

# KIC 007597771

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007597771-01	OBS	No	0.851709	132.173849	39.3	4.737	7.3	6.9	0.75	5125	0.46	1384.26
007597771-02	OBS	No	1.413187	132.828815	164.5	5.028	11.5	11.8	0.75	5125	0.94	704.70
007597771-03	OBS	No	53.296536	145.468901	1029.4	5.565	9.1	10.3	0.75	5125	2.61	5.57
007597771-04	OBS	No	394.148782	386.722088	1011.8	18.203	8.9	8.2	0.75	5125	2.67	0.39

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007597771-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_KIC_POS
007597771-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—CENT_KIC_POS
007597771-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007597771-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST

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

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

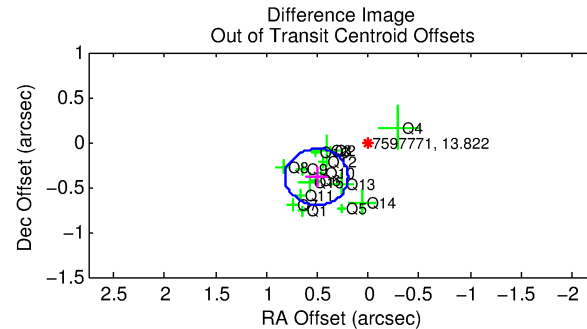
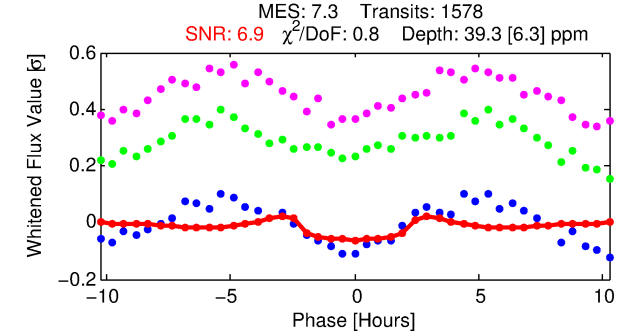
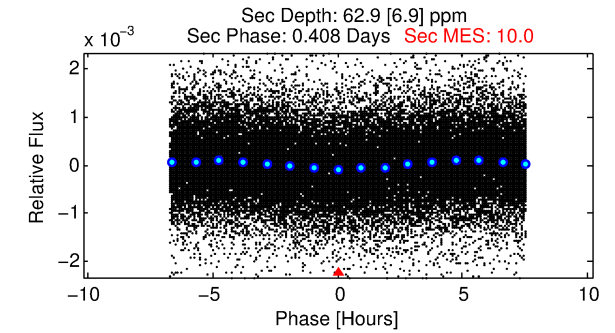
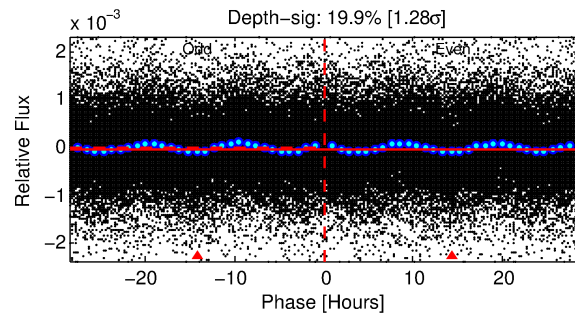
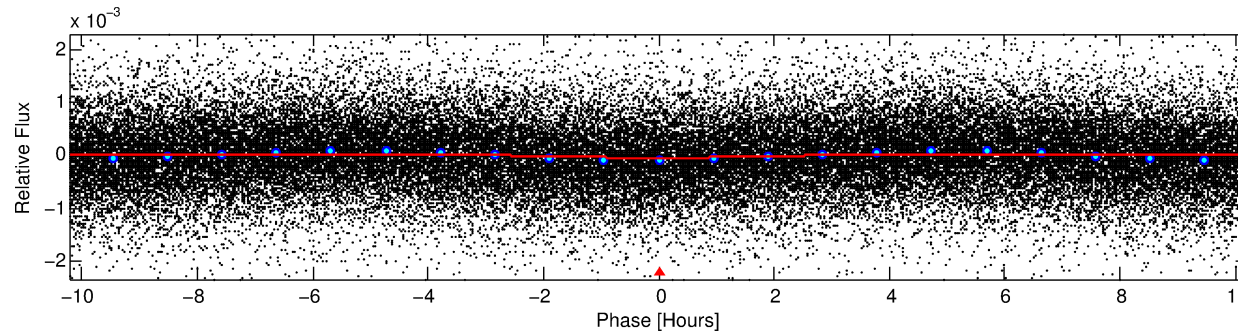
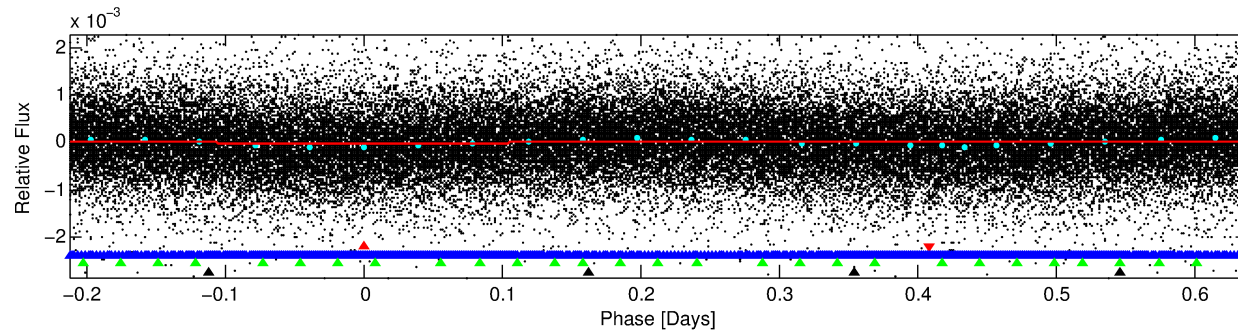
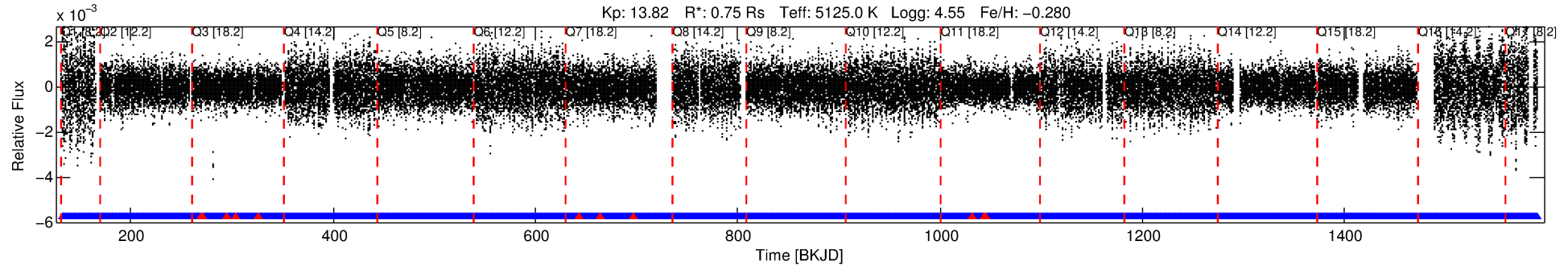
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007597771-01

No Significant Match Found

# DV One-Page Summary

KIC: 7597771 Candidate: 1 of 4 Period: 0.852 d



## DV Fit Results:

Period = 0.85171 [0.00002] d  
Epoch = 132.1738 [0.0056] BKJD  
Rp/R\* = 0.0056 [0.0087]  
a/R\* = 1.51 [4.85]  
b = 0.02 [270.97]  
Seff = 1384.25 [264.39]  
Teq = 1555 [74] K  
Rp = 0.46 [0.71] Re  
a = 0.0158 [0.0014] AU  
Ag = 41.45 [128.37] [0.32 $\sigma$ ]  
Teffp = 6102 [4725] K [0.96 $\sigma$ ]

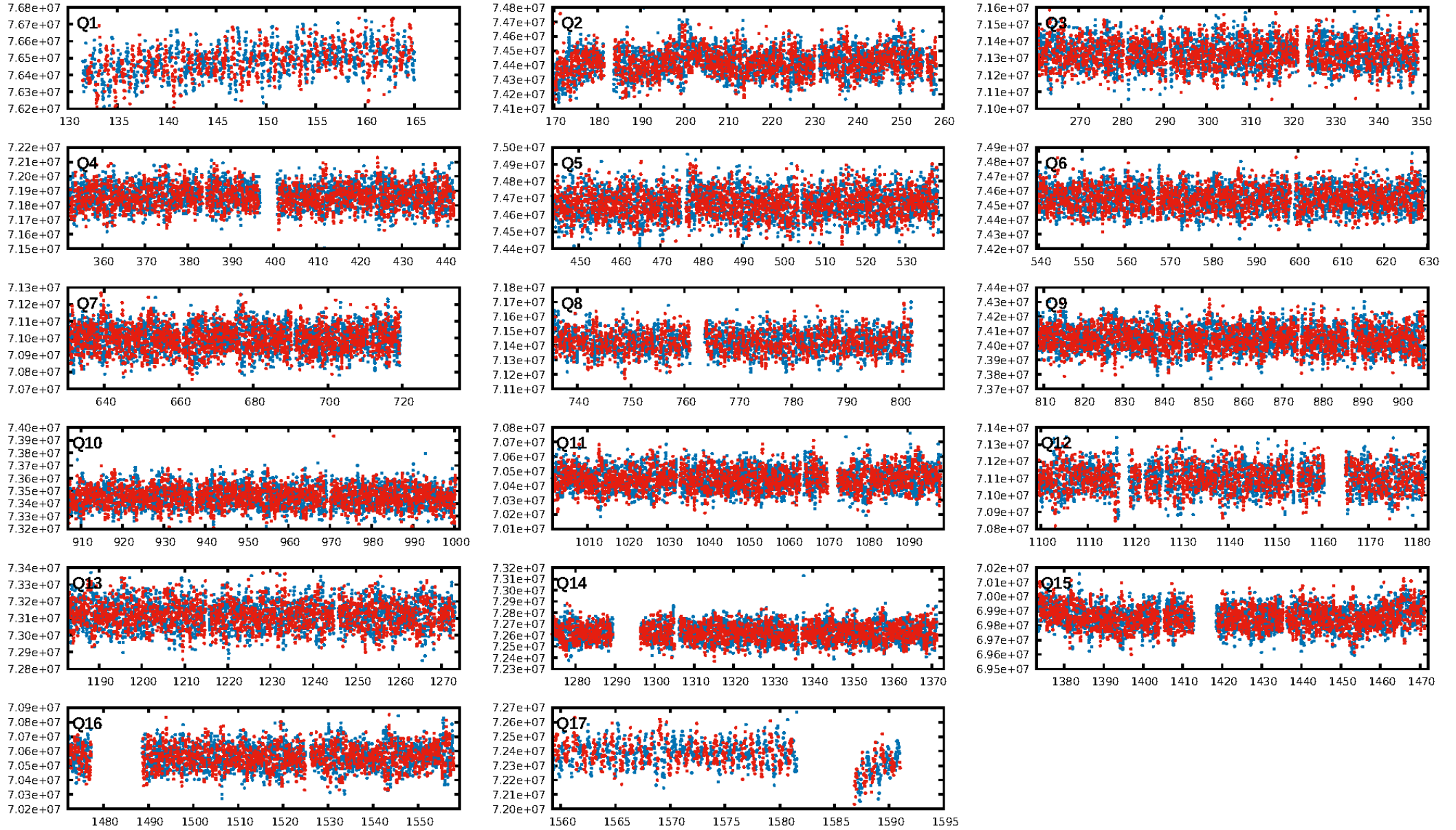
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 94.9% [1.95 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
**Bootstrap-pfa: 1.27e-09**  
RollingBand-fgt: 0.99 [1497/1508]  
GhostDiagnostic-chr: 1.976  
**Centroid-sig: 0.0%**  
**Centroid-so: 3.007 arcsec [3.91 $\sigma$ ]**  
**OotOffset-rm: 0.636 arcsec [6.13 $\sigma$ ]**  
**KicOffset-rm: 1.523 arcsec [15.23 $\sigma$ ]**  
OotOffset-st: 4/4/4 [16]  
KicOffset-st: 4/4/4 [16]  
DiffImageQuality-fgm: 1.00 [16/16]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:47:33 Z

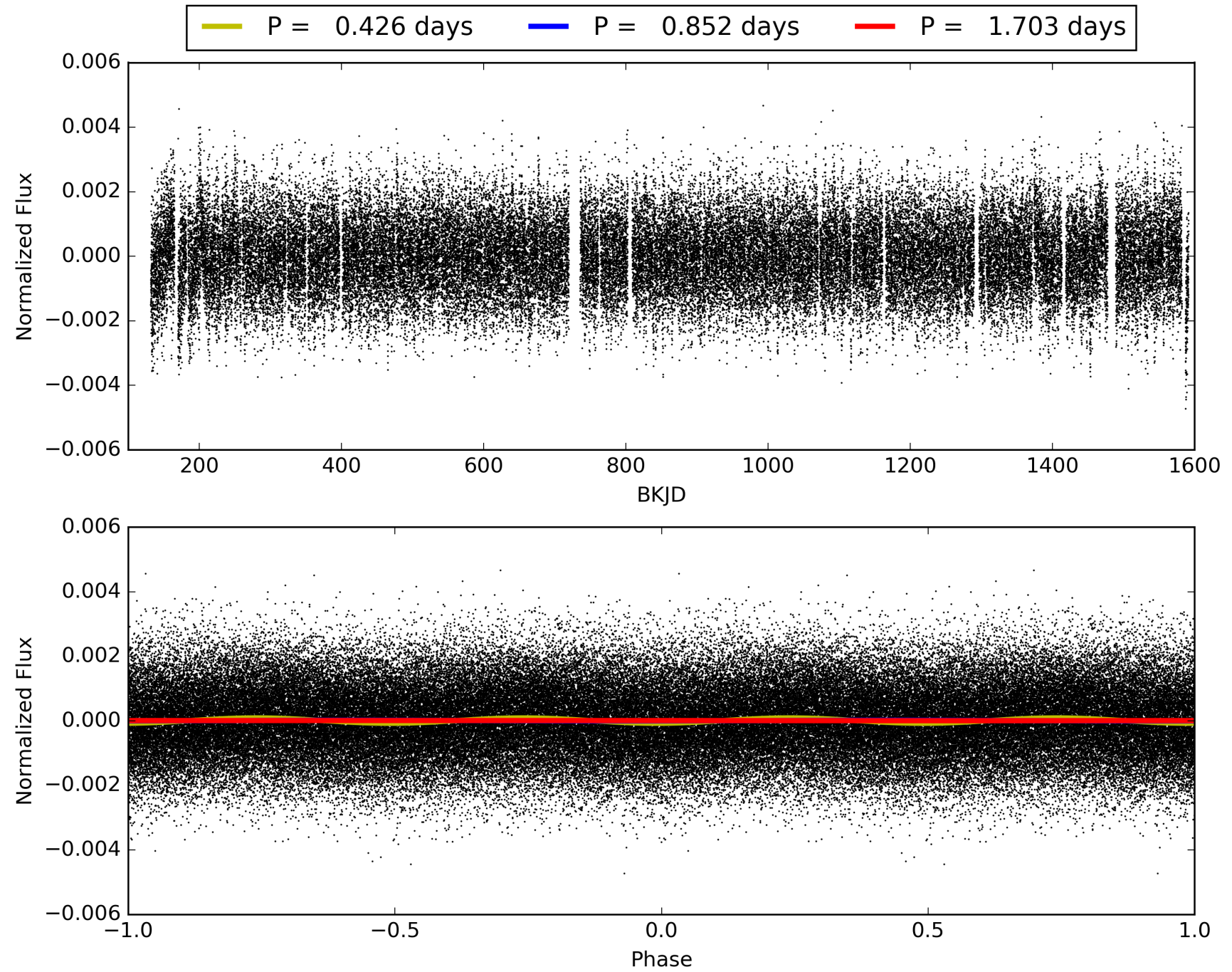
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007597771-01, PDC Light Curves





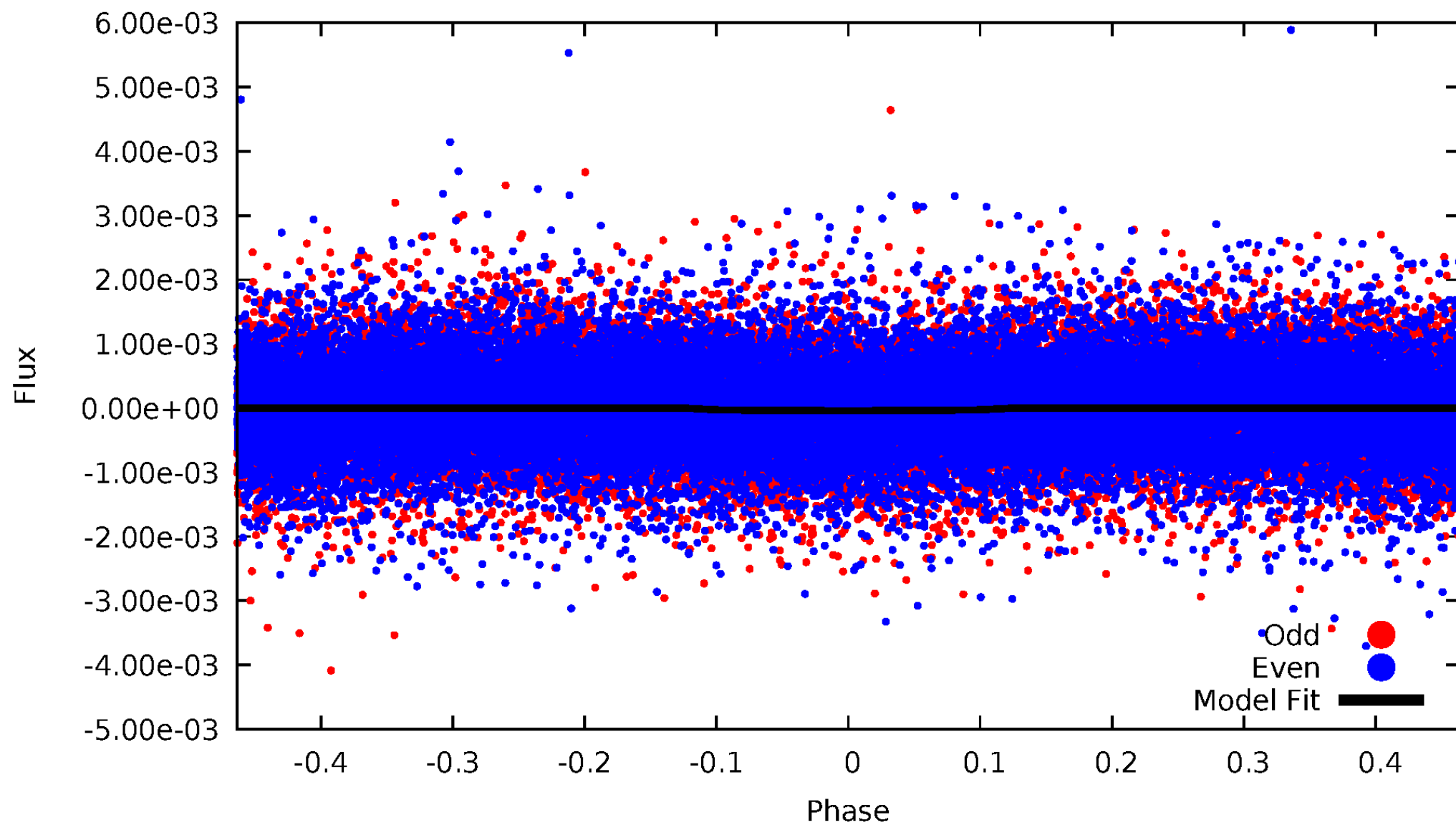
# TCE 007597771-01





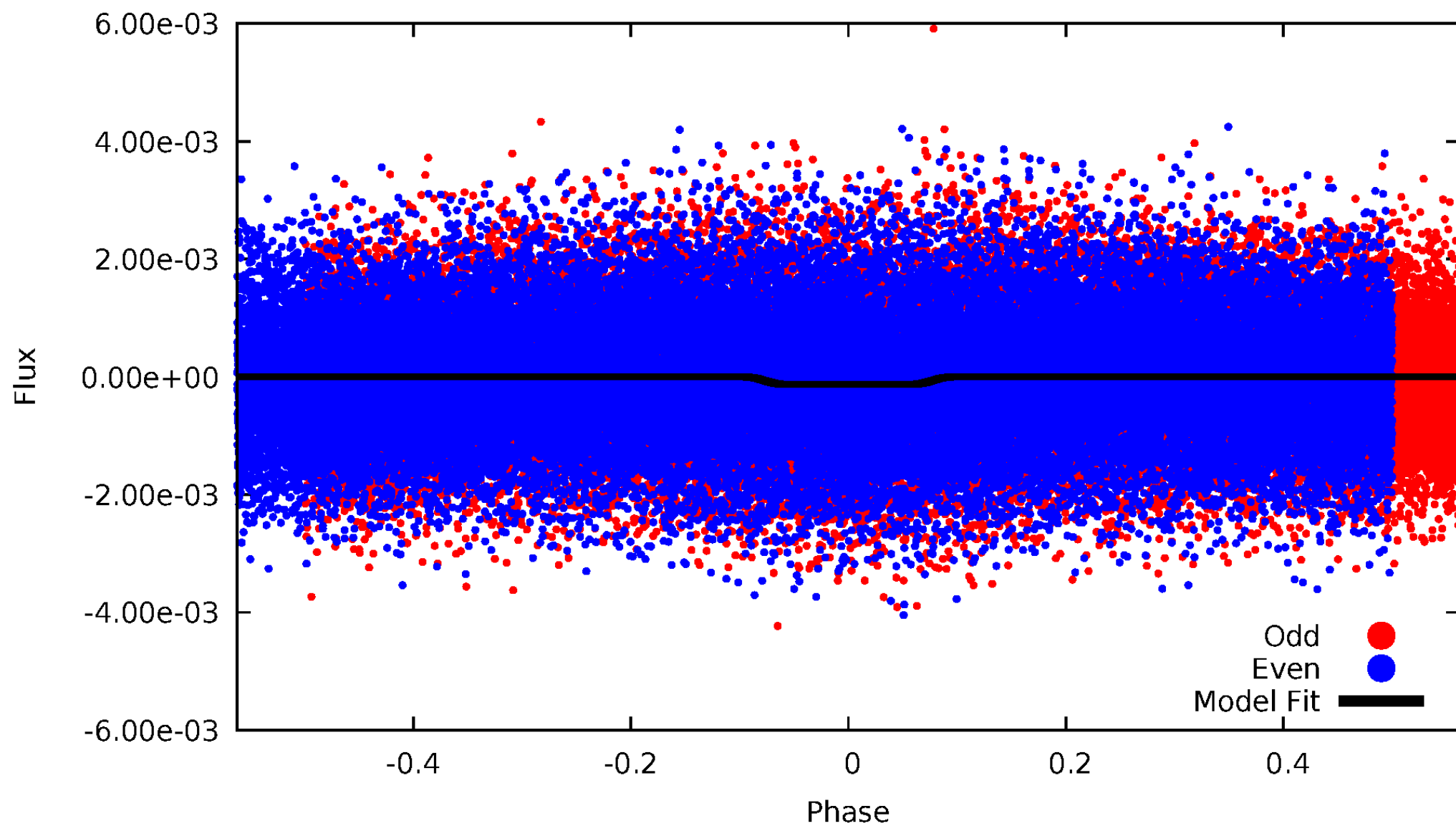
# DV Odd/Even

TCE 007597771-01



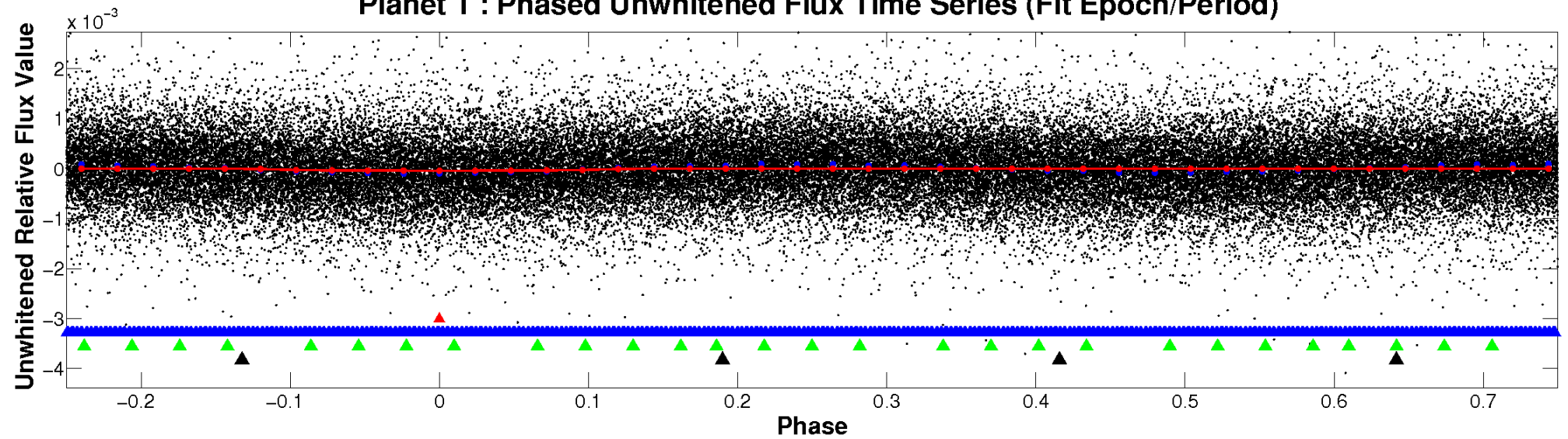
# ALT Odd/Even

TCE 007597771-01

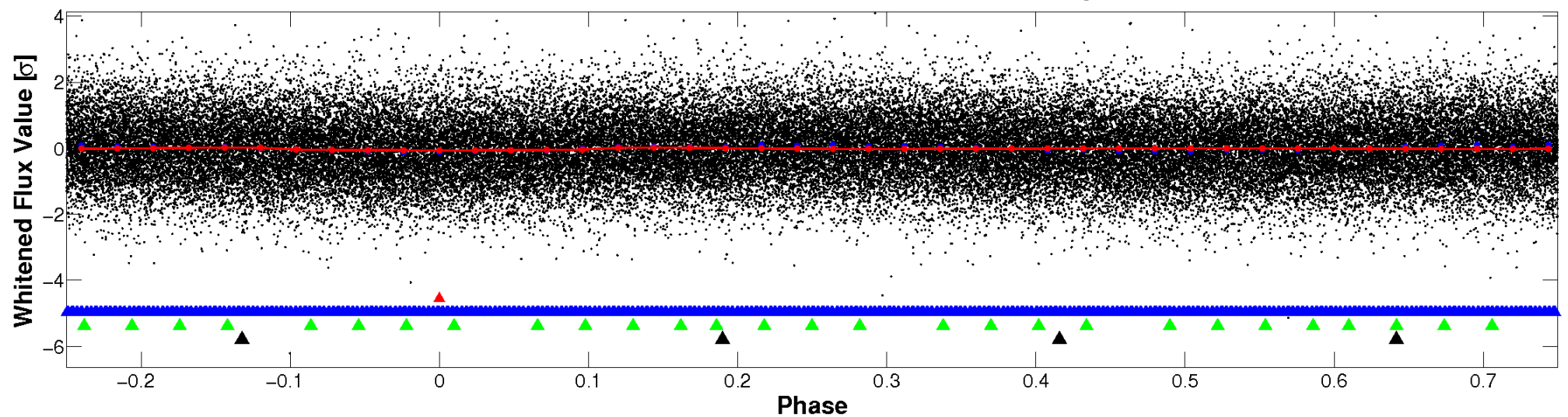


# Non-Whitened Vs. Whitened Light Curve

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



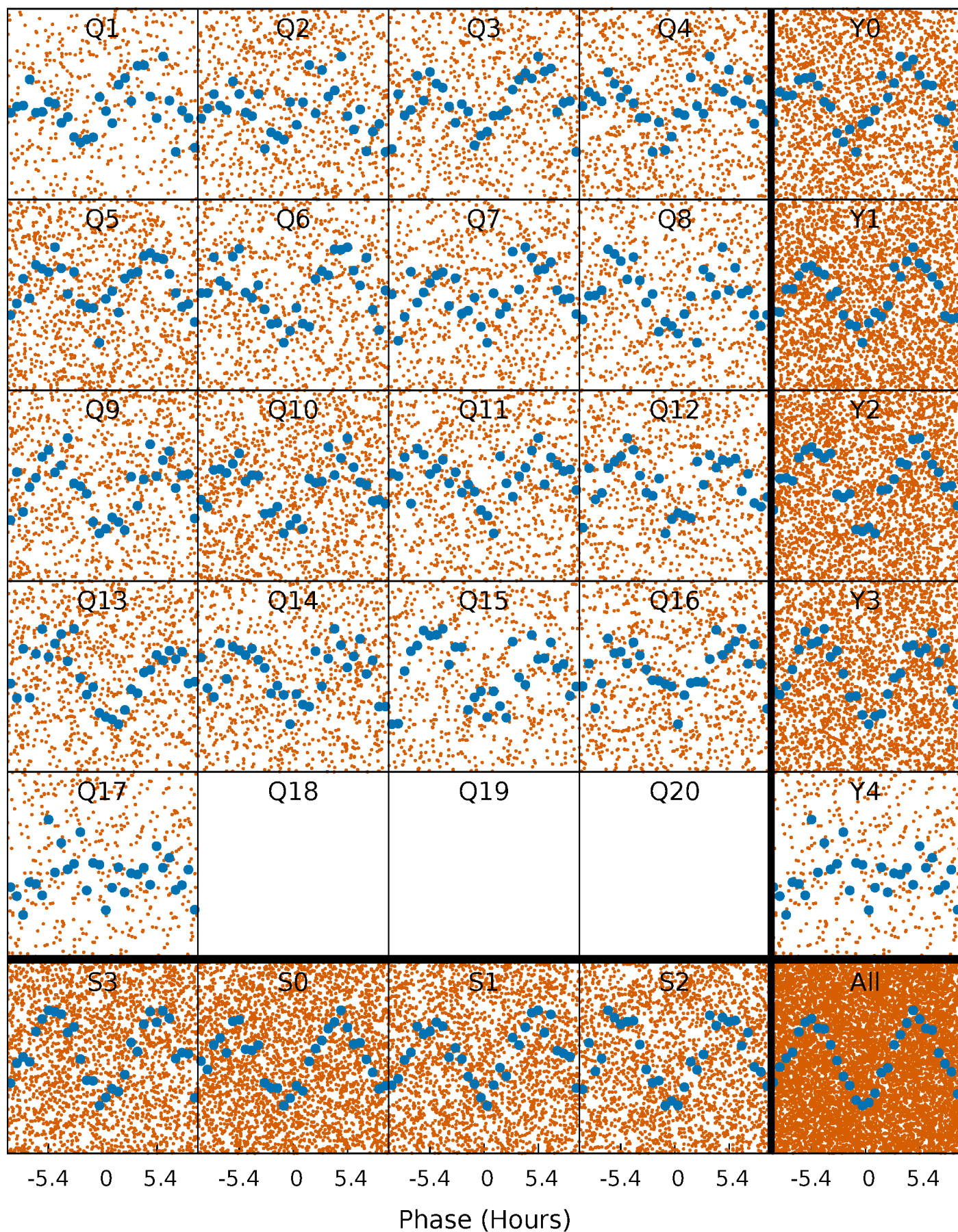
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





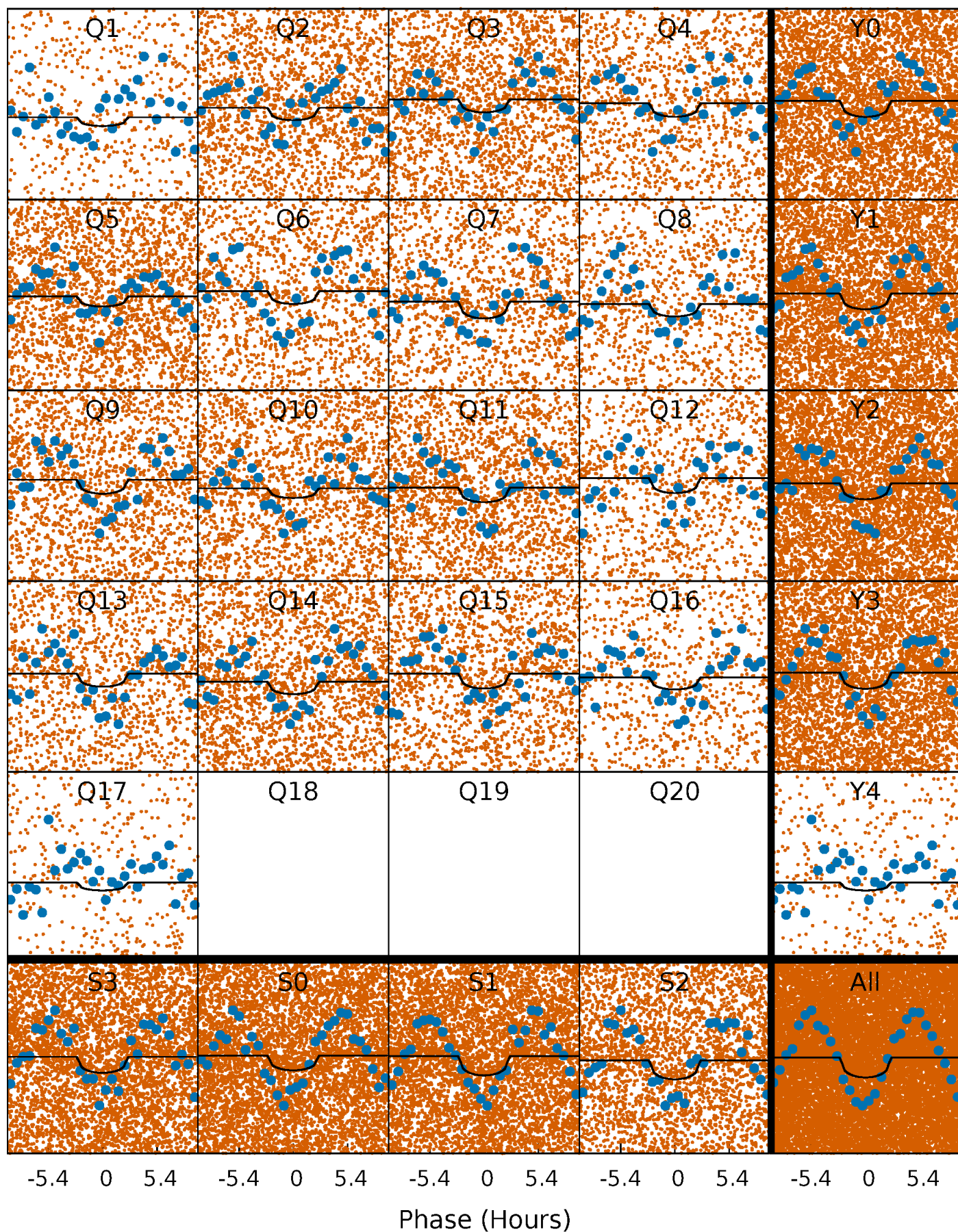
# PDC Quarter-Phased Transit Curves

TCE 007597771-01 P= 0.851709 Days  $T_0=132.173849$  (BKJD)



# DV Quarter-Phased Transit Curves

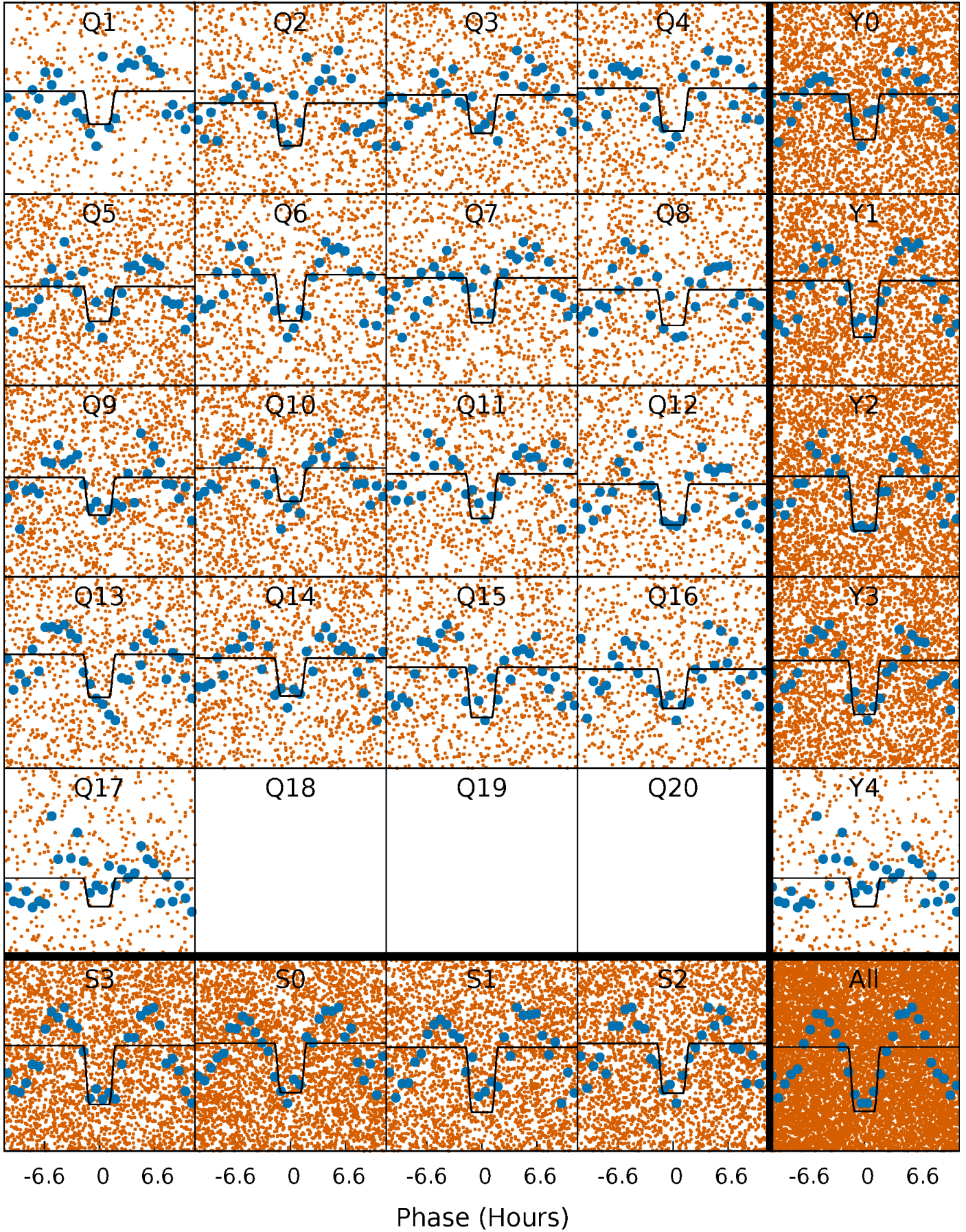
TCE 007597771-01 P= 0.851709 Days  $T_0=132.173849$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 007597771-01 P= 0.851744 Days  $T_0=132.132623$  (BKJD)

