

# KIC 005443604

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005443604-01	OBS	2713.01	21.391042	141.297902	617.0	5.003	26.2	24.1	0.69	4889	3.22	12.89
005443604-02	OBS	No	599.108840	226.577808	1548.3	52.369	25.1	7.6	0.69	4889	3.44	0.15
005443604-03	OBS	No	21.390848	145.700676	270.2	2.637	10.7	10.6	0.69	4889	1.15	12.89

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005443604-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
005443604-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005443604-03	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_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.

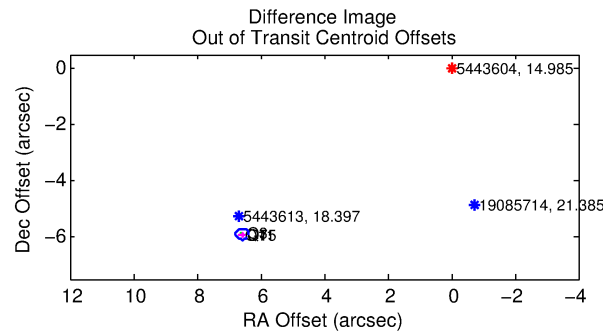
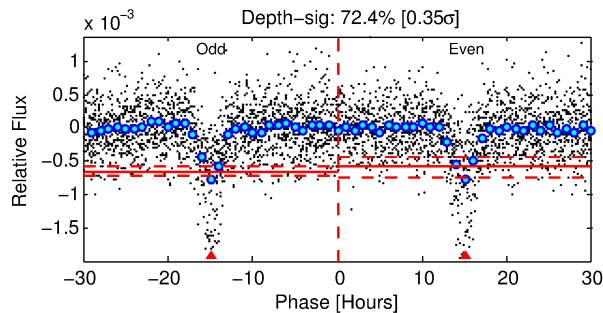
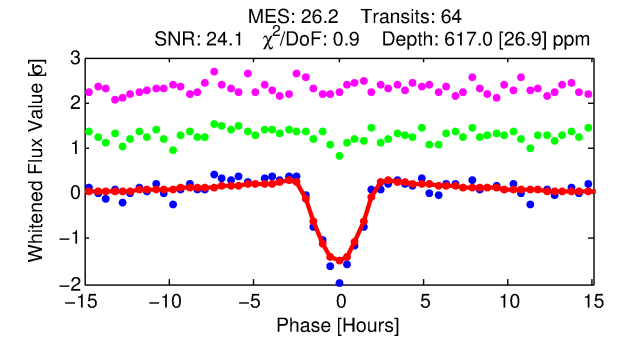
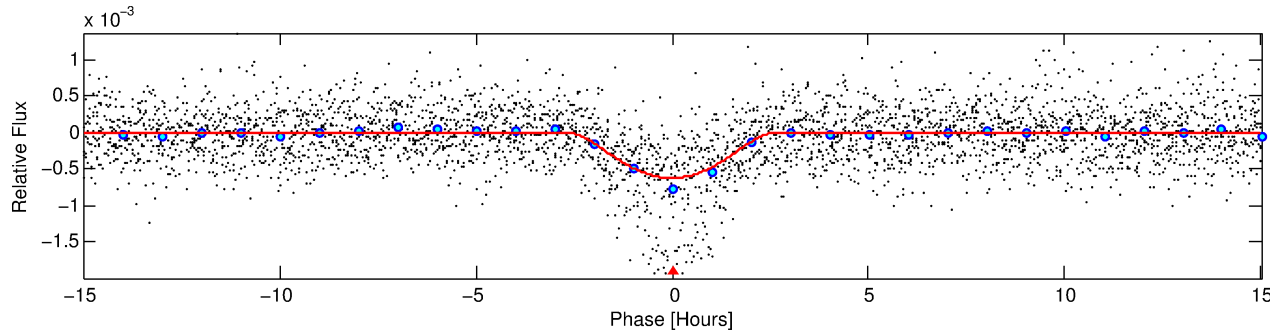
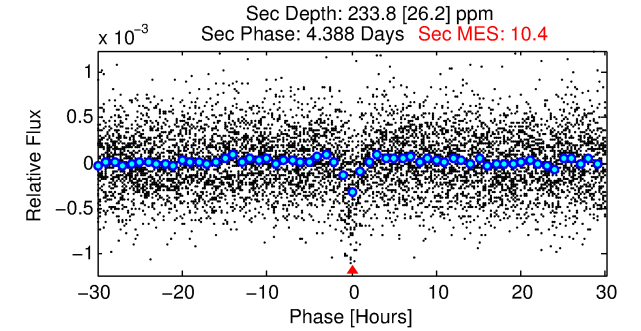
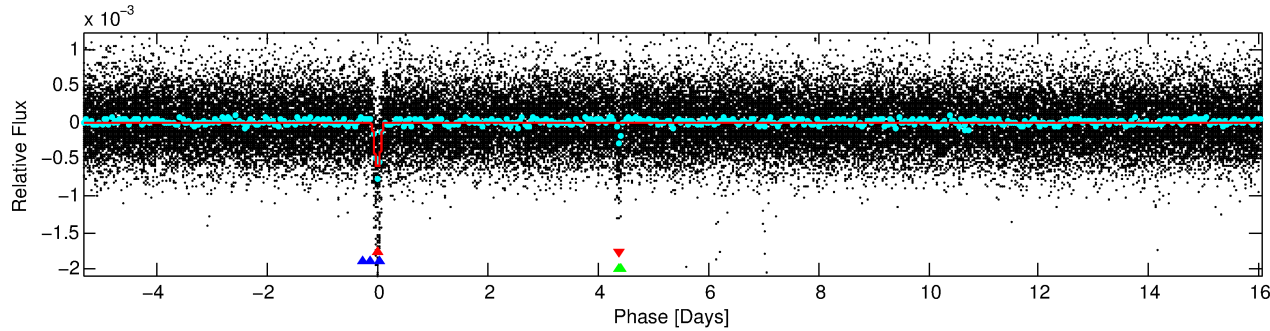
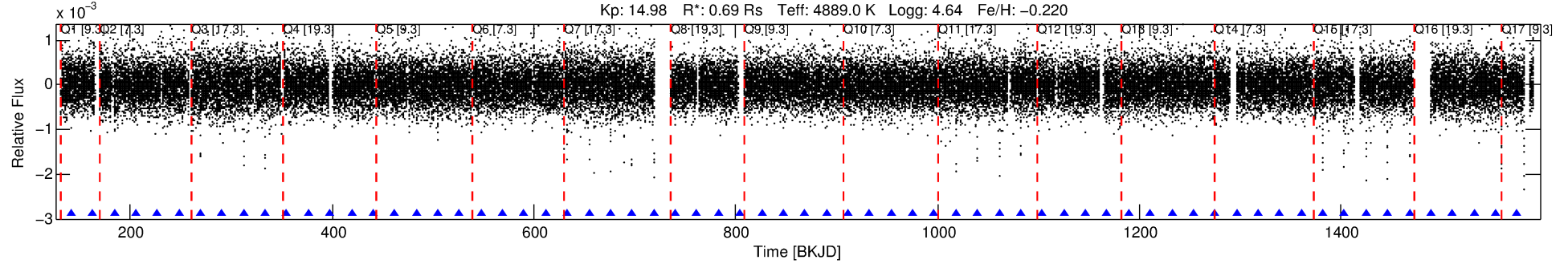
## Ephemeris Match Information For 005443604-01

No Significant Match Found

# DV One-Page Summary

KIC: 5443604 Candidate: 1 of 3 Period: 21.391 d  
KOI: K02713.01 Corr: 0.843

Kp: 14.98 R\*: 0.69 Rs Teff: 4889.0 K Logg: 4.64 Fe/H: -0.220



## DV Fit Results:

Period = 21.39104 [0.00011] d  
Epoch = 141.2979 [0.0045] BKJD  
Rp/R\* = 0.0431 [0.0441]  
a/R\* = 10.42 [2.93]  
b = 0.99 [0.07]  
Seff = 12.89 [2.13]  
Teq = 483 [20] K  
Rp = 3.22 [3.32] Re  
a = 0.1367 [0.0116] AU  
Ag = 231.17 [474.86] [0.48σ]  
Teffp = 2913 [1496] K [1.62σ]

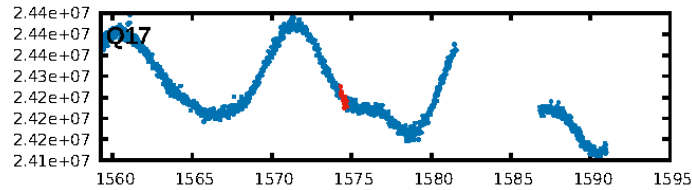
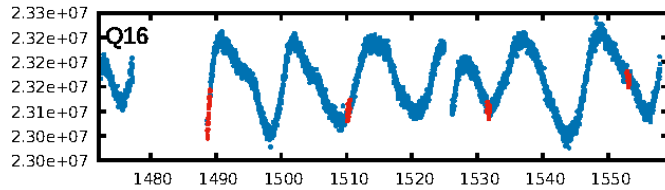
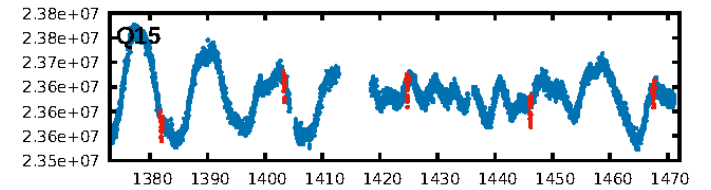
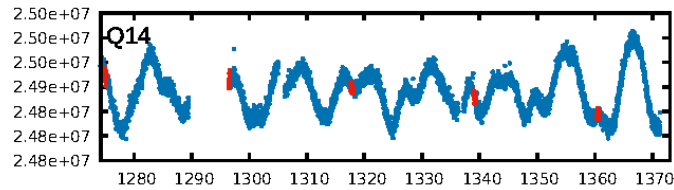
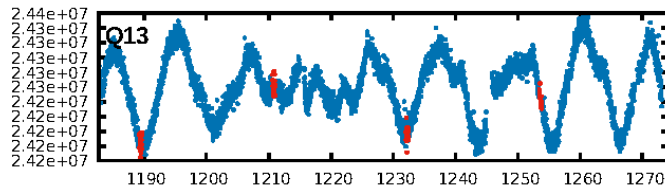
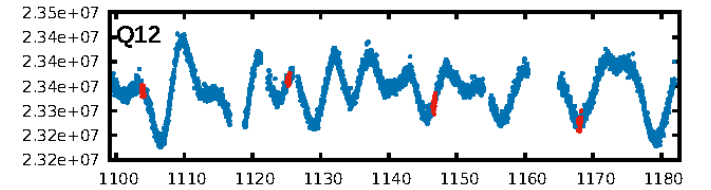
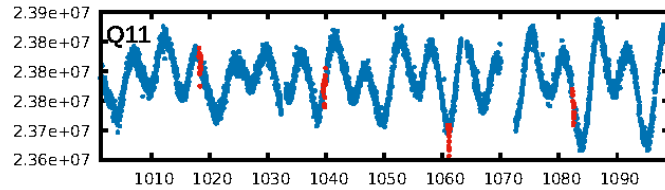
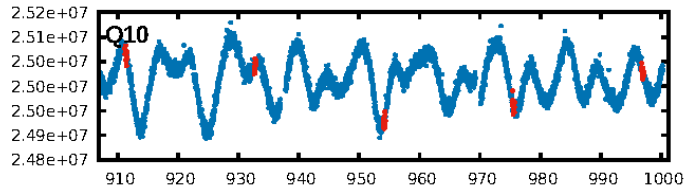
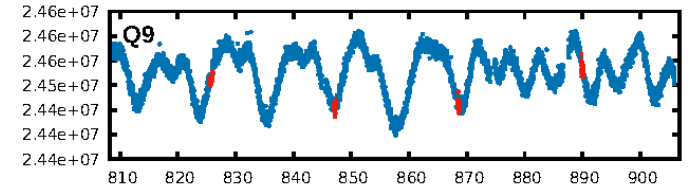
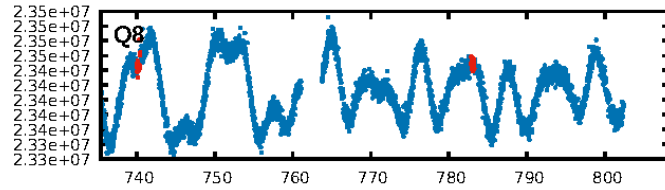
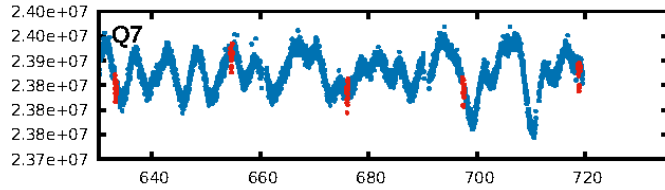
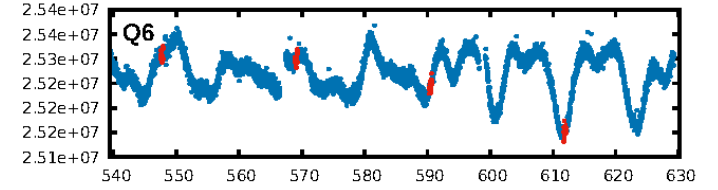
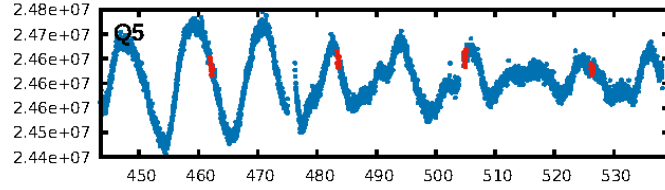
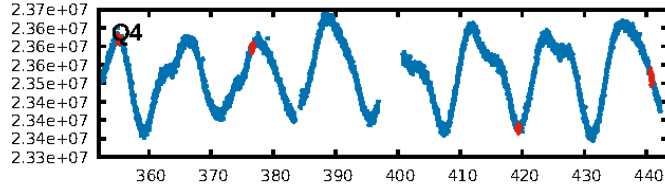
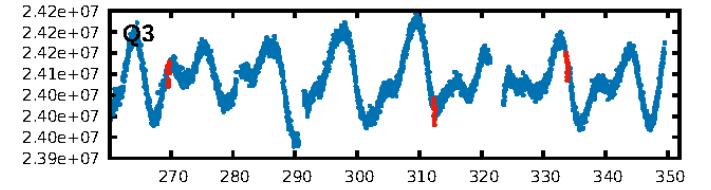
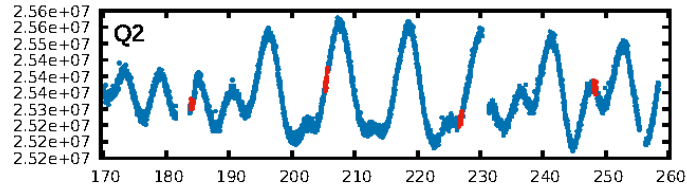
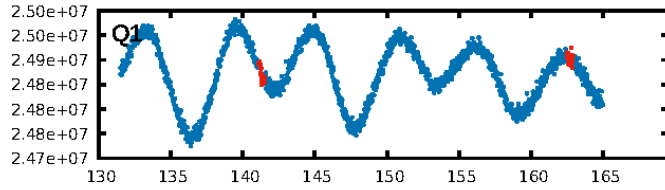
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: 100.0% [263.56σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 3.61e-142  
RollingBand-fgt: 1.00 [61/61]  
GhostDiagnostic-chr: -0.3516  
Centroid-sig: 0.0%  
Centroid-so: N/A  
OotOffset-rm: 8.845 arcsec [131.97σ]  
KicOffset-rm: 8.948 arcsec [133.65σ]  
OotOffset-st: 0/4/0/0 [4]  
KicOffset-st: 0/4/0/0 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 1.00 [17/17]

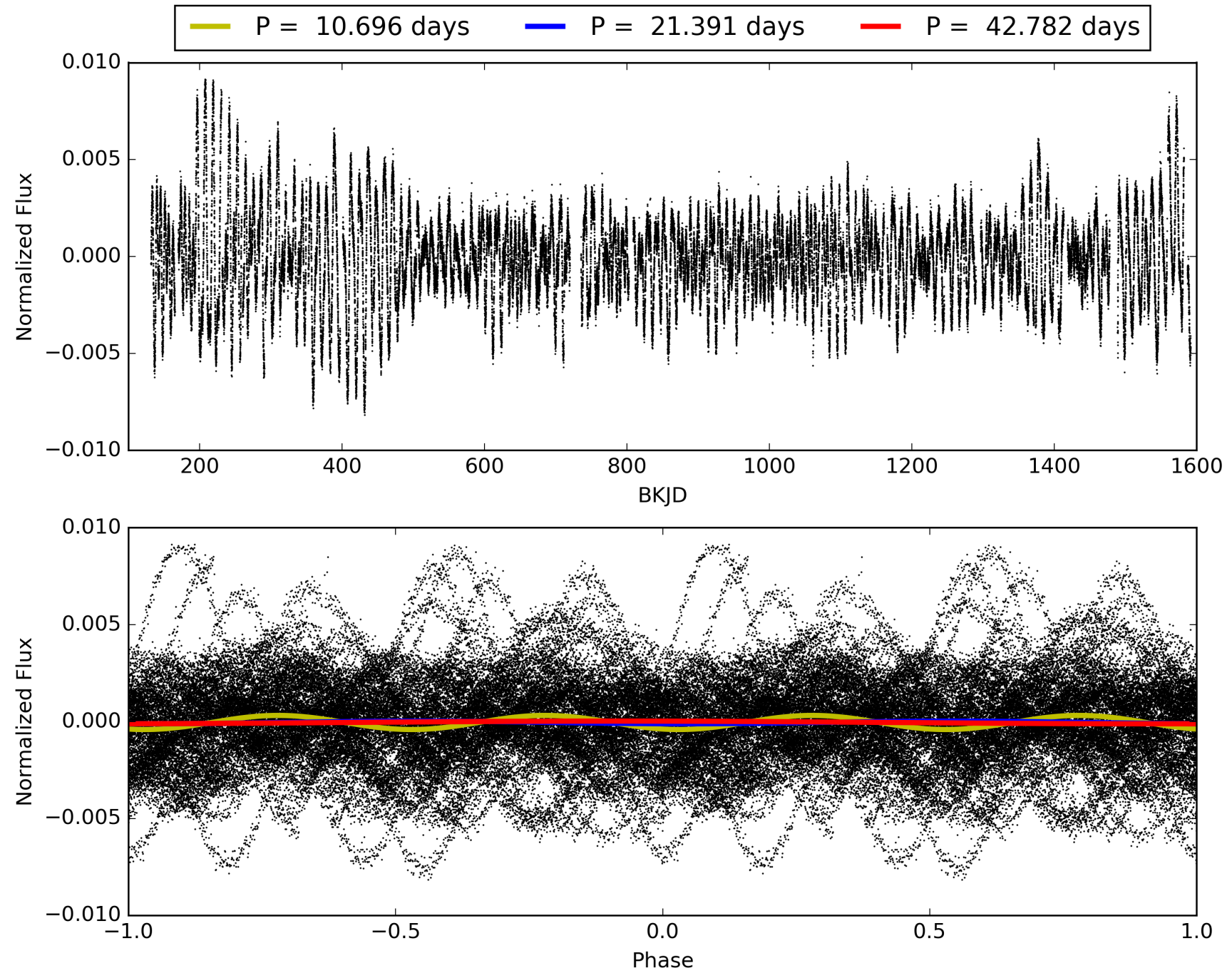
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:16:10 Z

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

# TCE 005443604-01, PDC Light Curves

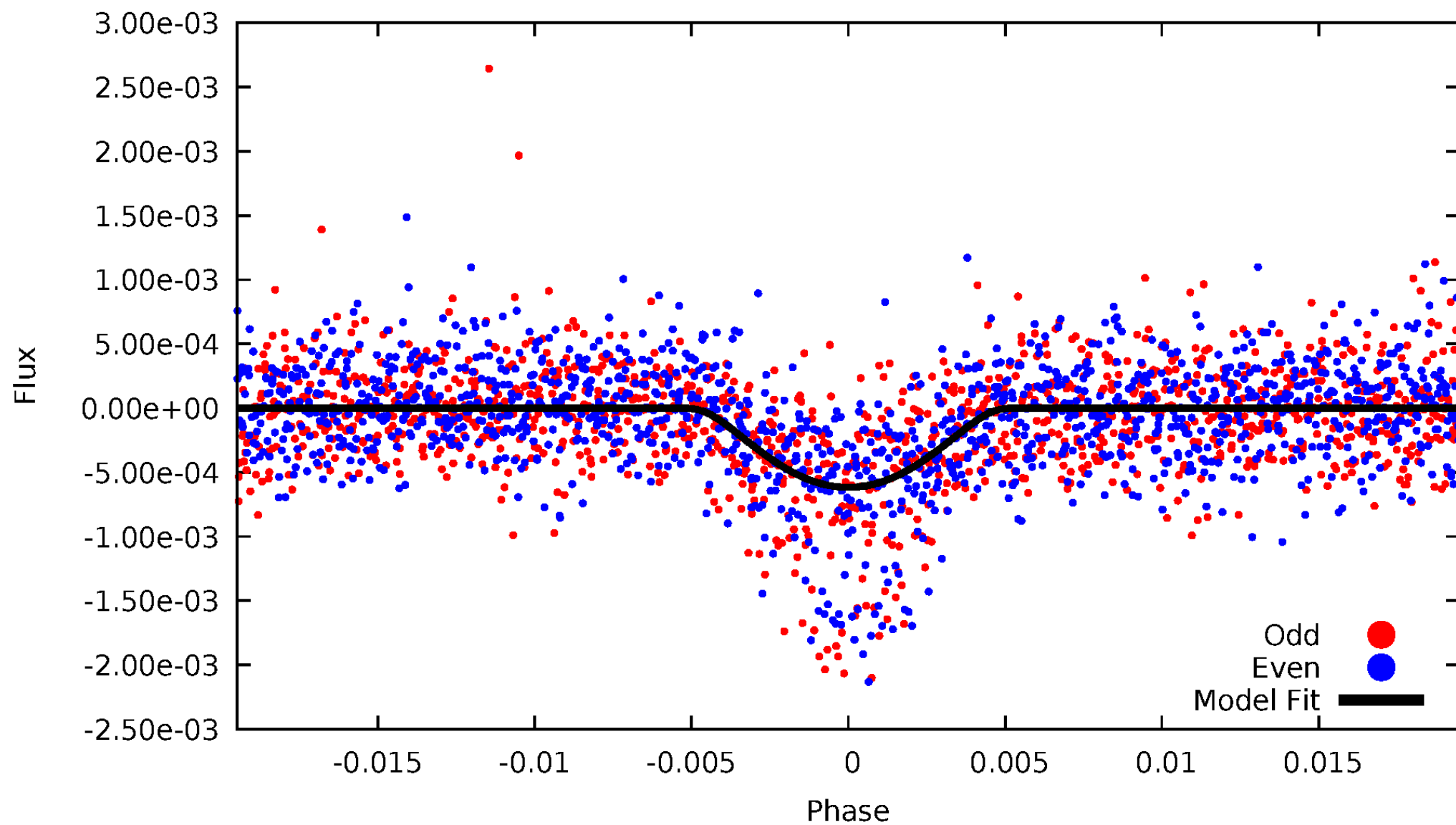


TCE 005443604-01



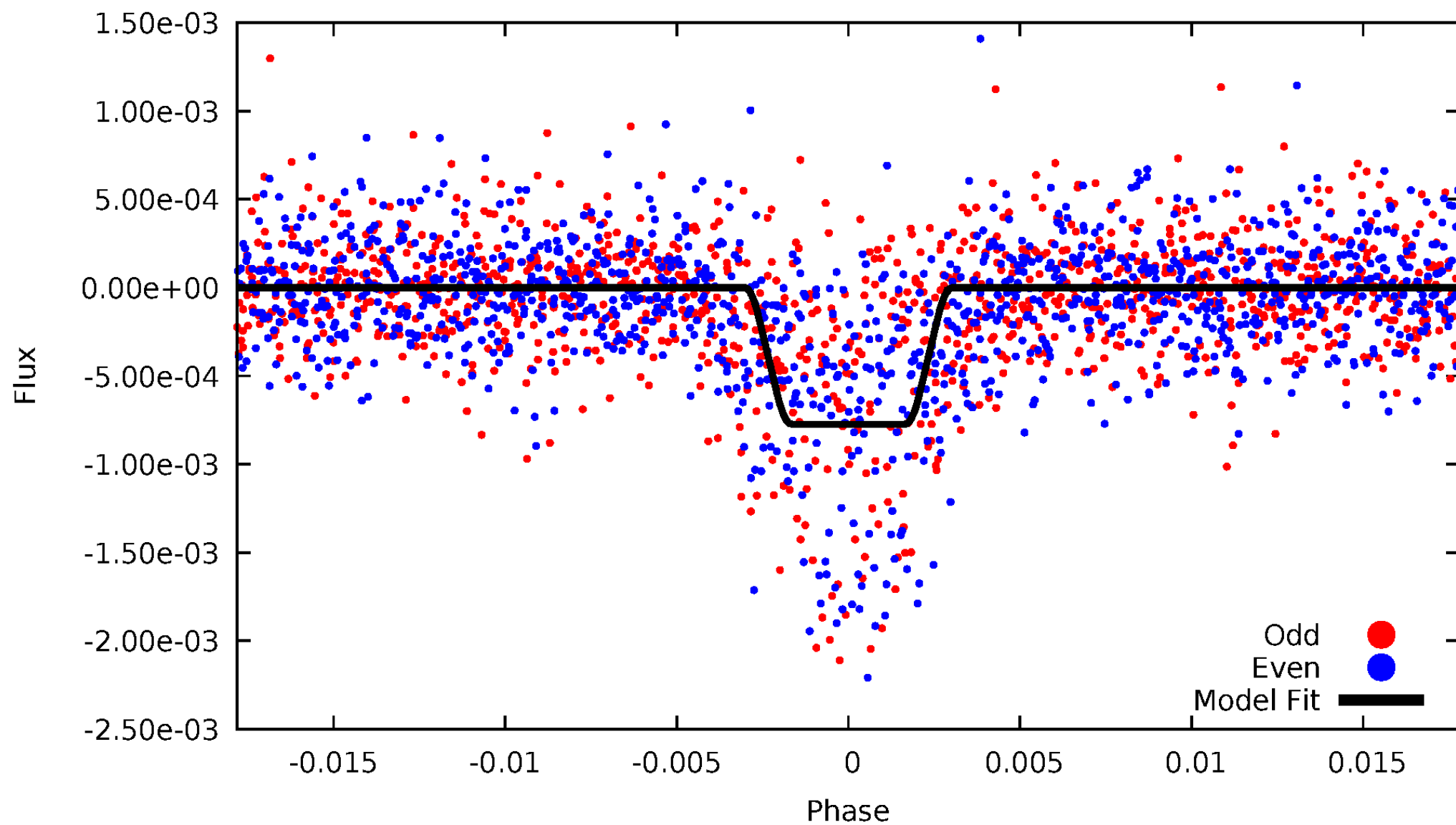
# DV Odd/Even

TCE 005443604-01



# ALT Odd/Even

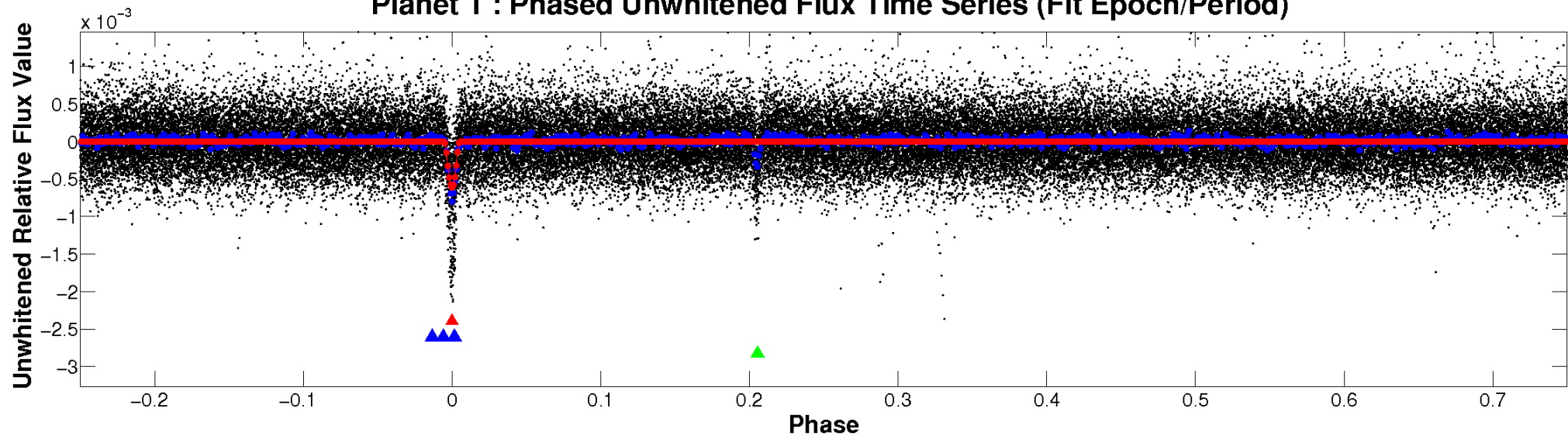
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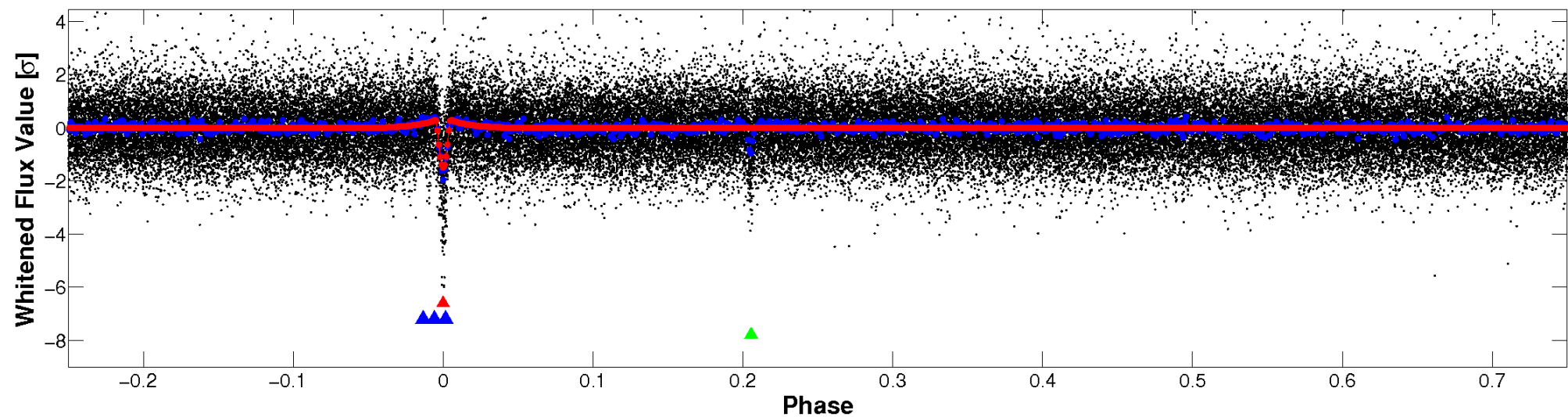


