

# KIC 005121915

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005121915-01	OBS	No	449.210680	558.809216	7349.1	15.052	24.6	22.8	1.59	6568	24.38	2.62
005121915-02	OBS	No	482.963675	489.749784	363.0	2.756	17.5	4.2	1.59	6568	3.44	2.38
005121915-03	OBS	No	454.973647	187.723717	506.1	7.500	17.2	-1.0	1.59	6568	3.61	2.58
005121915-04	OBS	No	413.119379	216.387643	5726.2	14.939	15.5	15.1	1.59	6568	21.67	2.93
005121915-05	OBS	No	494.219705	146.924709	398.9	7.500	14.1	-1.0	1.59	6568	3.20	2.31

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005121915-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
005121915-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
005121915-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

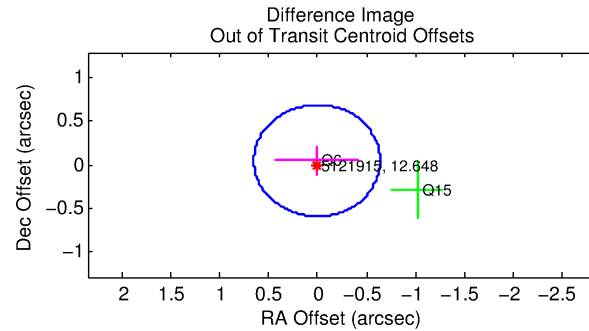
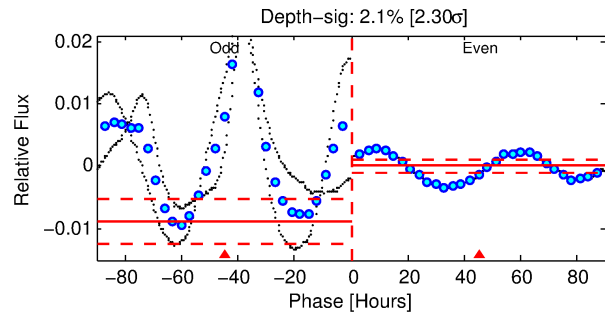
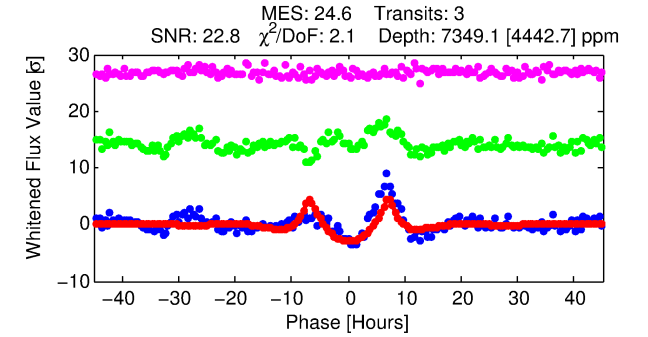
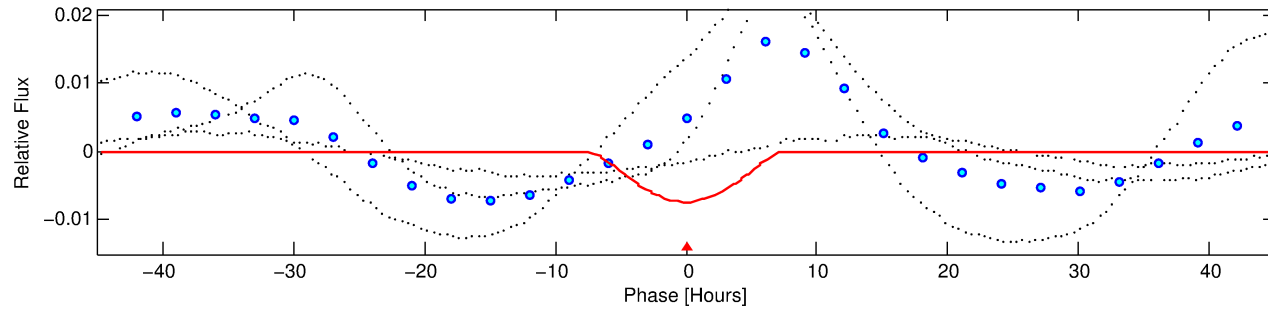
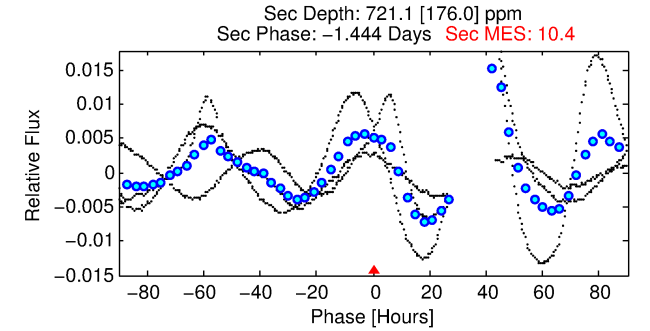
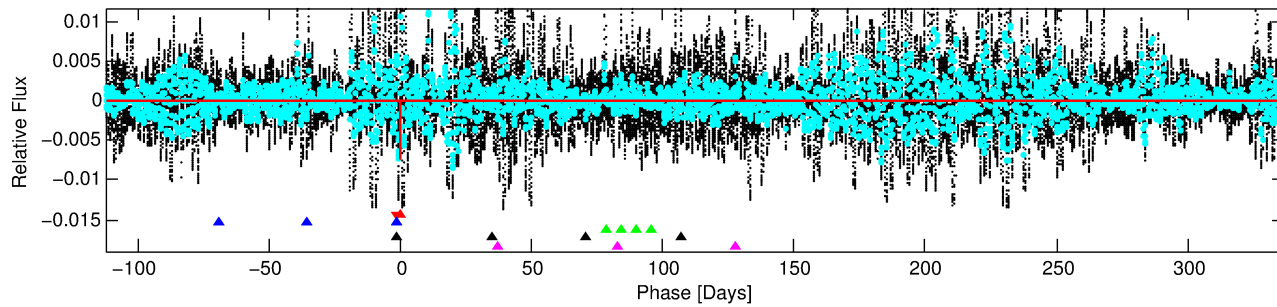
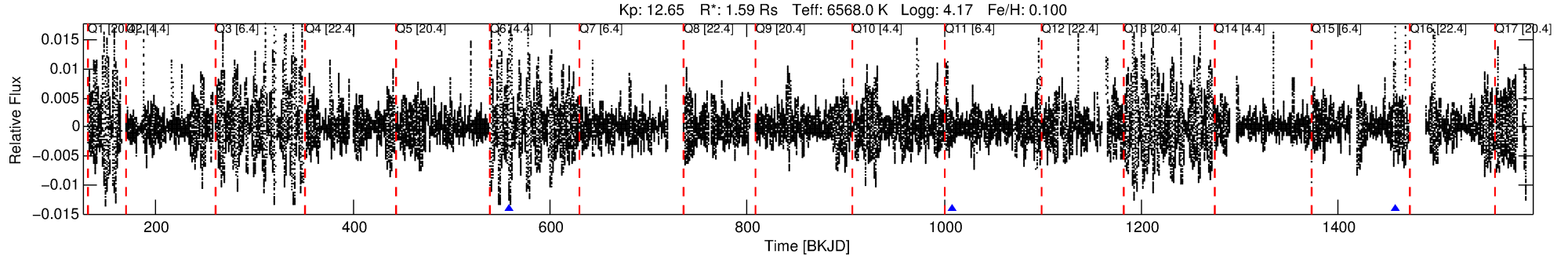
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005121915-01

No Significant Match Found

# DV One-Page Summary

KIC: 5121915 Candidate: 1 of 5 Period: 449.211 d



## DV Fit Results:

Period = 449.21068 [0.00491] d  
Epoch = 558.8092 [0.0066] BKJD  
Rp/R\* = 0.1401 [0.0684]  
a/R\* = 124.84 [9.59]  
b = 1.00 [0.04]  
Seff = 2.62 [1.07]  
Teq = 324 [33] K  
Rp = 24.38 [14.46] Re  
a = 1.2721 [0.3452] AU  
Ag = 1079.77 [1160.40] [0.93σ]  
T<sub>eff</sub> = 2876 [732] K [3.48σ]

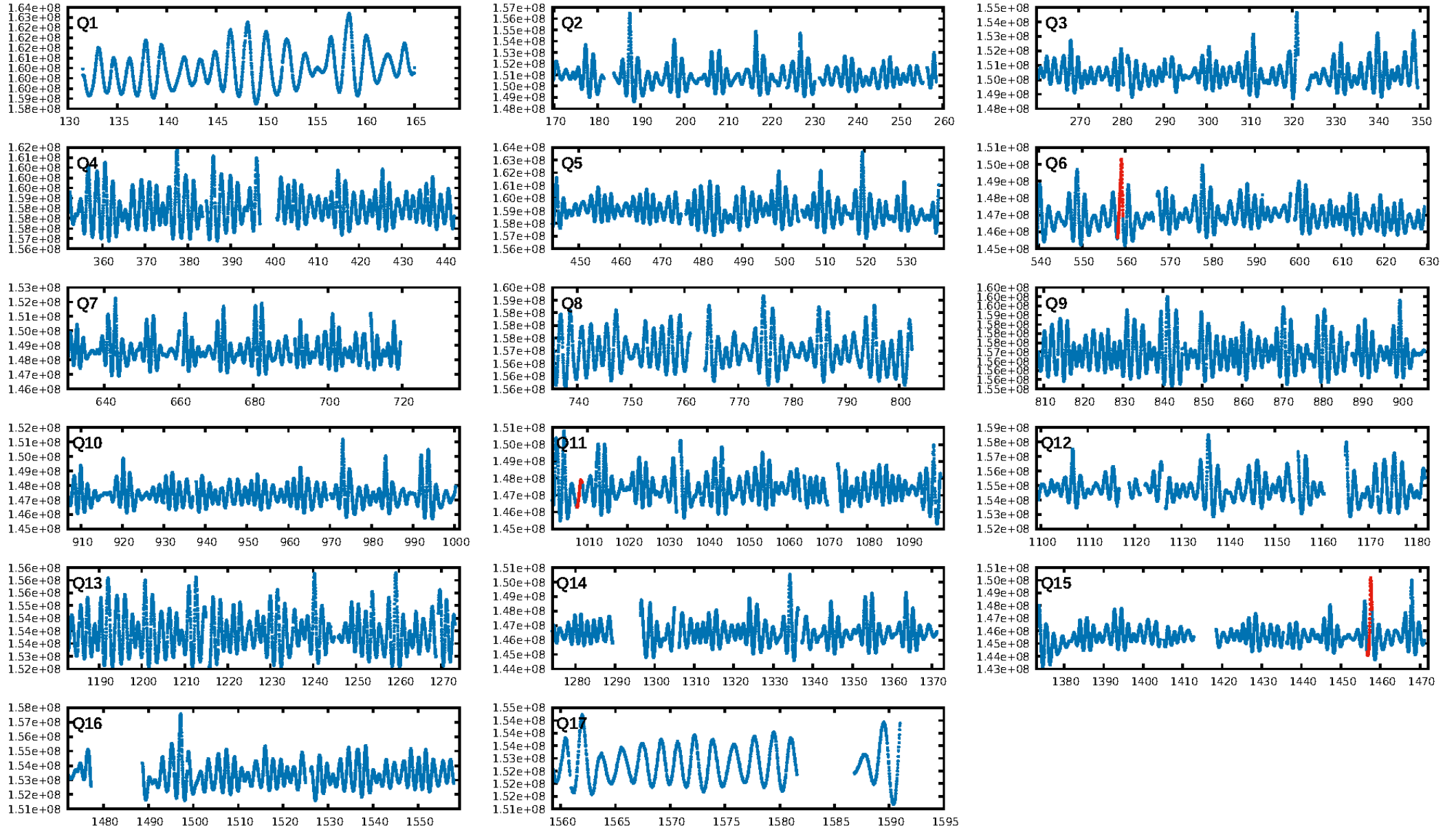
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [40.85σ]  
LongPeriod-sig: 100.0% [8.22σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 4.791  
Centroid-sig: 16.3%  
Centroid-so: 0.190 arcsec [2.96σ]  
OotOffset-rm: 0.046 arcsec [0.22σ]  
KicOffset-rm: 0.090 arcsec [0.21σ]  
OotOffset-st: 1/1/0/0 [2]  
KicOffset-st: 1/1/0/0 [2]  
DiffImageQuality-fgm: 0.00 [0/2]  
DiffImageOverlap-fno: 1.00 [2/2]

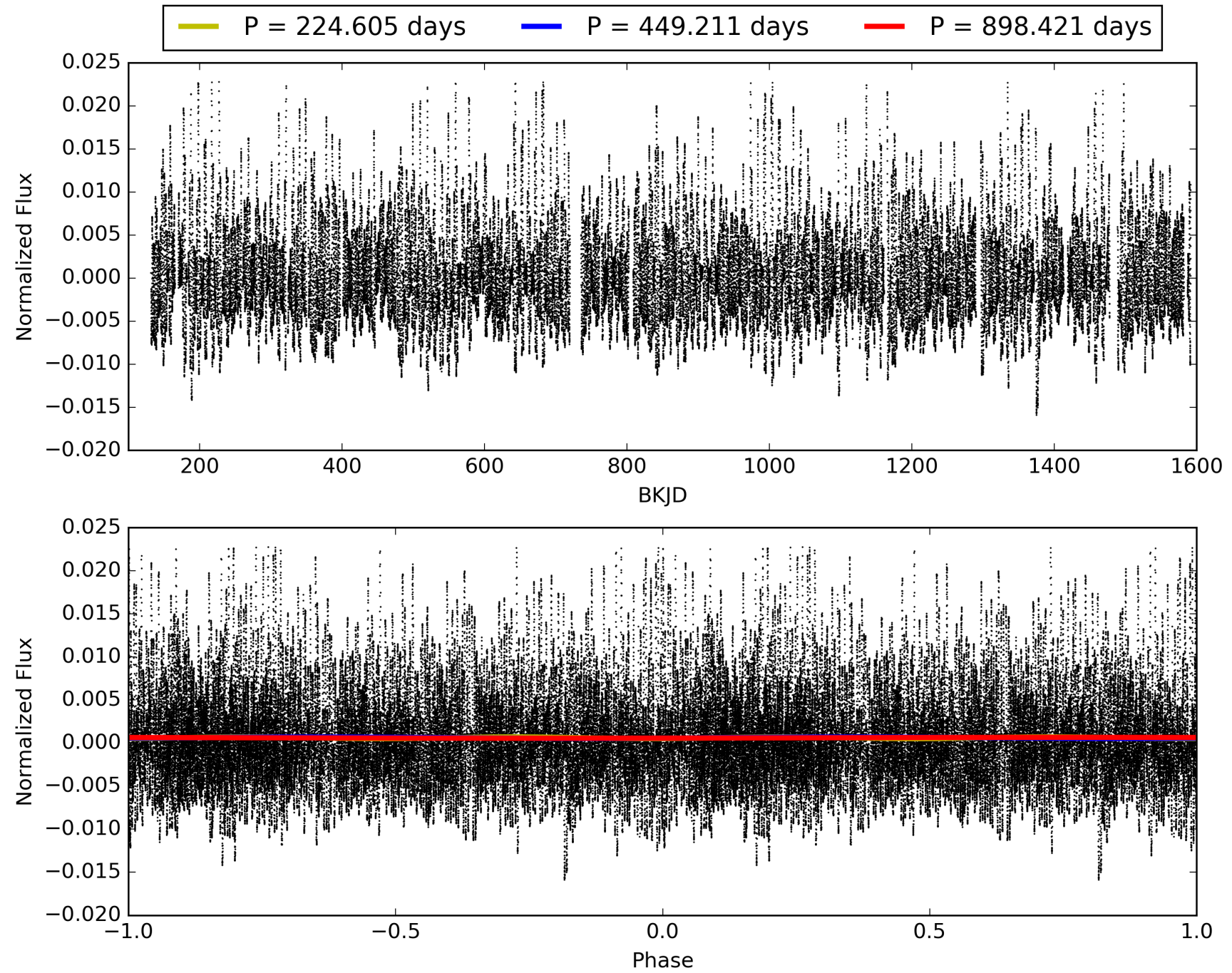
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:12:20 Z

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

# TCE 005121915-01, PDC Light Curves



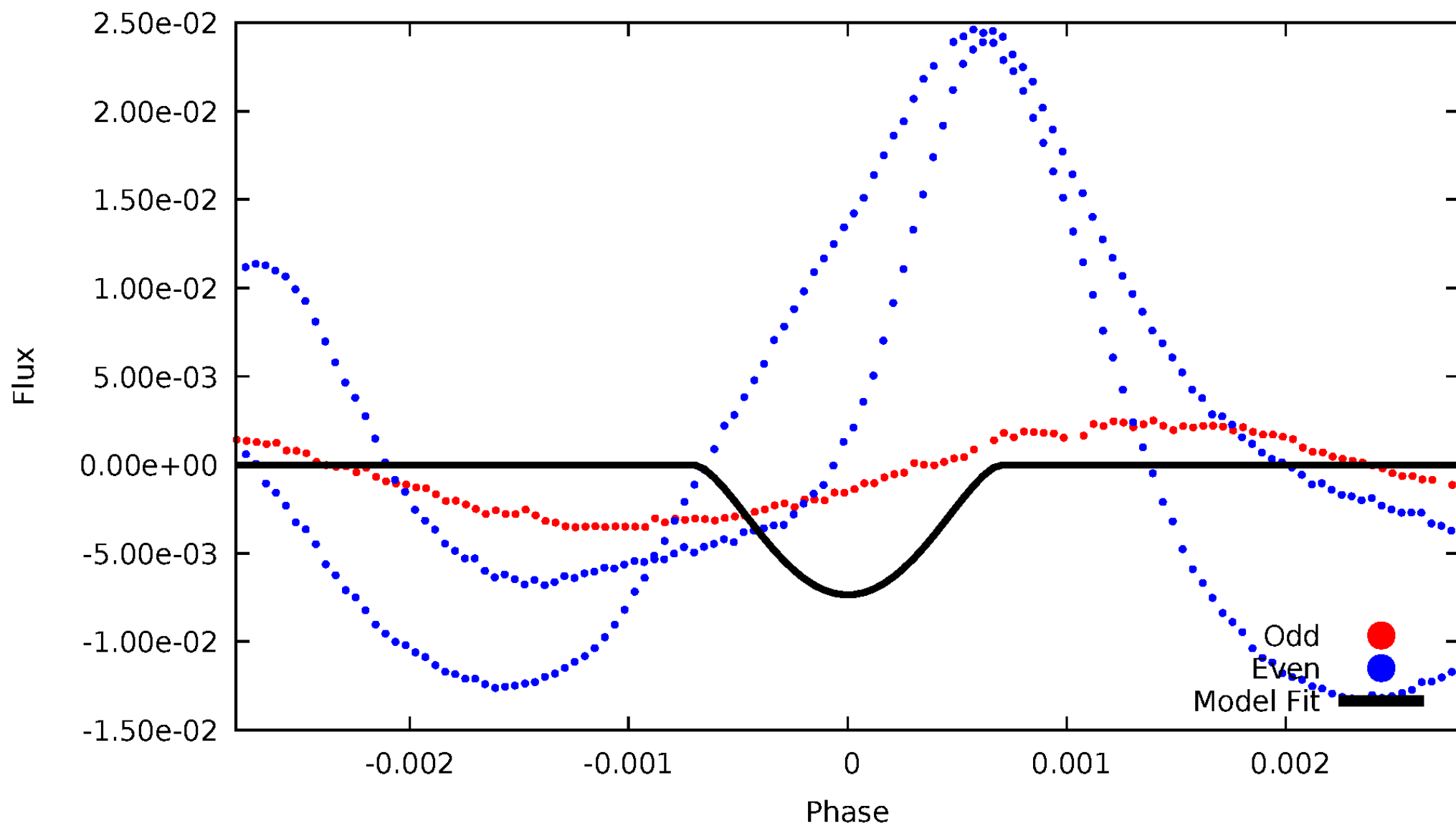
TCE 005121915-01





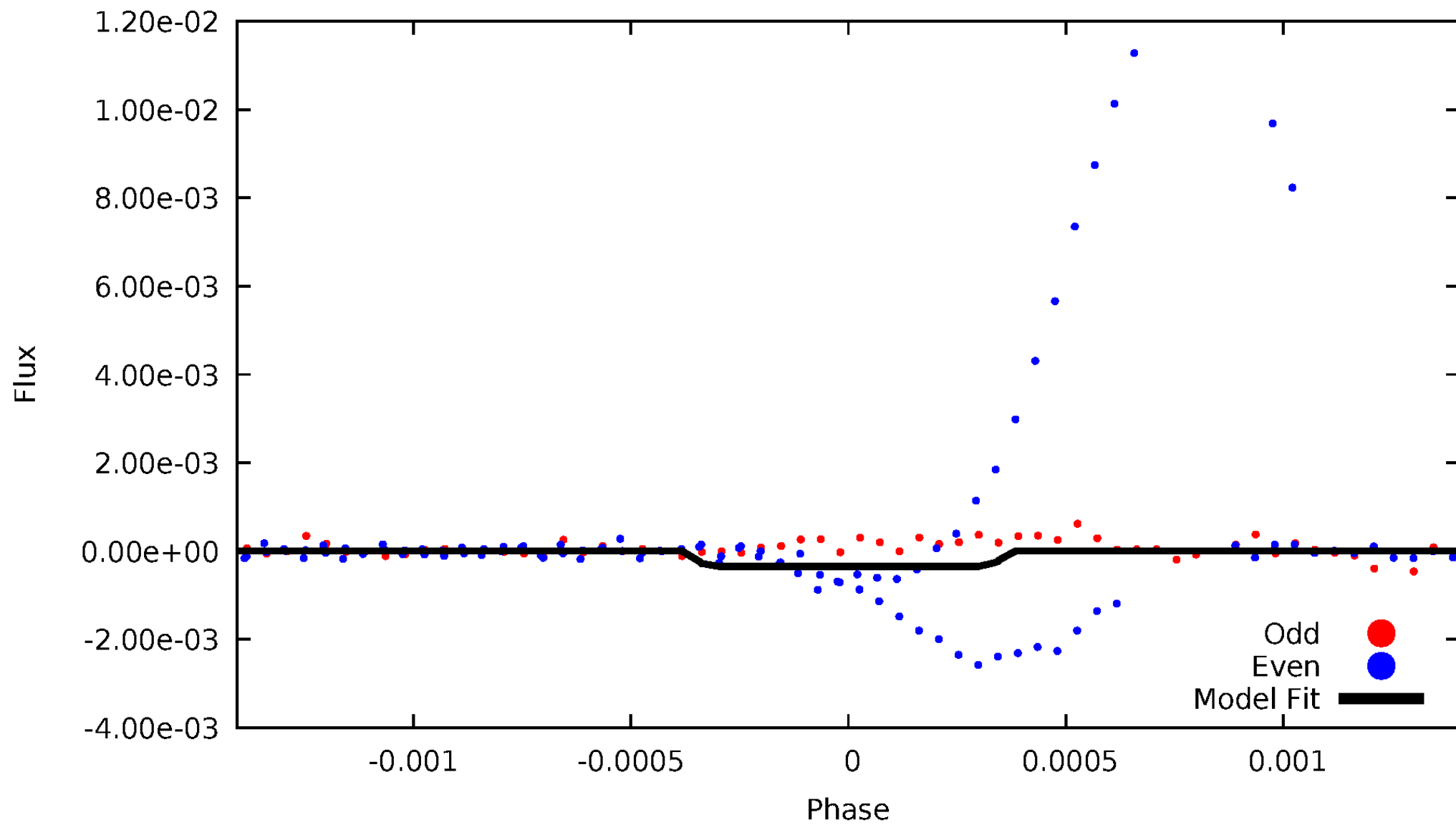
# DV Odd/Even

TCE 005121915-01



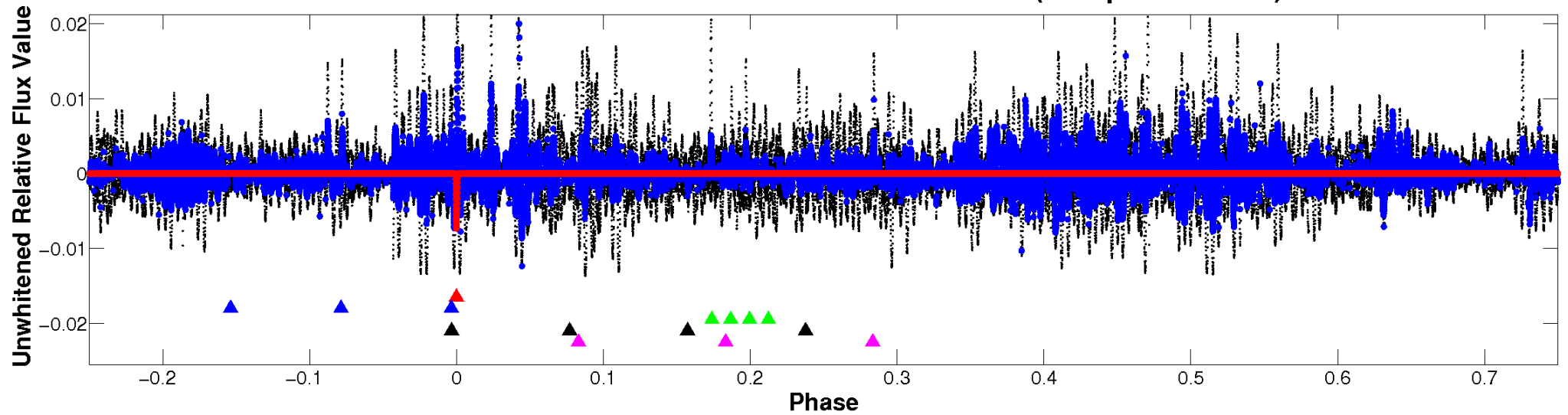
# ALT Odd/Even

TCE 005121915-01

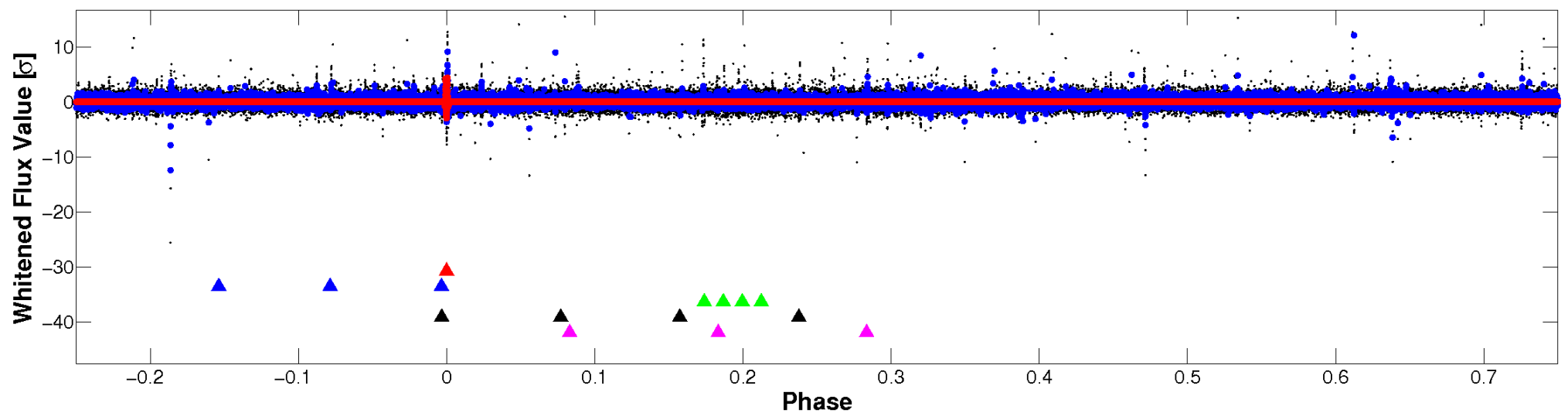


# Non-Whitened Vs. Whitened Light Curve

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

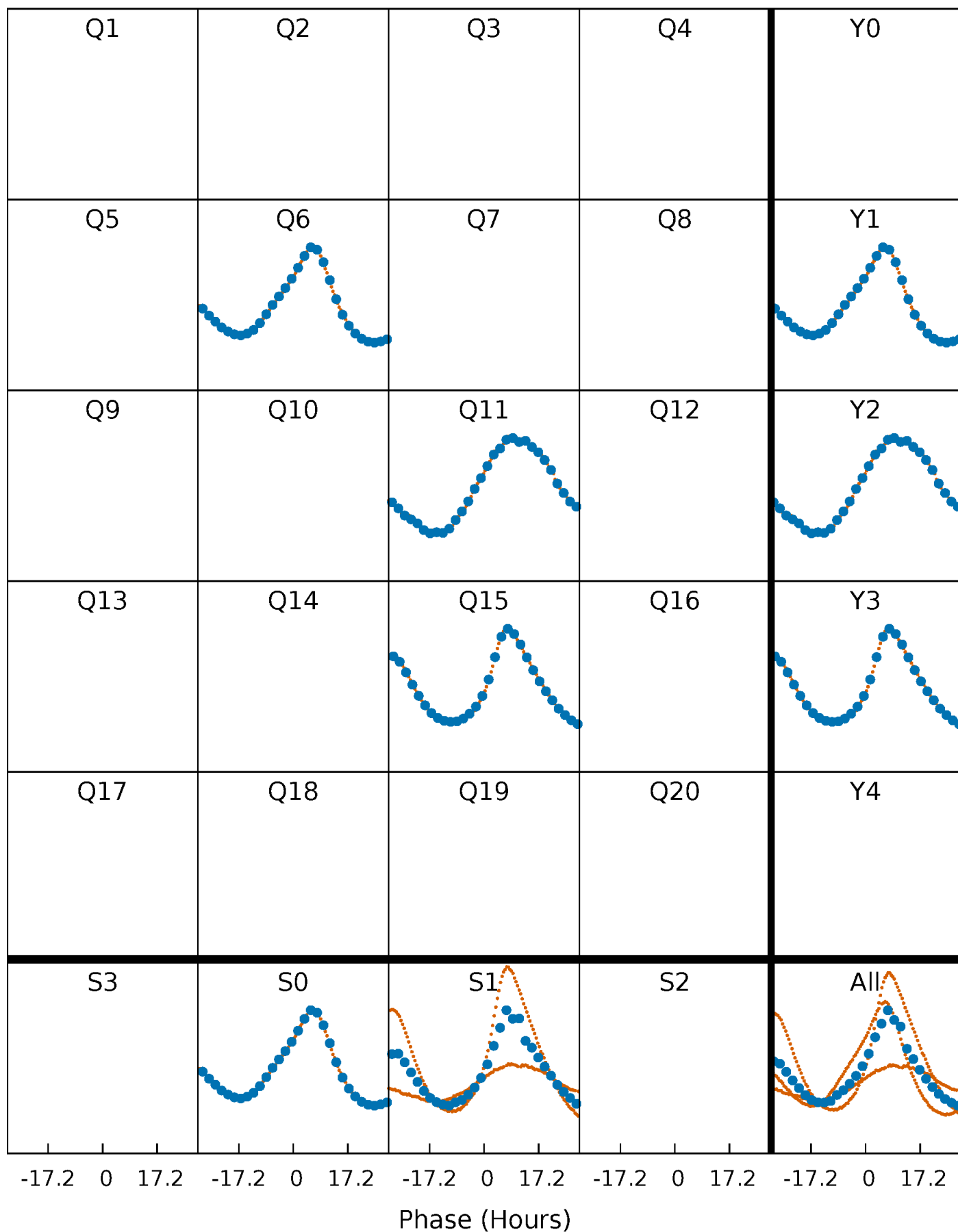


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

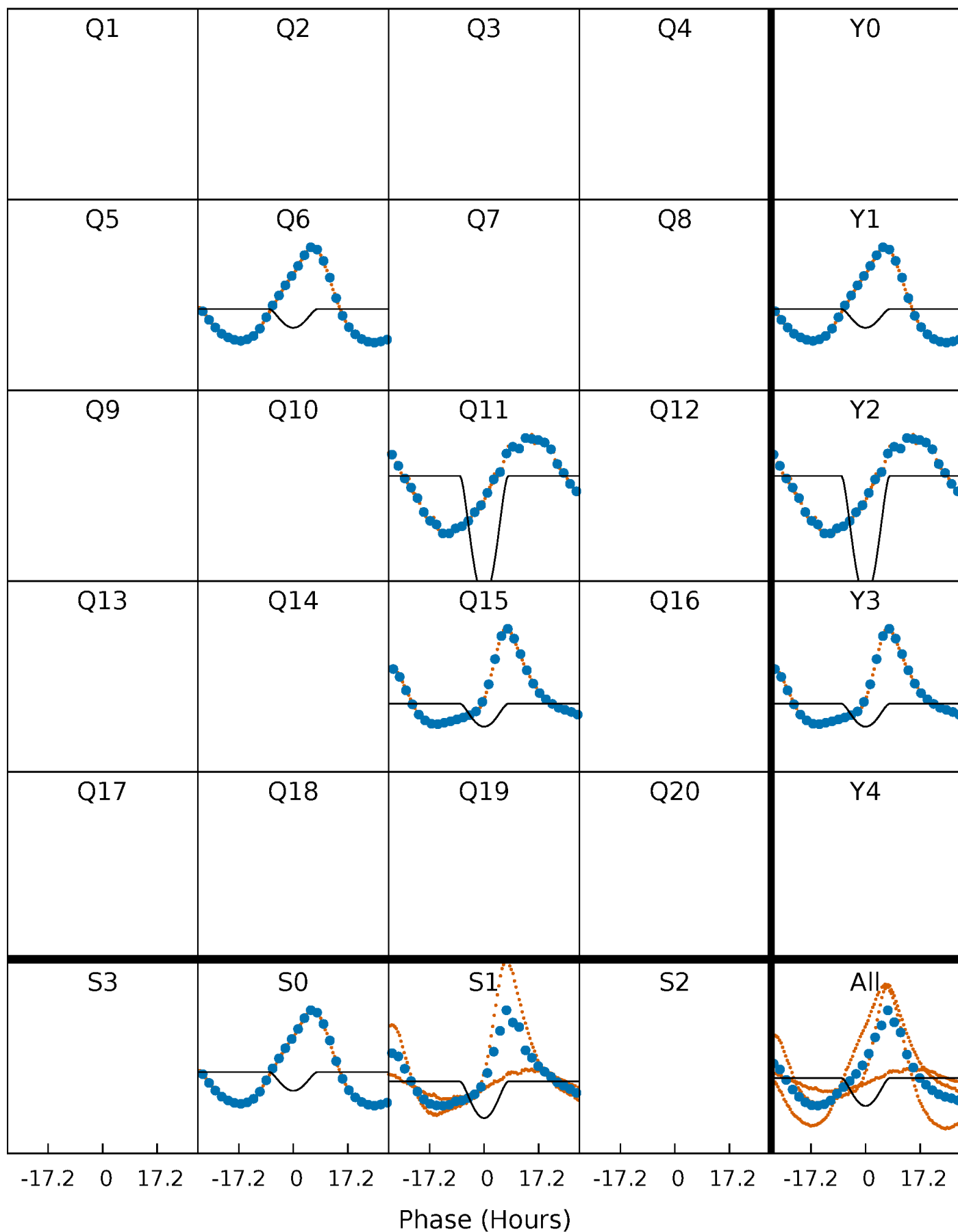
TCE 005121915-01 P=449.210680 Days  $T_0=558.809216$  (BKJD)





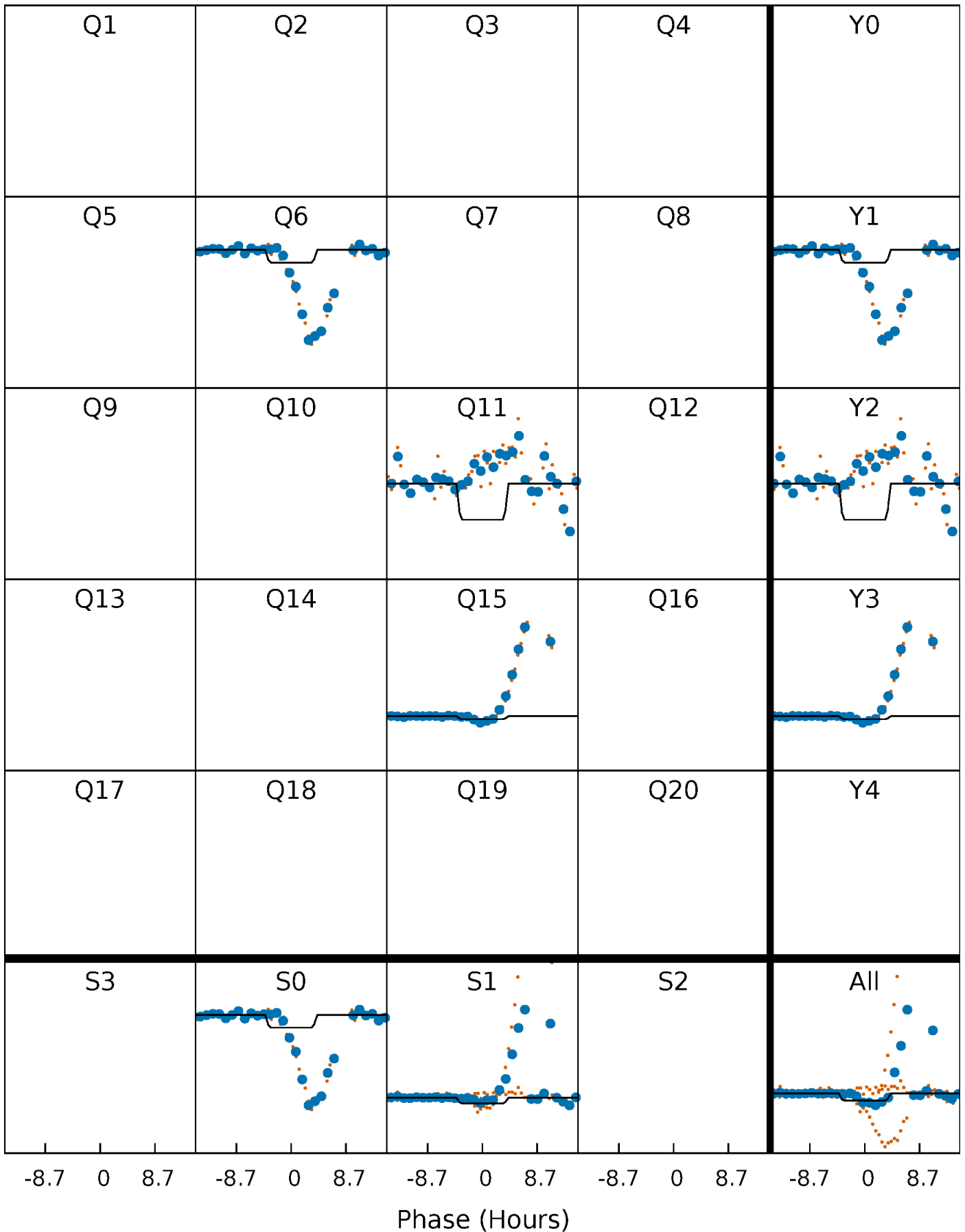
# DV Quarter-Phased Transit Curves

TCE 005121915-01 P=449.210680 Days  $T_0=558.809216$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

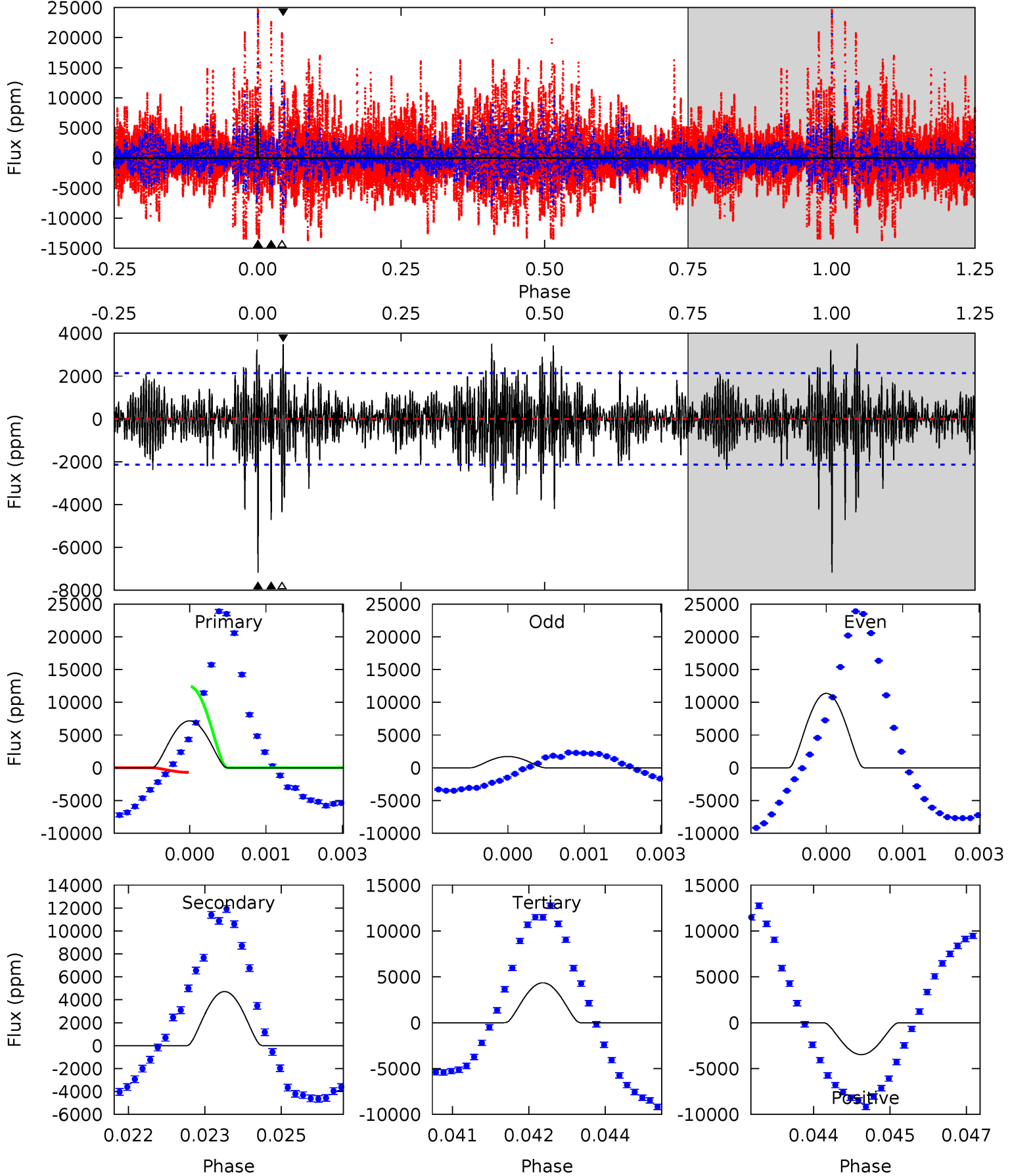
TCE 005121915-01 P=449.211383 Days  $T_0=558.707976$  (BKJD)



