.656851$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

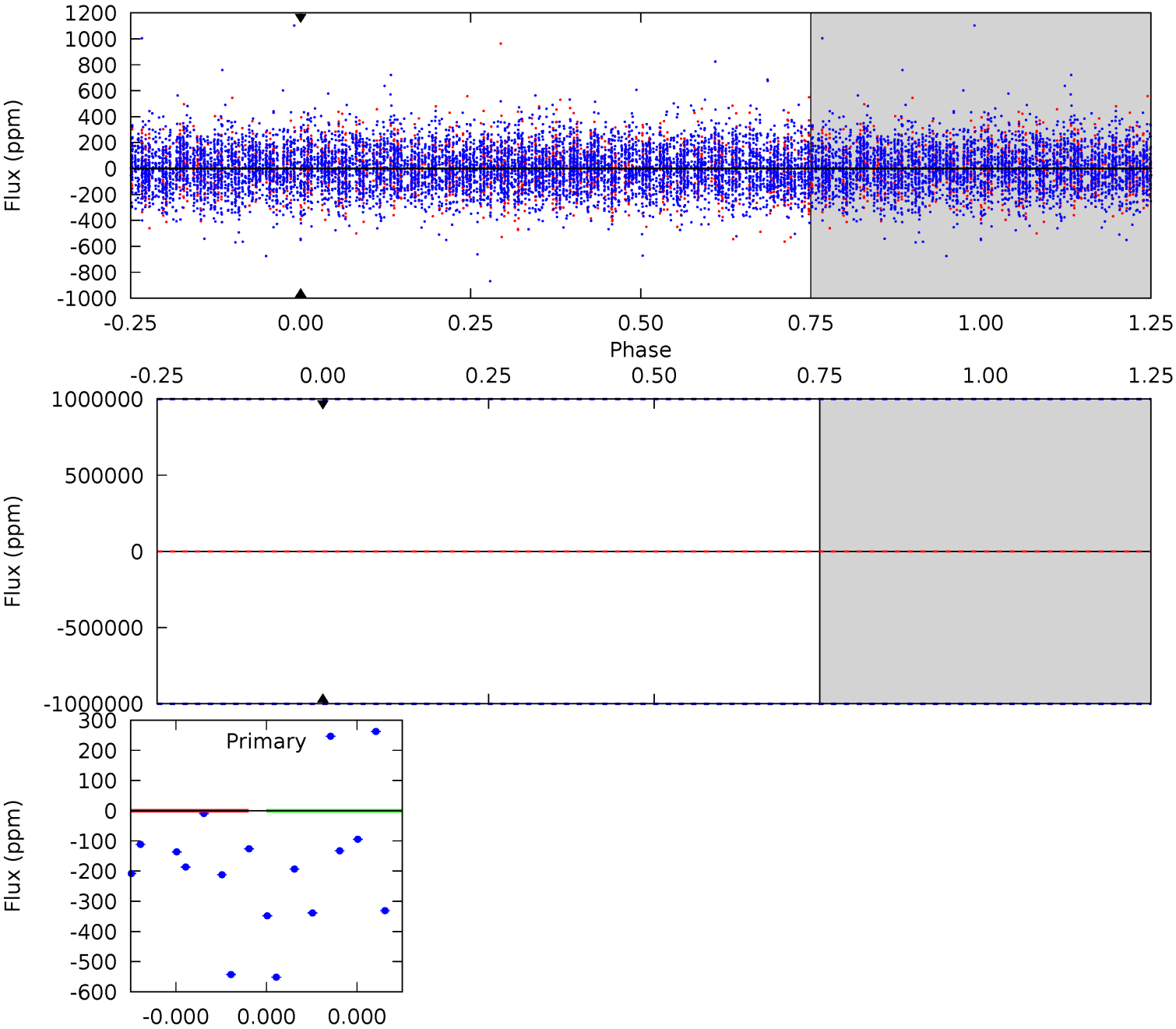
TCE 009111849-09 P=139.780377 Days  $T_0=232.766665$  (BKJD)



