

# KIC 010553017

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010553017-01	OBS	No	0.968799	131.624825	114.2	1.867	70.7	8.1	0.77	5149	1.00	1256.42
010553017-02	OBS	No	0.968847	132.060994	11582.4	1.500	146.0	-1.0	0.77	5149	8.14	1256.34

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010553017-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
010553017-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS—HALO_GHOST

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

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

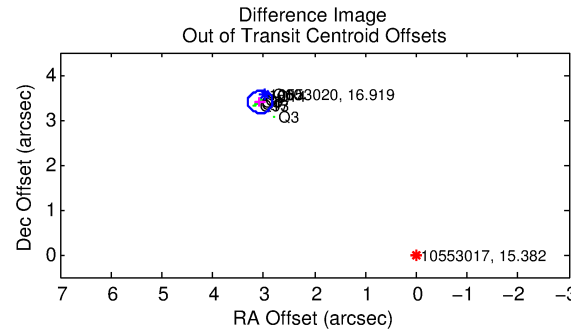
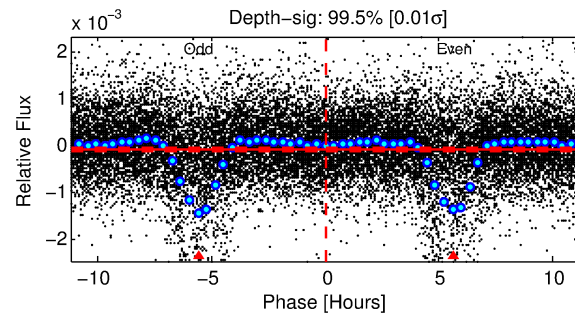
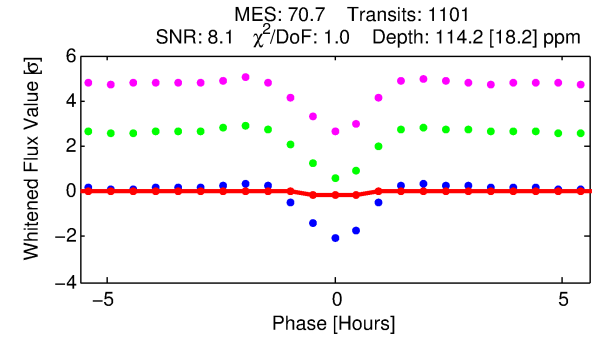
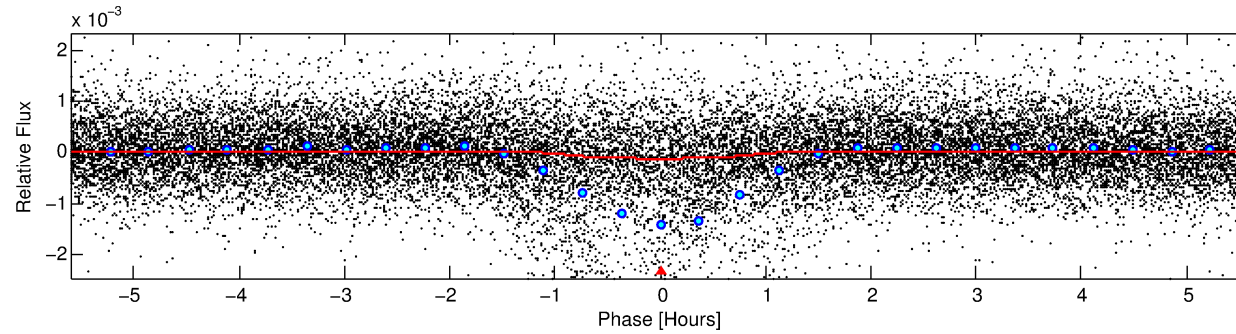
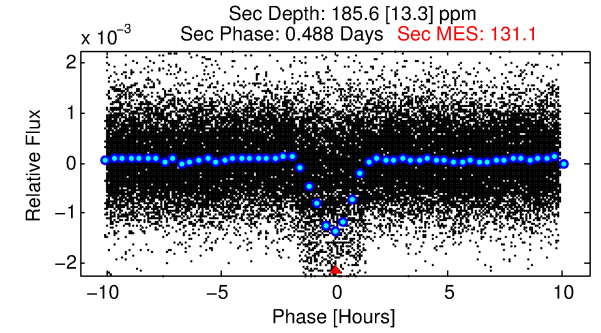
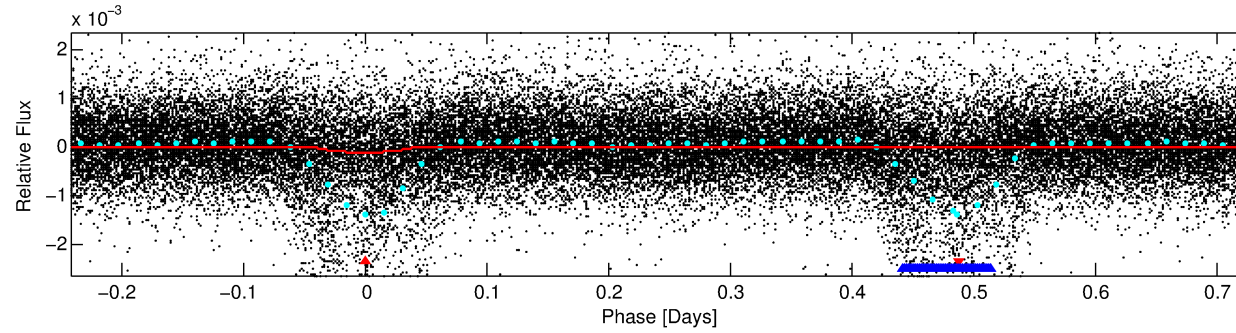
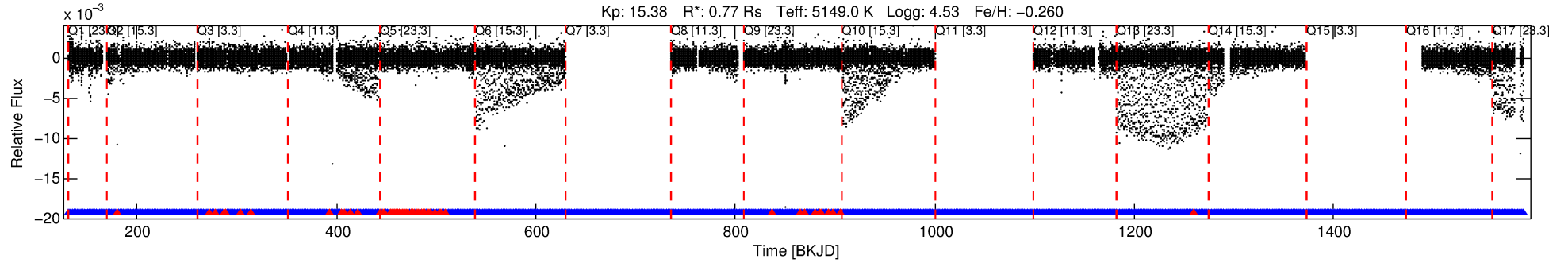
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010553017-01

No Significant Match Found

# DV One-Page Summary

KIC: 10553017 Candidate: 1 of 2 Period: 0.969 d



## DV Fit Results:

Period = 0.96880 [0.00001] d  
Epoch = 131.6248 [0.0030] BKJD  
Rp/R\* = 0.0118 [0.0133]  
a/R\* = 2.07 [7.47]  
b = 0.90 [1.04]  
Seff = 1256.42 [247.11]  
Teff = 1518 [75] K  
Rp = 1.00 [1.12] Re  
a = 0.0172 [0.0017] AU  
Ag = 30.62 [68.90] [0.43σ]  
Teffp = 5521 [3105] K [1.29σ]

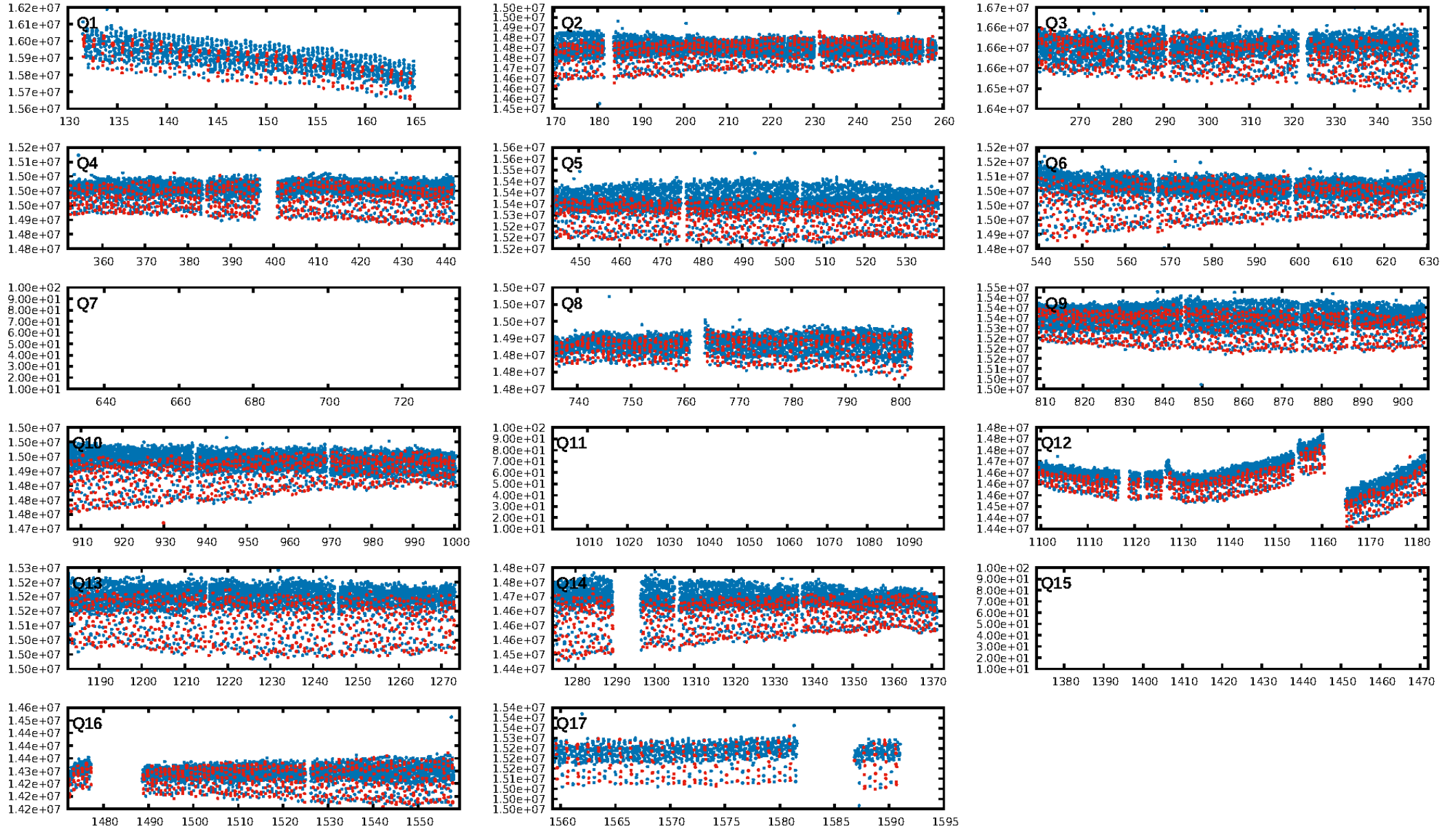
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.94 [976/1039]  
GhostDiagnostic-chr: -0.1618  
Centroid-sig: N/A  
Centroid-so: 14.442 arcsec [10.49σ]  
OotOffset-rm: 4.578 arcsec [56.22σ]  
KicOffset-rm: 4.843 arcsec [65.07σ]  
OotOffset-st: 4/1/0/5 [10]  
KicOffset-st: 4/1/0/5 [10]  
DiffImageQuality-fgm: 1.00 [10/10]  
DiffImageOverlap-fno: 1.00 [14/14]

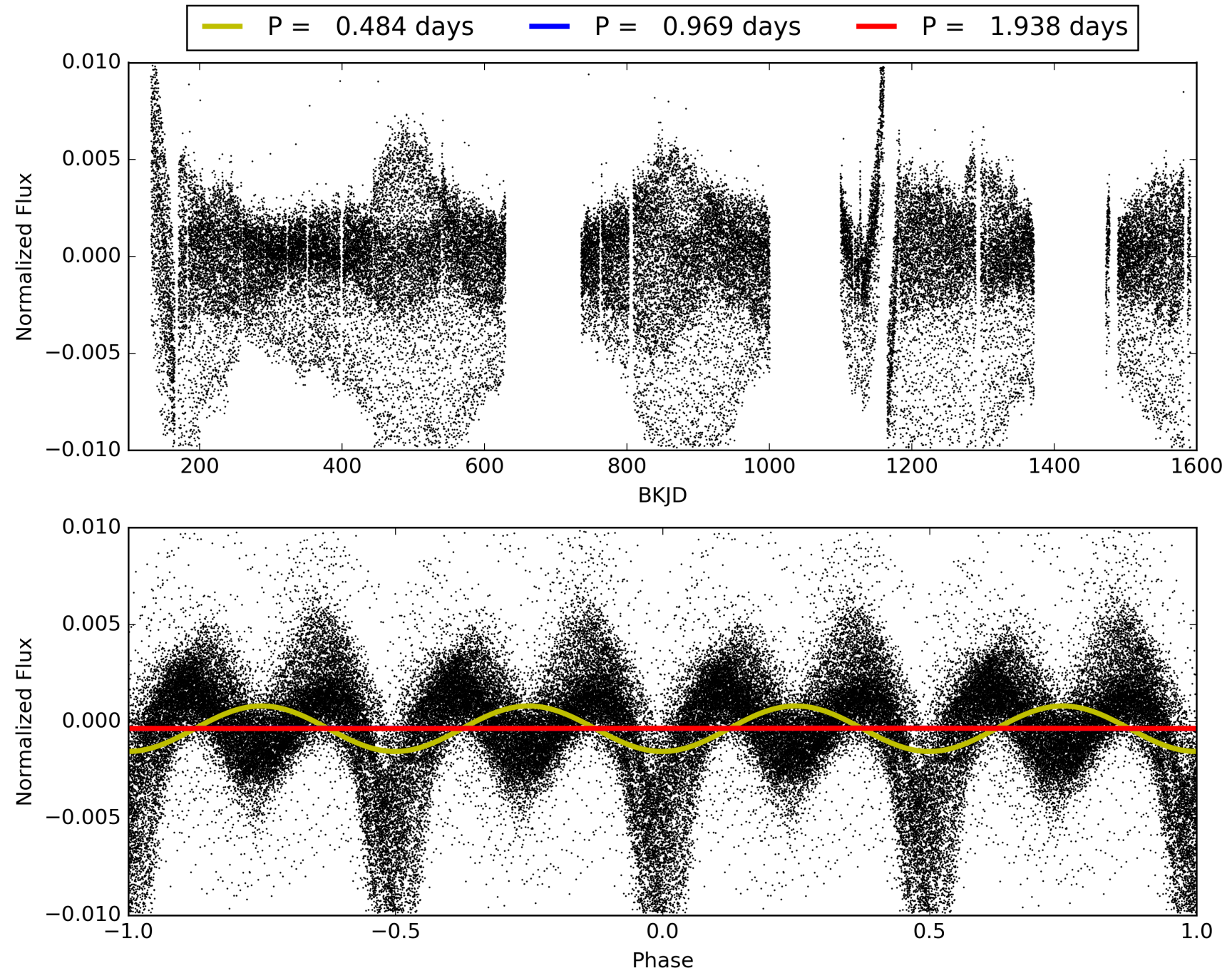
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010553017-01, PDC Light Curves



