

# KIC 005305237

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005305237-01	OBS	No	1.618744	131.754058	54.4	7.150	7.6	8.5	0.88	5102	0.79	736.67
005305237-03	OBS	No	133.912530	247.240897	683.3	18.125	15.2	6.9	0.88	5102	2.52	2.04

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005305237-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
005305237-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— INCONSISTENT_TRANS—CENT_FEW_DIFFS

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

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

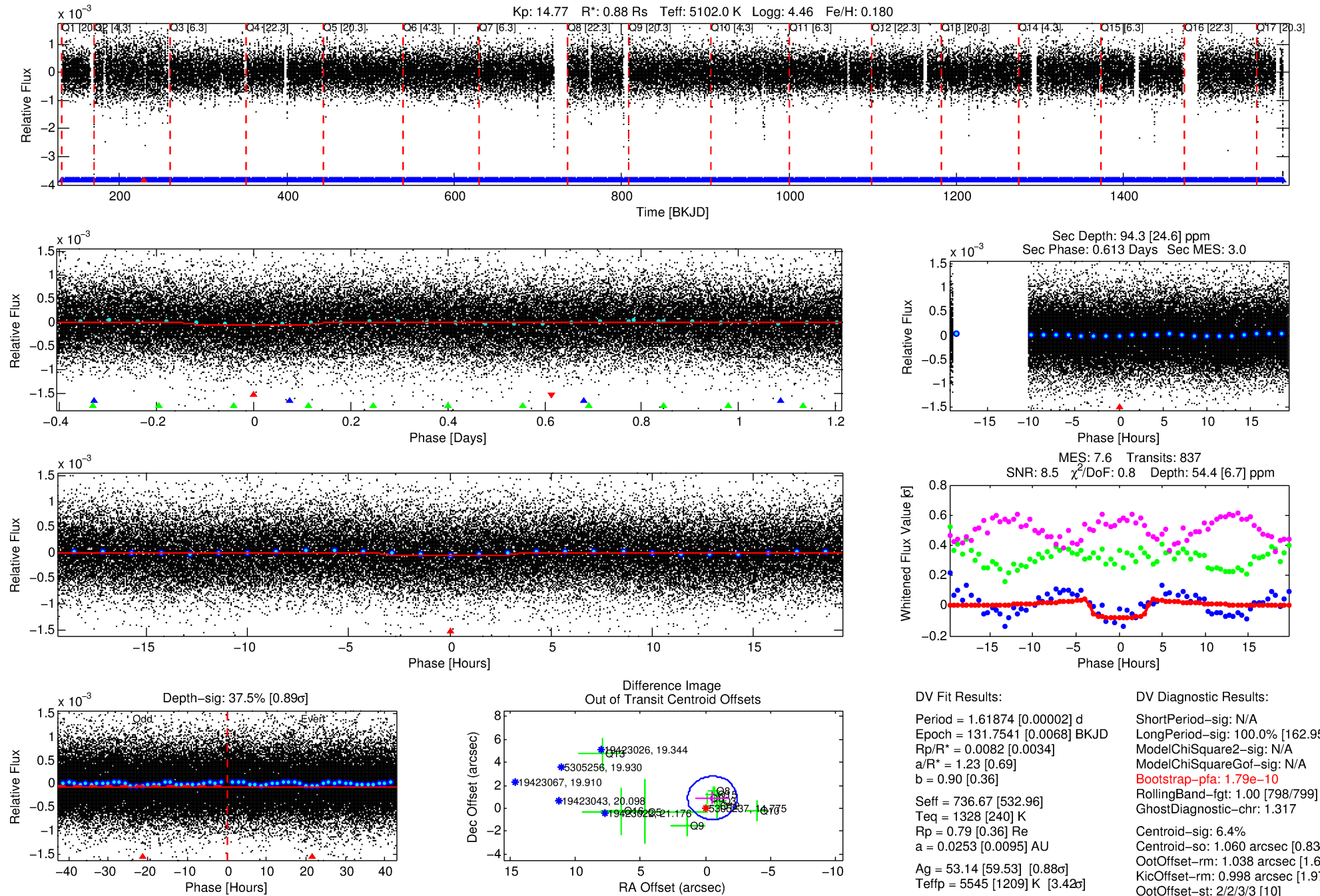
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005305237-01

No Significant Match Found

# DV One-Page Summary

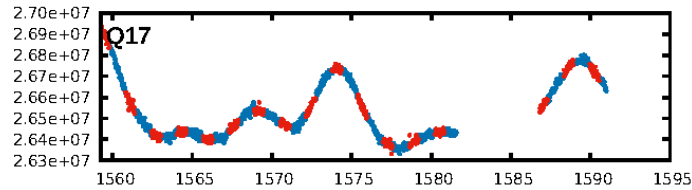
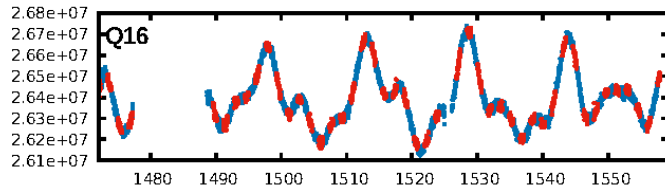
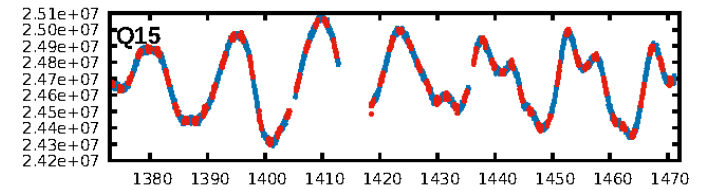
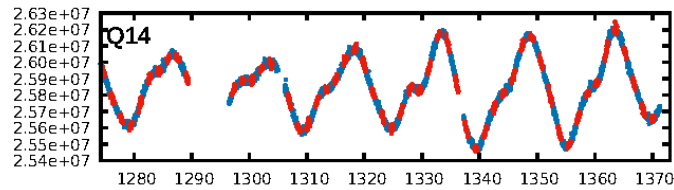
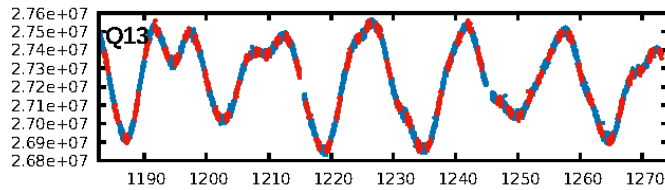
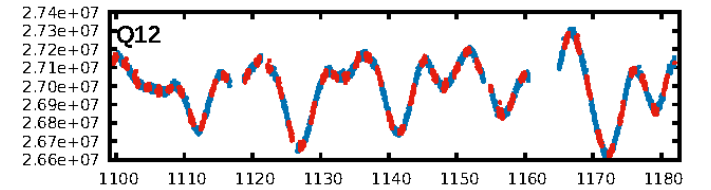
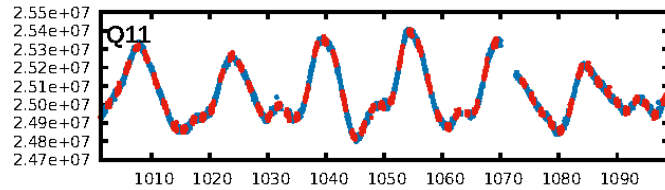
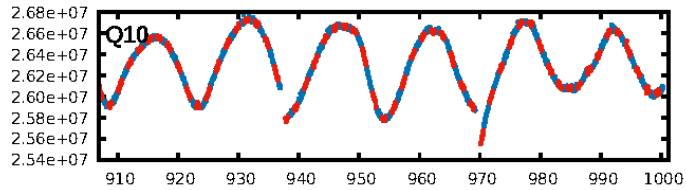
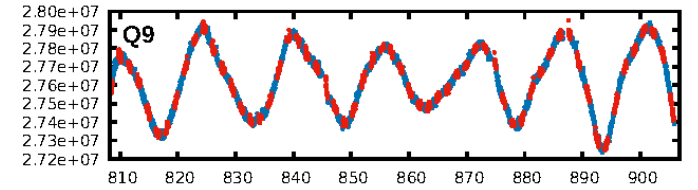
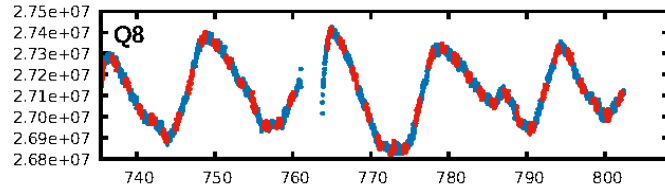
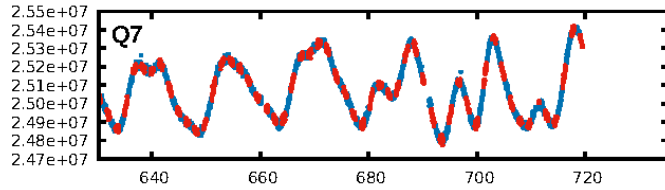
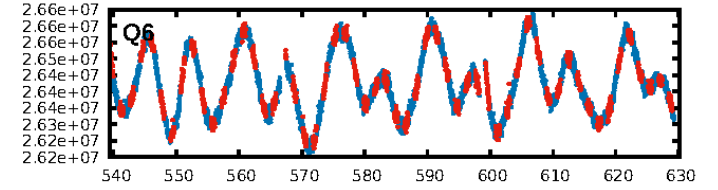
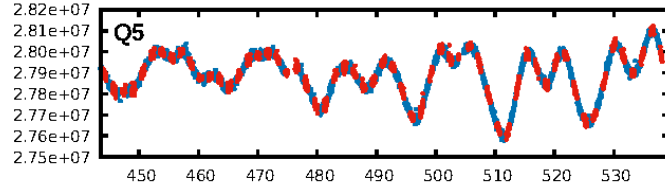
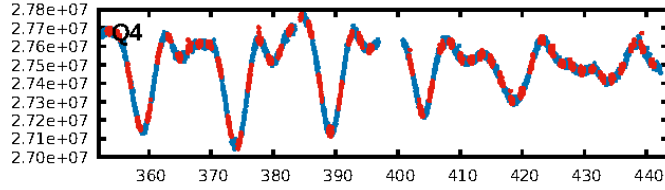
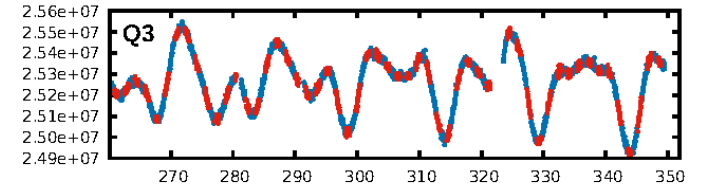
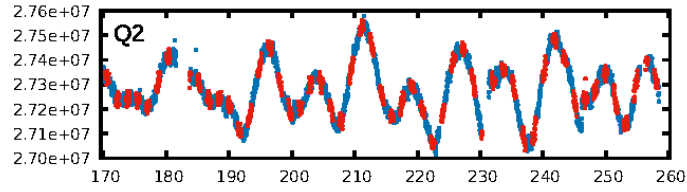
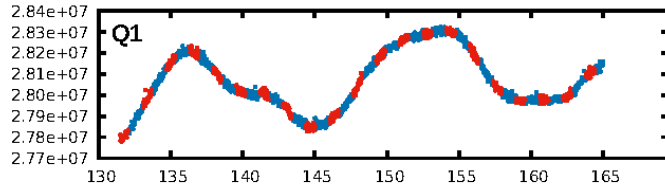
KIC: 5305237 Candidate: 1 of 3 Period: 1.619 d



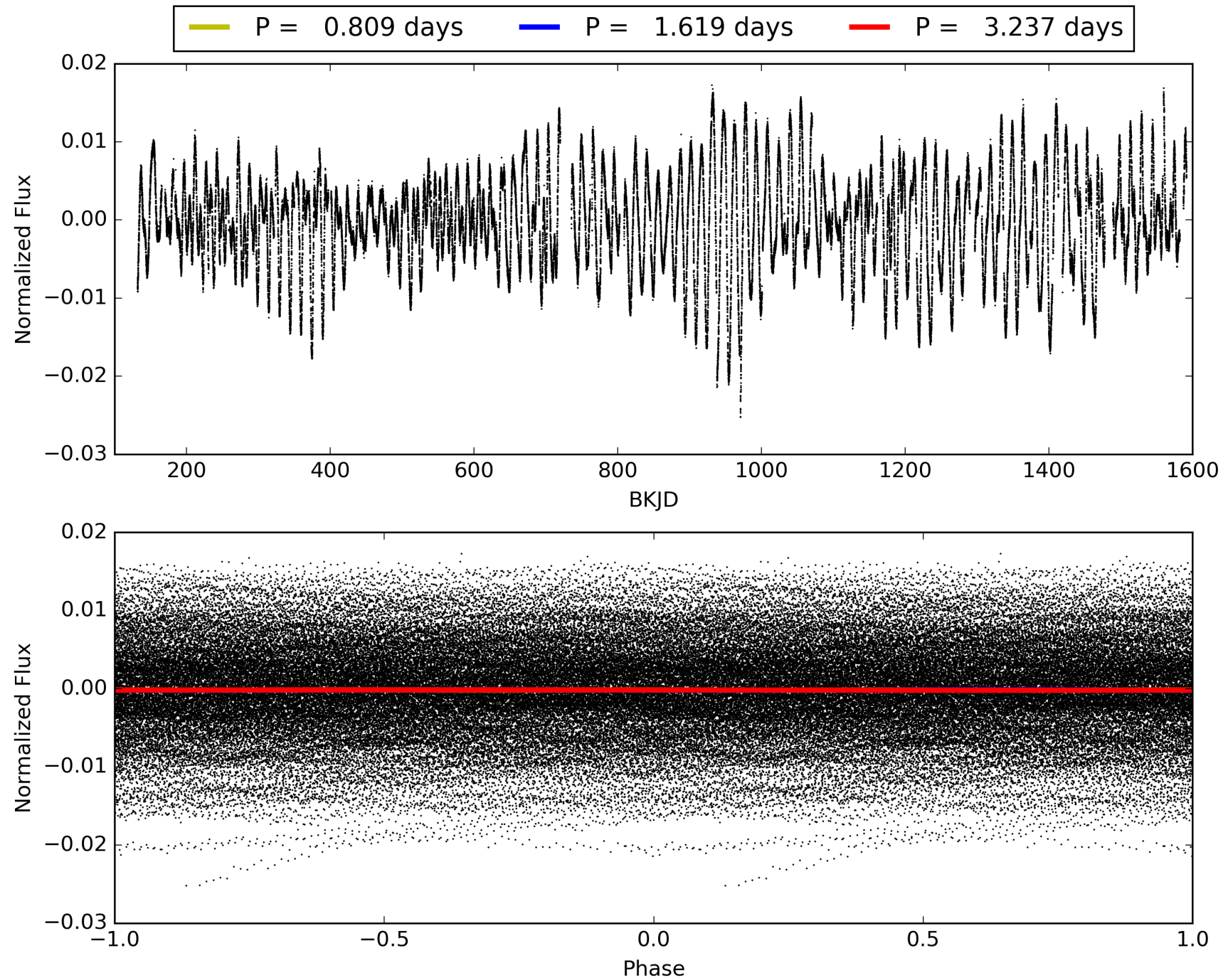
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:05:12 Z

