

# KIC 011654267

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654267-01	OBS	No	4.069759	132.432957	62.8	9.078	9.4	9.8	1.86	7306	1.71	2665.75
011654267-02	OBS	No	1.137067	132.049167	30.3	2.551	8.5	6.3	1.86	7306	1.19	14594.72
011654267-03	OBS	No	177.402079	137.513000	628.0	5.671	7.7	7.4	1.86	7306	8.21	17.38
011654267-04	OBS	No	425.521579	532.462151	505.2	6.770	7.4	6.6	1.86	7306	4.56	5.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011654267-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
011654267-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
011654267-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011654267-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

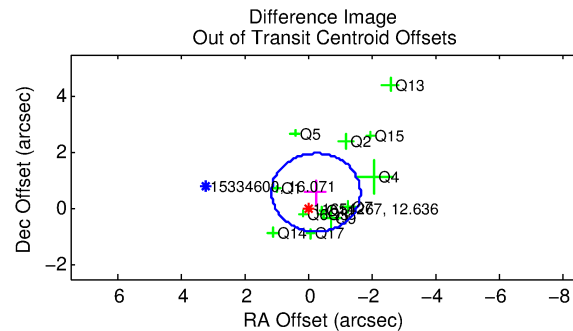
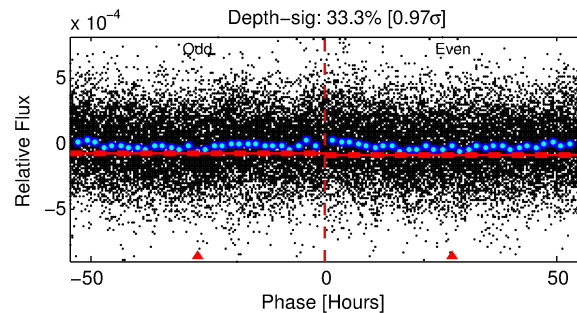
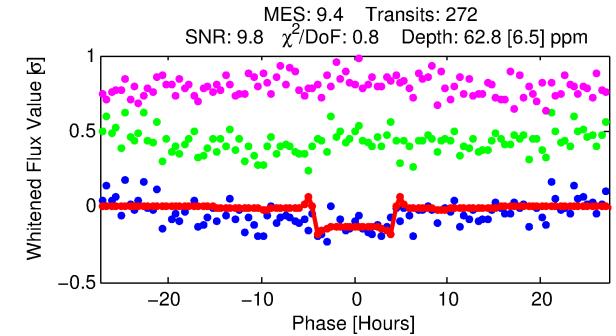
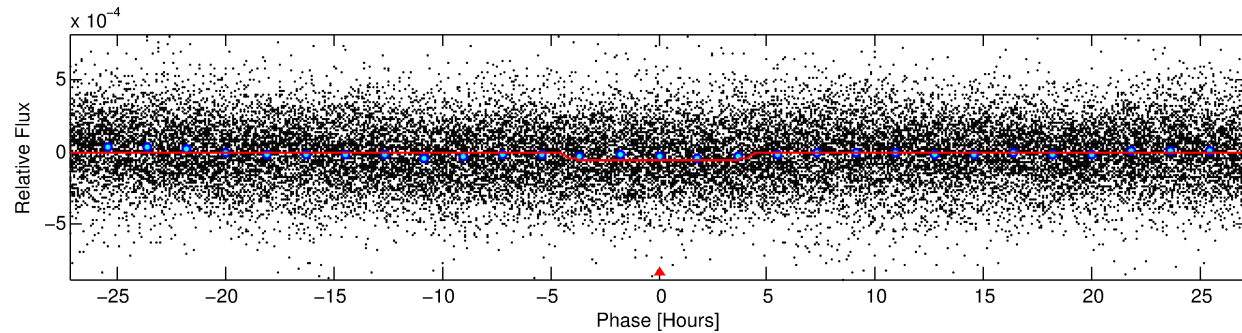
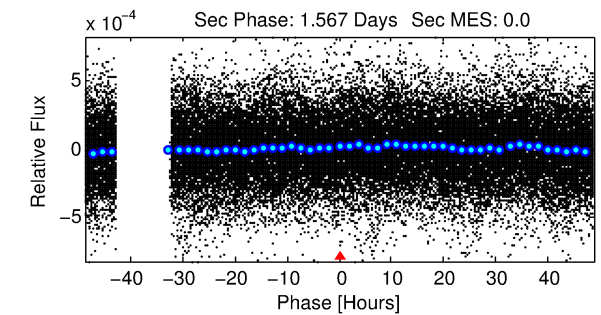
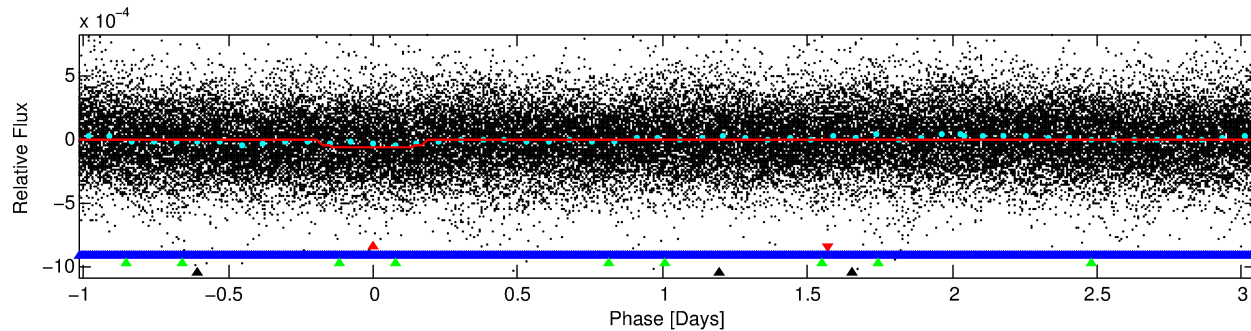
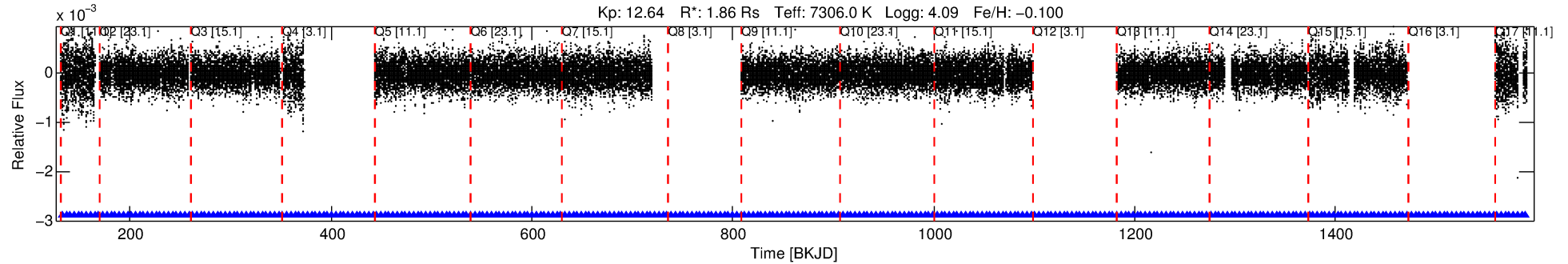
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011654267-01

No Significant Match Found

# DV One-Page Summary

KIC: 11654267 Candidate: 1 of 4 Period: 4.070 d



## DV Fit Results:

Period = 4.06976 [0.00003] d  
 Epoch = 132.4330 [0.0040] BKJD  
 Rp/R\* = 0.0084 [0.0008]  
 a/R\* = 1.82 [0.63]  
 b = 0.90 [0.11]  
 Seff = 2665.75 [984.54]  
 Teq = 1832 [169] K  
 Rp = 1.71 [0.51] Re  
 a = 0.0577 [0.0132] AU  
 Ag = N/A  
 Tefp = N/A

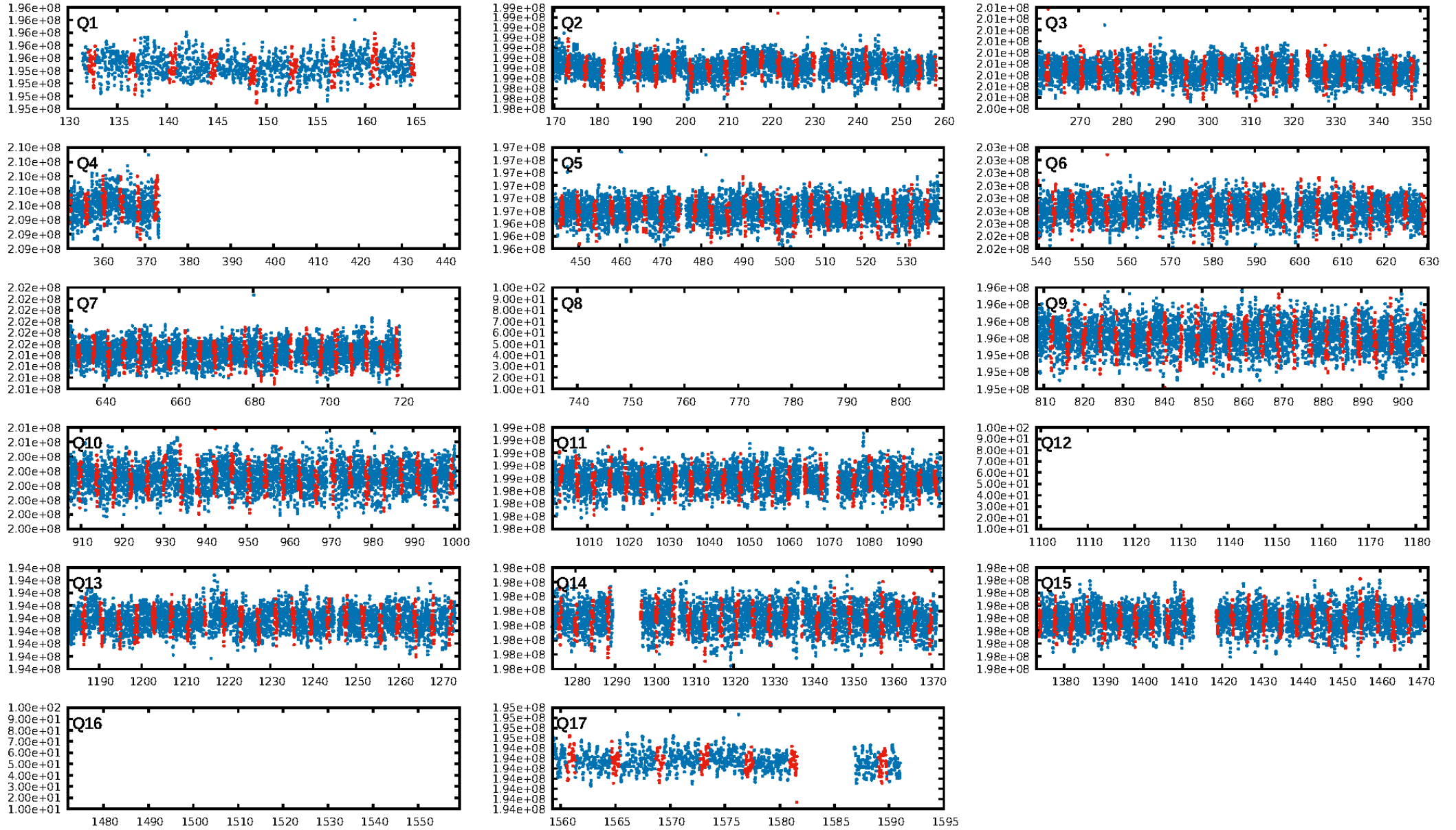
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [7.46σ]  
 LongPeriod-sig: 100.0% [388.65σ]  
 ModelChiSquare2-sig: N/A  
 ModelChiSquareGof-sig: N/A  
 Bootstrap-pfa: 5.32e-26  
 RollingBand-fgt: 1.00 [250/250]  
 GhostDiagnostic-chr: -9.872  
 Centroid-sig: N/A  
 Centroid-so: 1.521 arcsec [3.52σ]  
 OotOffset-rm: 0.621 arcsec [1.34σ]  
 KicOffset-rm: 0.658 arcsec [1.27σ]  
 OotOffset-st: 3/4/1/5 [13]  
 KicOffset-st: 3/4/1/5 [13]  
 DiffImageQuality-fgm: 0.54 [7/13]  
 DiffImageOverlap-fno: 0.00 [0/14]

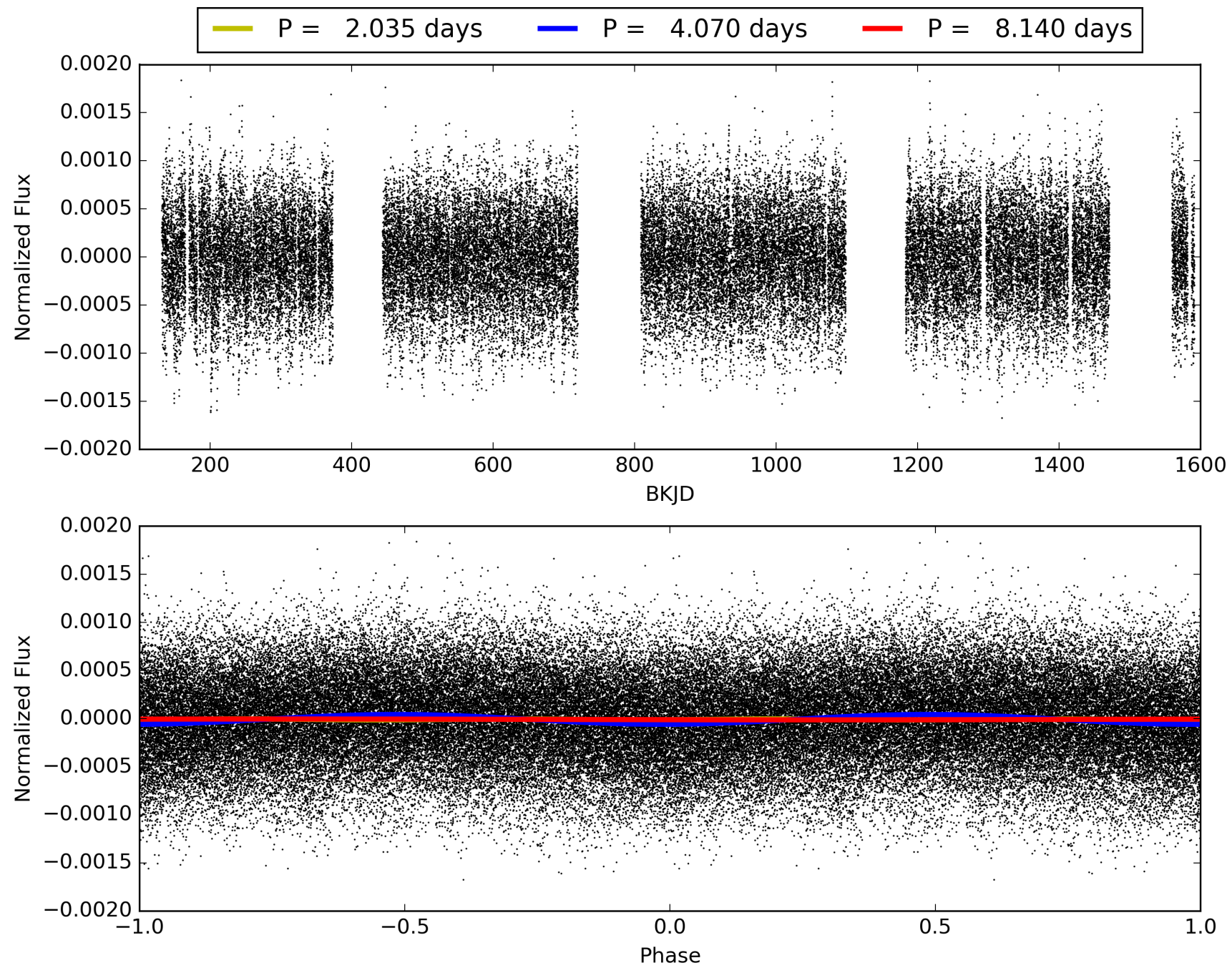
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:07:00 Z

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

# TCE 011654267-01, PDC Light Curves



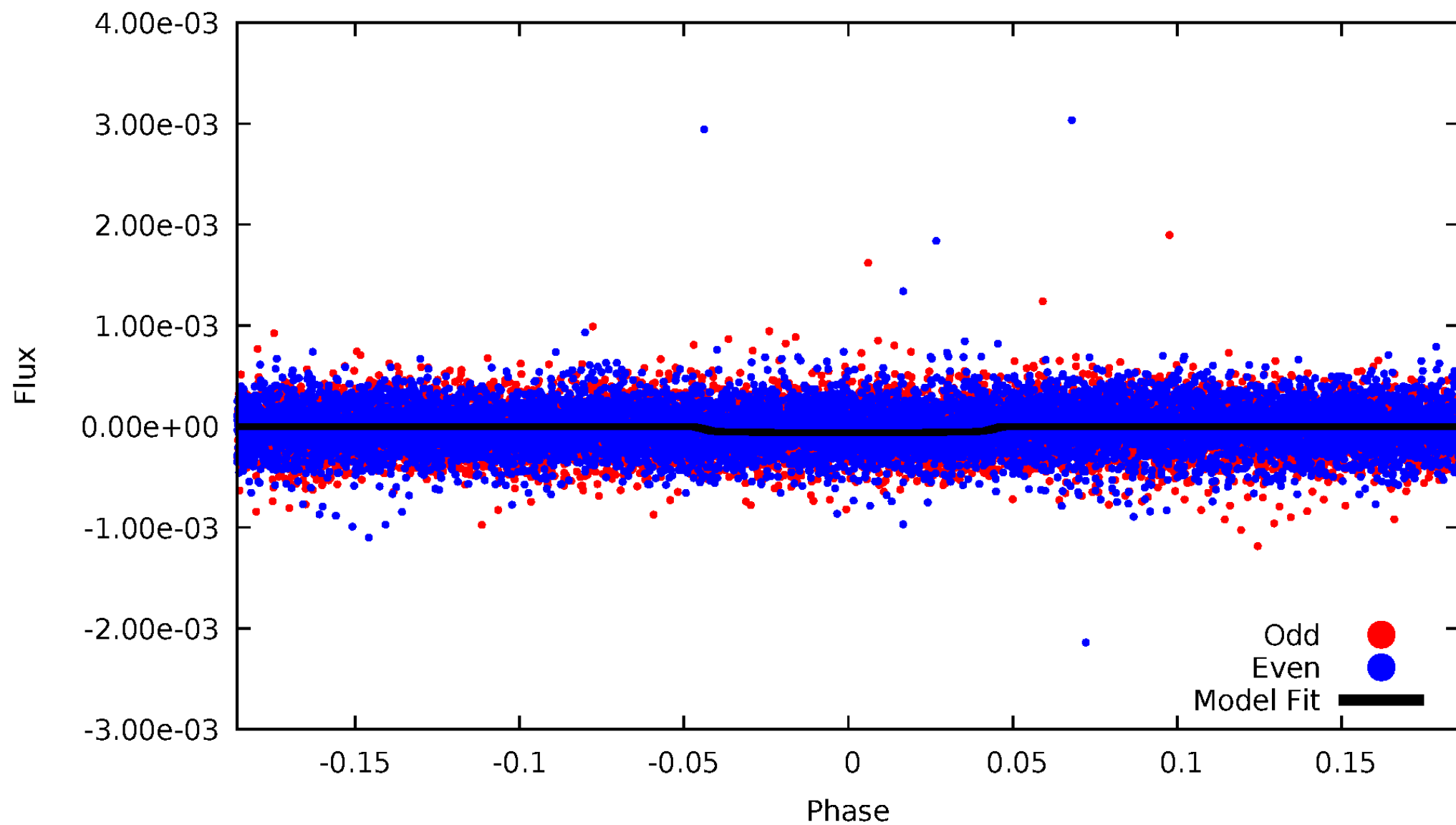
TCE 011654267-01





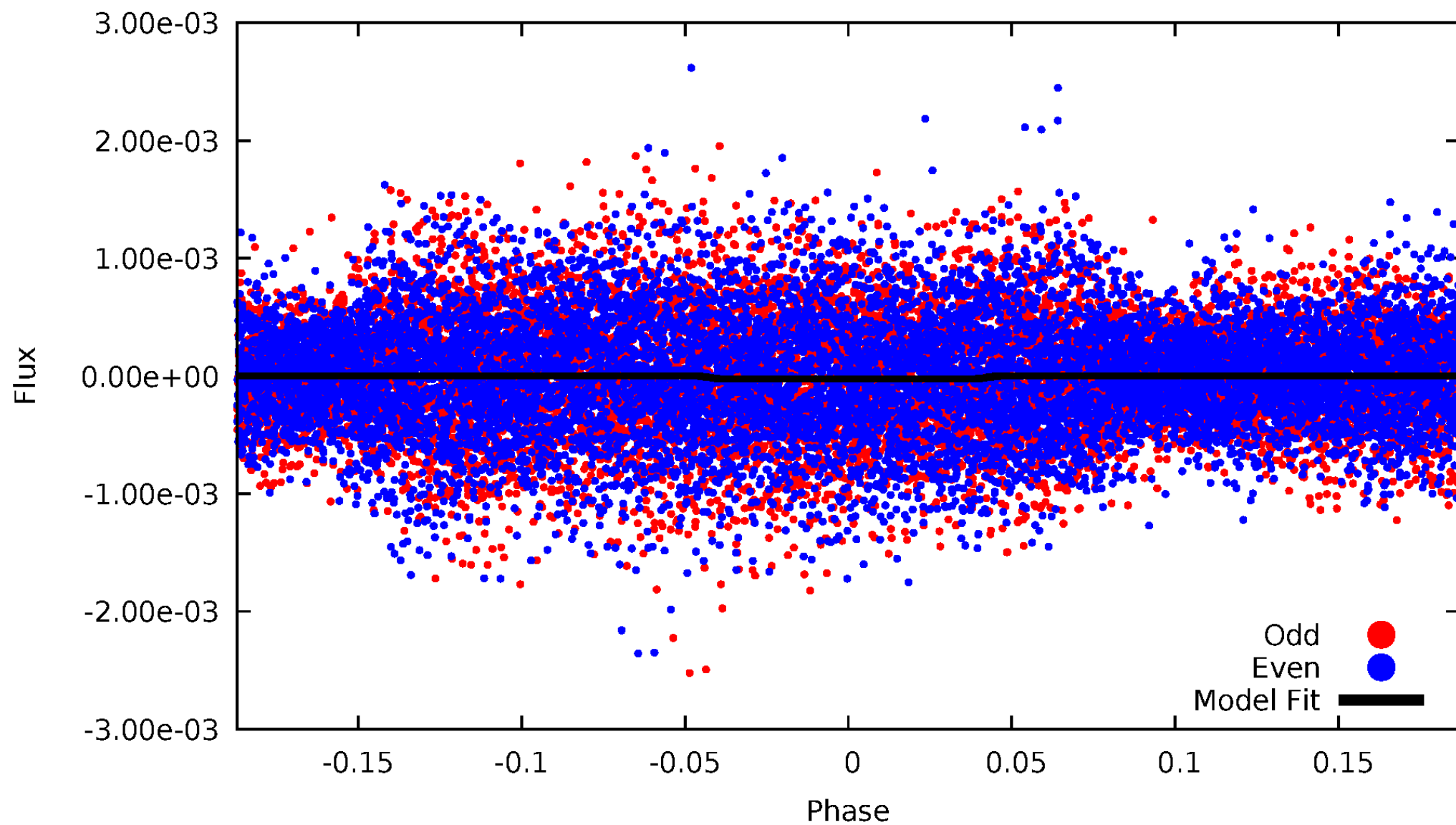
# DV Odd/Even

TCE 011654267-01

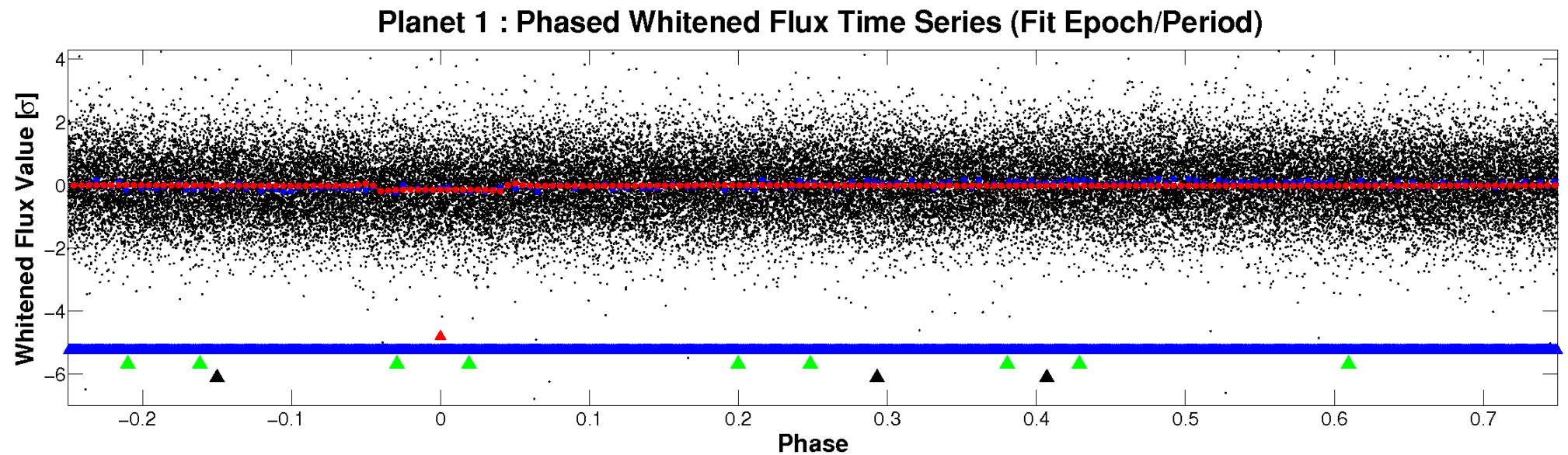
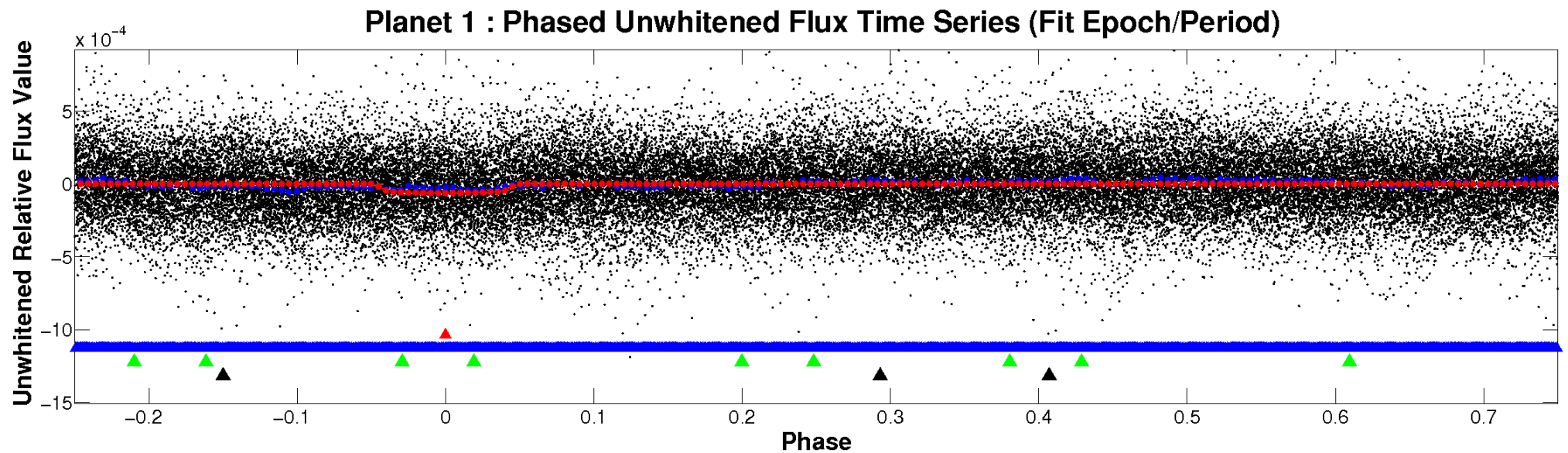


# ALT Odd/Even

TCE 011654267-01

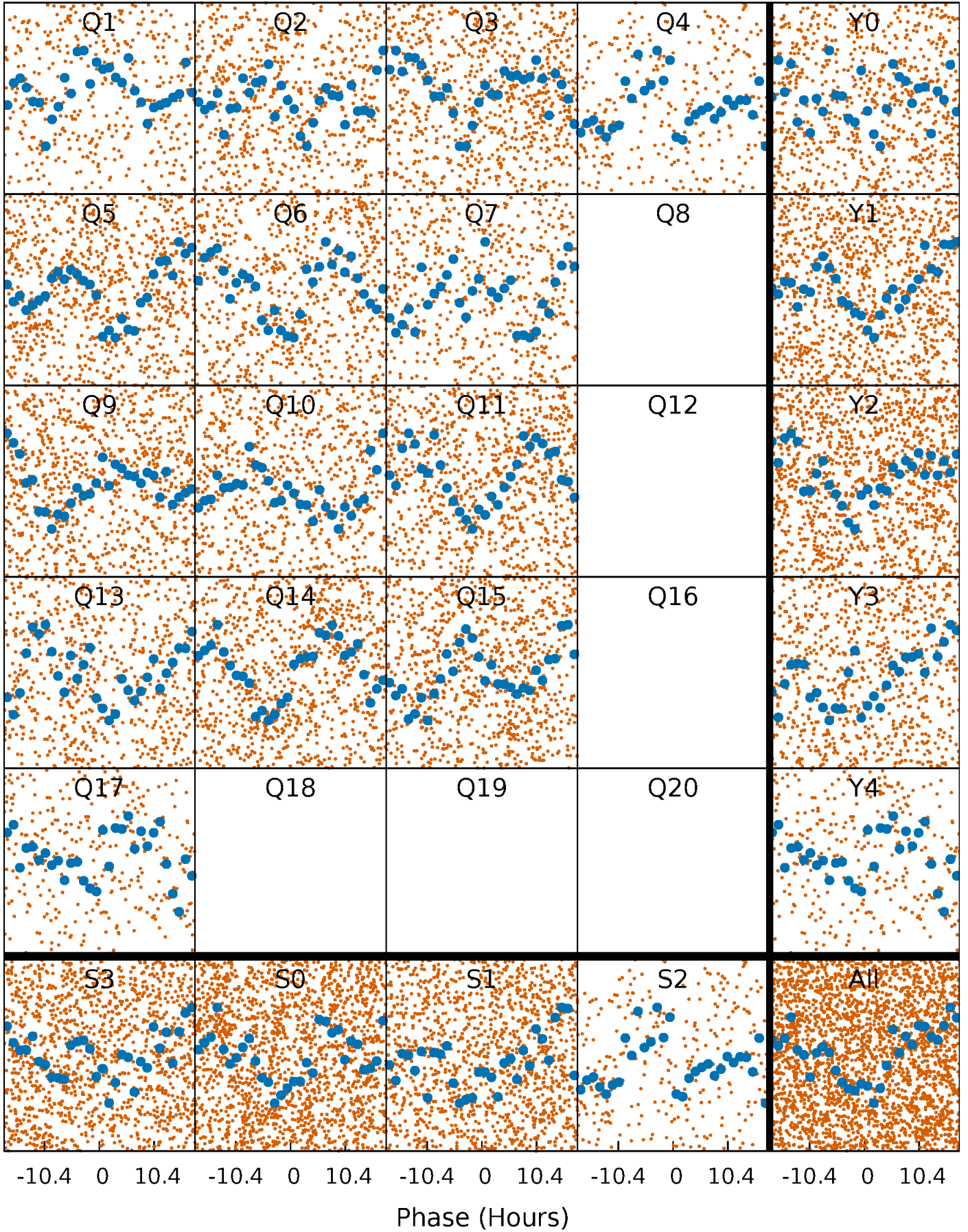


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

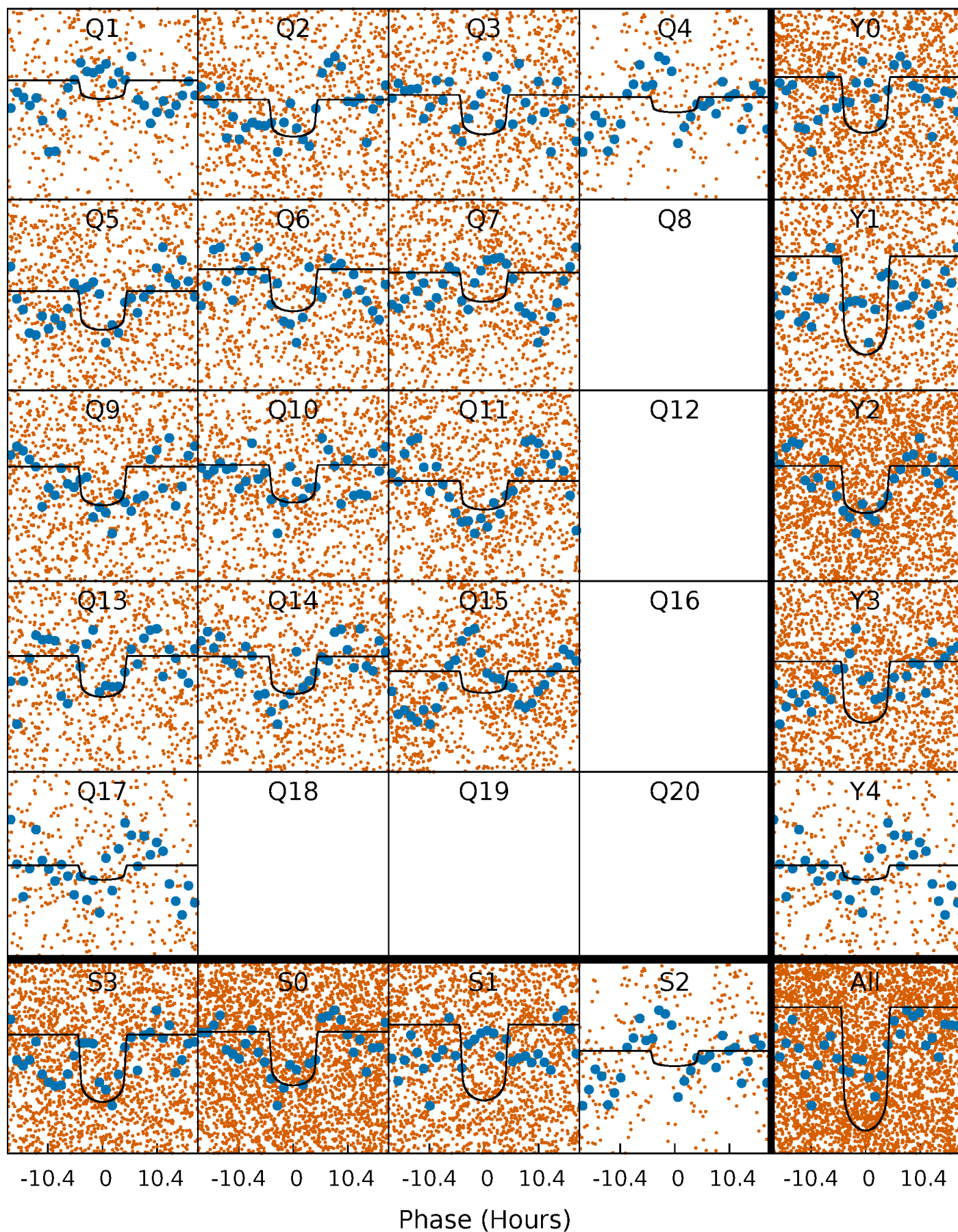
TCE 011654267-01    P= 4.069759 Days     $T_0=132.432956$  (BKJD)





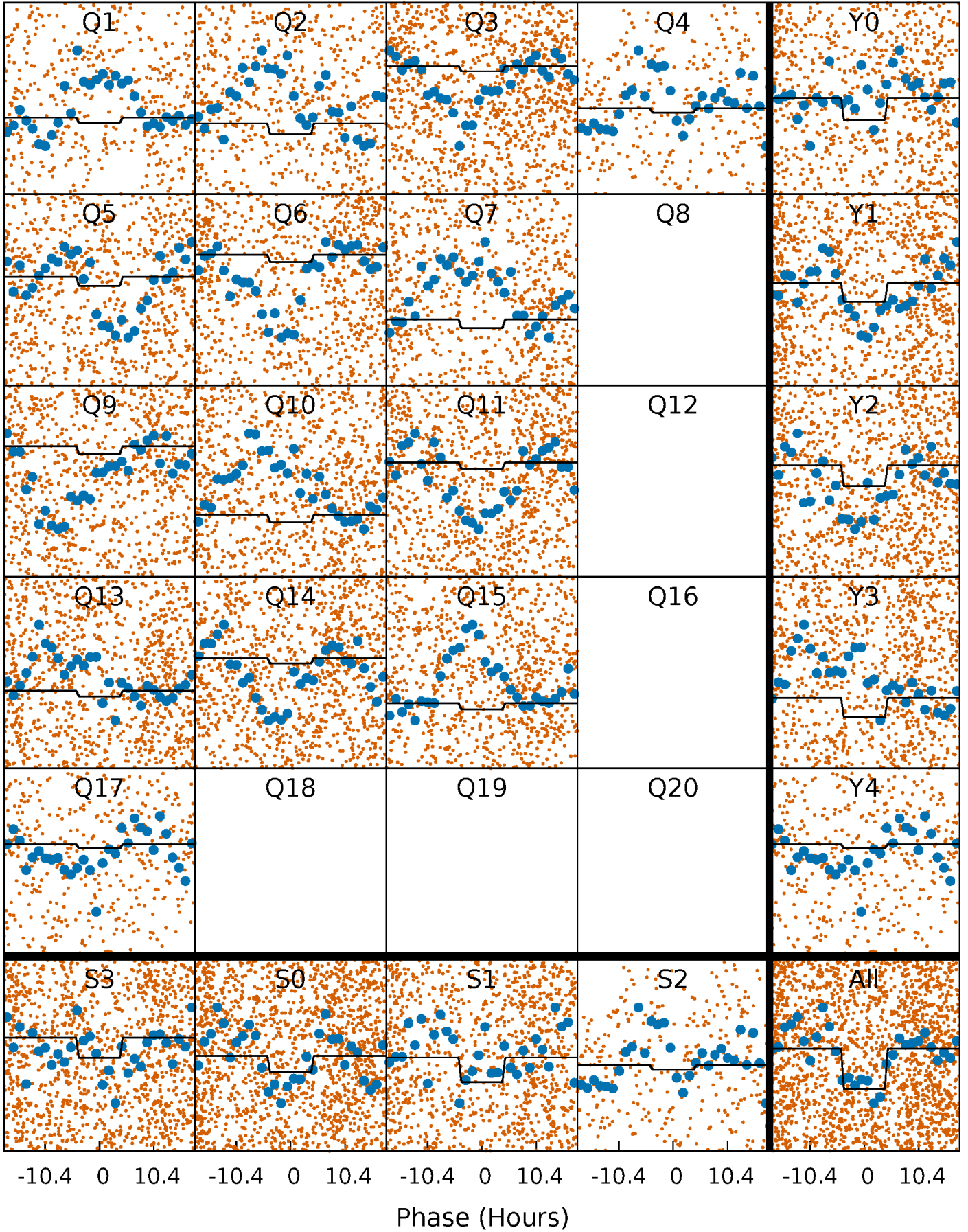
# DV Quarter-Phased Transit Curves

TCE 011654267-01   P= 4.069759 Days    $T_0=132.432956$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

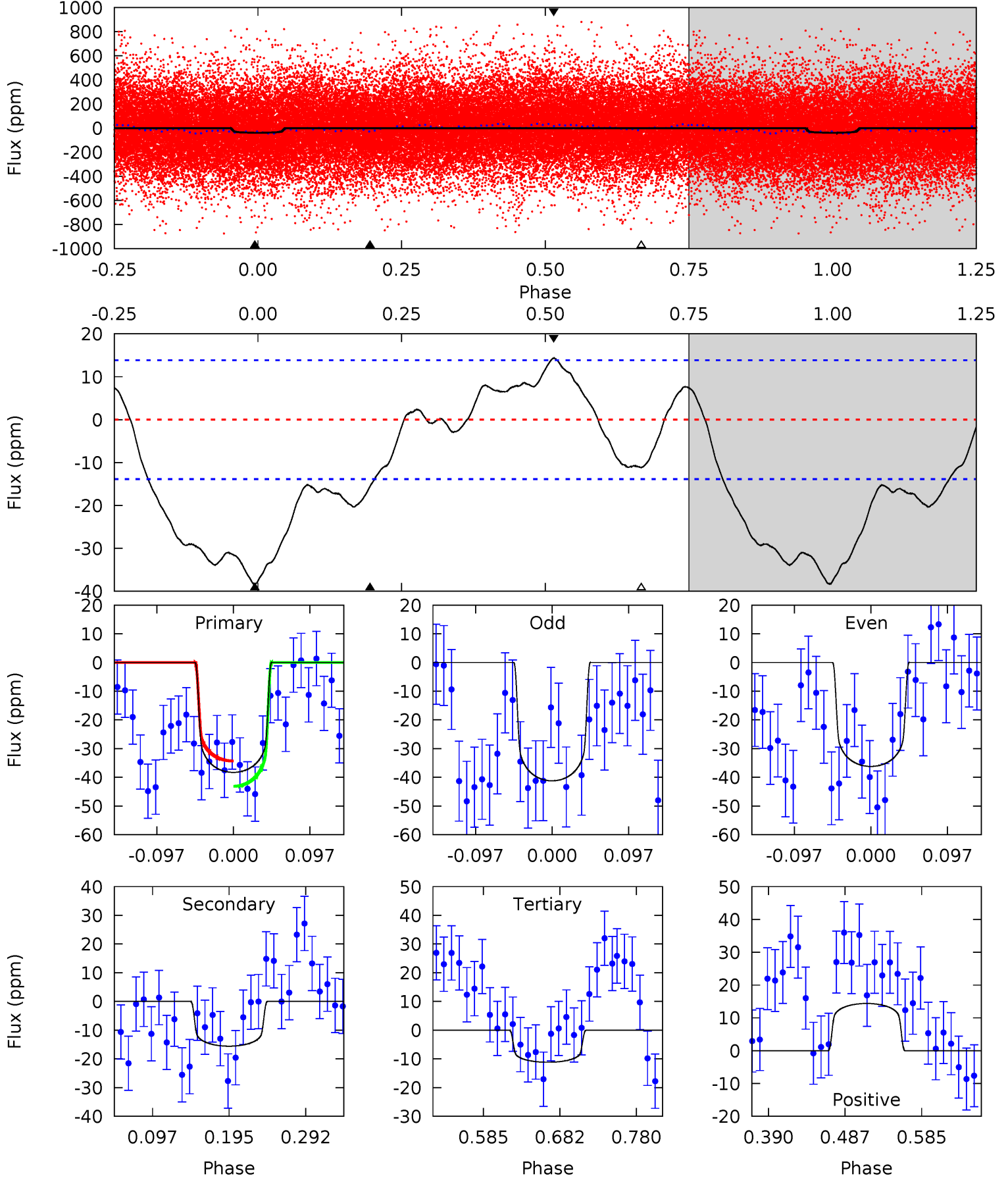
TCE 011654267-01   P= 4.069599 Days    $T_0=132.453814$  (BKJD)



# DV Model-Shift Uniqueness Test

011654267-01, P = 4.069759 Days, E = 128.363197 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
12.6	5.14	3.68	4.74	4.57	1.66	3.81	8.94	7.88	1.45	0.40	0.83	0.94	0.27	1.47