# Non-Whitened Vs. Whitened Light Curve

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

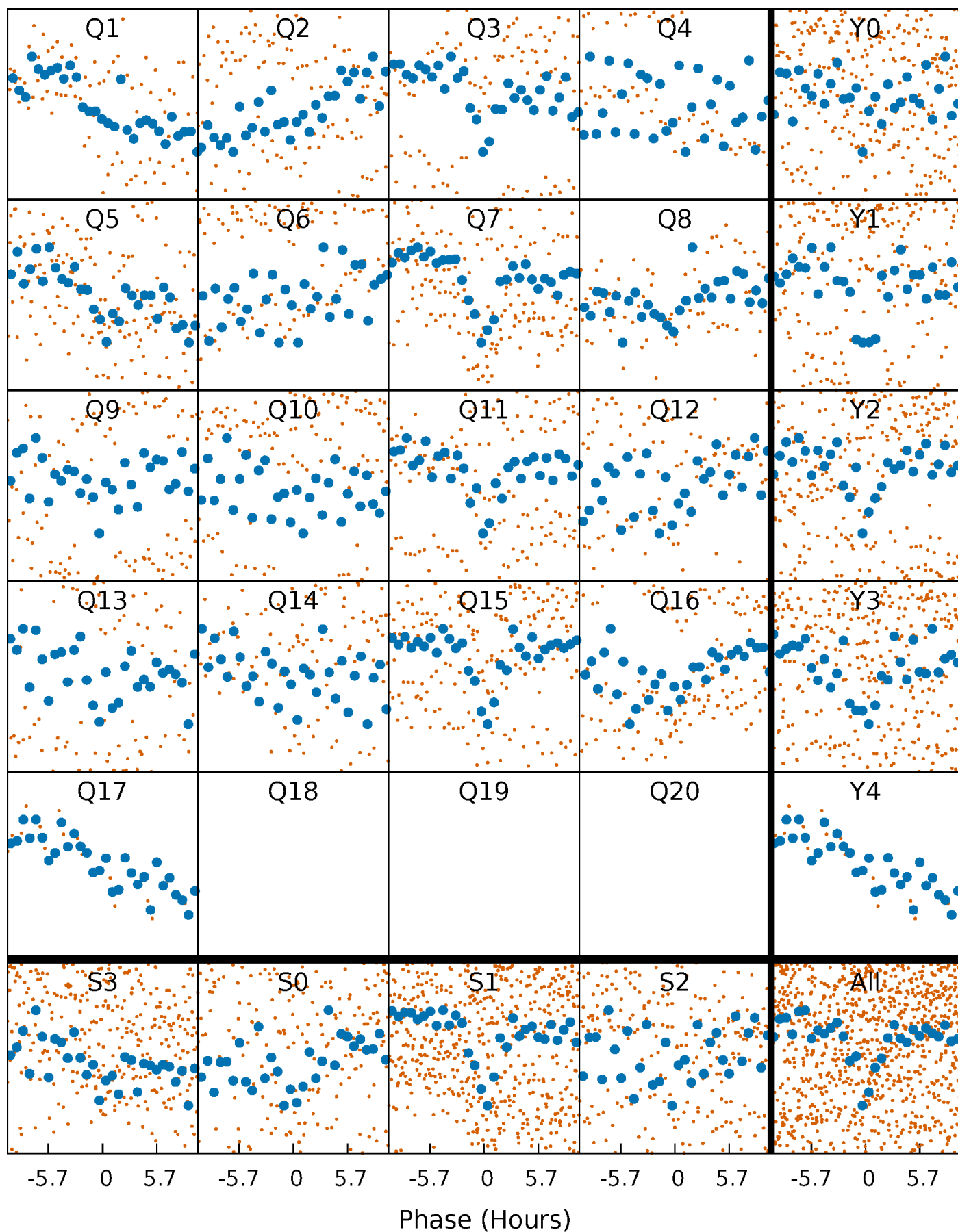


**Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)**



# PDC Quarter-Phased Transit Curves

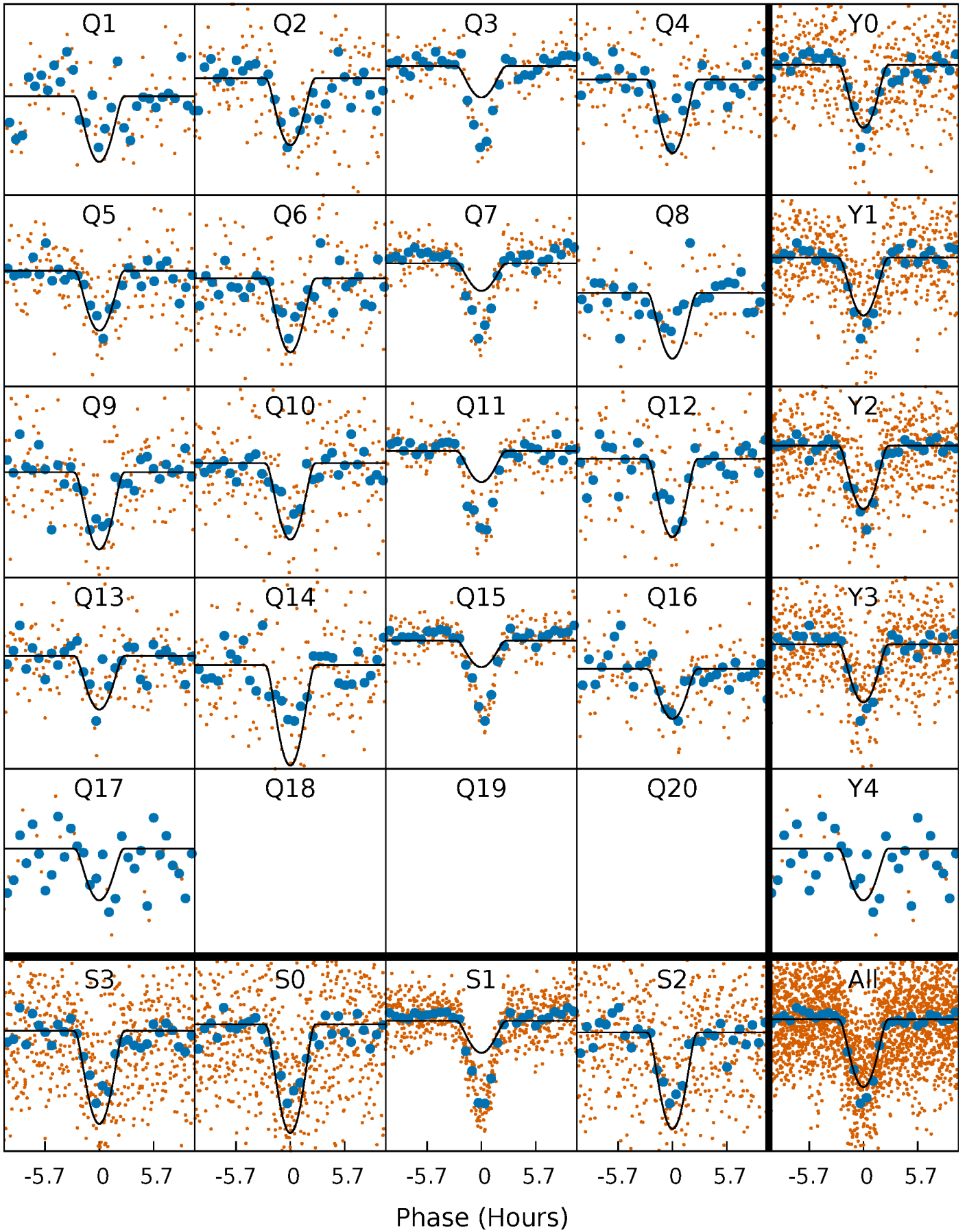
TCE 005443604-01 P= 21.391042 Days  $T_0=141.297902$  (BKJD)





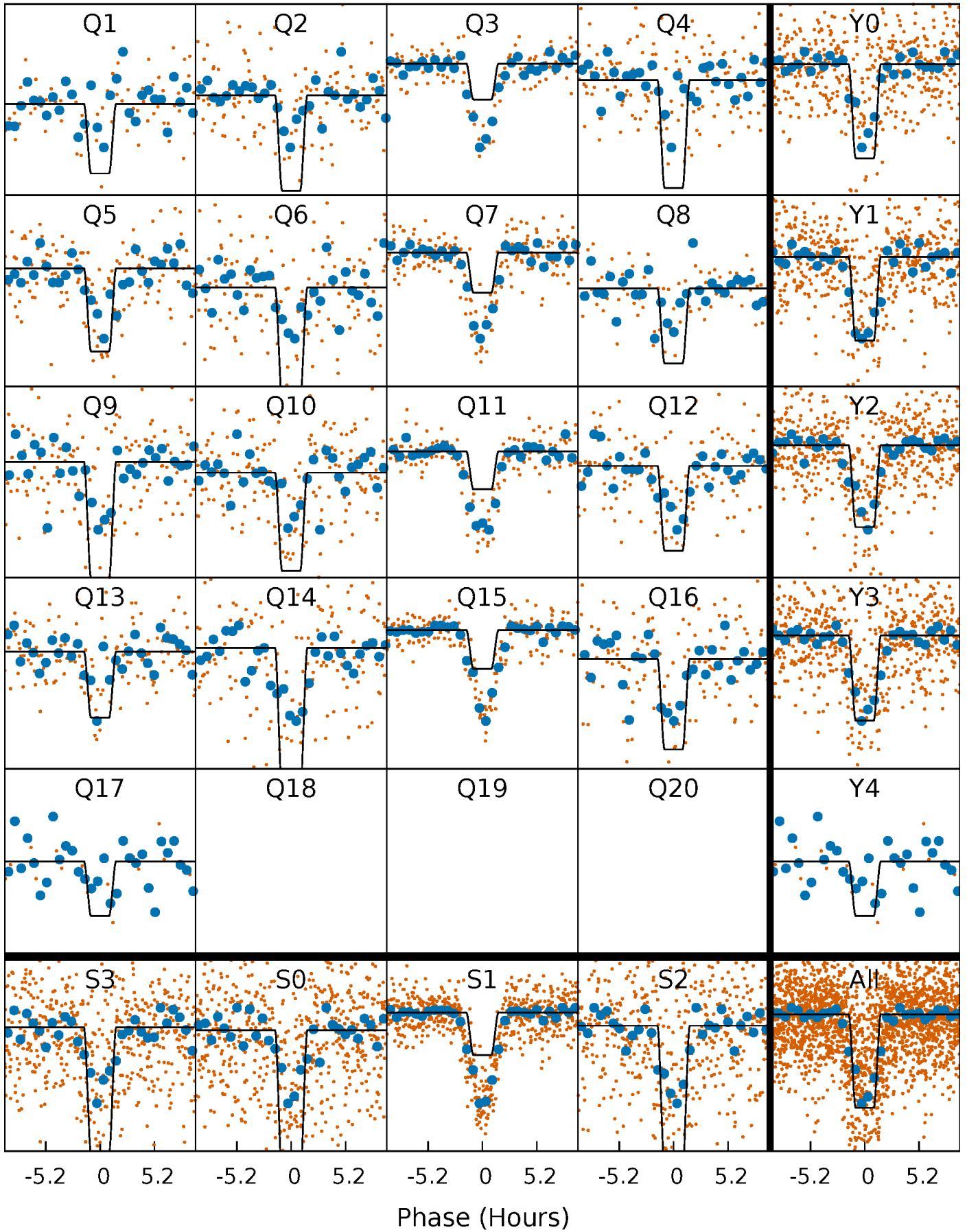
# DV Quarter-Phased Transit Curves

TCE 005443604-01 P= 21.391042 Days  $T_0=141.297902$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

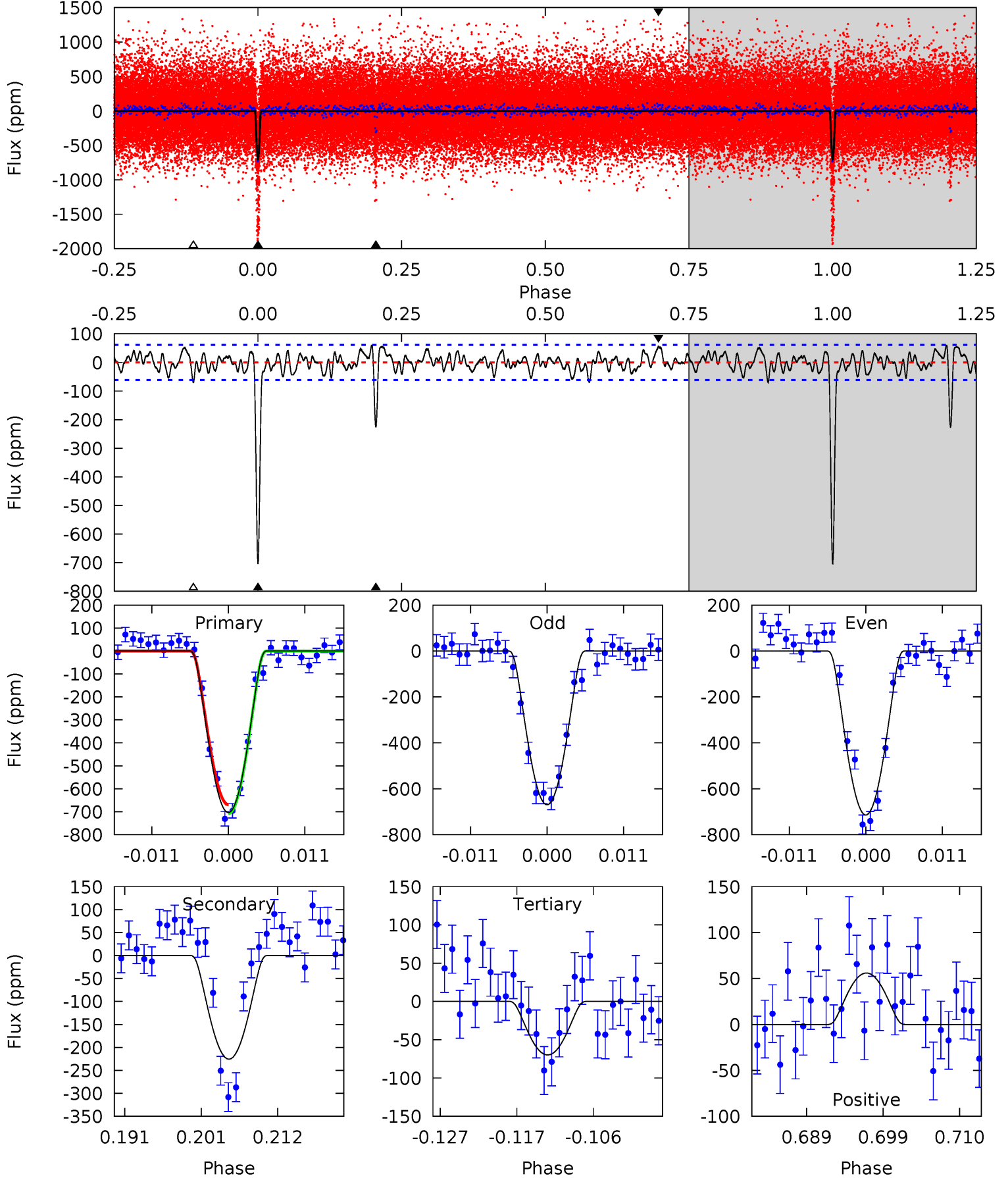
TCE 005443604-01 P= 21.391131 Days  $T_0=141.294373$  (BKJD)



# DV Model-Shift Uniqueness Test

005443604-01, P = 21.391042 Days, E = 119.906860 Days

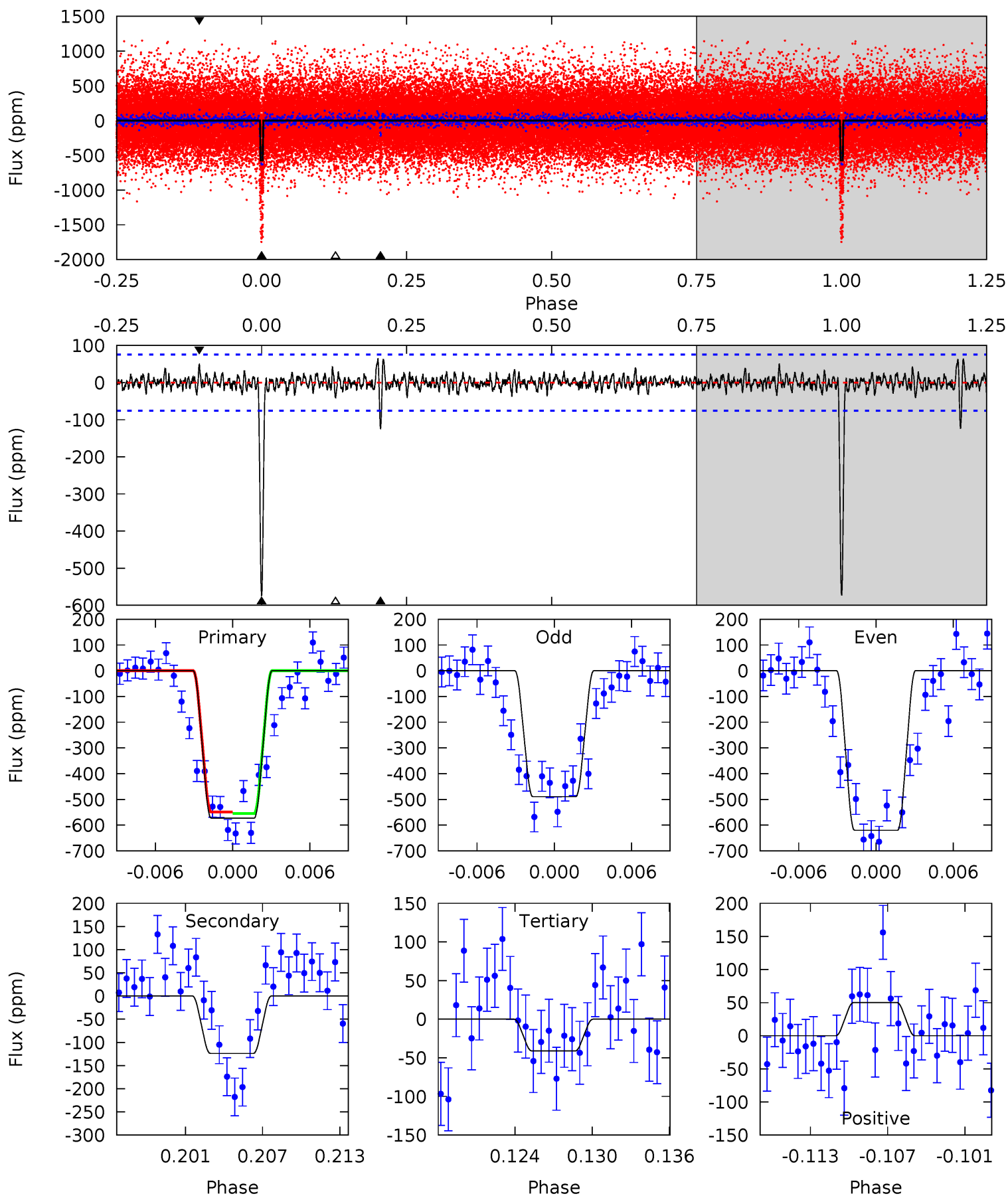
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
57.3	18.4	5.69	4.56	5.02	2.56	1.91	51.6	52.7	12.7	13.8	1.81	1.43	0.08	1.56



# Alt Model-Shift Uniqueness Test

005443604-01, P = 21.391131 Days, E = 119.903242 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
38.8	8.40	2.79	3.40	5.13	2.75	0.89	36.0	35.4	5.61	5.00	4.42	1.34	0.10	0.20



### Stellar Parameters For KIC 005443604

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4889^{+146}_{-131}$	$4.637^{+0.031}_{-0.058}$	$-0.220^{+0.300}_{-0.300}$	$0.686^{+0.074}_{-0.056}$	$0.759^{+0.060}_{-0.083}$	$3.310^{+0.484}_{-0.740}$
	+3%/-3%	+1%/-1%	+136%/-136%	+11%/-8%	+8%/-11%	+15%/-22%
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 005443604-01 / KOI 2713.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-226 \pm 12$	$3.92^{+3.13}_{-2.40}$	$680^{+27}_{-22}$	$3202^{+1145}_{-493}$	$149^{+845}_{-102}$
Alt.	$-124 \pm 15$	$3.03^{+2.62}_{-1.99}$	$680^{+25}_{-23}$	$3122^{+1384}_{-484}$	$134^{+1035}_{-95}$

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

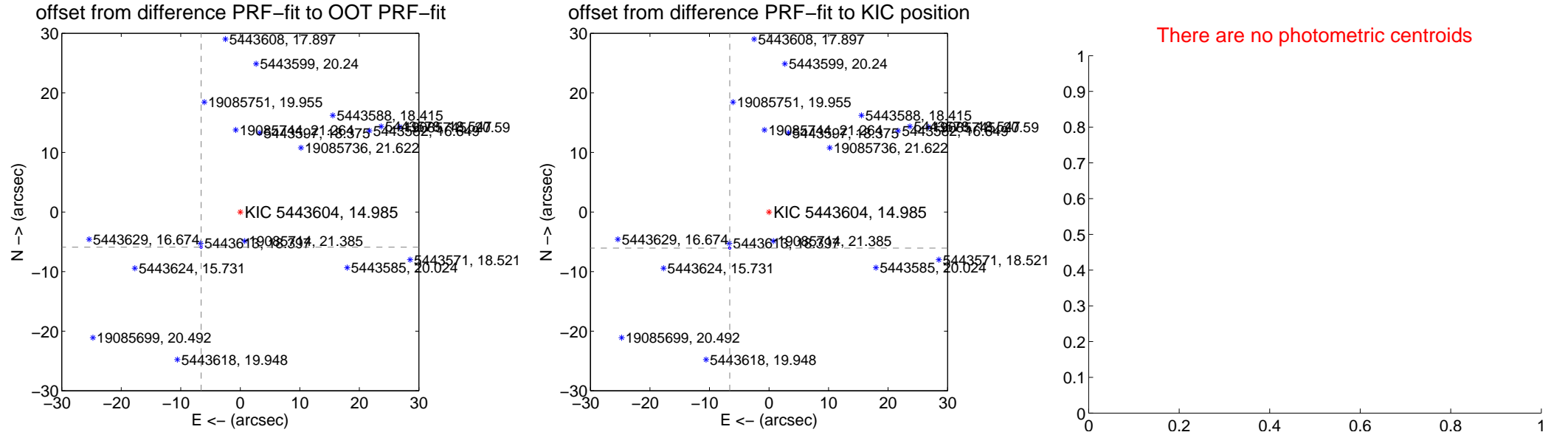
## DV Centroid Data

Supplemental centroid analysis for 005443604-01. Kepler magnitude: 14.98. Transit SNR 24.10

There are 4 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

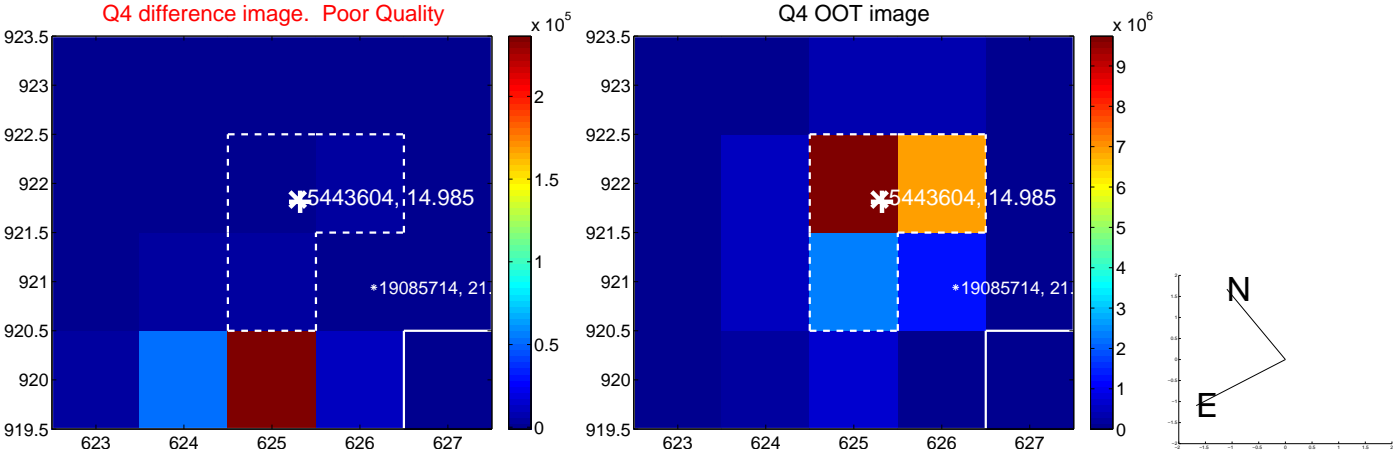
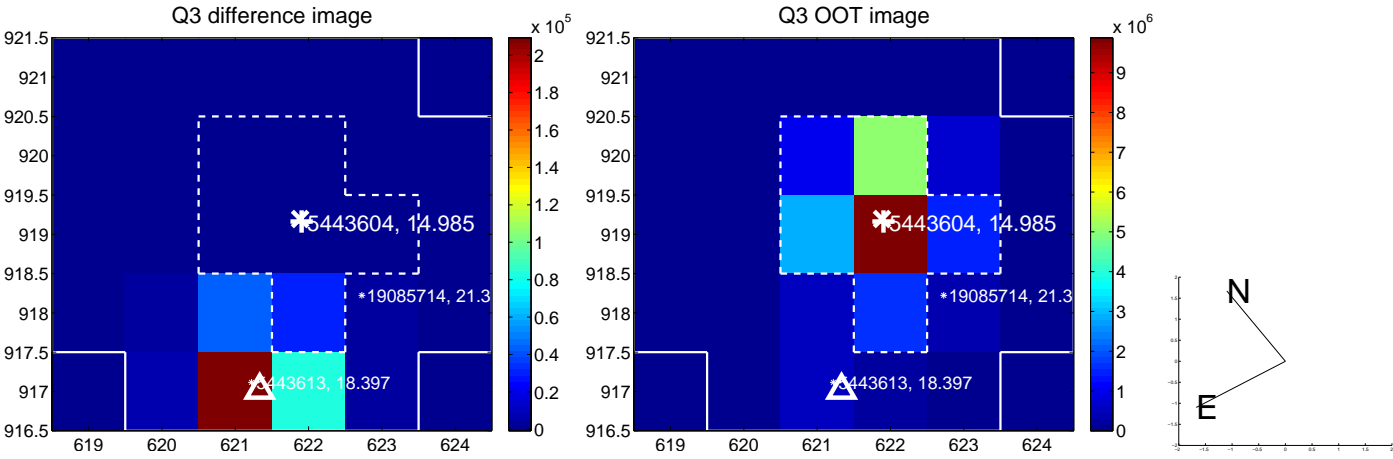
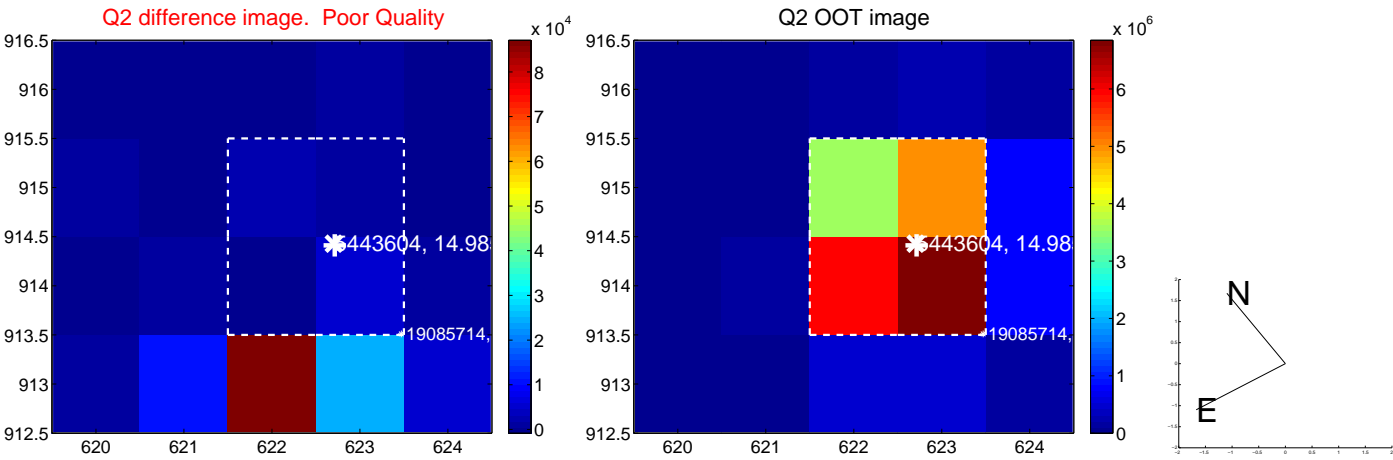
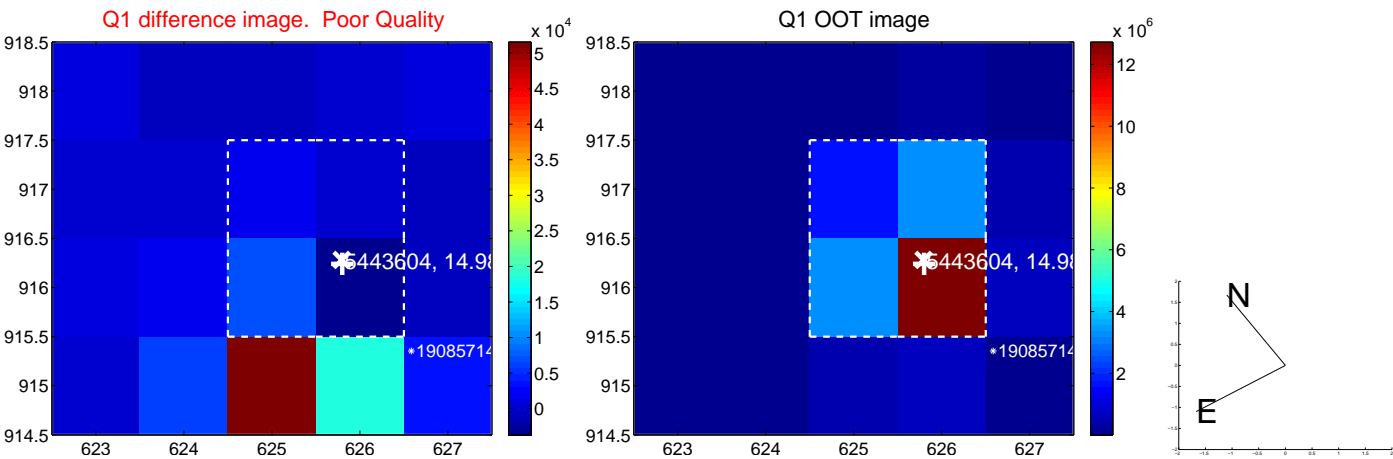
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	8.845 $\pm$ 0.067	131.97	6.584 $\pm$ 0.067	-5.906 $\pm$ 0.067
PRF-fit source offset from KIC position	8.948 $\pm$ 0.067	133.65	6.591 $\pm$ 0.067	-6.051 $\pm$ 0.067
photometric centroid source offset	—	—	—	—



