

# KIC 007135545

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007135545-01	OBS	No	1.458210	132.625812	25.7	4.426	9.1	8.8	1.73	6140	0.89	5787.69
007135545-02	OBS	No	1.458485	131.560213	23.8	7.573	9.1	10.3	1.73	6140	0.99	5786.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007135545-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT
007135545-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD

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

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

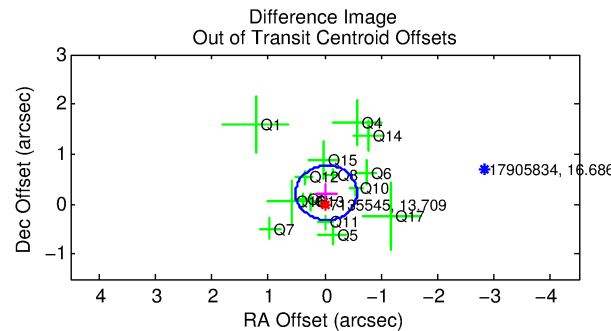
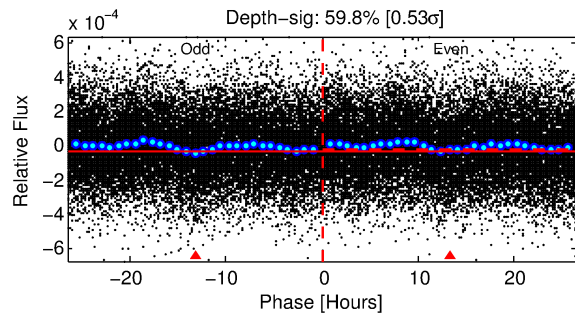
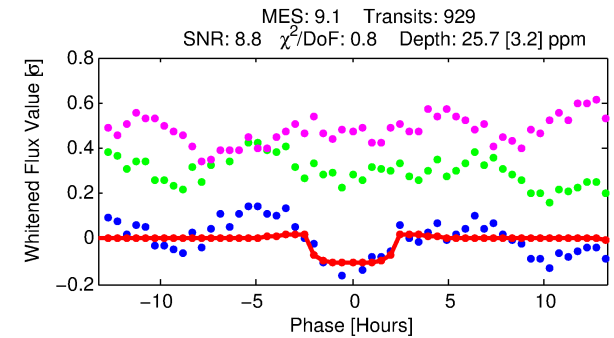
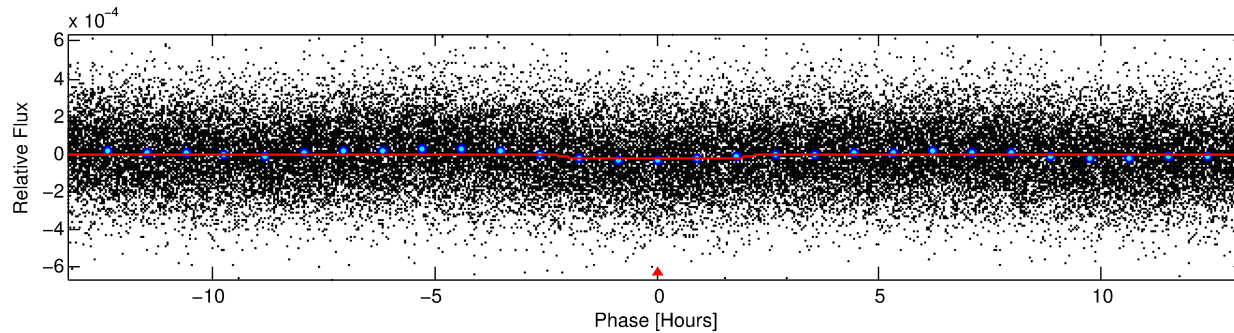
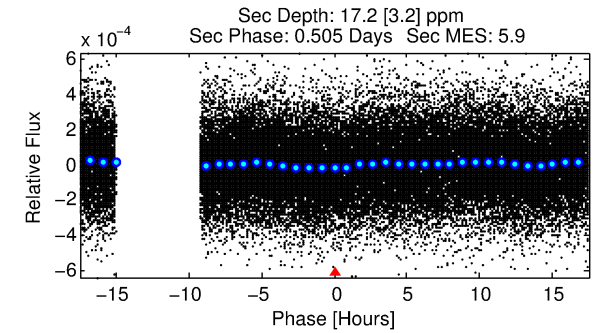
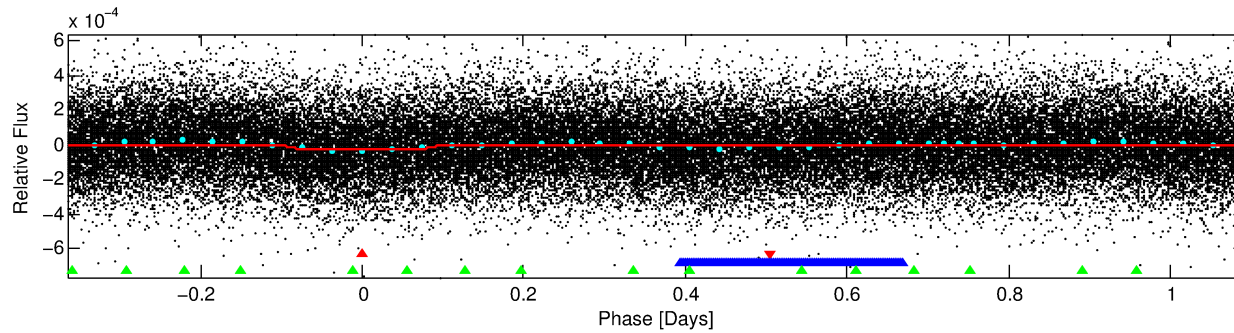
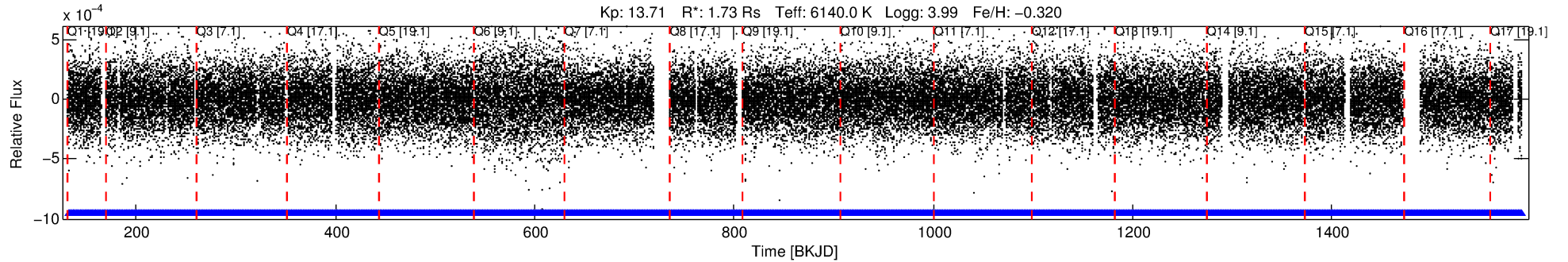
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007135545-01

No Significant Match Found

# DV One-Page Summary

KIC: 7135545 Candidate: 1 of 3 Period: 1.458 d



## DV Fit Results:

Period = 1.45821 [0.00002] d  
Epoch = 132.6258 [0.0046] BKJD  
Rp/R\* = 0.0047 [0.0030]  
a/R\* = 2.51 [6.73]  
b = 0.28 [10.56]  
Seff = 5787.69 [3878.26]  
Teq = 2224 [373] K  
Rp = 0.88 [0.68] Re  
a = 0.0257 [0.0105] AU  
Ag = 7.96 [11.50] [0.61σ]  
Teffp = 5776 [1870] K [1.86σ]

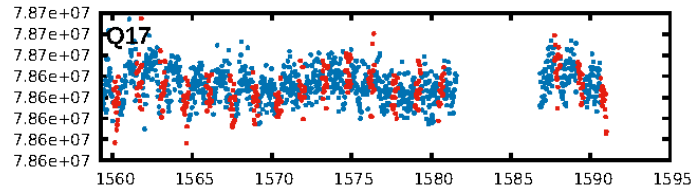
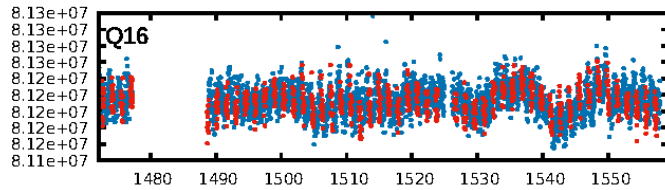
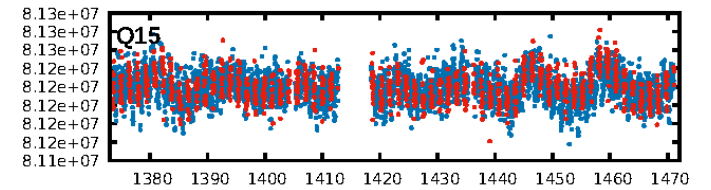
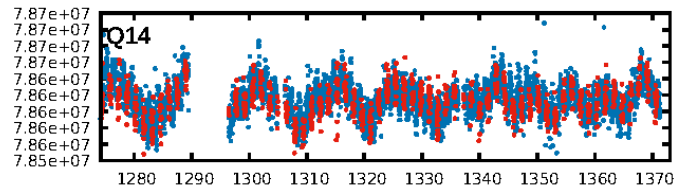
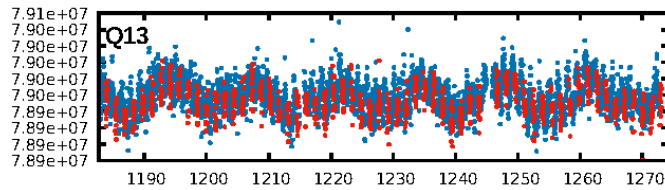
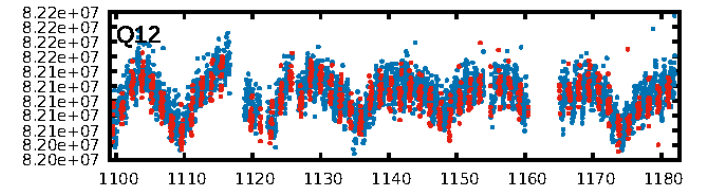
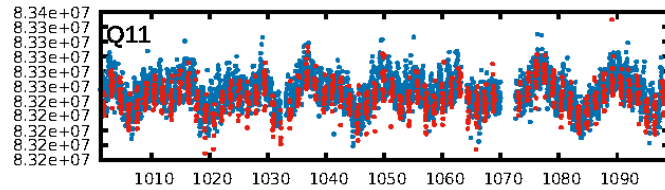
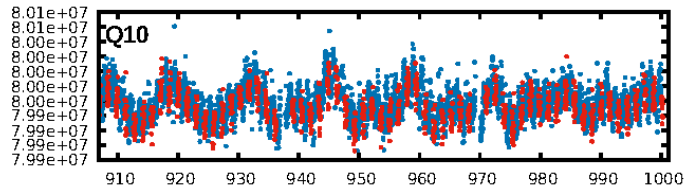
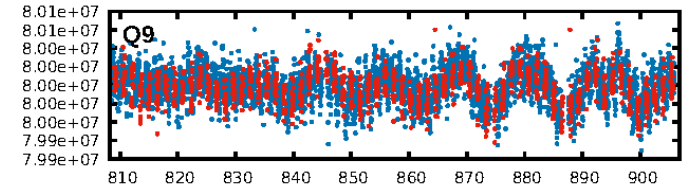
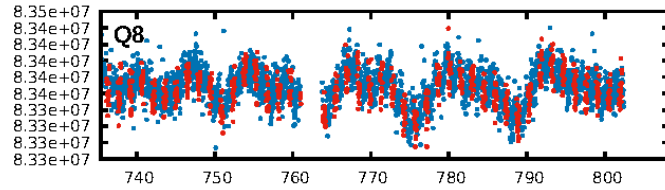
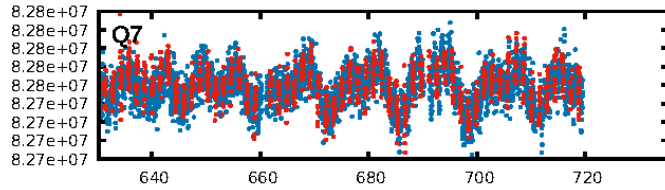
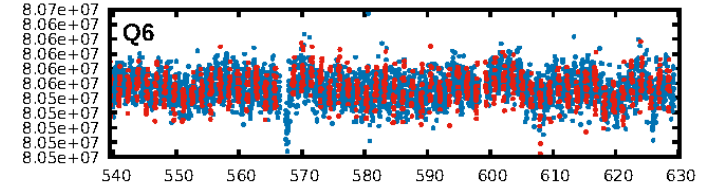
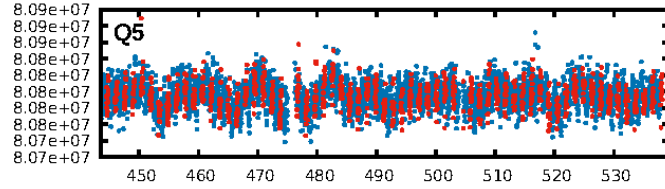
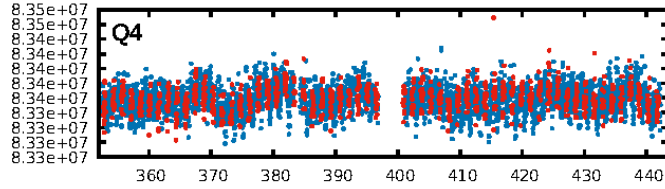
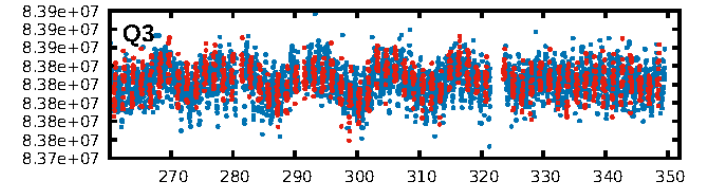
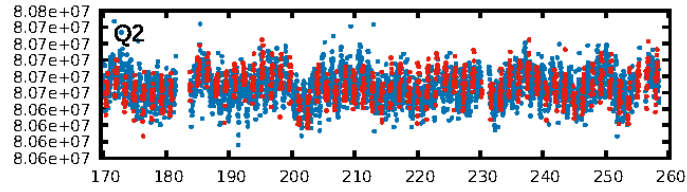
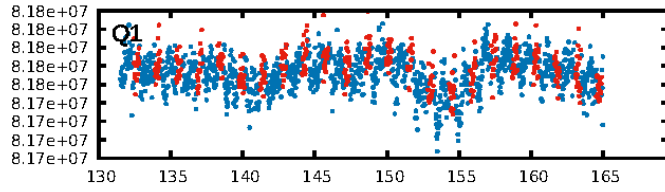
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.1% [0.00σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.10e-13  
RollingBand-fgt: 1.00 [888/888]  
GhostDiagnostic-chr: 1.058  
Centroid-sig: 14.9%  
Centroid-so: 1.103 arcsec [1.17σ]  
OotOffset-rm: 0.226 arcsec [1.24σ]  
OotOffset-st: 3/3/4/5 [15]  
KicOffset-rm: 0.308 arcsec [1.53σ]  
KicOffset-st: 3/3/4/5 [15]  
DiffImageQuality-fgm: 0.93 [14/15]  
DiffImageOverlap-fno: 0.41 [7/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:45:20 Z

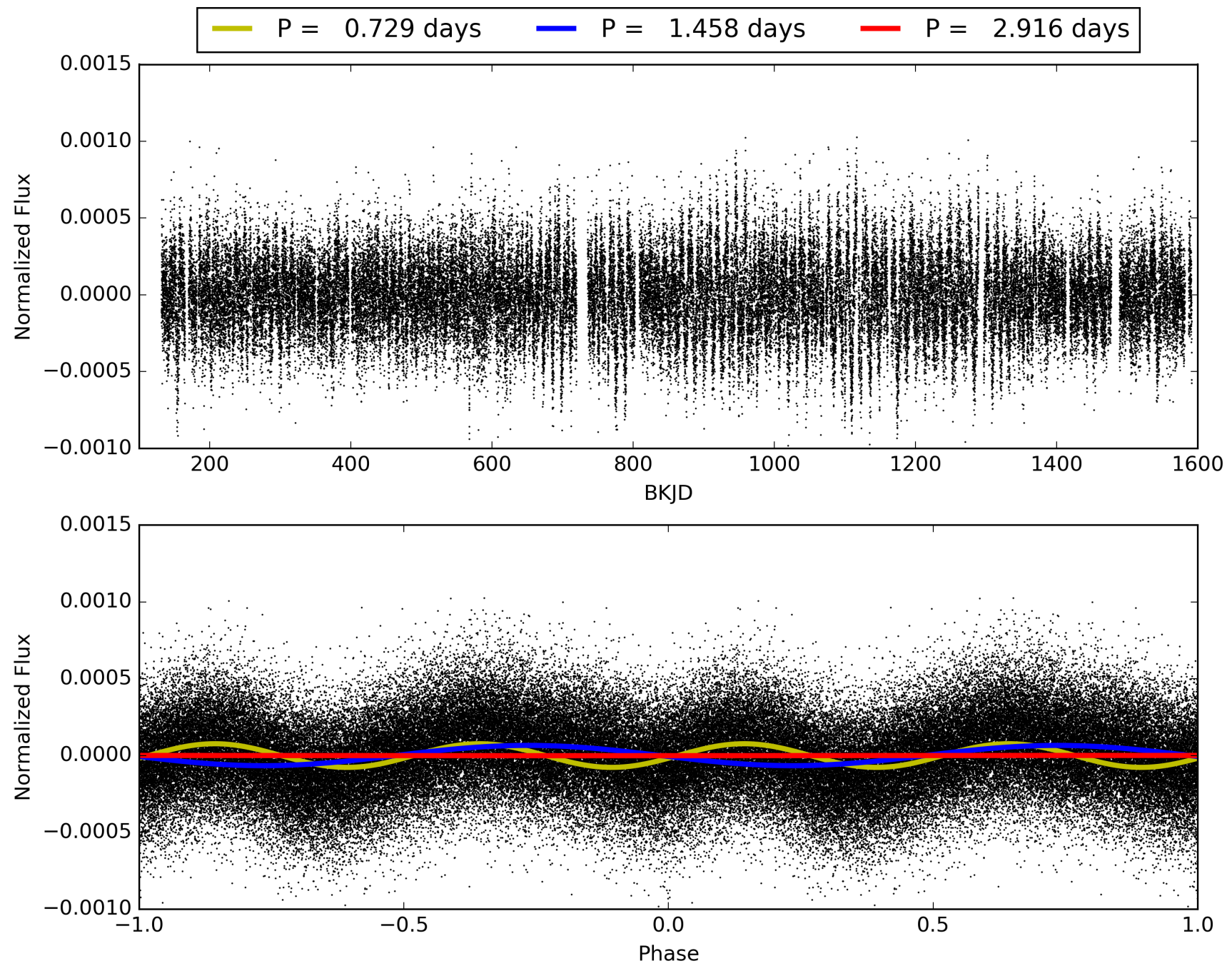
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007135545-01, PDC Light Curves



