

# KIC 005115008

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005115008-01	OBS	No	1.494260	132.835411	28.0	10.406	8.7	6.6	0.96	5825	0.55	1390.58
005115008-02	OBS	No	48.954889	155.910338	523.6	4.292	19.4	4.2	0.96	5825	2.41	13.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005115008-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
005115008-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT

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

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

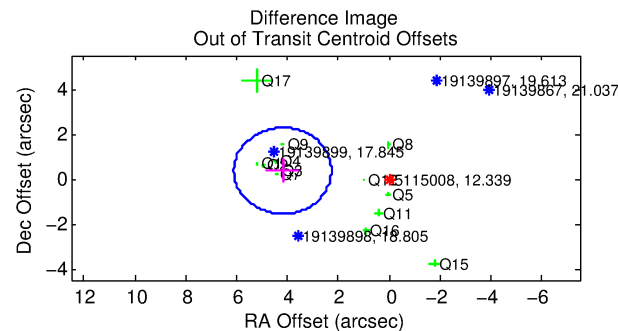
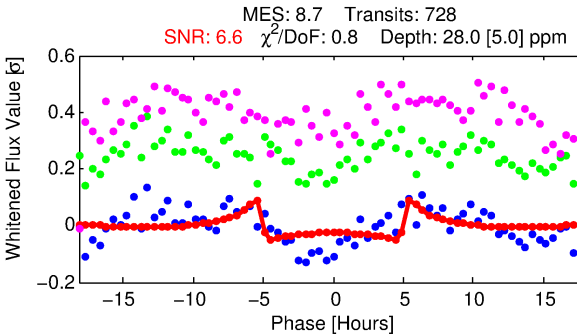
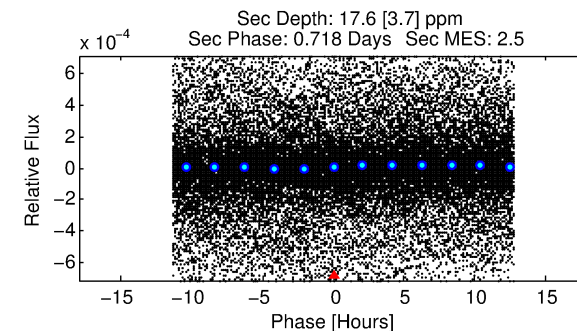
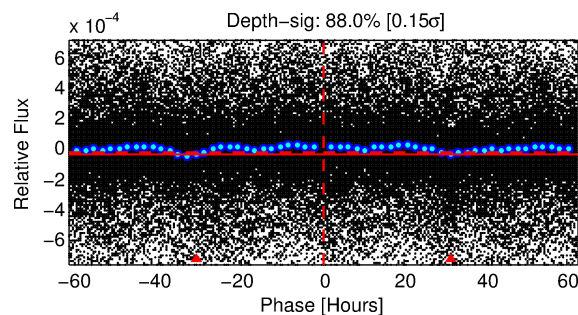
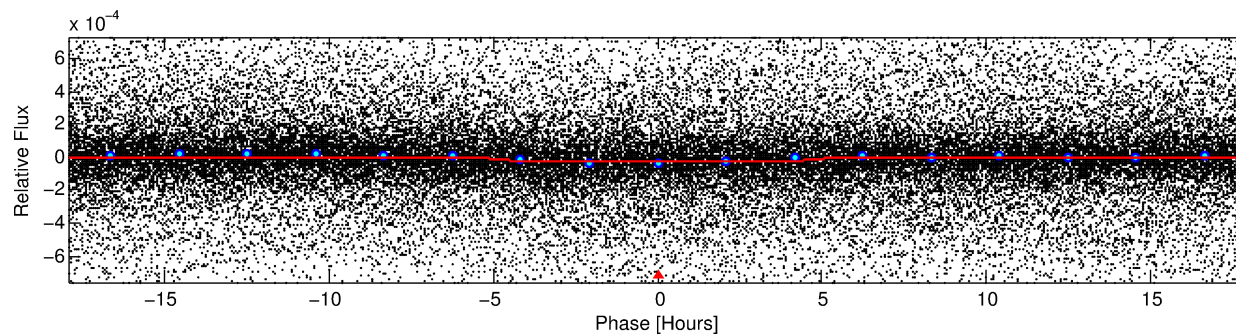
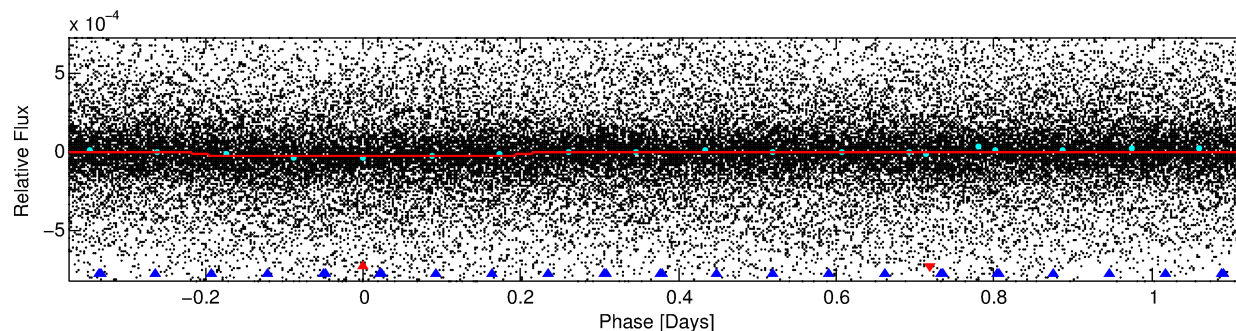
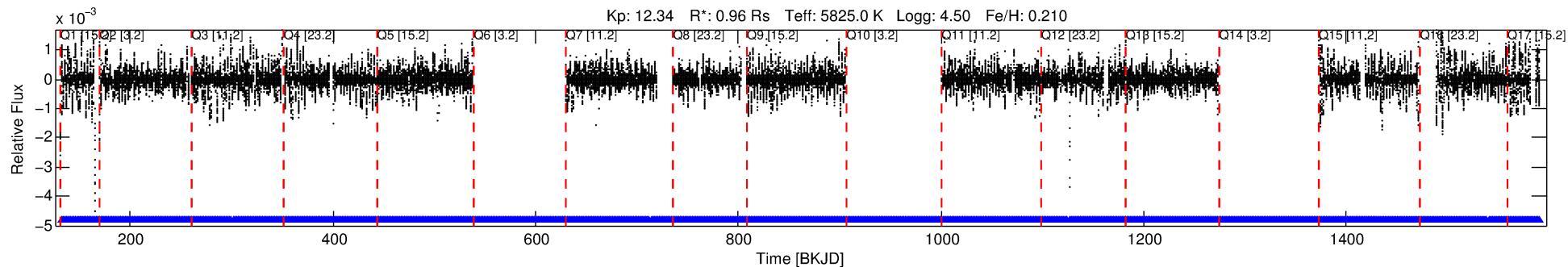
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 005115008-01

No Significant Match Found

# DV One-Page Summary

KIC: 5115008 Candidate: 1 of 2 Period: 1.494 d



## DV Fit Results:

Period = 1.49426 [0.00002] d  
Epoch = 132.8354 [0.0037] BKJD  
Rp/R\* = 0.0052 [0.0019]  
a/R\* = 1.15 [0.46]  
b = 0.70 [1.21]  
Seff = 1390.58 [208.08]  
Teq = 1557 [58] K  
Rp = 0.55 [0.21] Re  
a = 0.0263 [0.0023] AU  
Ag = 22.52 [17.52] [1.23 $\sigma$ ]  
Teffp = 5245 [1006] K [3.66 $\sigma$ ]

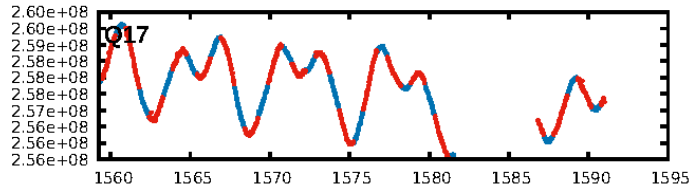
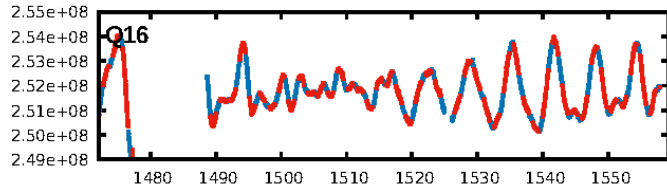
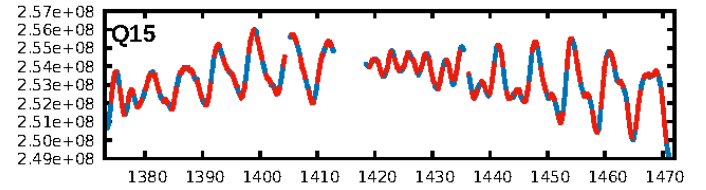
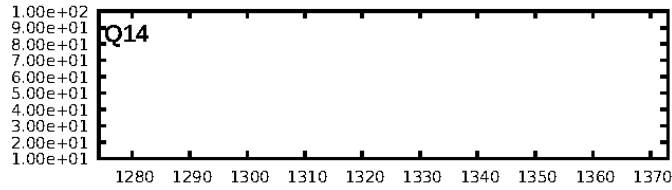
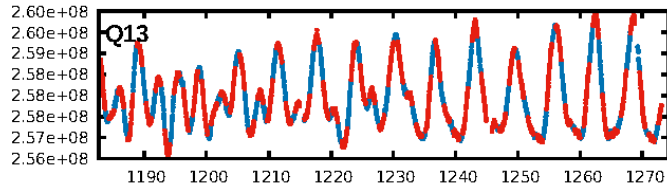
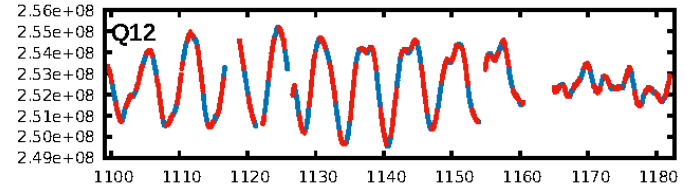
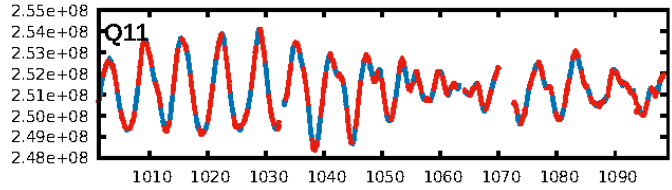
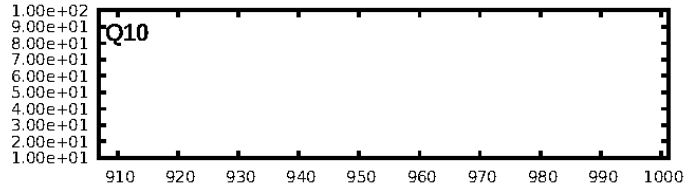
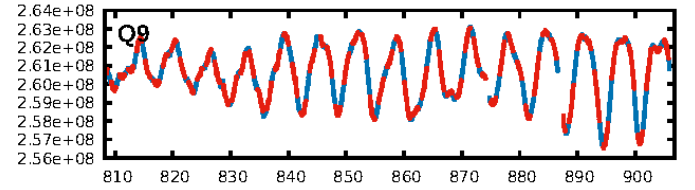
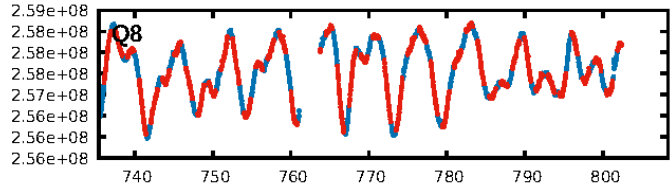
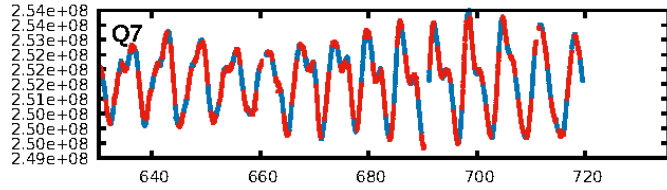
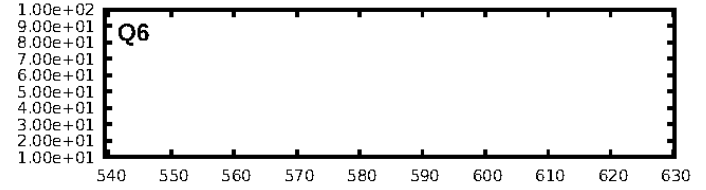
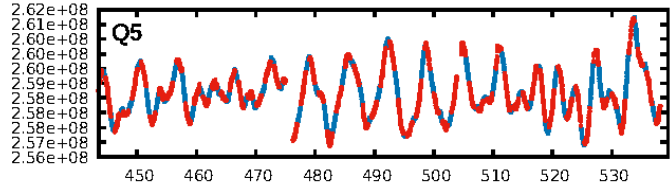
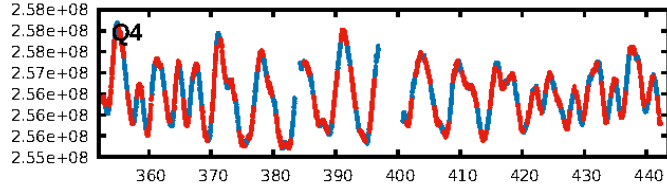
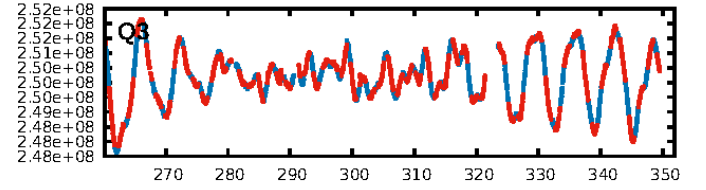
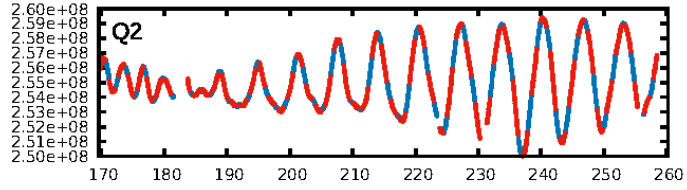
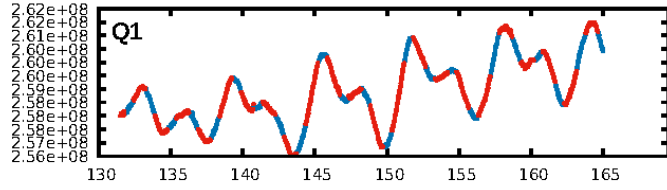
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [101.19 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.58e-11  
RollingBand-fgt: 1.00 [687/687]  
GhostDiagnostic-chr: 0.1474  
Centroid-sig: 0.0%  
Centroid-so: 3.543 arcsec [3.80 $\sigma$ ]  
OotOffset-rm: 4.204 arcsec [6.58 $\sigma$ ]  
KicOffset-rm: 4.271 arcsec [5.38 $\sigma$ ]  
OotOffset-st: 1/4/4/4 [13]  
KicOffset-st: 1/4/4/4 [13]  
DiffImageQuality-fgm: 0.62 [8/13]  
DiffImageOverlap-fno: 1.00 [14/14]

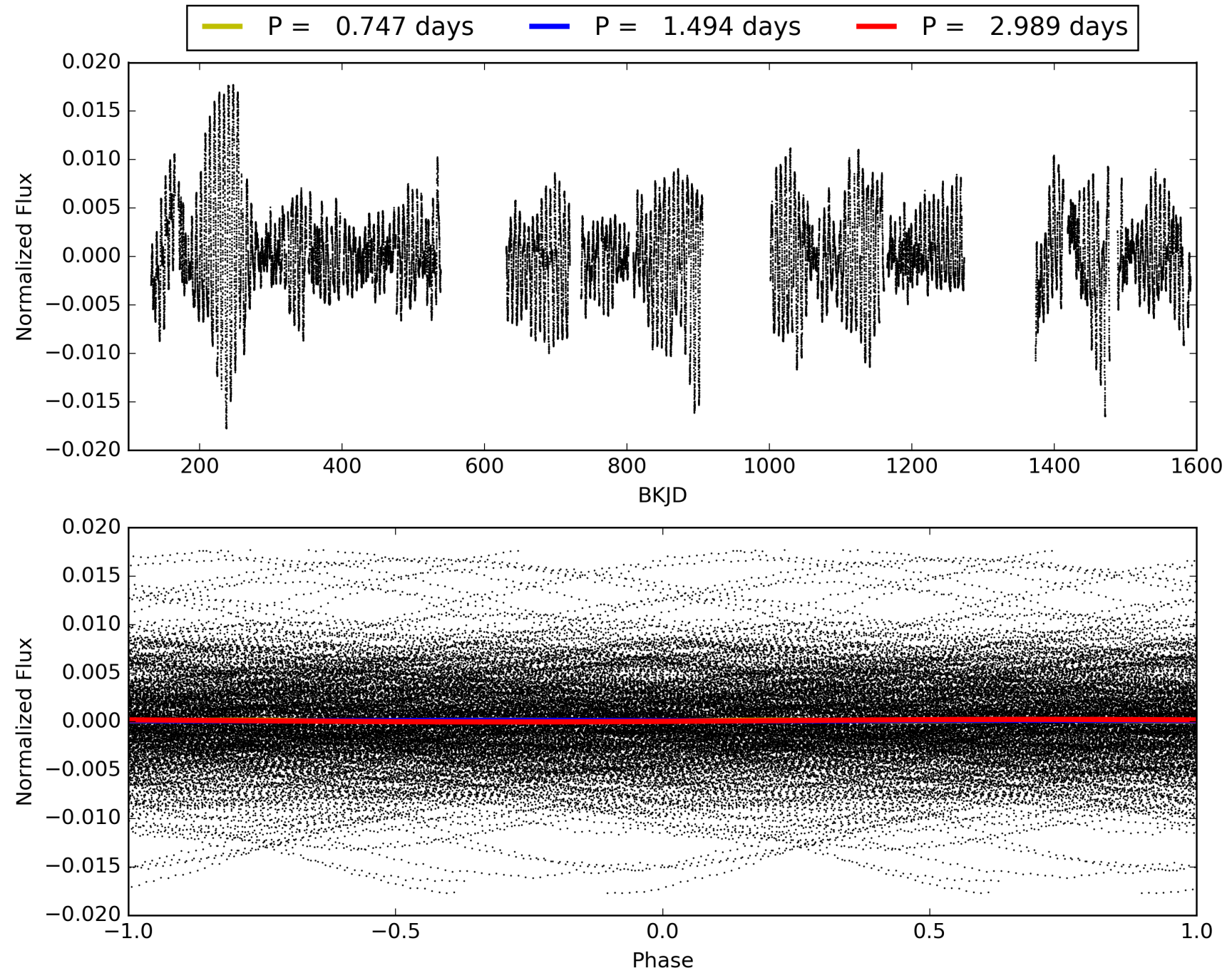
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:36:19 Z

