

# KIC 003954112

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003954112-01	OBS	No	1.193033	131.630990	0.0	8.770	12.0	0.0	3.40	6658	0.03	30203.64
003954112-03	OBS	No	63.836213	156.077208	819.7	1.907	11.0	9.8	3.40	6658	10.40	149.80
003954112-05	OBS	No	81.150550	154.876992	674.9	1.924	10.3	8.6	3.40	6658	10.24	108.78
003954112-07	OBS	No	14.392231	143.270046	377.7	1.692	8.5	6.7	3.40	6658	6.68	1091.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003954112-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003954112-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
003954112-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003954112-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—HALO_GHOST

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

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

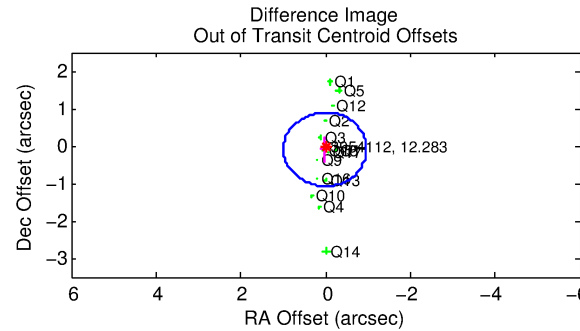
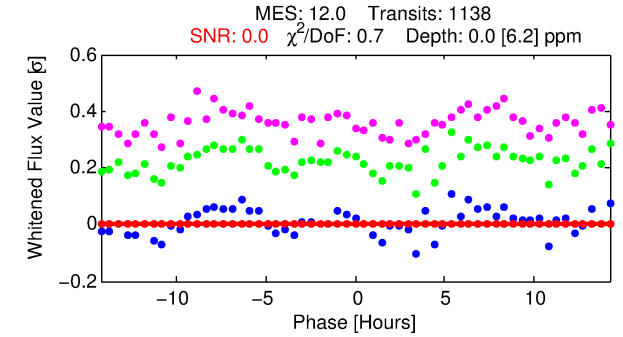
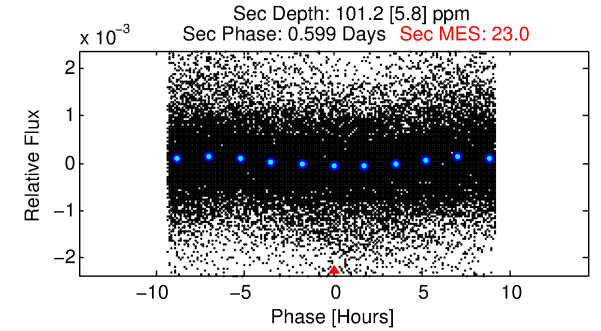
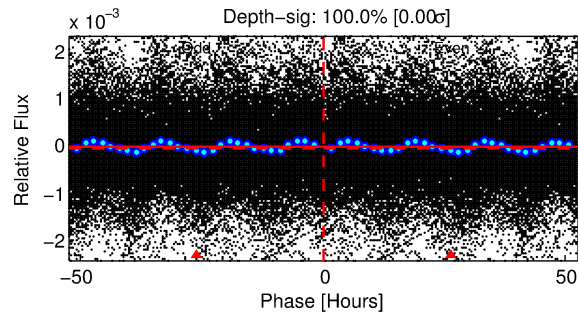
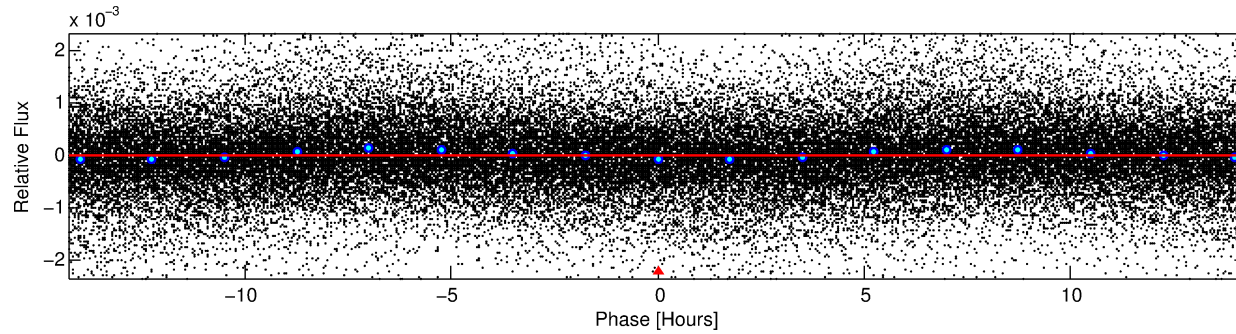
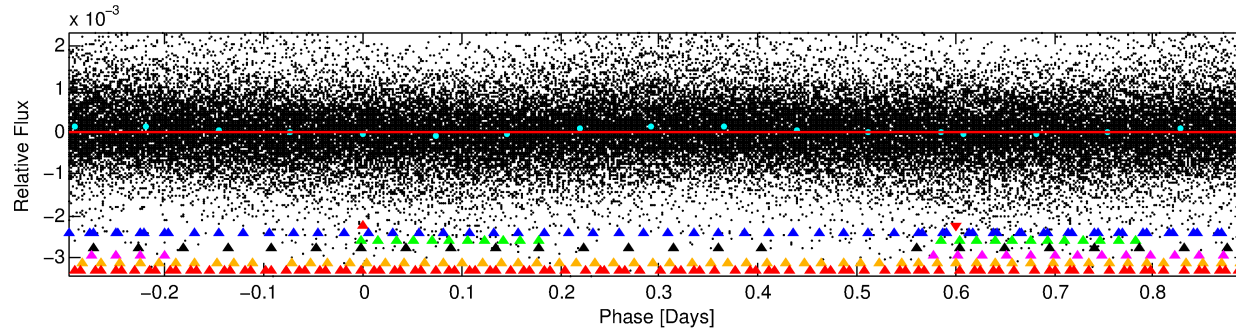
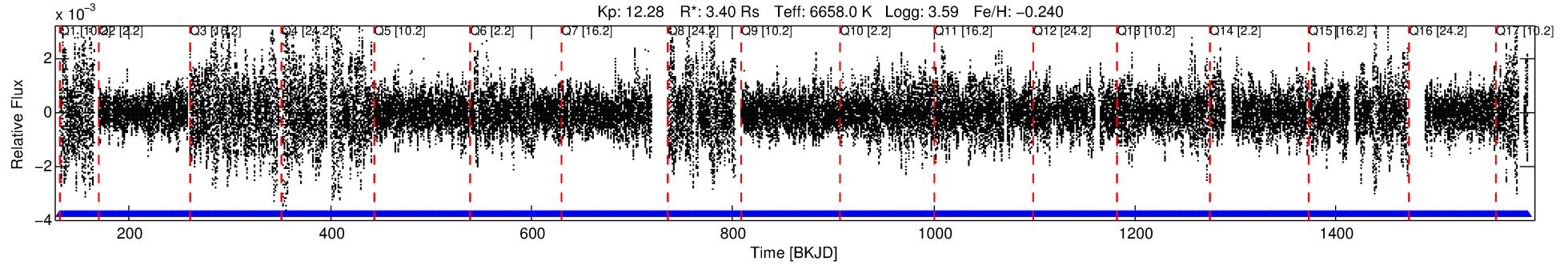
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003954112-01

No Significant Match Found

# DV One-Page Summary

KIC: 3954112 Candidate: 1 of 7 Period: 1.193 d



## DV Fit Results:

Period = 1.19303 [0.06450] d  
Epoch = 131.6310 [9.6137] BKJD  
Rp/R\* = 0.0001 [0.0320]  
a/R\* = 1.19 [41.44]  
b = 0.35 [295.67]  
Seff = 30203.64 [18887.97]  
Teq = 3362 [526] K  
Rp = 0.03 [11.90] Re  
a = 0.0260 [0.0100] AU  
Ag = 38116.32 [28877815.72] [0.00σ]  
Teffp = 72621 [13755502] K [0.01σ]

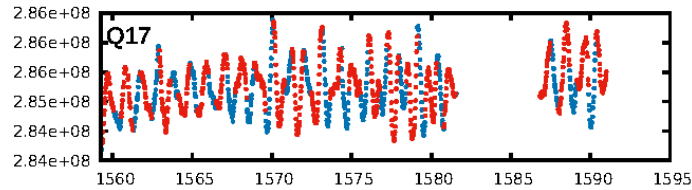
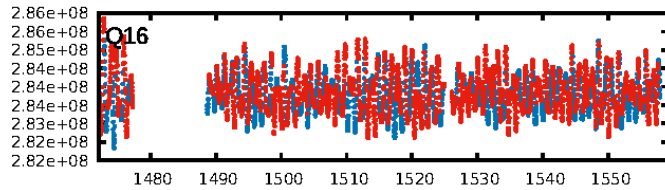
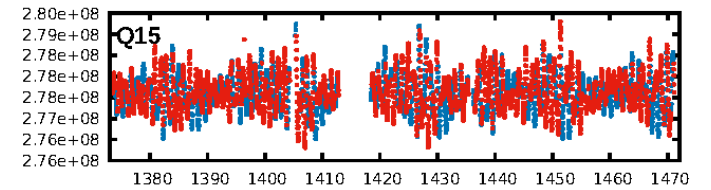
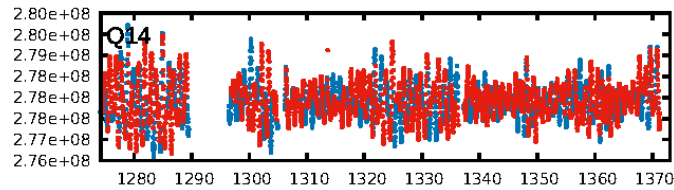
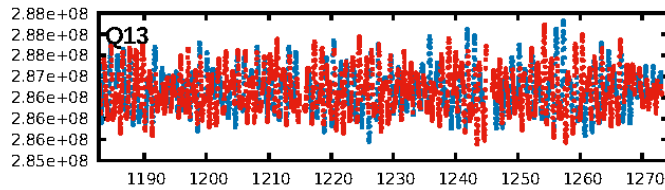
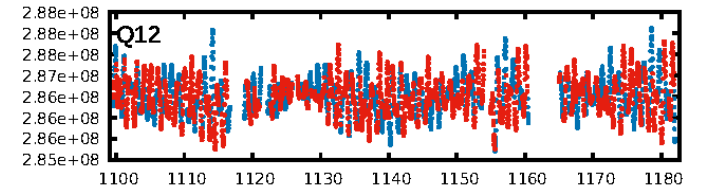
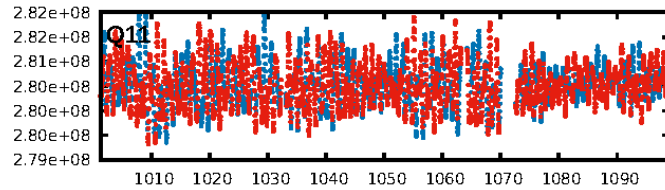
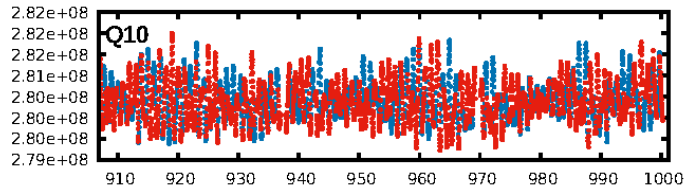
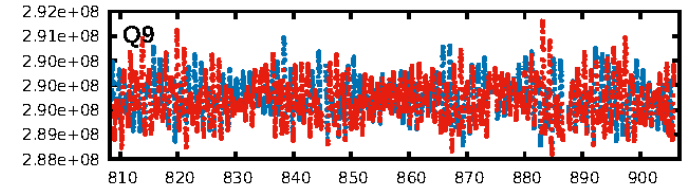
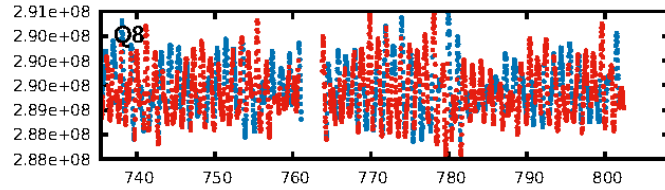
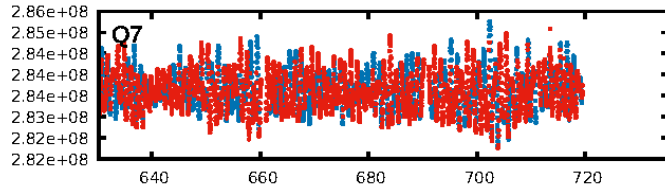
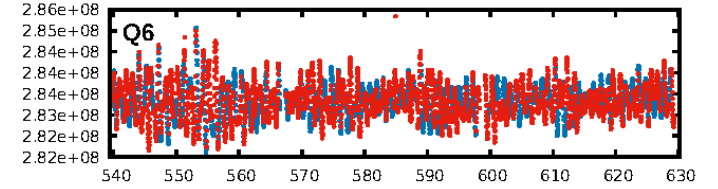
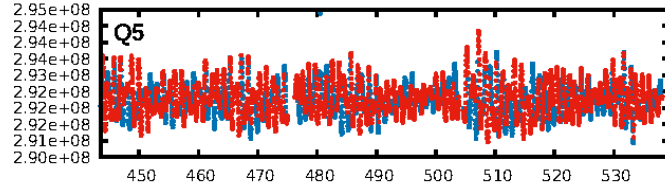
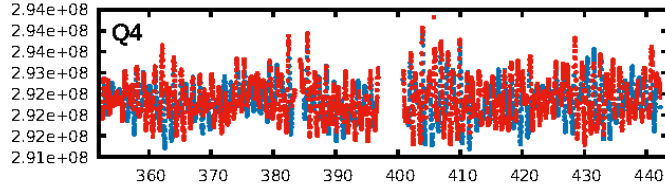
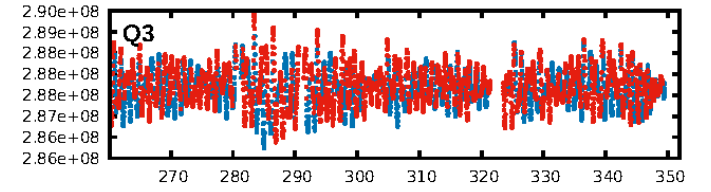
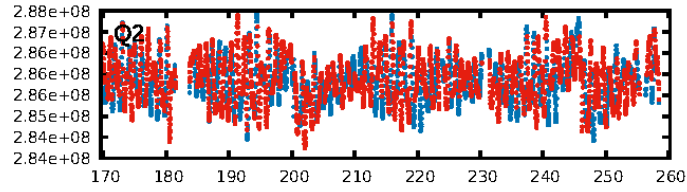
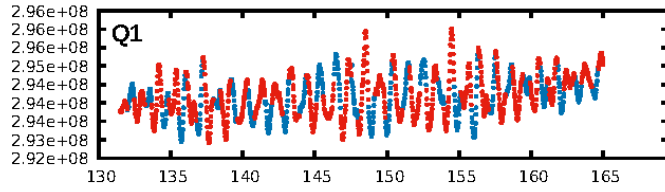
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [35.47σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1086/1086]  
GhostDiagnostic-chr: N/A  
Centroid-sig: N/A  
Centroid-so: N/A  
OotOffset-rm: 0.091 arcsec [0.28σ]  
KicOffset-rm: 0.080 arcsec [0.23σ]  
OotOffset-st: 3/3/3/5 [14]  
KicOffset-st: 3/3/3/5 [14]  
DiffImageQuality-fgm: 0.57 [8/14]  
DiffImageOverlap-fno: 1.00 [17/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:54:59 Z

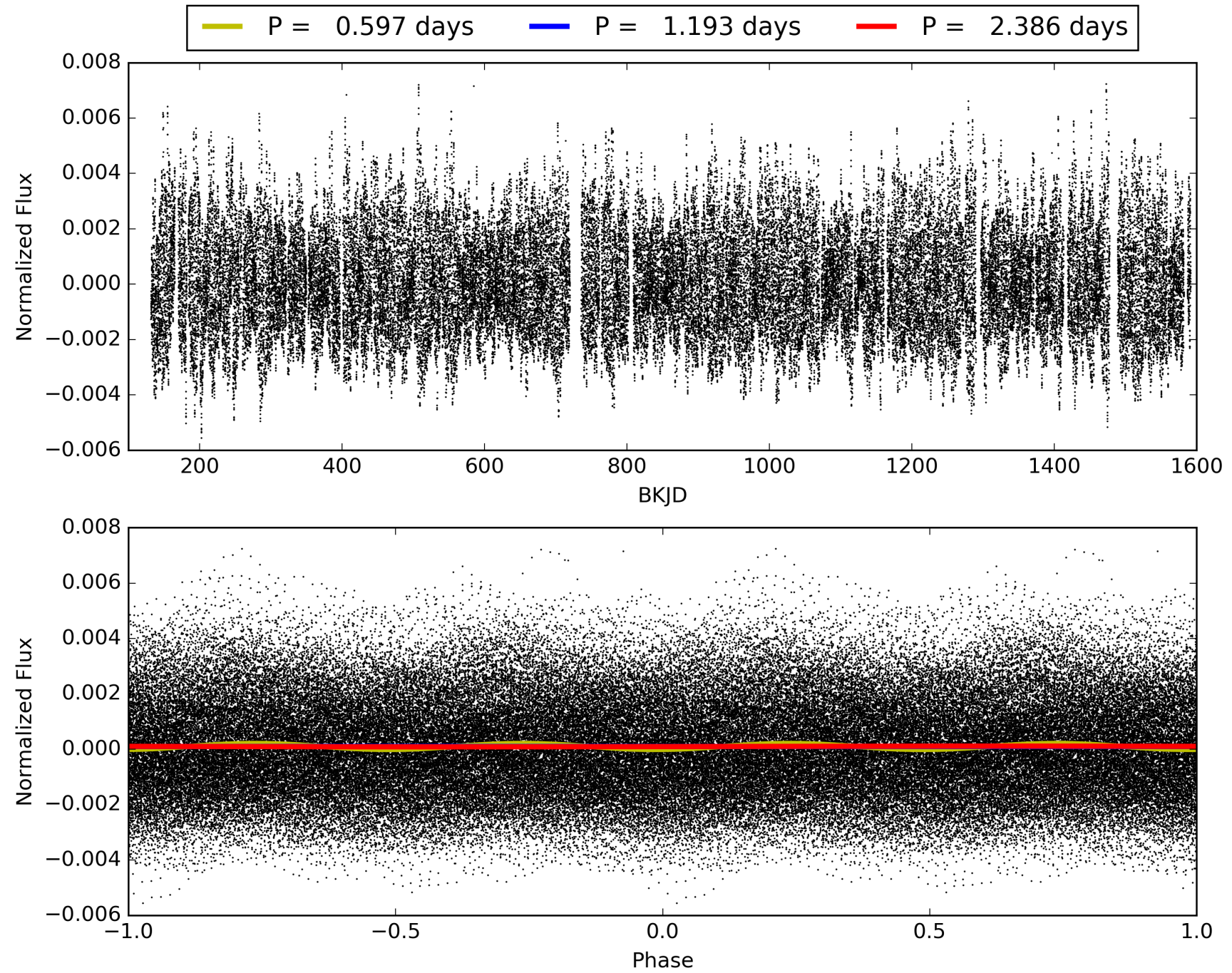
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 003954112-01, PDC Light Curves





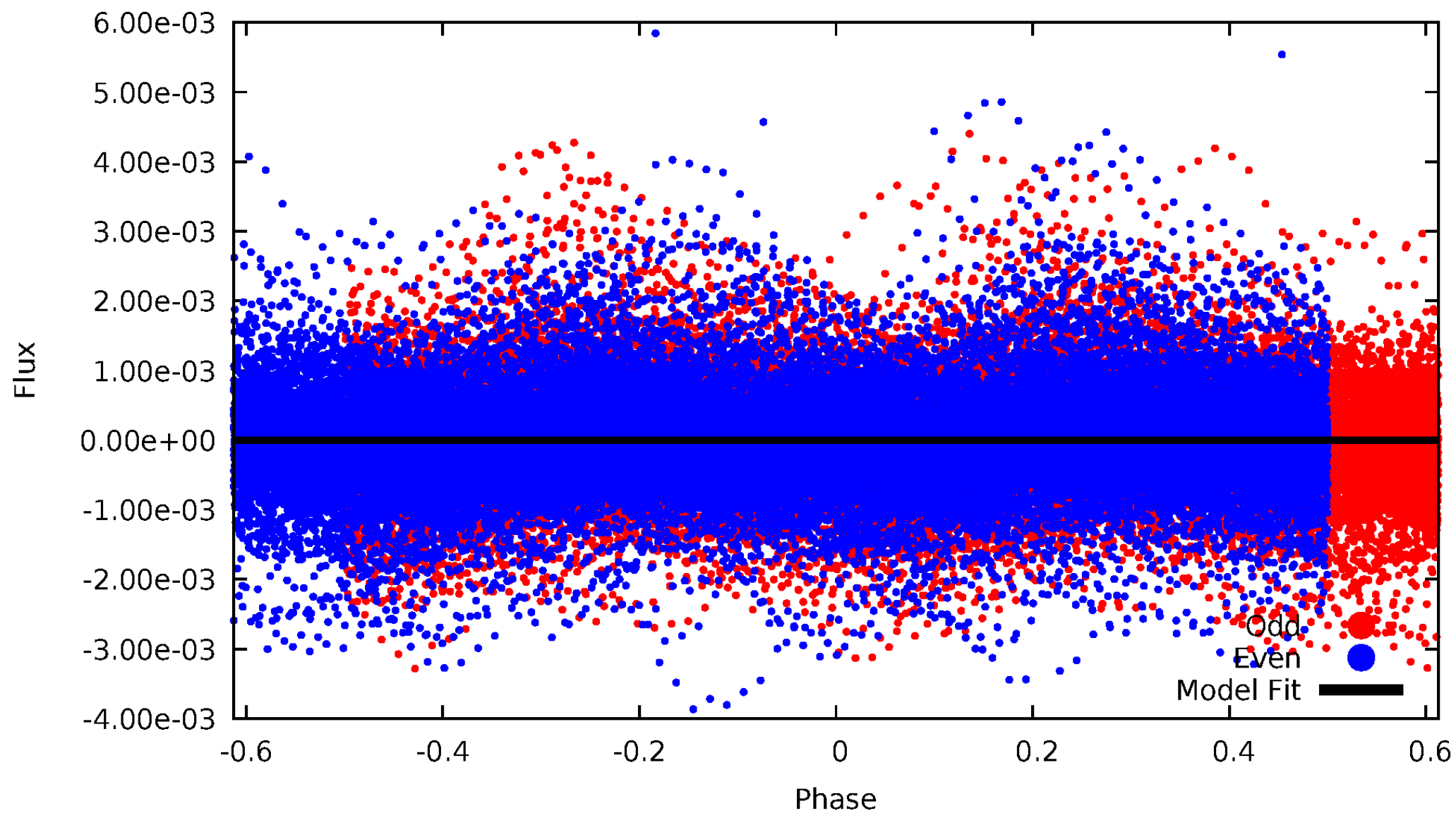
TCE 003954112-01





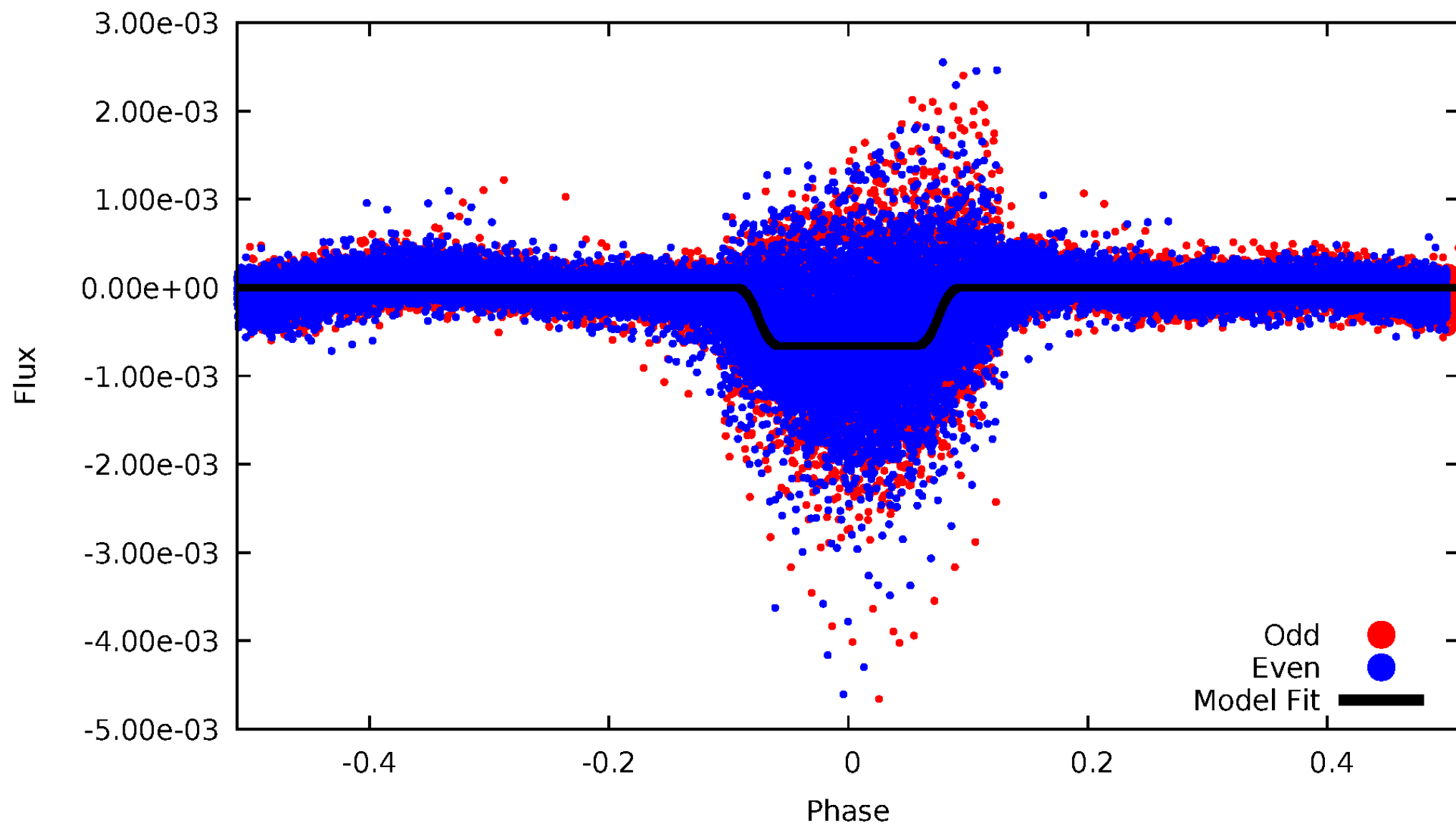
# DV Odd/Even

TCE 003954112-01



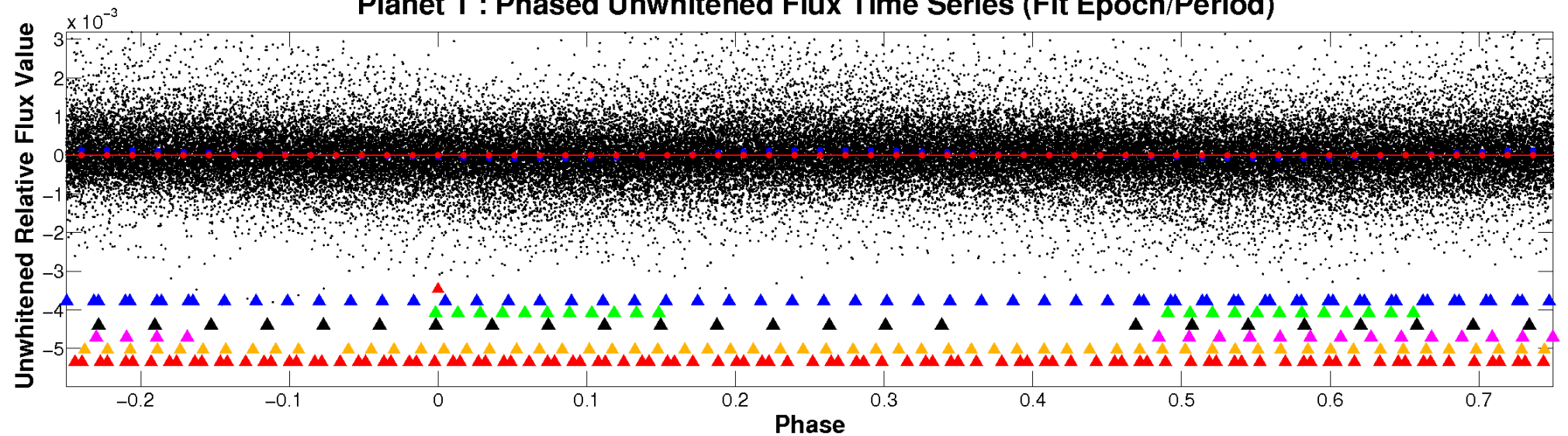
# ALT Odd/Even

TCE 003954112-01

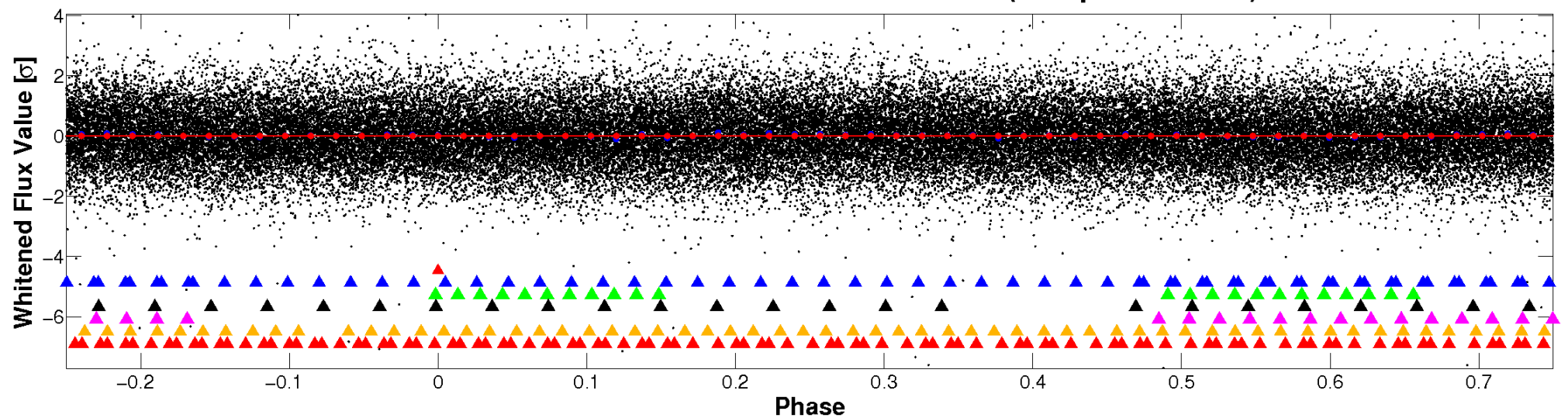


# Non-Whitened Vs. Whitened Light Curve

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



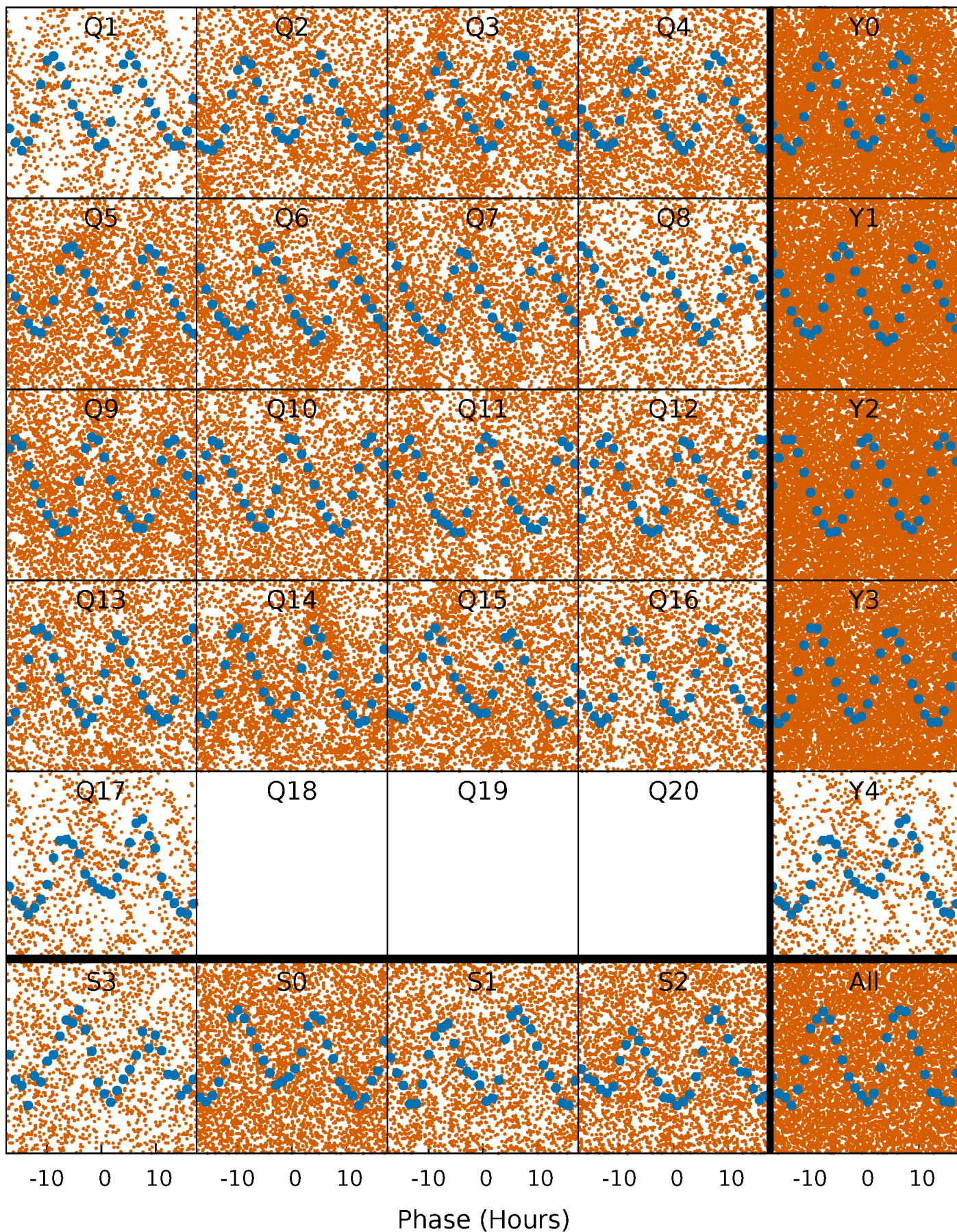
Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

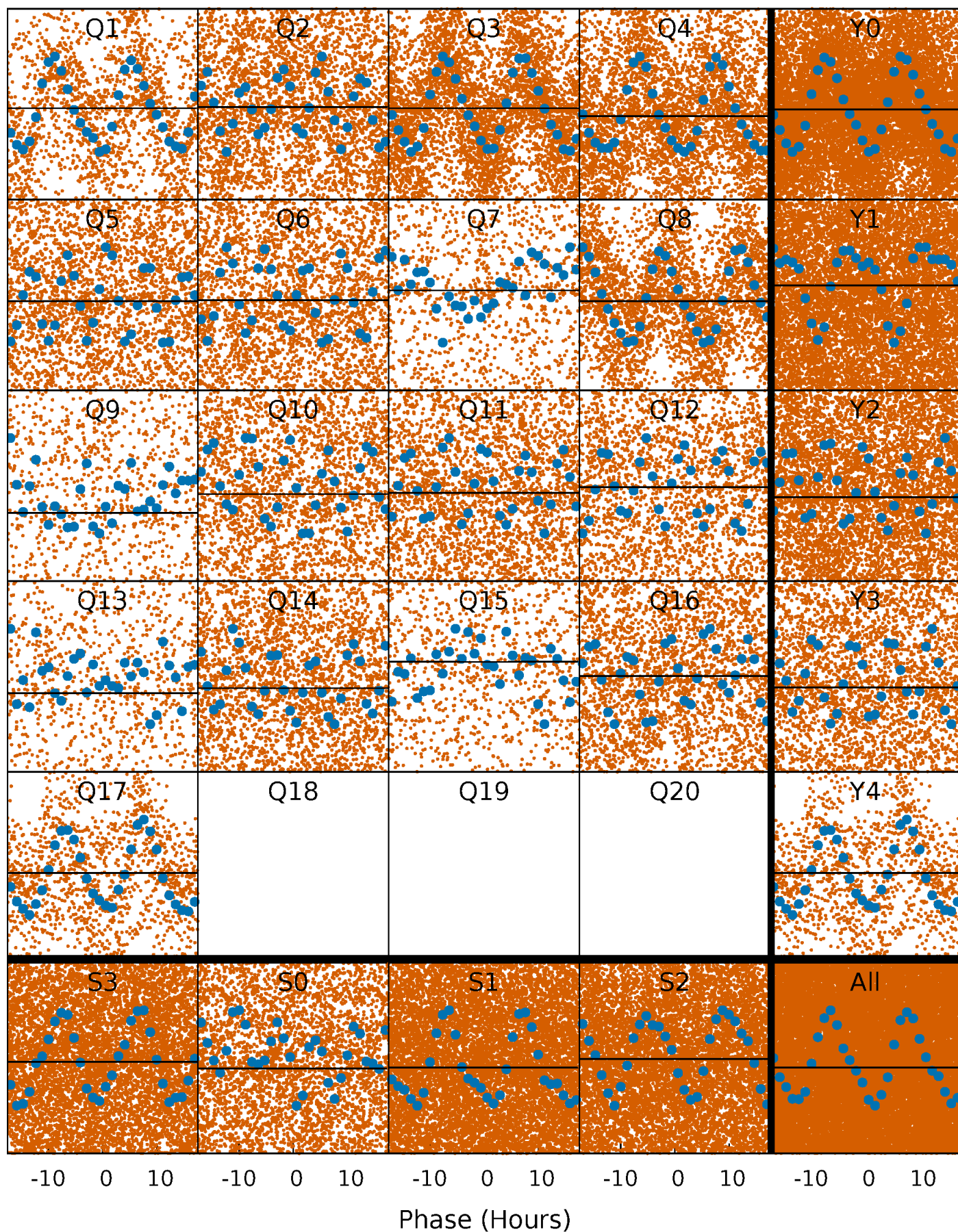
TCE 003954112-01 P= 1.193033 Days  $T_0=131.630990$  (BKJD)





