

# KIC 009552411

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009552411-01	OBS	No	0.652146	132.002493	11.0	4.784	10.5	2.9	1.63	6844	0.58	19691.95
009552411-02	OBS	No	34.819086	141.437002	1071.8	1.336	19.7	20.6	1.63	6844	5.41	97.95
009552411-03	OBS	No	18.567813	141.108223	425.1	3.063	17.5	12.8	1.63	6844	3.69	226.50
009552411-04	OBS	No	17.623722	147.830769	84.8	72.531	14.7	6.3	1.63	6844	1.59	242.82
009552411-05	OBS	No	7.040981	132.840594	97.0	1.401	10.7	2.5	1.63	6844	1.70	825.22
009552411-06	OBS	No	8.183251	134.814653	847.1	0.898	10.8	13.2	1.63	6844	5.32	675.33
009552411-07	OBS	No	5.029754	135.557261	1166.5	3.883	14.3	19.7	1.63	6844	9.31	1292.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009552411-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009552411-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009552411-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009552411-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
009552411-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009552411-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
009552411-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

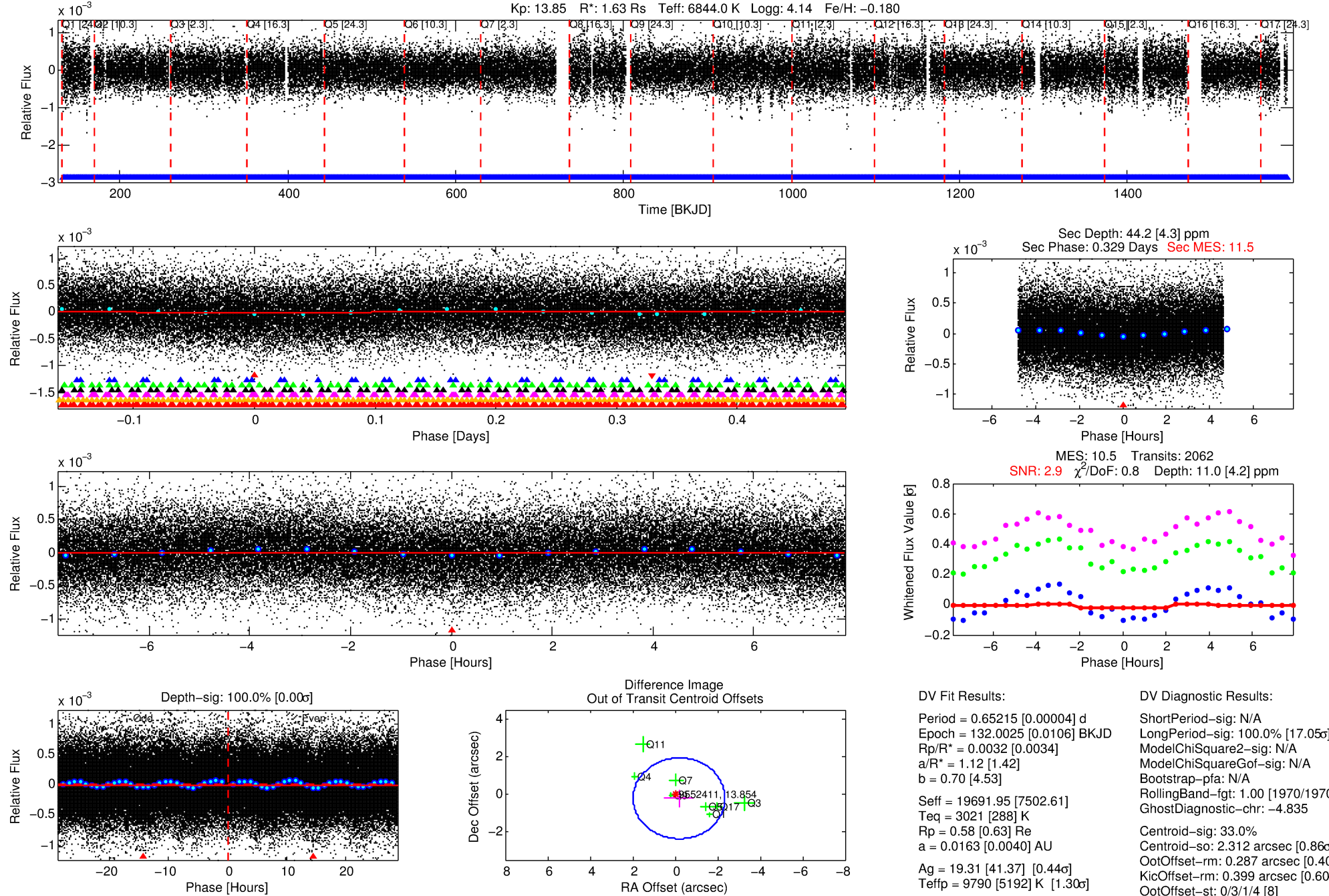
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009552411-01

No Significant Match Found

# DV One-Page Summary

KIC: 9552411 Candidate: 1 of 7 Period: 0.652 d



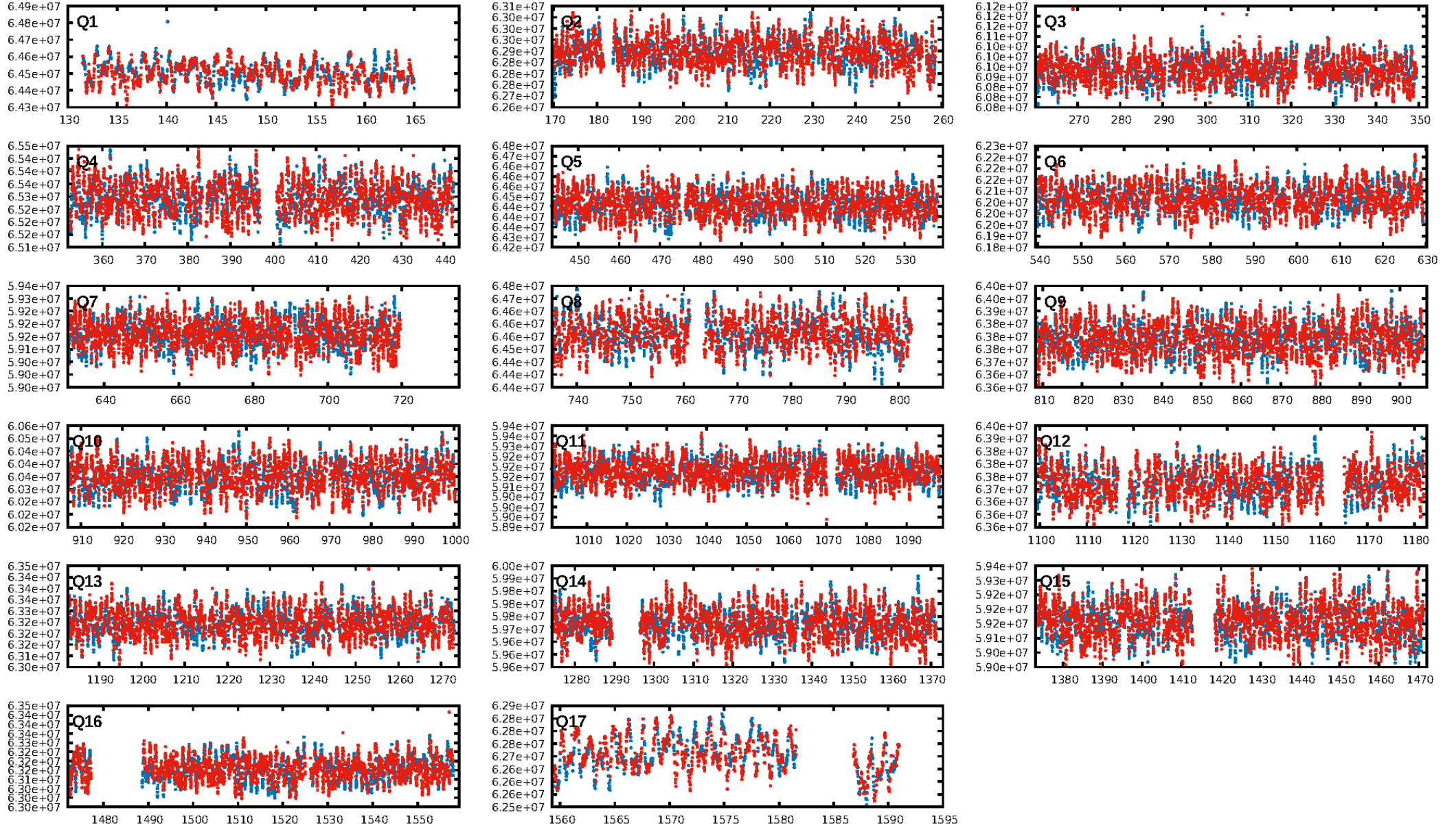
## DV Fit Results:

Period = 0.65215 [0.00004] d  
Epoch = 132.0025 [0.0106] BKJD  
Rp/R\* = 0.0032 [0.0034]  
a/R\* = 1.12 [1.42]  
b = 0.70 [4.53]  
Seff = 19691.95 [7502.61]  
Teff = 3021 [288] K  
Rp = 0.58 [0.63] Re  
a = 0.0163 [0.0040] AU  
Ag = 19.31 [41.37] [0.44 $\sigma$ ]  
Teffp = 9790 [5192] K [1.30 $\sigma$ ]

## DV Diagnostic Results:




ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [17.05 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1970/1970]  
GhostDiagnostic-chr: -4.835  
Centroid-sig: 33.0%  
Centroid-so: 2.312 arcsec [0.86 $\sigma$ ]  
OotOffset-rm: 0.287 arcsec [0.40 $\sigma$ ]  
OotOffset-st: 0/3/1/4 [8]  
KicOffset-rm: 0.399 arcsec [0.60 $\sigma$ ]  
KicOffset-st: 0/3/1/4 [8]  
DiffImageQuality-fgm: 0.50 [4/8]  
DiffImageOverlap-fno: 1.00 [17/17]

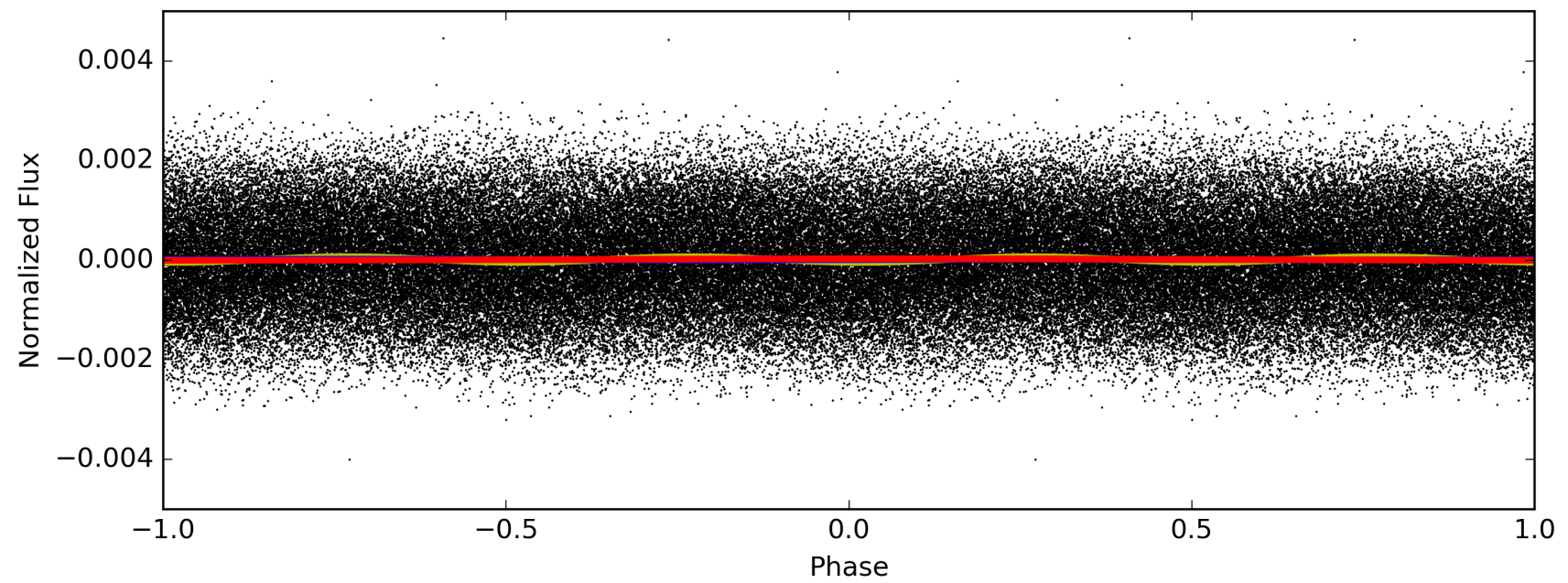
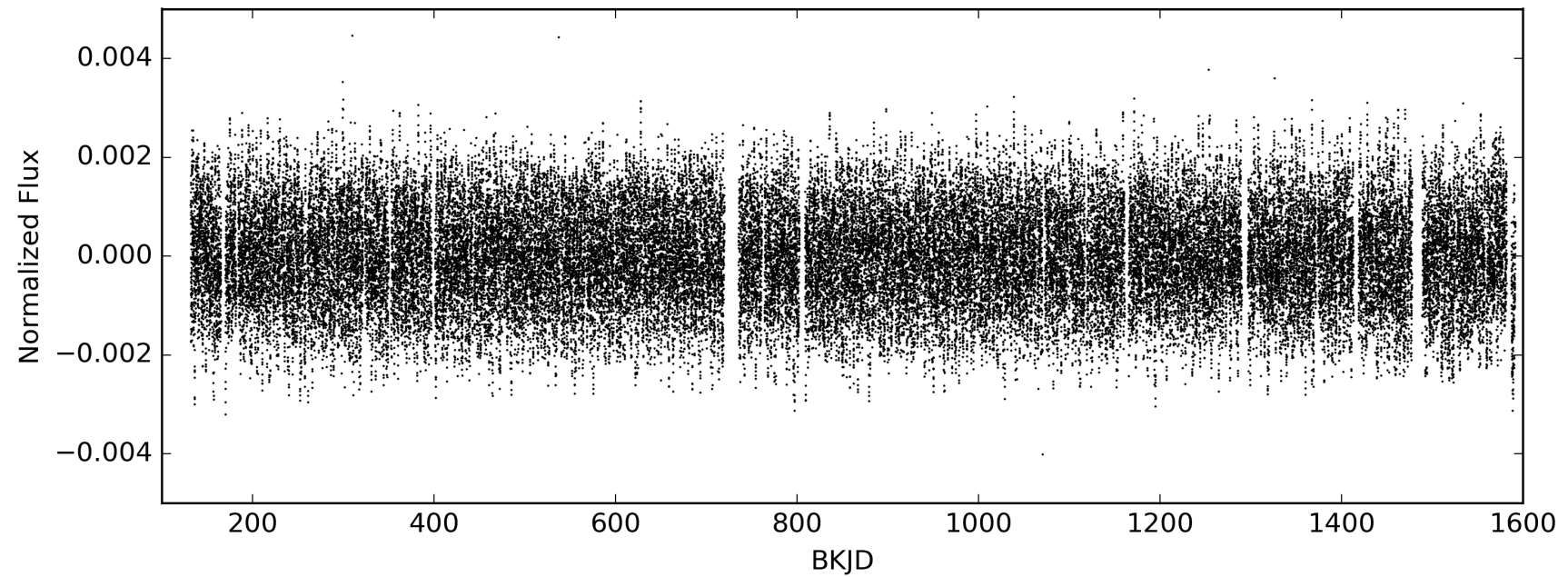
# TCE 009552411-01, PDC Light Curves





TCE 009552411-01

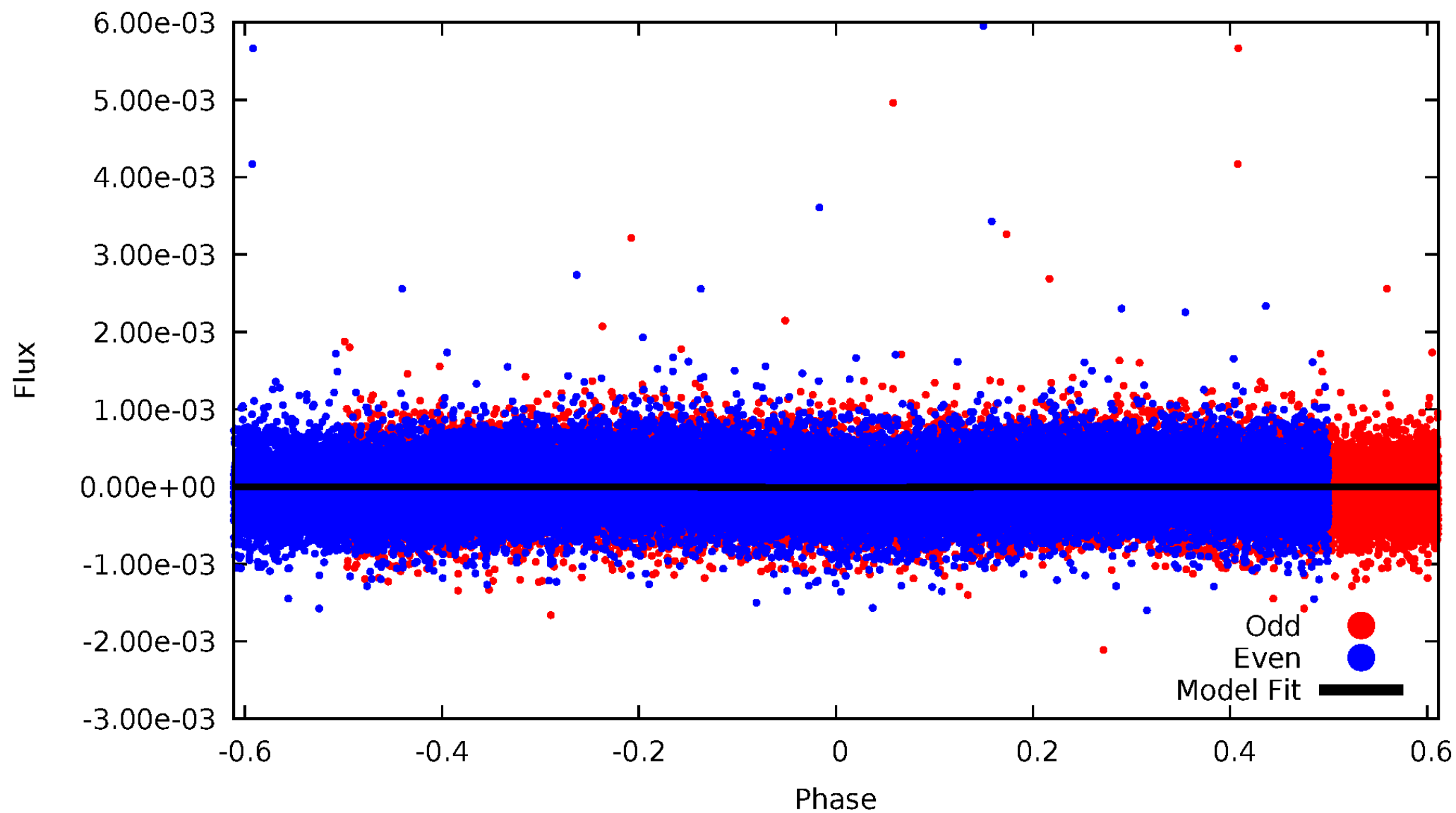
 P = 0.326 days     P = 0.652 days     P = 1.304 days





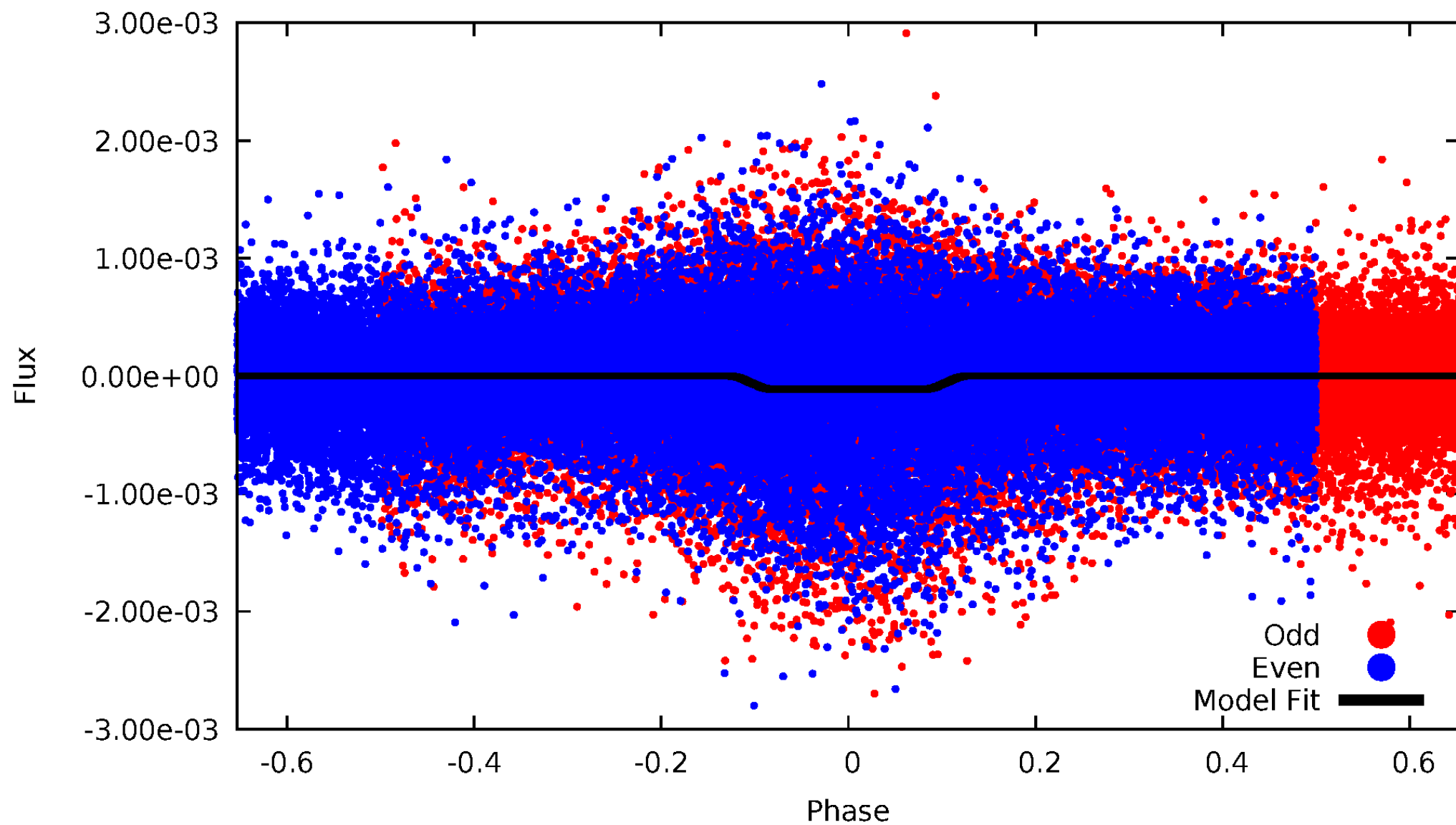
# DV Odd/Even

TCE 009552411-01



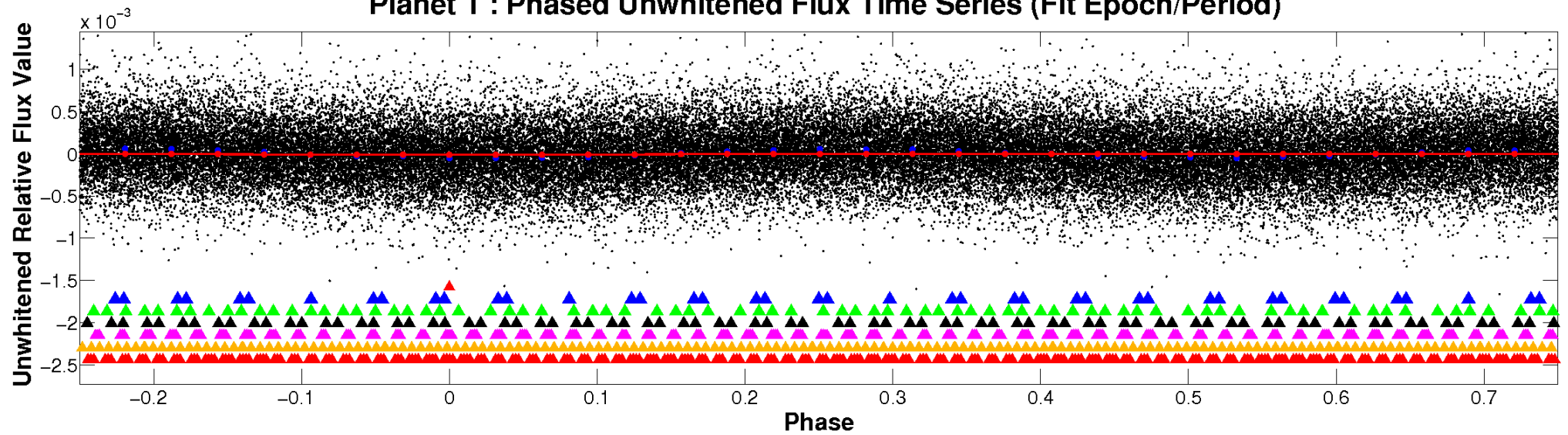
# ALT Odd/Even

TCE 009552411-01

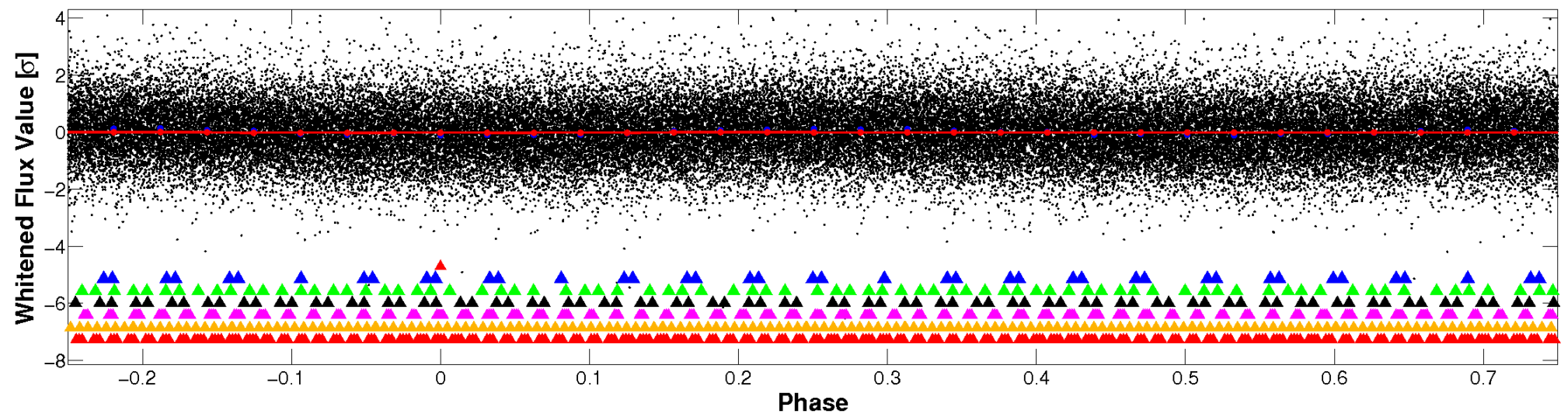


# Non-Whitened Vs. Whitened Light Curve

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



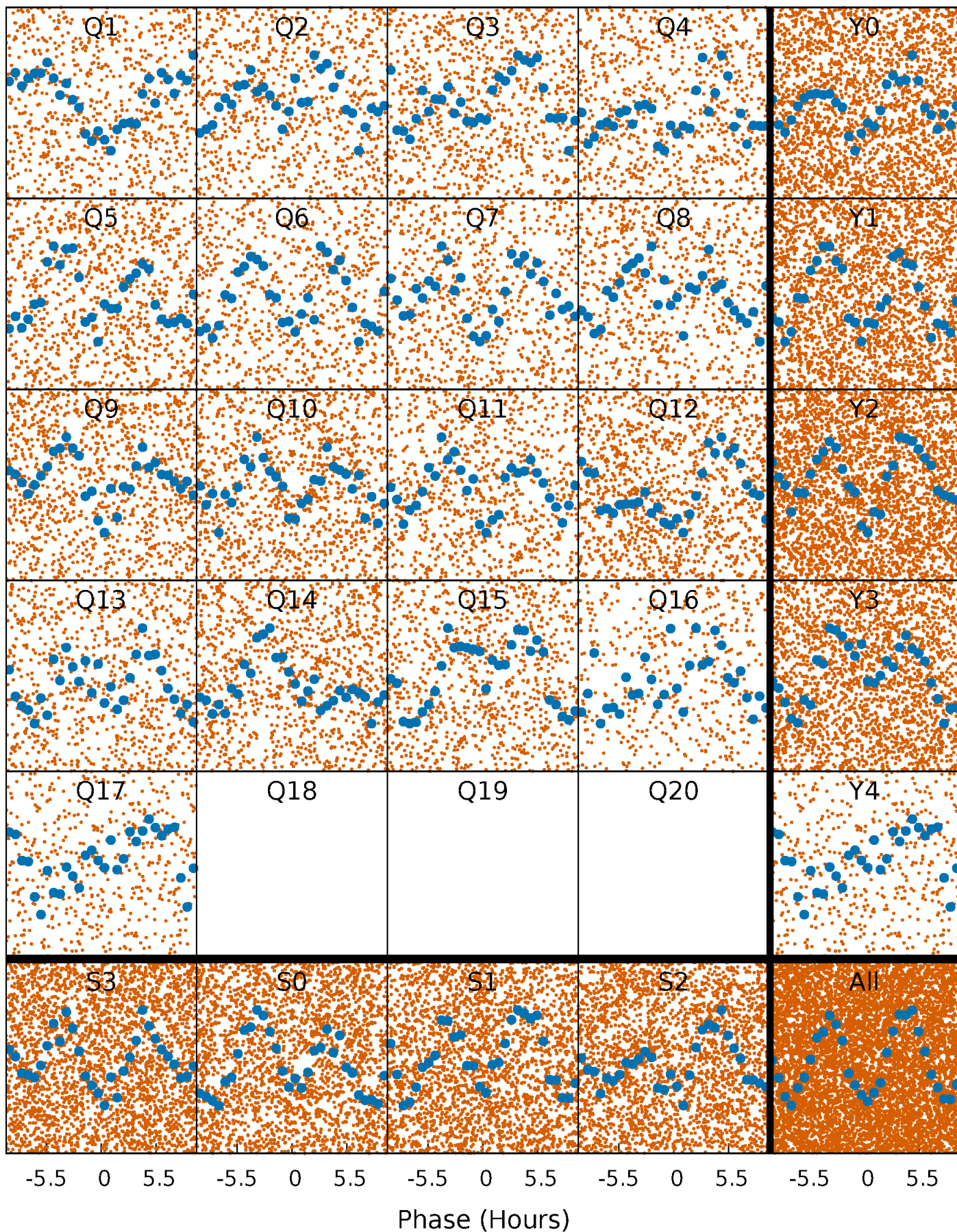
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





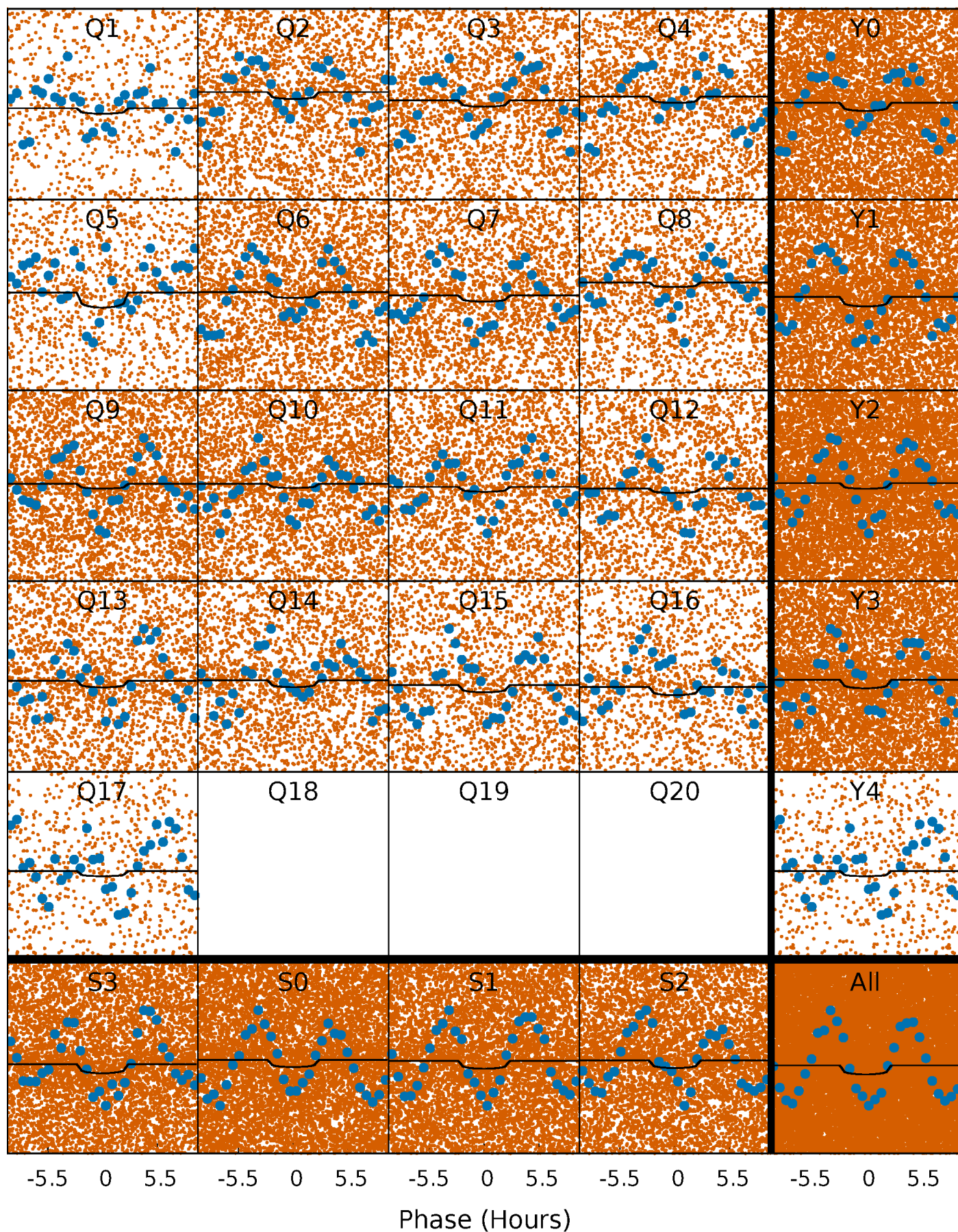
# PDC Quarter-Phased Transit Curves

TCE 009552411-01 P= 0.652146 Days  $T_0=132.002493$  (BKJD)



# DV Quarter-Phased Transit Curves

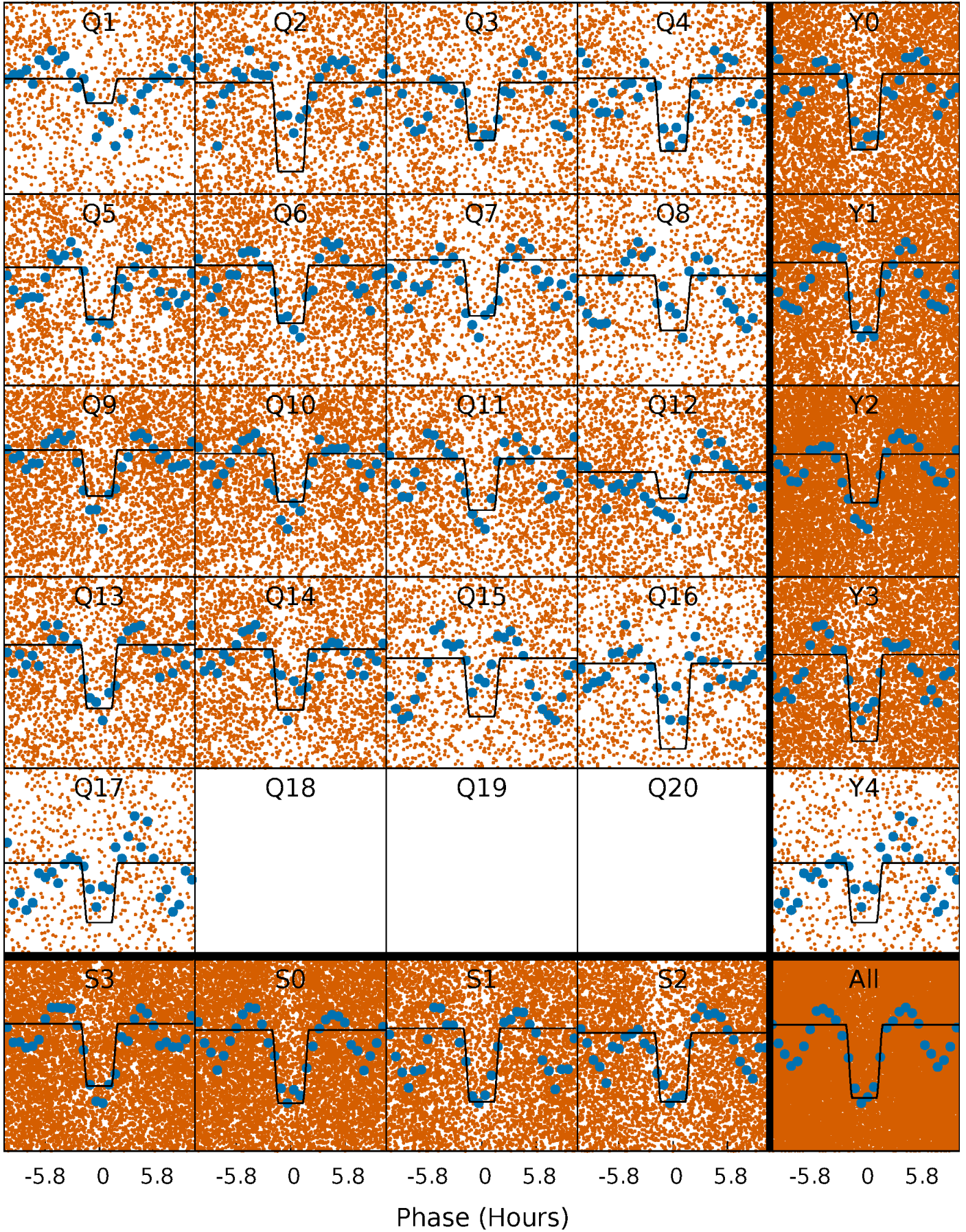
TCE 009552411-01 P= 0.652146 Days  $T_0=132.002493$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

TCE 009552411-01 P= 0.652204 Days  $T_0=131.949888$  (BKJD)

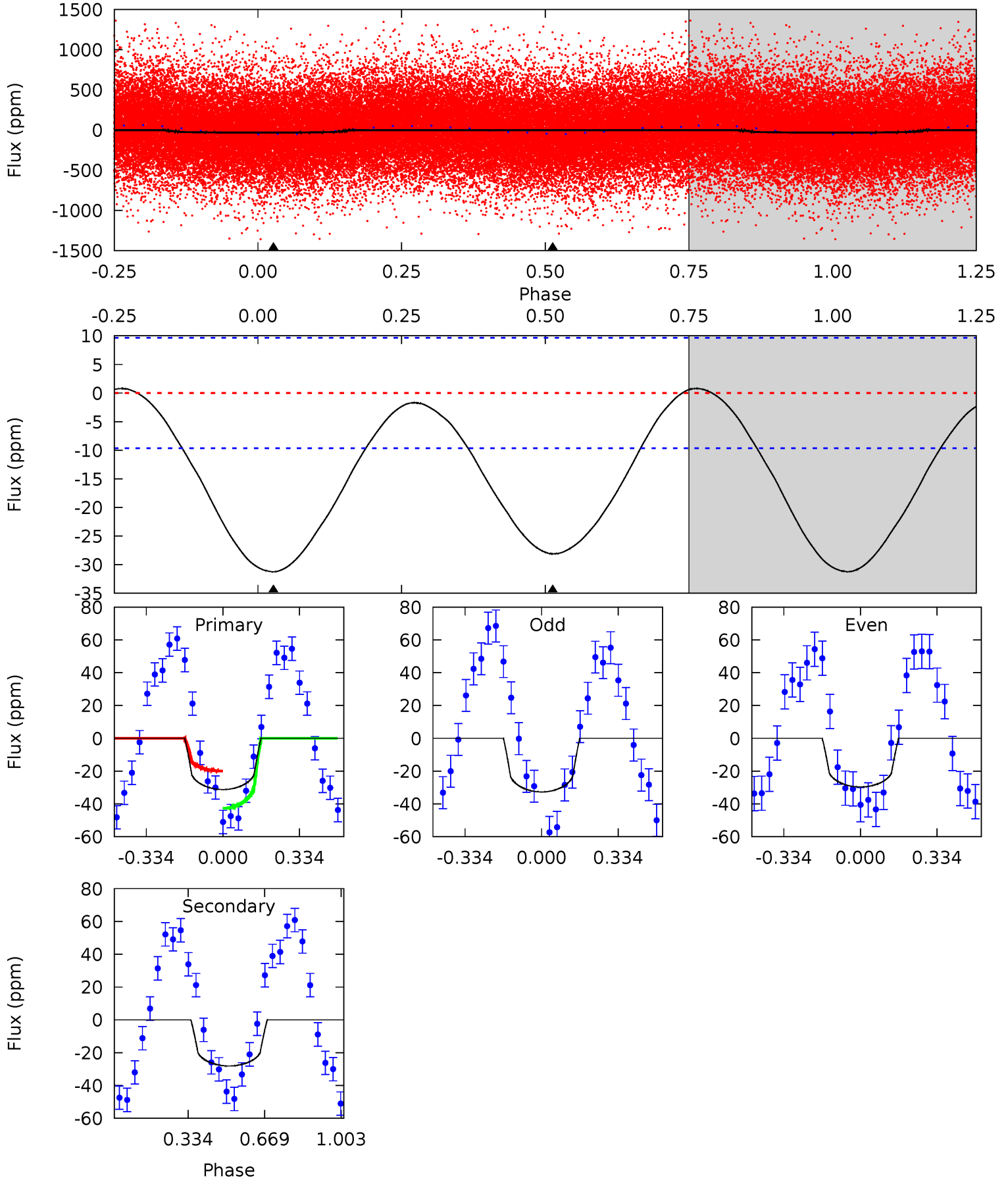




# DV Model-Shift Uniqueness Test

009552411-01, P = 0.652146 Days, E = 131.350347 Days

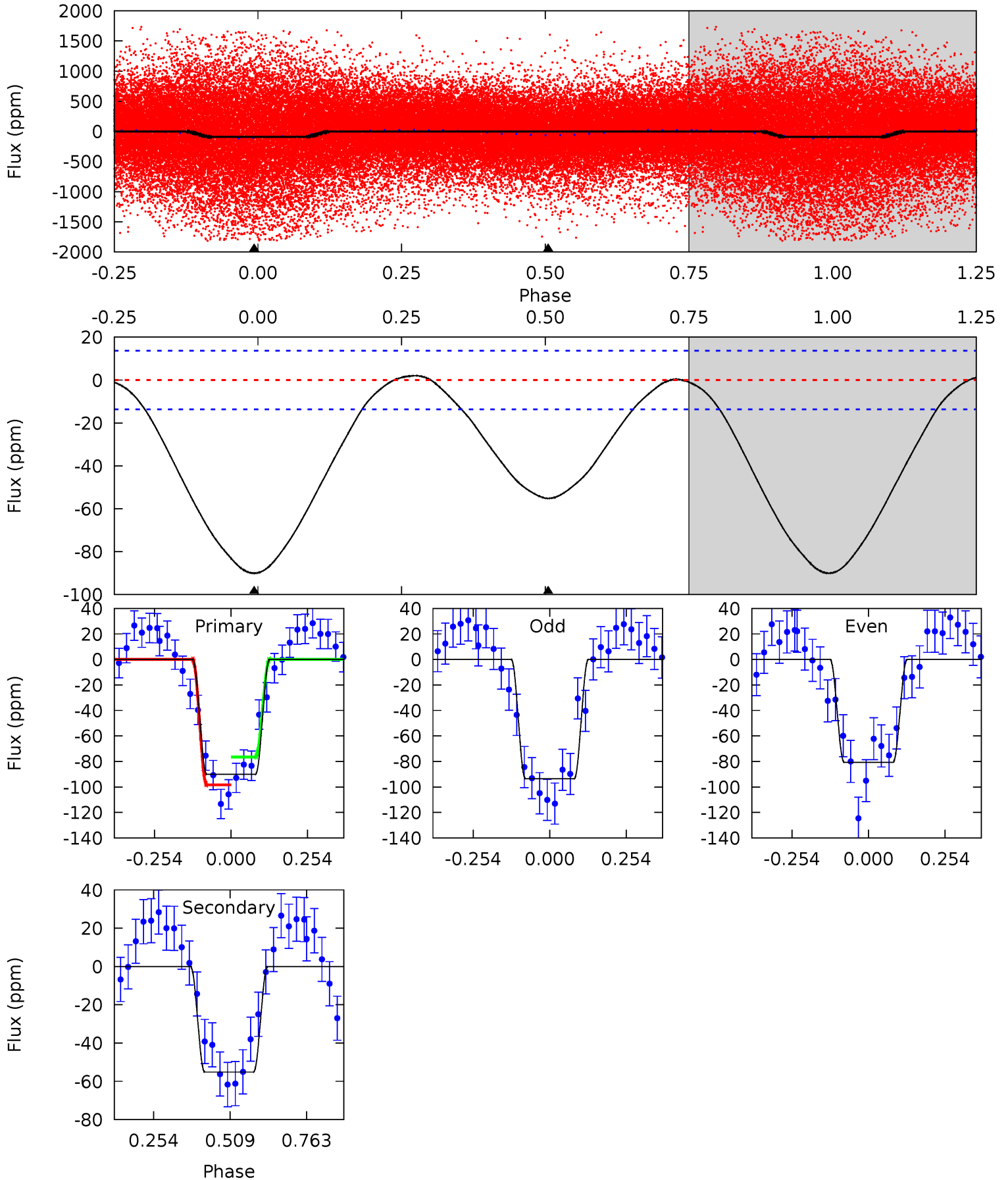
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.9	12.5	0	0	4.30	0.97	0.50	13.9	13.9	12.5	12.5	0.68	0.93	0.02	5.08



# Alt Model-Shift Uniqueness Test

009552411-01, P = 0.652204 Days, E = 131.297684 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
28.7	17.6	0	0	4.36	1.14	0.51	28.7	28.7	17.6	17.6	2.05	1.71	0.02	2.56



### Stellar Parameters For KIC 009552411

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6844^{+190}_{-286}$	$4.145^{+0.180}_{-0.180}$	$-0.180^{+0.250}_{-0.300}$	$1.629^{+0.494}_{-0.404}$	$1.358^{+0.202}_{-0.247}$	$0.443^{+0.435}_{-0.221}$
	+3%/-4%	+4%/-4%	+139%/-167%	+30%/-25%	+15%/-18%	+98%/-50%
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 009552411-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-28 \pm 2$	$0.72^{+0.56}_{-0.45}$	$4233^{+361}_{-315}$	$7939^{+10012}_{-2332}$	$7.590^{+51.724}_{-5.117}$
Alt.	$-55 \pm 3$	$1.84^{+0.68}_{-0.62}$	$4206^{+323}_{-290}$	$5570^{+1426}_{-801}$	$2.358^{+3.083}_{-1.072}$

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



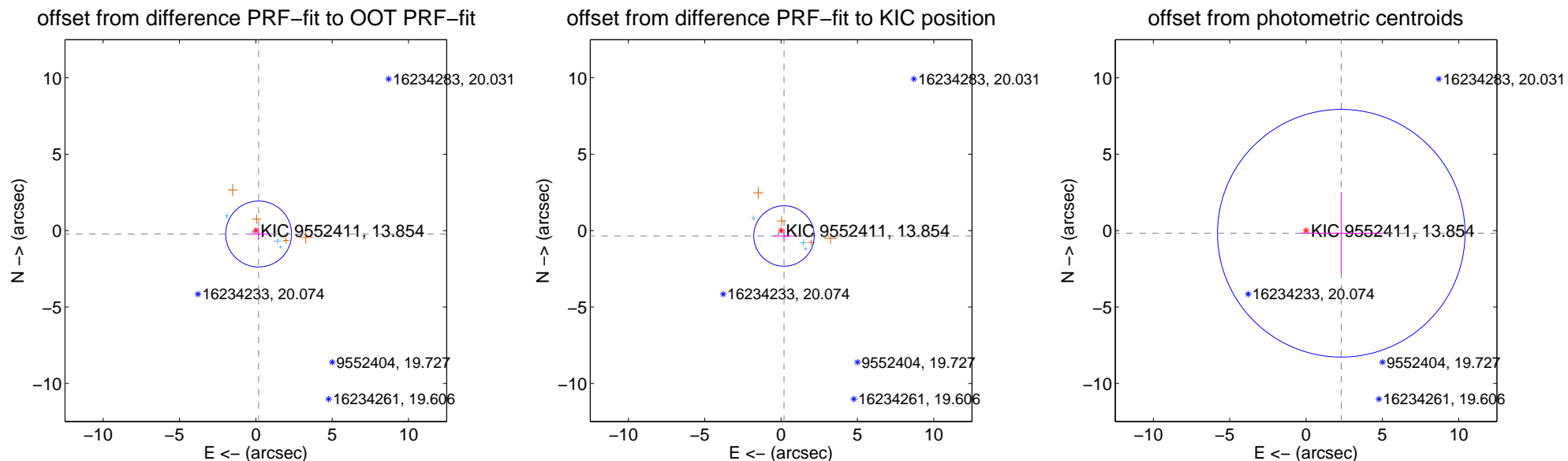
## DV Centroid Data

Supplemental centroid analysis for 009552411-01. Kepler magnitude: 13.85. Transit SNR 2.91

There are 4 quarters with good PRF difference image offsets

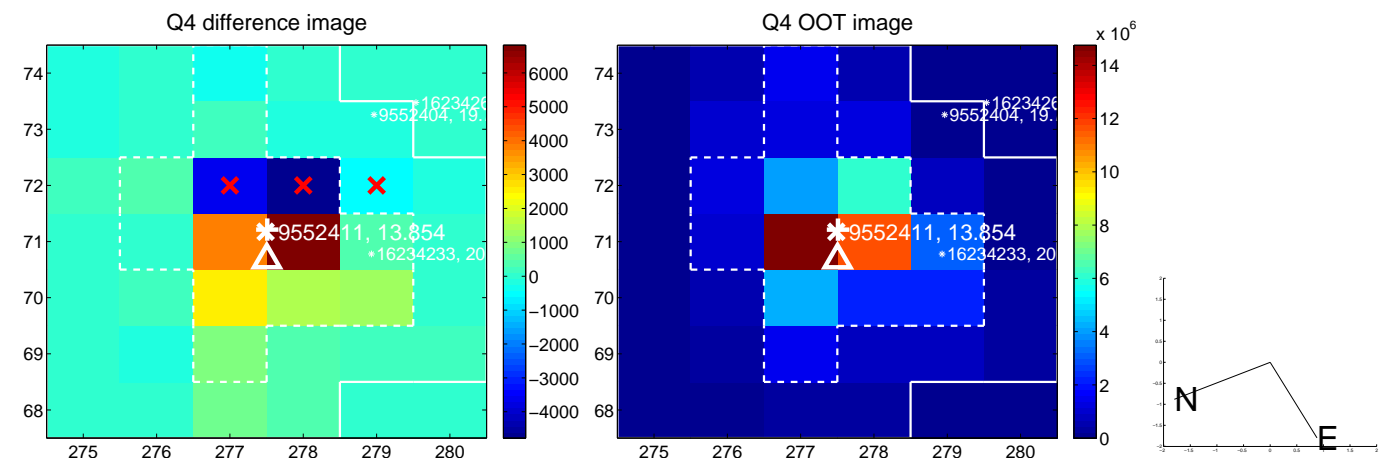
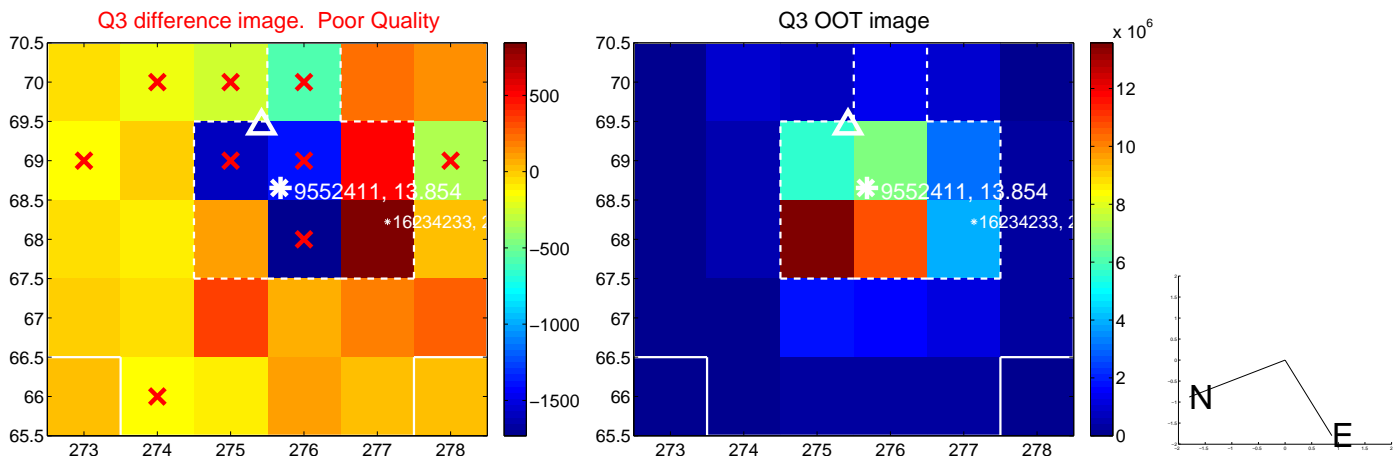
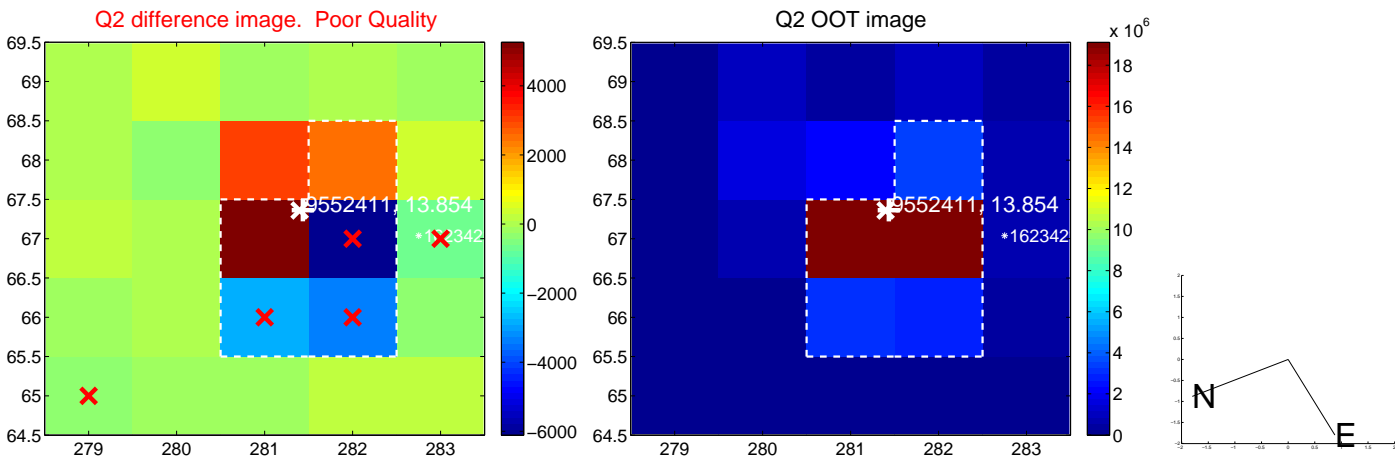
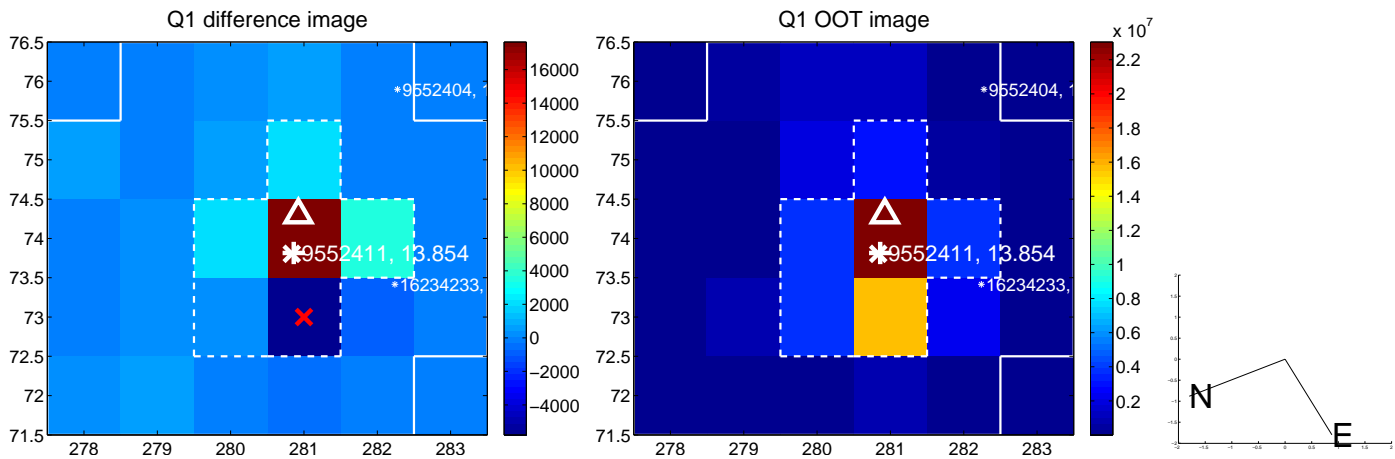
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.287 \pm 0.719$	0.40	$-0.183 \pm 0.666$	$-0.221 \pm 0.418$
PRF-fit source offset from KIC position	$0.399 \pm 0.660$	0.60	$-0.190 \pm 0.656$	$-0.350 \pm 0.432$
photometric centroid source offset	$2.31 \pm 2.70$	0.86	$-2.31 \pm 2.70$	$-0.17 \pm 2.69$

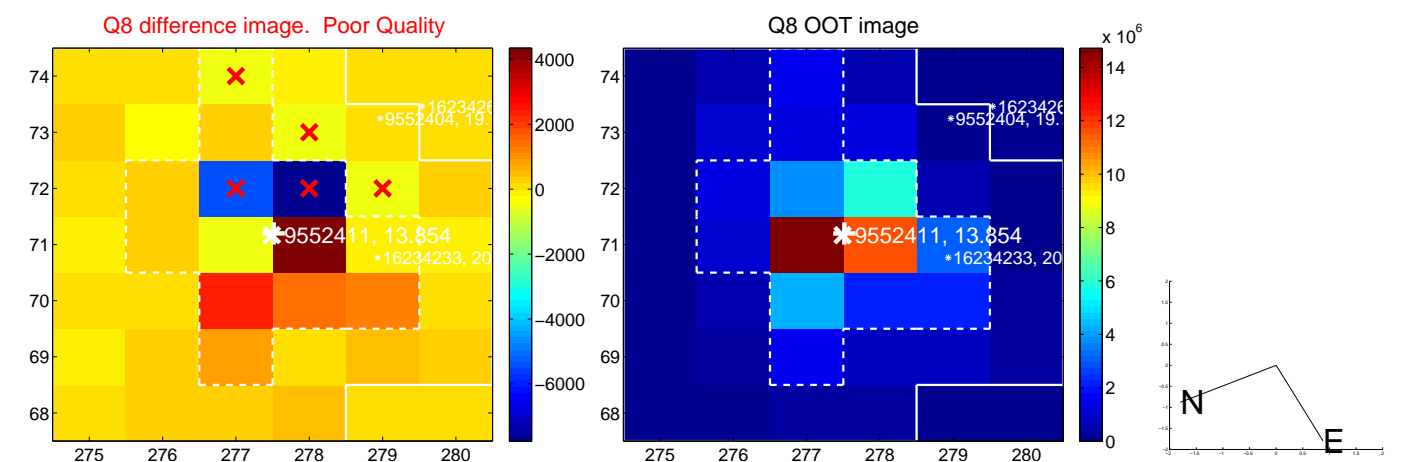
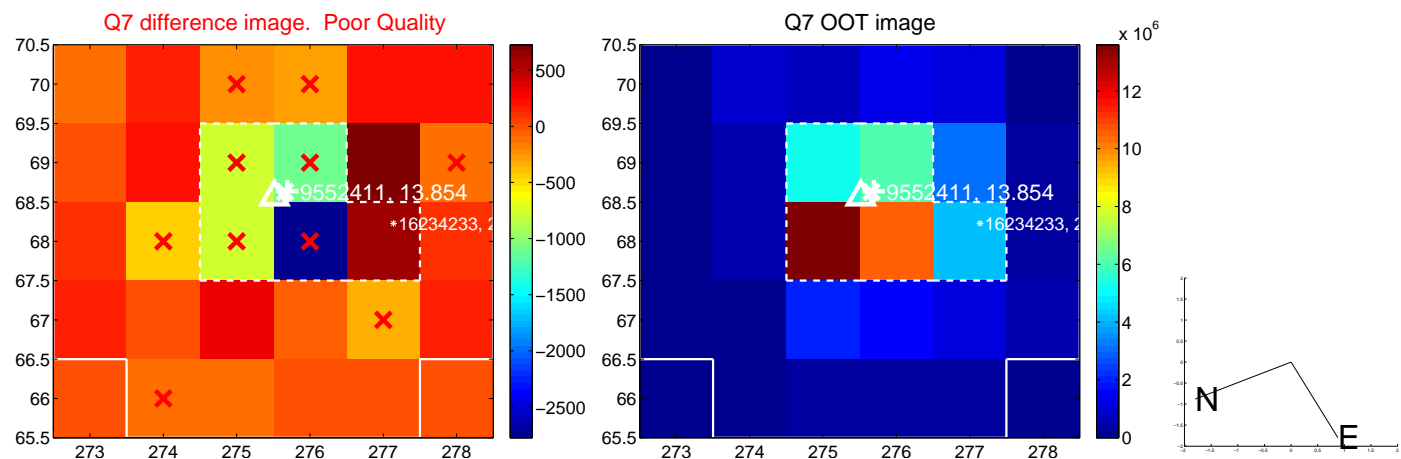
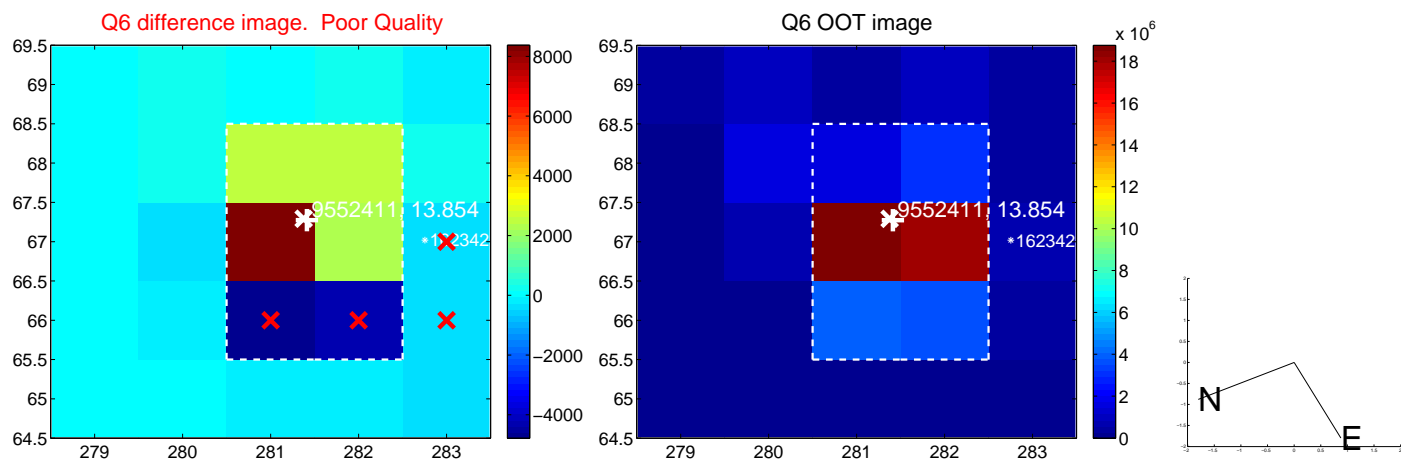
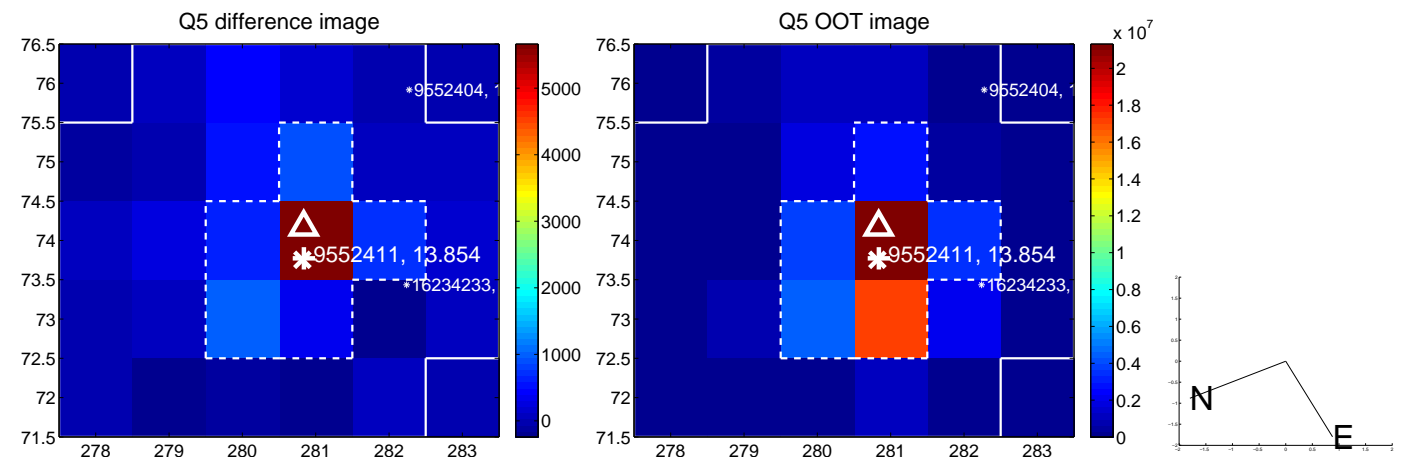


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

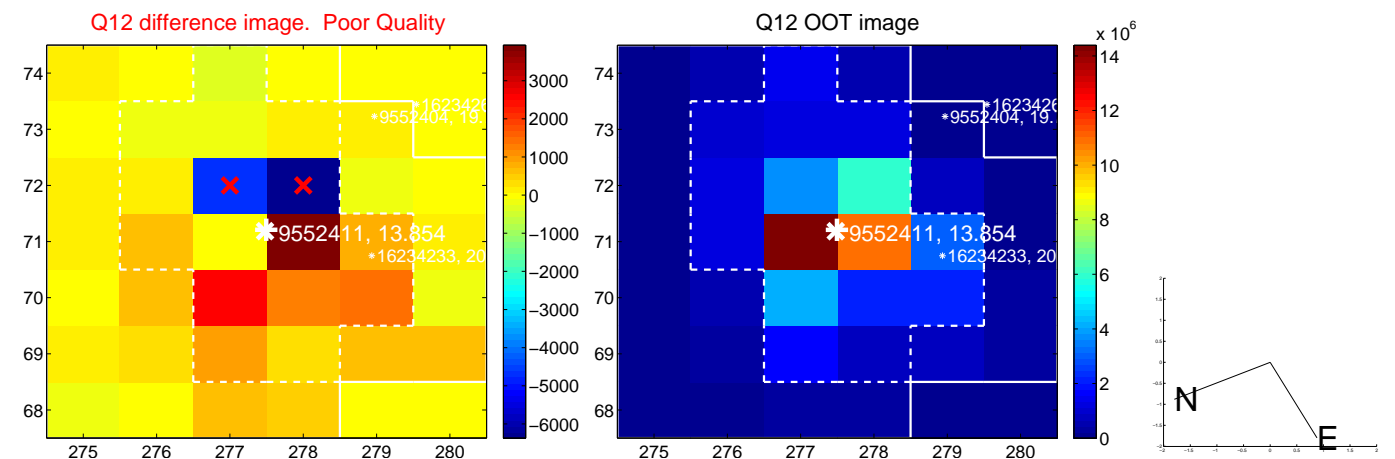
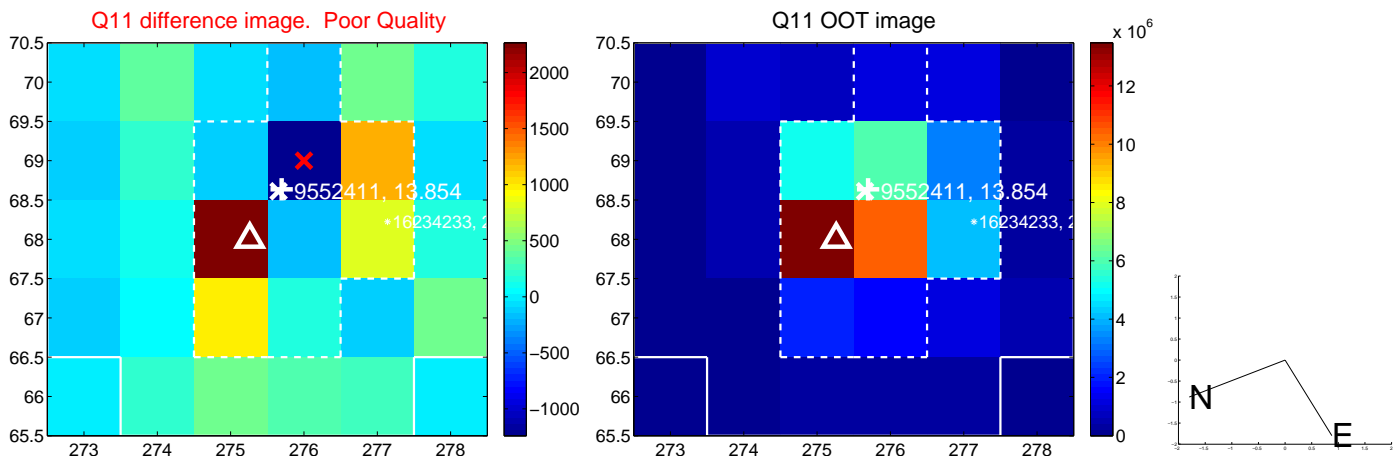
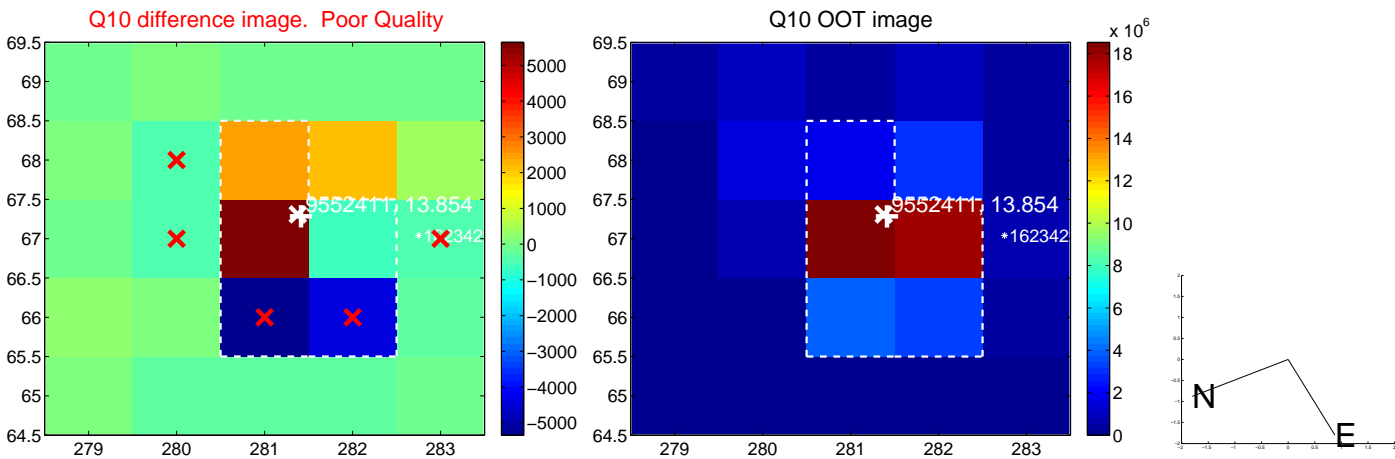
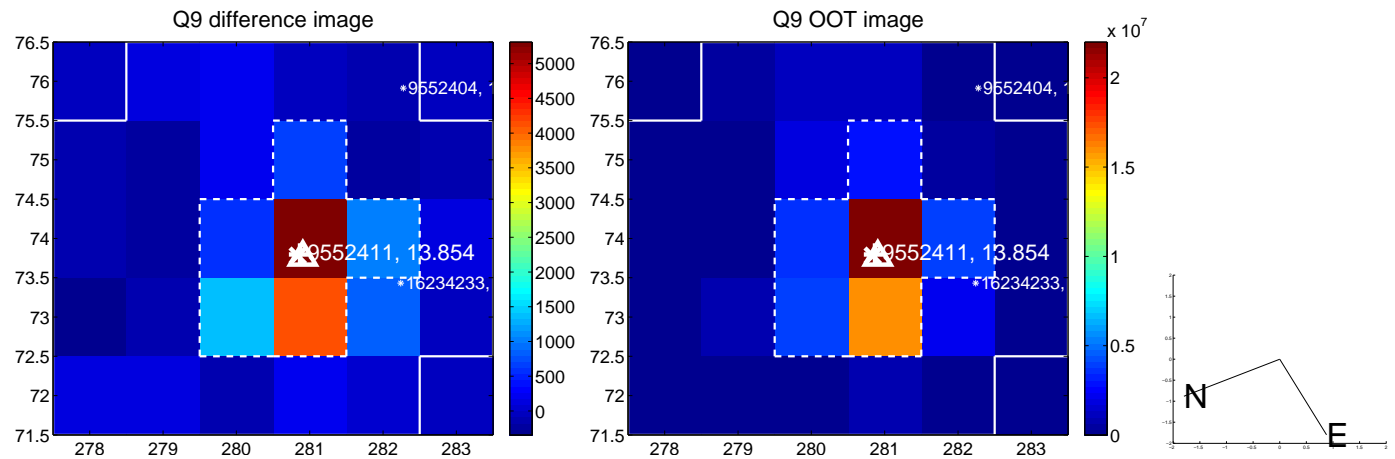