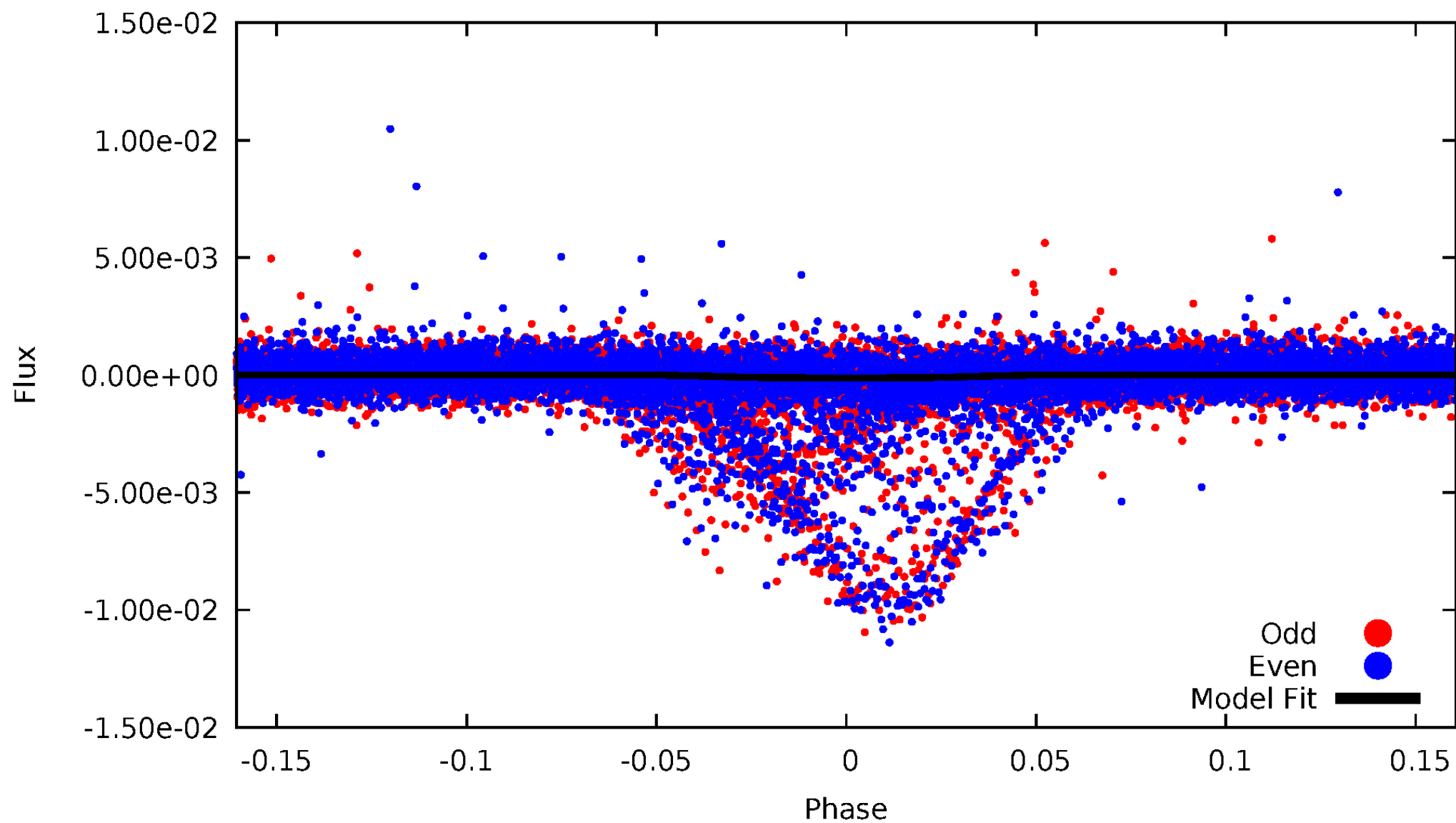
TCE 010553017-01





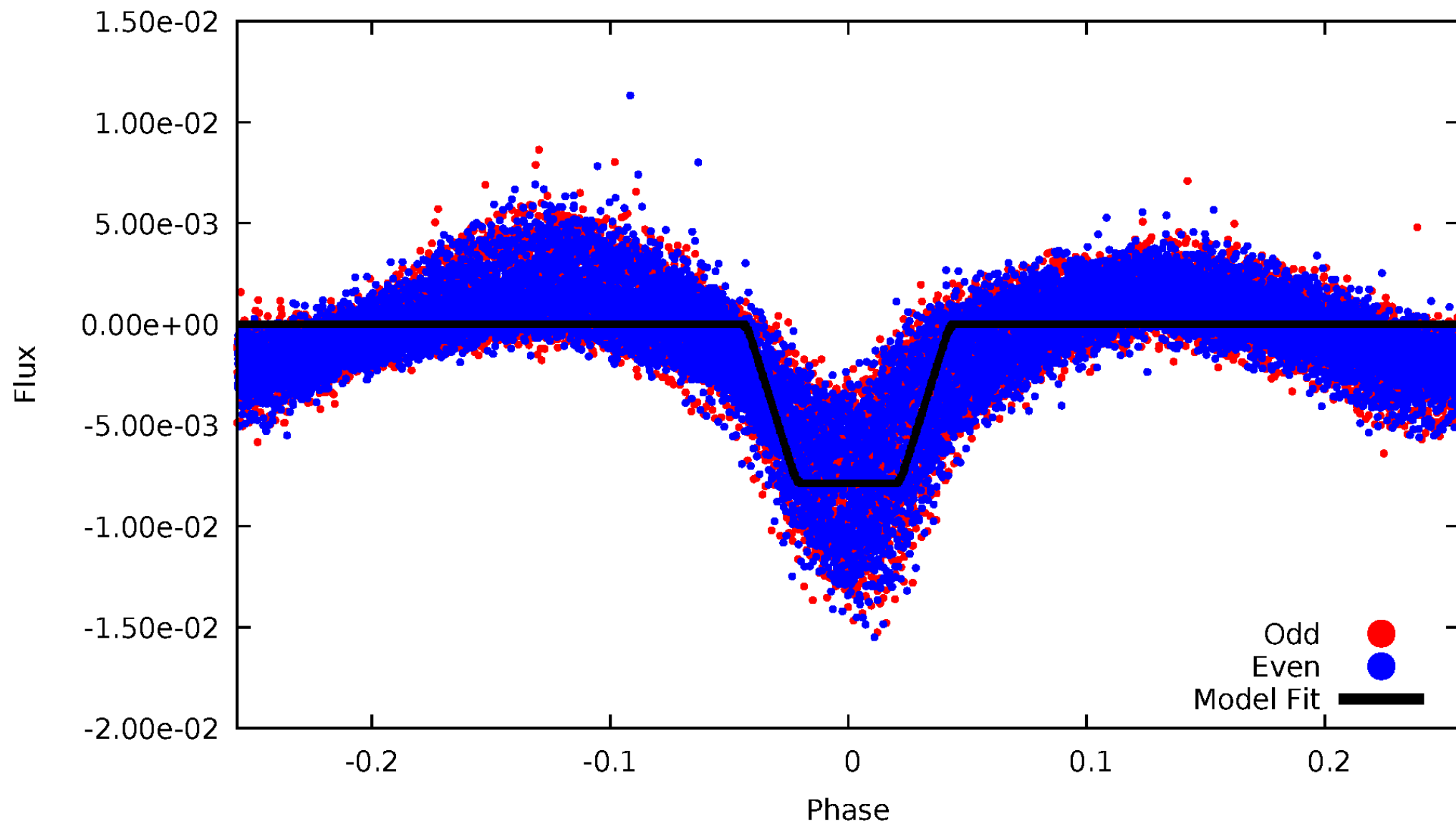
DV Odd/Even

TCE 010553017-01



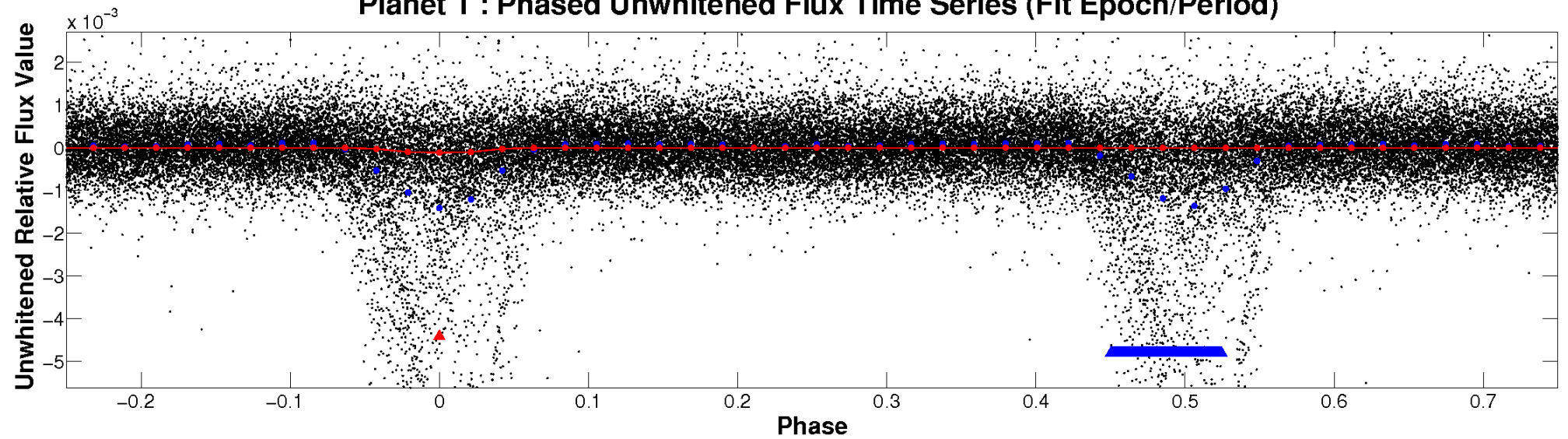
# ALT Odd/Even

TCE 010553017-01

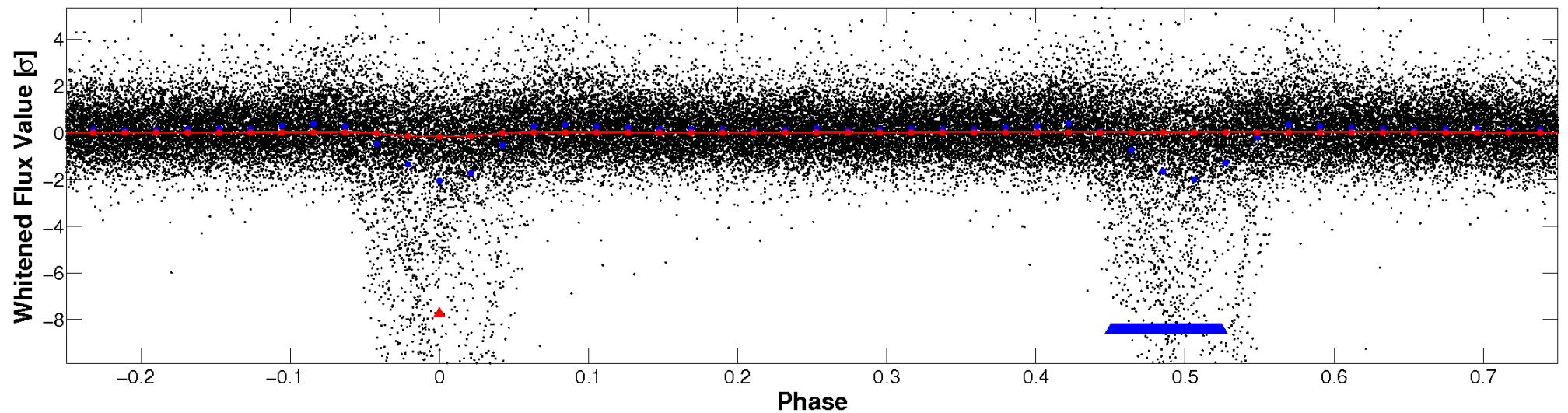


# Non-Whitened Vs. Whitened Light Curve

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

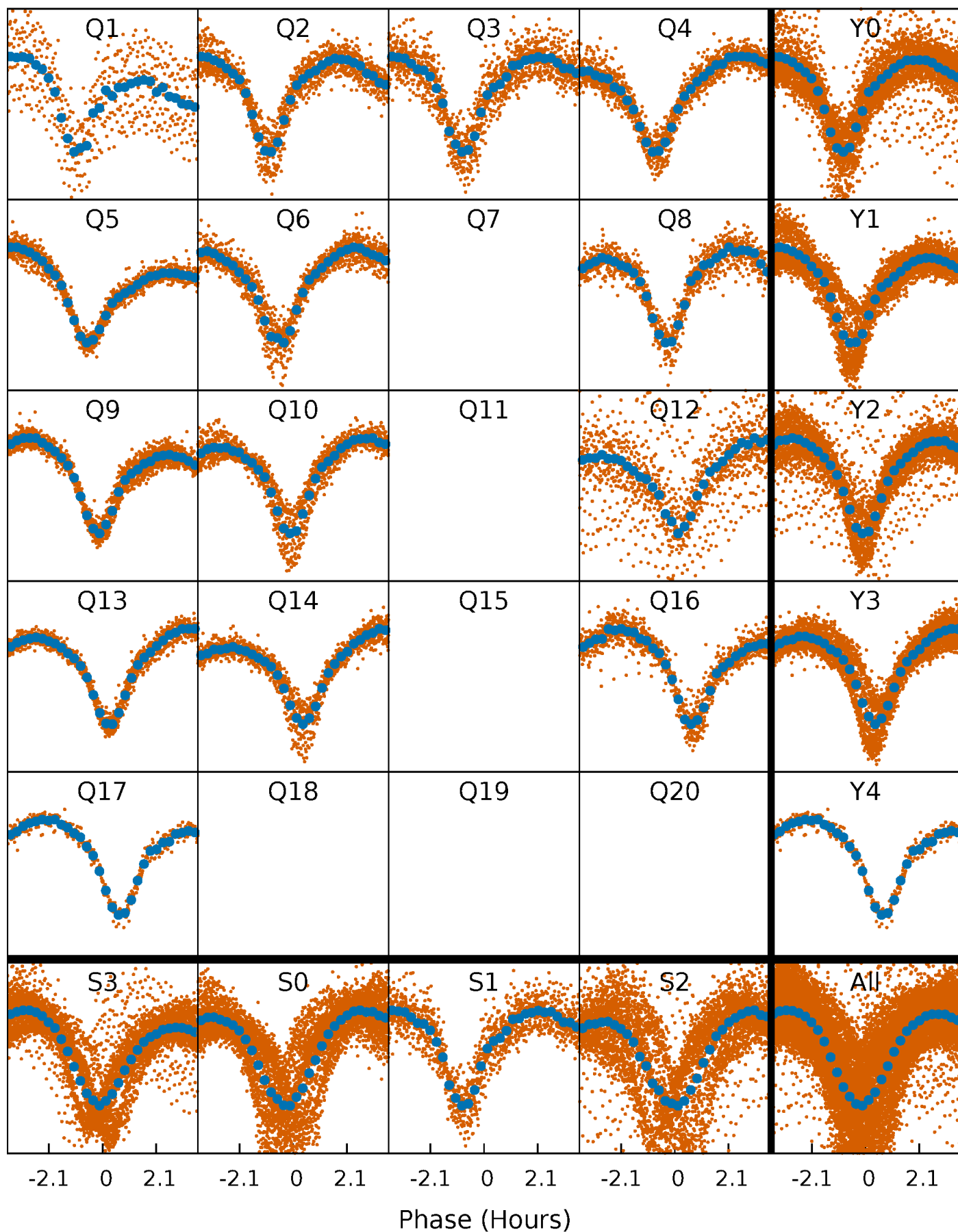


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

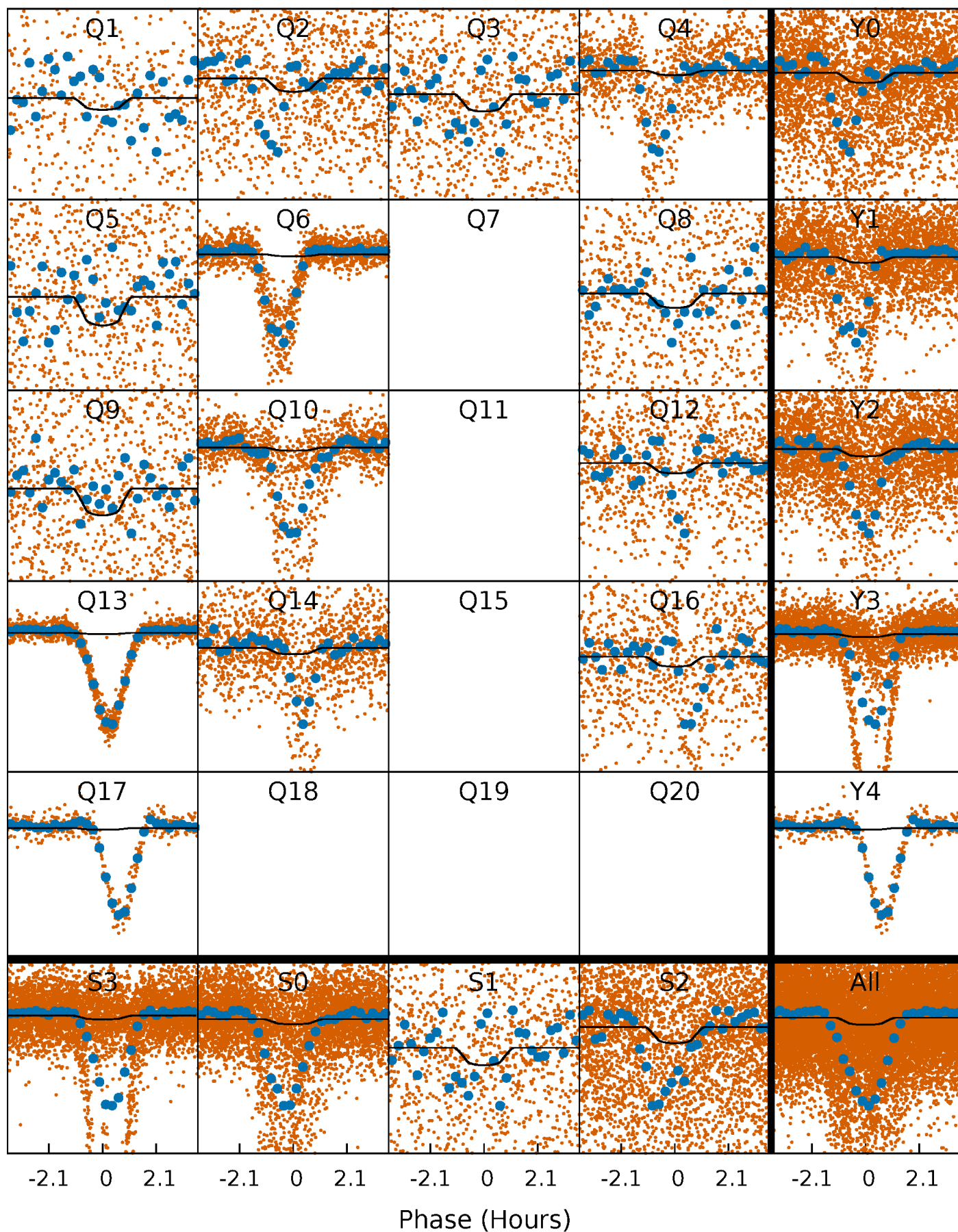
TCE 010553017-01   P= 0.968799 Days    $T_0=131.624825$  (BKJD)





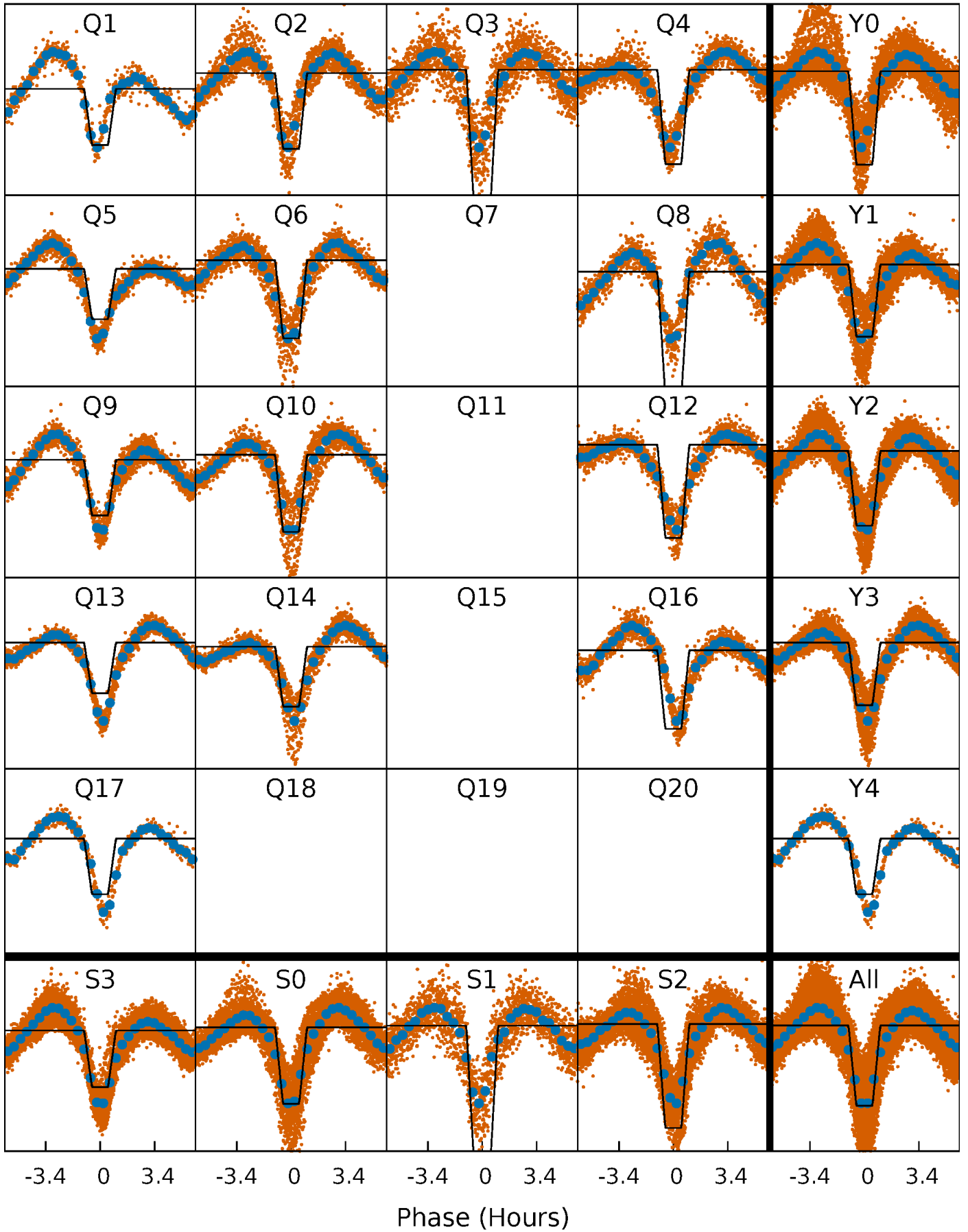
# DV Quarter-Phased Transit Curves

TCE 010553017-01   P= 0.968799 Days    $T_0=131.624825$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

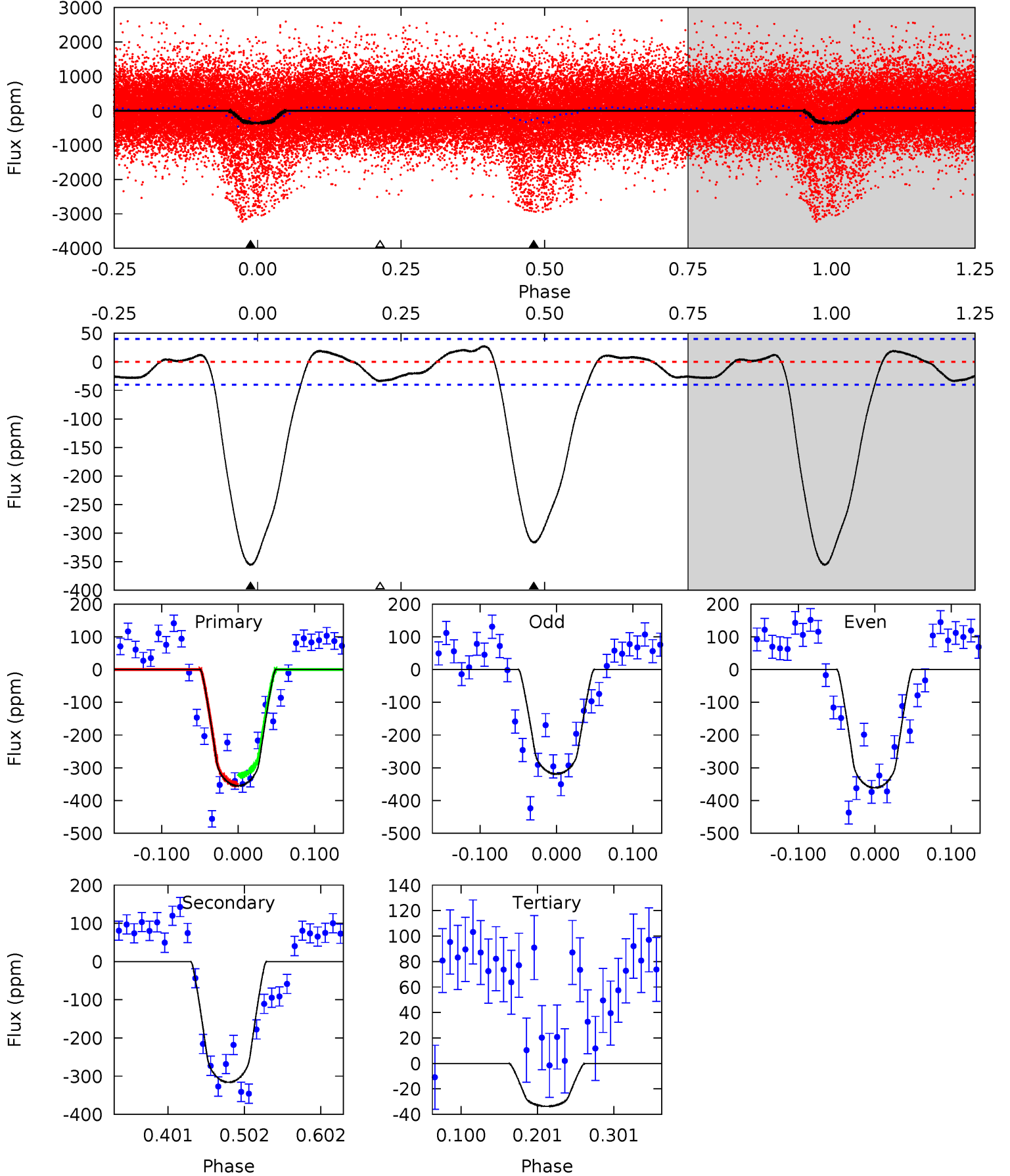
TCE 010553017-01   P= 0.968831 Days    $T_0=131.593213$  (BKJD)



# DV Model-Shift Uniqueness Test

010553017-01, P = 0.968799 Days, E = 130.656026 Days

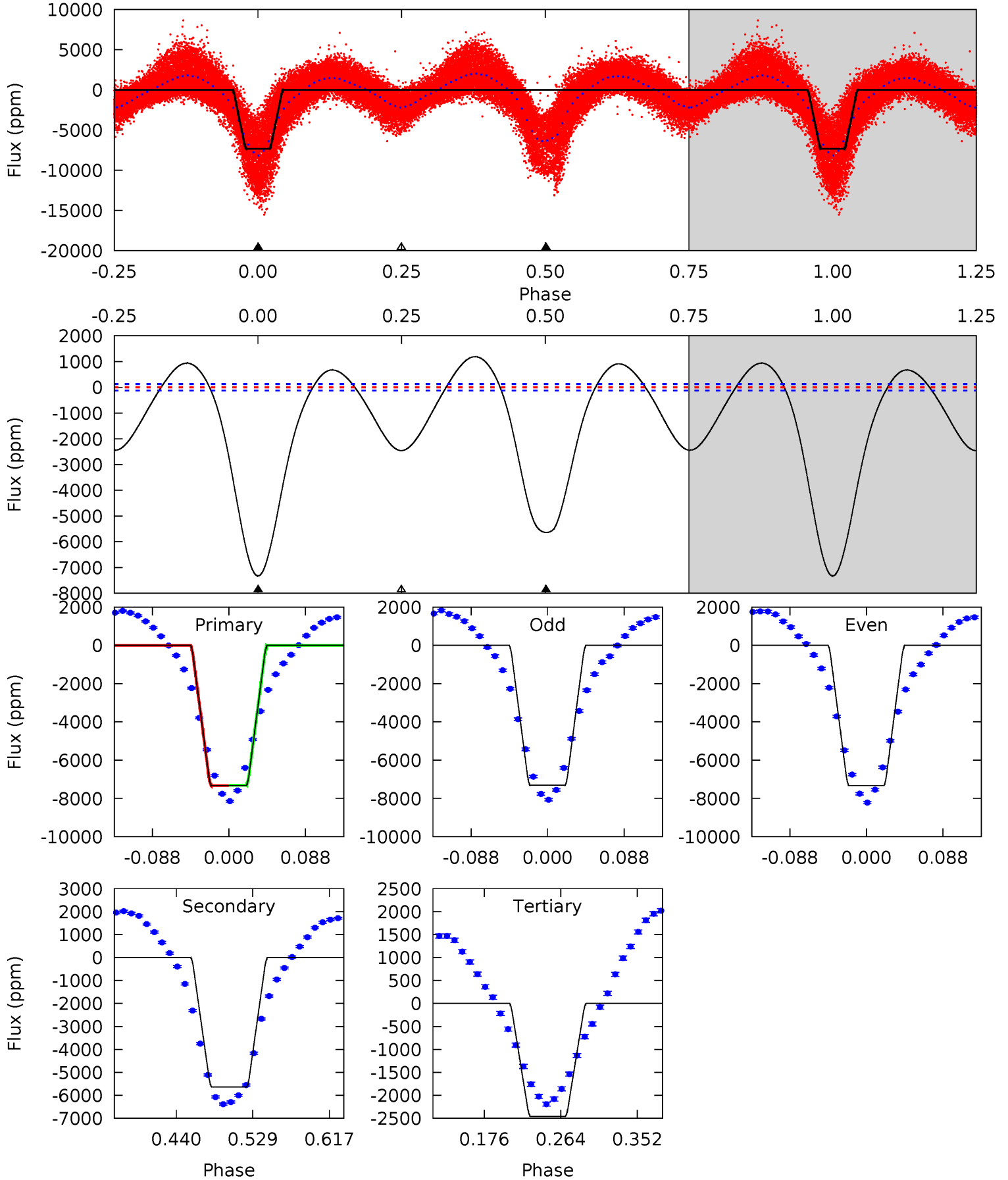
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
40.5	36.0	3.84	0	4.56	1.64	1.91	36.7	40.5	32.2	36.0	2.41	3.61	0.07	1.51