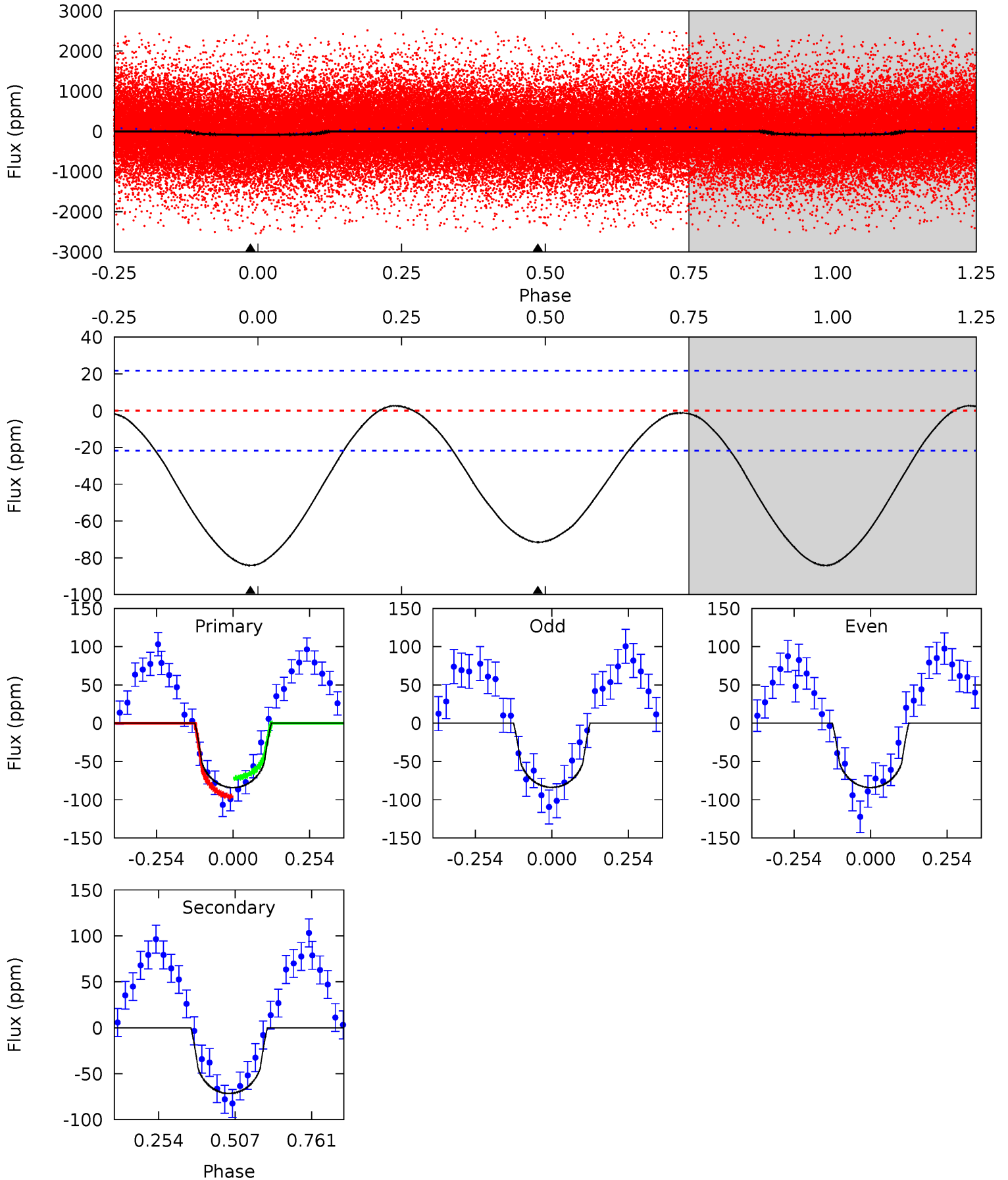




# DV Model-Shift Uniqueness Test

007597771-01, P = 0.851709 Days, E = 131.322140 Days

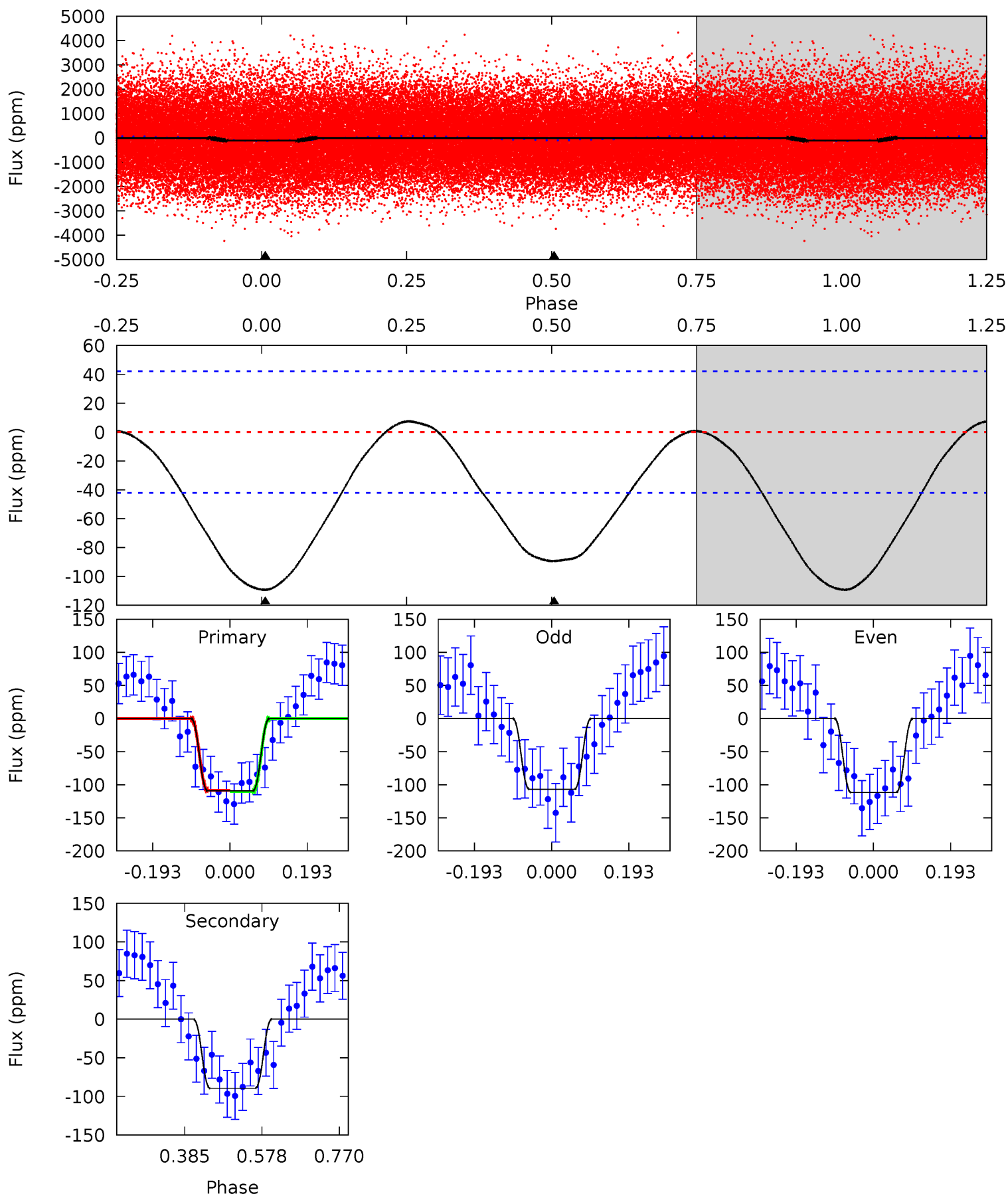
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	14.3	0	0	4.37	1.14	0.39	16.9	16.9	14.3	14.3	0.03	1.03	0.03	2.46



# Alt Model-Shift Uniqueness Test

007597771-01, P = 0.851744 Days, E = 131.280879 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
11.5	9.39	0	0	4.43	1.30	0.55	11.5	11.5	9.39	9.39	0.25	1.07	0.06	0.11



### Stellar Parameters For KIC 007597771

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5125^{+179}_{-179}$	$4.551^{+0.071}_{-0.058}$	$-0.280^{+0.300}_{-0.300}$	$0.748^{+0.080}_{-0.080}$	$0.727^{+0.098}_{-0.057}$	$2.447^{+0.785}_{-0.498}$
	+3%/-3%	+2%/-1%	+107%/-107%	+11%/-11%	+13%/-8%	+32%/-20%
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 007597771-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-72 \pm 5$	$0.70^{+0.58}_{-0.46}$	$2165^{+90}_{-101}$	$5028^{+3954}_{-1099}$	$20^{+145}_{-14}$
Alt.	$-89 \pm 10$	$1.05^{+0.68}_{-0.59}$	$2174^{+101}_{-99}$	$4447^{+2160}_{-712}$	$11^{+48}_{-7}$

$T_{max}$  = 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

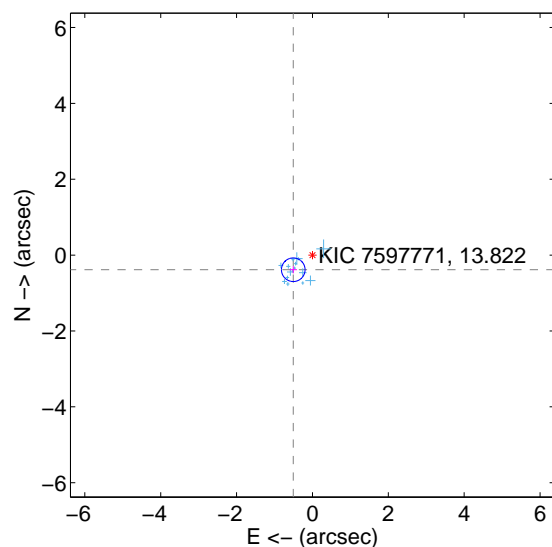
Supplemental centroid analysis for 007597771-01. Kepler magnitude: 13.82. Transit SNR 6.90

There are 16 quarters with good PRF difference image offsets

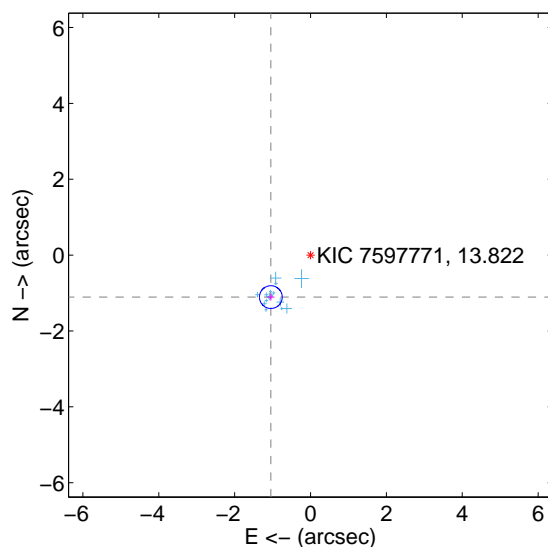
The direct PRF centroid is offset from the target star catalog position by about 1.00 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.636 \pm 0.104$	<b>6.13</b>	$0.506 \pm 0.097$	$-0.386 \pm 0.094$
PRF-fit source offset from KIC position	$1.523 \pm 0.100$	<b>15.23</b>	$1.046 \pm 0.097$	$-1.107 \pm 0.090$
photometric centroid source offset	$3.01 \pm 0.77$	<b>3.91</b>	$0.54 \pm 0.68$	$-2.96 \pm 0.77$

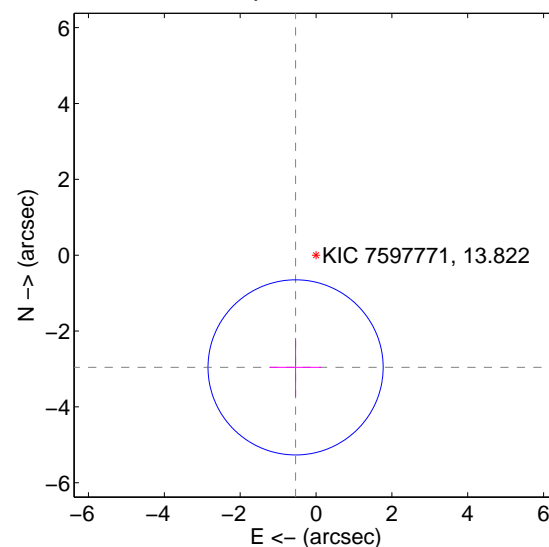
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

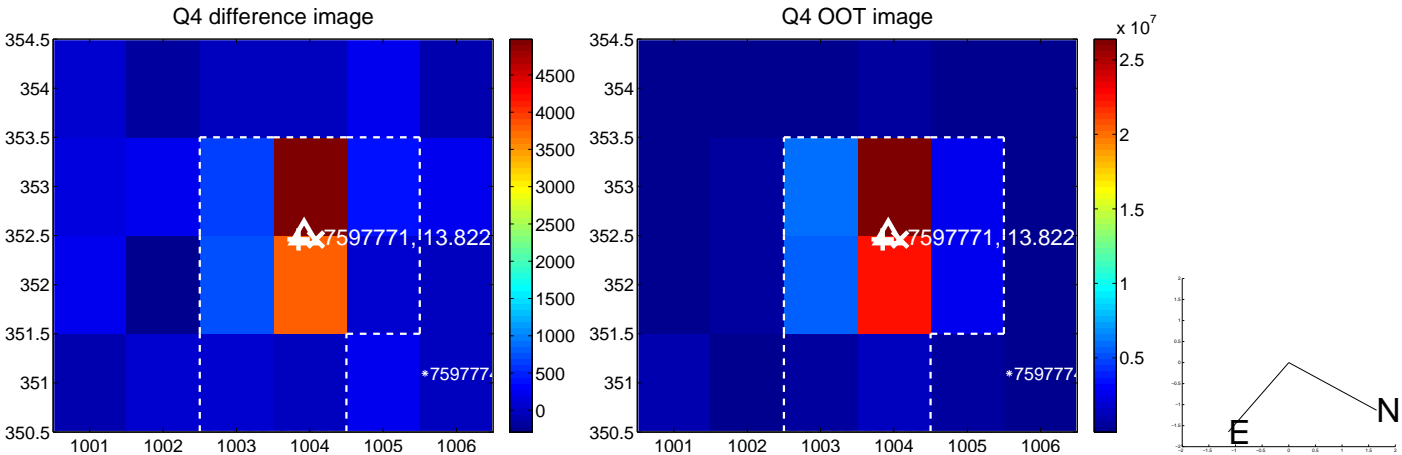
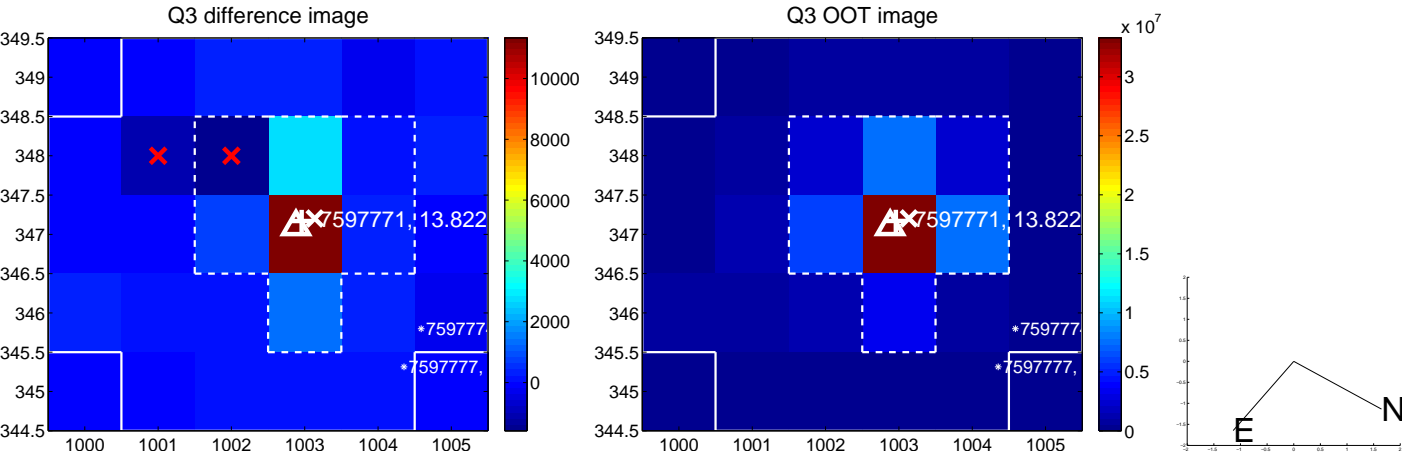
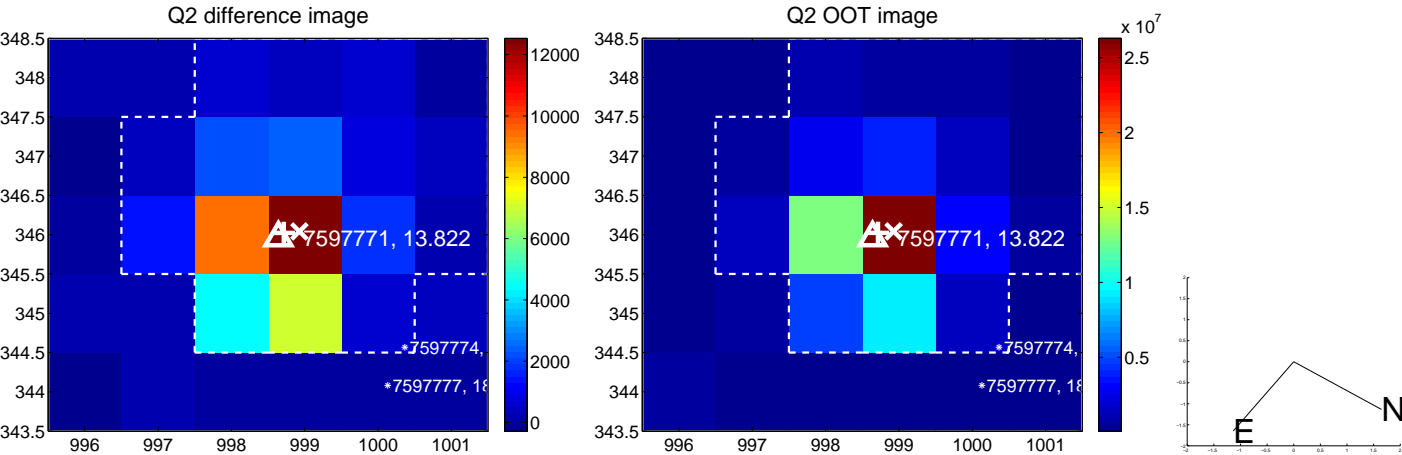
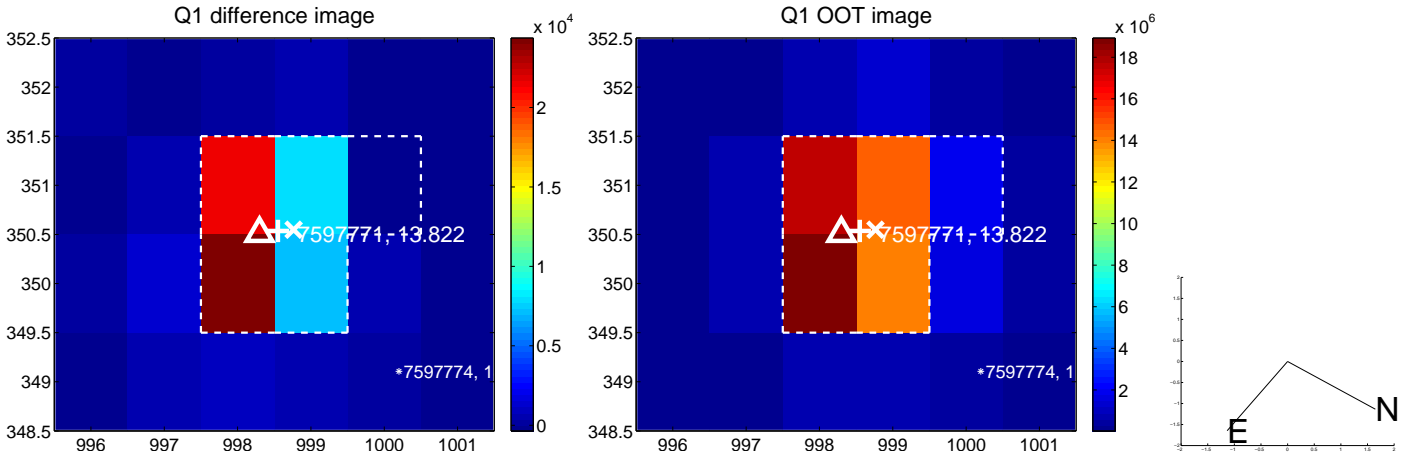


offset from photometric centroids

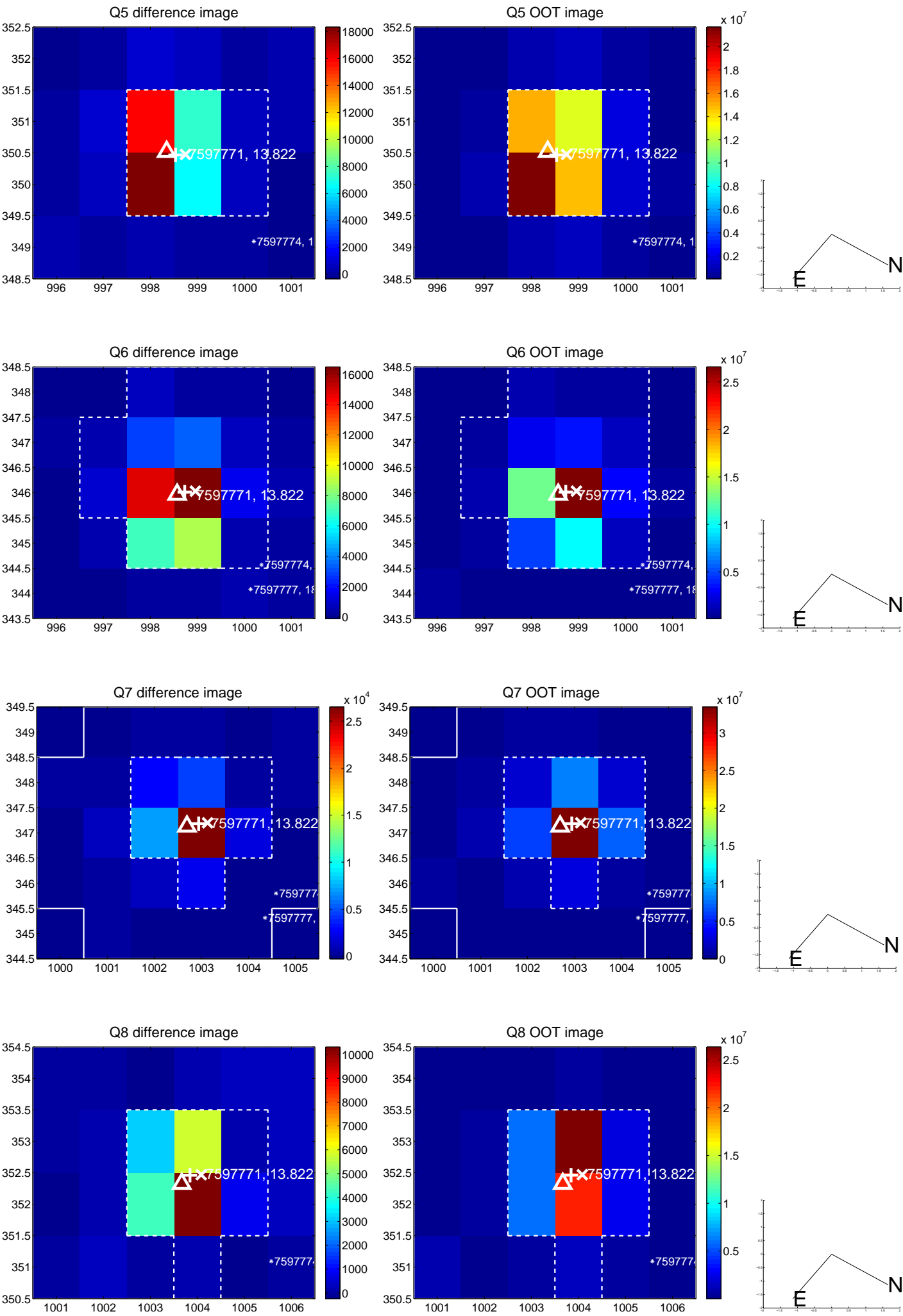


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

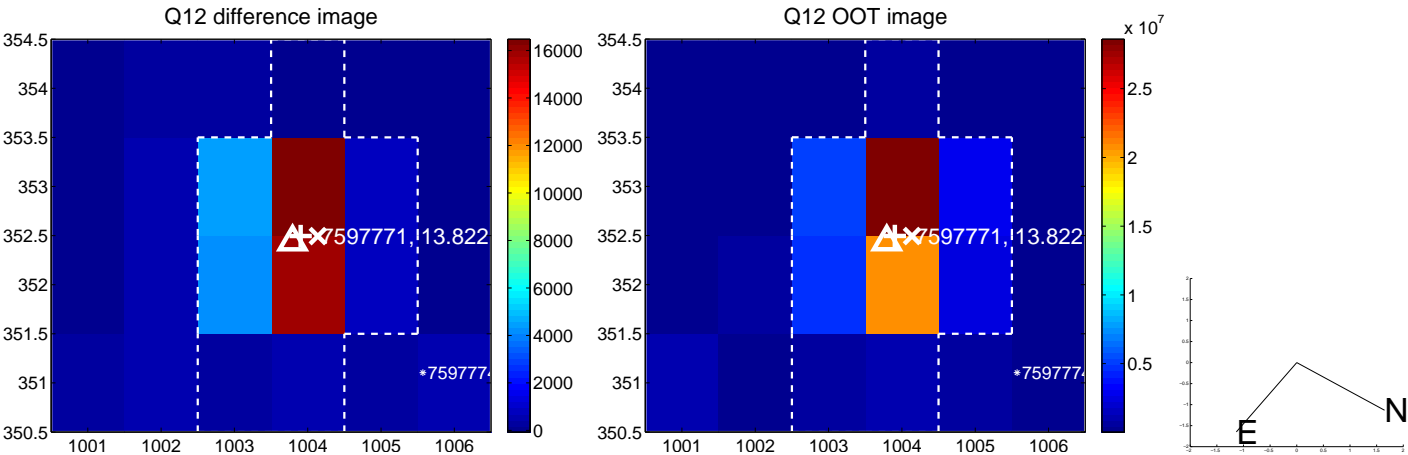
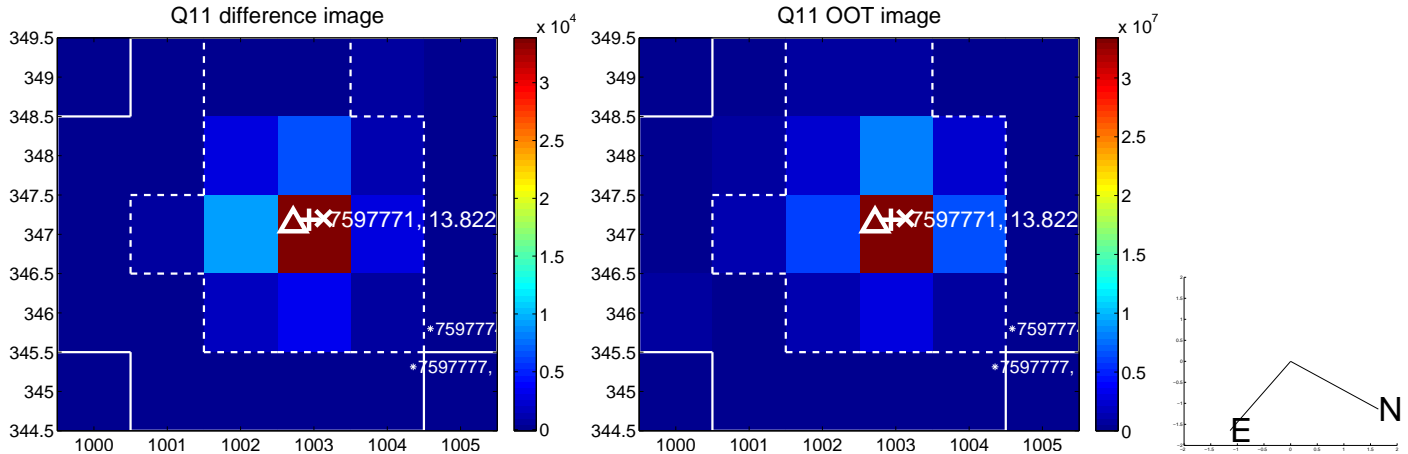
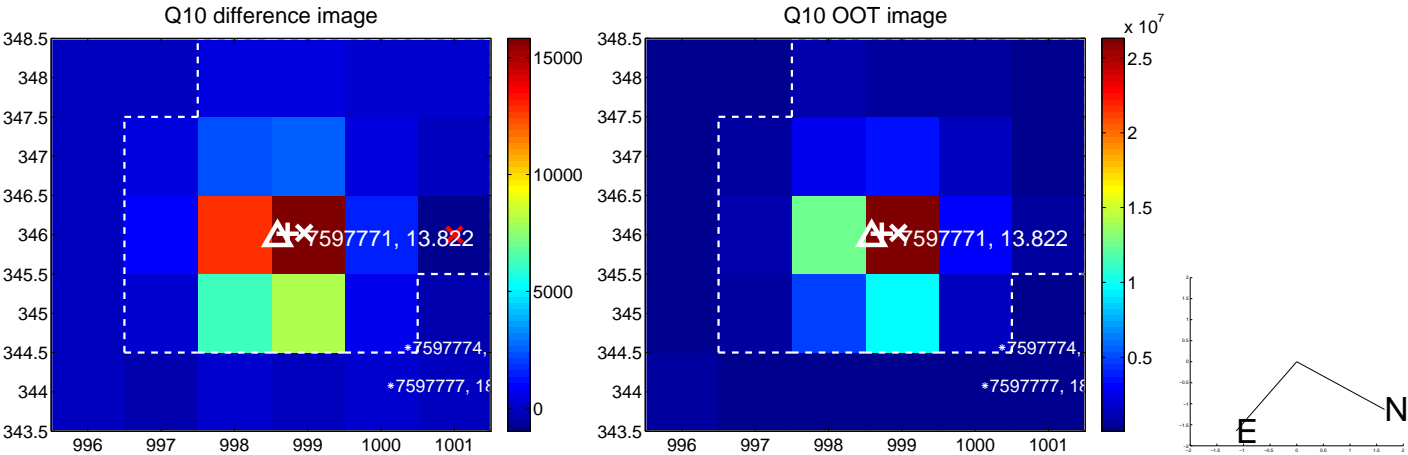
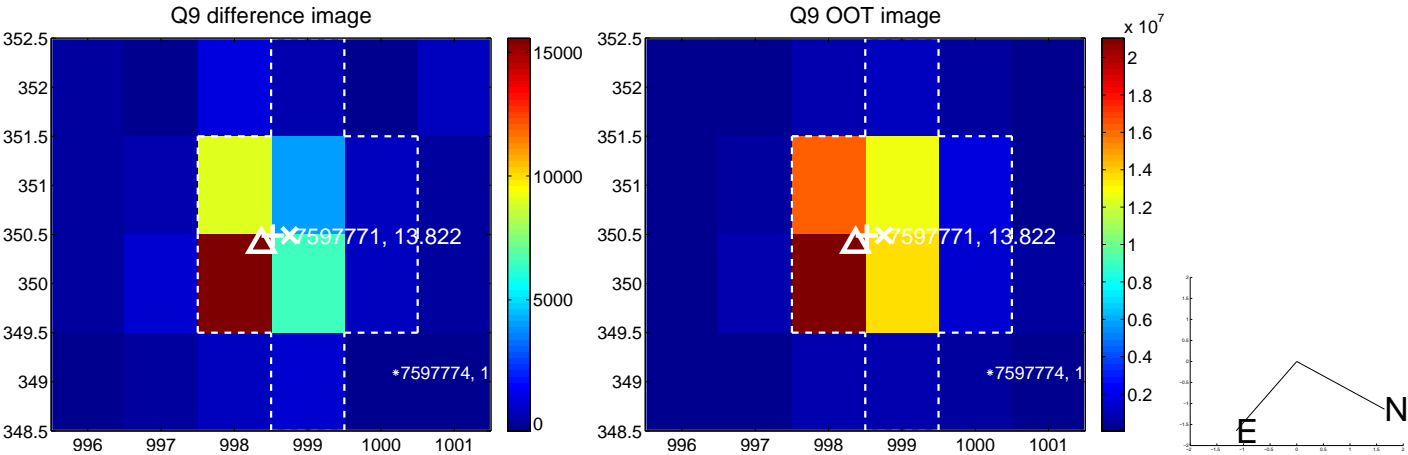


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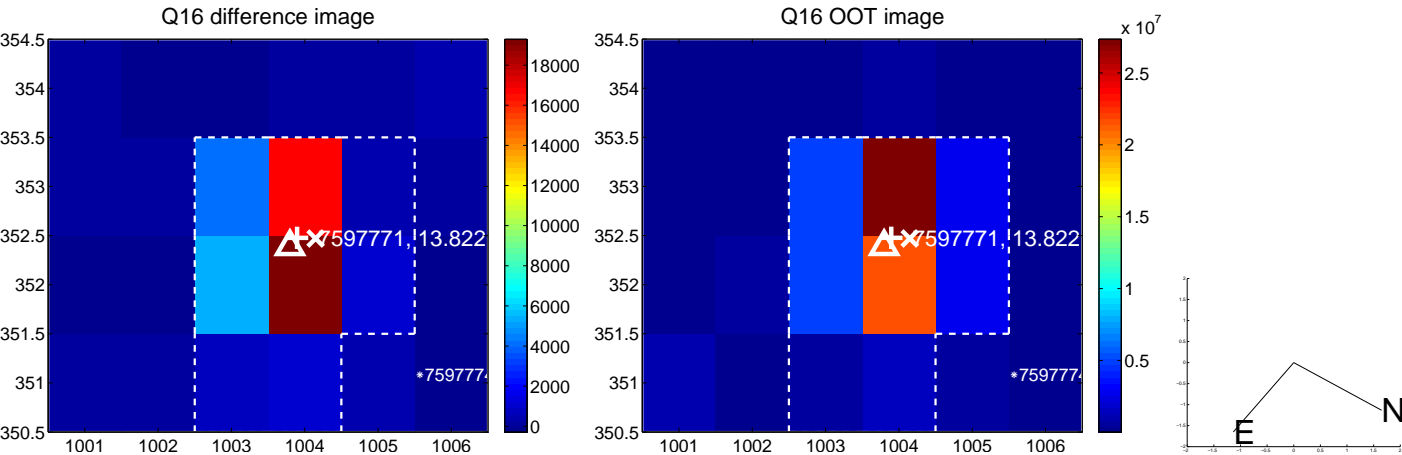
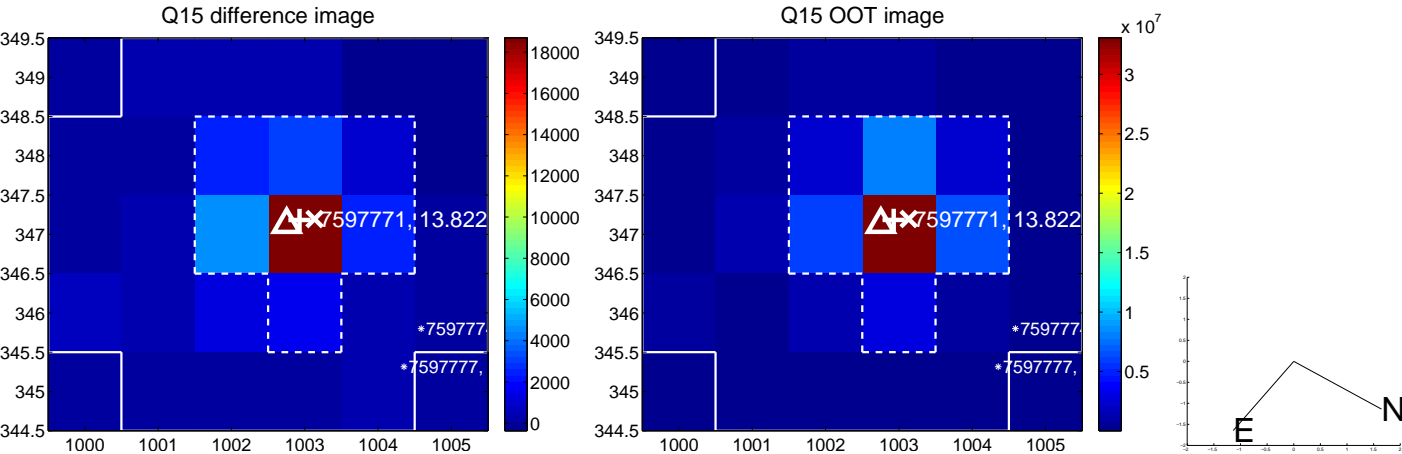
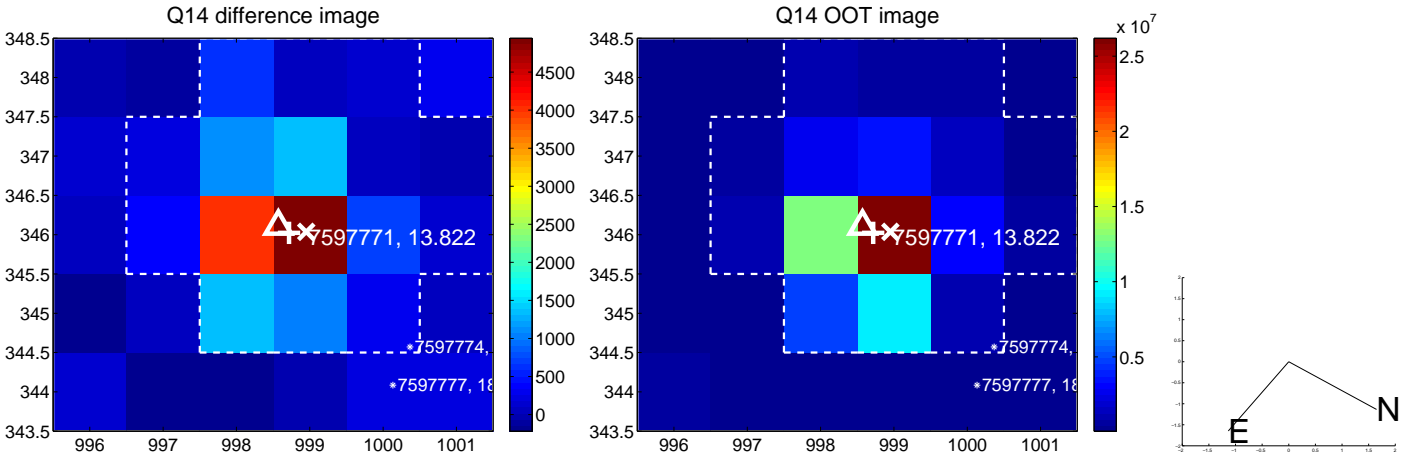
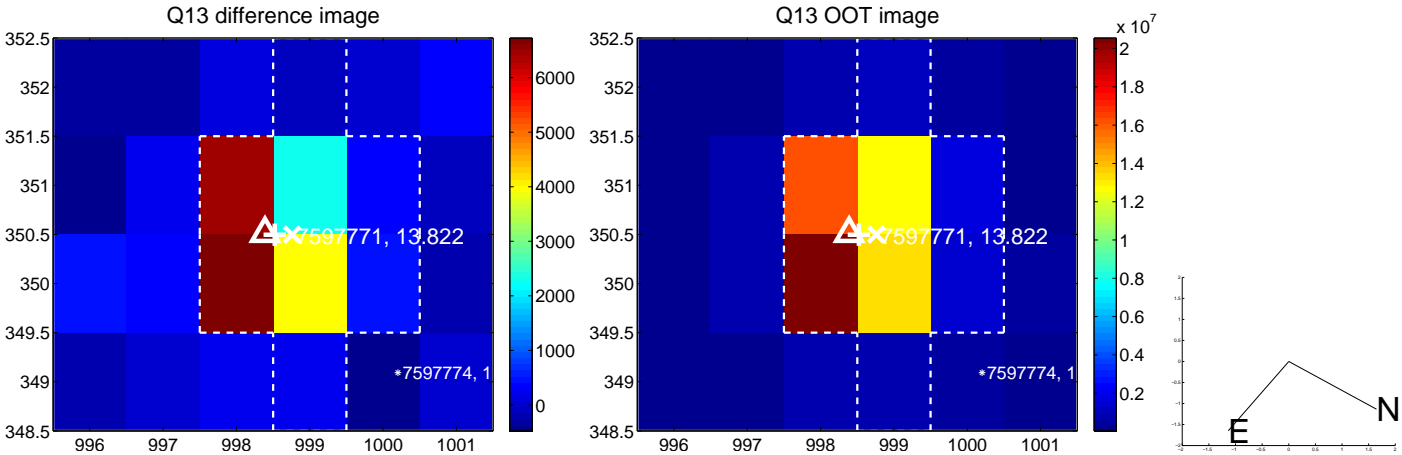




