

# KIC 009174919

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009174919-01	OBS	No	7.917217	134.568680	43.3	27.020	9.9	11.7	1.41	6261	1.06	430.91
009174919-02	OBS	No	7.918305	137.357363	51.1	26.278	10.4	14.3	1.41	6261	1.20	430.83

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009174919-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009174919-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

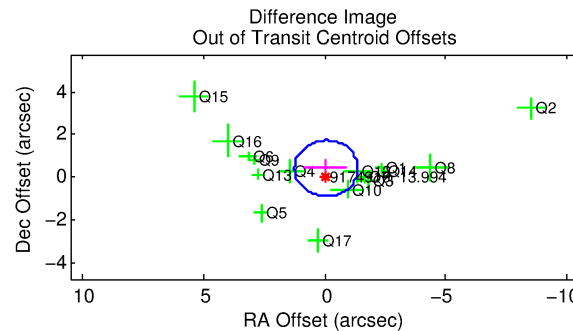
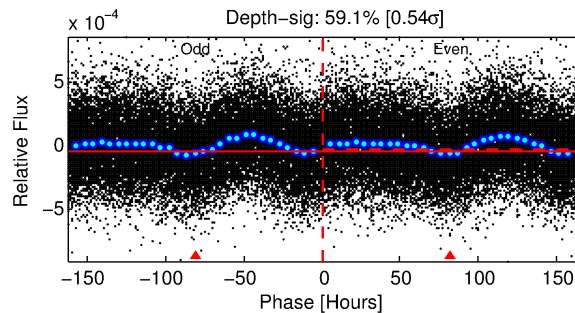
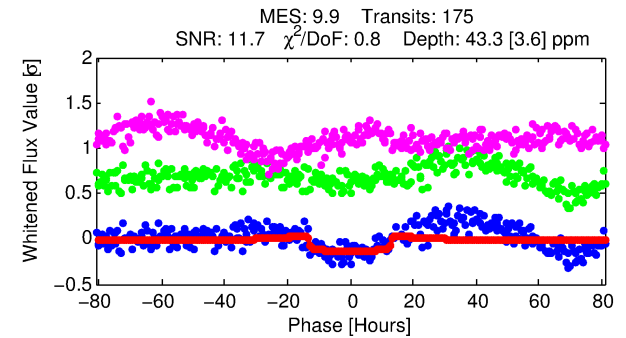
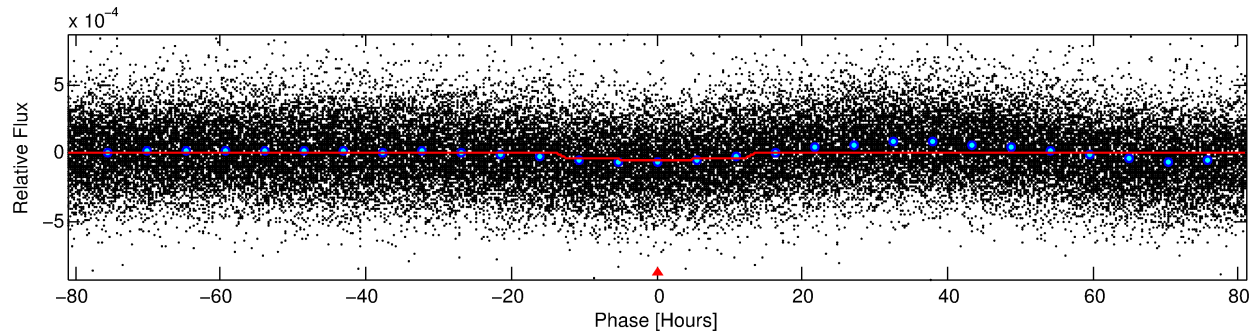
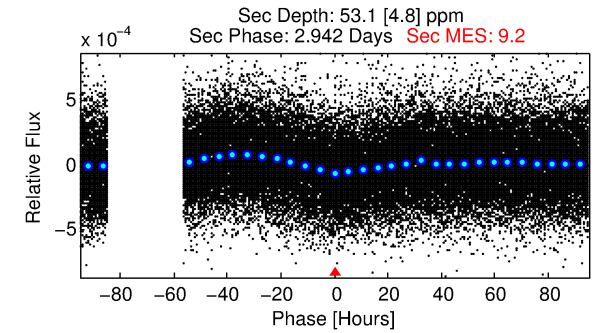
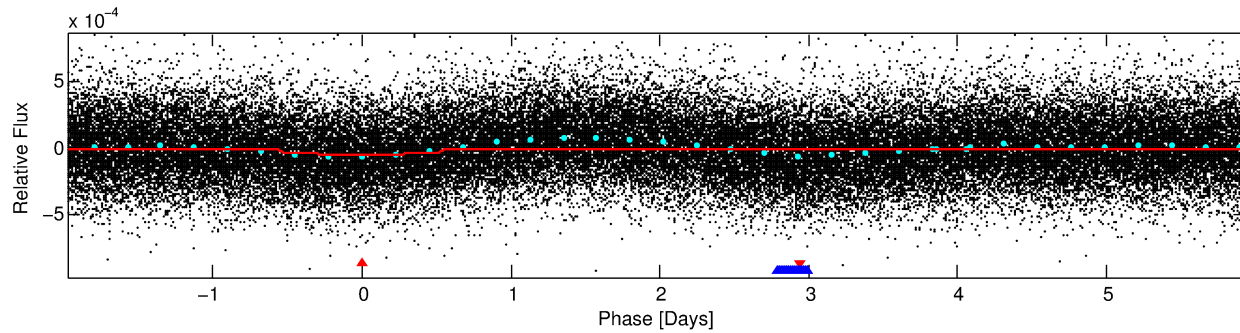
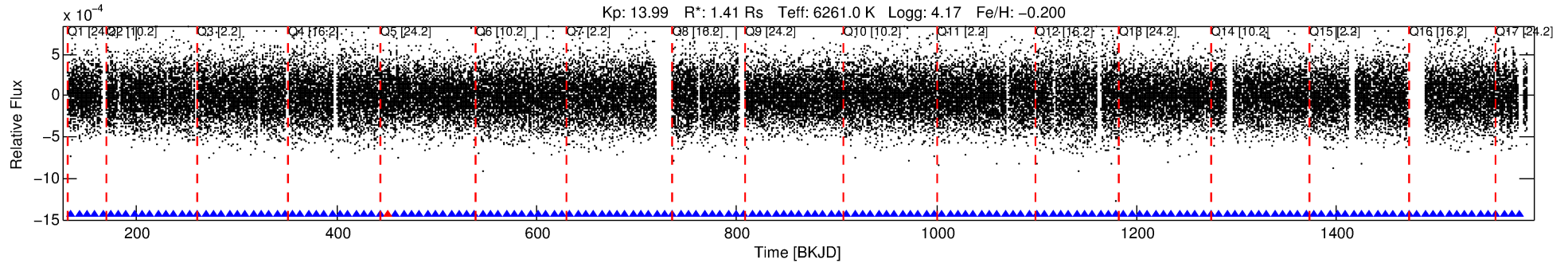
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009174919-01

No Significant Match Found

# DV One-Page Summary

KIC: 9174919 Candidate: 1 of 2 Period: 7.917 d



## DV Fit Results:

Period = 7.91722 [0.00022] d  
Epoch = 134.5687 [0.0219] BKJD  
Rp/R\* = 0.0069 [0.0008]  
a/R\* = 1.46 [0.44]  
b = 0.87 [0.16]  
Seff = 430.91 [179.92]  
Teq = 1162 [121] K  
Rp = 1.06 [0.34] Re  
a = 0.0798 [0.0210] AU  
Ag = 164.21 [75.70] [2.16σ]  
Teffp = 6430 [447] K [11.37σ]

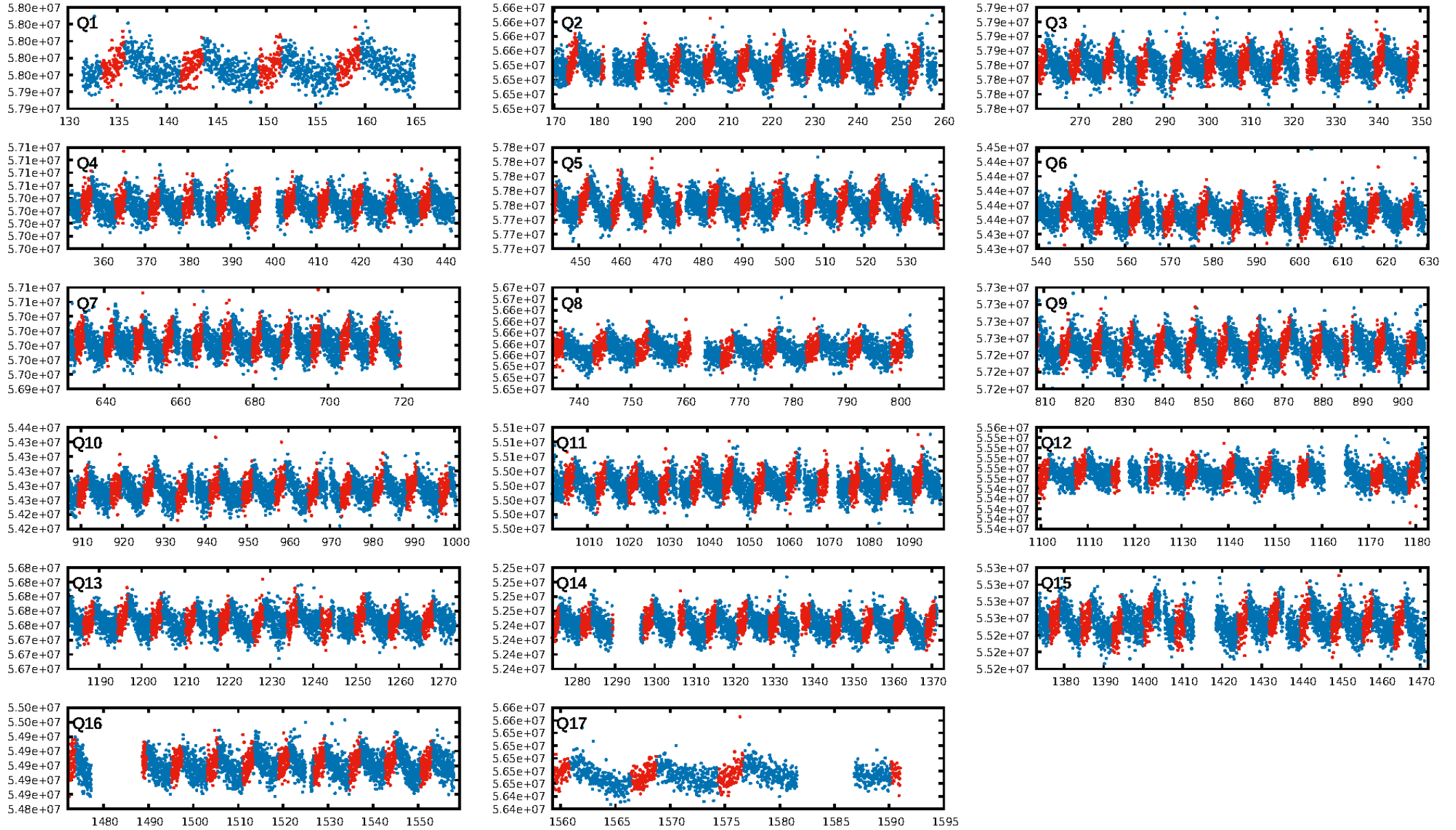
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 7.10e-36  
RollingBand-fgt: 0.99 [166/167]  
GhostDiagnostic-chr: 4.786  
Centroid-sig: 0.0%  
Centroid-so: 3.526 arcsec [2.95σ]  
OotOffset-rm: 0.427 arcsec [0.98σ]  
KicOffset-rm: 0.444 arcsec [1.13σ]  
OotOffset-st: 4/3/4/5 [16]  
KicOffset-st: 4/3/4/5 [16]  
DiffImageQuality-fgm: 0.75 [12/16]  
DiffImageOverlap-fno: 1.00 [17/17]

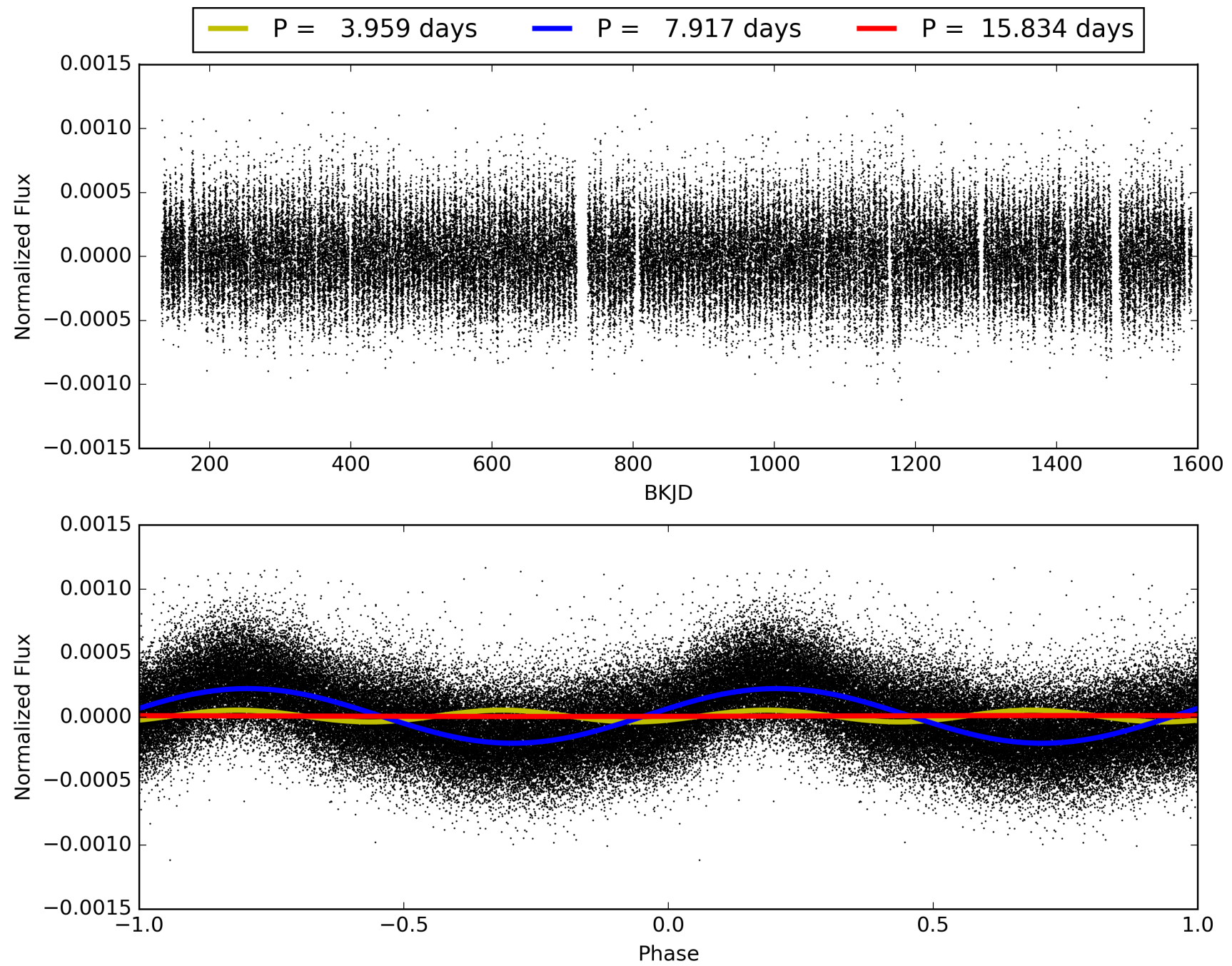
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:55:47 Z

