

# KIC 005553652

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005553652-01	OBS	1575.01	24.328226	141.049229	1035.7	5.981	24.0	24.0	0.78	5286	3.42	17.38
005553652-02	OBS	No	24.328069	150.366685	1269.9	3.693	20.9	22.5	0.78	5286	4.67	17.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005553652-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST
005553652-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

**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 005553652-01

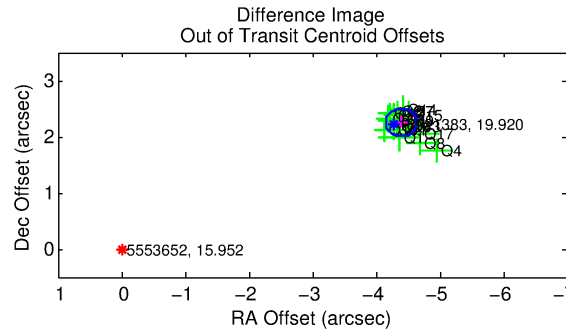
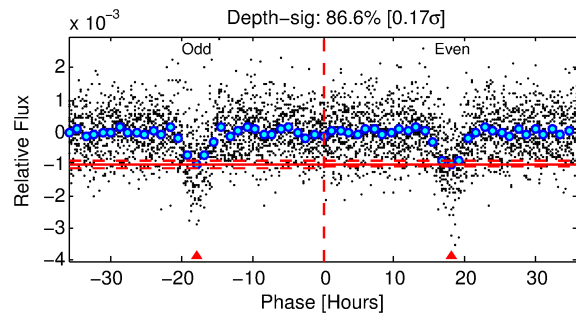
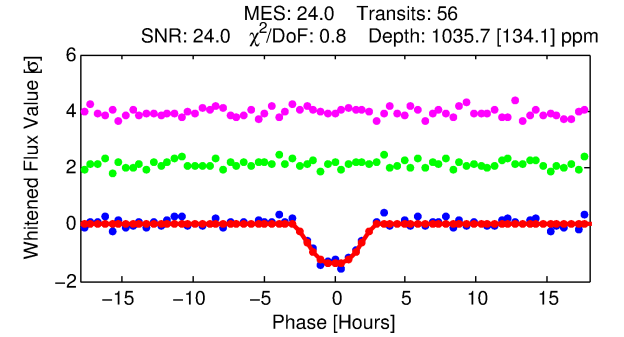
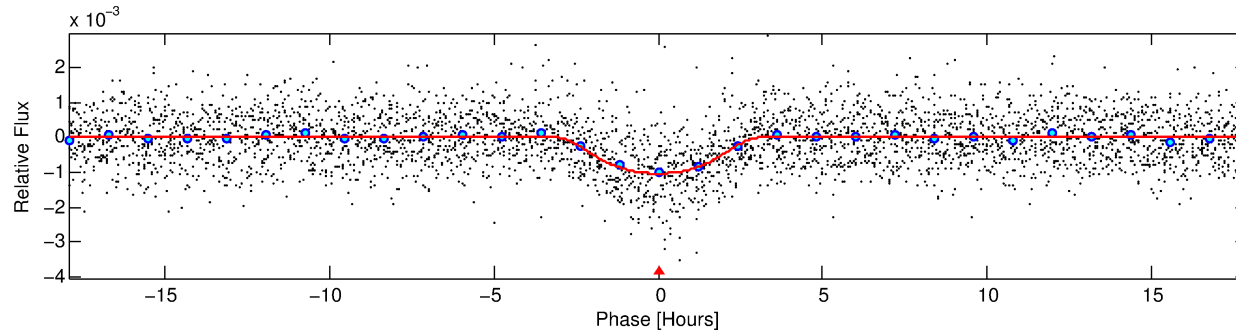
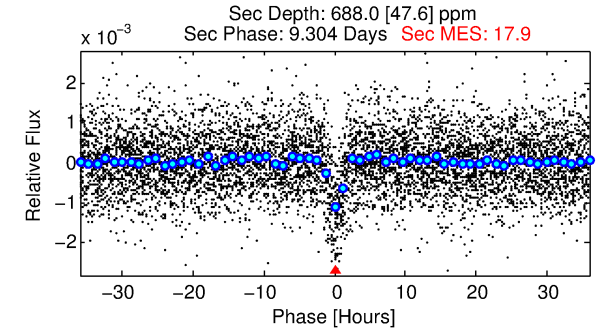
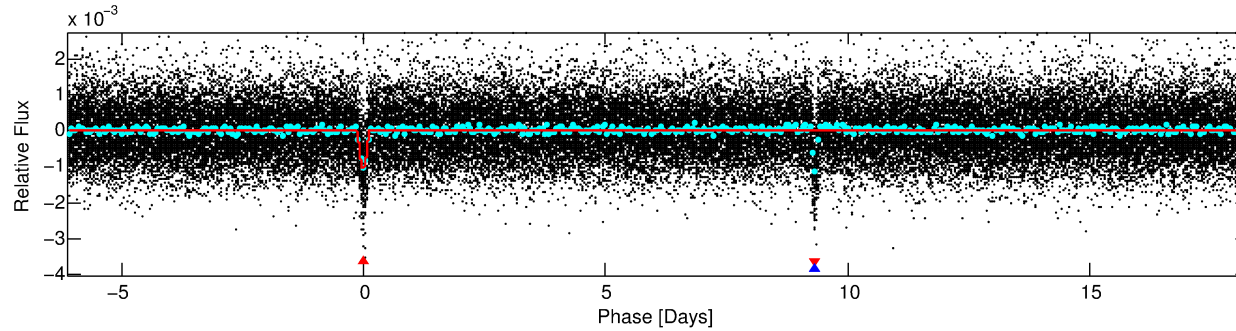
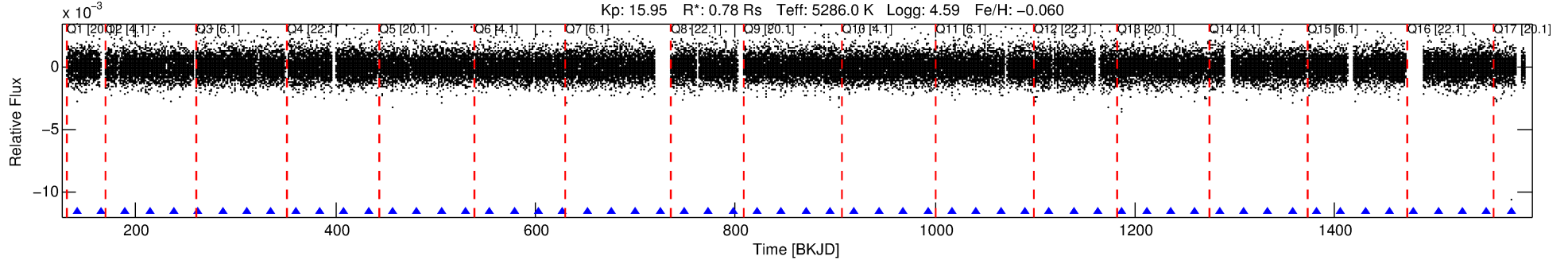
No Significant Match Found

# DV One-Page Summary

KIC: 5553652 Candidate: 1 of 2 Period: 24.328 d

KOI: K01575.01 Corr: 0.988

Kp: 15.95 R\*: 0.78 Rs Teff: 5286.0 K Logg: 4.59 Fe/H: -0.060



## DV Fit Results:

Period = 24.32823 [0.00018] d  
Epoch = 141.0492 [0.0061] BKJD  
Rp/R\* = 0.0402 [0.0061]  
a/R\* = 12.22 [1.58]  
b = 0.96 [0.02]  
Seff = 17.38 [3.92]  
Teq = 521 [29] K  
Rp = 3.42 [0.74] Re  
a = 0.1565 [0.0206] AU  
Ag = 792.85 [287.97] [2.75σ]  
Teffp = 4271 [354] K [10.55σ]

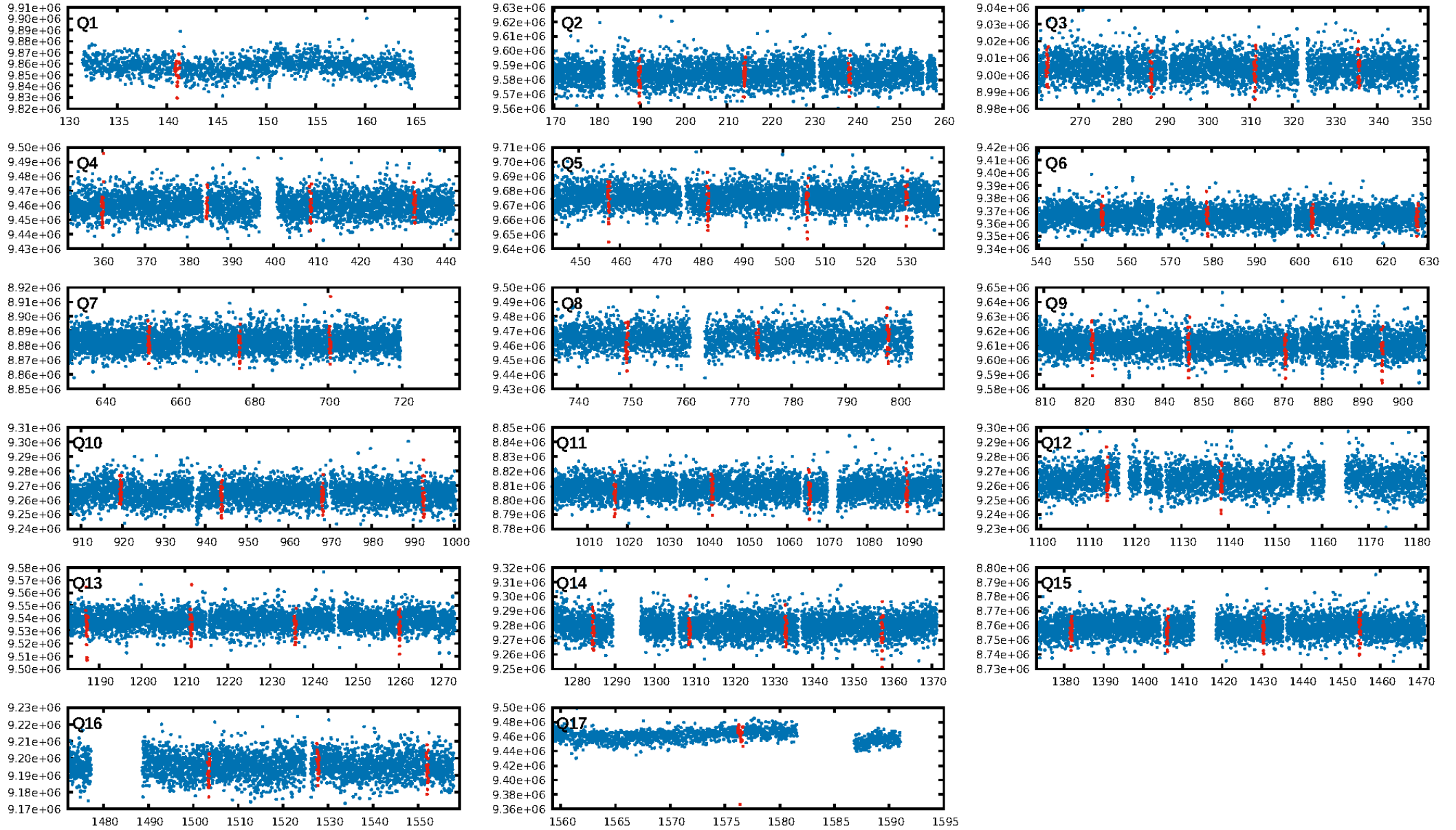
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 2.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 6.83e-128  
RollingBand-fgt: 1.00 [54/54]  
GhostDiagnostic-chr: 0.2375  
Centroid-sig: 0.0%  
Centroid-so: 10.712 arcsec [17.52σ]  
OotOffset-rm: 4.937 arcsec [60.28σ]  
KicOffset-rm: 4.815 arcsec [59.23σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

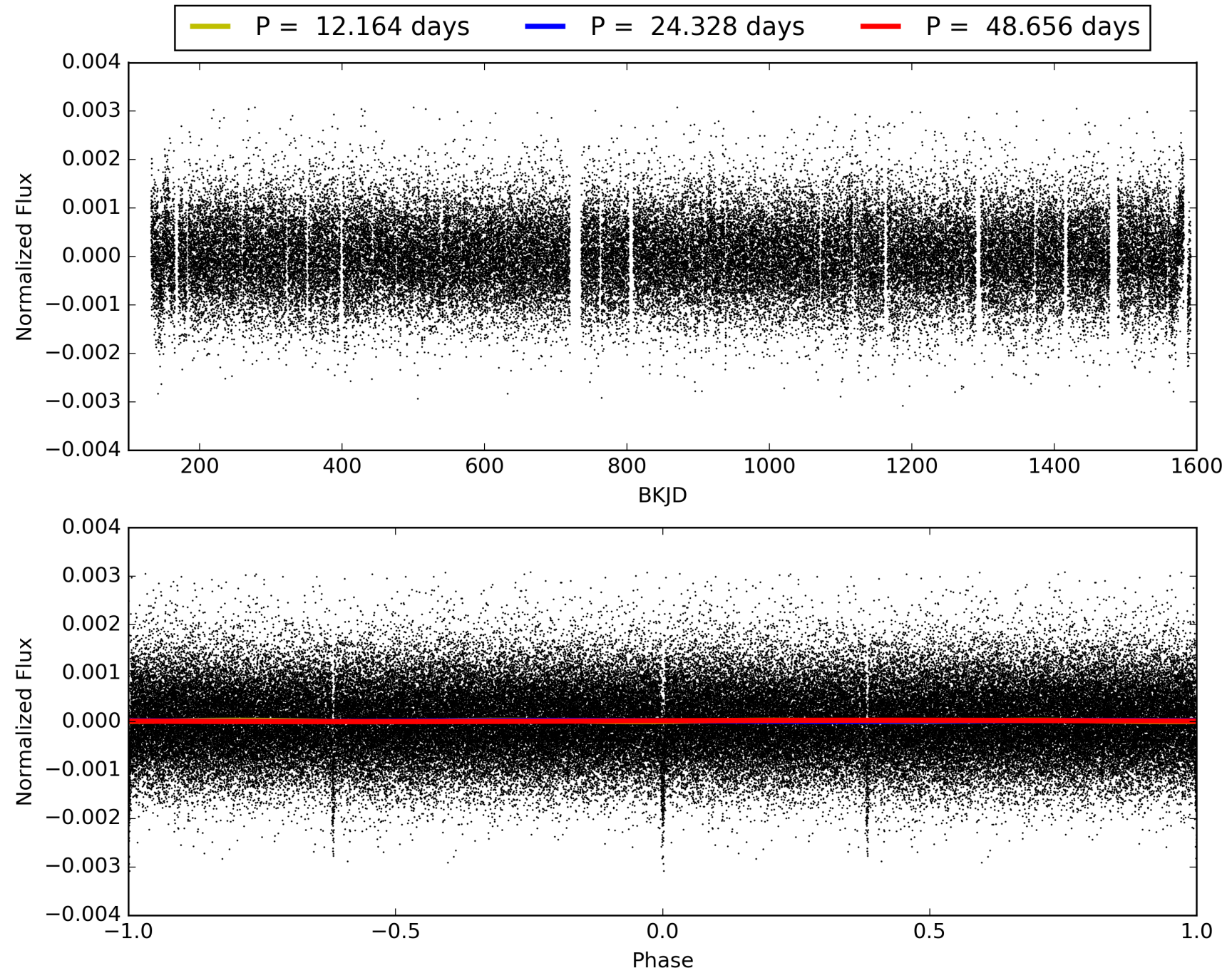
Software Revision: svn-ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:23:15 Z

