

# KIC 011124904

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011124904-01	OBS	No	4.411949	132.090641	18.7	15.728	9.5	6.8	1.54	6573	0.70	1301.35
011124904-02	OBS	No	292.687416	287.661747	165.3	11.551	11.5	6.8	1.54	6573	2.05	4.85
011124904-03	OBS	No	186.123014	266.666903	126.8	5.546	7.7	7.9	1.54	6573	2.03	8.86
011124904-04	OBS	No	374.723059	482.292915	103.5	5.952	7.5	4.7	1.54	6573	1.74	3.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011124904-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_SATURATED
011124904-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
011124904-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
011124904-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

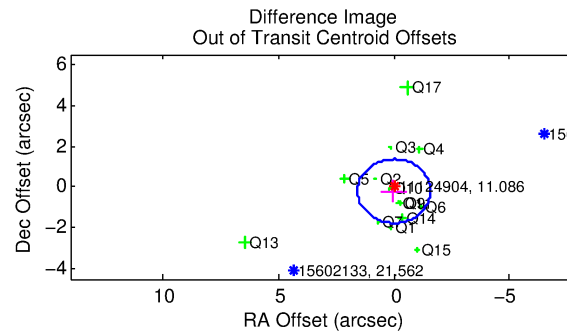
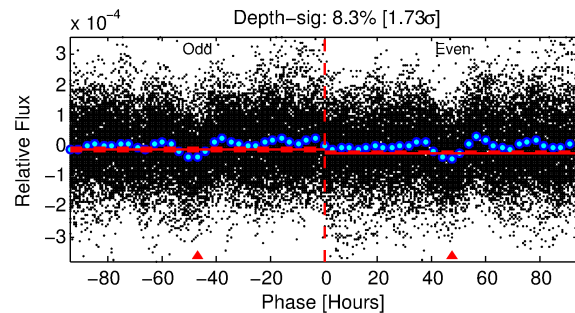
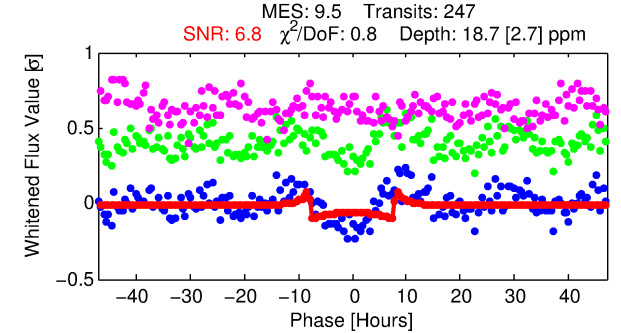
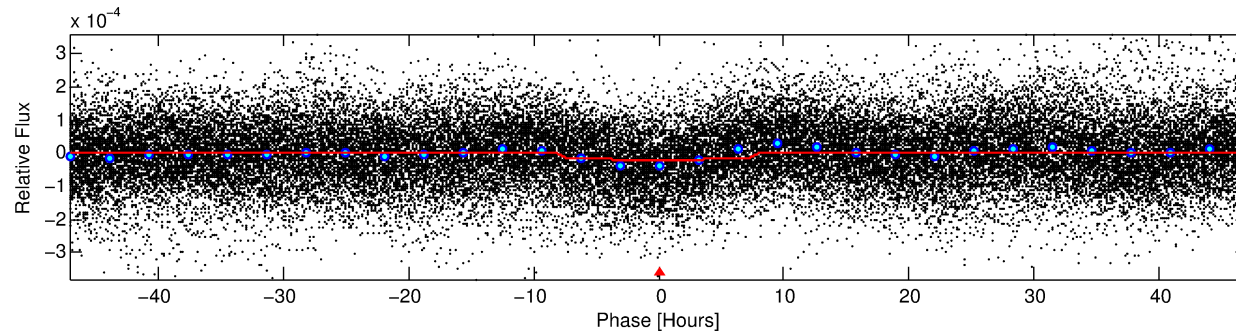
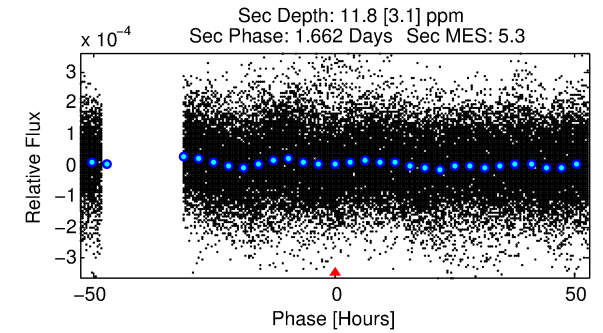
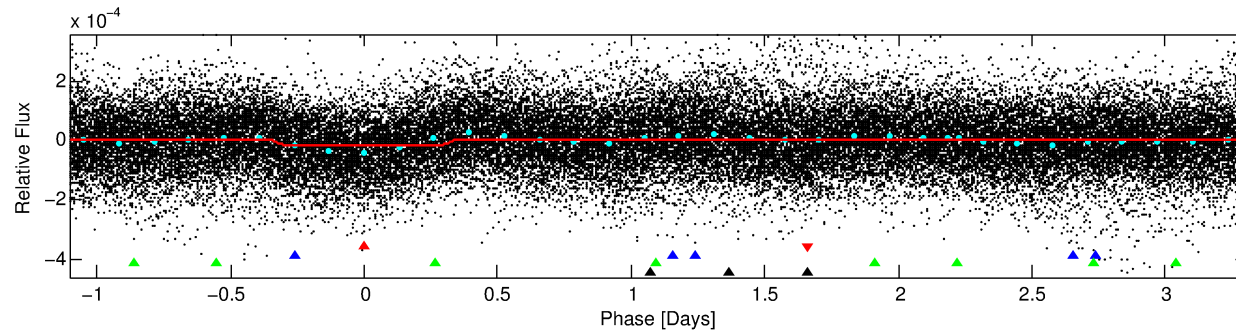
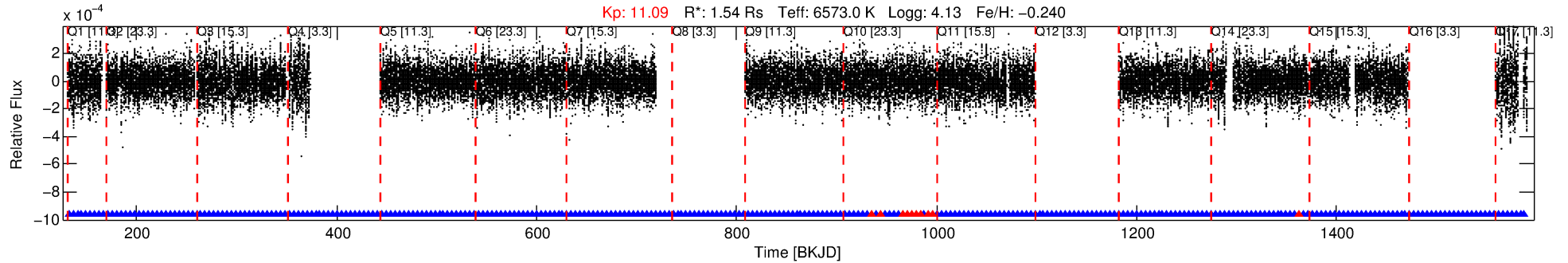
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Ephemeris Match Information For 011124904-01

No Significant Match Found

# DV One-Page Summary

KIC: 11124904 Candidate: 1 of 4 Period: 4.412 d



## DV Fit Results:

Period = 4.41195 [0.00005] d  
Epoch = 132.0906 [0.0066] BKJD  
Rp/R\* = 0.0041 [0.0007]  
a/R\* = 1.91 [1.28]  
b = 0.58 [1.05]  
Seff = 1301.35 [531.66]  
Teq = 1532 [156] K  
Rp = 0.70 [0.24] Re  
a = 0.0554 [0.0143] AU  
Ag = 40.82 [23.96] [1.66σ]  
Teffp = 5985 [695] K [6.25σ]

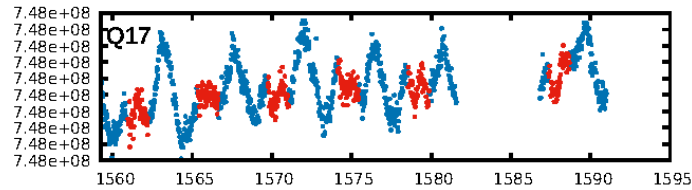
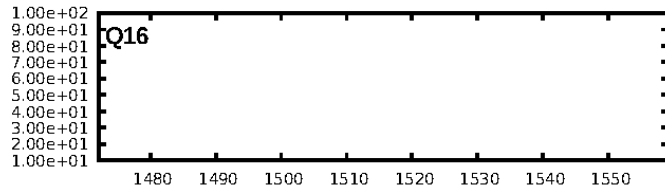
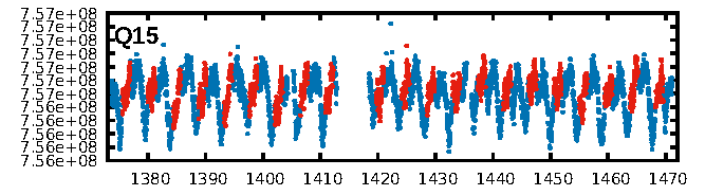
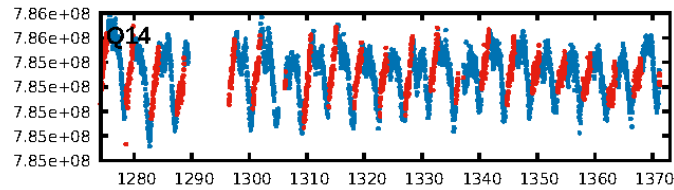
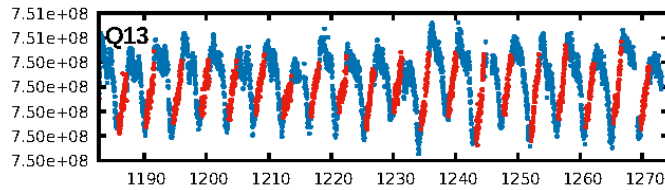
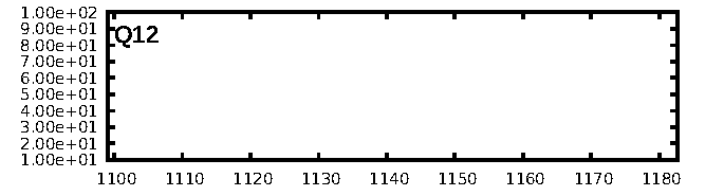
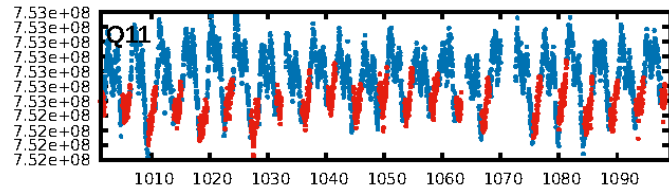
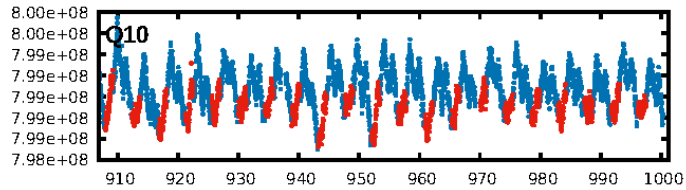
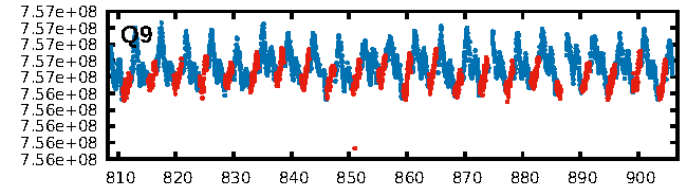
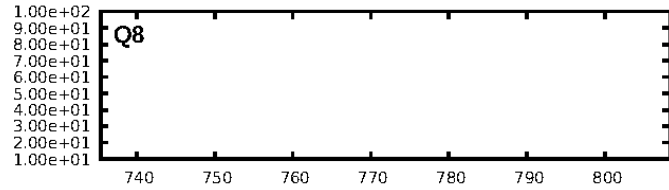
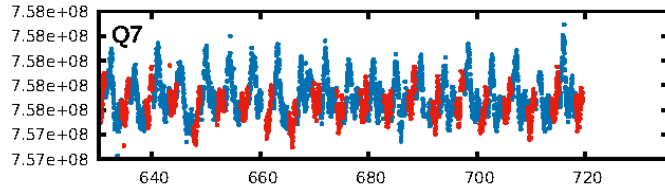
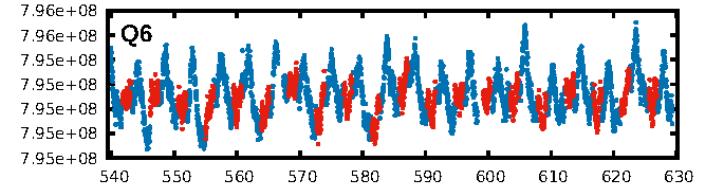
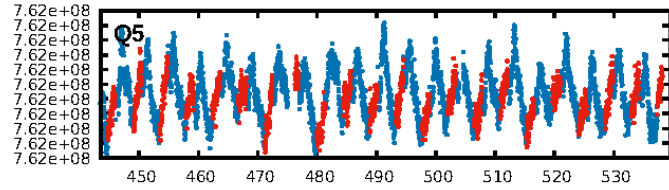
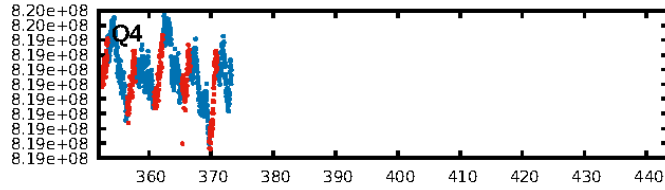
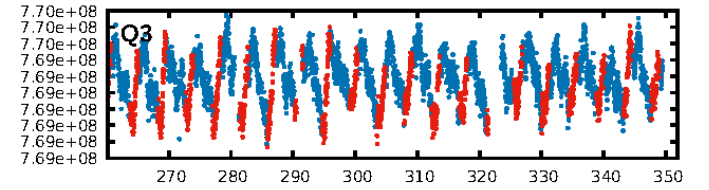
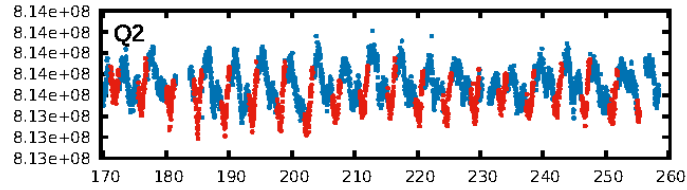
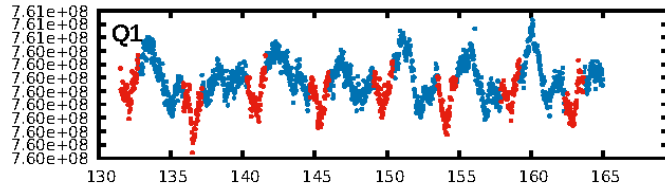
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [261.50σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 4.91e-12  
RollingBand-fgt: 0.96 [218/228]  
GhostDiagnostic-chr: 1.162  
Centroid-sig: 20.4%  
Centroid-so: 0.822 arcsec [1.02σ]  
OotOffset-rm: 0.199 arcsec [0.38σ]  
KicOffset-rm: 0.043 arcsec [0.07σ]  
OotOffset-st: 4/4/1/5 [14]  
KicOffset-st: 4/4/1/5 [14]  
DiffImageQuality-fgm: 0.64 [9/14]  
DiffImageOverlap-fno: 1.00 [14/14]

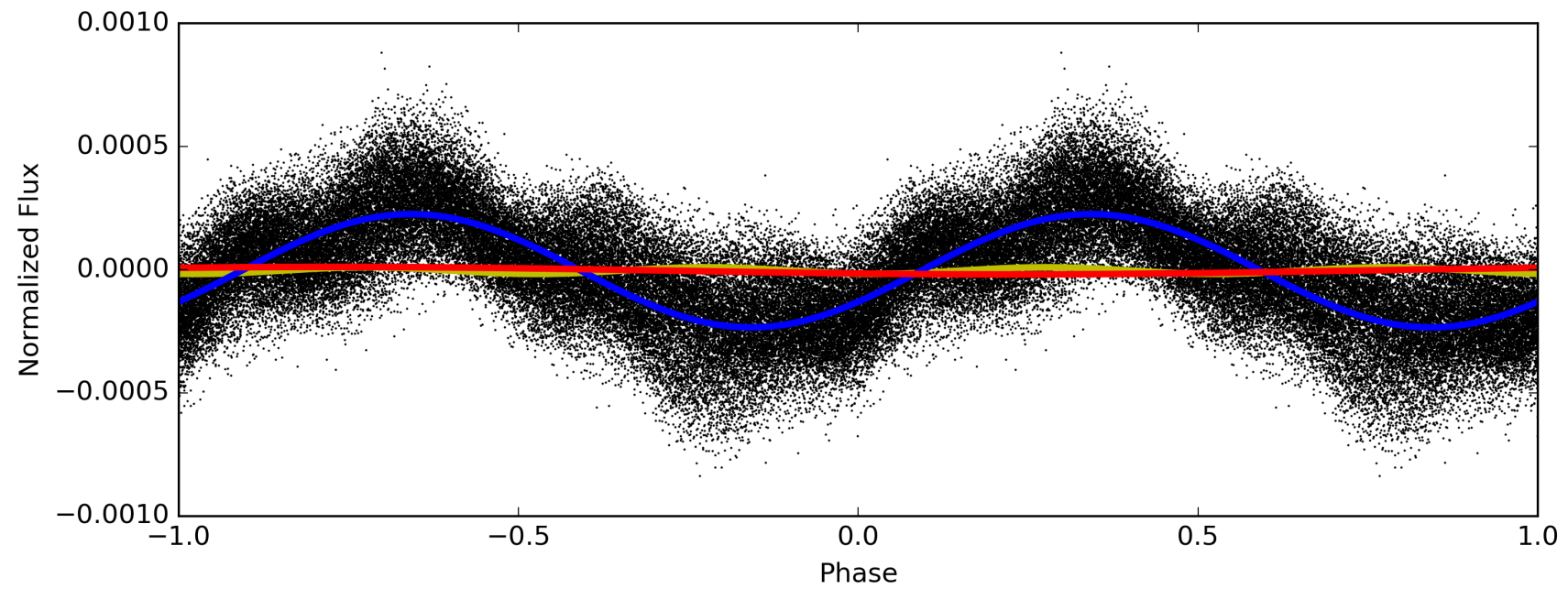
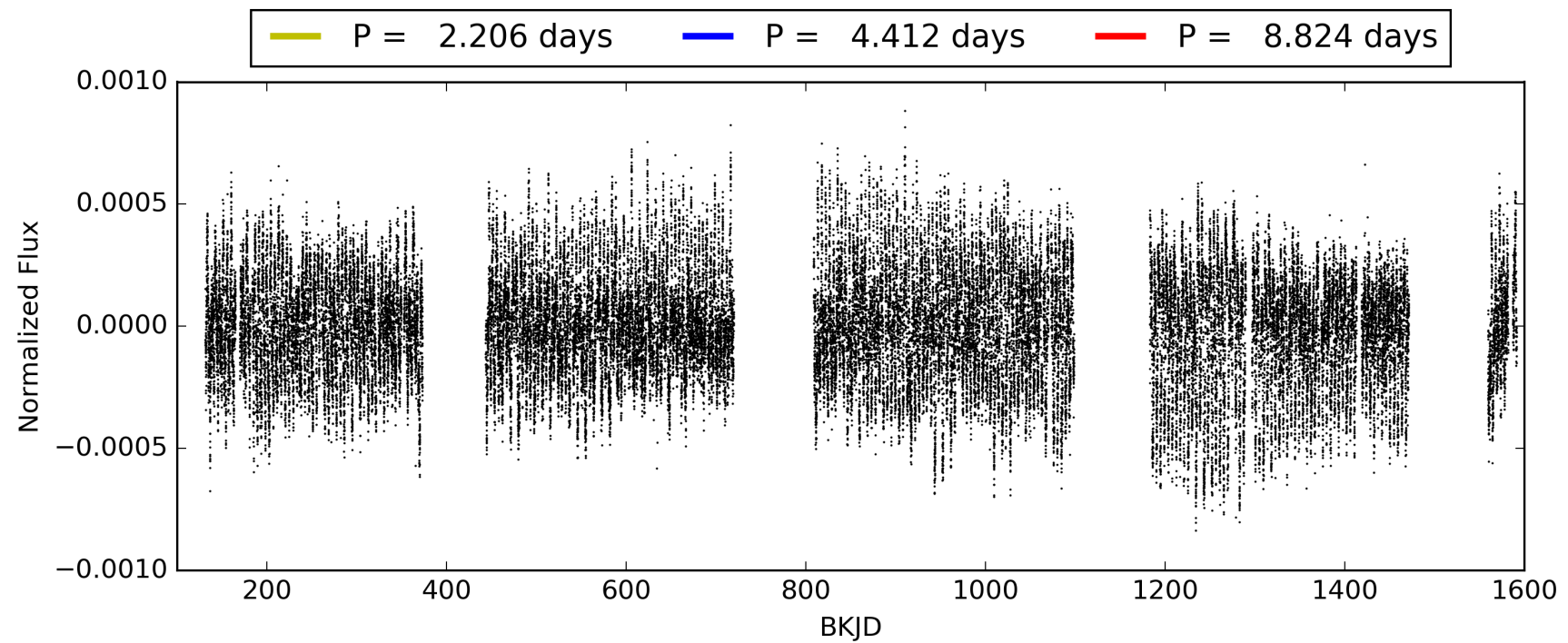
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

## TCE 011124904-01, PDC Light Curves



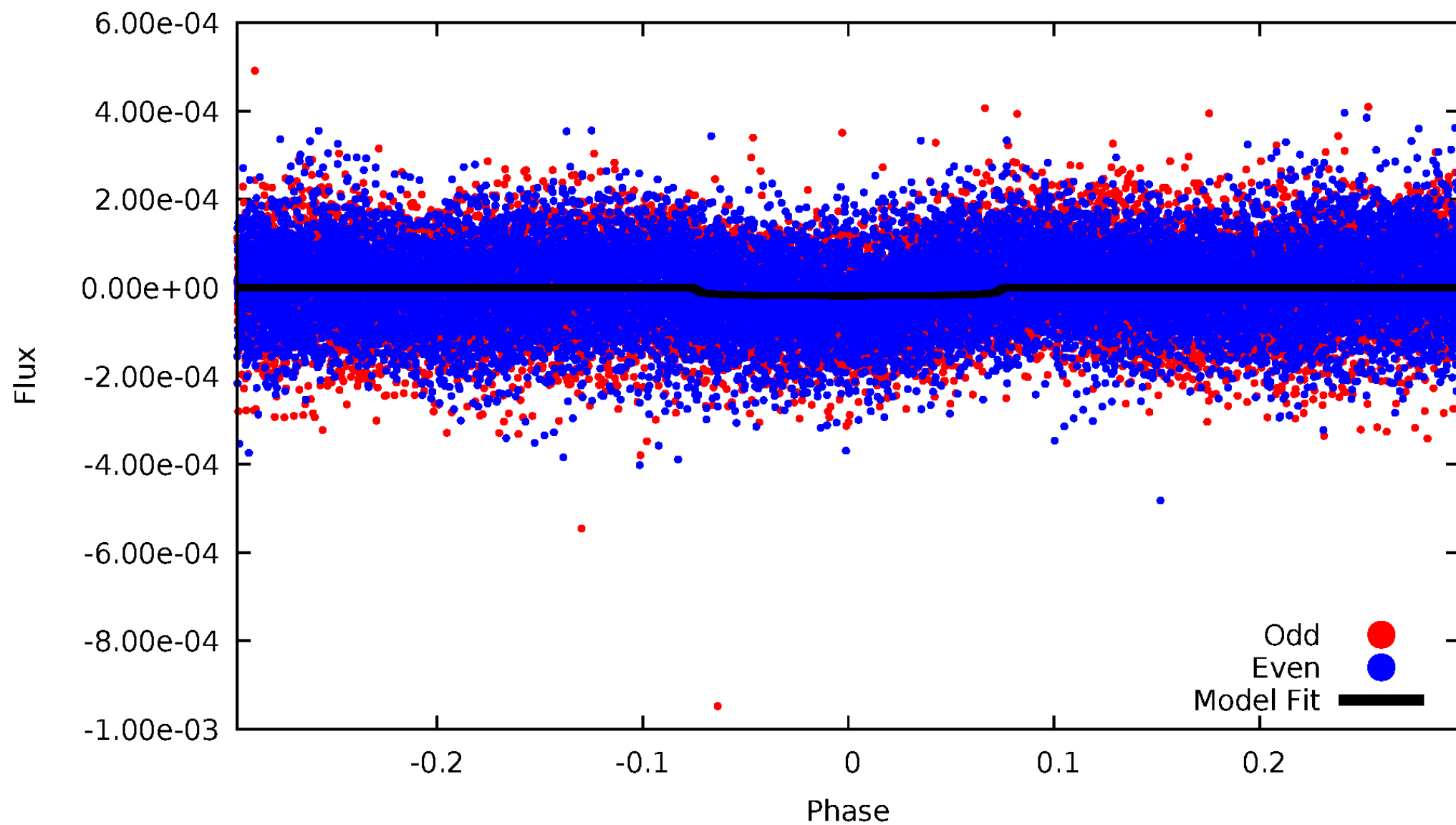
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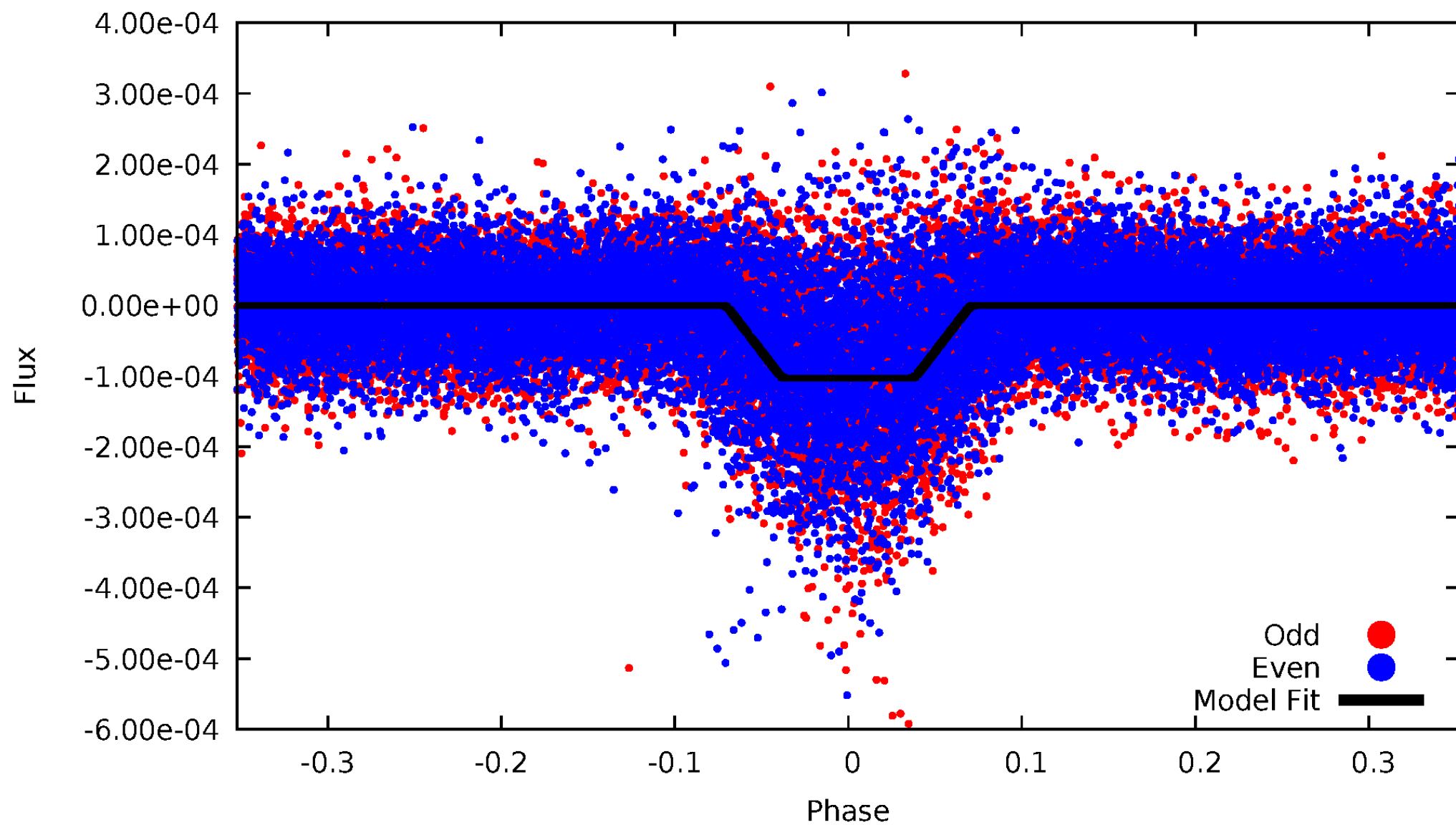
# DV Odd/Even

TCE 011124904-01

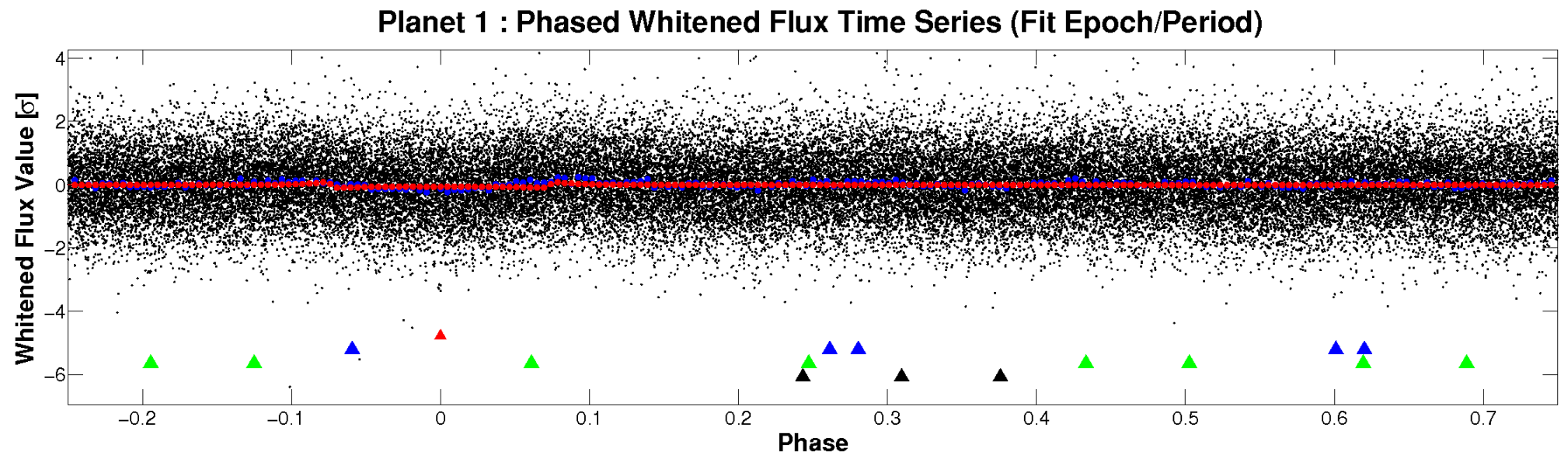
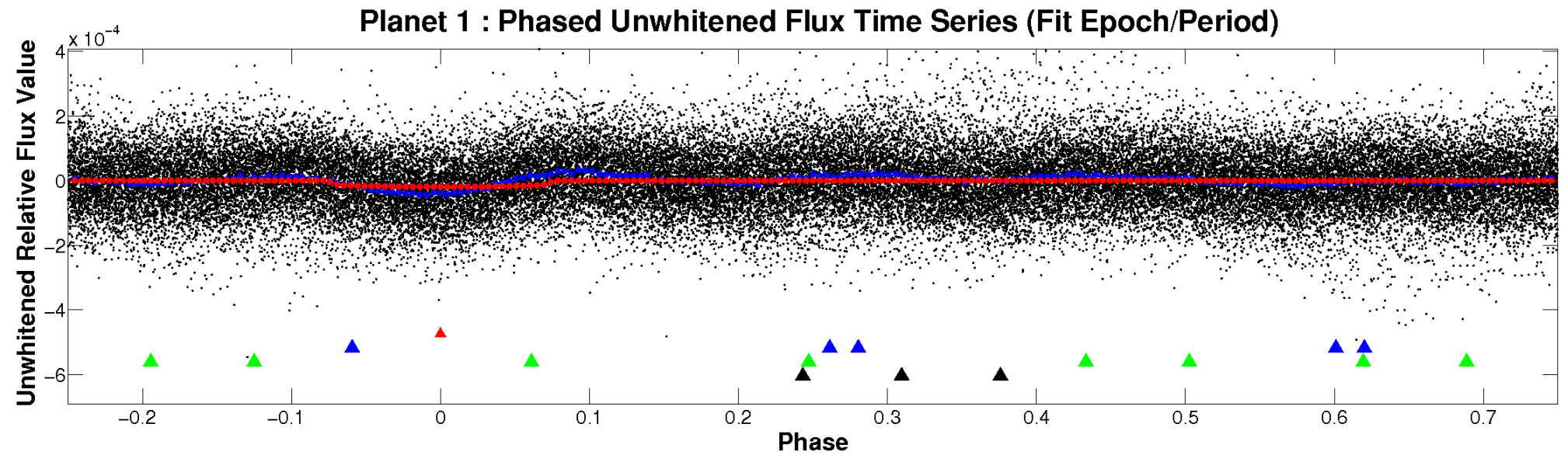


# ALT Odd/Even

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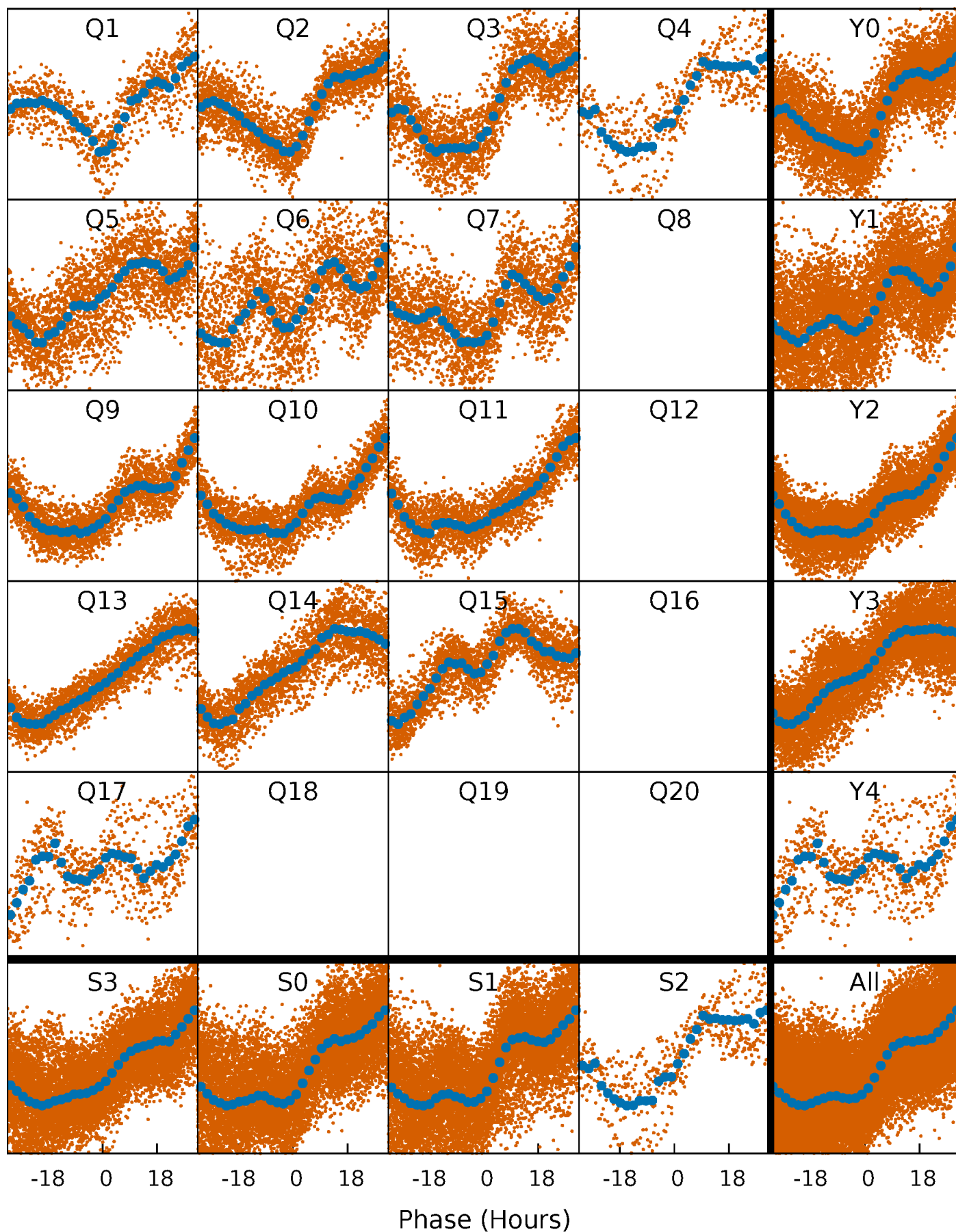


# Non-Whitened Vs. Whitened Light Curve



## PDC Quarter-Phased Transit Curves

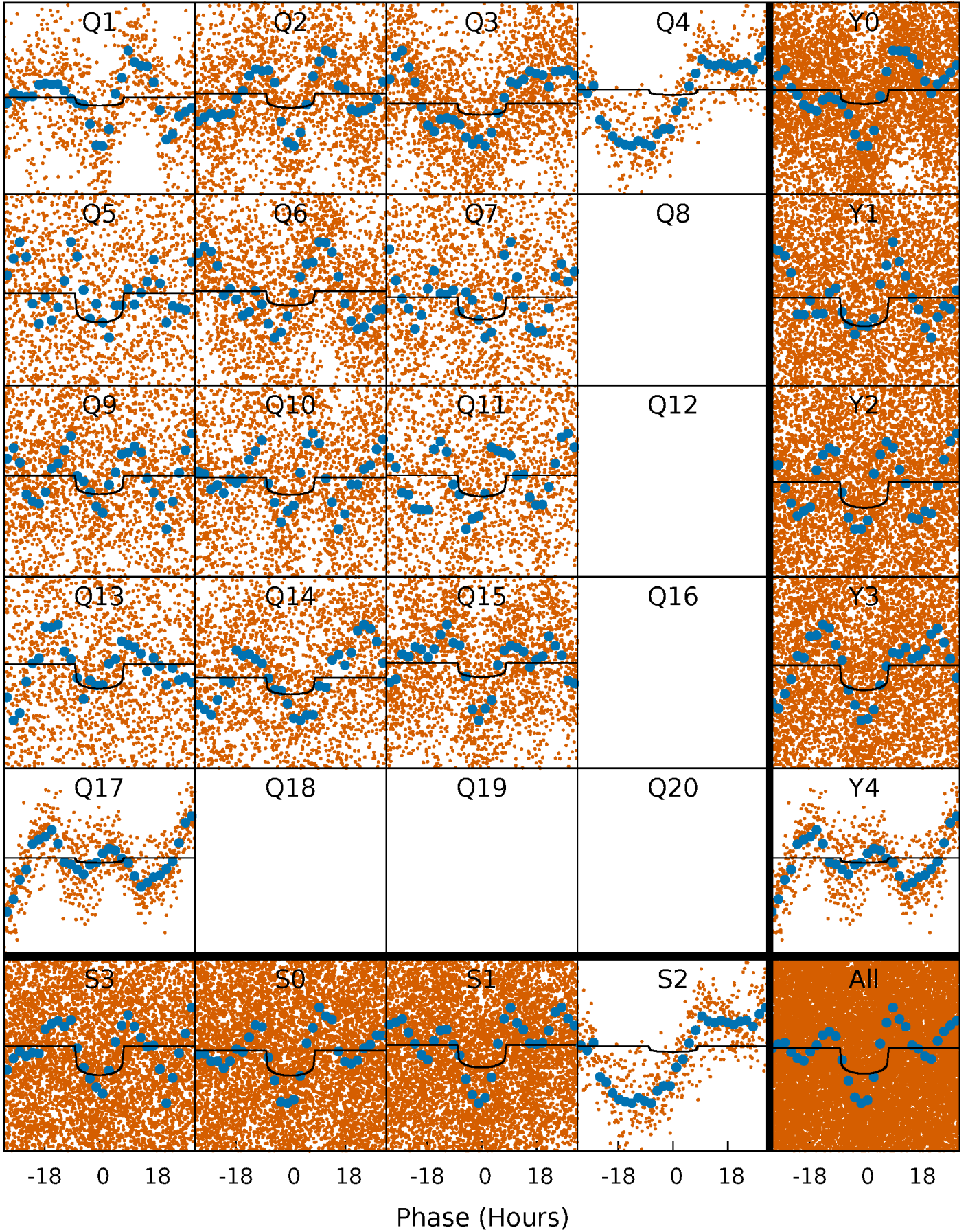
TCE 011124904-01 P= 4.411949 Days  $T_0=132.090641$  (BKJD)