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

# TCE 009174919-01, PDC Light Curves

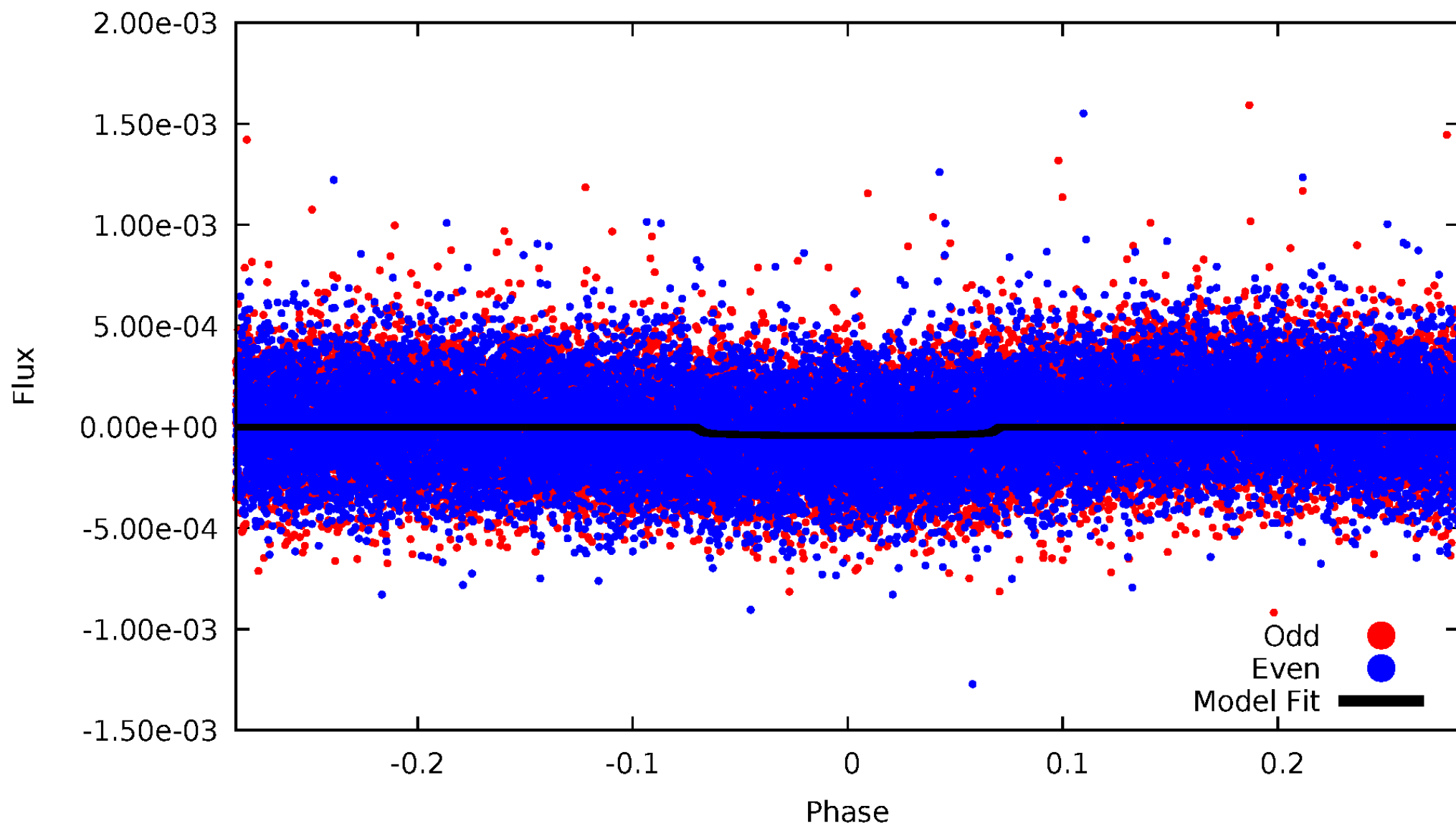


# TCE 009174919-01



# DV Odd/Even

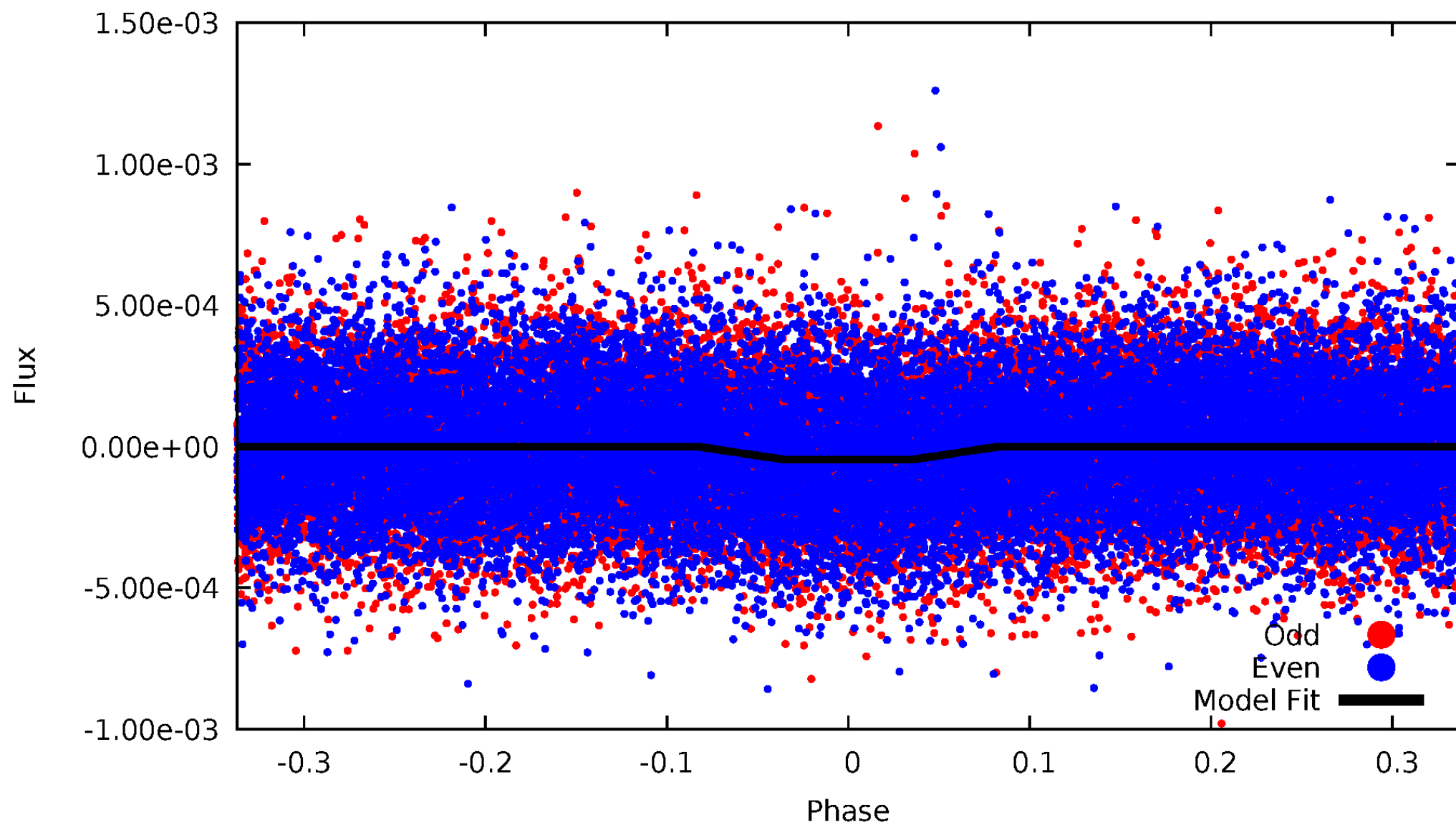
TCE 009174919-01



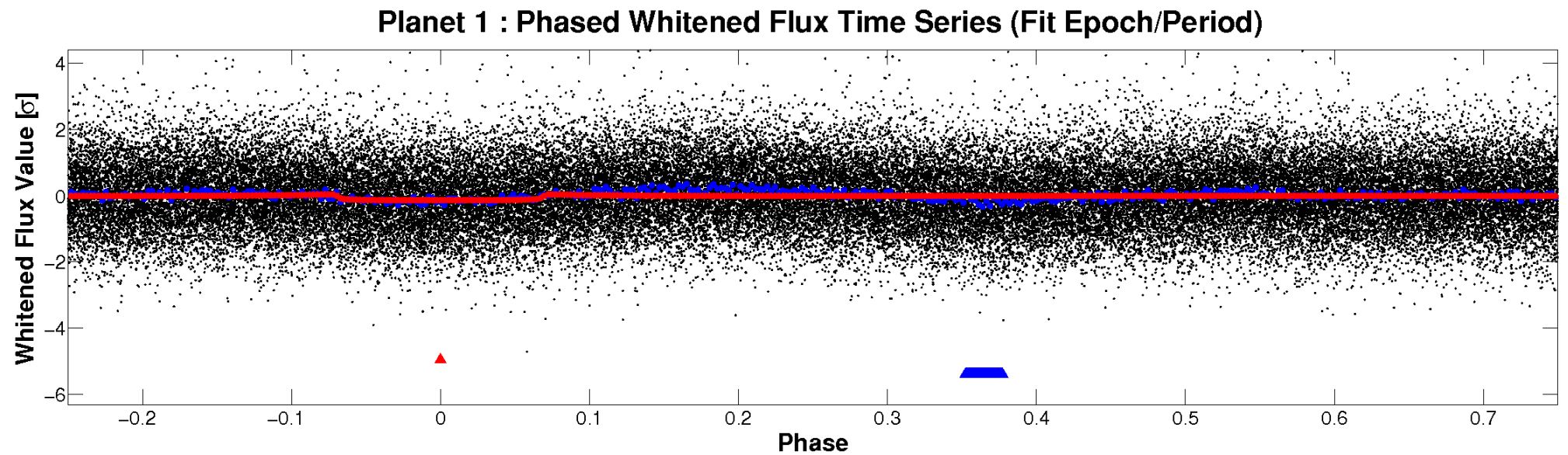
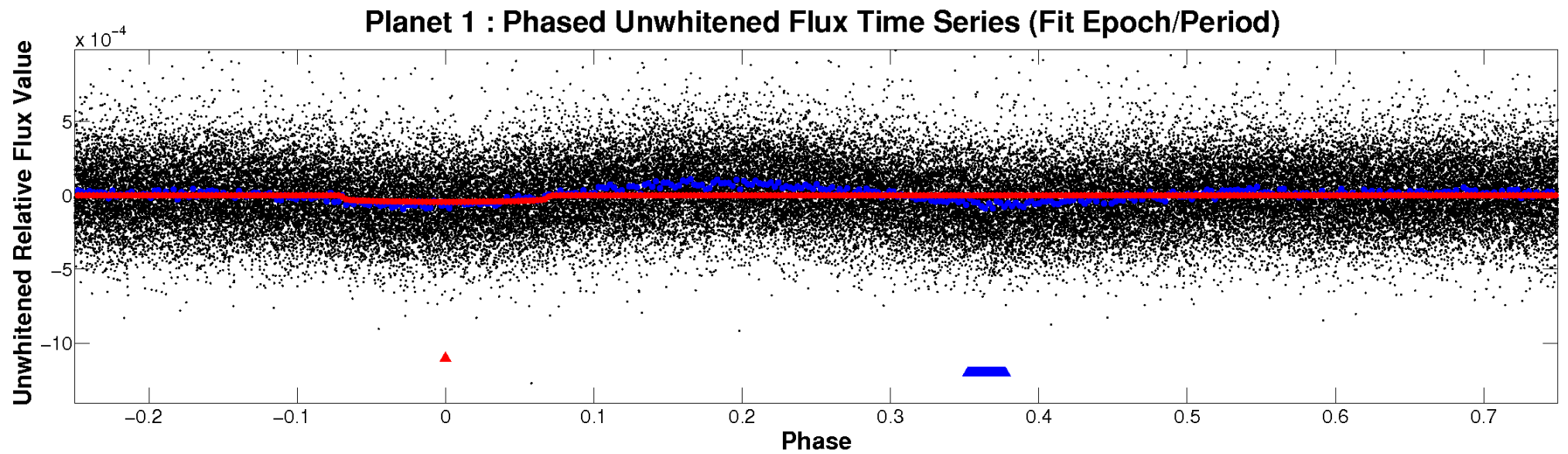


# ALT Odd/Even

TCE 009174919-01

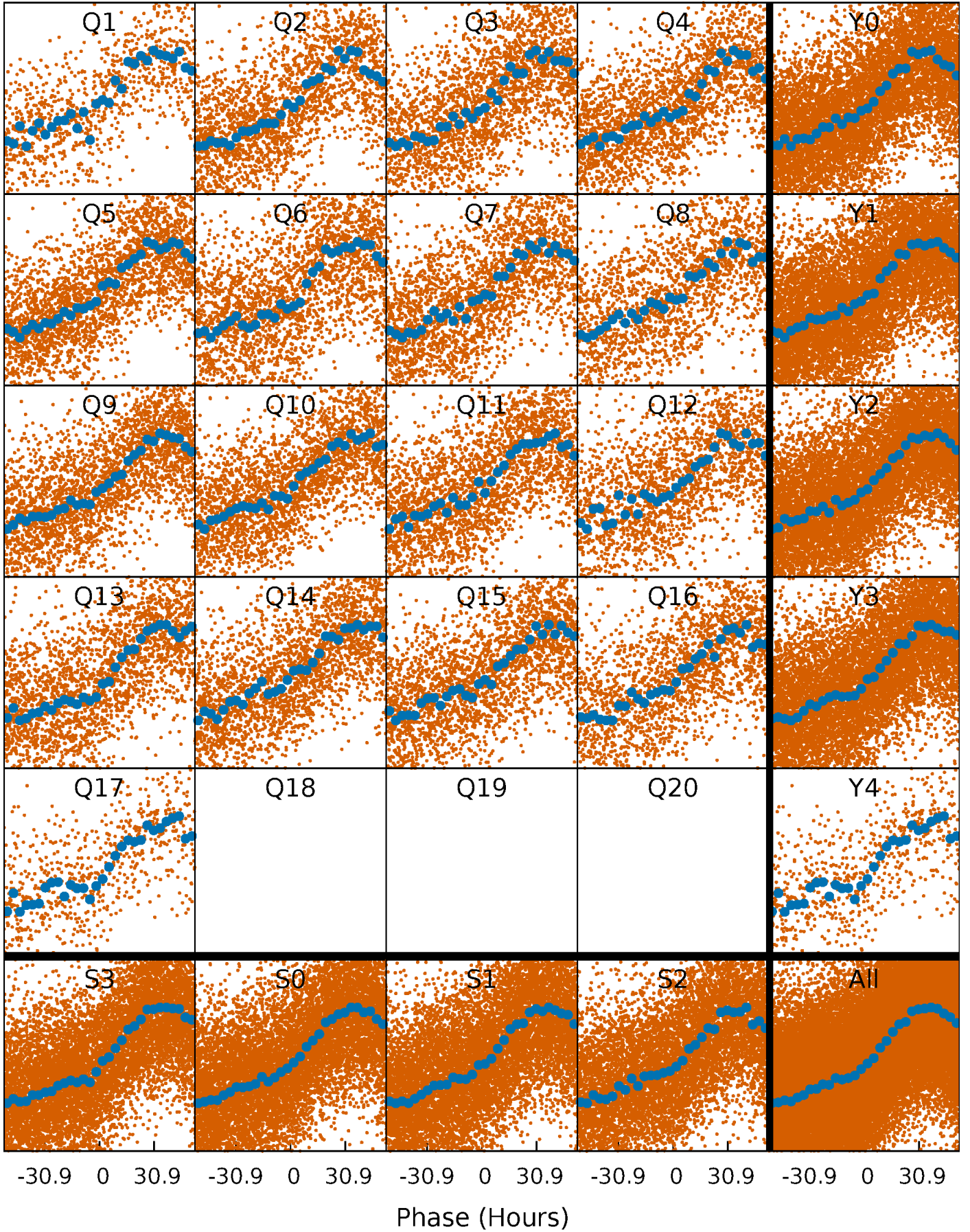


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

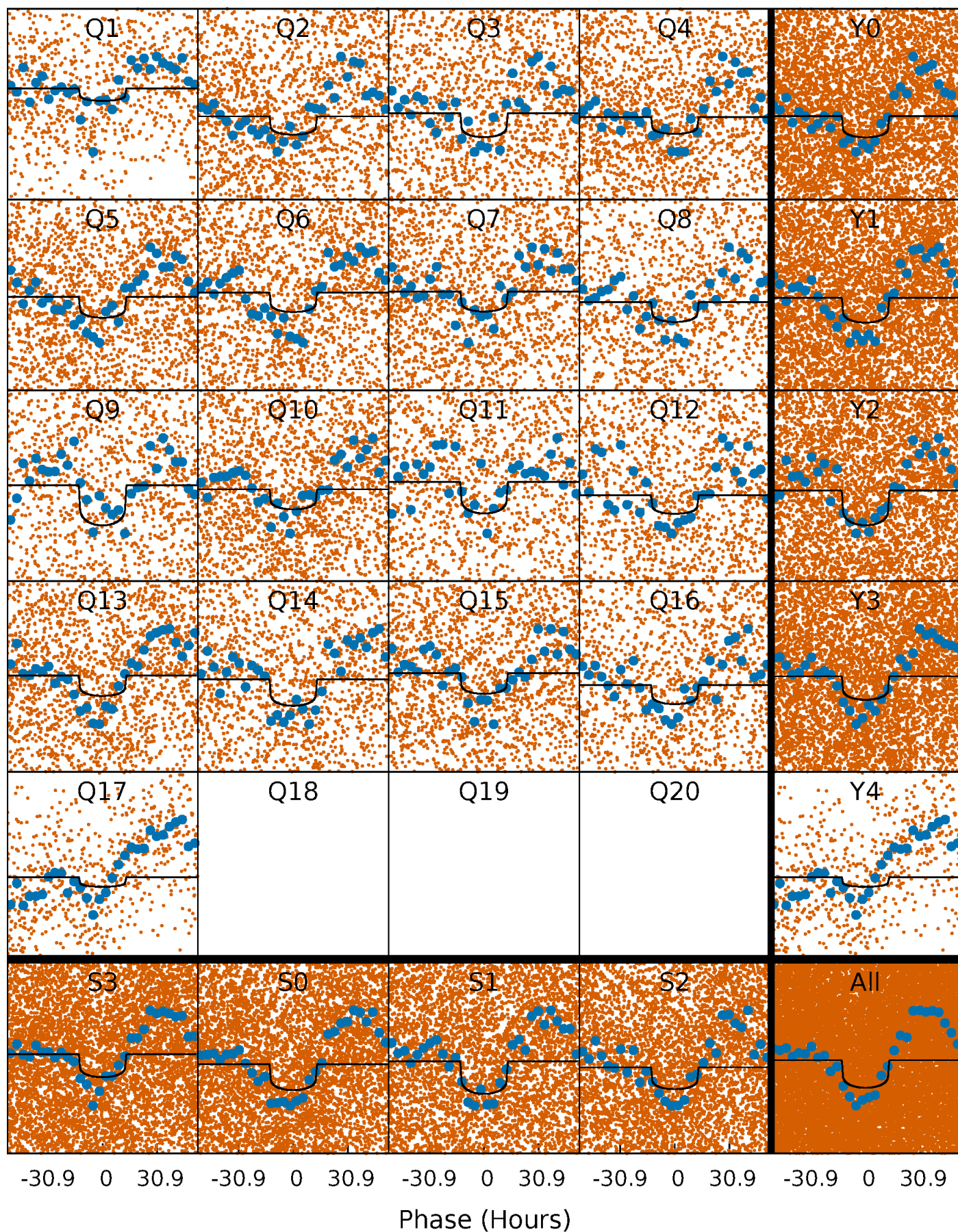
TCE 009174919-01   P= 7.917217 Days    $T_0=134.568680$  (BKJD)





# DV Quarter-Phased Transit Curves

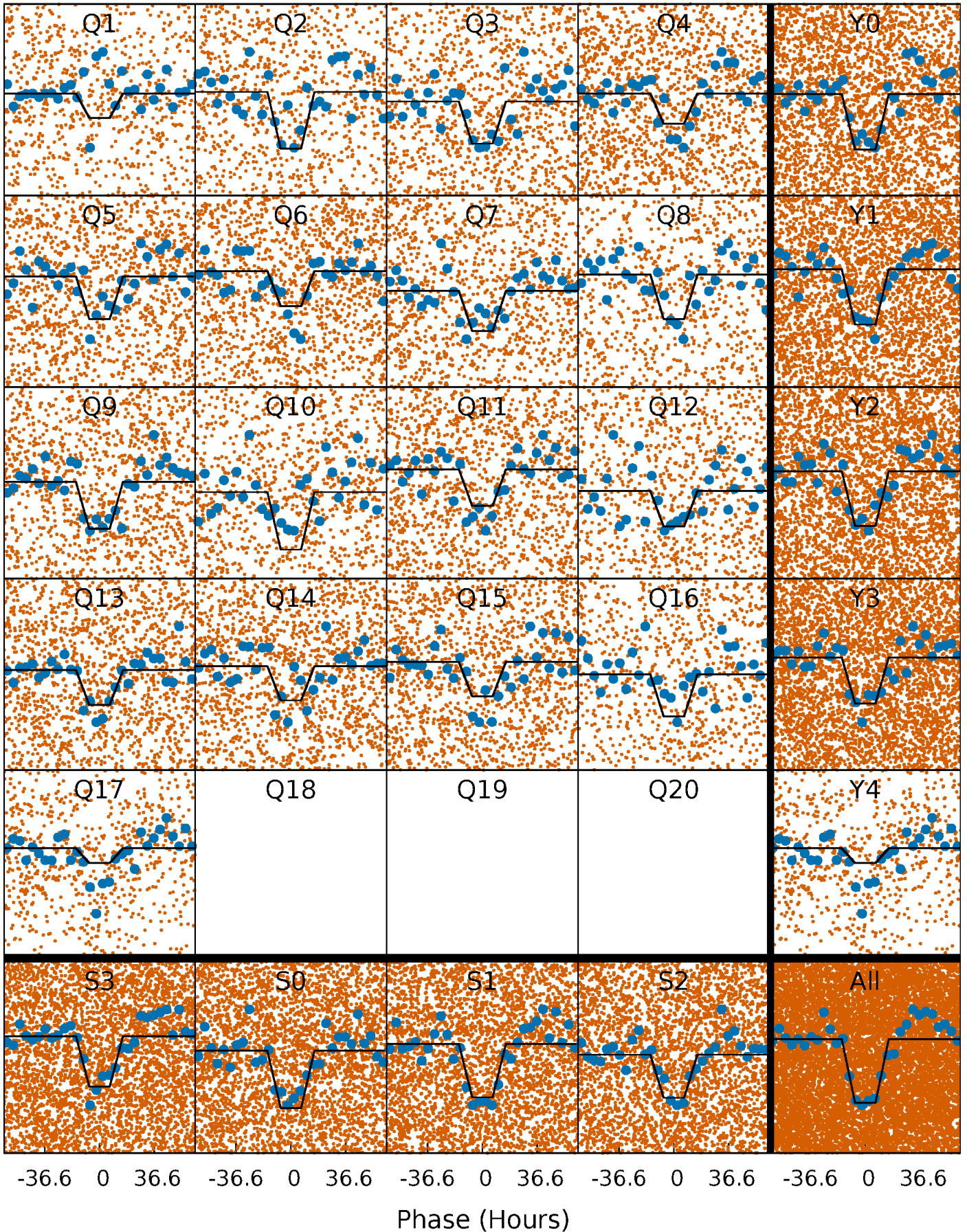
TCE 009174919-01 P= 7.917217 Days  $T_0=134.568680$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

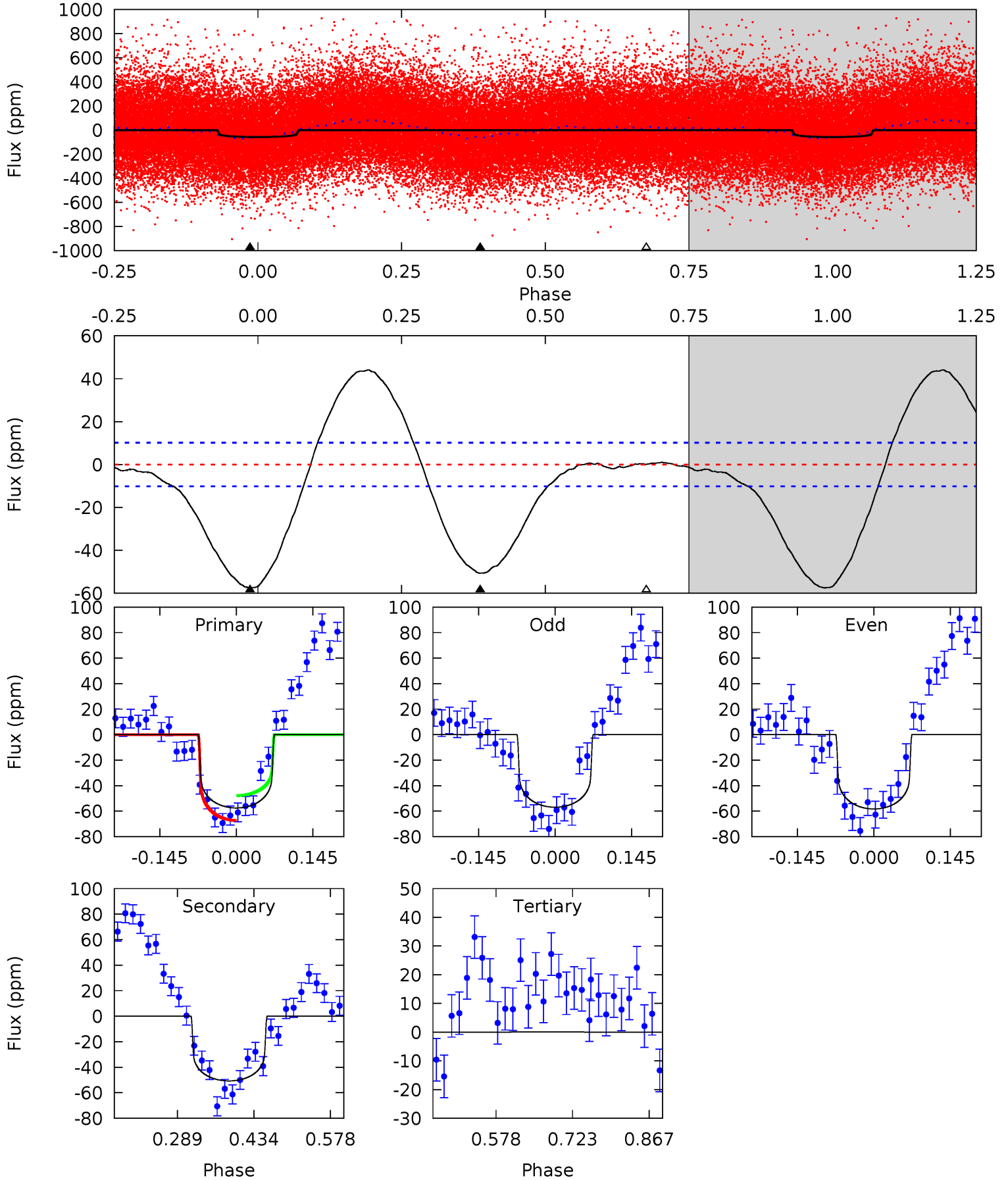
TCE 009174919-01 P= 7.916493 Days  $T_0=134.600212$  (BKJD)



# DV Model-Shift Uniqueness Test

009174919-01, P = 7.917217 Days, E = 126.651463 Days

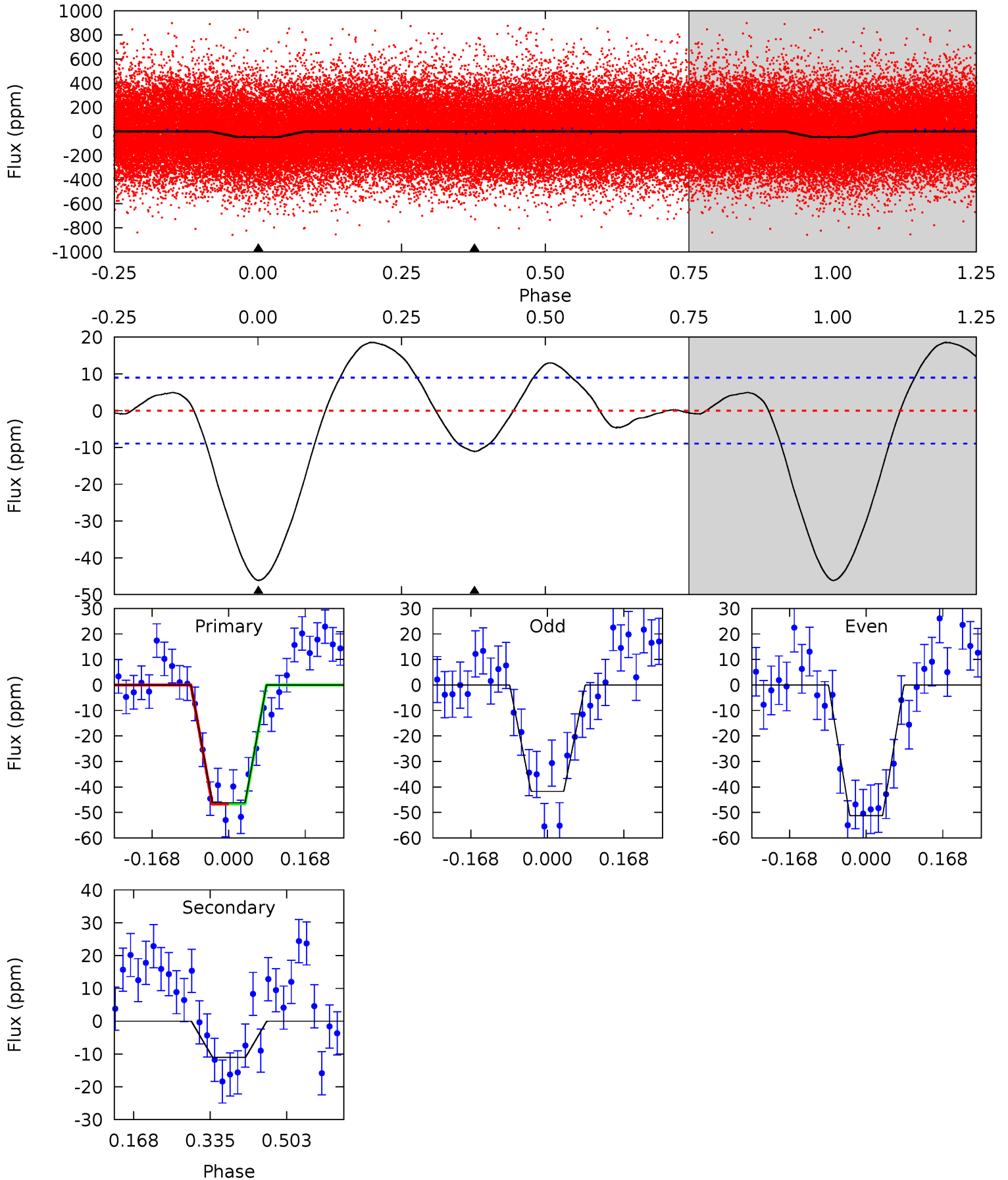
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.5	22.4	-0.05	0	4.49	1.46	7.86	25.5	25.5	22.5	22.4	0.30	1.01	0.43	4.25