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

# TCE 005553652-01, PDC Light Curves

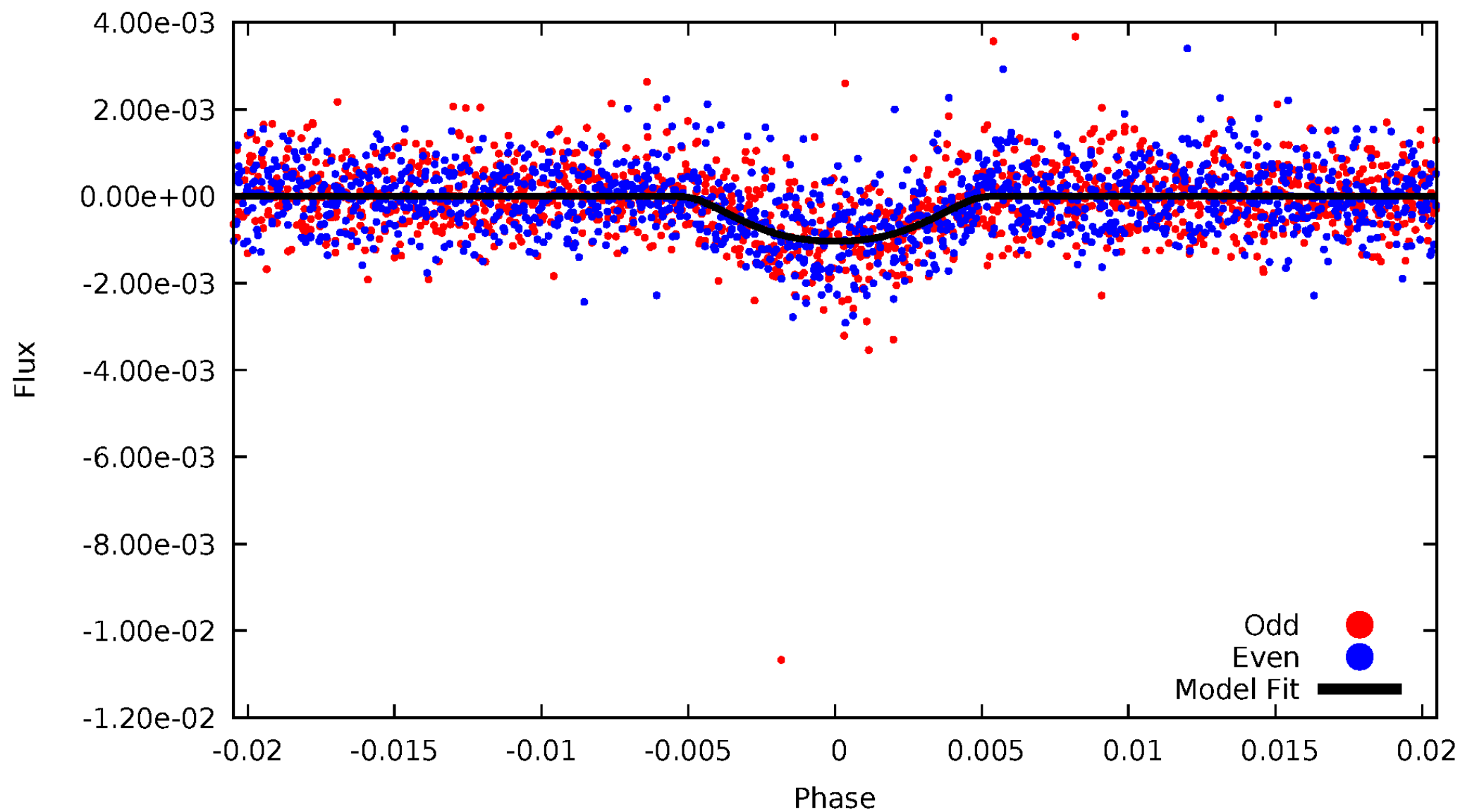


TCE 005553652-01



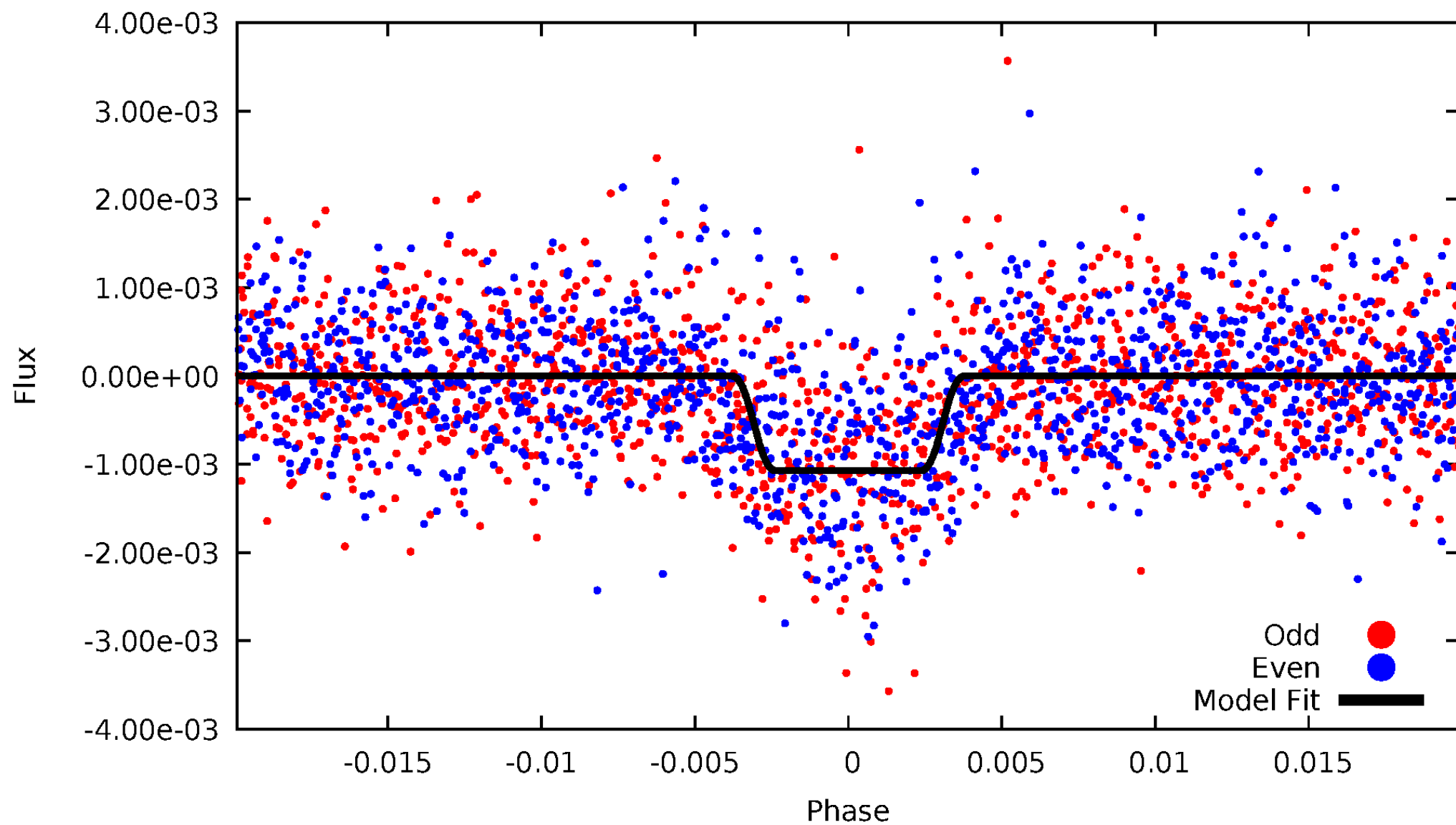
# DV Odd/Even

TCE 005553652-01



# ALT Odd/Even

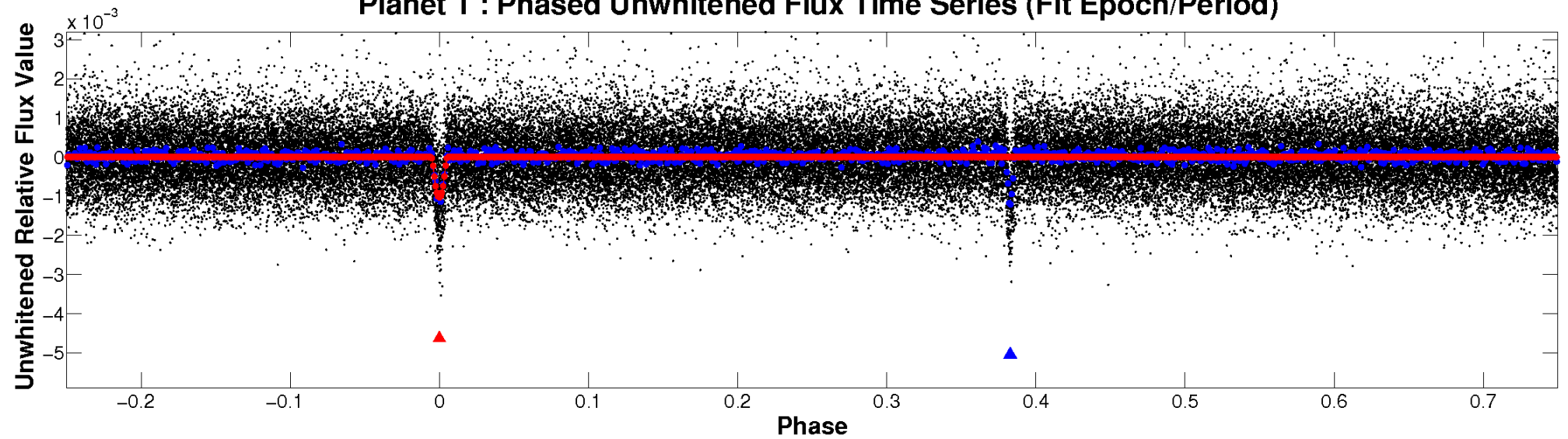
TCE 005553652-01



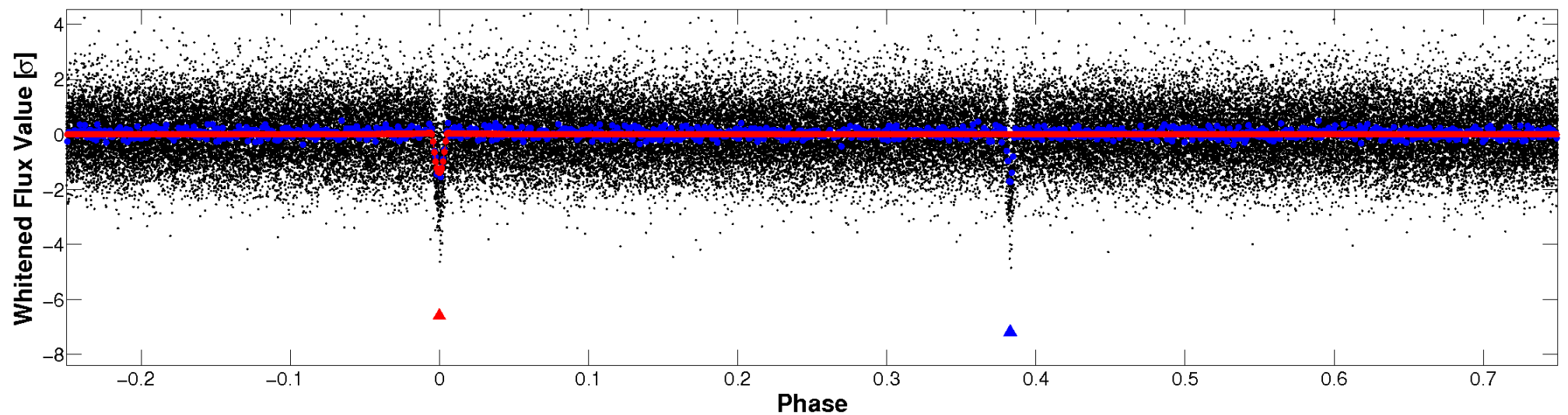


# Non-Whitened Vs. Whitened Light Curve

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

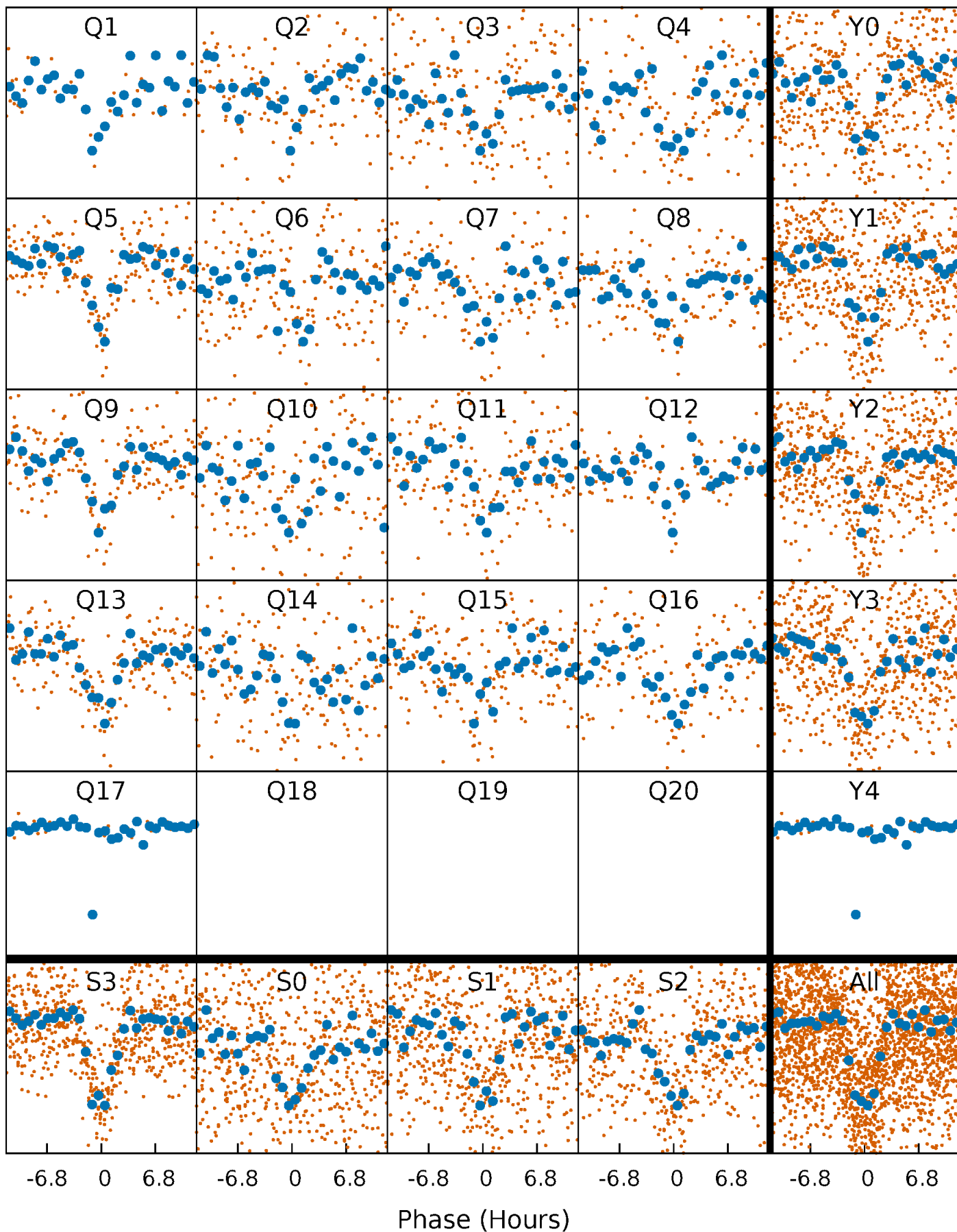


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

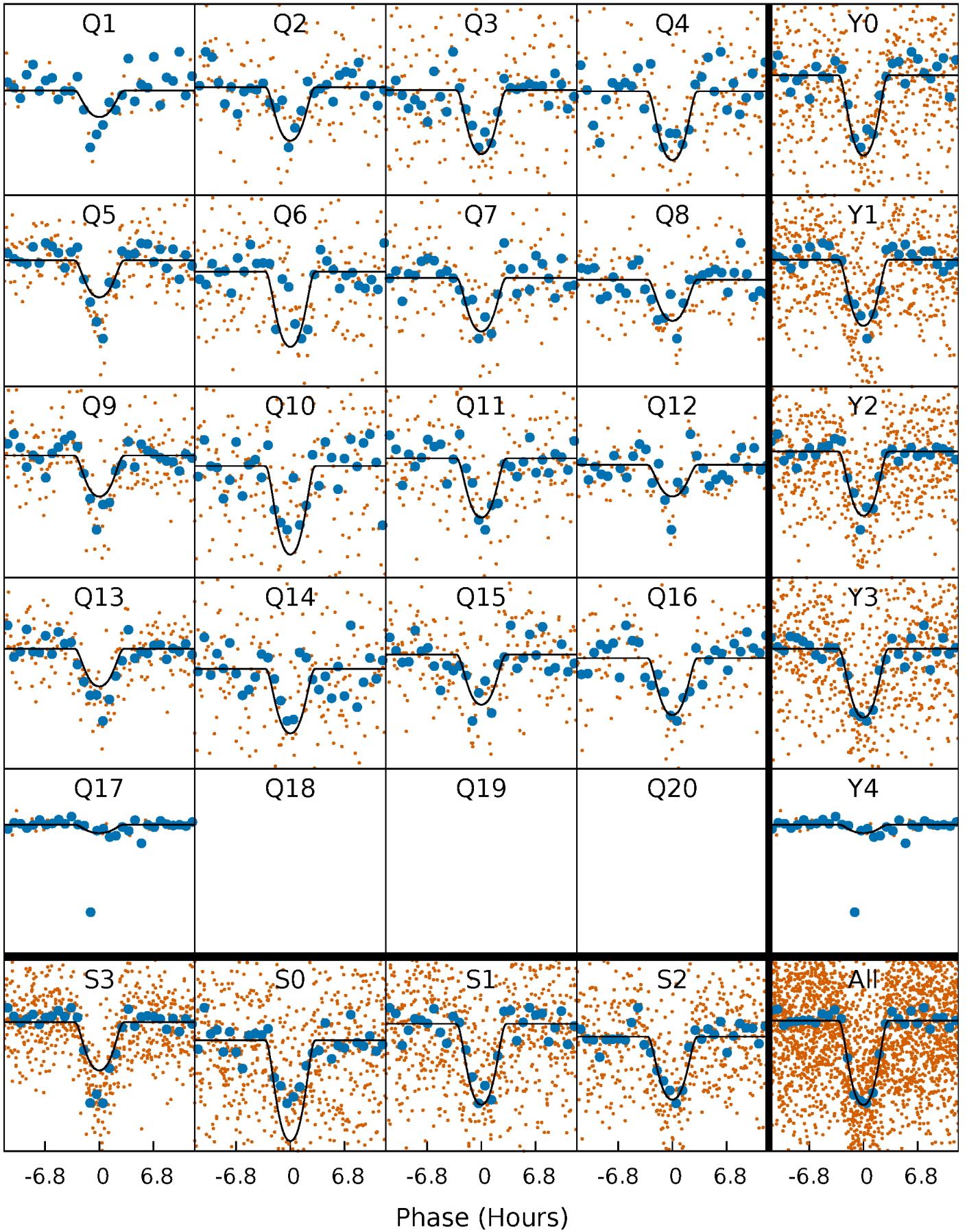
TCE 005553652-01 P= 24.328226 Days  $T_0=141.049229$  (BKJD)





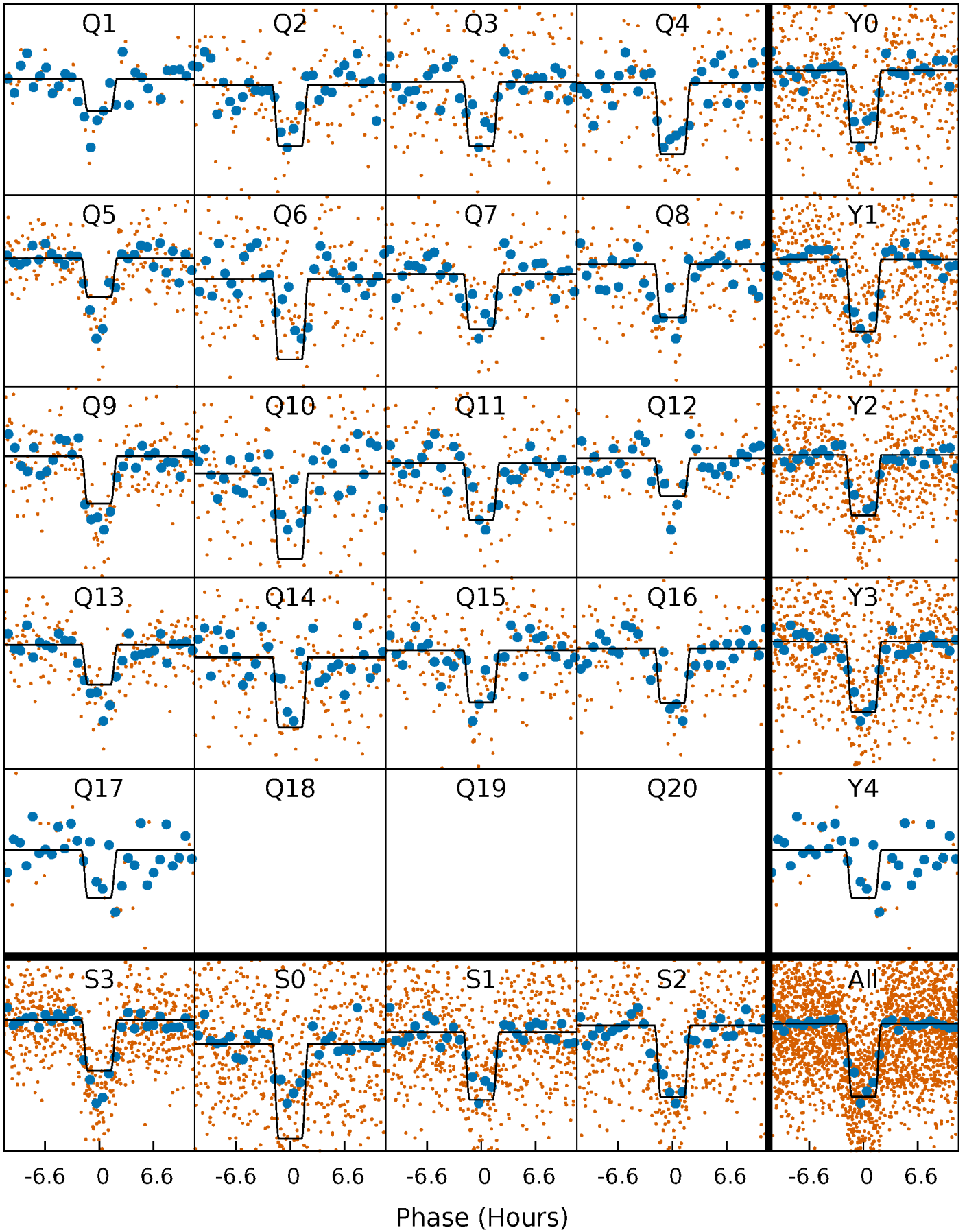
# DV Quarter-Phased Transit Curves

TCE 005553652-01 P= 24.328226 Days  $T_0=141.049229$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

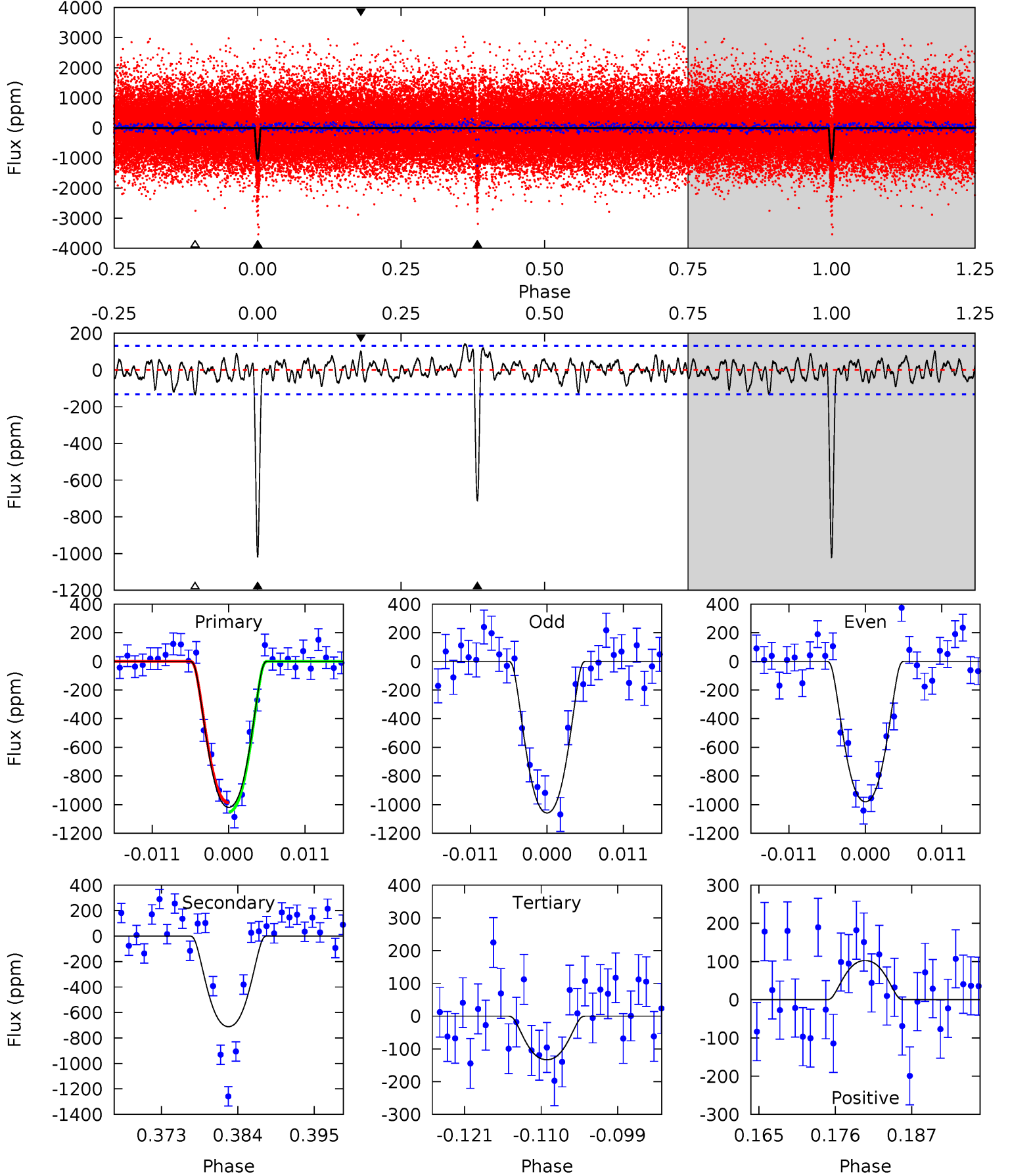
TCE 005553652-01 P= 24.327782 Days  $T_0=141.064336$  (BKJD)