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

# TCE 005305237-01, PDC Light Curves

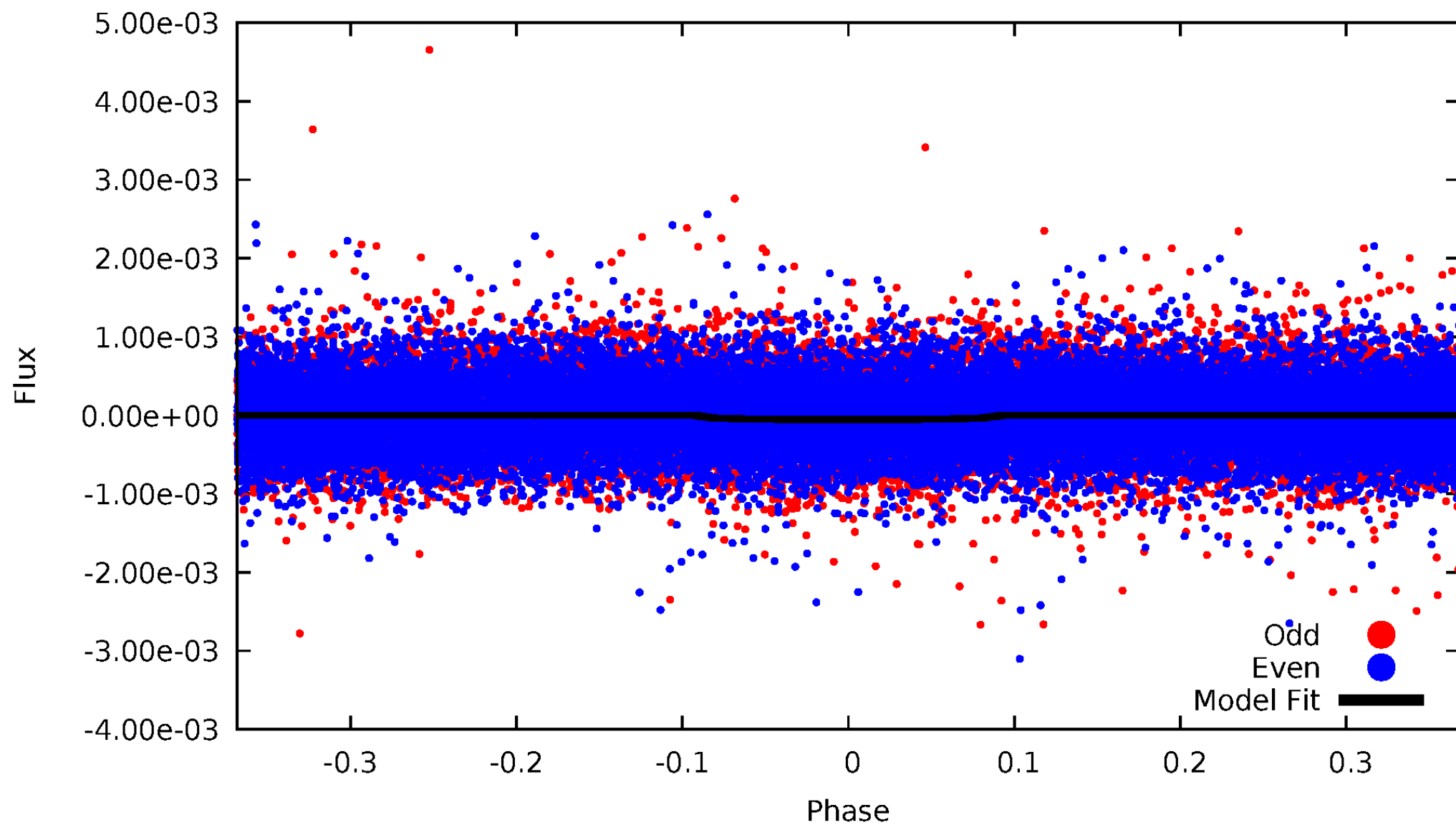


TCE 005305237-01



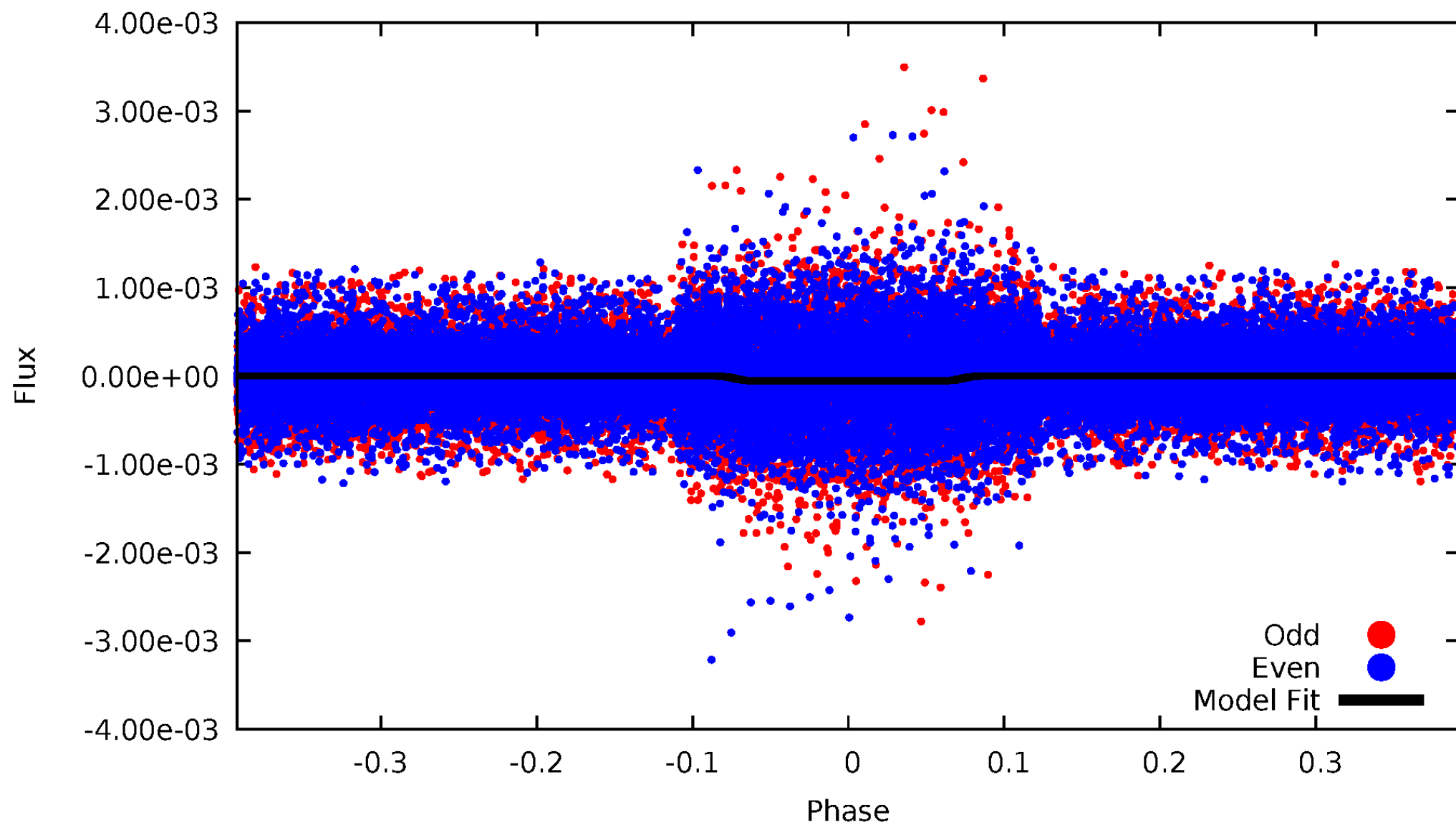
# DV Odd/Even

TCE 005305237-01



# ALT Odd/Even

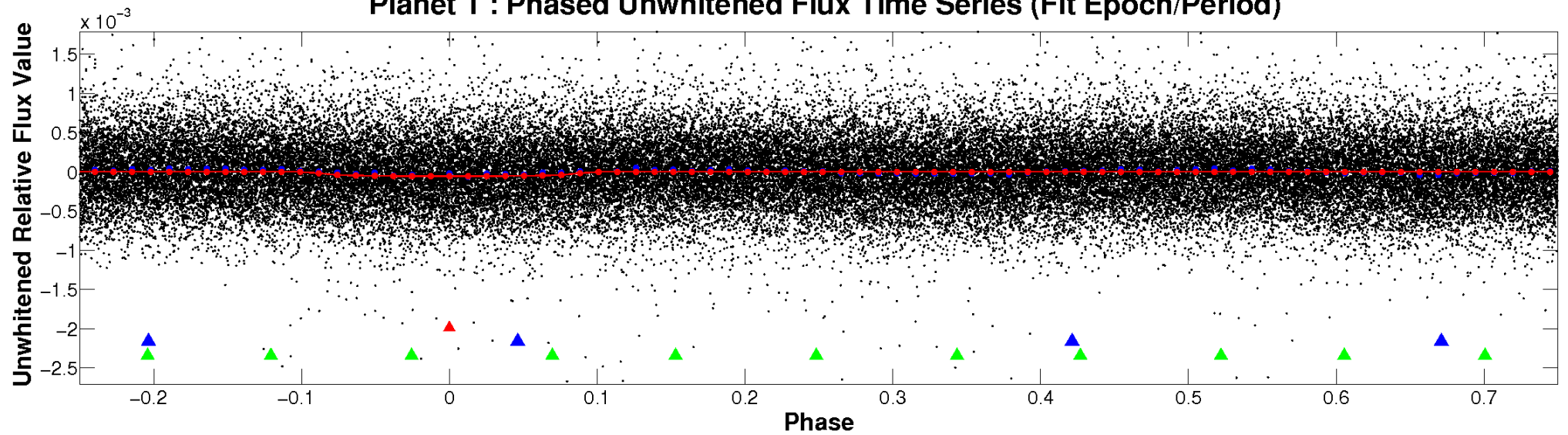
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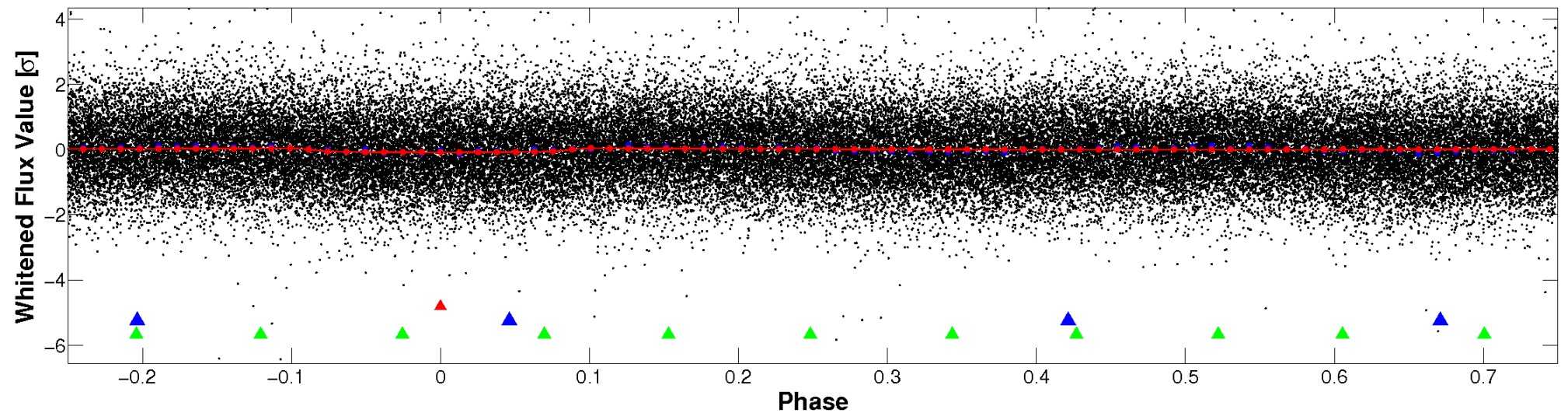


# Non-Whitened Vs. Whitened Light Curve

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

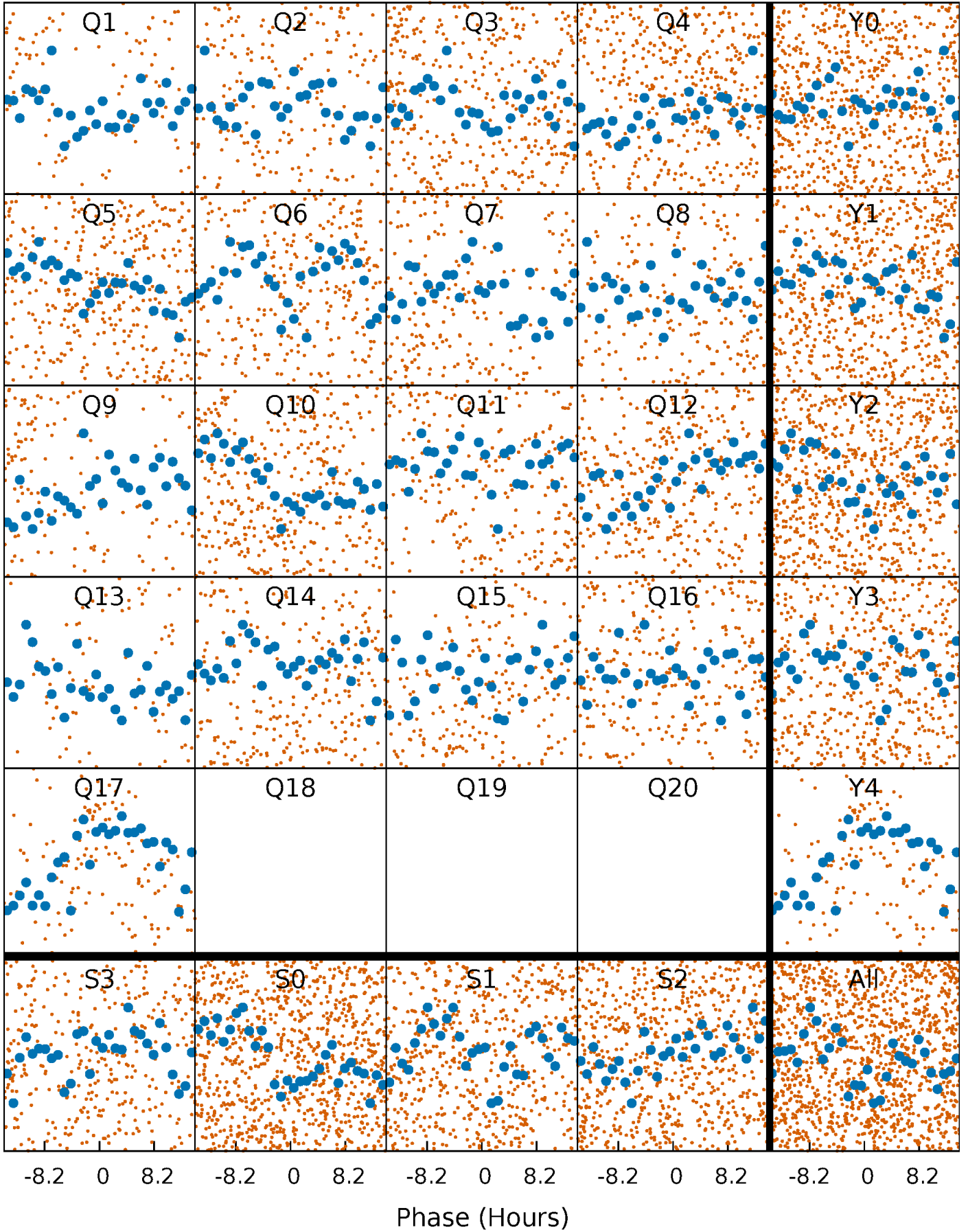


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

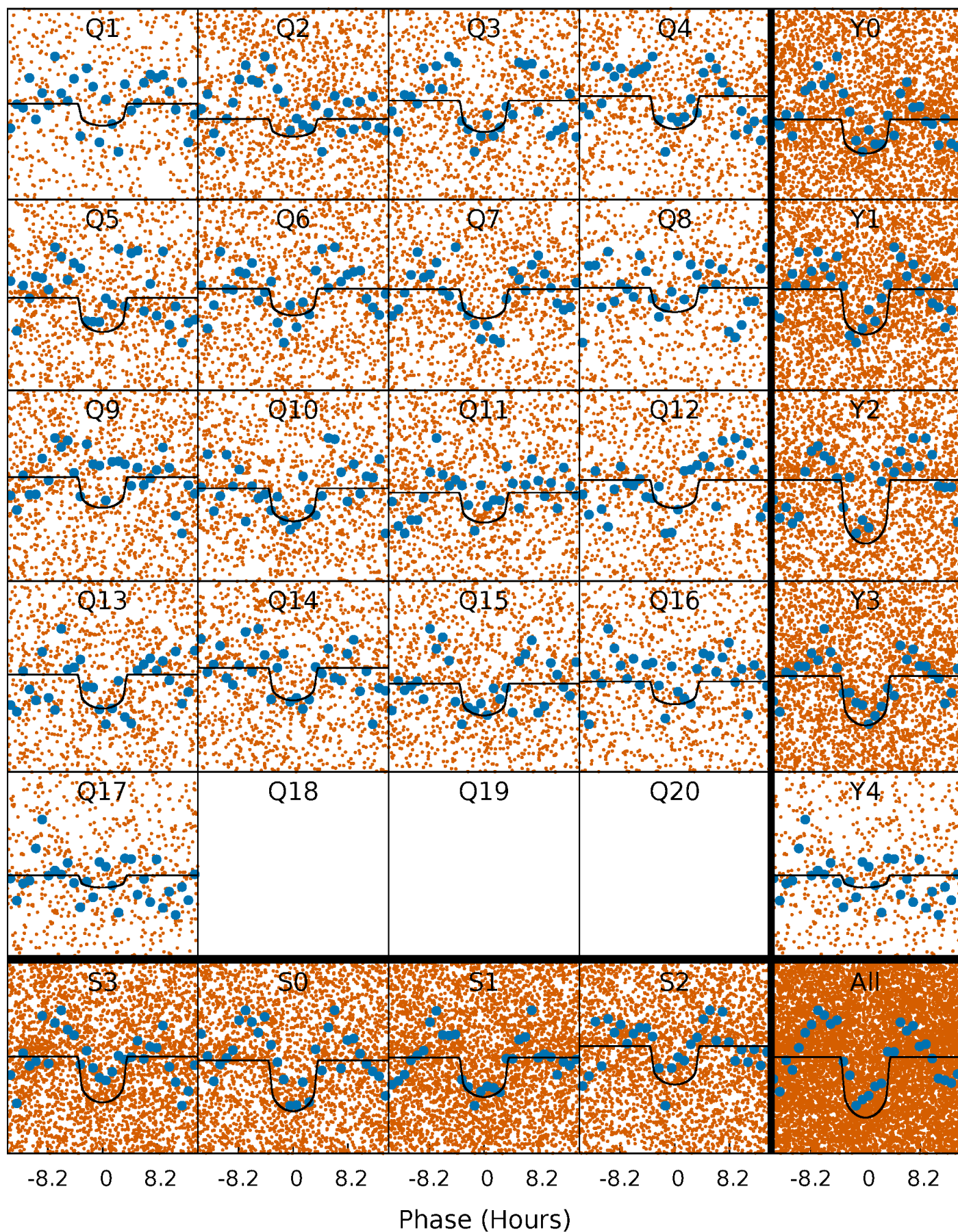
TCE 005305237-01 P= 1.618744 Days  $T_0=131.754058$  (BKJD)





# DV Quarter-Phased Transit Curves

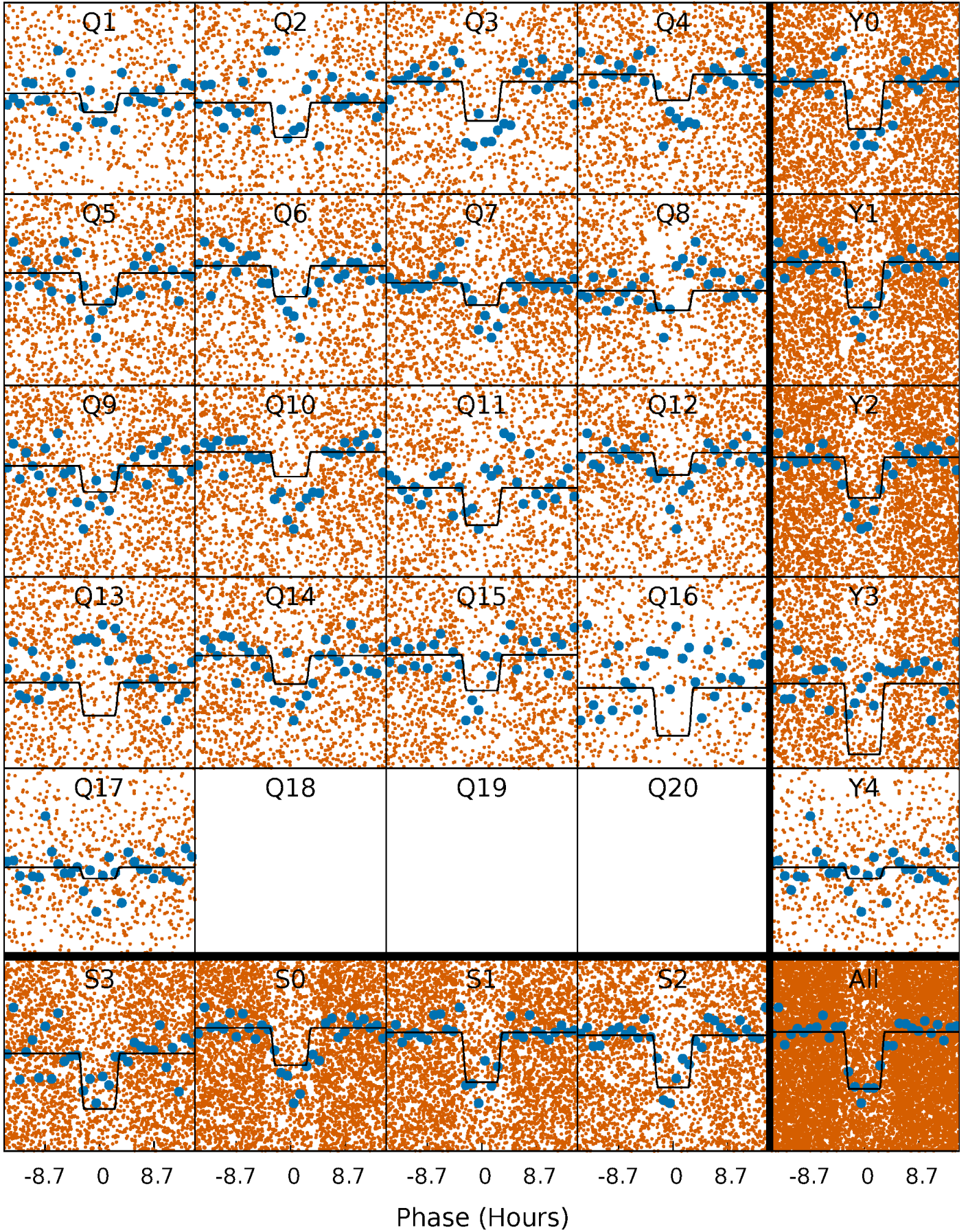
TCE 005305237-01 P= 1.618744 Days  $T_0=131.754058$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

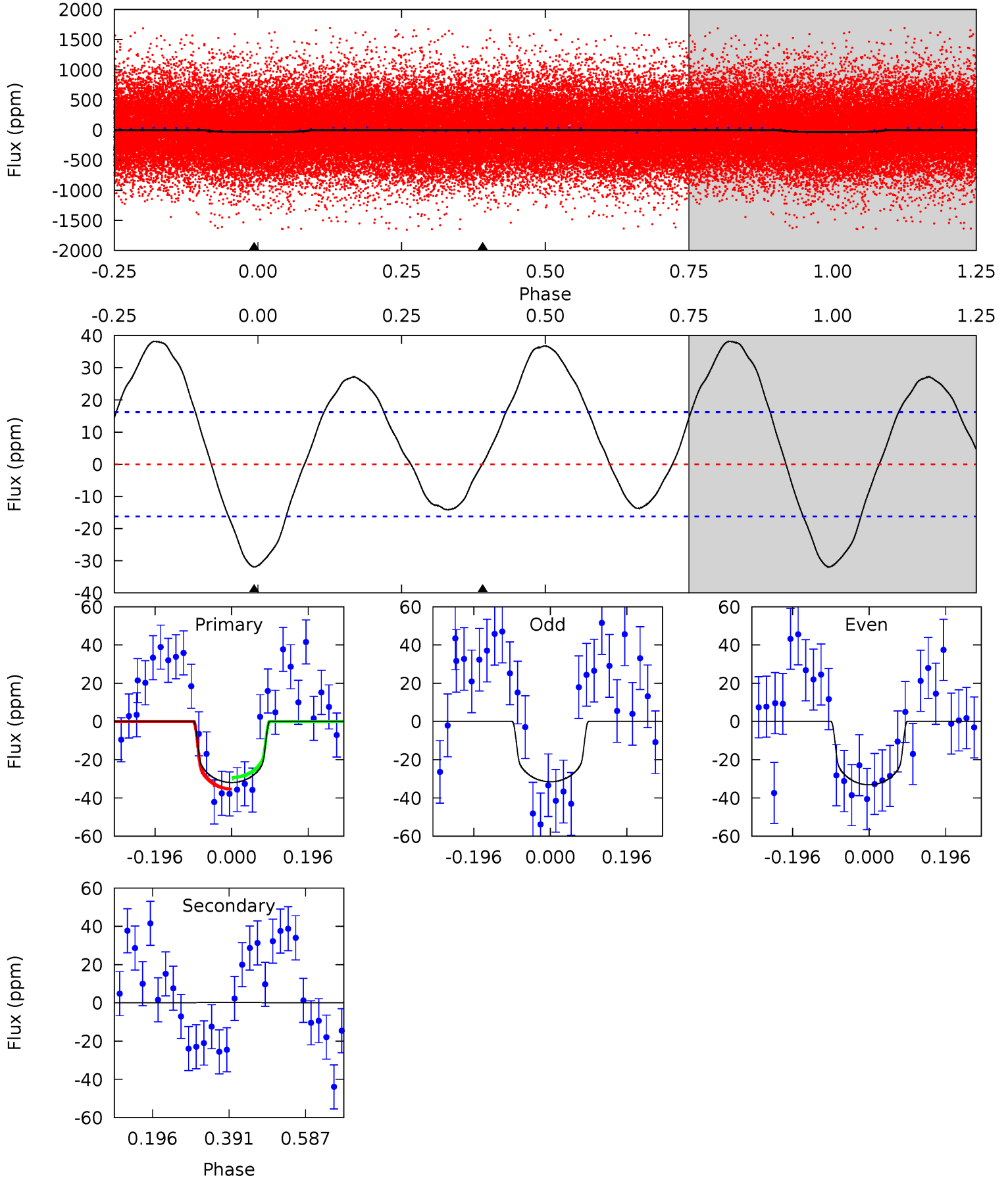
TCE 005305237-01 P= 1.618697 Days  $T_0=131.746123$  (BKJD)