# Alt Model-Shift Uniqueness Test

010553017-01, P = 0.968831 Days, E = 130.624382 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
273.3	210.3	91.7	0	4.59	1.71	44.0	181.6	273.3	118.6	210.3	0.35	1.05	0.14	0.42



### Stellar Parameters For KIC 010553017

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5149^{+168}_{-138}$	$4.527^{+0.082}_{-0.075}$	$-0.260^{+0.300}_{-0.300}$	$0.770^{+0.088}_{-0.080}$	$0.728^{+0.106}_{-0.049}$	$2.246^{+0.792}_{-0.538}$
	+3%/-3%	+2%/-2%	+115%/-115%	+11%/-10%	+15%/-7%	+35%/-24%
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 010553017-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-316 \pm 9$	$1.32^{+1.01}_{-0.83}$	$2122^{+89}_{-87}$	$5481^{+4172}_{-1200}$	$30^{+190}_{-21}$
Alt.	$-5640 \pm 27$	$7.53^{+1.18}_{-1.22}$	$2124^{+91}_{-85}$	$4803^{+375}_{-285}$	$17^{+6}_{-4}$

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



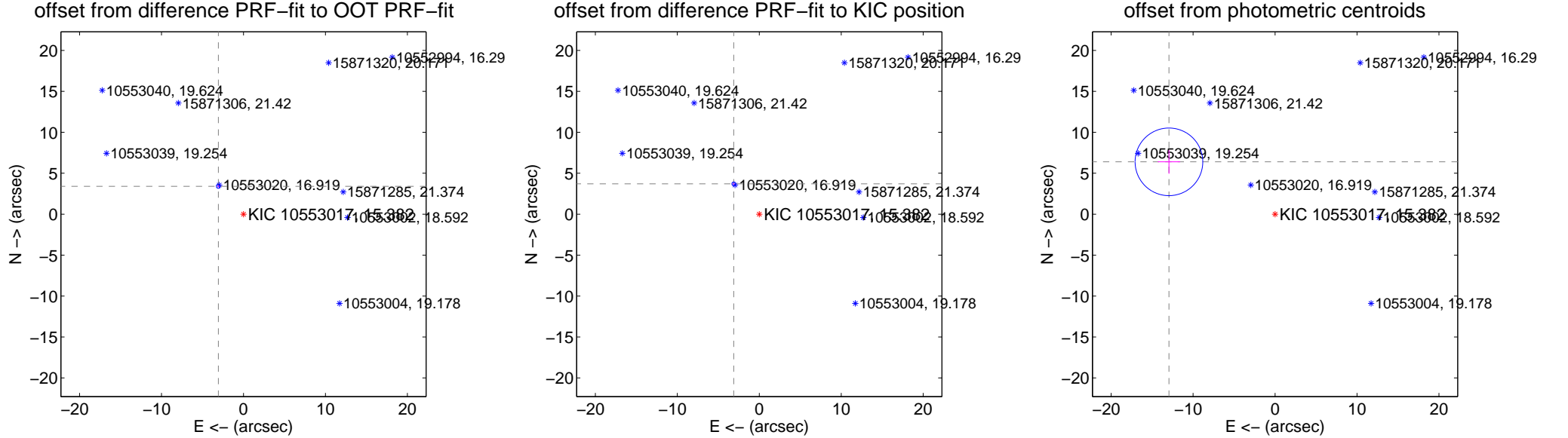
## DV Centroid Data

Supplemental centroid analysis for 010553017-01. Kepler magnitude: 15.38. Transit SNR 8.08

There are 10 quarters with good PRF difference image offsets

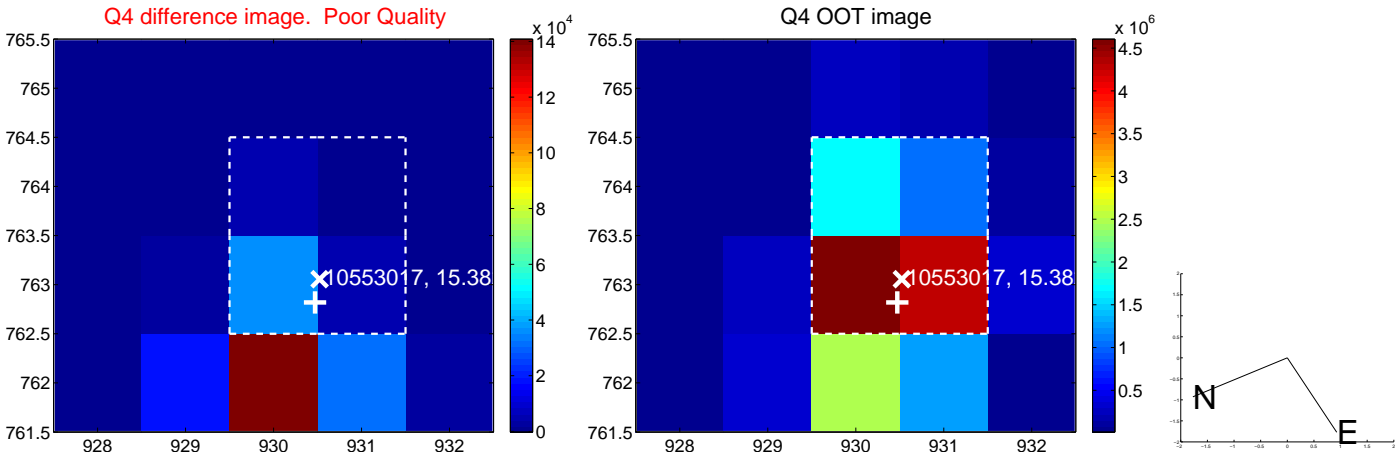
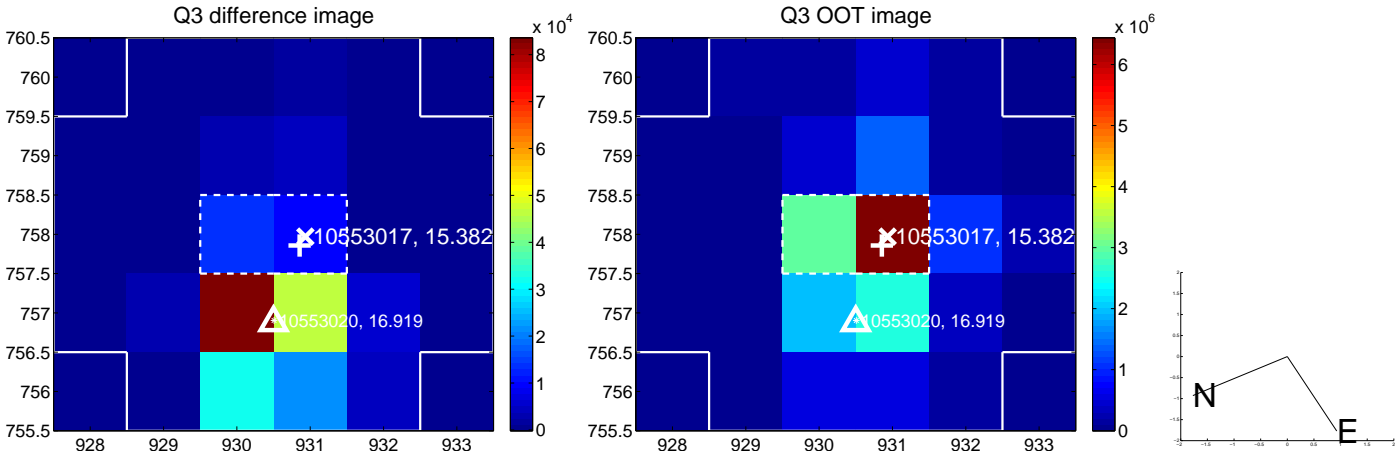
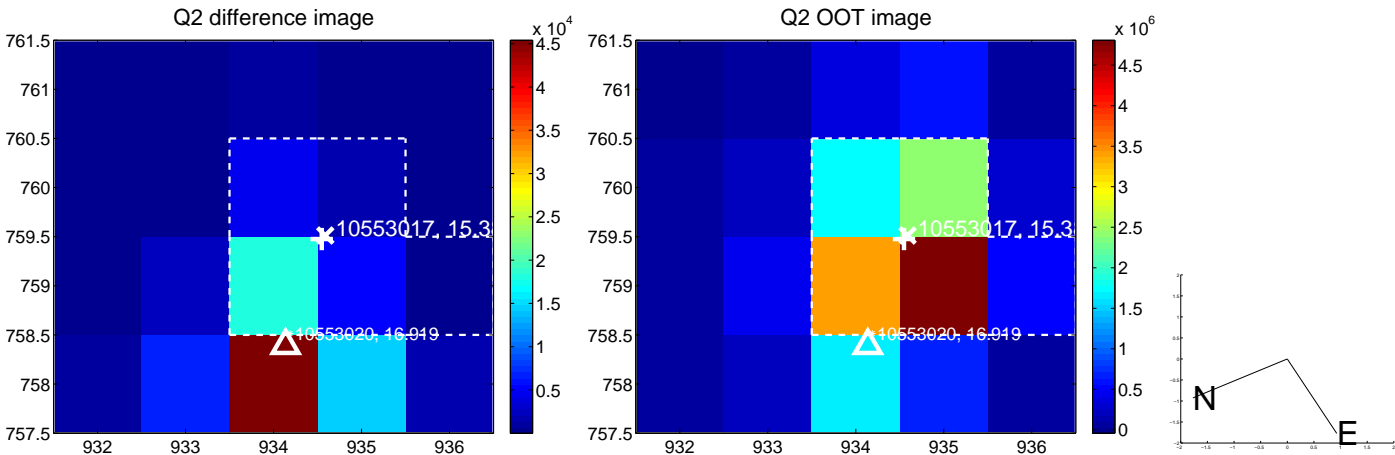
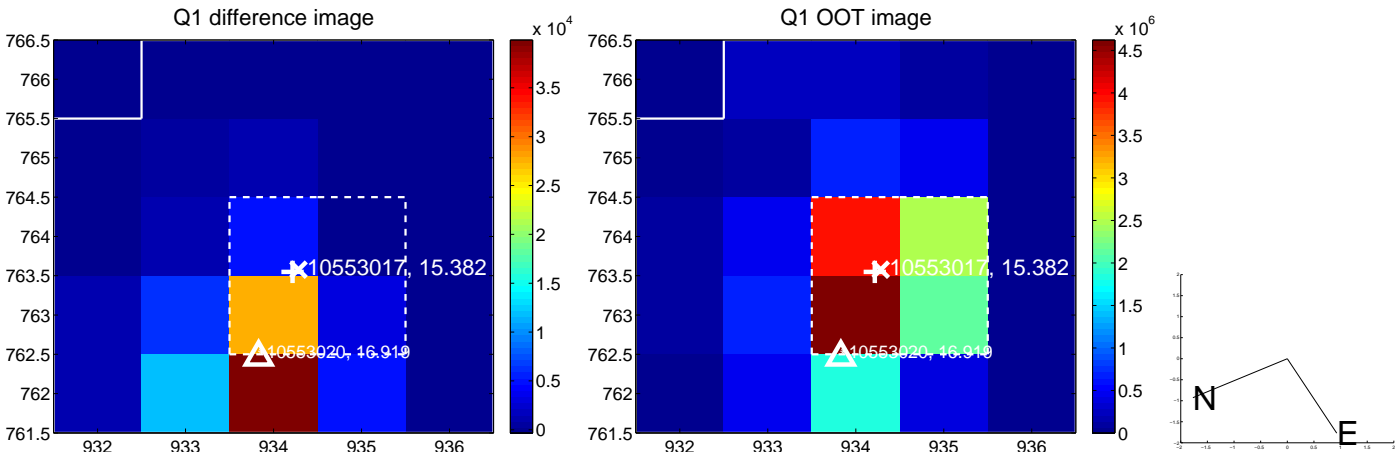
The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.578 \pm 0.081$	<b>56.22</b>	$3.067 \pm 0.083$	$3.399 \pm 0.080$
PRF-fit source offset from KIC position	$4.843 \pm 0.074$	<b>65.07</b>	$3.119 \pm 0.067$	$3.704 \pm 0.079$
photometric centroid source offset	$14.44 \pm 1.38$	<b>10.49</b>	$12.95 \pm 1.36$	$6.39 \pm 1.45$

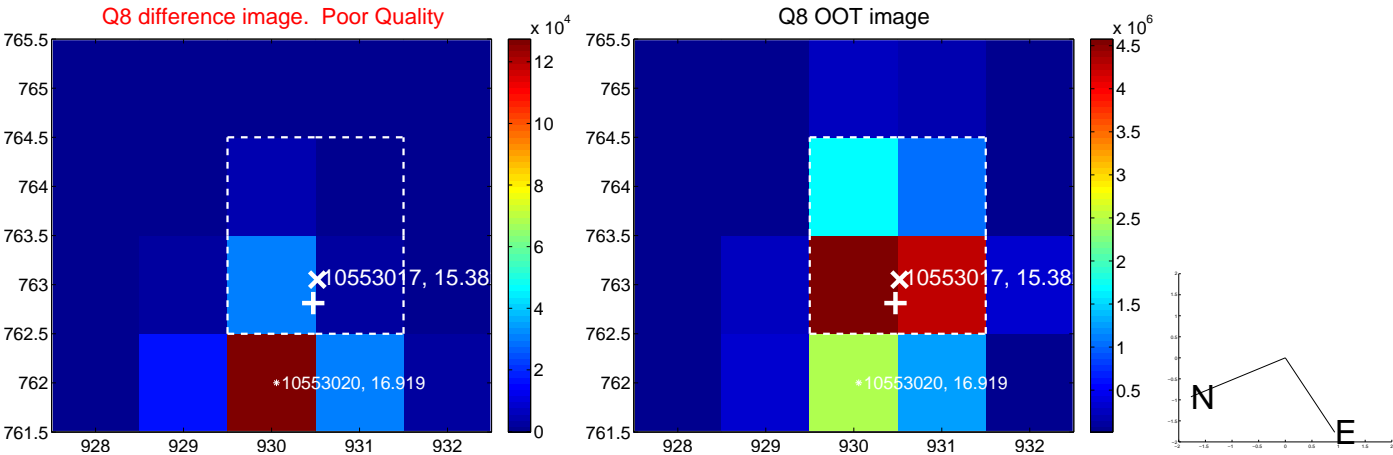
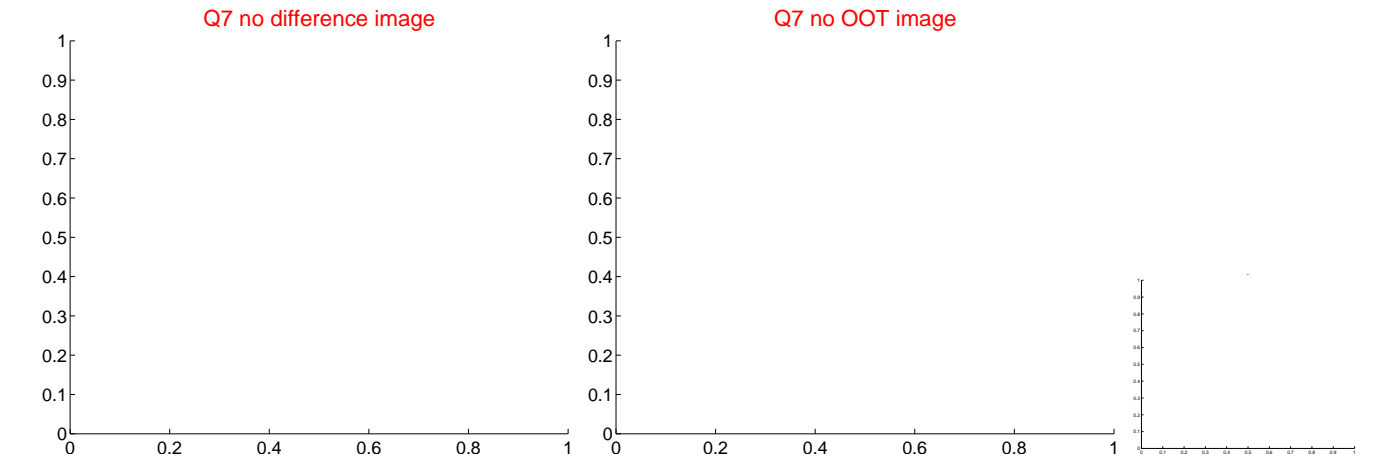
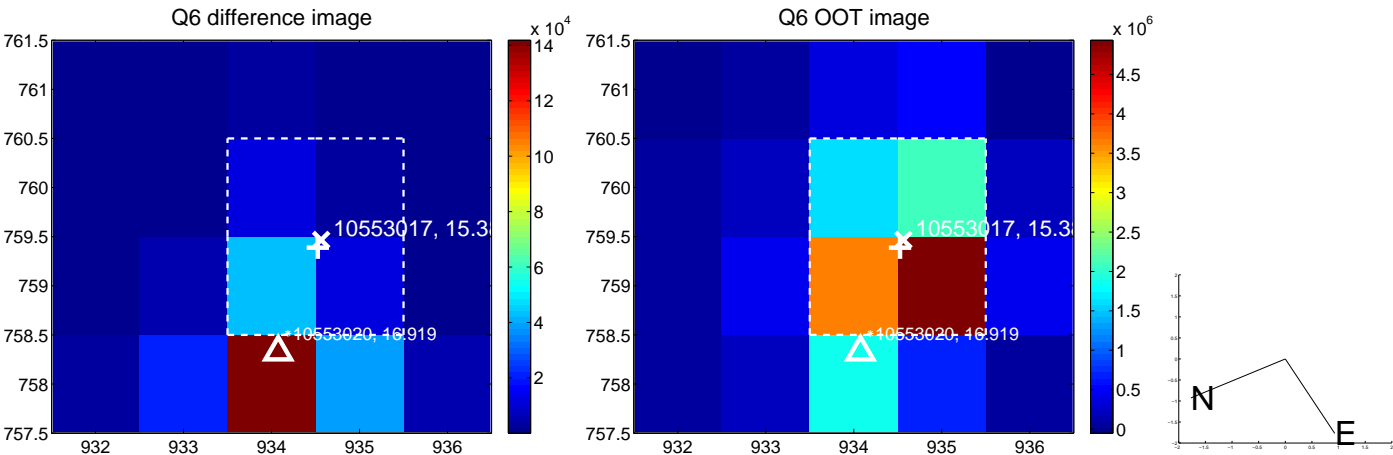
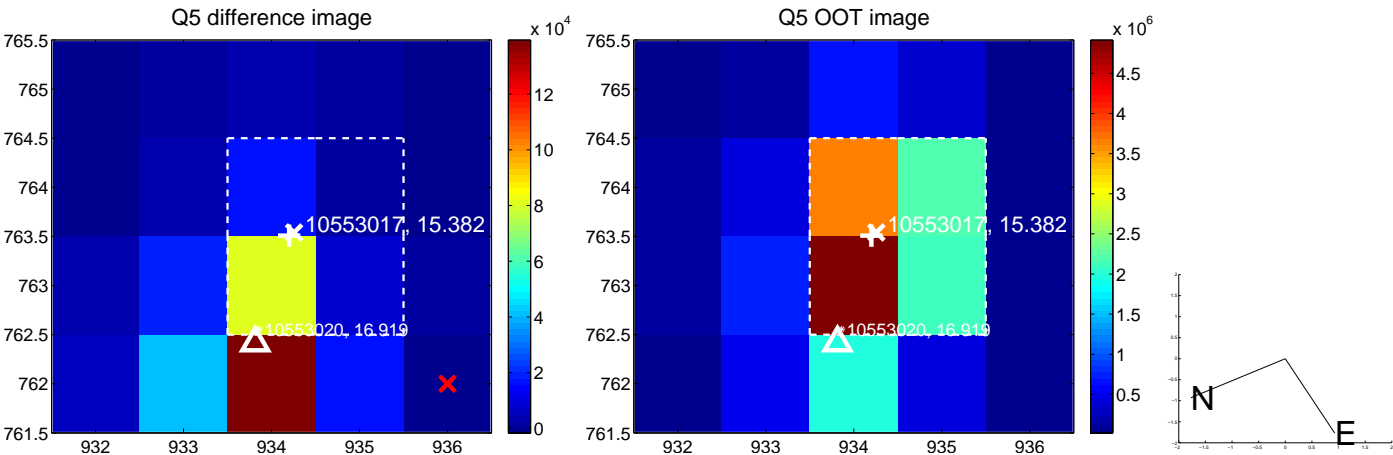