# DV Model-Shift Uniqueness Test

005553652-01, P = 24.328226 Days, E = 116.721003 Days

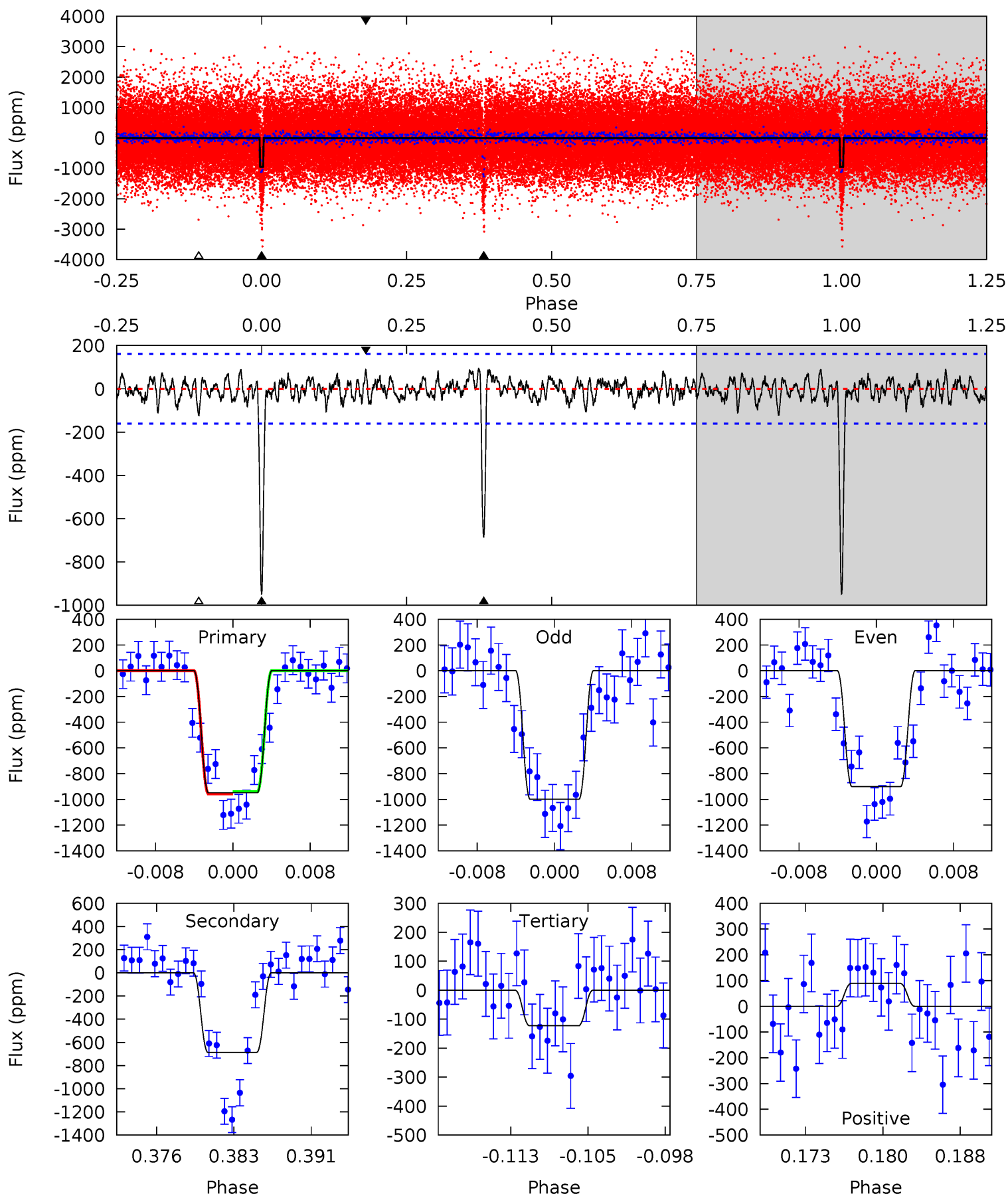
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
38.7	27.0	5.05	3.89	5.01	2.54	1.56	33.6	34.8	22.0	23.1	1.49	1.05	0.12	1.22



# Alt Model-Shift Uniqueness Test

005553652-01, P = 24.327782 Days, E = 116.736554 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
30.0	21.7	3.88	2.82	5.08	2.67	1.17	26.1	27.2	17.8	18.9	1.56	1.04	0.09	0.25



### Stellar Parameters For KIC 005553652

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5286^{+159}_{-159}$	$4.590^{+0.032}_{-0.104}$	$-0.060^{+0.300}_{-0.300}$	$0.780^{+0.122}_{-0.066}$	$0.872^{+0.061}_{-0.104}$	$2.585^{+0.467}_{-0.831}$
	+3%/-3%	+1%/-2%	+500%/-500%	+16%/-8%	+7%/-12%	+18%/-32%
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 005553652-01 / KOI 1575.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-711 \pm 26$	$3.51^{+0.59}_{-0.57}$	$737^{+31}_{-29}$	$4461^{+315}_{-251}$	$762^{+305}_{-189}$
Alt.	$-686 \pm 32$	$2.90^{+0.57}_{-0.56}$	$738^{+31}_{-29}$	$4797^{+426}_{-351}$	$1084^{+571}_{-318}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$



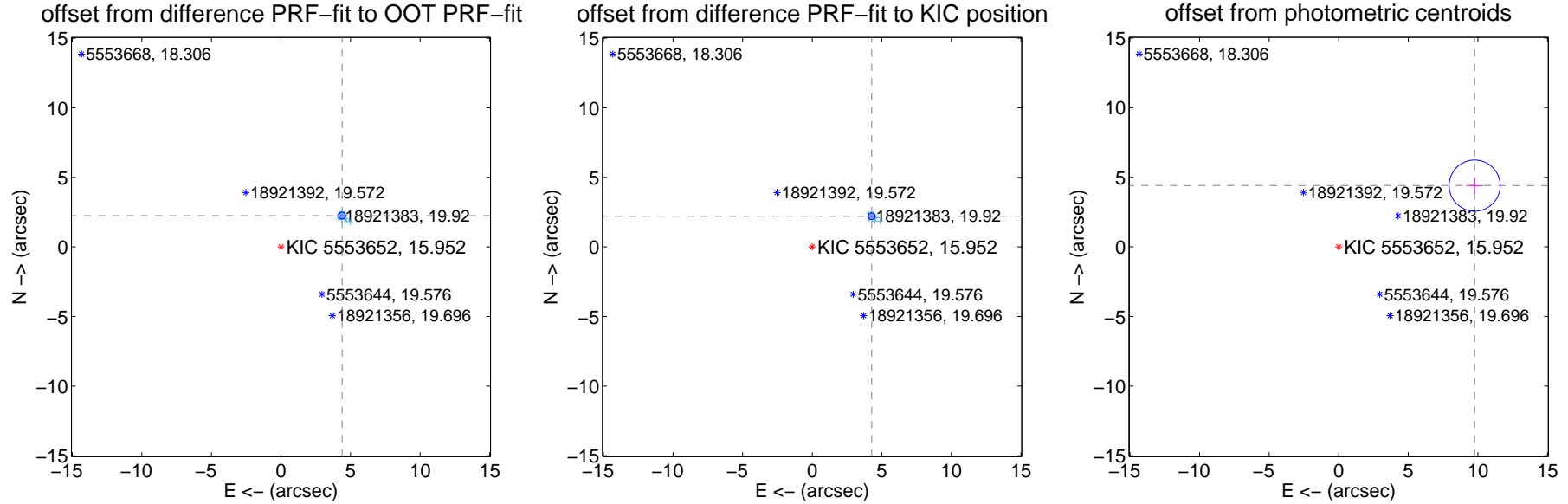
## DV Centroid Data

Supplemental centroid analysis for 005553652-01. Kepler magnitude: 15.95. Transit SNR 24.02

There are 17 quarters with good PRF difference image offsets

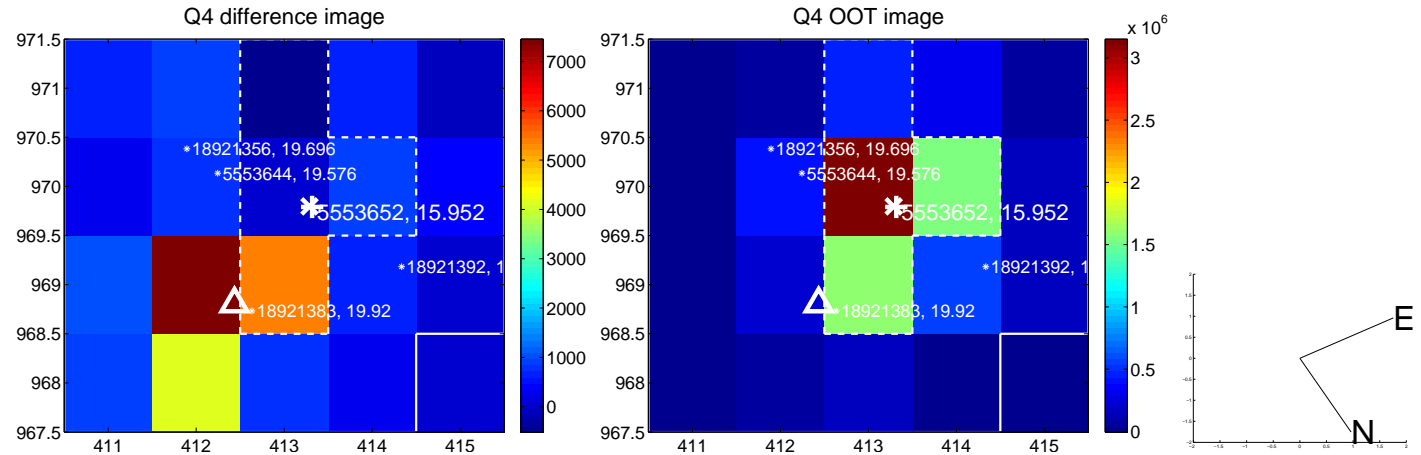
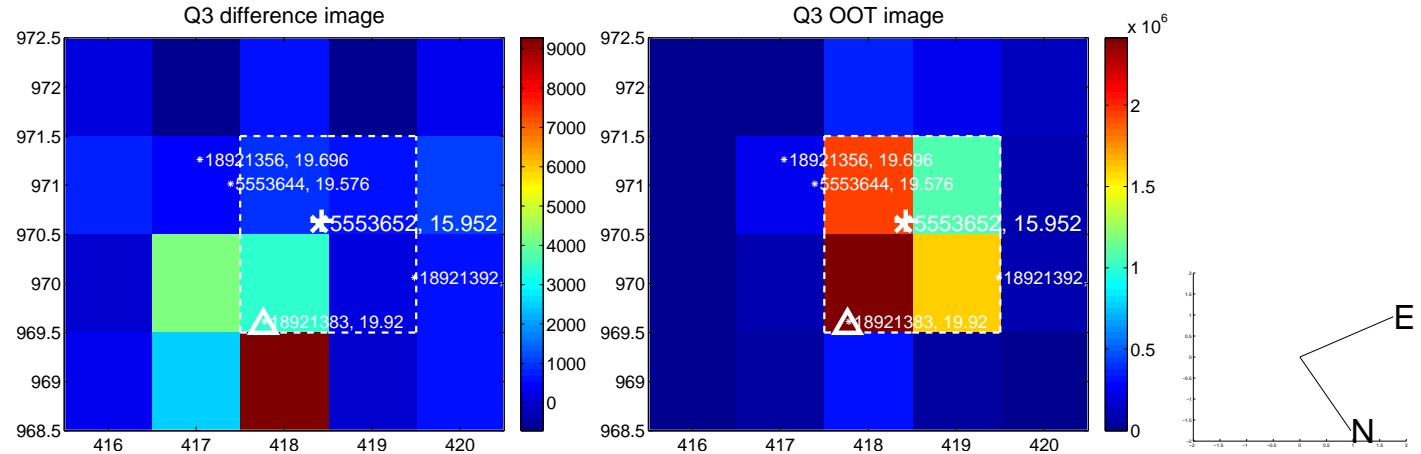
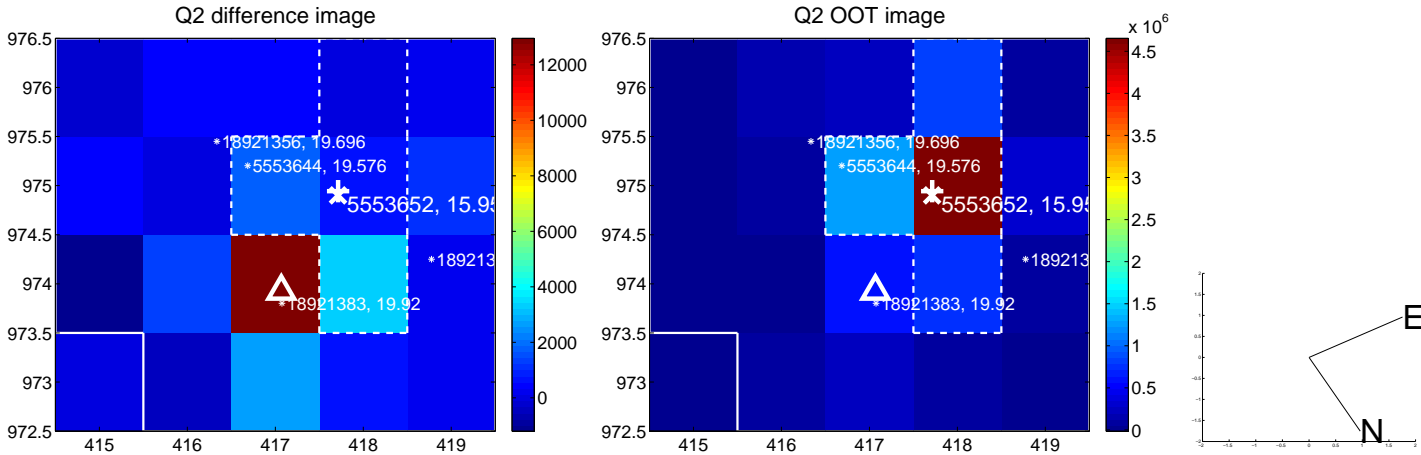
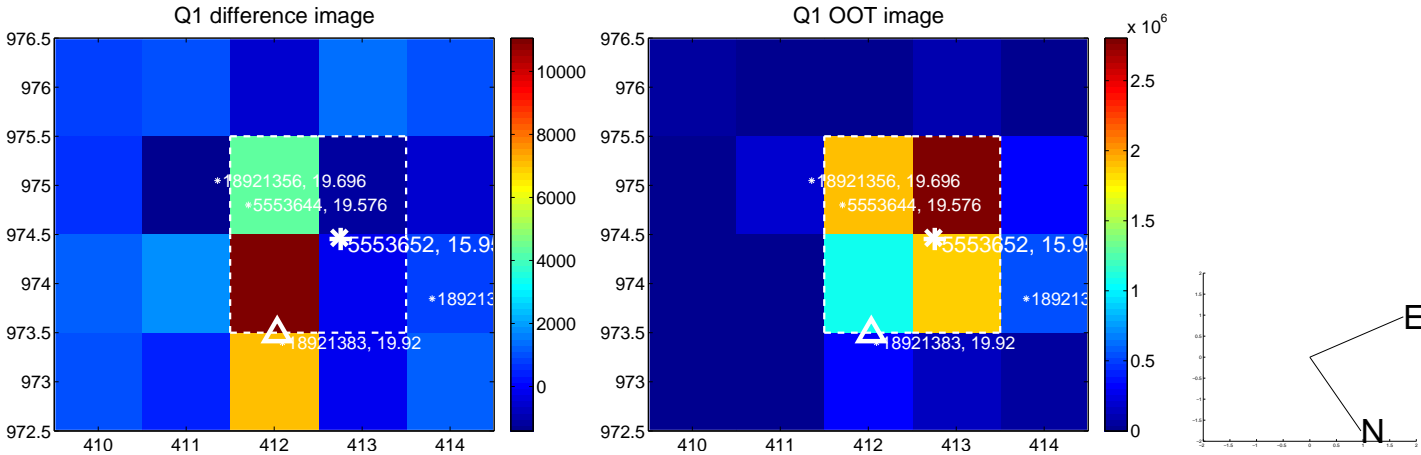
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.937 \pm 0.082$	60.28	$-4.394 \pm 0.082$	$2.251 \pm 0.083$
PRF-fit source offset from KIC position	$4.815 \pm 0.081$	59.23	$-4.279 \pm 0.081$	$2.208 \pm 0.080$
photometric centroid source offset	$10.71 \pm 0.61$	17.52	$-9.76 \pm 0.62$	$4.40 \pm 0.56$

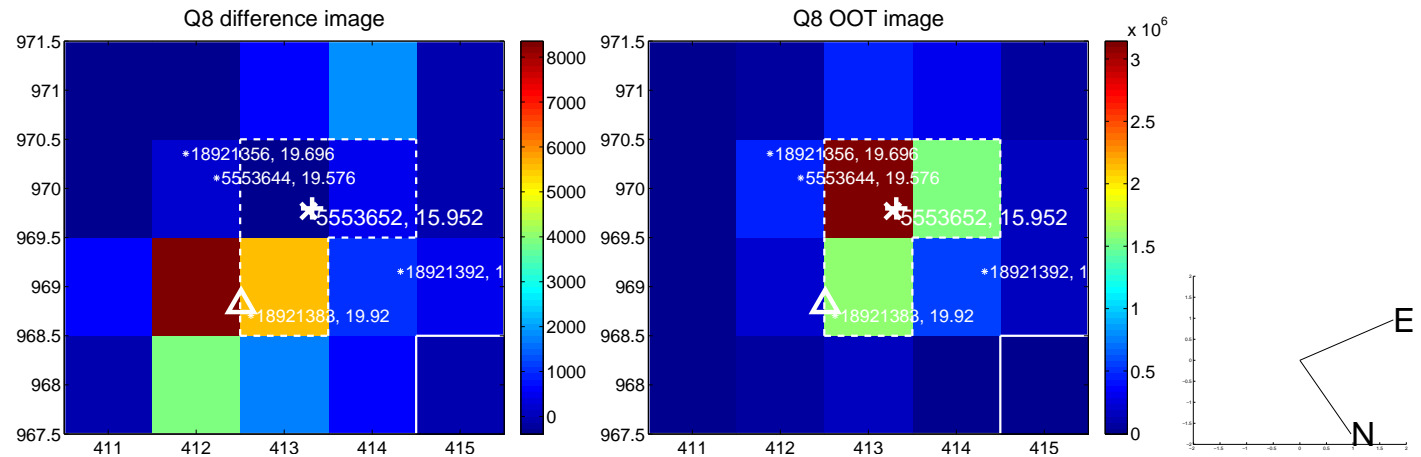
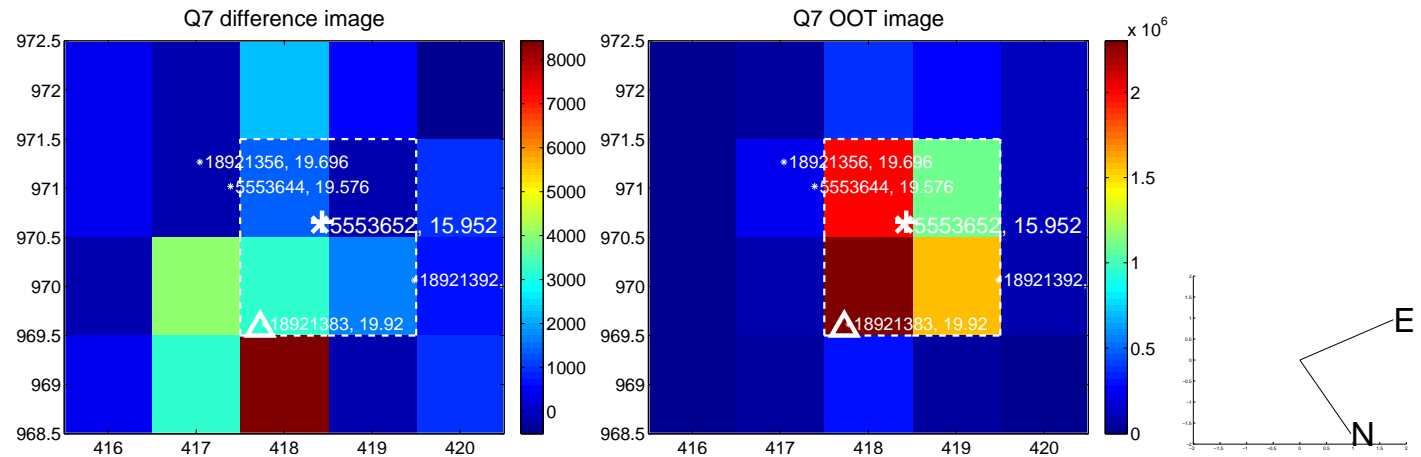
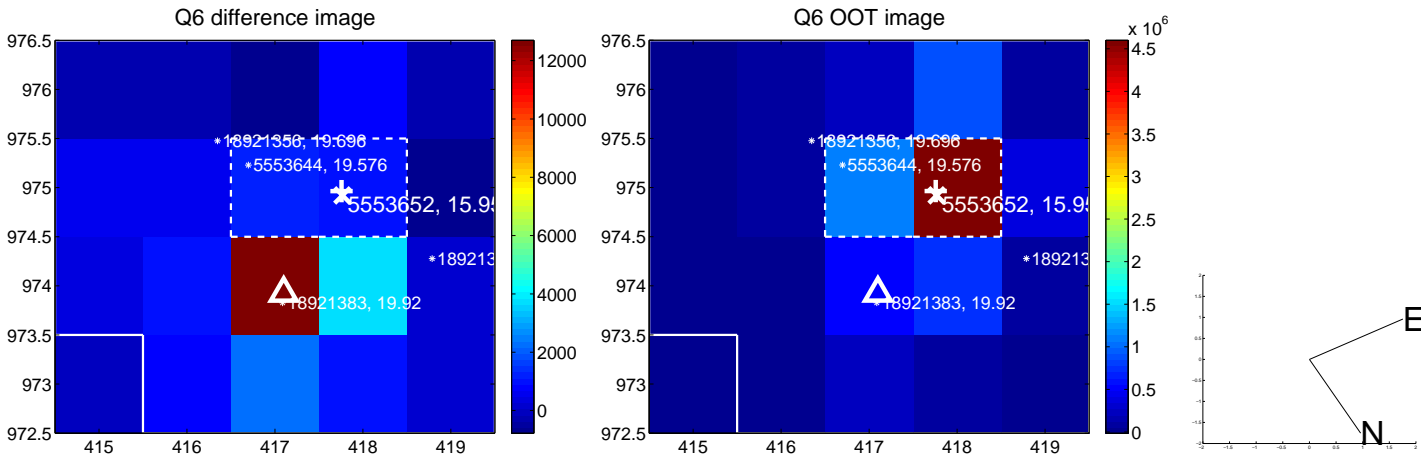
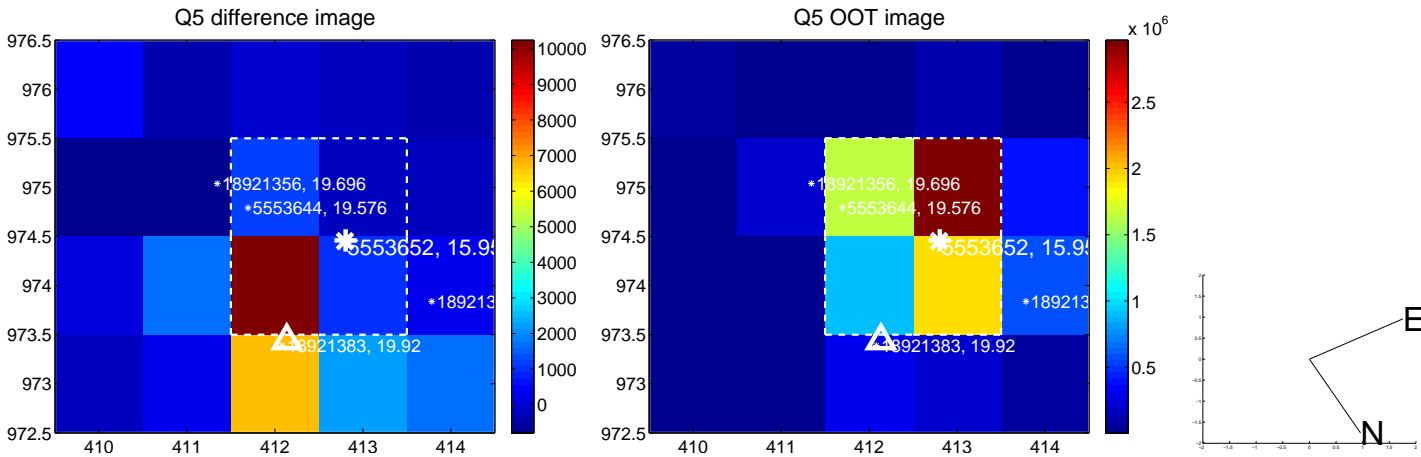