# Alt Model-Shift Uniqueness Test

009174919-01, P = 7.916493 Days, E = 126.683719 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
23.0	5.50	0	0	4.46	1.38	3.22	23.0	23.0	5.50	5.50	2.38	1.01	0.29	0.03





### Stellar Parameters For KIC 009174919

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6261^{+175}_{-219}$	$4.172^{+0.220}_{-0.180}$	$-0.200^{+0.250}_{-0.300}$	$1.411^{+0.427}_{-0.349}$	$1.079^{+0.181}_{-0.148}$	$0.541^{+0.727}_{-0.251}$
	+3%/-3%	+5%/-4%	+125%/-150%	+30%/-25%	+17%/-14%	+134%/-46%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 009174919-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-51 \pm 2$	$1.06^{+0.21}_{-0.18}$	$1612^{+127}_{-121}$	$6357^{+445}_{-421}$	$161^{+68}_{-49}$
Alt.	$-11 \pm 2$	$1.03^{+0.21}_{-0.18}$	$1619^{+124}_{-129}$	$4556^{+289}_{-270}$	$37^{+17}_{-13}$

$T_{max}$  = 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

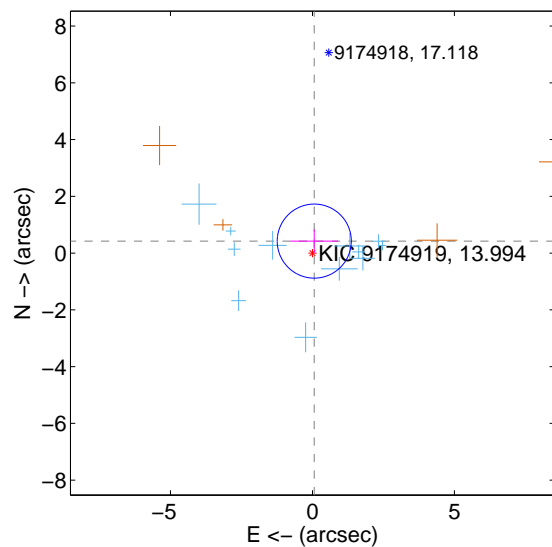
Supplemental centroid analysis for 009174919-01. Kepler magnitude: 13.99. Transit SNR 11.74

There are 12 quarters with good PRF difference image offsets

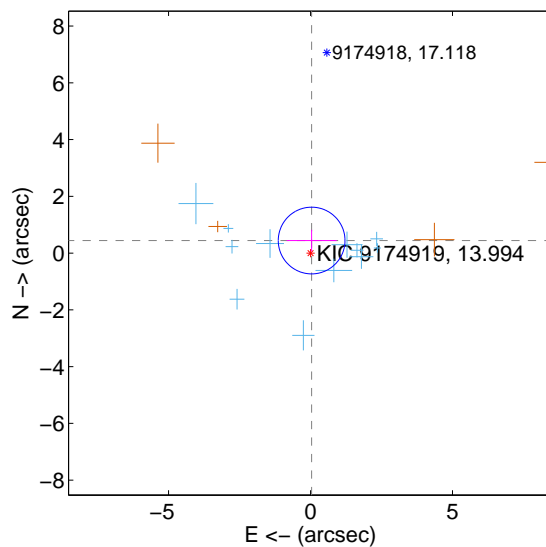
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.427 \pm 0.435$	0.98	$-0.064 \pm 0.841$	$0.423 \pm 0.412$
PRF-fit source offset from KIC position	$0.444 \pm 0.392$	1.13	$-0.039 \pm 0.879$	$0.443 \pm 0.379$
photometric centroid source offset	$3.53 \pm 1.19$	2.95	$-1.55 \pm 1.16$	$-3.17 \pm 1.20$

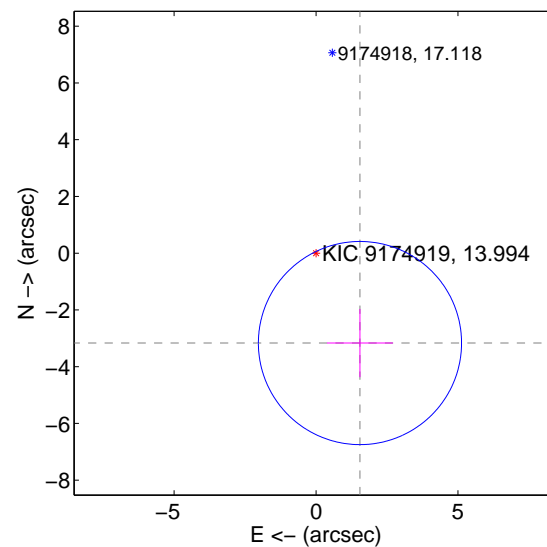
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

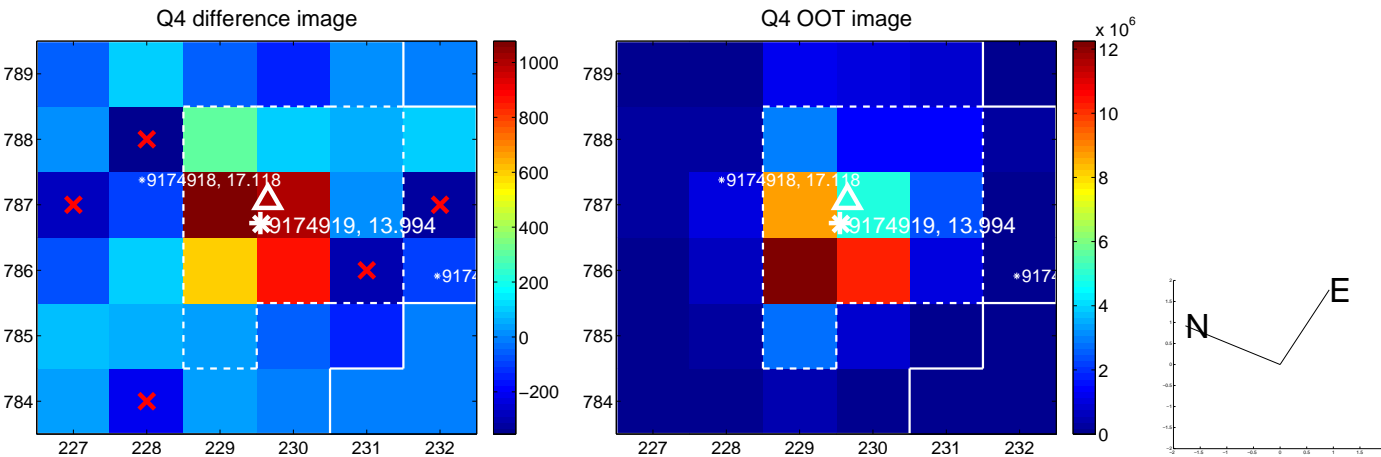
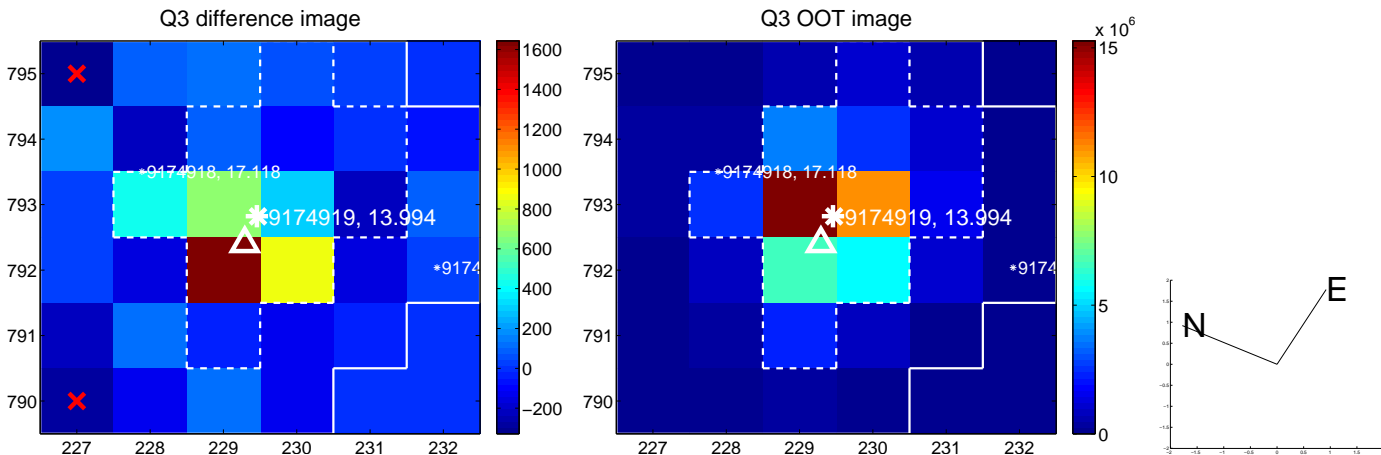
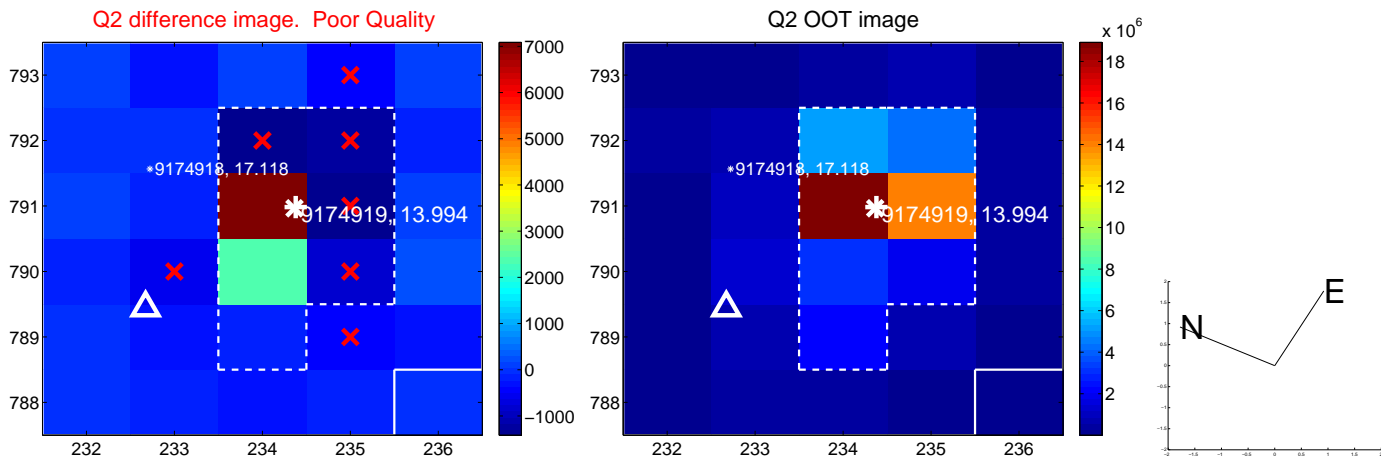
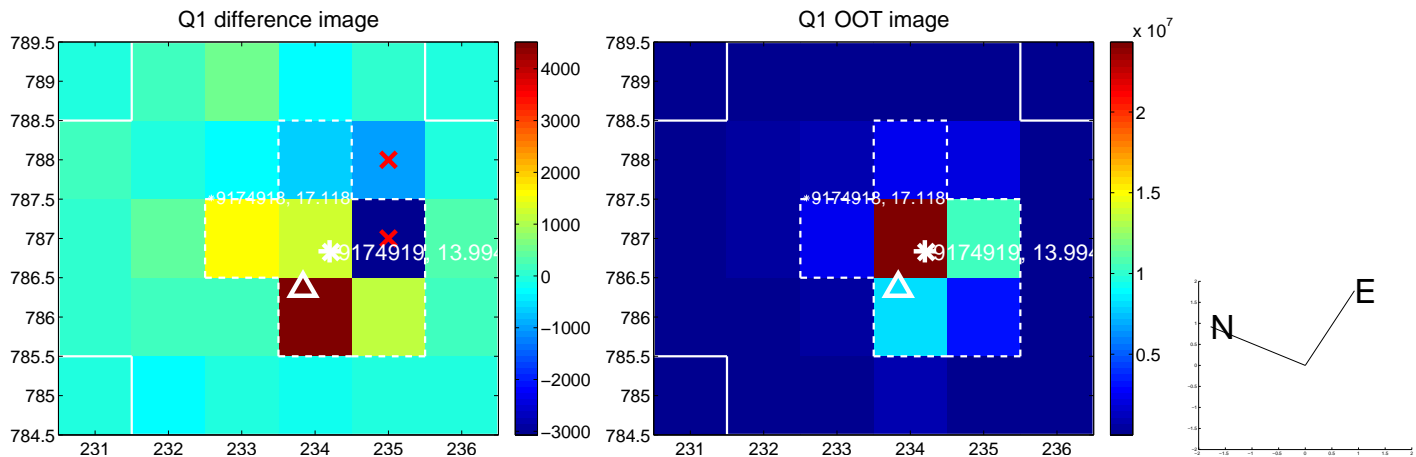


offset from photometric centroids

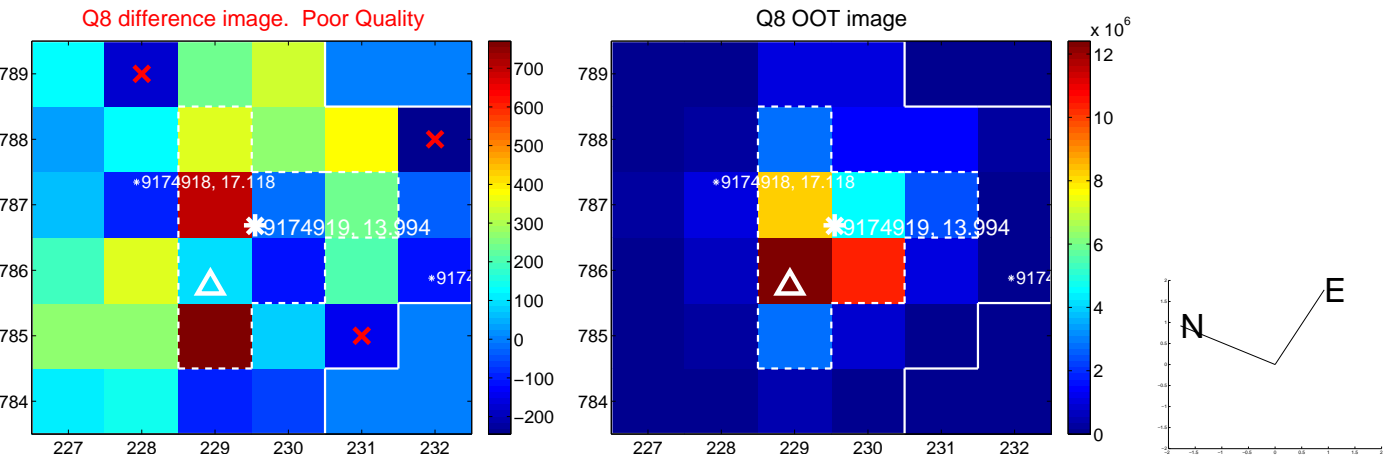
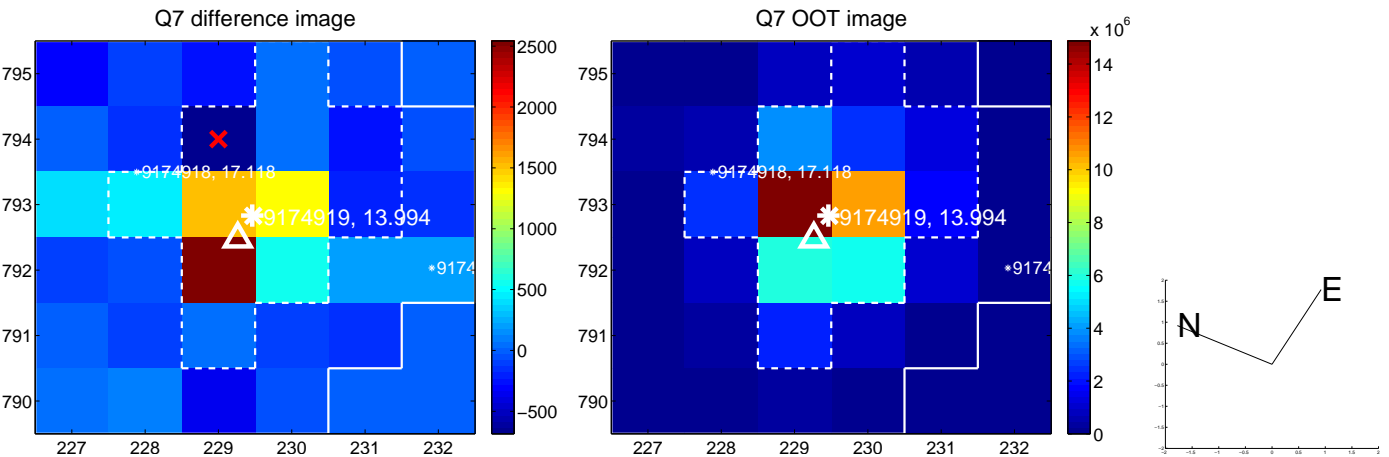
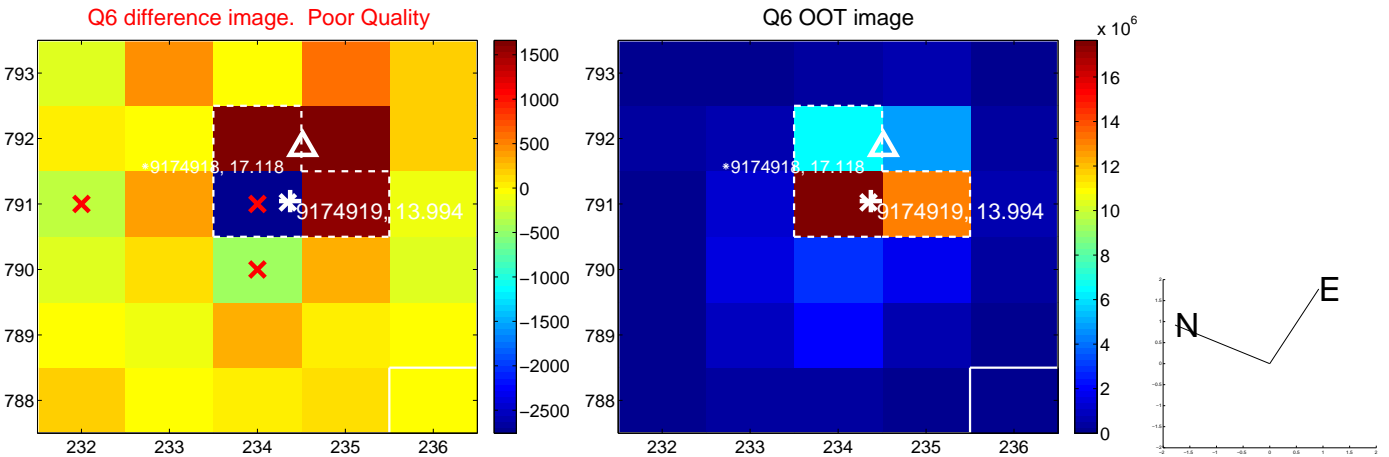
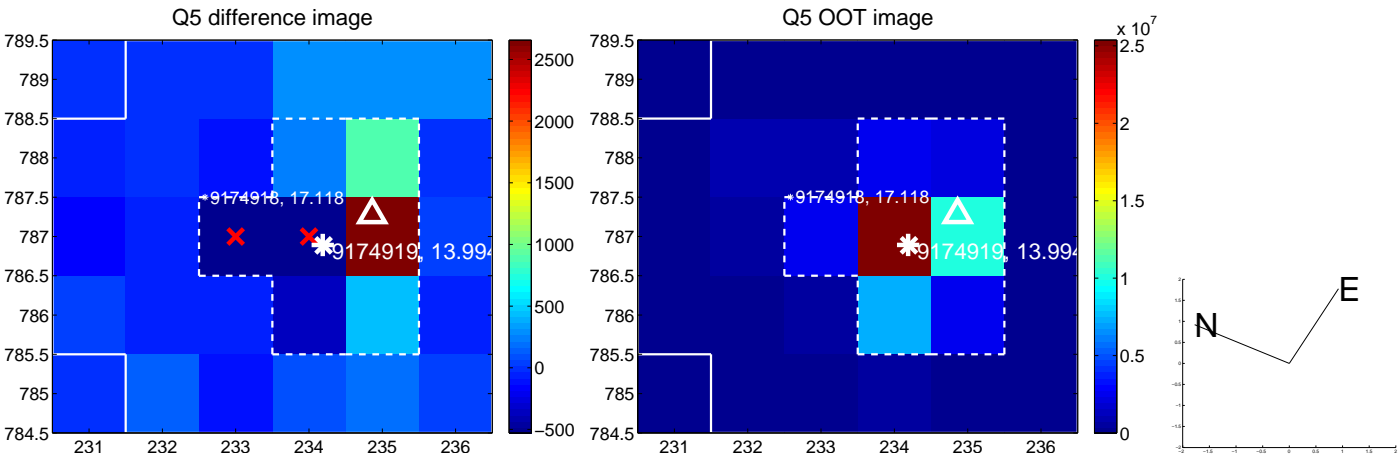