# DV Model-Shift Uniqueness Test

009111849-09, P = 139.780377 Days, E = 92.876474 Days

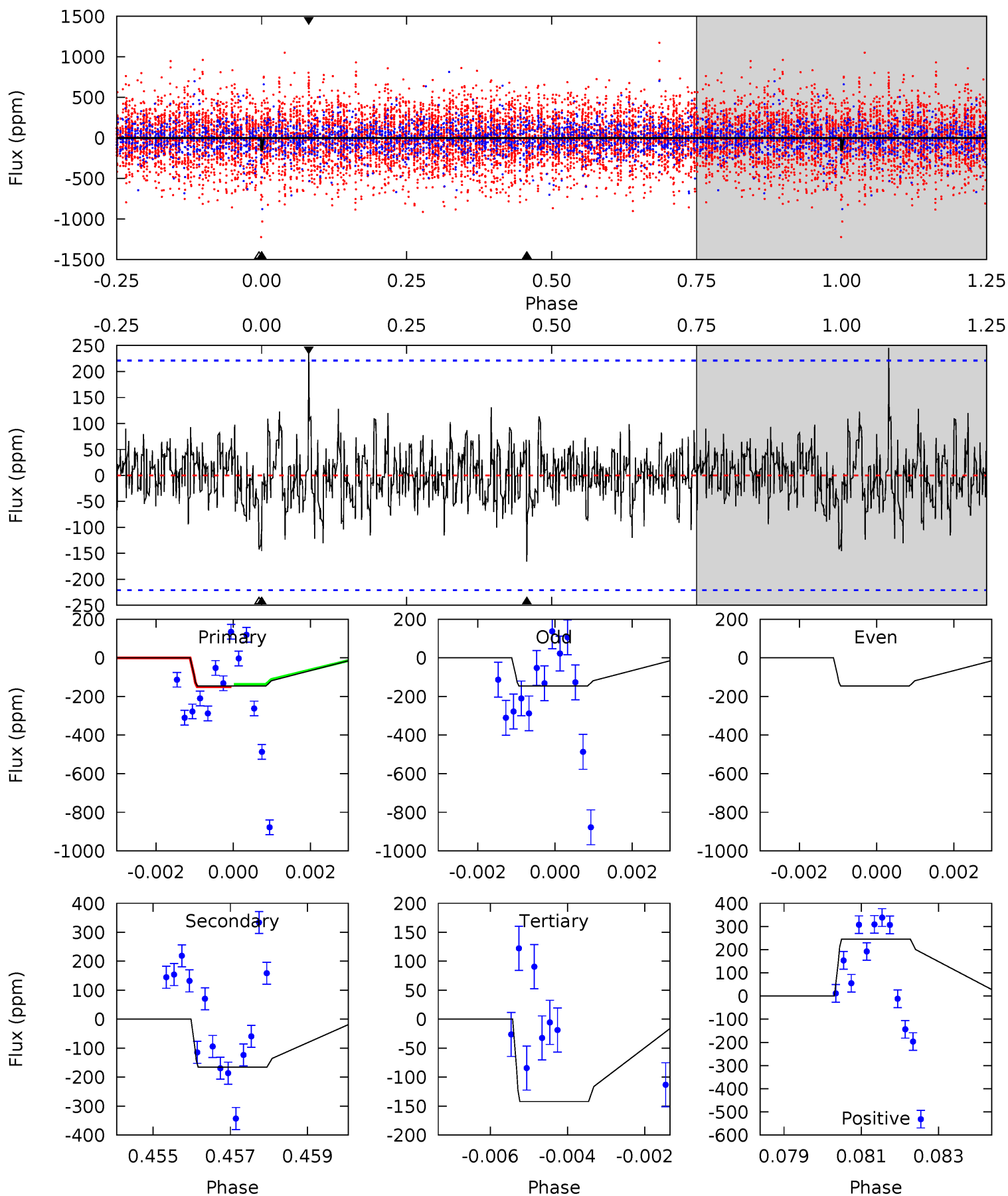
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

009111849-09, P = 139.780377 Days, E = 92.986288 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.50	3.98	3.42	5.90	5.32	3.07	1.02	0.08	-2.40	0.56	-1.92	0	6.96	0.60	0.15



### Stellar Parameters For KIC 009111849

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6234^{+74}_{-74}$	$3.209^{+0.458}_{-0.122}$	$0.560^{+0.050}_{-0.100}$	$6.354^{+1.590}_{-3.180}$	$2.382^{+0.277}_{-0.514}$	$0.013^{+0.056}_{-0.005}$
	+1%/-1%	+14%/-4%	+9%/-18%	+25%/-50%	+12%/-22%	+431%/-35%
Source	SPE90	FLK73	SPE90	DSEP		