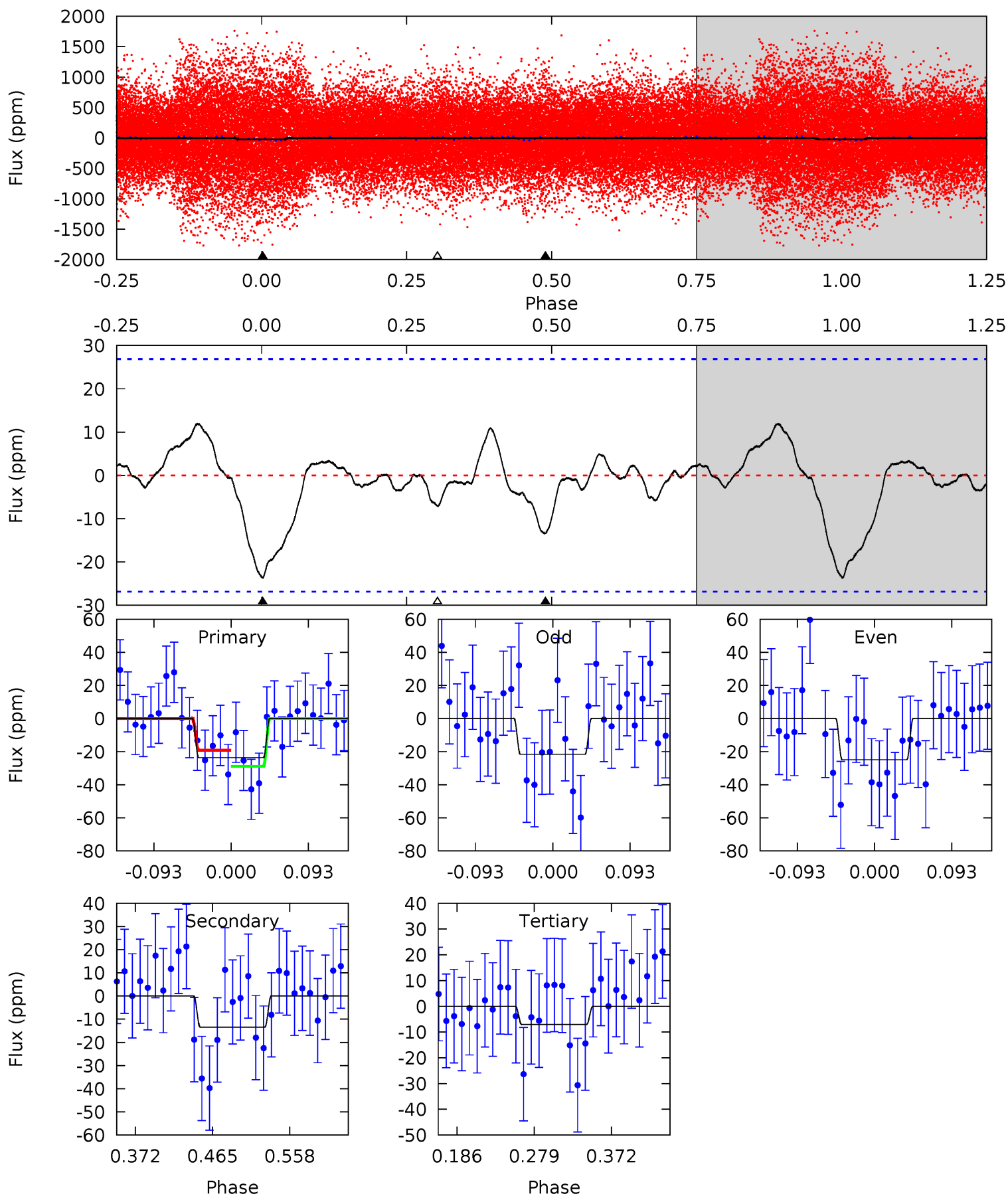




# Alt Model-Shift Uniqueness Test

011654267-01, P = 4.069599 Days, E = 128.384215 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
4.03	2.29	1.21	0	4.58	1.68	0.68	2.83	4.03	1.08	2.29	0.28	0.99	0.33	0.83





### Stellar Parameters For KIC 011654267

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7306^{+228}_{-330}$	$4.086^{+0.170}_{-0.170}$	$-0.100^{+0.200}_{-0.350}$	$1.864^{+0.528}_{-0.432}$	$1.542^{+0.211}_{-0.257}$	$0.336^{+0.316}_{-0.164}$
	+3%/-5%	+4%/-4%	+200%/-350%	+28%/-23%	+14%/-17%	+94%/-49%
Source	KIC0	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 011654267-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-16 \pm 3$	$1.71^{+0.32}_{-0.28}$	$2555^{+188}_{-189}$	$4971^{+346}_{-289}$	$9.626^{+4.583}_{-3.085}$
Alt.	$-13 \pm 6$	$0.98^{+0.20}_{-0.21}$	$2552^{+204}_{-184}$	$6269^{+962}_{-988}$	$26^{+20}_{-14}$

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

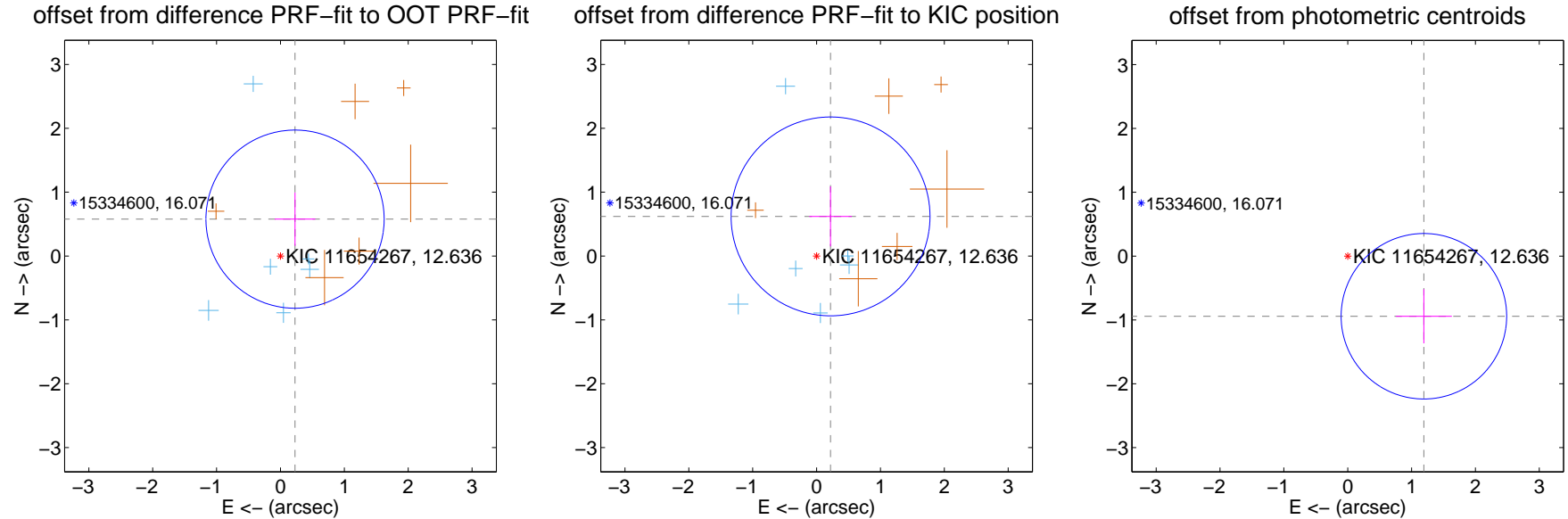
## DV Centroid Data

Supplemental centroid analysis for 011654267-01. Kepler magnitude: 12.64. Transit SNR 9.81

There are 7 quarters with good PRF difference image offsets

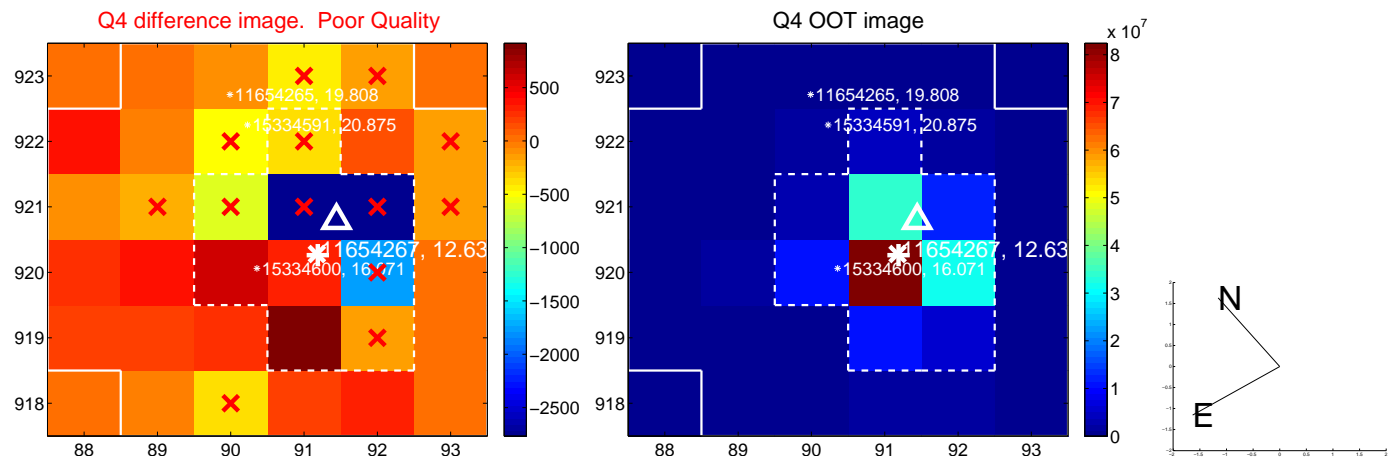
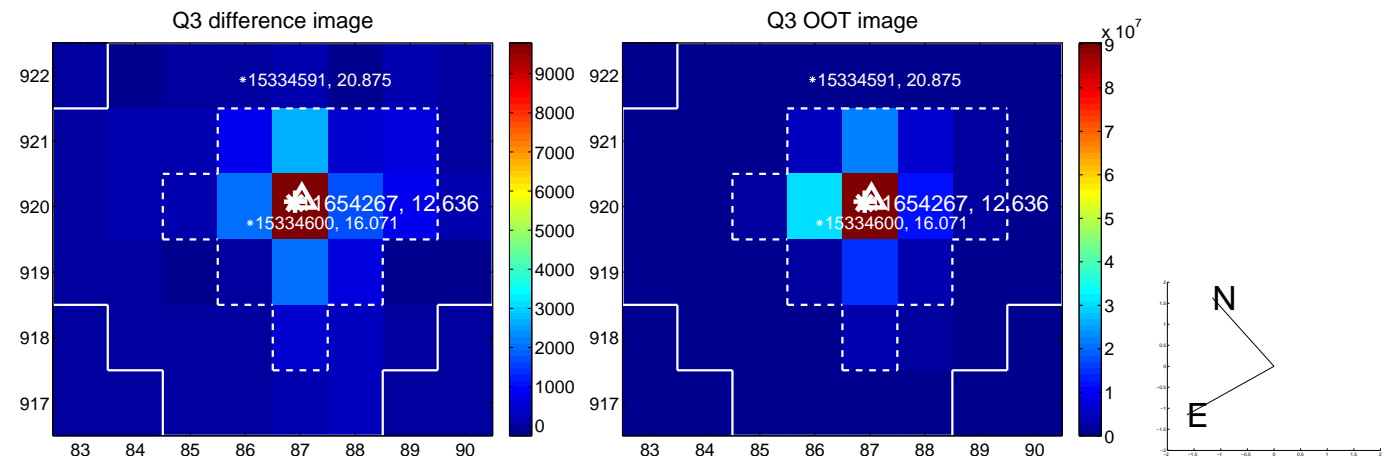
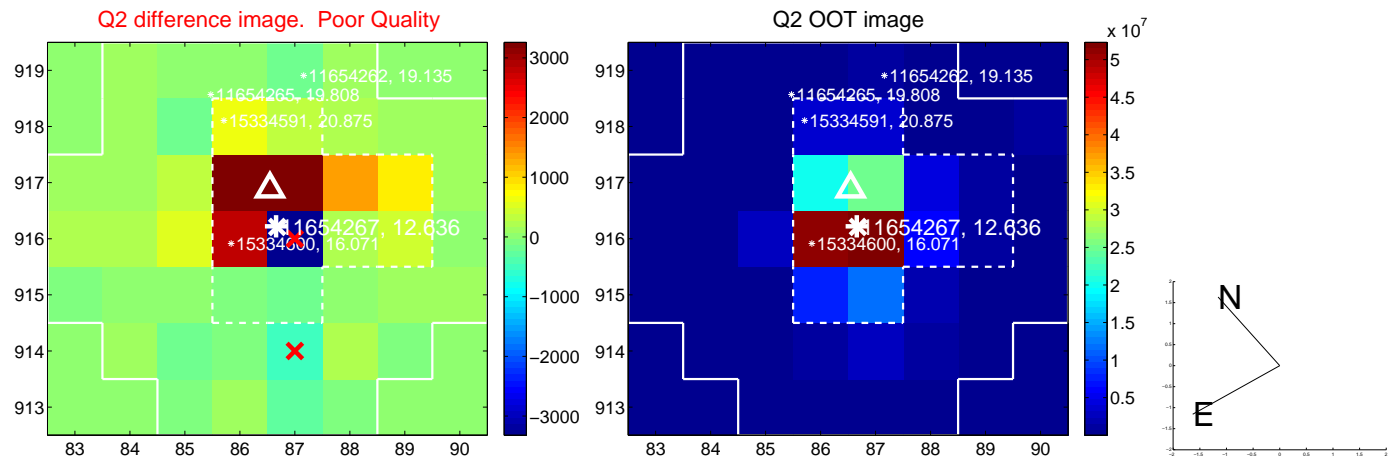
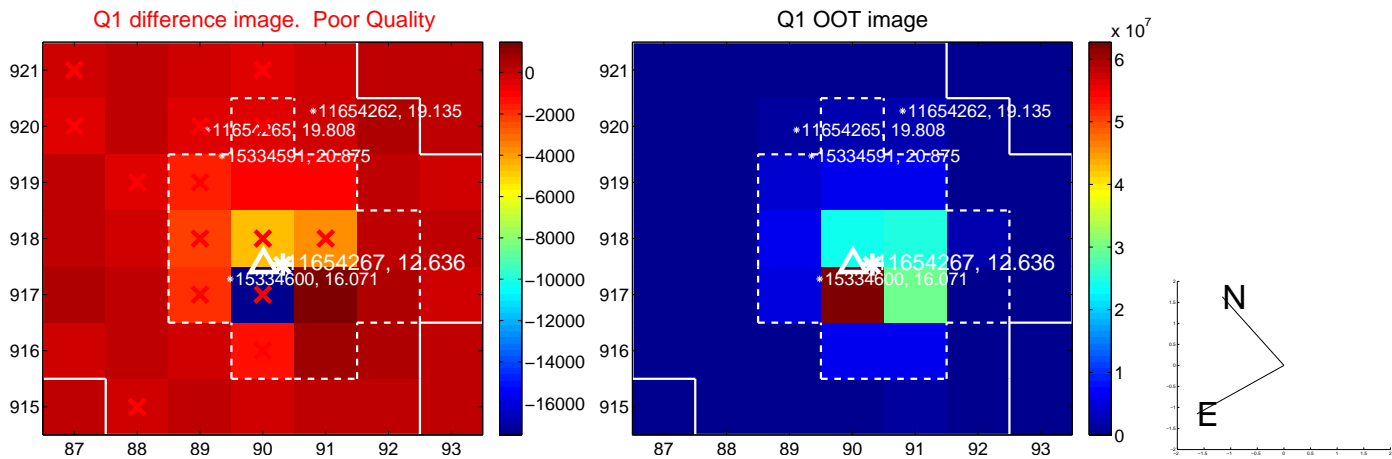
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.621 \pm 0.465$	1.34	$-0.229 \pm 0.318$	$0.578 \pm 0.417$
PRF-fit source offset from KIC position	$0.658 \pm 0.519$	1.27	$-0.219 \pm 0.333$	$0.621 \pm 0.470$
photometric centroid source offset	$1.52 \pm 0.43$	<b>3.52</b>	$-1.19 \pm 0.44$	$-0.94 \pm 0.42$

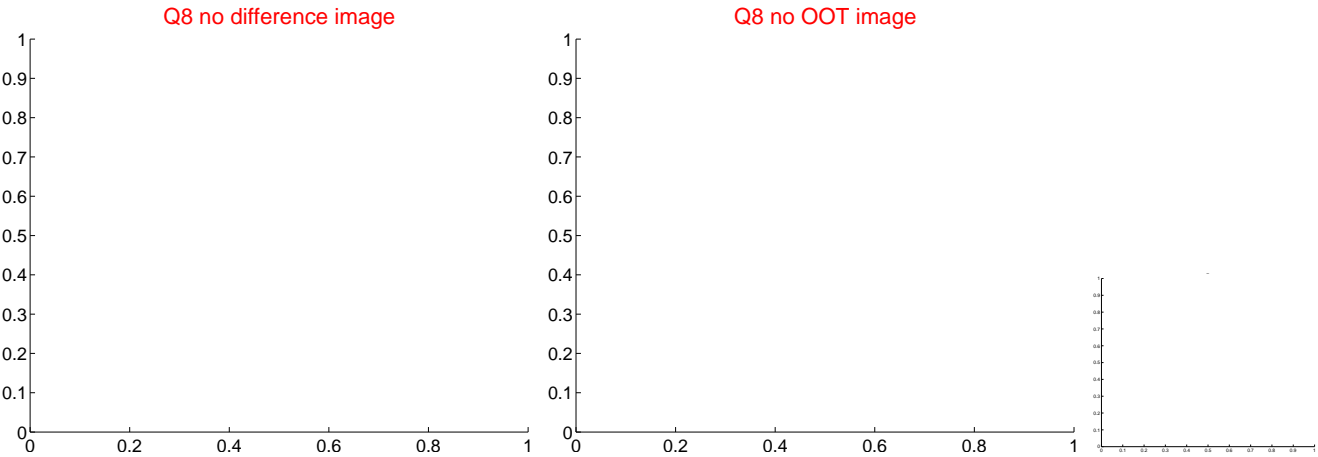
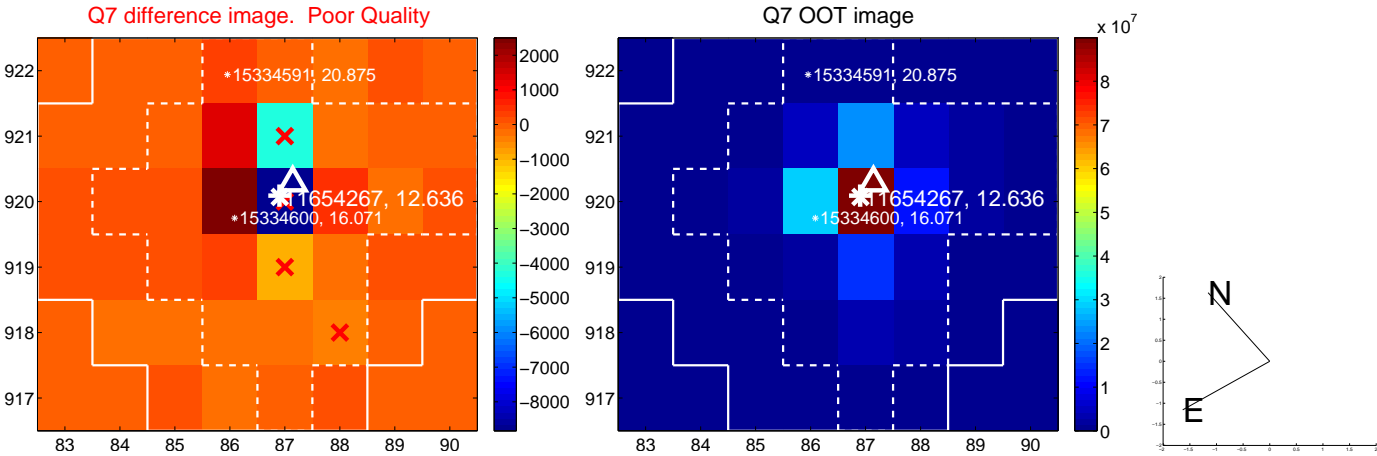
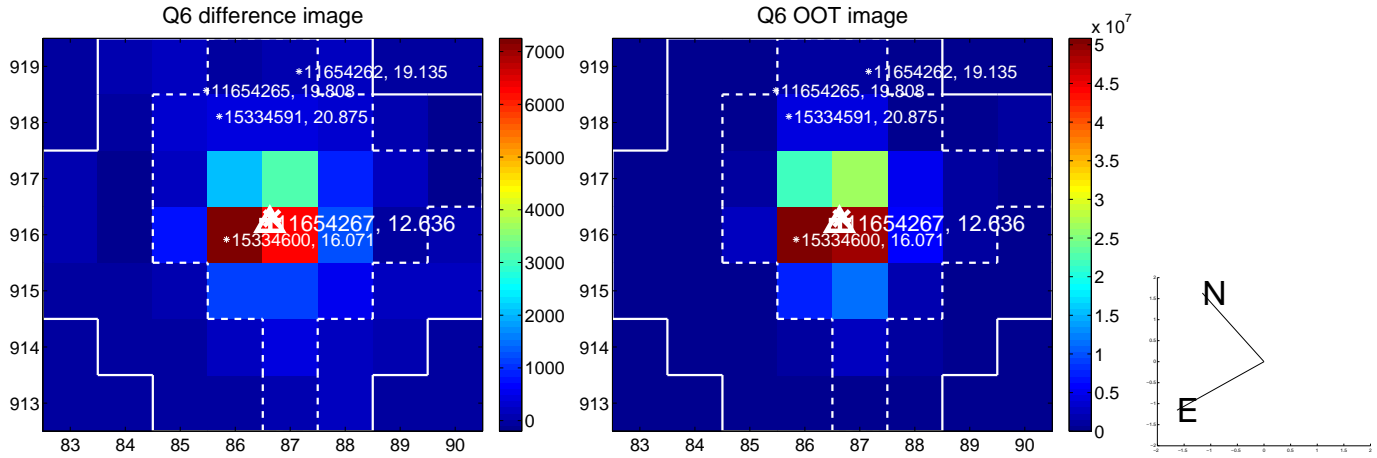
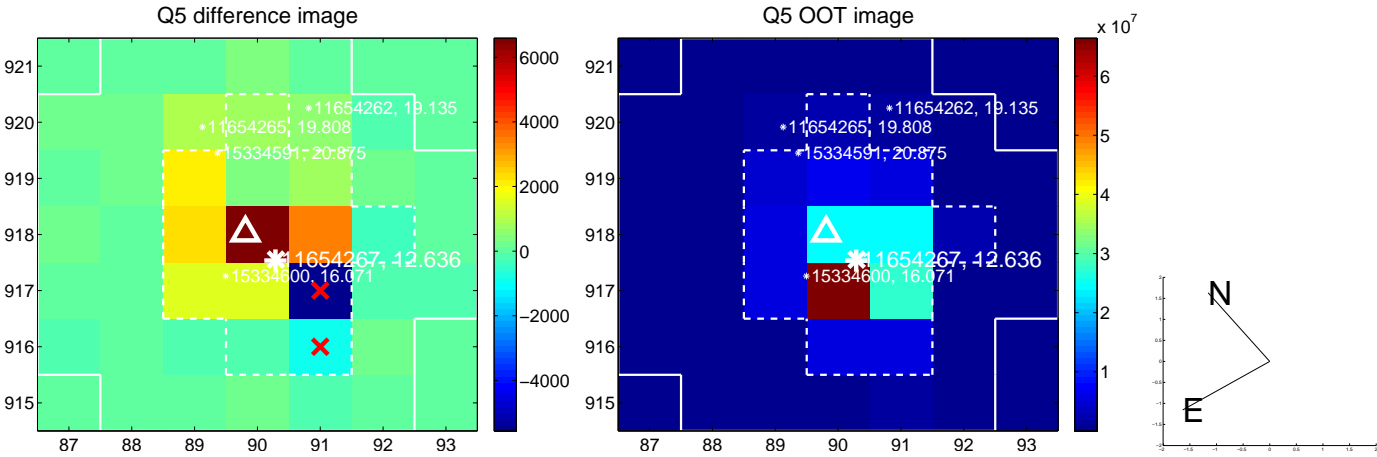


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

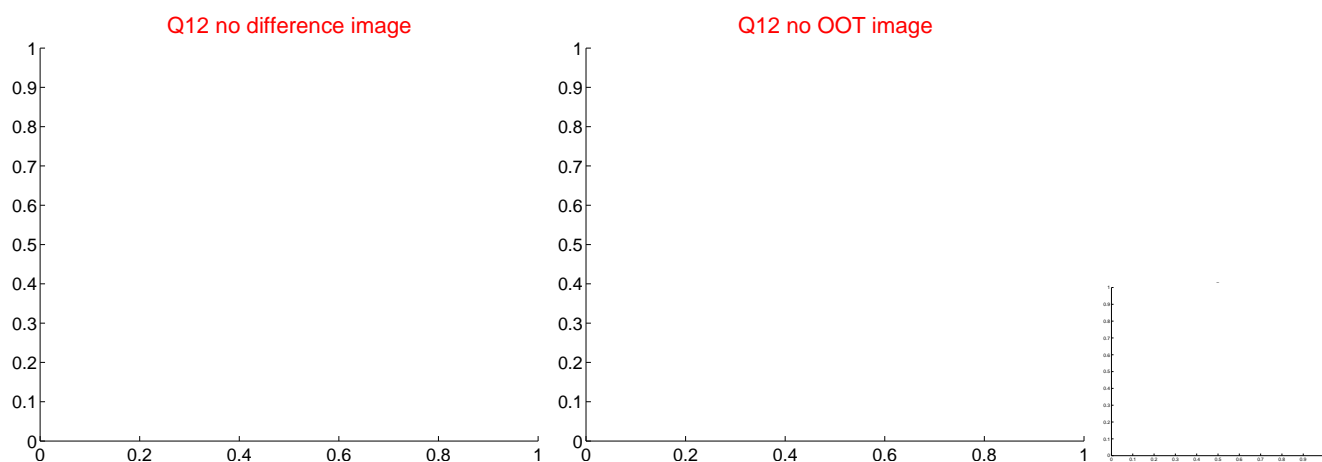
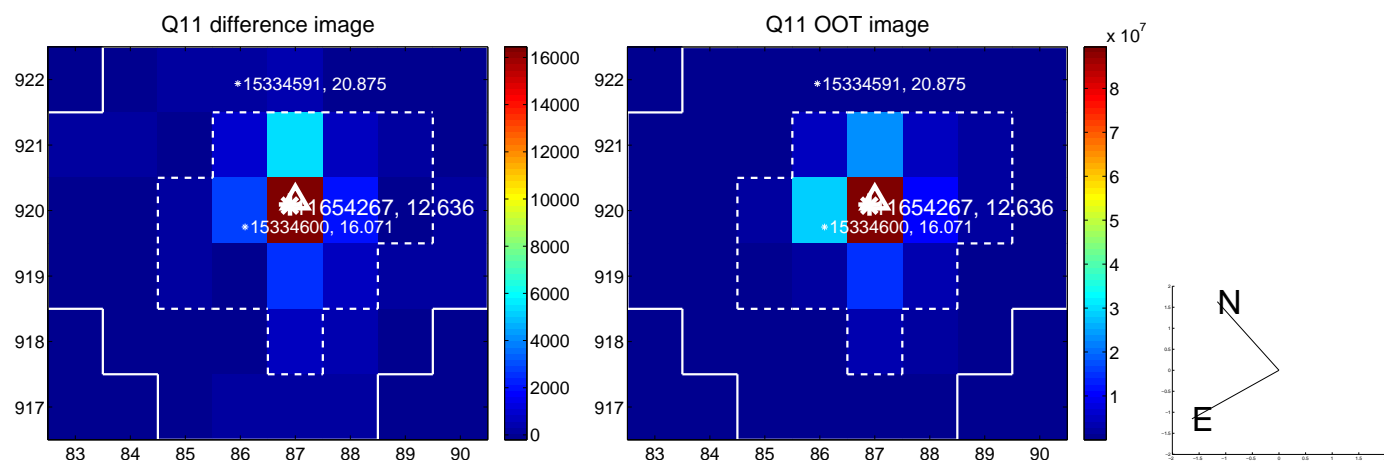
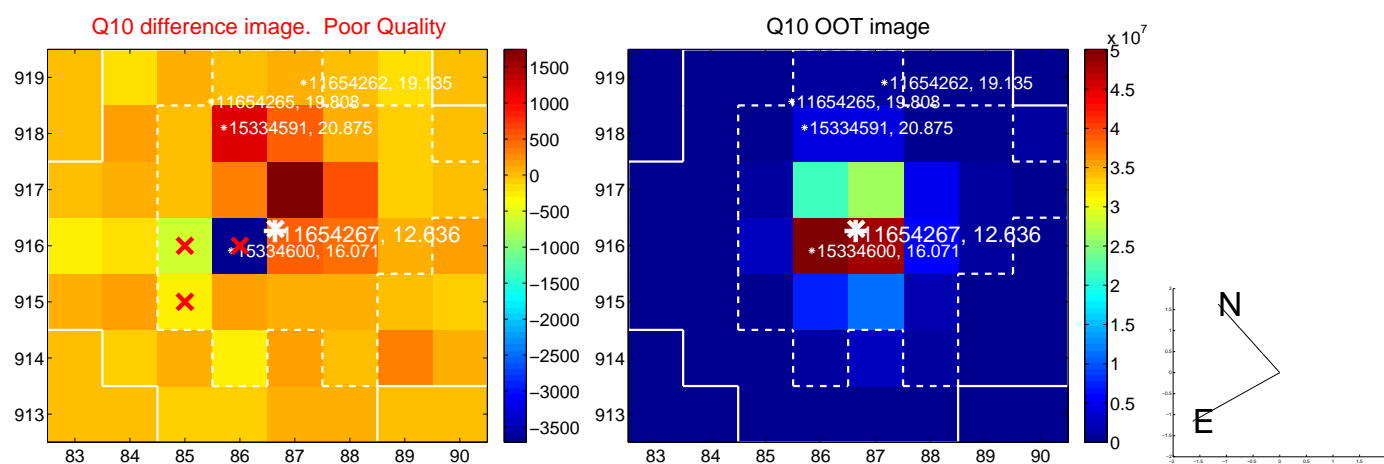
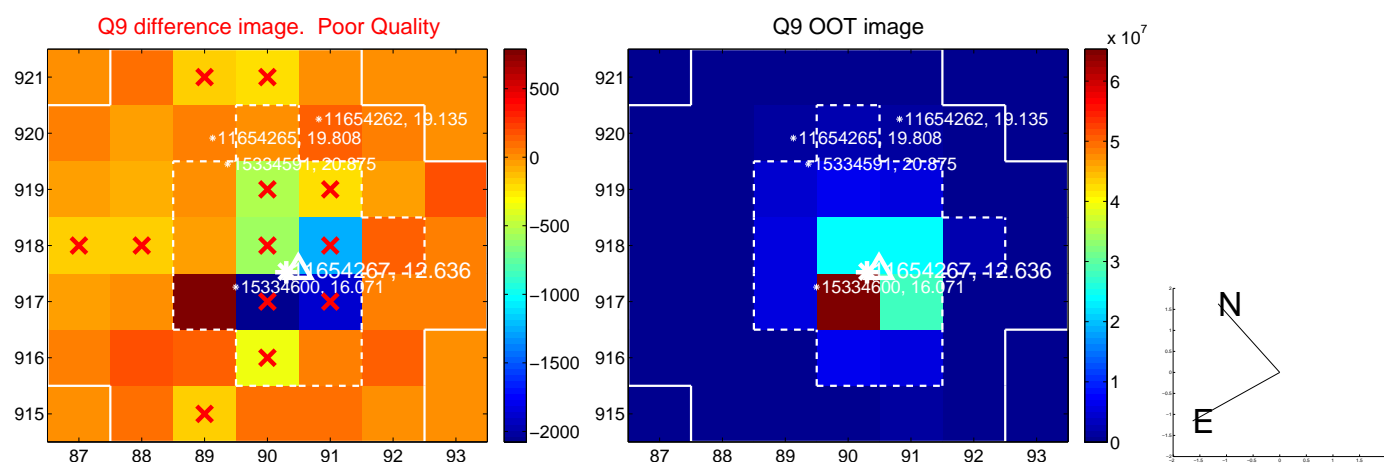


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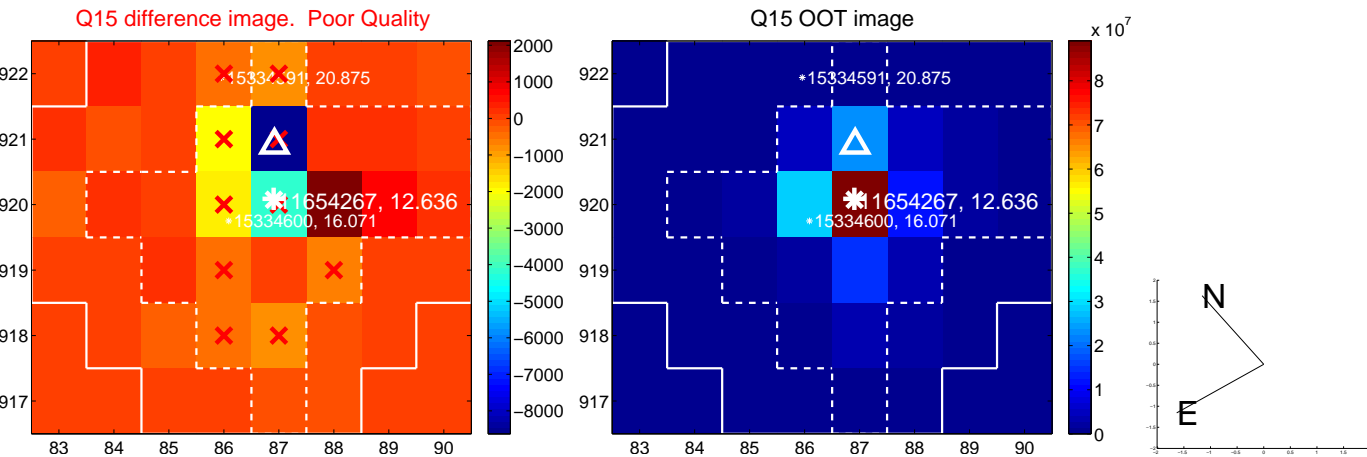
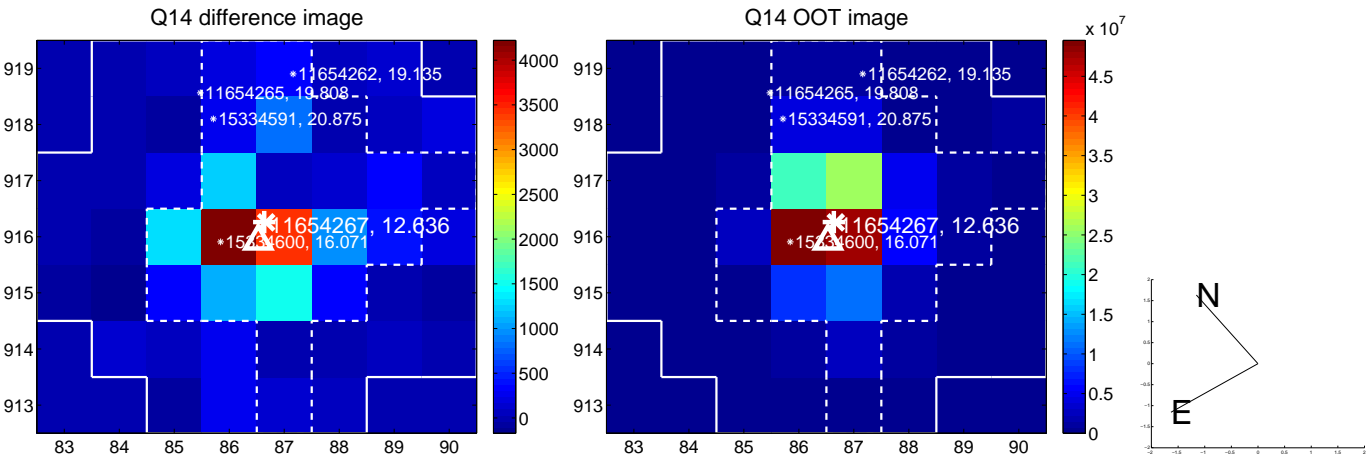
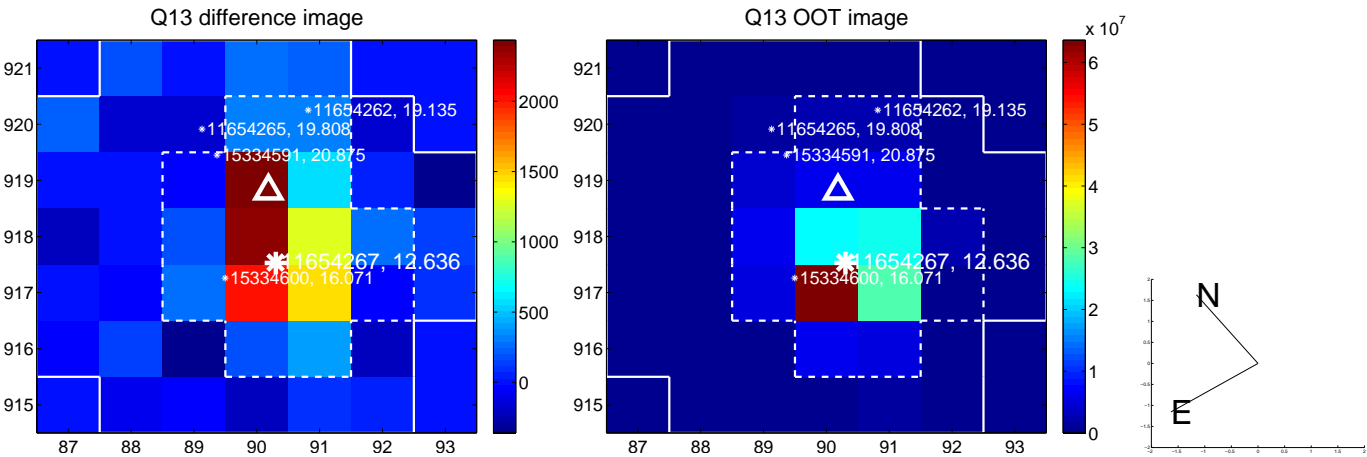




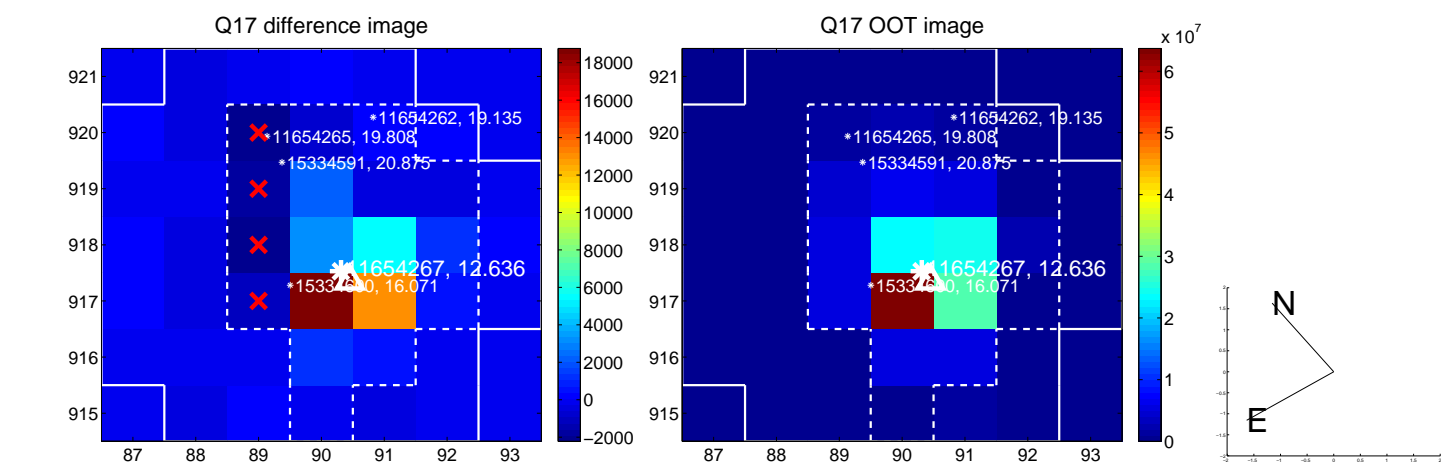
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



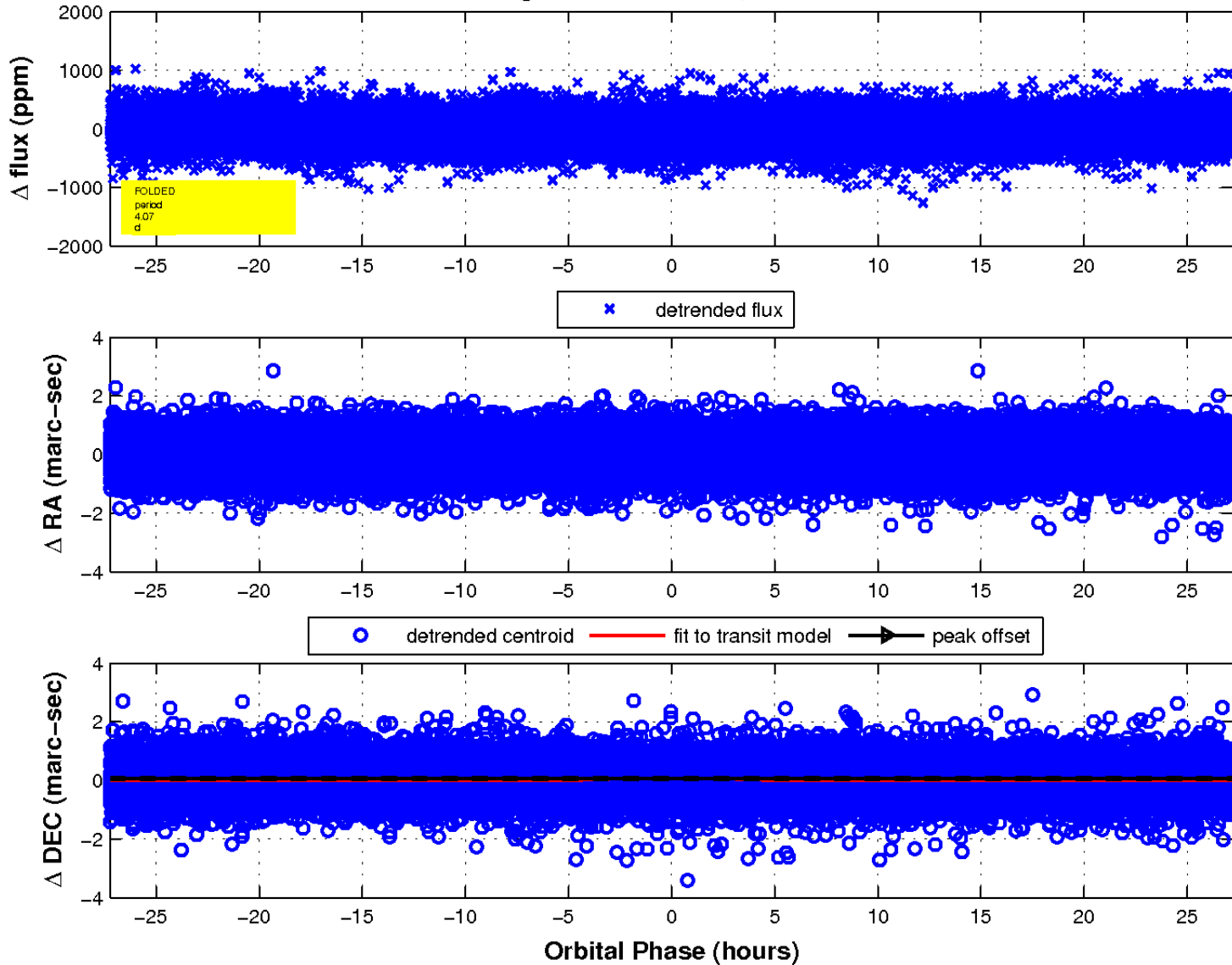
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