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

## TCE 005115008-01, PDC Light Curves

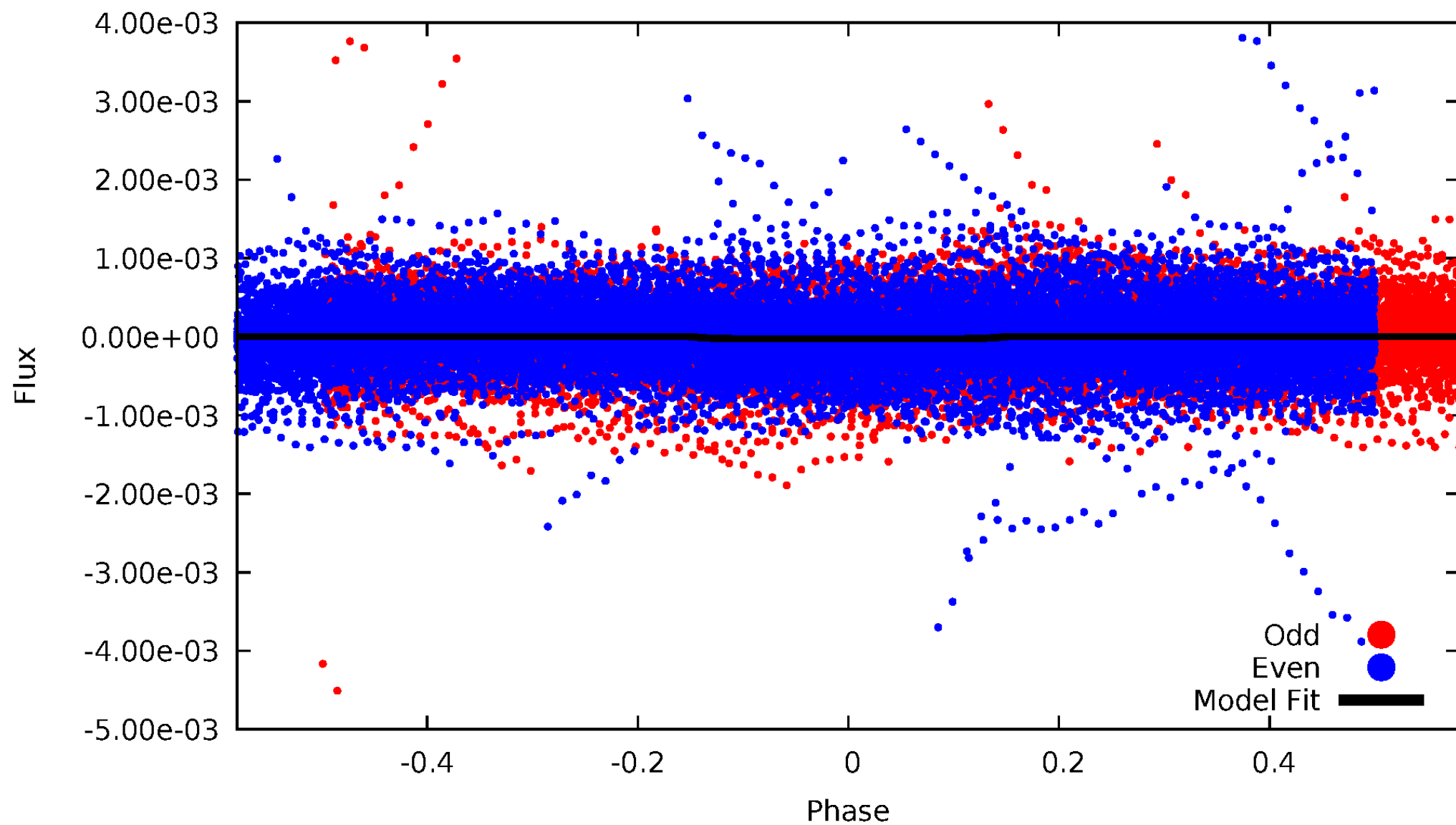


TCE 005115008-01



# DV Odd/Even

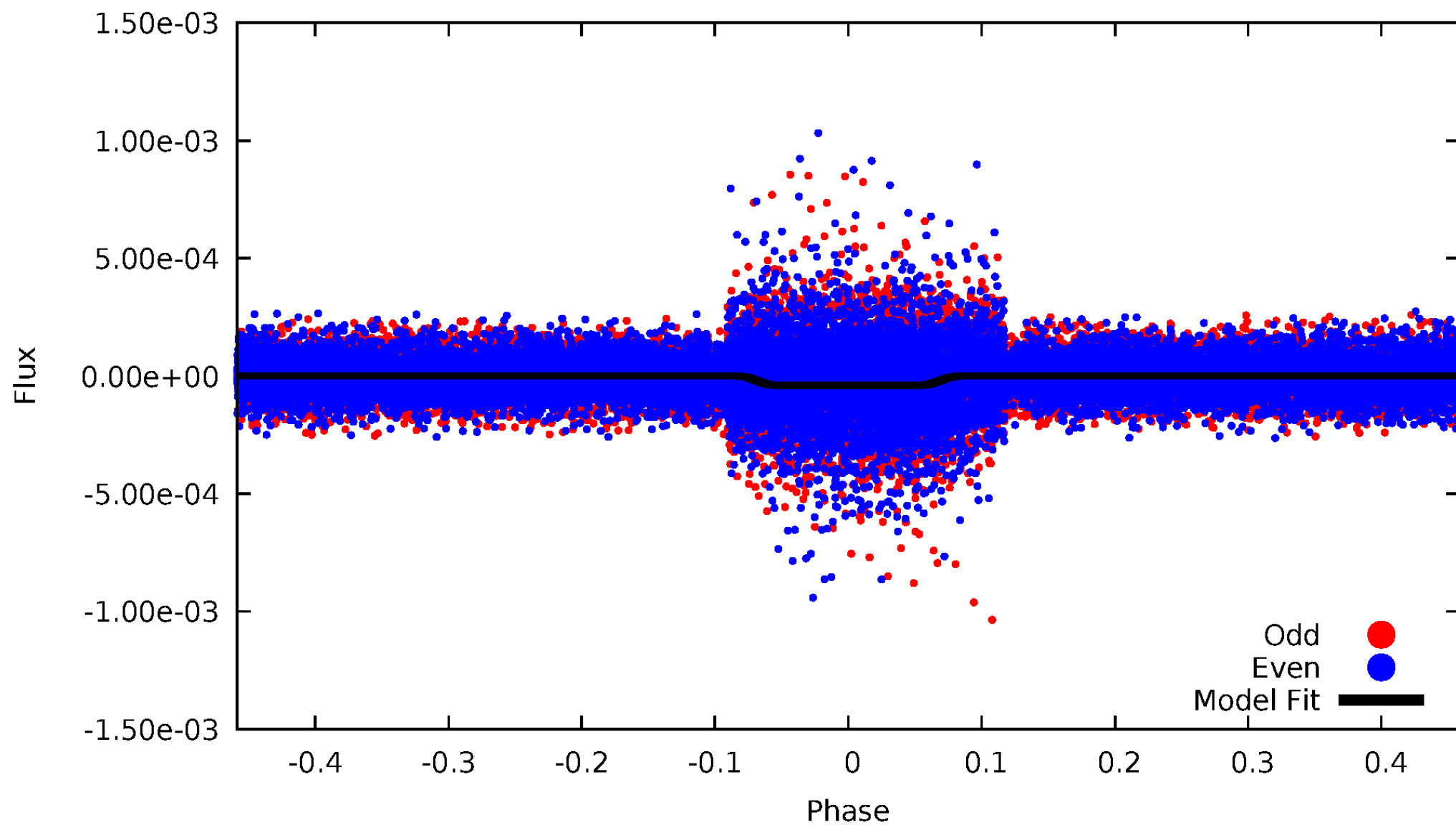
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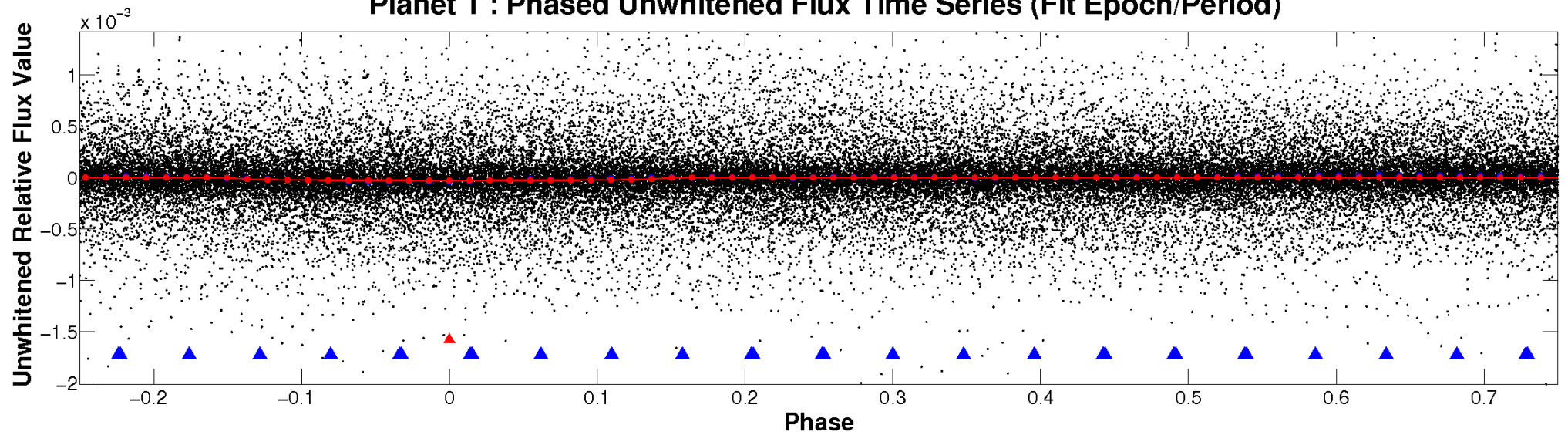
# ALT Odd/Even

TCE 005115008-01

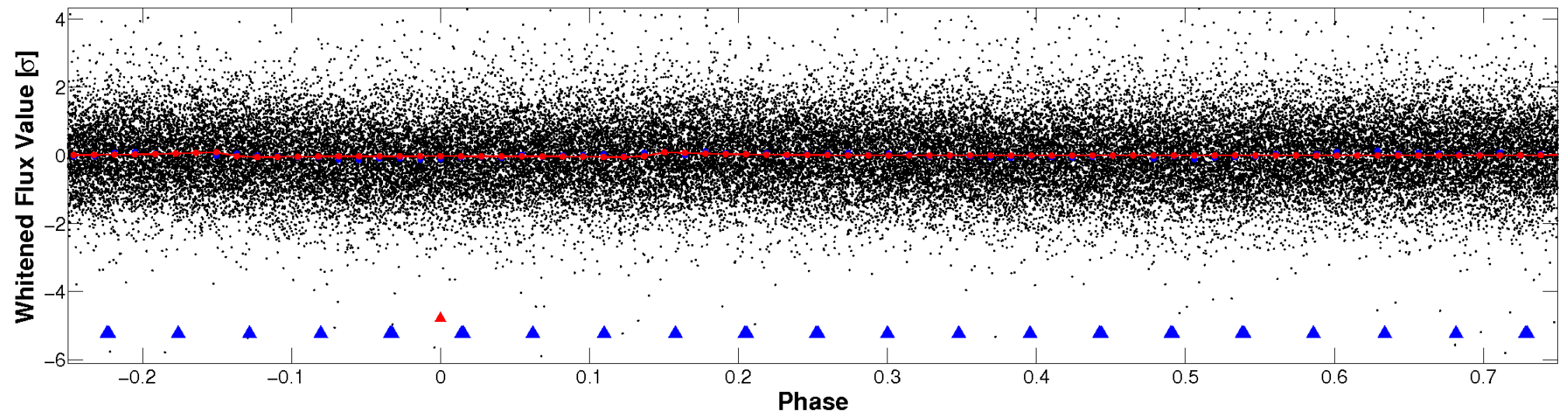


# Non-Whitened Vs. Whitened Light Curve

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

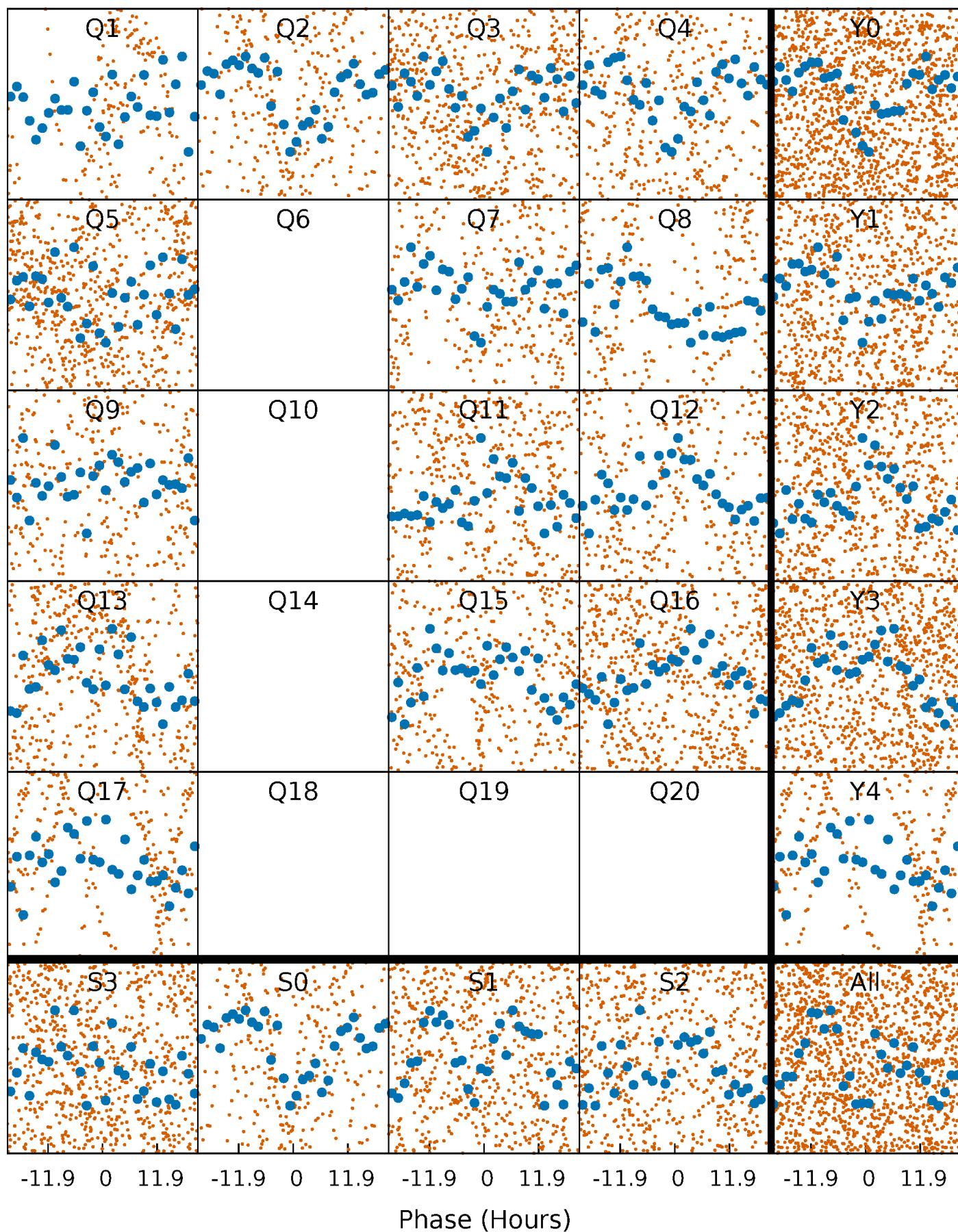


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

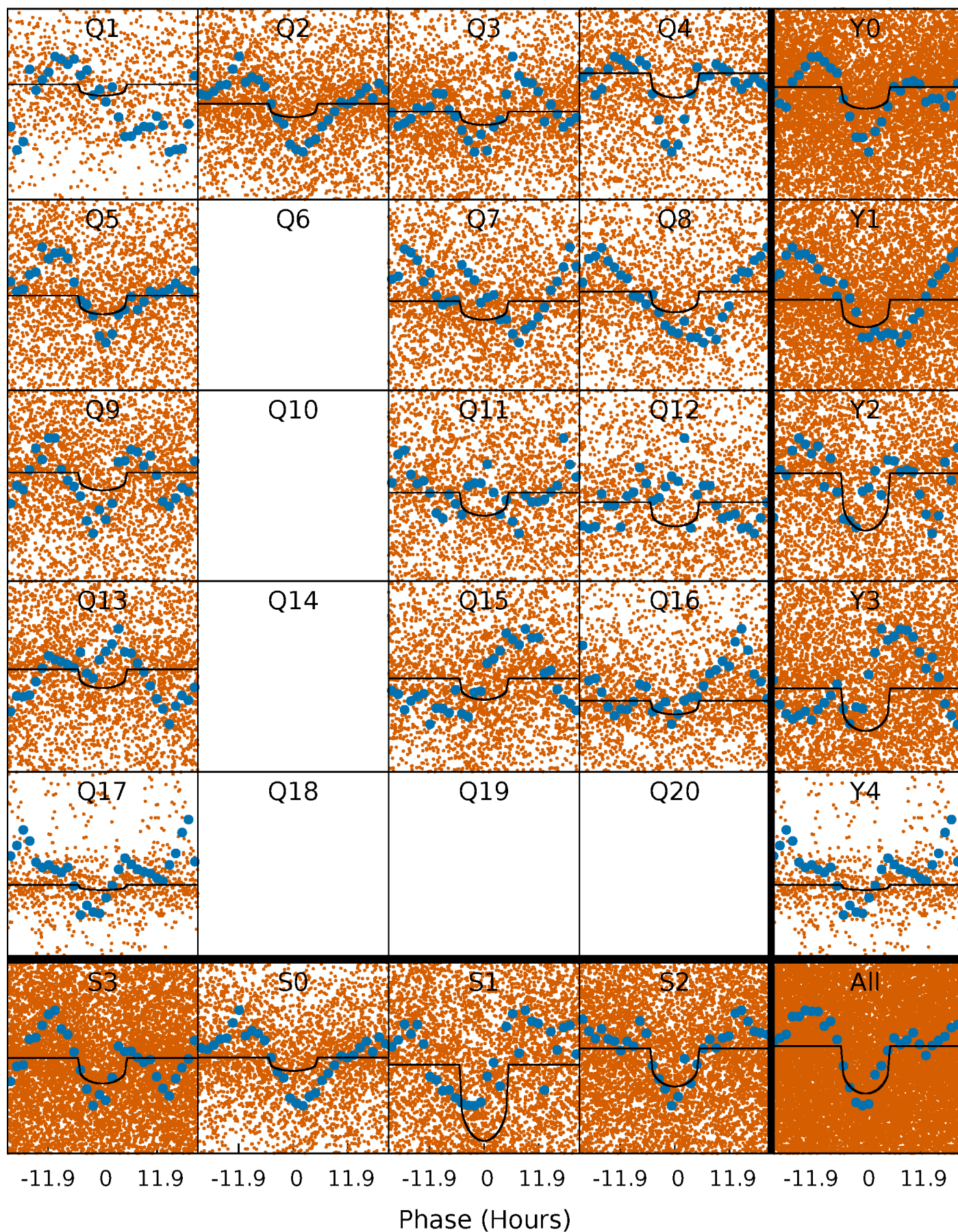
TCE 005115008-01 P= 1.494260 Days  $T_0=132.835411$  (BKJD)





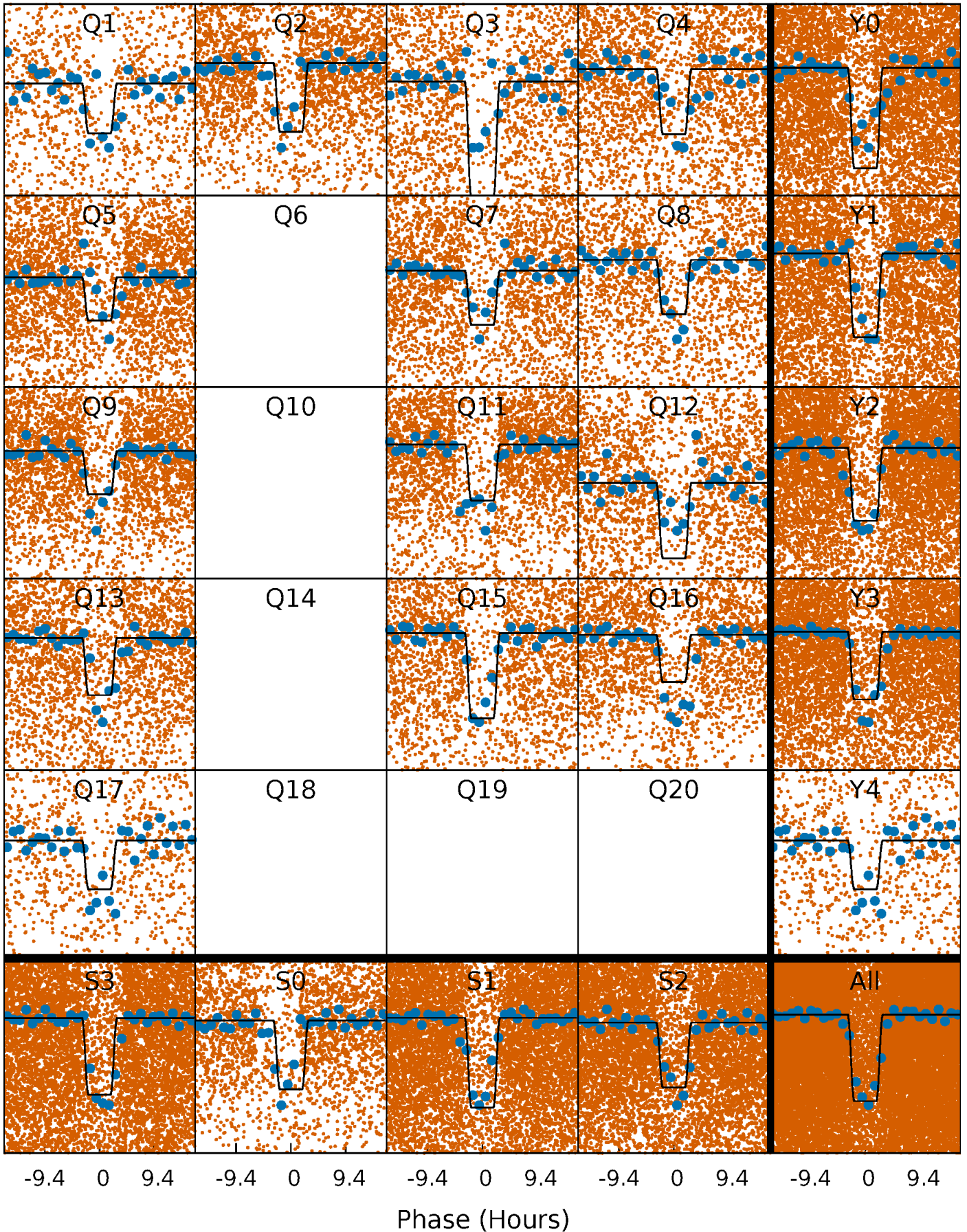
# DV Quarter-Phased Transit Curves

TCE 005115008-01 P= 1.494260 Days  $T_0=132.835411$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 005115008-01 P= 1.494109 Days  $T_0=132.841618$  (BKJD)