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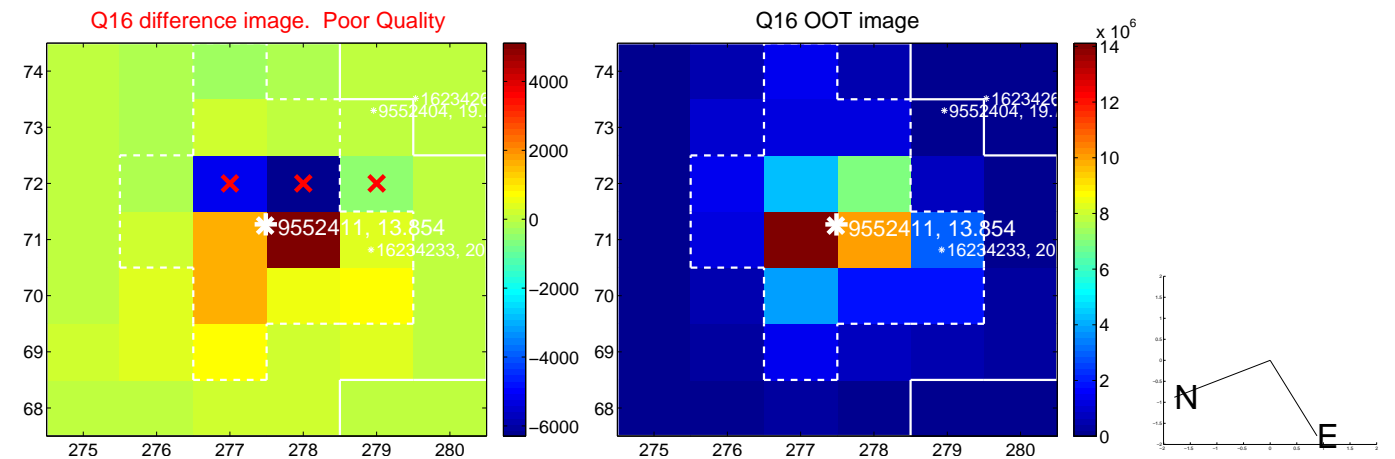
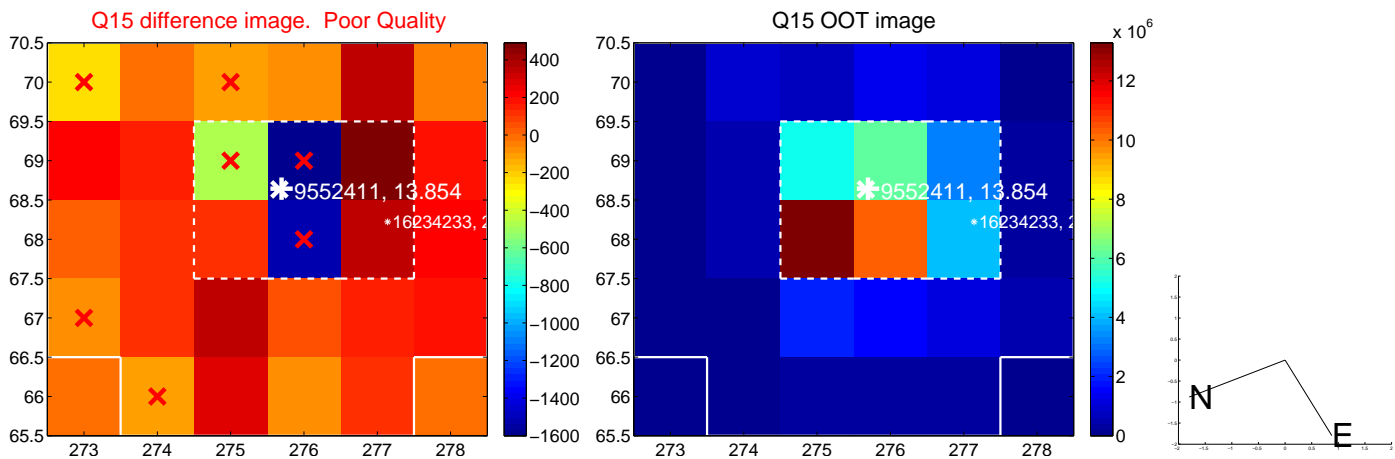
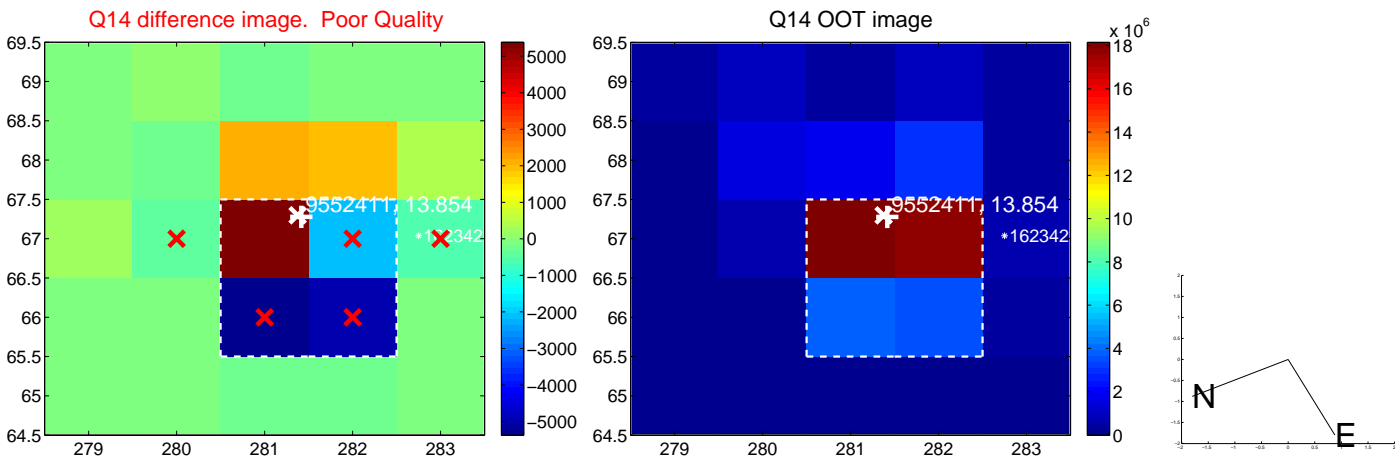
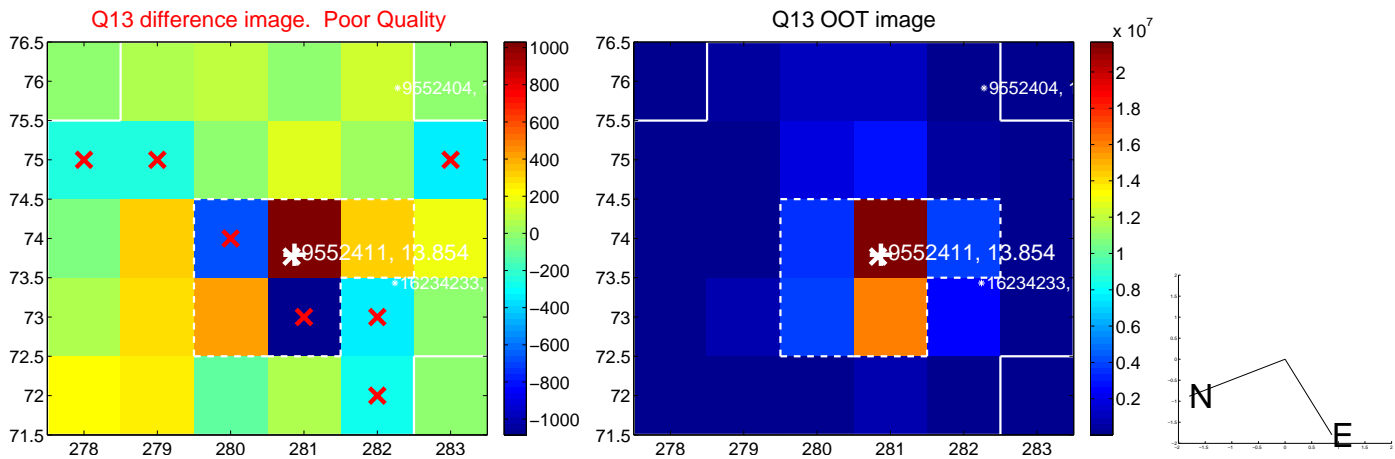




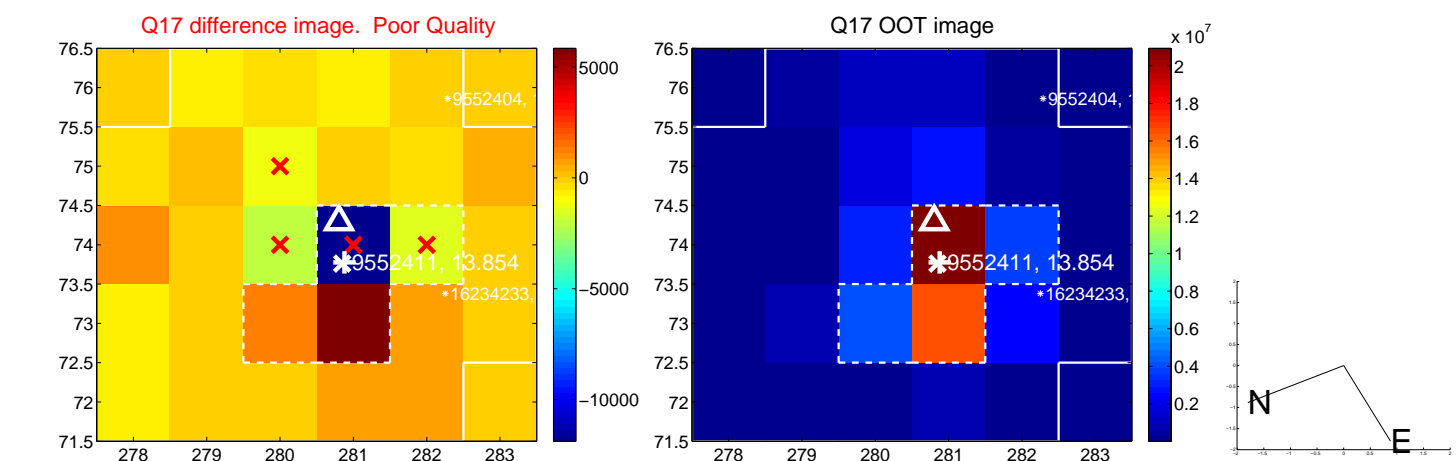
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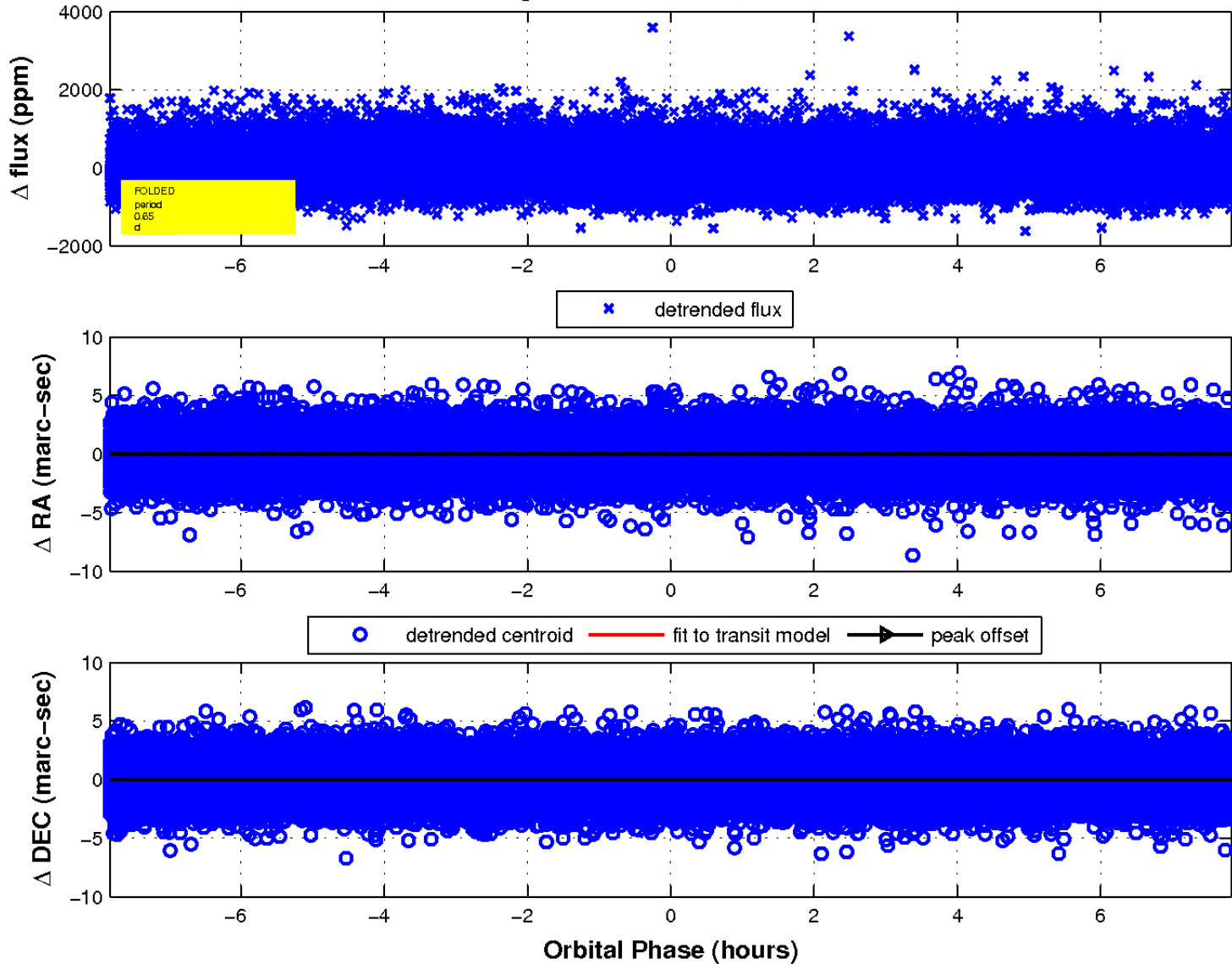
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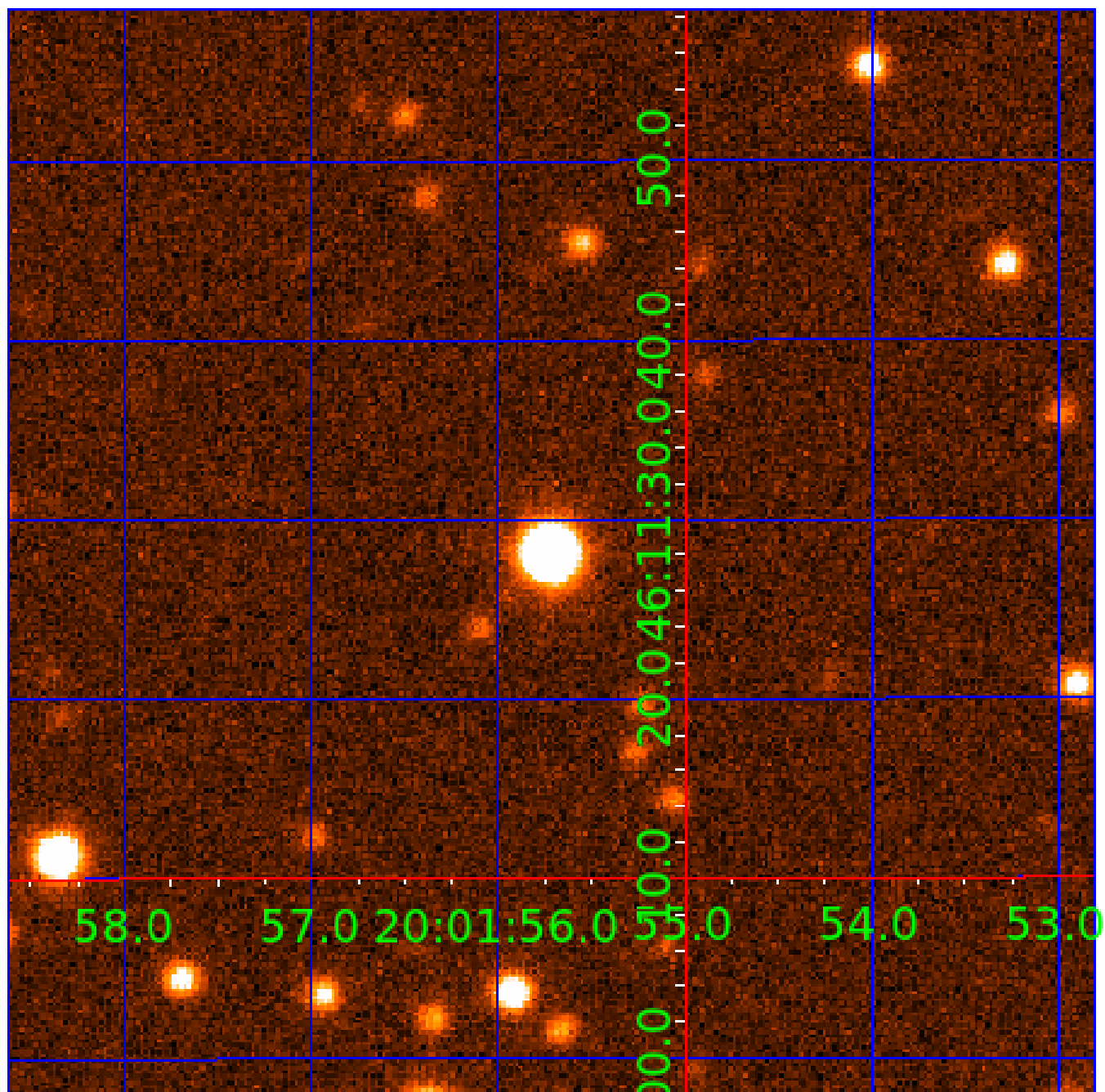


fluxWeightedCentroids, Planet 1 of 7



UKIRT Image

Declination



# KIC 009552411

## 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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009552411-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009552411-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
009552411-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009552411-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
009552411-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

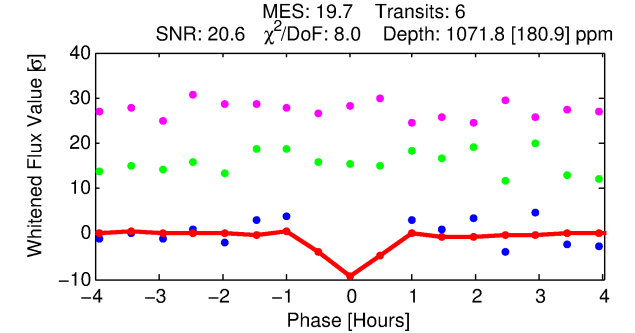
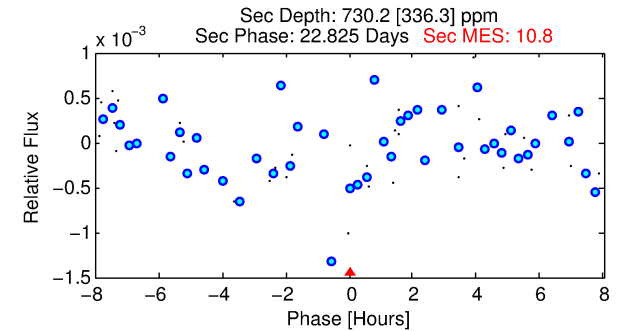
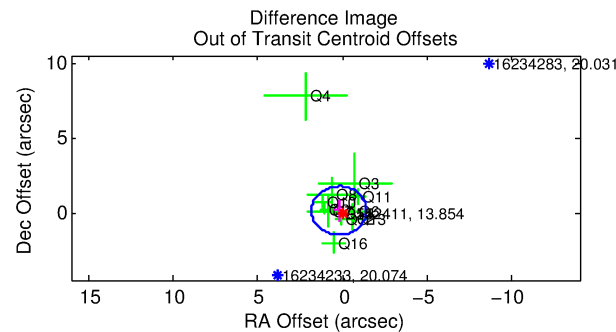
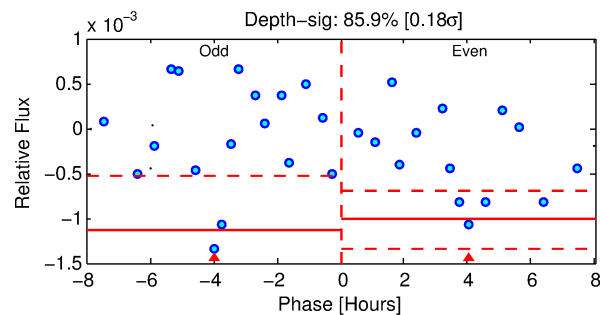
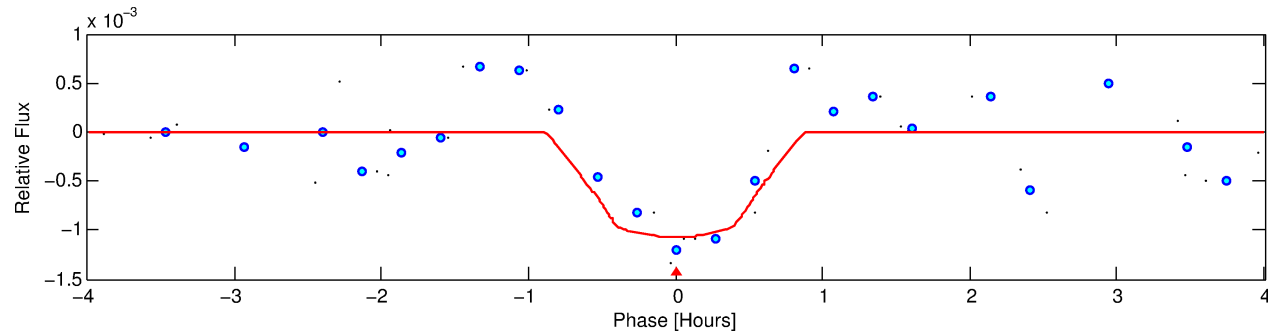
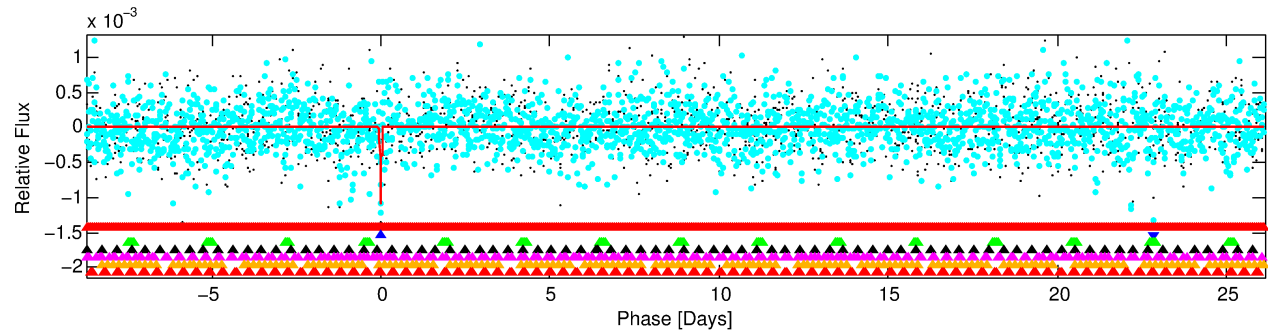
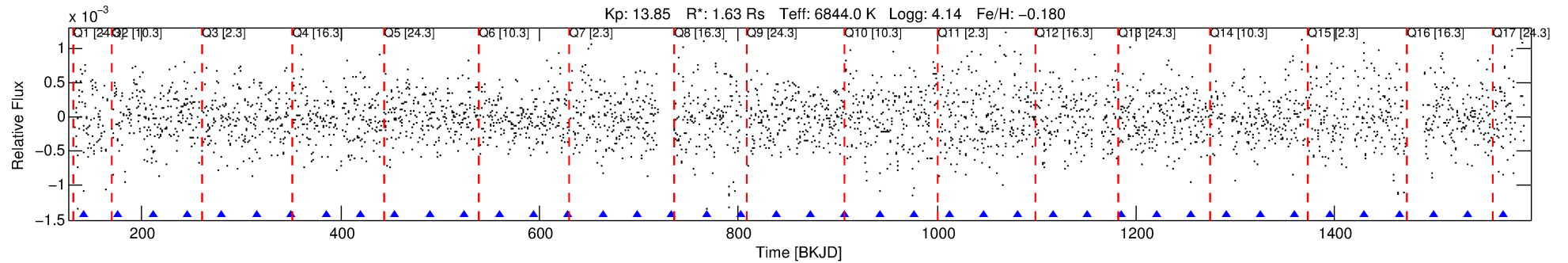
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009552411-02

No Significant Match Found

# DV One-Page Summary

KIC: 9552411 Candidate: 2 of 7 Period: 34.819 d



## DV Fit Results:

Period = 34.81909 [0.00029] d  
Epoch = 141.4370 [0.0070] BKJD  
Rp/R\* = 0.0304 [0.0535]  
a/R\* = 204.61 [1982.50]  
b = 0.07 [131.83]  
Seff = 97.95 [37.32]  
Teq = 802 [76] K  
Rp = 5.41 [9.66] Re  
a = 0.2308 [0.0565] AU  
Ag = 732.34 [2613.14] [0.28 $\sigma$ ]  
Teffp = 6452 [5735] K [0.99 $\sigma$ ]

## DV Diagnostic Results:

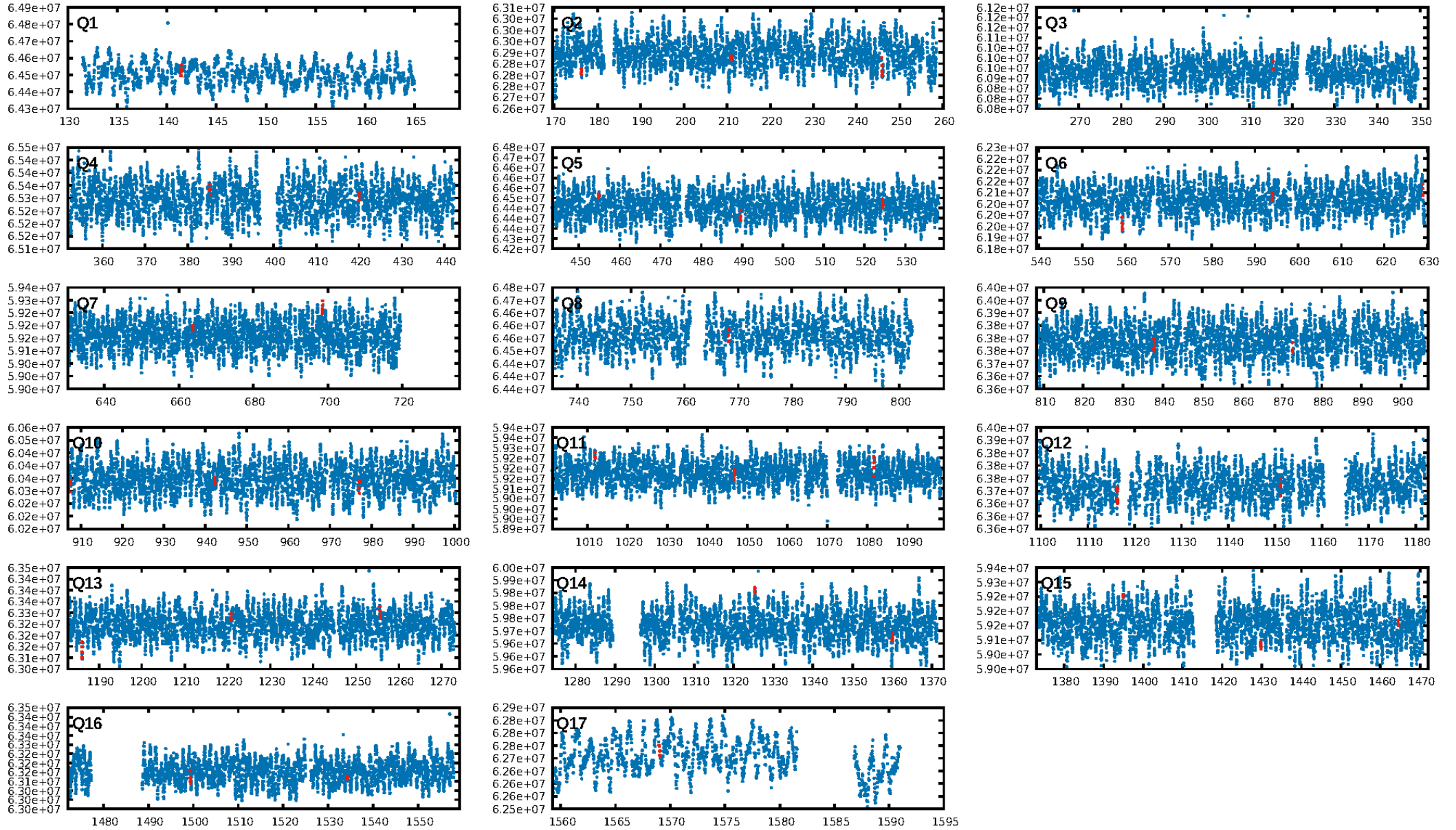
ShortPeriod-sig: 100.0% [116.73 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 13.8%  
ModelChiSquareGof-sig: 78.4%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
GhostDiagnostic-chr: 0.2362  
Centroid-sig: 64.1%  
Centroid-so: 0.551 arcsec [1.50 $\sigma$ ]  
OotOffset-rm: 0.252 arcsec [0.47 $\sigma$ ]  
KicOffset-rm: 0.189 arcsec [0.55 $\sigma$ ]  
OotOffset-st: 4/3/4/1 [12]  
KicOffset-st: 4/3/4/1 [12]  
DiffImageQuality-fgm: 0.42 [5/12]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:14:20 Z

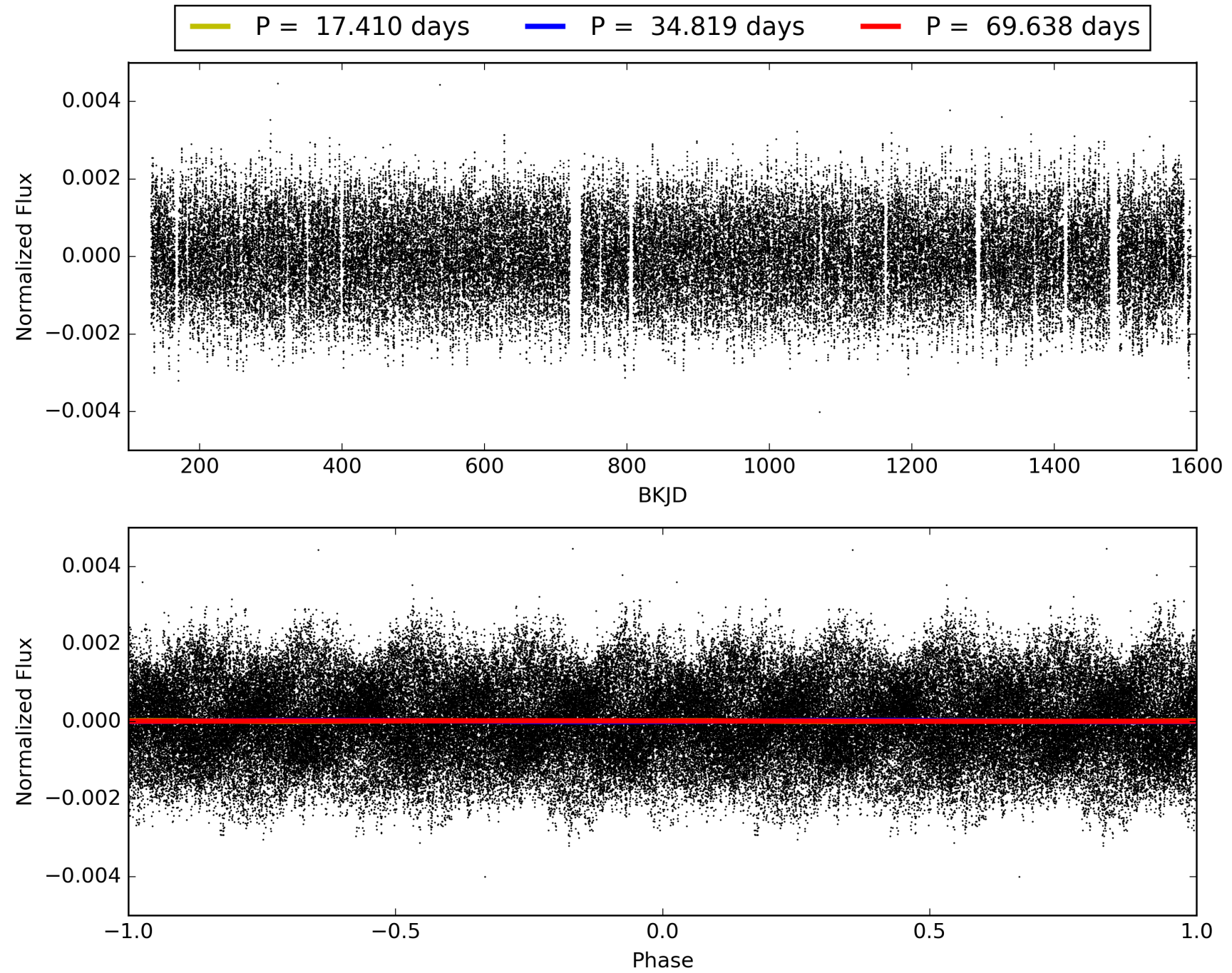
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 009552411-02, PDC Light Curves

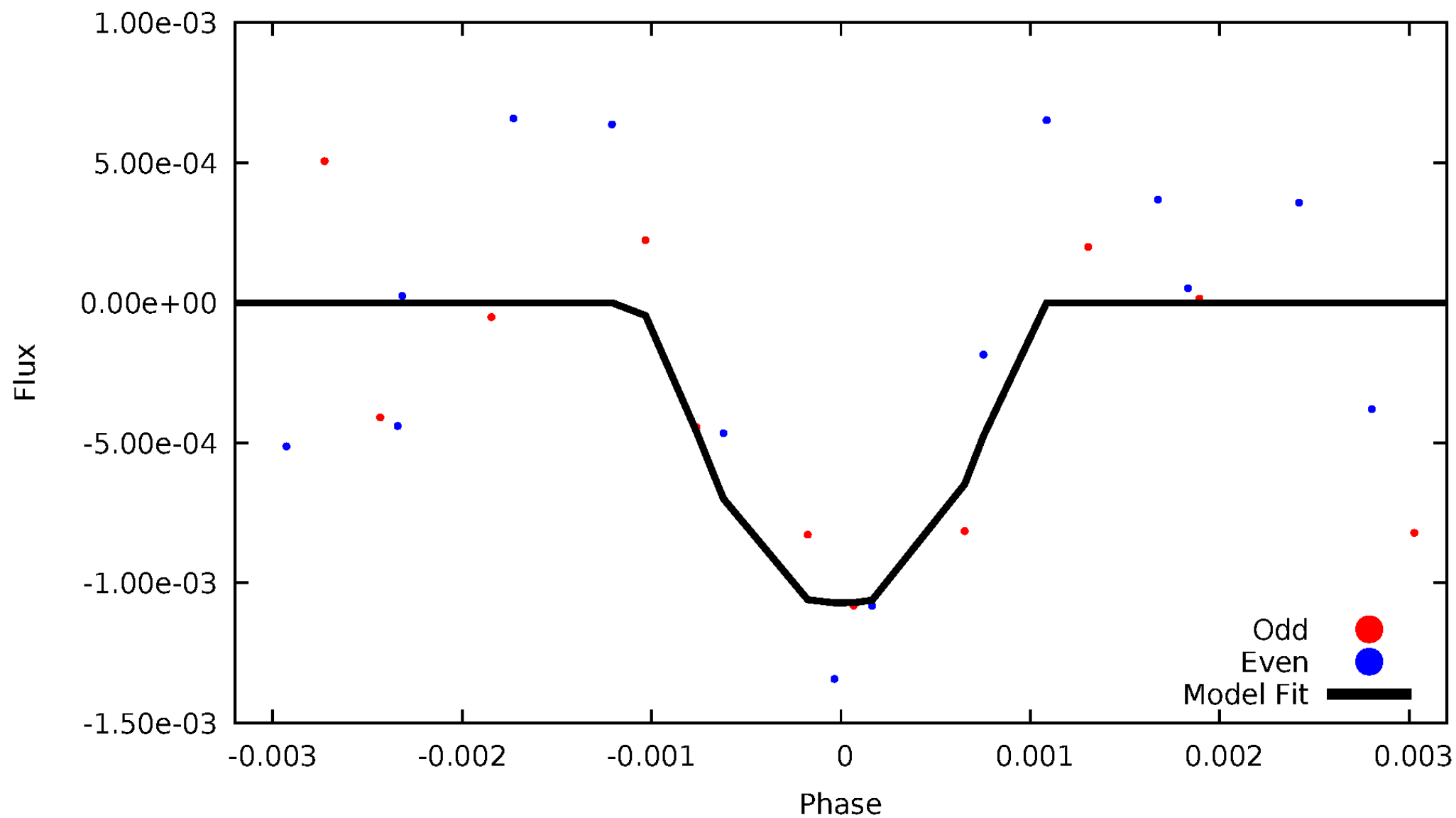


TCE 009552411-02



# DV Odd/Even

TCE 009552411-02



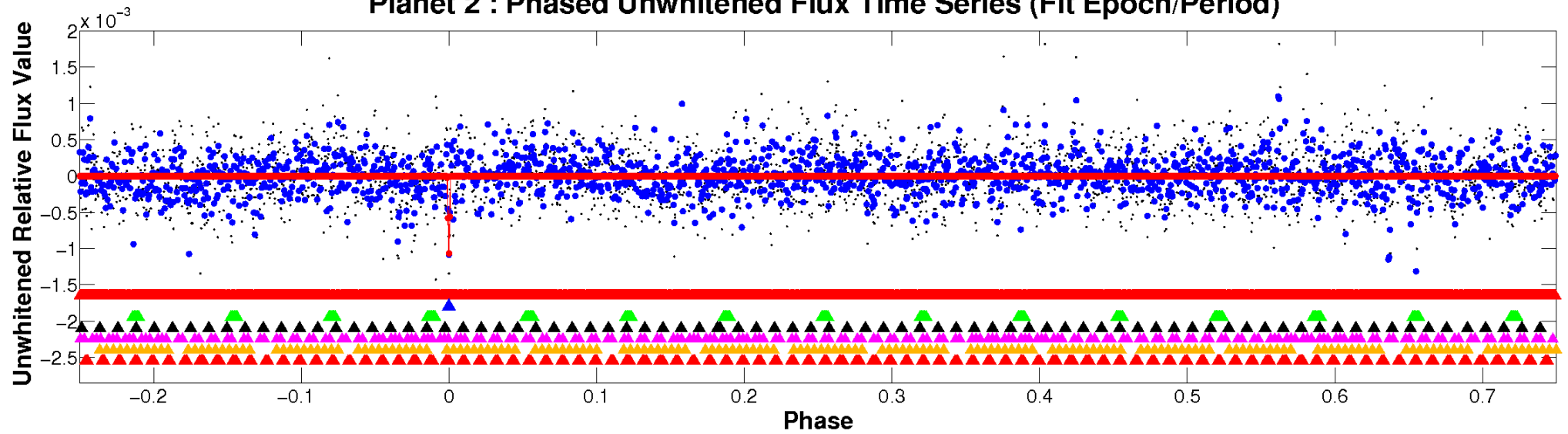


ALT Odd/Even

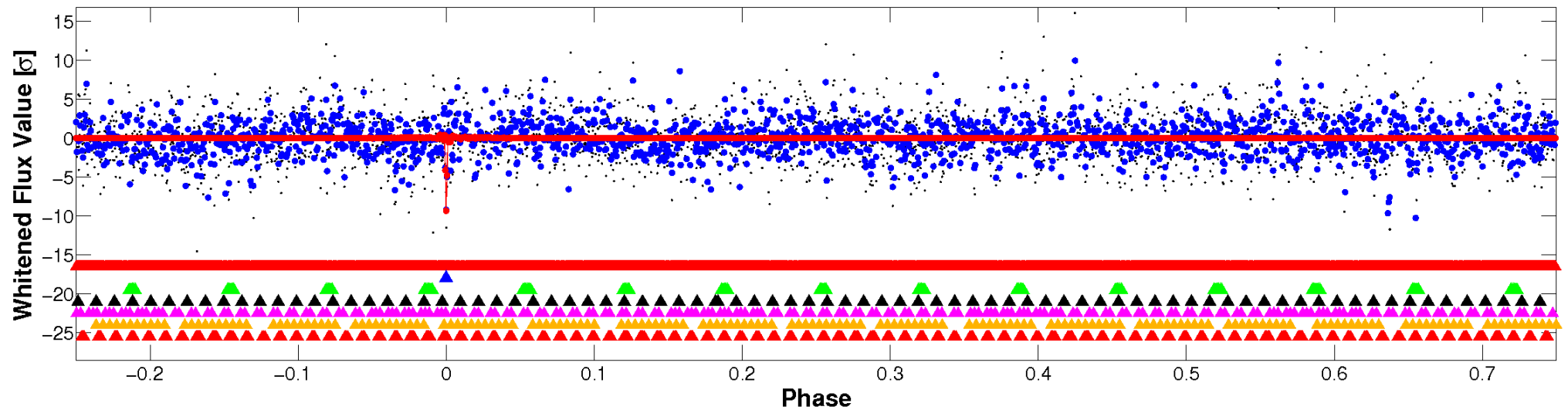
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

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



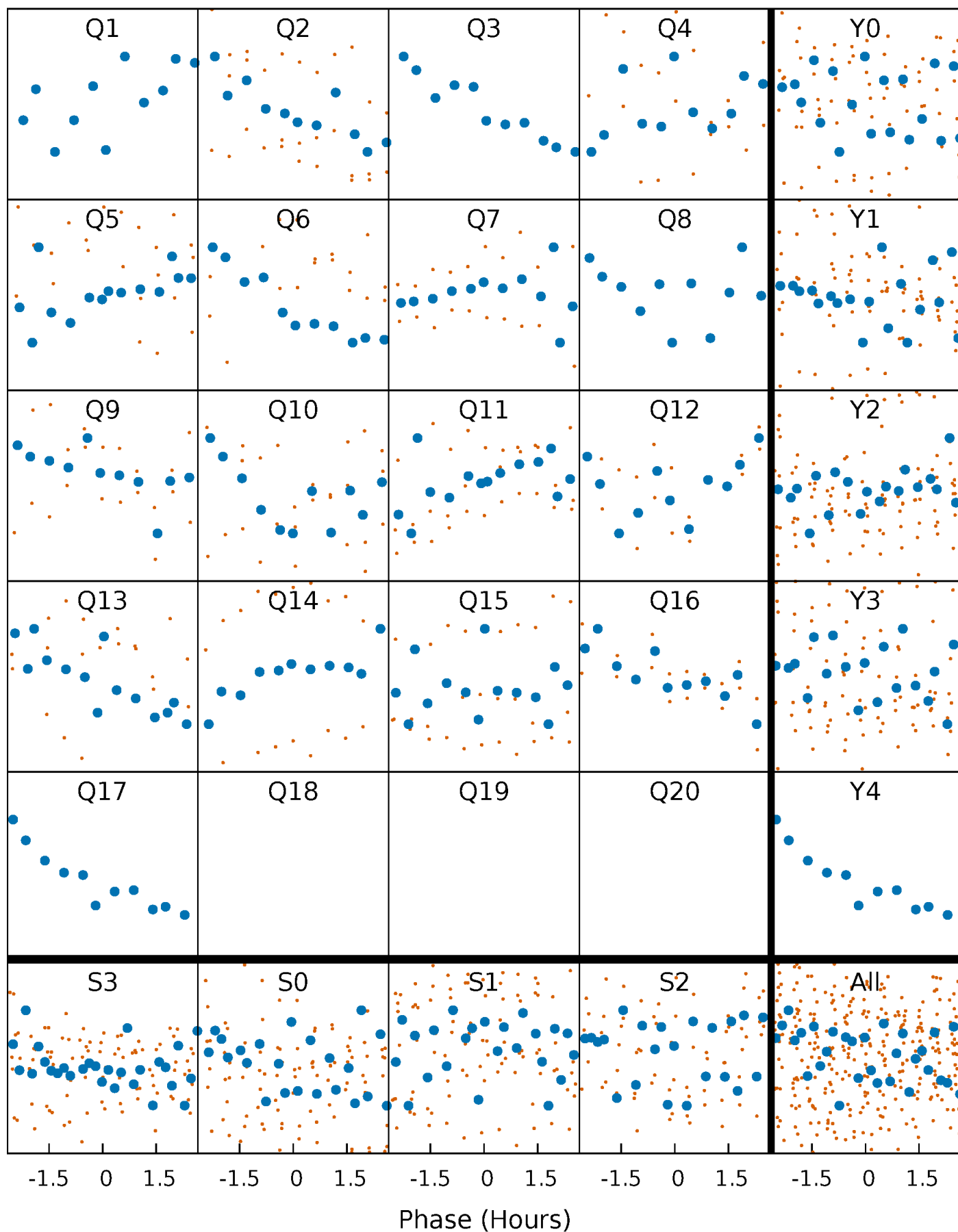
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





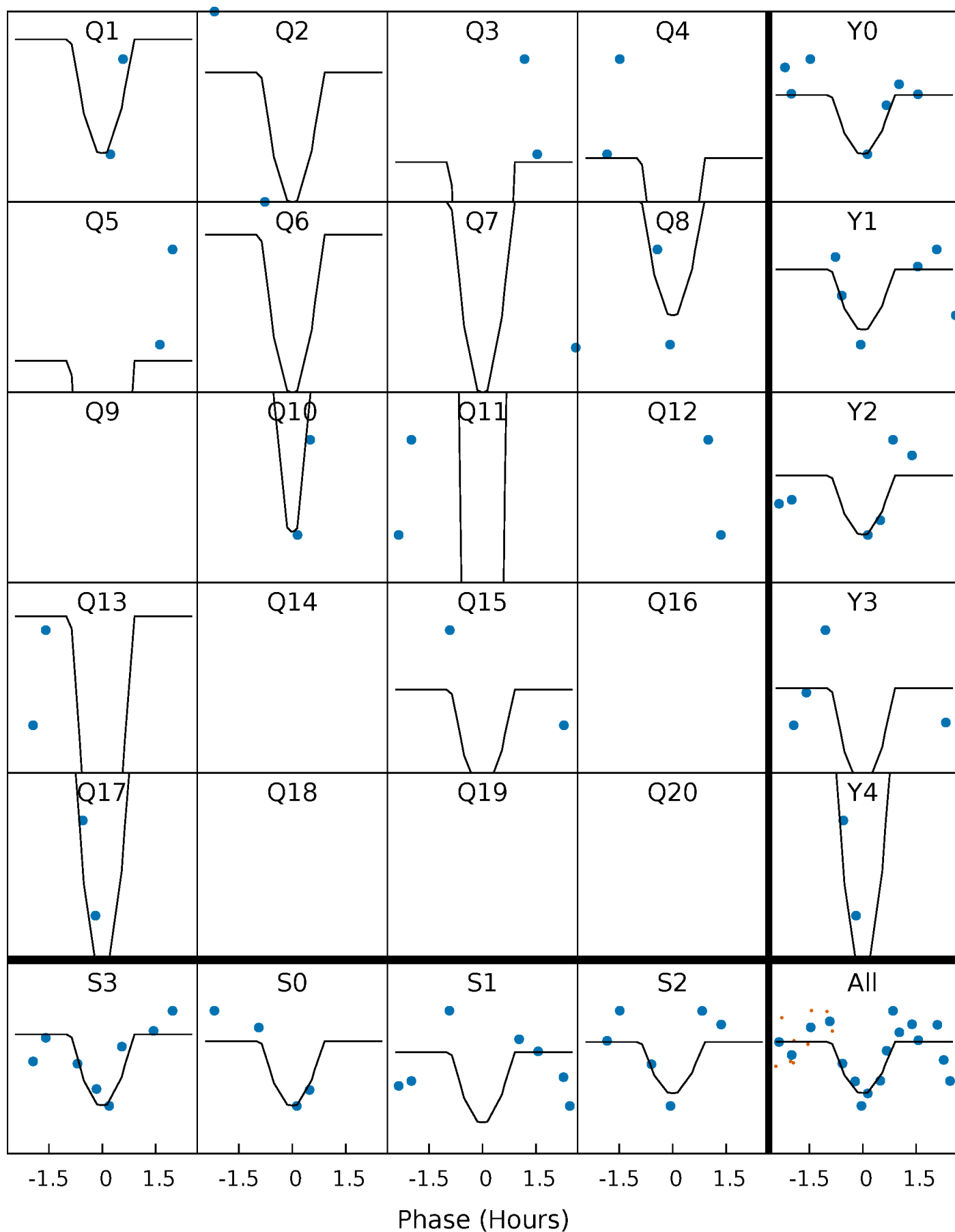
# PDC Quarter-Phased Transit Curves

TCE 009552411-02   P= 34.819086 Days    $T_0=141.437002$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 009552411-02 P= 34.819086 Days  $T_0=141.437002$  (BKJD)

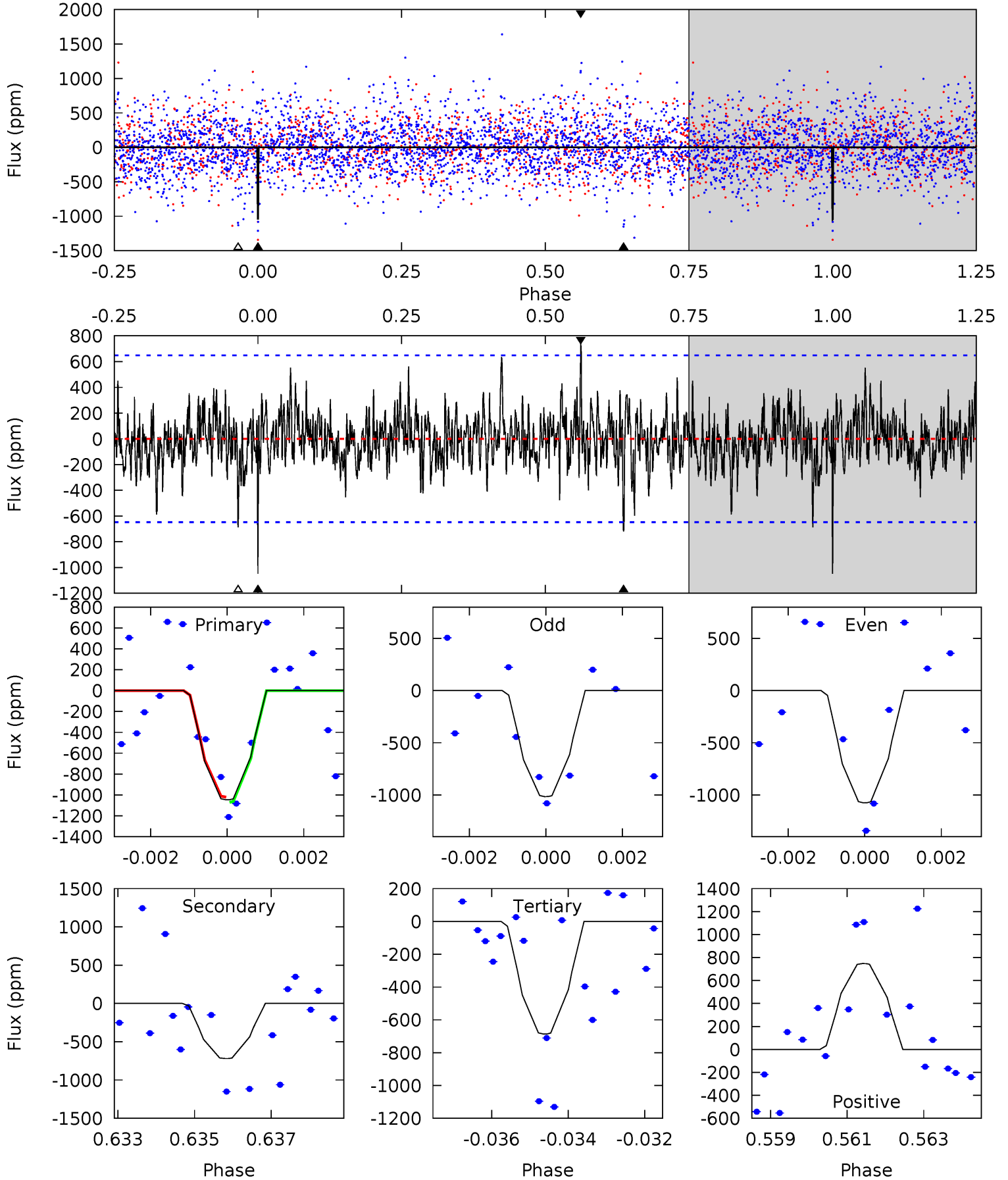


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

009552411-02, P = 34.819086 Days, E = 106.617916 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
8.59	5.90	5.63	6.13	5.32	3.07	1.40	2.96	2.45	0.27	-0.23	0.24	0.97	0.42	0.21



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 009552411

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6844^{+190}_{-286}$	$4.145^{+0.180}_{-0.180}$	$-0.180^{+0.250}_{-0.300}$	$1.629^{+0.494}_{-0.404}$	$1.358^{+0.202}_{-0.247}$	$0.443^{+0.435}_{-0.221}$
	+3%/-4%	+4%/-4%	+139%/-167%	+30%/-25%	+15%/-18%	+98%/-50%
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 009552411-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-720 \pm 122$	$8.81^{+8.61}_{-5.98}$	$1121^{+91}_{-82}$	$5055^{+4268}_{-1147}$	$267^{+2324}_{-199}$
Alt.	N/A	N/A	N/A	N/A	N/A

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



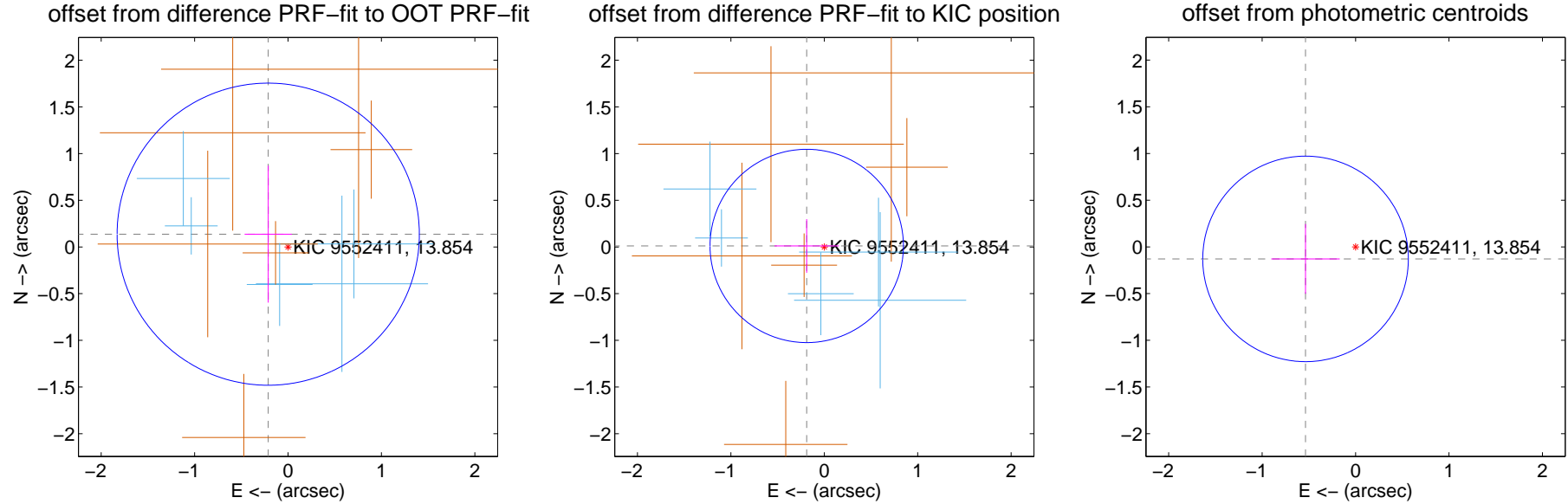
## DV Centroid Data

Supplemental centroid analysis for 009552411-02. Kepler magnitude: 13.85. Transit SNR 20.62

There are 5 quarters with good PRF difference image offsets

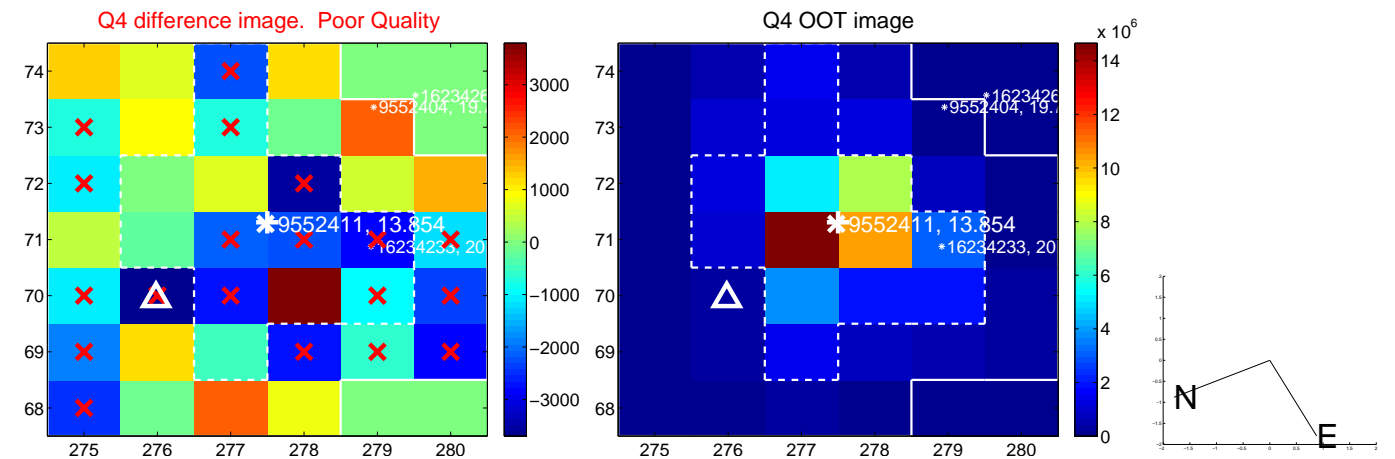
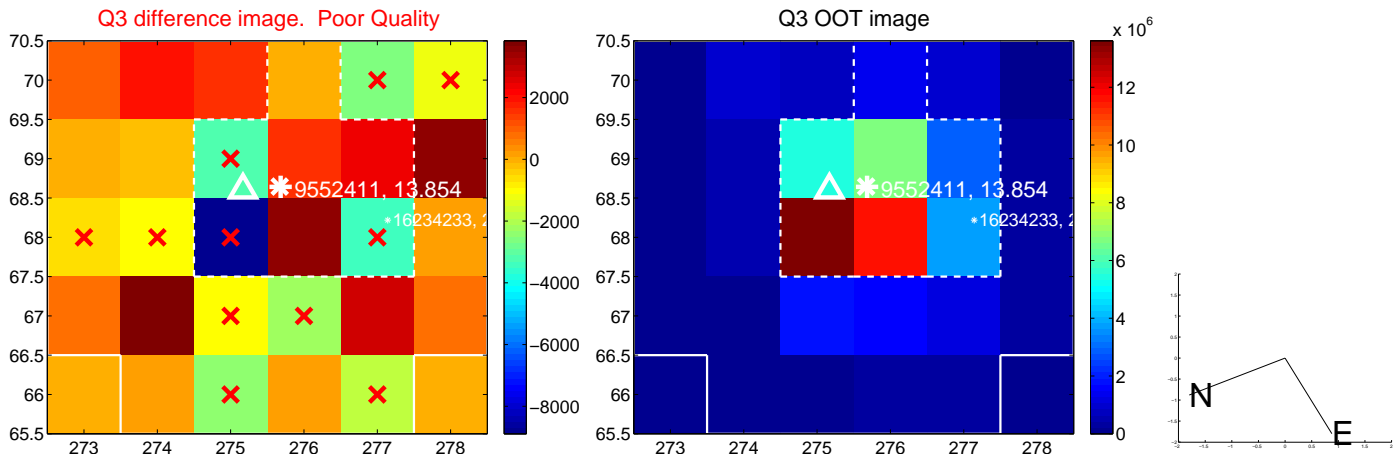
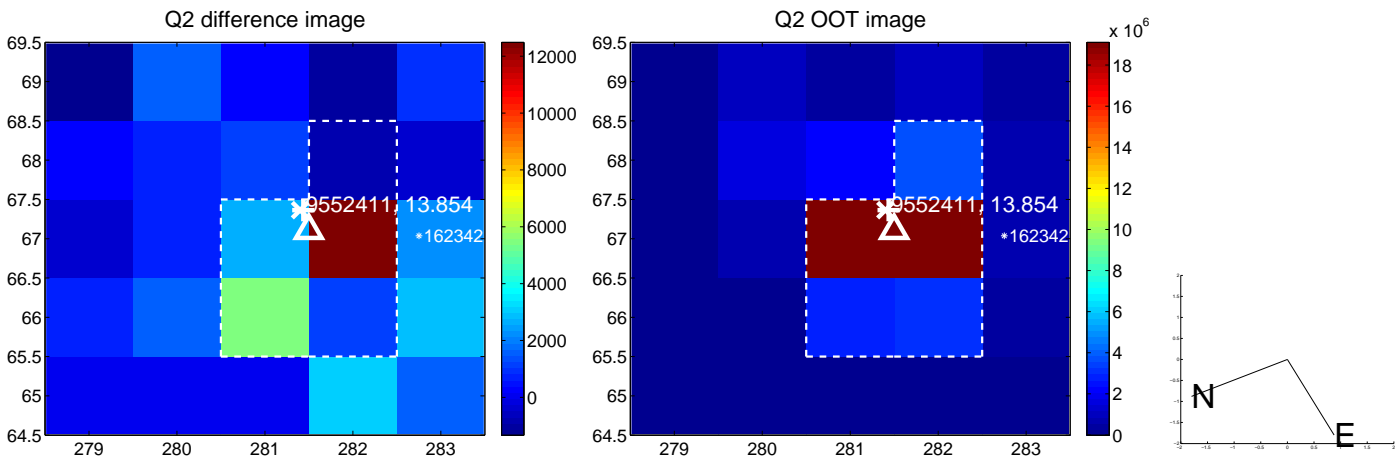
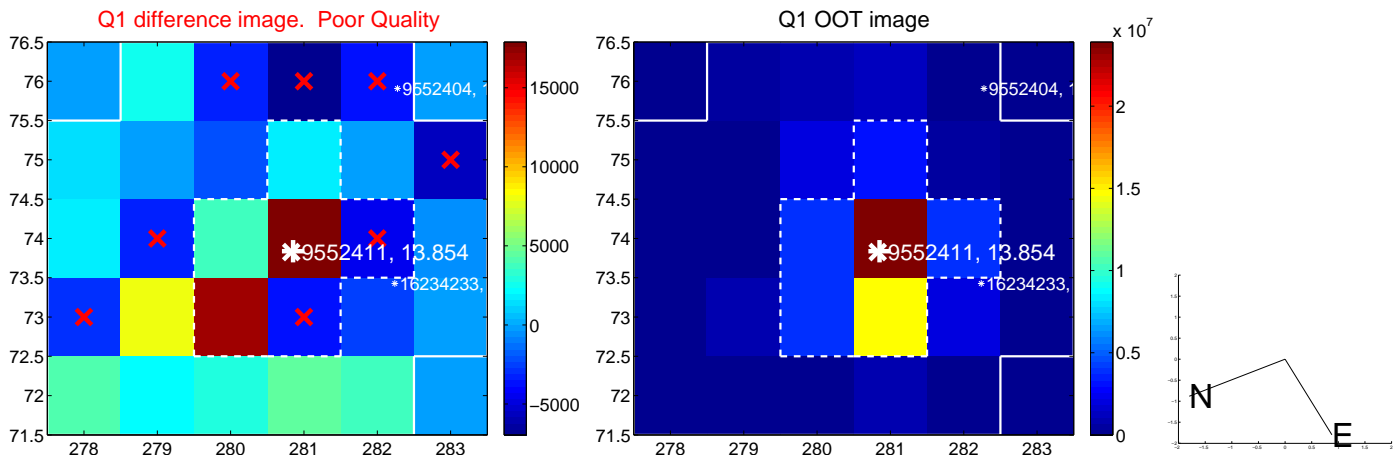
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.252 \pm 0.539$	0.47	$0.212 \pm 0.252$	$0.137 \pm 0.733$
PRF-fit source offset from KIC position	$0.189 \pm 0.345$	0.55	$0.188 \pm 0.345$	$0.011 \pm 0.288$
photometric centroid source offset	$0.55 \pm 0.37$	1.50	$0.54 \pm 0.37$	$-0.13 \pm 0.37$

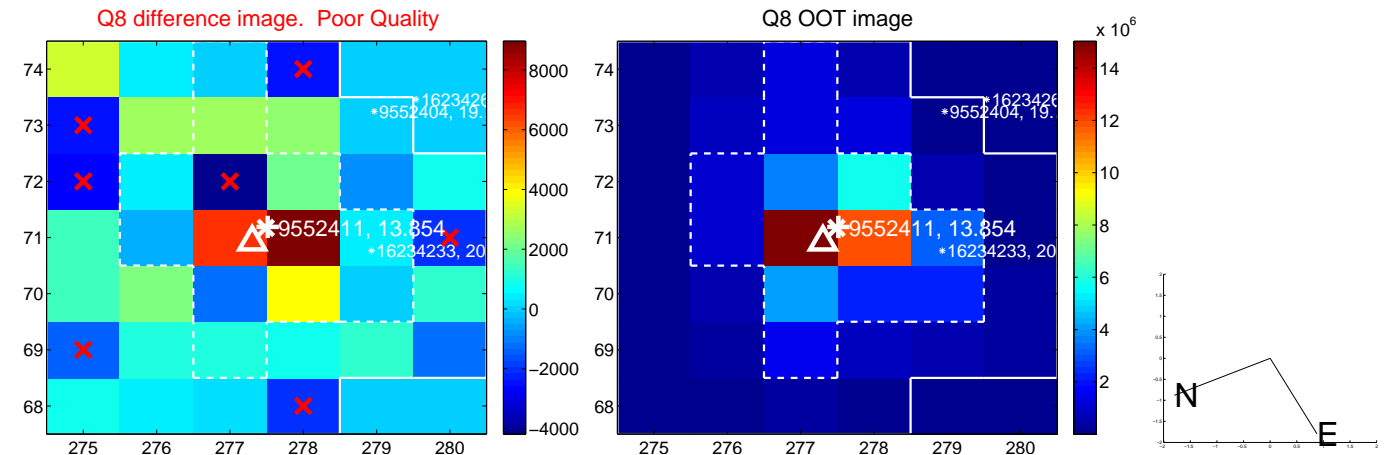
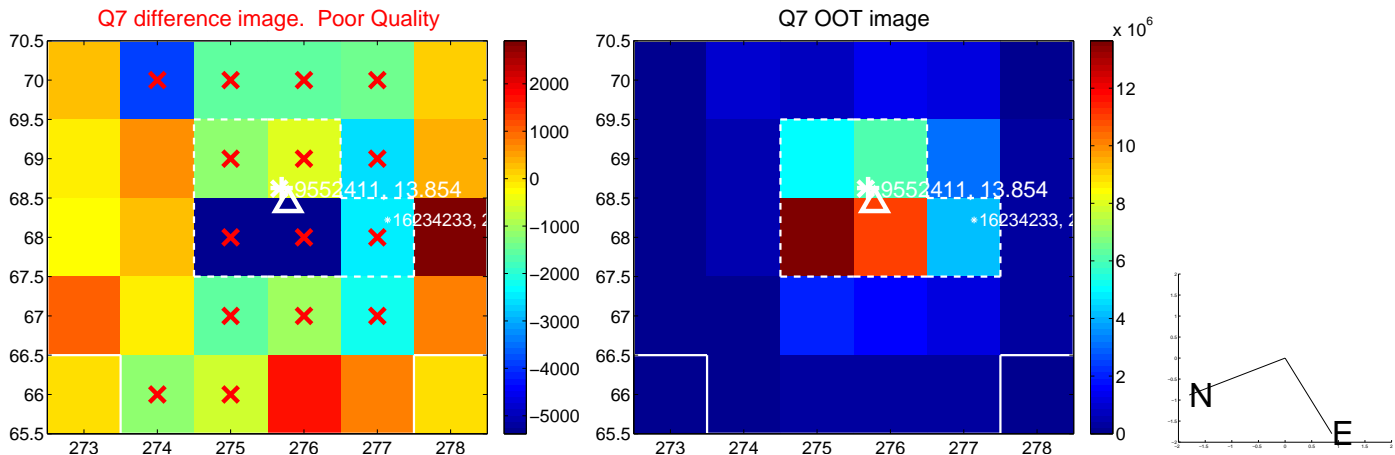
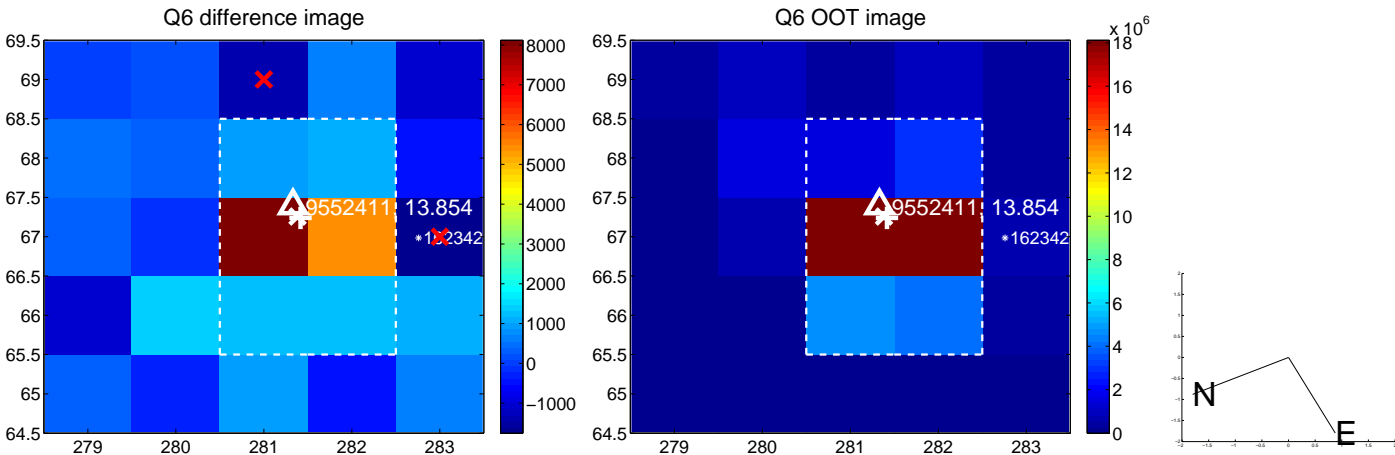
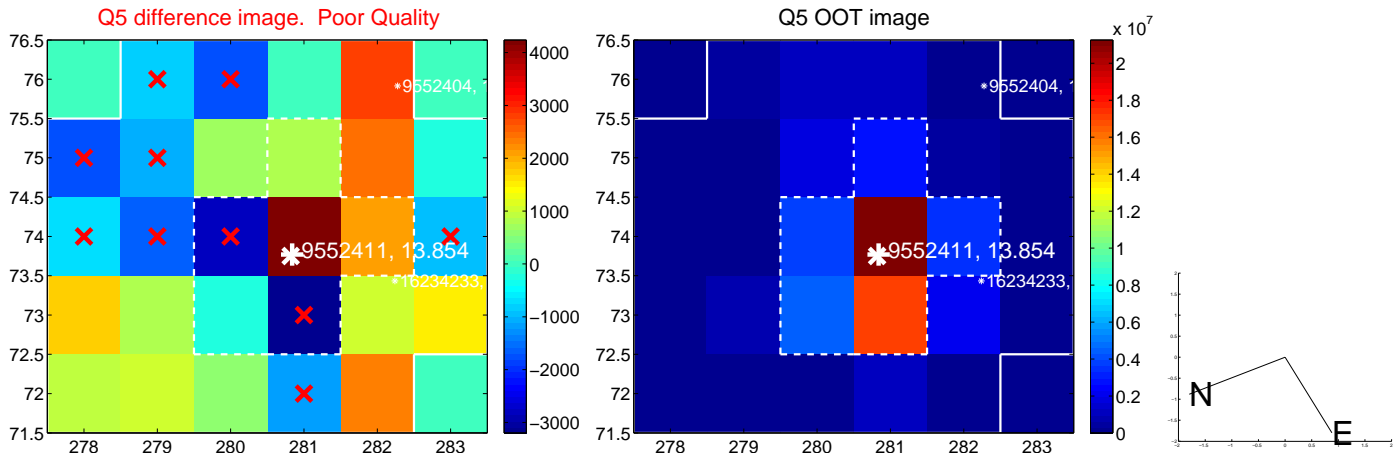


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

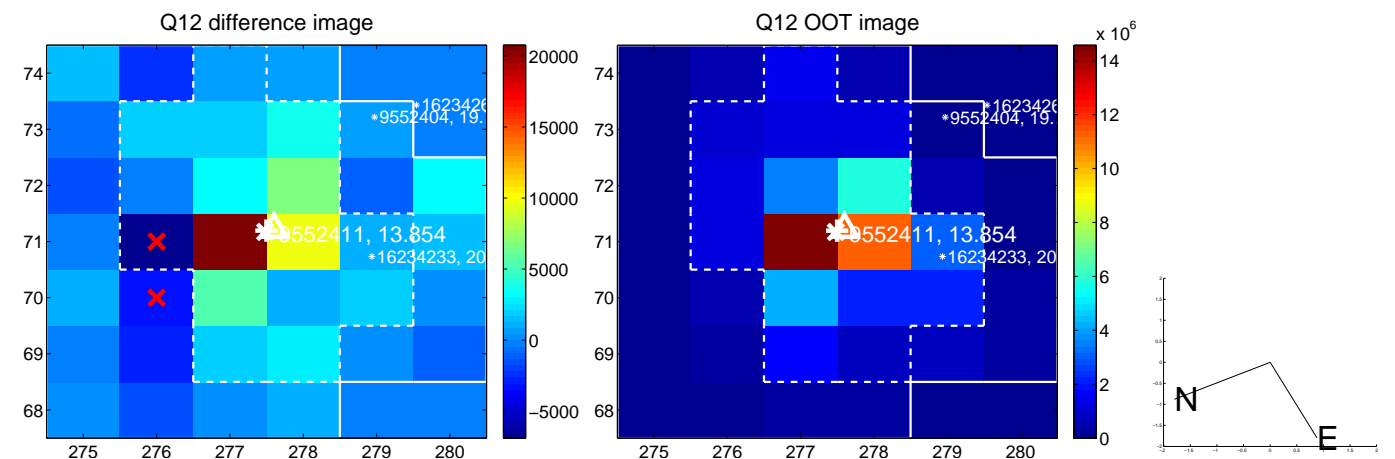
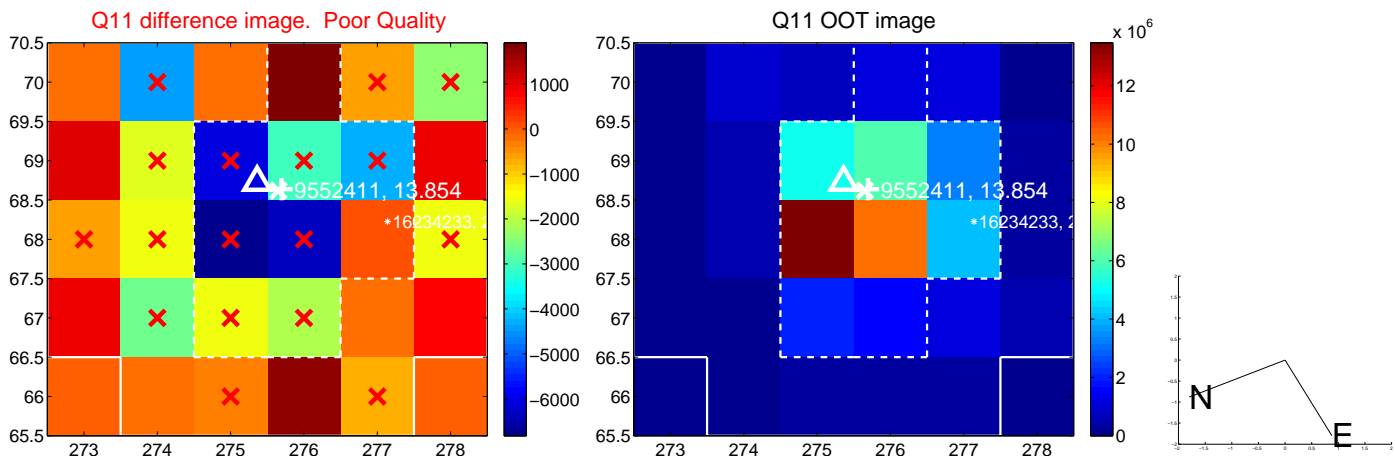
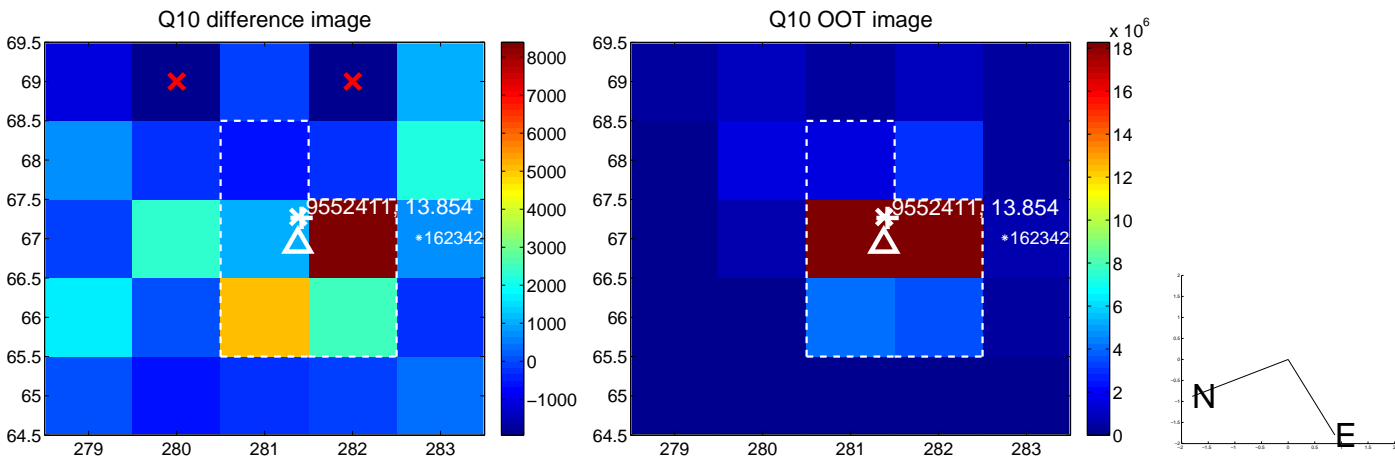
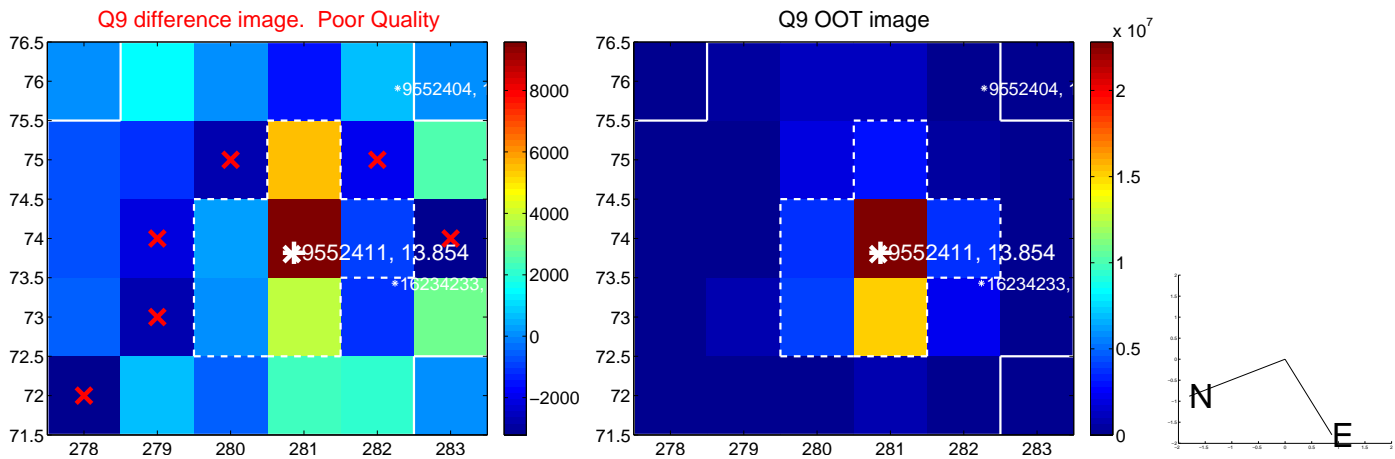
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