# DV Model-Shift Uniqueness Test

005305237-01, P = 1.618744 Days, E = 130.135314 Days

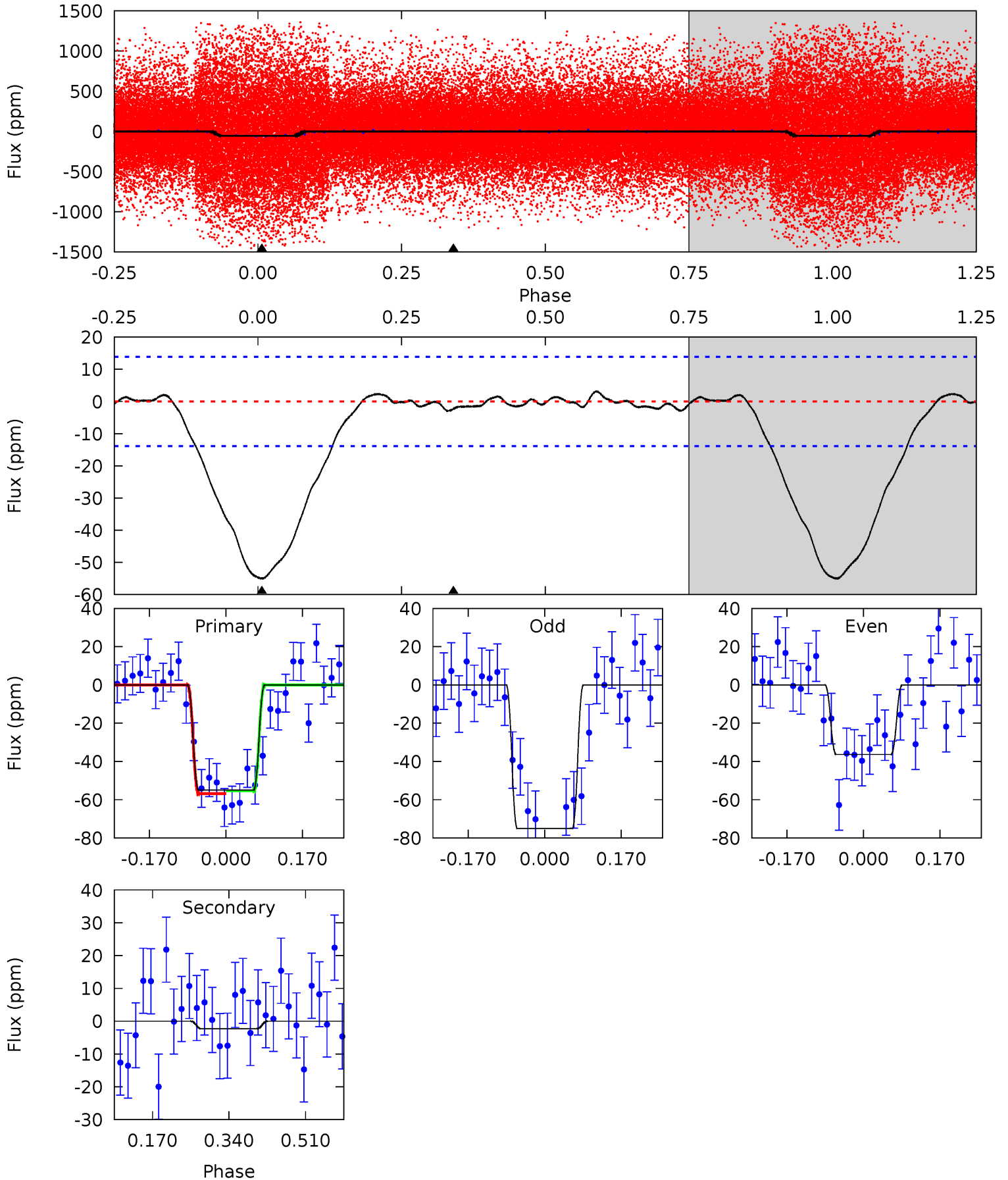
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.71	-0.06	0	0	4.42	1.29	3.88	8.71	8.71	-0.06	-0.06	0.22	0.83	0.54	0.83



# Alt Model-Shift Uniqueness Test

005305237-01, P = 1.618697 Days, E = 130.127426 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
17.6	0.75	0	0	4.45	1.37	0.44	17.6	17.6	0.75	0.75	6.23	1.08	0.05	0.24



### Stellar Parameters For KIC 005305237

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5102^{+152}_{-152}$	$4.463^{+0.120}_{-0.456}$	$0.180^{+0.250}_{-0.250}$	$0.880^{+0.183}_{-0.098}$	$0.819^{+0.084}_{-0.058}$	$1.692^{+0.794}_{-1.252}$
	+3%/-3%	+3%/-10%	+139%/-139%	+21%/-11%	+10%/-7%	+47%/-74%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 005305237-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 4$	$0.84^{+0.35}_{-0.36}$	$1888^{+149}_{-105}$	$-2528^{+5580}_{-796}$	$-0.117^{+2.159}_{-2.648}$
Alt.	$-2 \pm 3$	$0.75^{+0.39}_{-0.36}$	$1891^{+146}_{-111}$	$2823^{+872}_{-5493}$	$1.318^{+5.059}_{-1.648}$

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



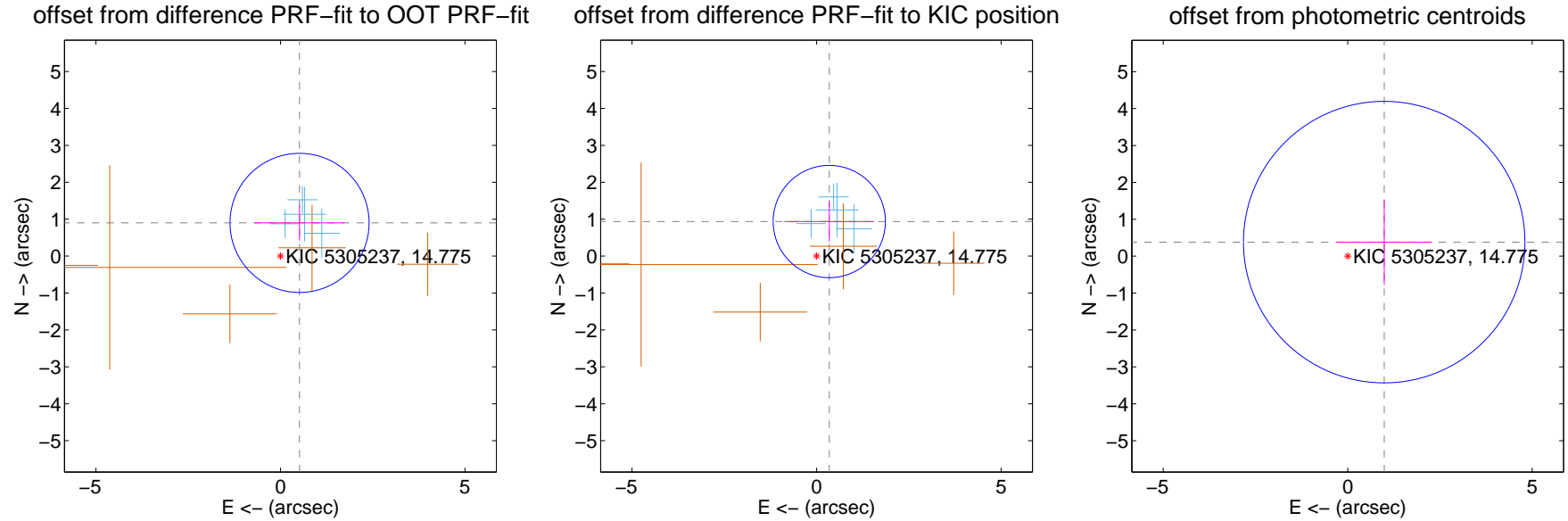
## DV Centroid Data

Supplemental centroid analysis for 005305237-01. Kepler magnitude: 14.78. Transit SNR 8.50

There are 4 quarters with good PRF difference image offsets

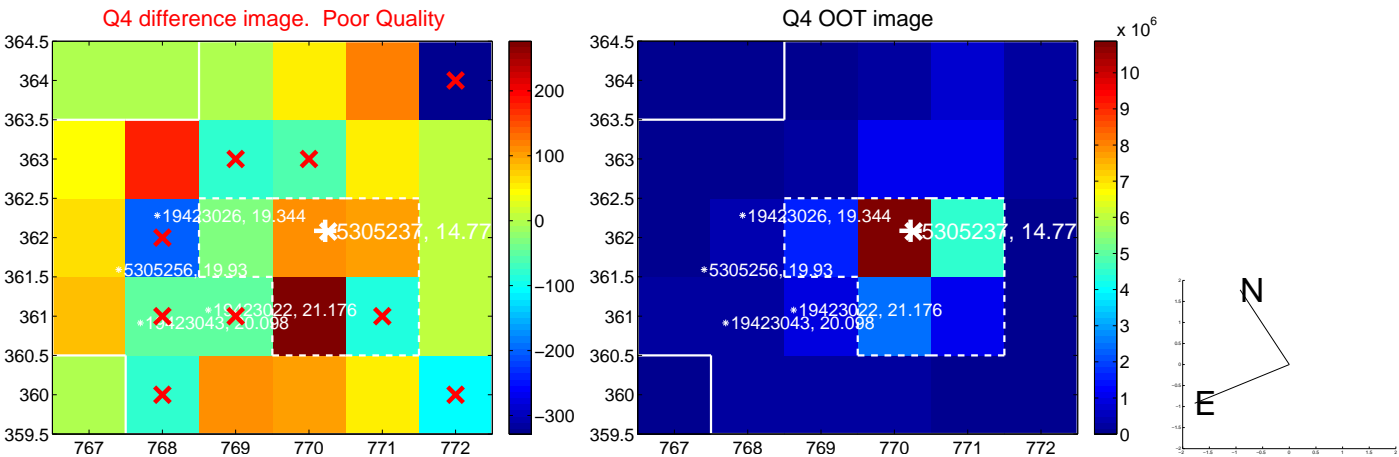
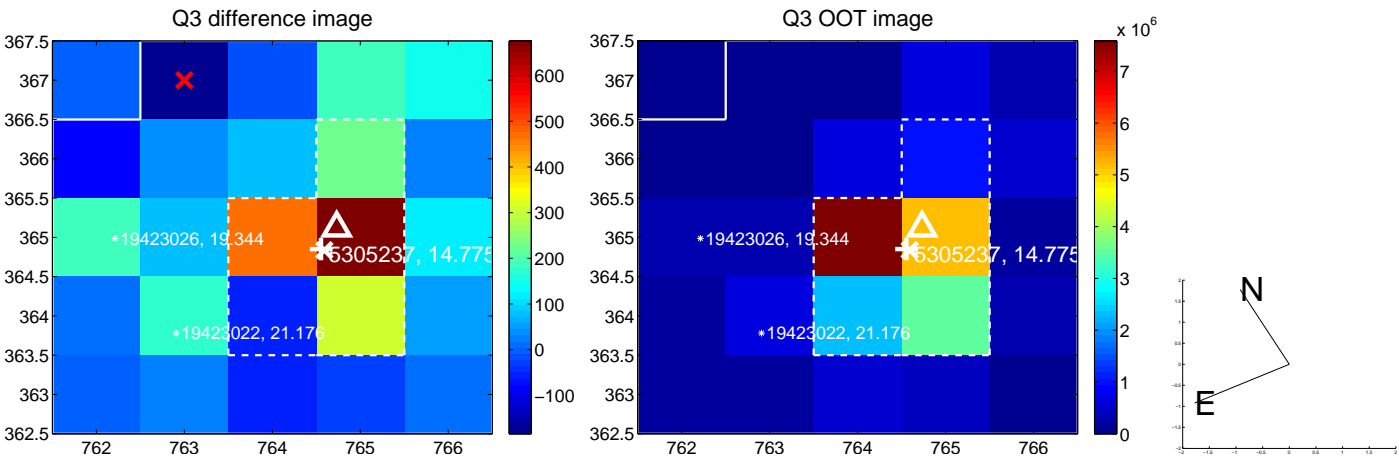
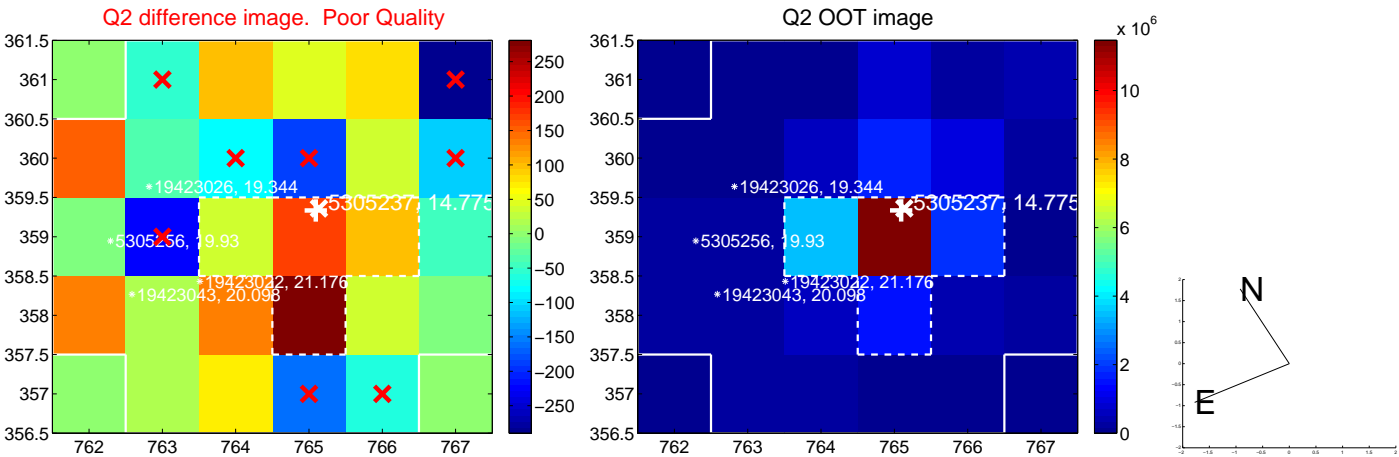
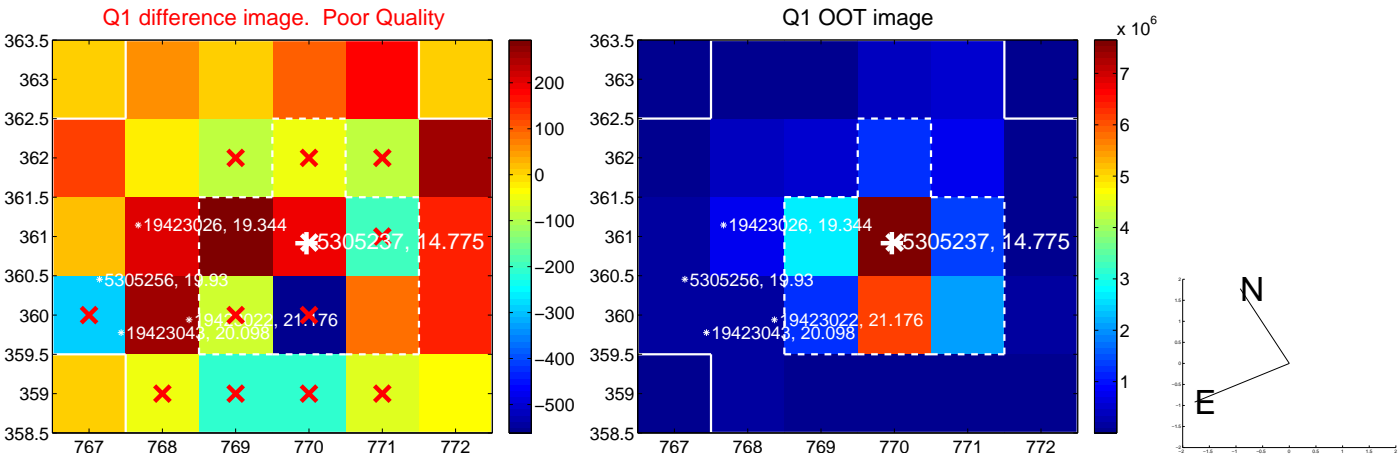
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.038 \pm 0.628$	1.65	$-0.517 \pm 1.221$	$0.900 \pm 0.477$
PRF-fit source offset from KIC position	$0.998 \pm 0.507$	1.97	$-0.344 \pm 1.214$	$0.937 \pm 0.541$
photometric centroid source offset	$1.06 \pm 1.27$	0.83	$-0.99 \pm 1.29$	$0.38 \pm 1.16$

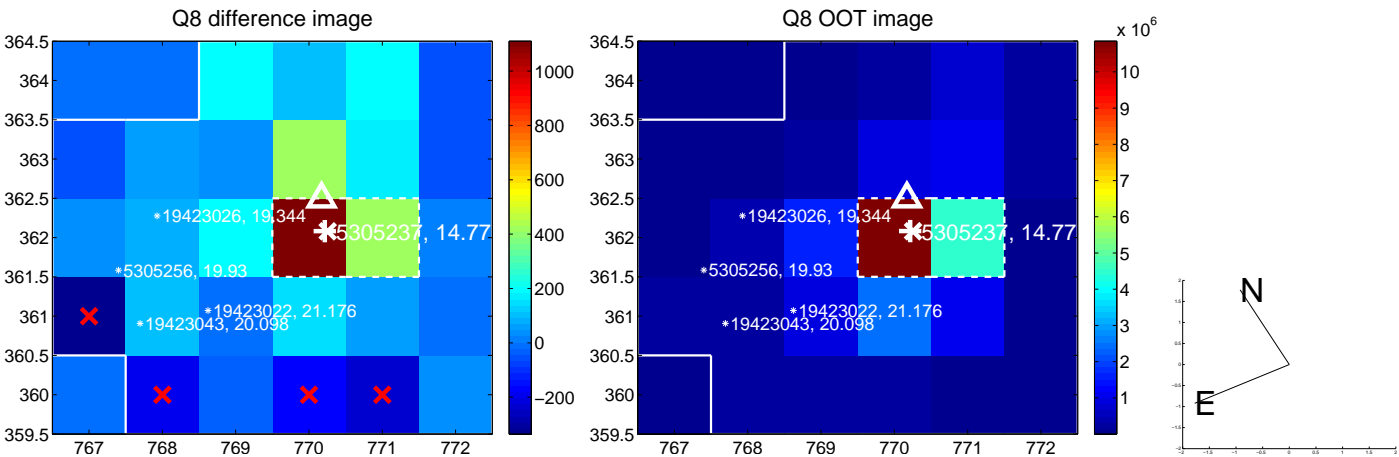
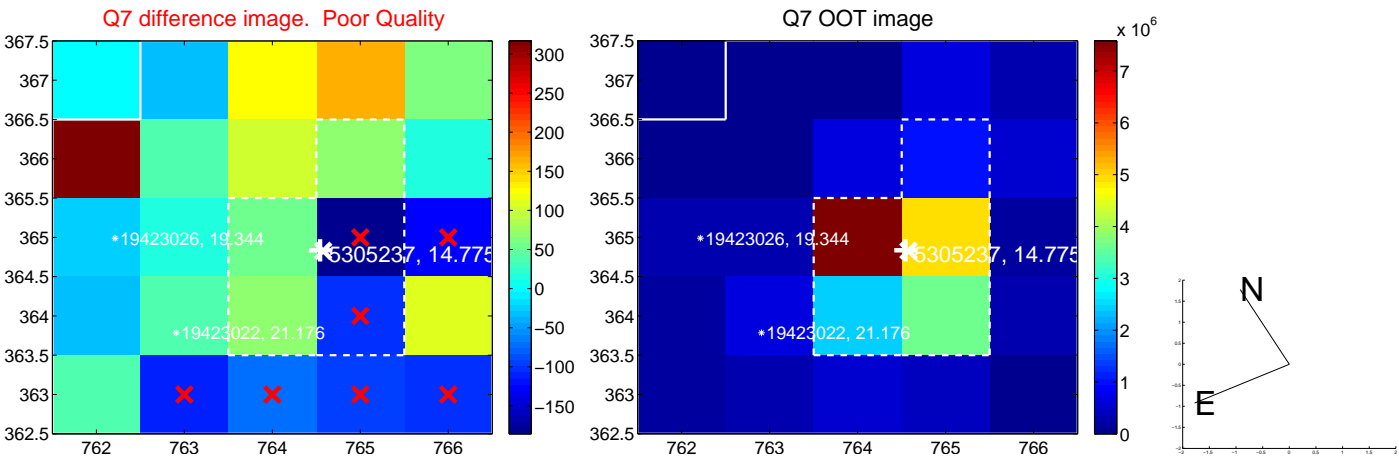
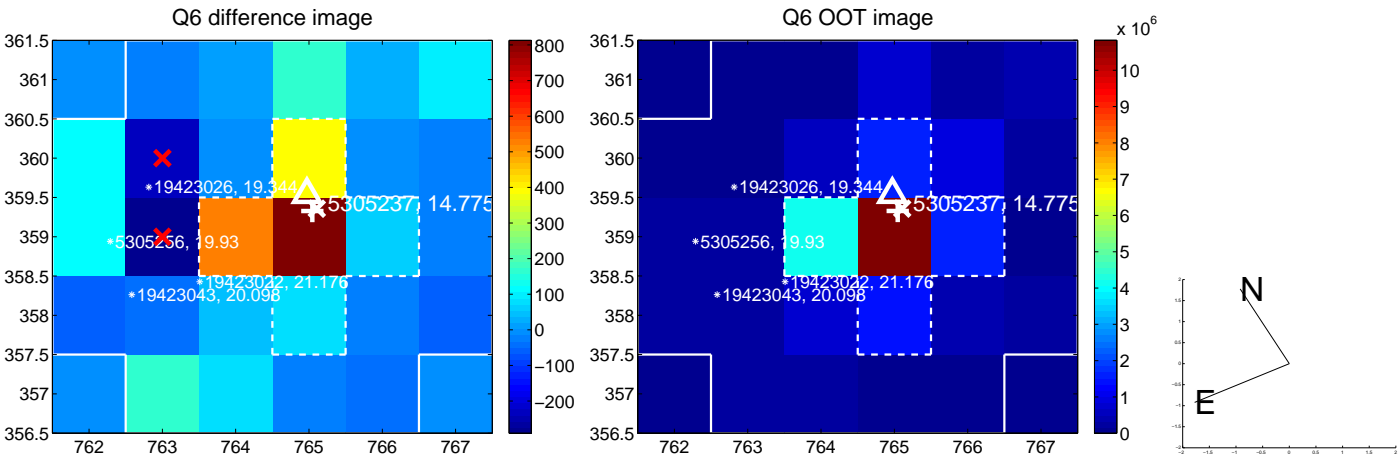
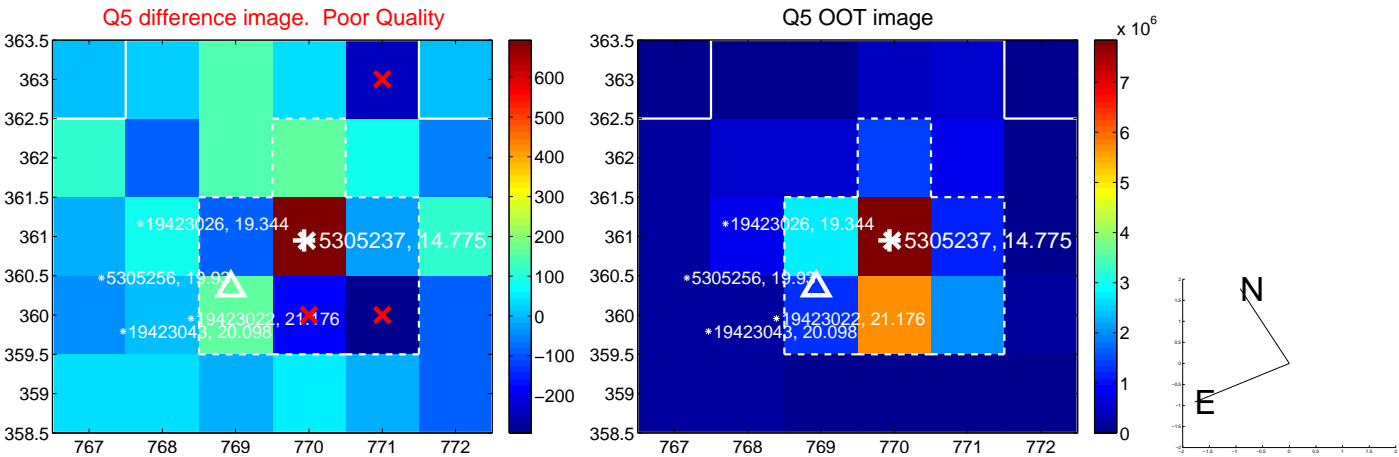