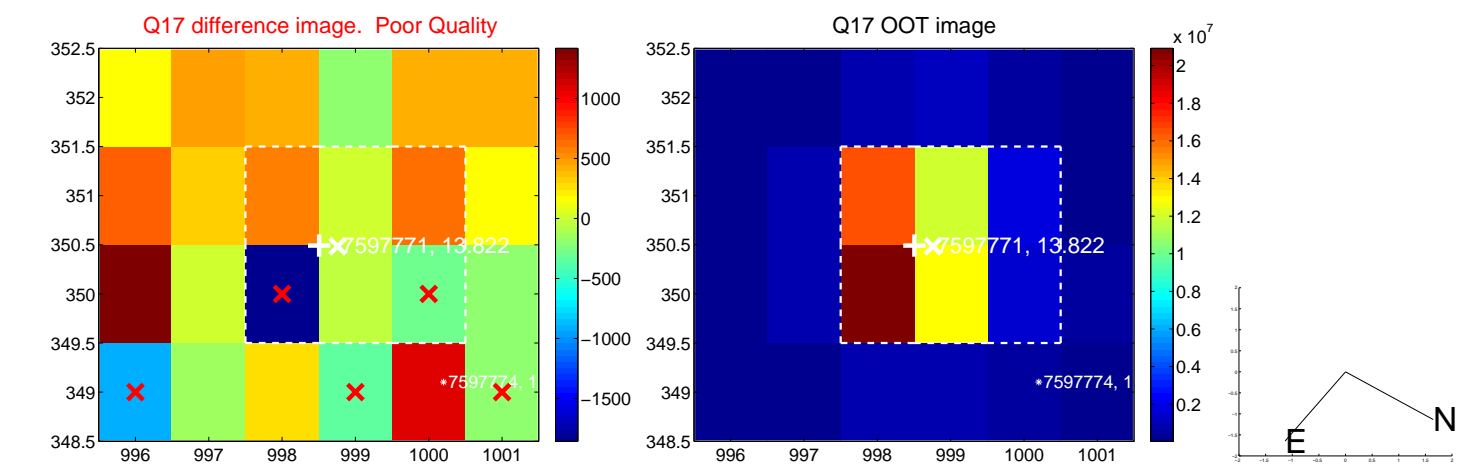
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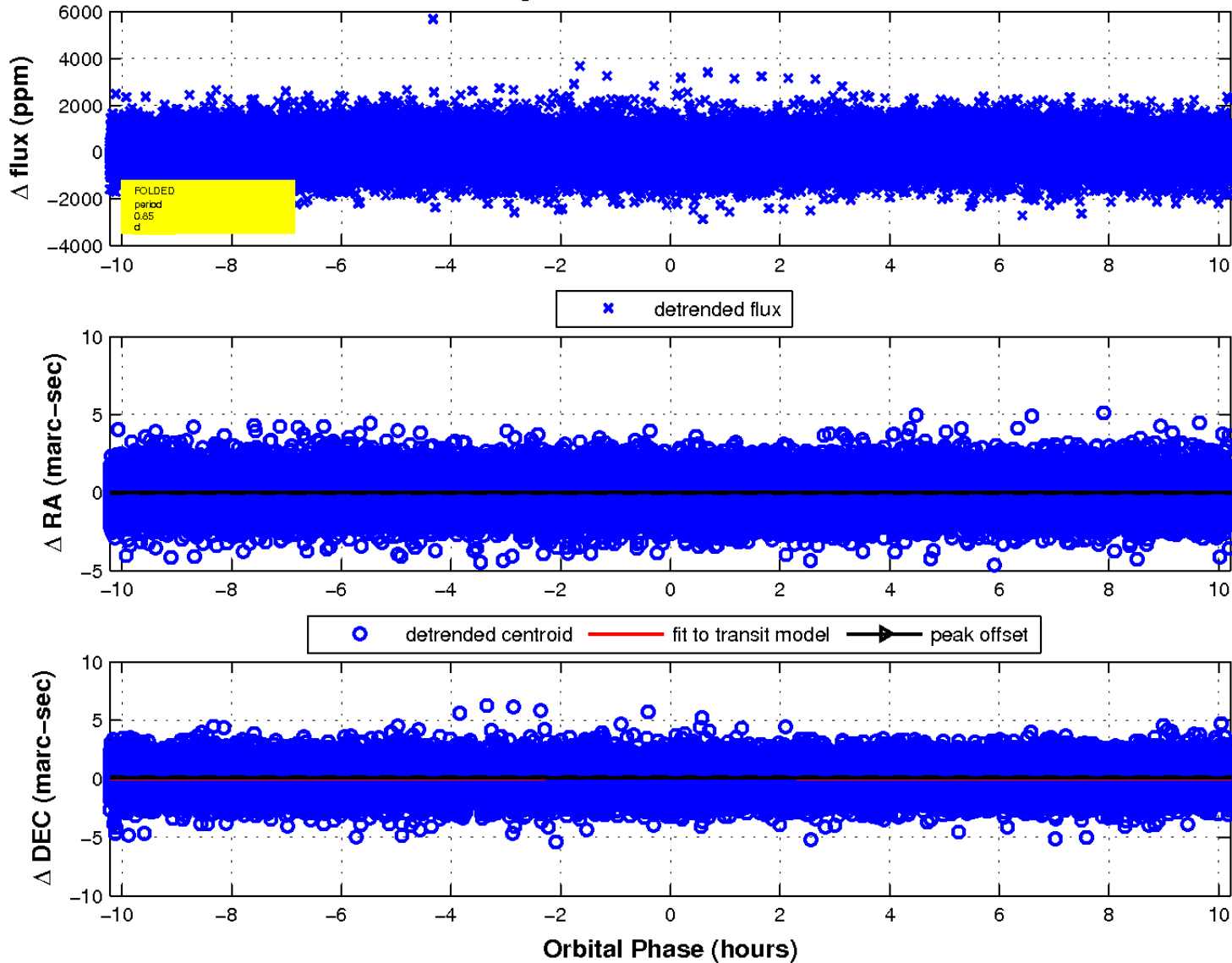
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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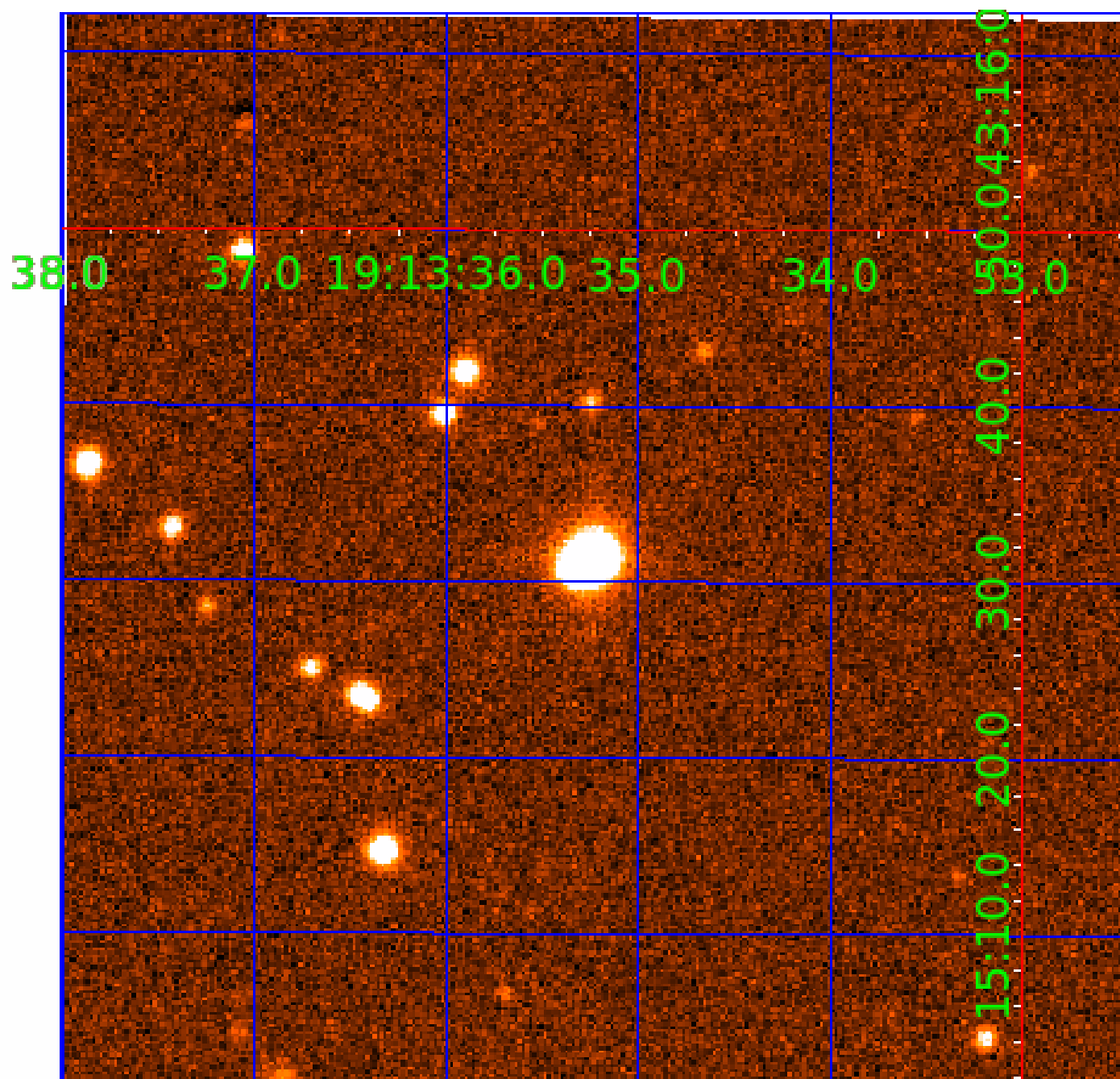


fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



# KIC 007597771

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
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007597771-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007597771-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST

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

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

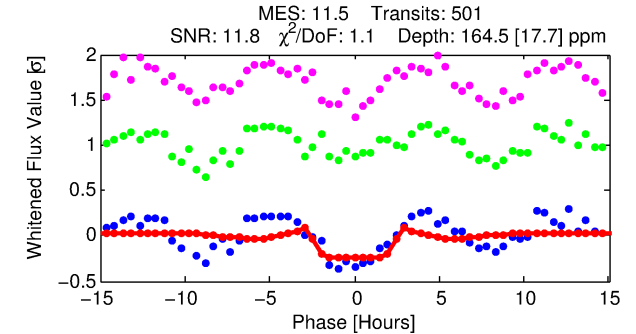
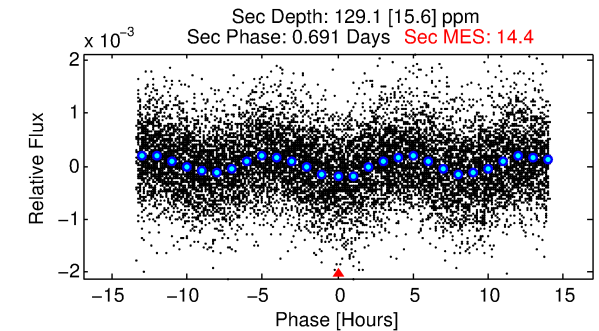
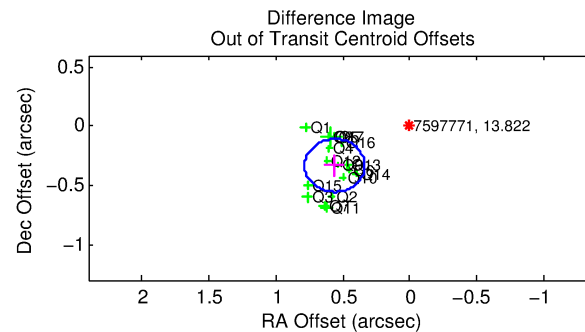
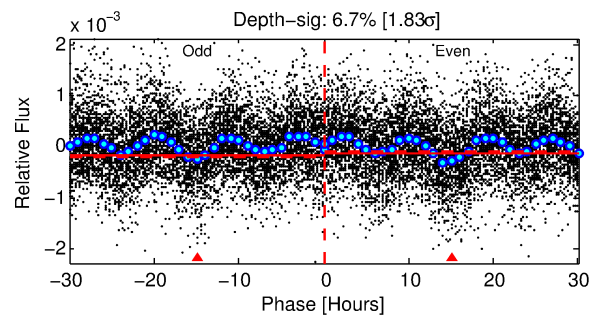
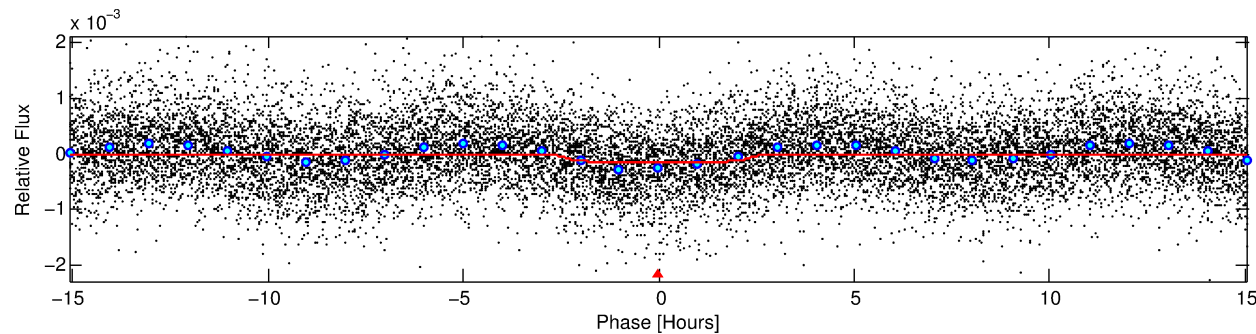
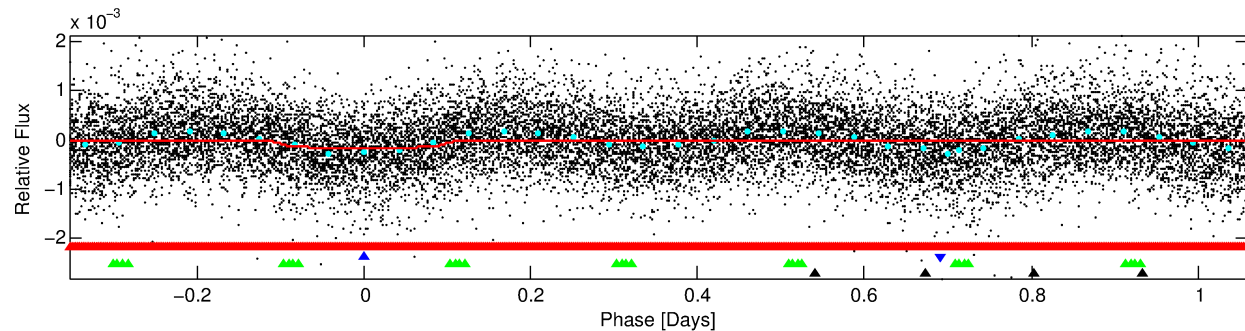
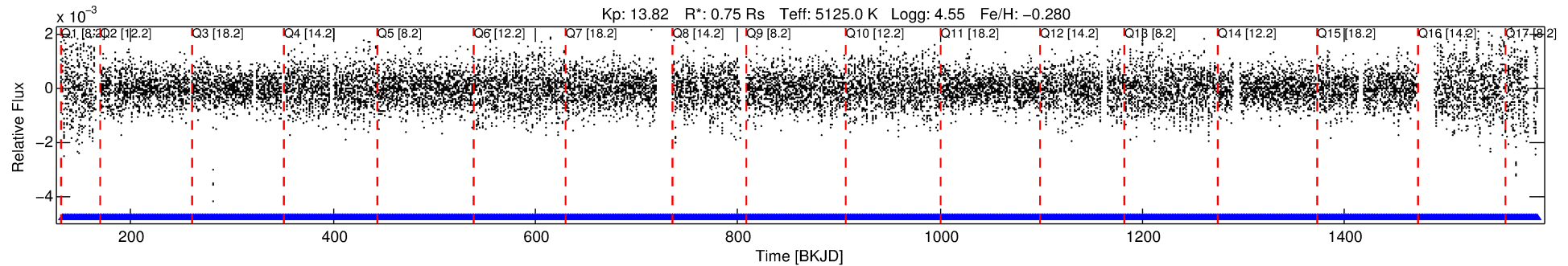
Ephemeris Match Information For 007597771-02

No Significant Match Found



# DV One-Page Summary

KIC: 7597771 Candidate: 2 of 4 Period: 1.413 d



## DV Fit Results:

Period = 1.41319 [0.00001] d  
Epoch = 132.8288 [0.0038] BKJD  
Rp/R\* = 0.0115 [0.0154]  
a/R\* = 2.22 [8.75]  
b = 0.18 [26.33]  
Seff = 704.70 [134.60]  
Teq = 1314 [63] K  
Rp = 0.94 [1.26] Re  
a = 0.0222 [0.0020] AU  
Ag = 39.52 [106.04] [0.36 $\sigma$ ]  
Teffp = 5093 [3417] K [1.11 $\sigma$ ]

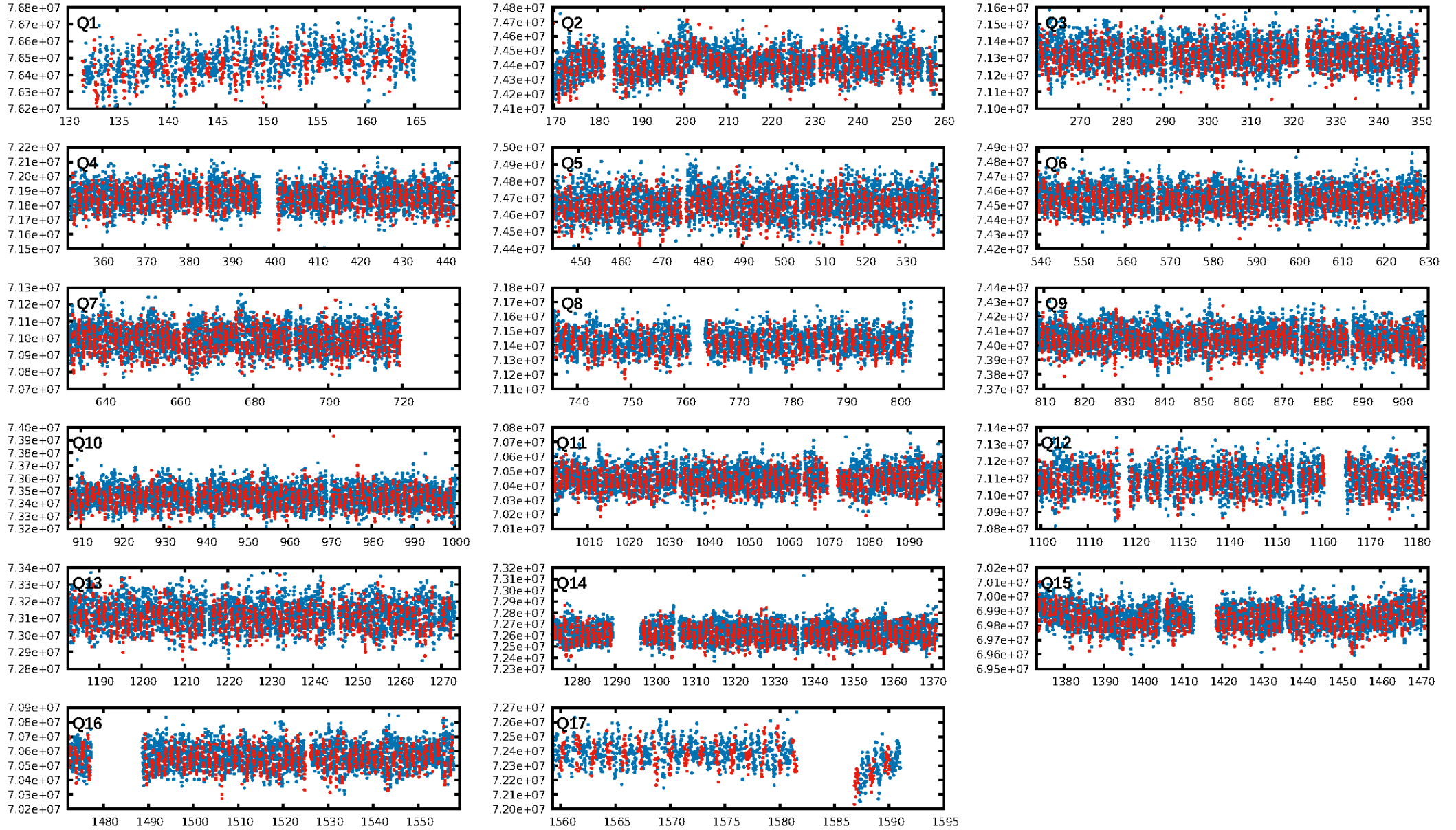
## DV Diagnostic Results:

ShortPeriod-sig: 94.9% [1.95 $\sigma$ ]  
LongPeriod-sig: 100.0% [166.02 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.11e-21  
RollingBand-fgt: 1.00 [476/476]  
**GhostDiagnostic-chr: 0.7257**  
Centroid-sig: 0.0%  
Centroid-so: 1.314 arcsec [5.96 $\sigma$ ]  
OotOffset-rm: 0.652 arcsec [8.71 $\sigma$ ]  
KicOffset-rm: 1.529 arcsec [20.76 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

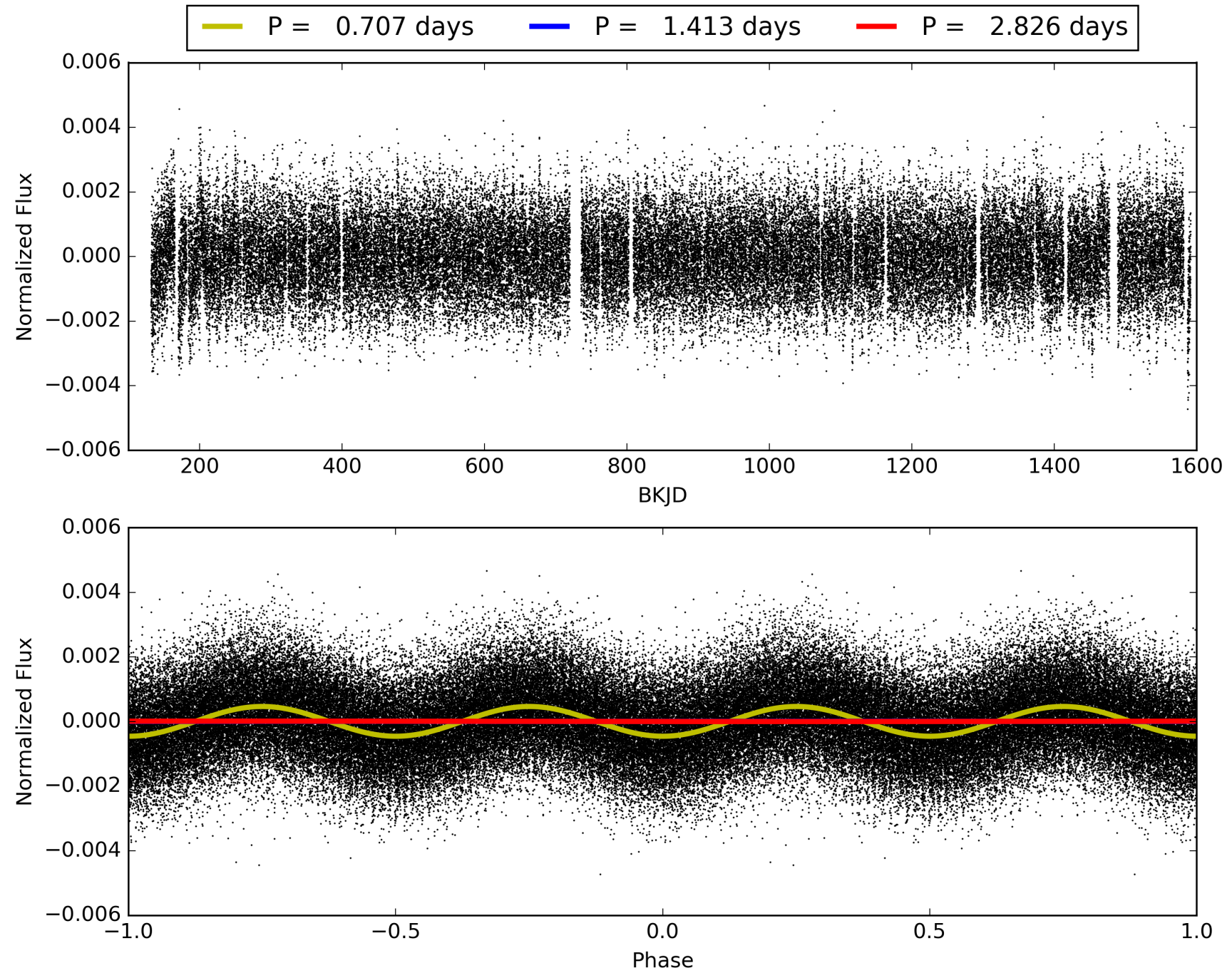
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:47:46 Z

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

# TCE 007597771-02, PDC Light Curves



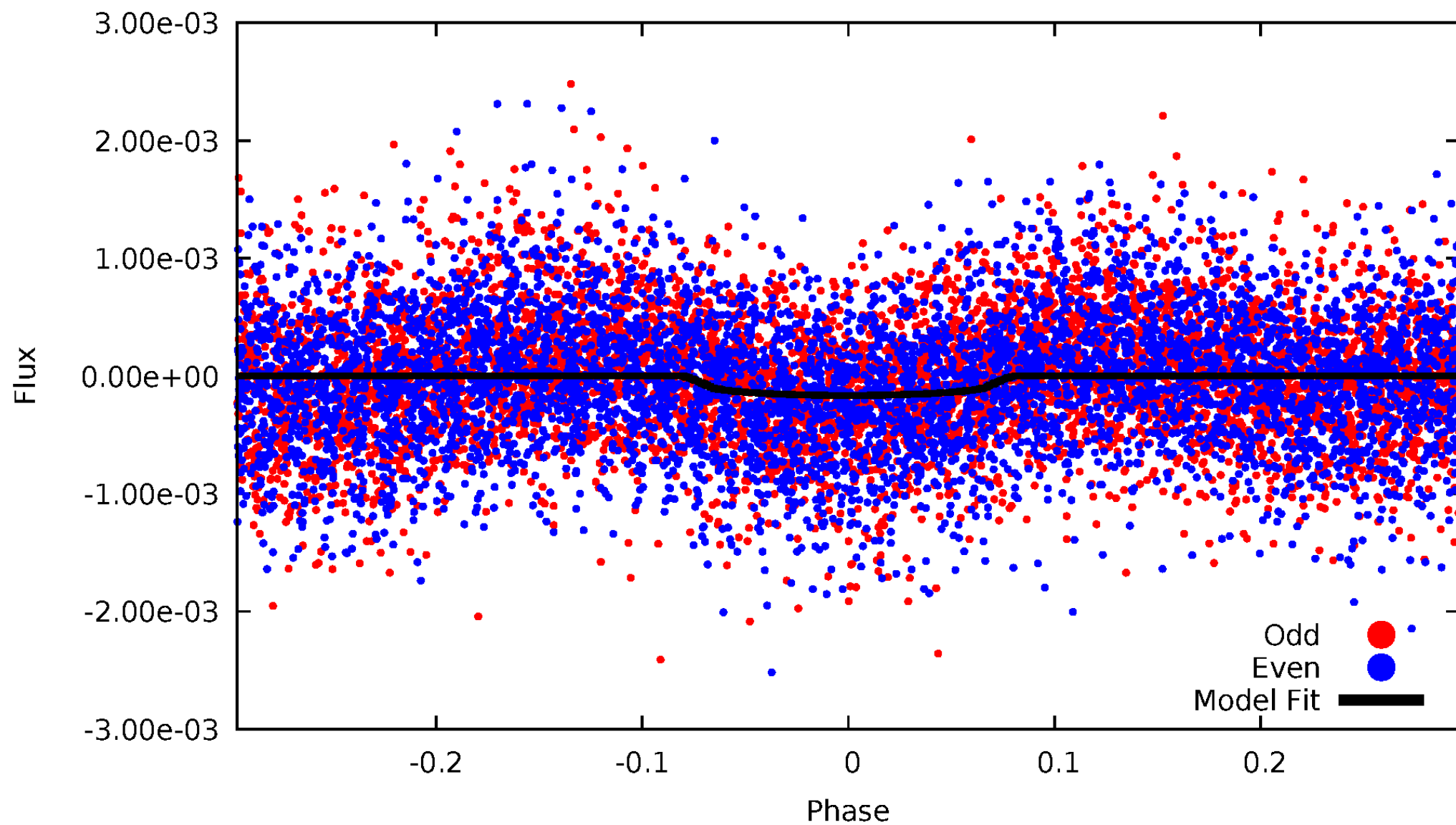
TCE 007597771-02





DV Odd/Even

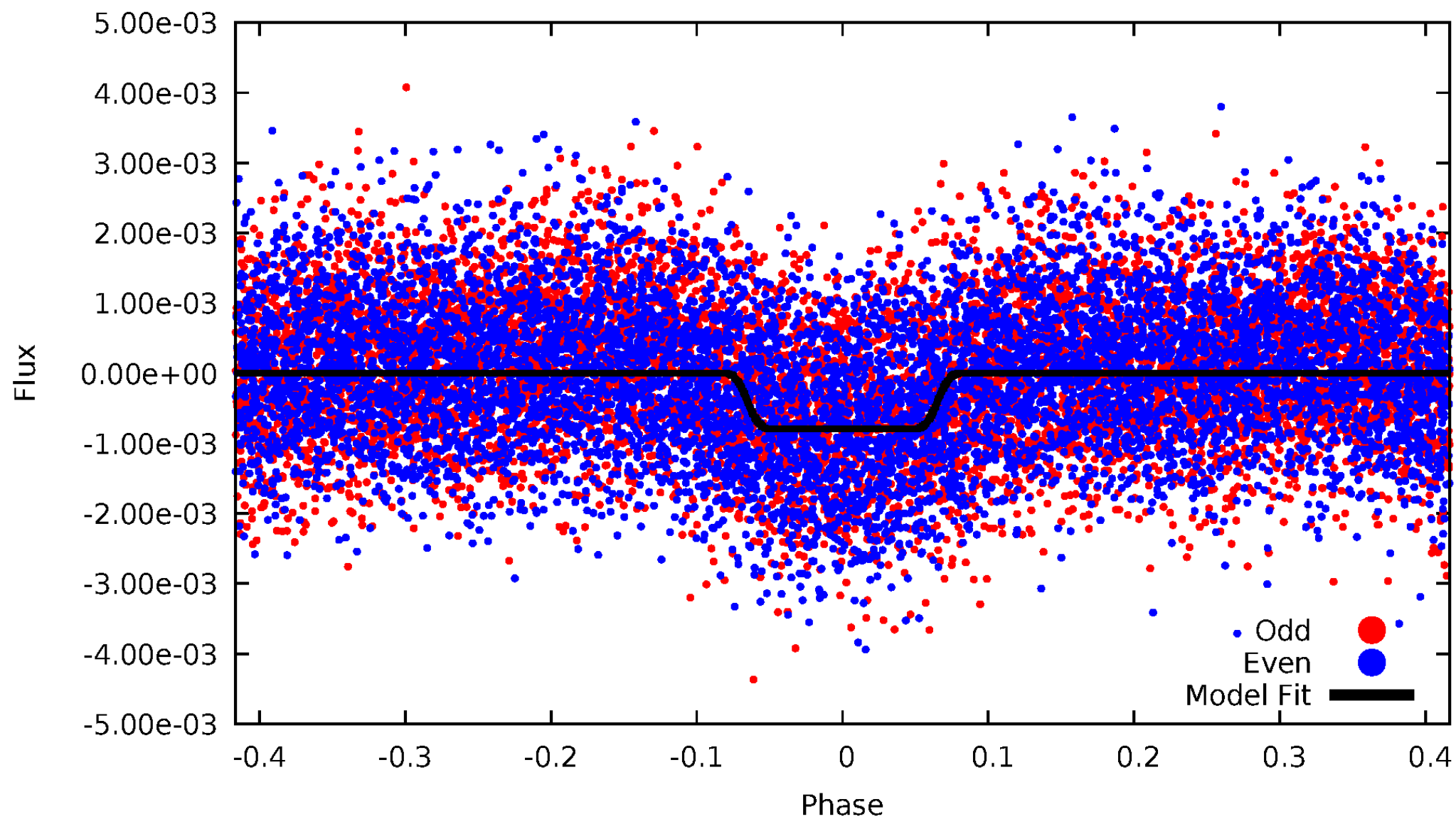
TCE 007597771-02





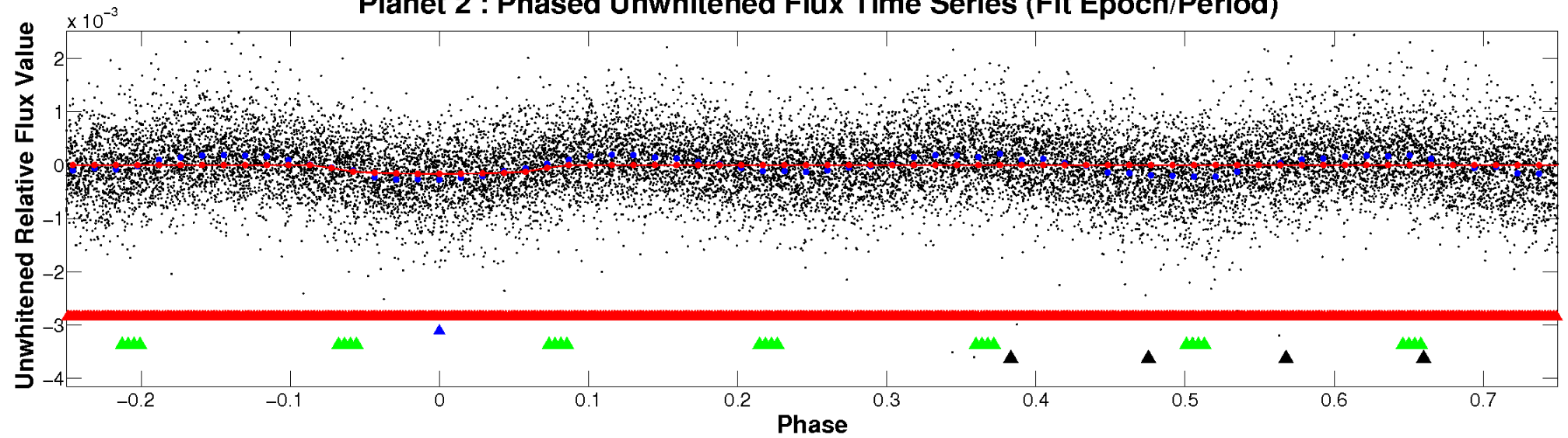
# ALT Odd/Even

TCE 007597771-02

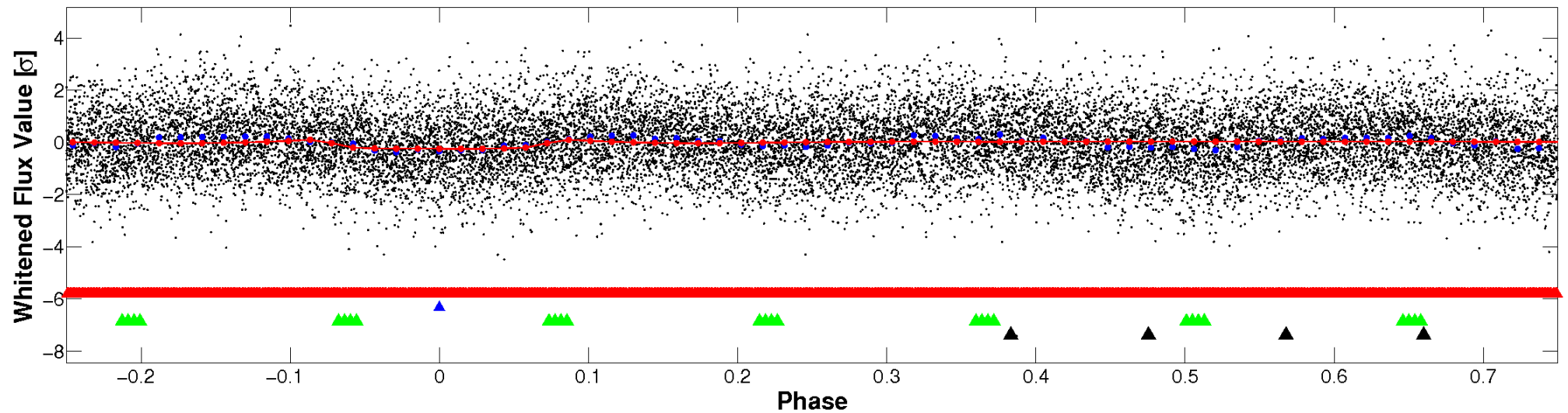


# Non-Whitened Vs. Whitened Light Curve

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

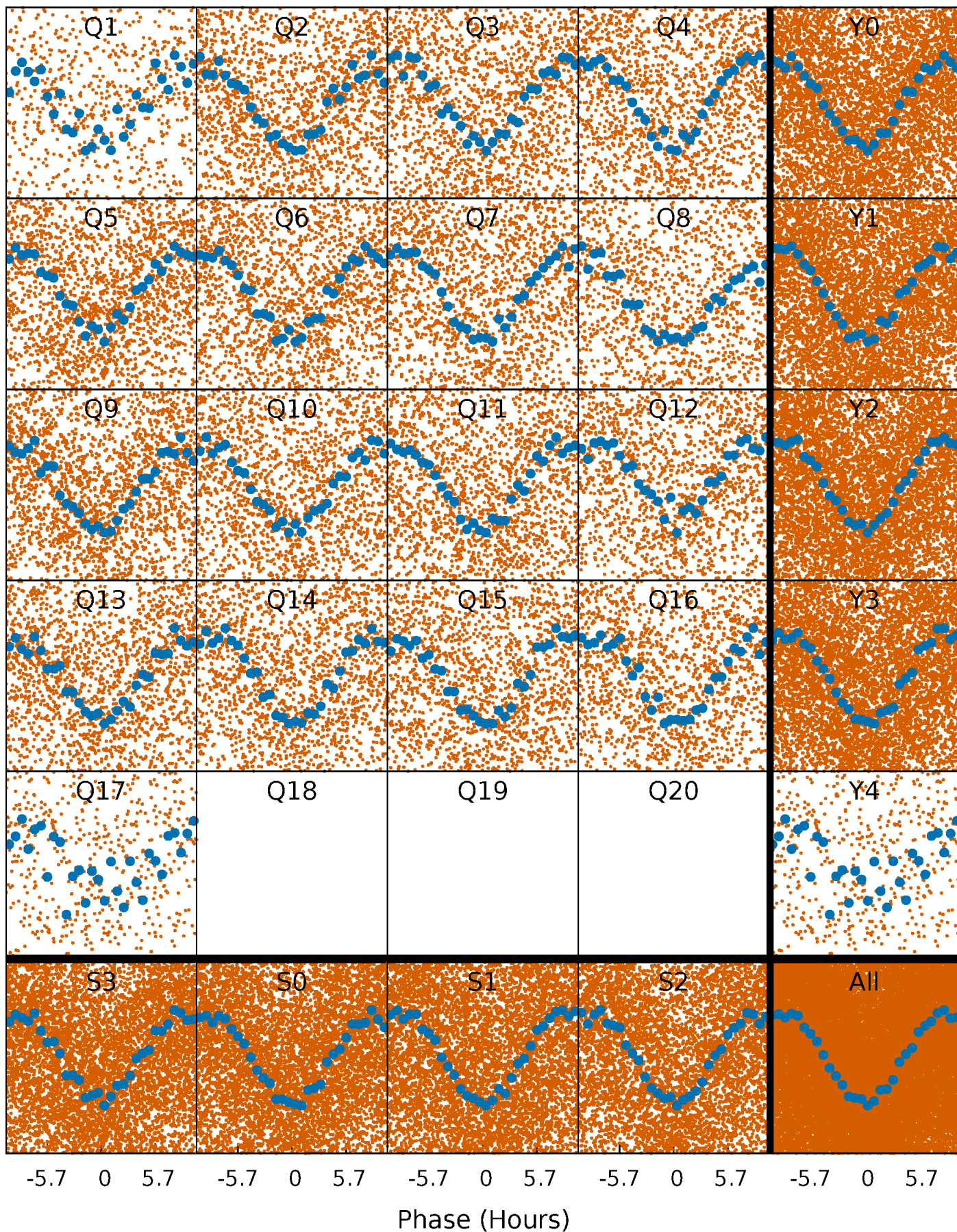


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

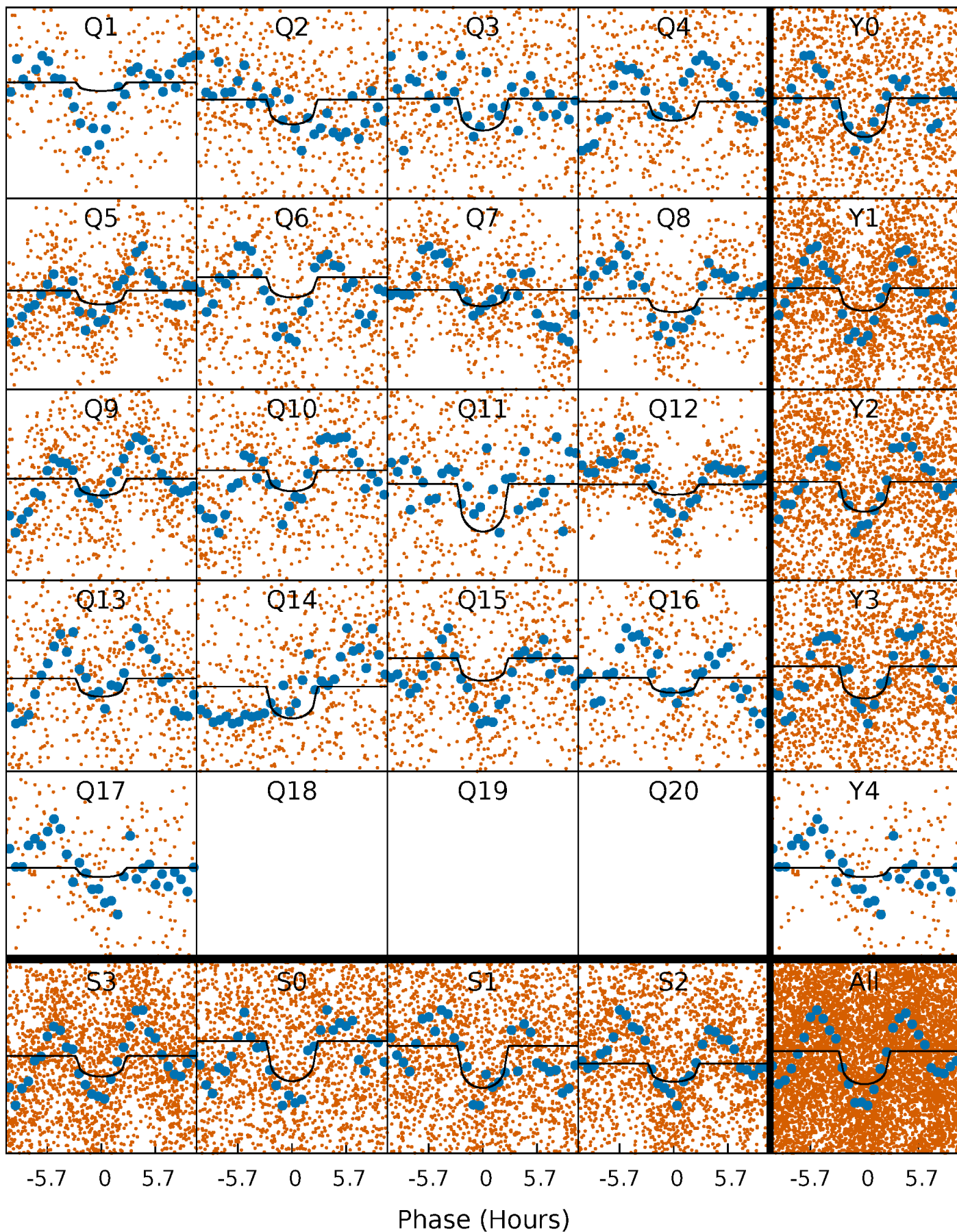
TCE 007597771-02 P= 1.413187 Days  $T_0=132.828815$  (BKJD)