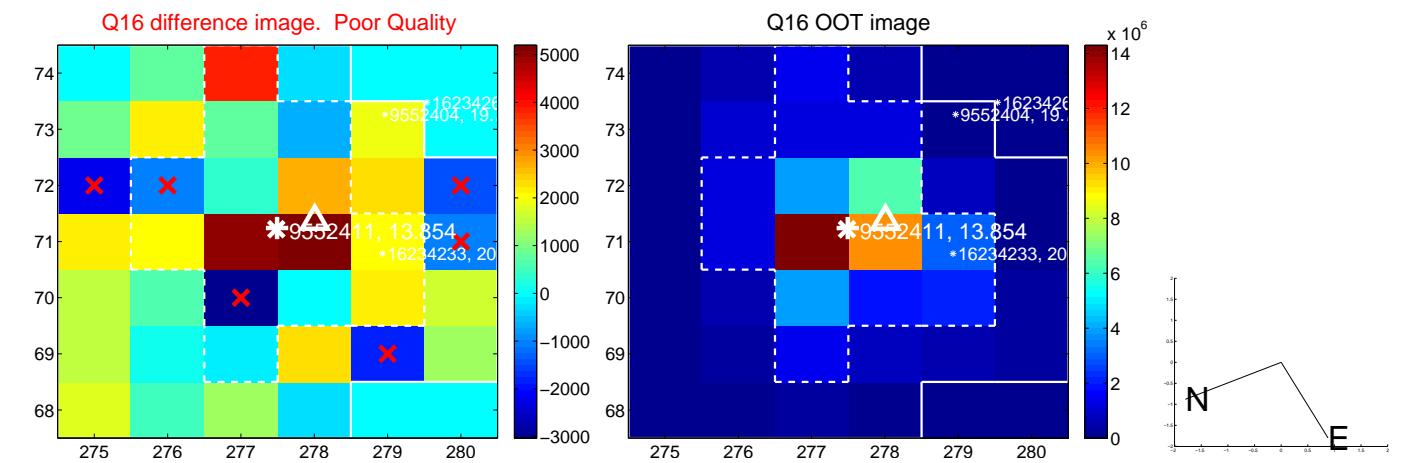
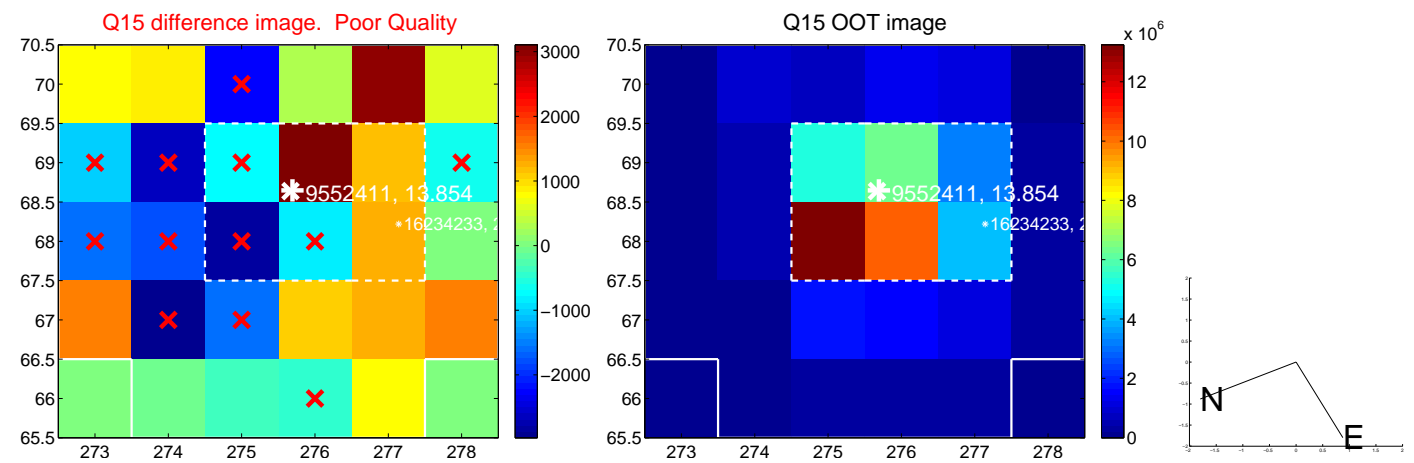
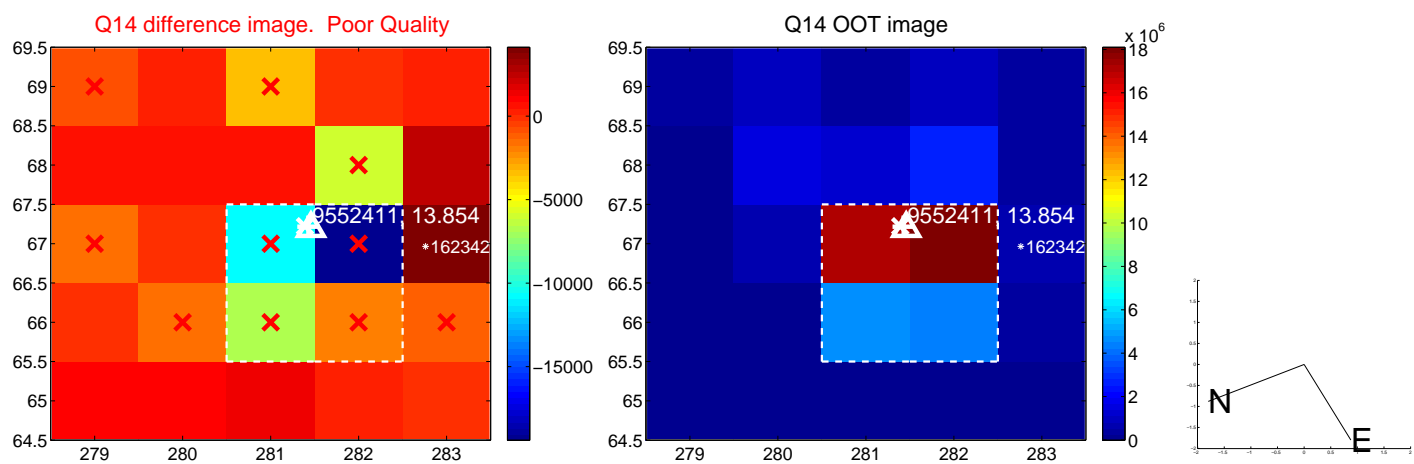
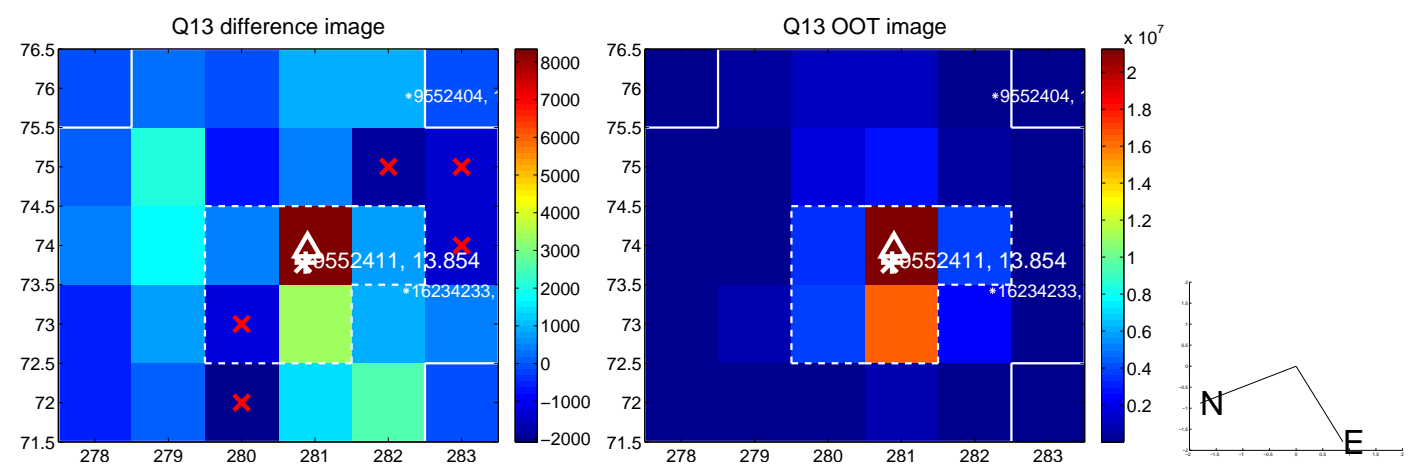


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

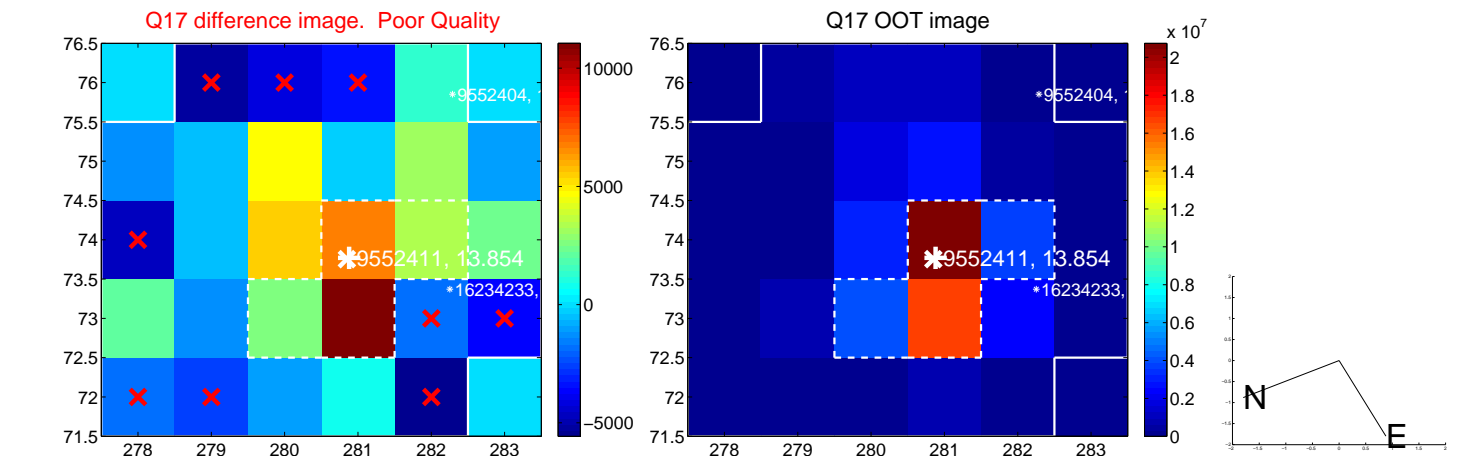




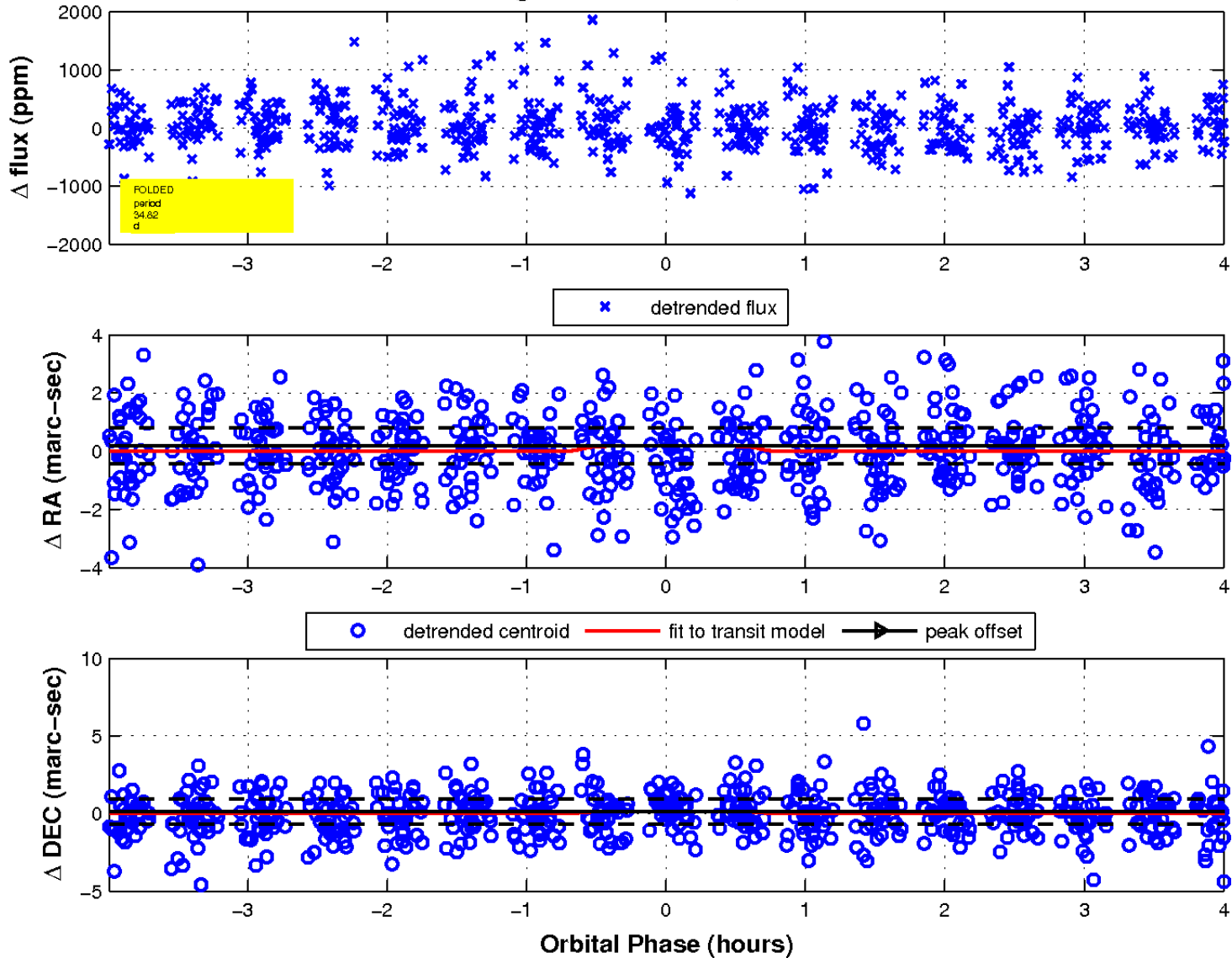
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

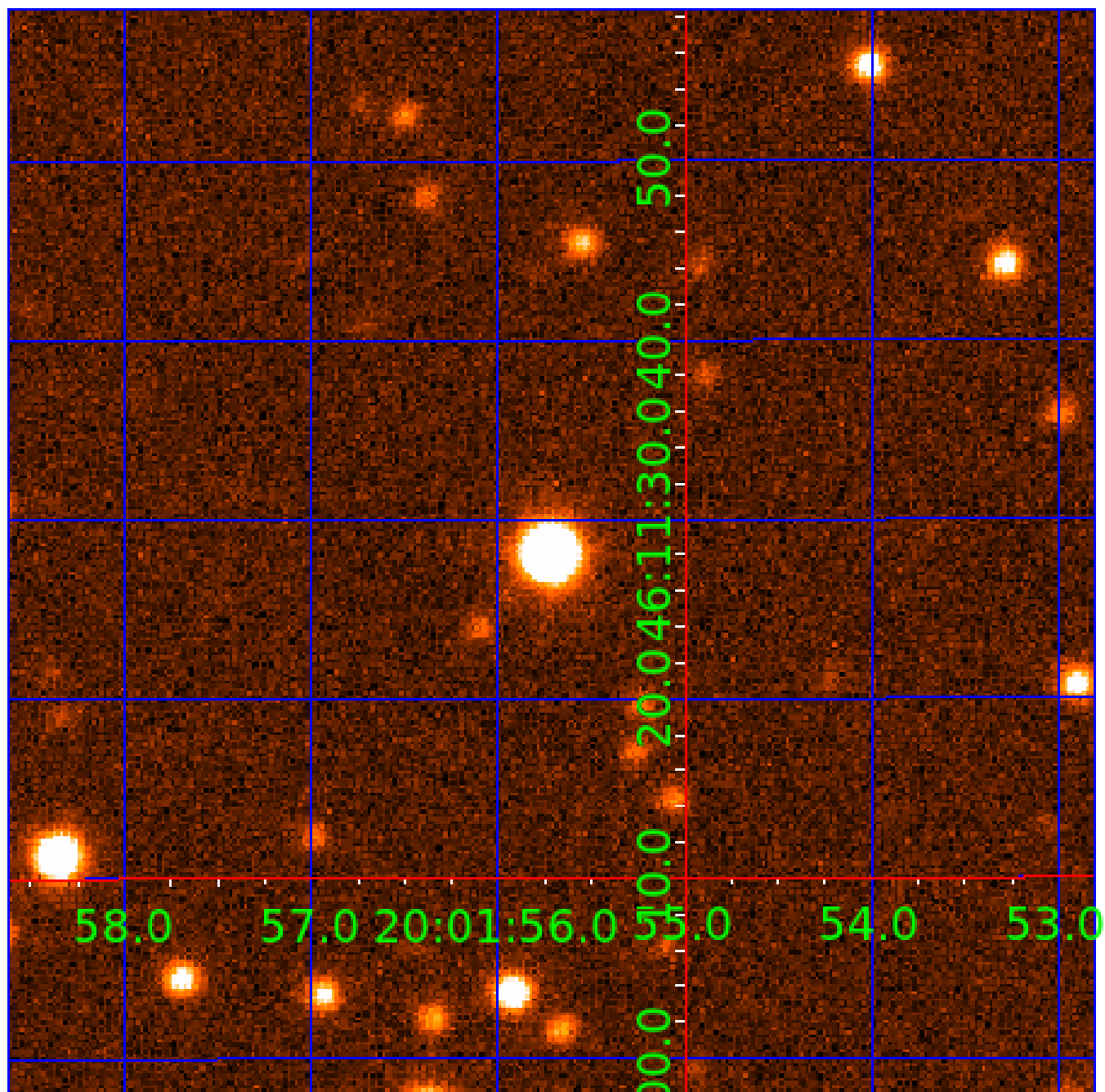


fluxWeightedCentroids, Planet 2 of 7



UKIRT Image

Declination



# KIC 009552411

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009552411-01	OBS	No	0.652146	132.002493	11.0	4.784	10.5	2.9	1.63	6844	0.58	19691.95
009552411-02	OBS	No	34.819086	141.437002	1071.8	1.336	19.7	20.6	1.63	6844	5.41	97.95
009552411-03	OBS	No	18.567813	141.108223	425.1	3.063	17.5	12.8	1.63	6844	3.69	226.50
009552411-04	OBS	No	17.623722	147.830769	84.8	72.531	14.7	6.3	1.63	6844	1.59	242.82
009552411-05	OBS	No	7.040981	132.840594	97.0	1.401	10.7	2.5	1.63	6844	1.70	825.22
009552411-06	OBS	No	8.183251	134.814653	847.1	0.898	10.8	13.2	1.63	6844	5.32	675.33
009552411-07	OBS	No	5.029754	135.557261	1166.5	3.883	14.3	19.7	1.63	6844	9.31	1292.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009552411-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009552411-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009552411-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009552411-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
009552411-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009552411-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
009552411-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

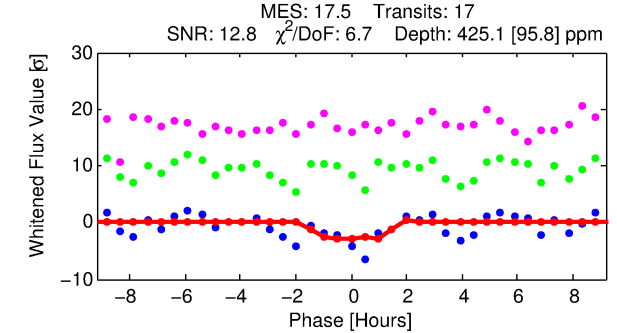
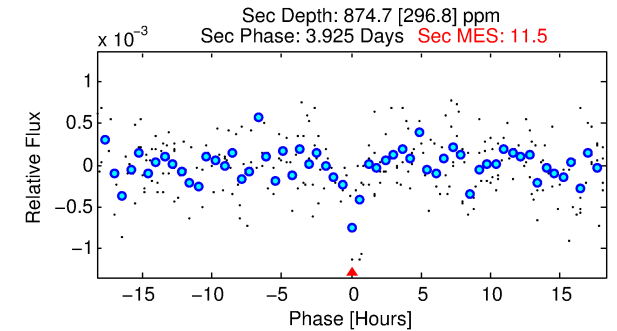
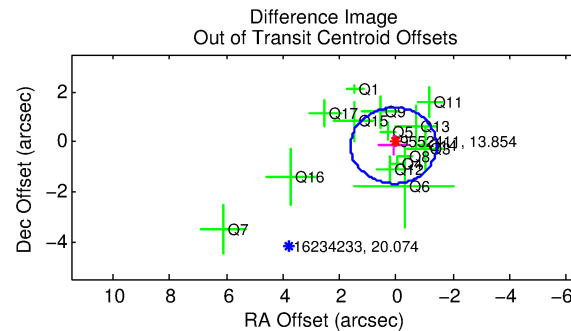
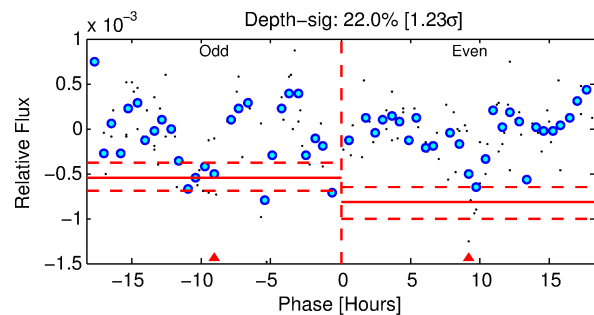
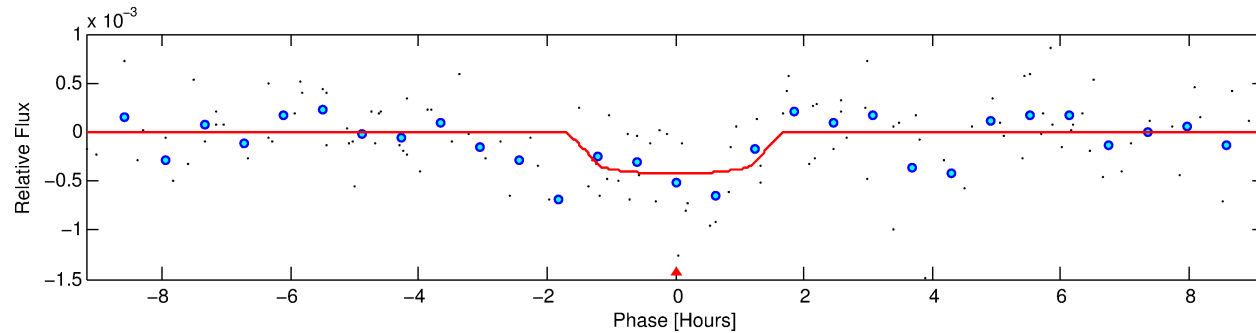
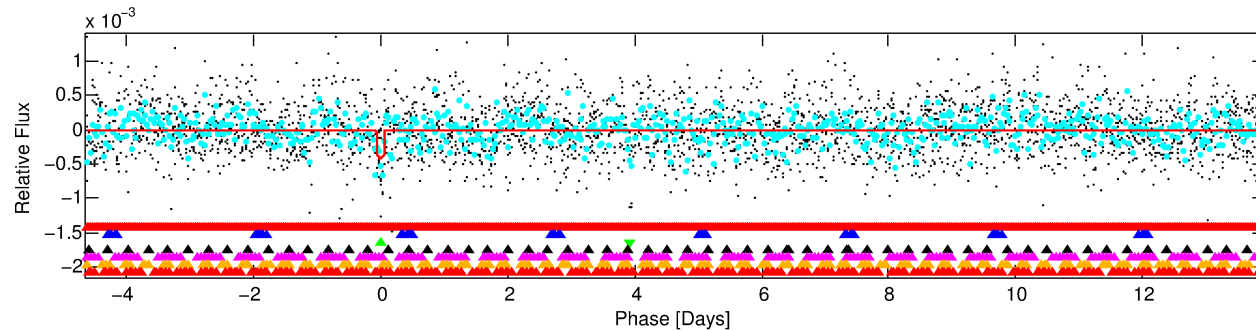
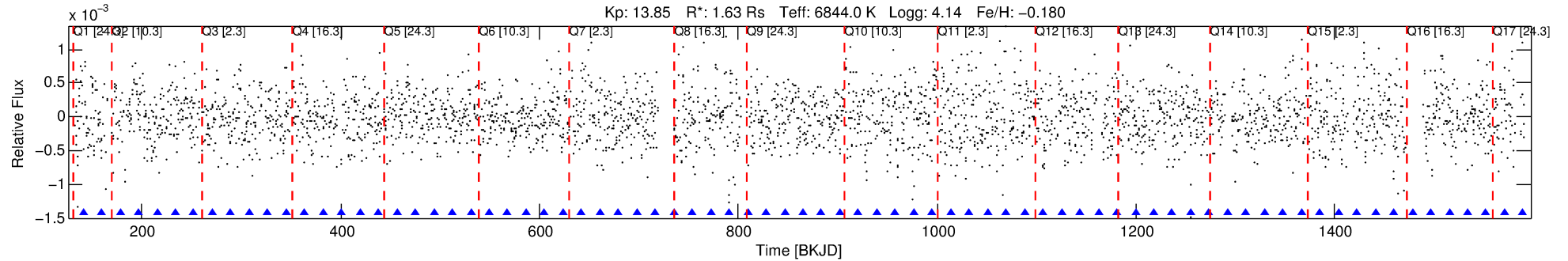
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009552411-03

No Significant Match Found

# DV One-Page Summary

KIC: 9552411 Candidate: 3 of 7 Period: 18.568 d



## DV Fit Results:

Period = 18.56781 [0.00033] d  
Epoch = 141.1082 [0.0154] BKJD  
Rp/R\* = 0.0208 [0.0352]  
a/R\* = 30.01 [297.52]  
b = 0.79 [4.78]  
Seff = 226.50 [86.30]  
Teff = 989 [94] K  
Rp = 3.69 [6.36] Re  
a = 0.1518 [0.0372] AU  
Ag = 812.54 [2783.71] [0.29 $\sigma$ ]  
Teffp = 8166 [6967] K [1.03 $\sigma$ ]

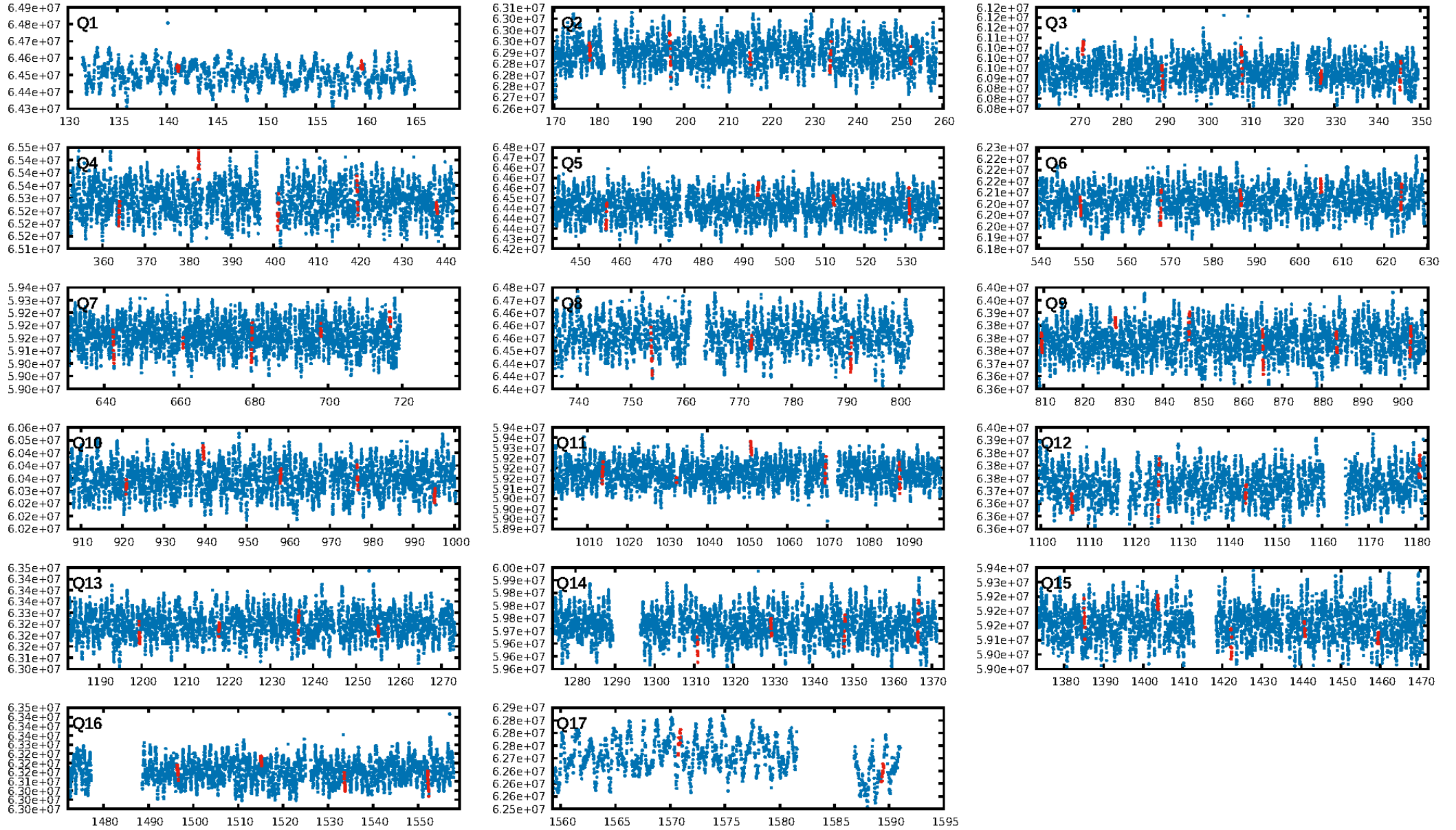
## DV Diagnostic Results:

ShortPeriod-sig: 24.5% [0.31 $\sigma$ ]  
LongPeriod-sig: 100.0% [116.73 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.1%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [16/16]  
GhostDiagnostic-chr: -0.7333  
Centroid-sig: 38.2%  
Centroid-so: 0.219 arcsec [0.48 $\sigma$ ]  
OotOffset-rm: 0.182 arcsec [0.36 $\sigma$ ]  
KicOffset-rm: 0.288 arcsec [0.77 $\sigma$ ]  
OotOffset-st: 2/4/4/5 [15]  
KicOffset-st: 2/4/4/5 [15]  
DiffImageQuality-fgm: 0.33 [5/15]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:14:23 Z

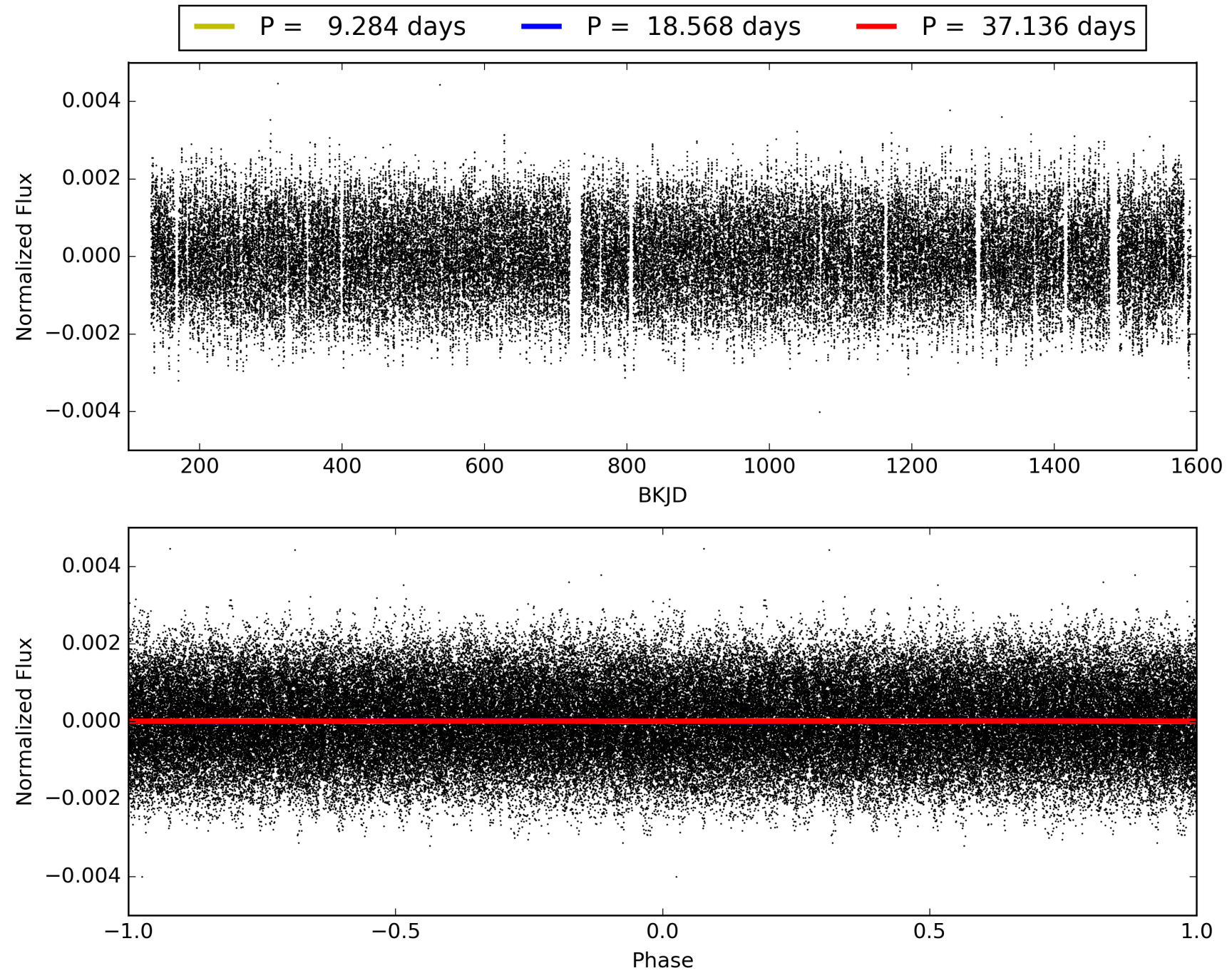
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009552411-03, PDC Light Curves



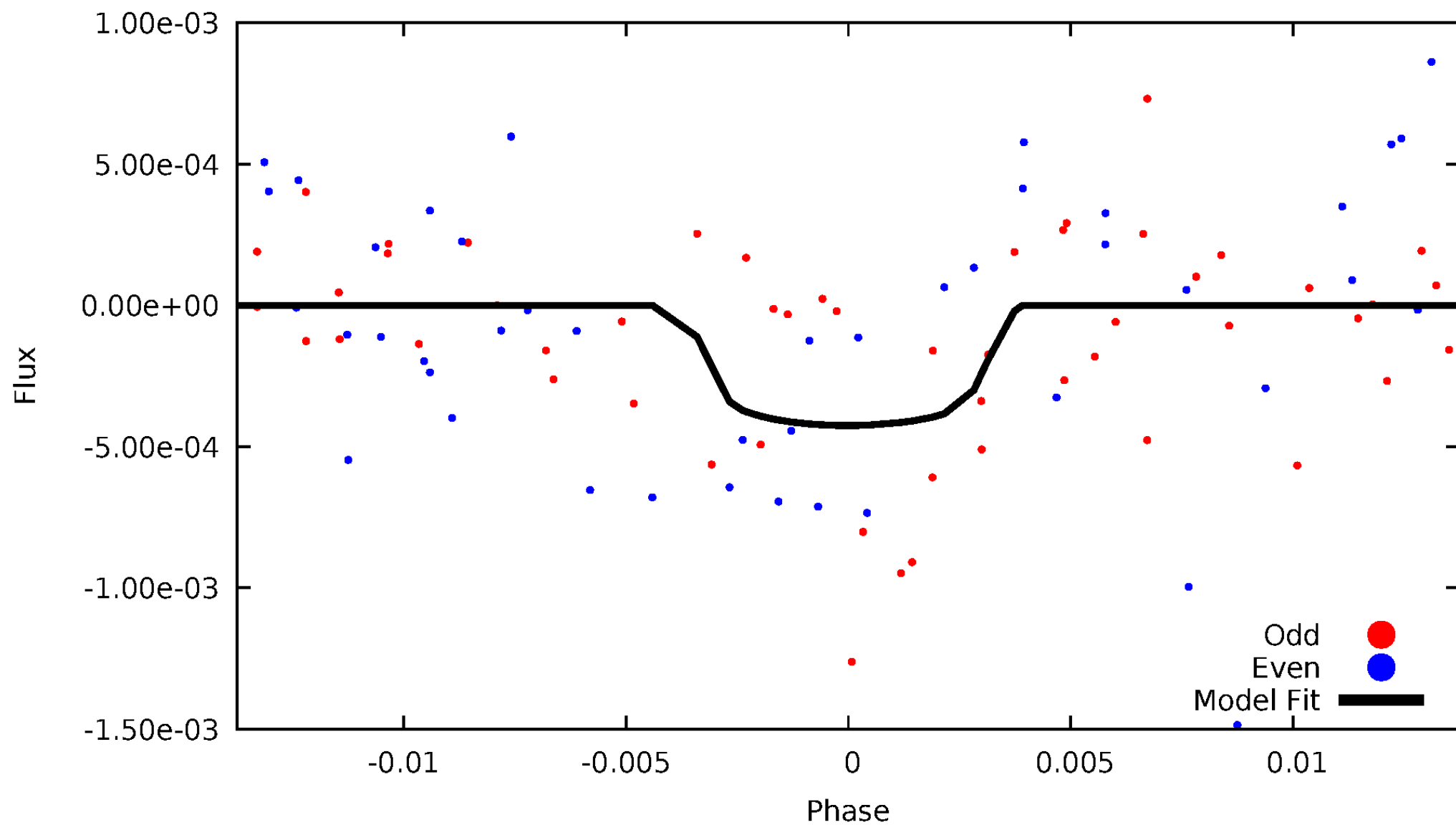


TCE 009552411-03



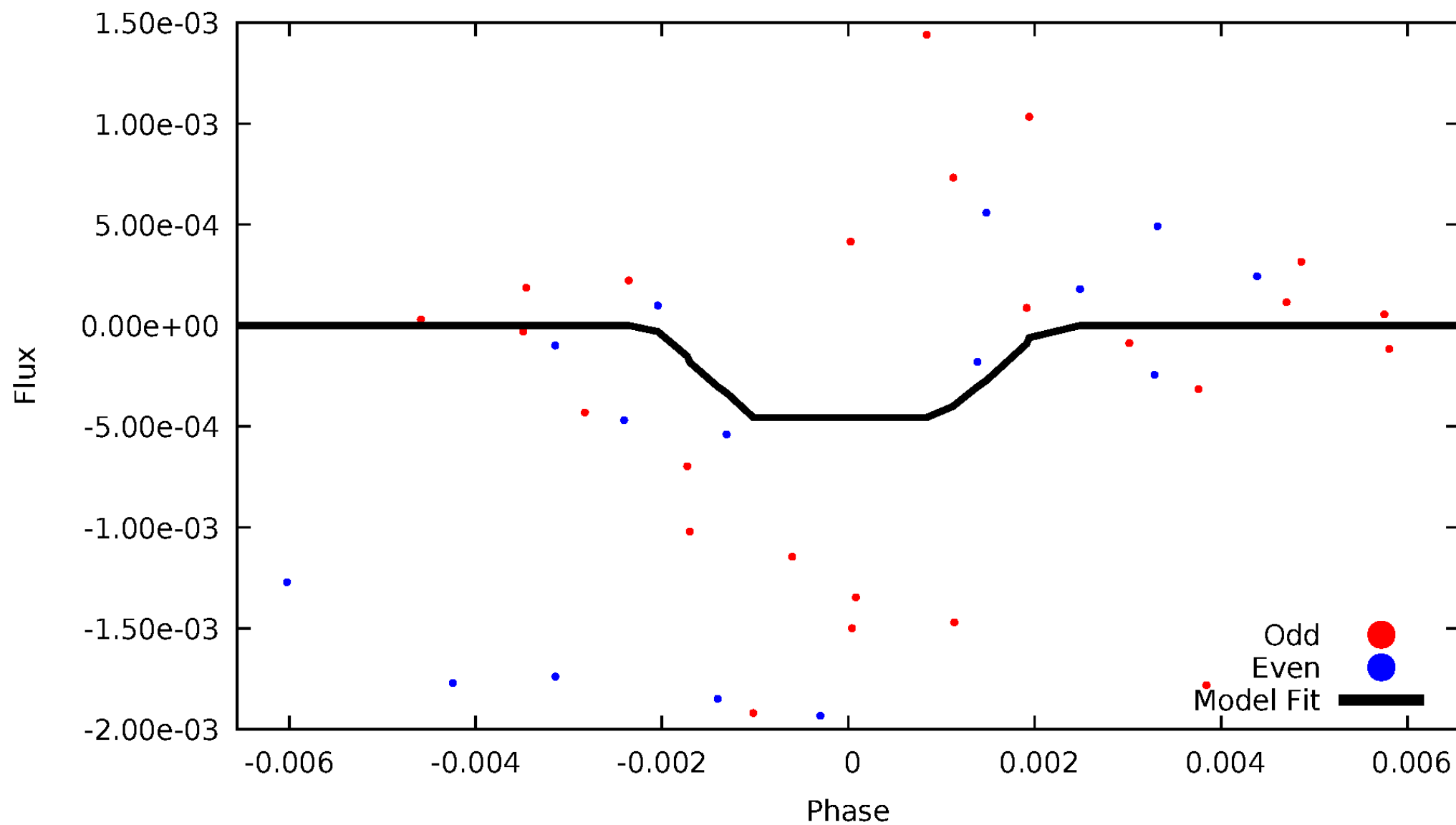
# DV Odd/Even

TCE 009552411-03



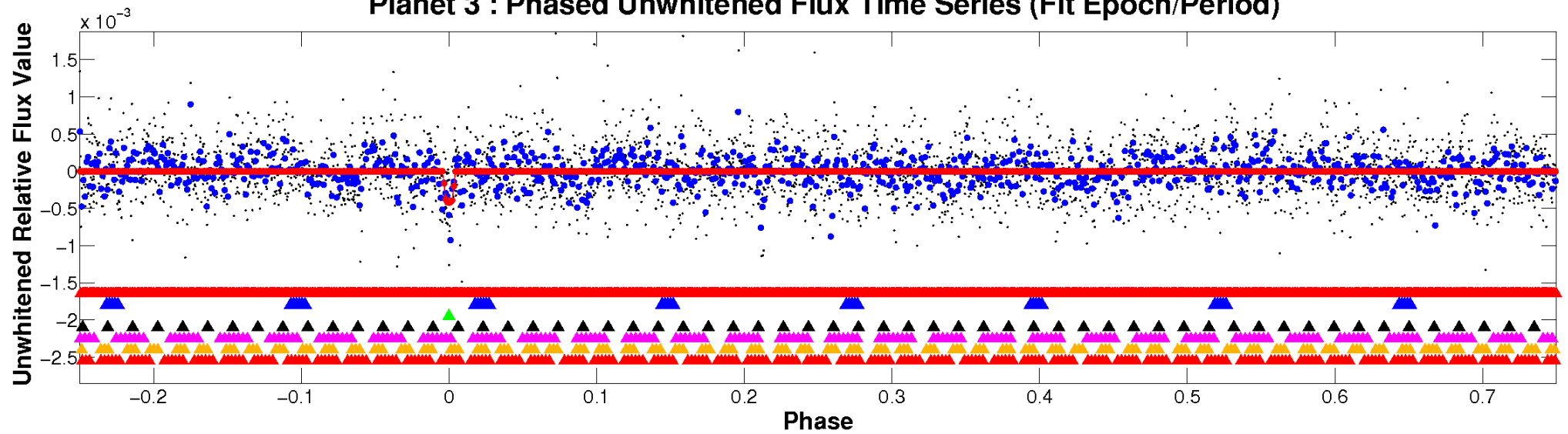
# ALT Odd/Even

TCE 009552411-03

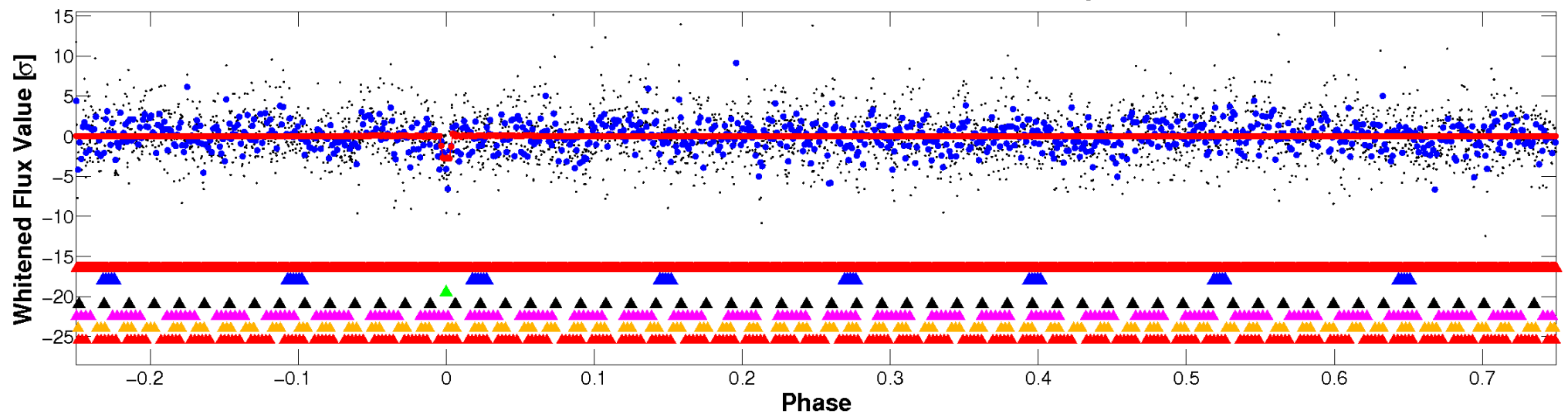


# Non-Whitened Vs. Whitened Light Curve

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

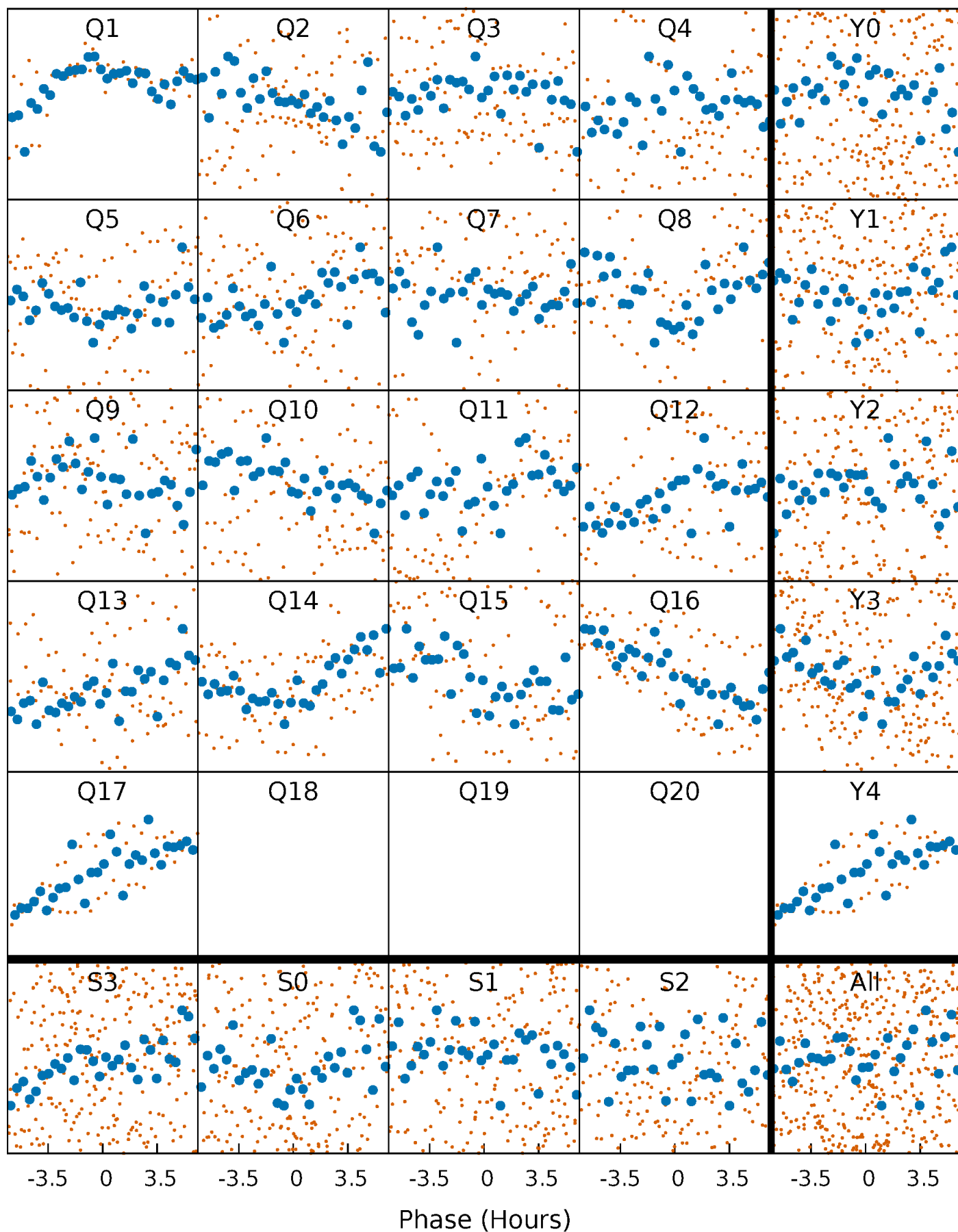


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



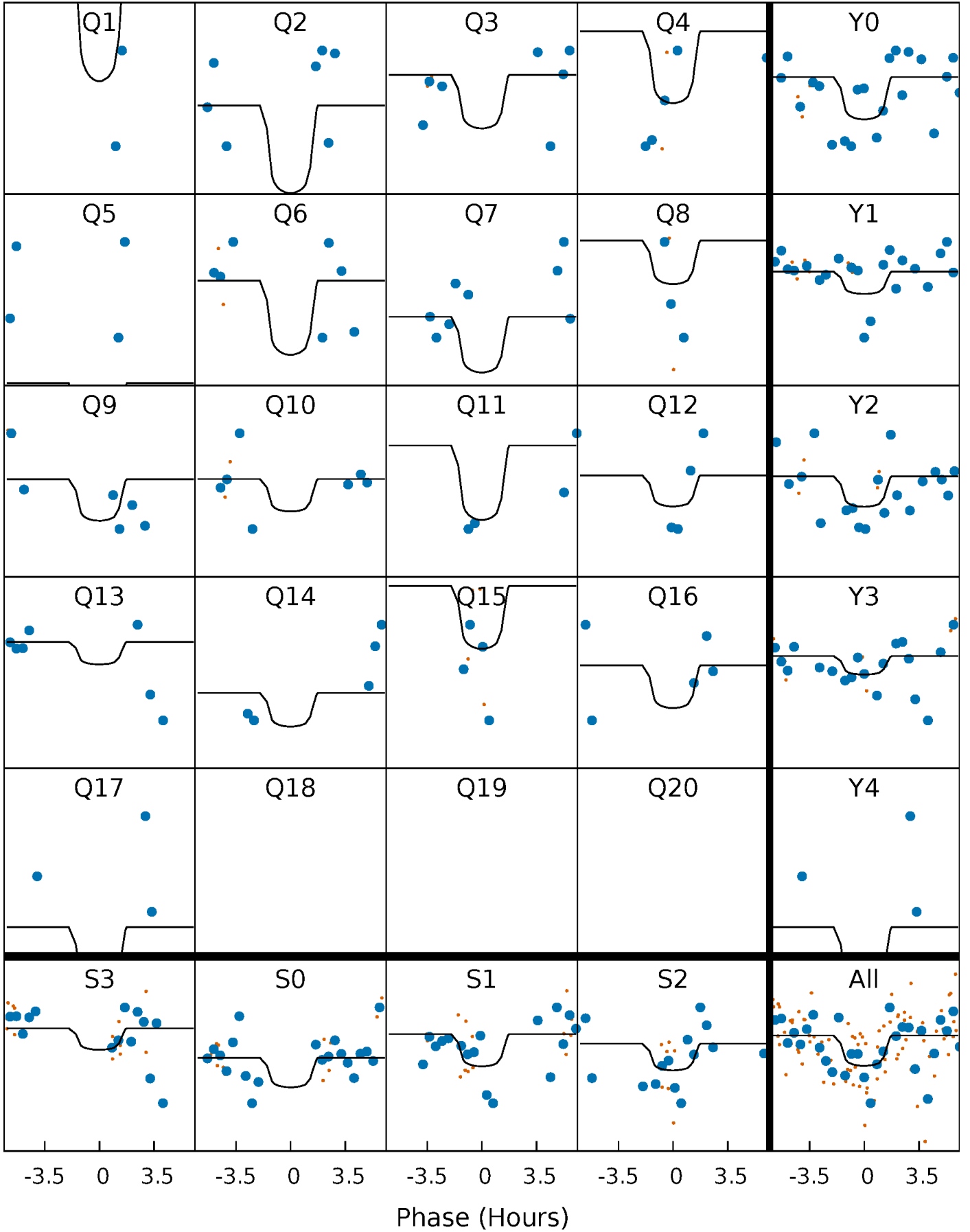
# PDC Quarter-Phased Transit Curves

TCE 009552411-03 P= 18.567813 Days  $T_0=141.108223$  (BKJD)



# DV Quarter-Phased Transit Curves

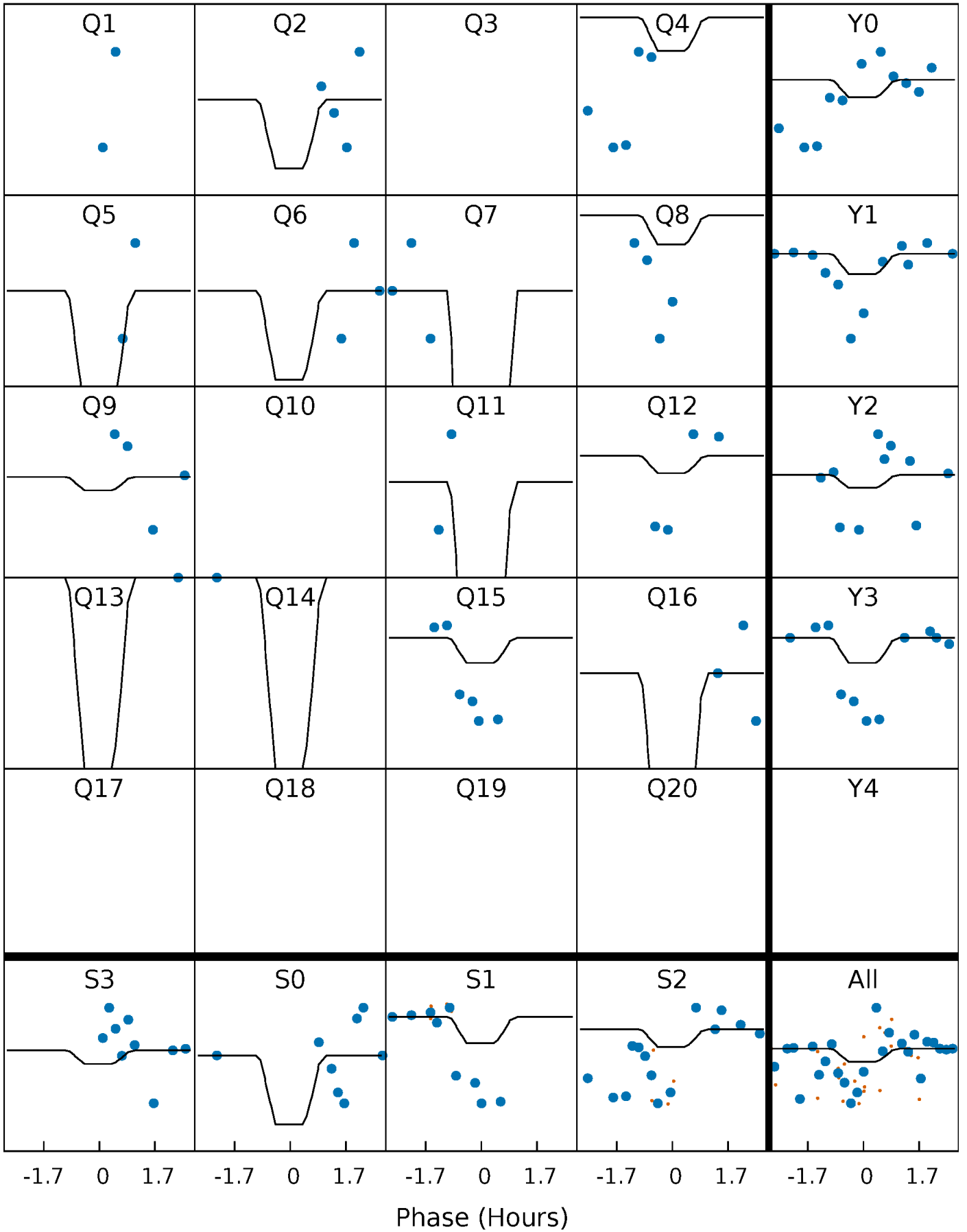
TCE 009552411-03 P= 18.567813 Days  $T_0=141.108223$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

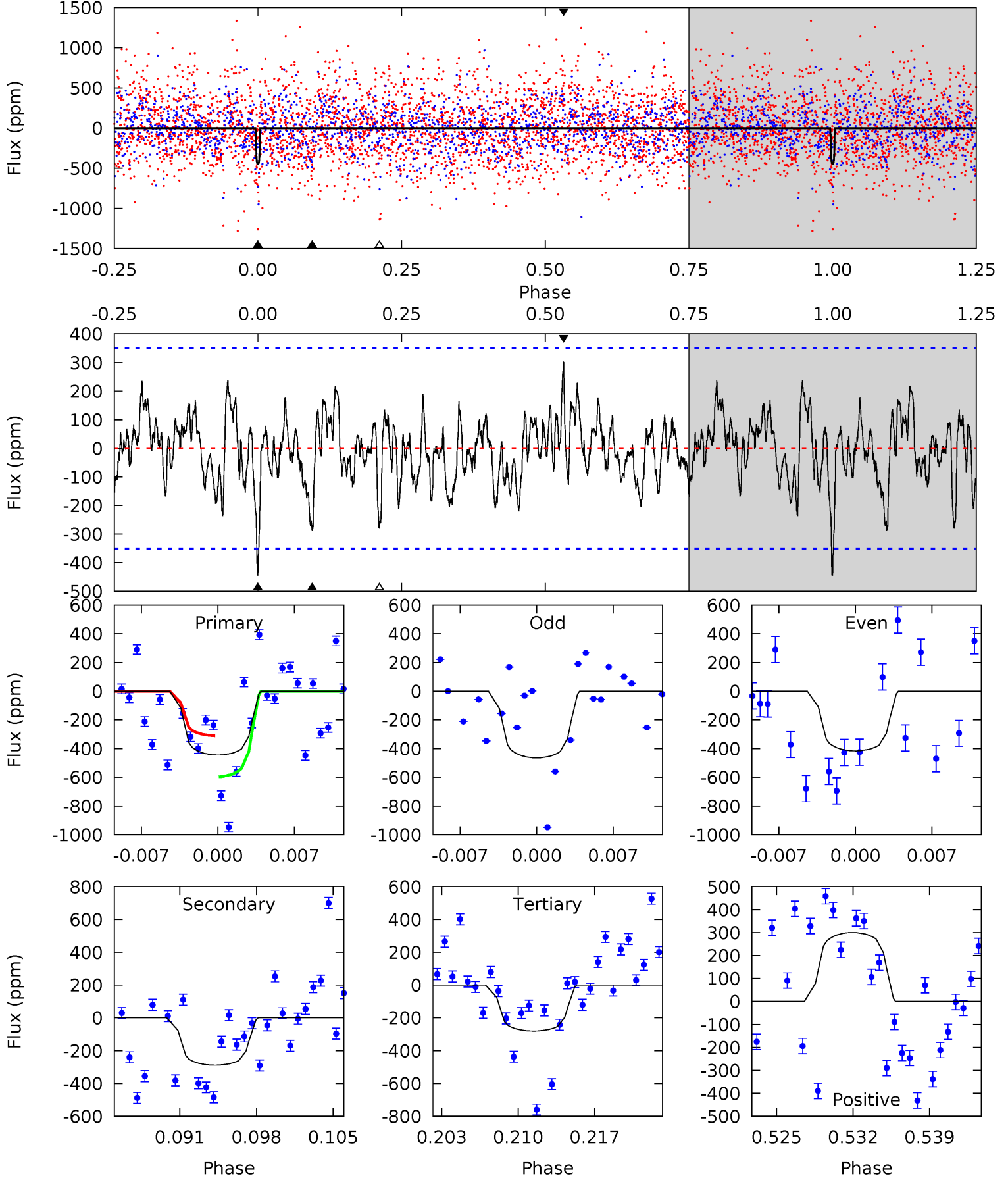
TCE 009552411-03   P= 18.567397 Days    $T_0=141.143263$  (BKJD)



# DV Model-Shift Uniqueness Test

009552411-03, P = 18.567813 Days, E = 122.540410 Days

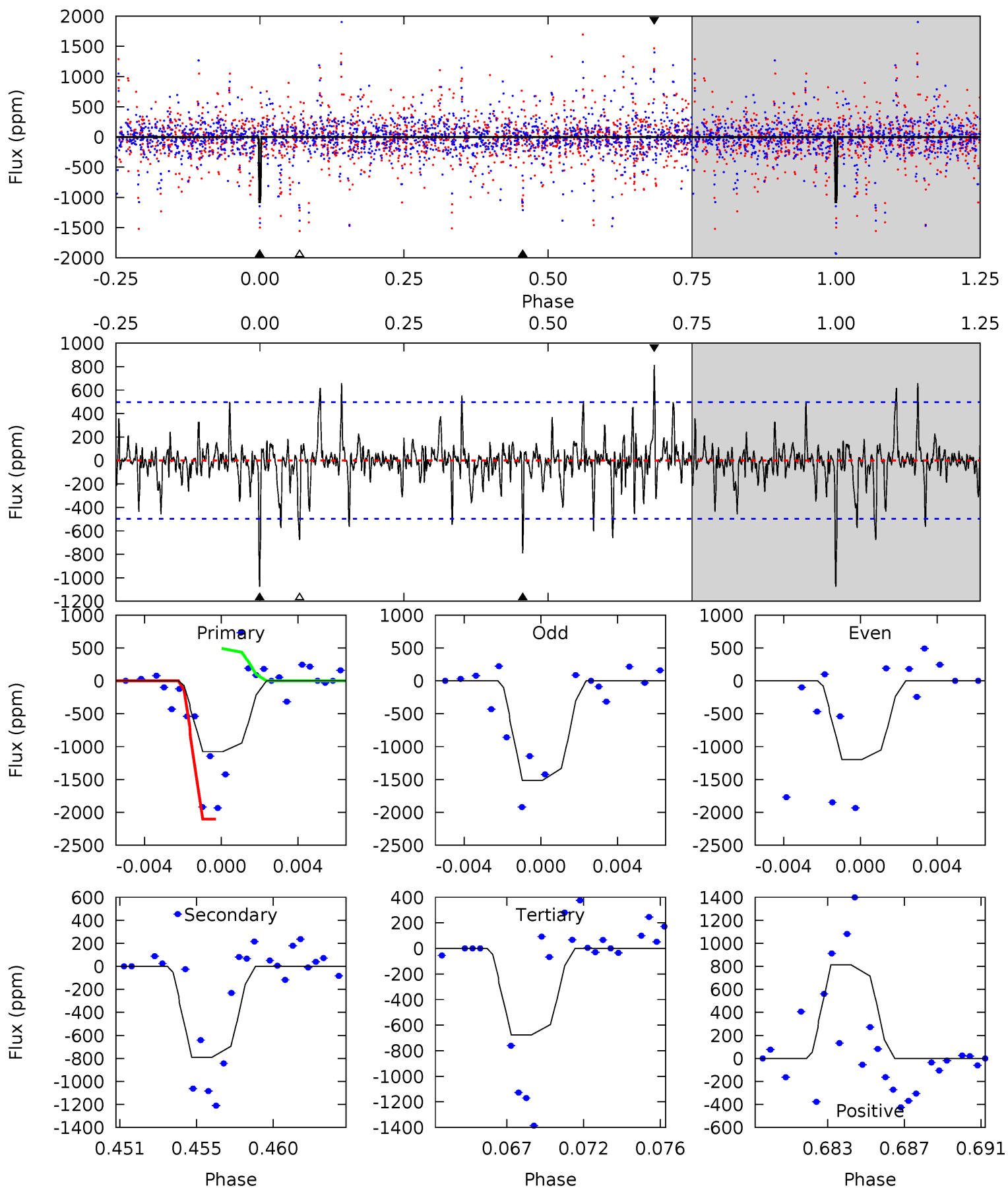
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.47	4.19	4.07	4.36	5.09	2.70	1.37	2.39	2.10	0.12	-0.17	0.34	0.83	0.40	2.09



# Alt Model-Shift Uniqueness Test

009552411-03, P = 18.567397 Days, E = 122.575866 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
11.2	8.26	7.07	8.49	5.19	2.86	1.55	4.17	2.75	1.19	-0.24	1.33	0.52	0.43	7.86



### Stellar Parameters For KIC 009552411

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6844^{+190}_{-286}$	$4.145^{+0.180}_{-0.180}$	$-0.180^{+0.250}_{-0.300}$	$1.629^{+0.494}_{-0.404}$	$1.358^{+0.202}_{-0.247}$	$0.443^{+0.435}_{-0.221}$
	+3%/-4%	+4%/-4%	+139%/-167%	+30%/-25%	+15%/-18%	+98%/-50%
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 009552411-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-288 \pm 69$	$5.86^{+6.17}_{-4.04}$	$1378^{+106}_{-98}$	$4917^{+4151}_{-1135}$	$107^{+974}_{-83}$
Alt.	$-791 \pm 96$	$5.93^{+5.64}_{-4.09}$	$1383^{+105}_{-99}$	$6237^{+7158}_{-1640}$	$288^{+2617}_{-214}$

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

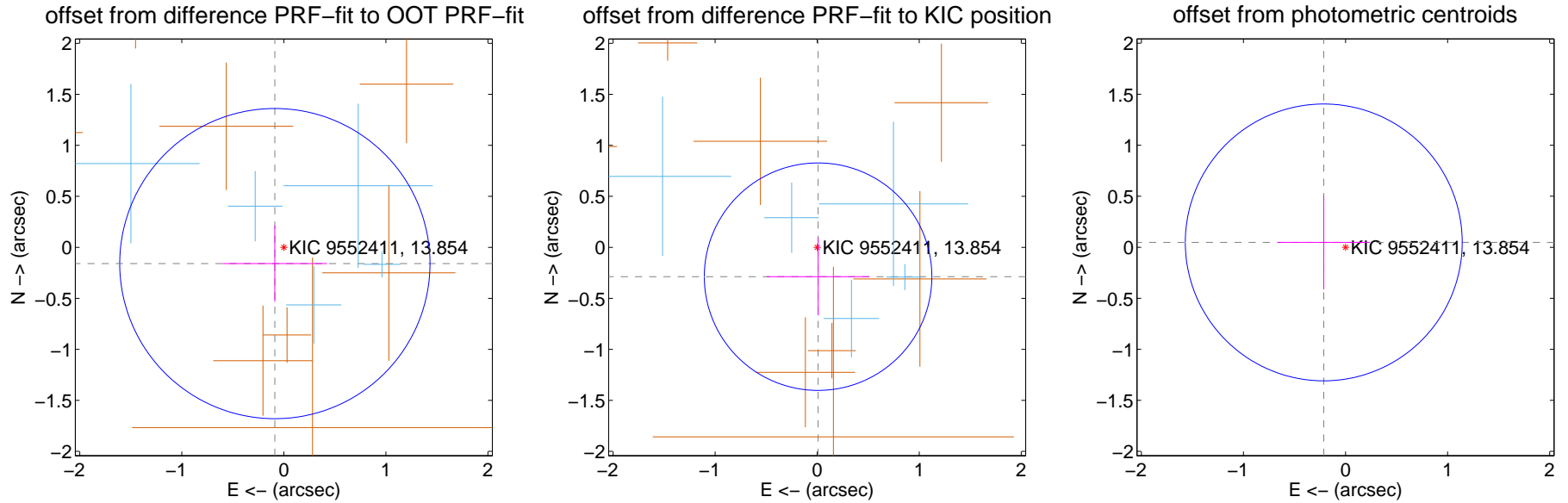
## DV Centroid Data

Supplemental centroid analysis for 009552411-03. Kepler magnitude: 13.85. Transit SNR 12.82