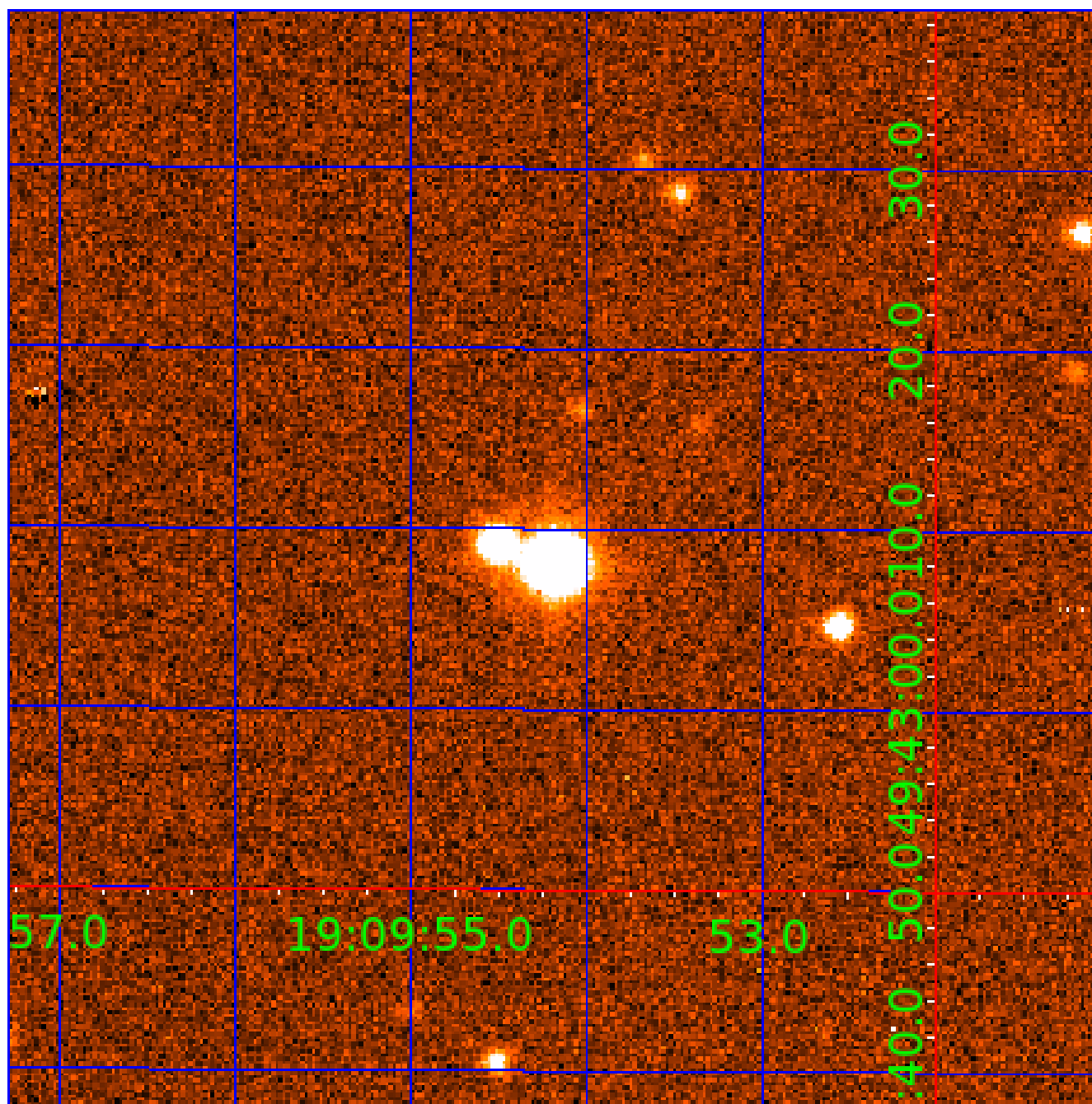


### fluxWeightedCentroids, Planet 1 of 4



UKIRT Image

Declination



# KIC 011654267

## 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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011654267-03	OBS	No	177.402079	137.513000	628.0	5.671	7.7	7.4	1.86	7306	8.21	17.38
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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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011654267-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
011654267-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011654267-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

**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.

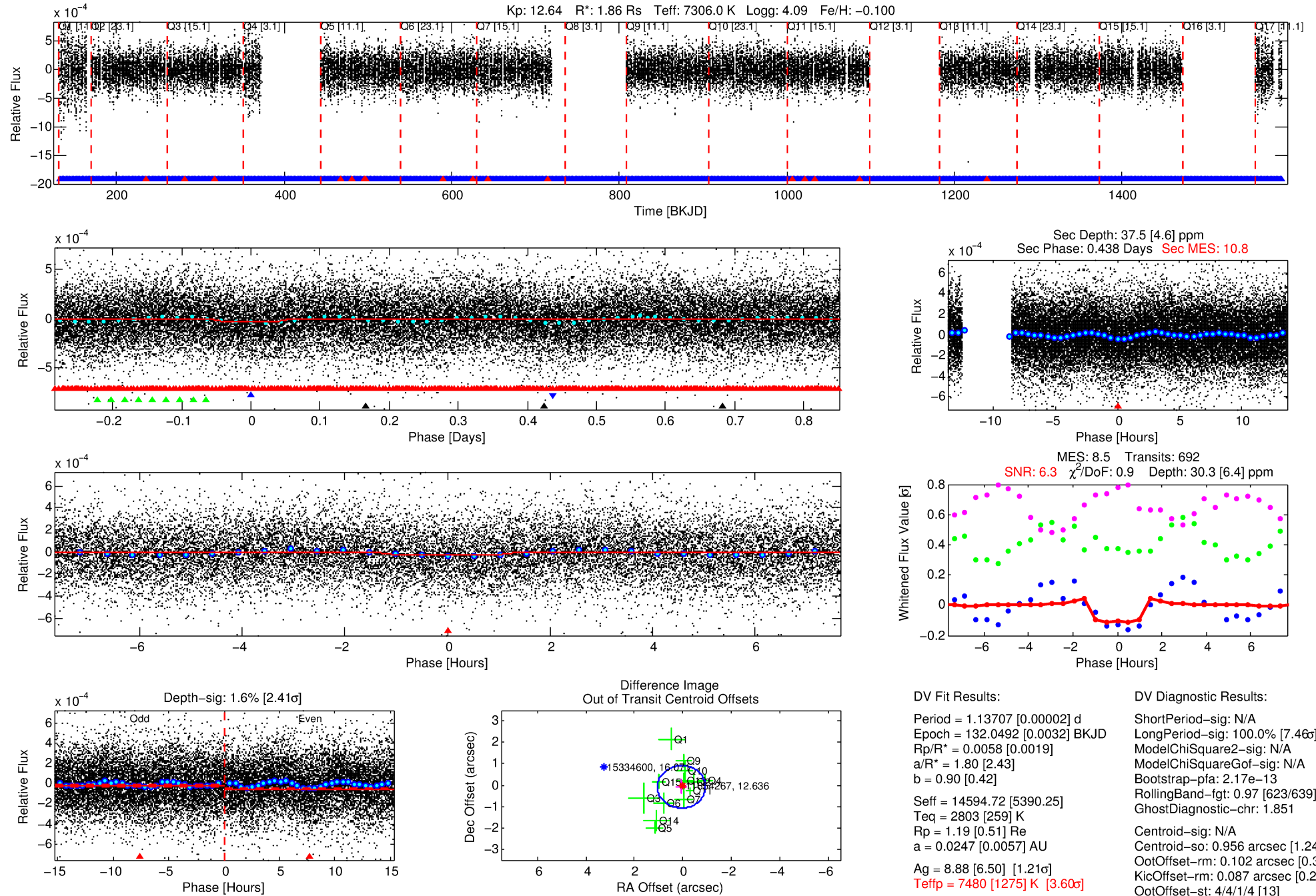
Ephemeris Match Information For 011654267-02

No Significant Match Found



# DV One-Page Summary

KIC: 11654267 Candidate: 2 of 4 Period: 1.137 d



## DV Fit Results:

Period = 1.13707 [0.00002] d  
Epoch = 132.0492 [0.0032] BKJD  
Rp/R\* = 0.0058 [0.0019]  
a/R\* = 1.80 [2.43]  
b = 0.90 [0.42]  
Seff = 14594.72 [5390.25]  
Teq = 2803 [259] K  
Rp = 1.19 [0.51] Re  
a = 0.0247 [0.0057] AU  
Ag = 8.88 [6.50] [1.21σ]  
**Teffp = 7480 [1275] K [3.60σ]**

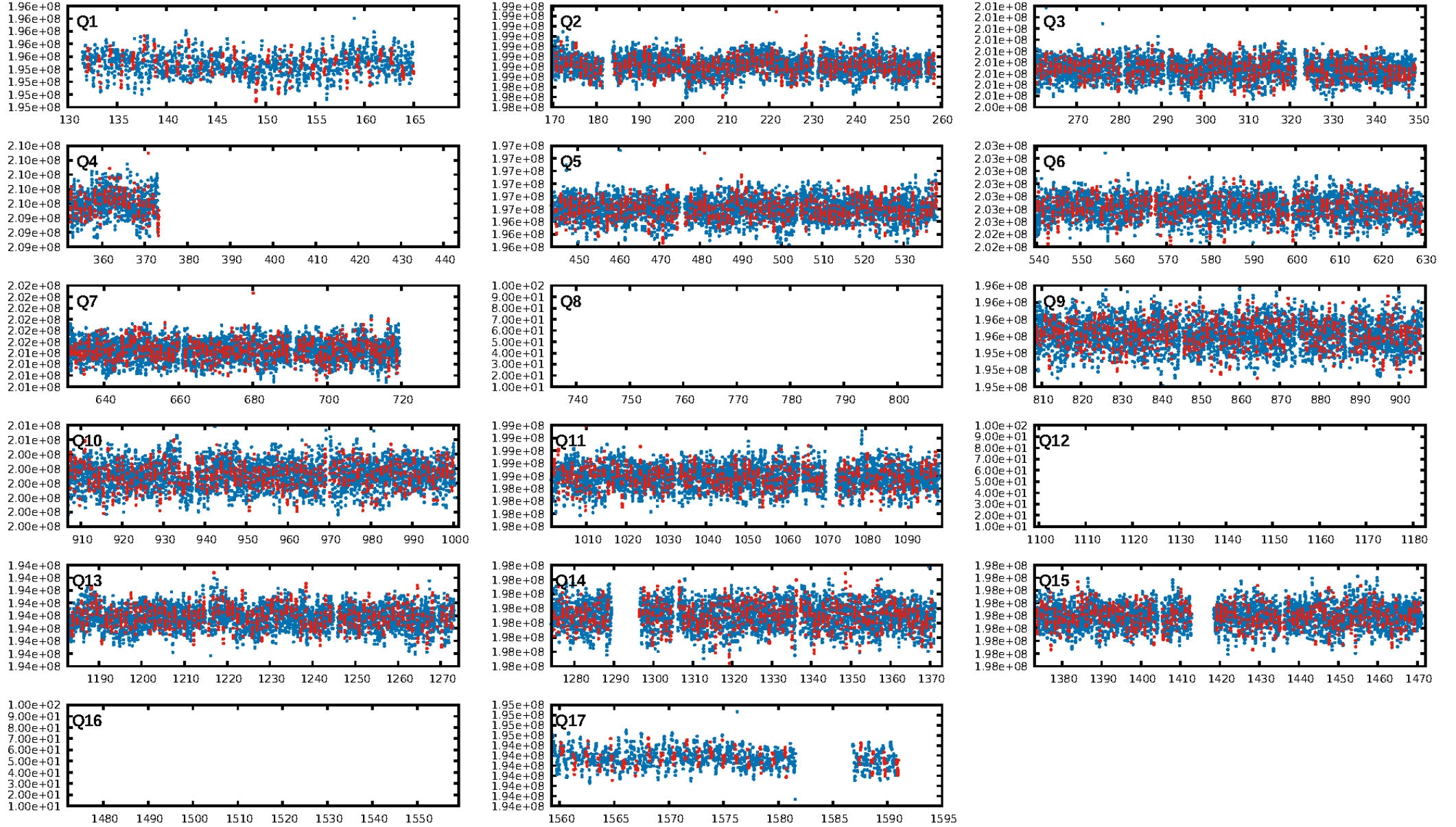
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [7.46σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 2.17e-13  
RollingBand-fgt: 0.97 [623/639]  
GhostDiagnostic-chr: 1.851  
Centroid-sig: N/A  
Centroid-so: 0.956 arcsec [1.24σ]  
OotOffset-rm: 0.102 arcsec [0.31σ]  
OotOffset-st: 4/4/1/4 [13]  
KicOffset-rm: 0.087 arcsec [0.28σ]  
KicOffset-st: 4/4/1/4 [13]  
DiffImageQuality-fgm: 0.77 [10/13]  
DiffImageOverlap-fno: 1.00 [14/14]

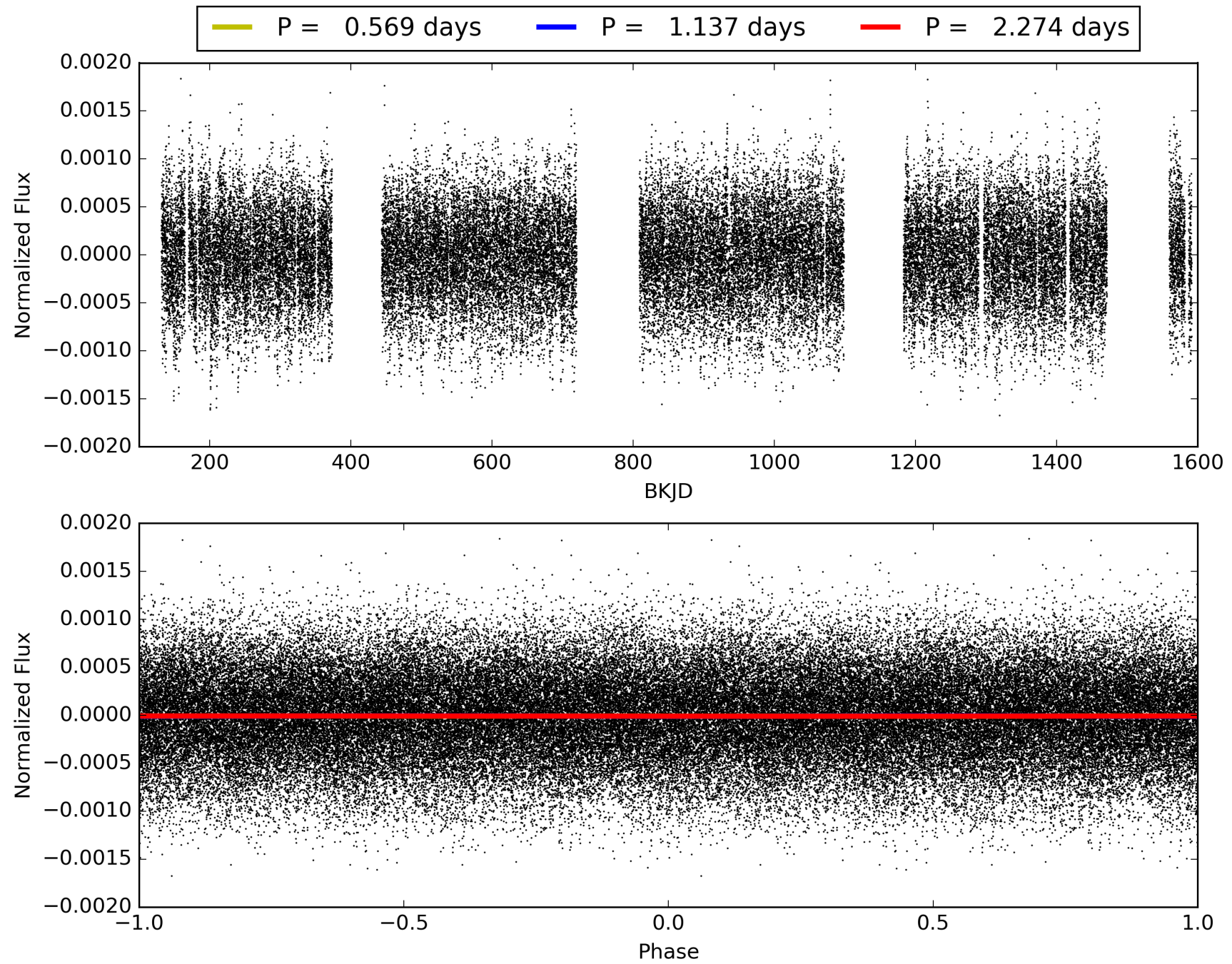
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:07:10 Z

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

# TCE 011654267-02, PDC Light Curves



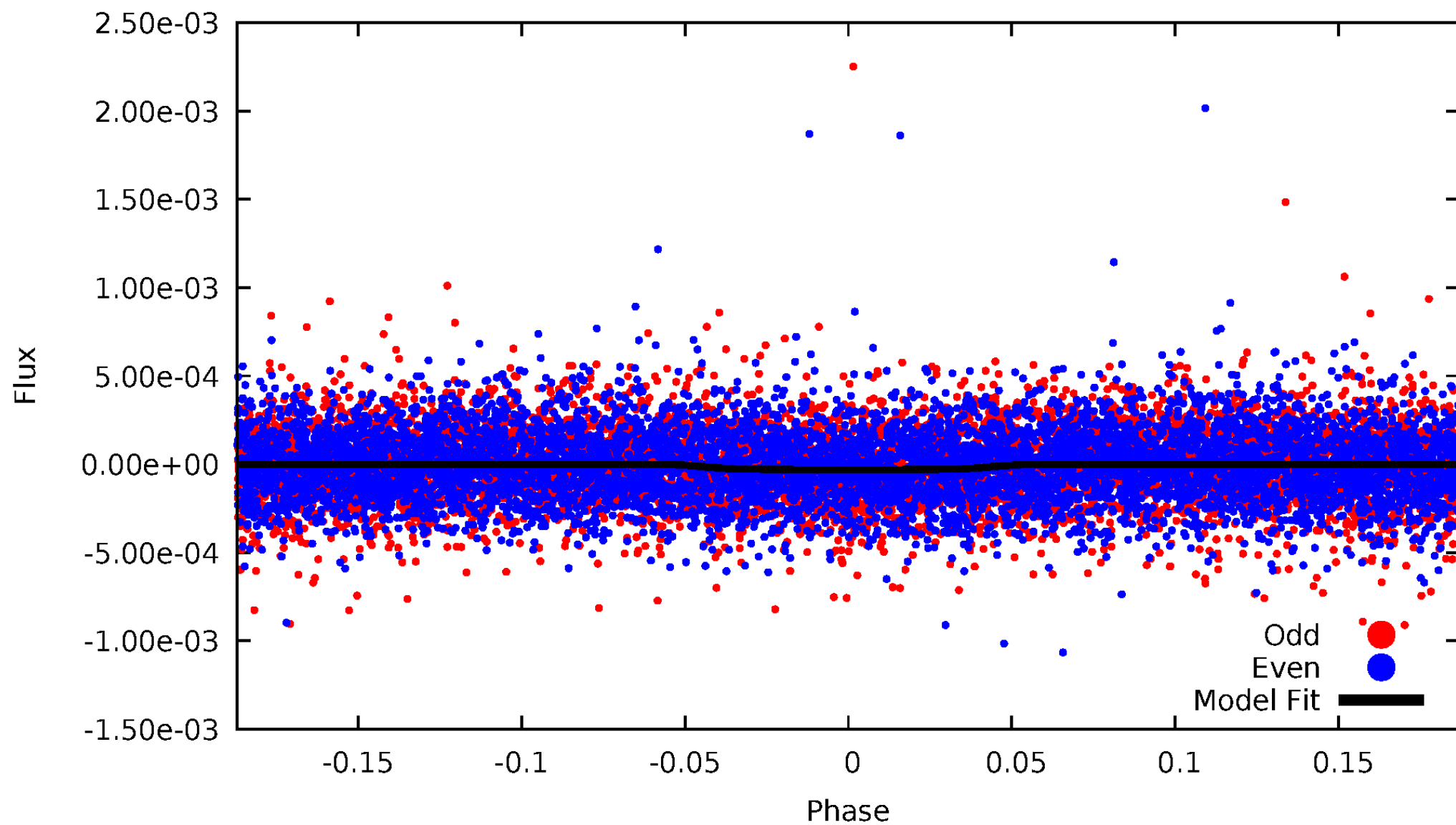
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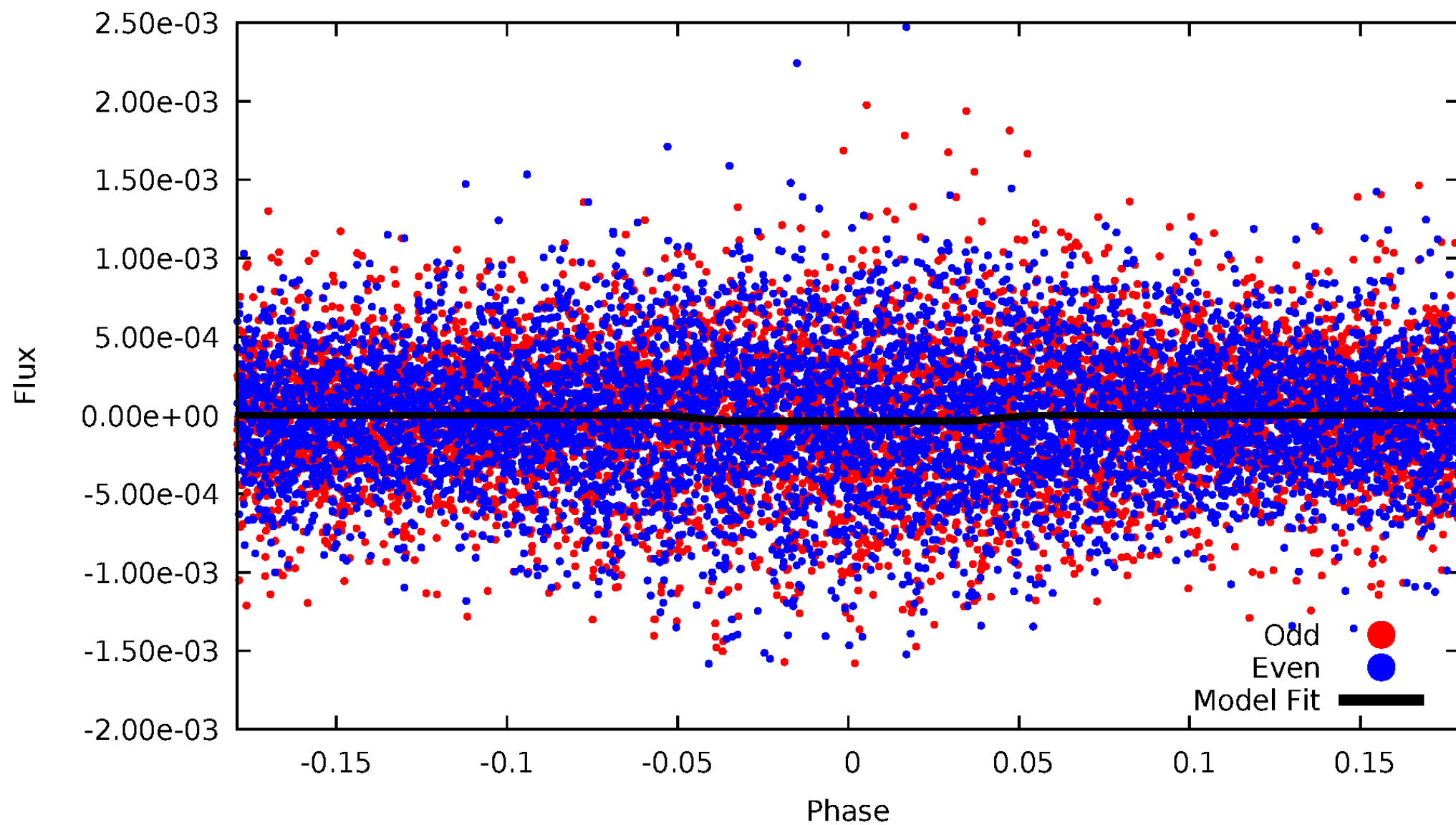
# DV Odd/Even

TCE 011654267-02



# ALT Odd/Even

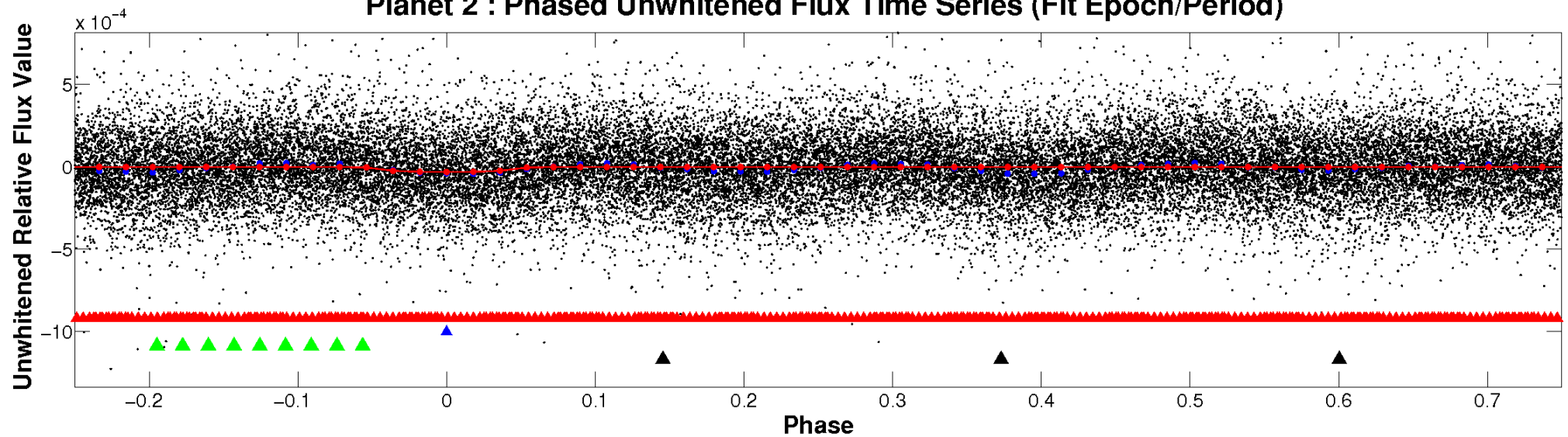
TCE 011654267-02



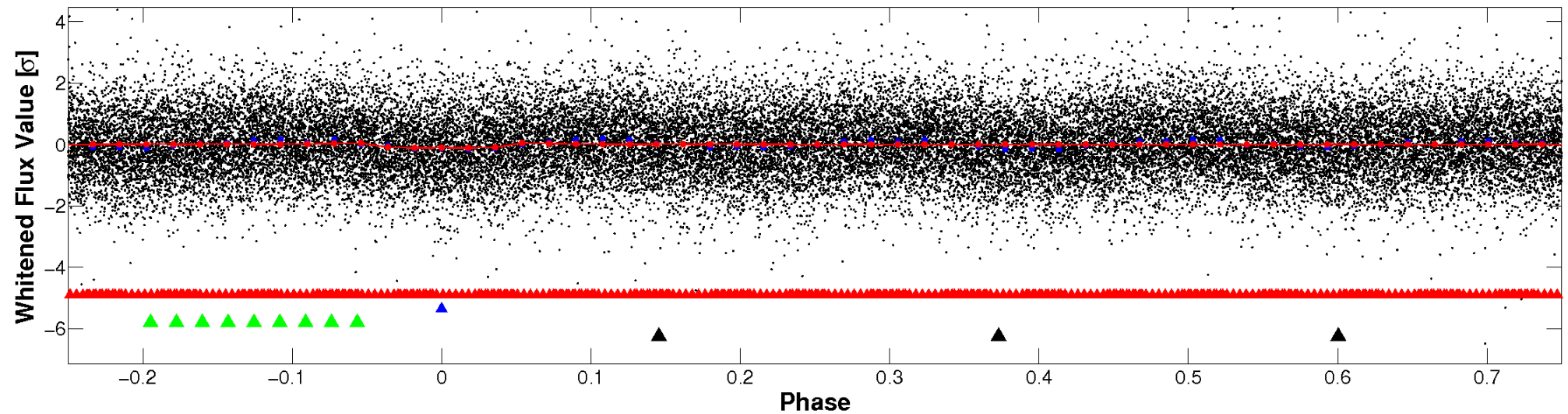


# Non-Whitened Vs. Whitened Light Curve

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

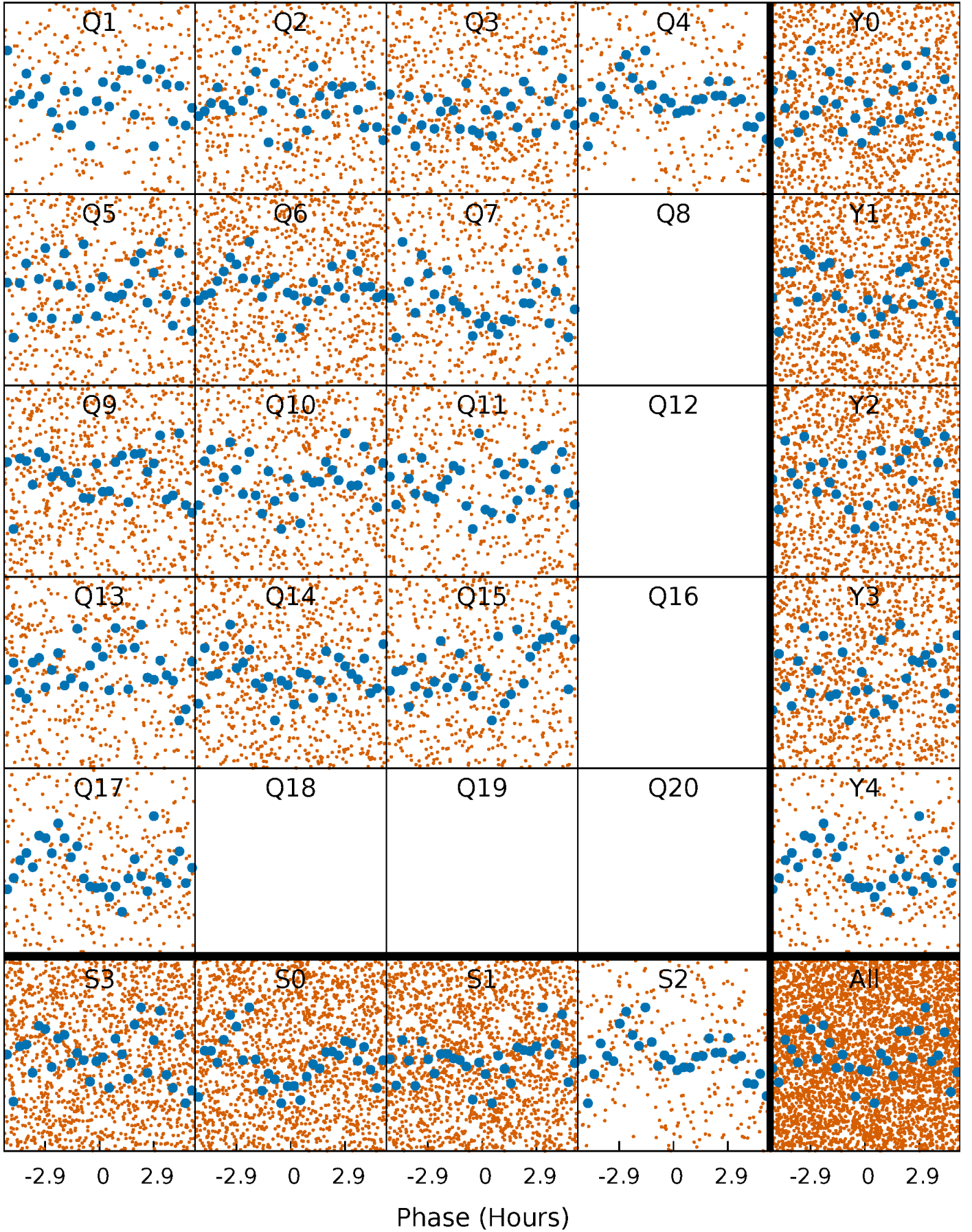


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



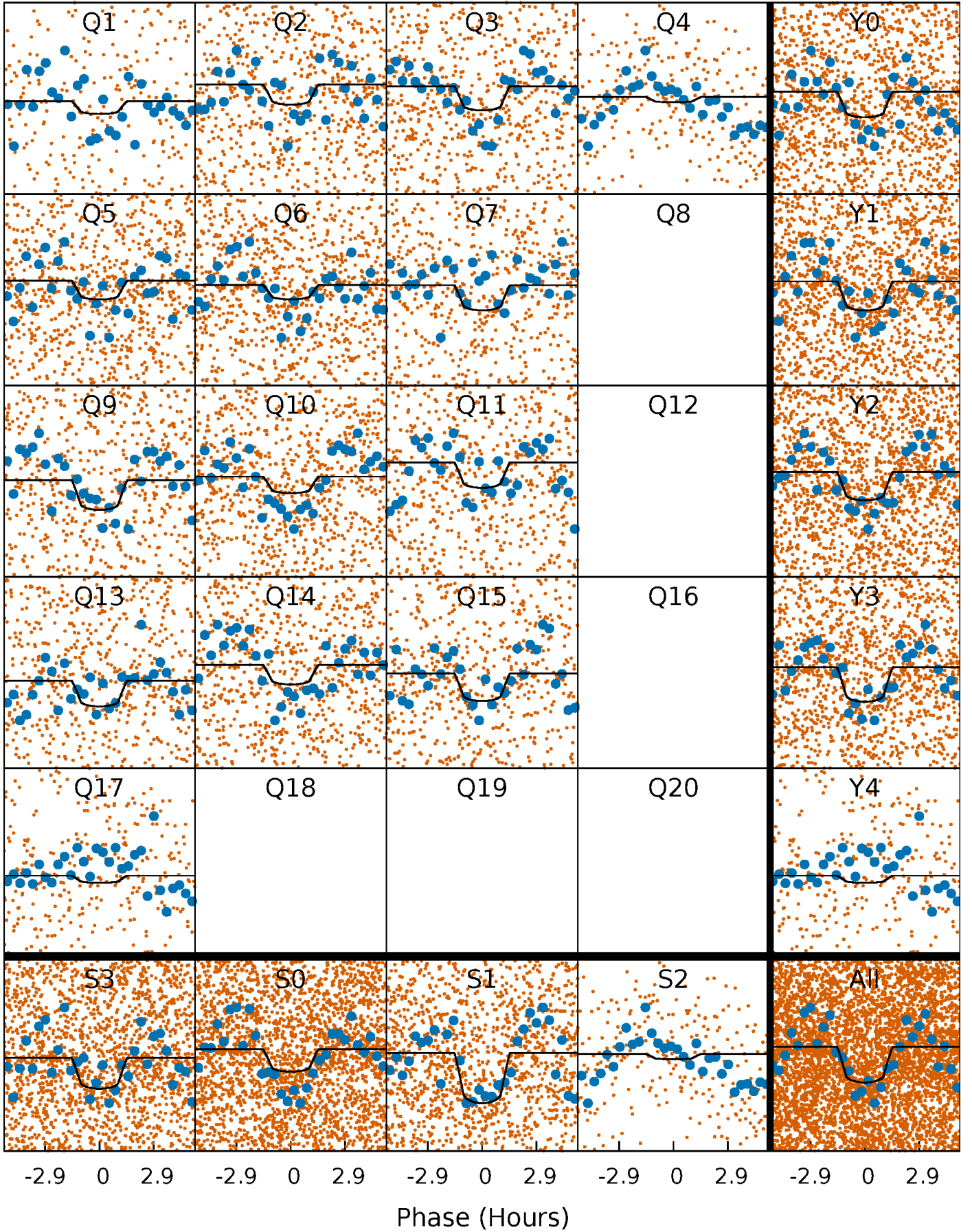
# PDC Quarter-Phased Transit Curves

TCE 011654267-02 P= 1.137067 Days  $T_0=132.049167$  (BKJD)



# DV Quarter-Phased Transit Curves

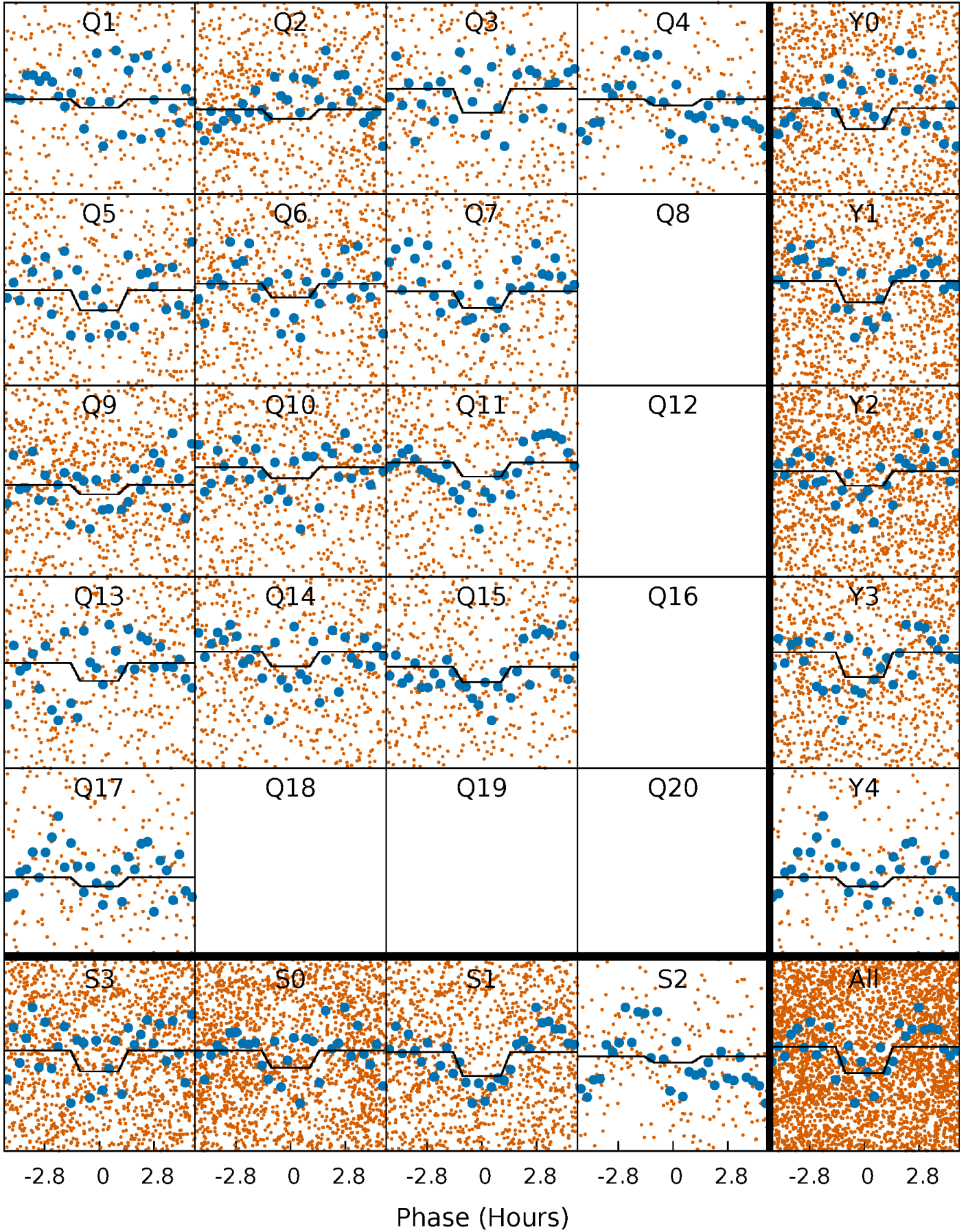
TCE 011654267-02   P= 1.137067 Days    $T_0=132.049167$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

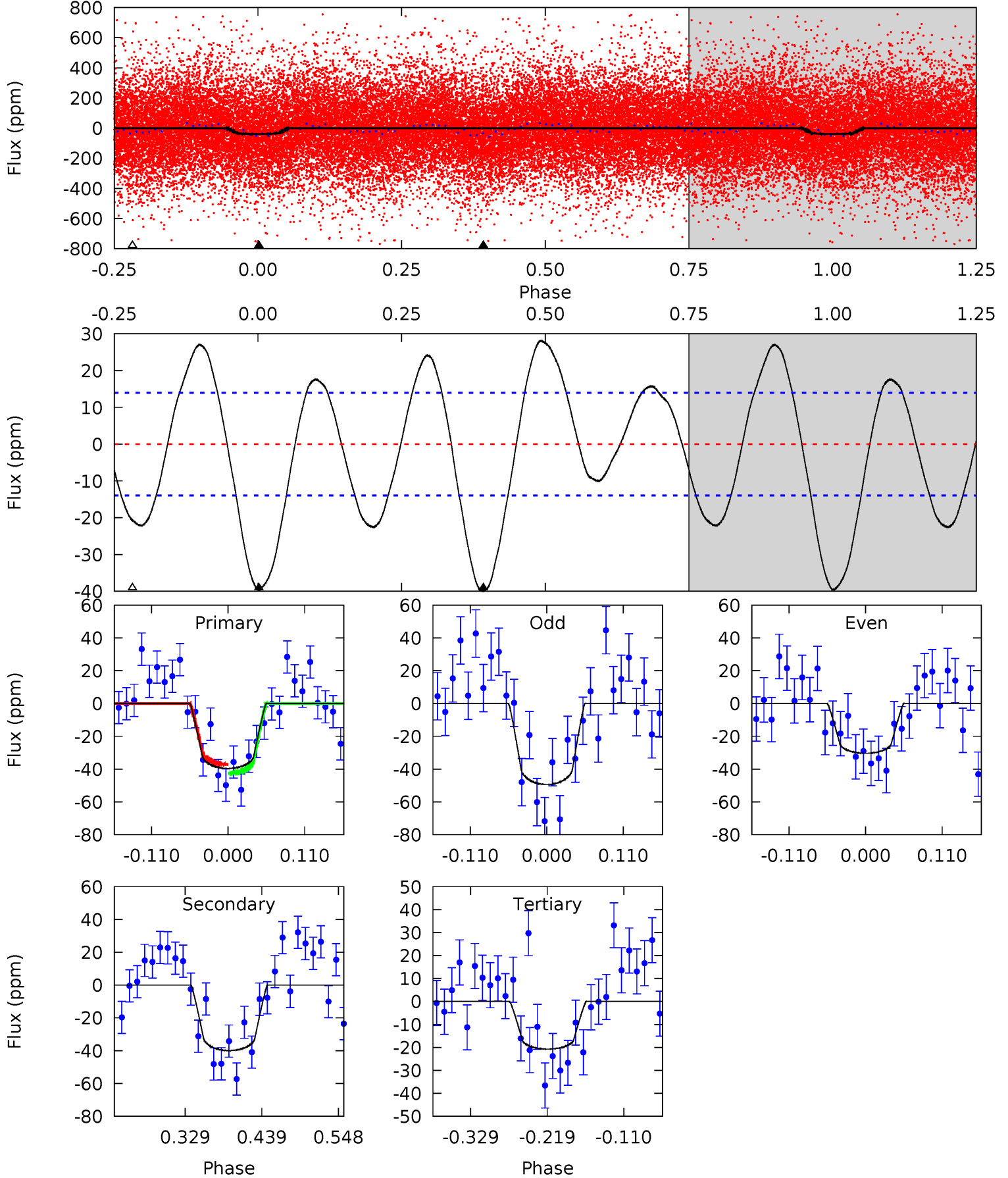
TCE 011654267-02   P= 1.137084 Days    $T_0=132.039688$  (BKJD)



# DV Model-Shift Uniqueness Test

011654267-02, P = 1.137067 Days, E = 130.912100 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
12.9	13.0	6.76	0	4.55	1.60	4.60	6.15	12.9	6.27	13.0	3.12	0.82	0.41	0.89