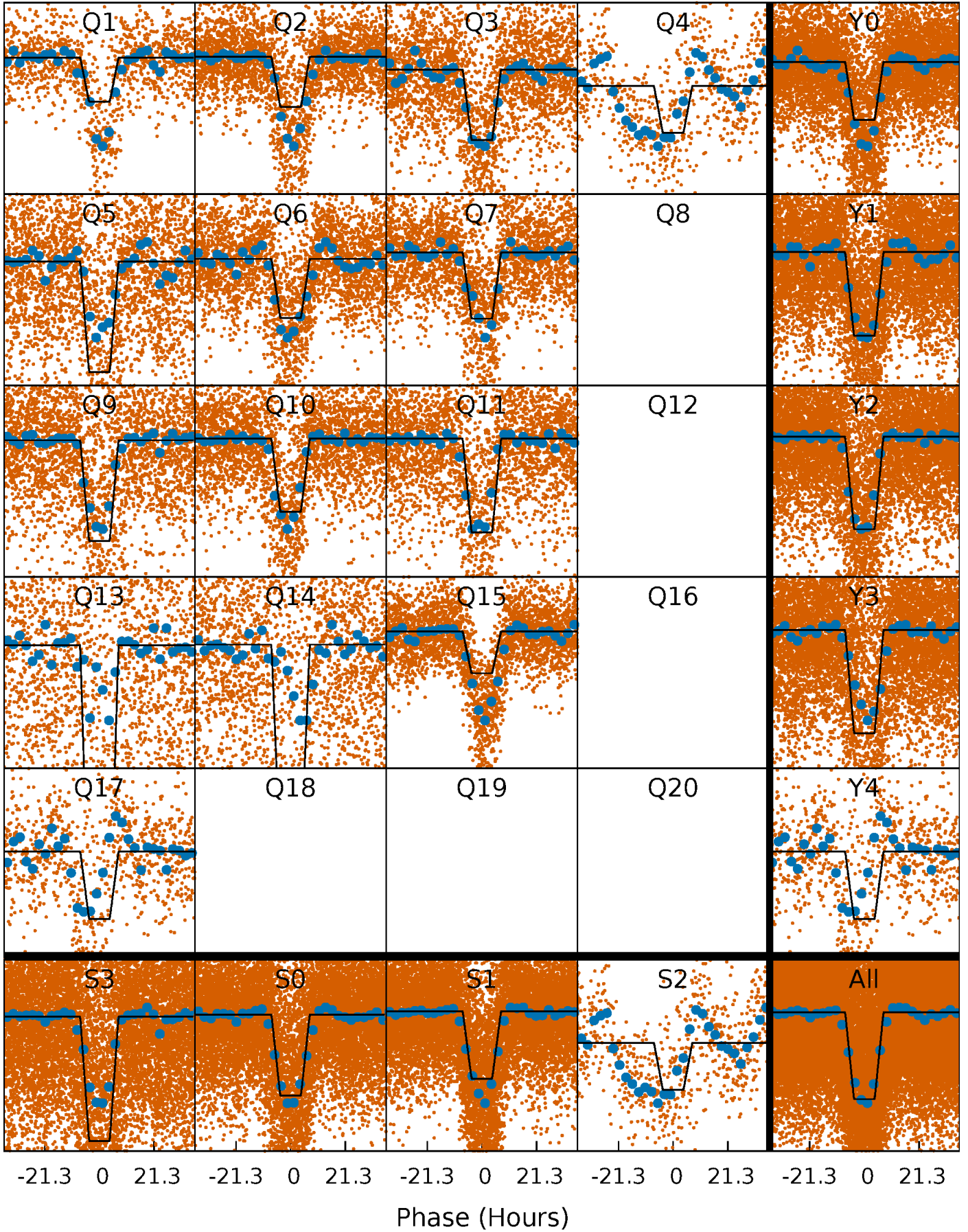
# DV Quarter-Phased Transit Curves

TCE 011124904-01   P= 4.411949 Days    $T_0=132.090641$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

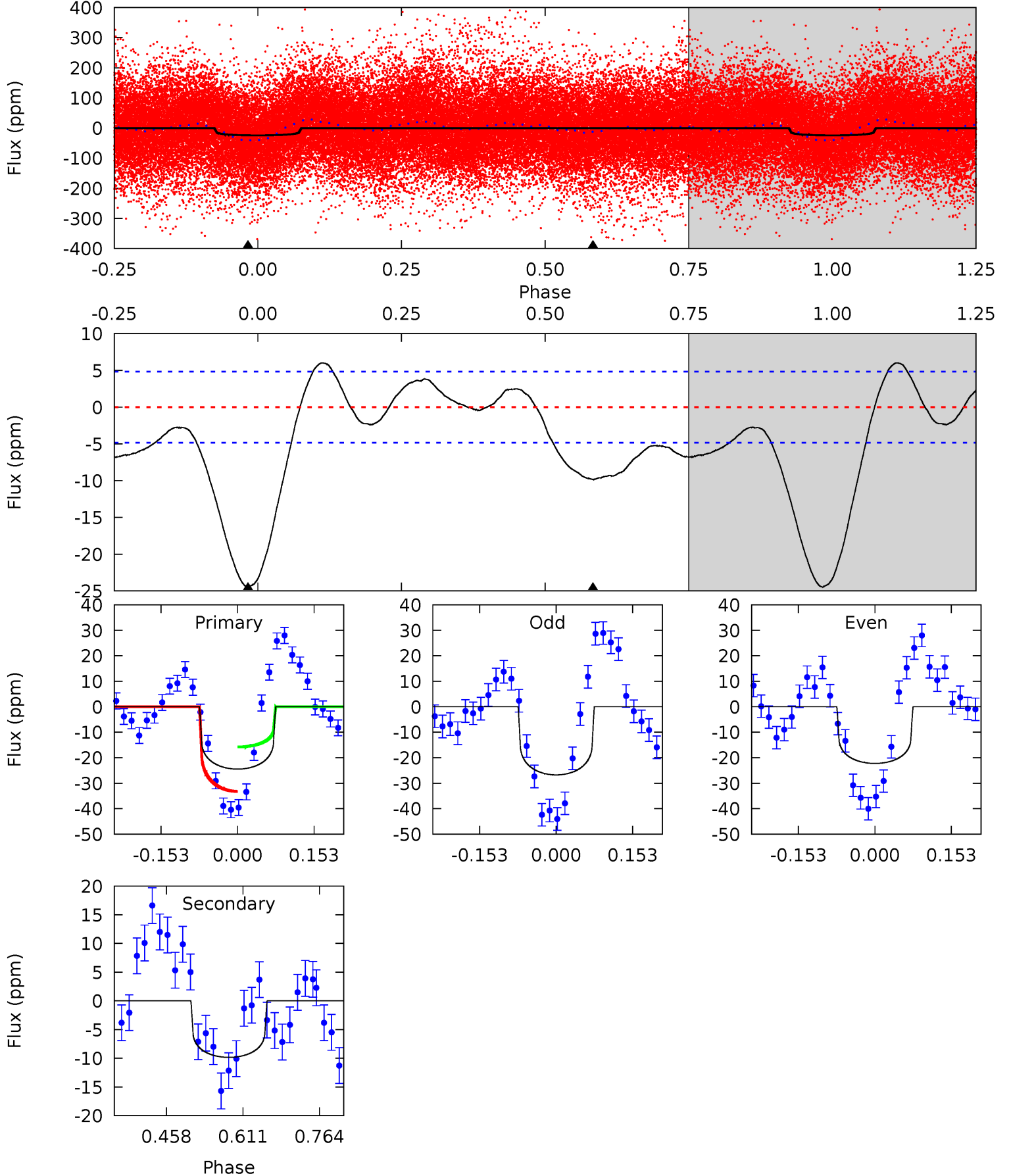
TCE 011124904-01 P= 4.411641 Days  $T_0=132.092724$  (BKJD)



# DV Model-Shift Uniqueness Test

011124904-01, P = 4.411949 Days, E = 127.678692 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
22.6	9.10	0	0	4.48	1.43	3.12	22.6	22.6	9.10	9.10	2.08	1.13	0.20	8.17

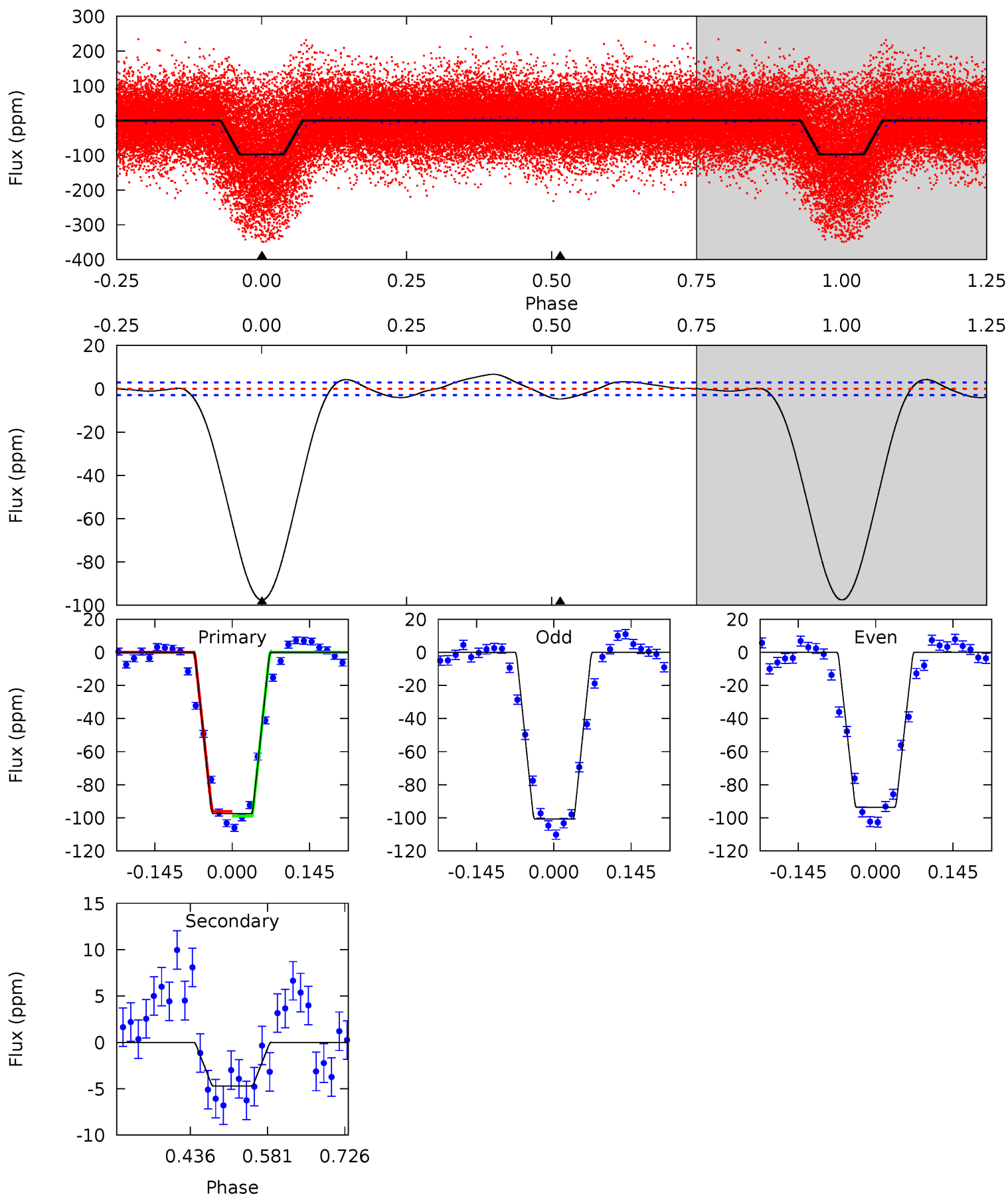




# Alt Model-Shift Uniqueness Test

011124904-01, P = 4.411641 Days, E = 127.681083 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
150.6	7.27	0	0	4.49	1.46	3.45	150.6	150.6	7.27	7.27	5.39	1.04	0.06	2.13





### Stellar Parameters For KIC 011124904

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-227}$	$4.126^{+0.214}_{-0.175}$	$-0.240^{+0.250}_{-0.300}$	$1.545^{+0.463}_{-0.421}$	$1.162^{+0.206}_{-0.150}$	$0.444^{+0.553}_{-0.215}$
	+3%/-3%	+5%/-4%	+104%/-125%	+30%/-27%	+18%/-13%	+125%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011124904-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-10 \pm 1$	$0.70^{+0.16}_{-0.16}$	$2131^{+156}_{-161}$	$5714^{+598}_{-475}$	$35^{+21}_{-12}$
Alt.	$-5 \pm 1$	$1.74^{+0.30}_{-0.29}$	$2138^{+179}_{-156}$	$3443^{+133}_{-146}$	$2.656^{+1.144}_{-0.757}$

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

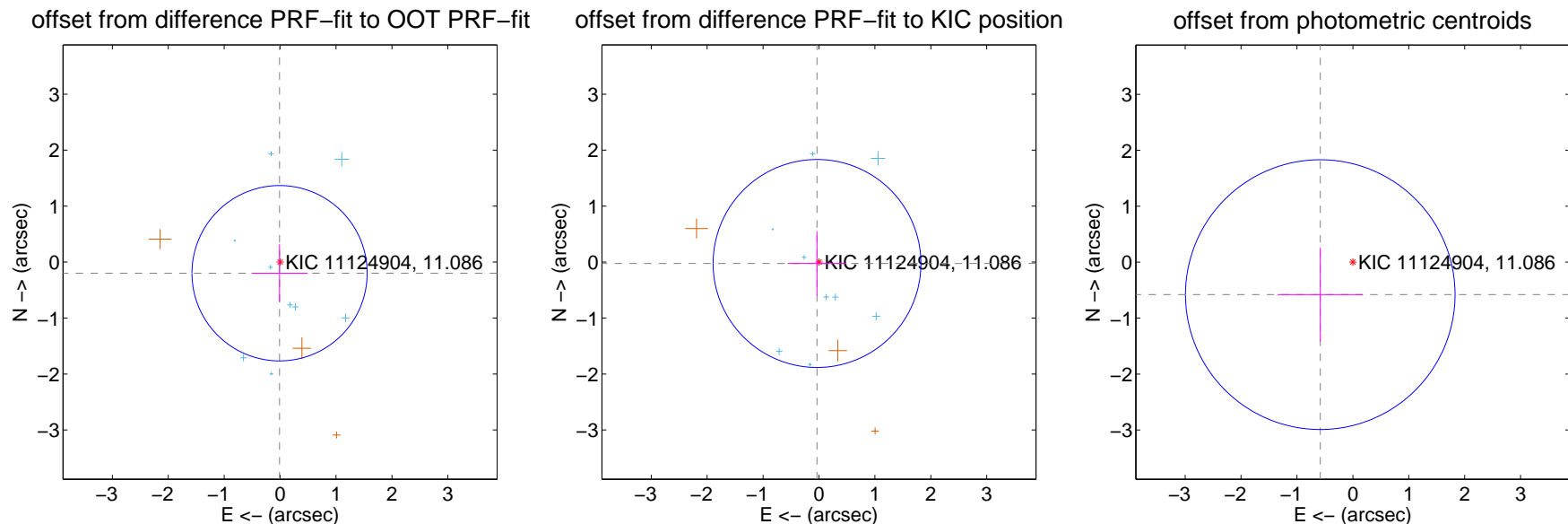
## DV Centroid Data

Supplemental centroid analysis for 011124904-01. **Kepler magnitude: 11.09.** Transit SNR 6.81

There are 9 quarters with good PRF difference image offsets

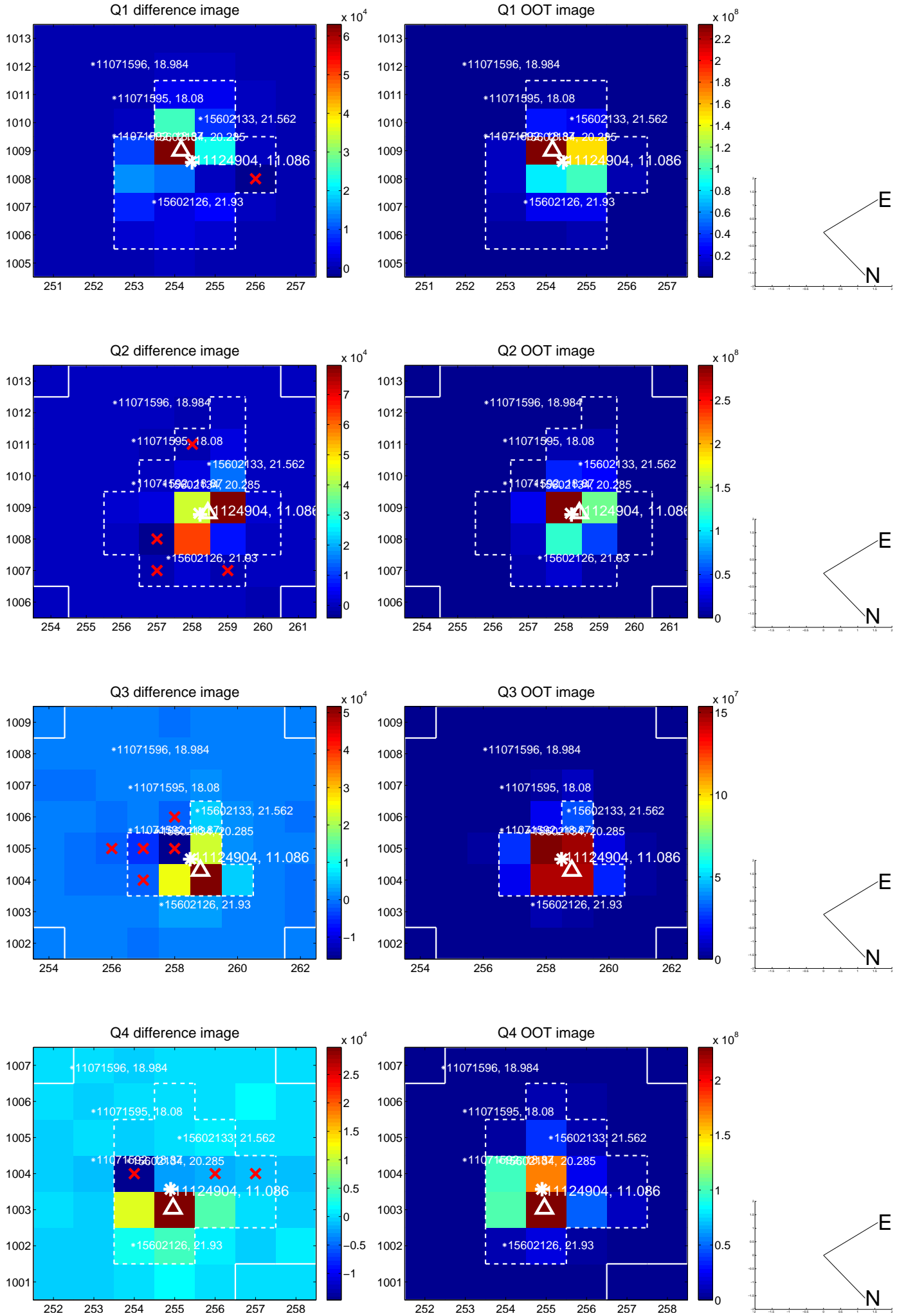
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.199 \pm 0.522$	0.38	$0.010 \pm 0.498$	$-0.199 \pm 0.517$
PRF-fit source offset from KIC position	$0.043 \pm 0.619$	0.07	$0.035 \pm 0.526$	$-0.025 \pm 0.574$
photometric centroid source offset	$0.82 \pm 0.80$	1.02	$0.58 \pm 0.76$	$-0.58 \pm 0.84$

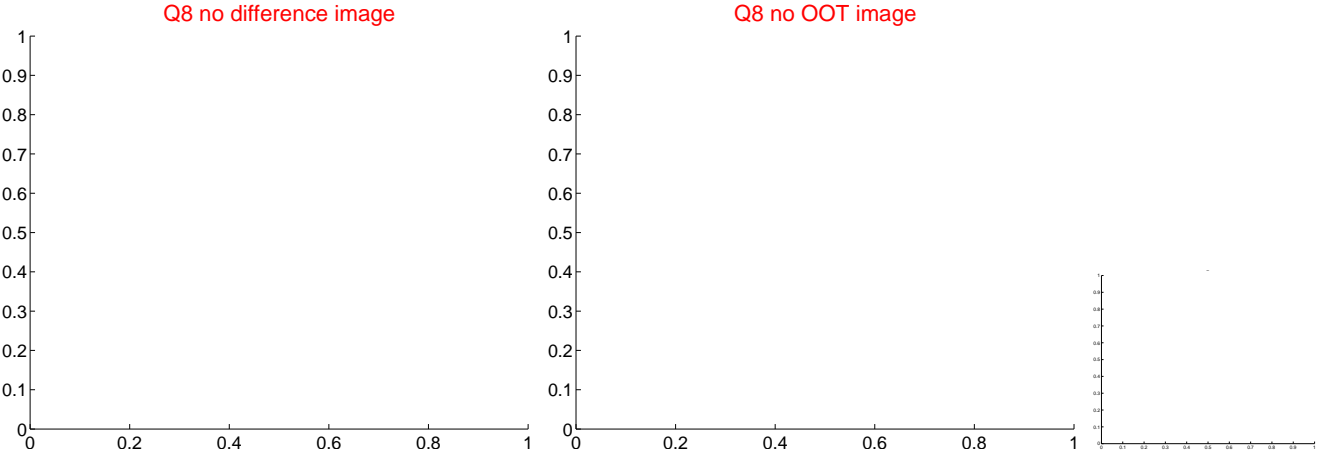
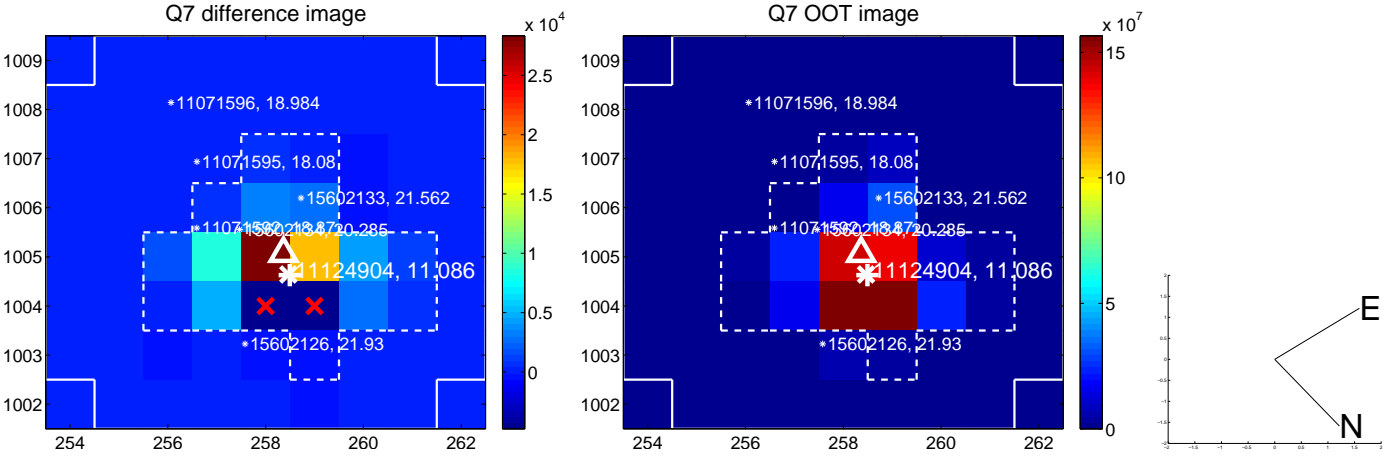
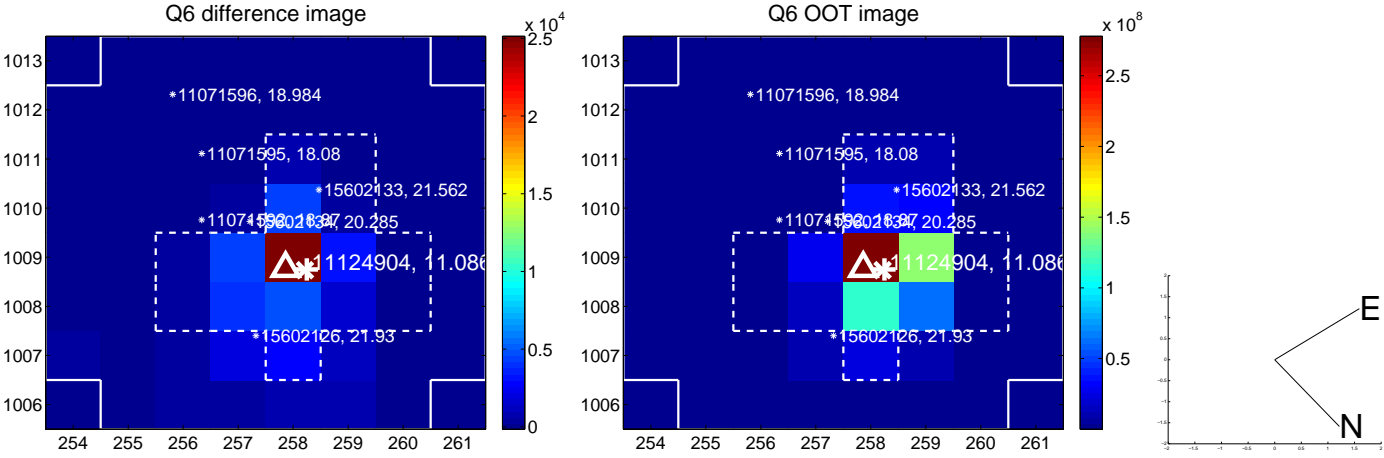
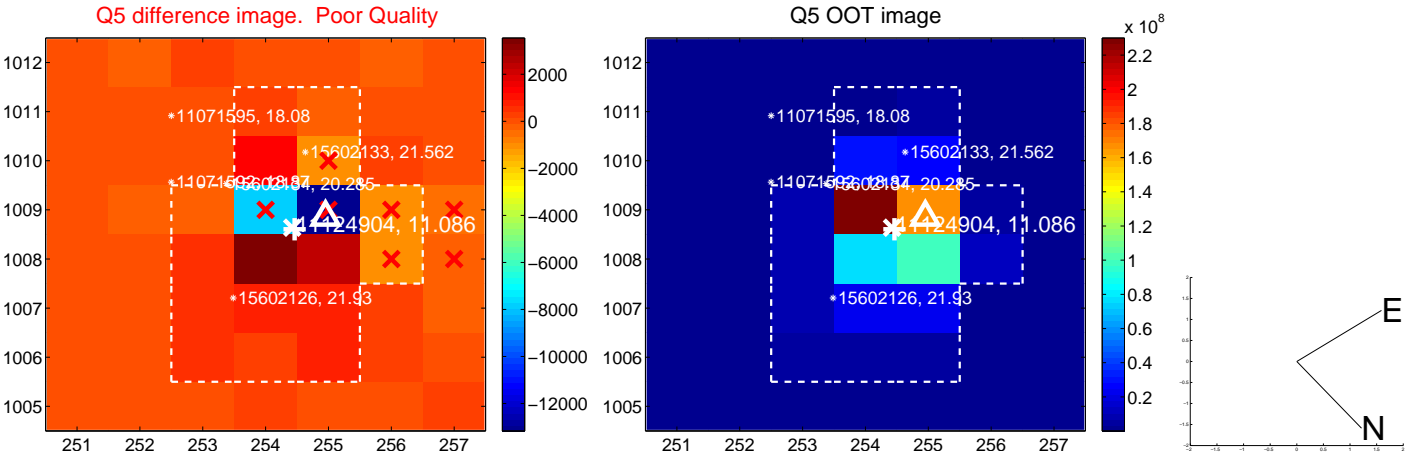


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

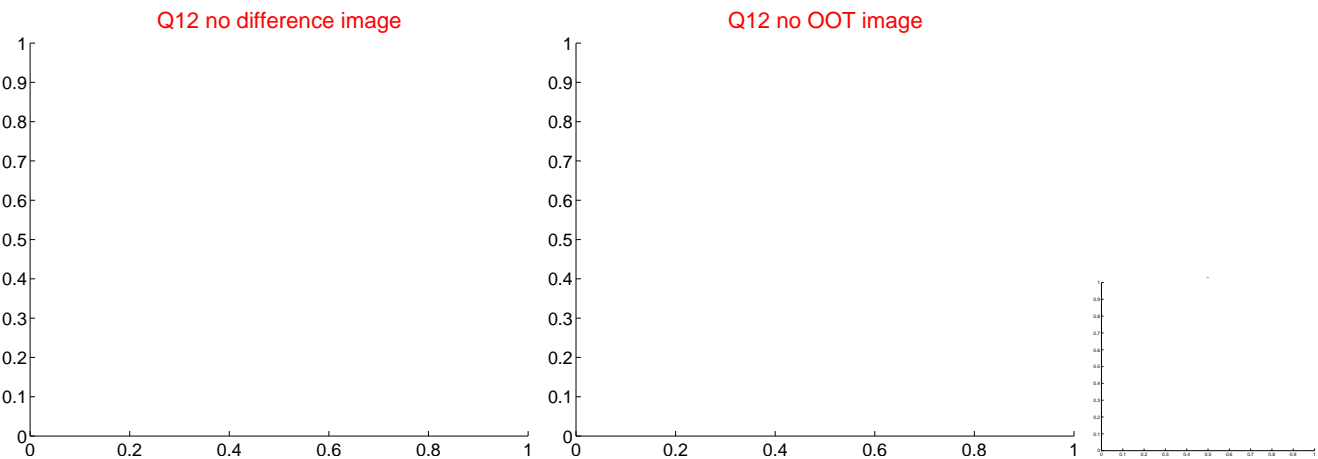
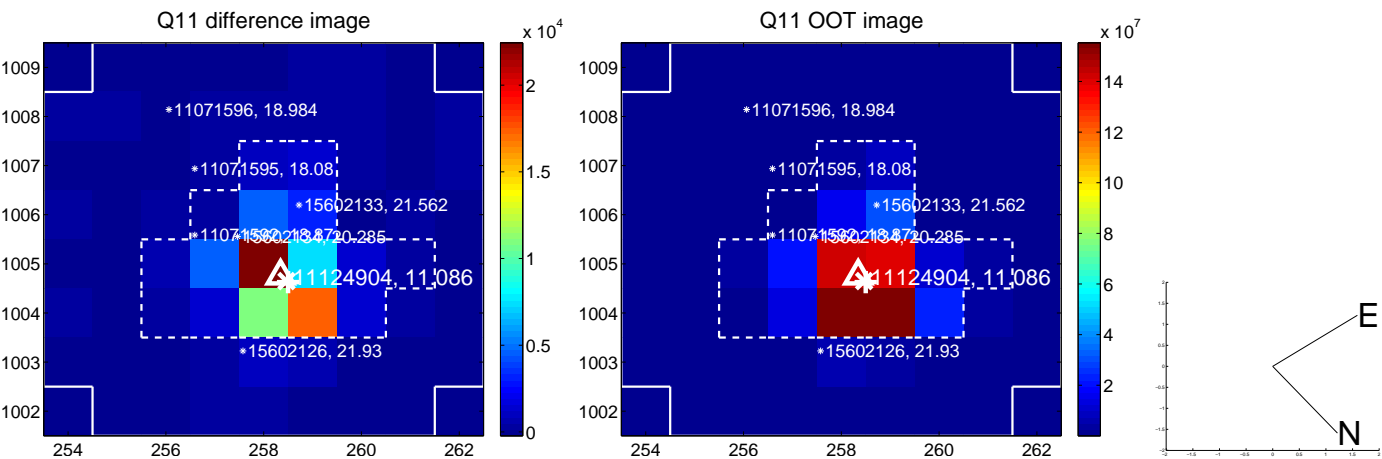
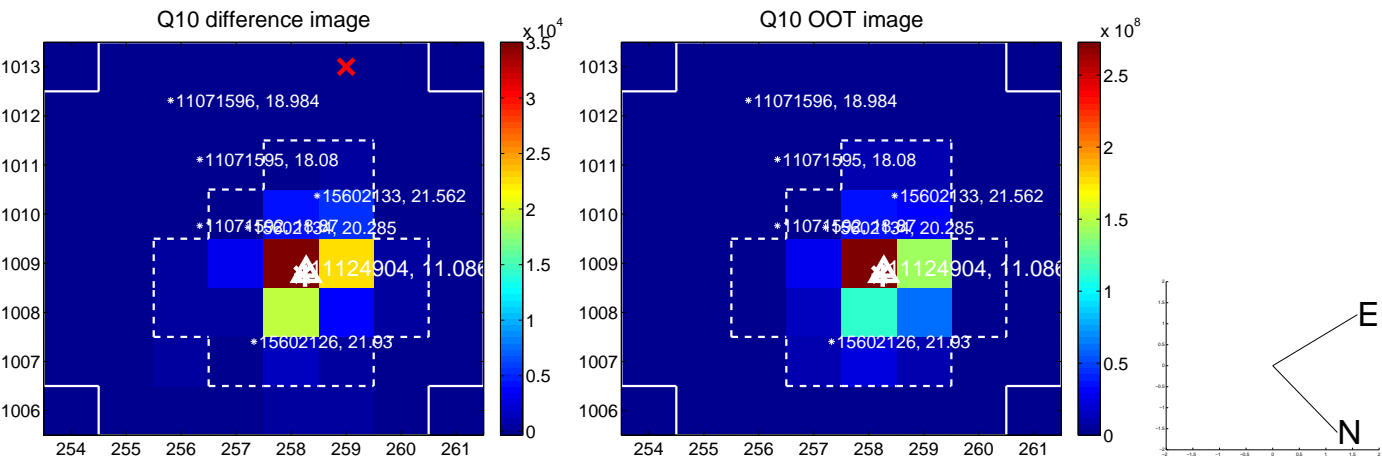
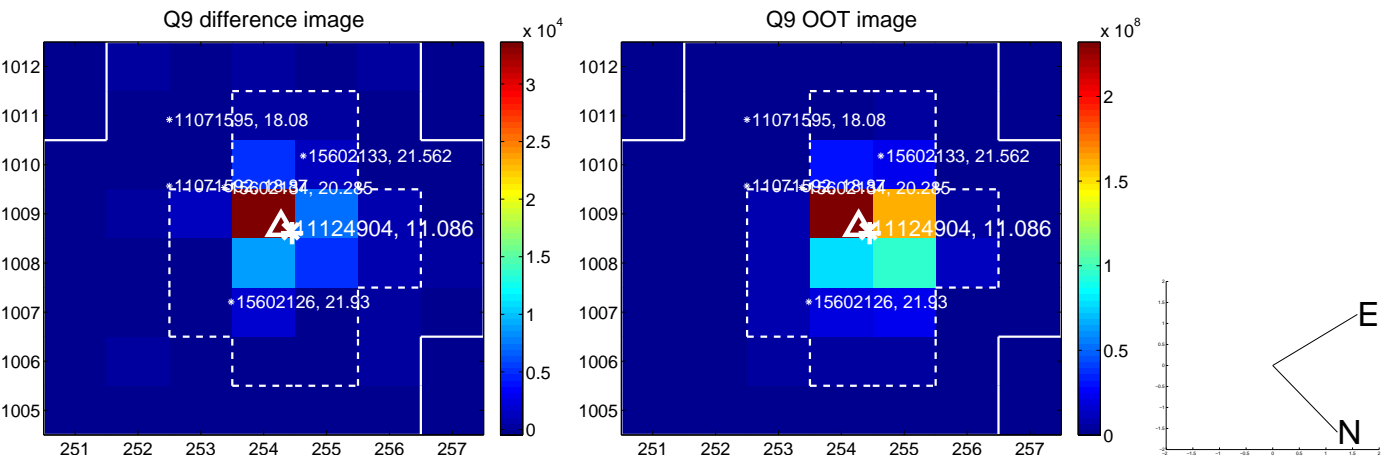


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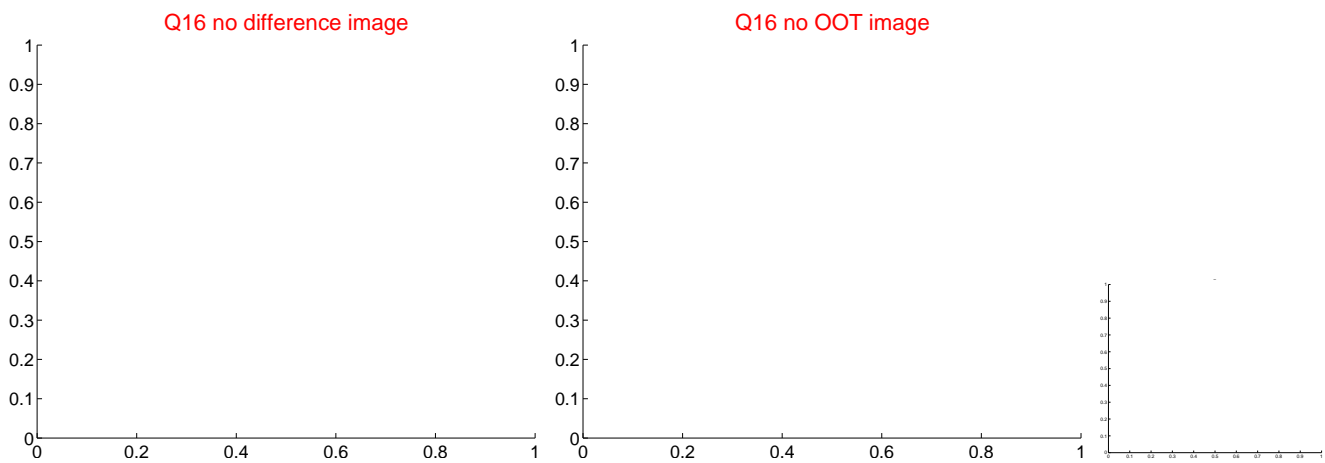
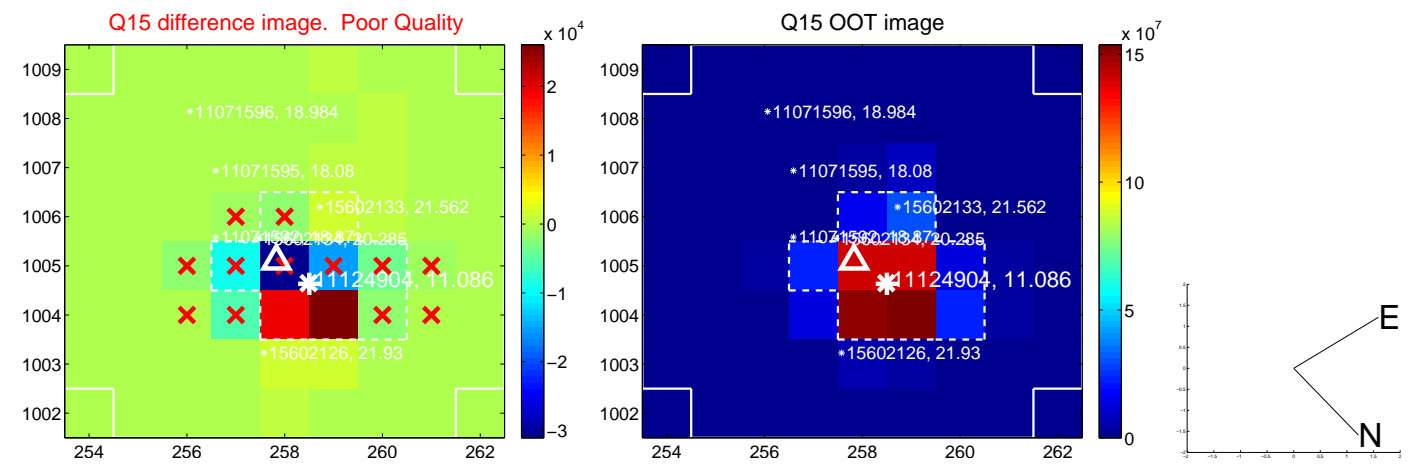
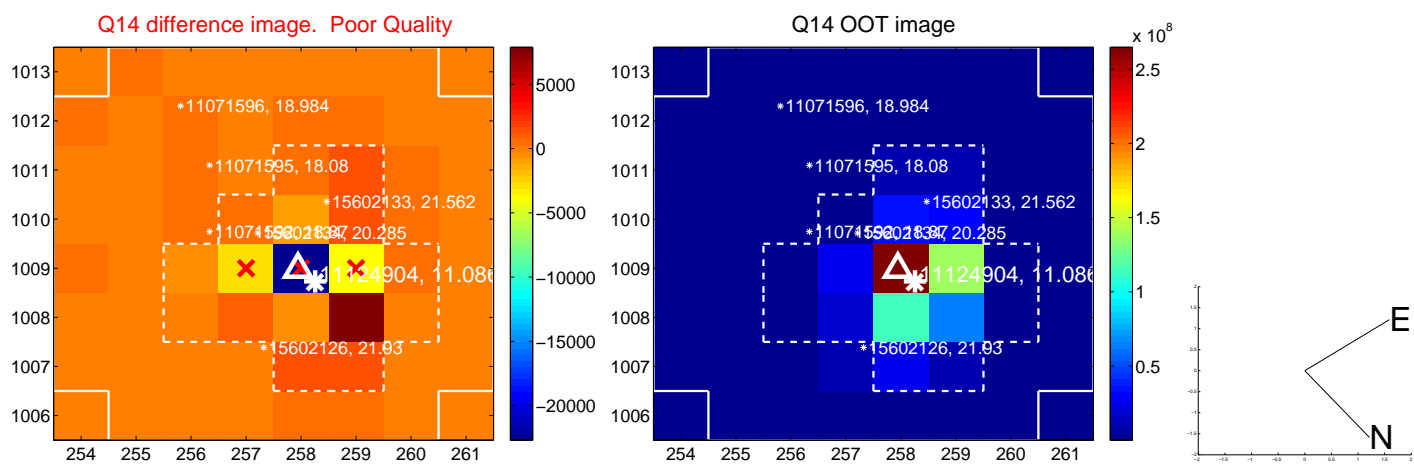
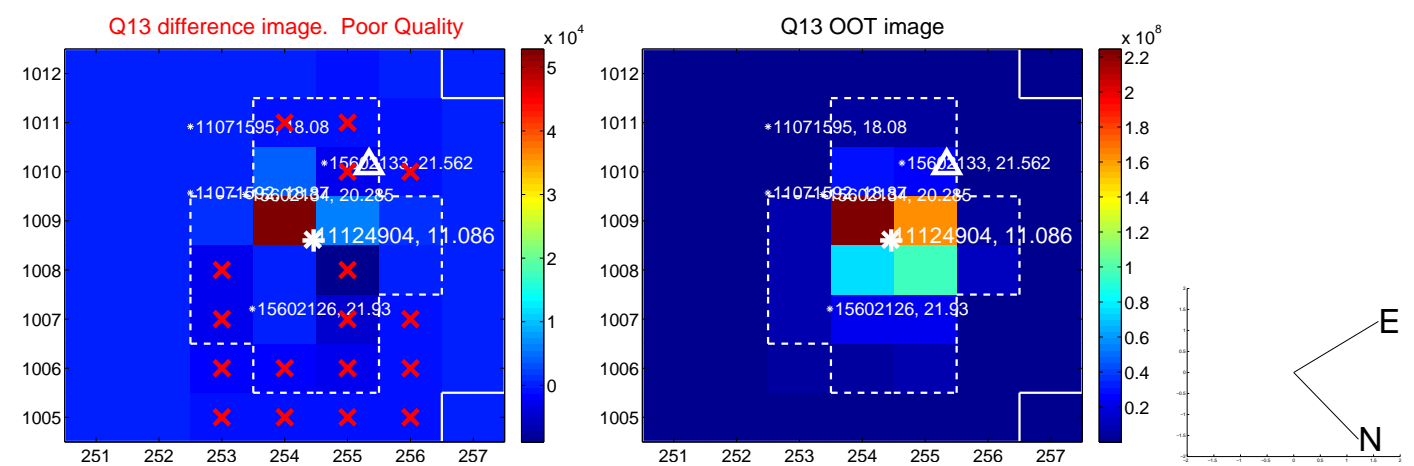