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

### Secondary Eclipse Parameters for KIC 009111849-09 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$0 \pm 1000000$	$46.84^{+53.42}_{-32.45}$	$1131^{+74}_{-145}$	$4586^{+23517}_{-25277}$	$171^{+26312}_{-16817}$
Alt.	$-166 \pm 42$	$43.80^{+44.90}_{-29.40}$	$1133^{+75}_{-136}$	$3249^{+1500}_{-623}$	$23^{+197}_{-17}$

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



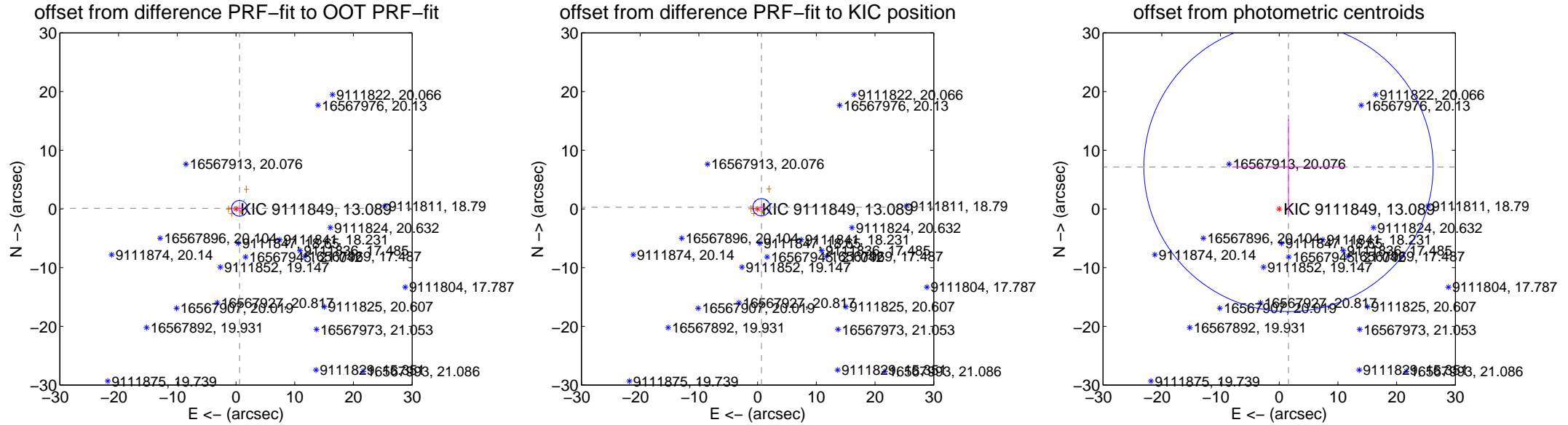
## DV Centroid Data

Supplemental centroid analysis for 009111849-09. Kepler magnitude: 13.09. Transit SNR -1.00