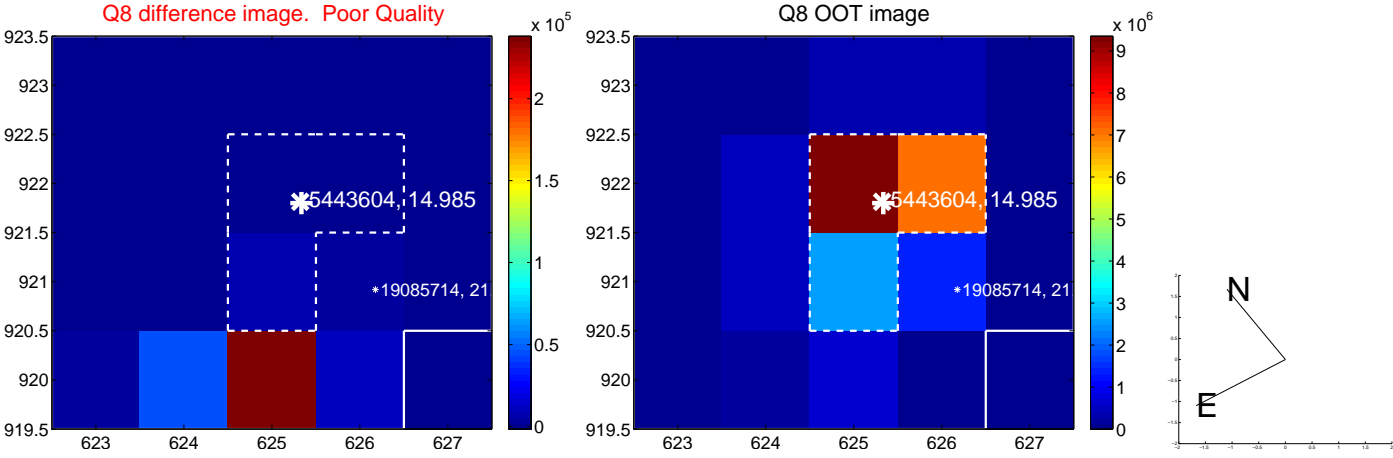
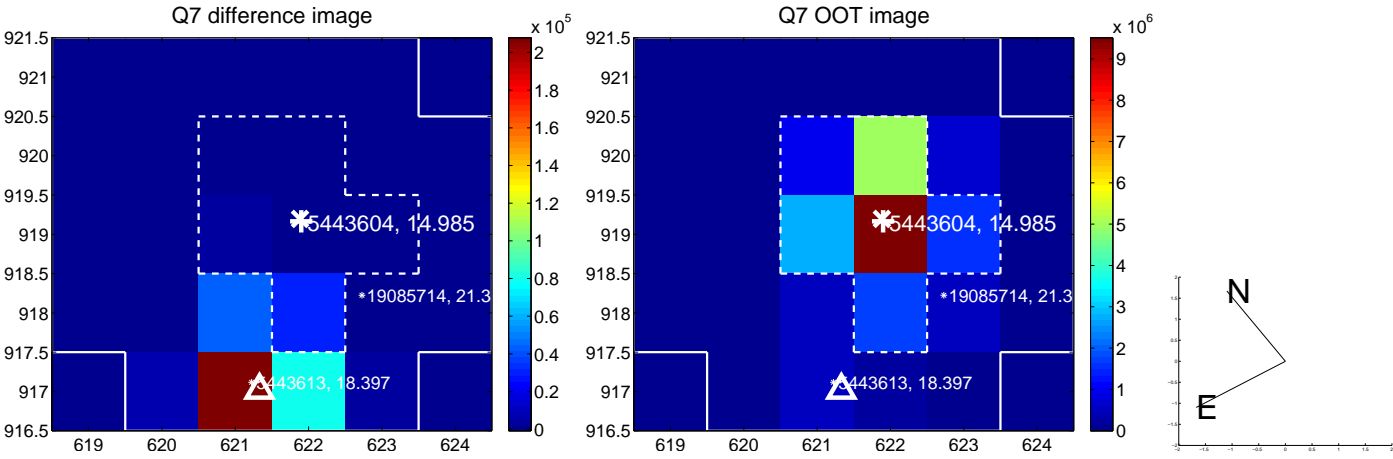
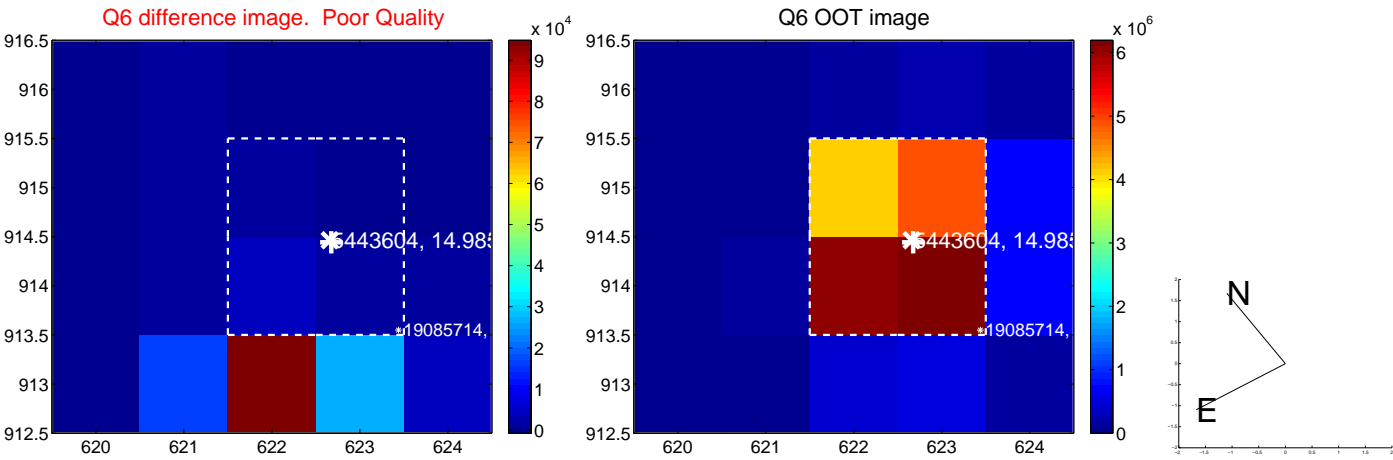
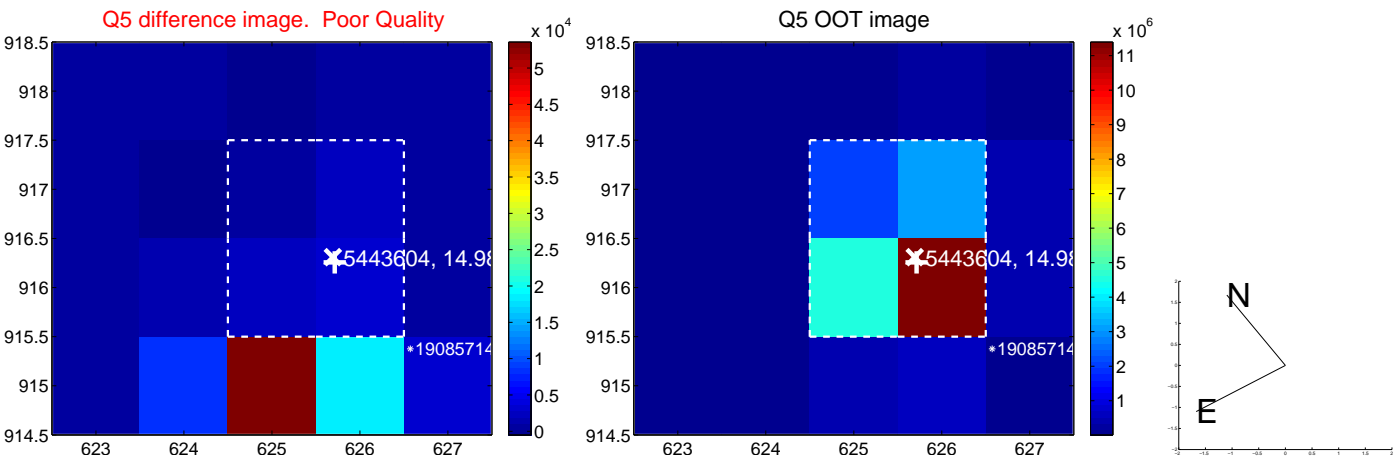
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



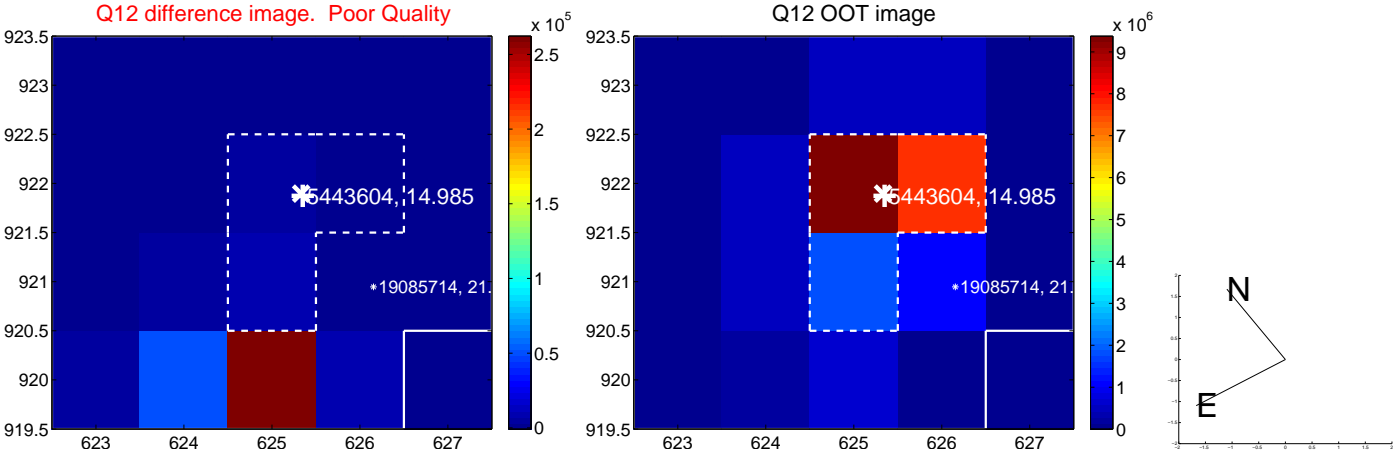
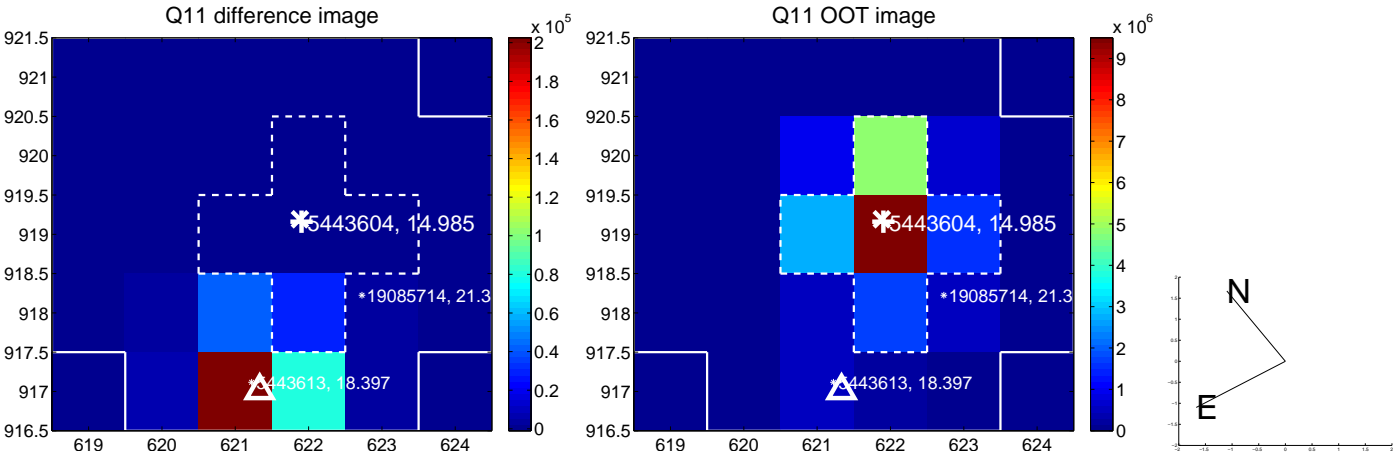
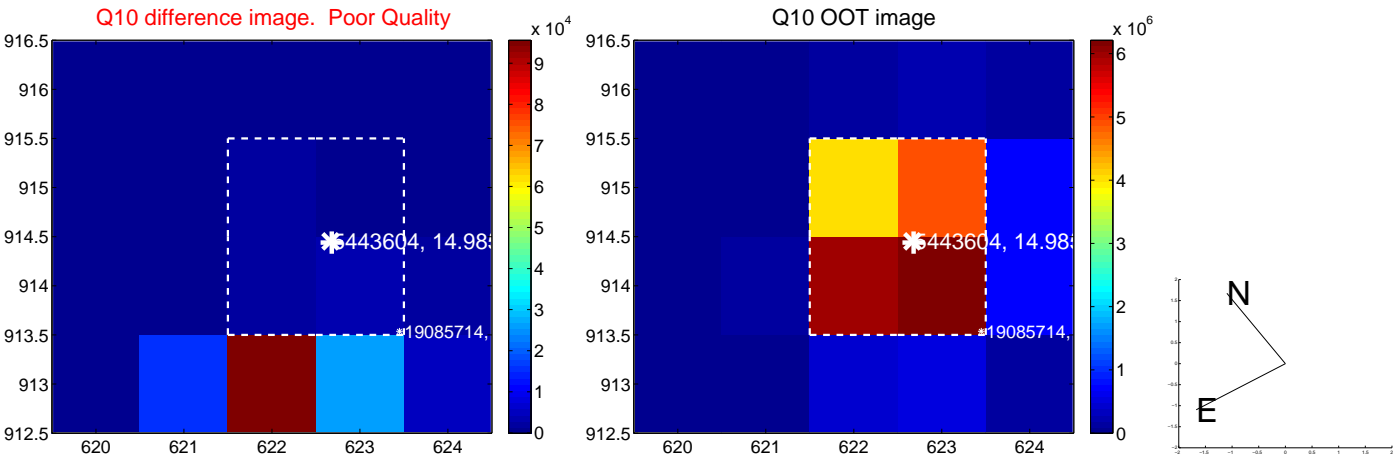
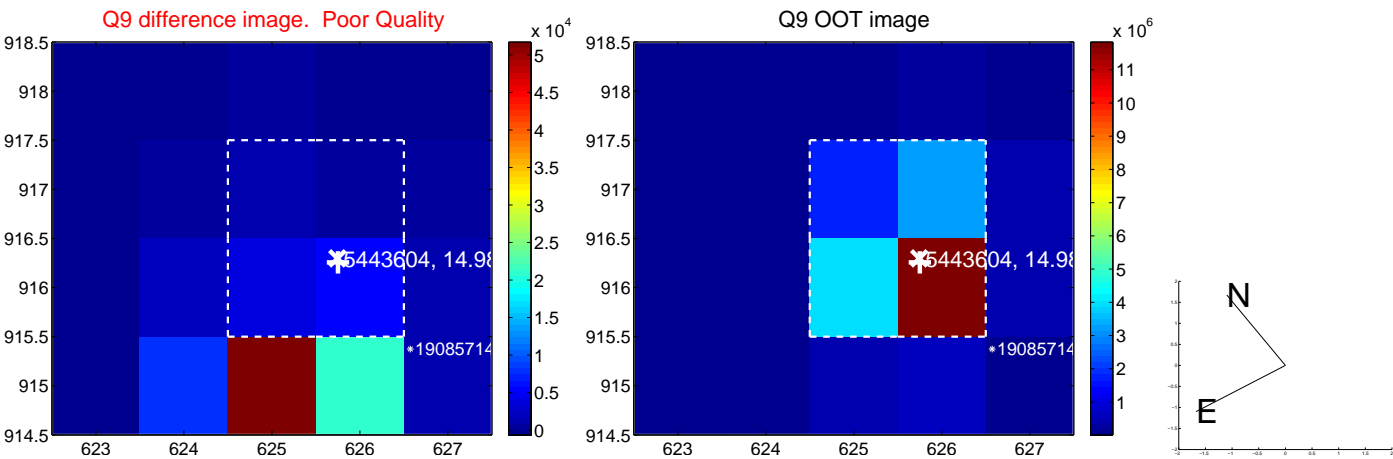
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



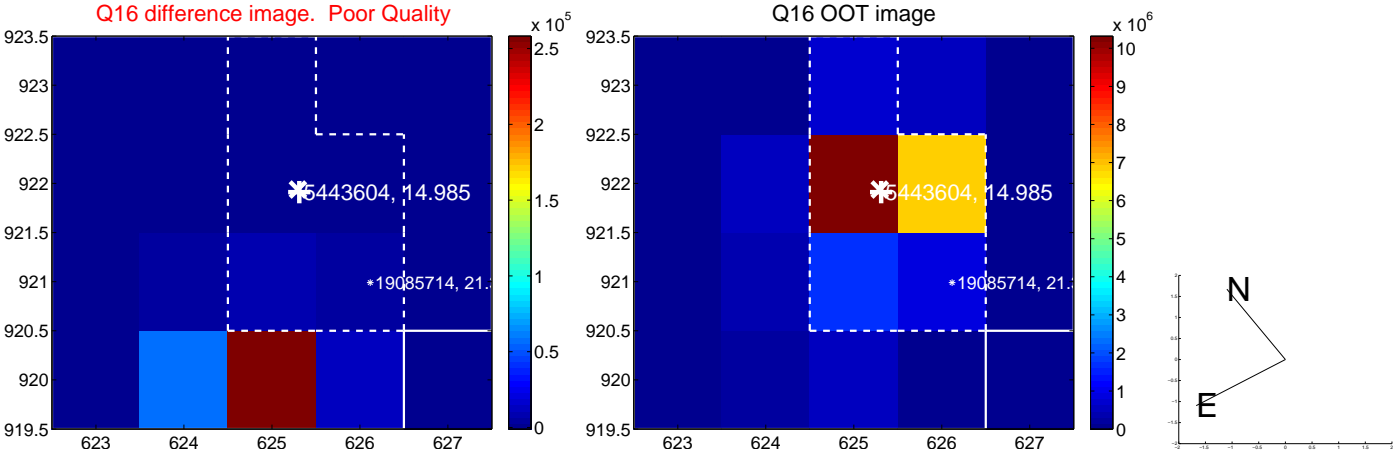
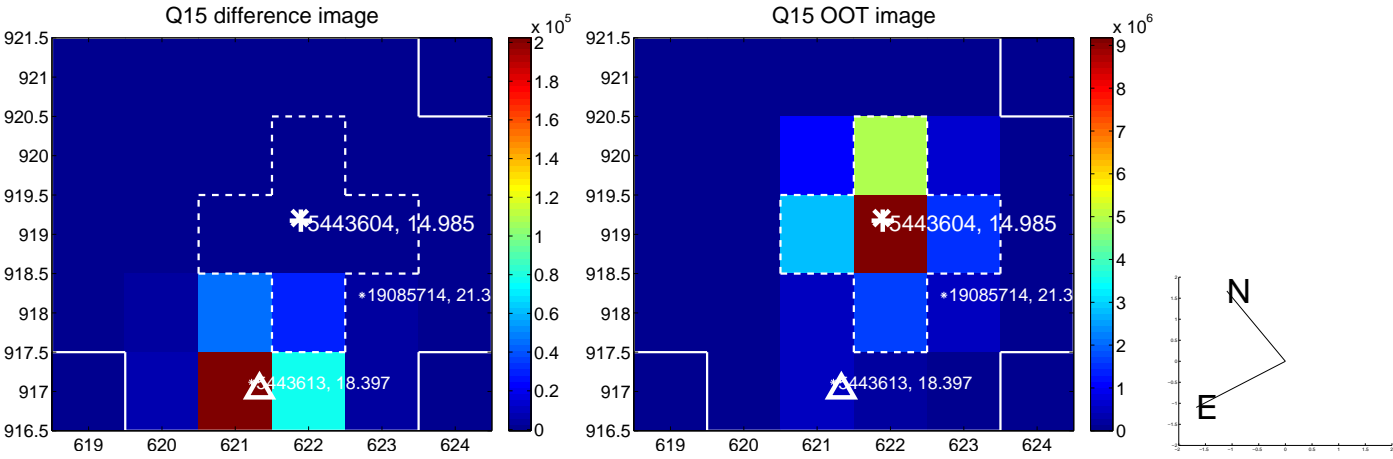
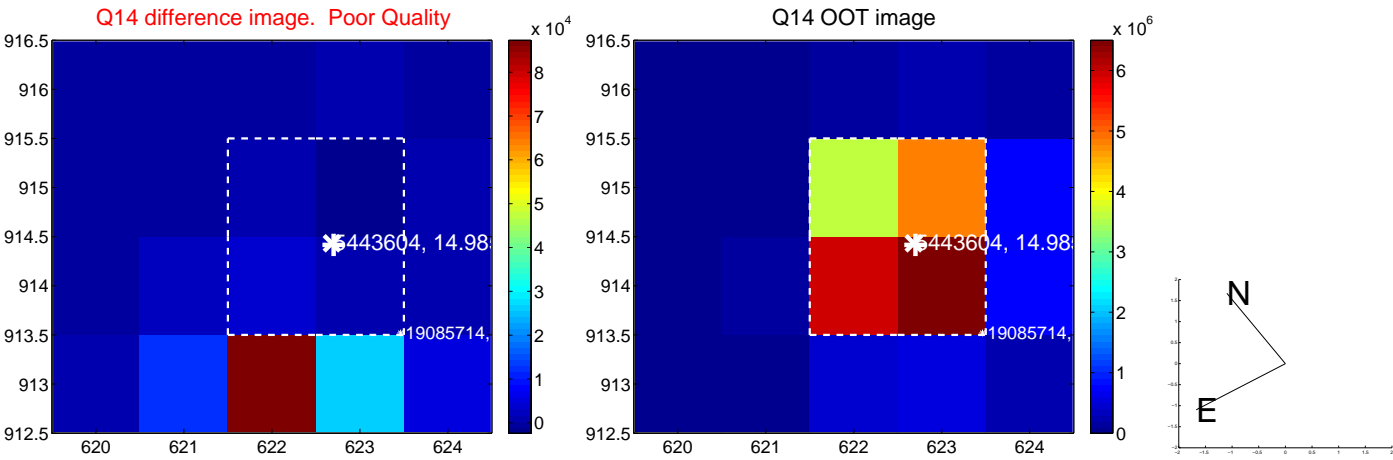
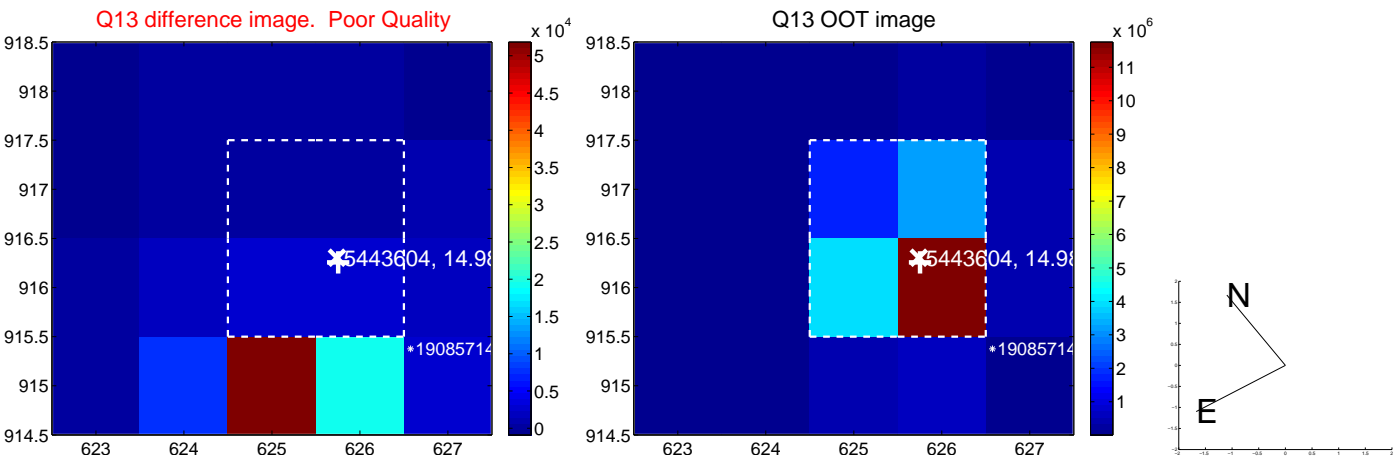
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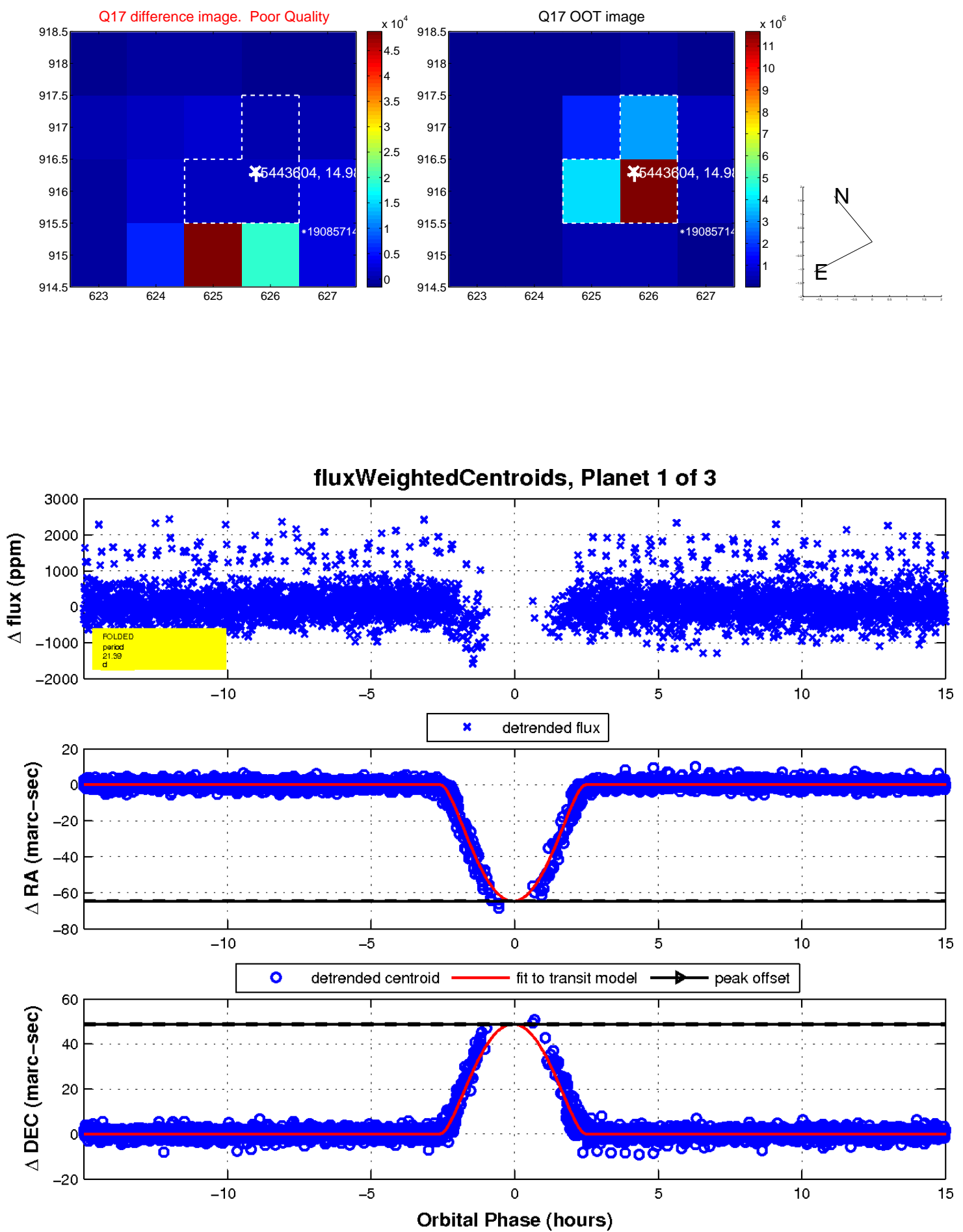
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



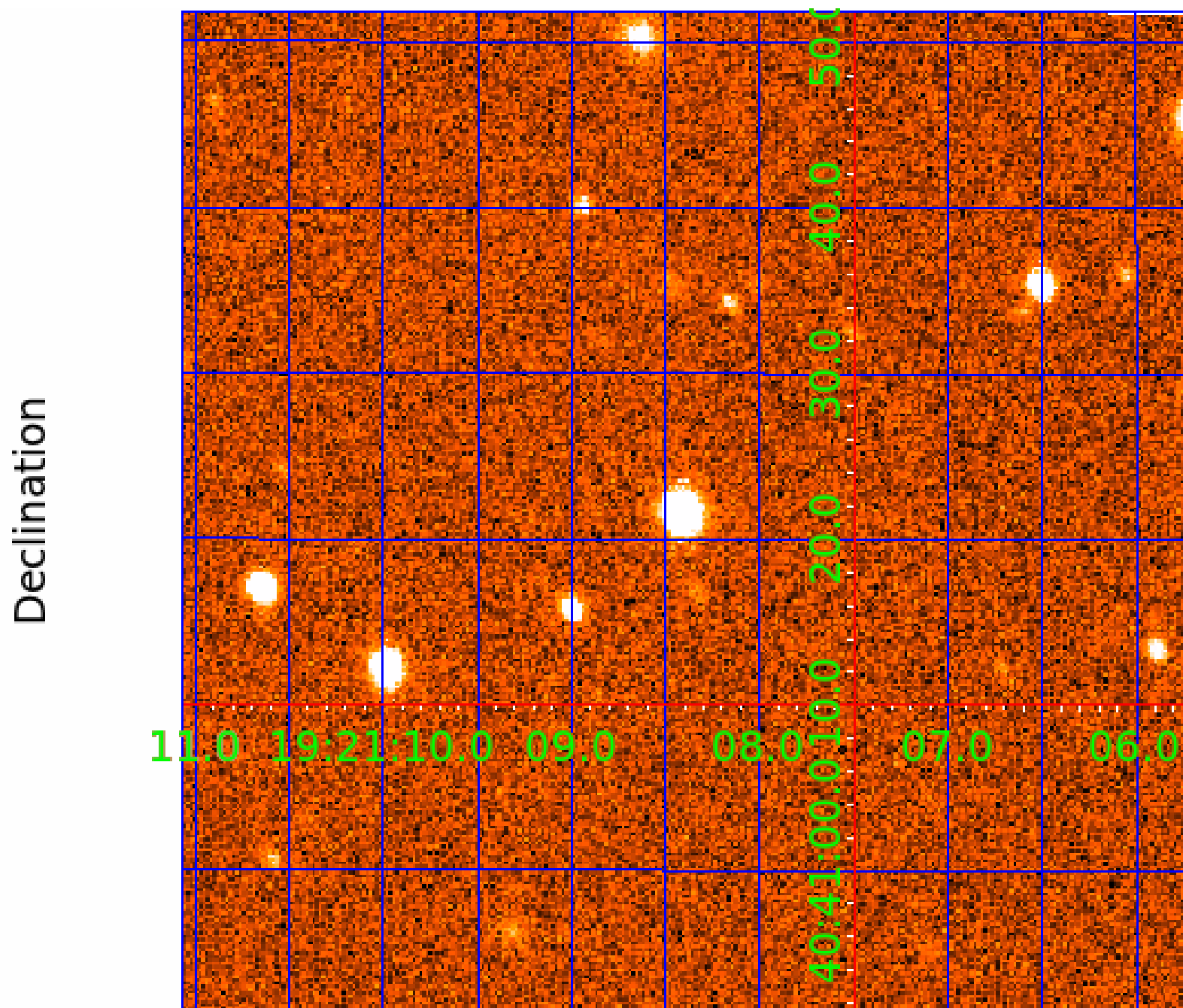
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





# KIC 005443604

## Q1-17 DR25 TCE Parameters

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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005443604-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
005443604-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005443604-03	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_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 005443604-02