# DV Model-Shift Uniqueness Test

005121915-01, P = 449.210680 Days, E = 109.598536 Days

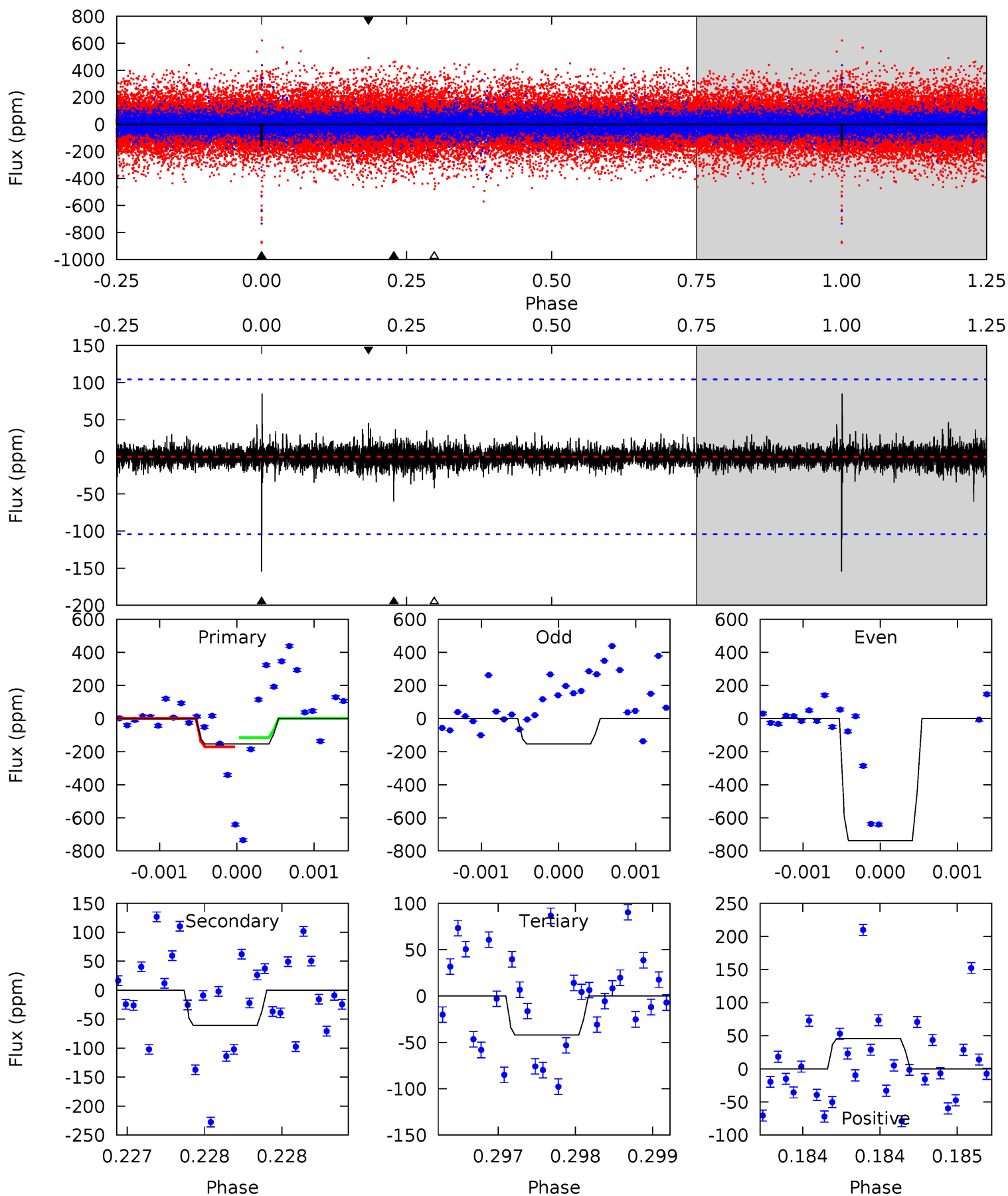
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.1	11.9	11.0	8.79	5.38	3.18	2.32	7.12	9.30	0.92	3.10	11.4	1.31	0.33	14.6



# Alt Model-Shift Uniqueness Test

005121915-01, P = 449.211383 Days, E = 109.496593 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
8.13	3.19	2.22	2.41	5.51	3.38	0.42	5.91	5.73	0.97	0.78	16.6	2.64	0.36	1.43





### Stellar Parameters For KIC 005121915

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6568^{+184}_{-253}$	$4.166^{+0.162}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.595^{+0.538}_{-0.359}$	$1.359^{+0.209}_{-0.230}$	$0.472^{+0.402}_{-0.251}$
	+3%/-4%	+4%/-5%	+200%/-350%	+34%/-23%	+15%/-17%	+85%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005121915-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-4715 \pm 396$	$24.90^{+11.61}_{-11.92}$	$455^{+34}_{-31}$	$4697^{+1599}_{-632}$	$6707^{+17384}_{-3633}$
Alt.	$-60 \pm 19$	$9.91^{+9.41}_{-6.71}$	$455^{+37}_{-34}$	$3053^{+1454}_{-491}$	$517^{+4835}_{-381}$

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

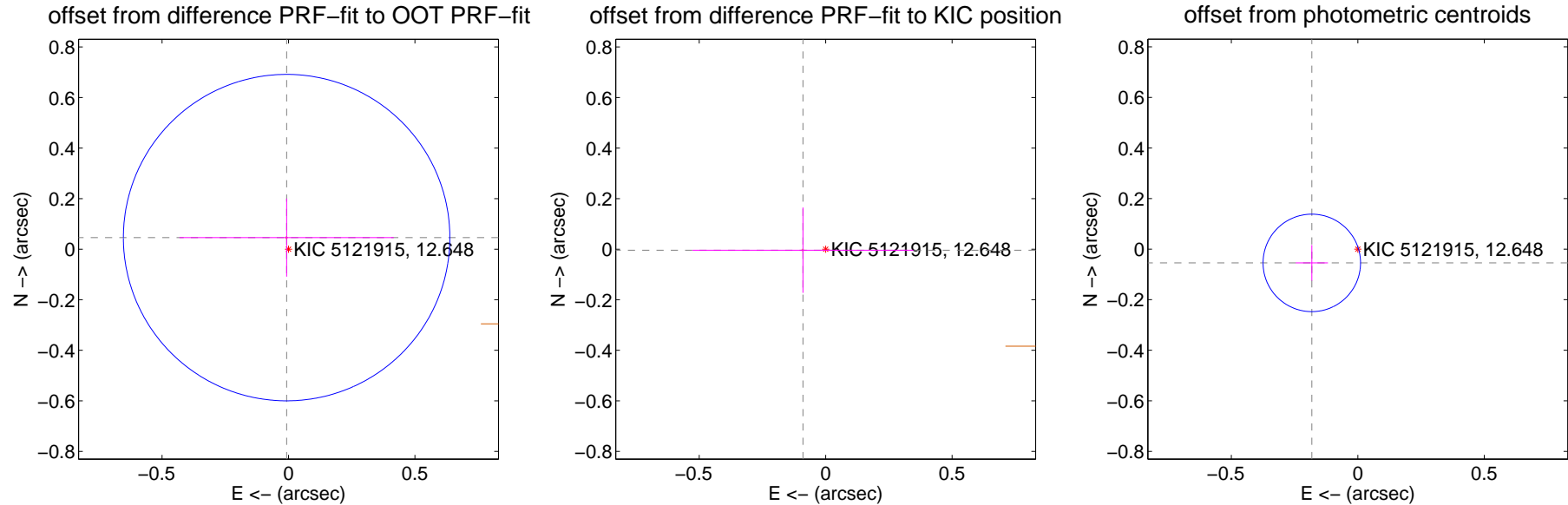
## DV Centroid Data

Supplemental centroid analysis for 005121915-01. Kepler magnitude: 12.65. Transit SNR 22.84

There are 0 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	$0.046 \pm 0.215$	0.22	$0.007 \pm 0.424$	$0.046 \pm 0.154$
PRF-fit source offset from KIC position	$0.090 \pm 0.430$	0.21	$0.090 \pm 0.437$	$-0.004 \pm 0.169$
photometric centroid source offset	$0.19 \pm 0.06$	2.96	$0.18 \pm 0.06$	$-0.05 \pm 0.07$

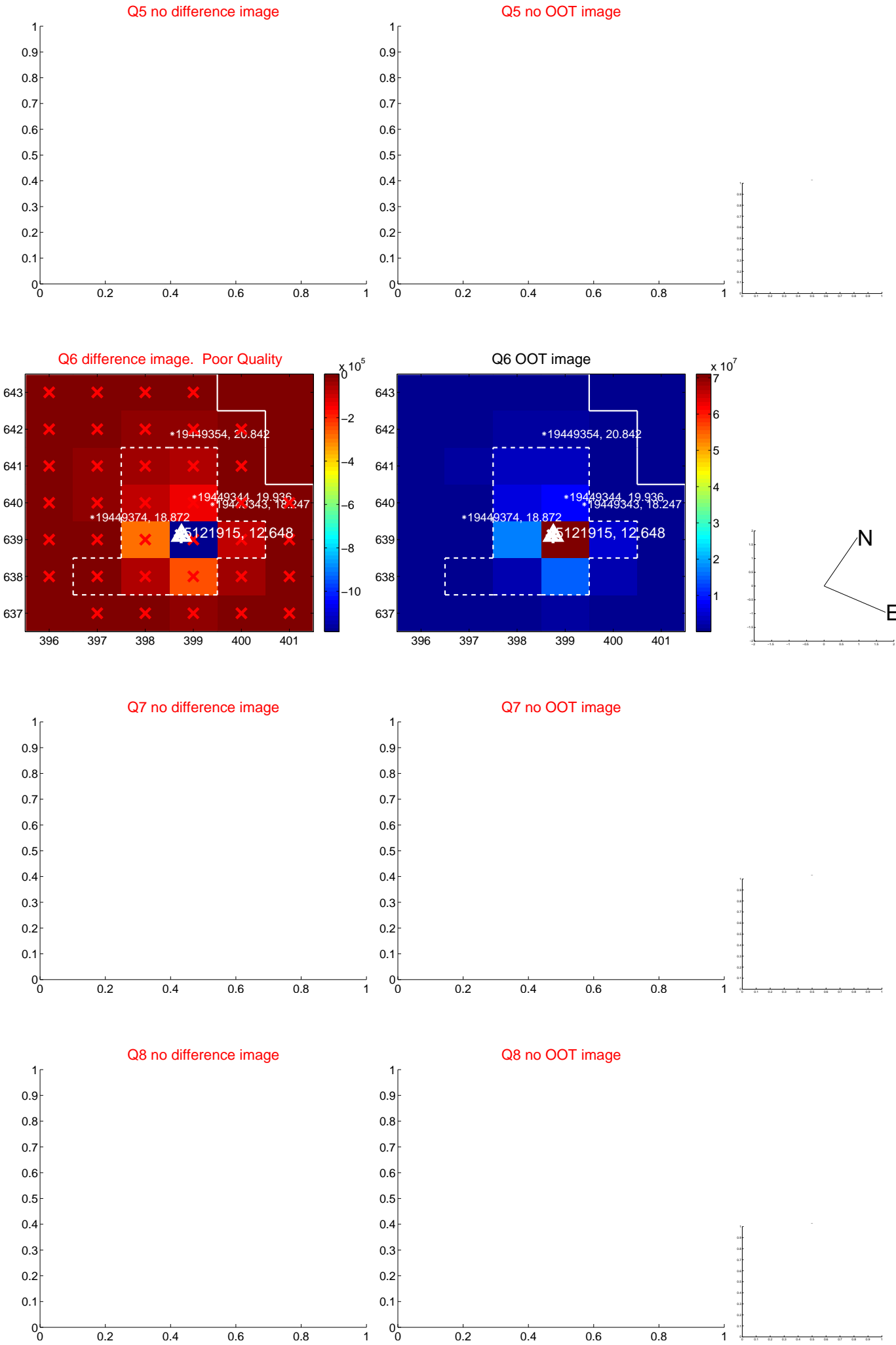


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

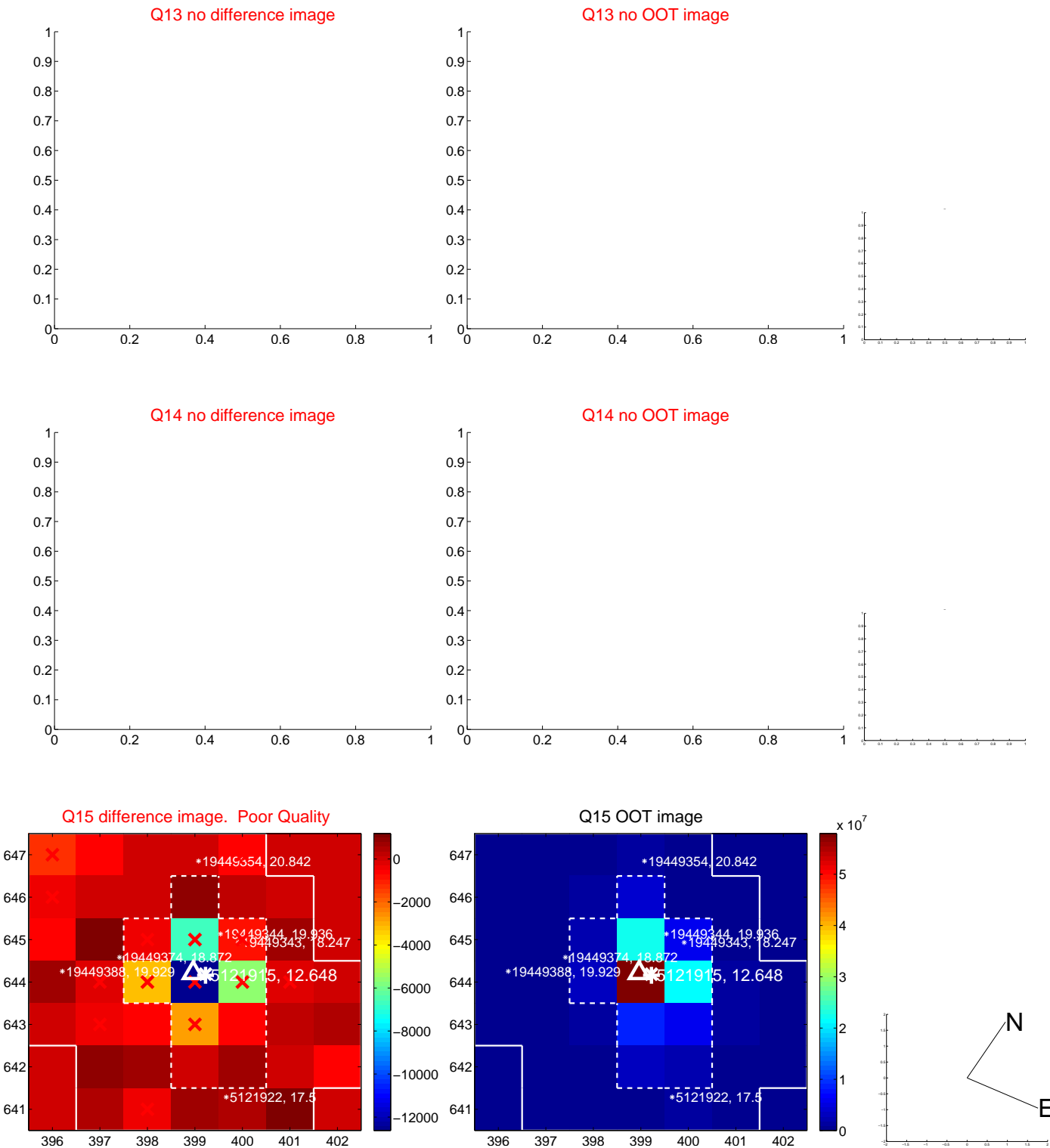




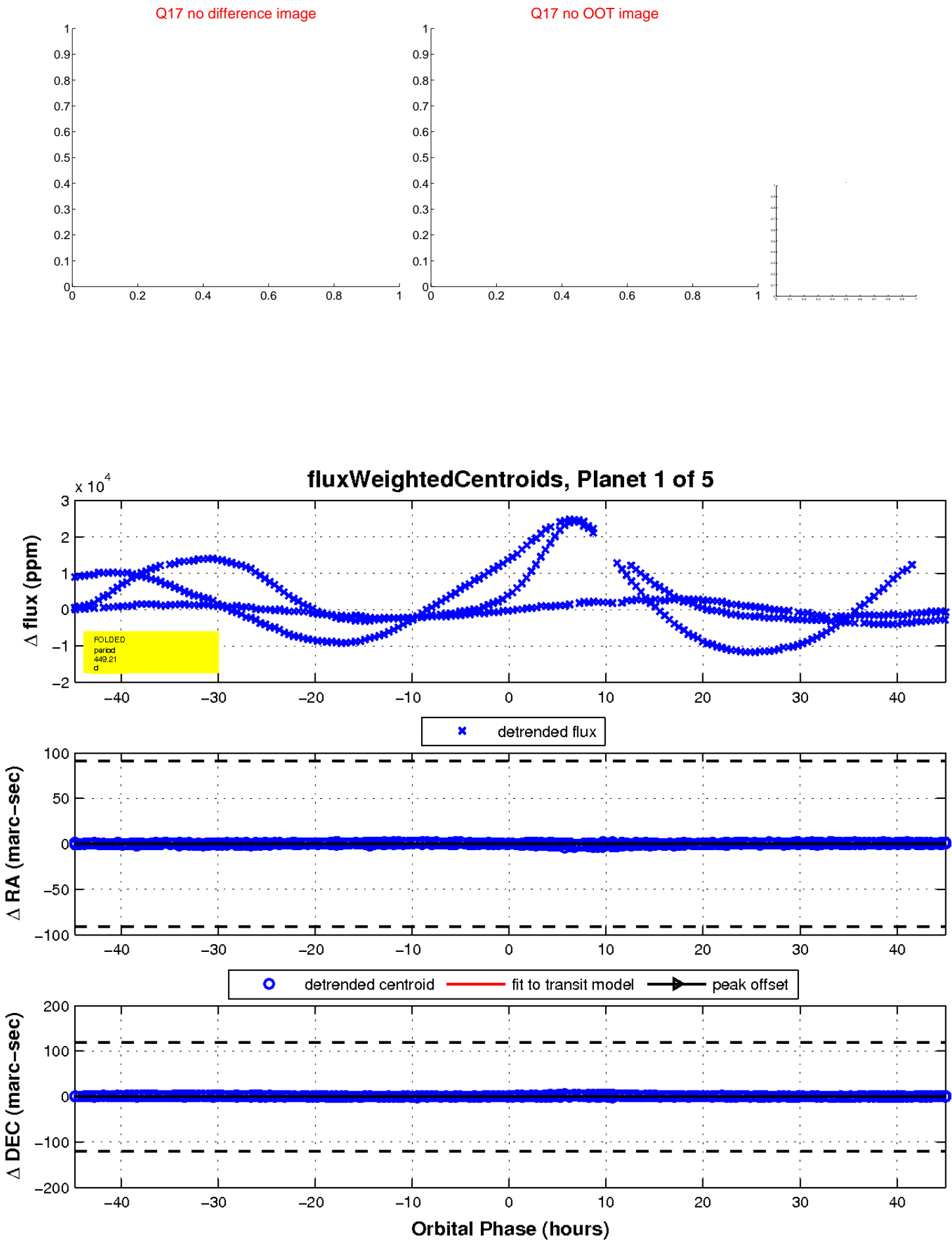
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white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

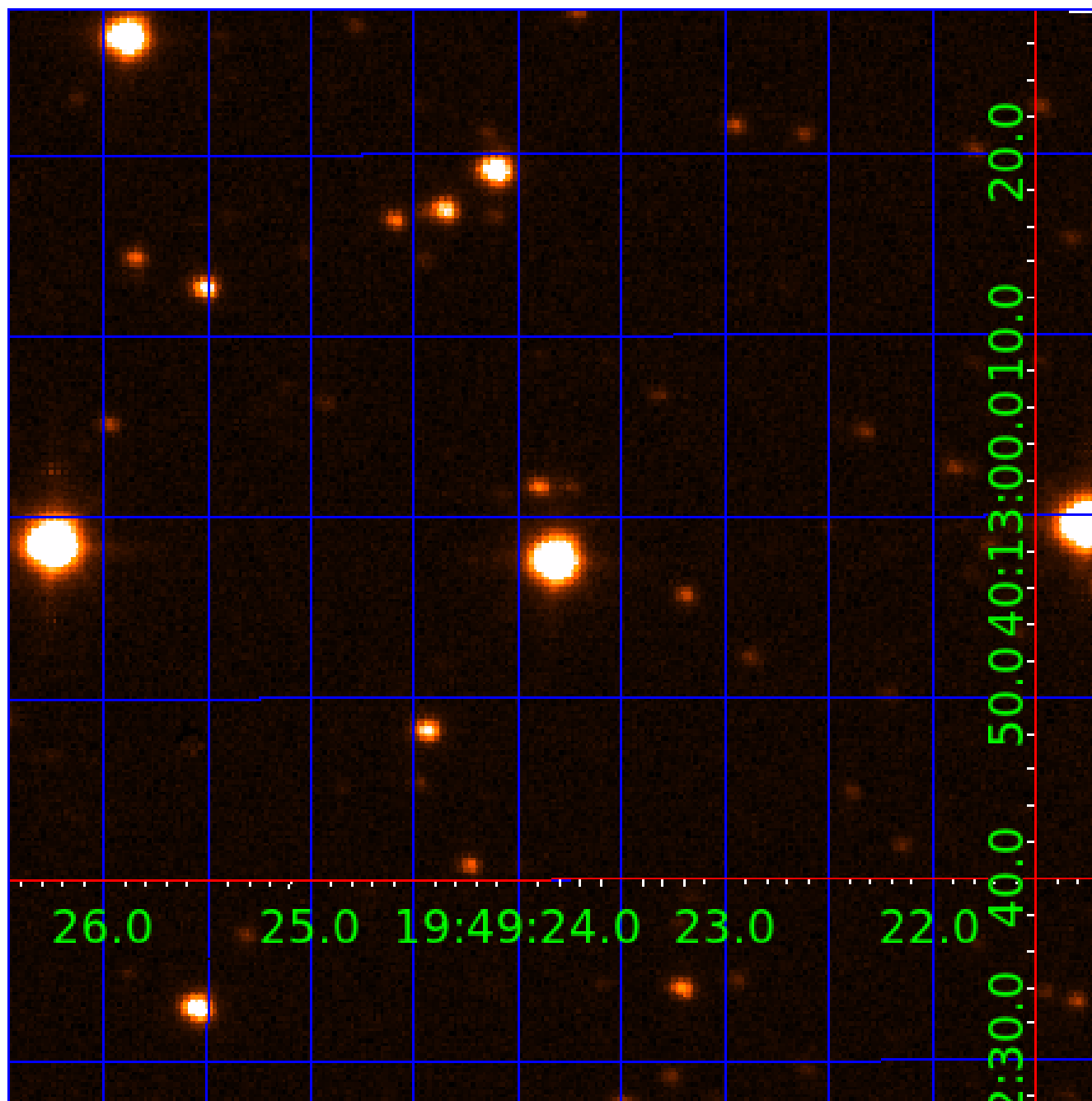


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005121915

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005121915-01	OBS	No	449.210680	558.809216	7349.1	15.052	24.6	22.8	1.59	6568	24.38	2.62
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005121915-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
005121915-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
005121915-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

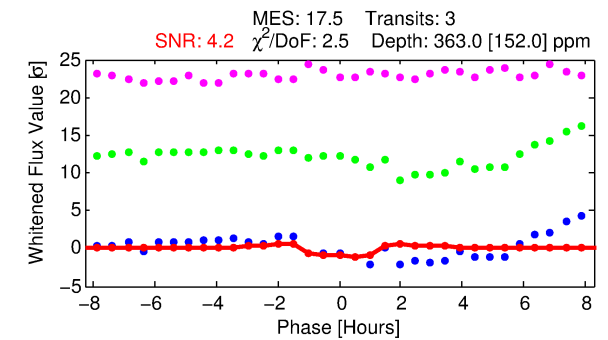
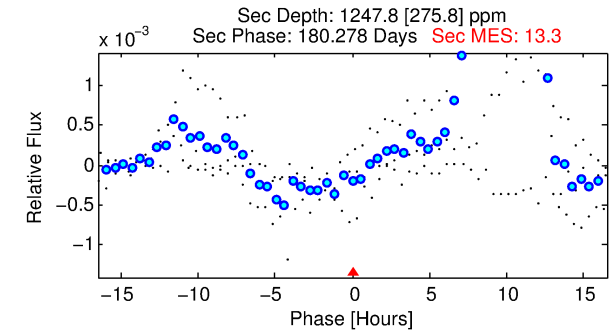
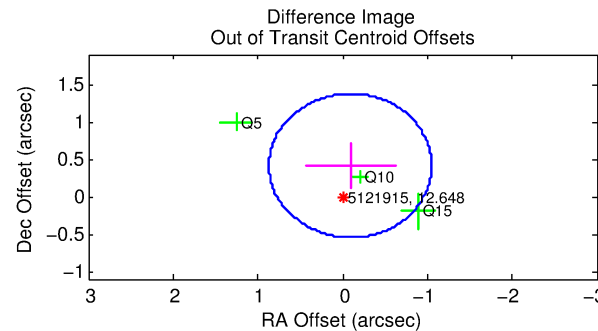
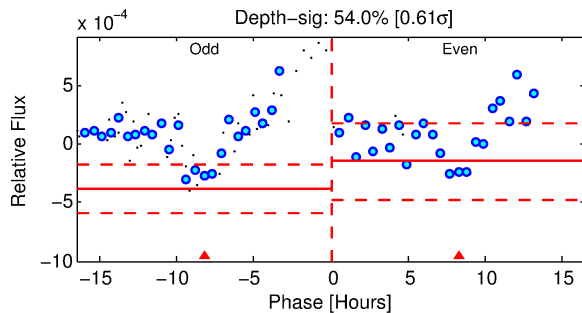
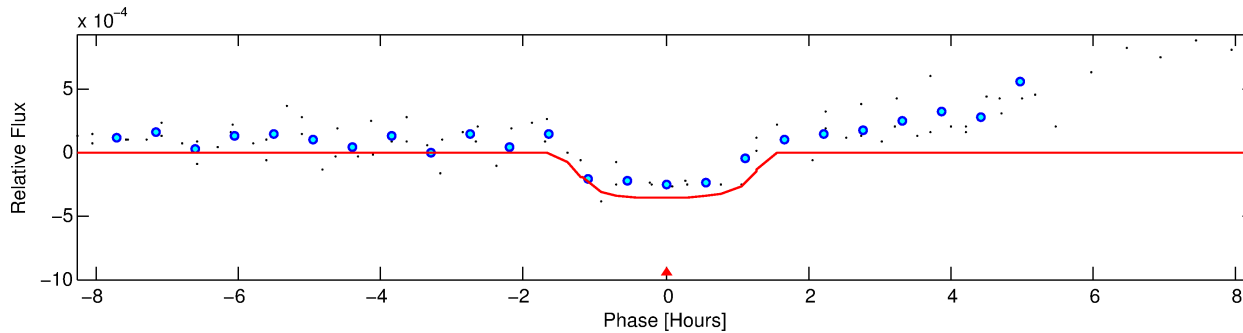
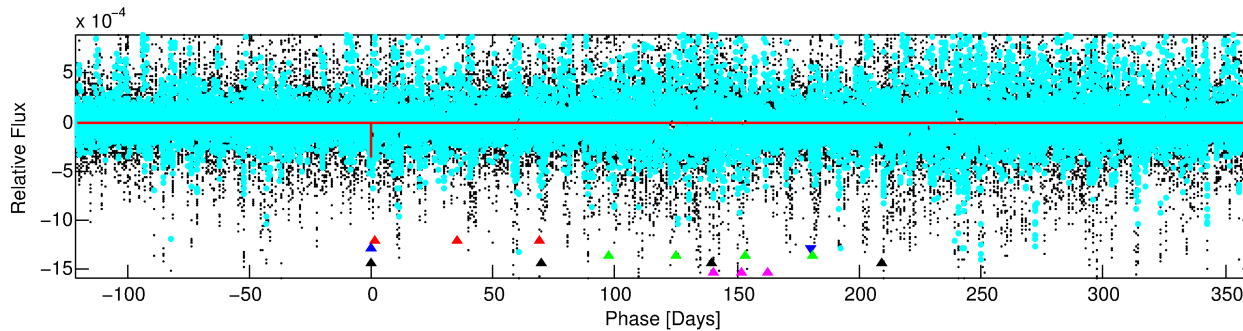
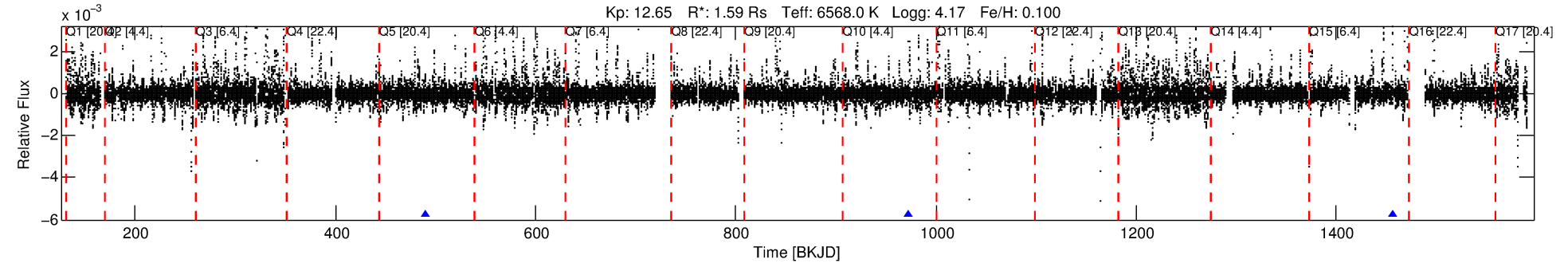
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005121915-02

No Significant Match Found

# DV One-Page Summary

KIC: 5121915 Candidate: 2 of 5 Period: 482.964 d



## DV Fit Results:

Period = 482.96368 [0.01017] d  
Epoch = 489.7498 [0.0142] BKJD  
Rp/R\* = 0.0198 [0.0283]  
a/R\* = 757.40 [5868.59]  
b = 0.85 [2.58]  
Seff = 2.38 [0.97]  
Teq = 317 [32] K  
Rp = 3.44 [5.06] Re  
a = 1.3350 [0.3623] AU  
Ag = 103514.64 [299769.45] [0.35 $\sigma$ ]  
Teffp = 8783 [6314] K [1.34 $\sigma$ ]

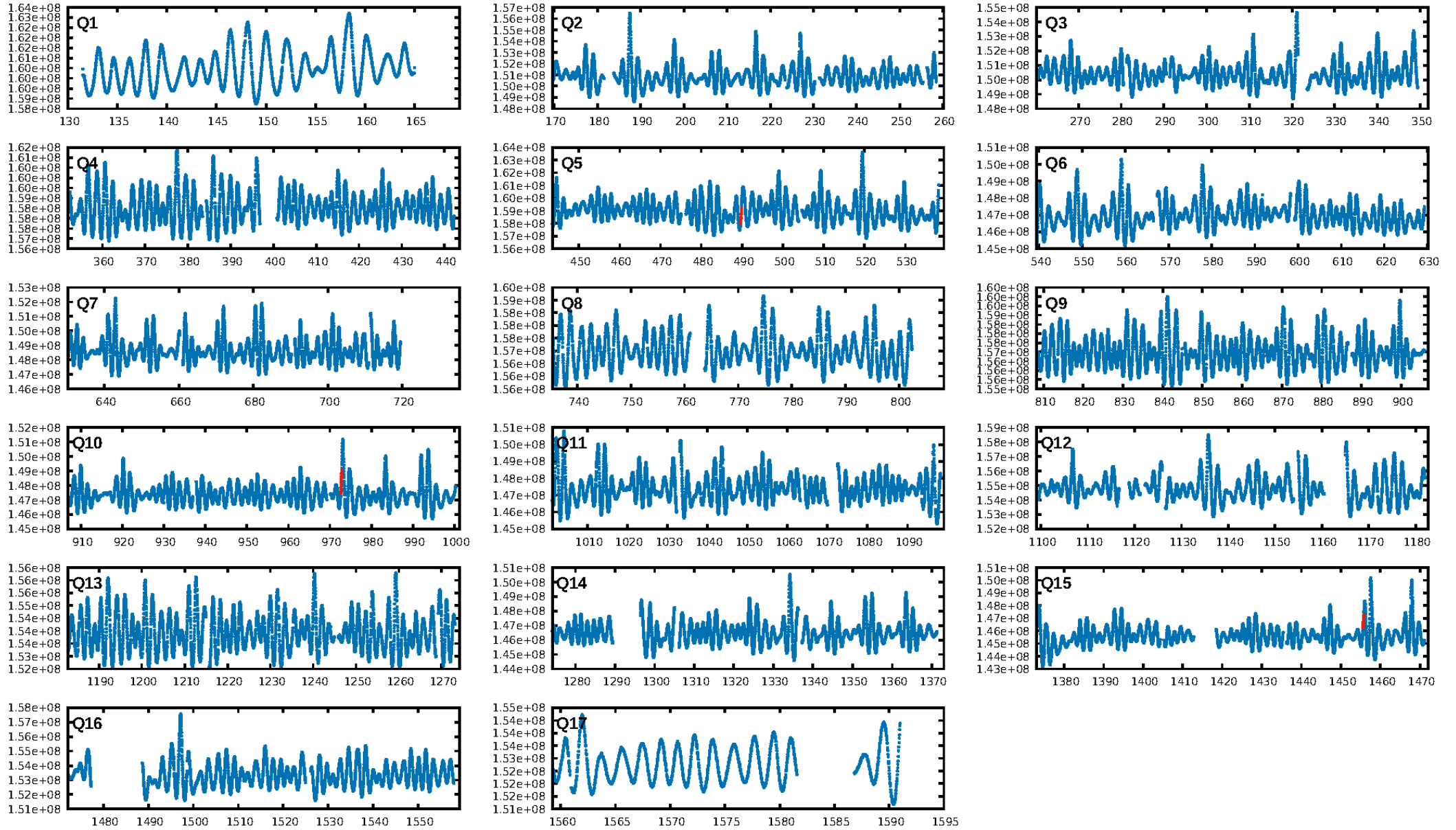
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [84.07 $\sigma$ ]  
LongPeriod-sig: 100.0% [33.81 $\sigma$ ]  
ModelChiSquare2-sig: 71.9%  
ModelChiSquareGof-sig: 97.8%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.07253**  
Centroid-sig: 19.8%  
Centroid-so: 1.800 arcsec [1.10 $\sigma$ ]  
OotOffset-rm: 0.423 arcsec [1.32 $\sigma$ ]  
KicOffset-rm: 0.419 arcsec [1.45 $\sigma$ ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.67 [2/3]

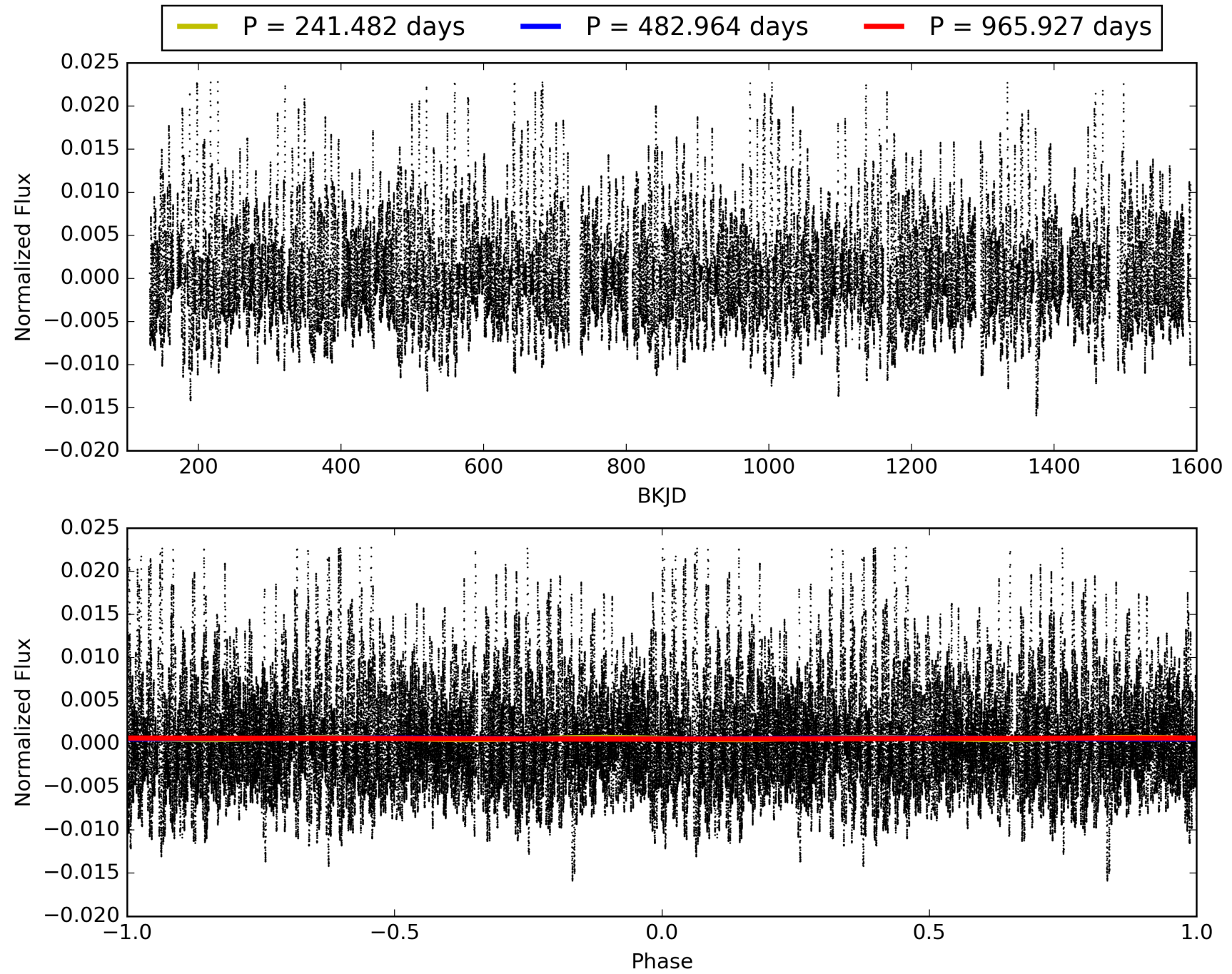
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:12:42 Z

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

# TCE 005121915-02, PDC Light Curves

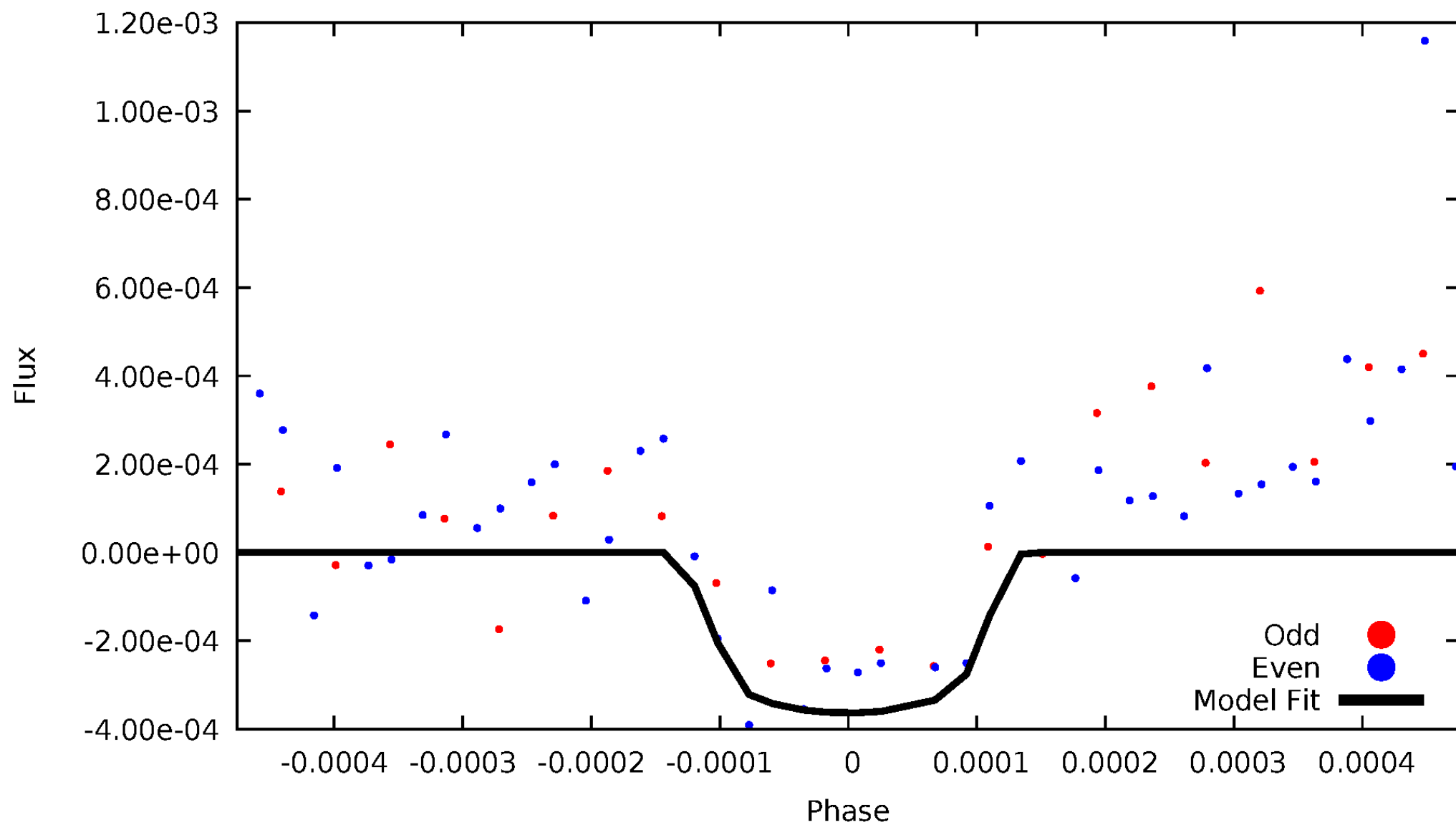


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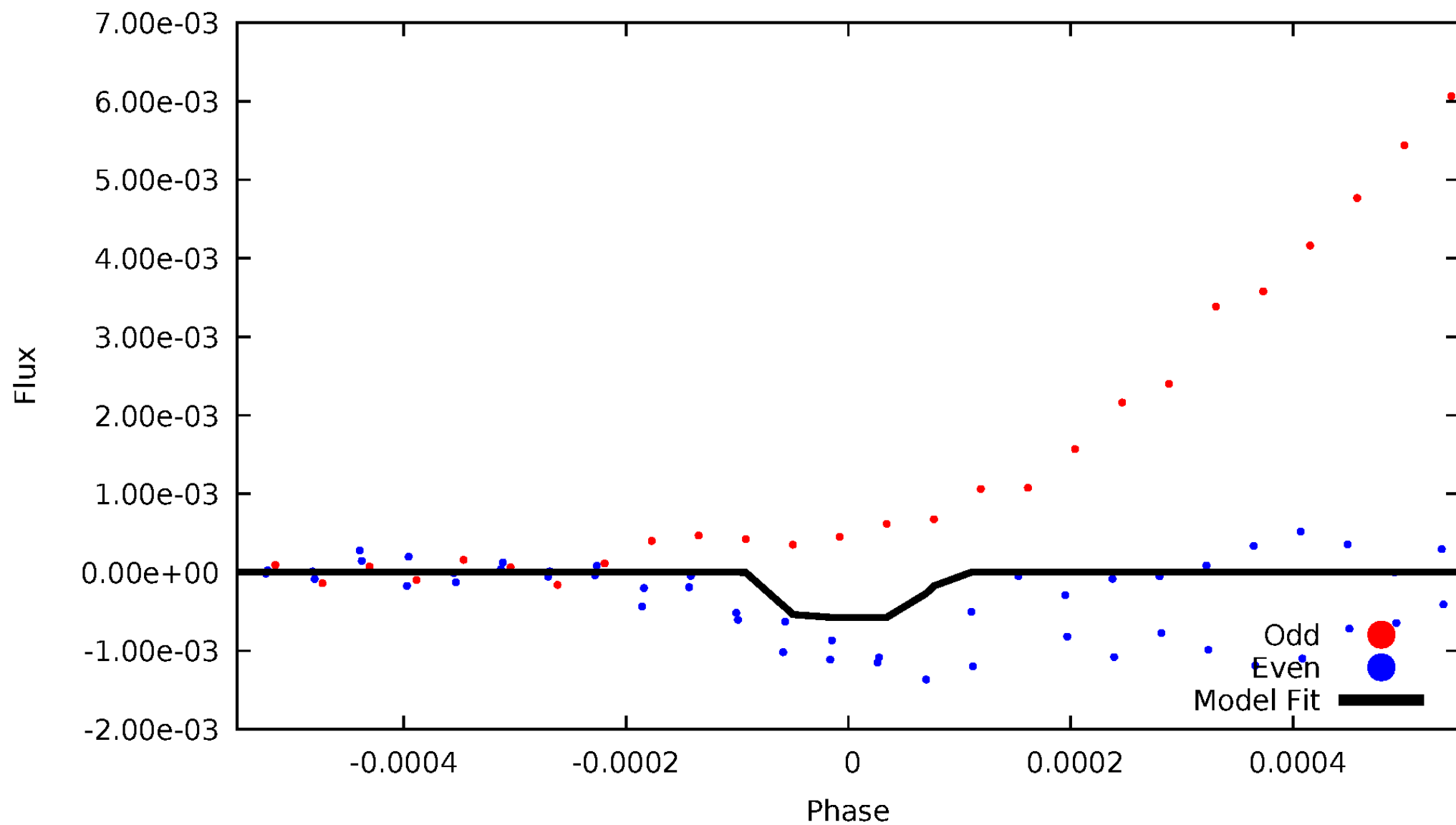
# DV Odd/Even