There are 3 quarters with good PRF difference image offsets

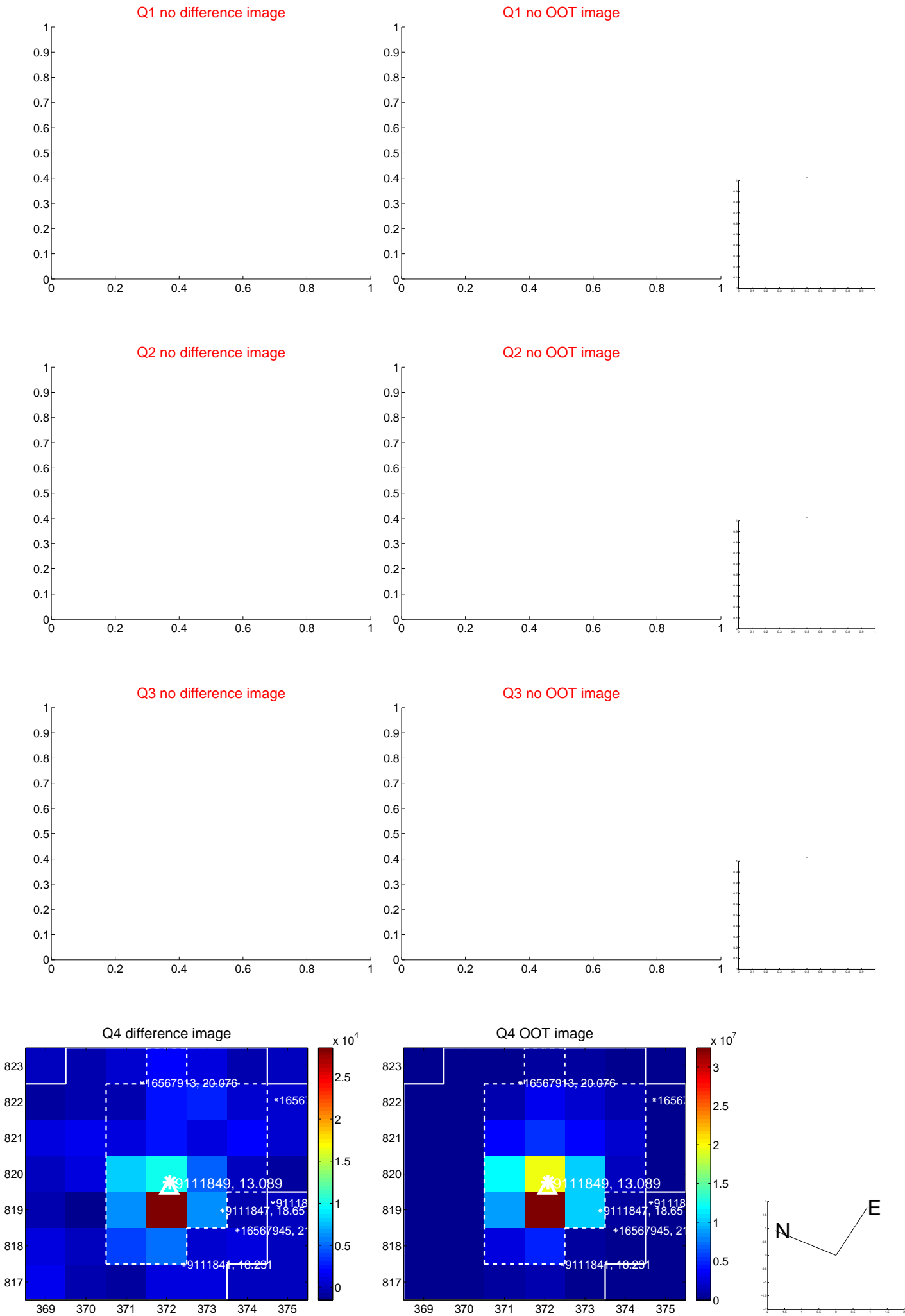
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.607 \pm 0.446$	1.36	$-0.599 \pm 0.387$	$0.101 \pm 0.519$
PRF-fit source offset from KIC position	$0.719 \pm 0.492$	1.46	$-0.660 \pm 0.358$	$0.286 \pm 0.505$
photometric centroid source offset	$7.32 \pm 8.21$	0.89	$-1.58 \pm 9.58$	$7.14 \pm 8.14$