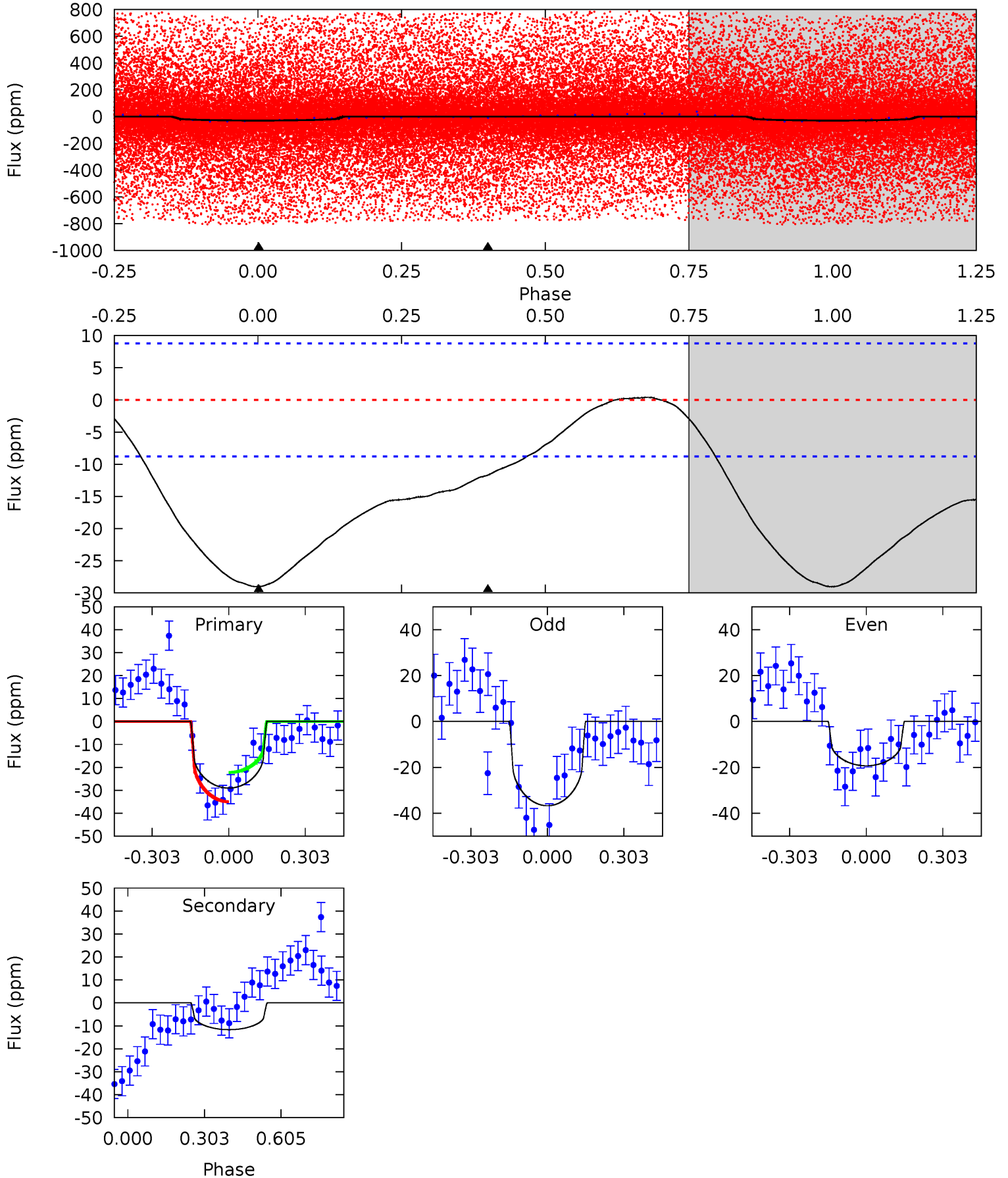




# DV Model-Shift Uniqueness Test

005115008-01, P = 1.494260 Days, E = 131.341151 Days

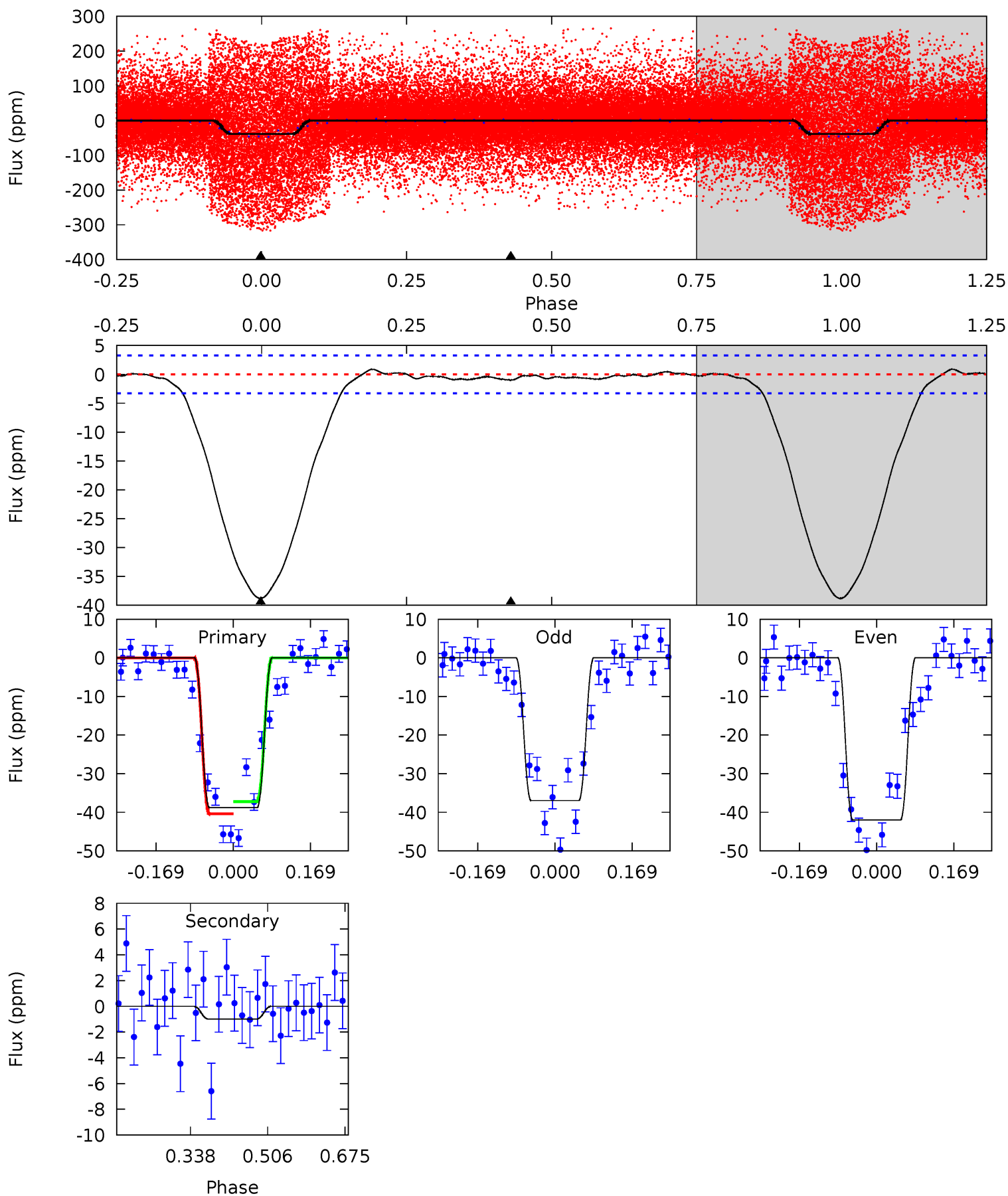
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.3	5.75	0	0	4.33	1.03	0.46	14.3	14.3	5.75	5.75	4.34	0.95	0.01	3.02



# Alt Model-Shift Uniqueness Test

005115008-01, P = 1.494109 Days, E = 131.347509 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
52.9	1.36	0	0	4.45	1.38	0.42	52.9	52.9	1.36	1.36	3.38	0.89	0.02	2.13



### Stellar Parameters For KIC 005115008

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5825^{+76}_{-81}$	$4.504^{+0.020}_{-0.080}$	$0.210^{+0.150}_{-0.200}$	$0.965^{+0.094}_{-0.047}$	$1.083^{+0.038}_{-0.082}$	$1.699^{+0.164}_{-0.410}$
	+1%/-1%	+0%/-2%	+71%/-95%	+10%/-5%	+4%/-8%	+10%/-24%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 005115008-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-12 \pm 2$	$0.56^{+0.19}_{-0.20}$	$2196^{+63}_{-43}$	$4792^{+1083}_{-563}$	$14^{+20}_{-6}$
Alt.	$-1 \pm 1$	$0.66^{+0.22}_{-0.19}$	$2195^{+58}_{-45}$	$2811^{+497}_{-5006}$	$0.832^{+1.141}_{-0.599}$

$T_{\text{max}}$  = 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

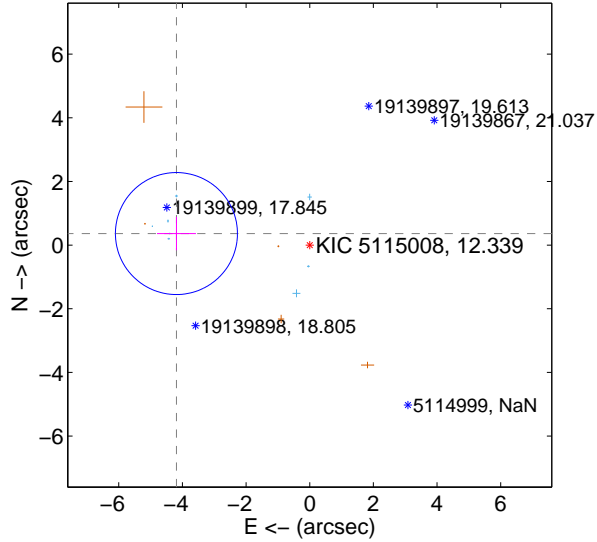
Supplemental centroid analysis for 005115008-01. Kepler magnitude: 12.34. Transit SNR 6.60

There are 8 quarters with good PRF difference image offsets

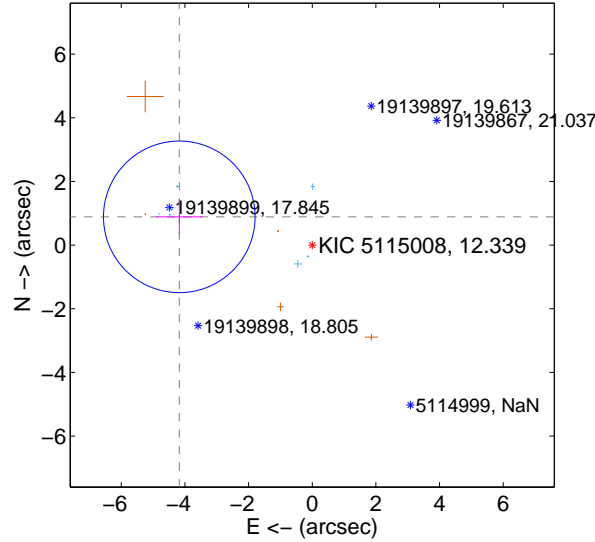
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.204 \pm 0.639$	<b>6.58</b>	$4.188 \pm 0.612$	$0.363 \pm 0.525$
PRF-fit source offset from KIC position	$4.271 \pm 0.794$	<b>5.38</b>	$4.178 \pm 0.723$	$0.888 \pm 0.549$
photometric centroid source offset	$3.54 \pm 0.93$	<b>3.80</b>	$-2.16 \pm 0.69$	$2.81 \pm 1.05$

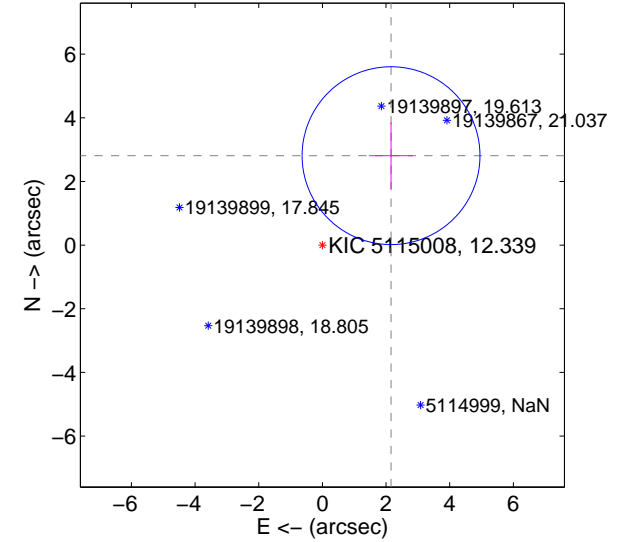
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

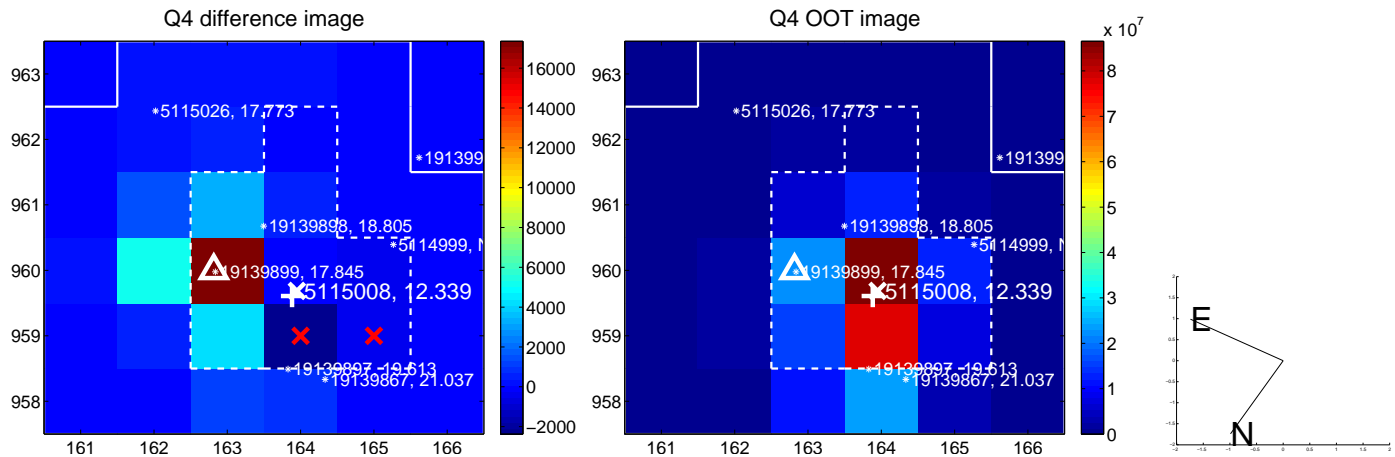
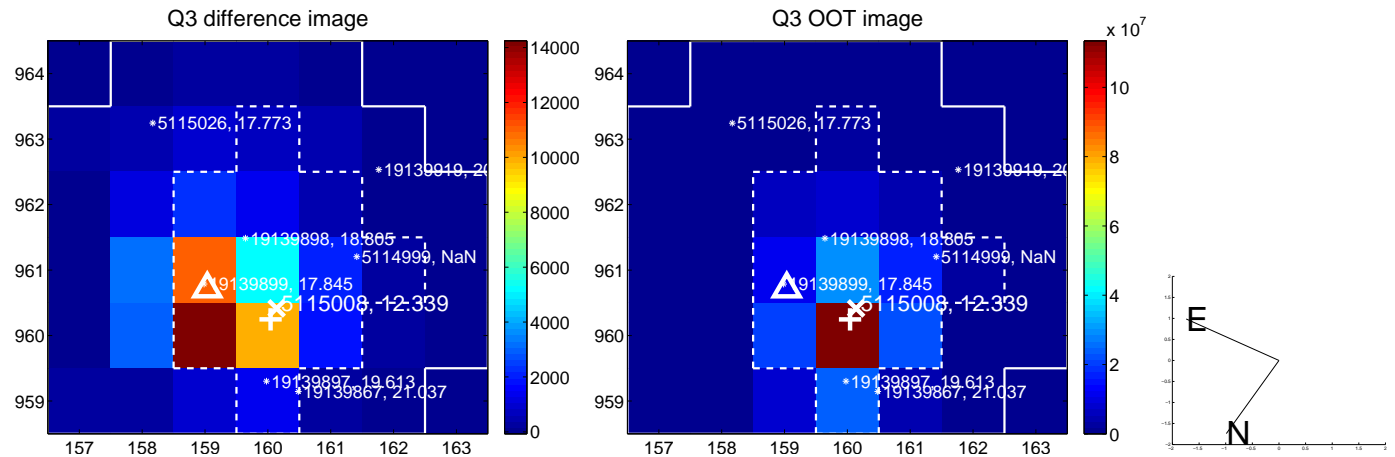
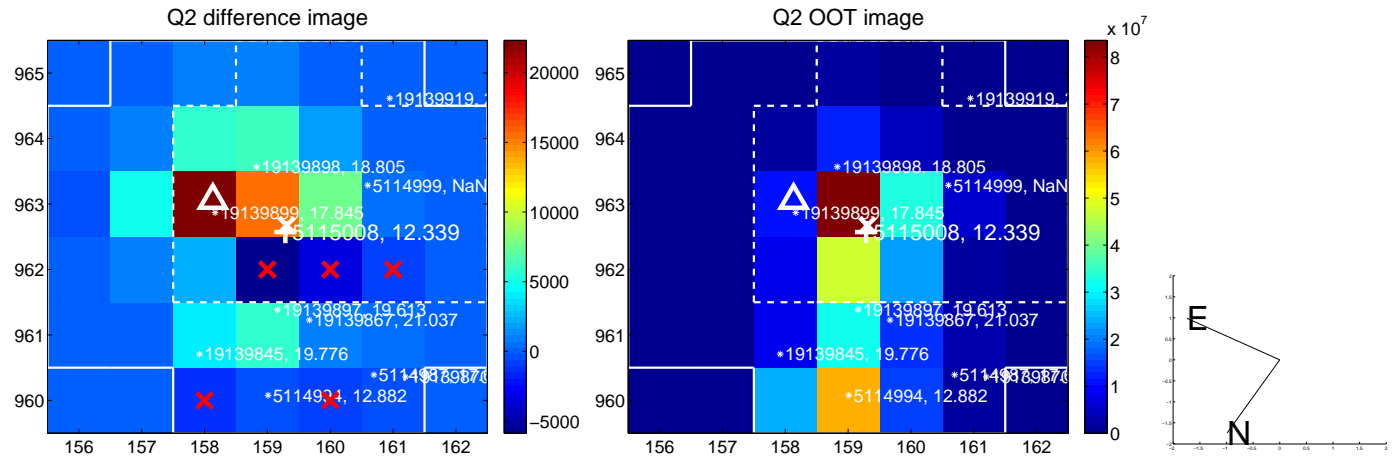
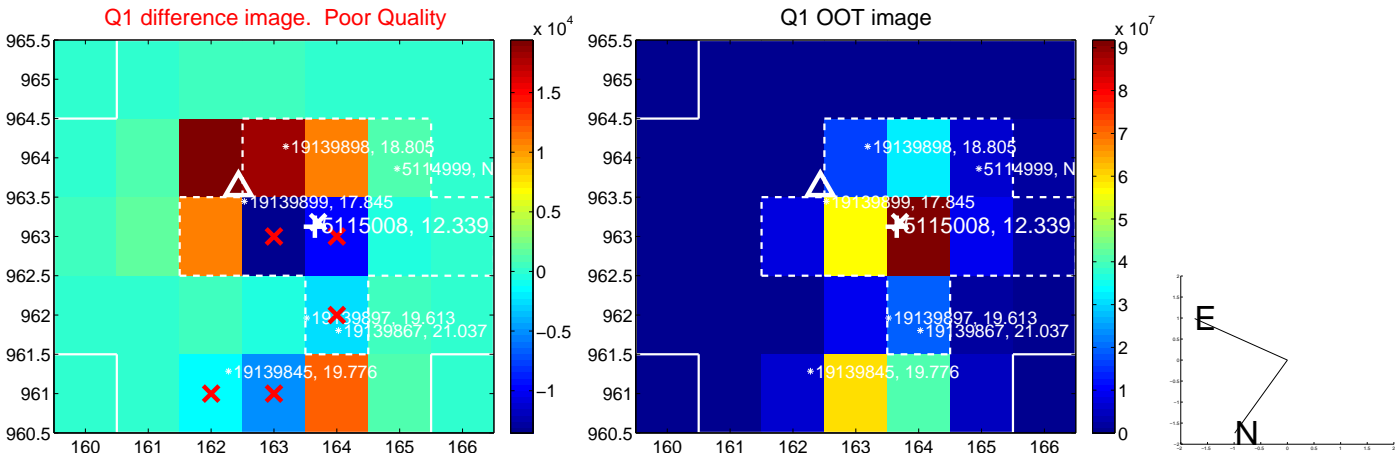


offset from photometric centroids

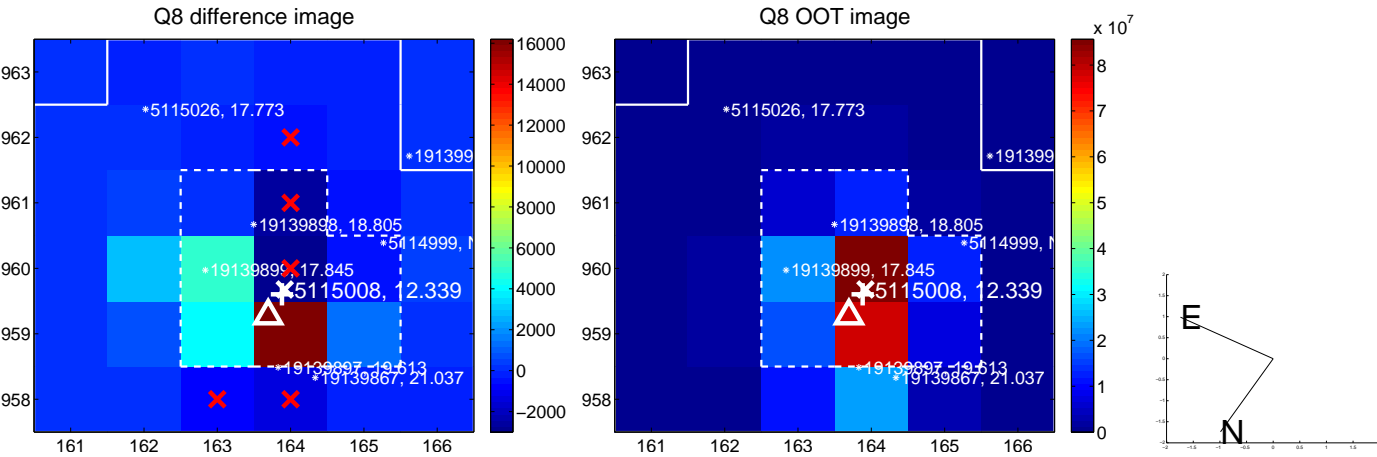
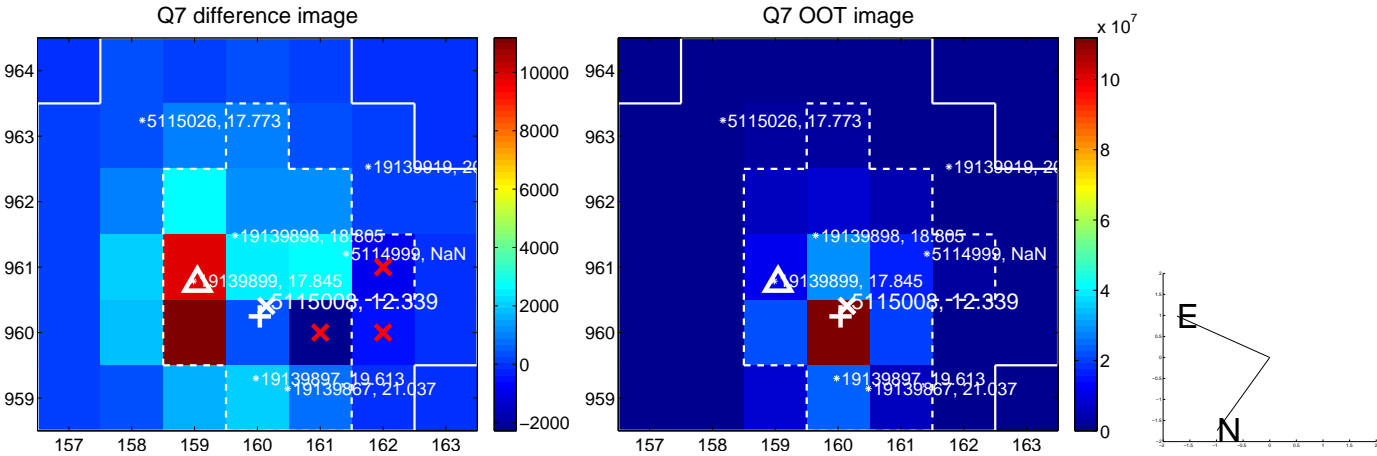
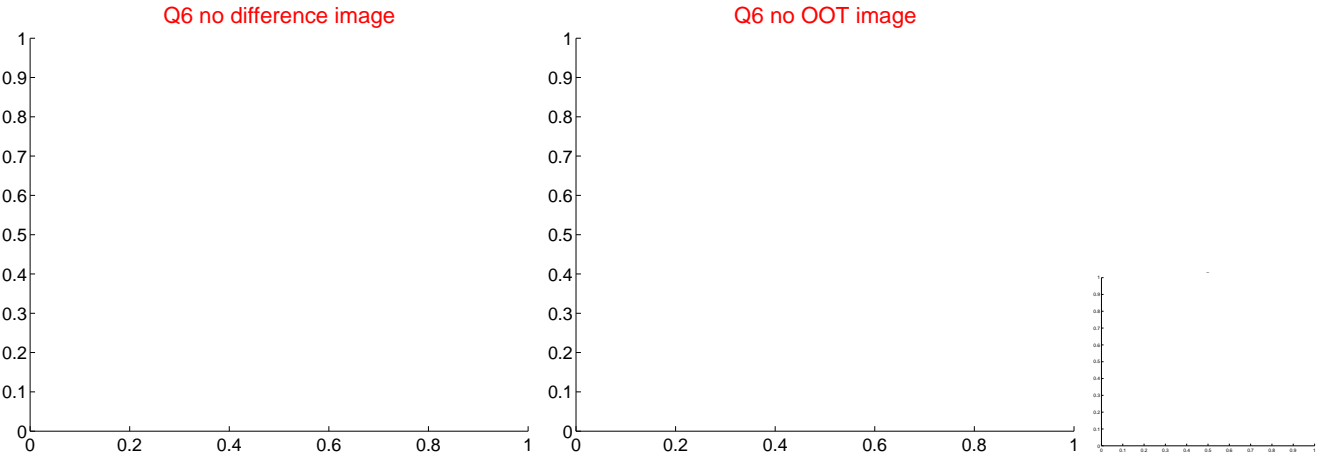
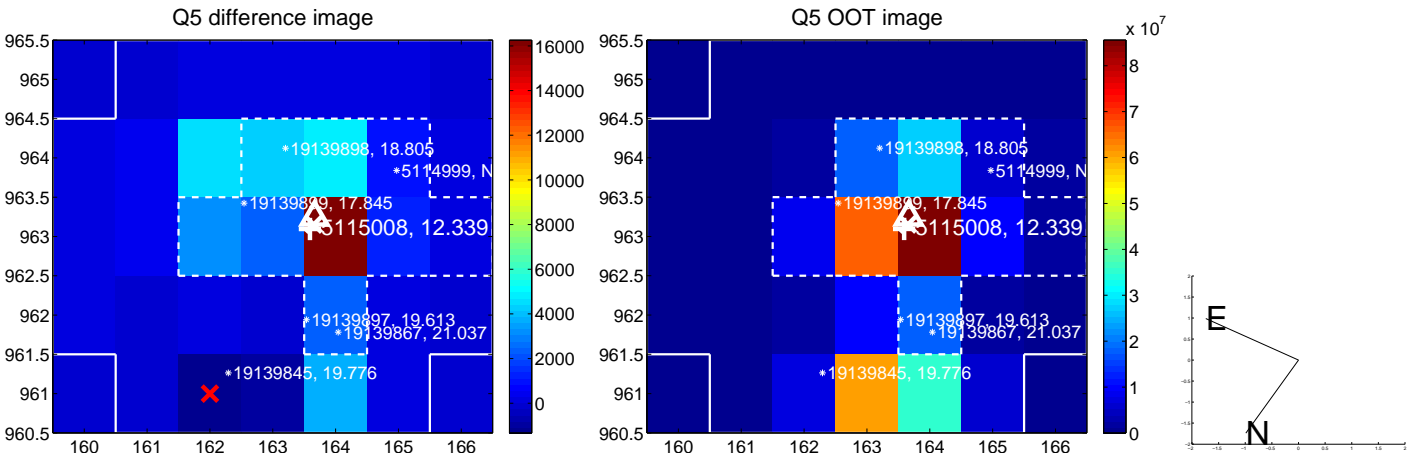