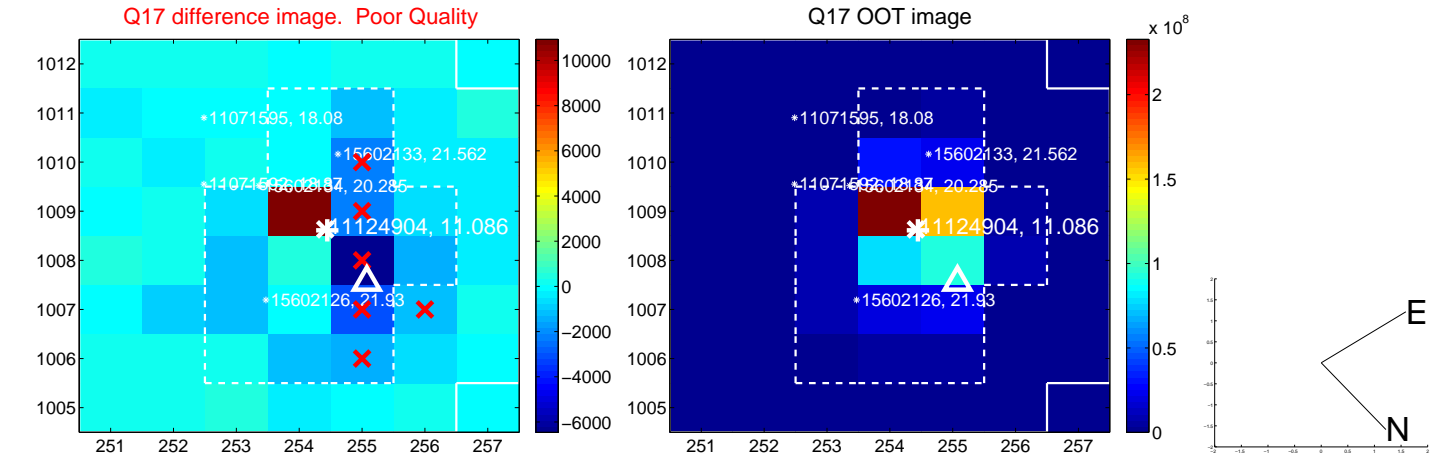
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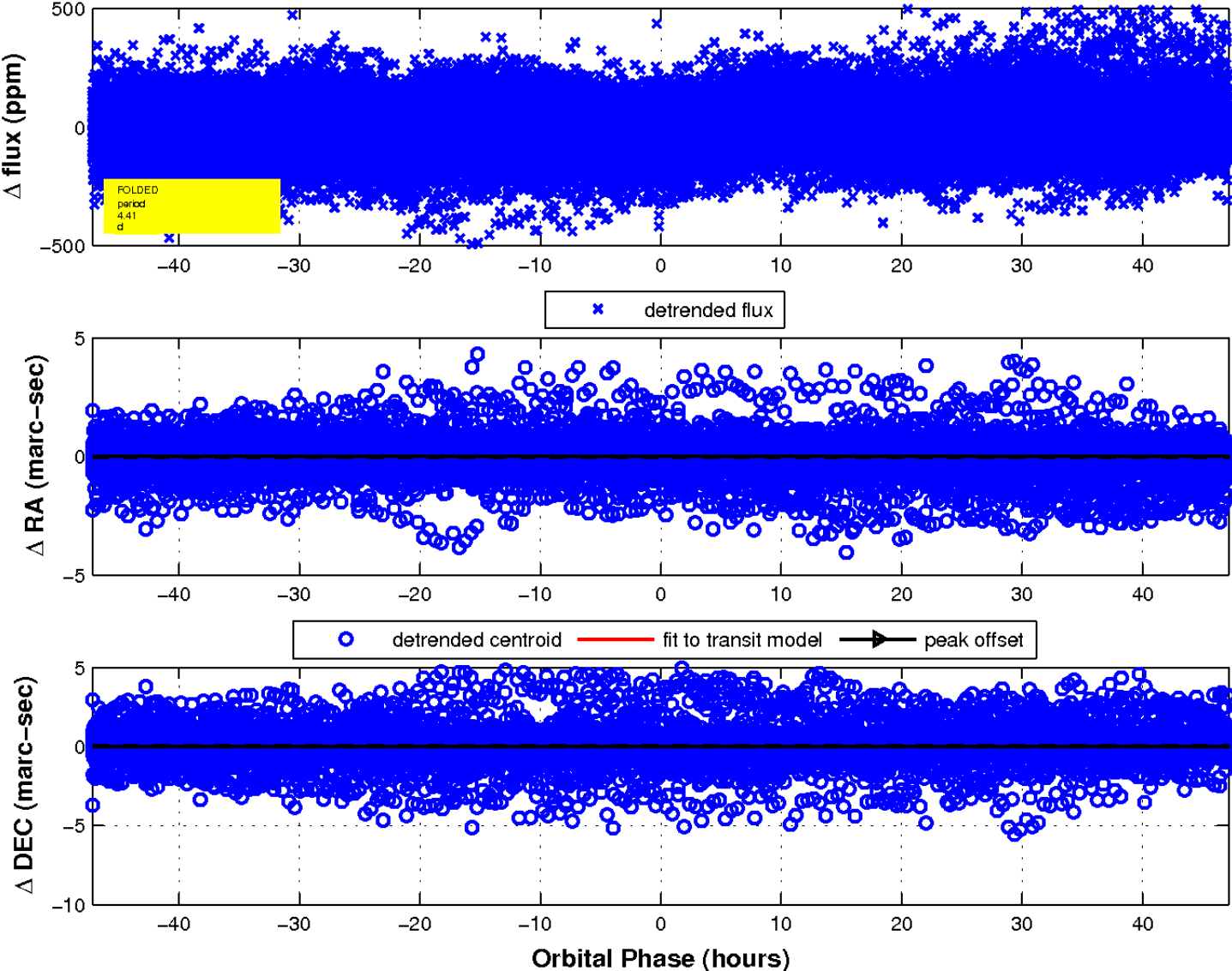
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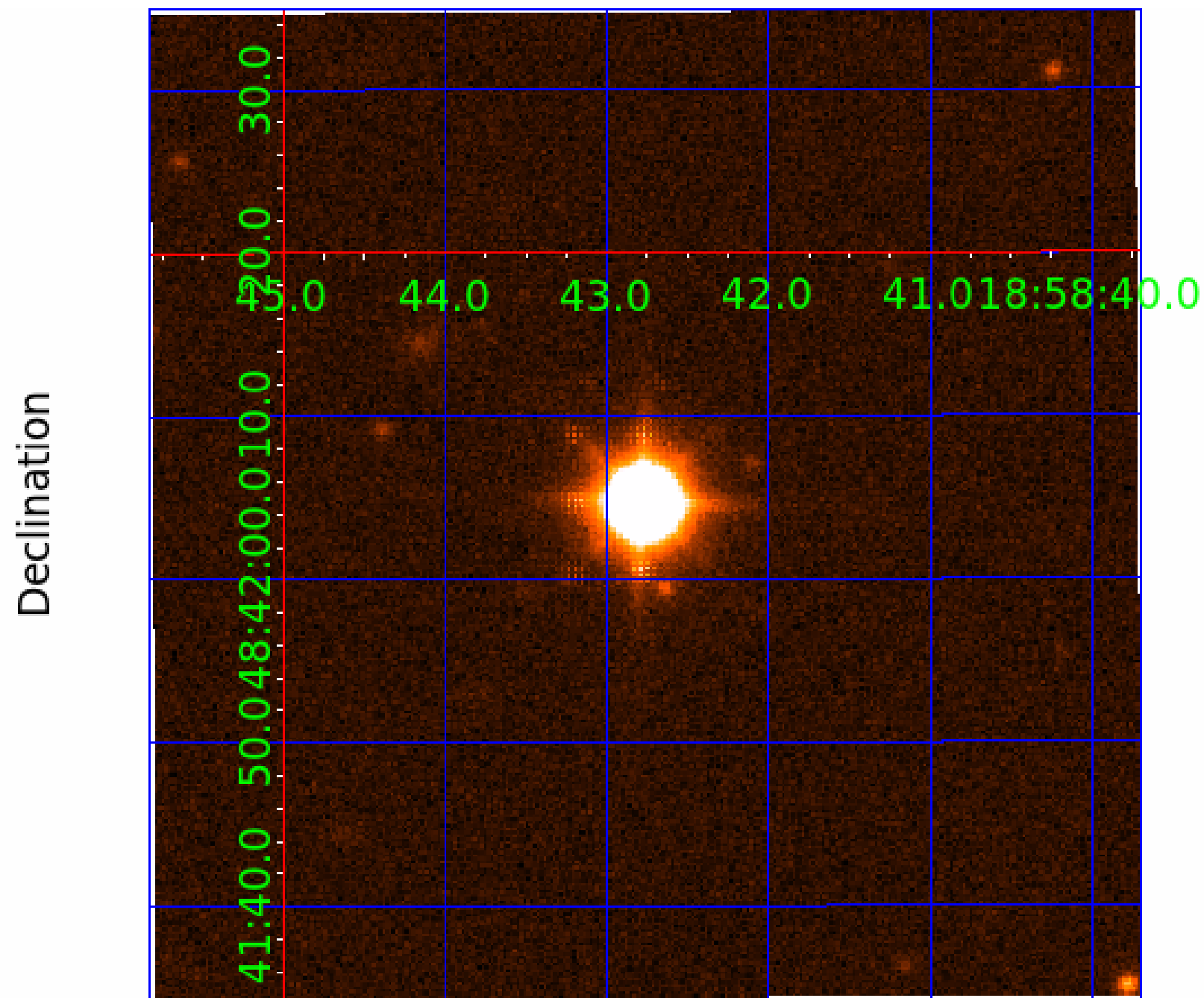
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fluxWeightedCentroids, Planet 1 of 4



UKIRT Image



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011124904-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
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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.

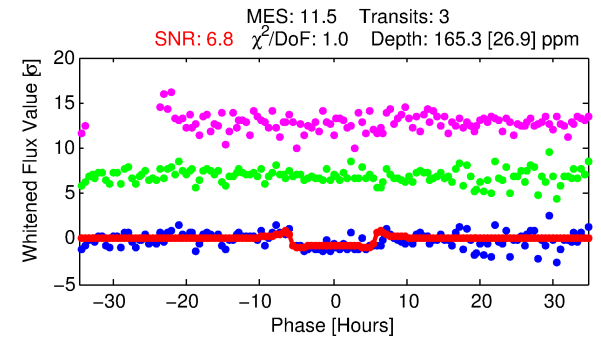
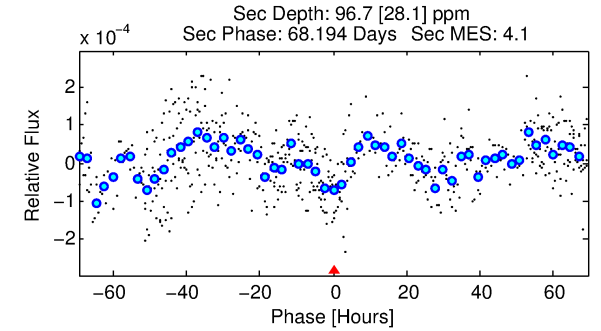
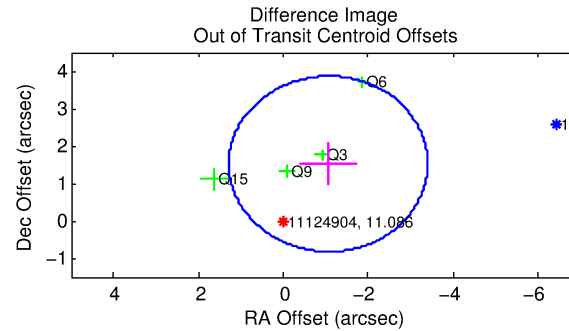
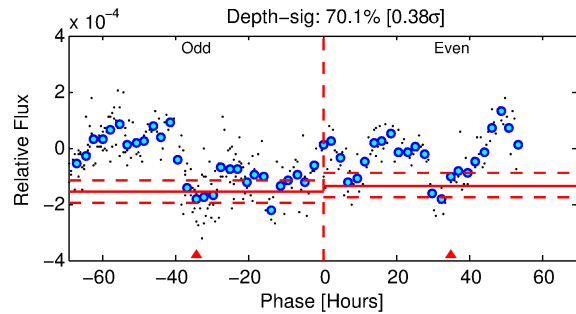
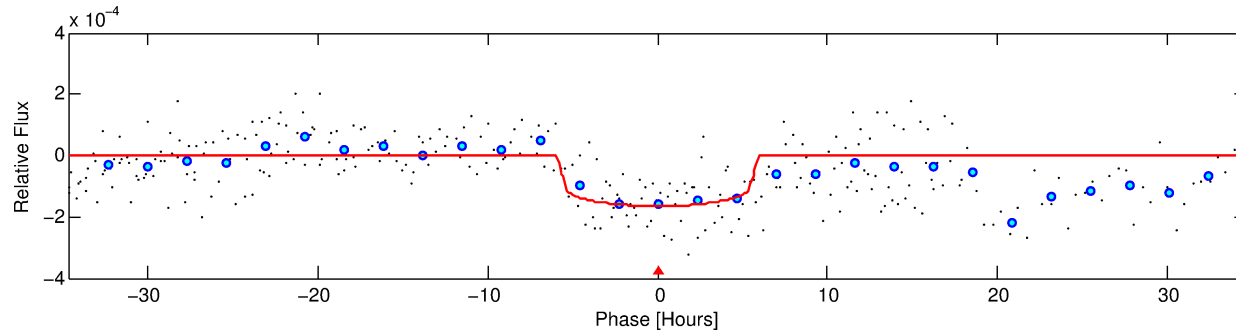
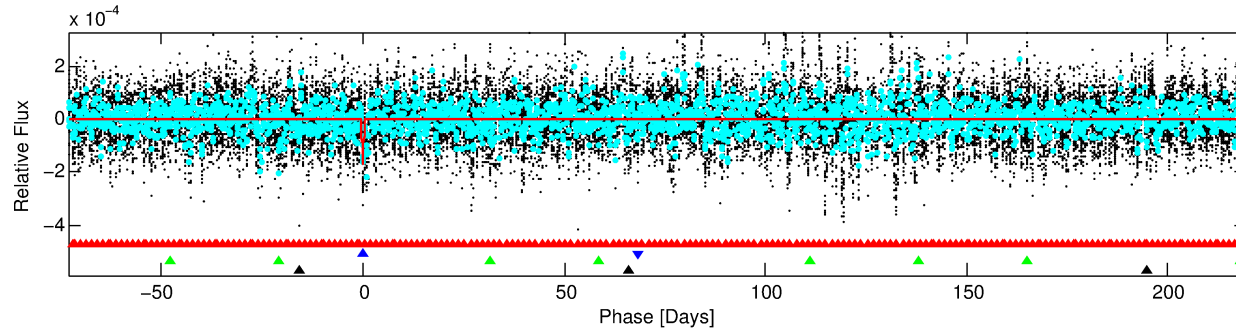
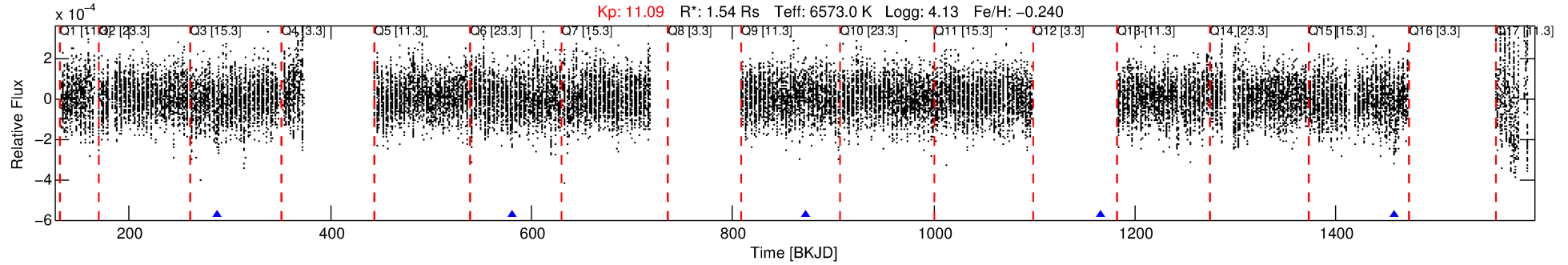
## Ephemeris Match Information For 011124904-02

No Significant Match Found



# DV One-Page Summary

KIC: 11124904 Candidate: 2 of 4 Period: 292.687 d



## DV Fit Results:

Period = 292.68742 [0.00418] d  
Epoch = 287.6617 [0.0113] BKJD  
 $R_p/R^* = 0.0121$  [0.0102]  
 $a/R^* = 172.97$  [804.98]  
 $b = 0.48$  [7.59]  
 $\text{Seff} = 4.85$  [1.98]  
 $T_{\text{eq}} = 378$  [39] K  
 $R_p = 2.05$  [1.83]  $R_{\text{e}}$   
 $a = 0.9077$  [0.2348] AU  
 $A_g = 10468.76$  [18362.07] [0.57 $\sigma$ ]  
 $T_{\text{eff}} = 5917$  [2540] K [2.18 $\sigma$ ]

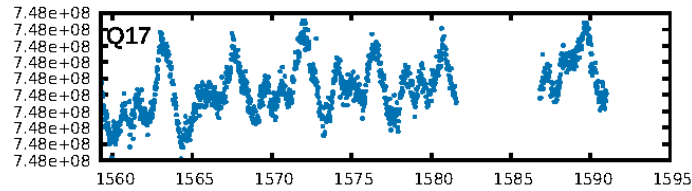
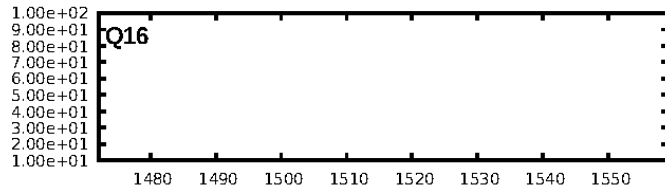
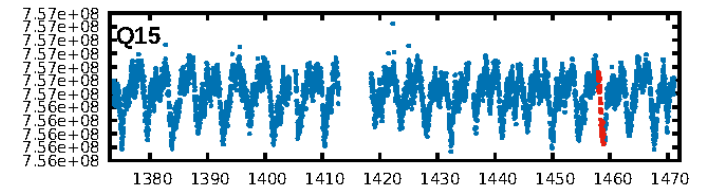
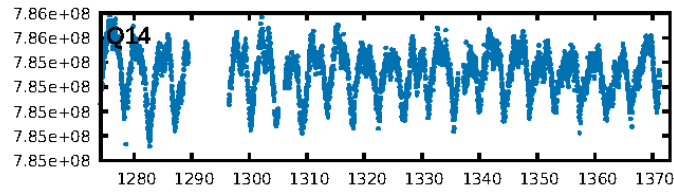
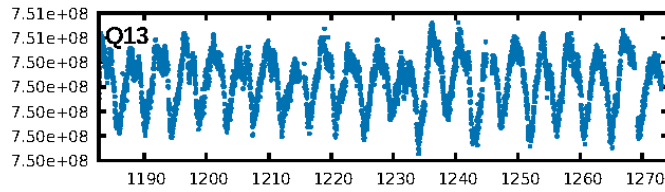
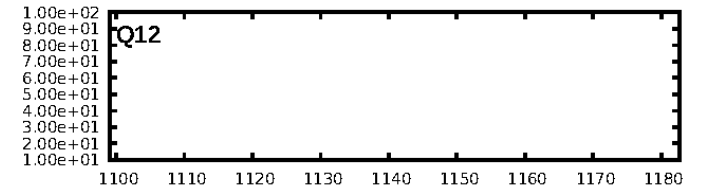
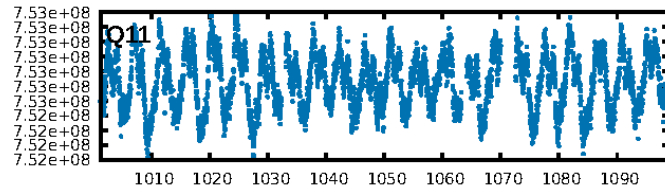
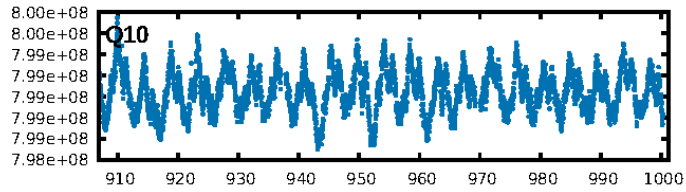
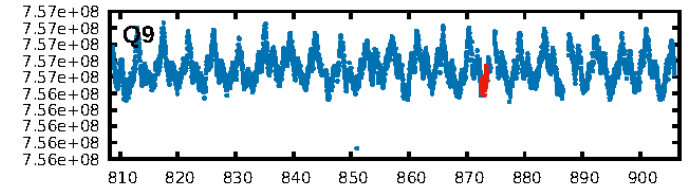
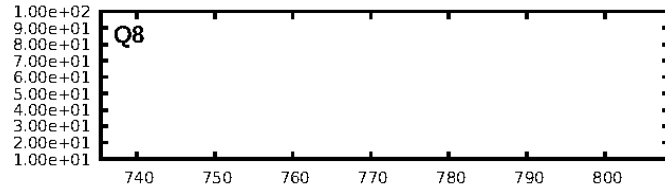
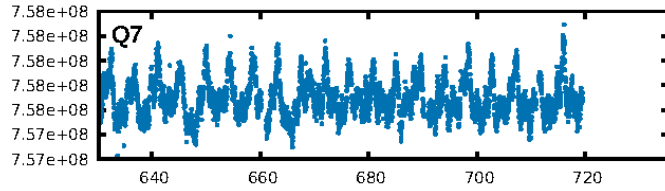
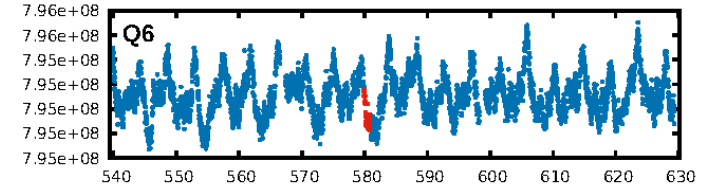
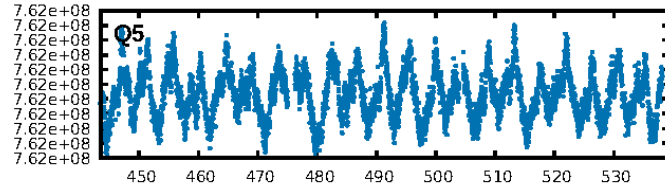
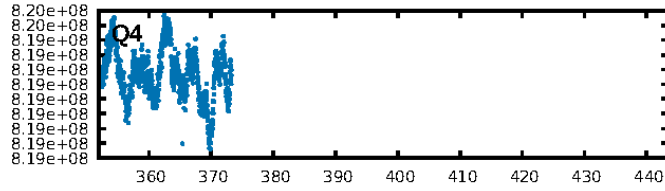
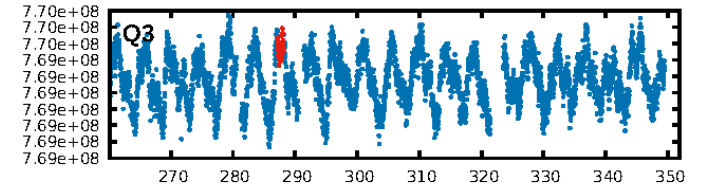
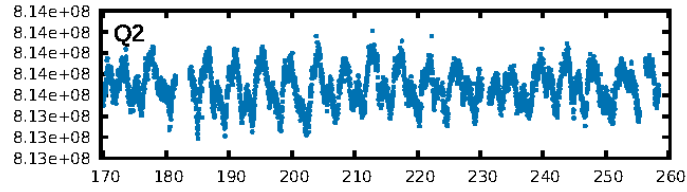
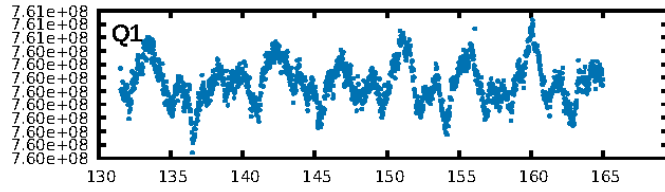
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [199.60 $\sigma$ ]  
LongPeriod-sig: 100.0% [151.52 $\sigma$ ]  
ModelChiSquare2-sig: 20.0%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: 1.41e-13  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 4.782  
Centroid-sig: 1.4%  
Centroid-so: 1.118 arcsec [1.69 $\sigma$ ]  
OotOffset-rm: 1.855 arcsec [2.37 $\sigma$ ]  
OotOffset-st: 1/2/0/1 [4]  
KicOffset-rm: 1.902 arcsec [2.75 $\sigma$ ]  
KicOffset-st: 1/2/0/1 [4]  
DiffImageQuality-fgm: 1.00 [4/4]  
DiffImageOverlap-fno: 0.50 [2/4]

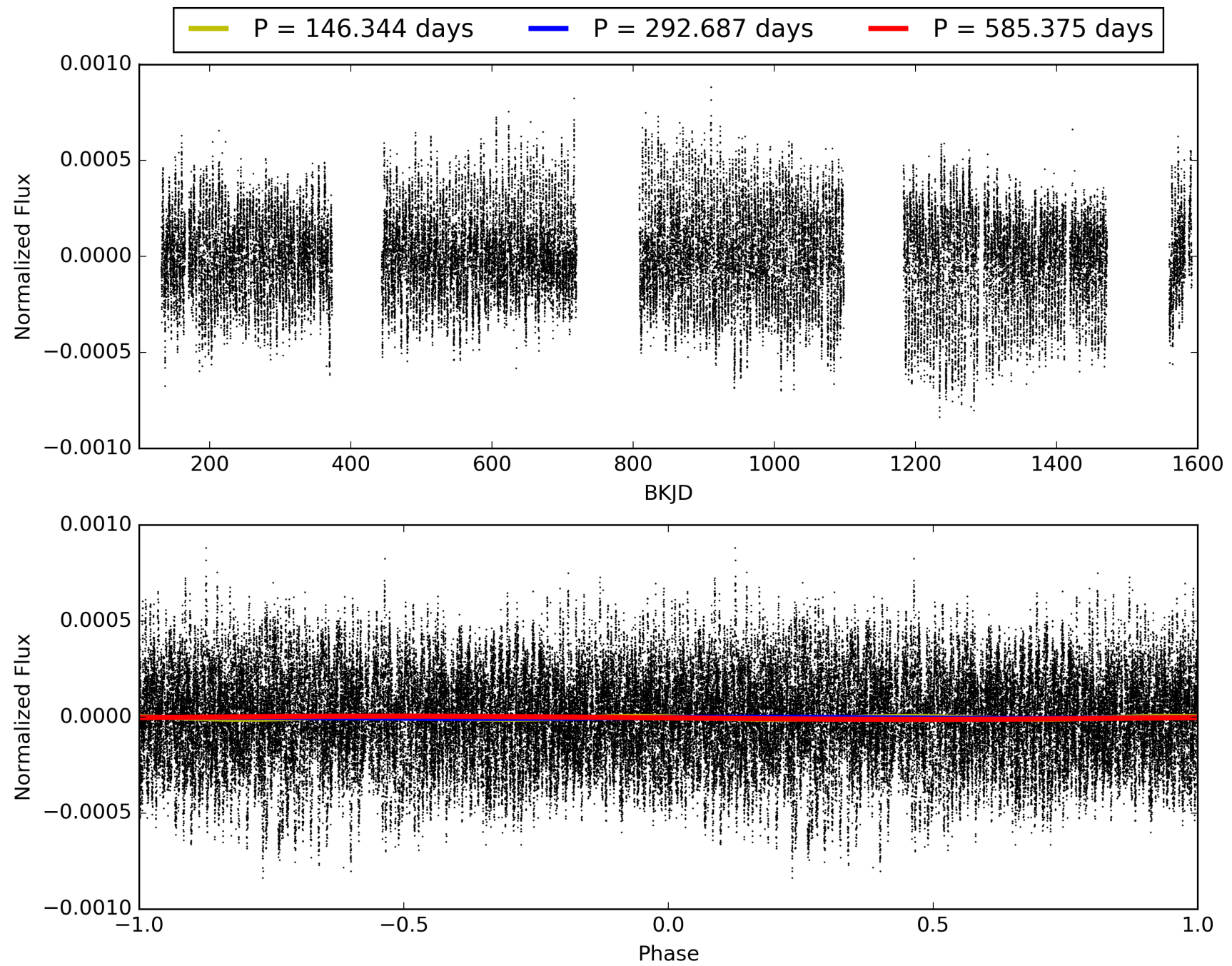
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:54:49 Z