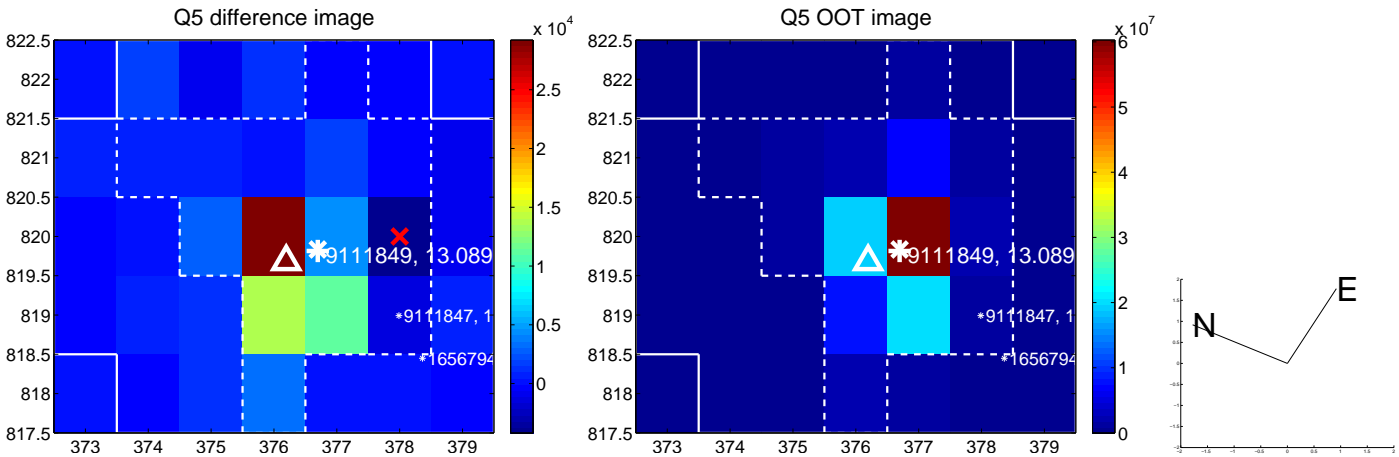


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

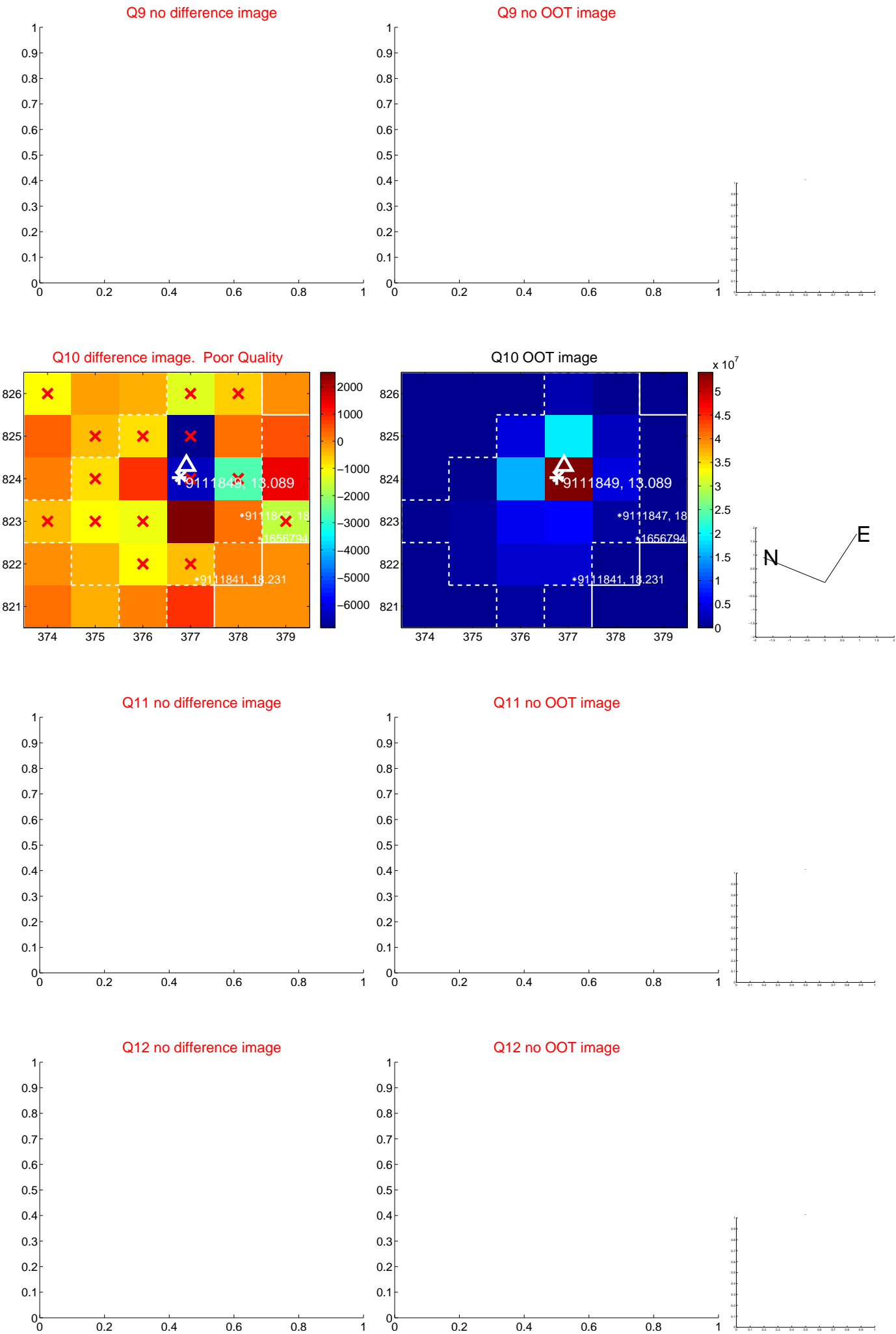
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