# DV Quarter-Phased Transit Curves

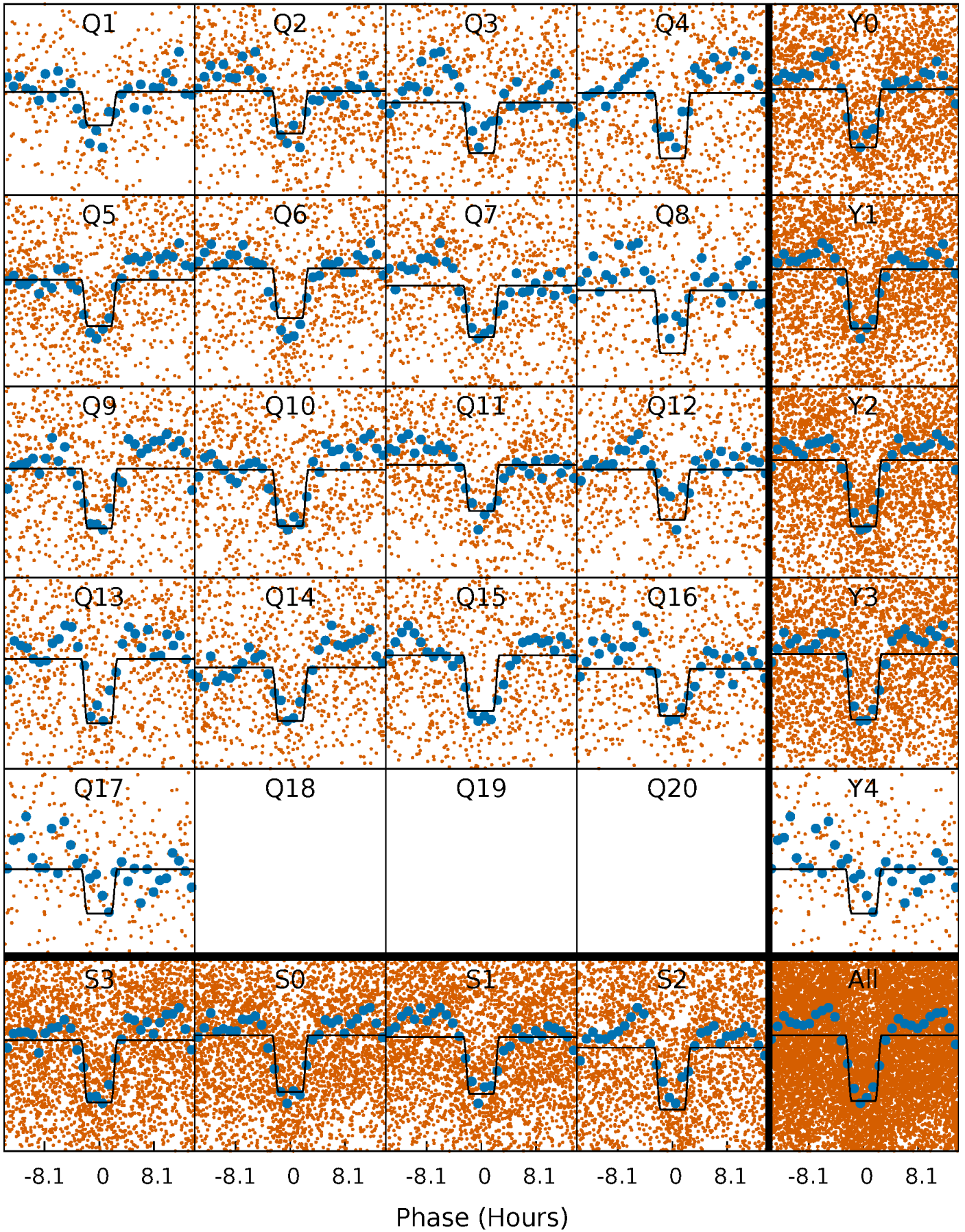
TCE 007597771-02 P= 1.413187 Days  $T_0=132.828815$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

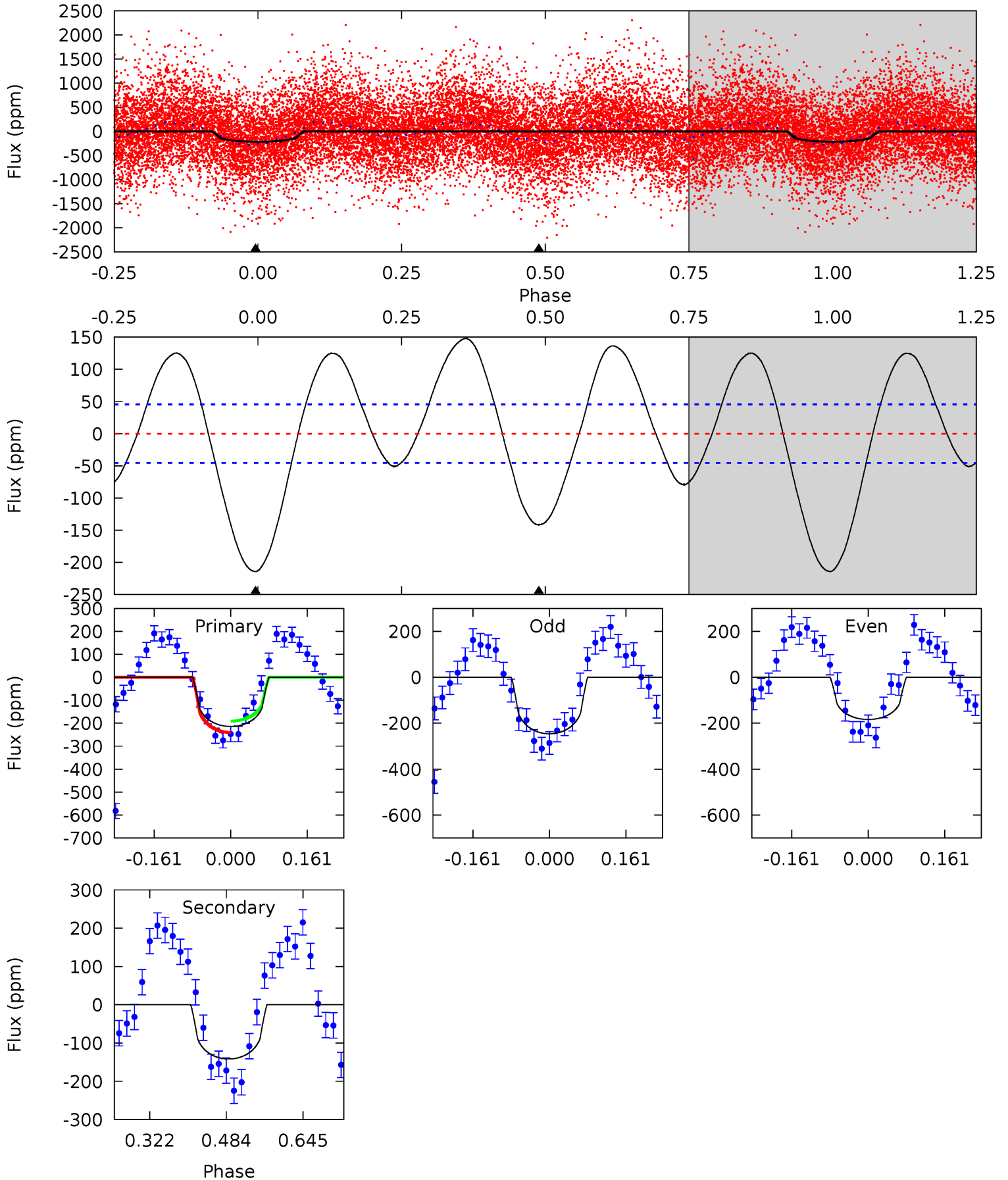
TCE 007597771-02 P= 1.413205 Days  $T_0=132.814248$  (BKJD)



# DV Model-Shift Uniqueness Test

007597771-02, P = 1.413187 Days, E = 131.415628 Days

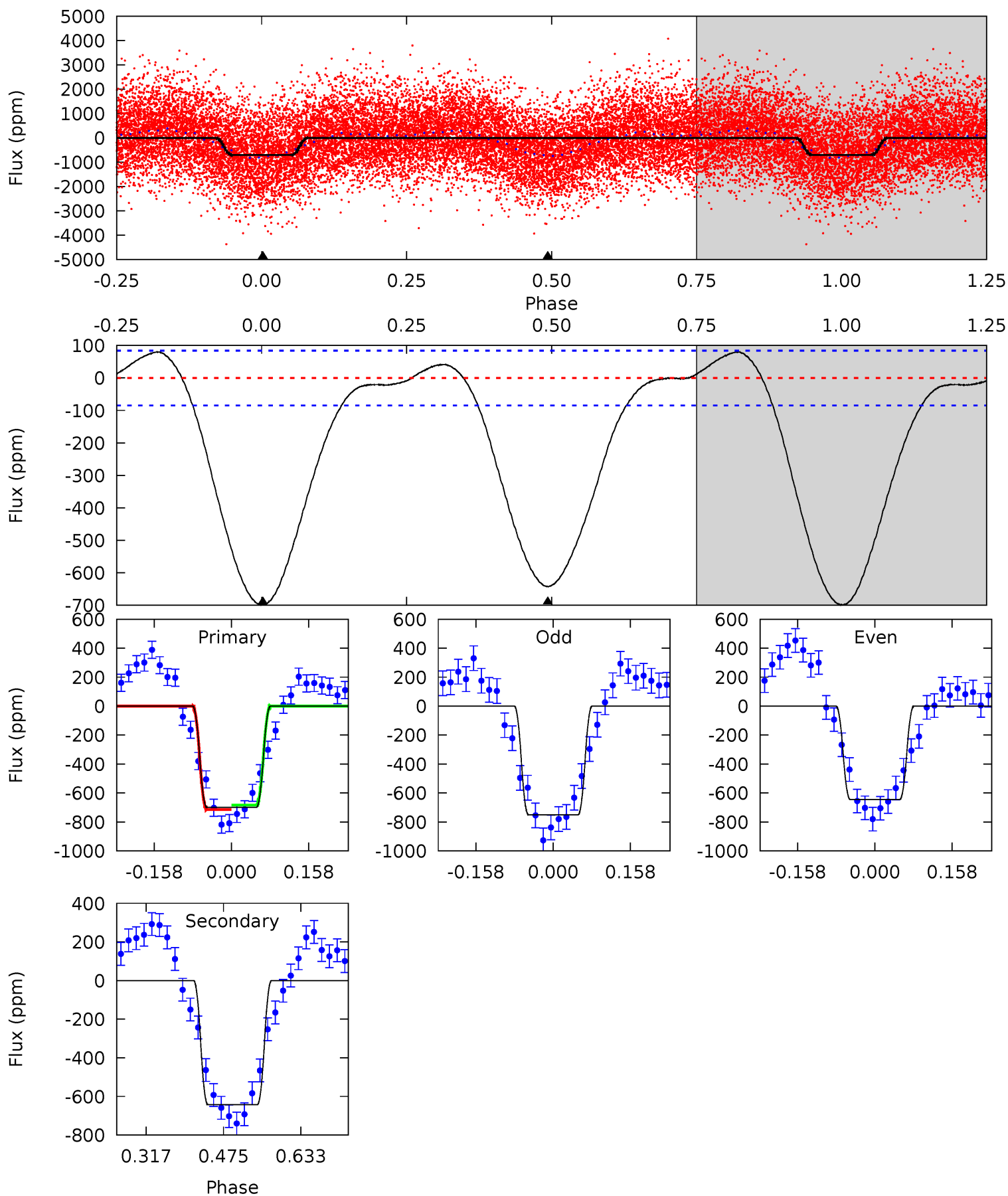
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.0	13.9	0	0	4.46	1.40	5.47	21.0	21.0	13.9	13.9	3.07	1.09	0.41	2.43



# Alt Model-Shift Uniqueness Test

007597771-02, P = 1.413205 Days, E = 131.401043 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
37.0	34.0	0	0	4.47	1.41	1.74	37.0	37.0	34.0	34.0	2.81	0.96	0.10	0.82



### Stellar Parameters For KIC 007597771

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5125^{+179}_{-179}$	$4.551^{+0.071}_{-0.058}$	$-0.280^{+0.300}_{-0.300}$	$0.748^{+0.080}_{-0.080}$	$0.727^{+0.098}_{-0.057}$	$2.447^{+0.785}_{-0.498}$
	+3%/-3%	+2%/-1%	+107%/-107%	+11%/-11%	+13%/-8%	+32%/-20%
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 007597771-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-142 \pm 10$	$1.34^{+1.04}_{-0.84}$	$1836^{+82}_{-74}$	$4519^{+2450}_{-894}$	$21^{+125}_{-15}$
Alt.	$-642 \pm 19$	$2.36^{+1.29}_{-1.16}$	$1834^{+76}_{-75}$	$4825^{+1714}_{-738}$	$31^{+86}_{-18}$

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



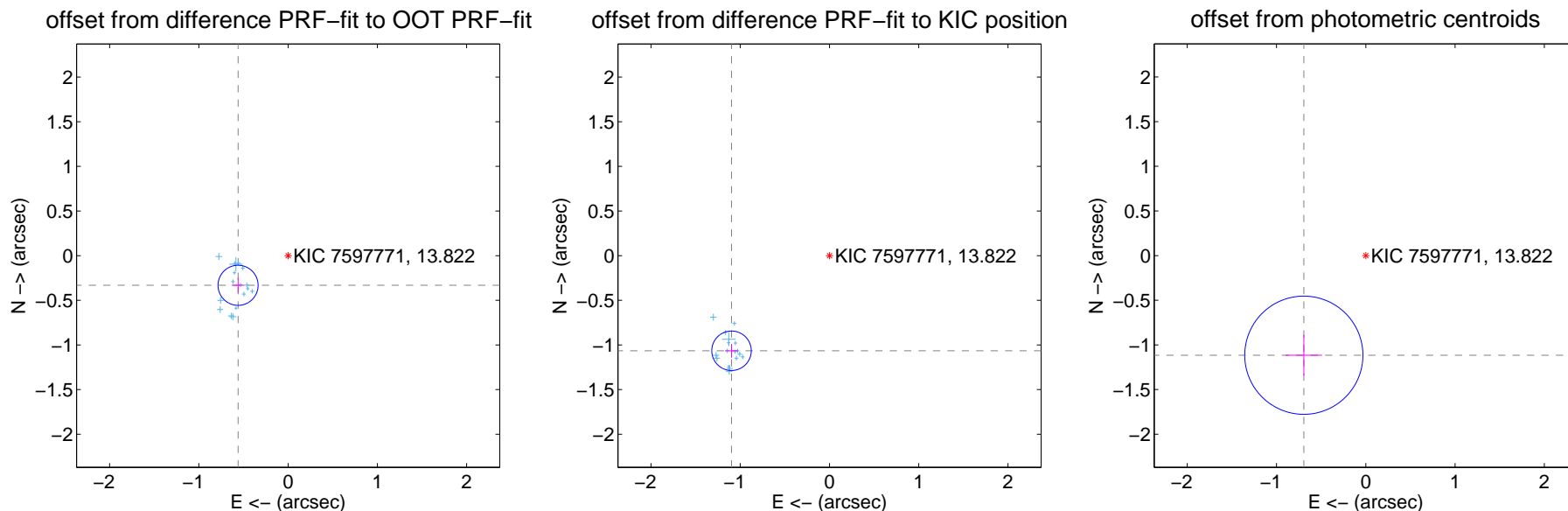
## DV Centroid Data

Supplemental centroid analysis for 007597771-02. Kepler magnitude: 13.82. Transit SNR 11.82

There are 17 quarters with good PRF difference image offsets

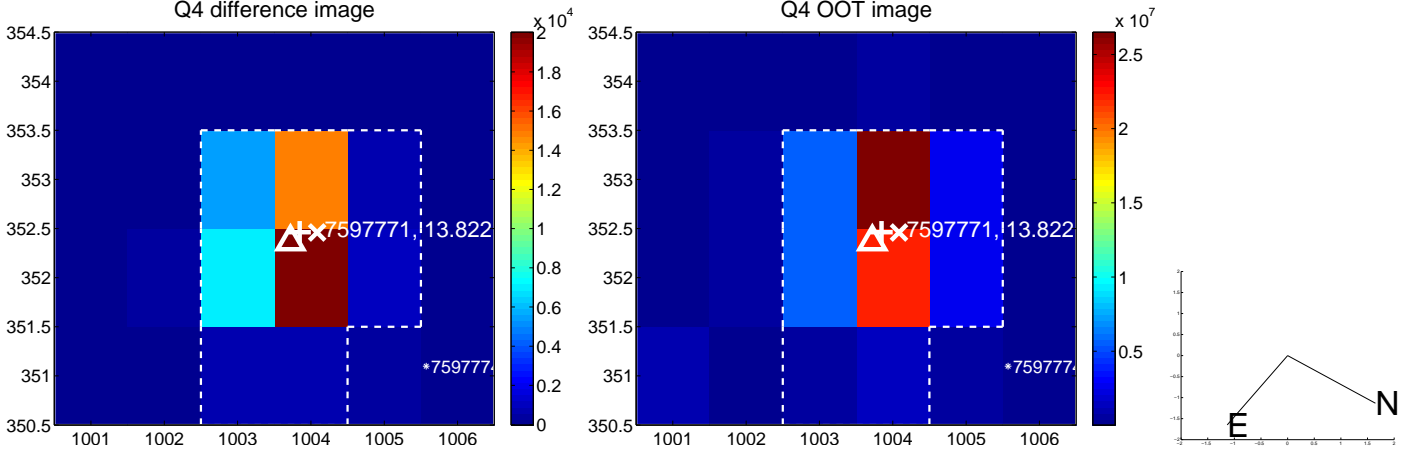
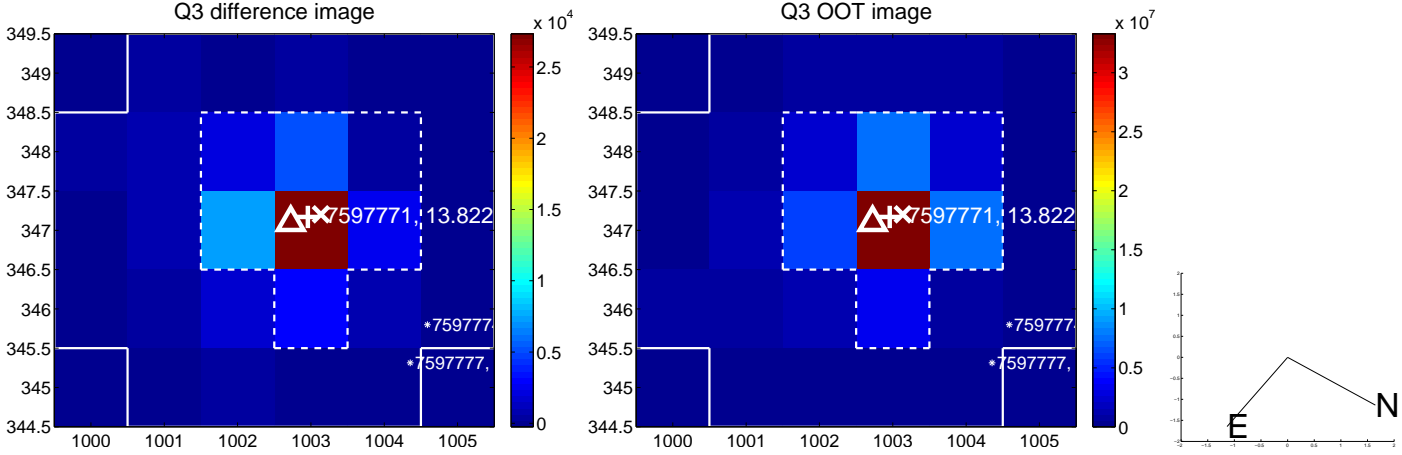
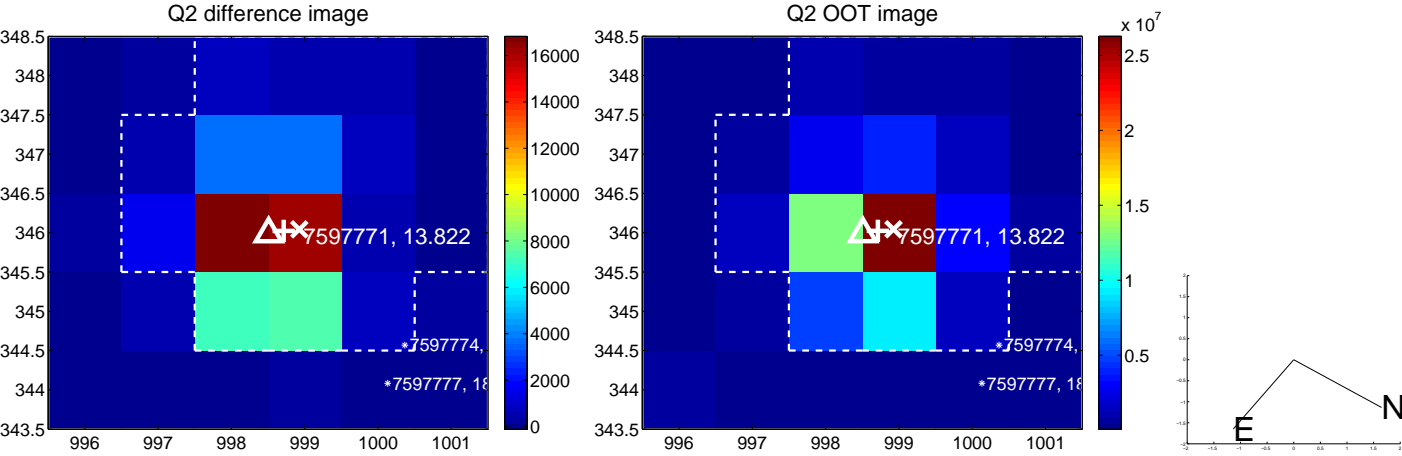
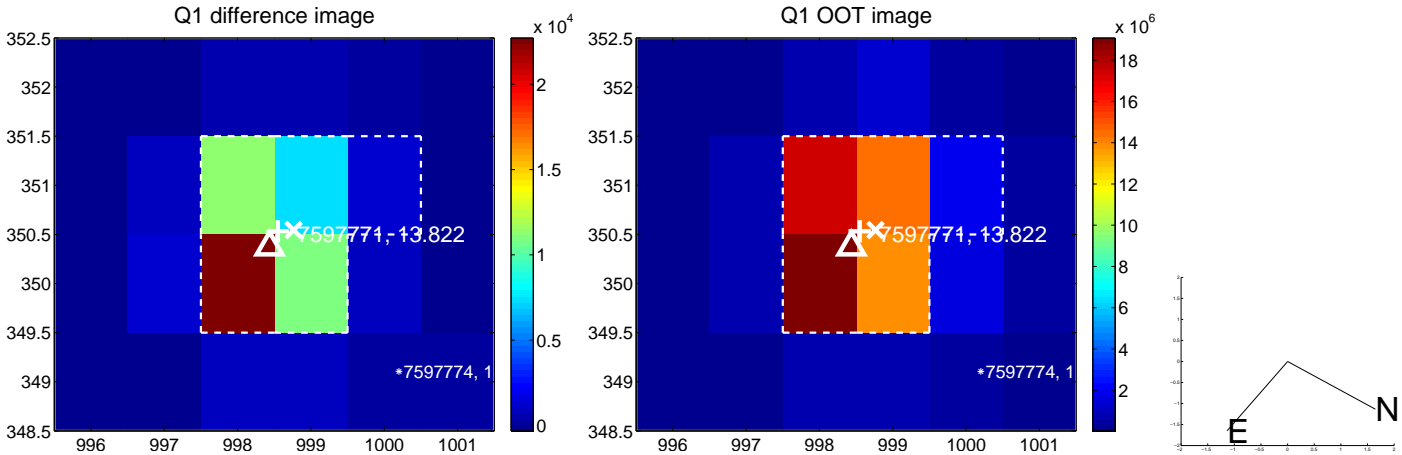
The direct PRF centroid is offset from the target star catalog position by about 1.00 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.652 \pm 0.075$	8.71	$0.561 \pm 0.071$	$-0.332 \pm 0.083$
PRF-fit source offset from KIC position	$1.529 \pm 0.074$	20.76	$1.098 \pm 0.070$	$-1.065 \pm 0.077$
photometric centroid source offset	$1.31 \pm 0.22$	5.96	$0.69 \pm 0.20$	$-1.12 \pm 0.23$



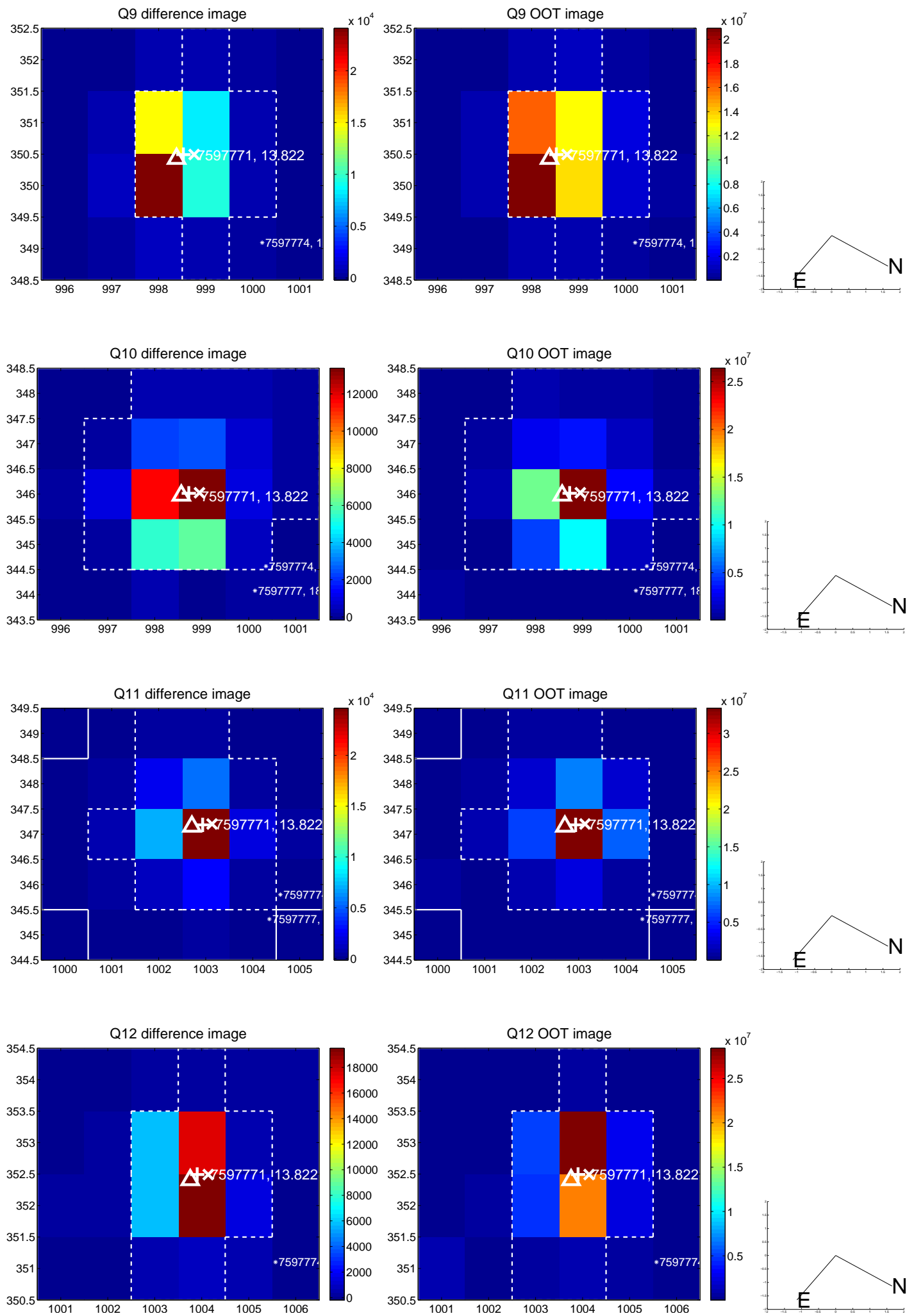
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

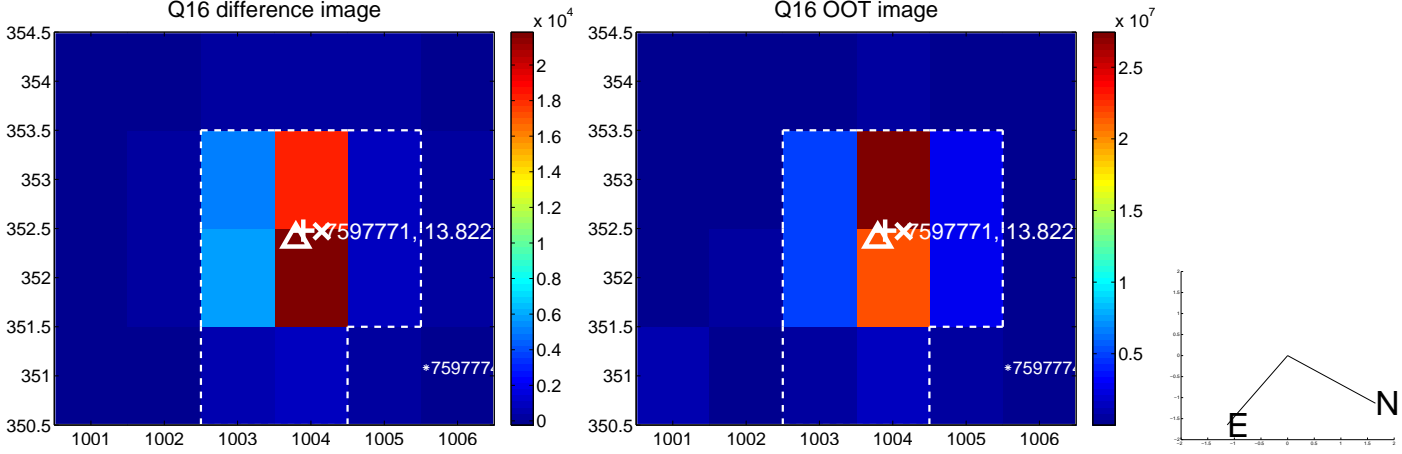
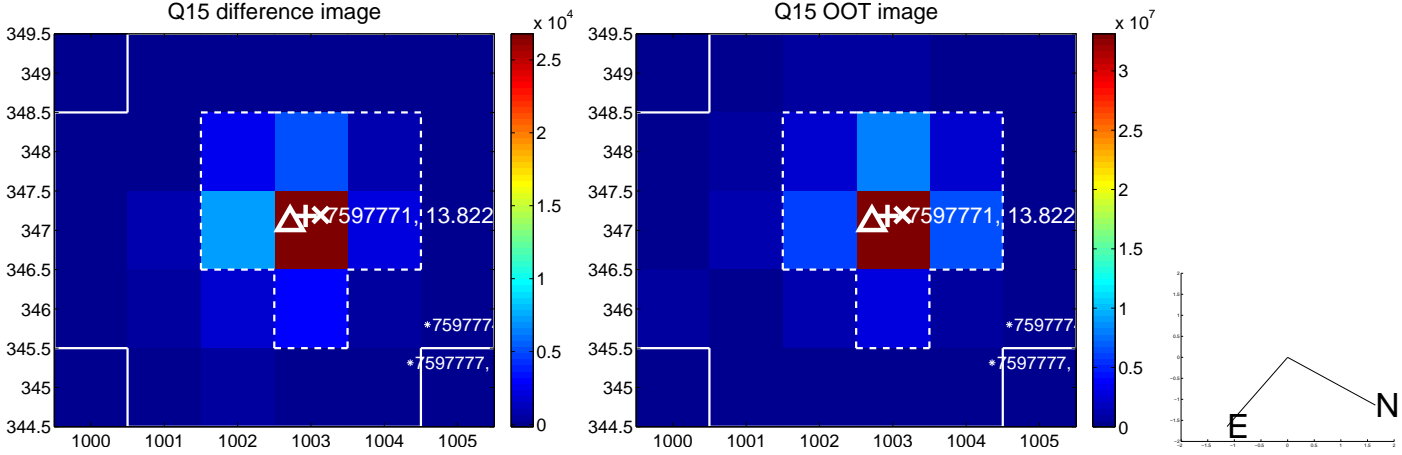
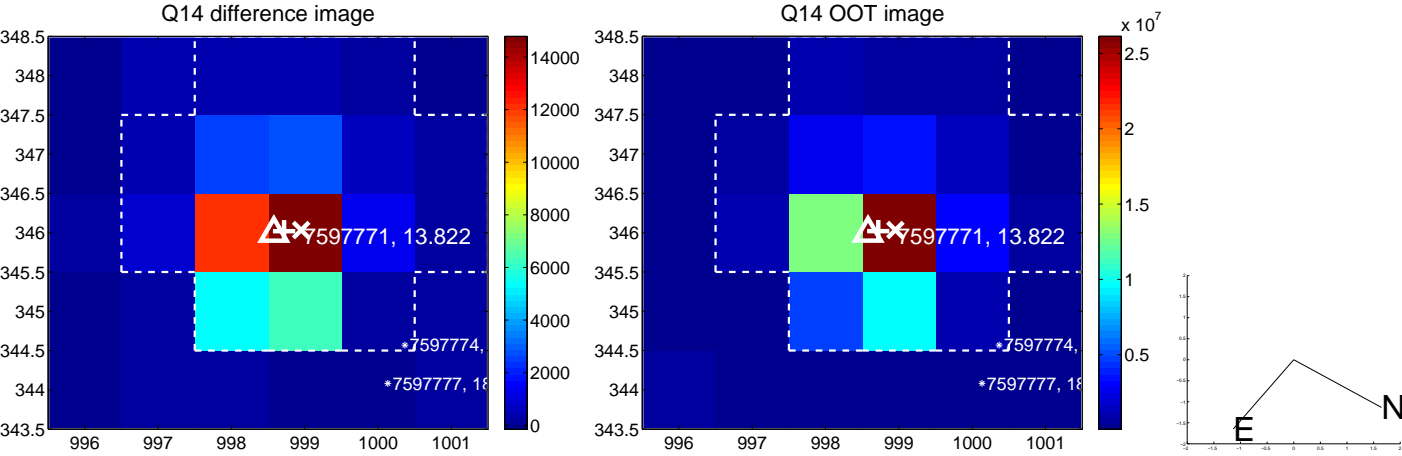
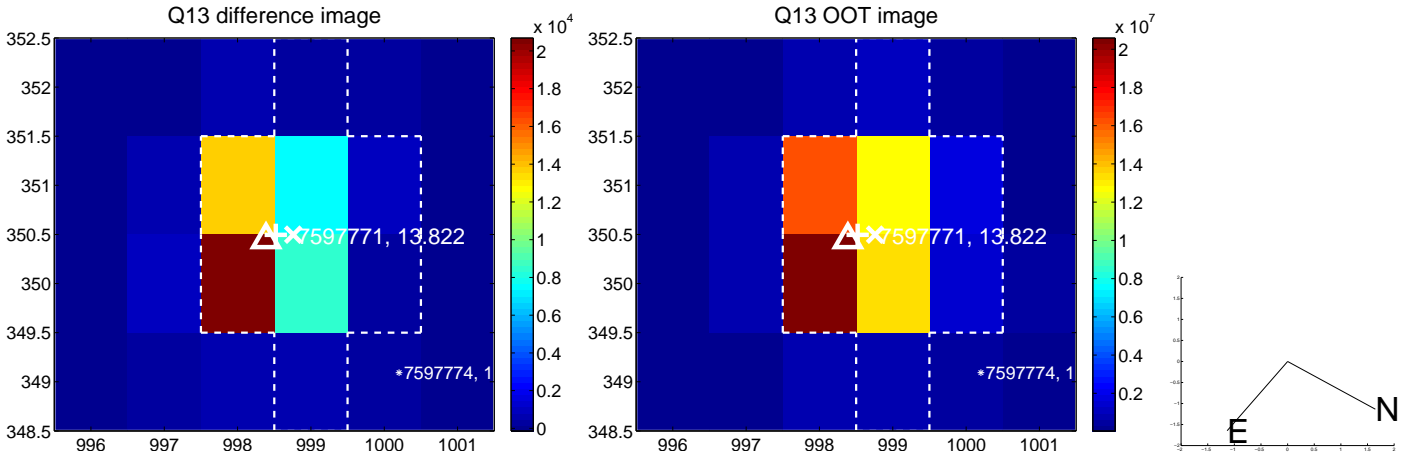




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

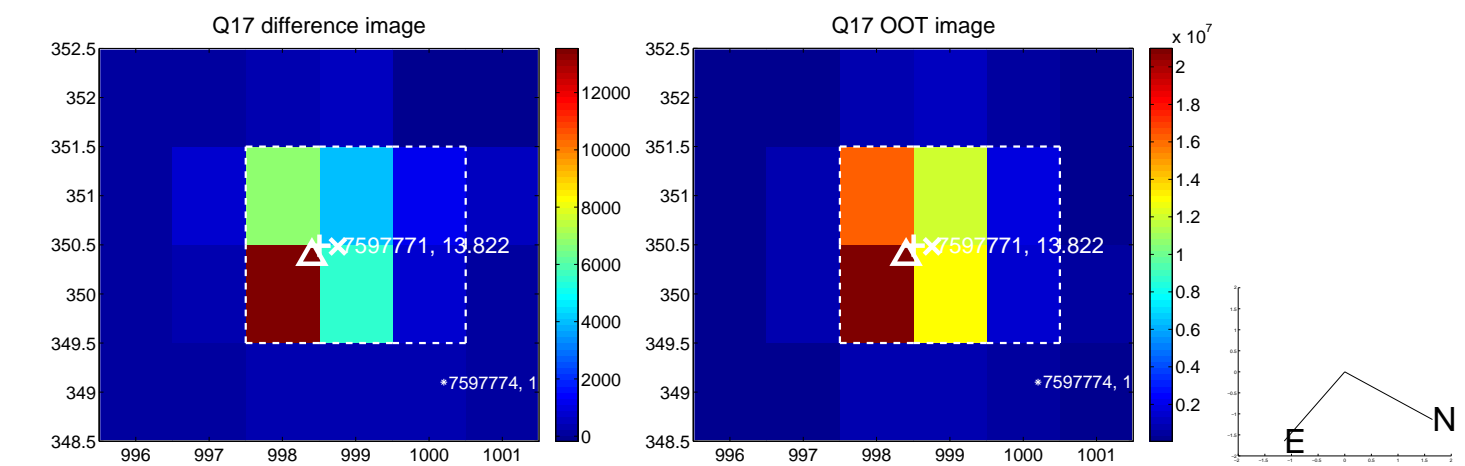


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

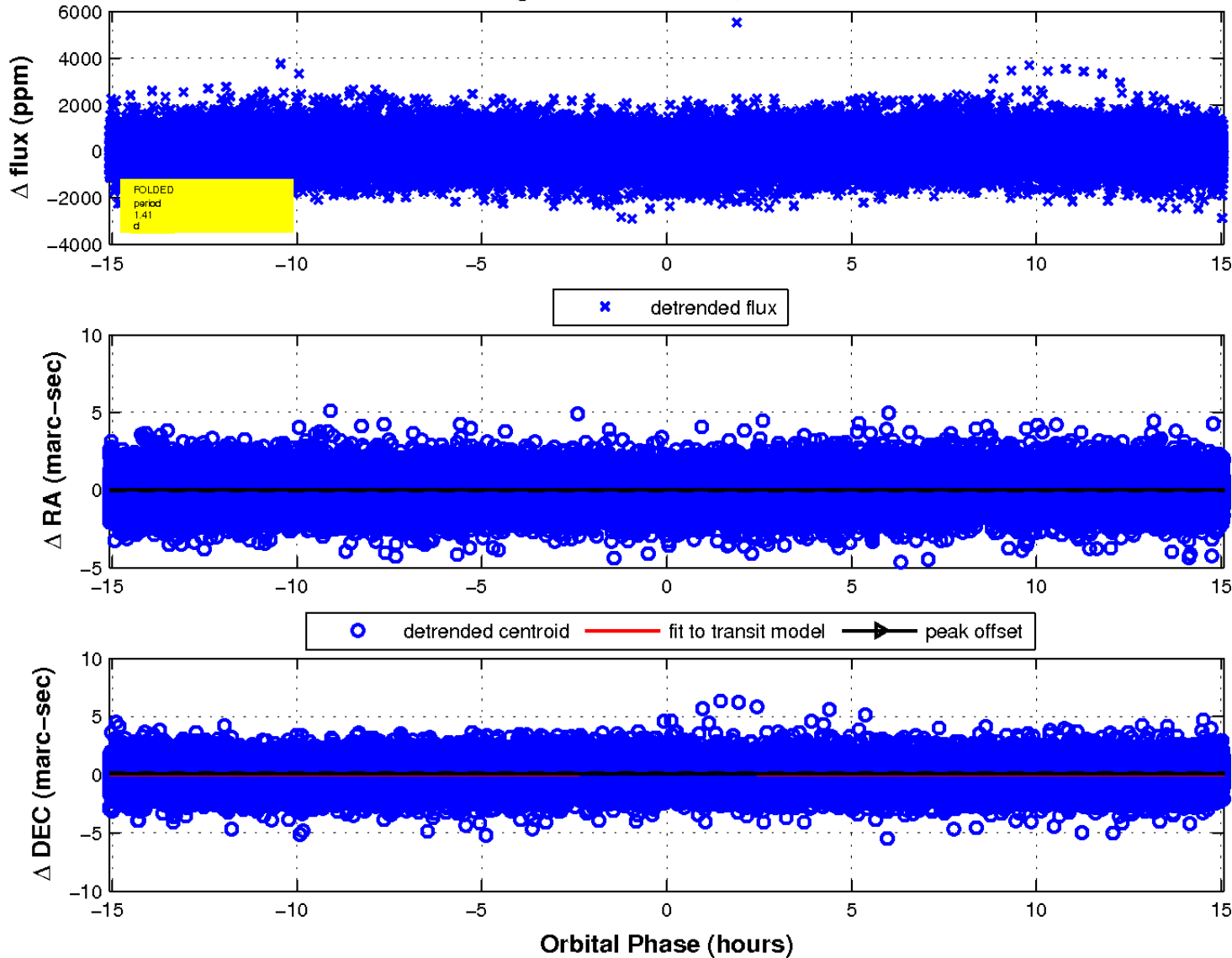




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

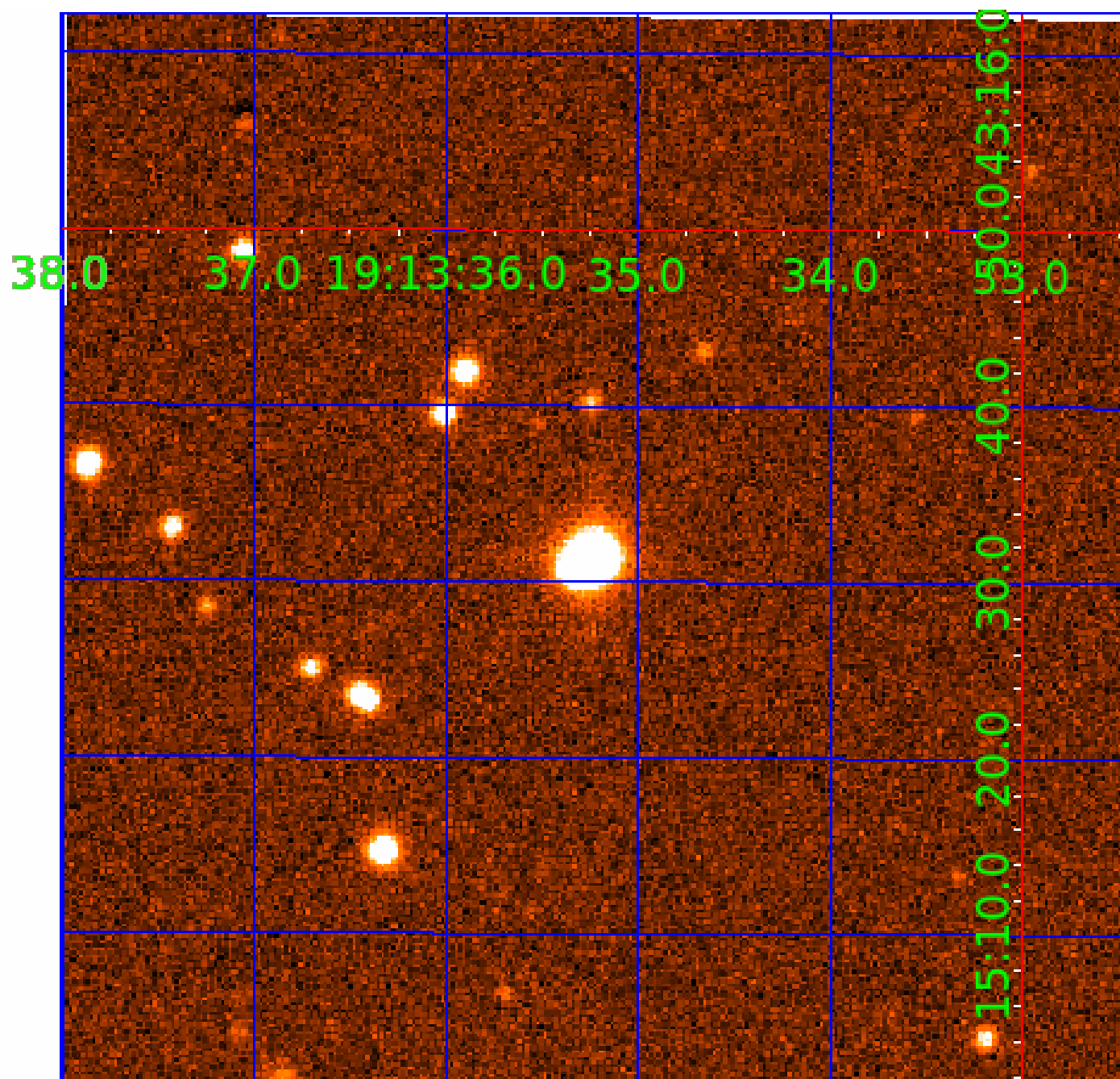


fluxWeightedCentroids, Planet 2 of 4



UKIRT Image

Declination



# KIC 007597771

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007597771-01	OBS	No	0.851709	132.173849	39.3	4.737	7.3	6.9	0.75	5125	0.46	1384.26
007597771-02	OBS	No	1.413187	132.828815	164.5	5.028	11.5	11.8	0.75	5125	0.94	704.70
007597771-03	OBS	No	53.296536	145.468901	1029.4	5.565	9.1	10.3	0.75	5125	2.61	5.57
007597771-04	OBS	No	394.148782	386.722088	1011.8	18.203	8.9	8.2	0.75	5125	2.67	0.39