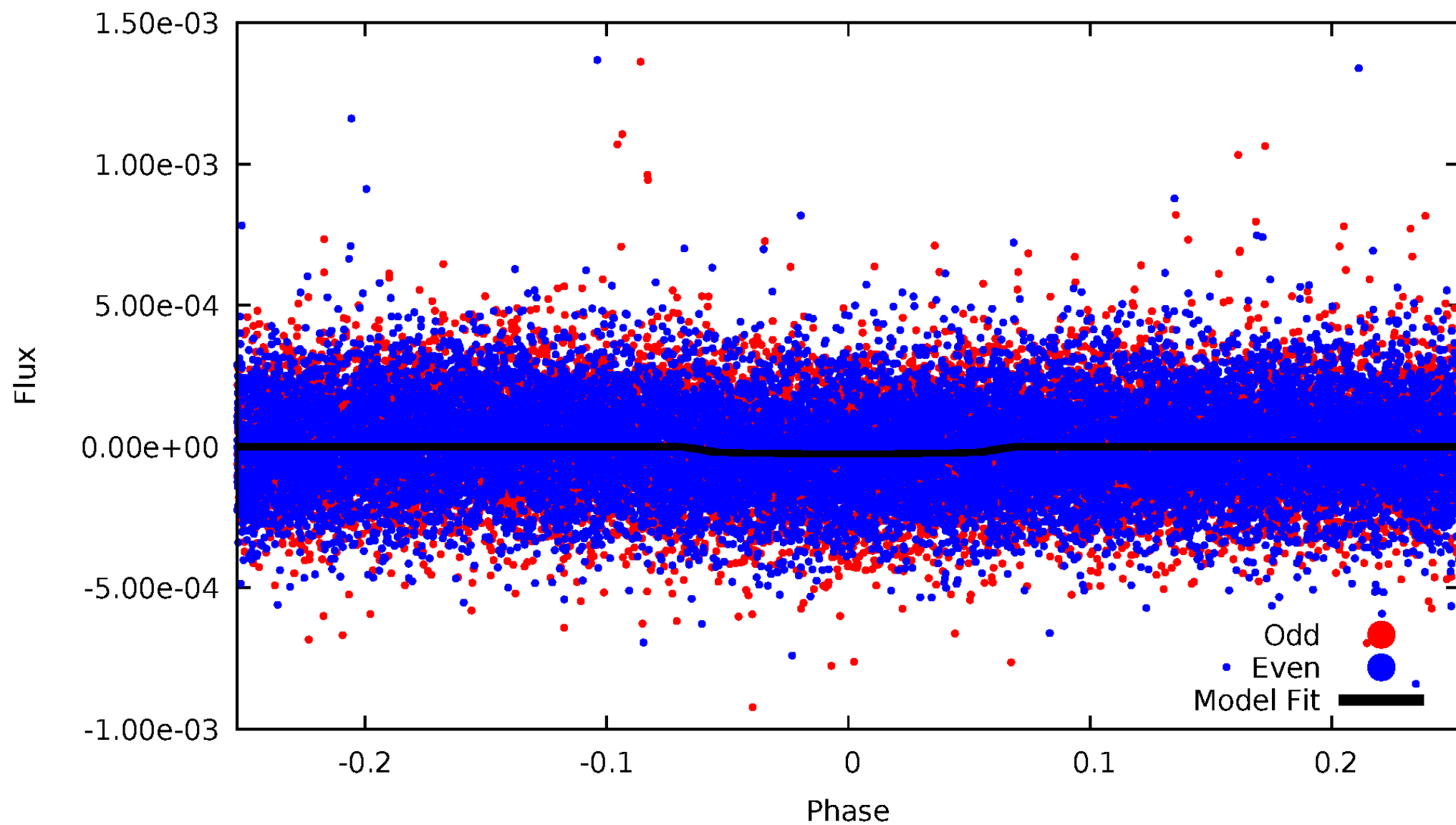


TCE 007135545-01



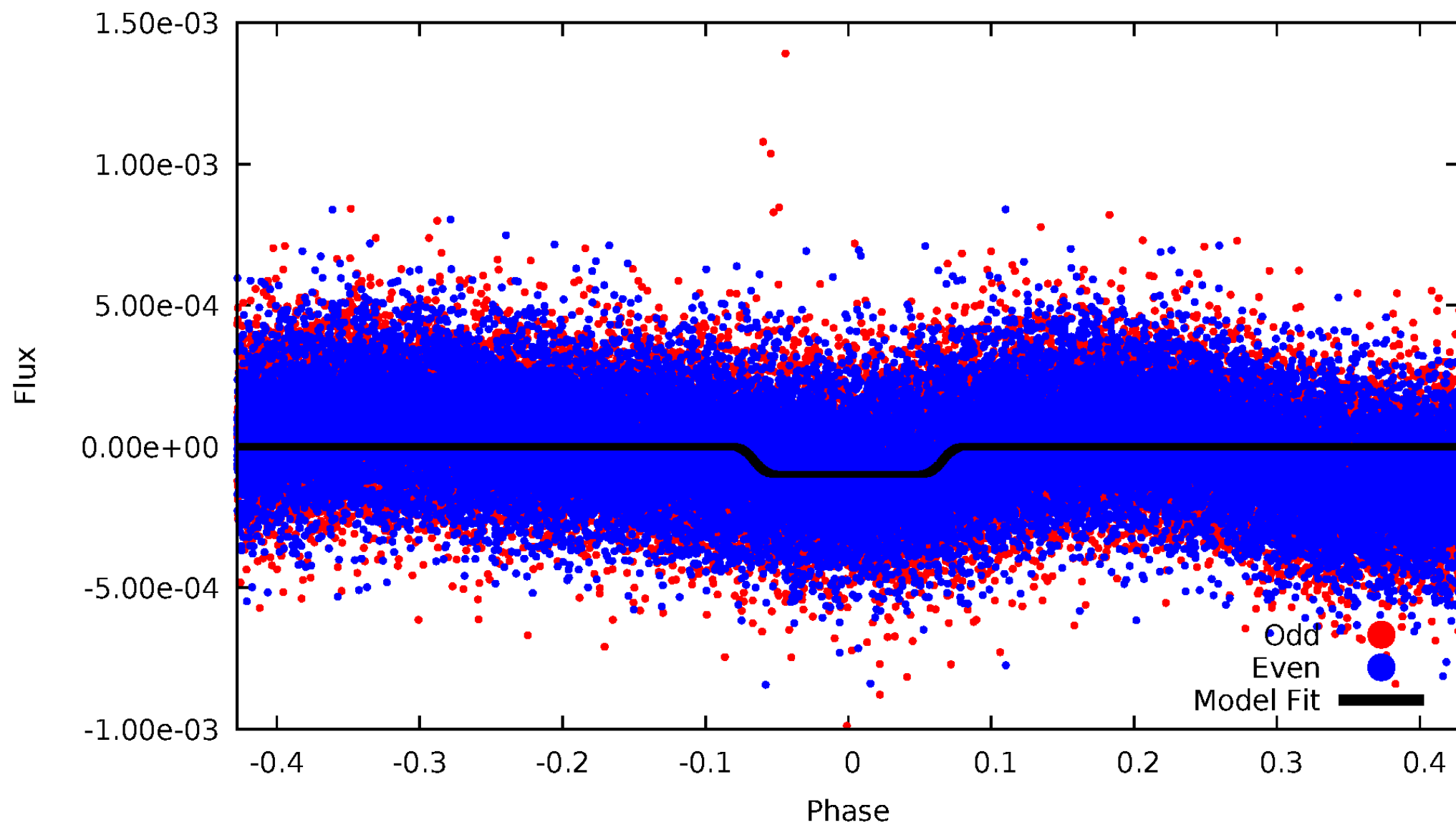
# DV Odd/Even

TCE 007135545-01



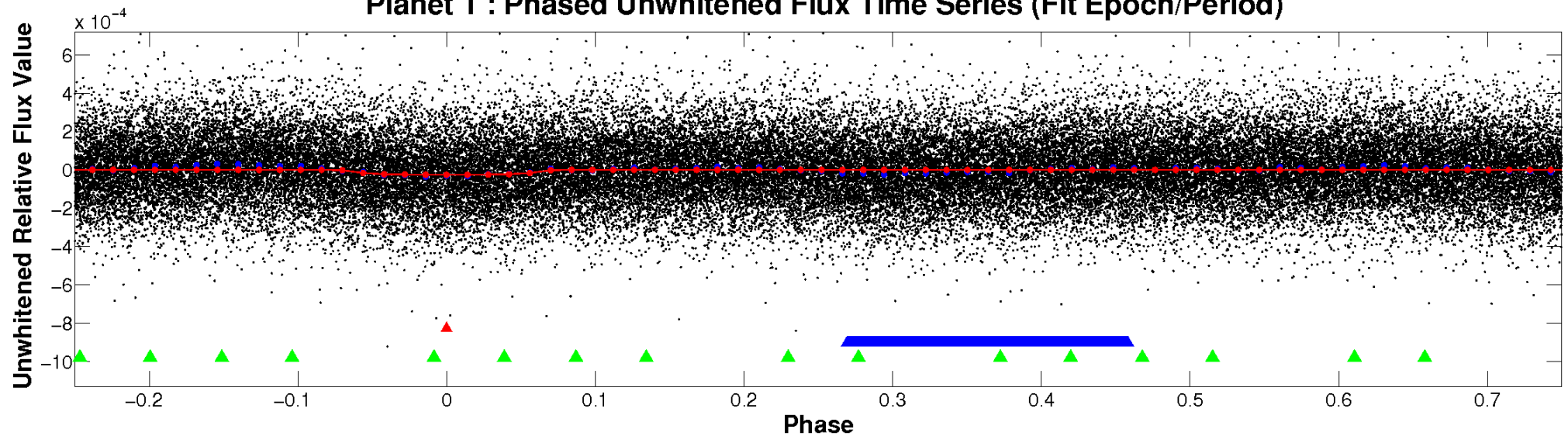
# ALT Odd/Even

TCE 007135545-01

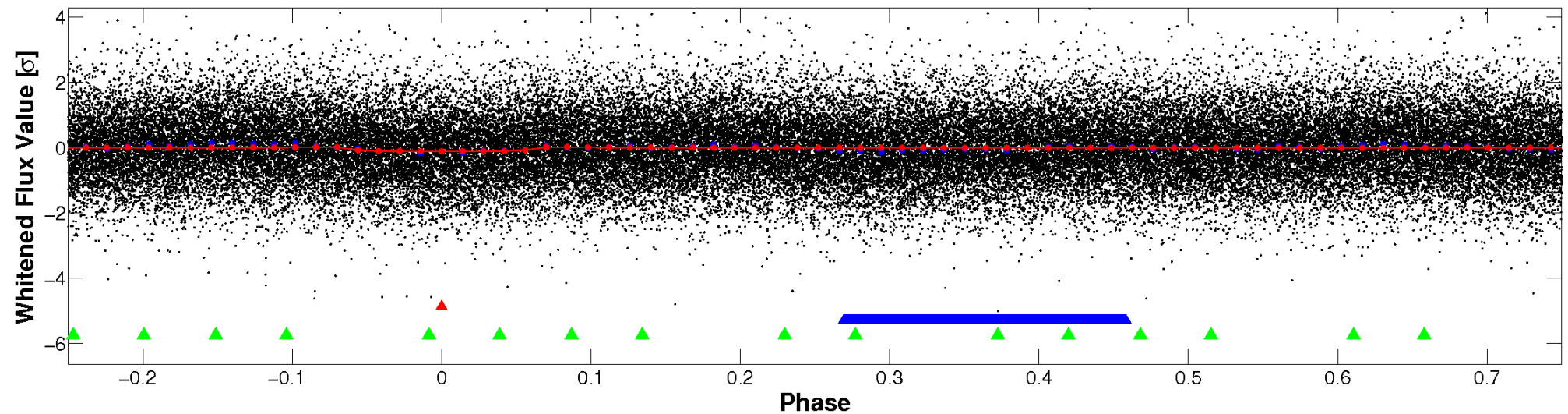


# Non-Whitened Vs. Whitened Light Curve

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



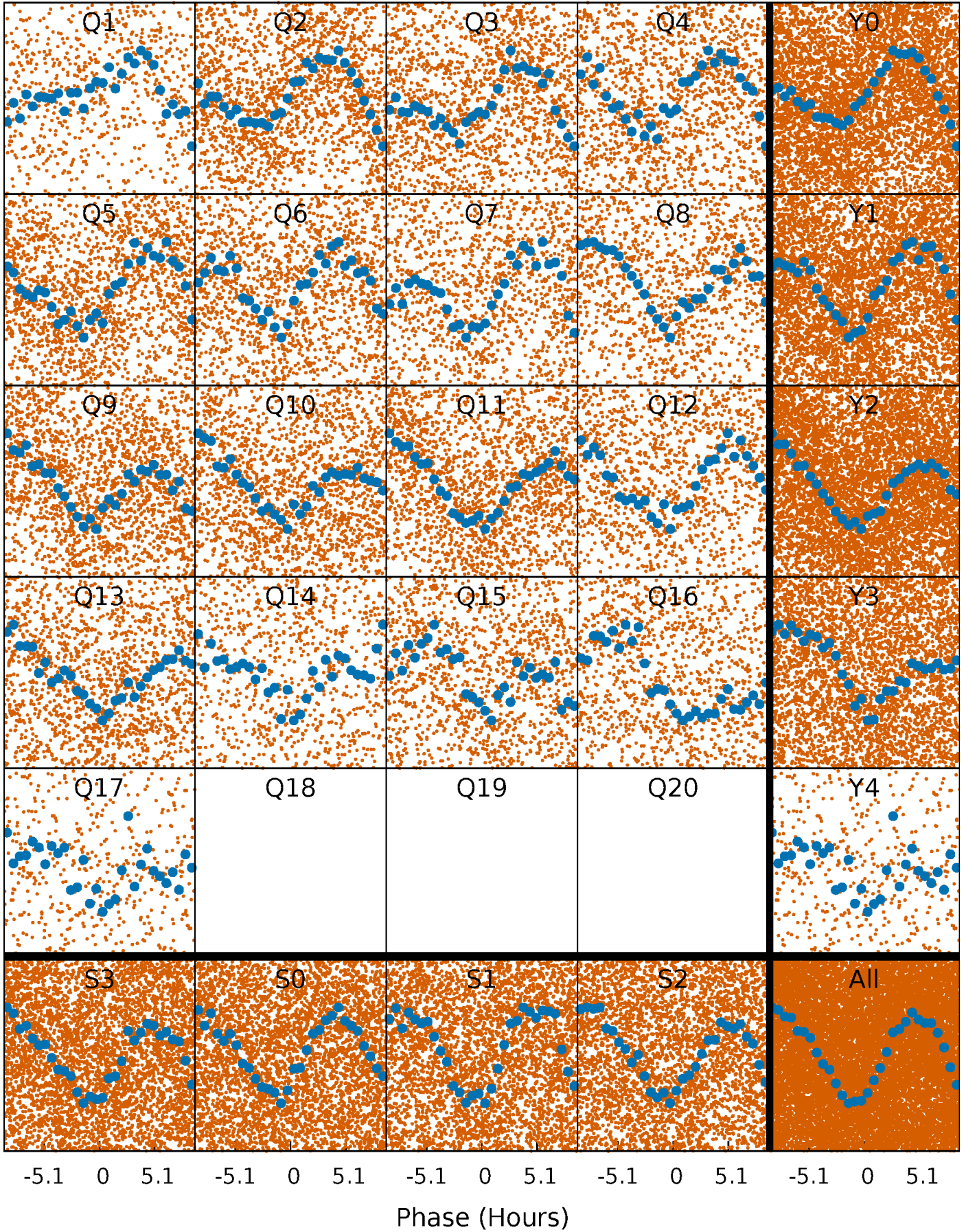
## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

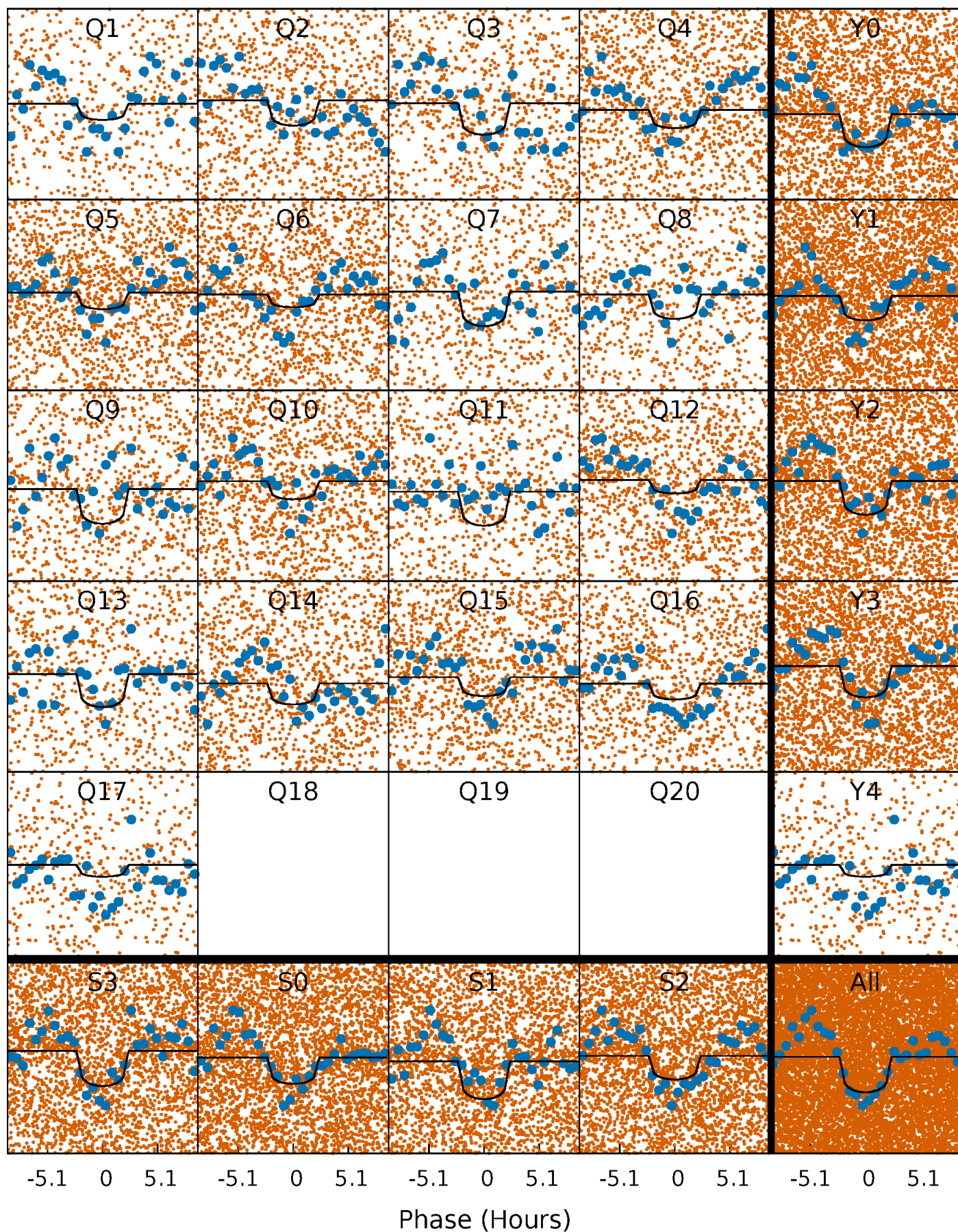
TCE 007135545-01 P= 1.458210 Days  $T_0=132.625812$  (BKJD)