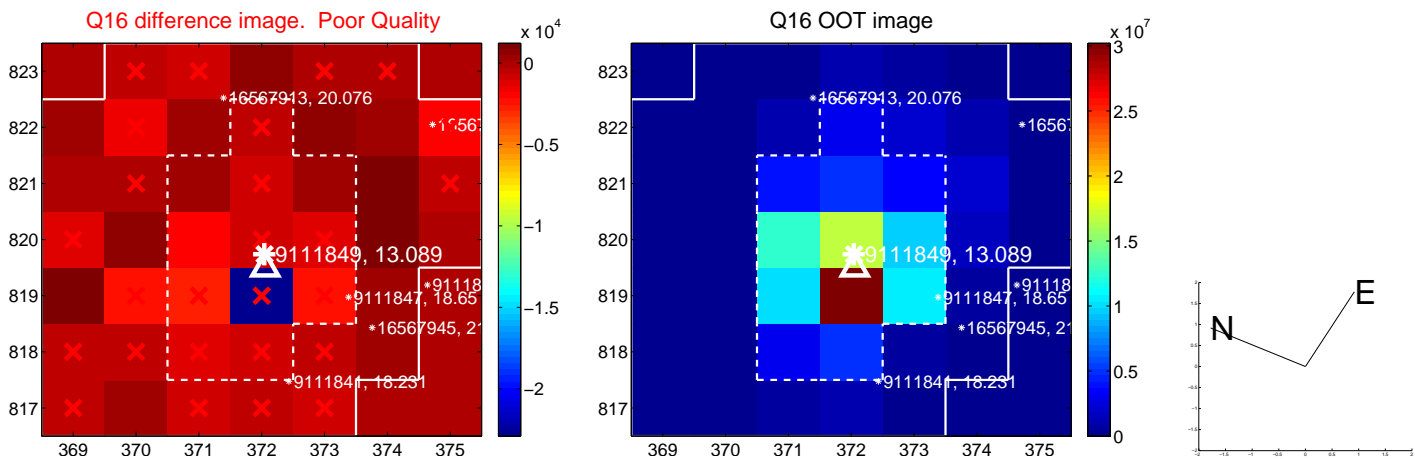
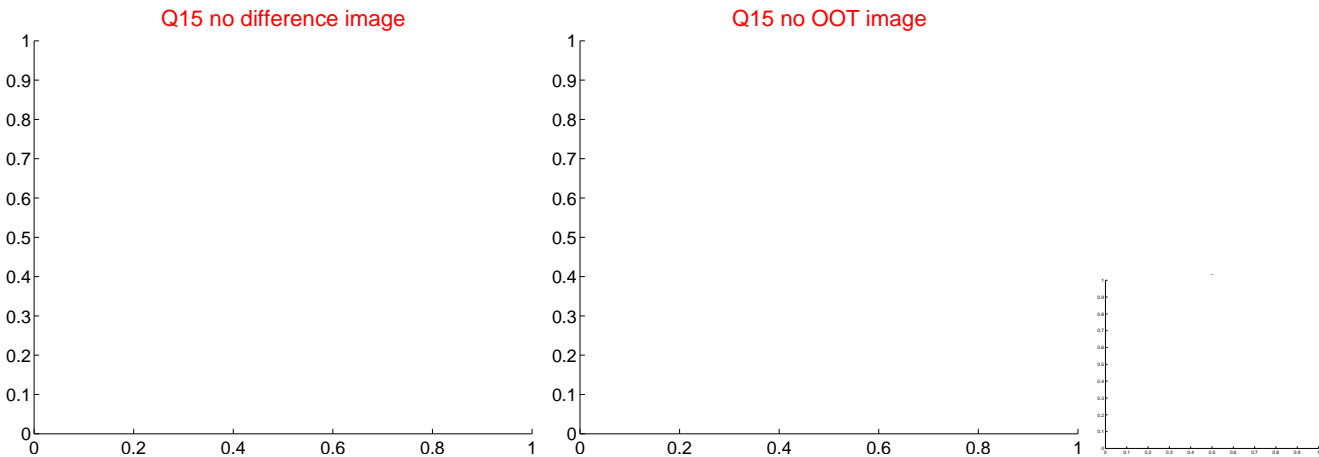
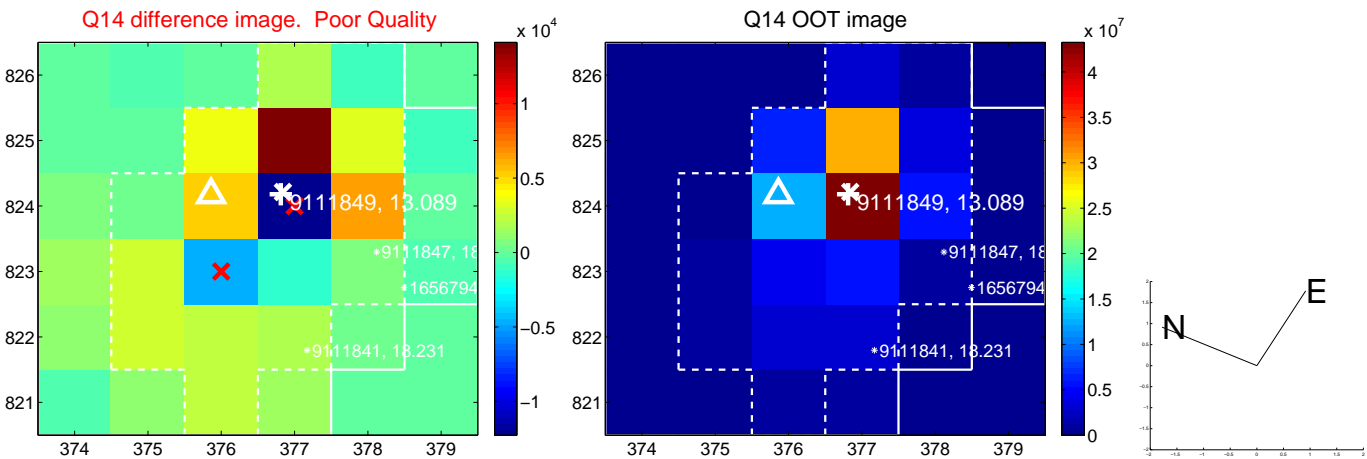