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

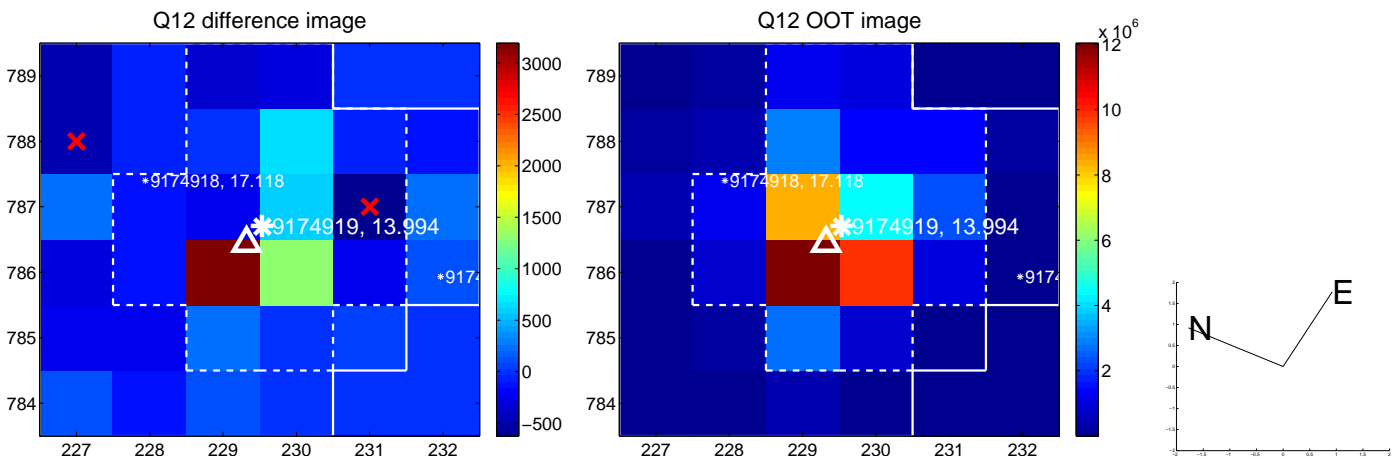
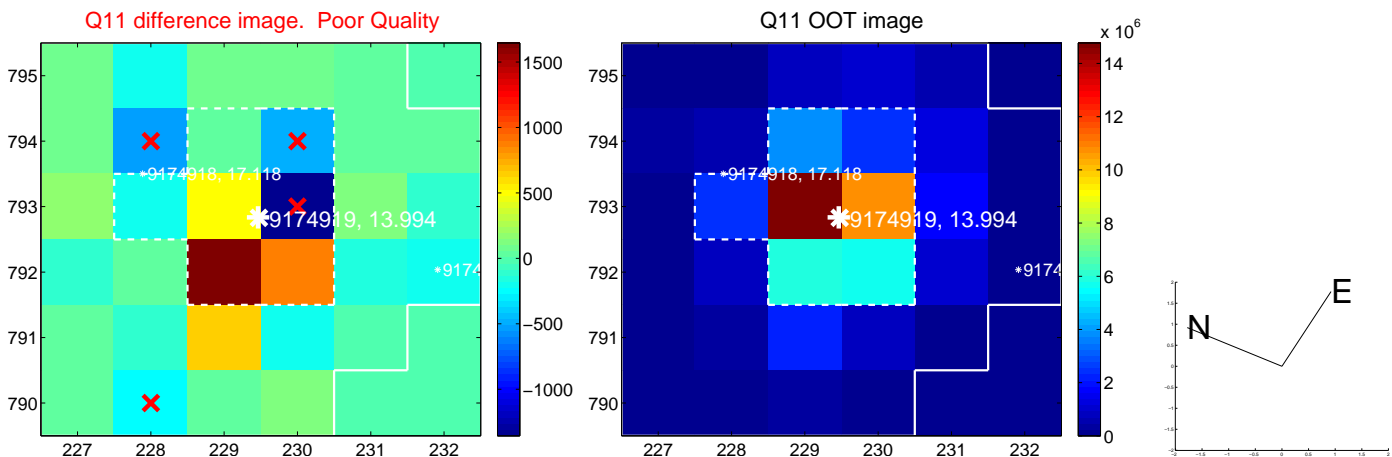
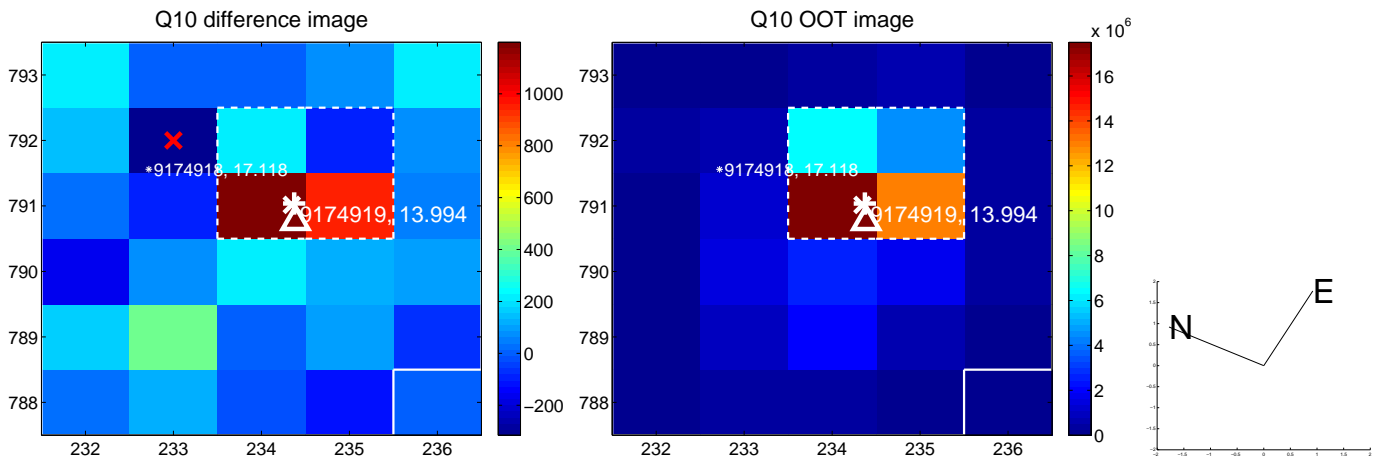
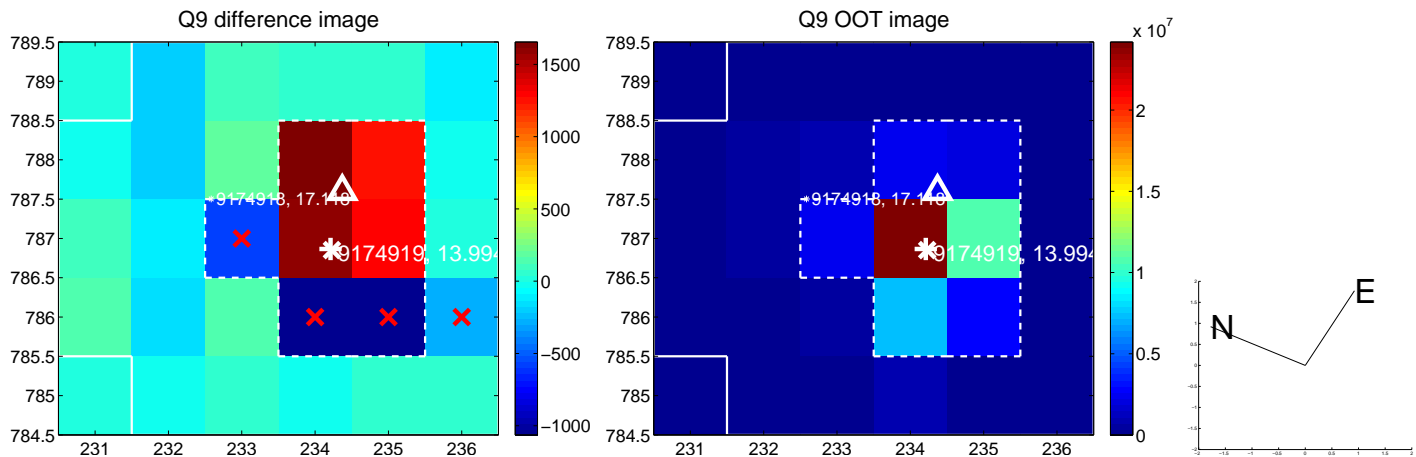


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

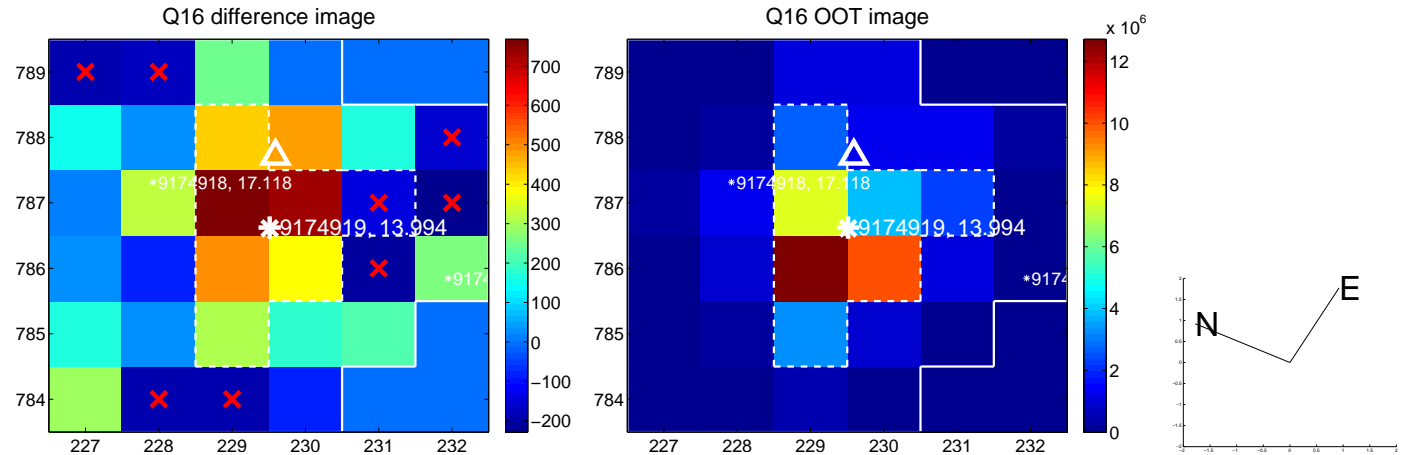
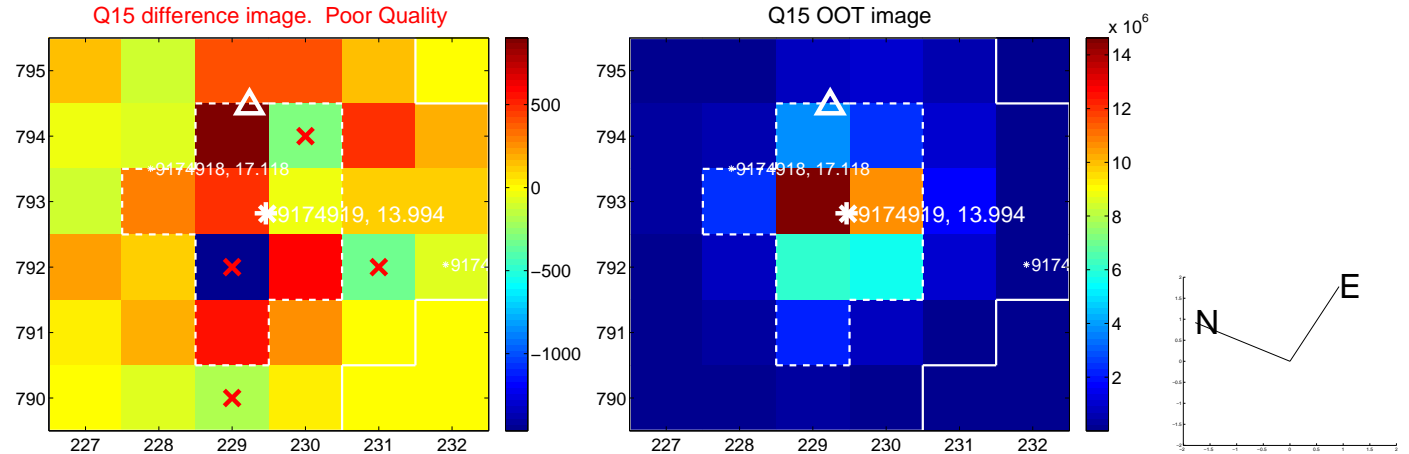
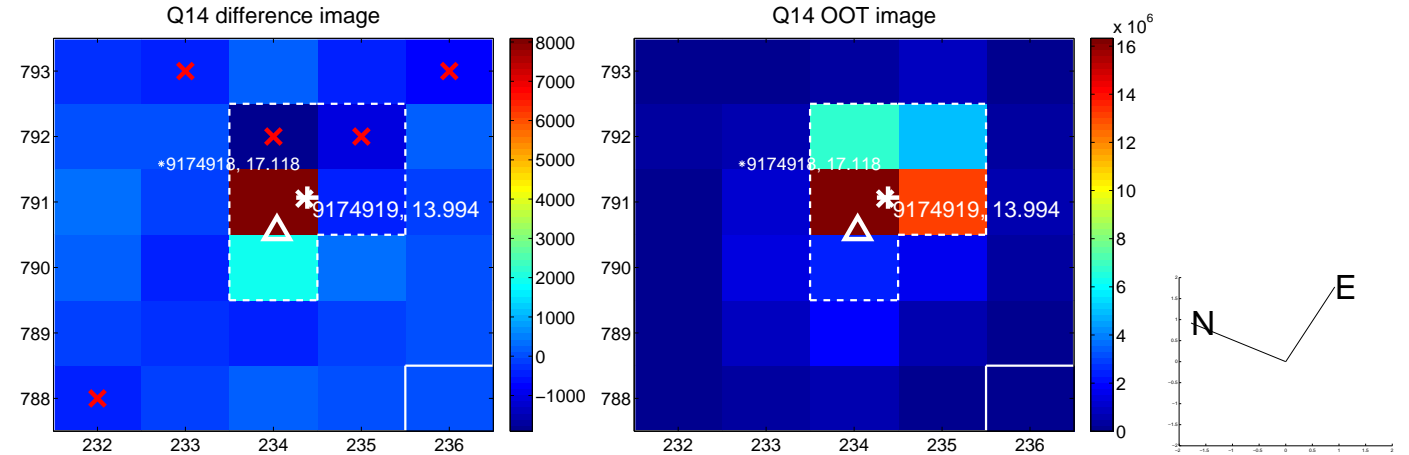
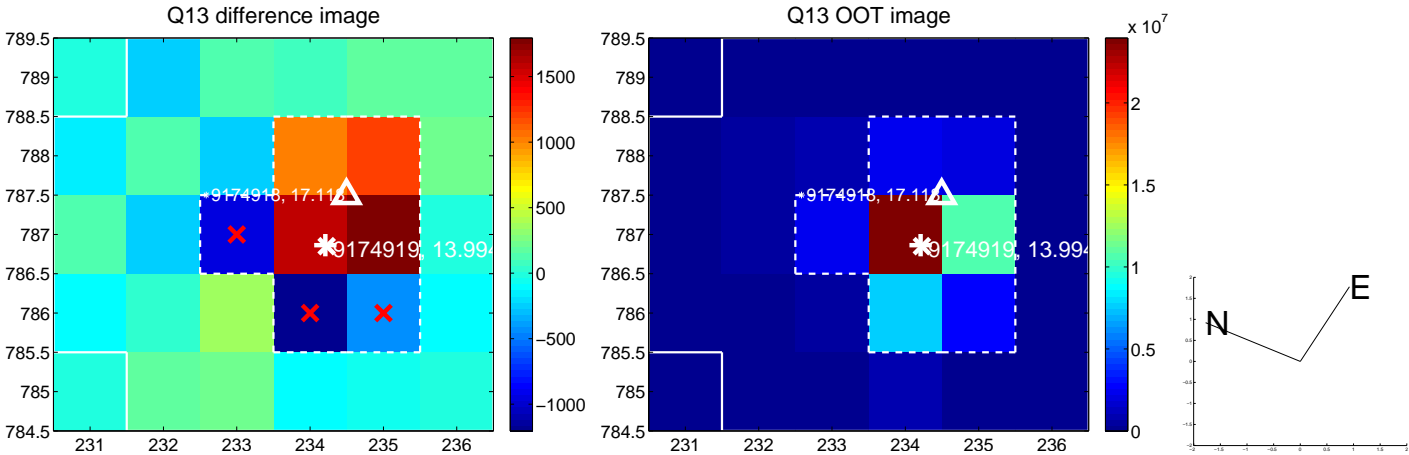




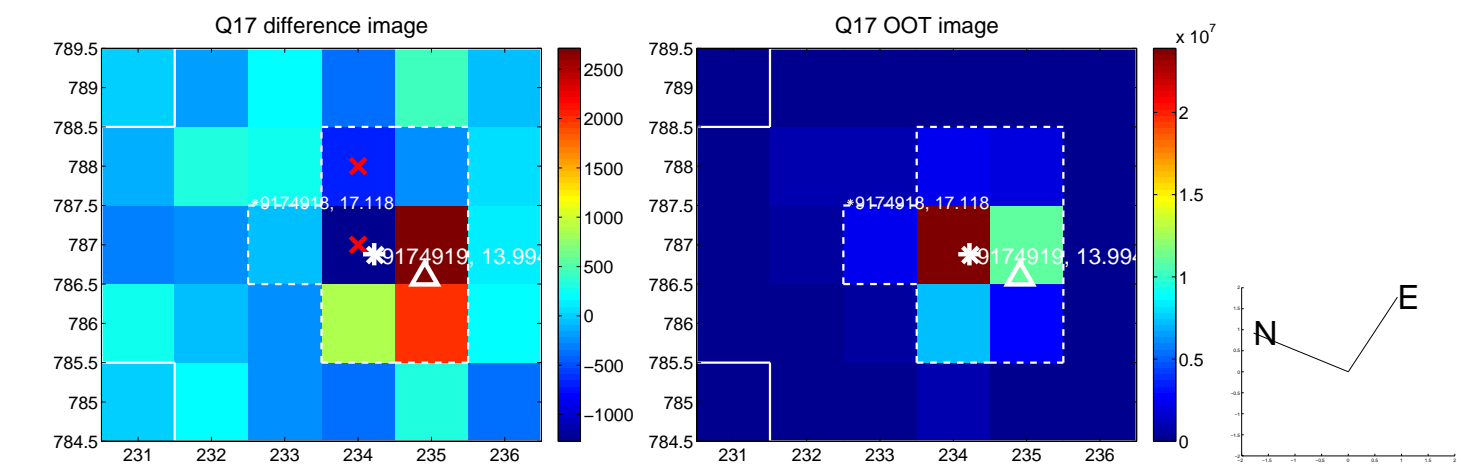
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



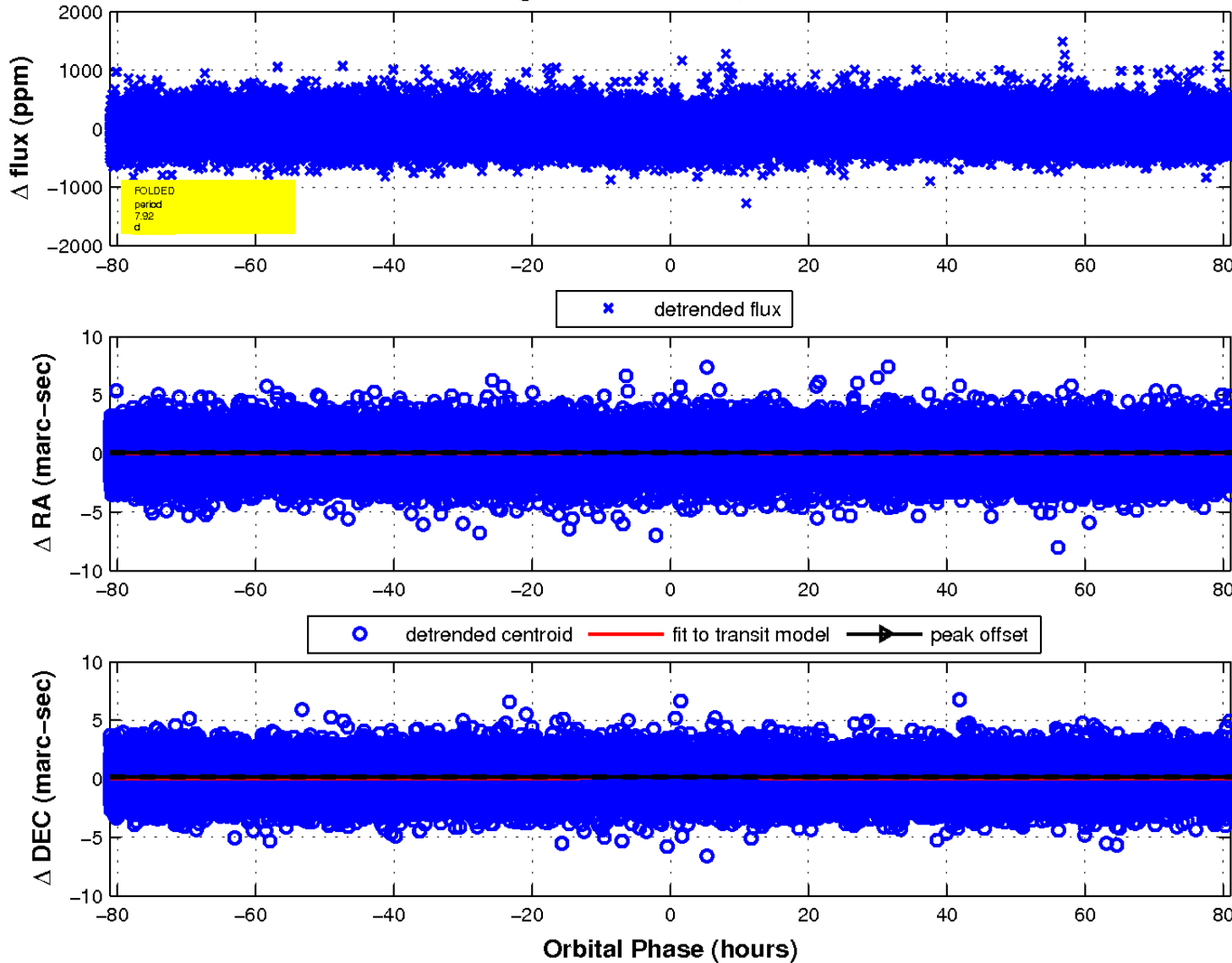
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