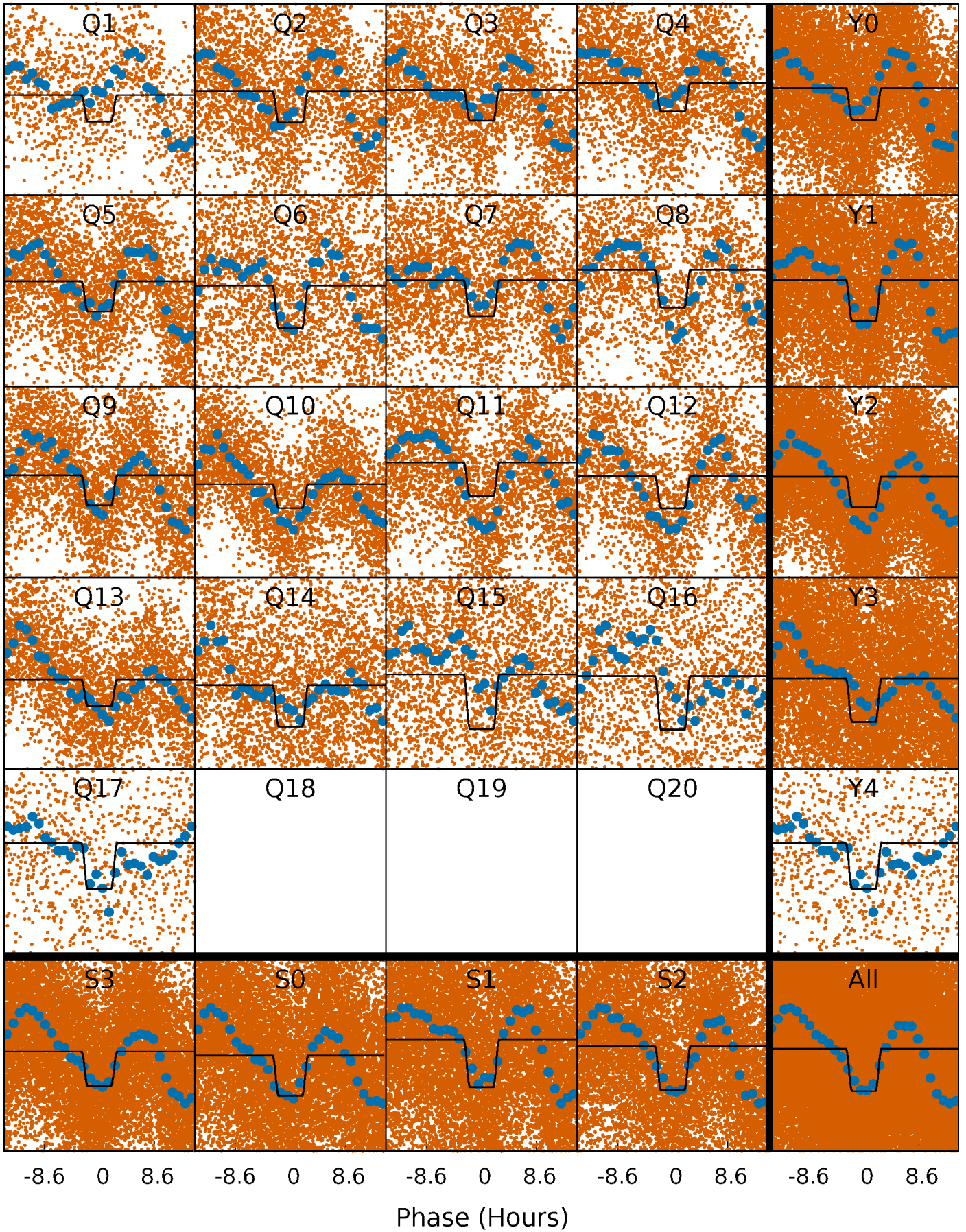
# DV Quarter-Phased Transit Curves

TCE 007135545-01 P= 1.458210 Days  $T_0=132.625812$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007135545-01 P= 1.458245 Days  $T_0=132.557727$  (BKJD)

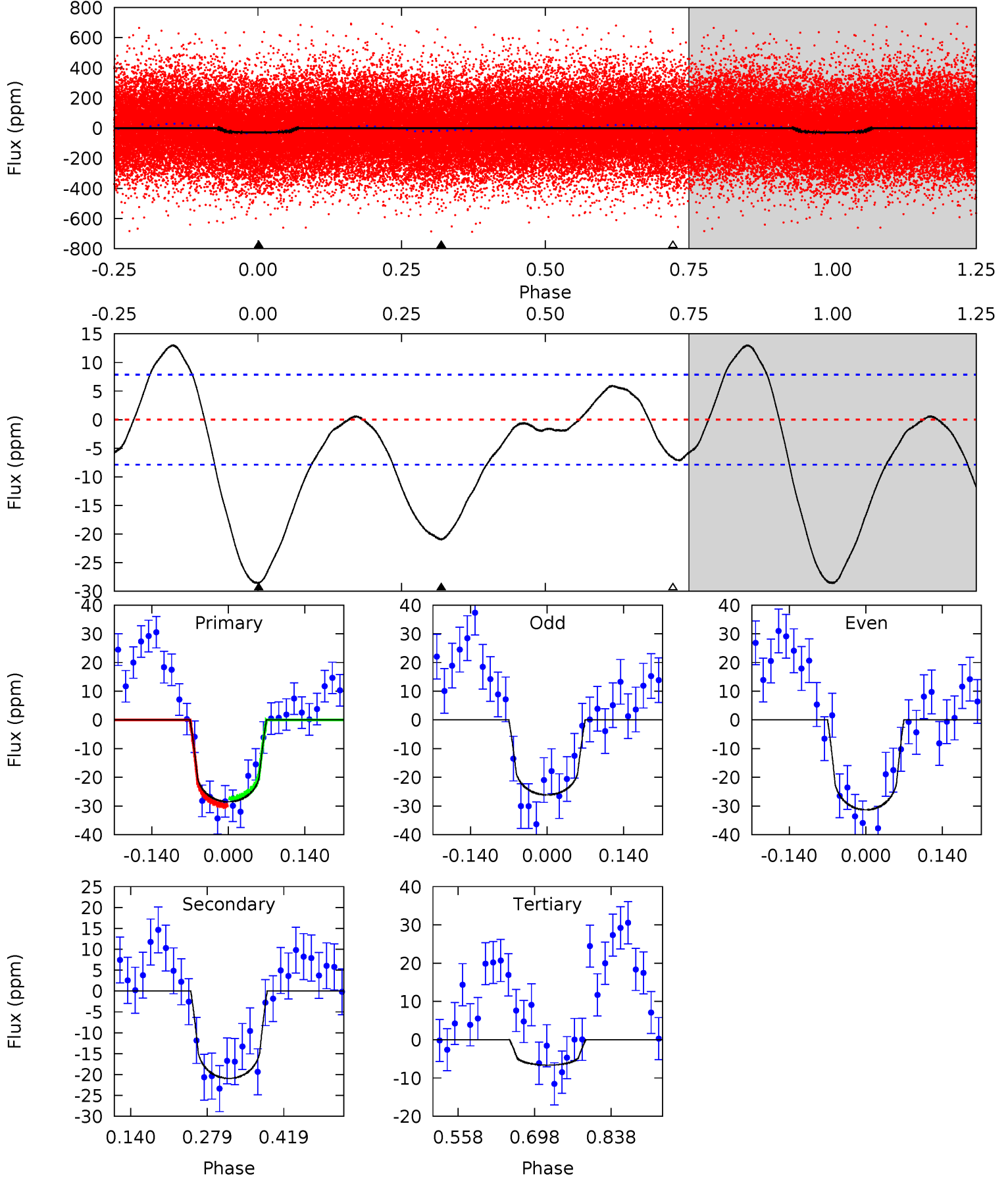




# DV Model-Shift Uniqueness Test

007135545-01, P = 1.458210 Days, E = 131.167602 Days

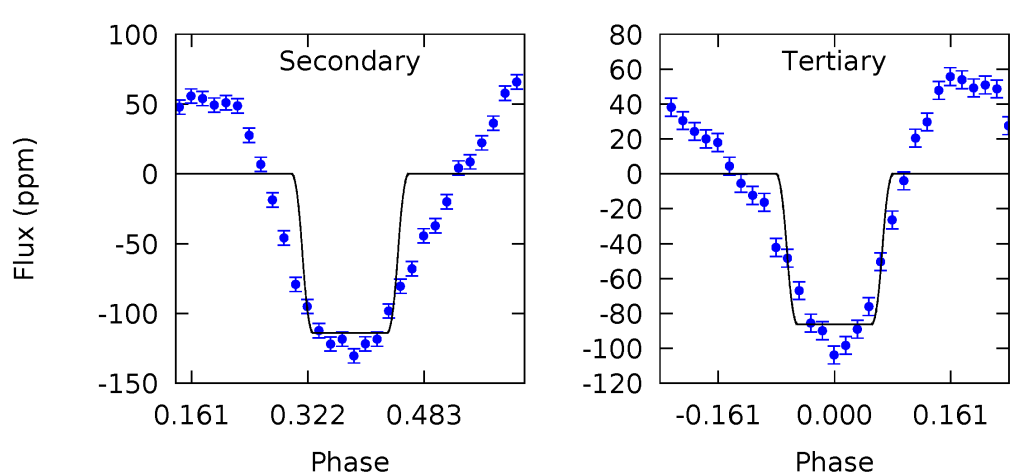
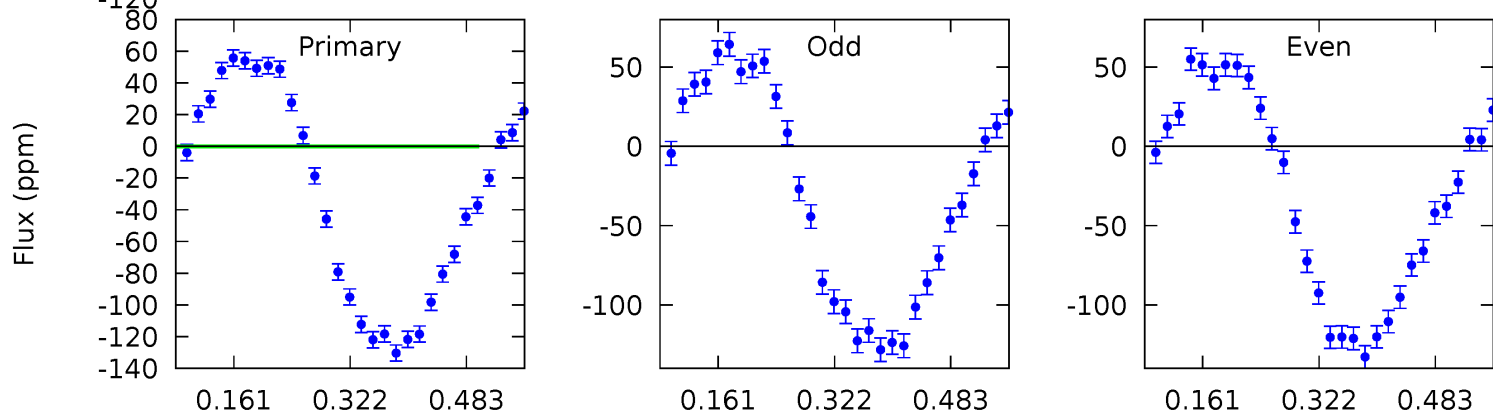
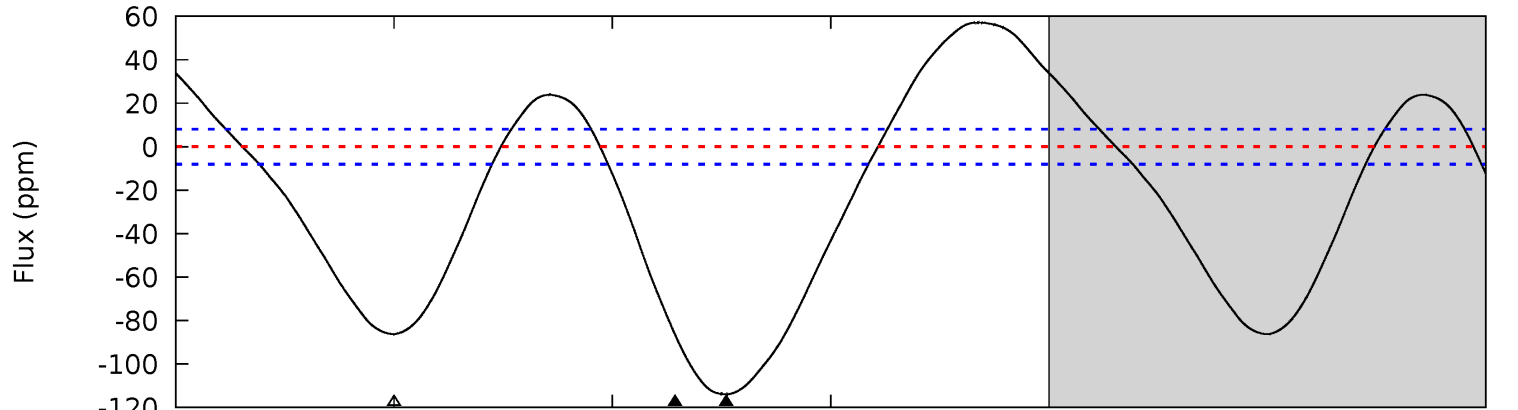
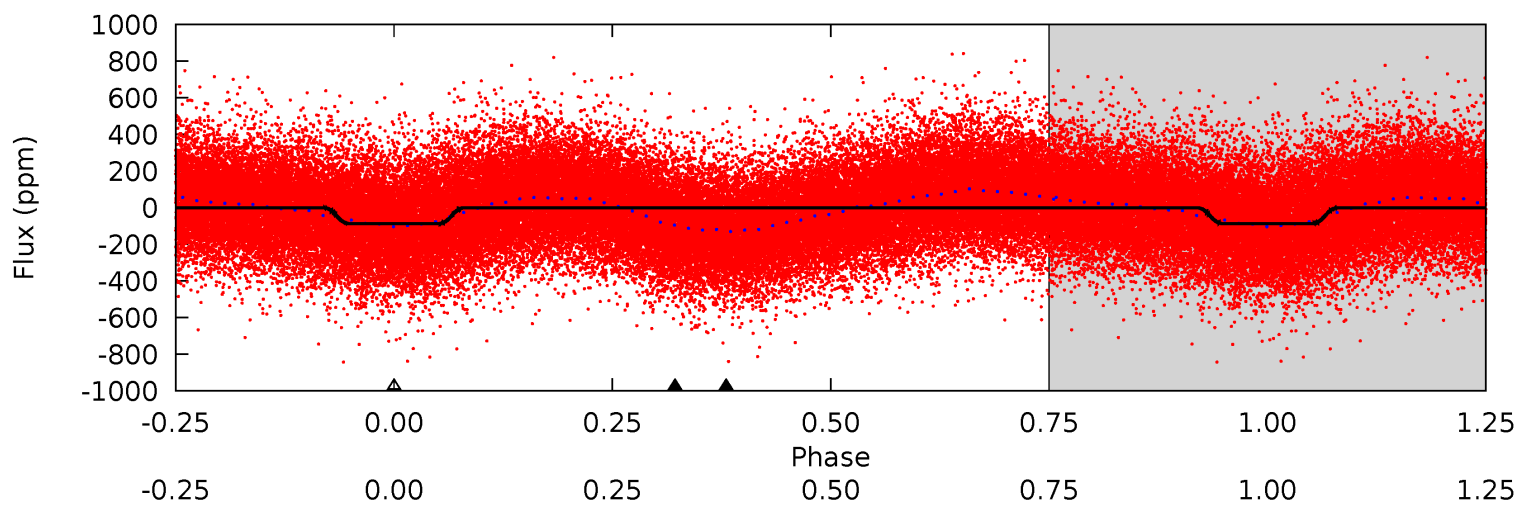
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	12.0	3.80	0	4.49	1.48	2.90	12.5	16.3	8.16	12.0	1.48	0.88	0.31	0.71



# Alt Model-Shift Uniqueness Test

007135545-01, P = 1.458245 Days, E = 131.099482 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
48.1	63.5	48.0	0	4.46	1.40	25.6	0.10	48.1	15.4	63.5	2.06	0.94	0.33	0.57





### Stellar Parameters For KIC 007135545

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6140^{+197}_{-218}$	$3.987^{+0.385}_{-0.138}$	$-0.320^{+0.300}_{-0.300}$	$1.730^{+0.451}_{-0.732}$	$1.060^{+0.165}_{-0.165}$	$0.288^{+0.913}_{-0.135}$
	+3%/-4%	+10%/-3%	+94%/-94%	+26%/-42%	+16%/-16%	+317%/-47%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007135545-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-21 \pm 2$	$0.85^{+0.59}_{-0.48}$	$3045^{+242}_{-330}$	$5873^{+3572}_{-1173}$	$11^{+42}_{-7}$
Alt.	$-114 \pm 2$	$1.74^{+0.65}_{-0.59}$	$3053^{+250}_{-329}$	$6379^{+1412}_{-847}$	$14^{+18}_{-7}$

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

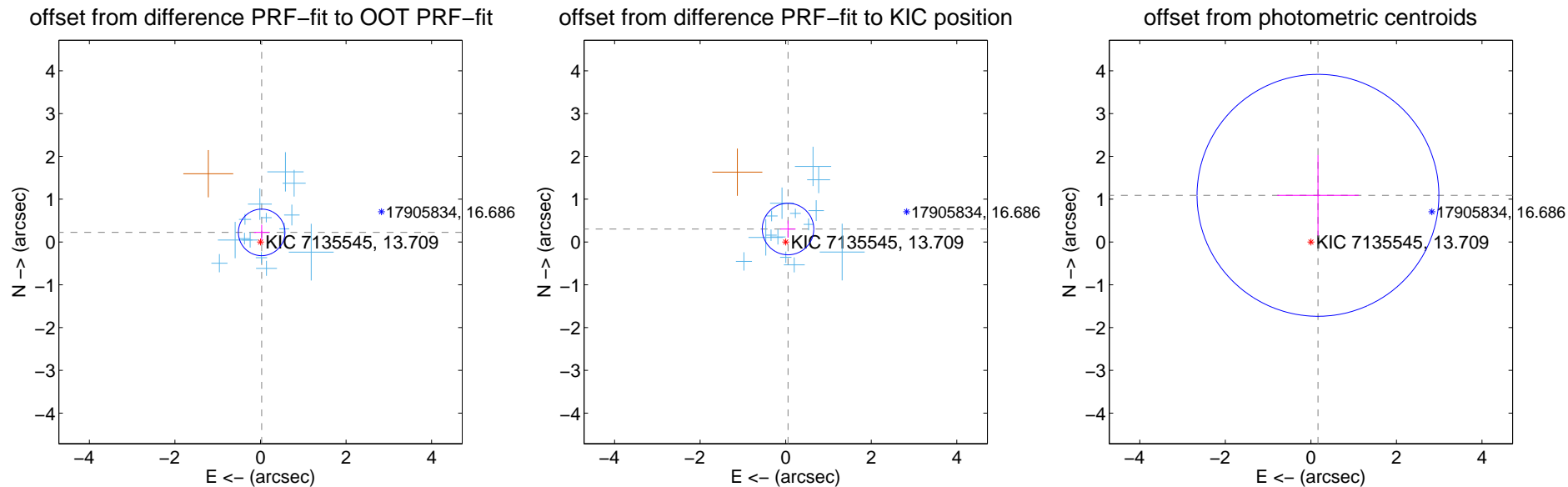
## DV Centroid Data

Supplemental centroid analysis for 007135545-01. Kepler magnitude: 13.71. Transit SNR 8.77

There are 14 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

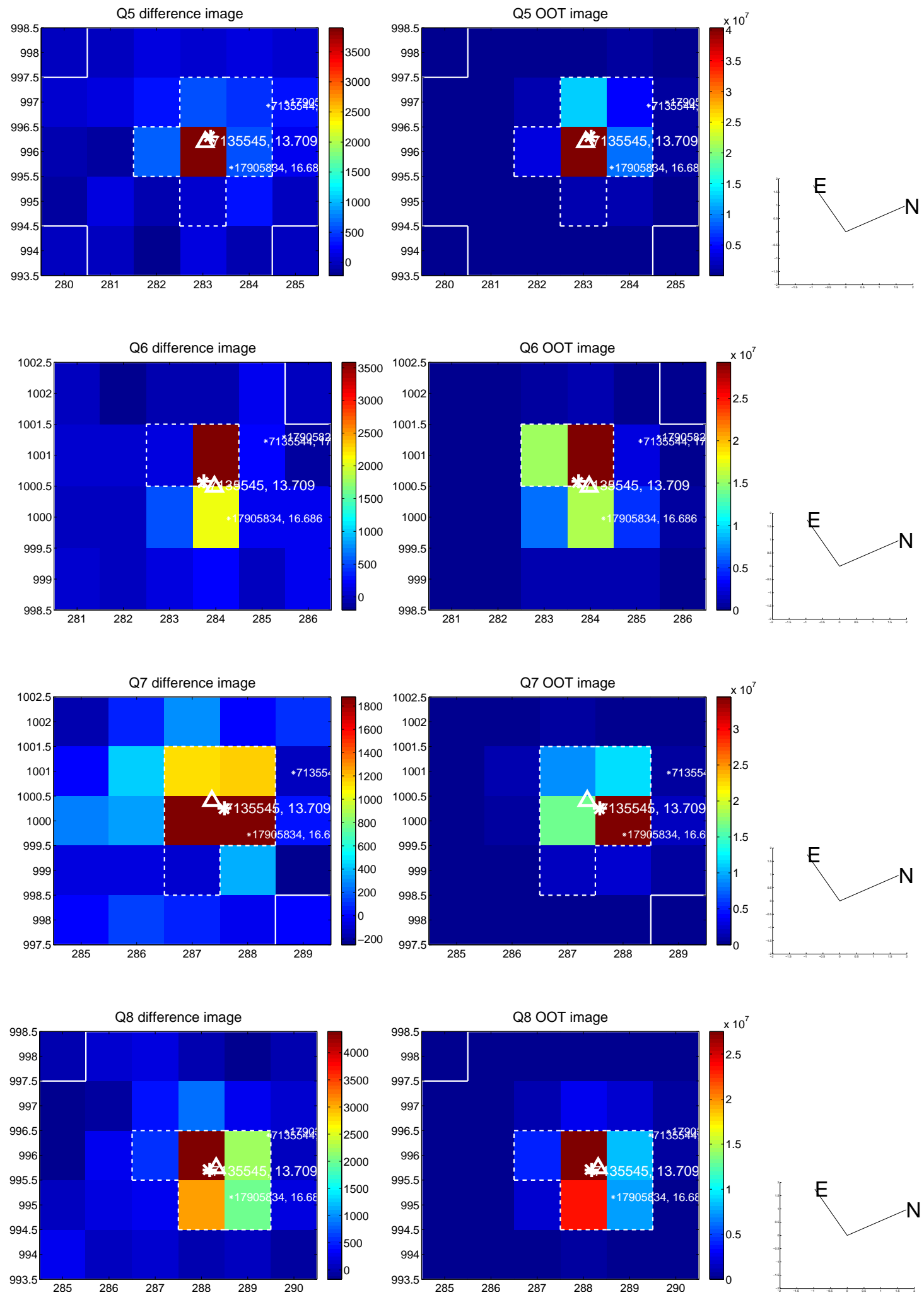
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.226 \pm 0.181$	1.24	$-0.027 \pm 0.181$	$0.224 \pm 0.180$
PRF-fit source offset from KIC position	$0.308 \pm 0.201$	1.53	$-0.054 \pm 0.176$	$0.303 \pm 0.199$
photometric centroid source offset	$1.10 \pm 0.94$	1.17	$-0.17 \pm 0.95$	$1.09 \pm 0.94$



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.