TCE 005121915-02



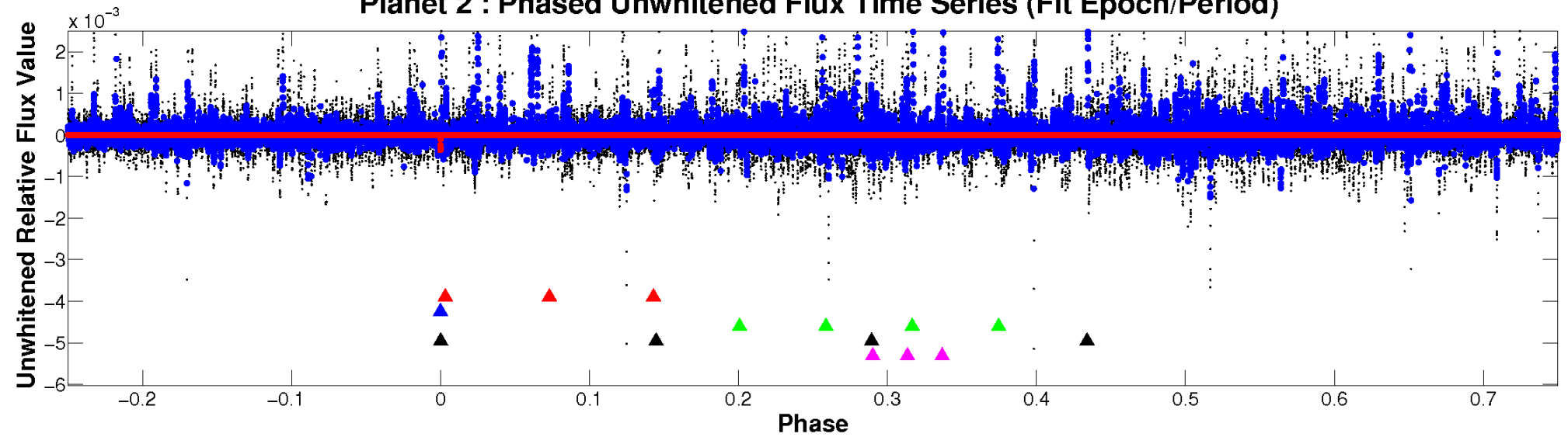
# ALT Odd/Even

TCE 005121915-02

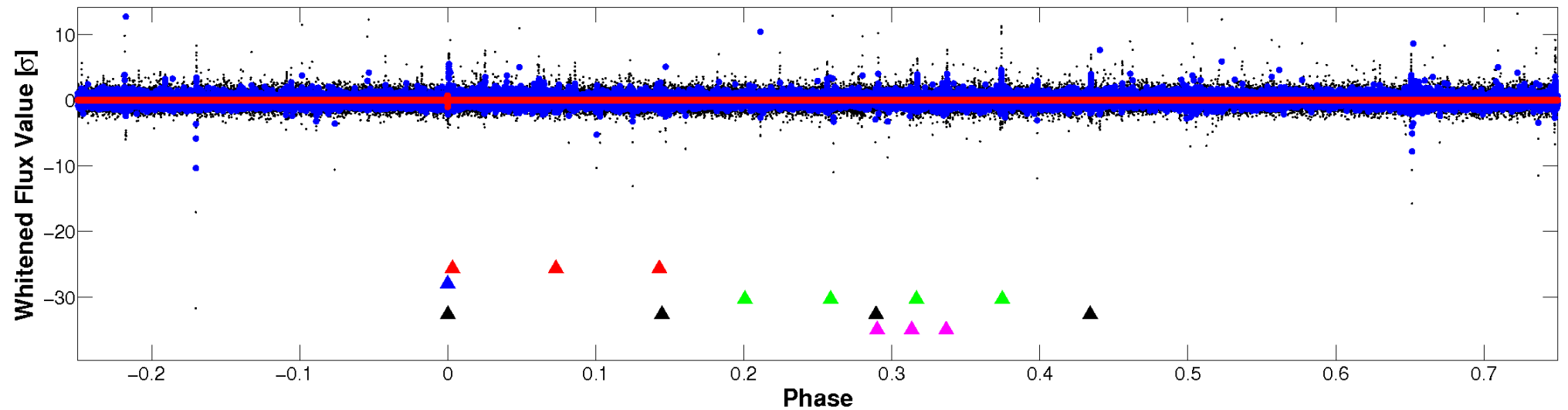


# Non-Whitened Vs. Whitened Light Curve

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

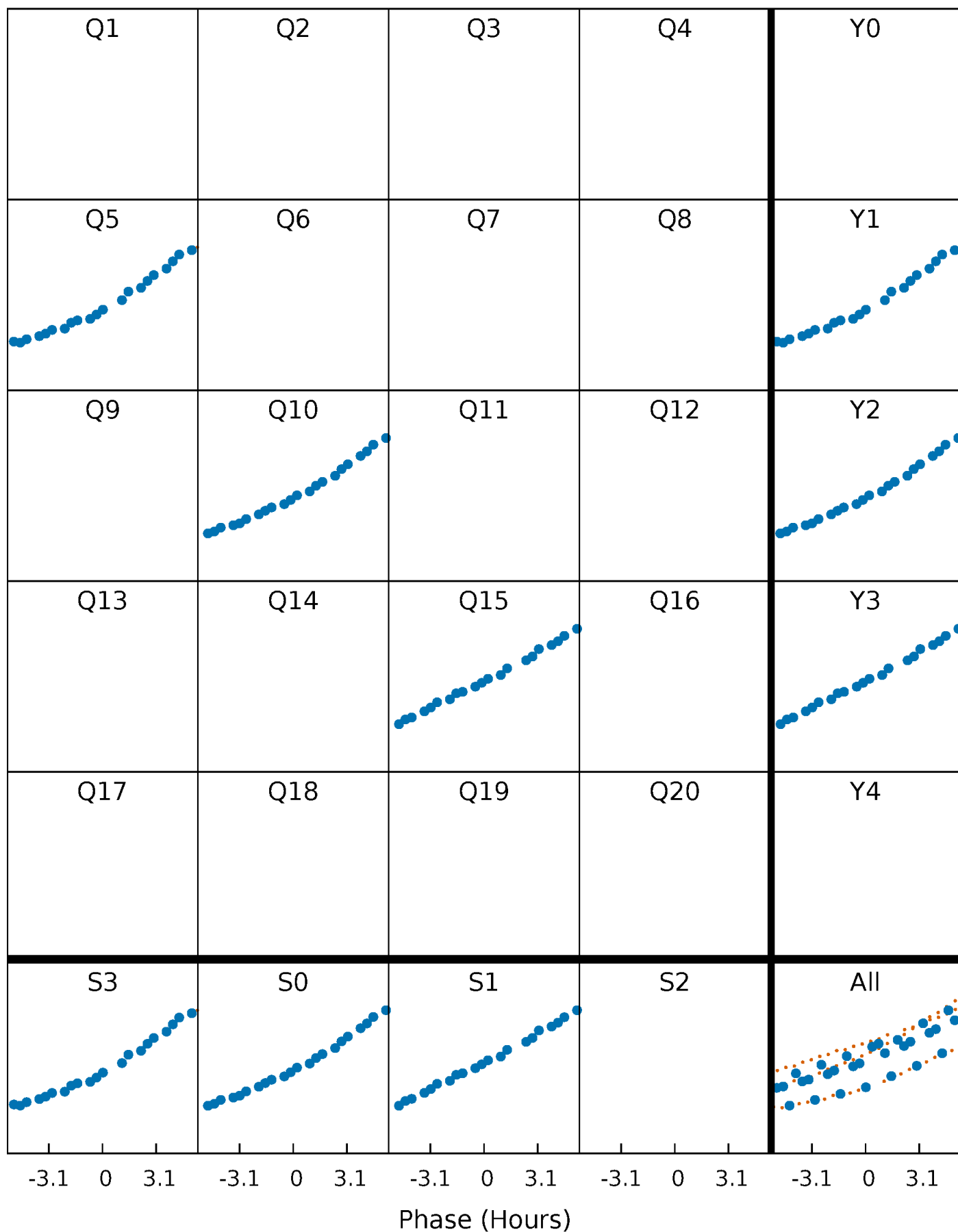


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

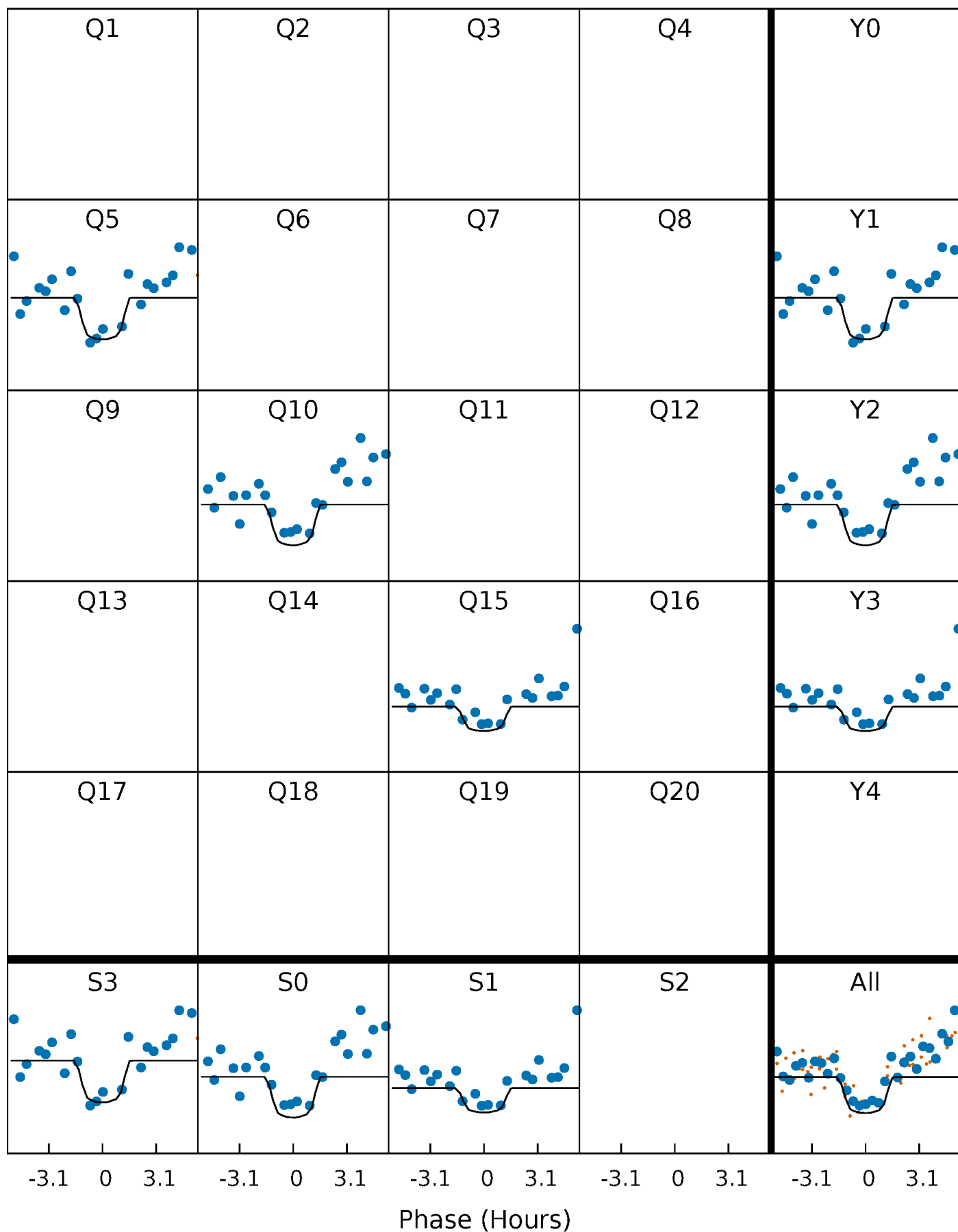
TCE 005121915-02 P=482.963675 Days  $T_0=489.749784$  (BKJD)





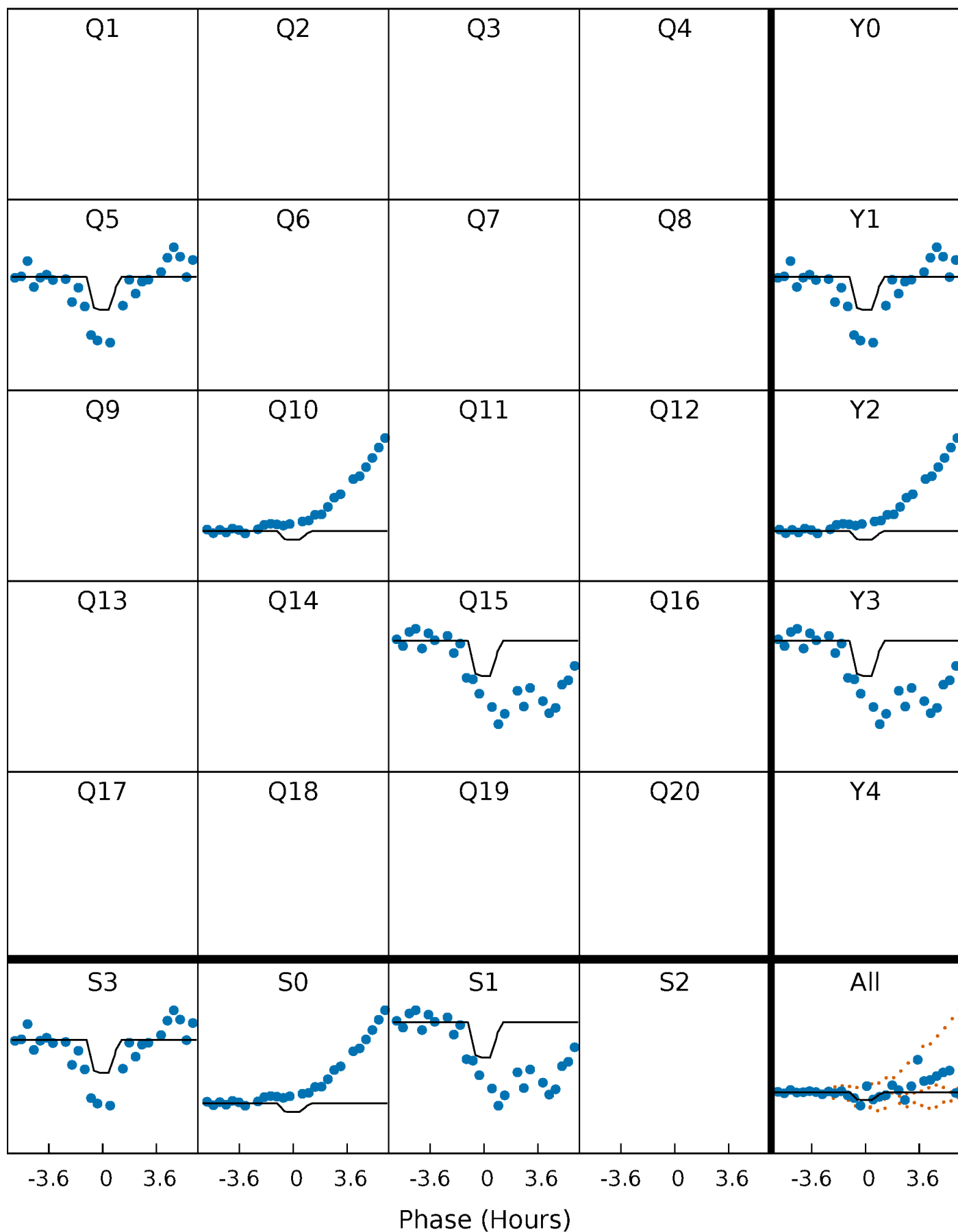
# DV Quarter-Phased Transit Curves

TCE 005121915-02 P=482.963675 Days  $T_0=489.749784$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

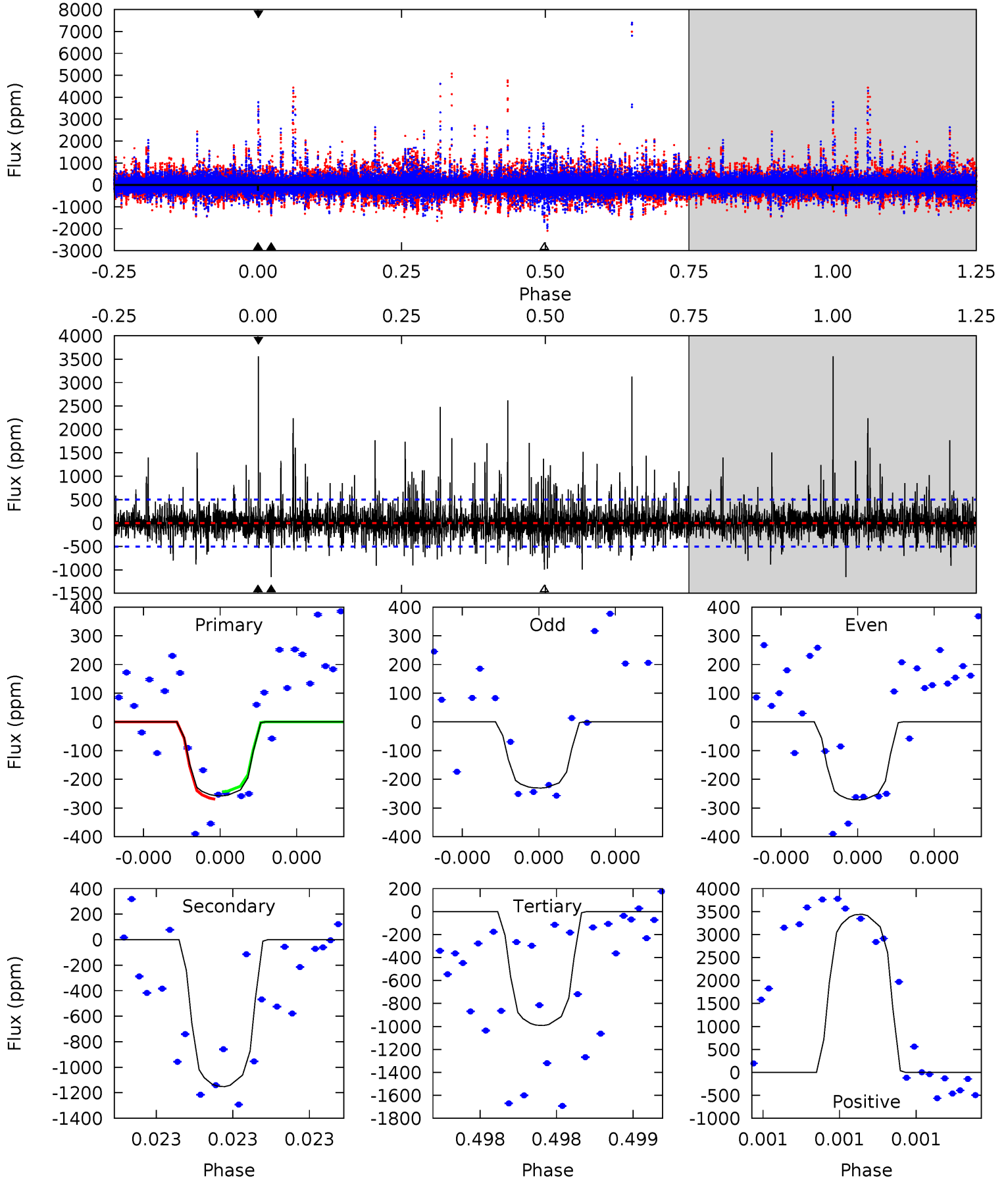
TCE 005121915-02 P=482.967624 Days  $T_0=489.740779$  (BKJD)



# DV Model-Shift Uniqueness Test

005121915-02, P = 482.963675 Days, E = 6.786109 Days

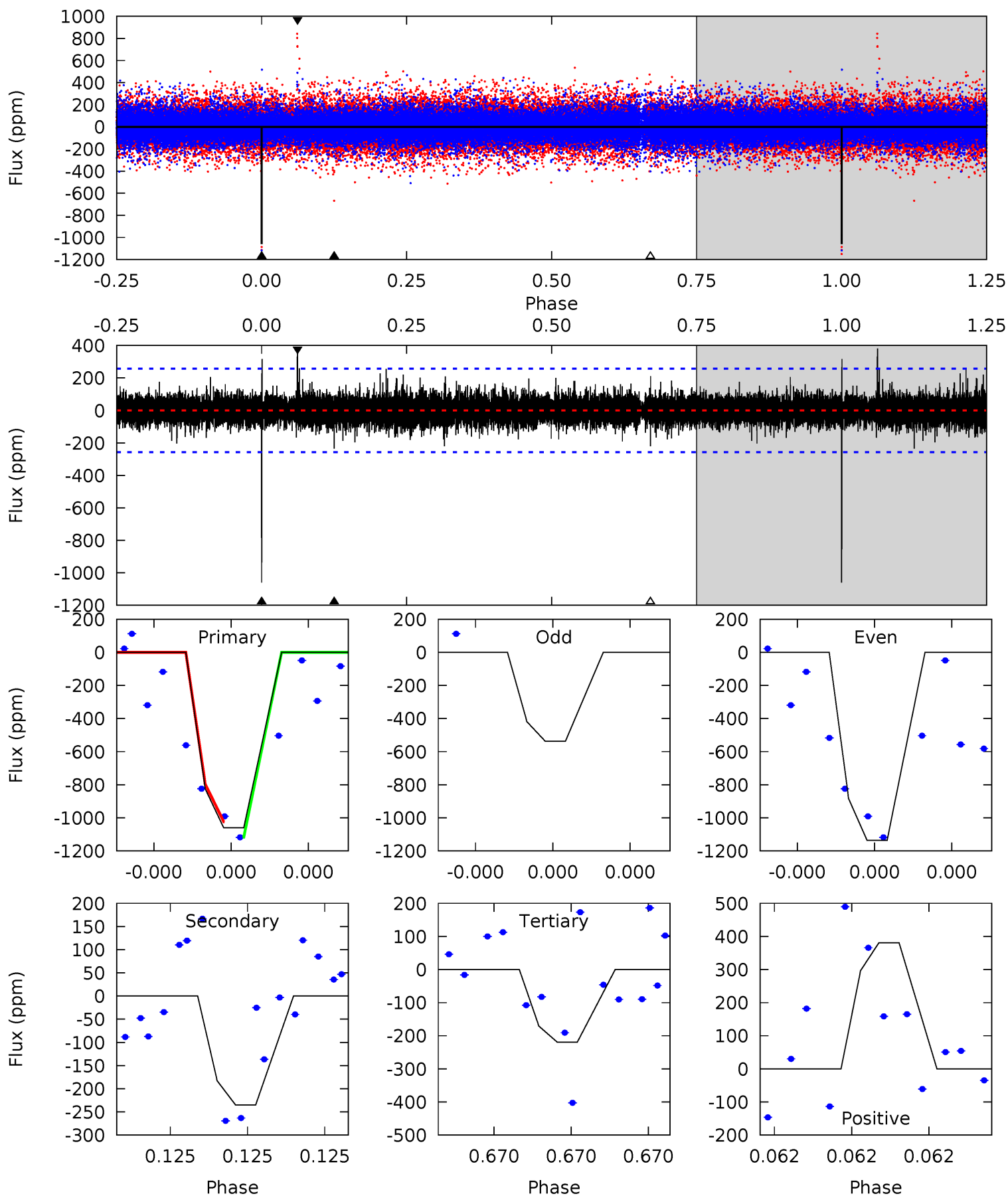
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.91	13.0	11.2	38.9	5.69	3.66	2.88	-8.30	-36.0	1.80	-25.9	0.18	1.14	0.76	0.15



# Alt Model-Shift Uniqueness Test

005121915-02, P = 482.967624 Days, E = 6.773155 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
23.7	5.26	4.91	8.53	5.76	3.76	1.00	18.8	15.2	0.35	-3.27	7.85	0.53	0.26	0



### Stellar Parameters For KIC 005121915

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6568^{+184}_{-253}$	$4.166^{+0.162}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.595^{+0.538}_{-0.359}$	$1.359^{+0.209}_{-0.230}$	$0.472^{+0.402}_{-0.251}$
	+3%/-4%	+4%/-5%	+200%/-350%	+34%/-23%	+15%/-17%	+85%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005121915-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-1152 \pm 89$	$5.10^{+4.66}_{-3.47}$	$444^{+37}_{-32}$	$7125^{+9763}_{-1896}$	$43015^{+360005}_{-31038}$
Alt.	$-235 \pm 45$	$5.27^{+4.53}_{-3.36}$	$442^{+37}_{-31}$	$4719^{+3181}_{-962}$	$8087^{+51400}_{-5966}$

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

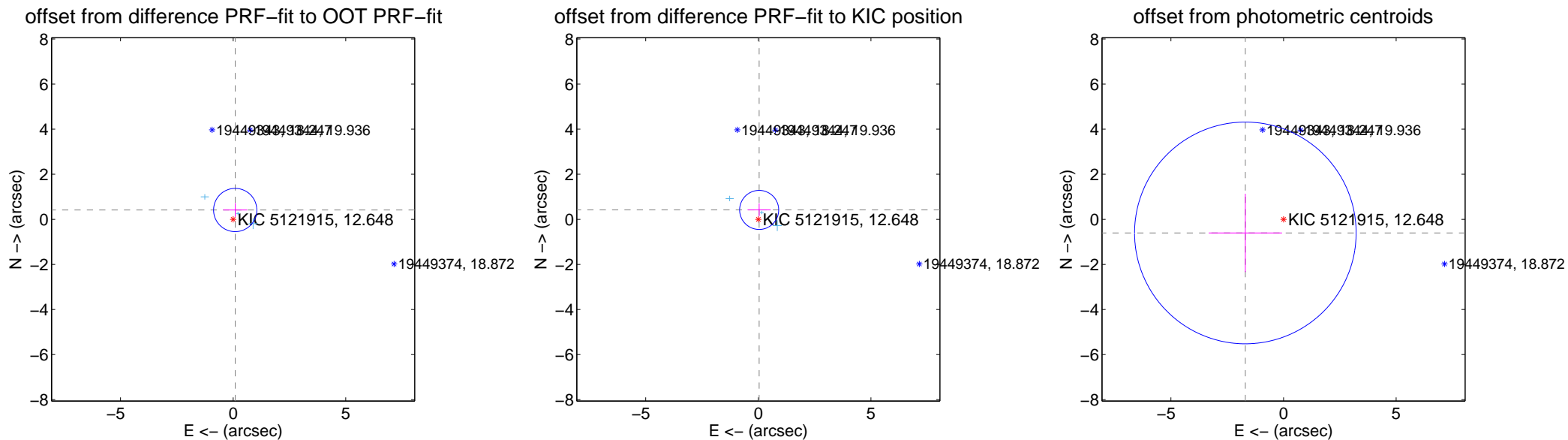
## DV Centroid Data

Supplemental centroid analysis for 005121915-02. Kepler magnitude: 12.65. Transit SNR 4.22

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	$0.423 \pm 0.320$	1.32	$-0.092 \pm 0.532$	$0.413 \pm 0.306$
PRF-fit source offset from KIC position	$0.419 \pm 0.289$	1.45	$-0.037 \pm 0.515$	$0.417 \pm 0.287$
photometric centroid source offset	$1.80 \pm 1.64$	1.10	$1.70 \pm 1.63$	$-0.60 \pm 1.74$

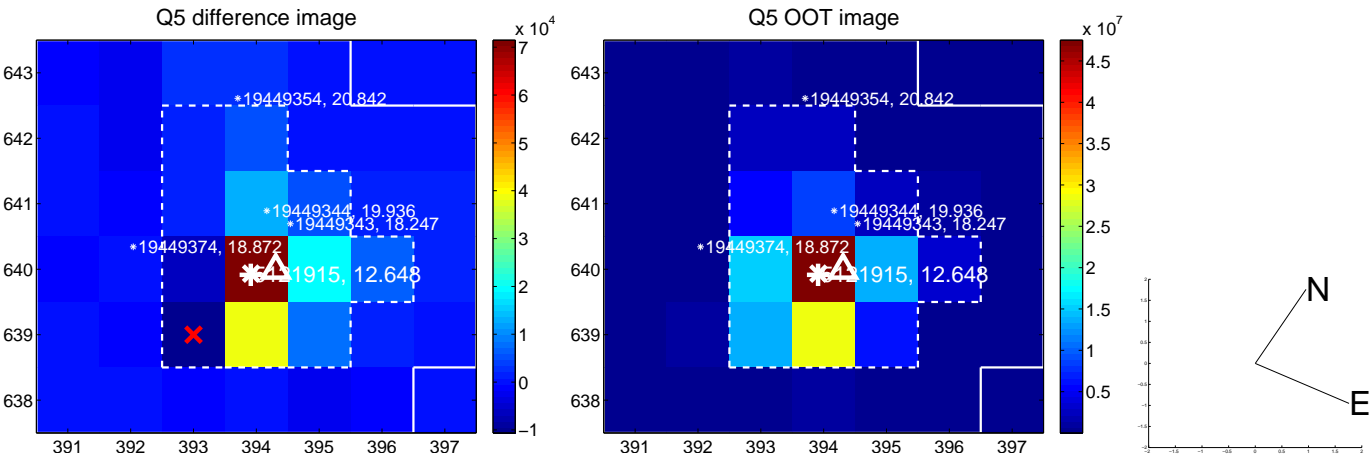


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

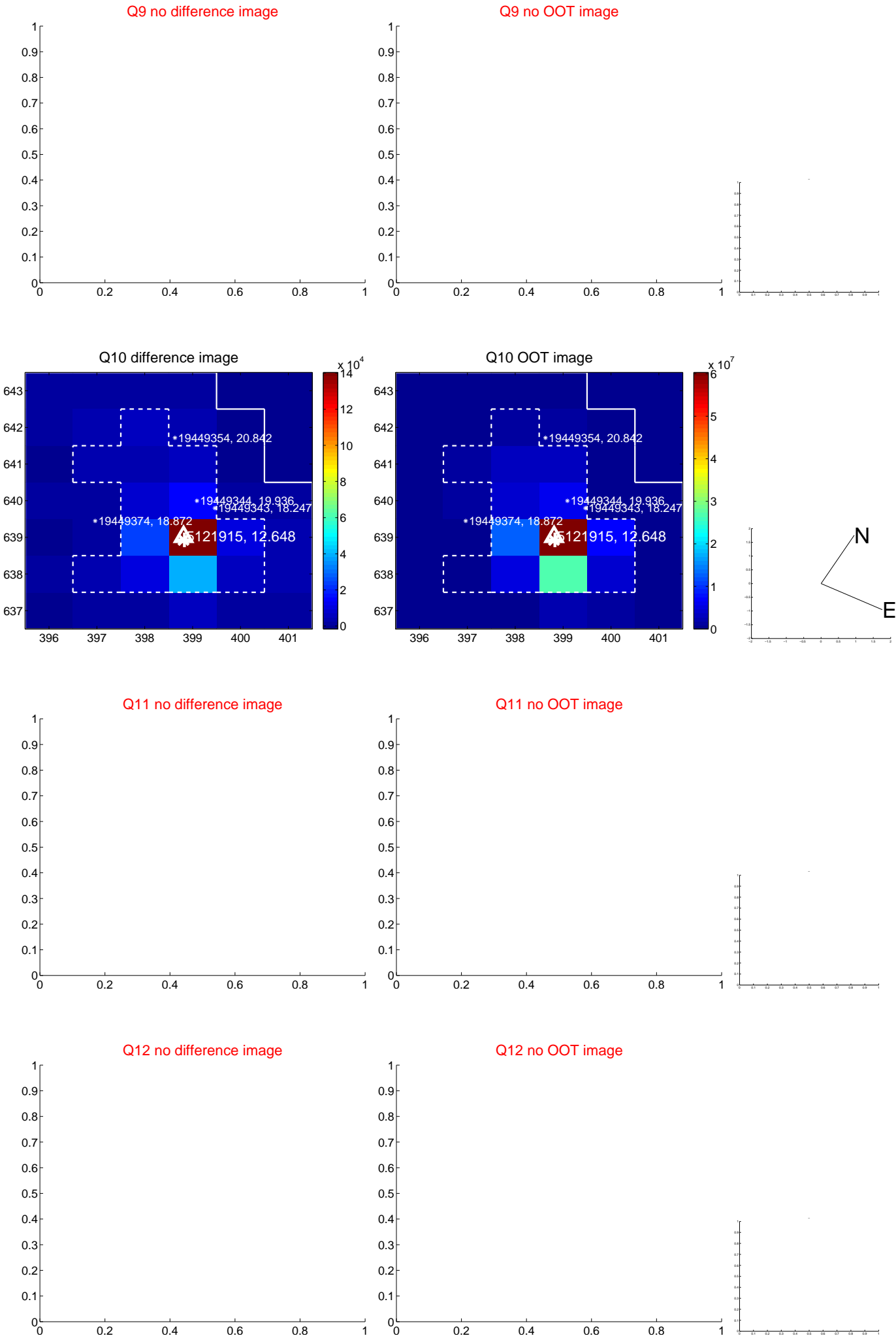


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

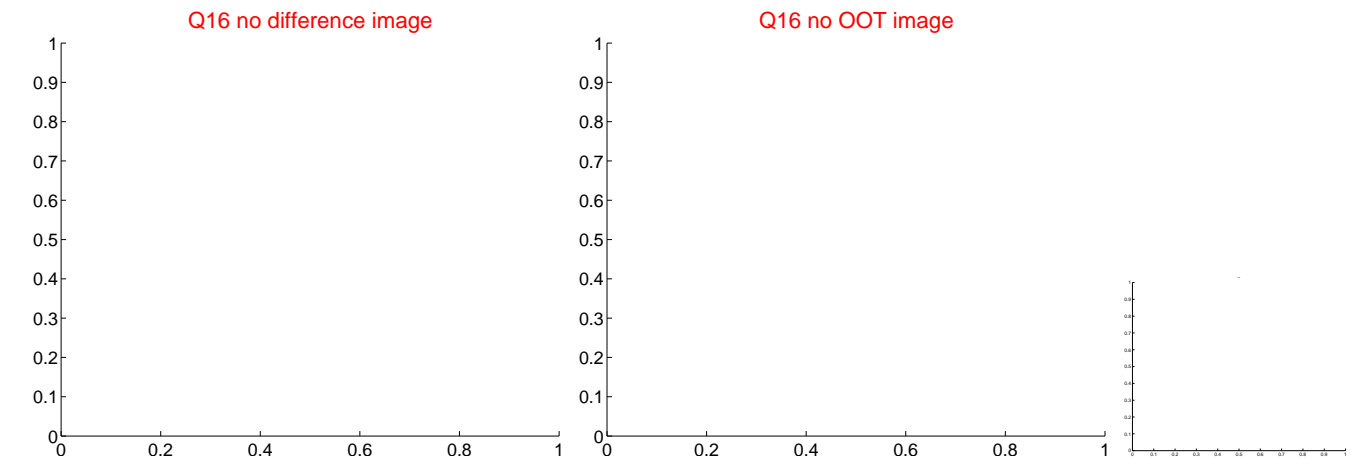
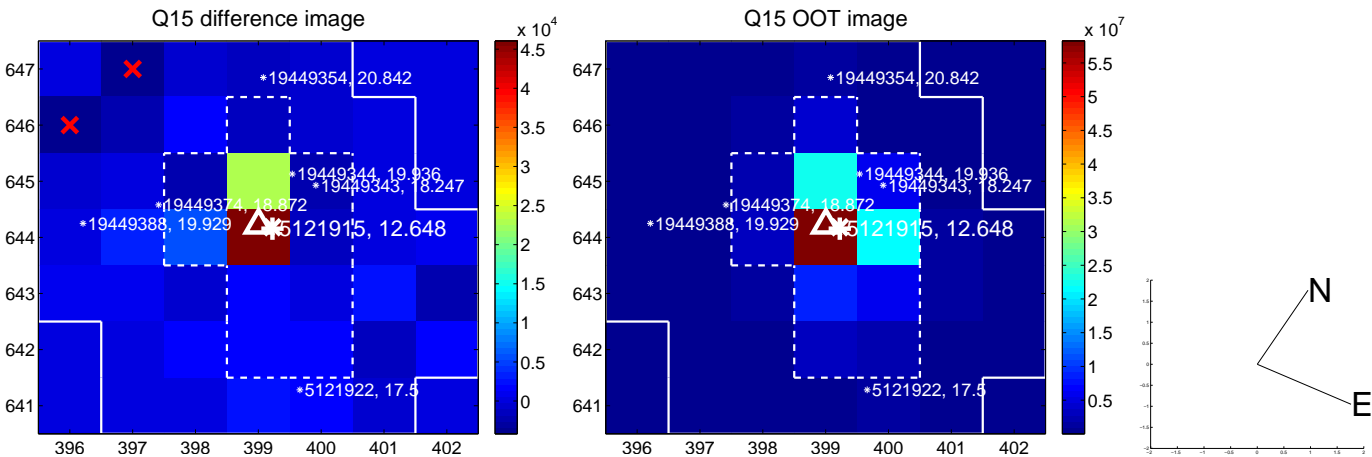
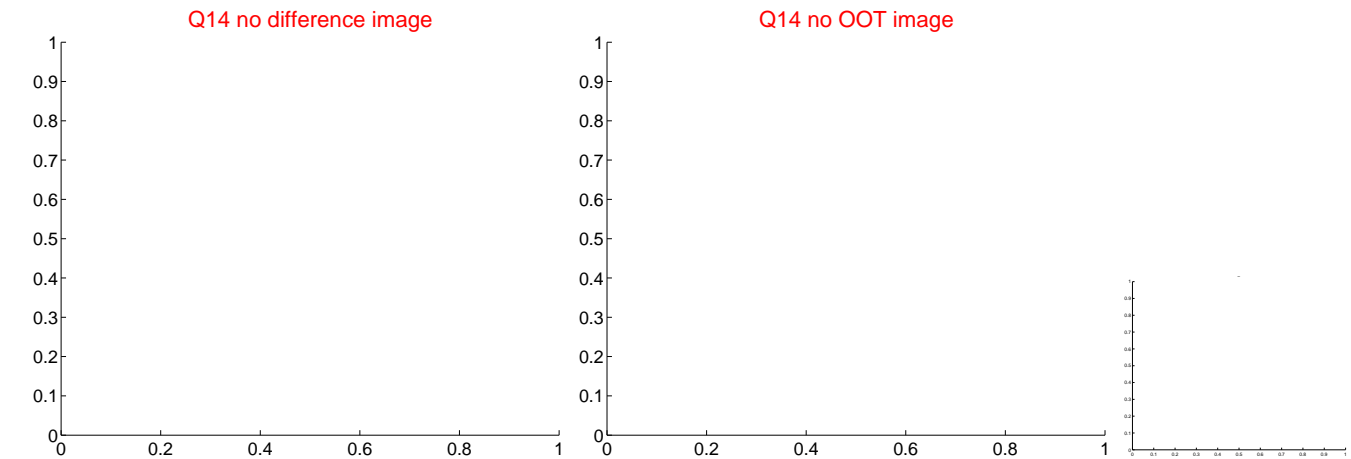
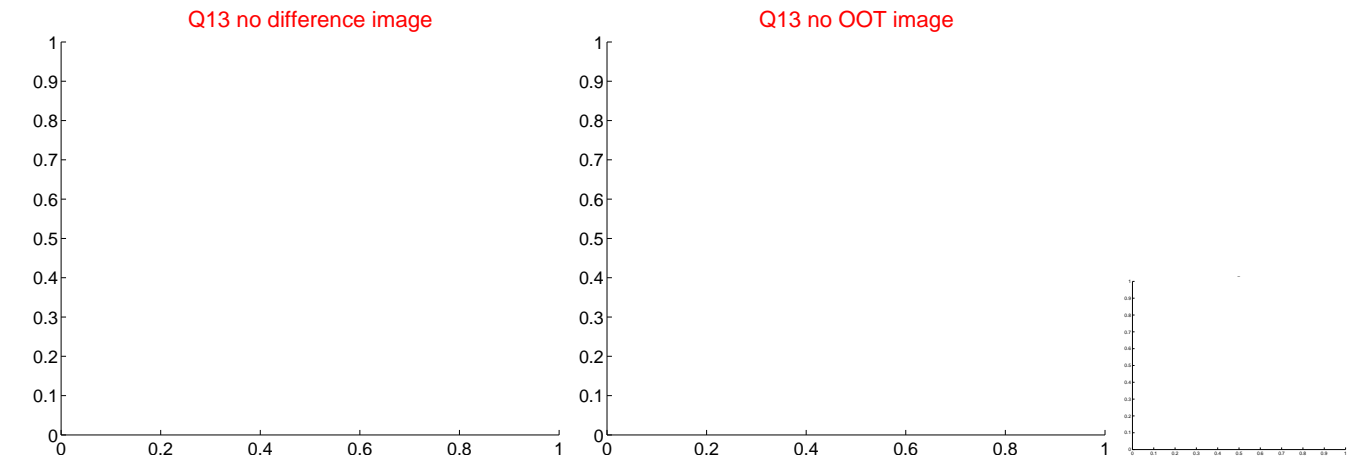