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

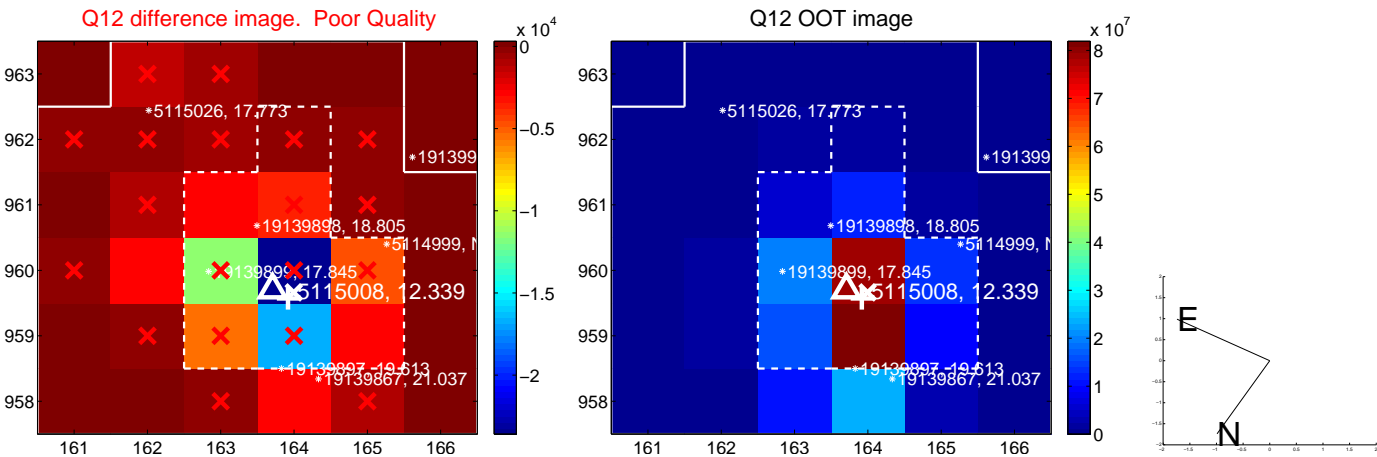
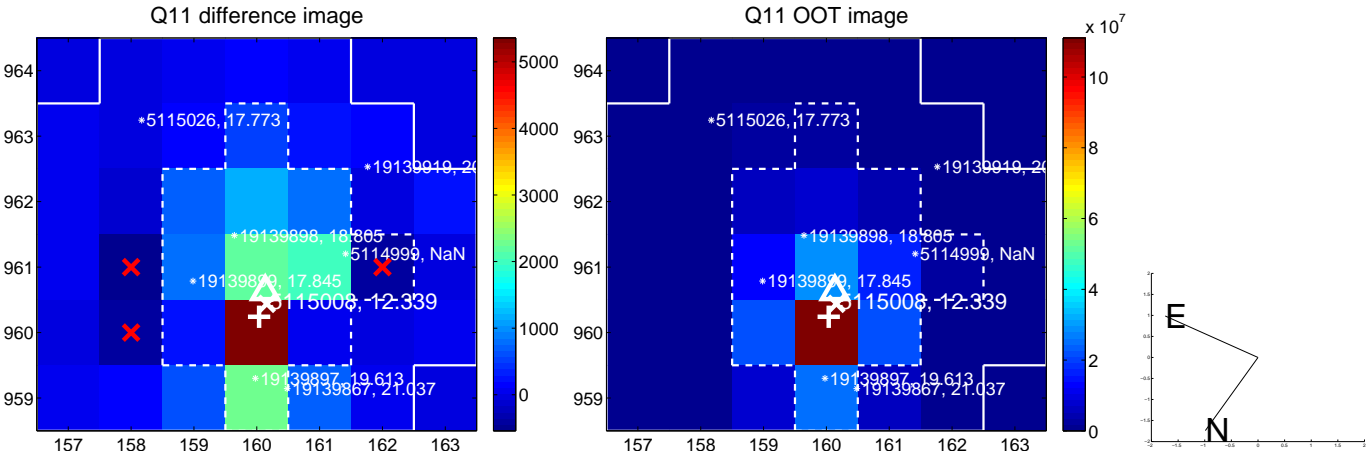
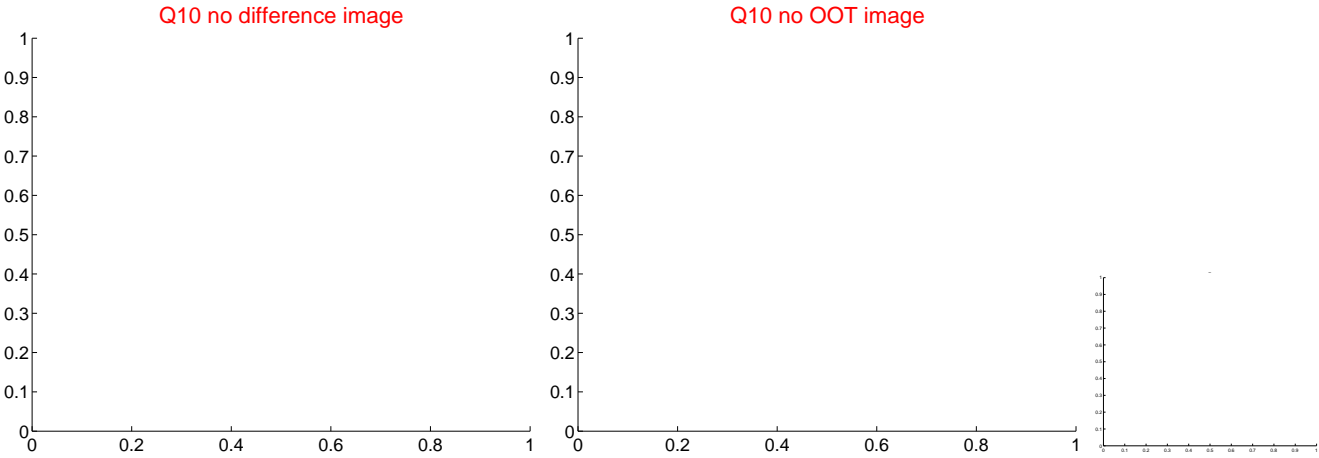
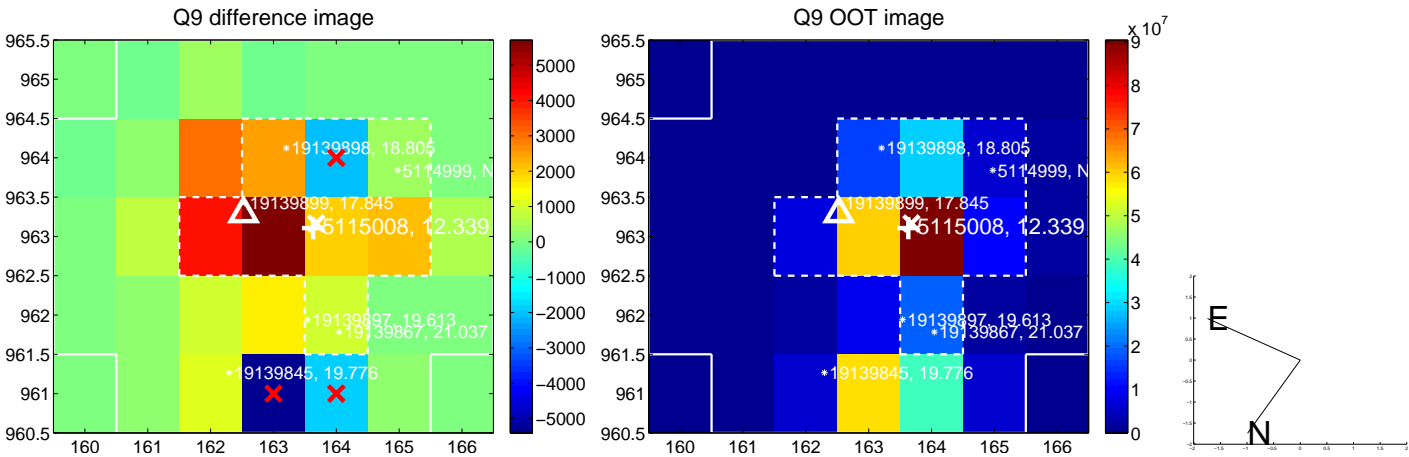
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



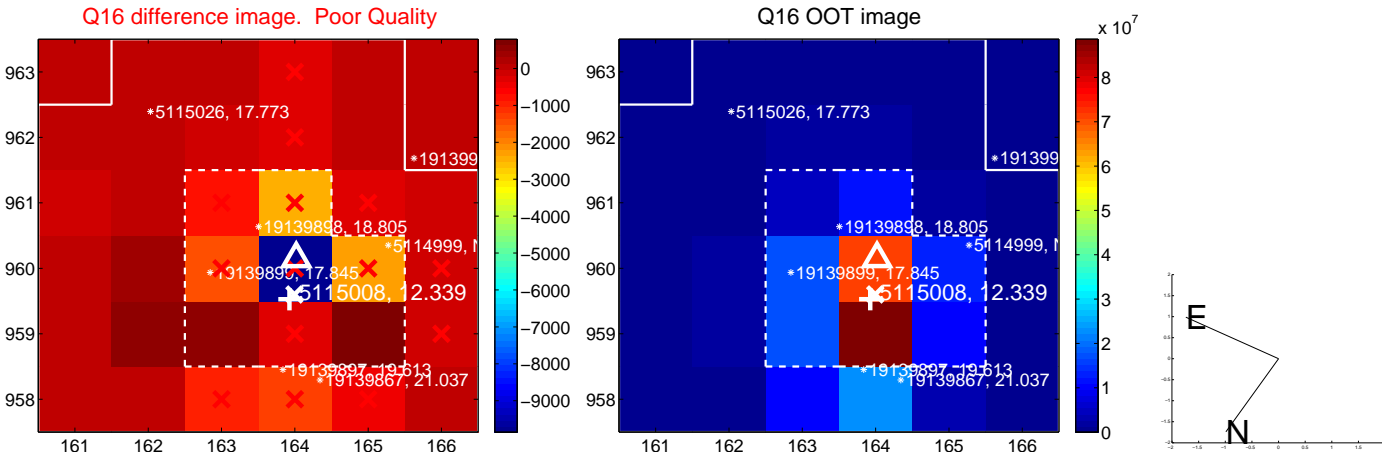
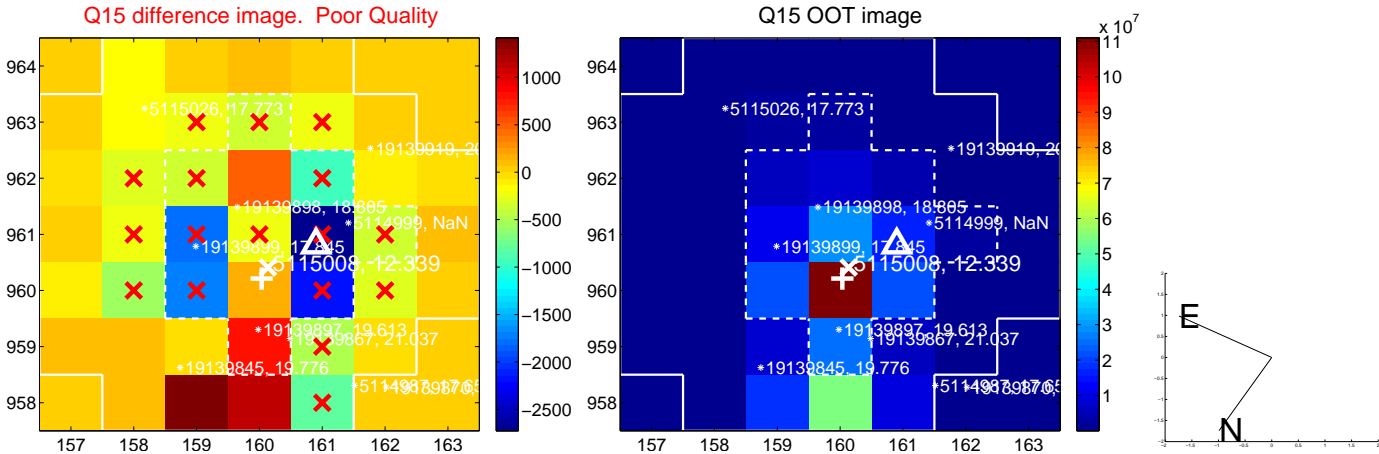
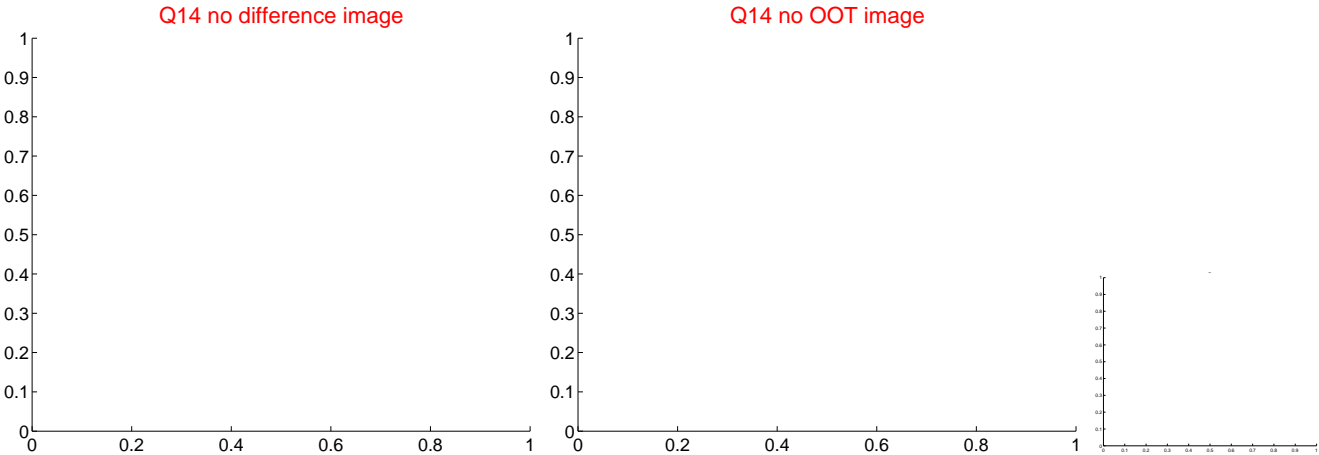
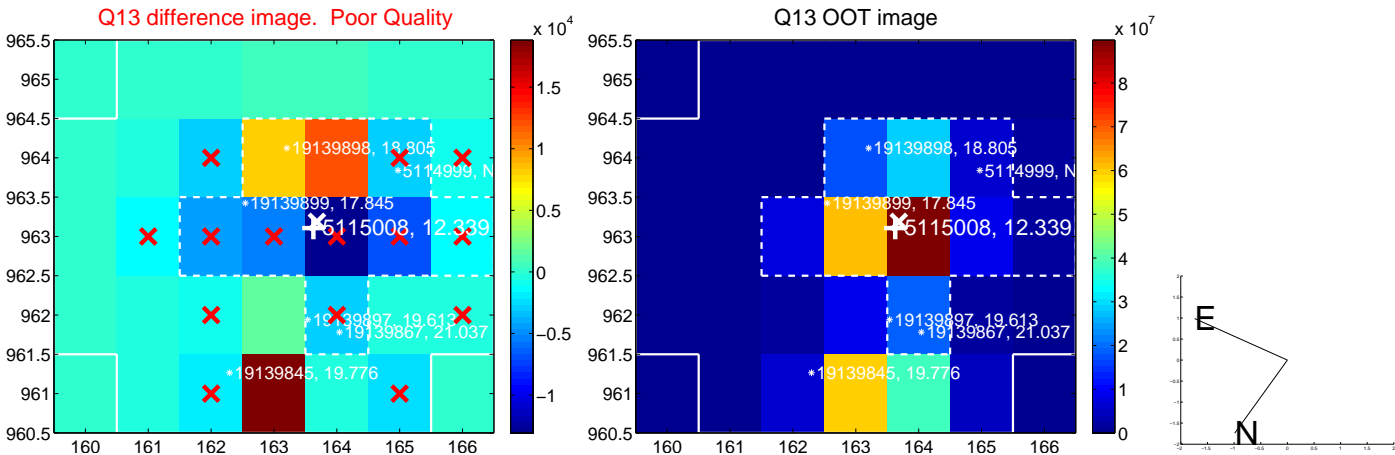
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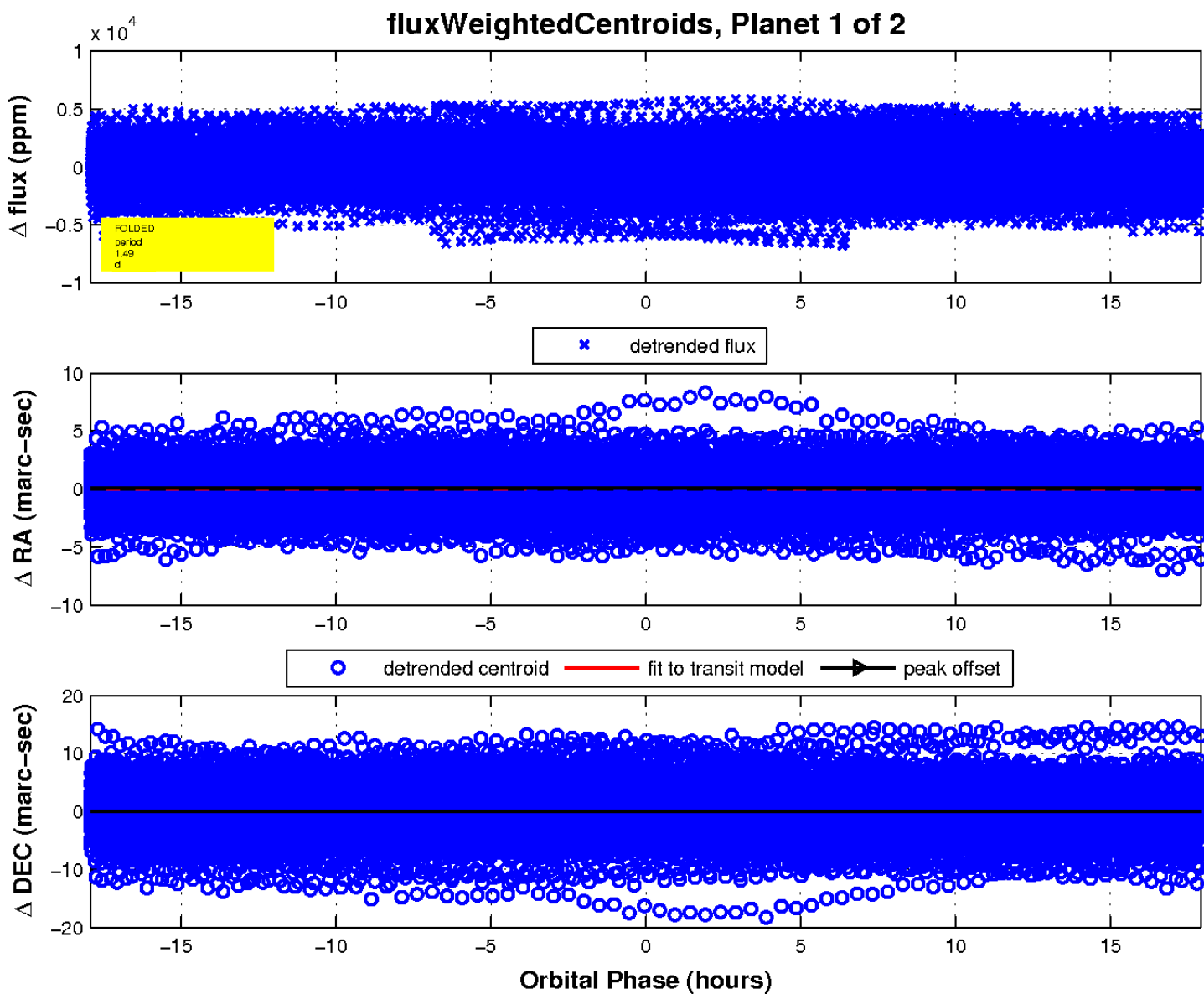
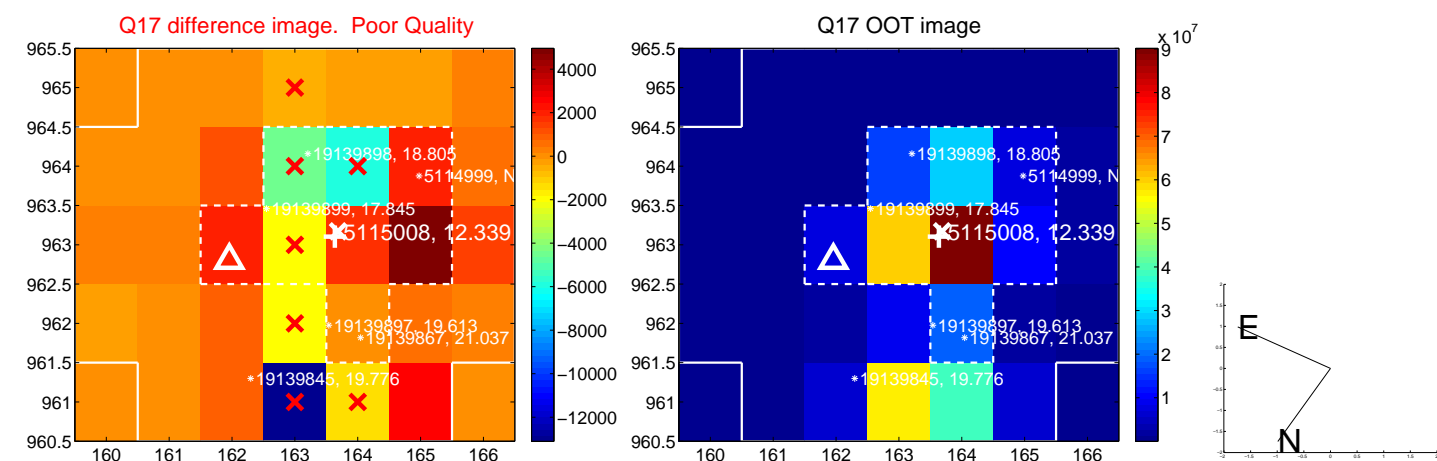