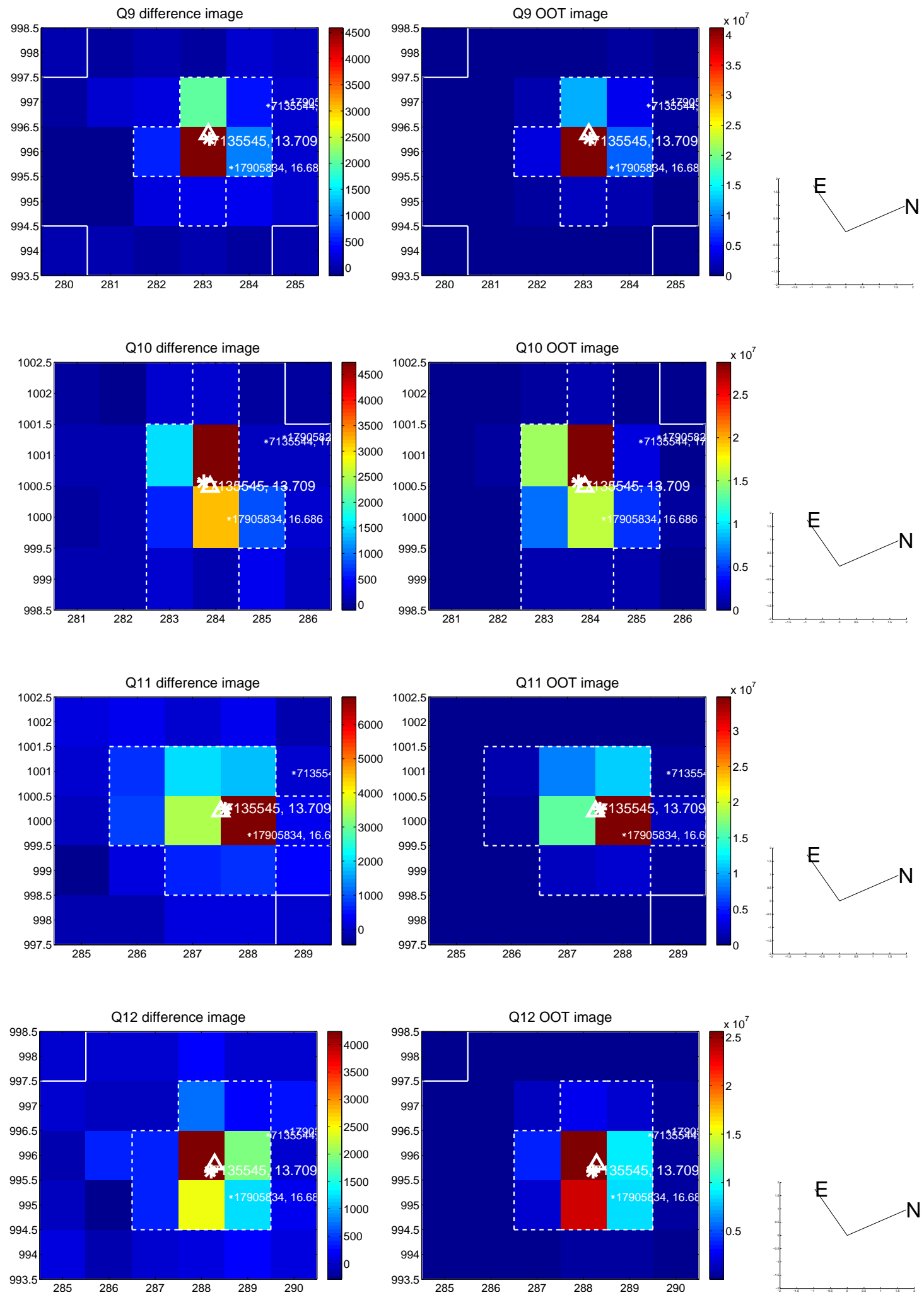


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

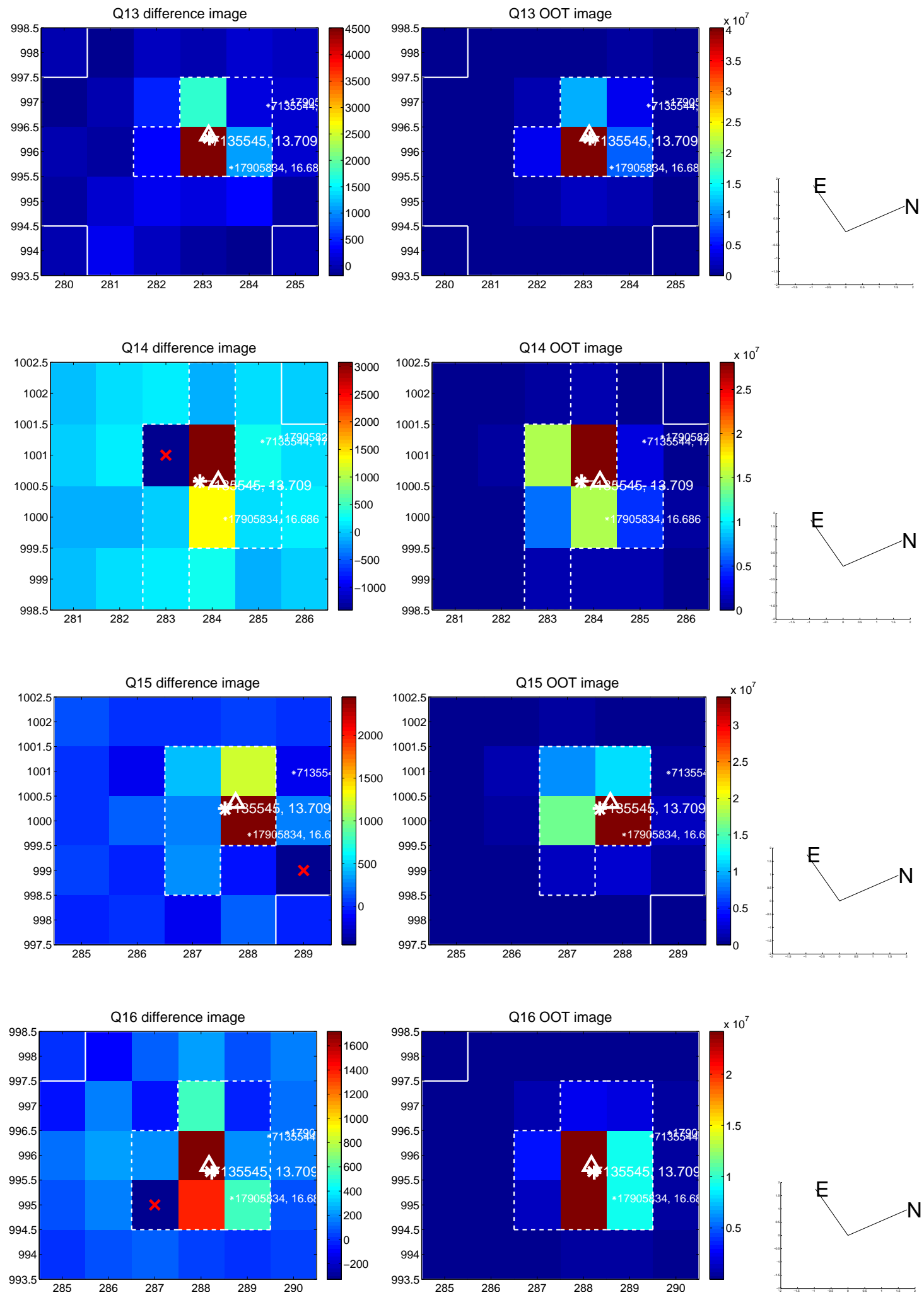




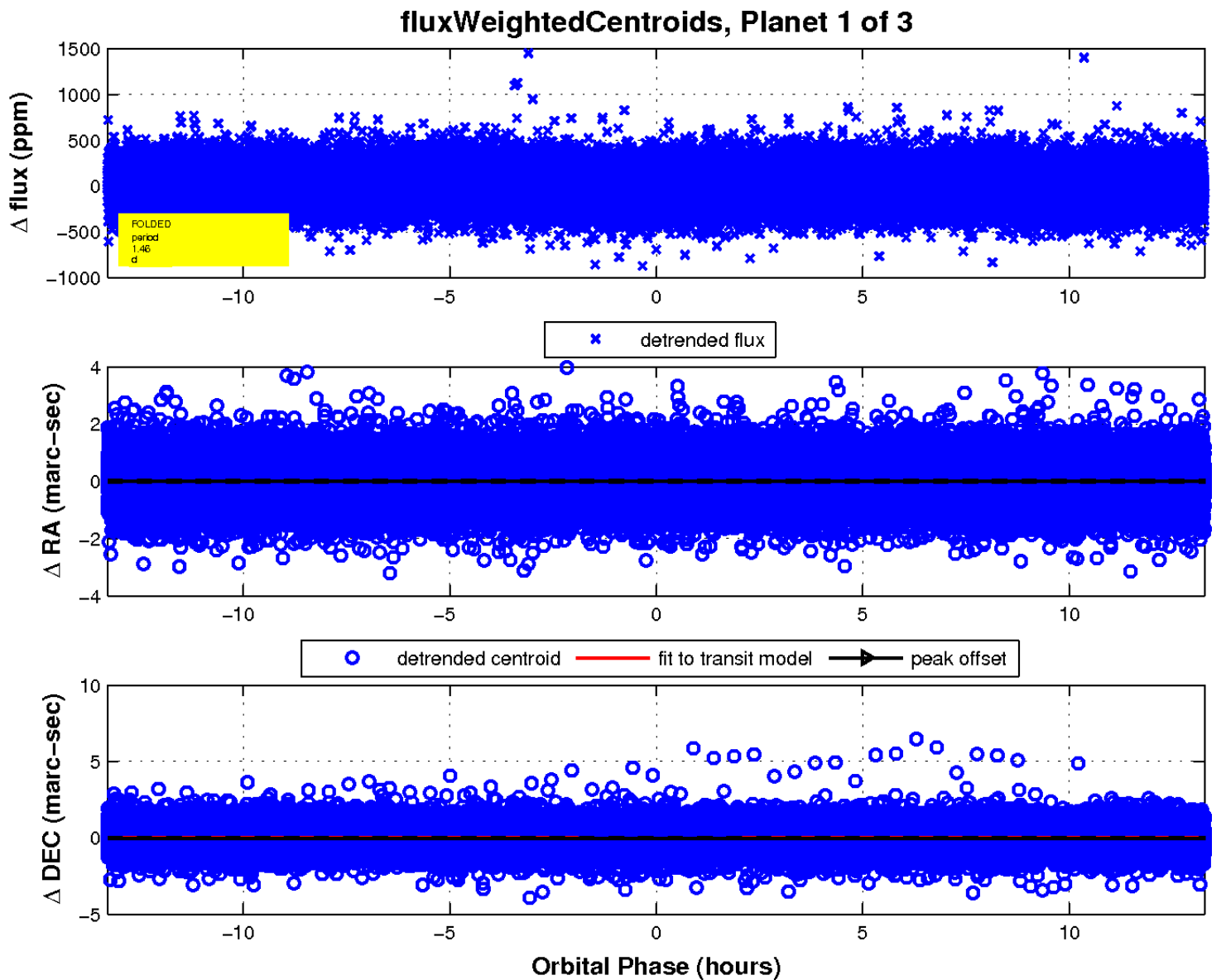
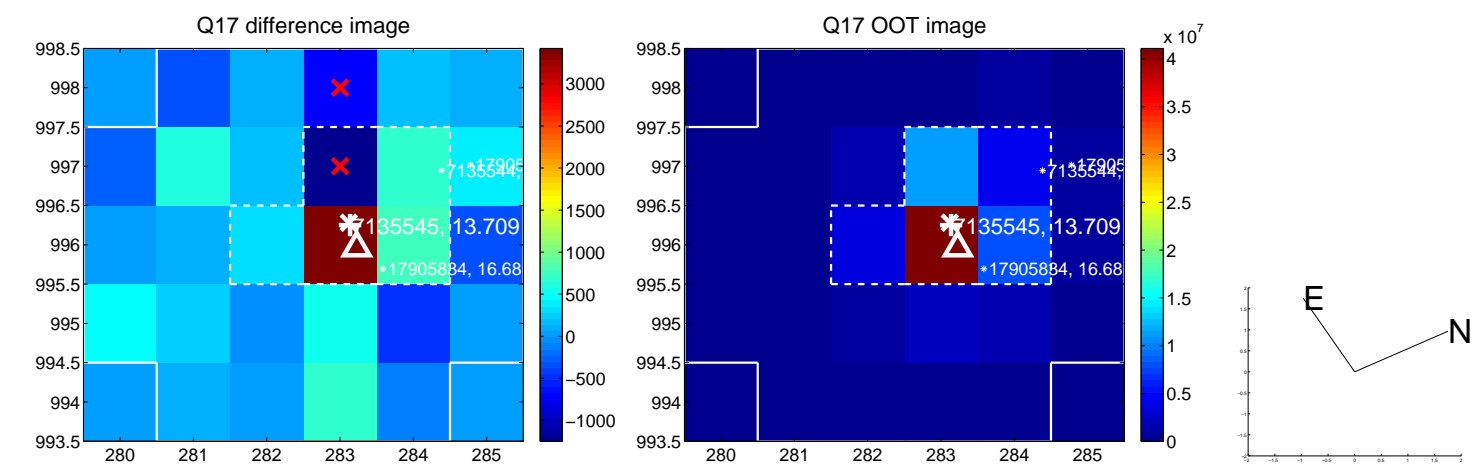
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

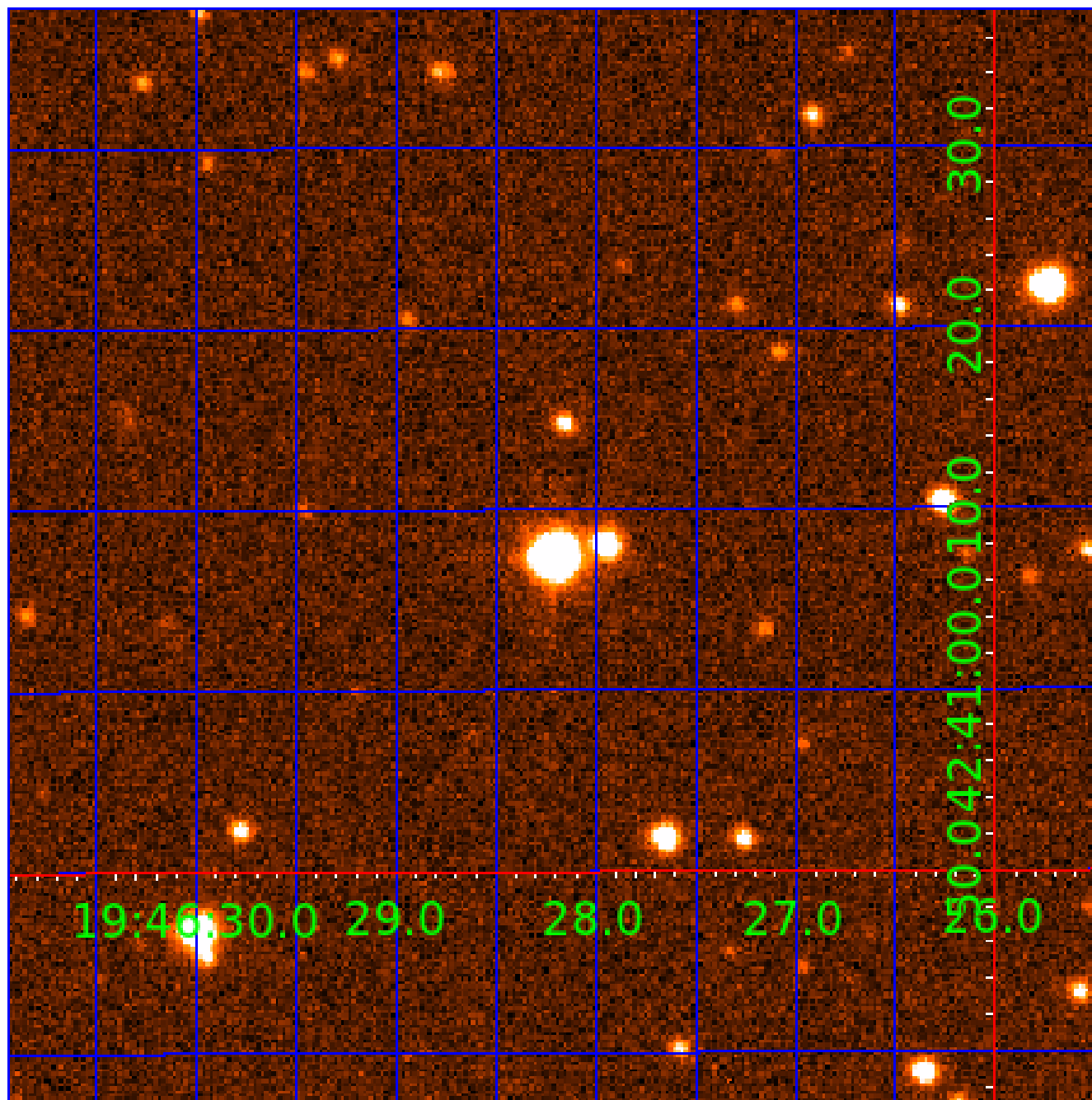


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



# UKIRT Image

Declination





# KIC 007135545

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007135545-01	OBS	No	1.458210	132.625812	25.7	4.426	9.1	8.8	1.73	6140	0.89	5787.69
007135545-02	OBS	No	1.458485	131.560213	23.8	7.573	9.1	10.3	1.73	6140	0.99	5786.23