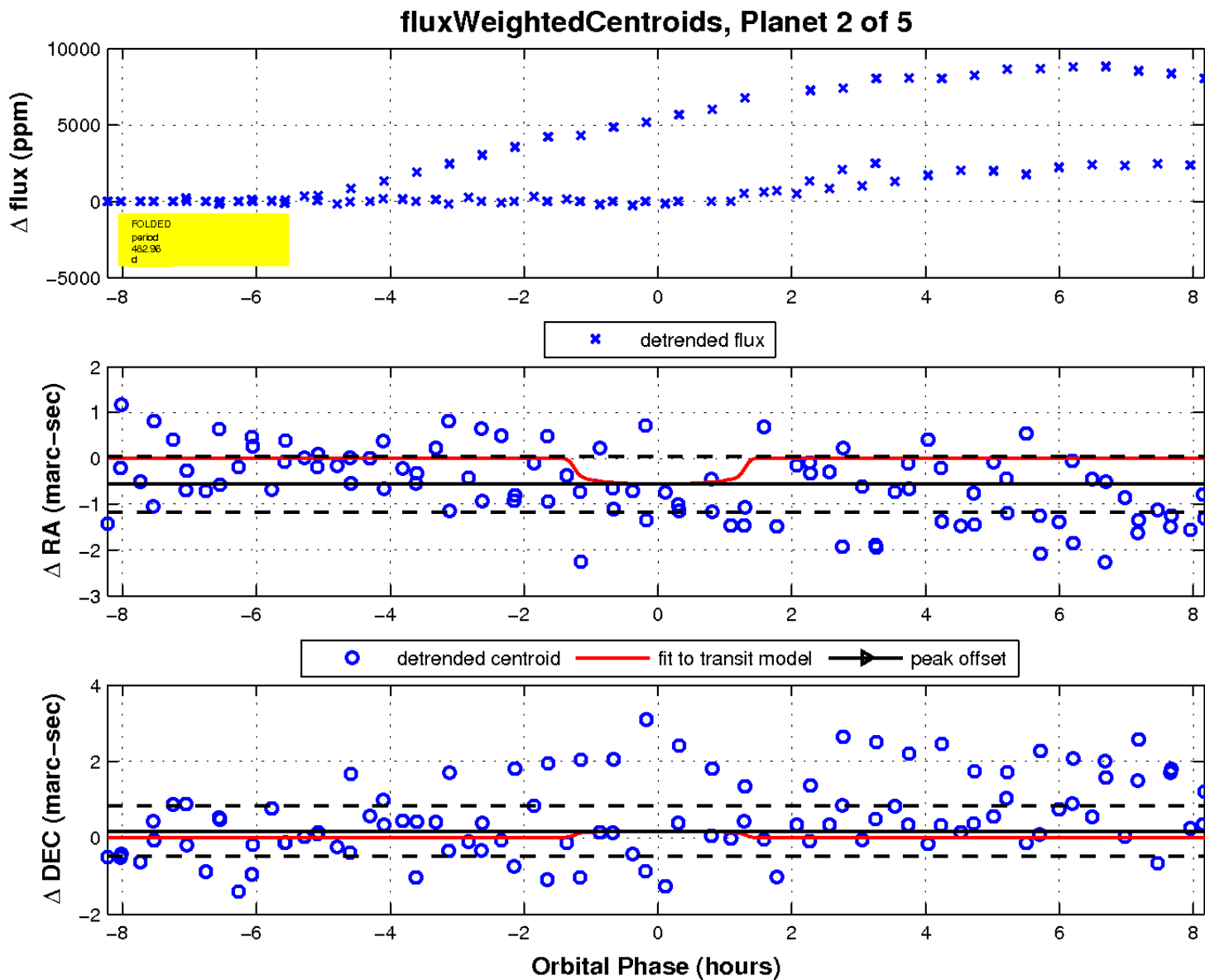
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

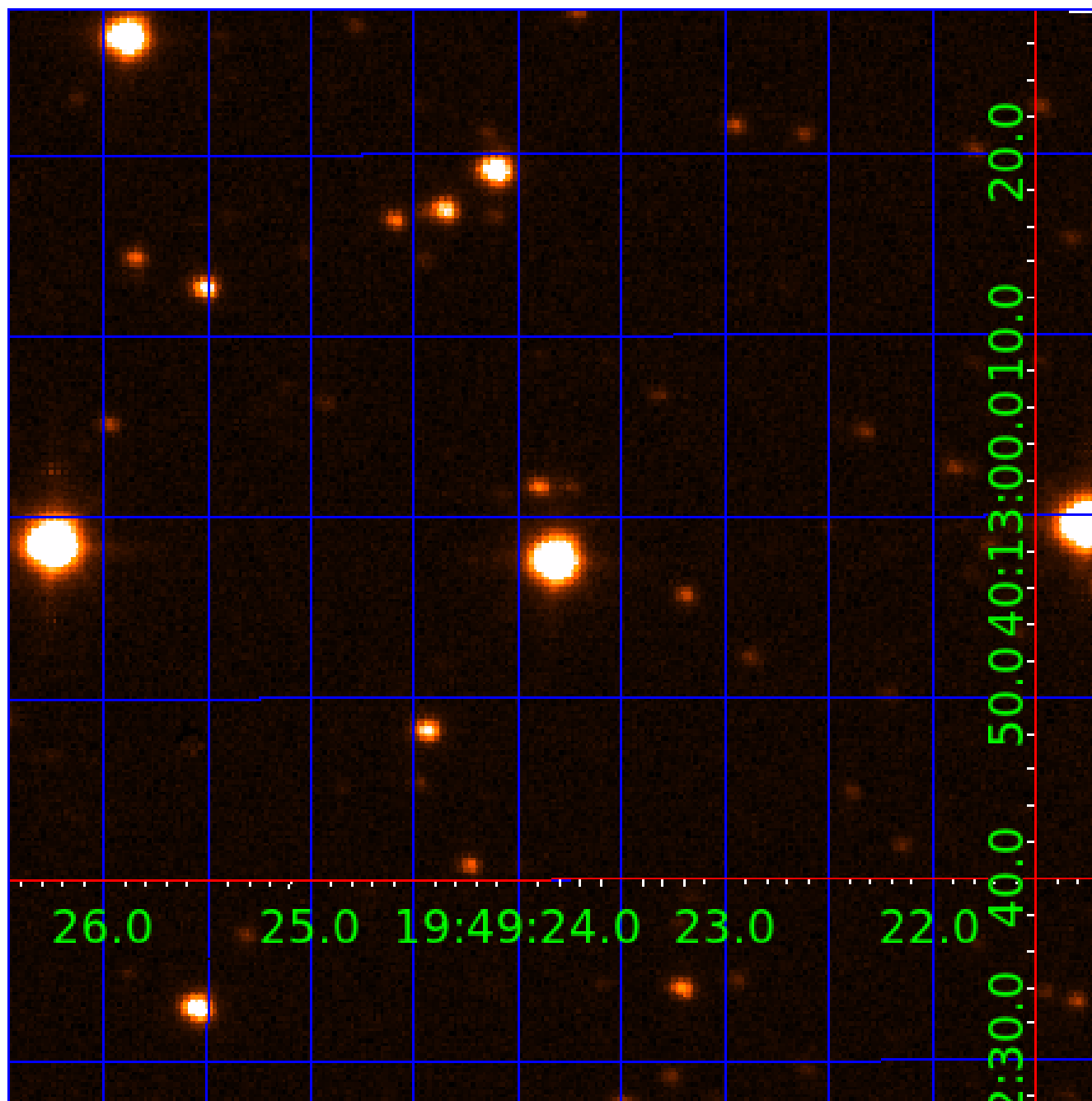


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005121915

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005121915-01	OBS	No	449.210680	558.809216	7349.1	15.052	24.6	22.8	1.59	6568	24.38	2.62
005121915-02	OBS	No	482.963675	489.749784	363.0	2.756	17.5	4.2	1.59	6568	3.44	2.38
005121915-03	OBS	No	454.973647	187.723717	506.1	7.500	17.2	-1.0	1.59	6568	3.61	2.58
005121915-04	OBS	No	413.119379	216.387643	5726.2	14.939	15.5	15.1	1.59	6568	21.67	2.93
005121915-05	OBS	No	494.219705	146.924709	398.9	7.500	14.1	-1.0	1.59	6568	3.20	2.31

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005121915-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
005121915-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
005121915-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

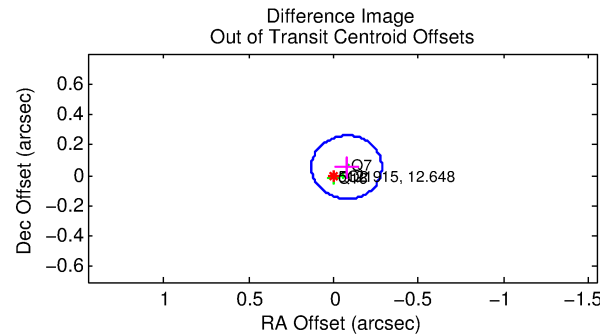
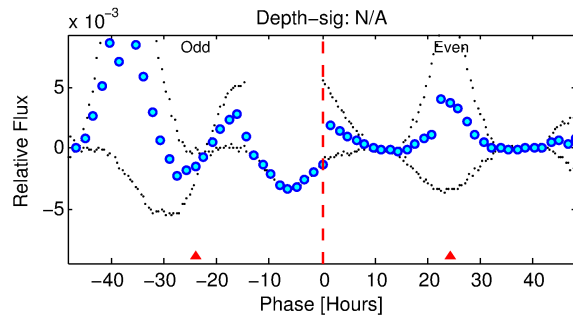
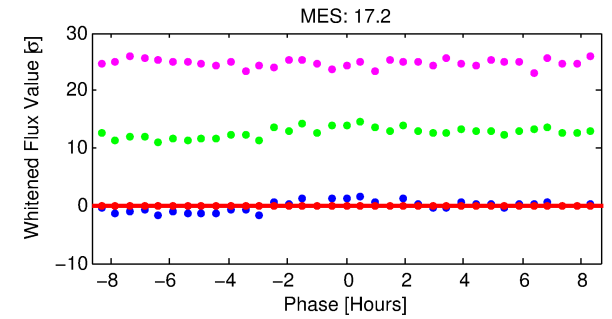
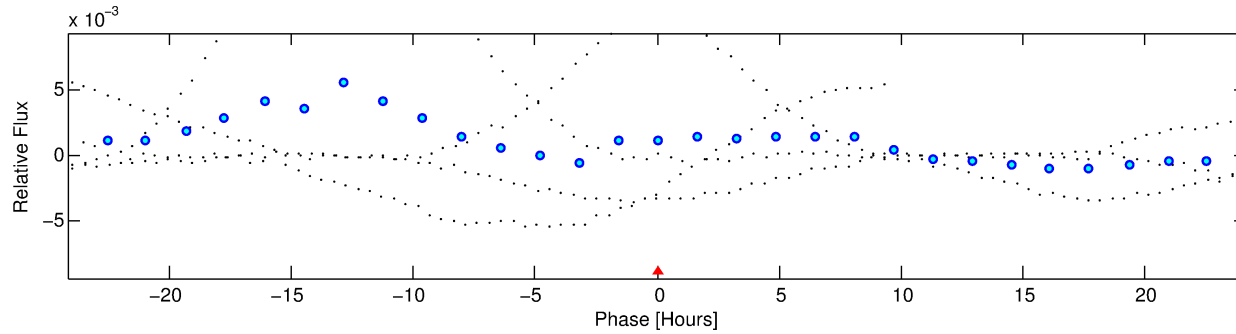
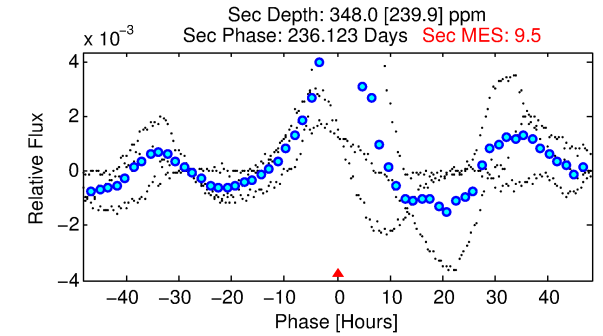
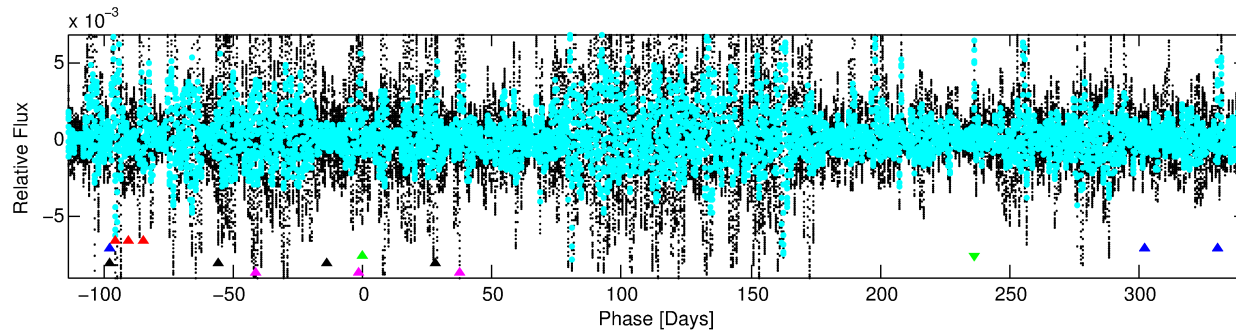
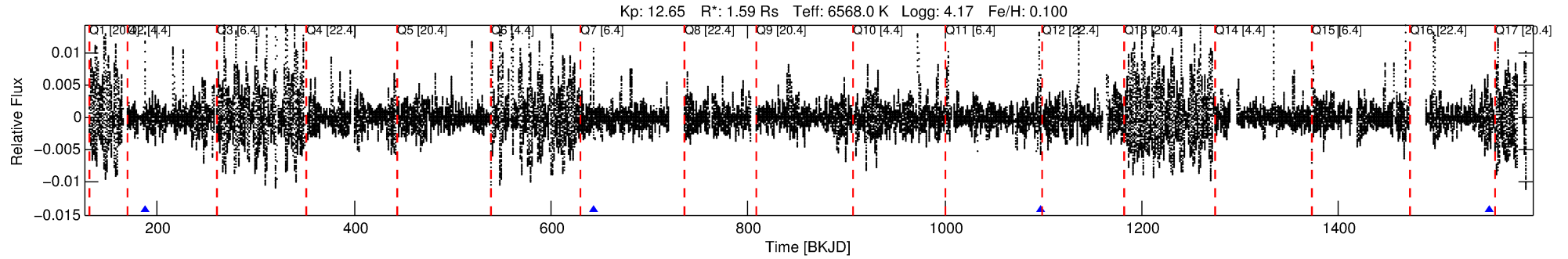
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005121915-03

No Significant Match Found

# DV One-Page Summary

KIC: 5121915 Candidate: 3 of 5 Period: 454.974 d



## TPS TCE Results:

Period = 454.97365 d  
Epoch = 187.7237 BKJD

**DV fit results are unavailable**

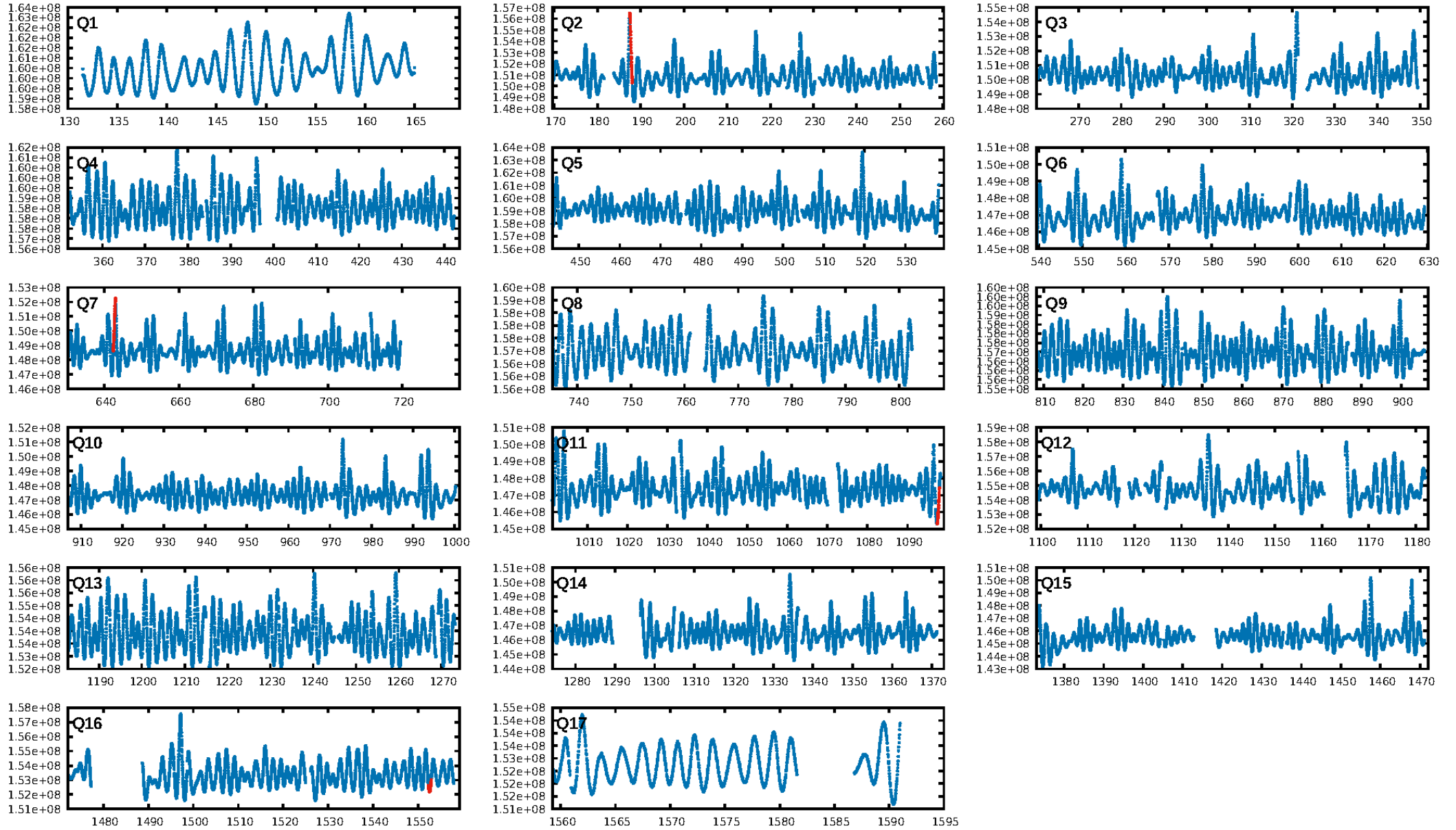
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.22 $\sigma$ ]  
LongPeriod-sig: 100.0% [84.07 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 2.491  
Centroid-sig: 80.2%  
Centroid-so: 3.070 arcsec [0.42 $\sigma$ ]  
OotOffset-rm: 0.094 arcsec [1.35 $\sigma$ ]  
KicOffset-rm: 0.045 arcsec [0.60 $\sigma$ ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:12:54 Z

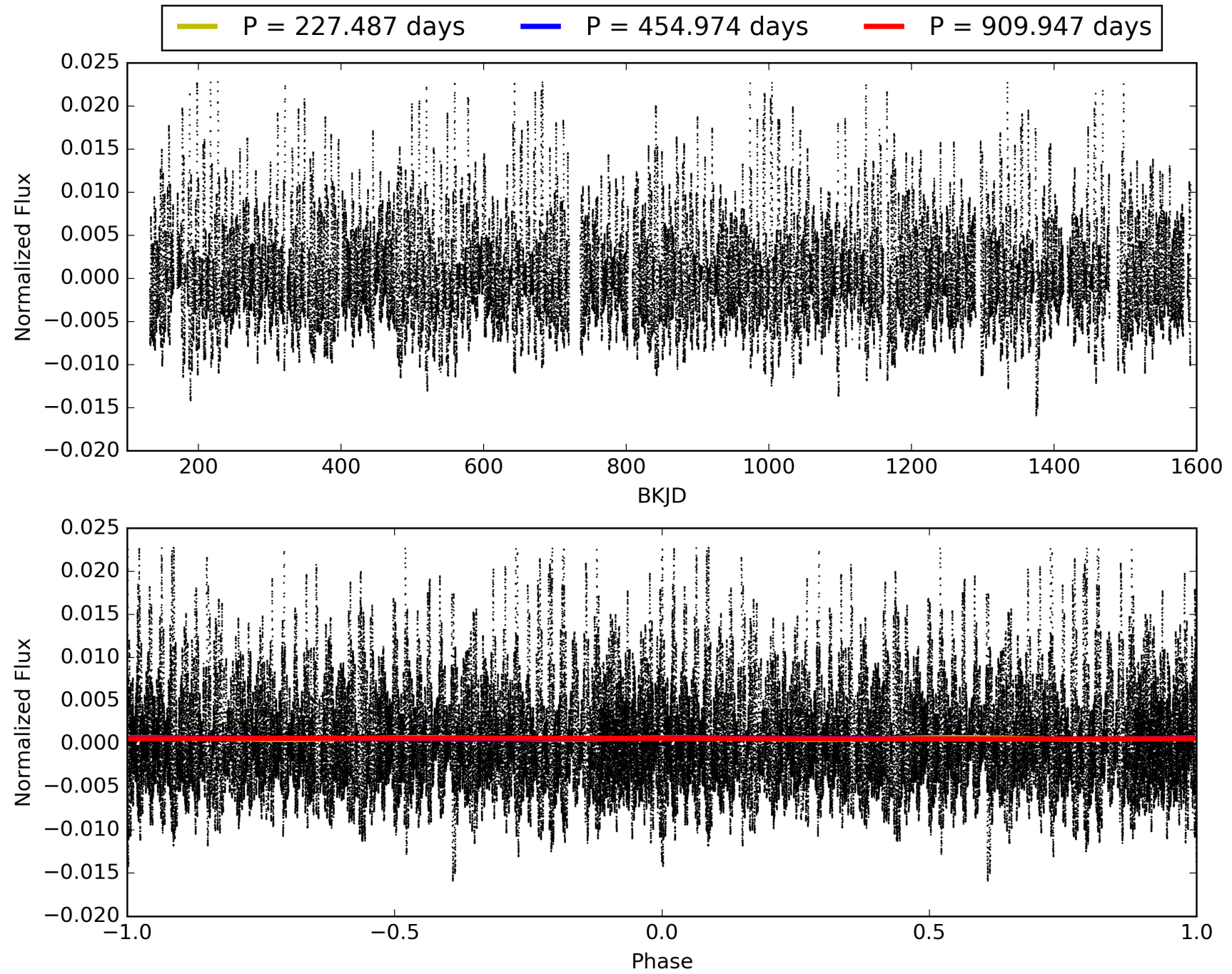
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005121915-03, PDC Light Curves





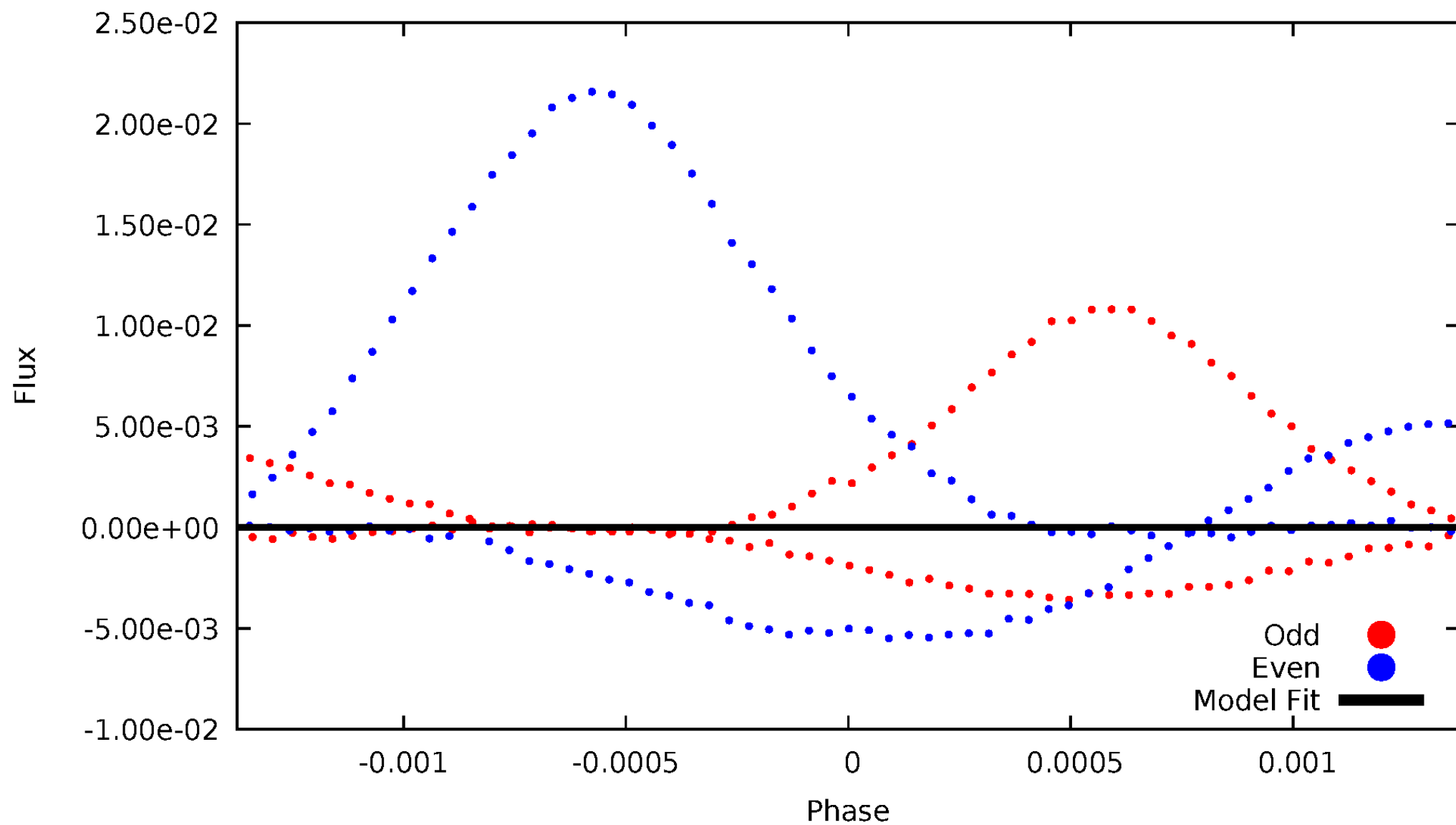
TCE 005121915-03





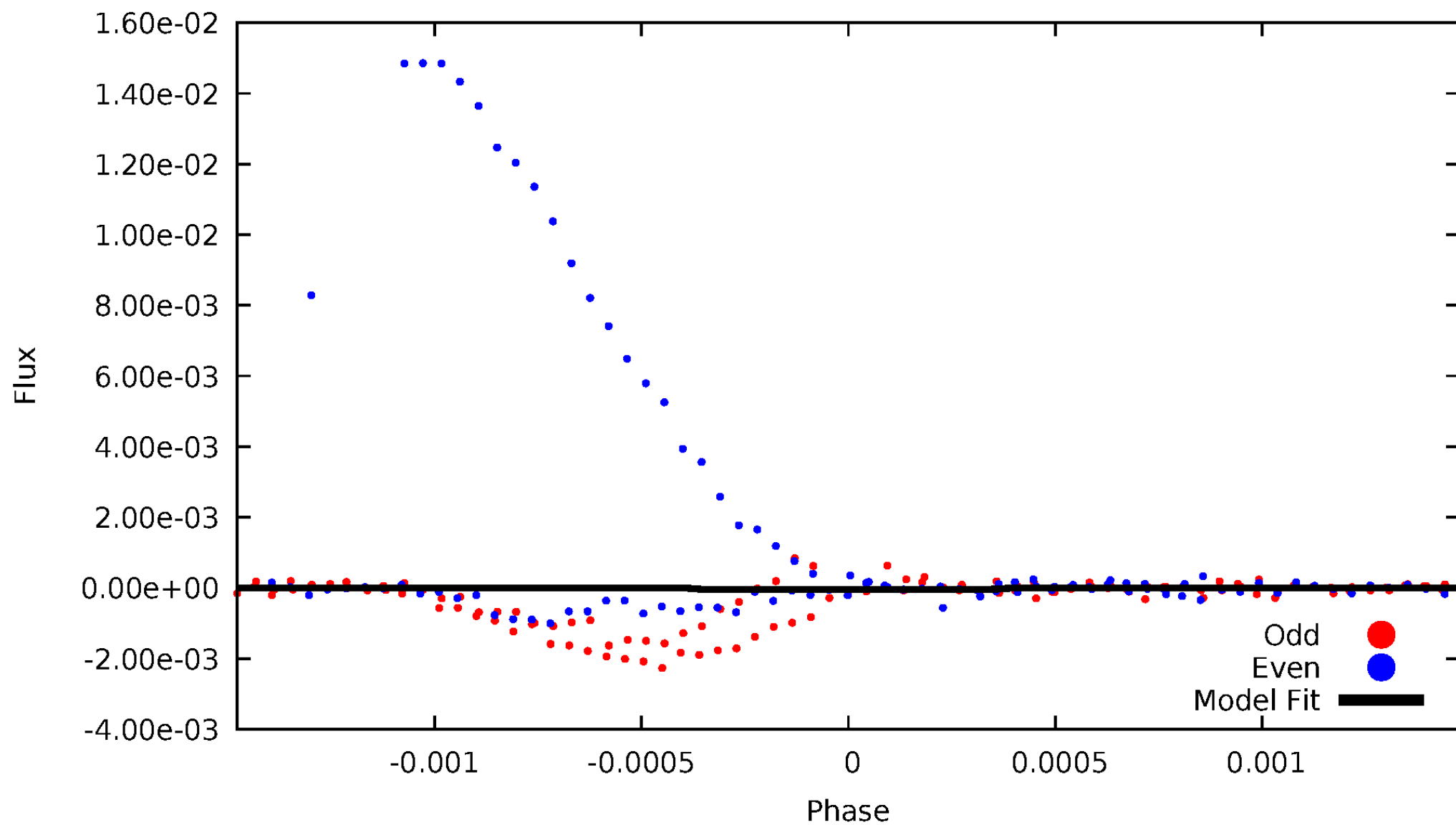
# DV Odd/Even

TCE 005121915-03



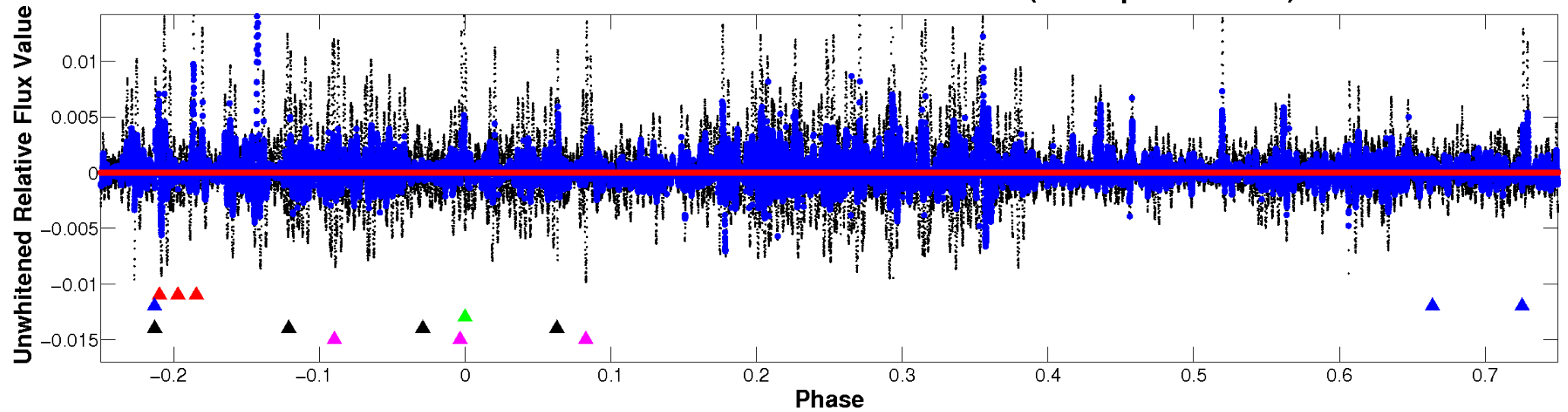
# ALT Odd/Even

TCE 005121915-03



# Non-Whitened Vs. Whitened Light Curve

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

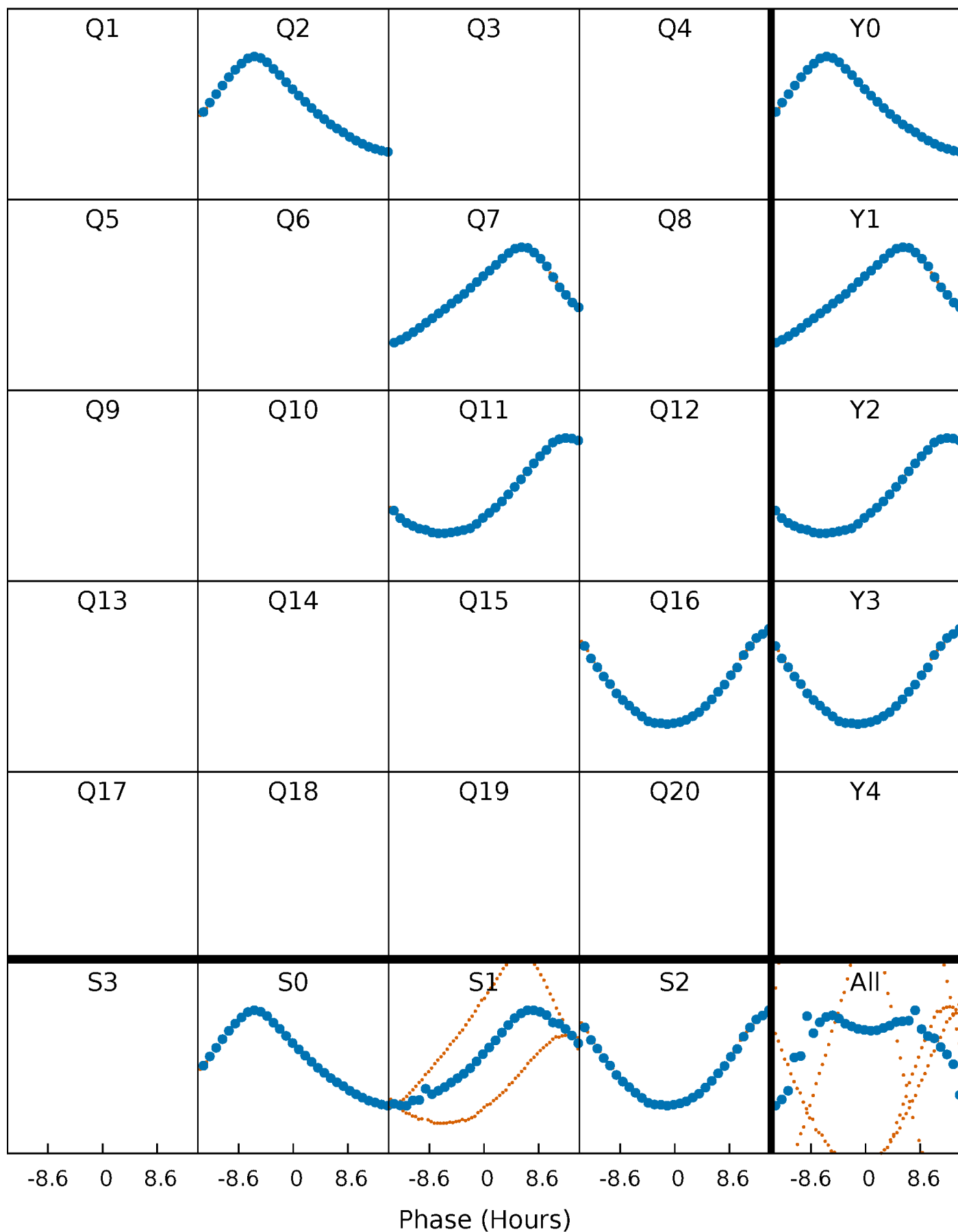


Planet 3 : Phased Whitened Flux Time Series (TPS Epoch/Period)



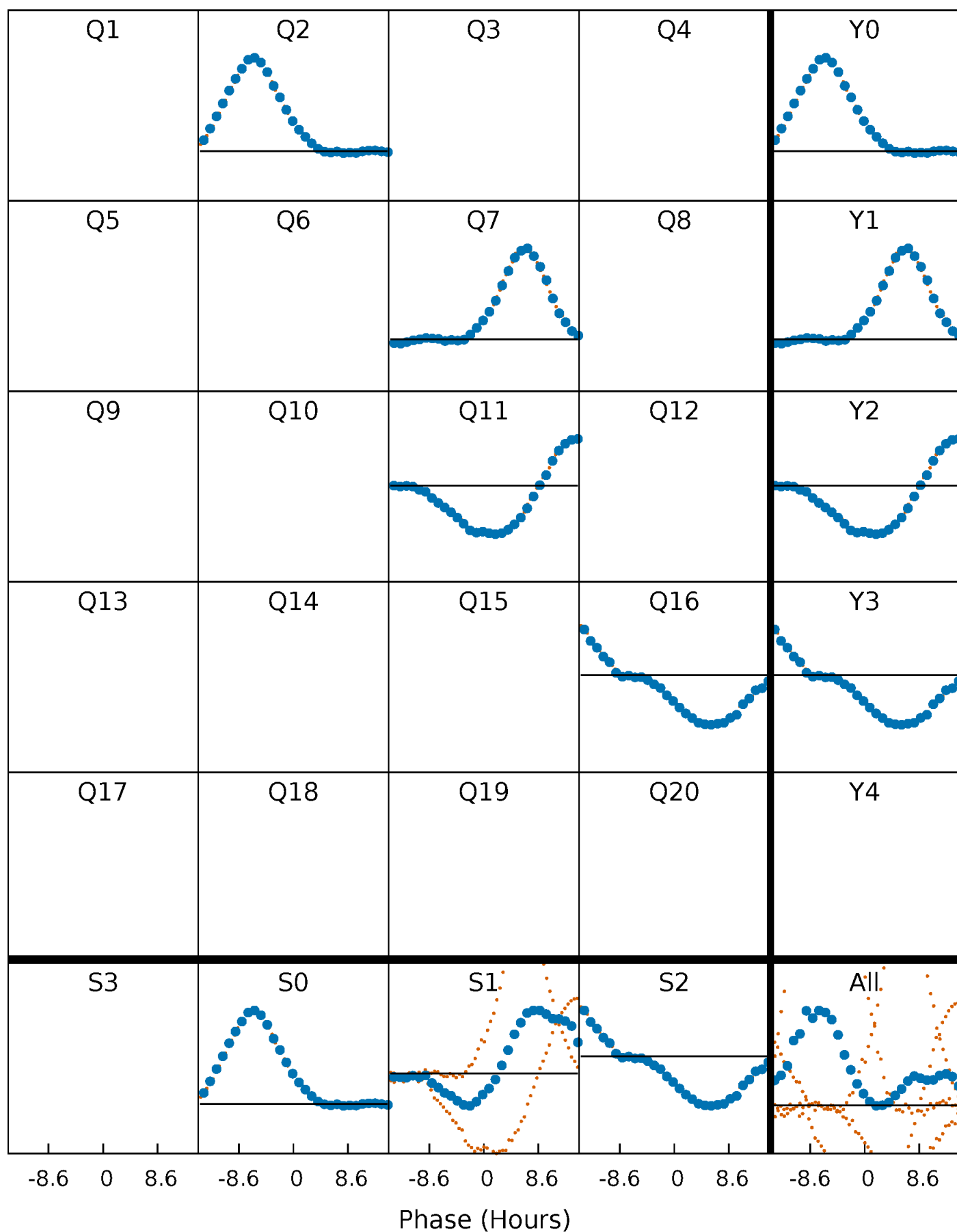
# PDC Quarter-Phased Transit Curves

TCE 005121915-03 P=454.973647 Days  $T_0=187.723717$  (BKJD)



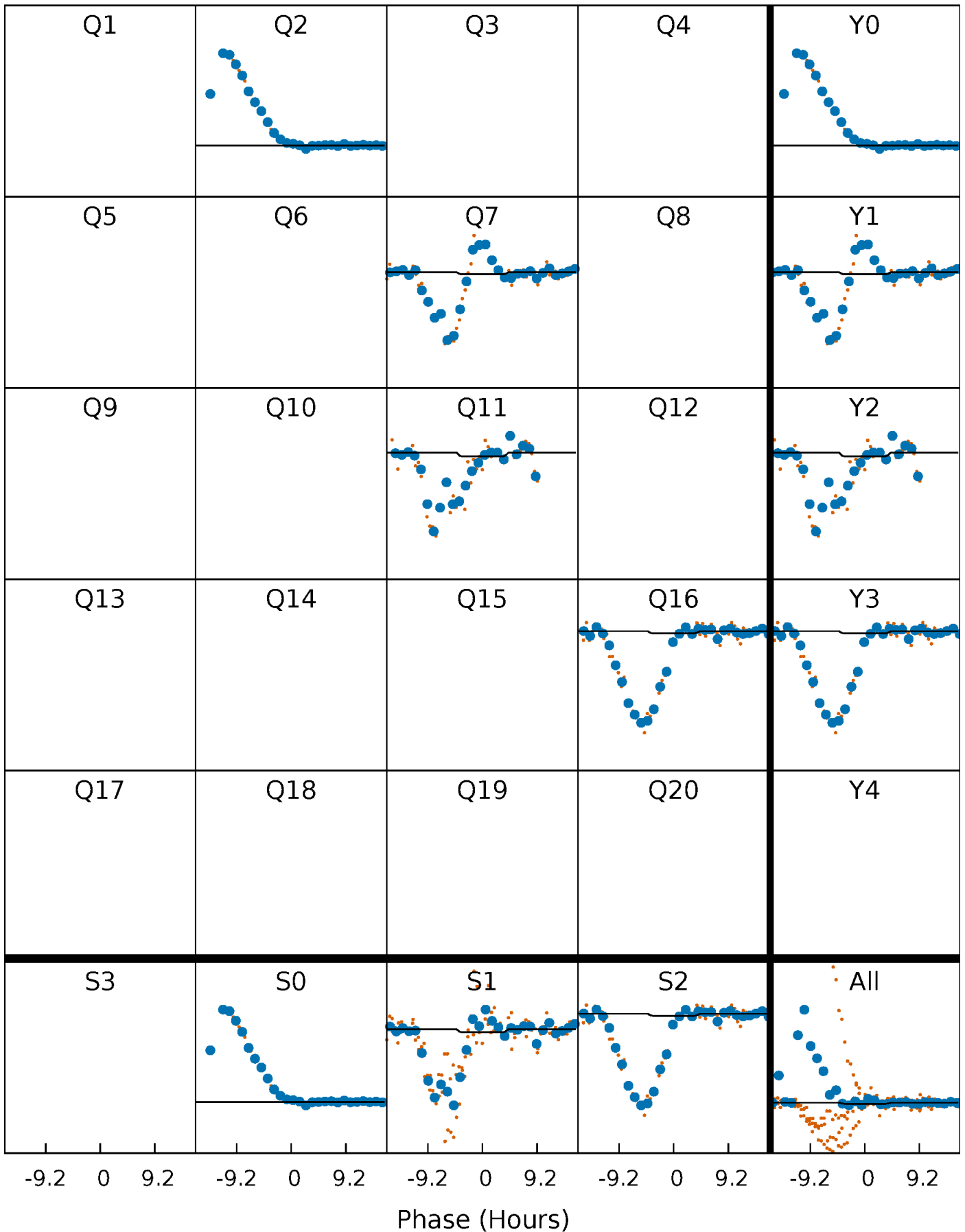
# DV Quarter-Phased Transit Curves

TCE 005121915-03 P=454.973647 Days  $T_0=187.723717$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