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

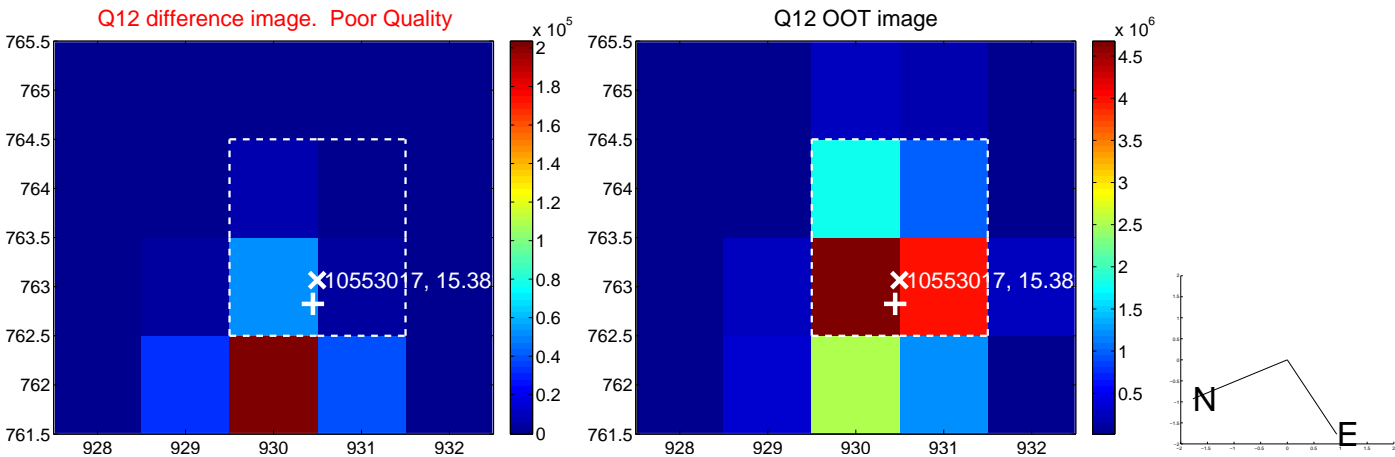
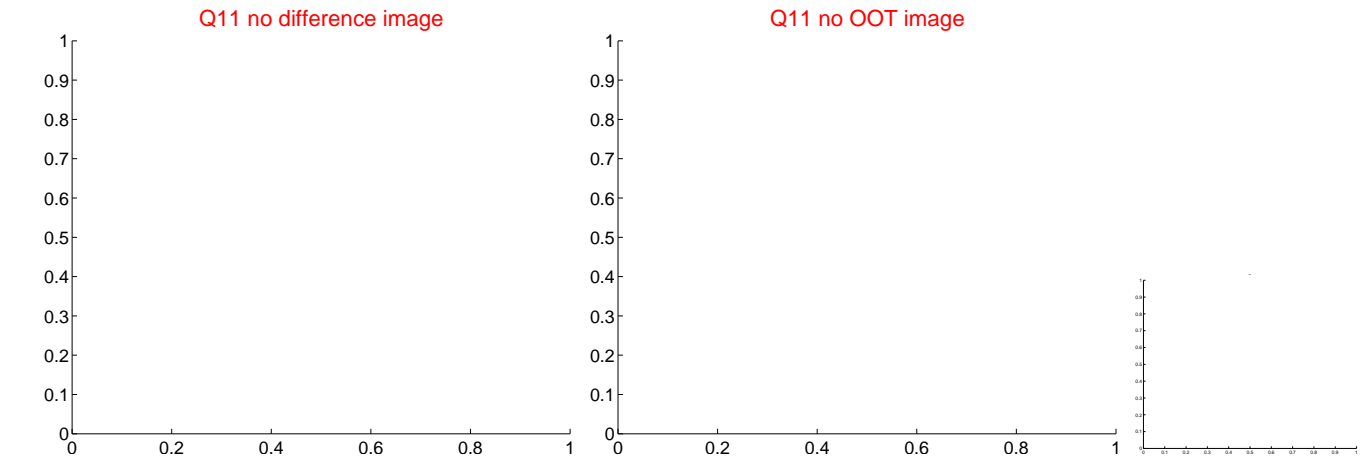
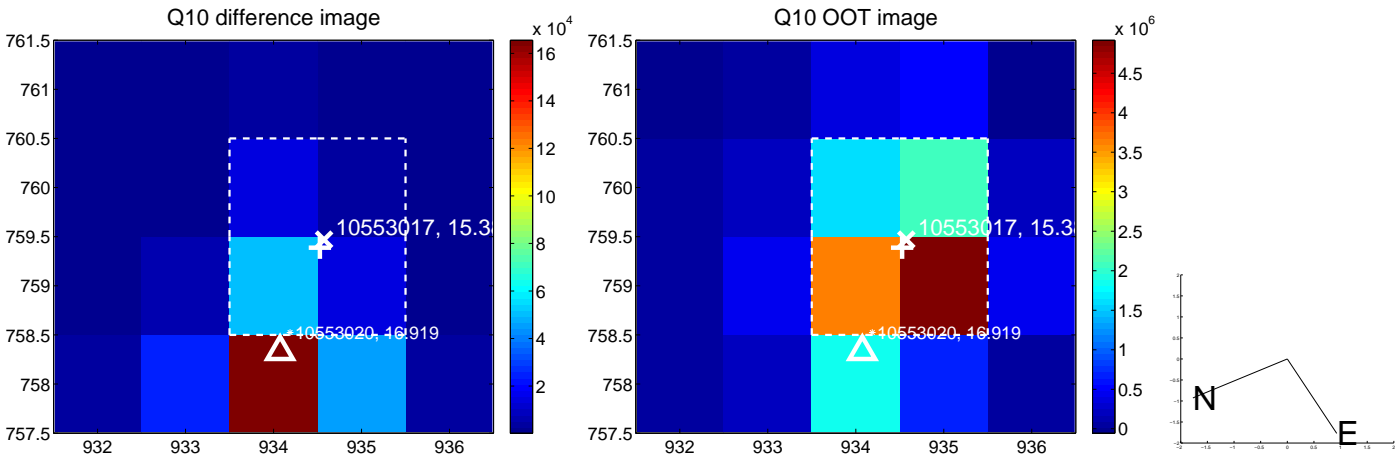
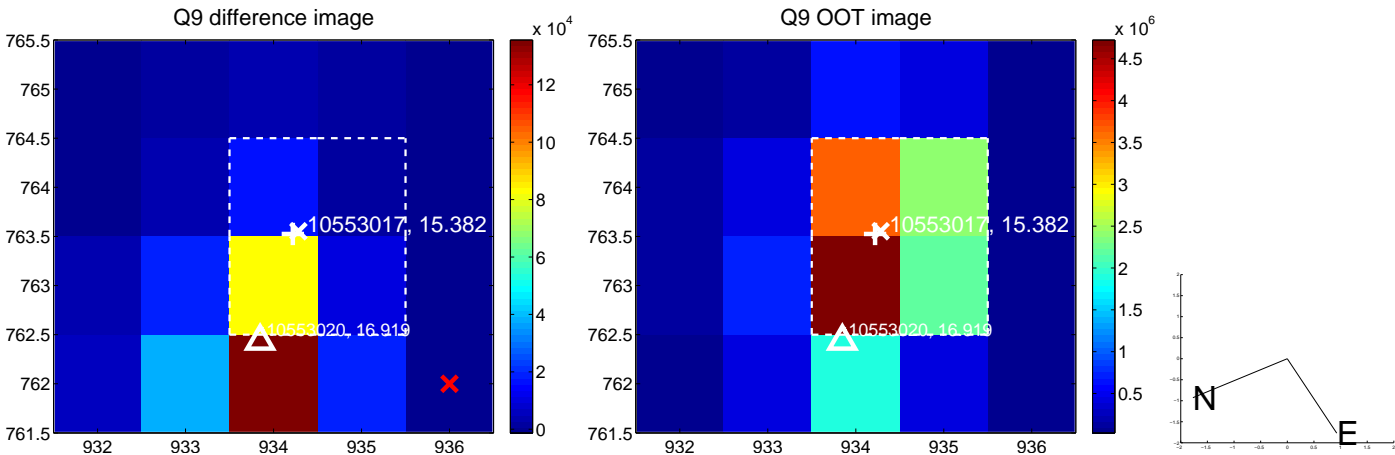
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



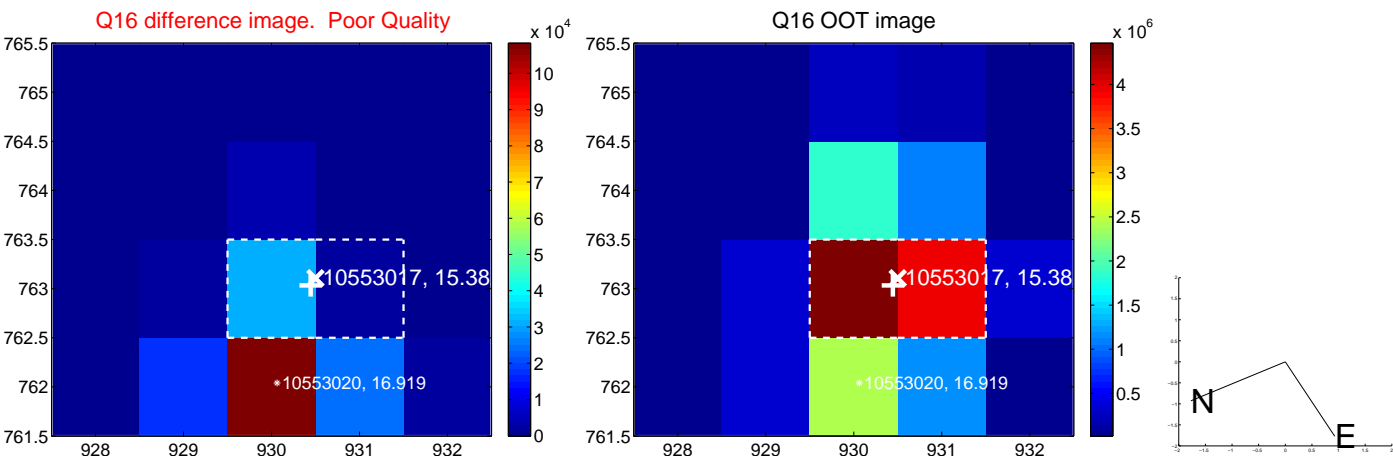
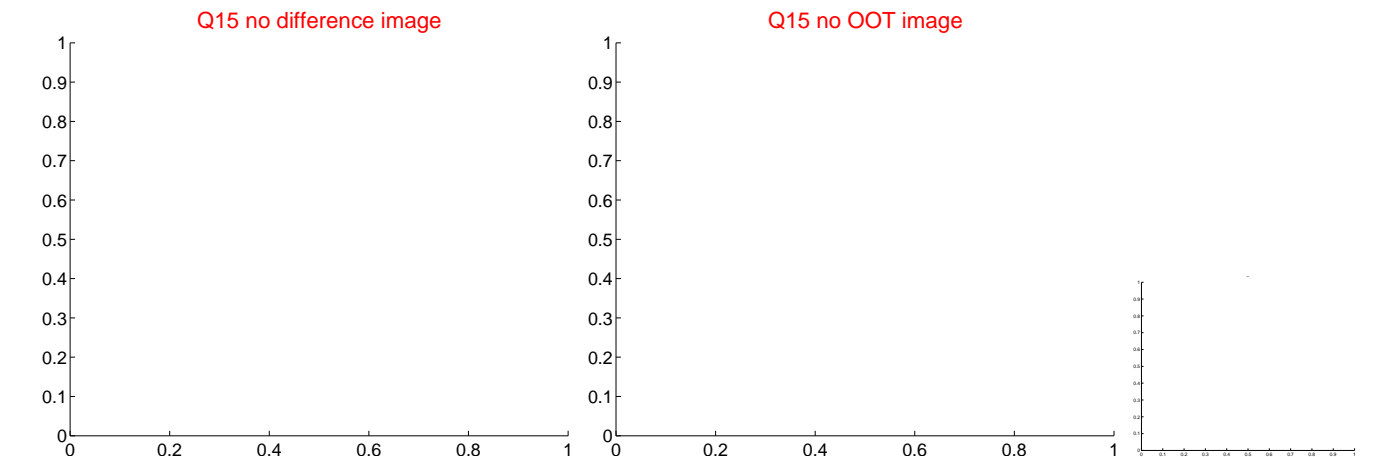
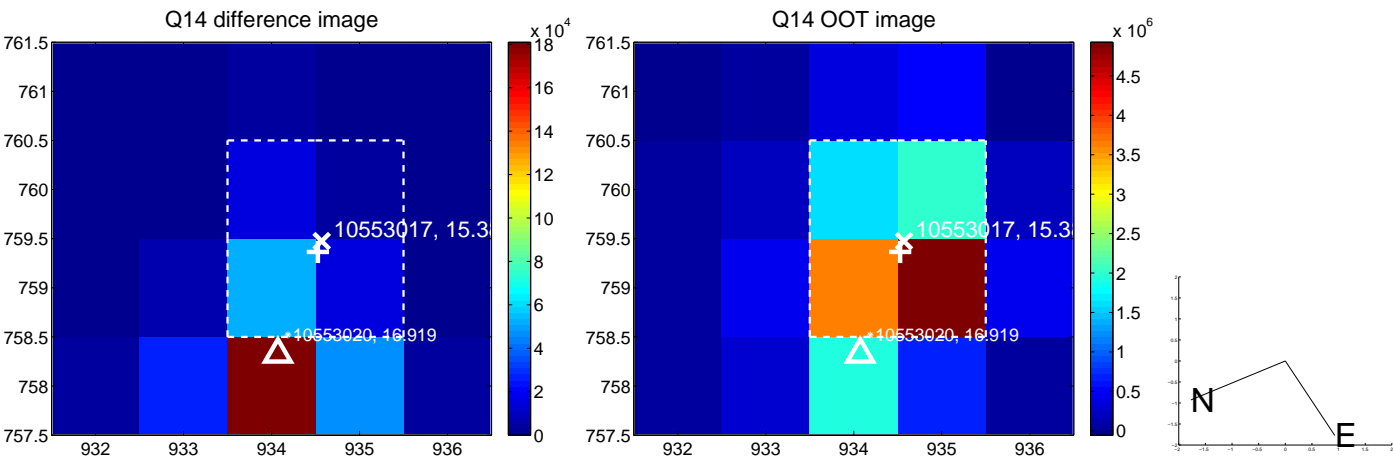
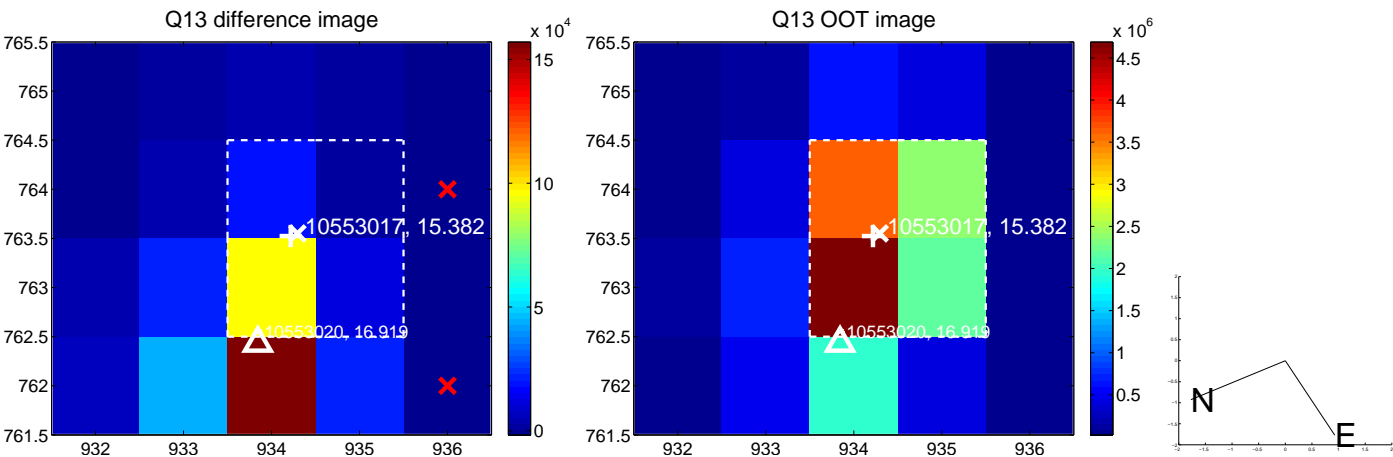
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

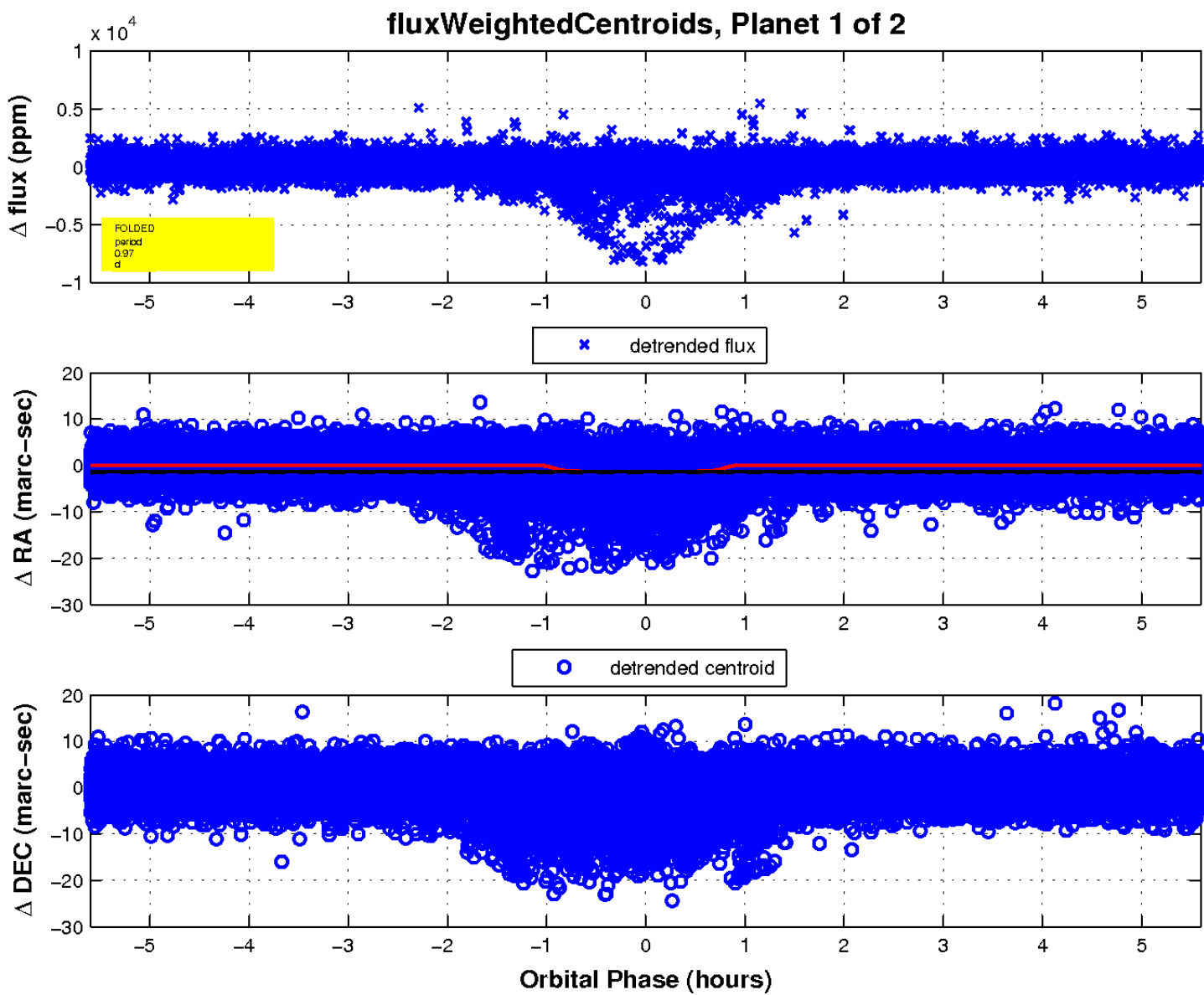
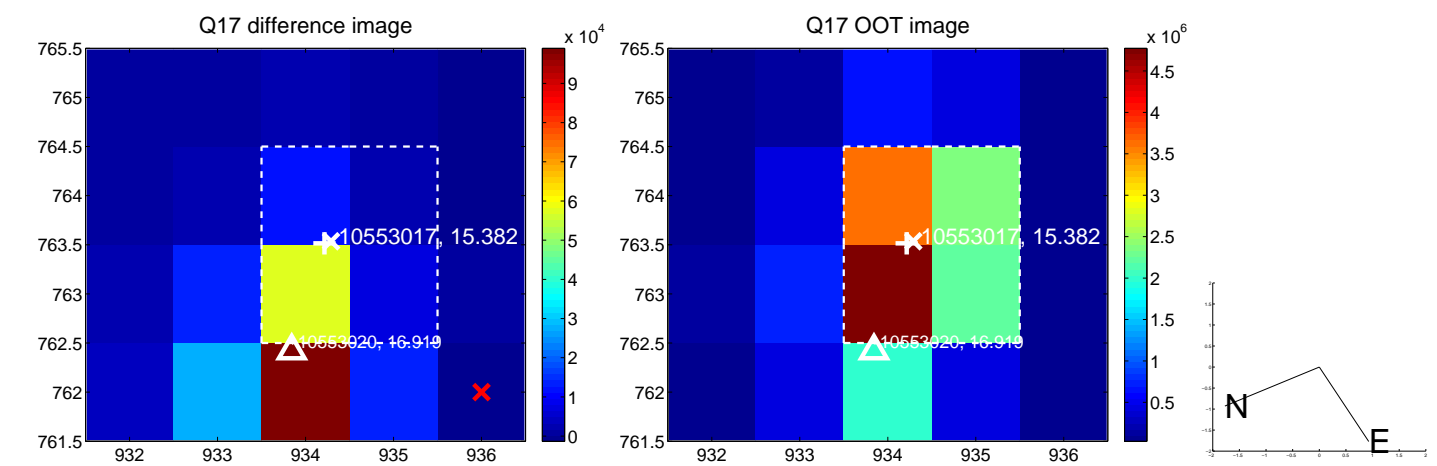