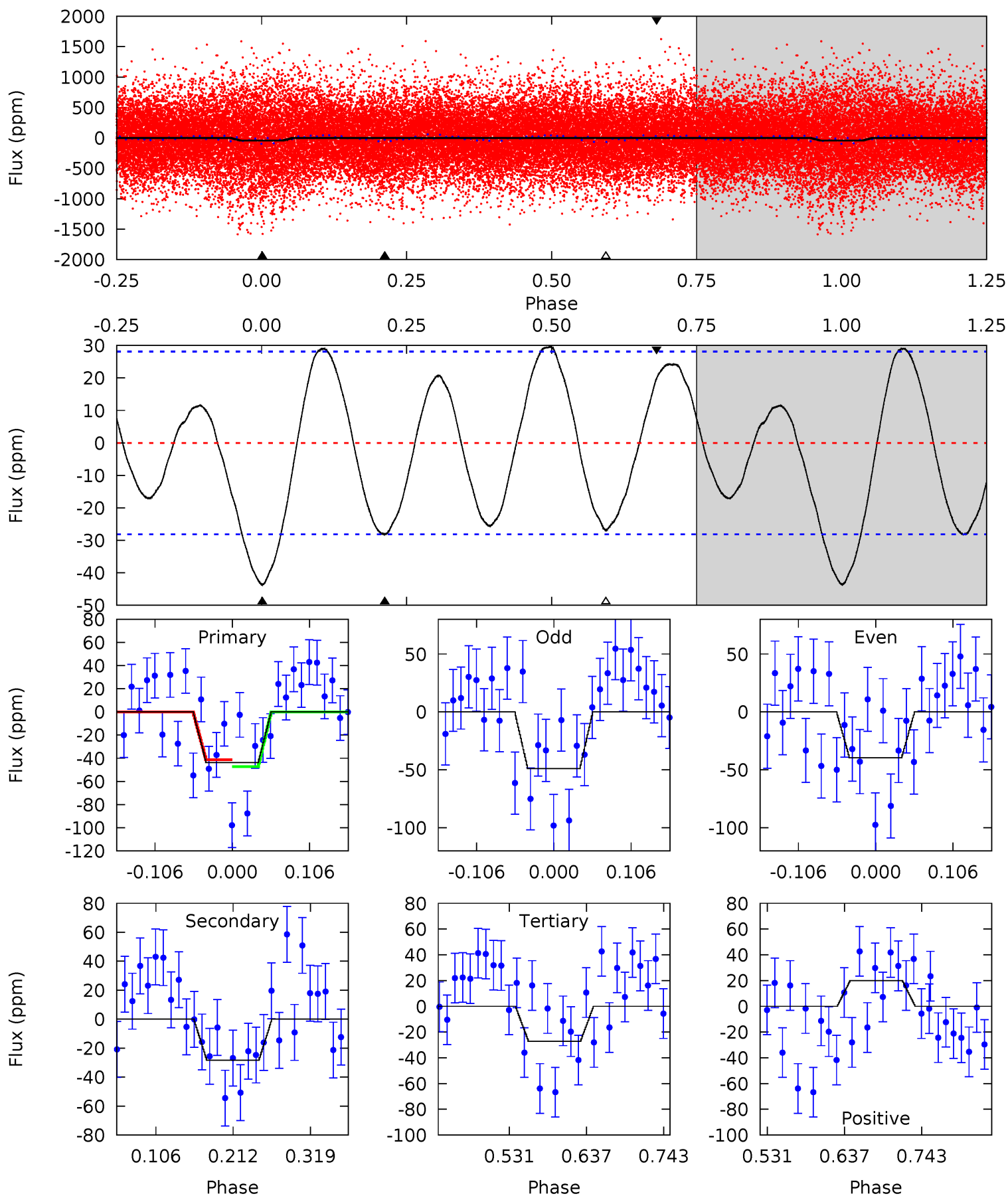




# Alt Model-Shift Uniqueness Test

011654267-02, P = 1.137084 Days, E = 130.902604 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
7.08	4.58	4.38	3.24	4.55	1.62	2.75	2.70	3.84	0.20	1.34	0.76	1.49	0.41	0.48



### Stellar Parameters For KIC 011654267

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7306^{+228}_{-330}$	$4.086^{+0.170}_{-0.170}$	$-0.100^{+0.200}_{-0.350}$	$1.864^{+0.528}_{-0.432}$	$1.542^{+0.211}_{-0.257}$	$0.336^{+0.316}_{-0.164}$
	+3%/-5%	+4%/-4%	+200%/-350%	+28%/-23%	+14%/-17%	+94%/-49%
Source	KIC0	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 011654267-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-40 \pm 3$	$1.20^{+0.42}_{-0.40}$	$3912^{+274}_{-276}$	$7602^{+2262}_{-1249}$	$9.588^{+11.686}_{-4.410}$
Alt.	$-28 \pm 6$	$1.23^{+0.41}_{-0.42}$	$3886^{+303}_{-276}$	$6643^{+1825}_{-1001}$	$6.164^{+7.794}_{-2.901}$

$T_{\text{max}}$  = 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

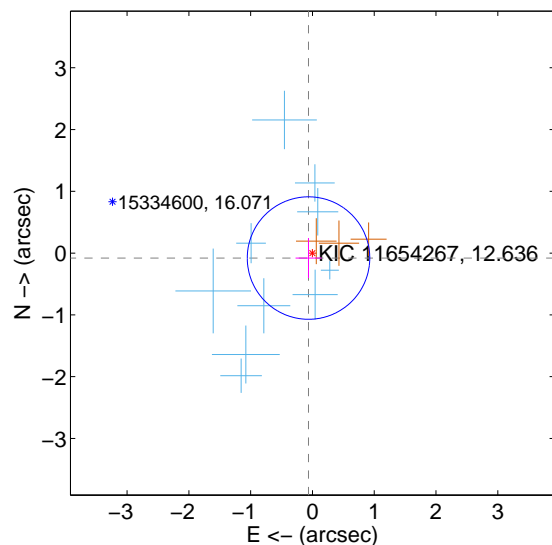
Supplemental centroid analysis for 011654267-02. Kepler magnitude: 12.64. Transit SNR 6.29

There are 10 quarters with good PRF difference image offsets

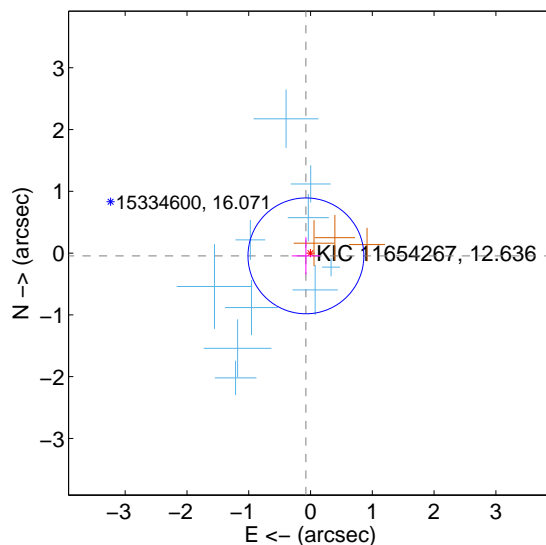
The direct PRF centroid is offset from the target star catalog position by about 0.06 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.102 \pm 0.330$	0.31	$0.063 \pm 0.211$	$-0.080 \pm 0.323$
PRF-fit source offset from KIC position	$0.087 \pm 0.313$	0.28	$0.075 \pm 0.229$	$-0.045 \pm 0.301$
photometric centroid source offset	$0.96 \pm 0.77$	1.24	$-0.92 \pm 0.77$	$0.25 \pm 0.78$

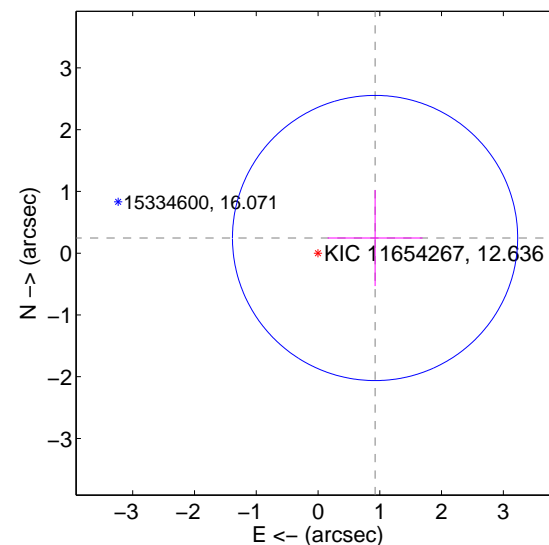
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

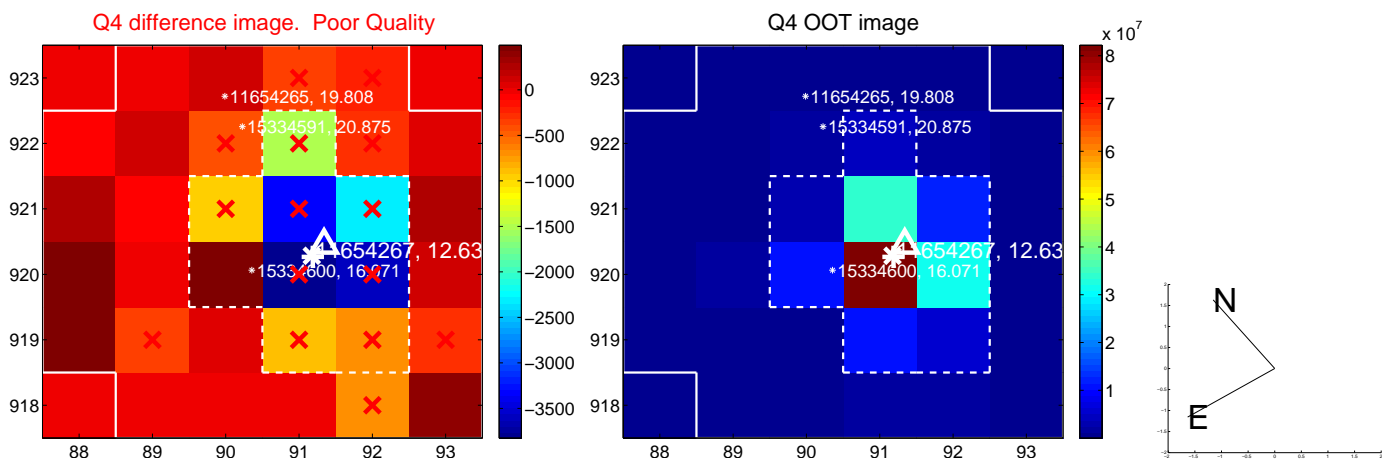
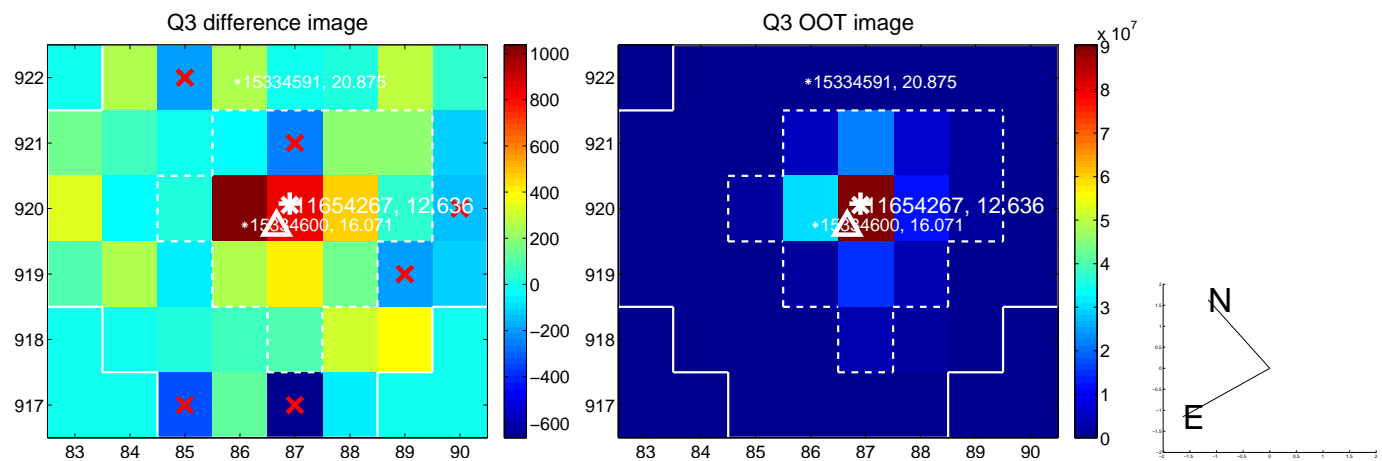
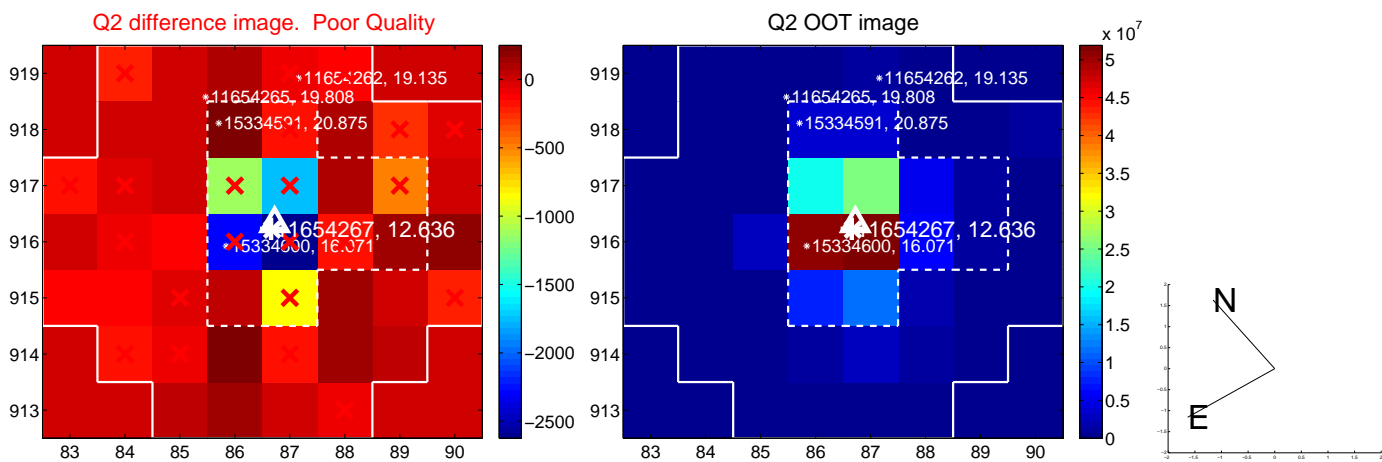
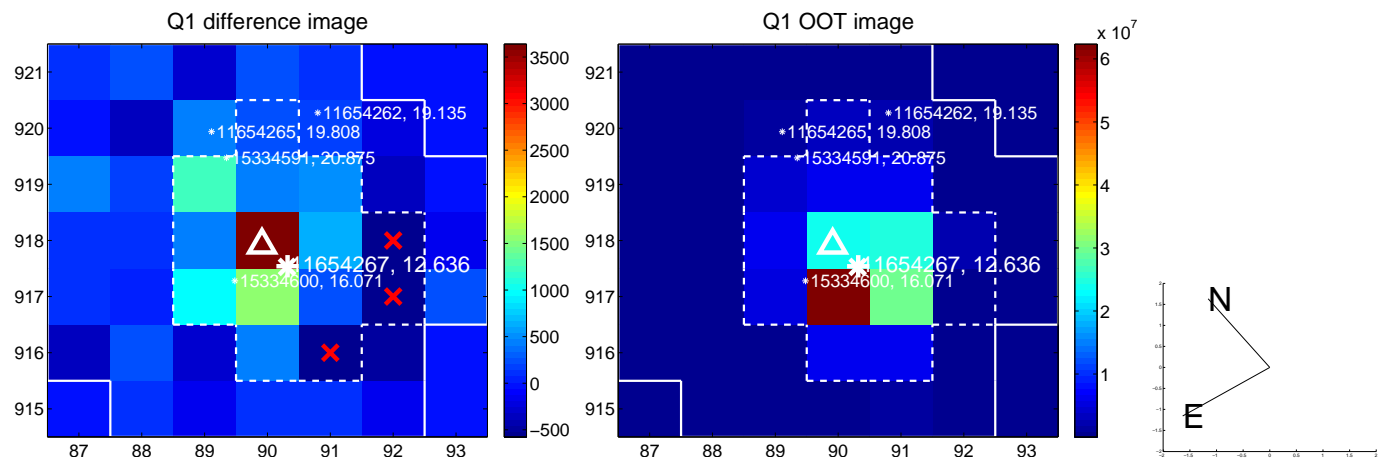


offset from photometric centroids

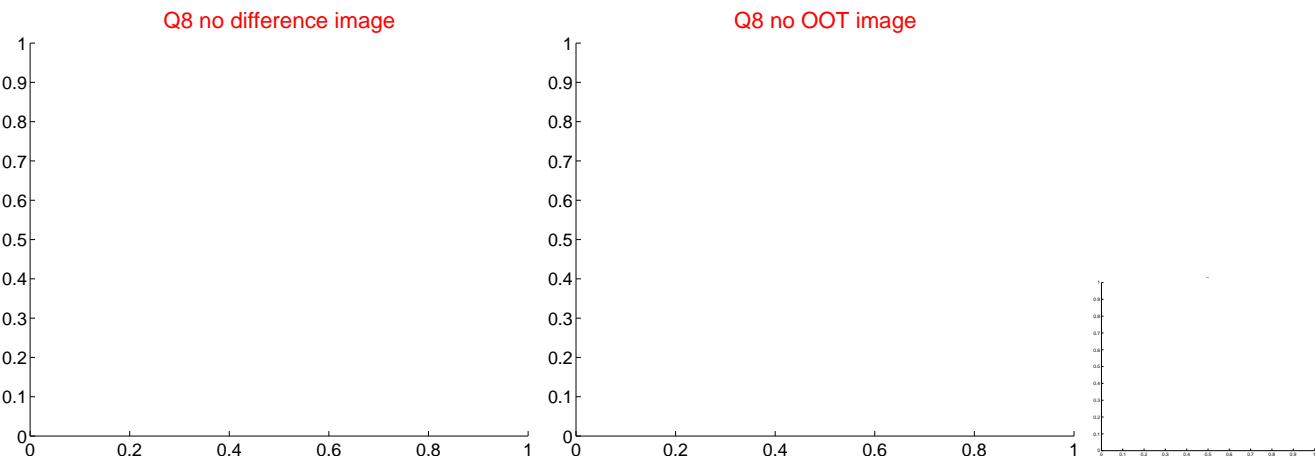
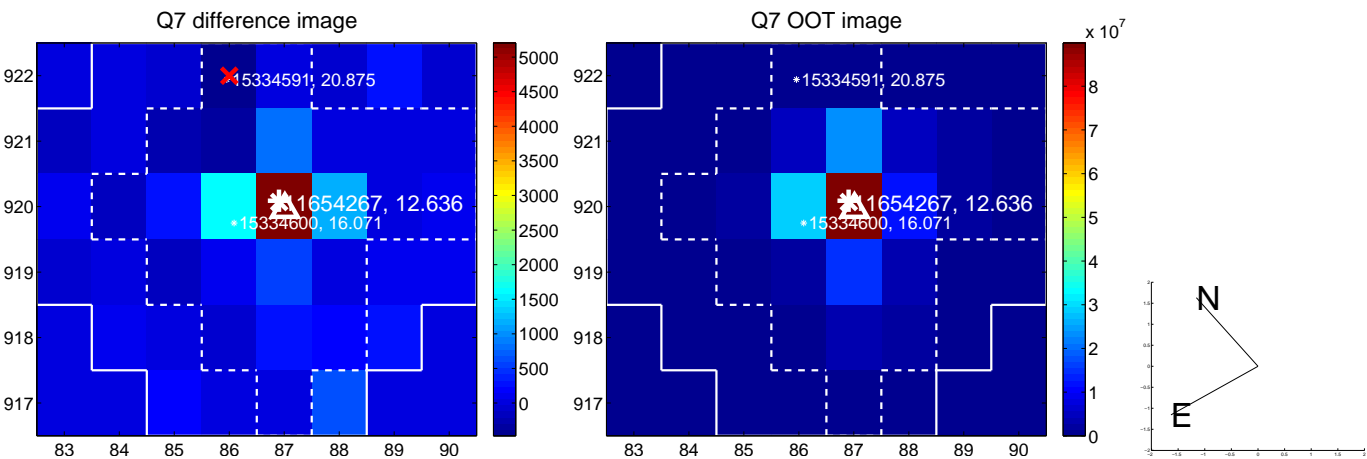
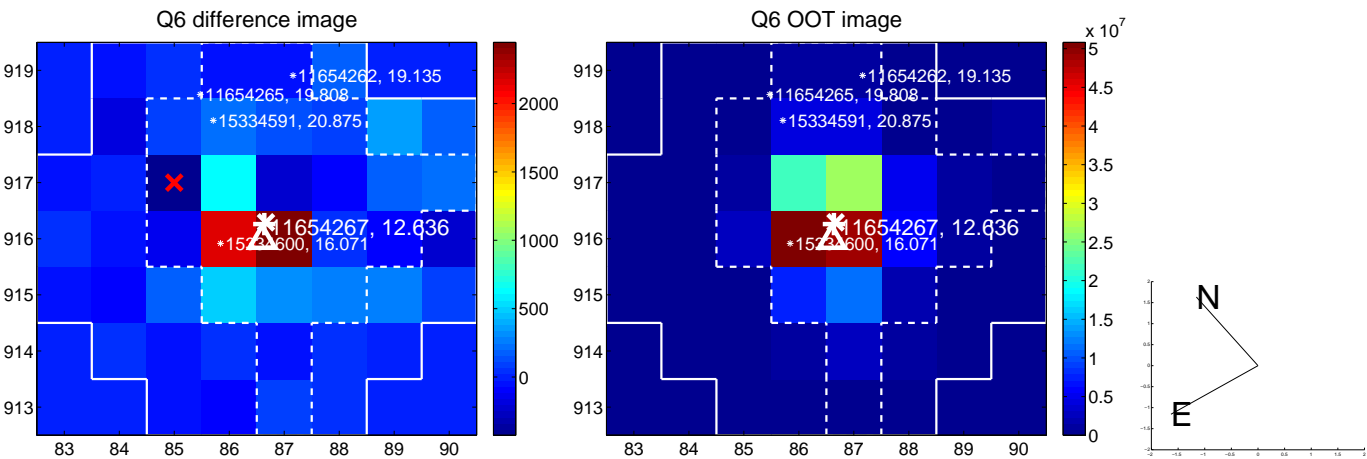
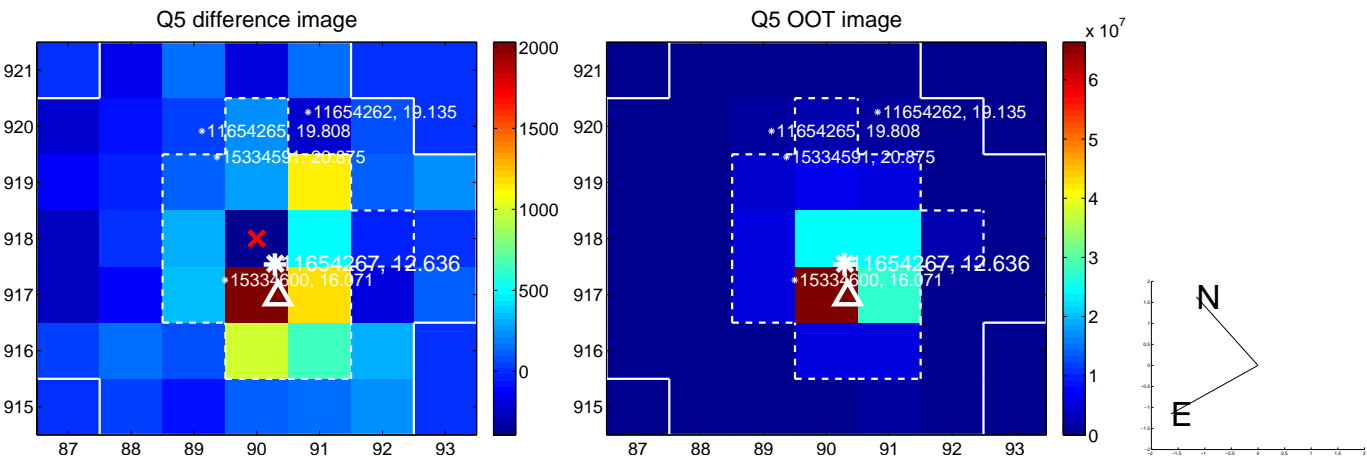


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

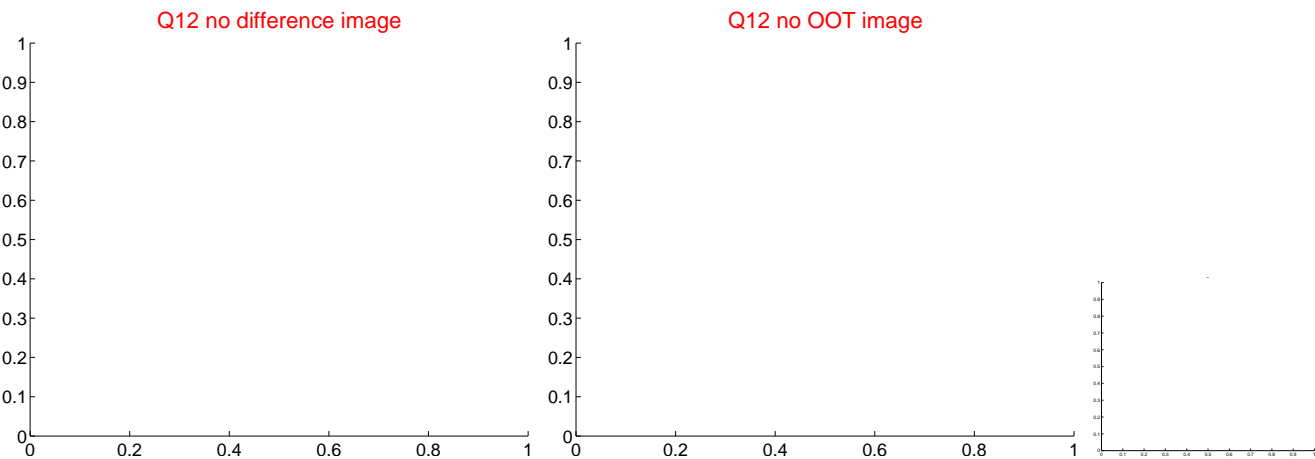
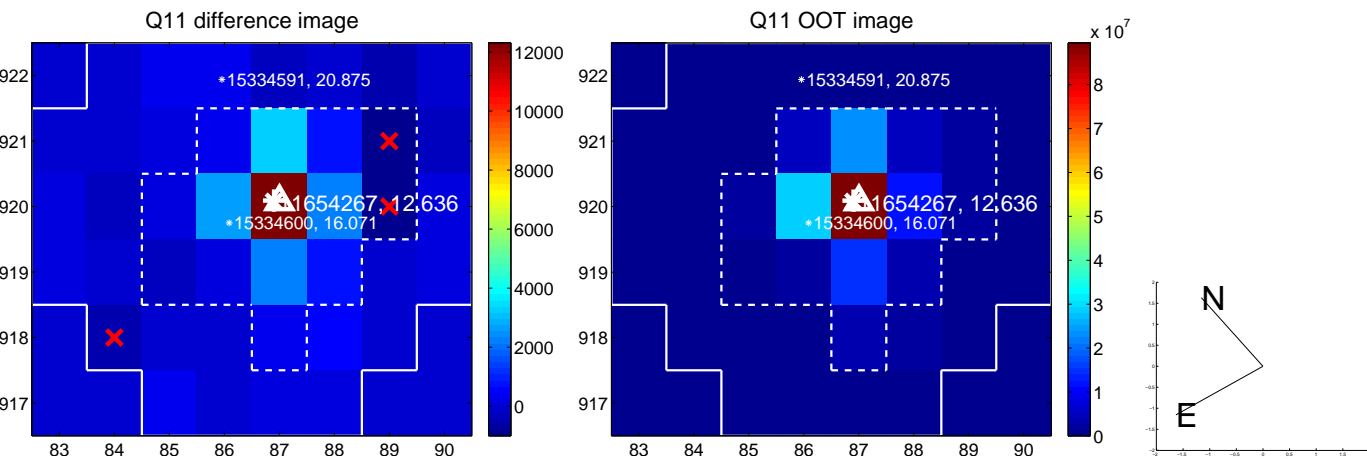
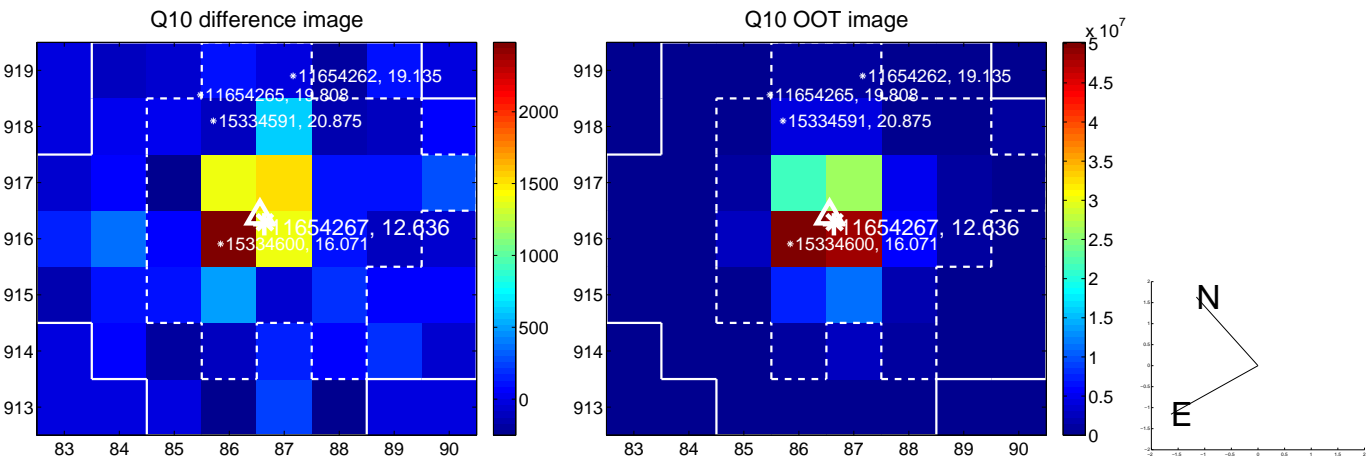
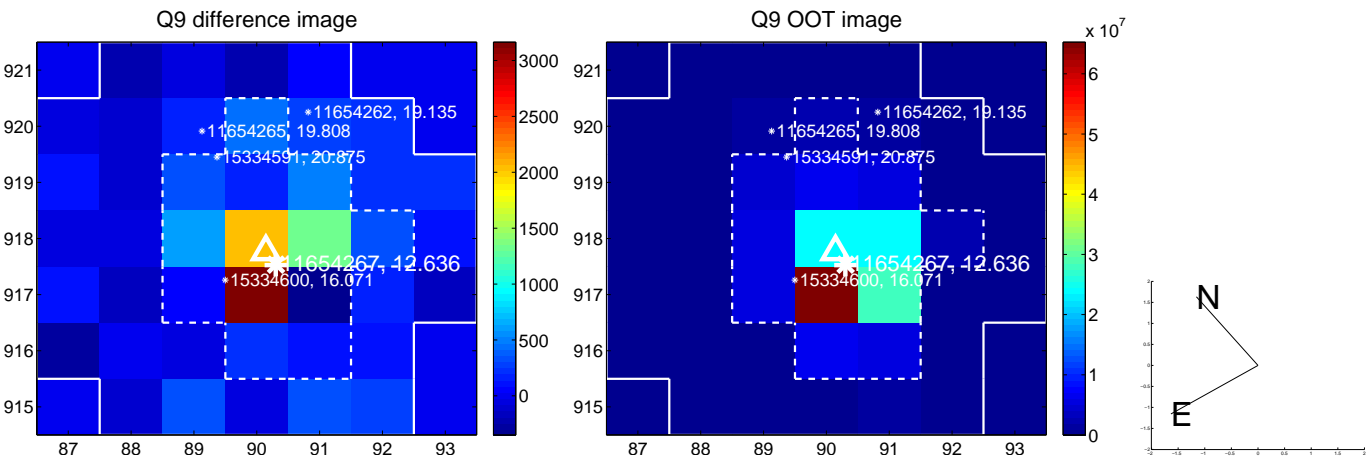
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

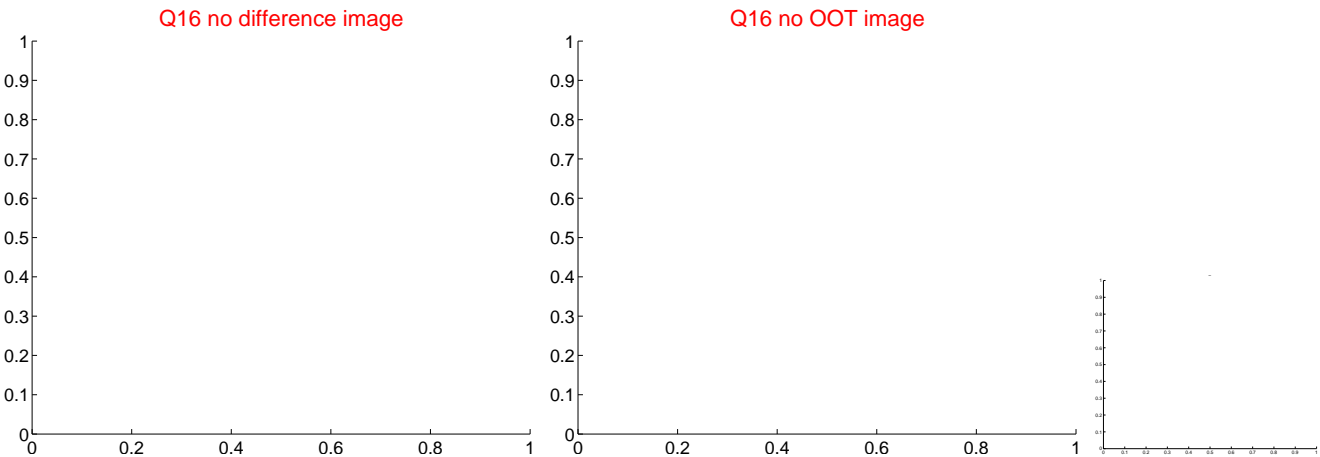
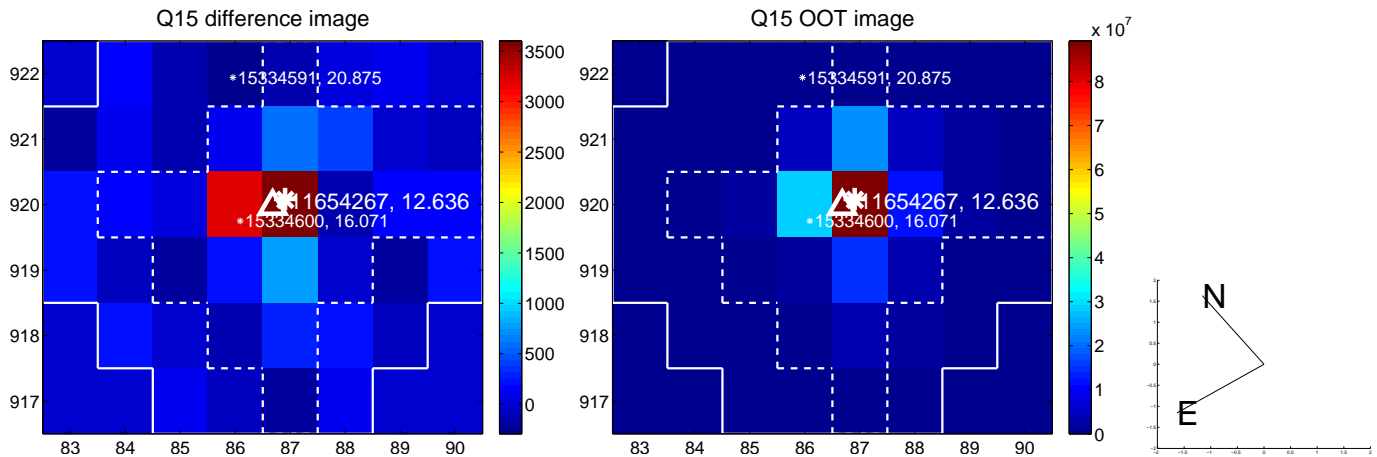
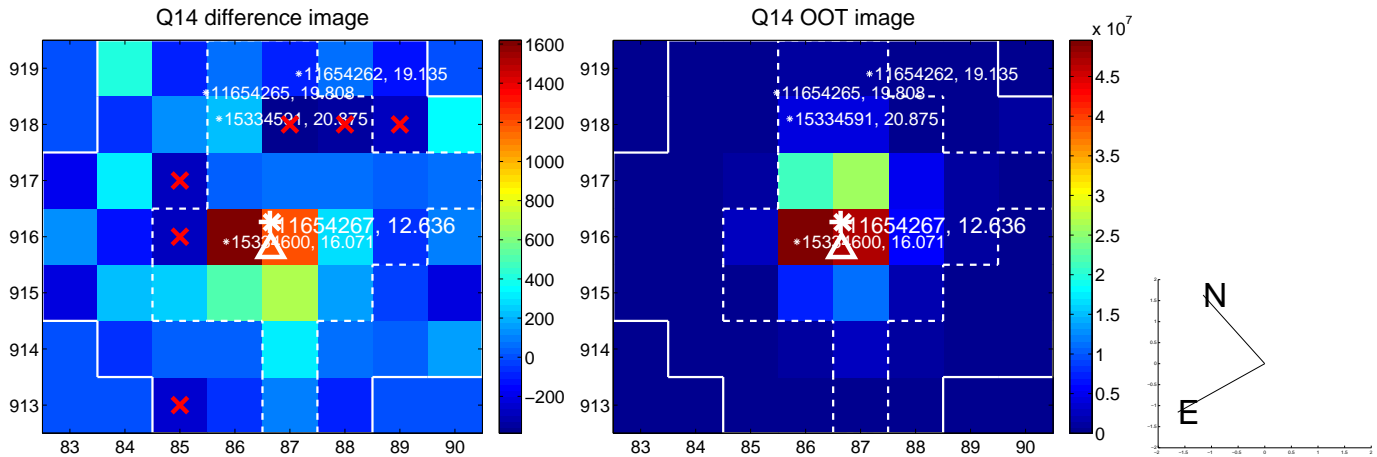
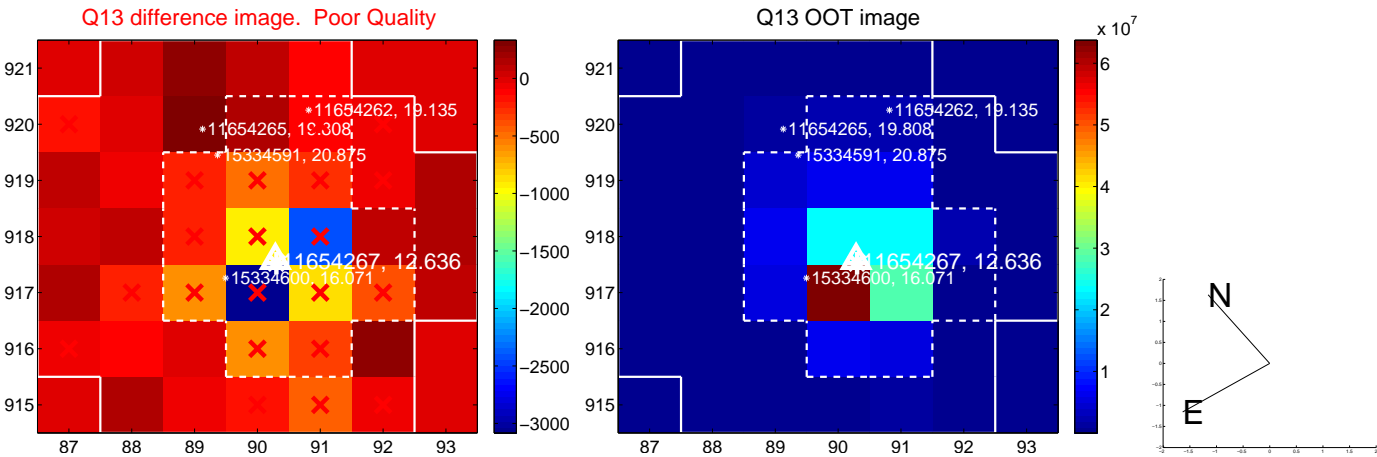


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

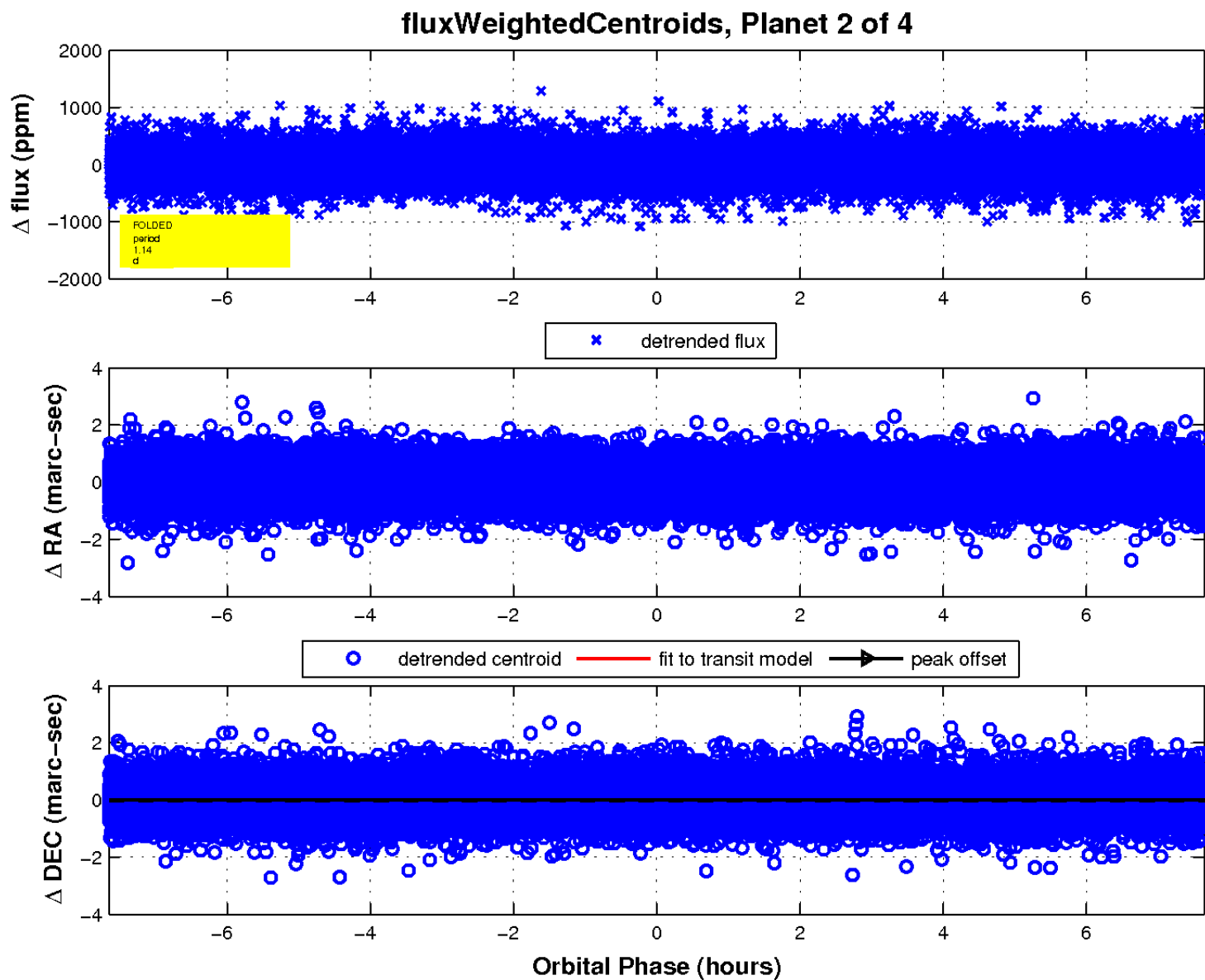
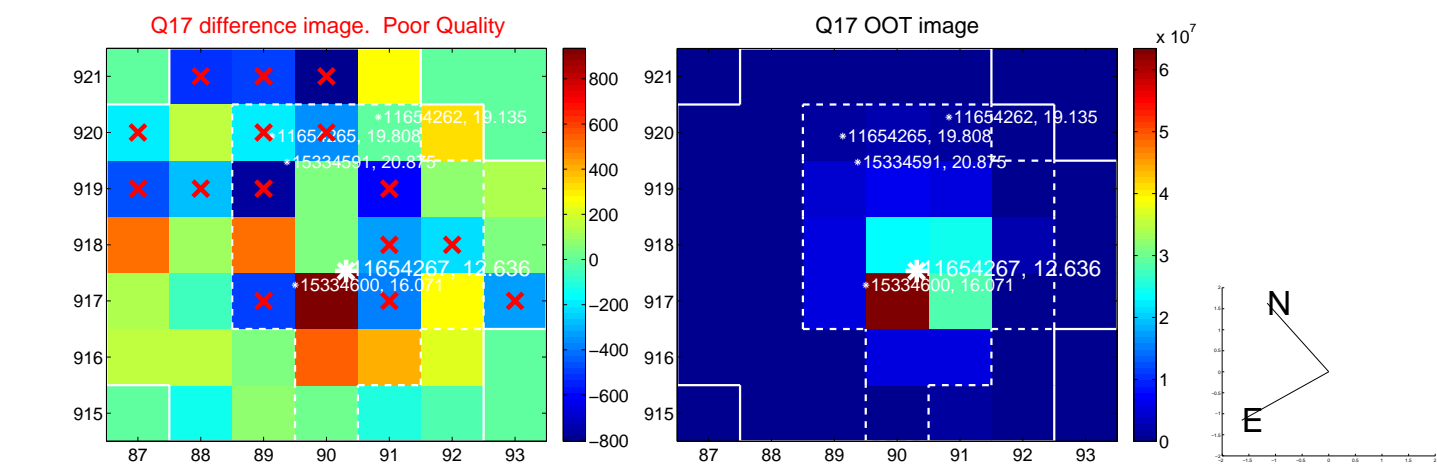




white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

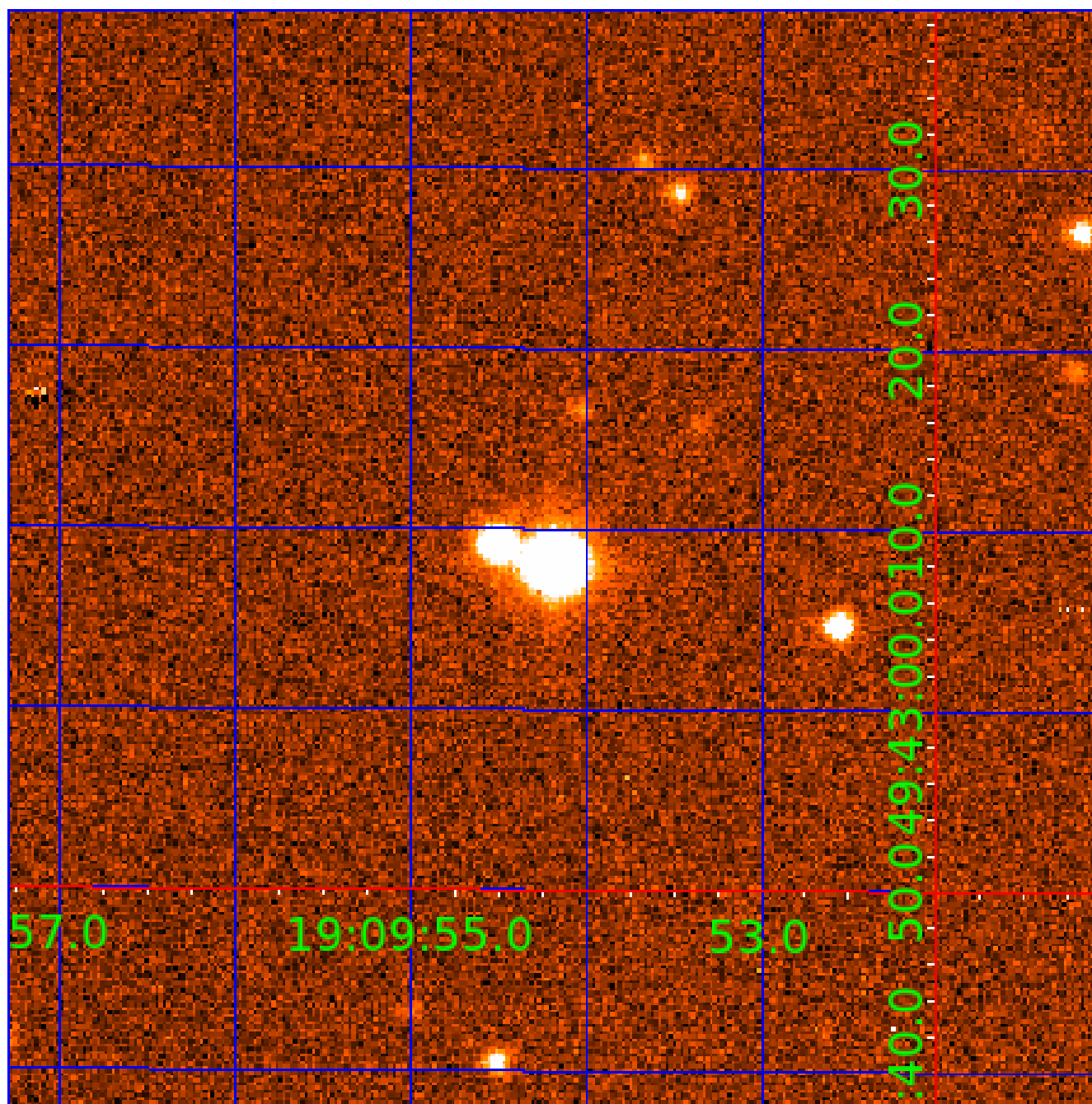


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011654267

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654267-01	OBS	No	4.069759	132.432957	62.8	9.078	9.4	9.8	1.86	7306	1.71	2665.75
011654267-02	OBS	No	1.137067	132.049167	30.3	2.551	8.5	6.3	1.86	7306	1.19	14594.72
011654267-03	OBS	No	177.402079	137.513000	628.0	5.671	7.7	7.4	1.86	7306	8.21	17.38
011654267-04	OBS	No	425.521579	532.462151	505.2	6.770	7.4	6.6	1.86	7306	4.56	5.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011654267-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
011654267-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
011654267-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011654267-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