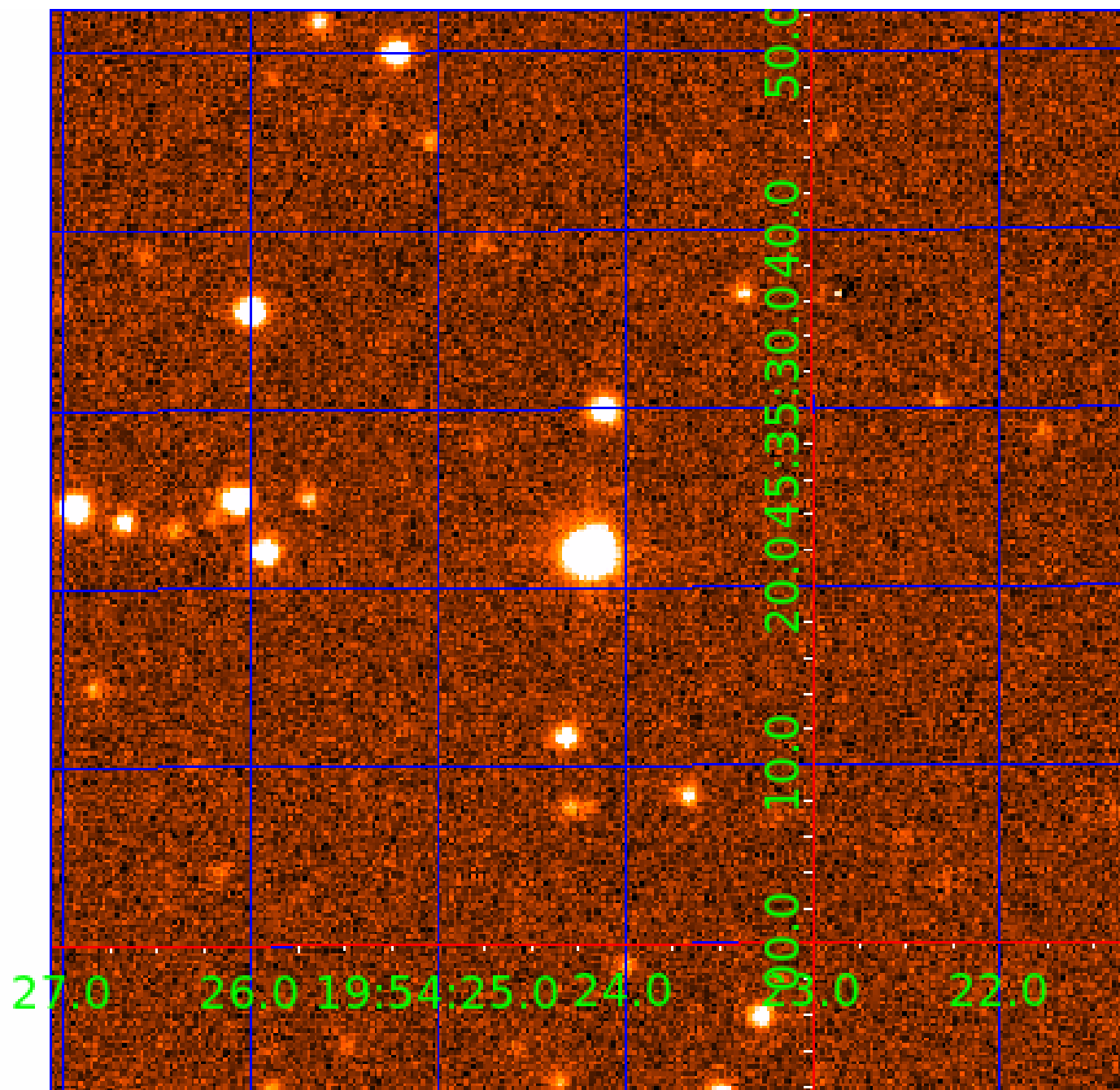


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination





# KIC 009174919

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009174919-01	OBS	No	7.917217	134.568680	43.3	27.020	9.9	11.7	1.41	6261	1.06	430.91
009174919-02	OBS	No	7.918305	137.357363	51.1	26.278	10.4	14.3	1.41	6261	1.20	430.83

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009174919-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009174919-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—SAME_NTL_PERIOD

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

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

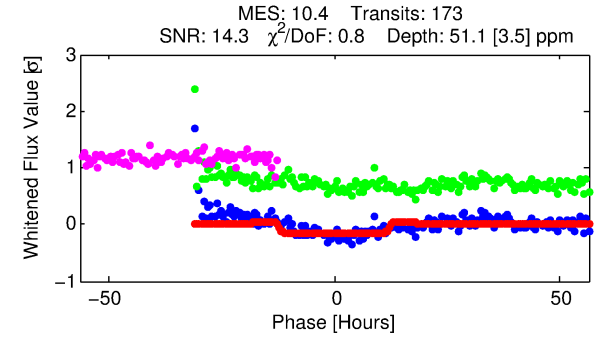
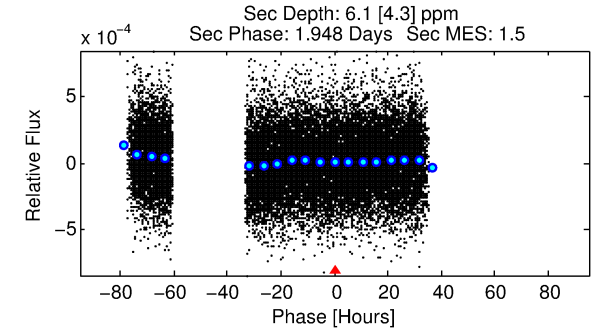
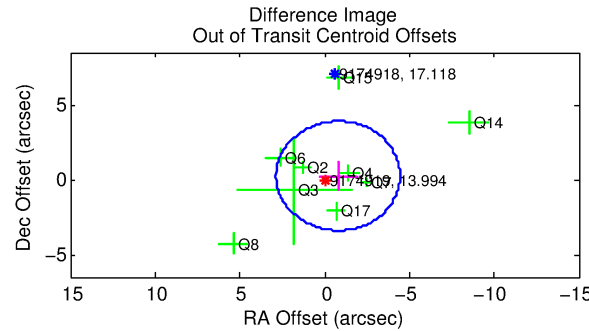
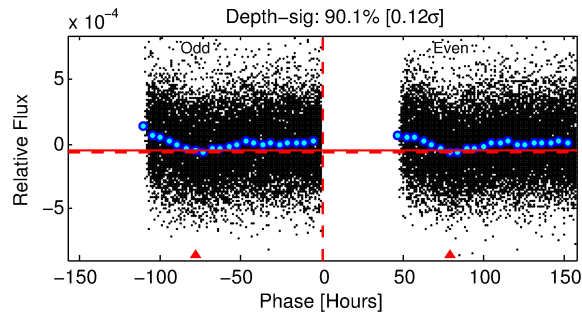
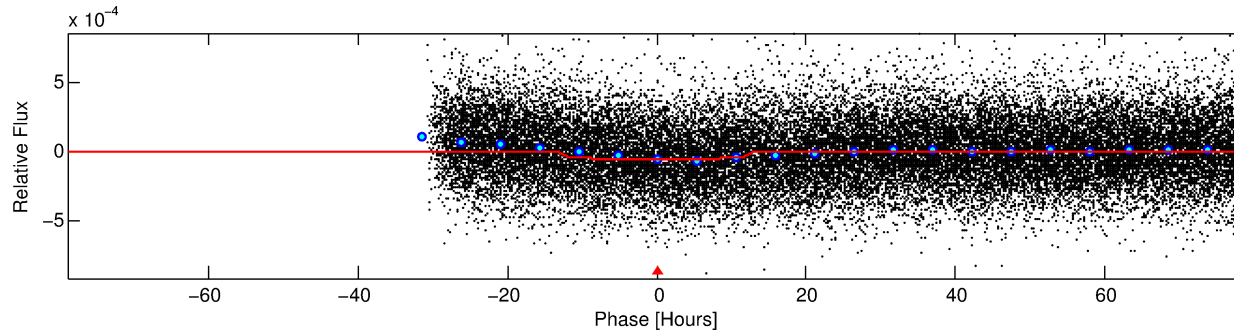
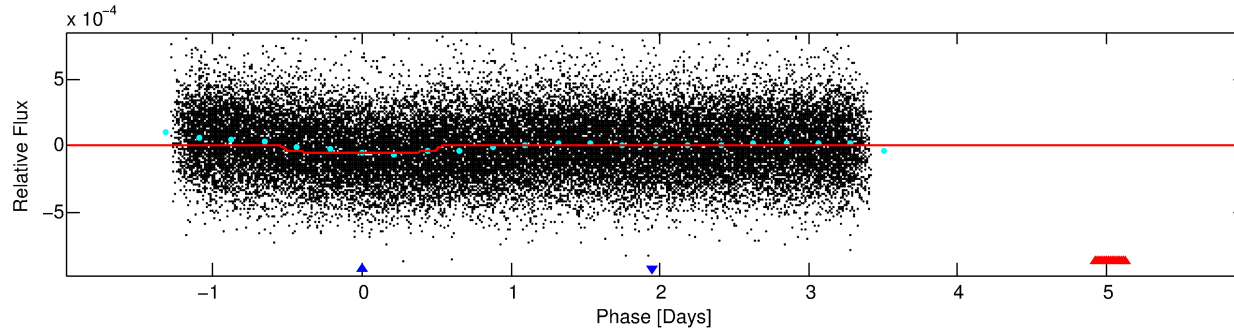
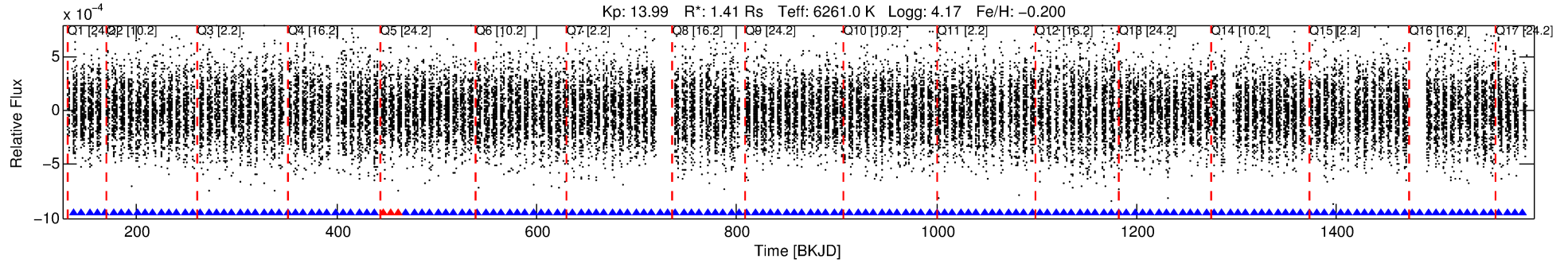
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009174919-02

No Significant Match Found

# DV One-Page Summary

KIC: 9174919 Candidate: 2 of 2 Period: 7.918 d



## DV Fit Results:

Period = 7.91830 [0.00021] d  
Epoch = 137.3574 [0.0215] BKJD  
Rp/R\* = 0.0078 [0.0006]  
a/R\* = 1.35 [0.24]  
b = 0.92 [0.07]  
Seff = 430.83 [179.88]  
Teq = 1162 [121] K  
Rp = 1.20 [0.38] Re  
a = 0.0798 [0.0210] AU  
Ag = 14.79 [12.15] [1.13 $\sigma$ ]  
Teffp = 3522 [647] K [3.59 $\sigma$ ]

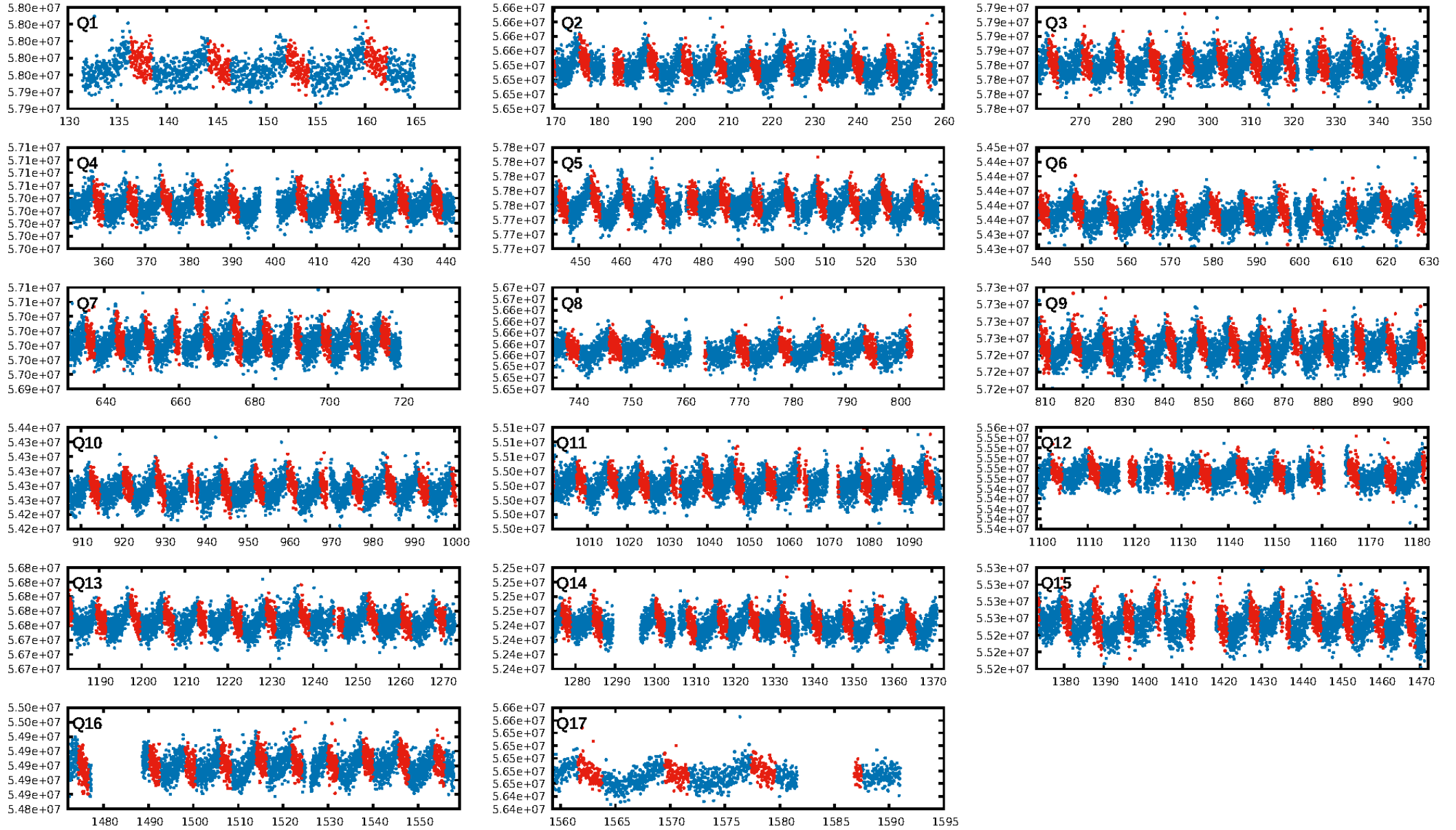
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 100.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 9.86e-39  
RollingBand-fgt: 0.98 [162/165]  
GhostDiagnostic-chr: 1.212  
Centroid-sig: 6.9%  
Centroid-so: 1.257 arcsec [1.22 $\sigma$ ]  
OotOffset-rm: 0.821 arcsec [0.68 $\sigma$ ]  
KicOffset-rm: 0.796 arcsec [0.65 $\sigma$ ]  
OotOffset-st: 3/3/2/1 [9]  
KicOffset-st: 3/3/2/1 [9]  
DiffImageQuality-fgm: 0.56 [5/9]  
DiffImageOverlap-fno: 1.00 [17/17]

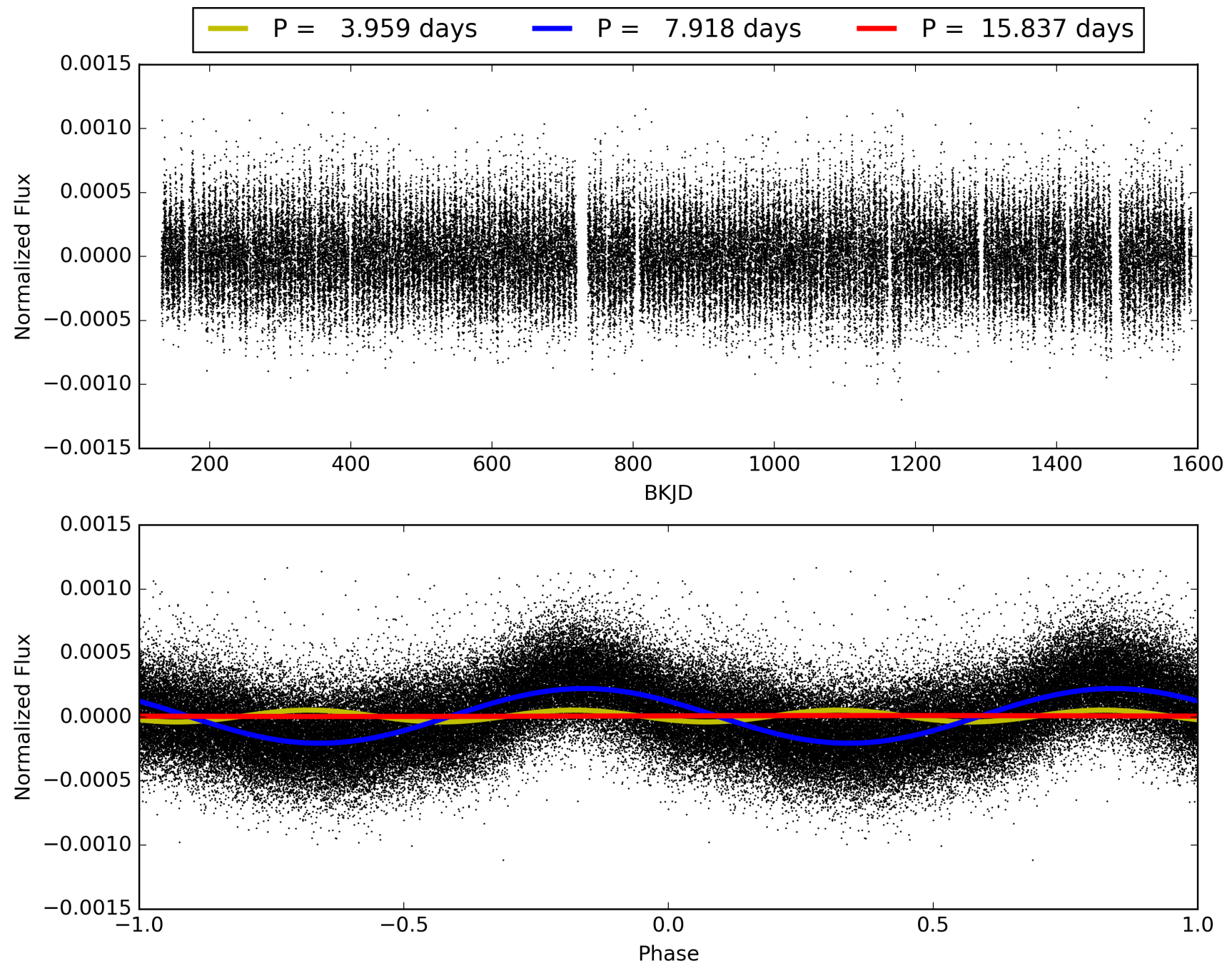
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 17:56:00 Z

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

# TCE 009174919-02, PDC Light Curves



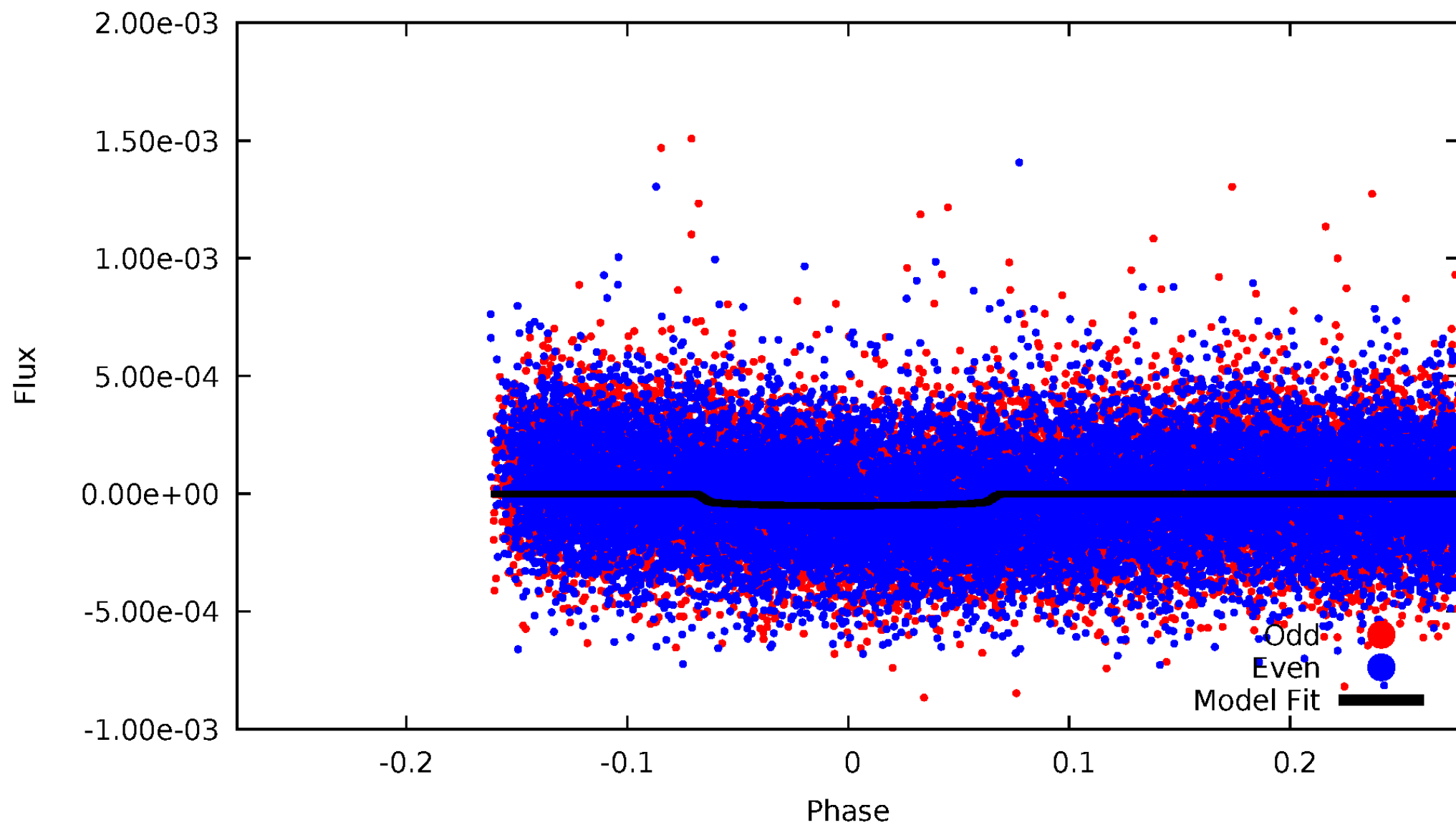
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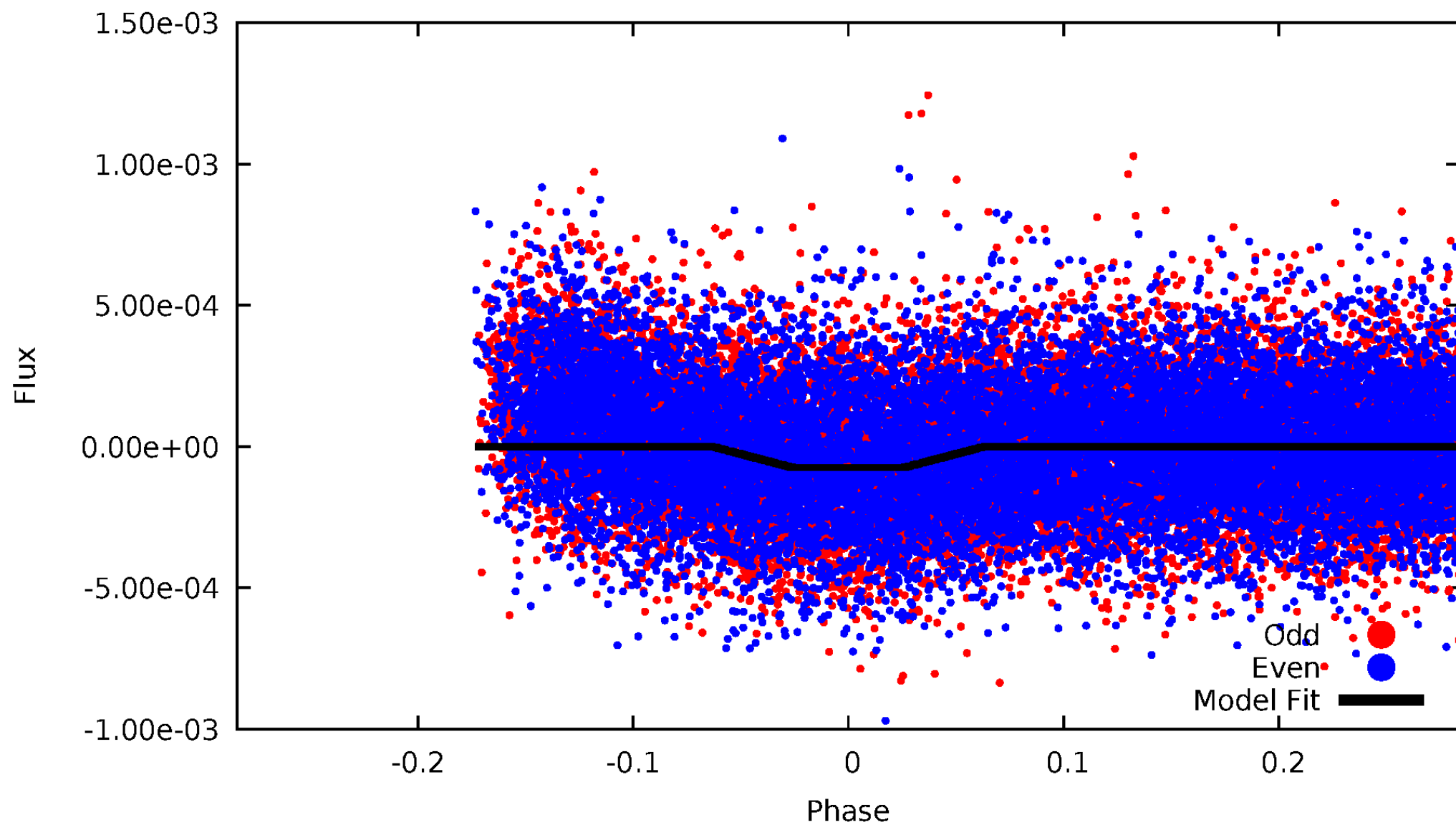
# DV Odd/Even