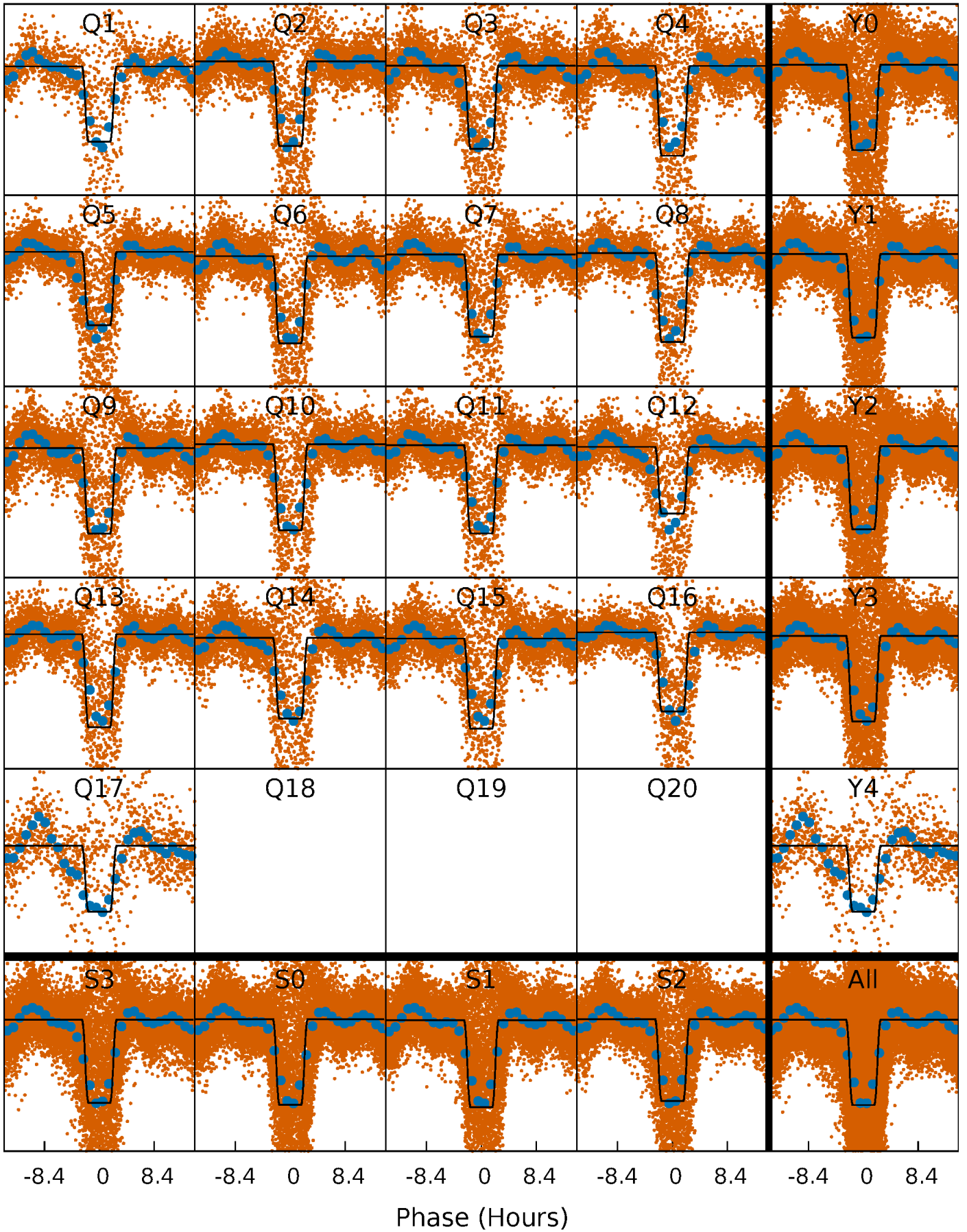
# DV Quarter-Phased Transit Curves

TCE 003954112-01 P= 1.193033 Days  $T_0=131.630990$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 003954112-01 P= 1.193593 Days  $T_0=131.643681$  (BKJD)

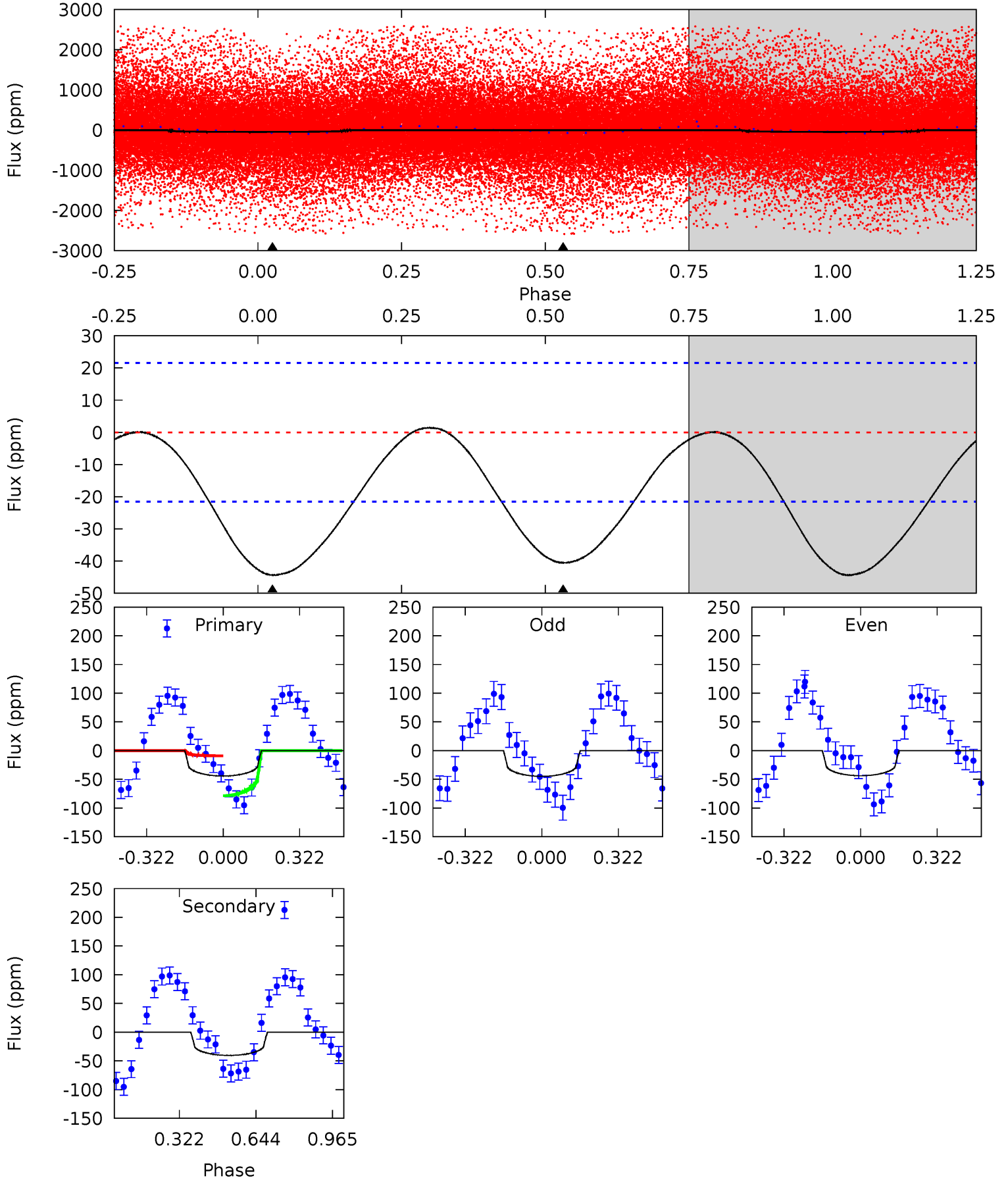




# DV Model-Shift Uniqueness Test

003954112-01, P = 1.193033 Days, E = 130.437957 Days

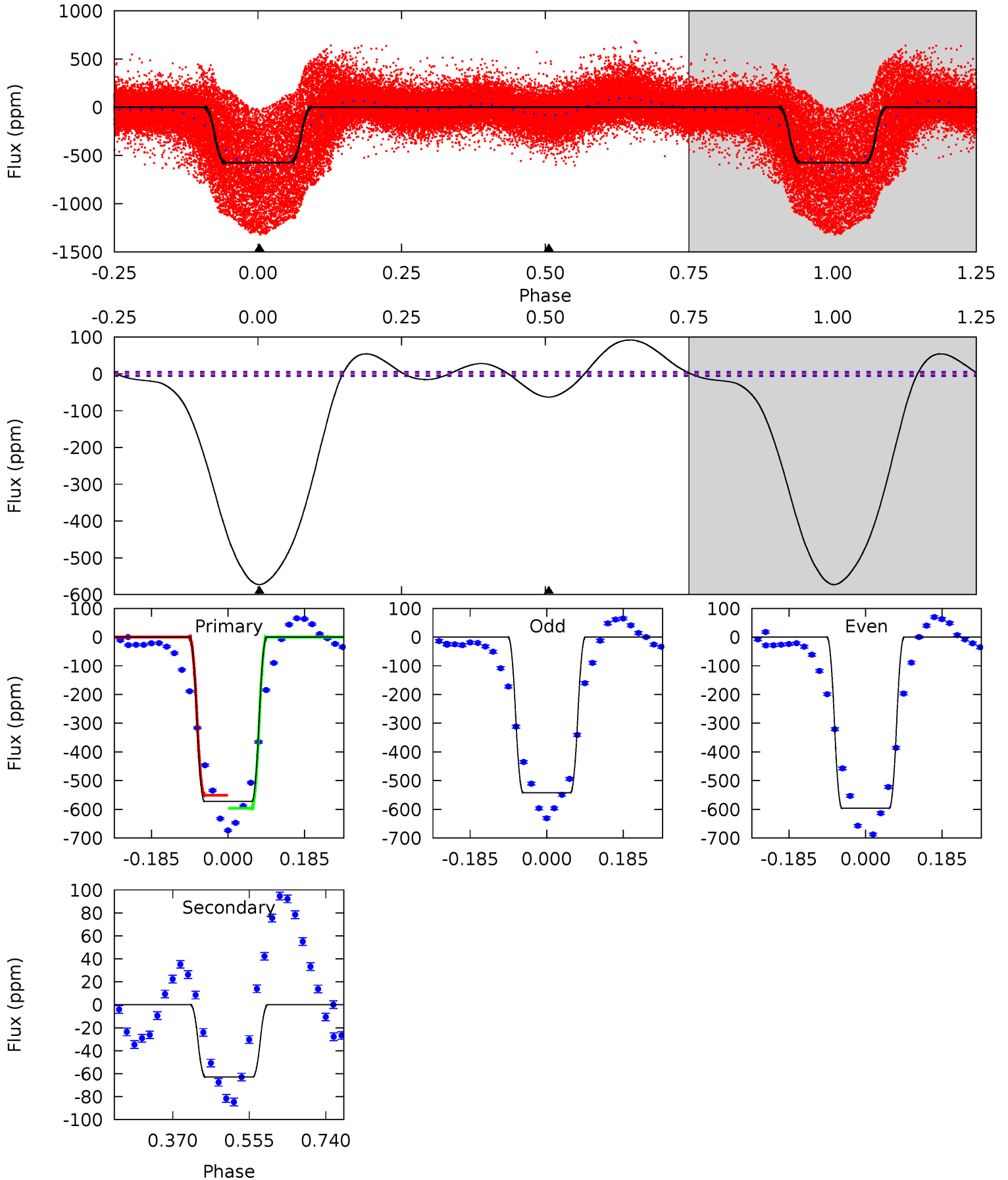
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.88	8.11	0	0	4.31	0.99	0.21	8.88	8.88	8.11	8.11	0.11	0.95	0.03	7.34



# Alt Model-Shift Uniqueness Test

003954112-01, P = 1.193593 Days, E = 130.450088 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
445.6	49.0	0	0	4.43	1.33	19.8	445.6	445.6	49.0	49.0	20.7	1.03	0.14	0



### Stellar Parameters For KIC 003954112

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6658^{+179}_{-199}$	$3.590^{+0.357}_{-0.084}$	$-0.240^{+0.300}_{-0.250}$	$3.404^{+0.341}_{-1.363}$	$1.645^{+0.224}_{-0.336}$	$0.059^{+0.145}_{-0.012}$
	+3%/-3%	+10%/-2%	+125%/-104%	+10%/-40%	+14%/-20%	+247%/-21%
Source	PHO1	FLK73	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 003954112-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-41 \pm 5$	$7.65^{+8.11}_{-5.33}$	$4601^{+270}_{-431}$	$-2972^{+9178}_{-958}$	$0.255^{+2.699}_{-0.195}$
Alt.	$-63 \pm 1$	$12.41^{+10.08}_{-8.00}$	$4622^{+255}_{-437}$	$-3481^{+8416}_{-502}$	$0.157^{+1.085}_{-0.110}$

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



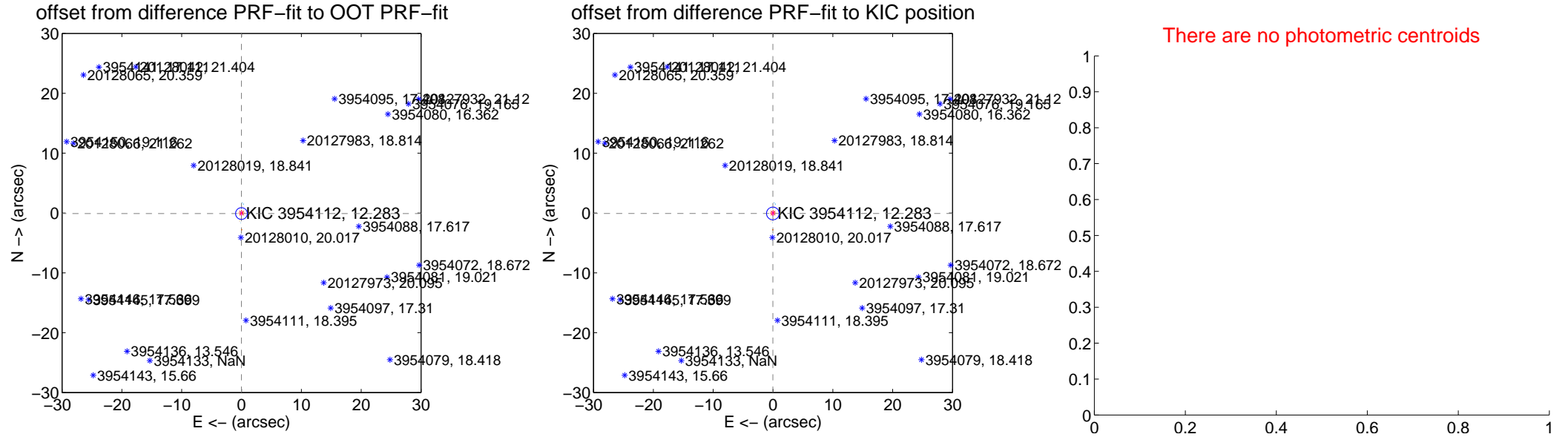
## DV Centroid Data

Supplemental centroid analysis for 003954112-01. Kepler magnitude: 12.28. Transit SNR 0.00

There are 8 quarters with good PRF difference image offsets

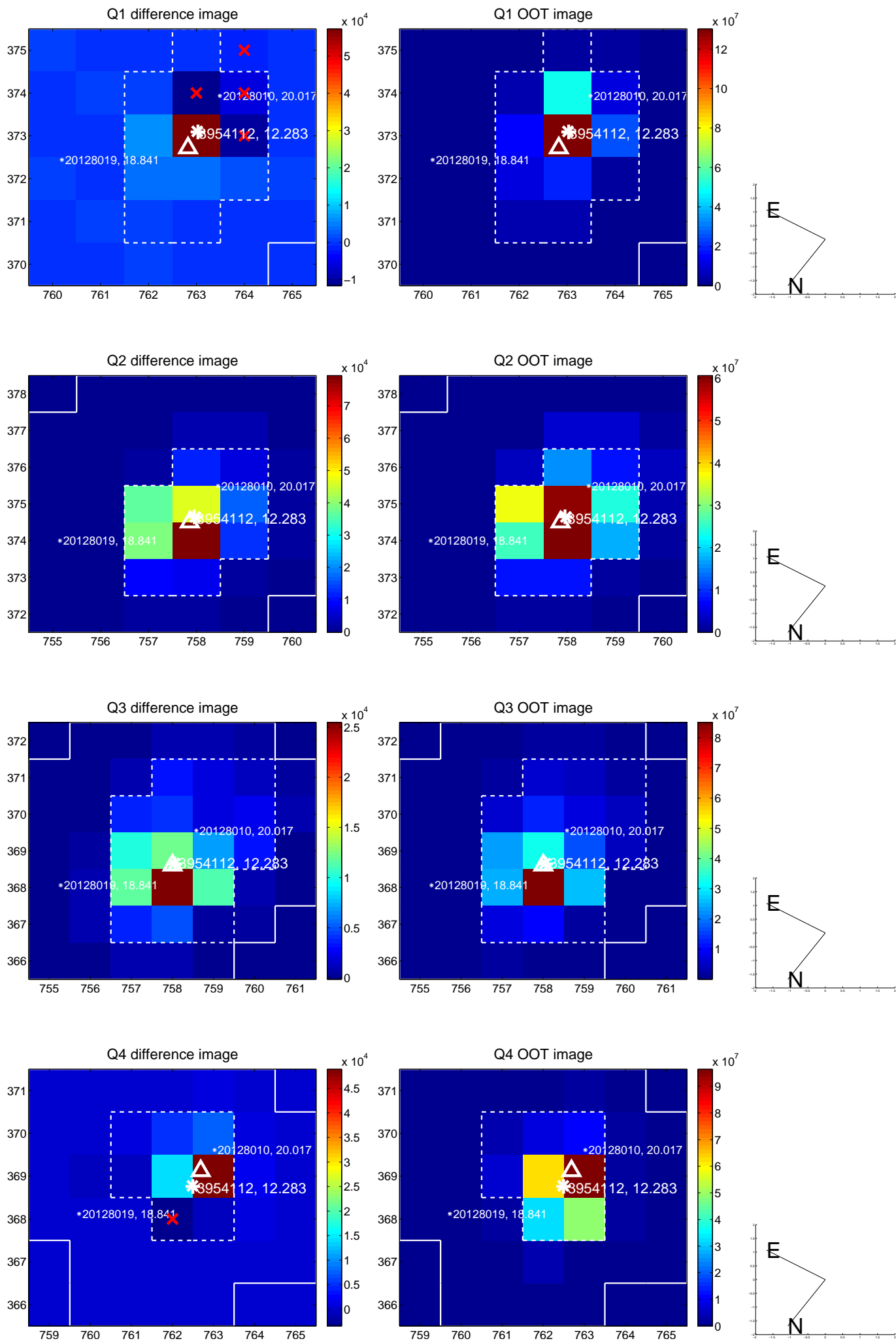
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.091 \pm 0.327$	0.28	$0.014 \pm 0.083$	$-0.090 \pm 0.327$
PRF-fit source offset from KIC position	$0.080 \pm 0.354$	0.23	$0.023 \pm 0.084$	$-0.076 \pm 0.359$
photometric centroid source offset	—	—	—	—

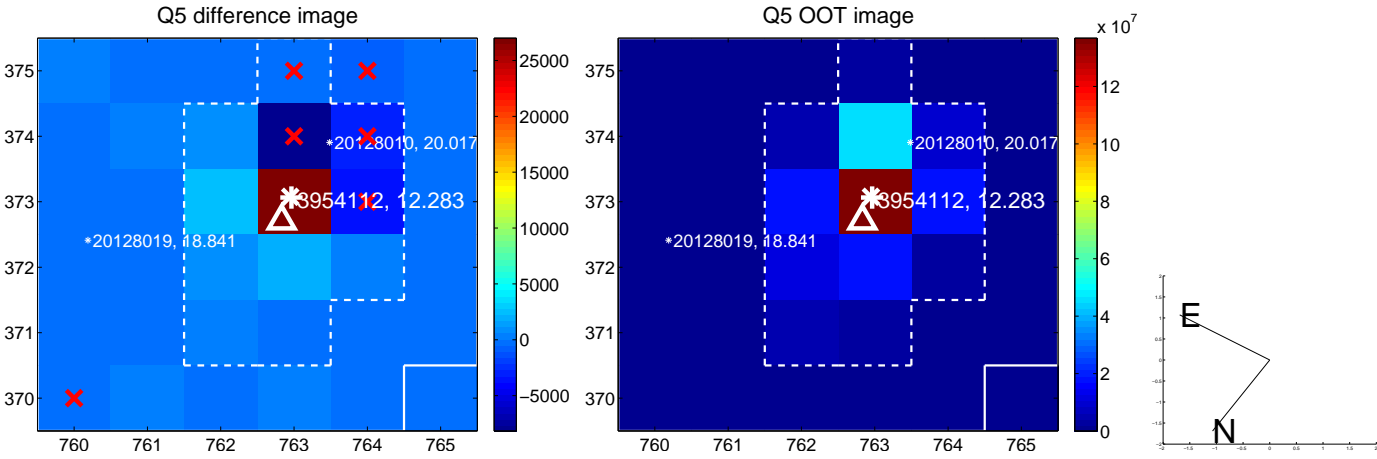


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

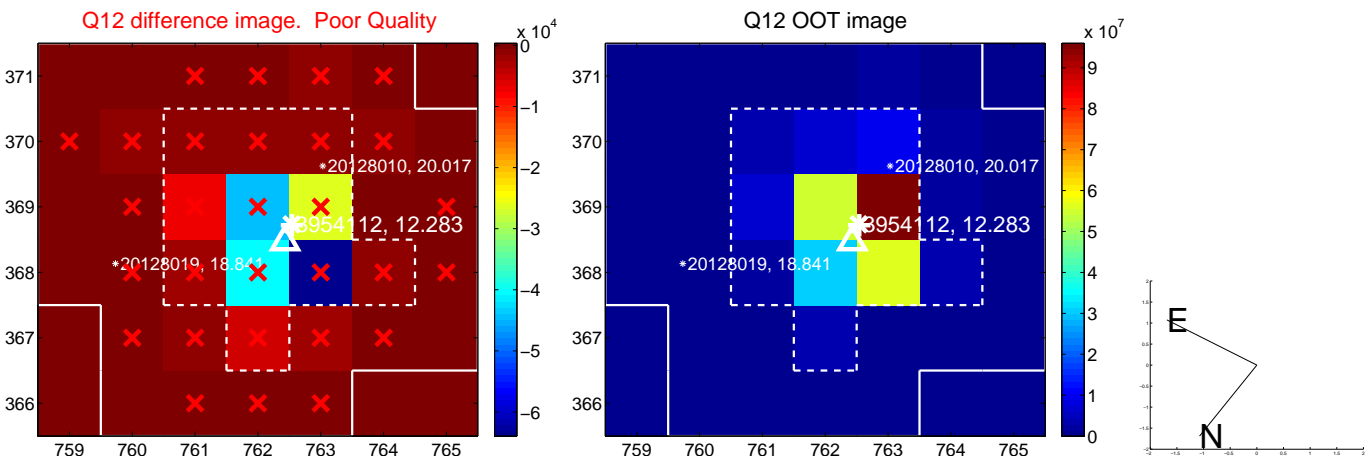
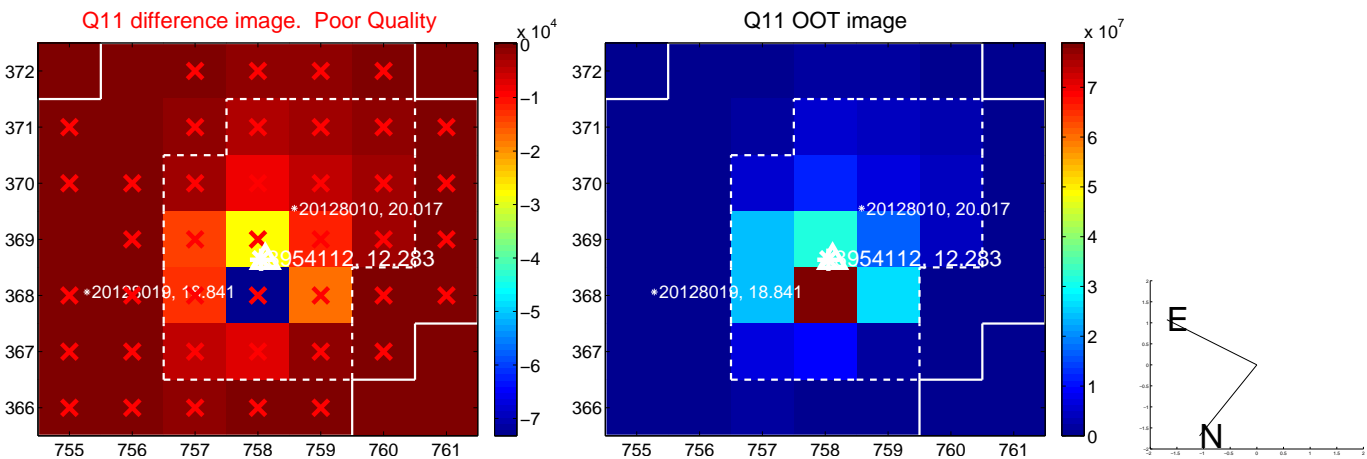
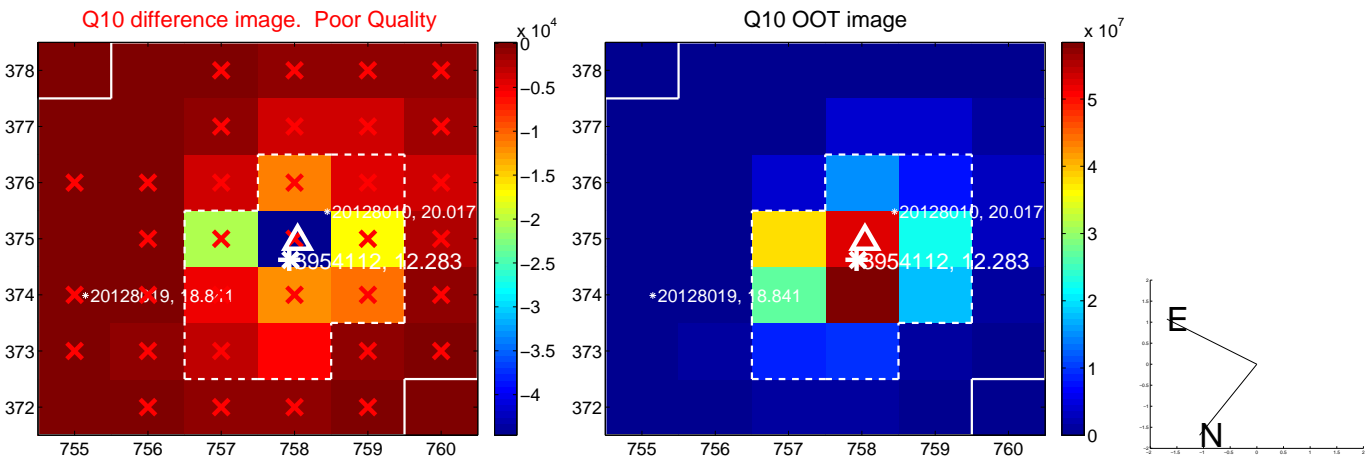
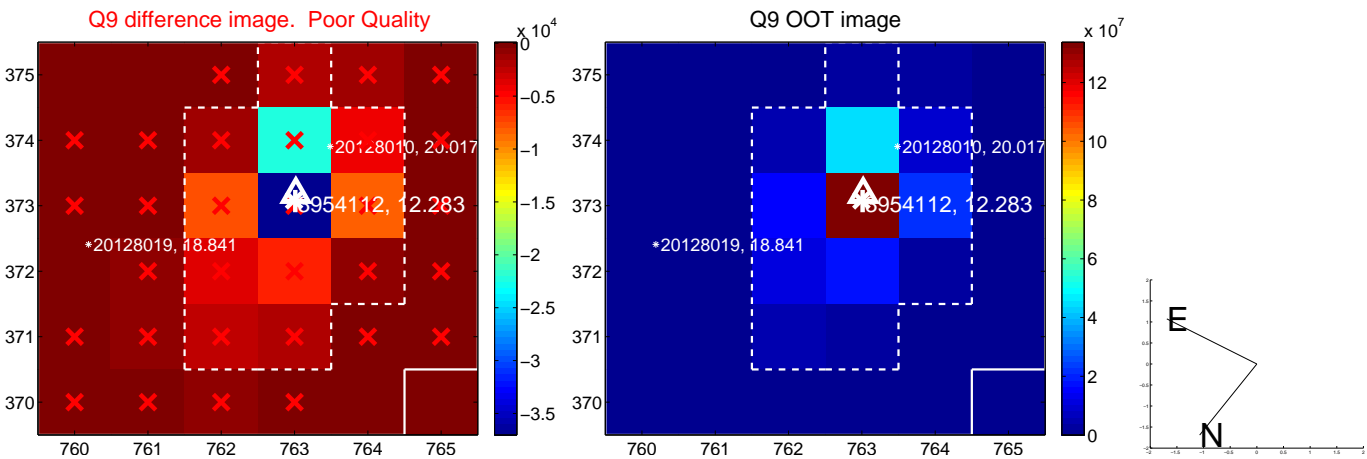


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



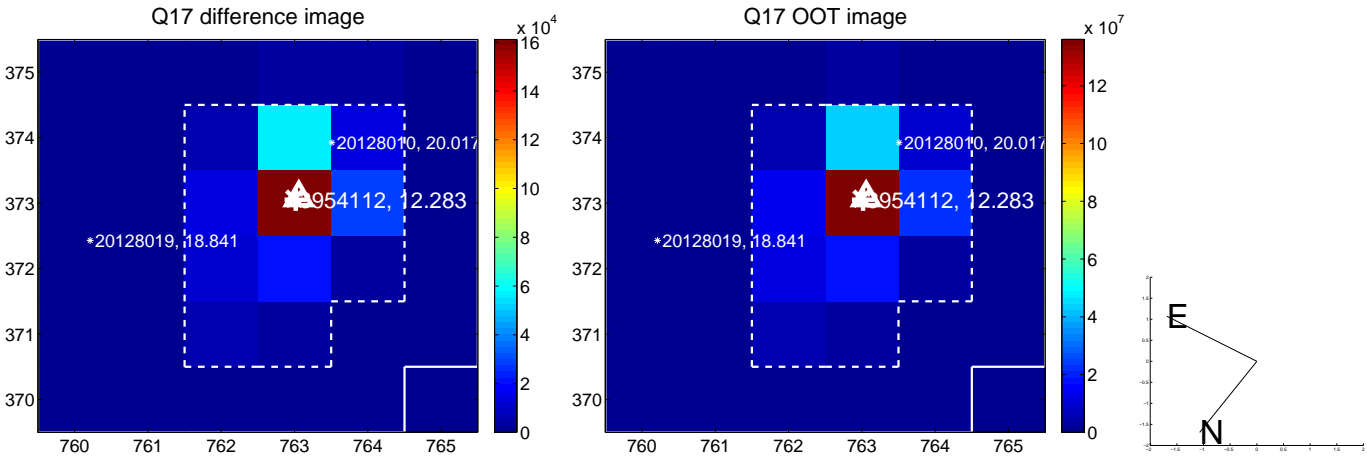


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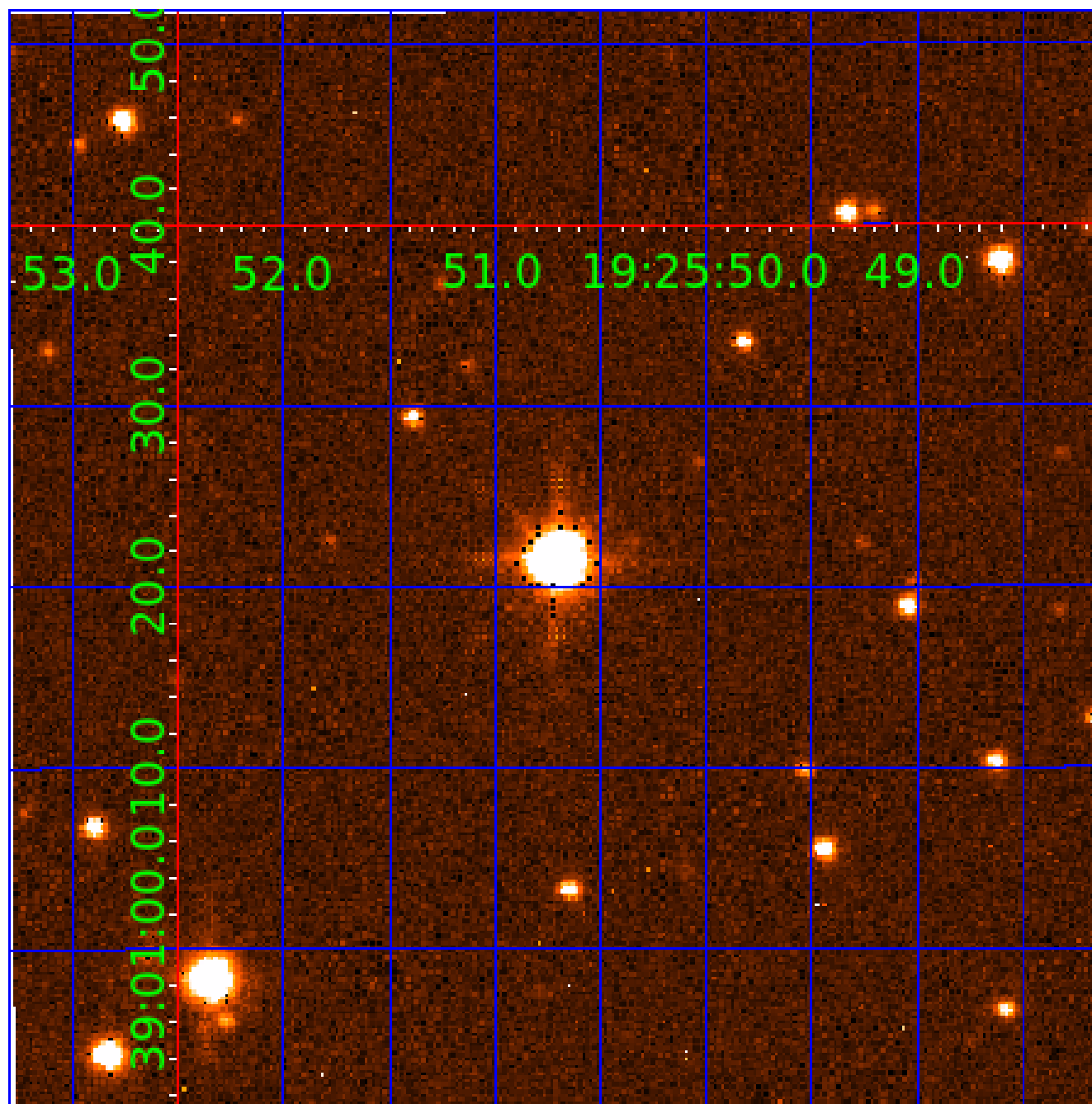
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



folded centroid time series figure for this object.