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007135545-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT
007135545-02	OBS	FP	0.00	1	0	0	0	LPP_DV—SAME_NTL_PERIOD

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

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

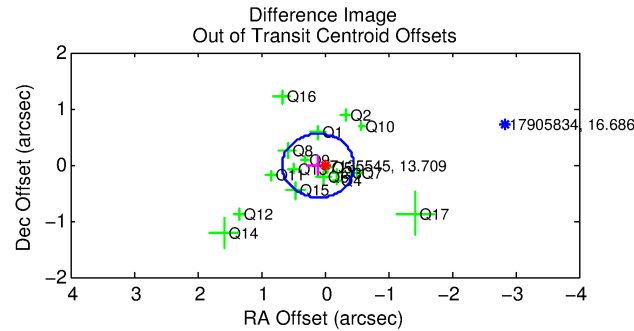
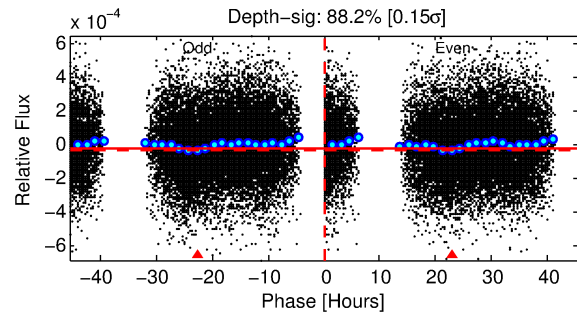
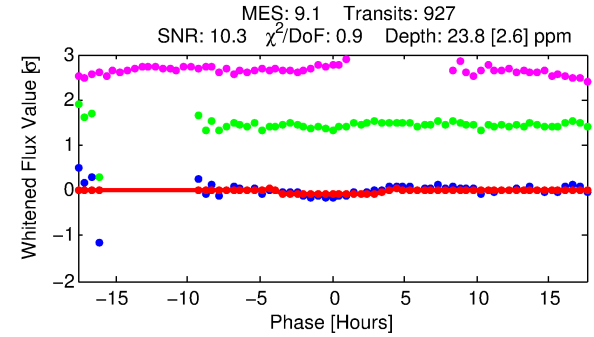
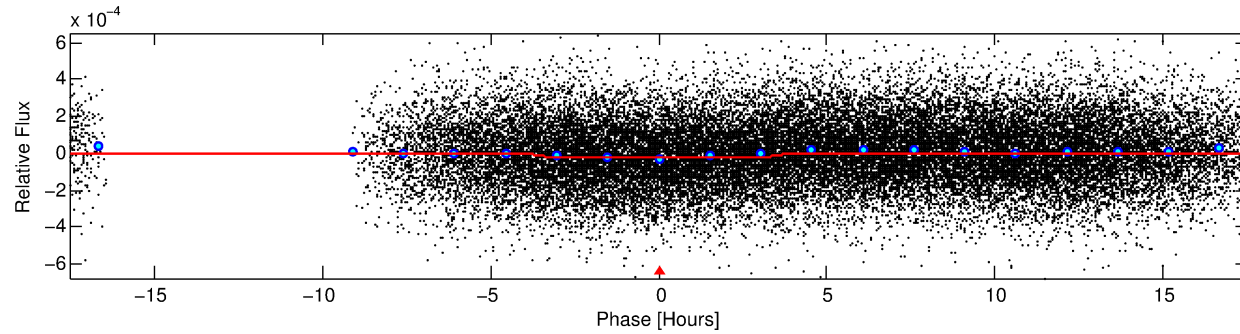
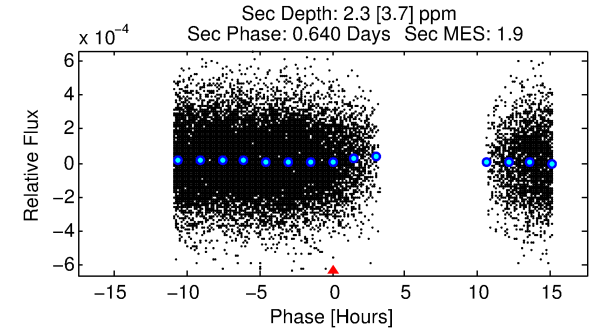
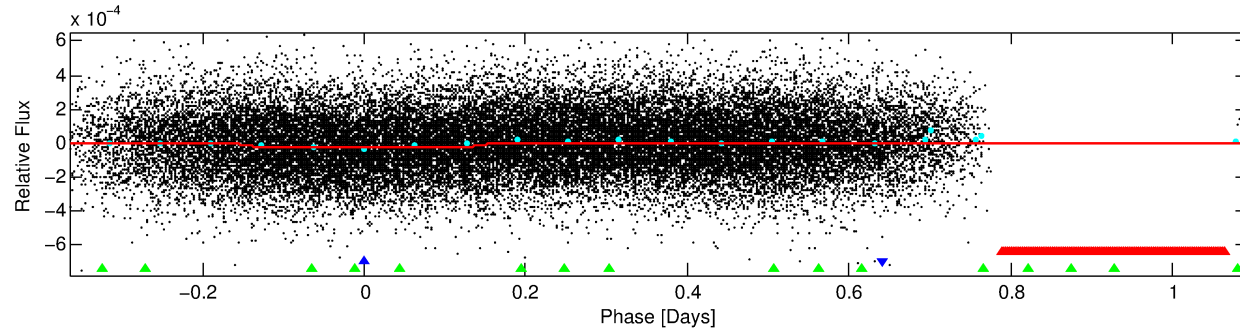
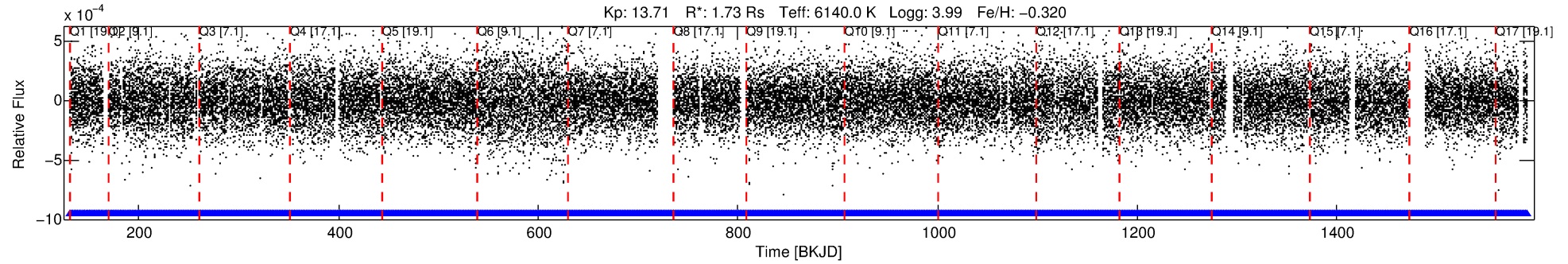
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 007135545-02

No Significant Match Found

# DV One-Page Summary

KIC: 7135545 Candidate: 2 of 3 Period: 1.458 d



## DV Fit Results:

Period = 1.45849 [0.00002] d  
Epoch = 131.5602 [0.0058] BKJD  
Rp/R\* = 0.0053 [0.0018]  
a/R\* = 1.14 [0.49]  
b = 0.90 [0.38]  
Seff = 5786.23 [3877.28]  
Teq = 2224 [373] K  
Rp = 0.99 [0.53] Re  
a = 0.0257 [0.0105] AU  
Ag = 0.85 [1.57] [-0.10σ]  
Teffp = 3300 [1431] K [0.73σ]

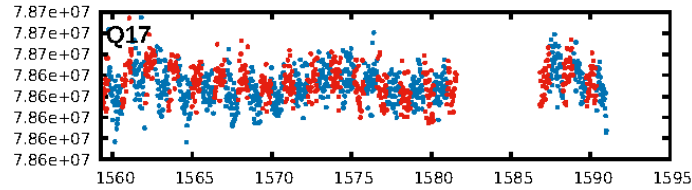
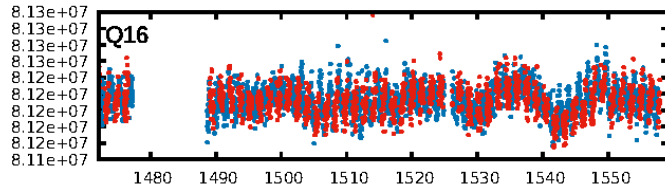
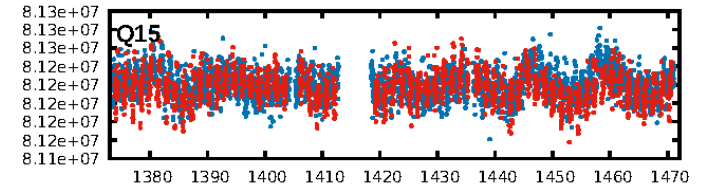
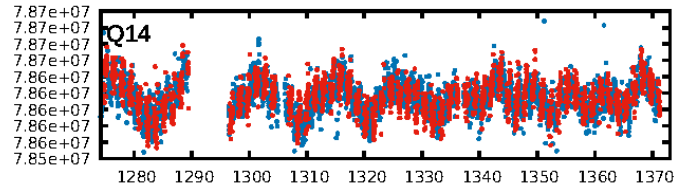
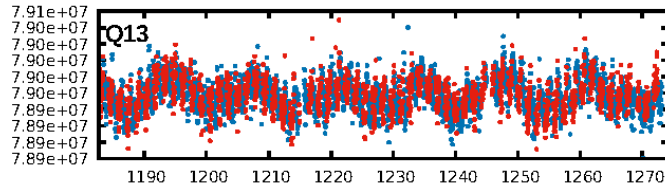
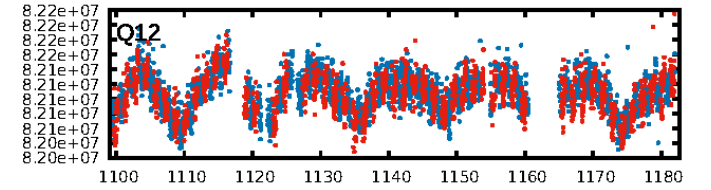
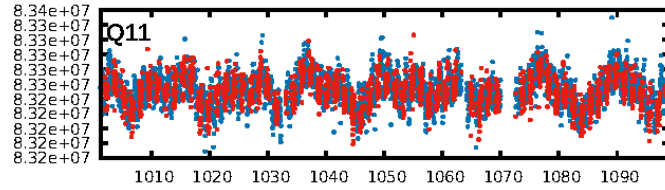
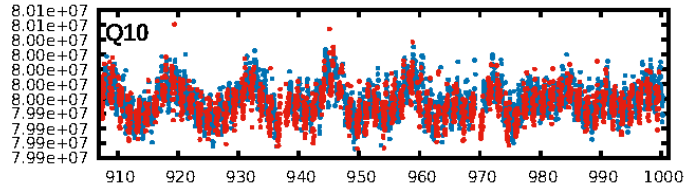
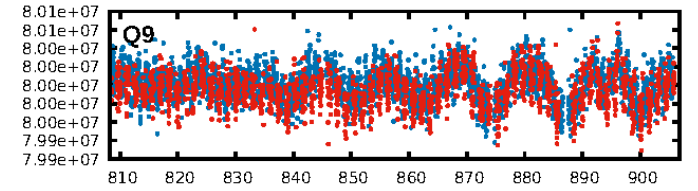
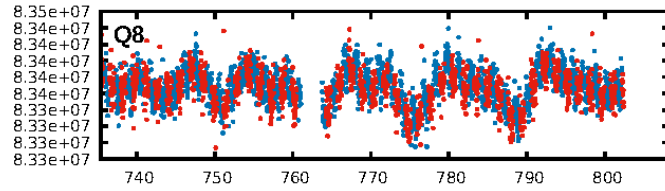
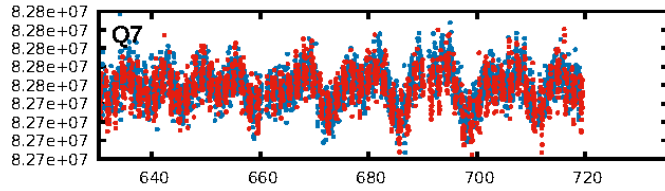
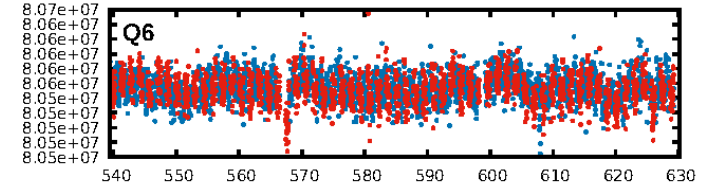
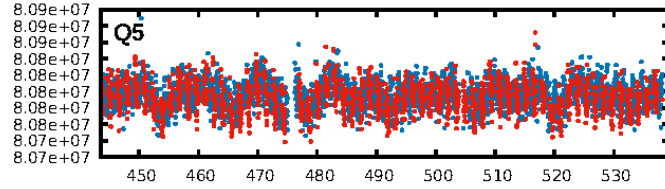
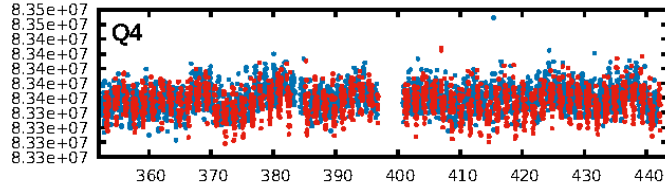
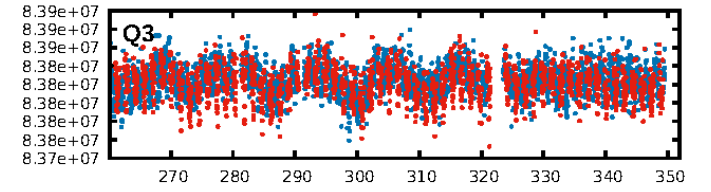
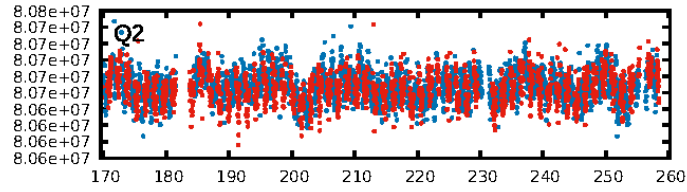
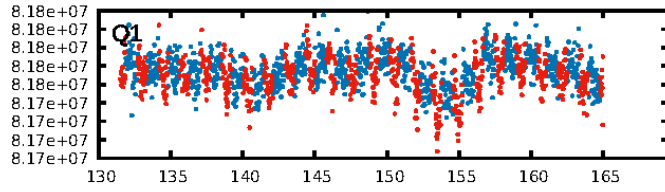
## DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00σ]  
LongPeriod-sig: 100.0% [242.59σ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: 1.78e-13  
RollingBand-fgt: 1.00 [885/885]  
GhostDiagnostic-chr: 0.9797  
Centroid-sig: 31.8%  
Centroid-so: 0.744 arcsec [0.90σ]  
OotOffset-rm: 0.106 arcsec [0.56σ]  
KicOffset-rm: 0.122 arcsec [0.75σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.94 [16/17]  
DiffImageOverlap-fno: 0.00 [0/17]

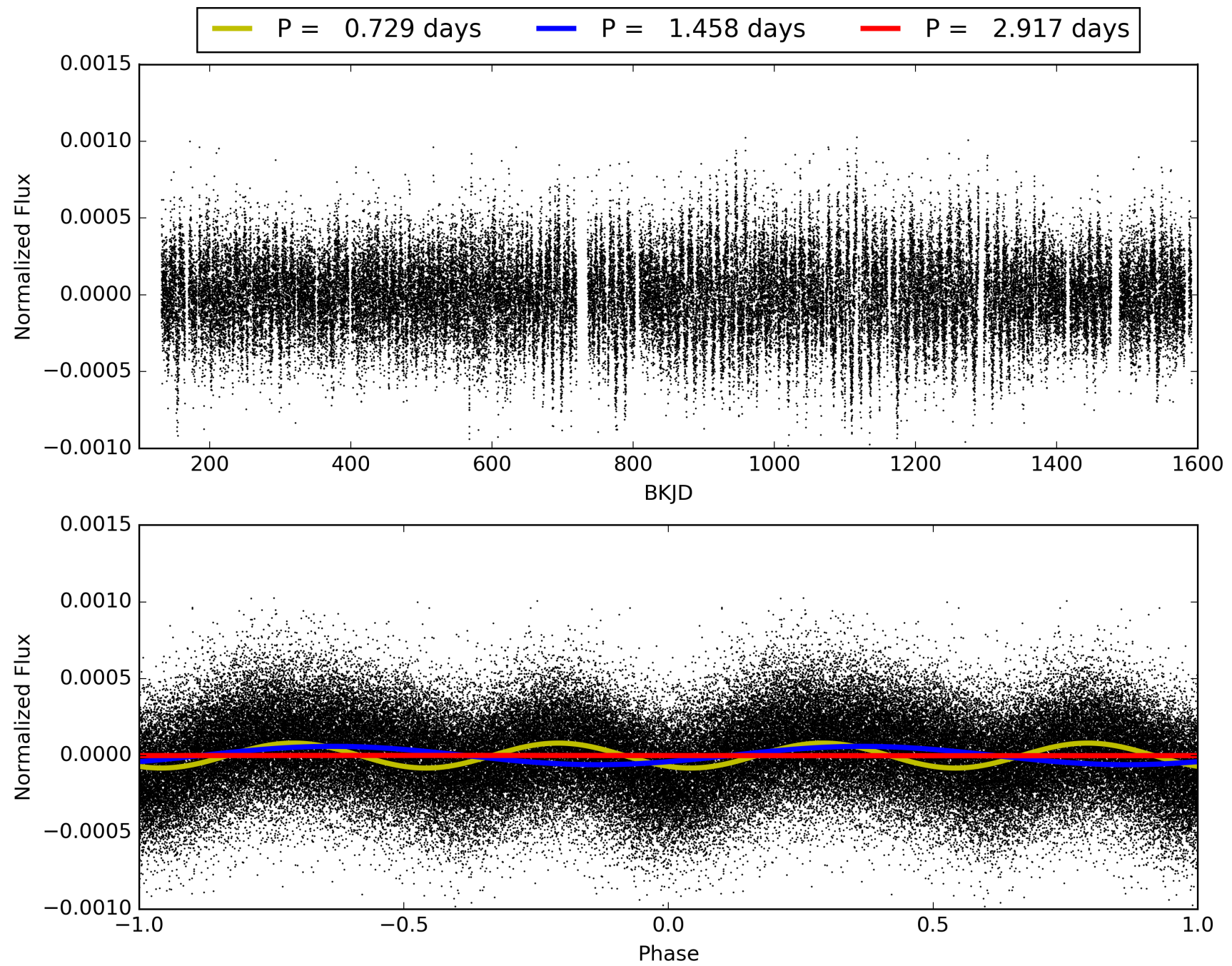
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:45:33 Z