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



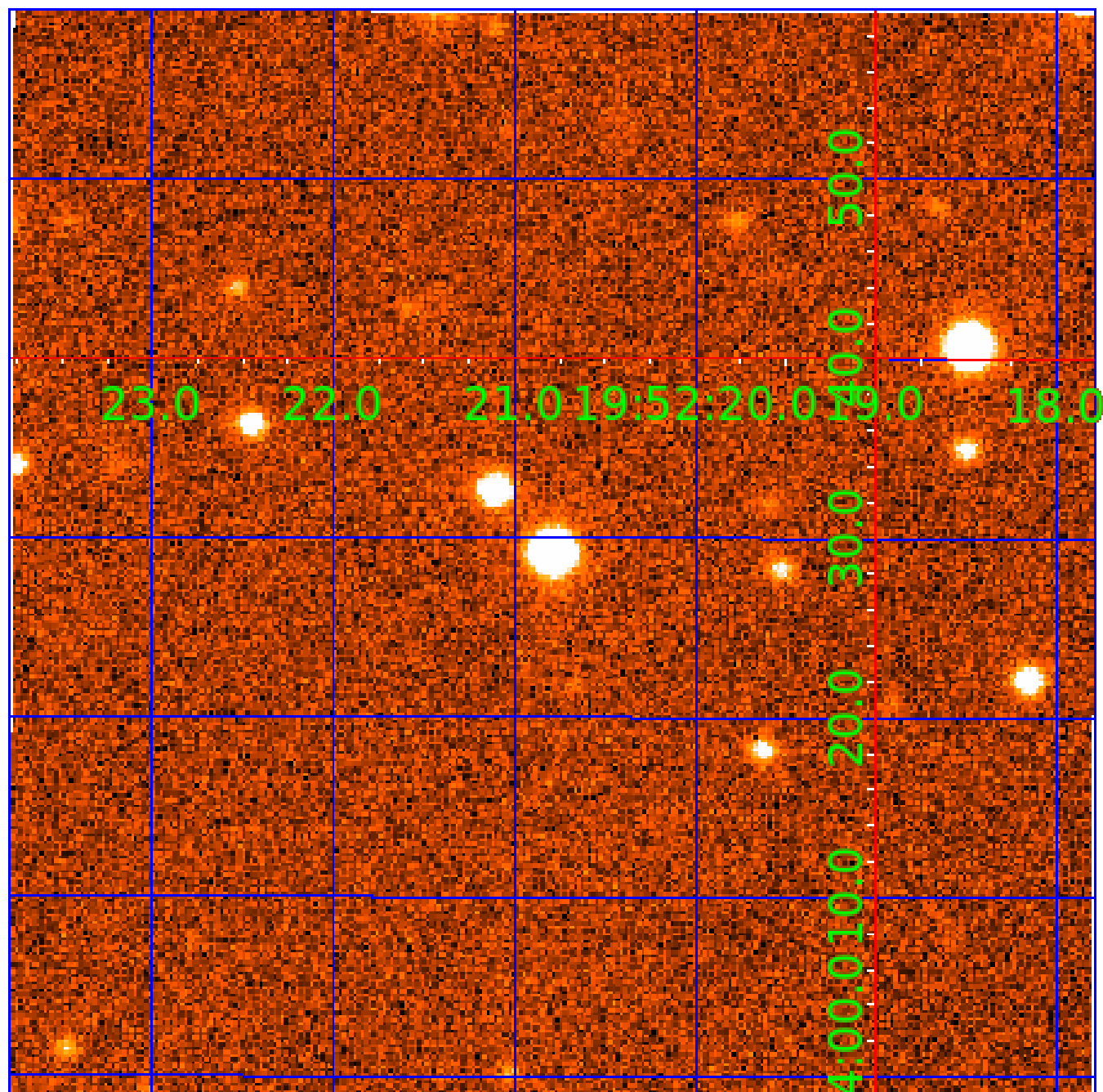


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 010553017

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
010553017-01	OBS	No	0.968799	131.624825	114.2	1.867	70.7	8.1	0.77	5149	1.00	1256.42
010553017-02	OBS	No	0.968847	132.060994	11582.4	1.500	146.0	-1.0	0.77	5149	8.14	1256.34

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010553017-01	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_ALT—CENT_RESOLVED_OFFSET—HALO_GHOST
010553017-02	OBS	FP	0.00	1	0	1	0	MOD_NONUNIQ_ALT—SAME_NTL_PERIOD—CENT_NOFITS—HALO_GHOST

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

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

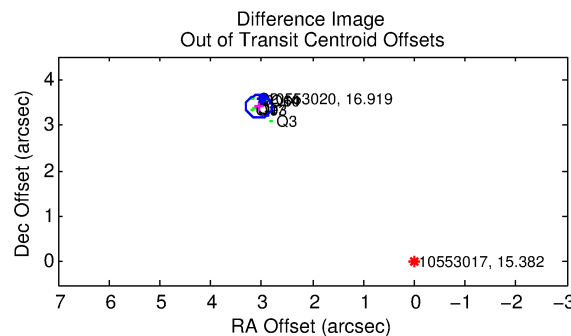
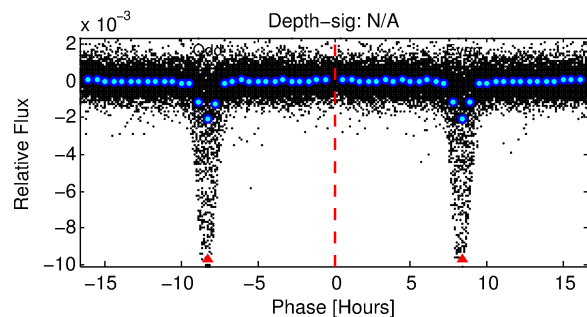
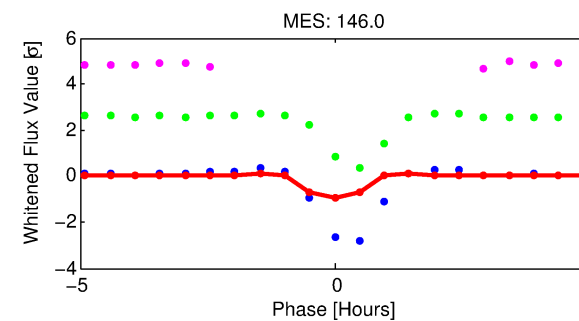
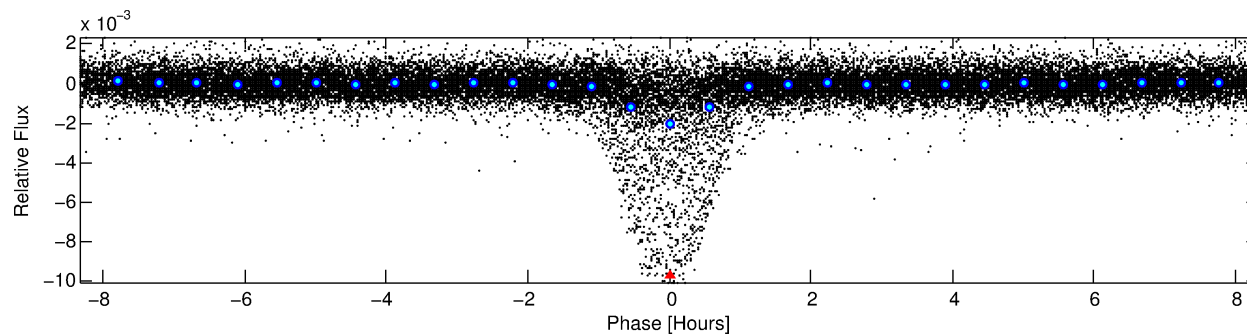
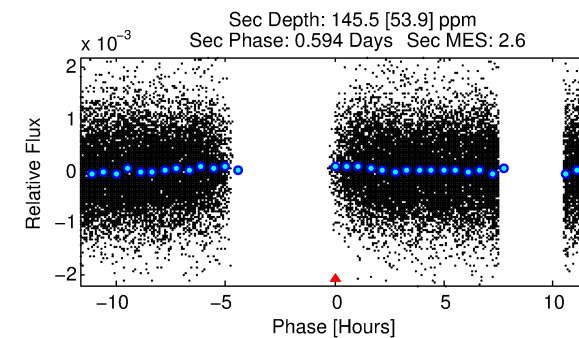
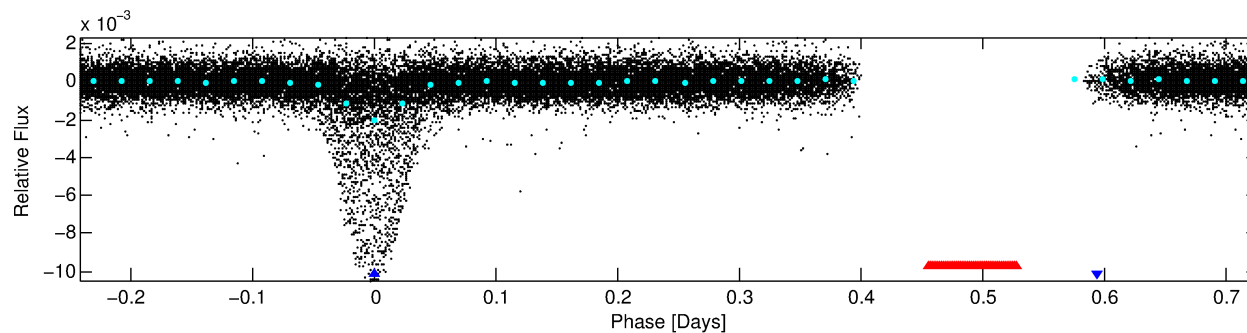
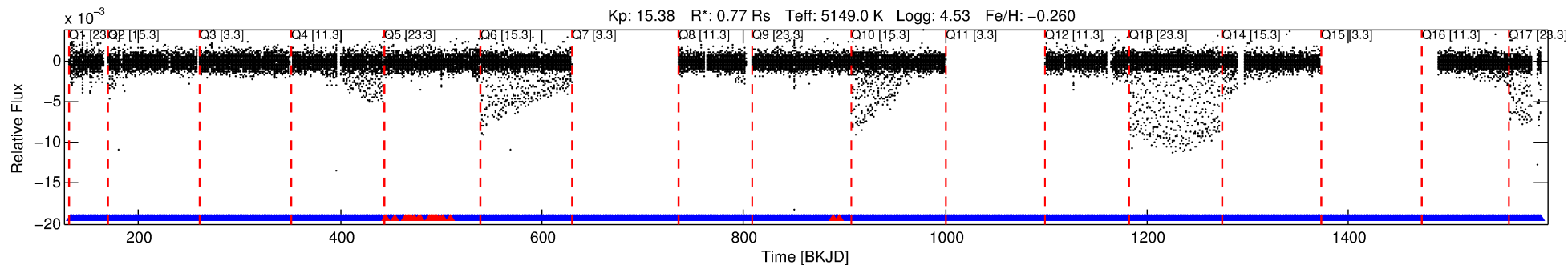
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 010553017-02

No Significant Match Found

# DV One-Page Summary

KIC: 10553017 Candidate: 2 of 2 Period: 0.969 d



## TPS TCE Results:

Period = 0.96885 d  
Epoch = 132.0610 BKJD

DV fit results are unavailable

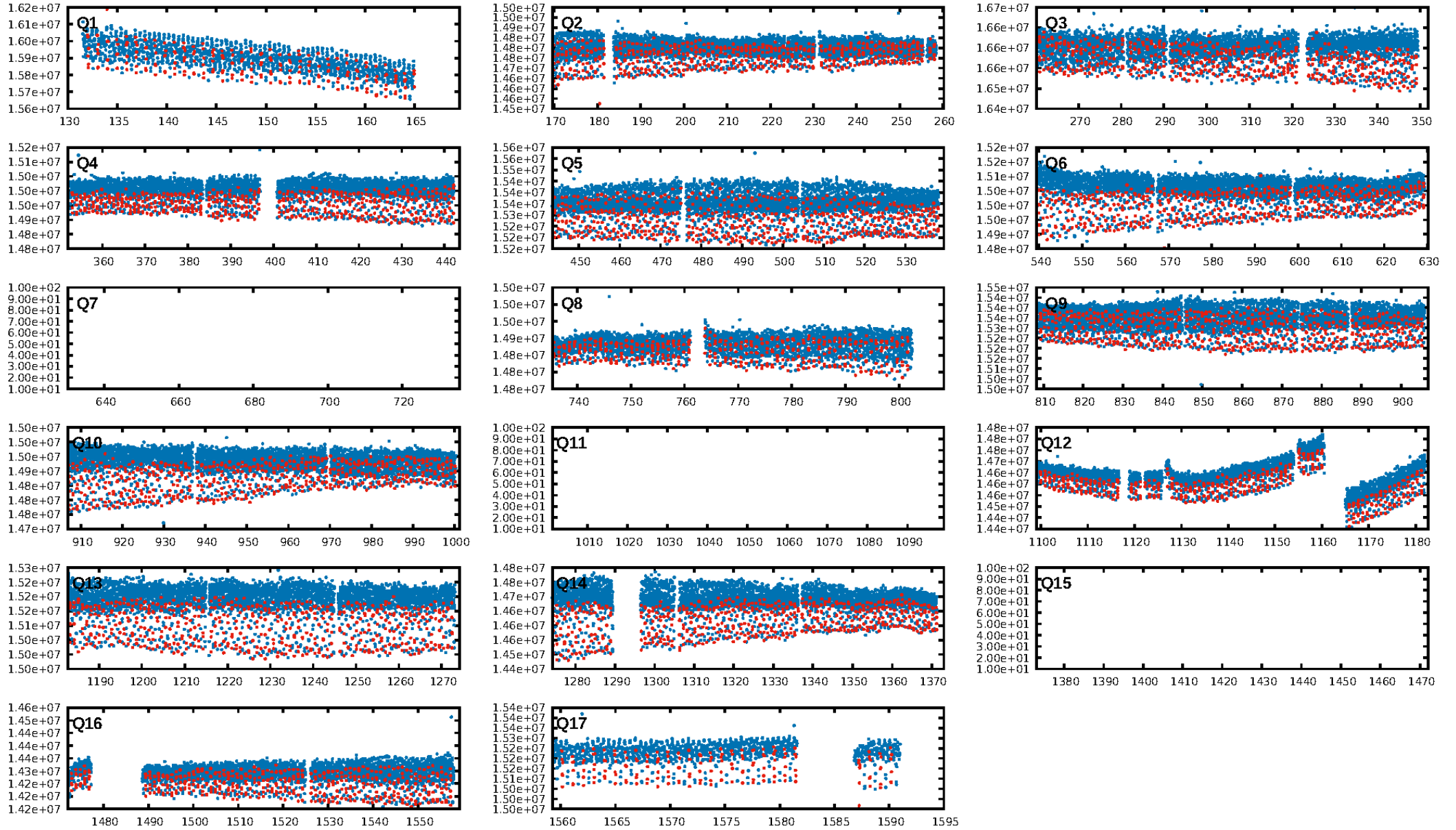
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.98 [1016/1040]  
GhostDiagnostic-chr: 0.1558  
Centroid-sig: N/A  
Centroid-so: 1.332 arcsec [63.57σ]  
OotOffset-rm: 4.576 arcsec [53.94σ]  
KicOffset-rm: 4.838 arcsec [64.26σ]  
OotOffset-st: 4/1/0/5 [10]  
KicOffset-st: 4/1/0/5 [10]  
DiffImageQuality-fgm: 1.00 [10/10]  
DiffImageOverlap-fno: 1.00 [14/14]

Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 11:24:14 Z

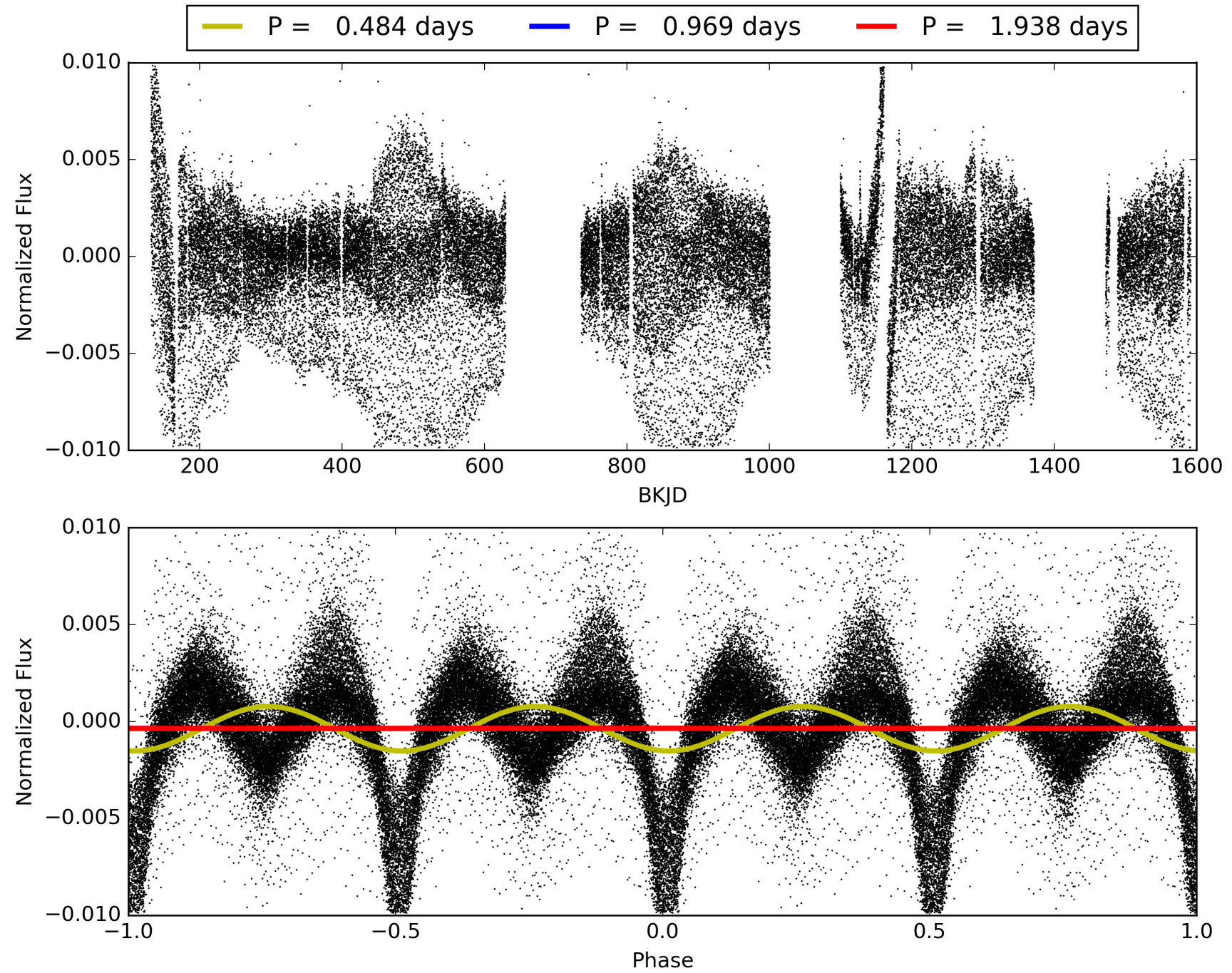
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 010553017-02, PDC Light Curves