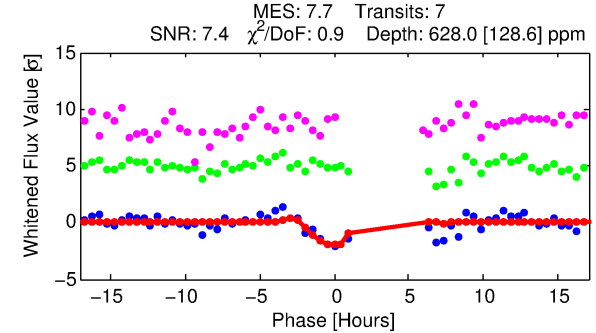
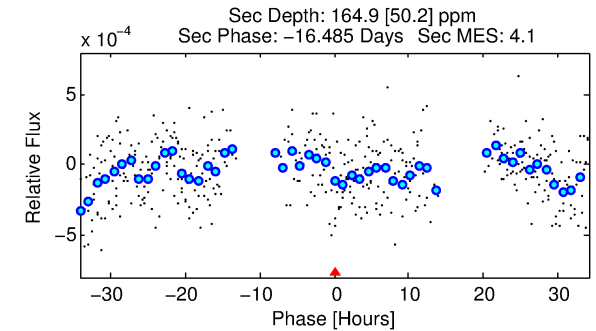
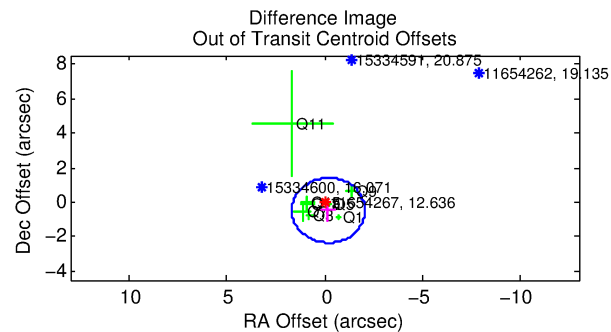
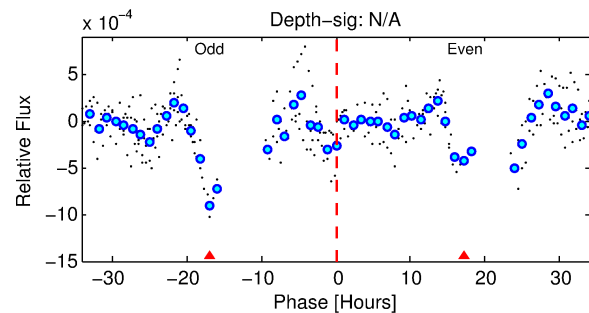
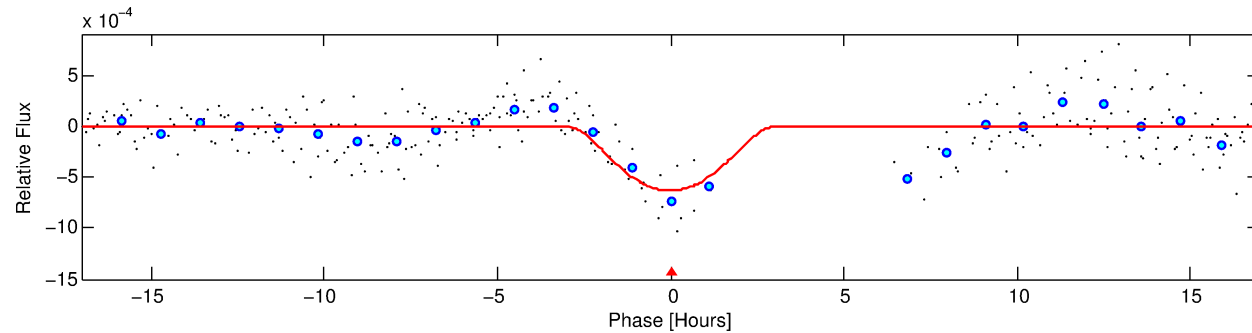
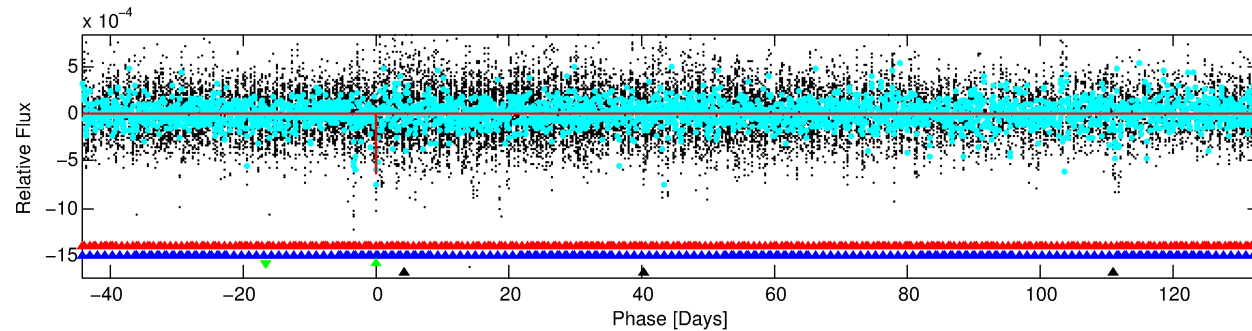
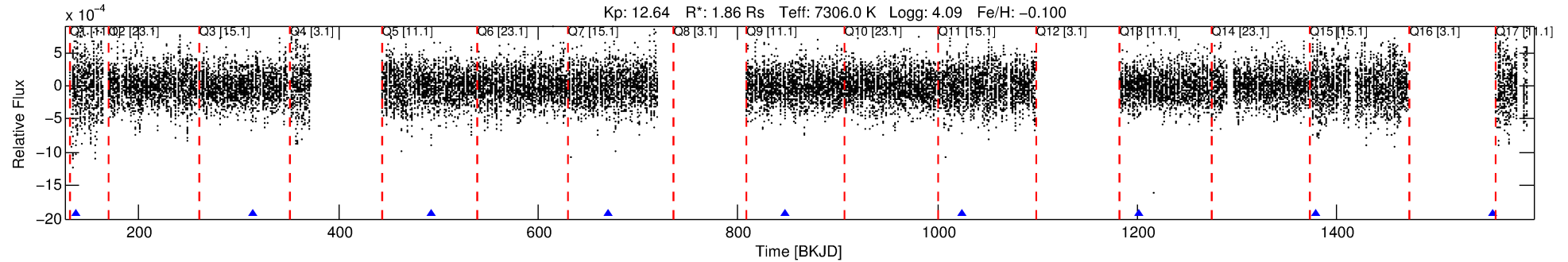
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011654267-03

No Significant Match Found

# DV One-Page Summary

KIC: 11654267 Candidate: 3 of 4 Period: 177.402 d



## DV Fit Results:

Period = 177.40208 [0.00374] d  
Epoch = 137.5130 [0.0274] BKJD  
Rp/R\* = 0.0404 [0.0932]  
a/R\* = 72.12 [40.48]  
b = 1.00 [0.15]  
Seff = 17.38 [6.42]  
Teq = 521 [48] K  
Rp = 8.21 [19.10] Re  
a = 0.7144 [0.1640] AU  
Ag = 686.80 [3186.72] [0.22σ]  
Teffp = 4121 [4772] K [0.75σ]

## DV Diagnostic Results:

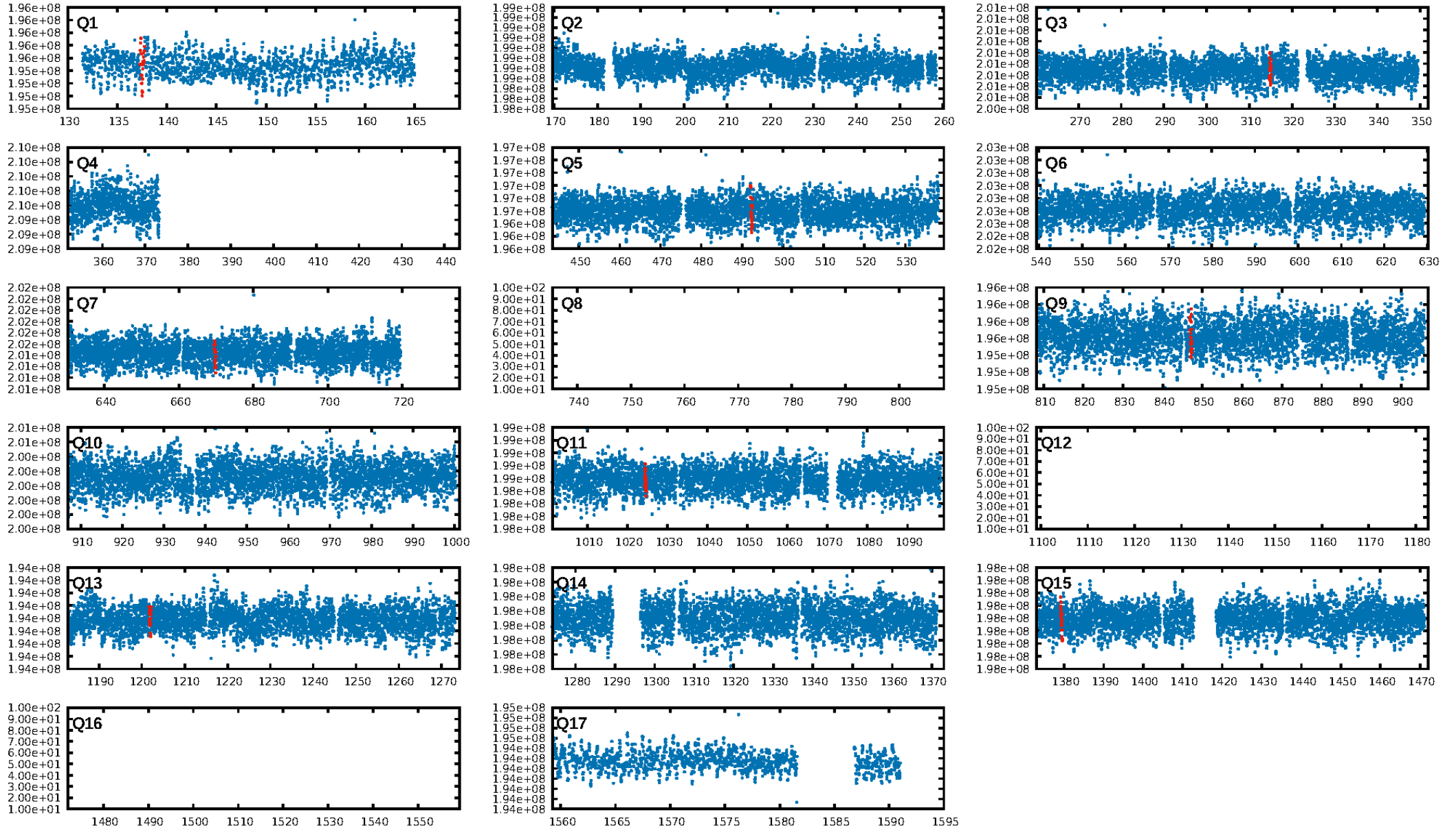
ShortPeriod-sig: 100.0% [388.65σ]  
LongPeriod-sig: 100.0% [674.29σ]  
ModelChiSquare2-sig: 67.5%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.10e-09**  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -3.323  
Centroid-sig: N/A  
Centroid-so: 0.474 arcsec [1.26σ]  
OotOffset-rm: 0.508 arcsec [0.81σ]  
OotOffset-st: 0/4/0/4 [8]  
KicOffset-rm: 0.483 arcsec [0.87σ]  
KicOffset-st: 0/4/0/4 [8]  
DiffImageQuality-fgm: 0.62 [5/8]  
DiffImageOverlap-fno: 0.00 [0/8]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:07:18 Z

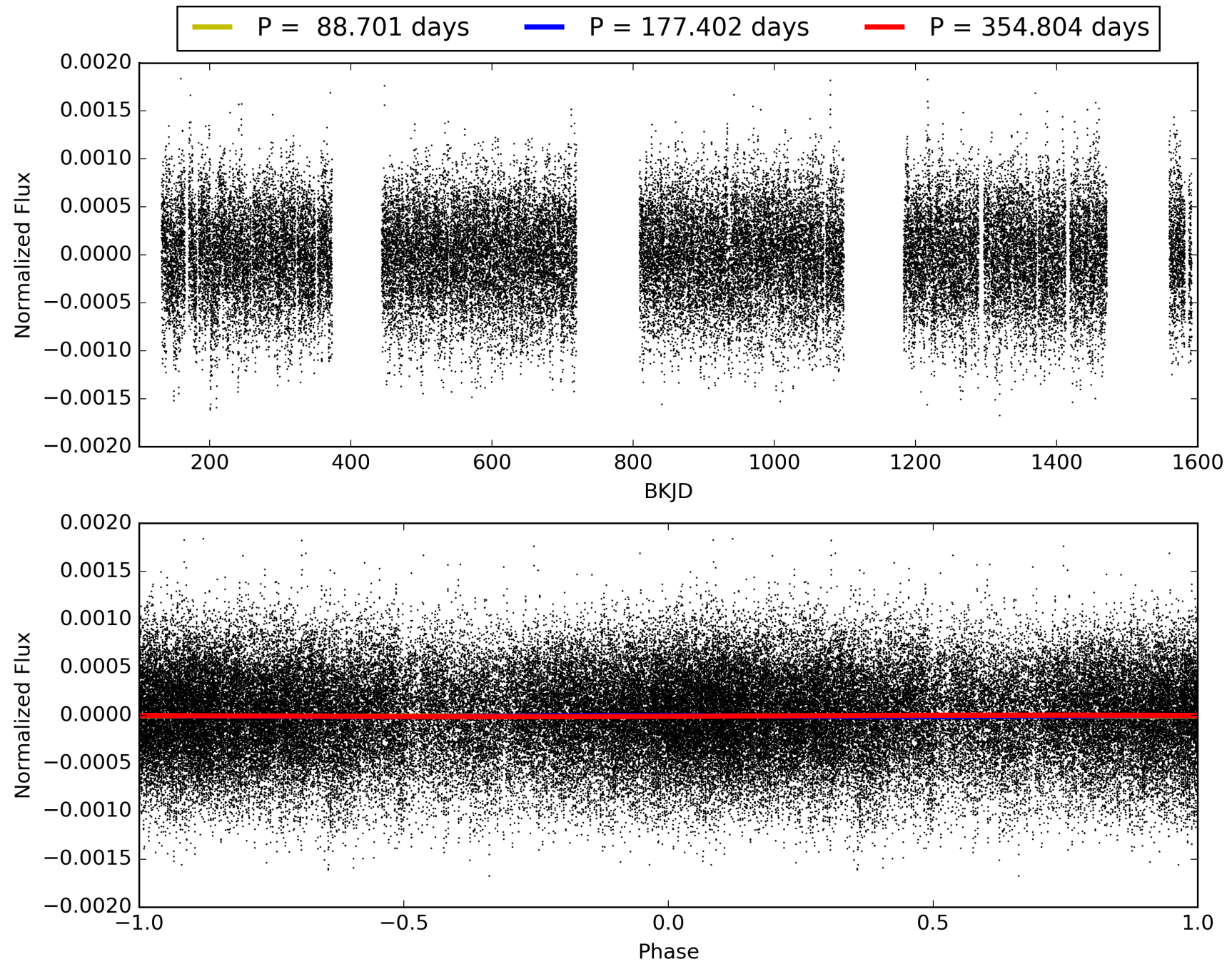
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 011654267-03, PDC Light Curves

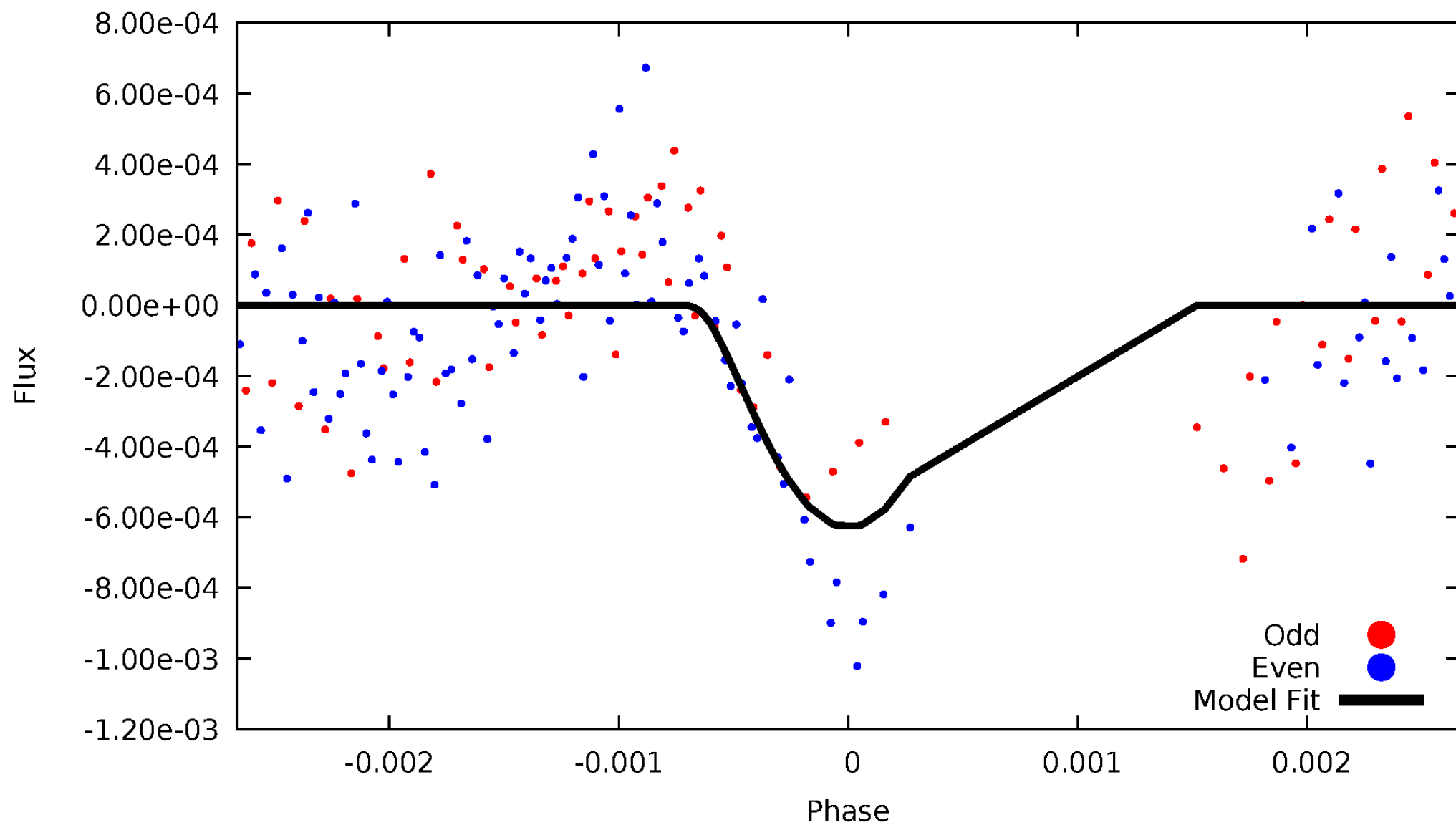


TCE 011654267-03



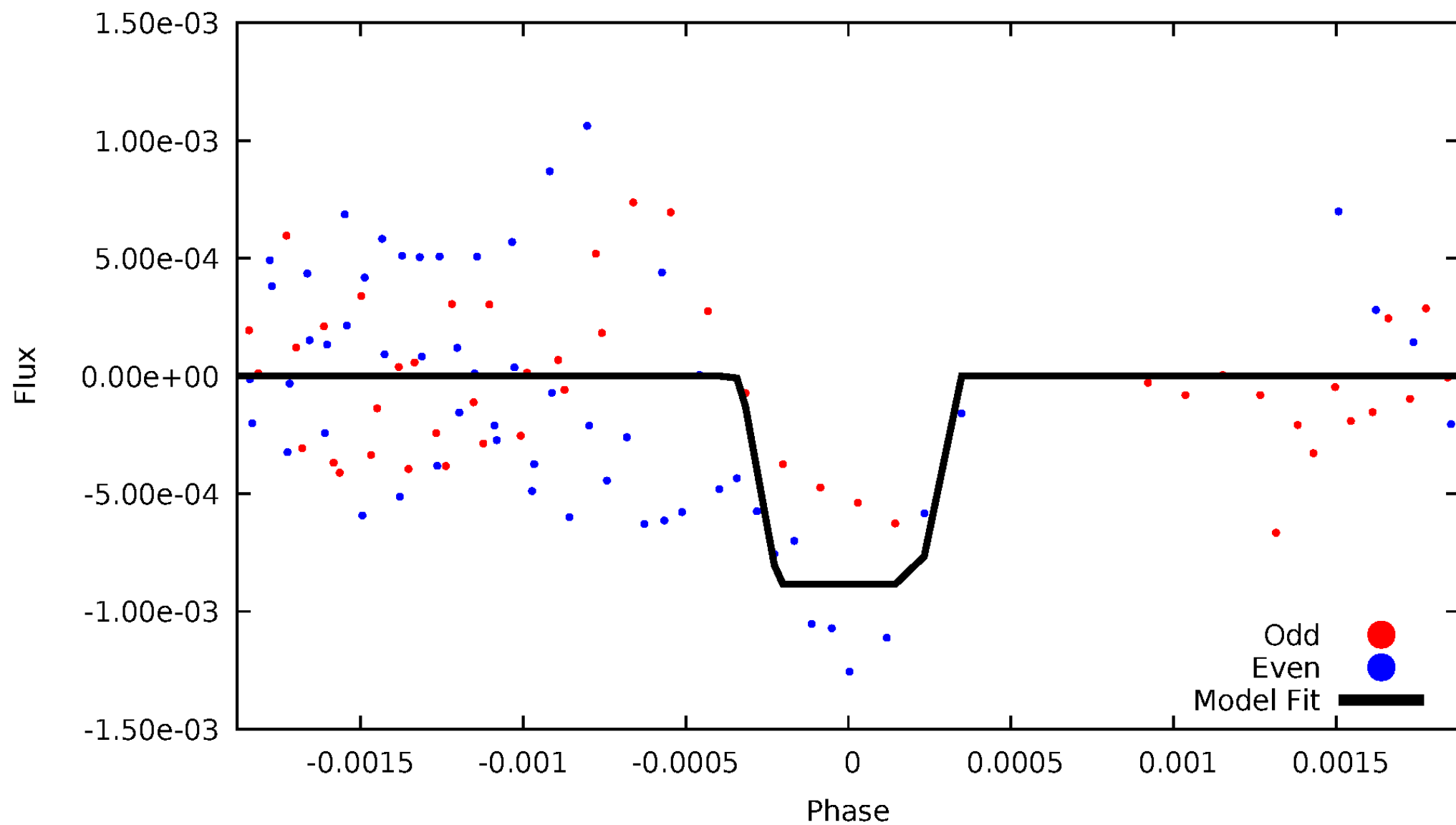
# DV Odd/Even

TCE 011654267-03



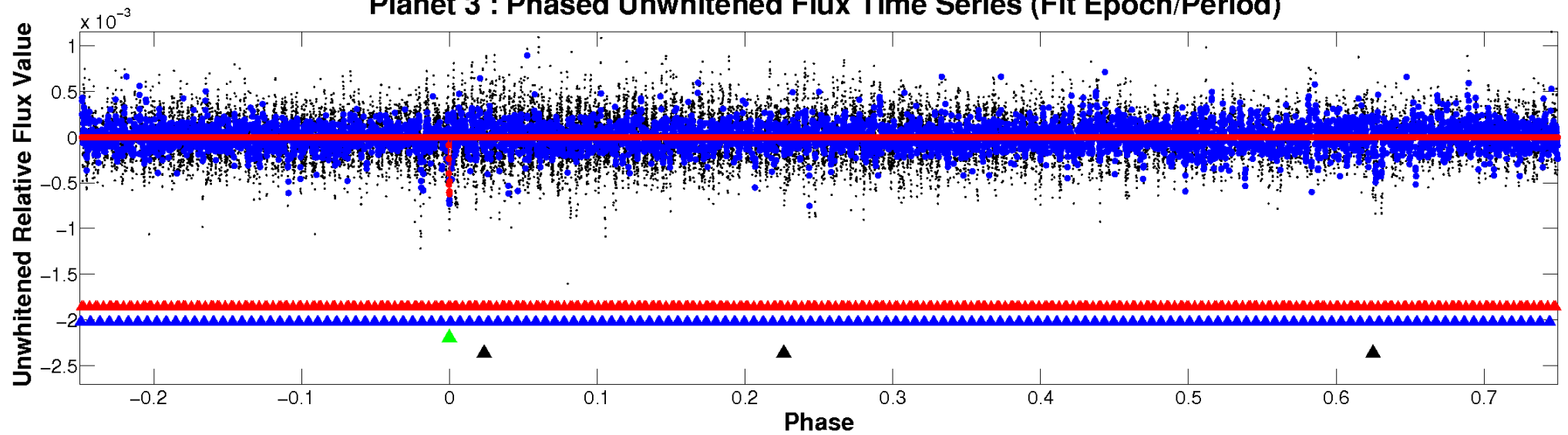
# ALT Odd/Even

TCE 011654267-03

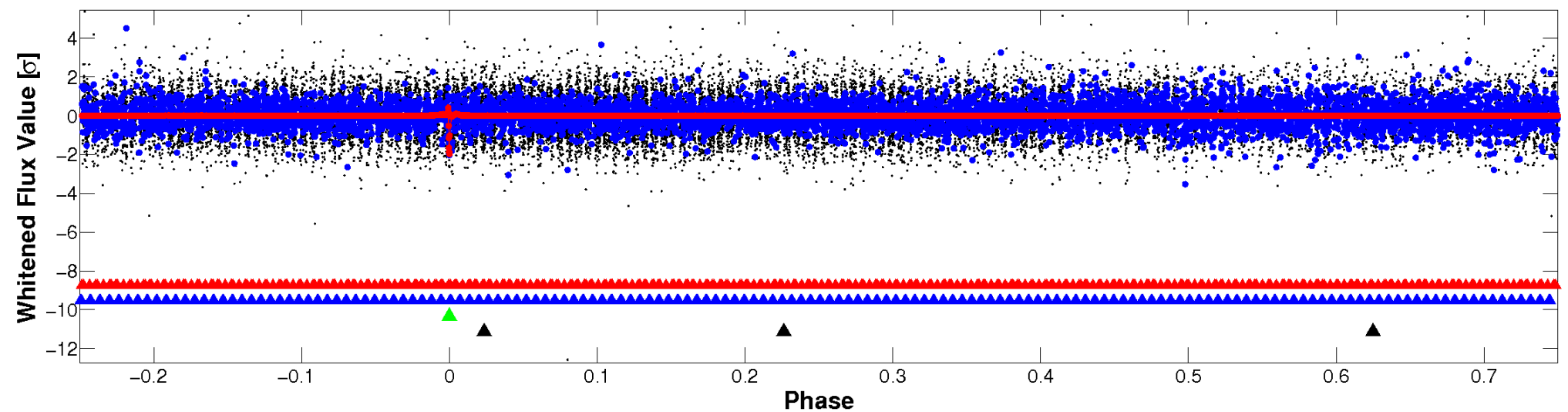


# Non-Whitened Vs. Whitened Light Curve

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



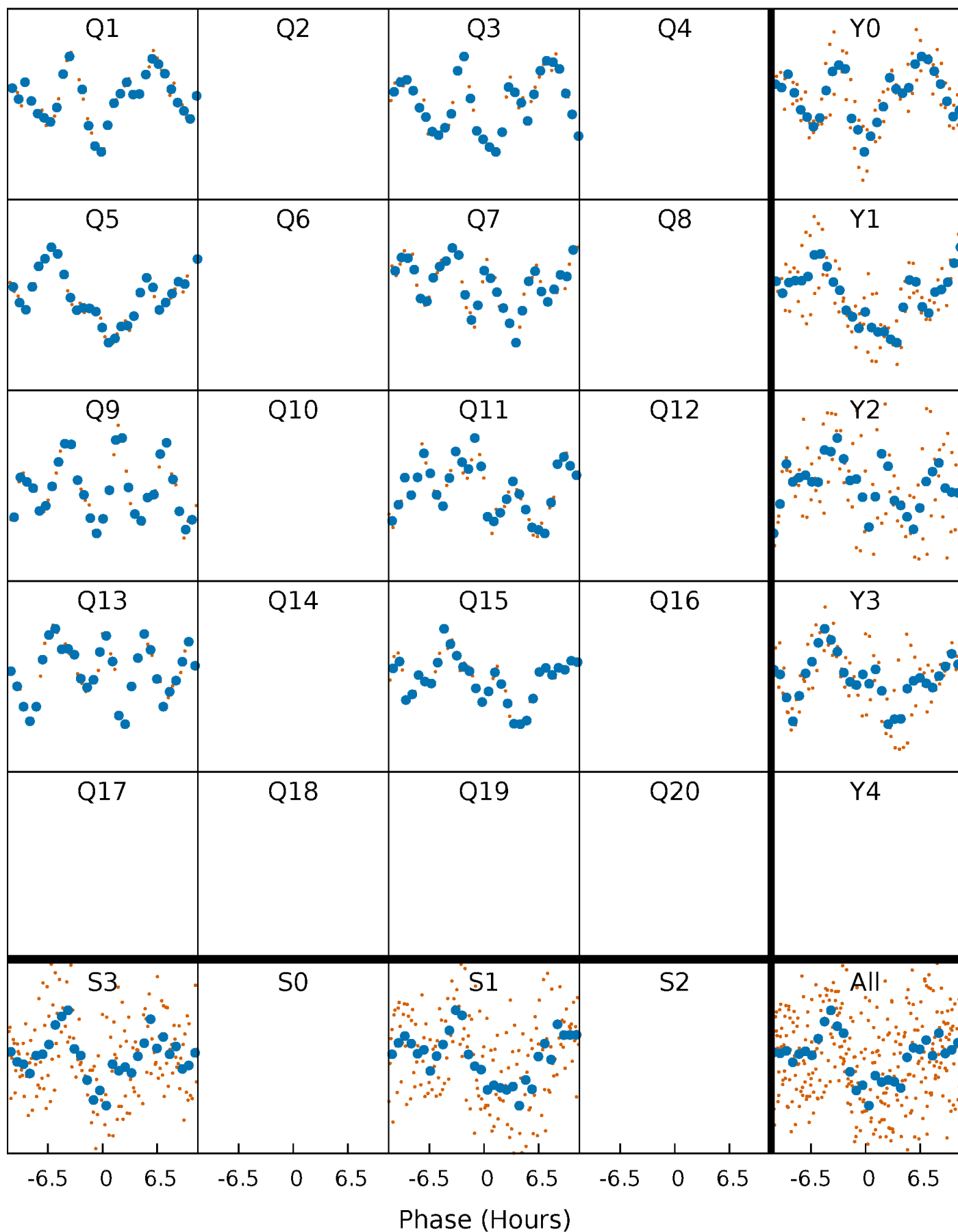
Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)





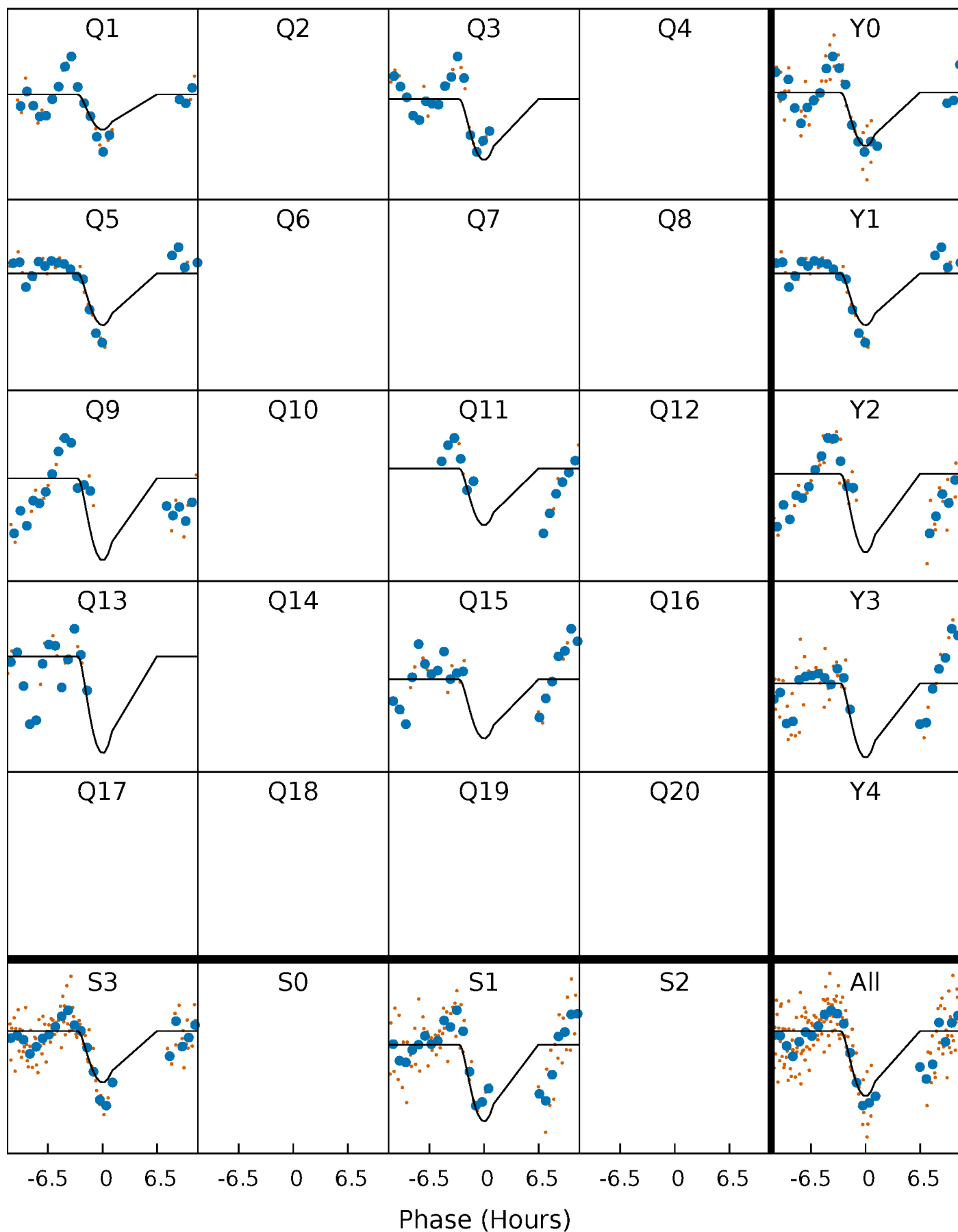
# PDC Quarter-Phased Transit Curves

TCE 011654267-03     $P=177.402079$  Days     $T_0=137.513000$  (BKJD)



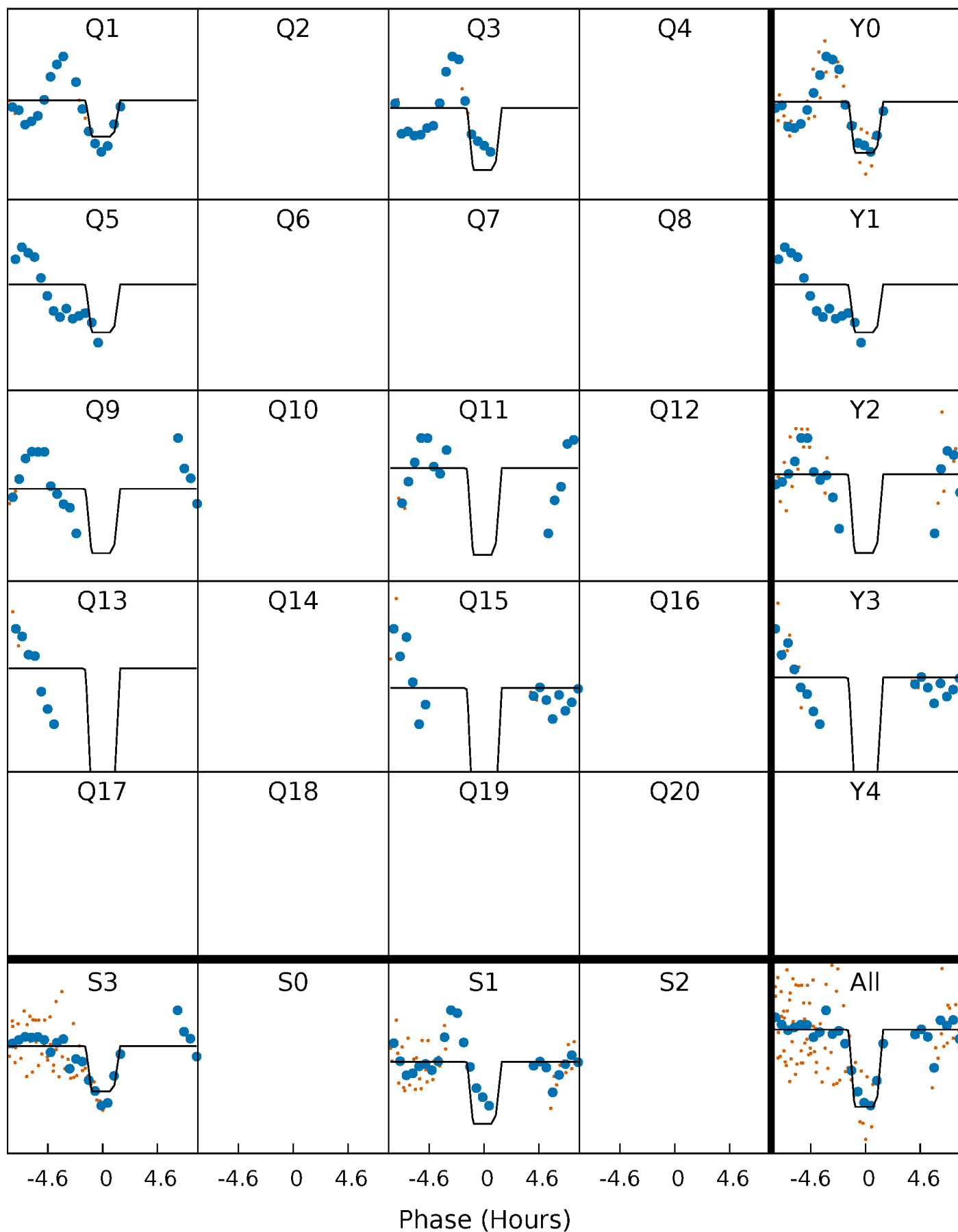
# DV Quarter-Phased Transit Curves

TCE 011654267-03     $P=177.402079$  Days     $T_0=137.513000$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