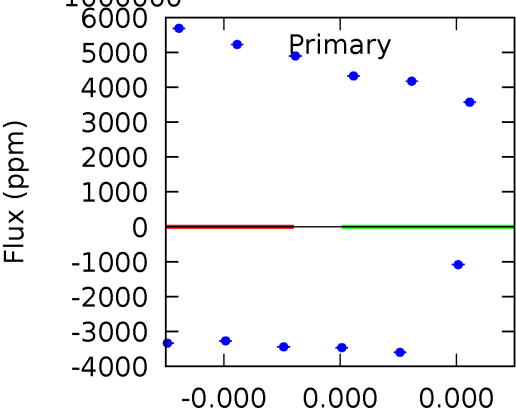
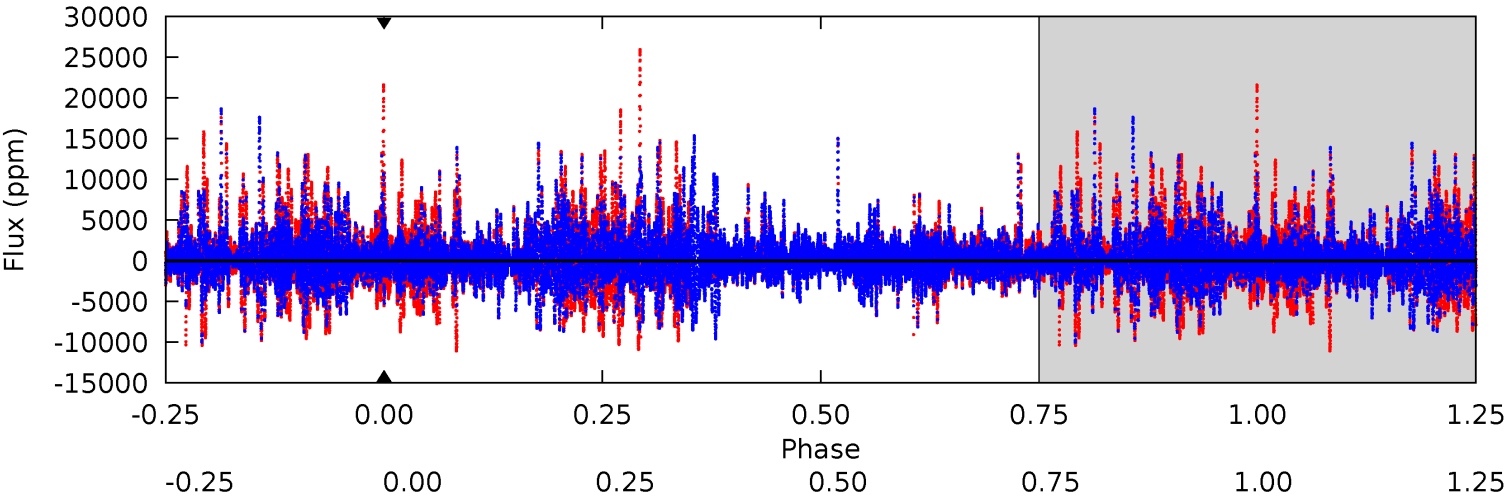
TCE 005121915-03 P=454.973647 Days  $T_0=187.990805$  (BKJD)



# DV Model-Shift Uniqueness Test

005121915-03, P = 454.973647 Days, E = 187.723717 Days

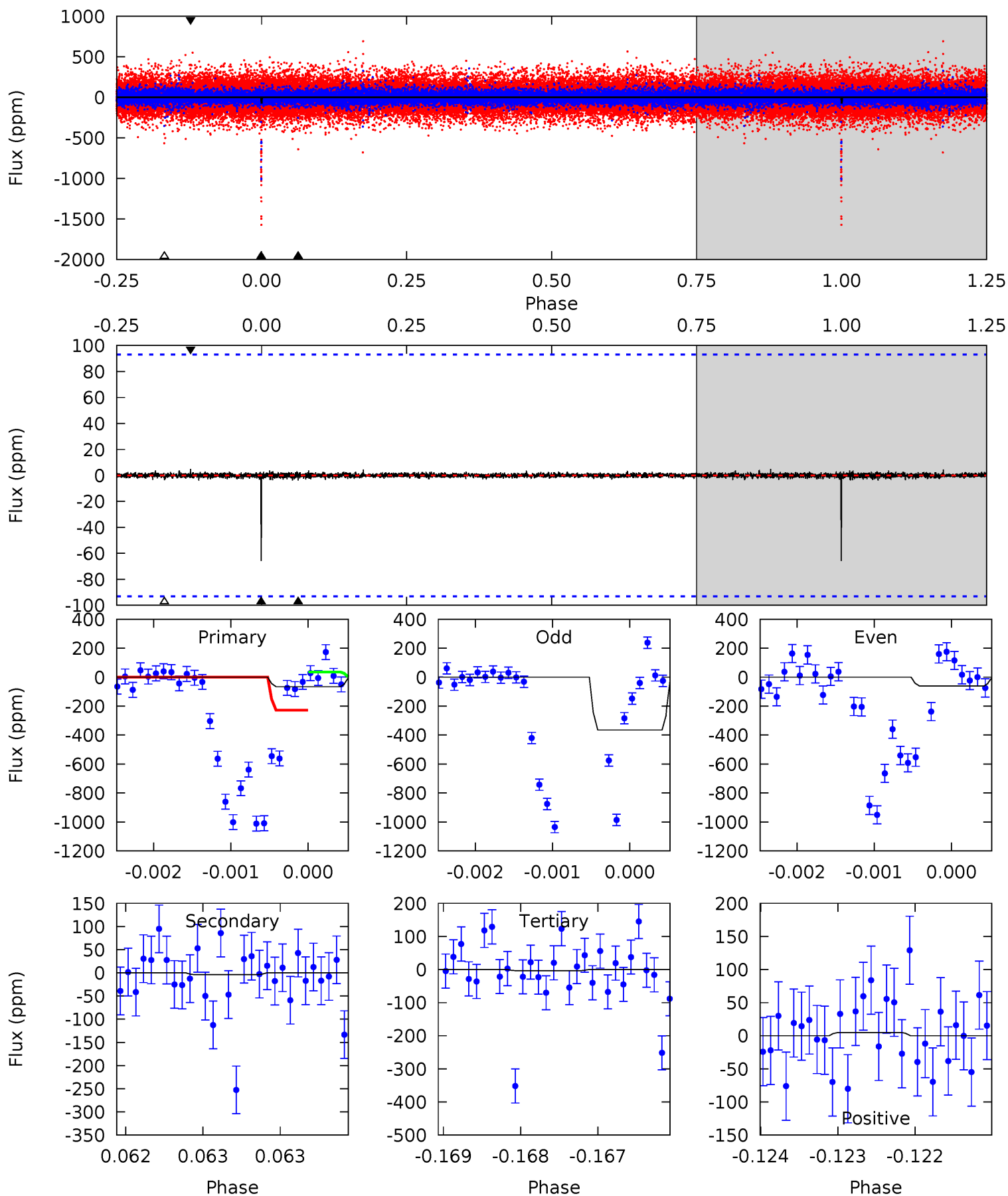
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

005121915-03, P = 454.973647 Days, E = 187.990805 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
3.90	0.23	0.21	0.29	5.50	3.37	0.05	3.69	3.61	0.02	-0.06	9.45	-1.17	0.07	5.50





### Stellar Parameters For KIC 005121915

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6568^{+184}_{-253}$	$4.166^{+0.162}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.595^{+0.538}_{-0.359}$	$1.359^{+0.209}_{-0.230}$	$0.472^{+0.402}_{-0.251}$
	+3%/-4%	+4%/-5%	+200%/-350%	+34%/-23%	+15%/-17%	+85%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005121915-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$12.84^{+14.55}_{-8.61}$	$451^{+38}_{-31}$	$5795^{+24820}_{-32714}$	$17017^{+1082715}_{-885894}$
Alt.	$-4 \pm 17$	$12.75^{+13.24}_{-9.15}$	$451^{+36}_{-32}$	$1919^{+948}_{-4364}$	$10^{+302}_{-106}$

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

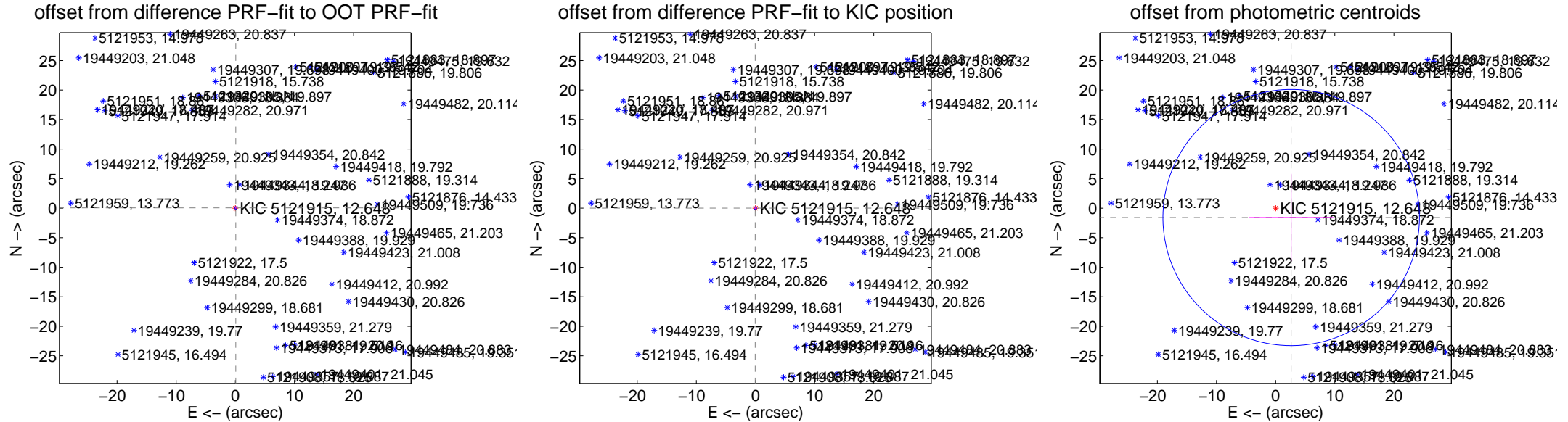
## DV Centroid Data

Supplemental centroid analysis for 005121915-03. Kepler magnitude: 12.65. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

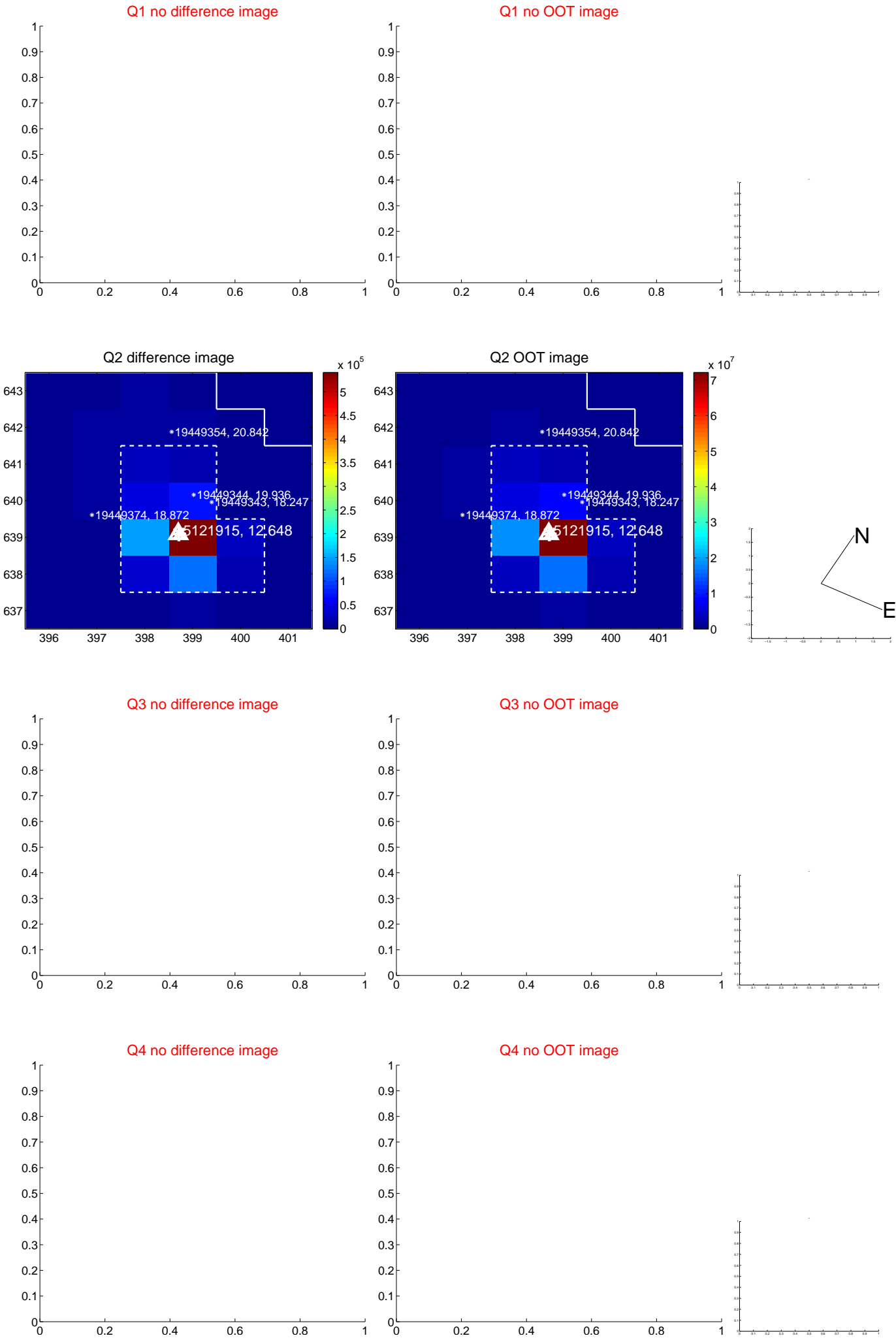
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.094 \pm 0.069$	1.35	$-0.076 \pm 0.068$	$0.054 \pm 0.068$
PRF-fit source offset from KIC position	$0.045 \pm 0.074$	0.60	$0.043 \pm 0.073$	$0.013 \pm 0.070$
photometric centroid source offset	$3.07 \pm 7.23$	0.42	$-2.63 \pm 7.17$	$-1.58 \pm 7.41$

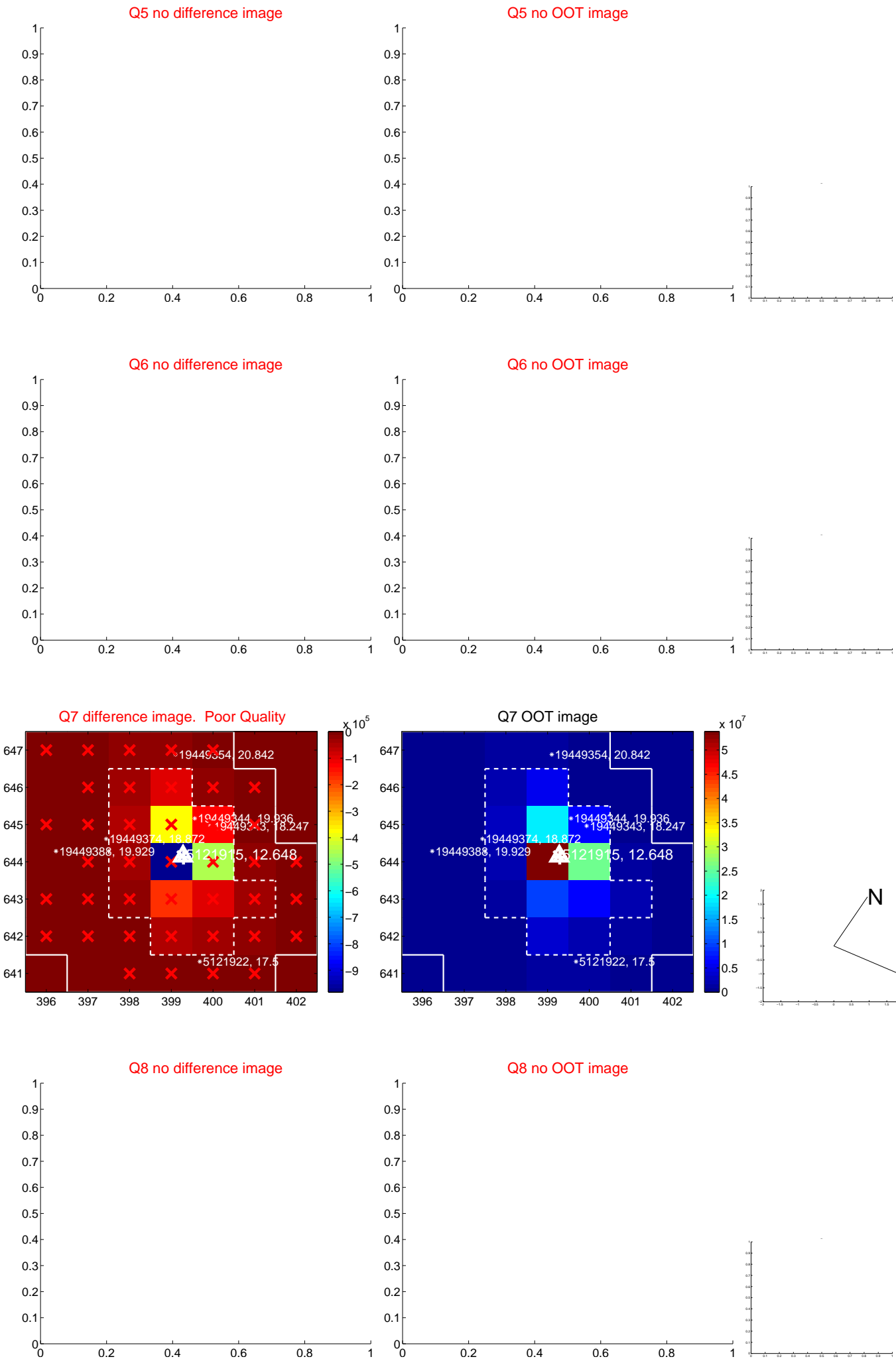


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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



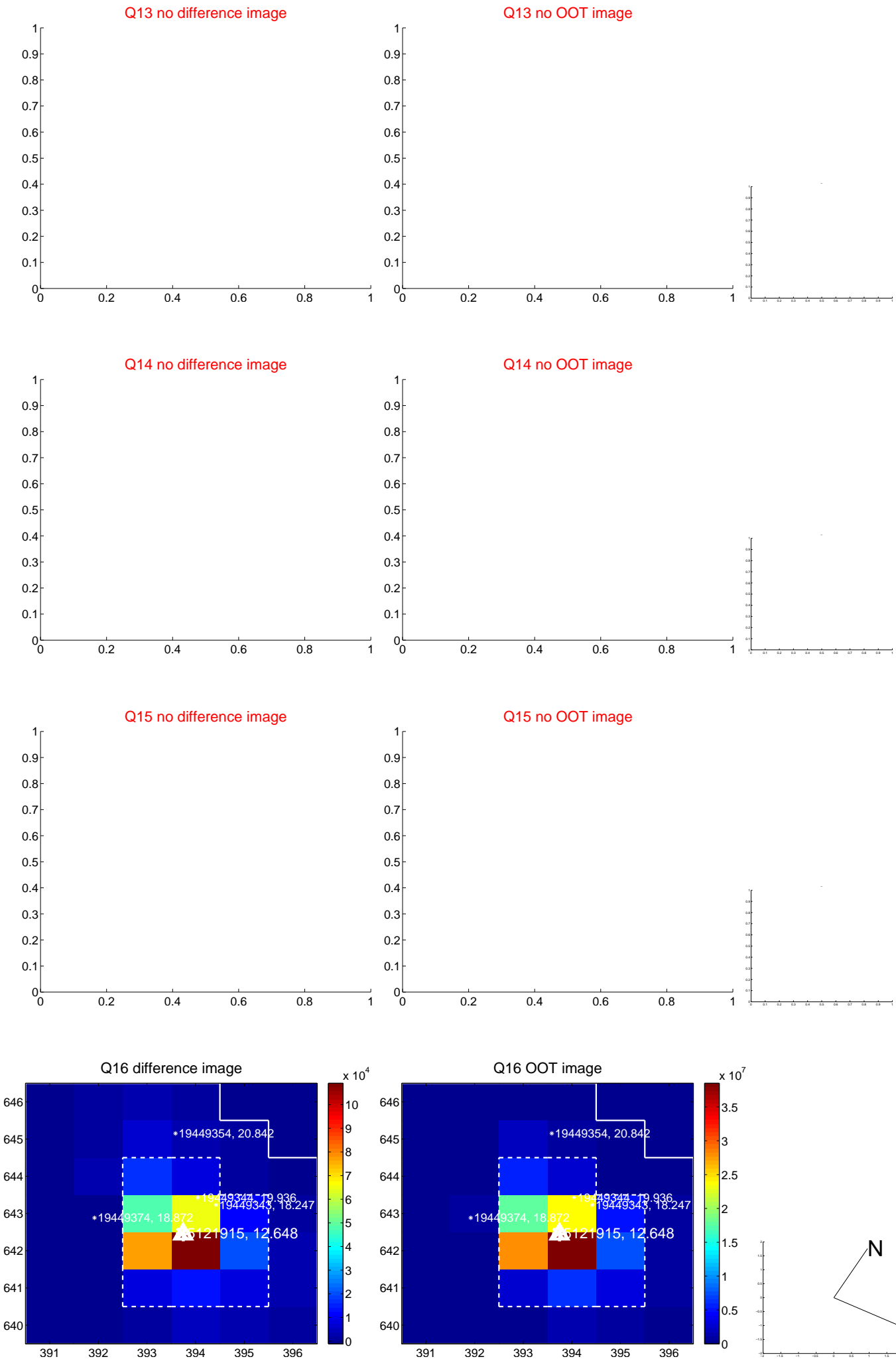
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



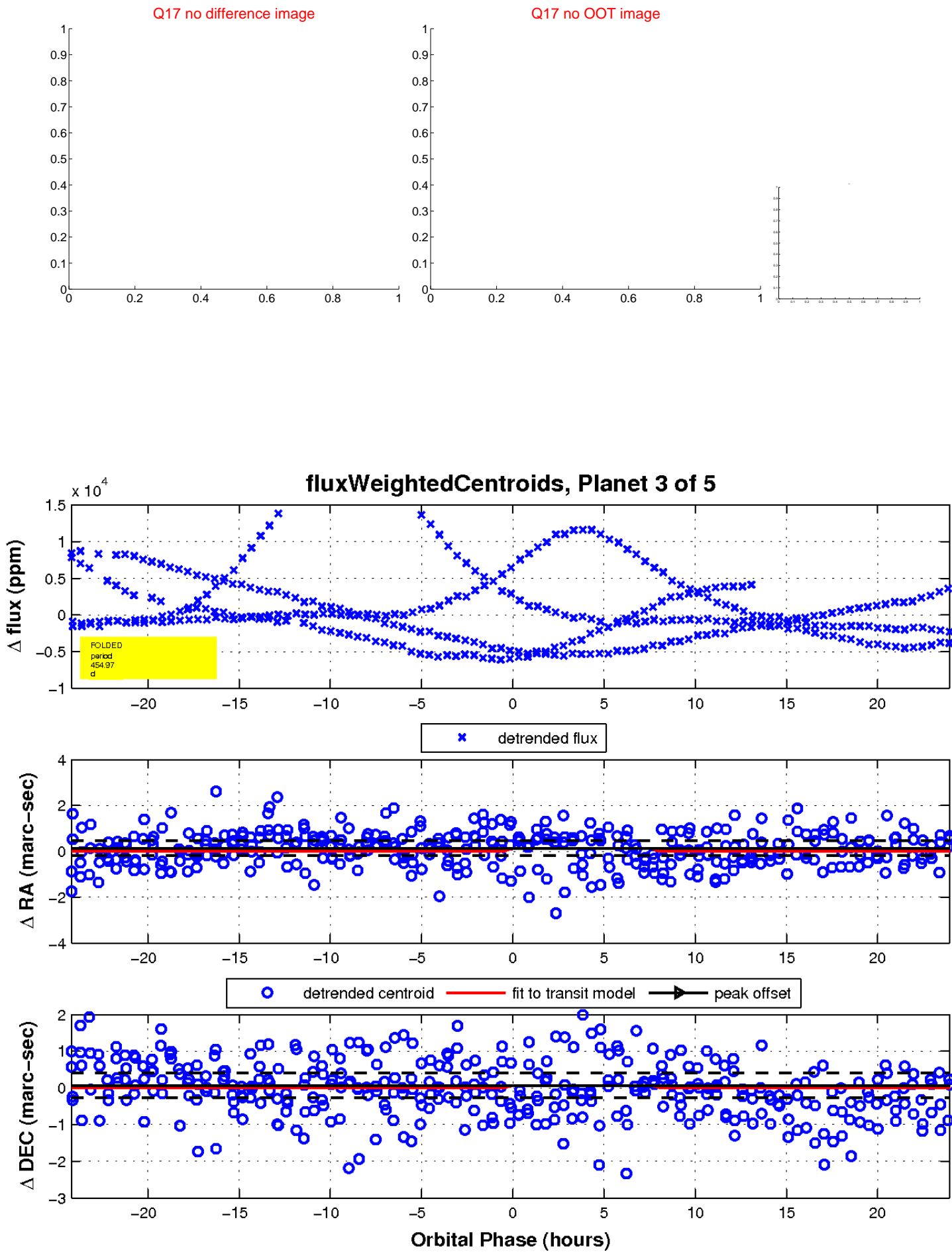
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

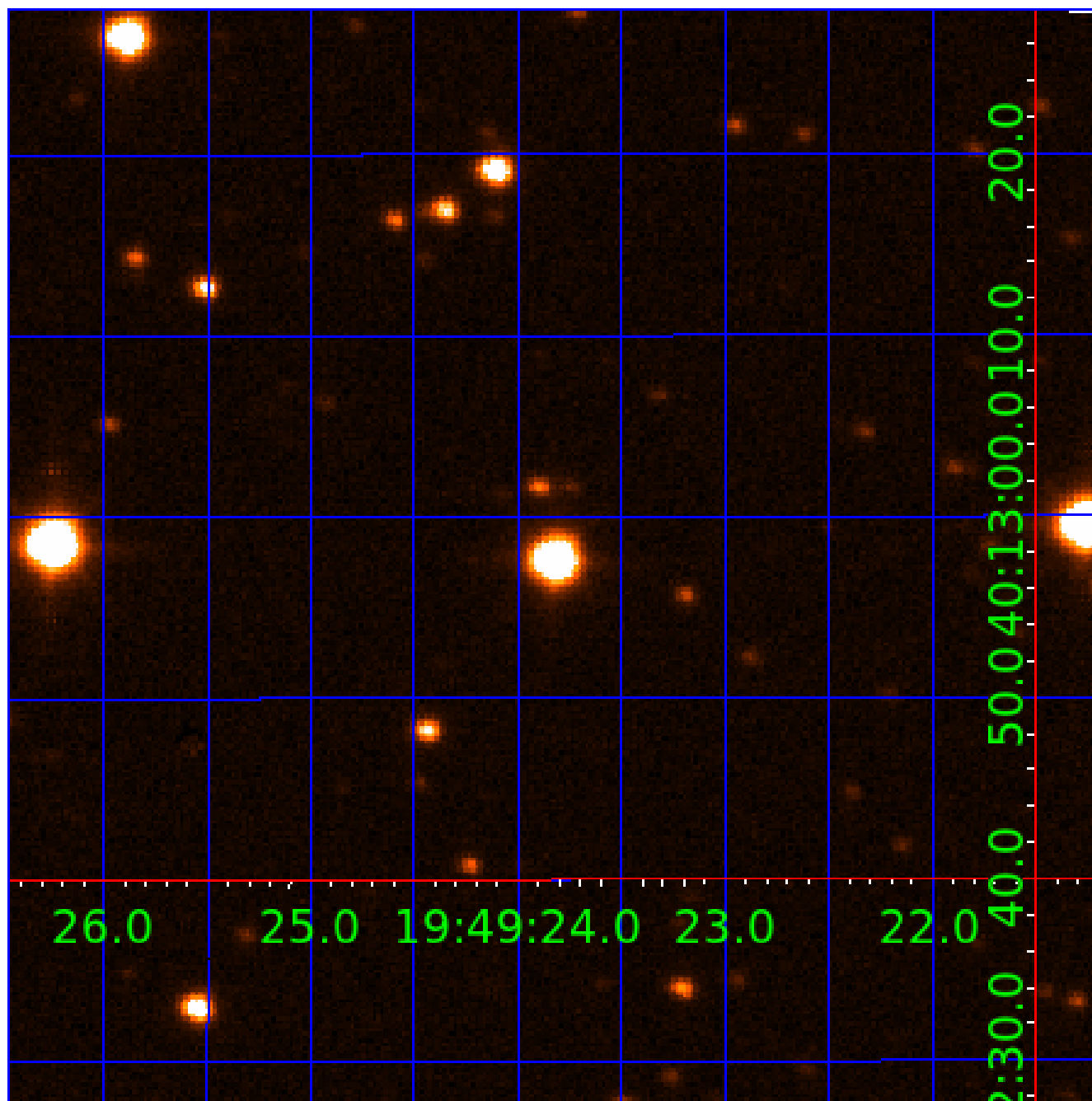


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 005121915

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005121915-01	OBS	No	449.210680	558.809216	7349.1	15.052	24.6	22.8	1.59	6568	24.38	2.62
005121915-02	OBS	No	482.963675	489.749784	363.0	2.756	17.5	4.2	1.59	6568	3.44	2.38
005121915-03	OBS	No	454.973647	187.723717	506.1	7.500	17.2	-1.0	1.59	6568	3.61	2.58
005121915-04	OBS	No	413.119379	216.387643	5726.2	14.939	15.5	15.1	1.59	6568	21.67	2.93
005121915-05	OBS	No	494.219705	146.924709	398.9	7.500	14.1	-1.0	1.59	6568	3.20	2.31

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005121915-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
005121915-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
005121915-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

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

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

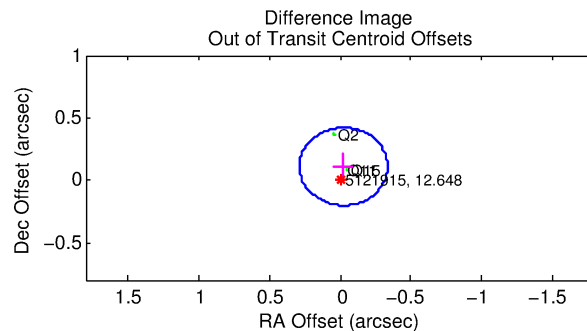
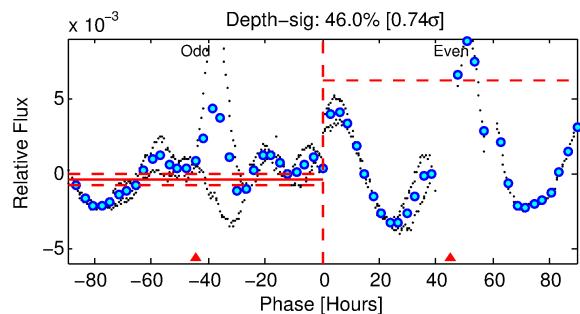
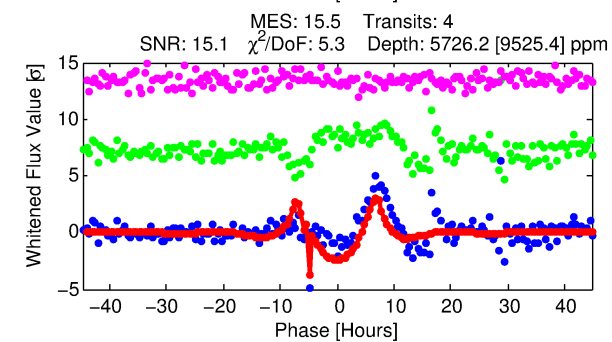
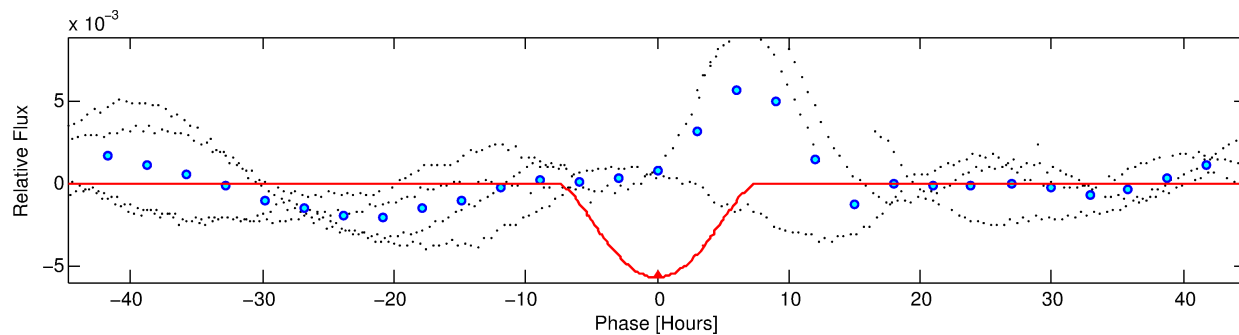
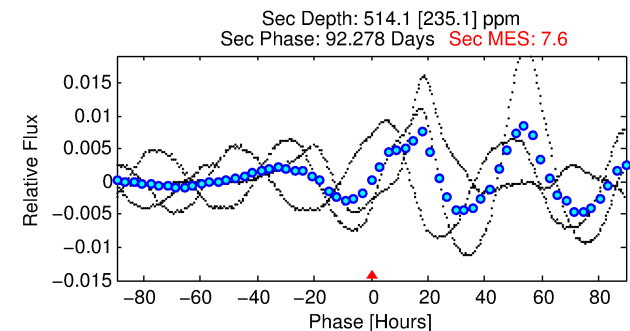
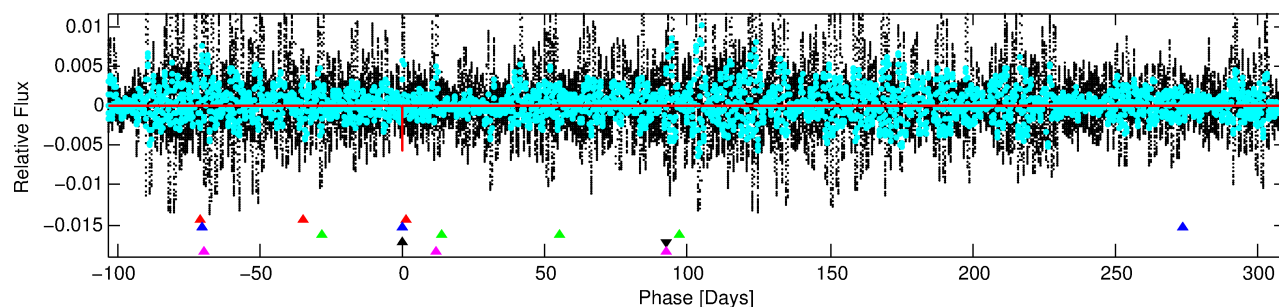
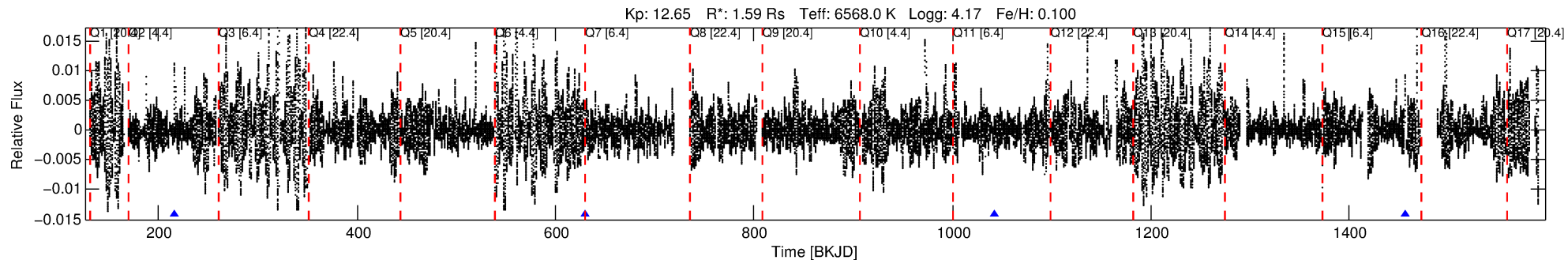
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005121915-04

No Significant Match Found

# DV One-Page Summary

KIC: 5121915 Candidate: 4 of 5 Period: 413.119 d



## DV Fit Results:

Period = 413.11938 [0.01026] d  
Epoch = 216.3876 [0.0257] BKJD  
Rp/R\* = 0.1245 [0.1739]  
a/R\* = 108.66 [27.38]  
b = 1.00 [0.38]  
Seff = 2.93 [1.20]  
Teq = 334 [34] K  
**Rp = 21.67 [31.13] Re**  
a = 1.2030 [0.3265] AU  
Ag = 871.67 [2488.82] [0.35σ]  
Teff = 2803 [1986] K [1.24σ]

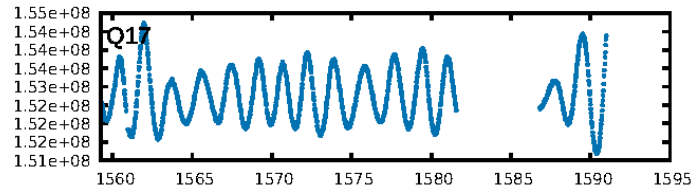
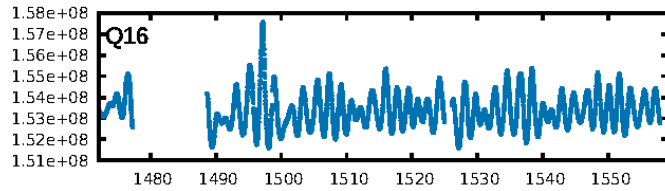
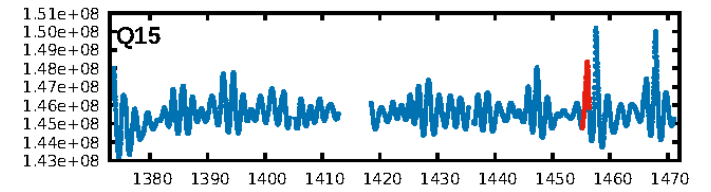
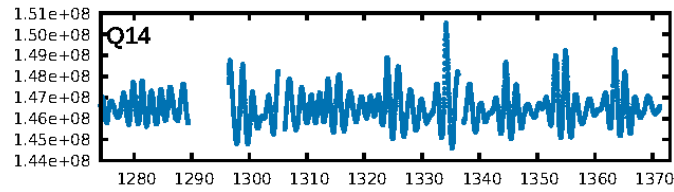
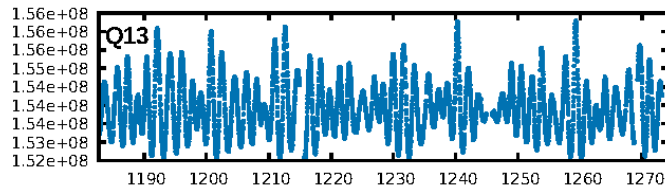
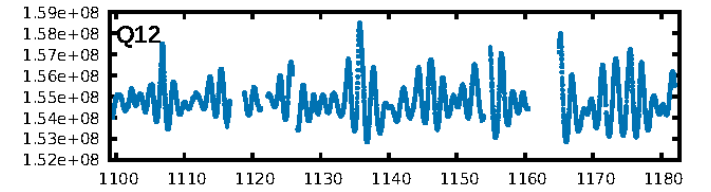
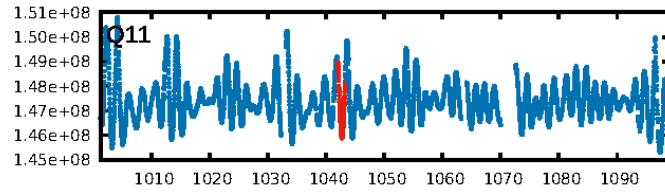
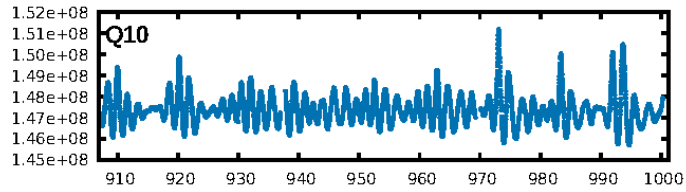
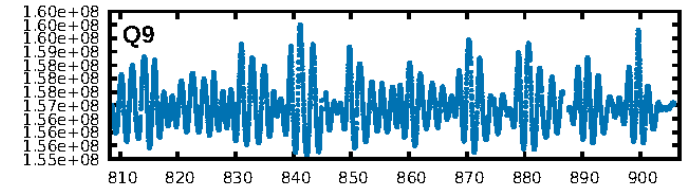
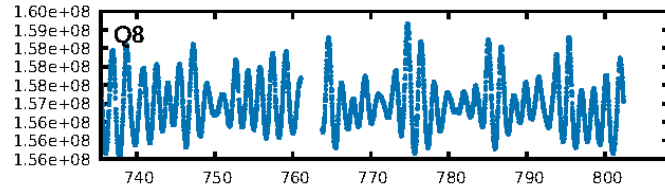
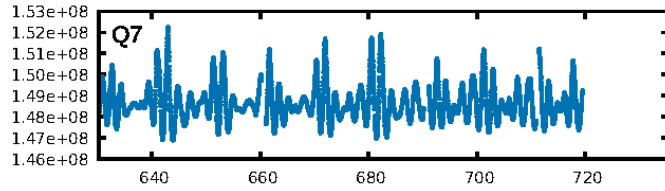
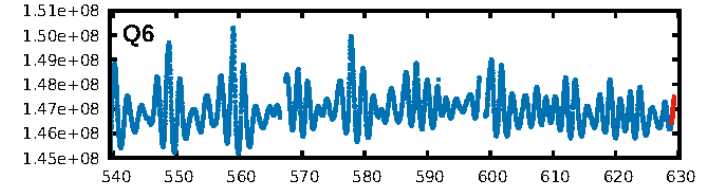
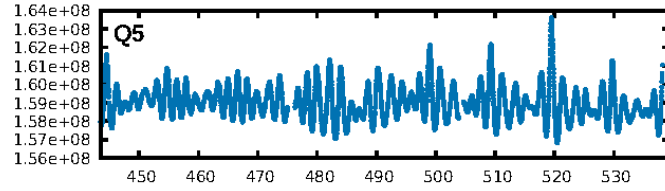
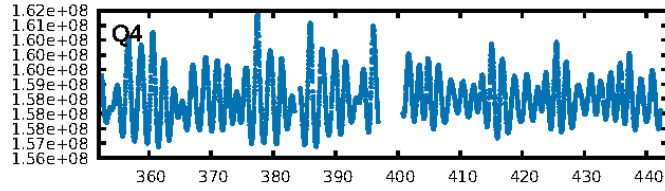
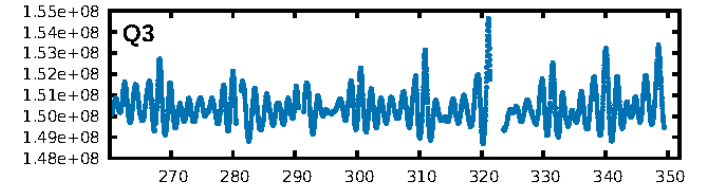
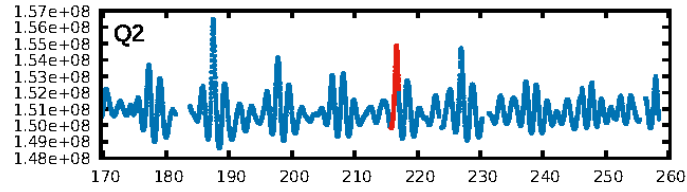
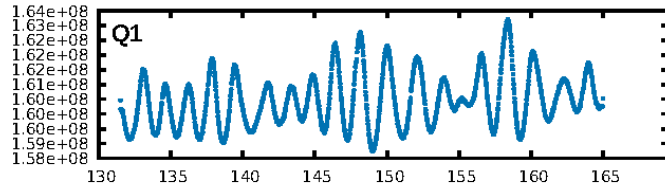
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [40.85σ]  
**ModelChiSquare2-sig: 0.0%**  
**ModelChiSquareGof-sig: 0.0%**  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -1.412  
Centroid-sig: 31.8%  
Centroid-so: 0.166 arcsec [2.00σ]  
OotOffset-rm: 0.111 arcsec [1.07σ]  
KicOffset-rm: 0.044 arcsec [0.40σ]  
OotOffset-st: 1/2/0/0 [3]  
KicOffset-st: 1/2/0/0 [3]  
DiffImageQuality-fgm: 0.33 [1/3]  
DiffImageOverlap-fno: 0.67 [2/3]