TCE 009174919-02



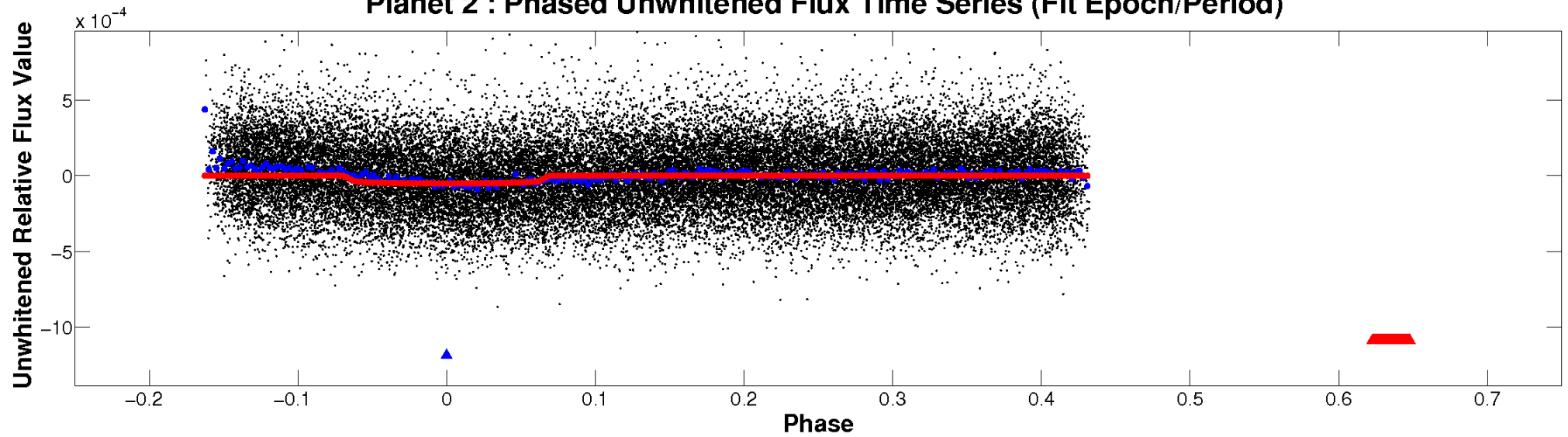
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TCE 009174919-02

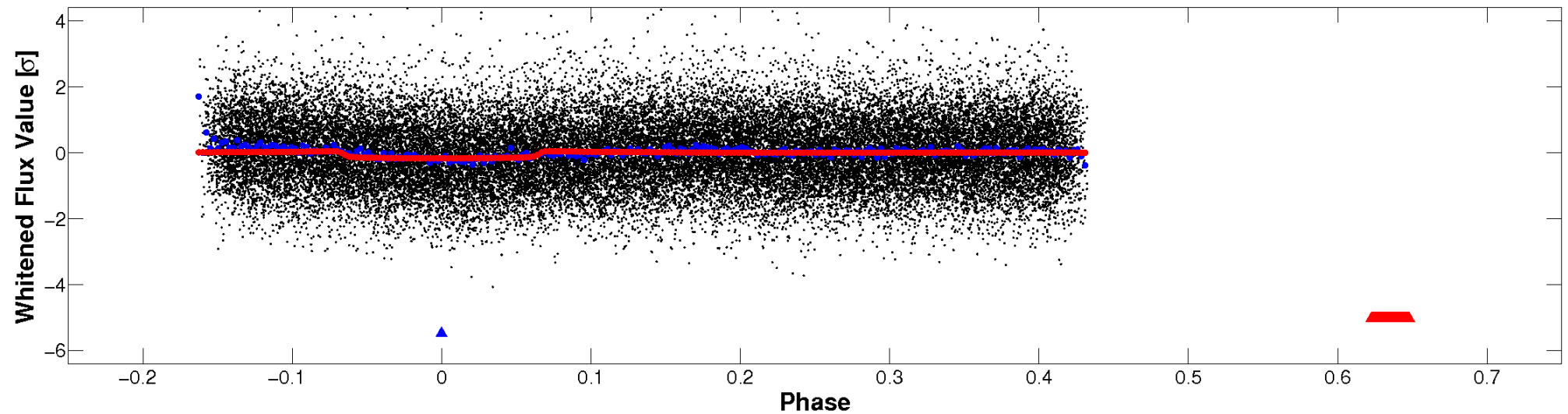


# Non-Whitened Vs. Whitened Light Curve

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

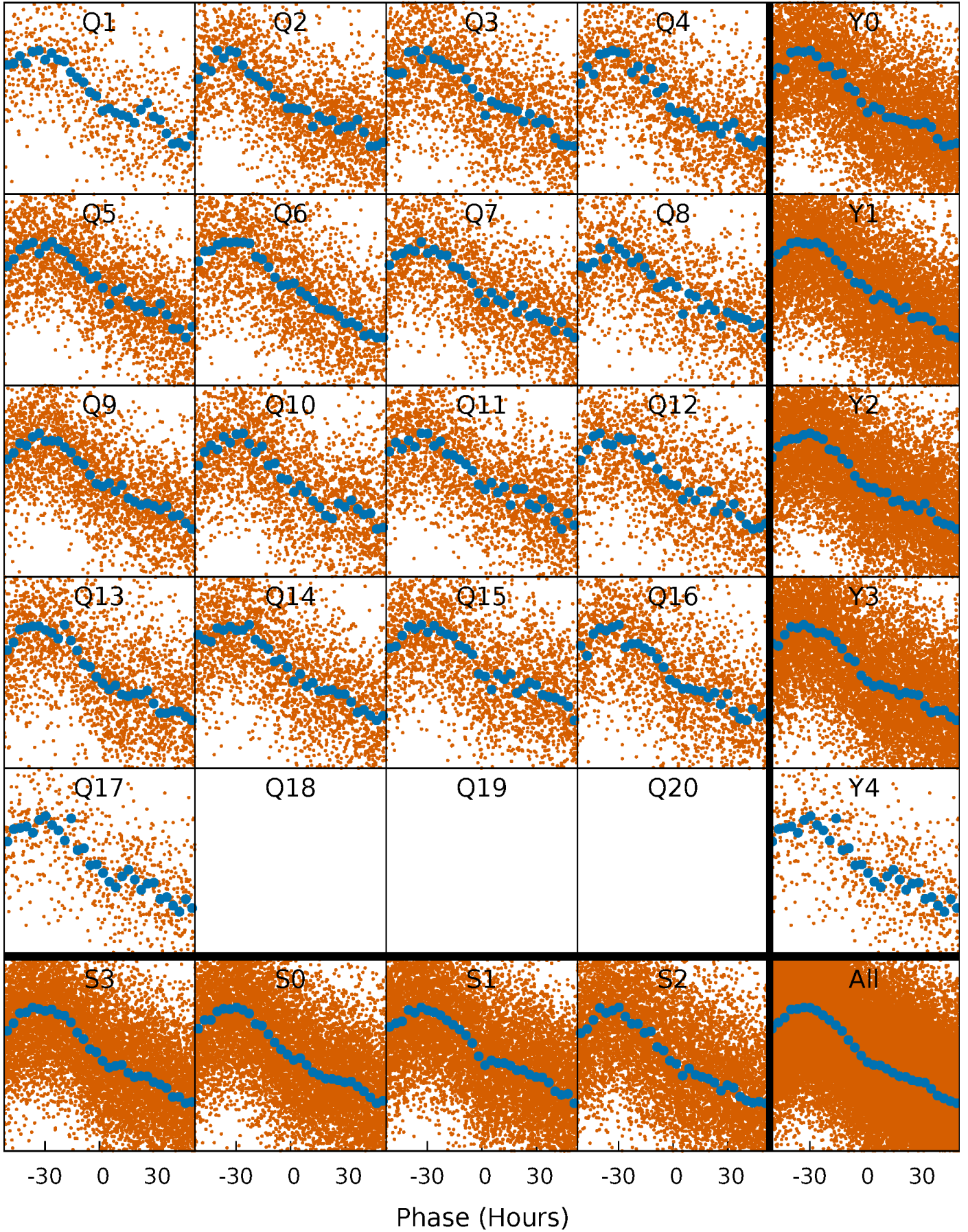


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

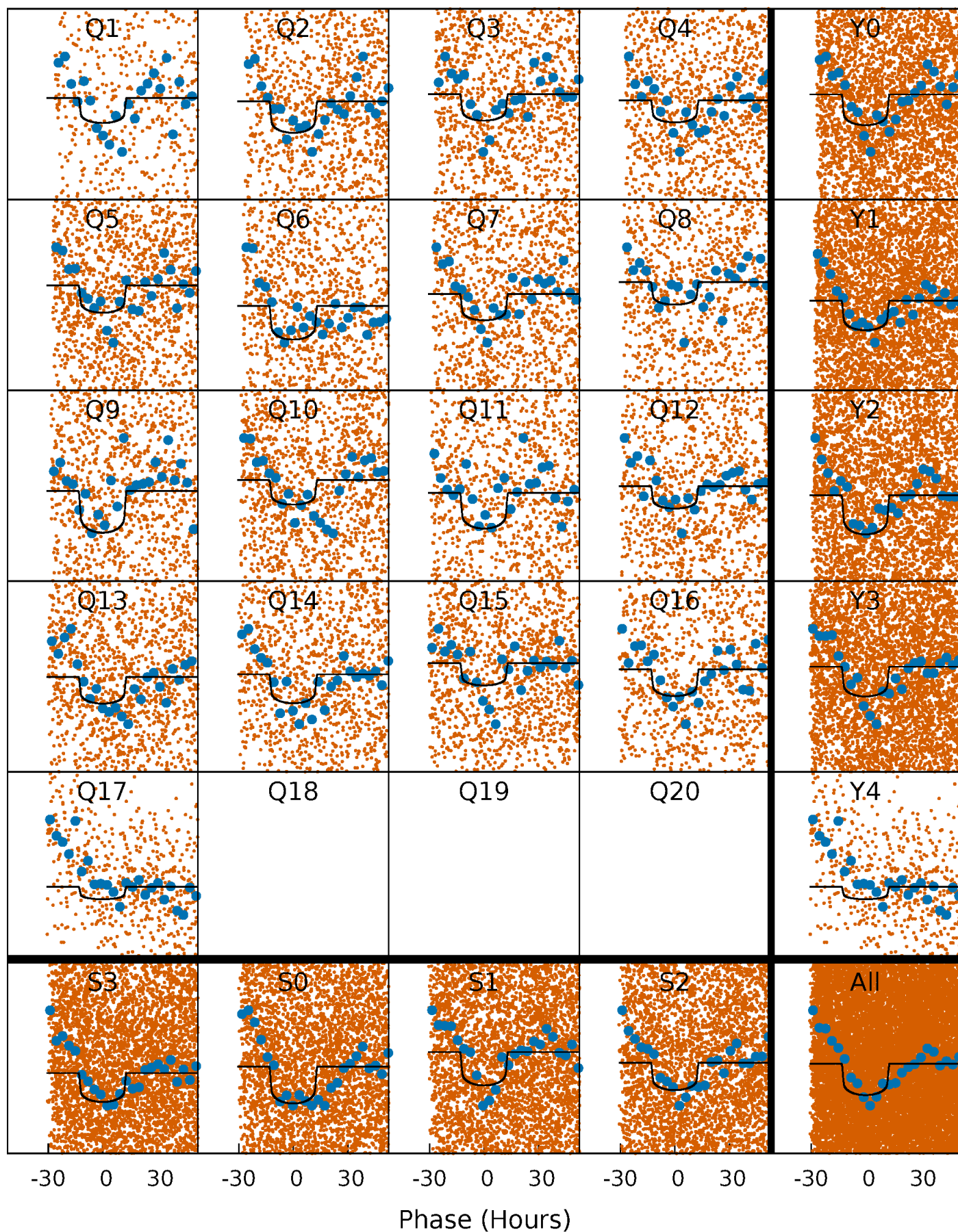
TCE 009174919-02   P= 7.918305 Days    $T_0=137.357363$  (BKJD)





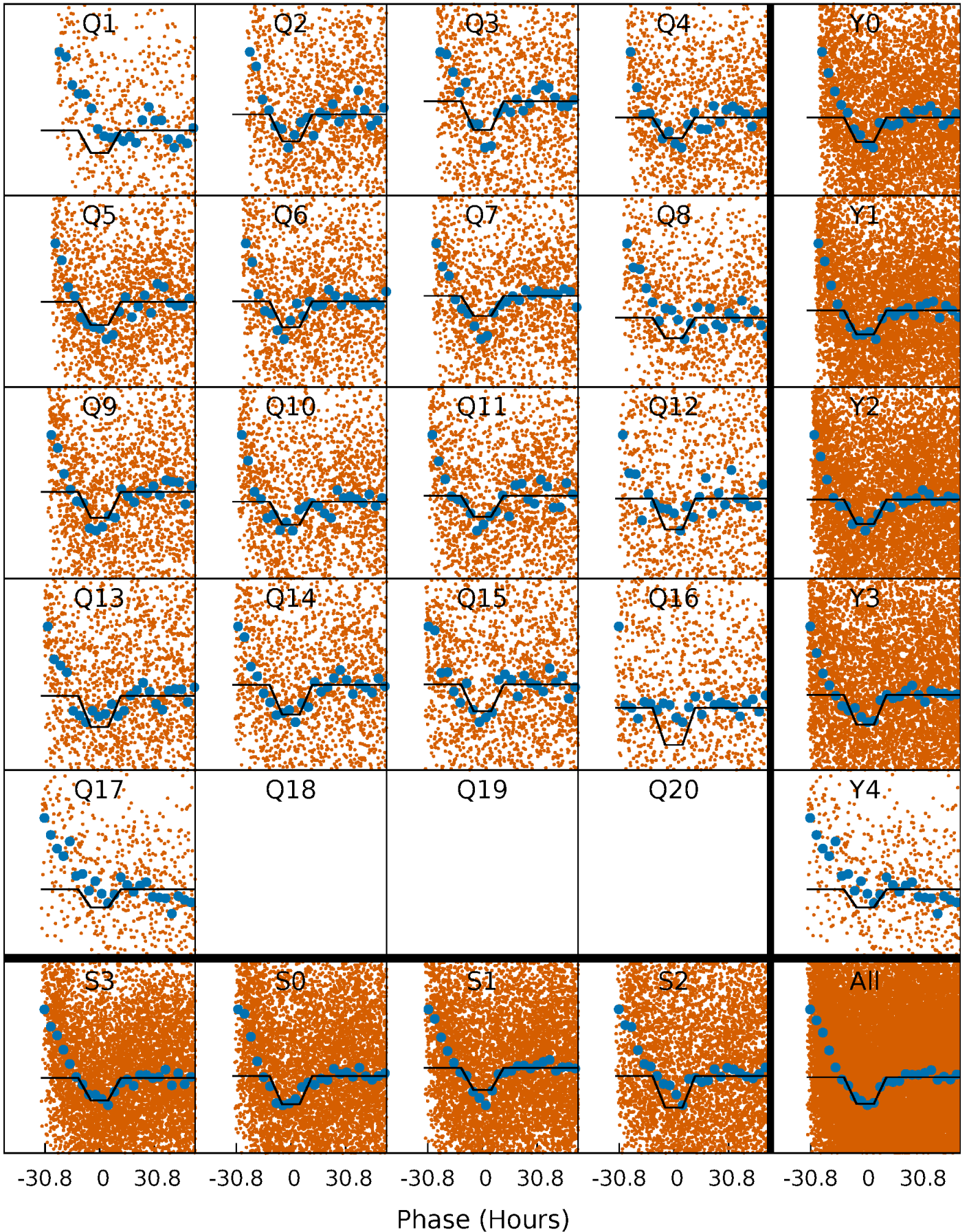
# DV Quarter-Phased Transit Curves

TCE 009174919-02   P= 7.918305 Days    $T_0=137.357363$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 009174919-02   P= 7.919196 Days    $T_0=137.285871$  (BKJD)

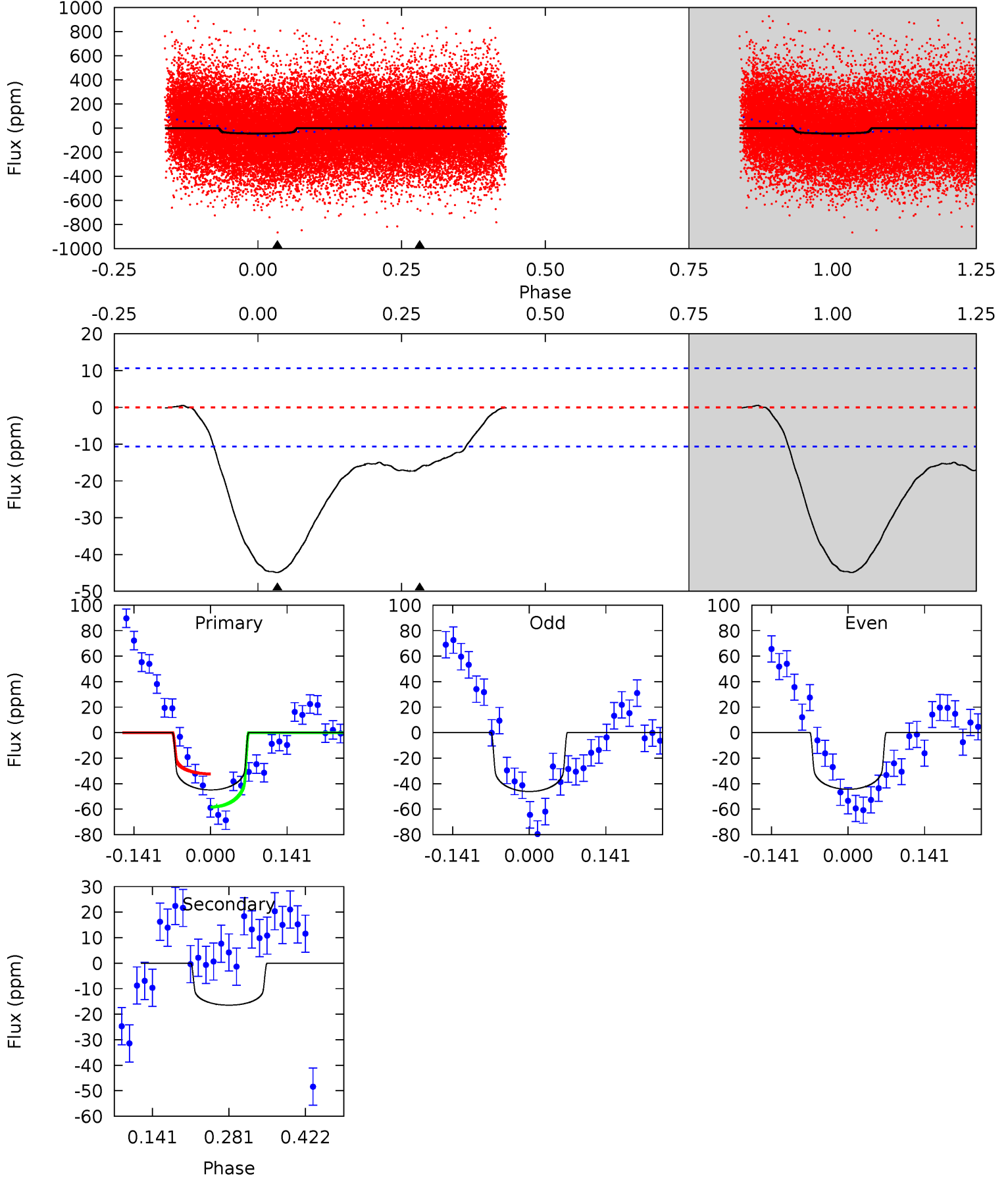




# DV Model-Shift Uniqueness Test

009174919-02, P = 7.918305 Days, E = 129.439058 Days

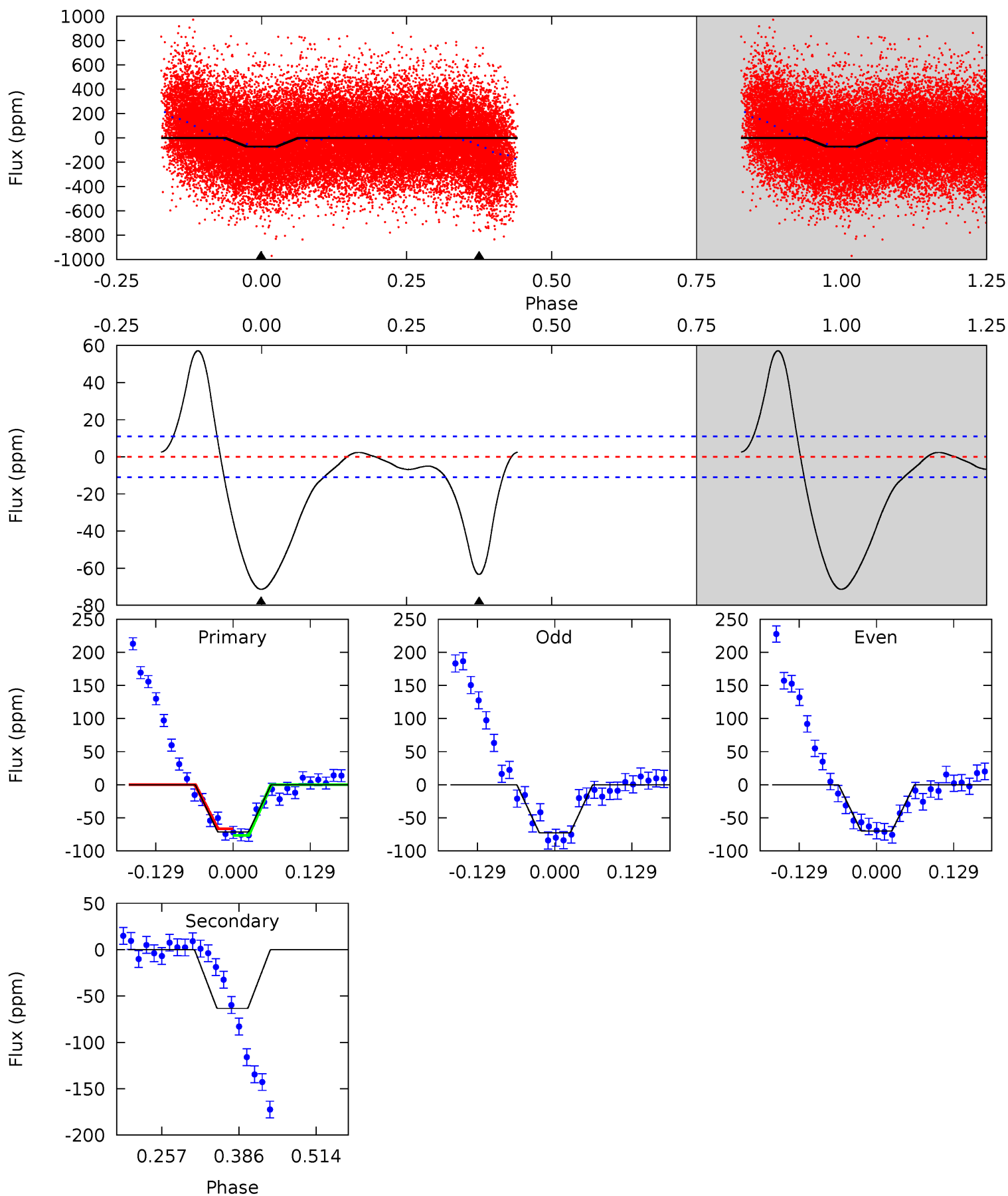
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.0	6.95	0	0	4.49	1.47	0.41	19.0	19.0	6.95	6.95	0.37	1.01	0.01	5.80