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

# TCE 007135545-02, PDC Light Curves



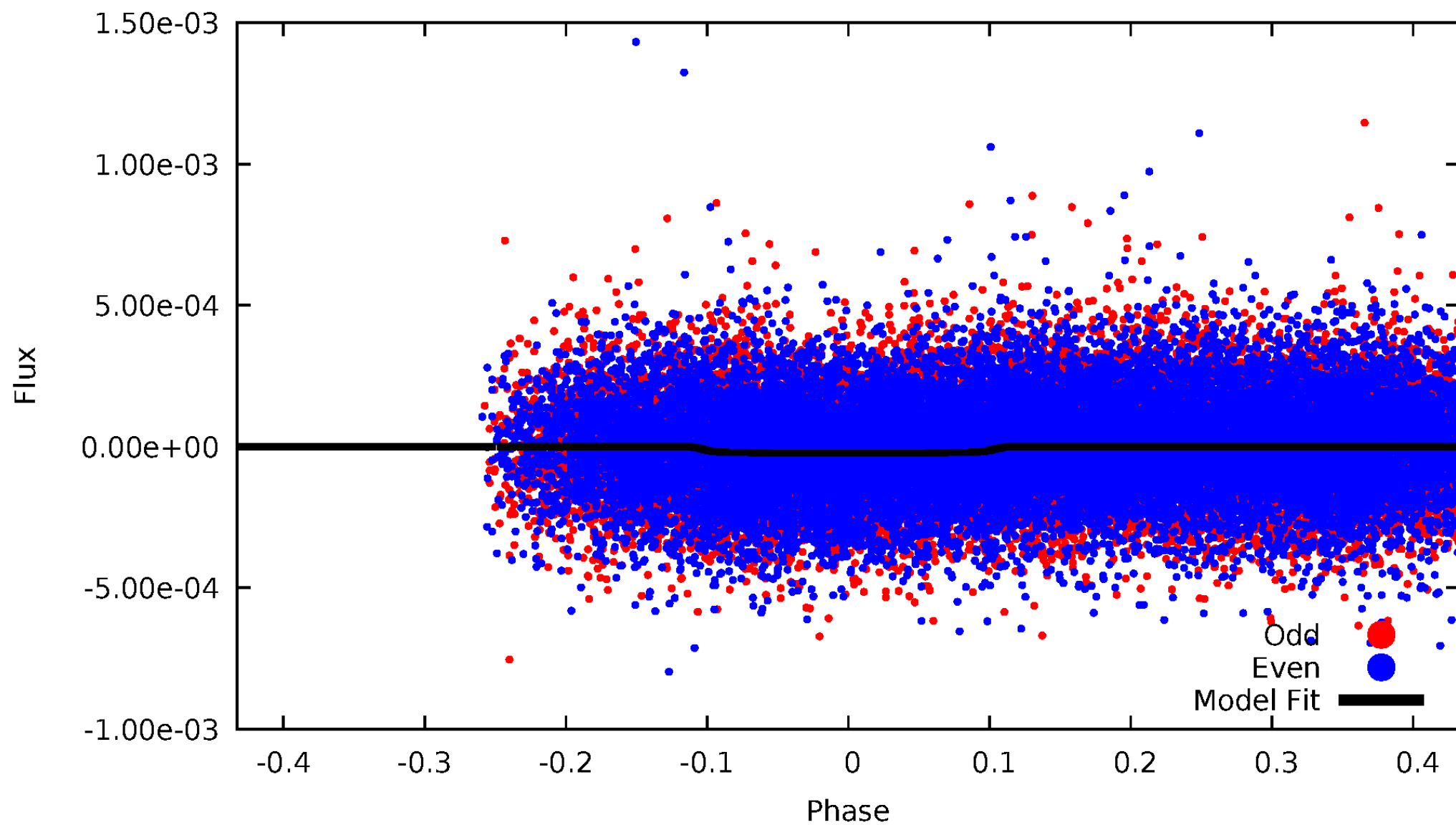
TCE 007135545-02





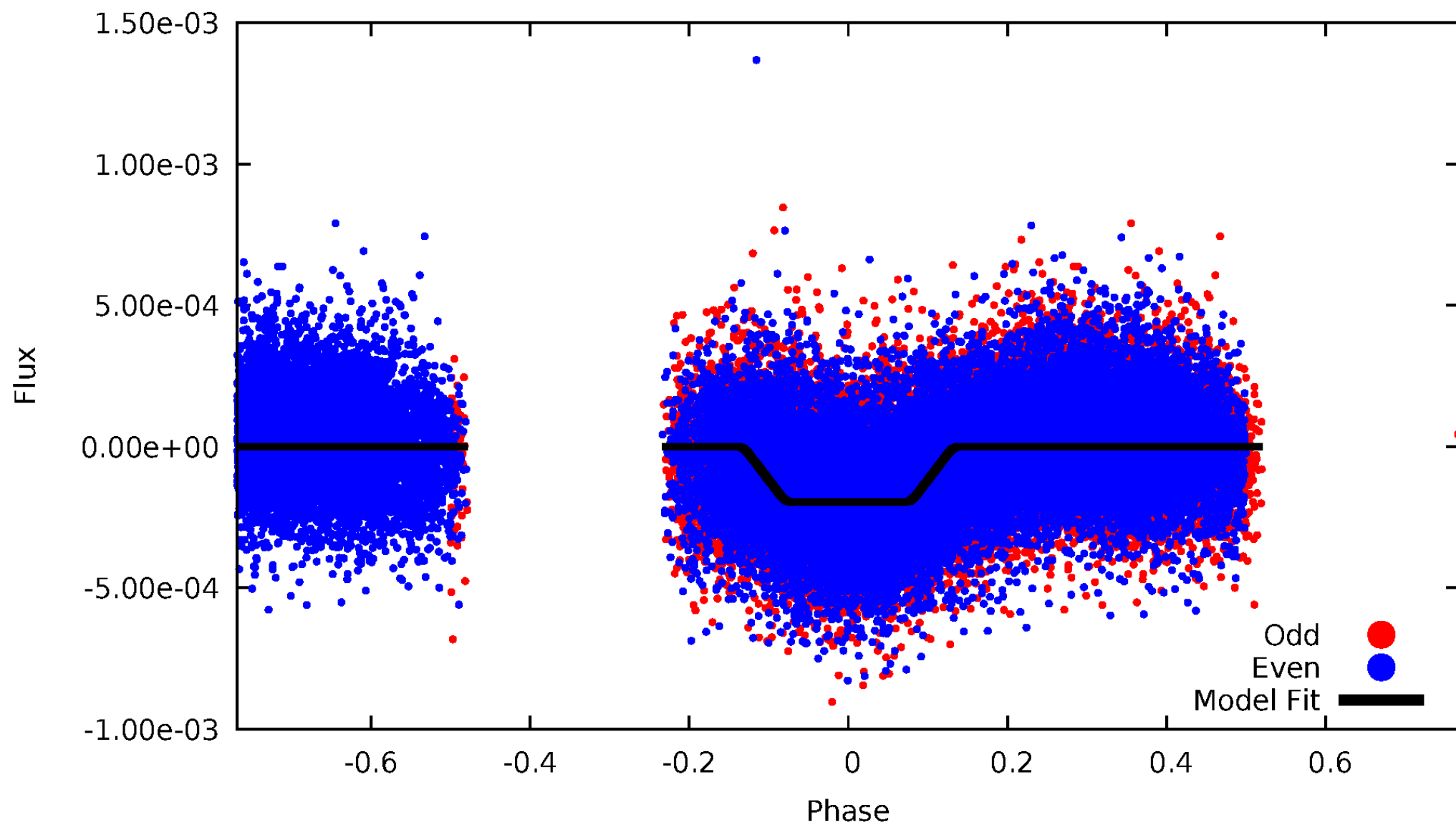
# DV Odd/Even

TCE 007135545-02



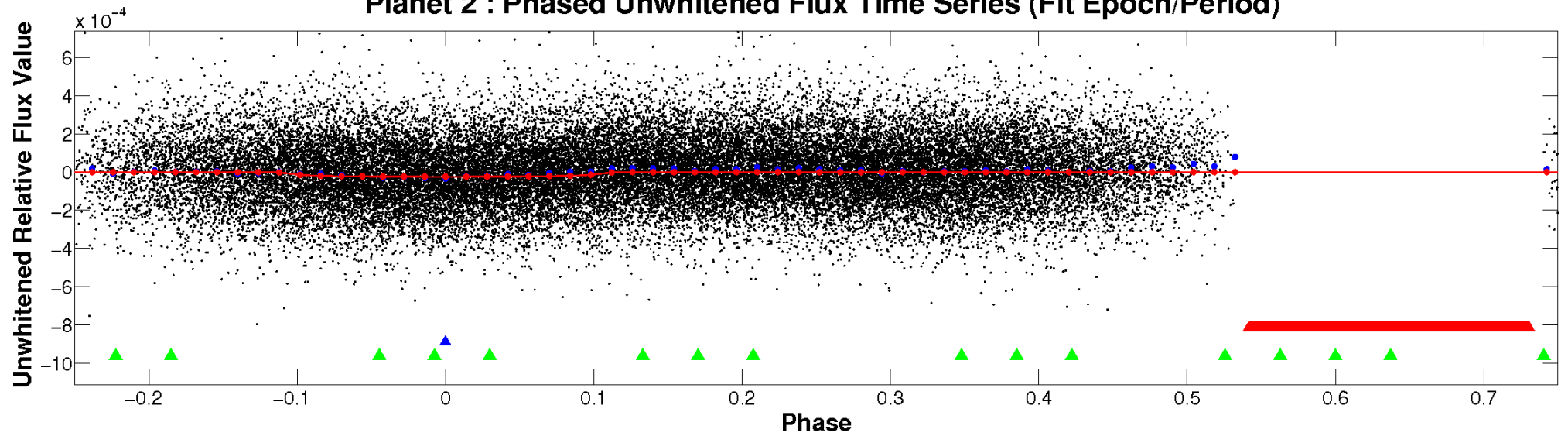
# ALT Odd/Even

TCE 007135545-02

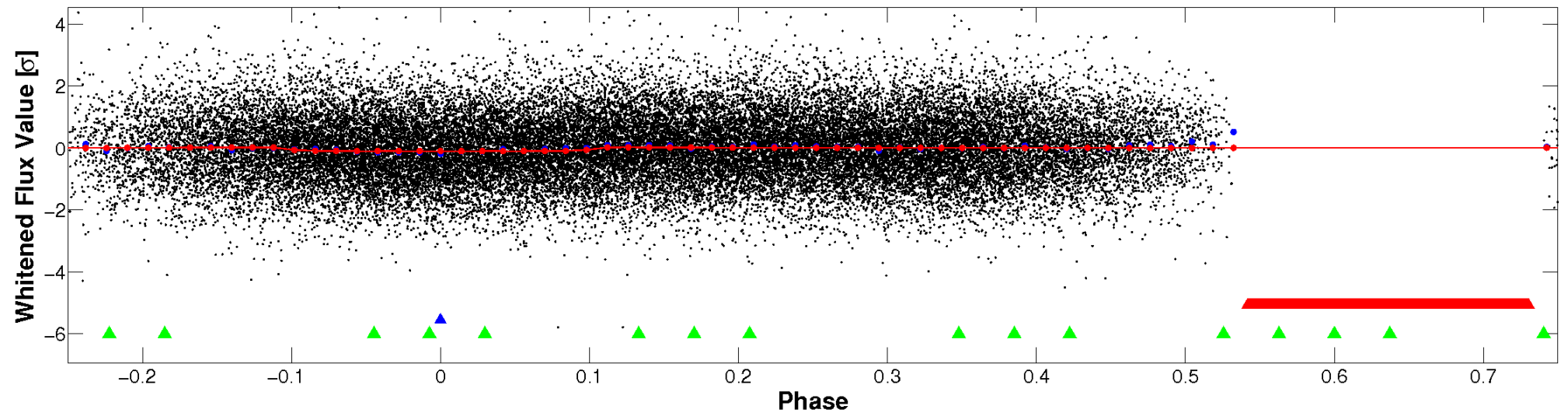


# Non-Whitened Vs. Whitened Light Curve

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

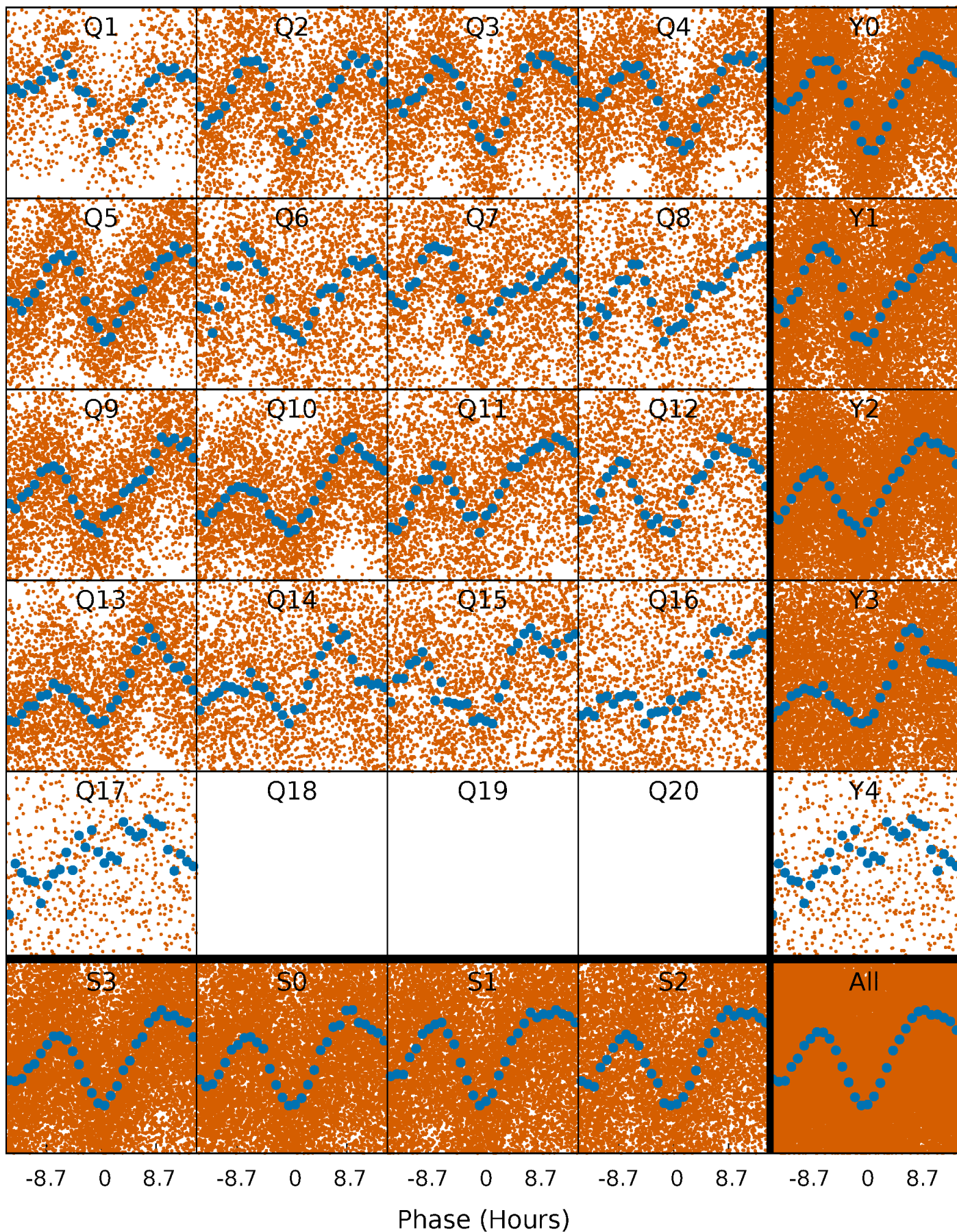


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

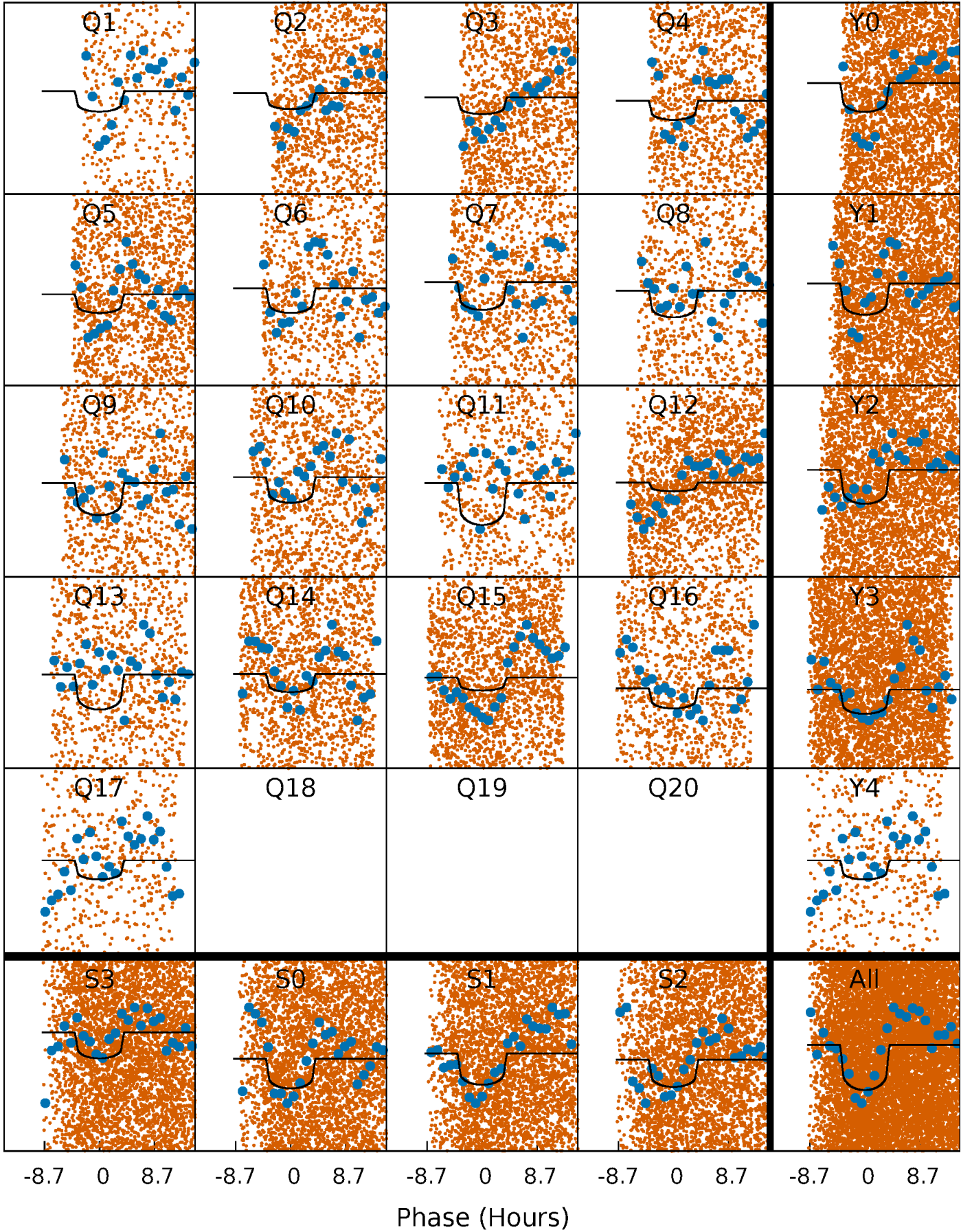
TCE 007135545-02 P= 1.458485 Days  $T_0=131.560213$  (BKJD)