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

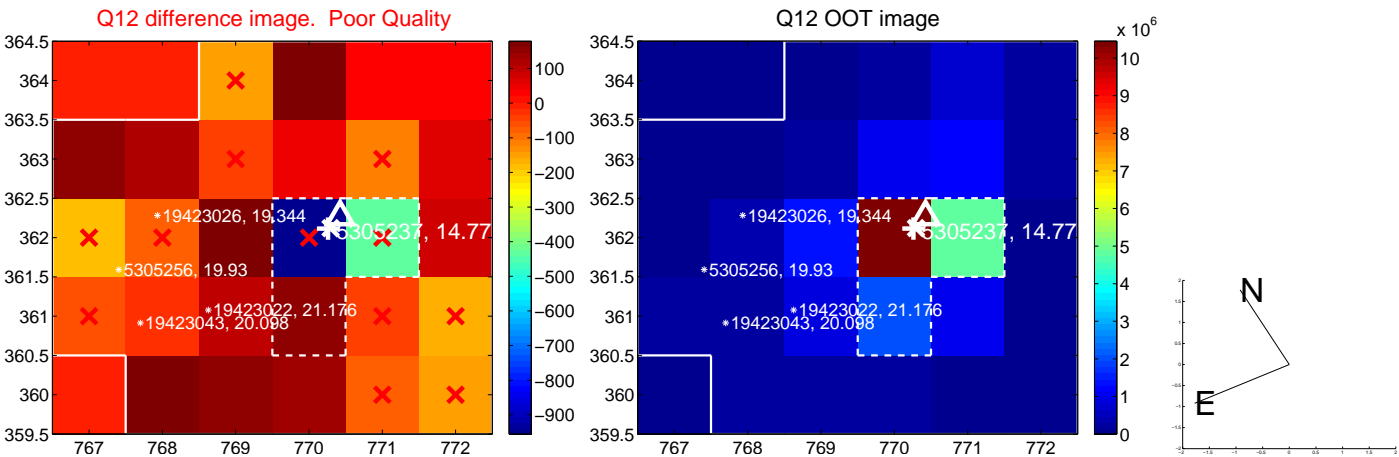
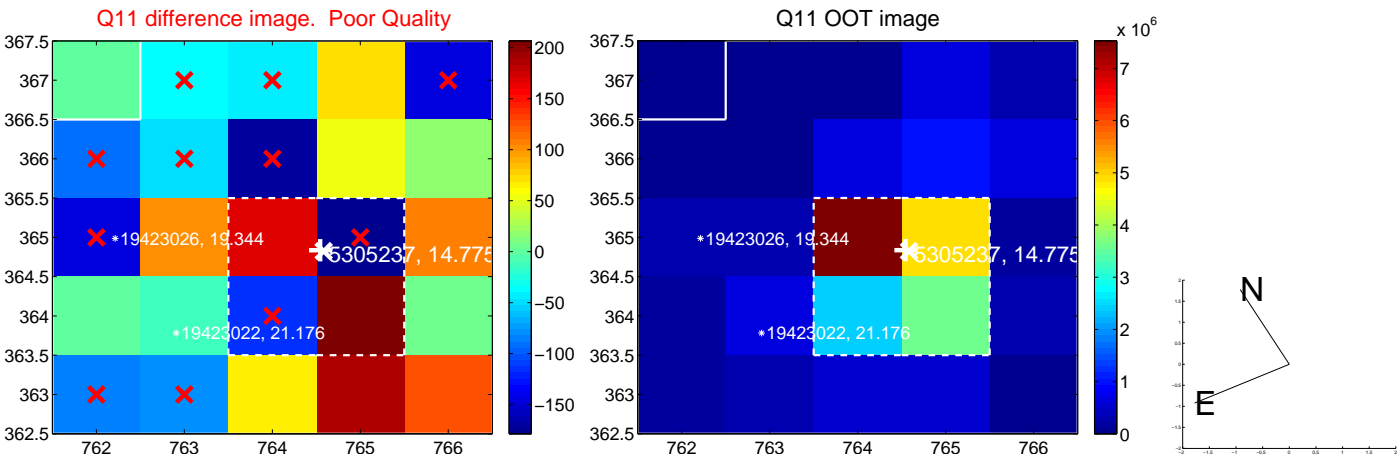
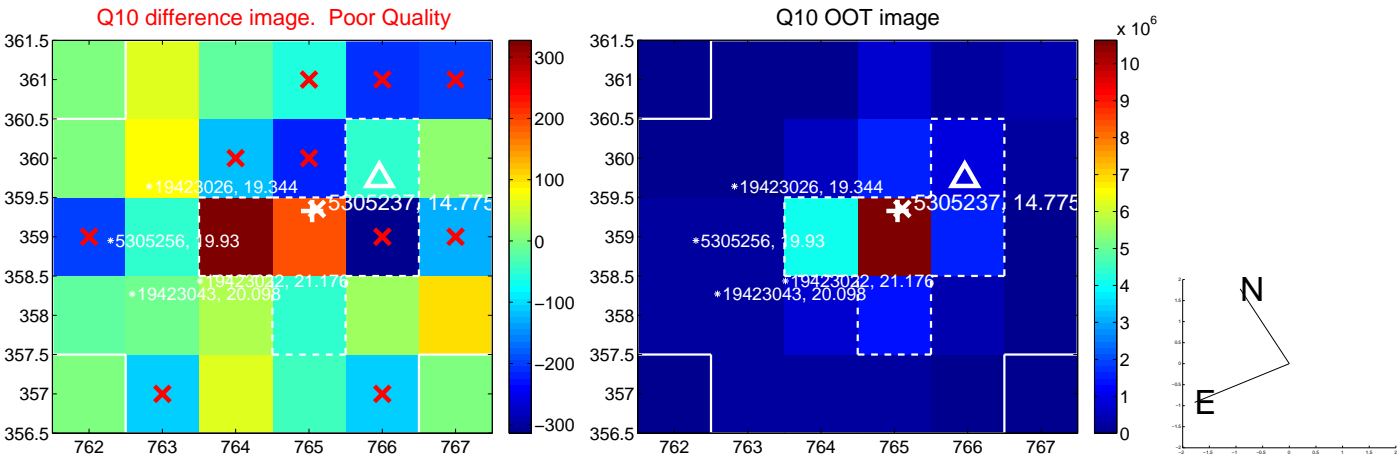
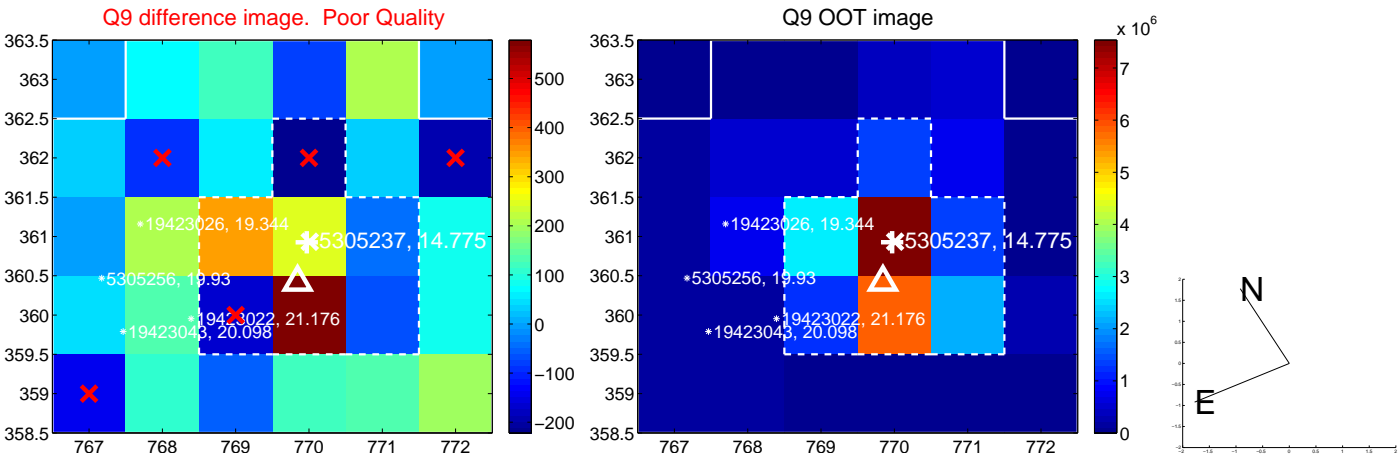
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



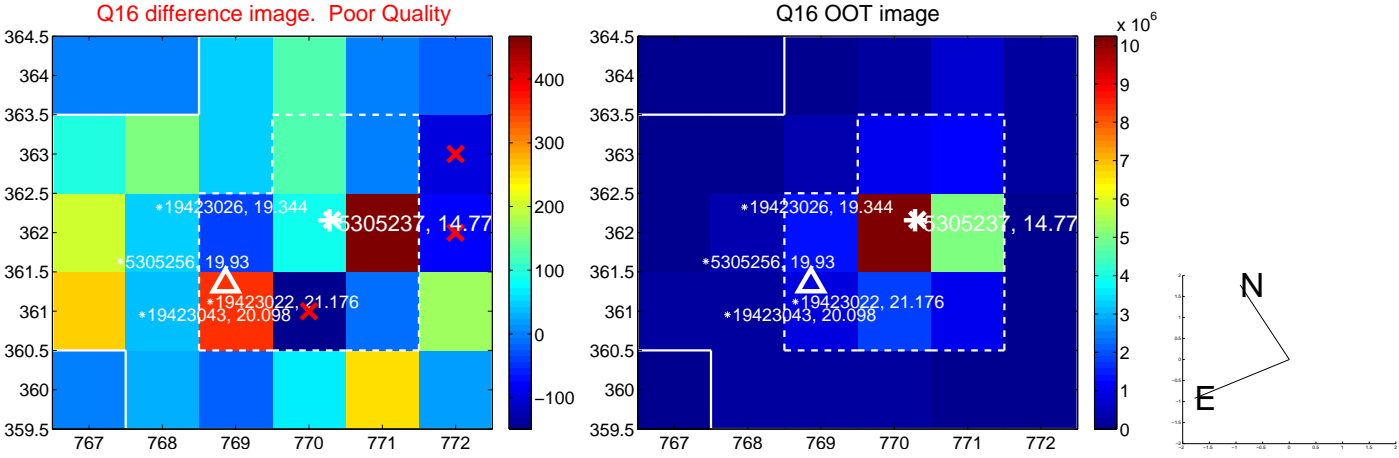
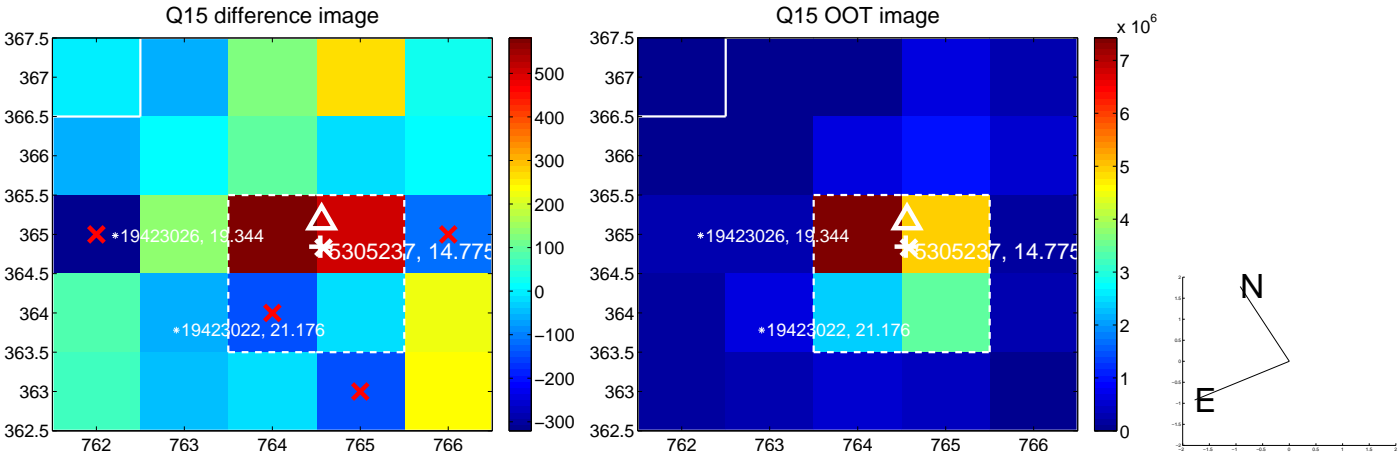
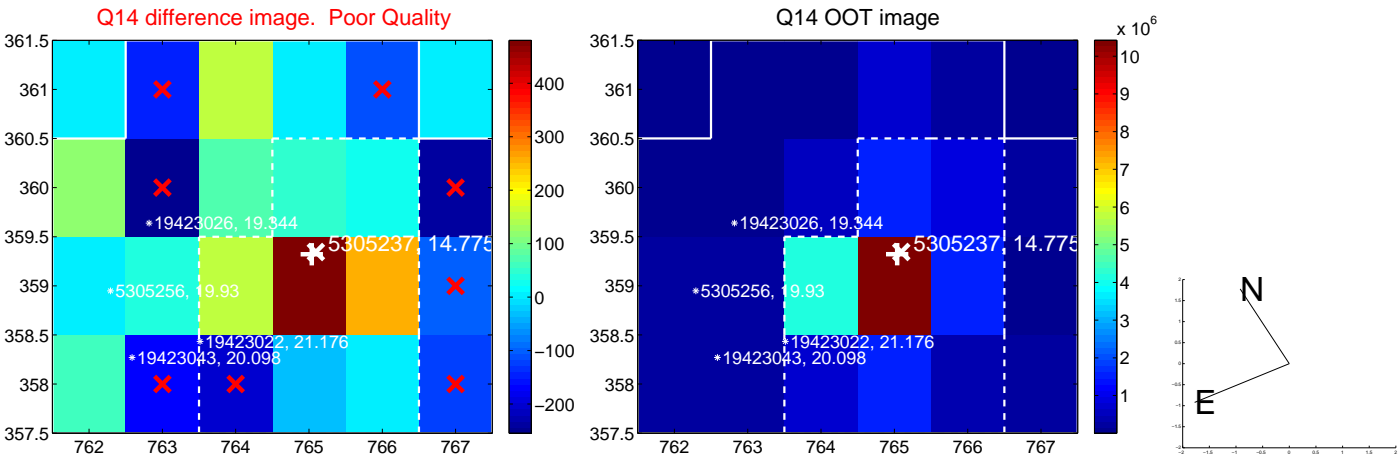
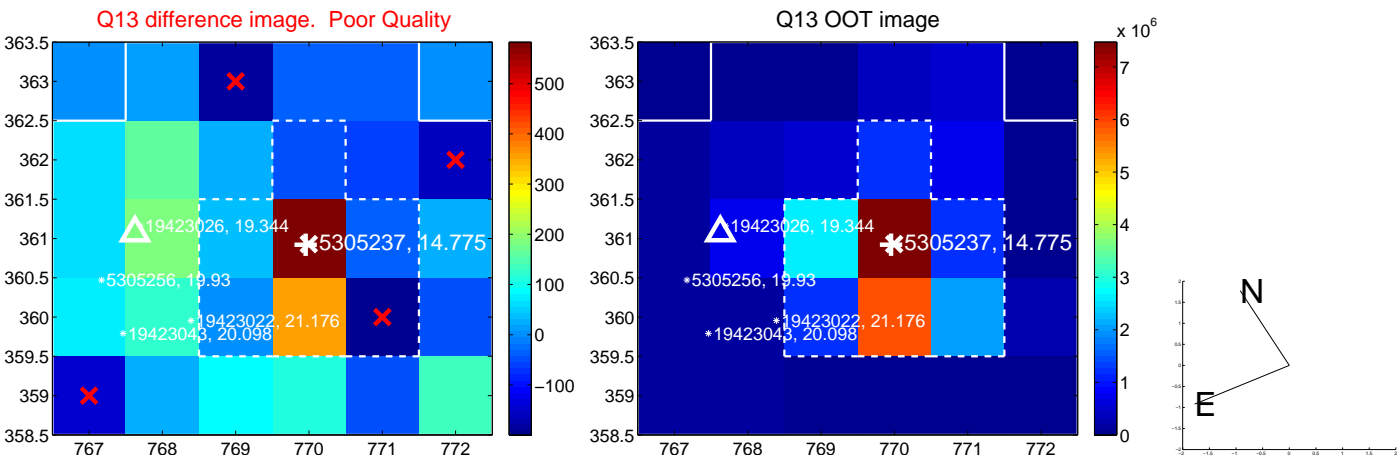
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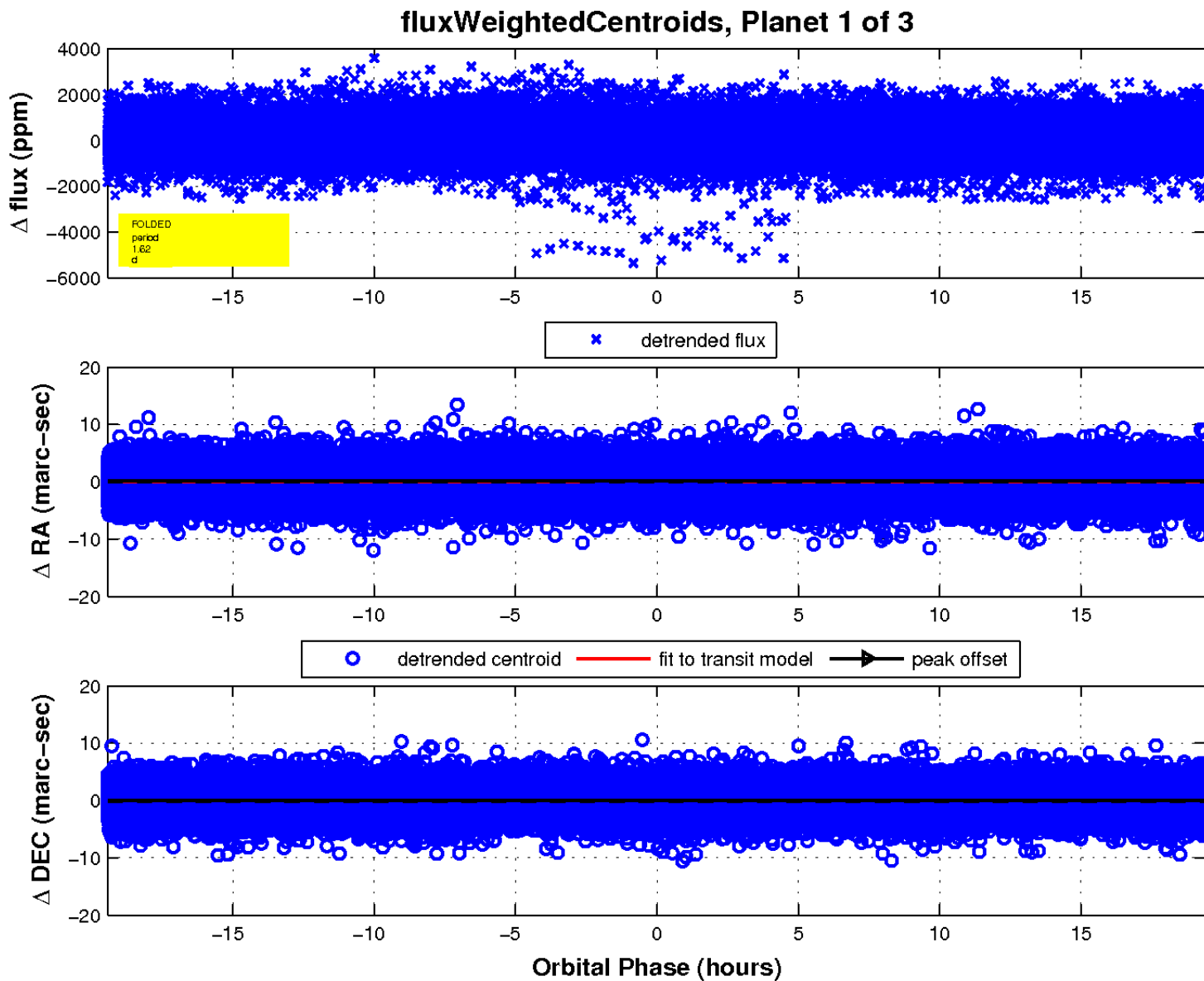
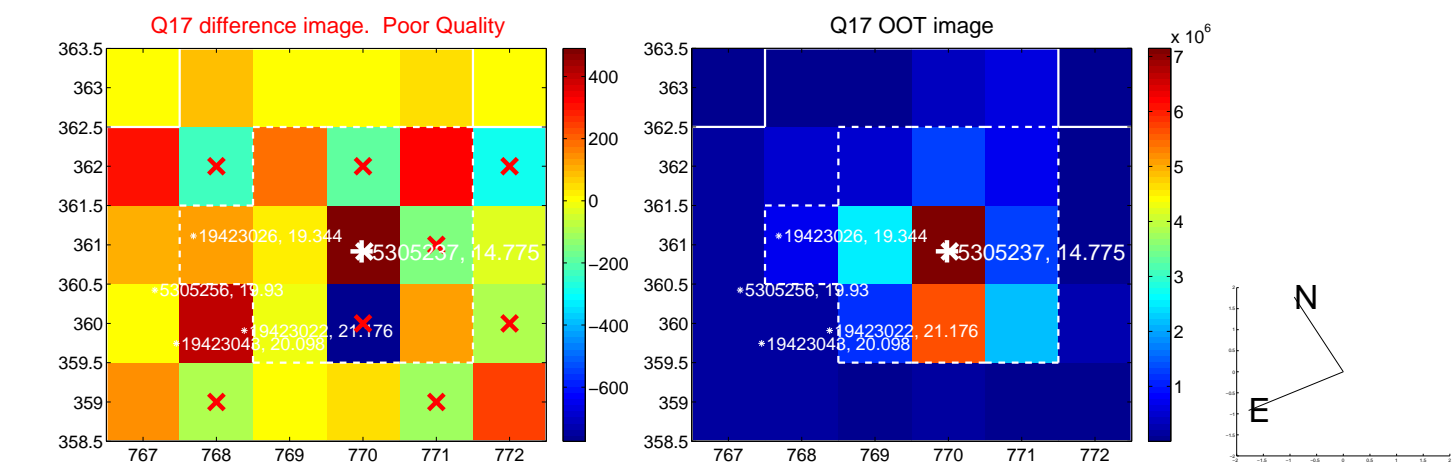