# Alt Model-Shift Uniqueness Test

009174919-02, P = 7.919196 Days, E = 129.366675 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
29.2	26.0	0	0	4.51	1.52	3.76	29.2	29.2	26.0	26.0	0.58	1.01	0.44	2.02



### Stellar Parameters For KIC 009174919

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6261^{+175}_{-219}$	$4.172^{+0.220}_{-0.180}$	$-0.200^{+0.250}_{-0.300}$	$1.411^{+0.427}_{-0.349}$	$1.079^{+0.181}_{-0.148}$	$0.541^{+0.727}_{-0.251}$
	+3%/-3%	+5%/-4%	+125%/-150%	+30%/-25%	+17%/-14%	+134%/-46%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 009174919-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-16 \pm 2$	$1.19^{+0.23}_{-0.19}$	$1617^{+119}_{-132}$	$4642^{+254}_{-227}$	$41^{+18}_{-13}$
Alt.	$-63 \pm 2$	$1.31^{+0.24}_{-0.20}$	$1605^{+138}_{-120}$	$5990^{+294}_{-275}$	$128^{+50}_{-33}$

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

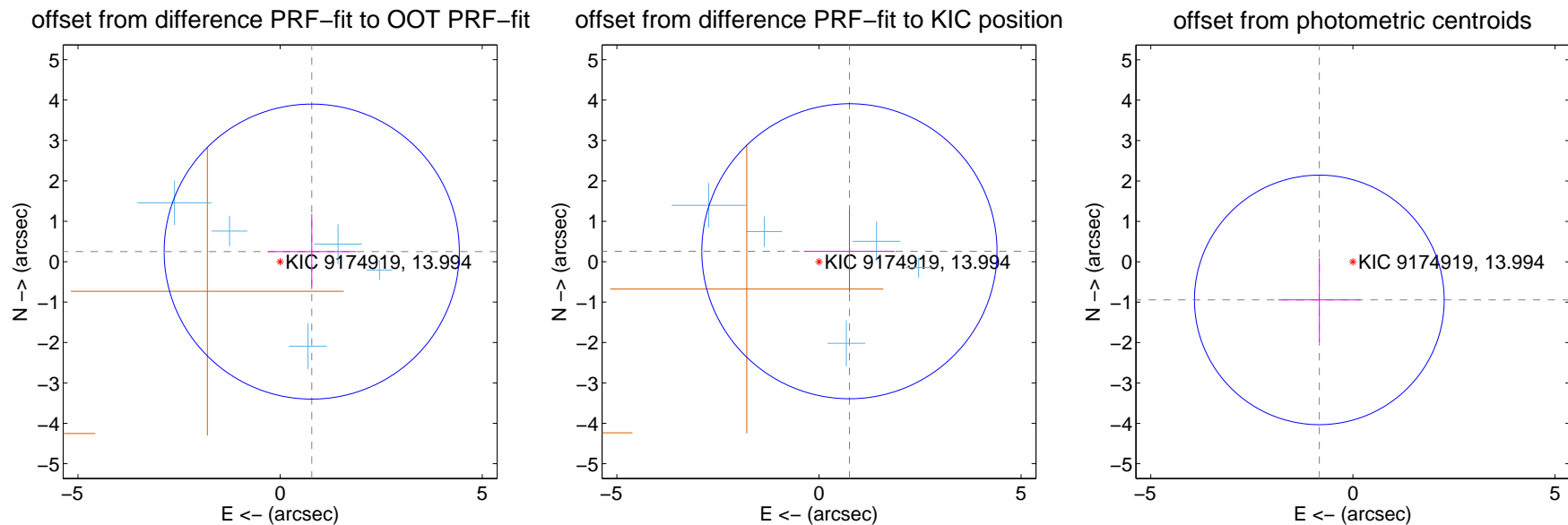
## DV Centroid Data

Supplemental centroid analysis for 009174919-02. Kepler magnitude: 13.99. Transit SNR 14.26

There are 5 quarters with good PRF difference image offsets

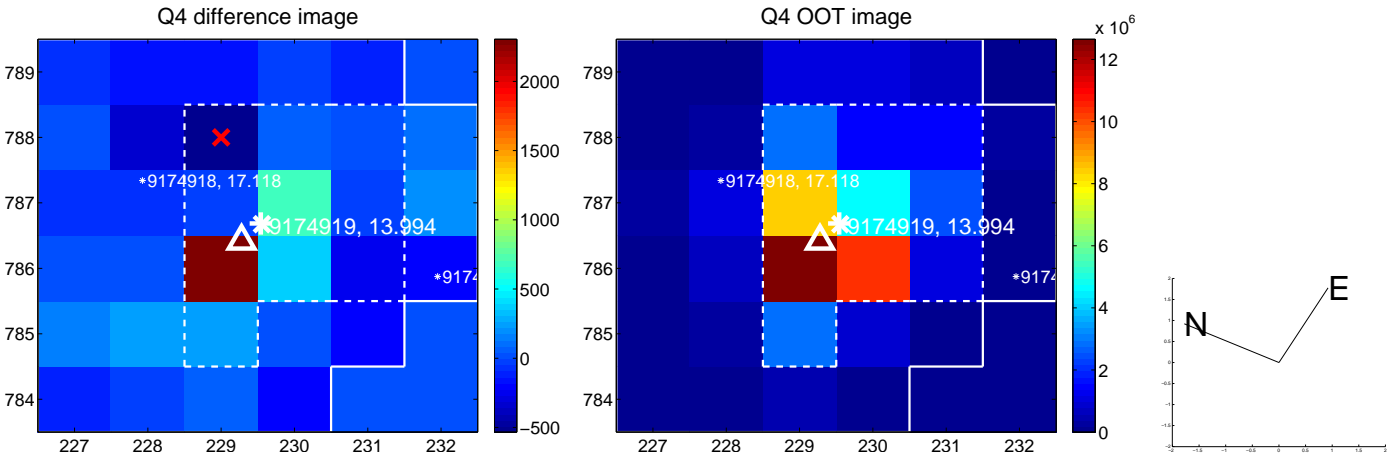
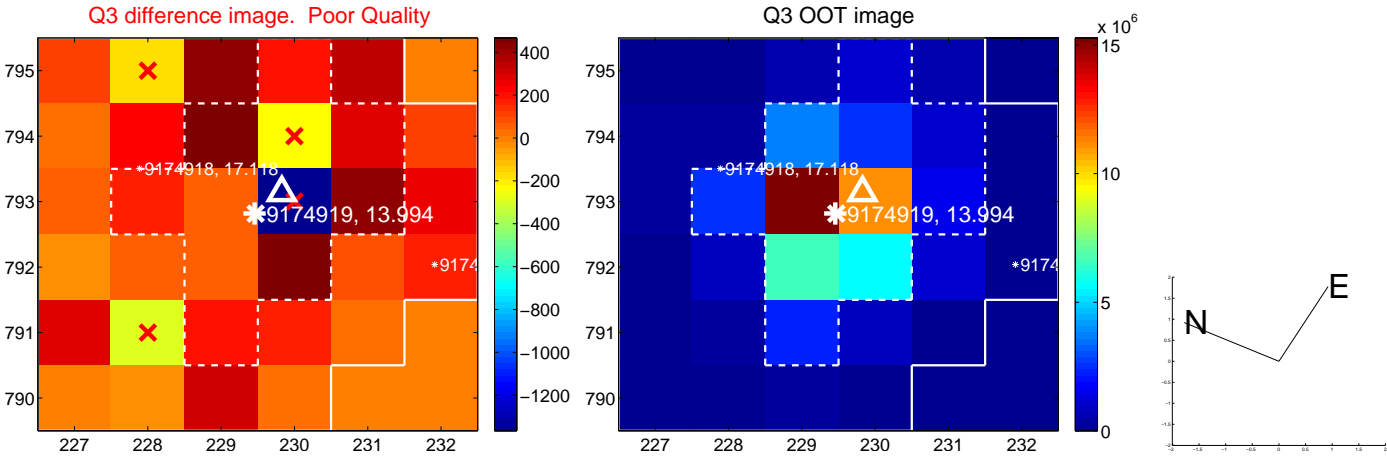
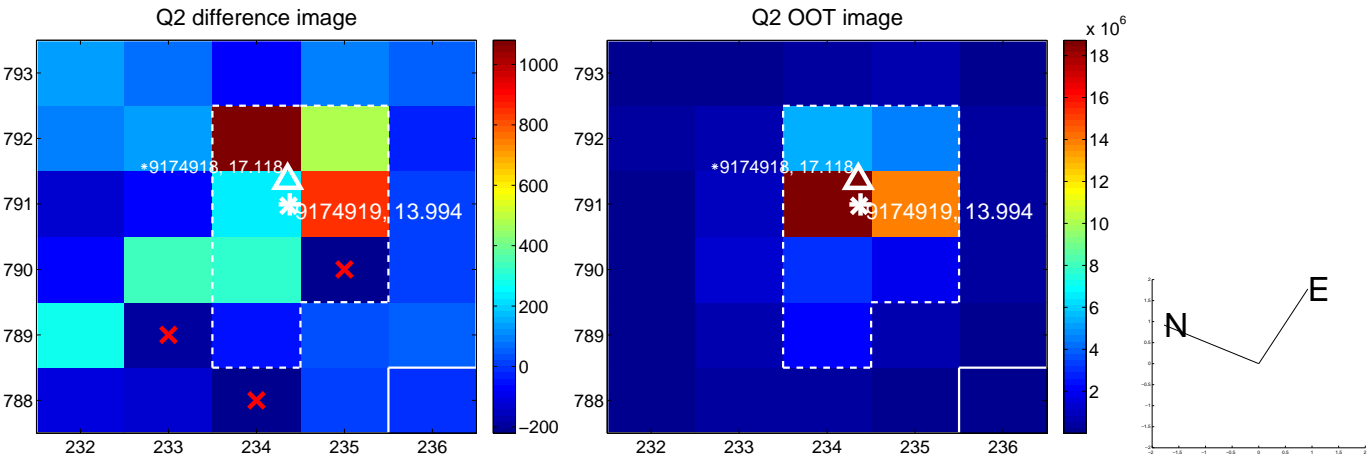
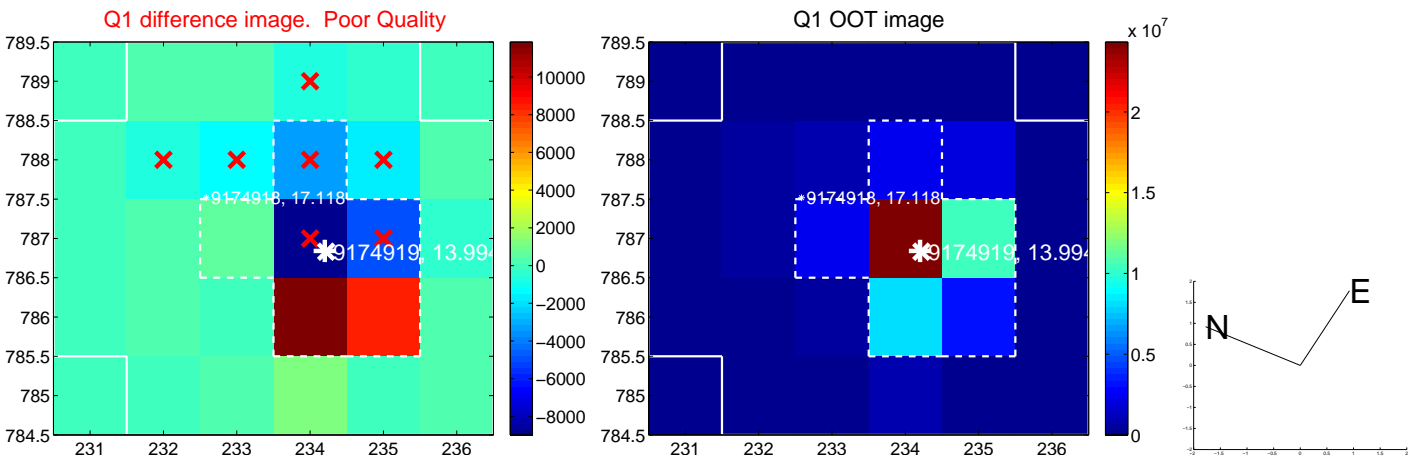
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.821 \pm 1.217$	0.68	$-0.782 \pm 1.095$	$0.250 \pm 0.928$
PRF-fit source offset from KIC position	$0.796 \pm 1.217$	0.65	$-0.753 \pm 1.120$	$0.259 \pm 1.023$
photometric centroid source offset	$1.26 \pm 1.03$	1.22	$0.83 \pm 1.01$	$-0.94 \pm 1.04$

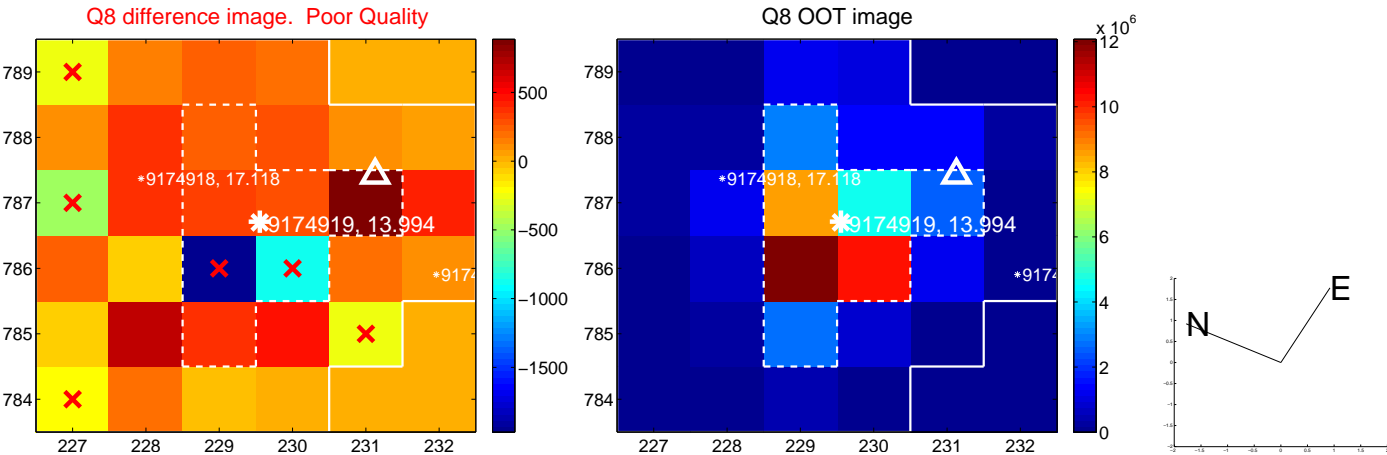
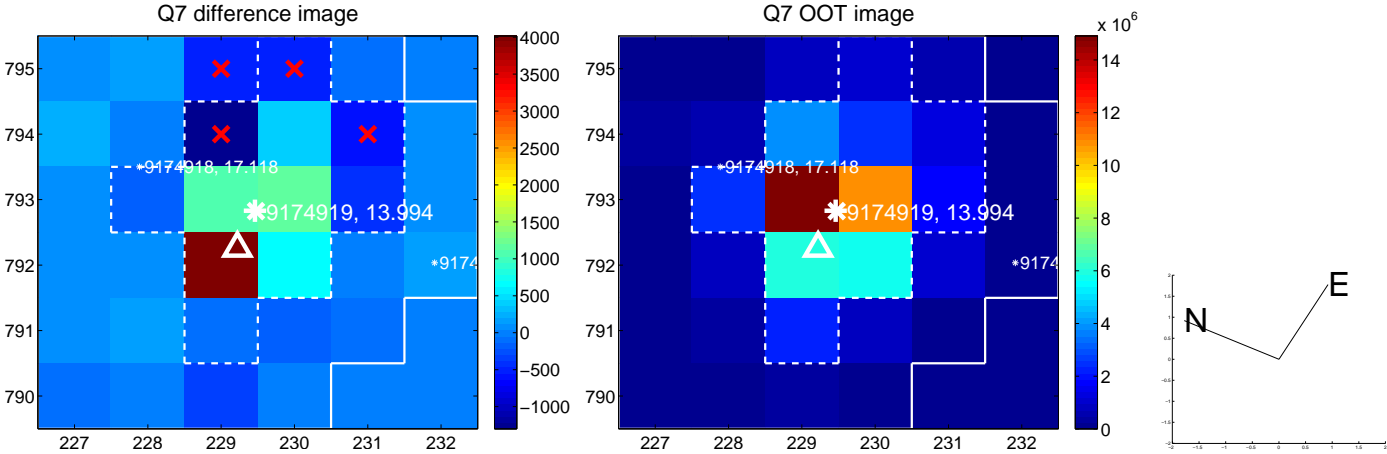
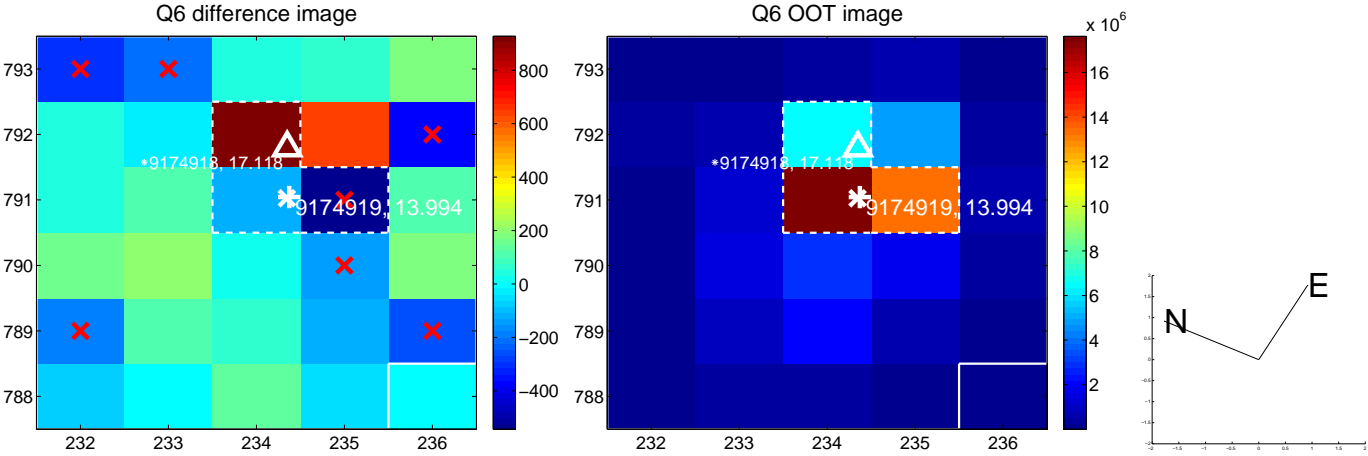
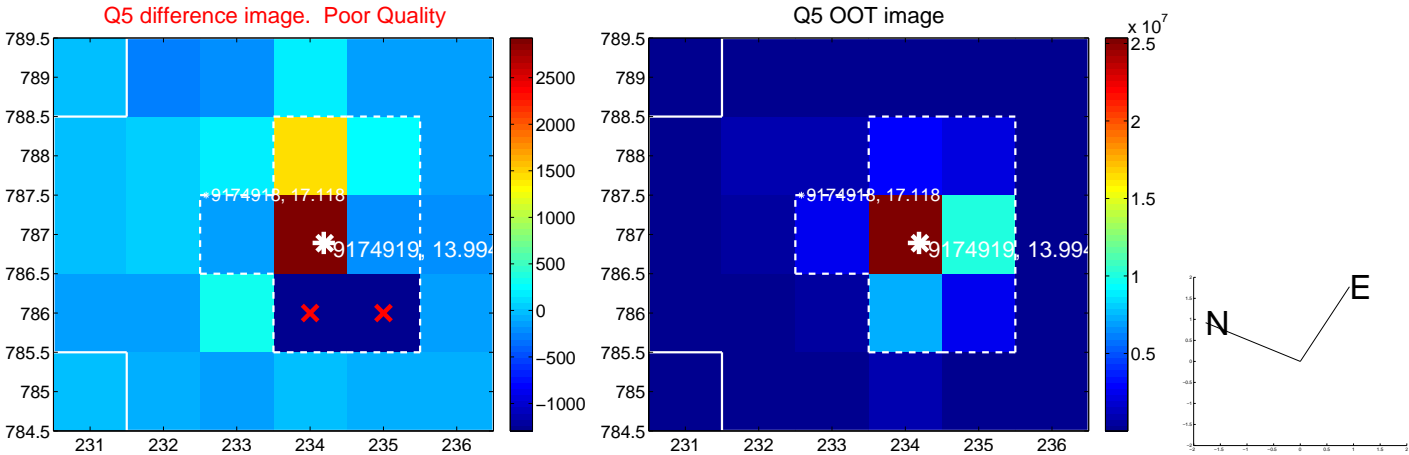