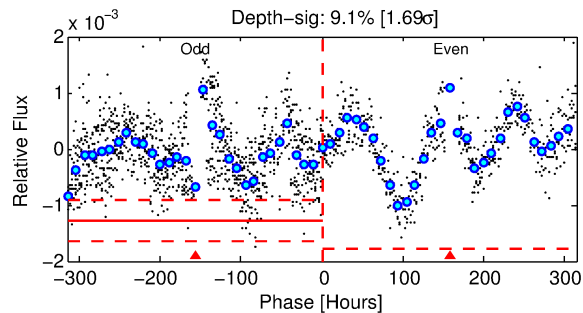
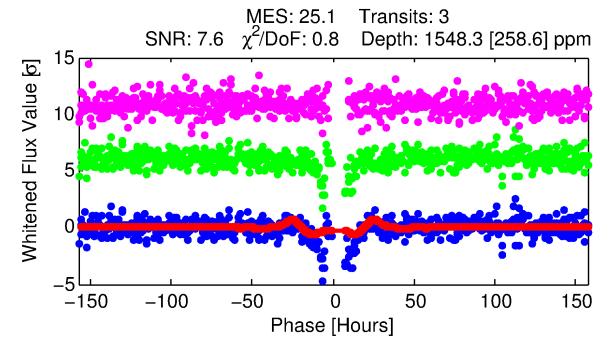
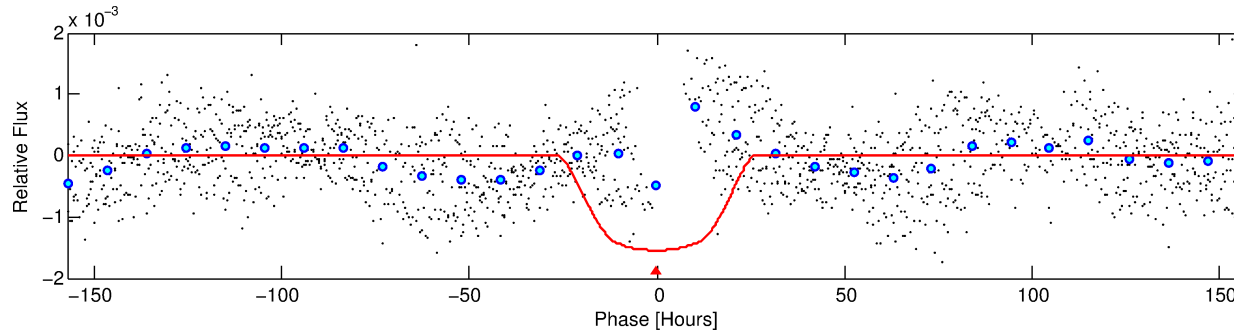
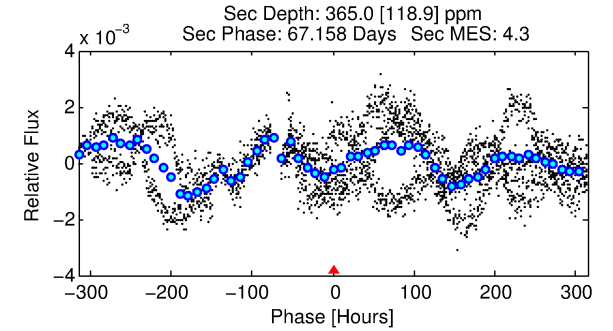
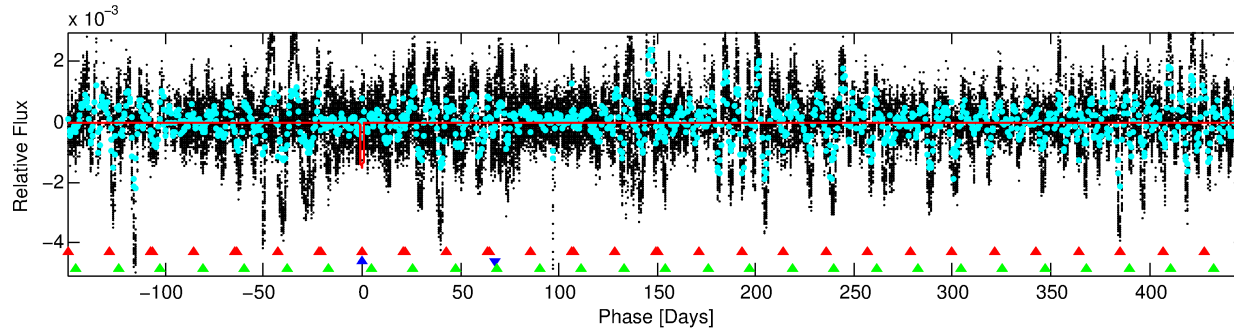
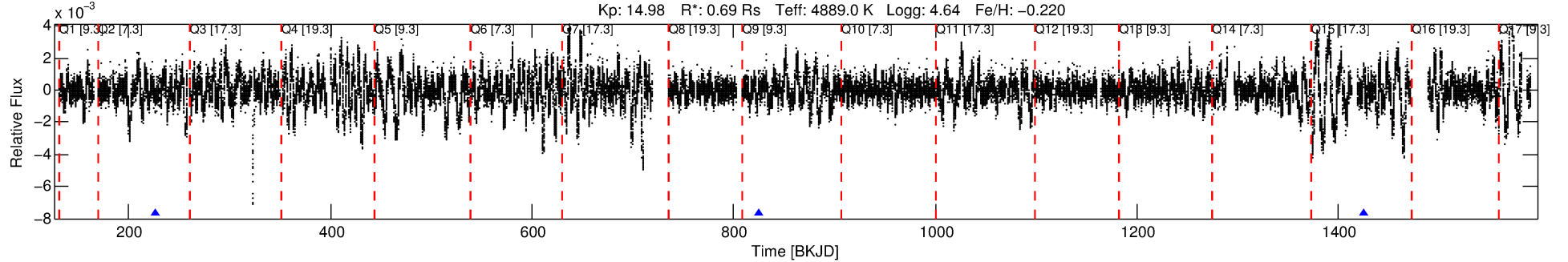
No Significant Match Found

# DV One-Page Summary

KIC: 5443604 Candidate: 2 of 3 Period: 599.109 d

KOI: K02713 Corr: No Ephemeris Match

Kp: 14.98 R\*: 0.69 Rs Teff: 4889.0 K Logg: 4.64 Fe/H: -0.220



## DV Fit Results:

Period = 599.10884 [0.03184] d  
Epoch = 226.5778 [0.0403] BKJD  
Rp/R\* = 0.0459 [0.0042]  
a/R\* = 41.92 [2.47]  
b = 0.93 [0.01]  
Seff = 0.15 [0.03]  
Teq = 159 [7] K  
Rp = 3.44 [0.48] Re  
a = 1.2606 [0.1066] AU  
Ag = 27010.55 [10532.09] [2.56σ]  
Teffp = 3154 [309] K [9.70σ]

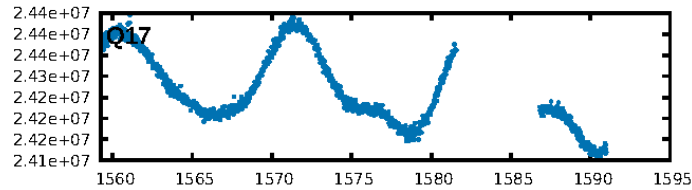
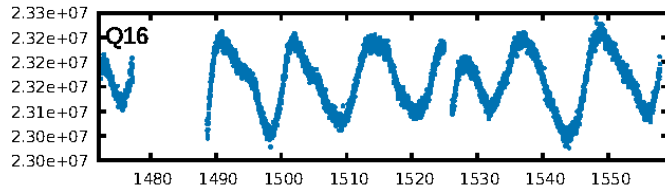
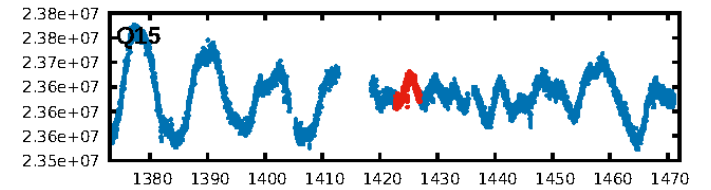
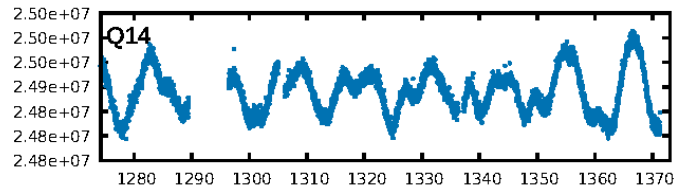
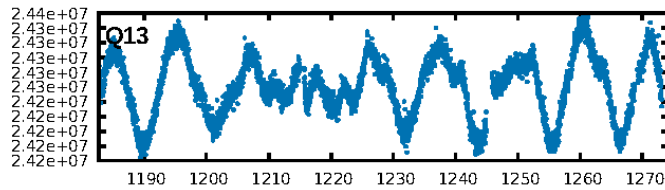
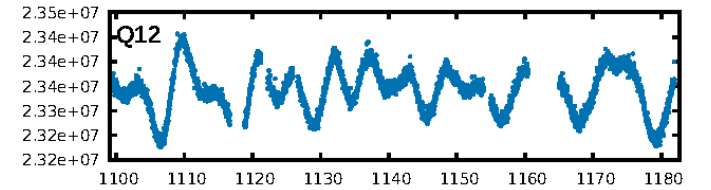
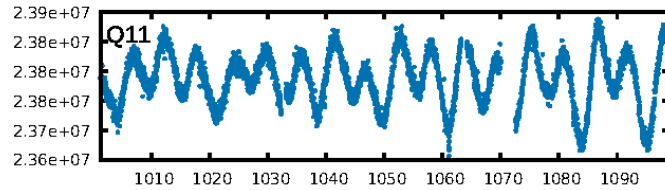
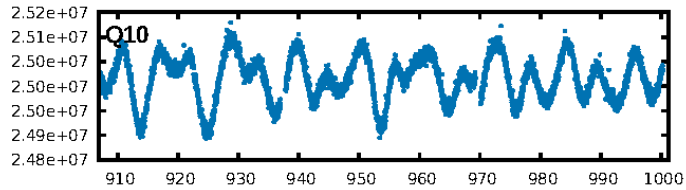
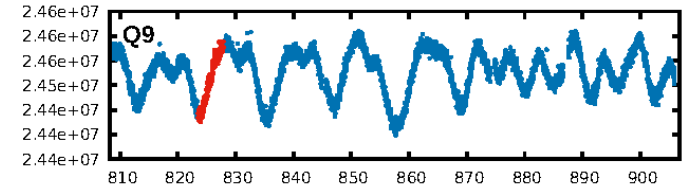
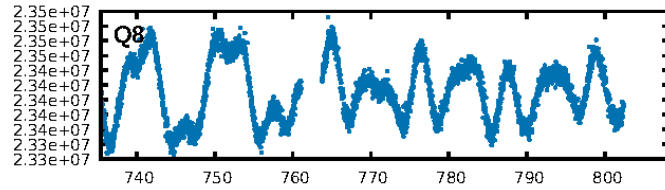
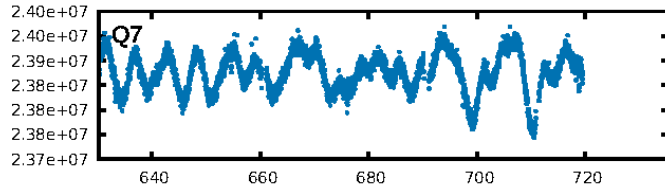
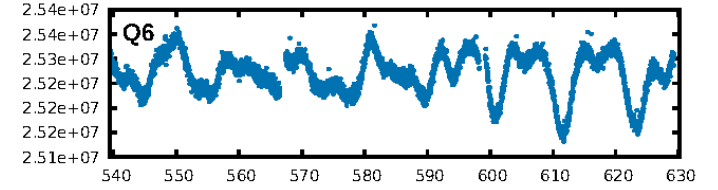
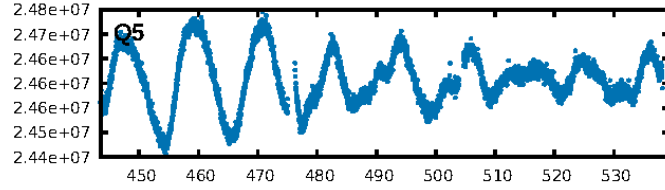
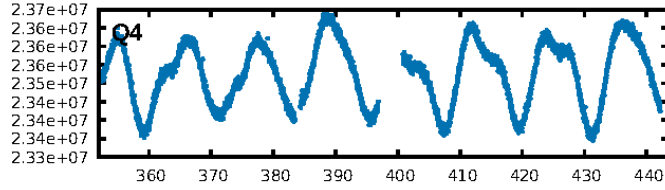
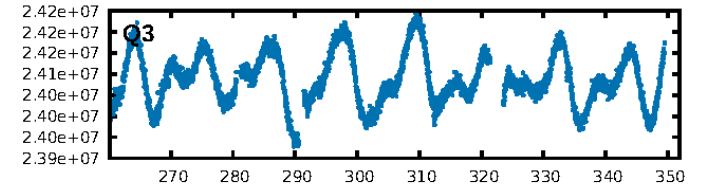
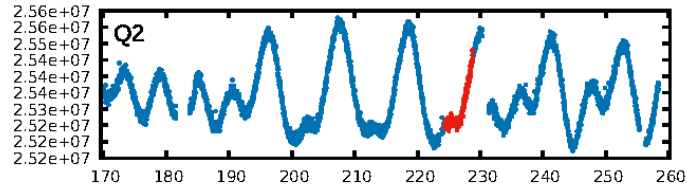
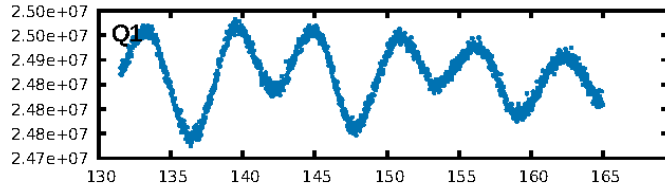
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [263.56σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.47e-44  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.6464**  
Centroid-sig: 7.0%  
Centroid-so: 0.689 arcsec [2.20σ]  
OotOffset-rm: N/A  
OotOffset-st: 0/0/0/0 [0]  
KicOffset-rm: N/A  
KicOffset-st: 0/0/0/0 [0]  
DiffImageQuality-fgm: N/A  
DiffImageOverlap-fno: 0.00 [0/2]

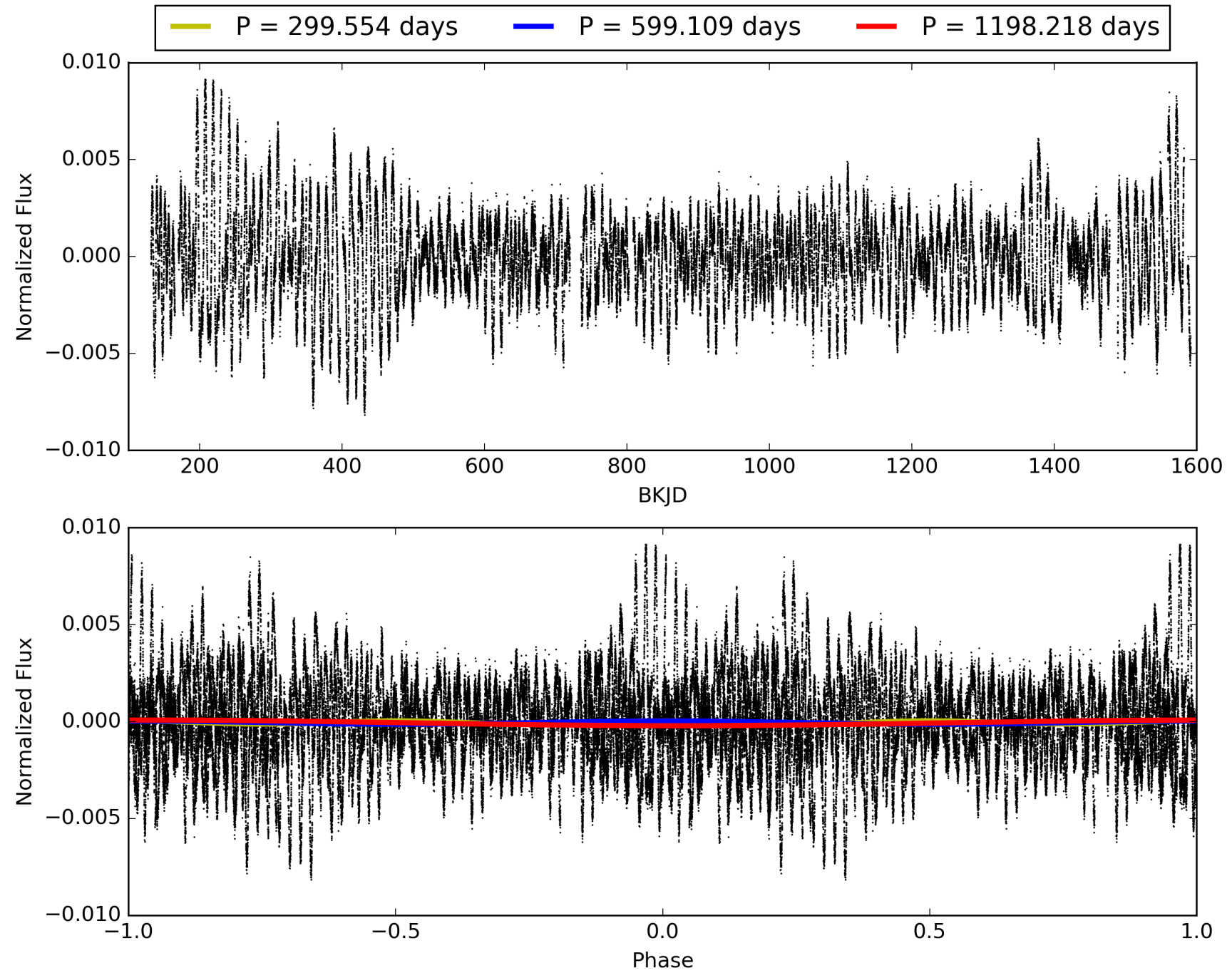
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:16:18 Z