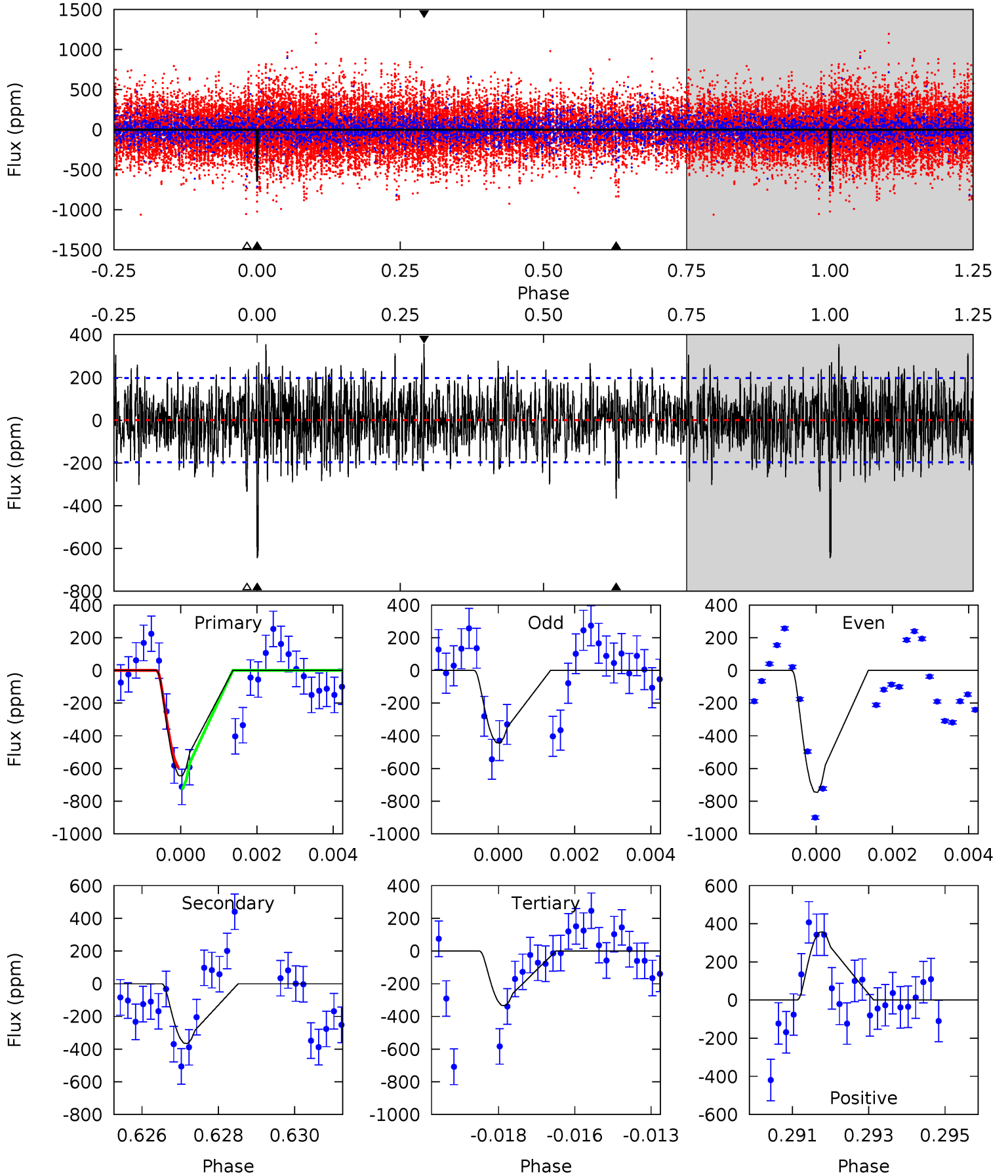
TCE 011654267-03 P=177.419264 Days  $T_0=137.498944$  (BKJD)



# DV Model-Shift Uniqueness Test

011654267-03, P = 177.402079 Days, E = 137.513000 Days

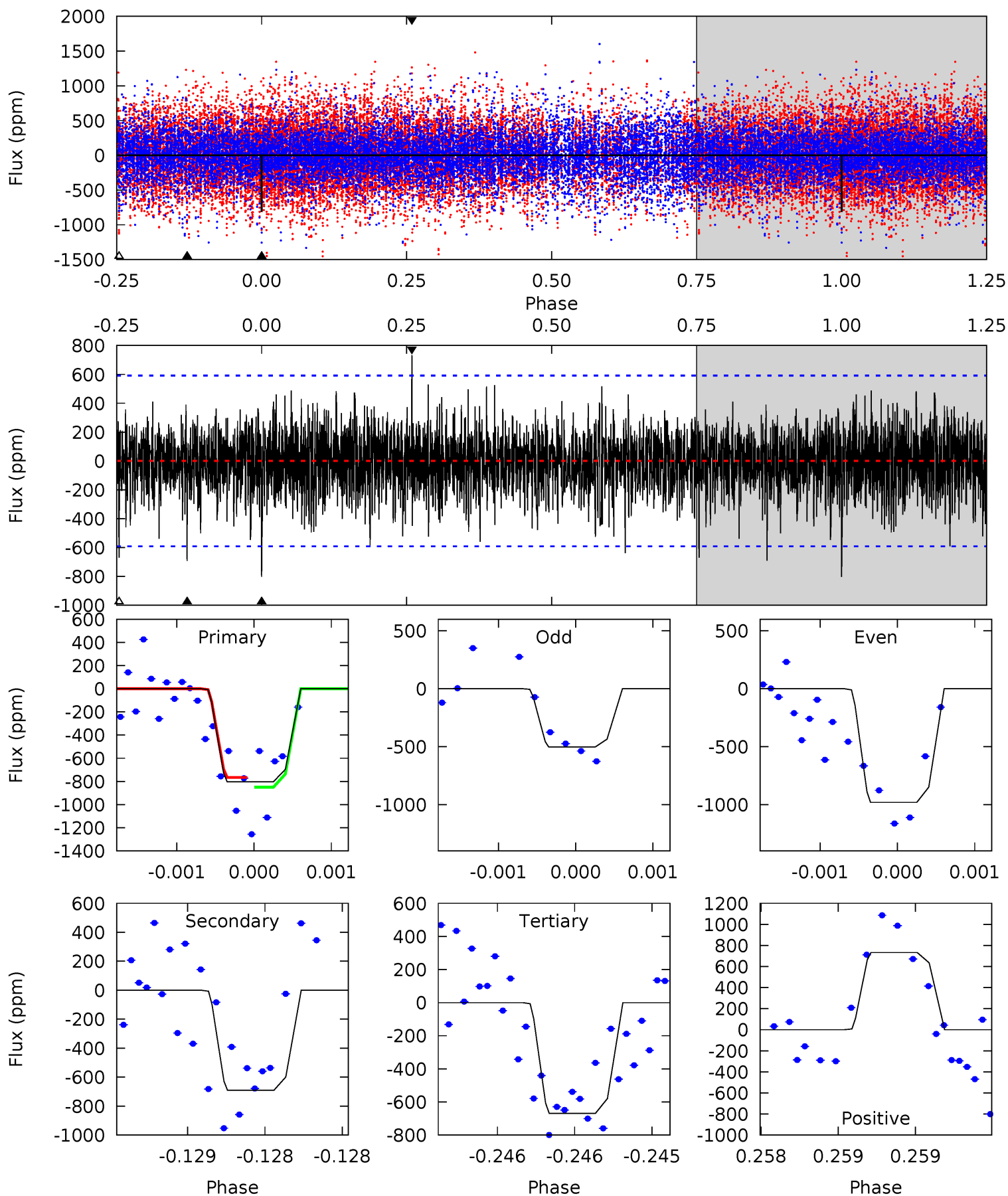
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.4	9.85	9.01	9.61	5.31	3.06	2.62	8.39	7.78	0.84	0.24	3.89	0.63	0.36	1.26



# Alt Model-Shift Uniqueness Test

011654267-03, P = 177.419264 Days, E = 137.498944 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
7.54	6.49	6.28	6.88	5.55	3.44	1.45	1.26	0.66	0.22	-0.39	2.21	0.88	0.48	0.37





### Stellar Parameters For KIC 011654267

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7306^{+228}_{-330}$	$4.086^{+0.170}_{-0.170}$	$-0.100^{+0.200}_{-0.350}$	$1.864^{+0.528}_{-0.432}$	$1.542^{+0.211}_{-0.257}$	$0.336^{+0.316}_{-0.164}$
	+3%/-5%	+4%/-4%	+200%/-350%	+28%/-23%	+14%/-17%	+94%/-49%
Source	KIC0	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 011654267-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-365 \pm 37$	$16.35^{+16.27}_{-11.37}$	$724^{+55}_{-51}$	$3879^{+2333}_{-782}$	$395^{+3616}_{-297}$
Alt.	$-691 \pm 107$	$15.66^{+15.83}_{-10.62}$	$726^{+60}_{-50}$	$4424^{+3153}_{-944}$	$793^{+6917}_{-600}$

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

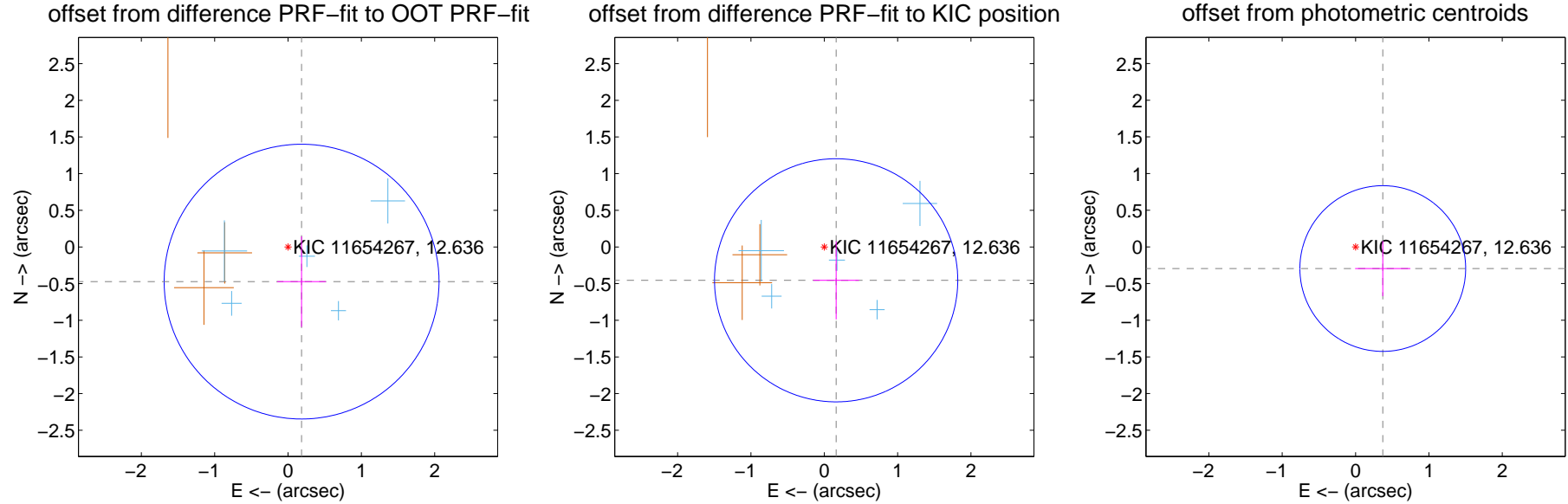
## DV Centroid Data

Supplemental centroid analysis for 011654267-03. Kepler magnitude: 12.64. Transit SNR 7.43

There are 5 quarters with good PRF difference image offsets

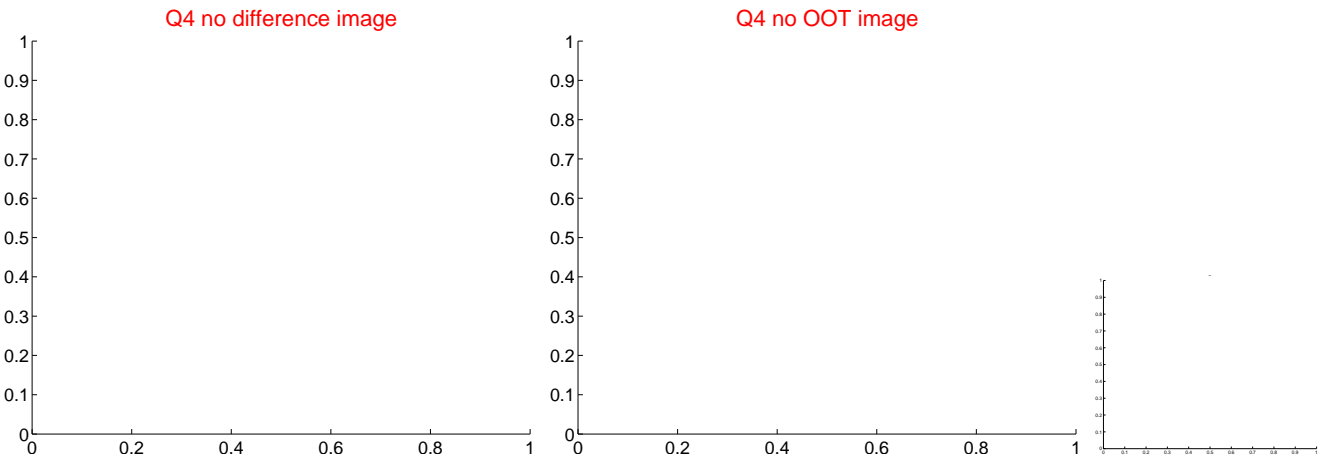
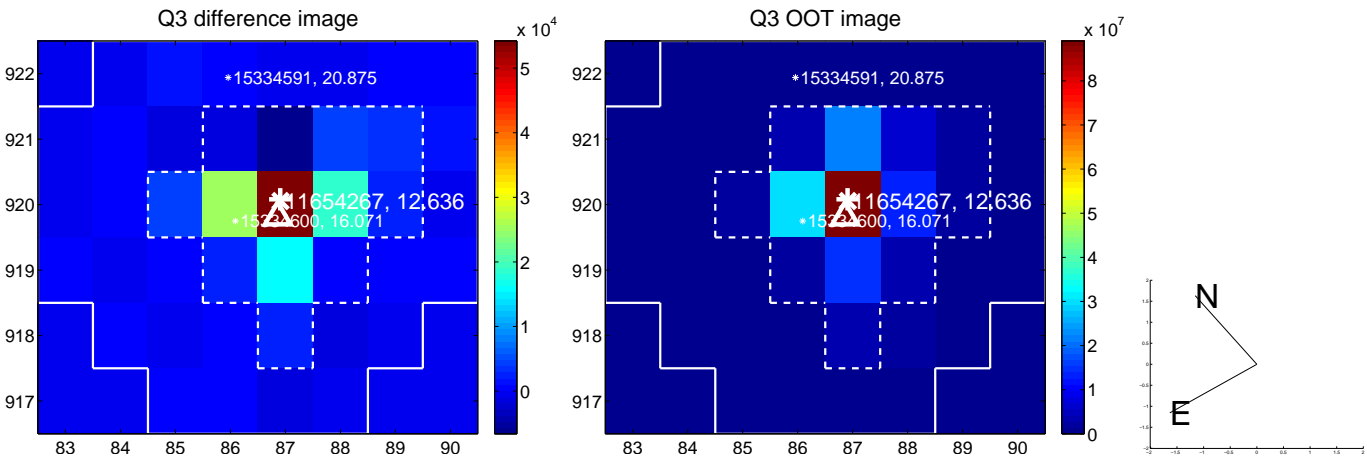
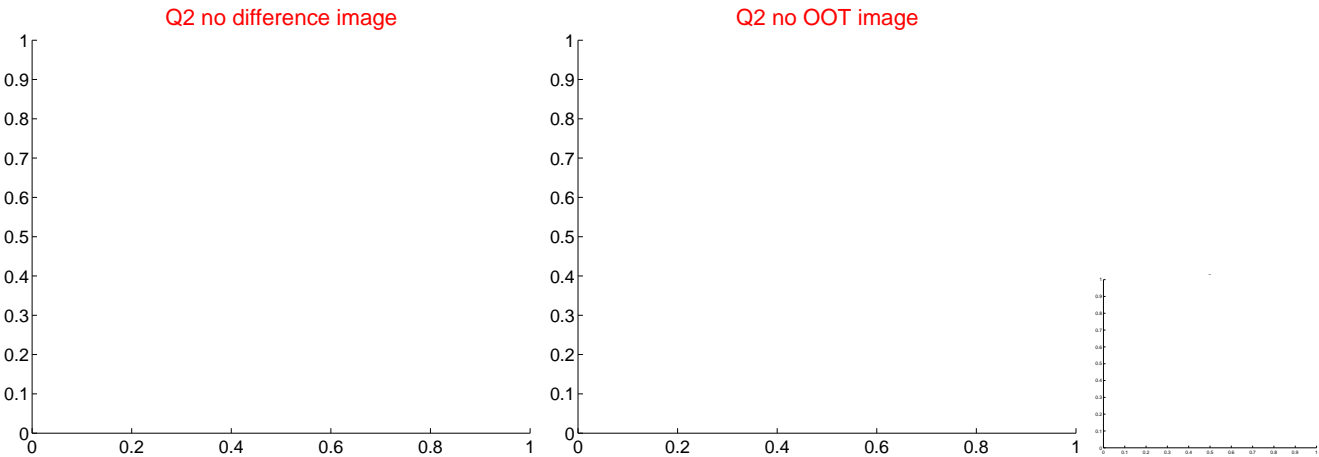
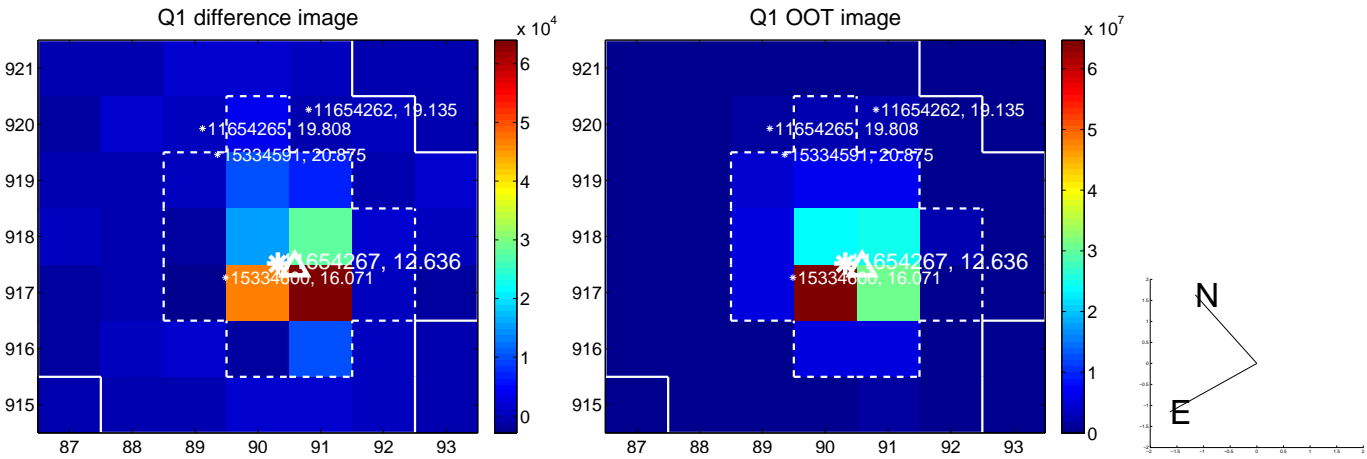
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.508 \pm 0.625$	0.81	$-0.185 \pm 0.333$	$-0.473 \pm 0.617$
PRF-fit source offset from KIC position	$0.483 \pm 0.553$	0.87	$-0.161 \pm 0.312$	$-0.455 \pm 0.533$
photometric centroid source offset	$0.47 \pm 0.38$	1.26	$-0.37 \pm 0.38$	$-0.30 \pm 0.38$

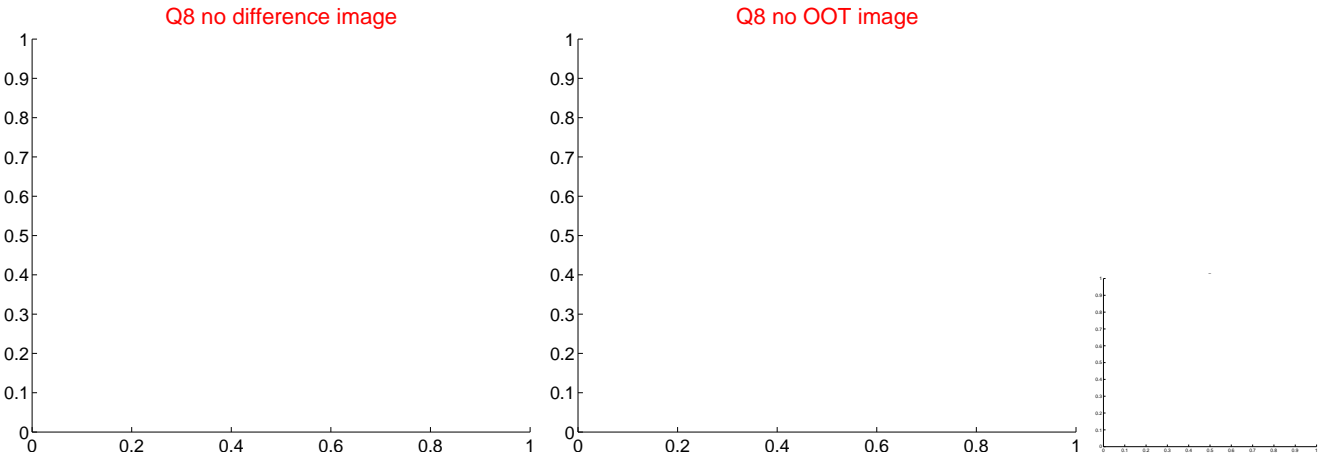
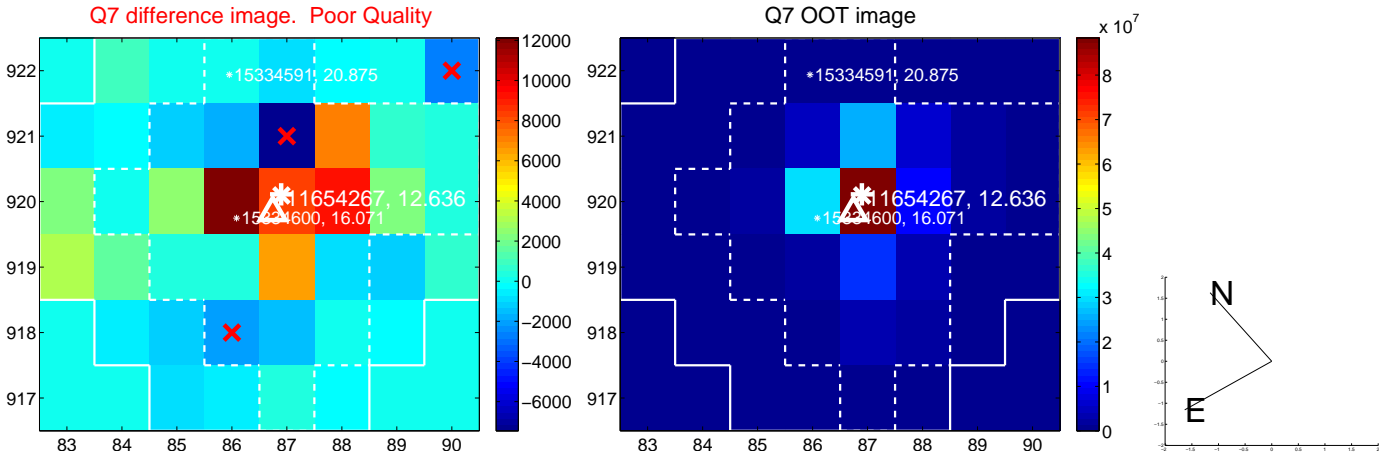
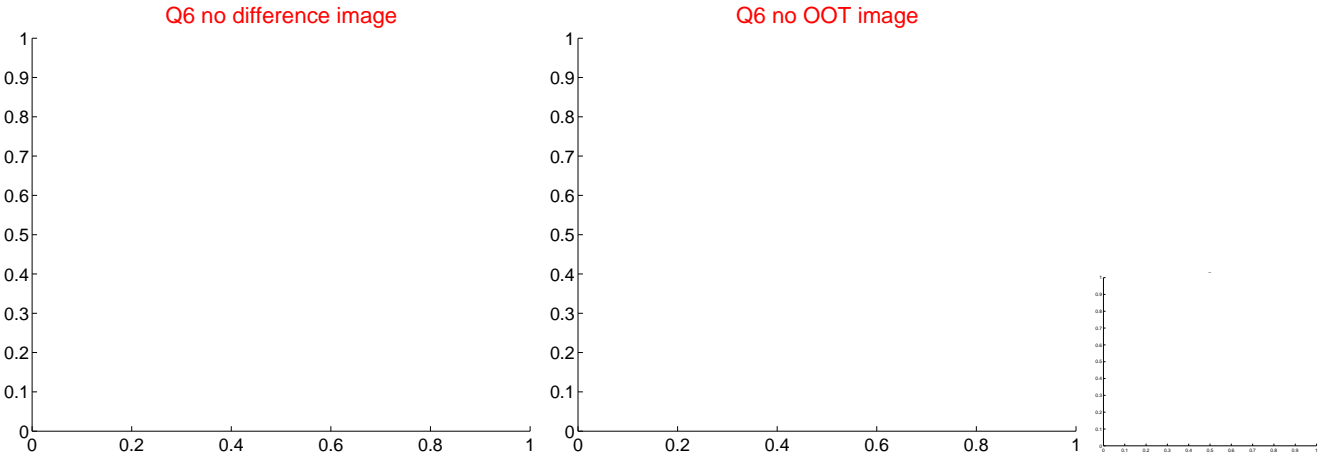
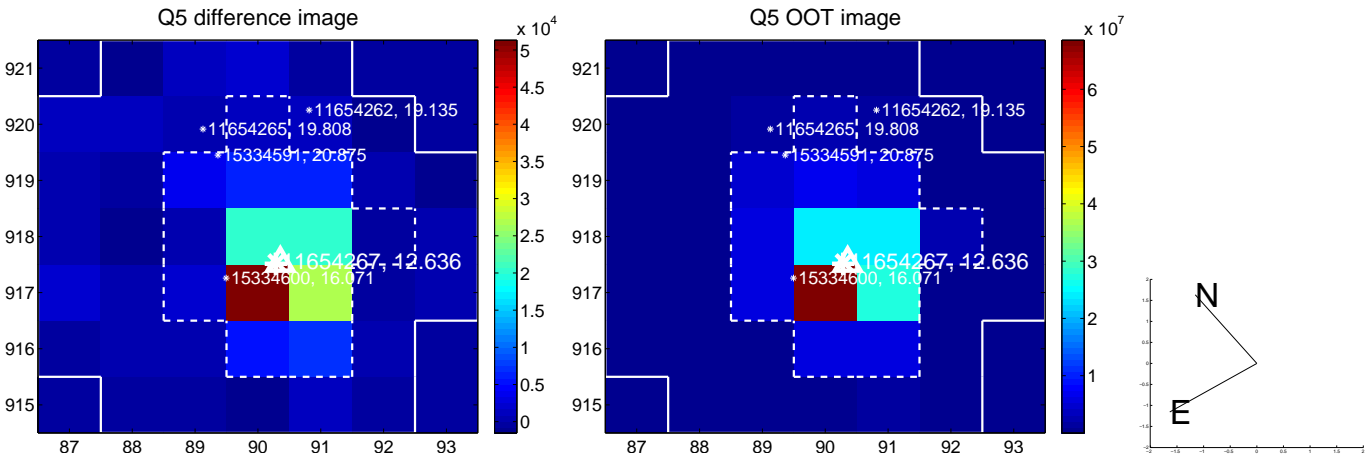


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

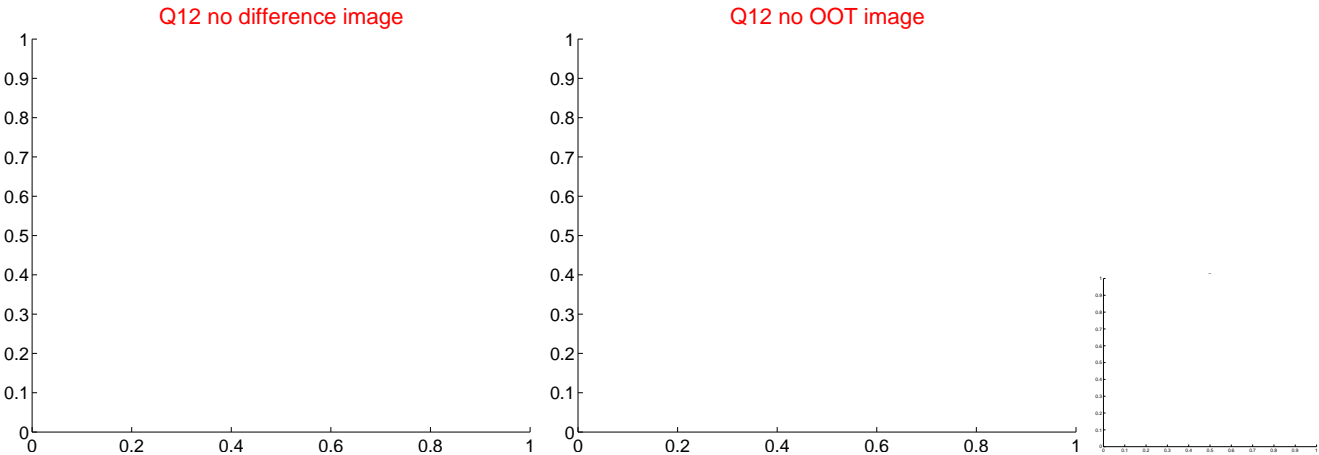
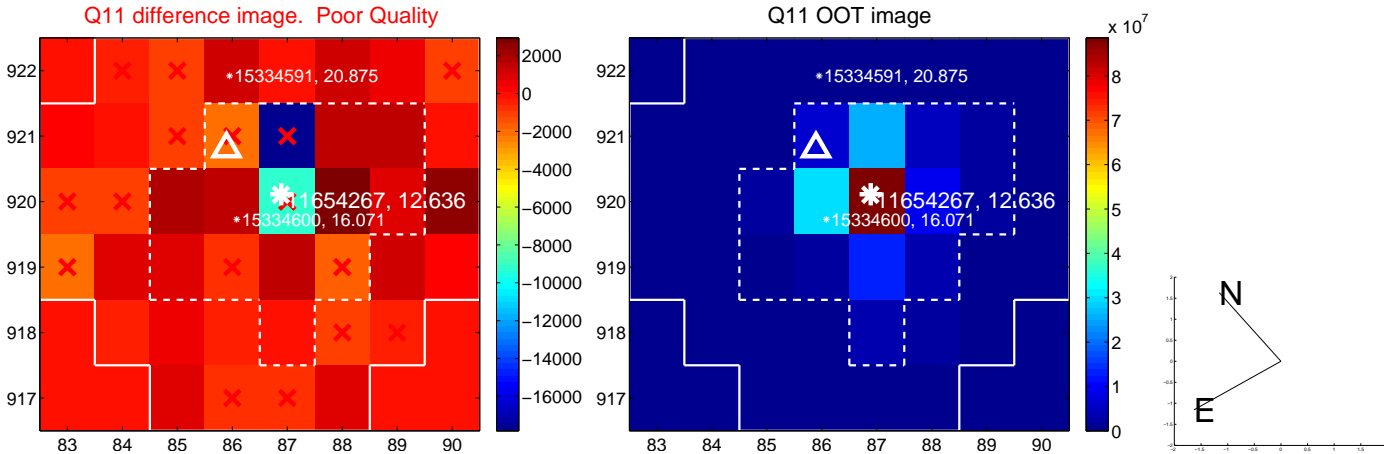
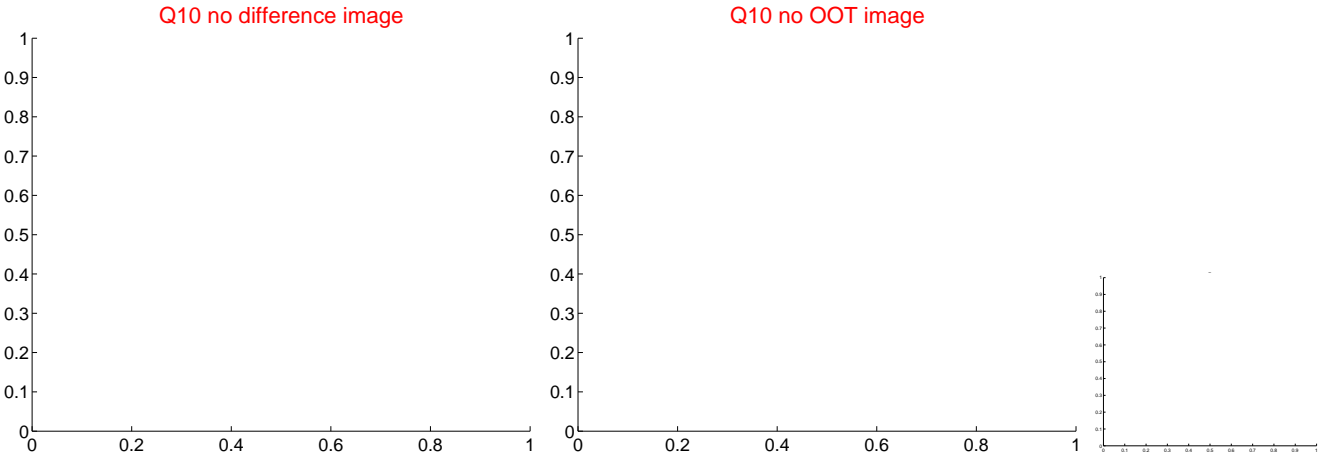
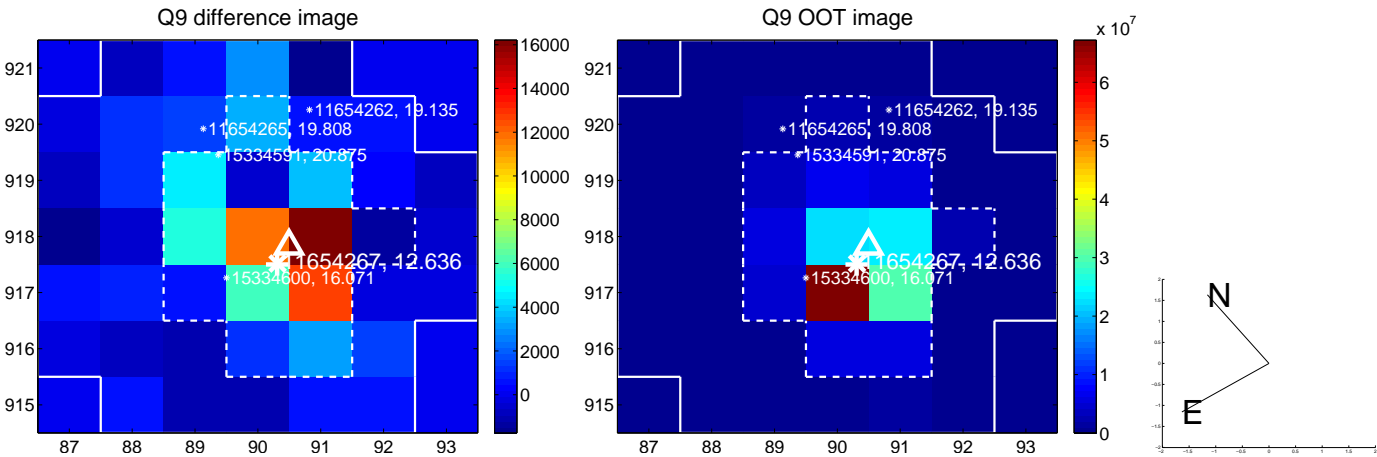
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

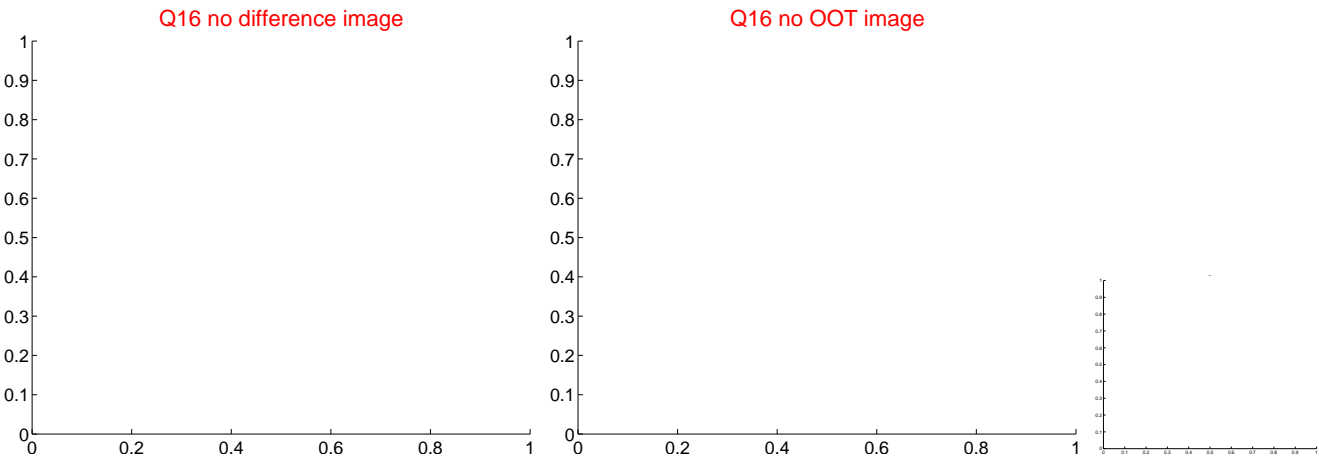
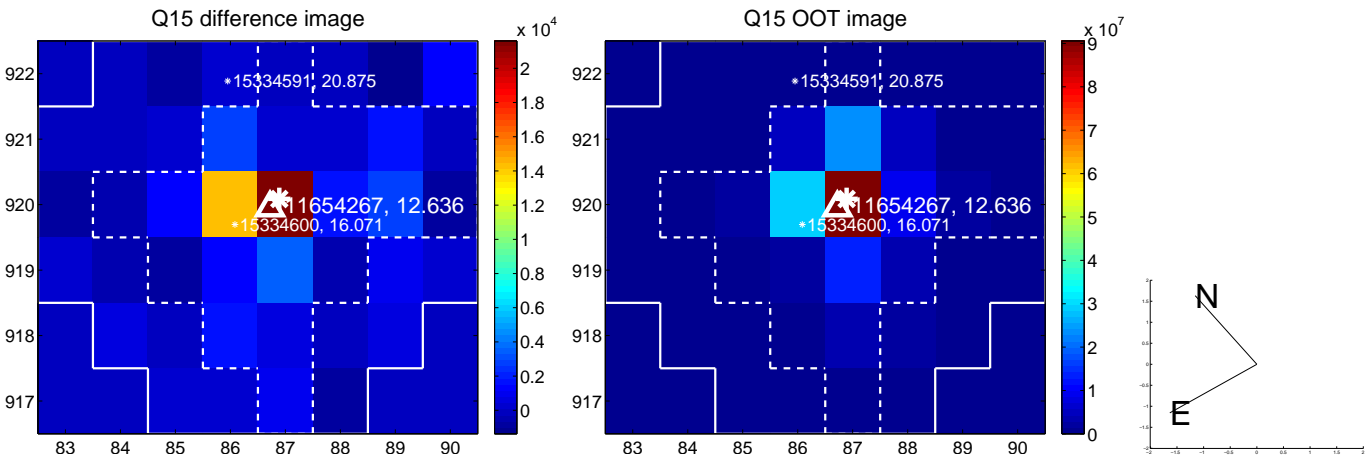
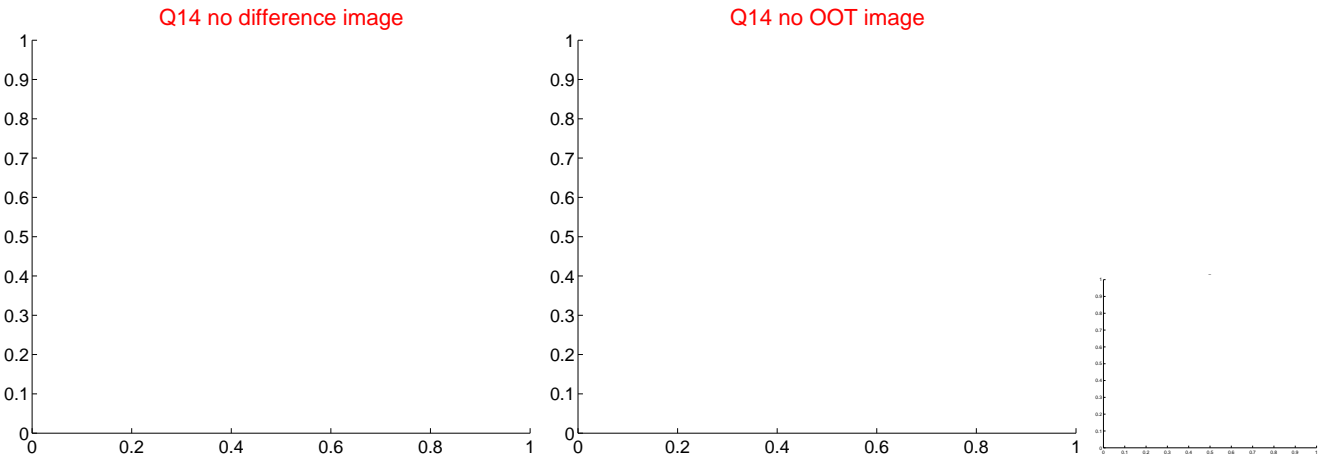
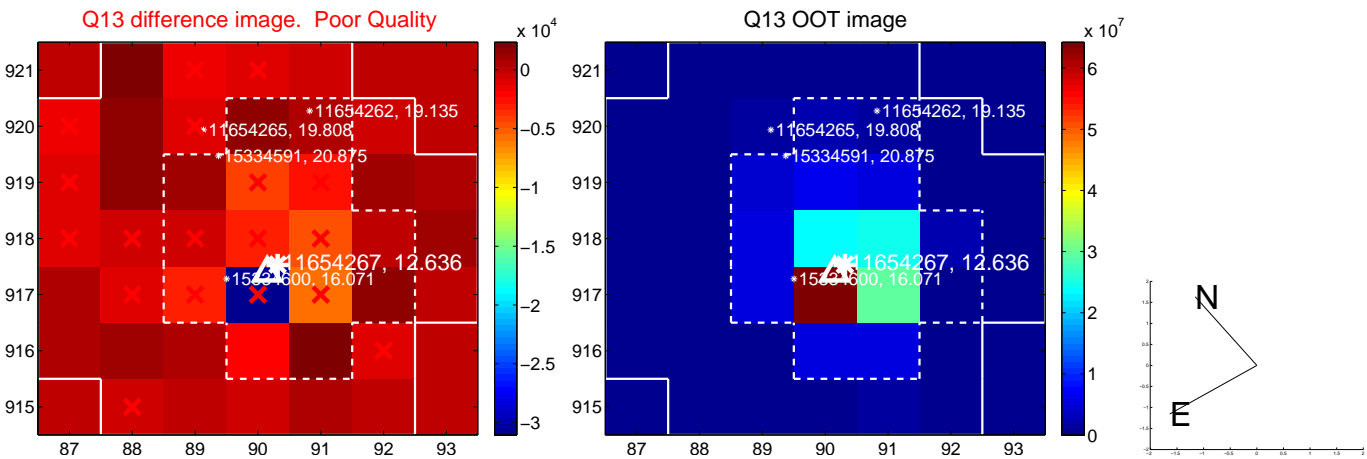