UKIRT Image

Declination





# KIC 003954112

## 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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## Robovetter Results

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003954112-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003954112-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
003954112-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003954112-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—HALO_GHOST

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

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

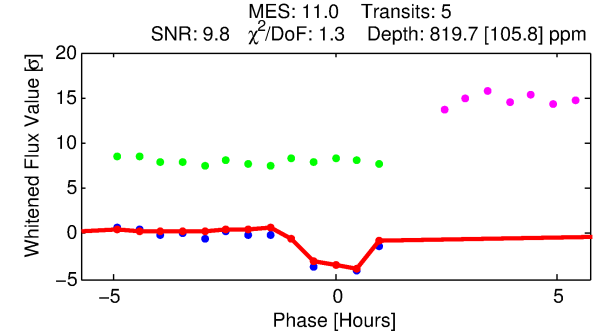
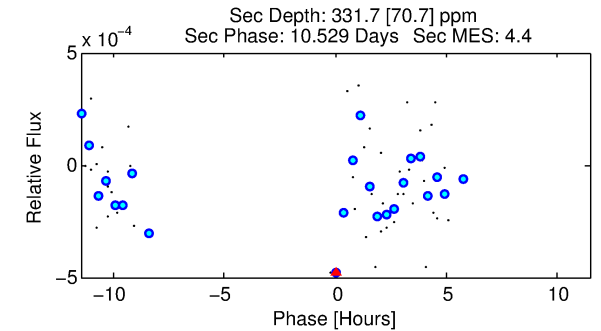
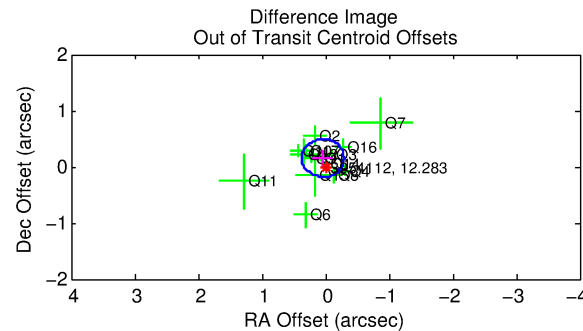
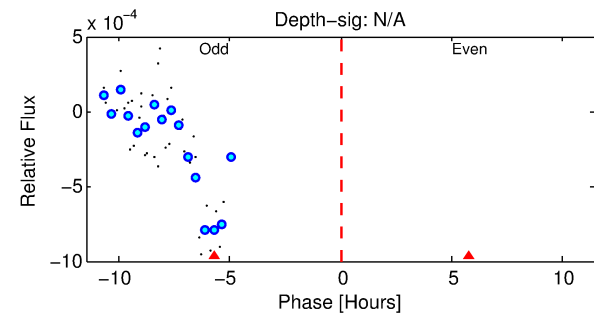
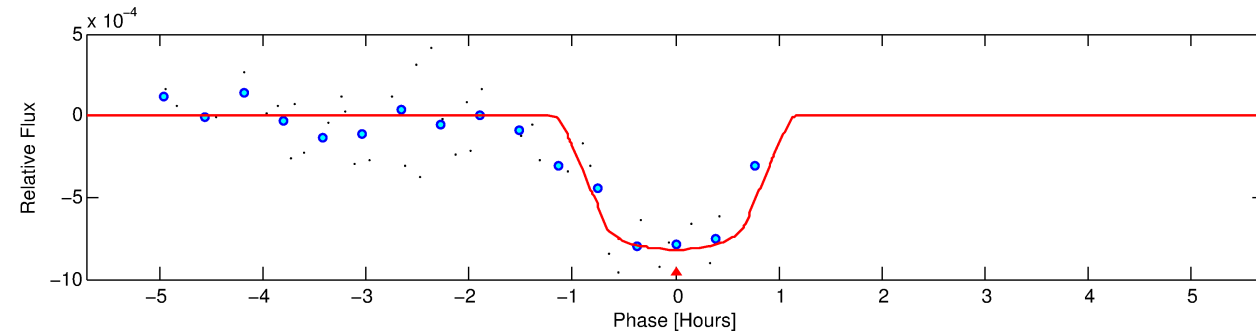
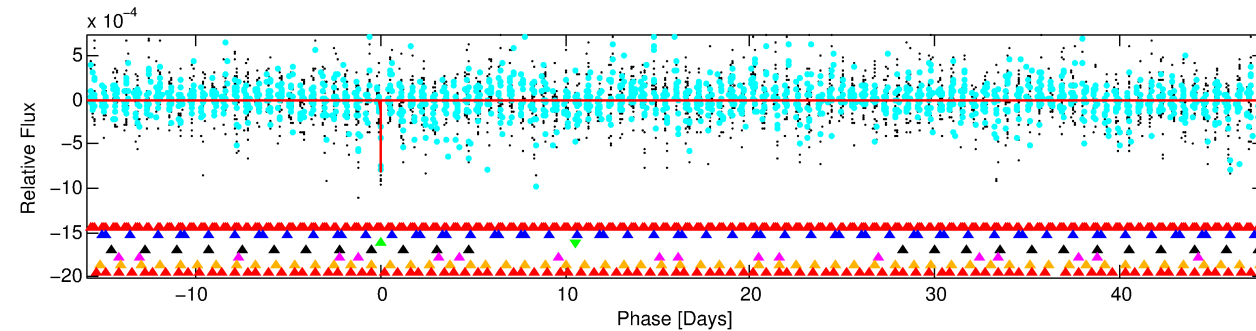
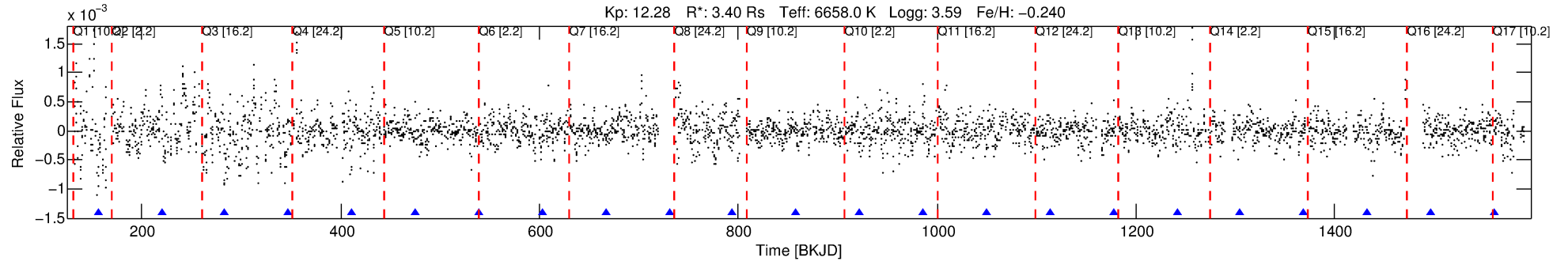
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003954112-03

No Significant Match Found

# DV One-Page Summary

KIC: 3954112 Candidate: 3 of 7 Period: 63.836 d



## DV Fit Results:

Period = 63.83621 [0.00130] d  
Epoch = 156.0772 [0.0049] BKJD  
Rp/R\* = 0.0280 [0.0298]  
a/R\* = 197.92 [1186.29]  
b = 0.68 [4.80]  
Seff = 149.80 [93.05]  
Teq = 892 [139] K  
Rp = 10.40 [11.81] Re  
a = 0.3690 [0.1412] AU  
Ag = 229.77 [510.41] [0.45σ]  
Teffp = 5370 [2872] K [1.56σ]

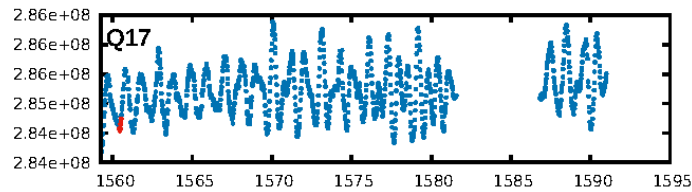
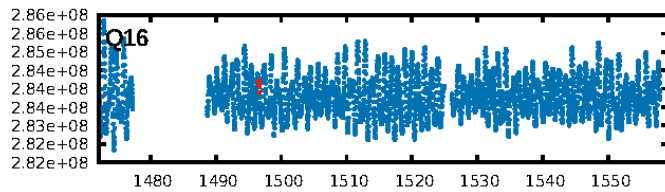
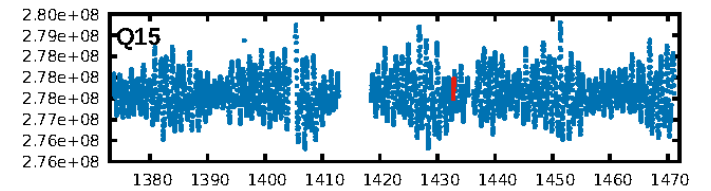
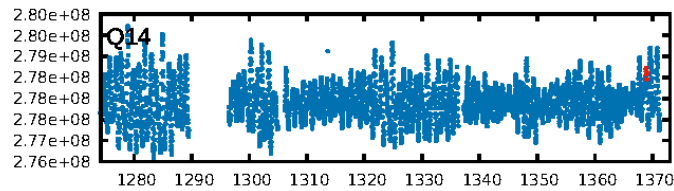
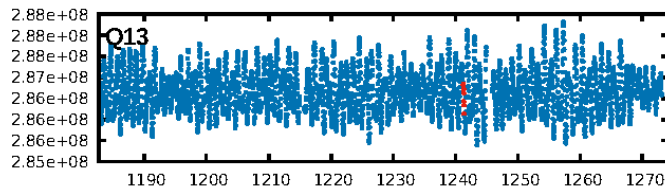
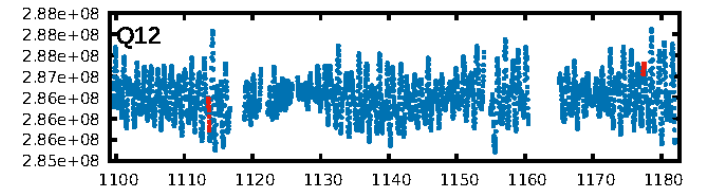
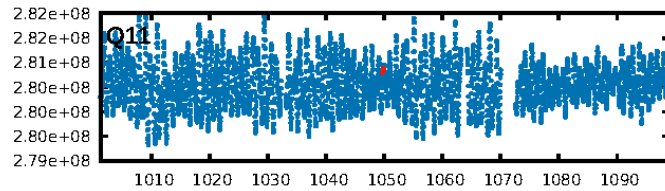
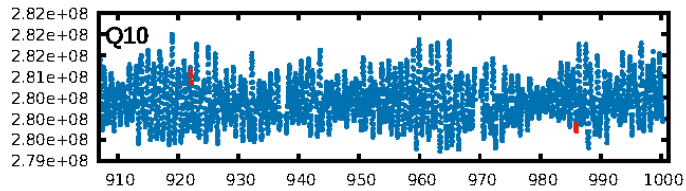
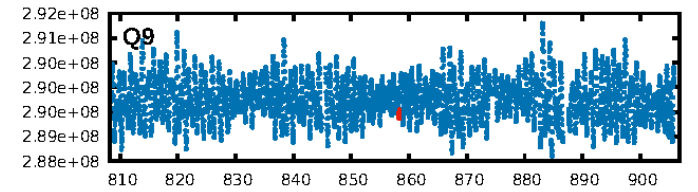
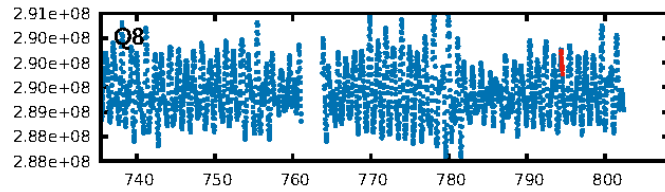
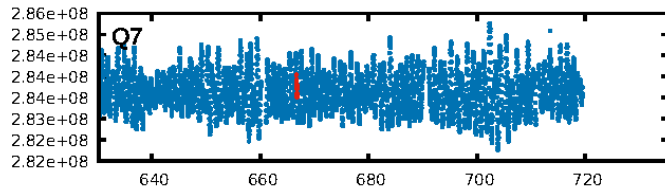
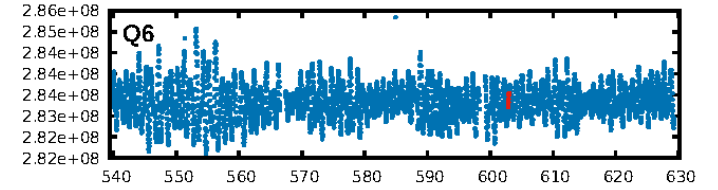
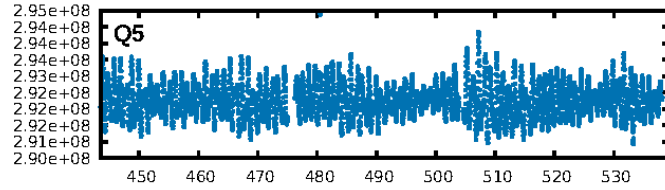
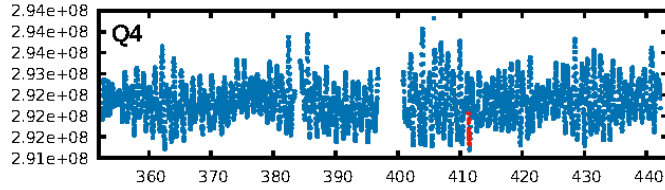
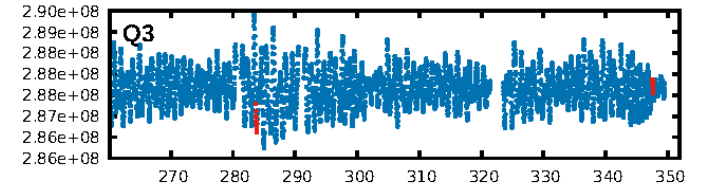
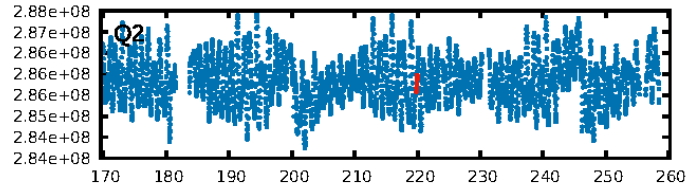
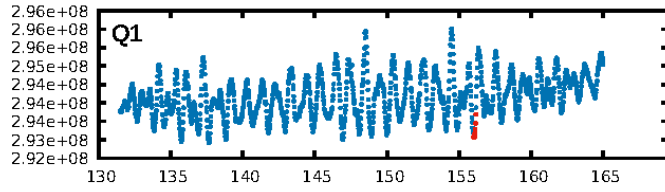
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [8.90σ]  
LongPeriod-sig: 100.0% [153.37σ]  
ModelChiSquare2-sig: 3.8%  
ModelChiSquareGof-sig: 98.2%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: -2.107  
Centroid-sig: 23.2%  
Centroid-so: 0.208 arcsec [1.07σ]  
OotOffset-rm: 0.157 arcsec [1.40σ]  
KicOffset-rm: 0.160 arcsec [1.30σ]  
OotOffset-st: 4/4/4/3 [15]  
KicOffset-st: 4/4/4/3 [15]  
DiffImageQuality-fgm: 0.47 [7/15]  
DiffImageOverlap-fno: 0.40 [6/15]

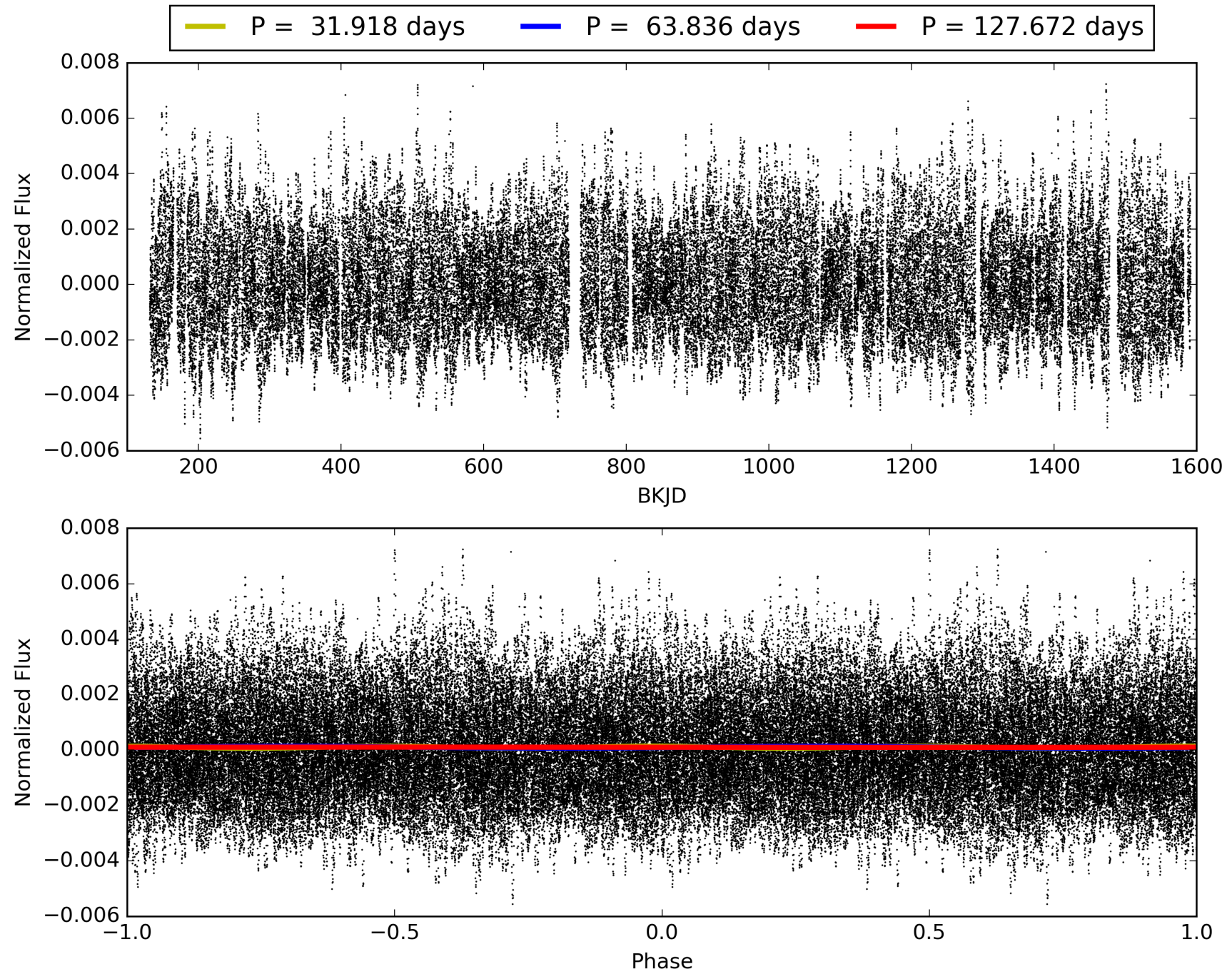
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:55:13 Z

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

# TCE 003954112-03, PDC Light Curves



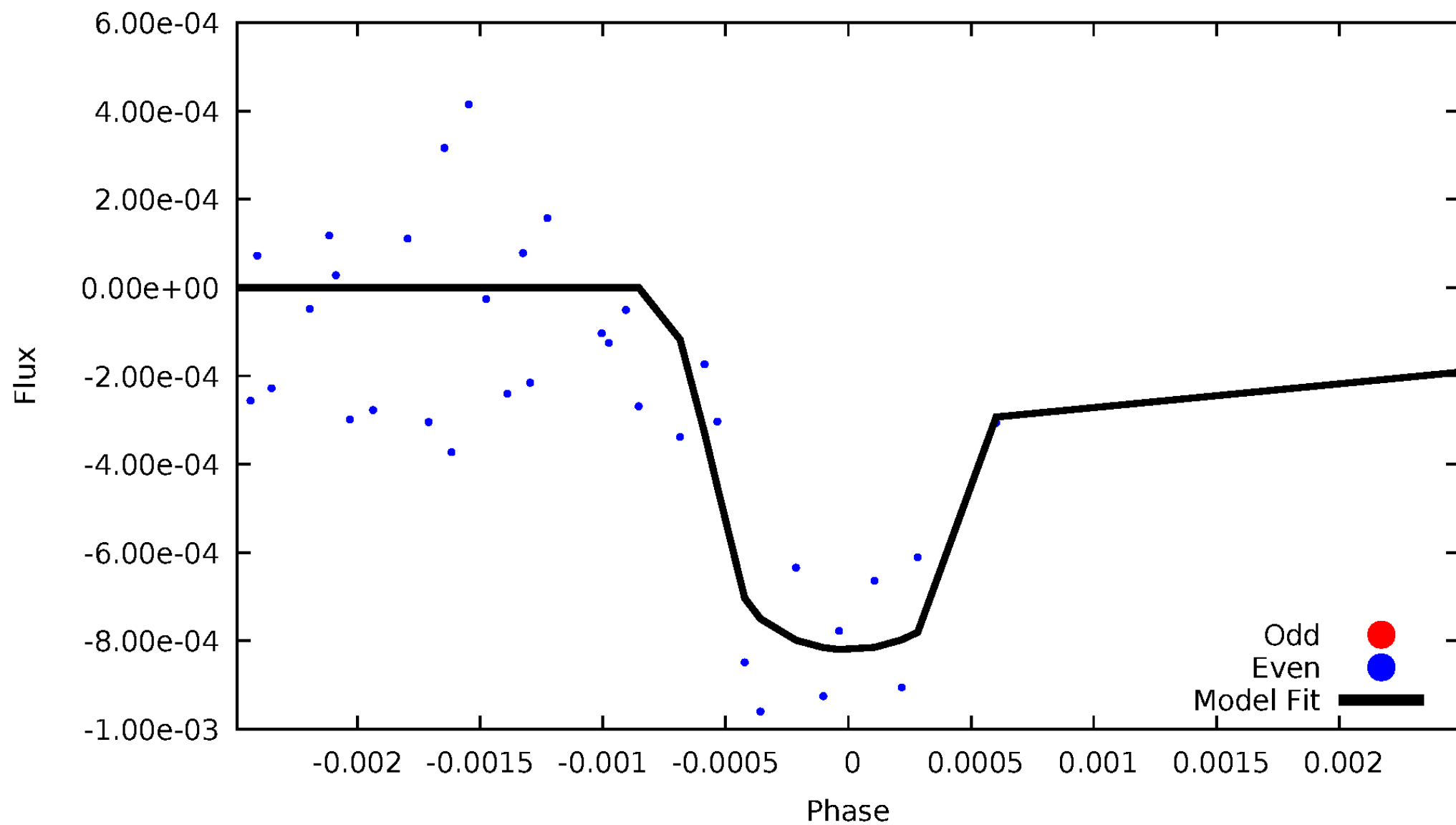
# TCE 003954112-03





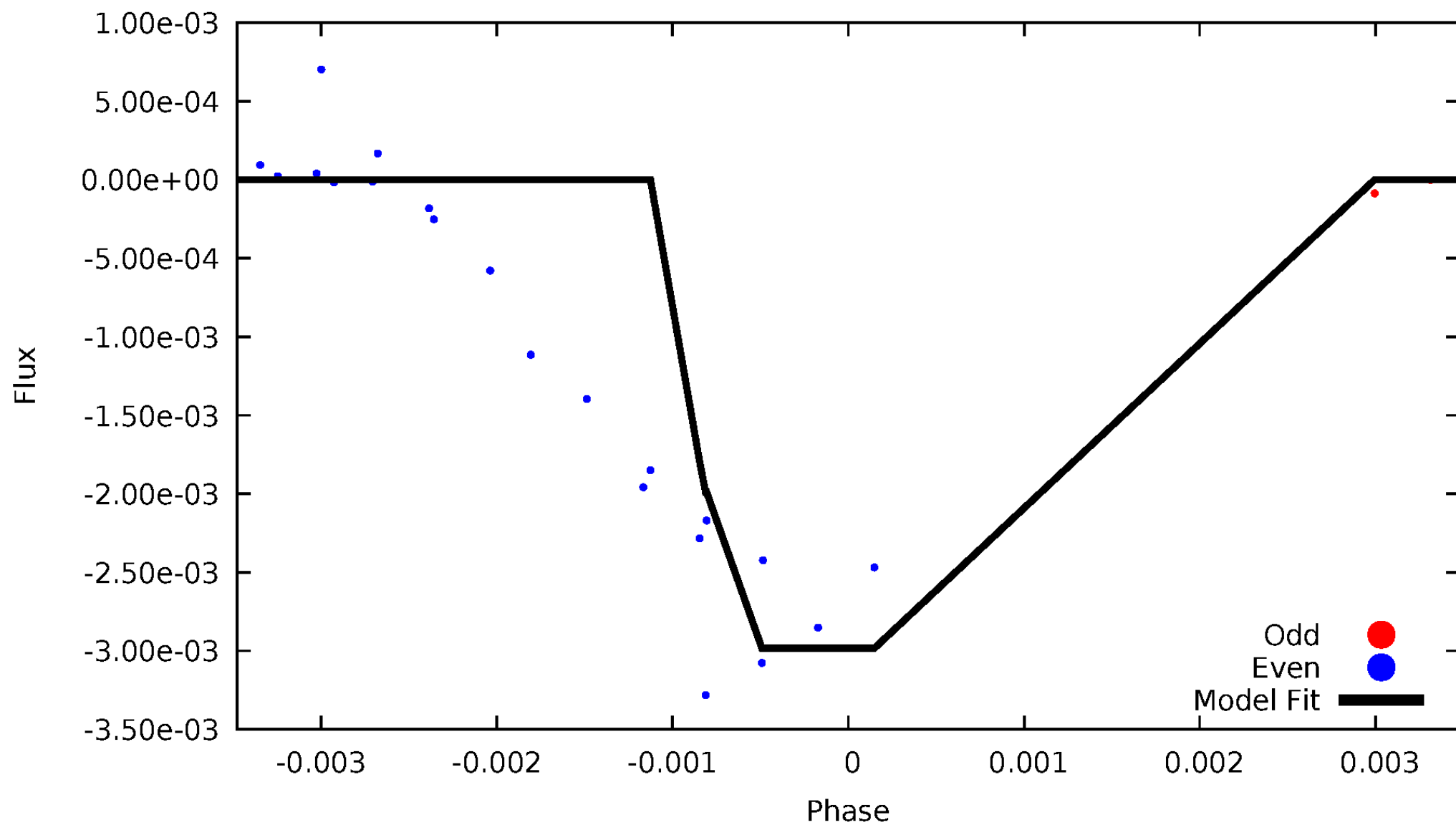
# DV Odd/Even

TCE 003954112-03



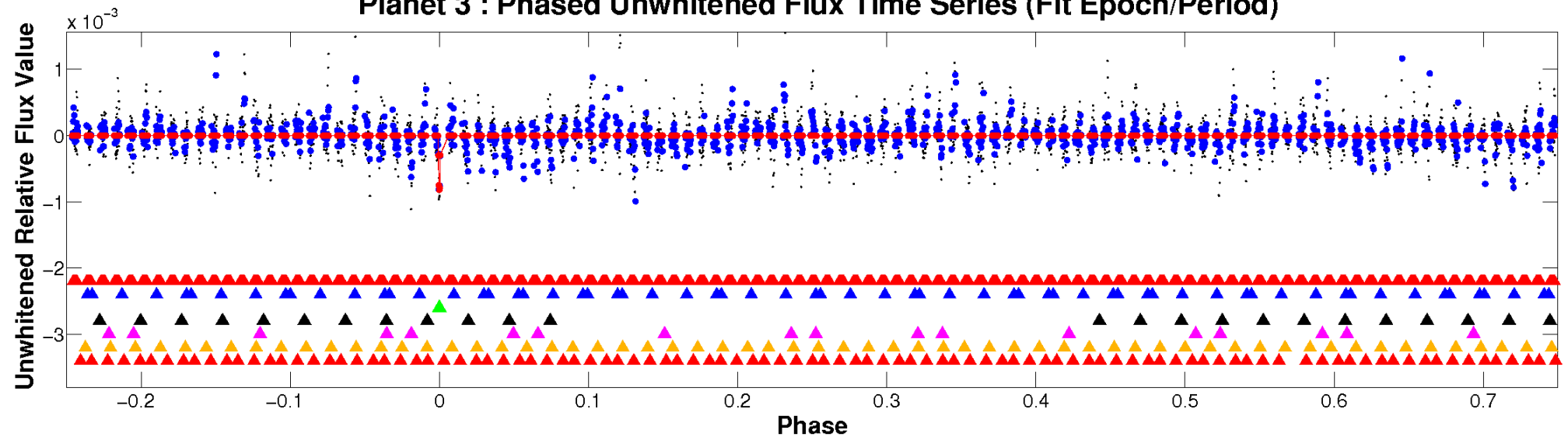
# ALT Odd/Even

TCE 003954112-03

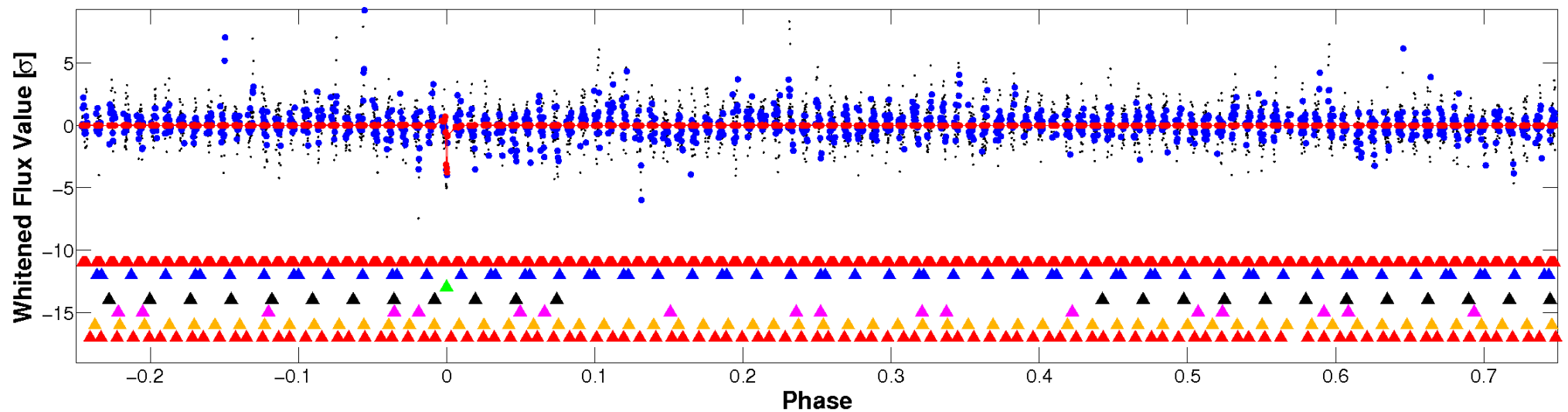


# Non-Whitened Vs. Whitened Light Curve

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

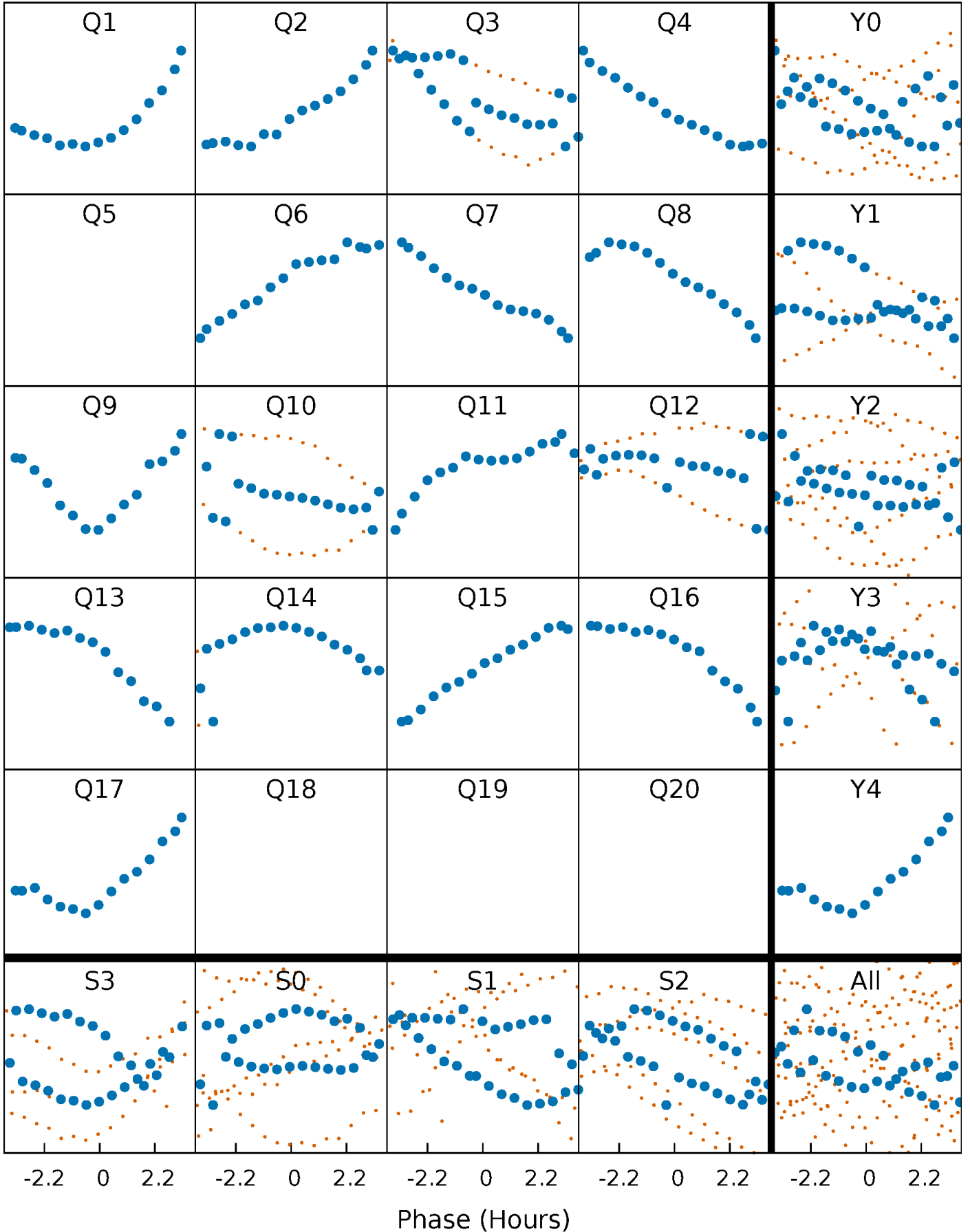


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

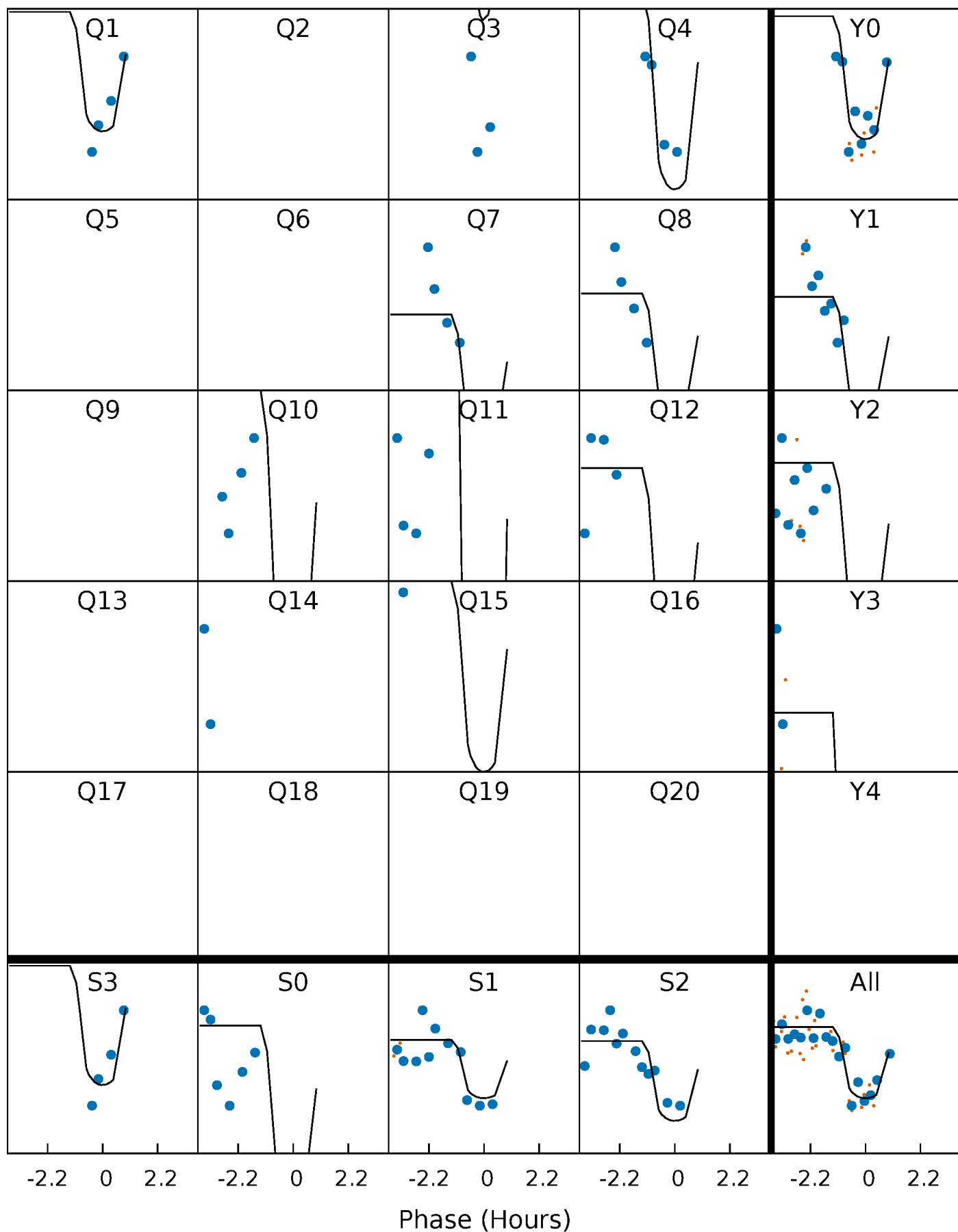
TCE 003954112-03 P= 63.836213 Days  $T_0=156.077208$  (BKJD)





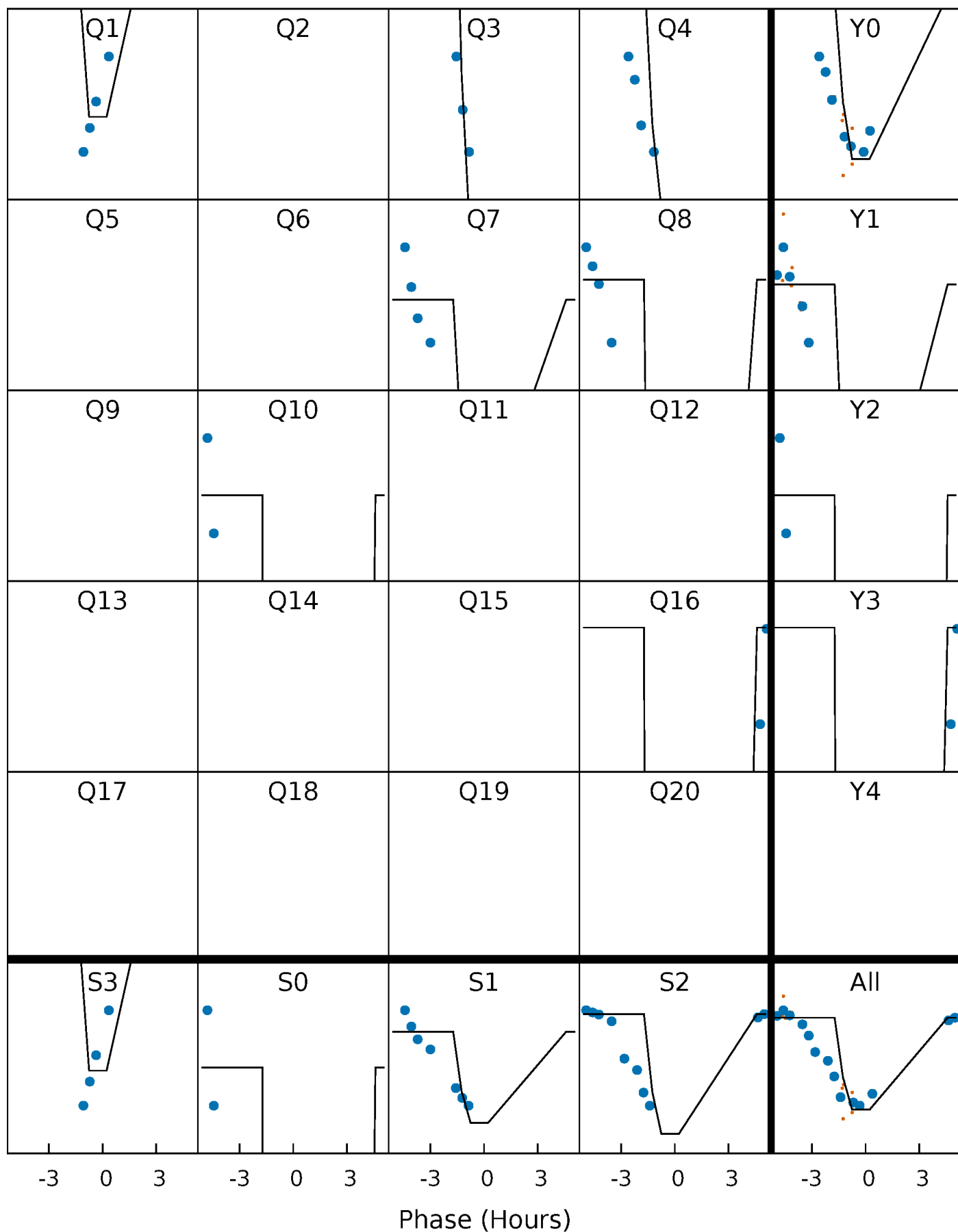
# DV Quarter-Phased Transit Curves

TCE 003954112-03     $P = 63.836213$  Days     $T_0 = 156.077208$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

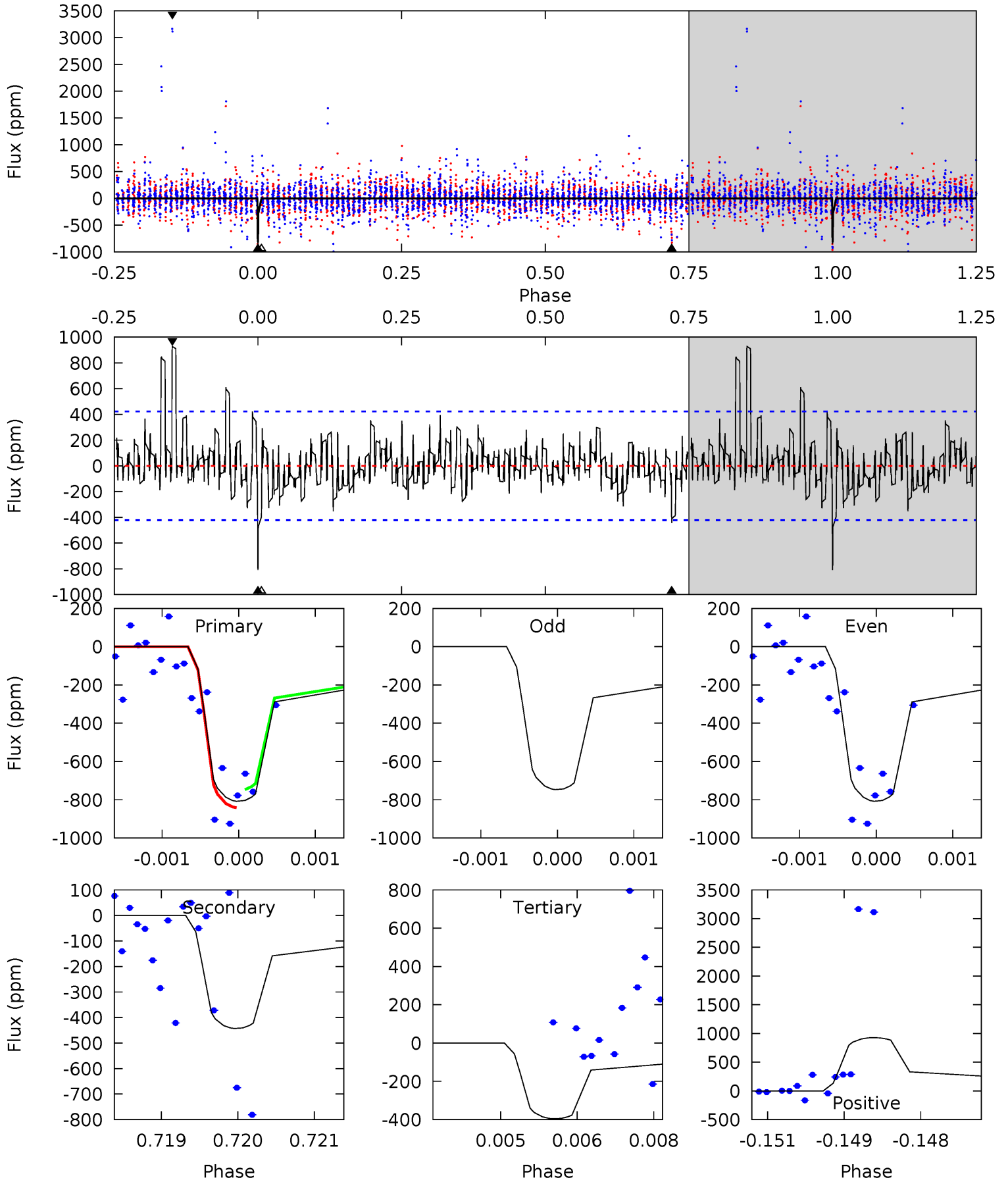
TCE 003954112-03     $P = 63.844171$  Days     $T_0 = 156.106233$  (BKJD)