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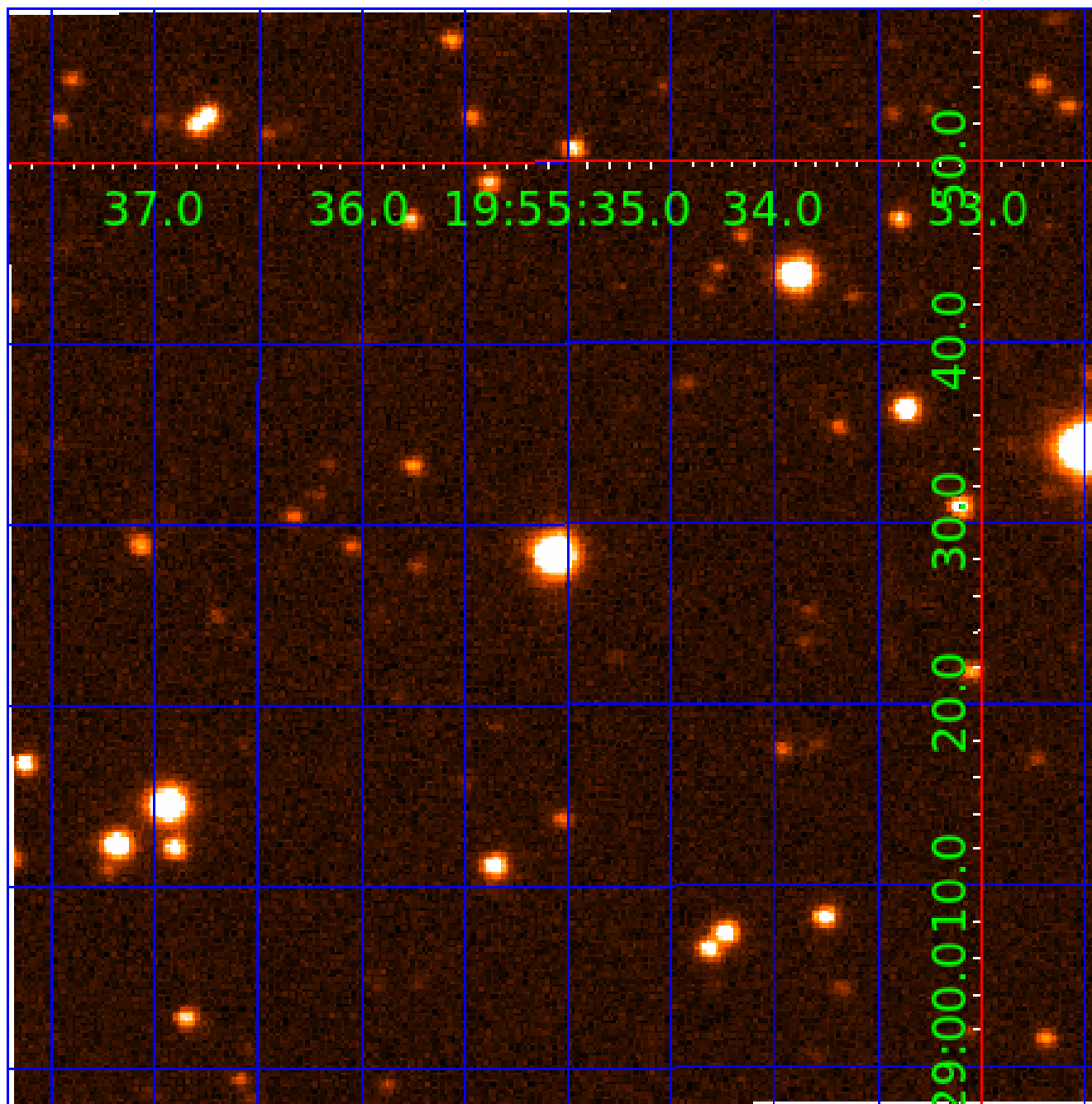


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UKIRT Image

Declination



# KIC 005305237

## Q1-17 DR25 TCE Parameters

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

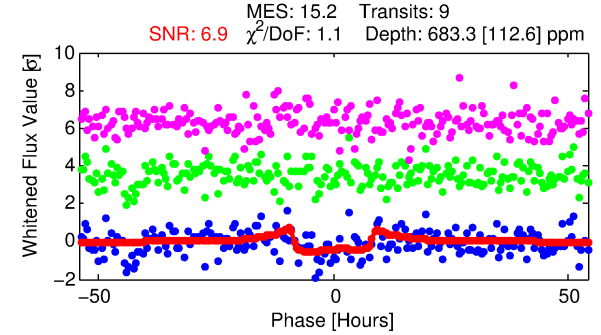
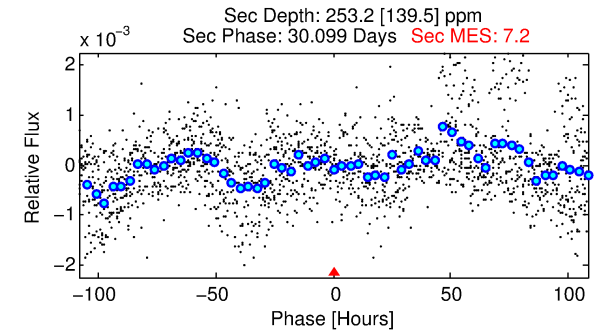
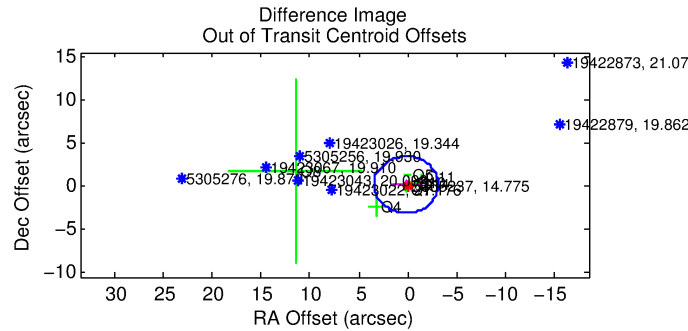
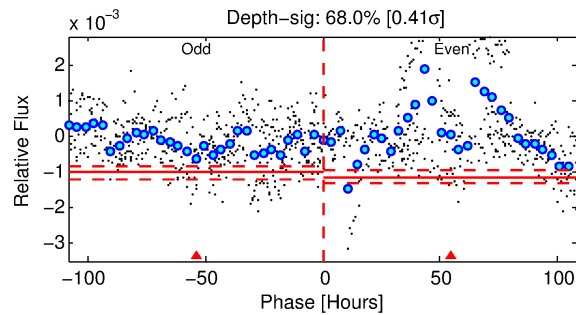
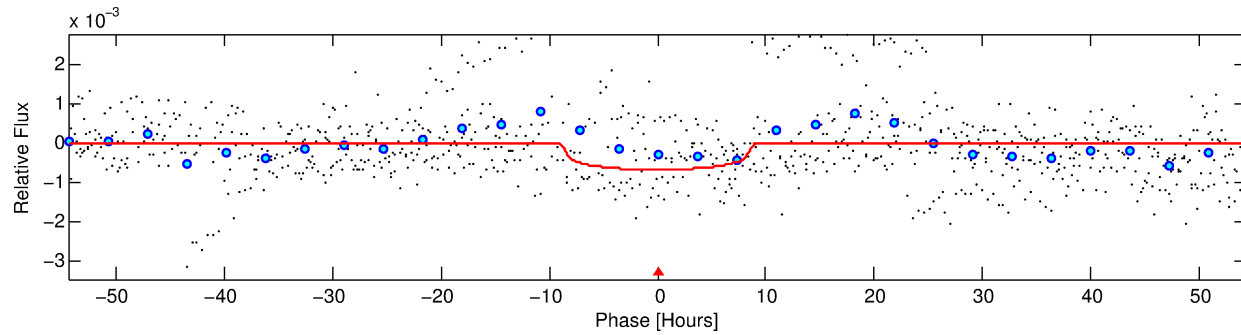
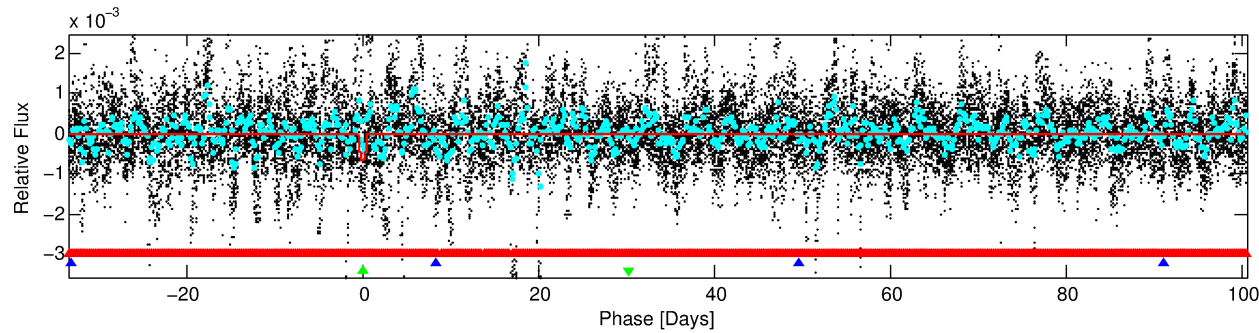
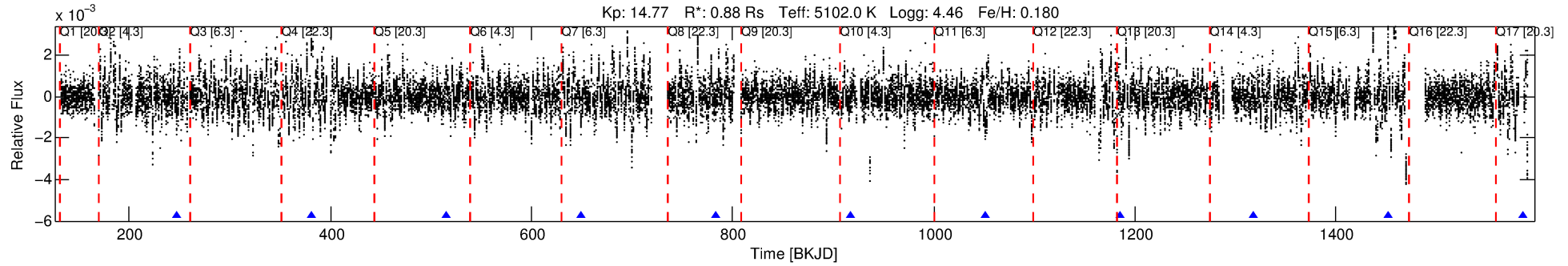
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005305237-03

No Significant Match Found

# DV One-Page Summary

KIC: 5305237 Candidate: 3 of 3 Period: 133.913 d



## DV Fit Results:

Period = 133.91253 [0.00408] d  
Epoch = 247.2409 [0.0231] BKJD  
Rp/R\* = 0.0263 [0.0053]  
a/R\* = 38.67 [24.66]  
b = 0.76 [0.35]  
Seff = 2.04 [1.48]  
Teq = 305 [55] K  
Rp = 2.52 [0.73] Re  
a = 0.4796 [0.1806] AU  
Ag = 5031.42 [4971.21] [1.01 $\sigma$ ]  
Teffp = 3970 [688] K [5.31 $\sigma$ ]

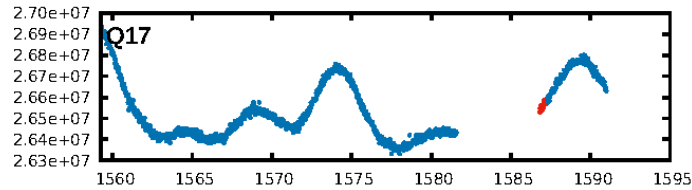
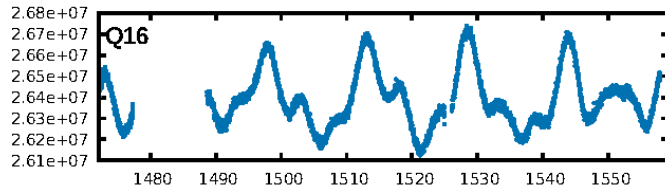
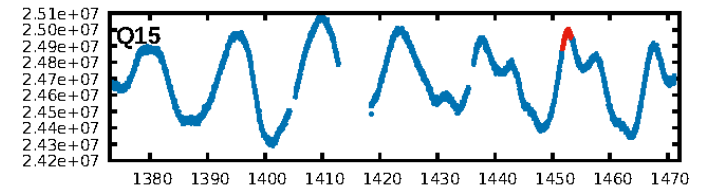
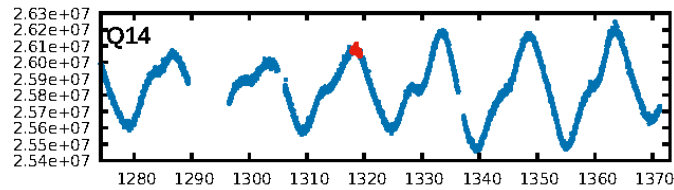
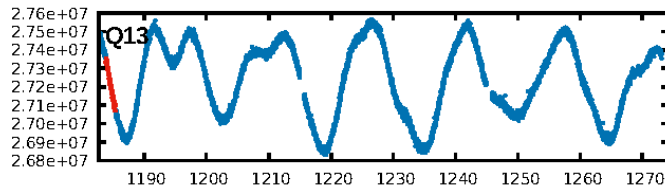
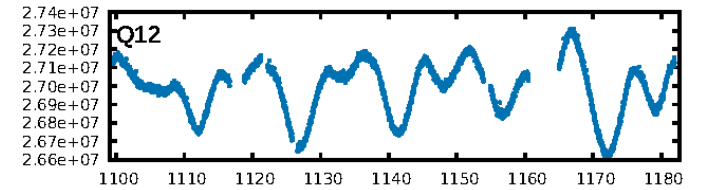
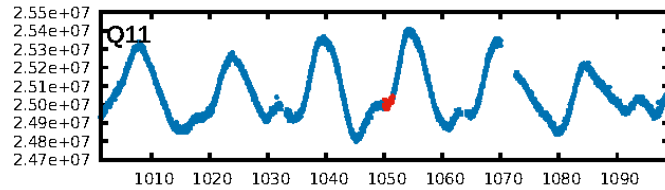
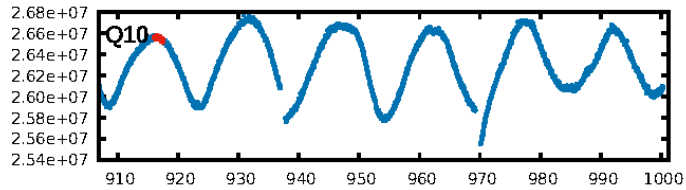
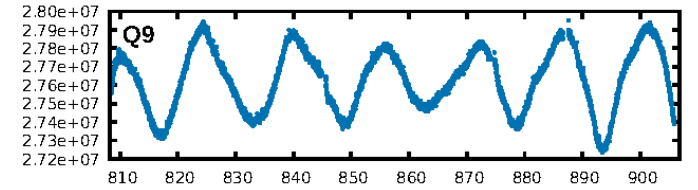
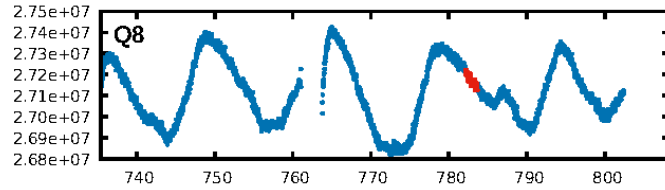
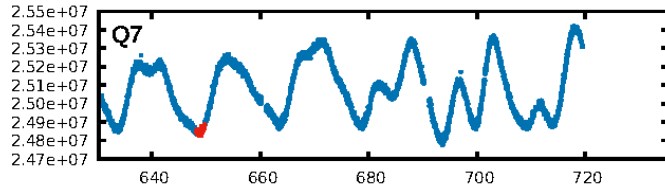
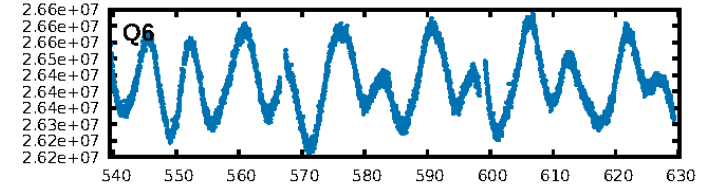
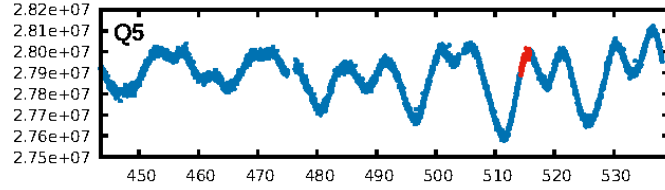
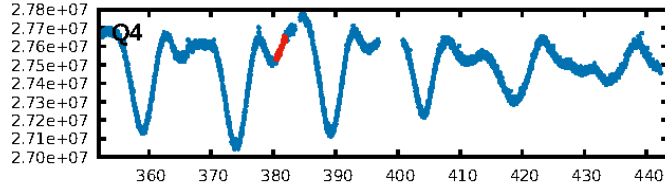
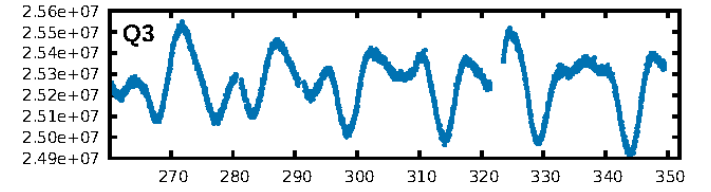
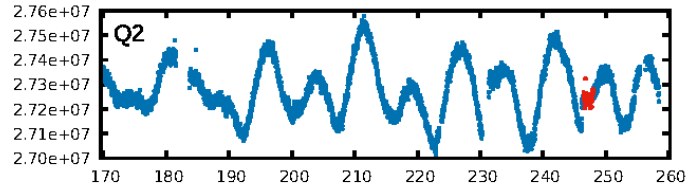
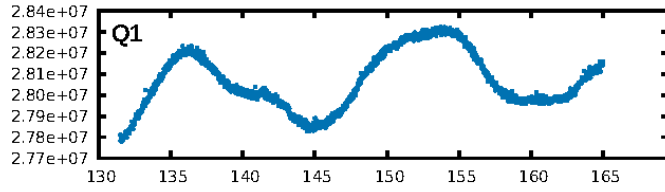
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [162.95 $\sigma$ ]  
LongPeriod-sig: 100.0% [179.66 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.11e-18  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: 4.074  
Centroid-sig: 54.9%  
Centroid-so: 1.098 arcsec [1.75 $\sigma$ ]  
OotOffset-rm: 0.267 arcsec [0.24 $\sigma$ ]  
OotOffset-st: 2/3/2/1 [8]  
KicOffset-rm: 0.426 arcsec [0.36 $\sigma$ ]  
KicOffset-st: 2/3/2/1 [8]  
DiffImageQuality-fgm: 0.25 [2/8]  
DiffImageOverlap-fno: 0.00 [0/8]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:05:29 Z