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

# TCE 011124904-02, PDC Light Curves

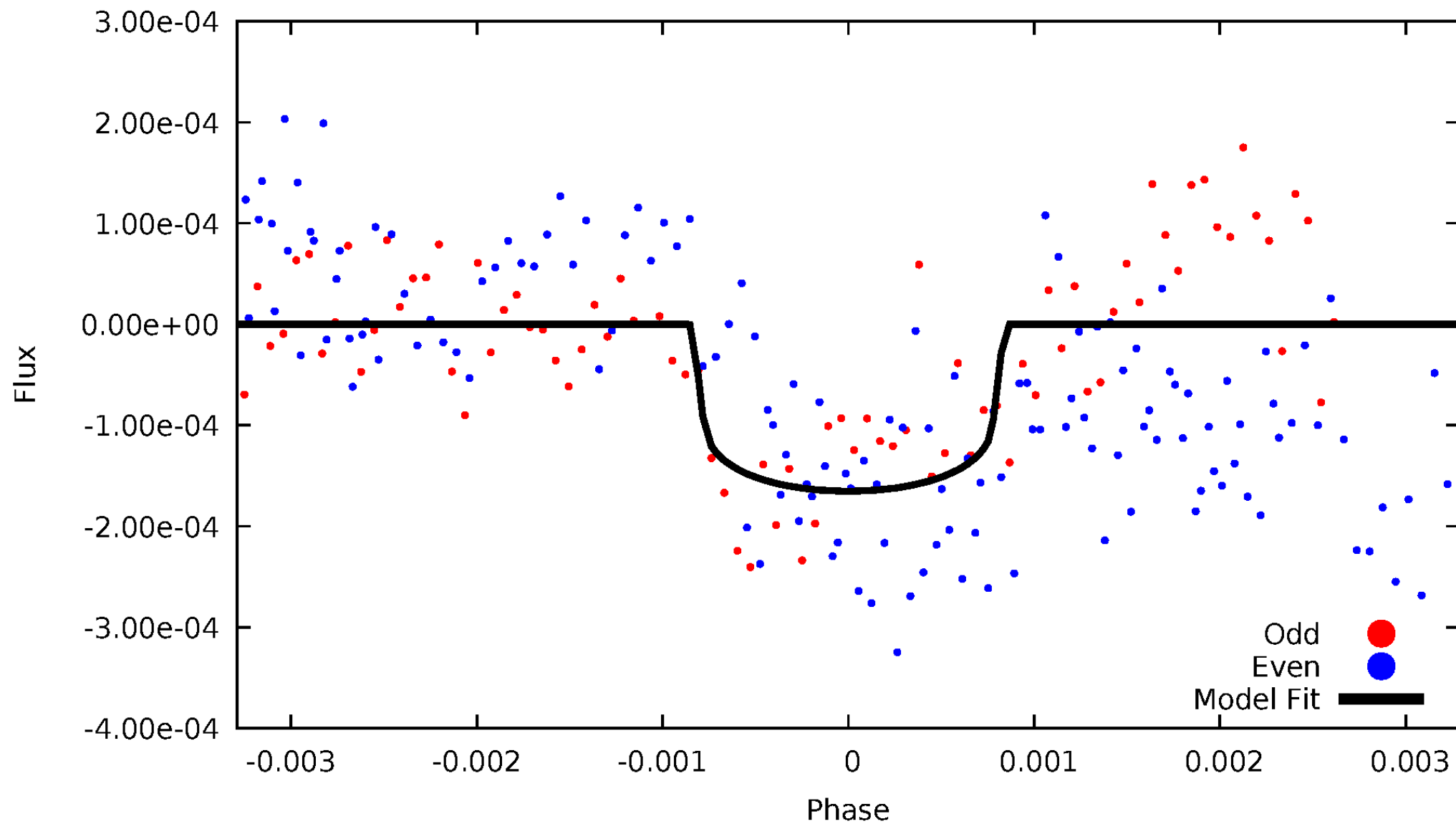


TCE 011124904-02



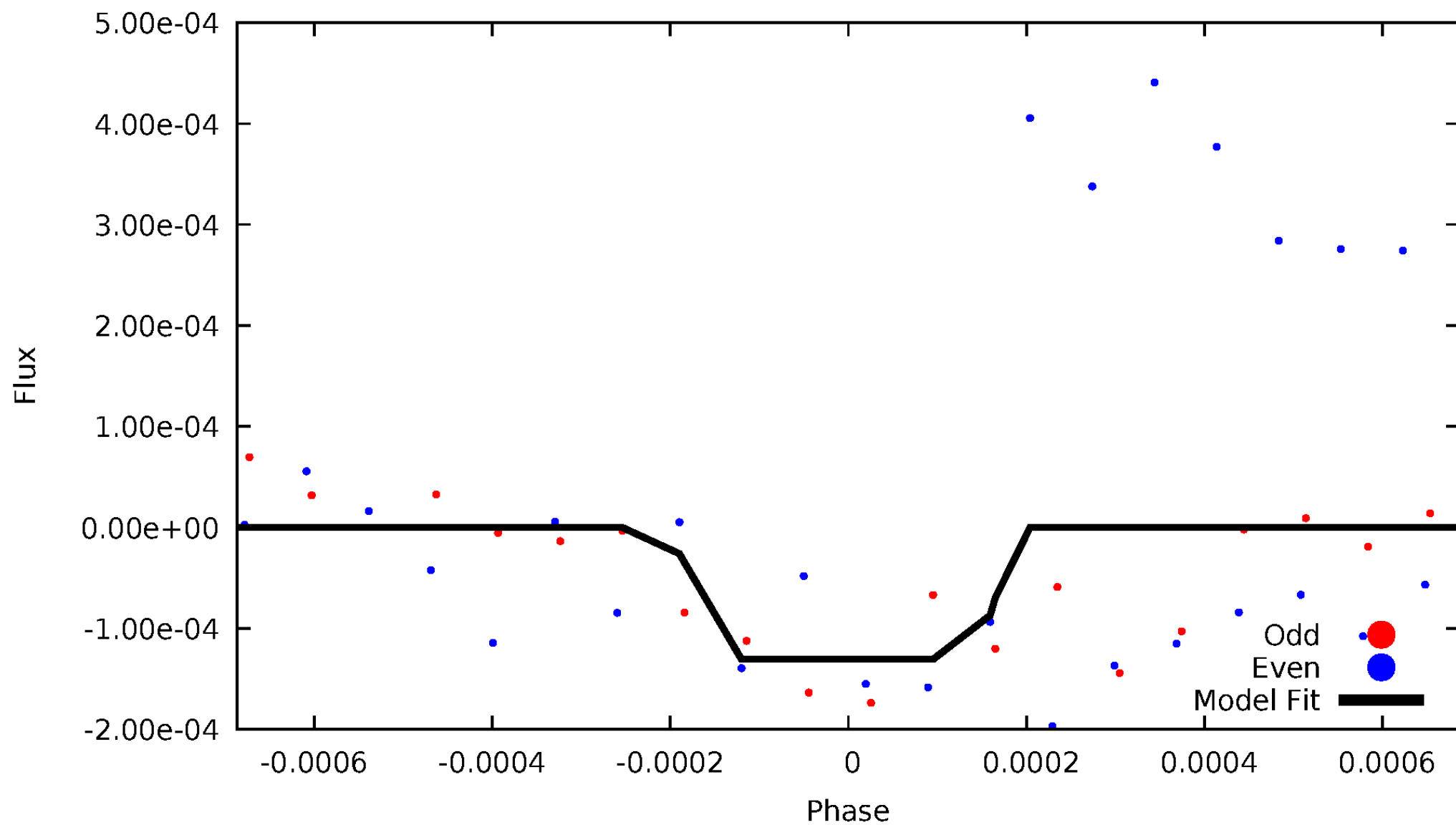
# DV Odd/Even

TCE 011124904-02



# ALT Odd/Even

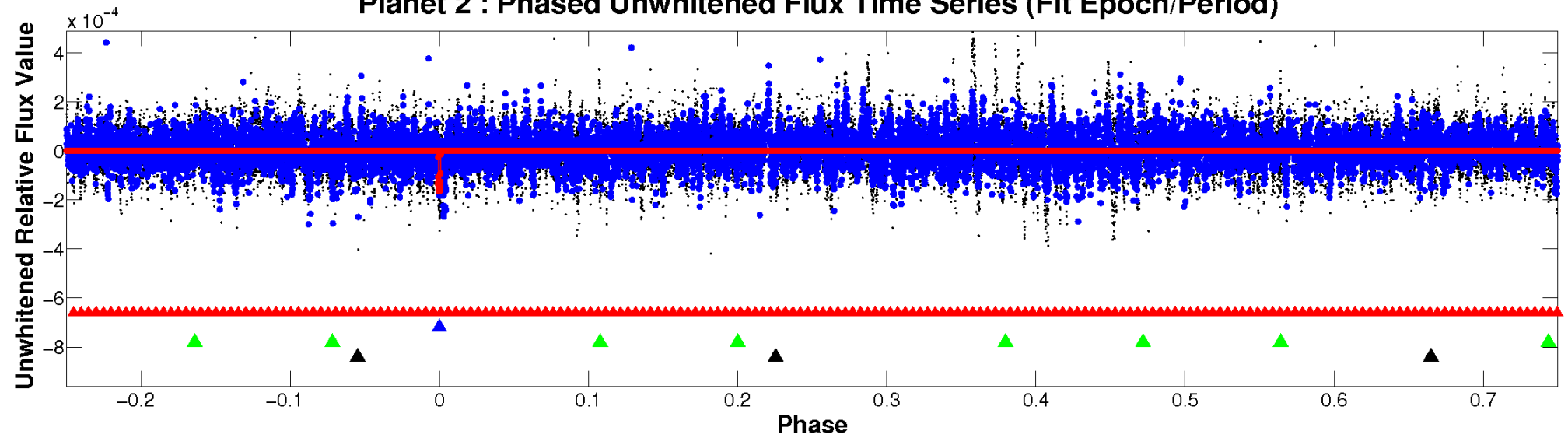
TCE 011124904-02



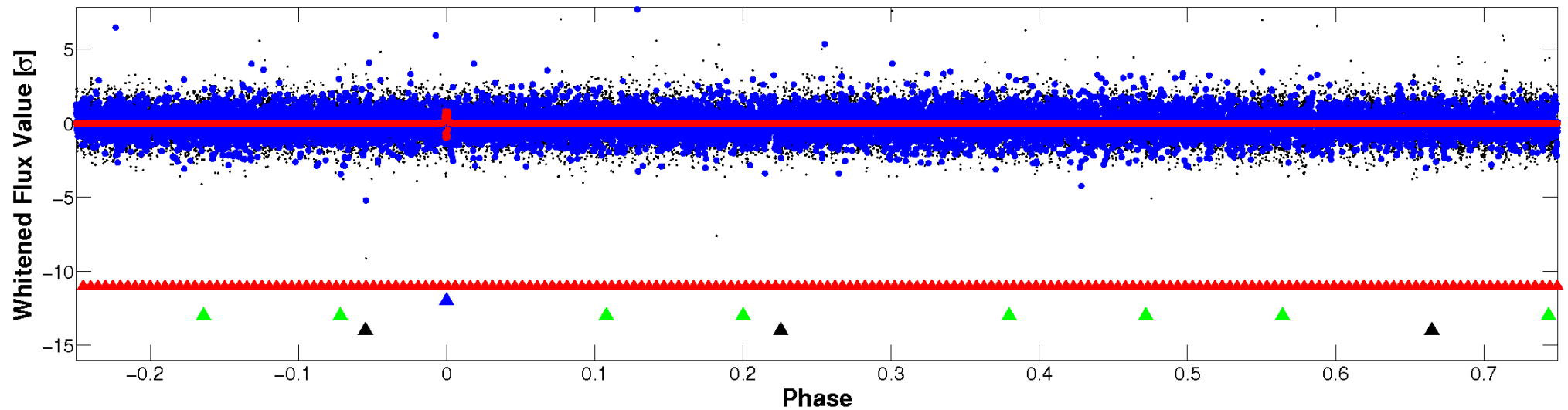


# Non-Whitened Vs. Whitened Light Curve

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

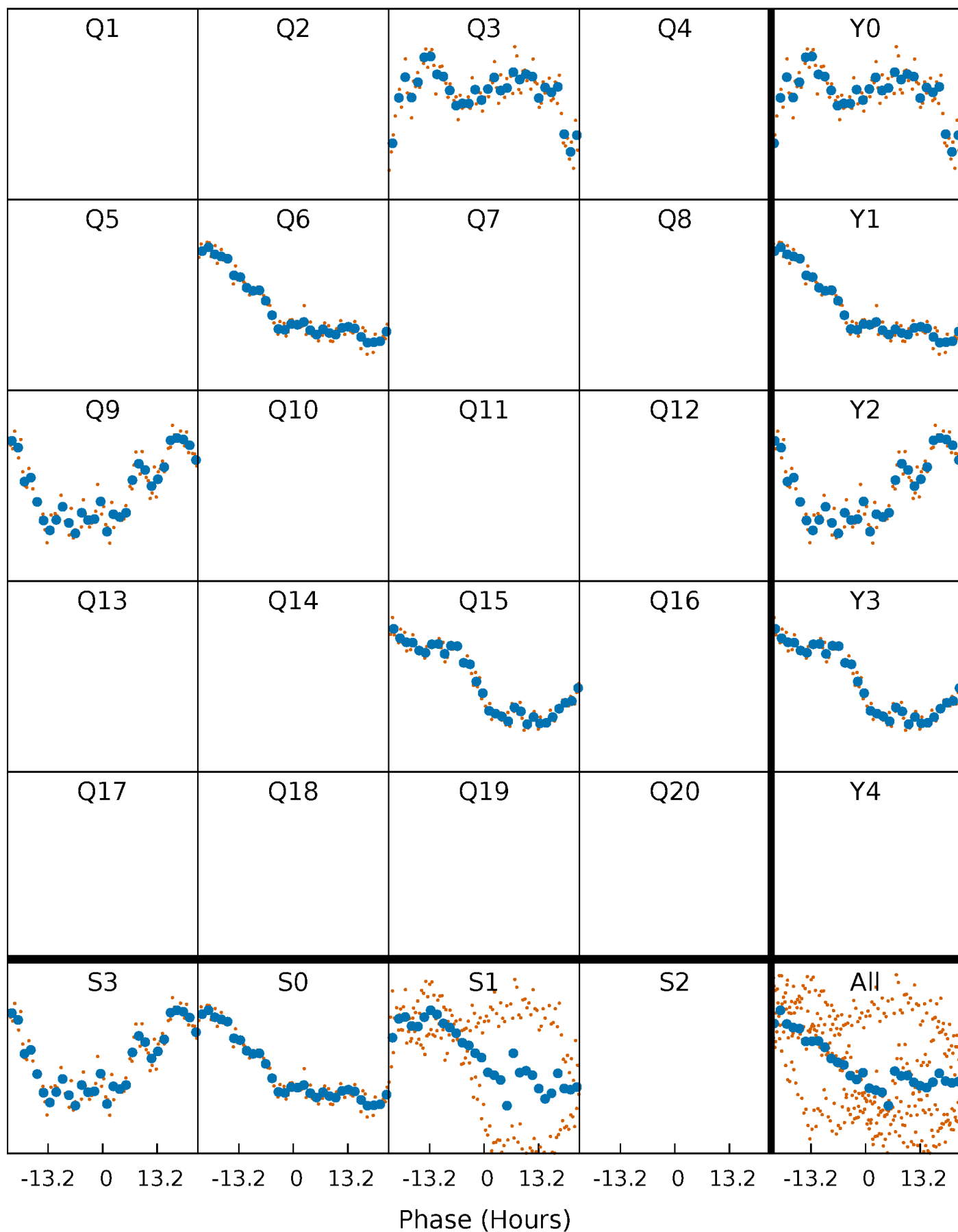


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



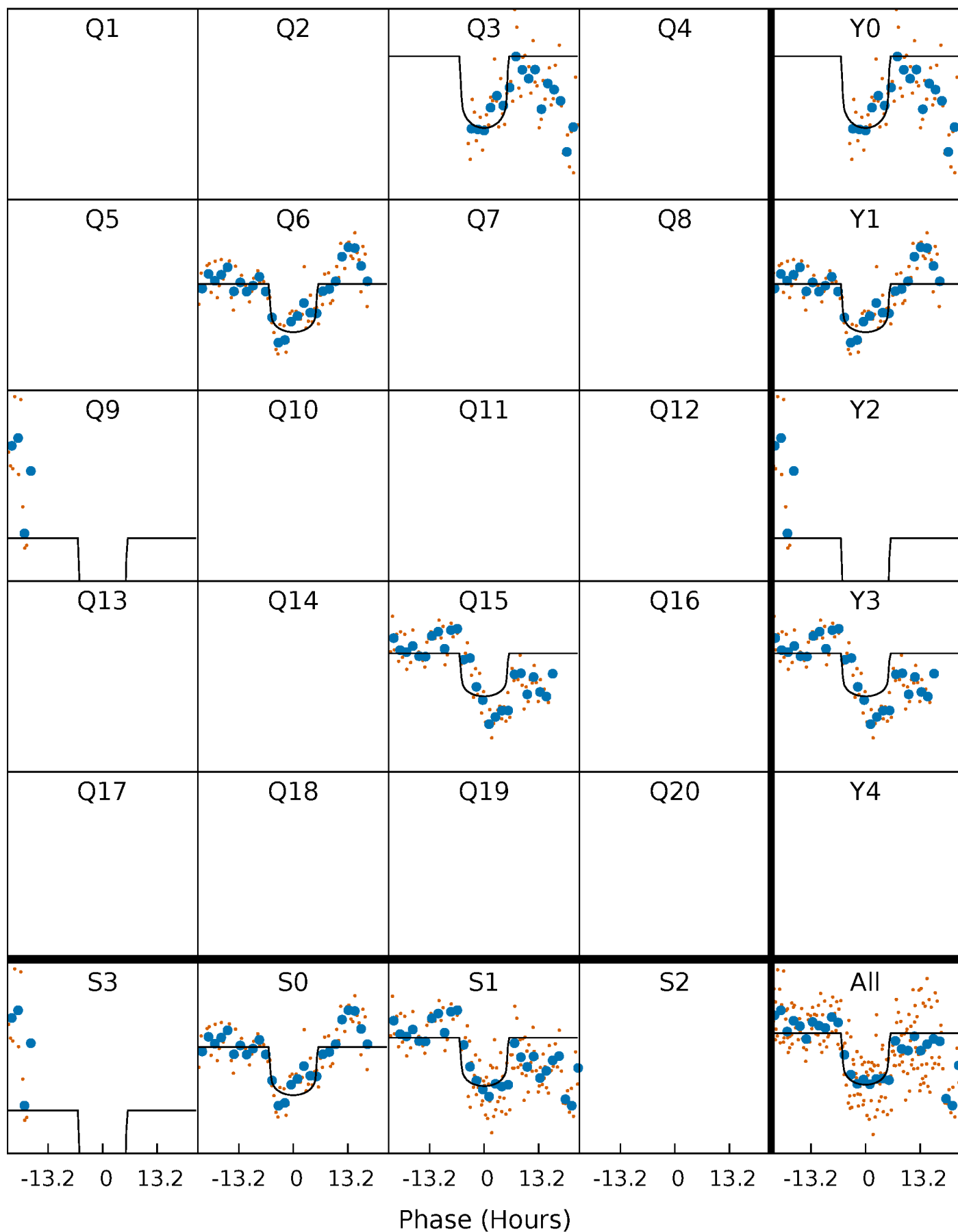
# PDC Quarter-Phased Transit Curves

TCE 011124904-02 P=292.687416 Days  $T_0=287.661747$  (BKJD)



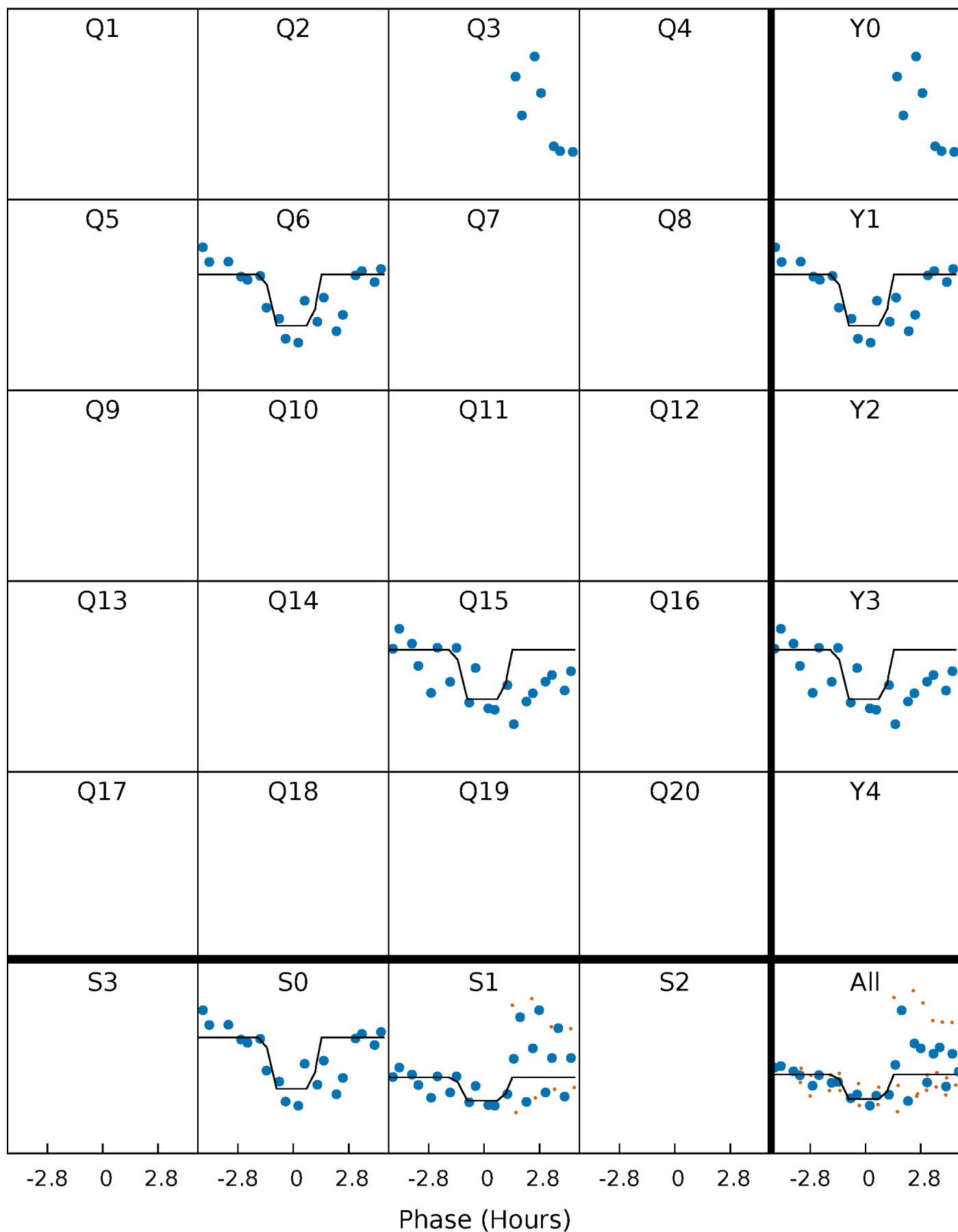
# DV Quarter-Phased Transit Curves

TCE 011124904-02 P=292.687416 Days  $T_0=287.661747$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

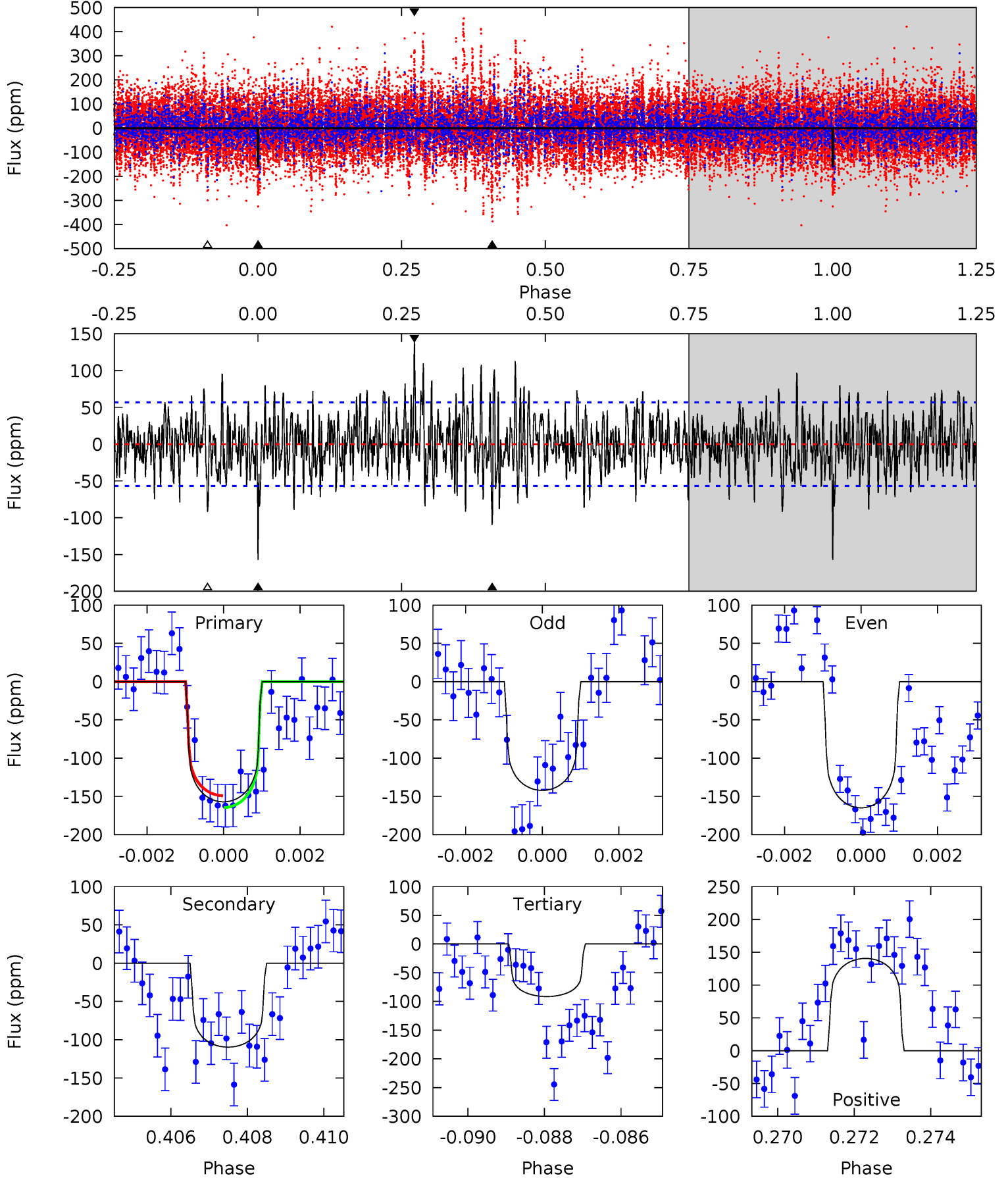
TCE 011124904-02 P=292.744803 Days  $T_0=287.442476$  (BKJD)



# DV Model-Shift Uniqueness Test

011124904-02, P = 292.687416 Days, E = 287.661747 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
14.8	10.3	8.62	13.3	5.35	3.13	3.06	6.19	1.56	1.72	-2.92	1.04	1.06	0.47	0.73

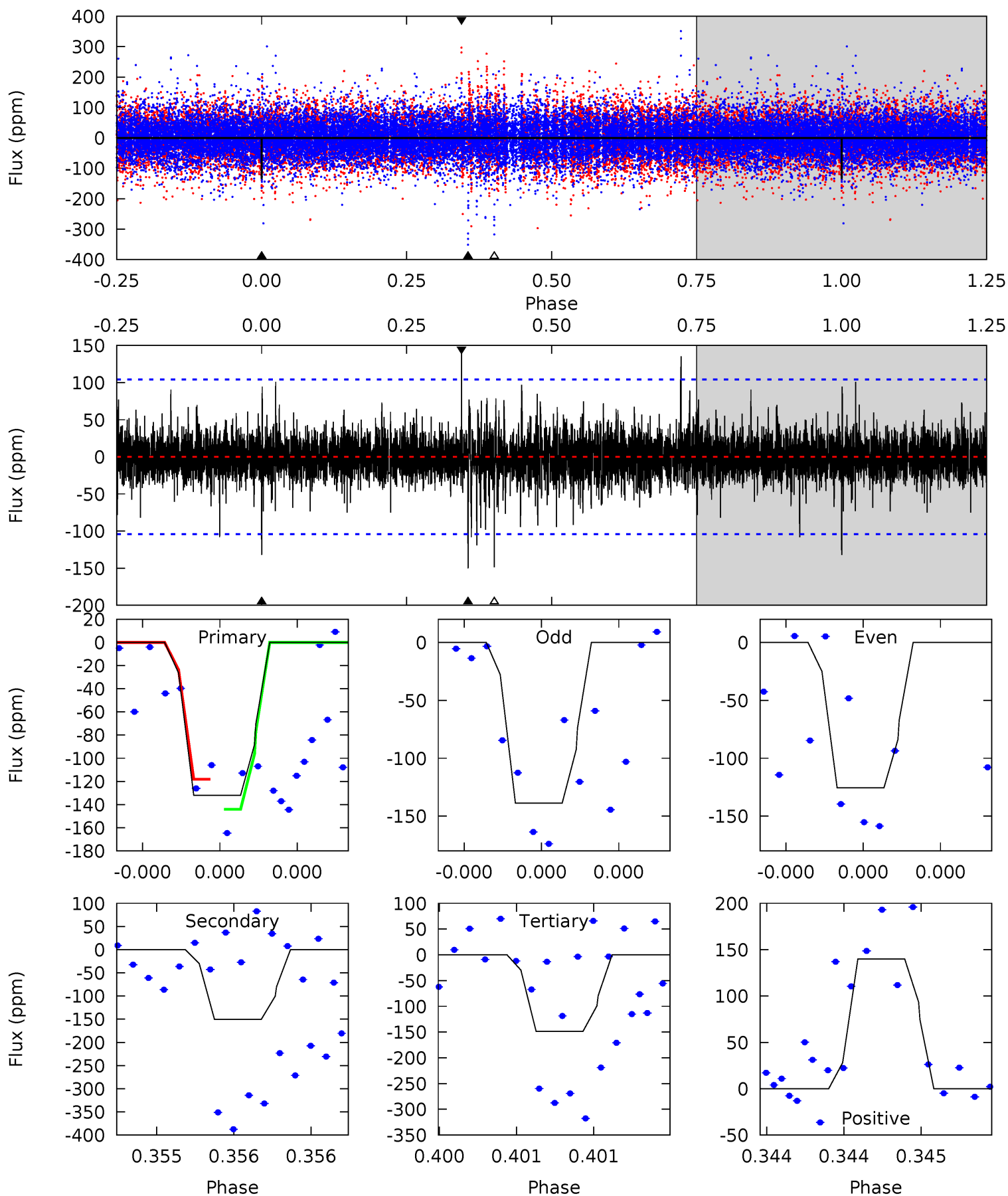




# Alt Model-Shift Uniqueness Test

011124904-02, P = 292.744803 Days, E = 287.442476 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
7.14	8.12	8.04	7.56	5.63	3.57	1.19	-0.90	-0.42	0.08	0.56	0.35	1.00	0.48	0.70



### Stellar Parameters For KIC 011124904

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-227}$	$4.126^{+0.214}_{-0.175}$	$-0.240^{+0.250}_{-0.300}$	$1.545^{+0.463}_{-0.421}$	$1.162^{+0.206}_{-0.150}$	$0.444^{+0.553}_{-0.215}$
	+3%/-3%	+5%/-4%	+104%/-125%	+30%/-27%	+18%/-13%	+125%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011124904-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-110 \pm 11$	$2.24^{+1.72}_{-1.30}$	$530^{+41}_{-44}$	$5771^{+3848}_{-1177}$	$9986^{+43806}_{-6738}$
Alt.	$-150 \pm 18$	$2.20^{+1.73}_{-1.34}$	$524^{+46}_{-40}$	$6295^{+5289}_{-1384}$	$14304^{+78534}_{-9913}$

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

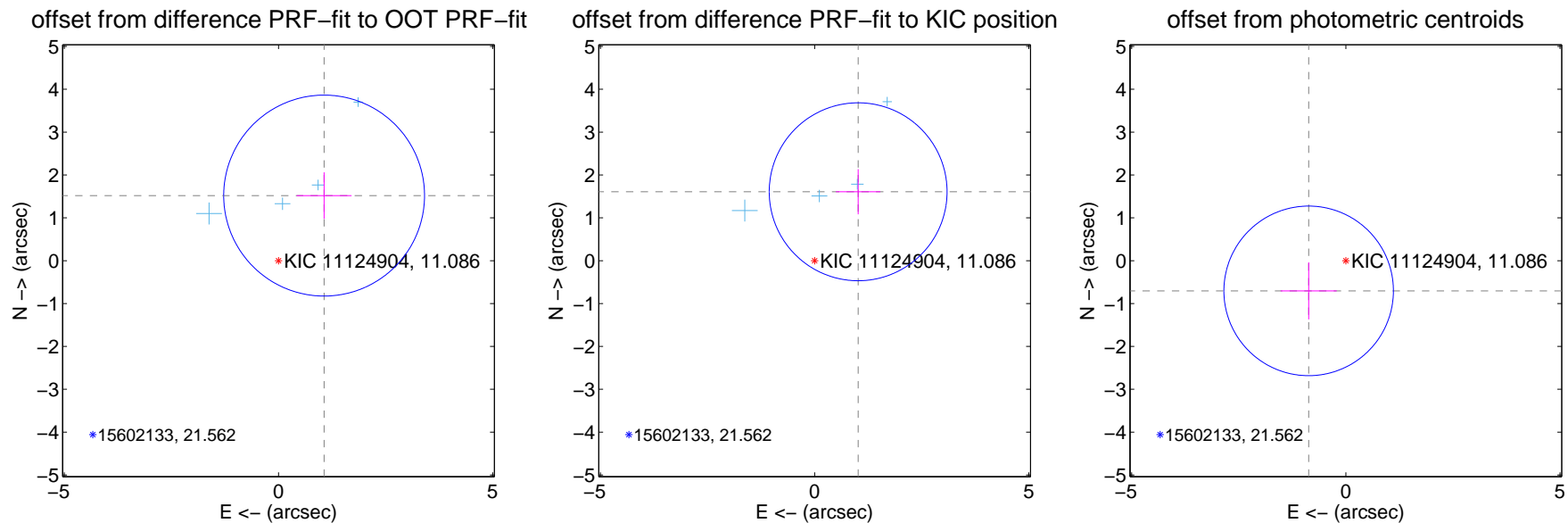
## DV Centroid Data

Supplemental centroid analysis for 011124904-02. **Kepler magnitude: 11.09.** Transit SNR 6.83

There are 4 quarters with good PRF difference image offsets

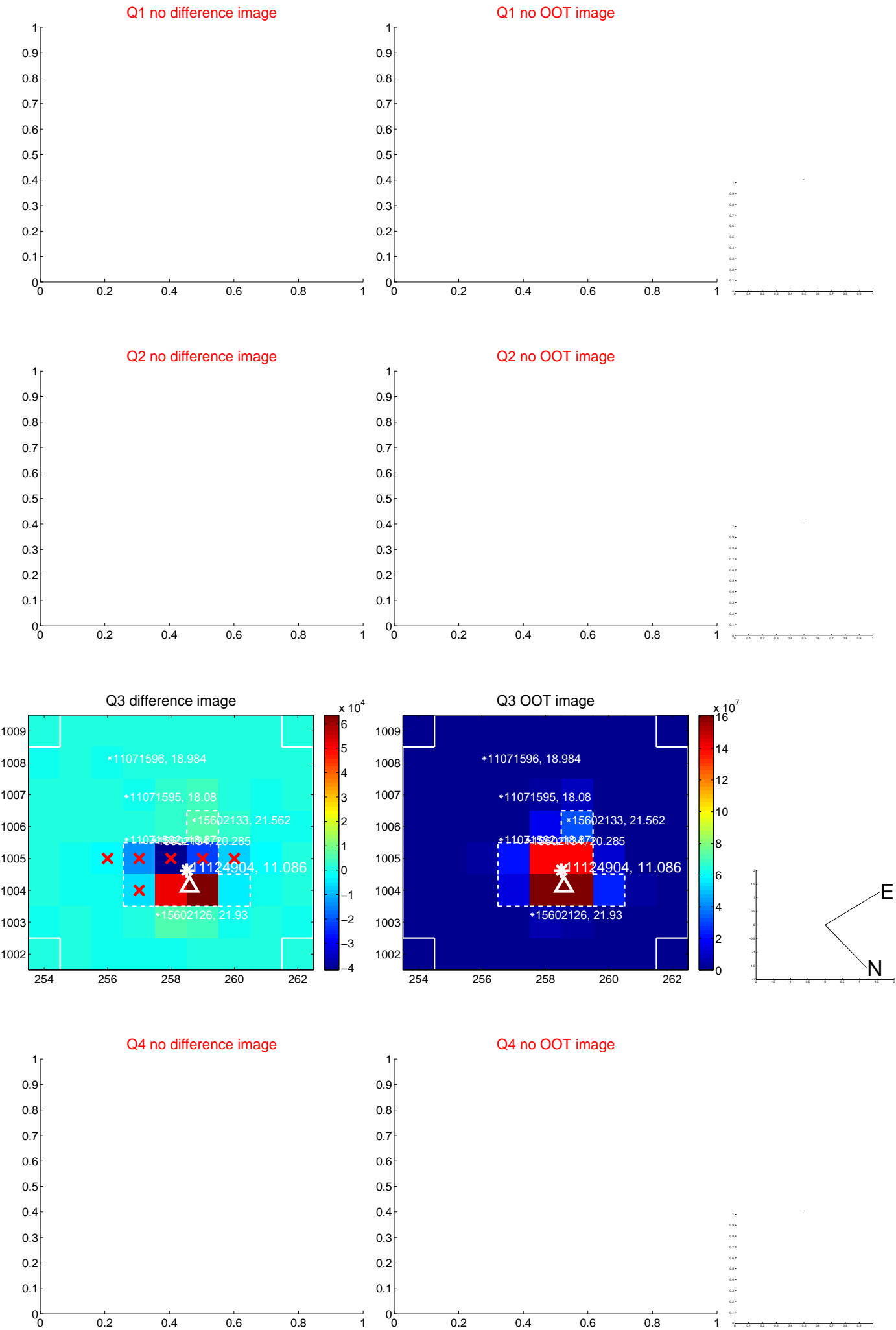
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.855 \pm 0.781$	2.37	$-1.065 \pm 0.641$	$1.519 \pm 0.542$
PRF-fit source offset from KIC position	$1.902 \pm 0.692$	2.75	$-1.016 \pm 0.519$	$1.608 \pm 0.527$
photometric centroid source offset	$1.12 \pm 0.66$	1.69	$0.87 \pm 0.66$	$-0.70 \pm 0.67$



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.

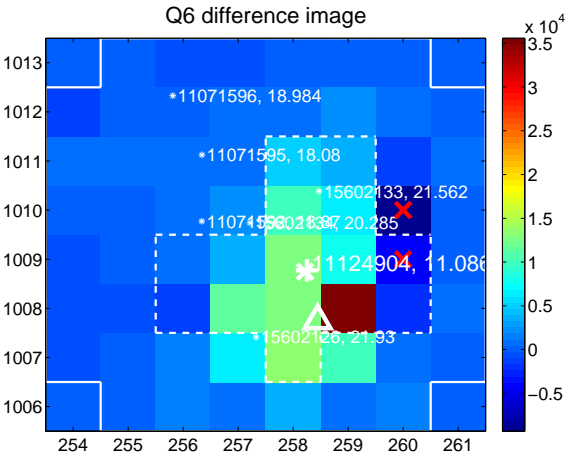
Q5 no difference image



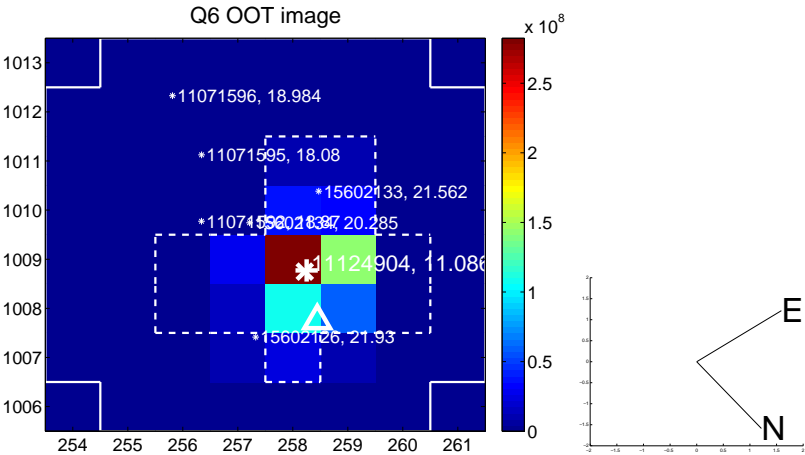
Q5 no OOT image



Q6 difference image



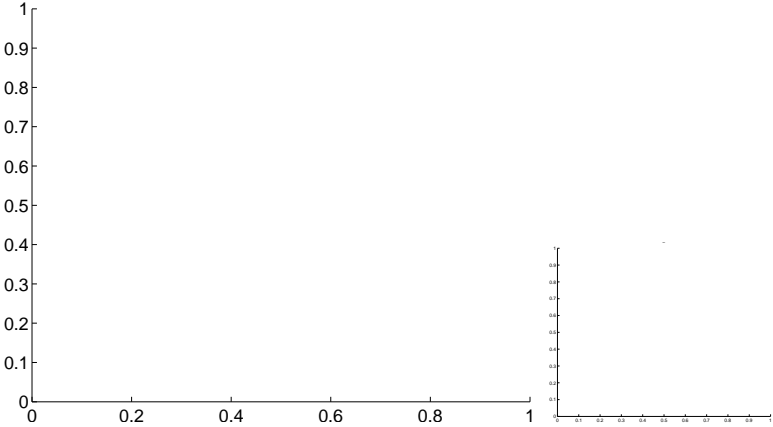
Q6 OOT image



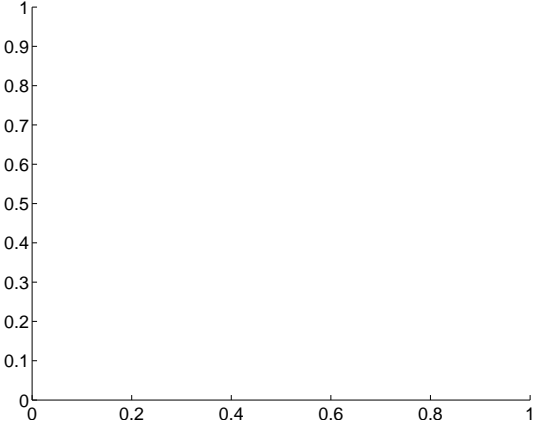
Q7 no difference image



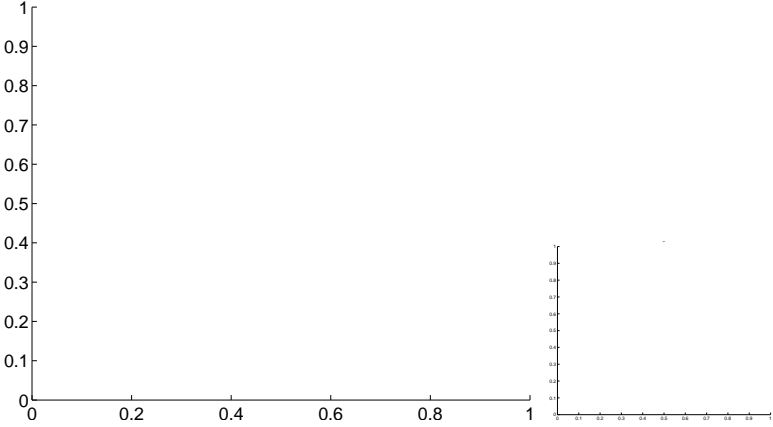
Q7 no OOT image



Q8 no difference image

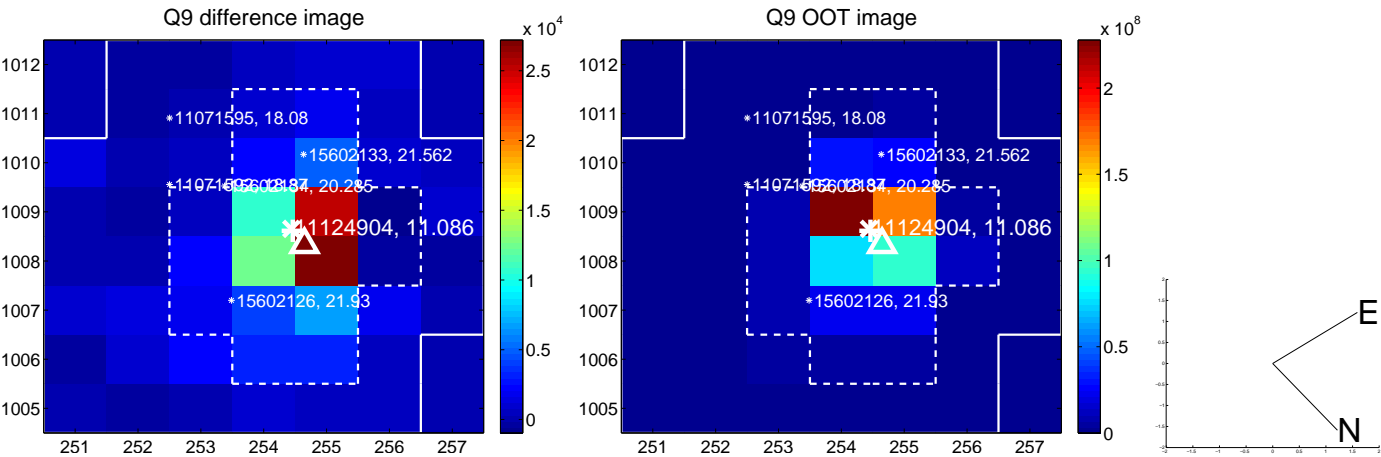


Q8 no OOT image

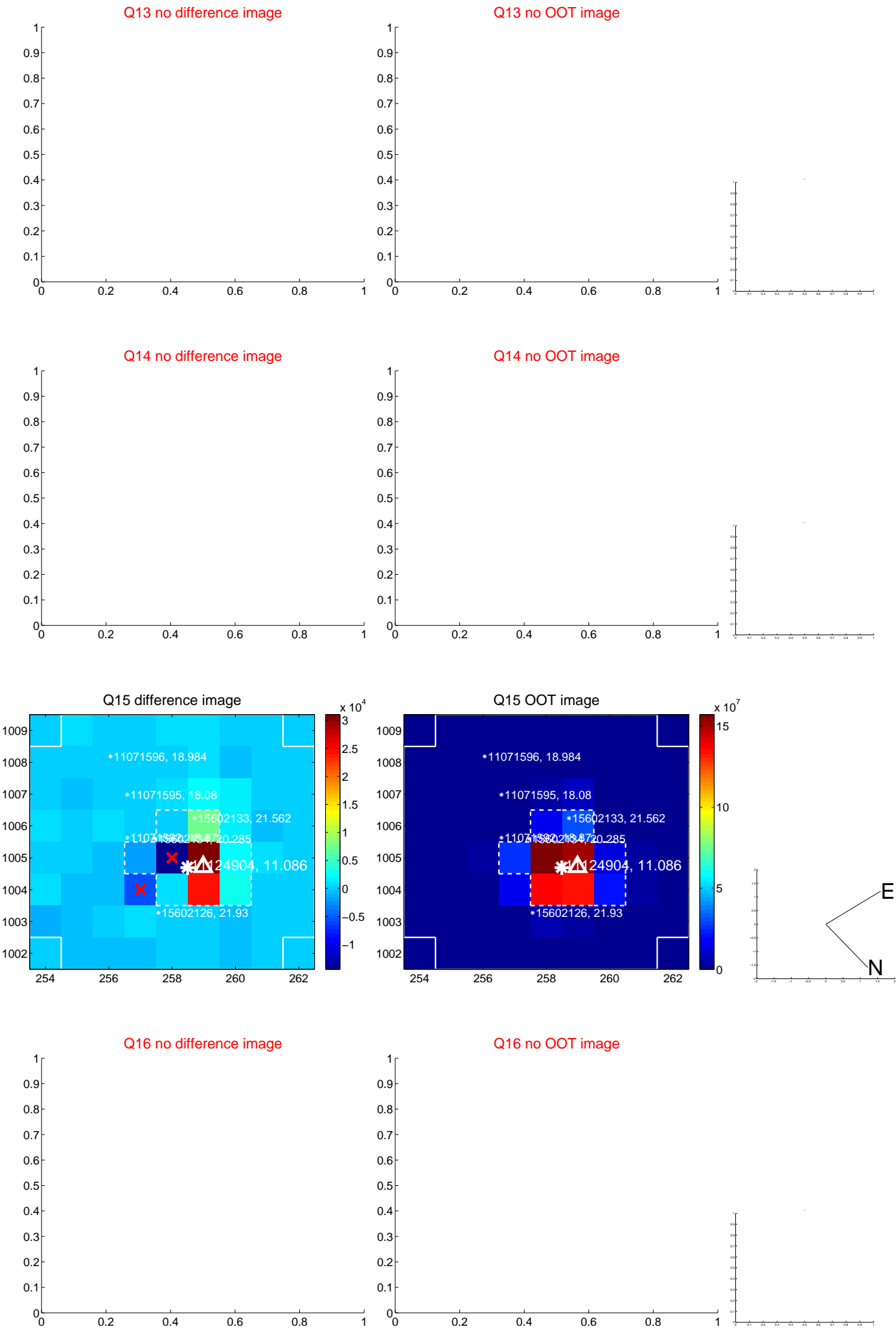




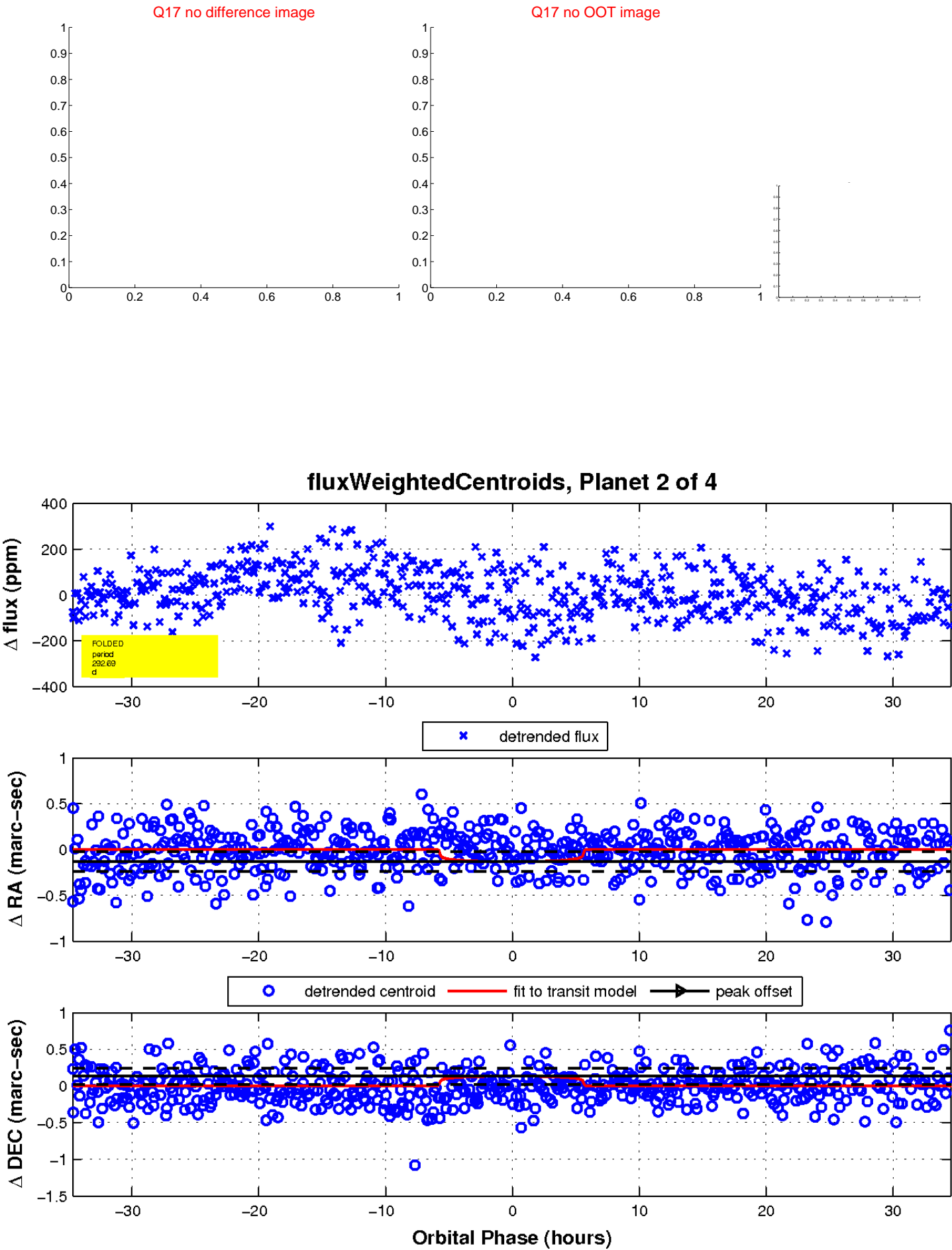
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