There are 5 quarters with good PRF difference image offsets

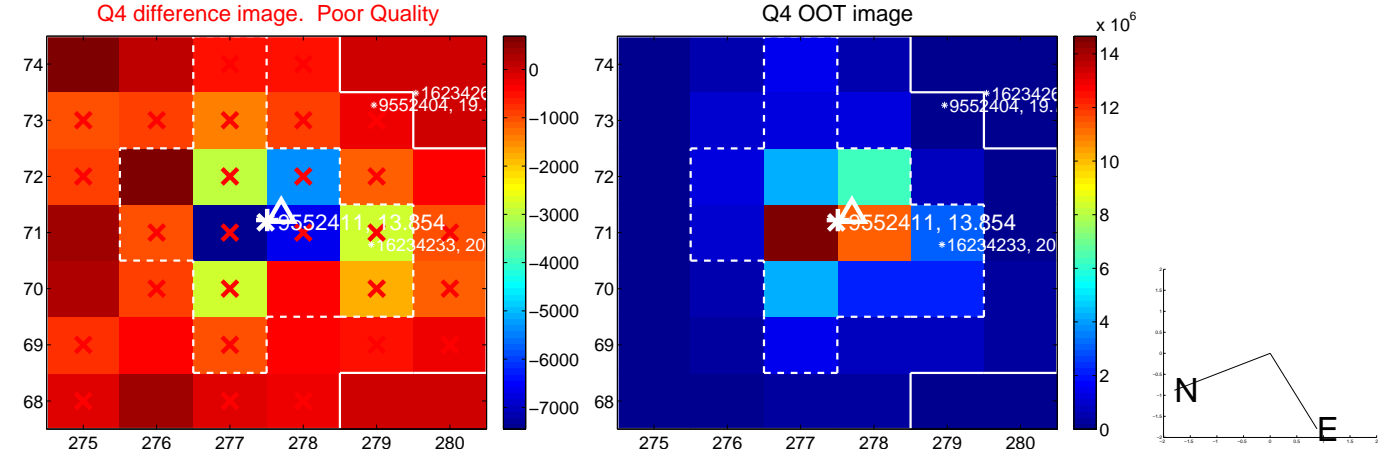
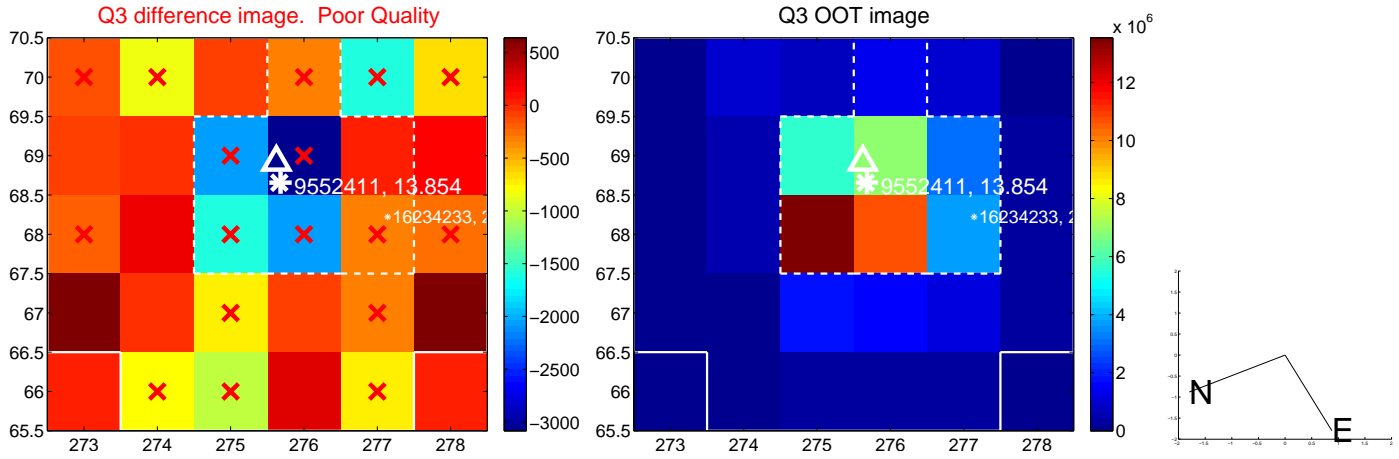
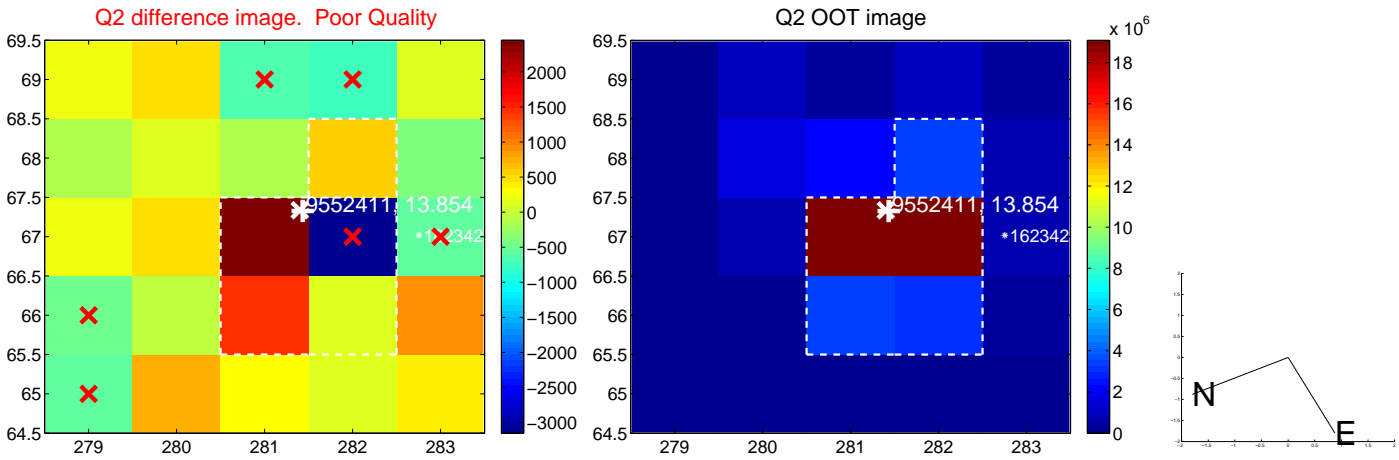
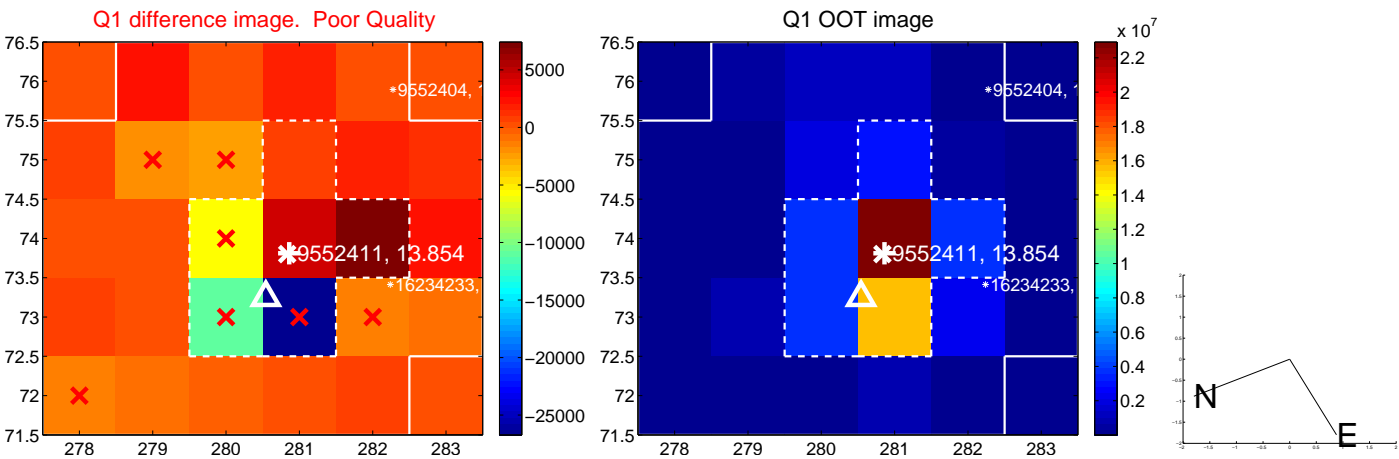
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.182 \pm 0.507$	0.36	$0.088 \pm 0.512$	$-0.159 \pm 0.374$
PRF-fit source offset from KIC position	$0.288 \pm 0.372$	0.77	$-0.009 \pm 0.504$	$-0.288 \pm 0.379$
photometric centroid source offset	$0.22 \pm 0.45$	0.48	$0.21 \pm 0.45$	$0.05 \pm 0.46$



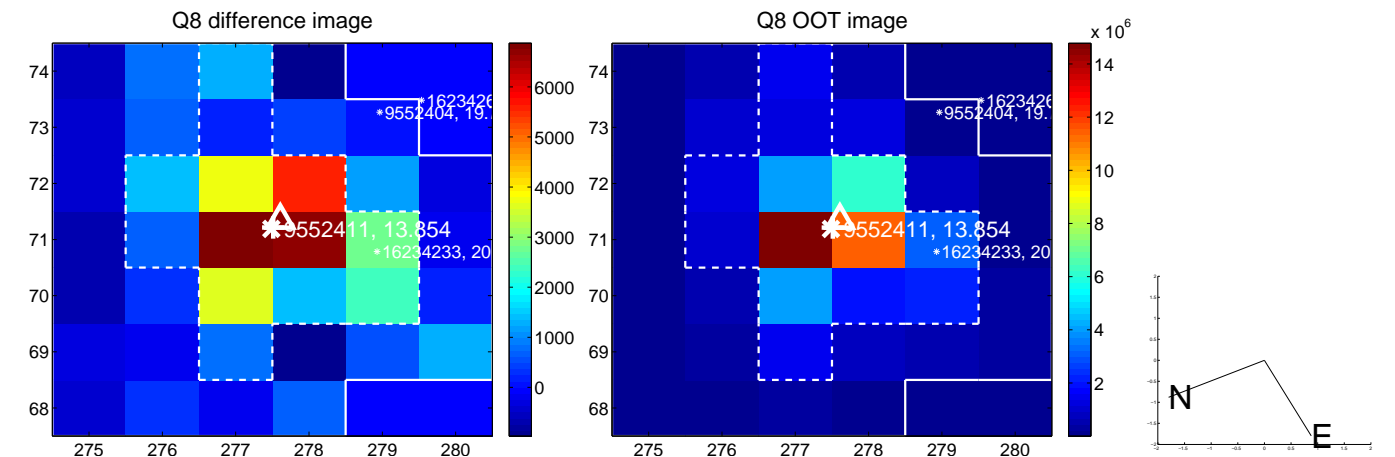
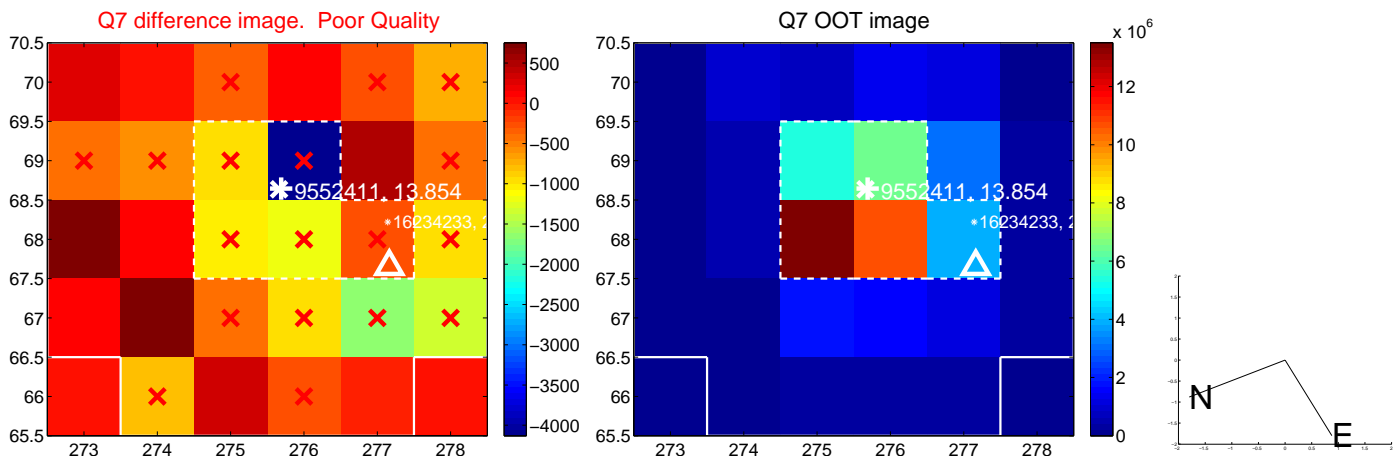
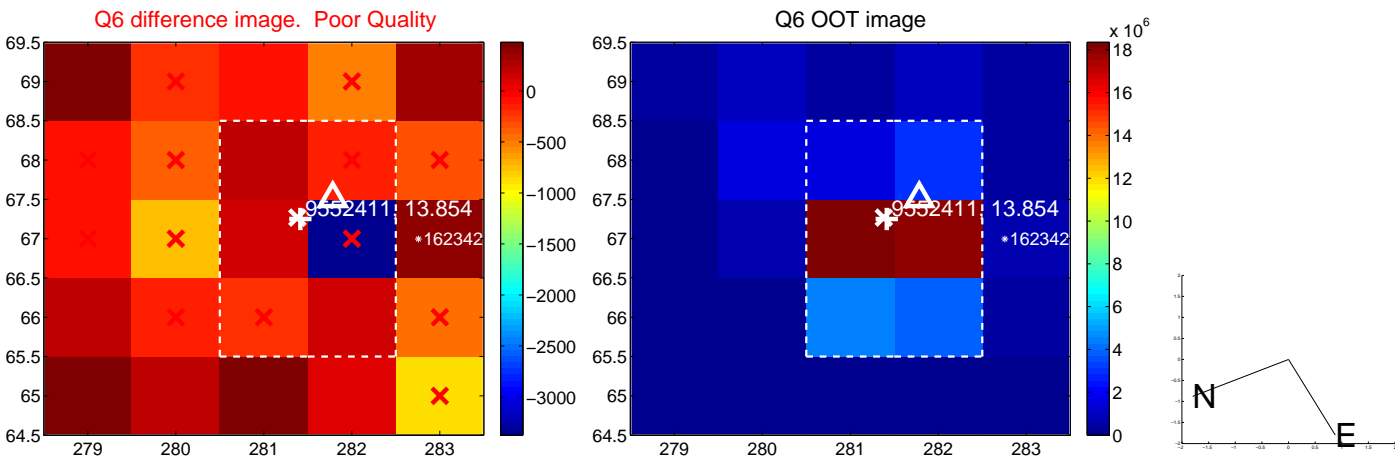
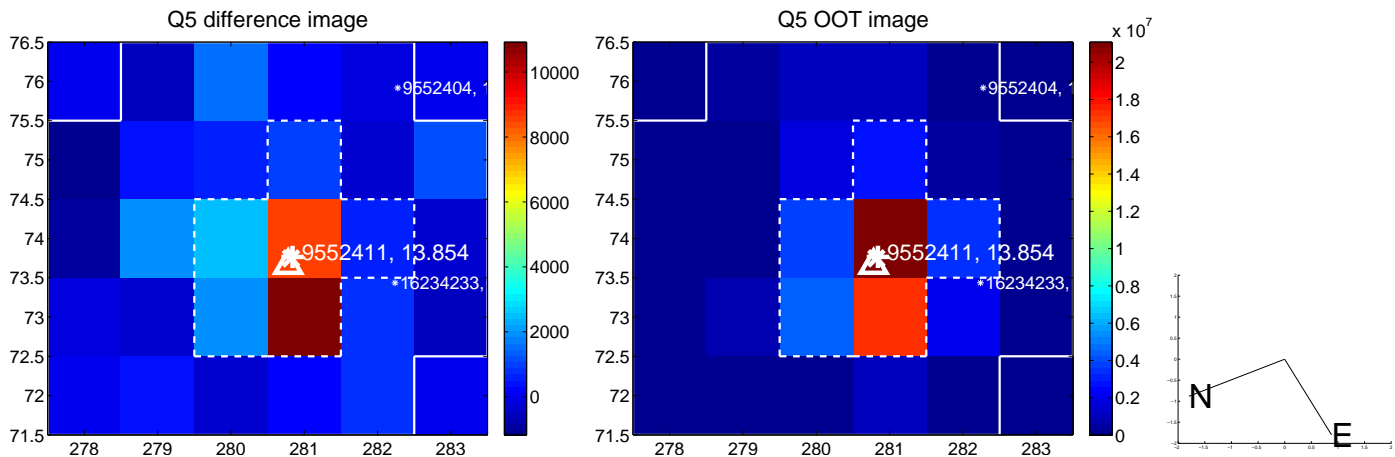
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

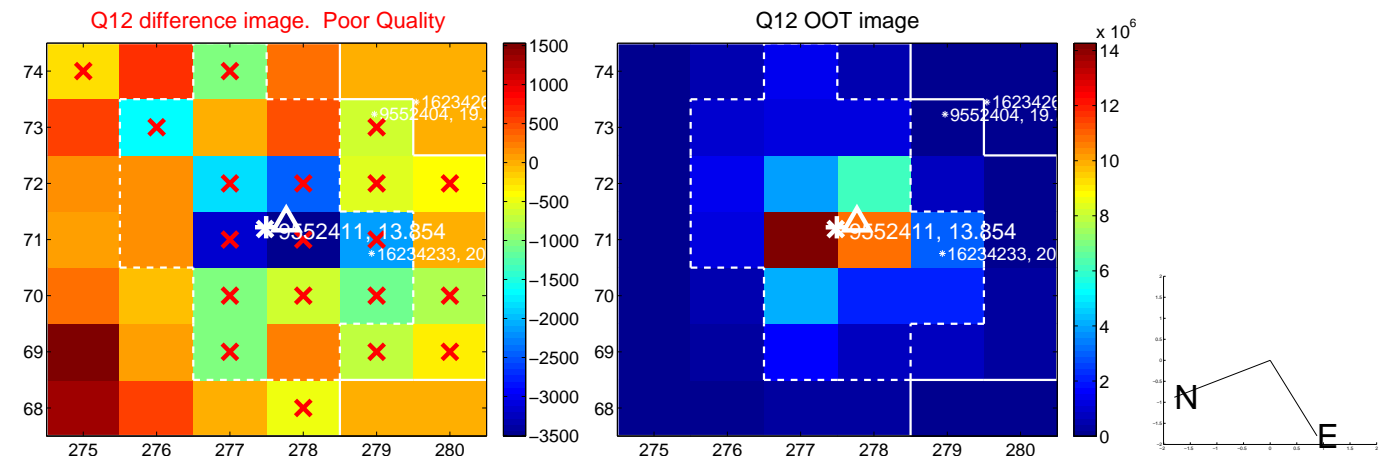
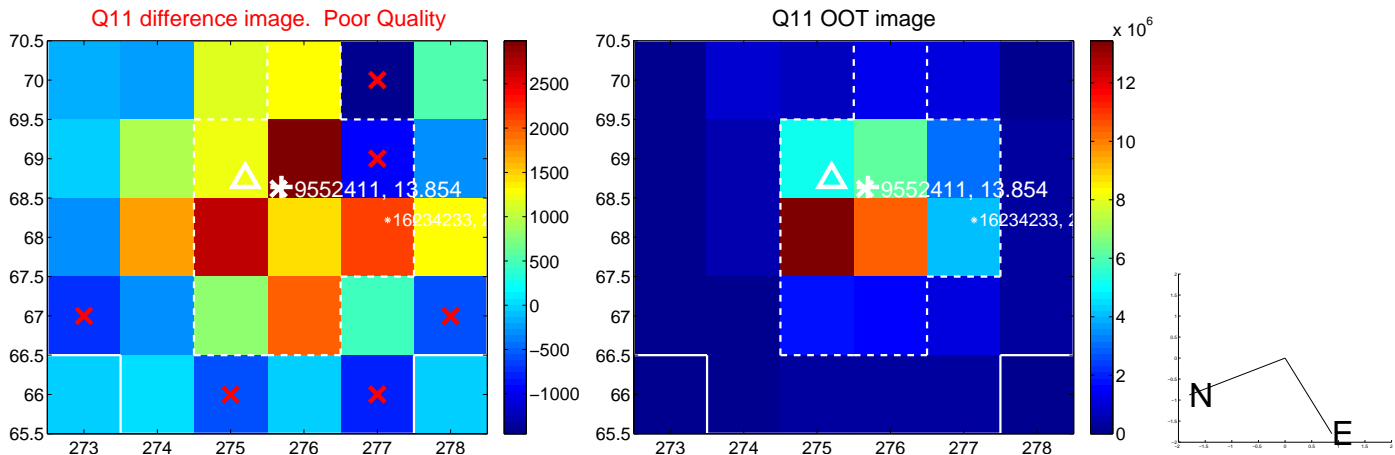
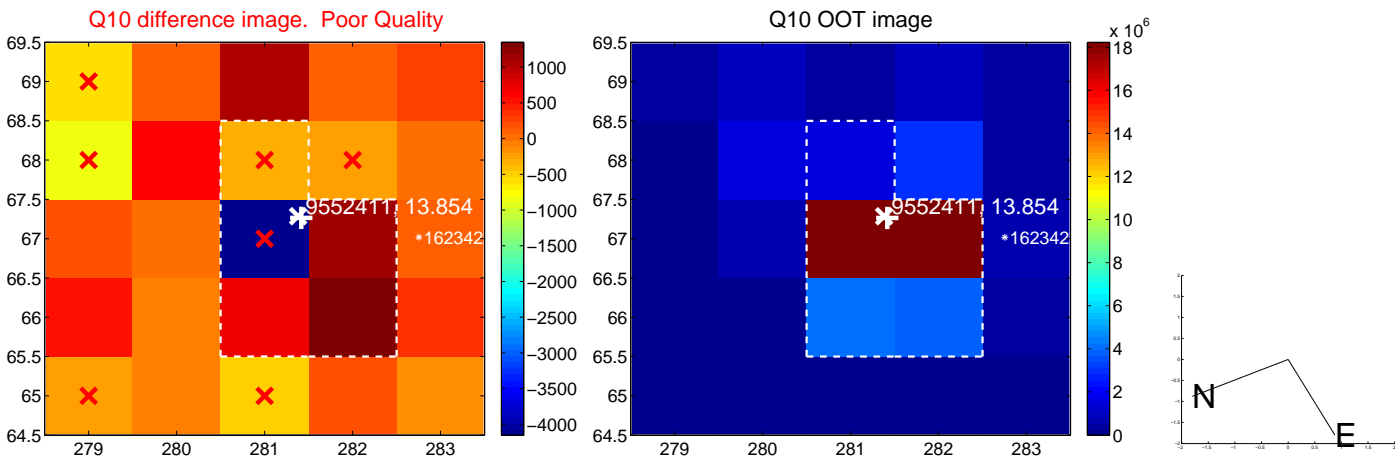
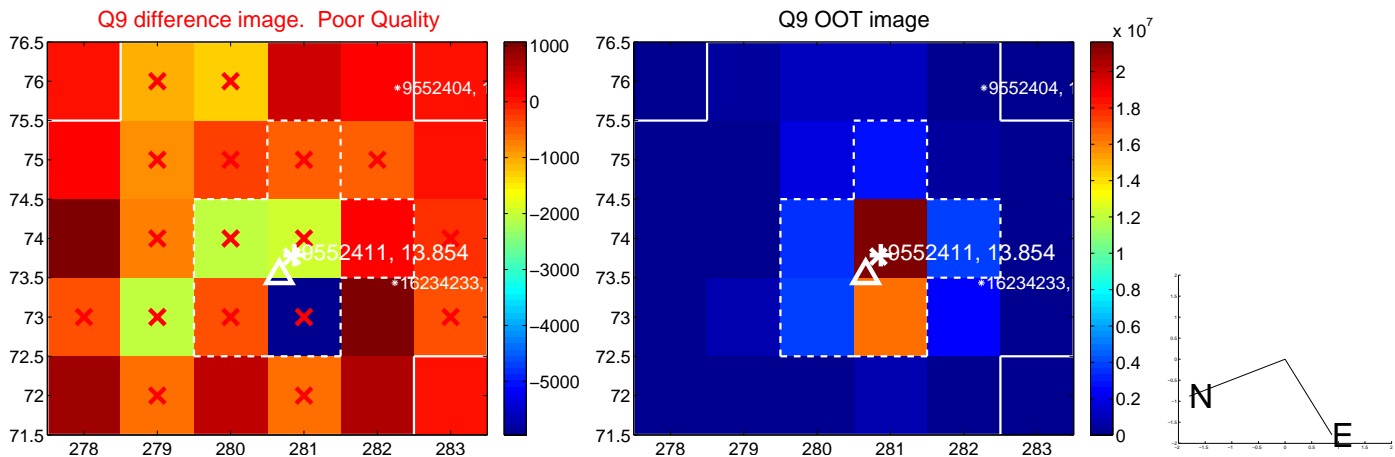




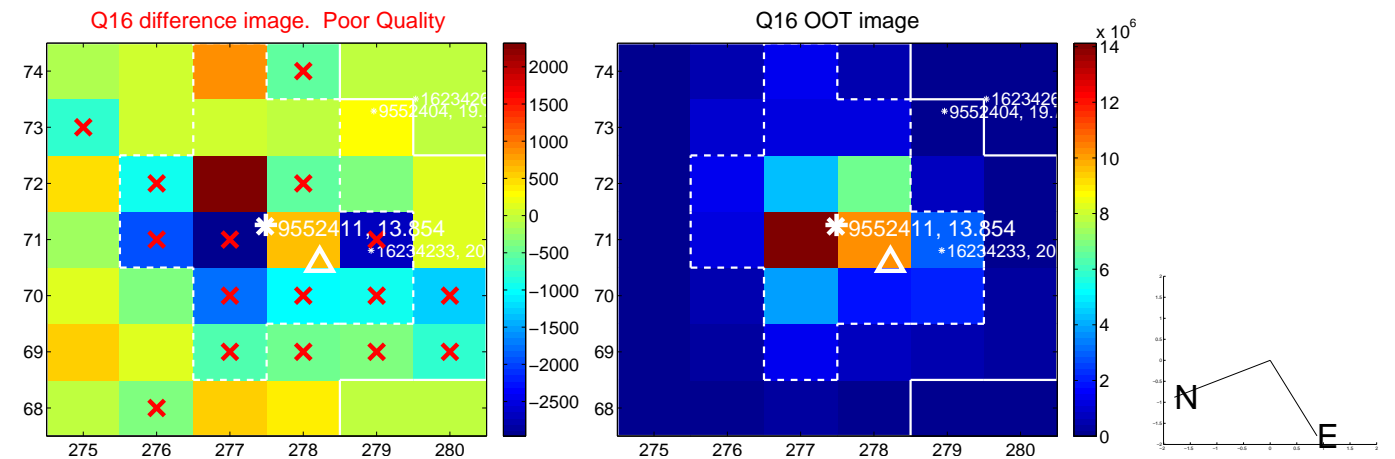
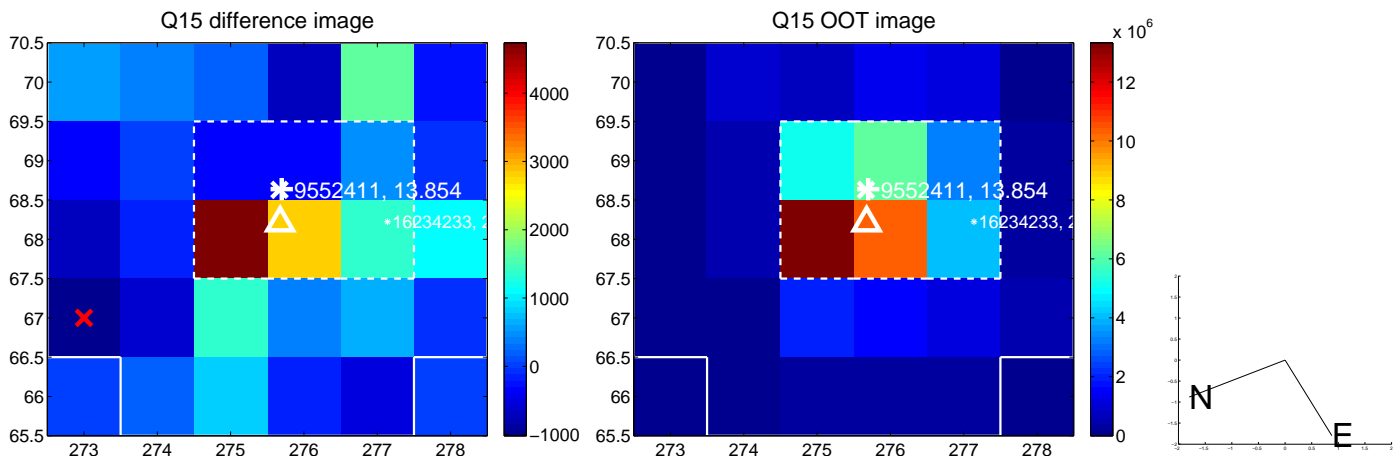
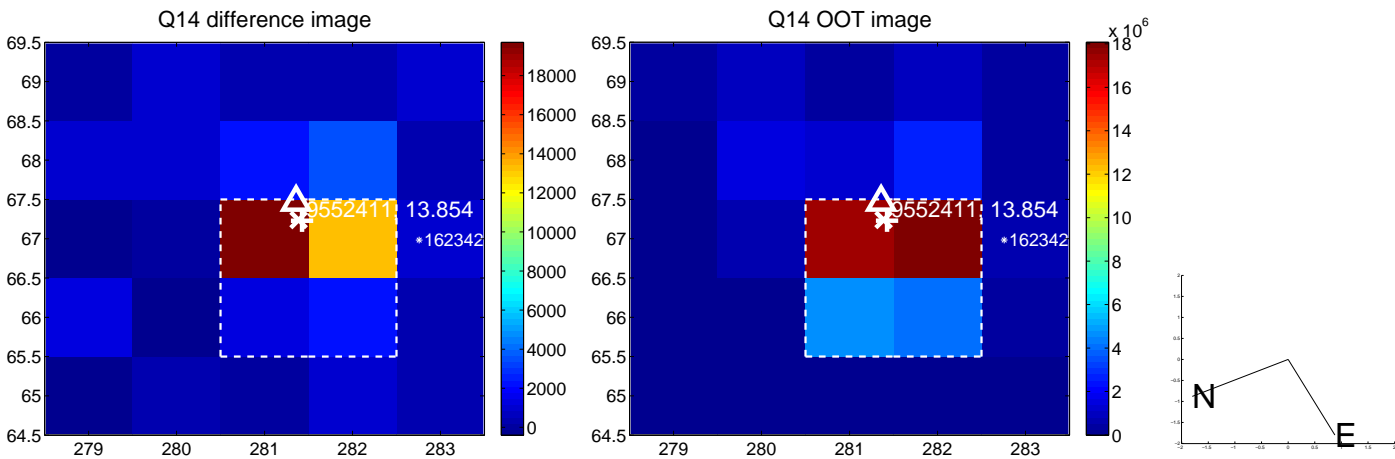
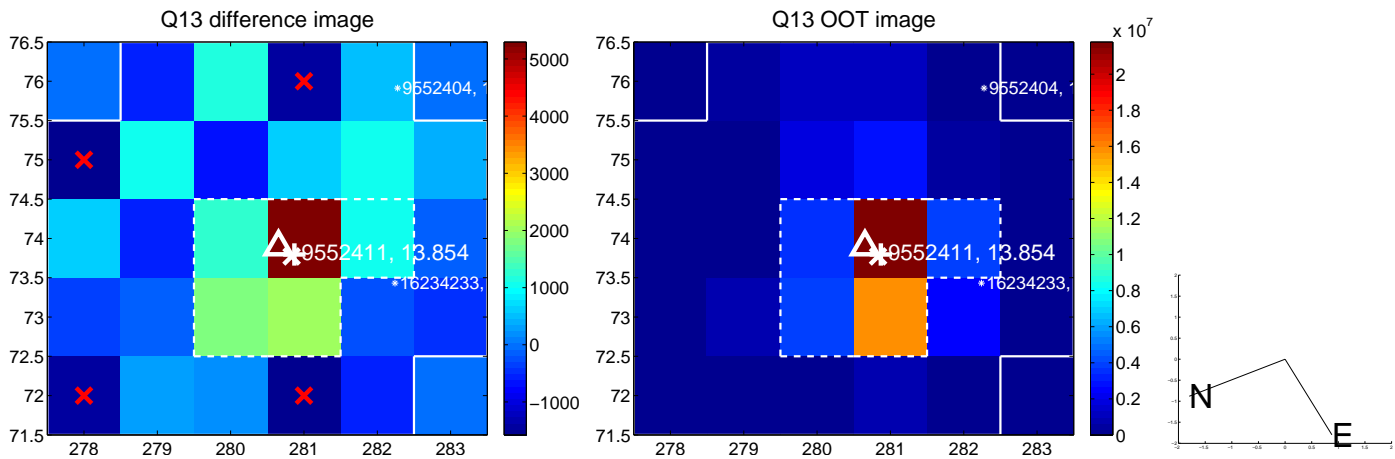
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



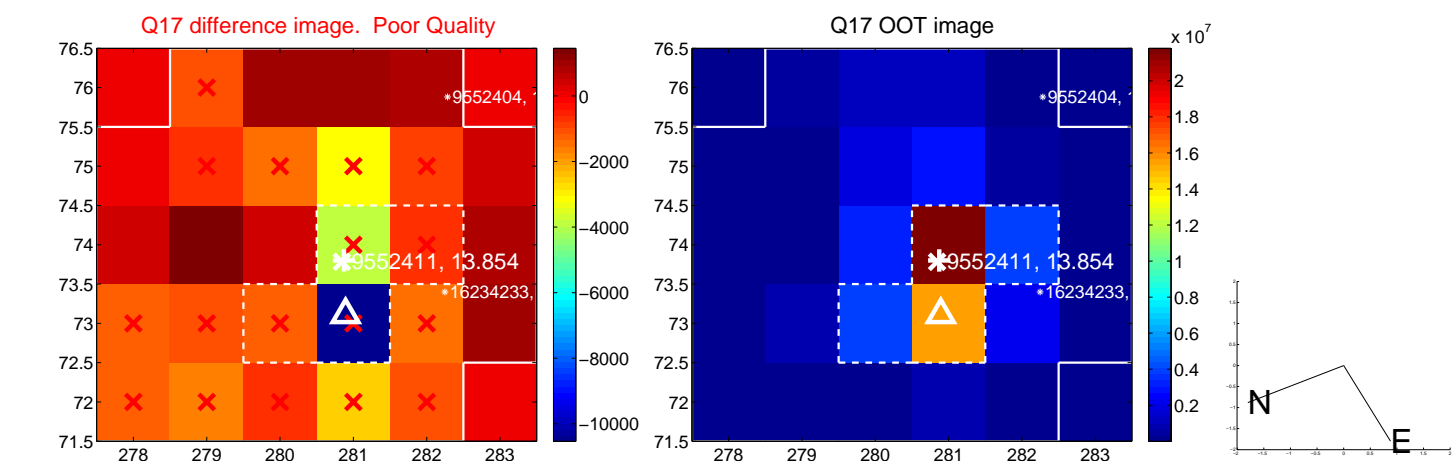
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



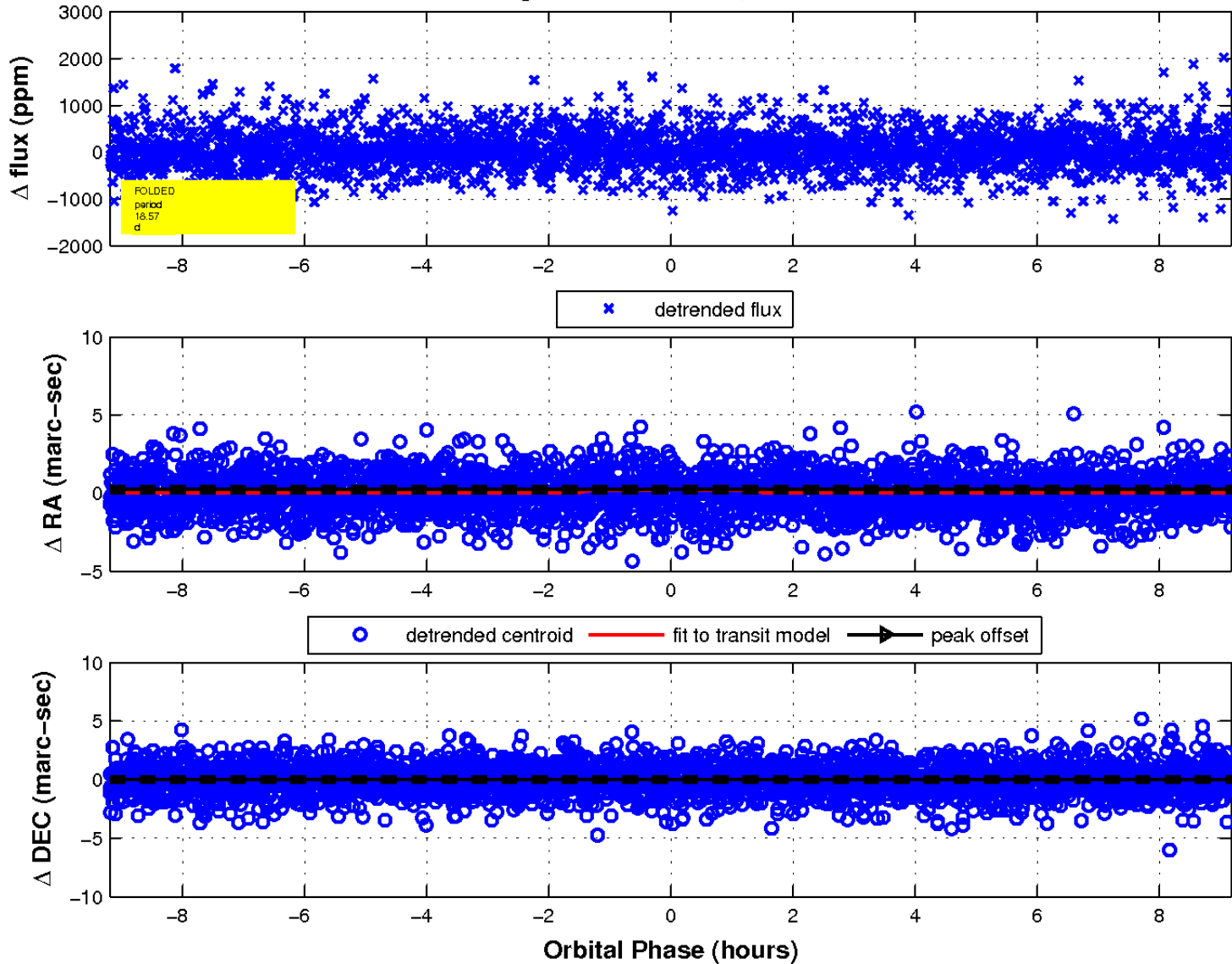
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

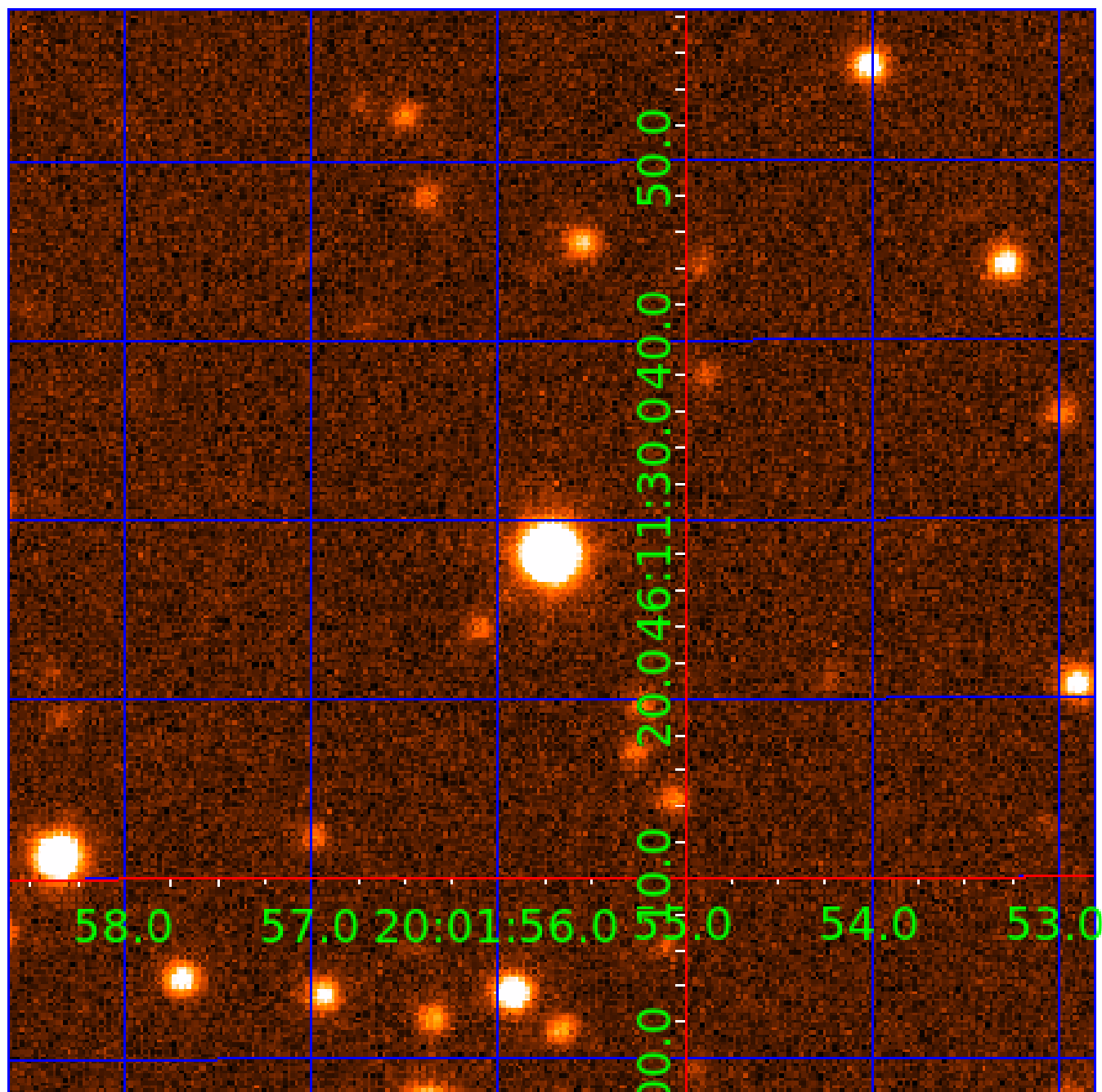


fluxWeightedCentroids, Planet 3 of 7



UKIRT Image

Declination



# KIC 009552411

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009552411-01	OBS	No	0.652146	132.002493	11.0	4.784	10.5	2.9	1.63	6844	0.58	19691.95
009552411-02	OBS	No	34.819086	141.437002	1071.8	1.336	19.7	20.6	1.63	6844	5.41	97.95
009552411-03	OBS	No	18.567813	141.108223	425.1	3.063	17.5	12.8	1.63	6844	3.69	226.50
009552411-04	OBS	No	17.623722	147.830769	84.8	72.531	14.7	6.3	1.63	6844	1.59	242.82
009552411-05	OBS	No	7.040981	132.840594	97.0	1.401	10.7	2.5	1.63	6844	1.70	825.22
009552411-06	OBS	No	8.183251	134.814653	847.1	0.898	10.8	13.2	1.63	6844	5.32	675.33
009552411-07	OBS	No	5.029754	135.557261	1166.5	3.883	14.3	19.7	1.63	6844	9.31	1292.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009552411-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009552411-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009552411-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009552411-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
009552411-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009552411-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
009552411-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

**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.

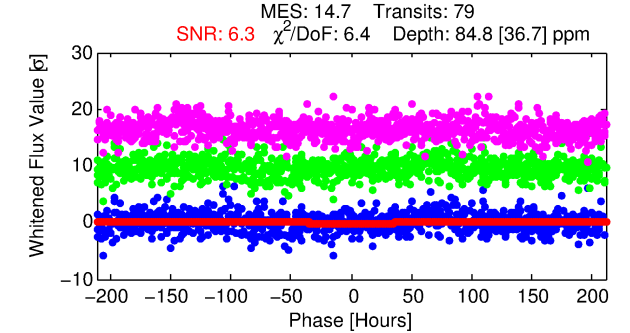
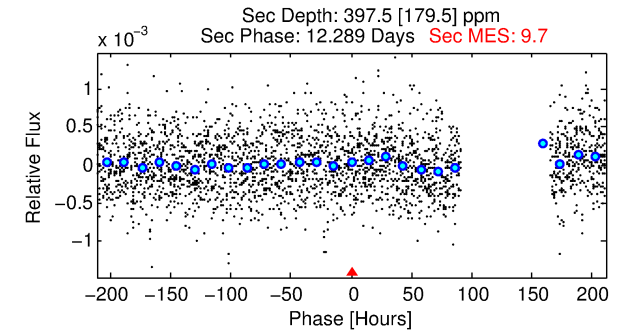
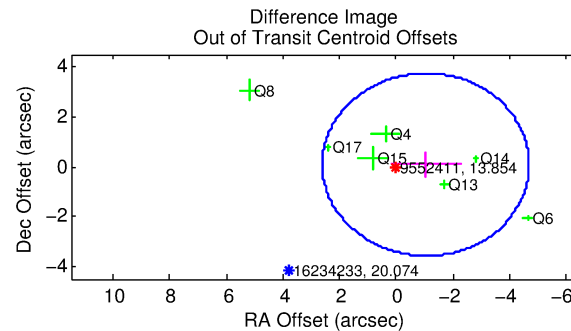
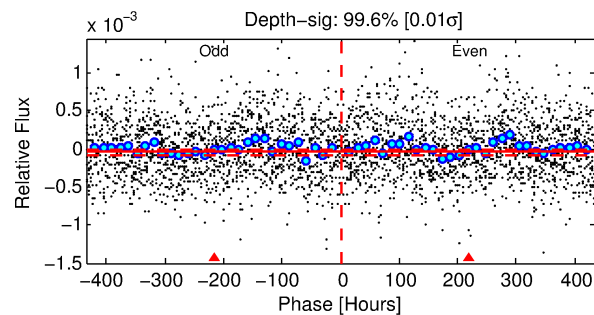
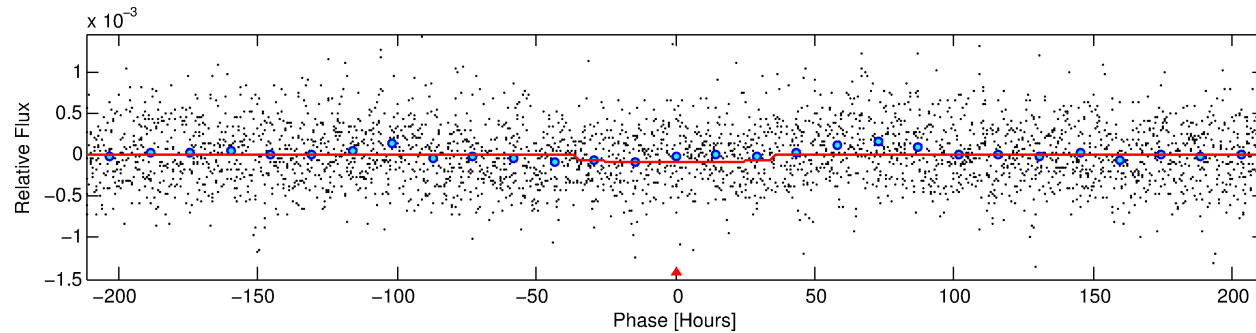
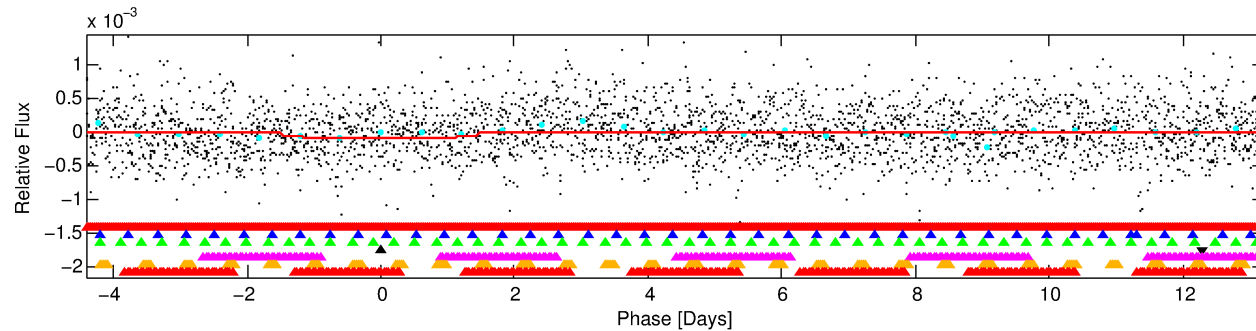
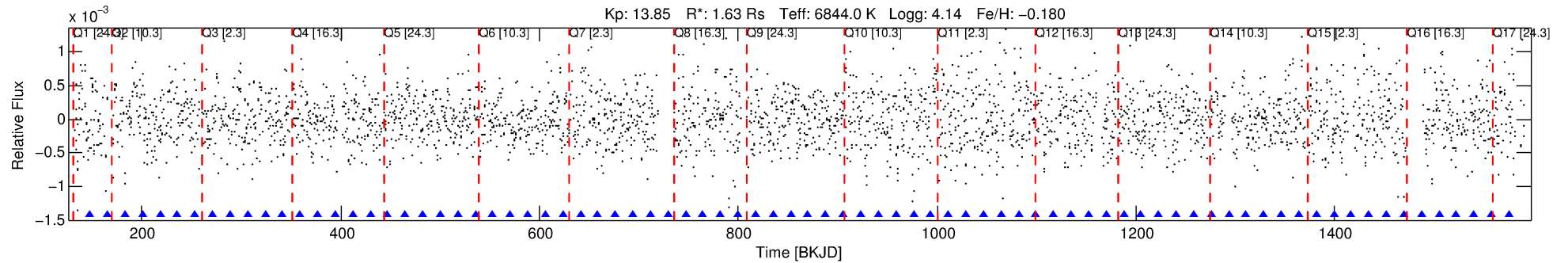
Ephemeris Match Information For 009552411-04

No Significant Match Found



# DV One-Page Summary

KIC: 9552411 Candidate: 4 of 7 Period: 17.624 d



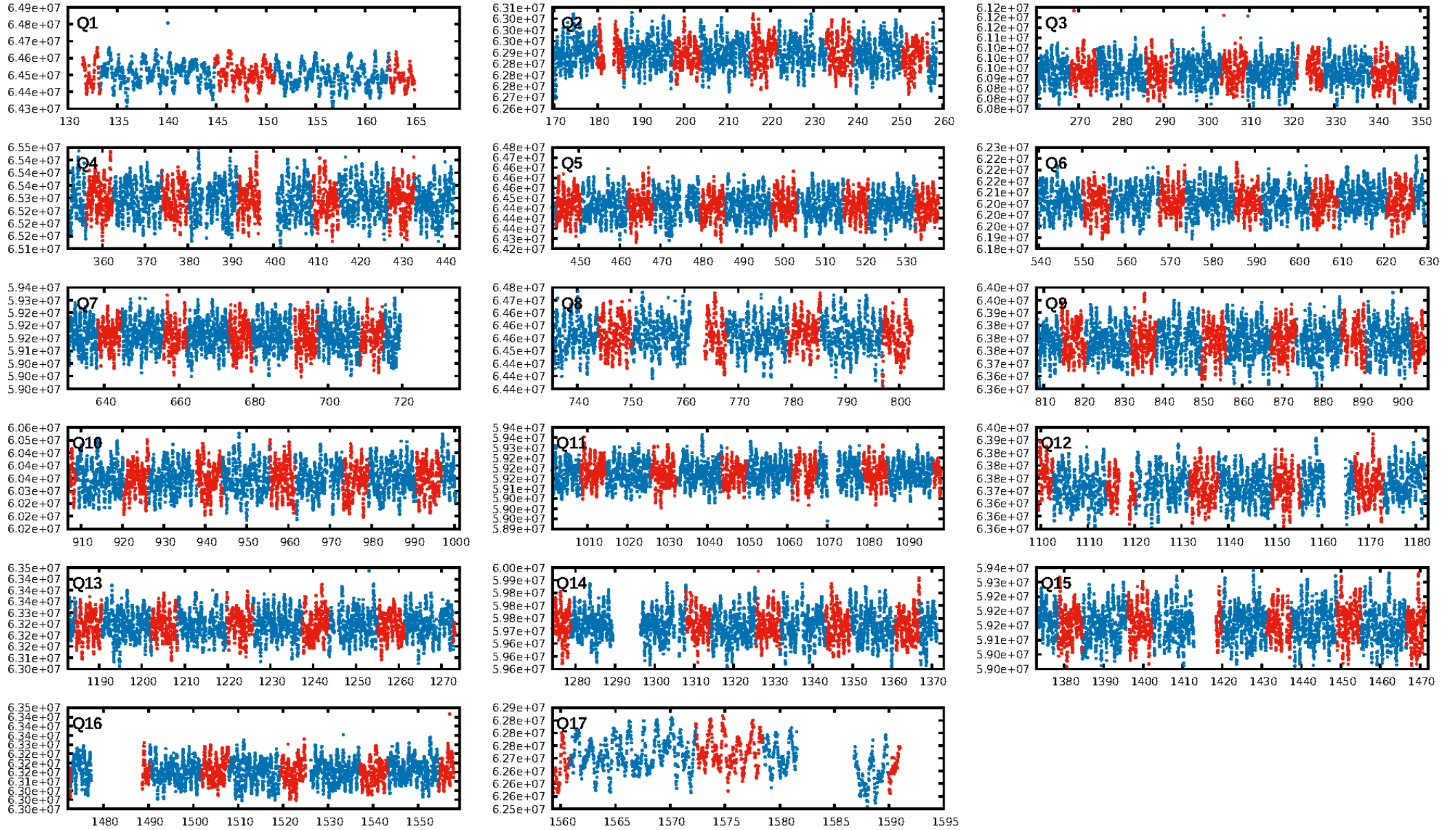
## DV Fit Results:

Period = 17.62372 [0.00382] d  
Epoch = 147.8308 [0.1697] BKJD  
Rp/R\* = 0.0089 [0.0036]  
a/R\* = 1.64 [2.02]  
b = 0.65 [1.77]  
Seff = 242.82 [92.51]  
Teq = 1007 [96] K  
Rp = 1.59 [0.81] Re  
a = 0.1466 [0.0359] AU  
Ag = 1864.73 [1853.77] [1.01σ]  
Teffp = 10227 [2424] K [3.80σ]

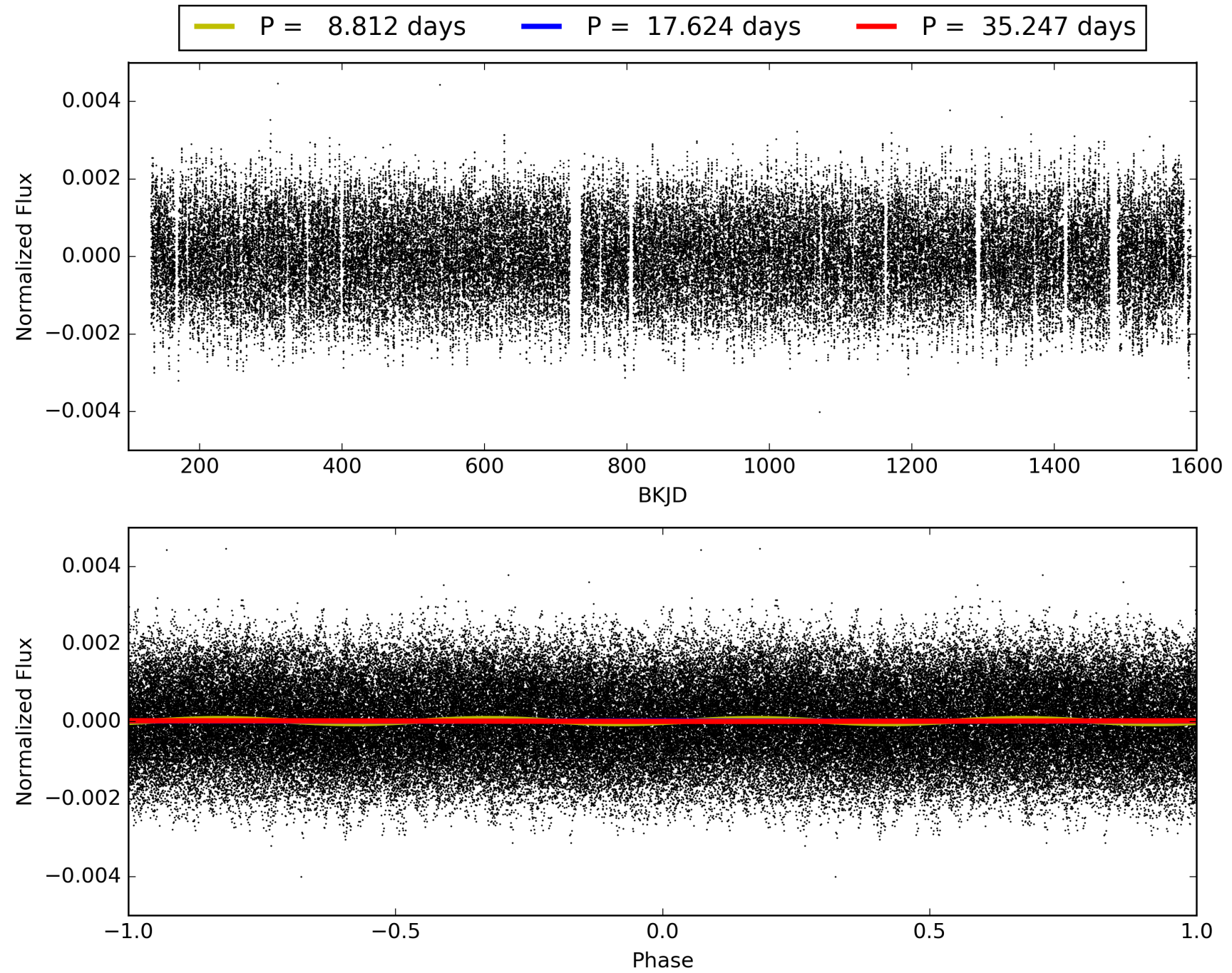
## DV Diagnostic Results:

ShortPeriod-sig: 99.8% [3.12σ]  
LongPeriod-sig: 24.5% [0.31σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [75/75]  
GhostDiagnostic-chr: -16.83  
Centroid-sig: 0.4%  
Centroid-so: 0.814 arcsec [1.36σ]  
OotOffset-rm: 1.051 arcsec [0.86σ]  
KicOffset-rm: 1.024 arcsec [0.85σ]  
OotOffset-st: 2/1/2/2 [7]  
KicOffset-st: 2/1/2/2 [7]  
DiffImageQuality-fgm: 0.29 [2/7]  
DiffImageOverlap-fno: 0.00 [0/16]

# TCE 009552411-04, PDC Light Curves

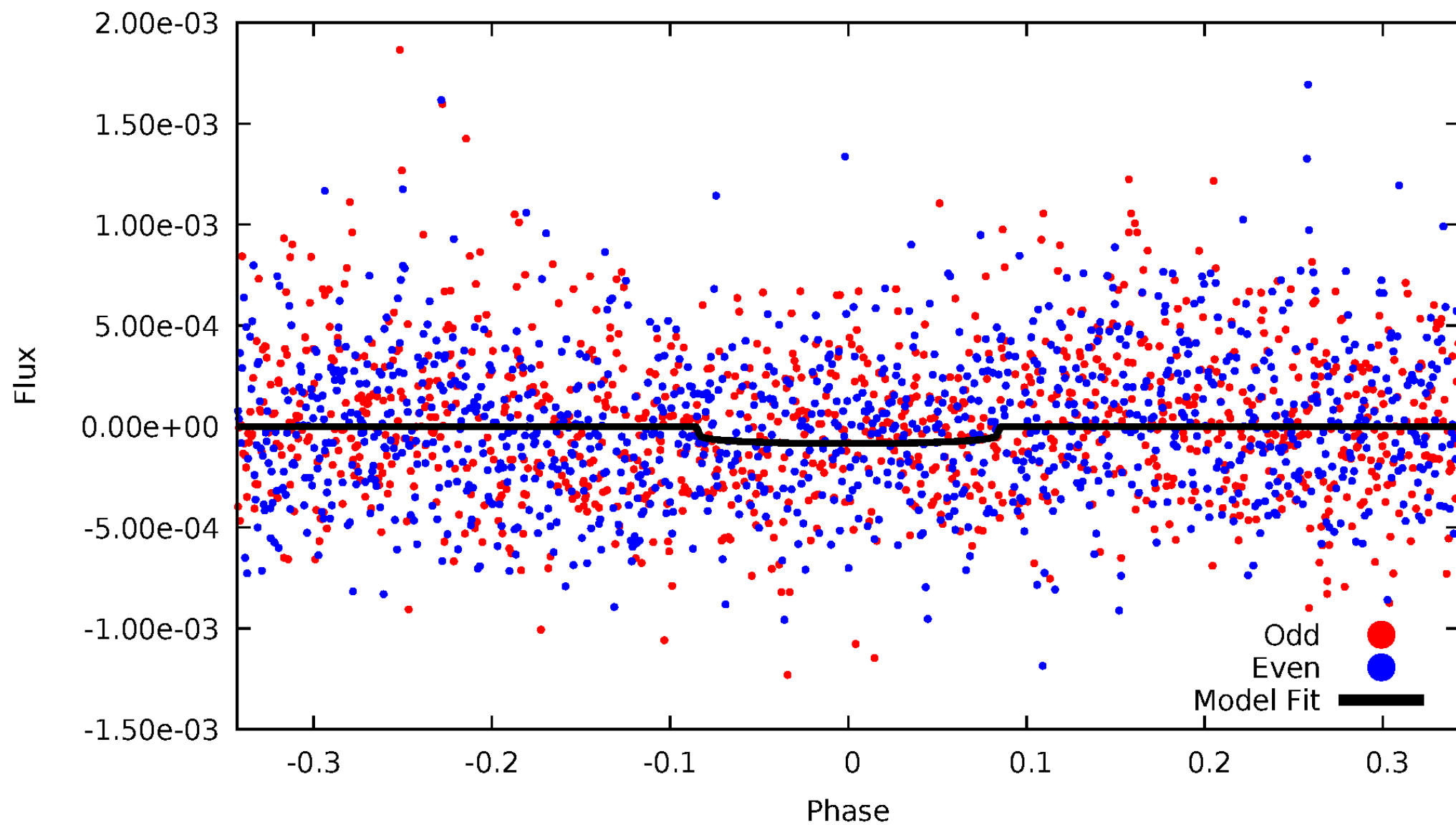


TCE 009552411-04



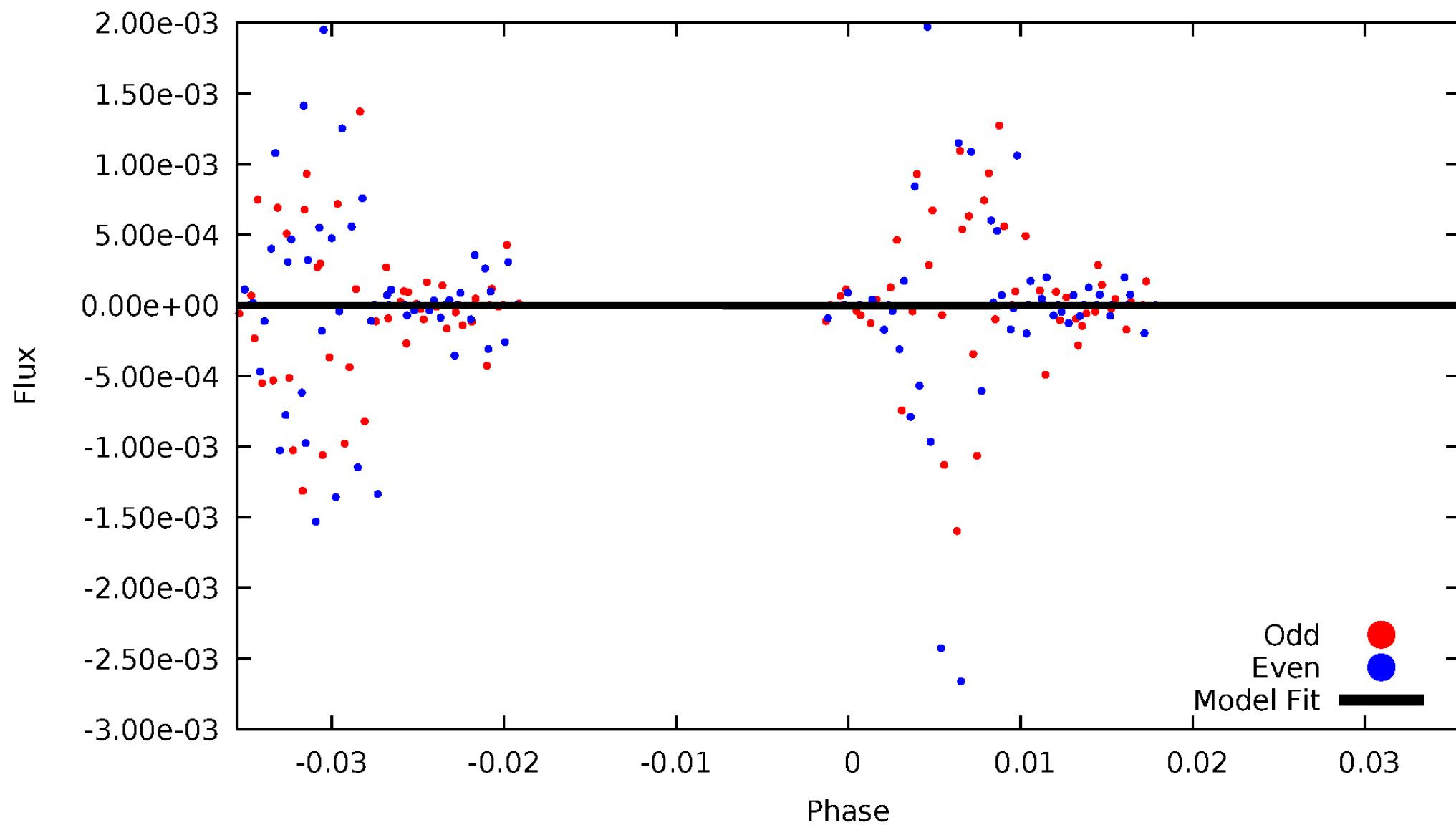
# DV Odd/Even

TCE 009552411-04



# ALT Odd/Even

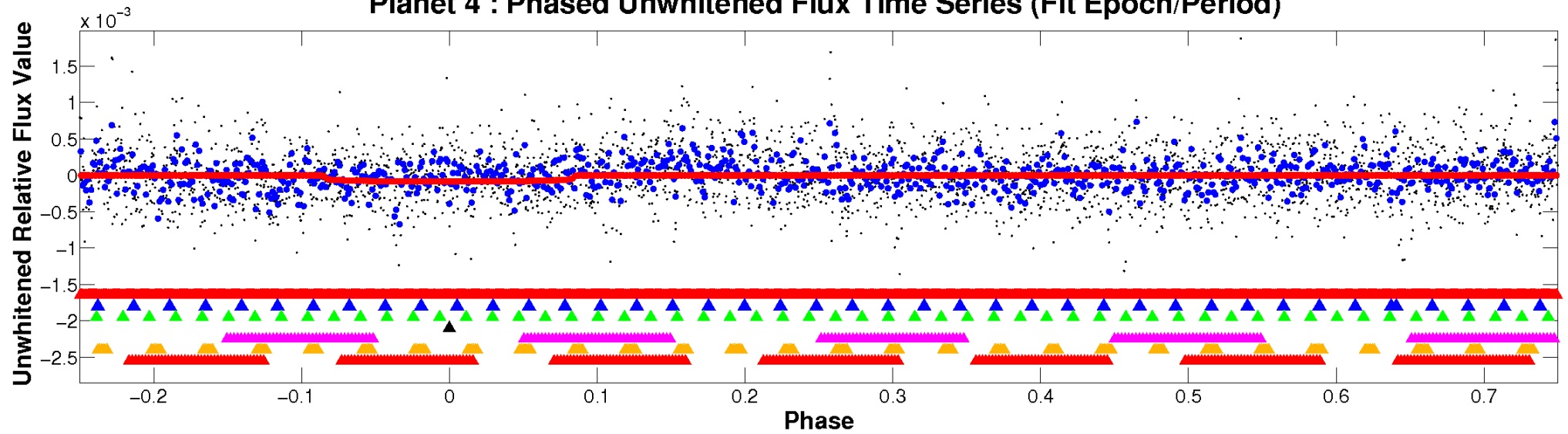
TCE 009552411-04



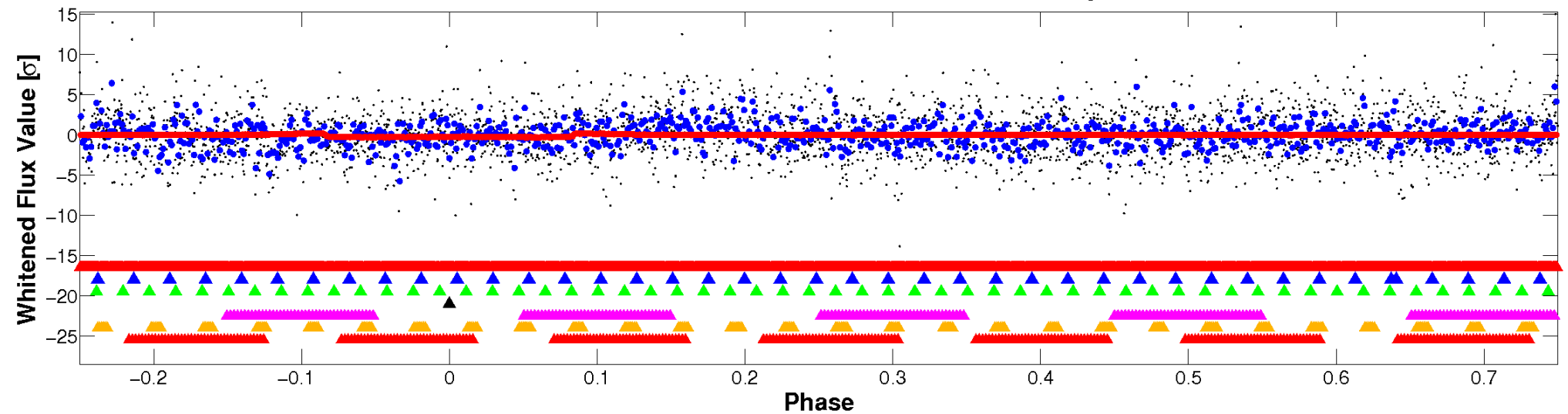


# Non-Whitened Vs. Whitened Light Curve

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

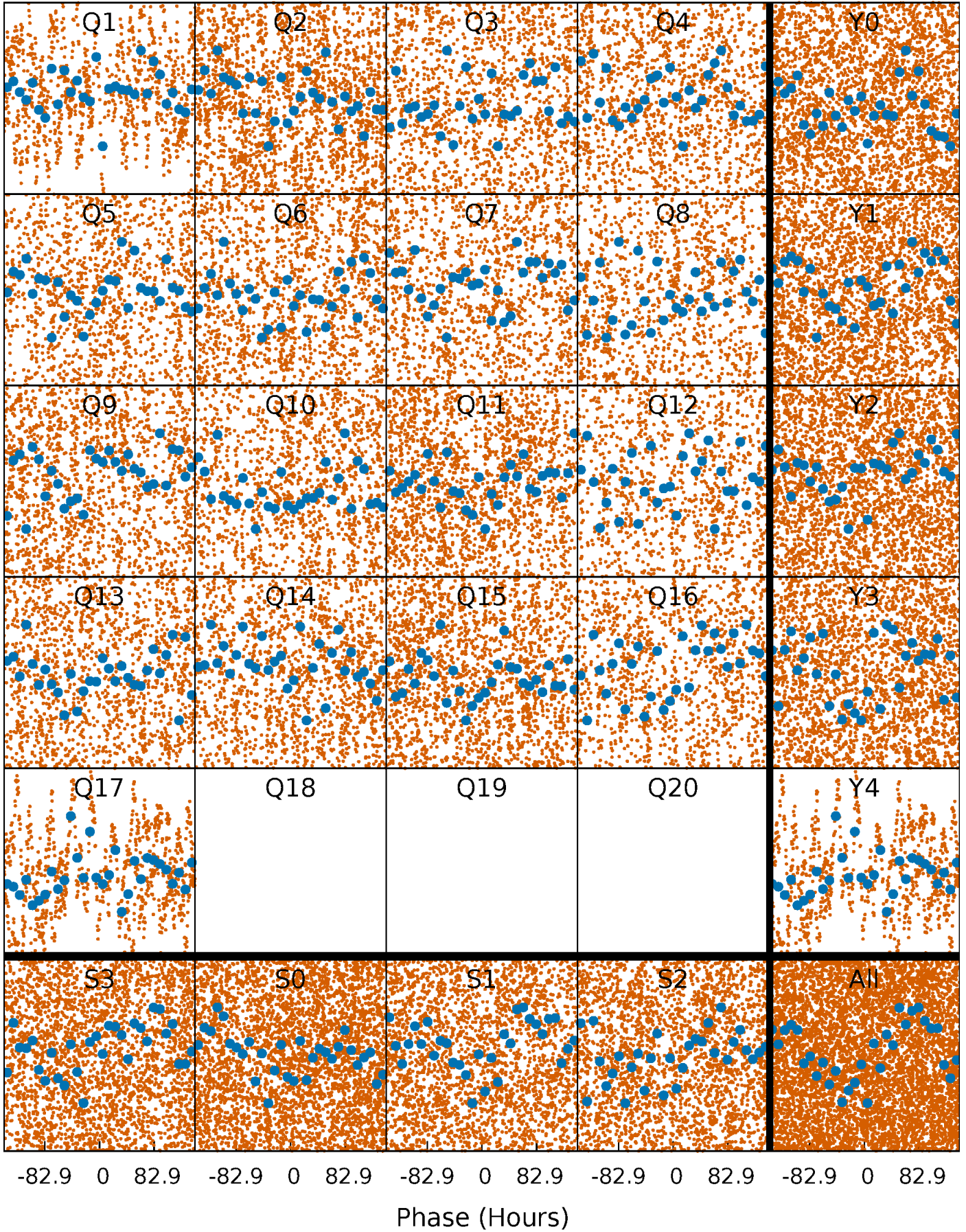


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

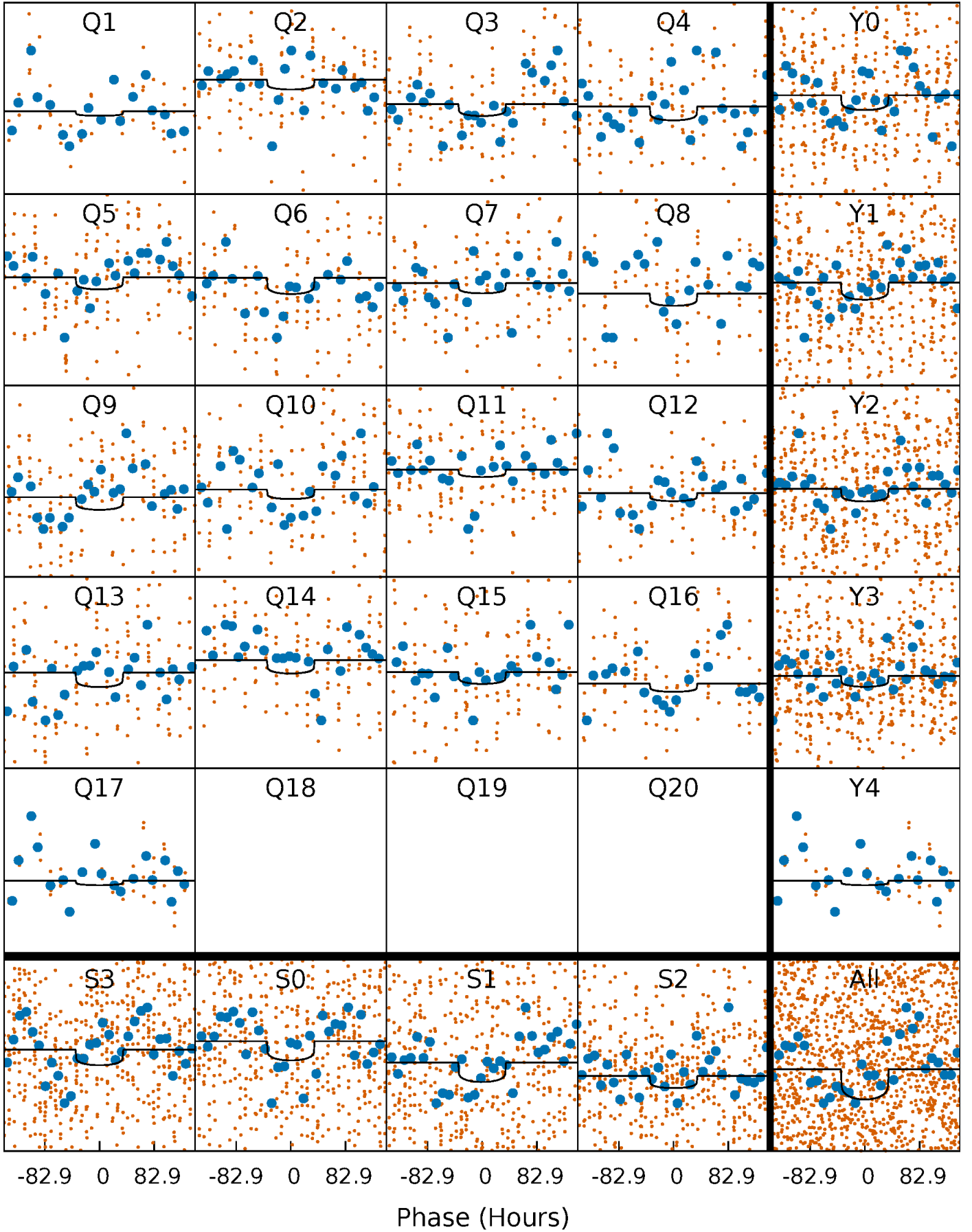
TCE 009552411-04 P= 17.623722 Days  $T_0=147.830770$  (BKJD)