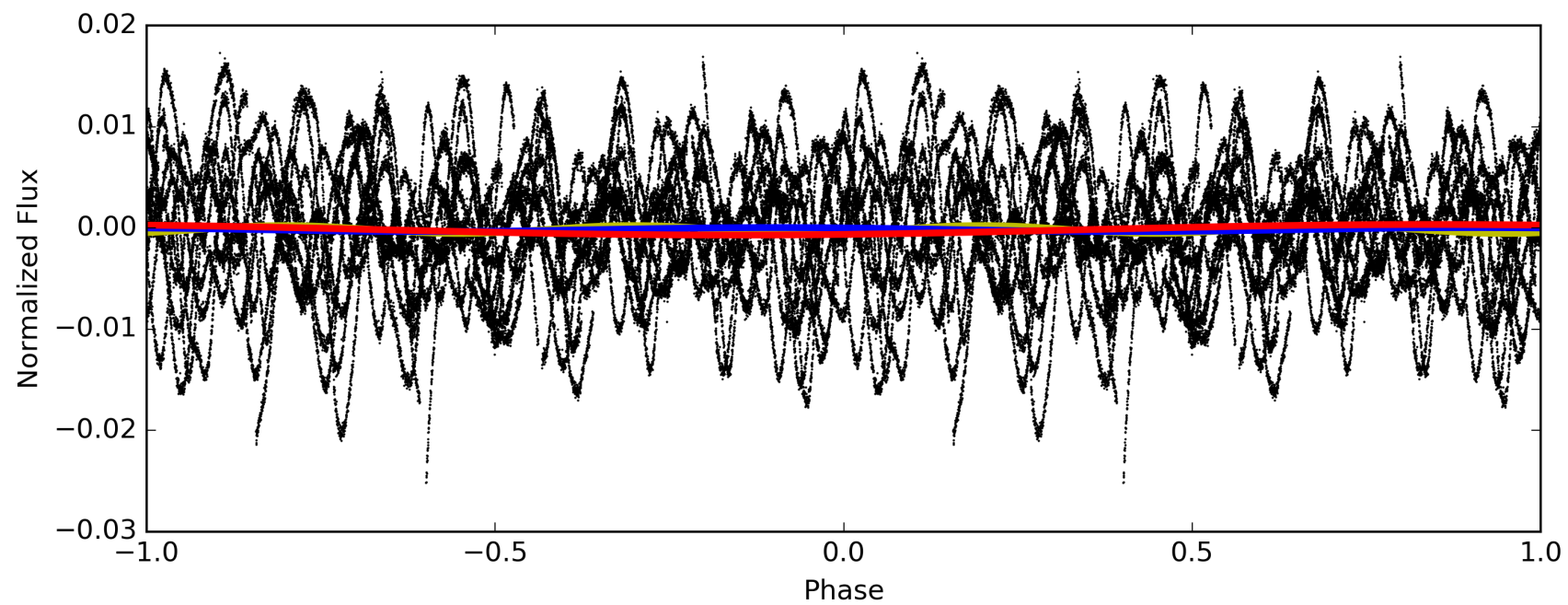
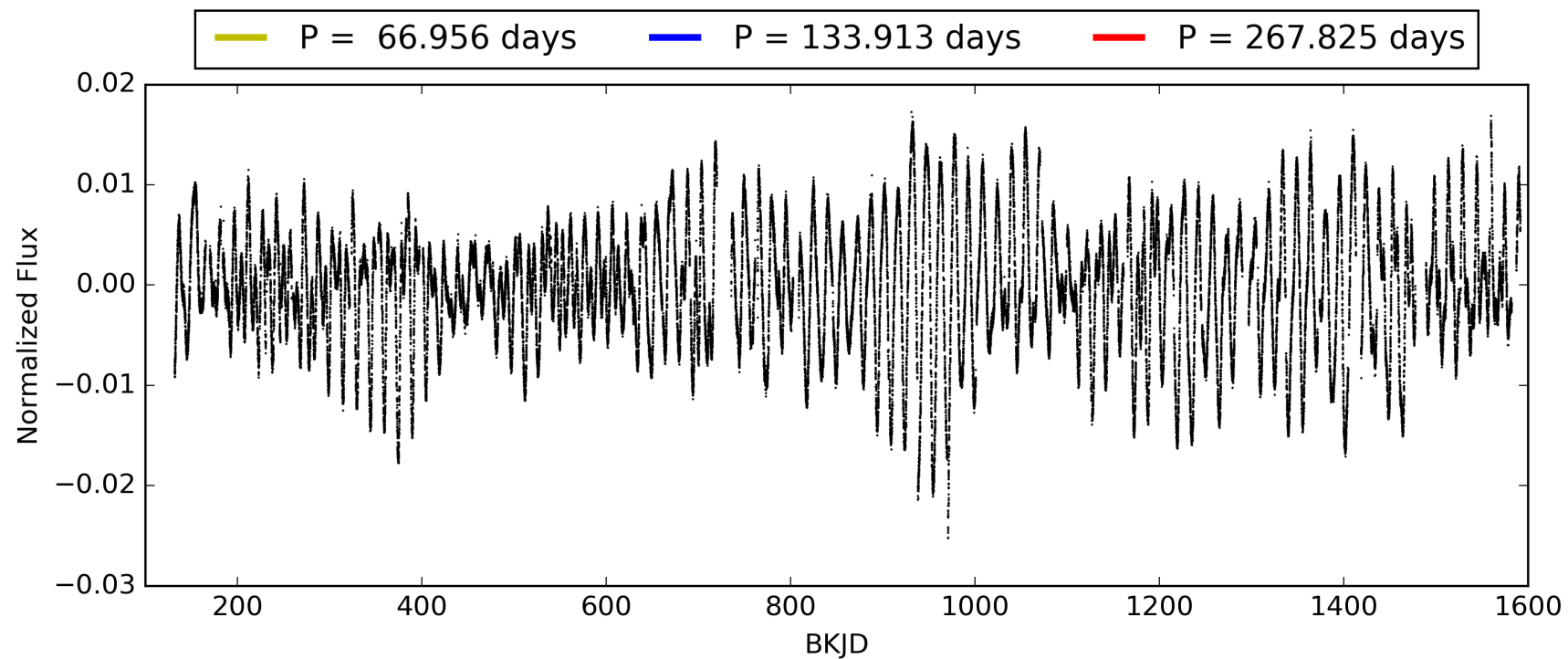
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005305237-03, PDC Light Curves



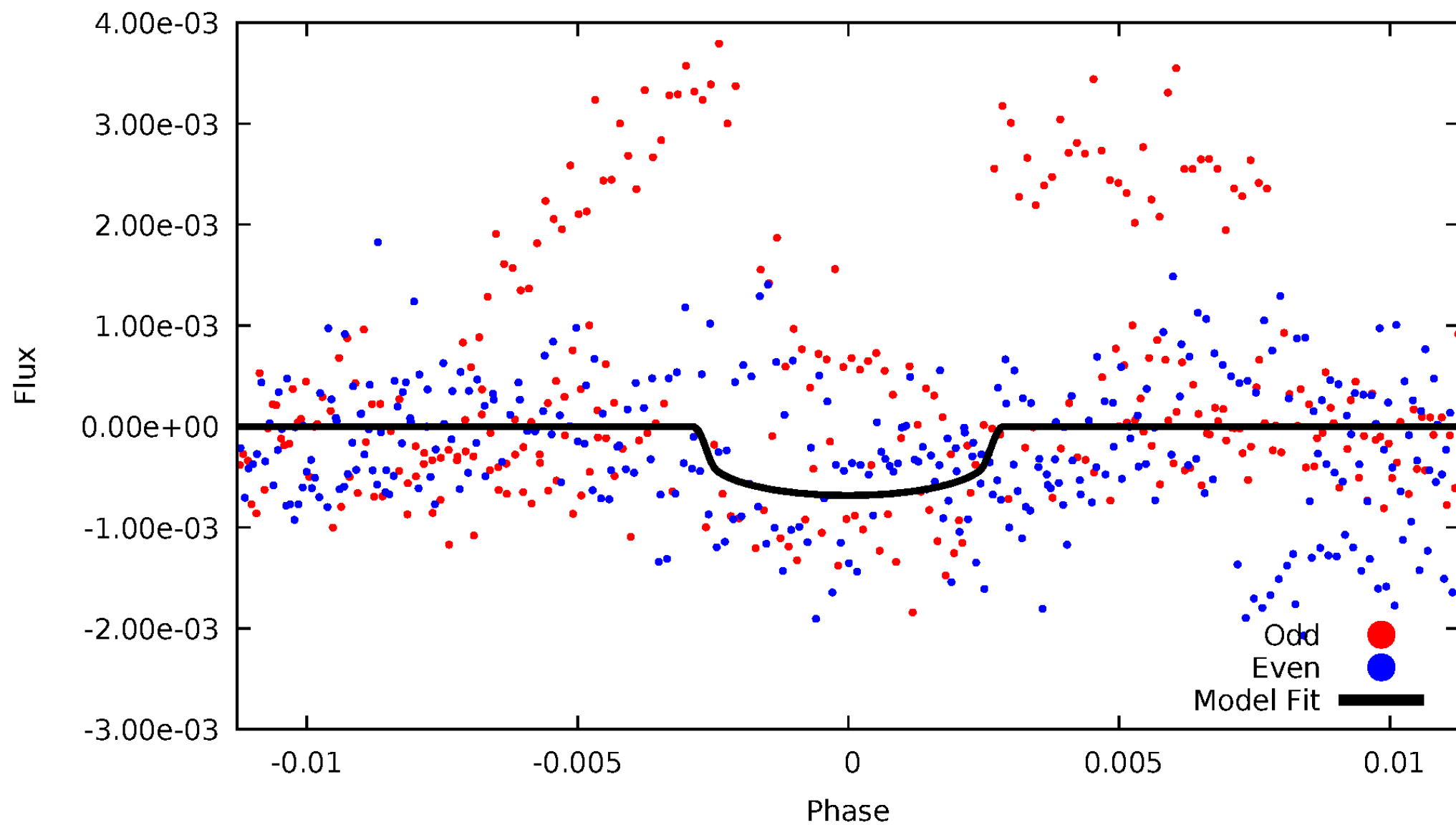


TCE 005305237-03



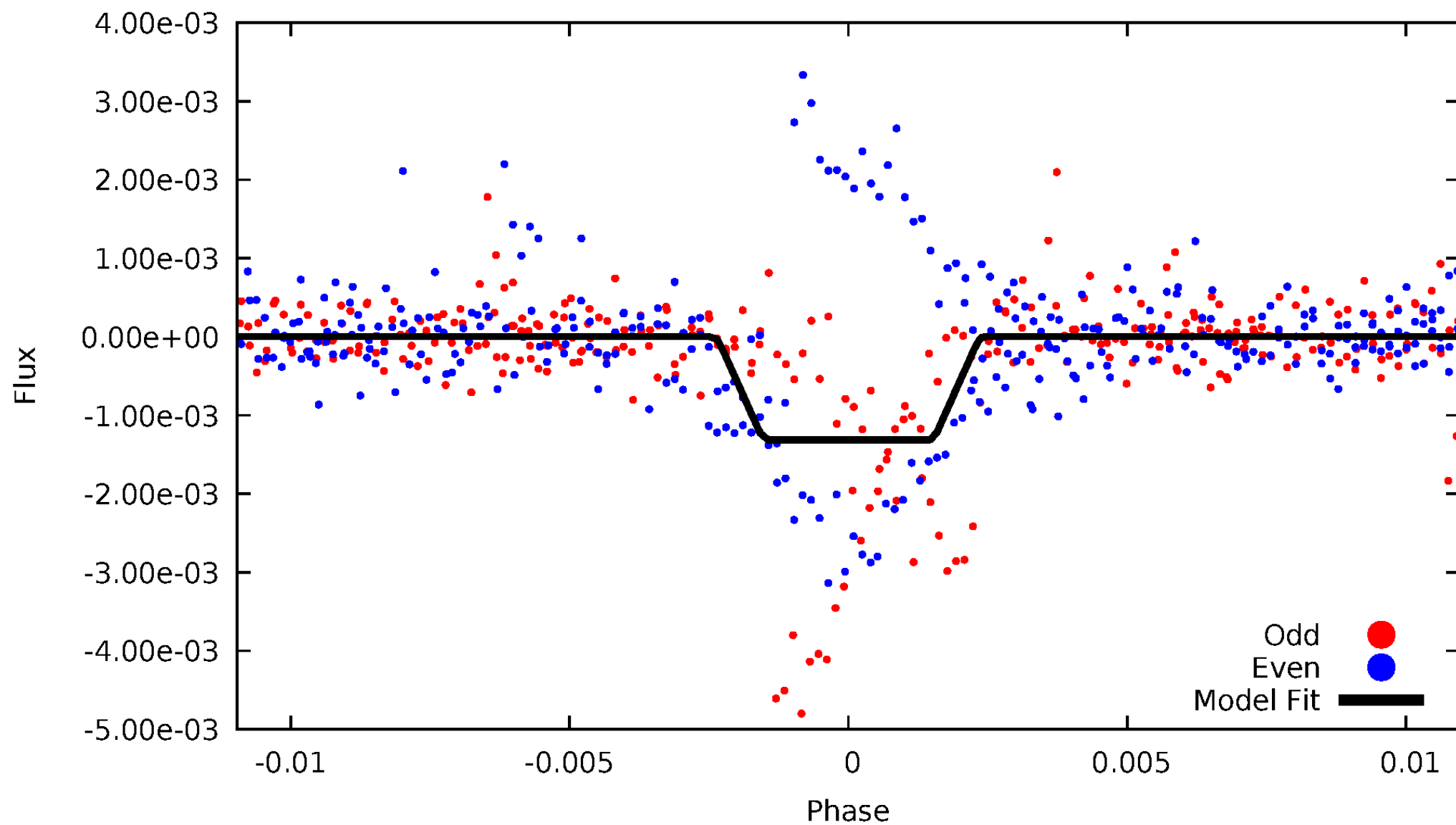
# DV Odd/Even

TCE 005305237-03



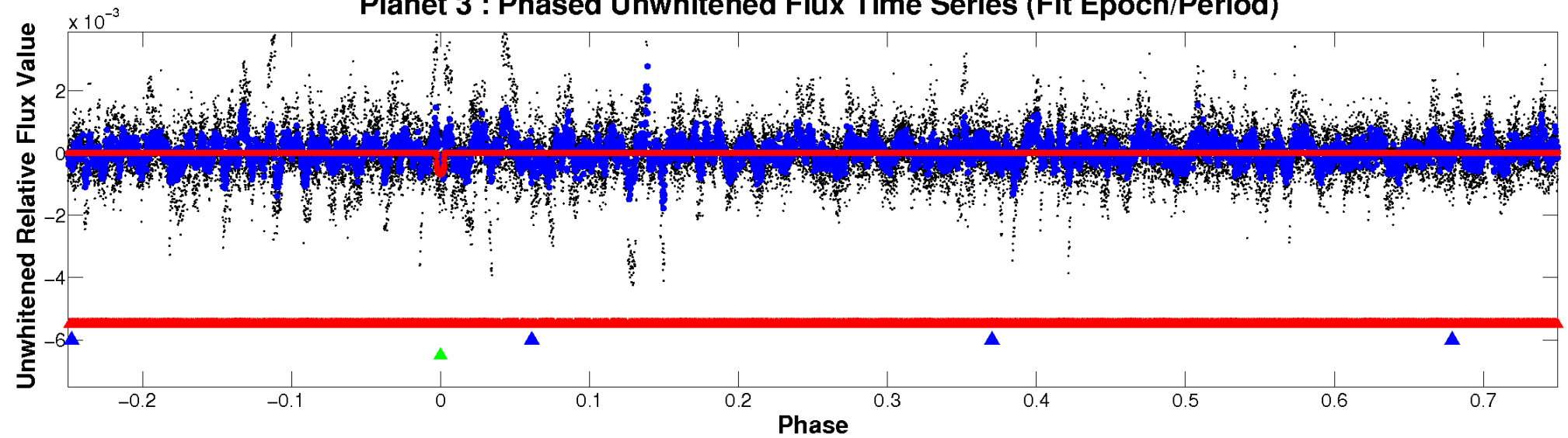
# ALT Odd/Even

TCE 005305237-03

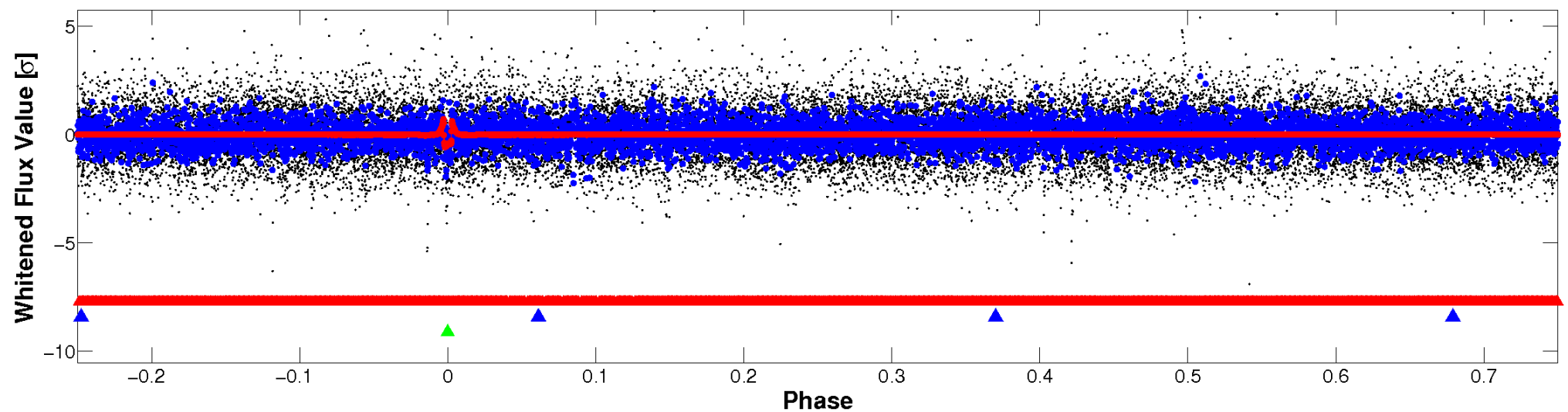


# Non-Whitened Vs. Whitened Light Curve

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

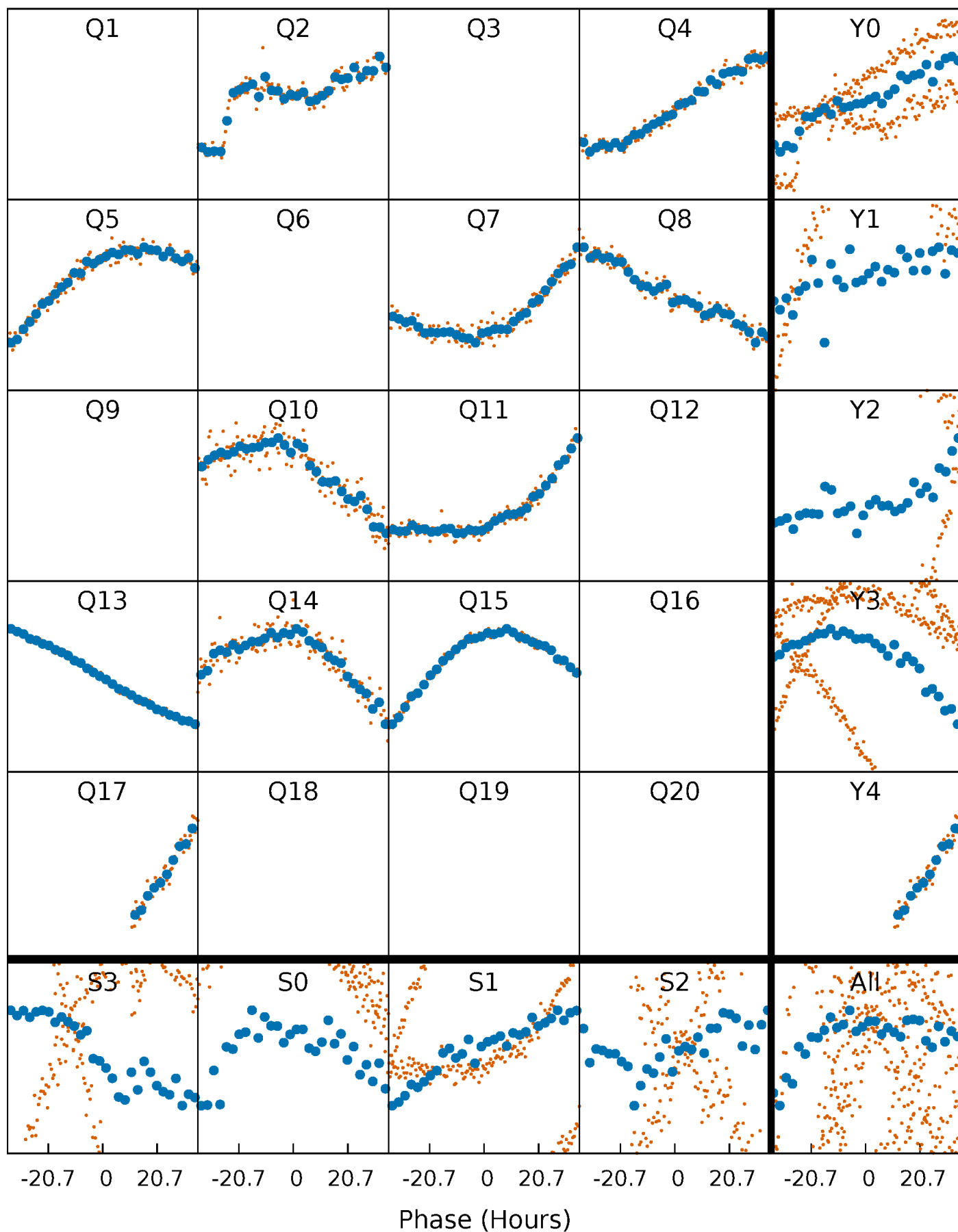


**Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

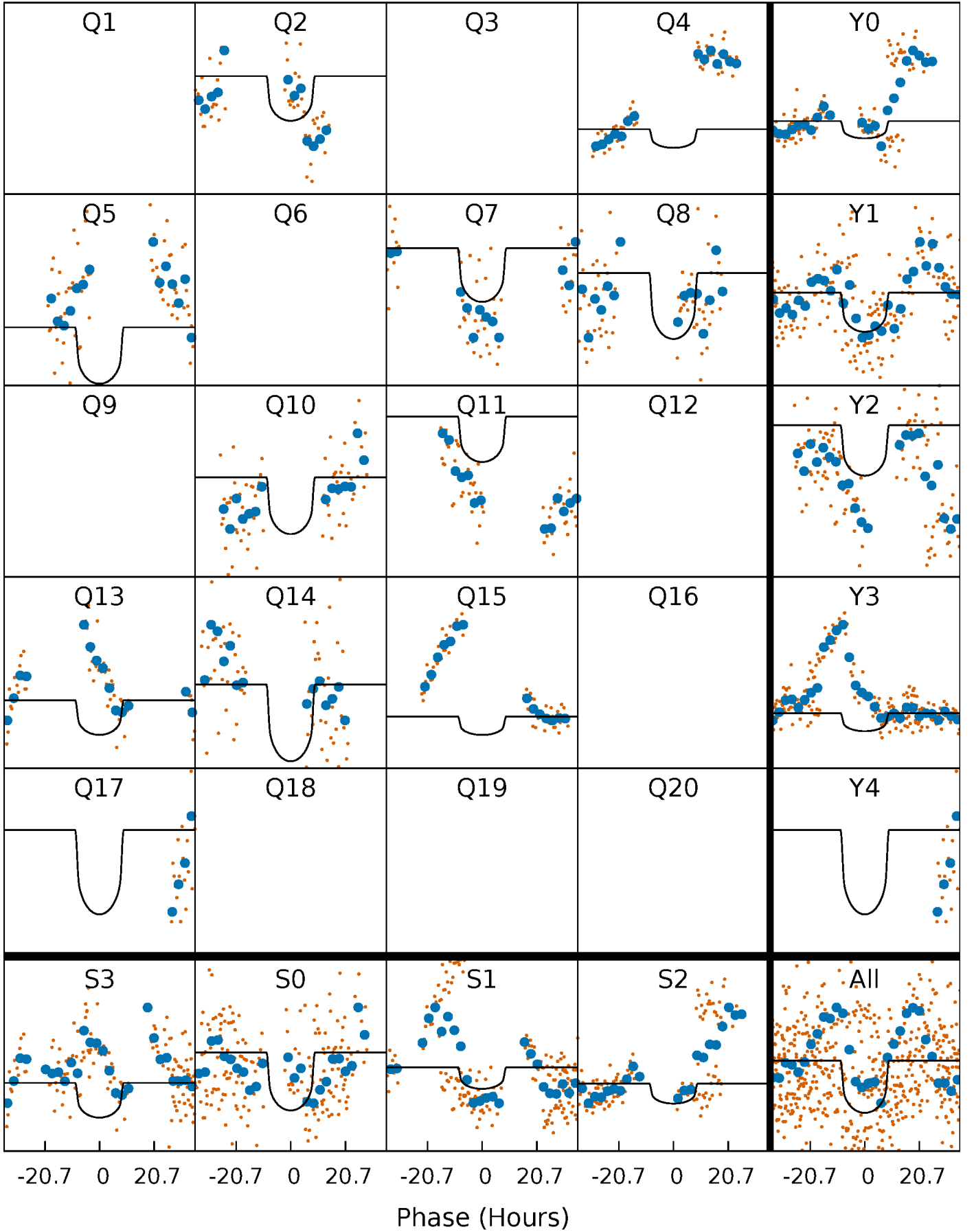
TCE 005305237-03 P=133.912530 Days  $T_0=247.240897$  (BKJD)