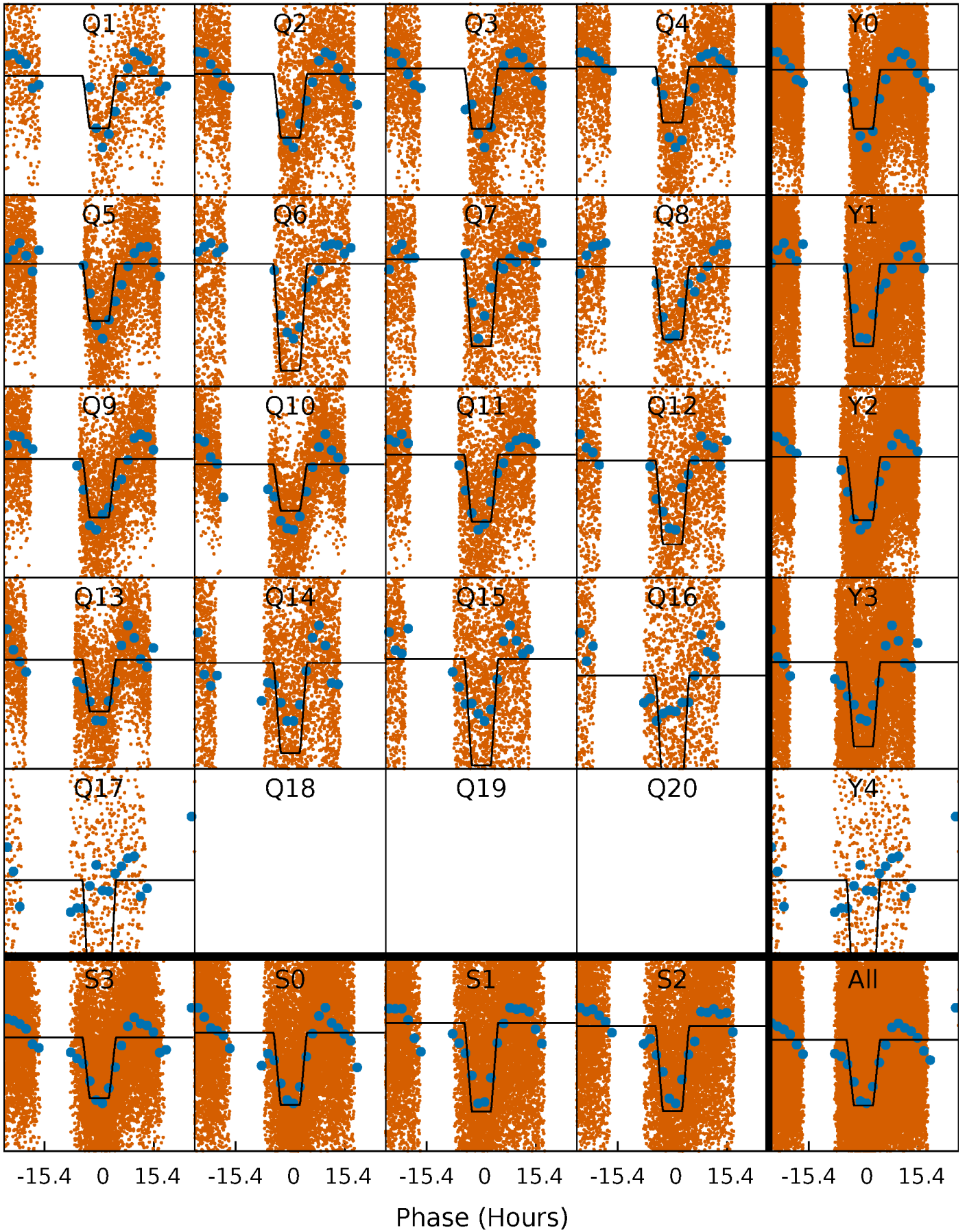
# DV Quarter-Phased Transit Curves

TCE 007135545-02   P= 1.458485 Days    $T_0=131.560213$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 007135545-02   P= 1.458432 Days    $T_0=131.575601$  (BKJD)

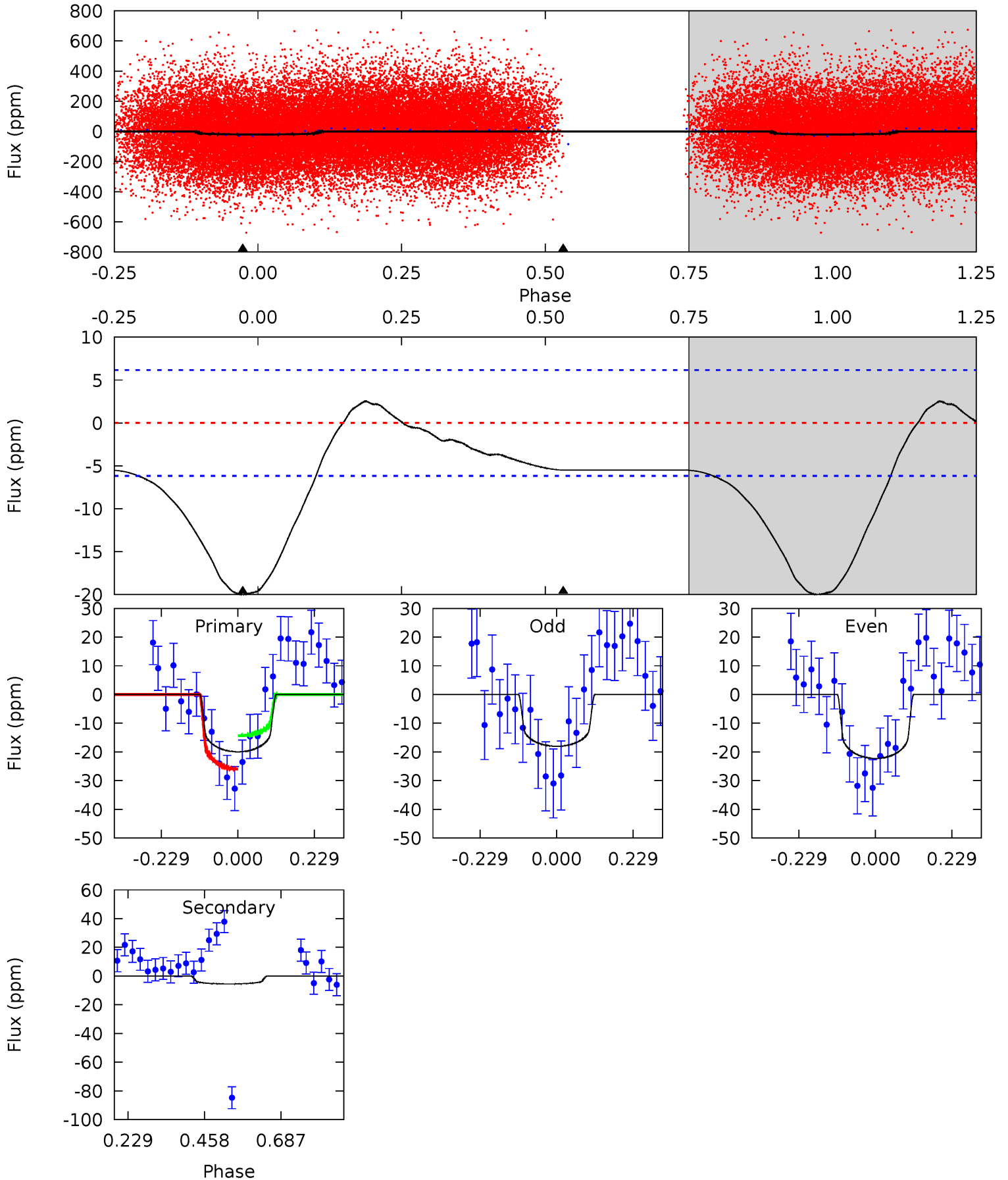




# DV Model-Shift Uniqueness Test

007135545-02, P = 1.458485 Days, E = 130.101728 Days

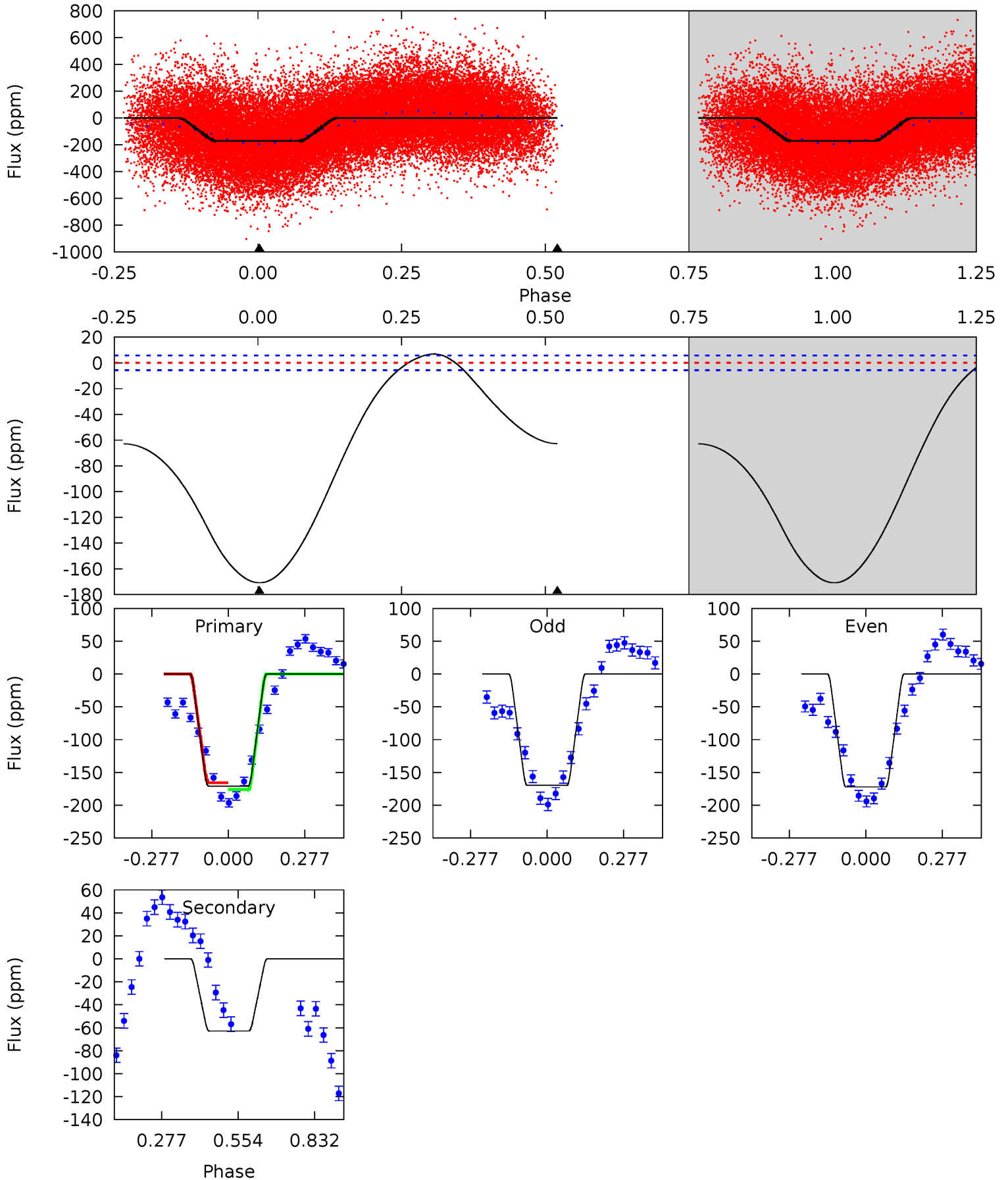
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	3.91	0	0	4.39	1.20	0.77	14.2	14.2	3.91	3.91	1.51	1.13	0.11	4.10



# Alt Model-Shift Uniqueness Test

007135545-02, P = 1.458432 Days, E = 130.117169 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
128.9	47.4	0	0	4.35	1.09	4.85	128.9	128.9	47.4	47.4	0.87	0.96	0.04	3.68



### Stellar Parameters For KIC 007135545

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$6140^{+197}_{-218}$	$3.987^{+0.385}_{-0.138}$	$-0.320^{+0.300}_{-0.300}$	$1.730^{+0.451}_{-0.732}$	$1.060^{+0.165}_{-0.165}$	$0.288^{+0.913}_{-0.135}$
	+3%/-4%	+10%/-3%	+94%/-94%	+26%/-42%	+16%/-16%	+317%/-47%
Source	PHO1	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 007135545-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-5 \pm 1$	$0.94^{+0.36}_{-0.35}$	$3042^{+248}_{-333}$	$4179^{+890}_{-542}$	$2.309^{+3.316}_{-1.226}$
Alt.	$-63 \pm 1$	$2.51^{+0.61}_{-0.59}$	$3047^{+253}_{-344}$	$4679^{+306}_{-279}$	$3.635^{+2.425}_{-1.220}$

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

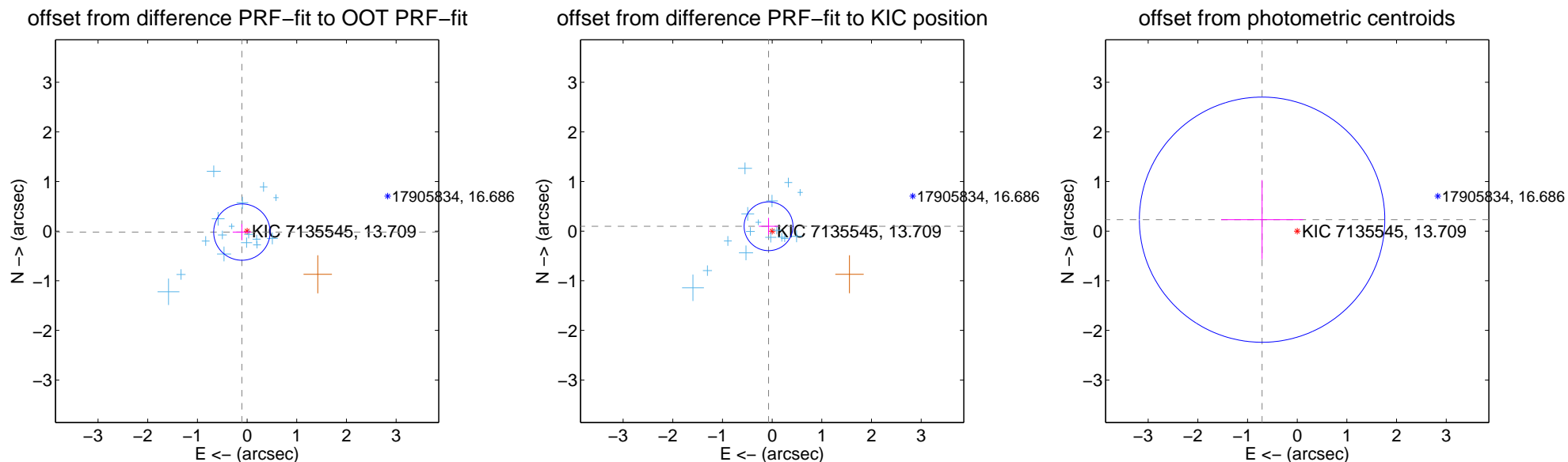
## DV Centroid Data

Supplemental centroid analysis for 007135545-02. Kepler magnitude: 13.71. Transit SNR 10.27

There are 16 quarters with good PRF difference image offsets

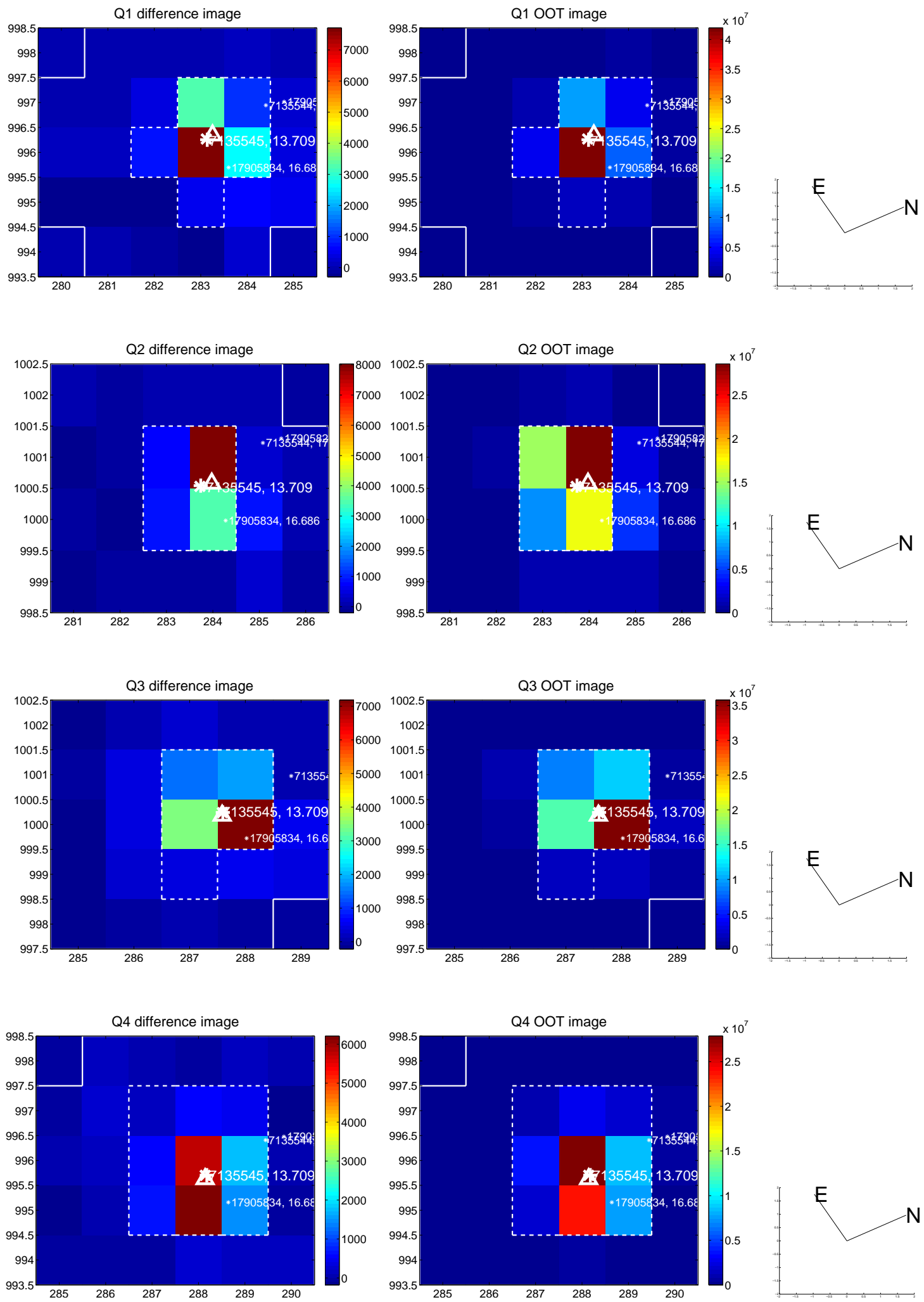
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.106 \pm 0.189$	0.56	$0.105 \pm 0.185$	$-0.019 \pm 0.162$
PRF-fit source offset from KIC position	$0.122 \pm 0.164$	0.75	$0.073 \pm 0.192$	$0.098 \pm 0.170$
photometric centroid source offset	$0.74 \pm 0.82$	0.90	$0.71 \pm 0.83$	$0.23 \pm 0.80$



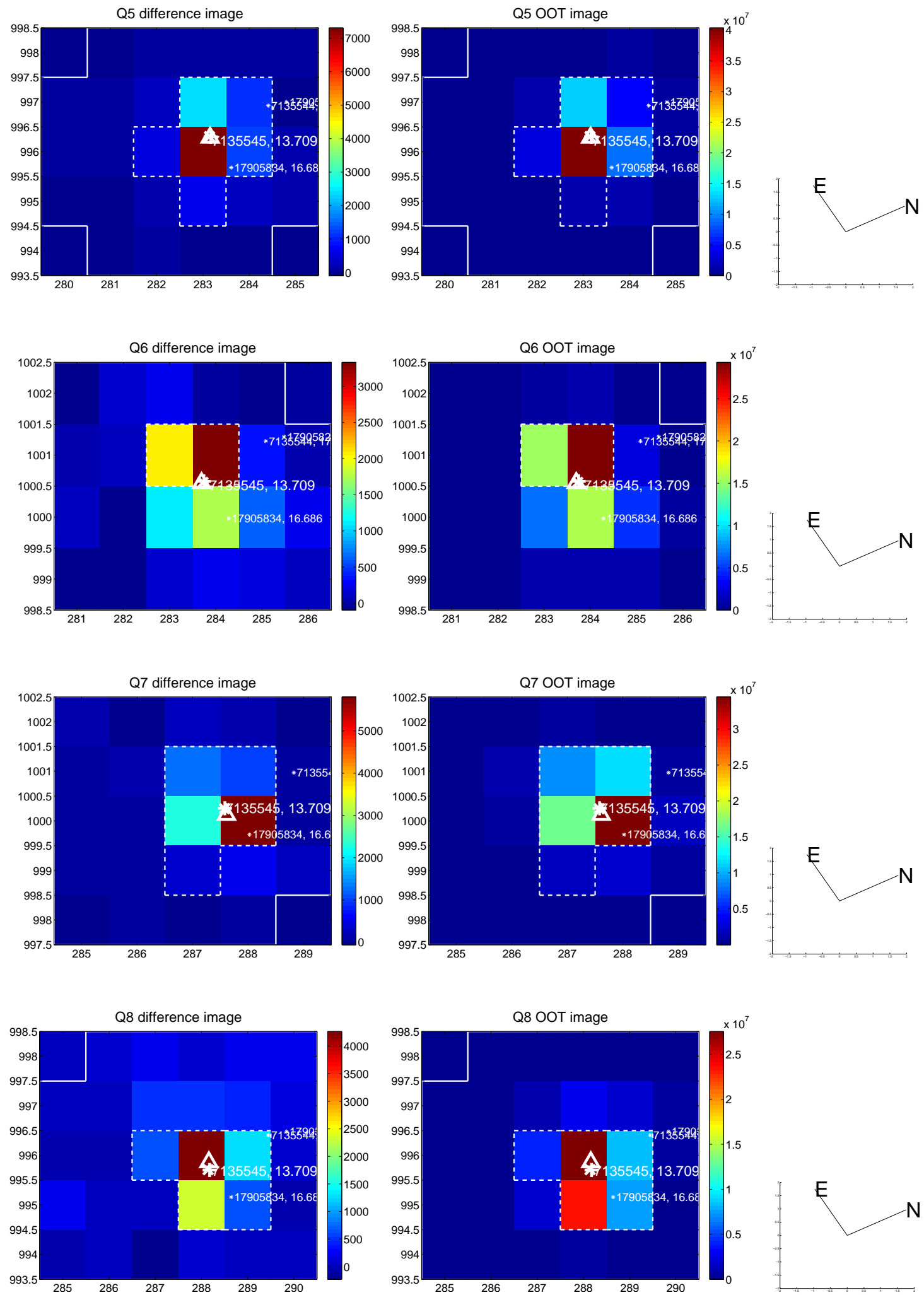
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