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



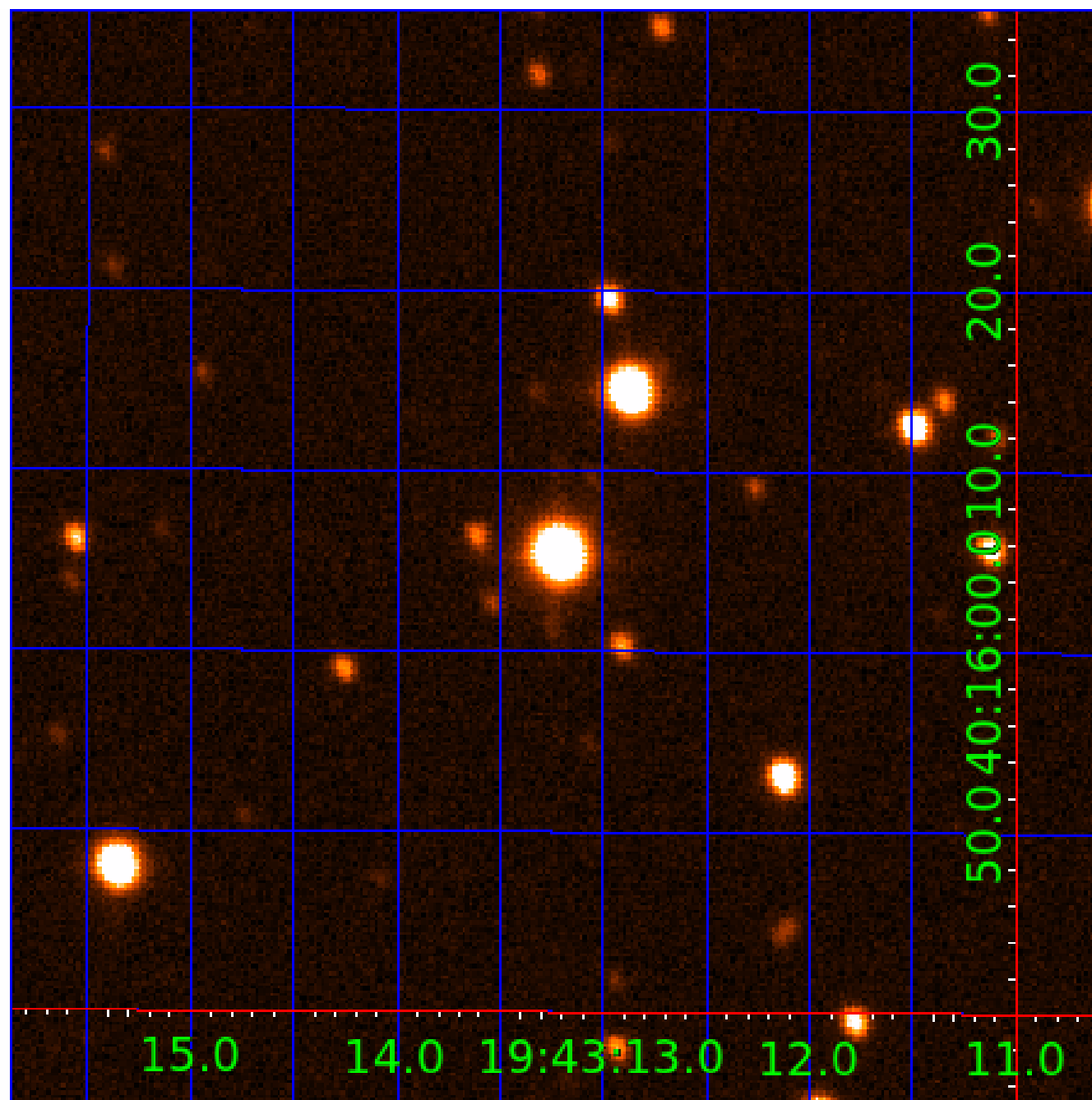


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UKIRT Image

Declination



# KIC 005115008

## Q1-17 DR25 TCE Parameters

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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005115008-01	OBS	FP	0.00	1	0	1	0	LPP_DV—HALO_GHOST
005115008-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT

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

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

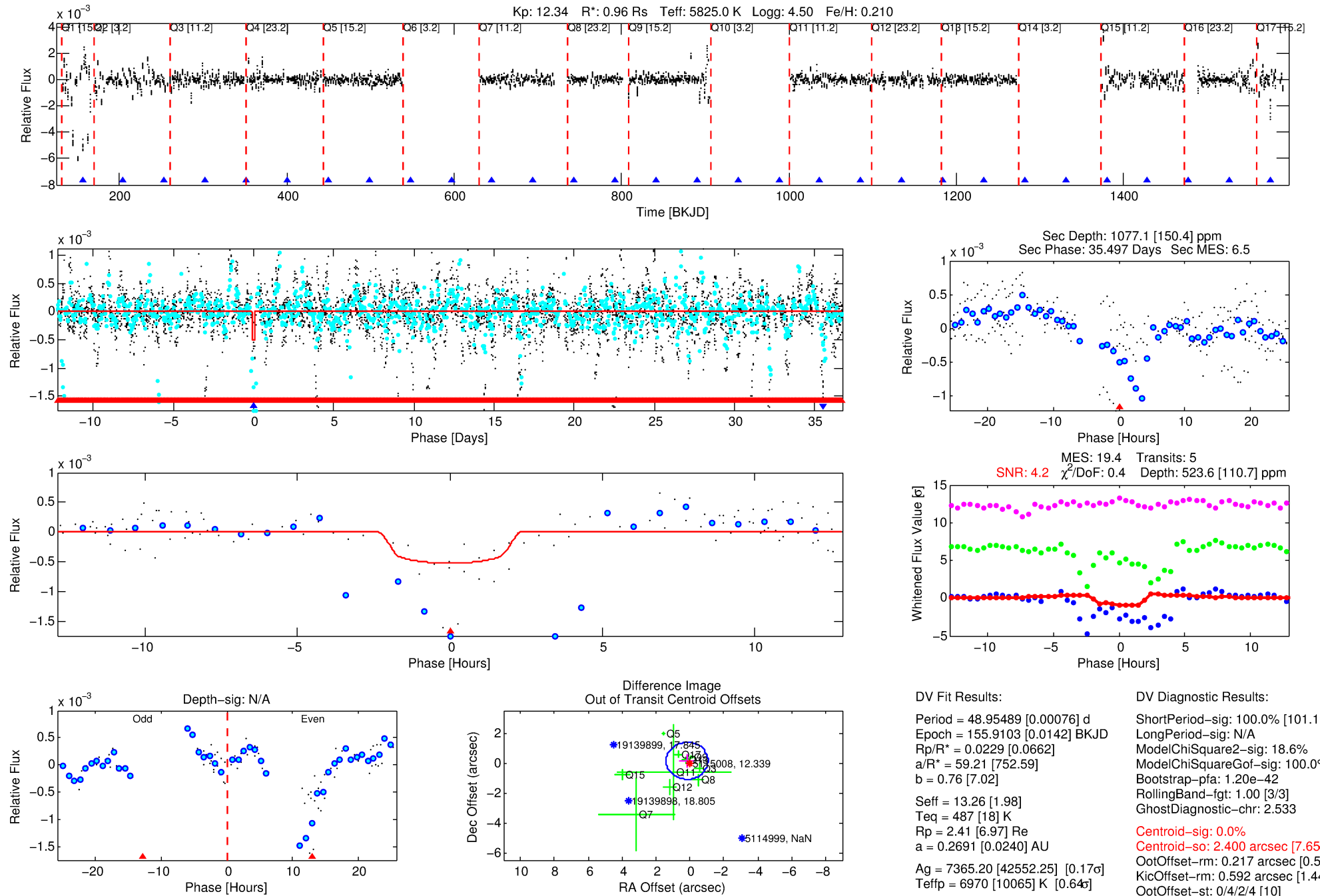
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005115008-02

No Significant Match Found

# DV One-Page Summary

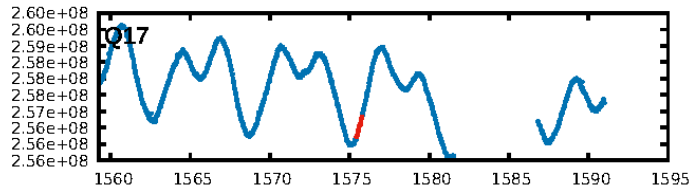
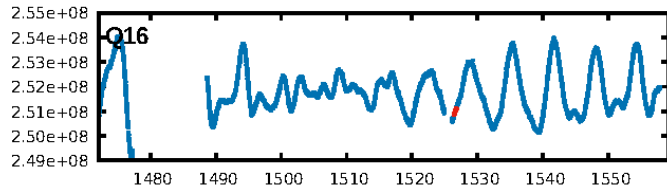
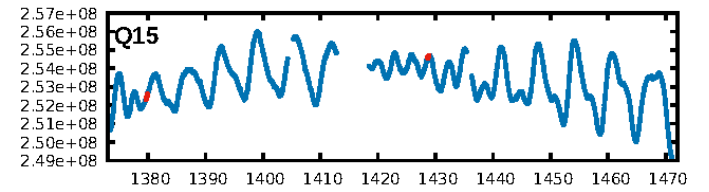
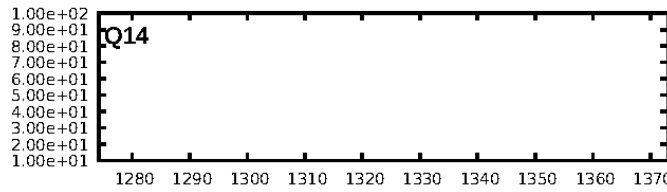
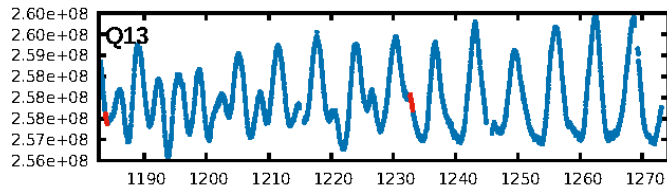
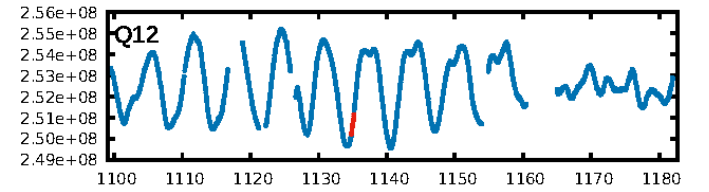
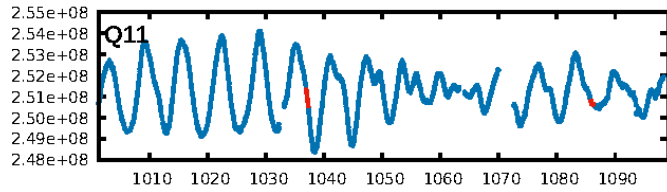
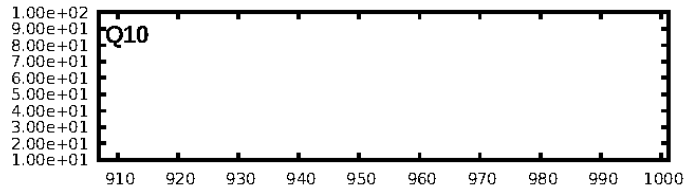
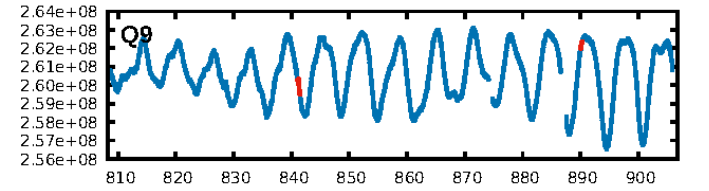
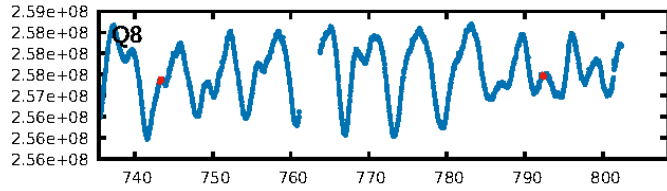
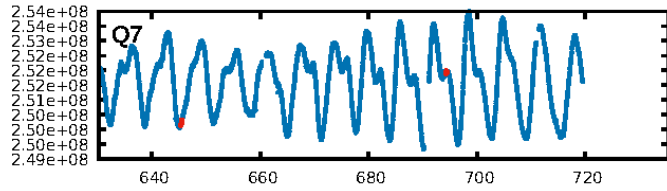
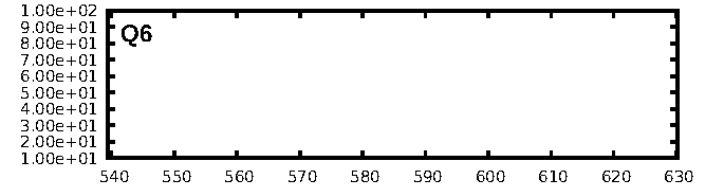
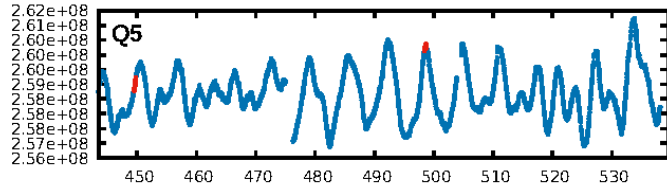
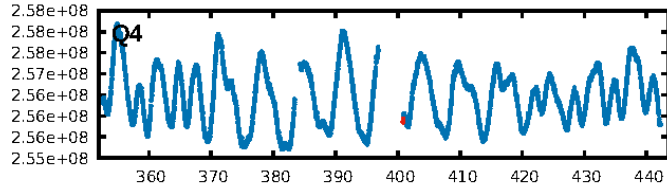
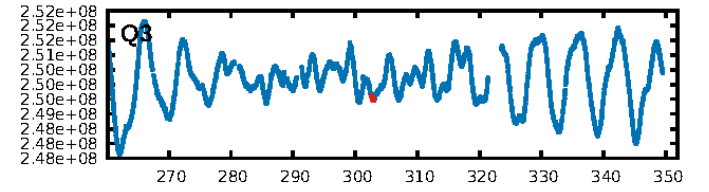
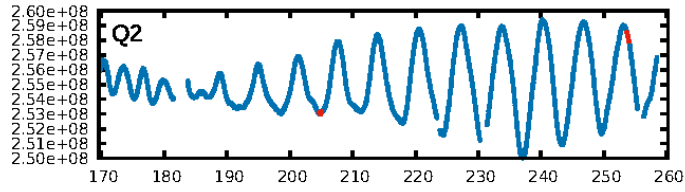
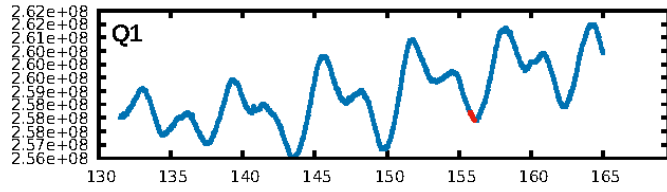
KIC: 5115008 Candidate: 2 of 2 Period: 48.955 d



Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 04:36:28 Z

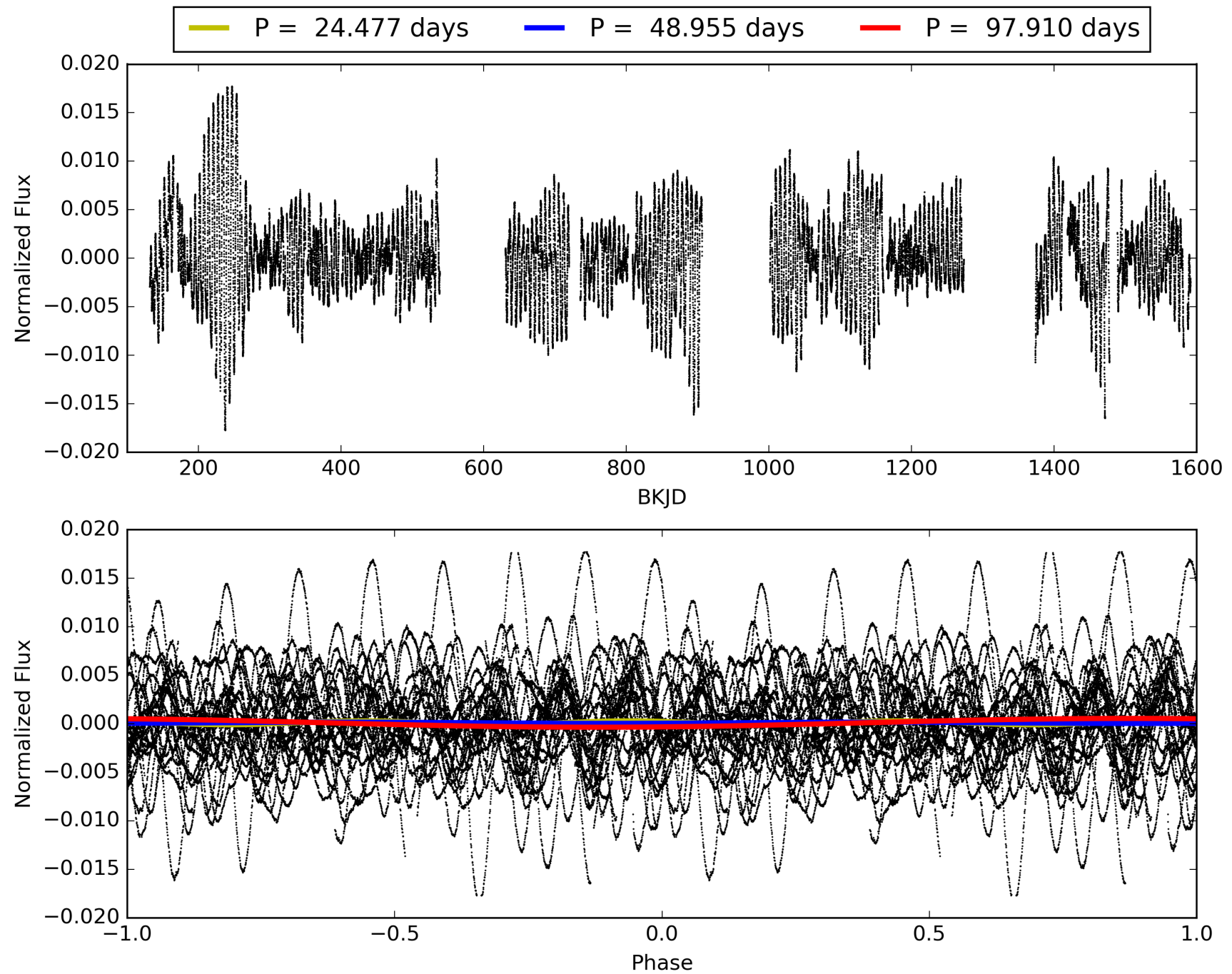
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005115008-02, PDC Light Curves