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

# TCE 005443604-02, PDC Light Curves

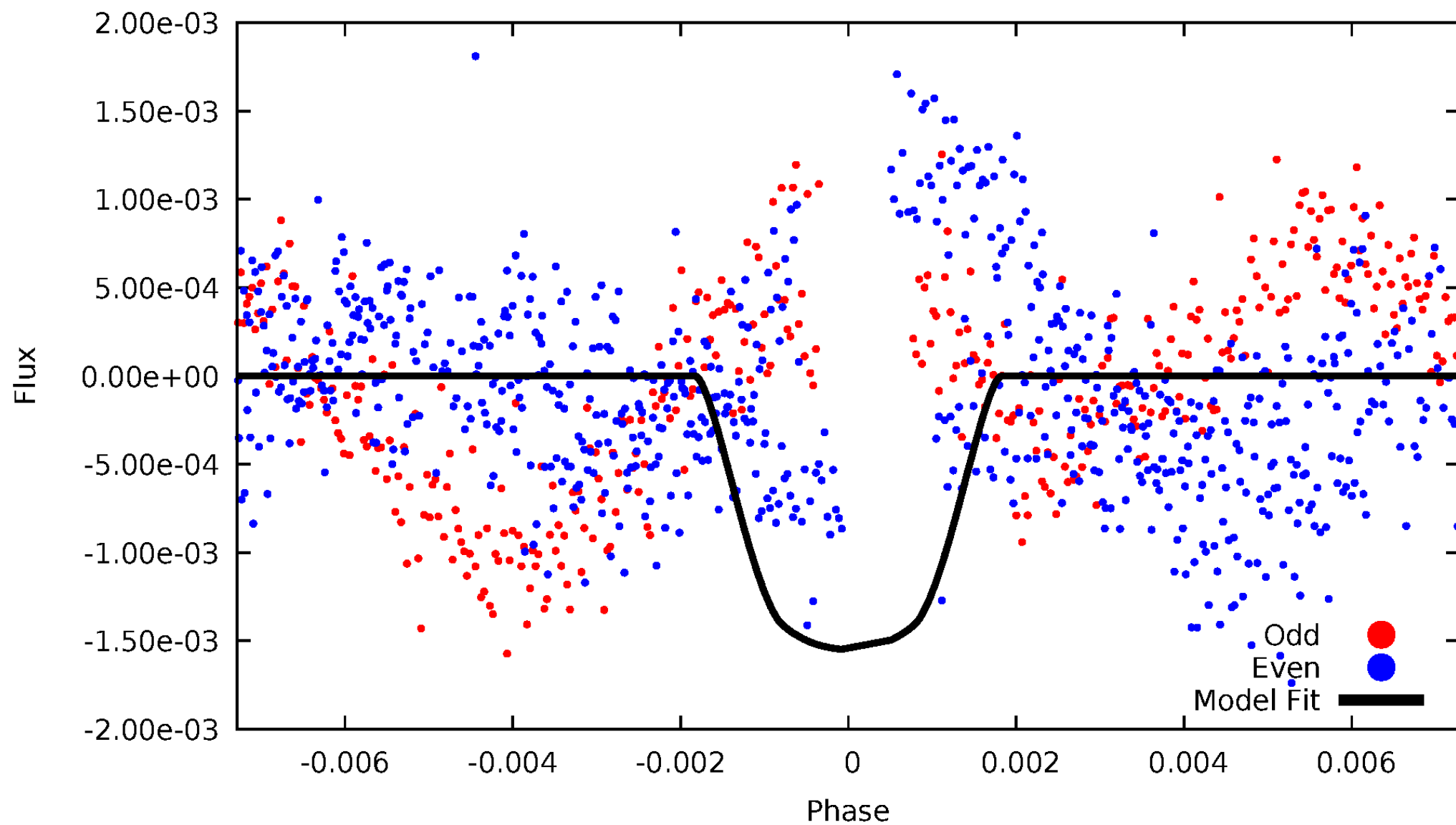


TCE 005443604-02



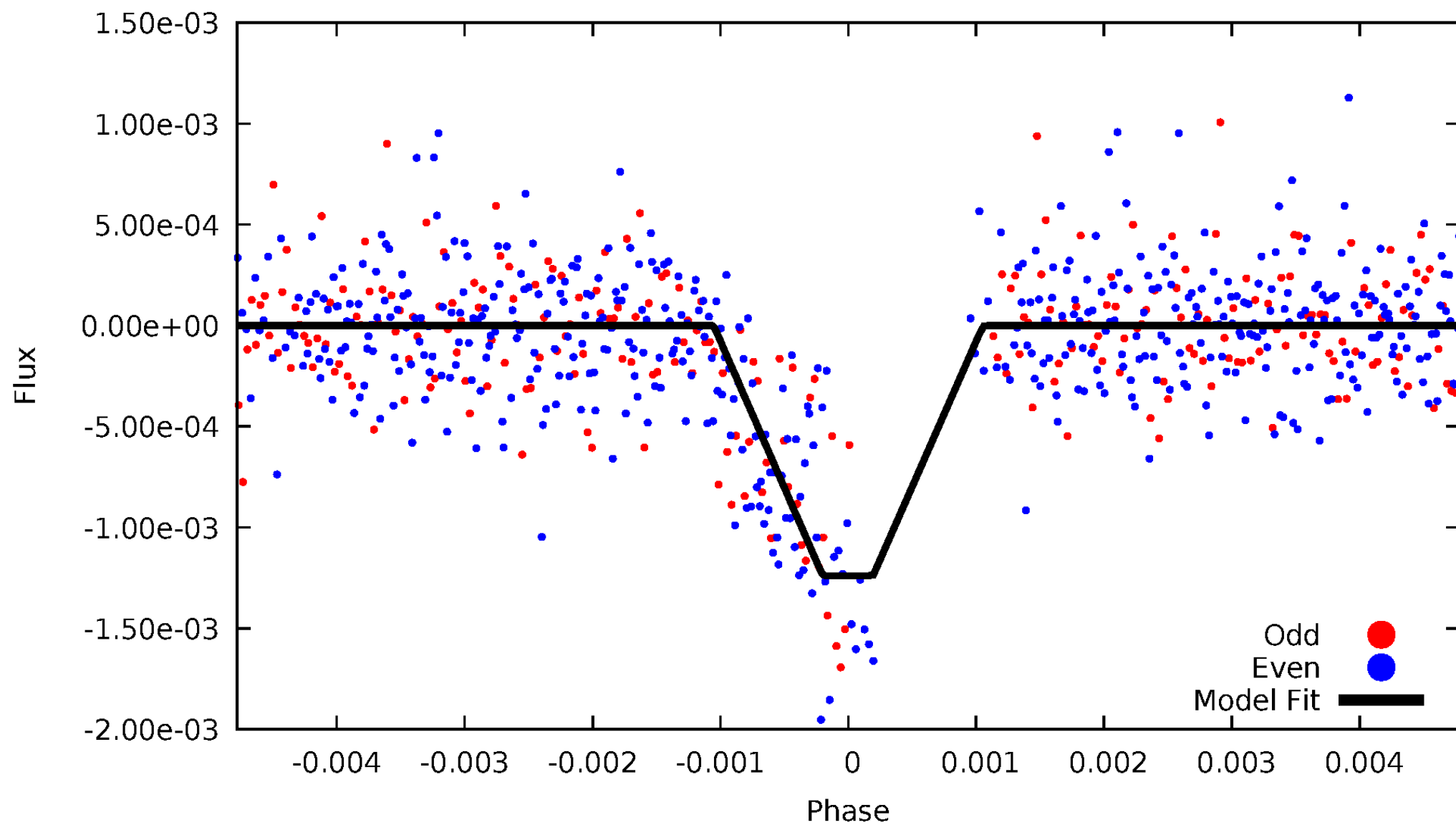
# DV Odd/Even

TCE 005443604-02



# ALT Odd/Even

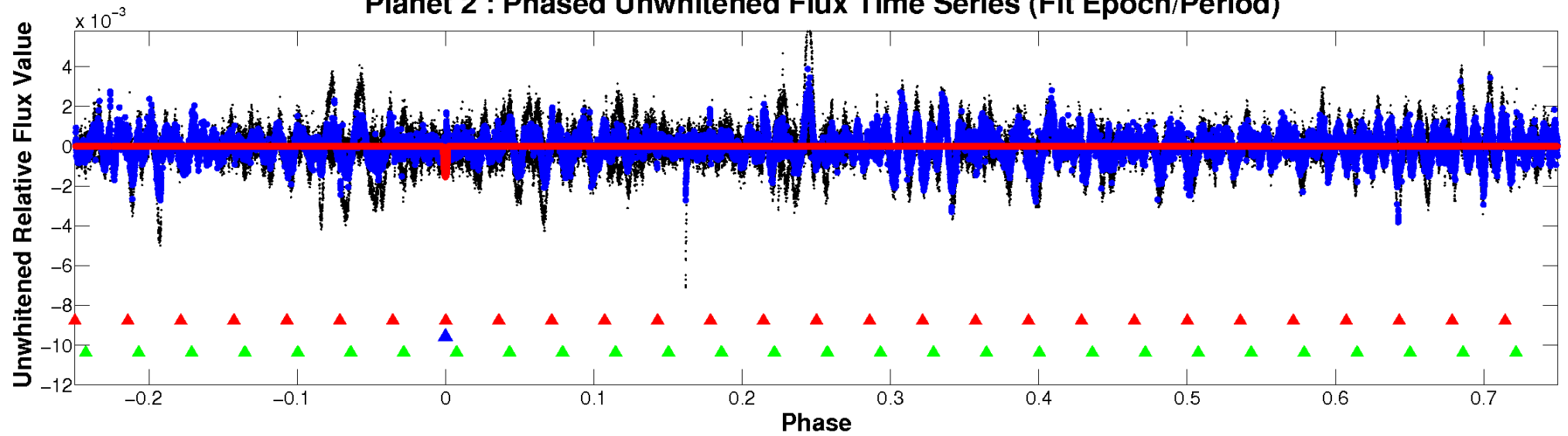
TCE 005443604-02



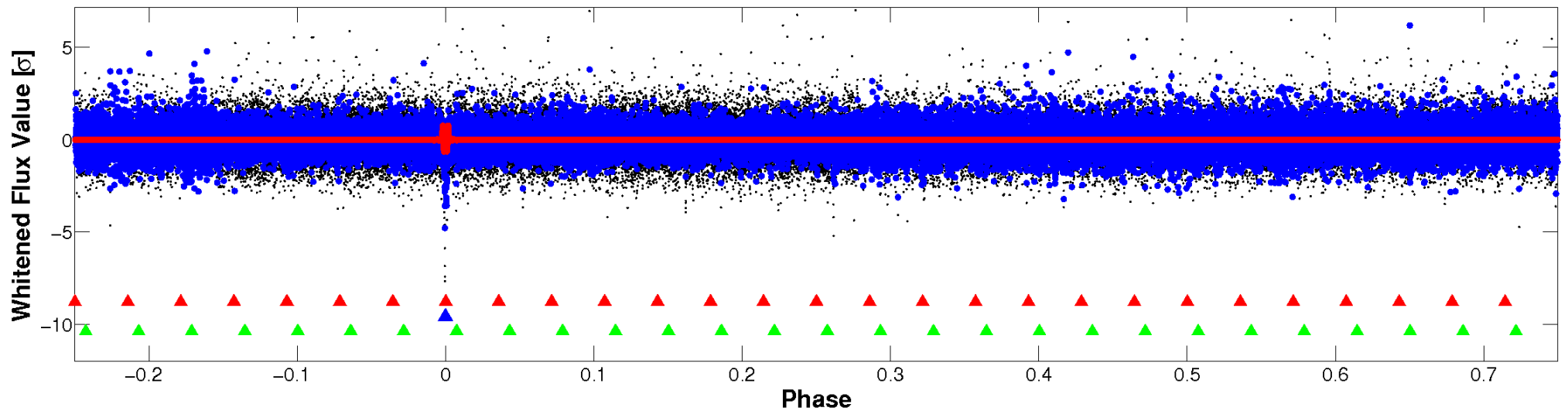


# Non-Whitened Vs. Whitened Light Curve

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

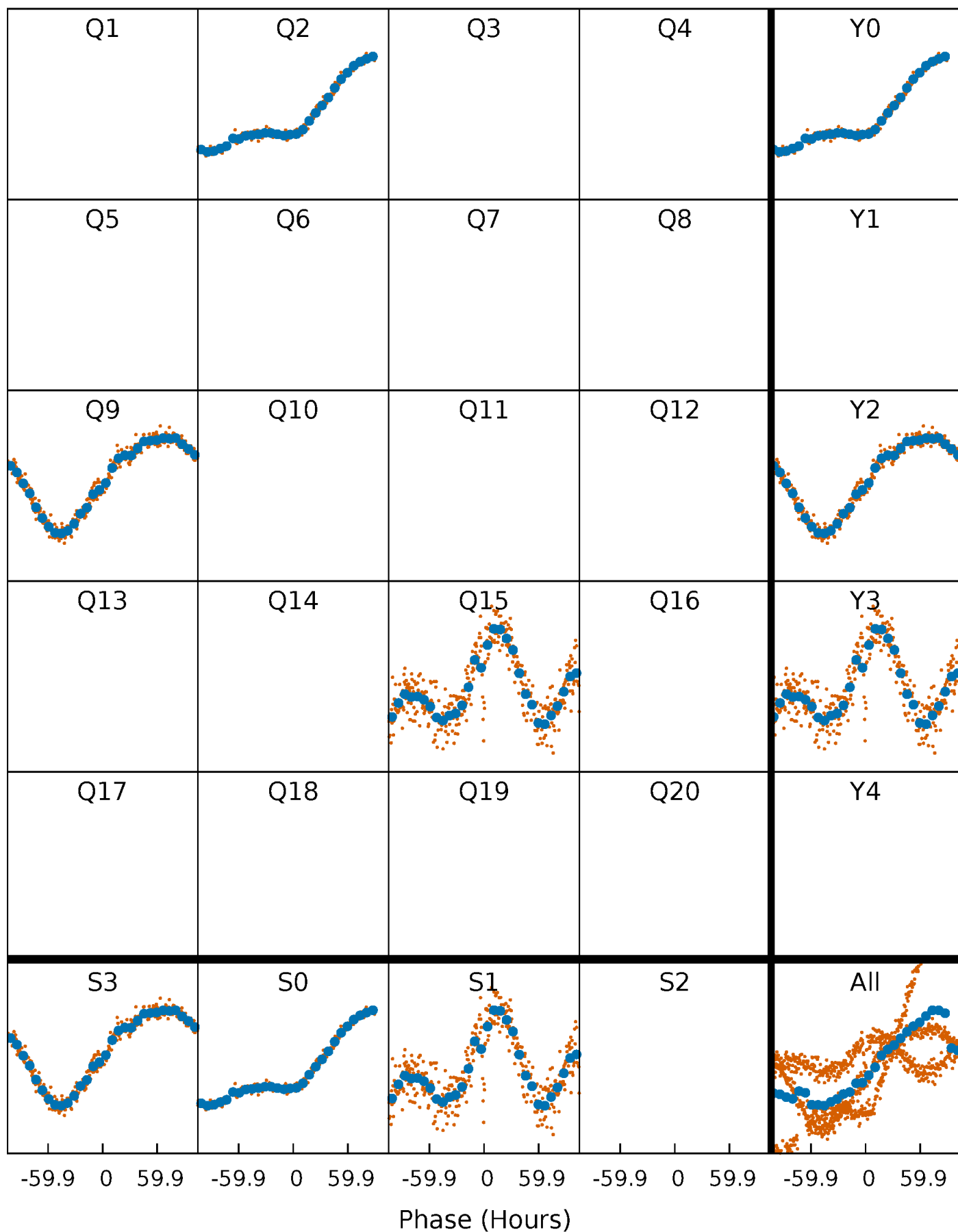


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



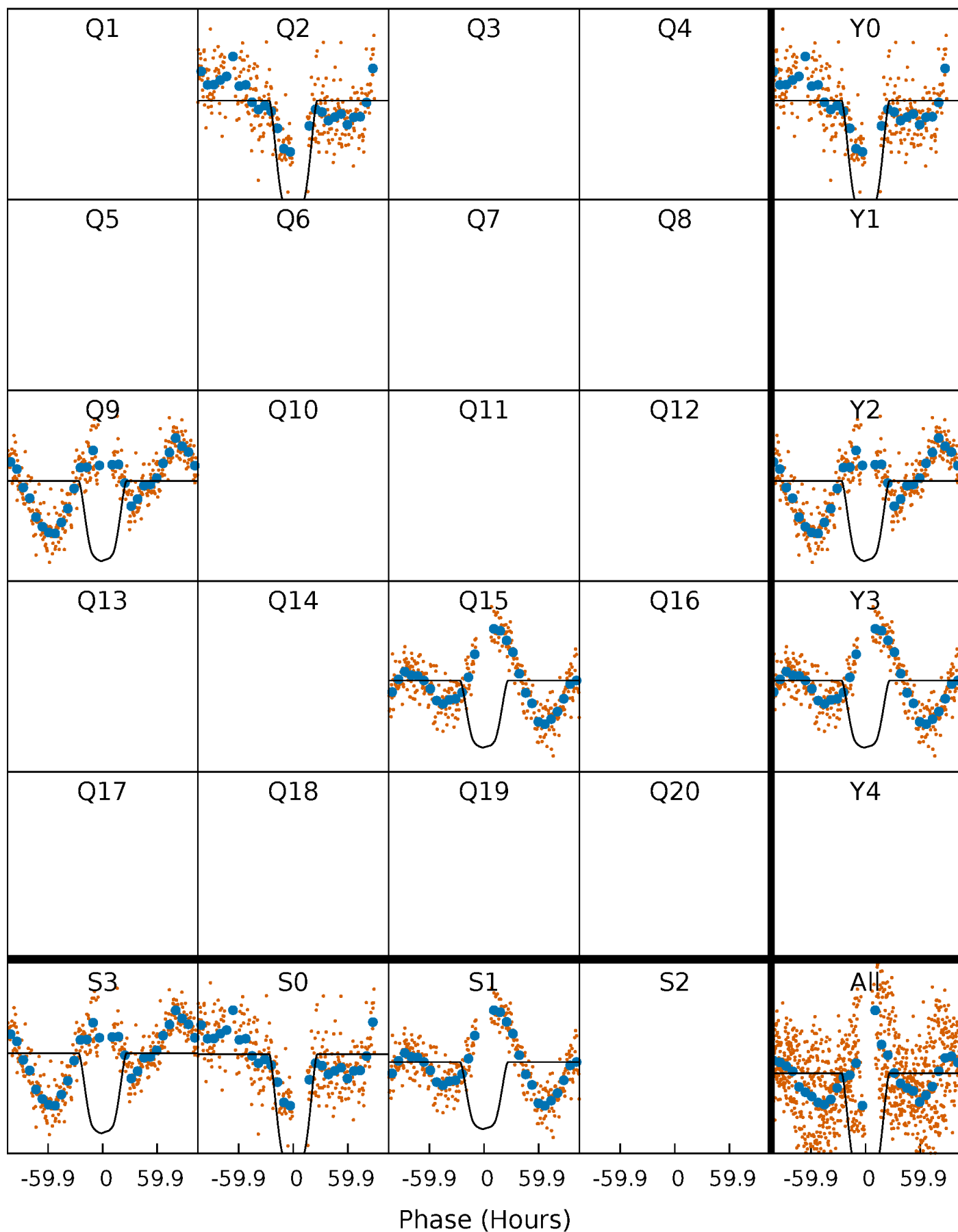
# PDC Quarter-Phased Transit Curves

TCE 005443604-02 P=599.108840 Days  $T_0=226.577808$  (BKJD)



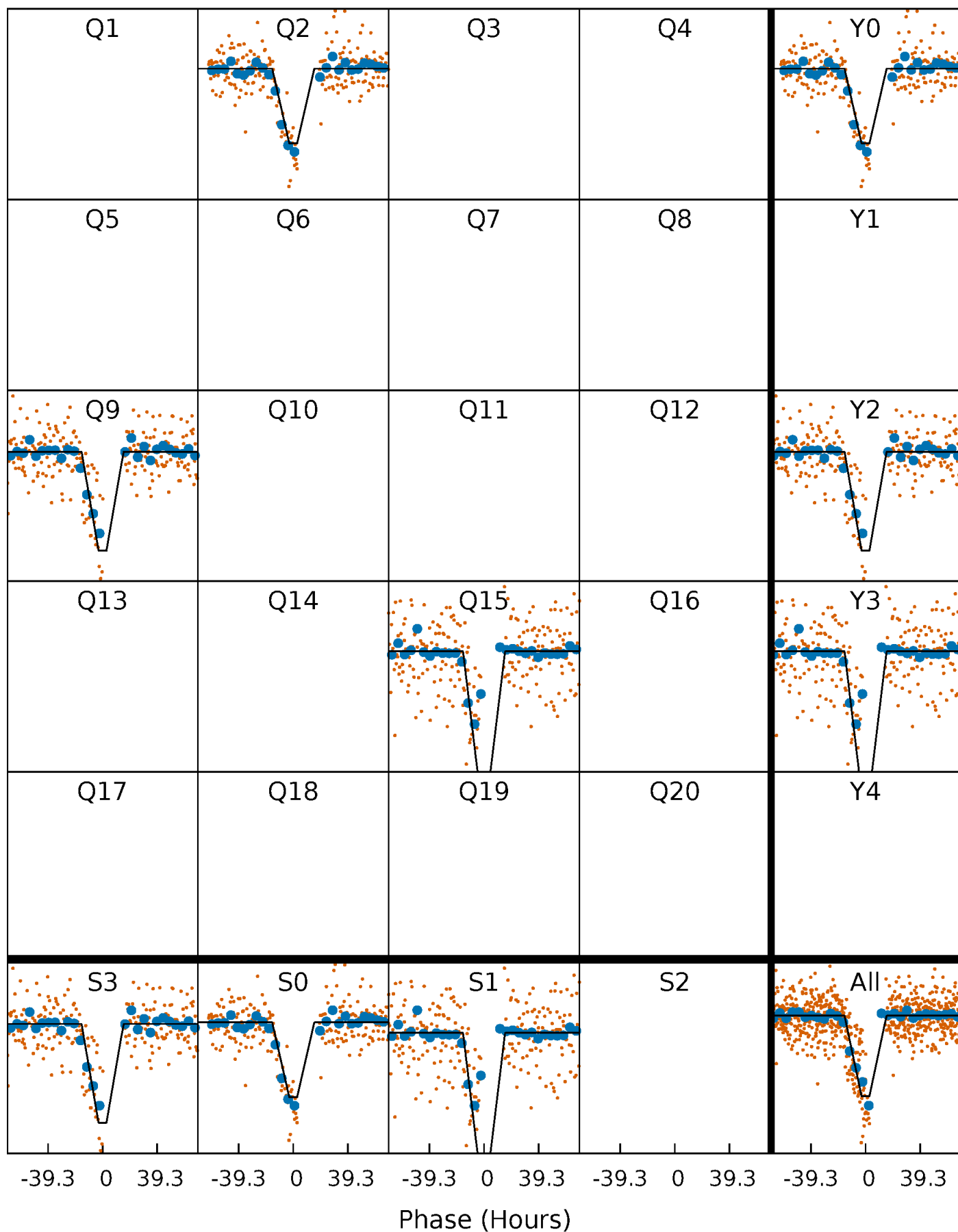
# DV Quarter-Phased Transit Curves

TCE 005443604-02 P=599.108840 Days  $T_0=226.577808$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

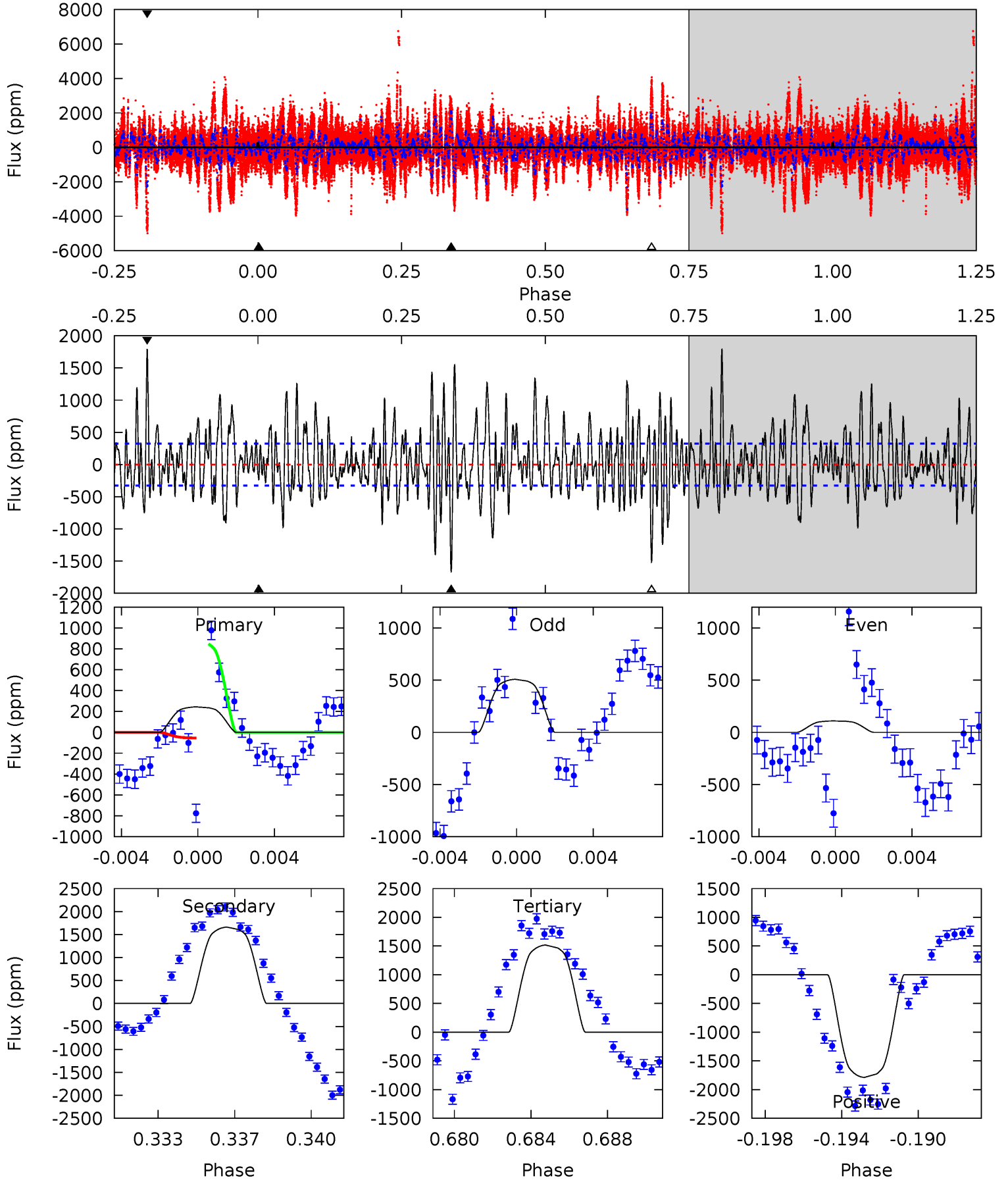
TCE 005443604-02   P=599.057490 Days    $T_0=226.413817$  (BKJD)



# DV Model-Shift Uniqueness Test

005443604-02, P = 599.108840 Days, E = 226.577808 Days

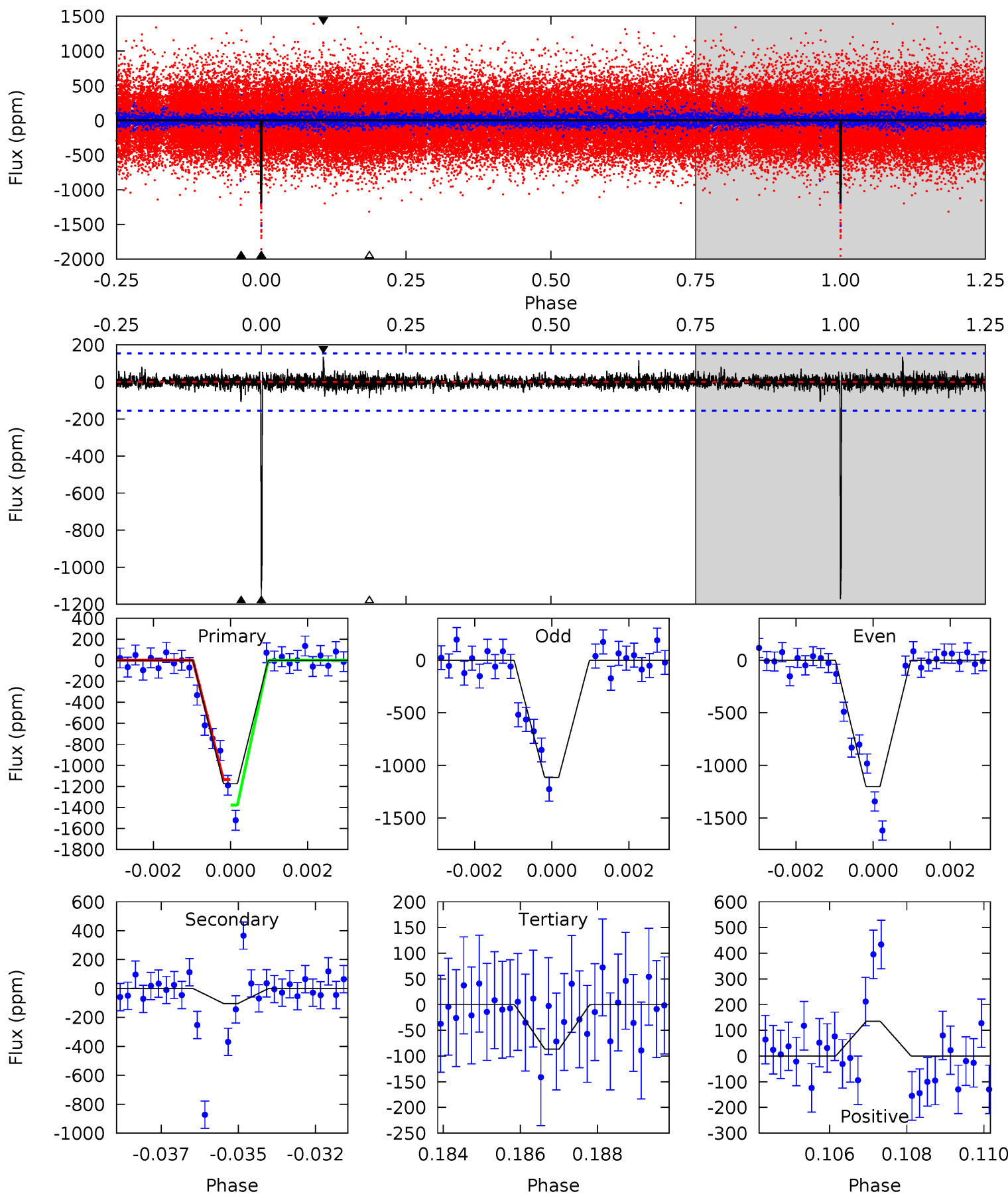
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.90	26.6	24.3	28.7	5.22	2.91	7.40	-20.4	-24.8	2.32	-2.02	3.12	0.53	0.52	6.36



# Alt Model-Shift Uniqueness Test

005443604-02, P = 599.057490 Days, E = 226.413817 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
40.4	3.58	2.99	4.65	5.31	3.07	0.59	37.4	35.8	0.59	-1.07	1.40	0.98	0.10	2.61





### Stellar Parameters For KIC 005443604

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4889^{+146}_{-131}$	$4.637^{+0.031}_{-0.058}$	$-0.220^{+0.300}_{-0.300}$	$0.686^{+0.074}_{-0.056}$	$0.759^{+0.060}_{-0.083}$	$3.310^{+0.484}_{-0.740}$
	+3%/-3%	+1%/-1%	+136%/-136%	+11%/-8%	+8%/-11%	+15%/-22%
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 005443604-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-1663 \pm 62$	$3.49^{+0.35}_{-0.36}$	$224^{+9}_{-8}$	$4657^{+228}_{-197}$	$119438^{+25090}_{-20105}$
Alt.	$-104 \pm 29$	$2.69^{+0.35}_{-0.36}$	$224^{+8}_{-8}$	$3178^{+190}_{-185}$	$12625^{+5381}_{-4113}$

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

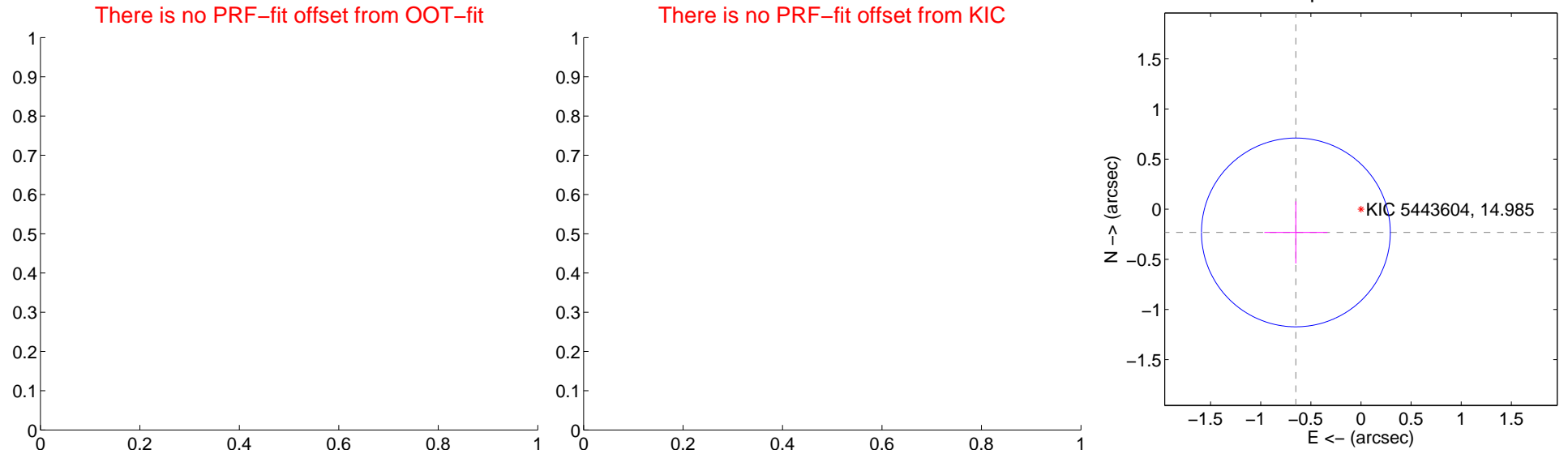
## DV Centroid Data

Supplemental centroid analysis for 005443604-02. Kepler magnitude: 14.98. Transit SNR 7.58

There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	$0.69 \pm 0.31$	2.20	$0.65 \pm 0.31$	$-0.23 \pm 0.31$



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.

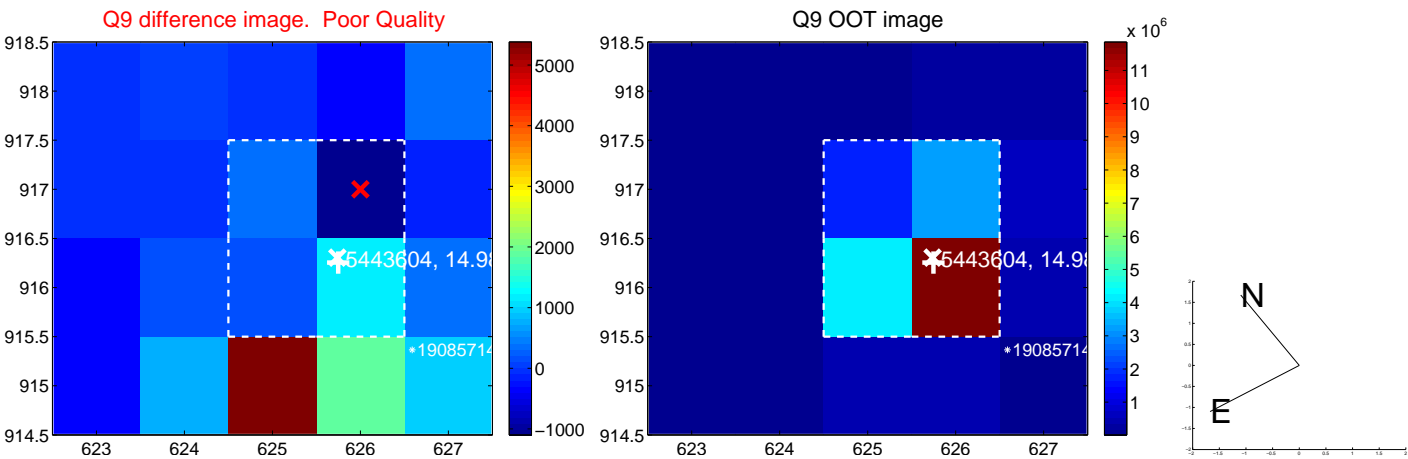
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



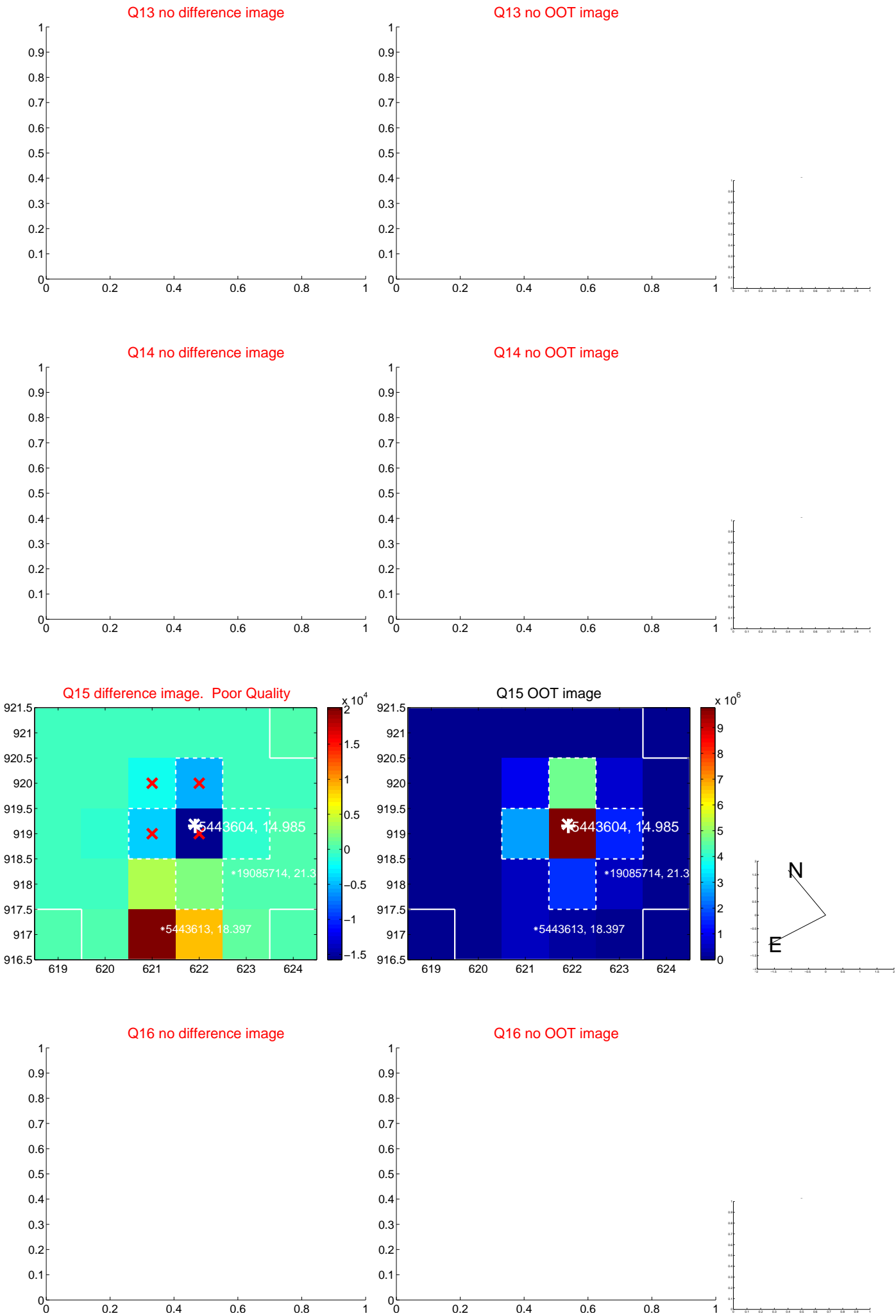
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



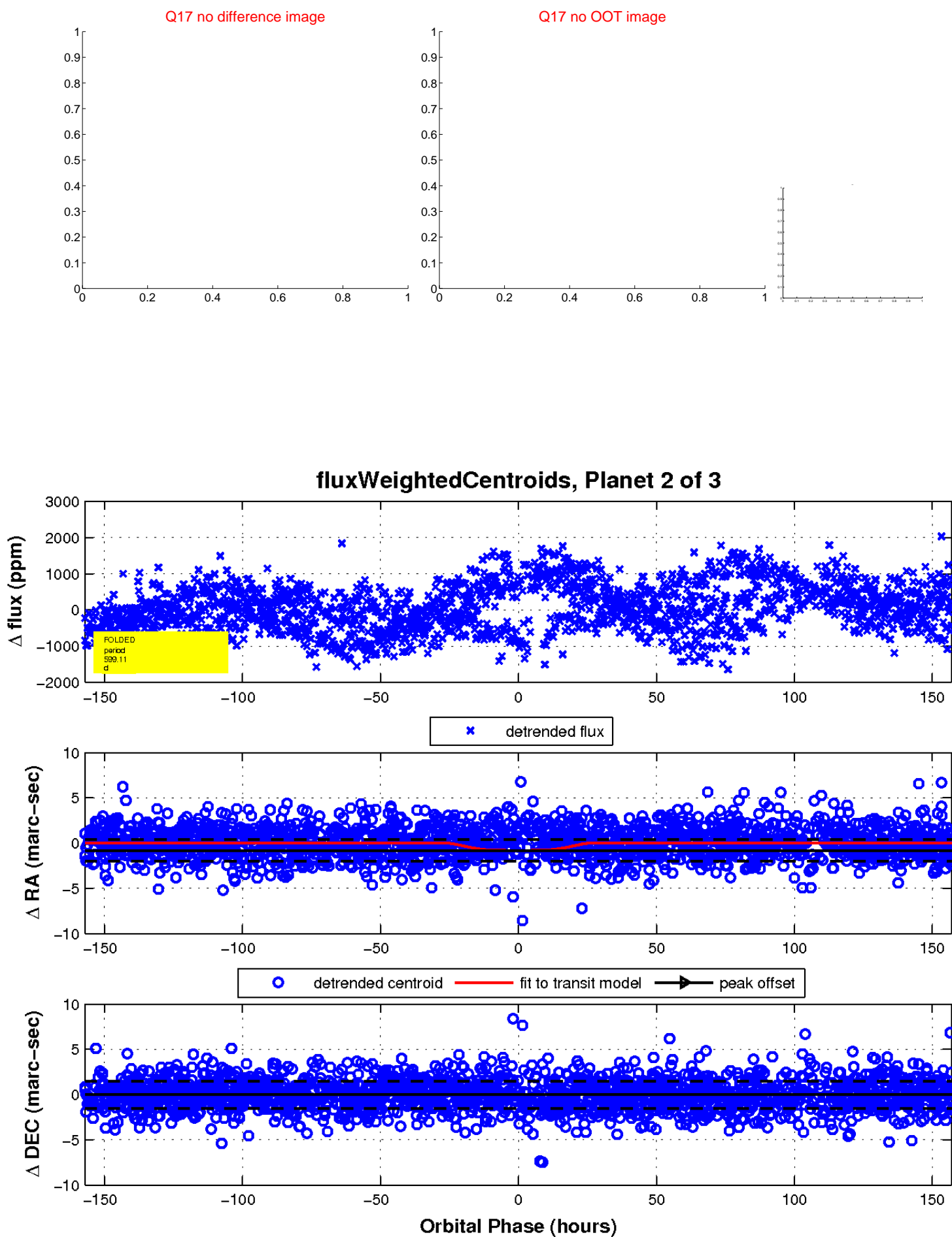
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



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

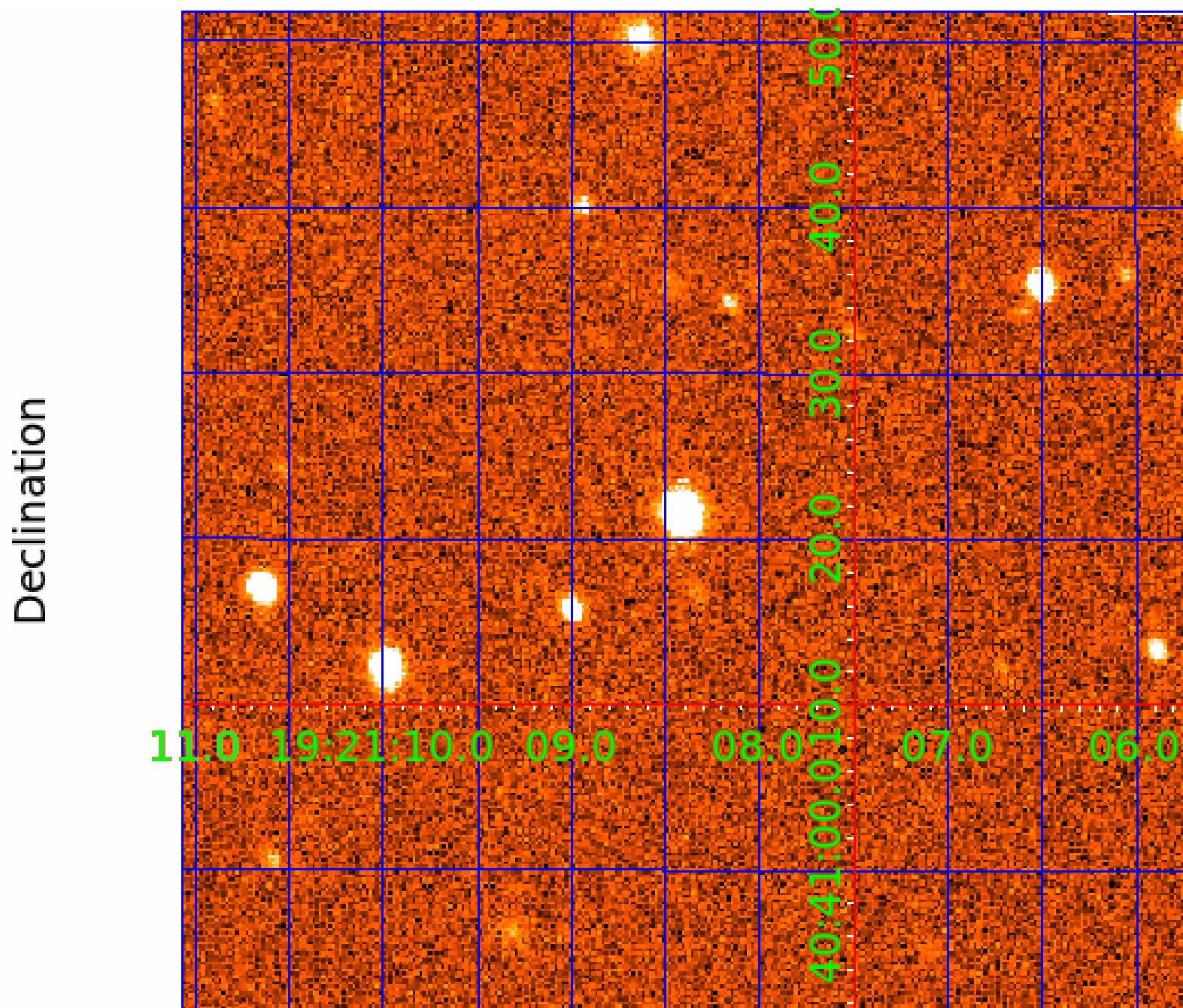


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





UKIRT Image



# KIC 005443604

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
005443604-01	OBS	2713.01	21.391042	141.297902	617.0	5.003	26.2	24.1	0.69	4889	3.22	12.89
005443604-02	OBS	No	599.108840	226.577808	1548.3	52.369	25.1	7.6	0.69	4889	3.44	0.15
005443604-03	OBS	No	21.390848	145.700676	270.2	2.637	10.7	10.6	0.69	4889	1.15	12.89

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005443604-01	OBS	FP	0.00	0	1	1	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET
005443604-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
005443604-03	OBS	FP	0.00	1	1	1	0	IS_SEC_TCE—CENT_RESOLVED_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.