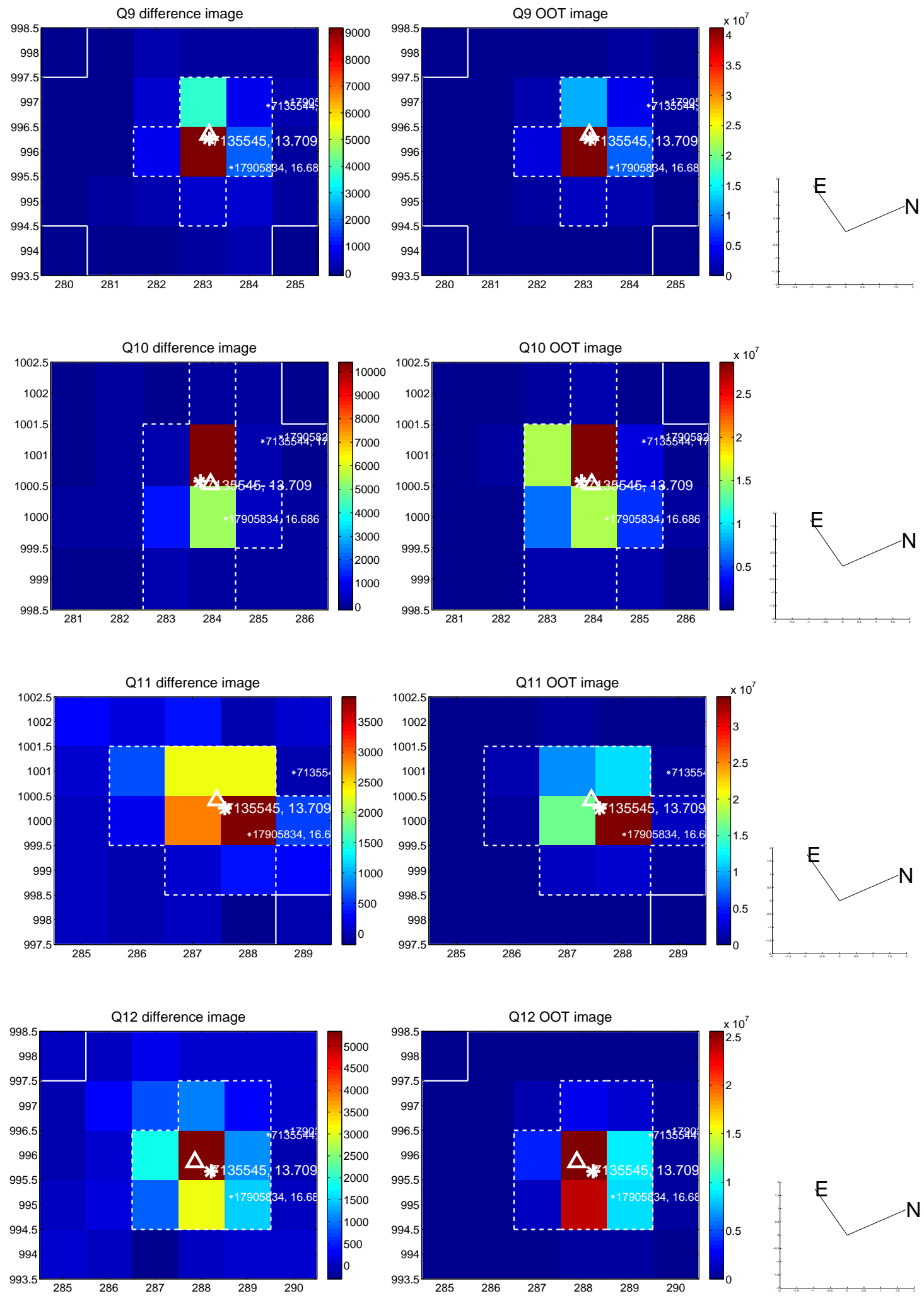




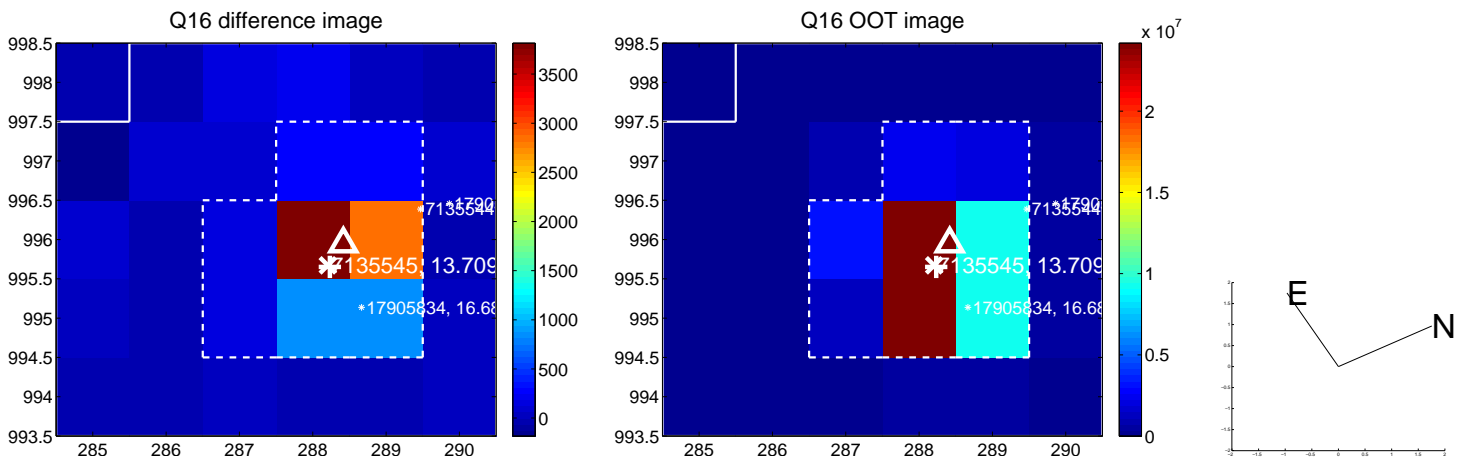
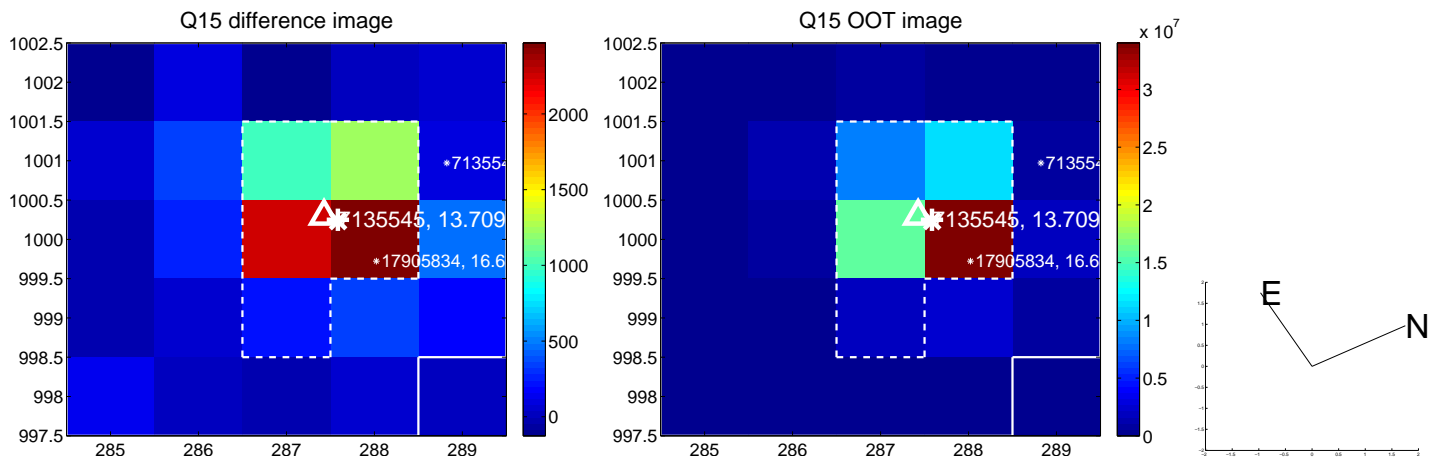
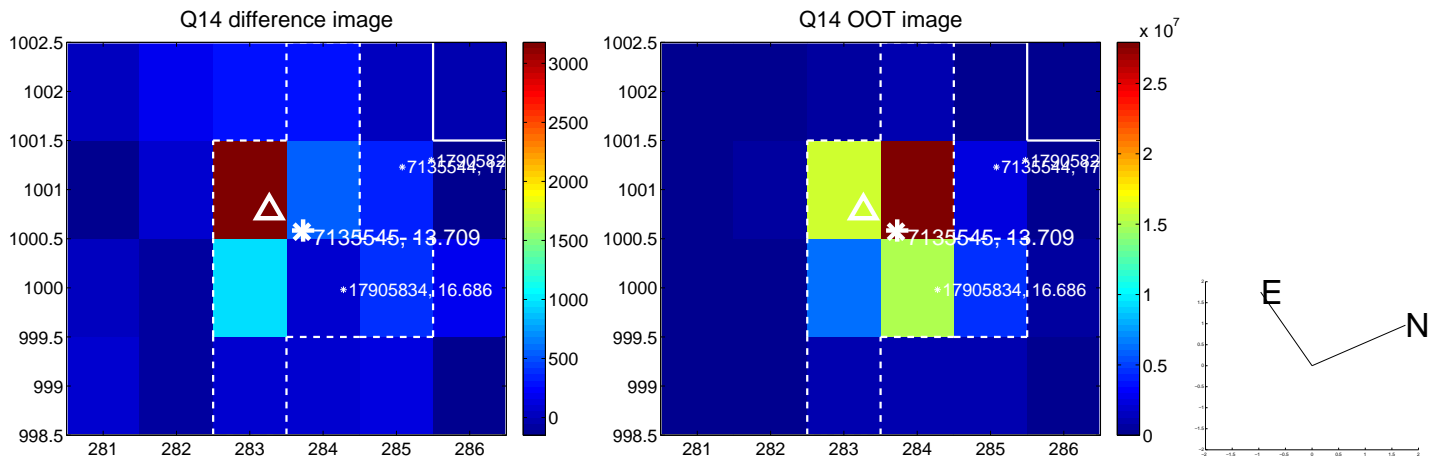
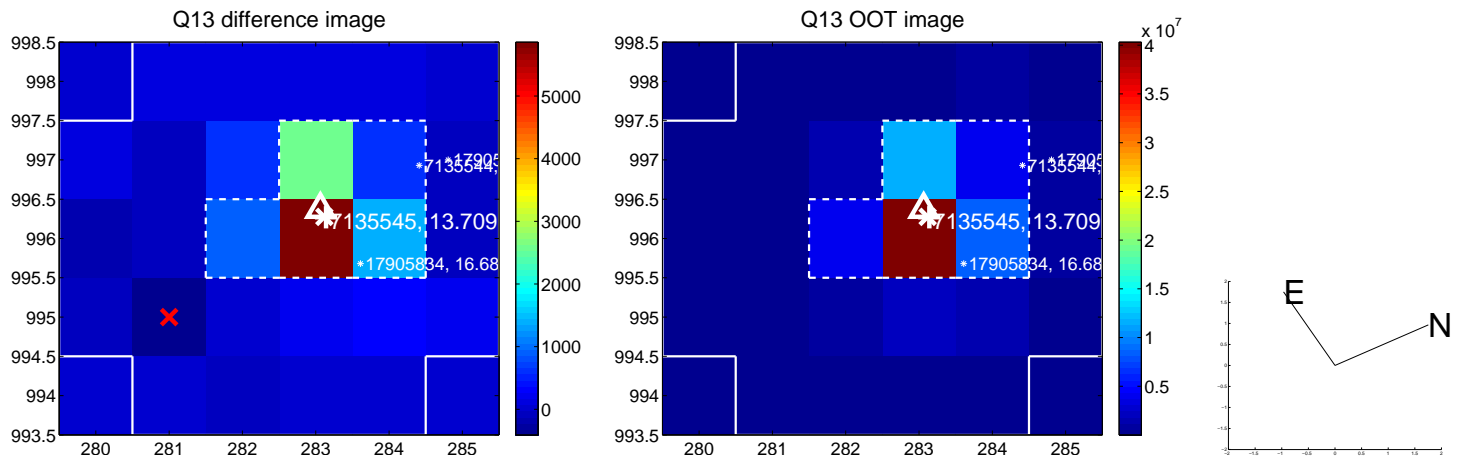
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



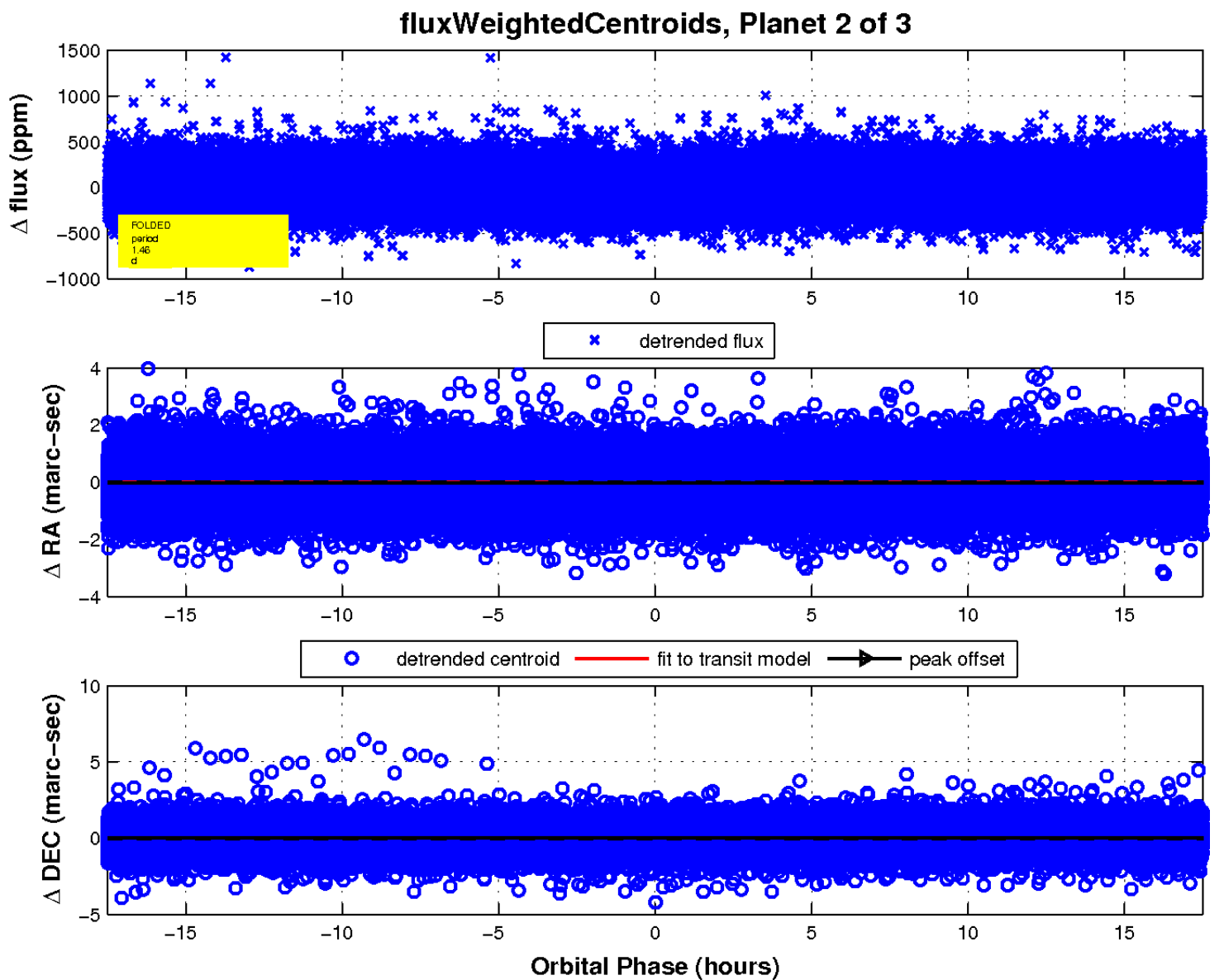
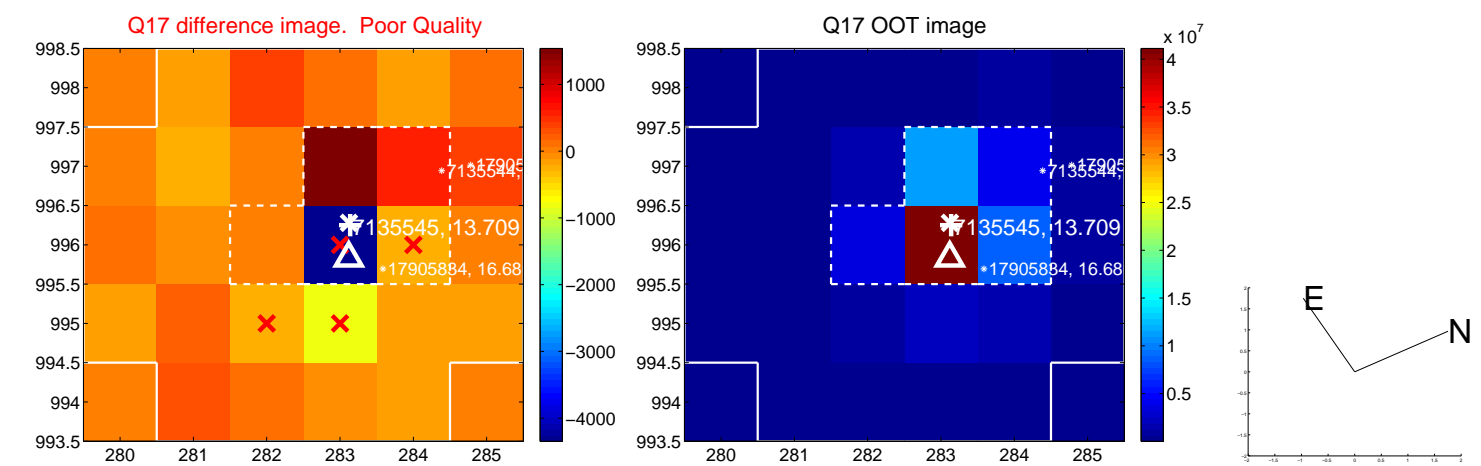
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