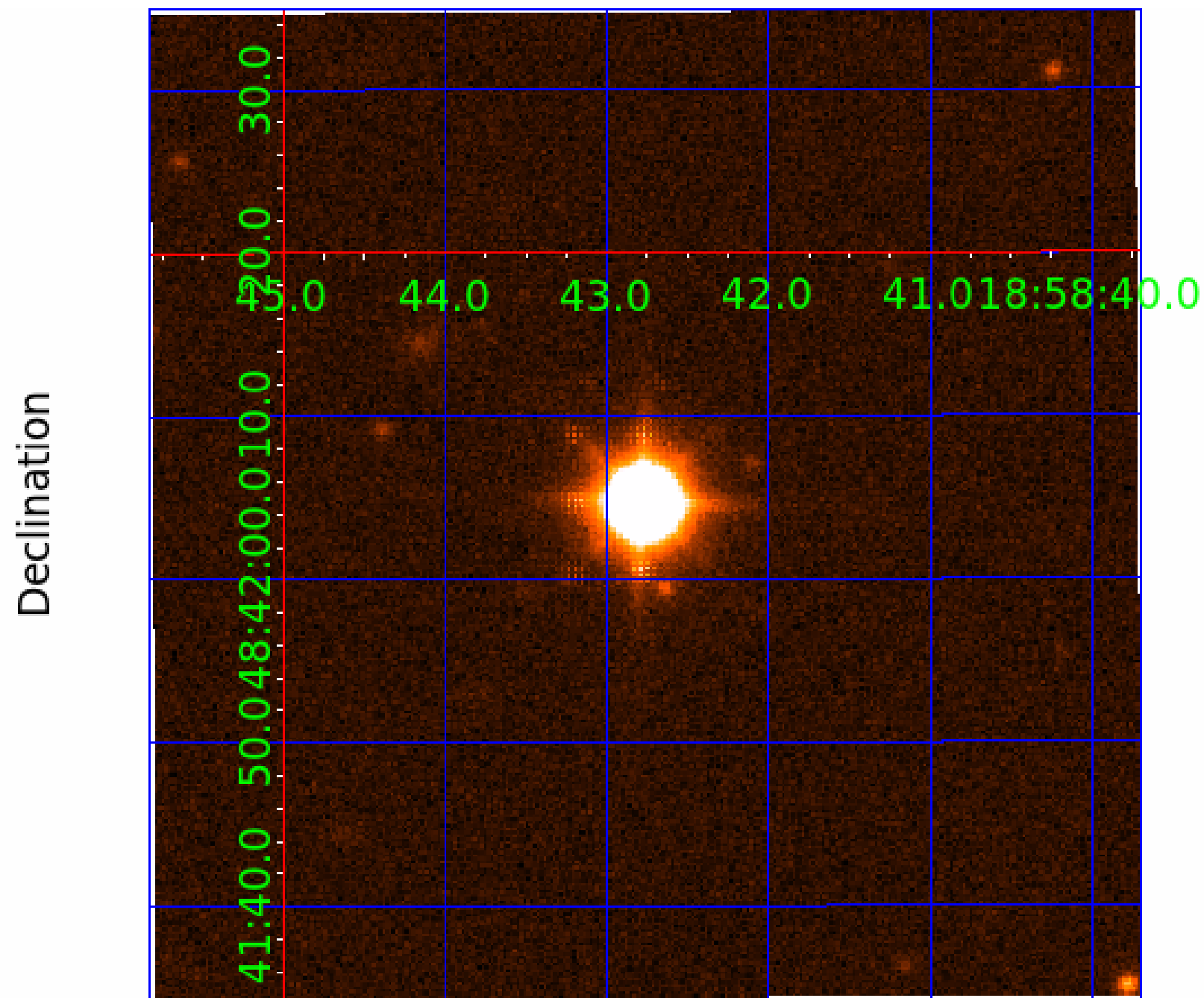
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 011124904

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011124904-01	OBS	No	4.411949	132.090641	18.7	15.728	9.5	6.8	1.54	6573	0.70	1301.35
011124904-02	OBS	No	292.687416	287.661747	165.3	11.551	11.5	6.8	1.54	6573	2.05	4.85
011124904-03	OBS	No	186.123014	266.666903	126.8	5.546	7.7	7.9	1.54	6573	2.03	8.86
011124904-04	OBS	No	374.723059	482.292915	103.5	5.952	7.5	4.7	1.54	6573	1.74	3.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011124904-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_SATURATED
011124904-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
011124904-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
011124904-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

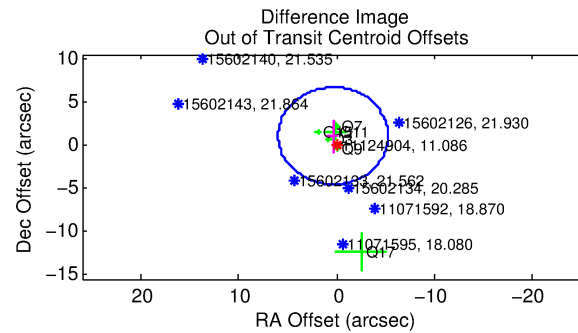
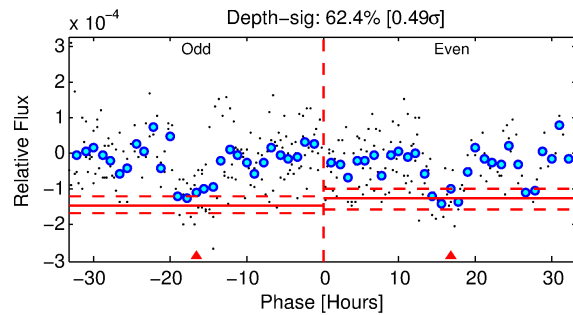
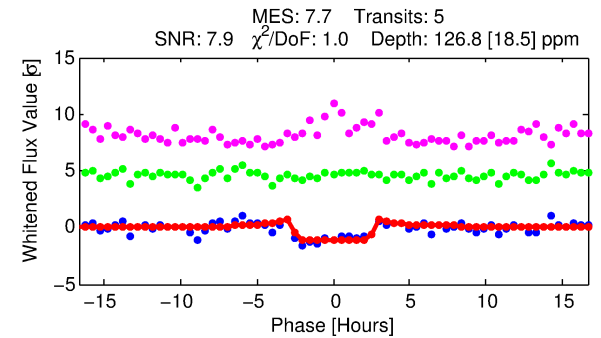
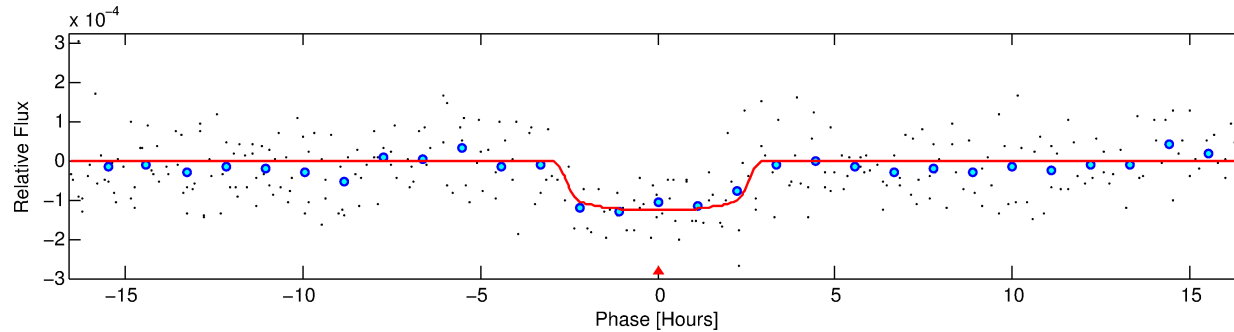
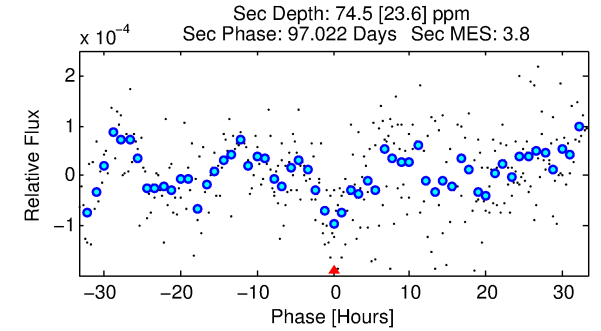
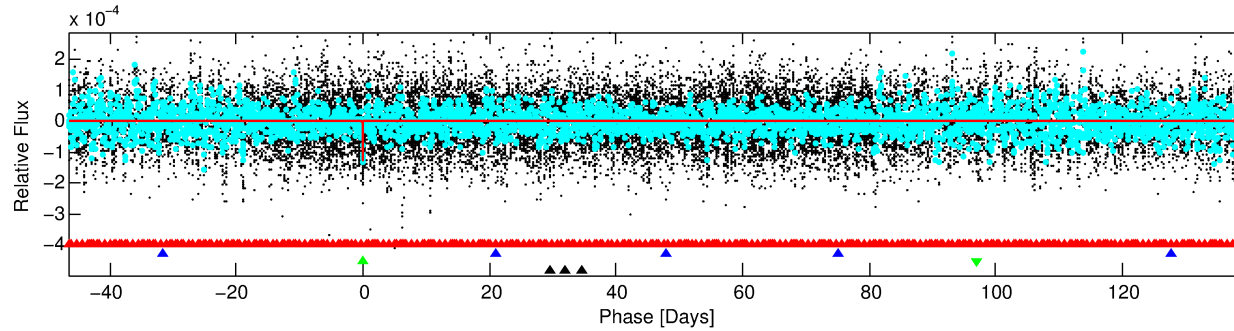
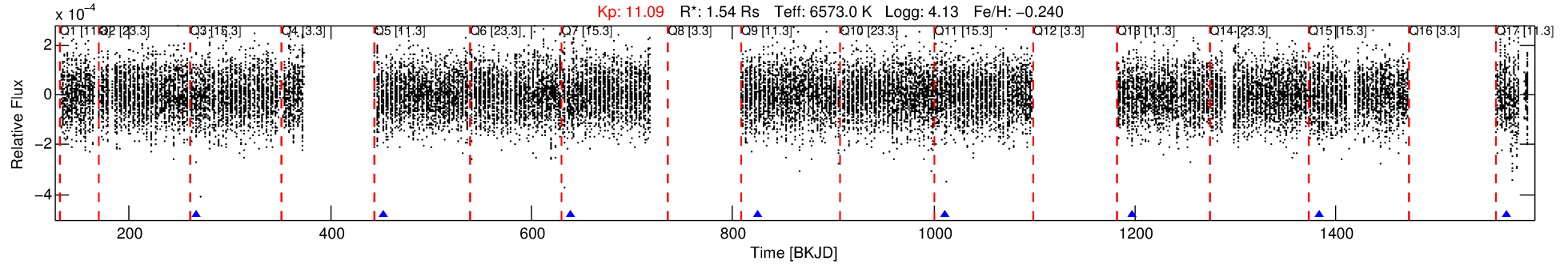
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 011124904-03

No Significant Match Found

# DV One-Page Summary

KIC: 11124904 Candidate: 3 of 4 Period: 186.123 d



## DV Fit Results:

Period = 186.12301 [0.00252] d  
Epoch = 266.6669 [0.0087] BKJD  
Rp/R\* = 0.0120 [0.0030]  
a/R\* = 118.70 [155.26]  
b = 0.90 [0.28]  
Seff = 8.86 [3.62]  
Teq = 440 [45] K  
Rp = 2.03 [0.79] Re  
a = 0.6712 [0.1736] AU  
Ag = 4481.51 [3134.45] [1.43σ]  
Teffp = 5565 [835] K [6.13σ]

## DV Diagnostic Results:

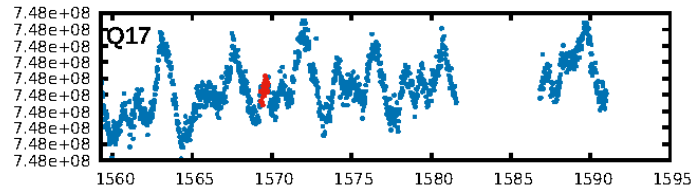
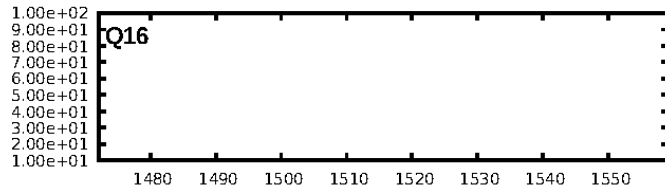
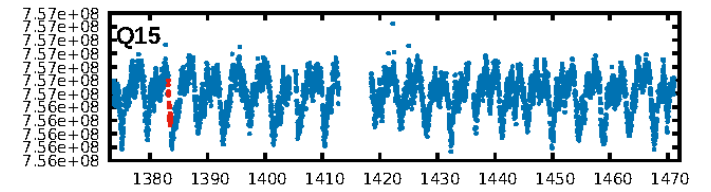
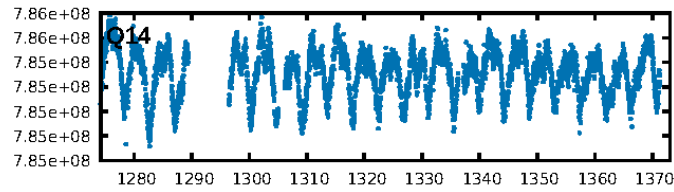
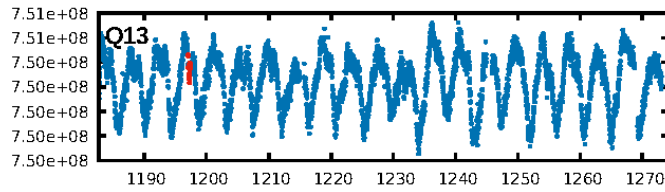
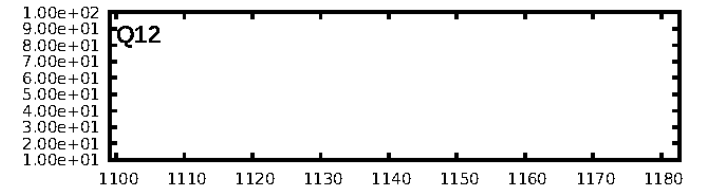
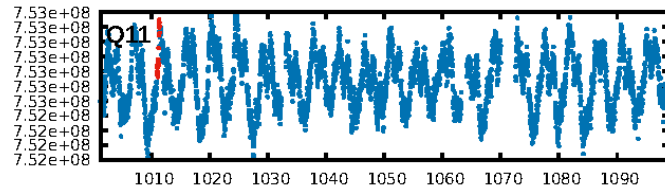
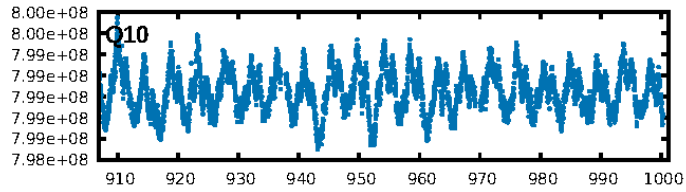
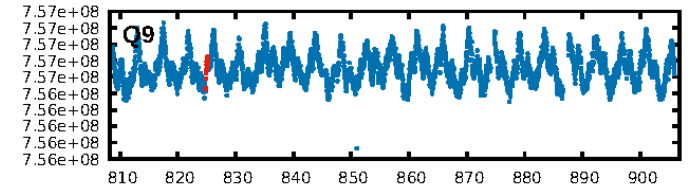
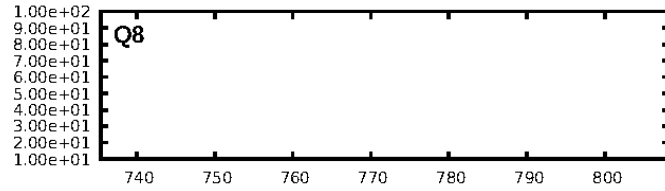
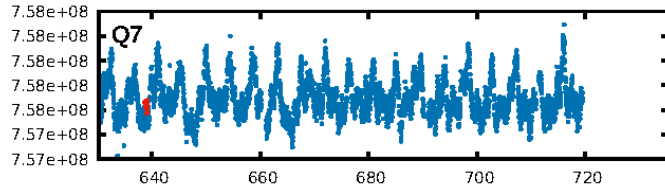
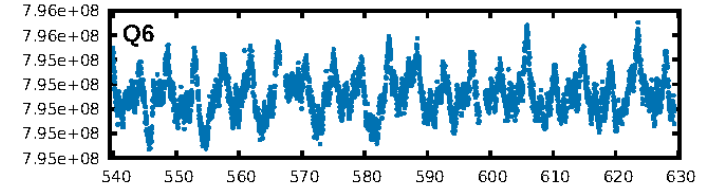
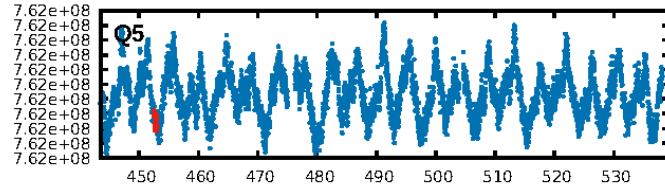
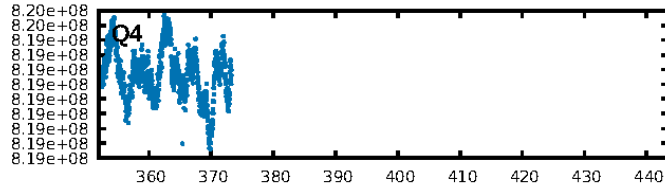
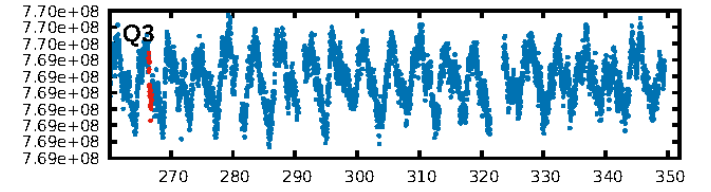
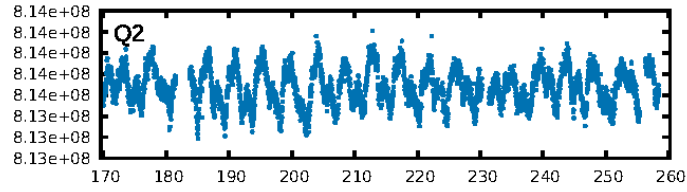
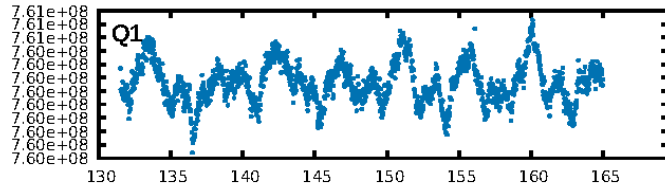
ShortPeriod-sig: 100.0% [261.50σ]  
LongPeriod-sig: 100.0% [199.60σ]  
ModelChiSquare2-sig: 86.8%  
ModelChiSquareGof-sig: 94.9%  
**Bootstrap-pfa: 3.51e-09**  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 1.446  
Centroid-sig: 20.8%  
Centroid-so: 1.074 arcsec [1.56σ]  
OotOffset-rm: 1.121 arcsec [0.60σ]  
OotOffset-st: 0/4/0/2 [6]  
KicOffset-rm: 1.156 arcsec [0.53σ]  
KicOffset-st: 0/4/0/2 [6]  
DiffImageQuality-fgm: 0.50 [3/6]  
DiffImageOverlap-fno: 0.71 [5/7]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:54:55 Z

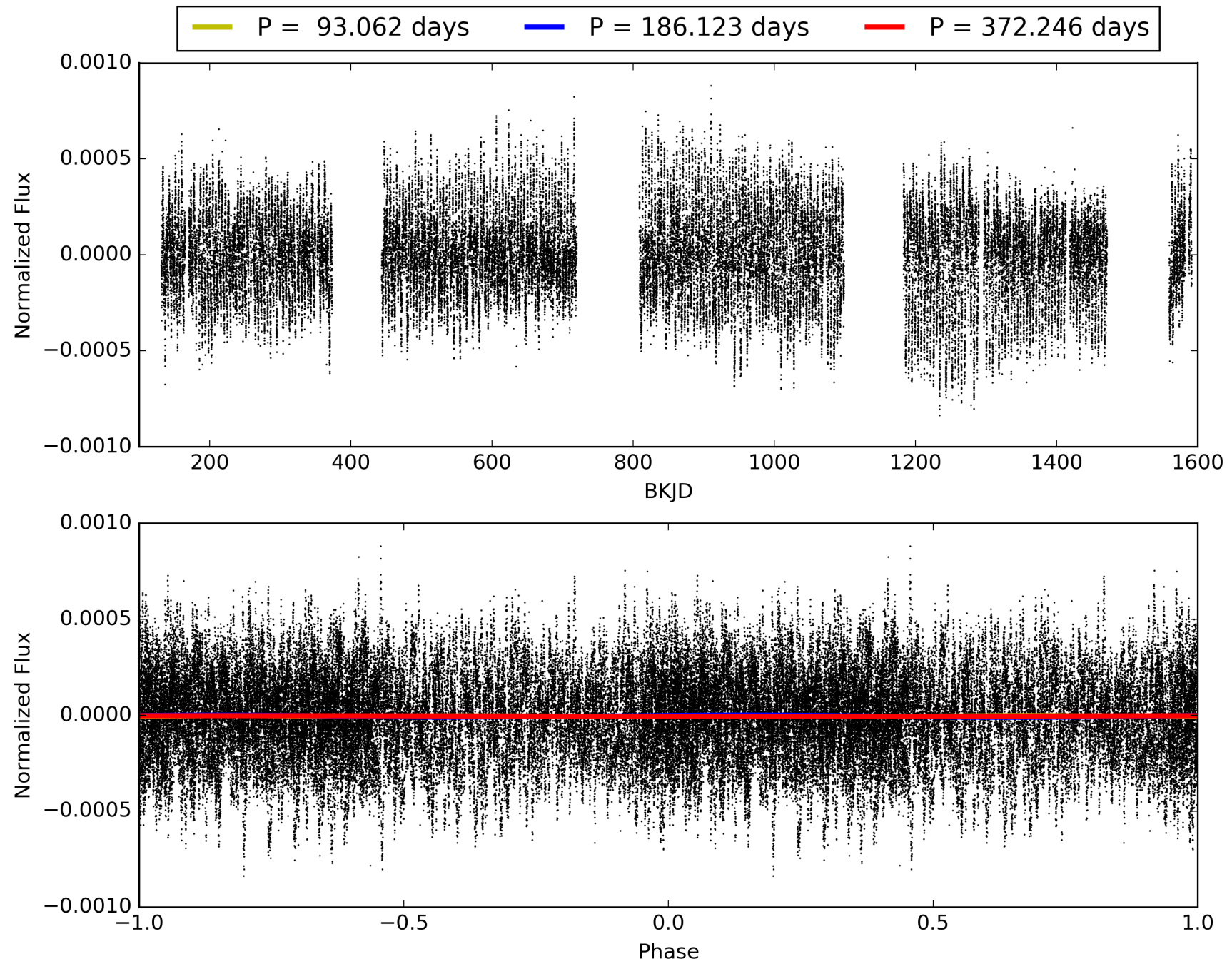
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011124904-03, PDC Light Curves

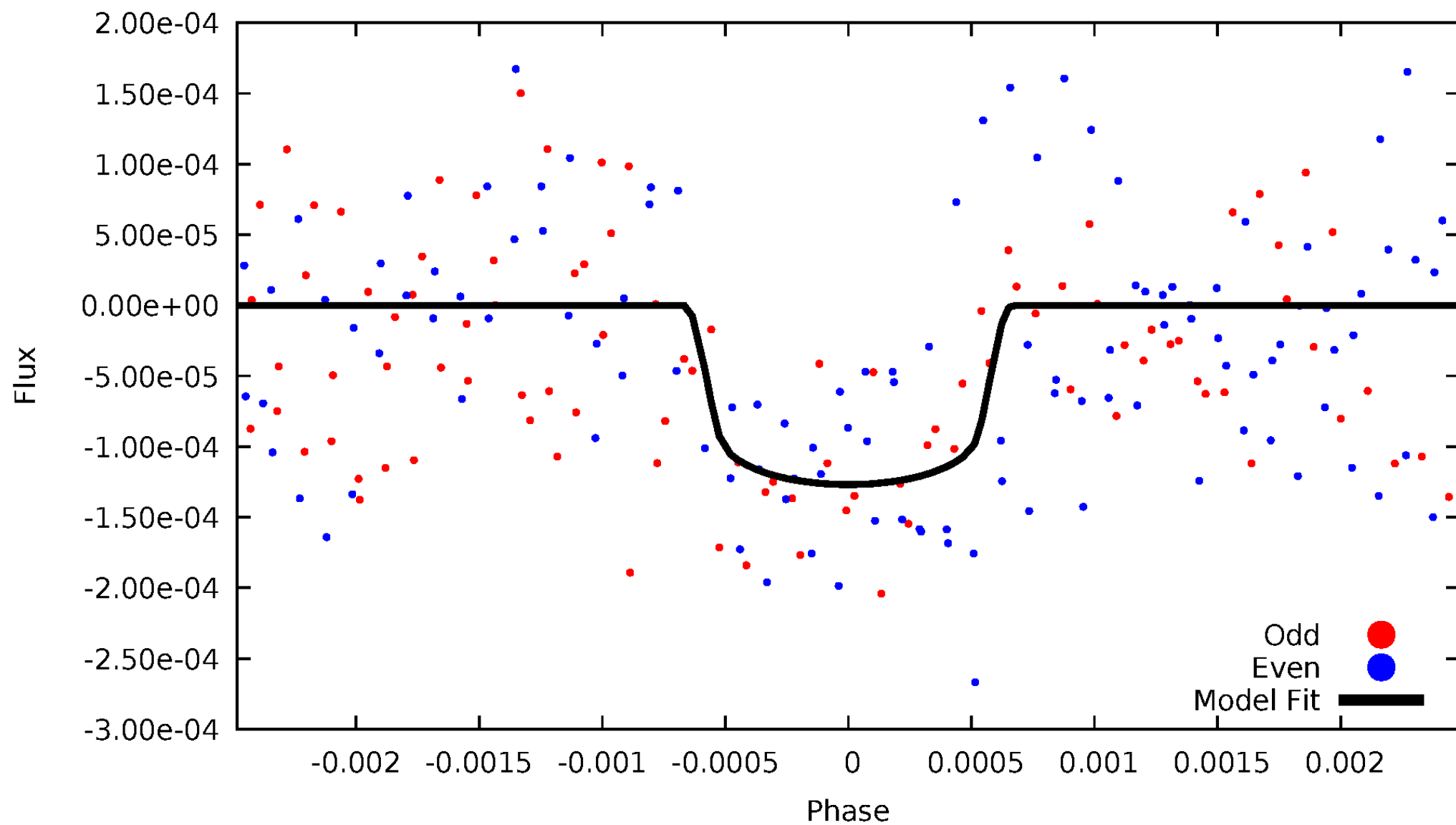


TCE 011124904-03



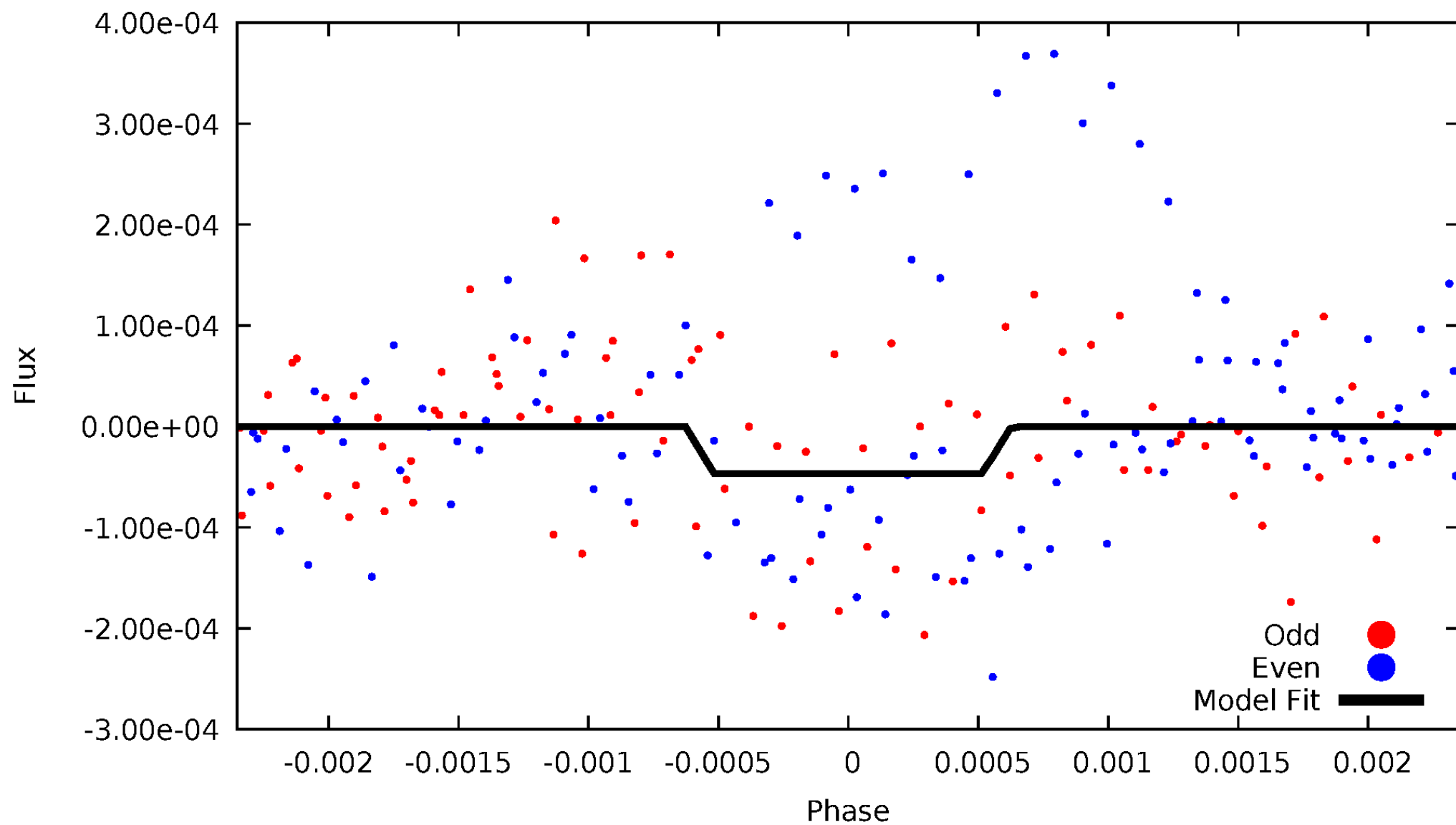
# DV Odd/Even

TCE 011124904-03



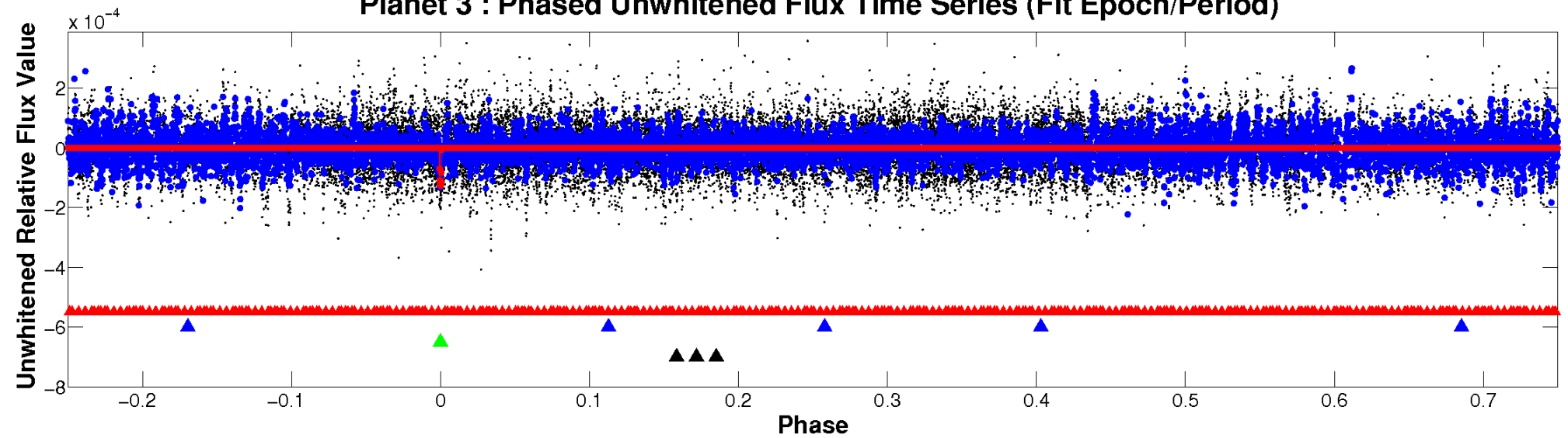
# ALT Odd/Even

TCE 011124904-03

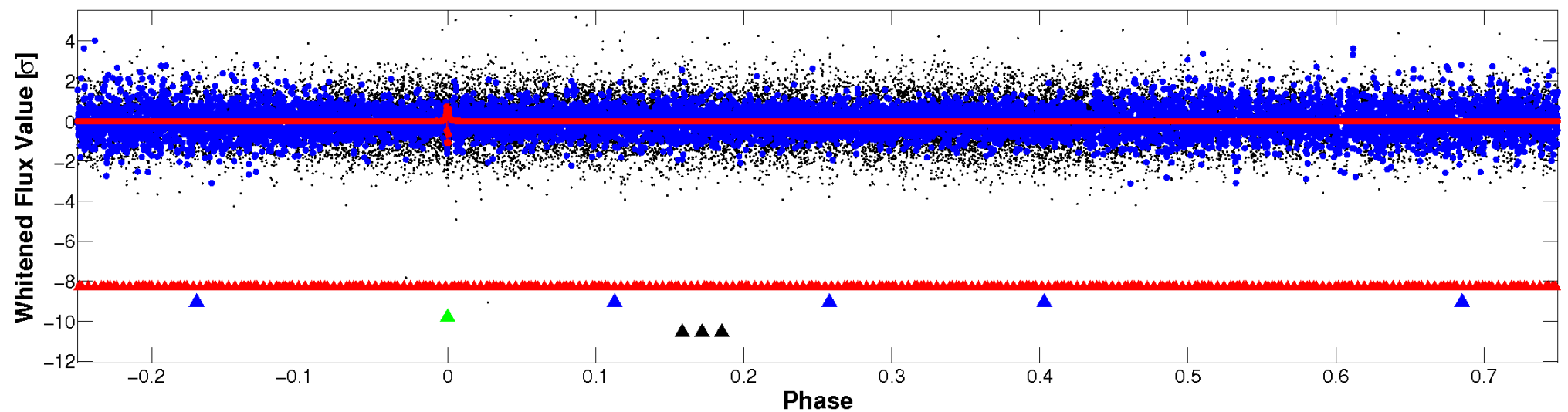


# Non-Whitened Vs. Whitened Light Curve

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

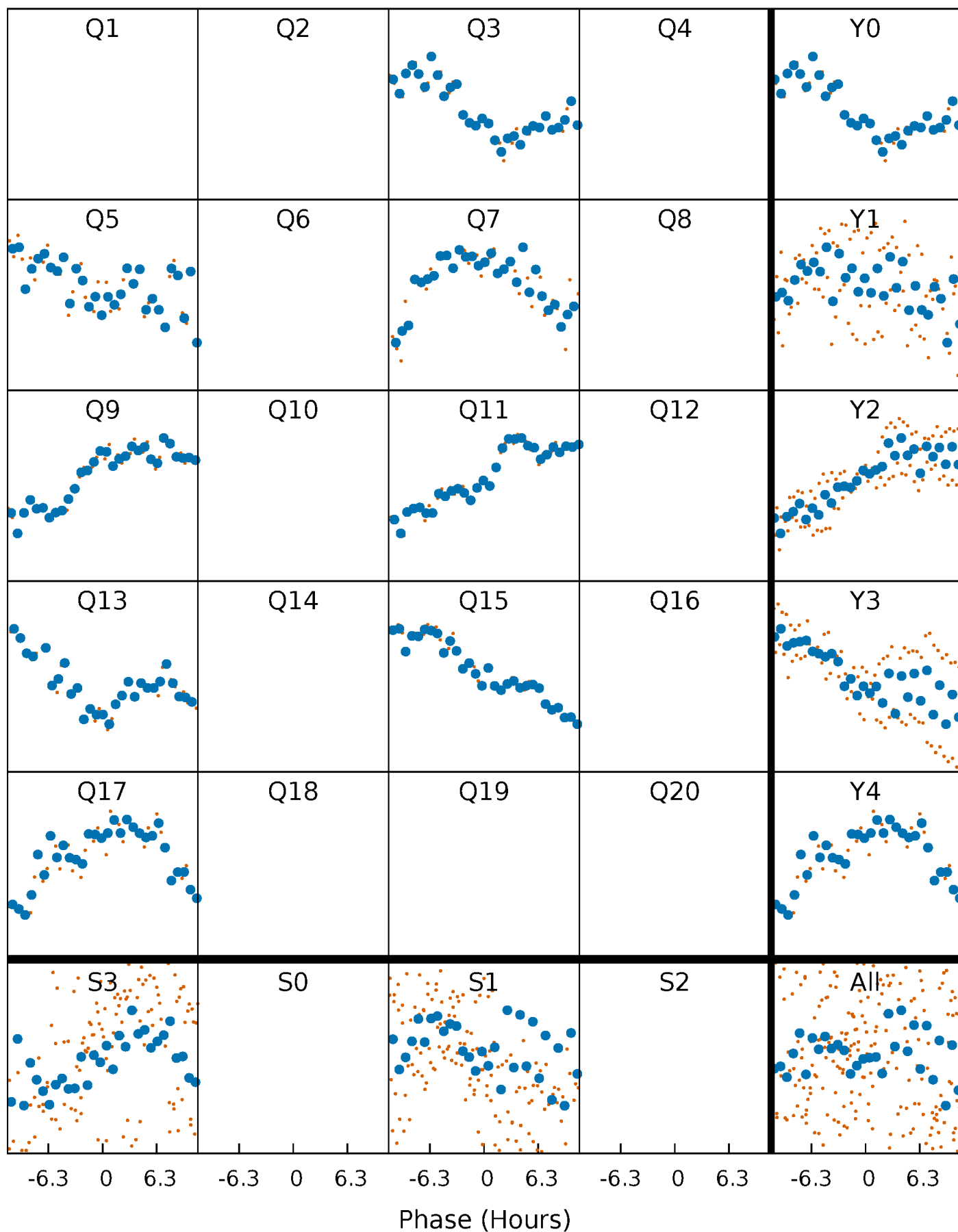


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



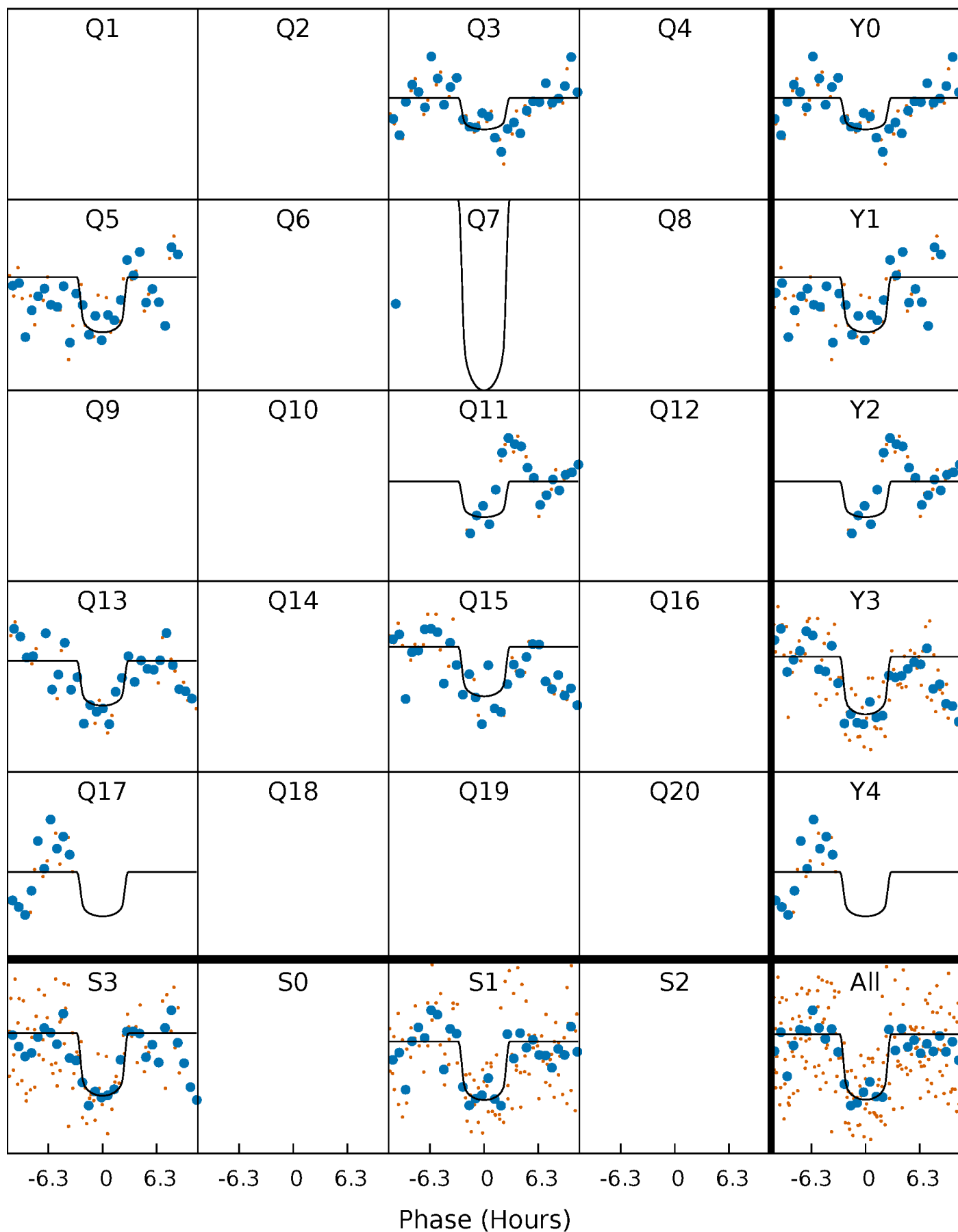
# PDC Quarter-Phased Transit Curves

TCE 011124904-03     $P=186.123014$  Days     $T_0=266.666903$  (BKJD)