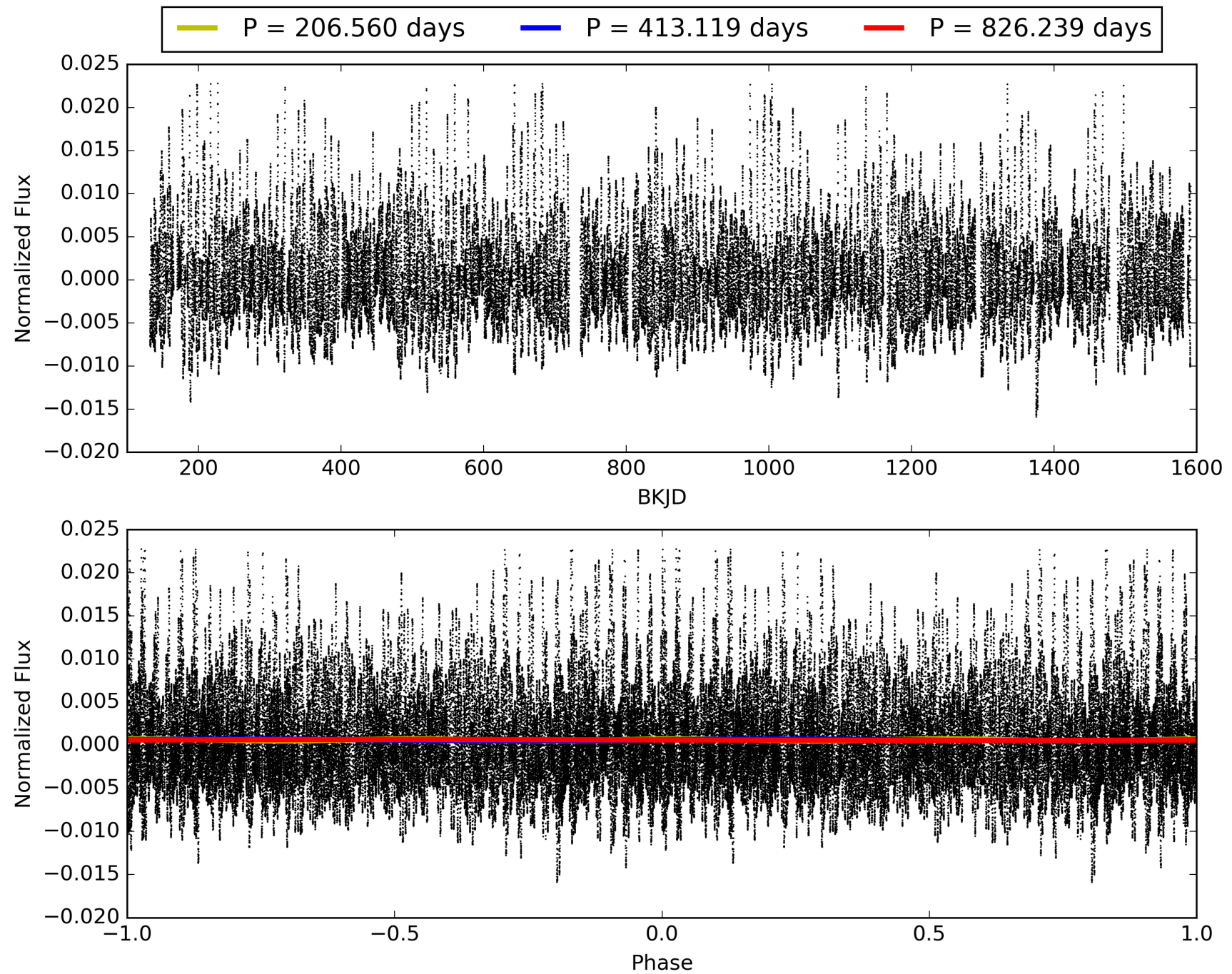
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:13:02 Z

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

# TCE 005121915-04, PDC Light Curves

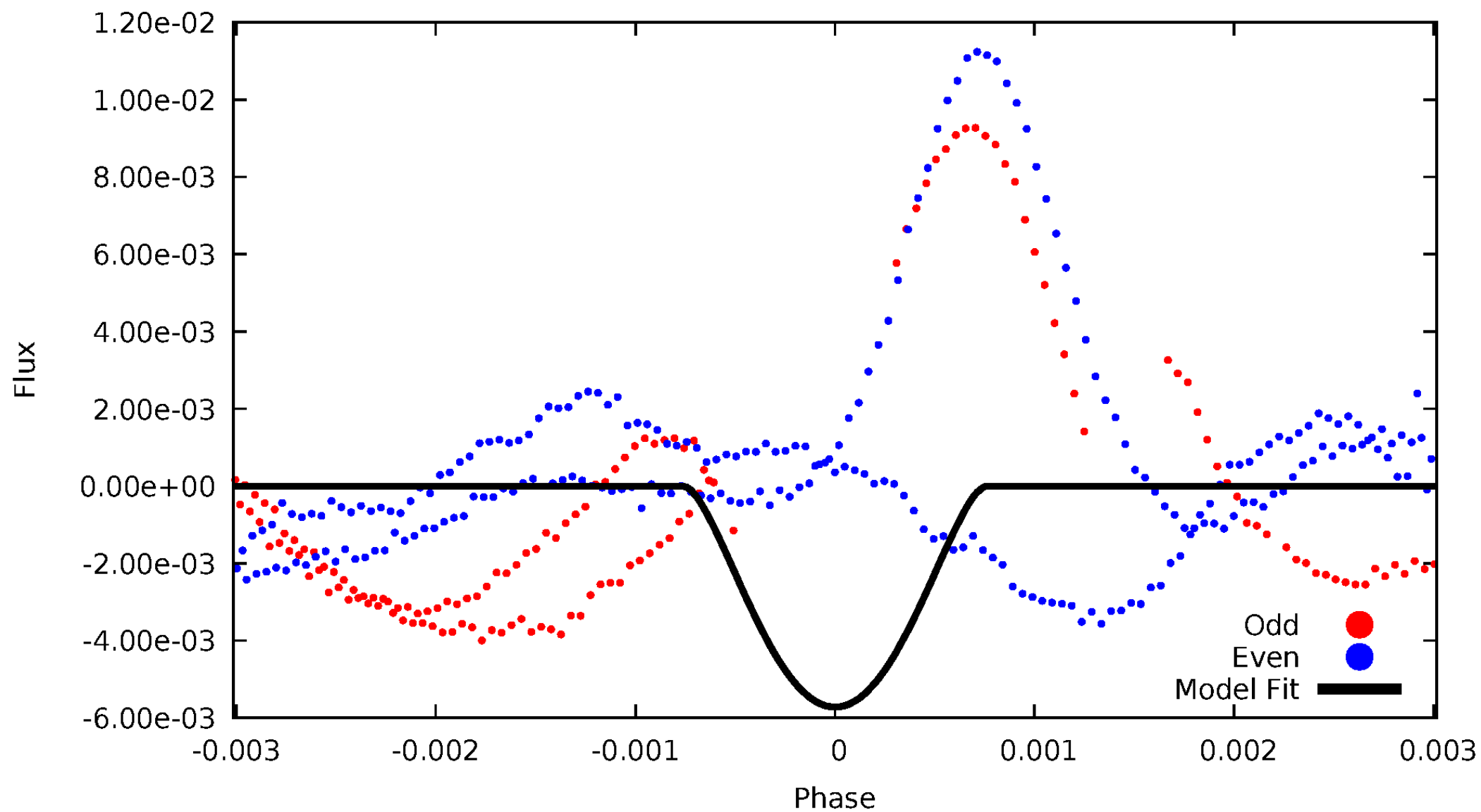


TCE 005121915-04



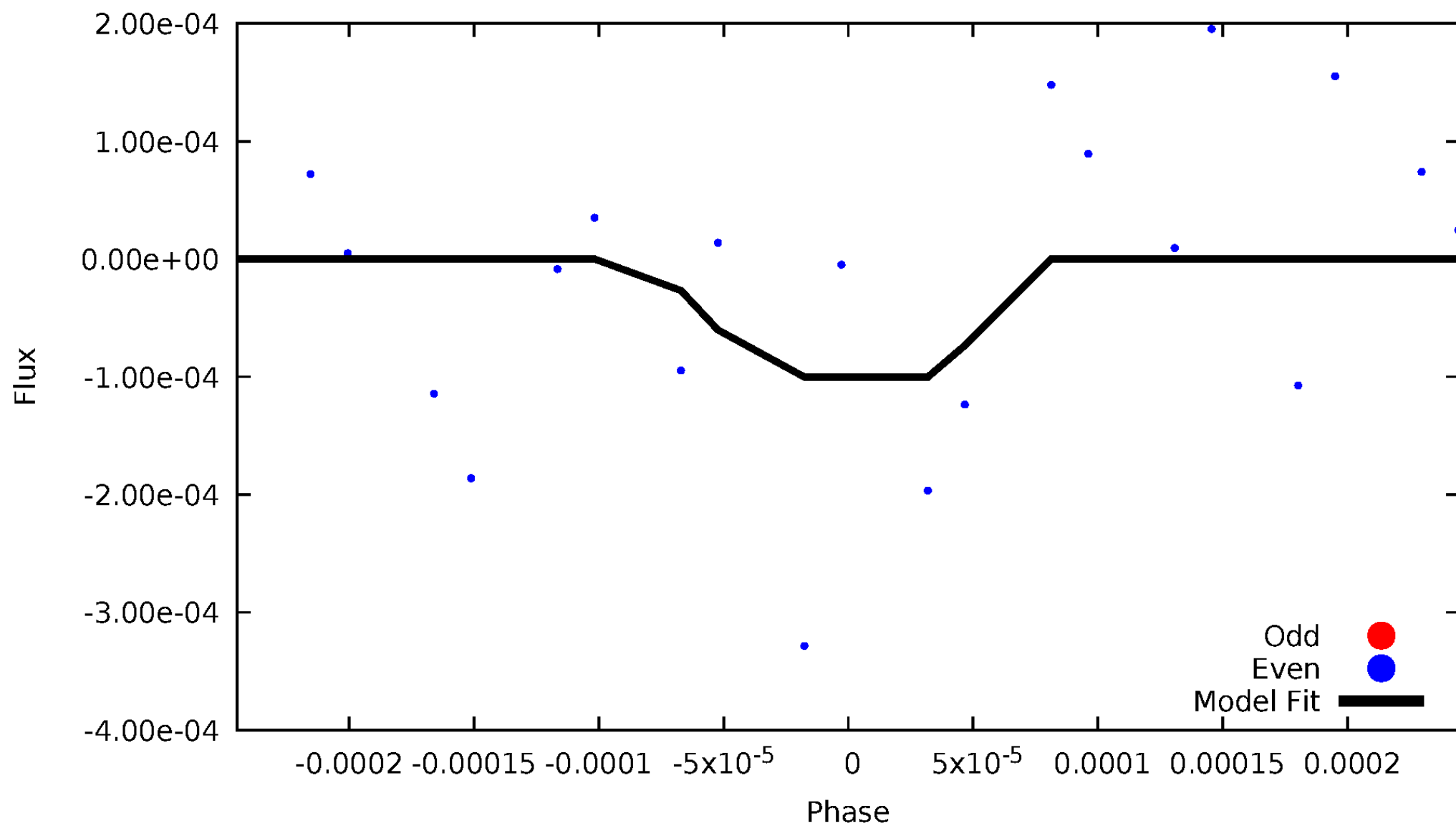
# DV Odd/Even

TCE 005121915-04



# ALT Odd/Even

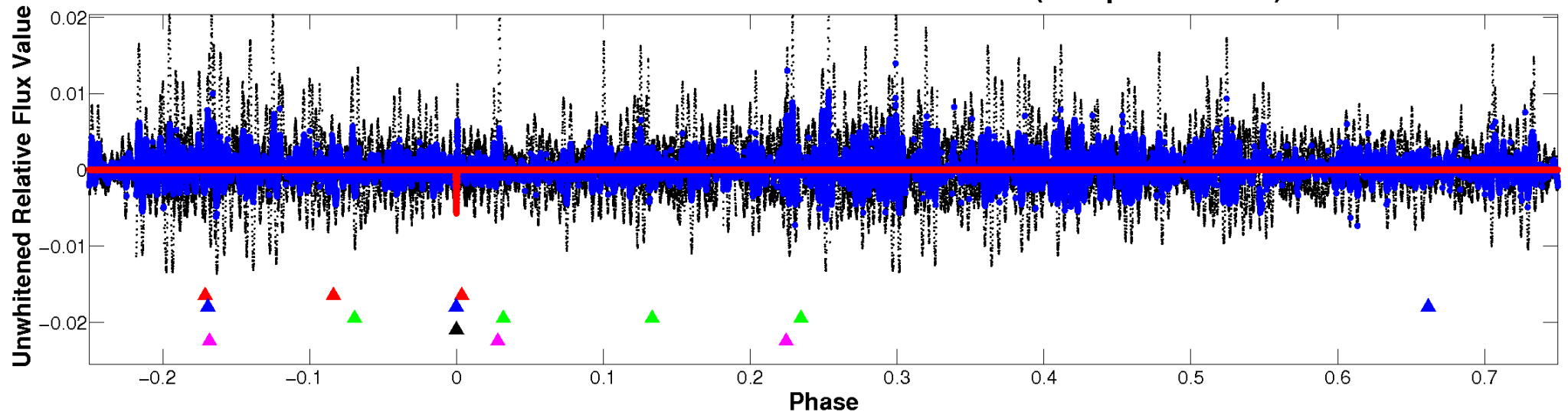
TCE 005121915-04



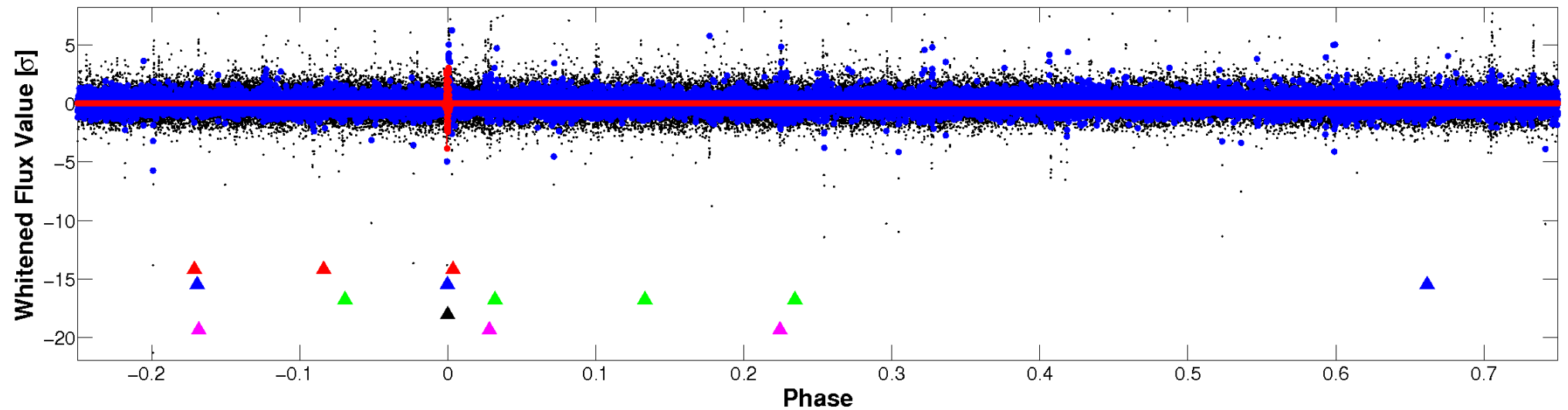


# Non-Whitened Vs. Whitened Light Curve

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

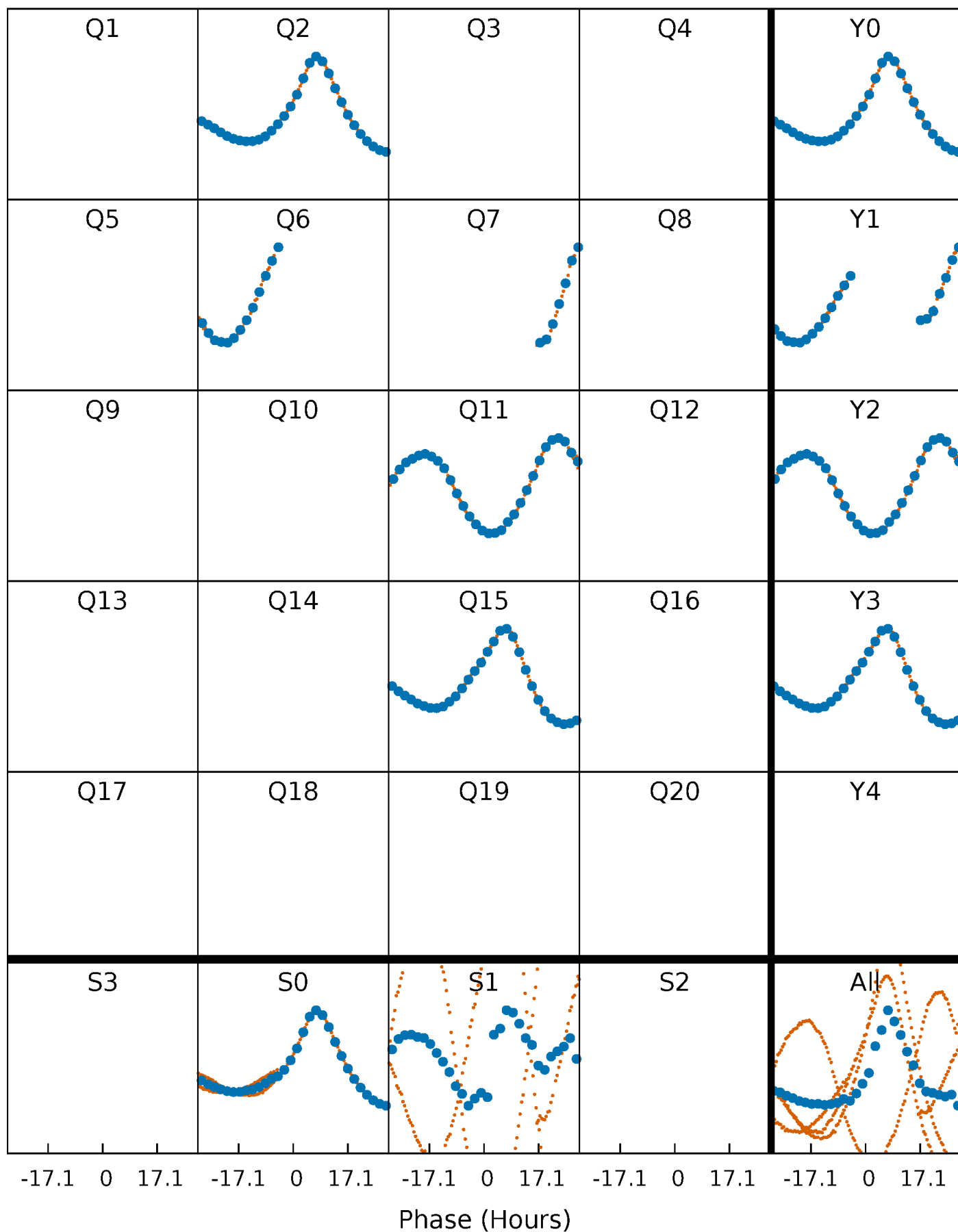


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

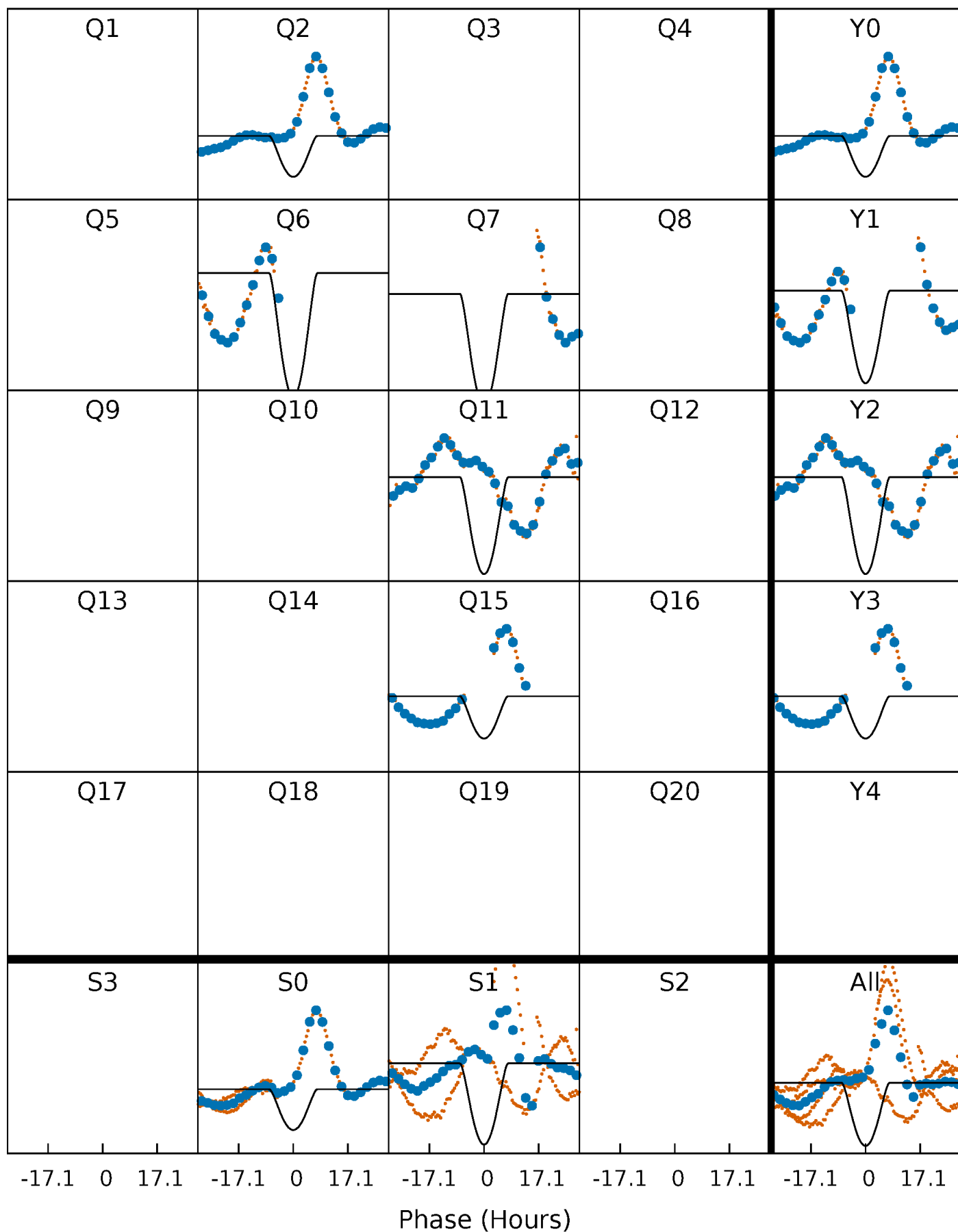
TCE 005121915-04 P=413.119379 Days  $T_0=216.387643$  (BKJD)





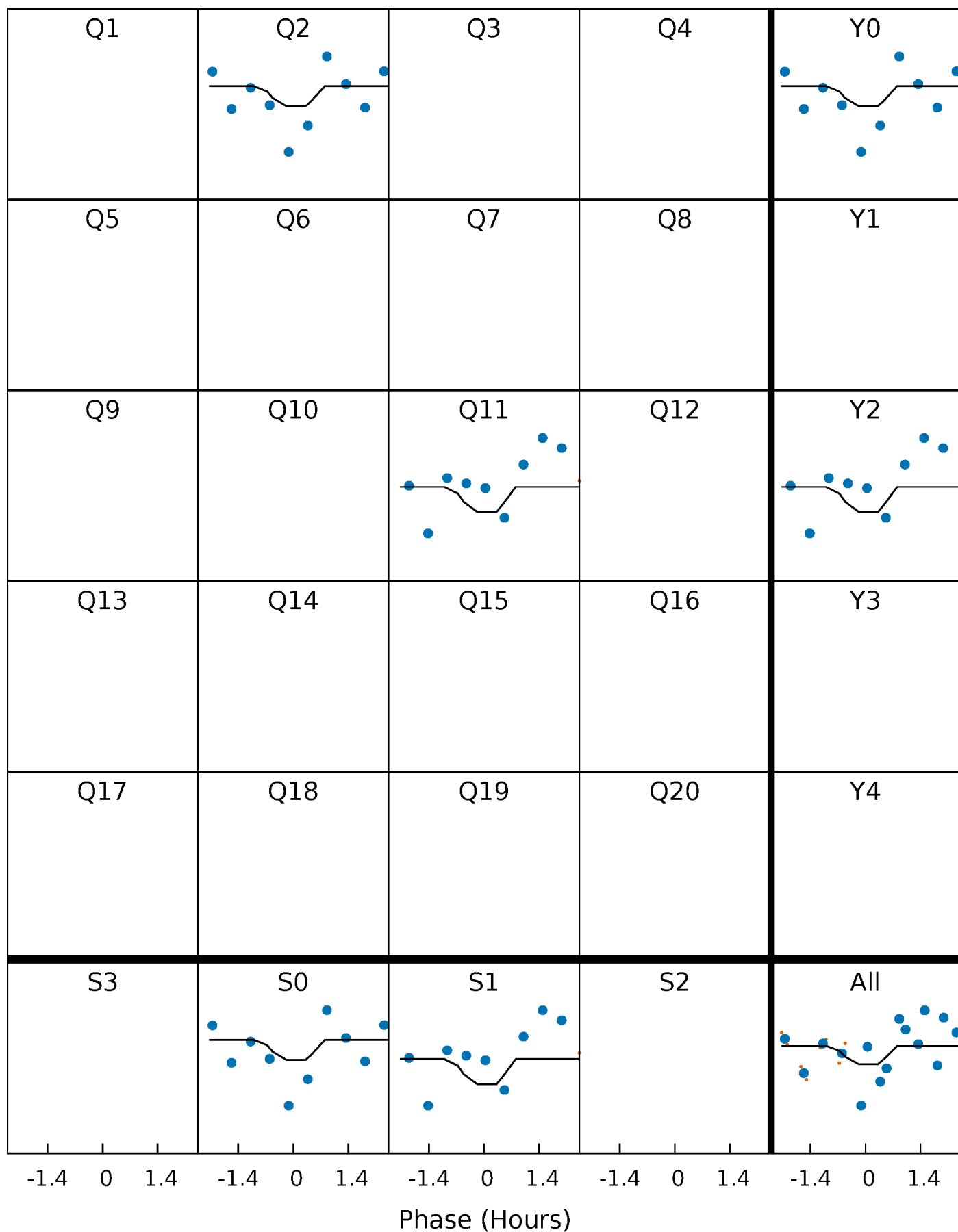
# DV Quarter-Phased Transit Curves

TCE 005121915-04 P=413.119379 Days  $T_0=216.387643$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

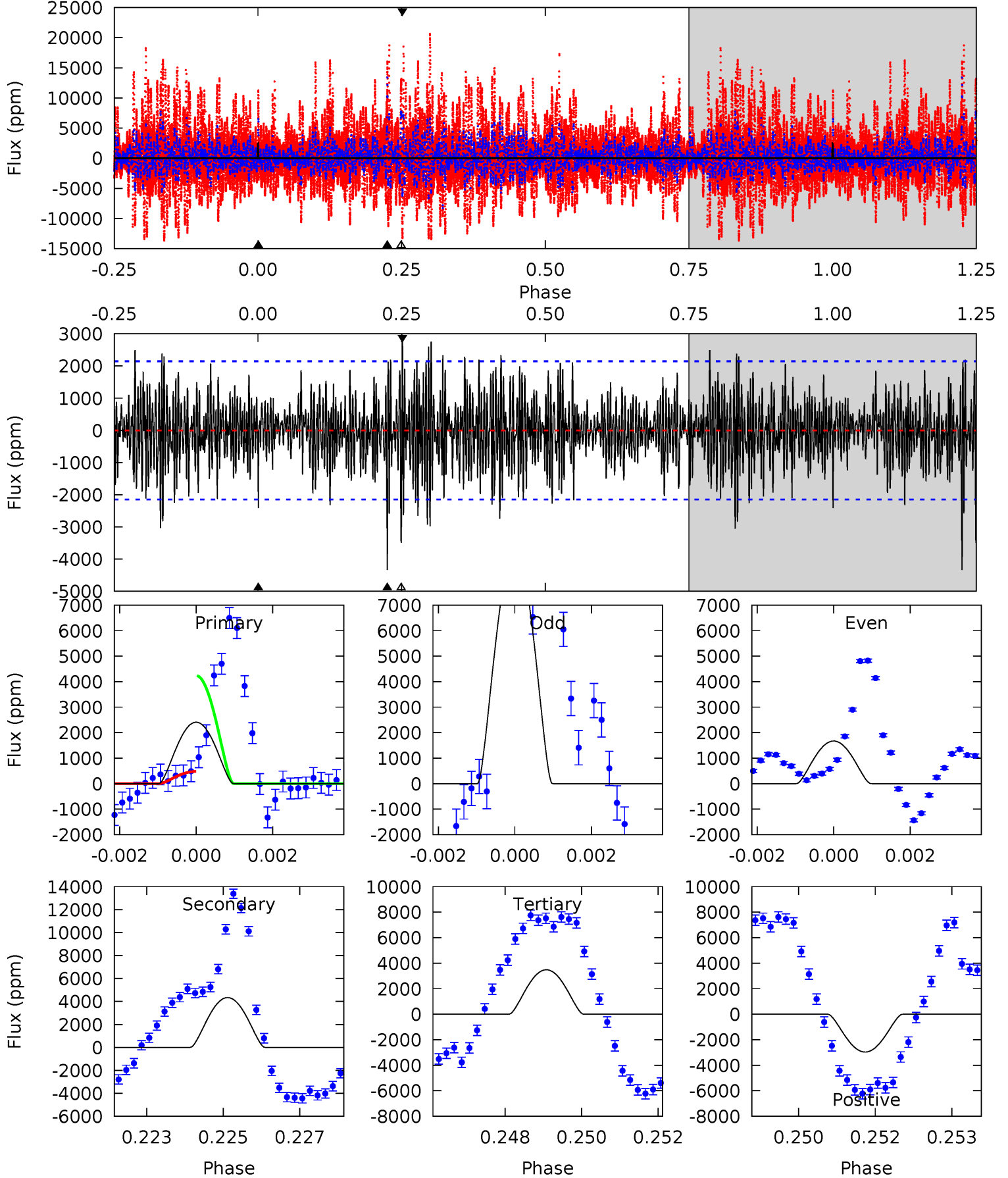
TCE 005121915-04 P=413.091660 Days  $T_0=216.505359$  (BKJD)



# DV Model-Shift Uniqueness Test

005121915-04, P = 413.119379 Days, E = 216.387643 Days

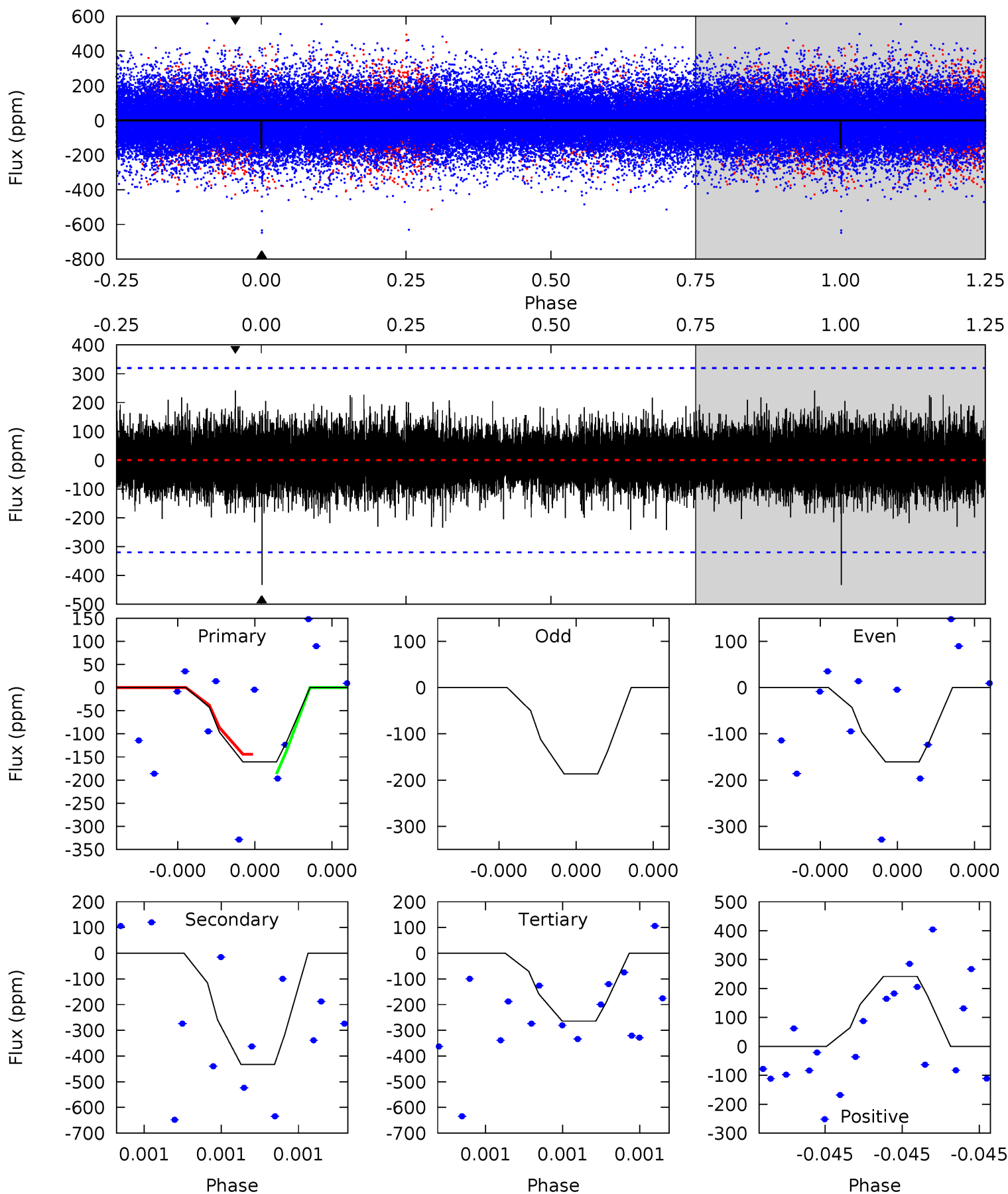
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.03	10.8	8.72	7.42	5.37	3.16	2.18	-2.69	-1.39	2.13	3.43	7.74	2.27	0.41	4.73



# Alt Model-Shift Uniqueness Test

005121915-04, P = 413.091660 Days, E = 216.505359 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
2.93	7.88	4.82	4.41	5.83	3.86	0.95	-1.89	-1.48	3.06	3.47	0.22	1.00	0.36	0.34



### Stellar Parameters For KIC 005121915

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6568^{+184}_{-253}$	$4.166^{+0.162}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.595^{+0.538}_{-0.359}$	$1.359^{+0.209}_{-0.230}$	$0.472^{+0.402}_{-0.251}$
	+3%/-4%	+4%/-5%	+200%/-350%	+34%/-23%	+15%/-17%	+85%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005121915-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-4337 \pm 400$	$32.57^{+25.13}_{-22.27}$	$467^{+41}_{-30}$	$4179^{+2890}_{-742}$	$3411^{+27716}_{-2383}$
Alt.	$-432 \pm 55$	$20.36^{+24.73}_{-14.57}$	$467^{+36}_{-30}$	$3279^{+1861}_{-632}$	$787^{+8853}_{-623}$

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

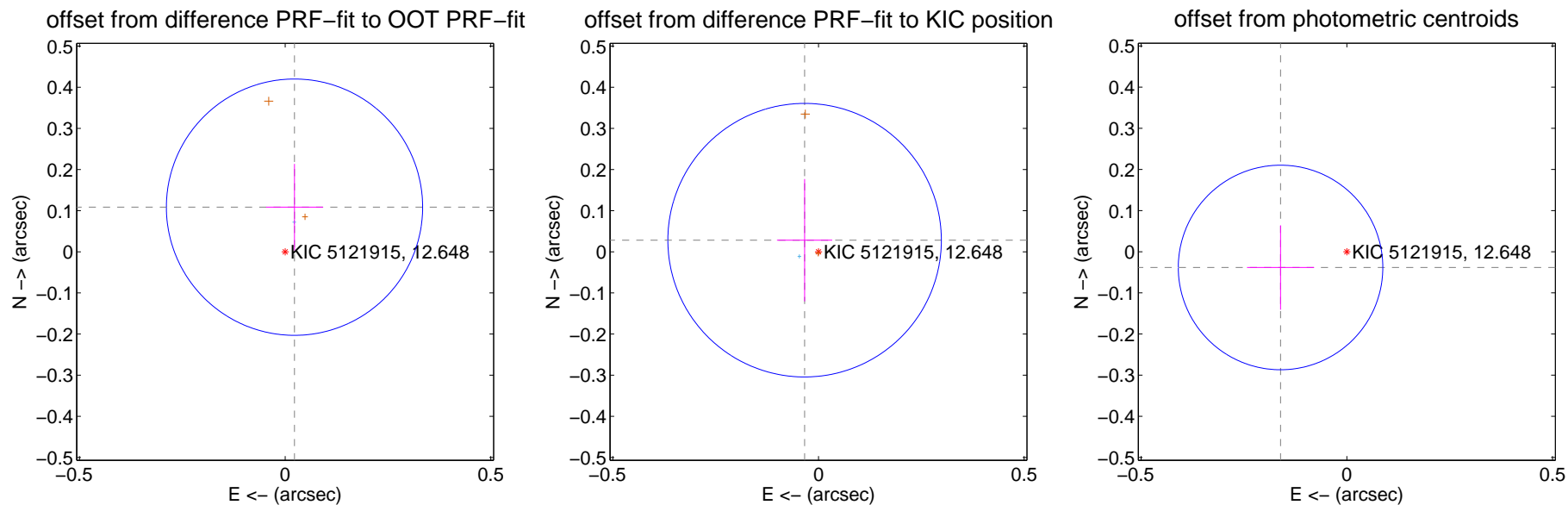
## DV Centroid Data

Supplemental centroid analysis for 005121915-04. Kepler magnitude: 12.65. Transit SNR 15.06

There are 1 quarters with good PRF difference image offsets

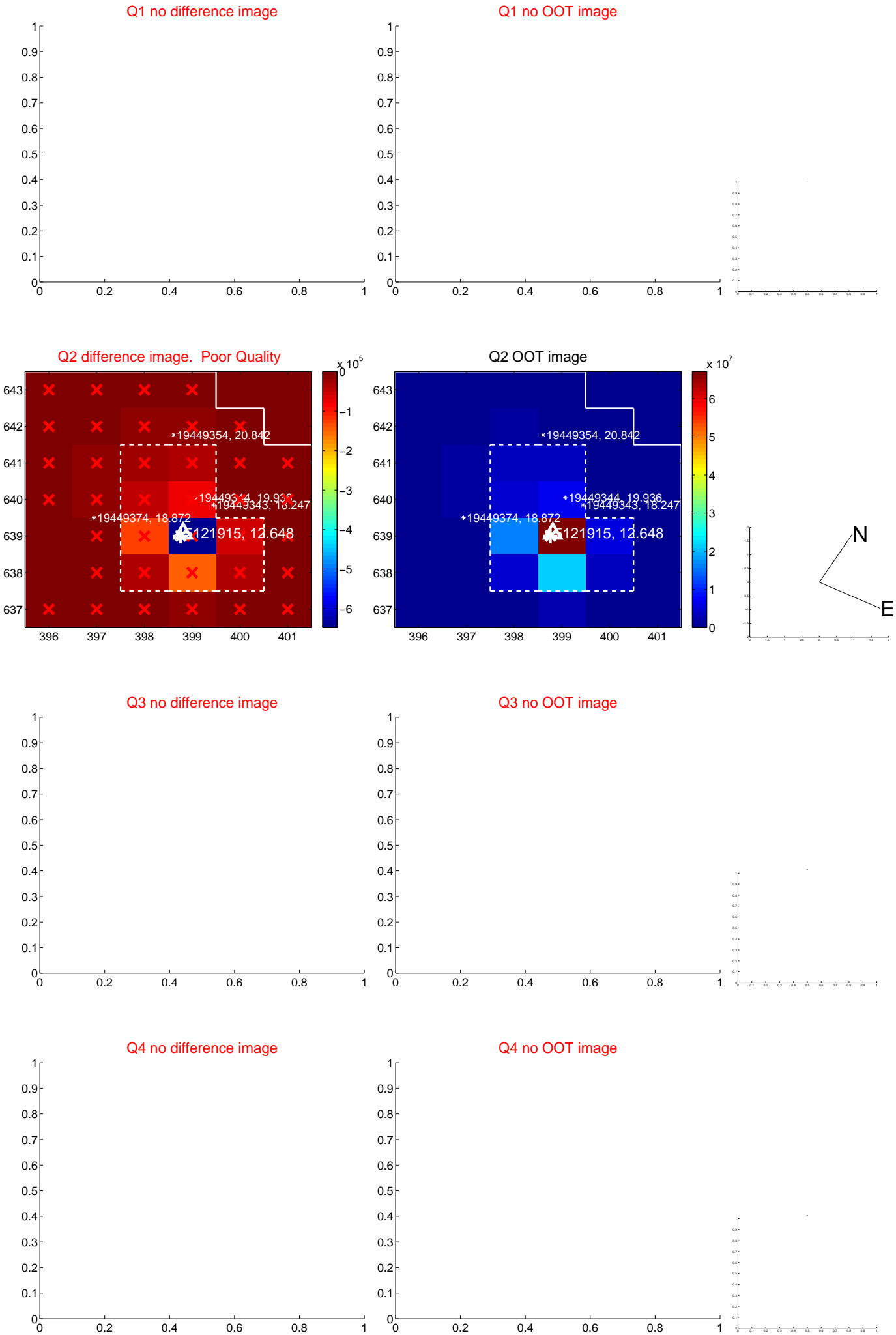
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.111 \pm 0.104$	1.07	$-0.023 \pm 0.069$	$0.108 \pm 0.105$
PRF-fit source offset from KIC position	$0.044 \pm 0.111$	0.40	$0.034 \pm 0.067$	$0.028 \pm 0.149$
photometric centroid source offset	$0.17 \pm 0.08$	2.00	$0.16 \pm 0.08$	$-0.04 \pm 0.10$