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007597771-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_KIC_POS
007597771-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—CENT_KIC_POS
007597771-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007597771-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST

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

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

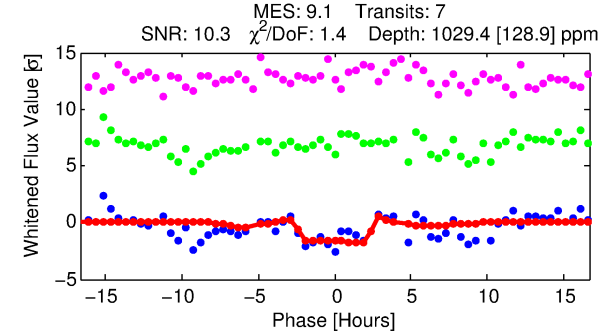
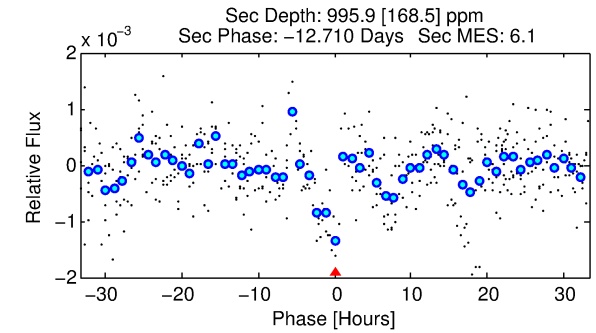
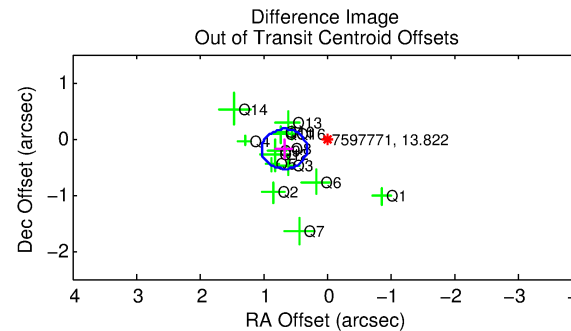
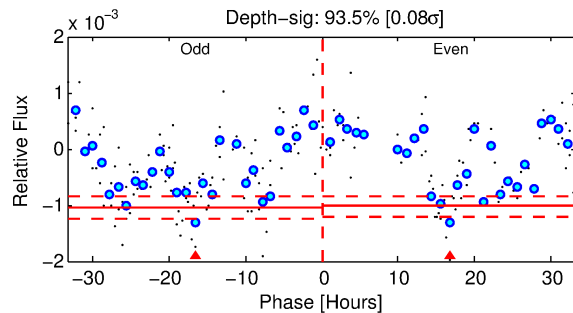
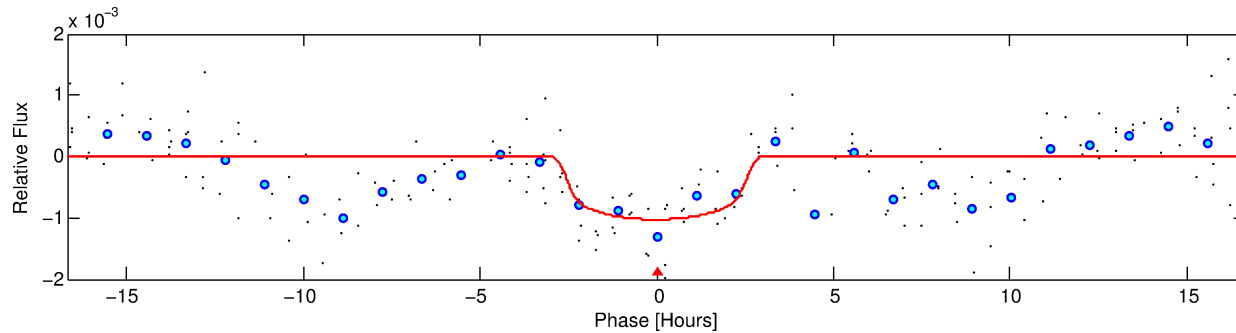
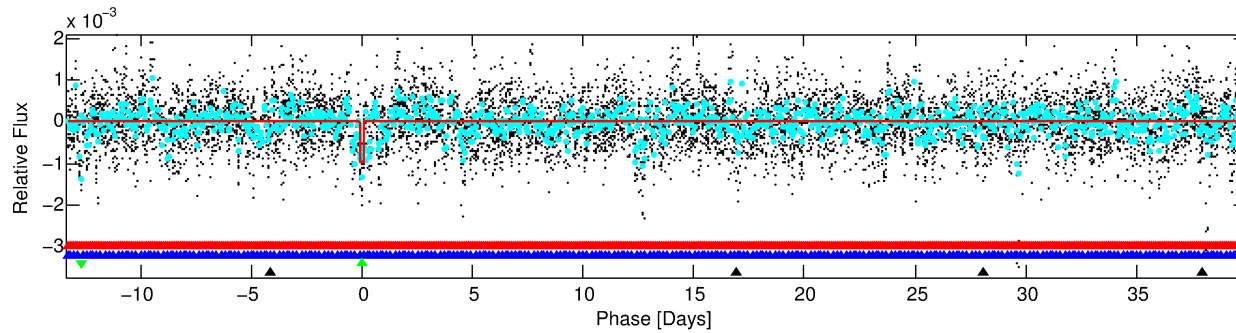
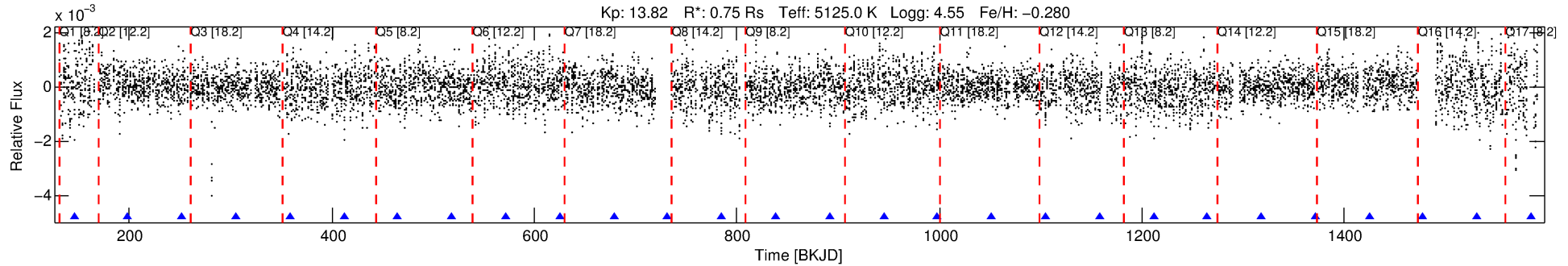
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007597771-03

No Significant Match Found

# DV One-Page Summary

KIC: 7597771 Candidate: 3 of 4 Period: 53.297 d



## DV Fit Results:

Period = 53.29654 [0.00071] d  
Epoch = 145.4689 [0.0119] BKJD  
Rp/R\* = 0.0320 [0.0168]  
a/R\* = 51.84 [100.83]  
b = 0.75 [1.15]  
Seff = 5.57 [1.06]  
Teq = 392 [19] K  
Rp = 2.61 [1.40] Re  
a = 0.2491 [0.0224] AU  
Ag = 4981.62 [5347.89] [0.93σ]  
Teff = 5089 [1367] K [3.44σ]

## DV Diagnostic Results:

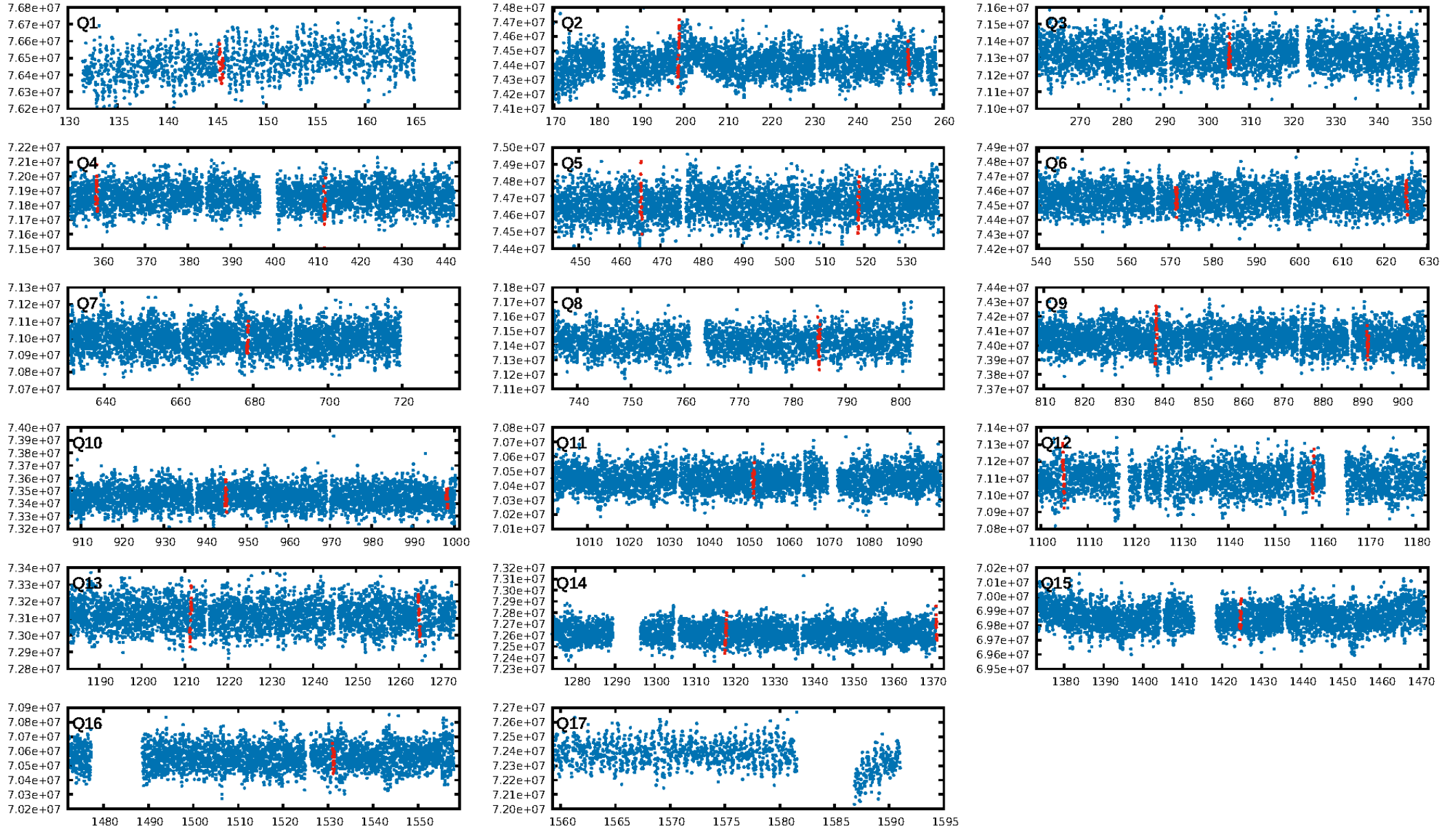
ShortPeriod-sig: 100.0% [166.02σ]  
LongPeriod-sig: 100.0% [429.77σ]  
ModelChiSquare2-sig: 40.8%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.60e-11**  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: -14.81  
Centroid-sig: 19.4%  
Centroid-so: 0.647 arcsec [3.23σ]  
OotOffset-rm: 0.691 arcsec [5.85σ]  
KicOffset-rm: 1.533 arcsec [14.45σ]  
OotOffset-st: 4/3/4/4 [15]  
KicOffset-st: 4/3/4/4 [15]  
DiffImageQuality-fgm: 0.53 [8/15]  
DiffImageOverlap-fno: 0.00 [0/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:47:52 Z

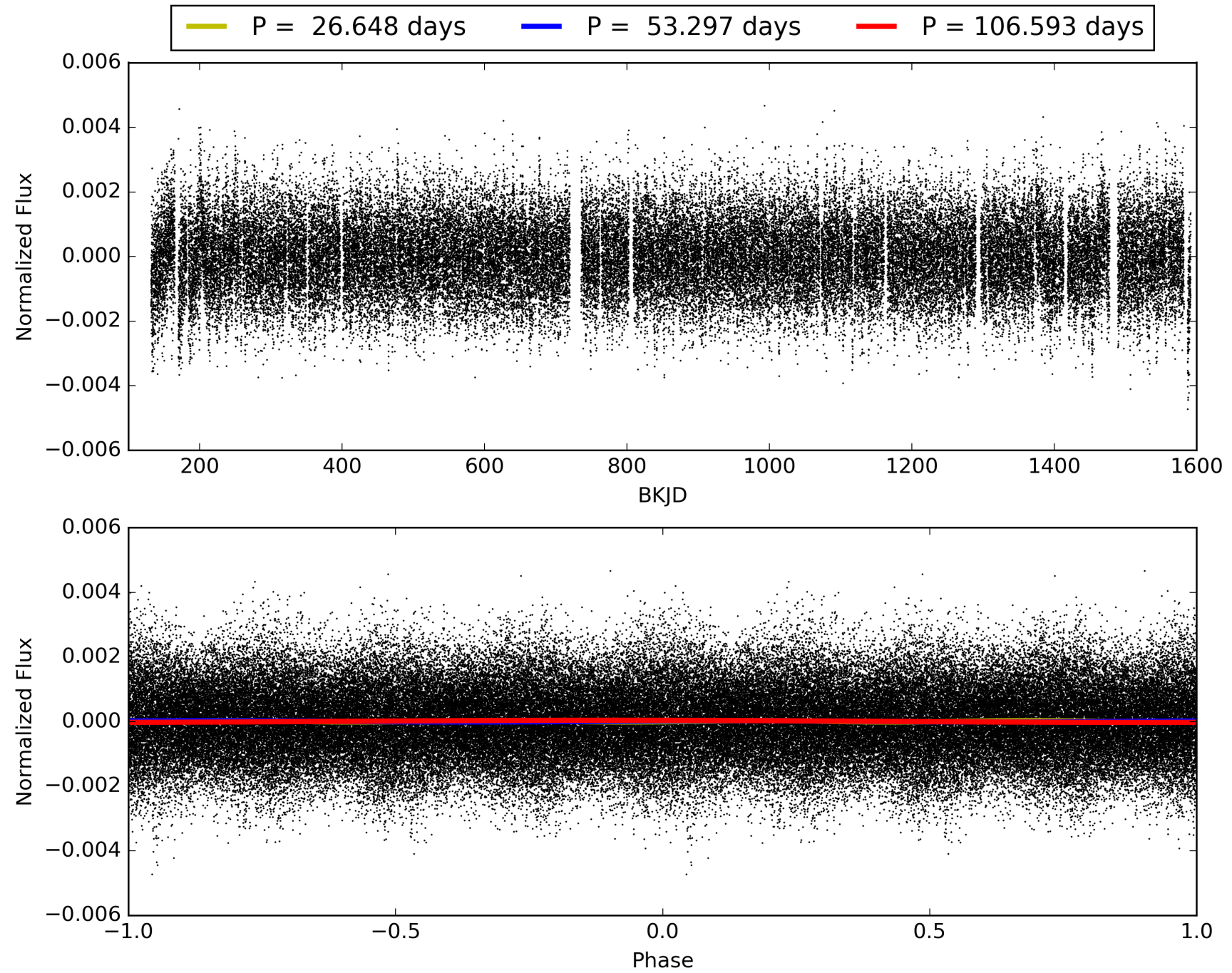
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# TCE 007597771-03, PDC Light Curves

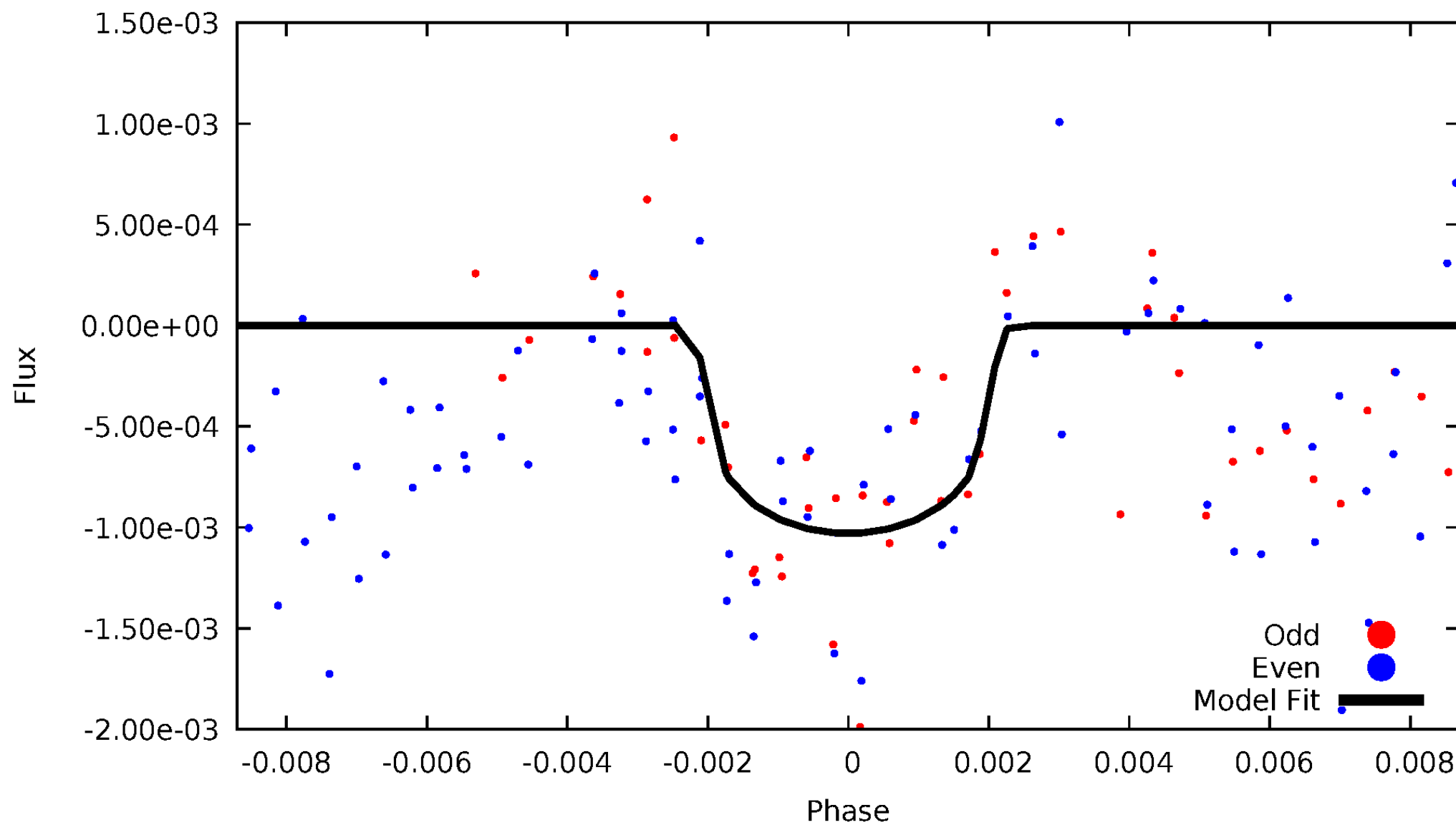


TCE 007597771-03



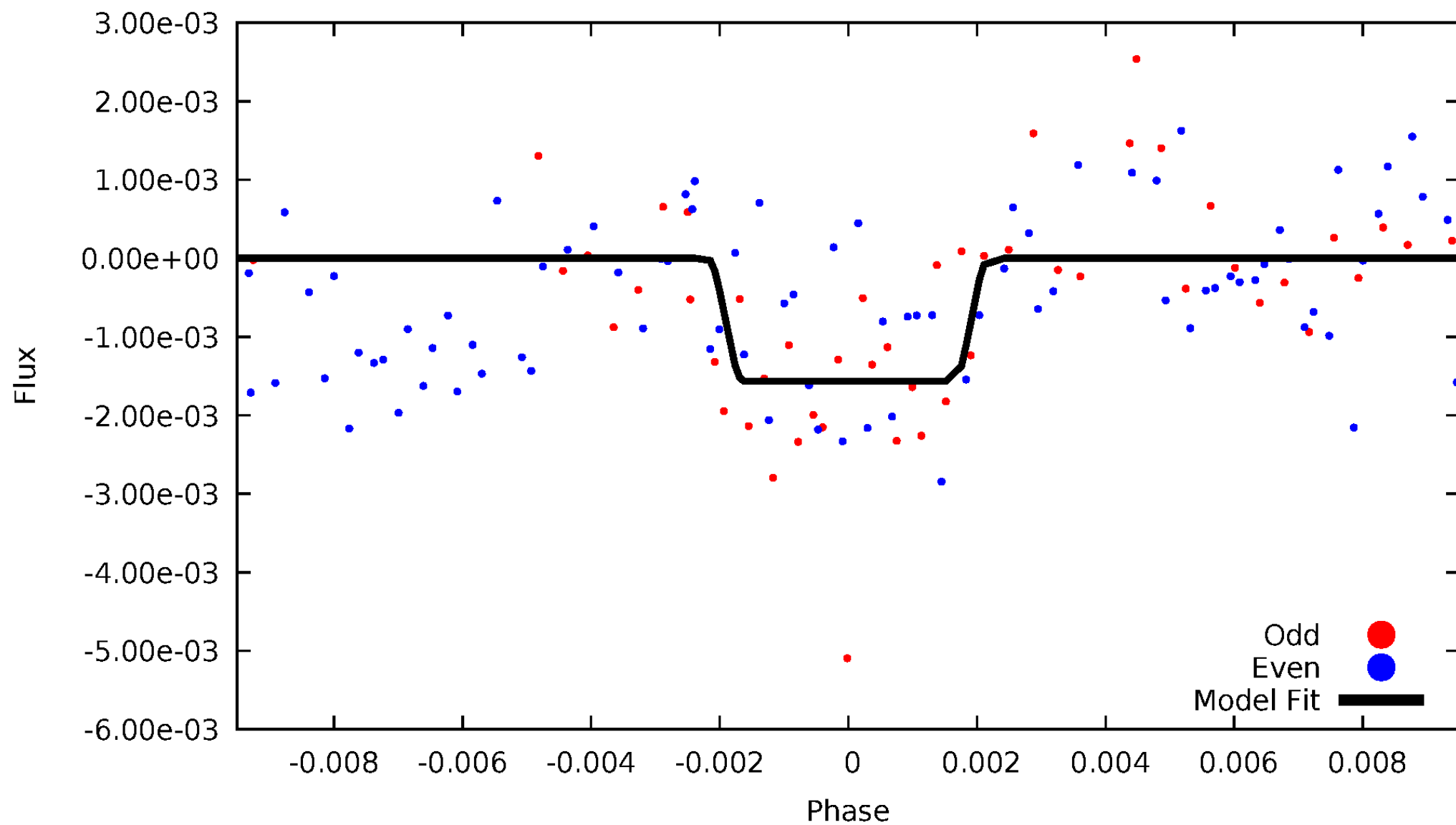
DV Odd/Even

TCE 007597771-03



# ALT Odd/Even

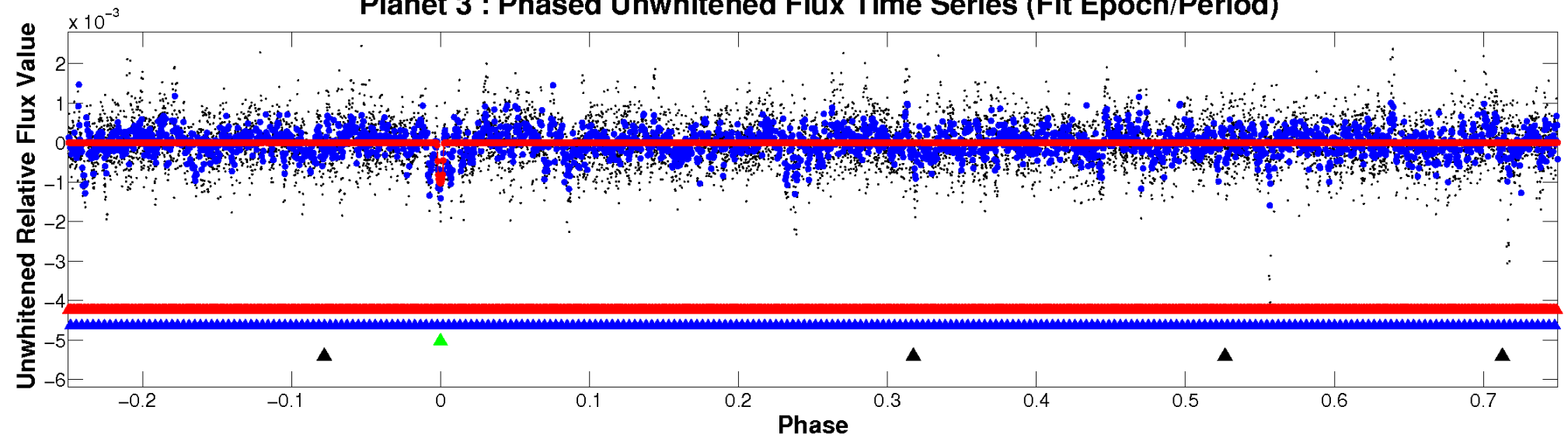
TCE 007597771-03



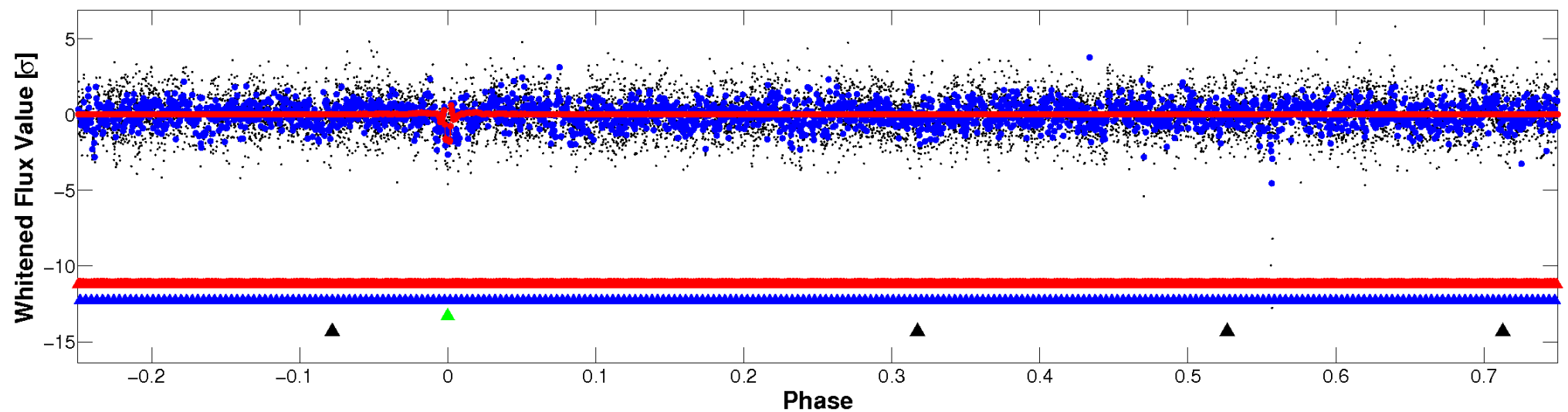


# Non-Whitened Vs. Whitened Light Curve

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

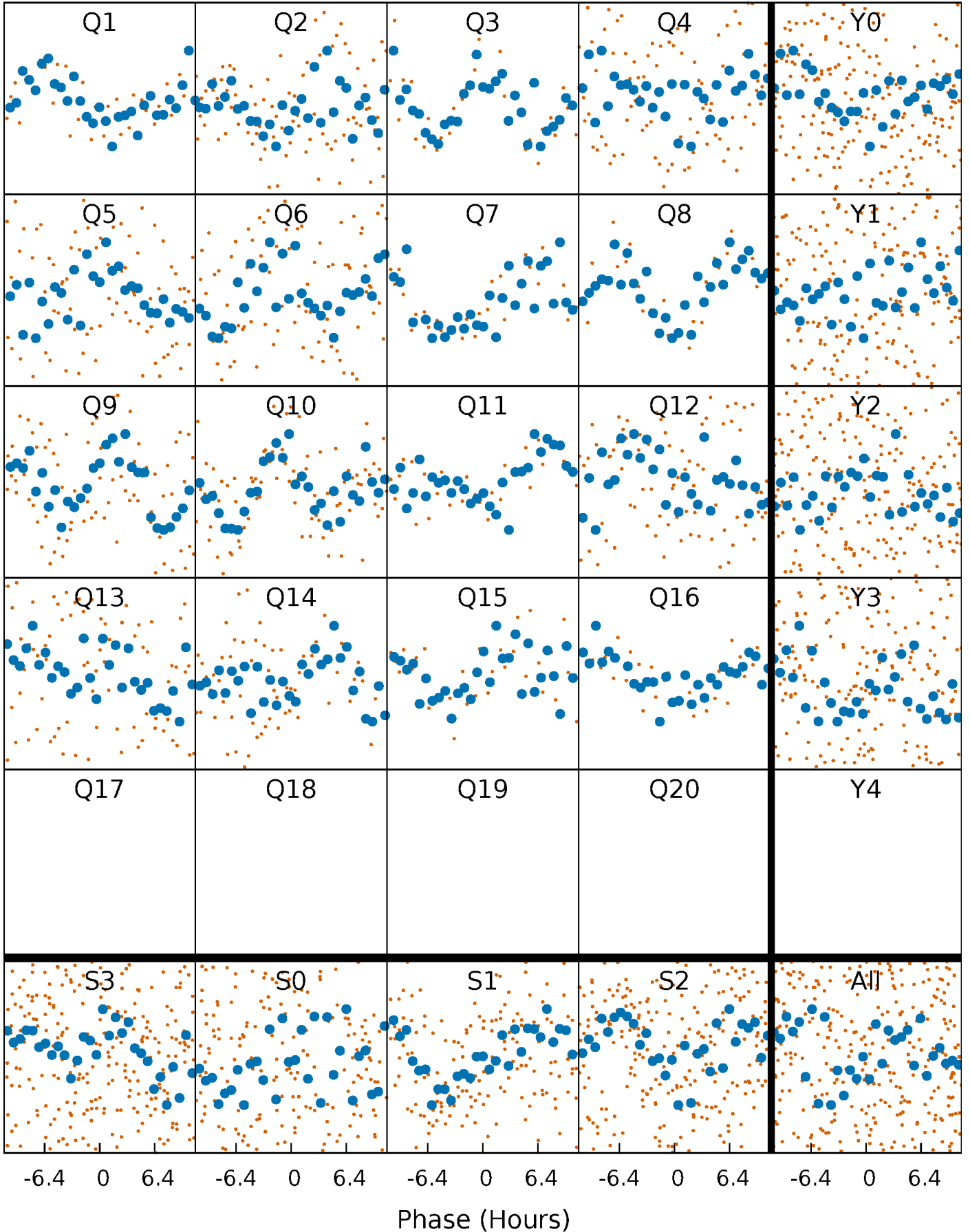


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



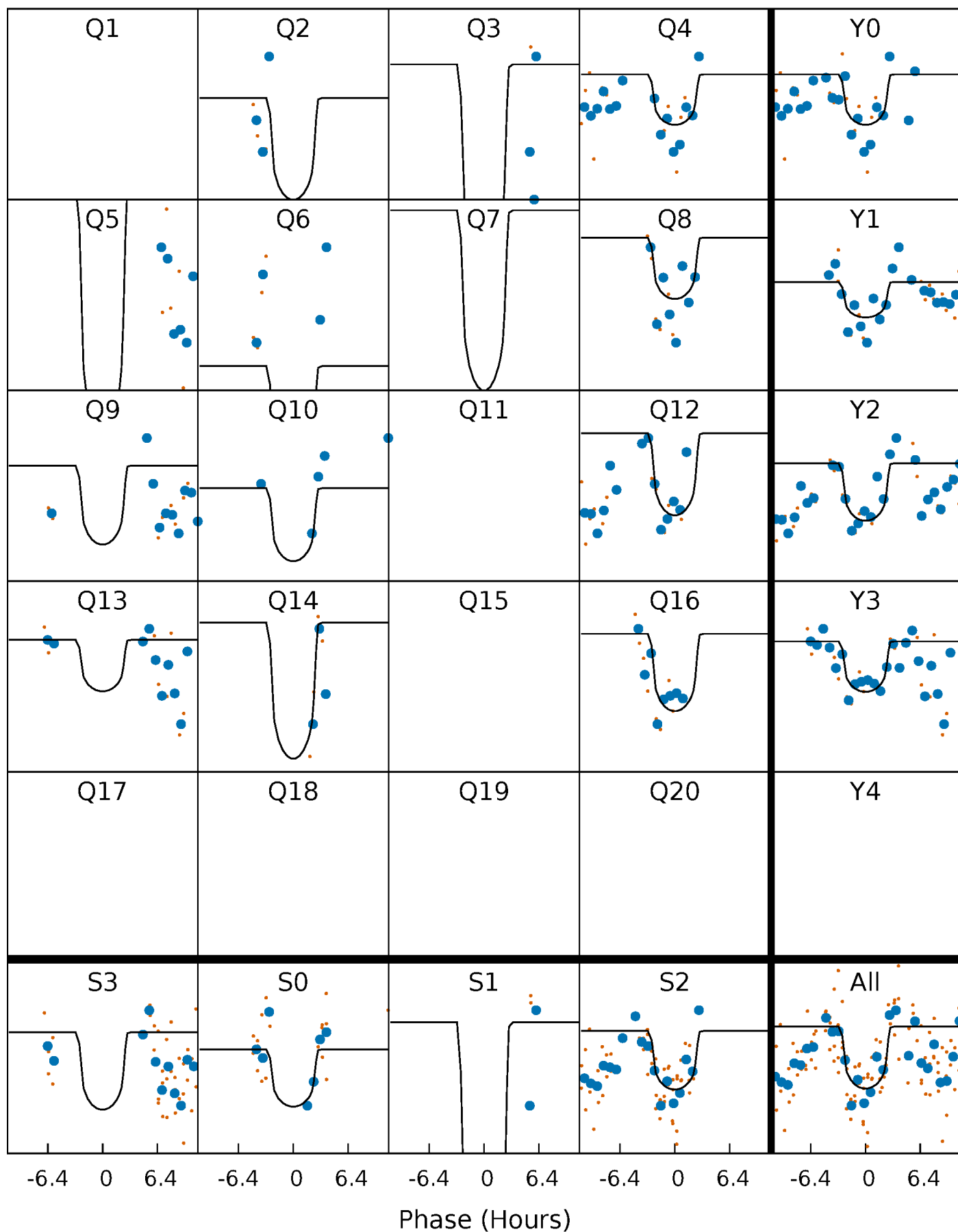
# PDC Quarter-Phased Transit Curves

TCE 007597771-03 P= 53.296536 Days  $T_0=145.468901$  (BKJD)



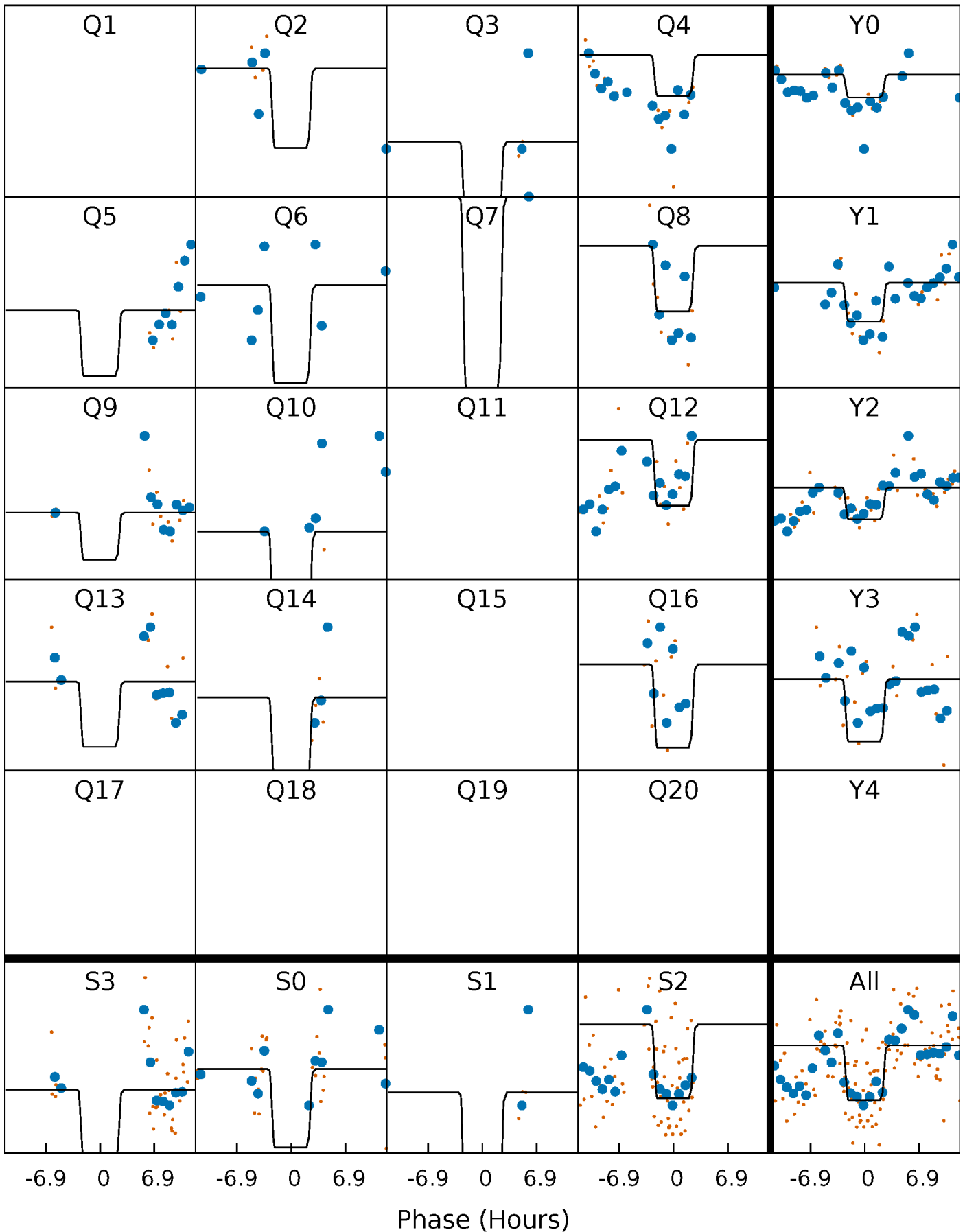
# DV Quarter-Phased Transit Curves

TCE 007597771-03 P= 53.296536 Days  $T_0=145.468901$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007597771-03 P= 53.294289 Days  $T_0=145.489967$  (BKJD)