# DV Model-Shift Uniqueness Test

003954112-03, P = 63.836213 Days, E = 92.240995 Days

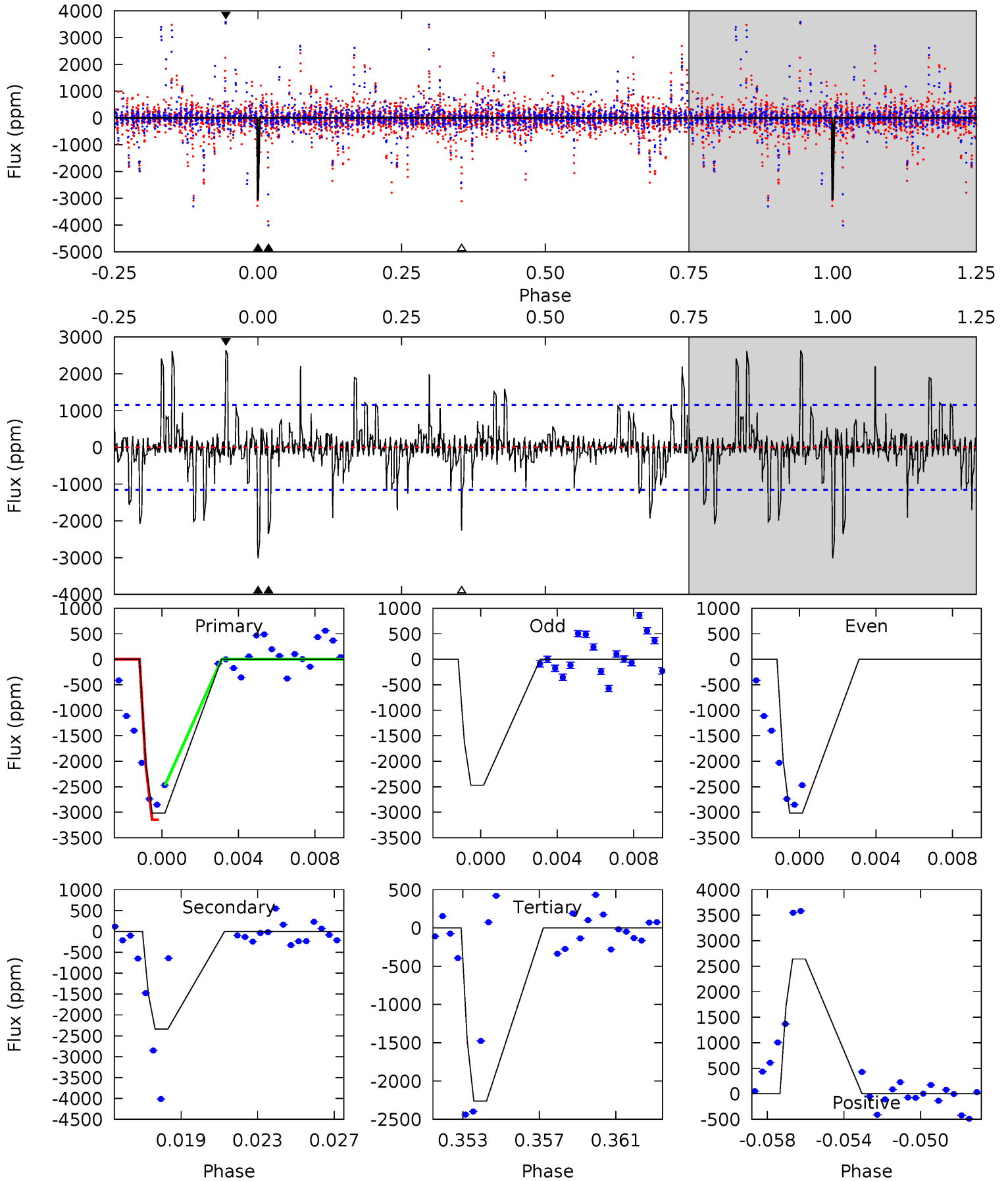
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.3	5.67	5.06	11.9	5.41	3.22	1.62	5.28	-1.53	0.61	-6.20	0.39	0.98	0.53	0.57



# Alt Model-Shift Uniqueness Test

003954112-03, P = 63.844171 Days, E = 92.262062 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
13.6	10.6	10.2	11.9	5.21	2.89	1.85	3.41	1.70	0.35	-1.36	0.93	1.00	0.47	1.17





### Stellar Parameters For KIC 003954112

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6658^{+179}_{-199}$	$3.590^{+0.357}_{-0.084}$	$-0.240^{+0.300}_{-0.250}$	$3.404^{+0.341}_{-1.363}$	$1.645^{+0.224}_{-0.336}$	$0.059^{+0.145}_{-0.012}$
	+3%/-3%	+10%/-2%	+125%/-104%	+10%/-40%	+14%/-20%	+247%/-21%
Source	PHO1	FLK73	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 003954112-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-443 \pm 78$	$12.30^{+8.82}_{-7.83}$	$1225^{+61}_{-115}$	$5179^{+3314}_{-1023}$	$218^{+1334}_{-148}$
Alt.	$-2338 \pm 221$	$19.40^{+10.95}_{-10.19}$	$1225^{+66}_{-111}$	$6164^{+3016}_{-1090}$	$477^{+1594}_{-280}$

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

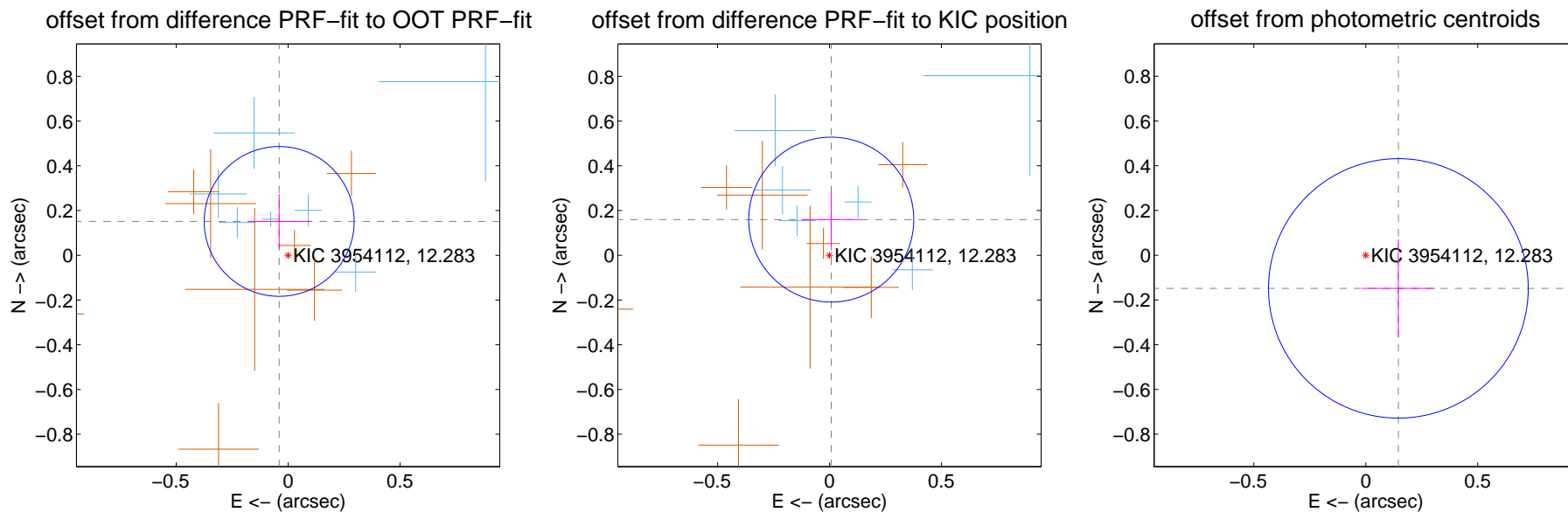
## DV Centroid Data

Supplemental centroid analysis for 003954112-03. Kepler magnitude: 12.28. Transit SNR 9.76

There are 7 quarters with good PRF difference image offsets

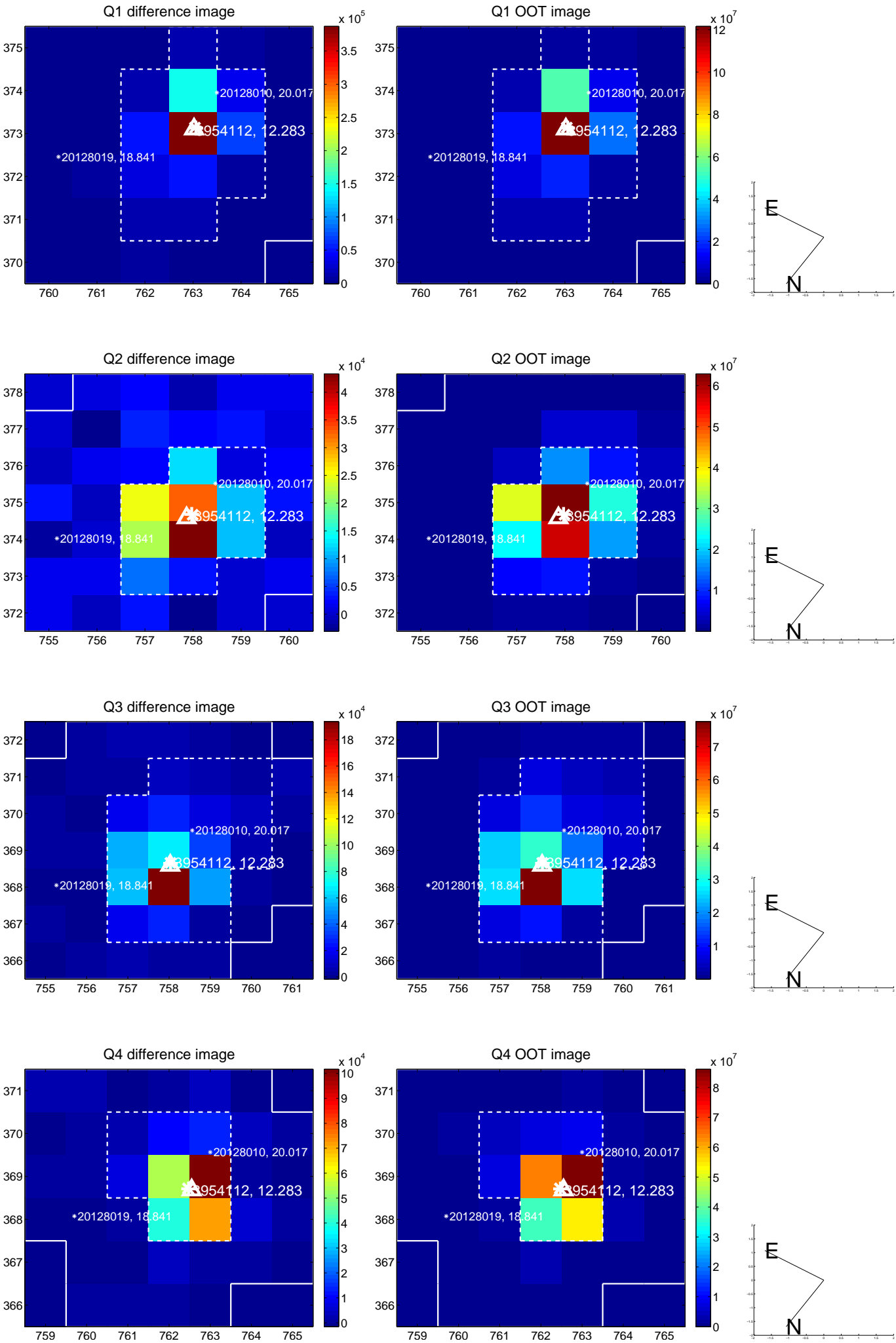
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.157 \pm 0.112$	1.40	$0.040 \pm 0.141$	$0.151 \pm 0.122$
PRF-fit source offset from KIC position	$0.160 \pm 0.123$	1.30	$-0.008 \pm 0.133$	$0.160 \pm 0.121$
photometric centroid source offset	$0.21 \pm 0.19$	1.07	$-0.15 \pm 0.16$	$-0.15 \pm 0.22$

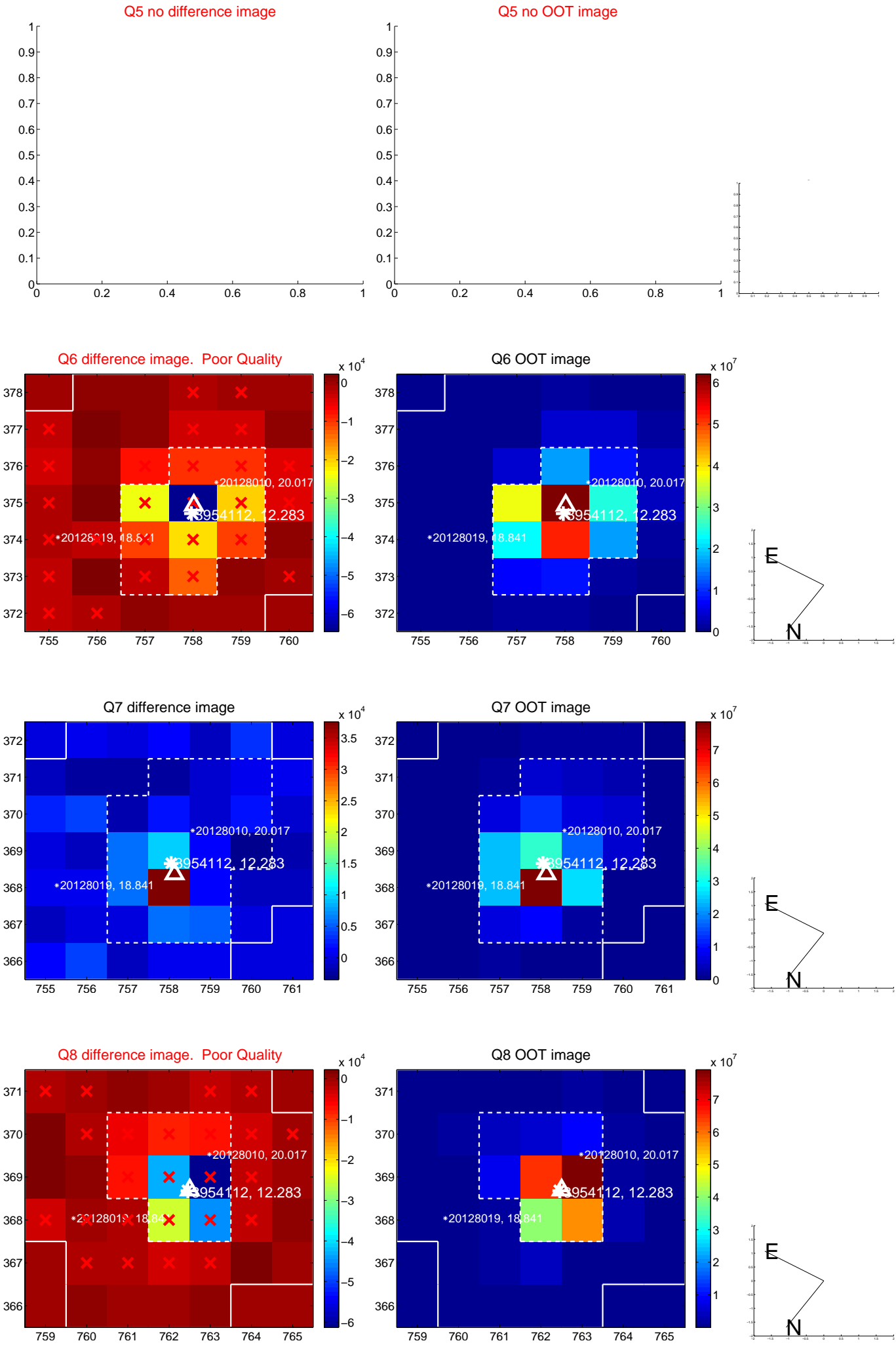


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

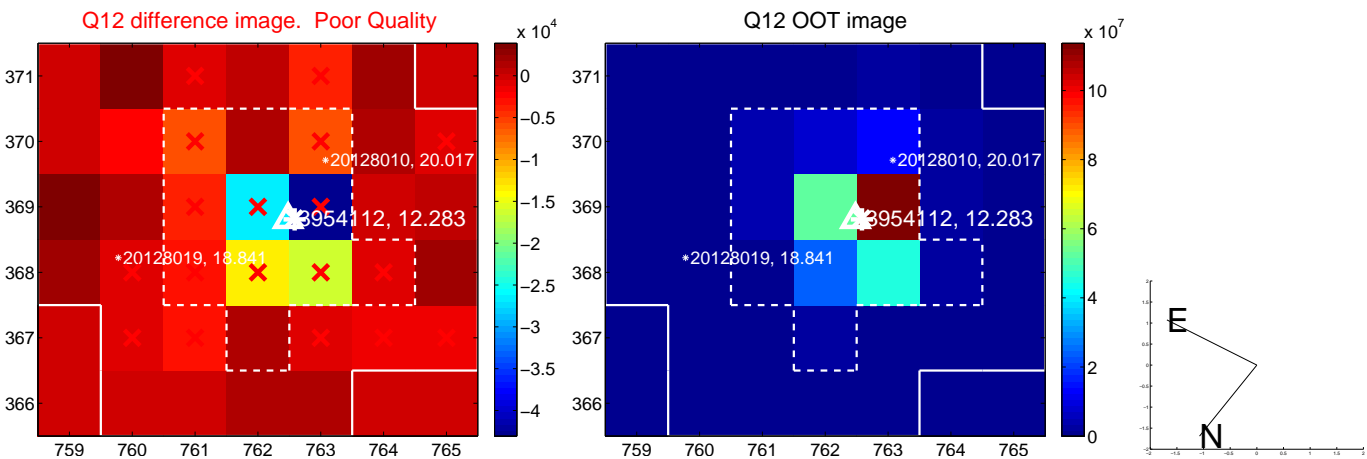
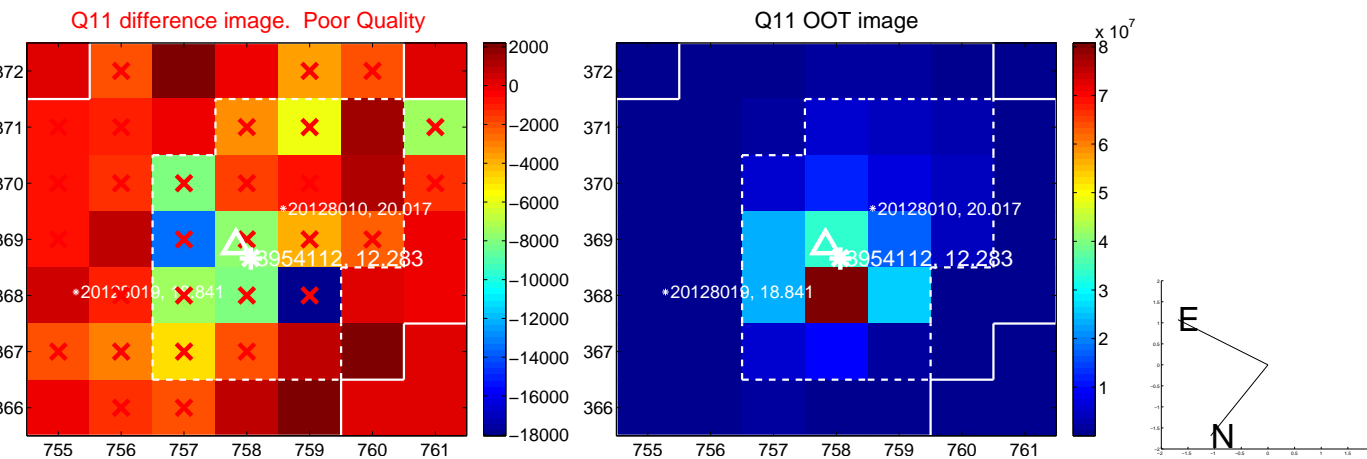
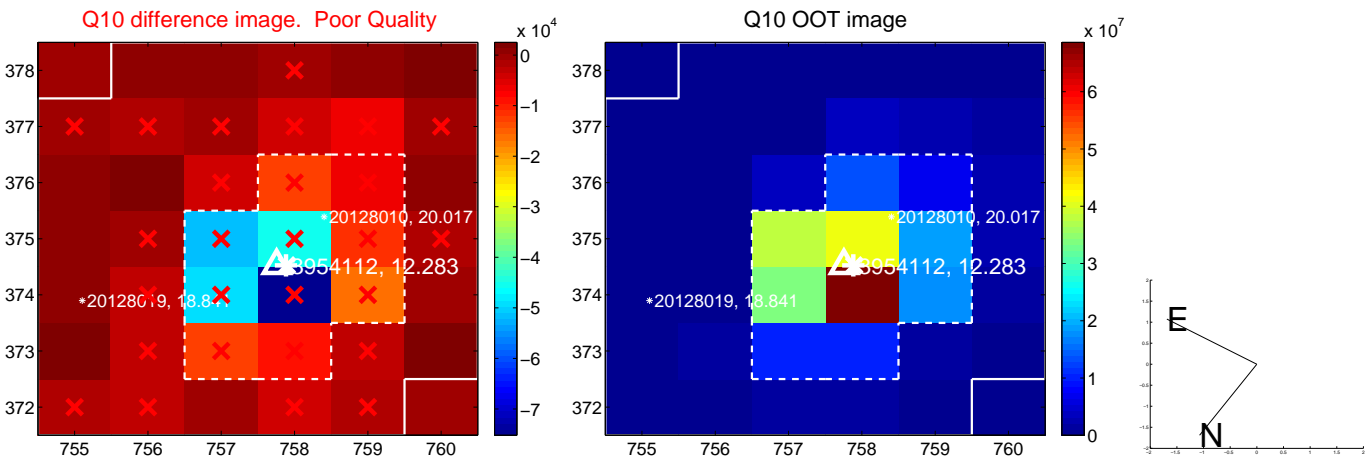
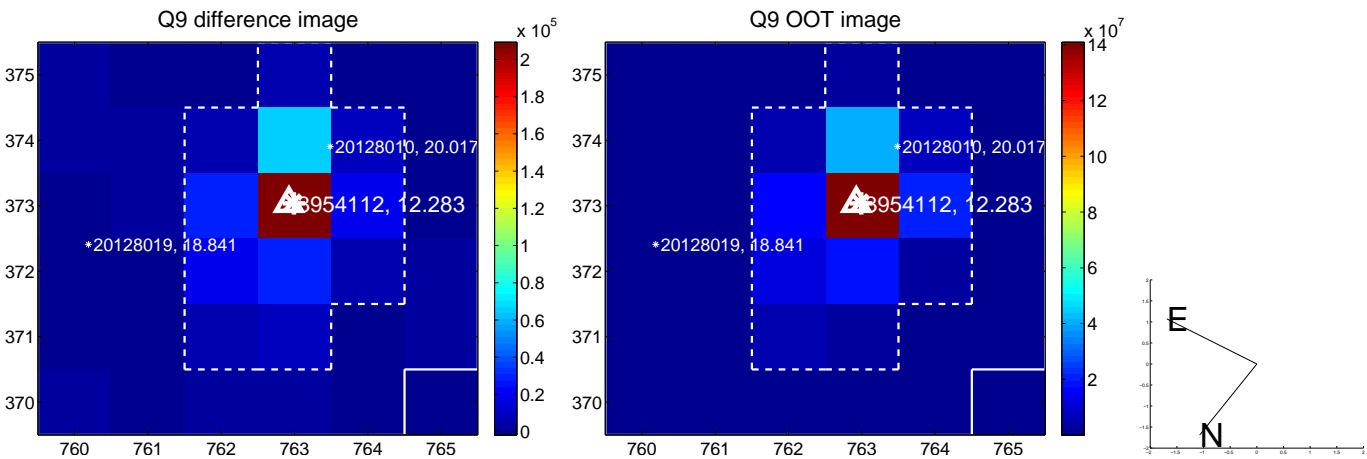
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

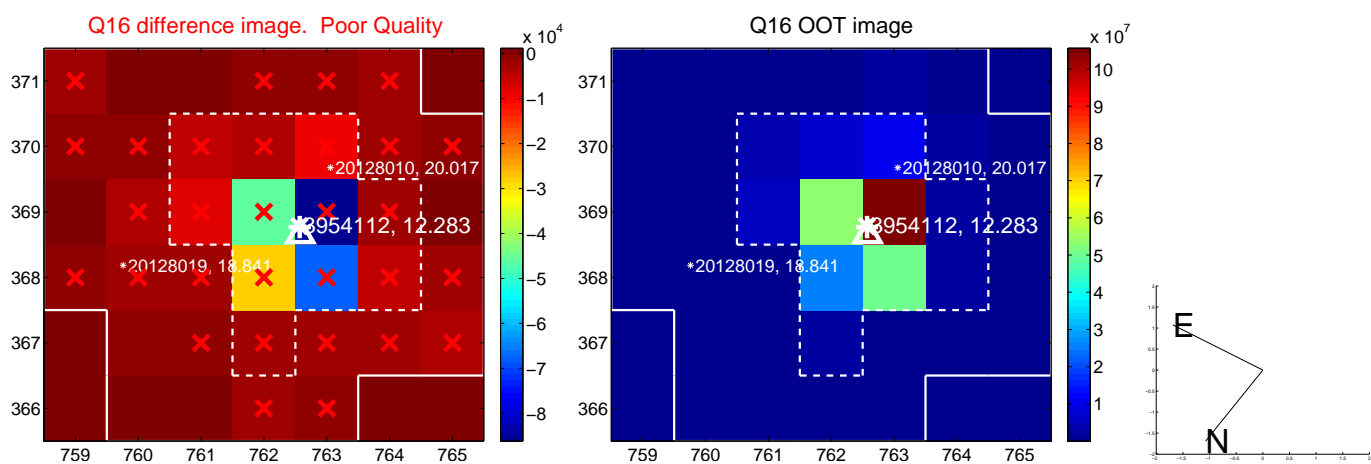
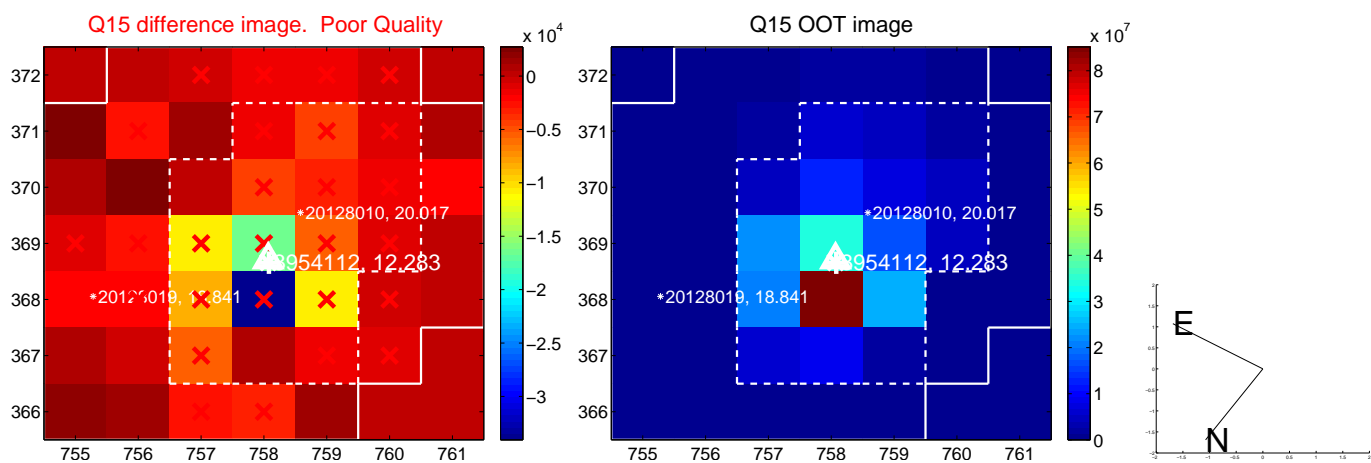
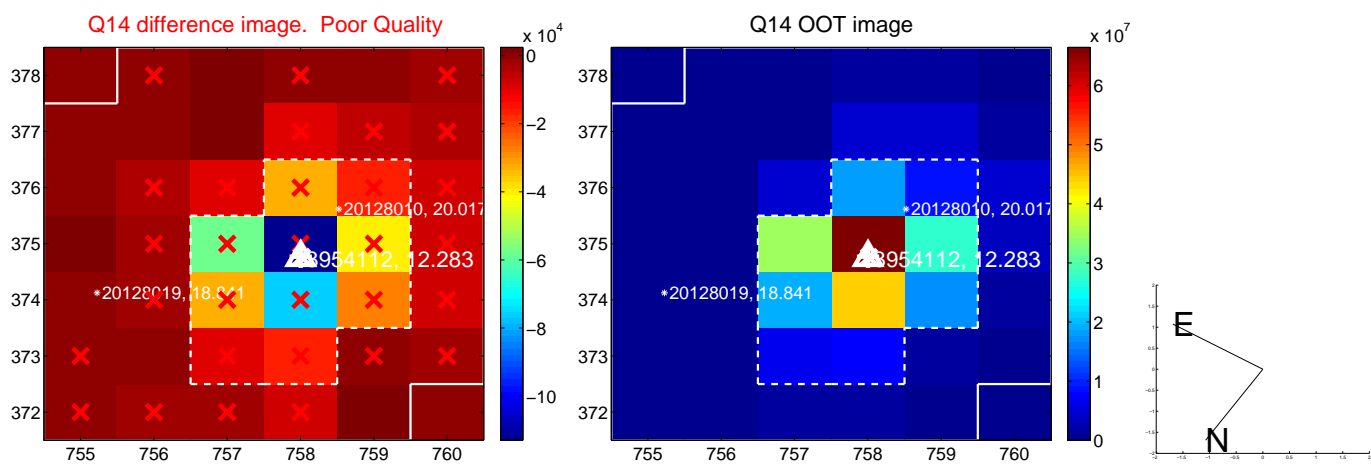
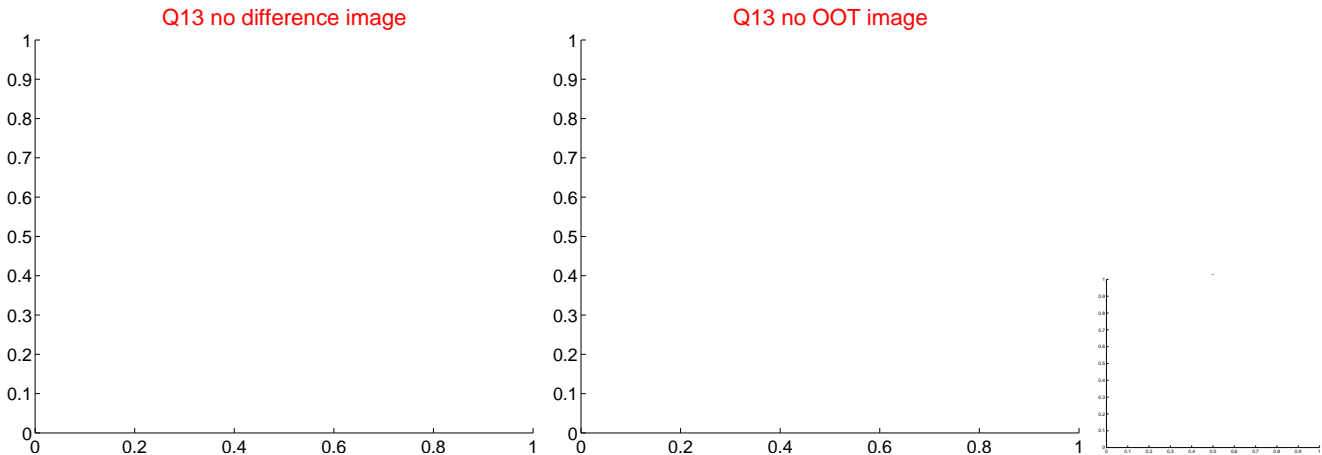


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

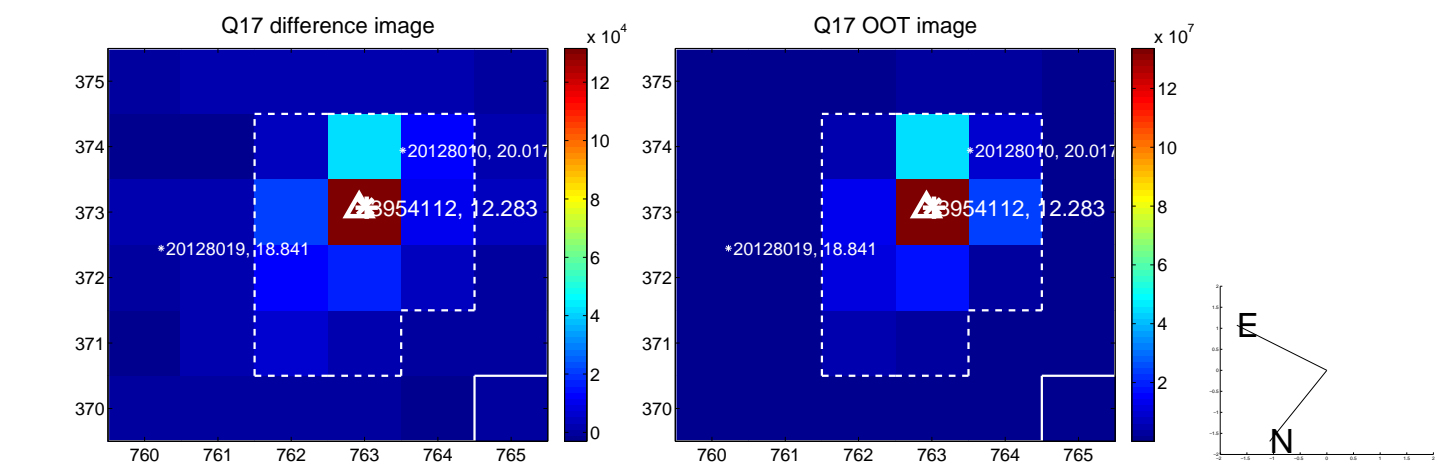




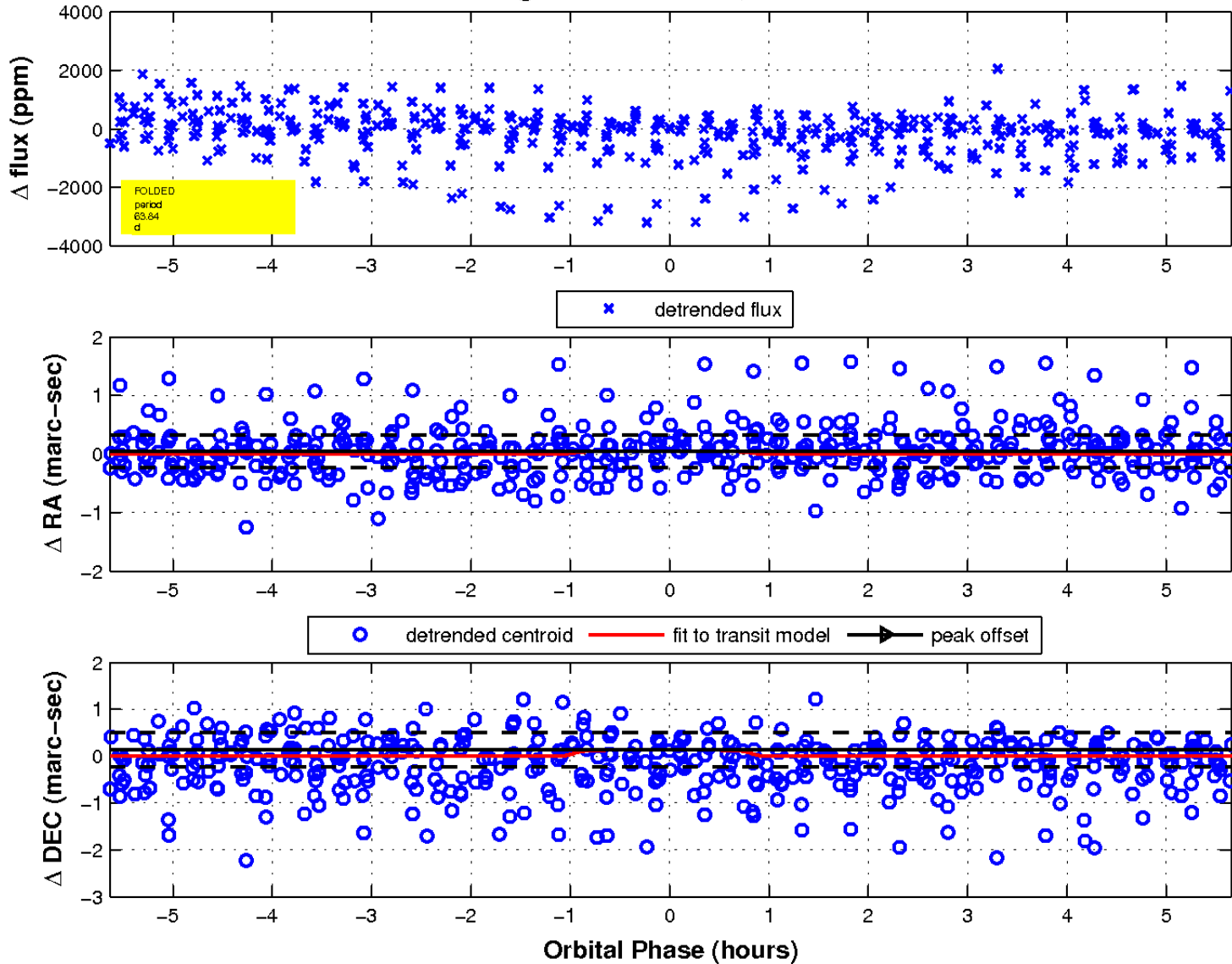
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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