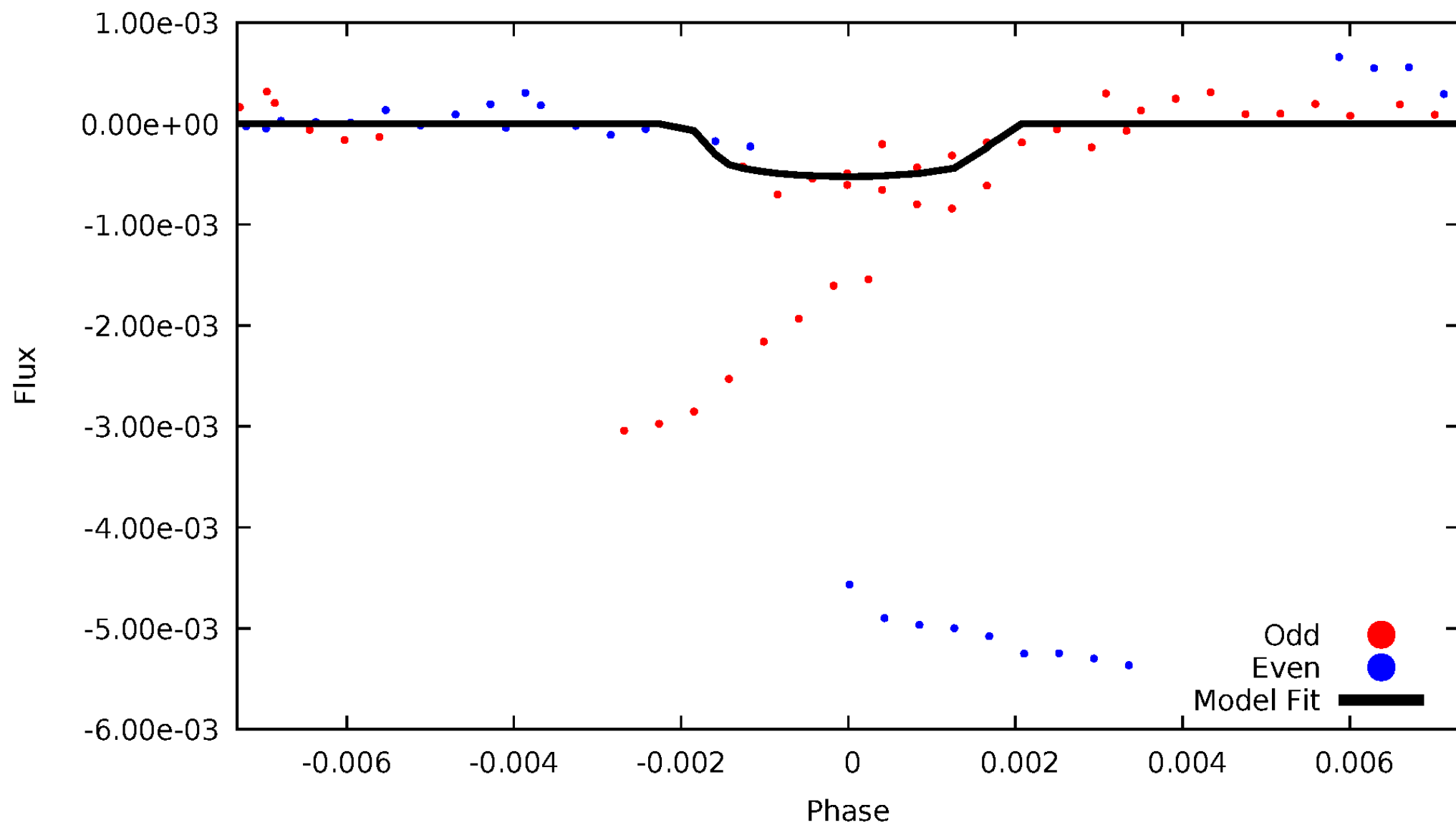


# TCE 005115008-02



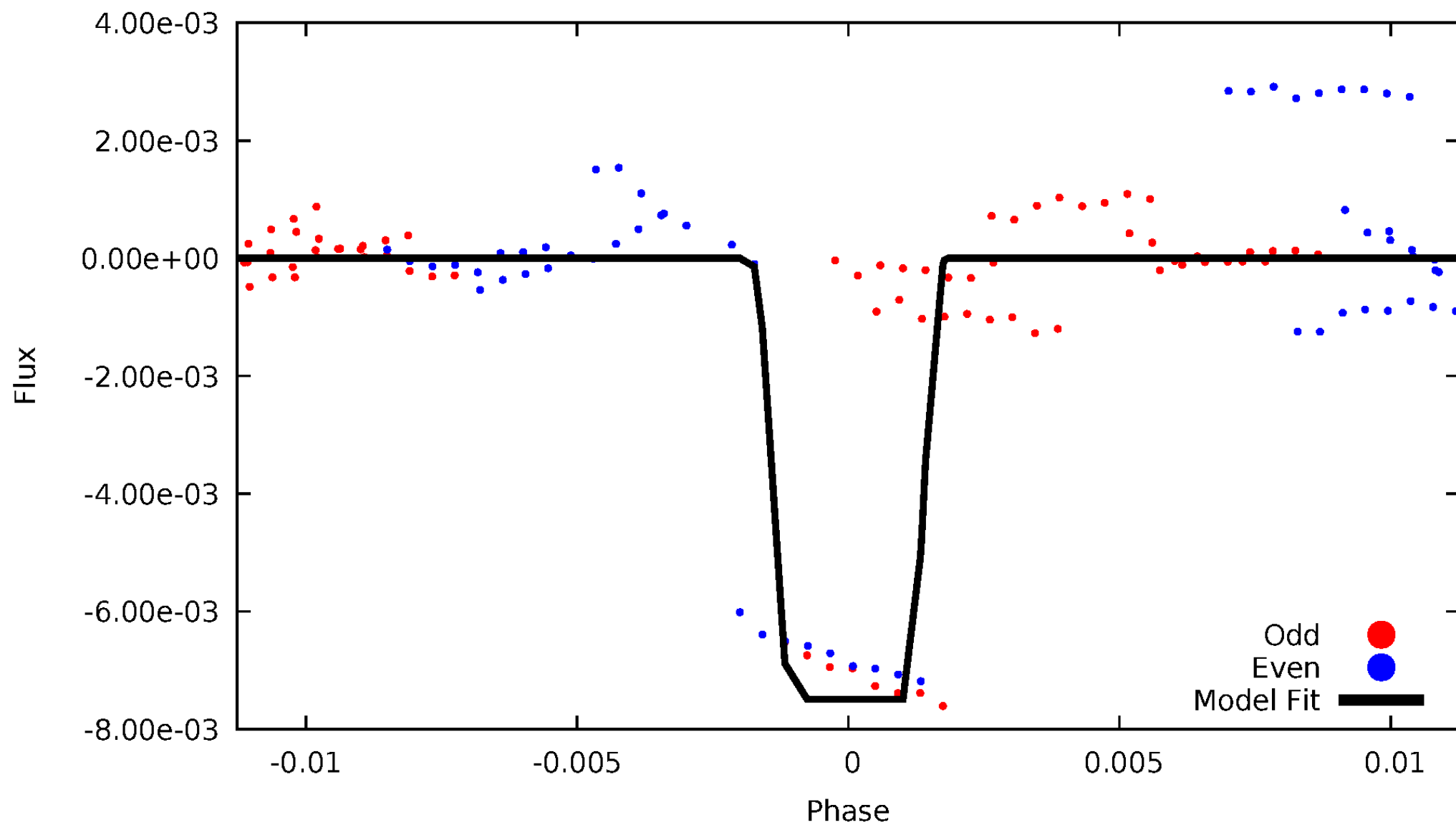
# DV Odd/Even

TCE 005115008-02



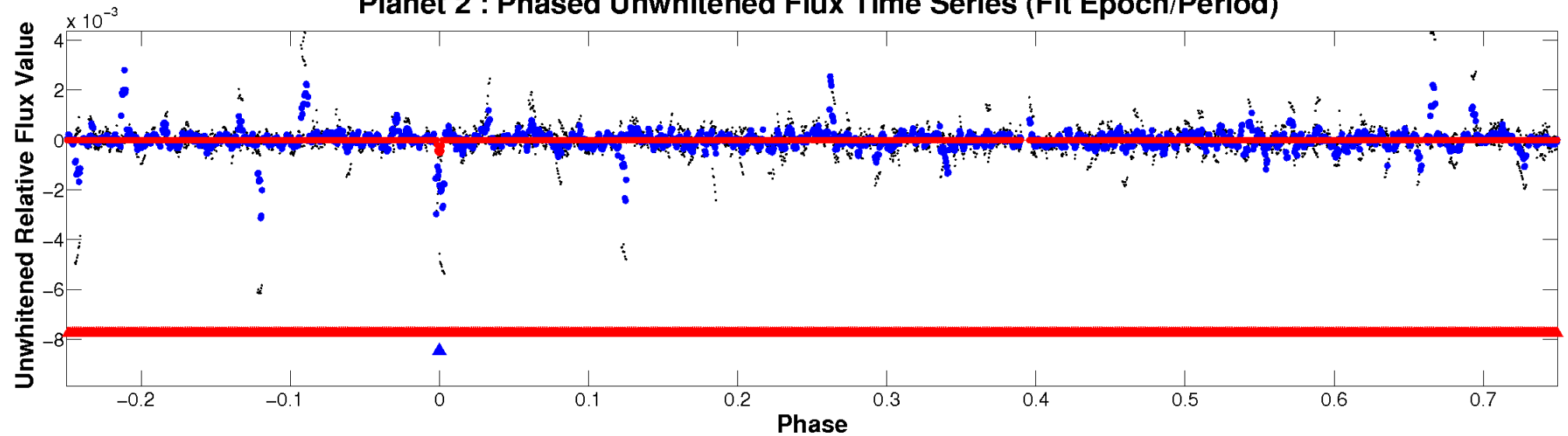
# ALT Odd/Even

TCE 005115008-02

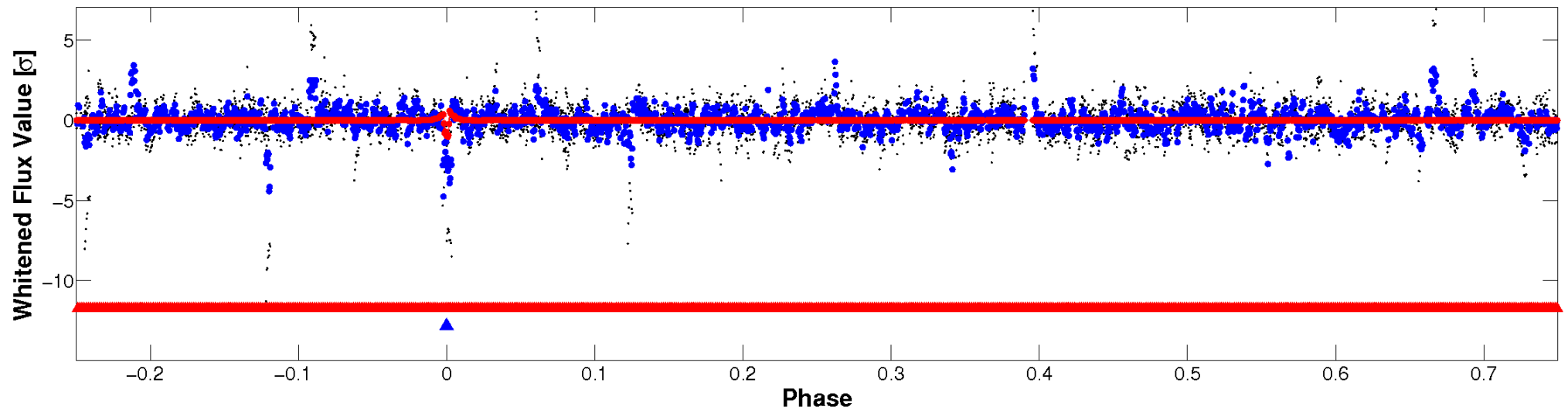


# Non-Whitened Vs. Whitened Light Curve

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

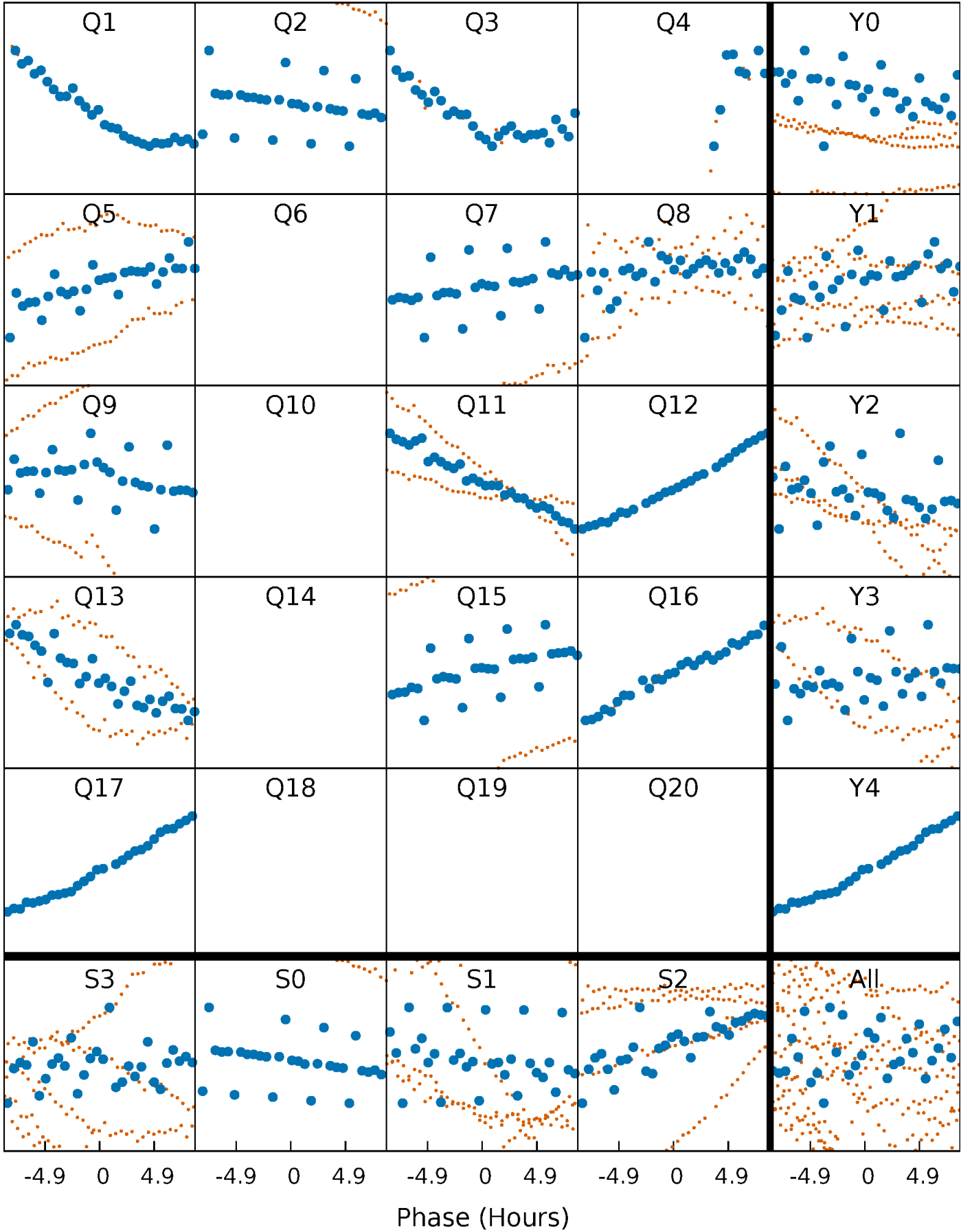


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

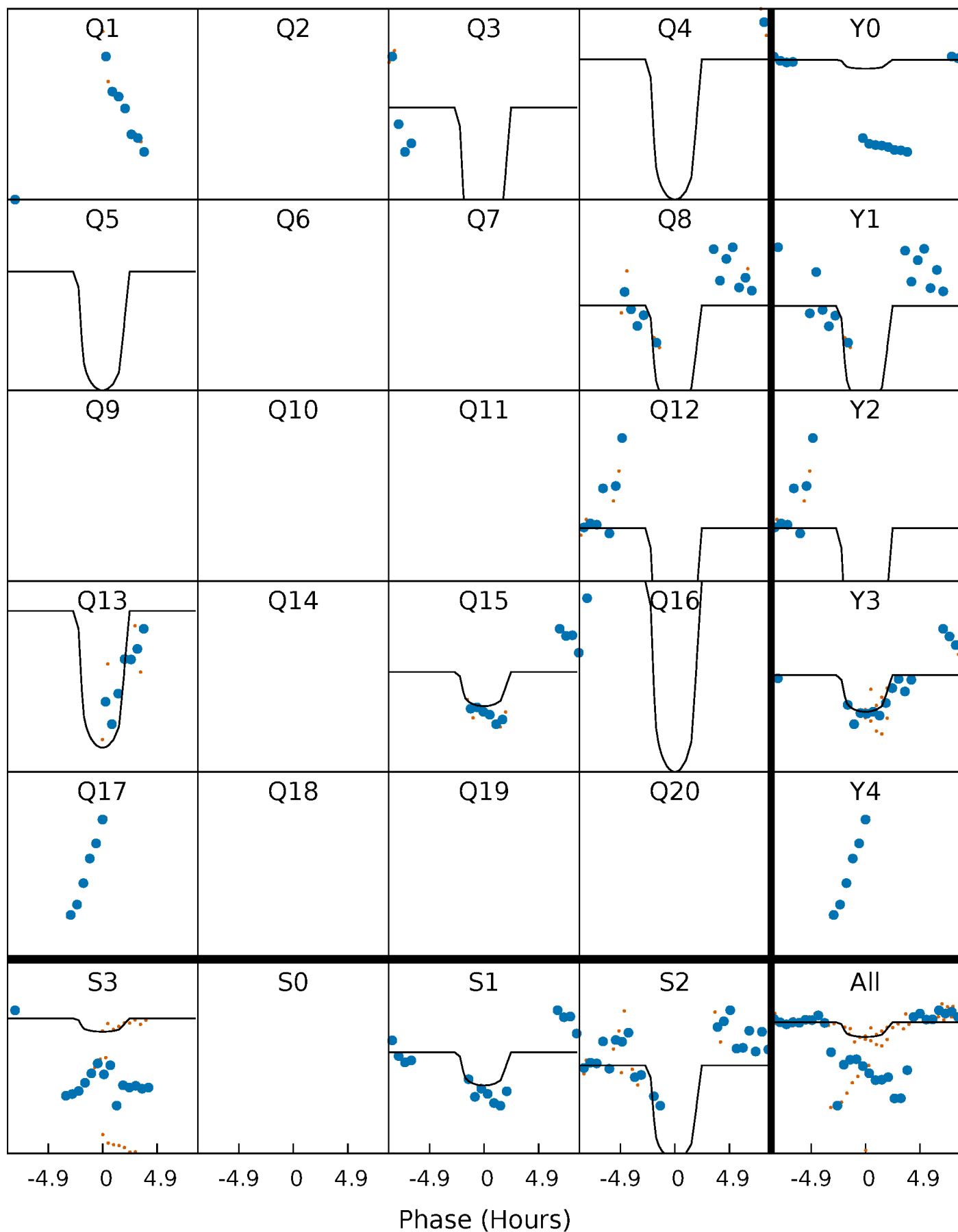
TCE 005115008-02   P= 48.954889 Days    $T_0=155.910338$  (BKJD)





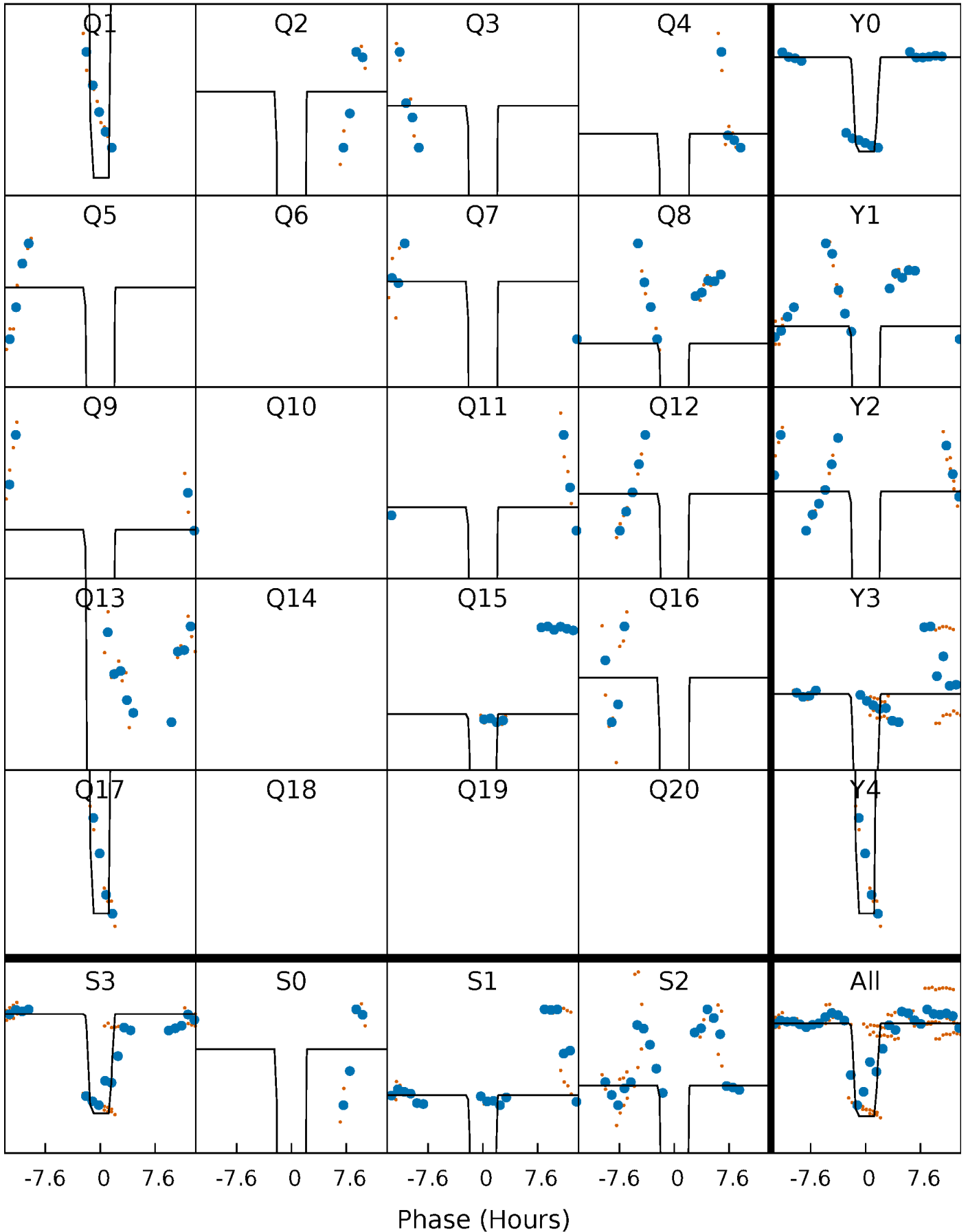
# DV Quarter-Phased Transit Curves

TCE 005115008-02 P= 48.954889 Days  $T_0=155.910338$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

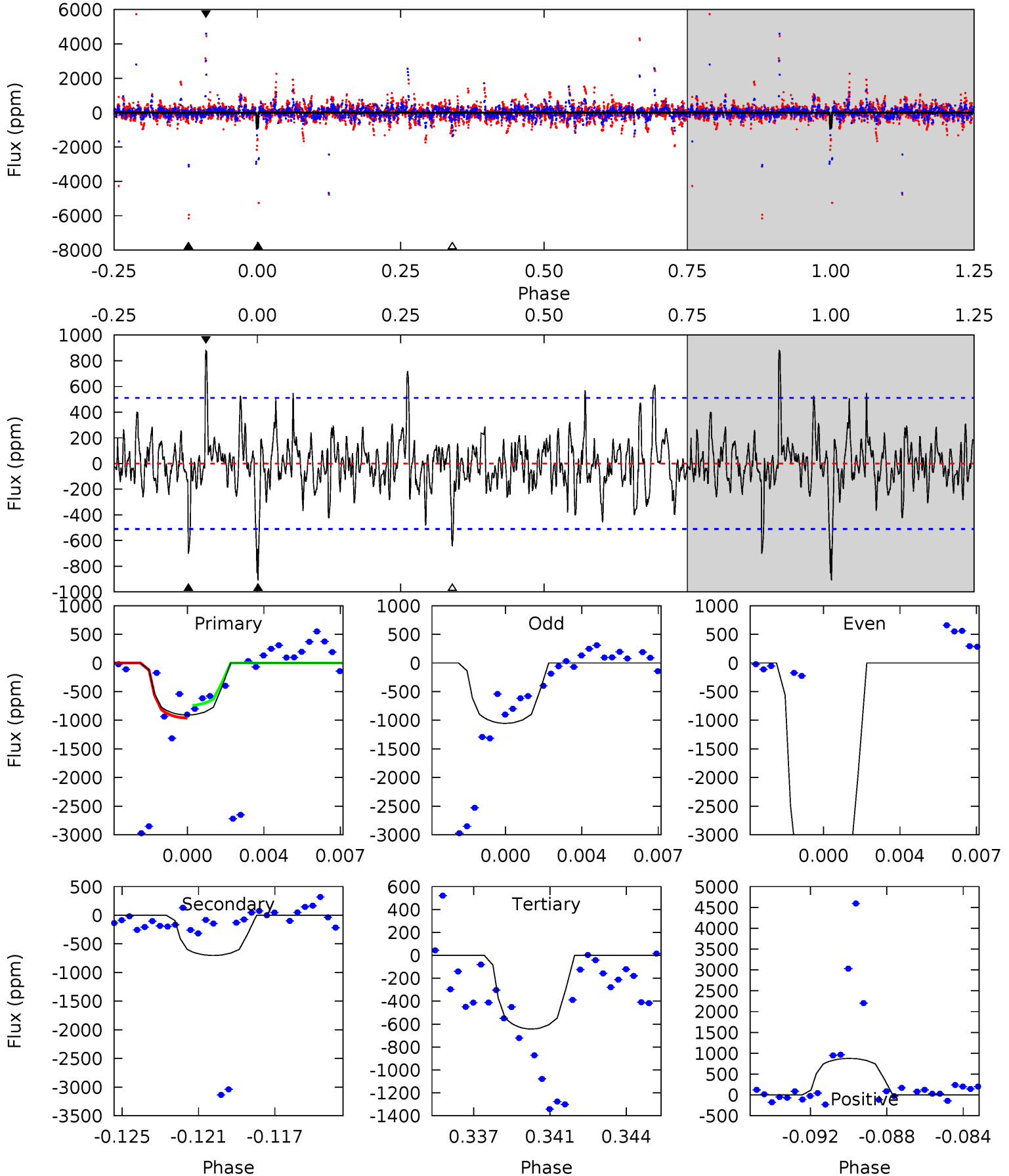
TCE 005115008-02 P= 48.948945 Days  $T_0=156.009054$  (BKJD)