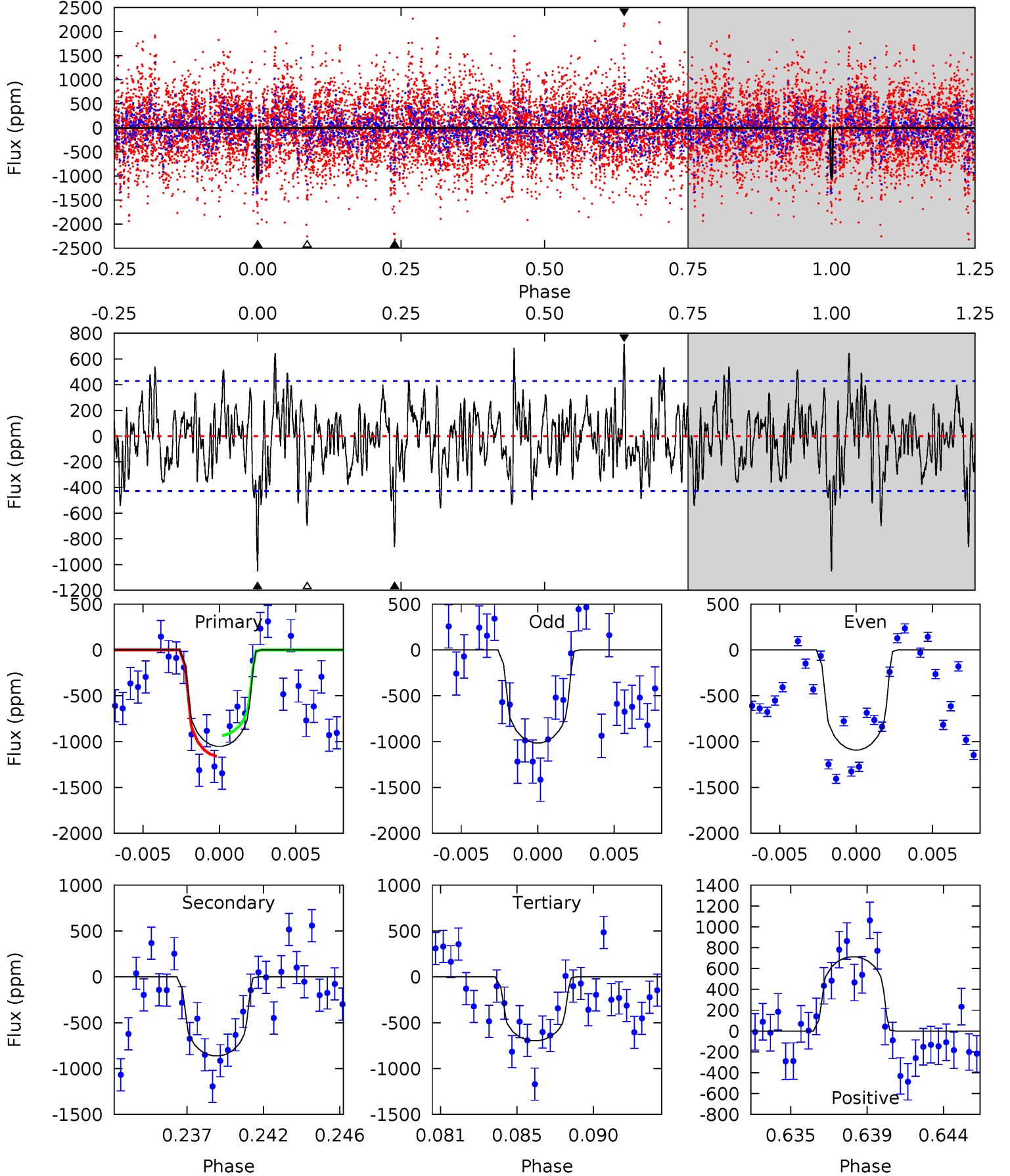




# DV Model-Shift Uniqueness Test

007597771-03, P = 53.296536 Days, E = 92.172365 Days

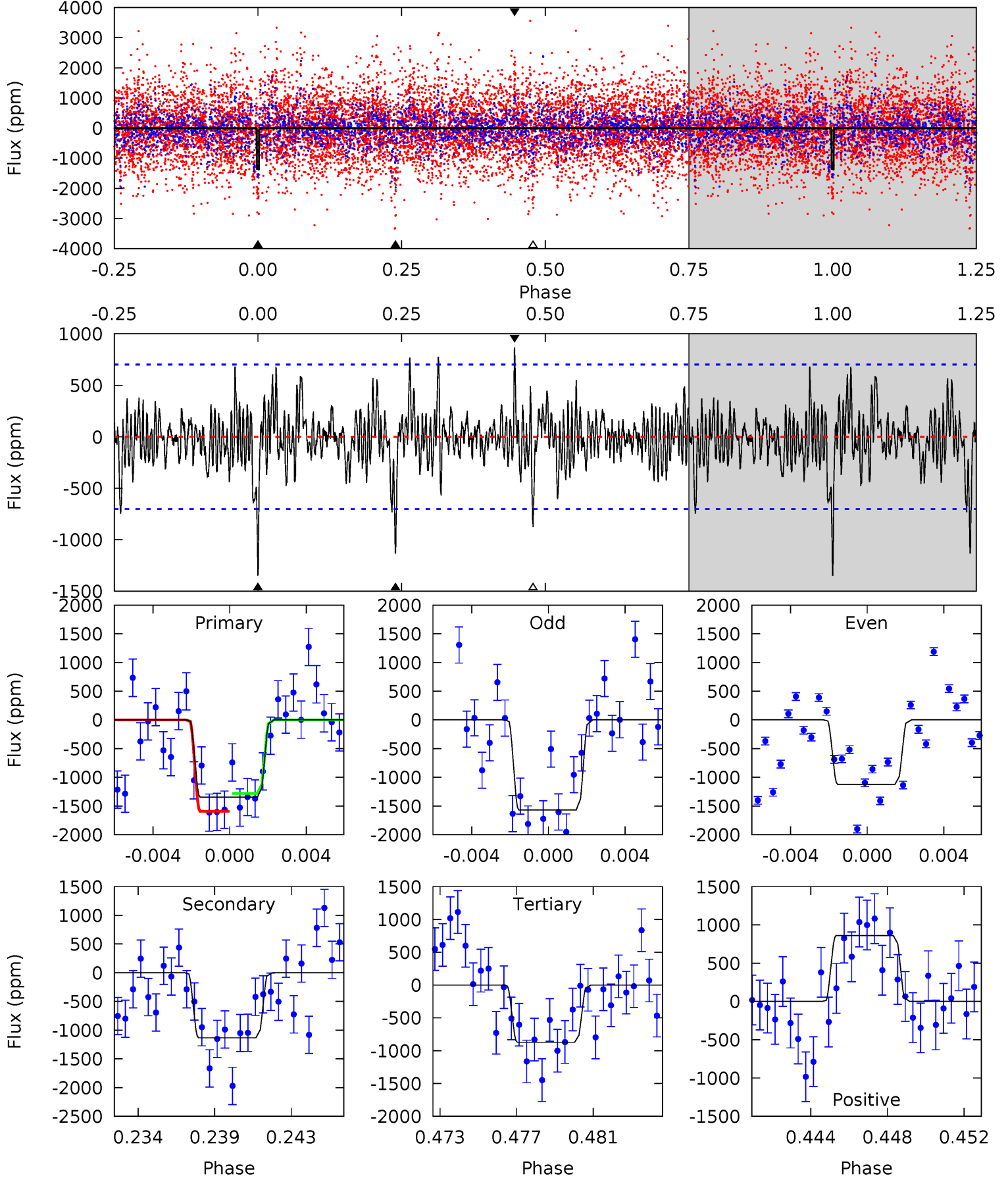
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.7	10.4	8.40	8.58	5.17	2.82	2.49	4.28	4.10	2.00	1.81	0.46	0.96	0.40	1.36



# Alt Model-Shift Uniqueness Test

007597771-03, P = 53.294289 Days, E = 92.195678 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
9.96	8.39	6.46	6.36	5.19	2.86	1.60	3.50	3.60	1.93	2.03	1.66	1.01	0.39	1.16



### Stellar Parameters For KIC 007597771

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5125^{+179}_{-179}$	$4.551^{+0.071}_{-0.058}$	$-0.280^{+0.300}_{-0.300}$	$0.748^{+0.080}_{-0.080}$	$0.727^{+0.098}_{-0.057}$	$2.447^{+0.785}_{-0.498}$
	+3%/-3%	+2%/-1%	+107%/-107%	+11%/-11%	+13%/-8%	+32%/-20%
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 007597771-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-862 \pm 83$	$2.63^{+1.48}_{-1.35}$	$547^{+22}_{-23}$	$4939^{+2010}_{-785}$	$4311^{+13546}_{-2555}$
Alt.	$-1134 \pm 135$	$3.27^{+1.37}_{-1.32}$	$546^{+24}_{-22}$	$4761^{+1271}_{-625}$	$3676^{+6596}_{-1861}$

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

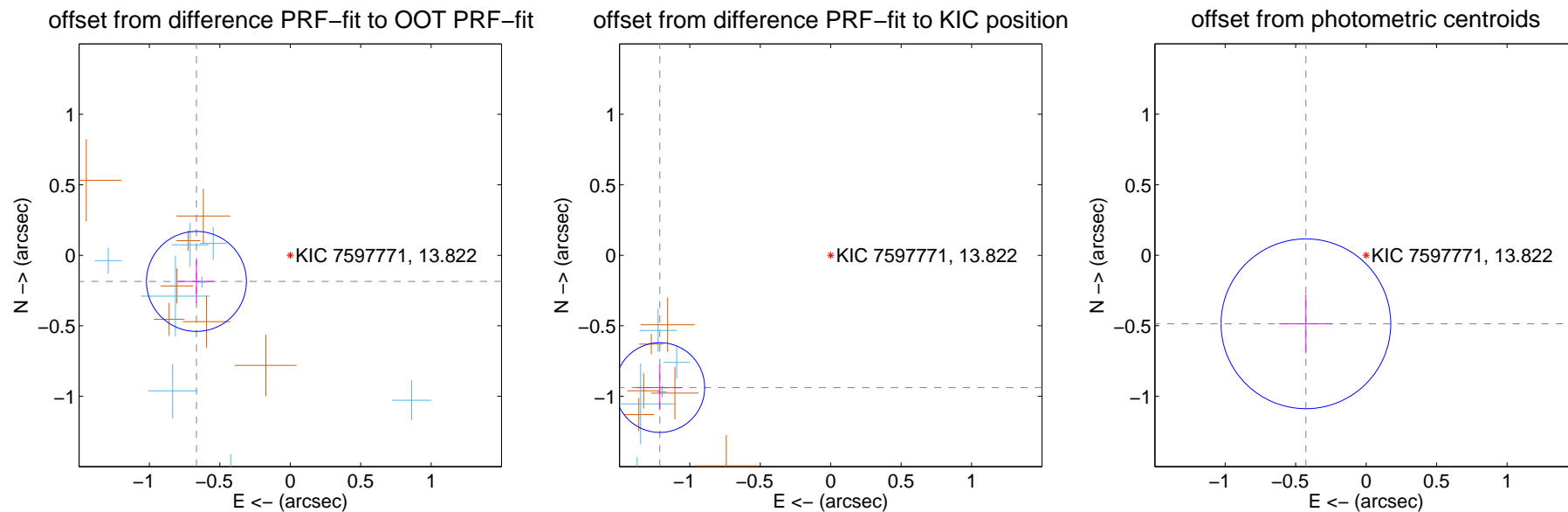
## DV Centroid Data

Supplemental centroid analysis for 007597771-03. Kepler magnitude: 13.82. Transit SNR 10.30

There are 8 quarters with good PRF difference image offsets

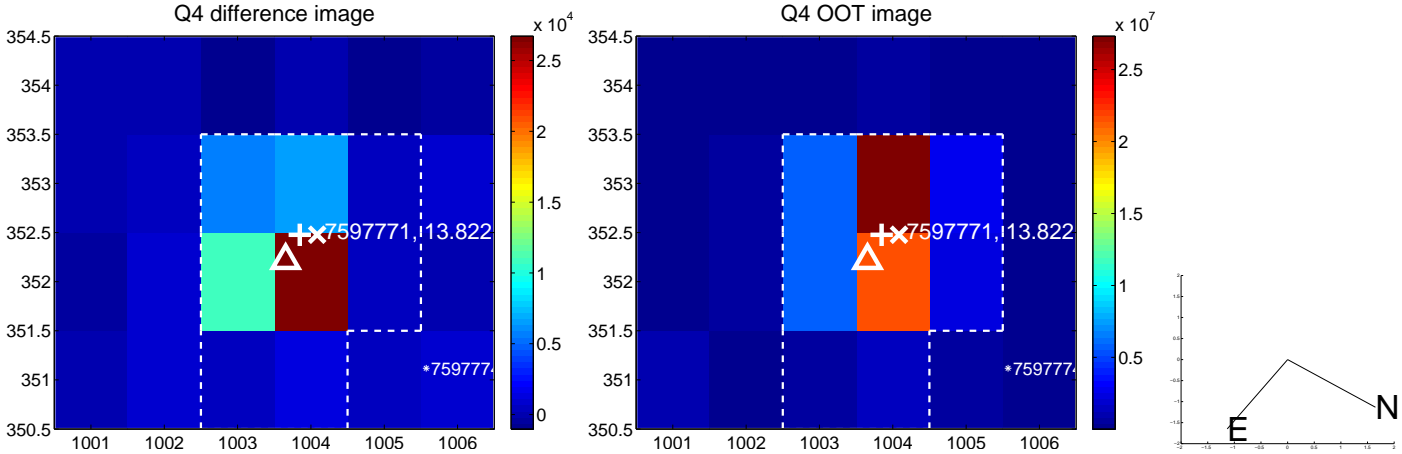
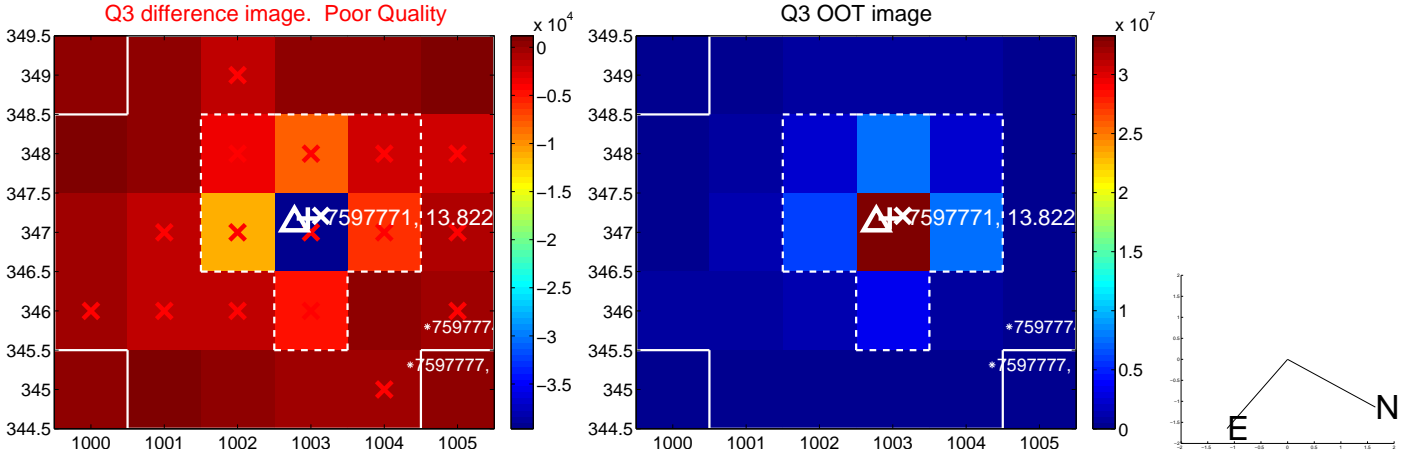
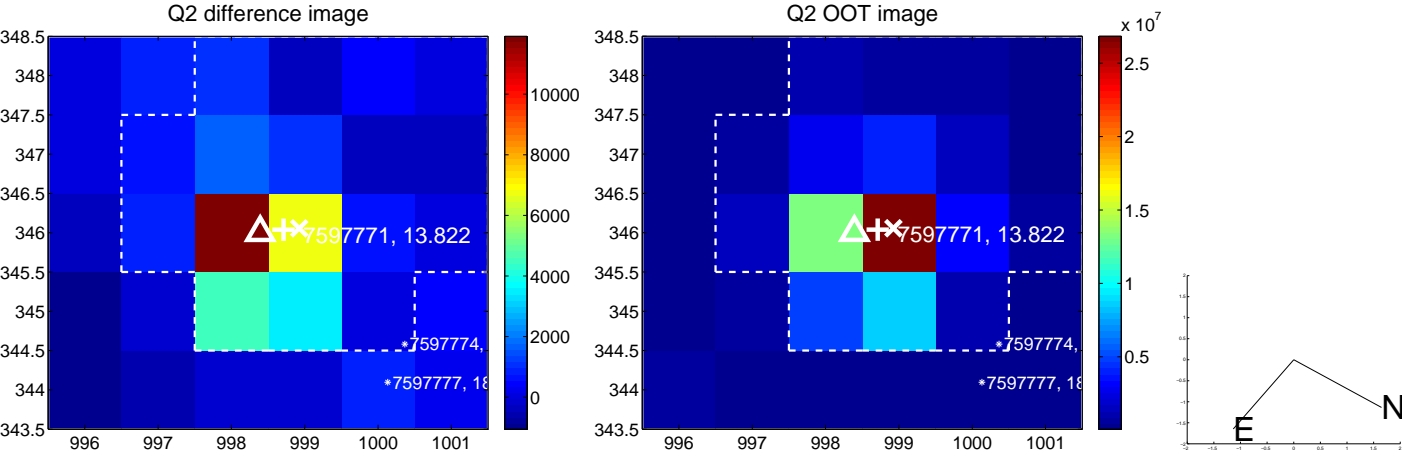
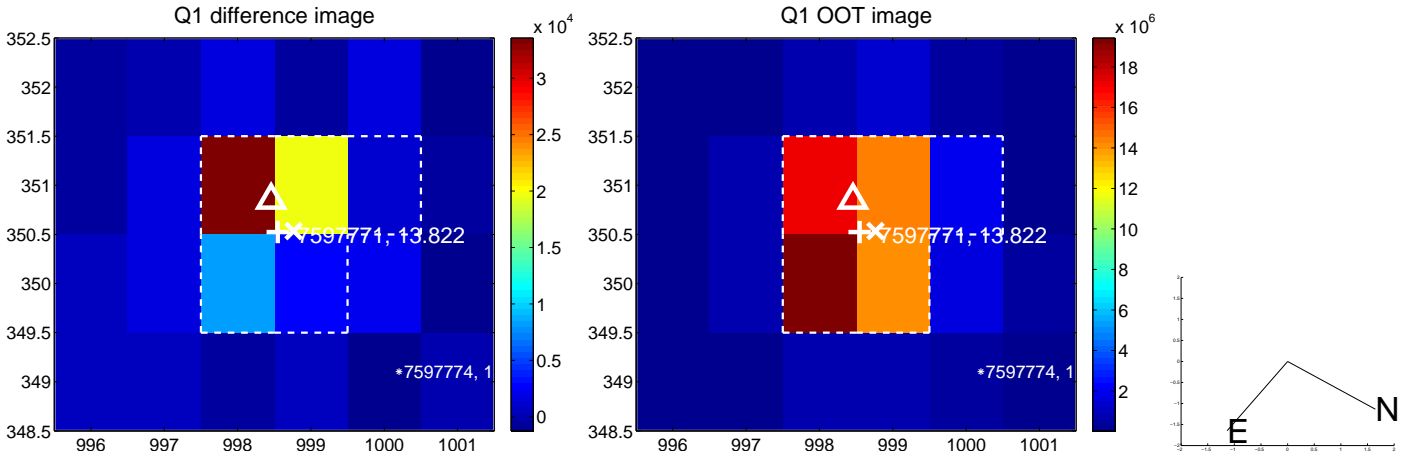
The direct PRF centroid is offset from the target star catalog position by about 1.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.691 \pm 0.118$	5.85	$0.666 \pm 0.136$	$-0.185 \pm 0.153$
PRF-fit source offset from KIC position	$1.533 \pm 0.106$	14.45	$1.213 \pm 0.161$	$-0.938 \pm 0.159$
photometric centroid source offset	$0.65 \pm 0.20$	3.23	$0.43 \pm 0.19$	$-0.49 \pm 0.21$



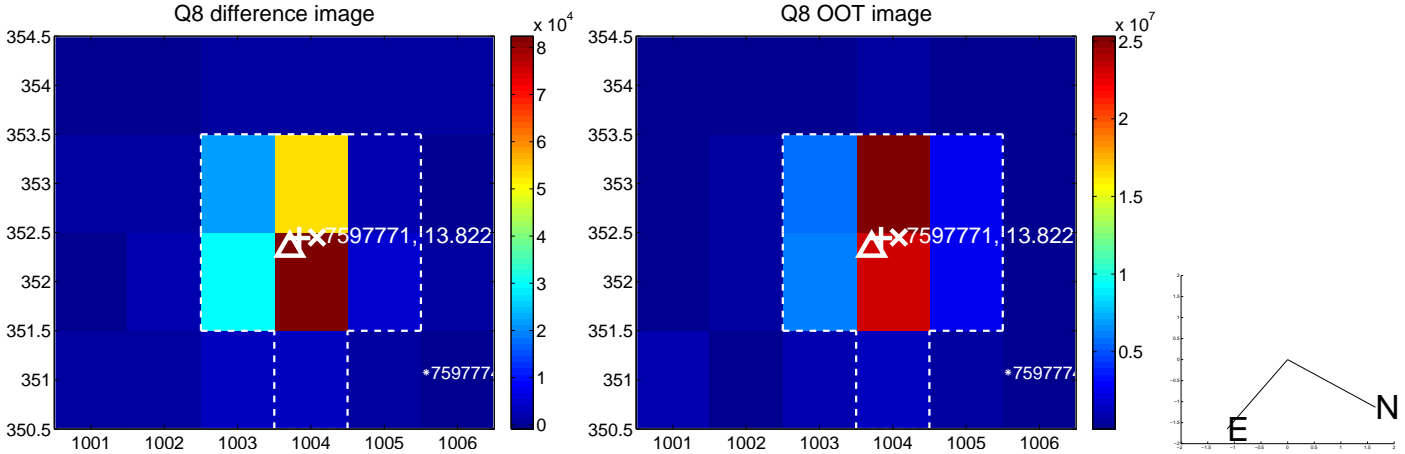
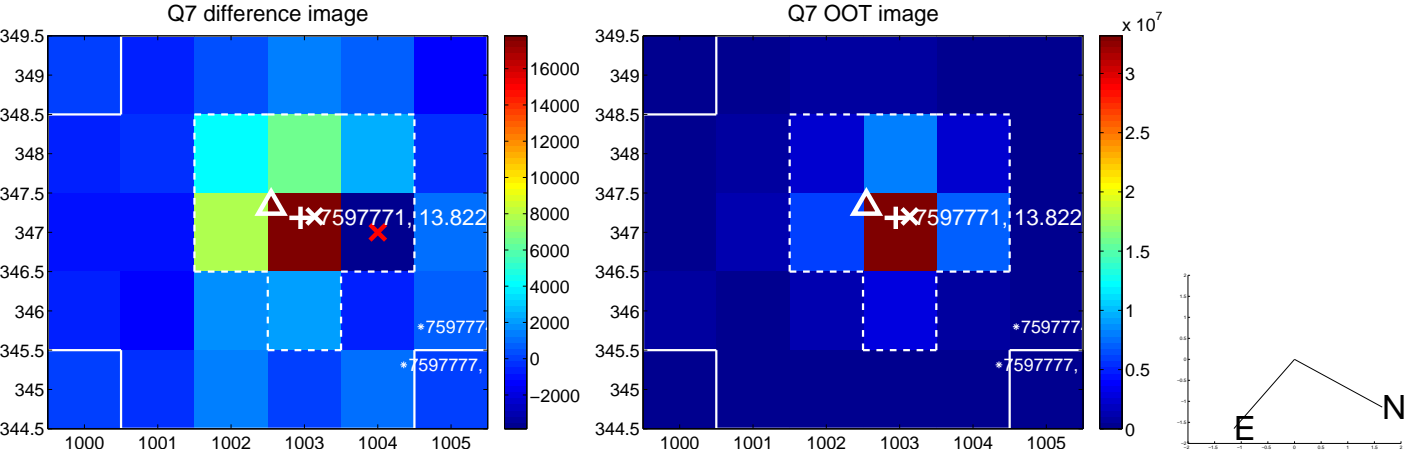
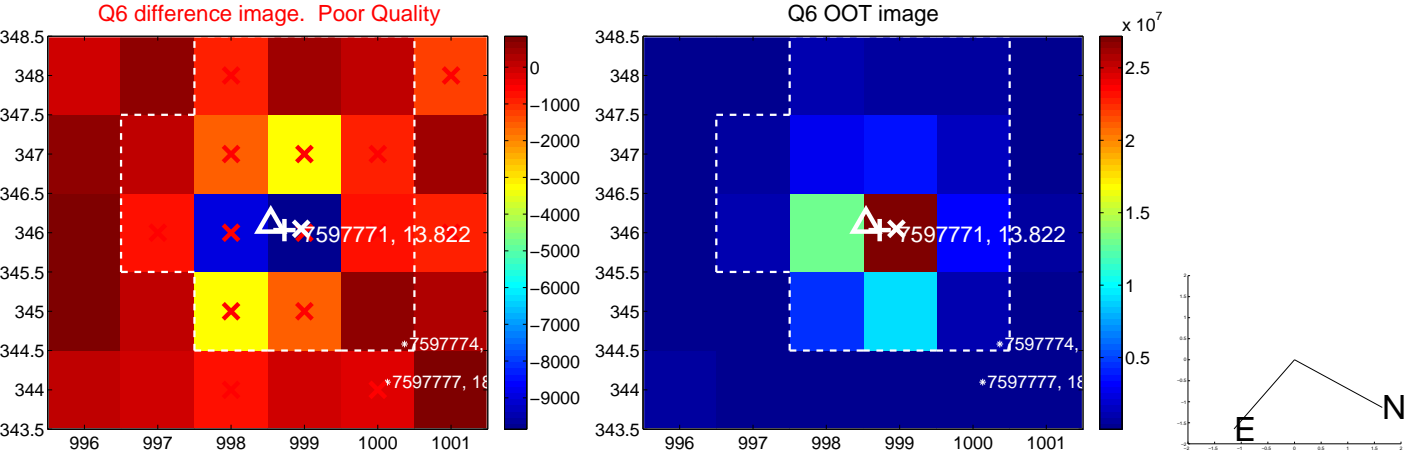
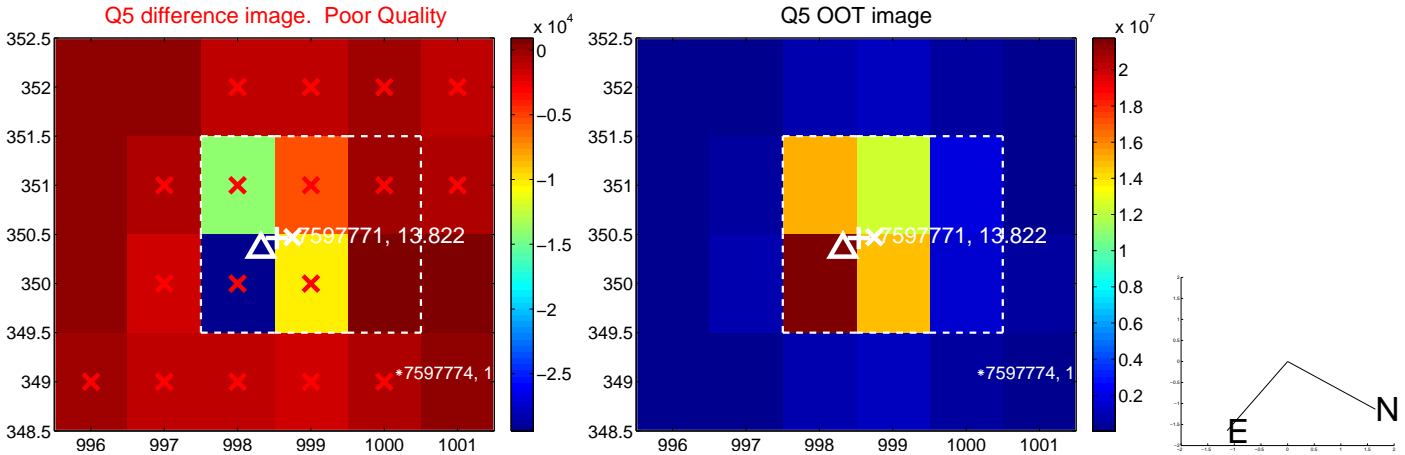
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

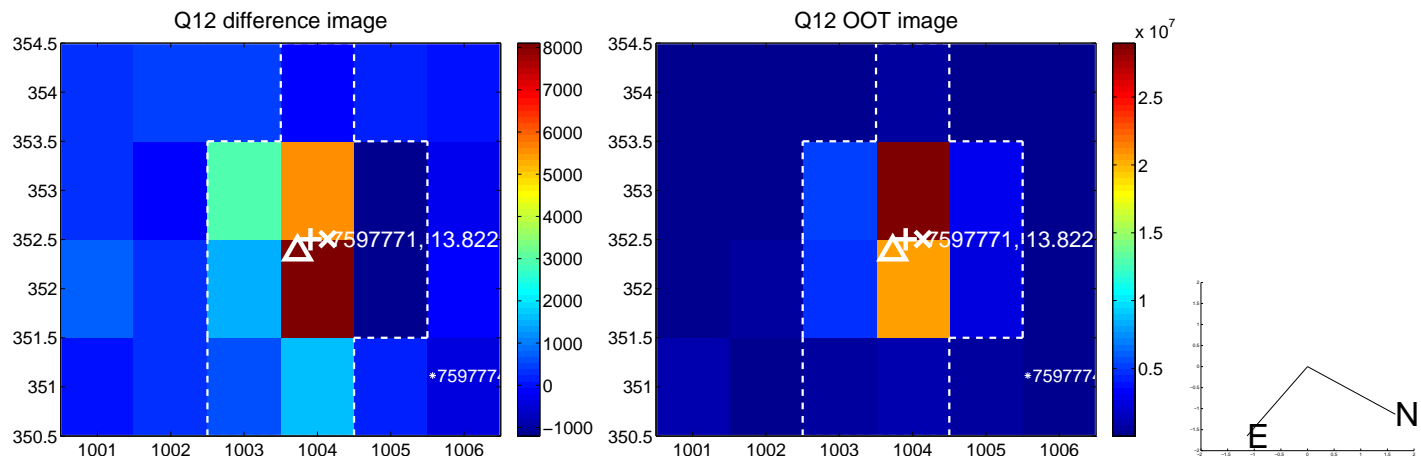
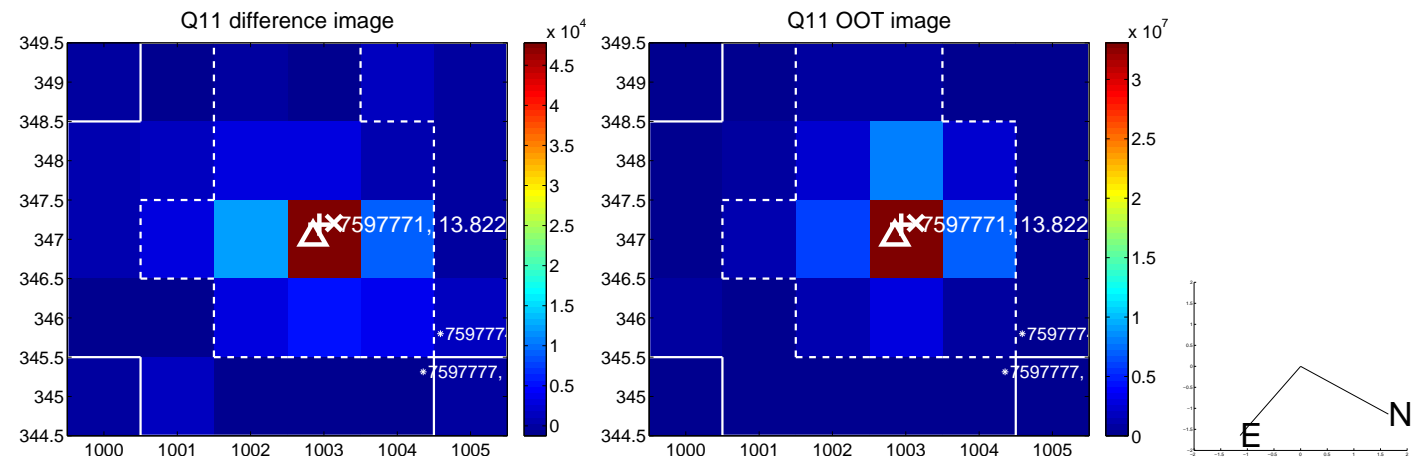
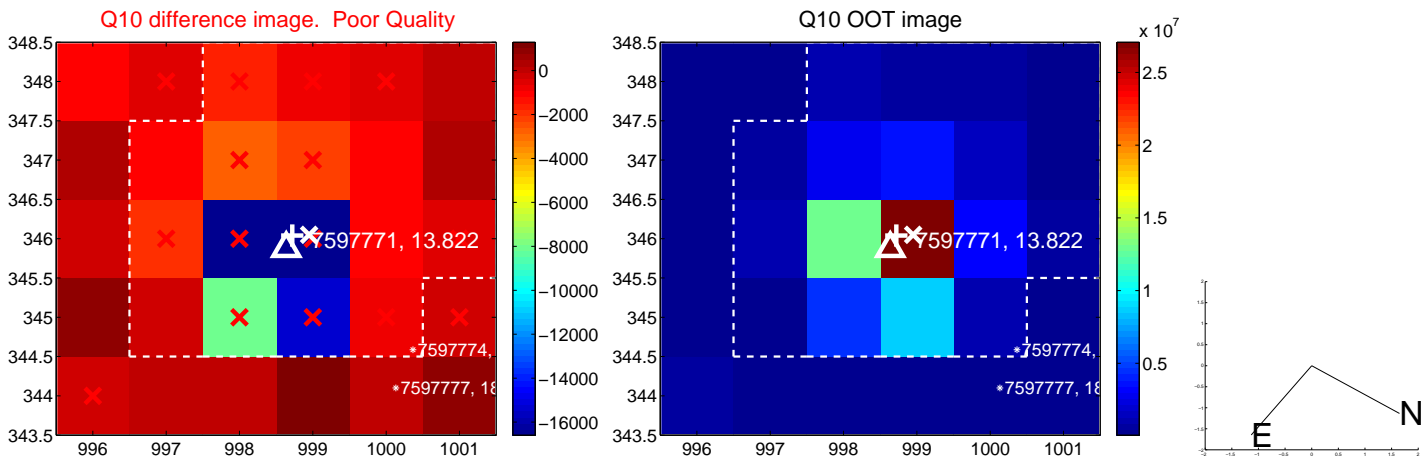
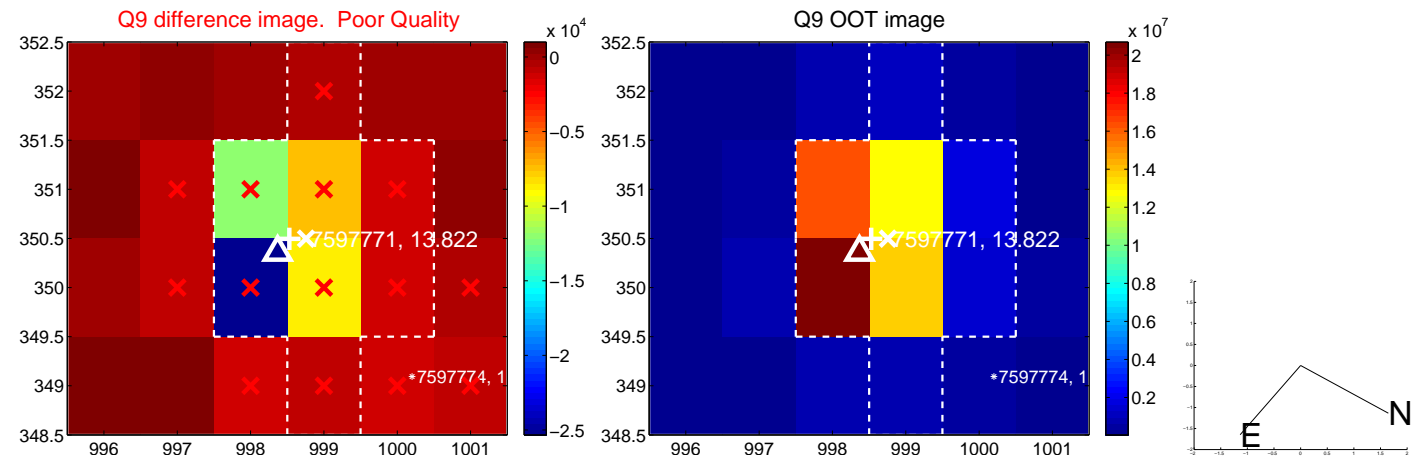




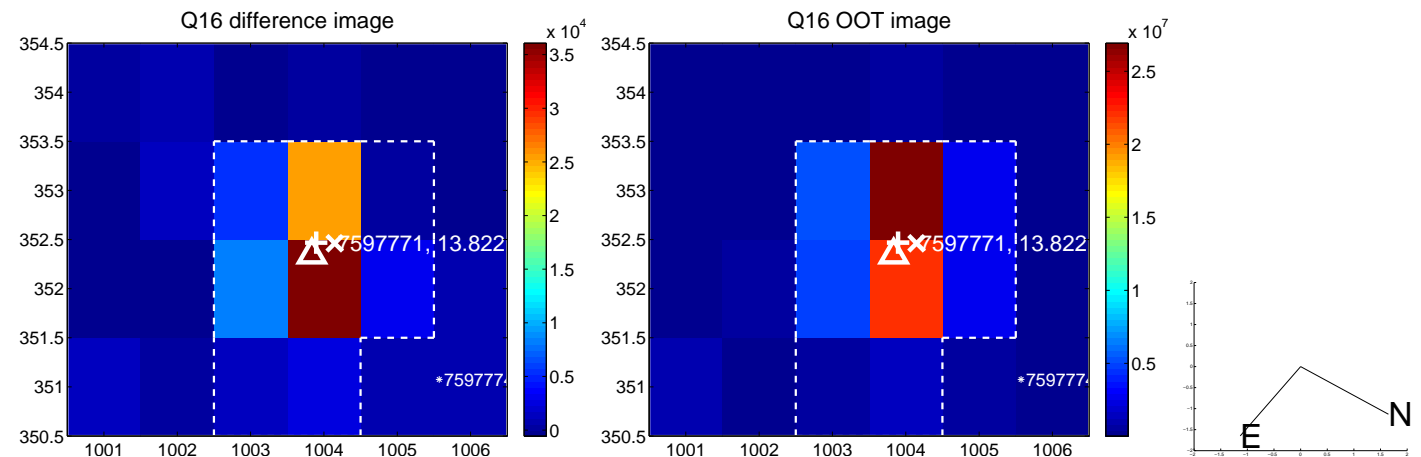
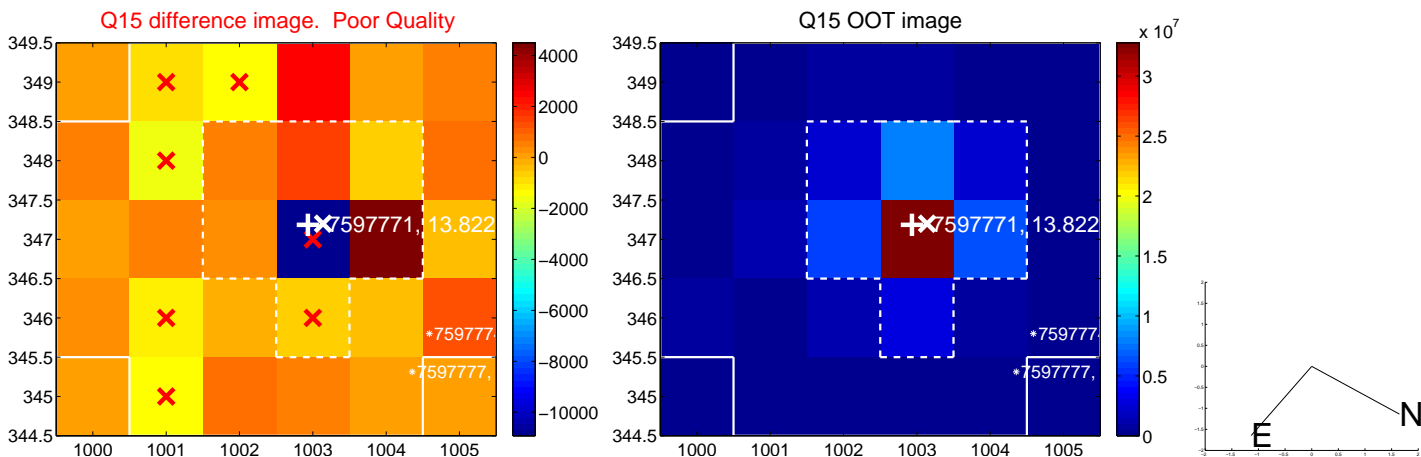
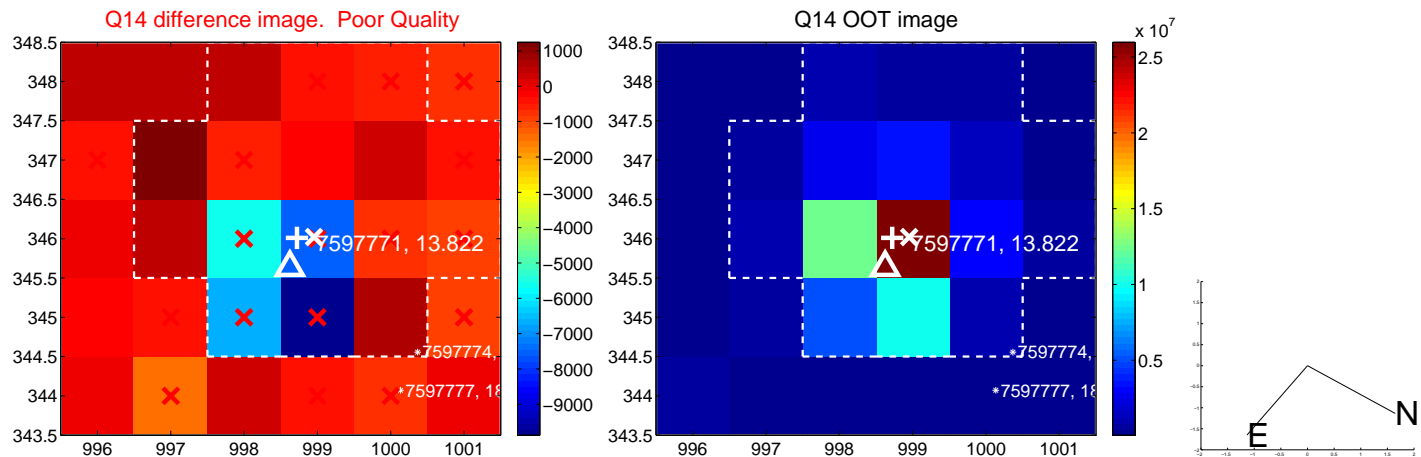
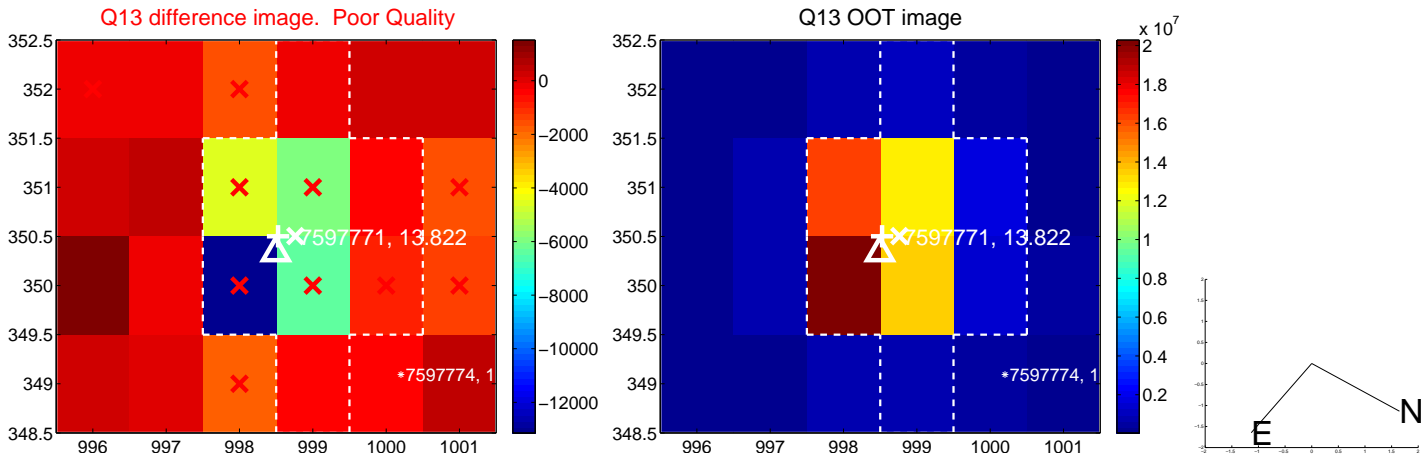
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