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

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

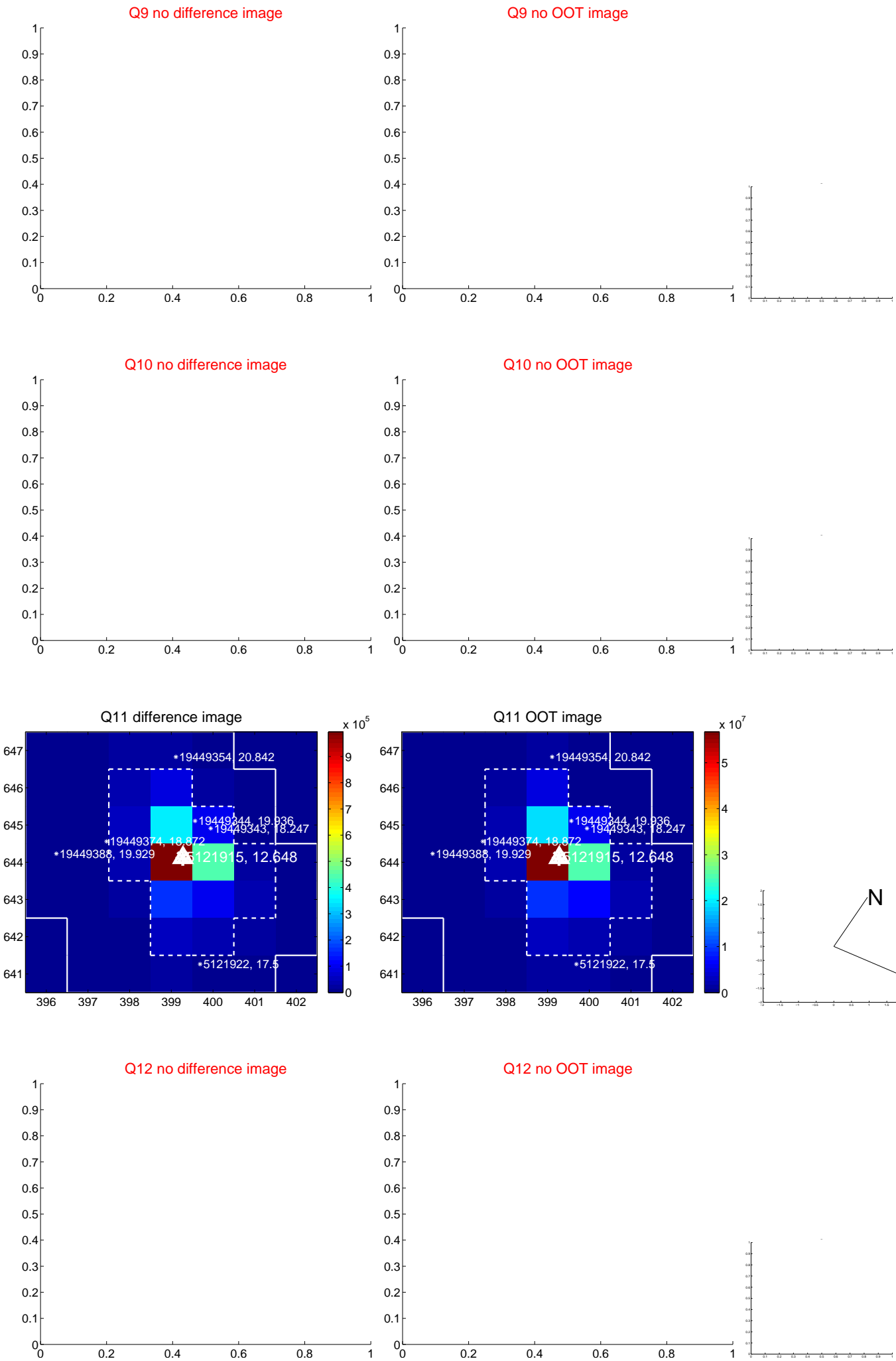


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

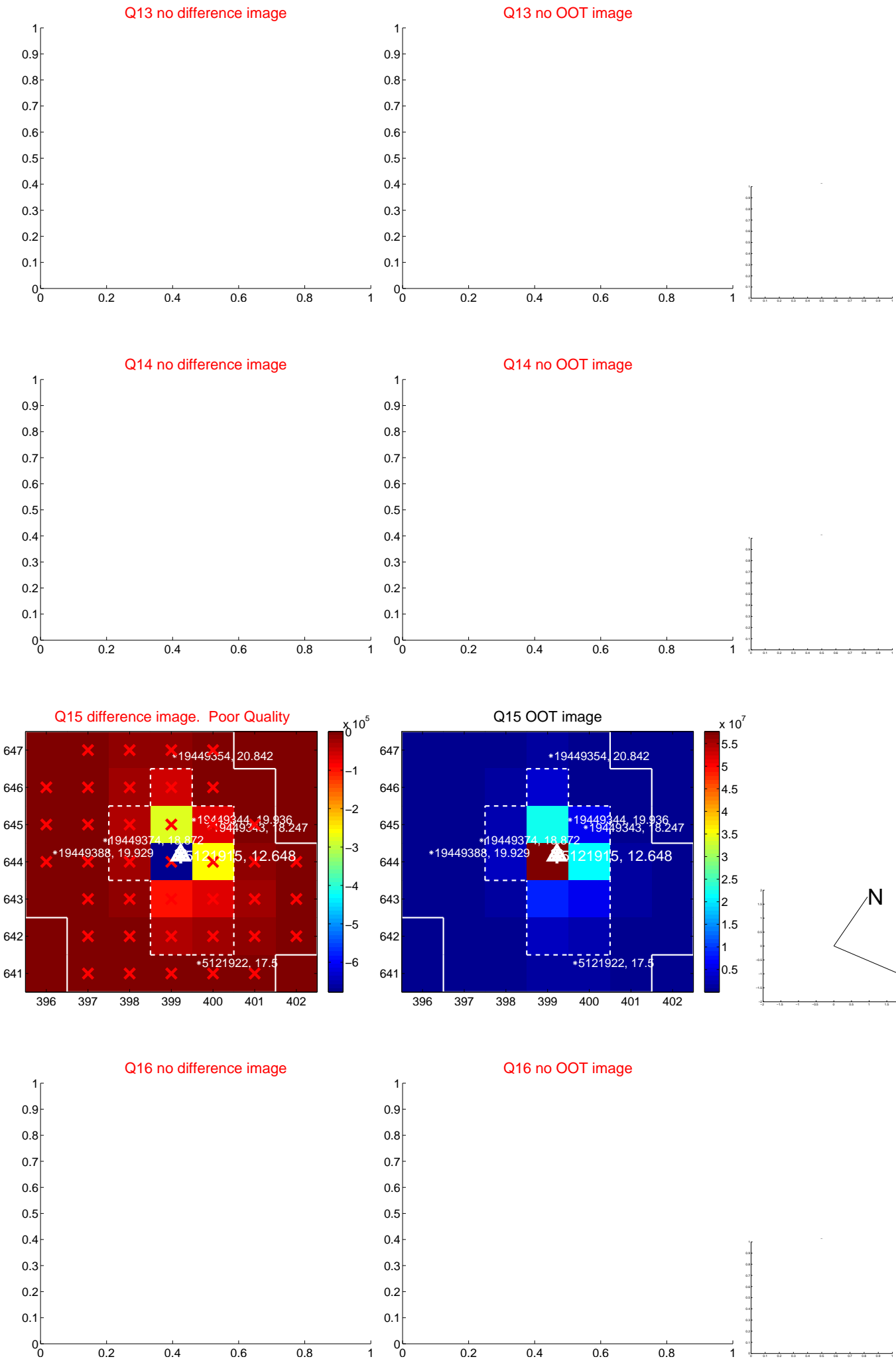




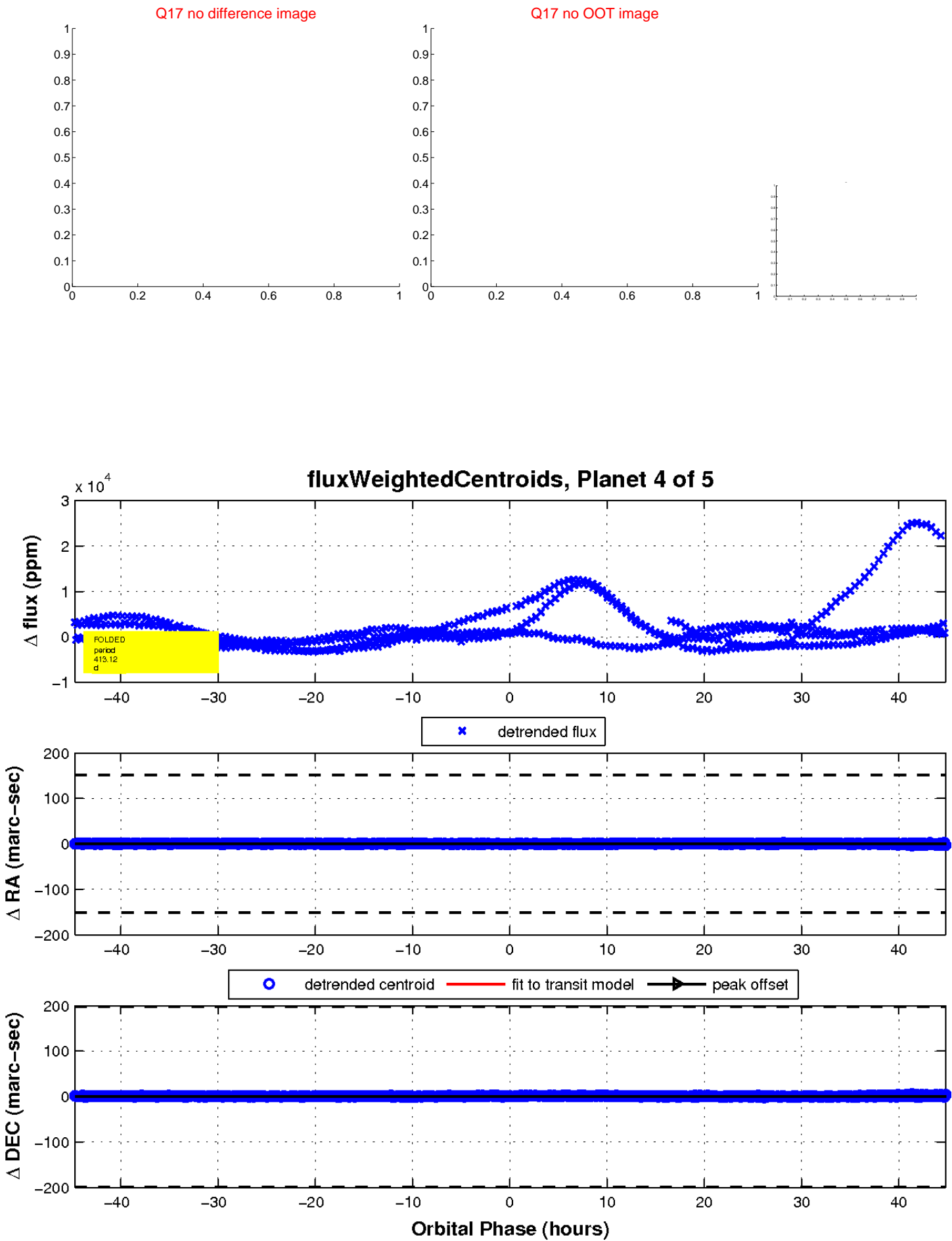
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

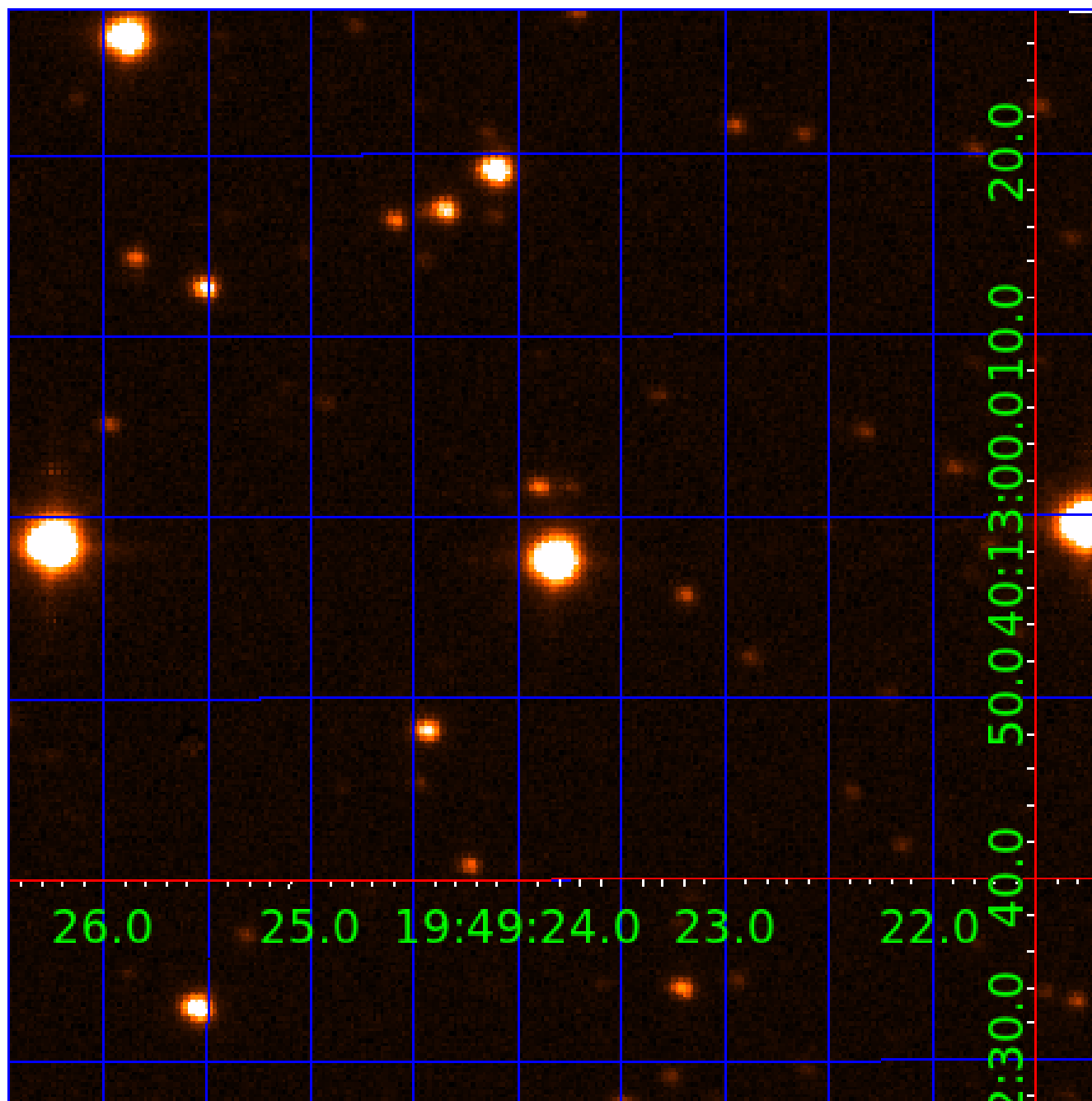


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 005121915

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005121915-01	OBS	No	449.210680	558.809216	7349.1	15.052	24.6	22.8	1.59	6568	24.38	2.62
005121915-02	OBS	No	482.963675	489.749784	363.0	2.756	17.5	4.2	1.59	6568	3.44	2.38
005121915-03	OBS	No	454.973647	187.723717	506.1	7.500	17.2	-1.0	1.59	6568	3.61	2.58
005121915-04	OBS	No	413.119379	216.387643	5726.2	14.939	15.5	15.1	1.59	6568	21.67	2.93
005121915-05	OBS	No	494.219705	146.924709	398.9	7.500	14.1	-1.0	1.59	6568	3.20	2.31

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005121915-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
005121915-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL_ZUMA—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS
005121915-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005121915-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_NOFITS

**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.

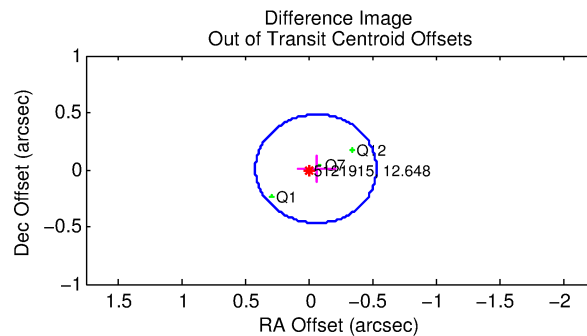
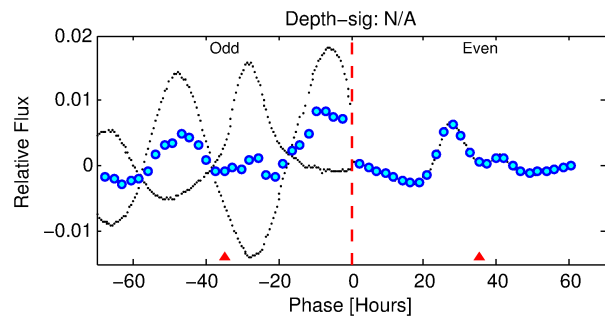
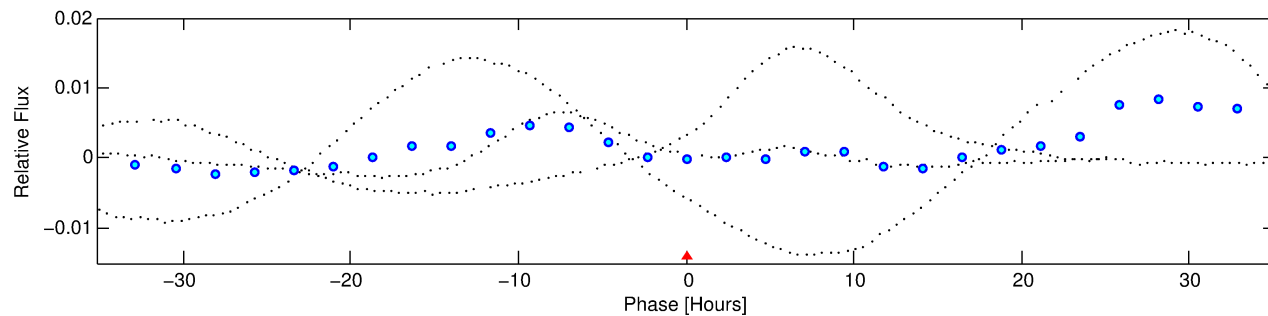
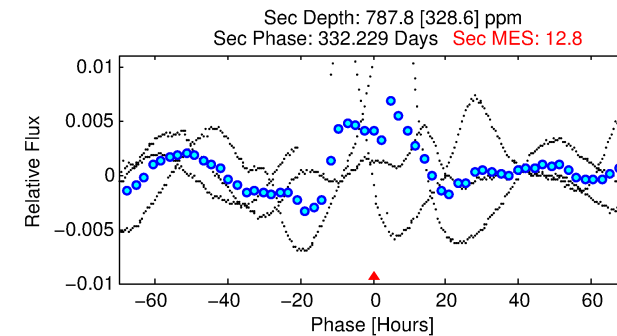
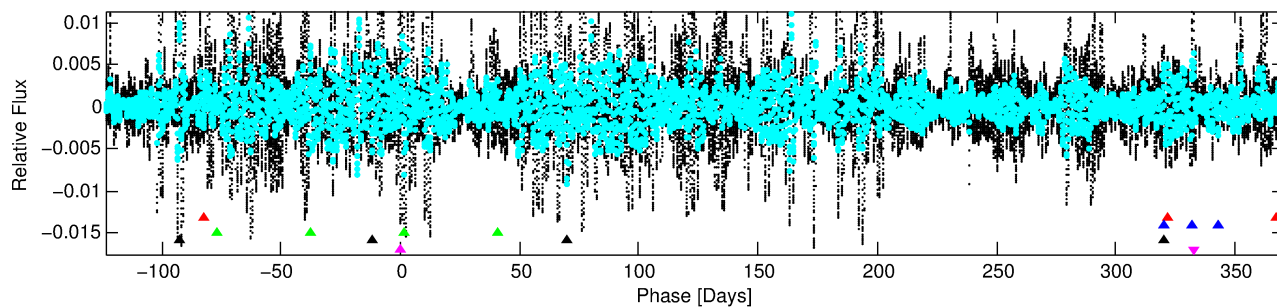
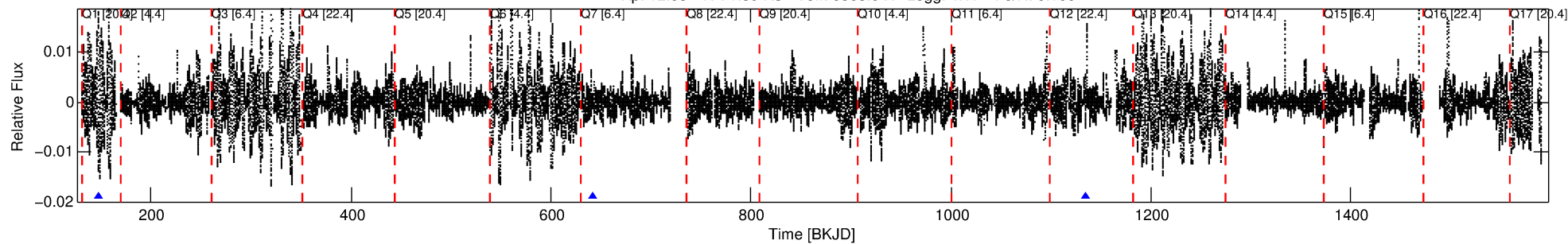
Ephemeris Match Information For 005121915-05

No Significant Match Found

# DV One-Page Summary

KIC: 5121915 Candidate: 5 of 5 Period: 494.220 d

Kp: 12.65 R\*: 1.59 Rs Teff: 6568.0 K Logg: 4.17 Fe/H: 0.100



## TPS TCE Results:

Period = 494.21970 d  
Epoch = 146.9247 BKJD

DV fit results are unavailable

## DV Diagnostic Results:

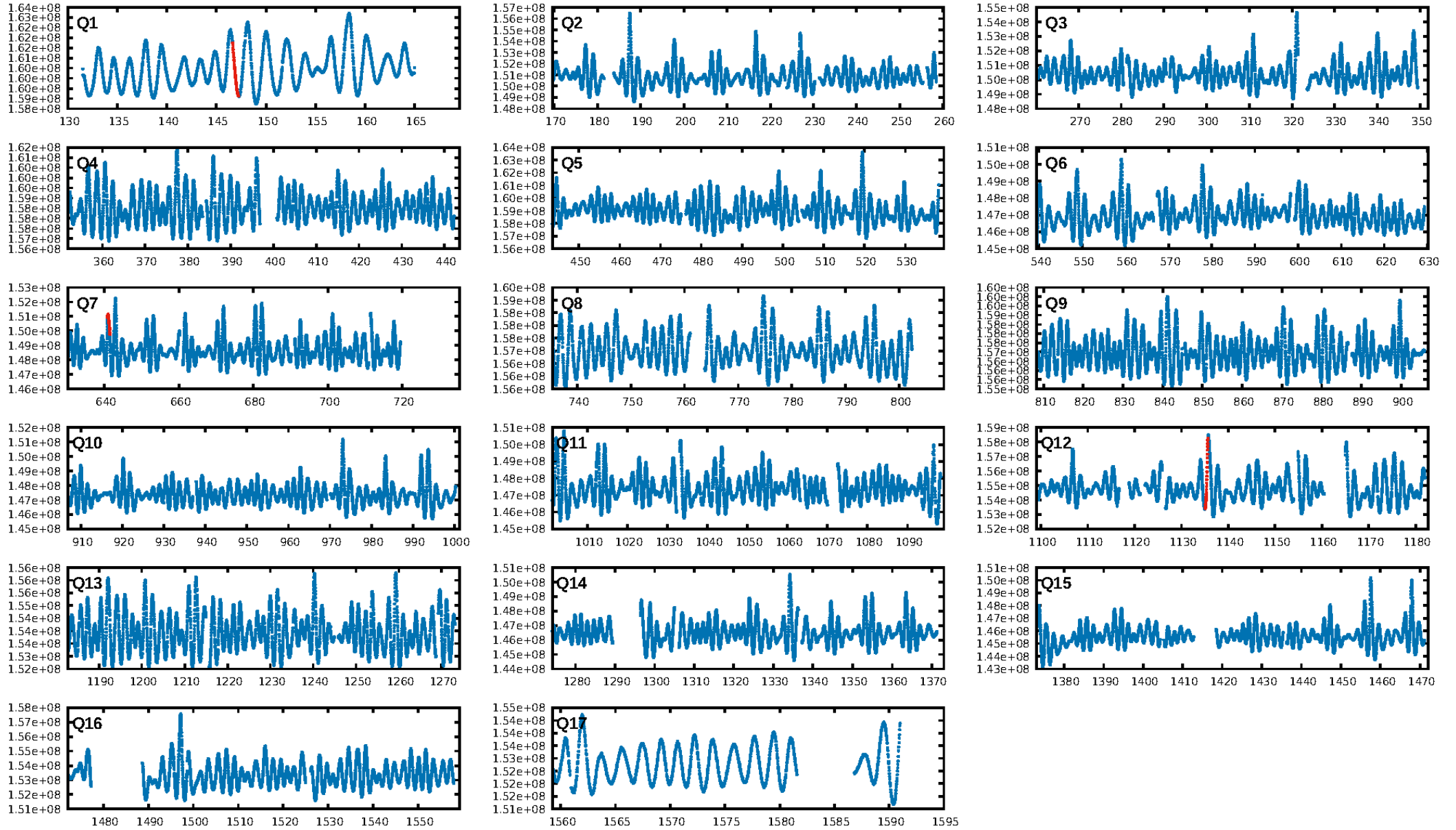
ShortPeriod-sig: 100.0% [33.81 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [2/2]  
GhostDiagnostic-chr: 5.336

Centroid-sig: 5.1%  
Centroid-so: 0.130 arcsec [0.75 $\sigma$ ]  
OotOffset-rm: 0.061 arcsec [0.39 $\sigma$ ]  
KicOffset-rm: 0.061 arcsec [0.33 $\sigma$ ]  
OotOffset-st: 0/1/1/1 [3]  
KicOffset-st: 0/1/1/1 [3]  
DiffImageQuality-fgm: 0.67 [2/3]  
DiffImageOverlap-fno: 1.00 [3/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:13:12 Z

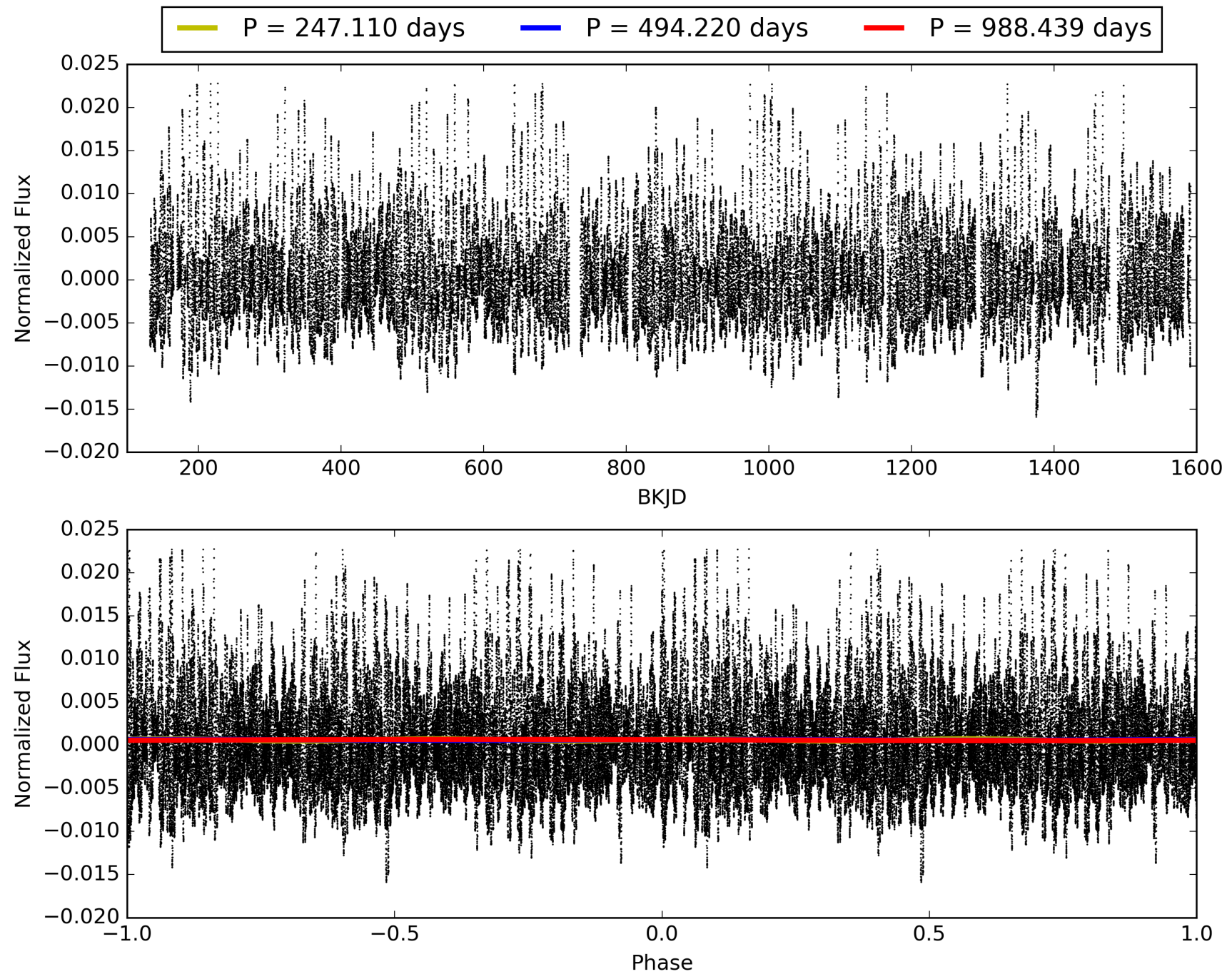
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005121915-05, PDC Light Curves





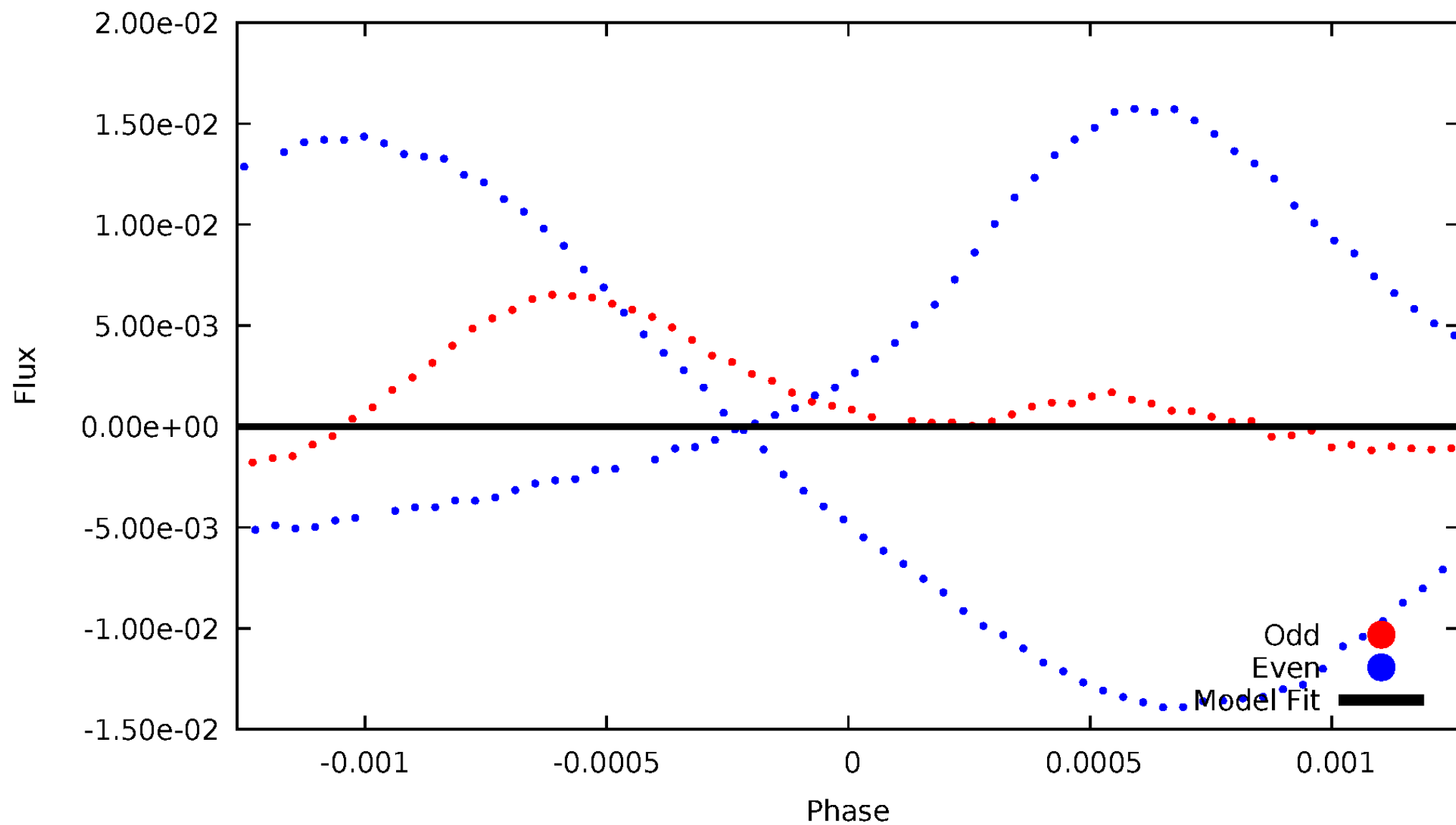
TCE 005121915-05





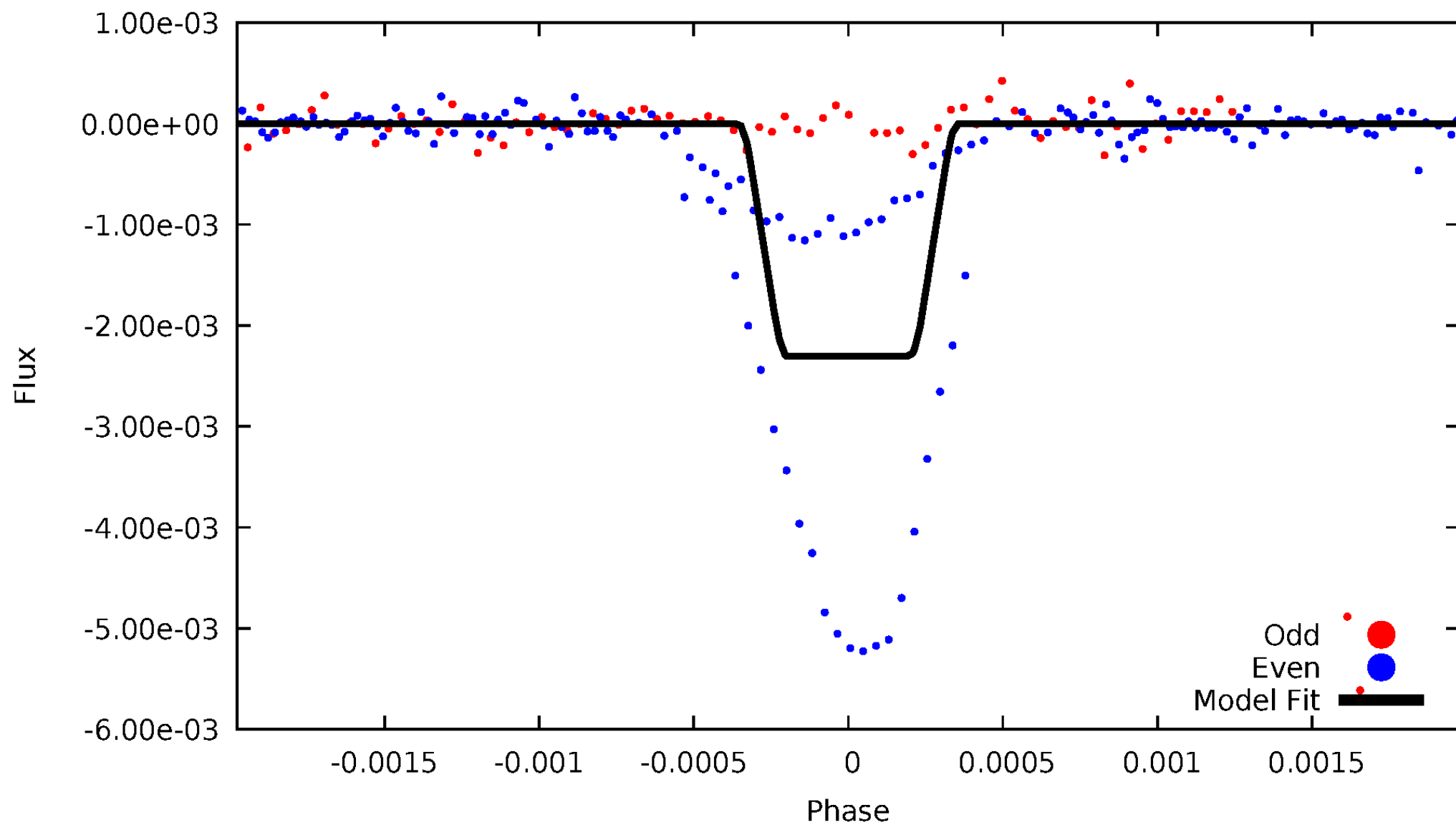
# DV Odd/Even

TCE 005121915-05



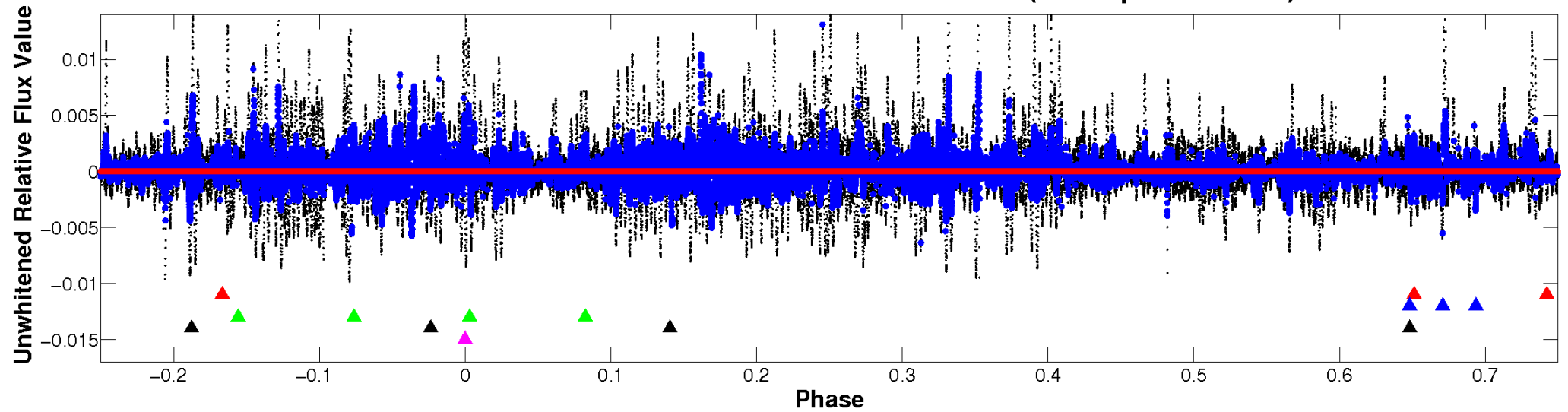
# ALT Odd/Even

TCE 005121915-05



# Non-Whitened Vs. Whitened Light Curve

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

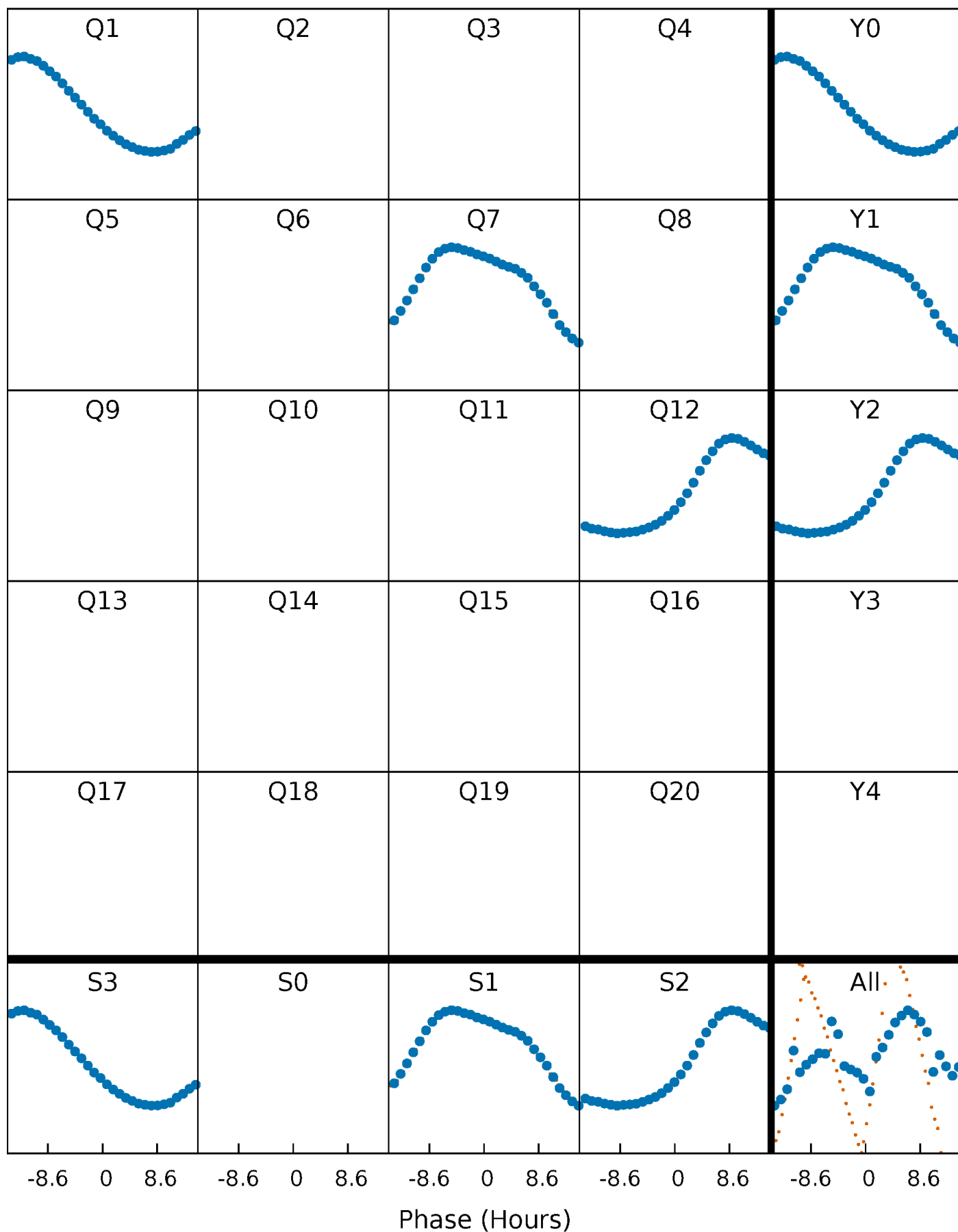


Planet 5 : Phased Whitened Flux Time Series (TPS Epoch/Period)