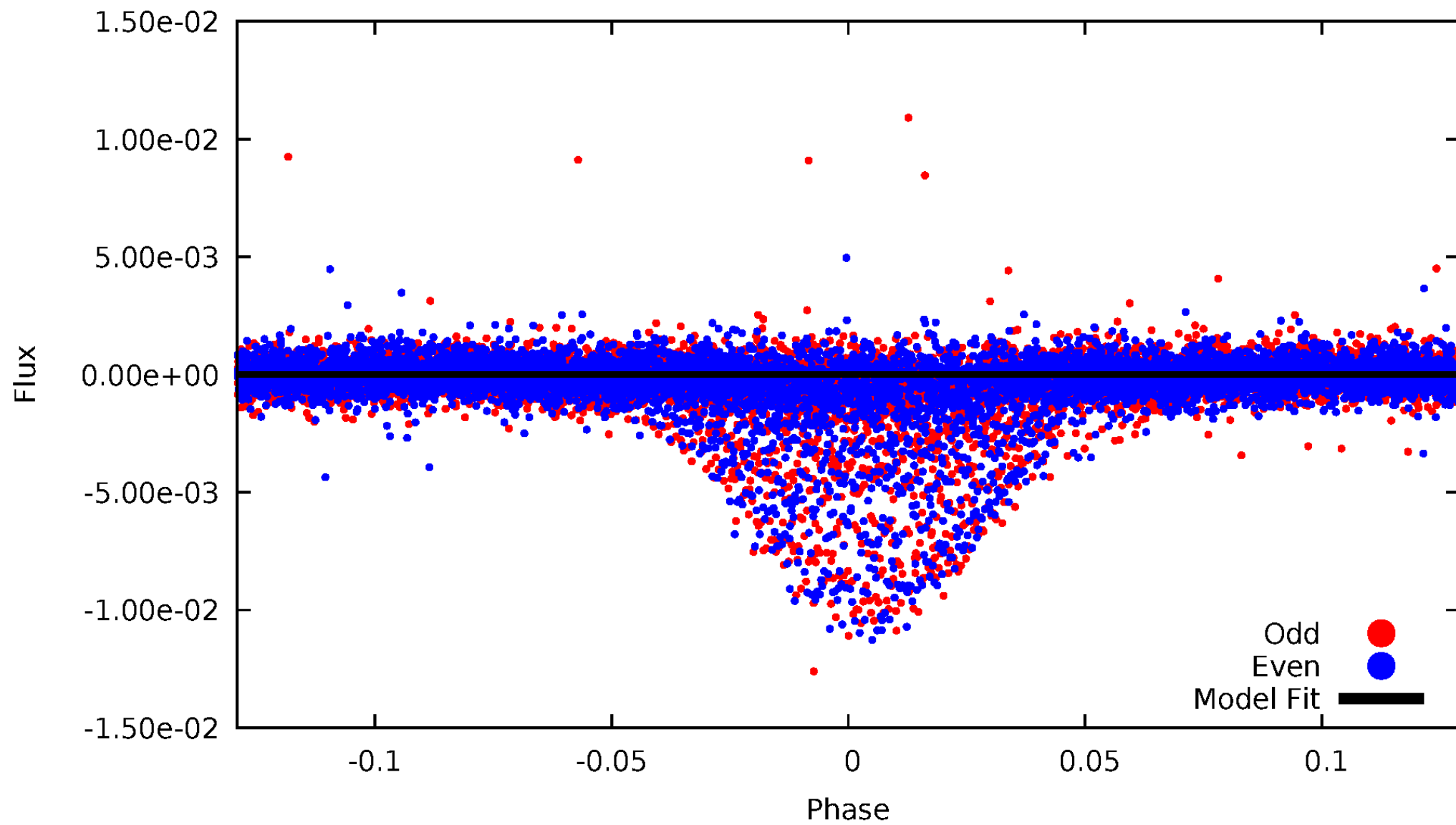


# TCE 010553017-02



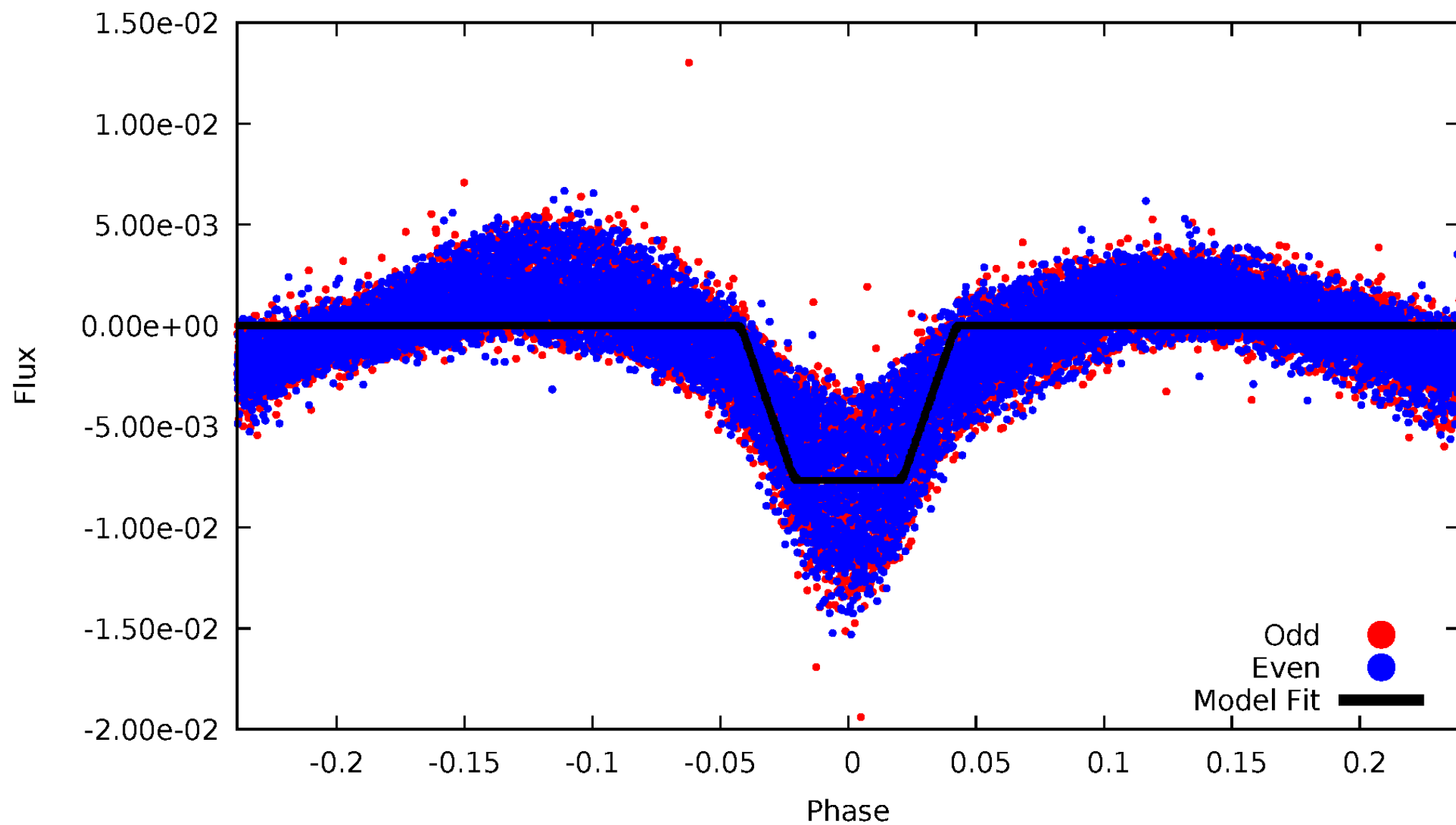
# DV Odd/Even

TCE 010553017-02



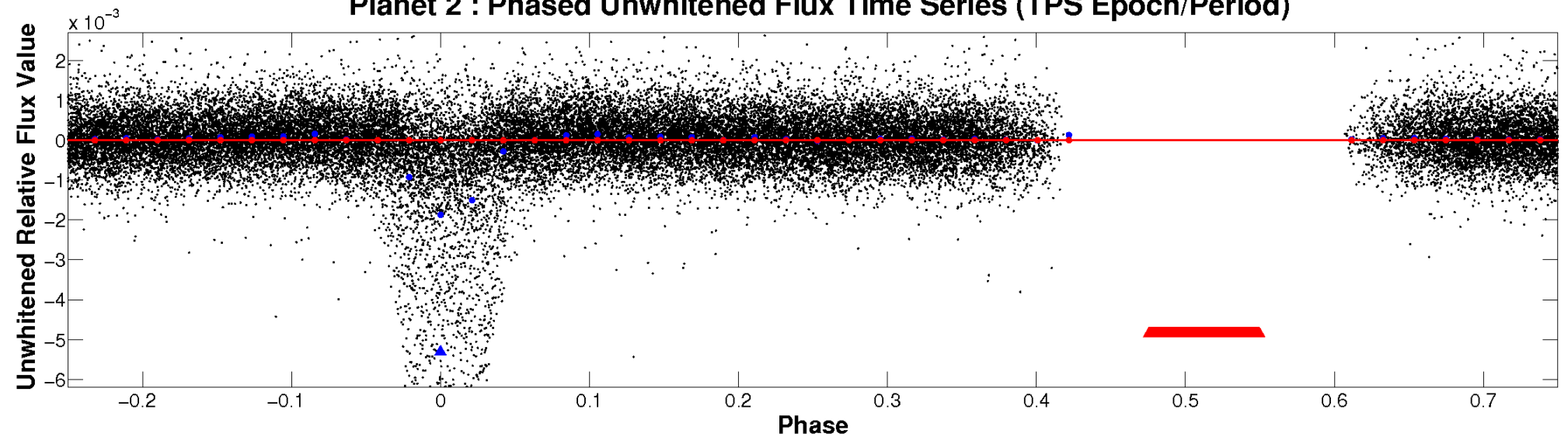
# ALT Odd/Even

TCE 010553017-02

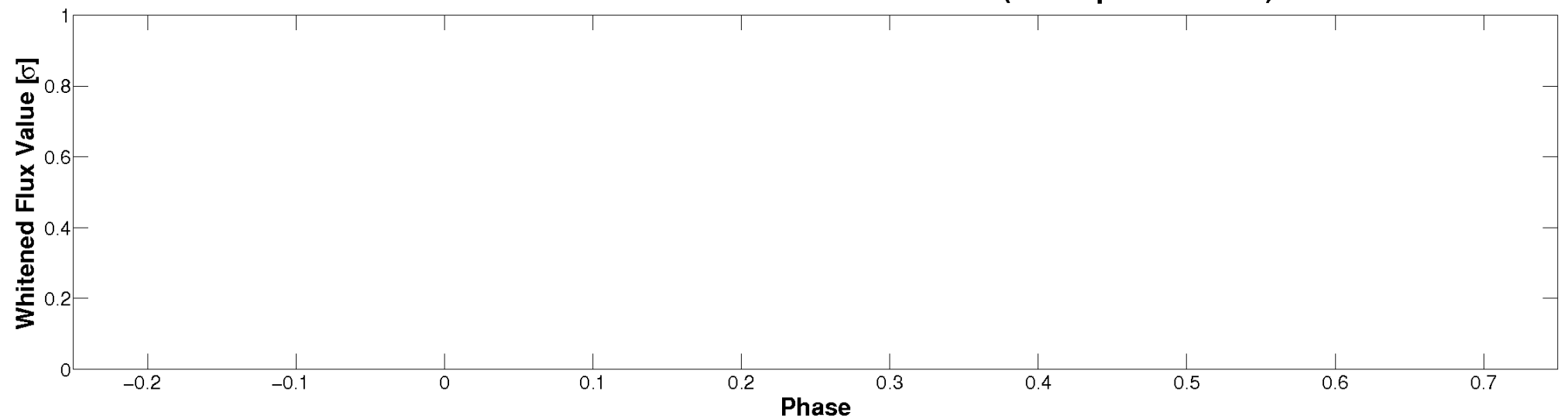


# Non-Whitened Vs. Whitened Light Curve

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

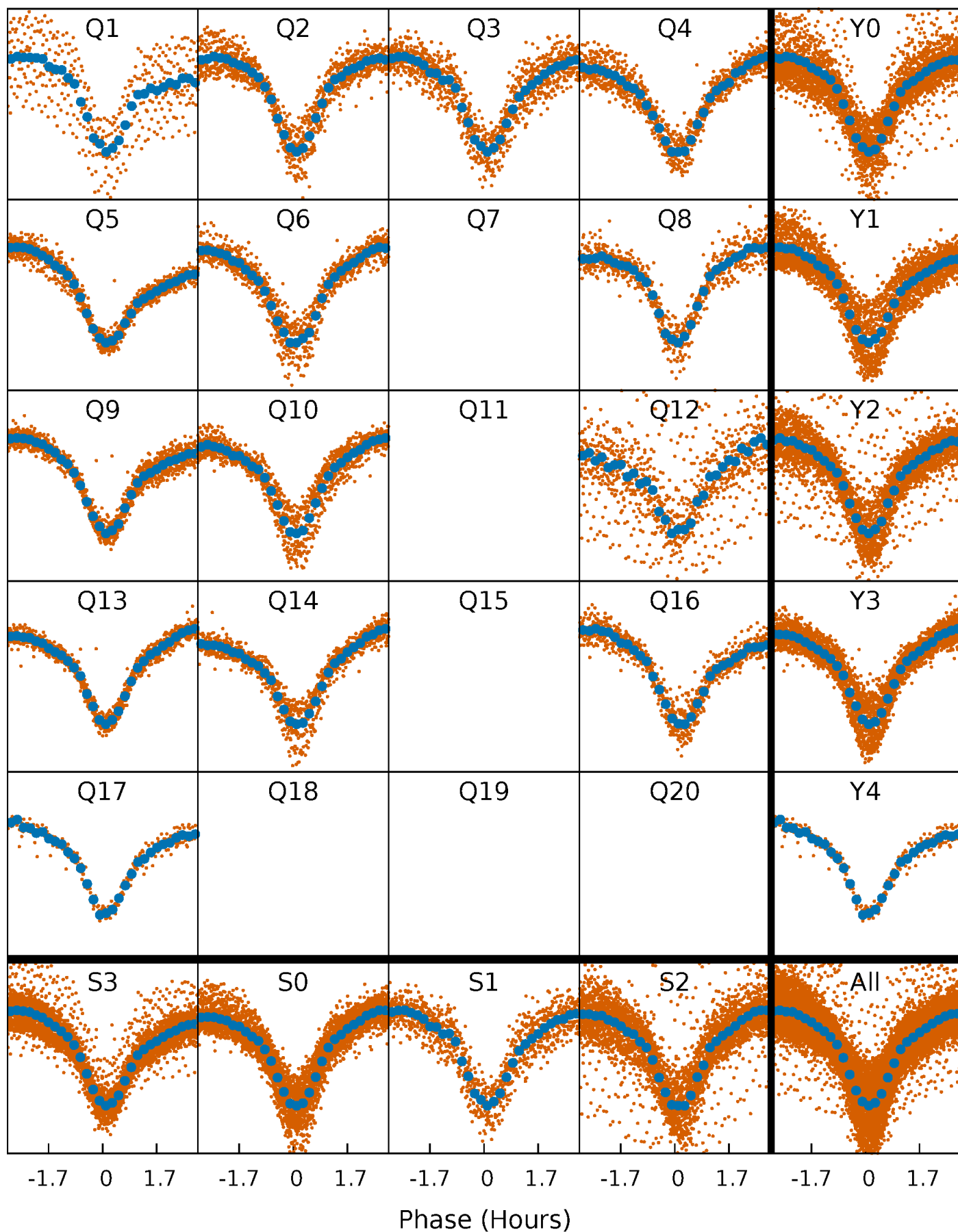


**Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)**



# PDC Quarter-Phased Transit Curves

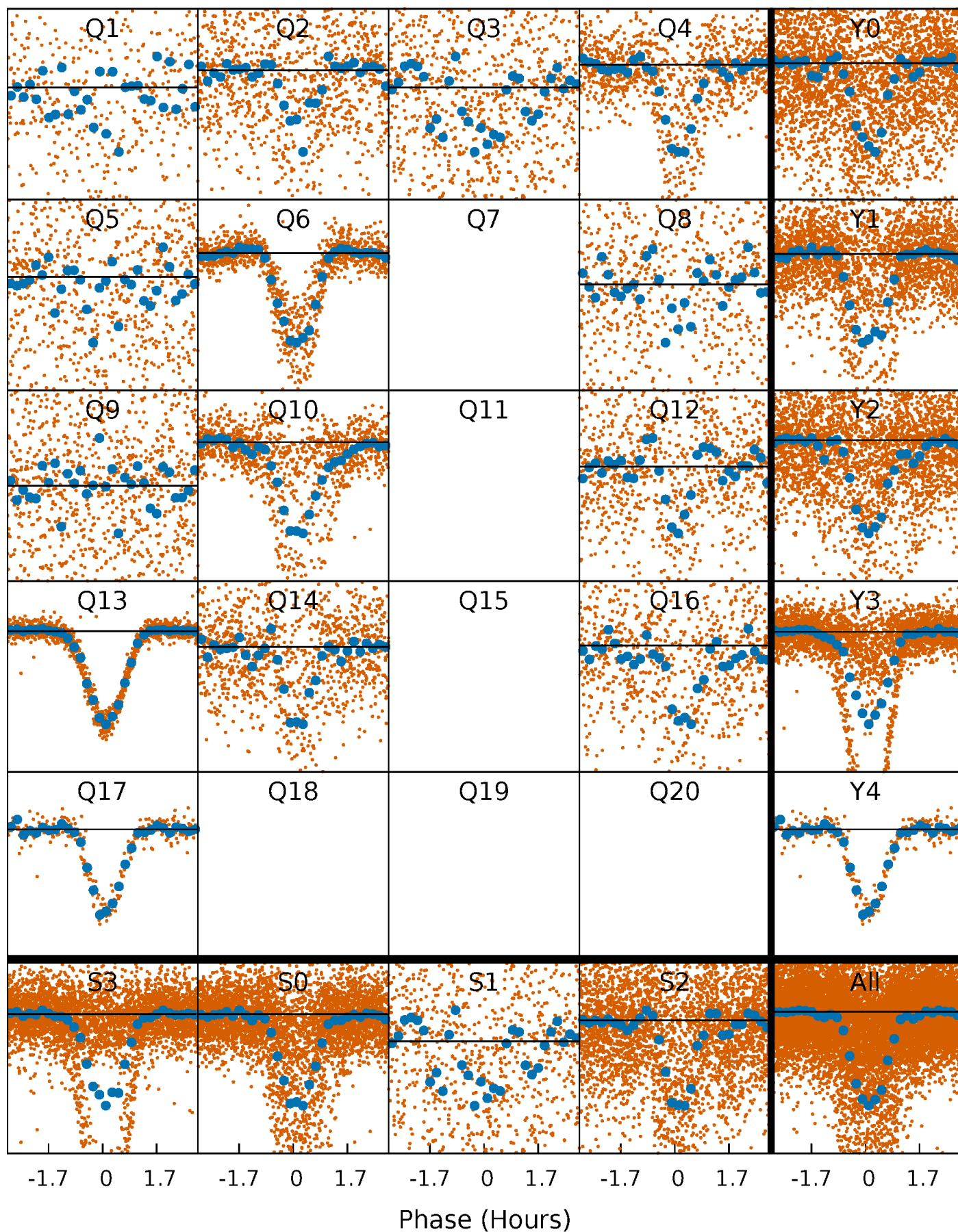
TCE 010553017-02     $P = 0.968847$  Days     $T_0 = 132.060994$  (BKJD)





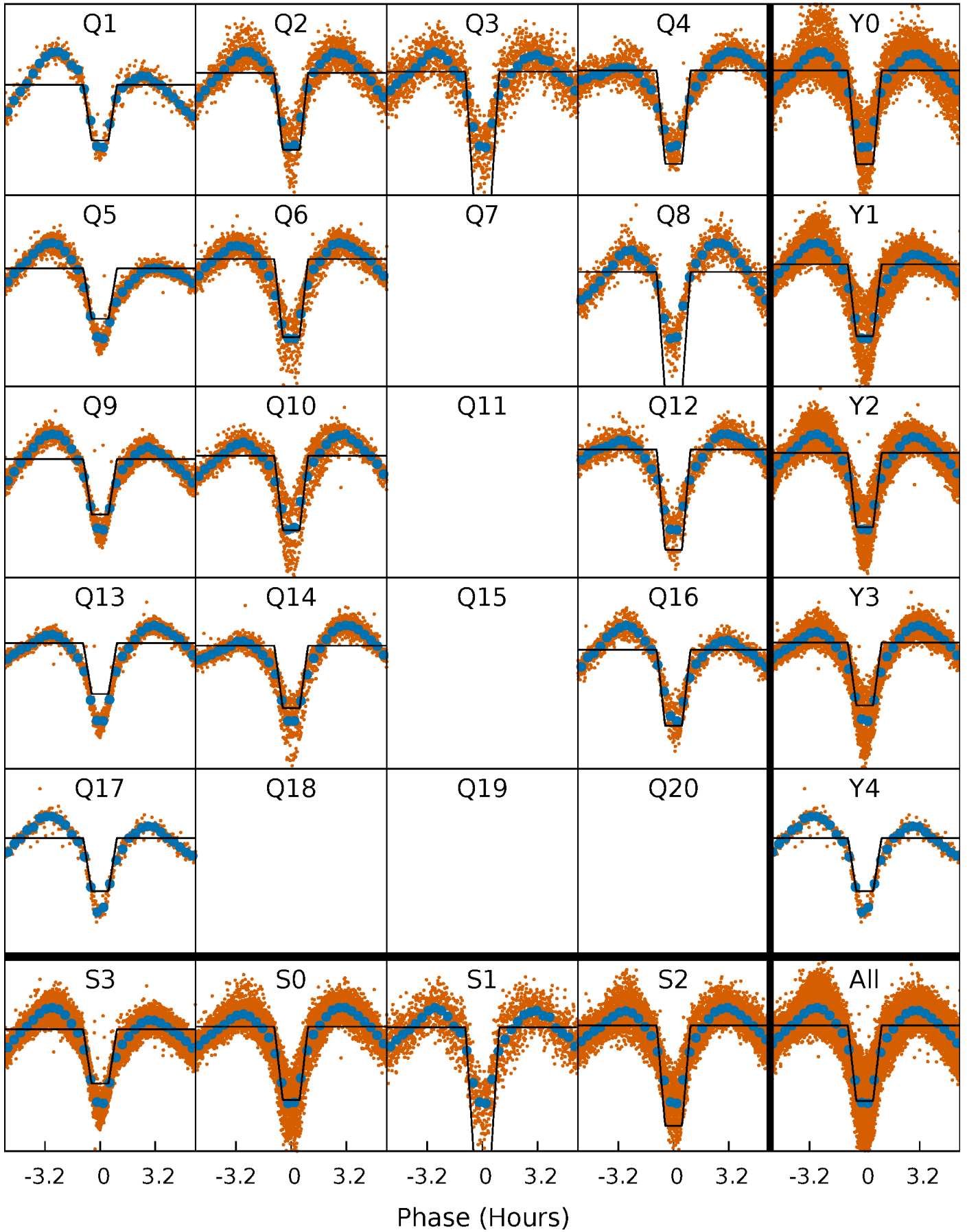
# DV Quarter-Phased Transit Curves

TCE 010553017-02   P= 0.968847 Days    $T_0=132.060994$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

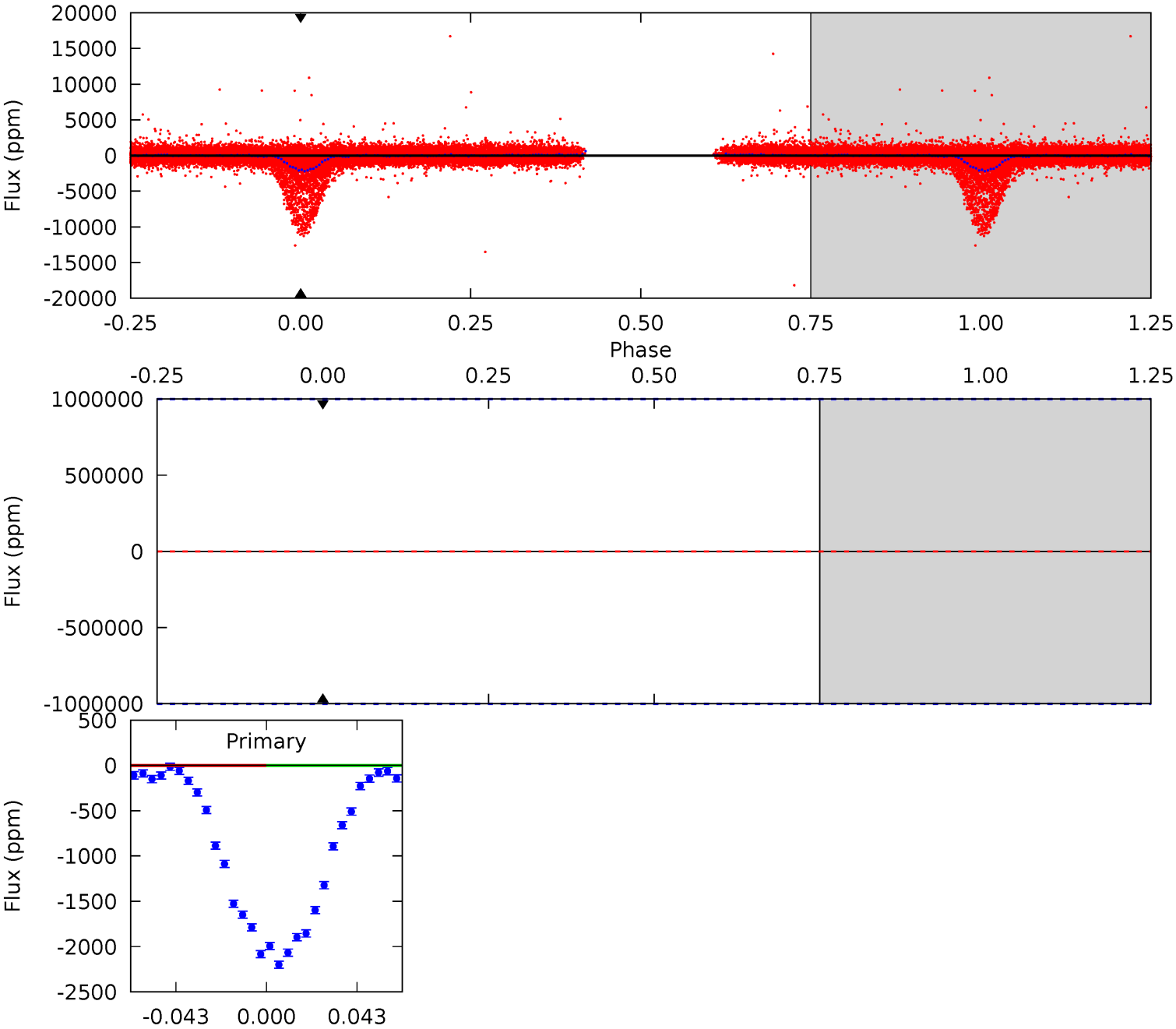
TCE 010553017-02     $P = 0.968847$  Days     $T_0 = 132.066109$  (BKJD)