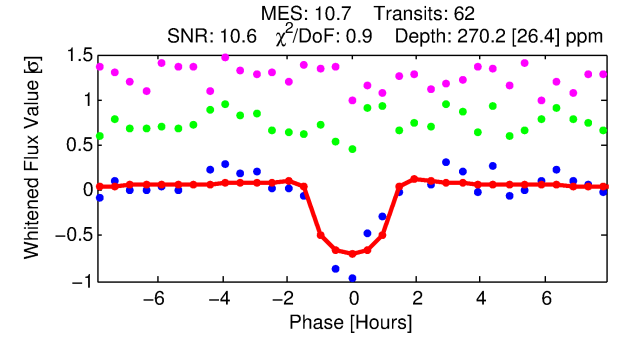
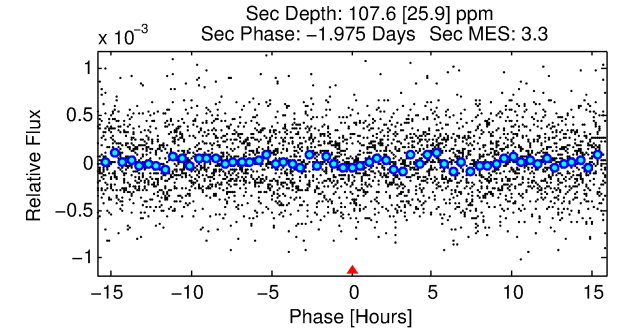
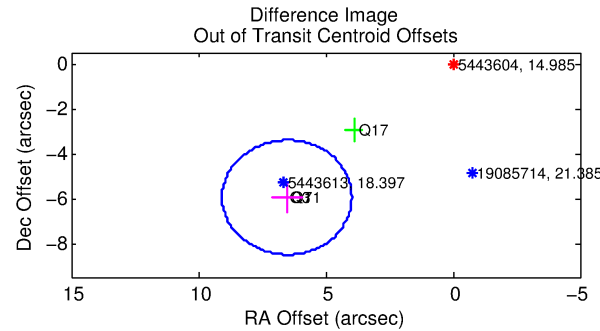
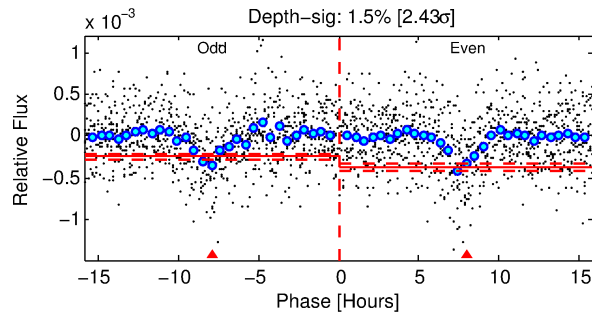
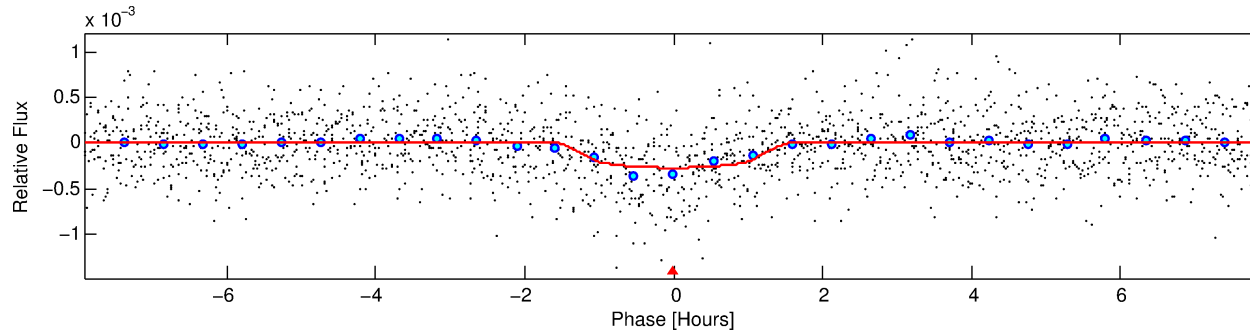
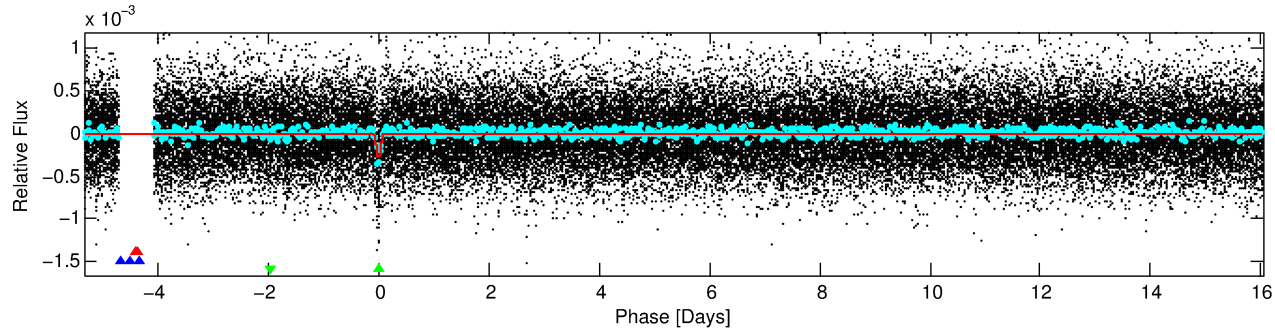
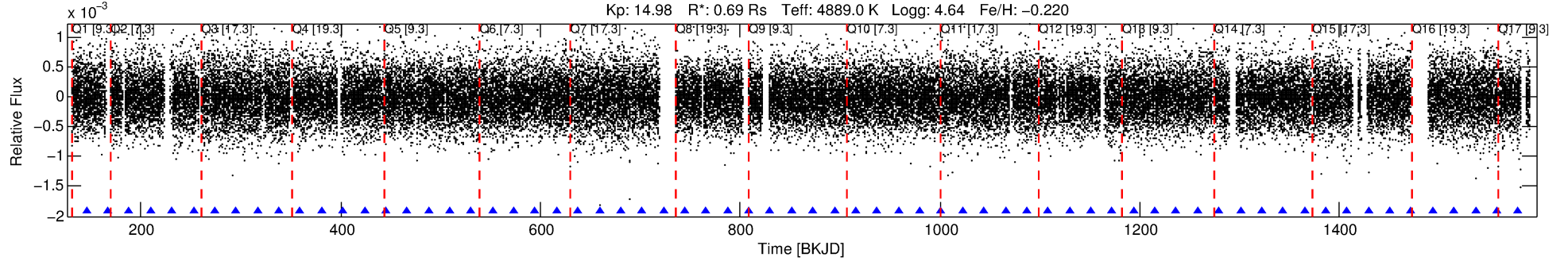
## Ephemeris Match Information For 005443604-03

No Significant Match Found

# DV One-Page Summary

KIC: 5443604 Candidate: 3 of 3 Period: 21.391 d  
KOI: K02713 Corr: No Ephemeris Match

Kp: 14.98 R\*: 0.69 Rs Teff: 4889.0 K Logg: 4.64 Fe/H: -0.220



## DV Fit Results:

Period = 21.39085 [0.00015] d  
Epoch = 145.7007 [0.0057] BKJD  
Rp/R\* = 0.0153 [0.0201]  
a/R\* = 53.27 [234.21]  
b = 0.54 [5.89]  
Seff = 12.89 [2.13]  
Teq = 483 [20] K  
Rp = 1.15 [1.51] Re  
a = 0.1367 [0.0116] AU  
Ag = 839.24 [2209.04] [0.38σ]  
Teffp = 4021 [2646] K [1.34σ]

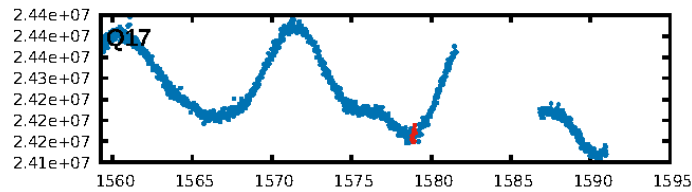
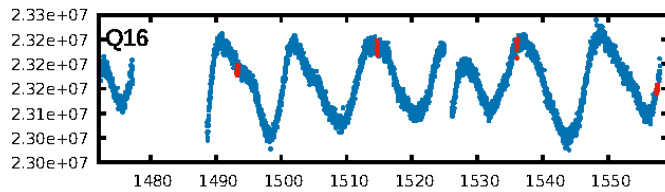
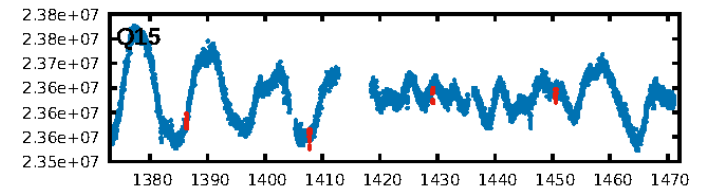
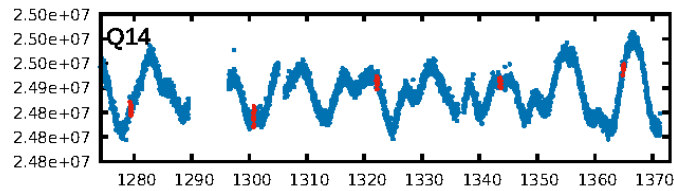
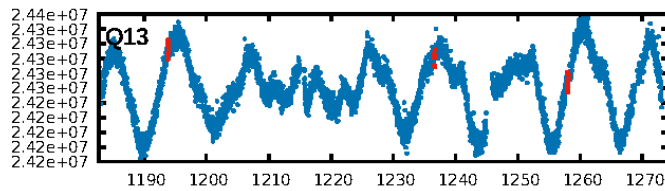
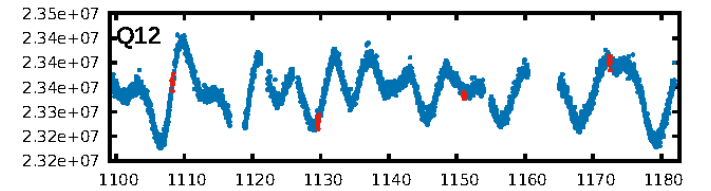
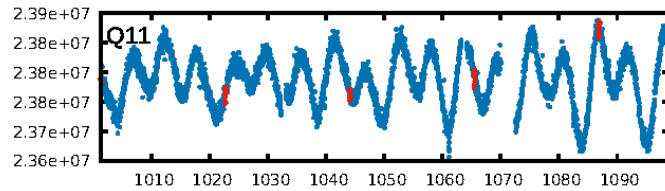
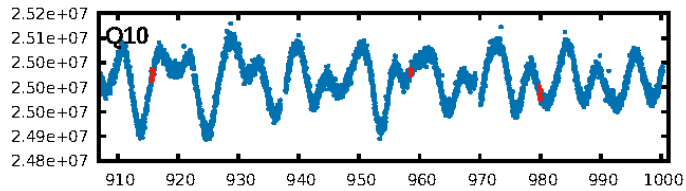
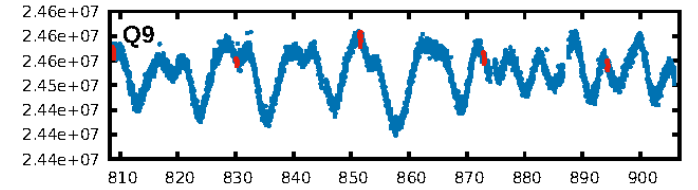
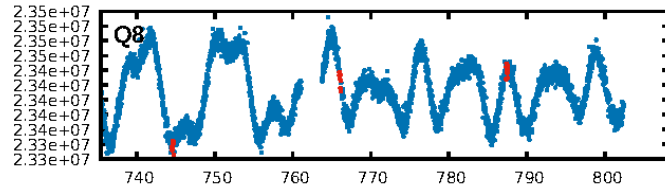
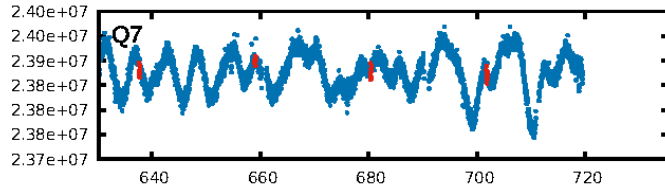
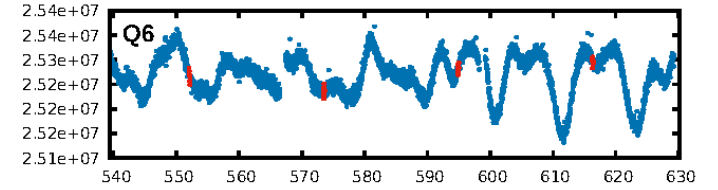
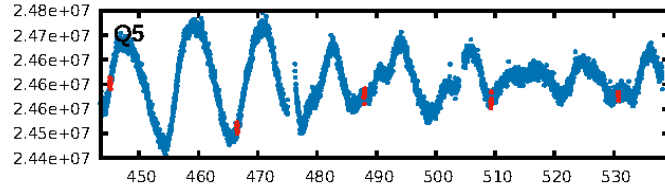
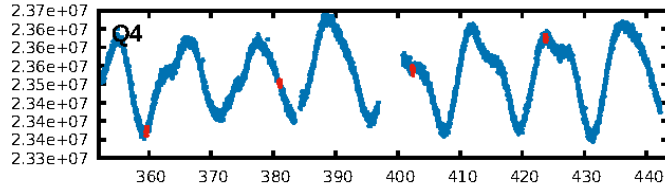
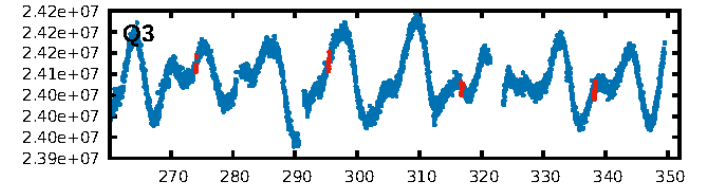
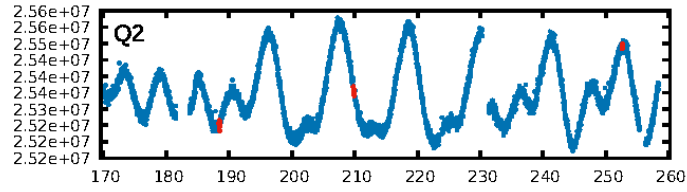
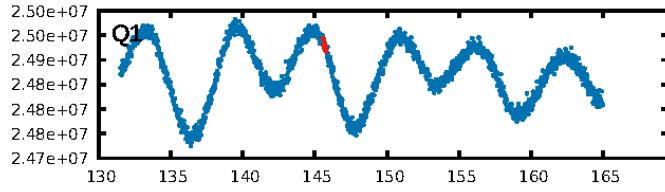
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: 75.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: 1.66e-25  
RollingBand-fgt: 1.00 [60/60]  
GhostDiagnostic-chr: -0.4881  
Centroid-sig: 0.0%  
Centroid-so: 100.048 arcsec [82.06σ]  
OotOffset-rm: 8.830 arcsec [10.39σ]  
KicOffset-rm: 8.929 arcsec [8.95σ]  
OotOffset-st: 0/3/0/1 [4]  
KicOffset-st: 0/3/0/1 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 1.00 [17/17]

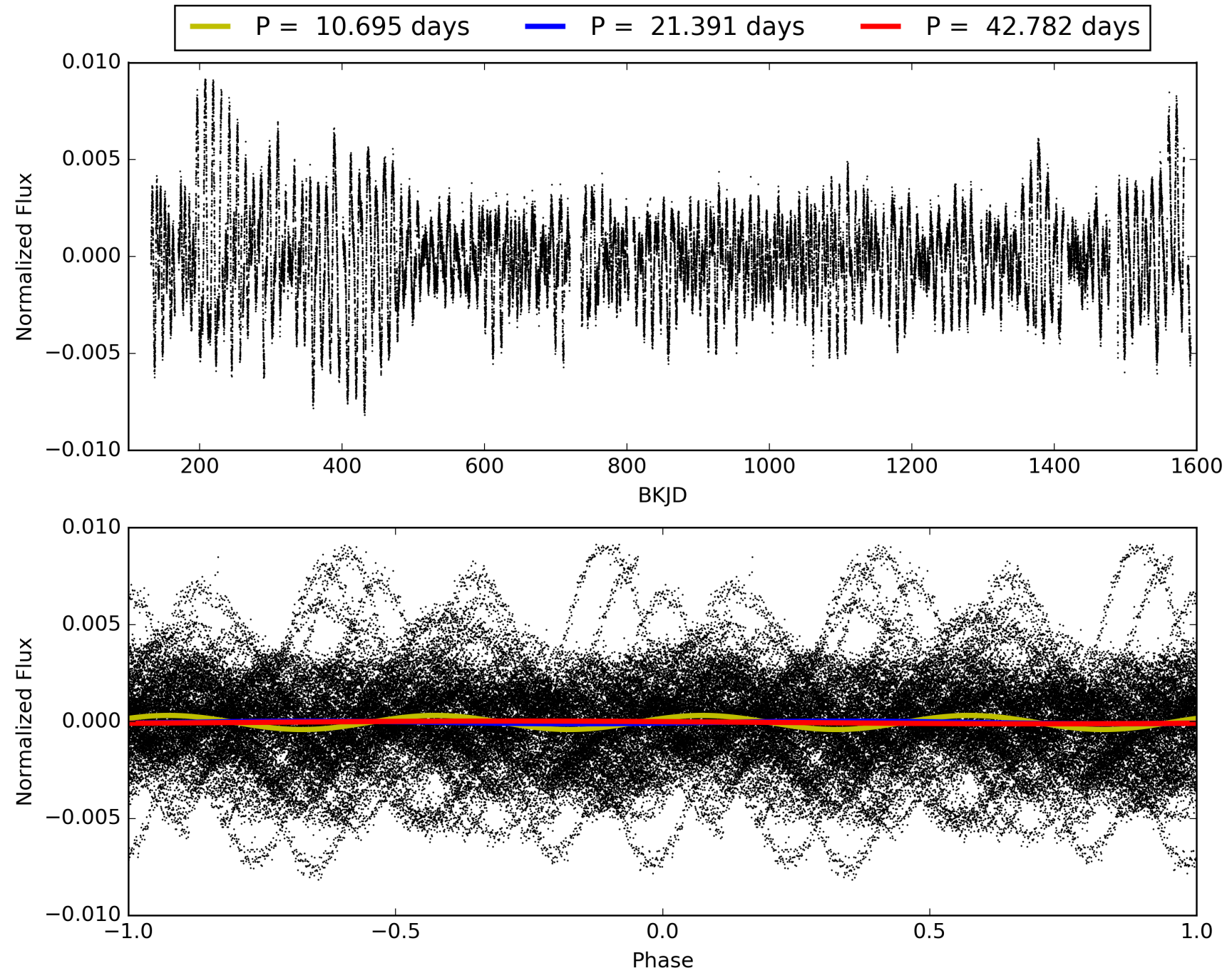
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 15:16:25 Z

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

# TCE 005443604-03, PDC Light Curves

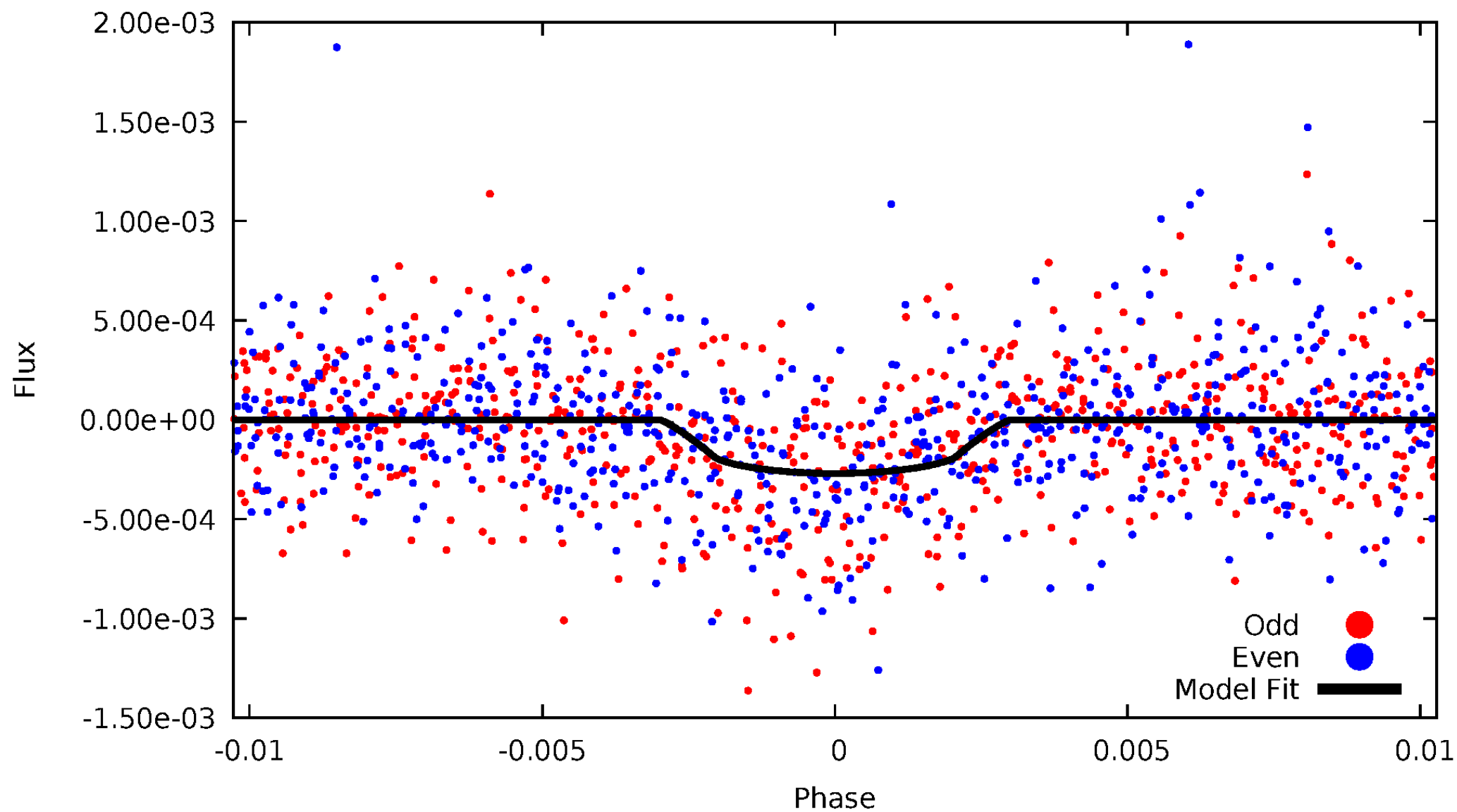


TCE 005443604-03



# DV Odd/Even

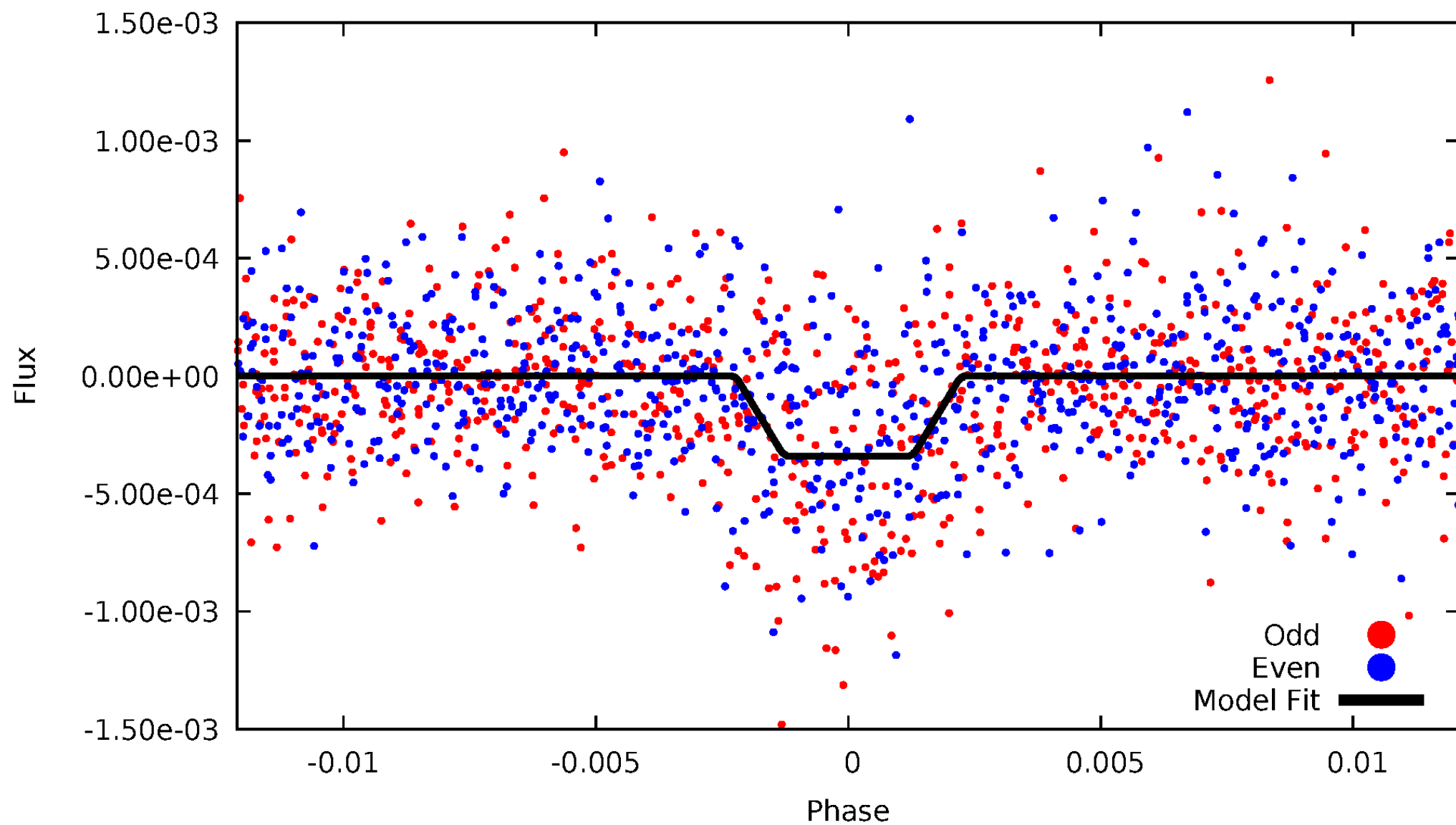
TCE 005443604-03





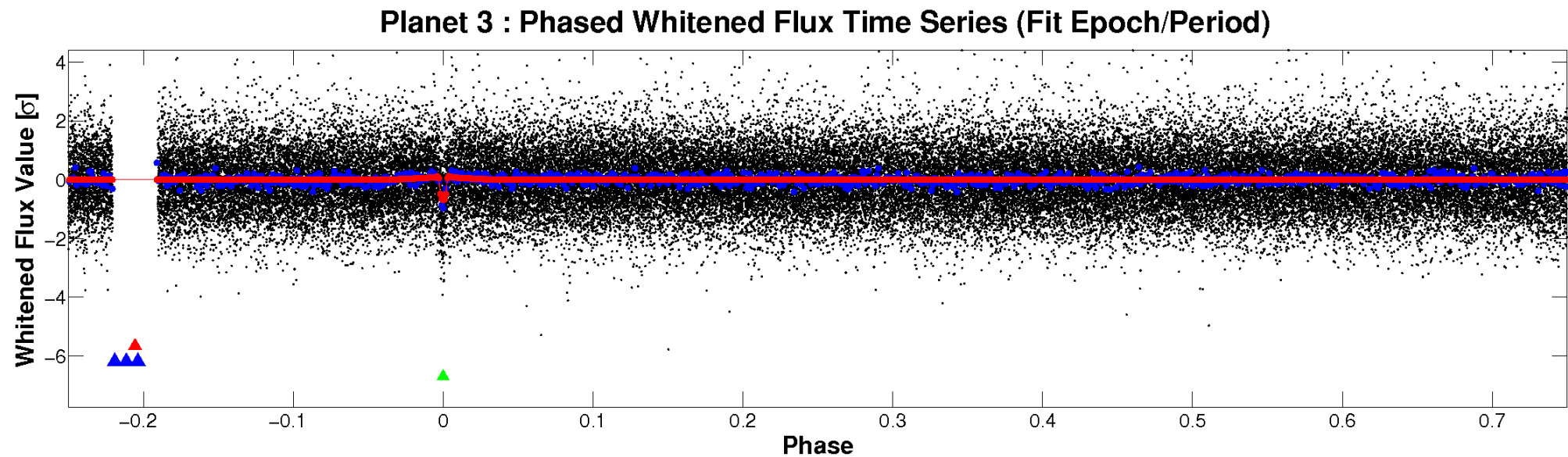
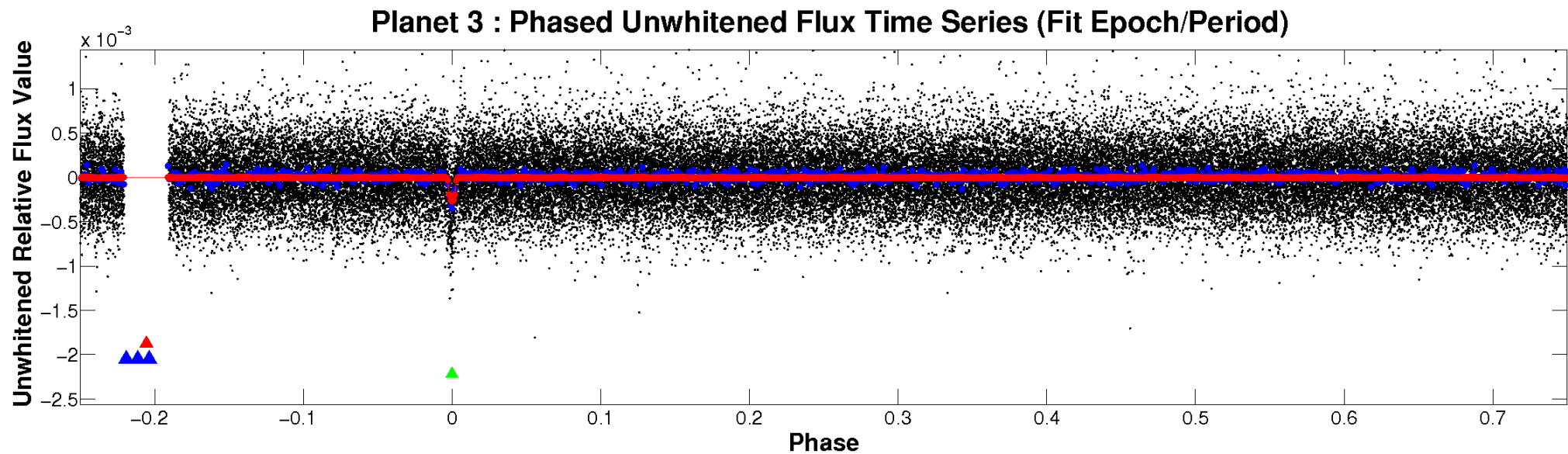
# ALT Odd/Even