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

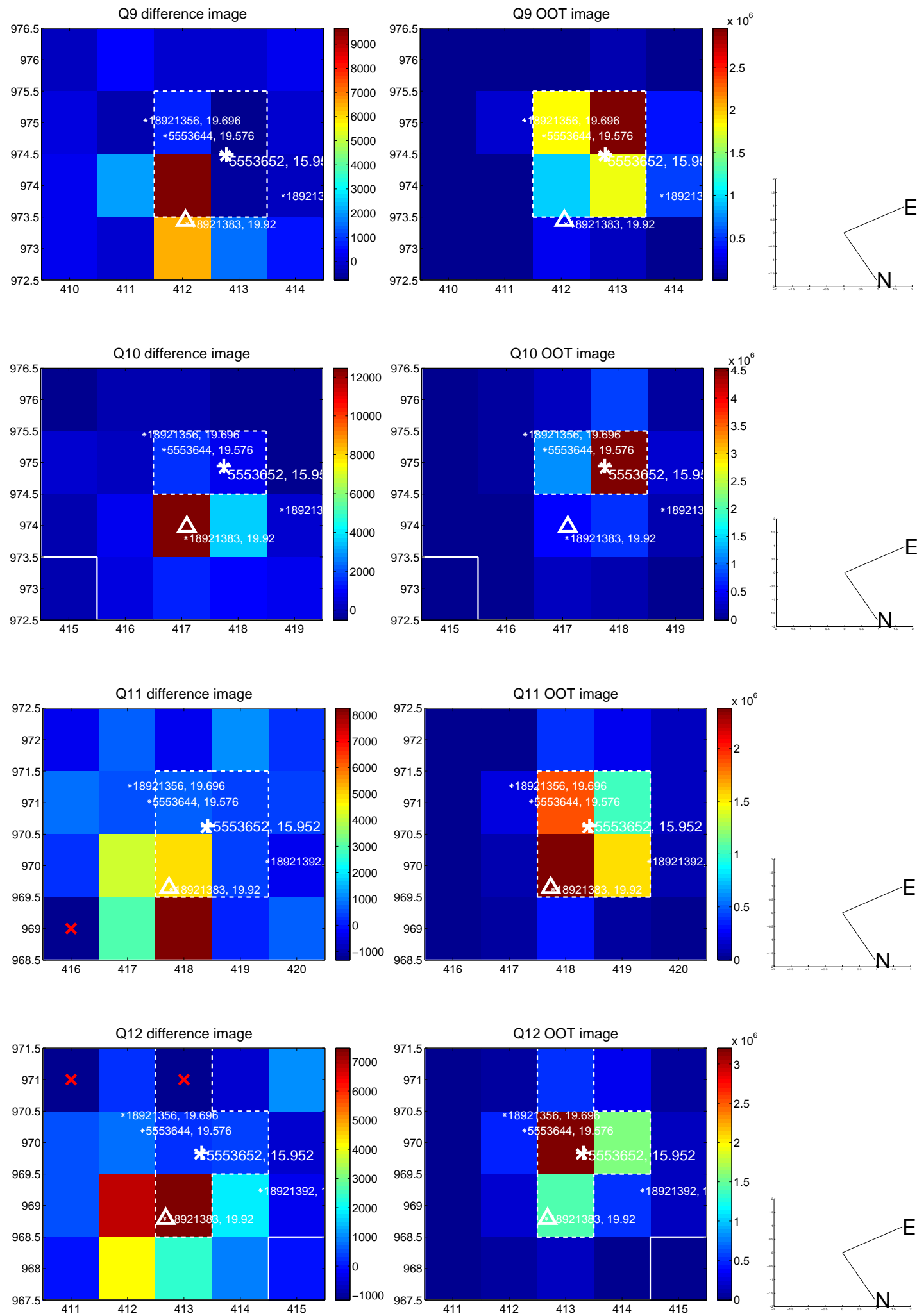
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



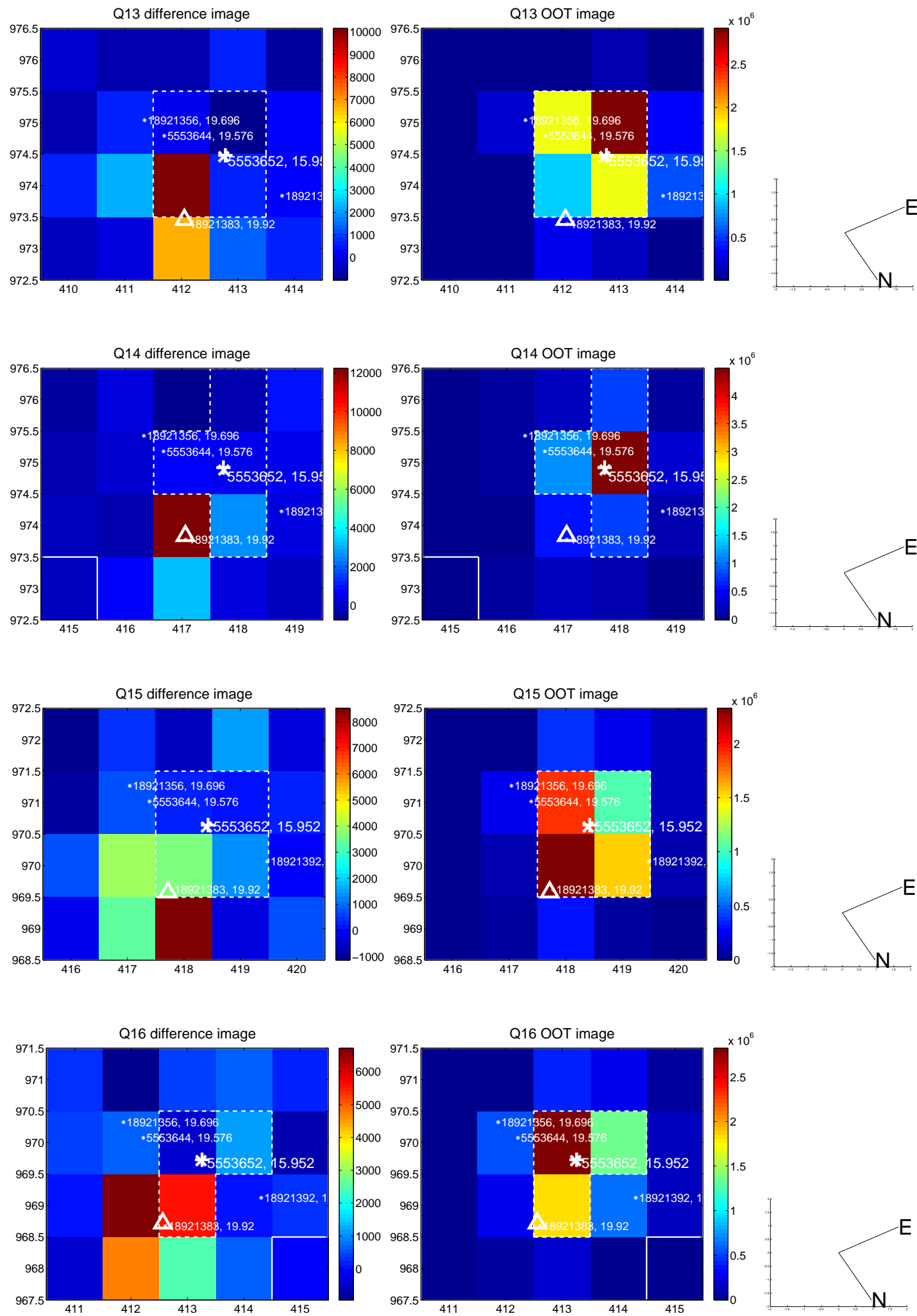
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

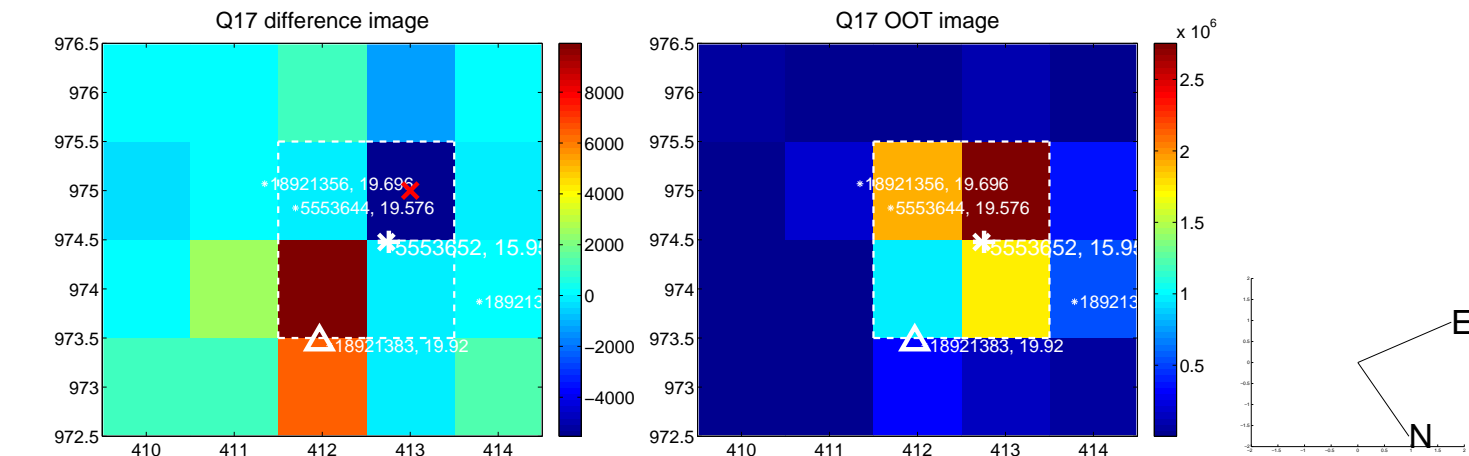


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

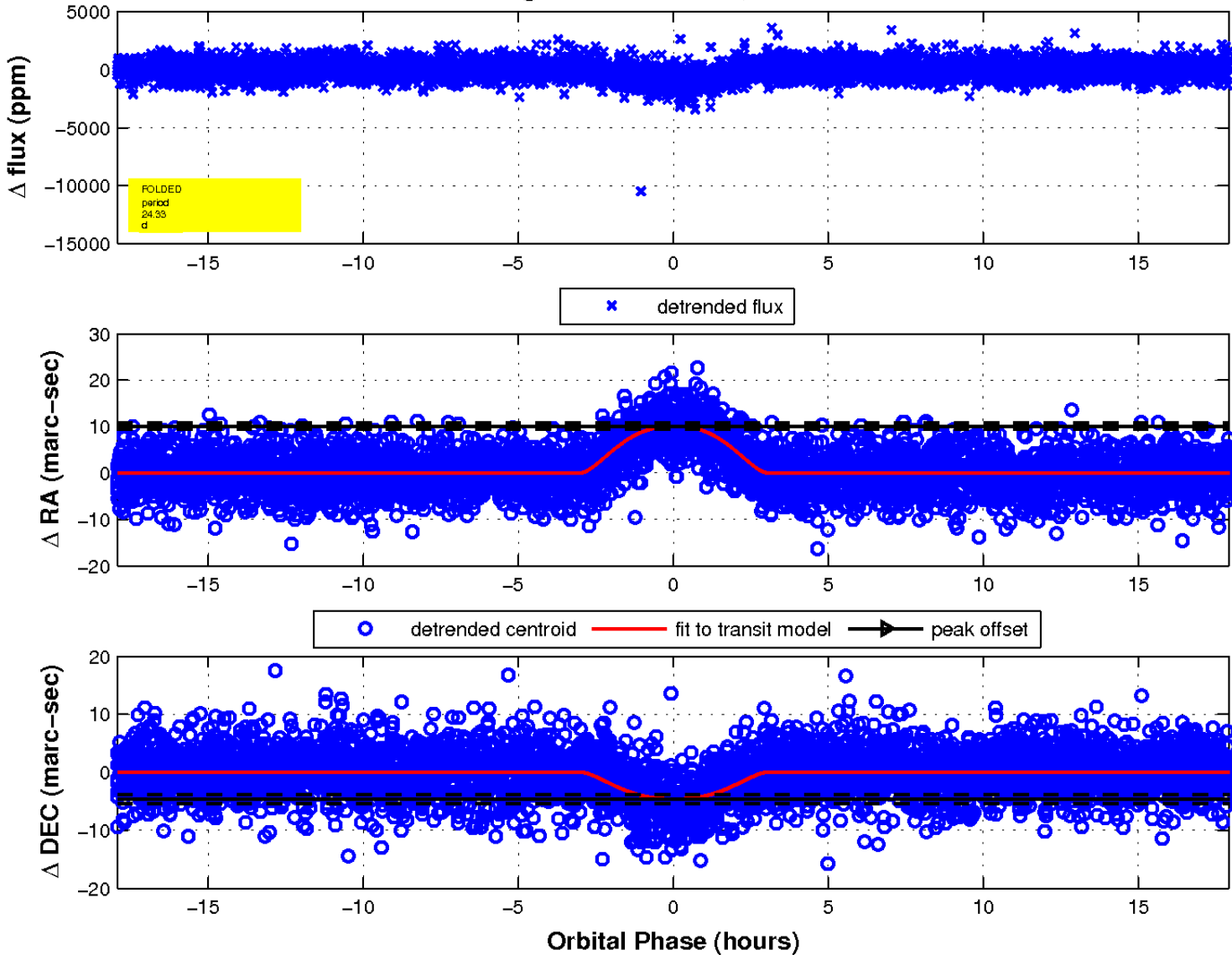




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

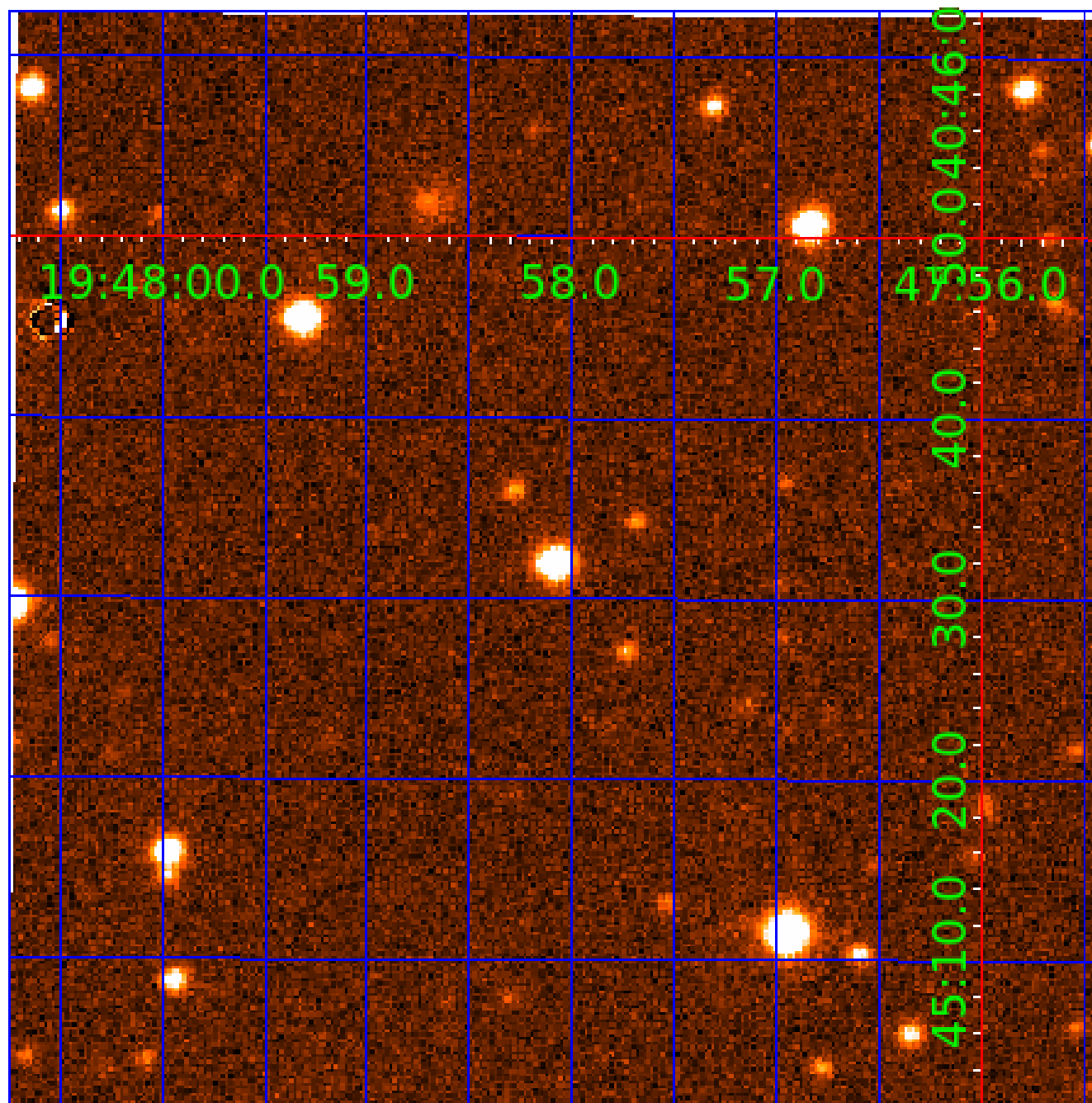


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



# KIC 005553652

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005553652-01	OBS	1575.01	24.328226	141.049229	1035.7	5.981	24.0	24.0	0.78	5286	3.42	17.38
005553652-02	OBS	No	24.328069	150.366685	1269.9	3.693	20.9	22.5	0.78	5286	4.67	17.38

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005553652-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_UNRESOLVED_OFFSET—HALO_GHOST
005553652-02	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_UNRESOLVED_OFFSET