# DV Model-Shift Uniqueness Test

010553017-02, P = 0.968847 Days, E = 131.092147 Days

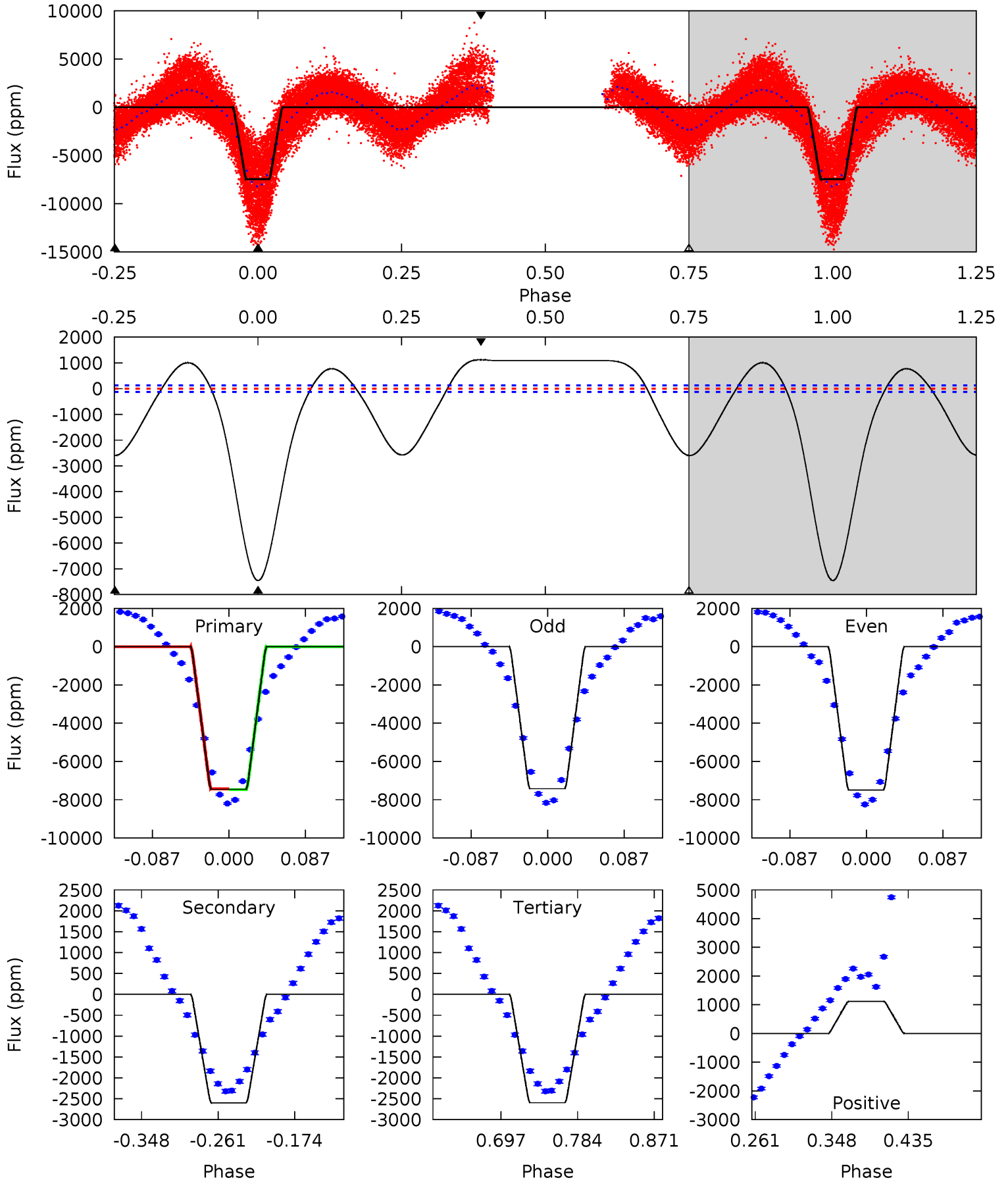
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

010553017-02, P = 0.968847 Days, E = 131.097262 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
274.3	95.6	95.5	41.3	4.59	1.71	45.3	178.7	233.0	0.05	54.3	1.23	1.03	0.13	0.66



### Stellar Parameters For KIC 010553017

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5149^{+168}_{-138}$	$4.527^{+0.082}_{-0.075}$	$-0.260^{+0.300}_{-0.300}$	$0.770^{+0.088}_{-0.080}$	$0.728^{+0.106}_{-0.049}$	$2.246^{+0.792}_{-0.538}$
	+3%/-3%	+2%/-2%	+115%/-115%	+11%/-10%	+15%/-7%	+35%/-24%
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 010553017-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$0 \pm 1000000$	$10.09^{+8.22}_{-6.54}$	$2126^{+89}_{-81}$	$2909^{+8175}_{-12505}$	$1.063^{+316.260}_{-218.732}$
Alt.	$-2598 \pm 27$	$9.21^{+8.23}_{-5.82}$	$2120^{+95}_{-85}$	$3812^{+1972}_{-753}$	$5.234^{+33.765}_{-3.774}$

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

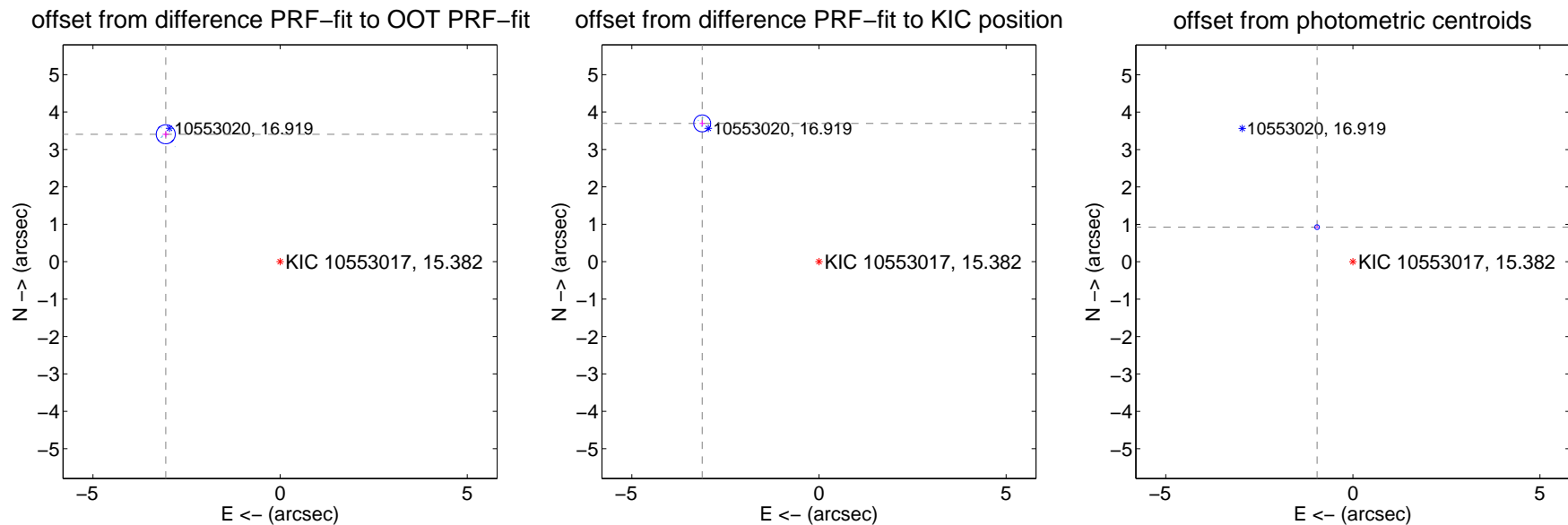
## DV Centroid Data

Supplemental centroid analysis for 010553017-02. Kepler magnitude: 15.38. Transit SNR -1.00

There are 10 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.31 arcsec

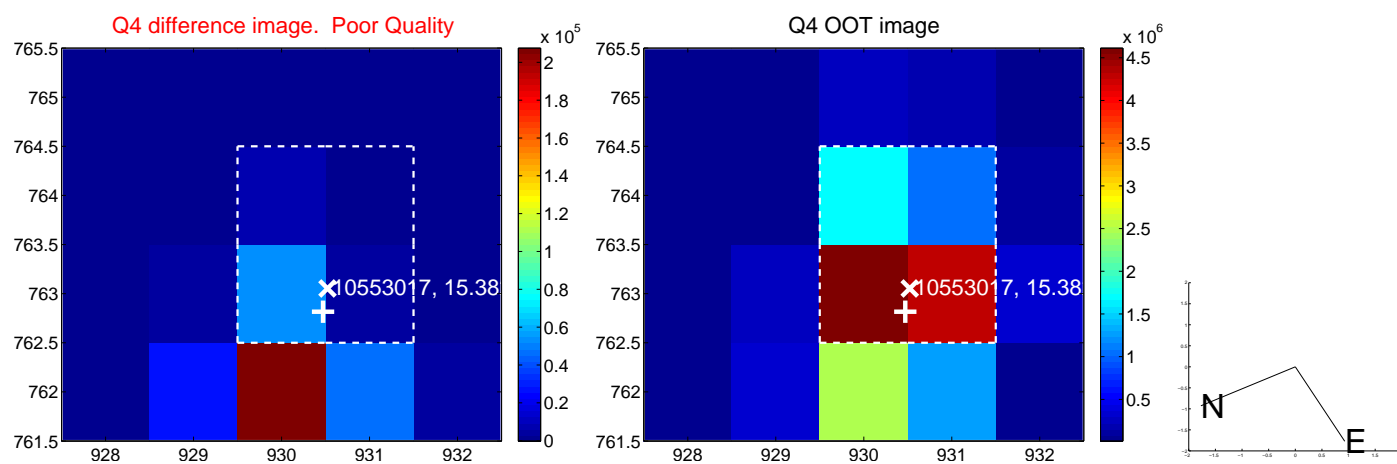
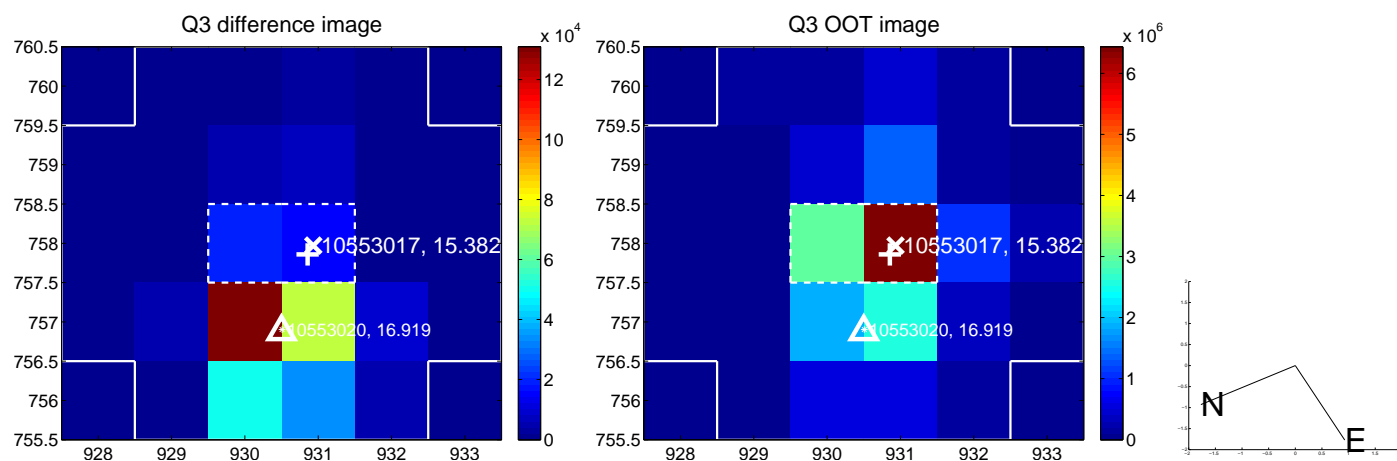
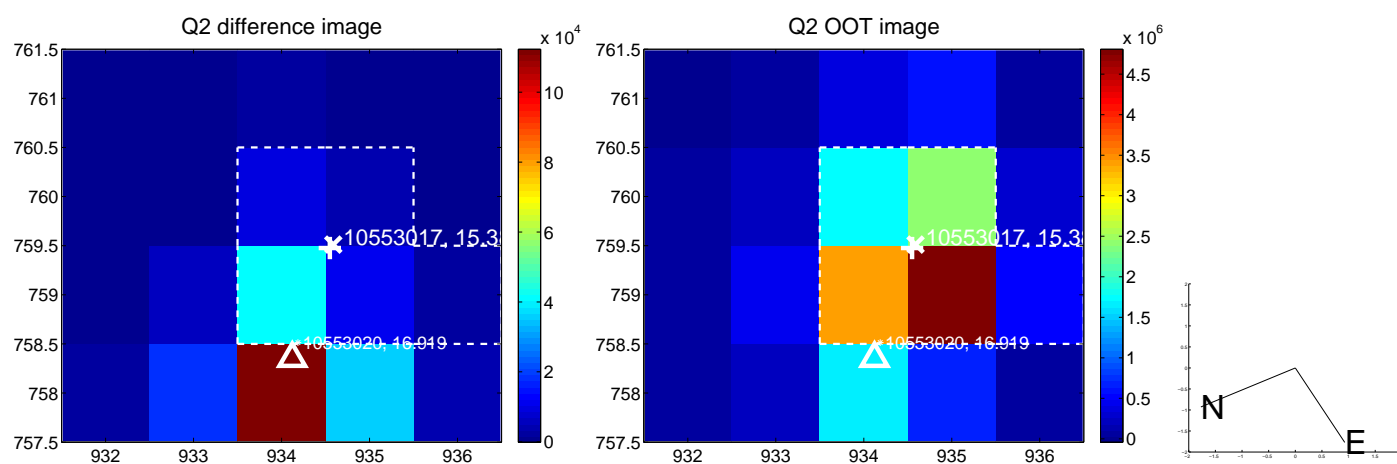
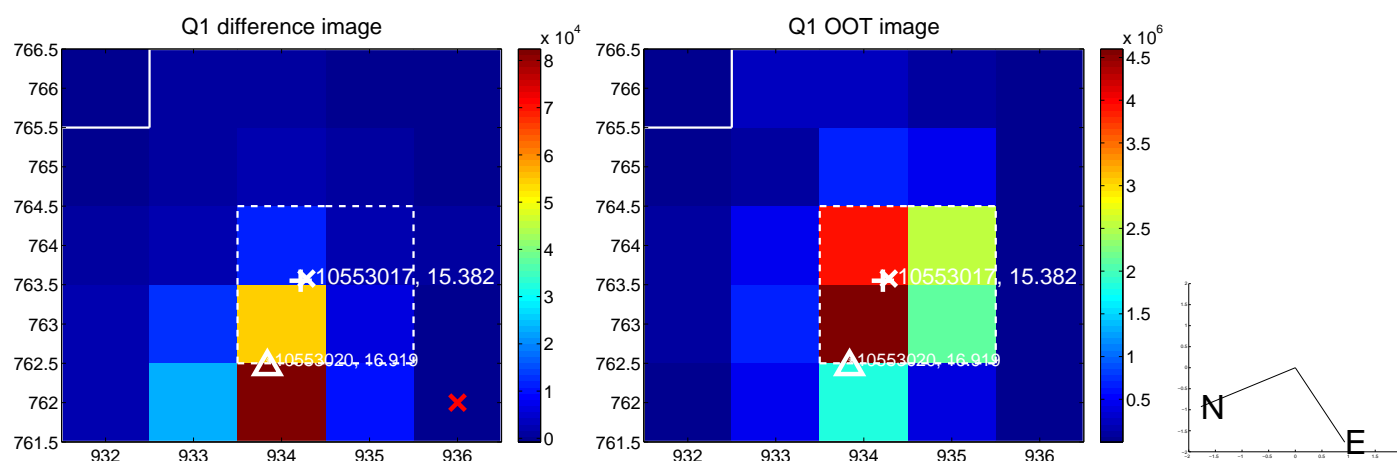
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.576 \pm 0.085$	<b>53.94</b>	$3.055 \pm 0.084$	$3.406 \pm 0.084$
PRF-fit source offset from KIC position	$4.838 \pm 0.075$	<b>64.26</b>	$3.120 \pm 0.068$	$3.698 \pm 0.080$
photometric centroid source offset	$1.33 \pm 0.02$	<b>63.57</b>	$0.96 \pm 0.02$	$0.93 \pm 0.02$



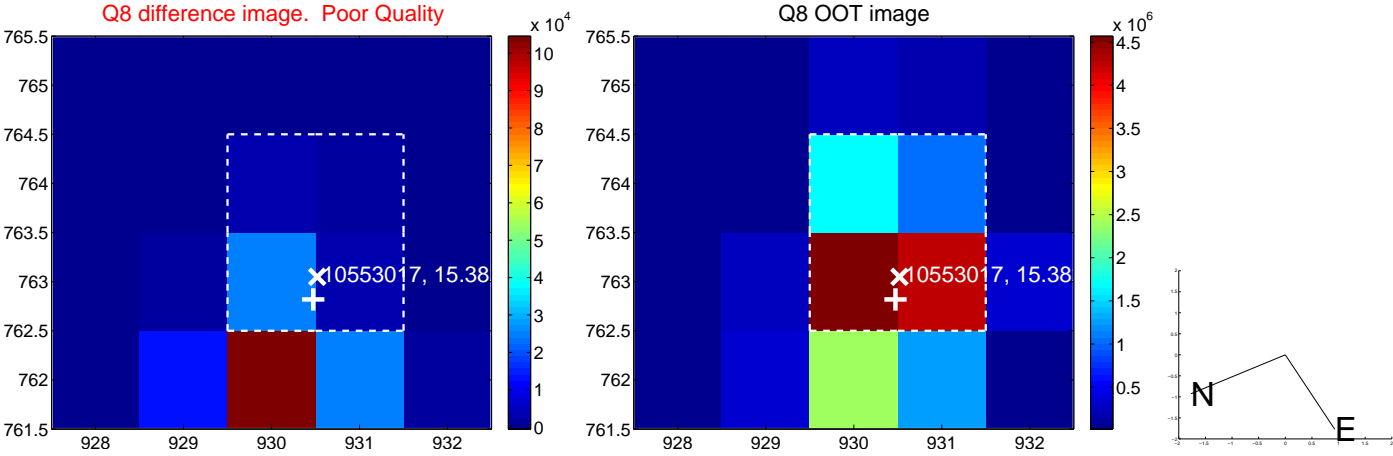
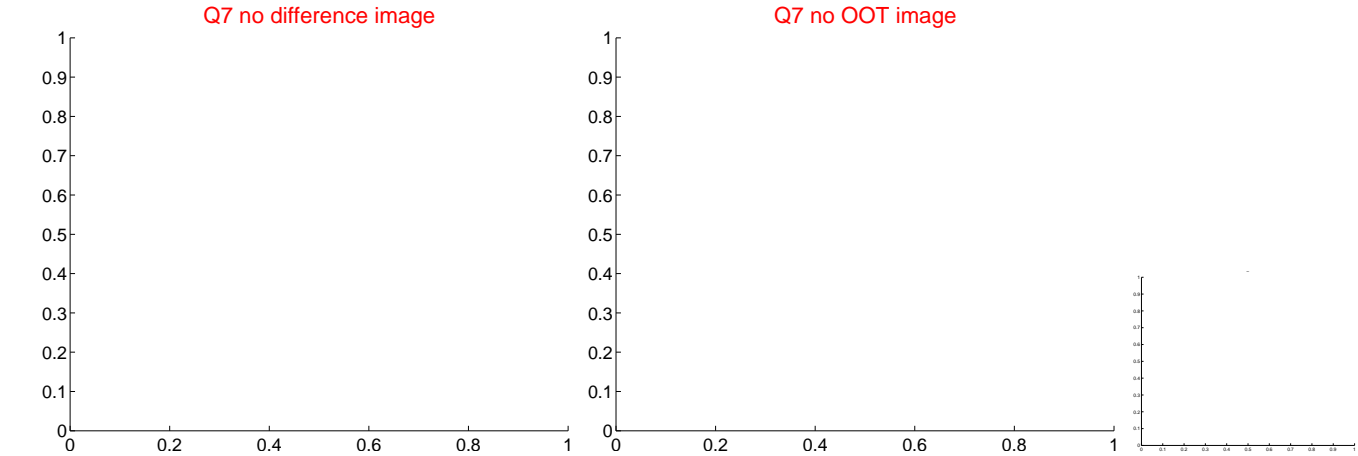
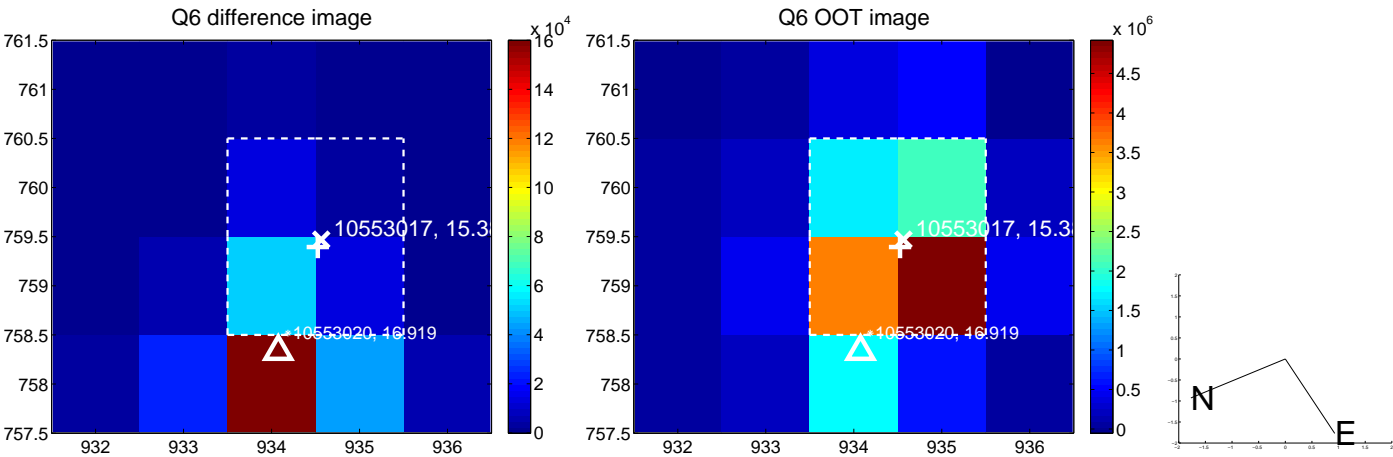
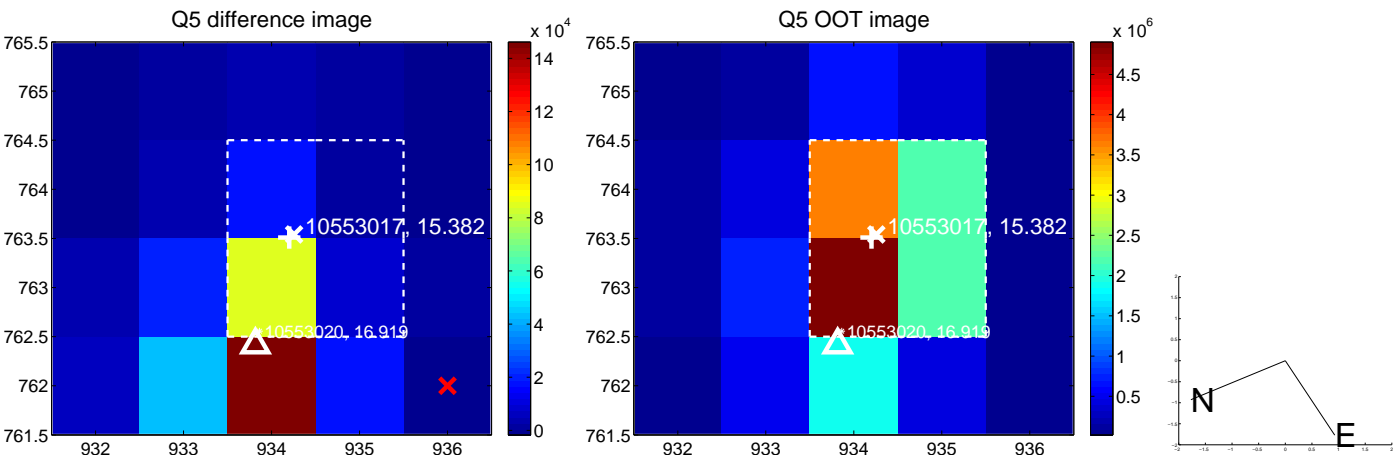
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