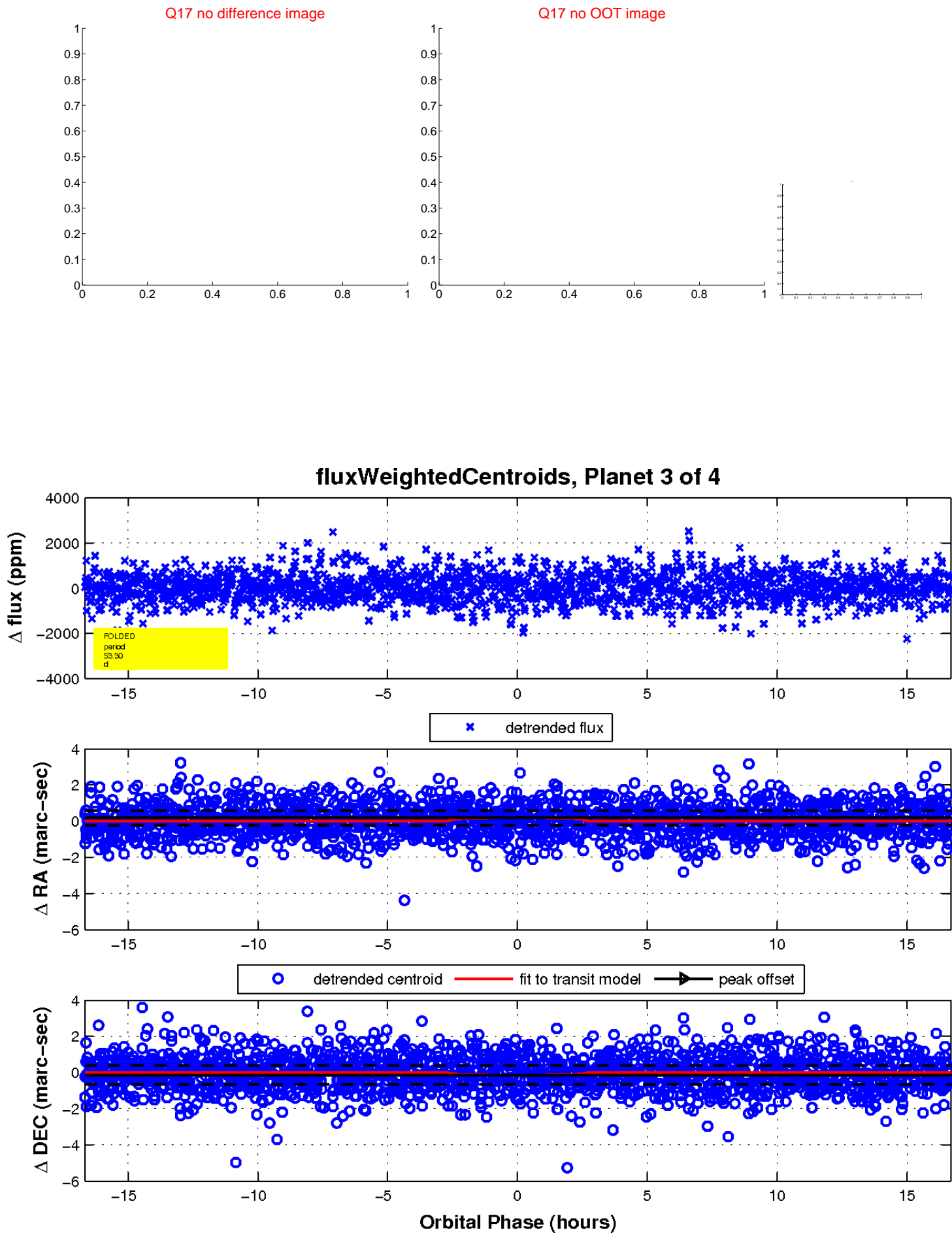
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

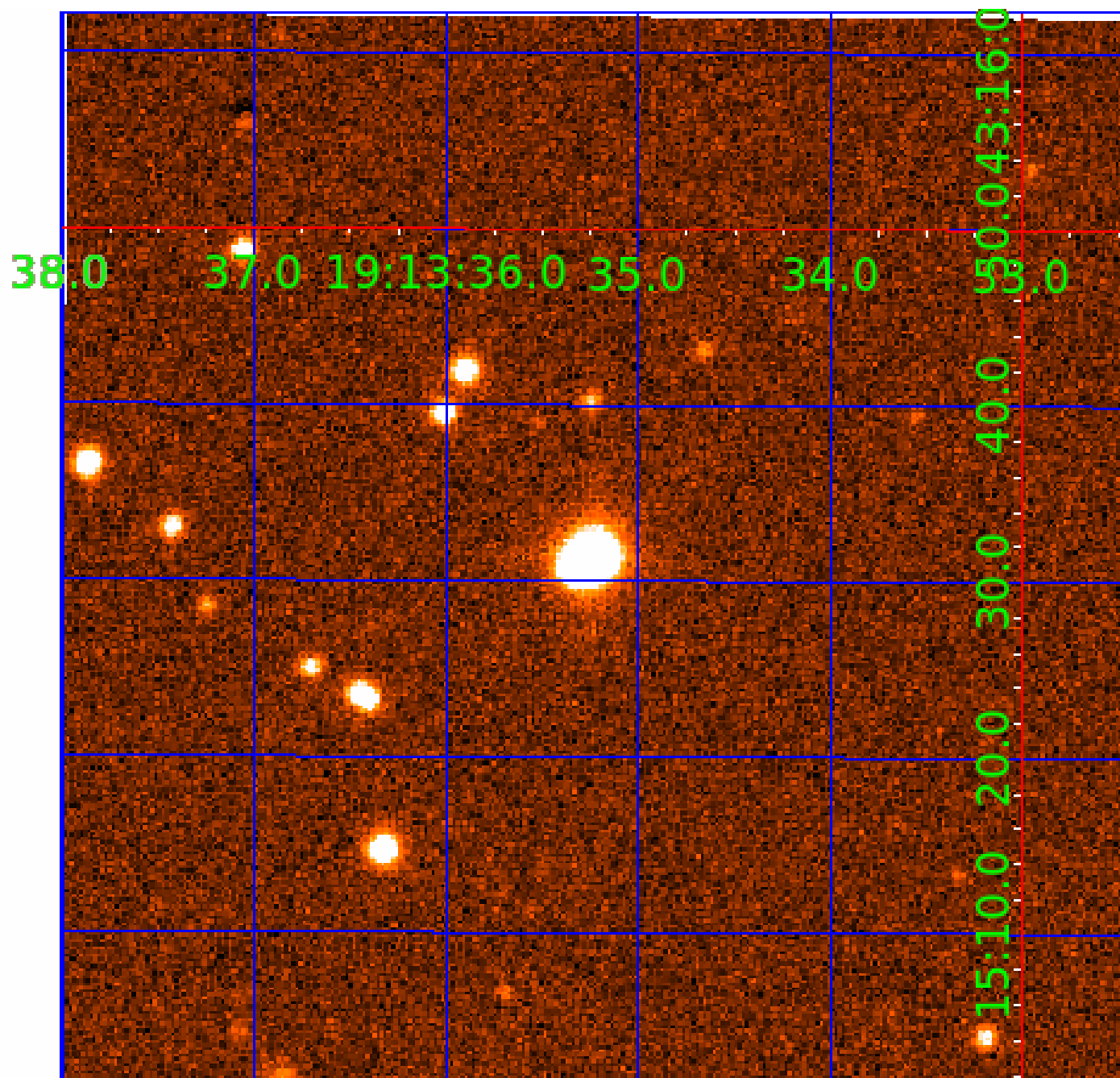


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 007597771

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007597771-01	OBS	No	0.851709	132.173849	39.3	4.737	7.3	6.9	0.75	5125	0.46	1384.26
007597771-02	OBS	No	1.413187	132.828815	164.5	5.028	11.5	11.8	0.75	5125	0.94	704.70
007597771-03	OBS	No	53.296536	145.468901	1029.4	5.565	9.1	10.3	0.75	5125	2.61	5.57
007597771-04	OBS	No	394.148782	386.722088	1011.8	18.203	8.9	8.2	0.75	5125	2.67	0.39

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007597771-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—CENT_KIC_POS
007597771-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—CENT_KIC_POS
007597771-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—CENT_KIC_POS
007597771-04	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS—HALO_GHOST

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

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

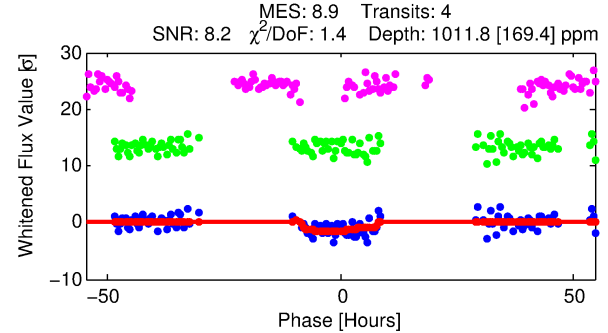
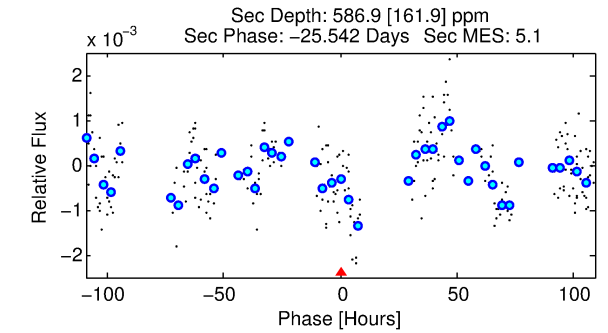
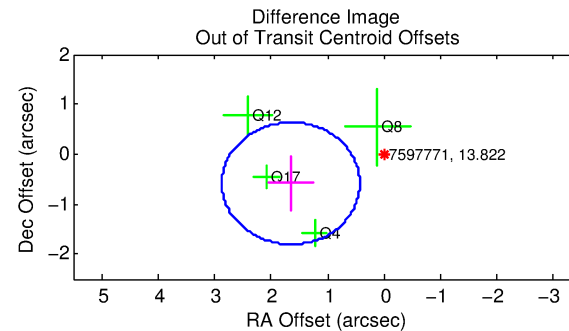
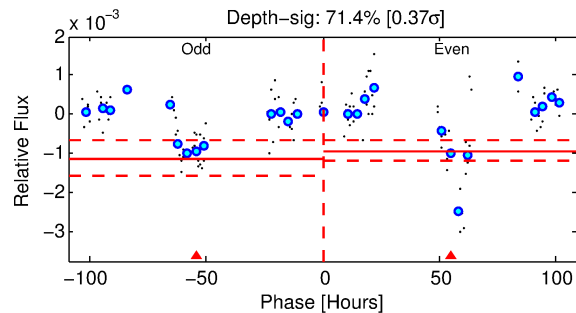
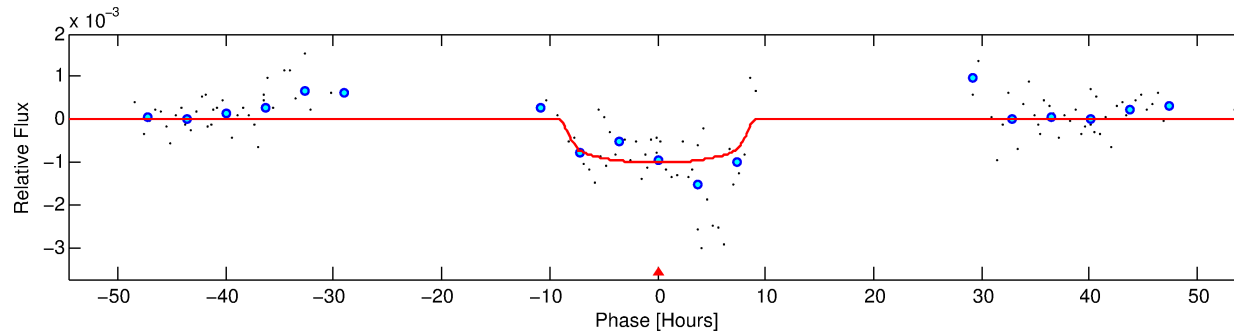
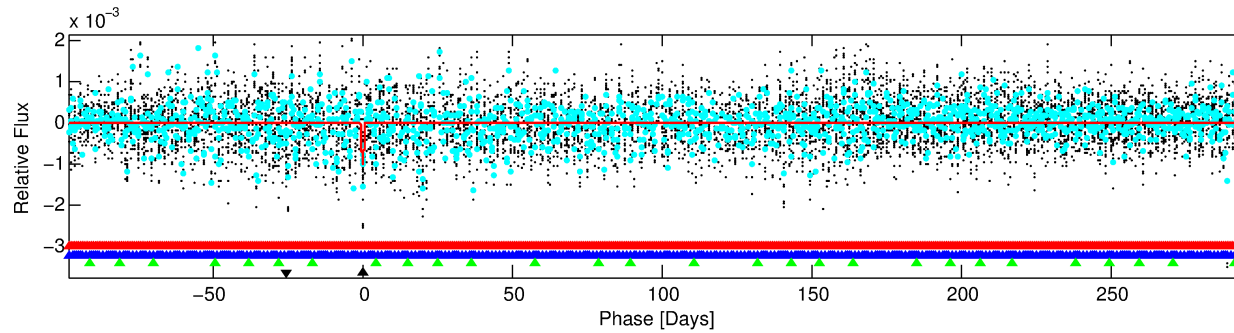
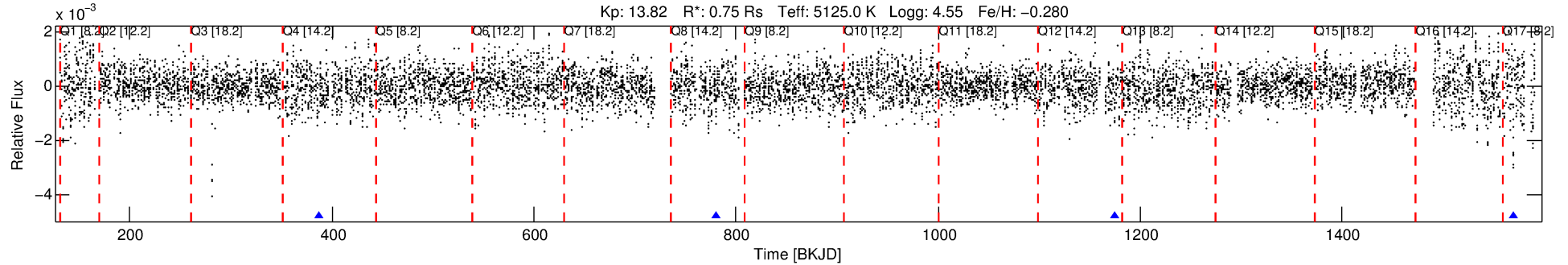
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007597771-04

No Significant Match Found

# DV One-Page Summary

KIC: 7597771 Candidate: 4 of 4 Period: 394.149 d



## DV Fit Results:

Period = 394.14878 [0.14871] d  
Epoch = 386.7221 [0.2258] BKJD  
Rp/R\* = 0.0327 [0.0083]  
a/R\* = 106.38 [74.28]  
b = 0.81 [0.44]  
Seff = 0.39 [0.07]  
Teq = 201 [10] K  
Rp = 2.67 [0.74] Re  
a = 0.9457 [0.0849] AU  
Ag = 40552.59 [24106.05] [1.68 $\sigma$ ]  
Teffp = 4412 [658] K [6.40 $\sigma$ ]

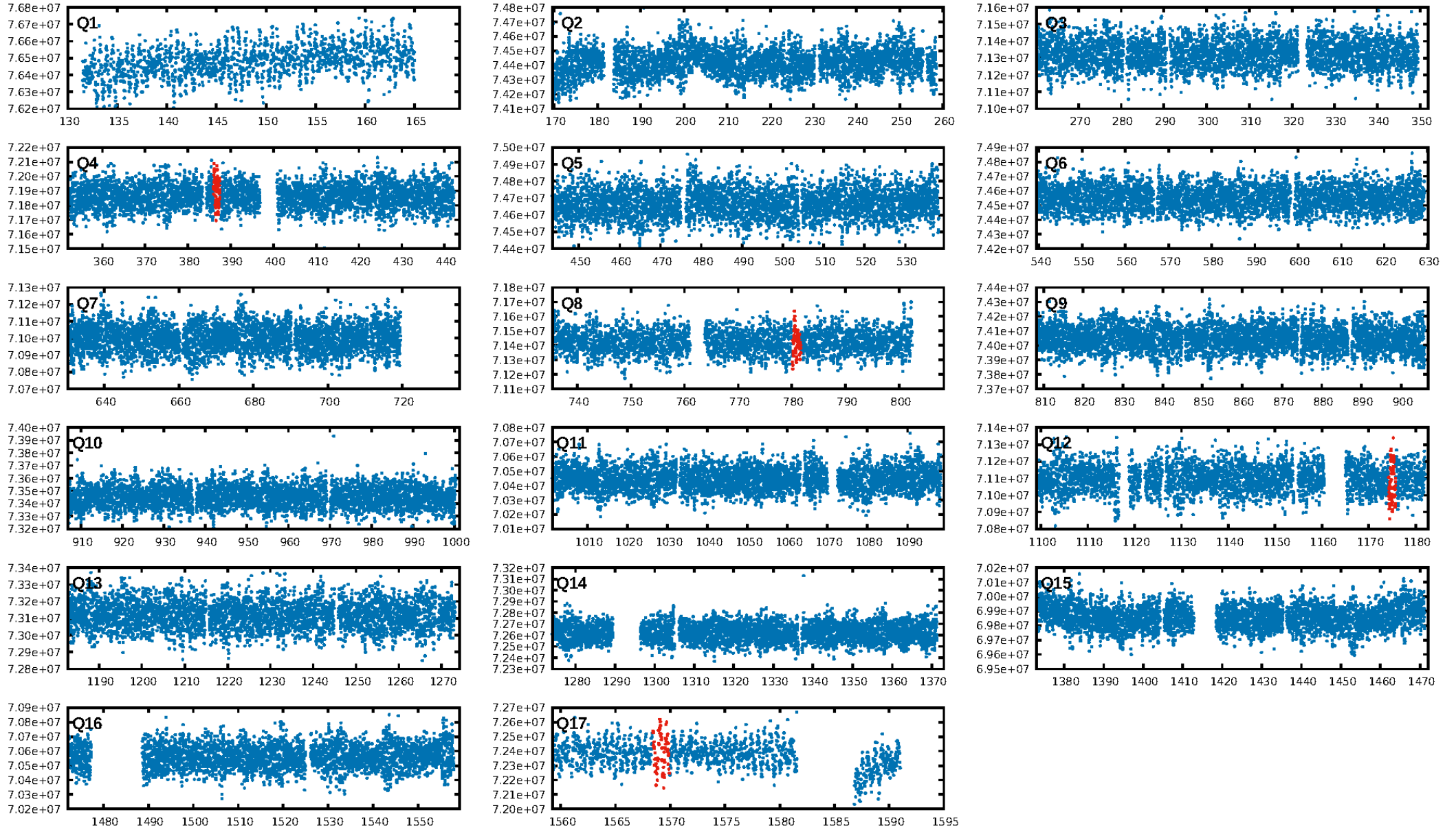
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [429.77 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 2.6%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 8.87e-10**  
RollingBand-fgm: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.1214**  
Centroid-sig: 7.1%  
Centroid-so: 0.629 arcsec [2.57 $\sigma$ ]  
**OotOffset-rm: 1.753 arcsec [4.31 $\sigma$ ]**  
**KicOffset-rm: 2.597 arcsec [6.00 $\sigma$ ]**  
OotOffset-st: 0/0/3/1 [4]  
KicOffset-st: 0/0/3/1 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.00 [0/4]

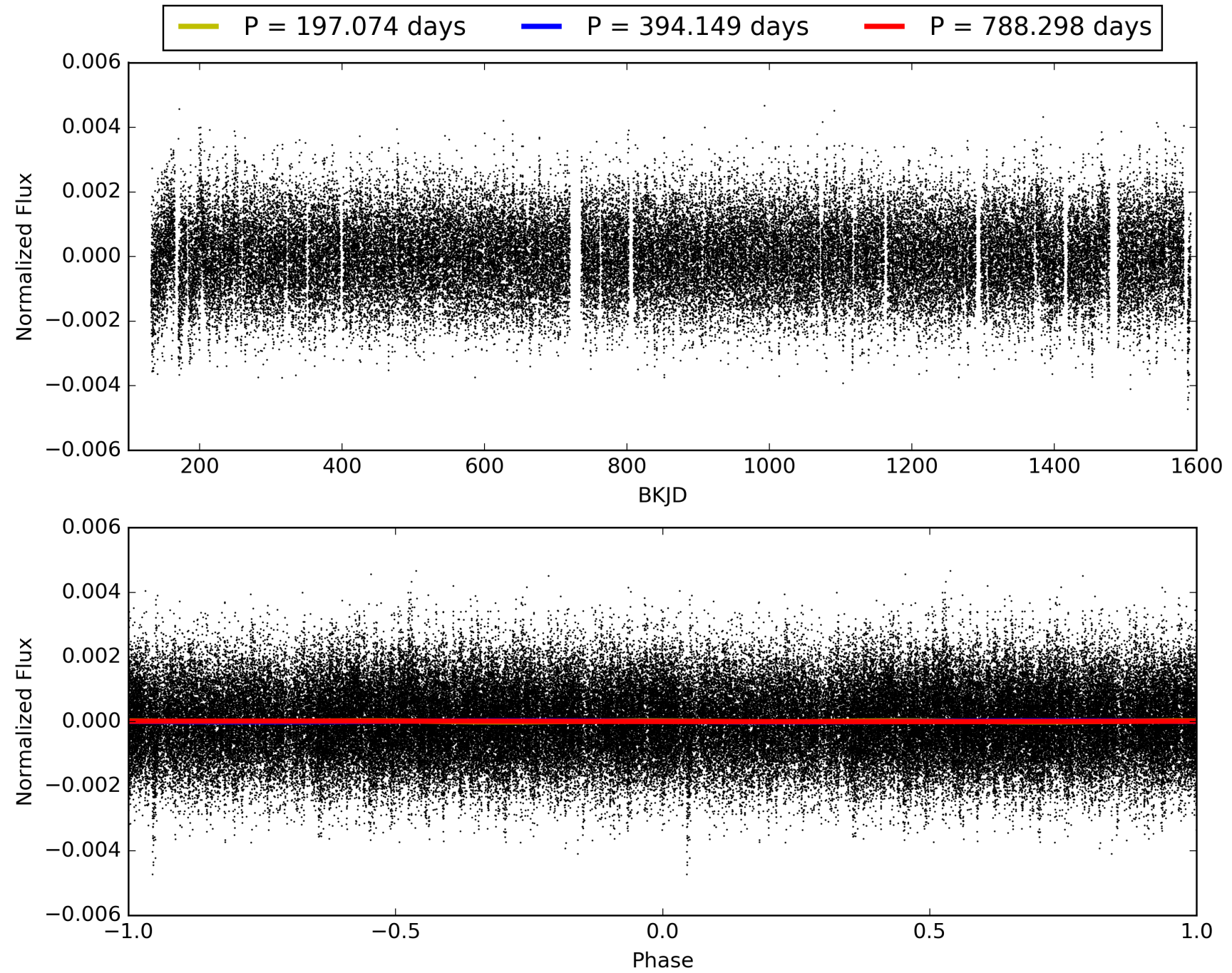
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 23:47:56 Z

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

# TCE 007597771-04, PDC Light Curves

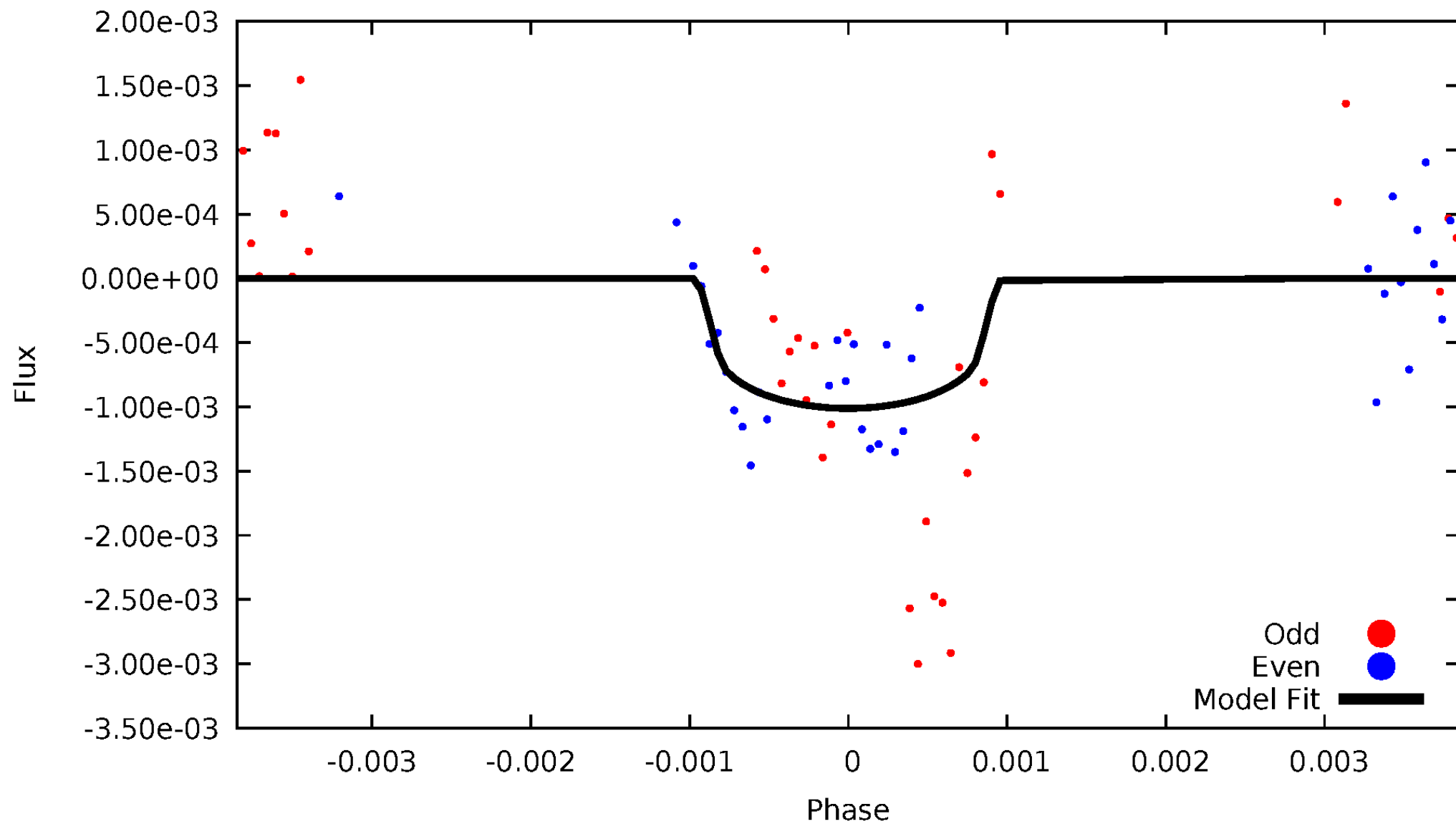


TCE 007597771-04



# DV Odd/Even

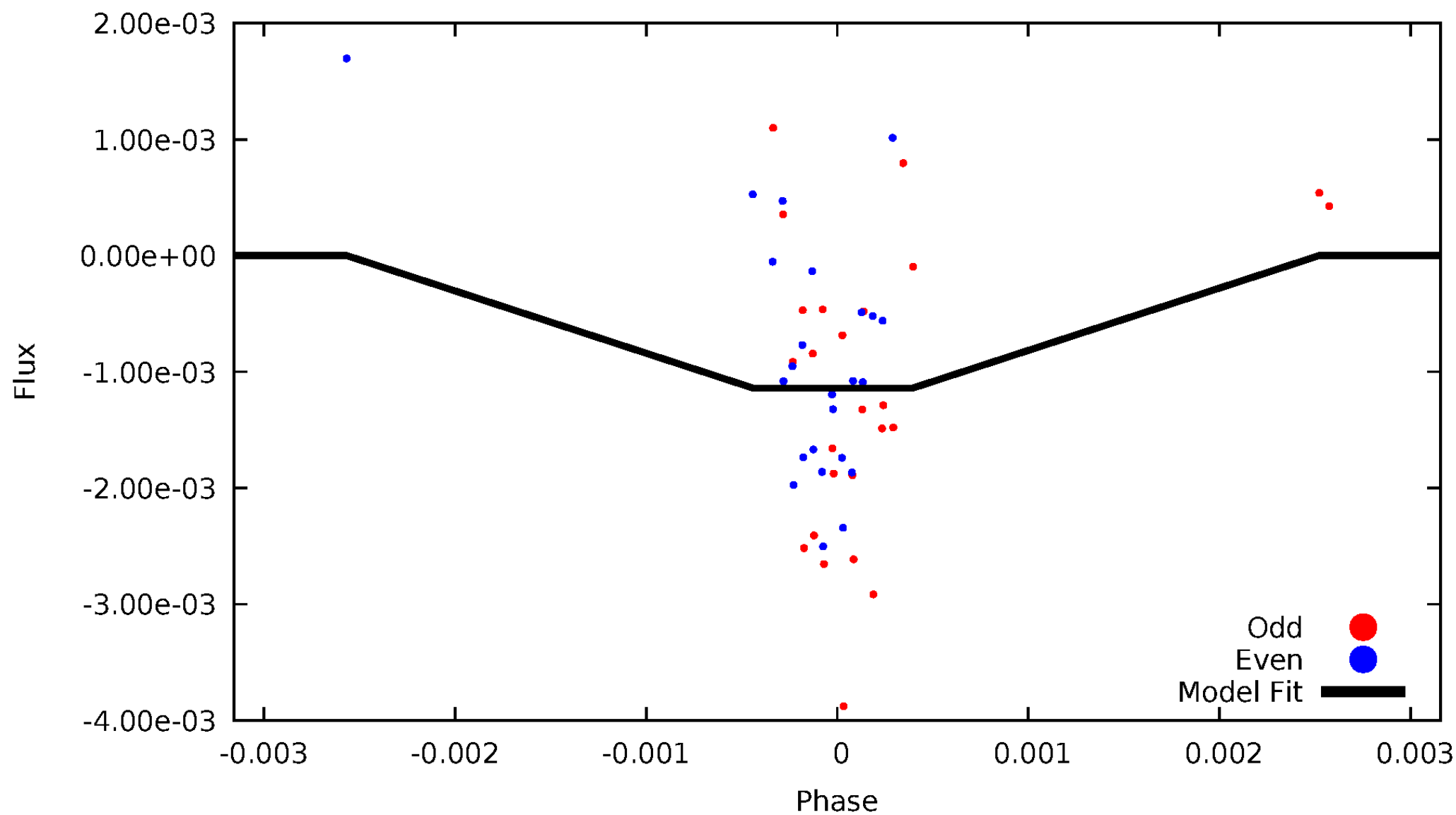
TCE 007597771-04





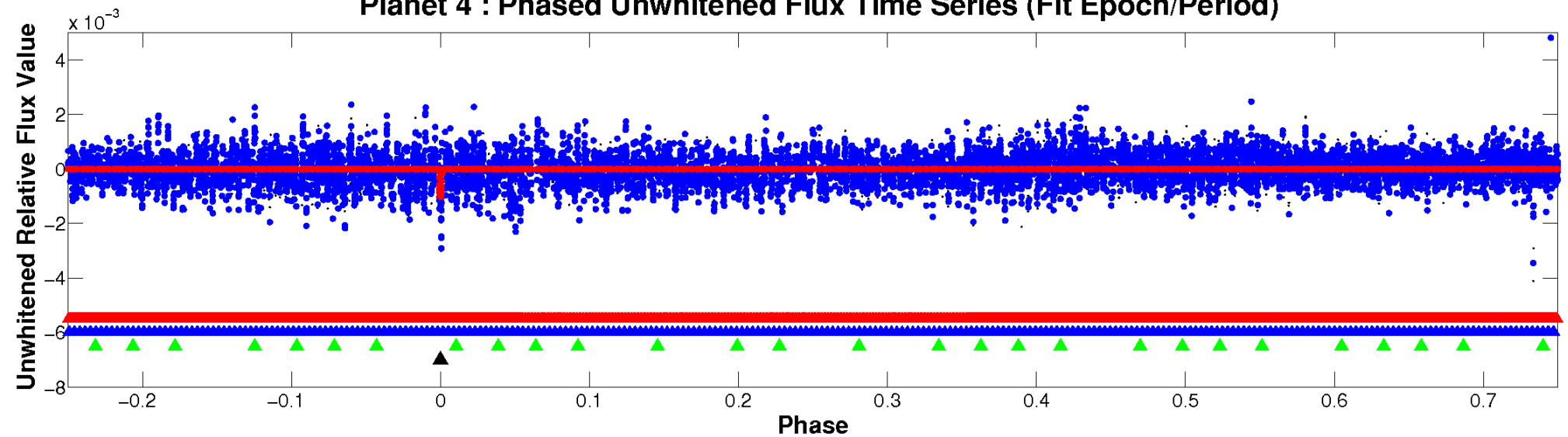
# ALT Odd/Even

TCE 007597771-04

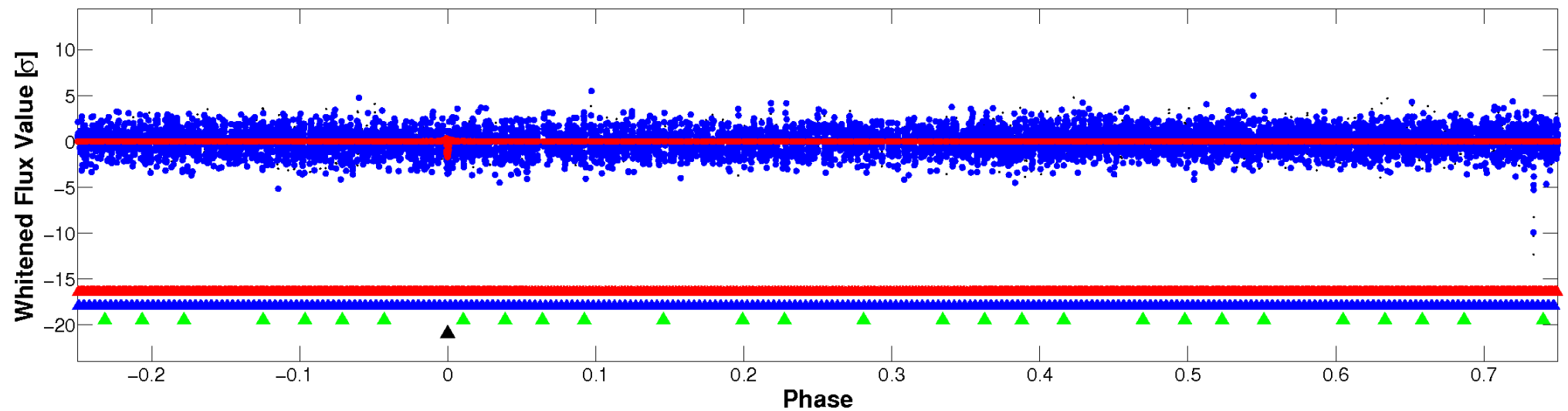


# Non-Whitened Vs. Whitened Light Curve

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

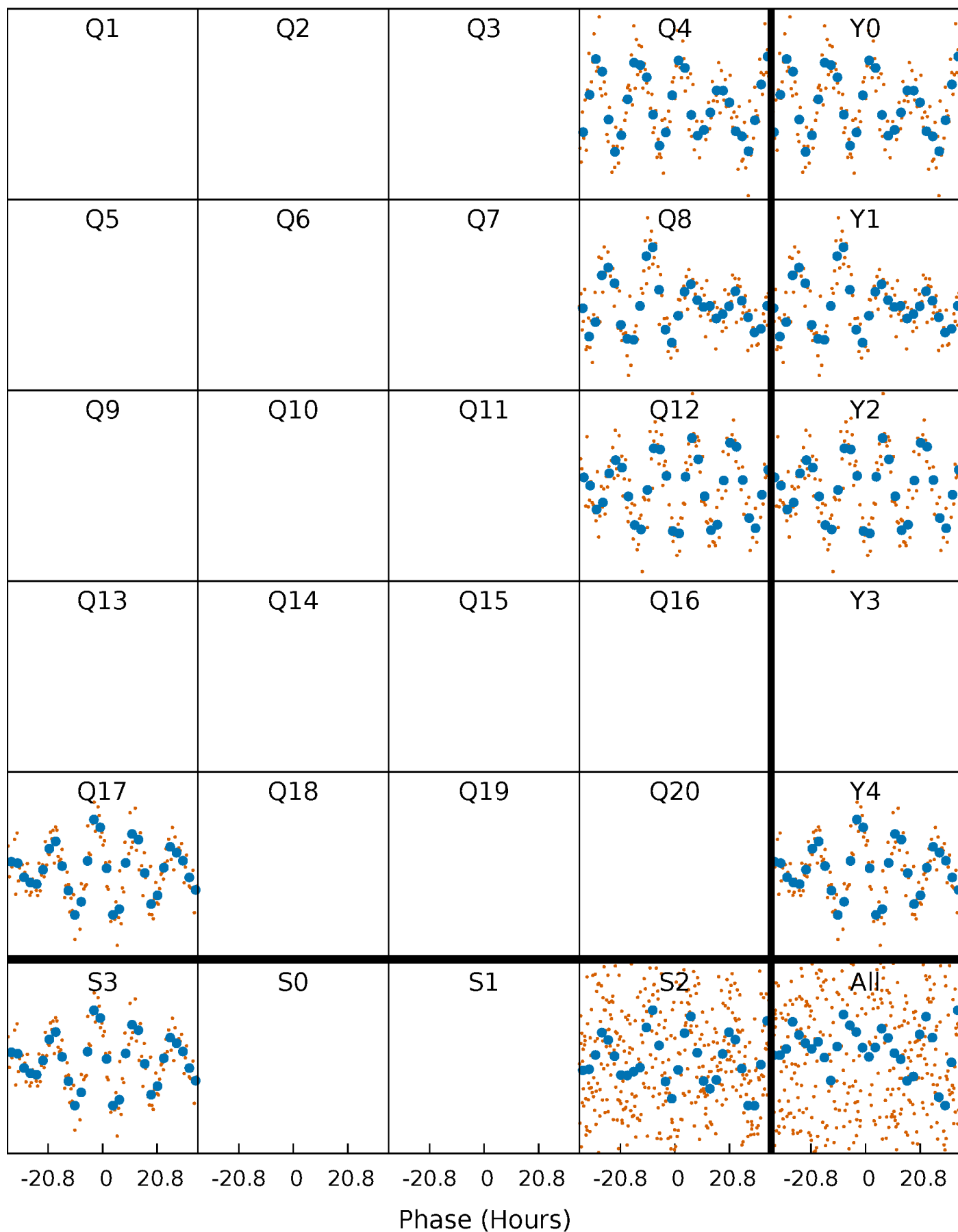


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



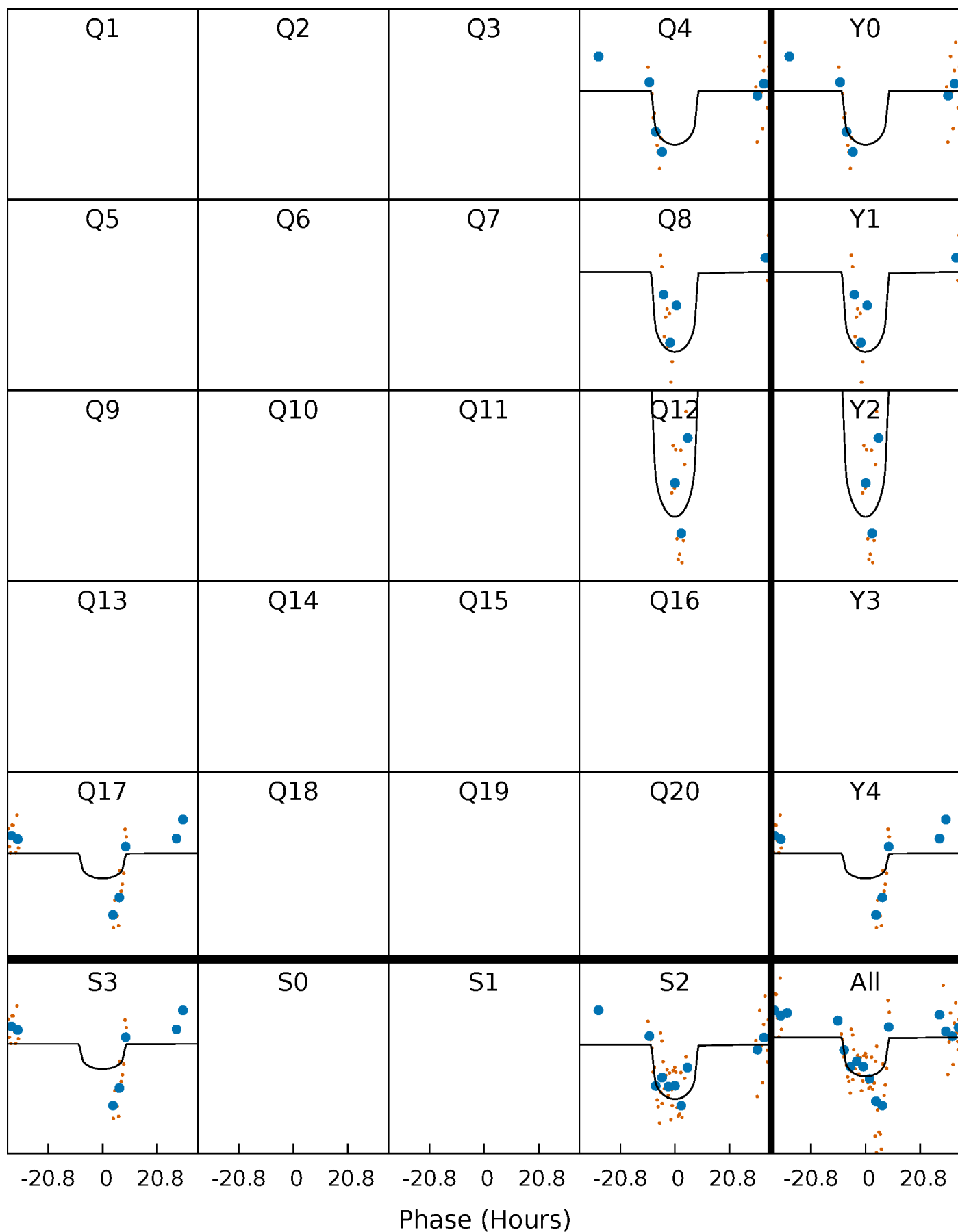
# PDC Quarter-Phased Transit Curves

TCE 007597771-04     $P=394.148782$  Days     $T_0=386.722088$  (BKJD)