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

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

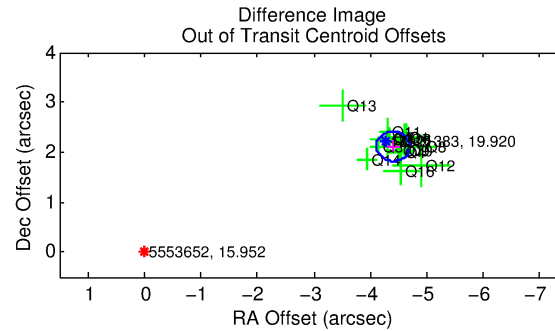
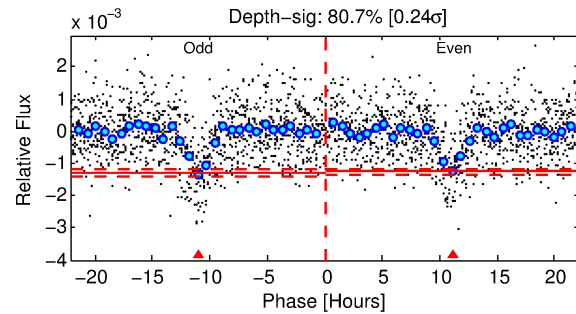
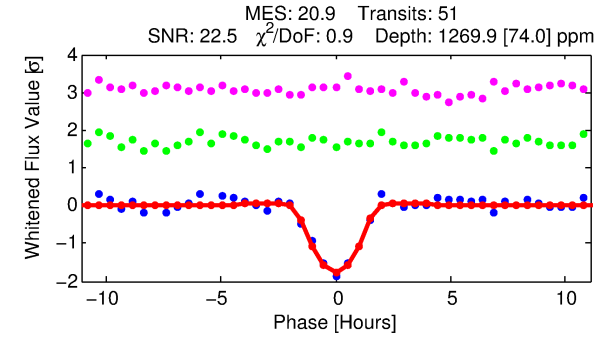
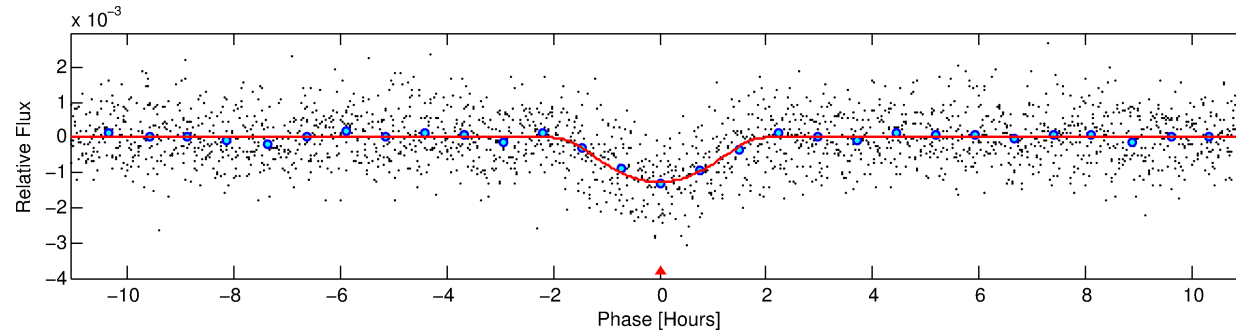
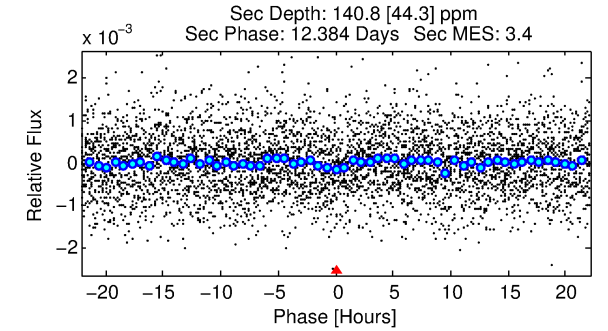
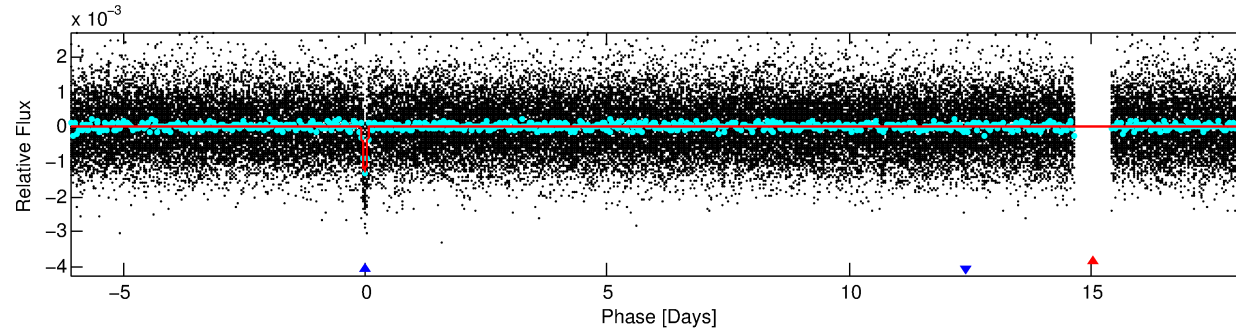
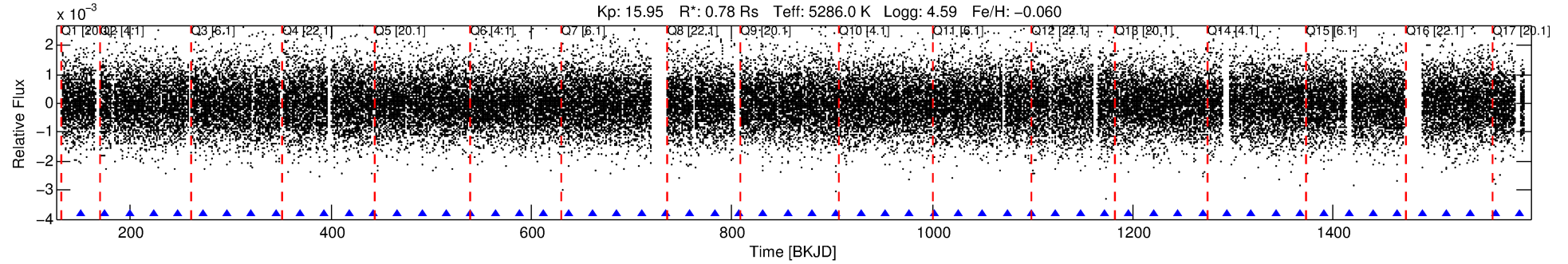
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 005553652-02

No Significant Match Found

# DV One-Page Summary

KIC: 5553652 Candidate: 2 of 2 Period: 24.328 d  
KOI: K01575 Corr: No Ephemeris Match



## DV Fit Results:

Period = 24.32807 [0.00012] d  
Epoch = 150.3667 [0.0039] BKJD  
Rp/R\* = 0.0549 [0.0629]  
a/R\* = 19.15 [6.73]  
b = 0.98 [0.11]  
Seff = 17.38 [3.92]  
Teq = 521 [29] K  
Rp = 4.68 [5.40] Re  
a = 0.1565 [0.0206] AU  
Ag = 86.77 [201.15] [0.43σ]  
Teff = 2457 [1421] K [1.36σ]

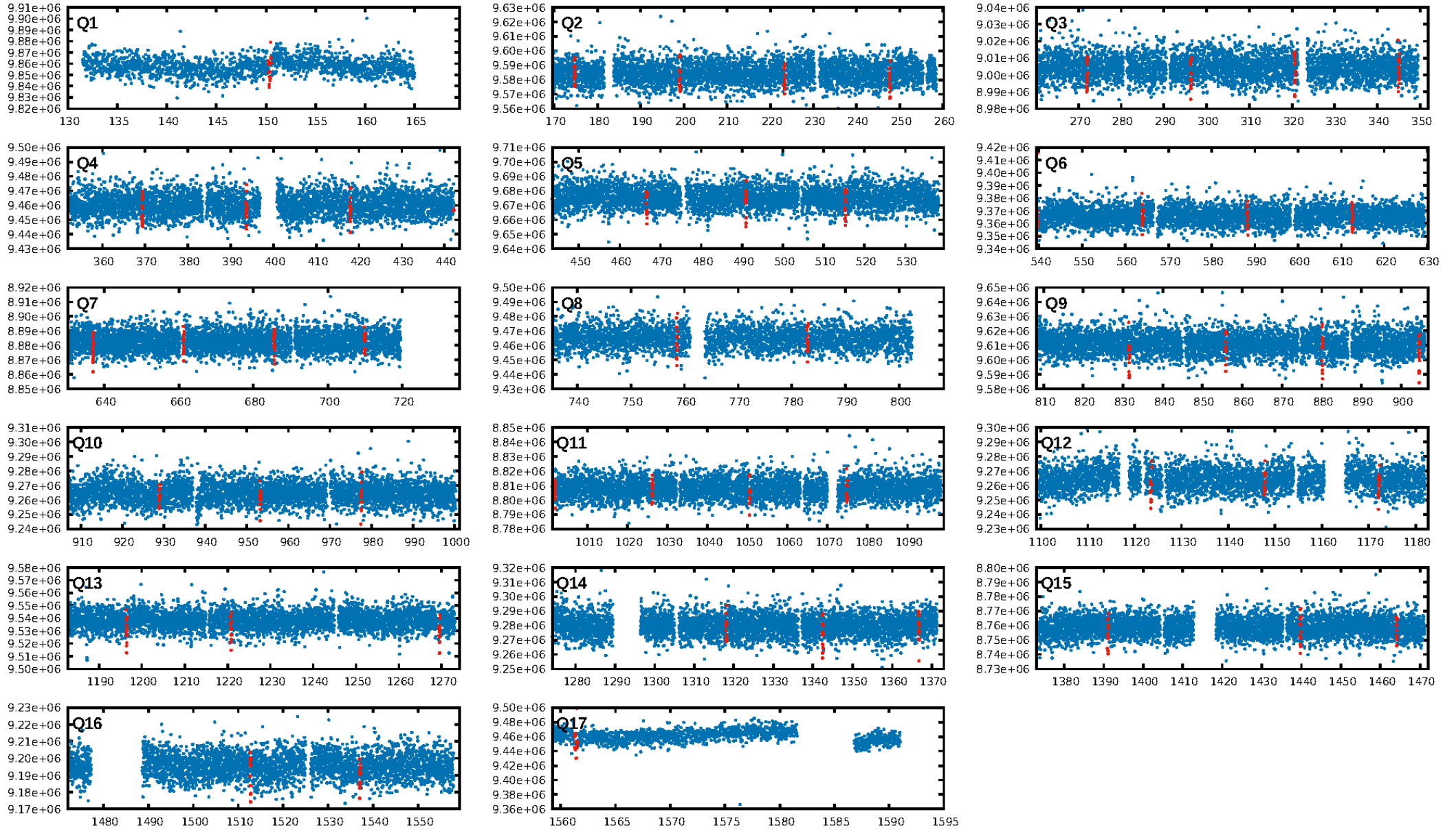
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 5.29e-98  
RollingBand-fgt: 1.00 [49/49]  
GhostDiagnostic-chr: 0.2599  
Centroid-sig: 0.0%  
Centroid-so: 9.665 arcsec [13.88σ]  
OotOffset-rm: 4.881 arcsec [49.63σ]  
KicOffset-rm: 4.745 arcsec [46.56σ]  
OotOffset-st: 4/4/4/3 [15]  
KicOffset-st: 4/4/4/3 [15]  
DiffImageQuality-fgm: 1.00 [15/15]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 16:23:23 Z

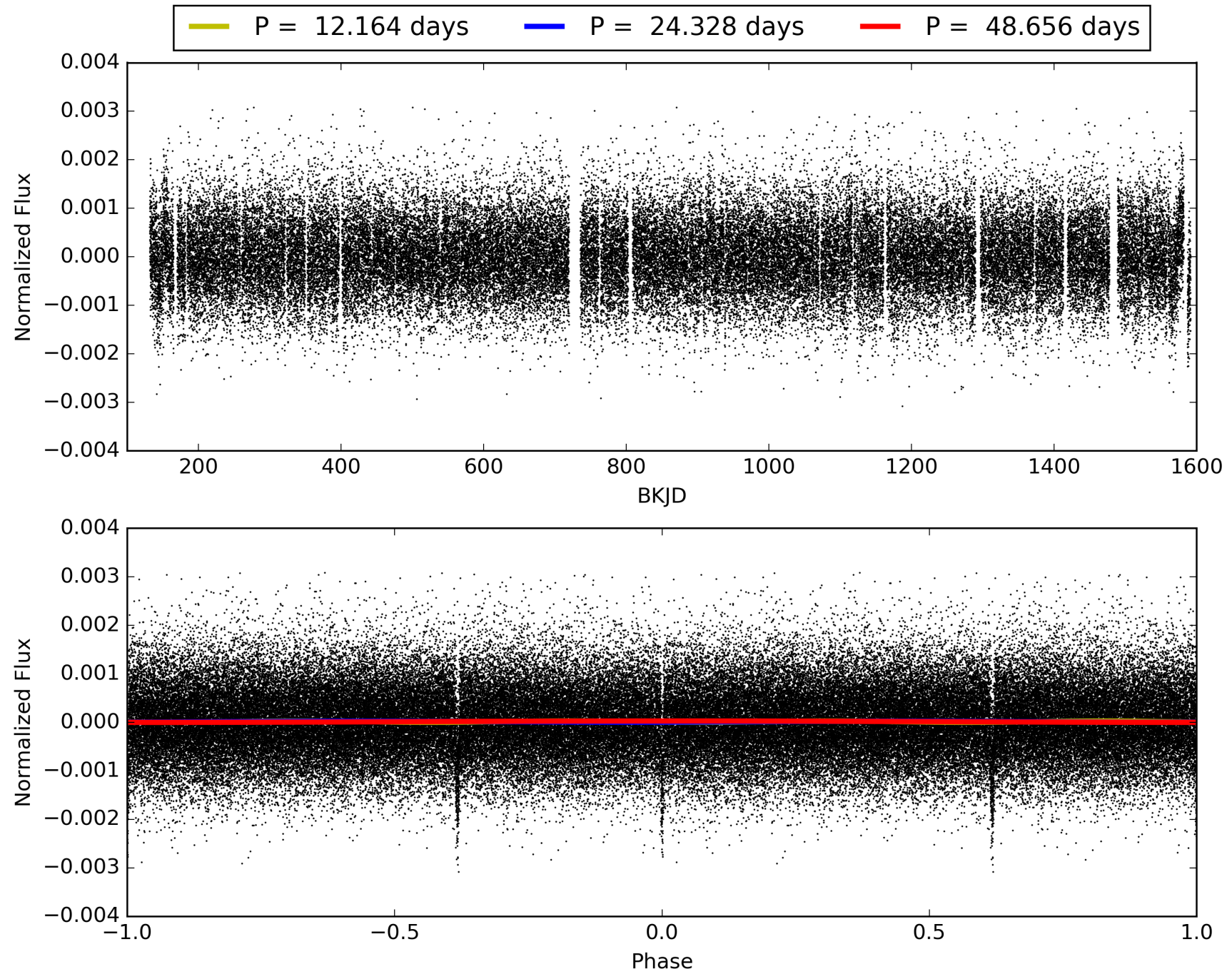
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 005553652-02, PDC Light Curves