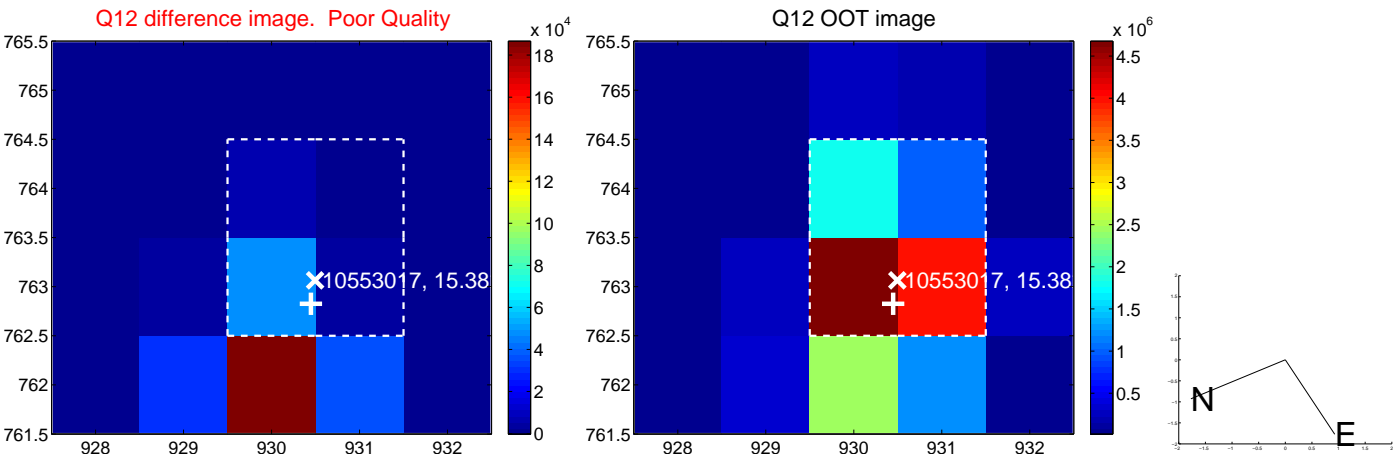
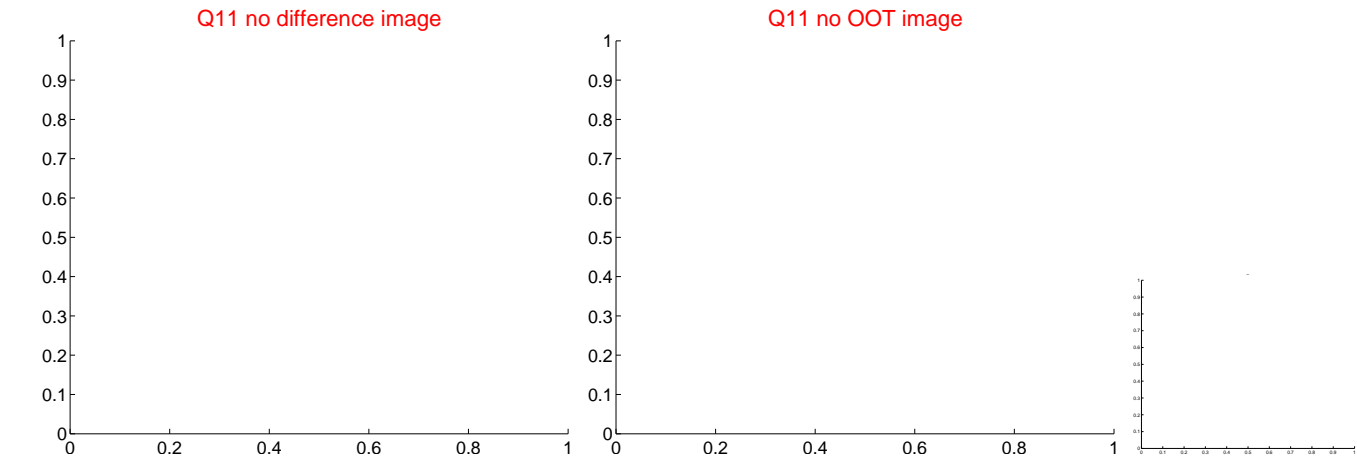
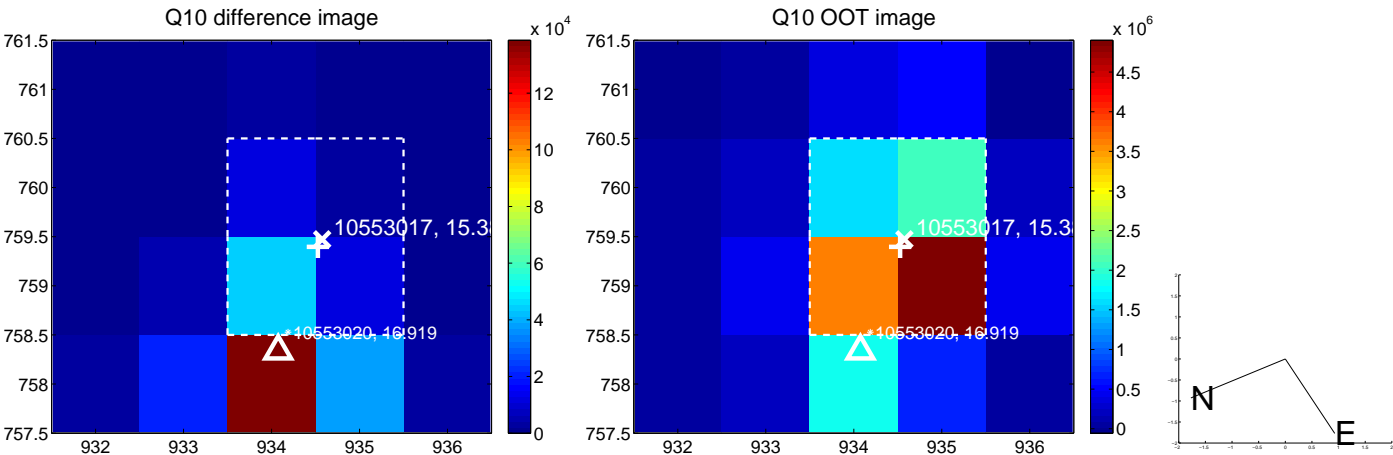
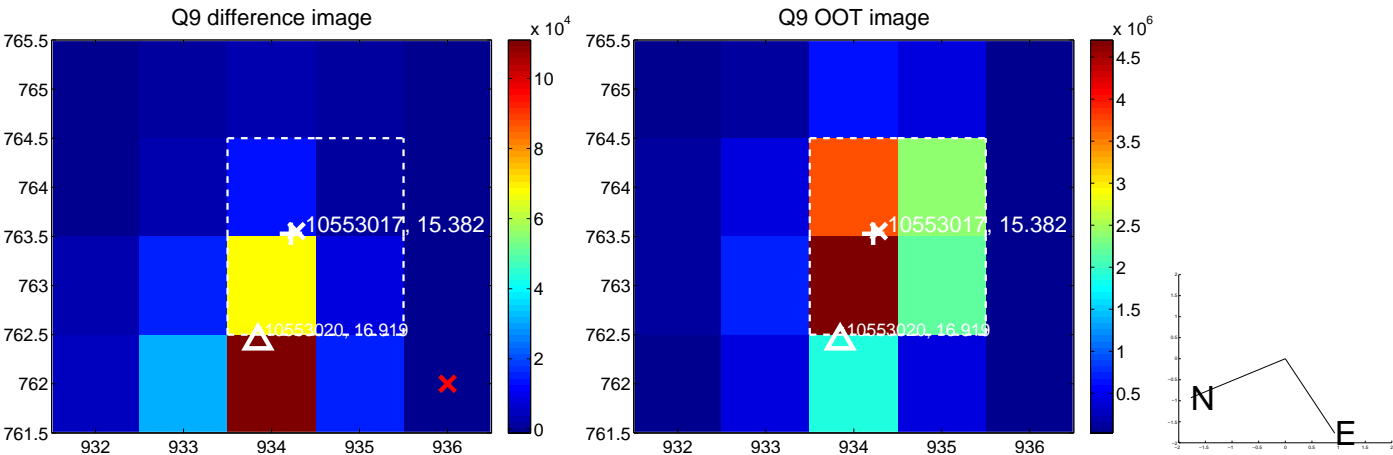
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



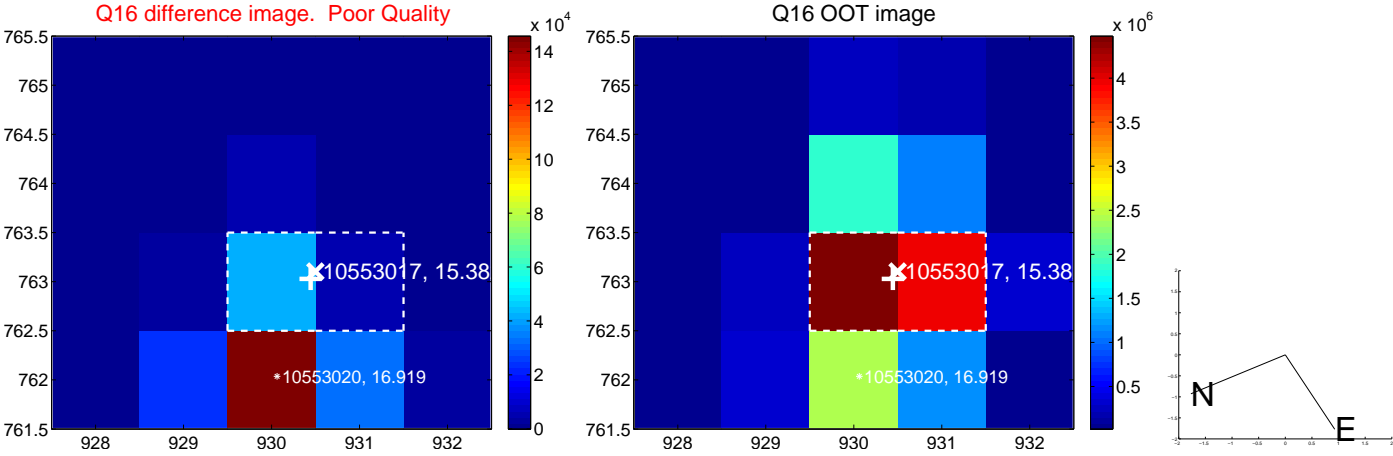
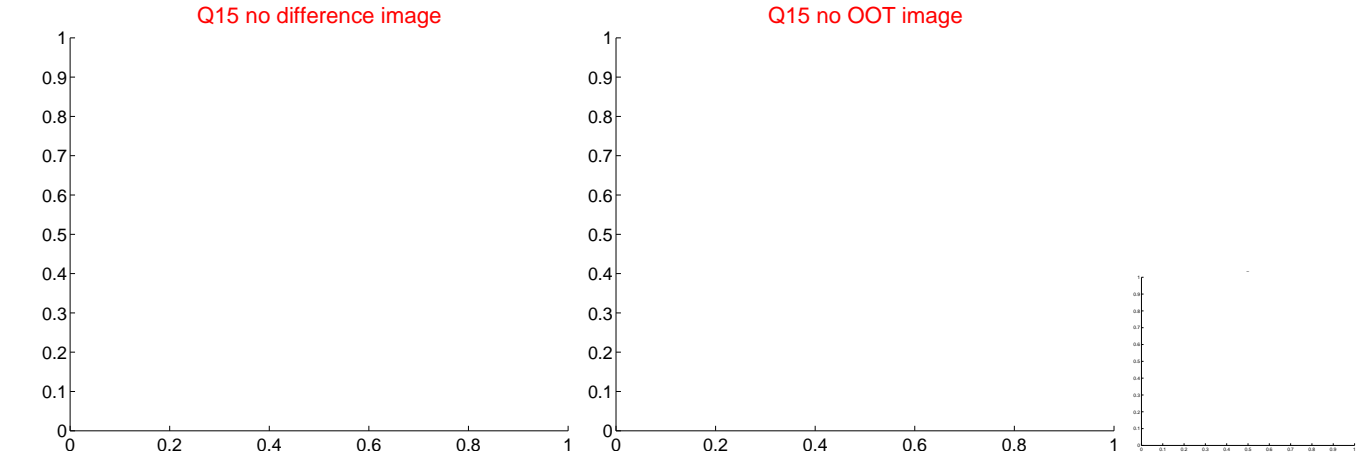
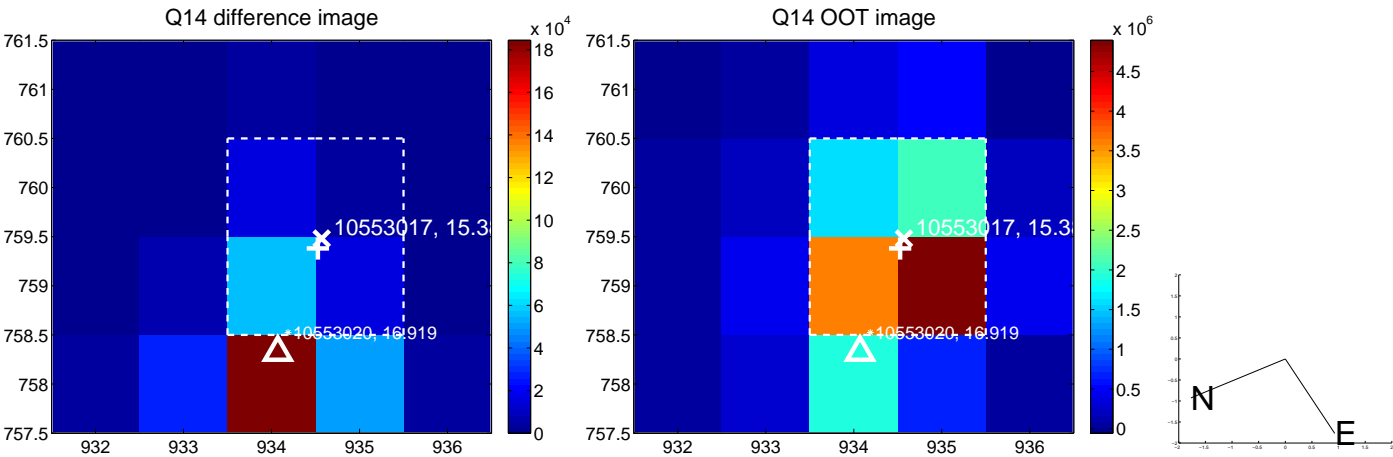
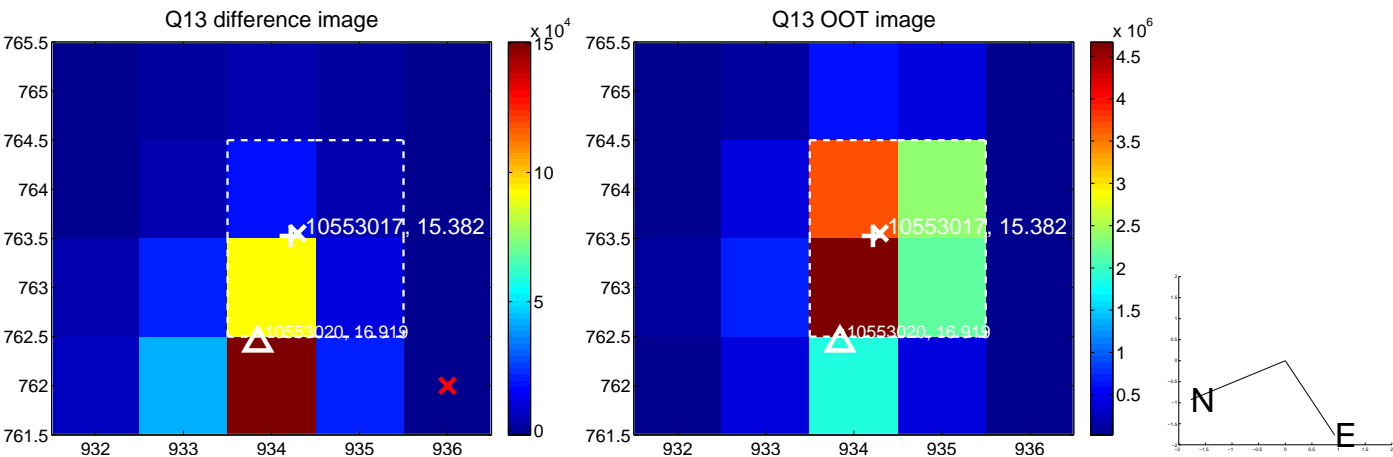
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



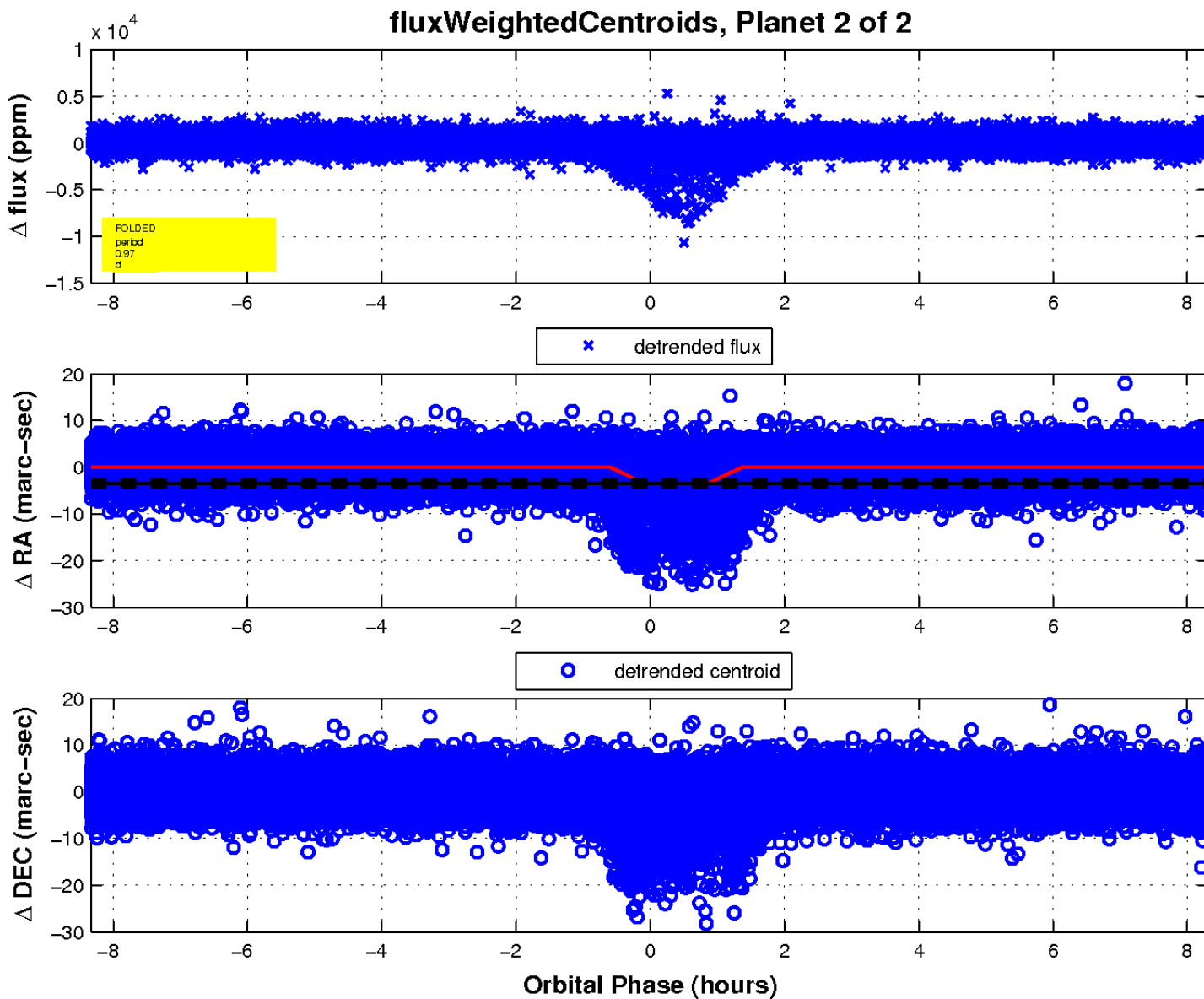
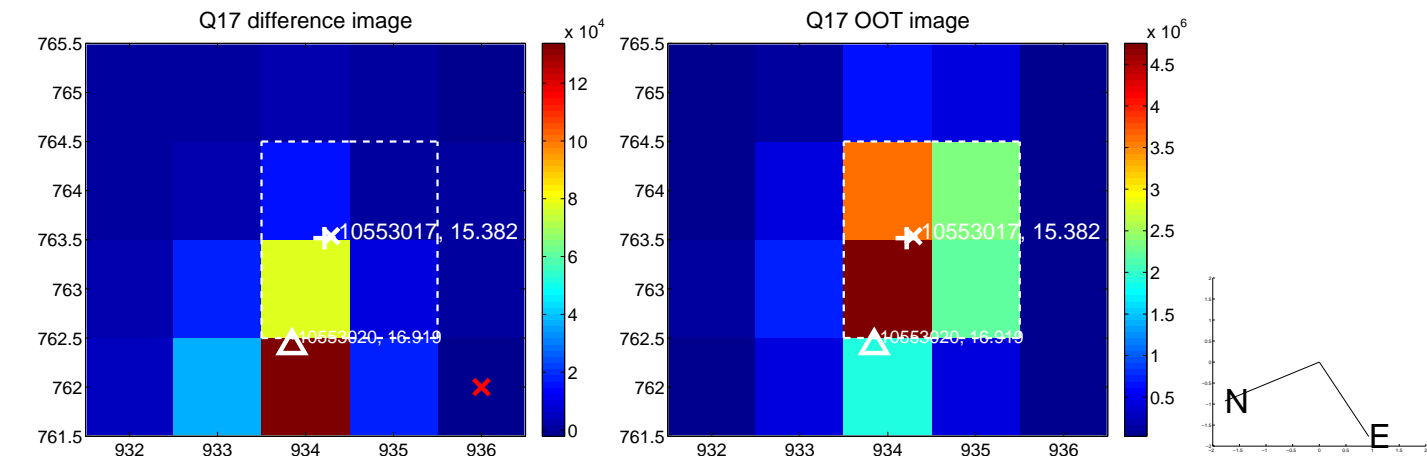
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