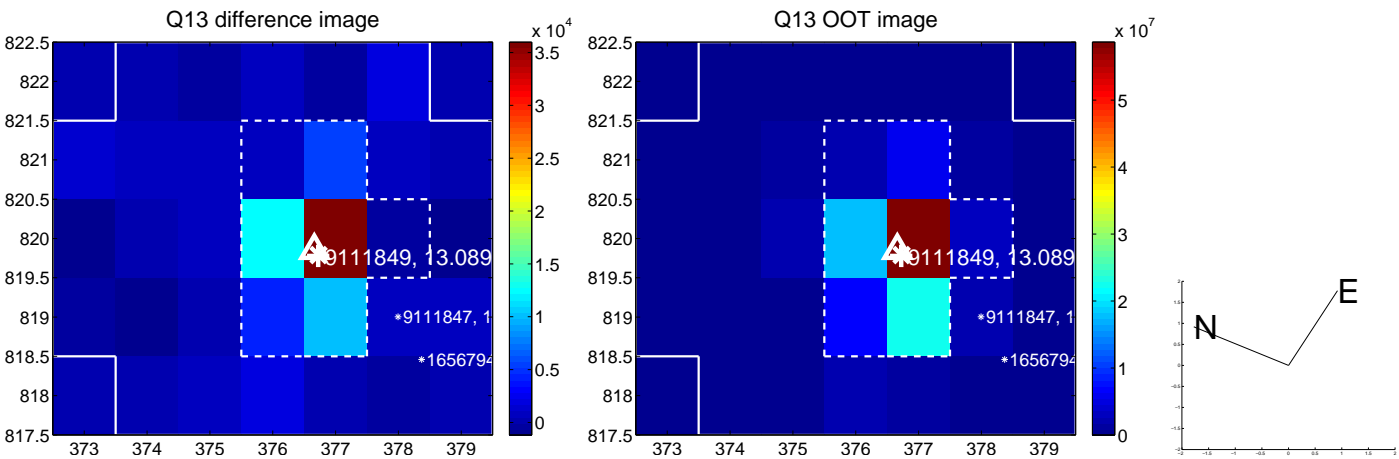
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