# DV Model-Shift Uniqueness Test

005115008-02, P = 48.954889 Days, E = 106.955449 Days

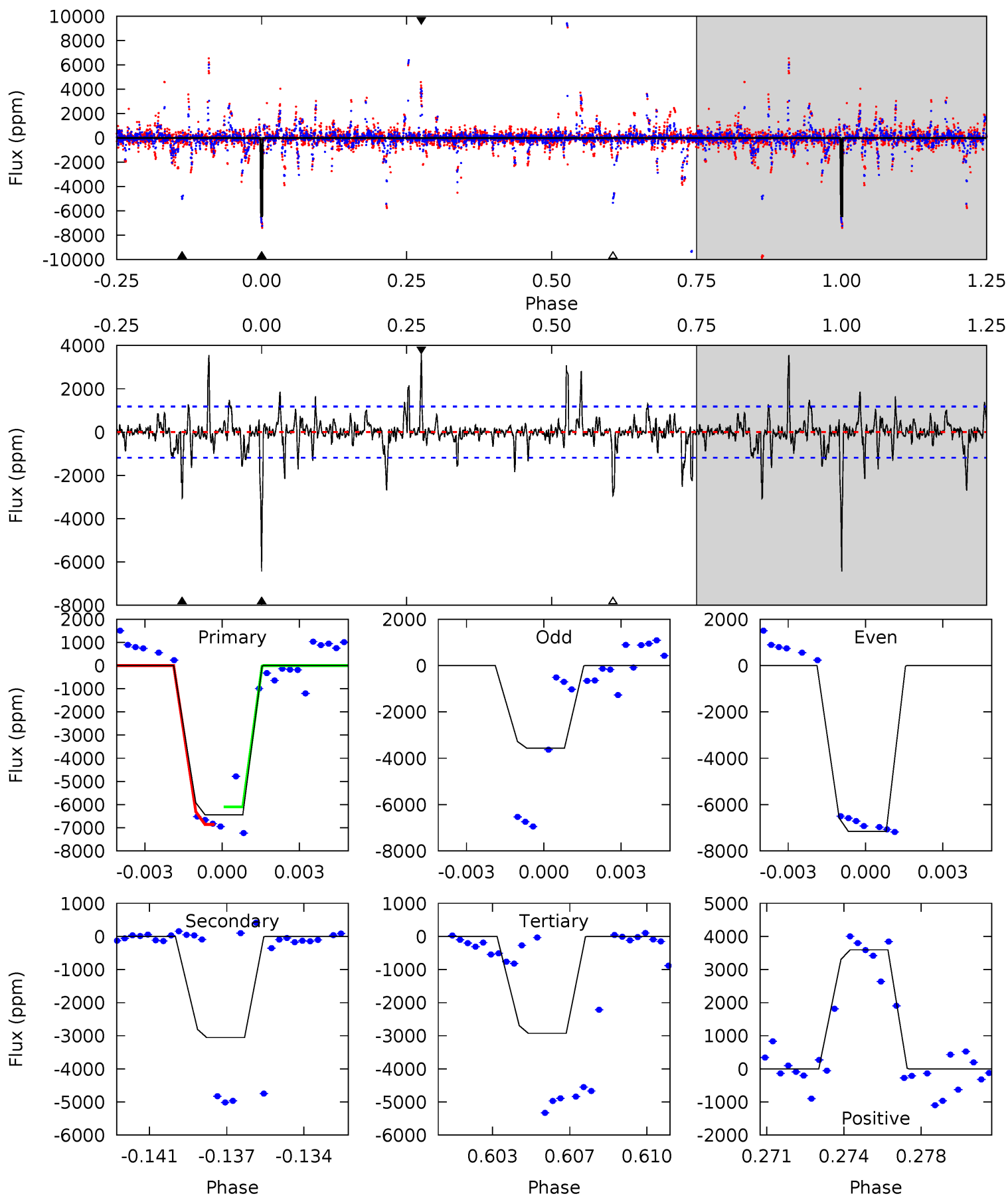
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.29	7.17	6.57	8.95	5.22	2.91	1.67	2.71	0.34	0.60	-1.78	12.1	2.50	0.49	1.13



# Alt Model-Shift Uniqueness Test

005115008-02, P = 48.948945 Days, E = 107.060109 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
28.5	13.5	13.0	15.9	5.23	2.93	2.33	15.5	12.6	0.56	-2.38	6.44	0.96	0.36	0



### Stellar Parameters For KIC 005115008

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$5825^{+76}_{-81}$	$4.504^{+0.020}_{-0.080}$	$0.210^{+0.150}_{-0.200}$	$0.965^{+0.094}_{-0.047}$	$1.083^{+0.038}_{-0.082}$	$1.699^{+0.164}_{-0.410}$
	+1%/-1%	+0%/-2%	+71%/-95%	+10%/-5%	+4%/-8%	+10%/-24%
Source	SPE68	SPE68	SPE68	DSEP		

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

### Secondary Eclipse Parameters for KIC 005115008-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-702 \pm 98$	$5.71^{+5.52}_{-3.82}$	$687^{+18}_{-14}$	$4331^{+2862}_{-897}$	$812^{+6622}_{-597}$
Alt.	$-3055 \pm 226$	$9.61^{+7.41}_{-5.65}$	$688^{+17}_{-16}$	$4680^{+2483}_{-846}$	$1274^{+6499}_{-860}$

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

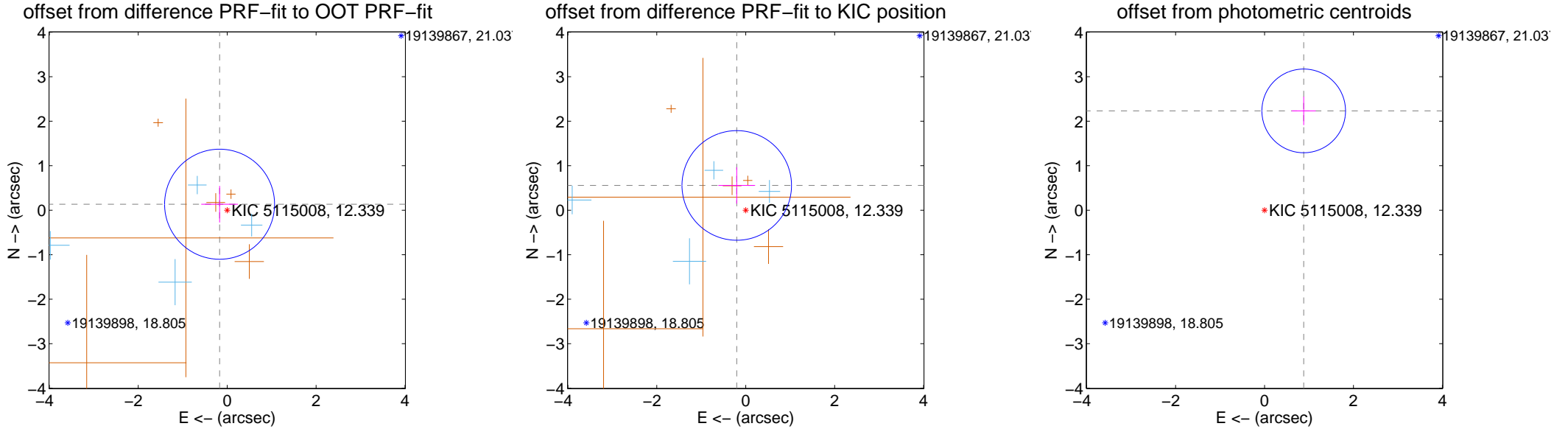
## DV Centroid Data

Supplemental centroid analysis for 005115008-02. Kepler magnitude: 12.34. Transit SNR 4.21

There are 4 quarters with good PRF difference image offsets

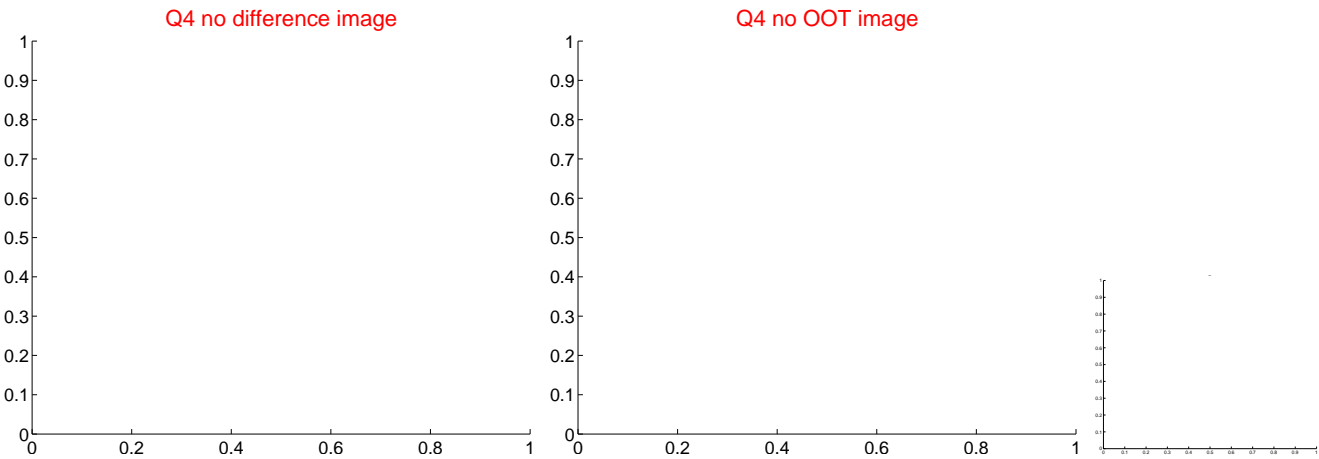
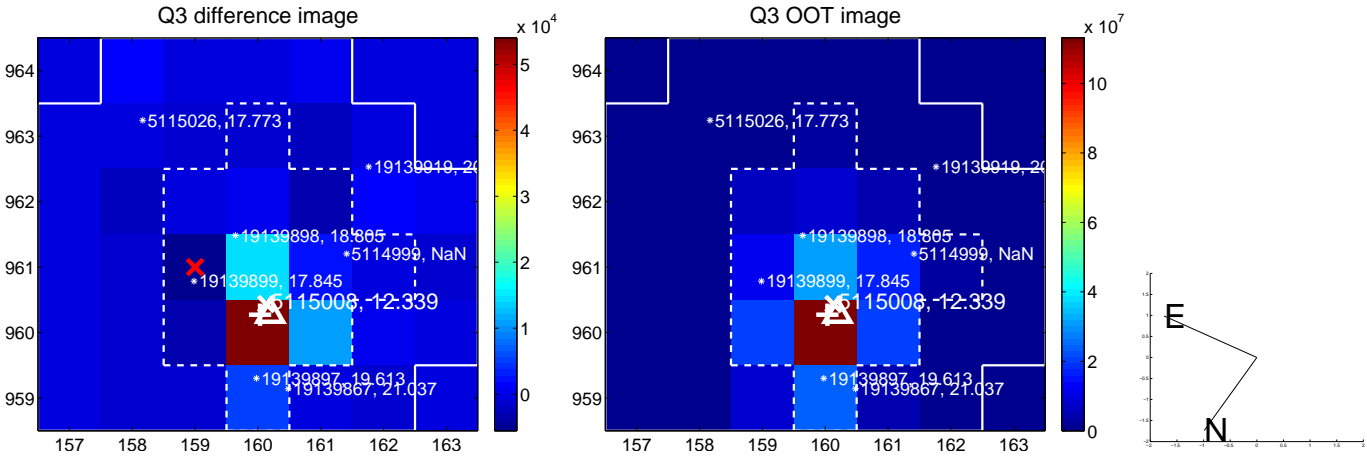
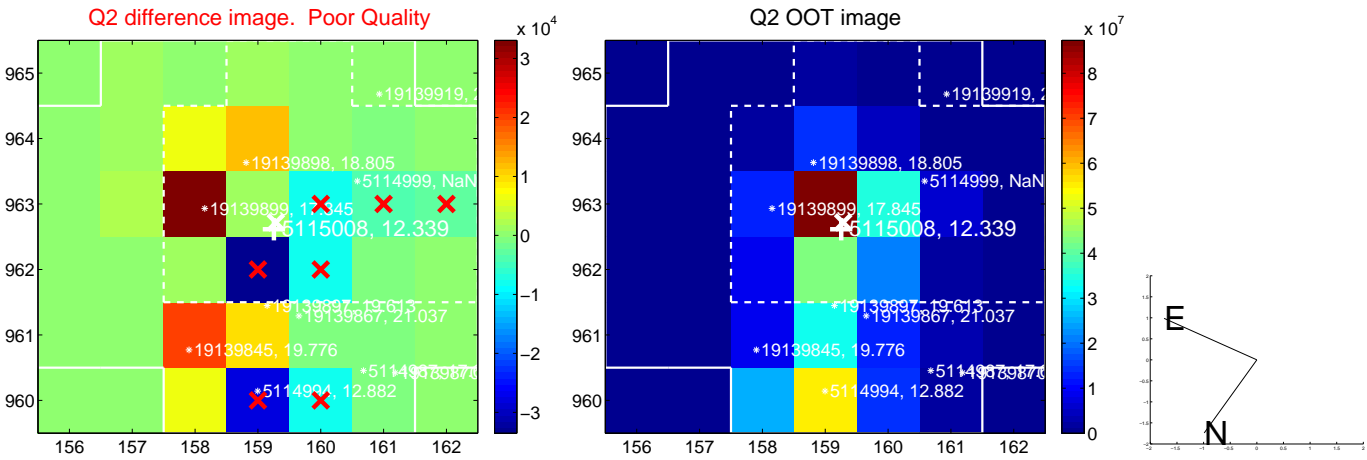
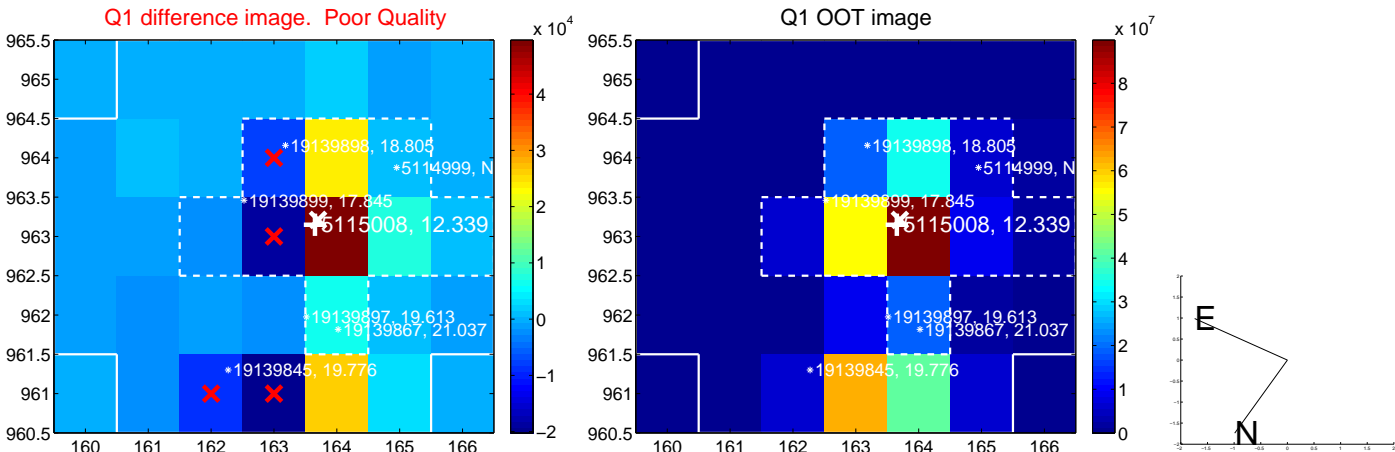
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.217 \pm 0.412$	0.53	$0.171 \pm 0.414$	$0.134 \pm 0.410$
PRF-fit source offset from KIC position	$0.592 \pm 0.411$	1.44	$0.202 \pm 0.414$	$0.556 \pm 0.410$
photometric centroid source offset	$2.40 \pm 0.31$	7.65	$-0.88 \pm 0.27$	$2.23 \pm 0.32$



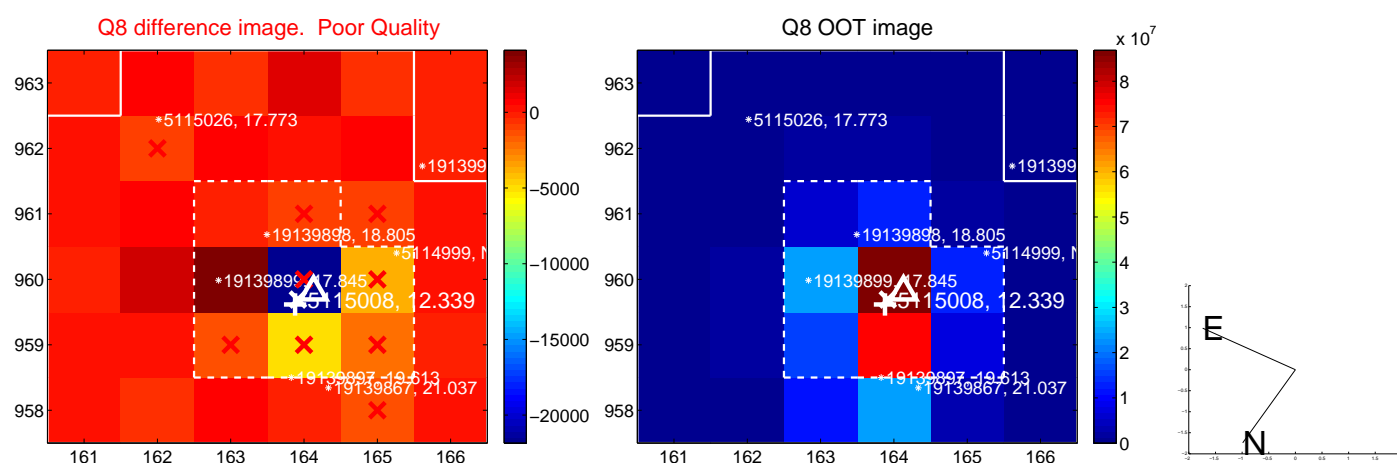
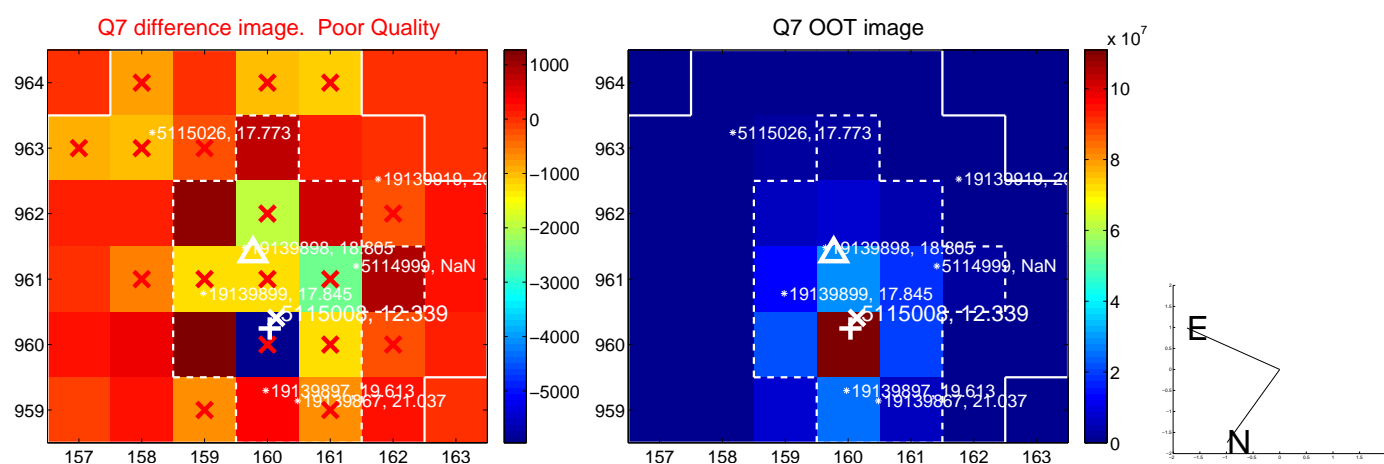
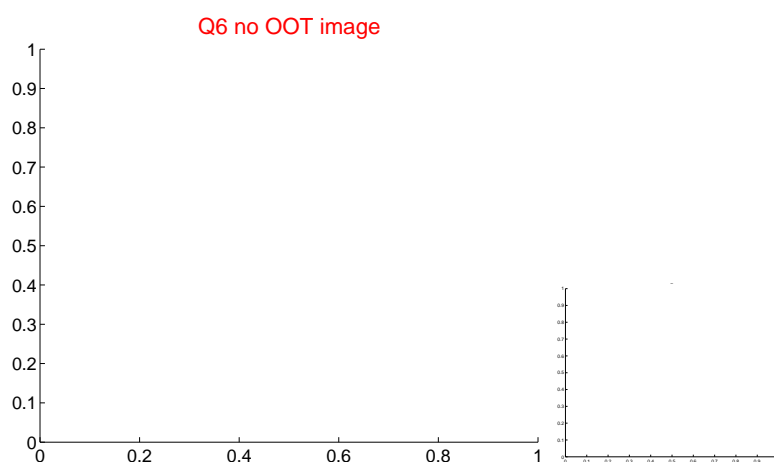
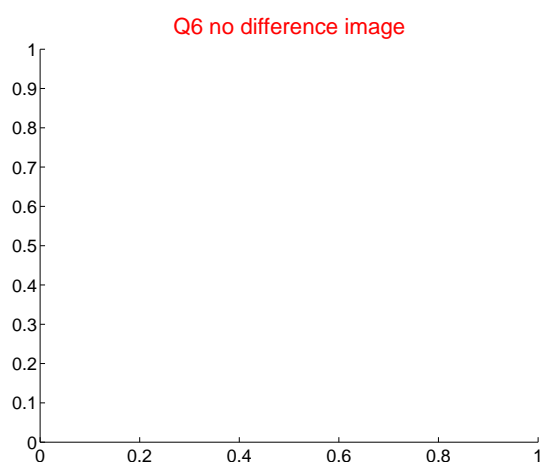
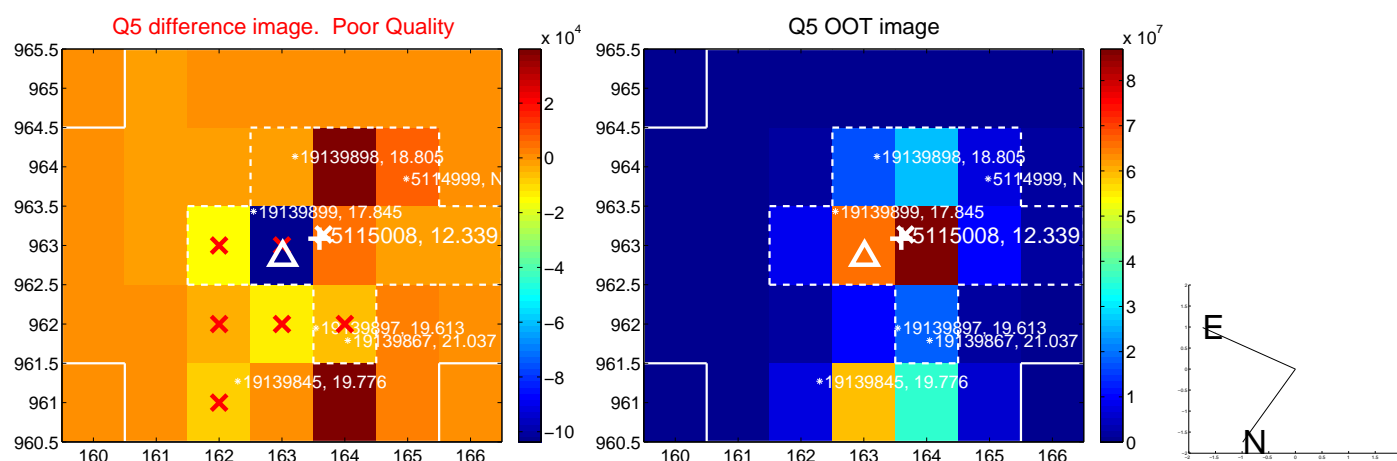
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