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

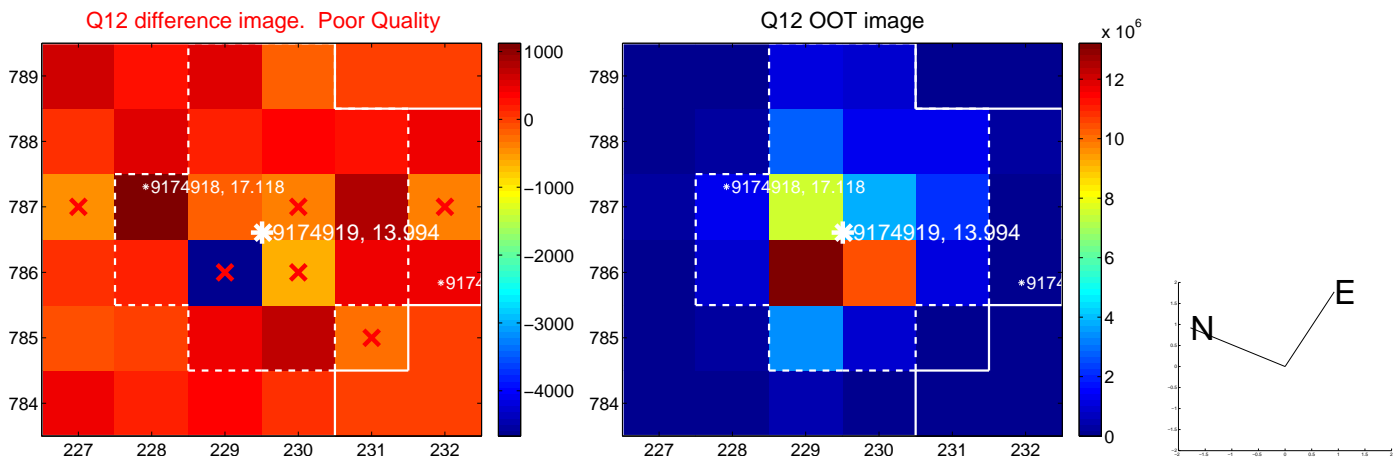
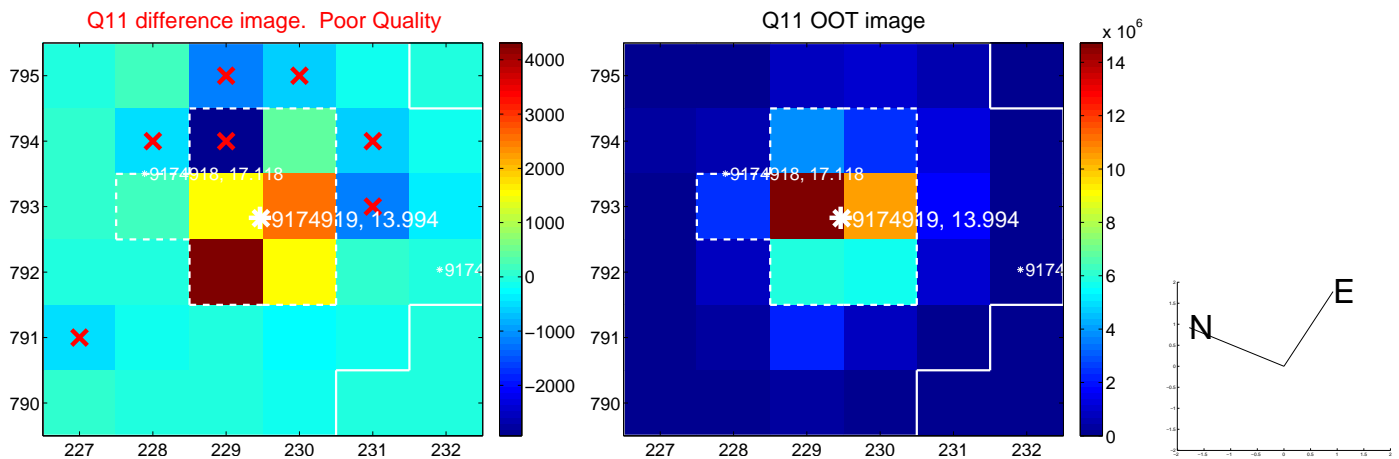
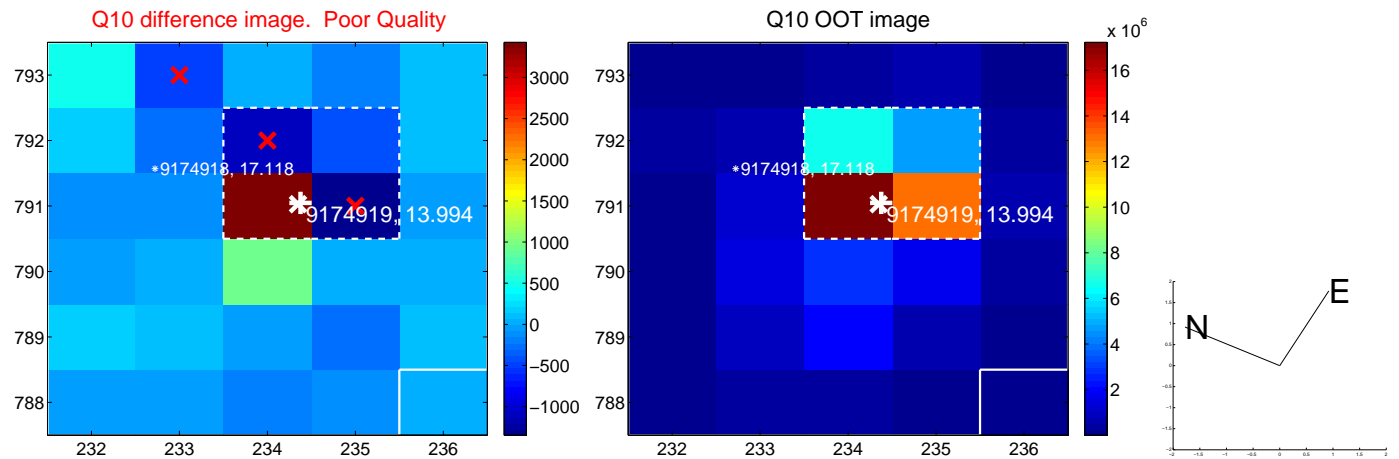
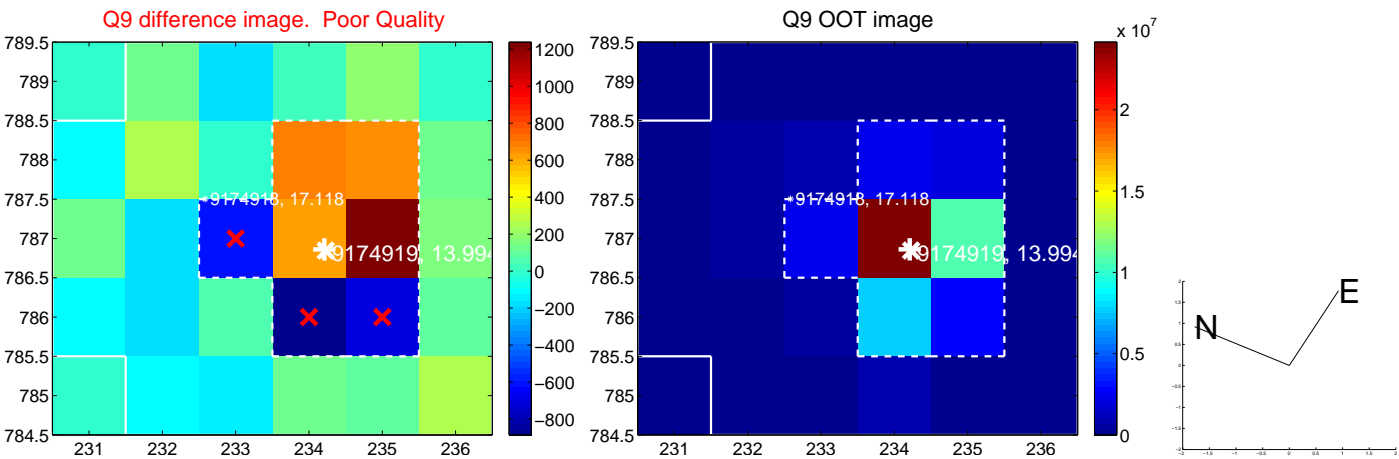


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

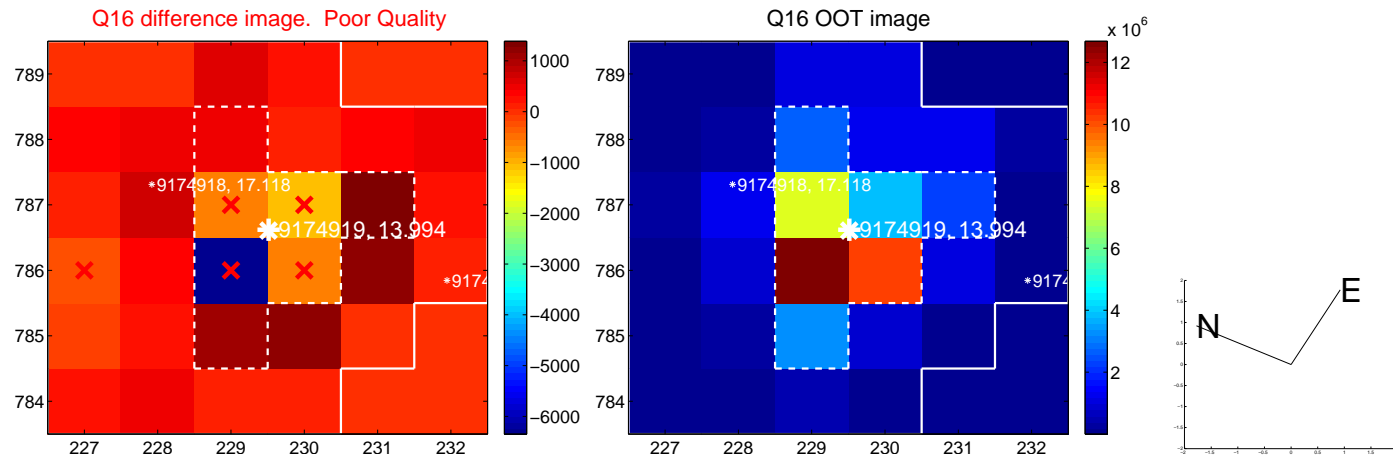
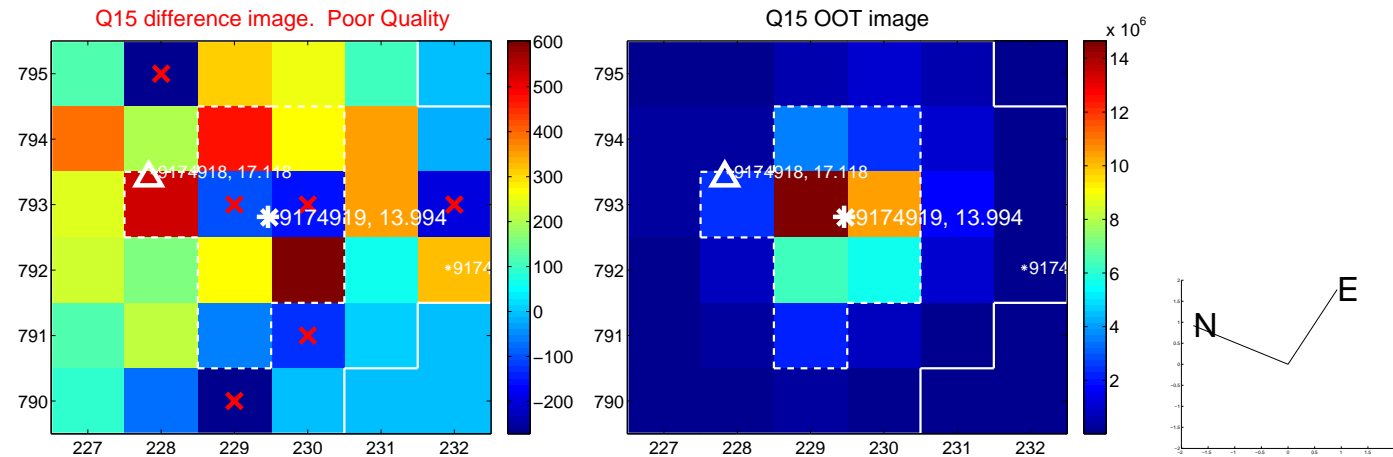
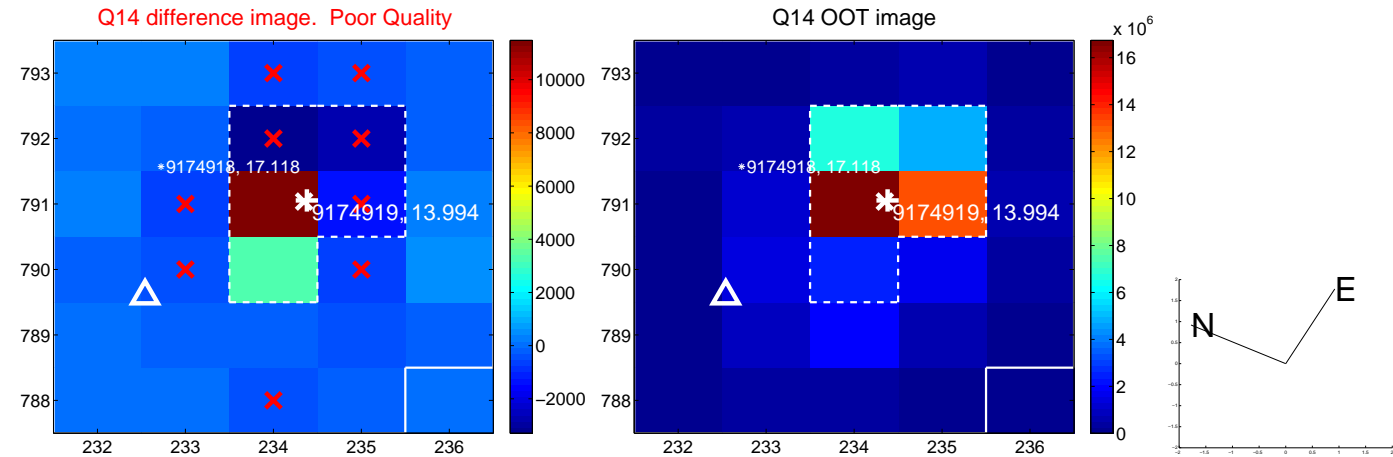
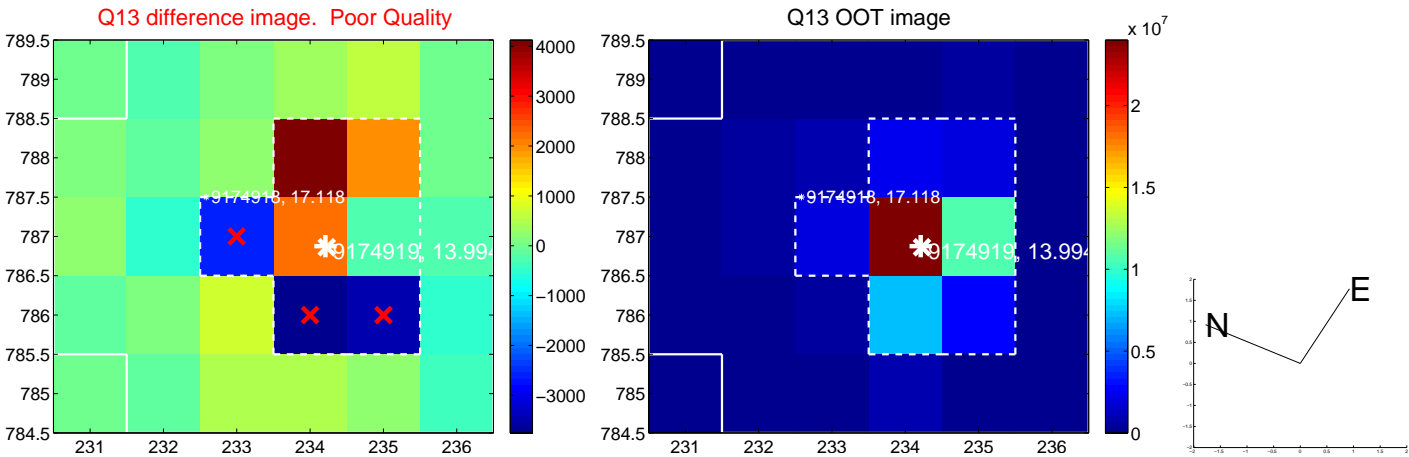




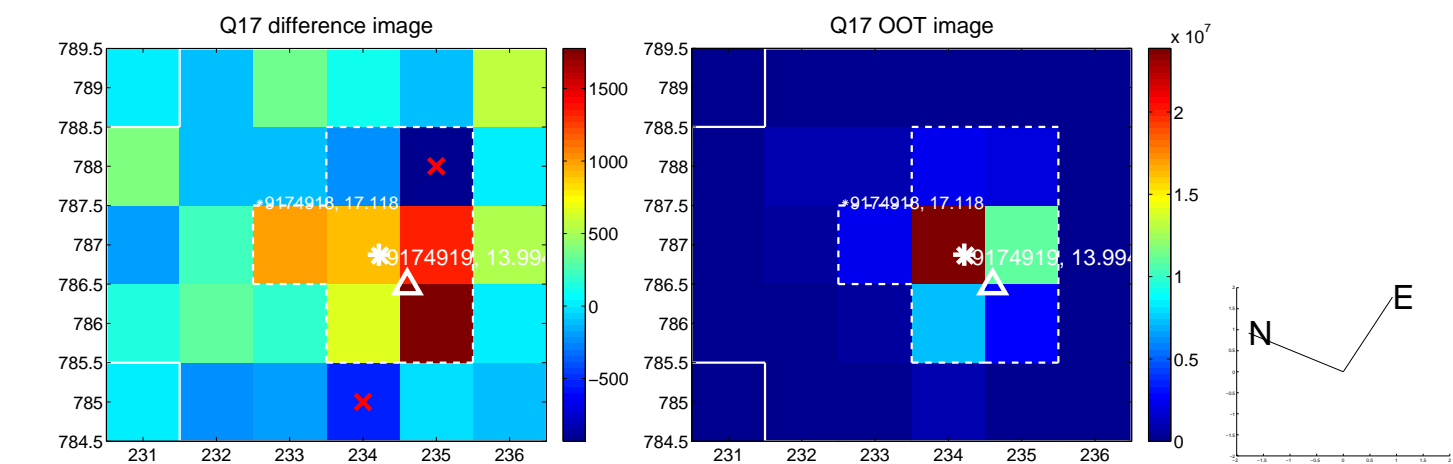
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



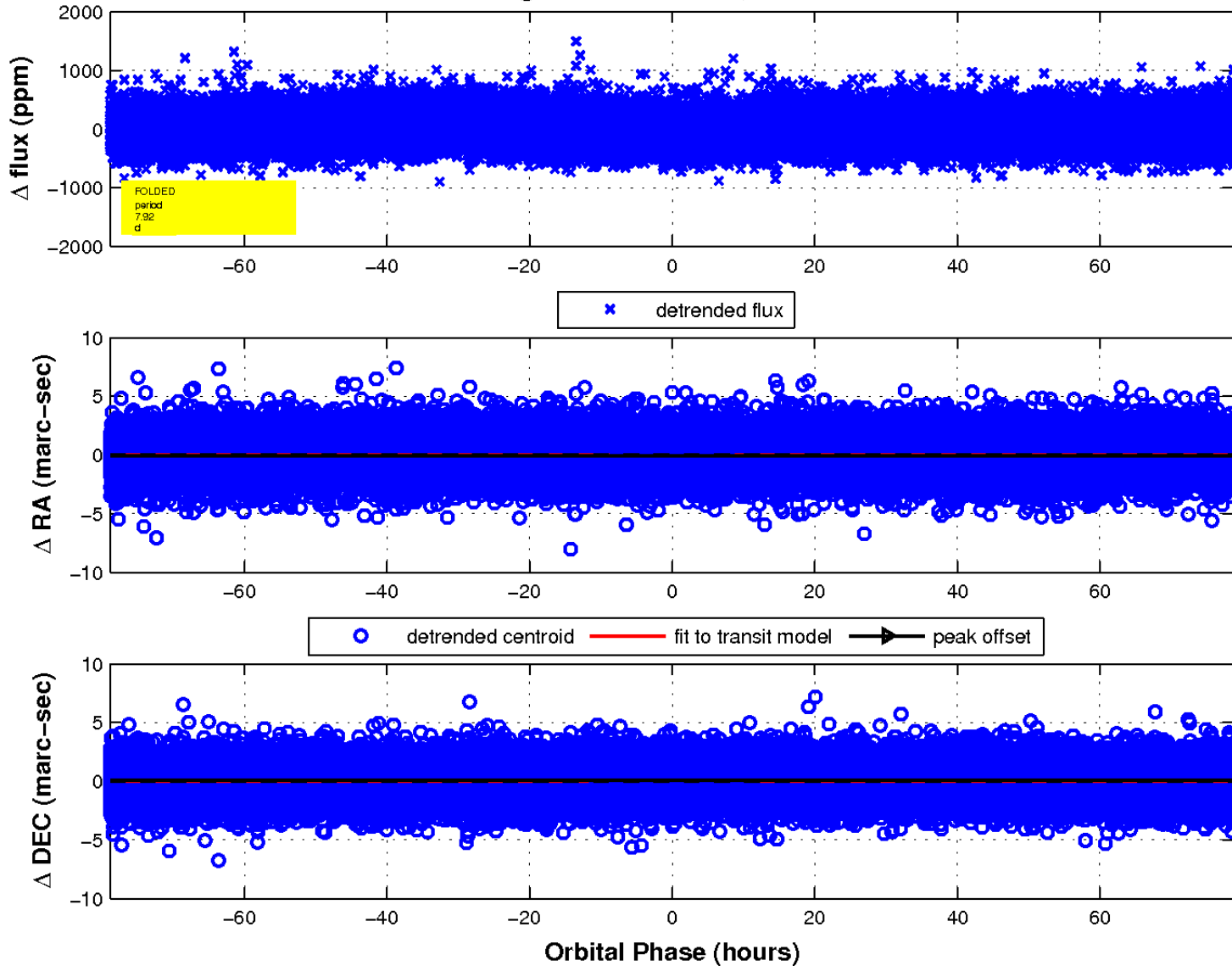
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