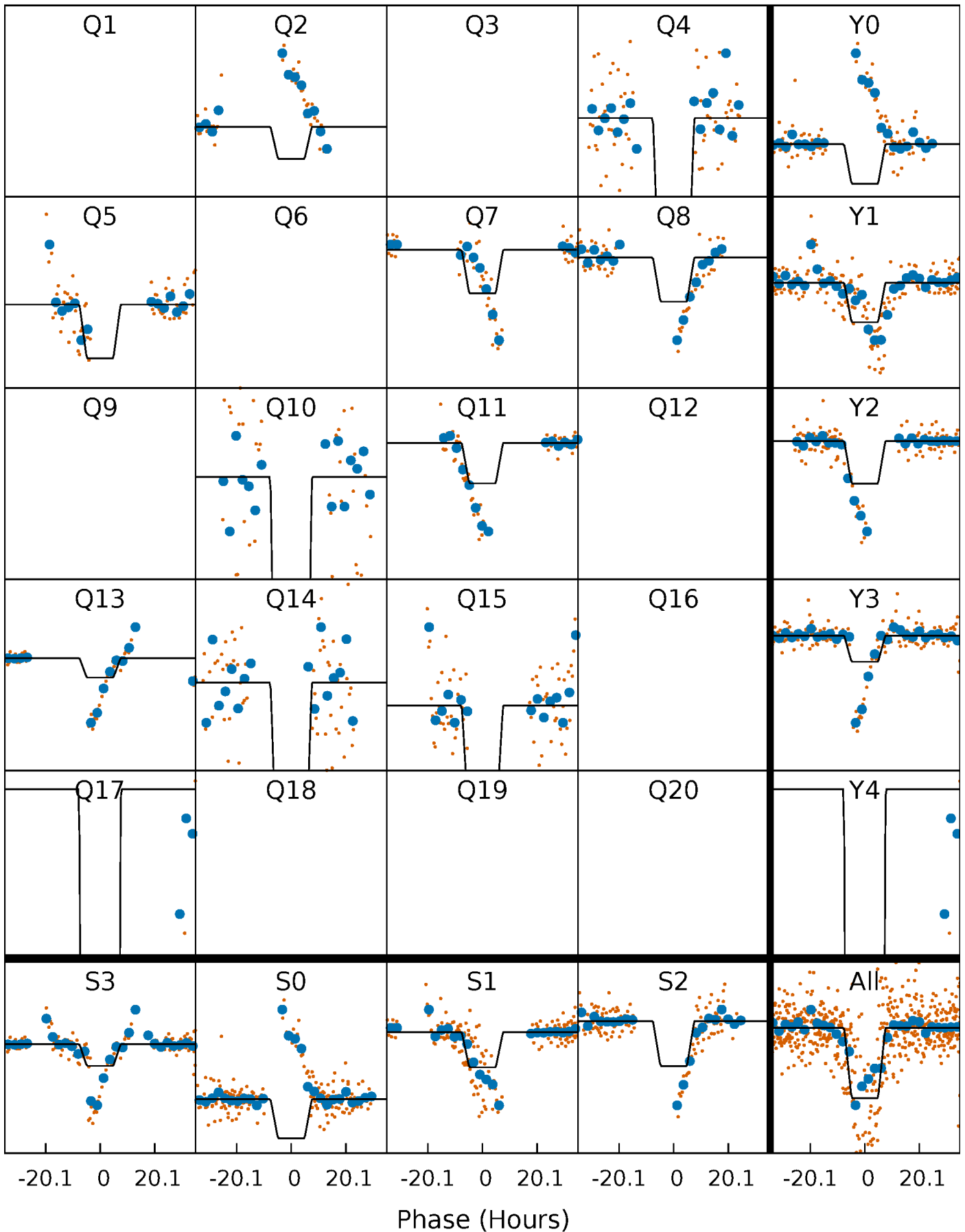
# DV Quarter-Phased Transit Curves

TCE 005305237-03     $P=133.912530$  Days     $T_0=247.240897$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

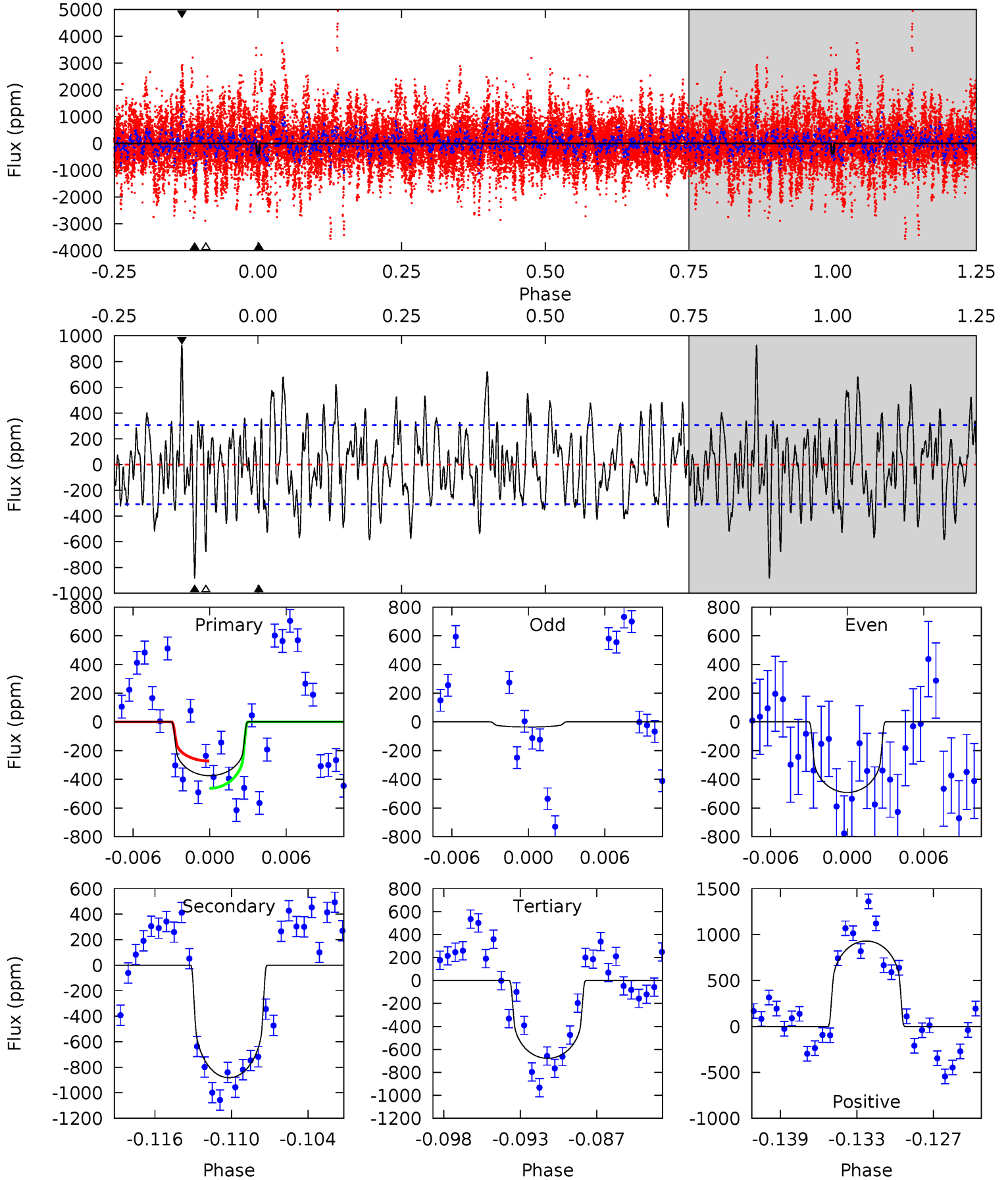
TCE 005305237-03 P=133.901119 Days  $T_0=247.277851$  (BKJD)



# DV Model-Shift Uniqueness Test

005305237-03, P = 133.912530 Days, E = 113.328367 Days

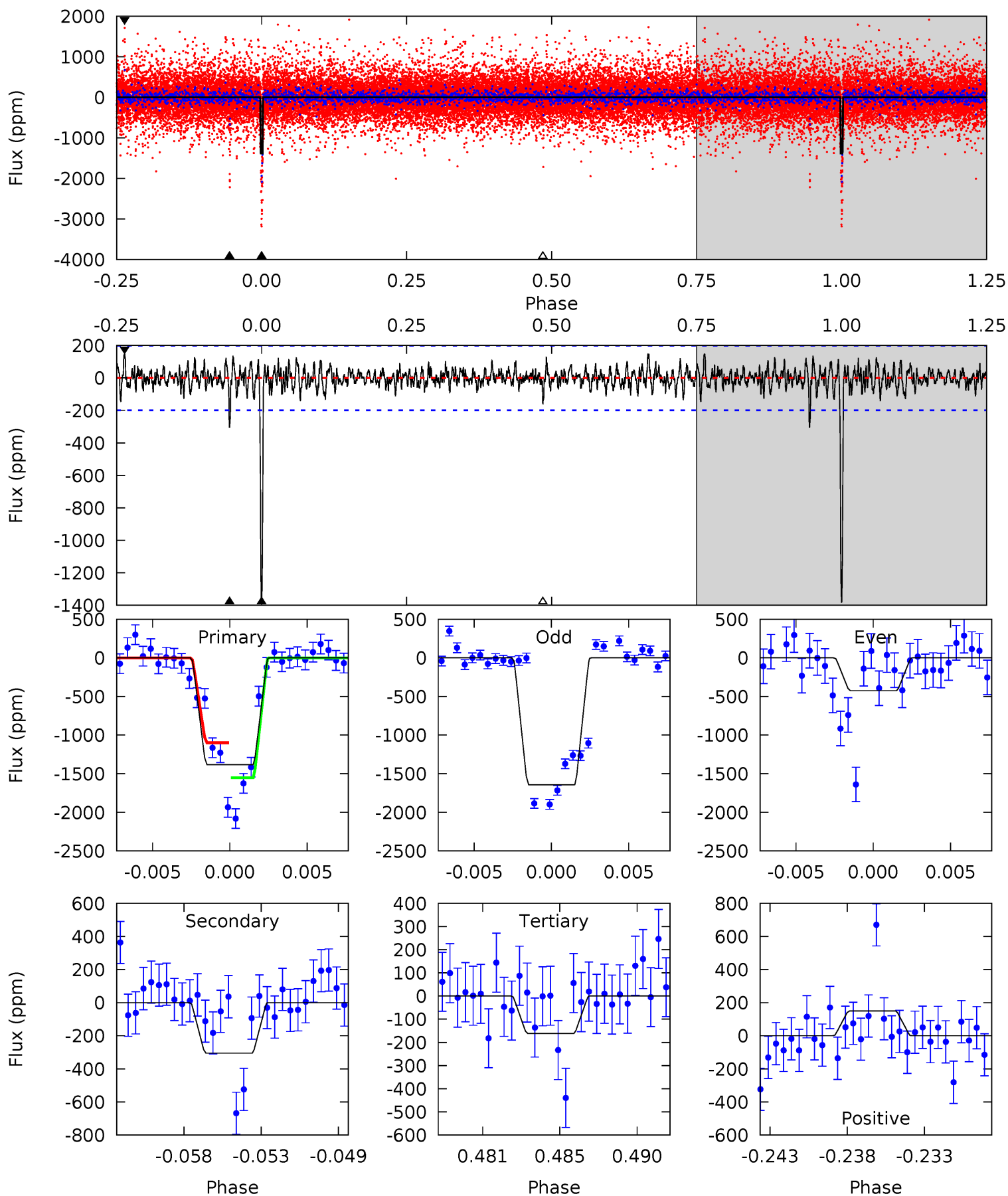
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.25	14.7	11.3	15.5	5.13	2.76	4.12	-5.05	-9.25	3.41	-0.79	3.75	-7.83	0.51	1.58



# Alt Model-Shift Uniqueness Test

005305237-03, P = 133.901119 Days, E = 113.376732 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
36.0	7.94	4.20	3.89	5.16	2.82	1.19	31.8	32.1	3.74	4.05	17.3	0.71	0.10	0



### Stellar Parameters For KIC 005305237

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5102^{+152}_{-152}$	$4.463^{+0.120}_{-0.456}$	$0.180^{+0.250}_{-0.250}$	$0.880^{+0.183}_{-0.098}$	$0.819^{+0.084}_{-0.058}$	$1.692^{+0.794}_{-1.252}$
	+3%/-3%	+3%/-10%	+139%/-139%	+21%/-11%	+10%/-7%	+47%/-74%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 005305237-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-882 \pm 60$	$2.67^{+0.66}_{-0.64}$	$435^{+37}_{-25}$	$5390^{+677}_{-452}$	$15829^{+11474}_{-5691}$
Alt.	$-305 \pm 38$	$3.66^{+0.76}_{-0.62}$	$434^{+35}_{-24}$	$3840^{+265}_{-212}$	$2873^{+1296}_{-951}$

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



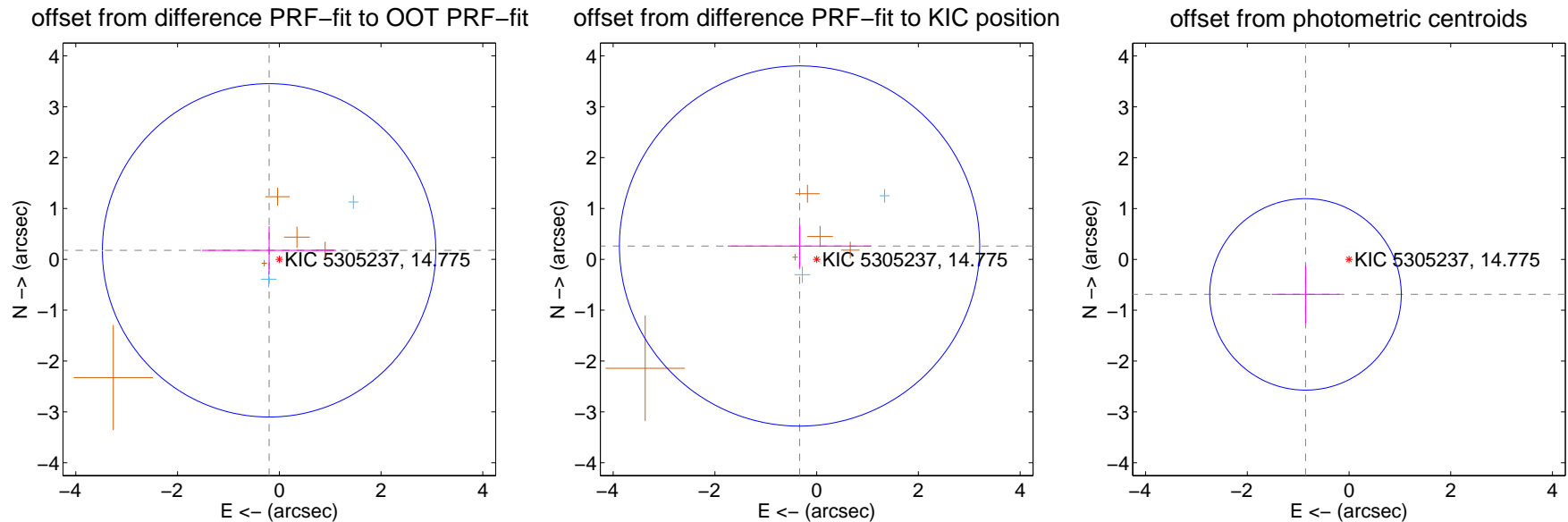
## DV Centroid Data

Supplemental centroid analysis for 005305237-03. Kepler magnitude: 14.78. Transit SNR 6.88

There are 2 quarters with good PRF difference image offsets

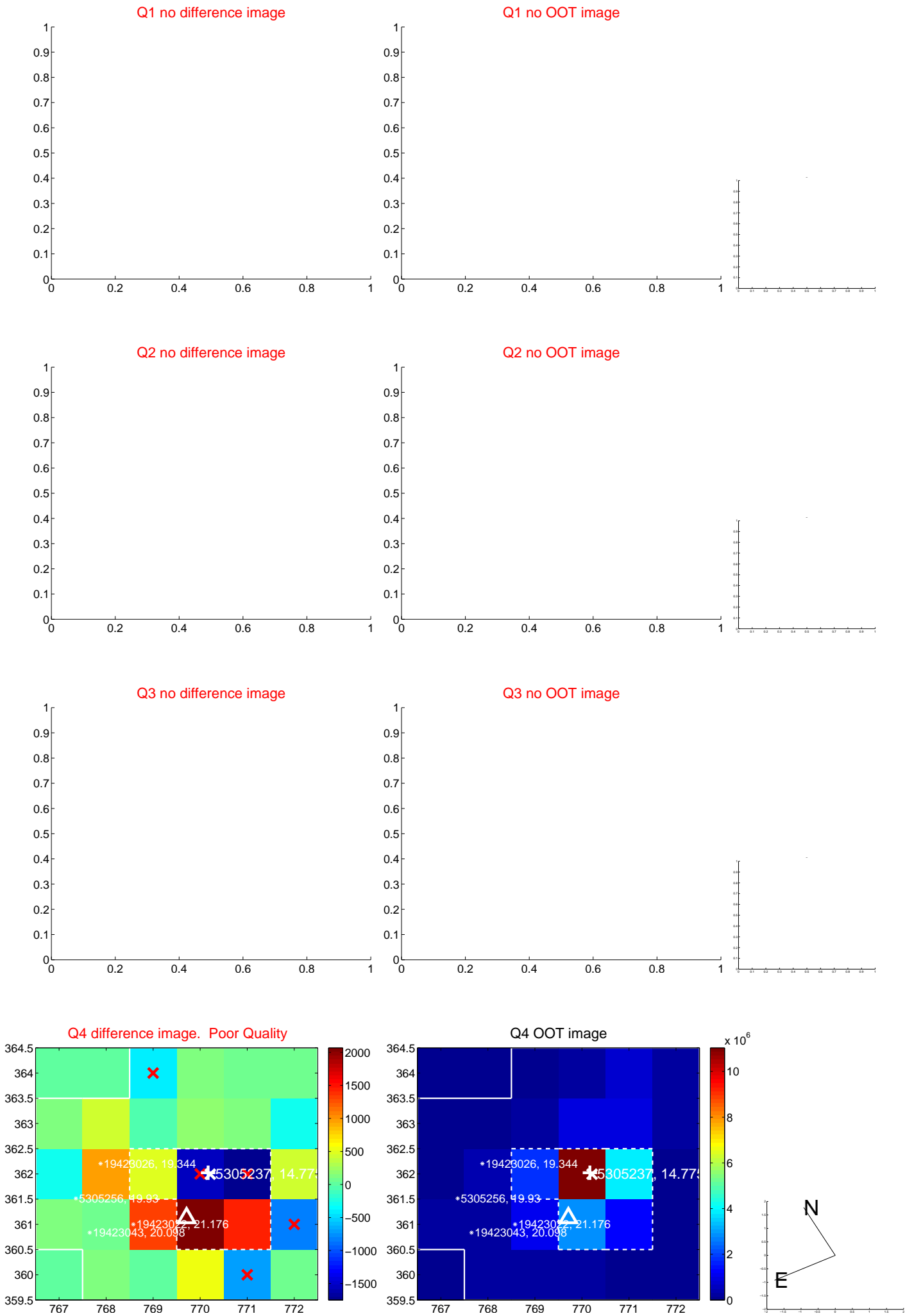
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.267 \pm 1.092$	0.24	$0.201 \pm 1.318$	$0.176 \pm 0.476$
PRF-fit source offset from KIC position	$0.426 \pm 1.180$	0.36	$0.336 \pm 1.411$	$0.262 \pm 0.419$
photometric centroid source offset	$1.10 \pm 0.63$	1.75	$0.86 \pm 0.66$	$-0.69 \pm 0.57$