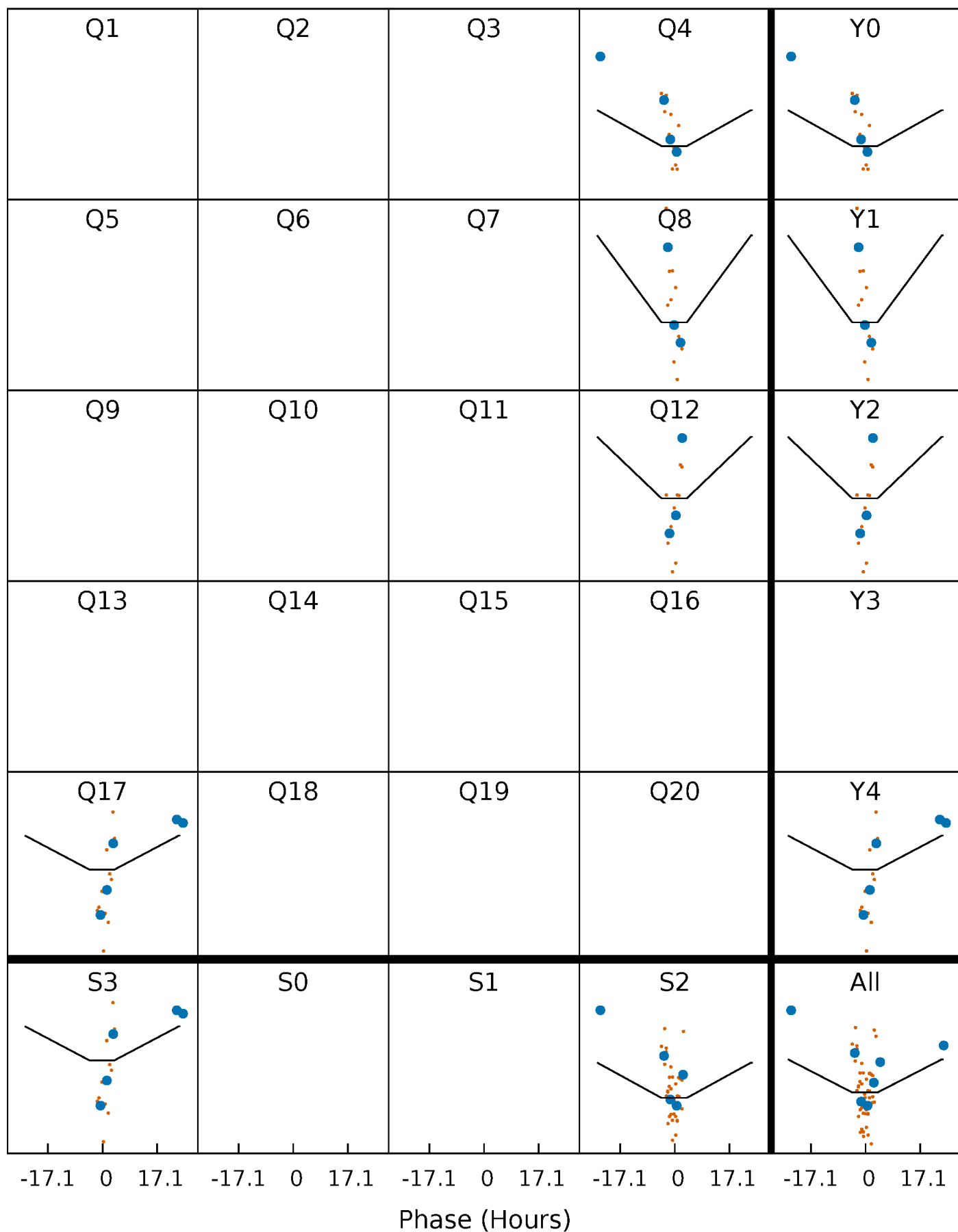
# DV Quarter-Phased Transit Curves

TCE 007597771-04     $P=394.148782$  Days     $T_0=386.722088$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007597771-04 P=394.306407 Days  $T_0=386.469895$  (BKJD)

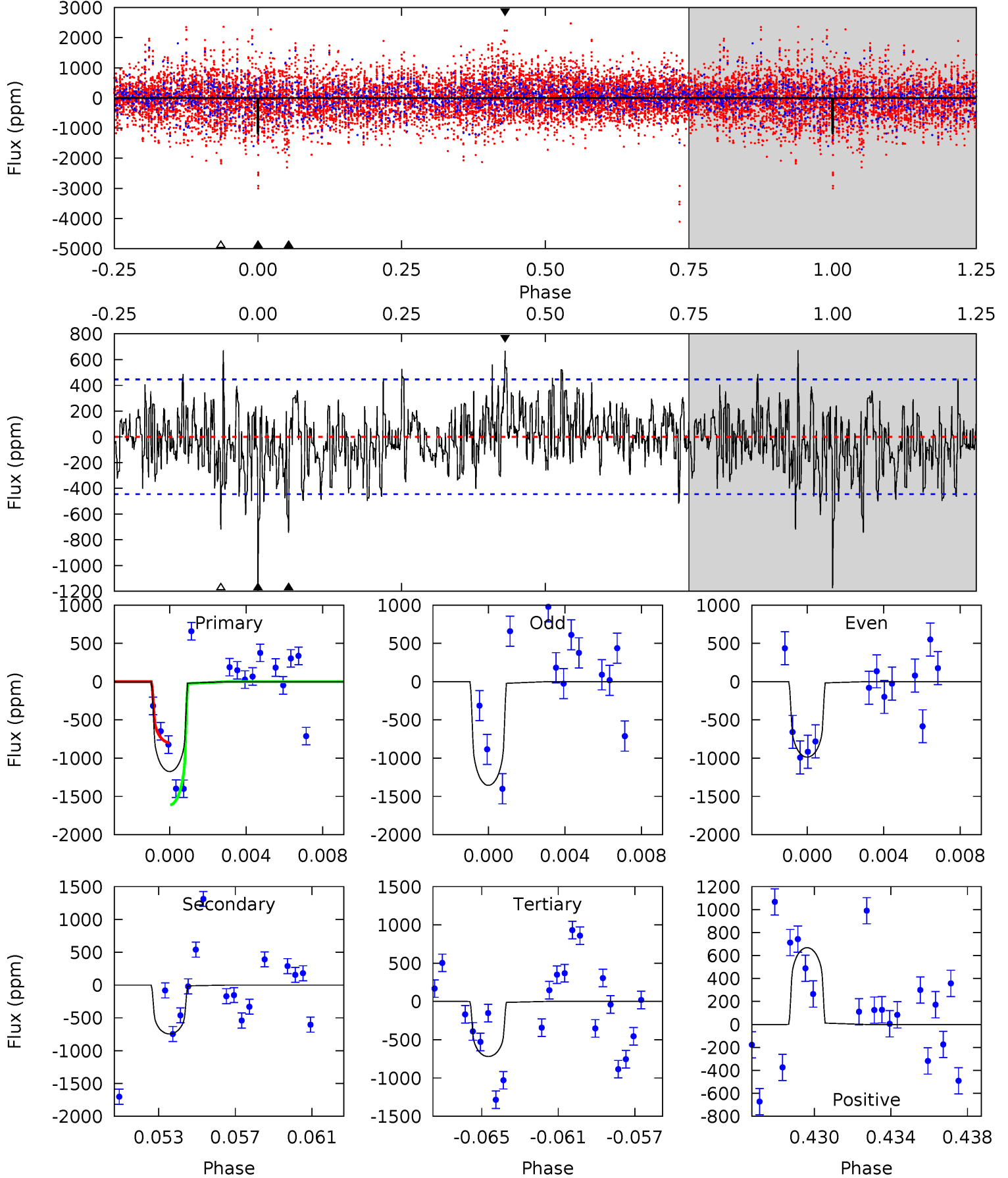




# DV Model-Shift Uniqueness Test

007597771-04, P = 394.148782 Days, E = 386.722088 Days

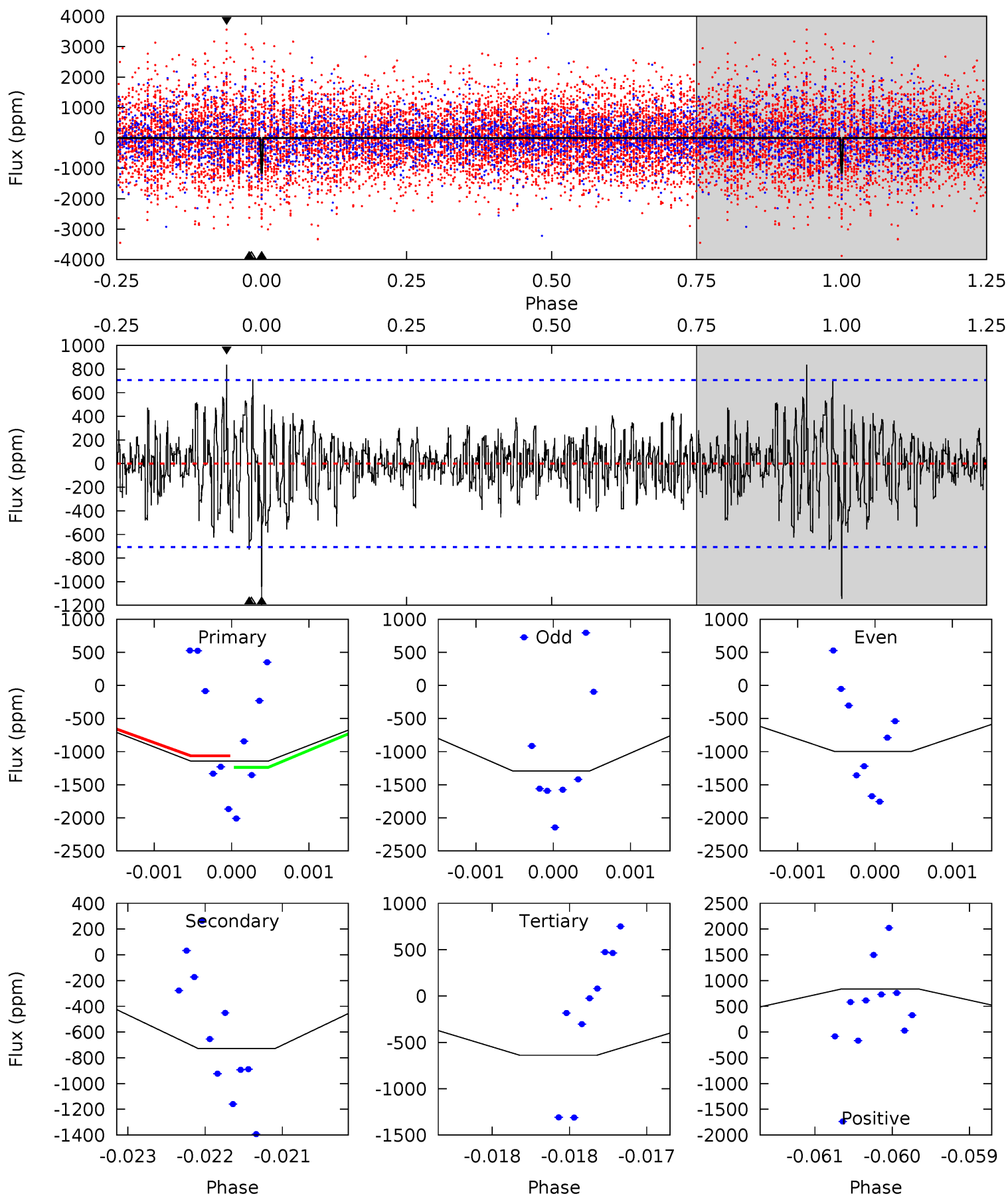
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.7	8.68	8.37	7.78	5.20	2.87	2.17	5.31	5.90	0.30	0.89	2.18	1.22	0.36	4.74



# Alt Model-Shift Uniqueness Test

007597771-04, P = 394.306407 Days, E = 386.469895 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.87	5.64	4.95	6.49	5.48	3.34	1.45	3.92	2.38	0.69	-0.84	1.15	1.13	0.42	0.68



### Stellar Parameters For KIC 007597771

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$5125^{+179}_{-179}$	$4.551^{+0.071}_{-0.058}$	$-0.280^{+0.300}_{-0.300}$	$0.748^{+0.080}_{-0.080}$	$0.727^{+0.098}_{-0.057}$	$2.447^{+0.785}_{-0.498}$
	+3%/-3%	+2%/-1%	+107%/-107%	+11%/-11%	+13%/-8%	+32%/-20%
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 007597771-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-745 \pm 86$	$2.64^{+0.73}_{-0.63}$	$280^{+13}_{-12}$	$4758^{+650}_{-453}$	$52411^{+41014}_{-20347}$
Alt.	$-728 \pm 129$	$2.75^{+0.74}_{-0.74}$	$281^{+12}_{-13}$	$4670^{+711}_{-495}$	$47501^{+42029}_{-19390}$

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

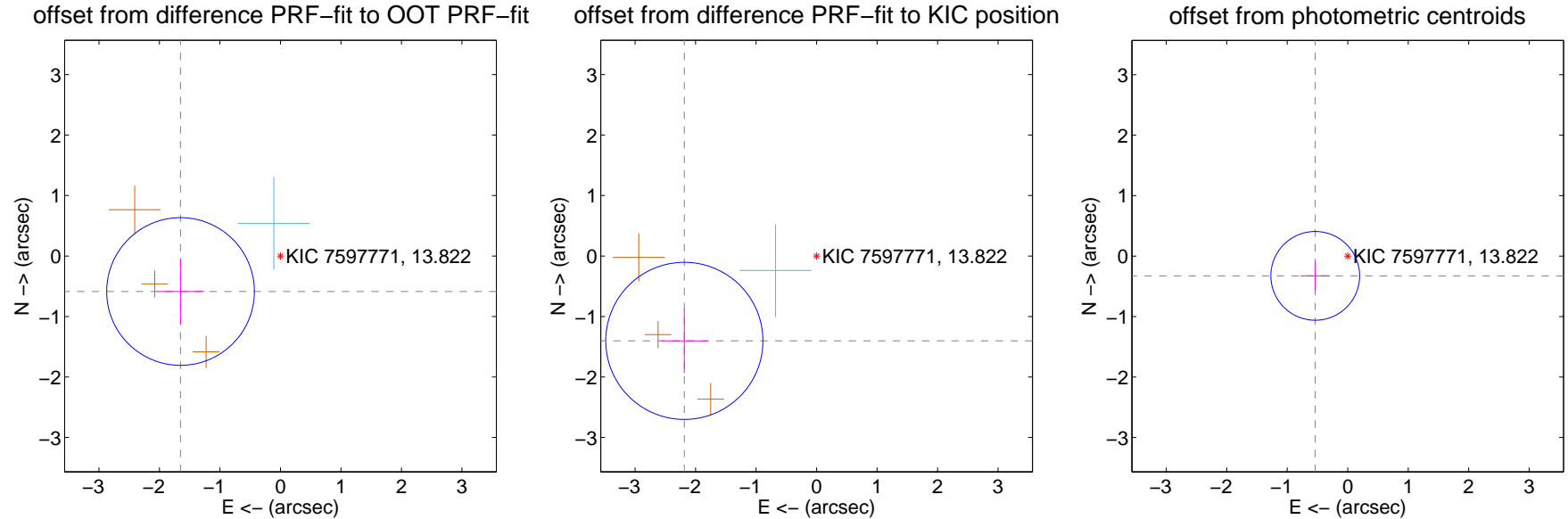
## DV Centroid Data

Supplemental centroid analysis for 007597771-04. Kepler magnitude: 13.82. Transit SNR 8.20

There are 1 quarters with good PRF difference image offsets

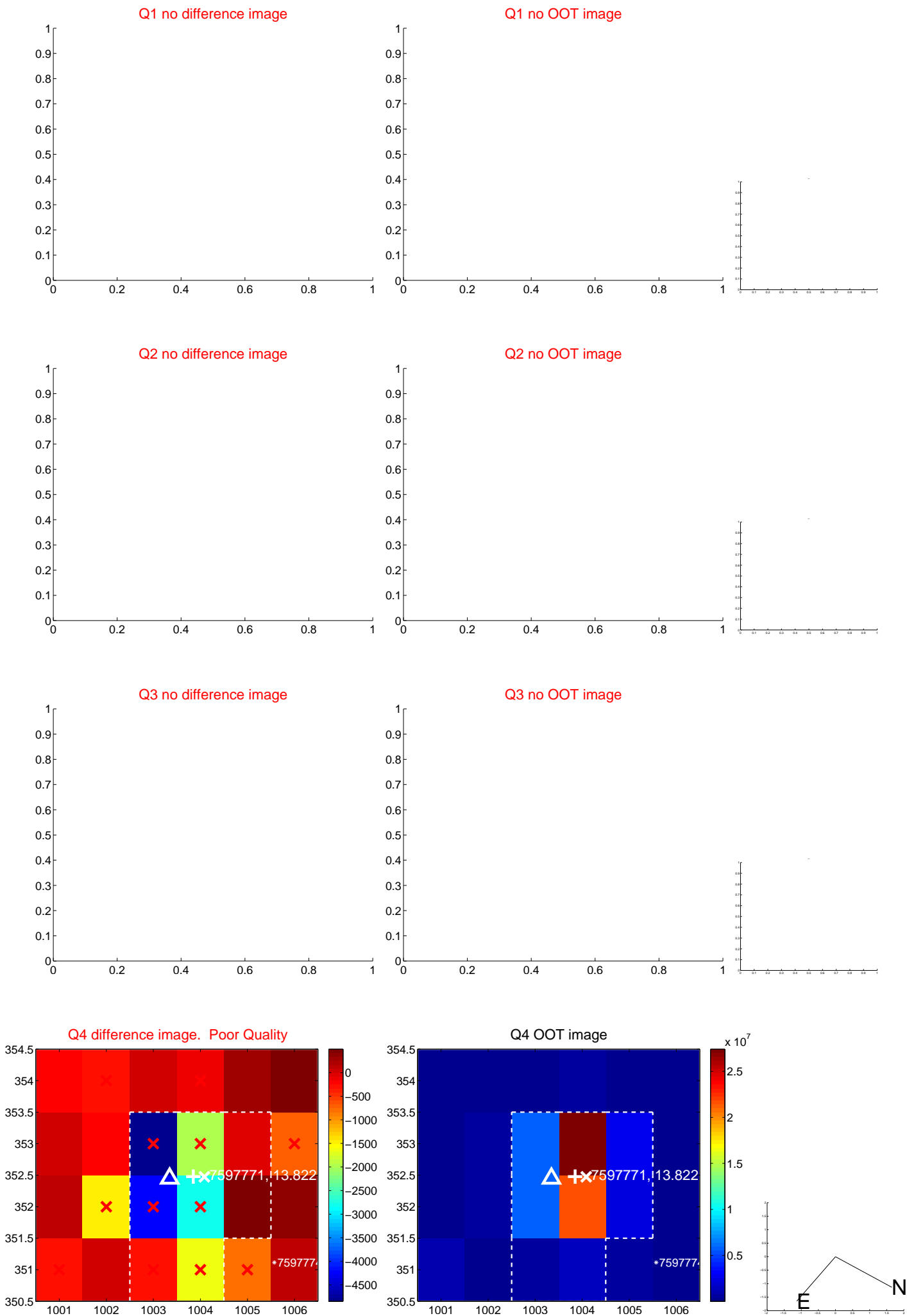
The direct PRF centroid is offset from the target star catalog position by about 1.00 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.753 \pm 0.407$	4.31	$1.652 \pm 0.387$	$-0.586 \pm 0.538$
PRF-fit source offset from KIC position	$2.597 \pm 0.433$	6.00	$2.186 \pm 0.386$	$-1.403 \pm 0.530$
photometric centroid source offset	$0.63 \pm 0.24$	2.57	$0.54 \pm 0.25$	$-0.33 \pm 0.24$

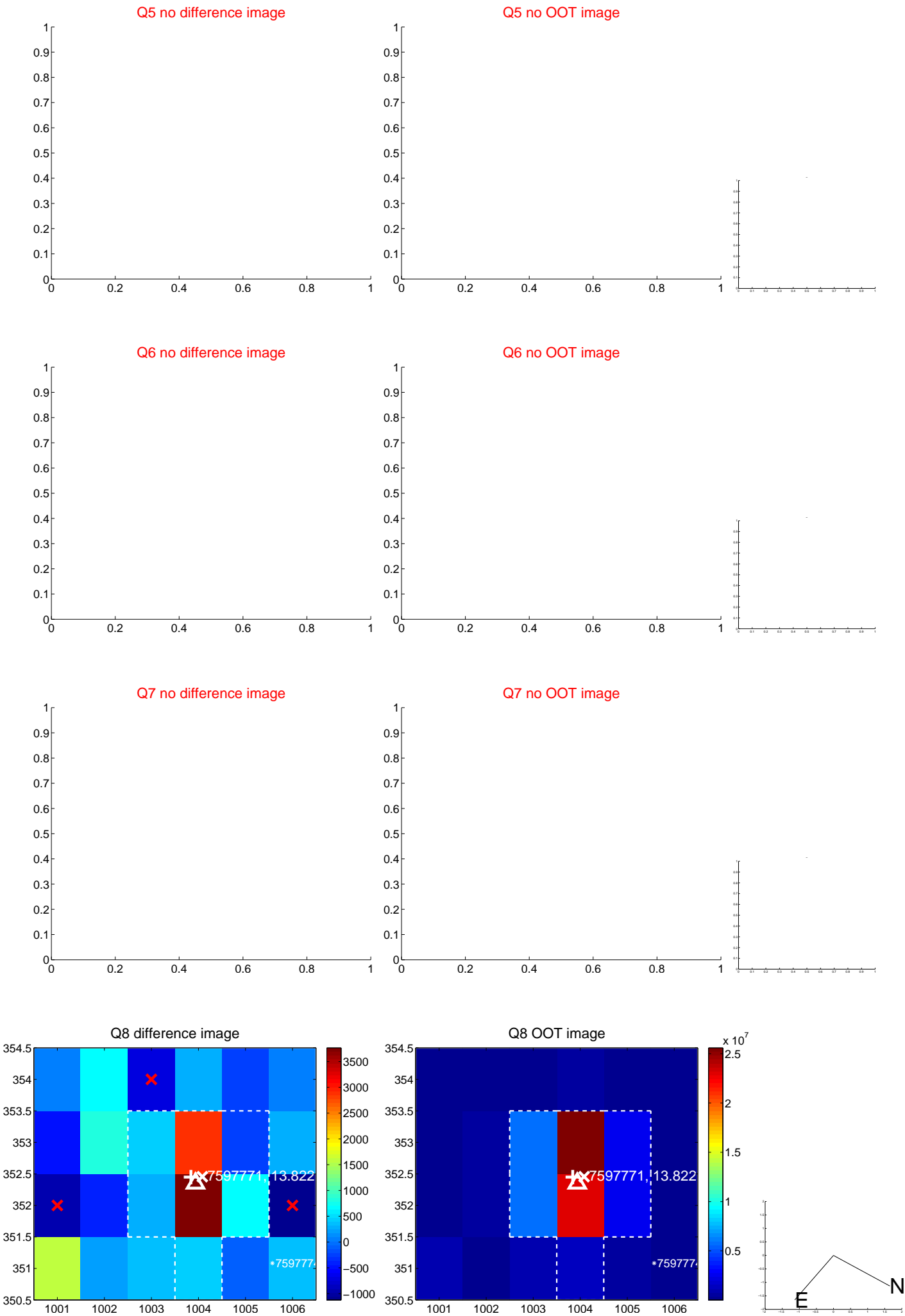


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

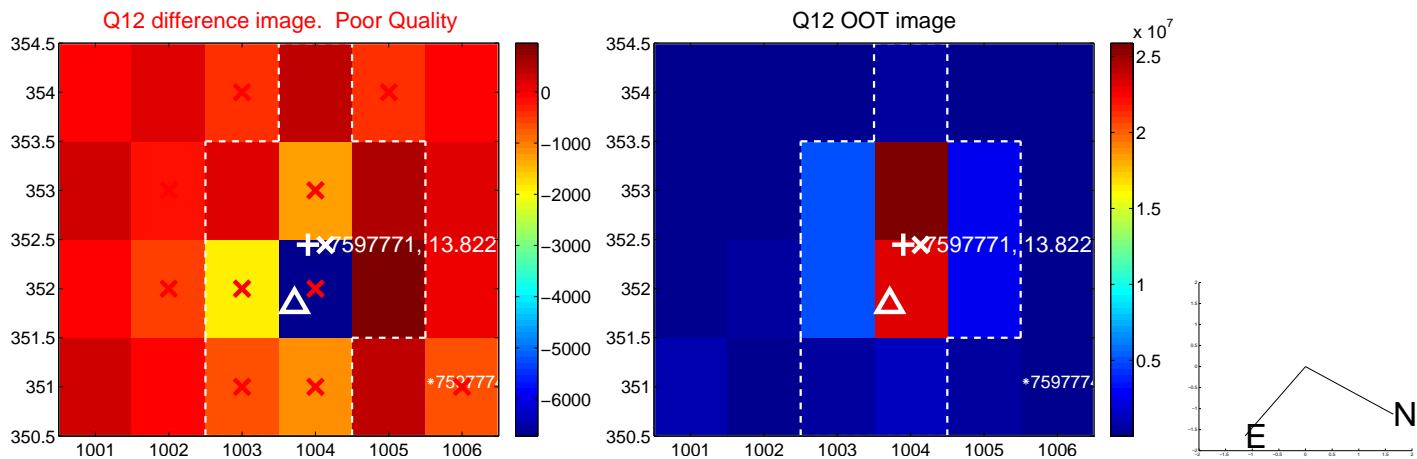
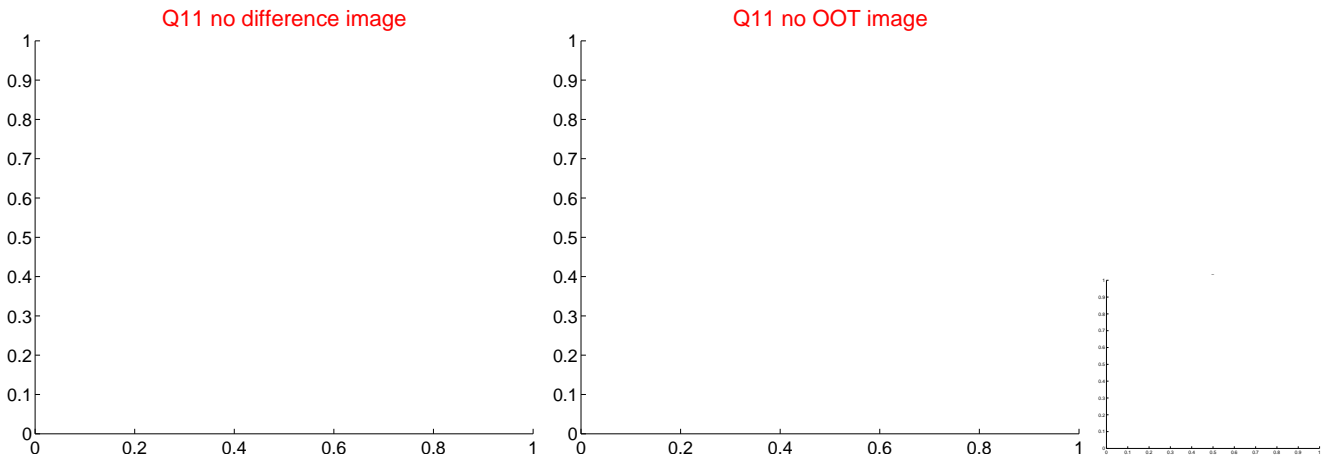
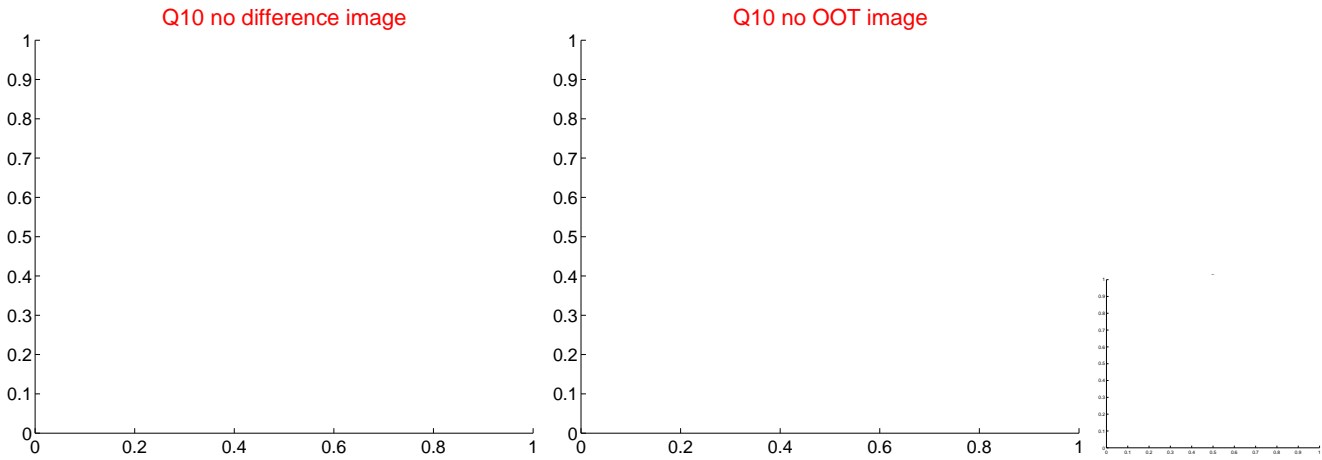
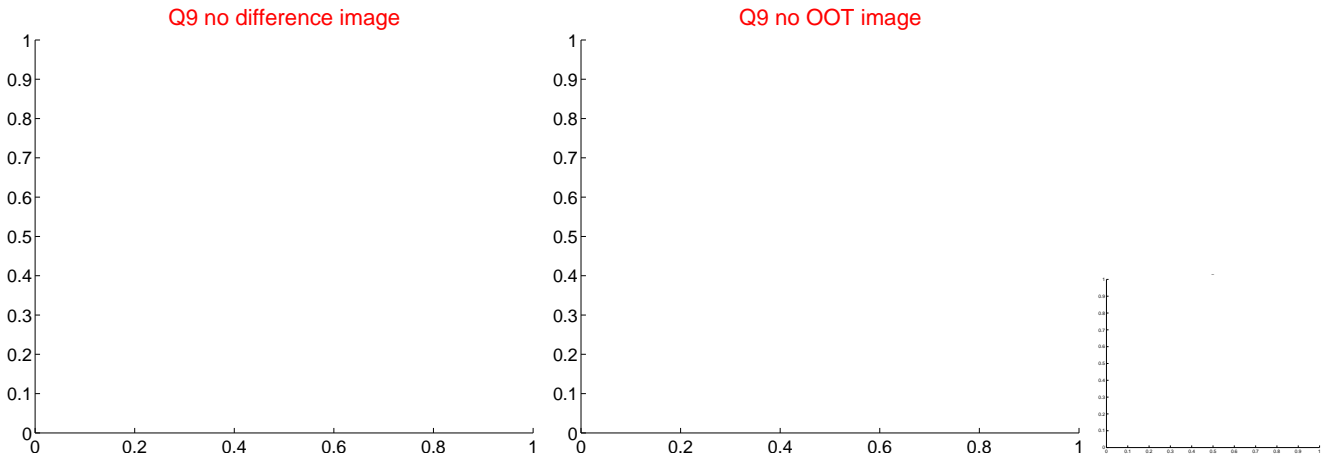


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





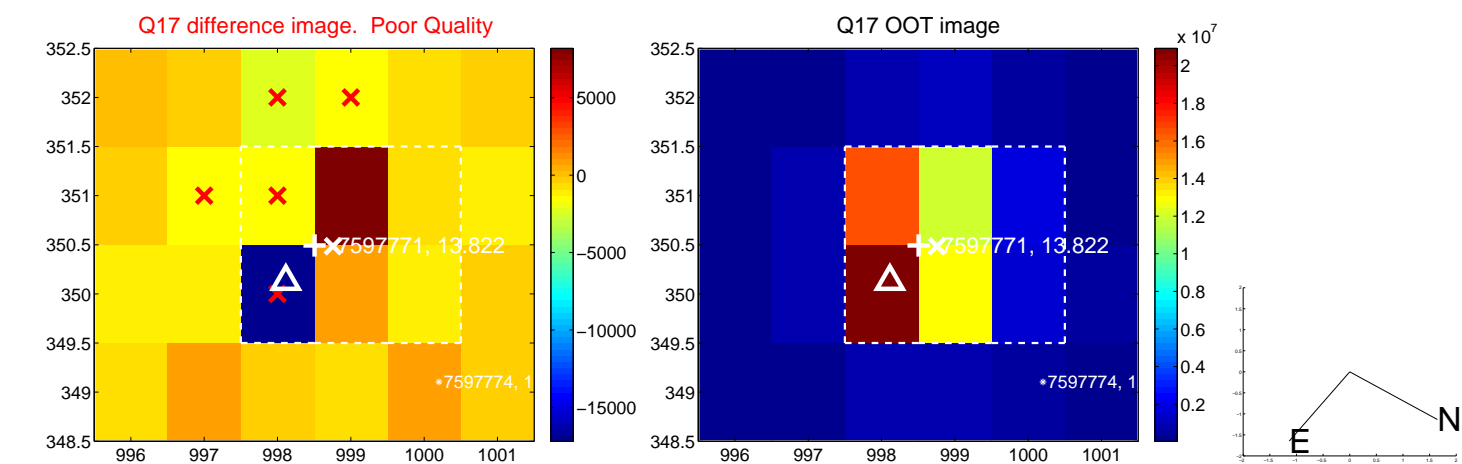
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



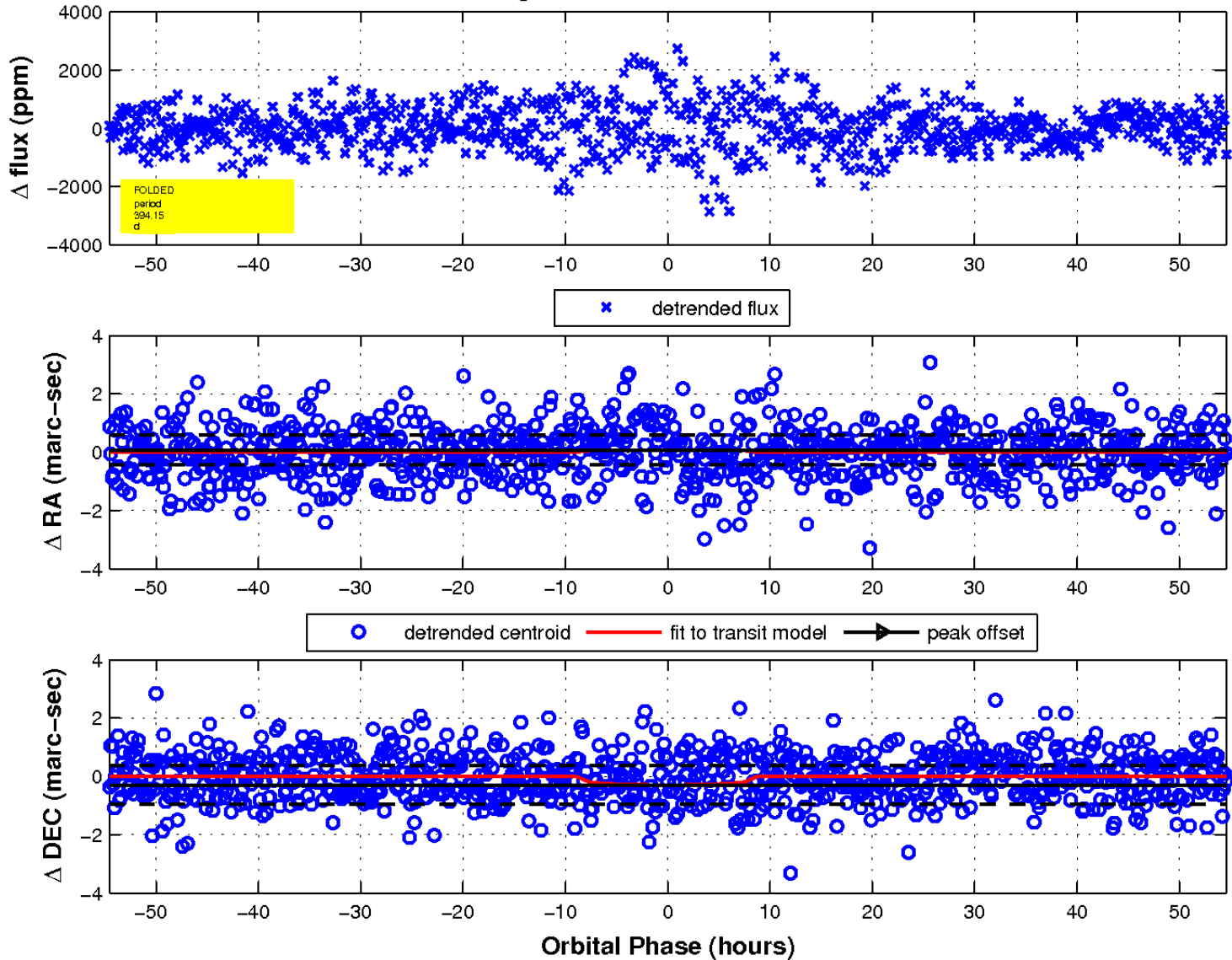
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



### fluxWeightedCentroids, Planet 4 of 4



UKIRT Image

Declination