# DV Quarter-Phased Transit Curves

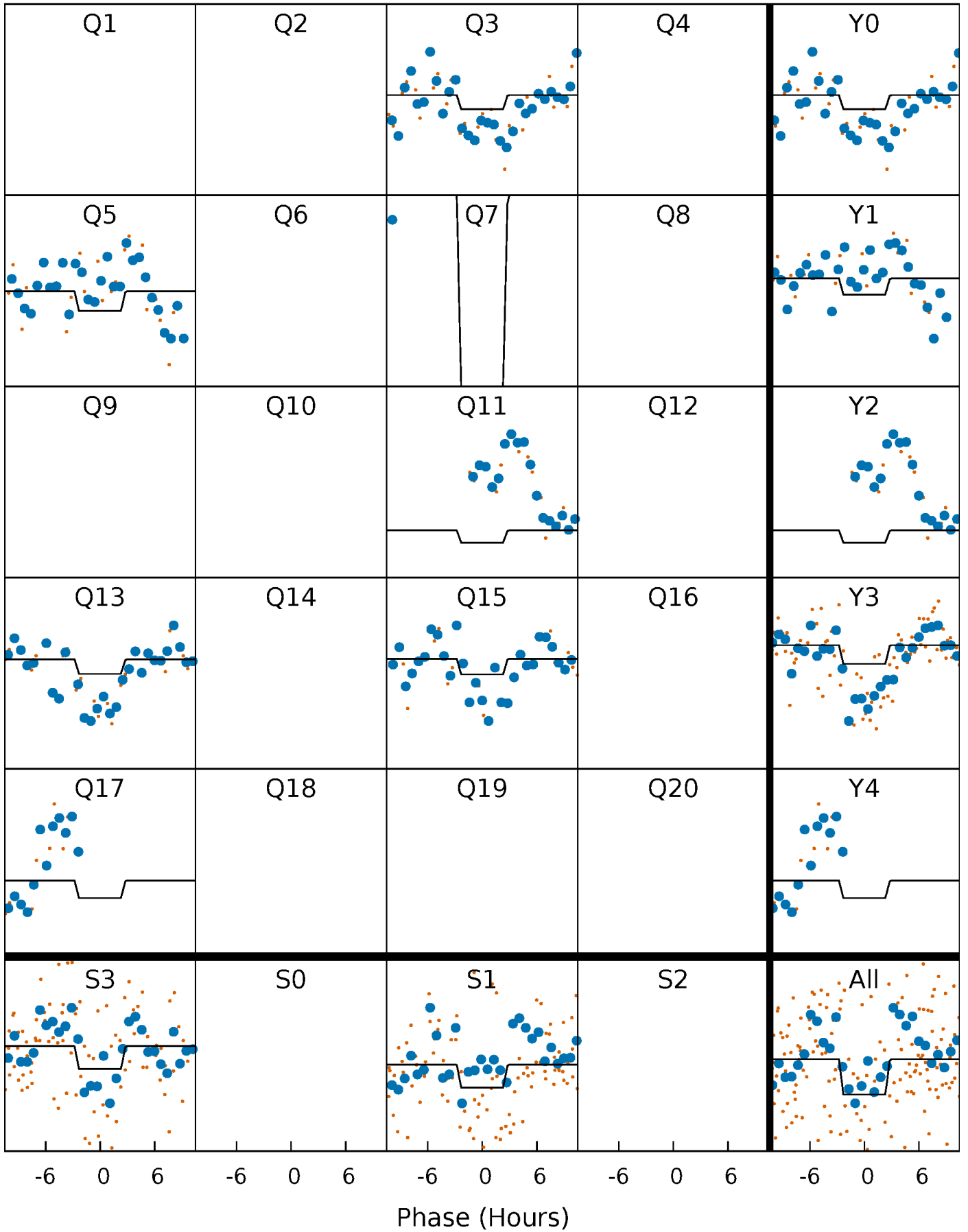
TCE 011124904-03     $P=186.123014$  Days     $T_0=266.666903$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

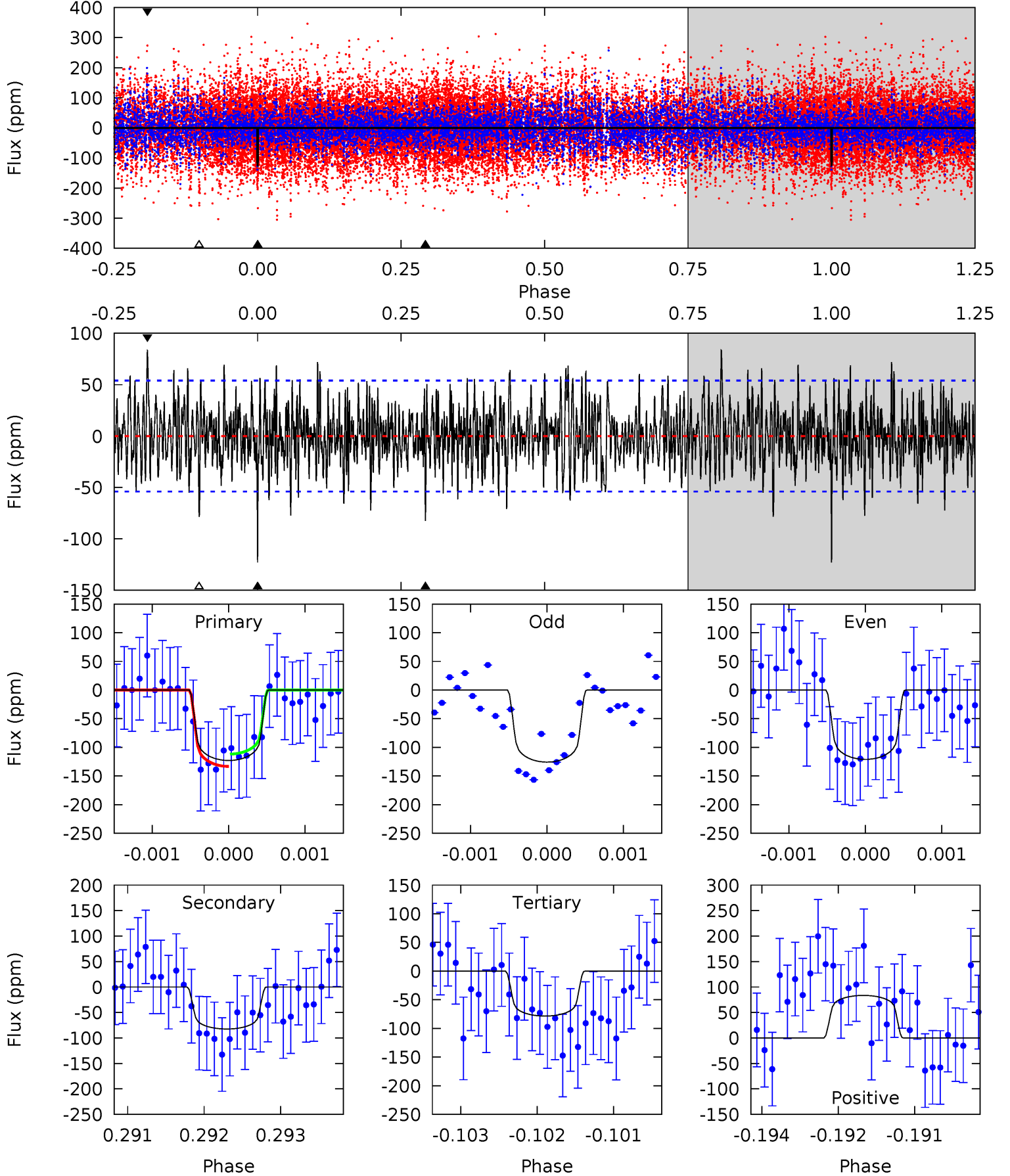
TCE 011124904-03     $P=186.118650$  Days     $T_0=266.659244$  (BKJD)



# DV Model-Shift Uniqueness Test

011124904-03, P = 186.123014 Days, E = 80.543889 Days

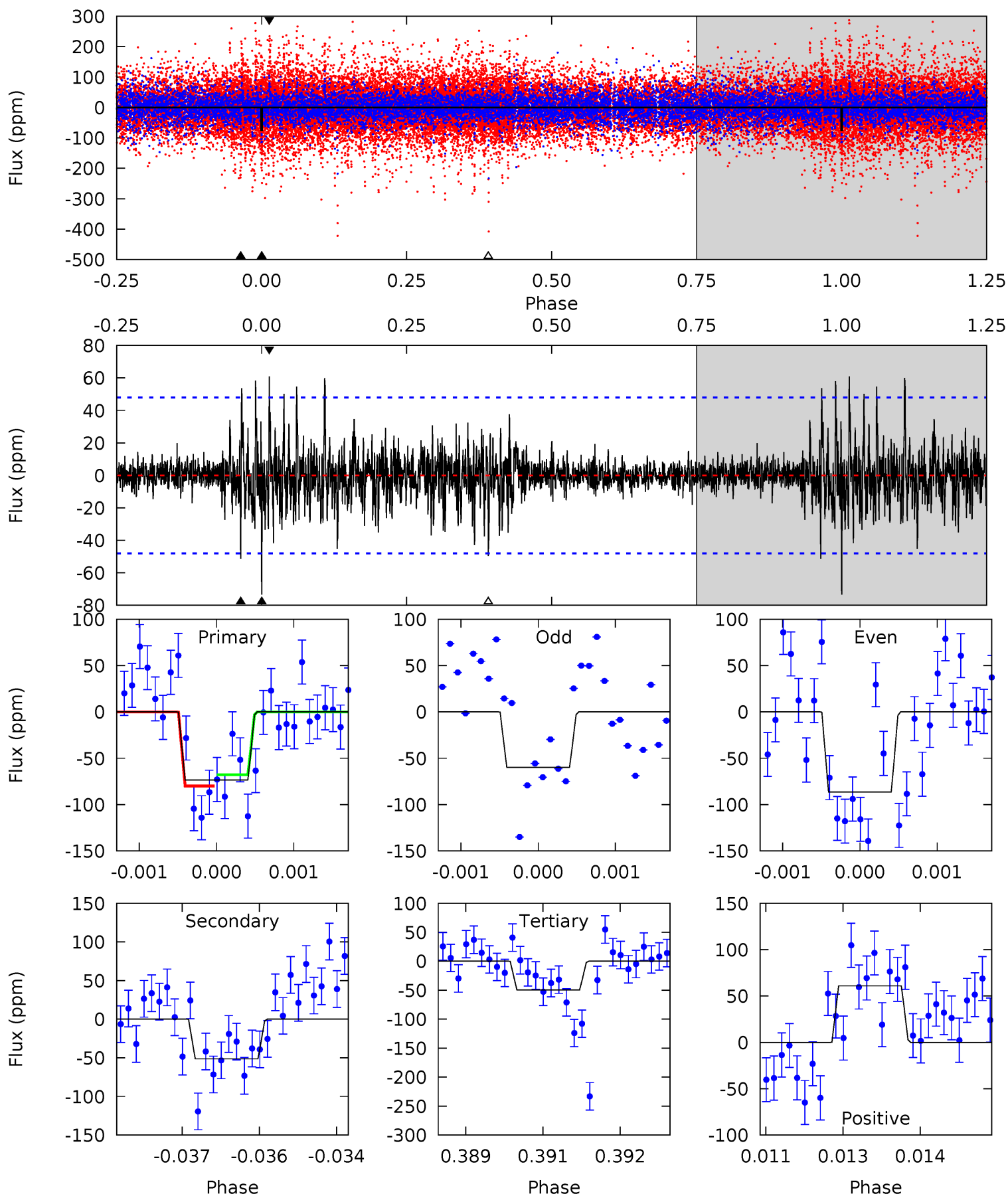
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.3	8.26	7.86	8.37	5.41	3.22	2.38	4.46	3.95	0.40	-0.11	0.23	0.93	0.40	1.07



# Alt Model-Shift Uniqueness Test

011124904-03, P = 186.118650 Days, E = 80.540594 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
8.27	5.79	5.58	6.86	5.41	3.22	1.33	2.69	1.41	0.21	-1.07	1.40	0.25	0.45	0.69



### Stellar Parameters For KIC 011124904

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-227}$	$4.126^{+0.214}_{-0.175}$	$-0.240^{+0.250}_{-0.300}$	$1.545^{+0.463}_{-0.421}$	$1.162^{+0.206}_{-0.150}$	$0.444^{+0.553}_{-0.215}$
	+3%/-3%	+5%/-4%	+104%/-125%	+30%/-27%	+18%/-13%	+125%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011124904-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-82 \pm 10$	$2.03^{+0.66}_{-0.53}$	$614^{+47}_{-46}$	$5681^{+913}_{-547}$	$5008^{+4241}_{-2139}$
Alt.	$-51 \pm 9$	$1.14^{+0.57}_{-0.50}$	$612^{+52}_{-45}$	$6677^{+2633}_{-1082}$	$9724^{+20259}_{-5385}$

$T_{max}$  = 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

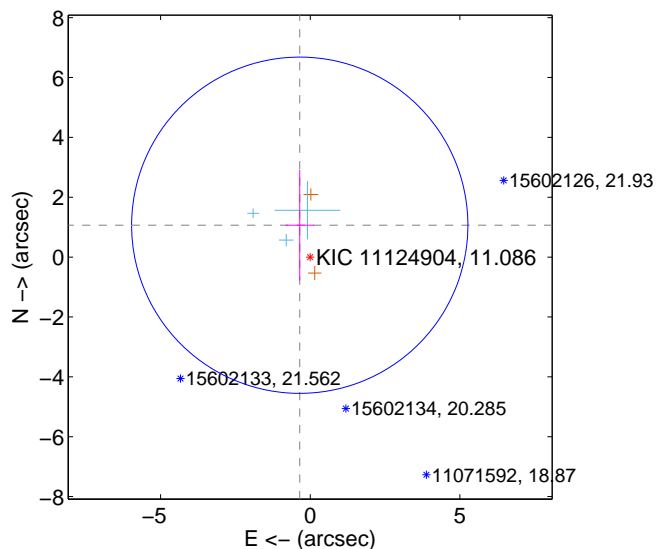
Supplemental centroid analysis for 011124904-03. **Kepler magnitude: 11.09.** Transit SNR 7.91

**There are 3 quarters with good PRF difference image offsets**

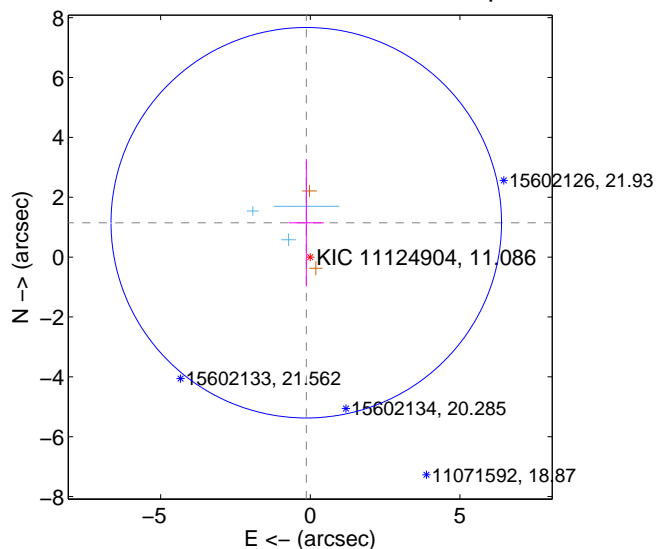
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.121 \pm 1.872$	0.60	$0.350 \pm 0.476$	$1.065 \pm 1.845$
PRF-fit source offset from KIC position	$1.156 \pm 2.174$	0.53	$0.133 \pm 0.586$	$1.148 \pm 2.128$
photometric centroid source offset	$1.07 \pm 0.69$	1.56	$1.07 \pm 0.69$	$0.06 \pm 0.77$

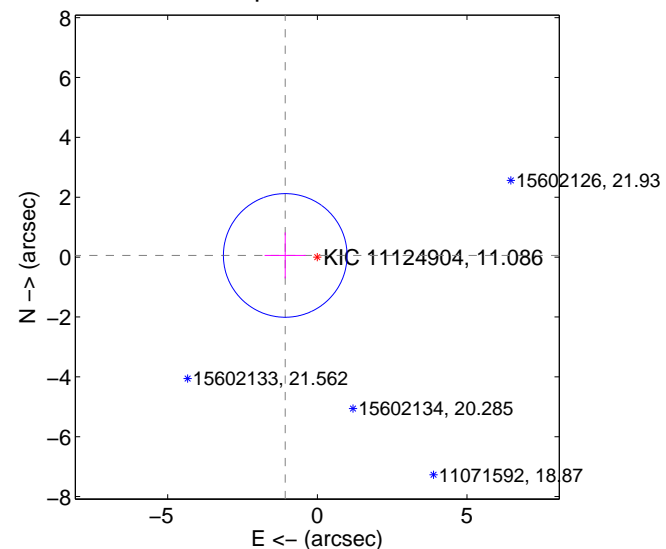
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids



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

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

Q1 no difference image



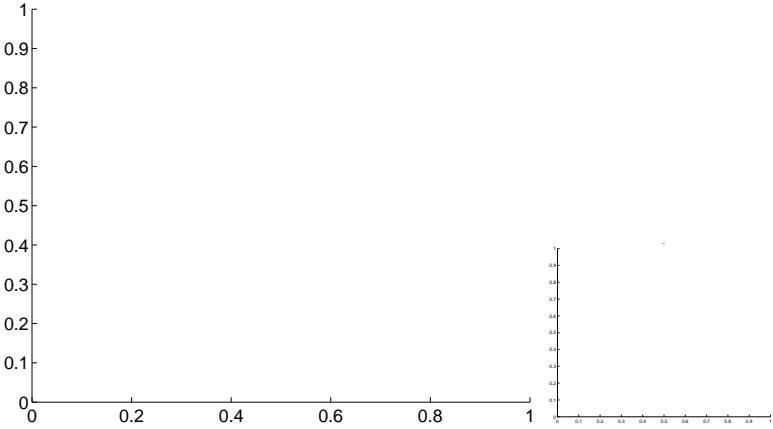
Q1 no OOT image



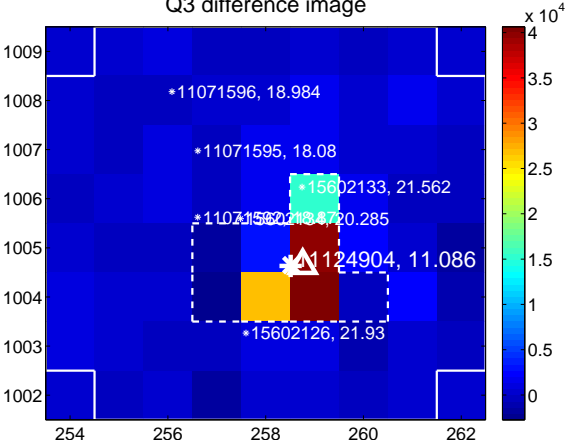
Q2 no difference image



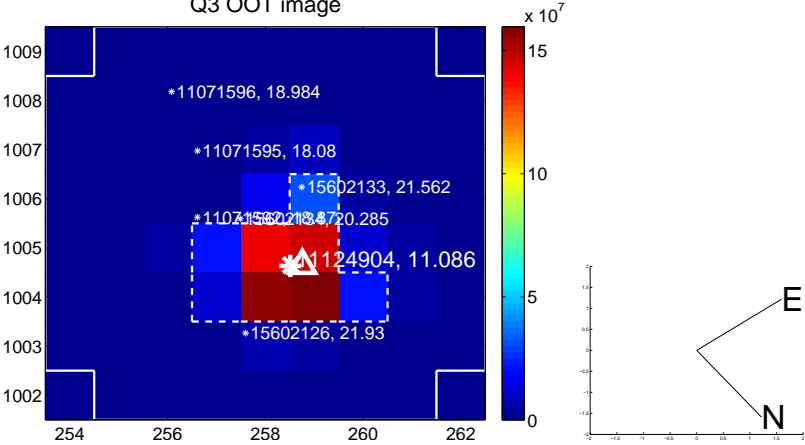
Q2 no OOT image



Q3 difference image



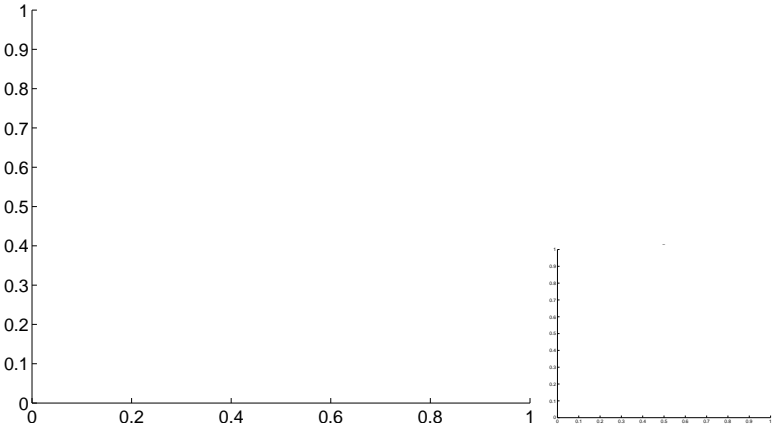
Q3 OOT image



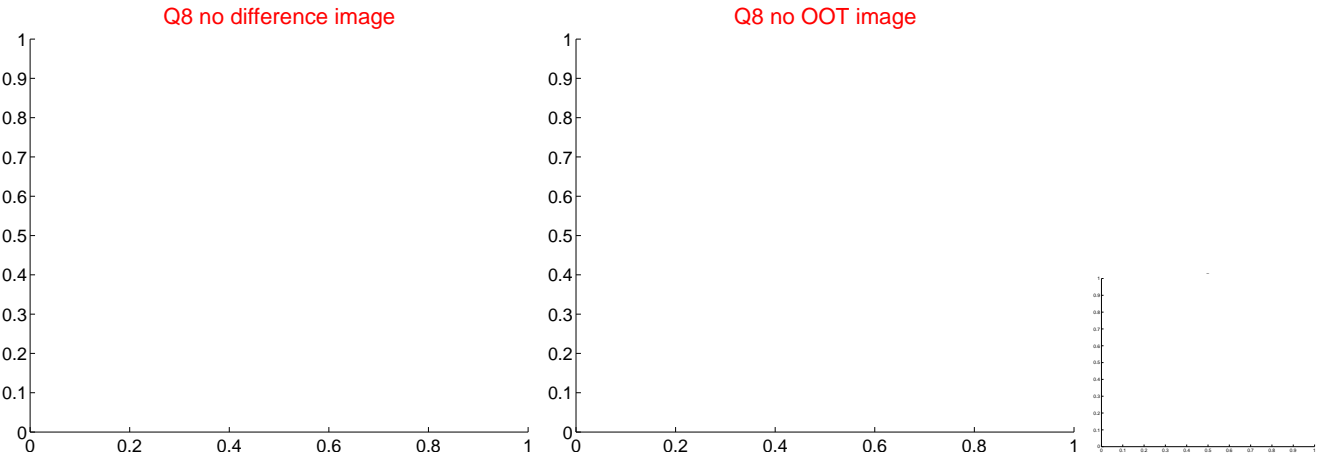
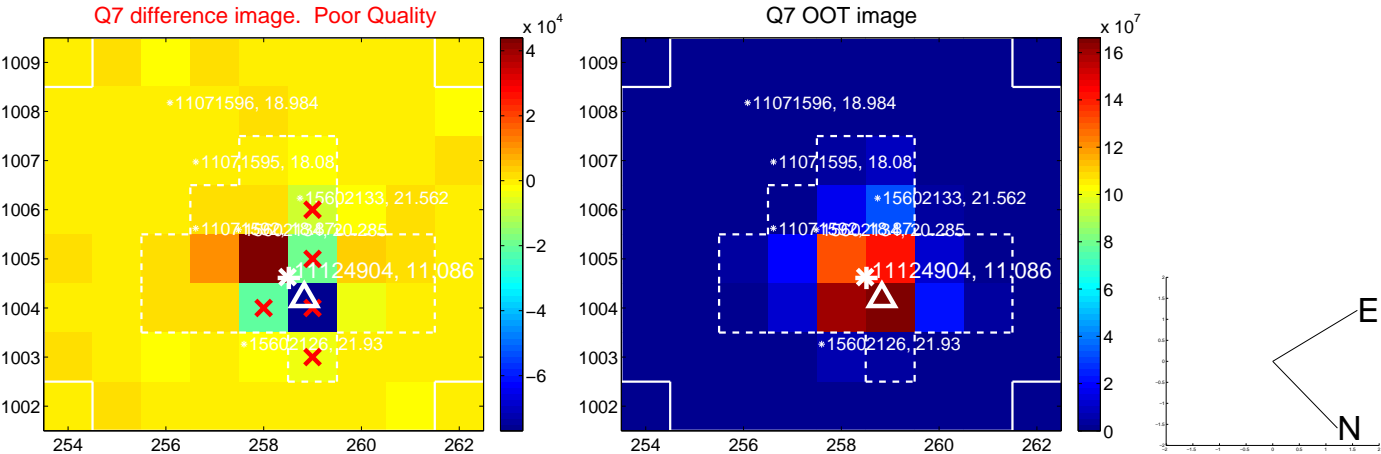
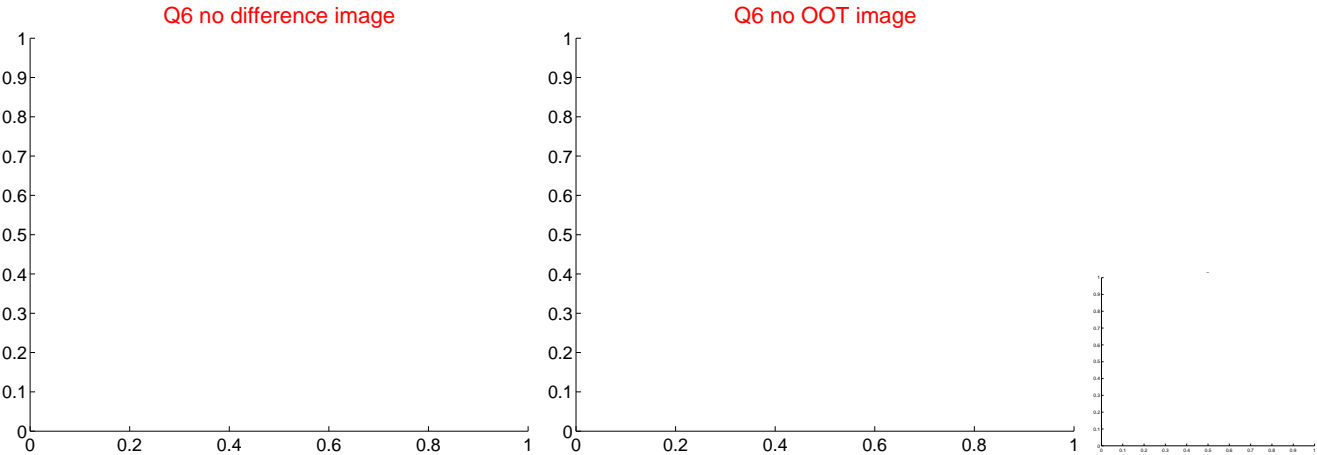
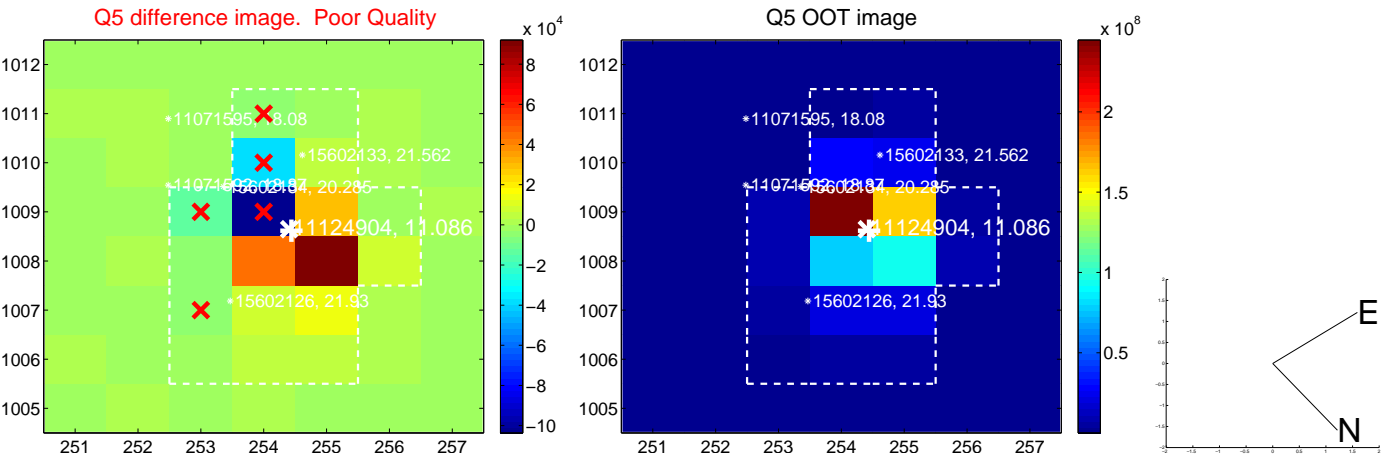
Q4 no difference image



Q4 no OOT image

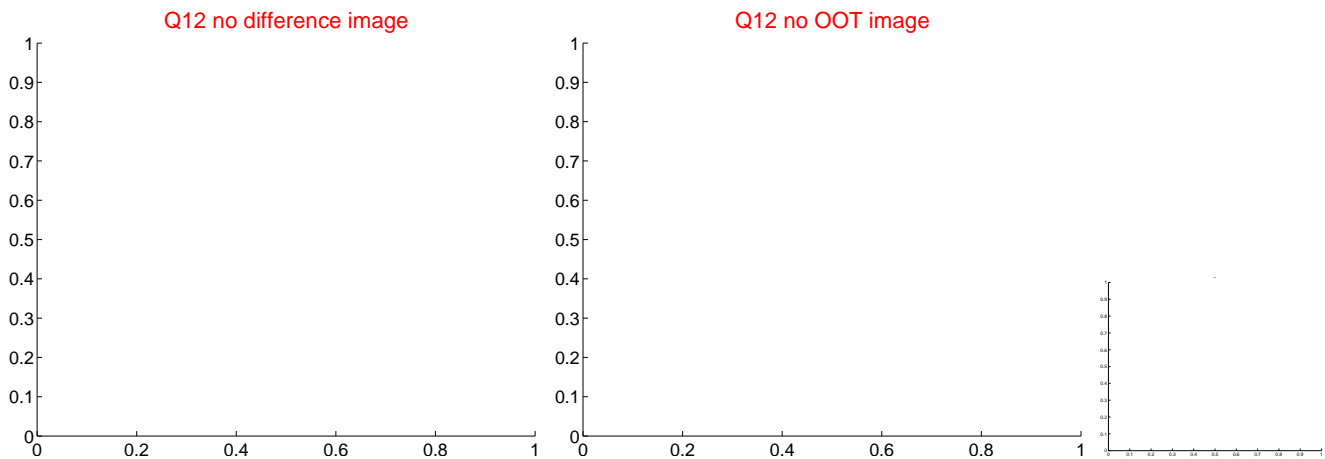
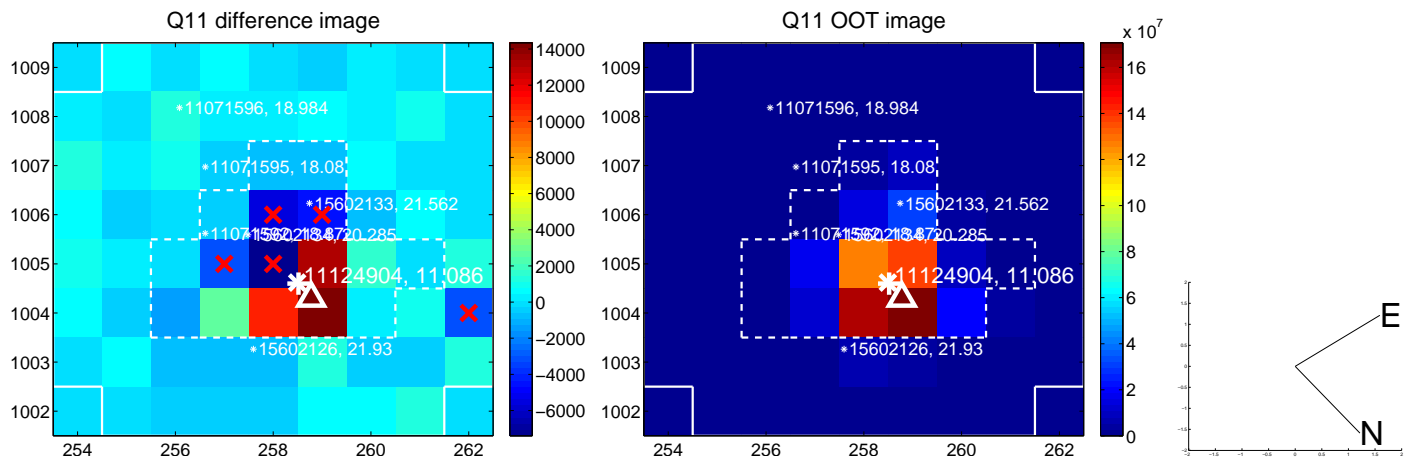
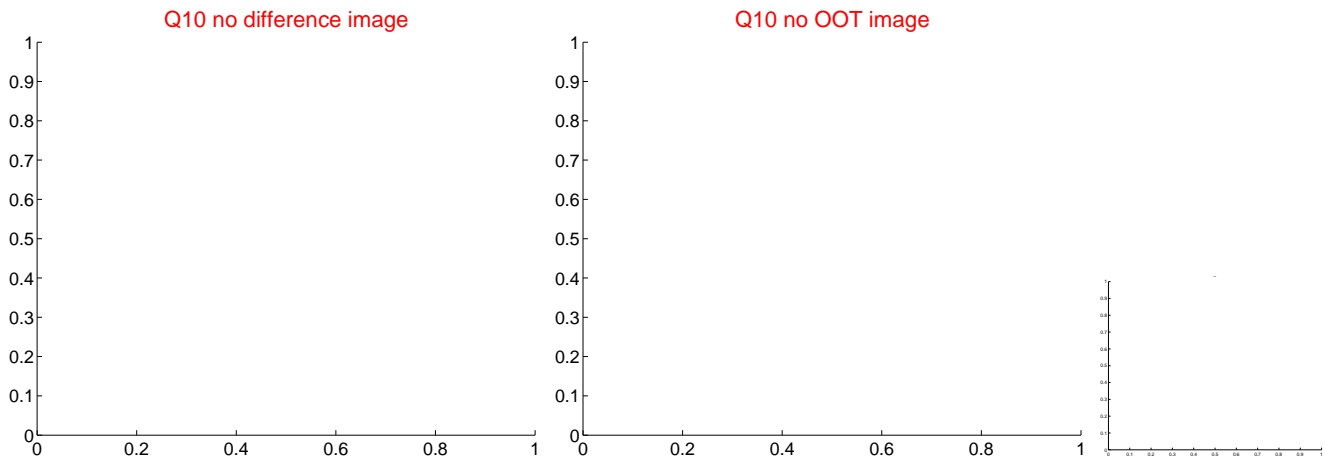
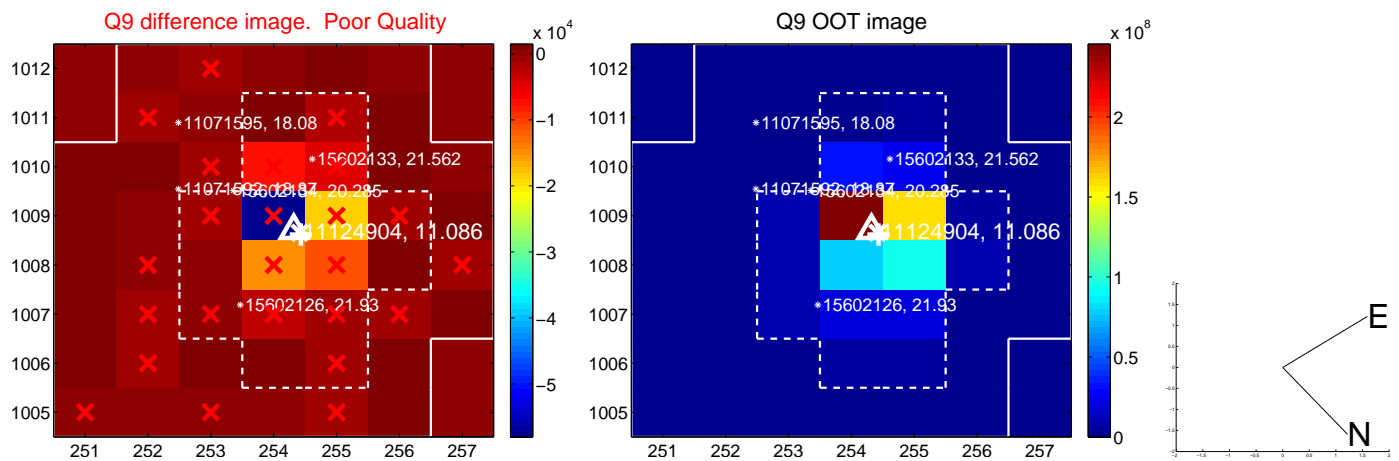