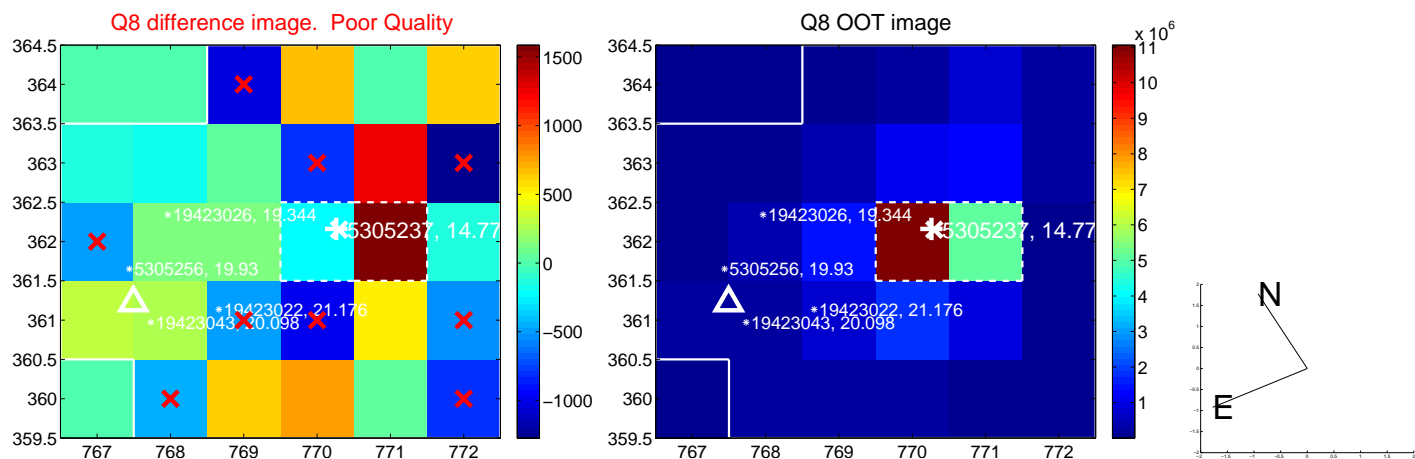
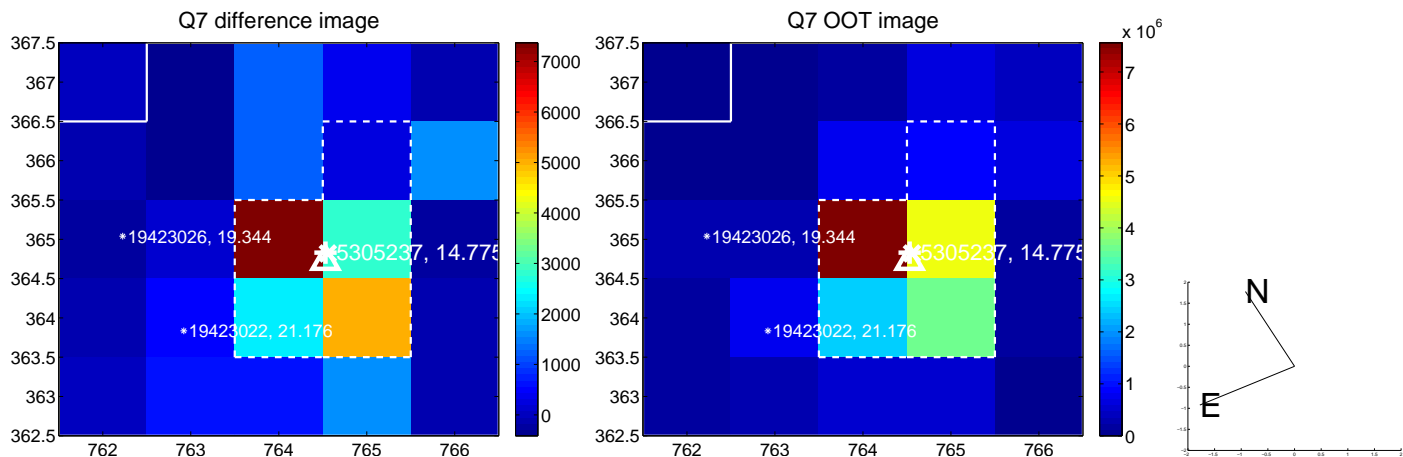
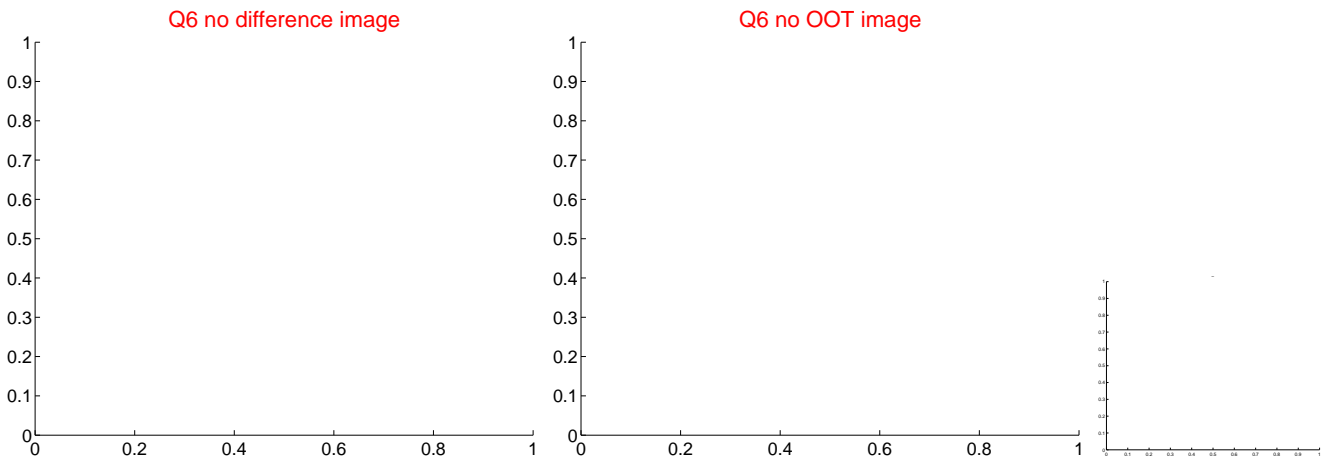
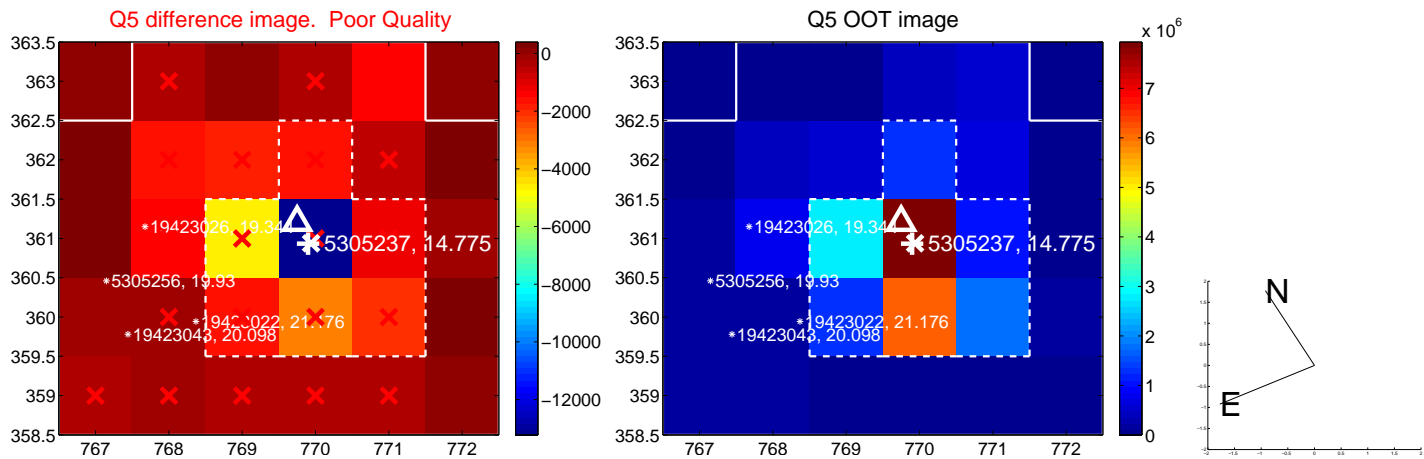


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

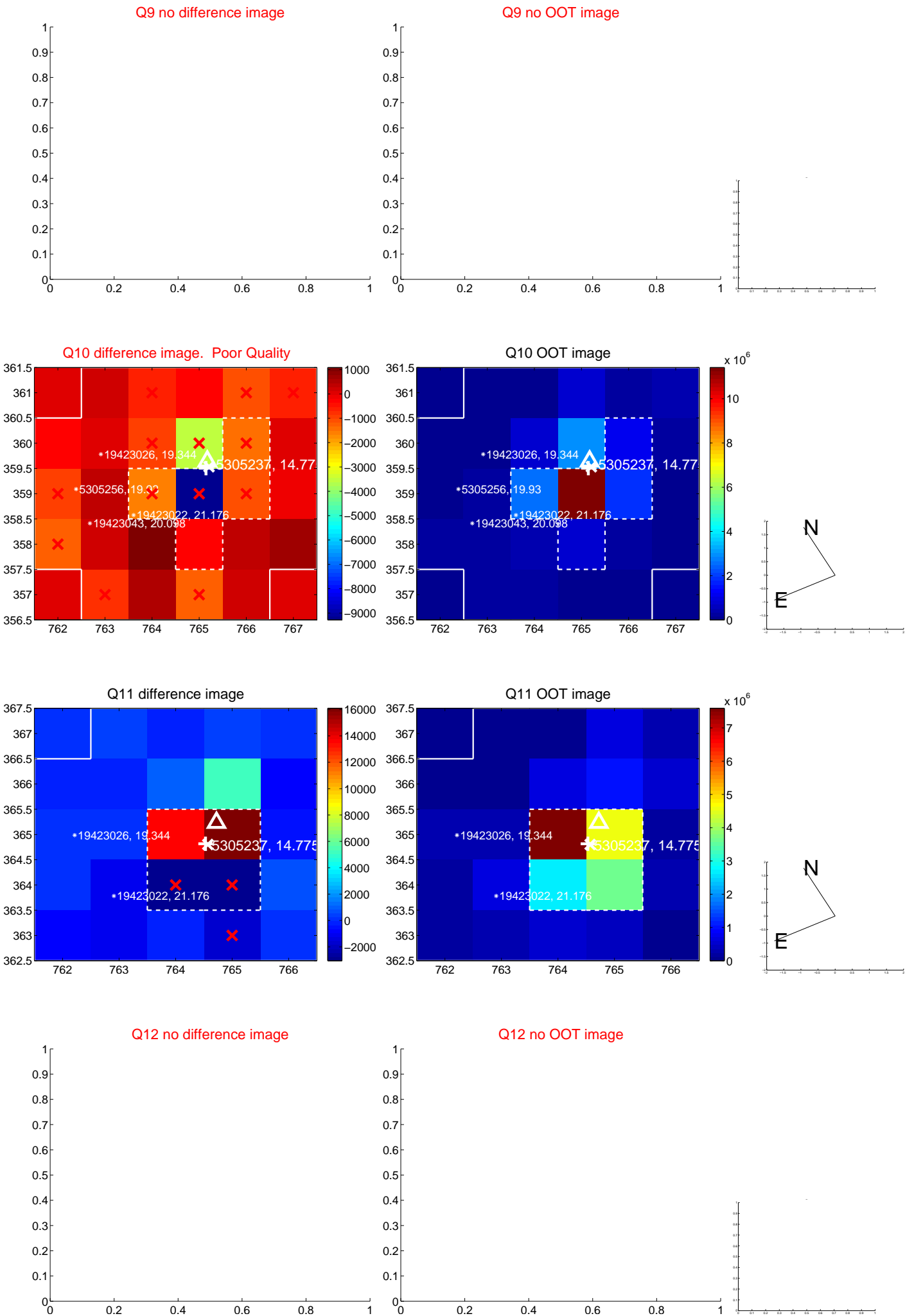
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



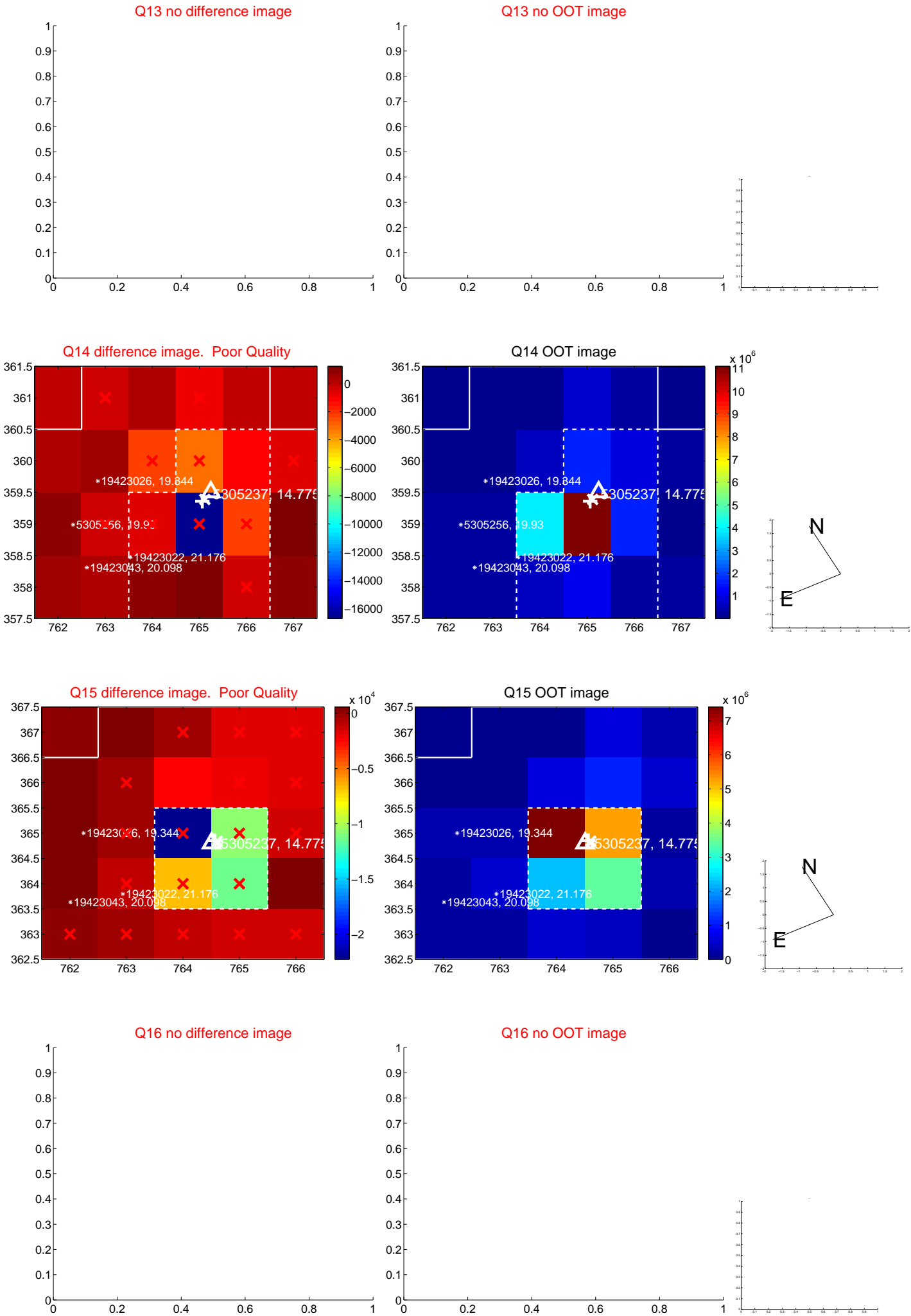
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

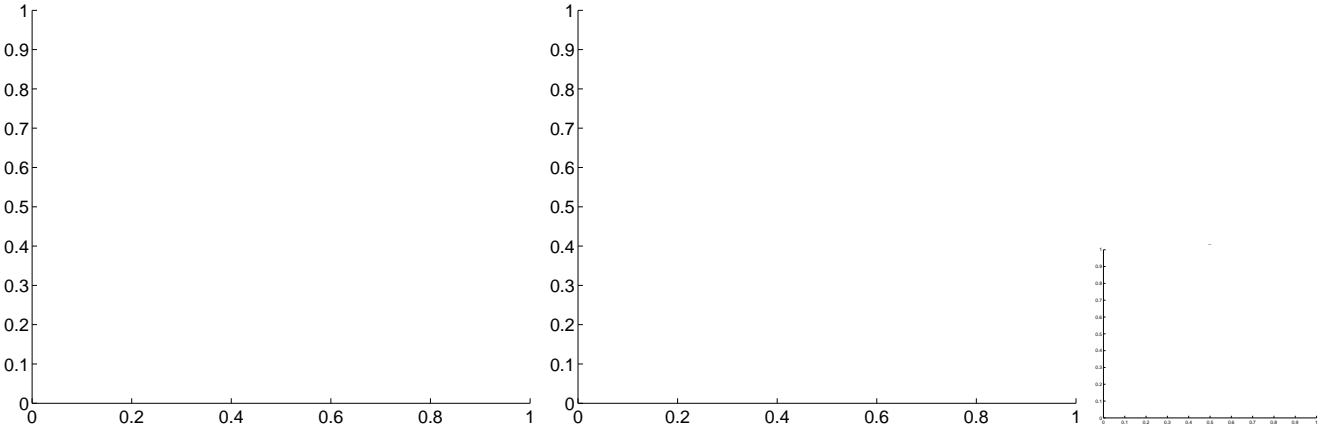




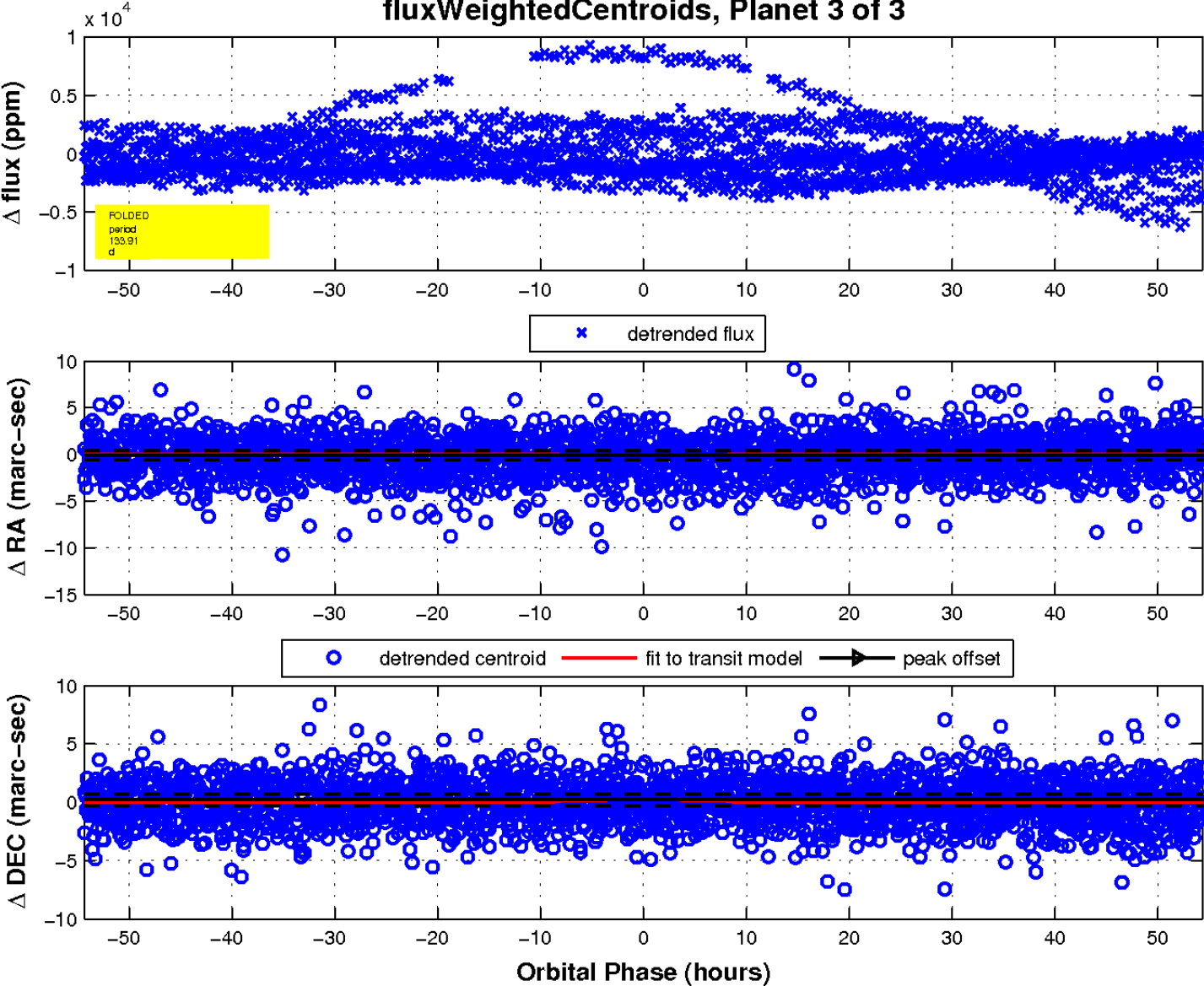
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

Q17 no difference image

Q17 no OOT image



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