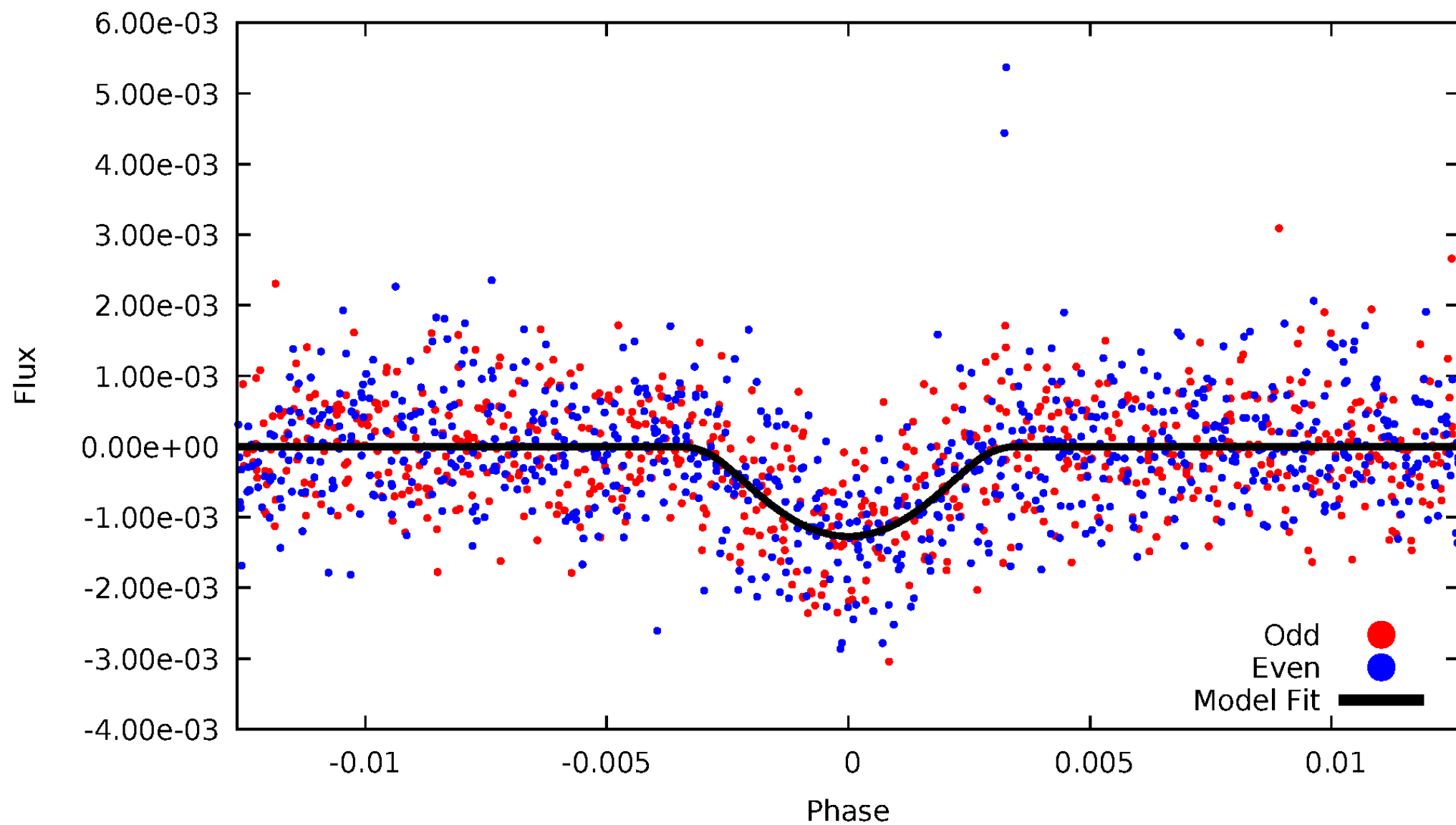


TCE 005553652-02



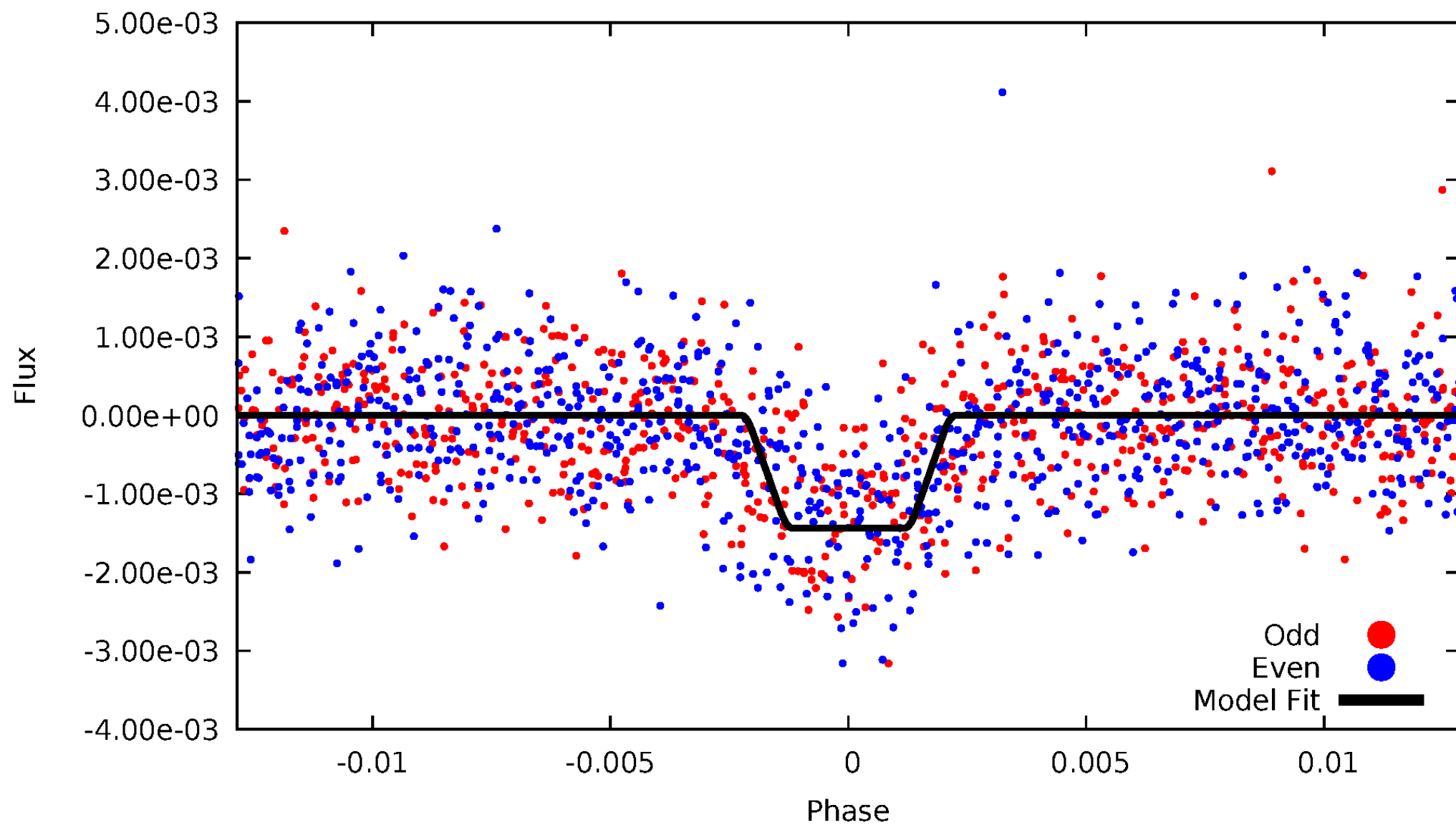
# DV Odd/Even

TCE 005553652-02



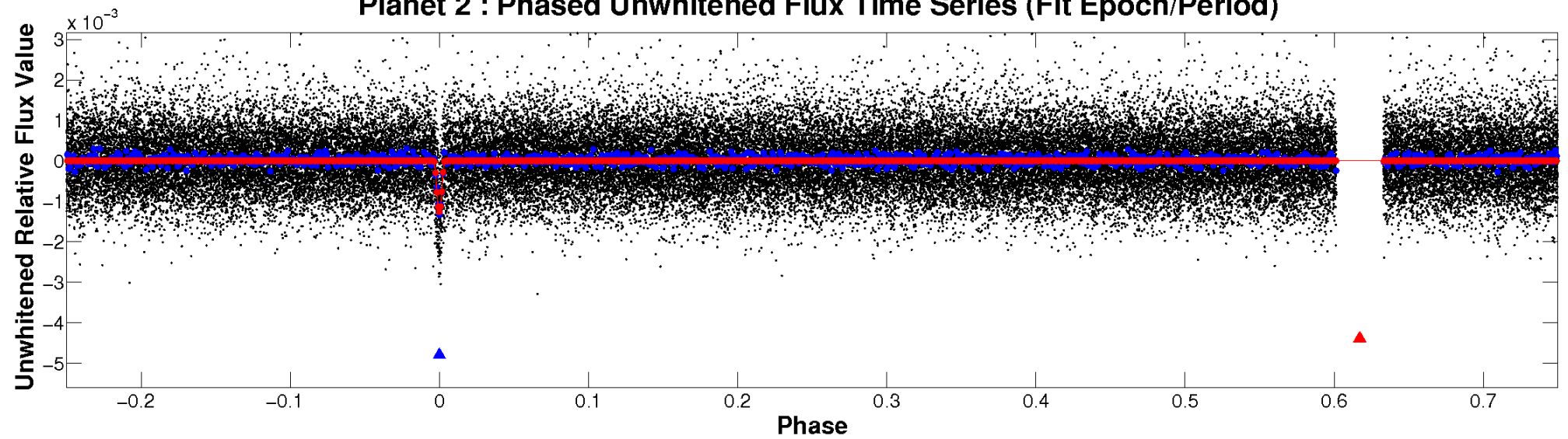
# ALT Odd/Even

TCE 005553652-02

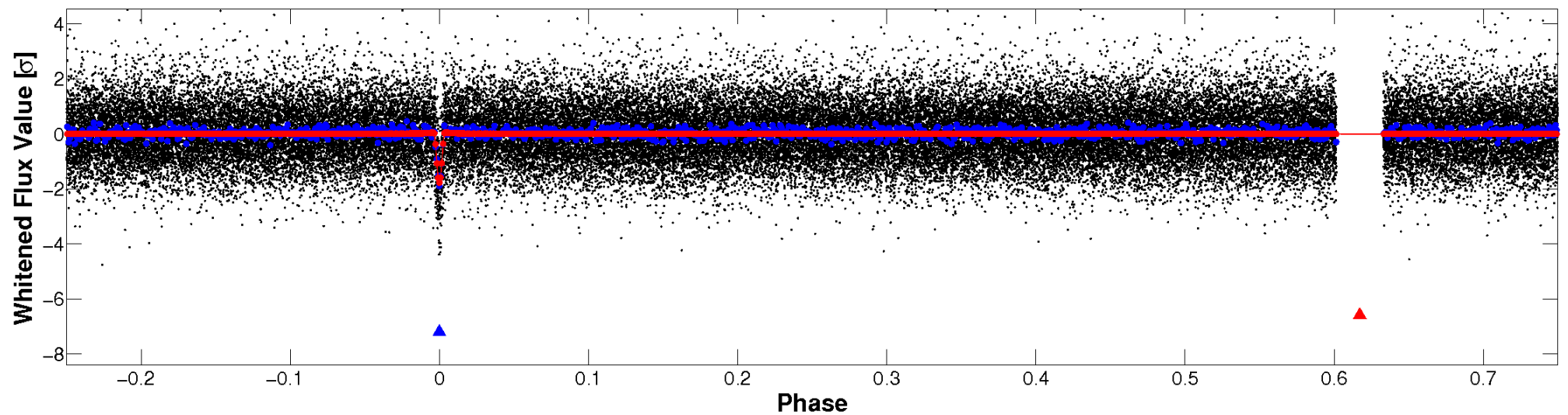


# Non-Whitened Vs. Whitened Light Curve

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

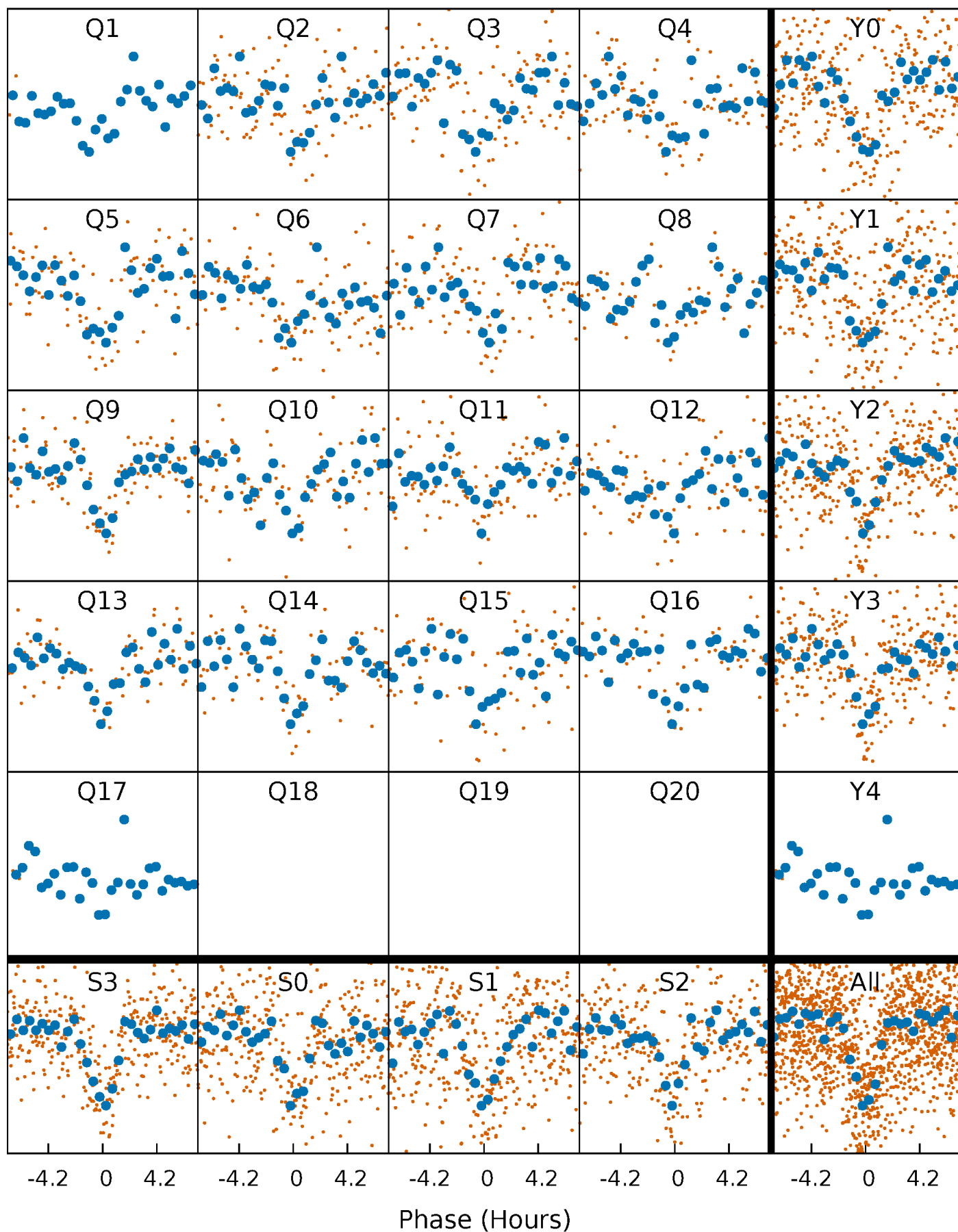


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

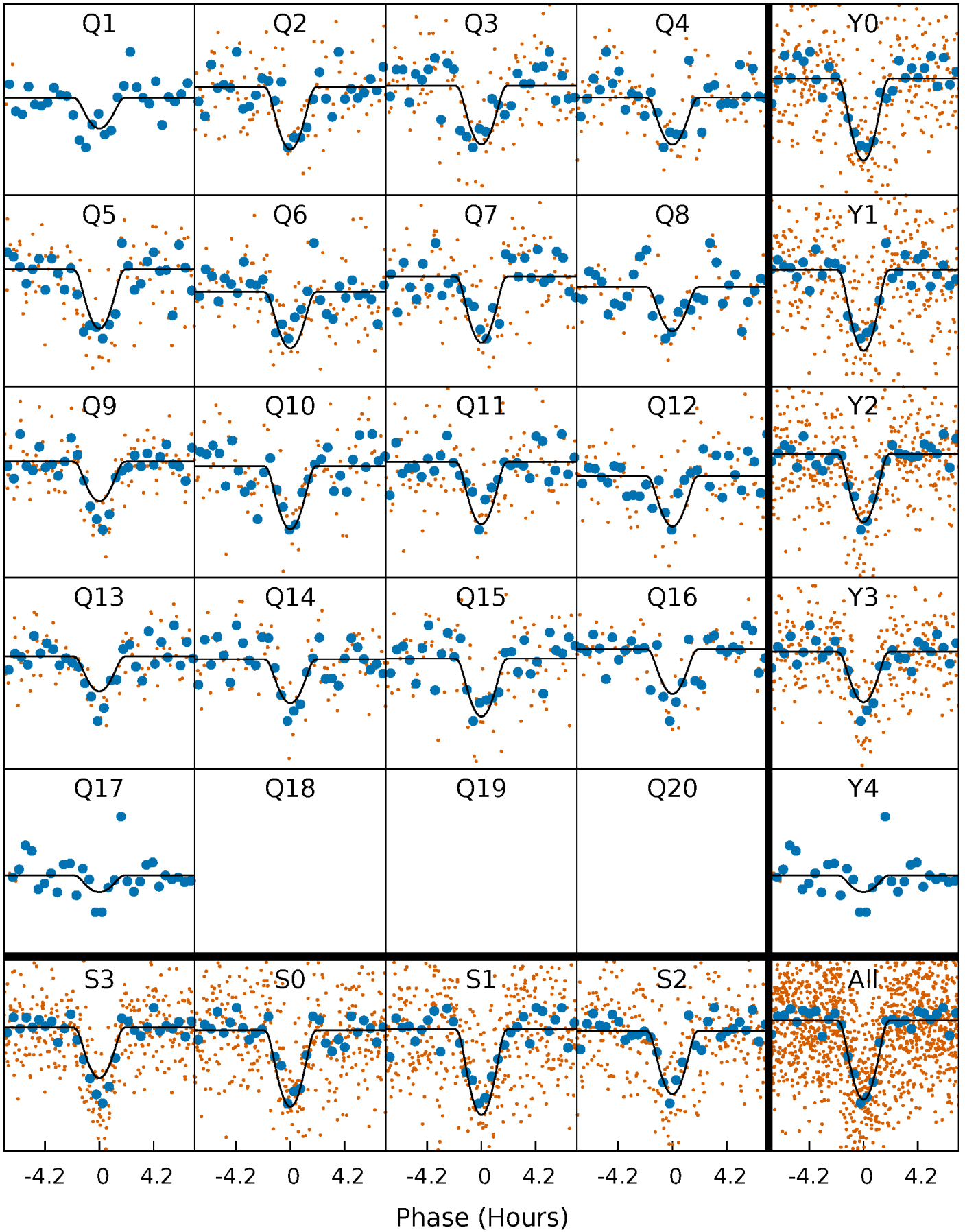
TCE 005553652-02   P= 24.328069 Days    $T_0=150.366685$  (BKJD)





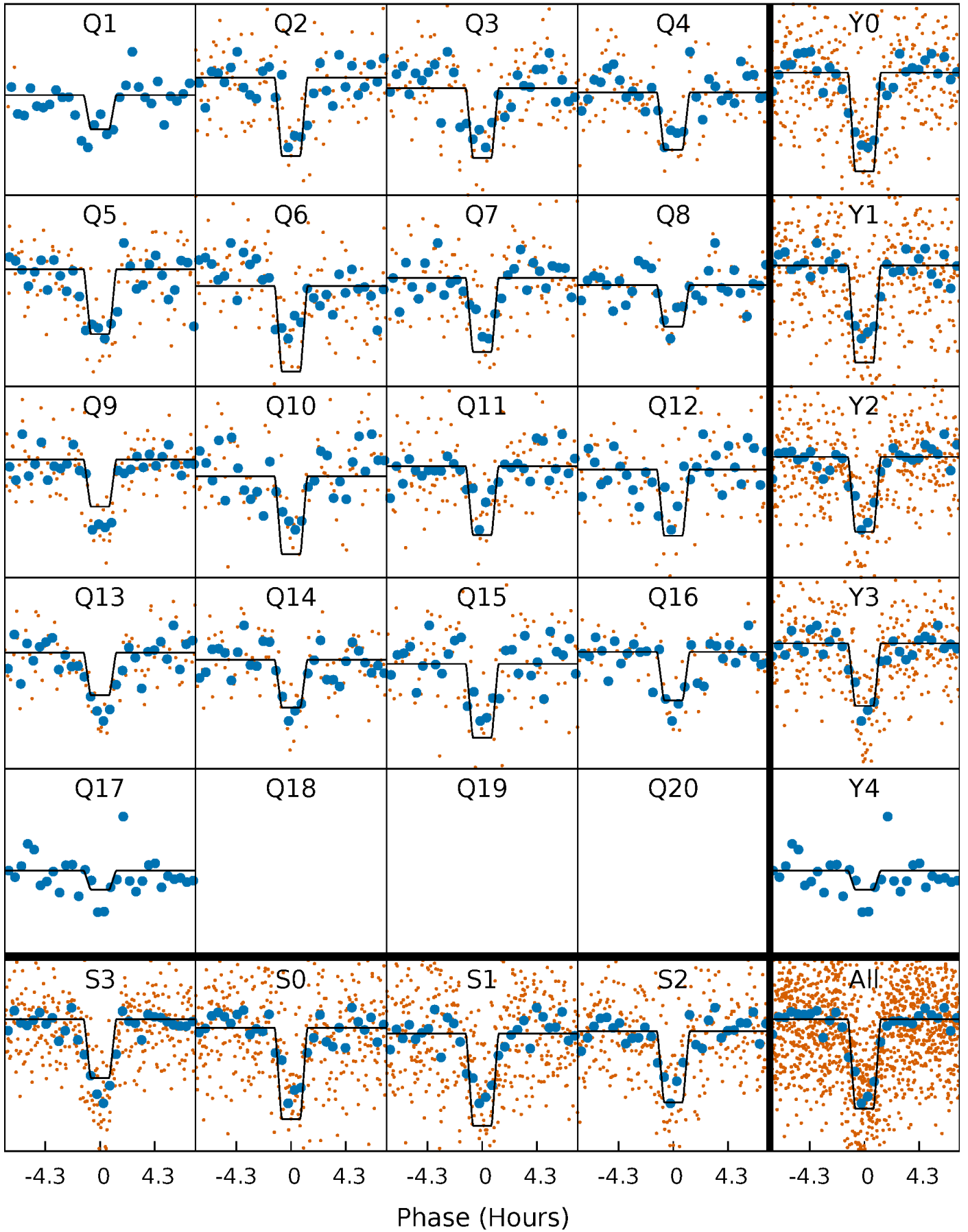
# DV Quarter-Phased Transit Curves

TCE 005553652-02   P= 24.328069 Days    $T_0=150.366685$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

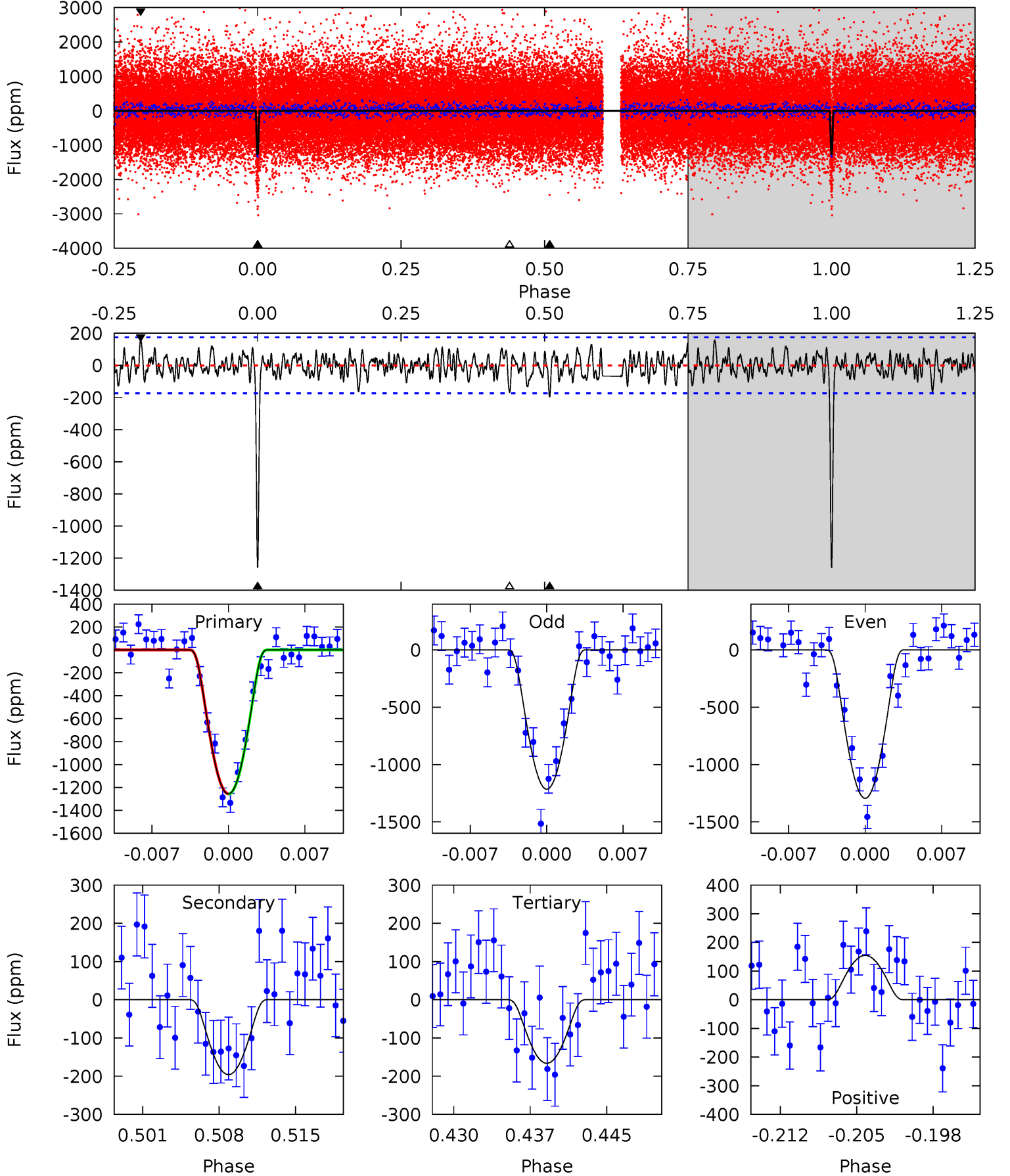
TCE 005553652-02   P= 24.328057 Days    $T_0=150.367104$  (BKJD)