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

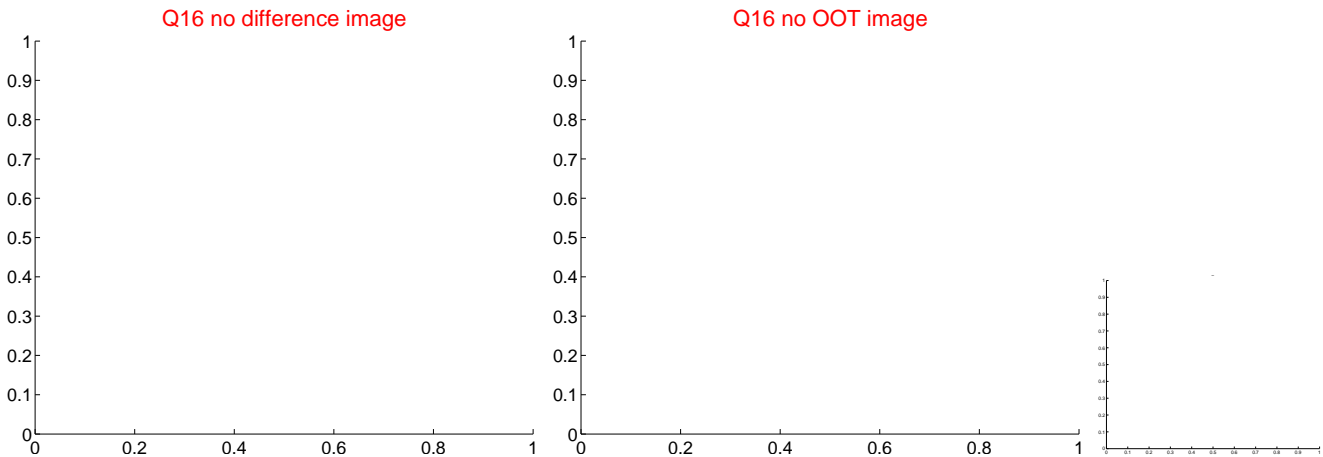
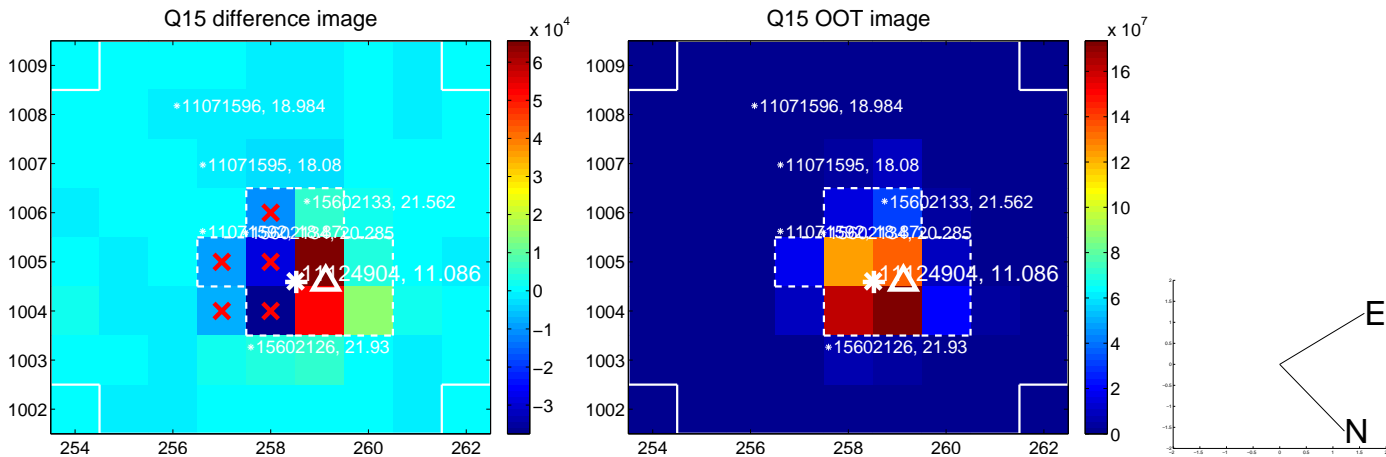
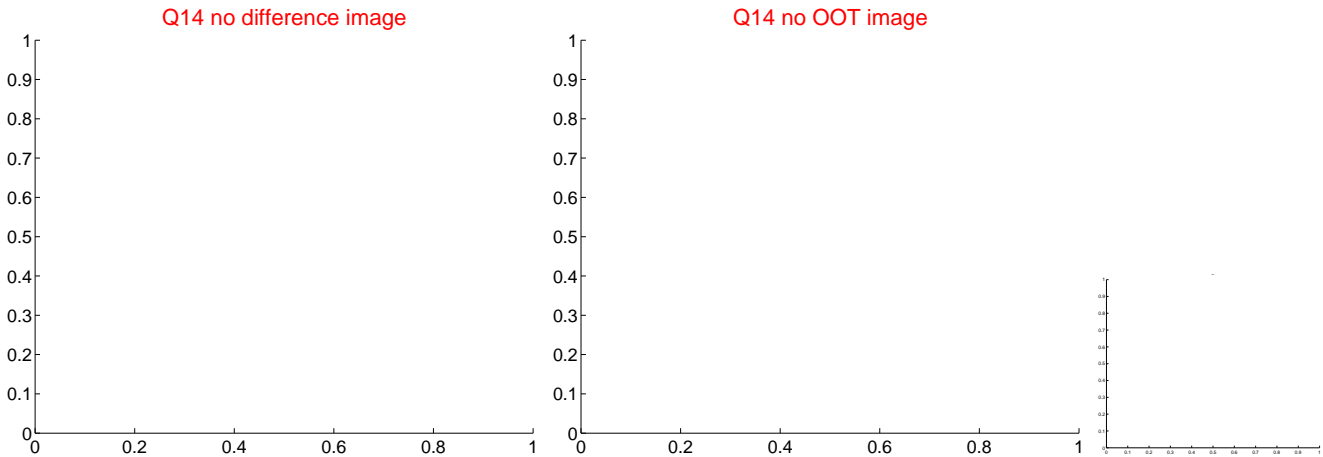
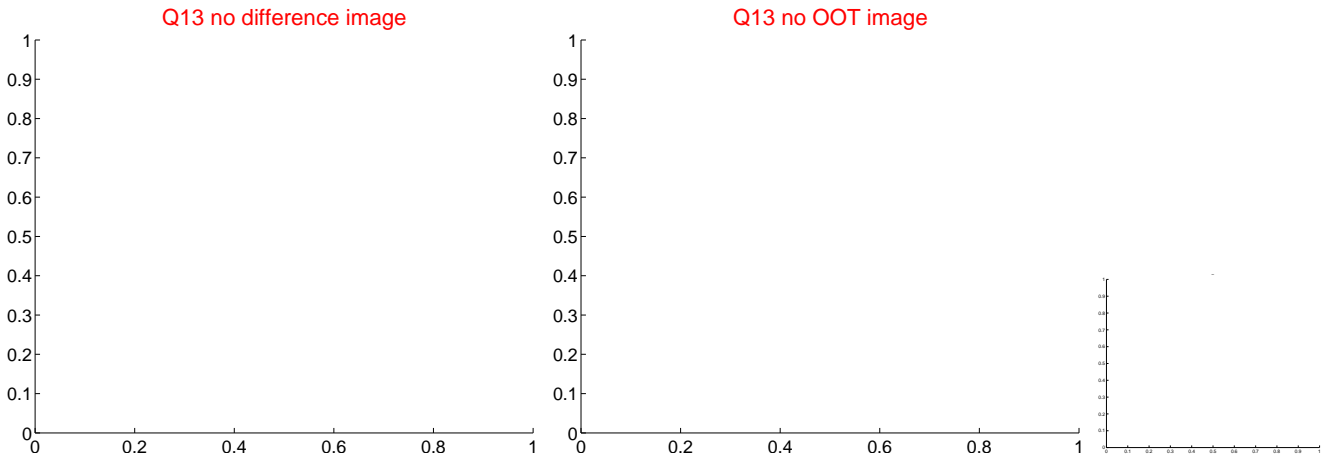




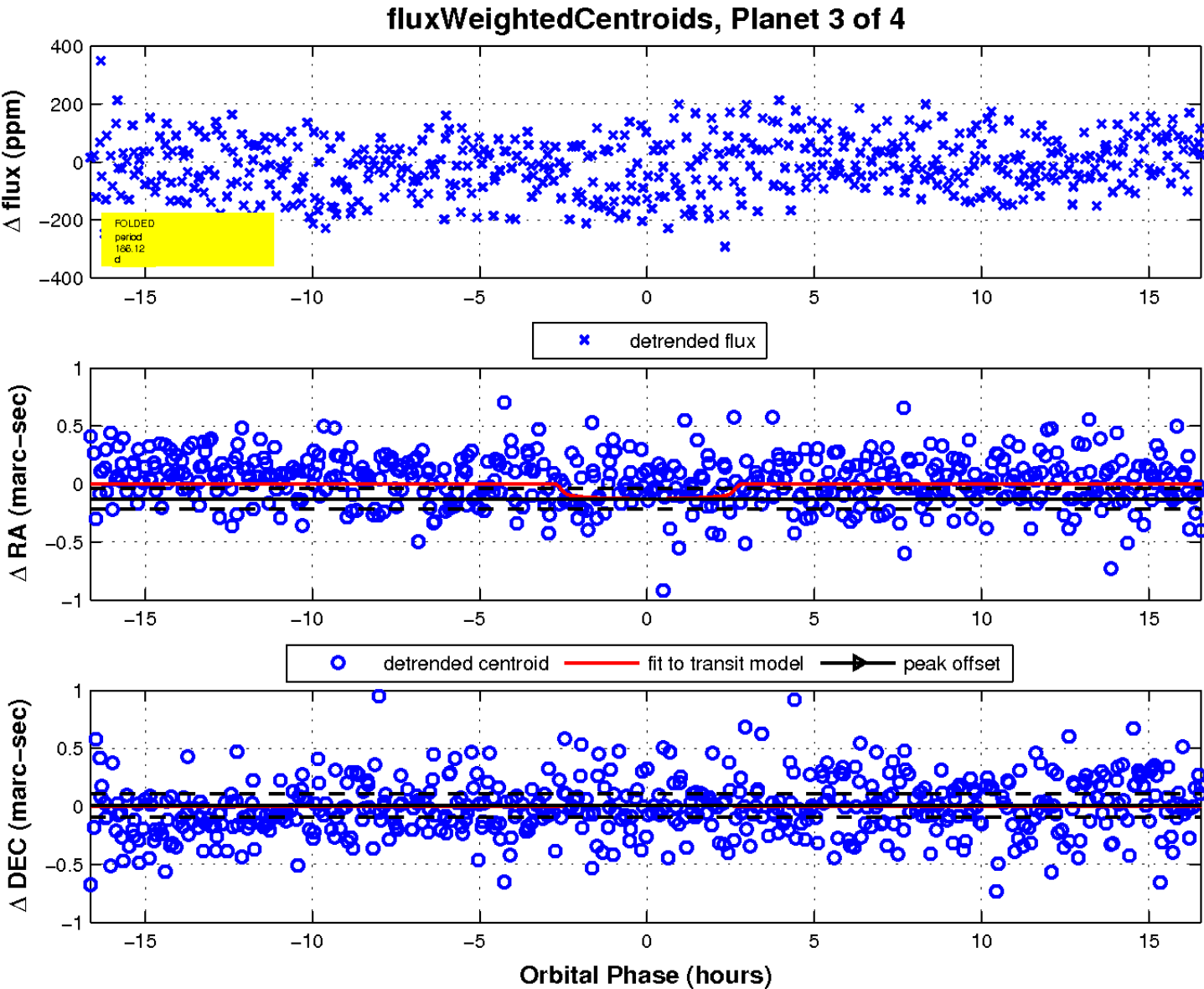
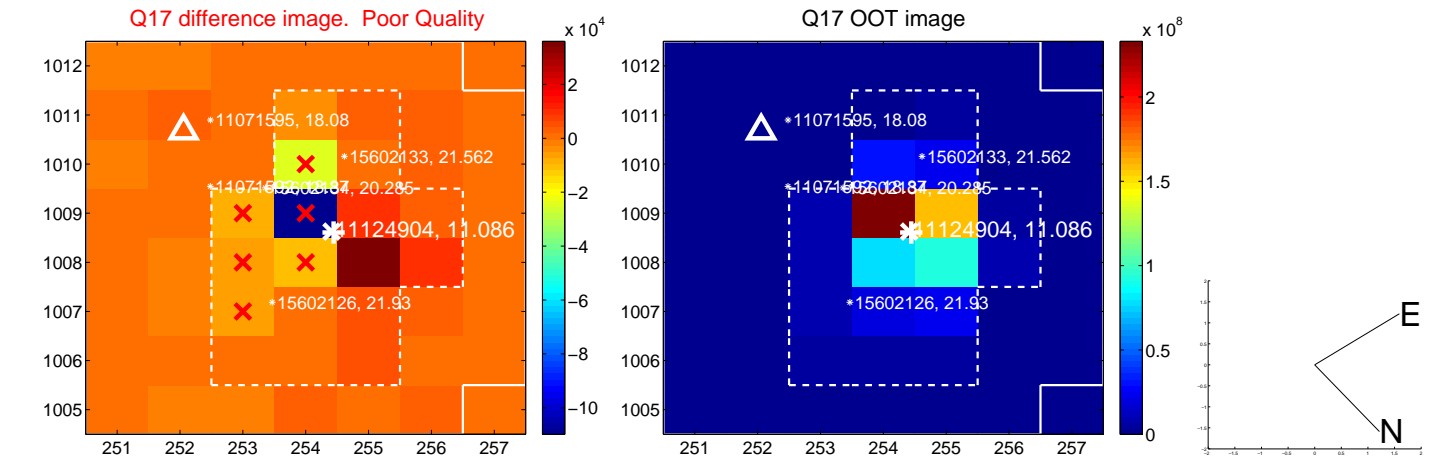
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



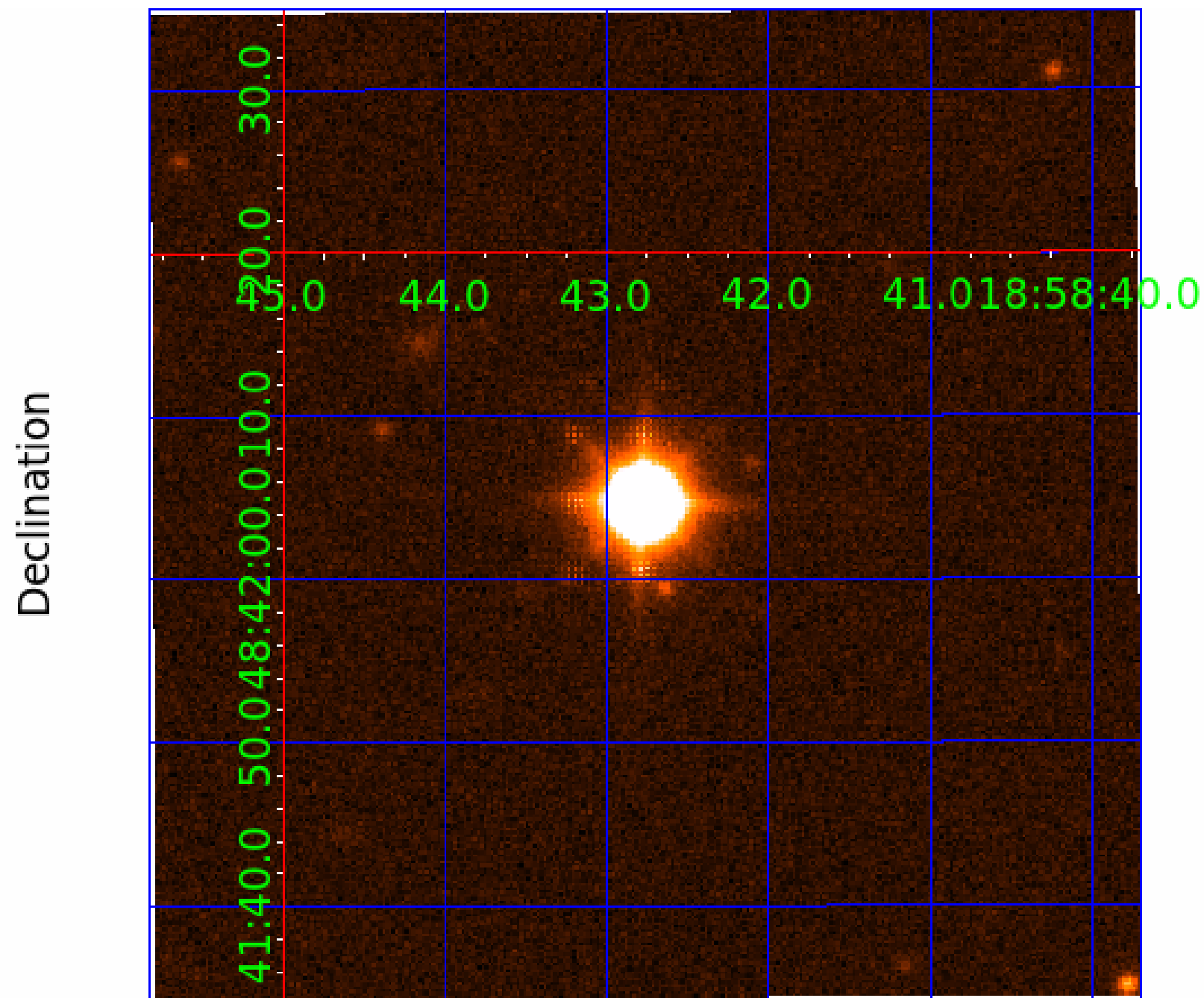
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 011124904

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011124904-01	OBS	No	4.411949	132.090641	18.7	15.728	9.5	6.8	1.54	6573	0.70	1301.35
011124904-02	OBS	No	292.687416	287.661747	165.3	11.551	11.5	6.8	1.54	6573	2.05	4.85
011124904-03	OBS	No	186.123014	266.666903	126.8	5.546	7.7	7.9	1.54	6573	2.03	8.86
011124904-04	OBS	No	374.723059	482.292915	103.5	5.952	7.5	4.7	1.54	6573	1.74	3.49

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011124904-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_SATURATED
011124904-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_SATURATED
011124904-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_POS_ALT—CENT_SATURATED
011124904-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED

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

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

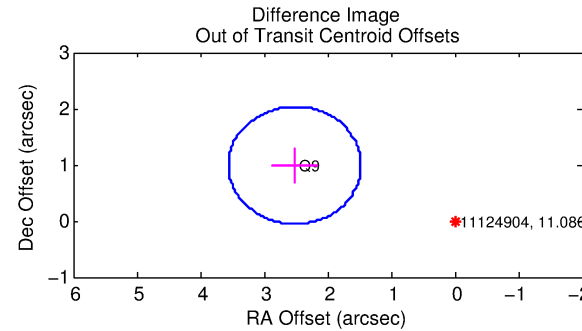
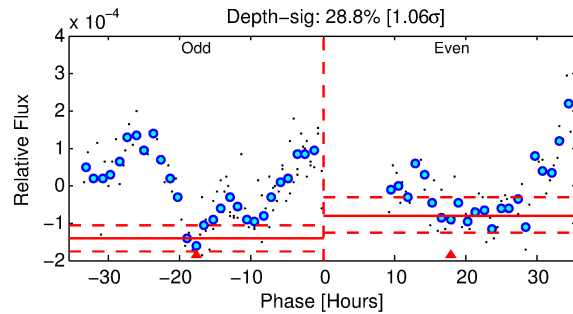
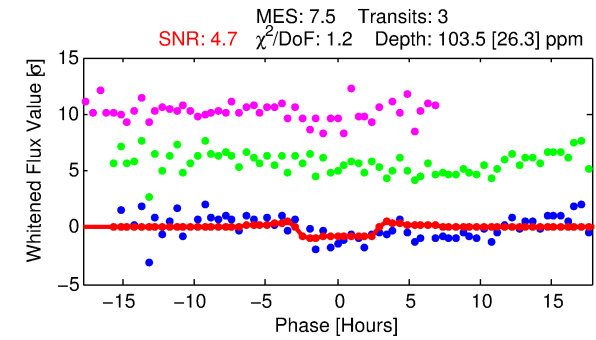
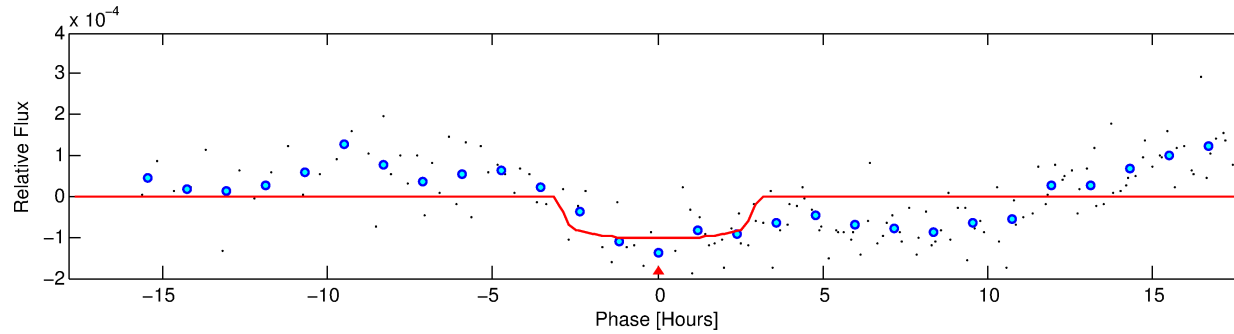
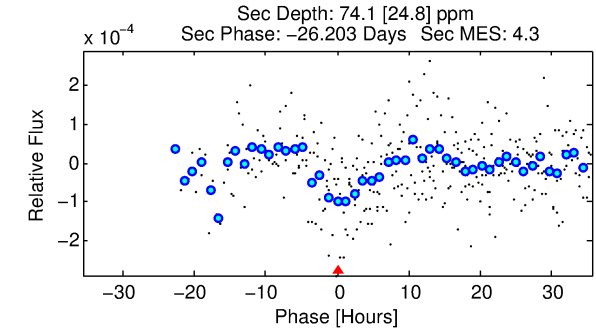
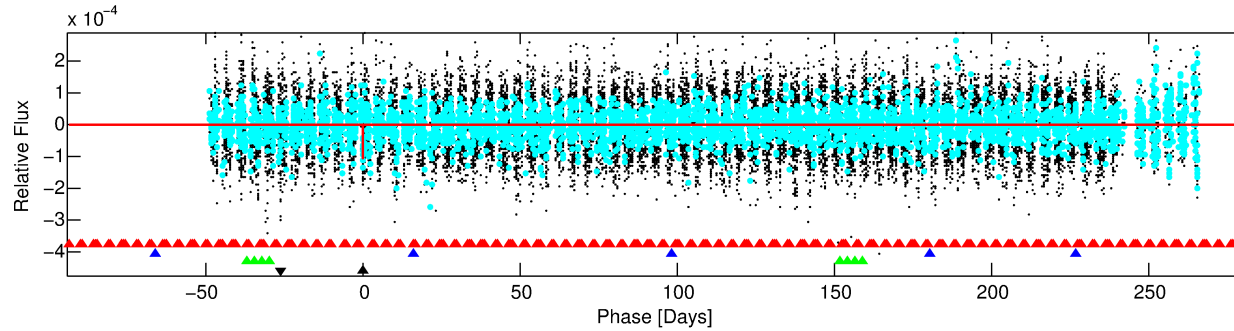
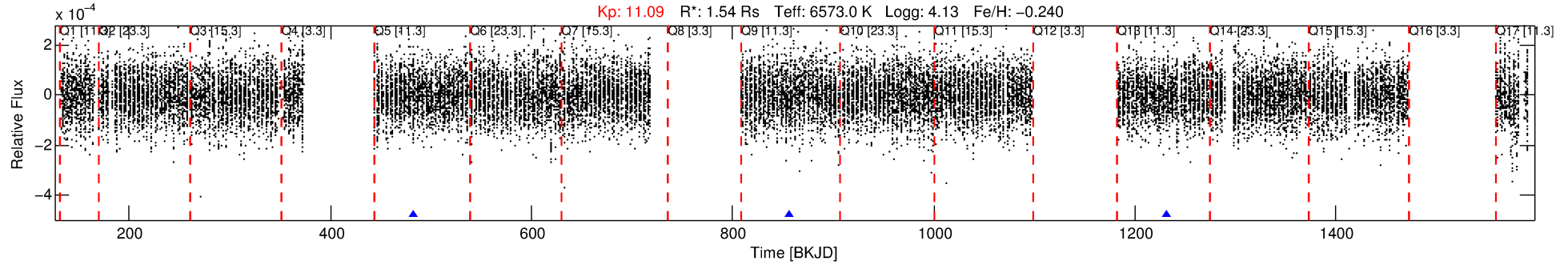
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011124904-04

No Significant Match Found

# DV One-Page Summary

KIC: 11124904 Candidate: 4 of 4 Period: 374.723 d



## DV Fit Results:

Period = 374.72306 [0.01281] d  
Epoch = 482.2929 [0.0116] BKJD  
Rp/R\* = 0.0103 [0.0070]  
a/R\* = 292.84 [1109.55]  
b = 0.81 [1.65]  
Seff = 3.49 [1.42]  
Teq = 348 [36] K  
Rp = 1.74 [1.29] Re  
a = 1.0702 [0.2768] AU  
Ag = 15429.02 [22303.65] [0.69σ]  
Teffp = 6004 [2102] K [2.69σ]

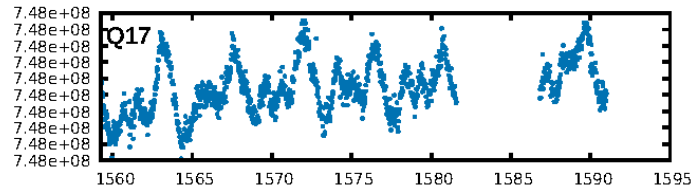
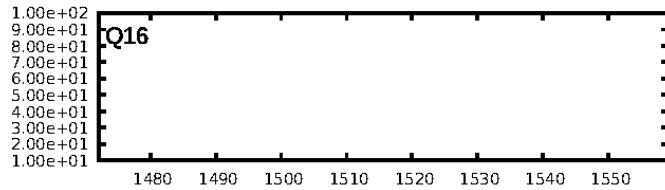
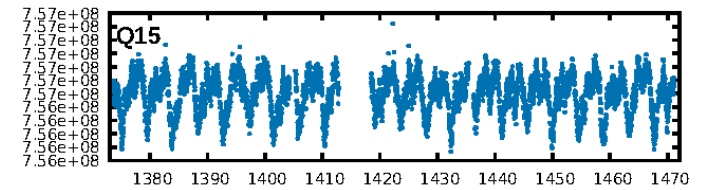
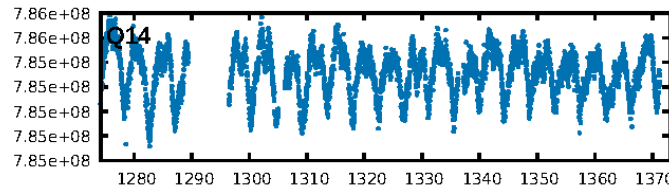
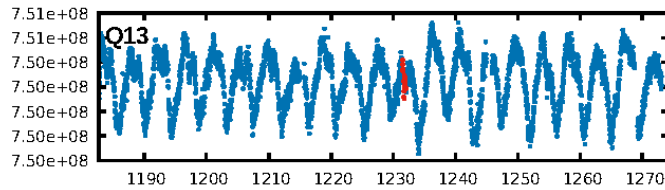
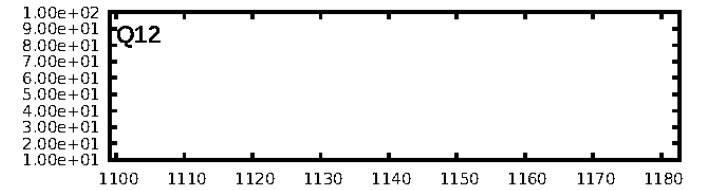
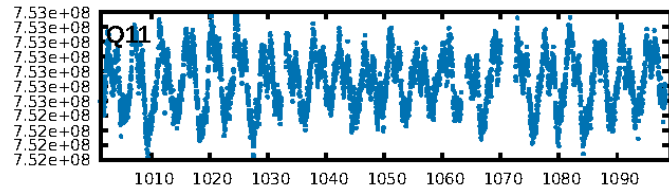
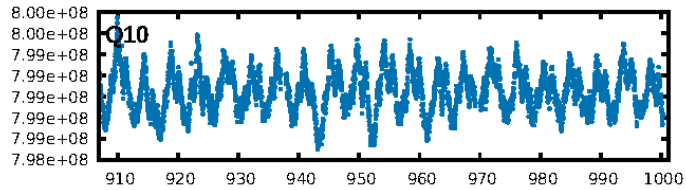
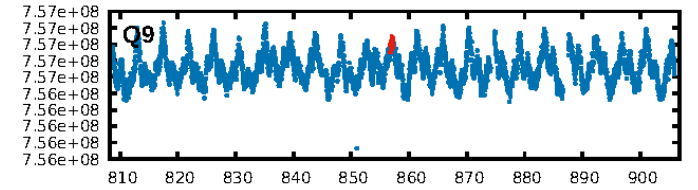
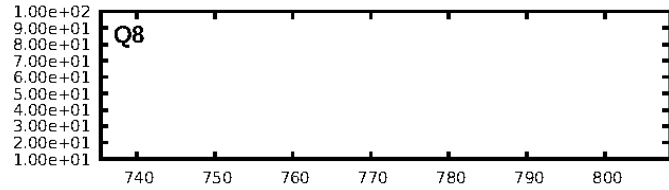
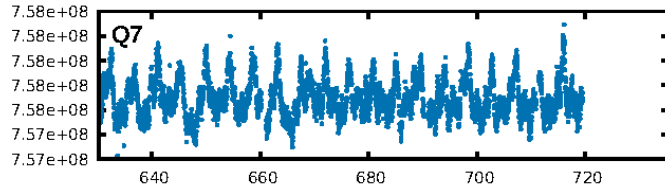
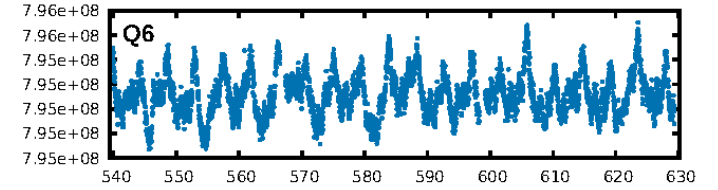
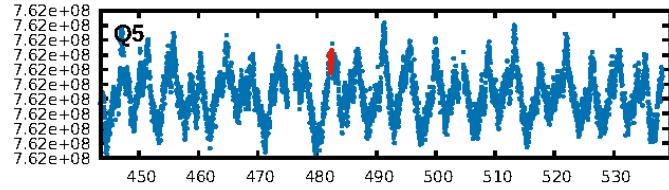
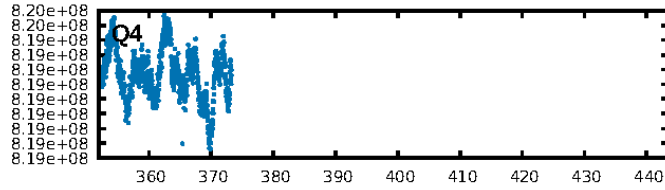
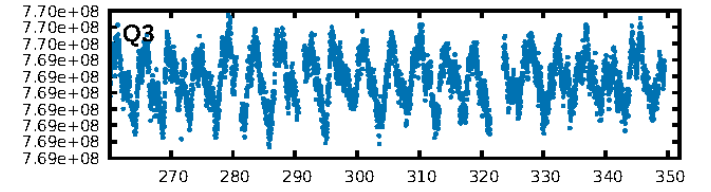
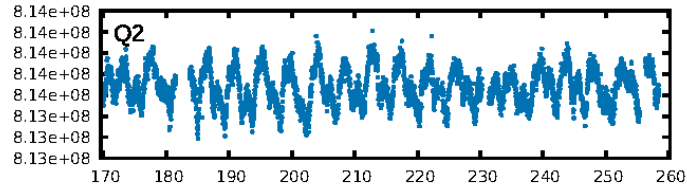
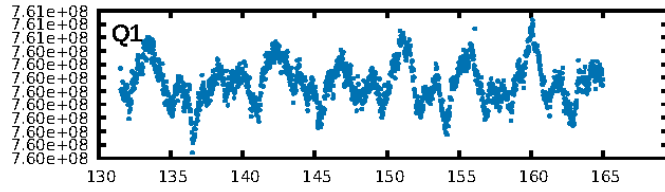
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [151.52σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 34.2%  
ModelChiSquareGof-sig: 99.7%  
Bootstrap-pfa: 5.97e-08  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 8.017  
Centroid-sig: 71.6%  
Centroid-so: 0.690 arcsec [0.37σ]  
OotOffset-rm: 2.702 arcsec [7.77σ]  
KicOffset-rm: 2.733 arcsec [7.92σ]  
OotOffset-st: 0/0/0/1 [1]  
KicOffset-st: 0/0/0/1 [1]  
DiffImageQuality-fgm: 0.00 [0/1]  
DiffImageOverlap-fno: 1.00 [2/2]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 09:55:02 Z

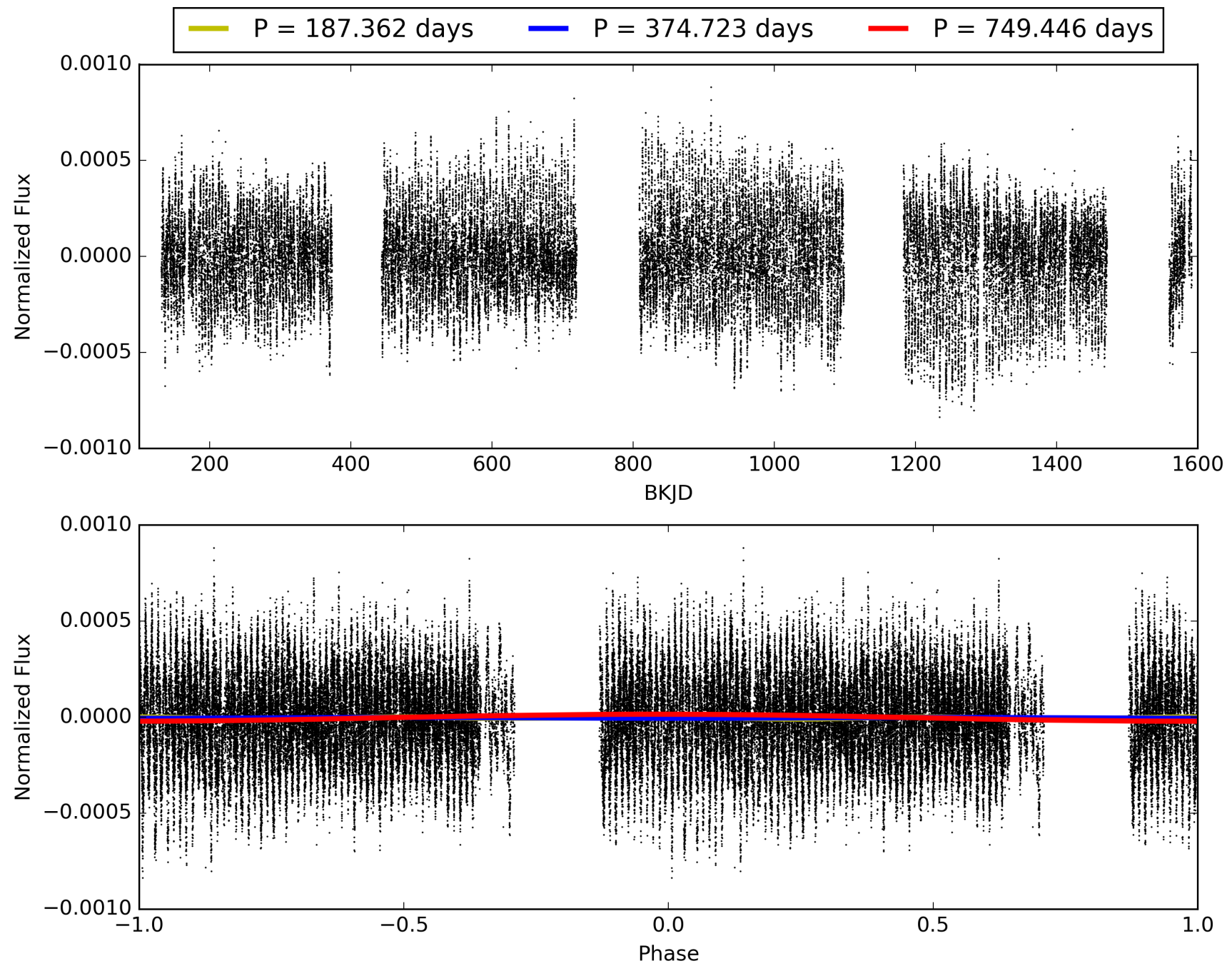
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011124904-04, PDC Light Curves