TCE 005443604-03



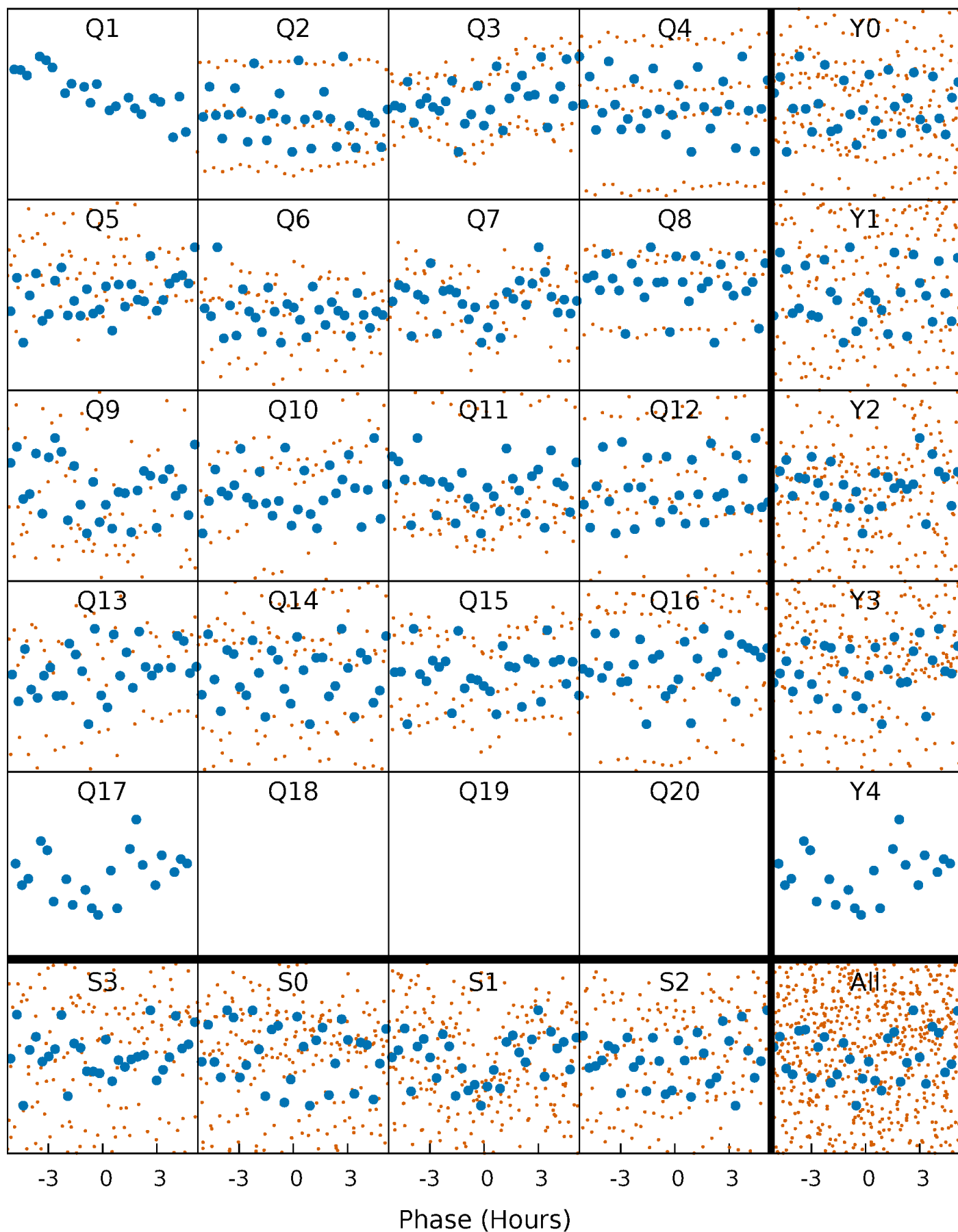


# Non-Whitened Vs. Whitened Light Curve



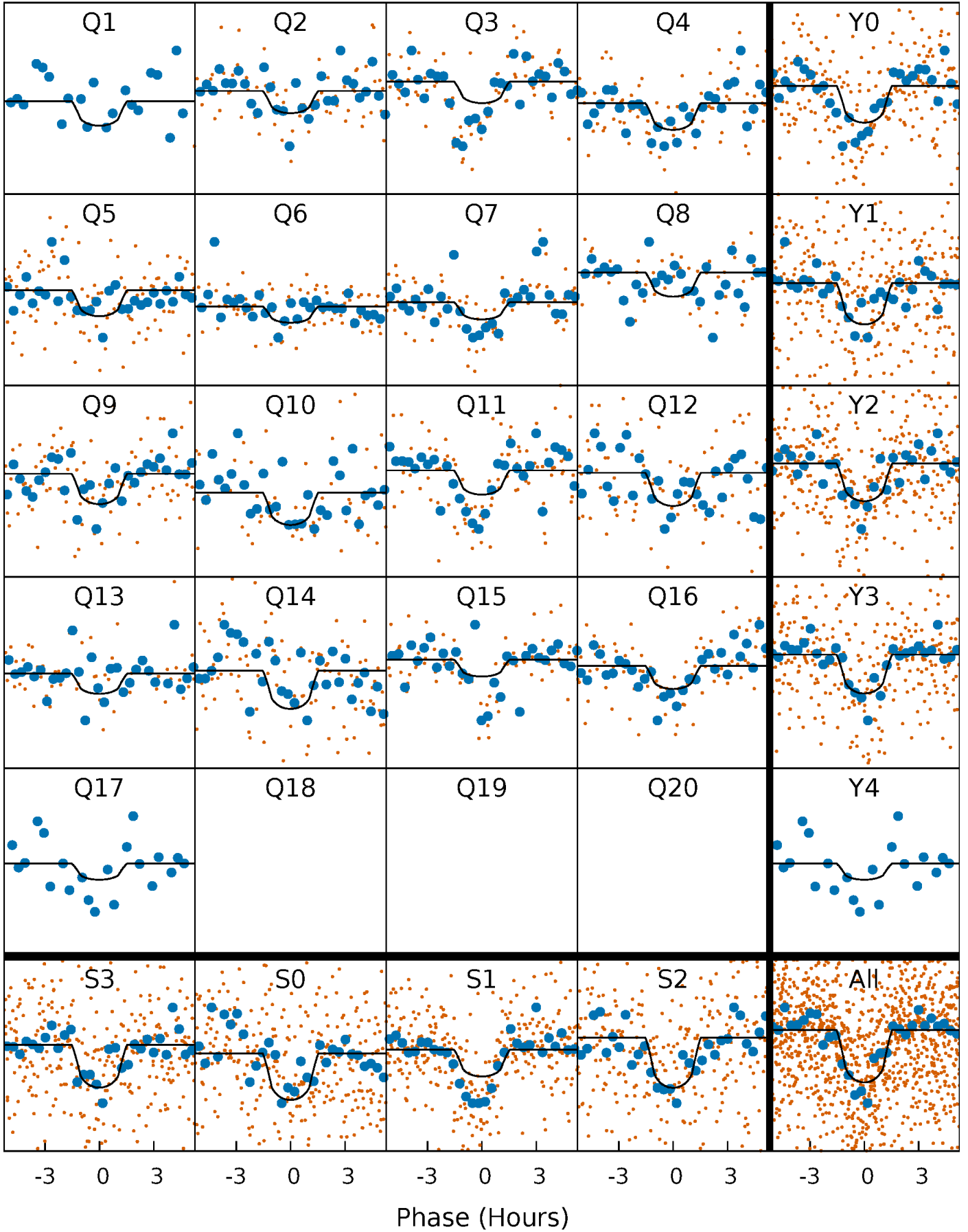
# PDC Quarter-Phased Transit Curves

TCE 005443604-03   P= 21.390848 Days    $T_0=145.700676$  (BKJD)



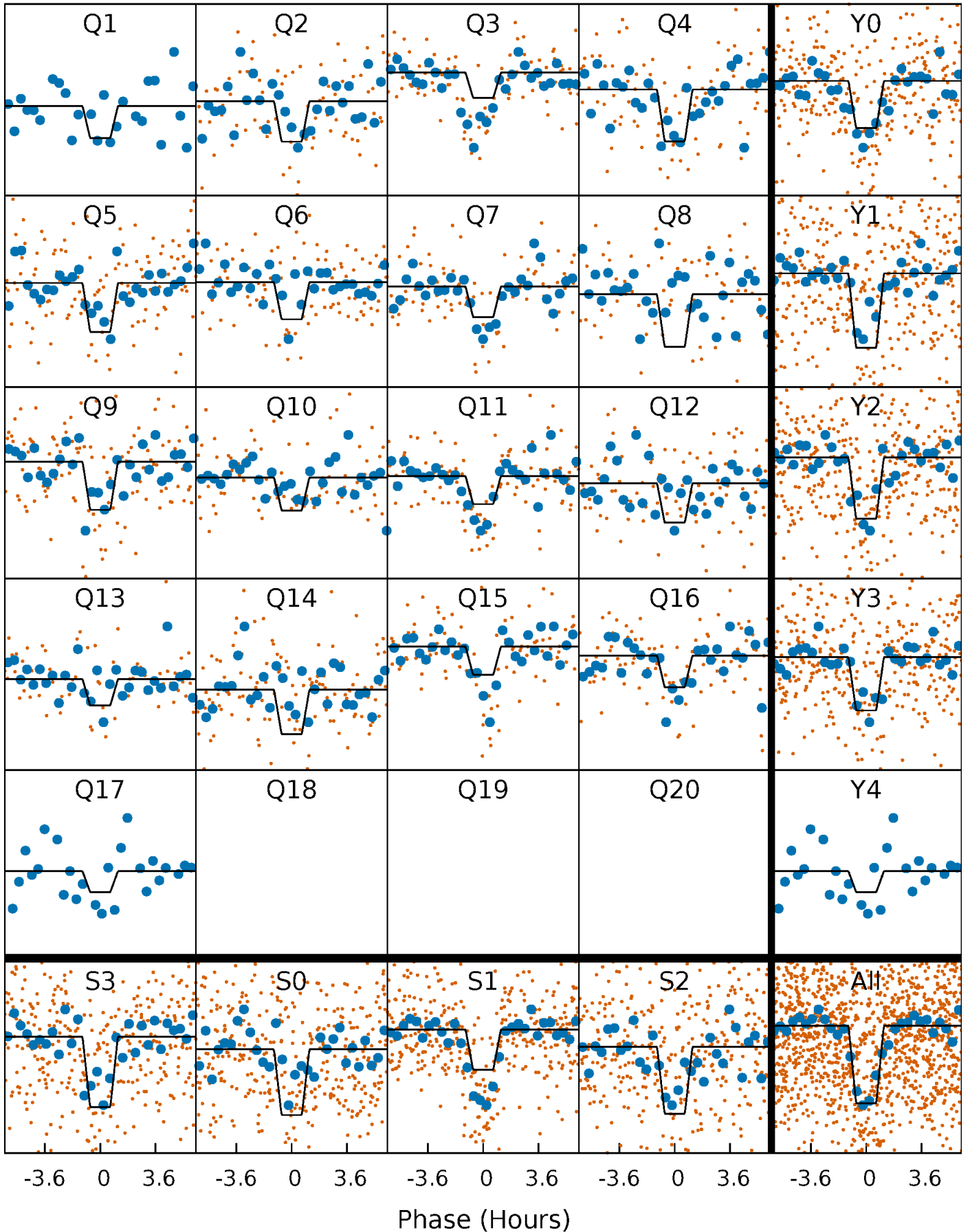
# DV Quarter-Phased Transit Curves

TCE 005443604-03 P= 21.390848 Days  $T_0=145.700676$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

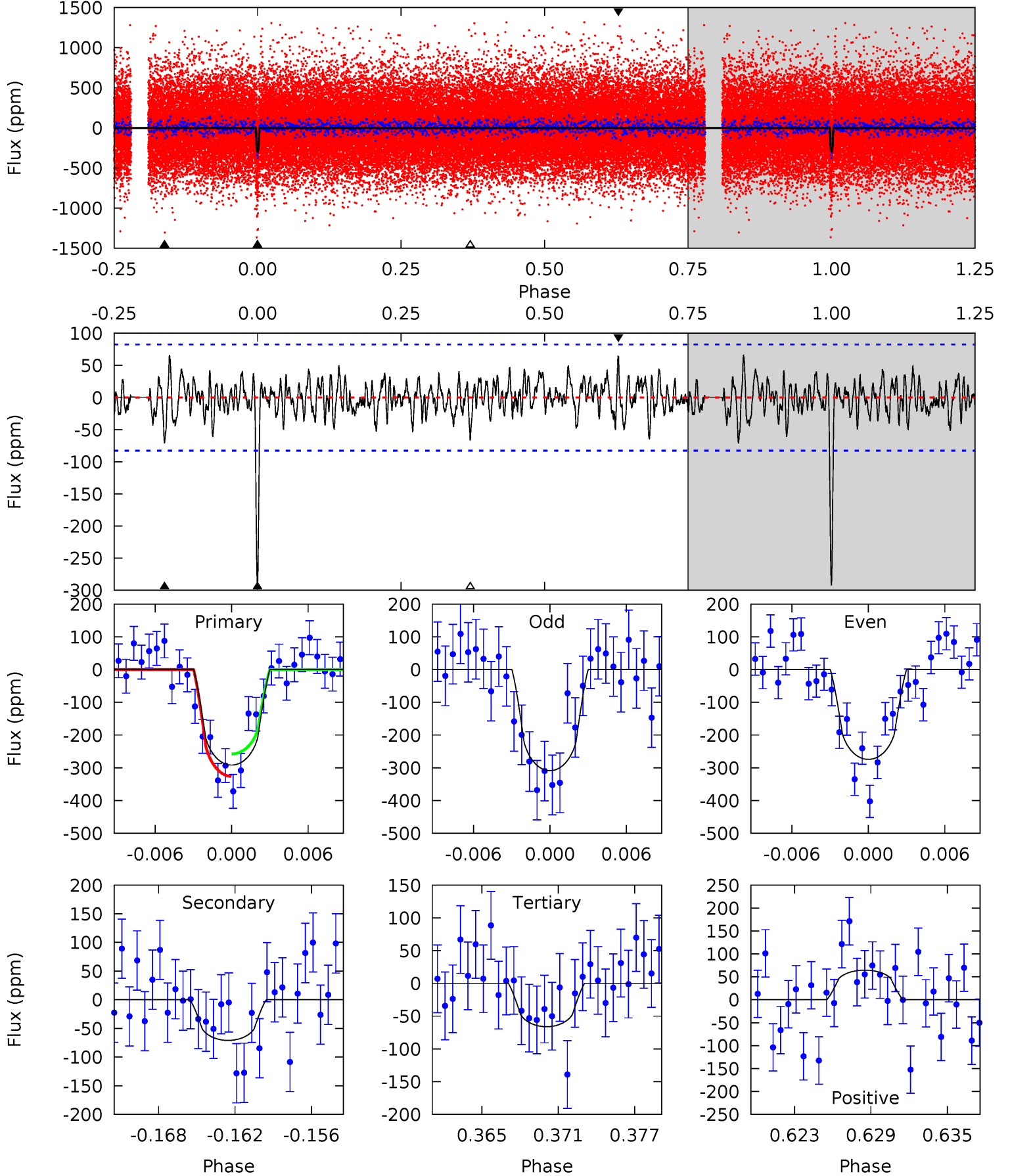
TCE 005443604-03 P= 21.391017 Days  $T_0=145.686146$  (BKJD)



# DV Model-Shift Uniqueness Test

005443604-03, P = 21.390848 Days, E = 124.309828 Days

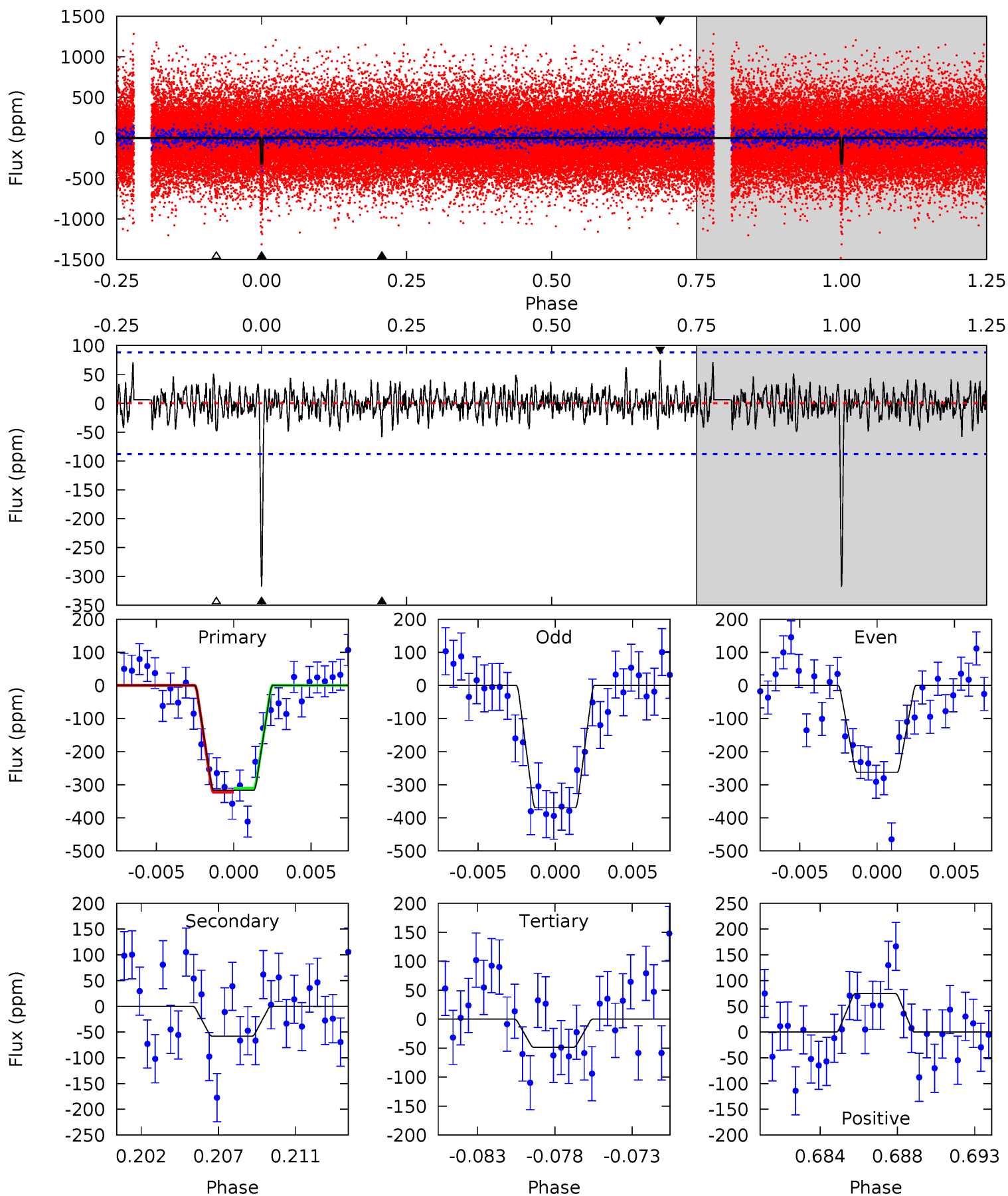
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
18.1	4.40	4.10	4.00	5.12	2.75	1.31	14.0	14.1	0.29	0.39	1.08	1.14	0.18	2.13



# Alt Model-Shift Uniqueness Test

005443604-03, P = 21.391017 Days, E = 124.295129 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
18.6	3.42	2.86	4.39	5.17	2.83	1.06	15.8	14.3	0.56	-0.97	3.16	1.09	0.19	0.34





### Stellar Parameters For KIC 005443604

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$4889^{+146}_{-131}$	$4.637^{+0.031}_{-0.058}$	$-0.220^{+0.300}_{-0.300}$	$0.686^{+0.074}_{-0.056}$	$0.759^{+0.060}_{-0.083}$	$3.310^{+0.484}_{-0.740}$
	+3%/-3%	+1%/-1%	+136%/-136%	+11%/-8%	+8%/-11%	+15%/-22%
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 005443604-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-71 \pm 16$	$1.61^{+1.32}_{-1.04}$	$681^{+26}_{-23}$	$3523^{+1741}_{-611}$	$283^{+1875}_{-204}$
Alt.	$-58 \pm 17$	$1.78^{+1.34}_{-1.11}$	$679^{+26}_{-23}$	$3270^{+1416}_{-495}$	$178^{+1200}_{-121}$

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



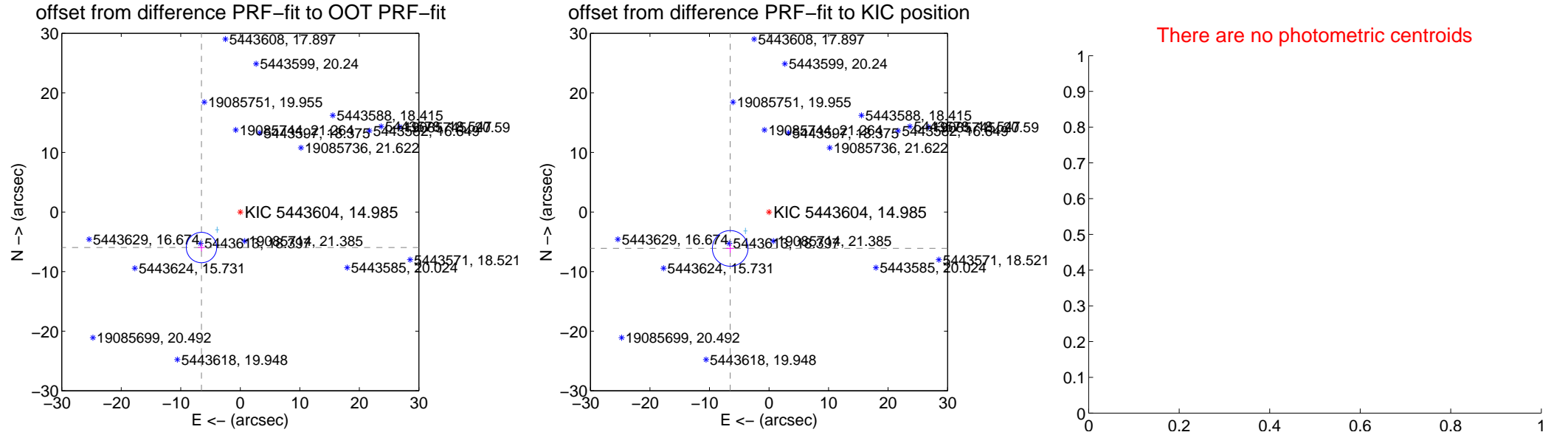
## DV Centroid Data

Supplemental centroid analysis for 005443604-03. Kepler magnitude: 14.98. Transit SNR 10.56

There are 4 quarters with good PRF difference image offsets

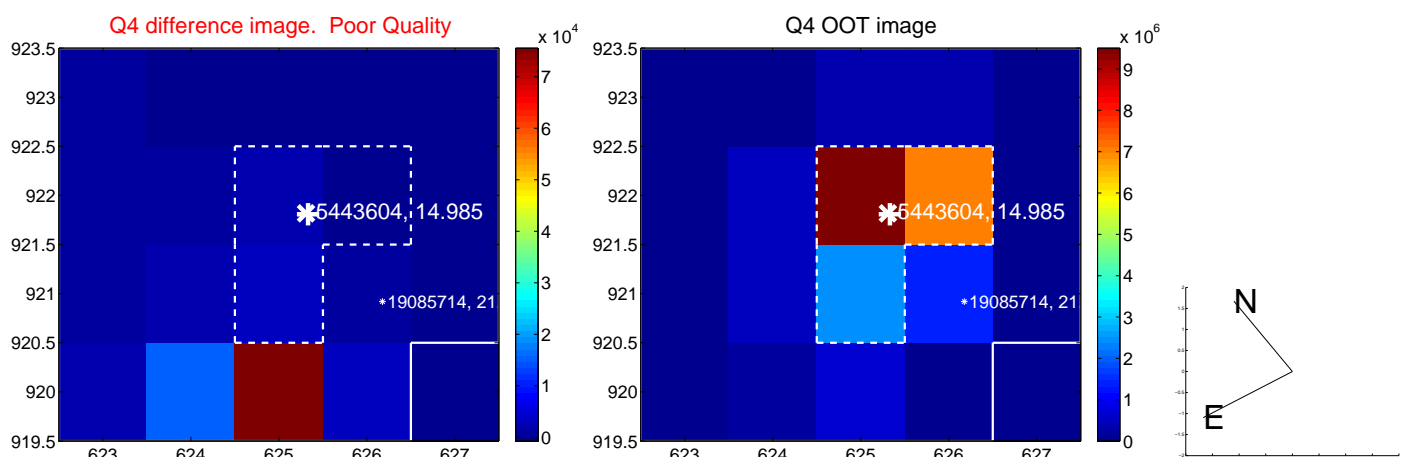
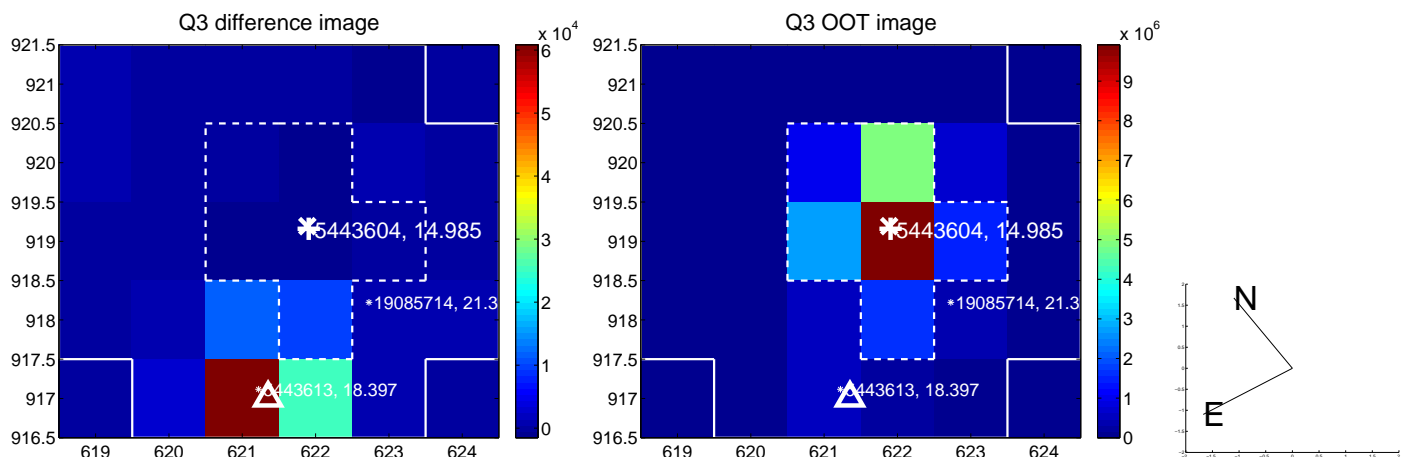
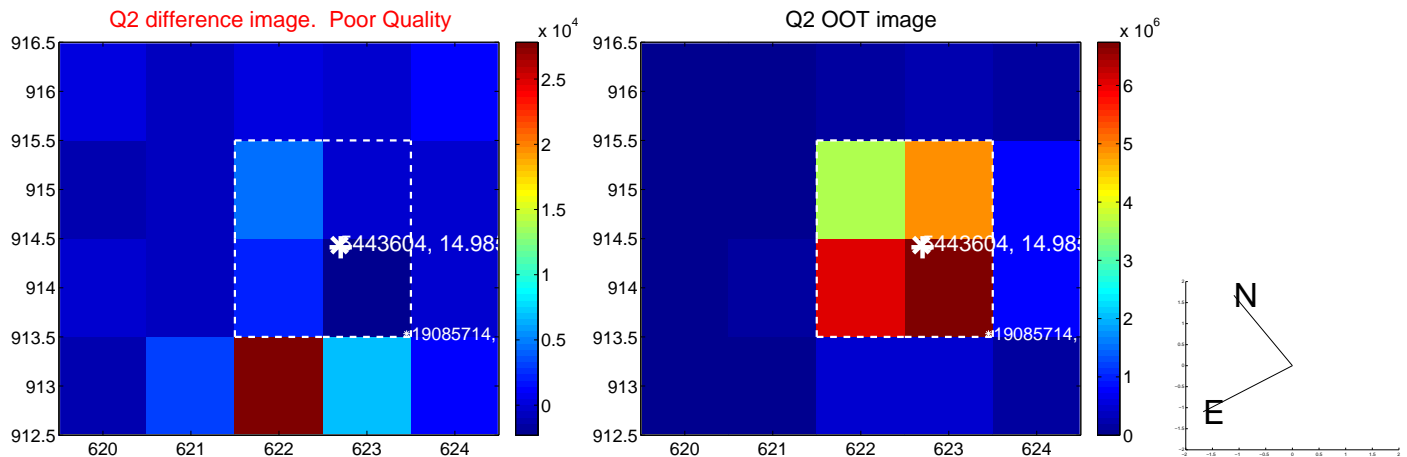
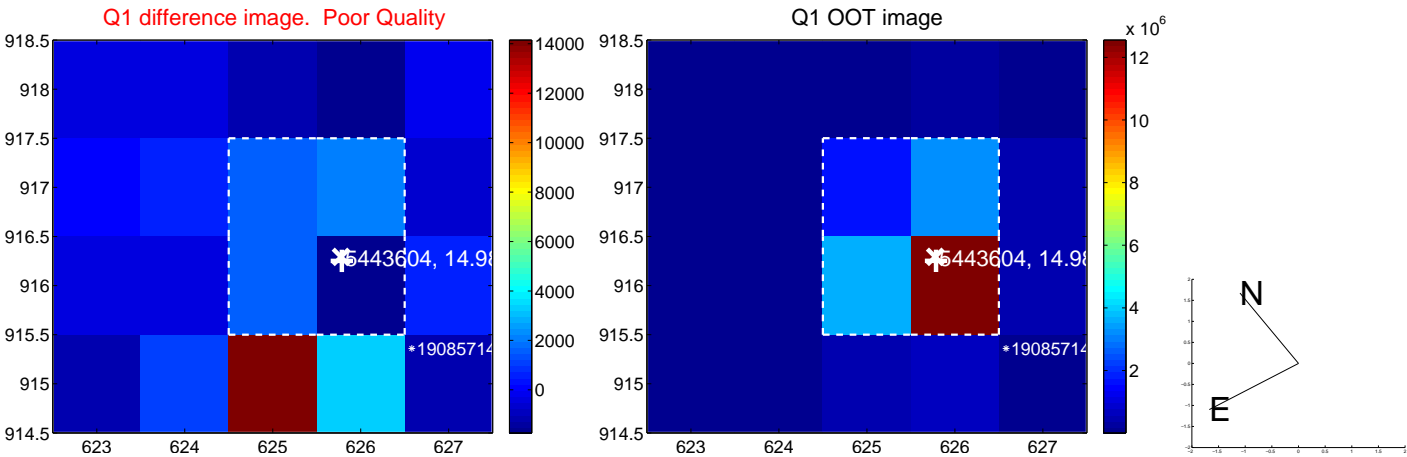
The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	8.830 $\pm$ 0.850	10.39	6.518 $\pm$ 0.568	-5.957 $\pm$ 0.642
PRF-fit source offset from KIC position	8.929 $\pm$ 0.998	8.95	6.520 $\pm$ 0.663	-6.102 $\pm$ 0.755
photometric centroid source offset	—	—	—	—