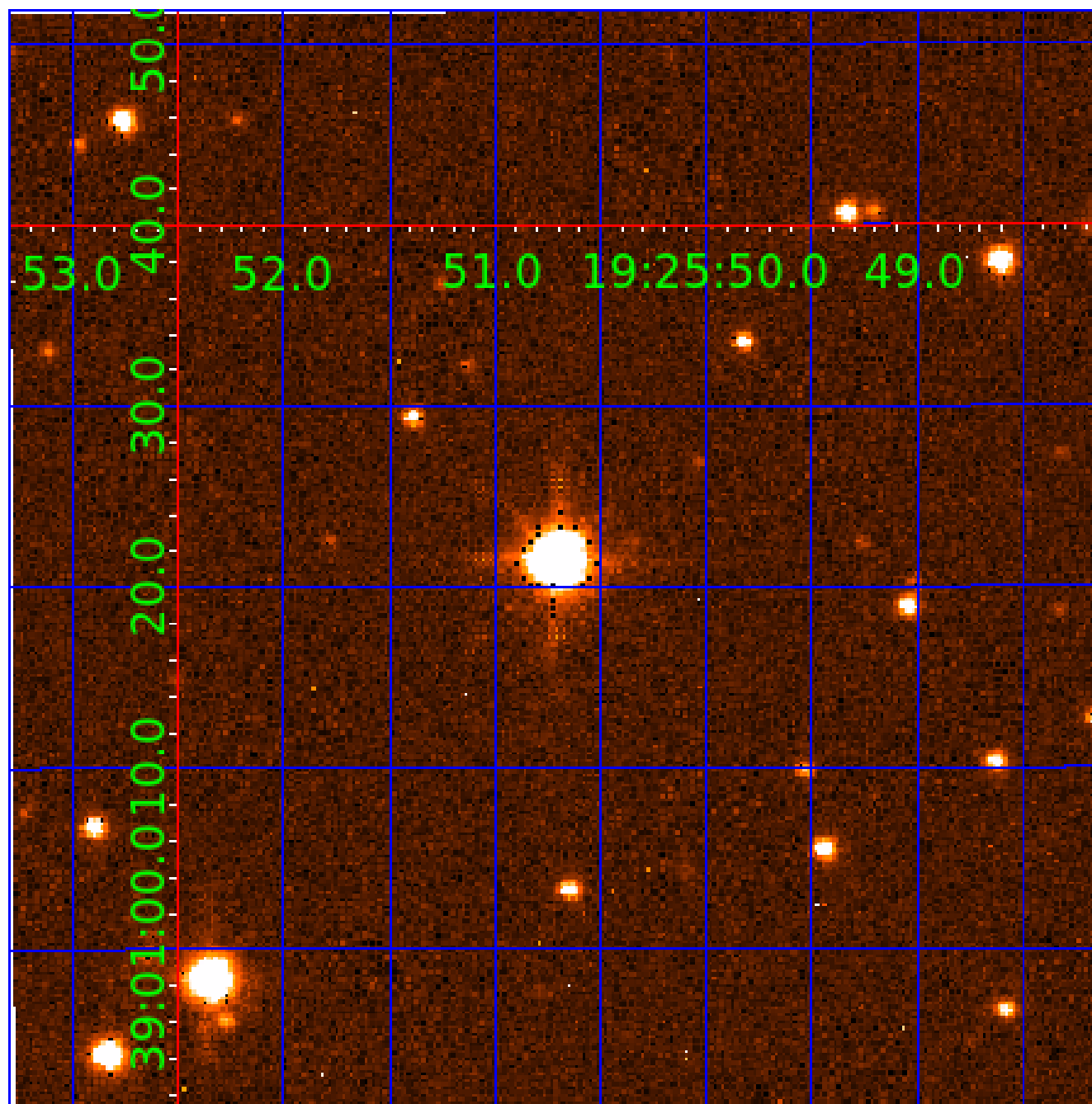


fluxWeightedCentroids, Planet 3 of 7



UKIRT Image

Declination



# KIC 003954112

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003954112-01	OBS	No	1.193033	131.630990	0.0	8.770	12.0	0.0	3.40	6658	0.03	30203.64
003954112-03	OBS	No	63.836213	156.077208	819.7	1.907	11.0	9.8	3.40	6658	10.40	149.80
003954112-05	OBS	No	81.150550	154.876992	674.9	1.924	10.3	8.6	3.40	6658	10.24	108.78
003954112-07	OBS	No	14.392231	143.270046	377.7	1.692	8.5	6.7	3.40	6658	6.68	1091.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003954112-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003954112-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
003954112-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003954112-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—HALO_GHOST

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

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

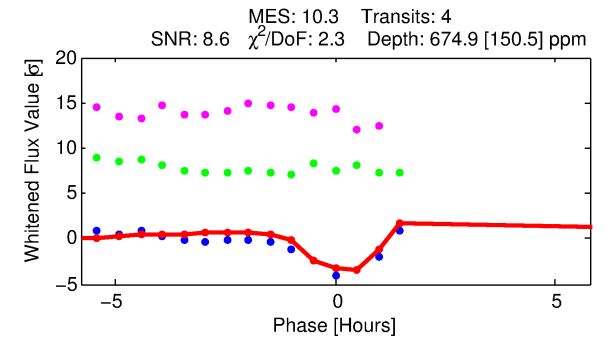
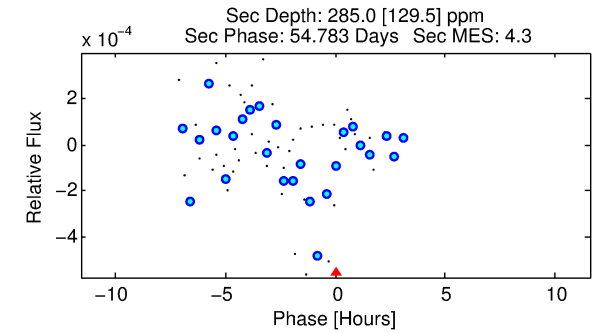
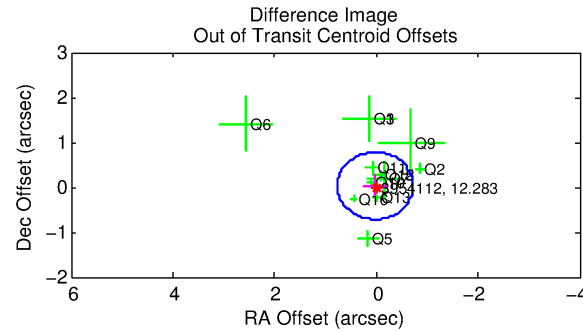
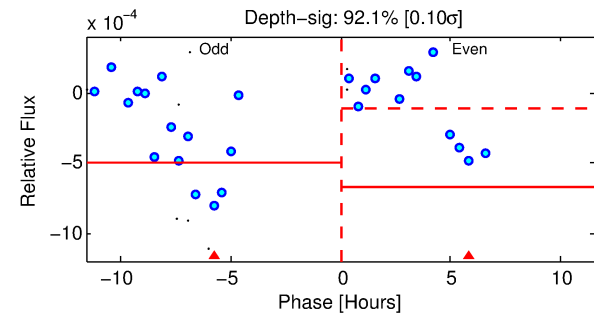
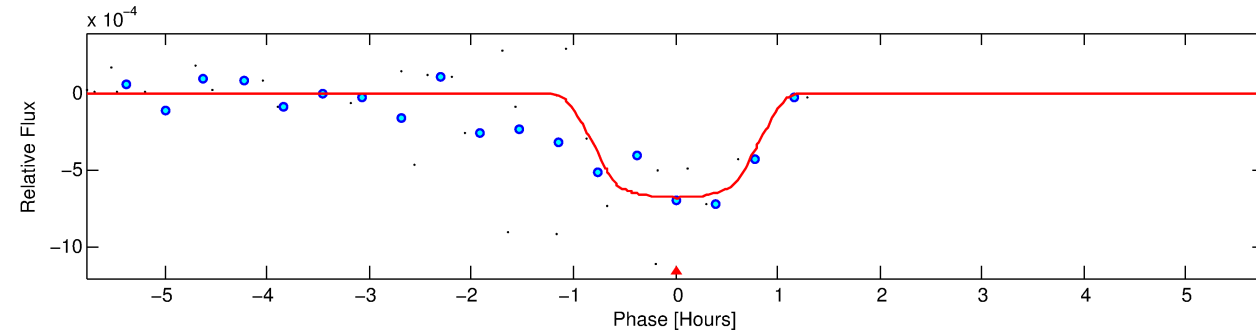
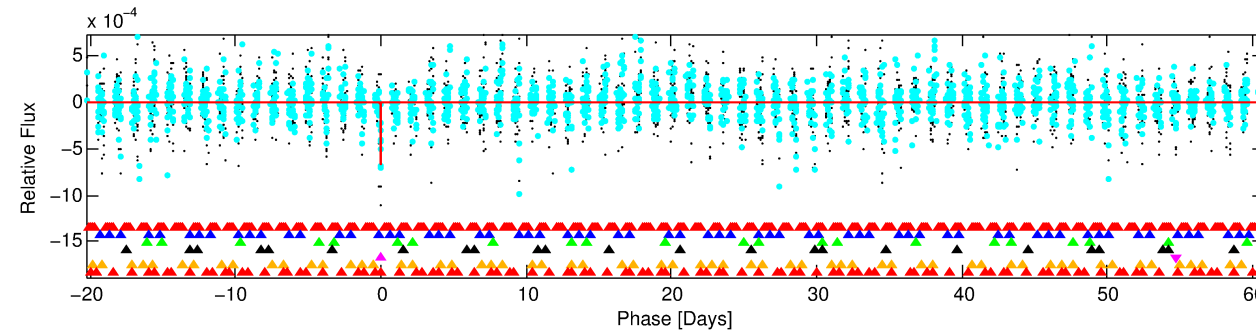
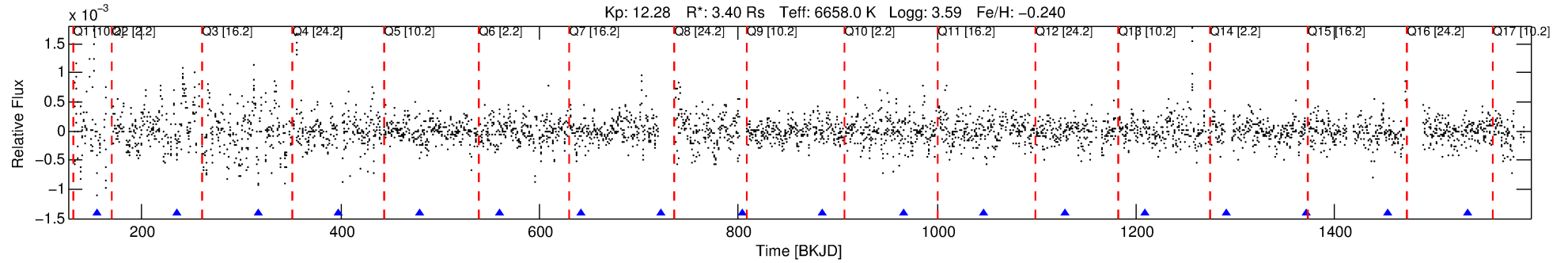
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 003954112-05

No Significant Match Found

# DV One-Page Summary

KIC: 3954112 Candidate: 5 of 7 Period: 81.151 d



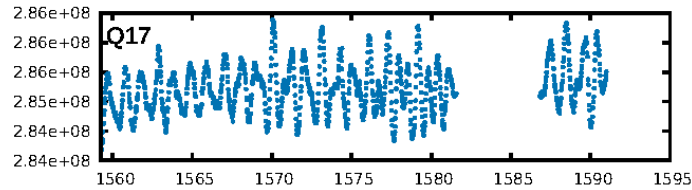
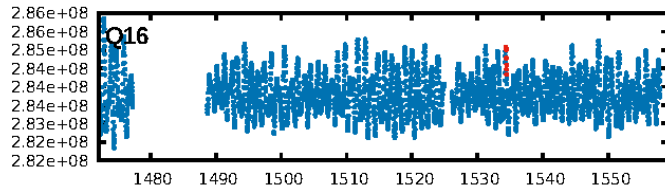
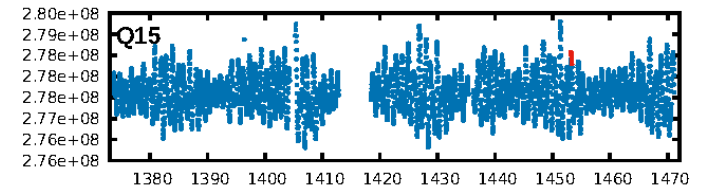
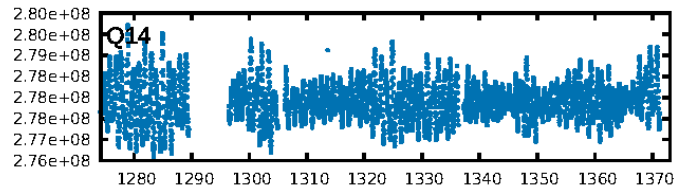
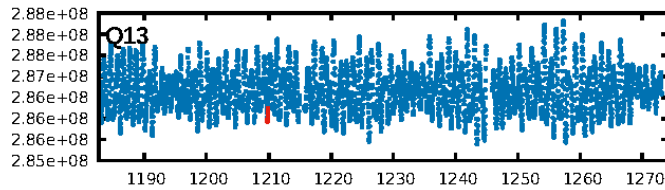
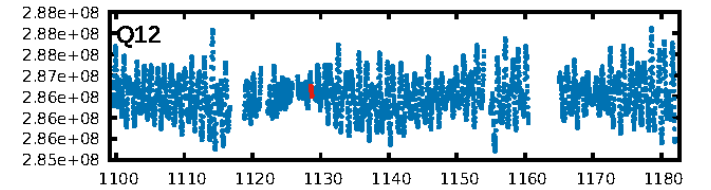
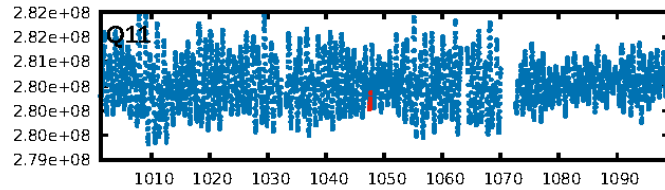
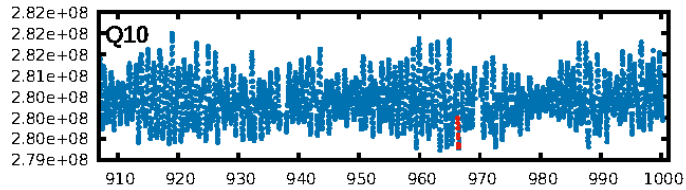
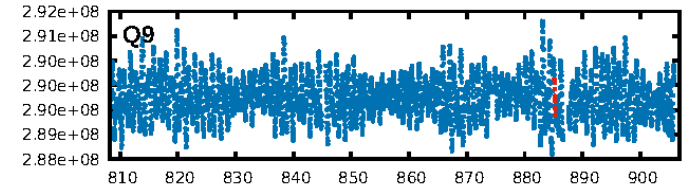
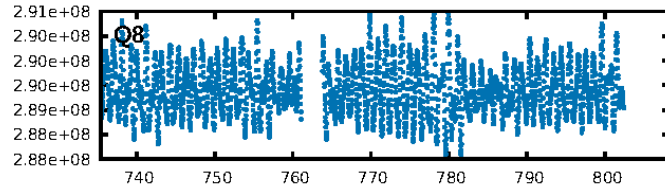
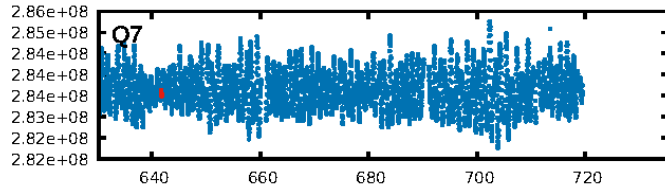
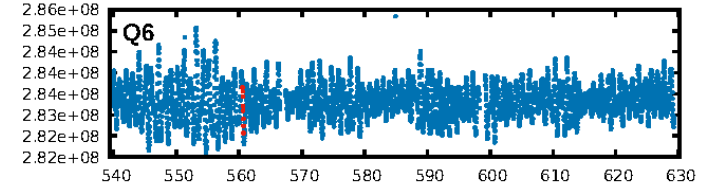
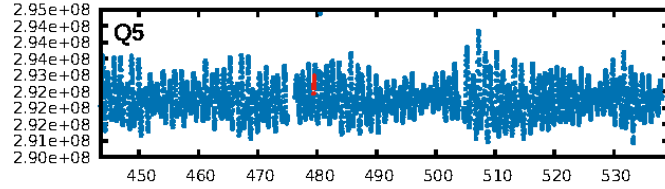
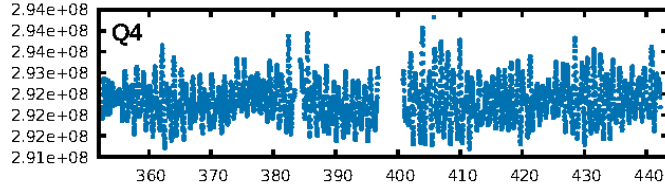
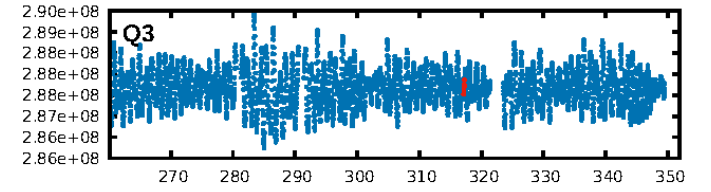
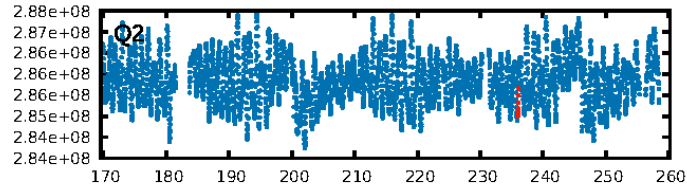
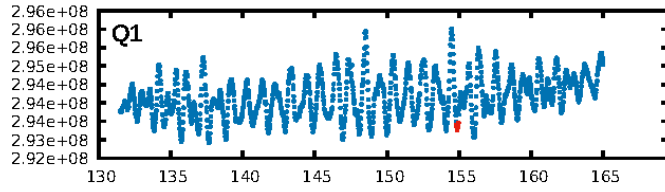
## DV Fit Results:

Period = 81.15055 [0.00754] d  
Epoch = 154.8770 [0.0068] BKJD  
Rp/R\* = 0.0276 [0.0241]  
a/R\* = 166.02 [834.07]  
b = 0.89 [1.17]  
Seff = 108.78 [67.57]  
Teq = 823 [128] K  
Rp = 10.25 [9.84] Re  
a = 0.4331 [0.1657] AU  
Ag = 280.09 [533.32] [0.52 $\sigma$ ]  
Teffp = 5209 [2354] K [1.86 $\sigma$ ]

## DV Diagnostic Results:

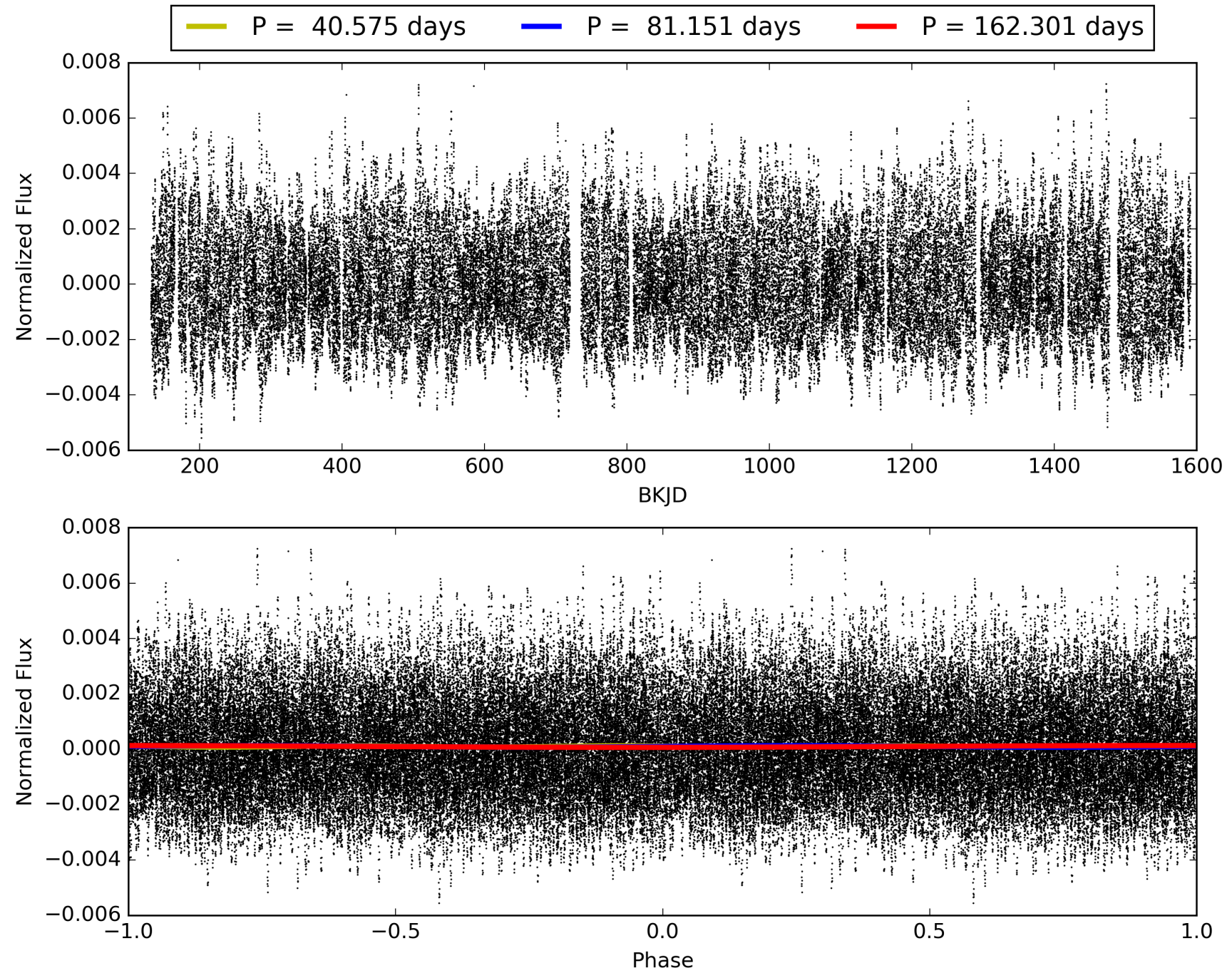
ShortPeriod-sig: 100.0% [153.37 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 16.5%  
ModelChiSquareGof-sig: 86.3%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [3/3]  
**GhostDiagnostic-chr: 0.8622**  
Centroid-sig: 23.5%  
Centroid-so: 0.291 arcsec [0.79 $\sigma$ ]  
OotOffset-rm: 0.039 arcsec [0.16 $\sigma$ ]  
KicOffset-rm: 0.042 arcsec [0.21 $\sigma$ ]  
OotOffset-st: 3/4/2/4 [13]  
KicOffset-st: 3/4/2/4 [13]  
DiffImageQuality-fgm: 0.69 [9/13]  
DiffImageOverlap-fno: 0.38 [5/13]

# TCE 003954112-05, PDC Light Curves



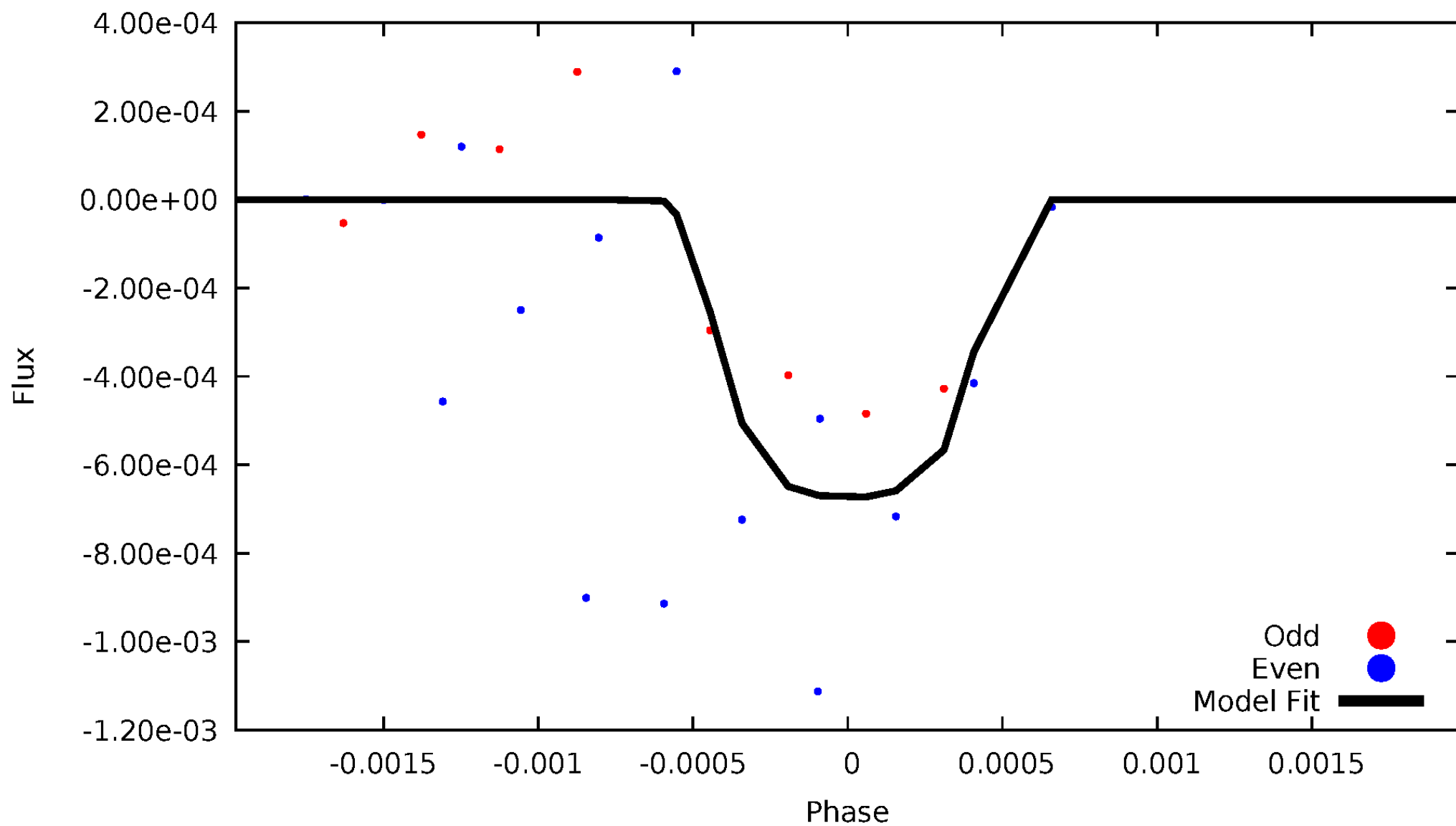


# TCE 003954112-05



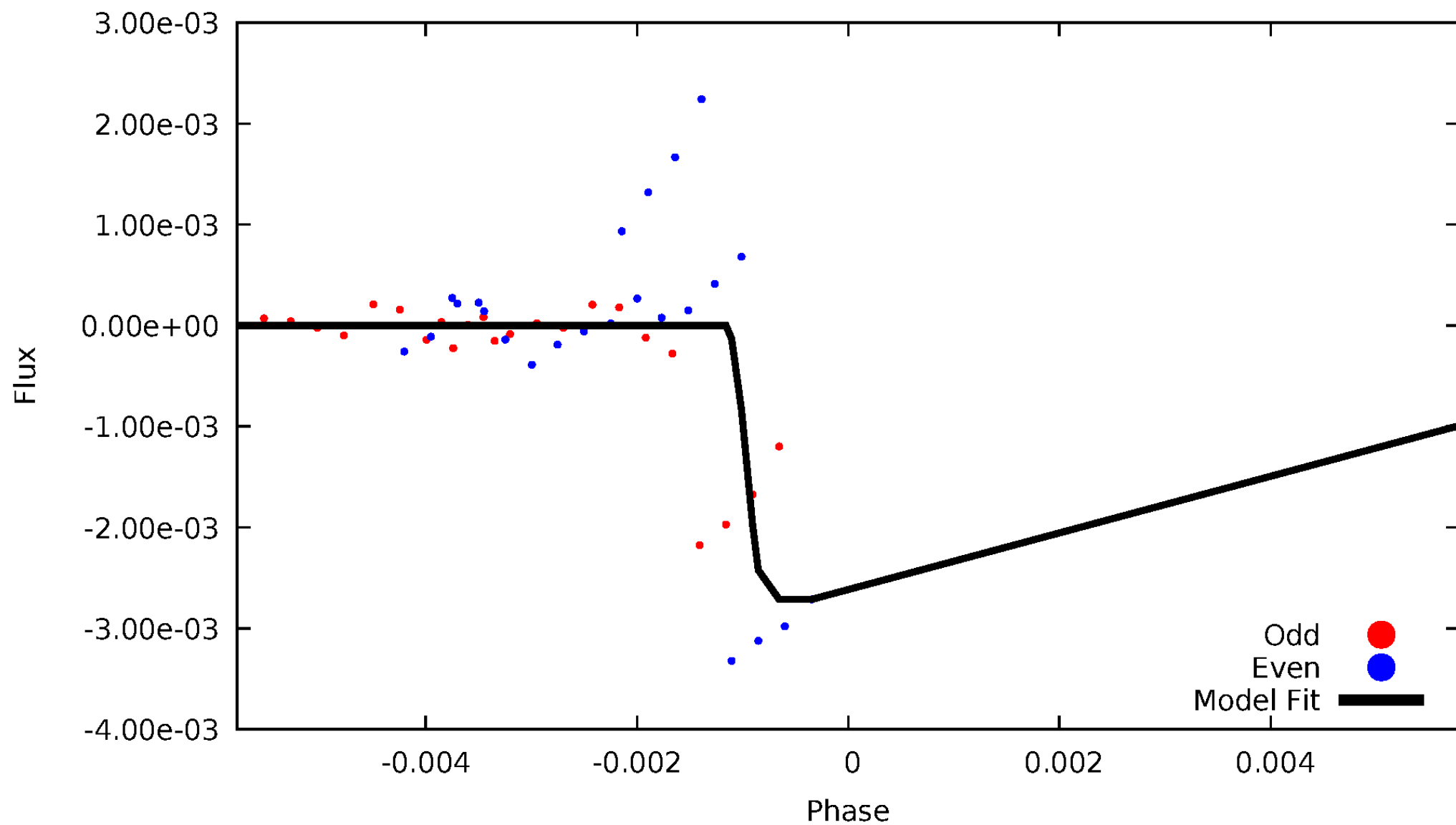
# DV Odd/Even

TCE 003954112-05



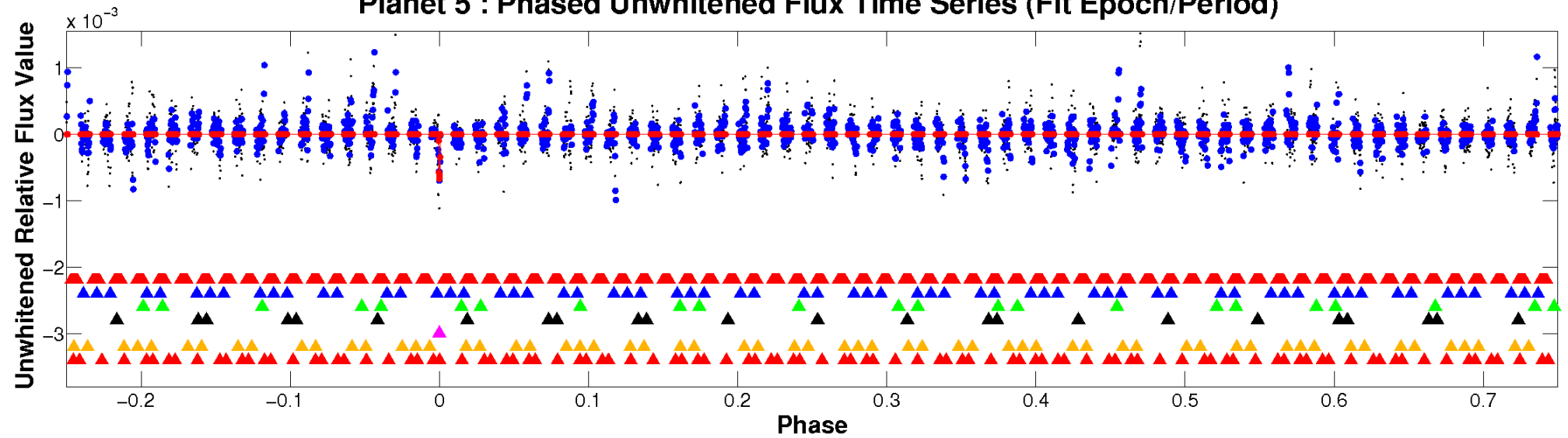
# ALT Odd/Even

TCE 003954112-05

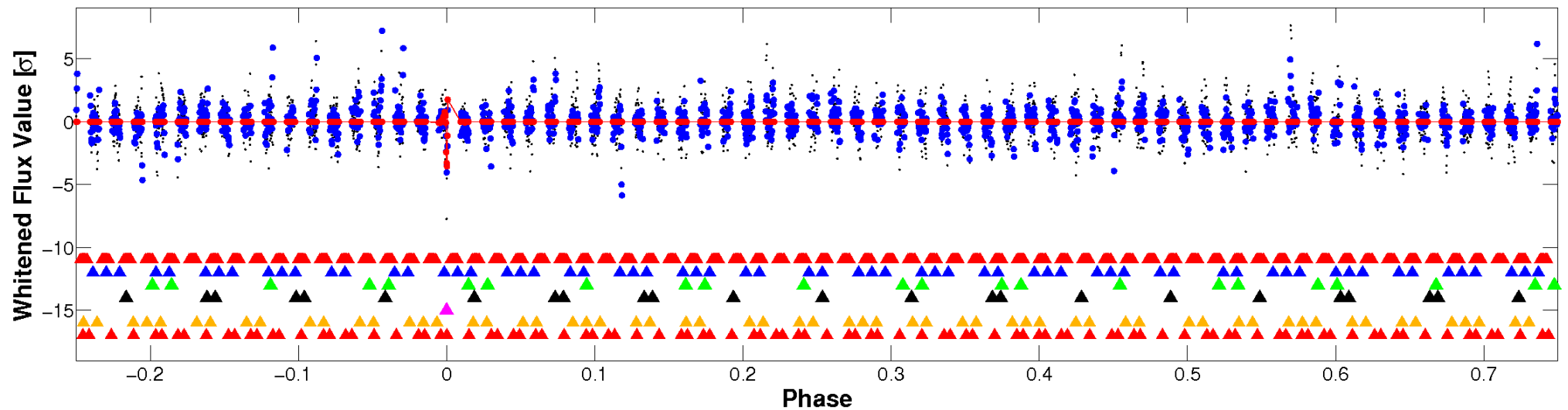


# Non-Whitened Vs. Whitened Light Curve

## Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

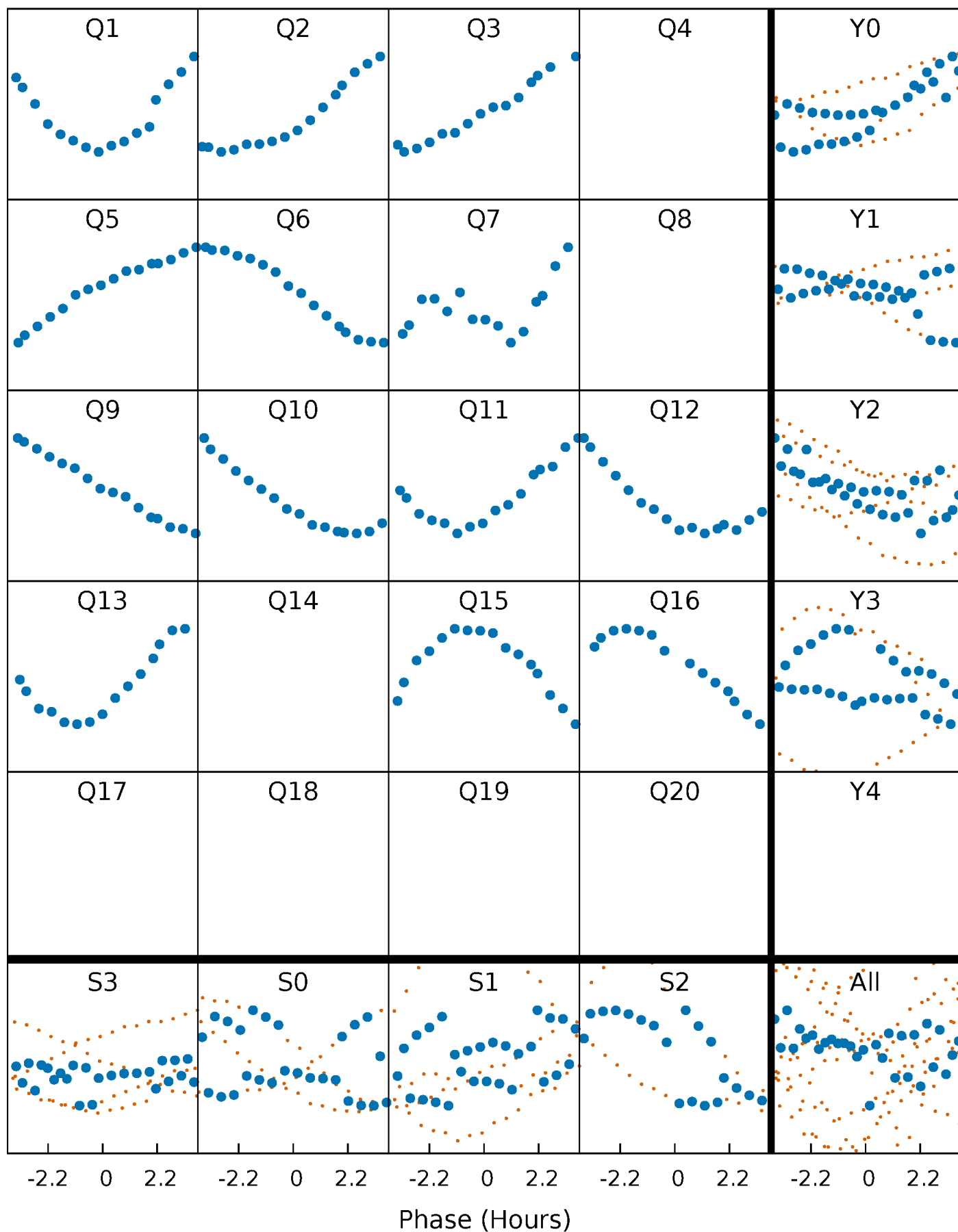


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



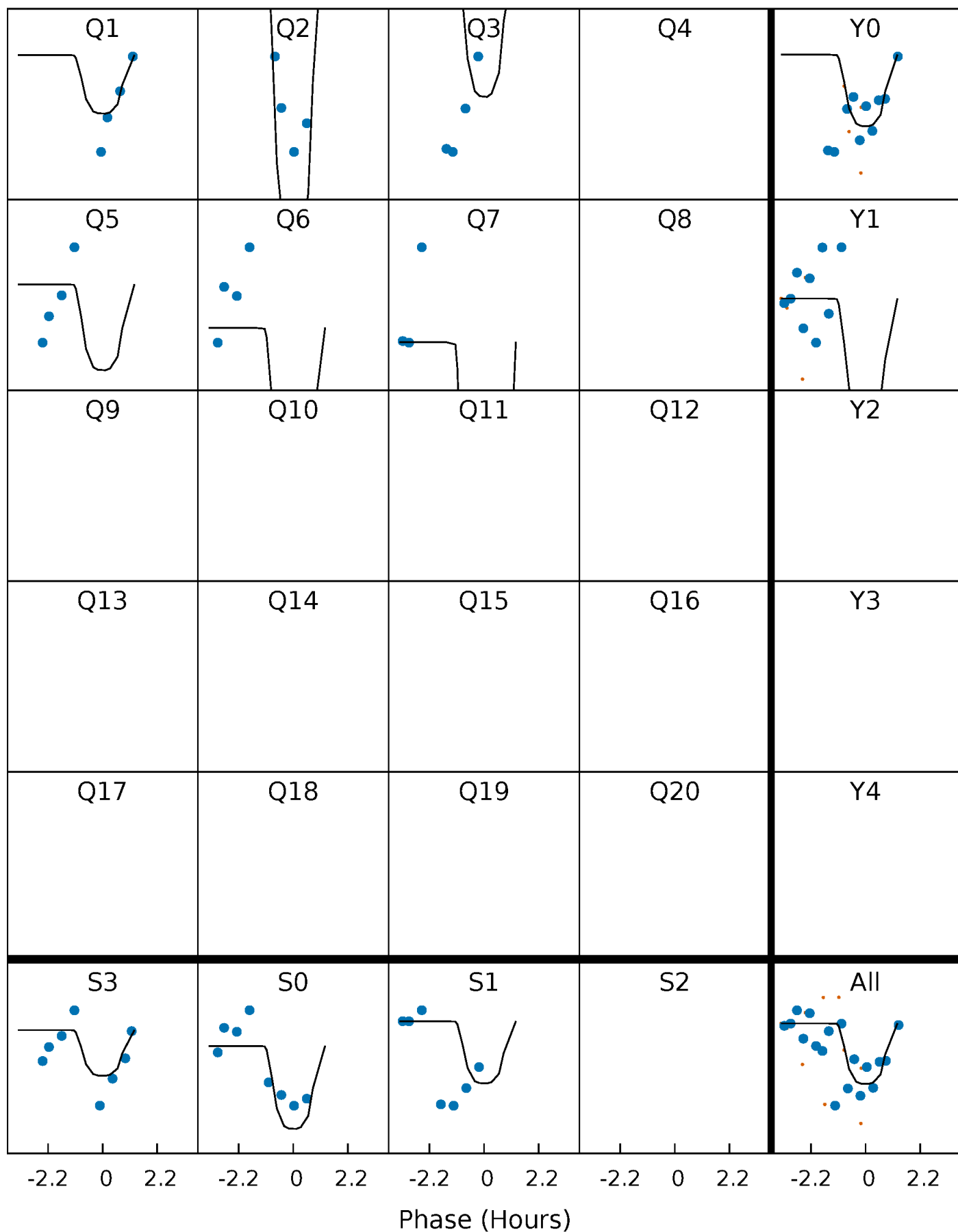
# PDC Quarter-Phased Transit Curves

TCE 003954112-05   P= 81.150550 Days    $T_0=154.876992$  (BKJD)