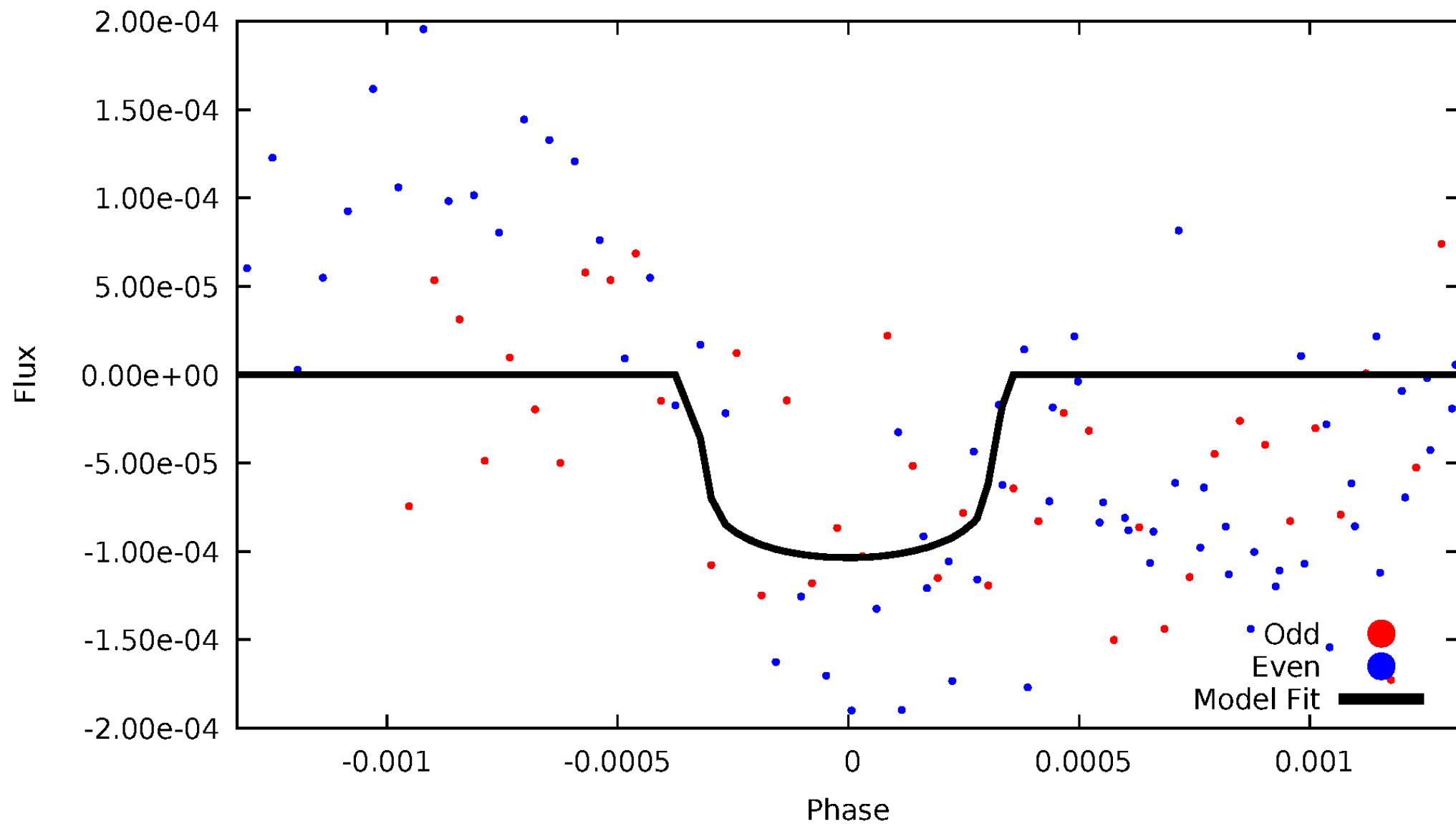


TCE 011124904-04



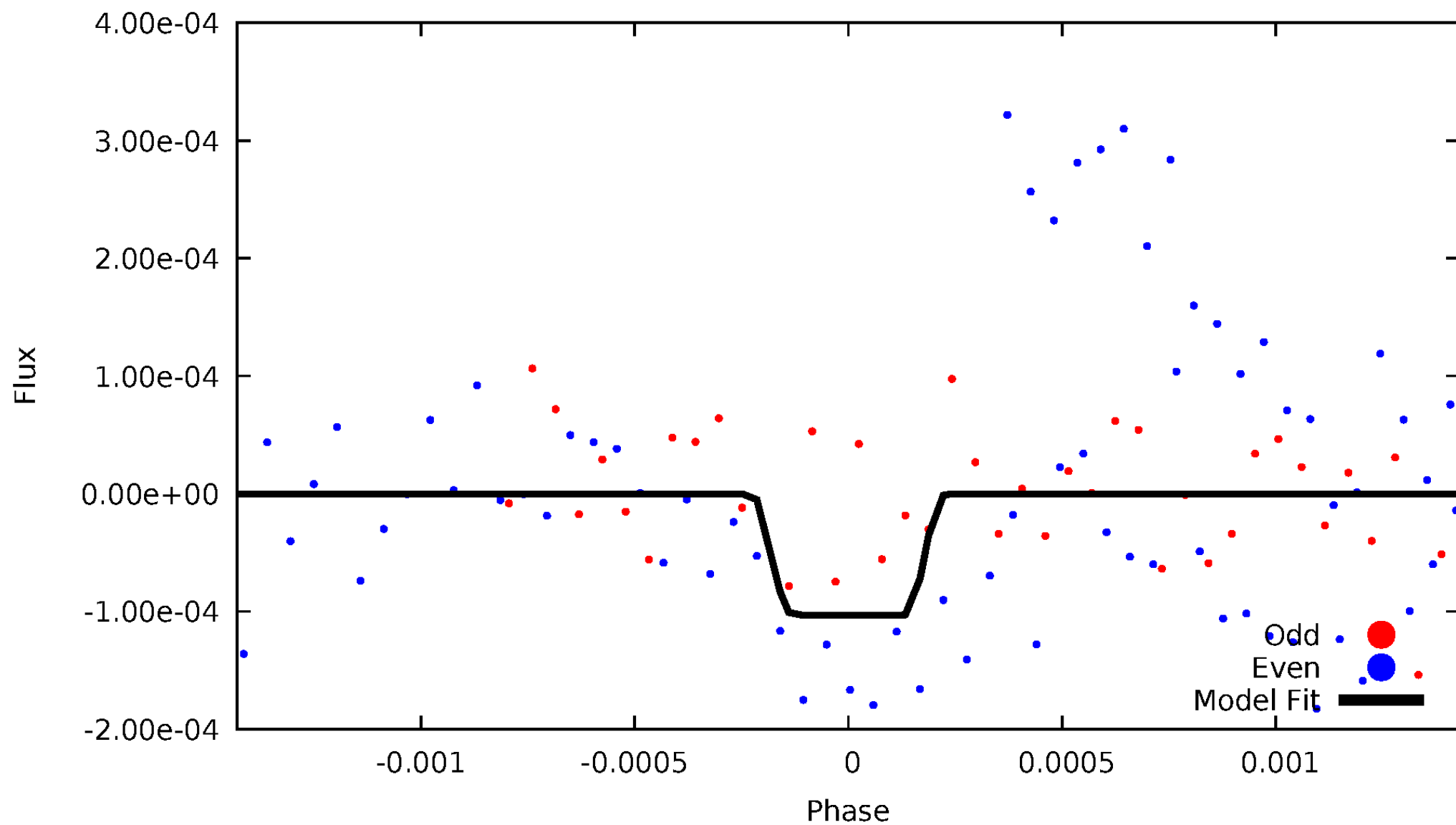
# DV Odd/Even

TCE 011124904-04



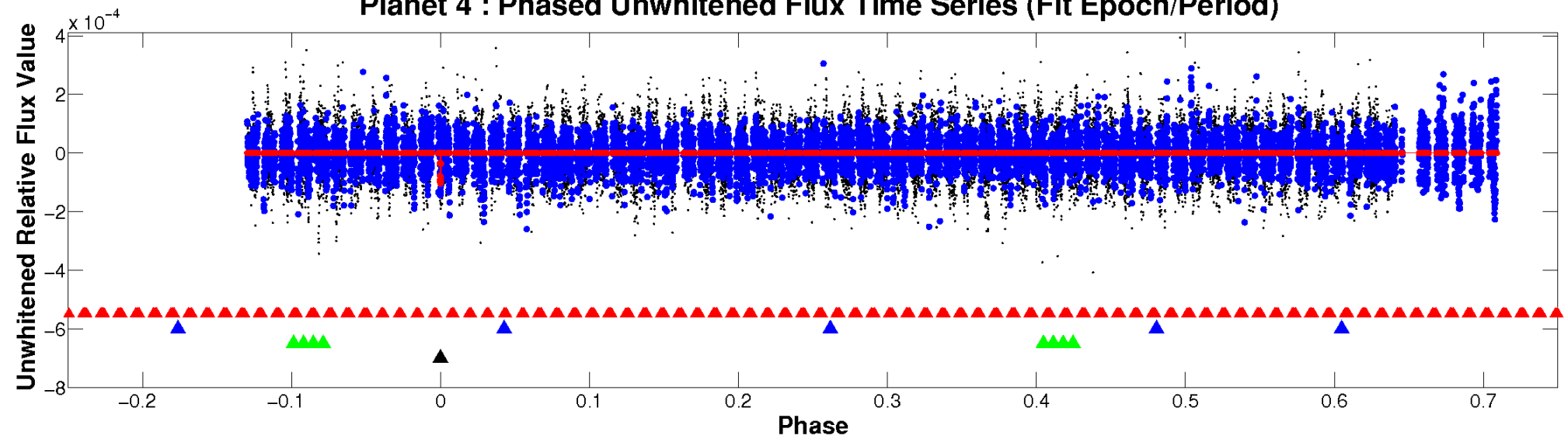
# ALT Odd/Even

TCE 011124904-04

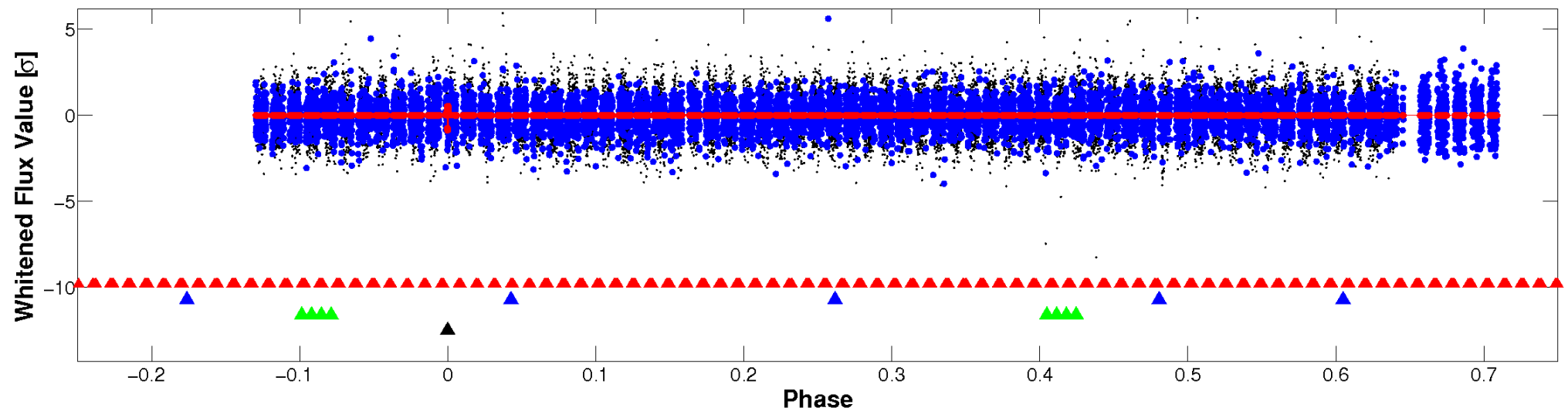


# Non-Whitened Vs. Whitened Light Curve

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

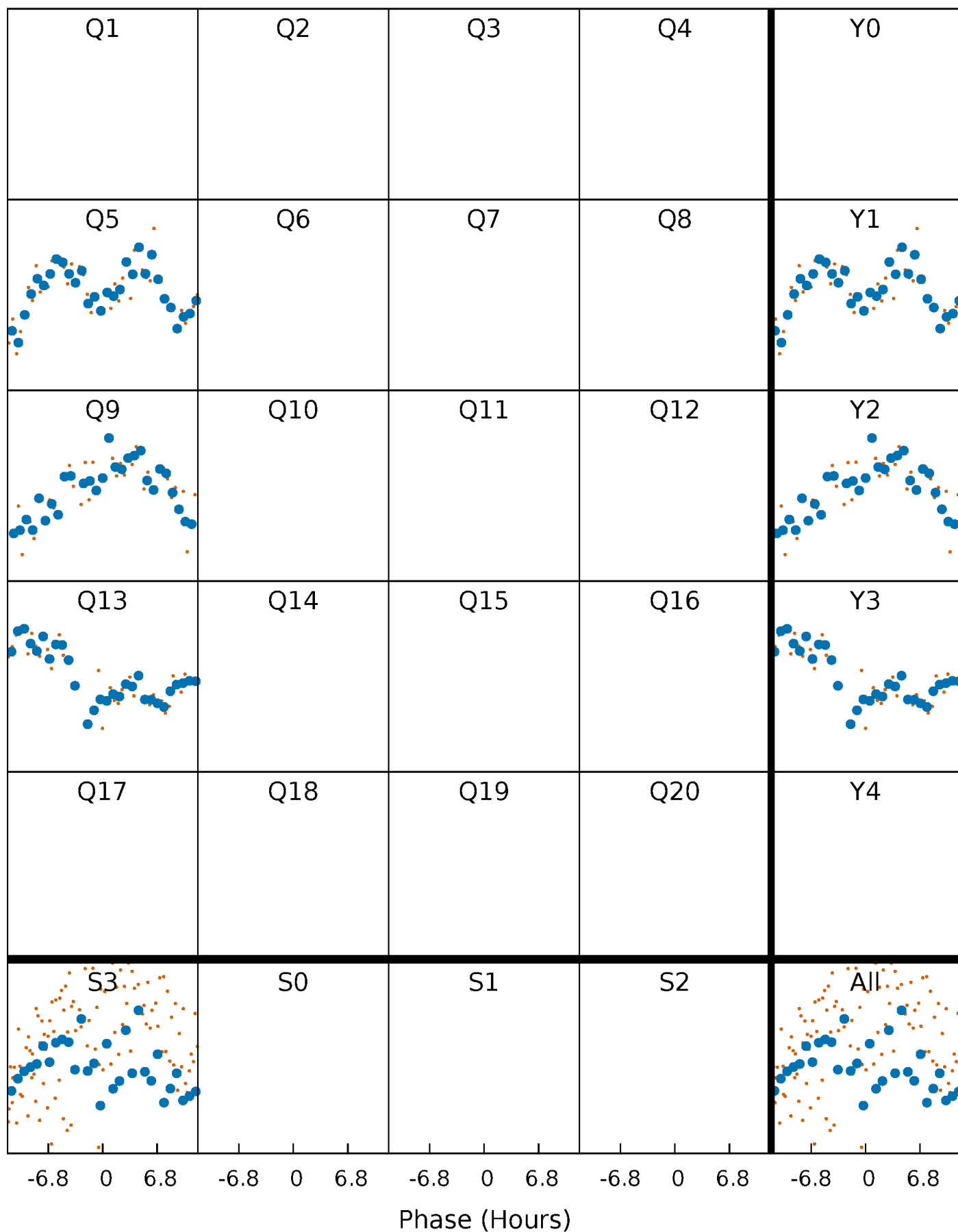


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



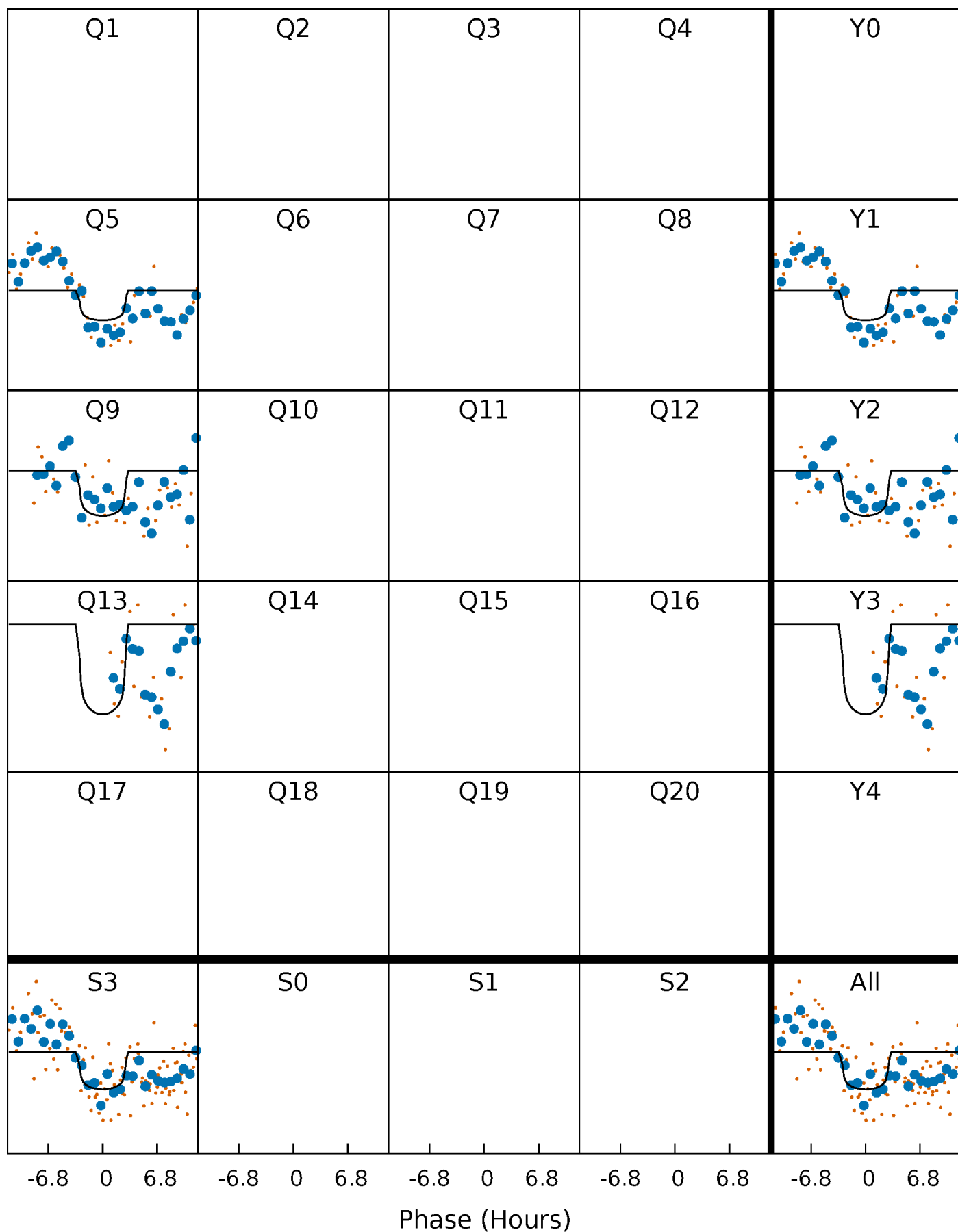
# PDC Quarter-Phased Transit Curves

TCE 011124904-04     $P=374.723059$  Days     $T_0=482.292914$  (BKJD)



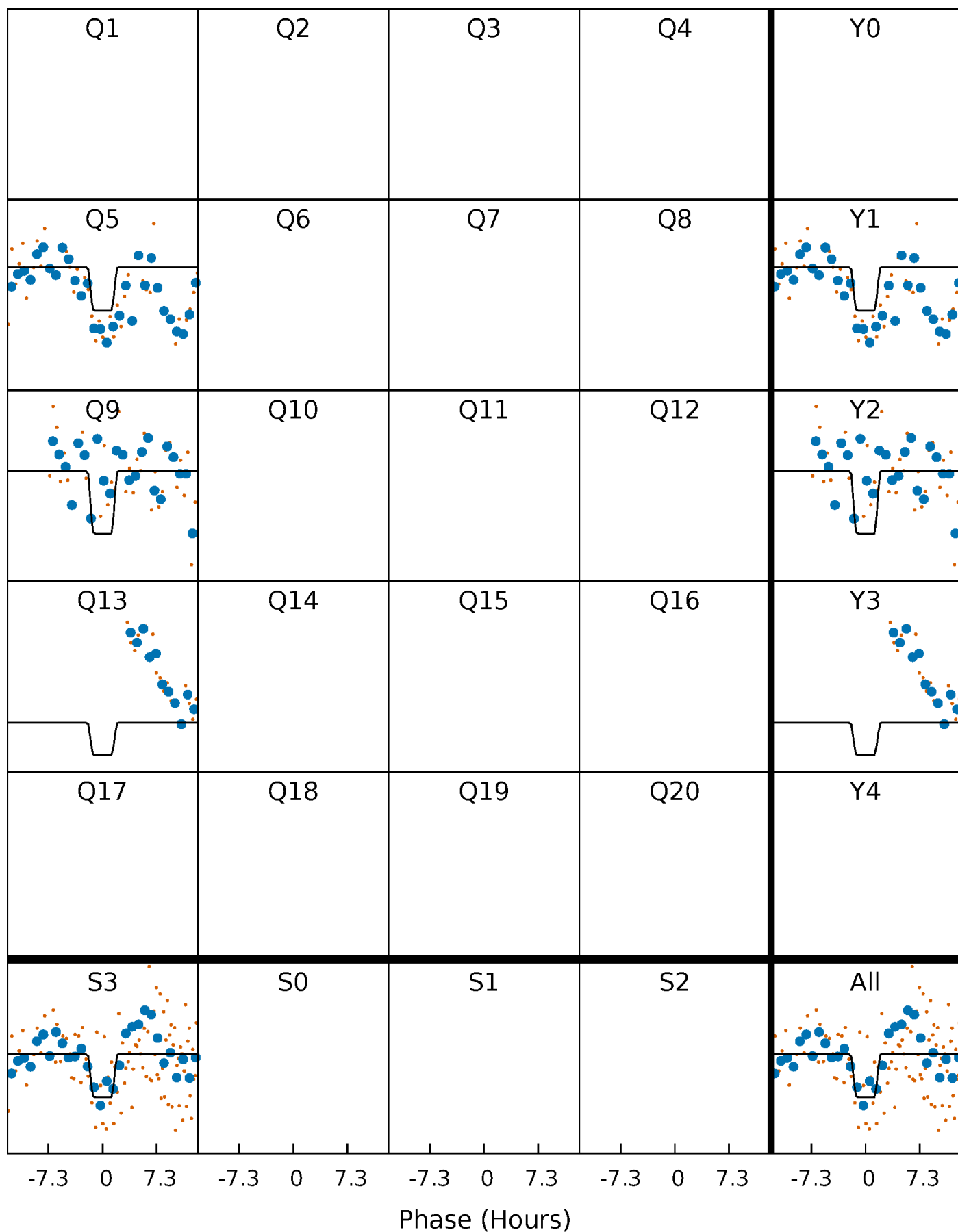
# DV Quarter-Phased Transit Curves

TCE 011124904-04     $P=374.723059$  Days     $T_0=482.292914$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 011124904-04     $P=374.683379$  Days     $T_0=482.273465$  (BKJD)

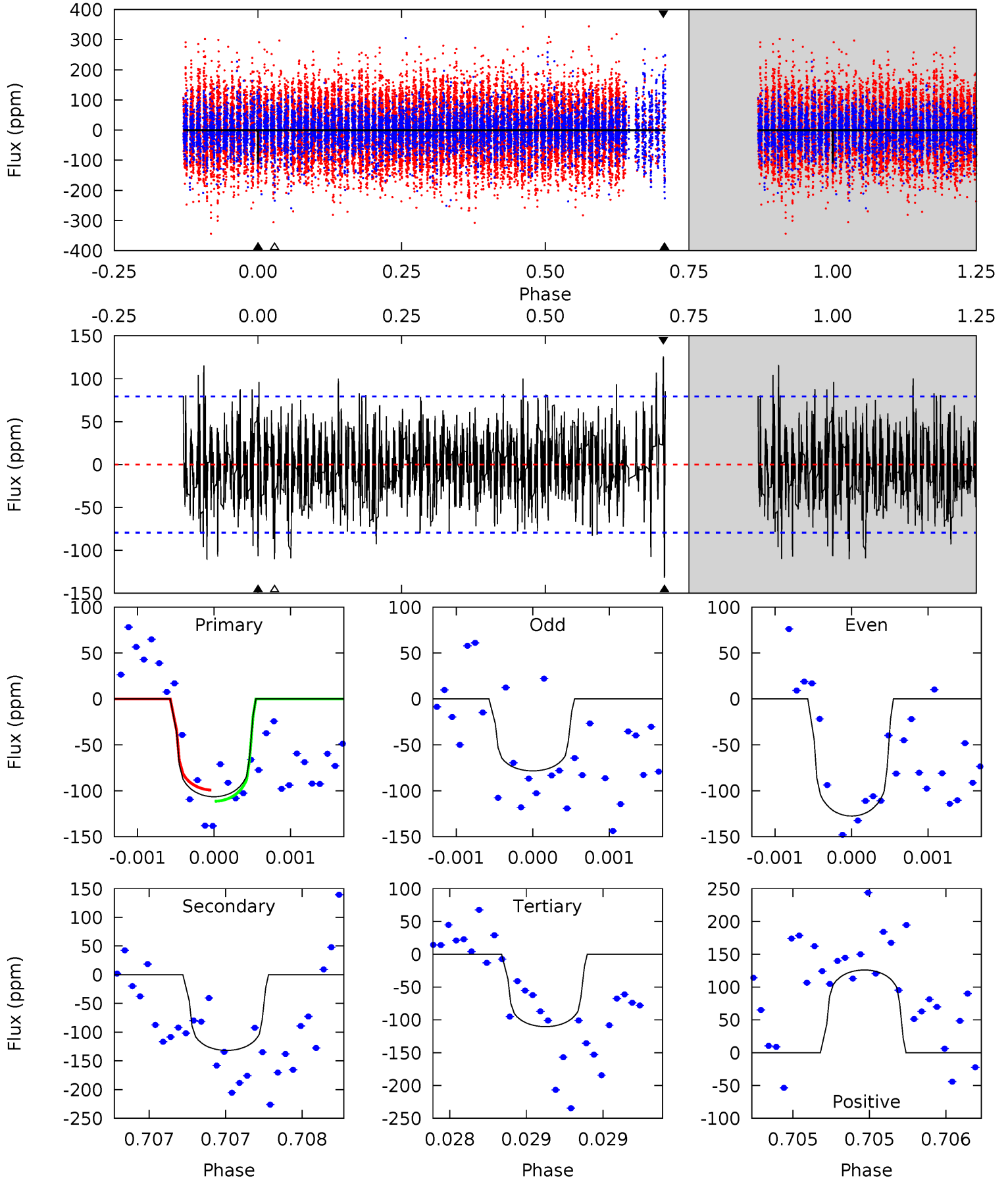




# DV Model-Shift Uniqueness Test

011124904-04, P = 374.723059 Days, E = 107.569855 Days

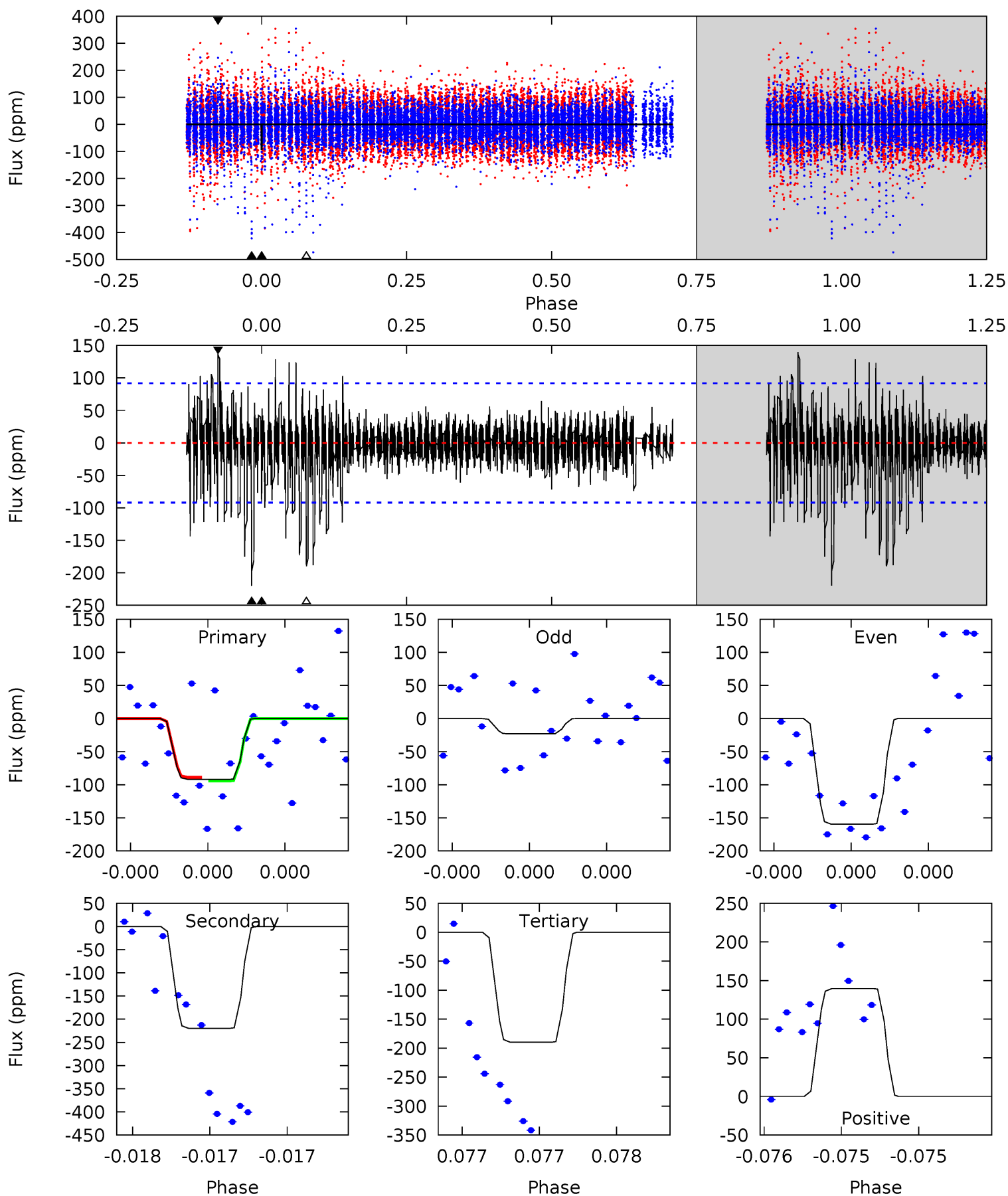
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.43	9.19	7.69	8.79	5.53	3.41	2.18	-0.27	-1.36	1.50	0.40	1.72	1.27	0.49	0.41



# Alt Model-Shift Uniqueness Test

011124904-04, P = 374.683379 Days, E = 107.590086 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
5.61	13.4	11.6	8.52	5.61	3.54	1.46	-5.98	-2.92	1.83	4.89	4.27	1.00	0.39	0.16



### Stellar Parameters For KIC 011124904

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$\rho_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6573^{+181}_{-227}$	$4.126^{+0.214}_{-0.175}$	$-0.240^{+0.250}_{-0.300}$	$1.545^{+0.463}_{-0.421}$	$1.162^{+0.206}_{-0.150}$	$0.444^{+0.553}_{-0.215}$
	+3%/-3%	+5%/-4%	+104%/-125%	+30%/-27%	+18%/-13%	+125%/-48%
Source	PHO54	PHO54	PHO54	DSEP		

KIC = Kepler Input Catalog; PHO = Photometry; SPE = Spectroscopy; AST = Asteroseismology  
 TRA = Transits; DESP = Dartmouth Models; MULT = Multiple Models

### Secondary Eclipse Parameters for KIC 011124904-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-132 \pm 14$	$1.79^{+1.26}_{-1.01}$	$485^{+38}_{-39}$	$6824^{+5118}_{-1491}$	$26836^{+113670}_{-17923}$
Alt.	$-220 \pm 16$	$1.83^{+1.26}_{-1.05}$	$486^{+35}_{-38}$	$7737^{+7048}_{-1804}$	$39868^{+189894}_{-25409}$

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

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

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

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

## DV Centroid Data

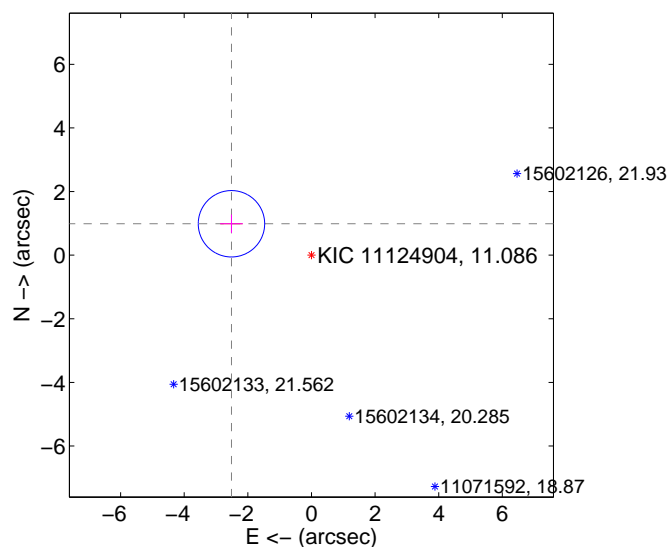
Supplemental centroid analysis for 011124904-04. **Kepler magnitude: 11.09.** Transit SNR 4.65

**There are 0 quarters with good PRF difference image offsets**

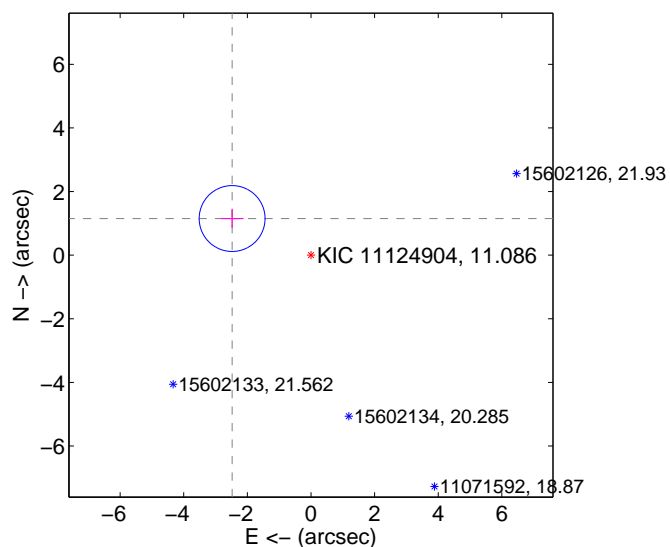
The direct PRF centroid is offset from the target star catalog position by about 0.17 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>2.702 \pm 0.348</math></b>	<b>7.77</b>	$2.515 \pm 0.356$	$0.987 \pm 0.288$
PRF-fit source offset from KIC position	<b><math>2.733 \pm 0.345</math></b>	<b>7.92</b>	$2.479 \pm 0.356$	$1.152 \pm 0.288$
photometric centroid source offset	$0.69 \pm 1.88$	0.37	$0.22 \pm 1.70$	$-0.65 \pm 1.90$

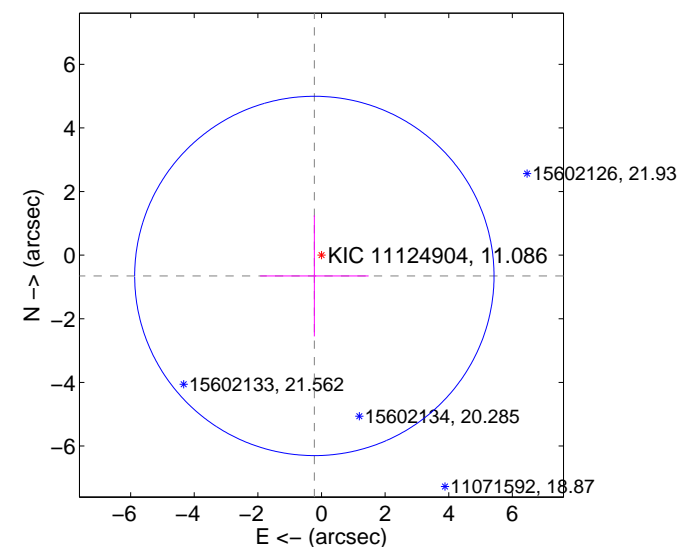
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position



offset from photometric centroids

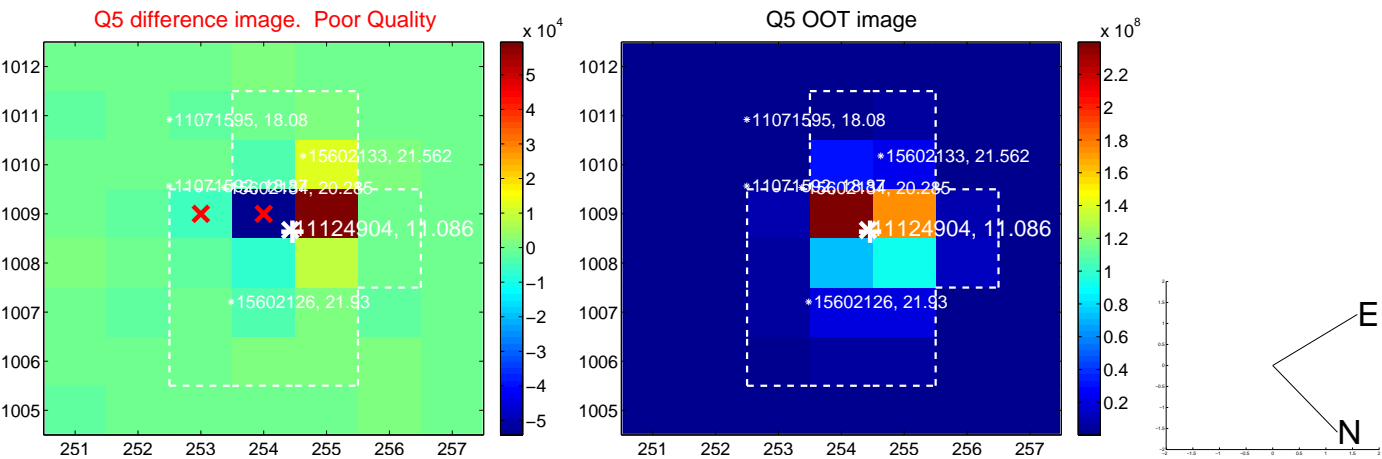


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

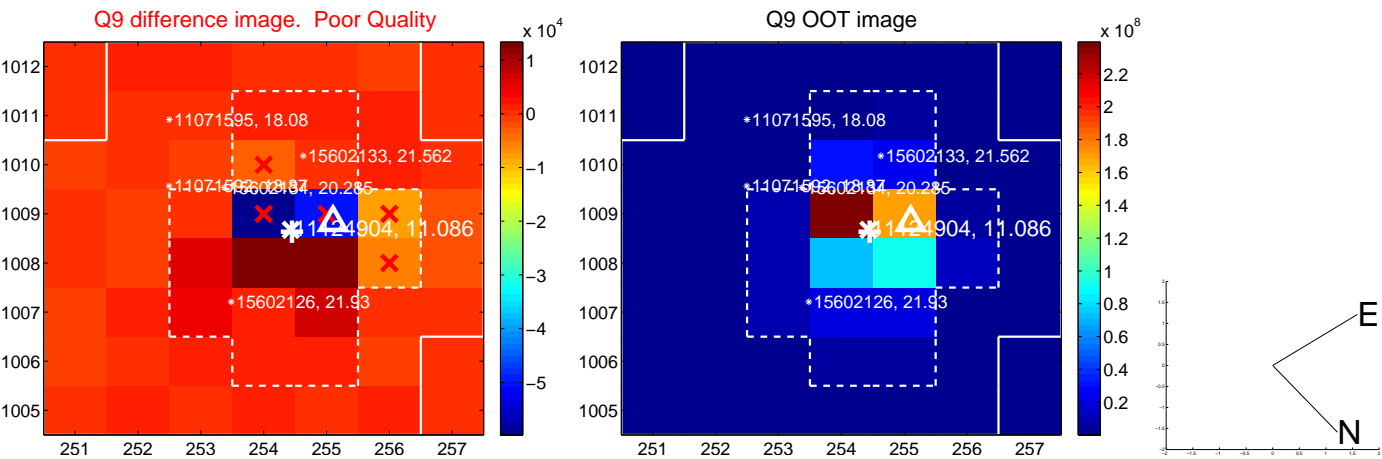
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



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

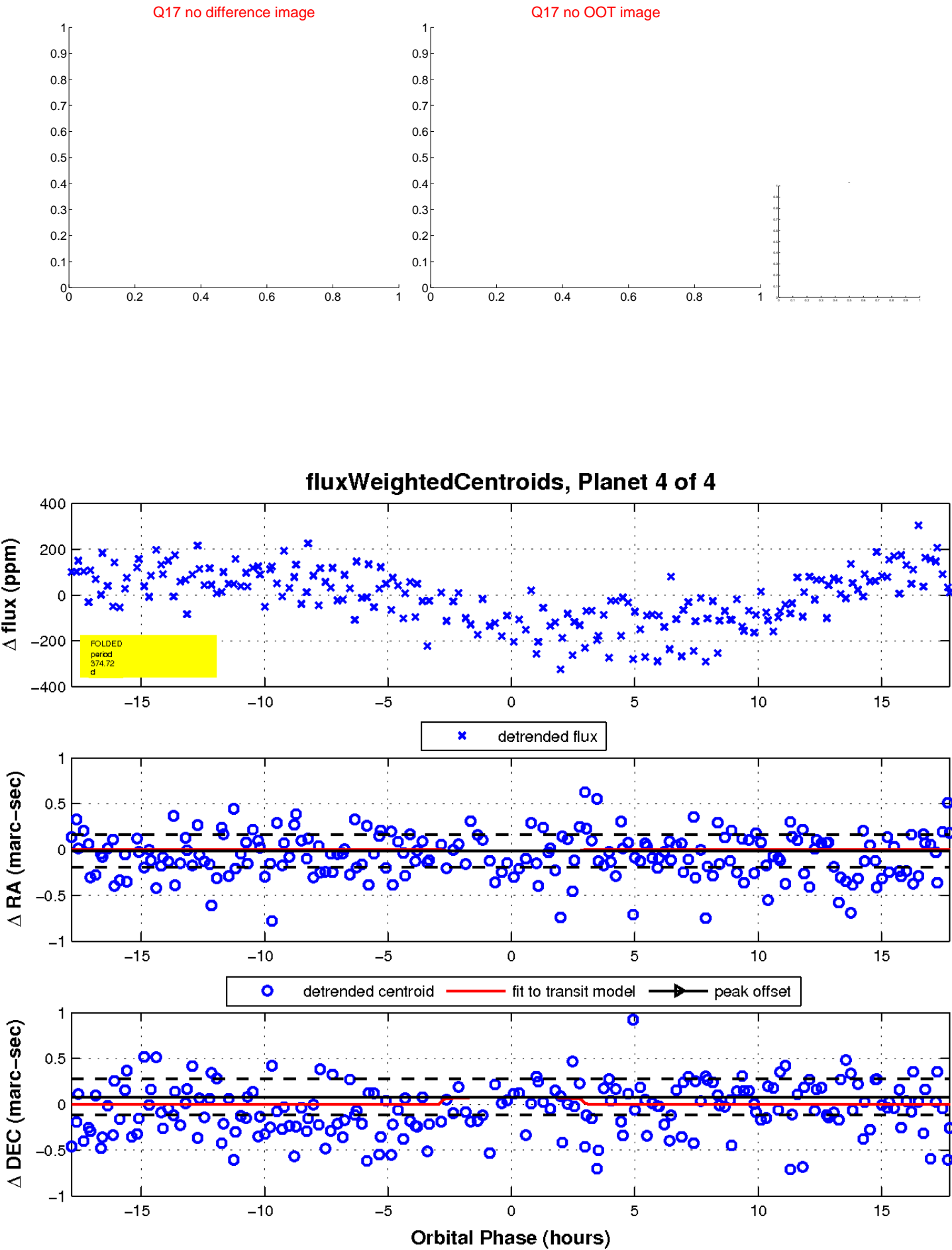


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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



UKIRT Image