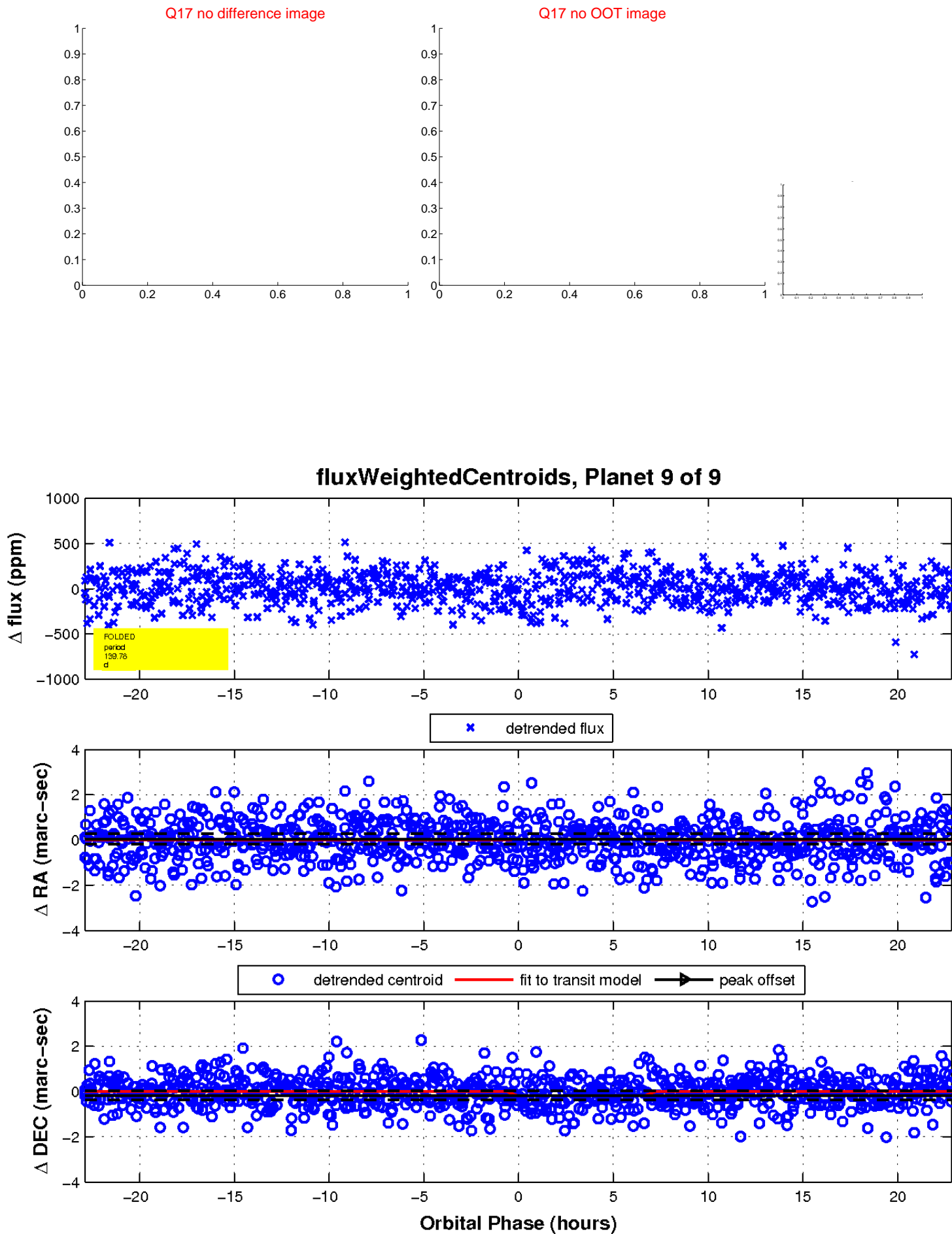
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