# DV Quarter-Phased Transit Curves

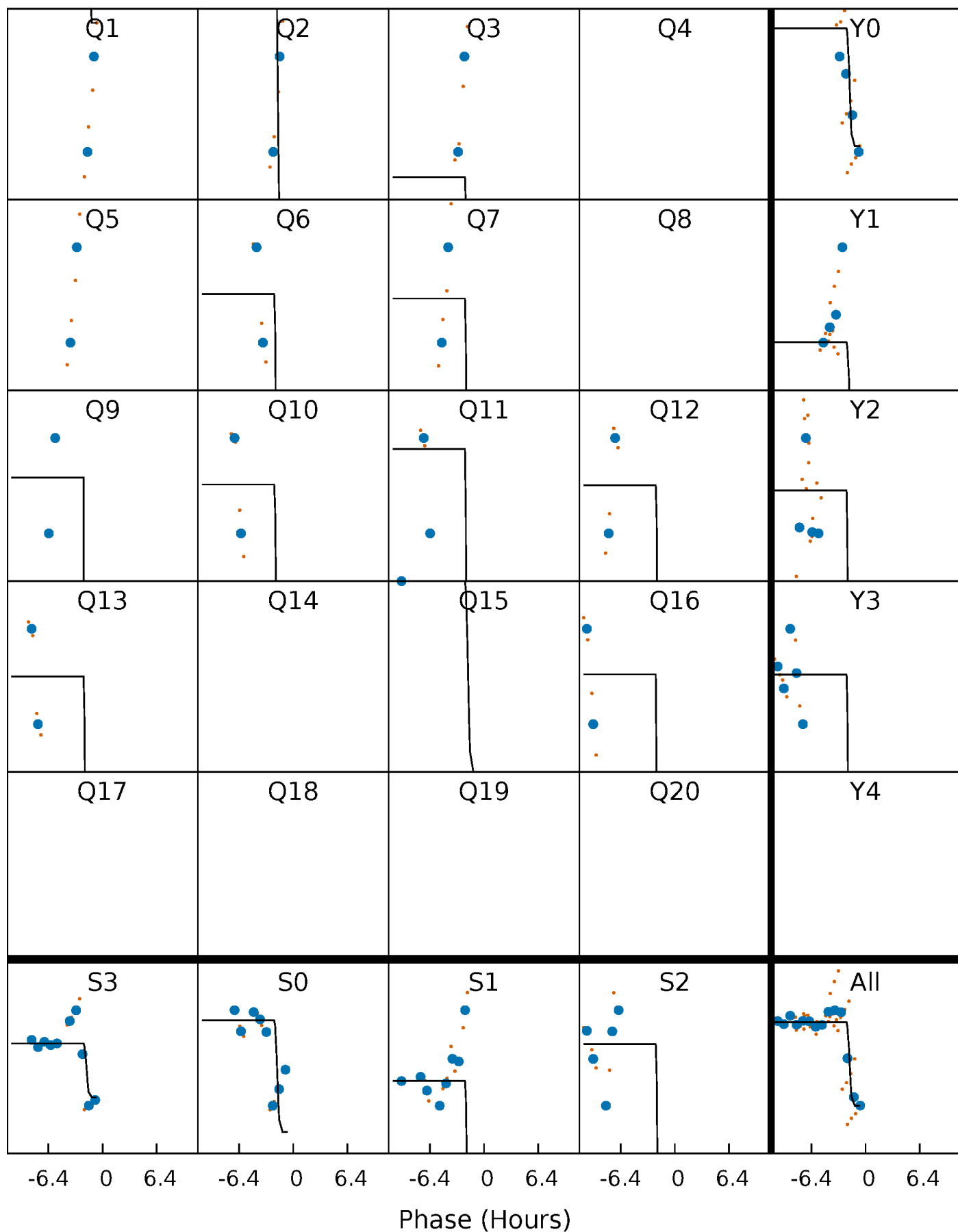
TCE 003954112-05     $P = 81.150550$  Days     $T_0 = 154.876992$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

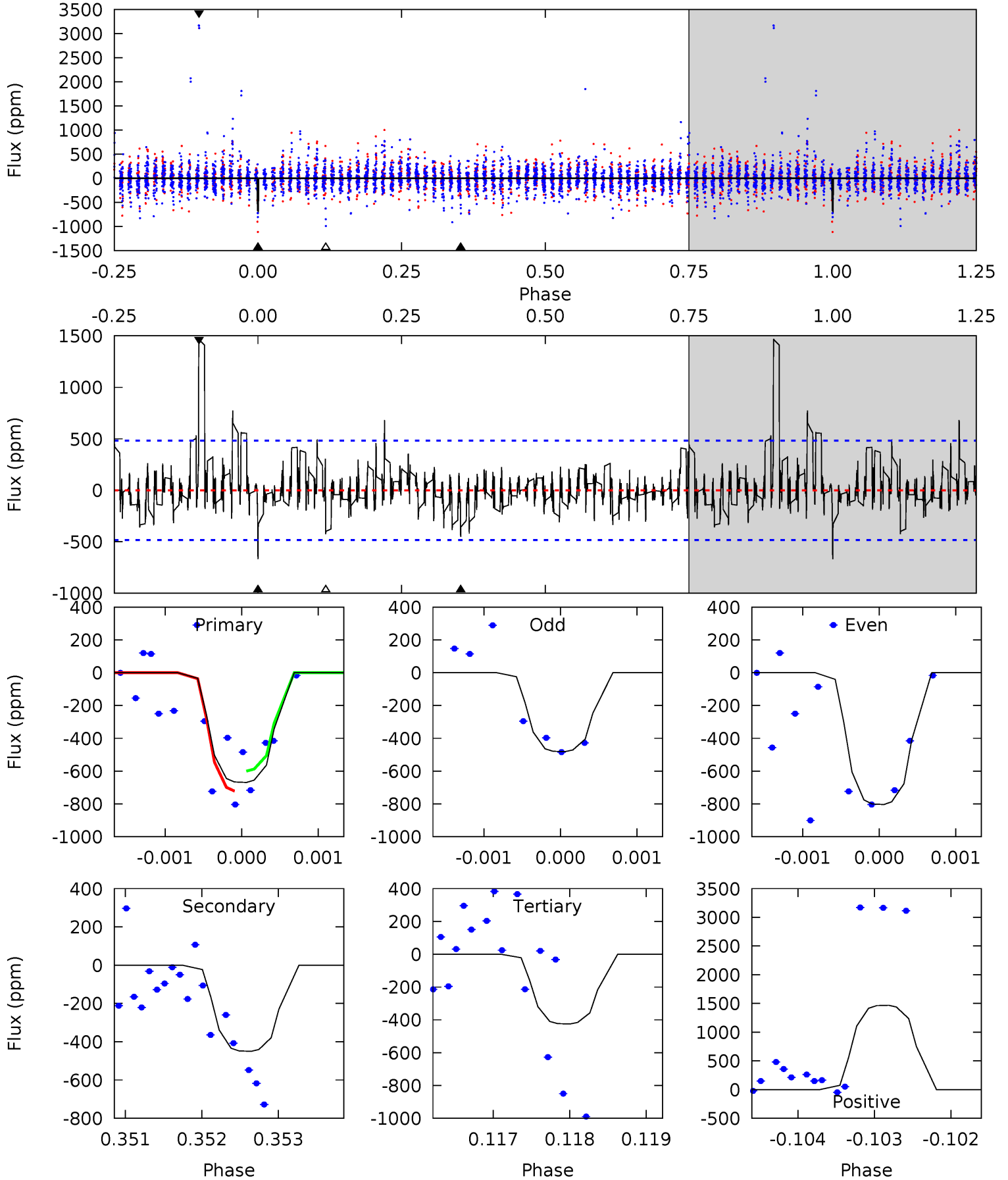
TCE 003954112-05     $P = 81.147068$  Days     $T_0 = 154.958812$  (BKJD)



# DV Model-Shift Uniqueness Test

003954112-05, P = 81.150550 Days, E = 73.726442 Days

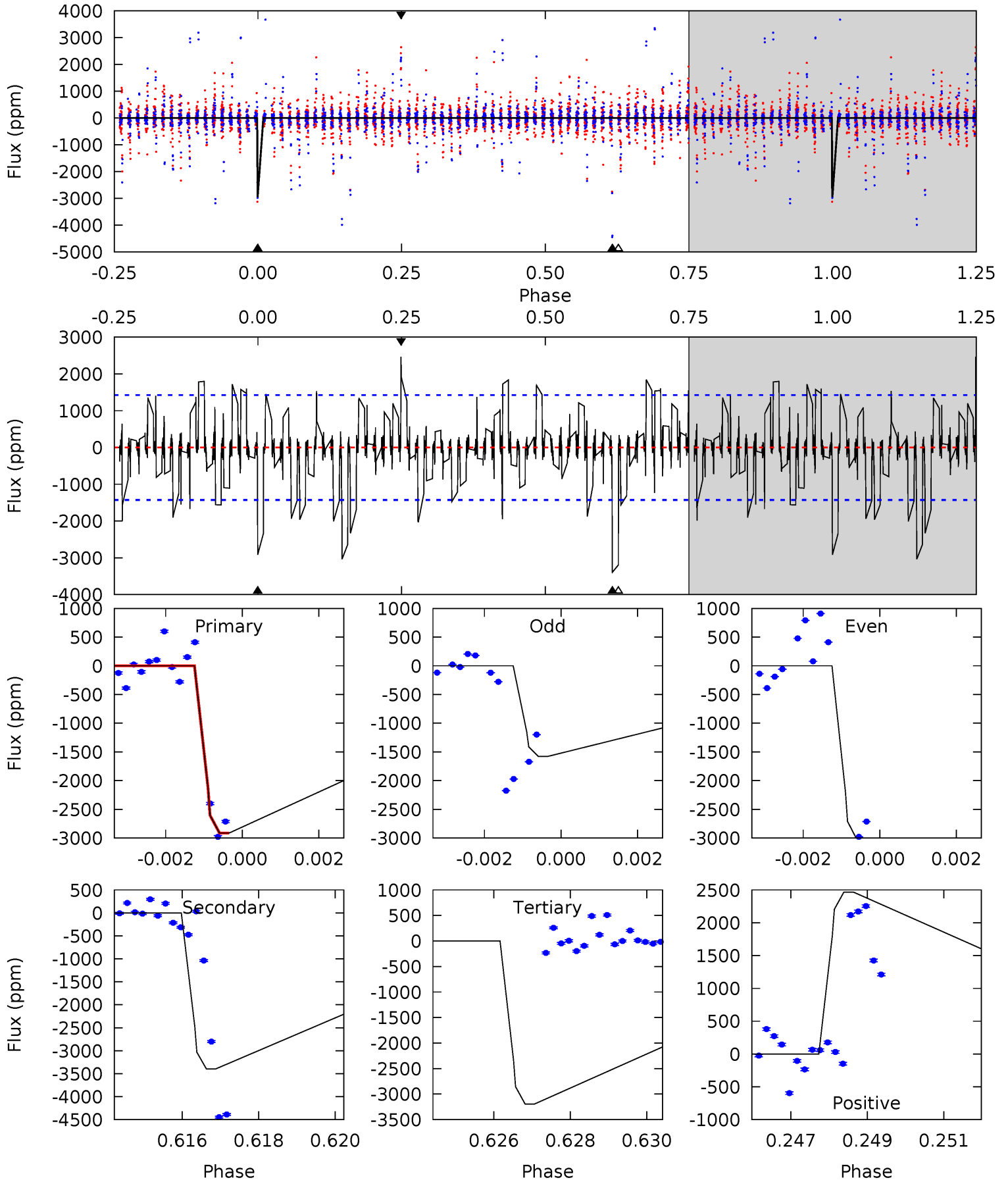
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.57	5.09	4.80	16.6	5.46	3.30	1.63	2.76	-9.04	0.29	-11.5	1.69	1.03	0.69	0.69



# Alt Model-Shift Uniqueness Test

003954112-05, P = 81.147068 Days, E = 73.811744 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
10.9	12.7	11.9	9.22	5.32	3.09	1.48	-1.05	1.67	0.75	3.46	2.36	0	0.42	0



### Stellar Parameters For KIC 003954112

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6658^{+179}_{-199}$	$3.590^{+0.357}_{-0.084}$	$-0.240^{+0.300}_{-0.250}$	$3.404^{+0.341}_{-1.363}$	$1.645^{+0.224}_{-0.336}$	$0.059^{+0.145}_{-0.012}$
	+3%/-3%	+10%/-2%	+125%/-104%	+10%/-40%	+14%/-20%	+247%/-21%
Source	PHO1	FLK73	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 003954112-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-450 \pm 88$	$10.87^{+8.24}_{-6.79}$	$1125^{+64}_{-107}$	$5424^{+3981}_{-1119}$	$383^{+2574}_{-260}$
Alt.	$-3394 \pm 268$	$18.04^{+8.66}_{-8.47}$	$1128^{+60}_{-107}$	$7021^{+3224}_{-1189}$	$1050^{+2617}_{-541}$

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

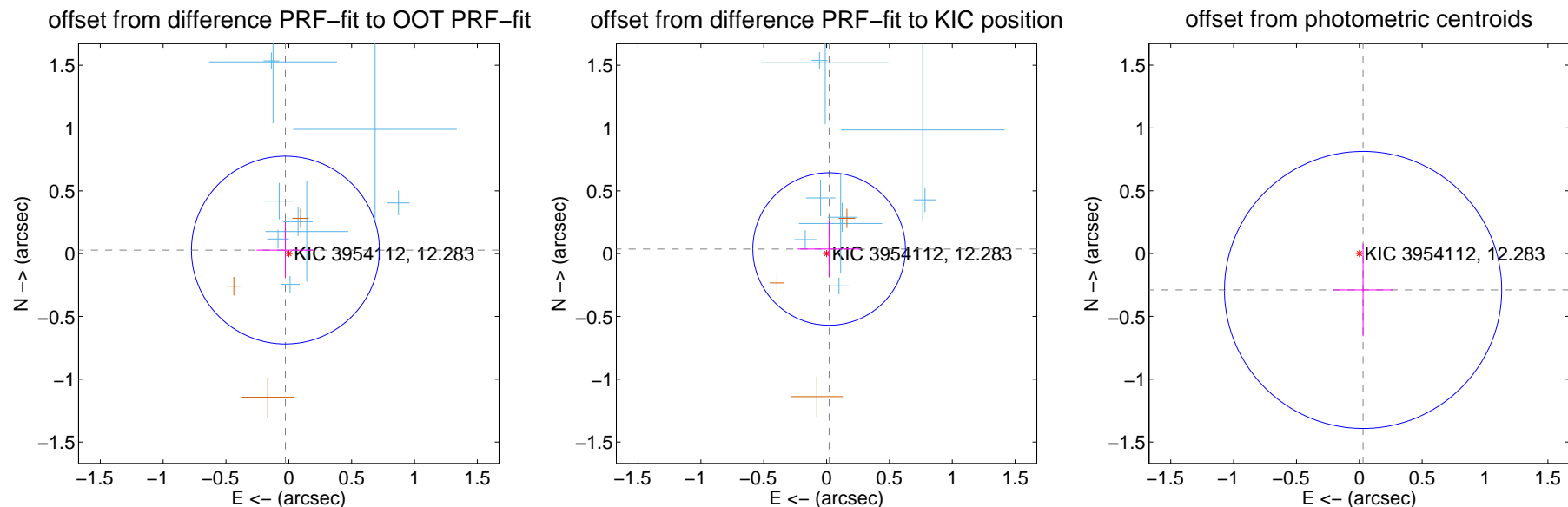
## DV Centroid Data

Supplemental centroid analysis for 003954112-05. Kepler magnitude: 12.28. Transit SNR 8.62

There are 9 quarters with good PRF difference image offsets

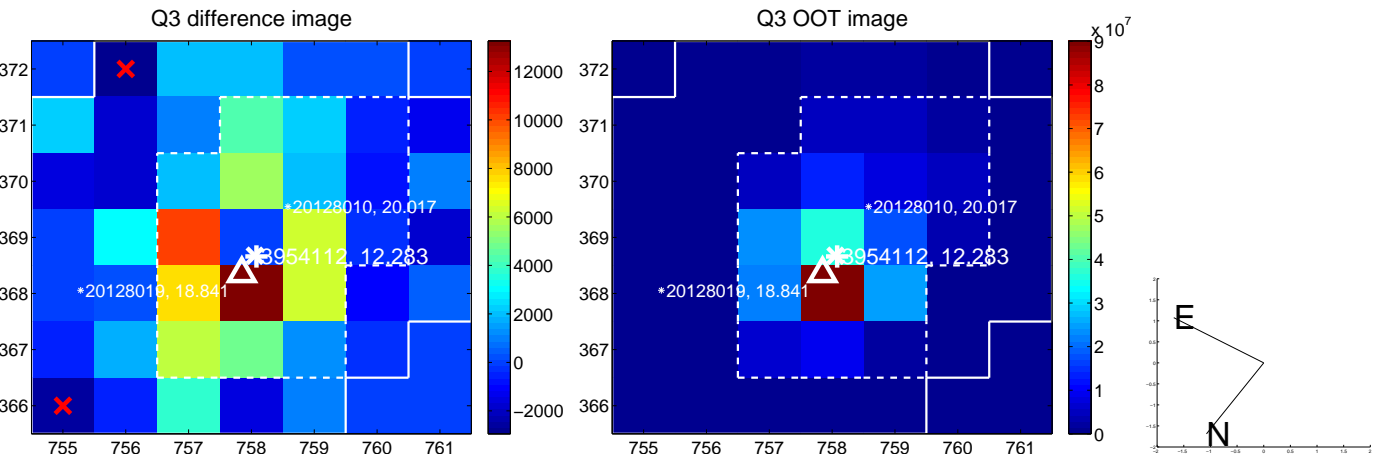
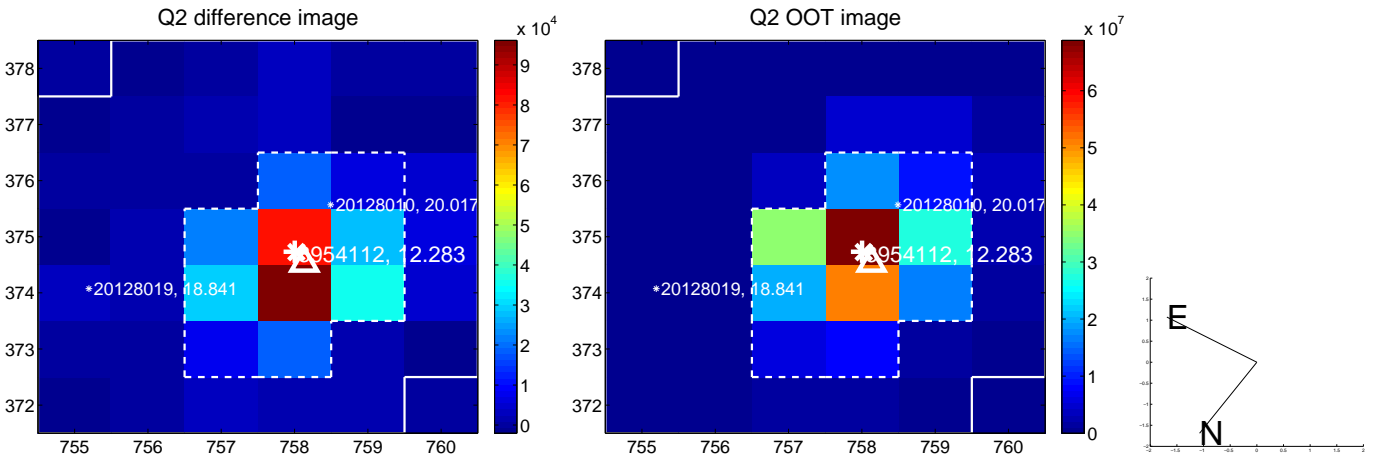
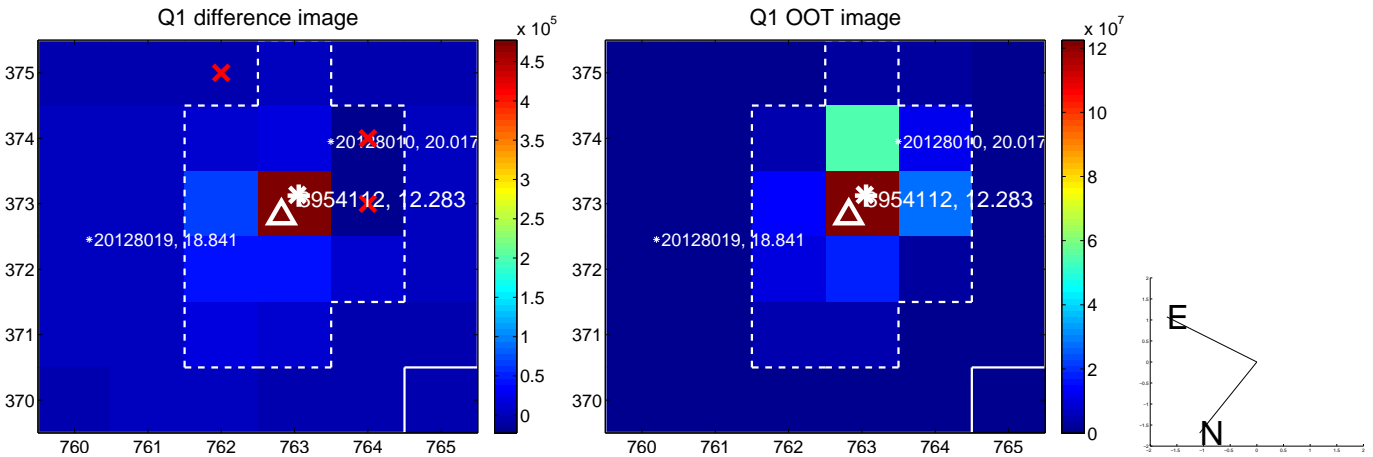
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.039 \pm 0.249$	0.16	$0.027 \pm 0.229$	$0.028 \pm 0.223$
PRF-fit source offset from KIC position	$0.042 \pm 0.202$	0.21	$-0.020 \pm 0.250$	$0.037 \pm 0.221$
photometric centroid source offset	$0.29 \pm 0.37$	0.79	$-0.03 \pm 0.24$	$-0.29 \pm 0.37$



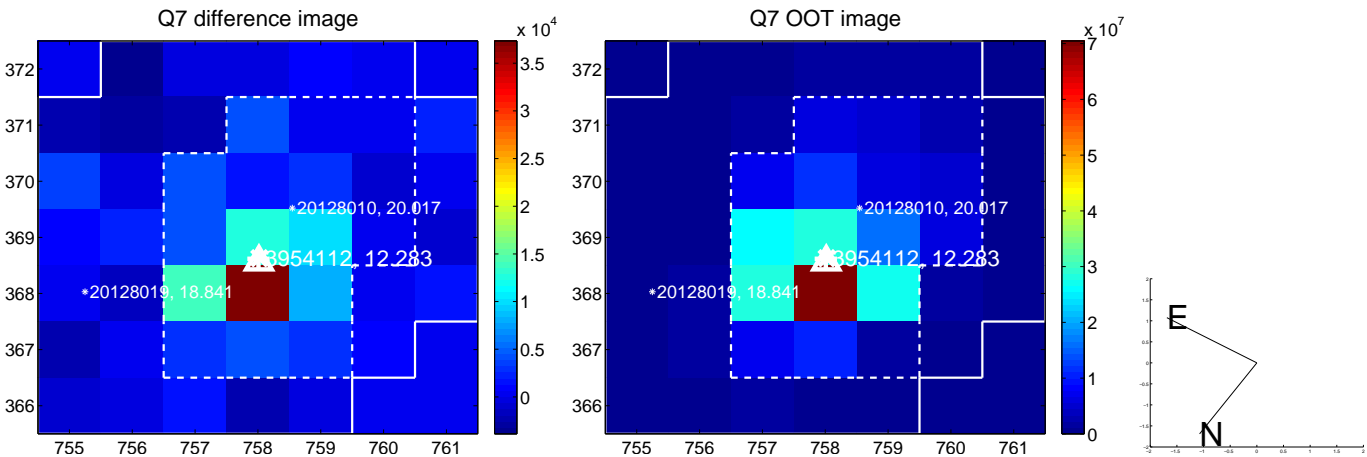
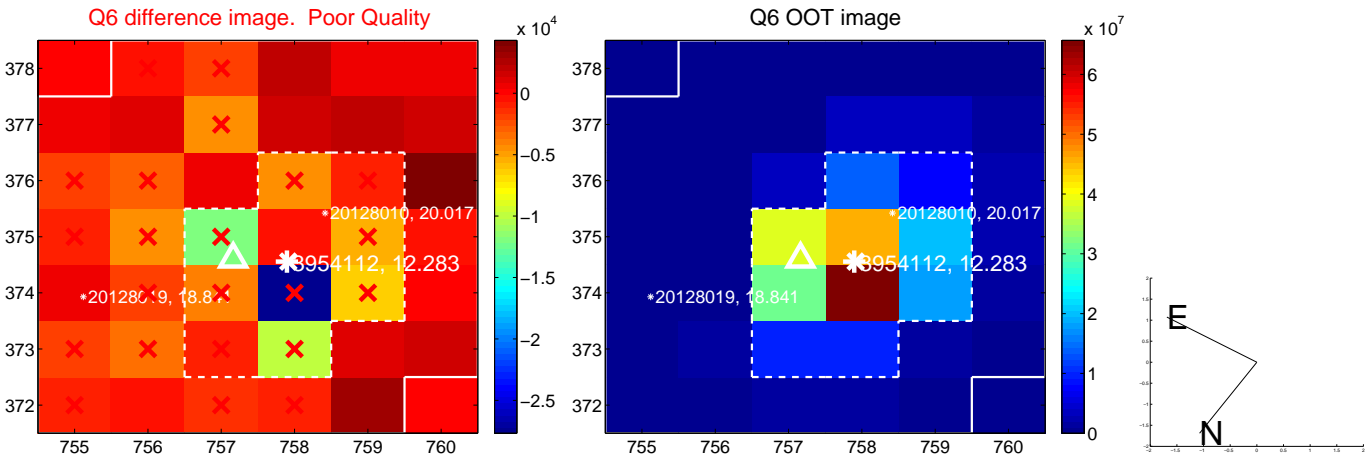
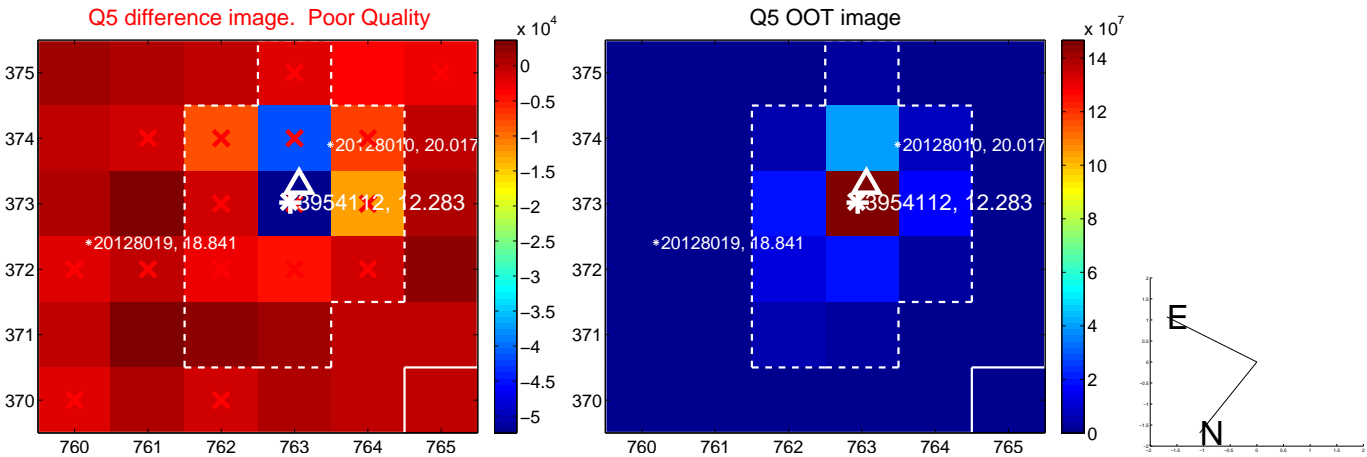
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

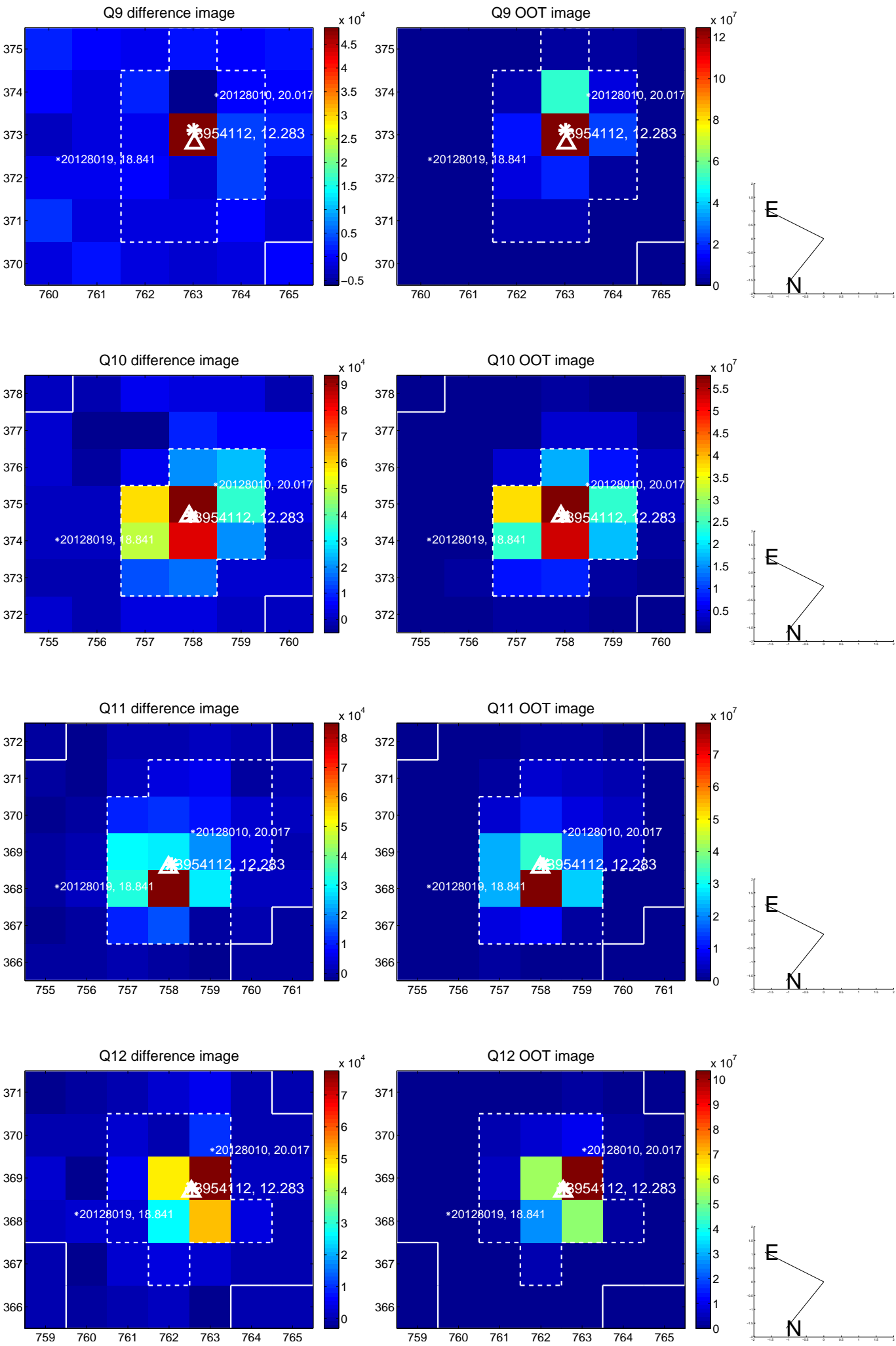




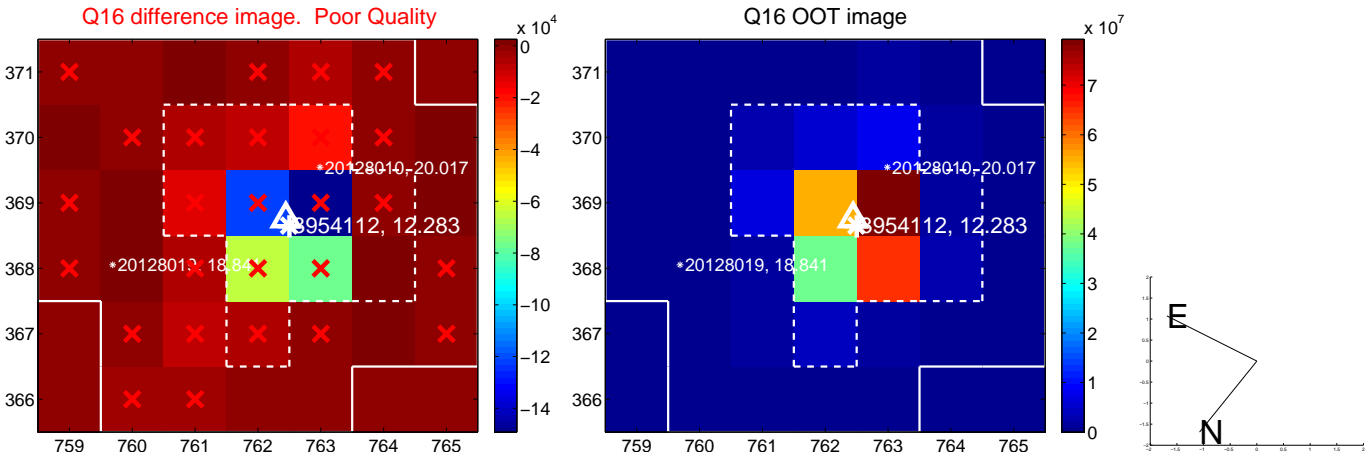
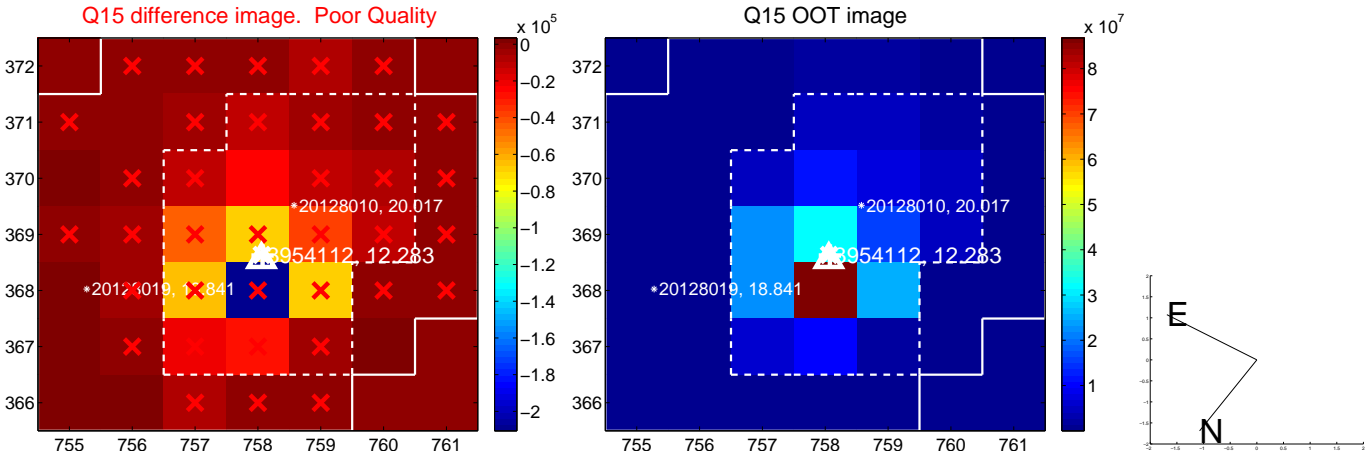
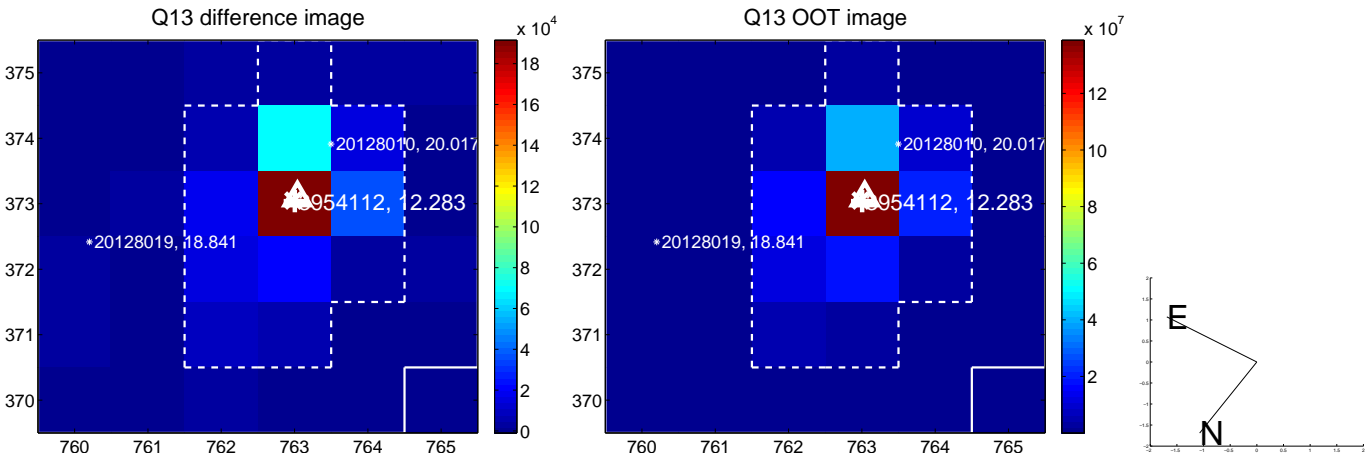
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