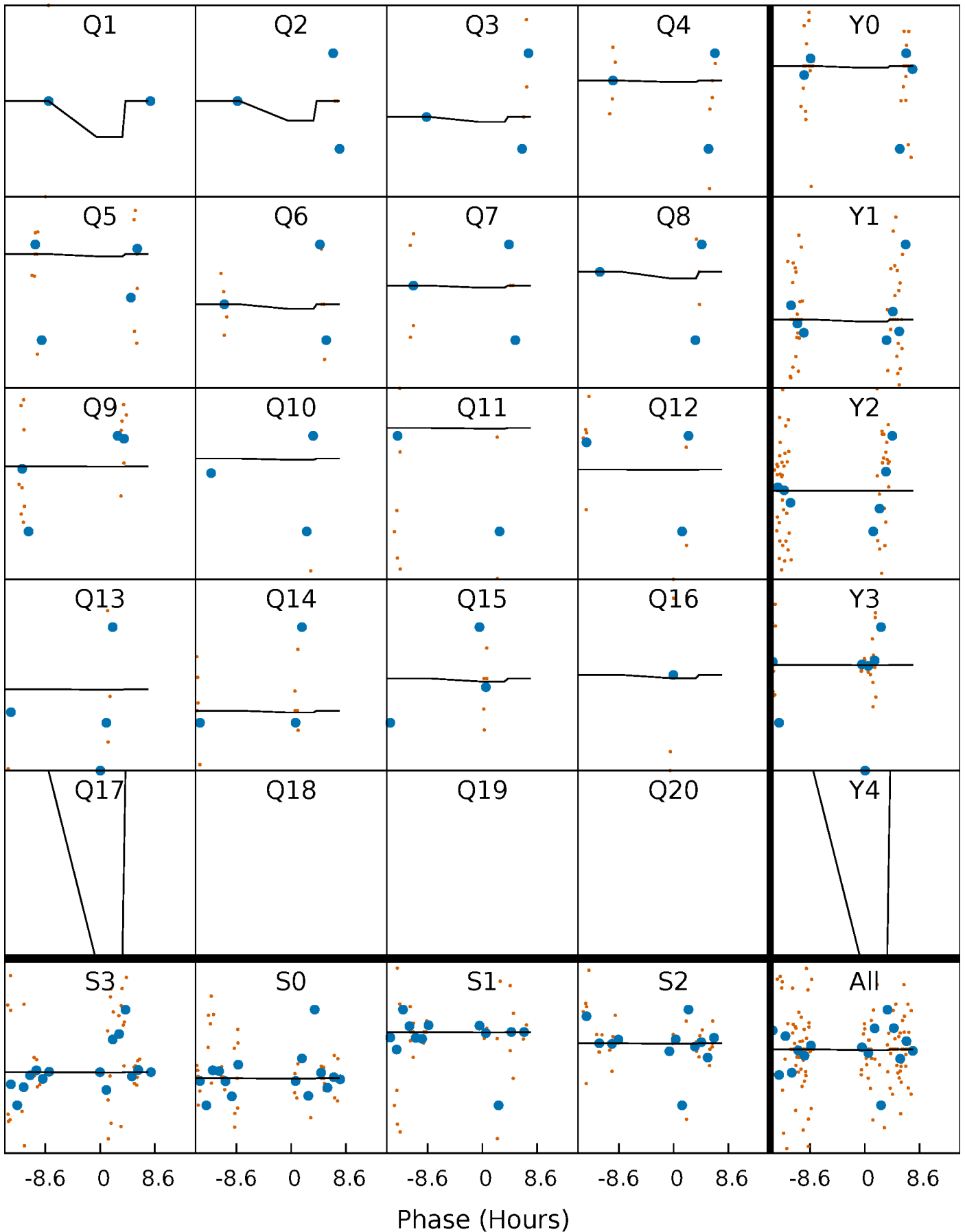
# DV Quarter-Phased Transit Curves

TCE 009552411-04   P= 17.623722 Days    $T_0=147.830770$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

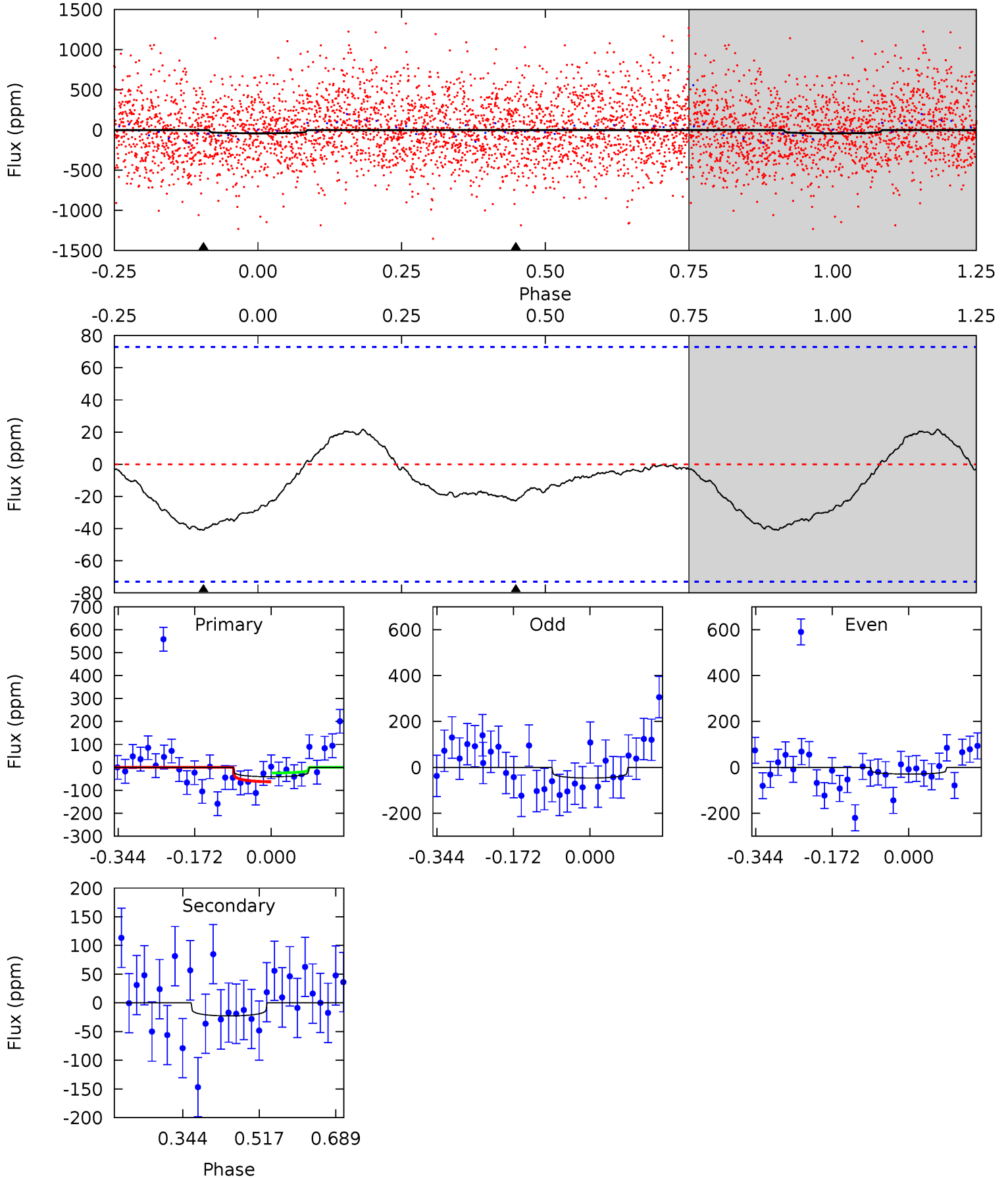
TCE 009552411-04   P= 17.612045 Days    $T_0=147.667302$  (BKJD)



# DV Model-Shift Uniqueness Test

009552411-04, P = 17.623722 Days, E = 130.207048 Days

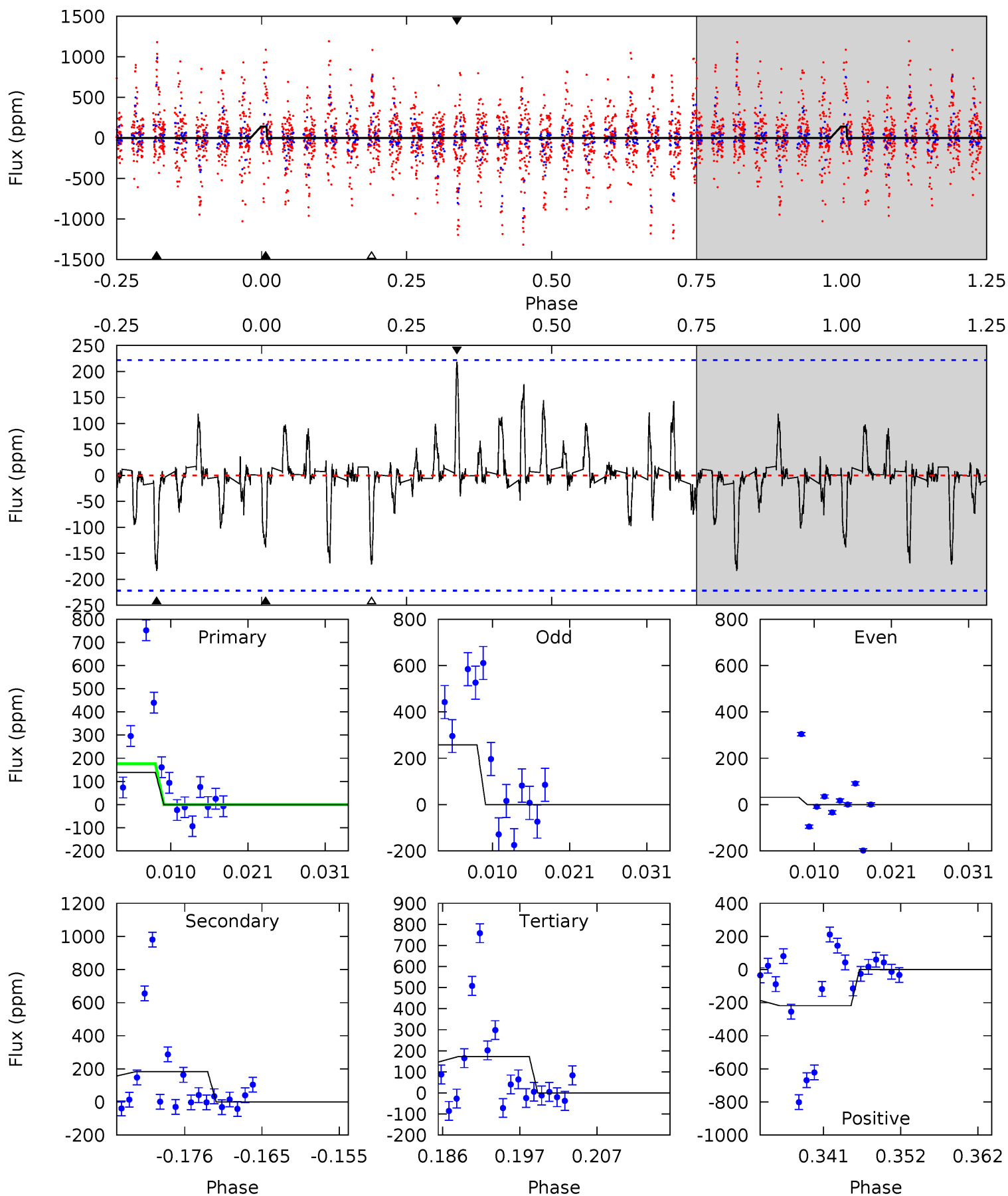
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.50	1.39	0	0	4.45	1.37	0.59	2.50	2.50	1.39	1.39	0.52	0.81	0.35	1.24



# Alt Model-Shift Uniqueness Test

009552411-04, P = 17.612045 Days, E = 130.055257 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.13	4.15	3.88	4.94	5.02	2.56	1.14	-0.75	-1.81	0.27	-0.79	2.56	0	0.54	1.49



### Stellar Parameters For KIC 009552411

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6844^{+190}_{-286}$	$4.145^{+0.180}_{-0.180}$	$-0.180^{+0.250}_{-0.300}$	$1.629^{+0.494}_{-0.404}$	$1.358^{+0.202}_{-0.247}$	$0.443^{+0.435}_{-0.221}$
	+3%/-4%	+4%/-4%	+139%/-167%	+30%/-25%	+15%/-18%	+98%/-50%
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 009552411-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-23 \pm 16$	$1.63^{+0.72}_{-0.70}$	$1400^{+119}_{-95}$	$4924^{+1561}_{-1112}$	$94^{+231}_{-72}$
Alt.	$-183 \pm 44$	$0.56^{+0.54}_{-0.37}$	$1396^{+108}_{-96}$	$21497^{+89590}_{-10428}$	$6587^{+51225}_{-4878}$

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

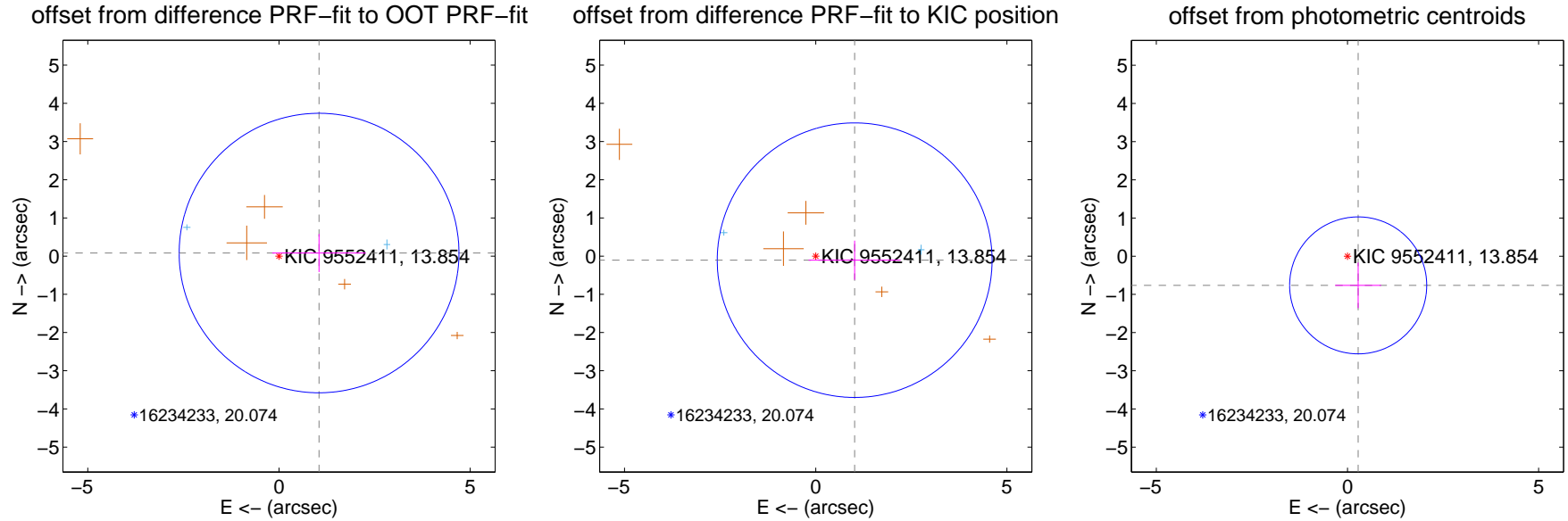
## DV Centroid Data

Supplemental centroid analysis for 009552411-04. Kepler magnitude: 13.85. Transit SNR 6.26

There are 2 quarters with good PRF difference image offsets

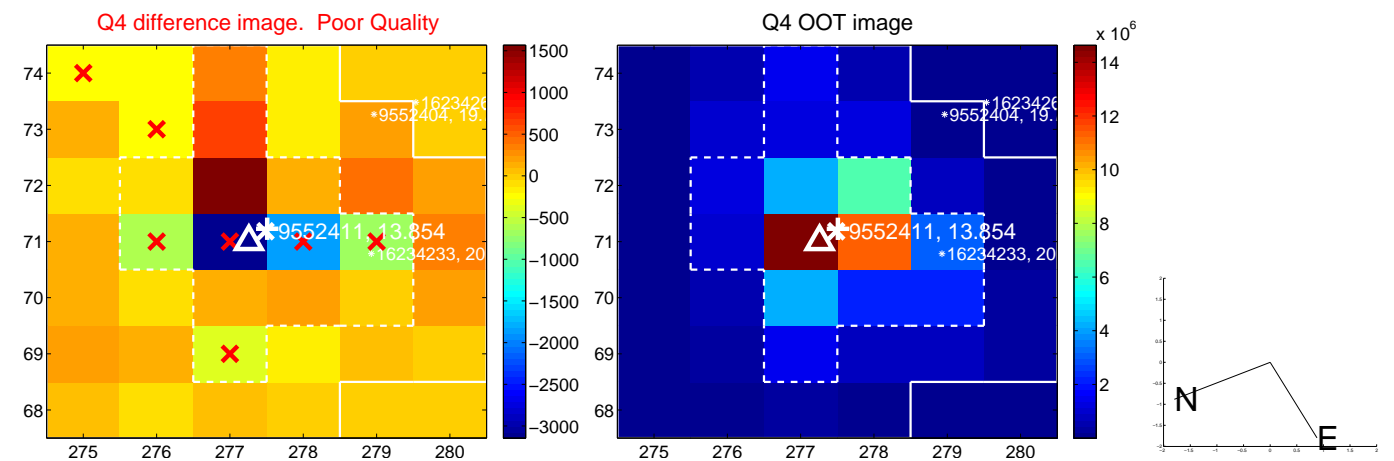
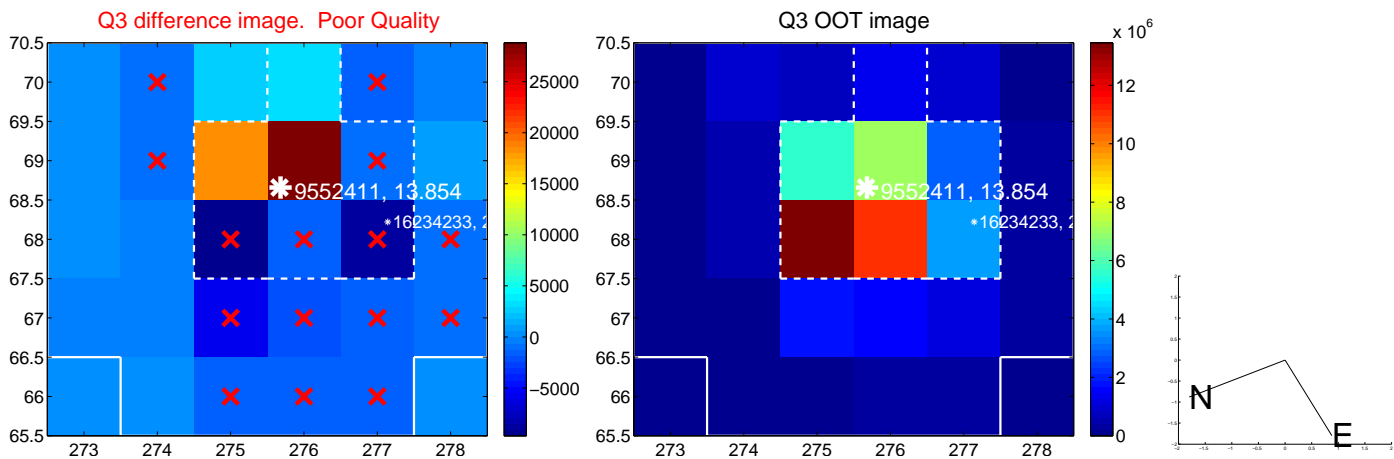
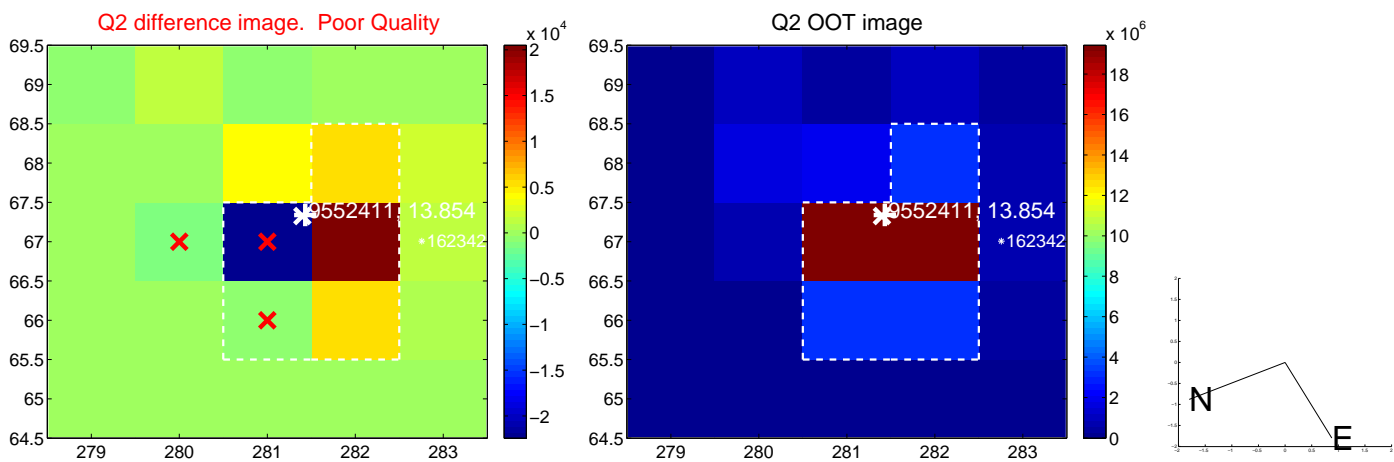
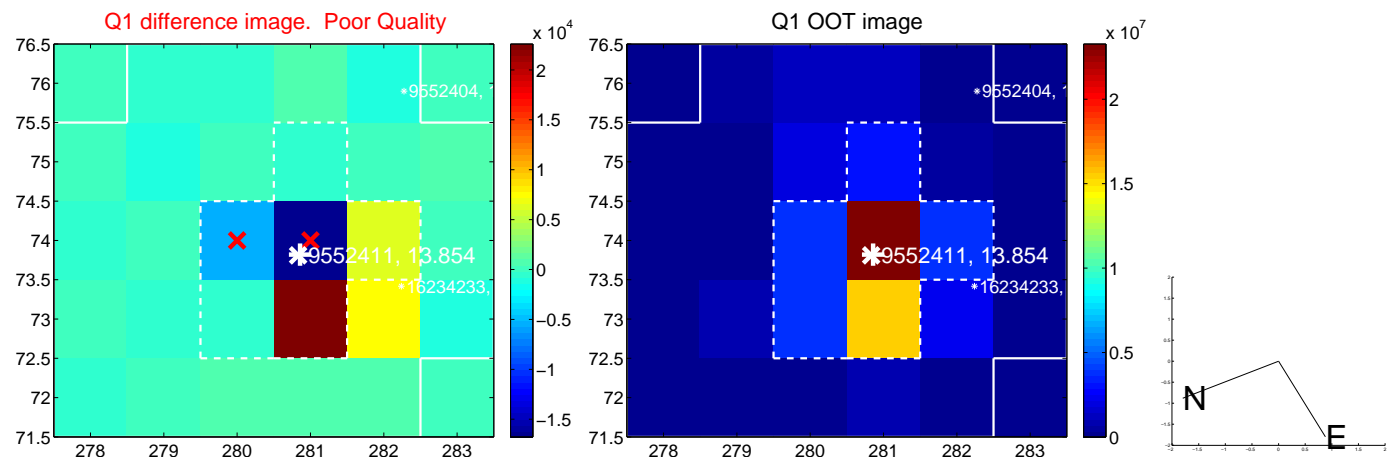
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.051 \pm 1.219$	0.86	$-1.048 \pm 1.223$	$0.081 \pm 0.497$
PRF-fit source offset from KIC position	$1.024 \pm 1.198$	0.85	$-1.018 \pm 1.203$	$-0.106 \pm 0.512$
photometric centroid source offset	$0.81 \pm 0.60$	1.36	$-0.28 \pm 0.60$	$-0.76 \pm 0.60$



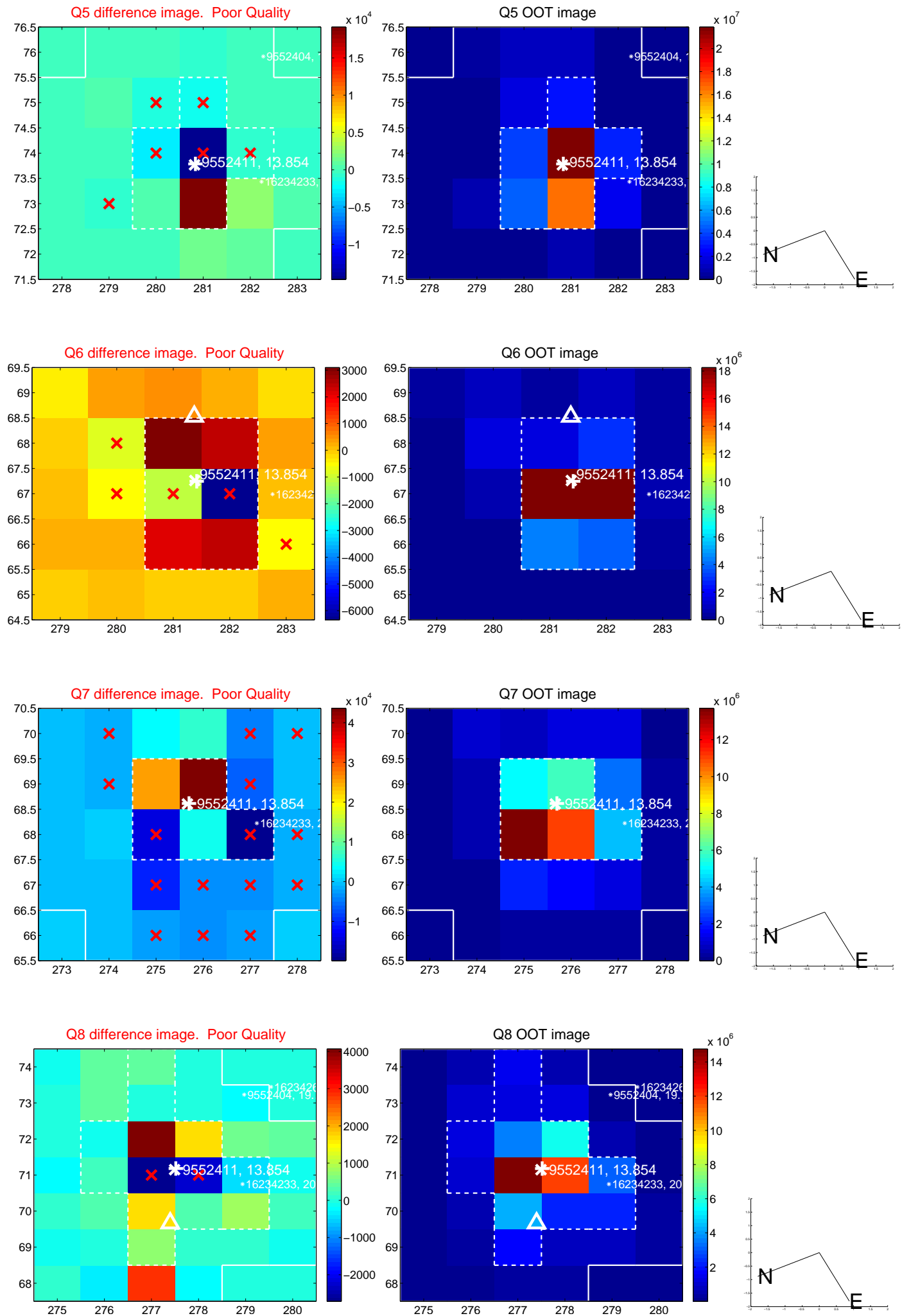
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

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

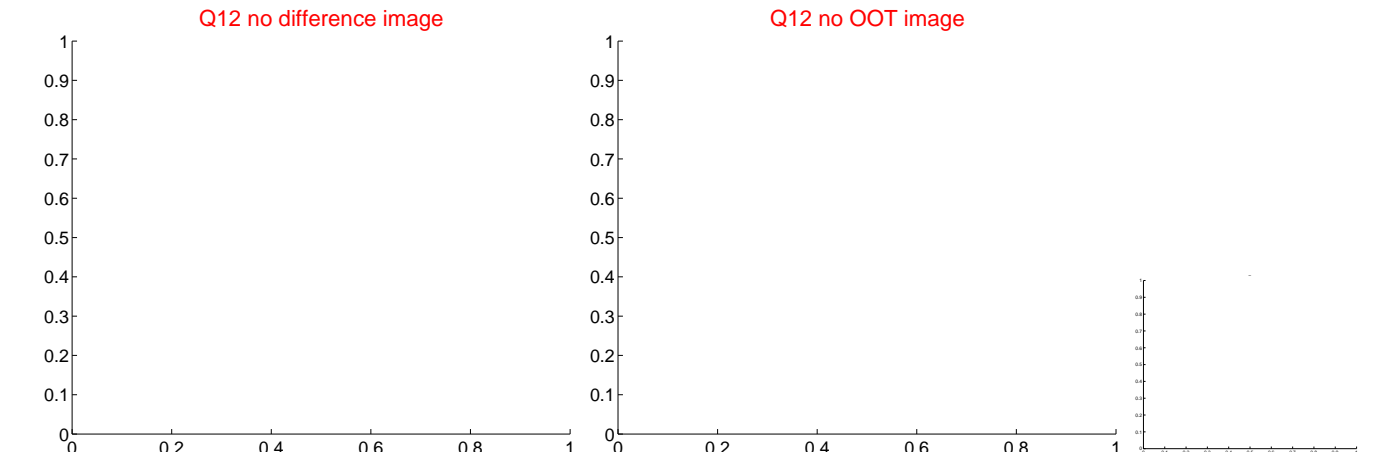
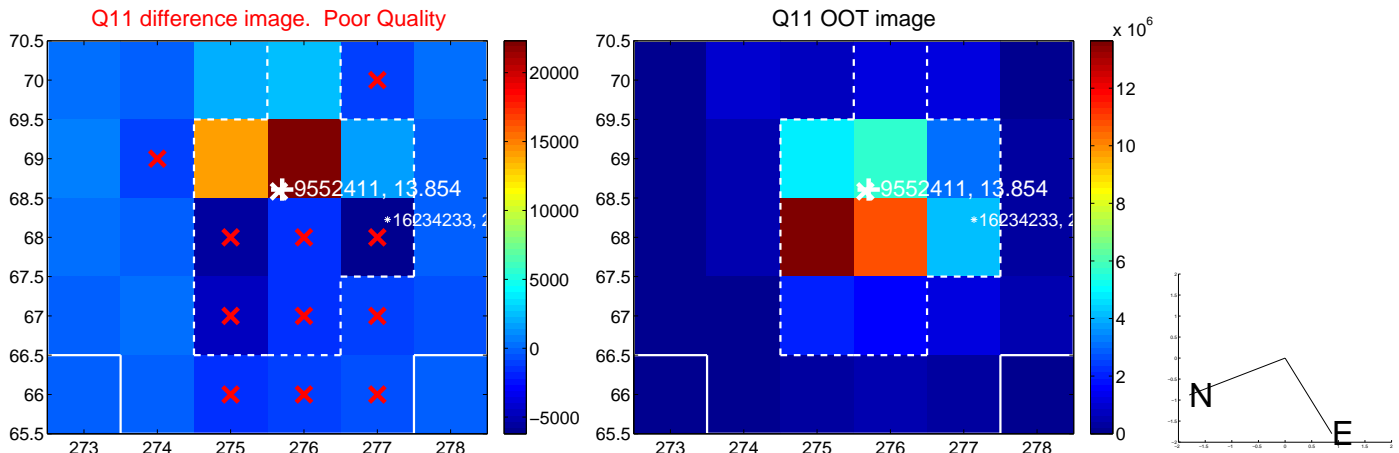
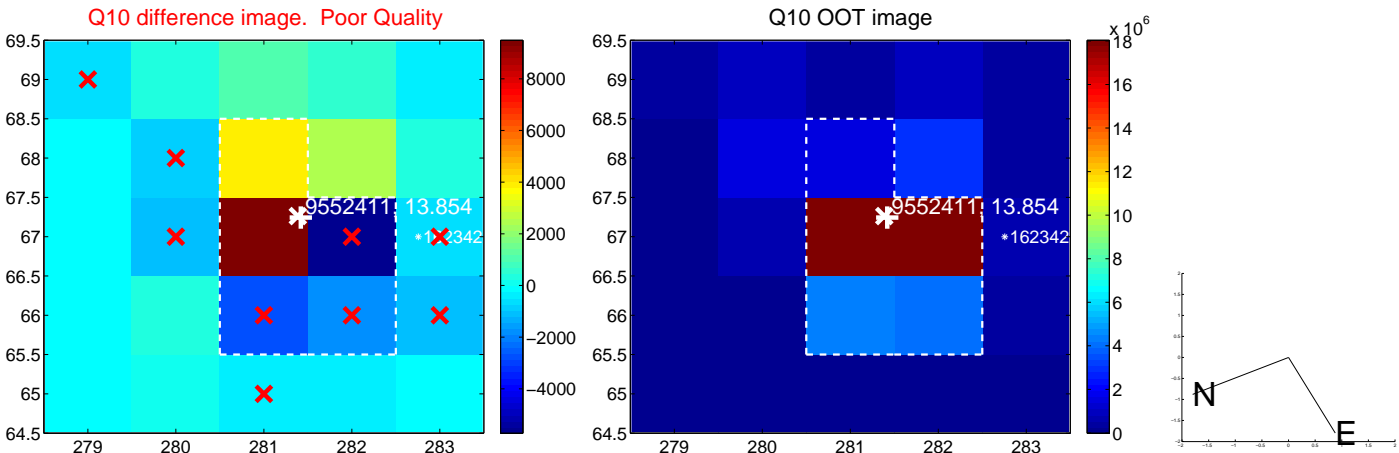
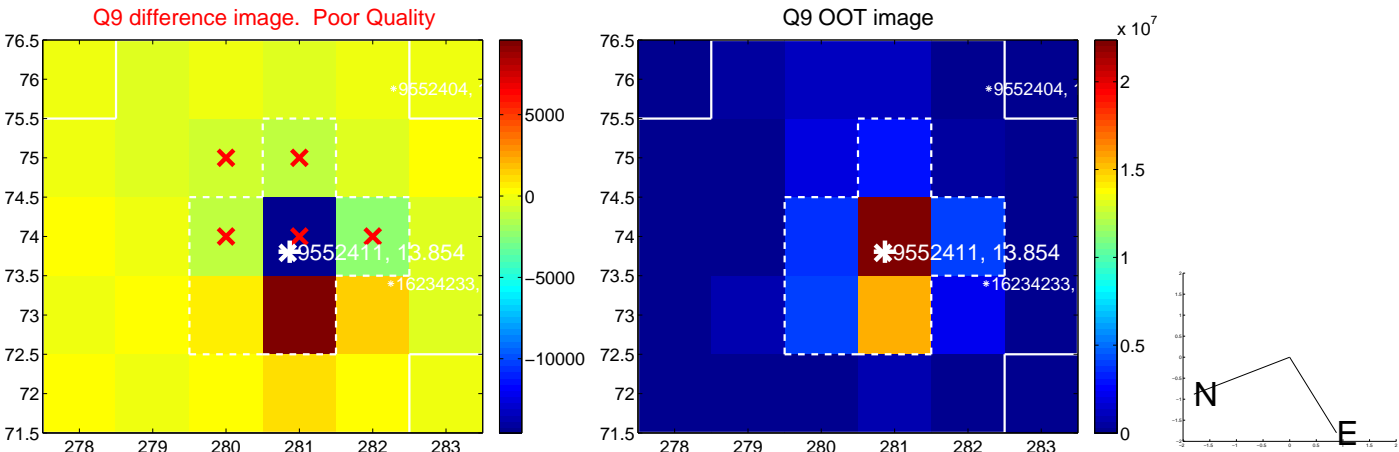




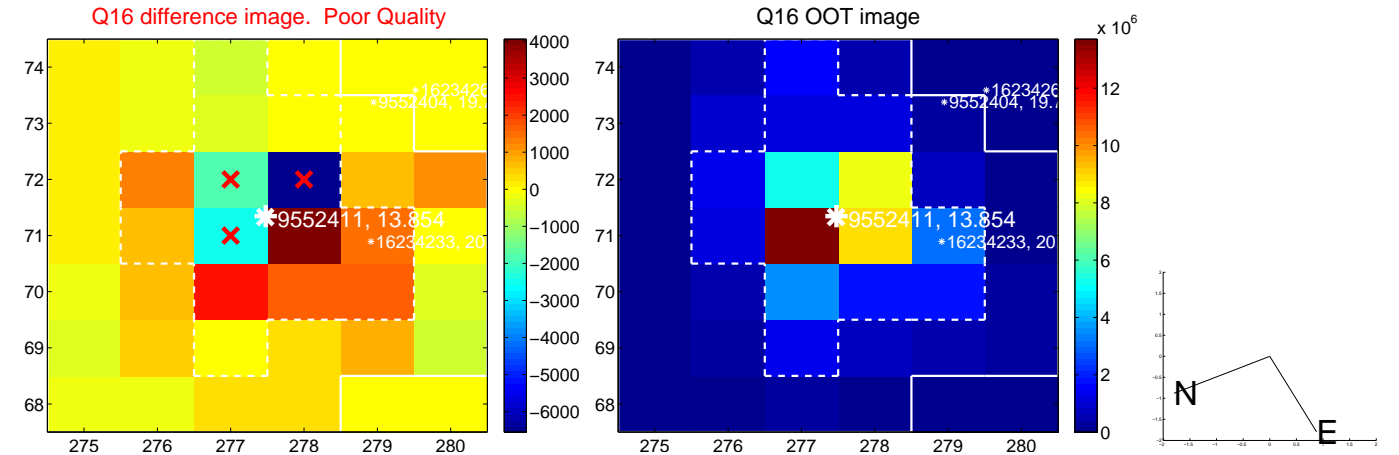
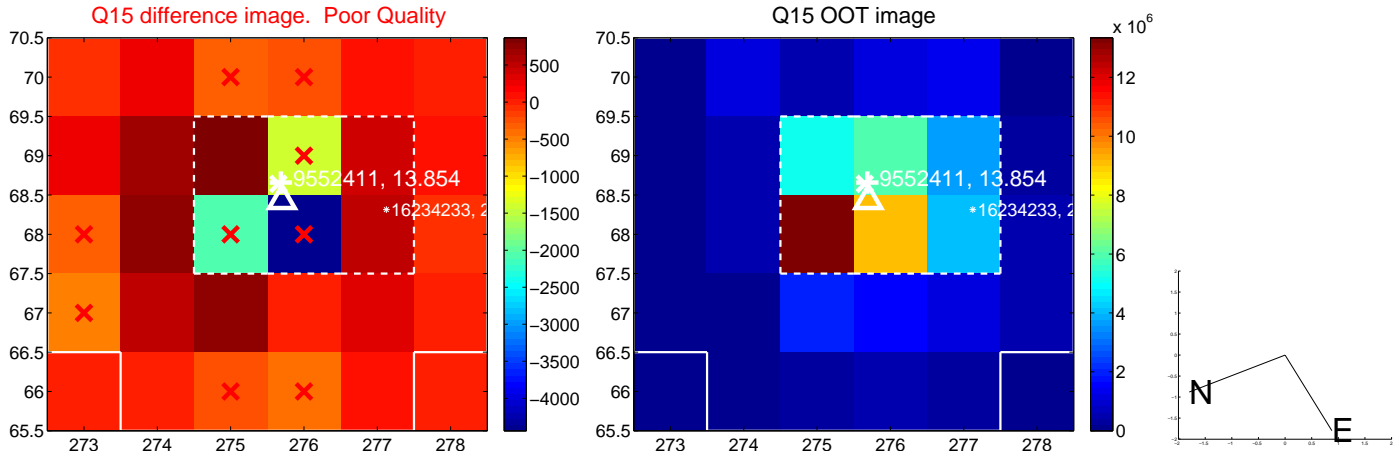
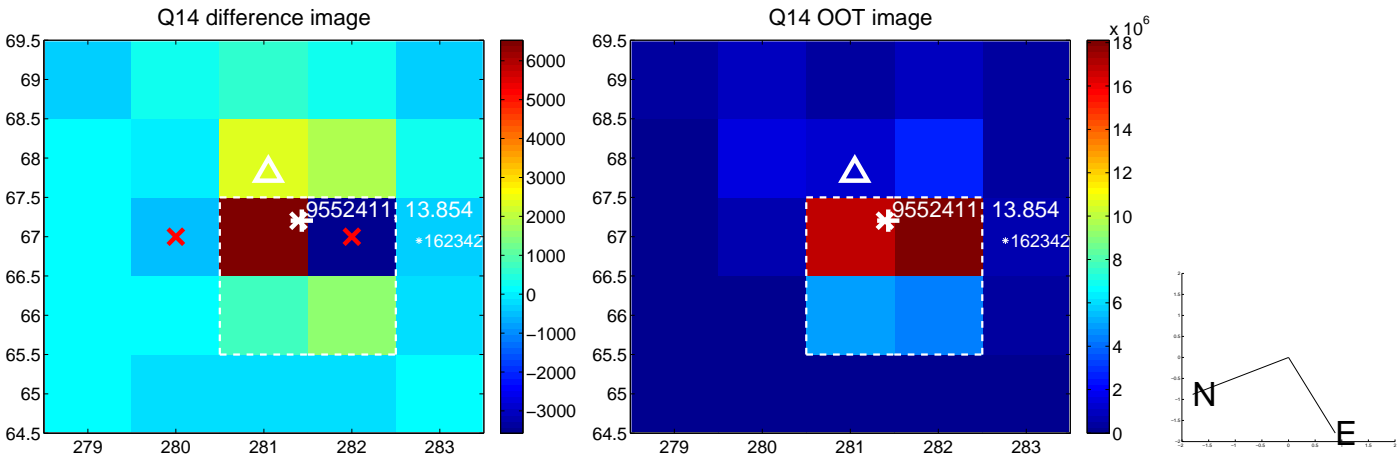
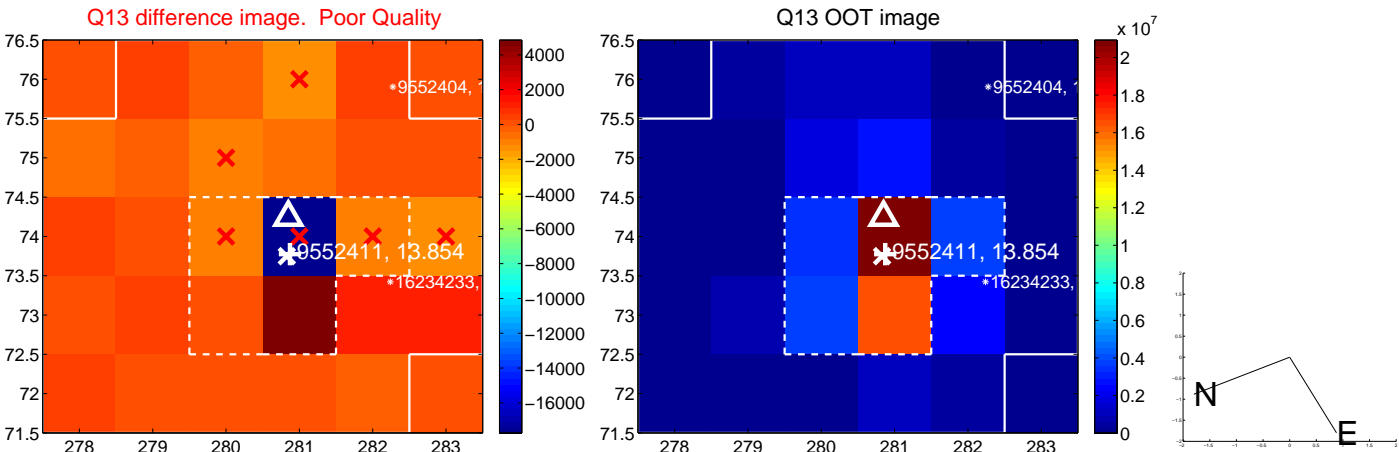
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



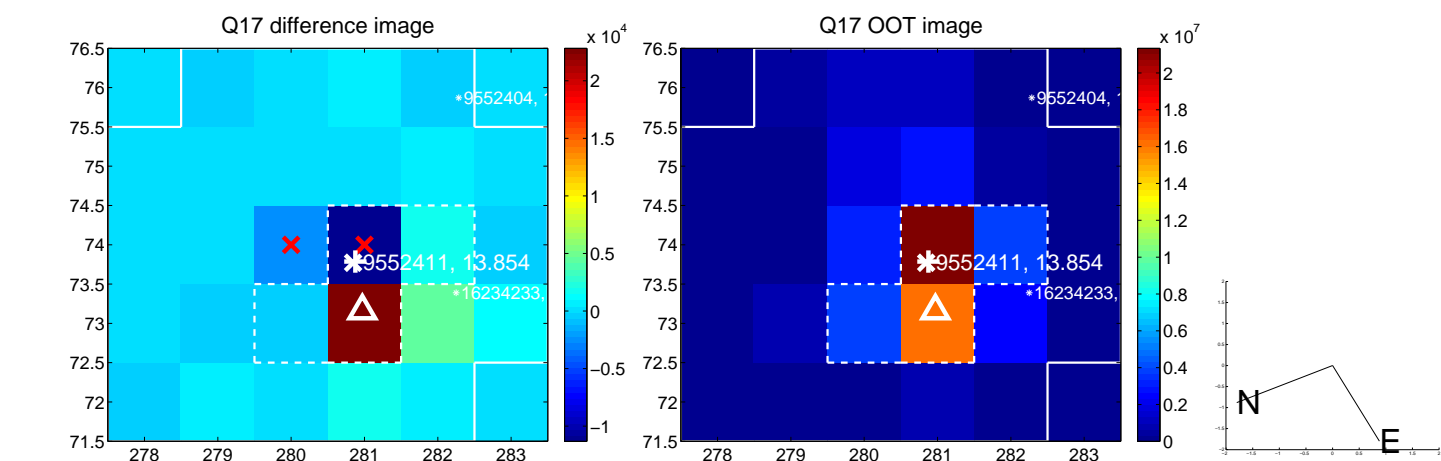
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



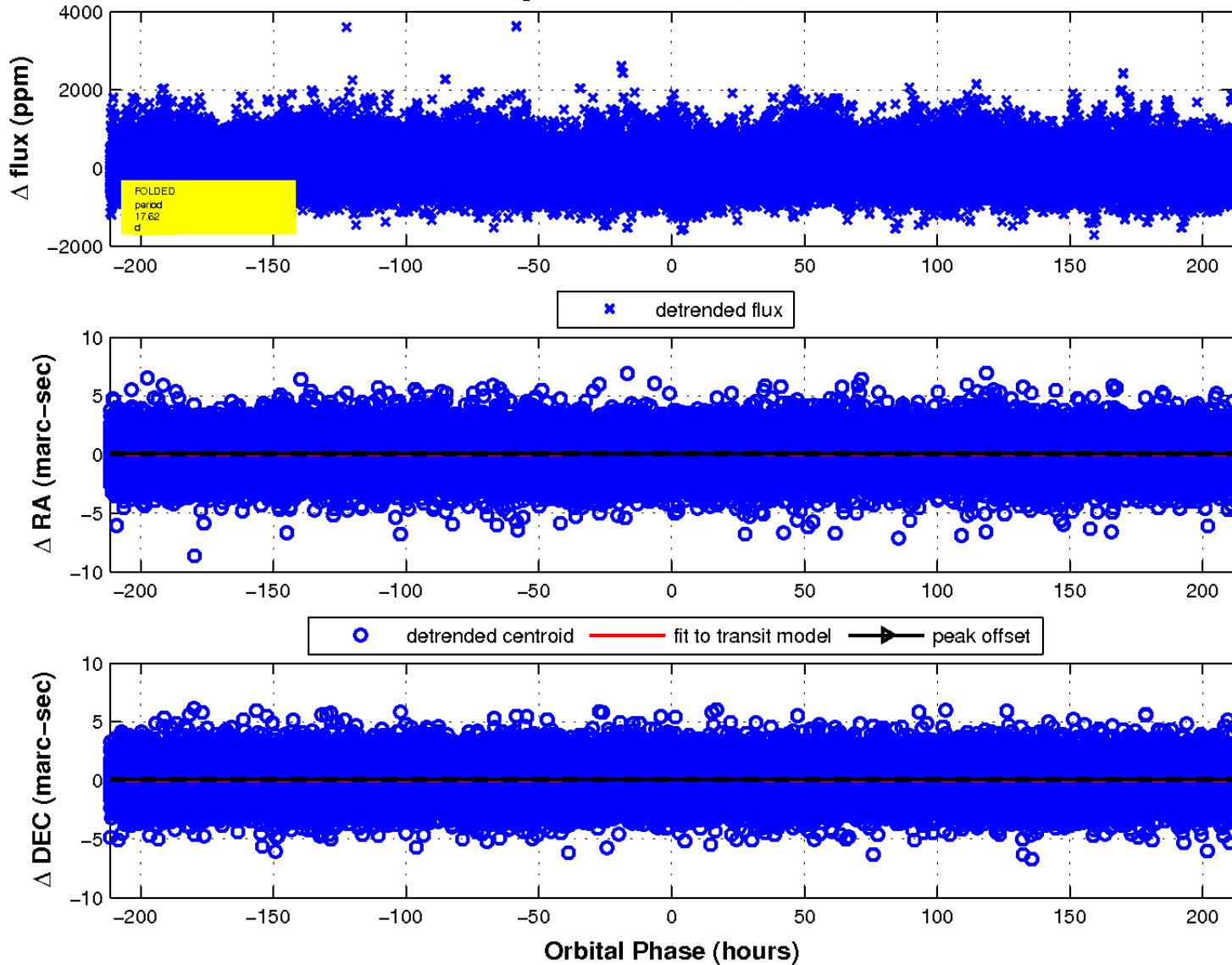
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

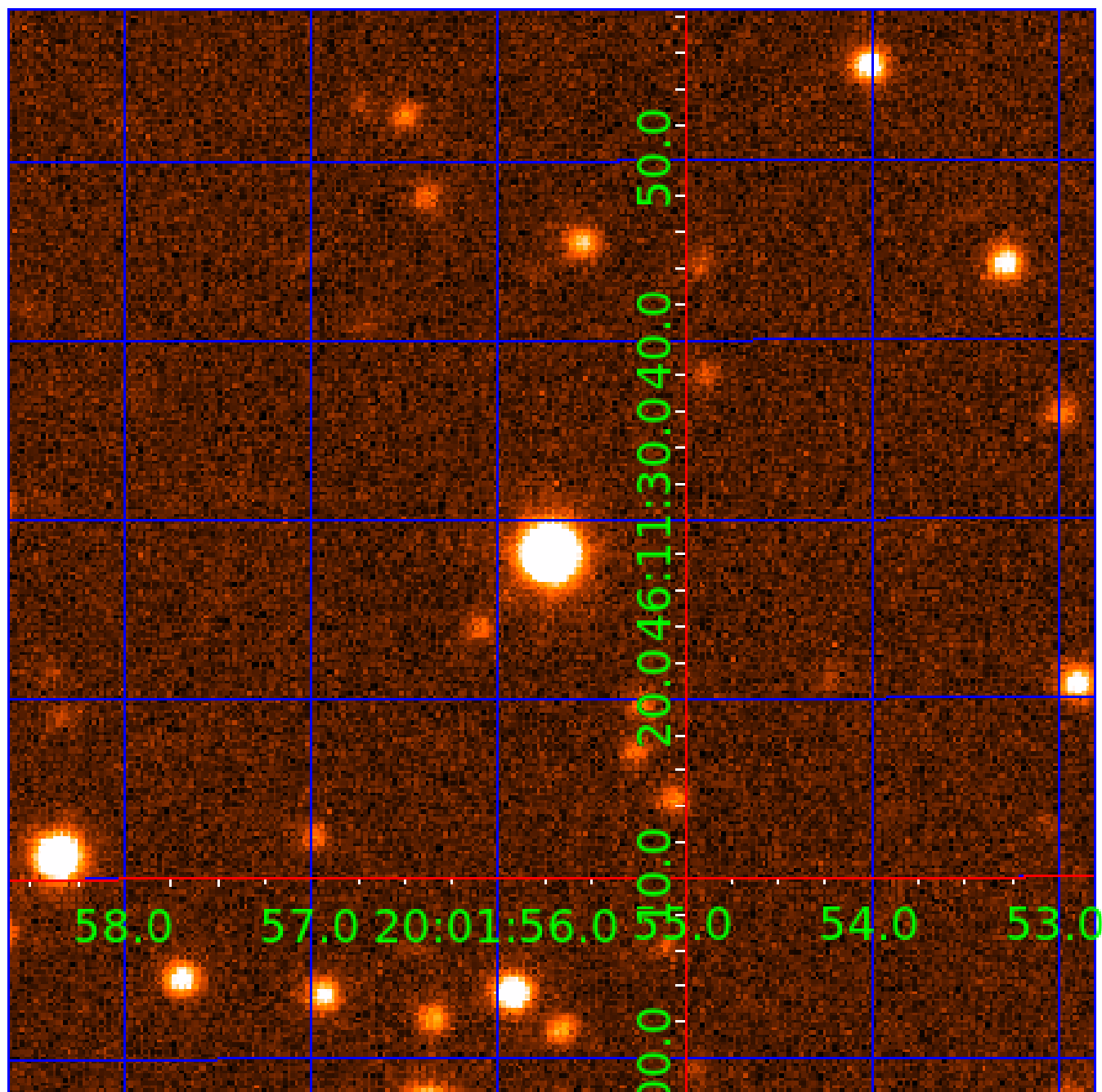


fluxWeightedCentroids, Planet 4 of 7



UKIRT Image

Declination



# KIC 009552411

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009552411-01	OBS	No	0.652146	132.002493	11.0	4.784	10.5	2.9	1.63	6844	0.58	19691.95
009552411-02	OBS	No	34.819086	141.437002	1071.8	1.336	19.7	20.6	1.63	6844	5.41	97.95
009552411-03	OBS	No	18.567813	141.108223	425.1	3.063	17.5	12.8	1.63	6844	3.69	226.50
009552411-04	OBS	No	17.623722	147.830769	84.8	72.531	14.7	6.3	1.63	6844	1.59	242.82
009552411-05	OBS	No	7.040981	132.840594	97.0	1.401	10.7	2.5	1.63	6844	1.70	825.22
009552411-06	OBS	No	8.183251	134.814653	847.1	0.898	10.8	13.2	1.63	6844	5.32	675.33
009552411-07	OBS	No	5.029754	135.557261	1166.5	3.883	14.3	19.7	1.63	6844	9.31	1292.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009552411-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009552411-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009552411-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009552411-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
009552411-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009552411-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
009552411-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

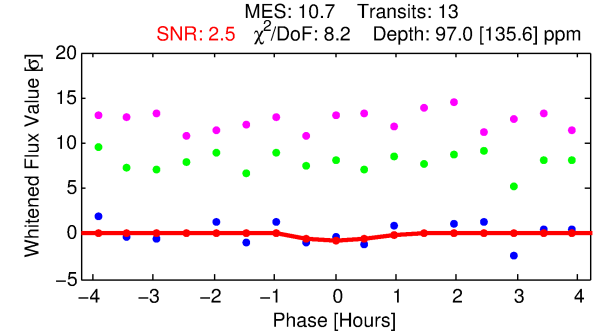
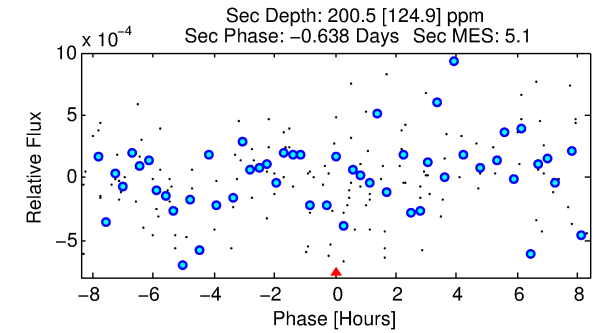
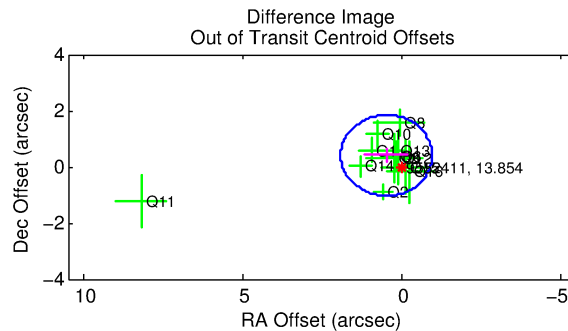
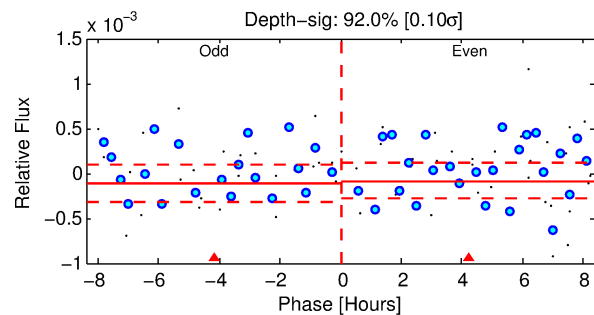
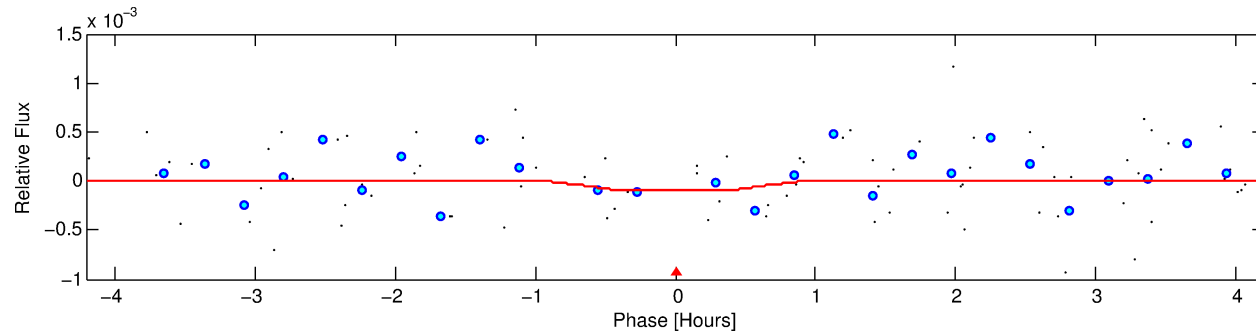
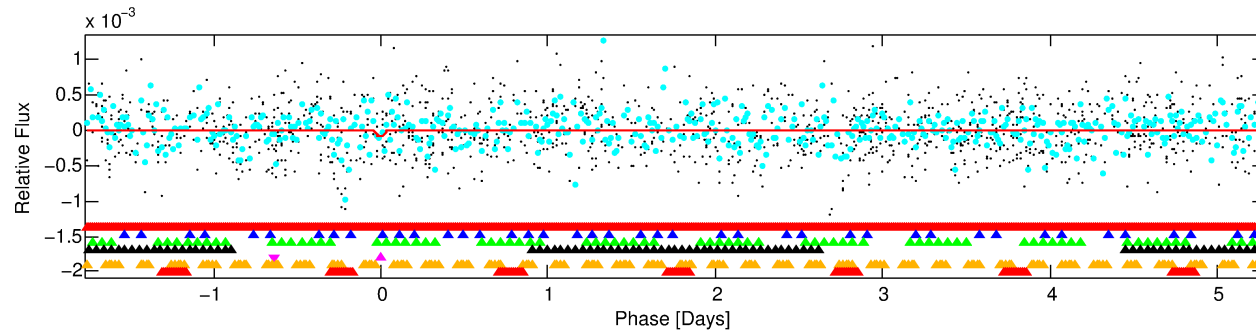
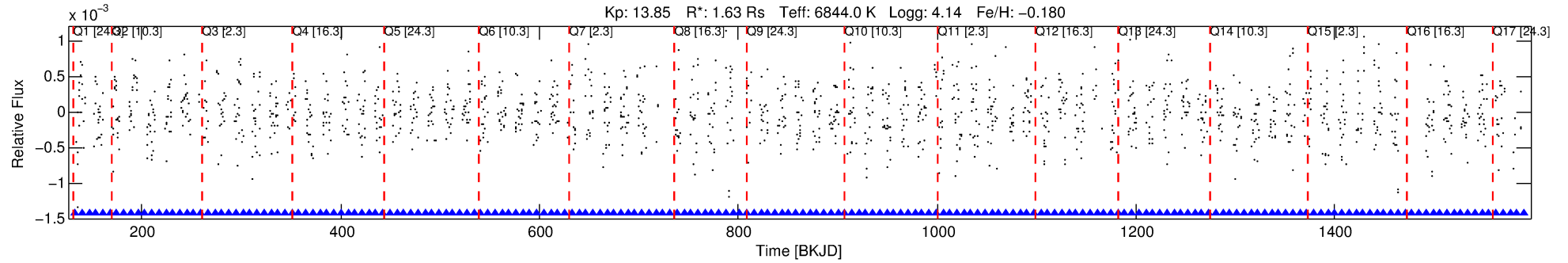
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009552411-05

No Significant Match Found

# DV One-Page Summary

KIC: 9552411 Candidate: 5 of 7 Period: 7.041 d



## DV Fit Results:

Period = 7.04098 [0.00061] d  
Epoch = 132.8406 [0.0568] BKJD  
Rp/R\* = 0.0095 [0.0591]  
a/R\* = 30.72 [1067.29]  
b = 0.62 [35.50]  
Seff = 825.22 [314.41]  
Teq = 1367 [130] K  
Rp = 1.69 [10.52] Re  
a = 0.0795 [0.0195] AU  
Ag = 242.75 [3015.61] [0.08 $\sigma$ ]  
Teffp = 8341 [25896] K [0.27 $\sigma$ ]

## DV Diagnostic Results:

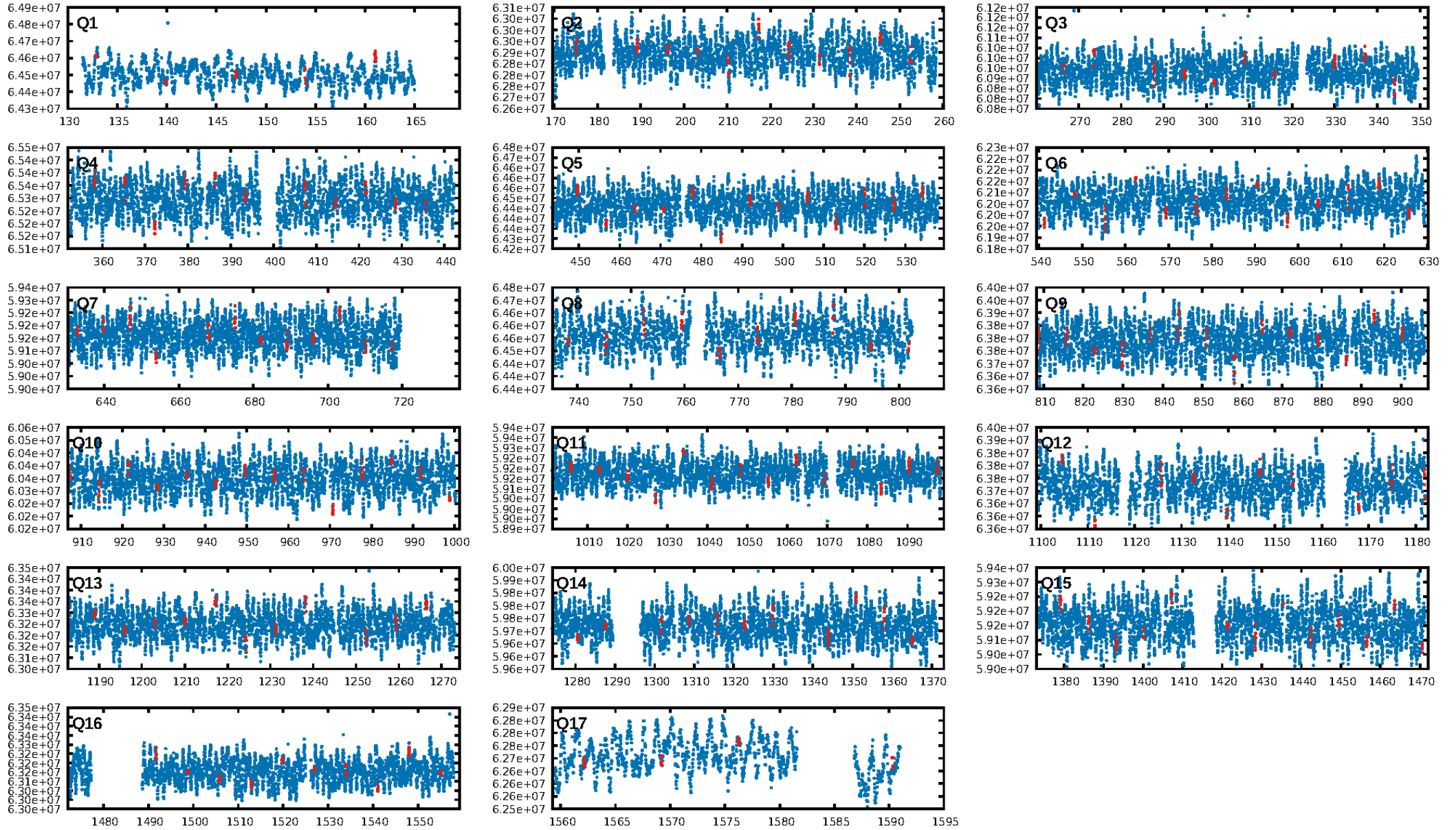
ShortPeriod-sig: 100.0% [11.69 $\sigma$ ]  
LongPeriod-sig: 100.0% [16.47 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 9.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [13/13]  
GhostDiagnostic-chr: -3.646  
Centroid-sig: 1.5%  
Centroid-so: 2.682 arcsec [1.48 $\sigma$ ]  
OotOffset-rm: 0.637 arcsec [1.33 $\sigma$ ]  
KicOffset-rm: 0.593 arcsec [1.06 $\sigma$ ]  
OotOffset-st: 4/3/3/2 [12]  
KicOffset-st: 4/3/3/2 [12]  
DiffImageQuality-fgm: 0.25 [3/12]  
DiffImageOverlap-fno: 0.12 [2/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:14:34 Z

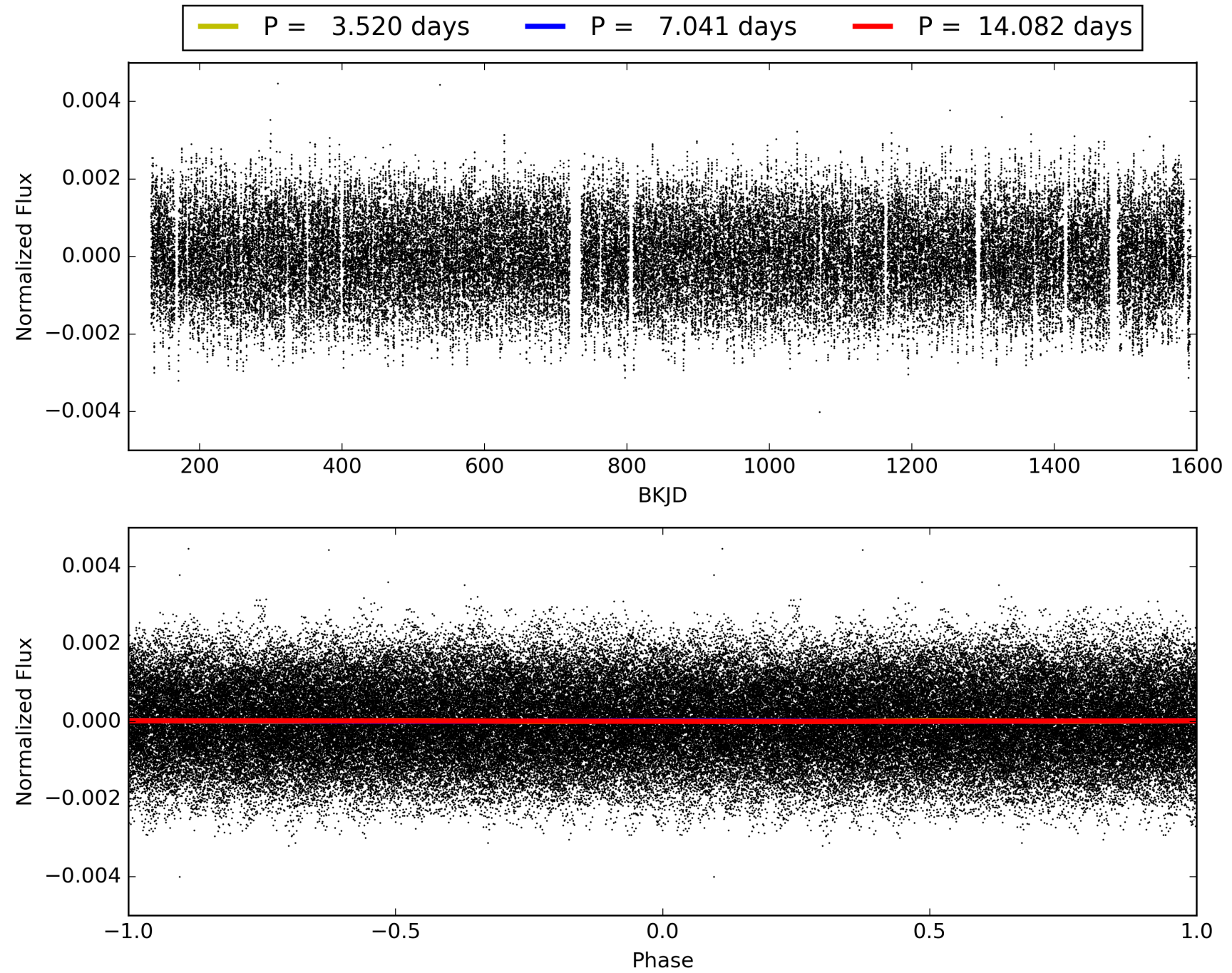
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 009552411-05, PDC Light Curves