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

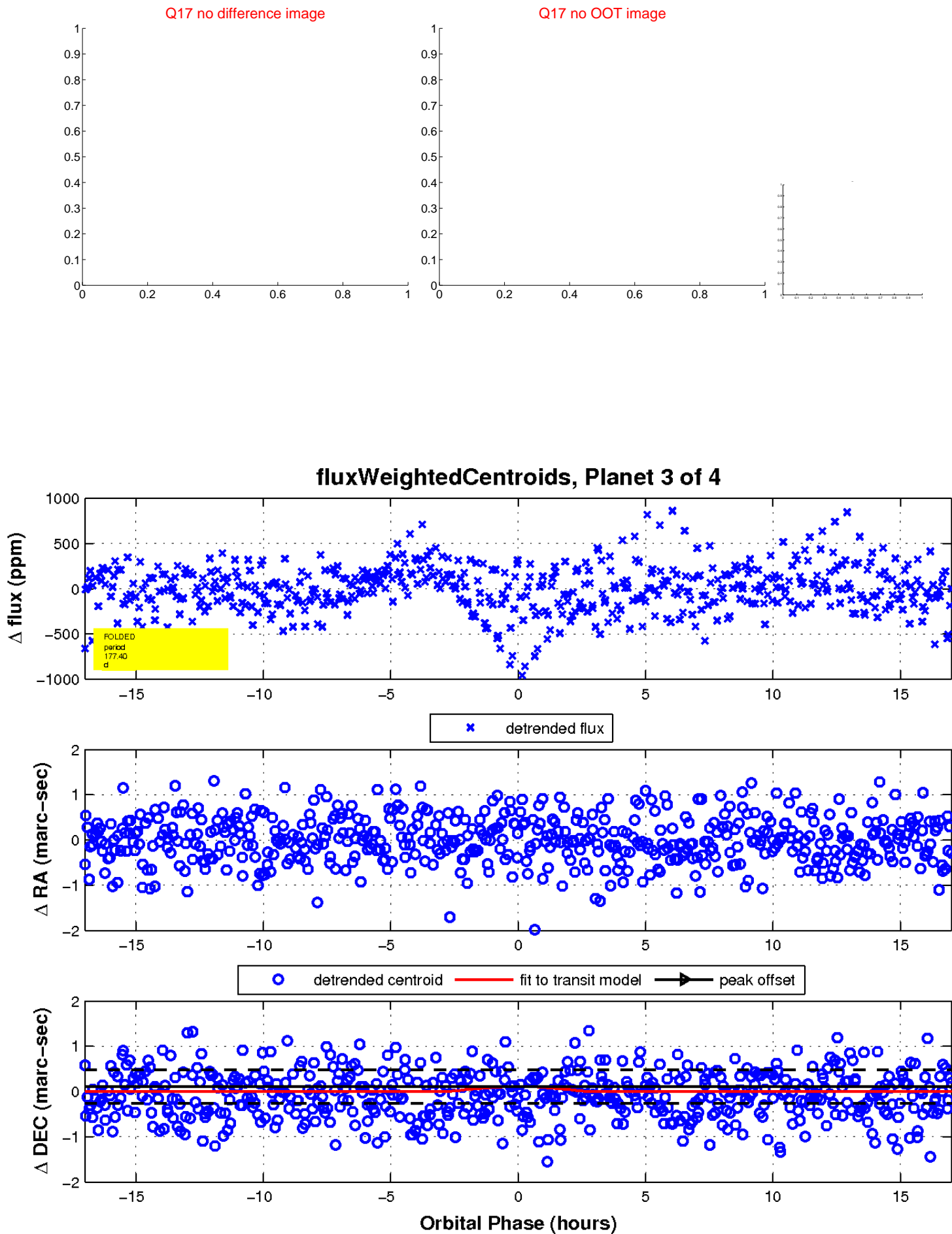




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

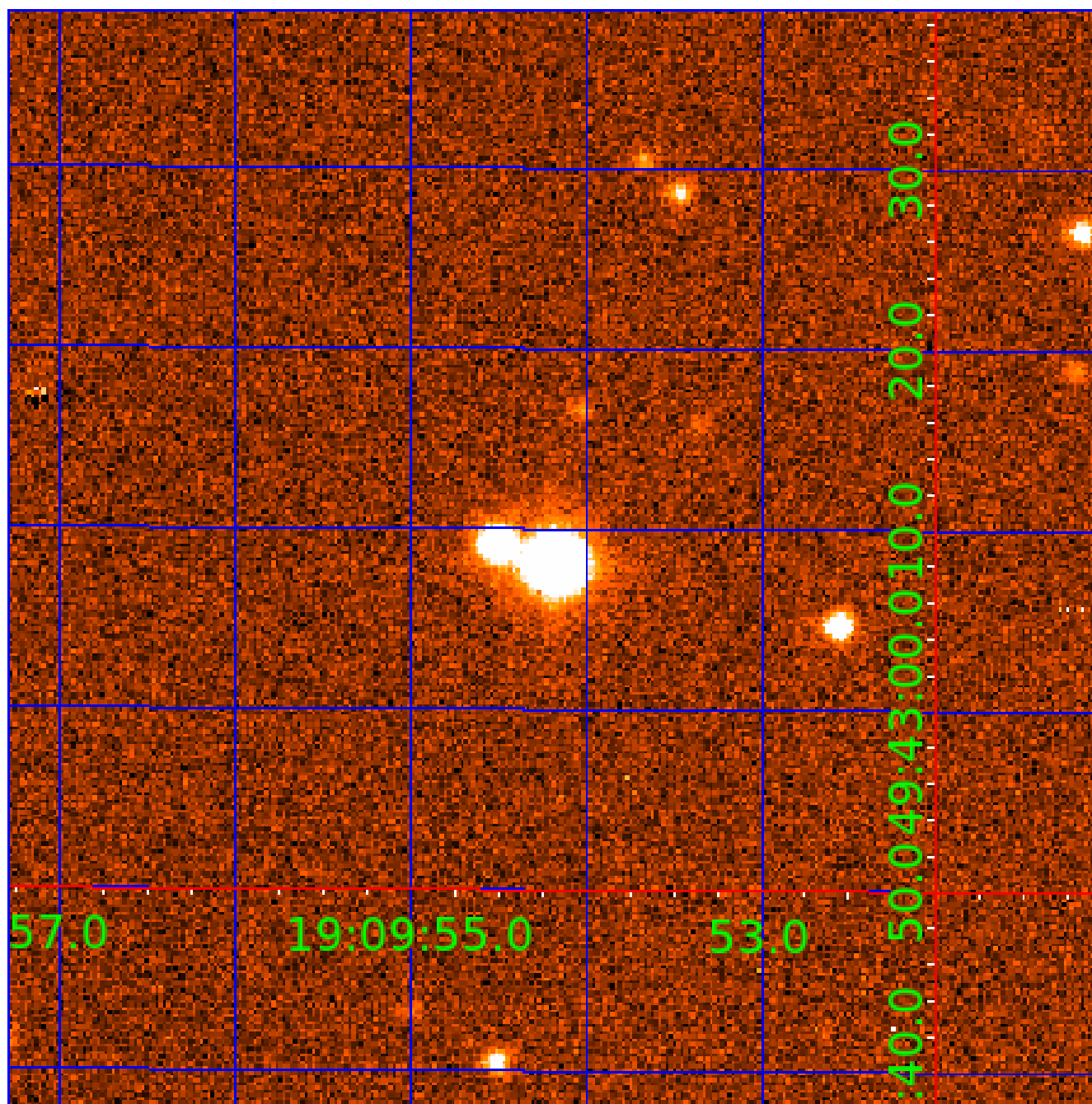


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 011654267

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
011654267-01	OBS	No	4.069759	132.432957	62.8	9.078	9.4	9.8	1.86	7306	1.71	2665.75
011654267-02	OBS	No	1.137067	132.049167	30.3	2.551	8.5	6.3	1.86	7306	1.19	14594.72
011654267-03	OBS	No	177.402079	137.513000	628.0	5.671	7.7	7.4	1.86	7306	8.21	17.38
011654267-04	OBS	No	425.521579	532.462151	505.2	6.770	7.4	6.6	1.86	7306	4.56	5.41

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
011654267-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
011654267-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
011654267-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
011654267-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_POS_ALT—INCONSISTENT_TRANS

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

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

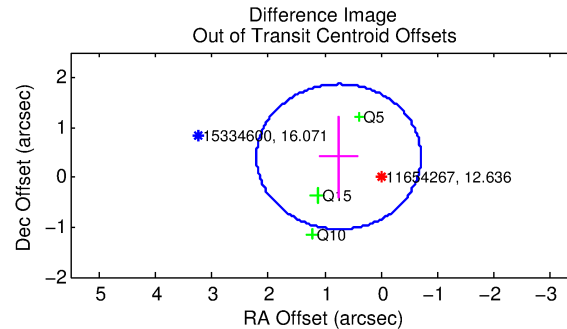
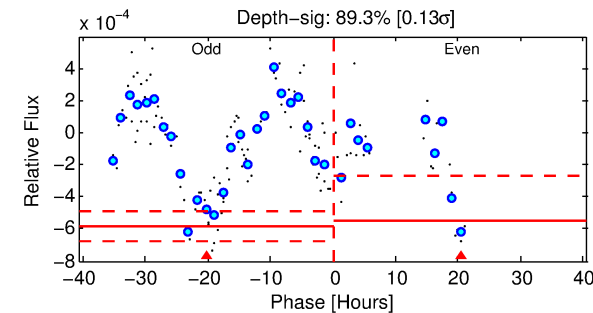
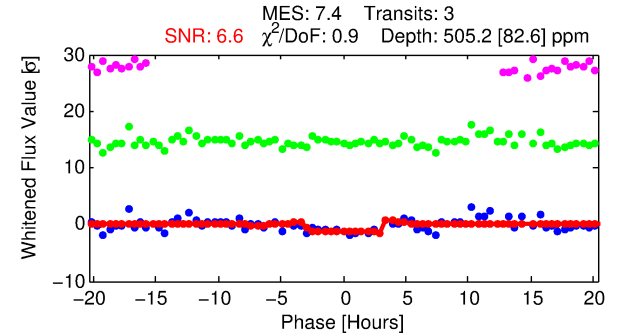
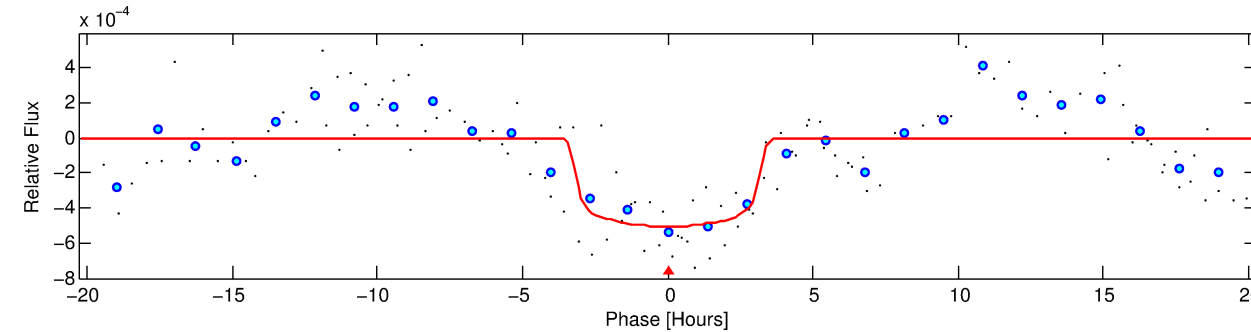
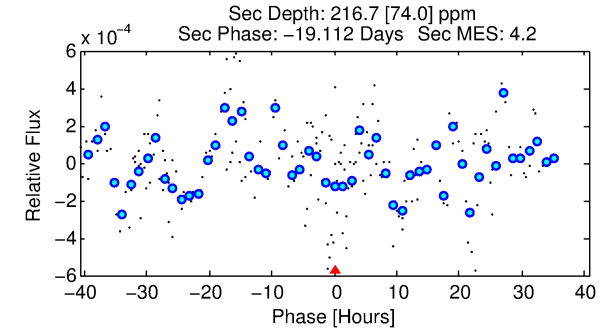
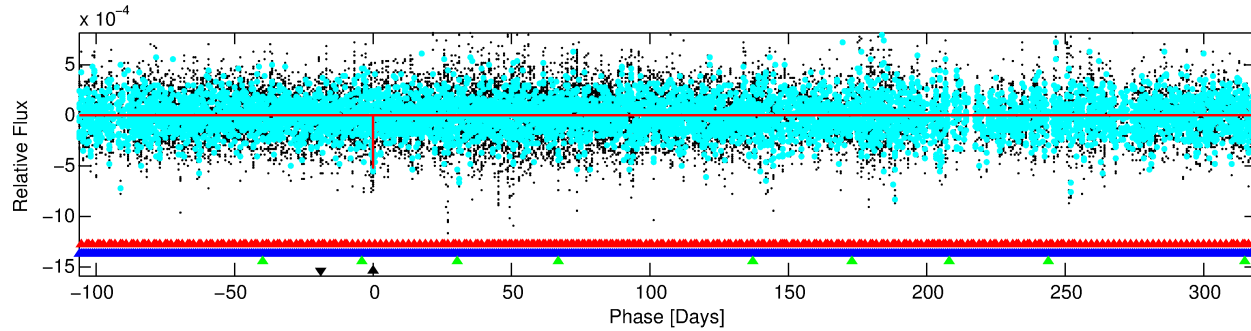
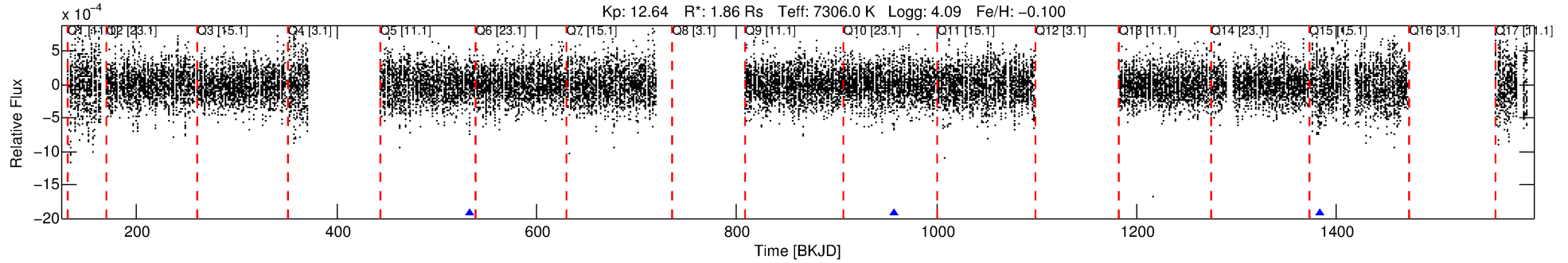
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 011654267-04

No Significant Match Found

# DV One-Page Summary

KIC: 11654267 Candidate: 4 of 4 Period: 425.522 d



## DV Fit Results:

Period = 425.52158 [0.00677] d  
Epoch = 532.4622 [0.0107] BKJD  
Rp/R\* = 0.0224 [0.0056]  
a/R\* = 326.36 [447.53]  
b = 0.76 [0.75]  
Seff = 5.41 [2.00]  
Teq = 389 [36] K  
Rp = 4.56 [1.73] Re  
a = 1.2802 [0.2938] AU  
Ag = 9380.15 [6456.68] [1.45 $\sigma$ ]  
Teffp = 5918 [939] K [5.88 $\sigma$ ]

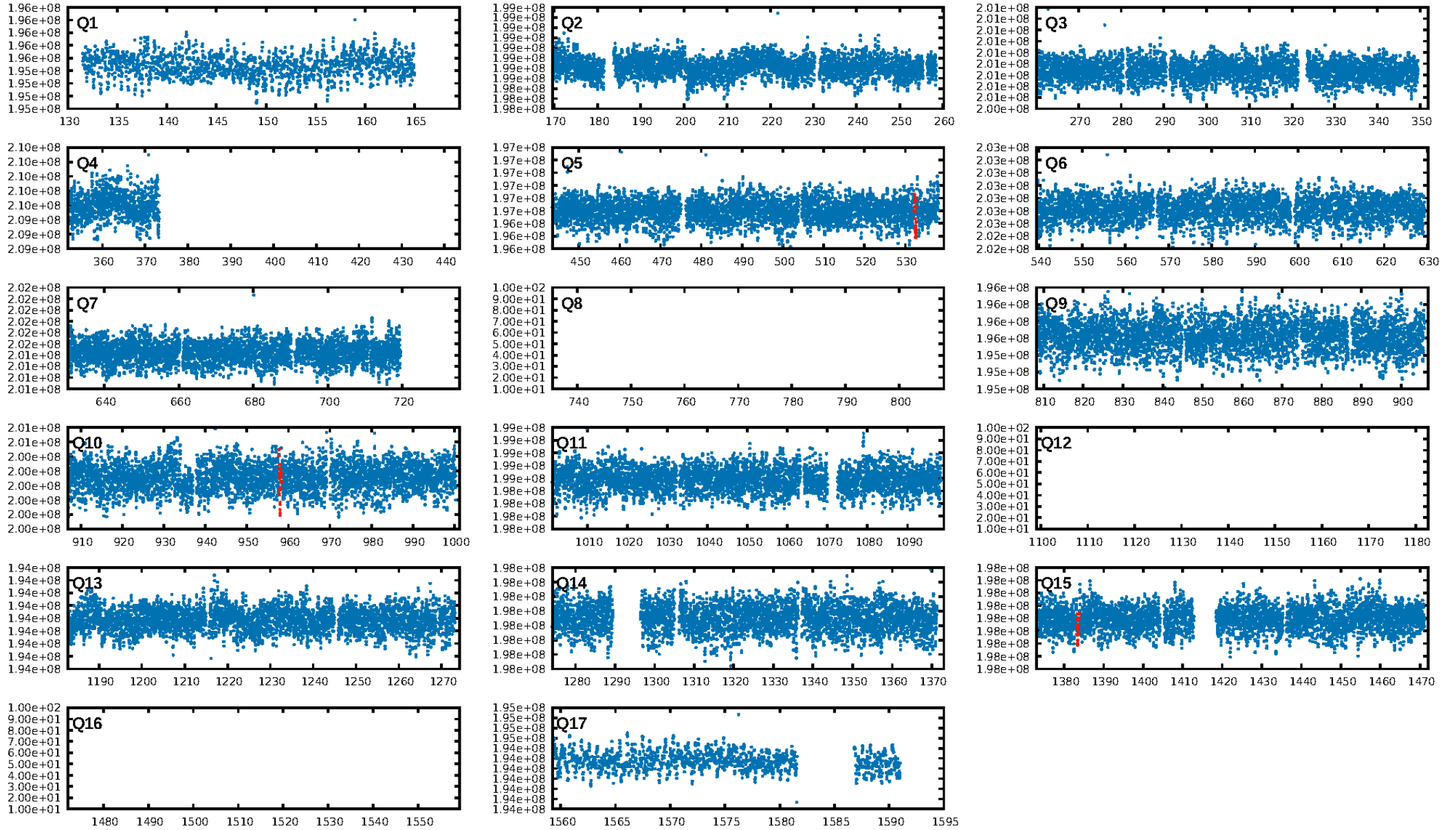
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [674.29 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 18.1%  
ModelChiSquareGof-sig: 100.0%  
**Bootstrap-pfa: 1.87e-09**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: -3.149  
Centroid-sig: N/A  
Centroid-so: 1.227 arcsec [1.94 $\sigma$ ]  
OotOffset-rm: 0.854 arcsec [1.76 $\sigma$ ]  
KicOffset-rm: 0.856 arcsec [1.73 $\sigma$ ]  
OotOffset-st: 1/1/0/1 [3]  
KicOffset-st: 1/1/0/1 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 0.00 [0/3]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 16:07:24 Z

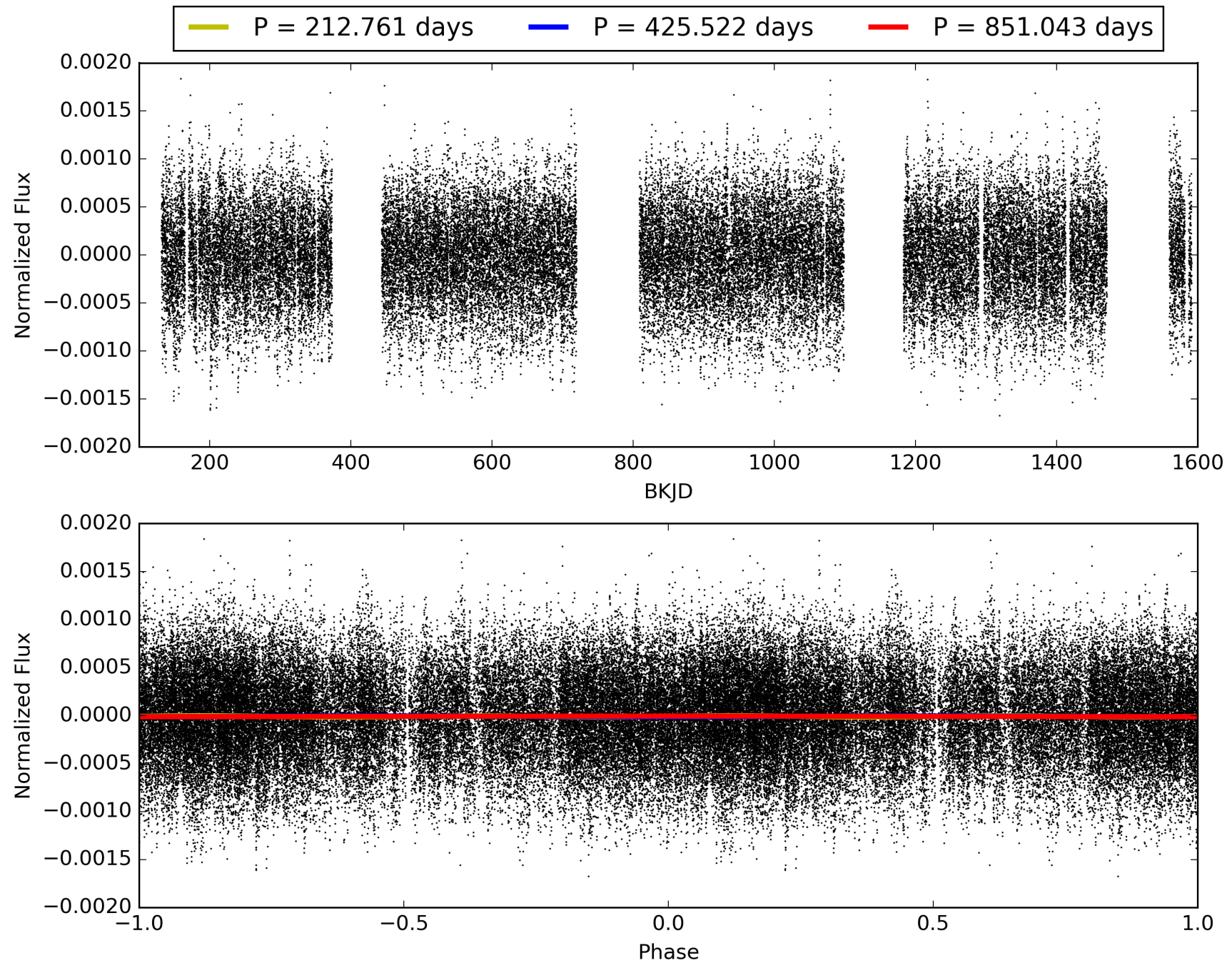
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 011654267-04, PDC Light Curves



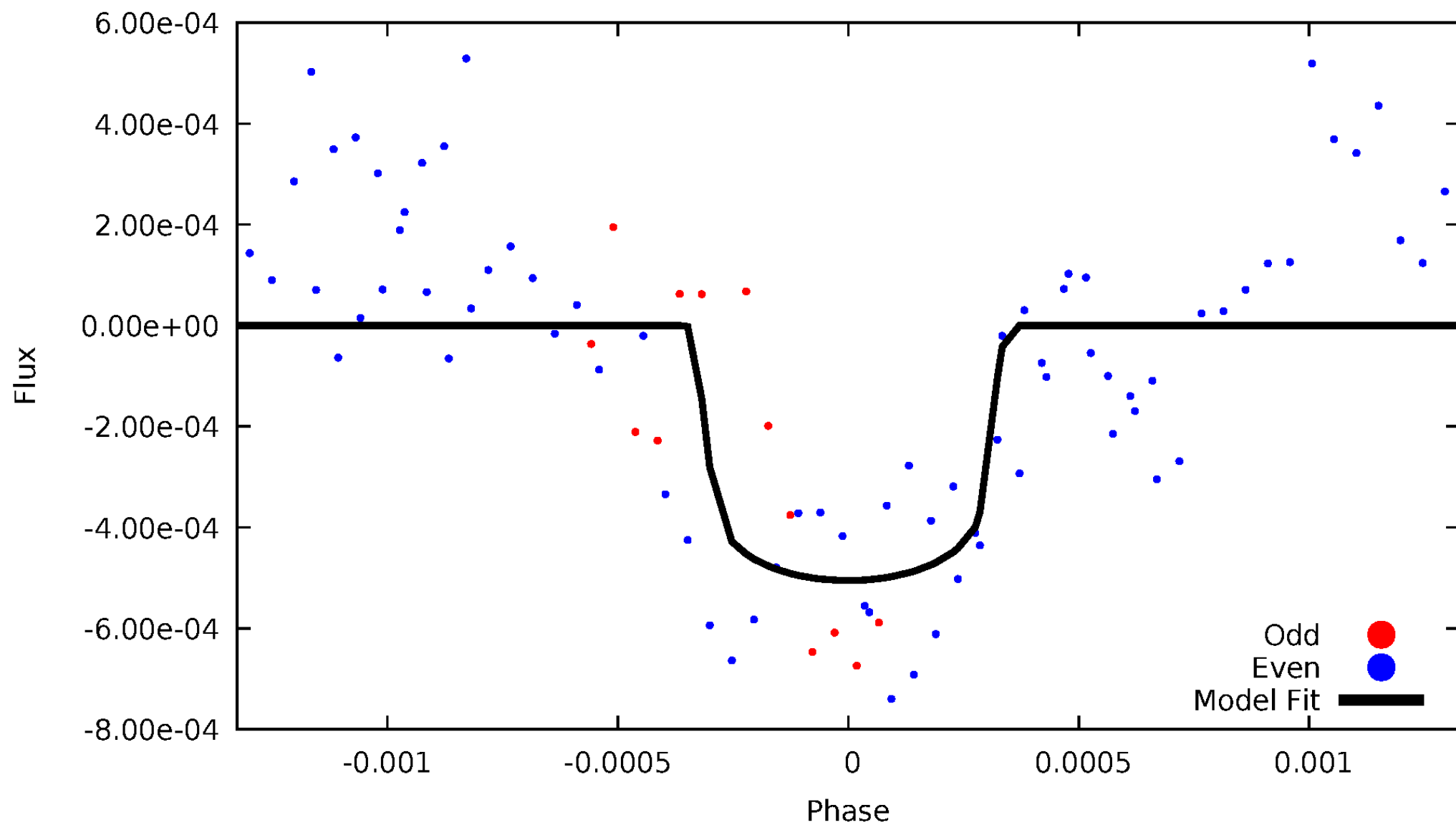


TCE 011654267-04



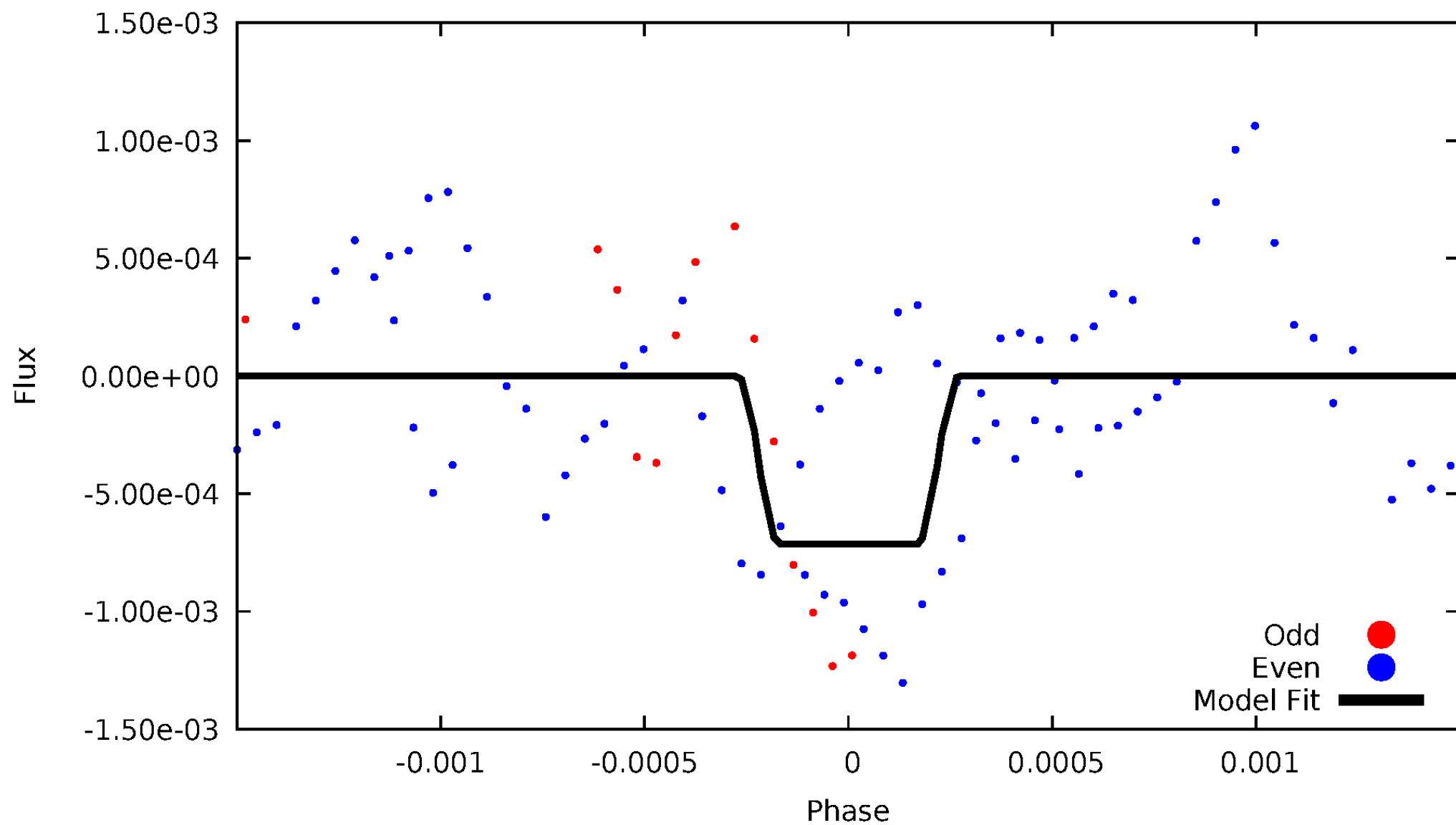
# DV Odd/Even

TCE 011654267-04



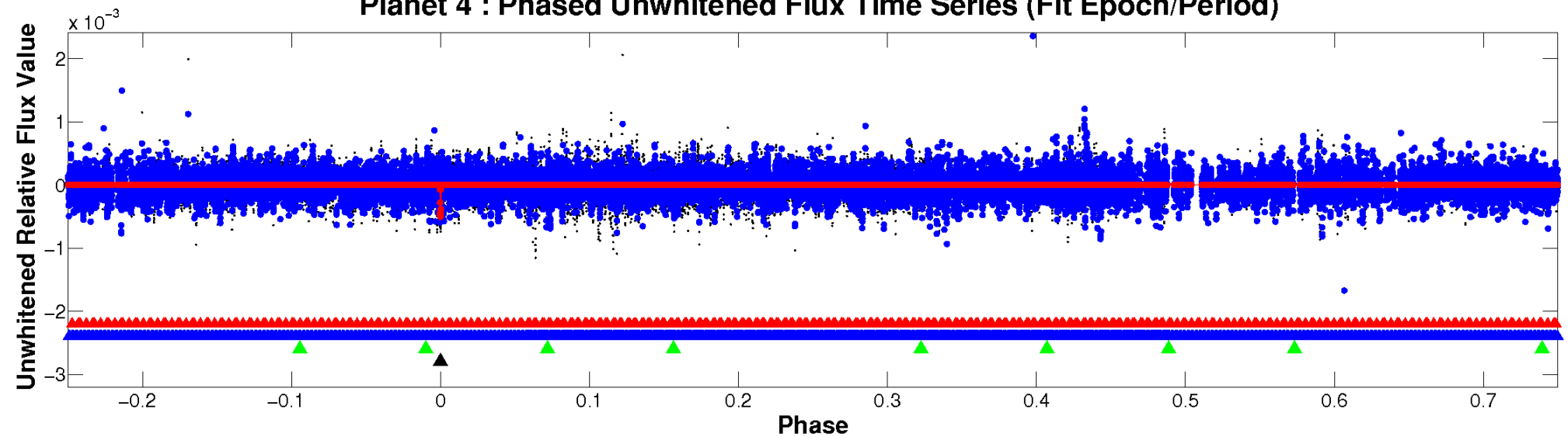
# ALT Odd/Even

TCE 011654267-04

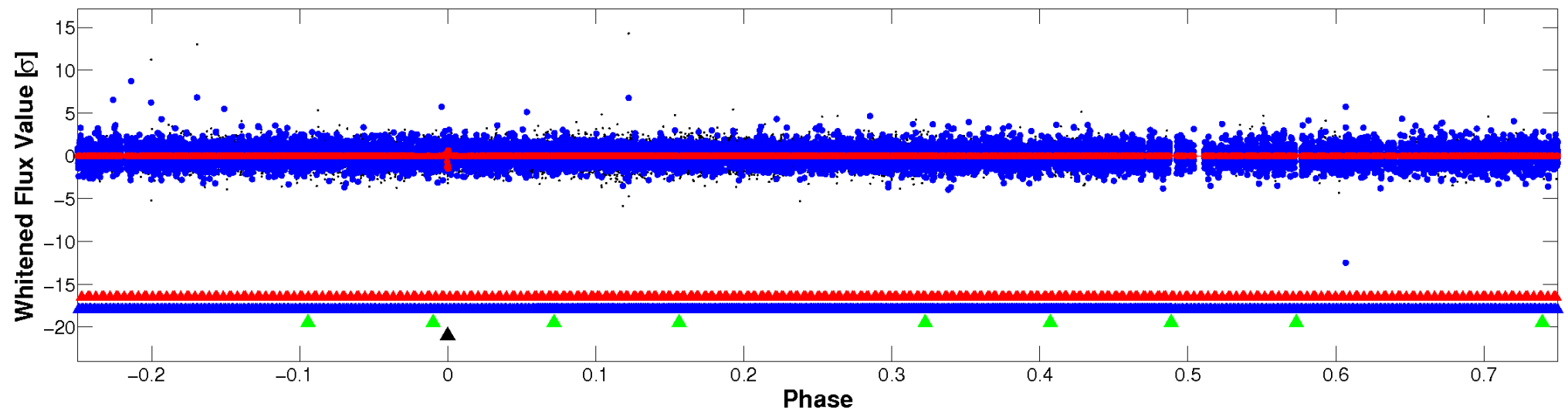


# Non-Whitened Vs. Whitened Light Curve

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

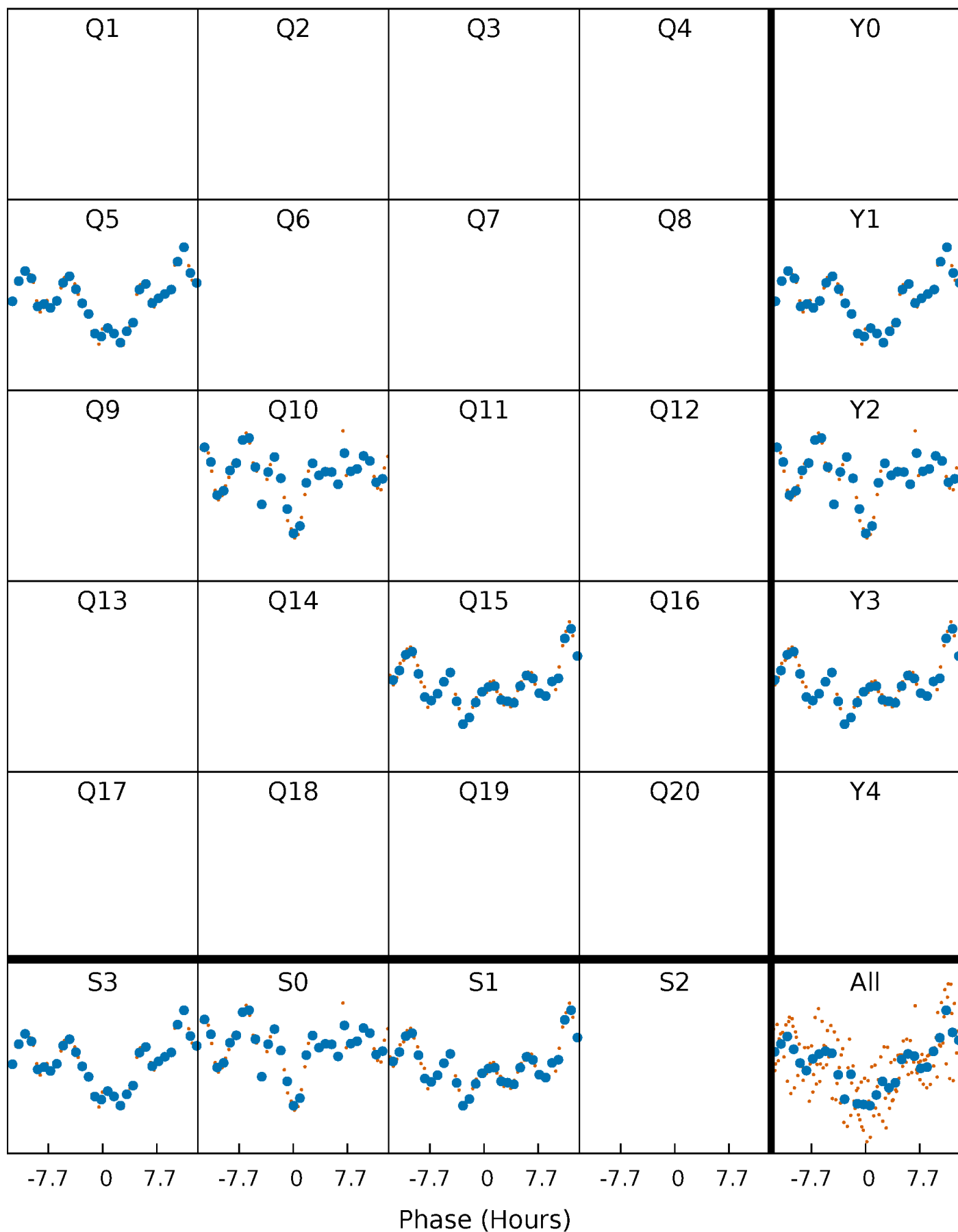


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



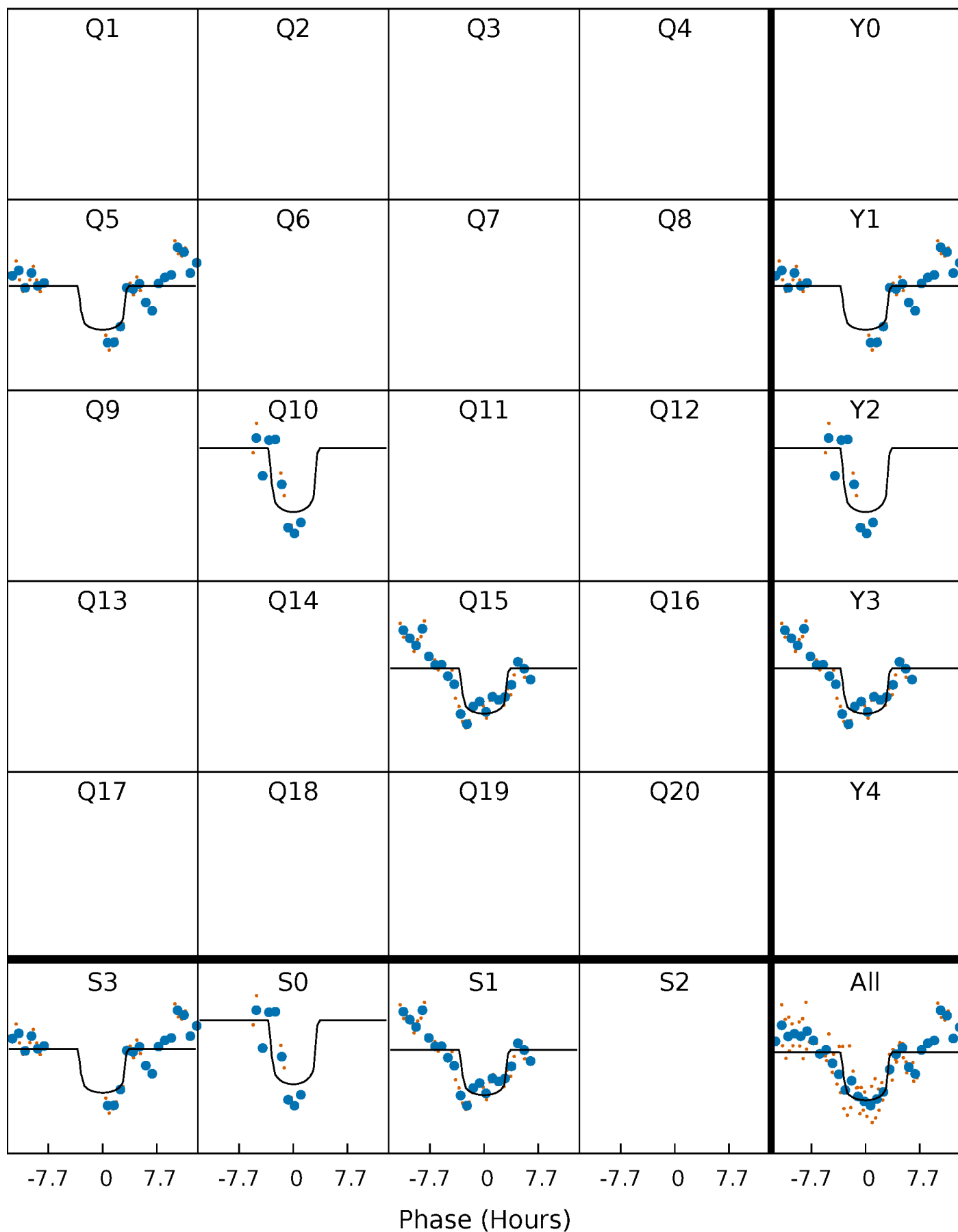
# PDC Quarter-Phased Transit Curves

TCE 011654267-04     $P=425.521579$  Days     $T_0=532.462151$  (BKJD)



# DV Quarter-Phased Transit Curves

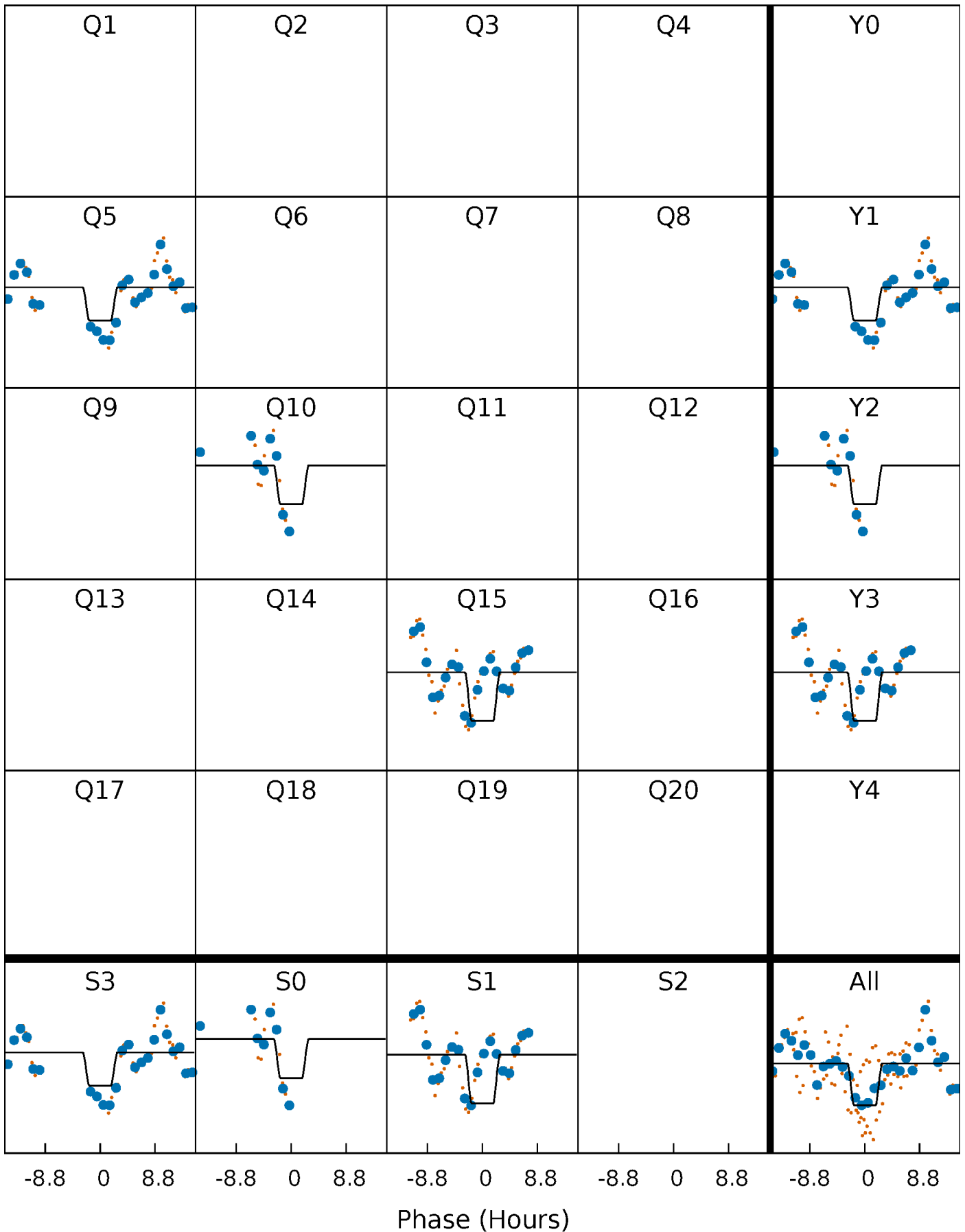
TCE 011654267-04 P=425.521579 Days  $T_0=532.462151$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