# DV Model-Shift Uniqueness Test

005553652-02, P = 24.328069 Days, E = 126.038616 Days

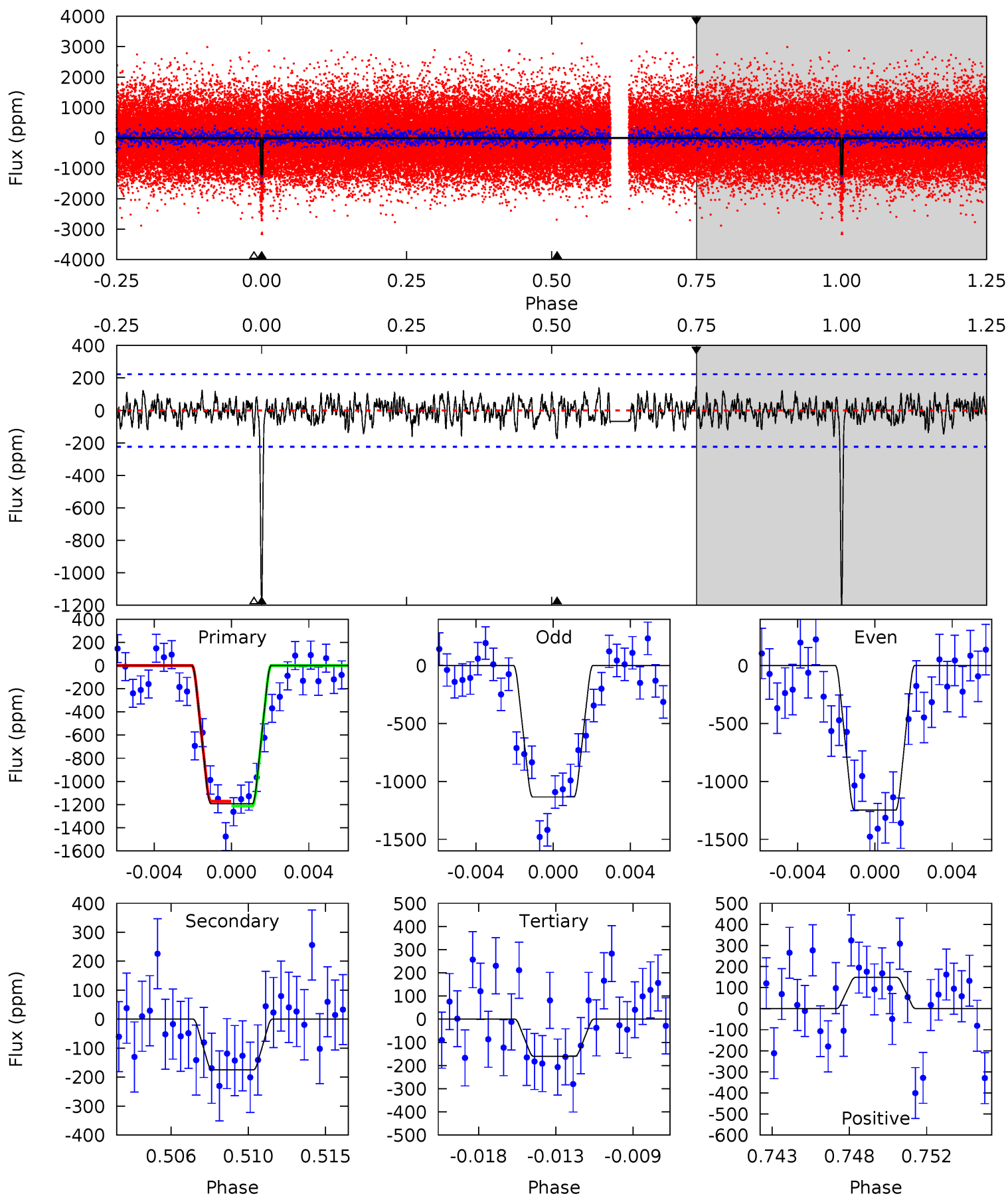
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
36.8	5.73	4.86	4.52	5.09	2.69	1.58	31.9	32.2	0.87	1.21	1.16	1.14	0.11	0.05



# Alt Model-Shift Uniqueness Test

005553652-02, P = 24.328057 Days, E = 126.039047 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
27.7	4.05	3.72	3.44	5.18	2.85	1.20	23.9	24.2	0.34	0.62	1.33	1.12	0.11	0.47



### Stellar Parameters For KIC 005553652

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5286^{+159}_{-159}$	$4.590^{+0.032}_{-0.104}$	$-0.060^{+0.300}_{-0.300}$	$0.780^{+0.122}_{-0.066}$	$0.872^{+0.061}_{-0.104}$	$2.585^{+0.467}_{-0.831}$
	+3%/-3%	+1%/-2%	+500%/-500%	+16%/-8%	+7%/-12%	+18%/-32%
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 005553652-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-196 \pm 34$	$6.52^{+5.05}_{-4.15}$	$738^{+35}_{-28}$	$2941^{+1095}_{-422}$	$59^{+387}_{-41}$
Alt.	$-175 \pm 43$	$5.40^{+4.64}_{-3.56}$	$740^{+33}_{-31}$	$3077^{+1284}_{-484}$	$79^{+604}_{-57}$

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

$A_{\text{obs}}$  = Observed Albedo (Assuming  $T=0$ )

If a secondary eclipse is present, the system is likely an EB if  $T_{\text{obs}} \gg T_{\text{max}}$  AND  $A_{\text{obs}} \gg 1.0$

## DV Centroid Data

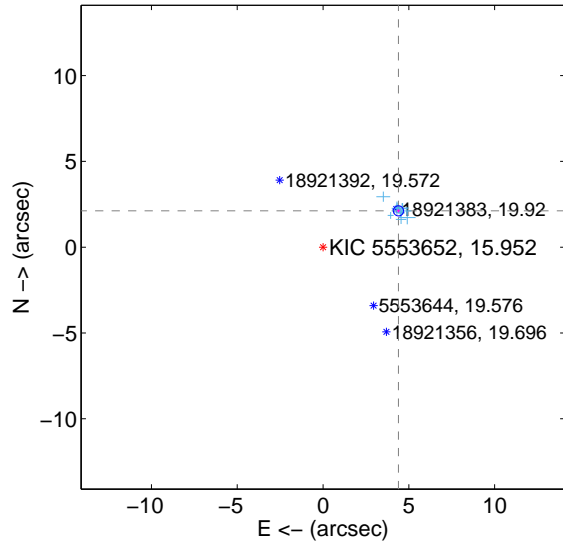
Supplemental centroid analysis for 005553652-02. Kepler magnitude: 15.95. Transit SNR 22.48

There are 15 quarters with good PRF difference image offsets

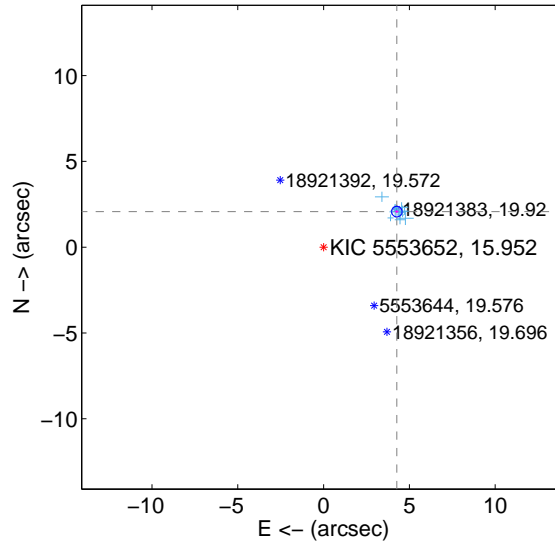
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	4.881 $\pm$ 0.098	49.63	-4.398 $\pm$ 0.099	2.117 $\pm$ 0.094
PRF-fit source offset from KIC position	4.745 $\pm$ 0.102	46.56	-4.269 $\pm$ 0.104	2.072 $\pm$ 0.094
photometric centroid source offset	9.66 $\pm$ 0.70	13.88	-8.66 $\pm$ 0.71	4.30 $\pm$ 0.64

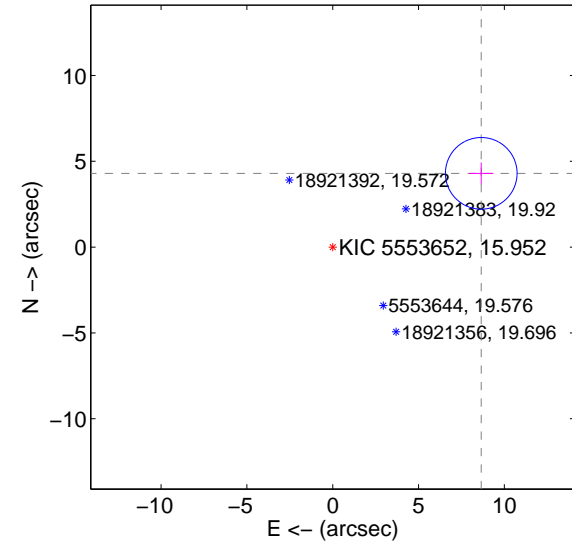
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



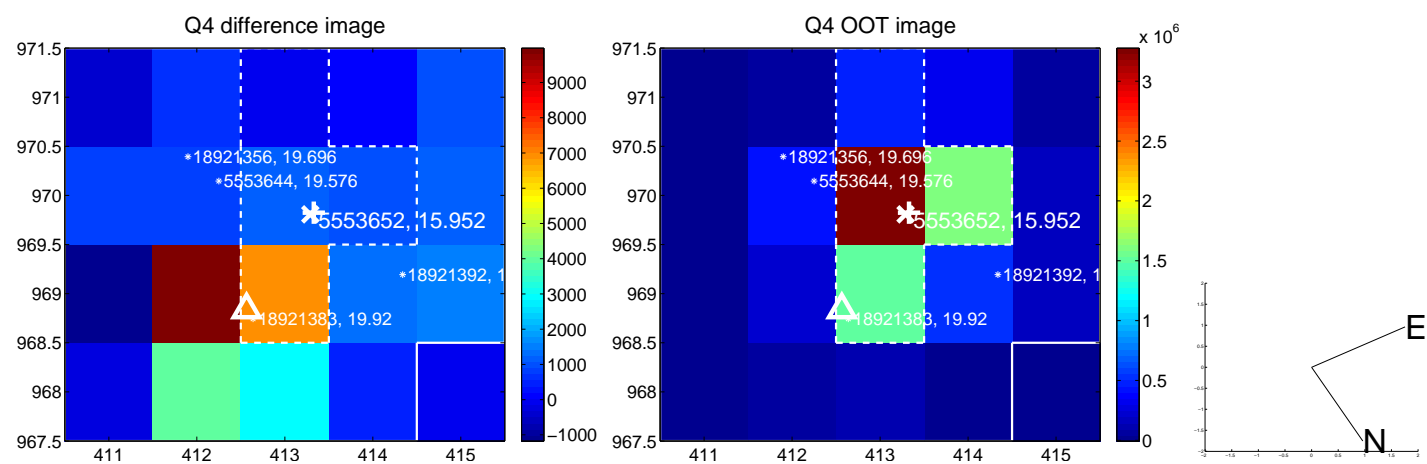
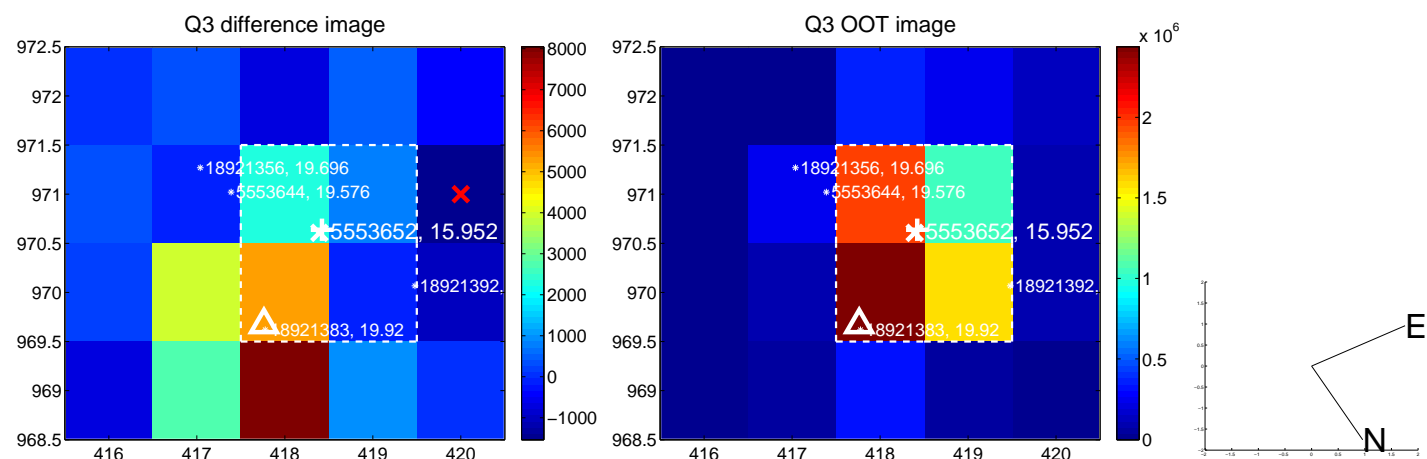
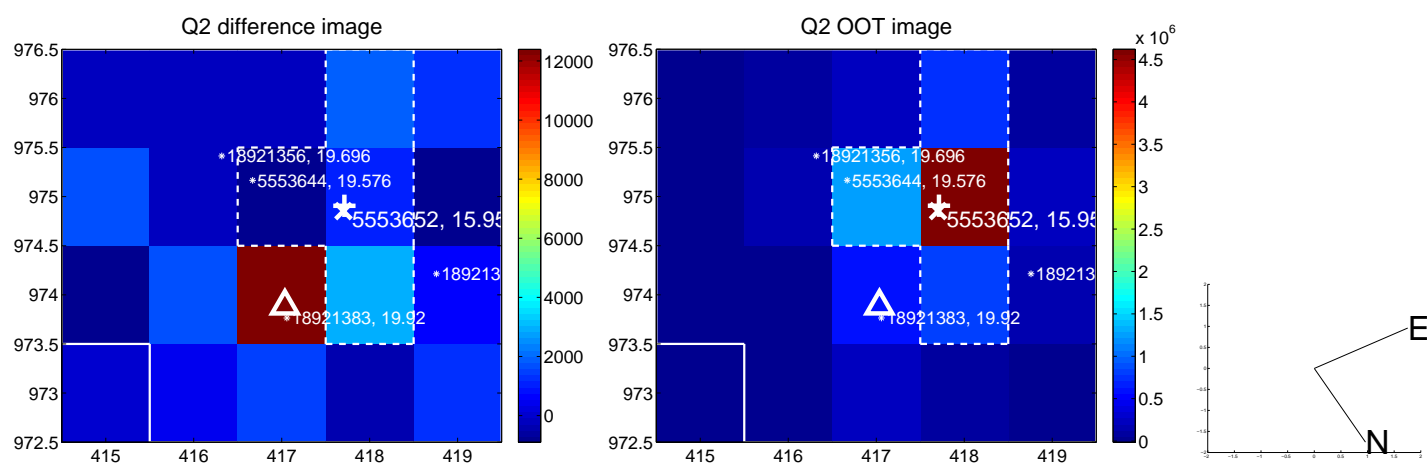
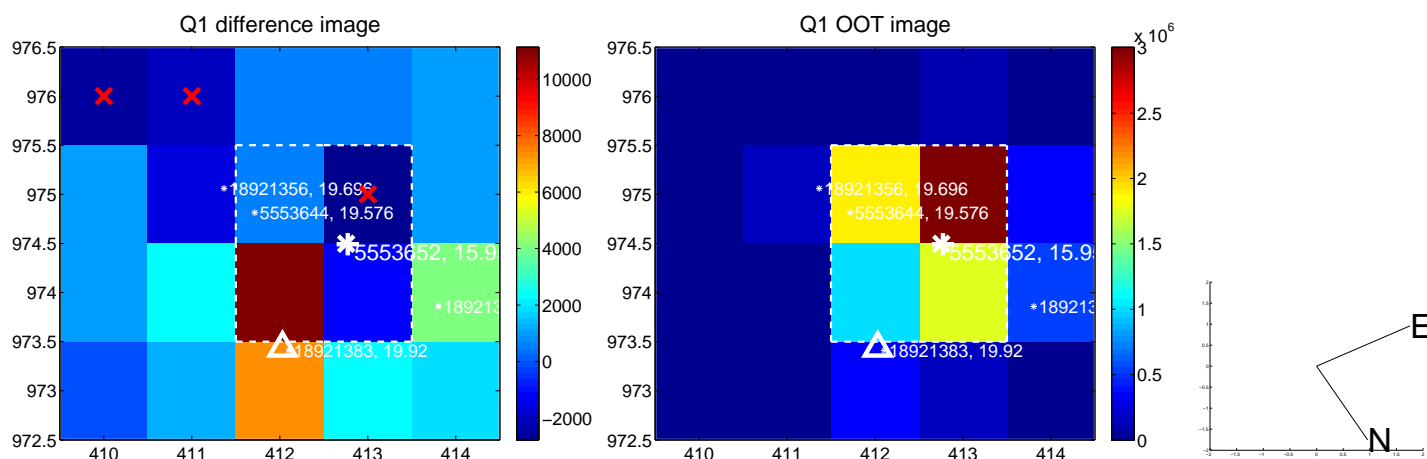
offset from photometric centroids



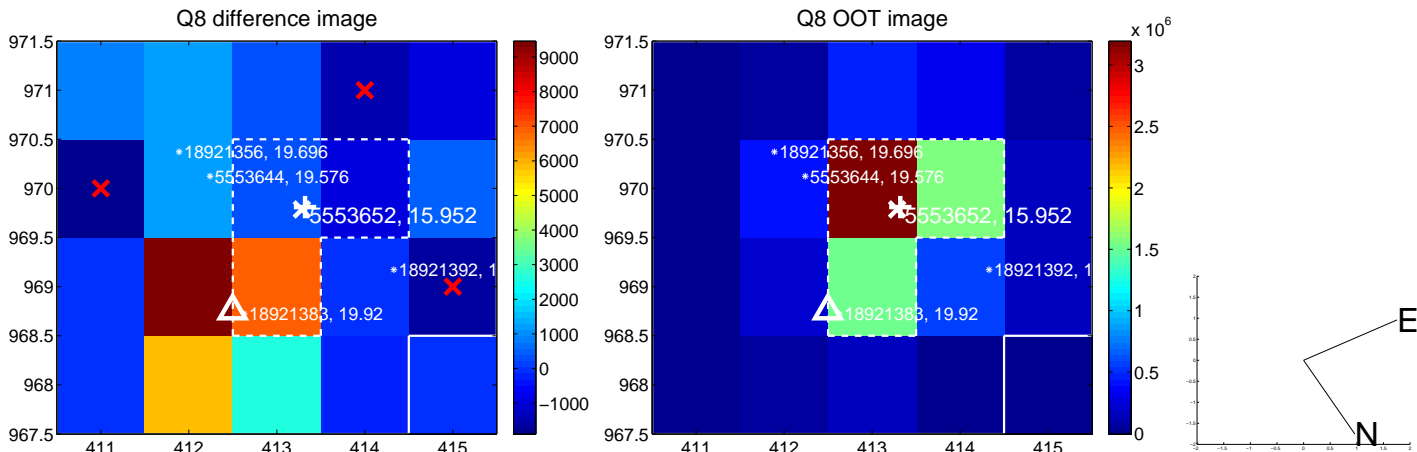
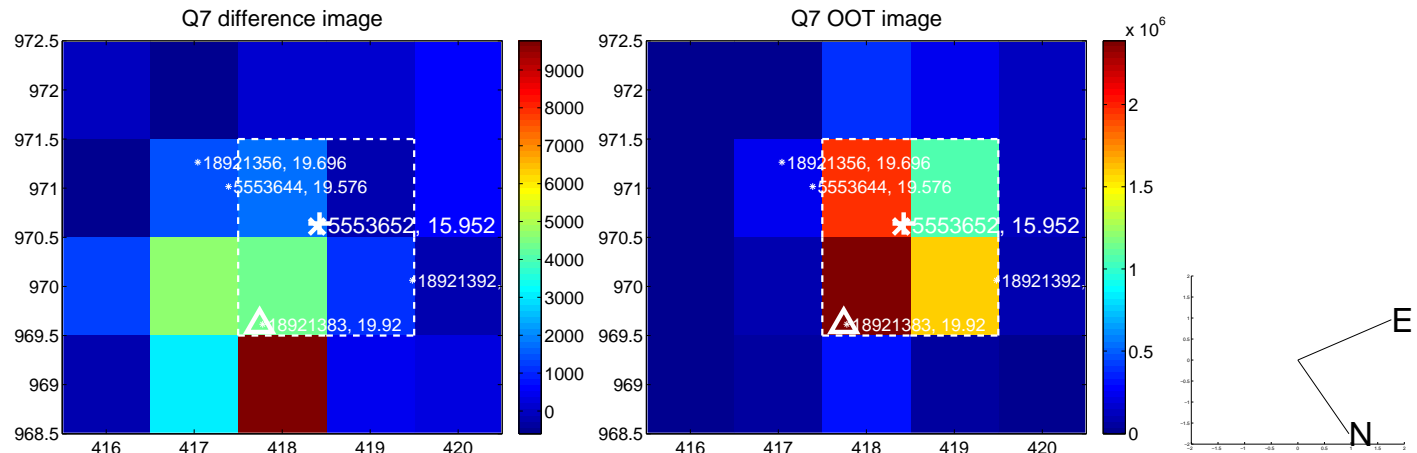
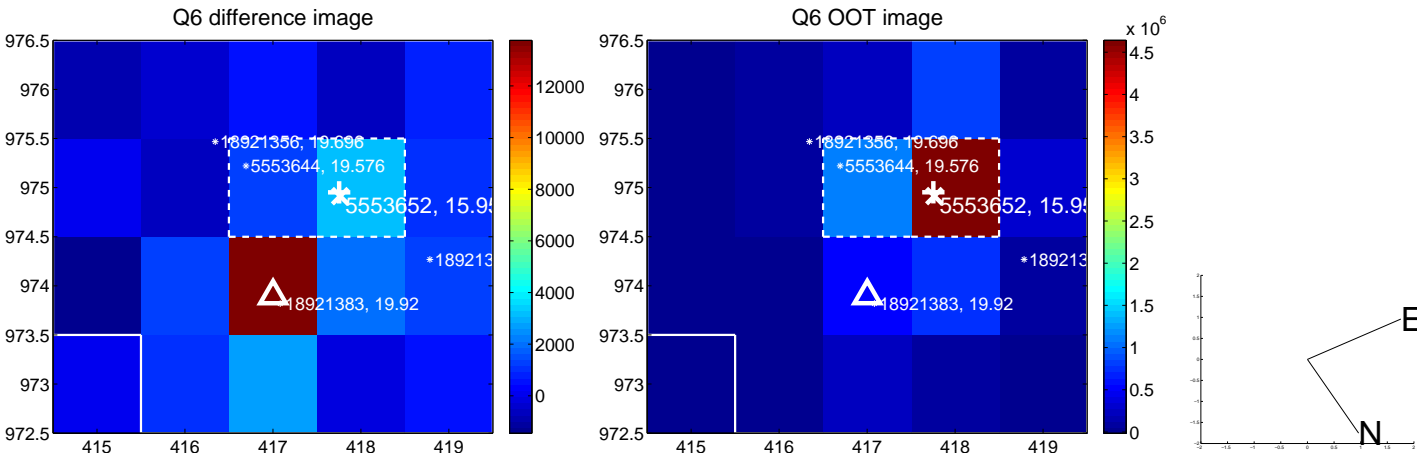
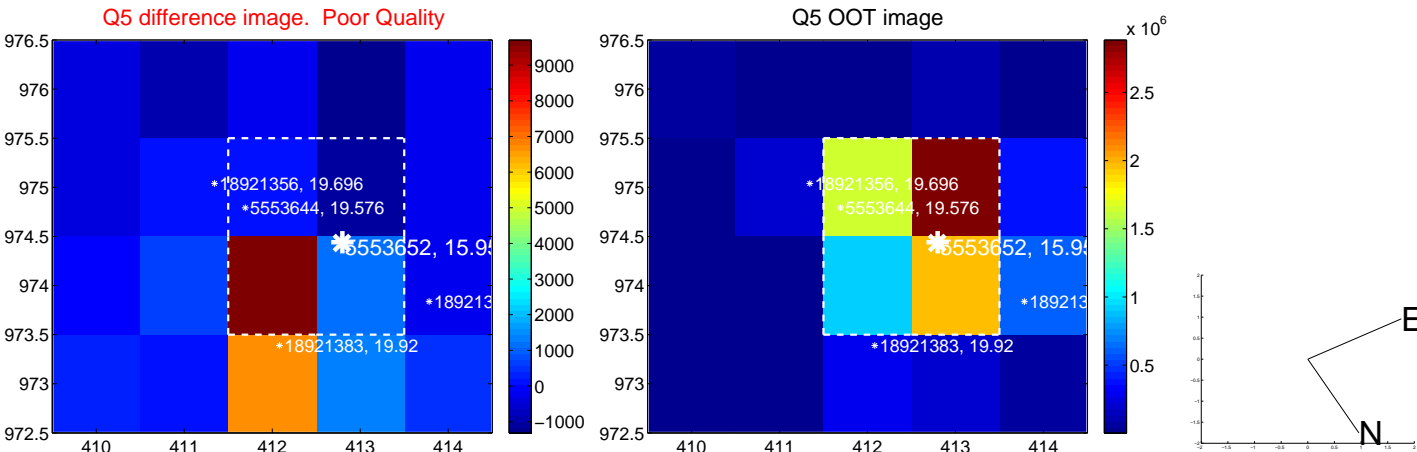
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