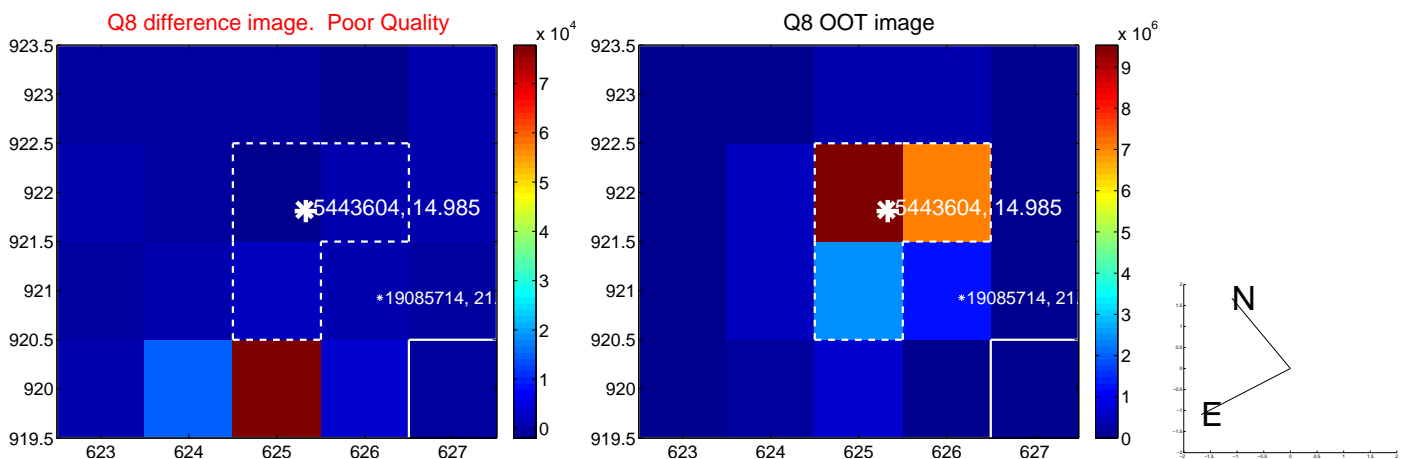
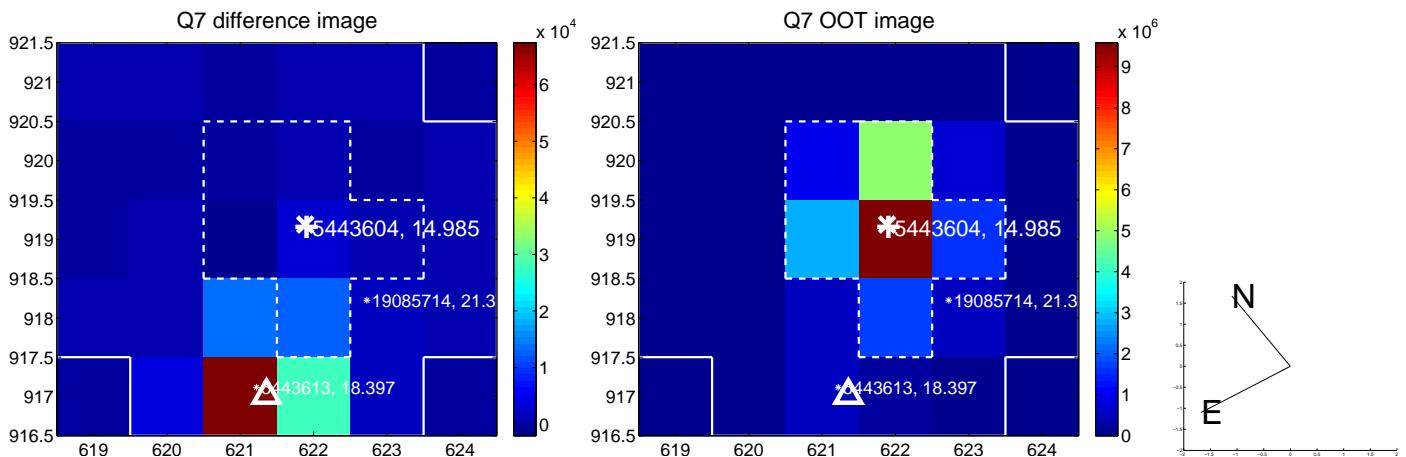
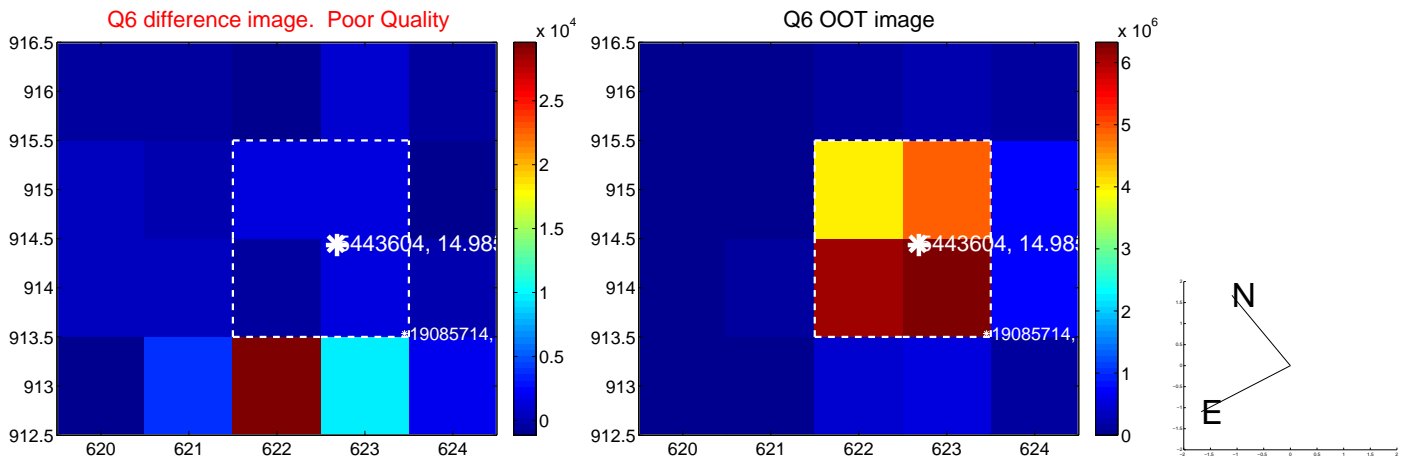
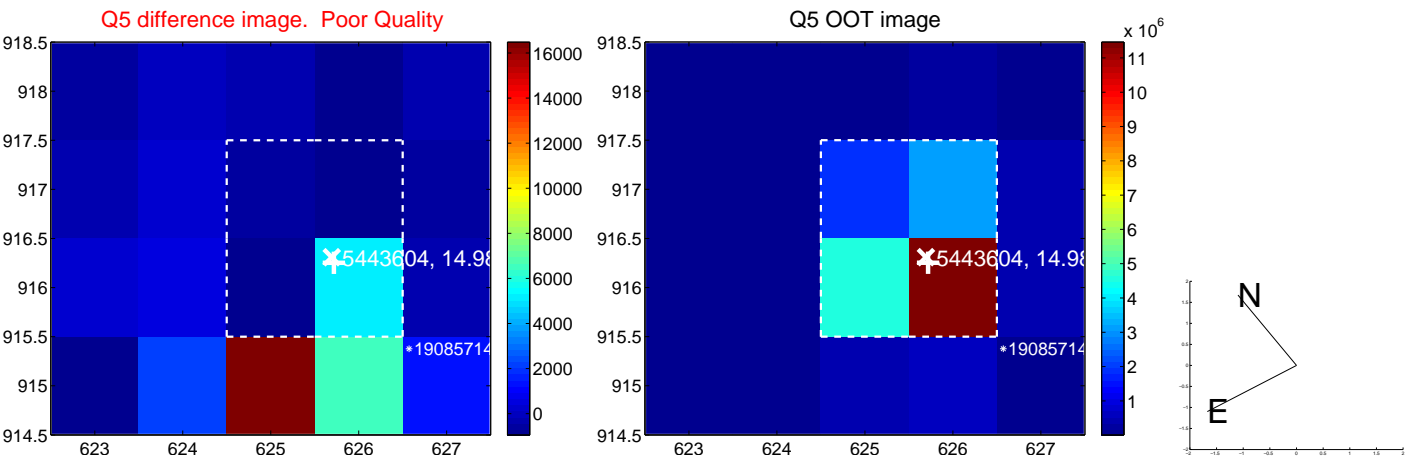


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

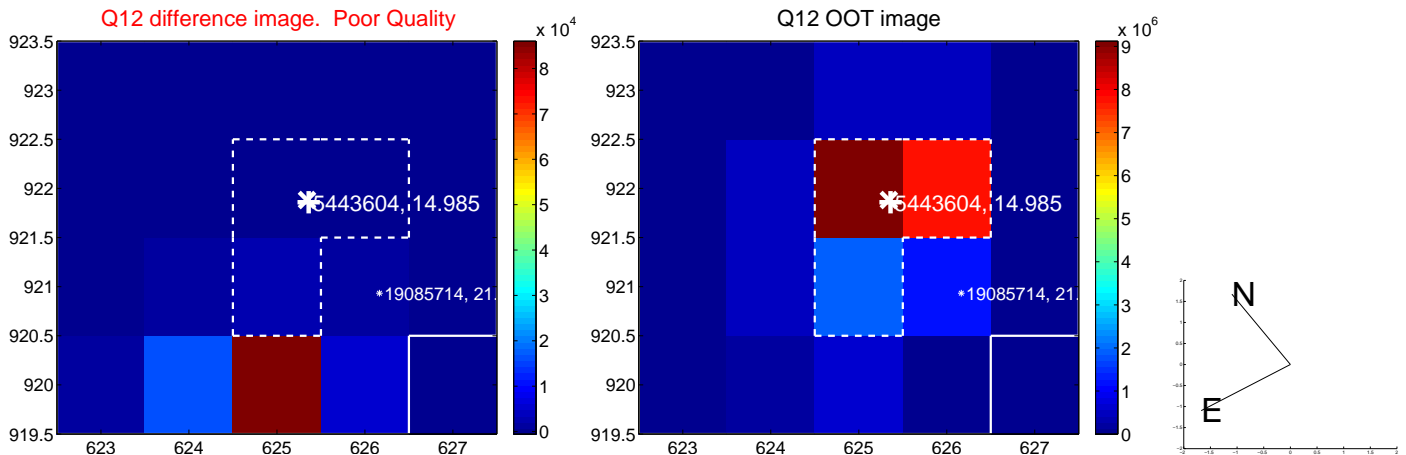
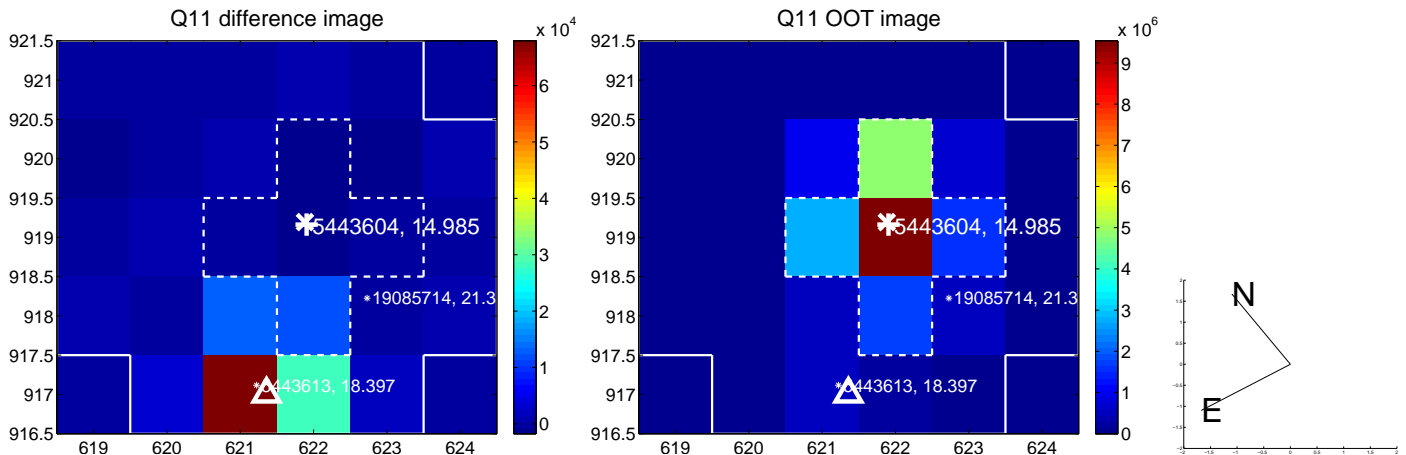
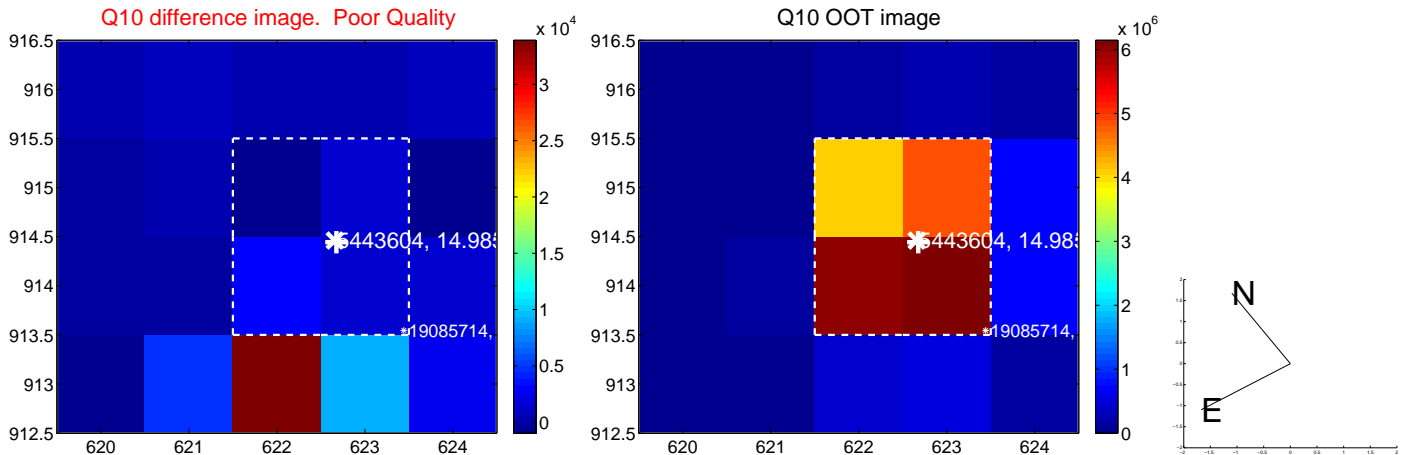
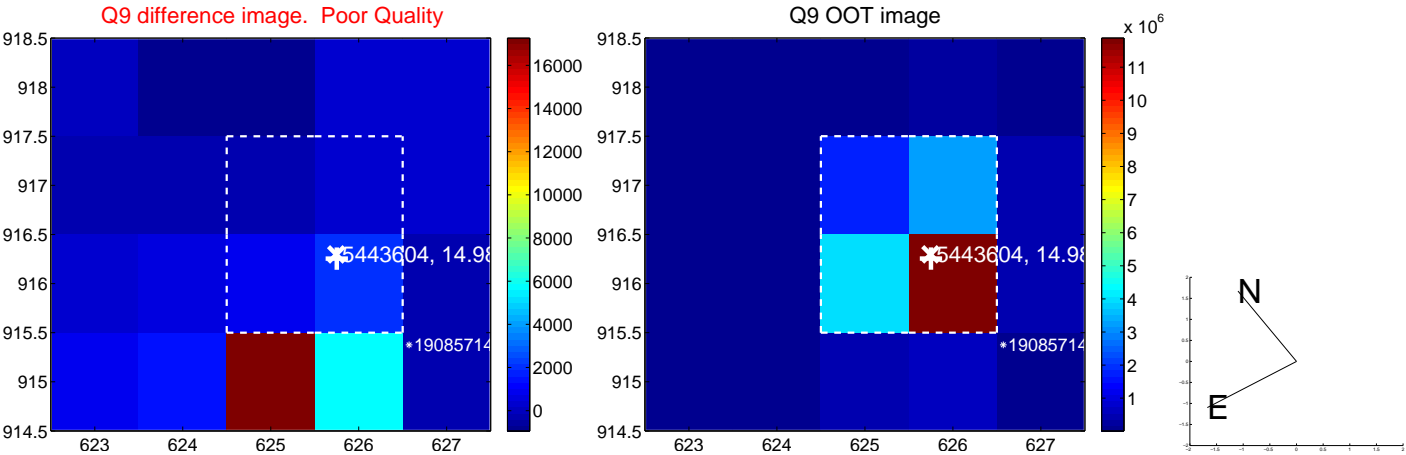
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



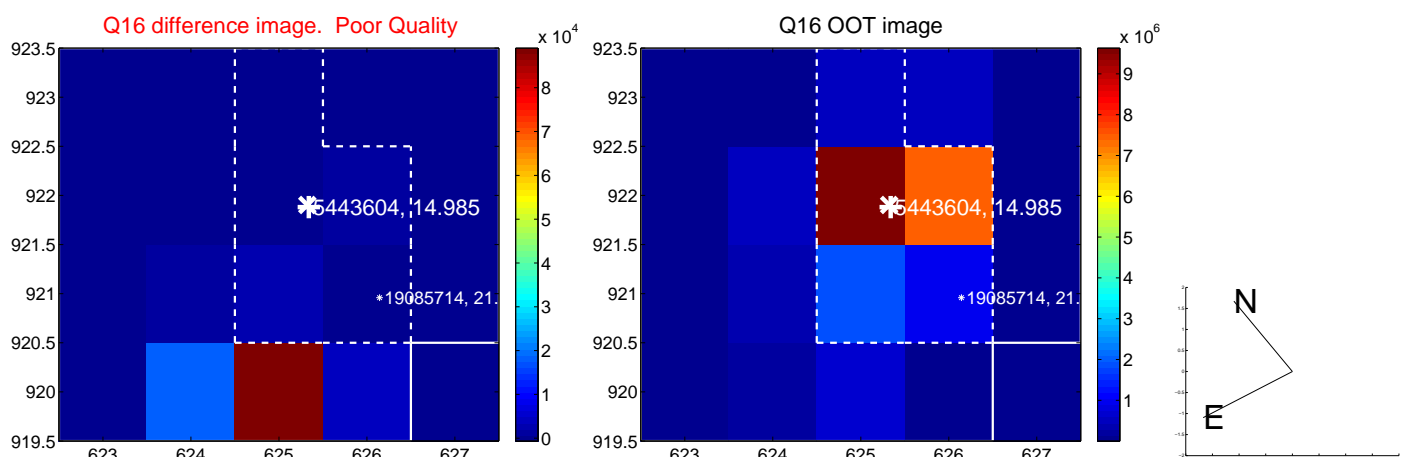
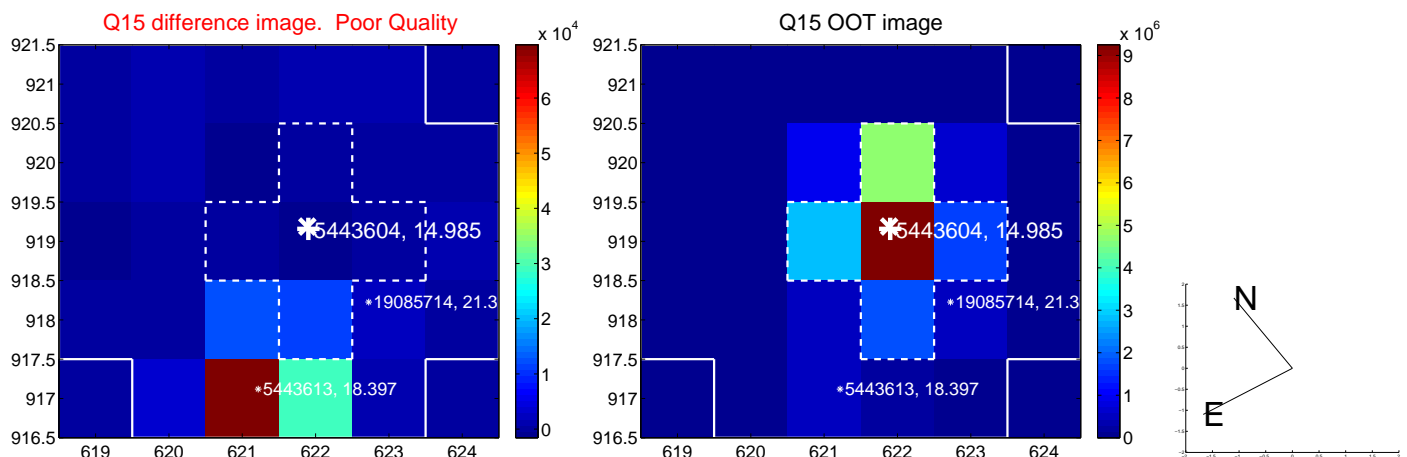
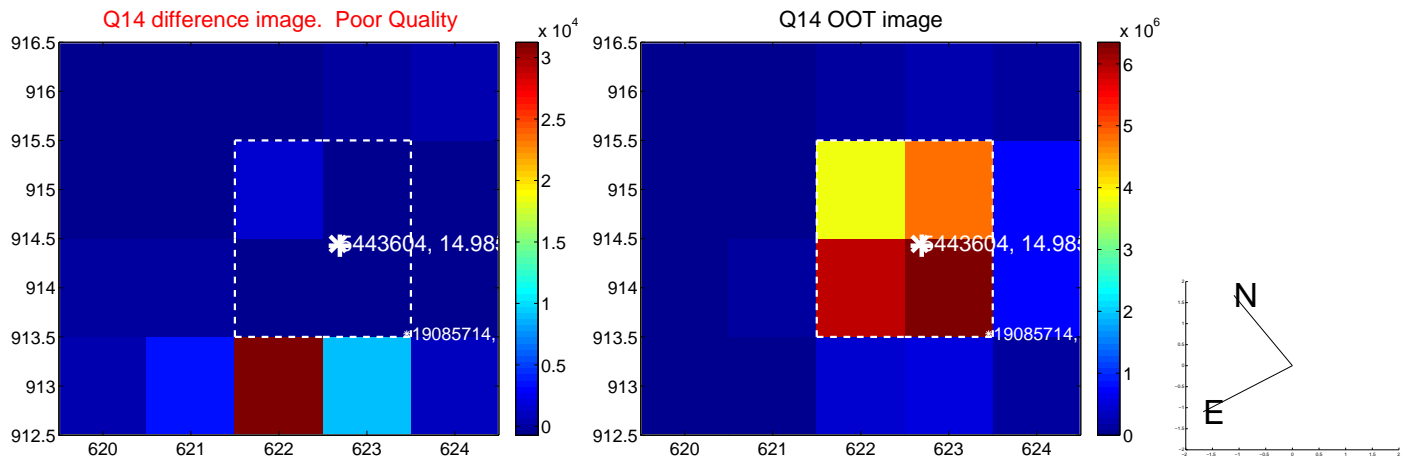
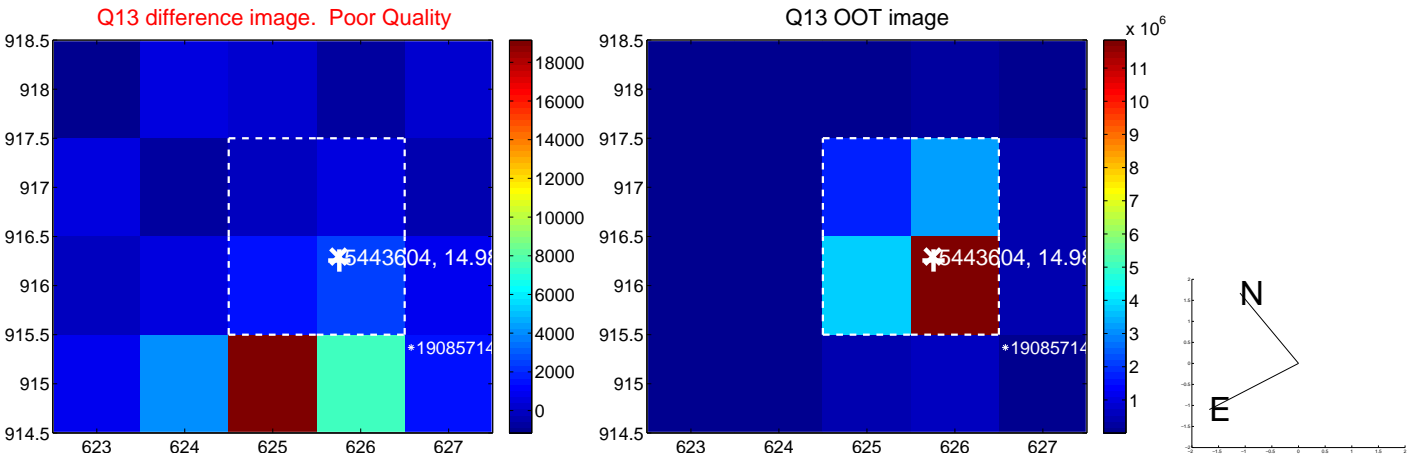
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



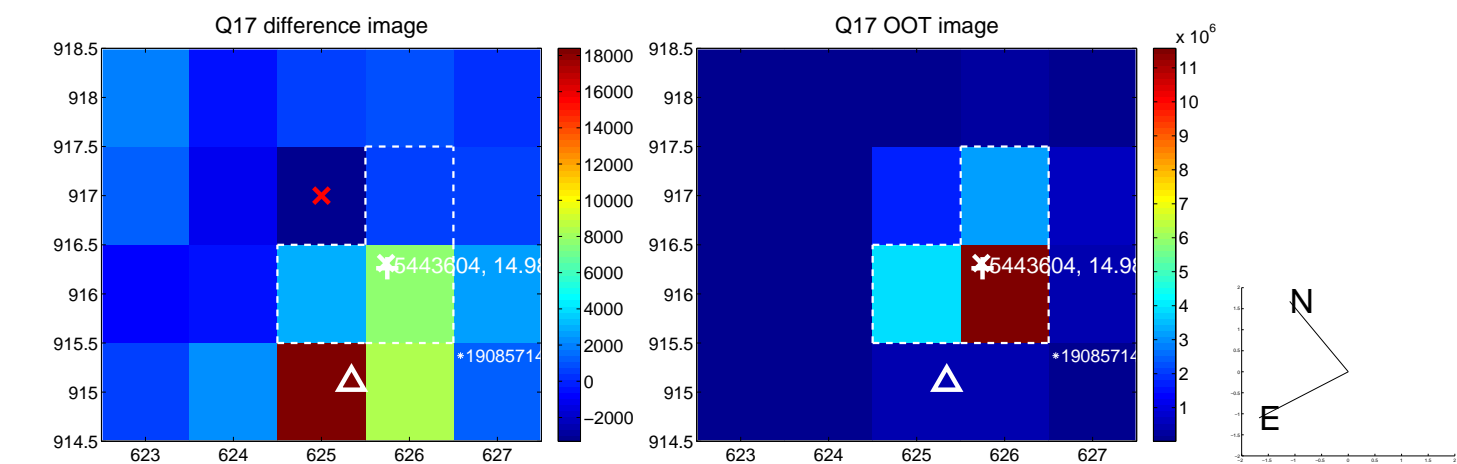
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



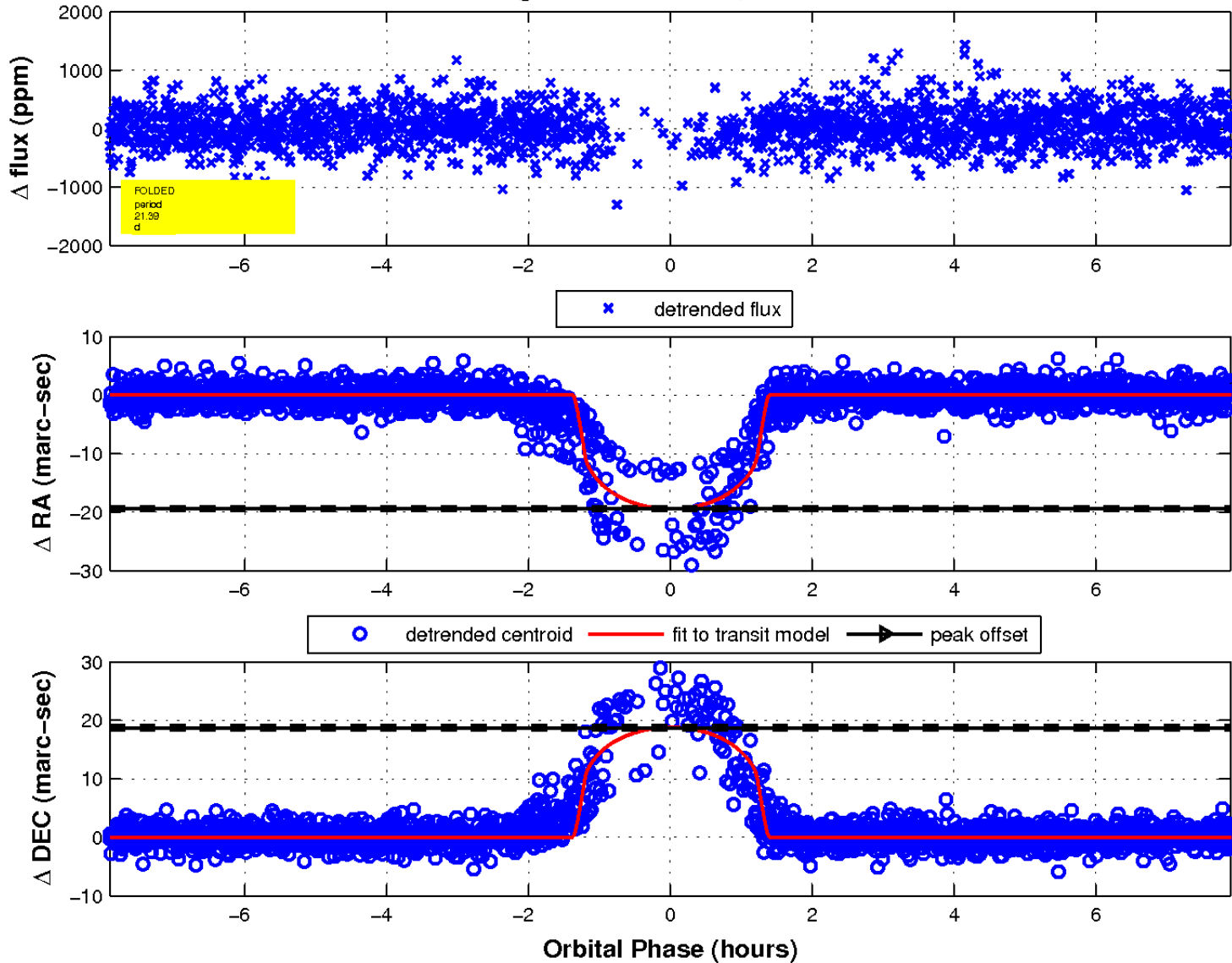
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