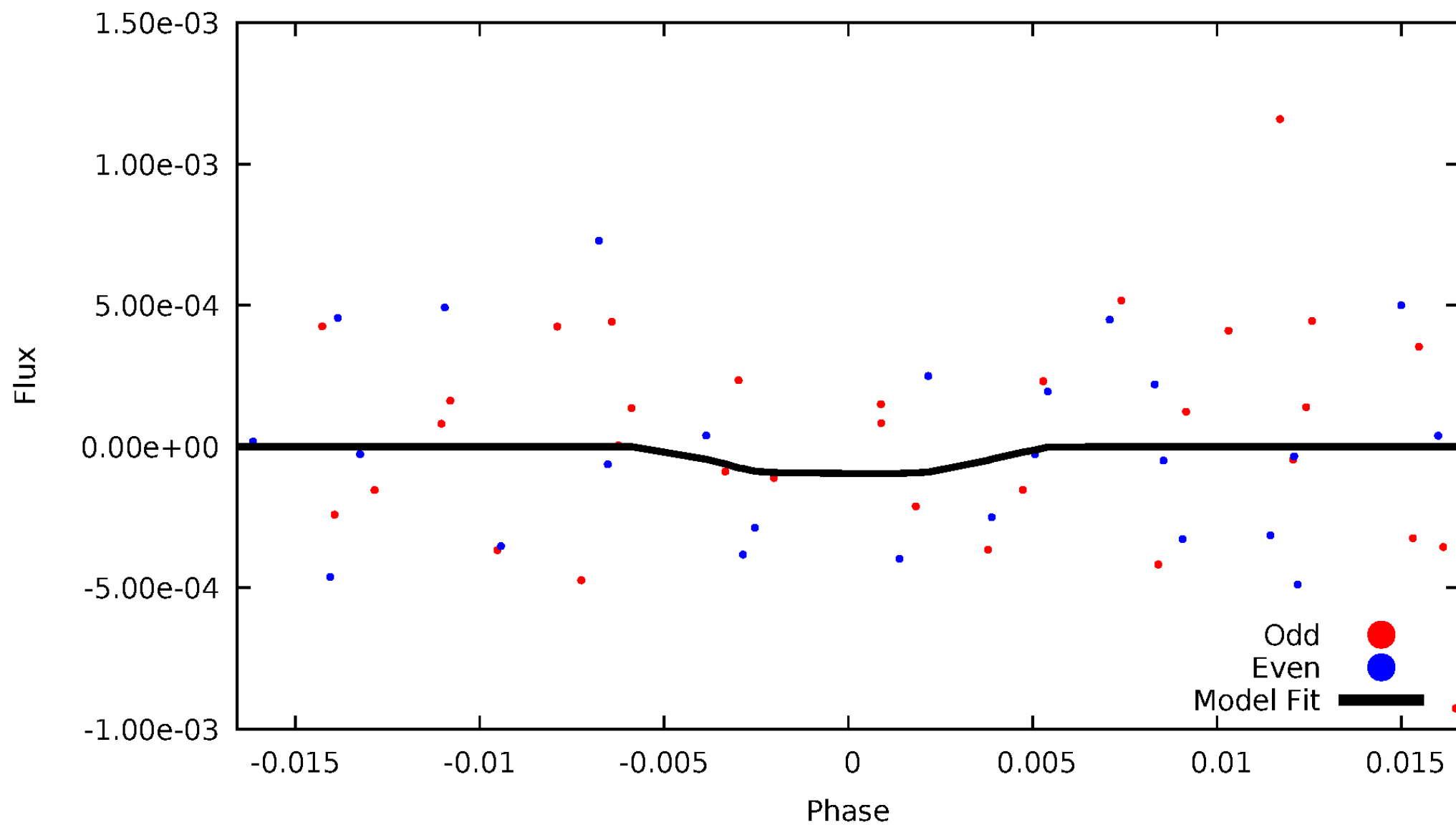


TCE 009552411-05



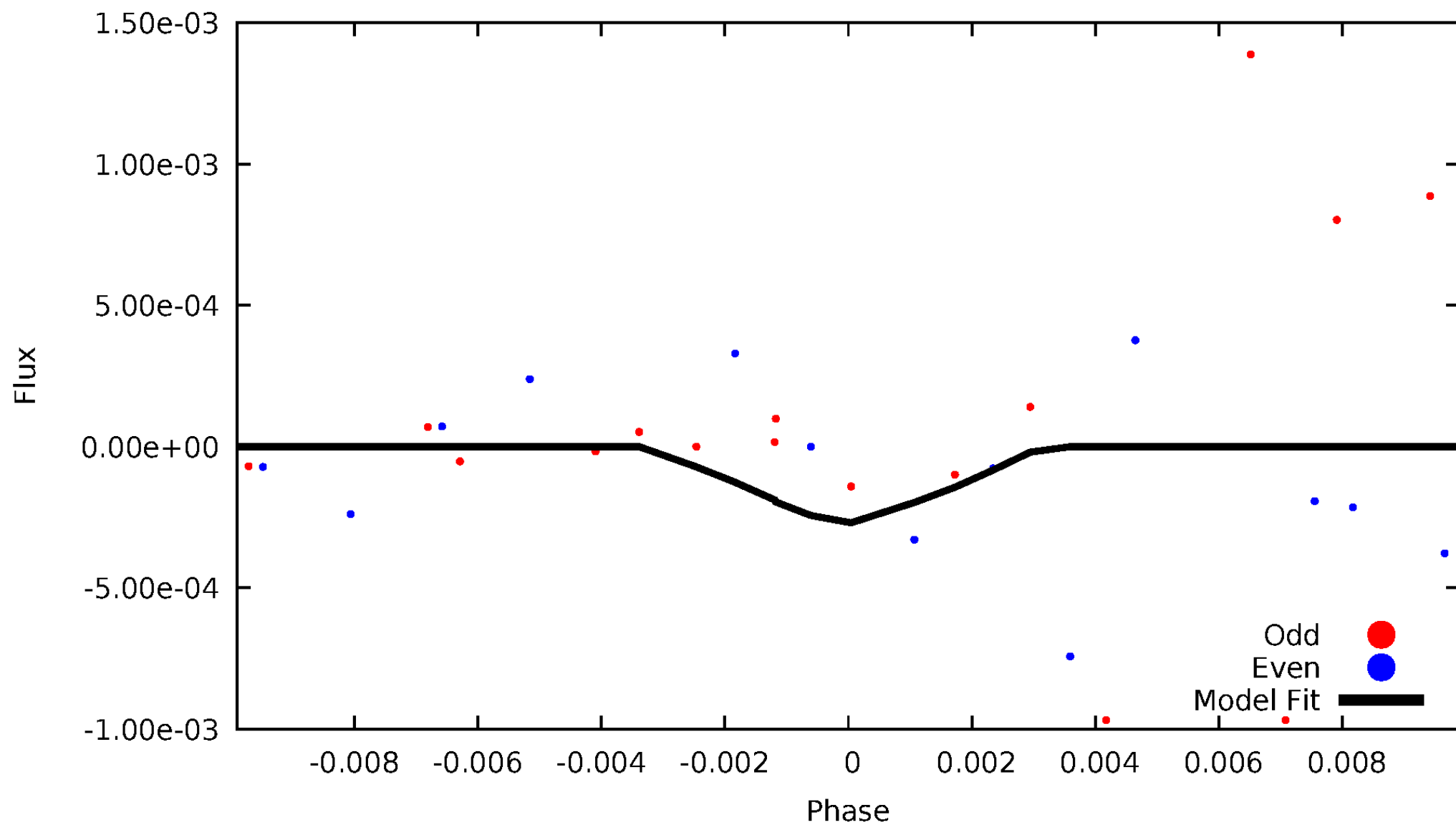
# DV Odd/Even

TCE 009552411-05



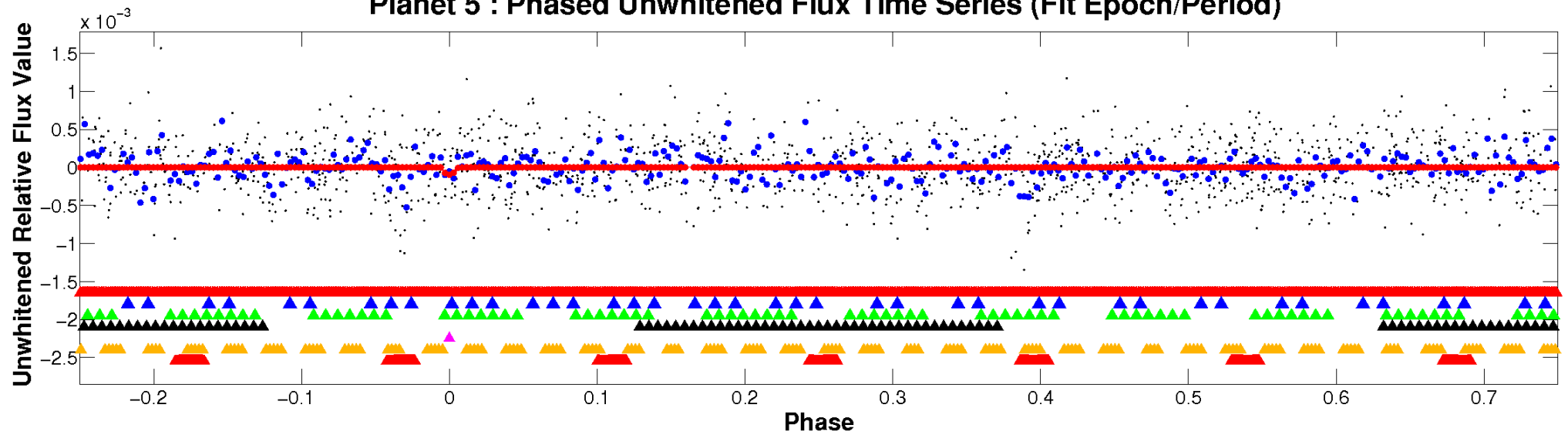
# ALT Odd/Even

TCE 009552411-05

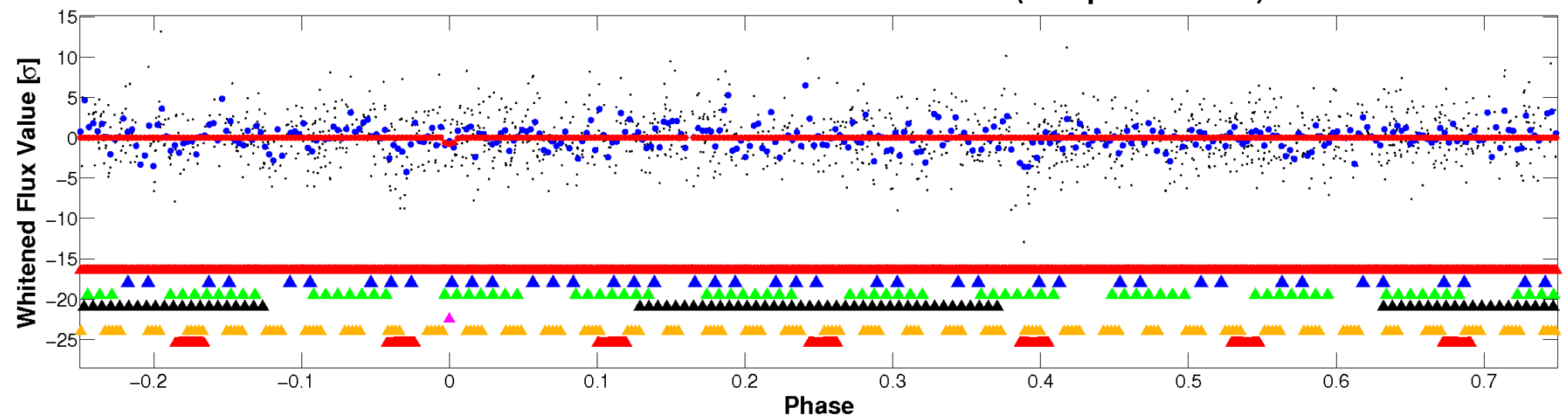


# Non-Whitened Vs. Whitened Light Curve

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

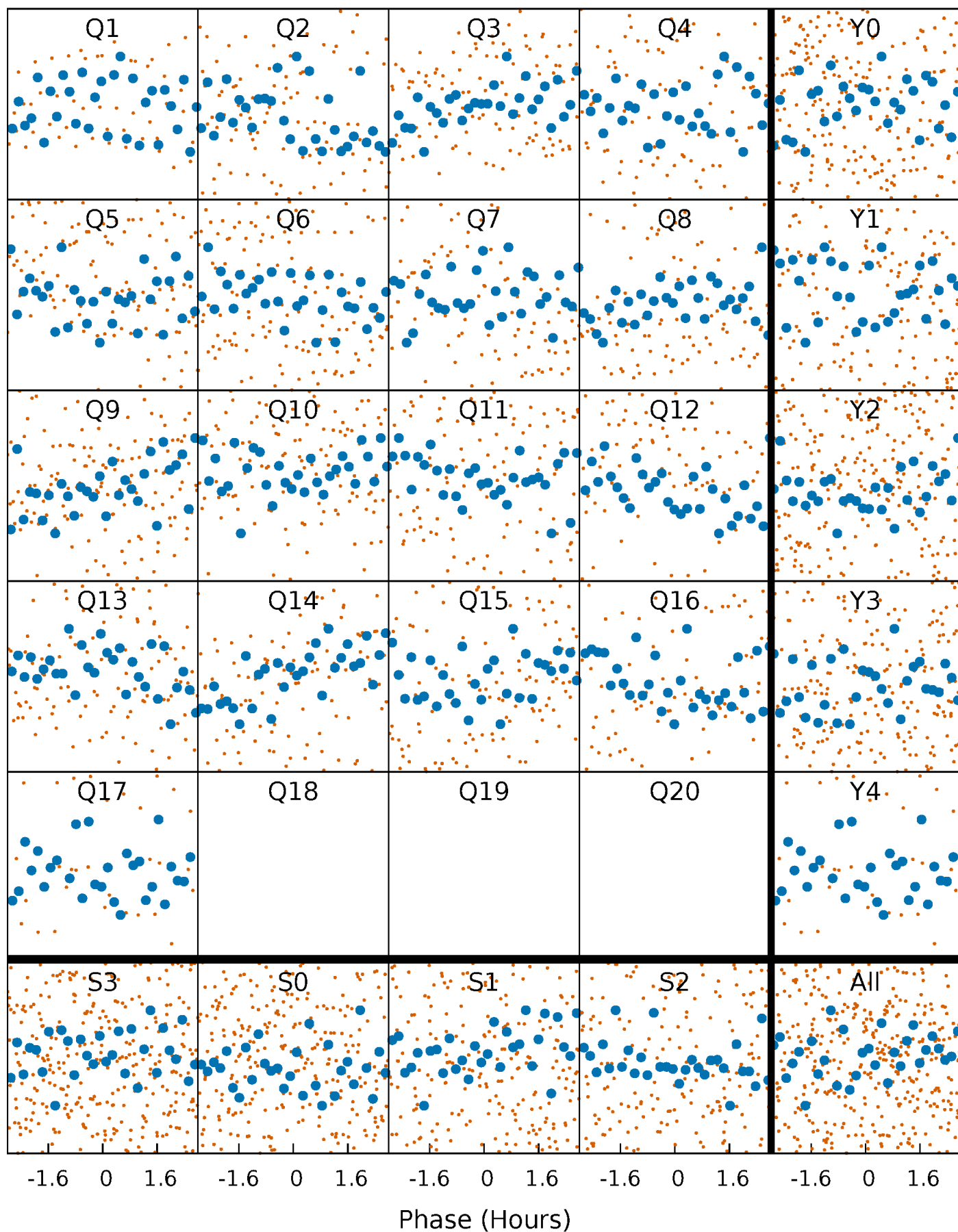


## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



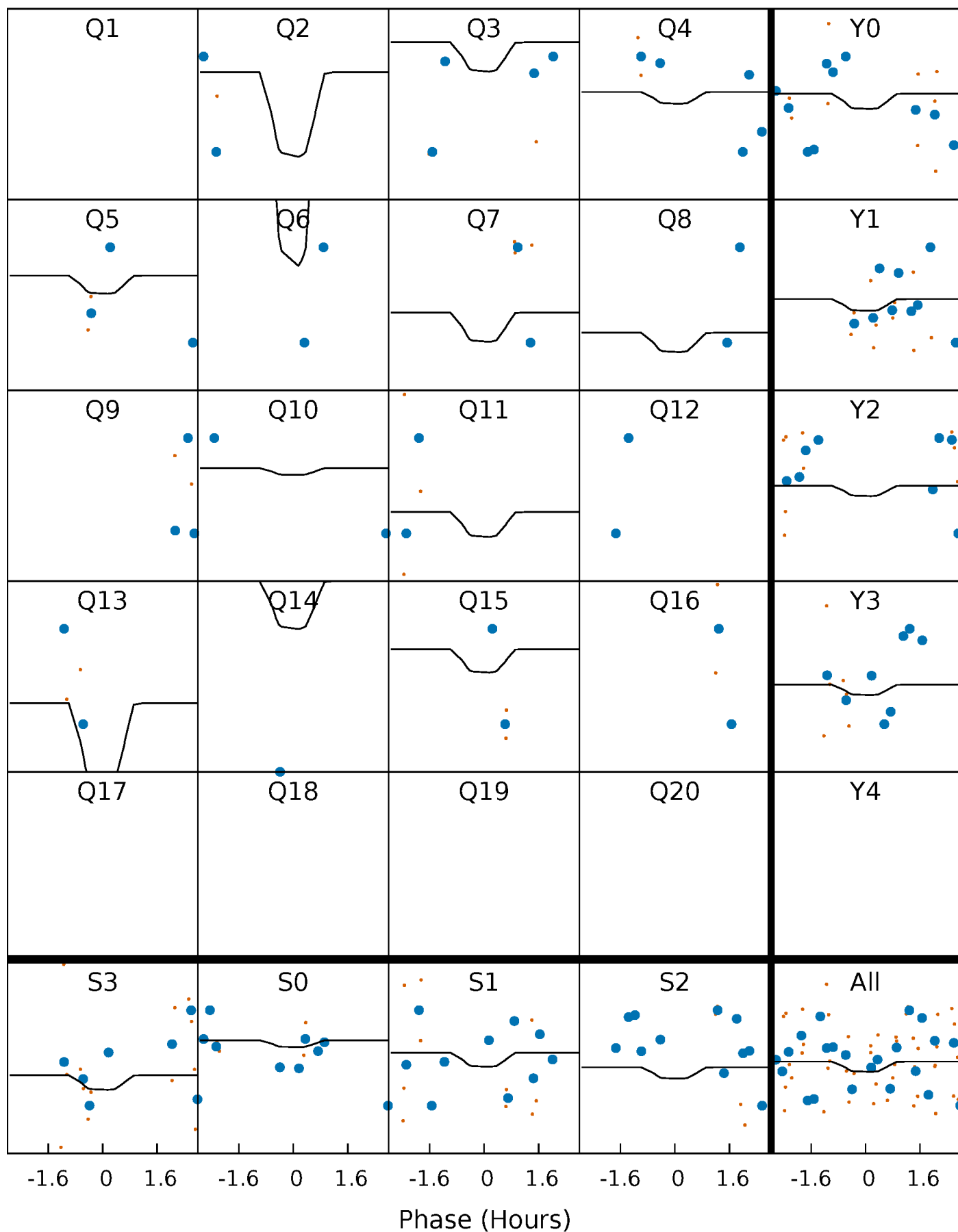
# PDC Quarter-Phased Transit Curves

TCE 009552411-05   P= 7.040981 Days    $T_0=132.840594$  (BKJD)



# DV Quarter-Phased Transit Curves

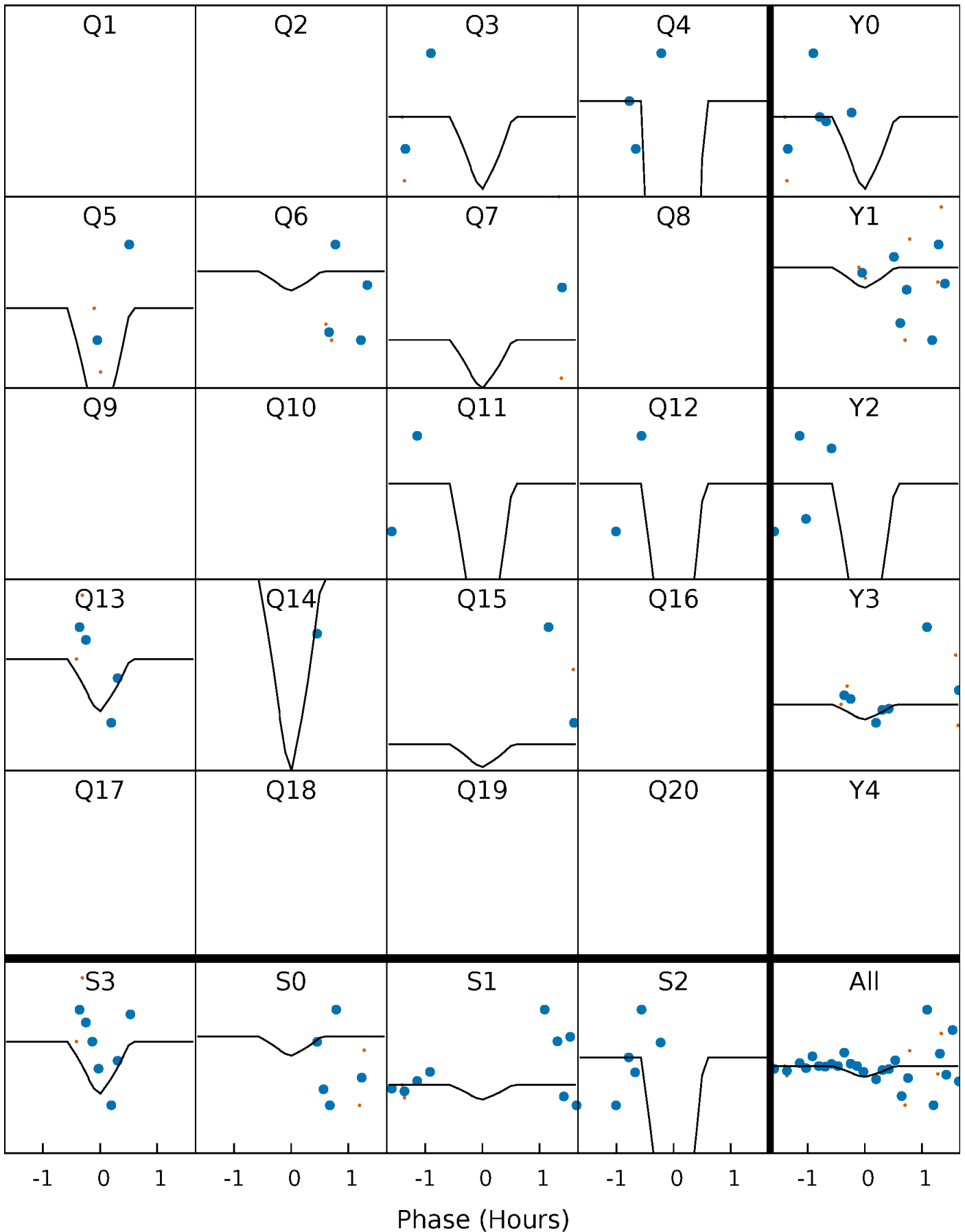
TCE 009552411-05     $P = 7.040981$  Days     $T_0 = 132.840594$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

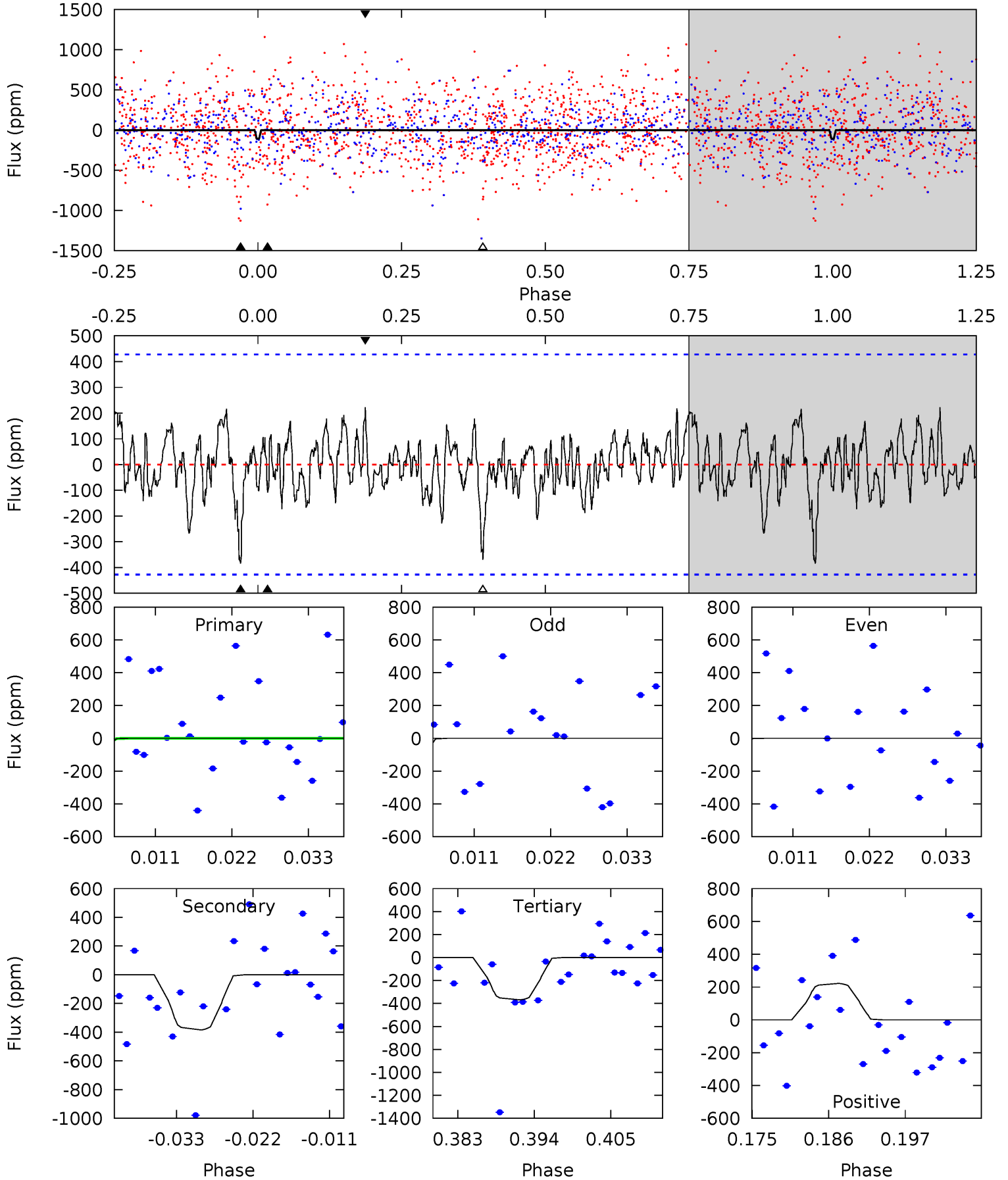
TCE 009552411-05     $P = 7.040785$  Days     $T_0 = 132.836432$  (BKJD)



# DV Model-Shift Uniqueness Test

009552411-05, P = 7.040981 Days, E = 132.840594 Days

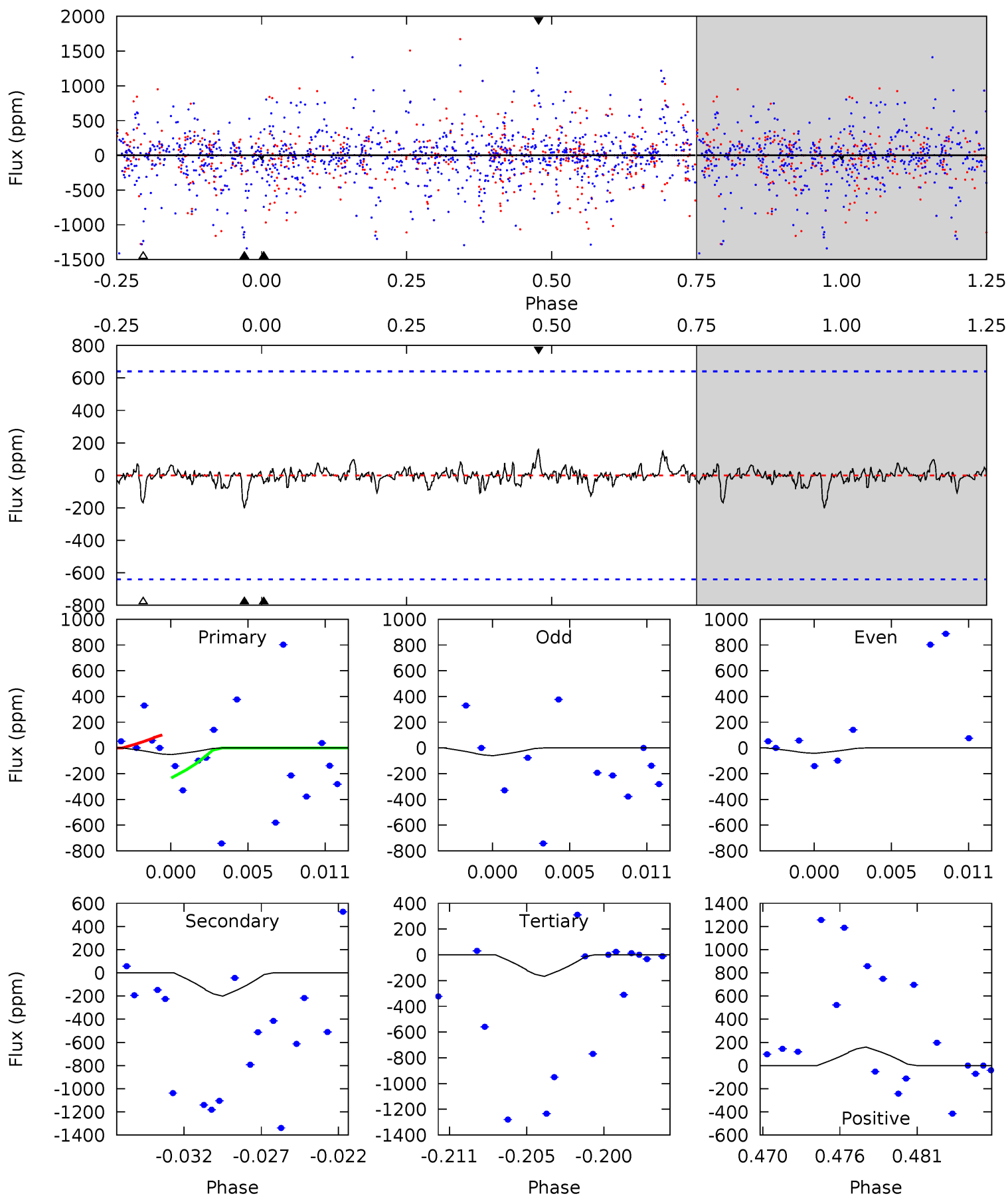
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.27	4.51	4.33	2.61	5.01	2.54	1.06	-3.05	-1.33	0.18	1.90	1.07	0.37	0.37	0.31



# Alt Model-Shift Uniqueness Test

009552411-05, P = 7.040785 Days, E = 132.836432 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.42	1.61	1.35	1.28	5.14	2.78	0.29	-0.93	-0.86	0.27	0.33	0.07	0.64	0.44	0.56



### Stellar Parameters For KIC 009552411

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6844^{+190}_{-286}$	$4.145^{+0.180}_{-0.180}$	$-0.180^{+0.250}_{-0.300}$	$1.629^{+0.494}_{-0.404}$	$1.358^{+0.202}_{-0.247}$	$0.443^{+0.435}_{-0.221}$
	+3%/-4%	+4%/-4%	+139%/-167%	+30%/-25%	+15%/-18%	+98%/-50%
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 009552411-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-385 \pm 85$	$7.88^{+7.91}_{-5.36}$	$1903^{+149}_{-134}$	$4615^{+3587}_{-1034}$	$21^{+181}_{-16}$
Alt.	$-201 \pm 125$	$8.49^{+7.98}_{-5.82}$	$1907^{+144}_{-135}$	$3925^{+2228}_{-1008}$	$8.629^{+69.389}_{-7.217}$

$T_{max}$  = 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

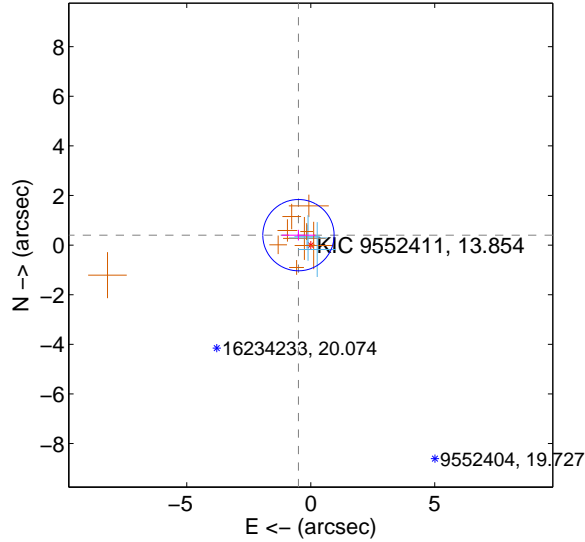
Supplemental centroid analysis for 009552411-05. Kepler magnitude: 13.85. Transit SNR 2.48

There are 3 quarters with good PRF difference image offsets

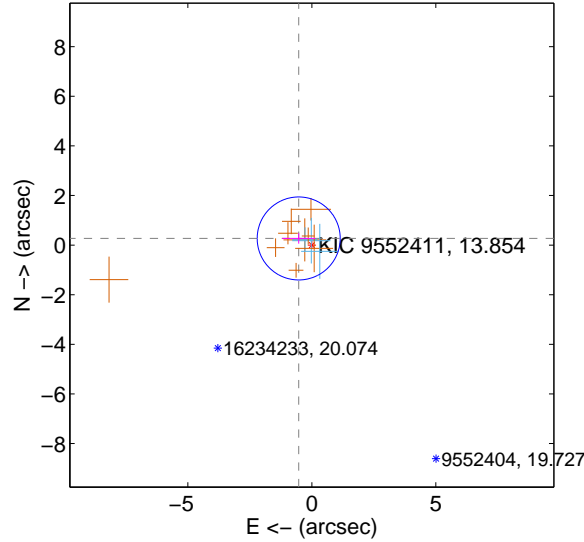
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.637 \pm 0.479$	1.33	$0.495 \pm 0.682$	$0.401 \pm 0.216$
PRF-fit source offset from KIC position	$0.593 \pm 0.558$	1.06	$0.529 \pm 0.672$	$0.268 \pm 0.211$
photometric centroid source offset	$2.68 \pm 1.82$	1.48	$-0.68 \pm 1.79$	$-2.59 \pm 1.82$

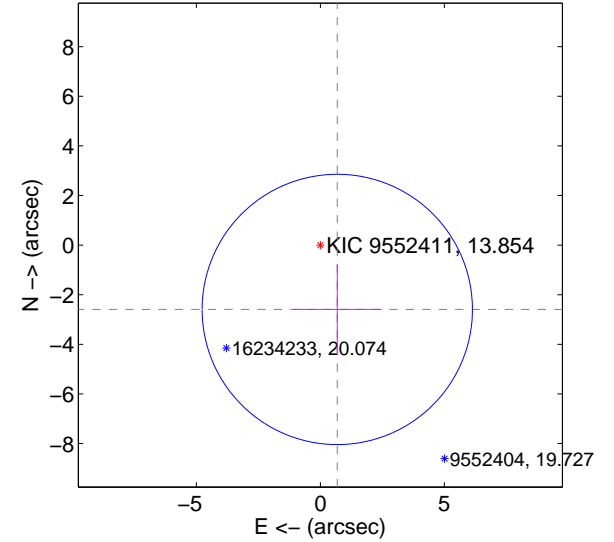
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



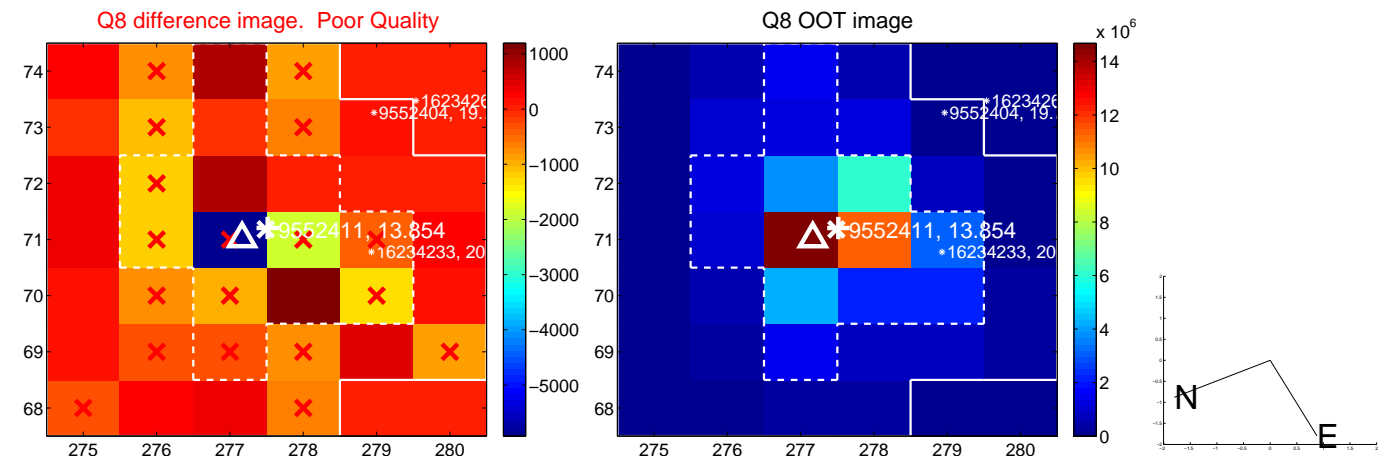
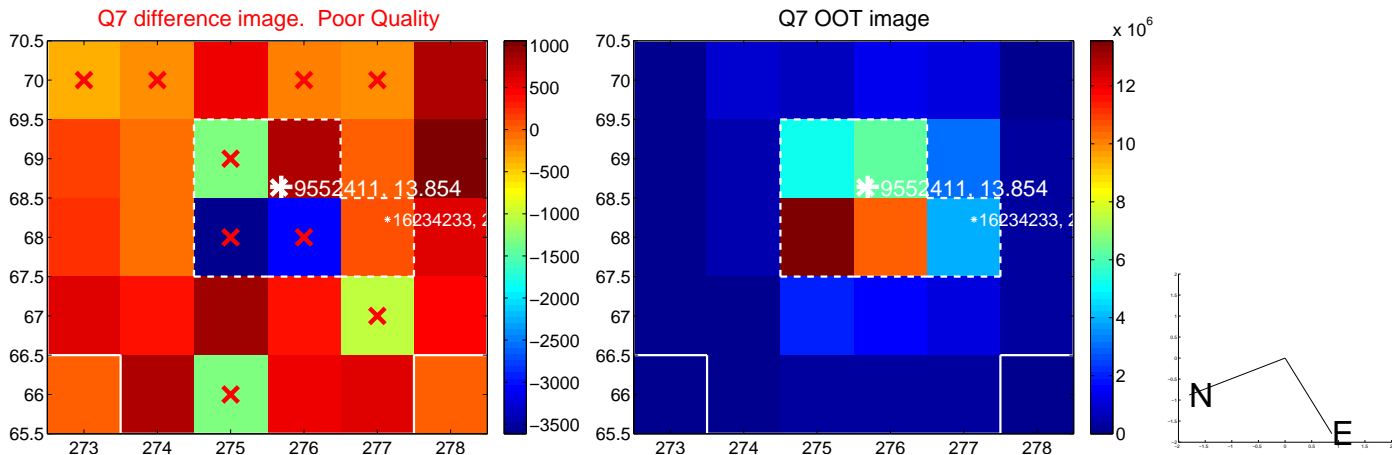
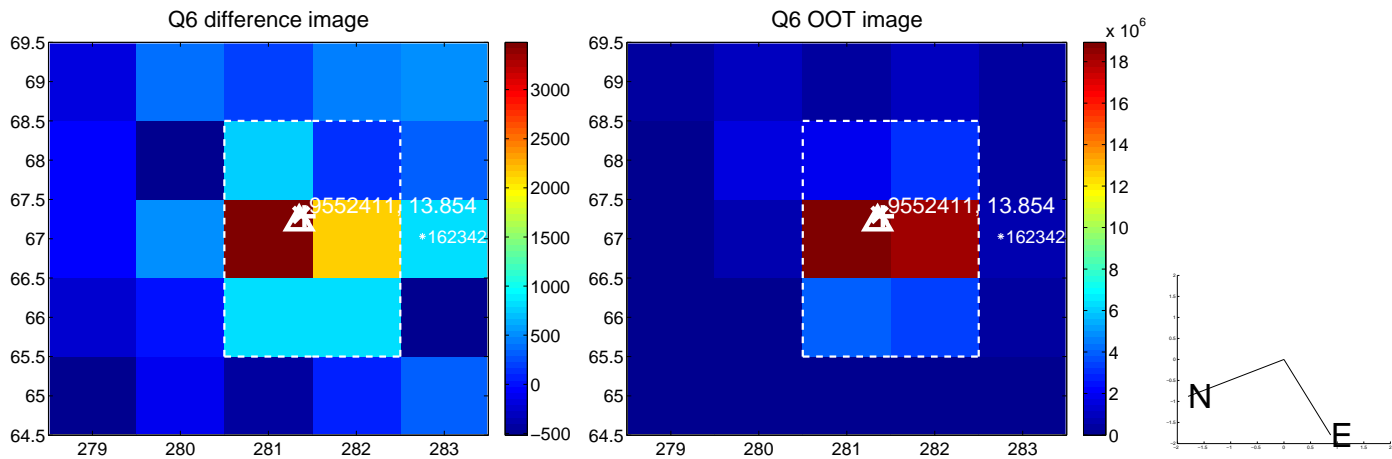
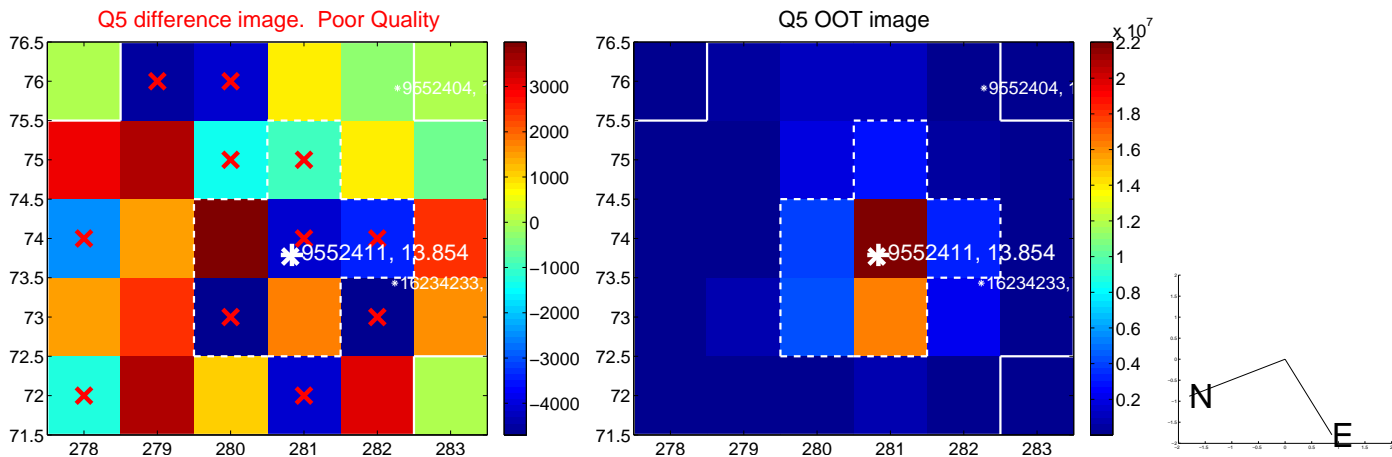
offset from photometric centroids



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

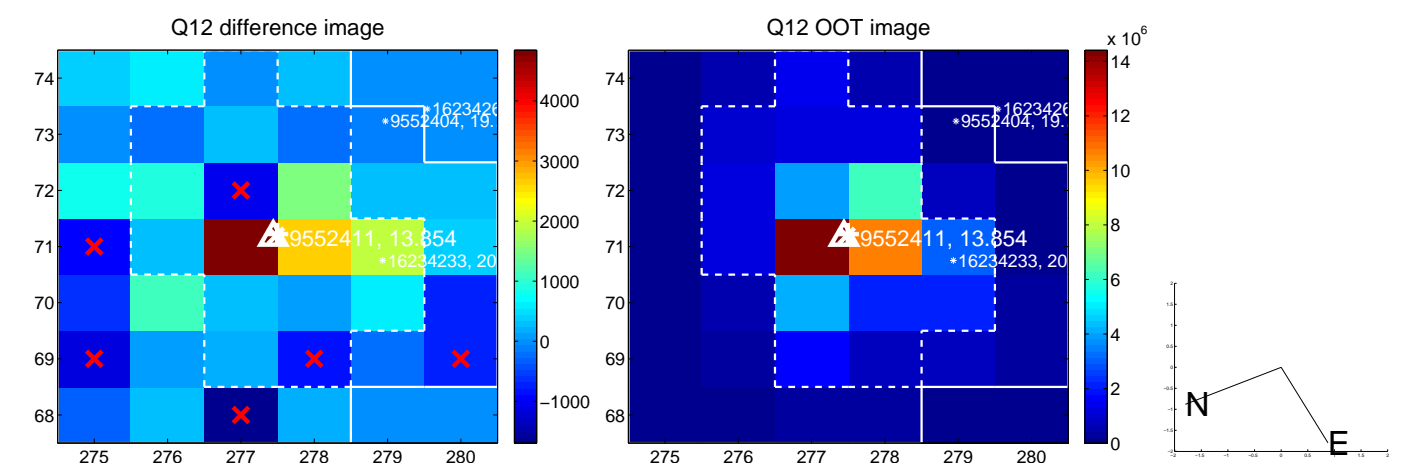
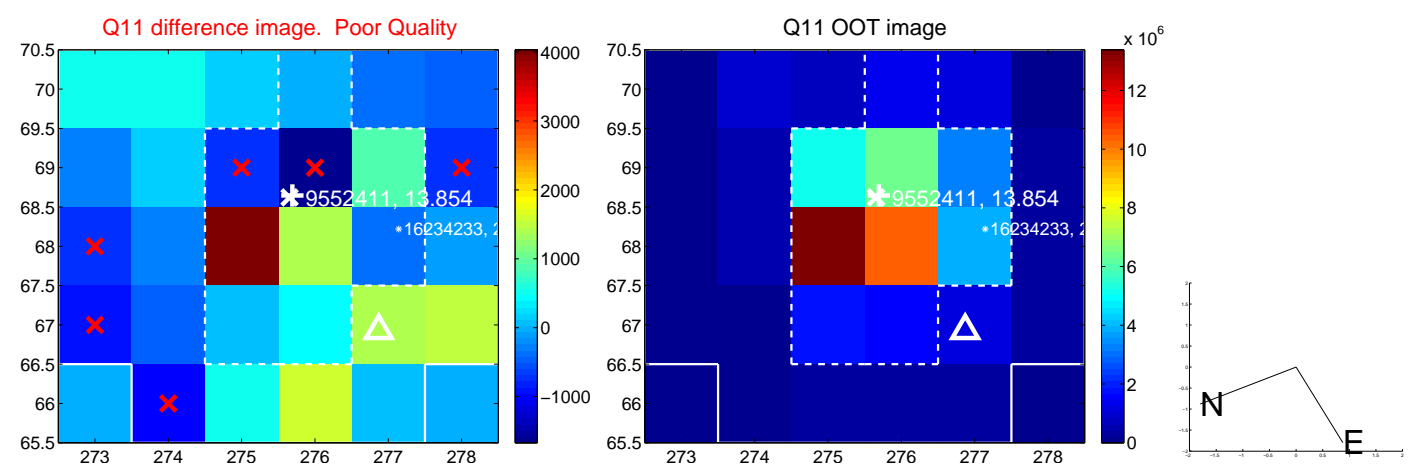
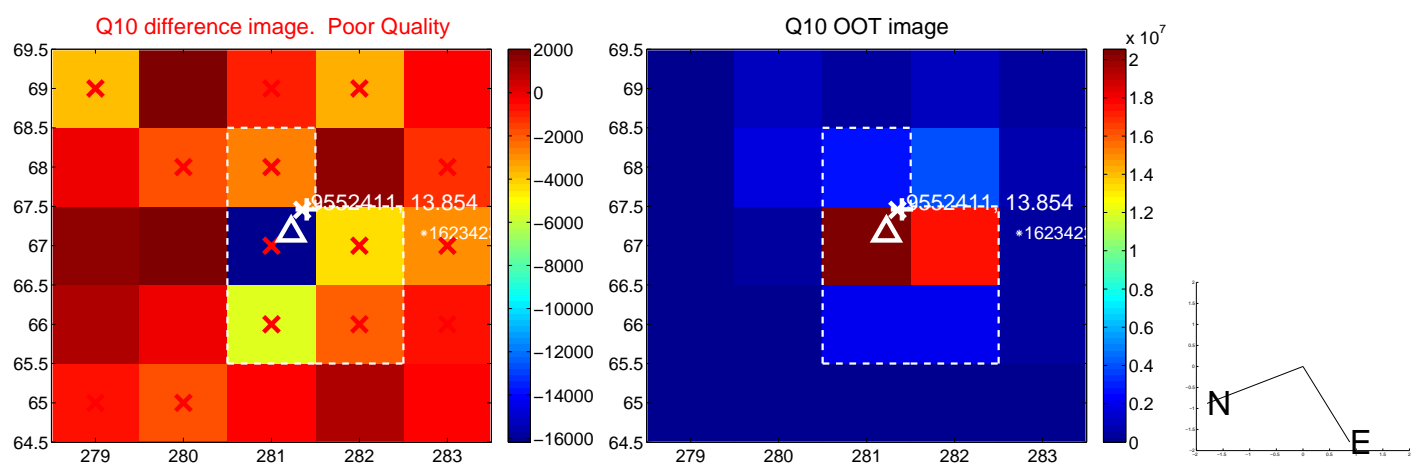
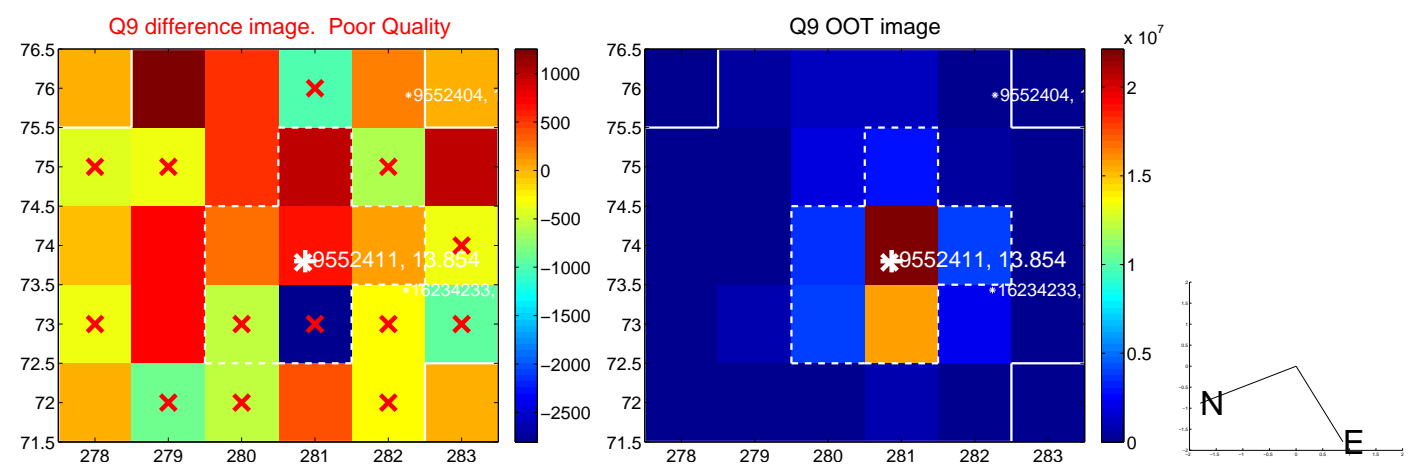


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

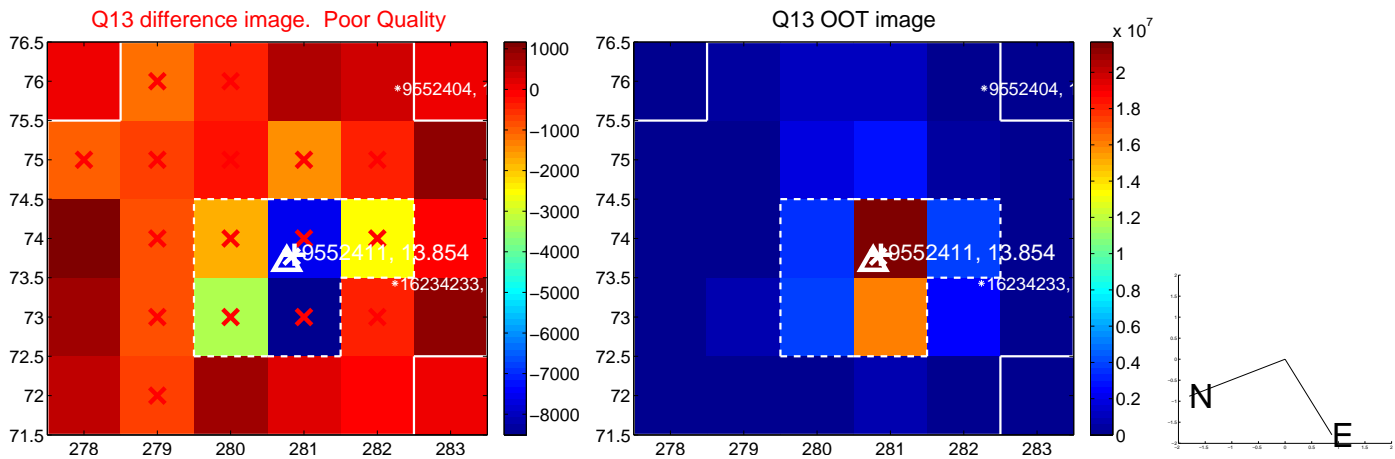




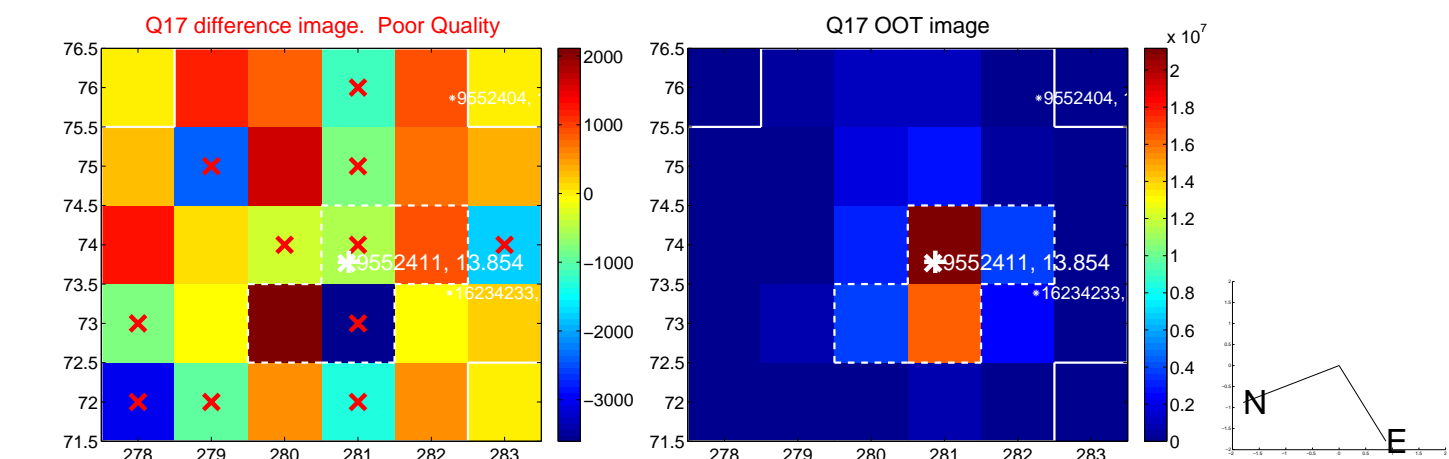
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



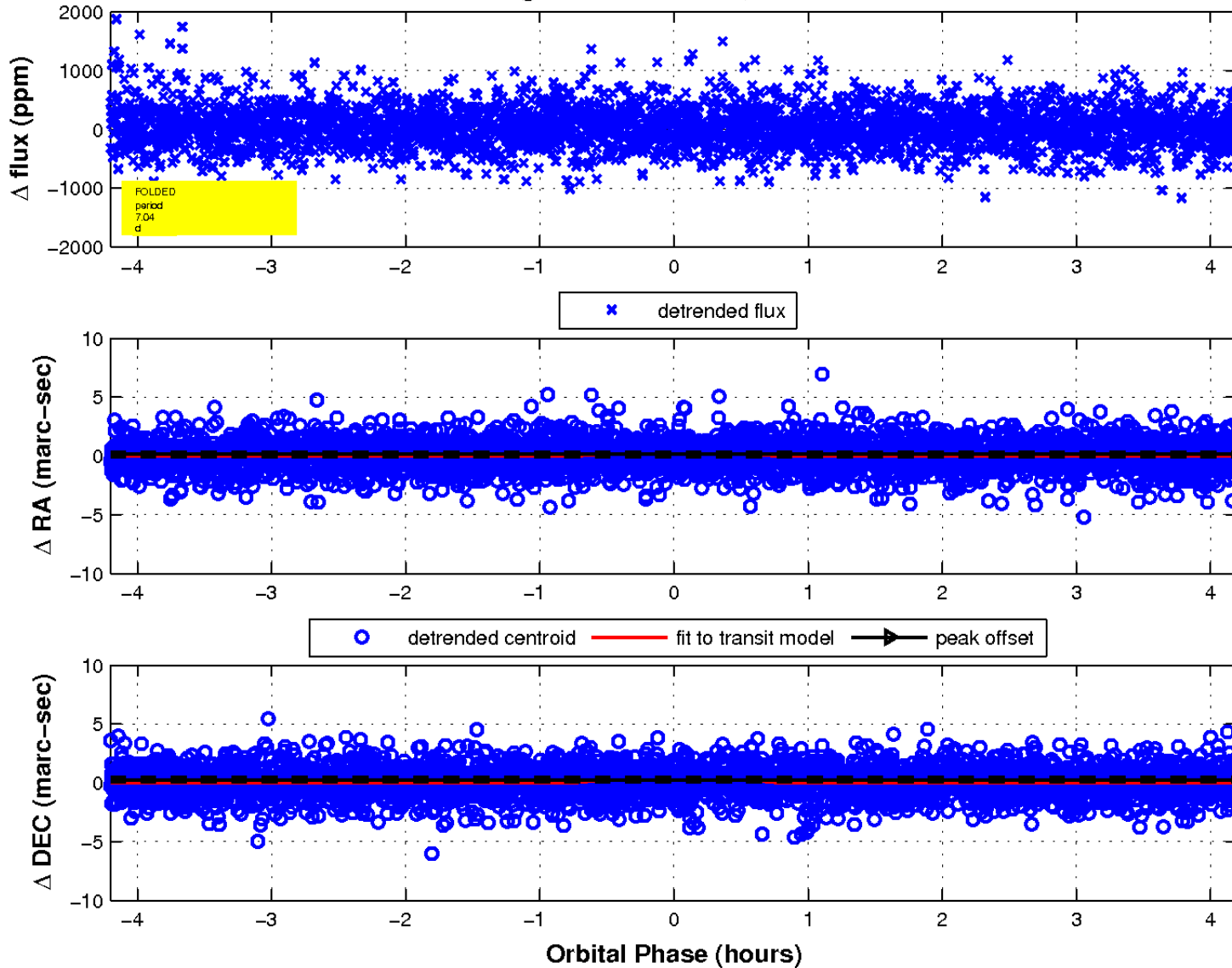
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

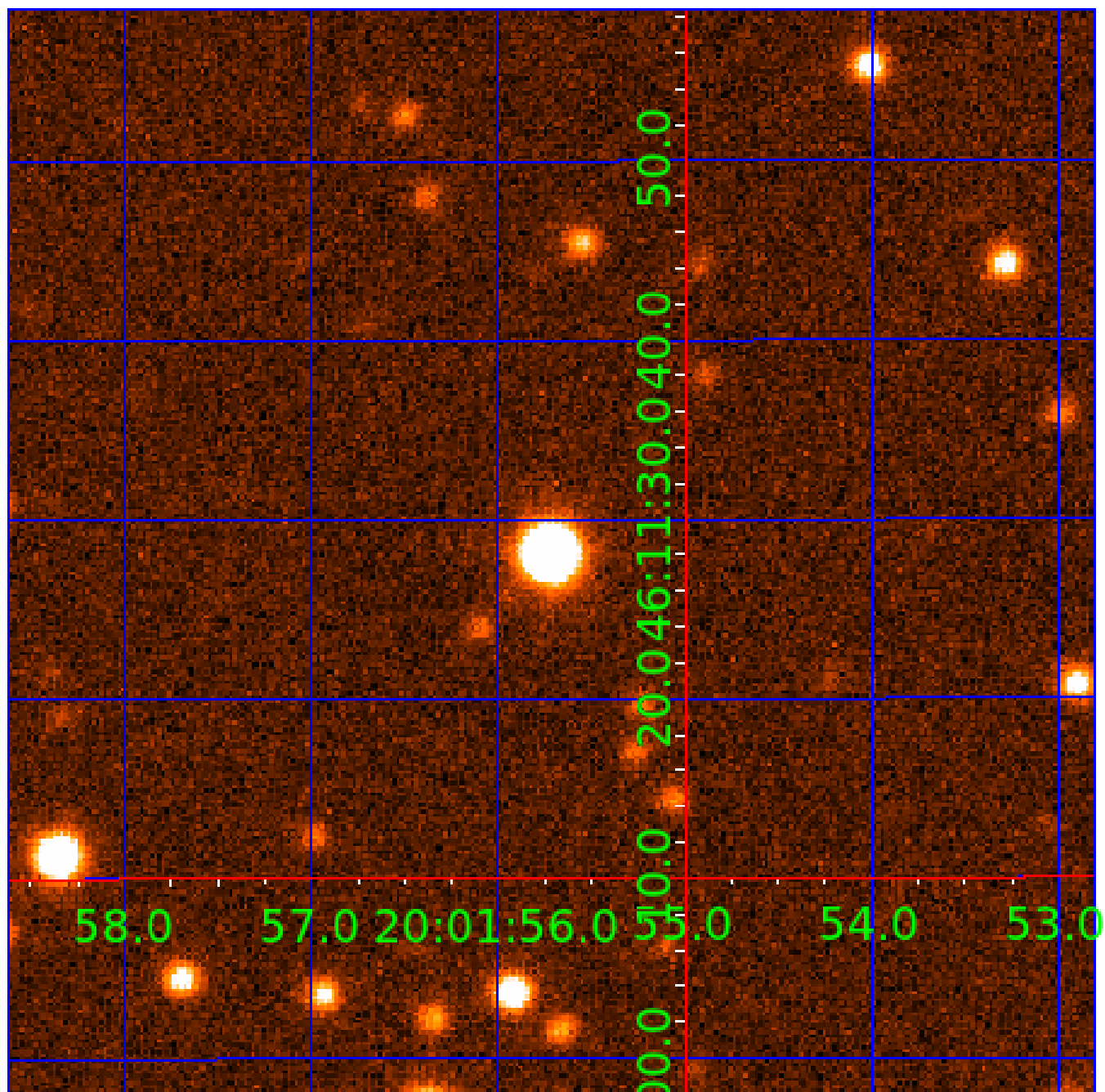


fluxWeightedCentroids, Planet 5 of 7



UKIRT Image

Declination



# KIC 009552411

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009552411-01	OBS	No	0.652146	132.002493	11.0	4.784	10.5	2.9	1.63	6844	0.58	19691.95
009552411-02	OBS	No	34.819086	141.437002	1071.8	1.336	19.7	20.6	1.63	6844	5.41	97.95
009552411-03	OBS	No	18.567813	141.108223	425.1	3.063	17.5	12.8	1.63	6844	3.69	226.50
009552411-04	OBS	No	17.623722	147.830769	84.8	72.531	14.7	6.3	1.63	6844	1.59	242.82
009552411-05	OBS	No	7.040981	132.840594	97.0	1.401	10.7	2.5	1.63	6844	1.70	825.22
009552411-06	OBS	No	8.183251	134.814653	847.1	0.898	10.8	13.2	1.63	6844	5.32	675.33
009552411-07	OBS	No	5.029754	135.557261	1166.5	3.883	14.3	19.7	1.63	6844	9.31	1292.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009552411-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009552411-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009552411-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009552411-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
009552411-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009552411-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
009552411-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

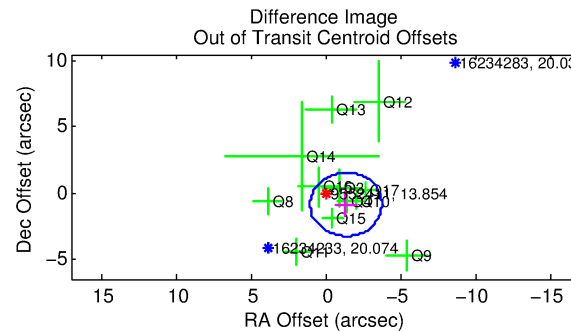
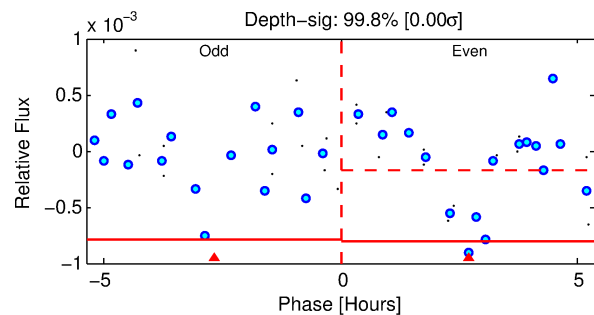
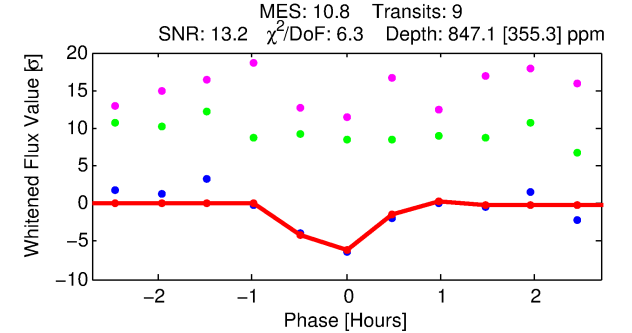
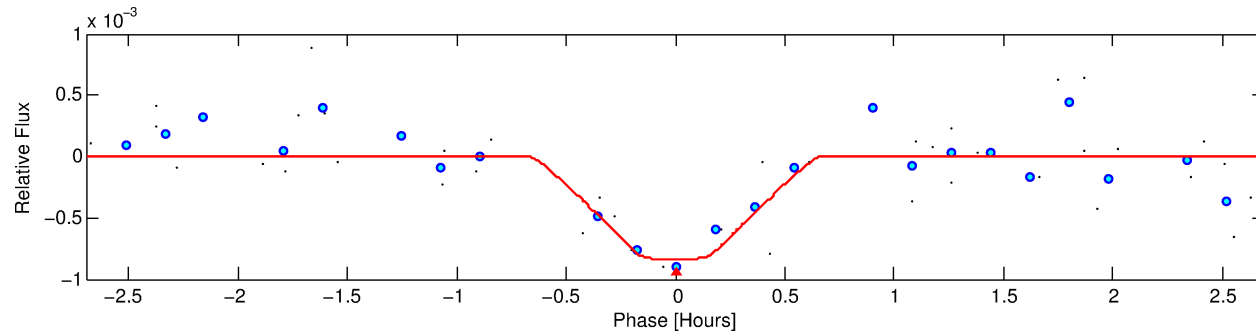
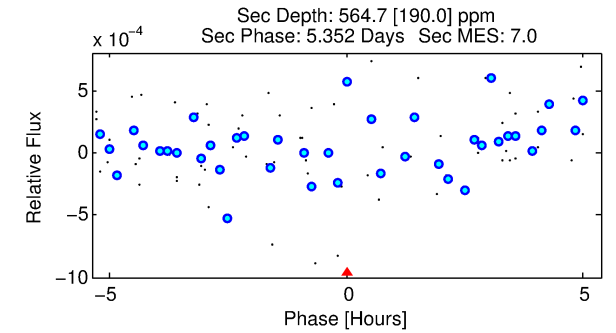
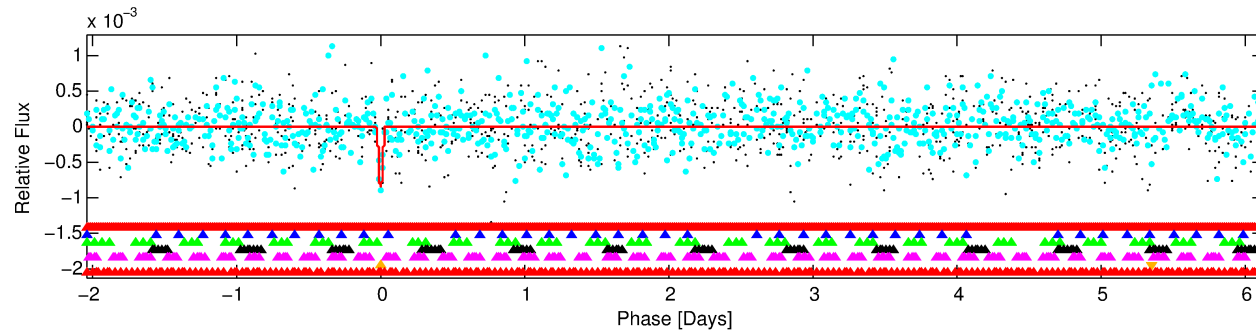
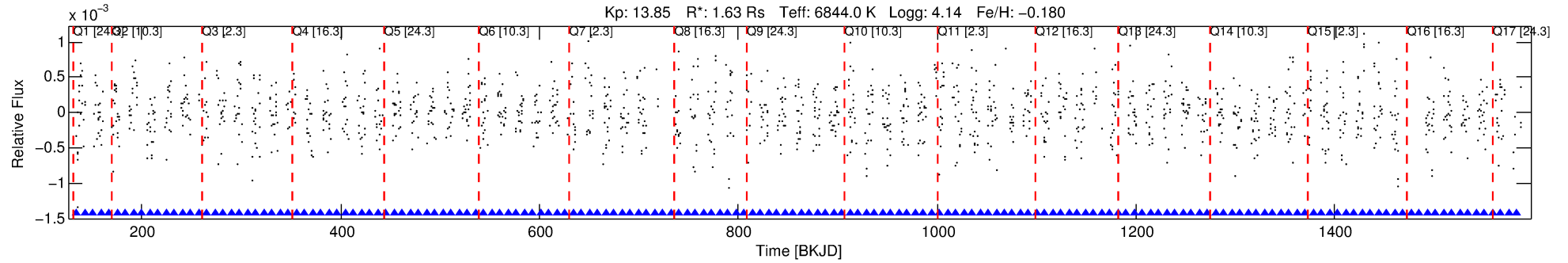
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 009552411-06

No Significant Match Found

# DV One-Page Summary

KIC: 9552411 Candidate: 6 of 7 Period: 8.183 d



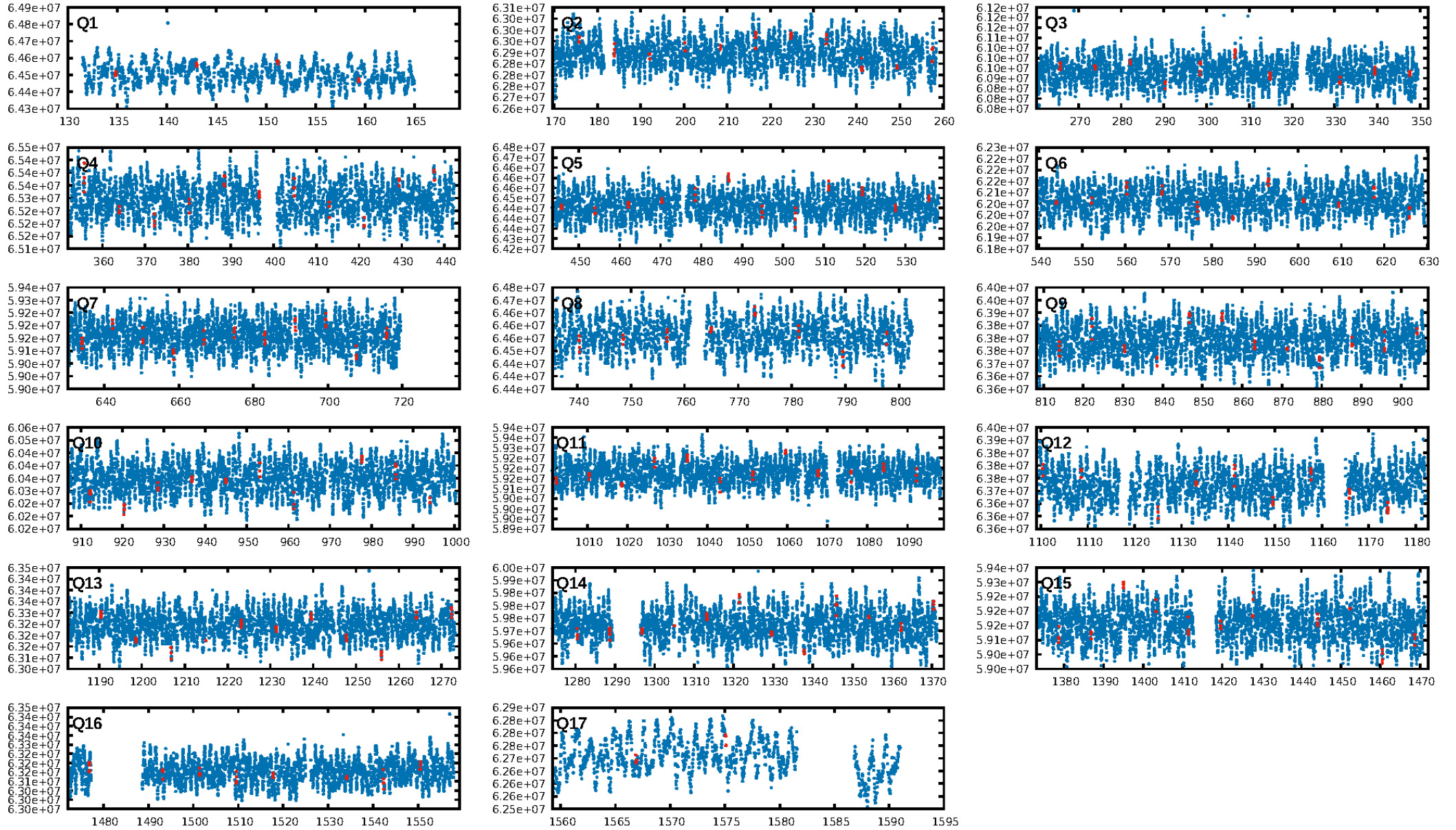
## DV Fit Results:

Period = 8.18325 [0.00008] d  
Epoch = 134.8147 [0.0056] BKJD  
Rp/R\* = 0.0299 [0.0767]  
a/R\* = 43.65 [665.08]  
b = 0.82 [6.24]  
Seff = 675.33 [257.30]  
Teff = 1300 [124] K  
Rp = 5.32 [13.73] Re  
a = 0.0879 [0.0215] AU  
Ag = 84.67 [435.67] [0.19σ]  
Teffp = 6096 [7829] K [0.61σ]

## DV Diagnostic Results:

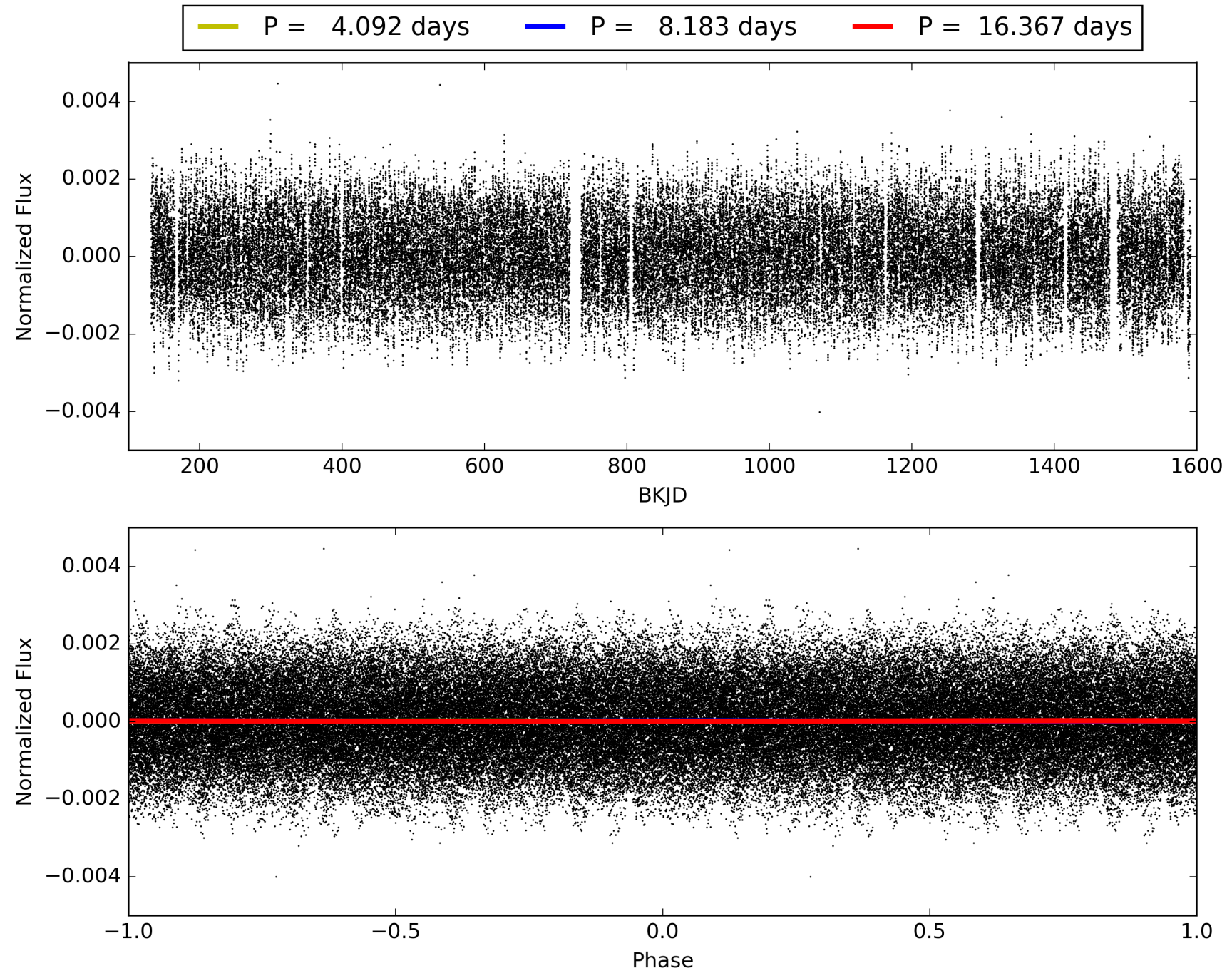
ShortPeriod-sig: 100.0% [16.47σ]  
LongPeriod-sig: 99.8% [3.12σ]  
ModelChiSquare2-sig: 0.9%  
ModelChiSquareGof-sig: 41.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: 2.844  
Centroid-sig: 34.3%  
Centroid-so: 0.487 arcsec [1.69σ]  
OotOffset-rm: 1.616 arcsec [2.02σ]  
KicOffset-rm: 1.637 arcsec [2.14σ]  
OotOffset-st: 2/3/4/3 [12]  
KicOffset-st: 2/3/4/3 [12]  
DiffImageQuality-fgm: 0.08 [1/12]  
DiffImageOverlap-fno: 0.00 [0/17]

# TCE 009552411-06, PDC Light Curves



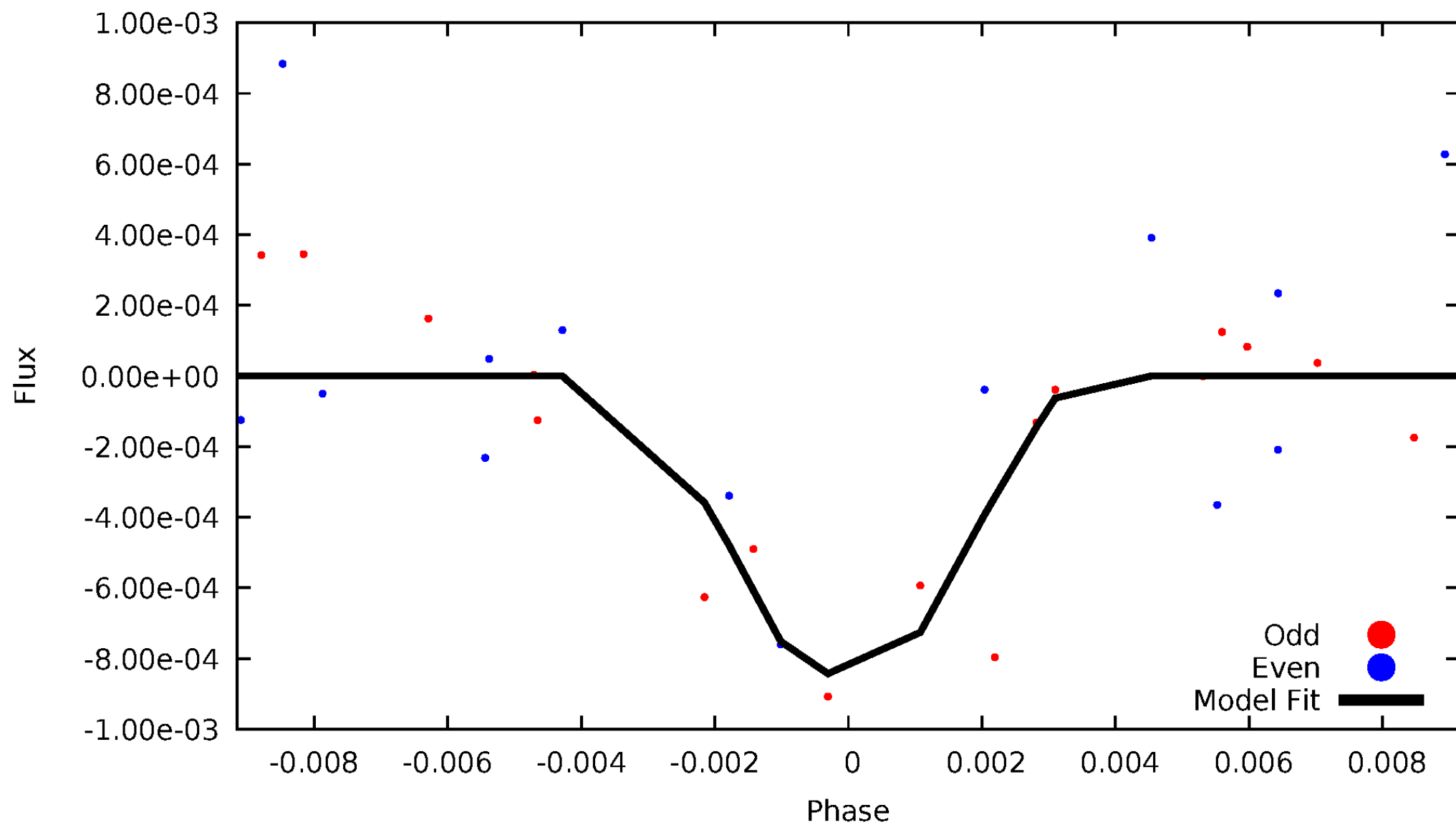


TCE 009552411-06



# DV Odd/Even

TCE 009552411-06



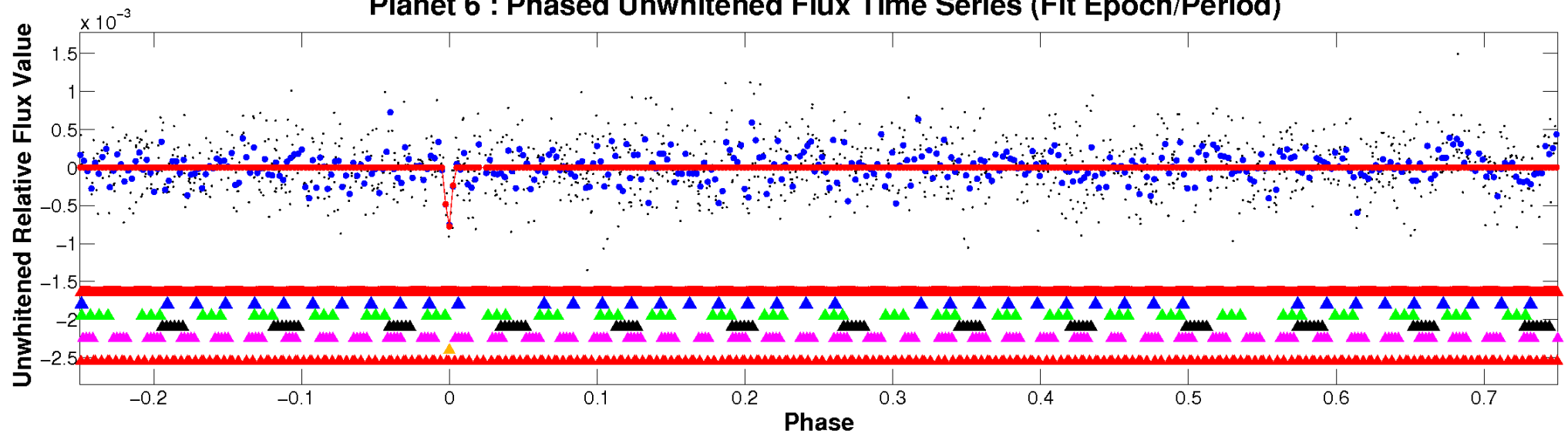


ALT Odd/Even

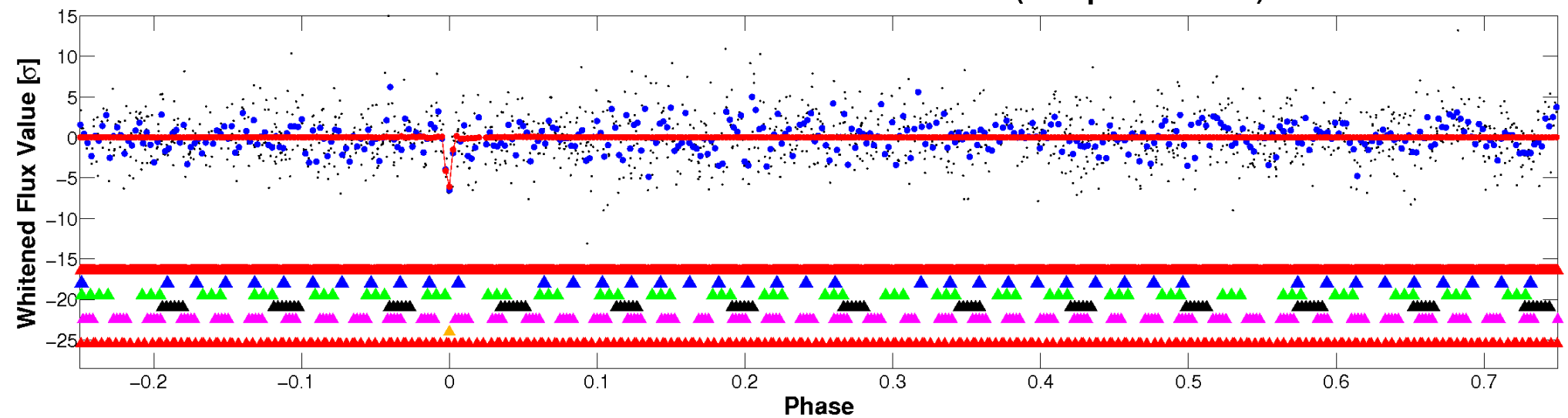
This plot does not exist for this TCE.