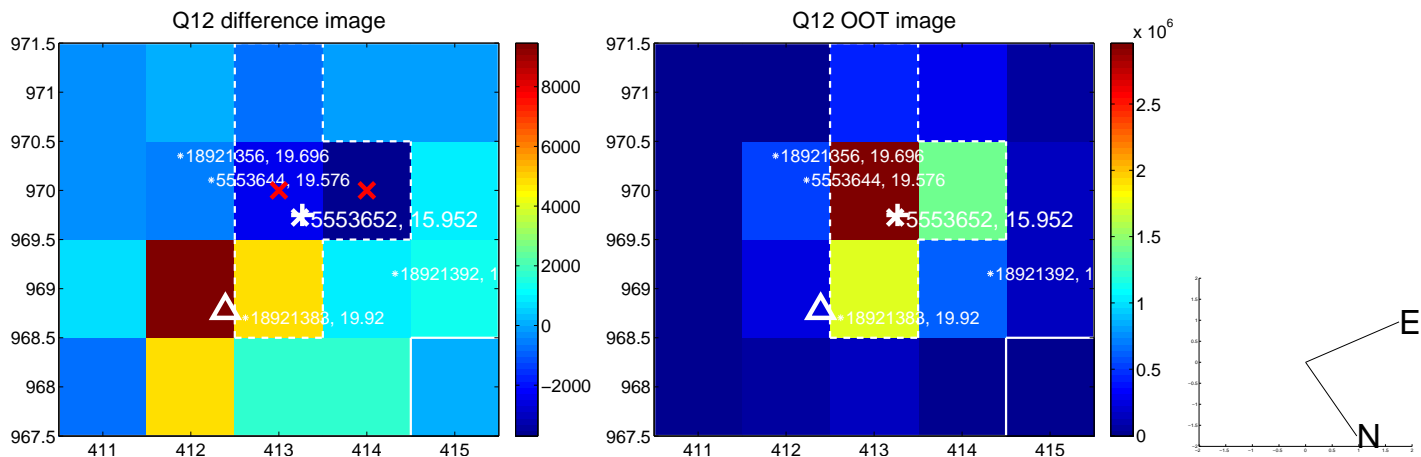
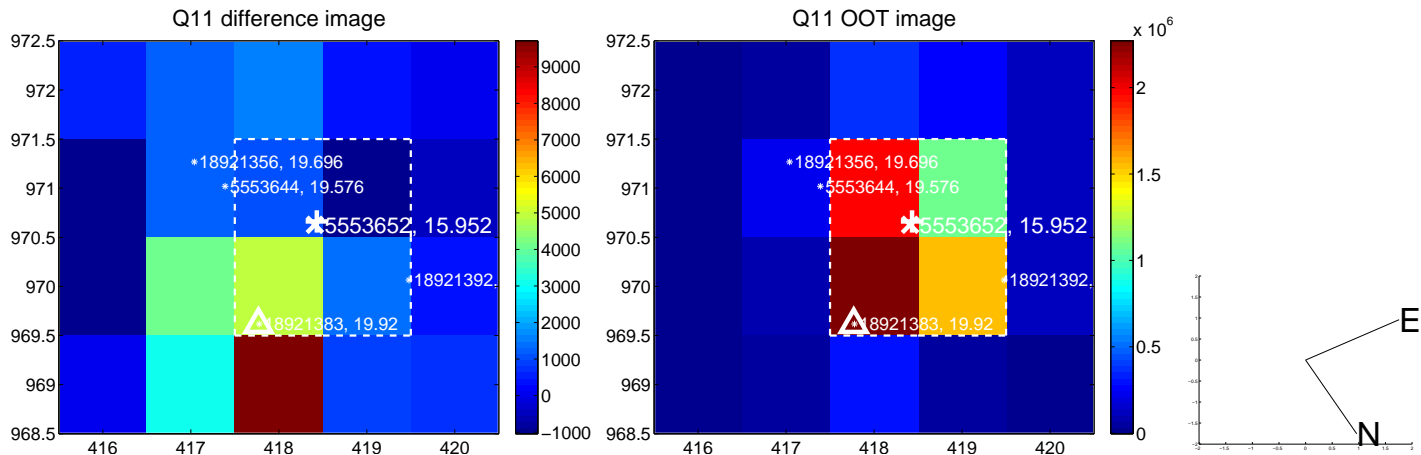
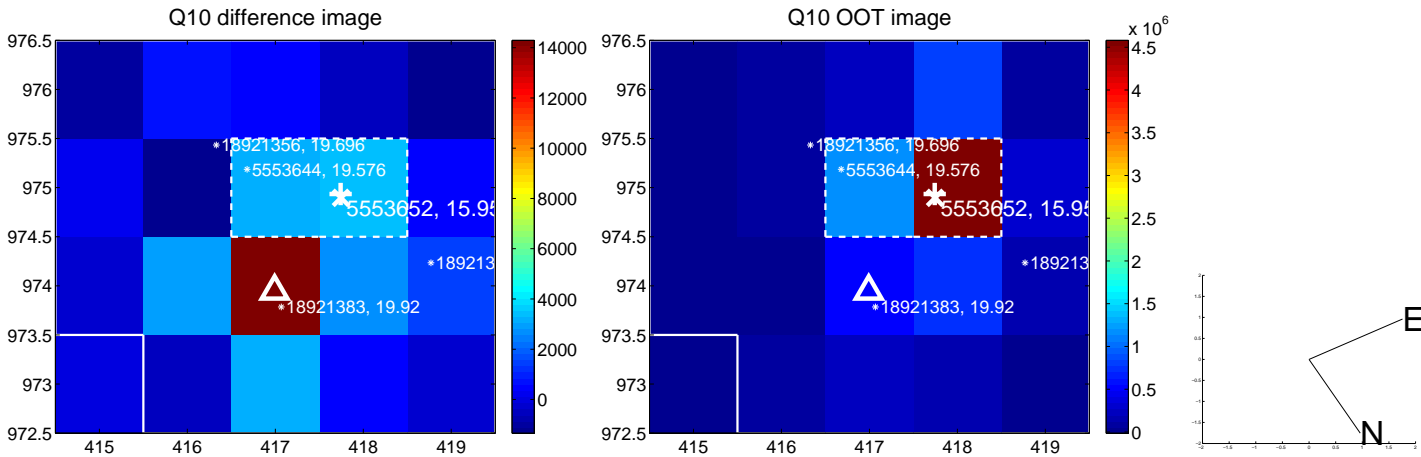
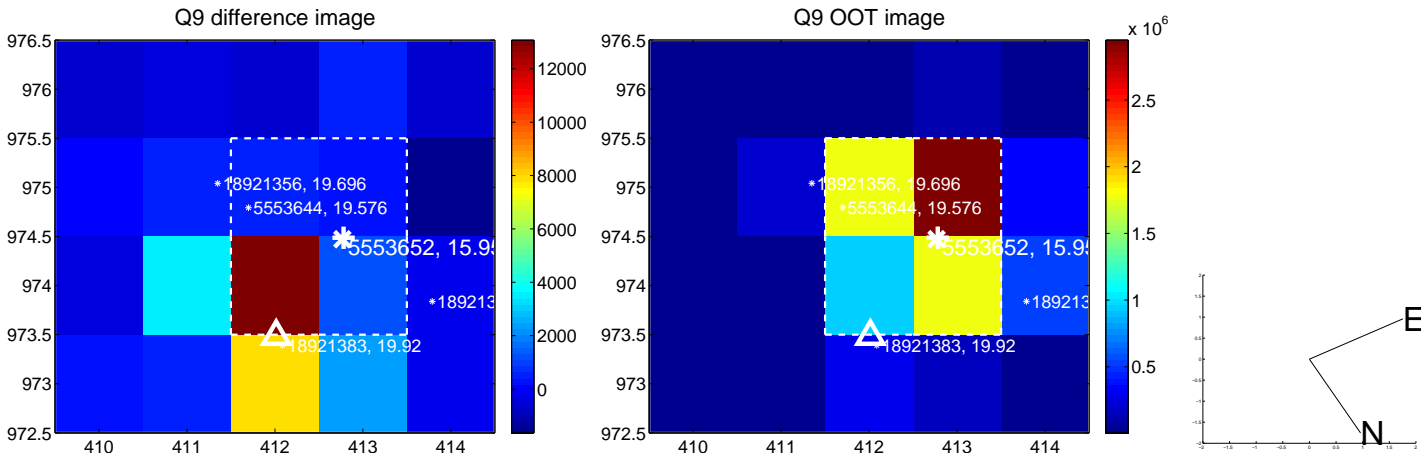
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



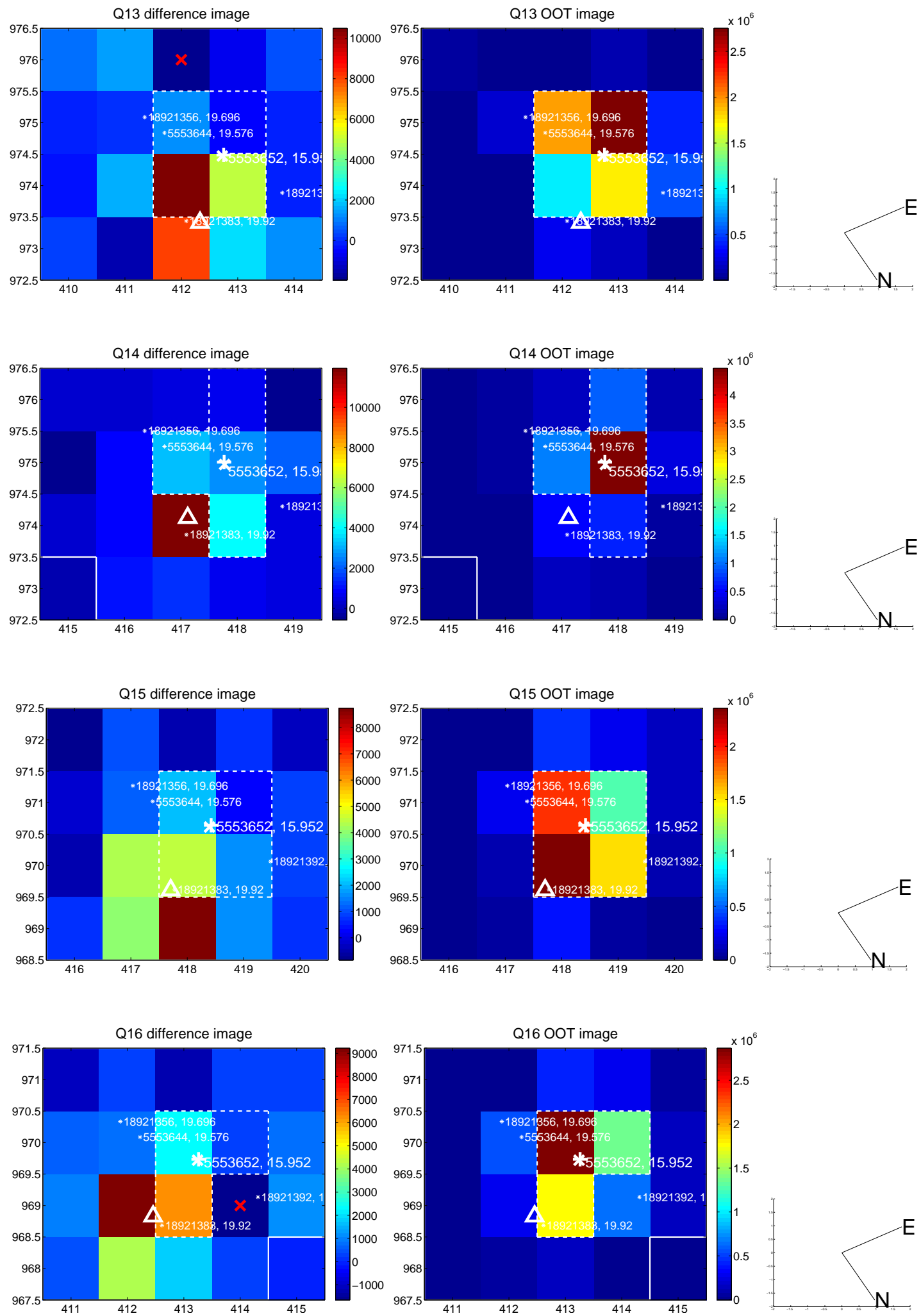
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



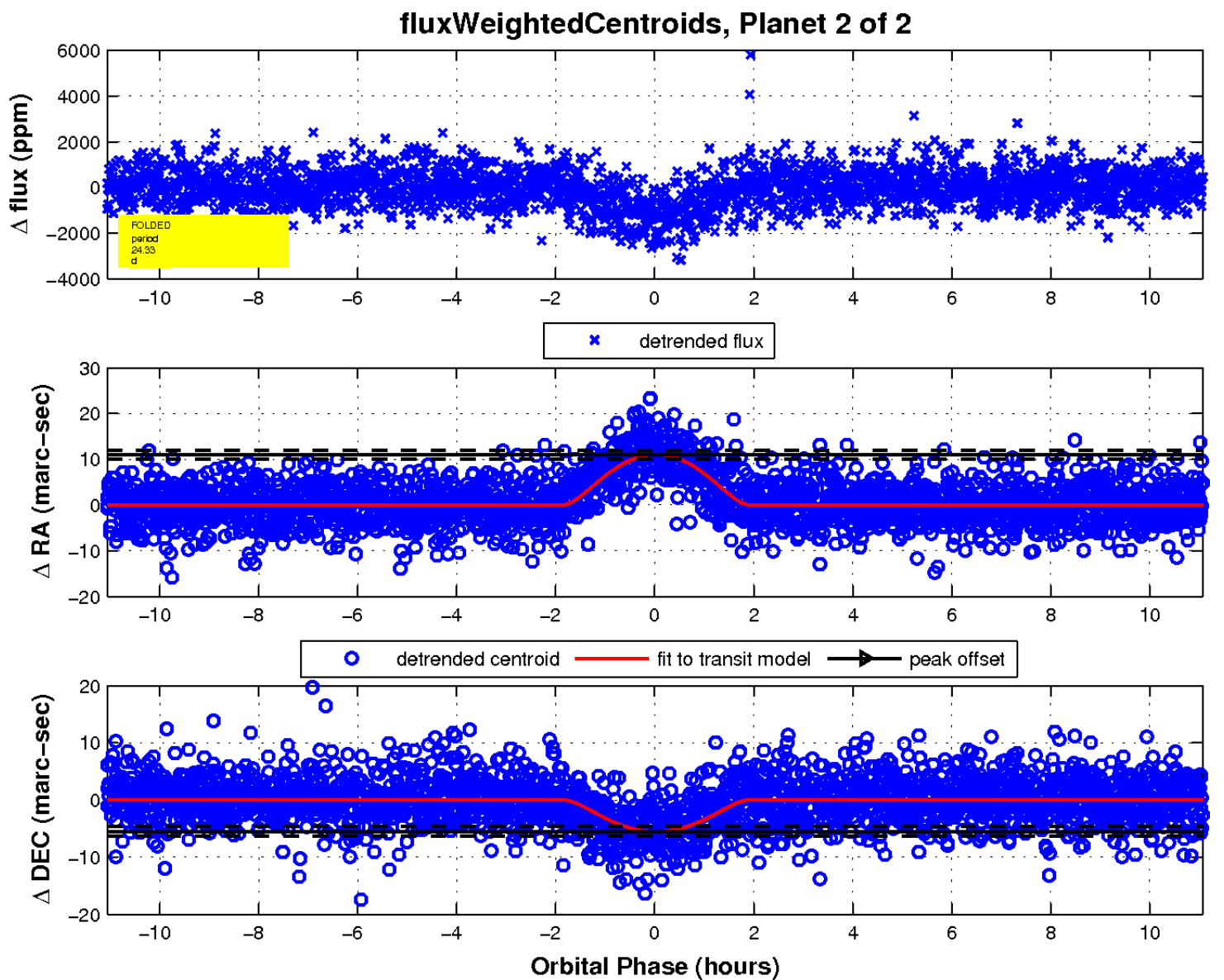
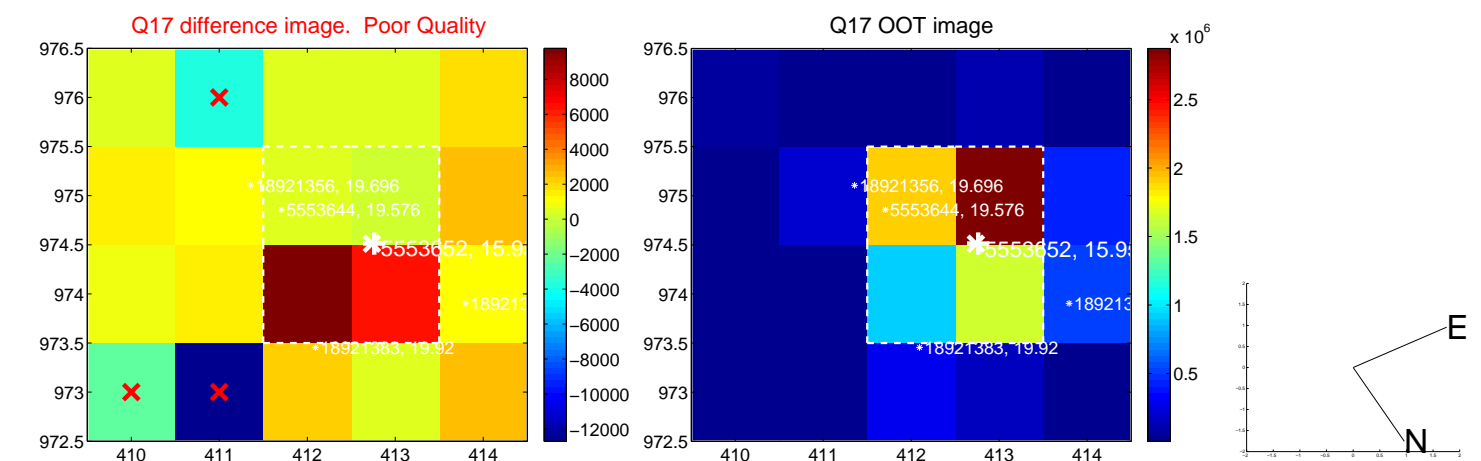
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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



UKIRT Image

Declination