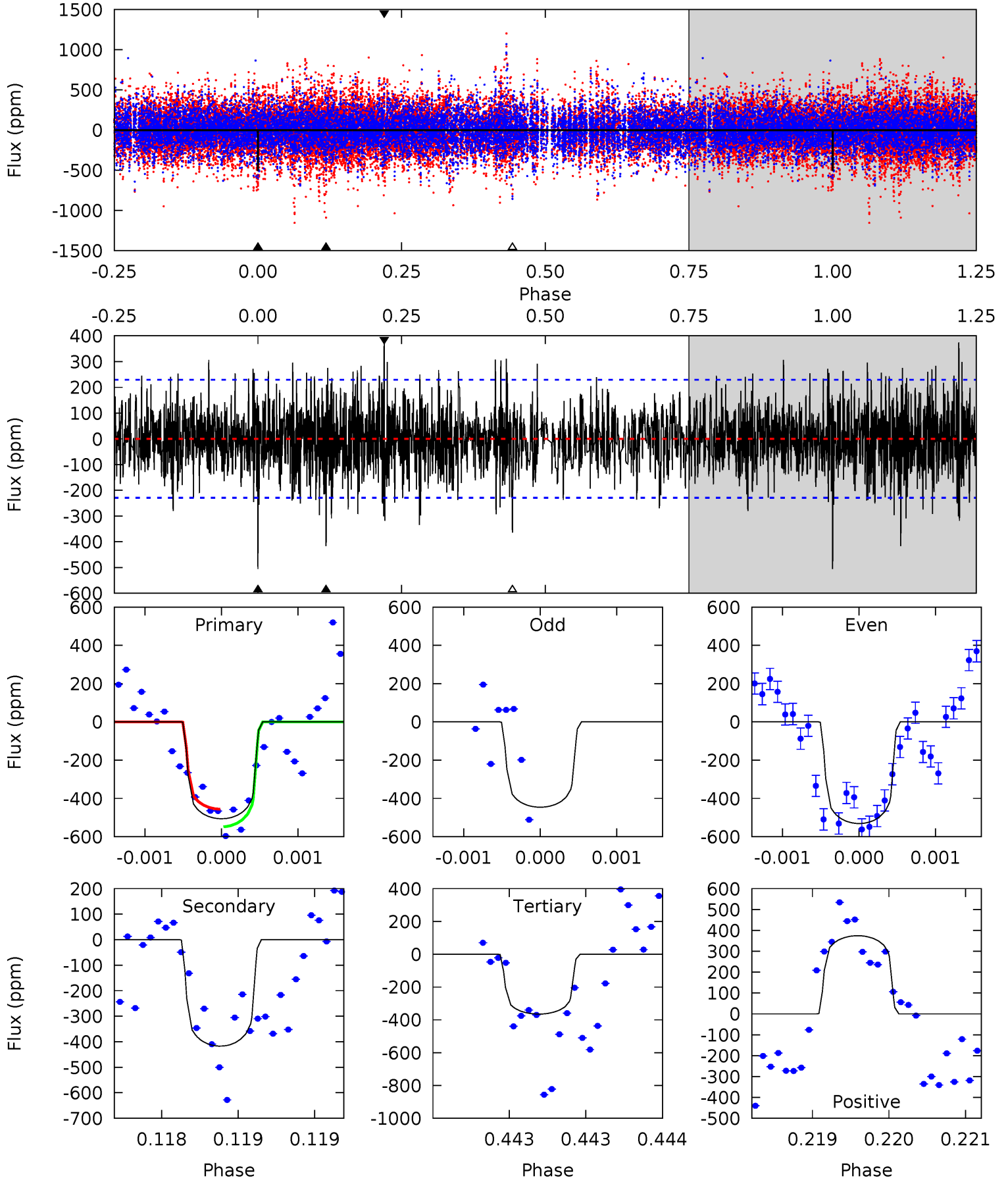
TCE 011654267-04     $P=425.481002$  Days     $T_0=532.526961$  (BKJD)



# DV Model-Shift Uniqueness Test

011654267-04, P = 425.521579 Days, E = 106.940572 Days

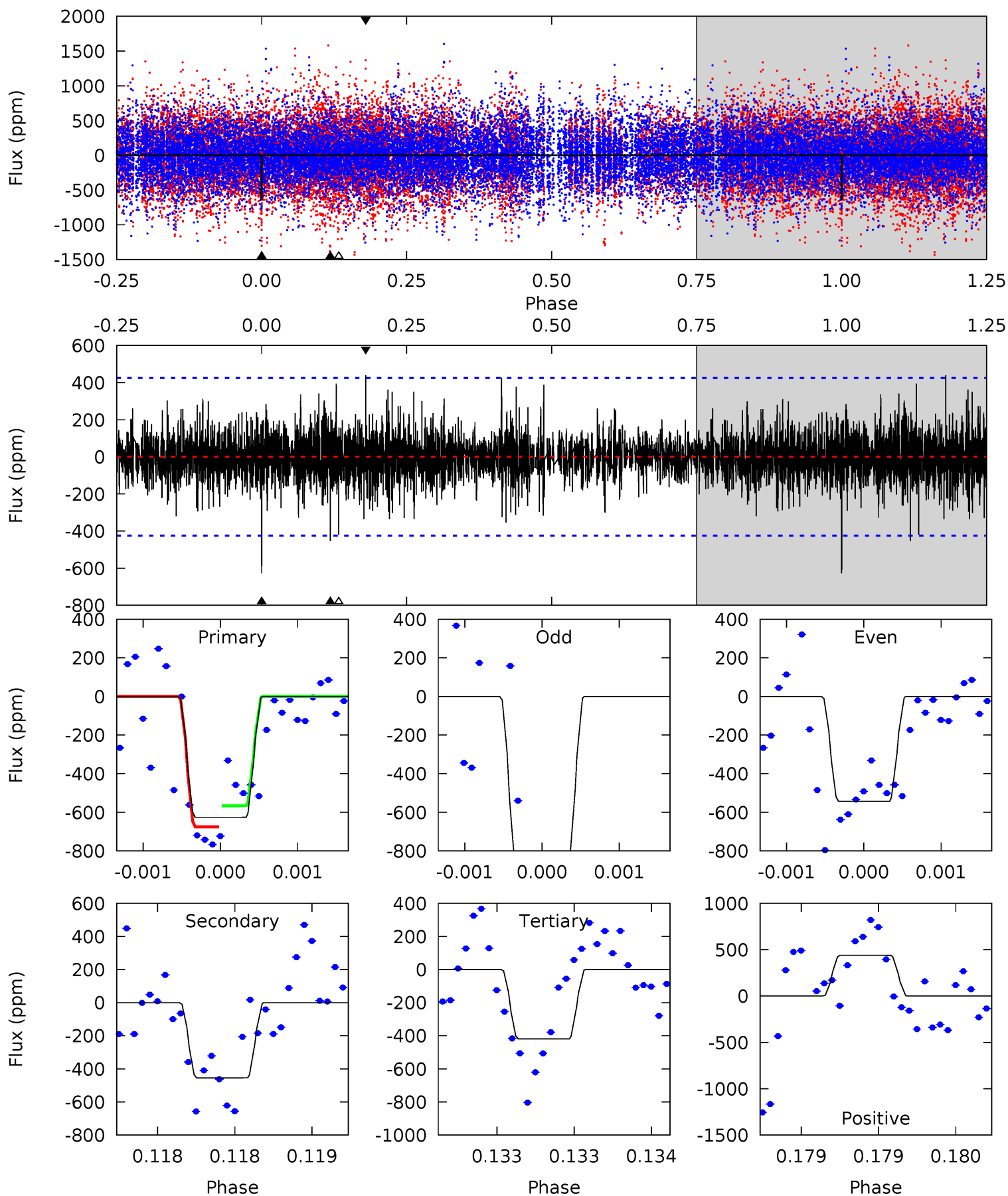
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.2	10.0	8.76	9.00	5.52	3.39	2.22	3.40	3.16	1.26	1.02	0.89	1.10	0.43	1.11



# Alt Model-Shift Uniqueness Test

011654267-04, P = 425.481002 Days, E = 107.045959 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
8.21	5.96	5.50	5.75	5.57	3.48	1.29	2.71	2.46	0.46	0.20	1.79	0.78	0.41	0.72



### Stellar Parameters For KIC 011654267

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7306^{+228}_{-330}$	$4.086^{+0.170}_{-0.170}$	$-0.100^{+0.200}_{-0.350}$	$1.864^{+0.528}_{-0.432}$	$1.542^{+0.211}_{-0.257}$	$0.336^{+0.316}_{-0.164}$
	+3%/-5%	+4%/-4%	+200%/-350%	+28%/-23%	+14%/-17%	+94%/-49%
Source	KIC0	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 011654267-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-417 \pm 42$	$4.55^{+1.48}_{-1.30}$	$542^{+39}_{-40}$	$6844^{+1267}_{-856}$	$17636^{+16640}_{-7434}$
Alt.	$-454 \pm 76$	$5.46^{+1.45}_{-1.26}$	$543^{+43}_{-41}$	$6399^{+915}_{-633}$	$13709^{+9551}_{-5413}$

$T_{max}$  = 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

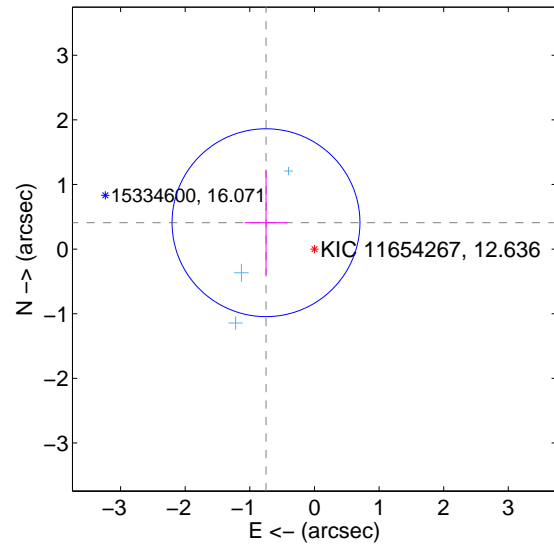
Supplemental centroid analysis for 011654267-04. Kepler magnitude: 12.64. Transit SNR 6.64

There are 3 quarters with good PRF difference image offsets

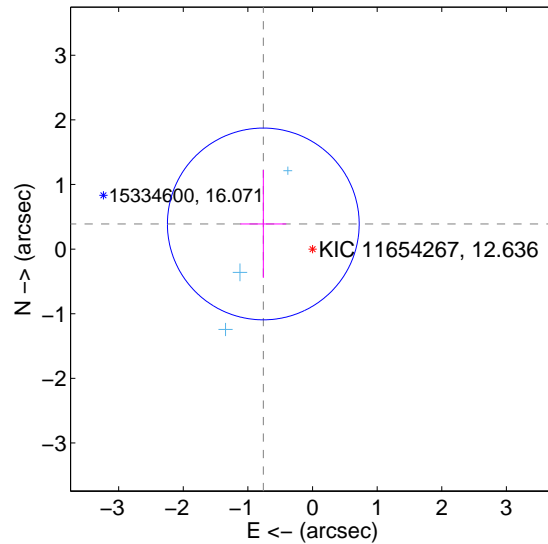
The direct PRF centroid is offset from the target star catalog position by about 0.01 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.854 \pm 0.485$	1.76	$0.750 \pm 0.333$	$0.409 \pm 0.808$
PRF-fit source offset from KIC position	$0.856 \pm 0.495$	1.73	$0.762 \pm 0.356$	$0.389 \pm 0.835$
photometric centroid source offset	$1.23 \pm 0.63$	1.94	$0.14 \pm 0.63$	$-1.22 \pm 0.63$

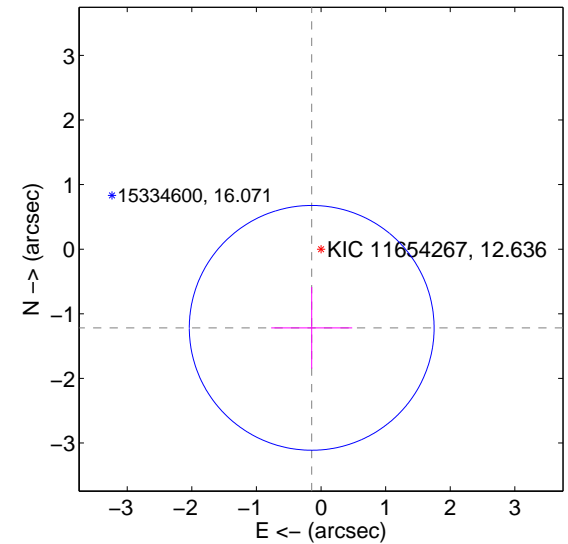
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

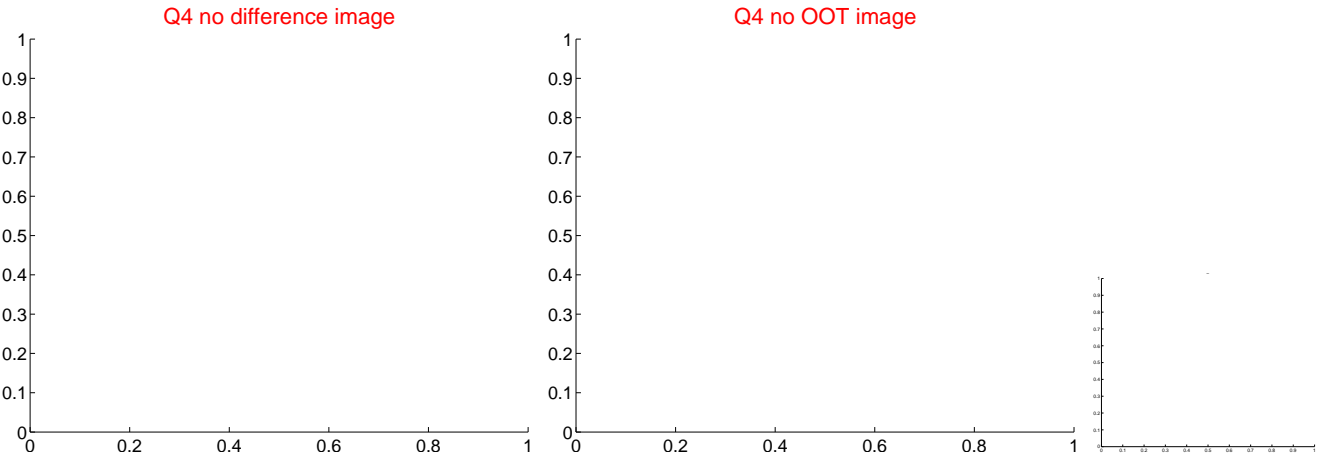
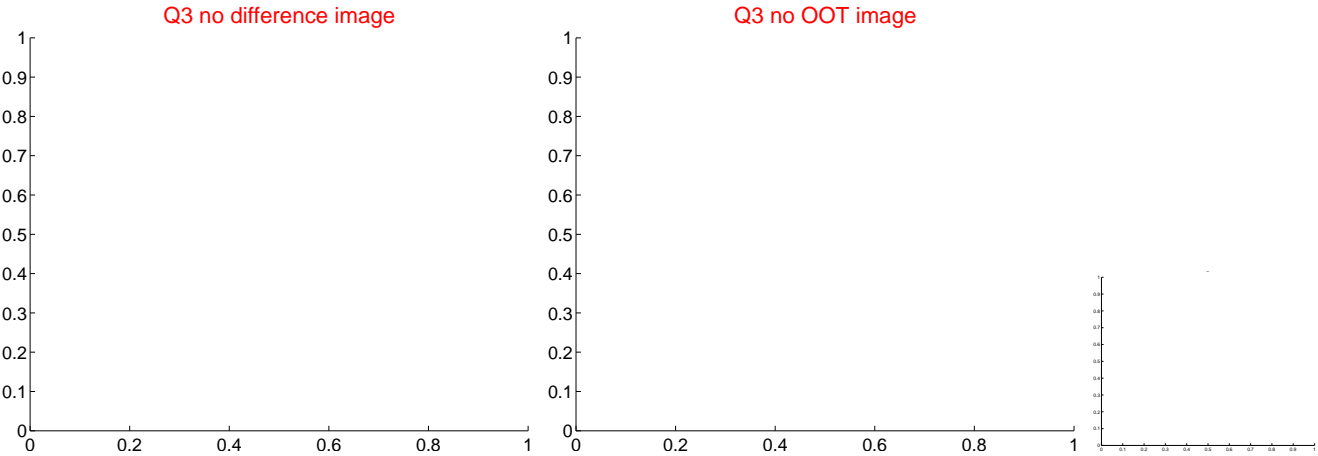
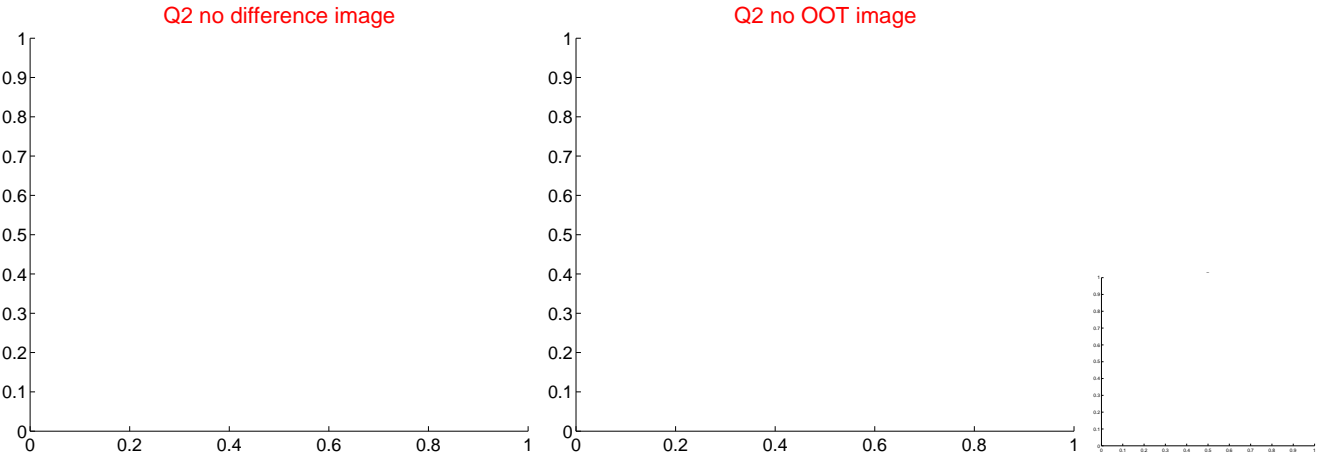
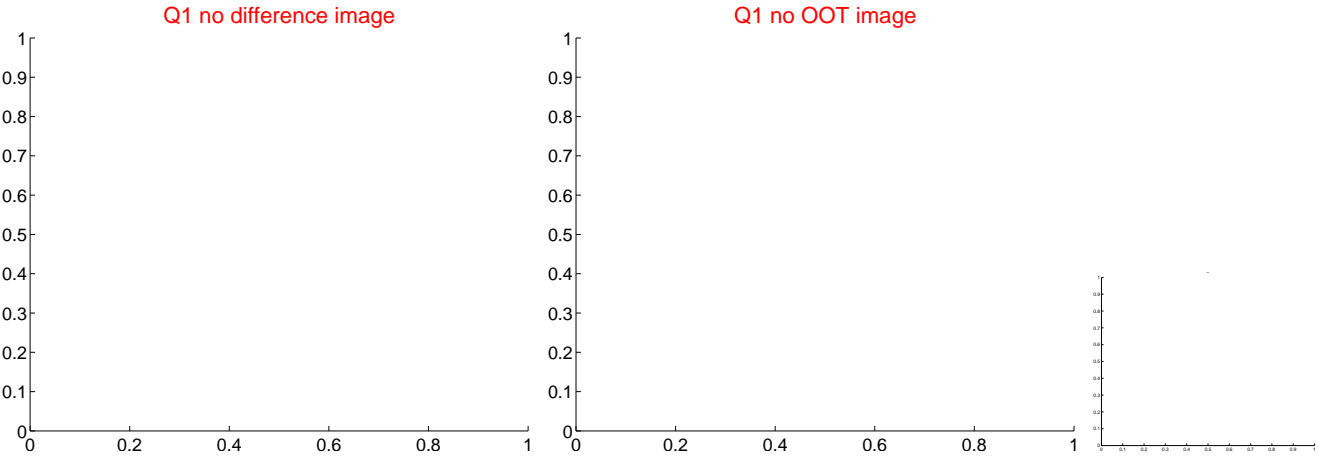


offset from photometric centroids



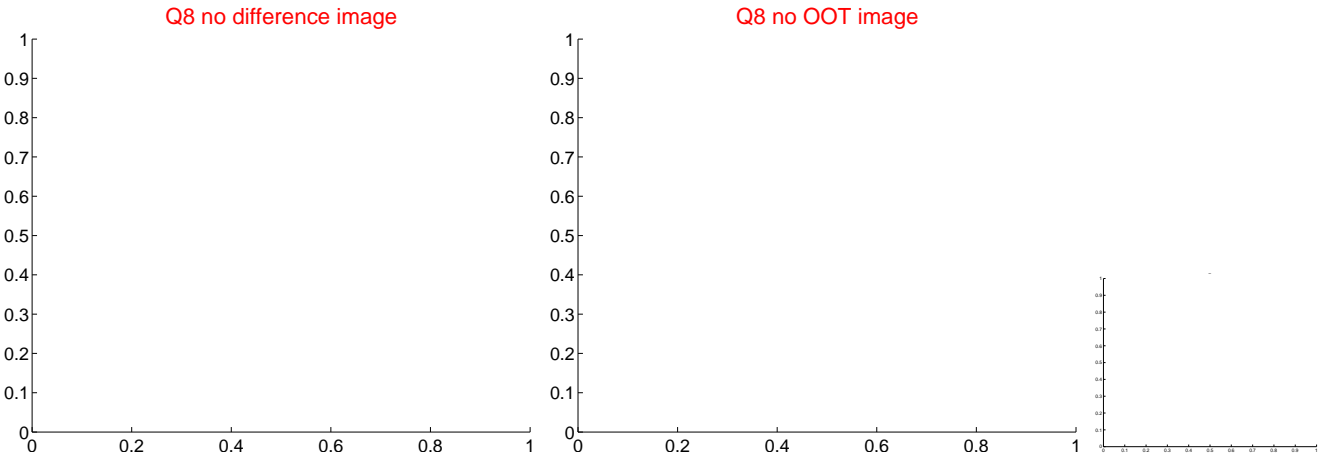
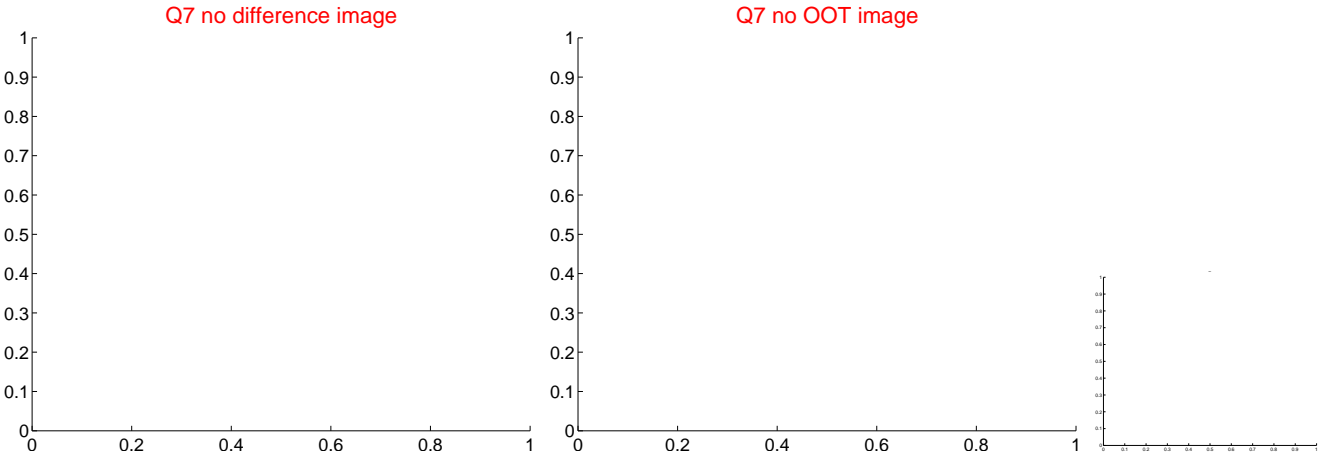
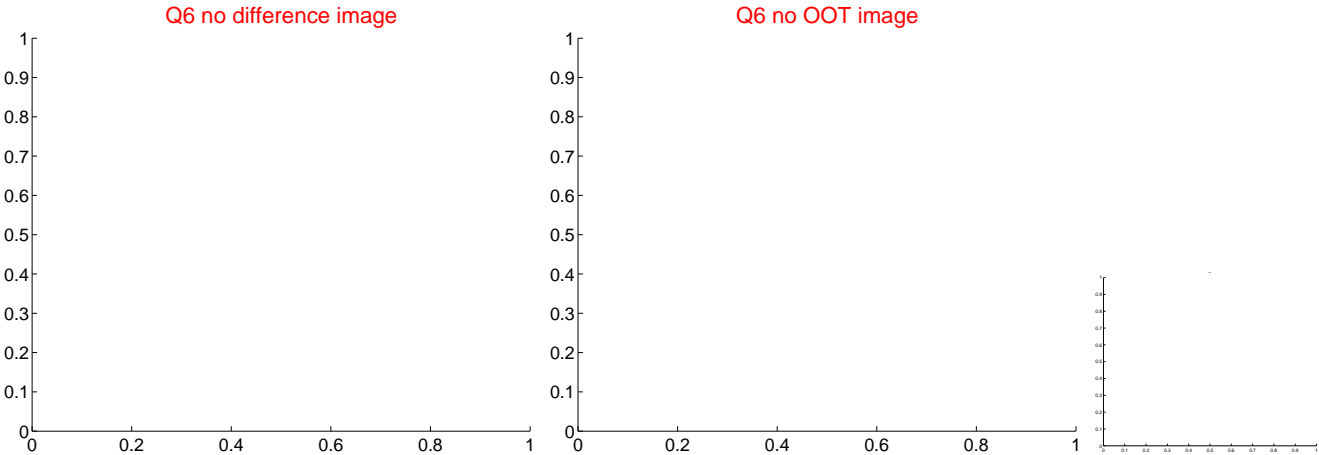
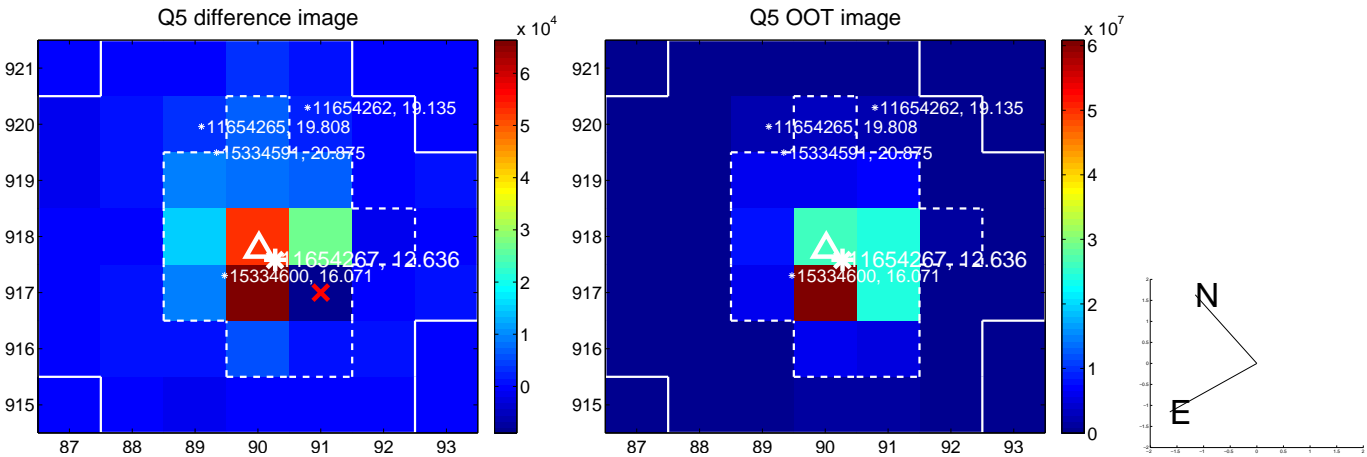
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

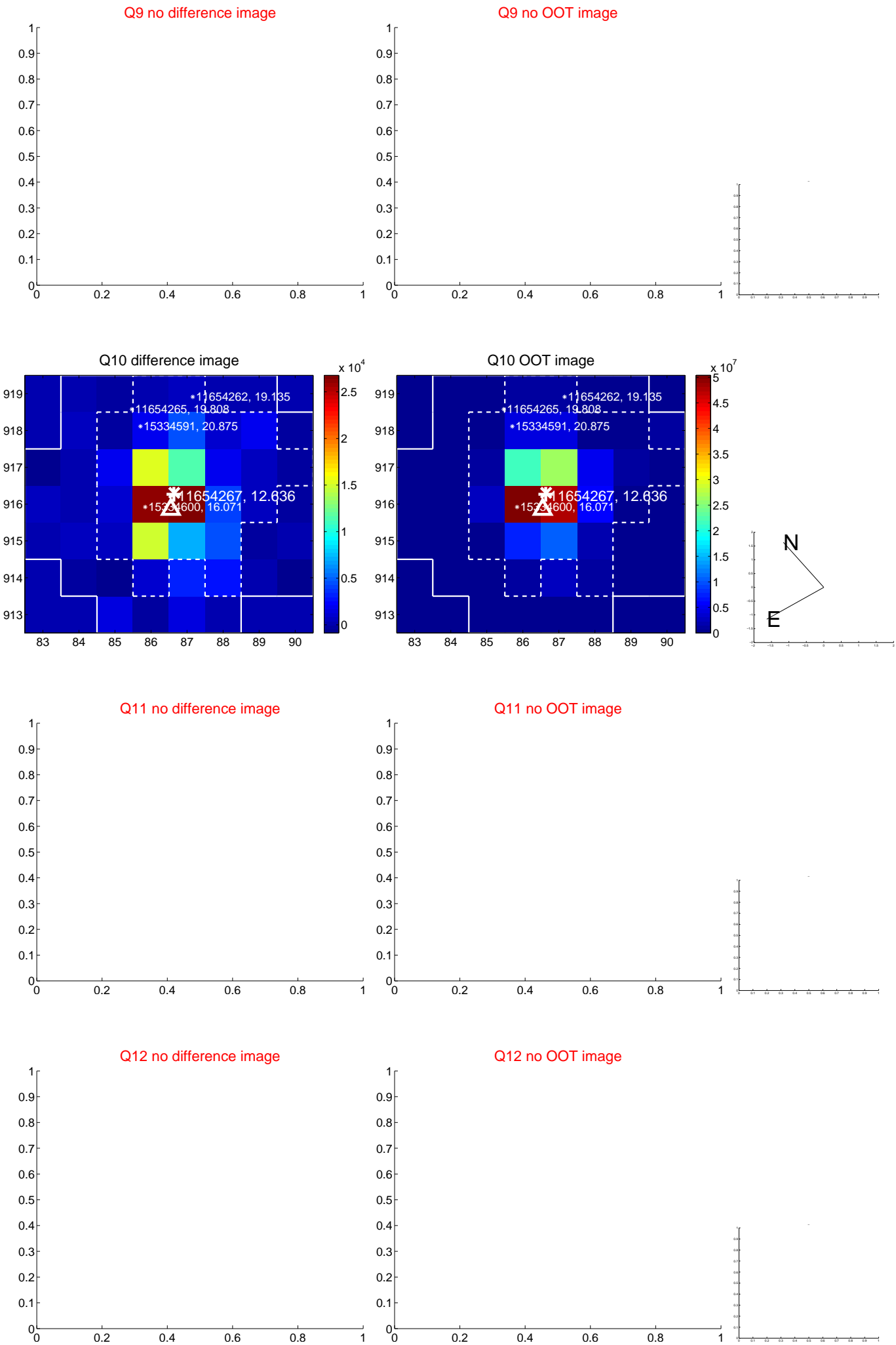




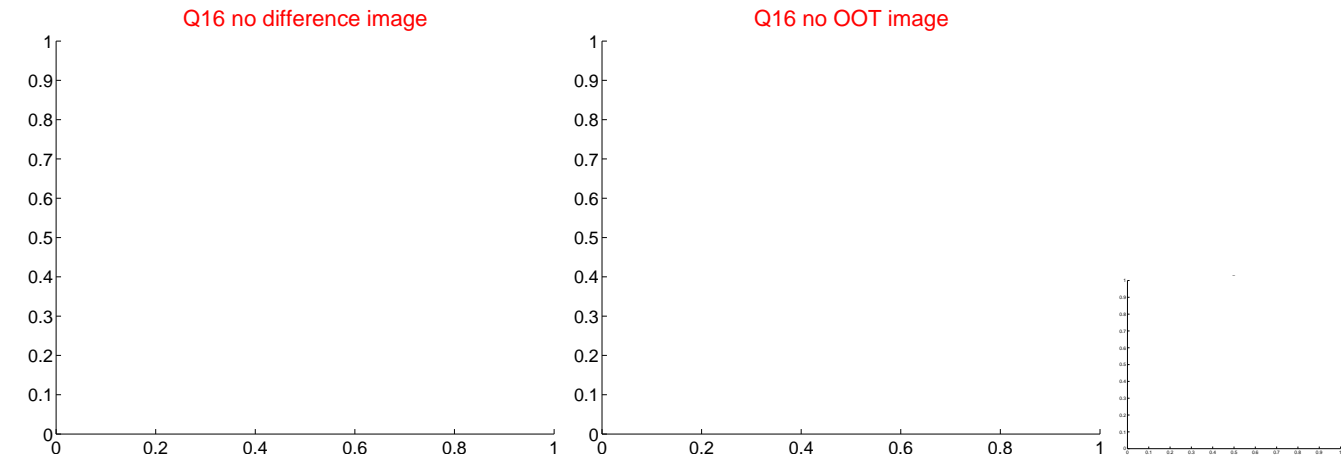
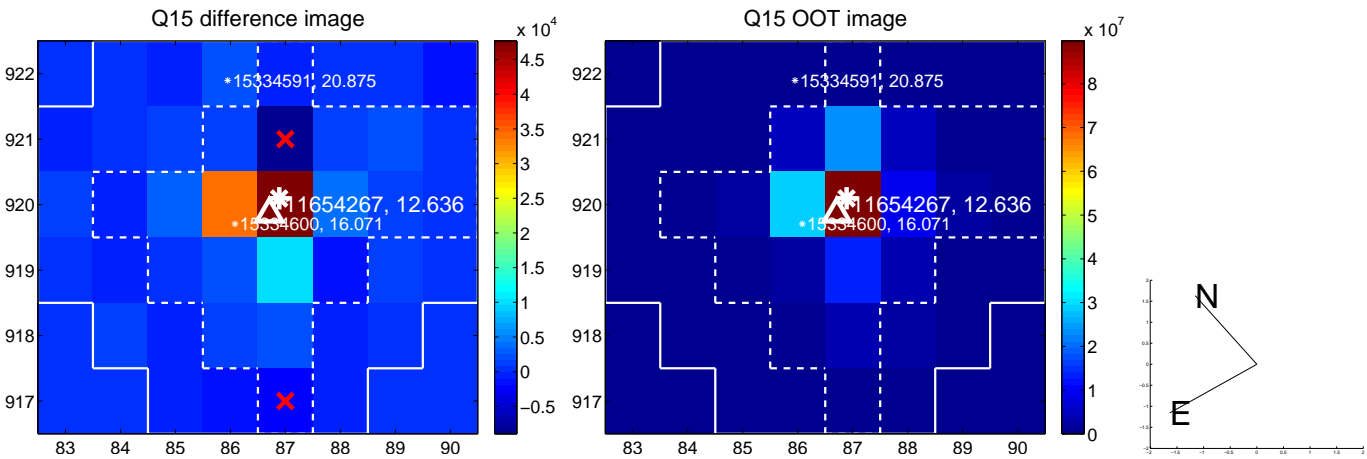
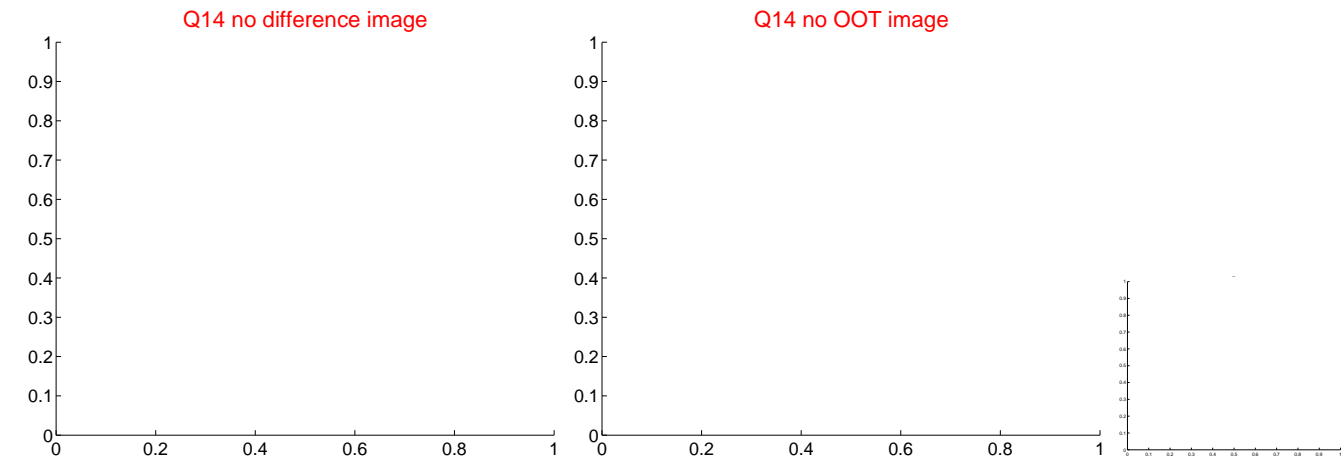
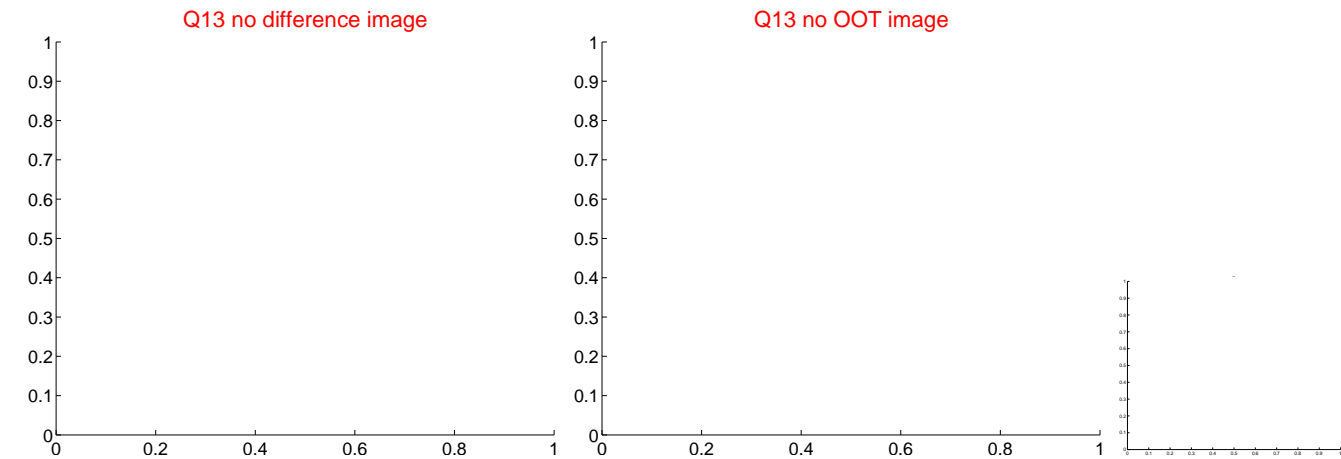
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



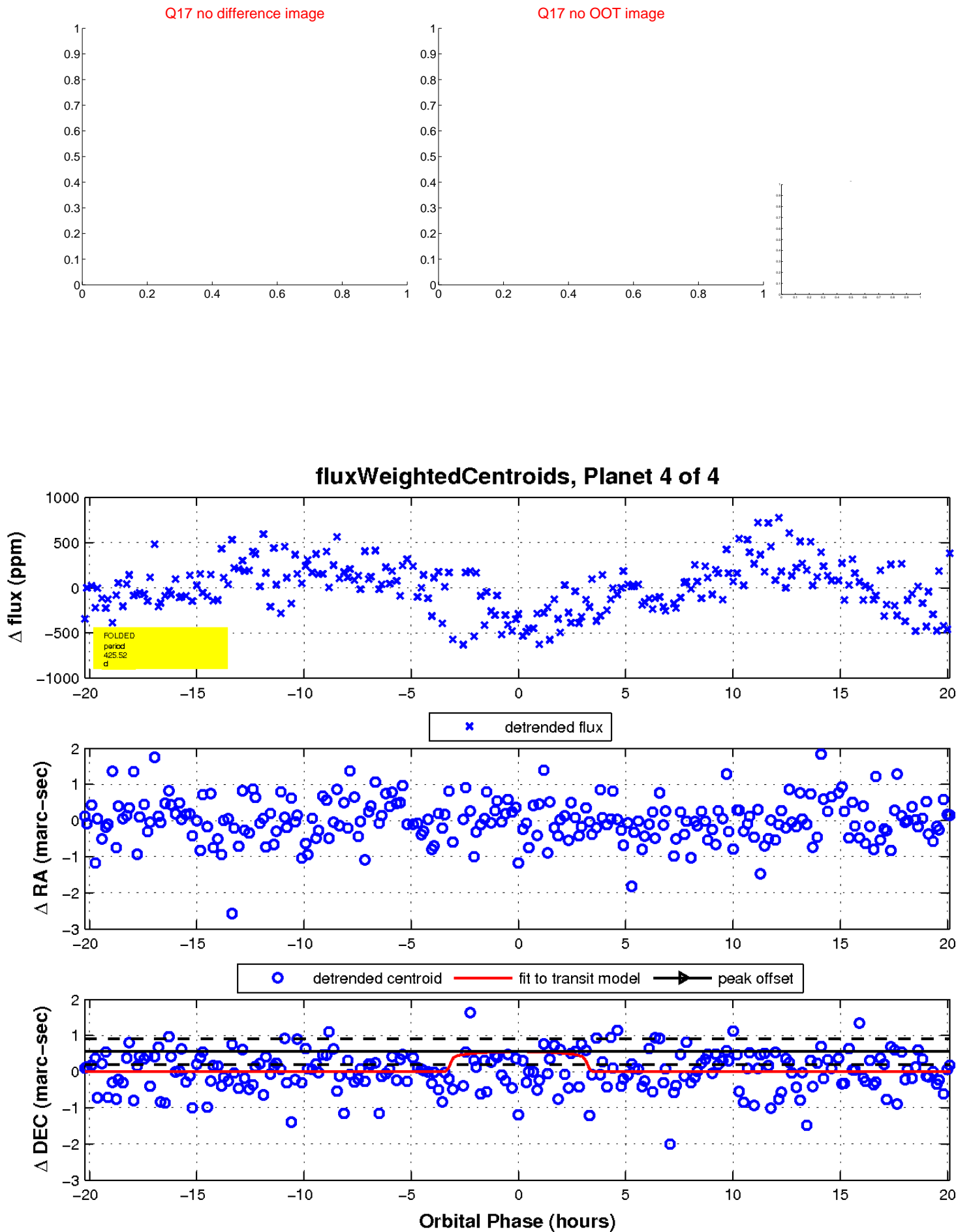
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

Declination