# Non-Whitened Vs. Whitened Light Curve

## Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

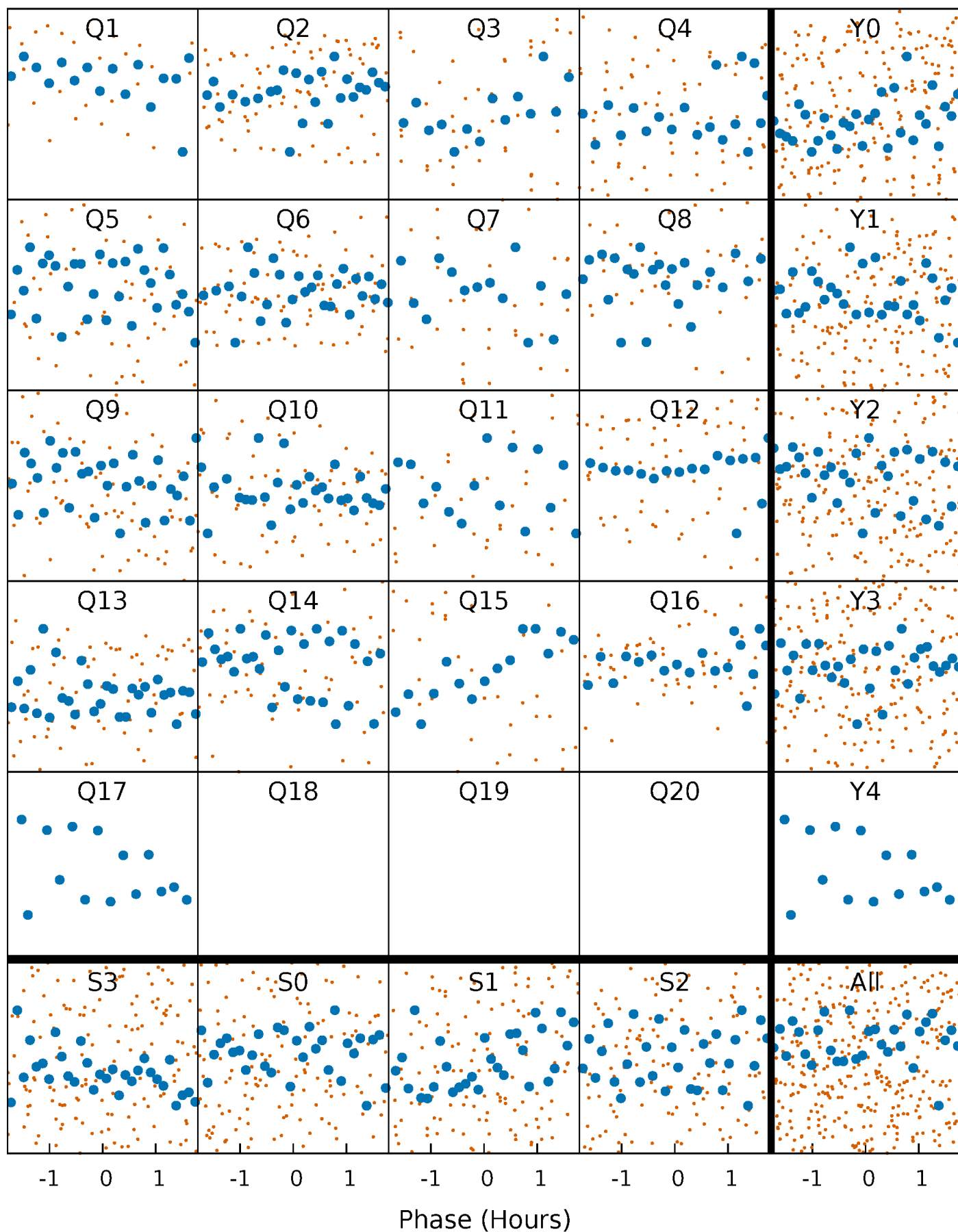


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



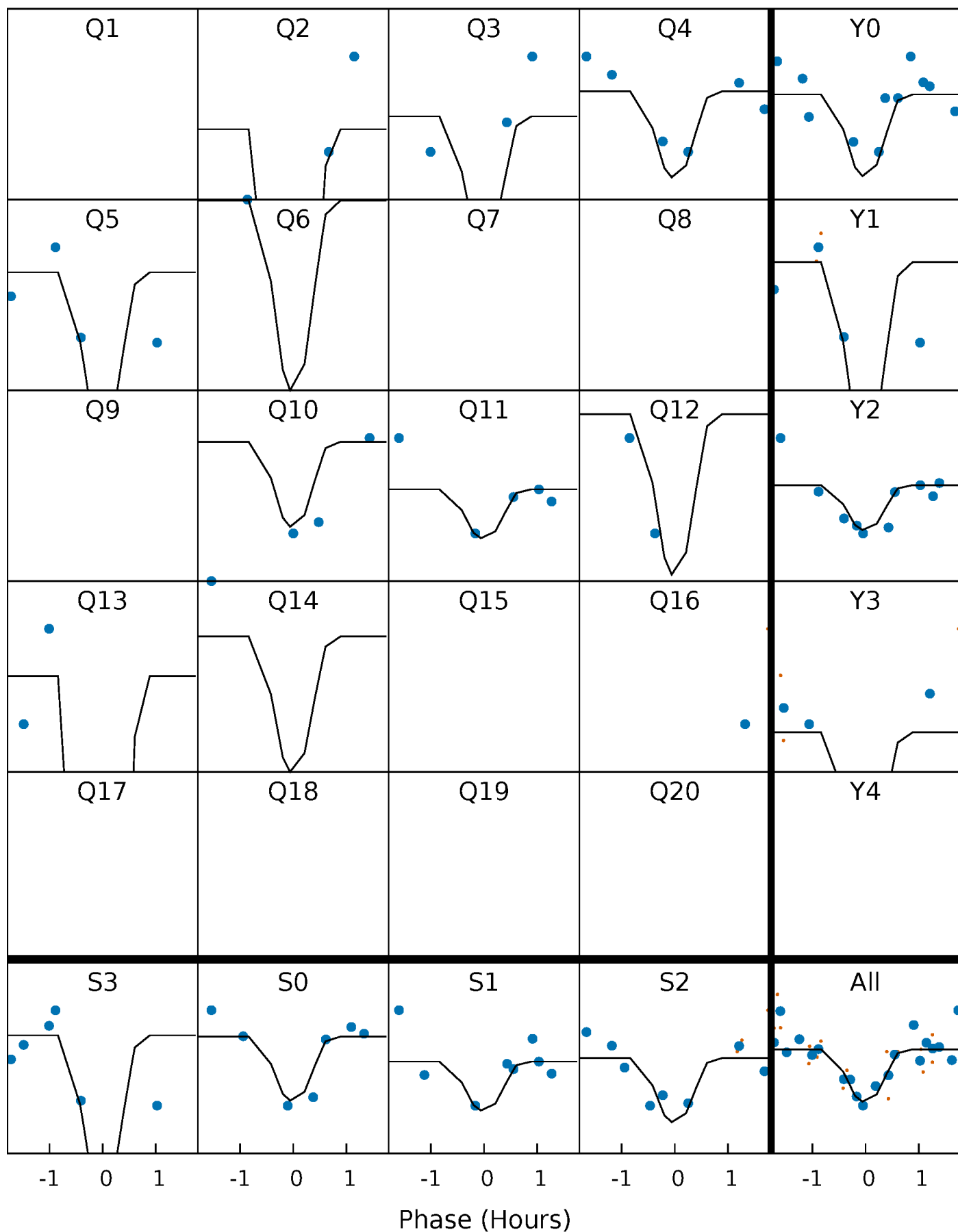
# PDC Quarter-Phased Transit Curves

TCE 009552411-06 P= 8.183251 Days  $T_0=134.814653$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 009552411-06 P= 8.183251 Days  $T_0=134.814653$  (BKJD)



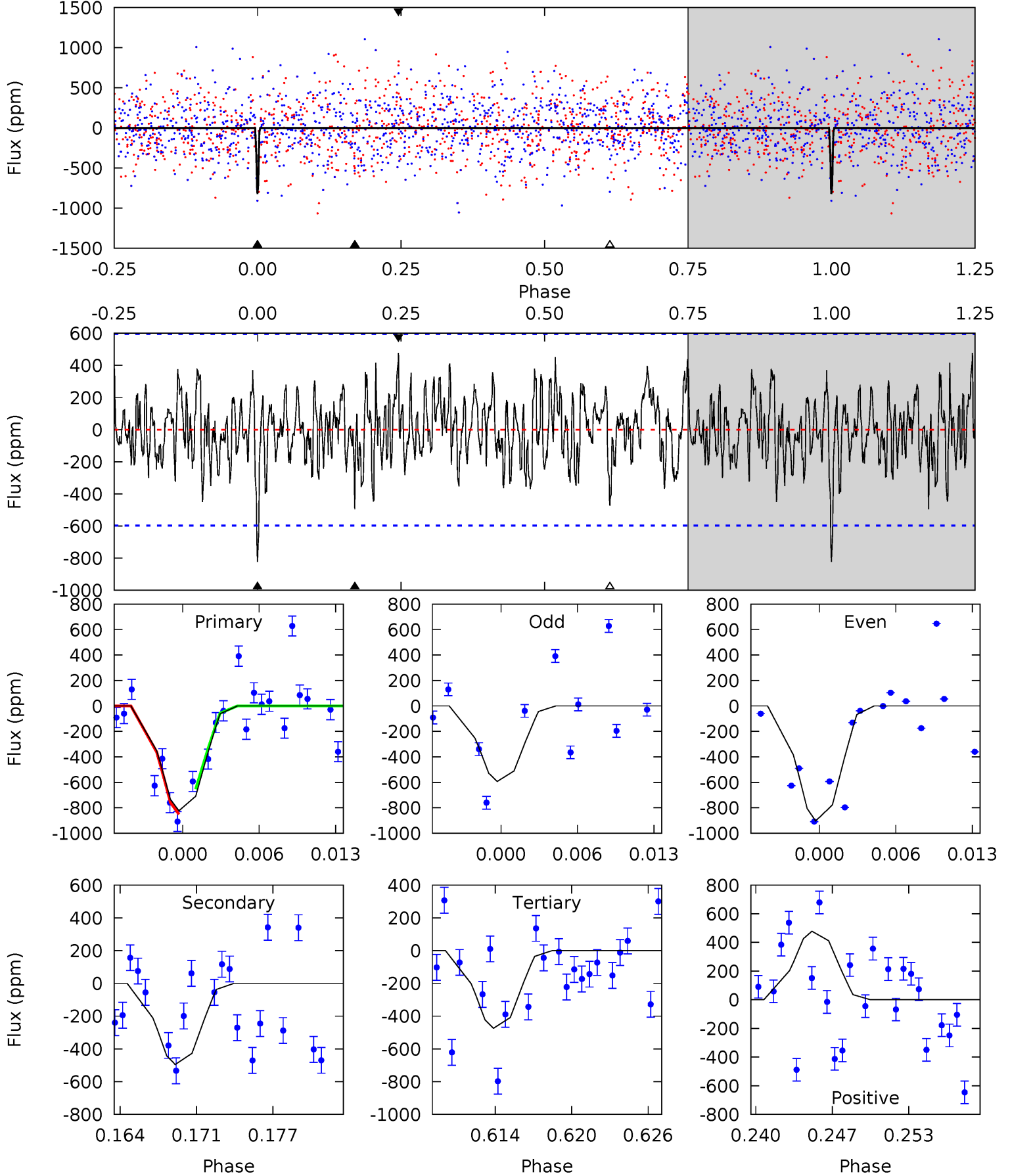


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

009552411-06, P = 8.183251 Days, E = 134.814653 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
7.06	4.25	4.06	4.10	5.11	2.73	1.48	2.99	2.96	0.19	0.15	1.11	1.00	0.37	0.85



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 009552411

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6844^{+190}_{-286}$	$4.145^{+0.180}_{-0.180}$	$-0.180^{+0.250}_{-0.300}$	$1.629^{+0.494}_{-0.404}$	$1.358^{+0.202}_{-0.247}$	$0.443^{+0.435}_{-0.221}$
	+3%/-4%	+4%/-4%	+139%/-167%	+30%/-25%	+15%/-18%	+98%/-50%
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 009552411-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-496 \pm 117$	$10.92^{+12.77}_{-7.28}$	$1811^{+140}_{-136}$	$4276^{+3061}_{-987}$	$17^{+145}_{-14}$
Alt.	N/A	N/A	N/A	N/A	N/A

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

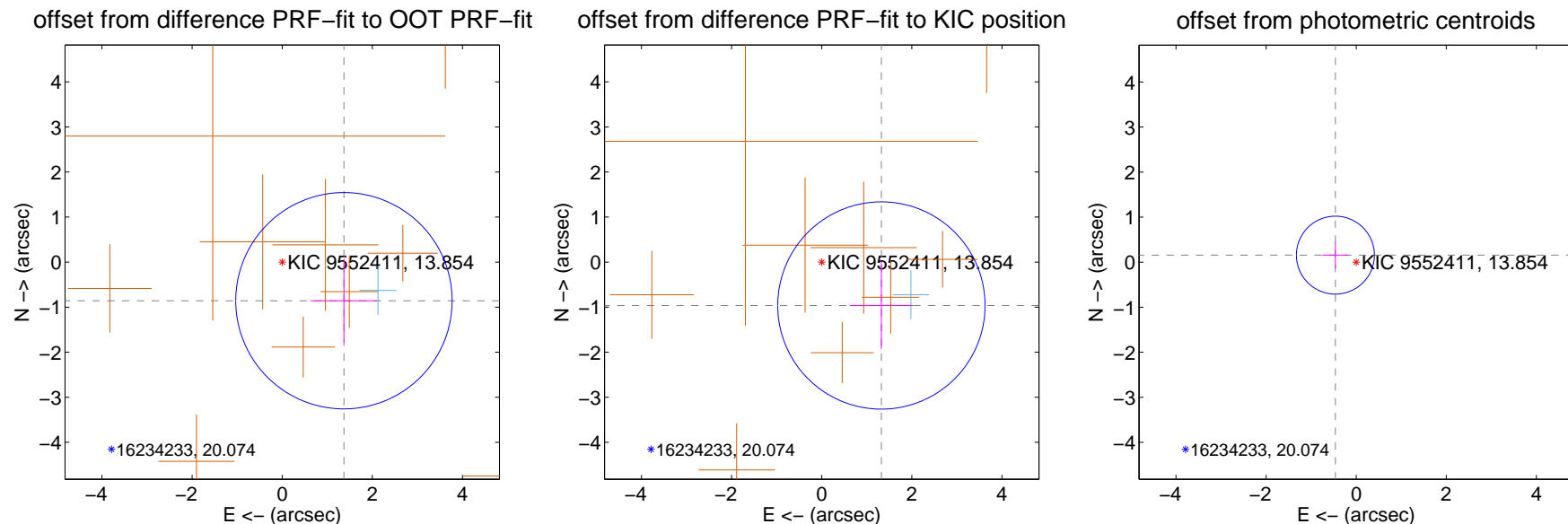
## DV Centroid Data

Supplemental centroid analysis for 009552411-06. Kepler magnitude: 13.85. Transit SNR 13.16

There are 1 quarters with good PRF difference image offsets

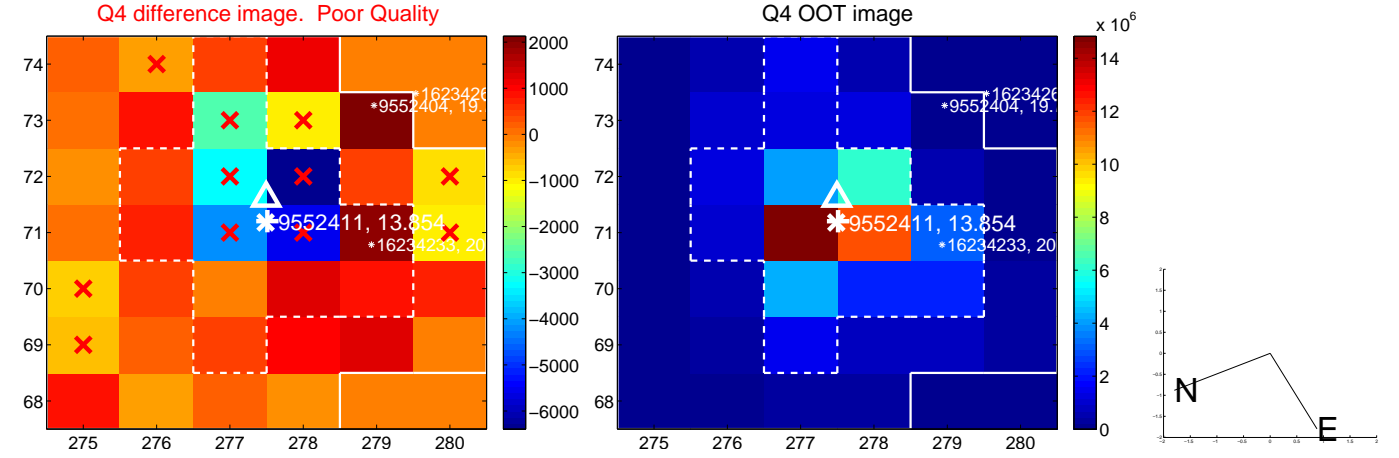
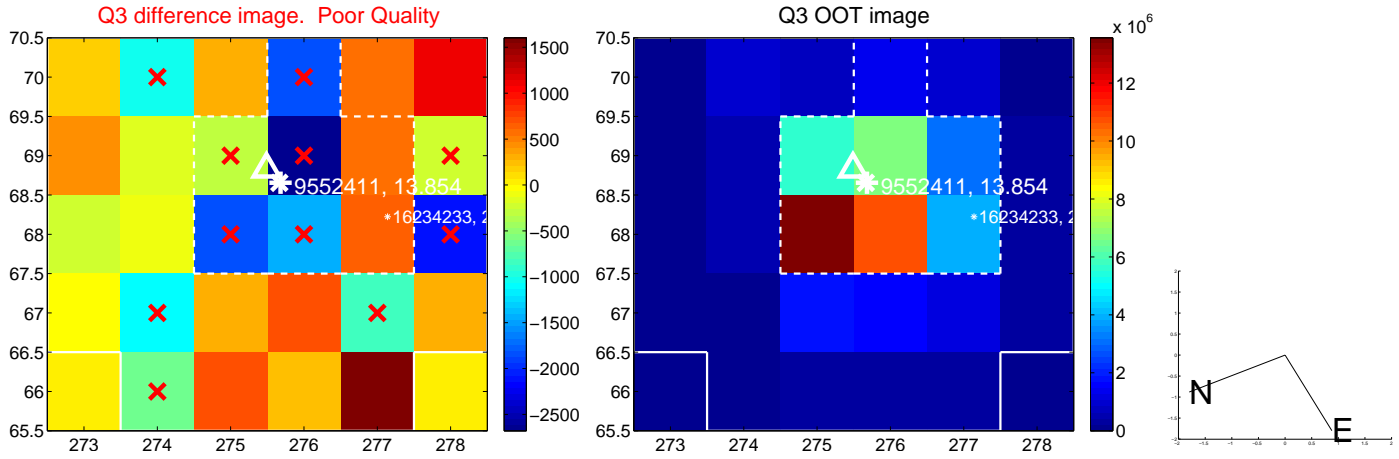
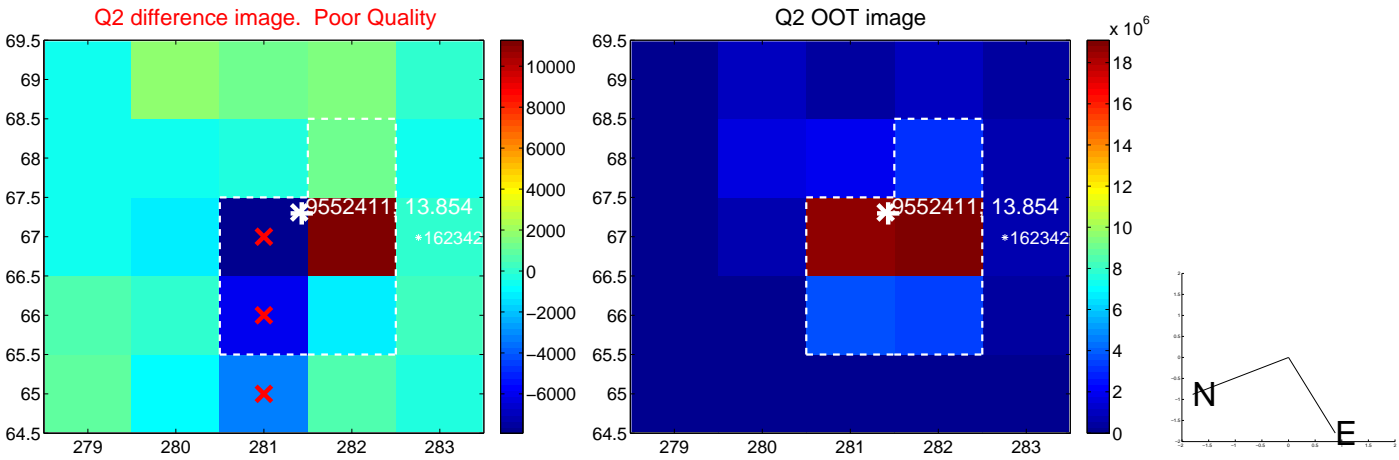
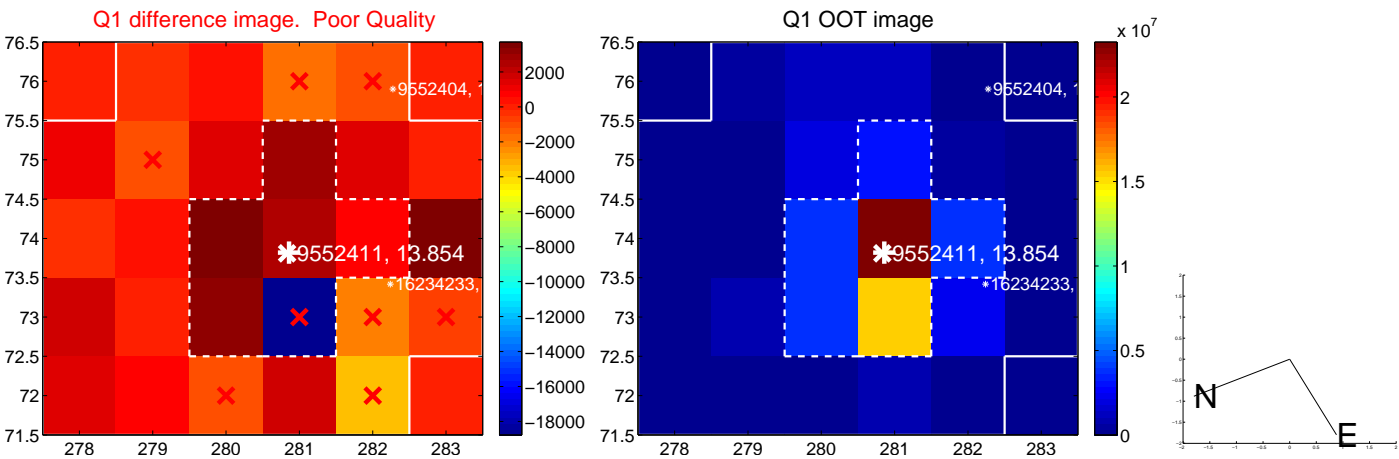
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.616 \pm 0.800$	2.02	$-1.369 \pm 0.735$	$-0.858 \pm 0.934$
PRF-fit source offset from KIC position	$1.637 \pm 0.767$	2.14	$-1.324 \pm 0.699$	$-0.963 \pm 0.966$
photometric centroid source offset	$0.49 \pm 0.29$	1.69	$0.46 \pm 0.29$	$0.16 \pm 0.29$

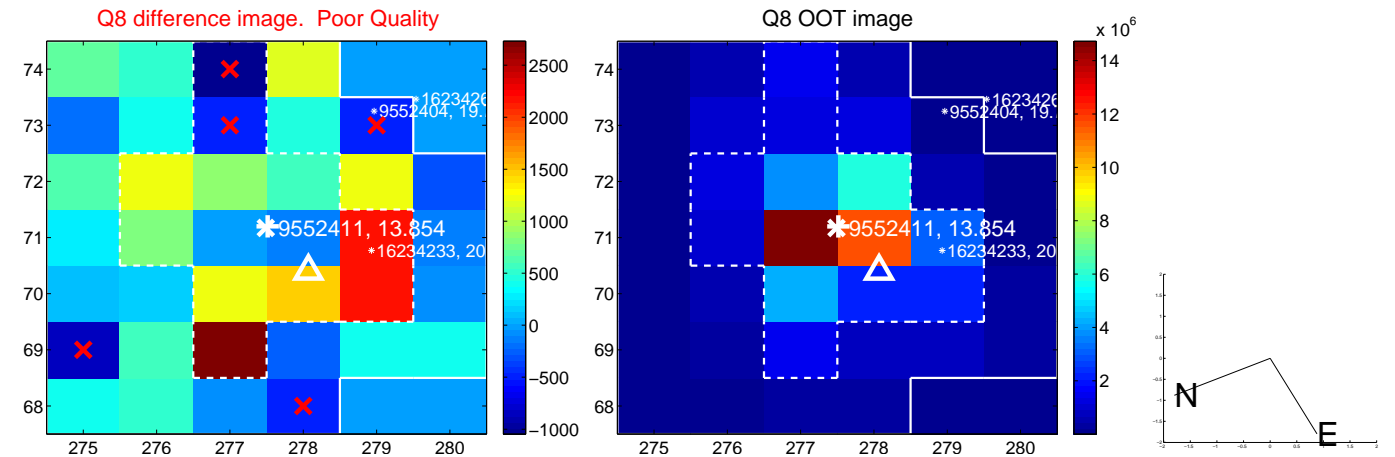
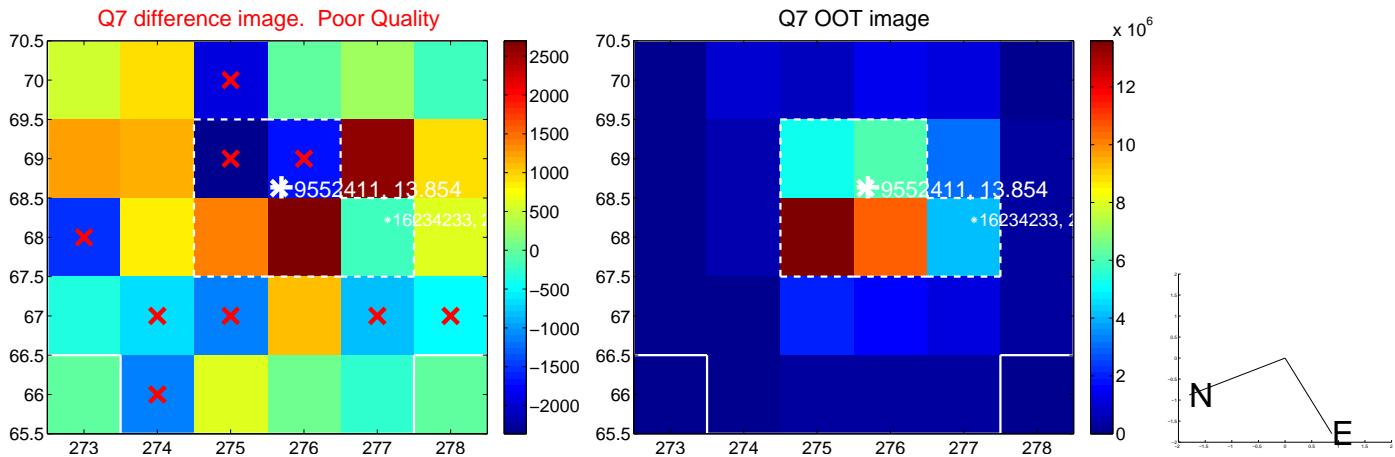
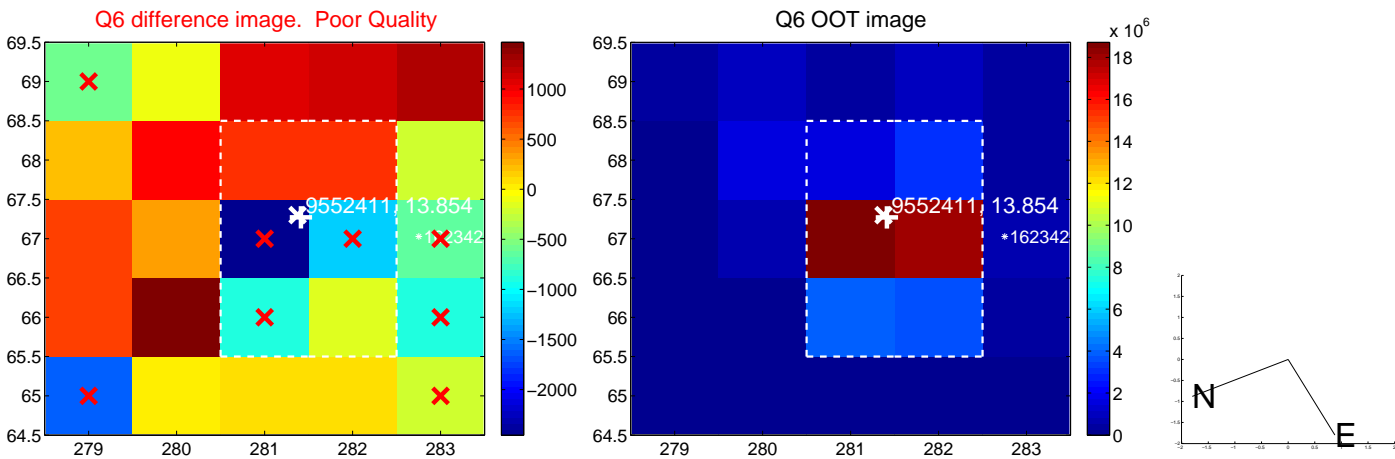
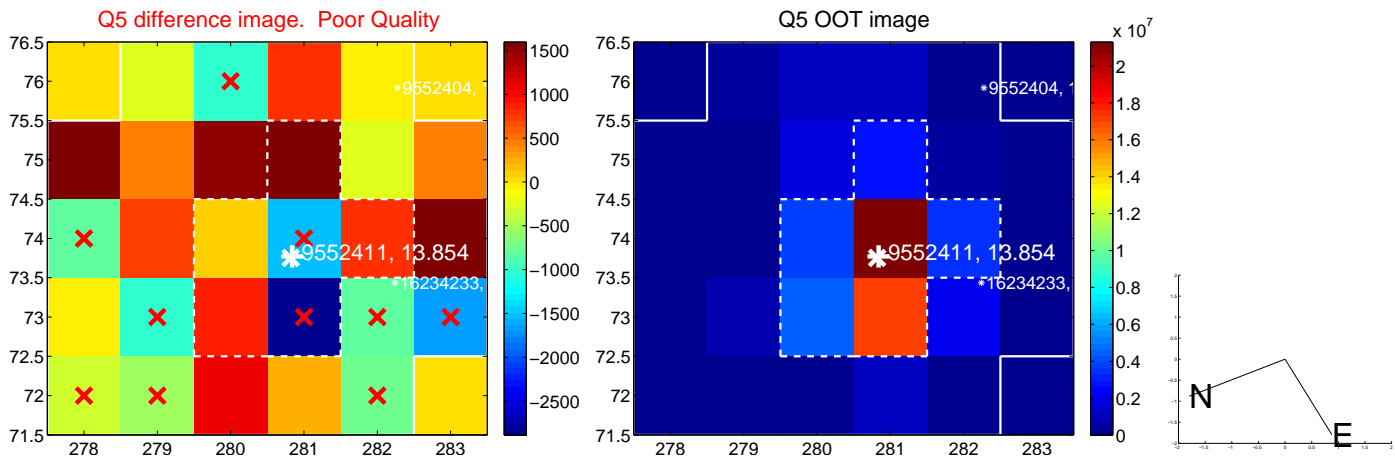


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

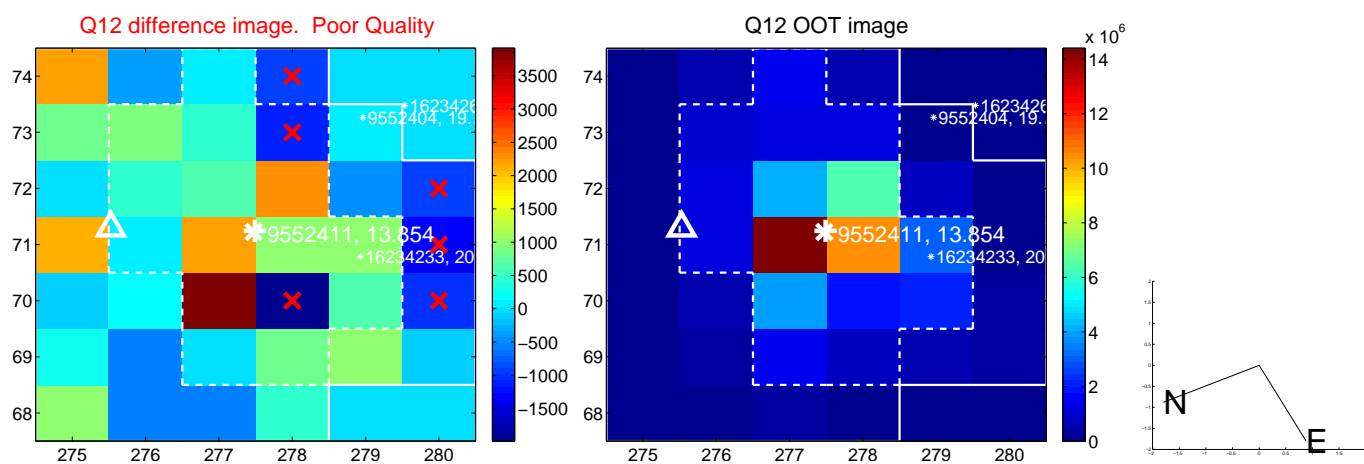
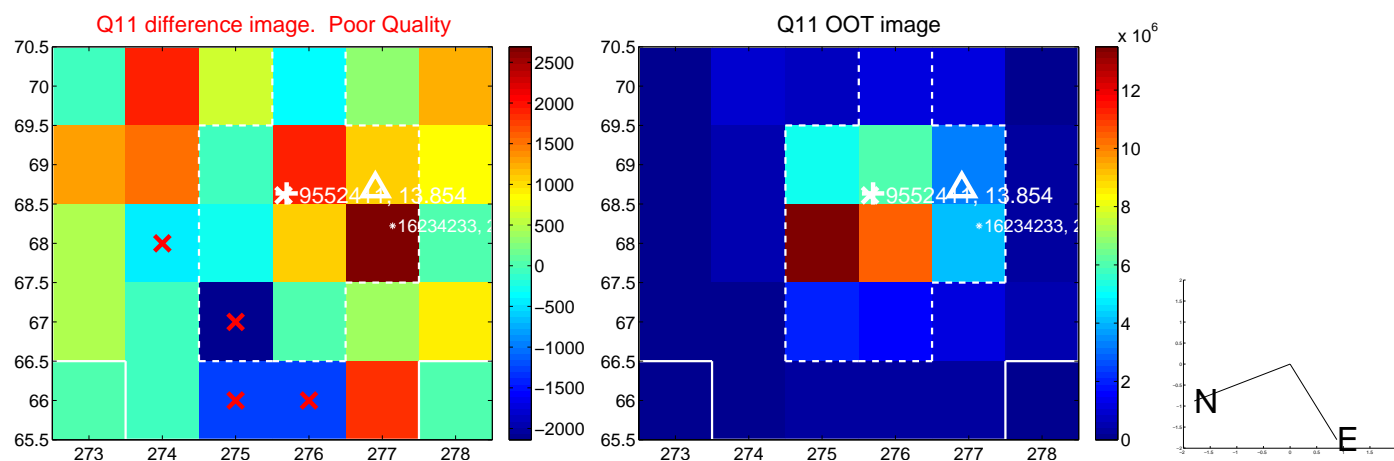
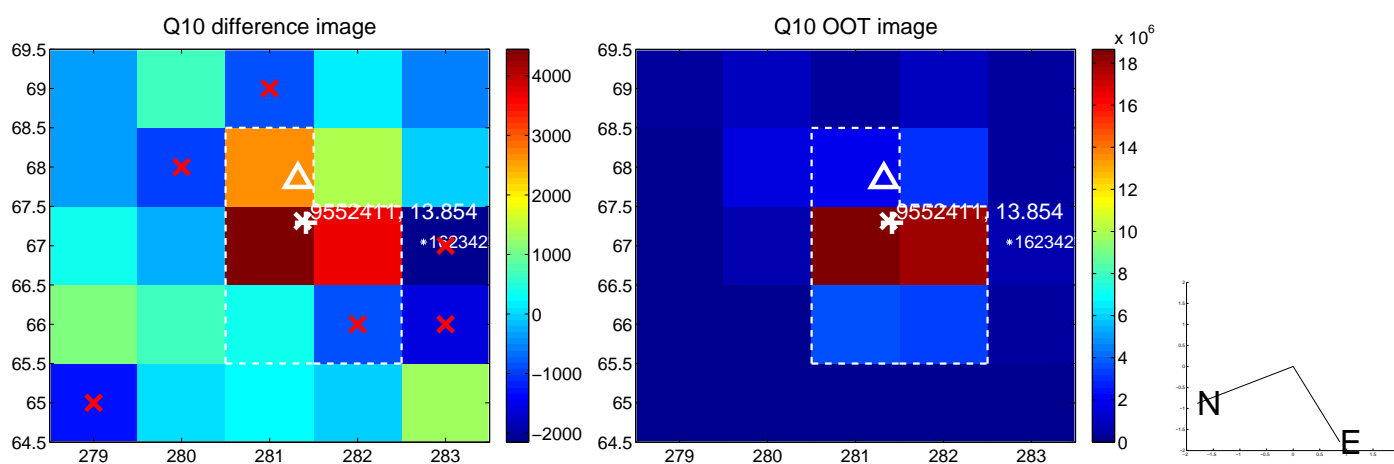
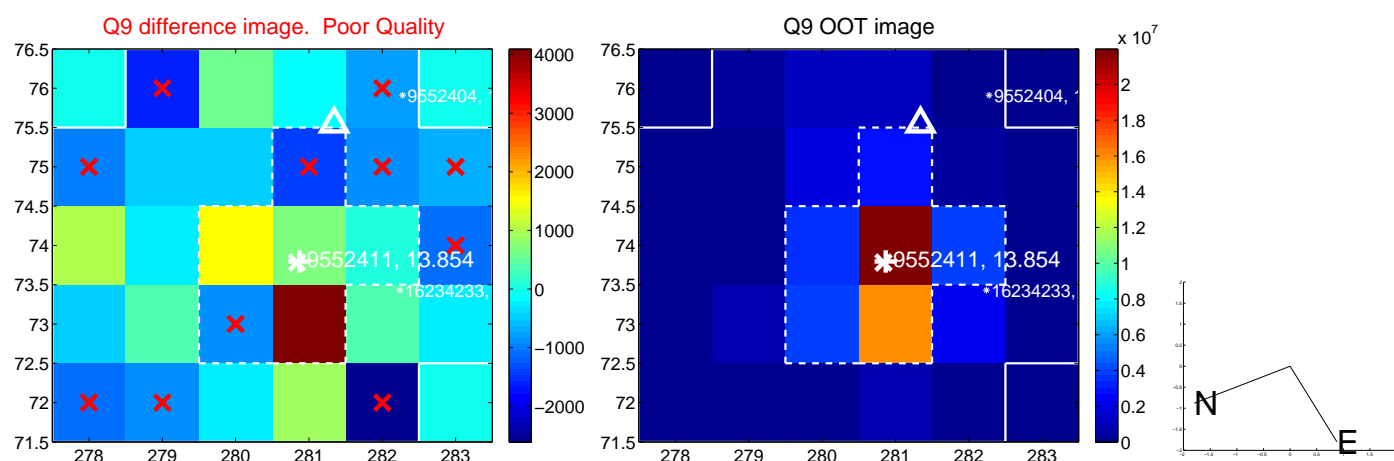


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

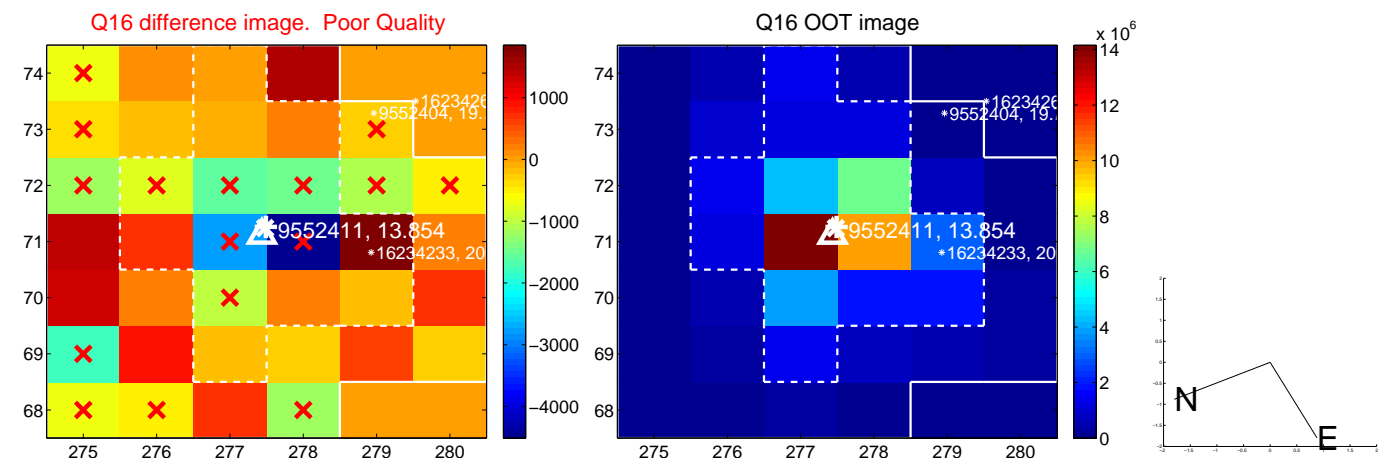
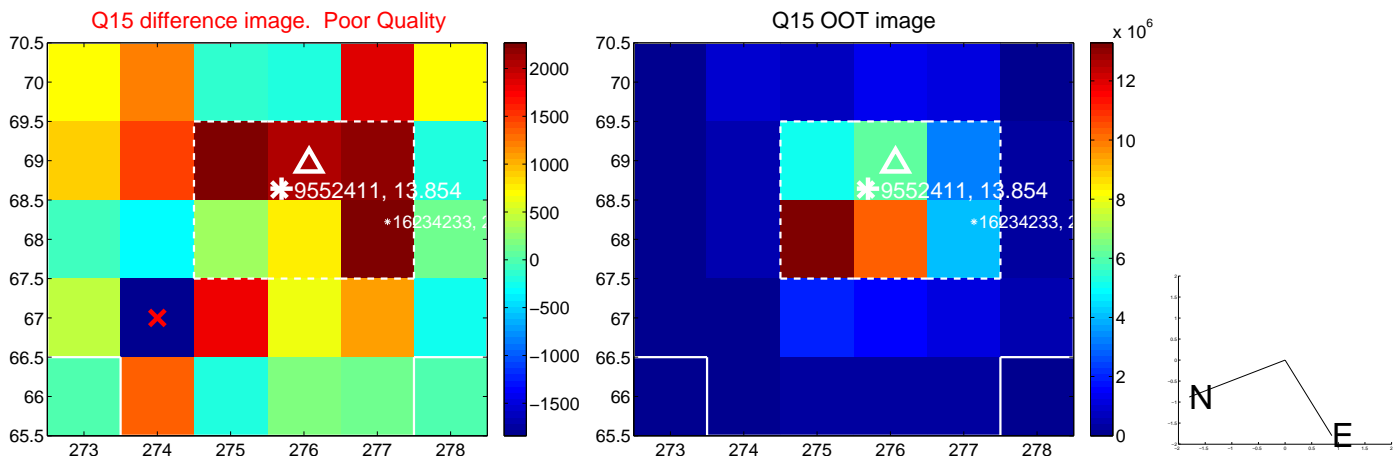
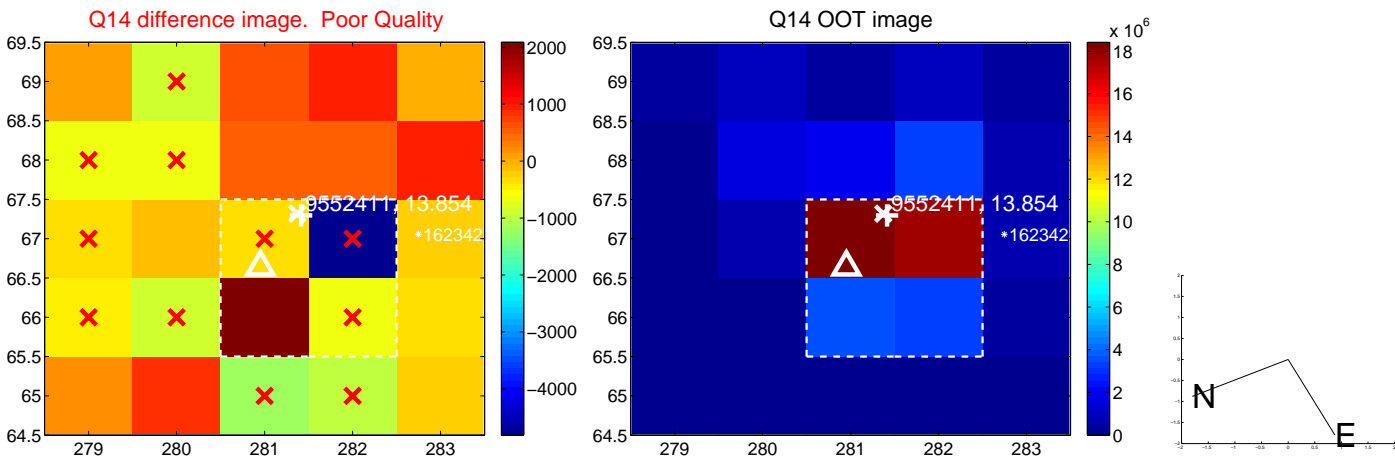
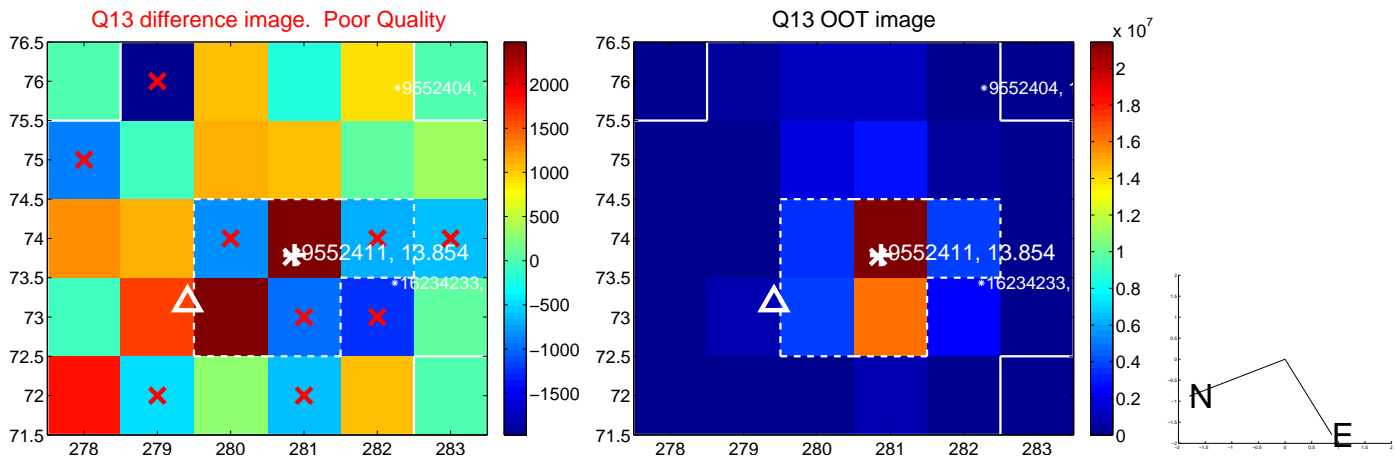




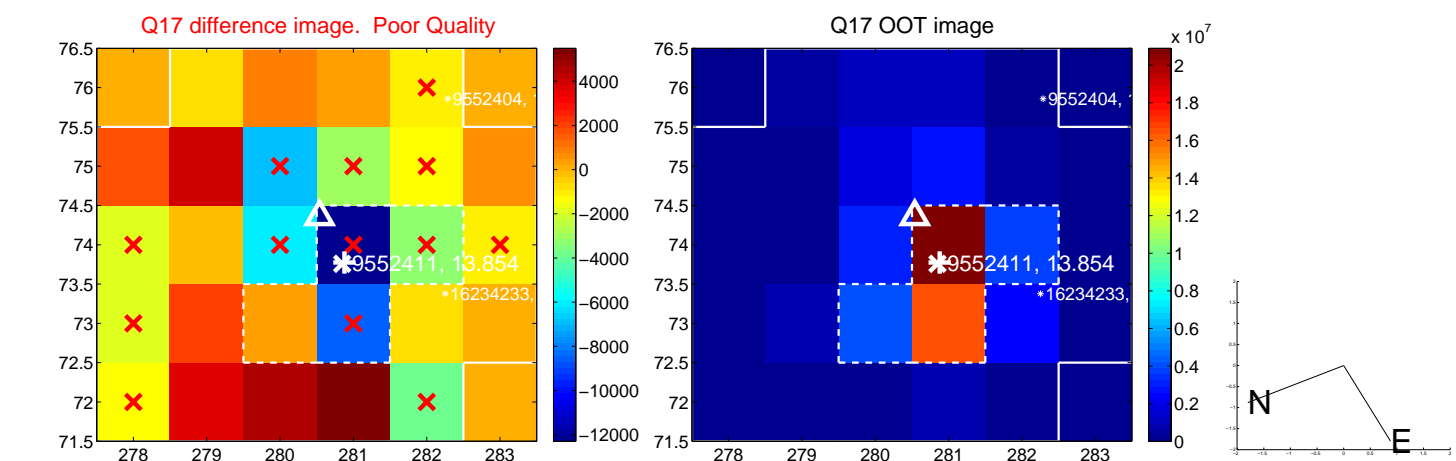
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



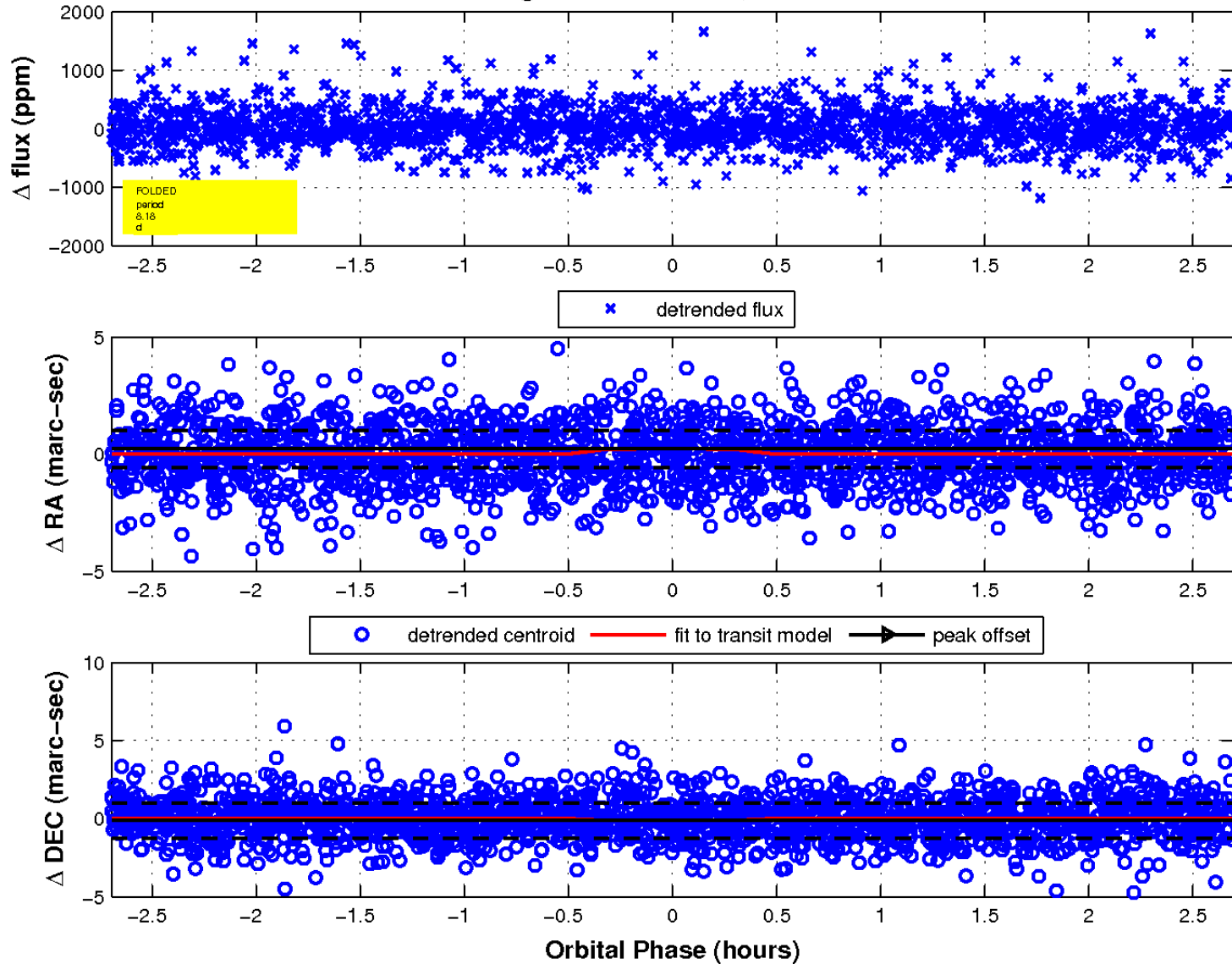
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

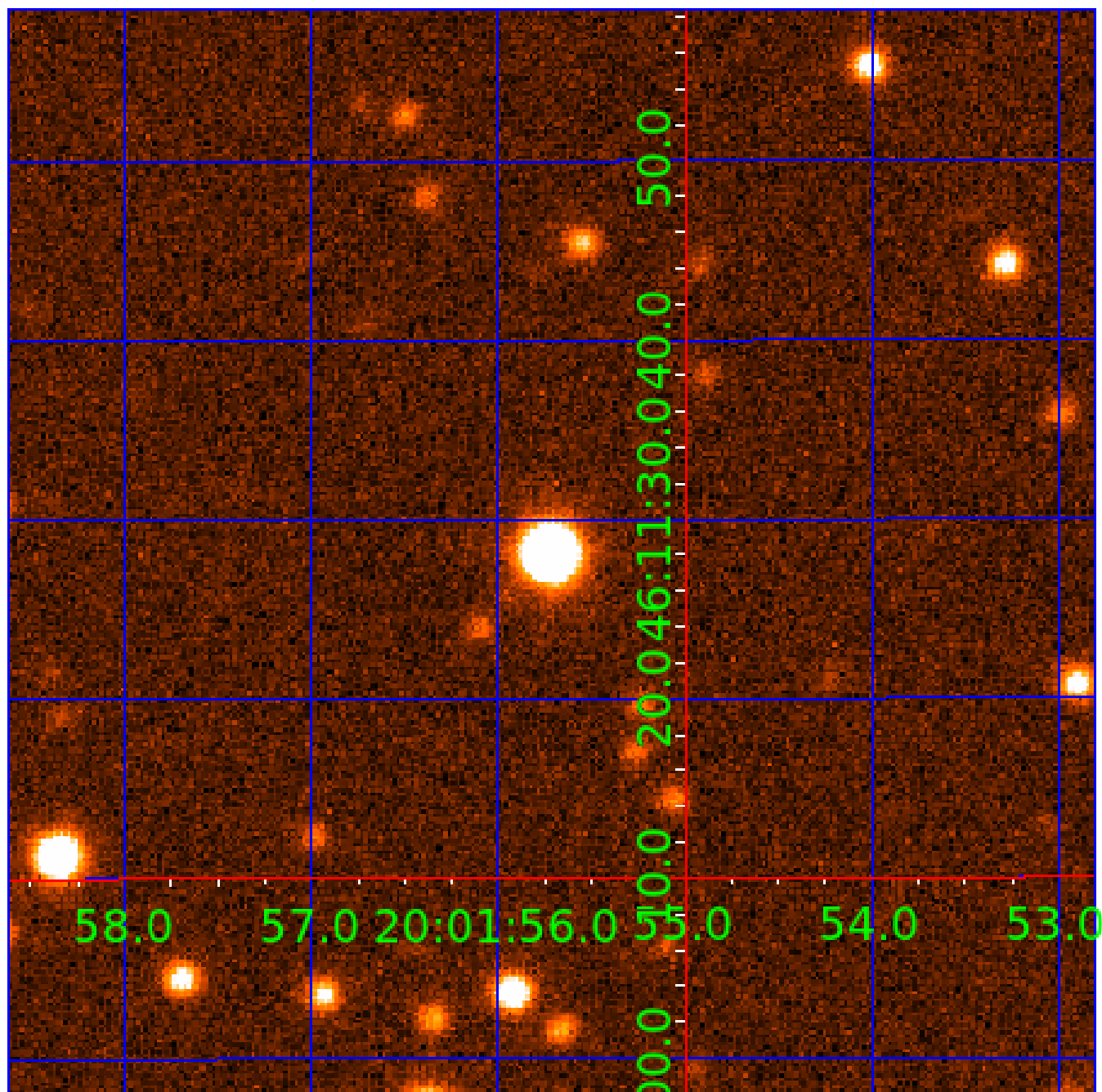


fluxWeightedCentroids, Planet 6 of 7



UKIRT Image

Declination



# KIC 009552411

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
009552411-01	OBS	No	0.652146	132.002493	11.0	4.784	10.5	2.9	1.63	6844	0.58	19691.95
009552411-02	OBS	No	34.819086	141.437002	1071.8	1.336	19.7	20.6	1.63	6844	5.41	97.95
009552411-03	OBS	No	18.567813	141.108223	425.1	3.063	17.5	12.8	1.63	6844	3.69	226.50
009552411-04	OBS	No	17.623722	147.830769	84.8	72.531	14.7	6.3	1.63	6844	1.59	242.82
009552411-05	OBS	No	7.040981	132.840594	97.0	1.401	10.7	2.5	1.63	6844	1.70	825.22
009552411-06	OBS	No	8.183251	134.814653	847.1	0.898	10.8	13.2	1.63	6844	5.32	675.33
009552411-07	OBS	No	5.029754	135.557261	1166.5	3.883	14.3	19.7	1.63	6844	9.31	1292.27

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009552411-01	OBS	FP	0.00	1	0	0	0	LPP_DV
009552411-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—HALO_GHOST
009552411-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
009552411-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_MEAS
009552411-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_TRACKER—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
009552411-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV
009552411-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT

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

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

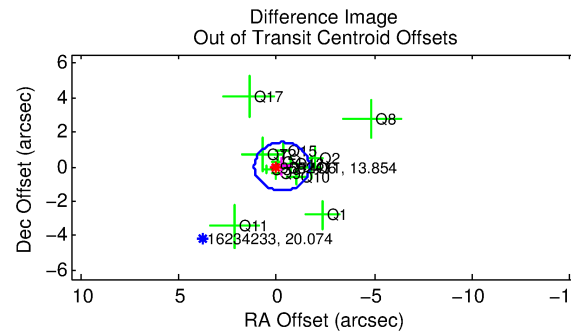
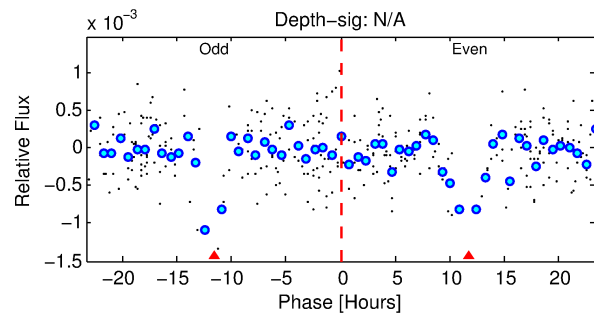
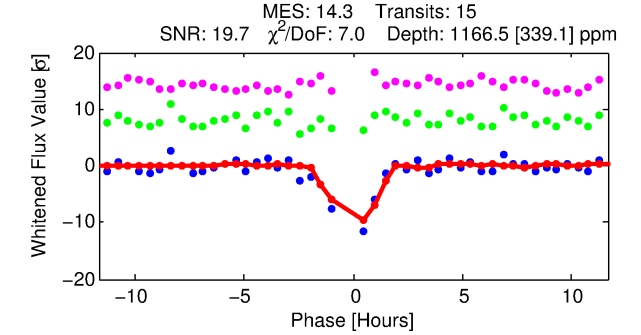
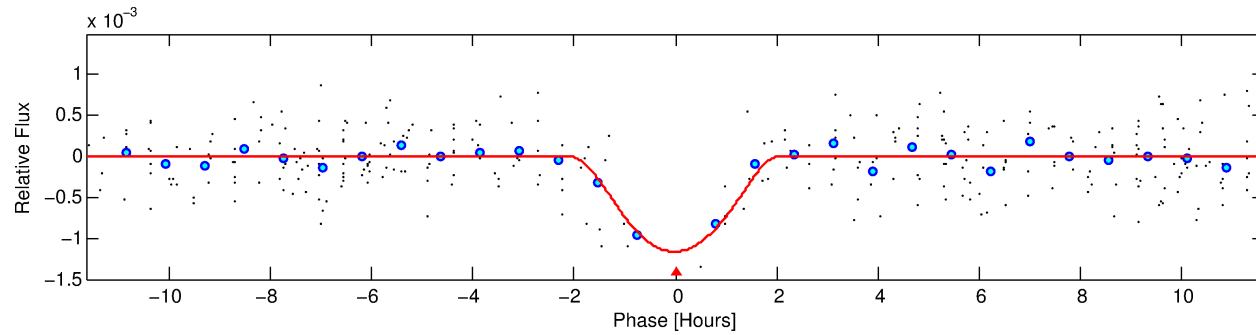
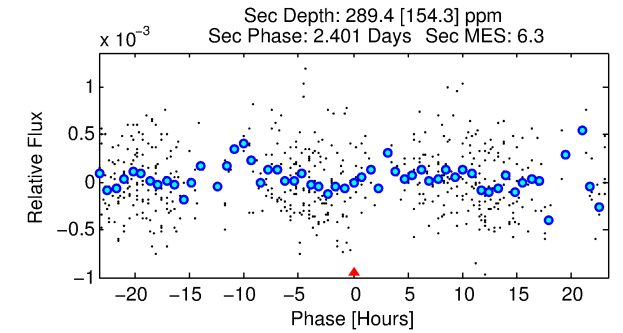
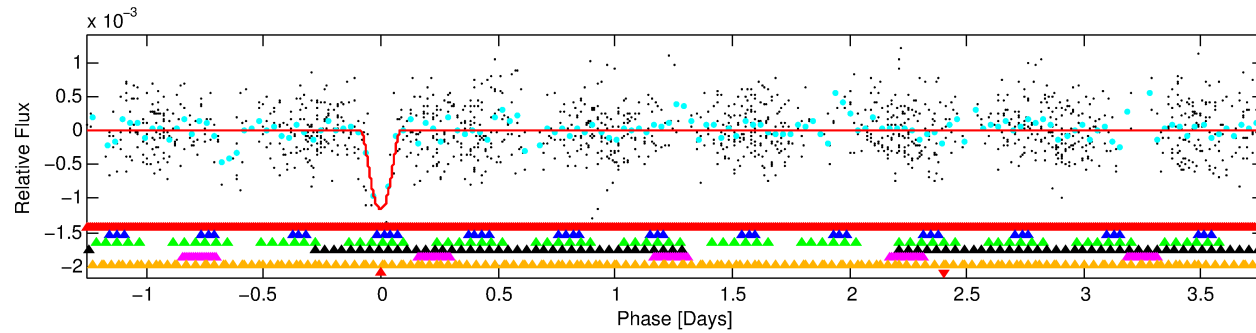
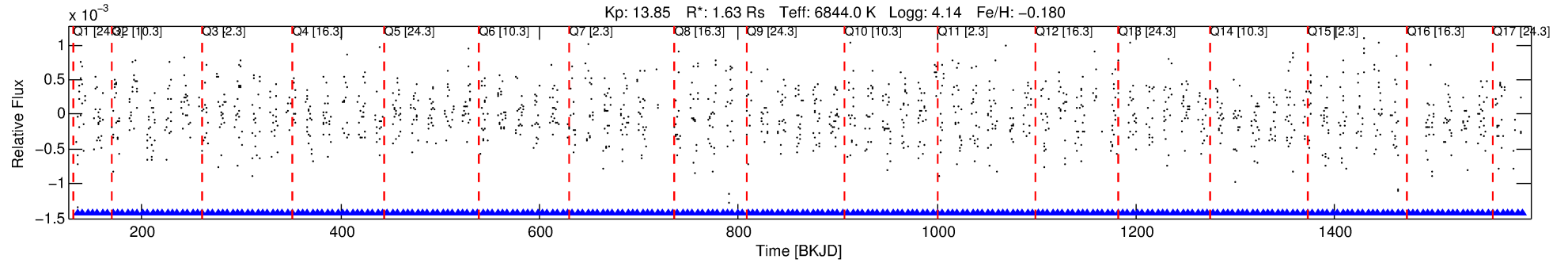
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009552411-07

No Significant Match Found

# DV One-Page Summary

KIC: 9552411 Candidate: 7 of 7 Period: 5.030 d



## DV Fit Results:

Period = 5.02975 [0.00011] d  
Epoch = 135.5573 [0.0116] BKJD  
Rp/R\* = 0.0524 [0.2597]  
a/R\* = 3.66 [4.05]  
b = 0.99 [0.42]  
Seff = 1292.27 [492.35]  
Teq = 1529 [146] K  
Rp = 9.31 [46.25] Re  
a = 0.0635 [0.0156] AU  
Ag = 7.41 [73.59] [0.09σ]  
Teffp = 3900 [9680] K [0.24σ]

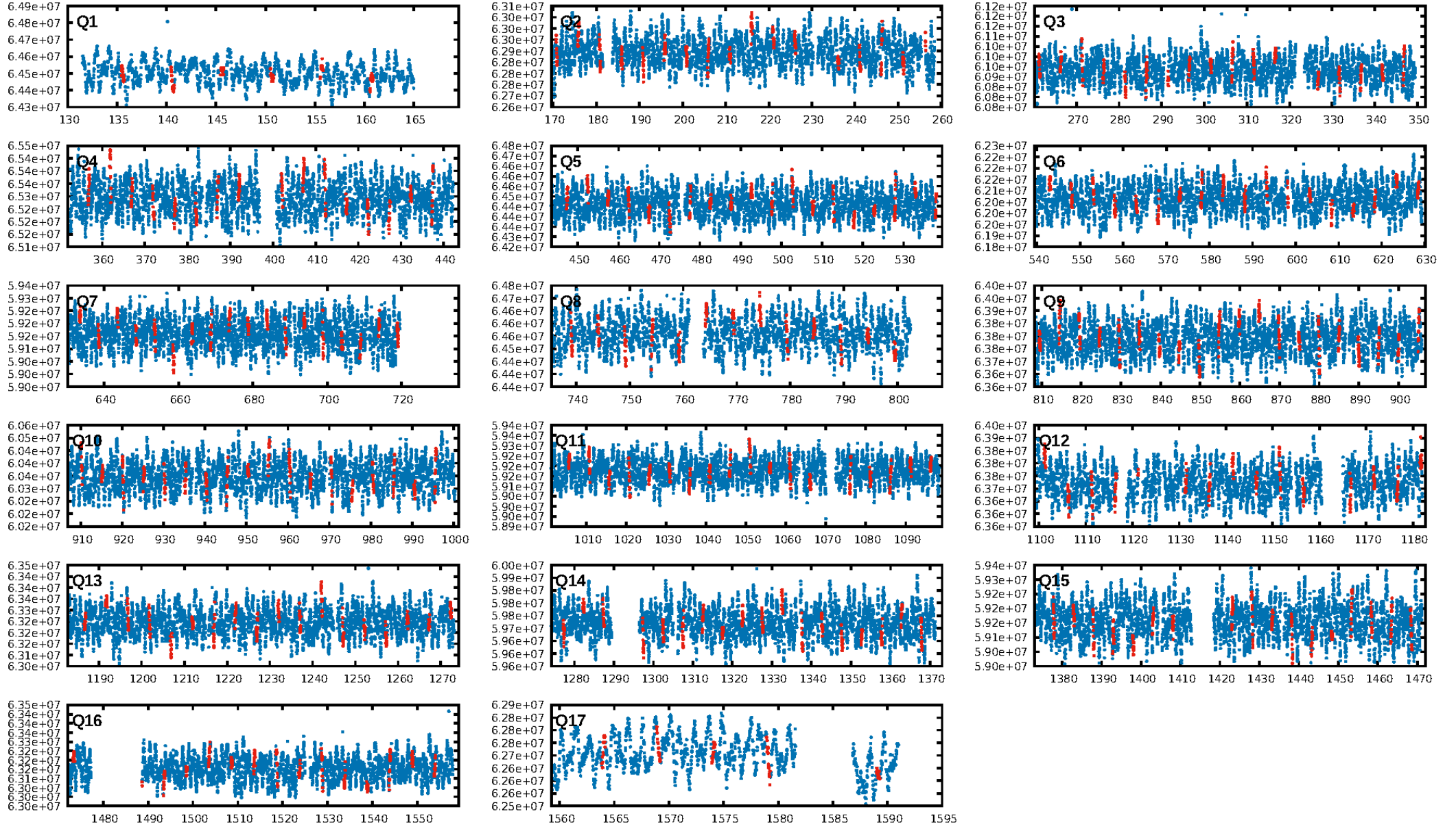
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.05σ]  
LongPeriod-sig: 100.0% [11.69σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 78.1%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [14/14]  
GhostDiagnostic-chr: -0.7766  
Centroid-sig: 36.8%  
Centroid-so: 0.618 arcsec [6.27σ]  
OotOffset-rm: 0.259 arcsec [0.56σ]  
KicOffset-rm: 0.264 arcsec [0.62σ]  
OotOffset-st: 4/4/3/4 [15]  
KicOffset-st: 4/4/3/4 [15]  
DiffImageQuality-fgm: 0.33 [5/15]  
DiffImageOverlap-fno: 0.00 [0/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 01-Feb-2016 13:14:39 Z