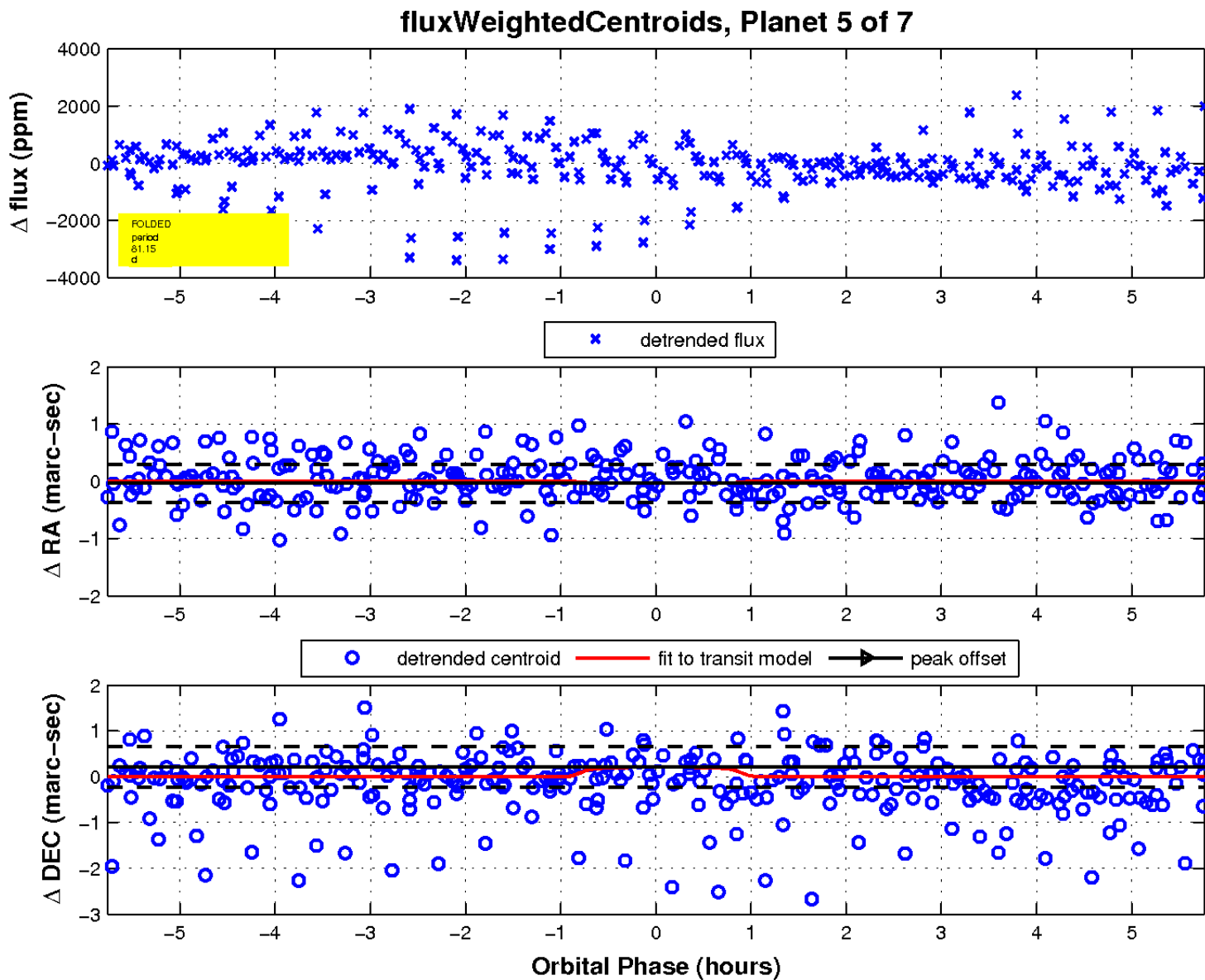
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

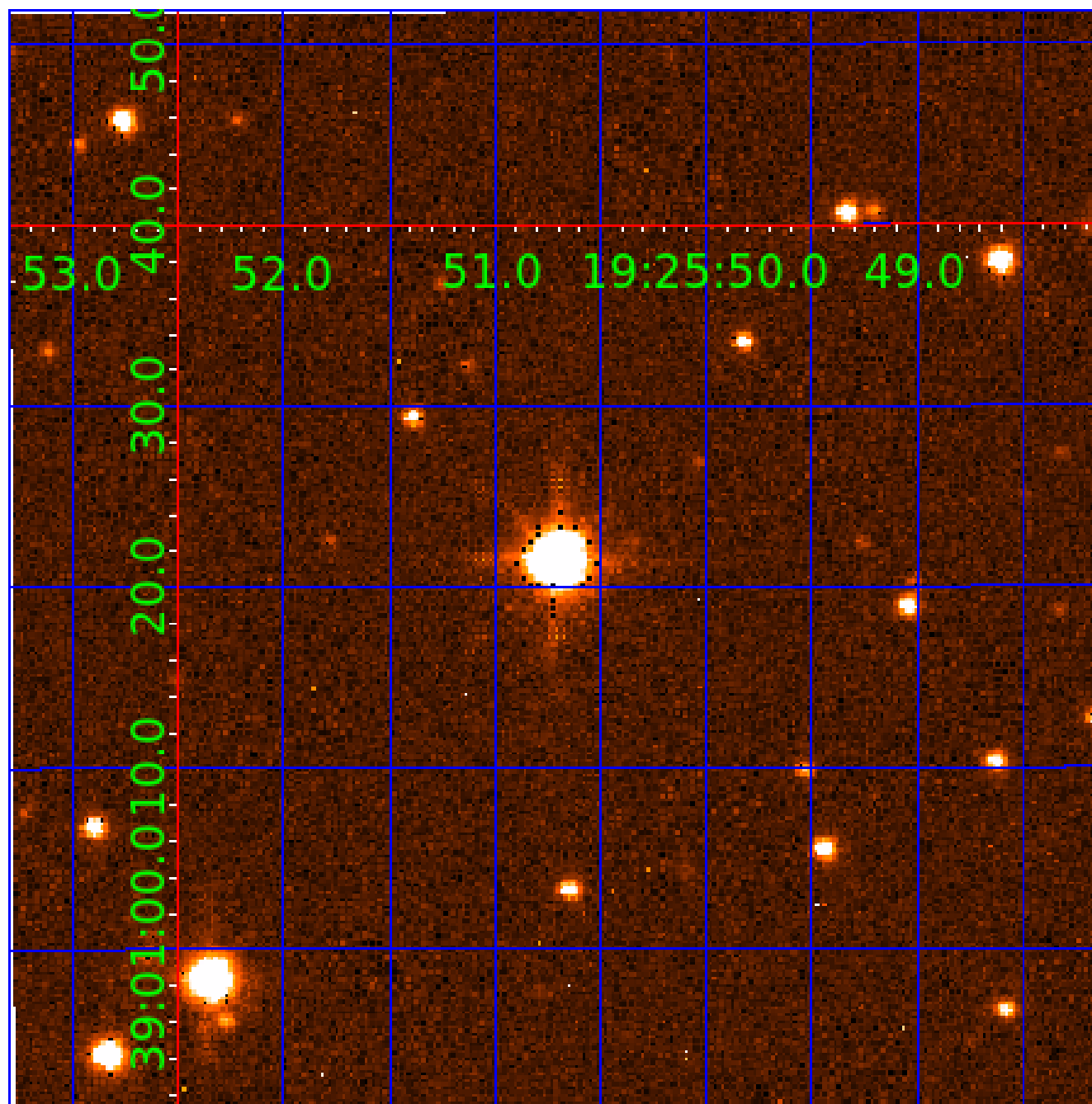


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 003954112

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
003954112-01	OBS	No	1.193033	131.630990	0.0	8.770	12.0	0.0	3.40	6658	0.03	30203.64
003954112-03	OBS	No	63.836213	156.077208	819.7	1.907	11.0	9.8	3.40	6658	10.40	149.80
003954112-05	OBS	No	81.150550	154.876992	674.9	1.924	10.3	8.6	3.40	6658	10.24	108.78
003954112-07	OBS	No	14.392231	143.270046	377.7	1.692	8.5	6.7	3.40	6658	6.68	1091.67

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
003954112-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT
003954112-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT
003954112-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
003954112-07	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE—TRANS_GAPPED—ALL_TRANS_CHASES—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.

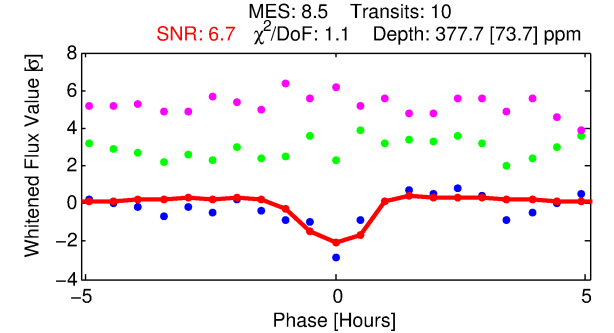
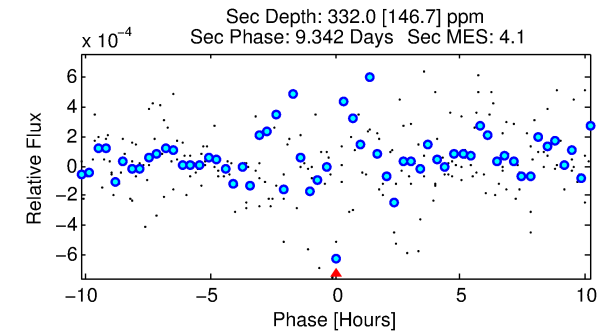
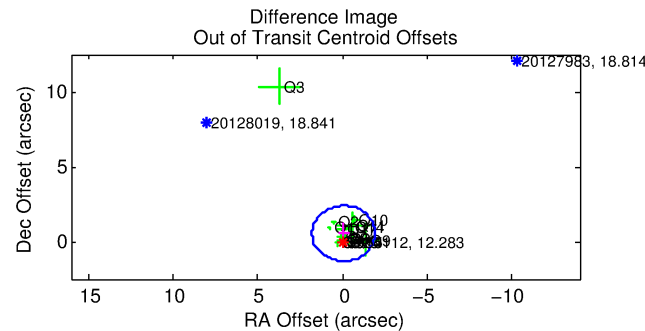
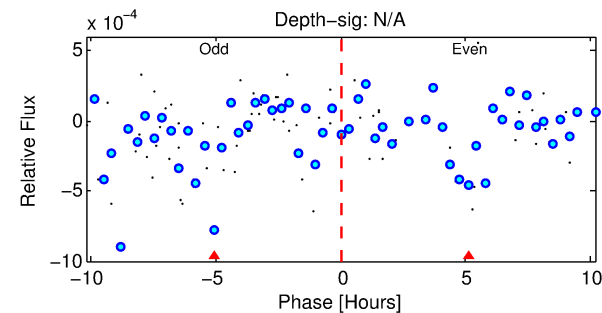
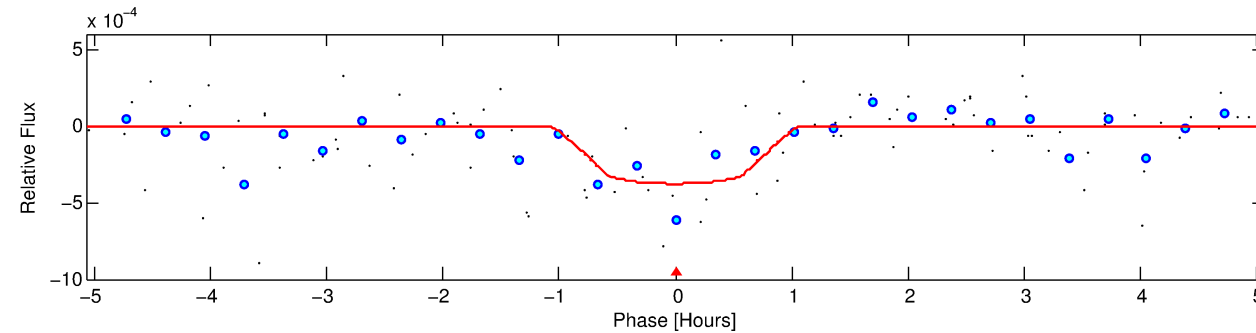
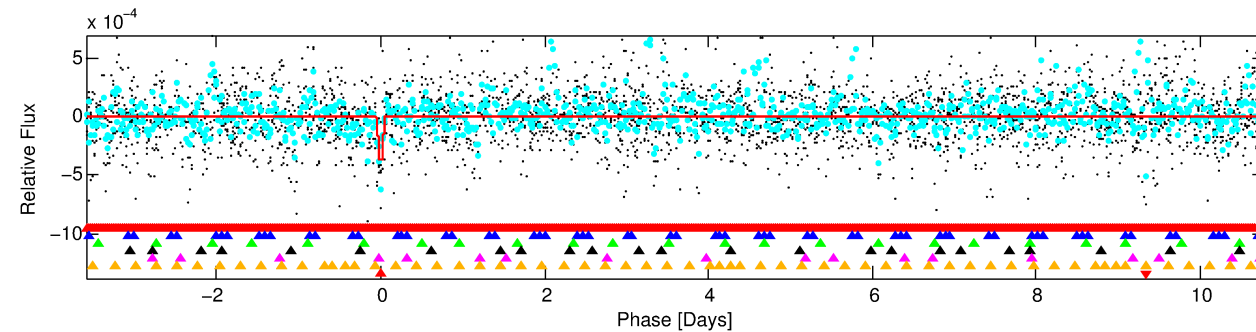
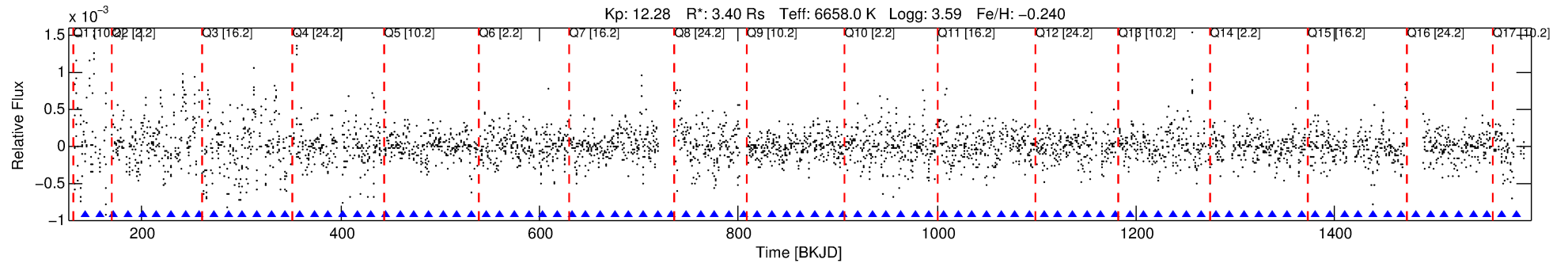
Ephemeris Match Information For 003954112-07

No Significant Match Found



# DV One-Page Summary

KIC: 3954112 Candidate: 7 of 7 Period: 14.392 d



## DV Fit Results:

Period = 14.39223 [0.00020] d  
Epoch = 143.2700 [0.0119] BKJD  
Rp/R\* = 0.0180 [0.0542]  
a/R\* = 66.15 [1044.46]  
b = 0.01 [1952.68]  
Seff = 1091.67 [678.13]  
Teq = 1466 [228] K  
Rp = 6.68 [20.32] Re  
a = 0.1367 [0.0523] AU  
Ag = 76.56 [465.40] [0.16 $\sigma$ ]  
Teff = 6703 [10138] K [0.52 $\sigma$ ]

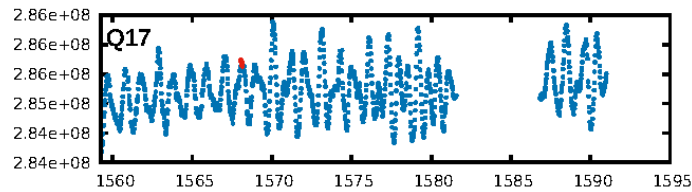
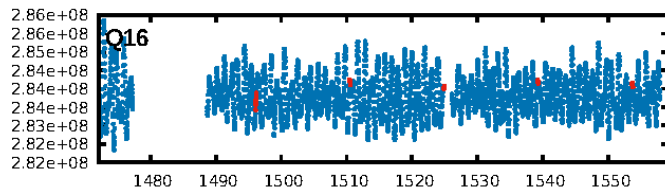
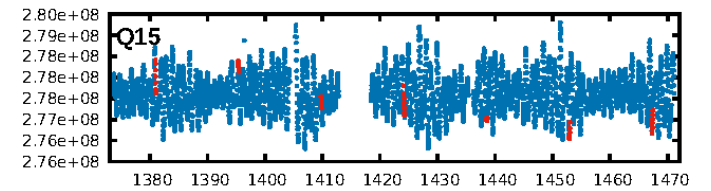
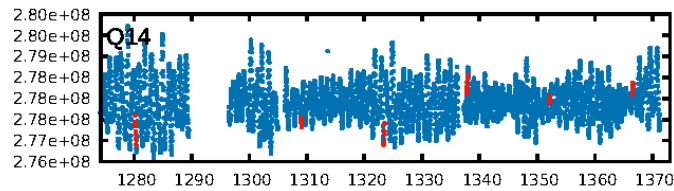
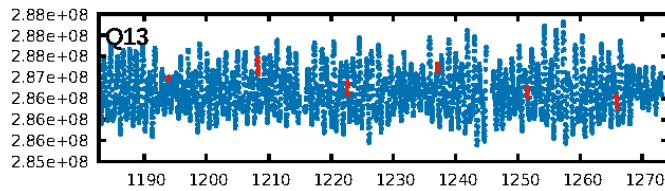
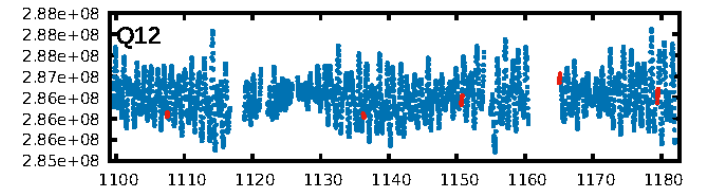
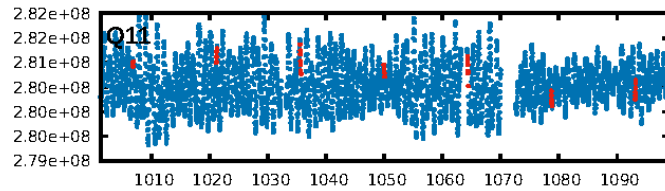
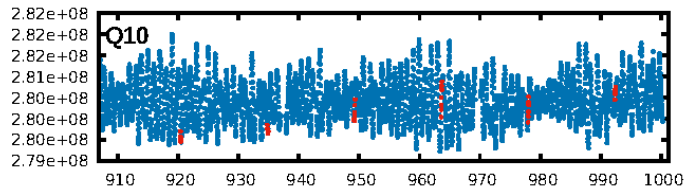
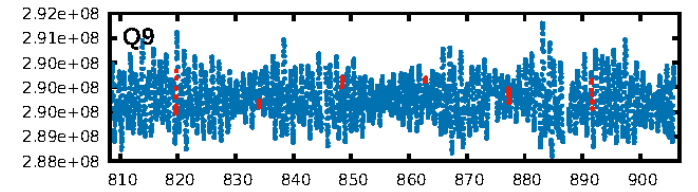
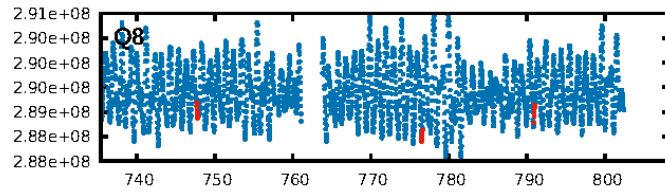
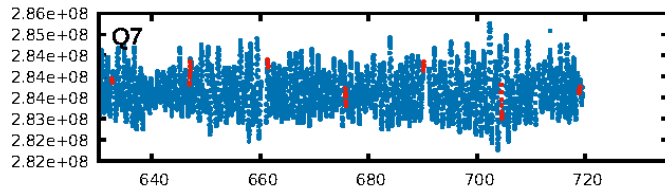
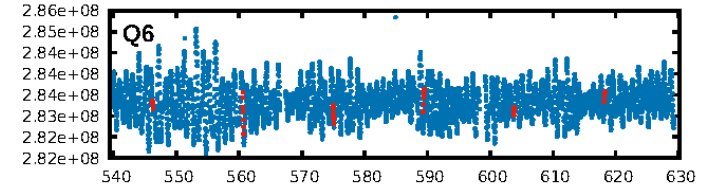
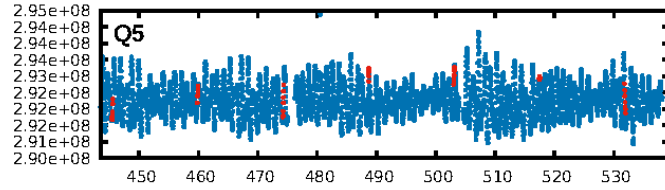
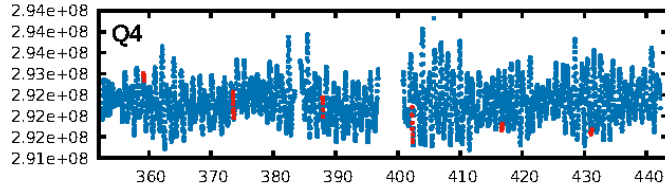
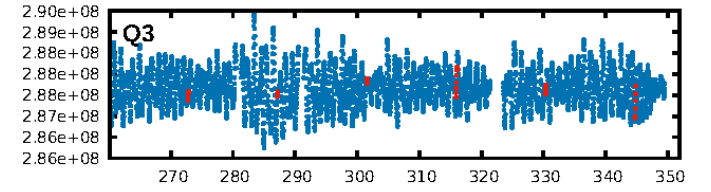
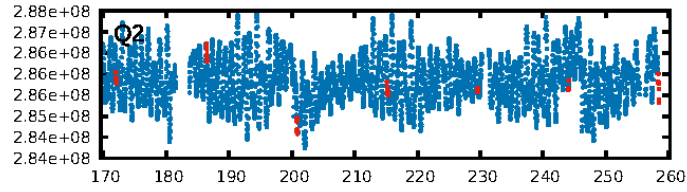
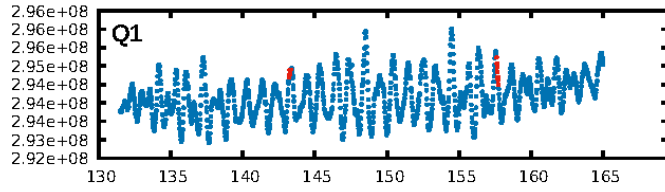
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [35.47 $\sigma$ ]  
LongPeriod-sig: 100.0% [45.34 $\sigma$ ]  
ModelChiSquare2-sig: 6.1%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [10/10]  
GhostDiagnostic-chr: 0.2375  
Centroid-sig: 10.7%  
Centroid-so: 0.180 arcsec [1.01 $\sigma$ ]  
OotOffset-rm: 0.542 arcsec [0.88 $\sigma$ ]  
KicOffset-rm: 0.545 arcsec [0.90 $\sigma$ ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 0.53 [8/15]  
DiffImageOverlap-fno: 0.47 [8/17]

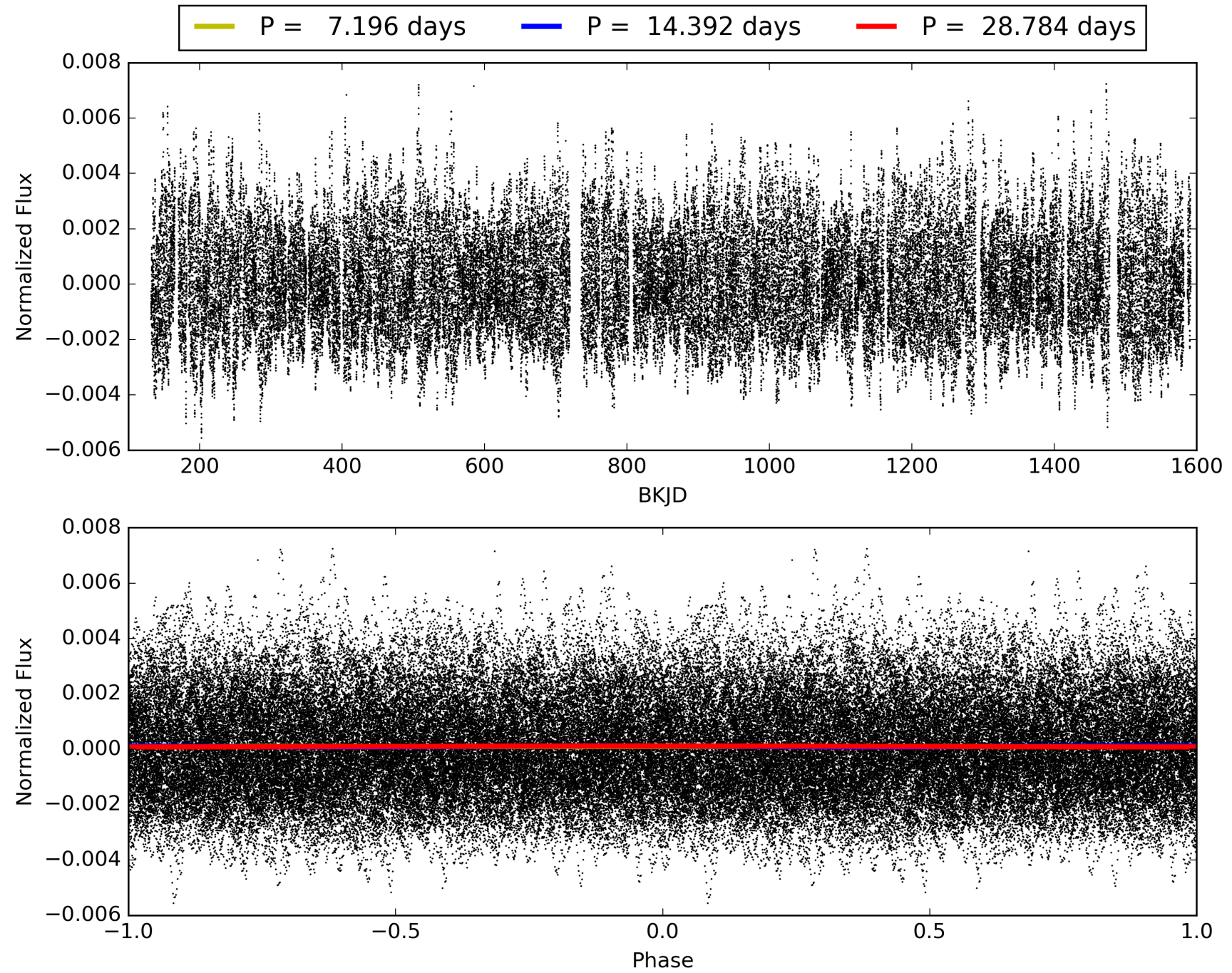
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 05:55:25 Z

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

# TCE 003954112-07, PDC Light Curves

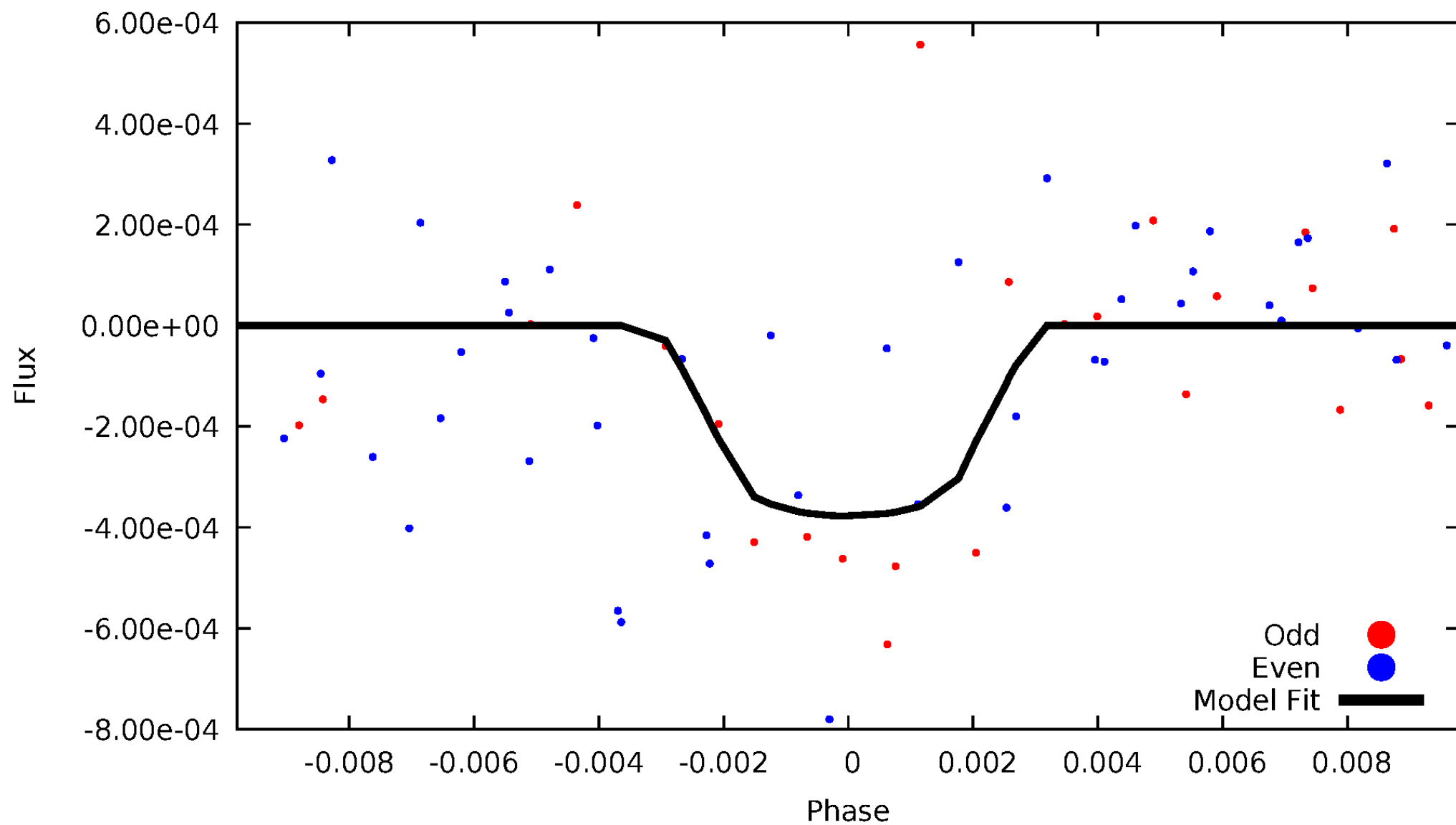


# TCE 003954112-07



# DV Odd/Even

TCE 003954112-07

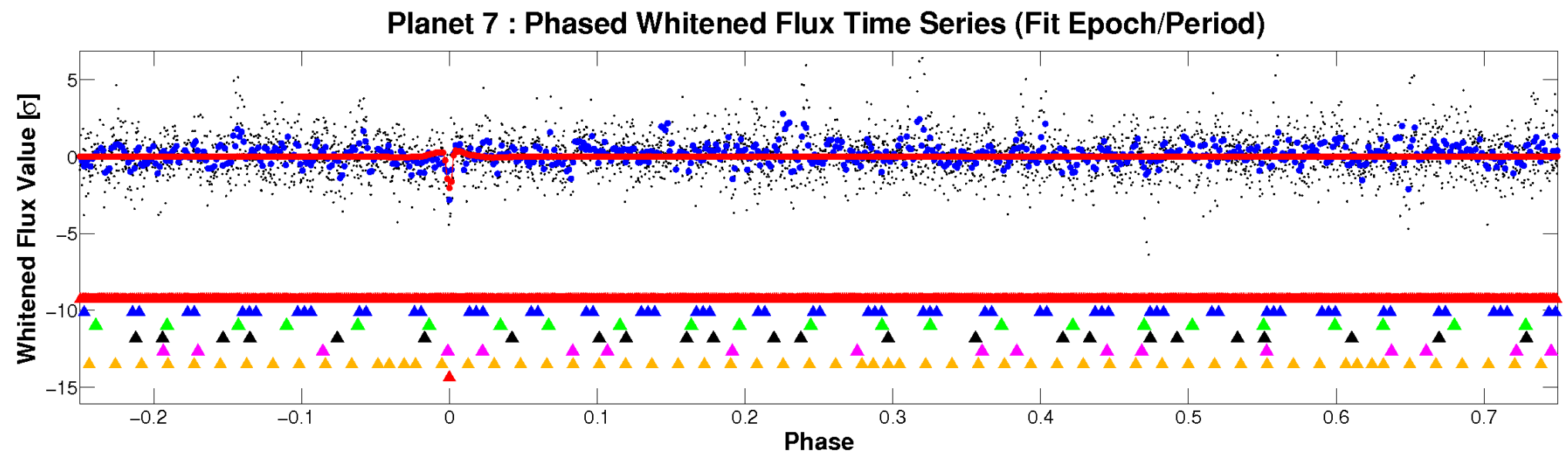
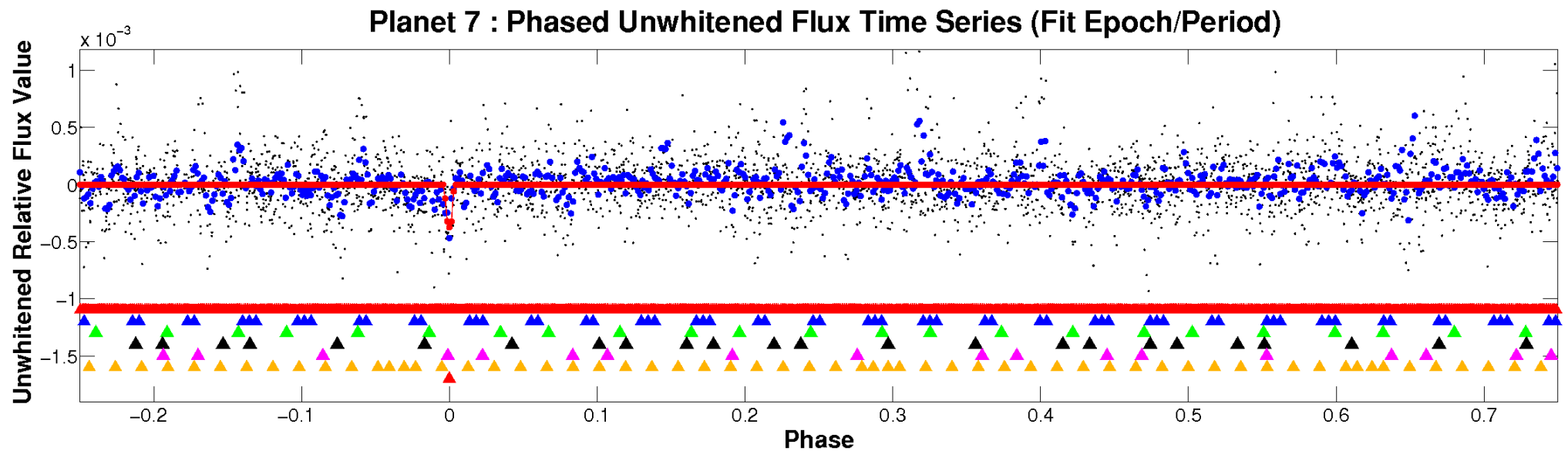




ALT Odd/Even

This plot does not exist for this TCE.