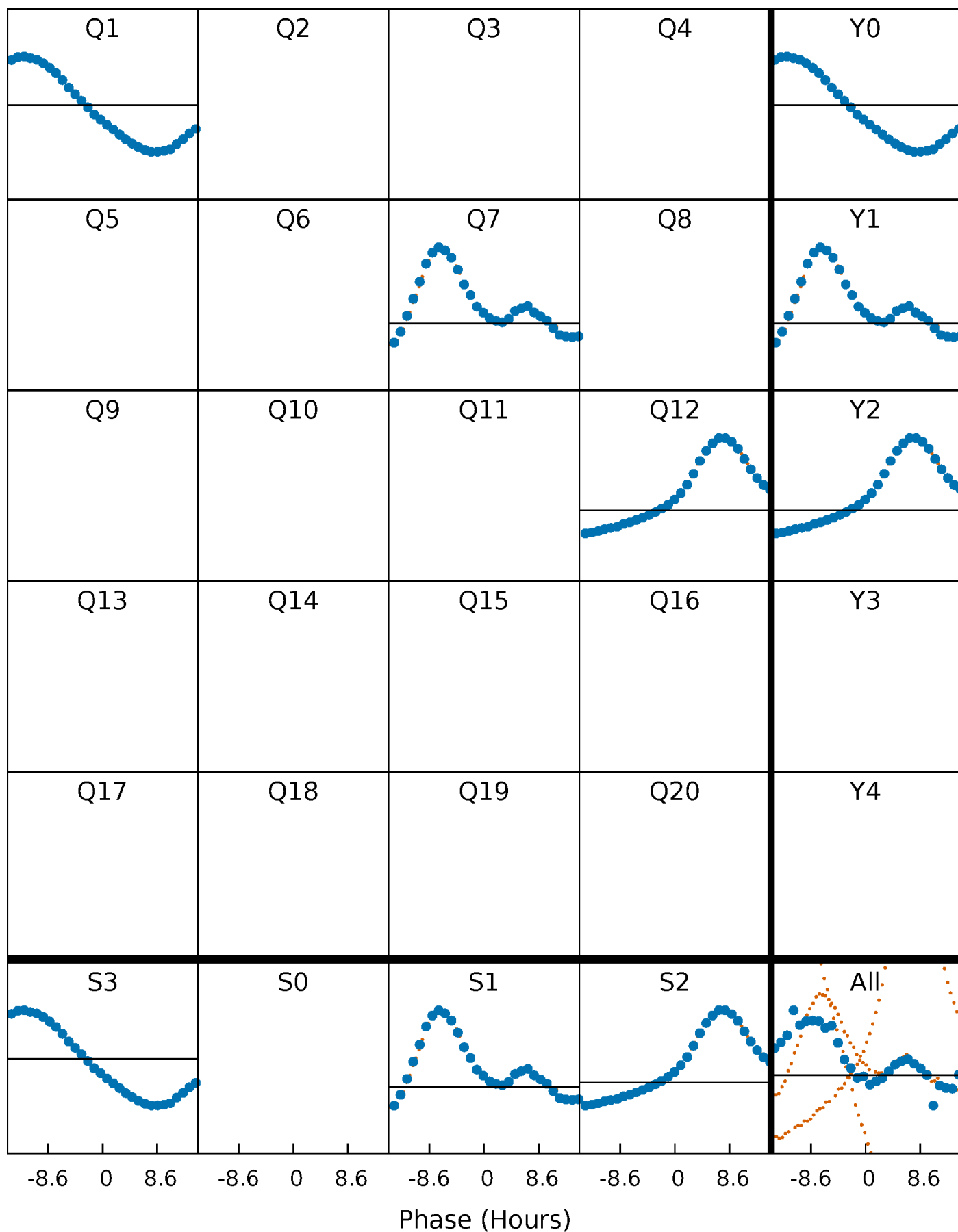
# PDC Quarter-Phased Transit Curves

TCE 005121915-05 P=494.219704 Days  $T_0=146.924709$  (BKJD)



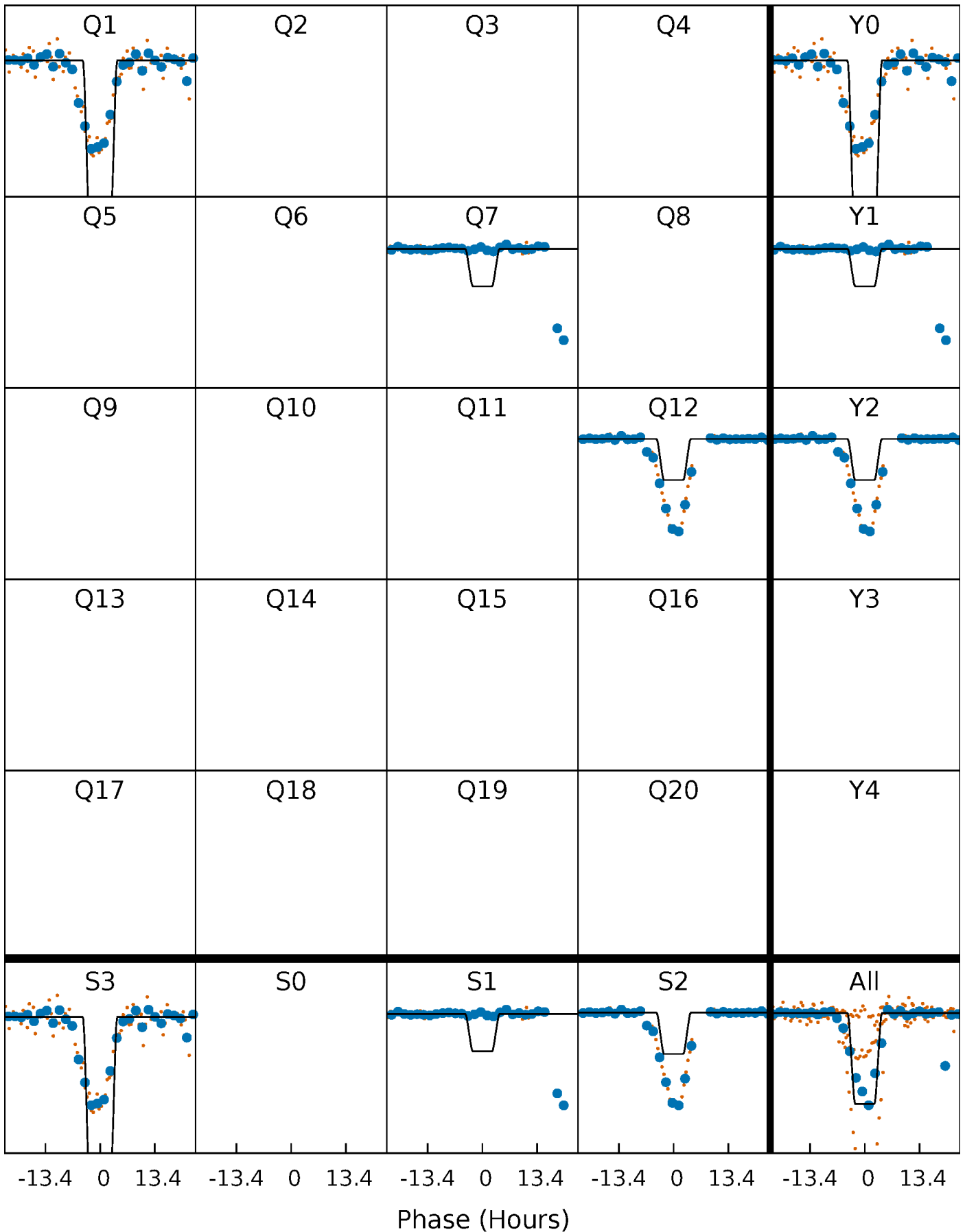
# DV Quarter-Phased Transit Curves

TCE 005121915-05     $P=494.219704$  Days     $T_0=146.924709$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

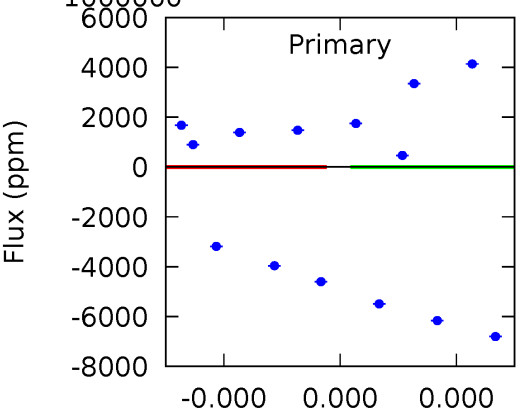
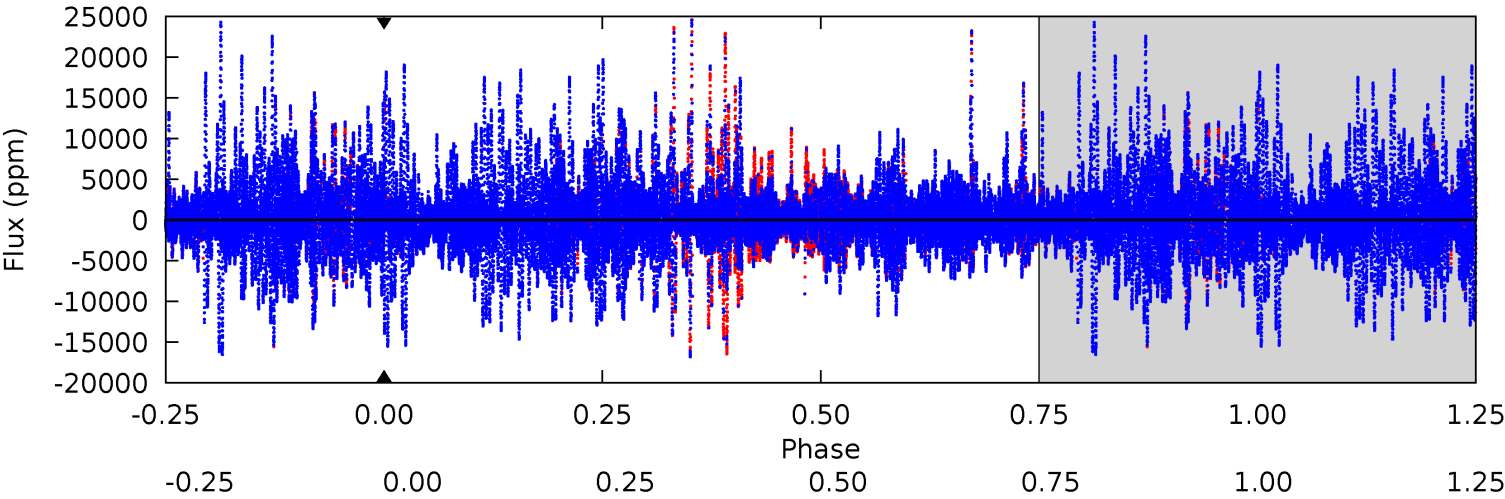
TCE 005121915-05     $P=494.219704$  Days     $T_0=146.948353$  (BKJD)



# DV Model-Shift Uniqueness Test

005121915-05, P = 494.219704 Days, E = 146.924709 Days

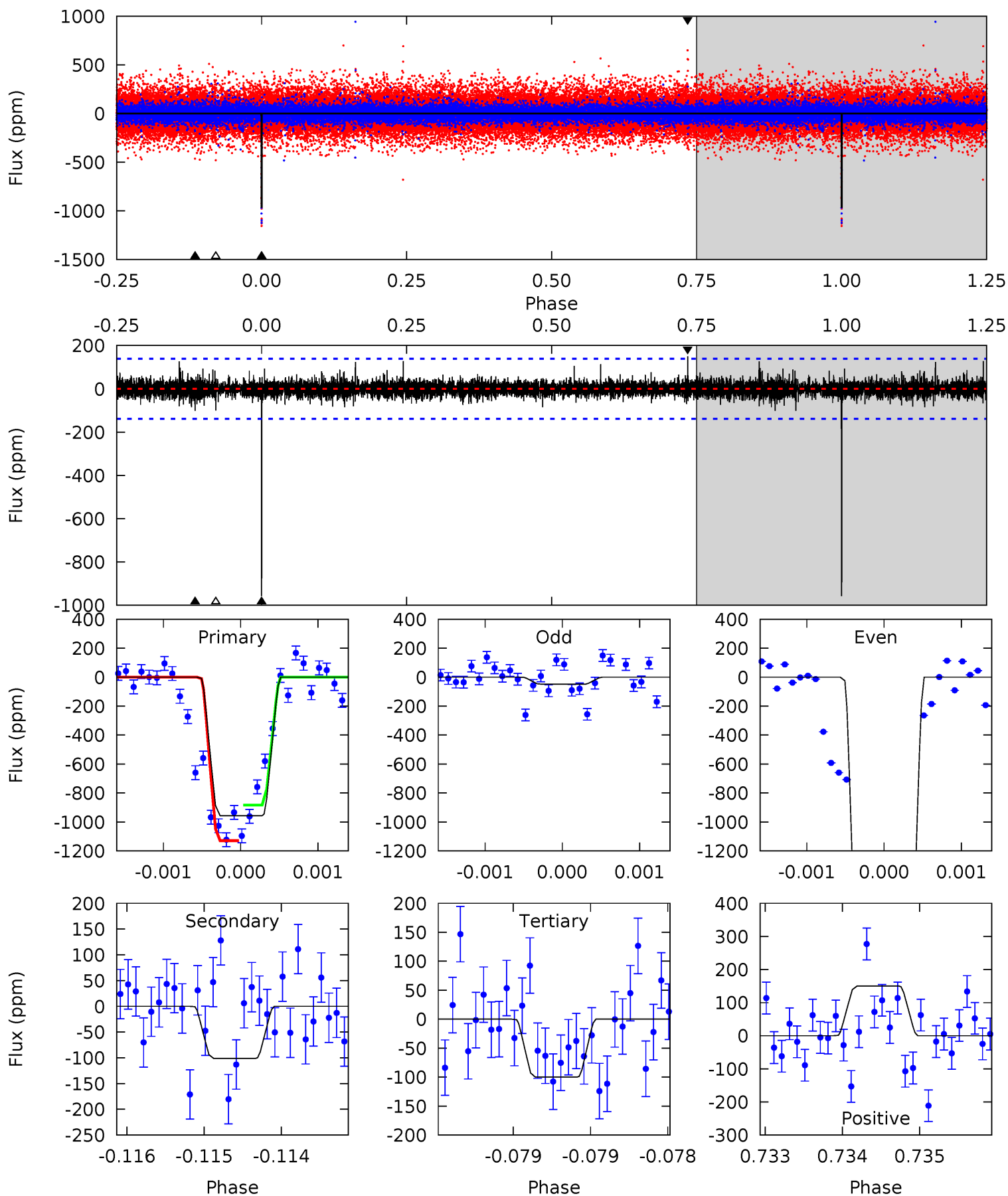
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

005121915-05, P = 494.219704 Days, E = 146.948353 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
38.0	4.02	3.97	5.96	5.52	3.40	0.77	34.1	32.1	0.05	-1.94	76.6	1.90	0.14	4.75





### Stellar Parameters For KIC 005121915

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6568^{+184}_{-253}$	$4.166^{+0.162}_{-0.198}$	$0.100^{+0.200}_{-0.350}$	$1.595^{+0.538}_{-0.359}$	$1.359^{+0.209}_{-0.230}$	$0.472^{+0.402}_{-0.251}$
	+3%/-4%	+4%/-5%	+200%/-350%	+34%/-23%	+15%/-17%	+85%/-53%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 005121915-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$13.17^{+13.63}_{-9.18}$	$438^{+35}_{-32}$	$4359^{+28047}_{-26801}$	$4475^{+1270667}_{-798217}$
Alt.	$-101 \pm 25$	$14.56^{+15.52}_{-9.31}$	$437^{+38}_{-29}$	$2946^{+1122}_{-522}$	$477^{+3098}_{-370}$

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

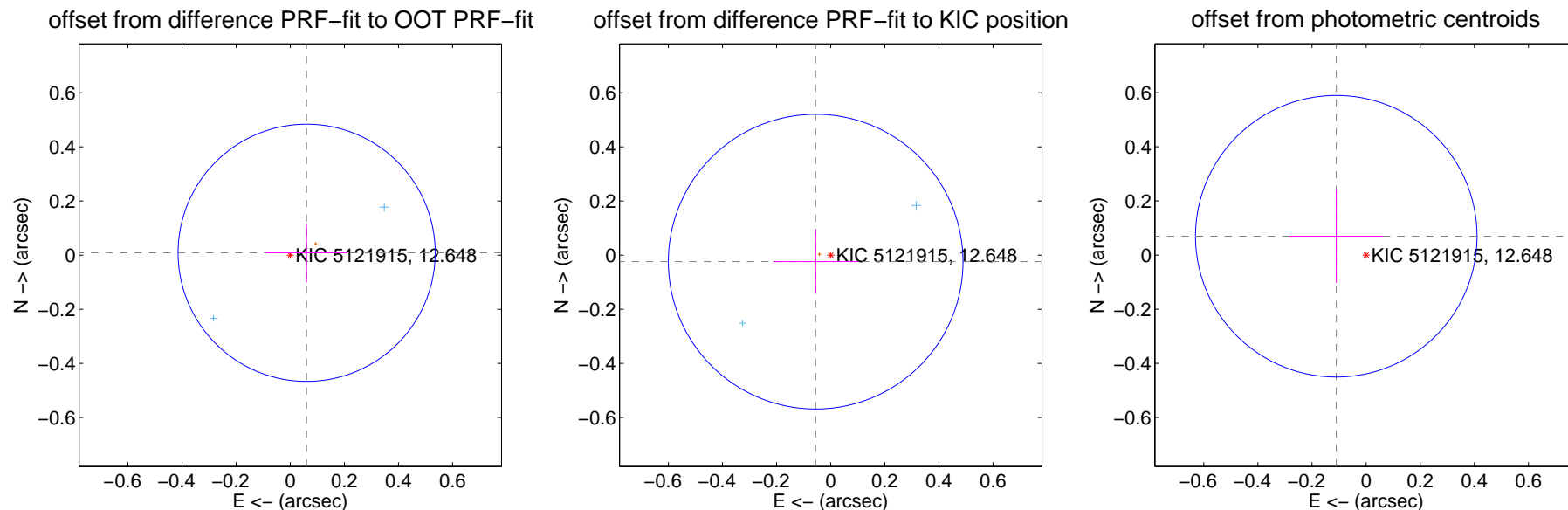
## DV Centroid Data

Supplemental centroid analysis for 005121915-05. Kepler magnitude: 12.65. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

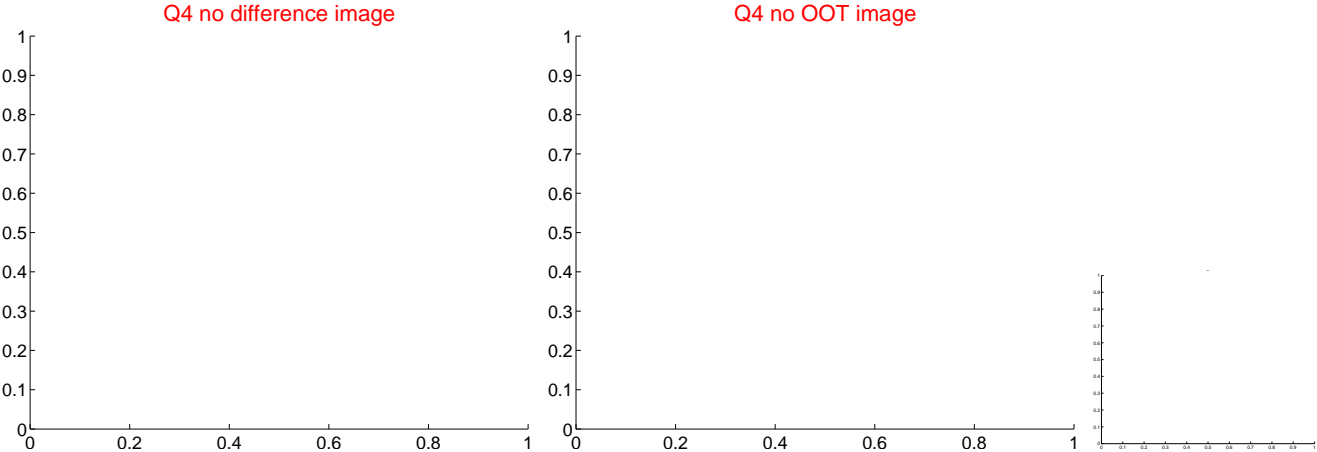
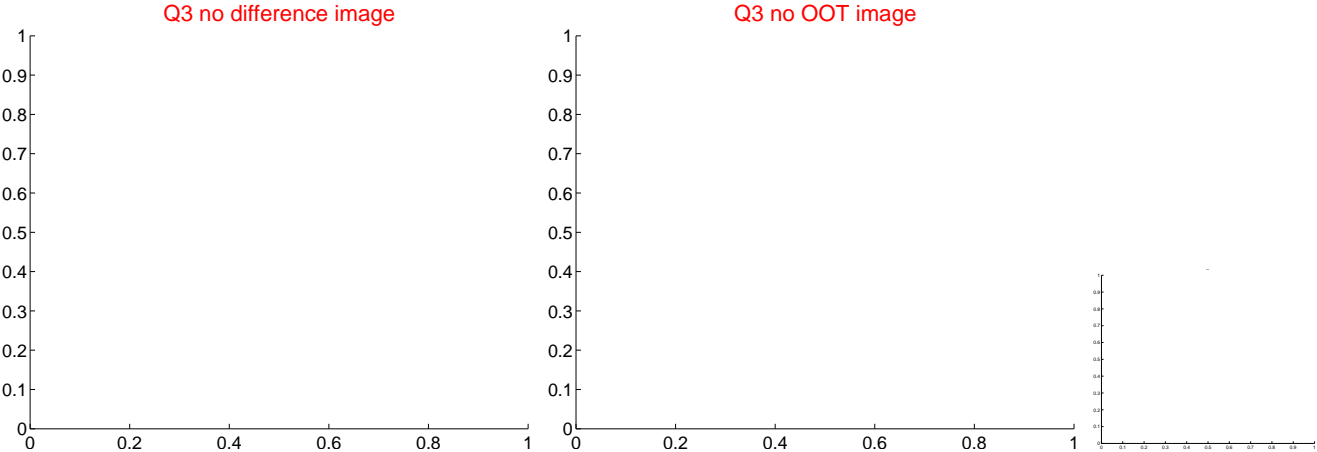
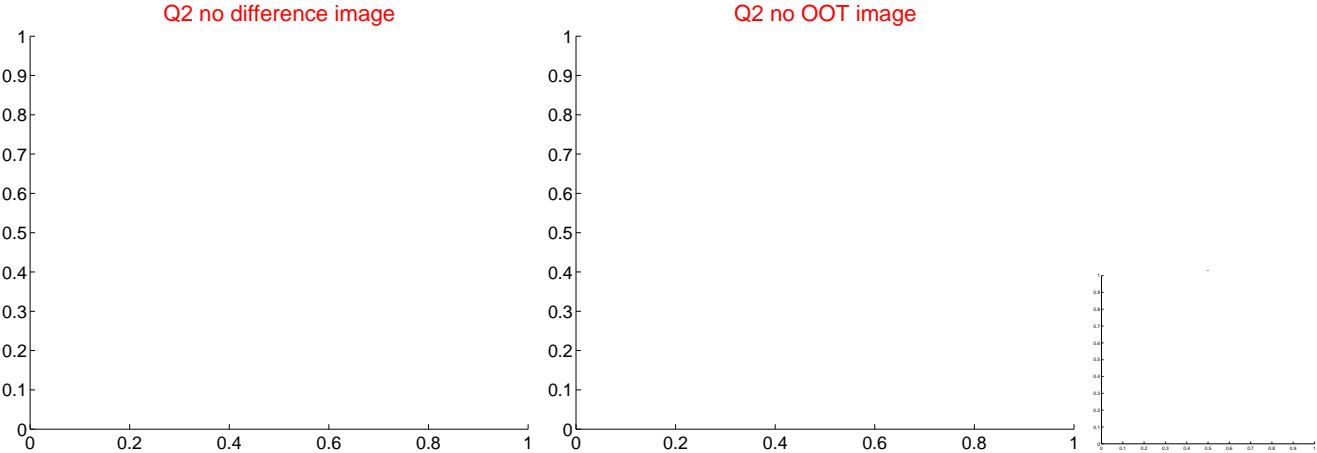
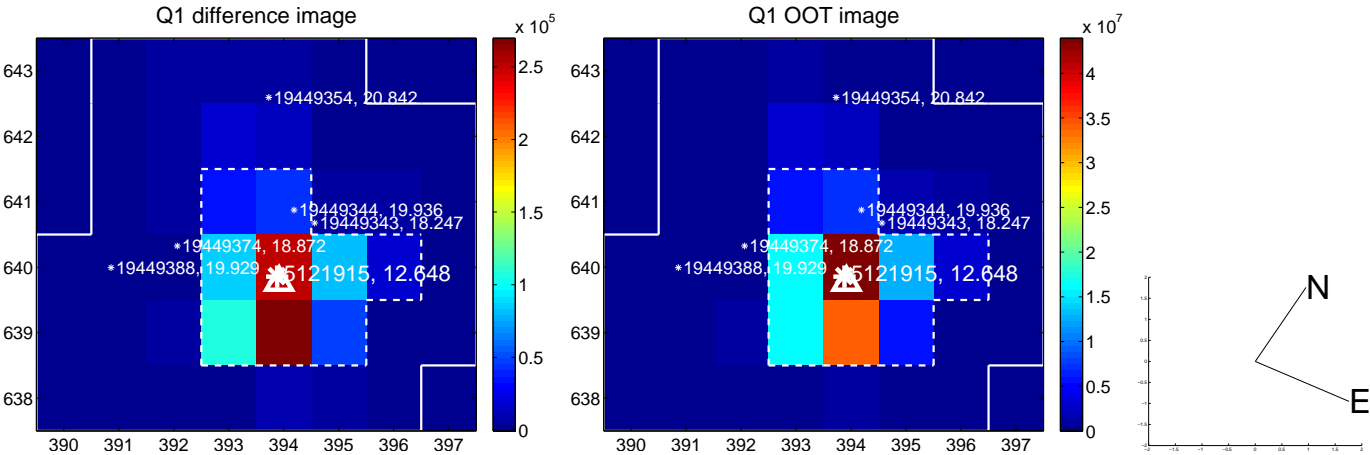
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.061 \pm 0.158$	0.39	$-0.061 \pm 0.149$	$0.009 \pm 0.110$
PRF-fit source offset from KIC position	$0.061 \pm 0.181$	0.33	$0.056 \pm 0.157$	$-0.024 \pm 0.119$
photometric centroid source offset	$0.13 \pm 0.17$	0.75	$0.11 \pm 0.17$	$0.07 \pm 0.17$

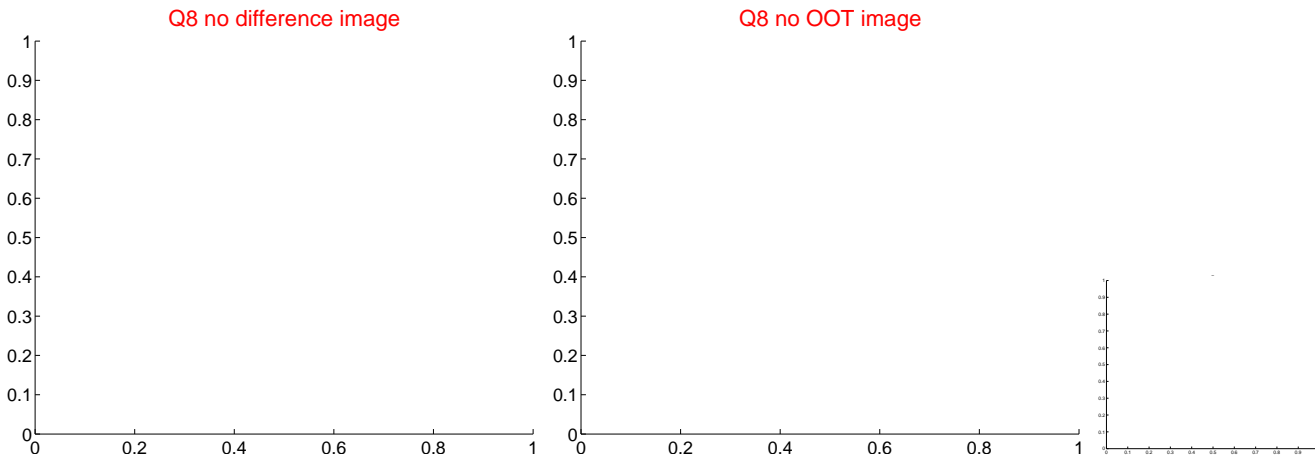
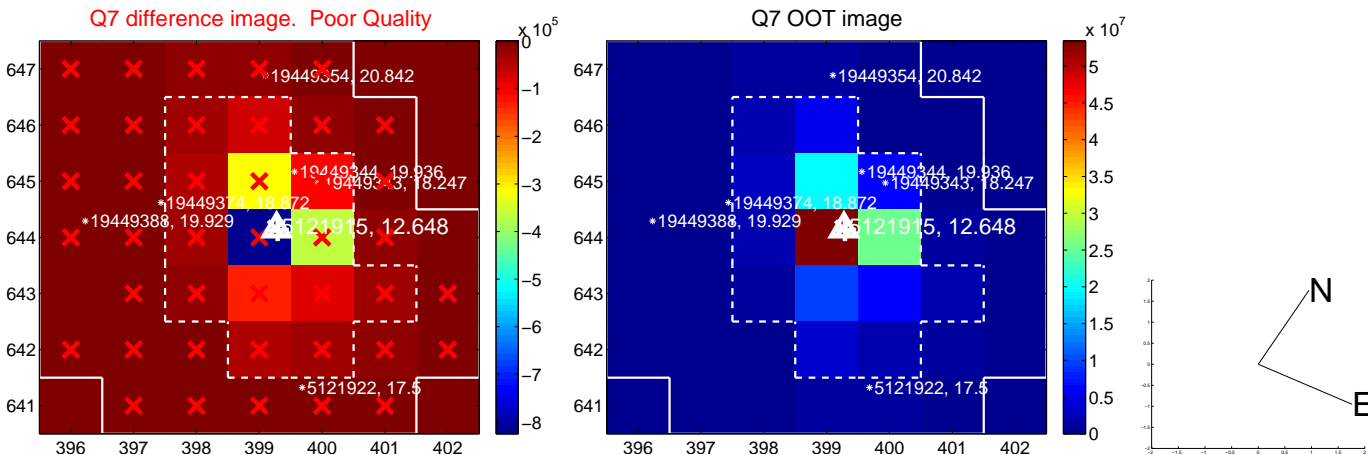
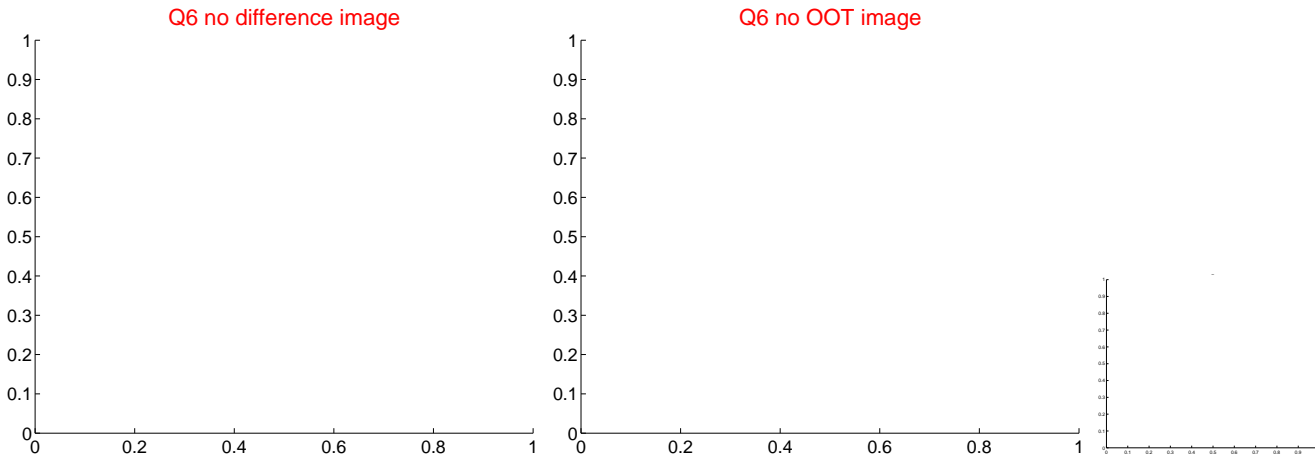
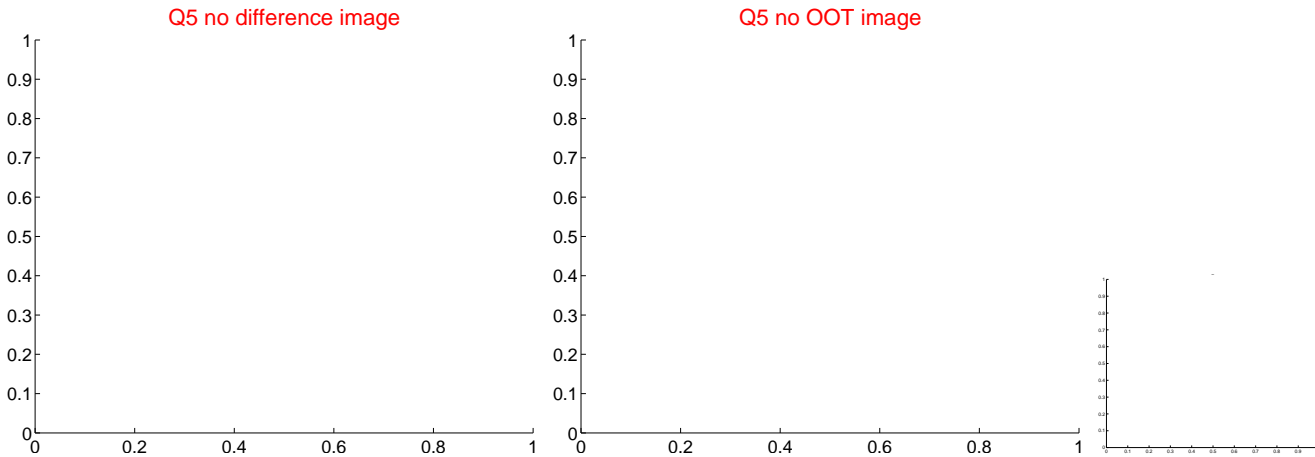


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

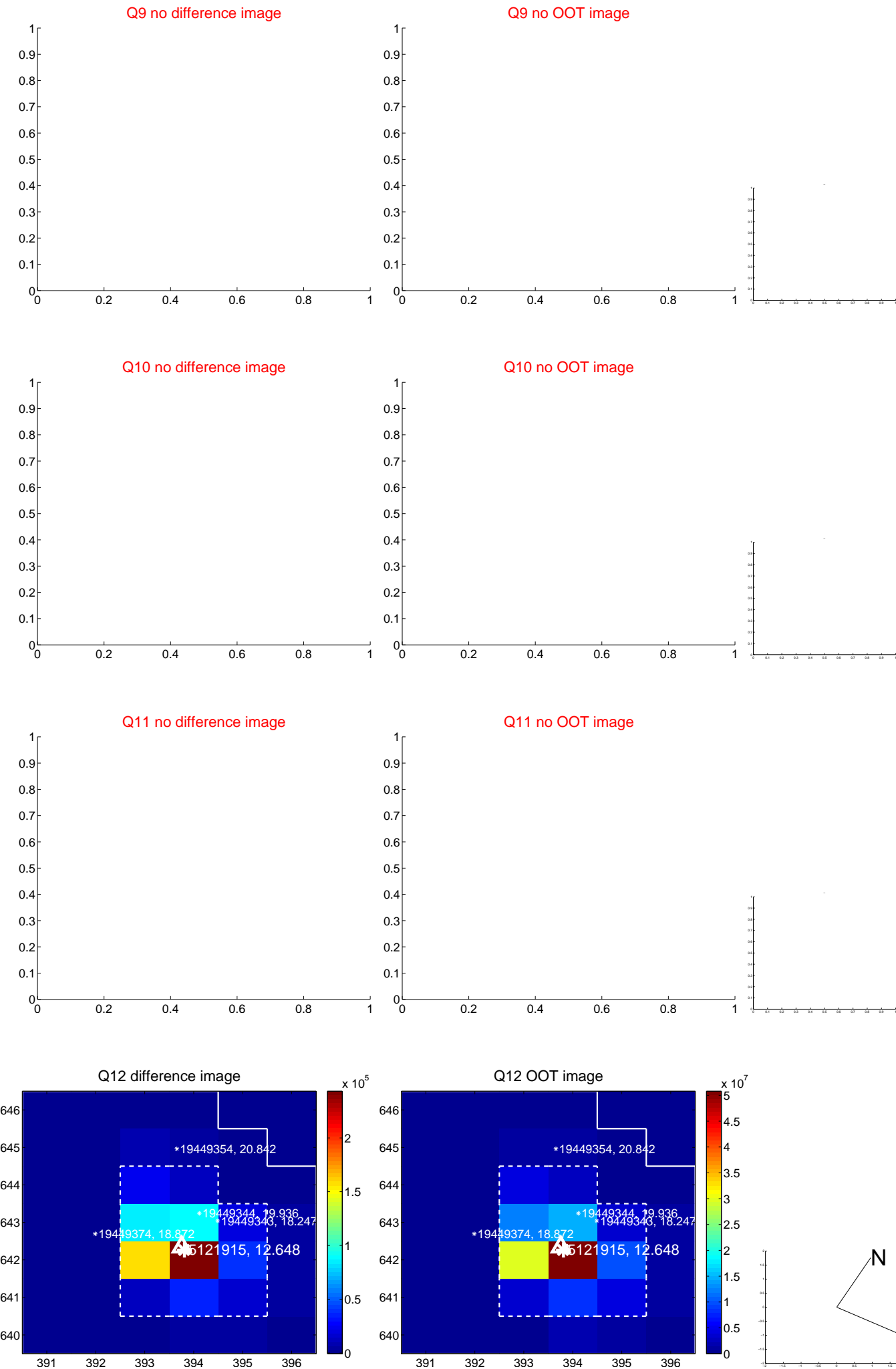
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



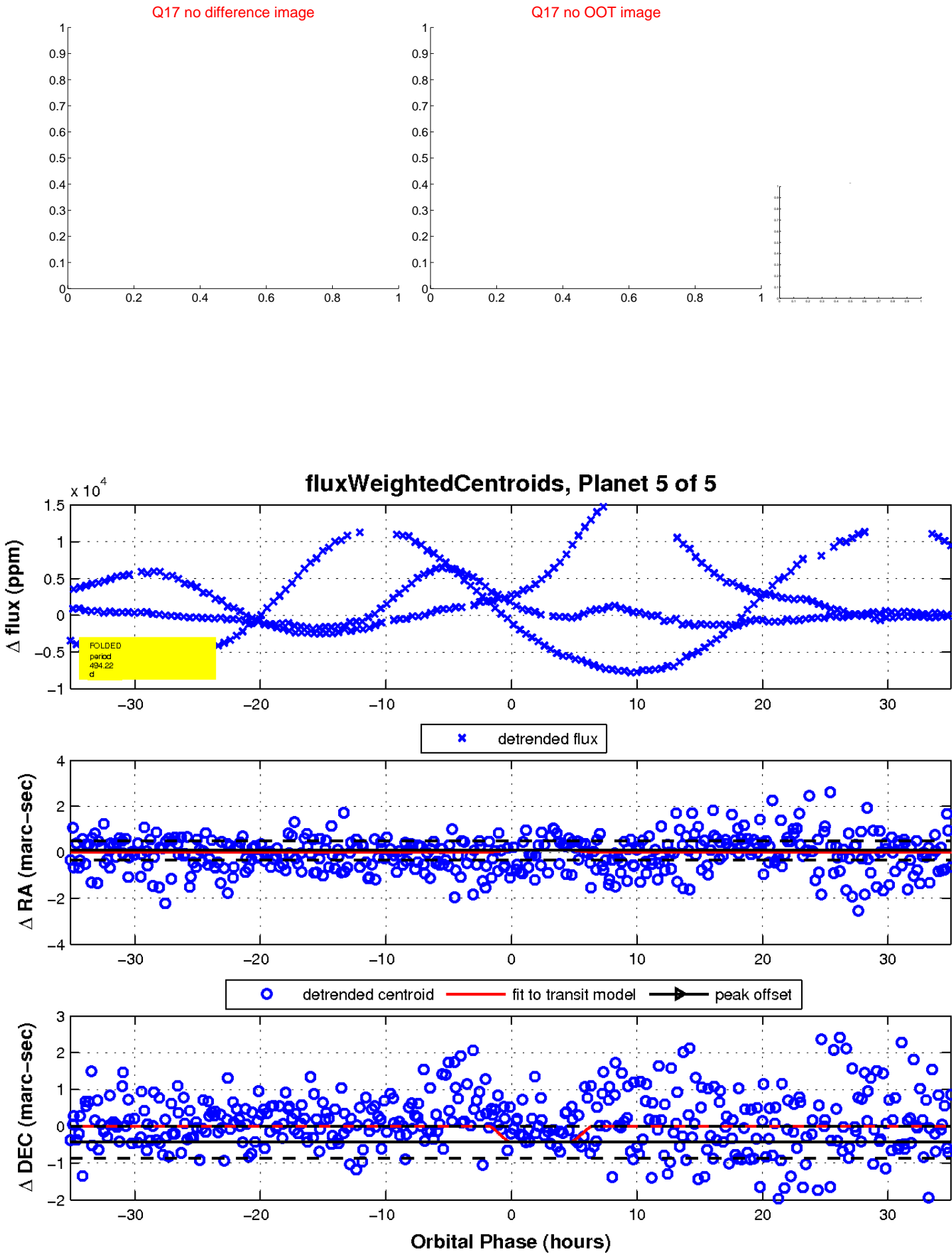
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