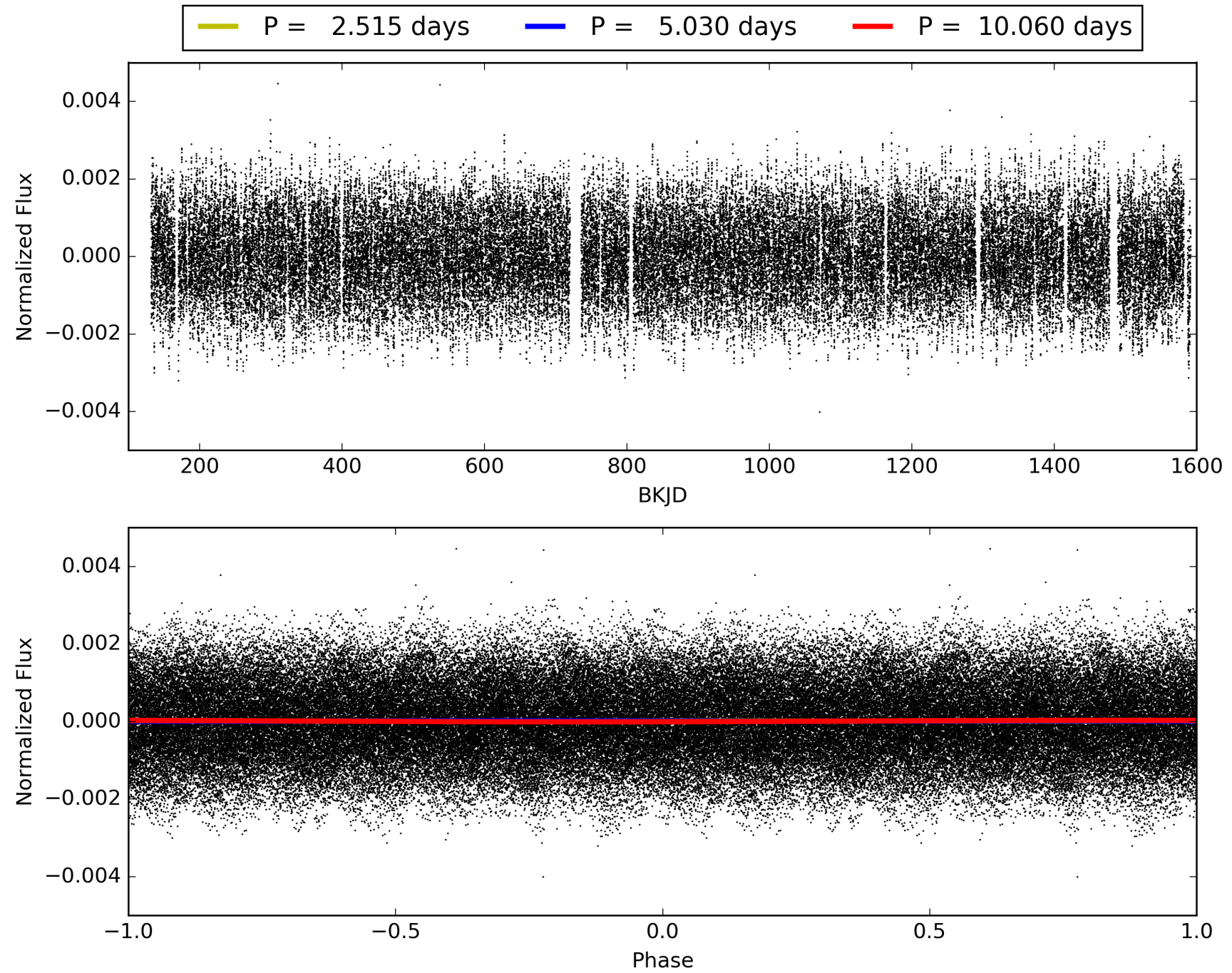
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 009552411-07, PDC Light Curves





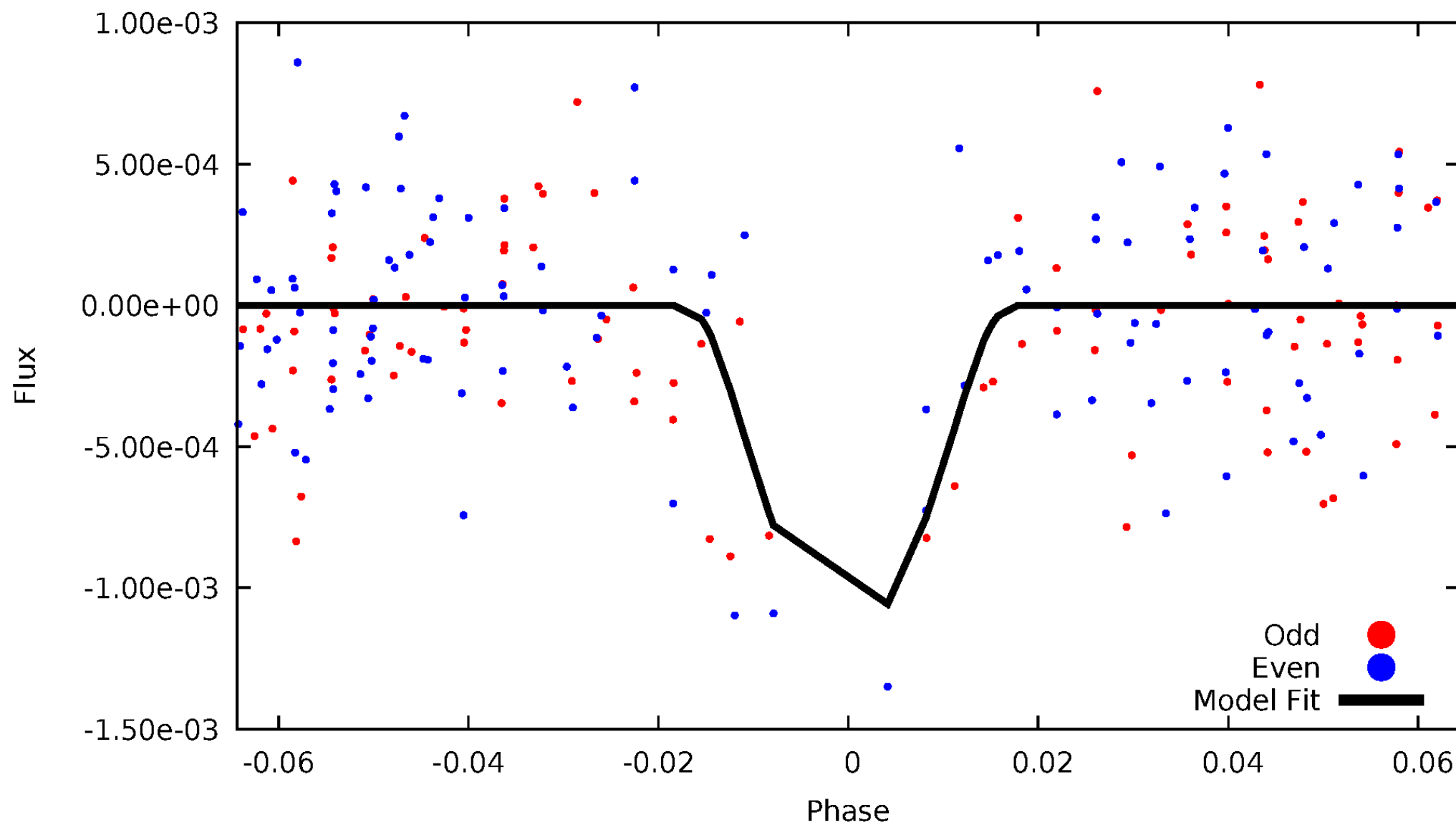
TCE 009552411-07





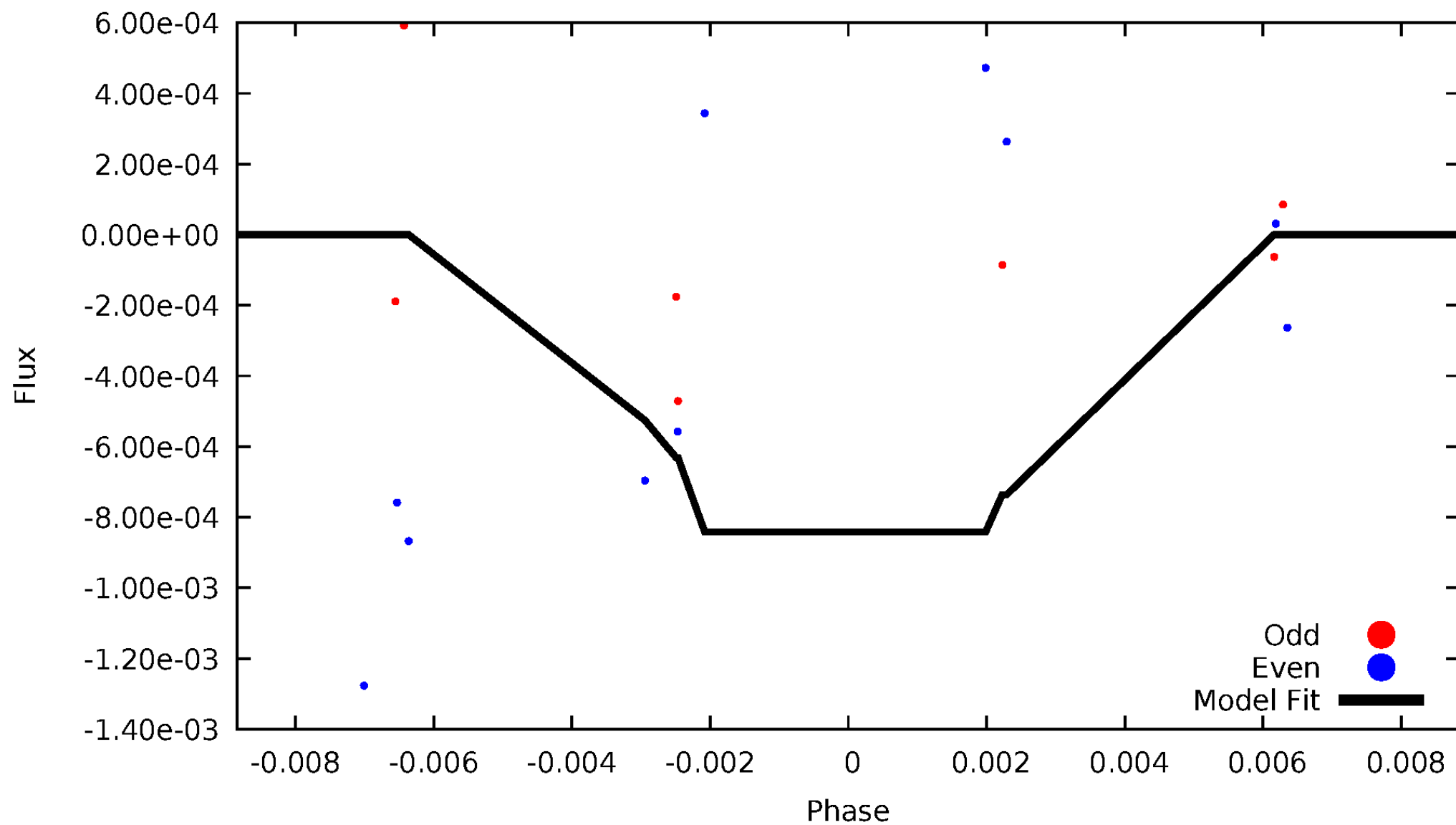
# DV Odd/Even

TCE 009552411-07



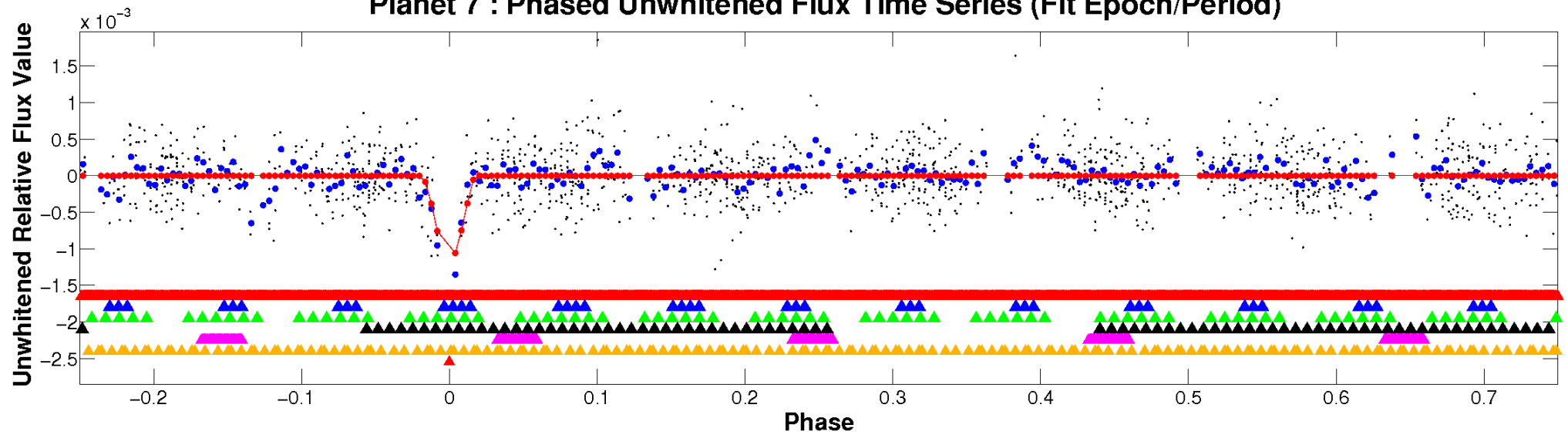
# ALT Odd/Even

TCE 009552411-07

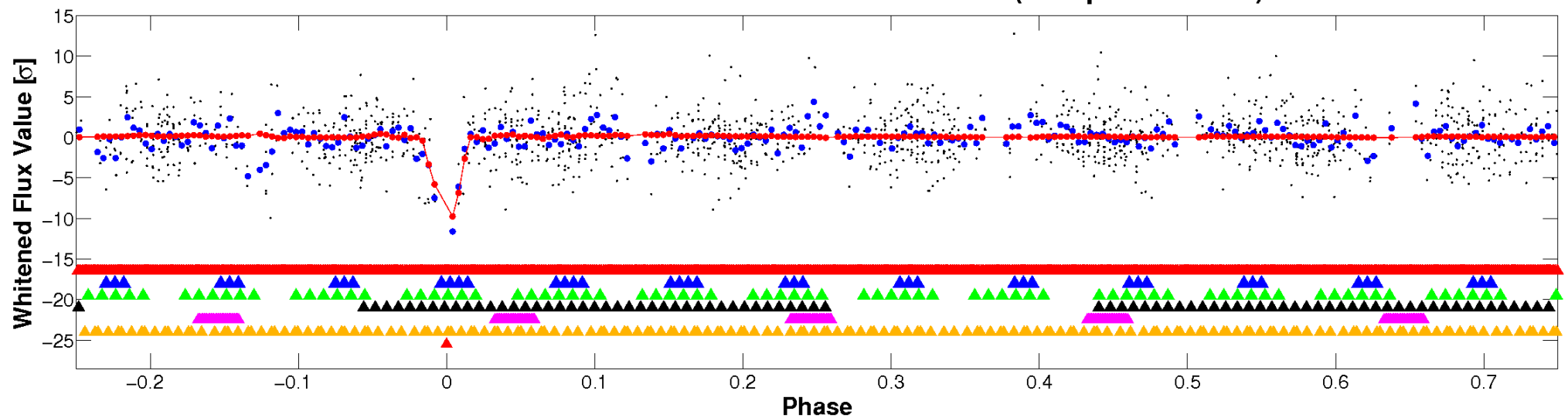


# Non-Whitened Vs. Whitened Light Curve

## Planet 7 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

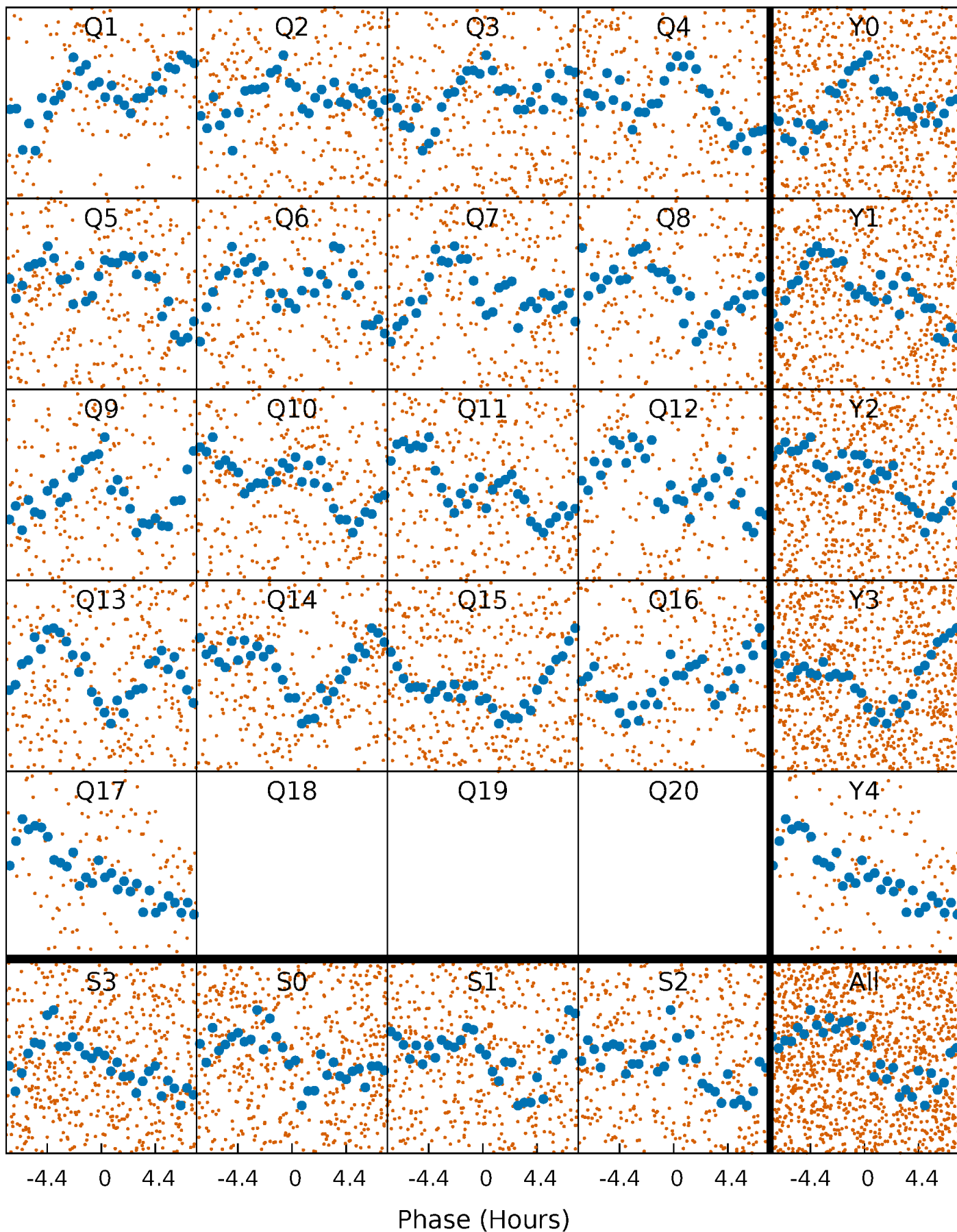


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



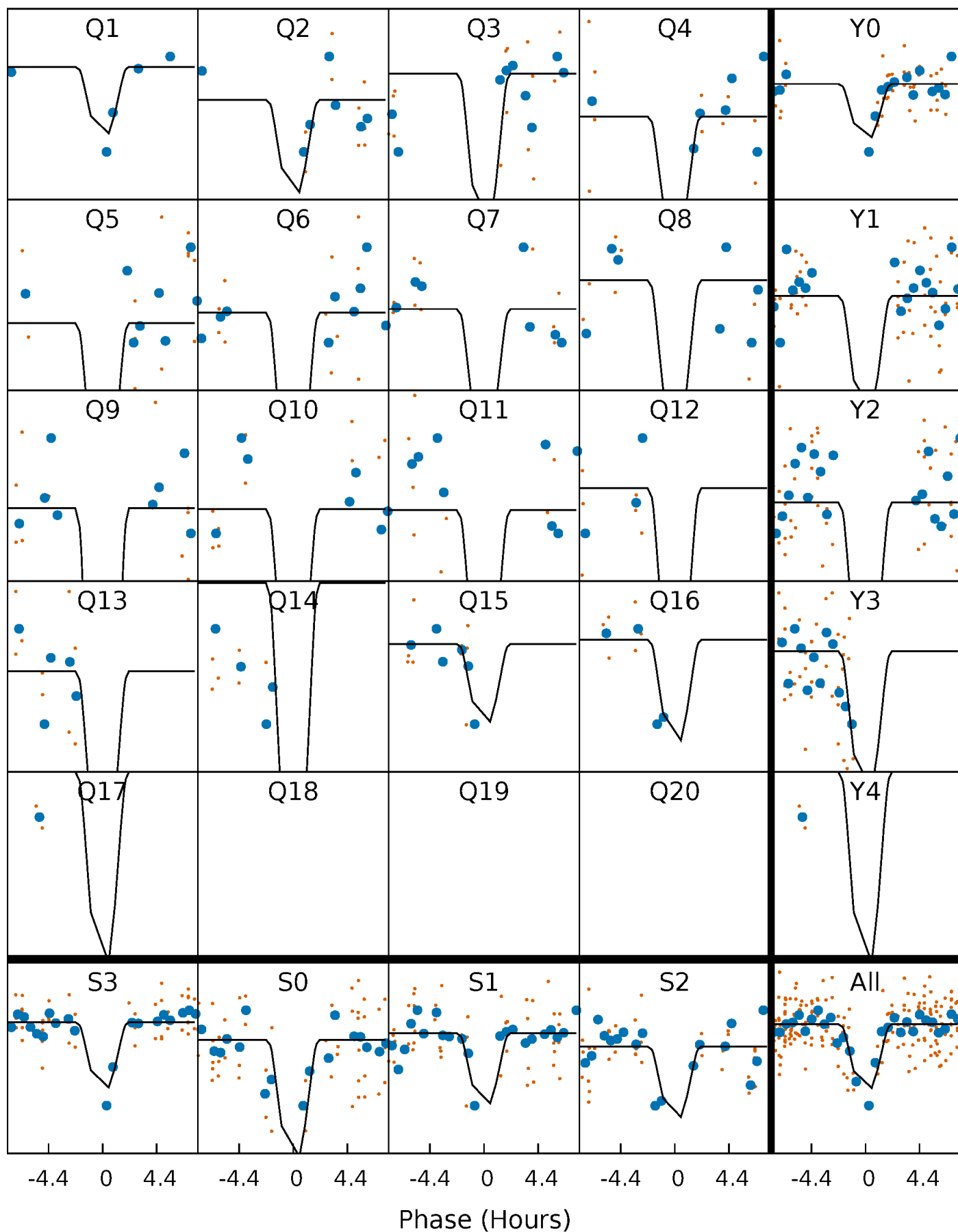
# PDC Quarter-Phased Transit Curves

TCE 009552411-07   P= 5.029754 Days    $T_0=135.557261$  (BKJD)



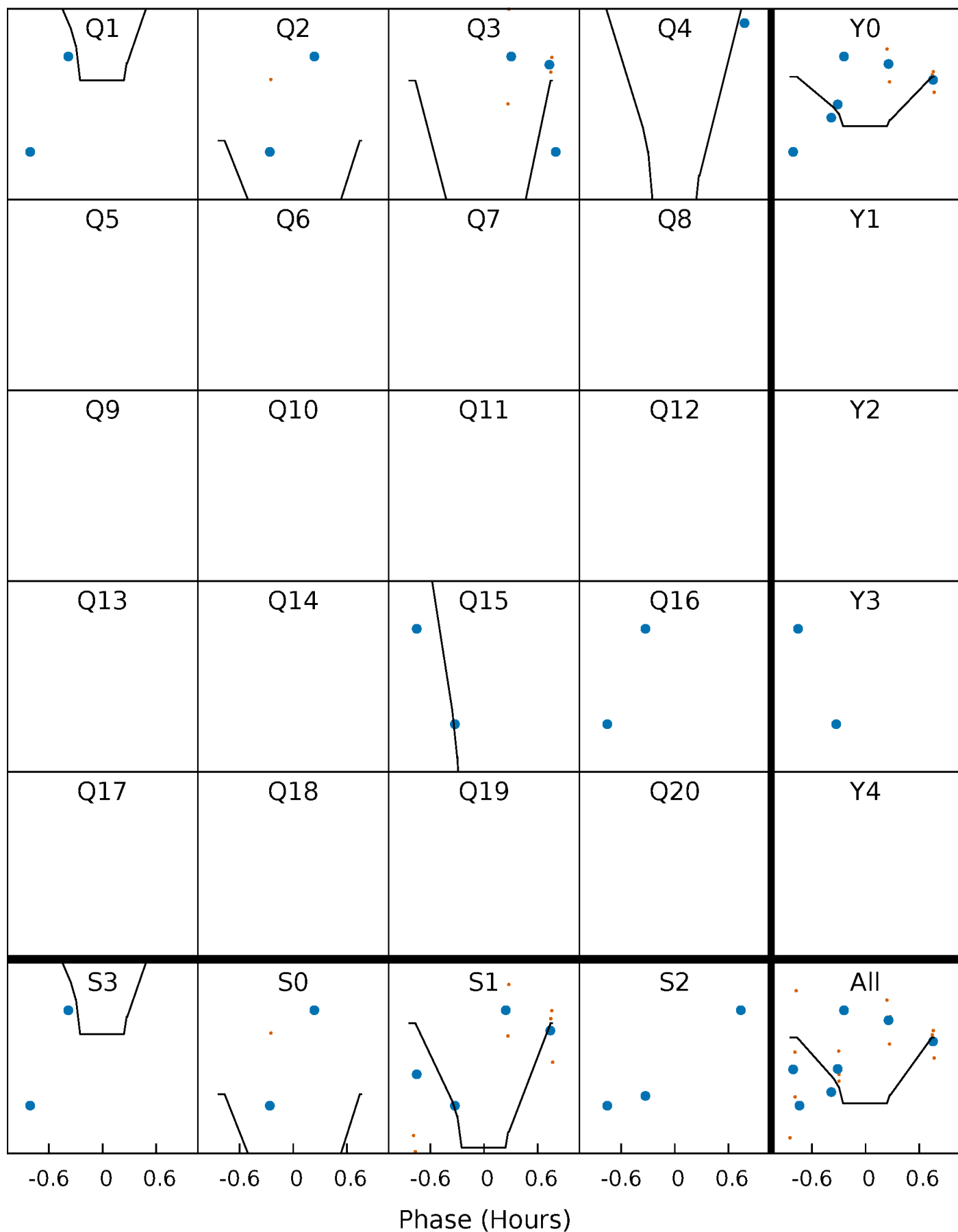
# DV Quarter-Phased Transit Curves

TCE 009552411-07   P= 5.029754 Days    $T_0=135.557261$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

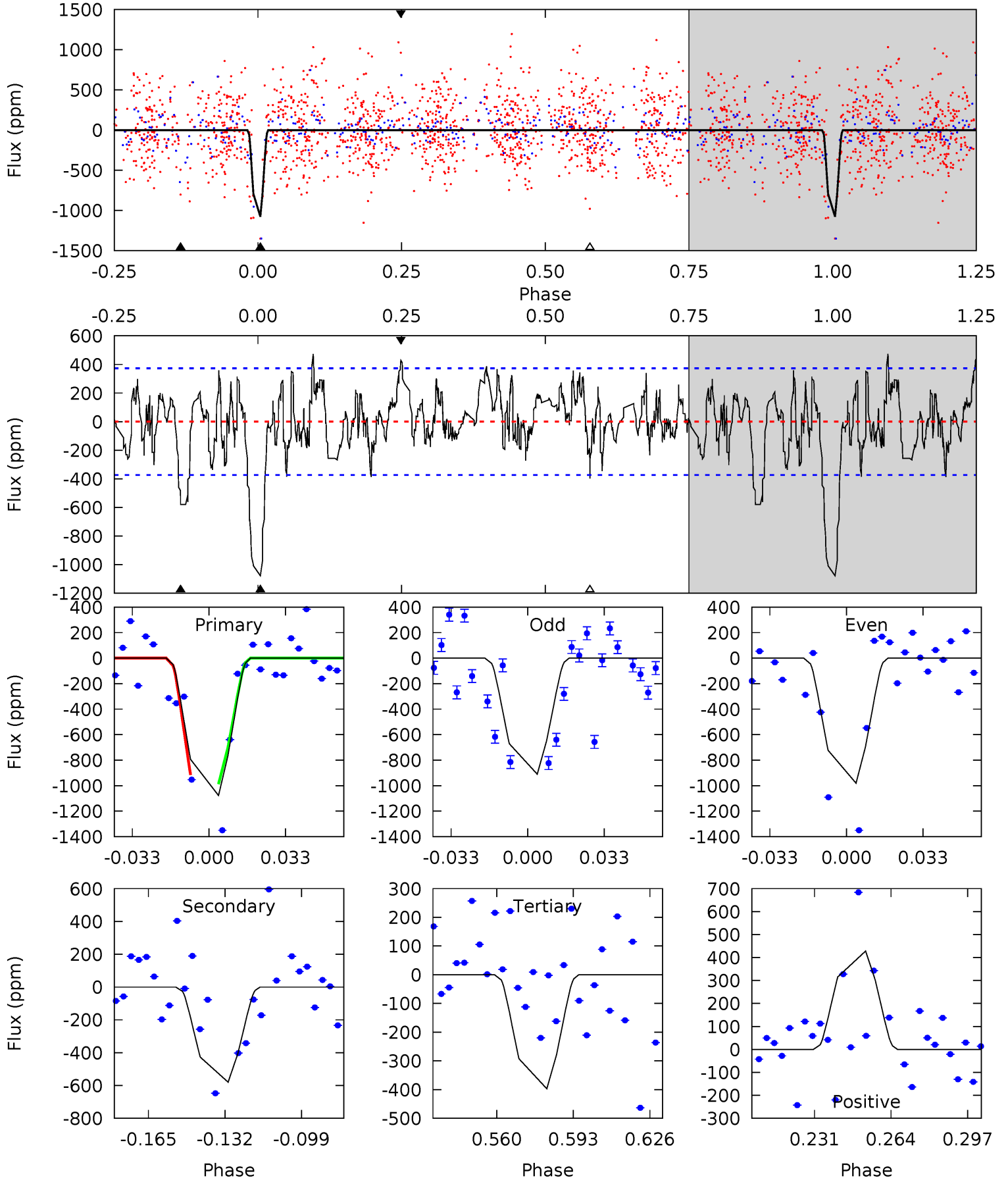
TCE 009552411-07 P= 5.029438 Days  $T_0=135.613307$  (BKJD)



# DV Model-Shift Uniqueness Test

009552411-07, P = 5.029754 Days, E = 130.527507 Days

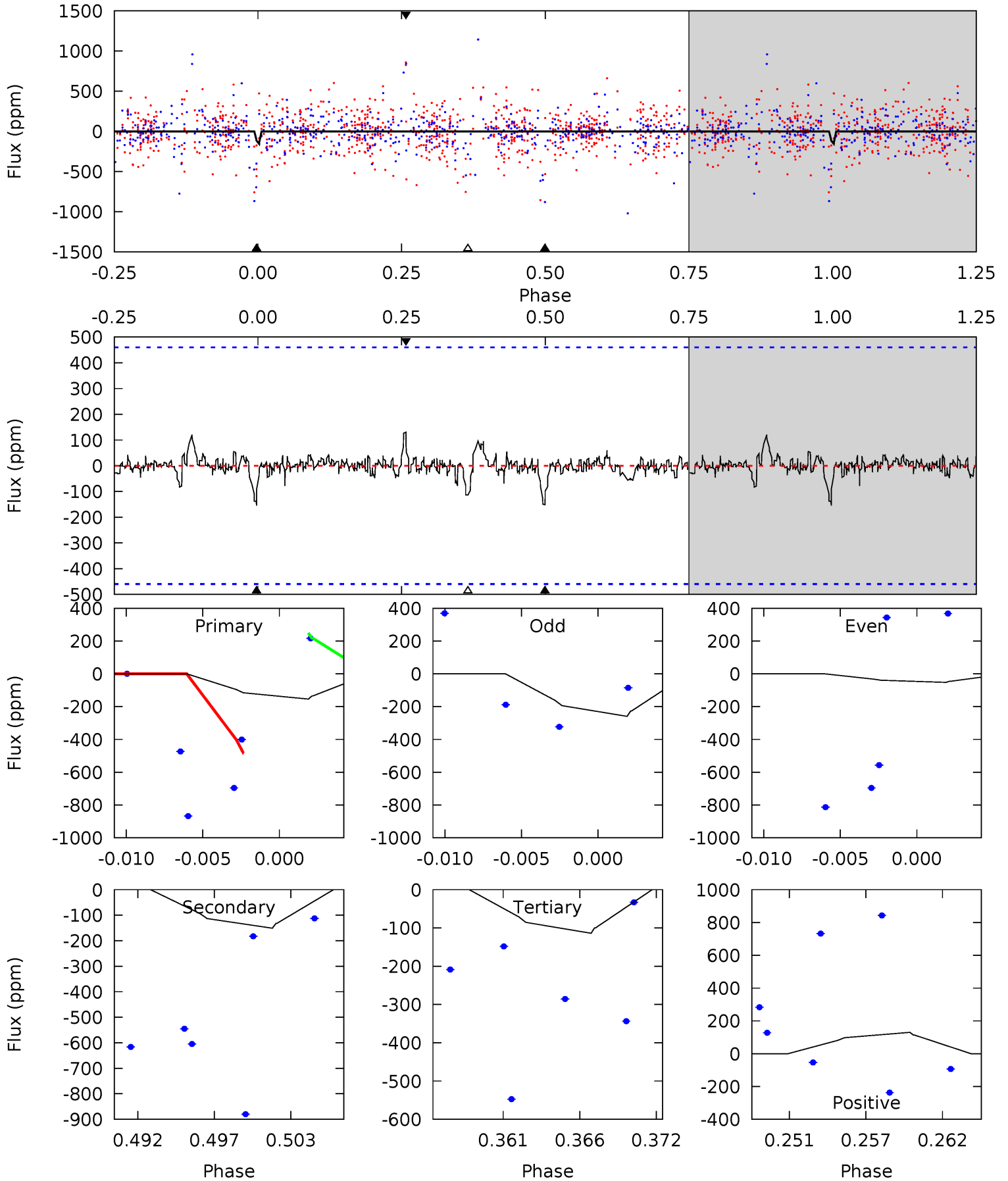
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
13.8	7.44	5.09	5.49	4.79	2.13	2.01	8.73	8.33	2.34	1.94	0.46	0.65	0.31	0.46



# Alt Model-Shift Uniqueness Test

009552411-07, P = 5.029438 Days, E = 130.583869 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
1.72	1.69	1.28	1.46	5.15	2.79	0.26	0.45	0.27	0.42	0.23	1.01	1.00	0.46	0





### Stellar Parameters For KIC 009552411

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6844^{+190}_{-286}$	$4.145^{+0.180}_{-0.180}$	$-0.180^{+0.250}_{-0.300}$	$1.629^{+0.494}_{-0.404}$	$1.358^{+0.202}_{-0.247}$	$0.443^{+0.435}_{-0.221}$
	+3%/-4%	+4%/-4%	+139%/-167%	+30%/-25%	+15%/-18%	+98%/-50%
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 009552411-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-580 \pm 78$	$34.26^{+36.45}_{-24.07}$	$2119^{+163}_{-151}$	$2886^{+1631}_{-5011}$	$1.072^{+11.858}_{-0.829}$
Alt.	$-151 \pm 89$	$32.39^{+35.33}_{-22.34}$	$2131^{+176}_{-151}$	$-1966^{+5470}_{-564}$	$0.274^{+2.937}_{-0.224}$

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

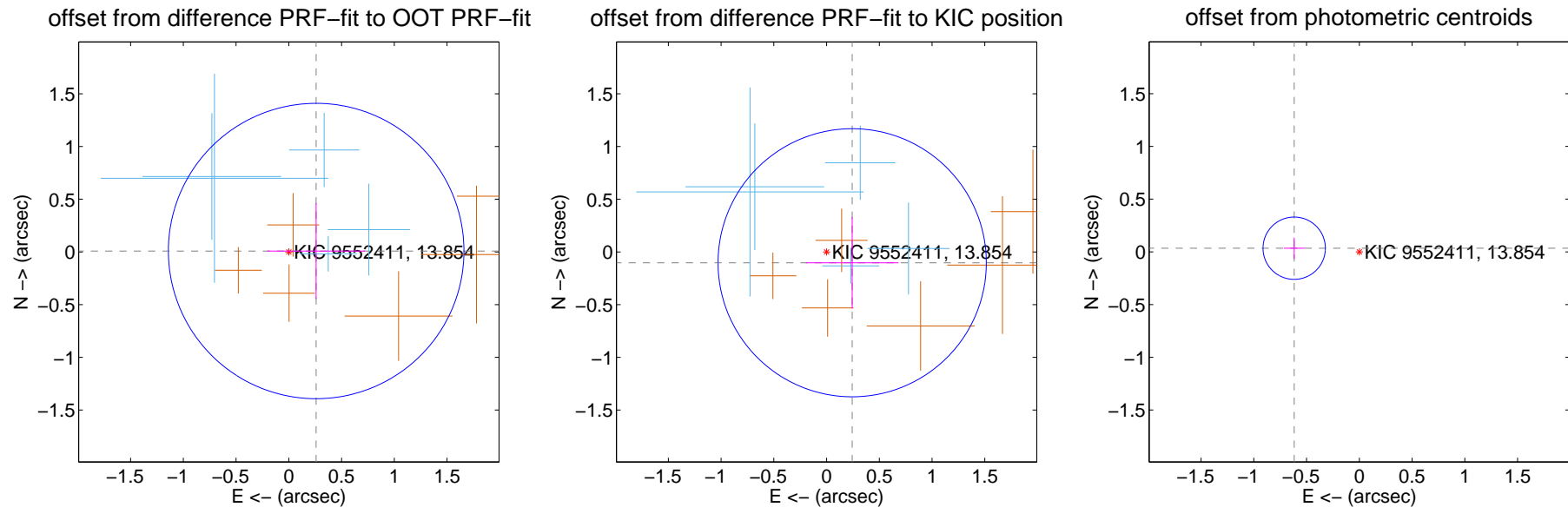
## DV Centroid Data

Supplemental centroid analysis for 009552411-07. Kepler magnitude: 13.85. Transit SNR 19.67

There are 5 quarters with good PRF difference image offsets

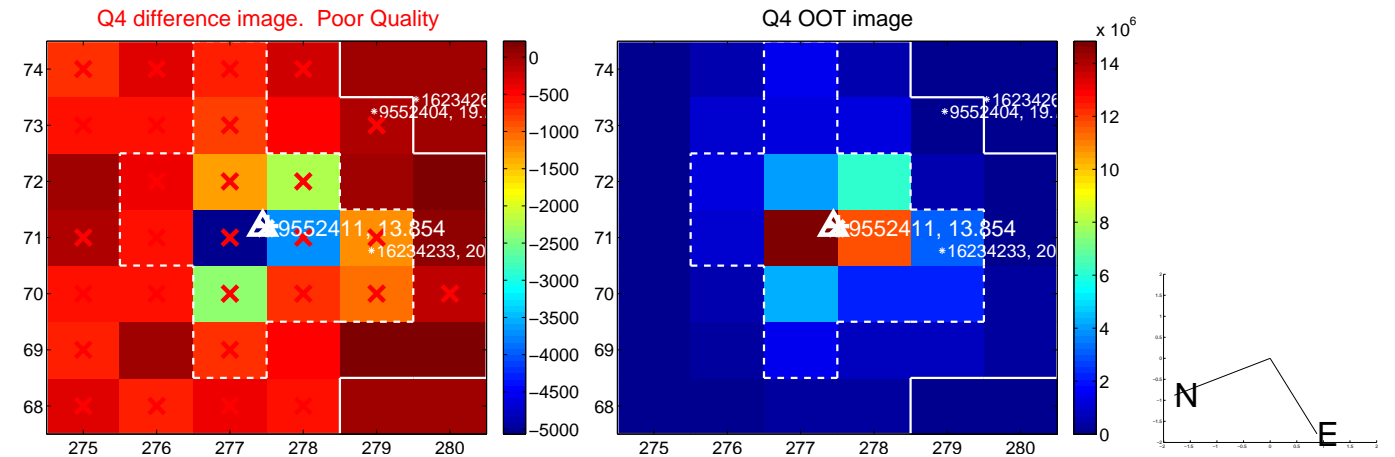
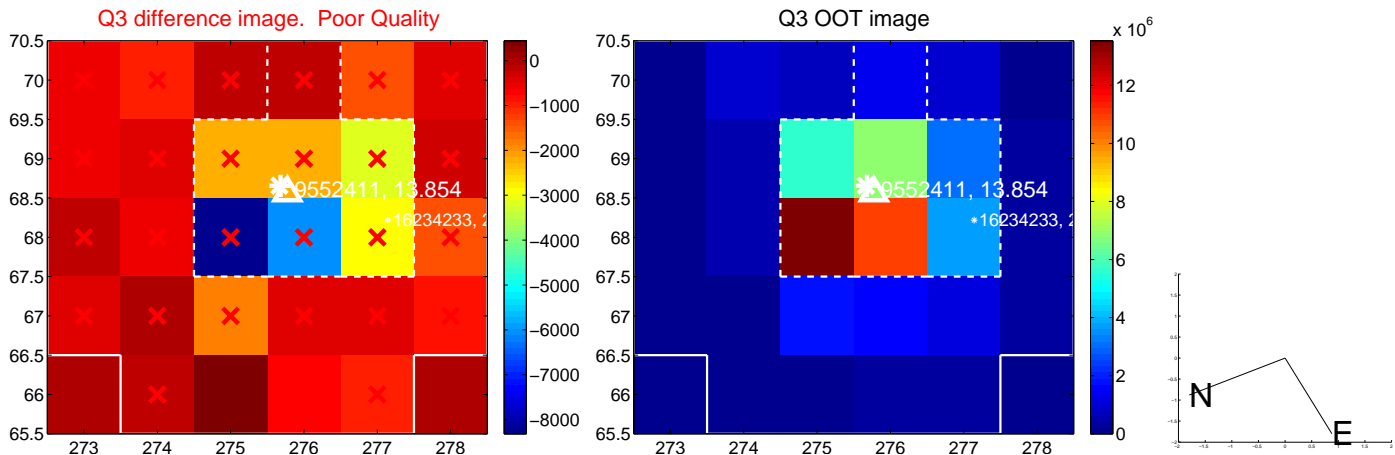
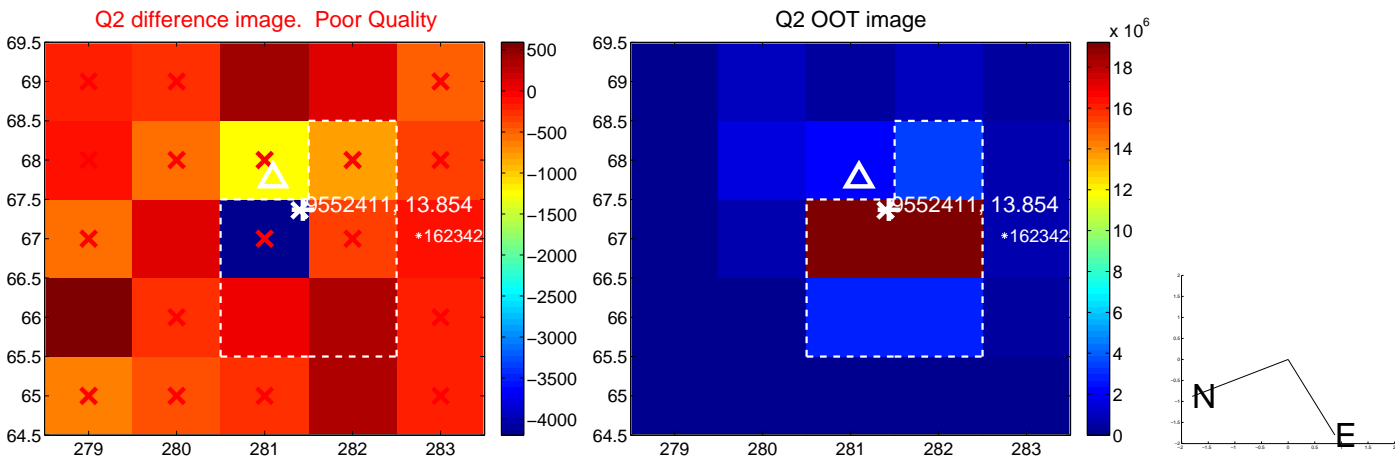
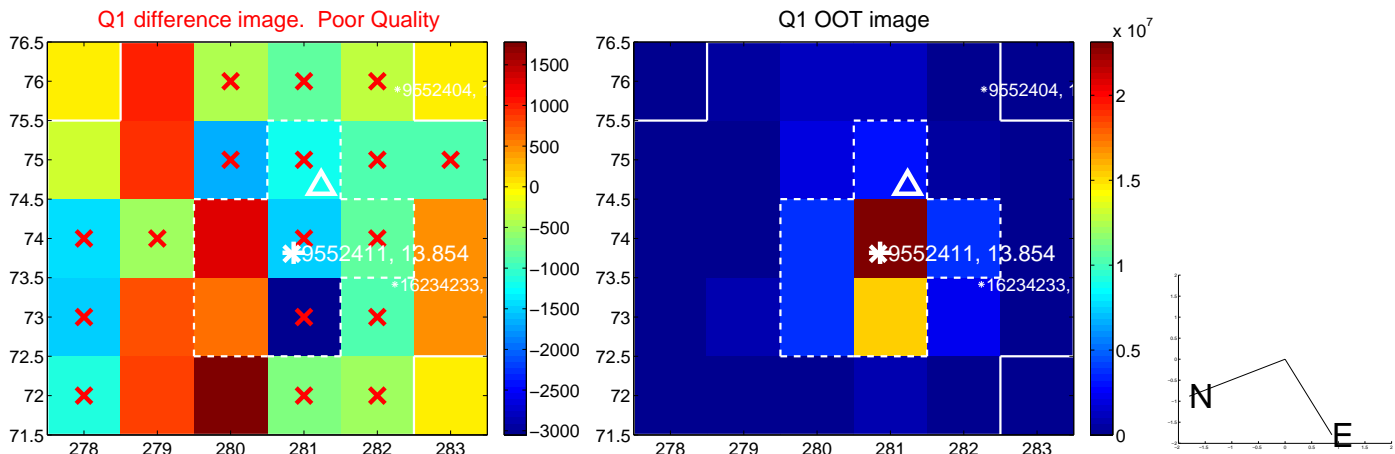
The direct PRF centroid is offset from the target star catalog position by about 0.14 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.259 \pm 0.467$	0.56	$-0.259 \pm 0.464$	$0.008 \pm 0.455$
PRF-fit source offset from KIC position	$0.264 \pm 0.424$	0.62	$-0.243 \pm 0.440$	$-0.103 \pm 0.433$
photometric centroid source offset	$0.62 \pm 0.10$	6.27	$0.62 \pm 0.10$	$0.03 \pm 0.10$

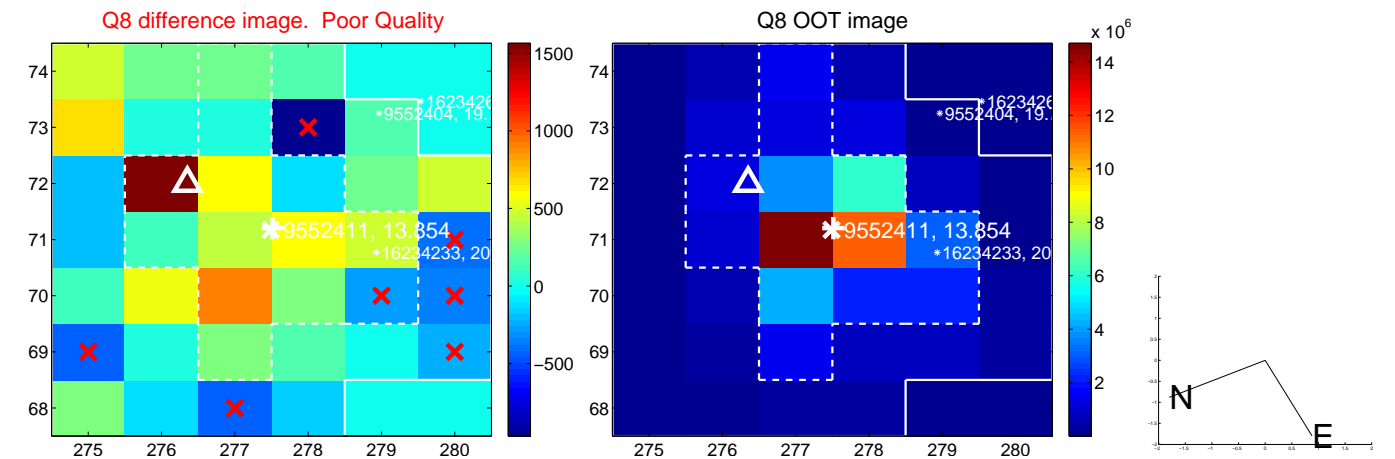
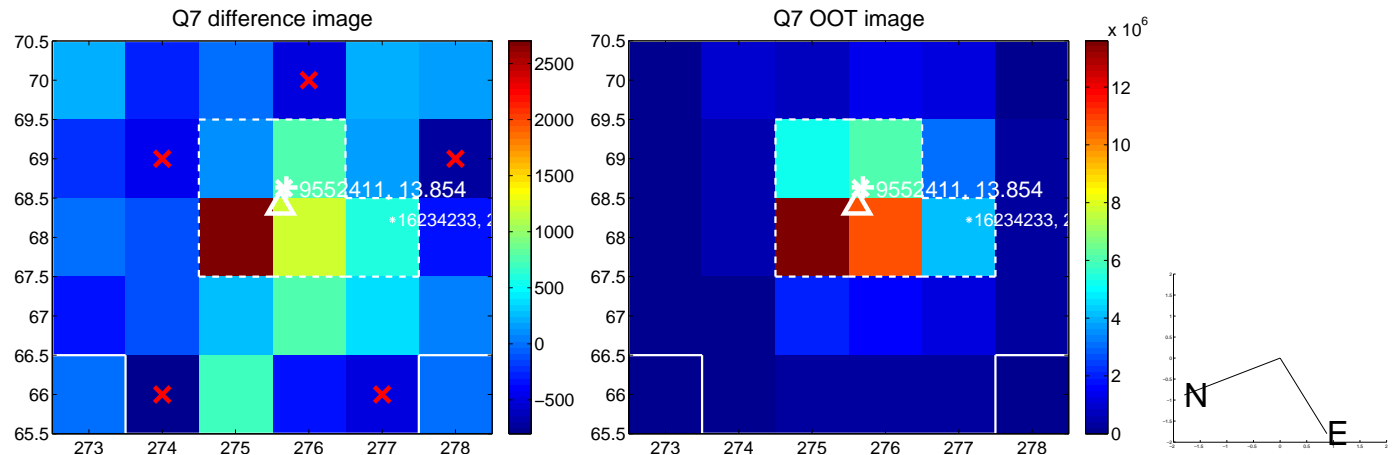
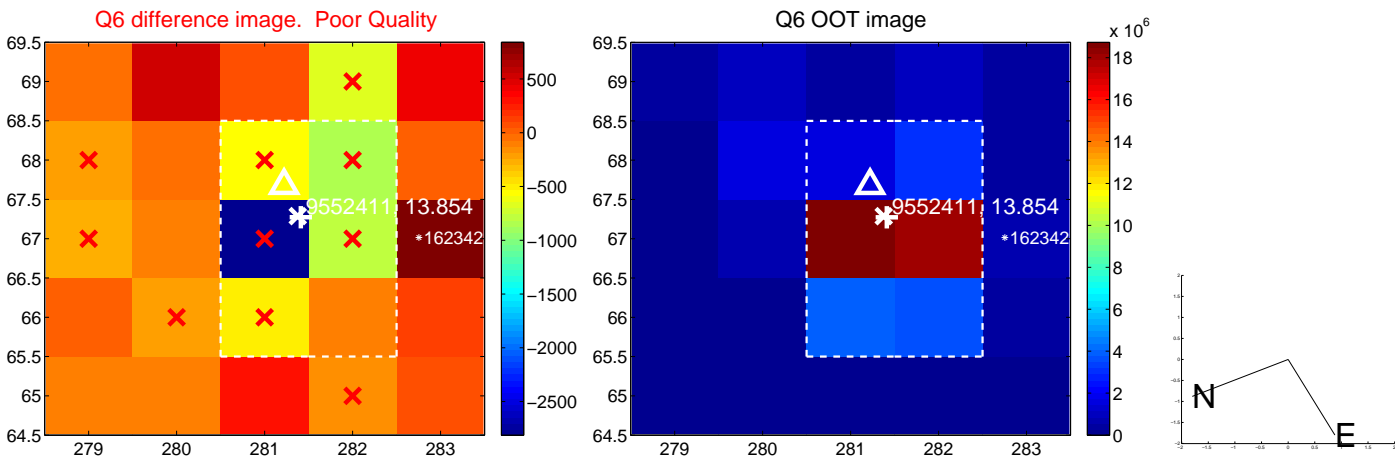
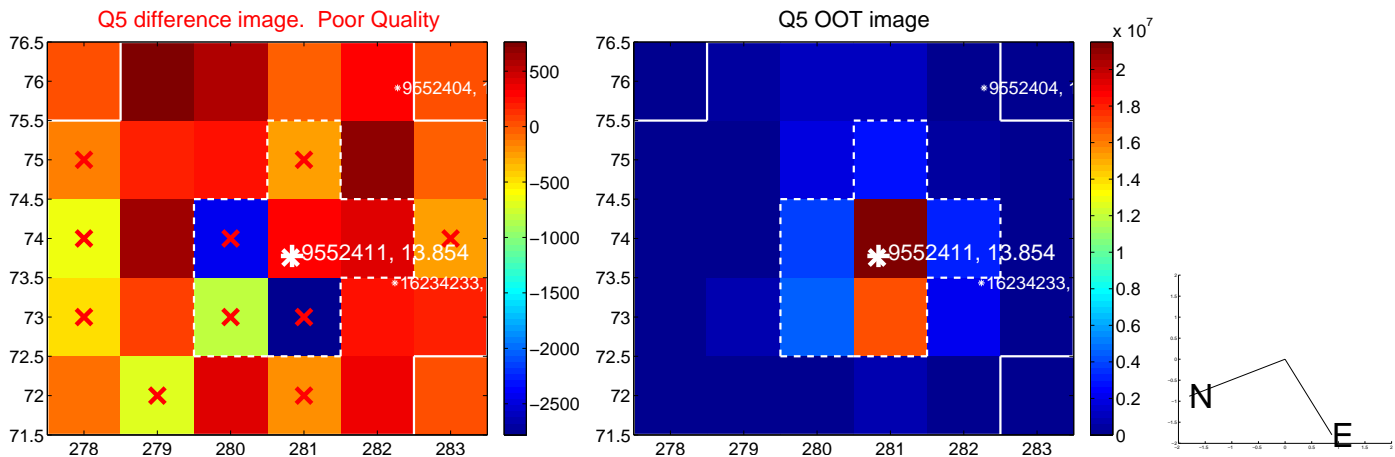


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

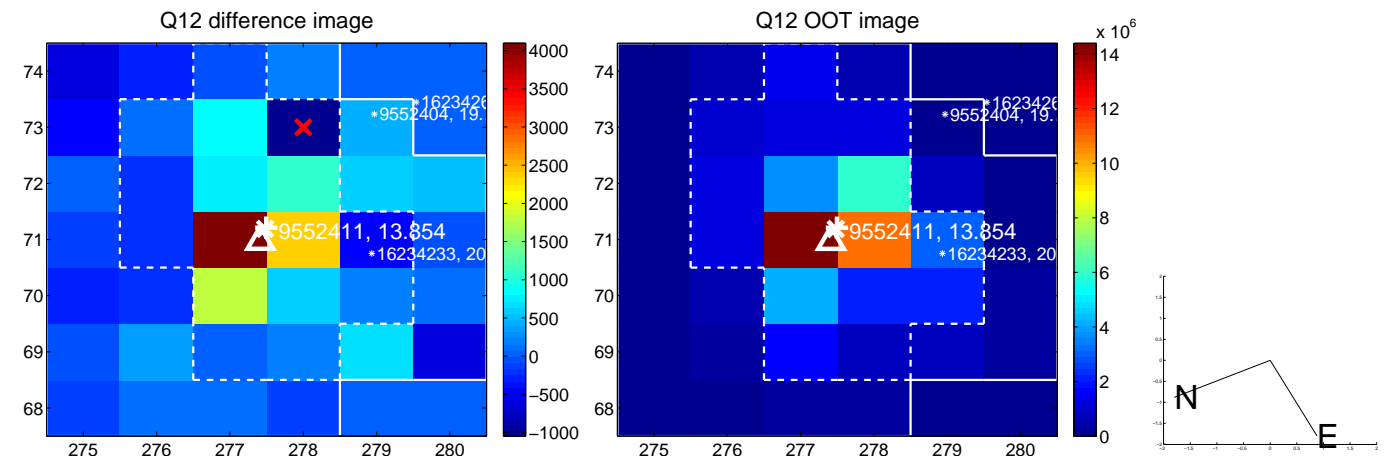
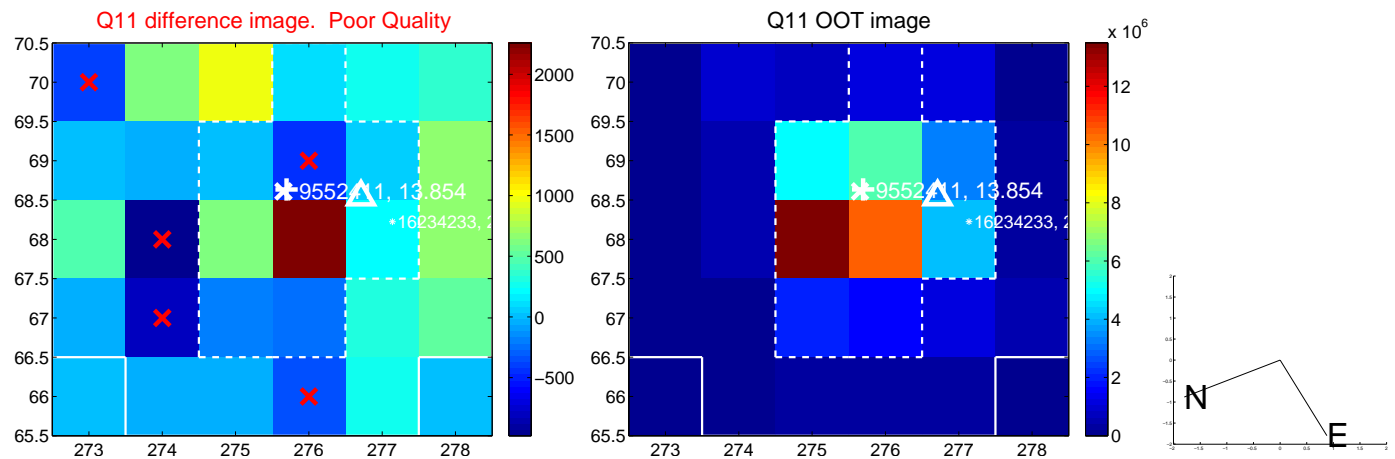
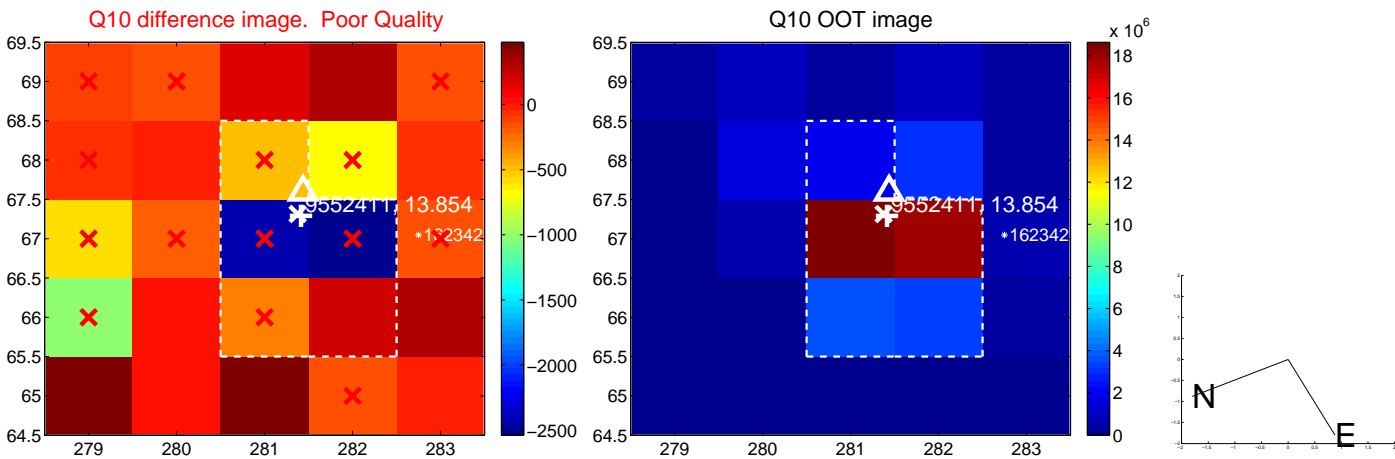
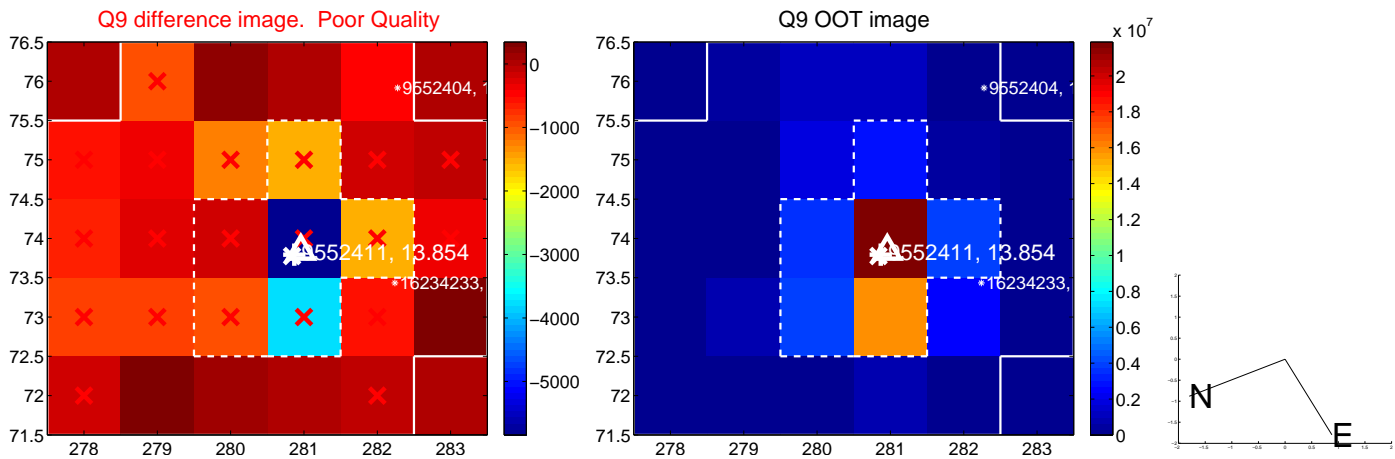
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



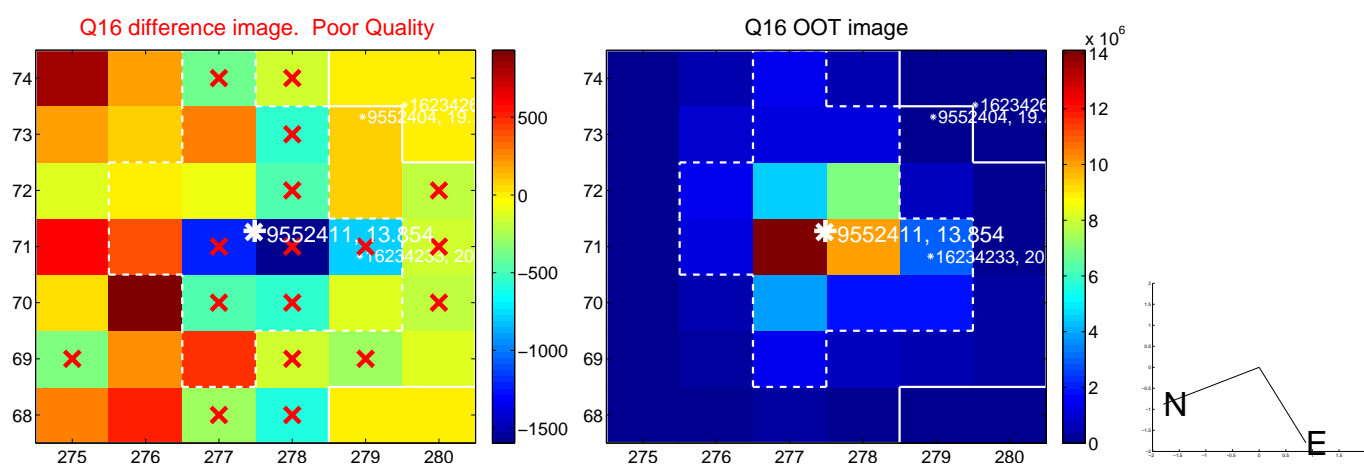
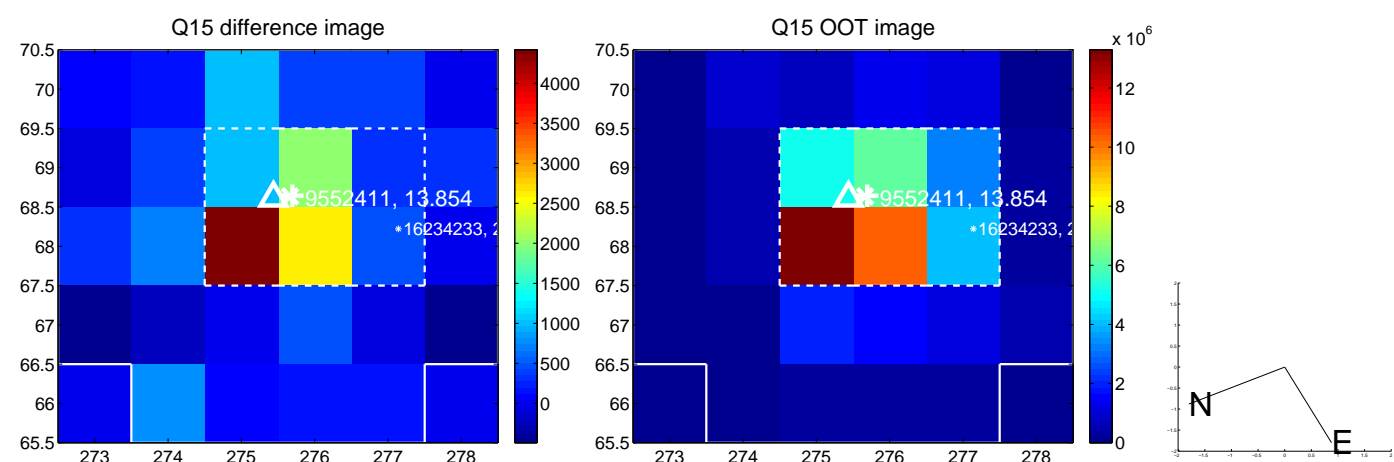
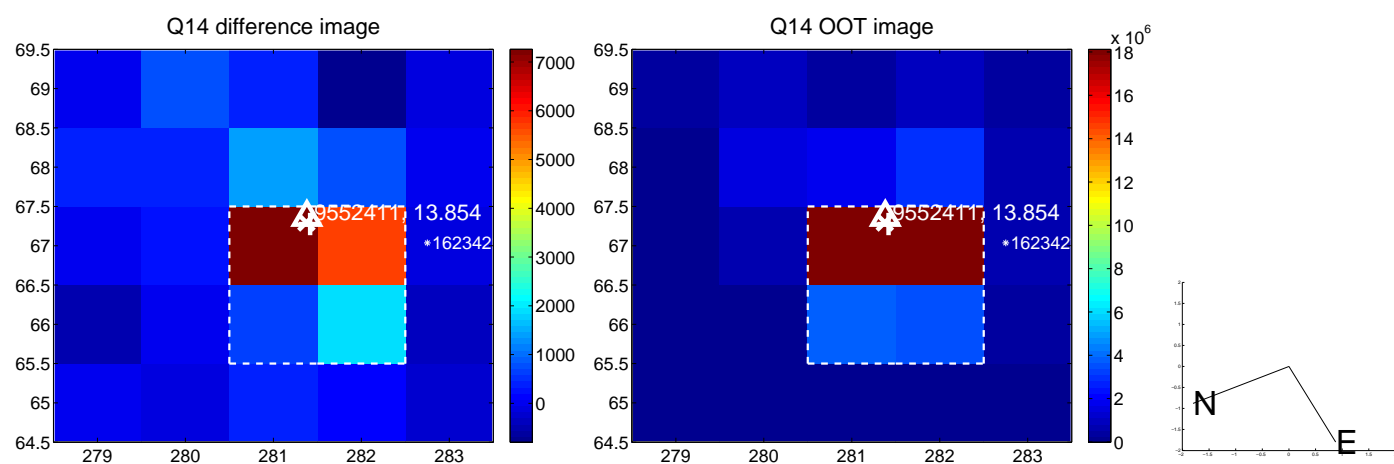
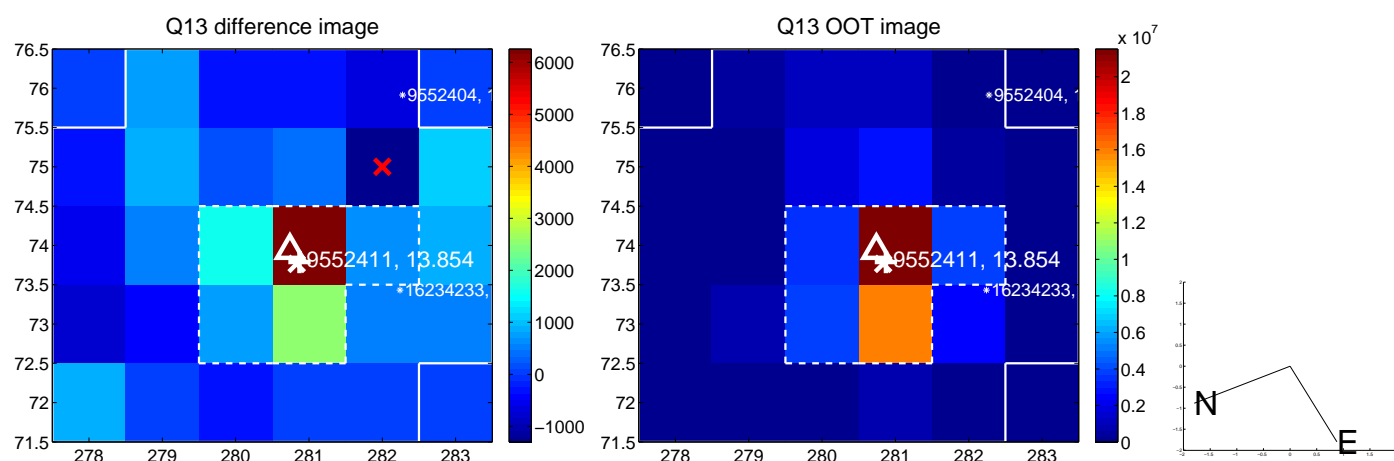
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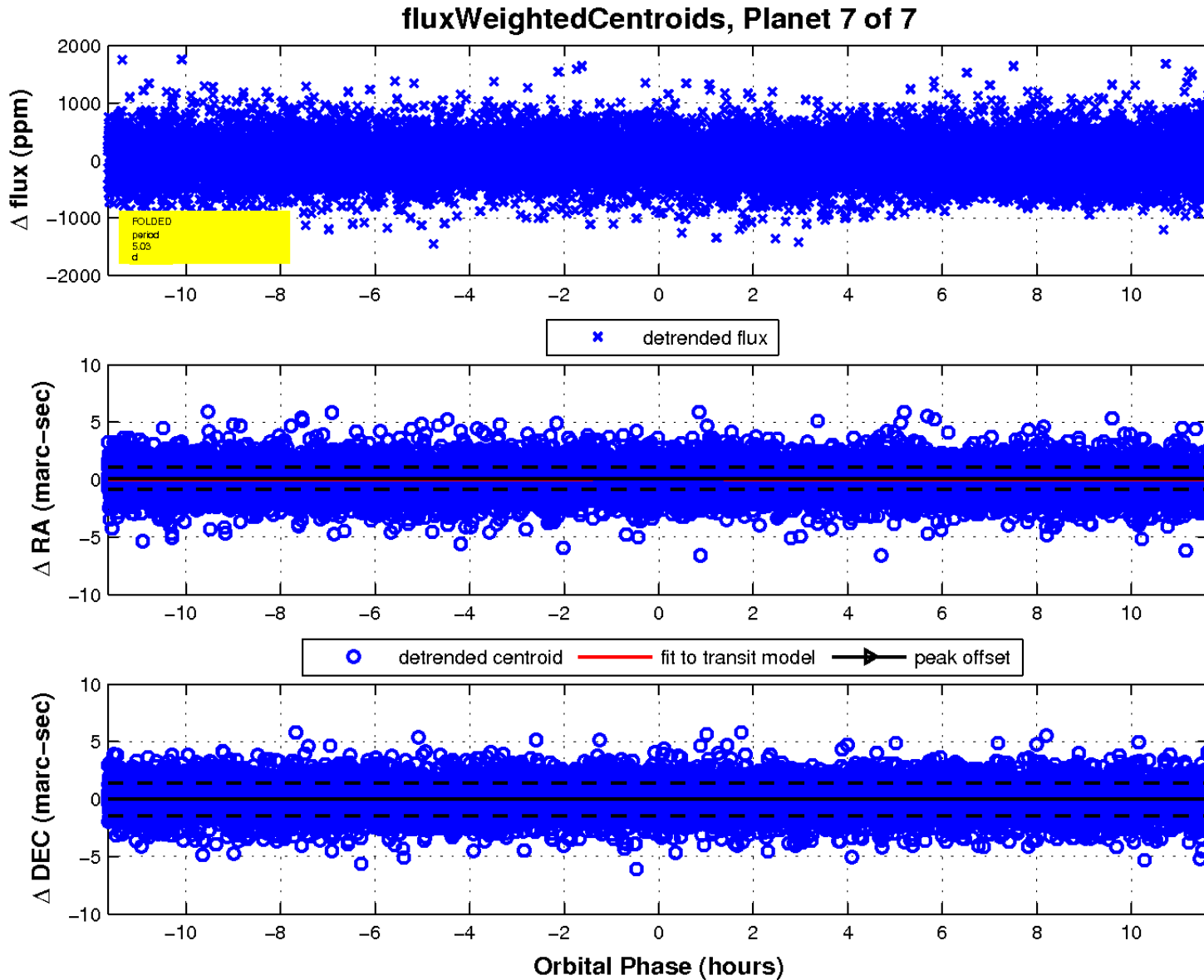
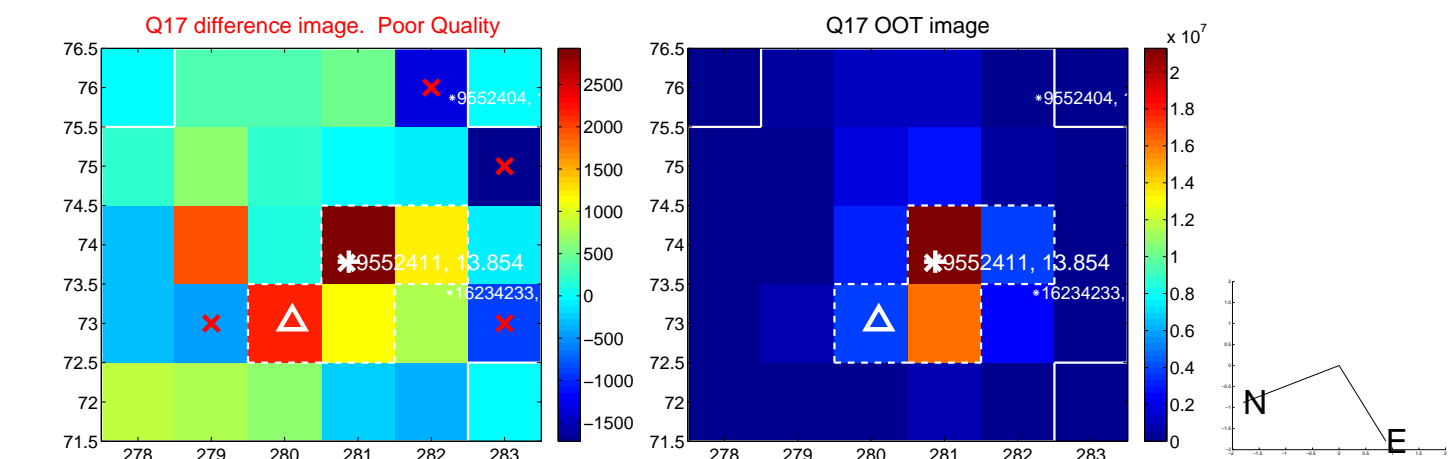
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UKIRT Image

Declination