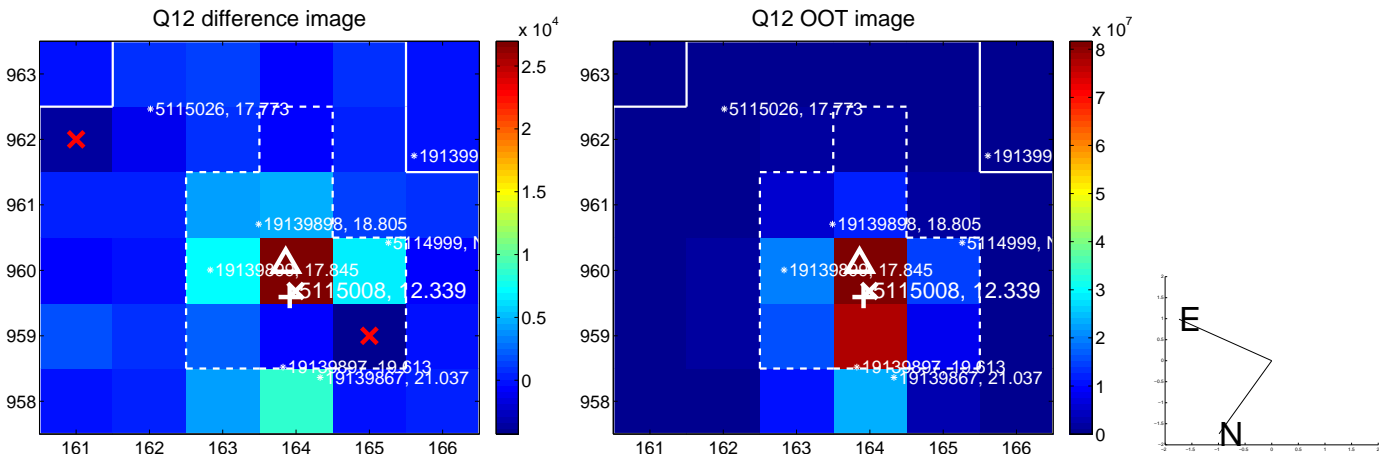
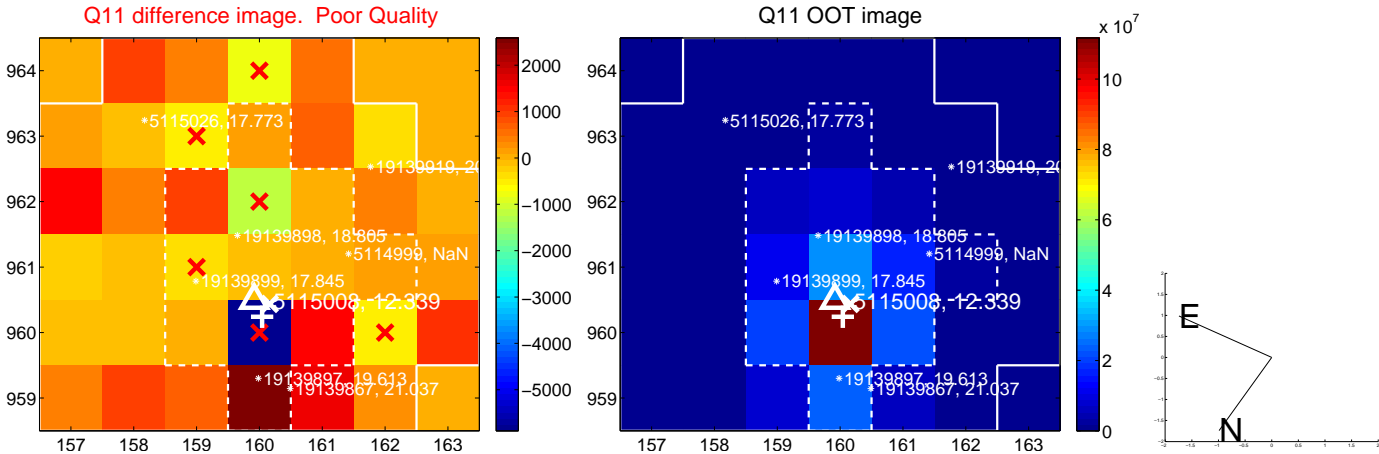
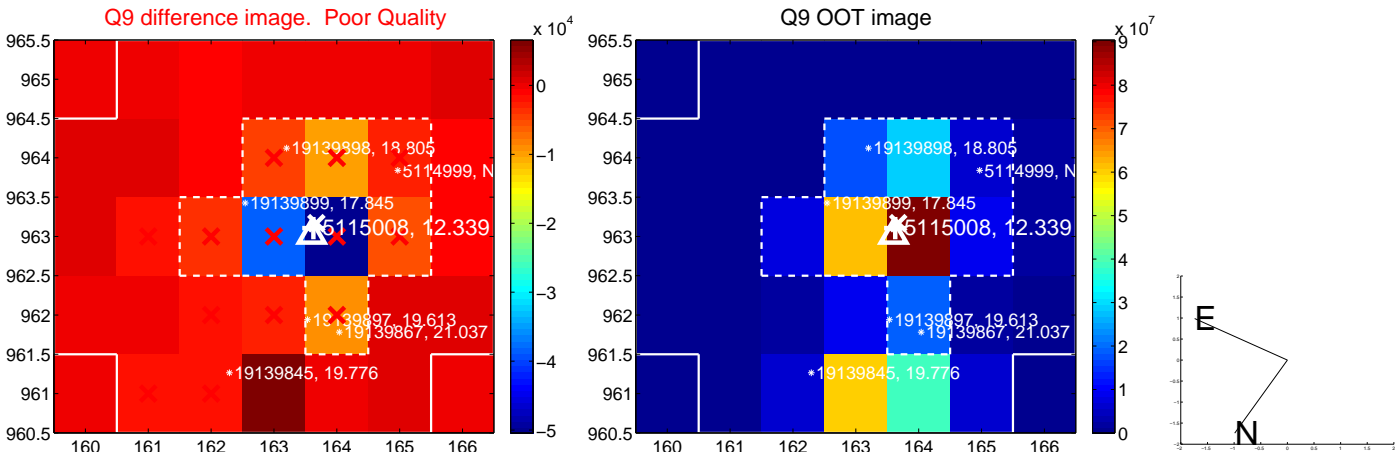




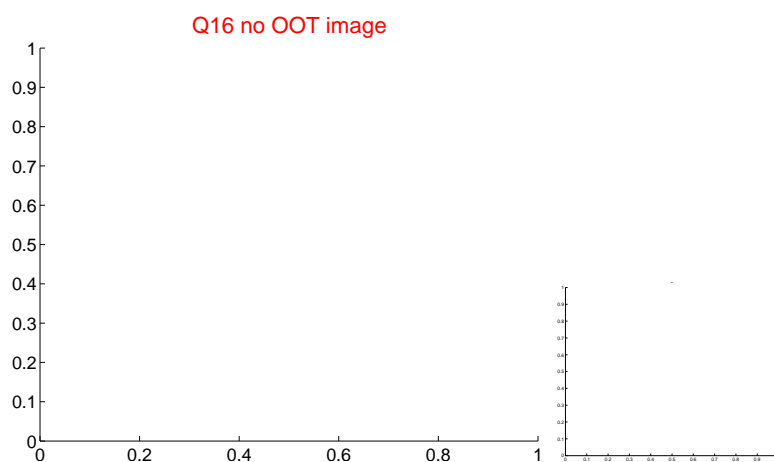
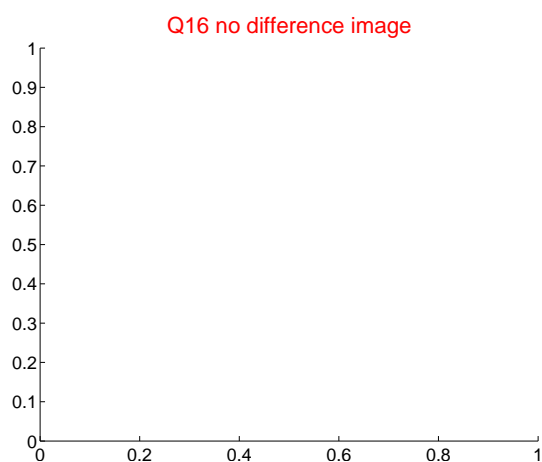
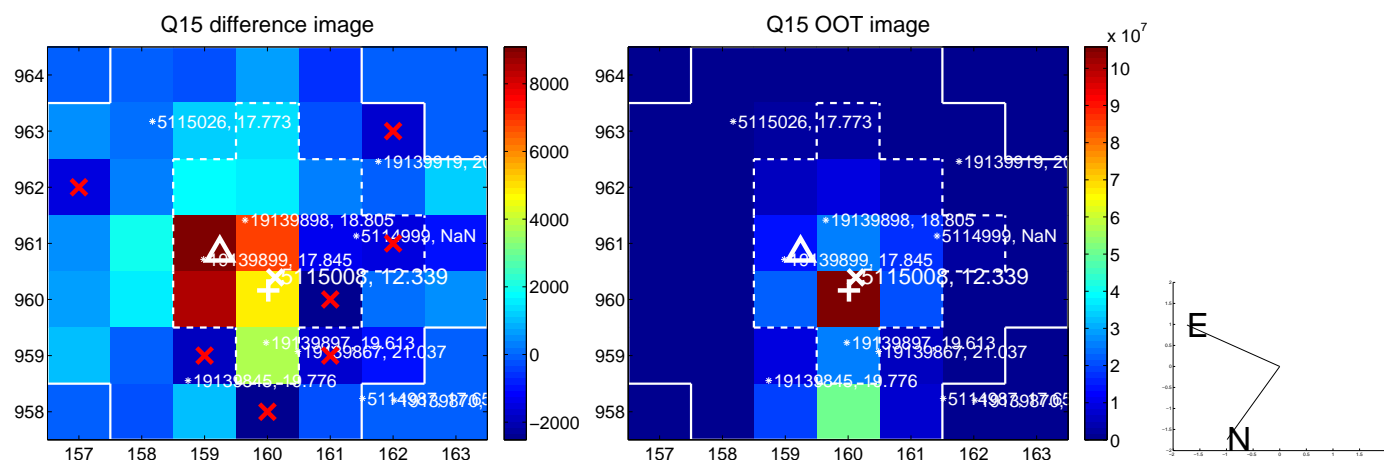
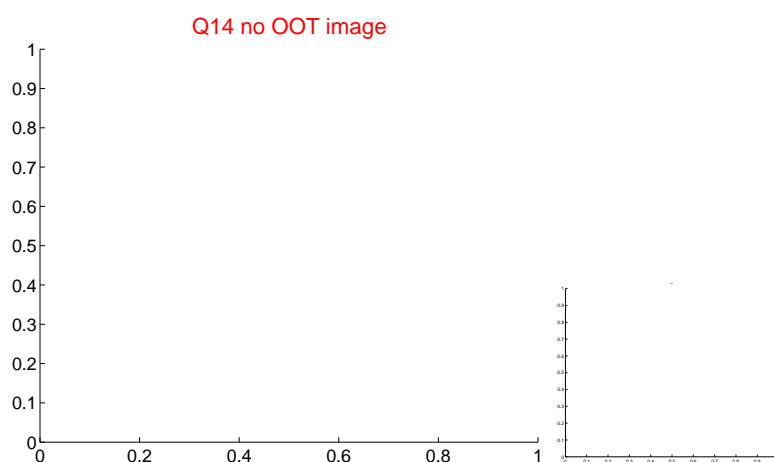
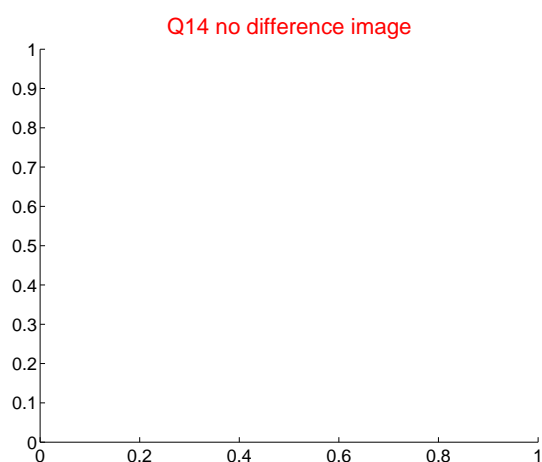
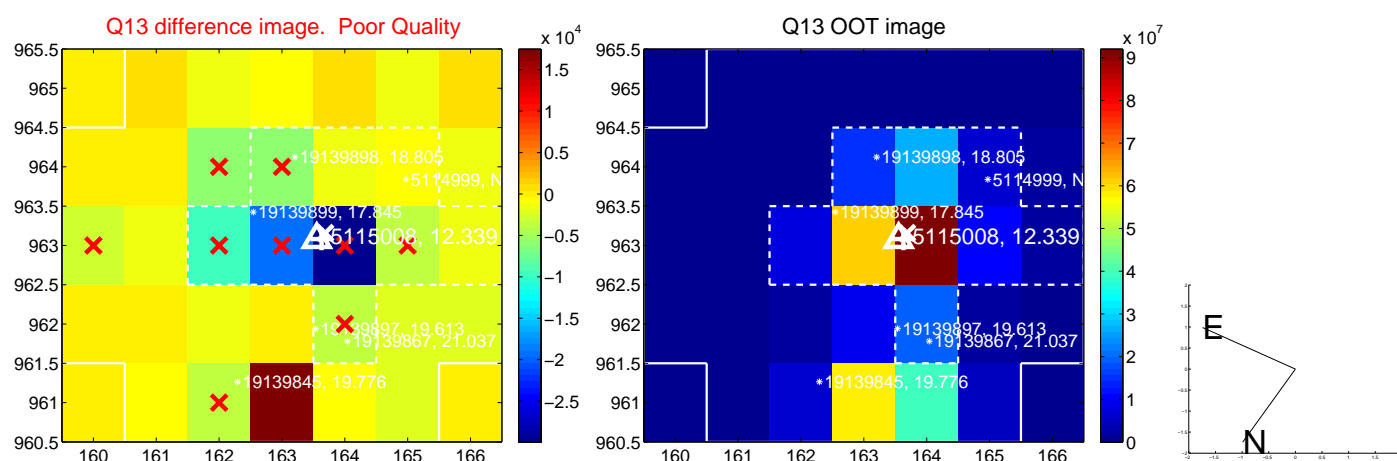
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



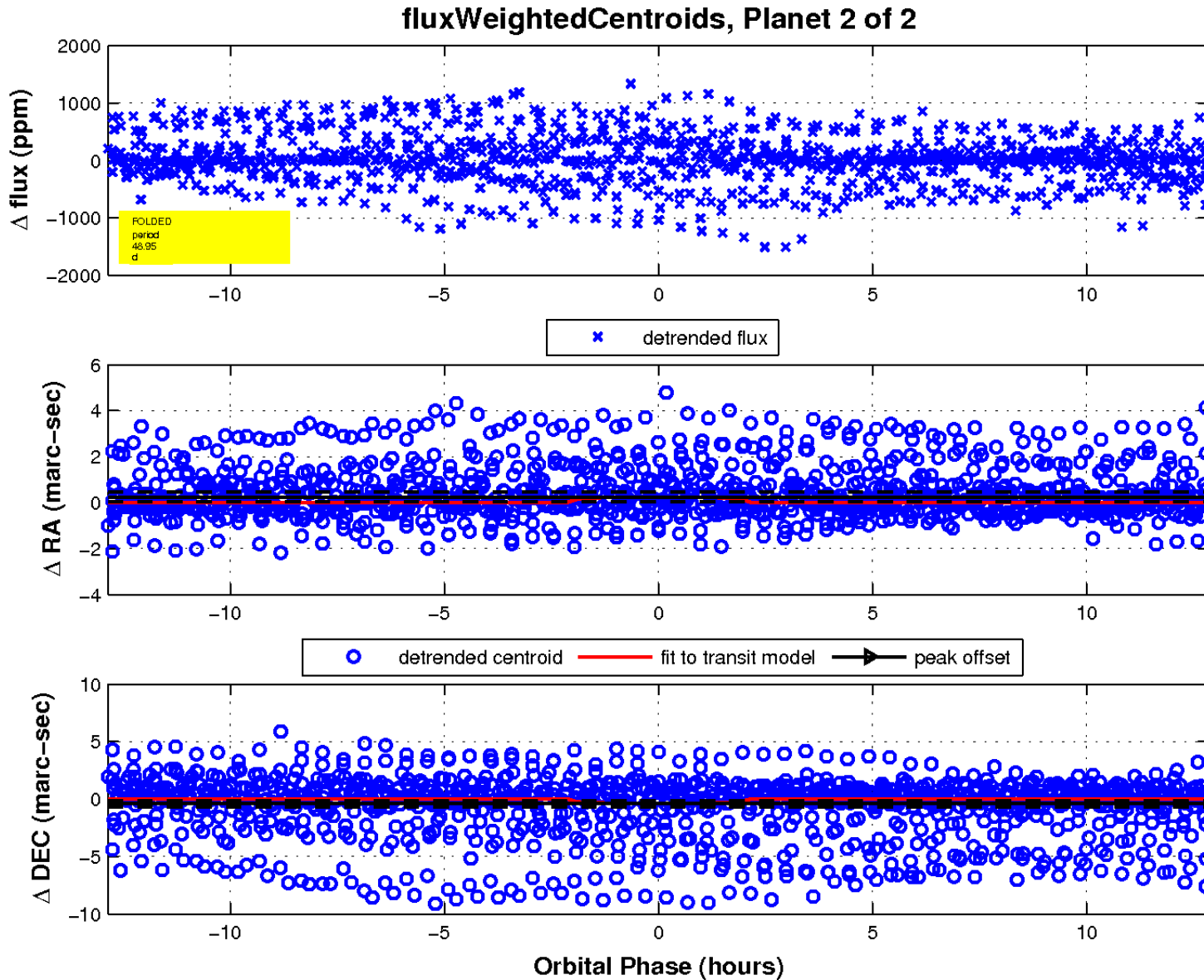
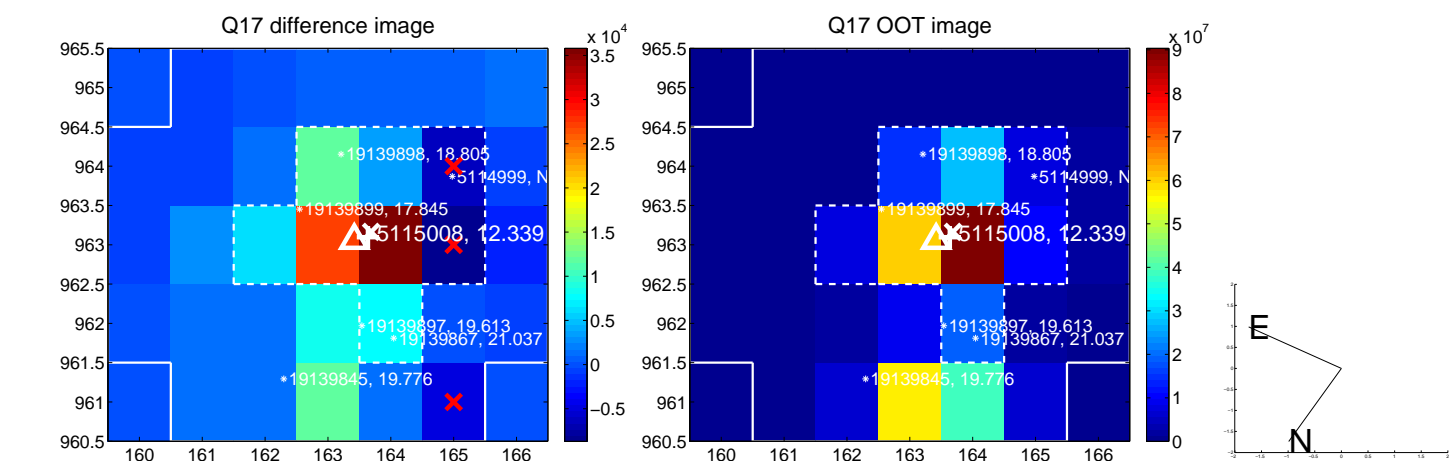
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