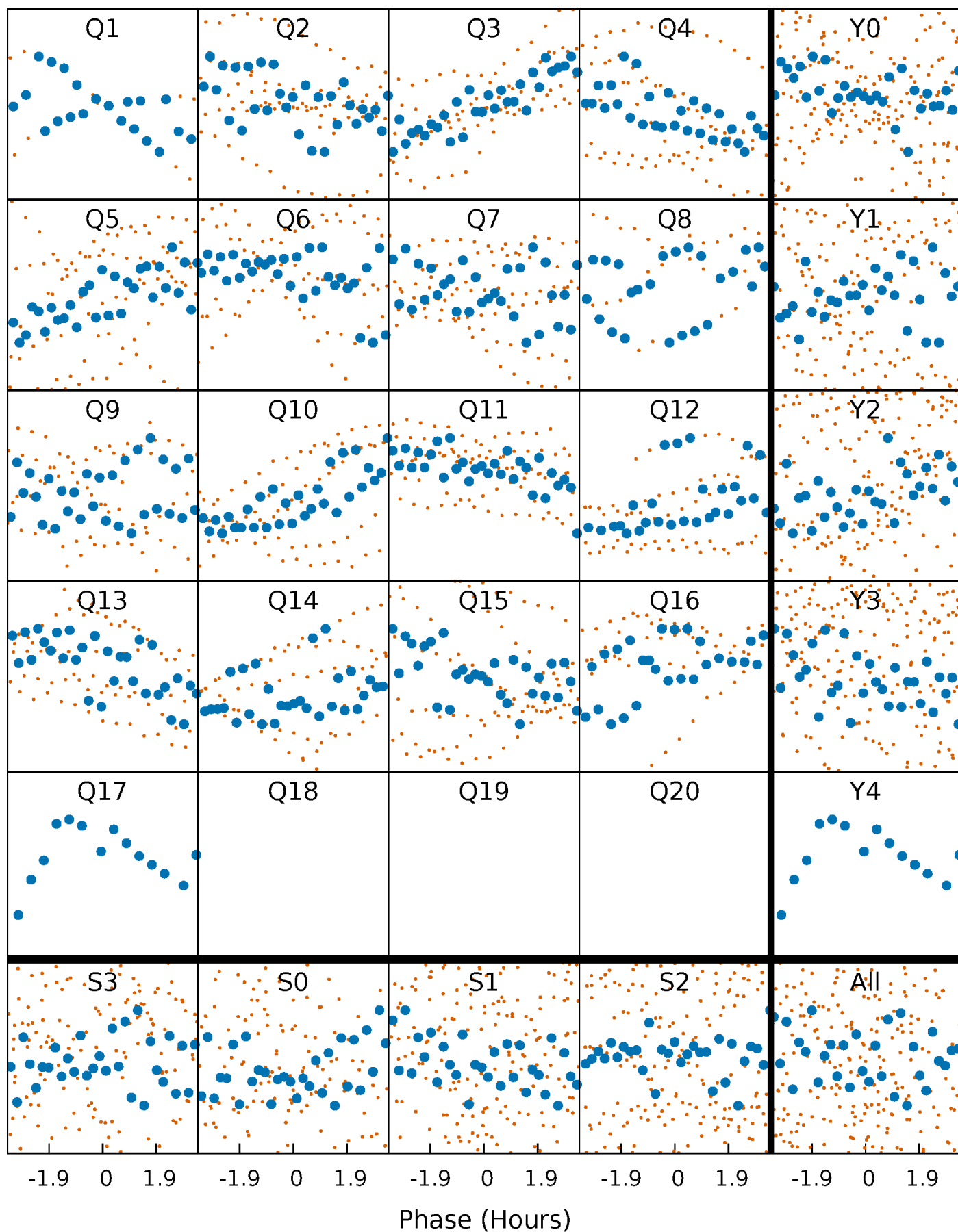
# Non-Whitened Vs. Whitened Light Curve





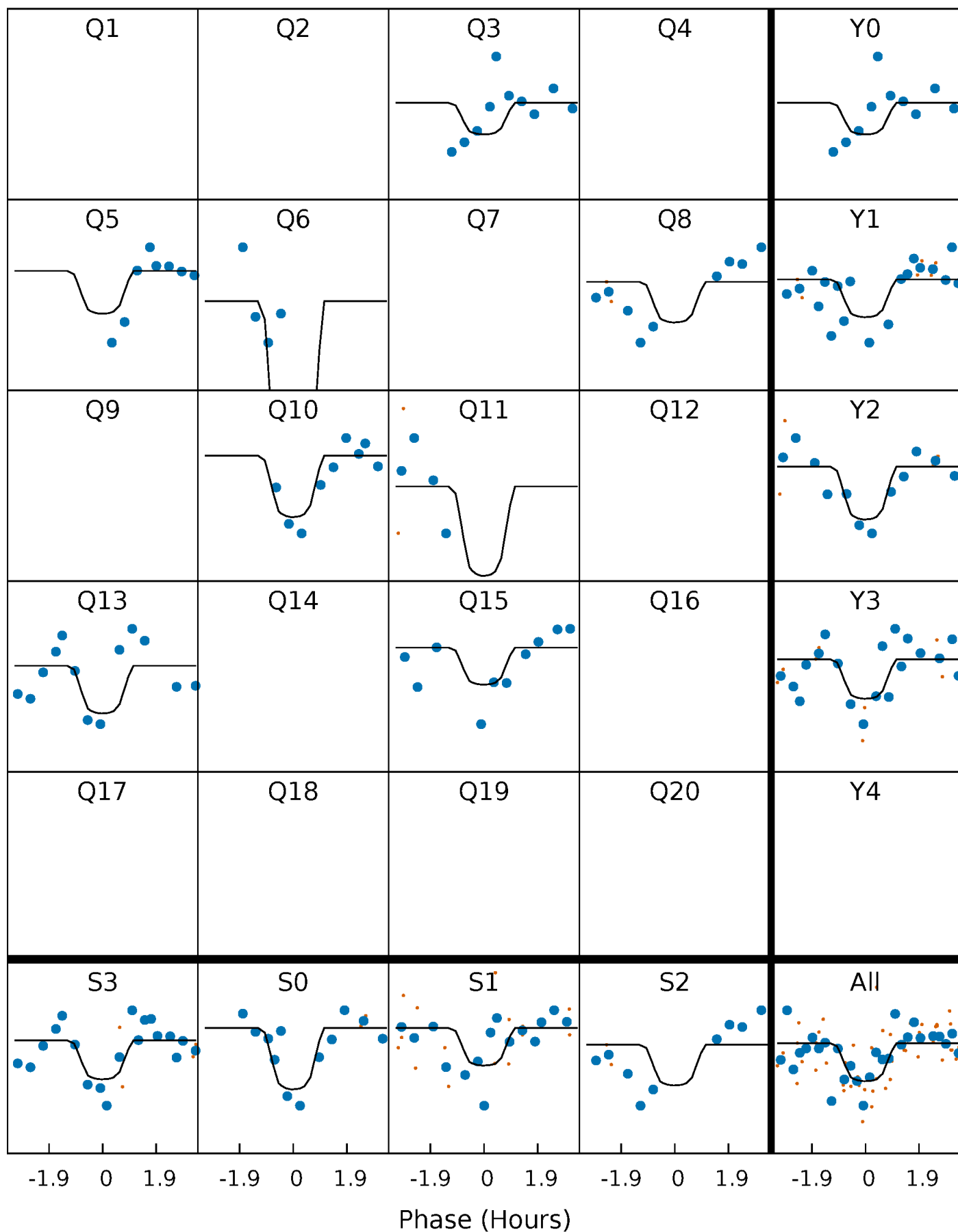
# PDC Quarter-Phased Transit Curves

TCE 003954112-07 P= 14.392231 Days  $T_0=143.270046$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 003954112-07     $P = 14.392231$  Days     $T_0 = 143.270046$  (BKJD)

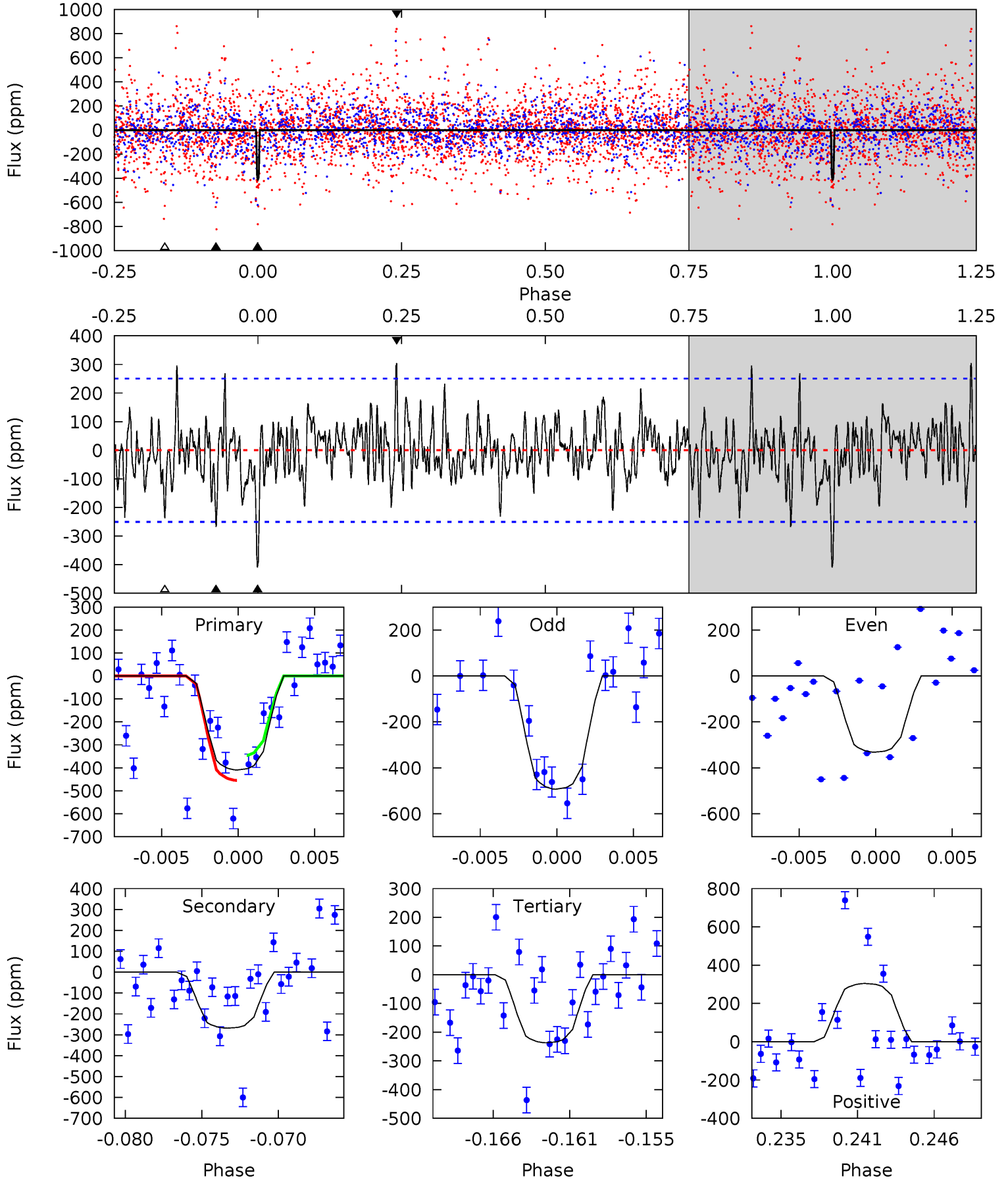


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

003954112-07, P = 14.392231 Days, E = 128.877815 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
8.41	5.51	4.87	6.25	5.14	2.79	1.61	3.54	2.16	0.64	-0.74	1.57	0.64	0.43	1.13



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 003954112

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6658^{+179}_{-199}$	$3.590^{+0.357}_{-0.084}$	$-0.240^{+0.300}_{-0.250}$	$3.404^{+0.341}_{-1.363}$	$1.645^{+0.224}_{-0.336}$	$0.059^{+0.145}_{-0.012}$
	+3%/-3%	+10%/-2%	+125%/-104%	+10%/-40%	+14%/-20%	+247%/-21%
Source	PHO1	FLK73	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 003954112-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-269 \pm 49$	$15.06^{+16.38}_{-10.16}$	$2004^{+113}_{-189}$	$4244^{+2911}_{-923}$	$12^{+103}_{-9}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

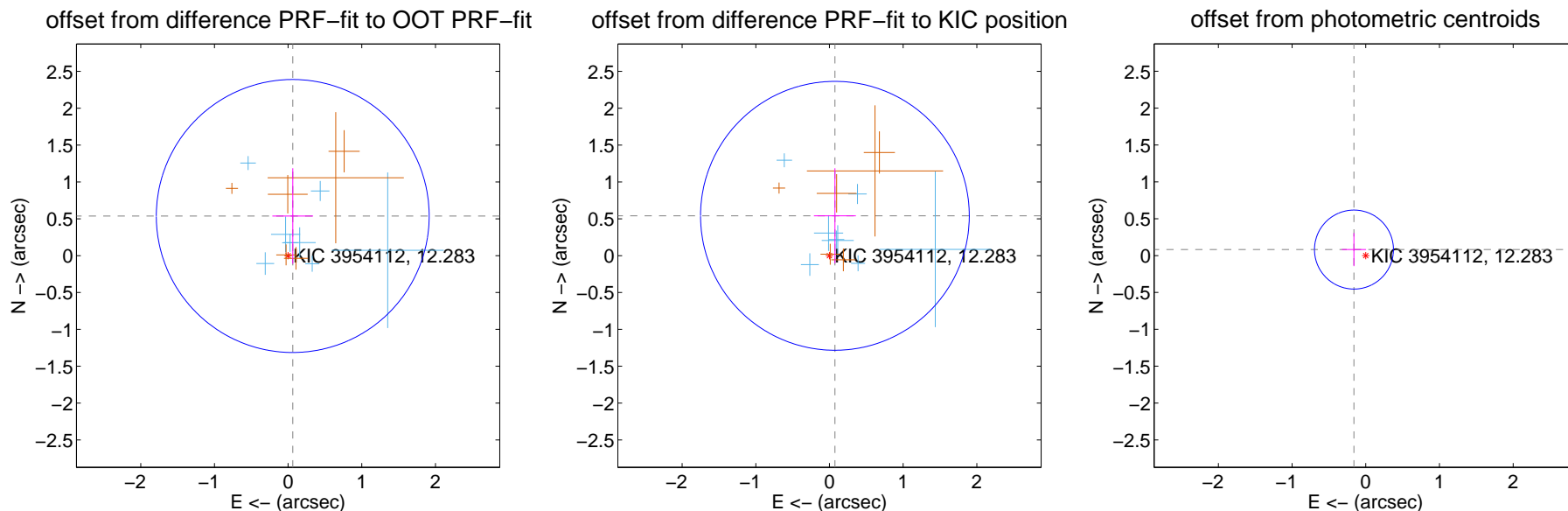
## DV Centroid Data

Supplemental centroid analysis for 003954112-07. Kepler magnitude: 12.28. Transit SNR 6.66

There are 8 quarters with good PRF difference image offsets

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

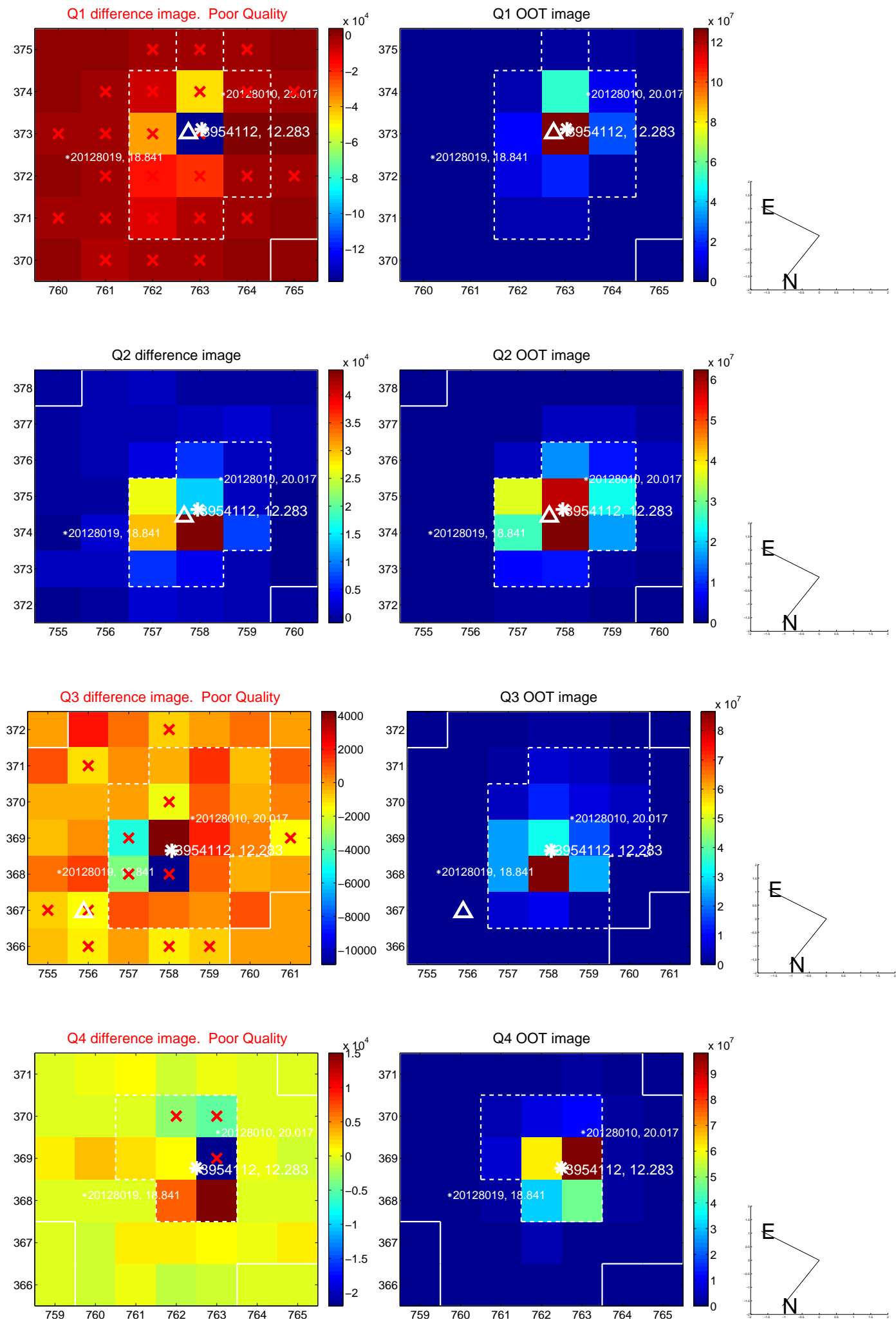
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.542 \pm 0.617$	0.88	$-0.063 \pm 0.276$	$0.538 \pm 0.647$
PRF-fit source offset from KIC position	$0.545 \pm 0.608$	0.90	$-0.074 \pm 0.285$	$0.540 \pm 0.646$
photometric centroid source offset	$0.18 \pm 0.18$	1.01	$0.16 \pm 0.16$	$0.08 \pm 0.23$



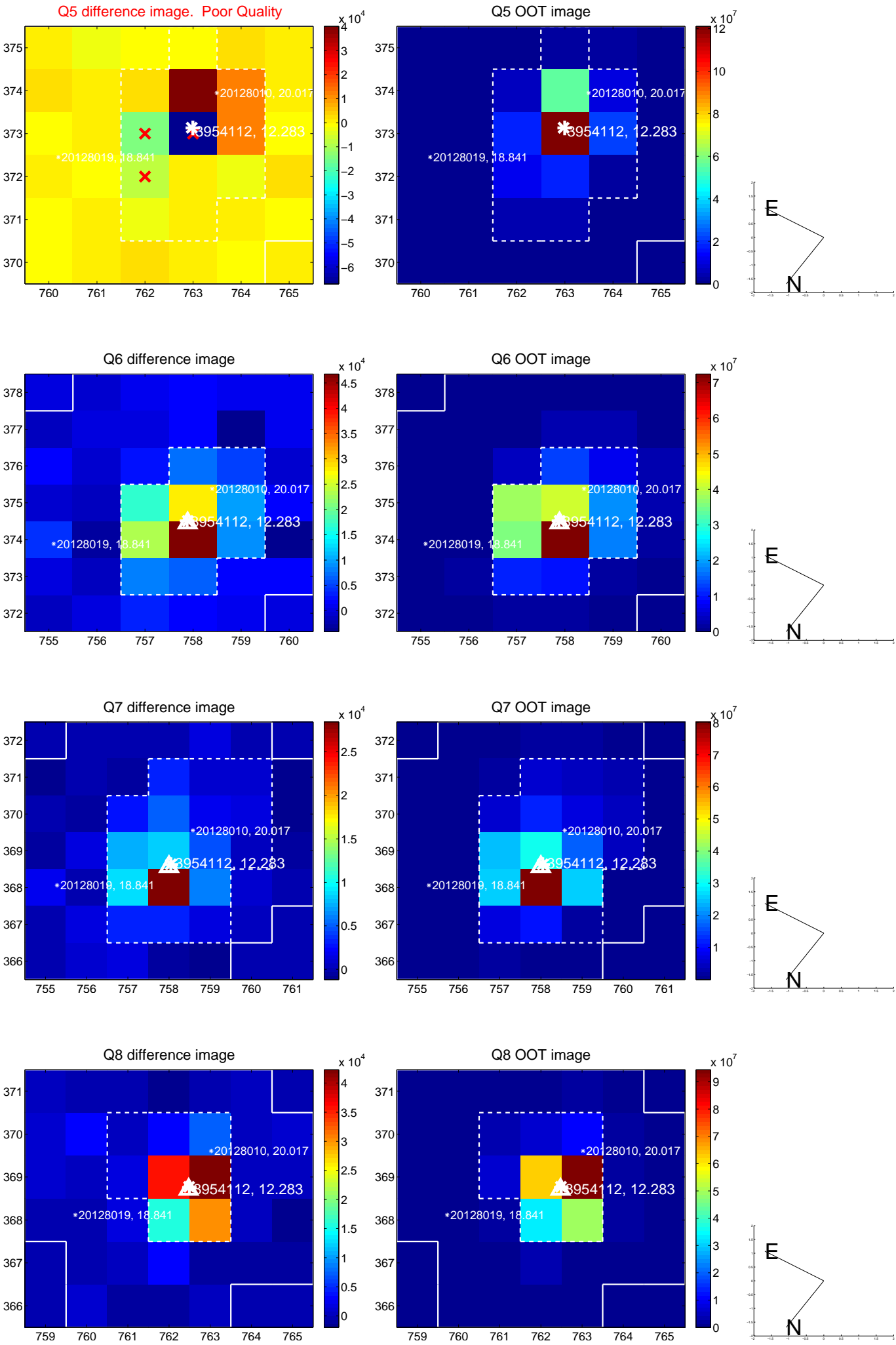
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



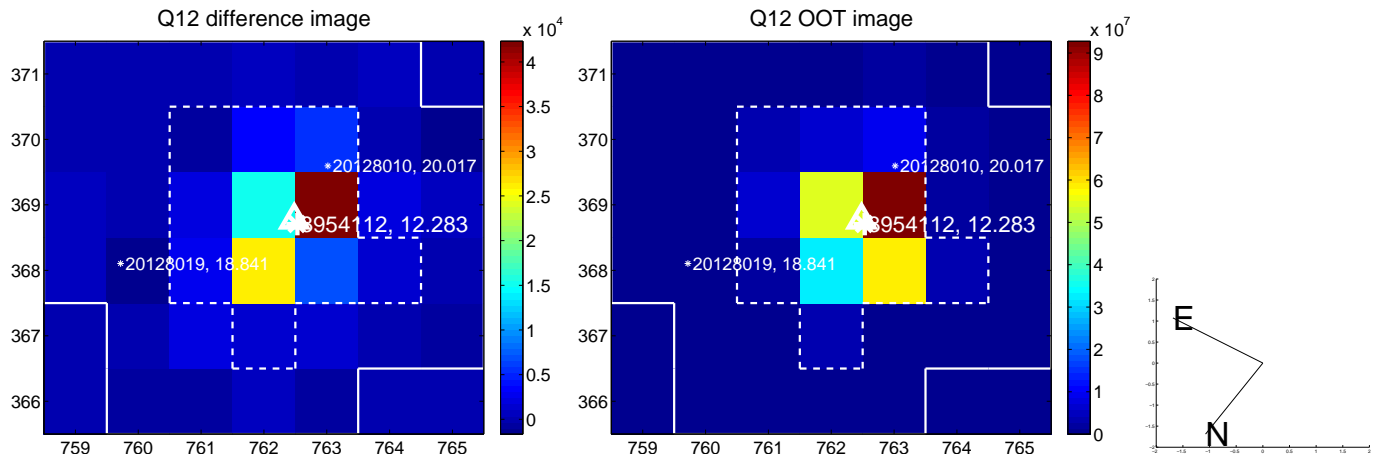
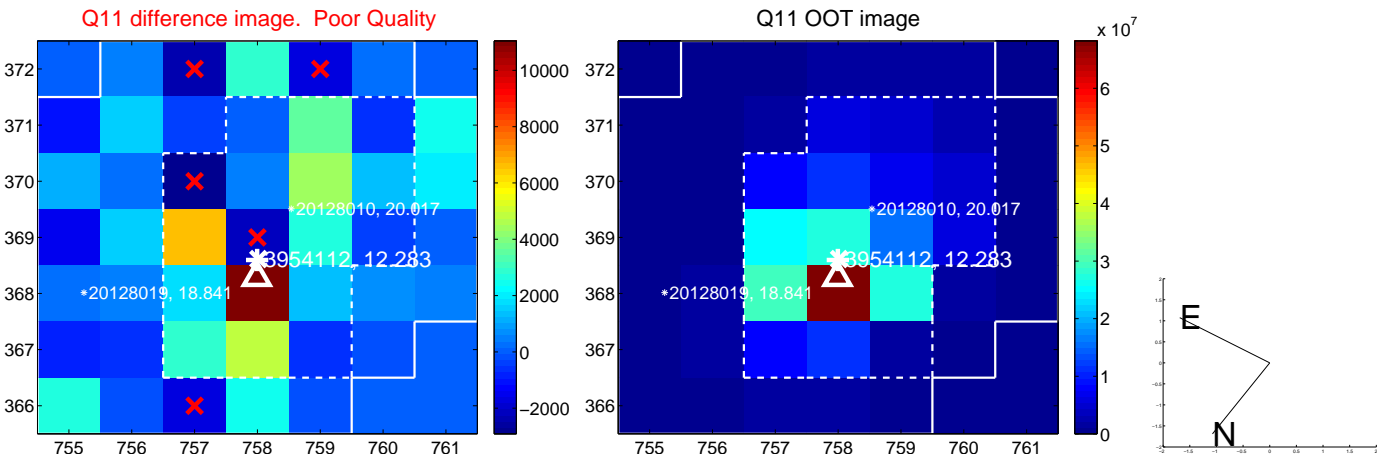
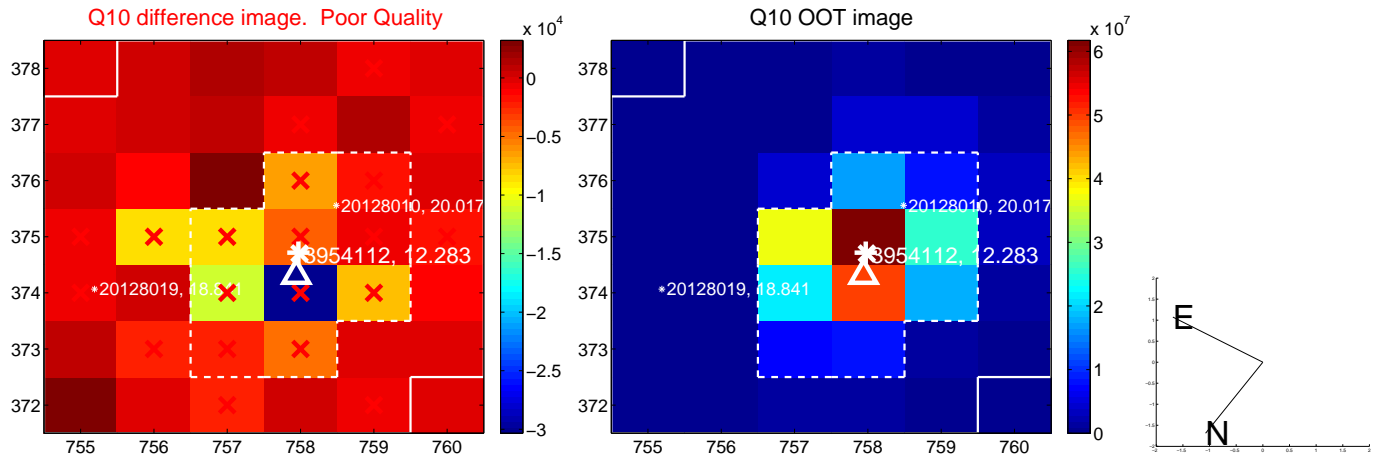
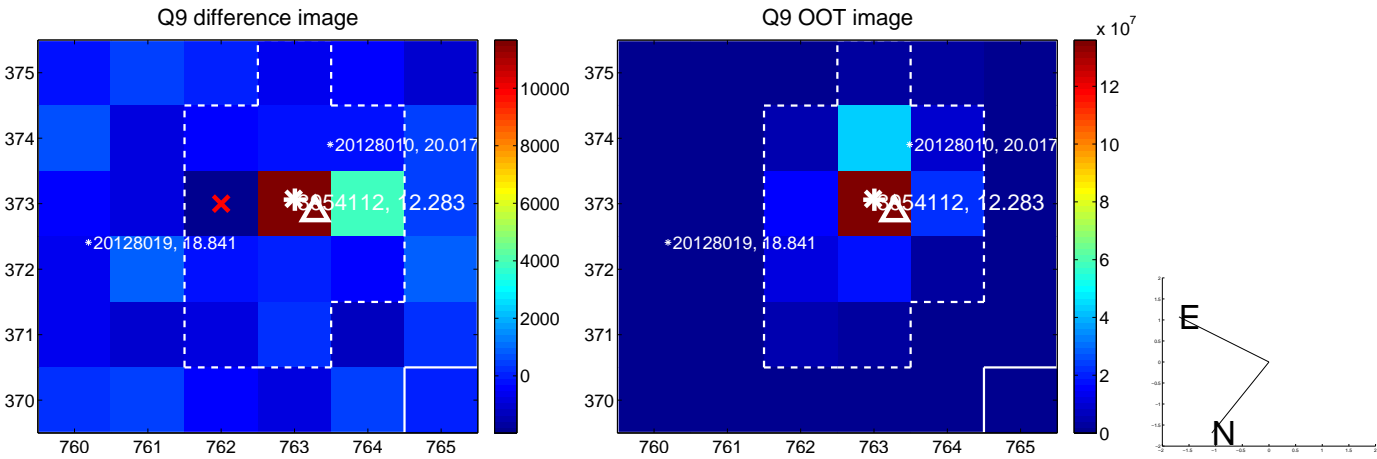
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



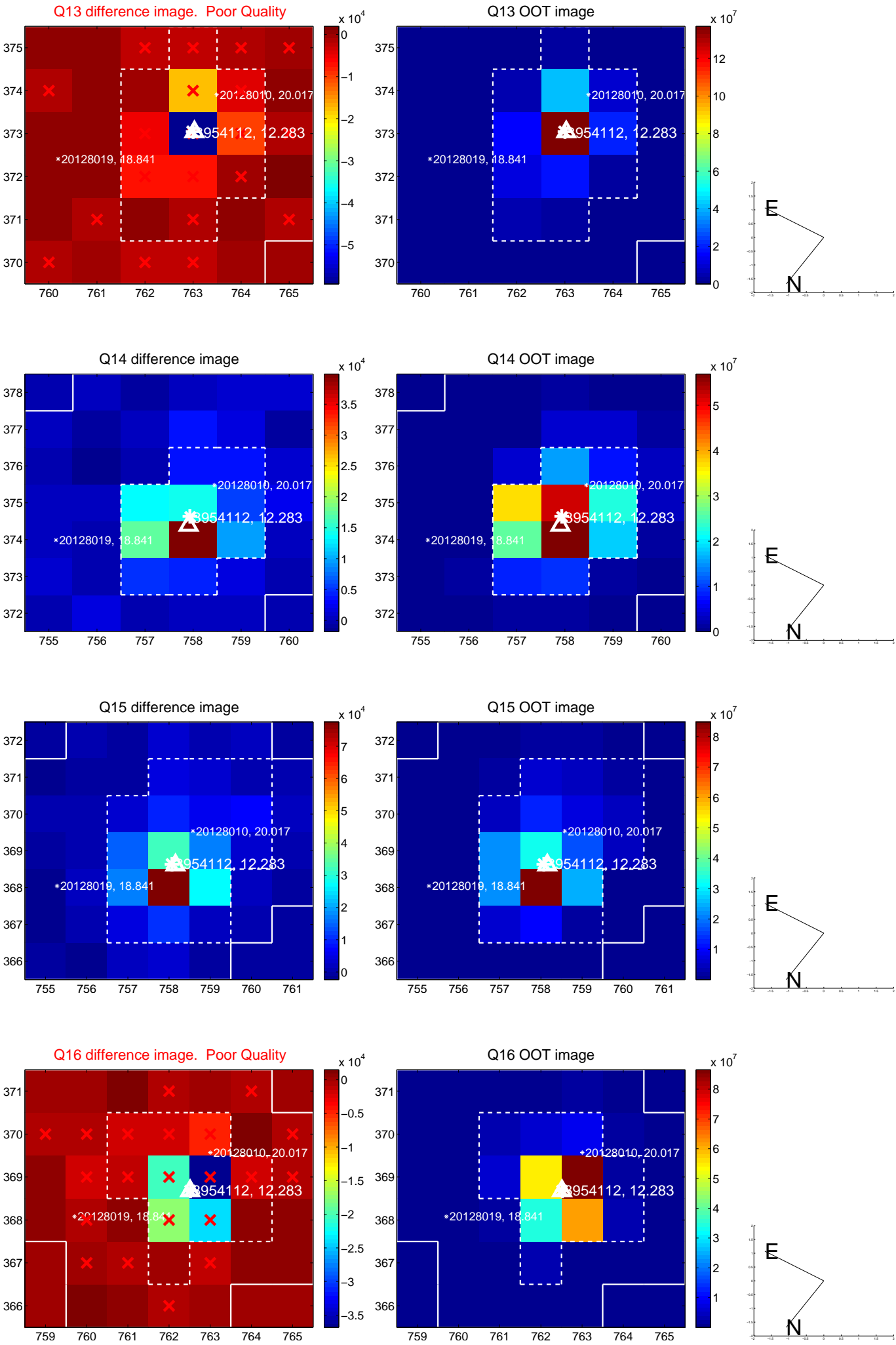
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



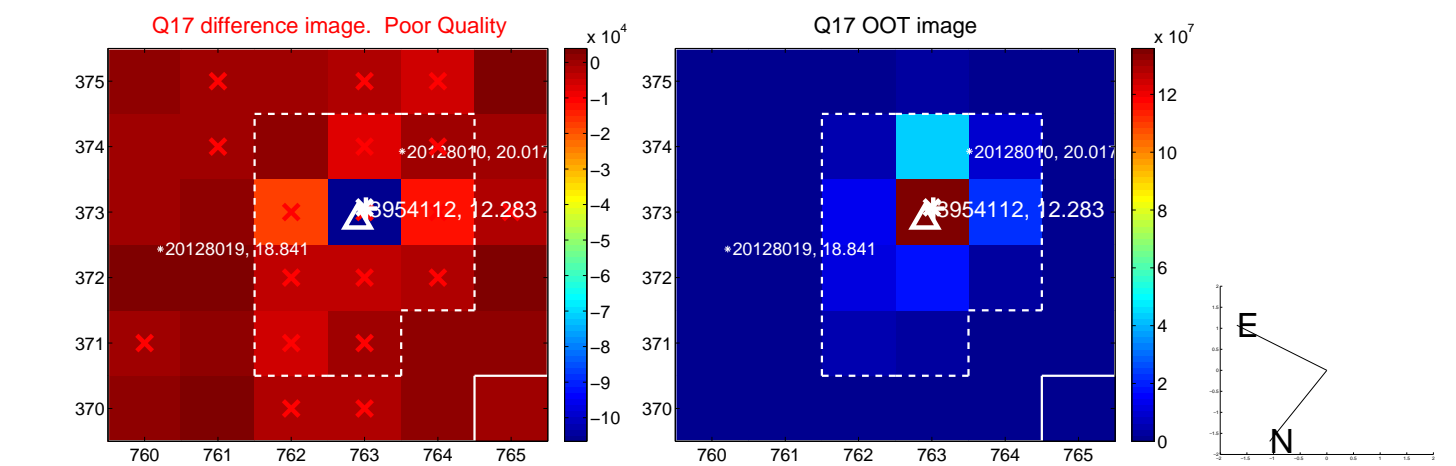
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



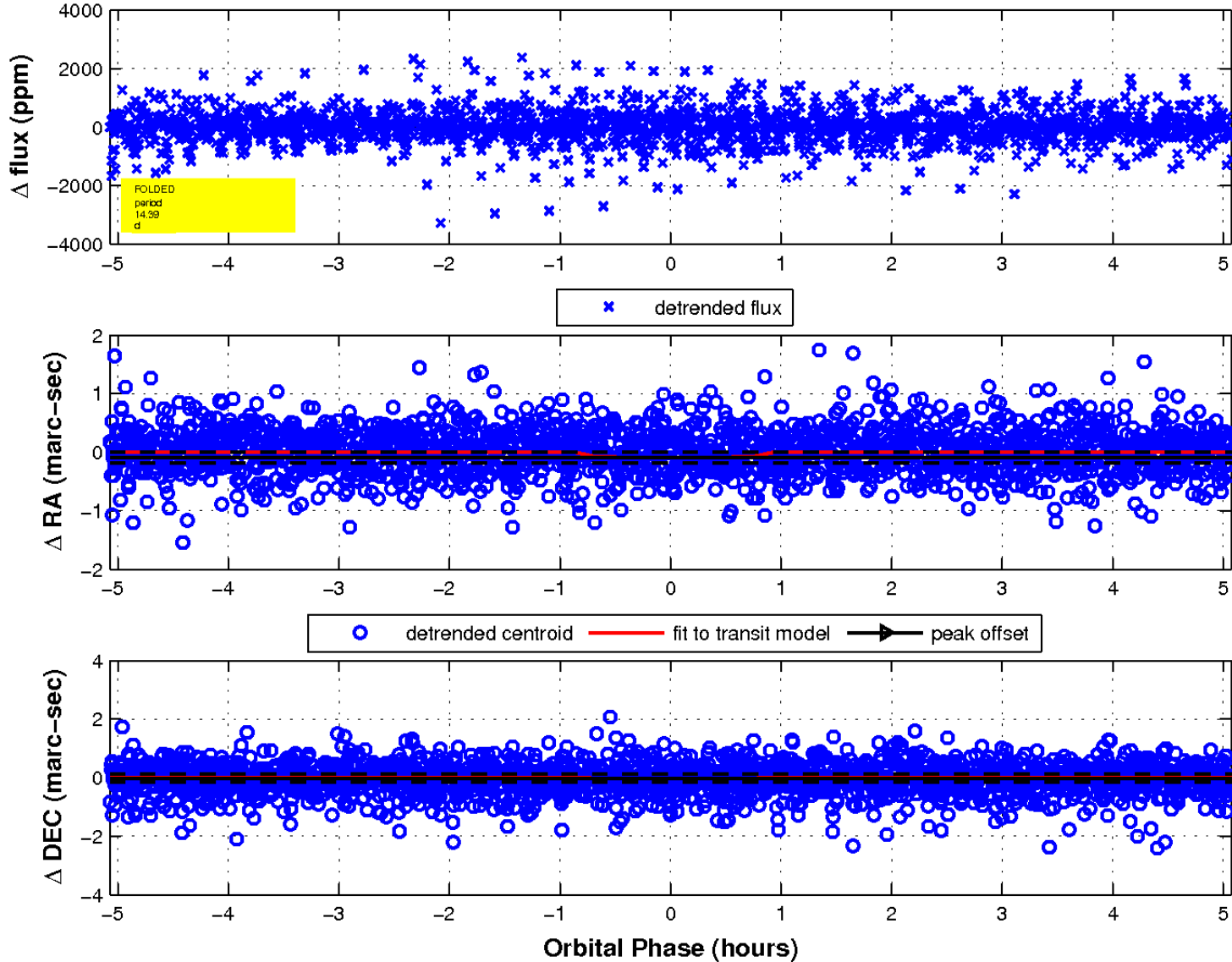
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 7 of 7



UKIRT Image

Declination

