

## KIC 006113656

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113656-01	OBS	No	2.646238	132.447489	5.6	18.121	11.4	3.0	1.88	7266	0.46	4677.99
006113656-02	OBS	No	58.535580	182.791356	207.4	17.532	46.1	7.6	1.88	7266	5.23	75.34
006113656-03	OBS	No	54.788959	170.151339	184.7	12.850	20.9	9.7	1.88	7266	2.58	82.28
006113656-04	OBS	No	44.294861	175.427489	174.4	6.797	11.3	10.5	1.88	7266	2.78	109.25
006113656-05	OBS	No	39.904031	136.547656	166.1	4.552	11.1	10.6	1.88	7266	2.77	125.57
006113656-06	OBS	No	57.280460	137.501760	190.8	6.317	11.1	11.6	1.88	7266	2.88	77.55
006113656-07	OBS	No	62.394926	153.799040	161.0	11.070	11.8	8.4	1.88	7266	2.70	69.19
006113656-08	OBS	No	30.838567	148.567220	249.9	2.104	10.9	10.1	1.88	7266	3.01	177.05
006113656-09	OBS	No	30.832288	161.442836	130.4	9.084	9.9	10.9	1.88	7266	2.38	177.10
006113656-10	OBS	No	15.974468	134.165876	100.7	9.468	10.0	7.9	1.88	7266	2.01	425.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113656-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
006113656-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
006113656-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
006113656-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

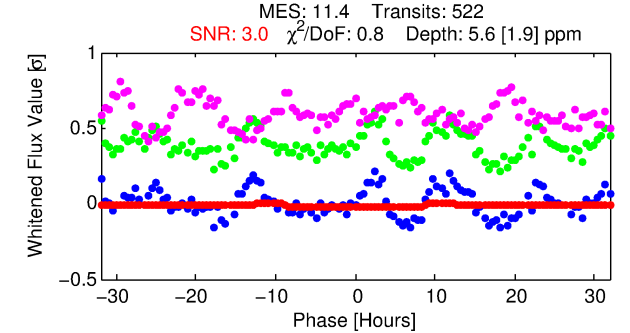
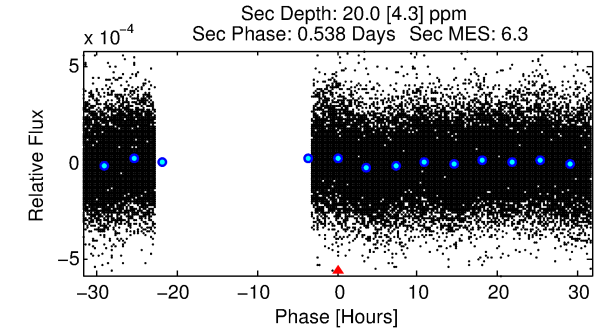
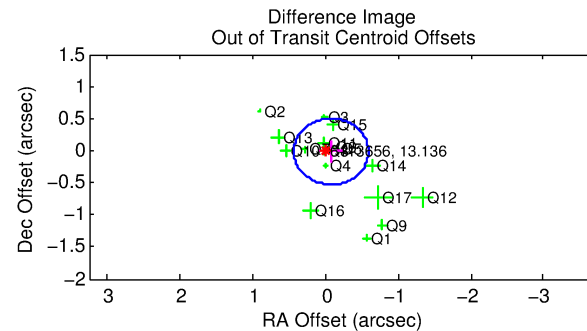
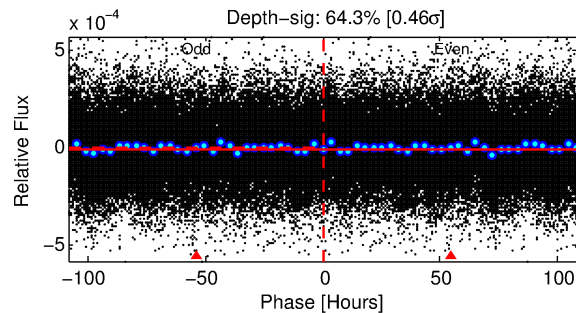
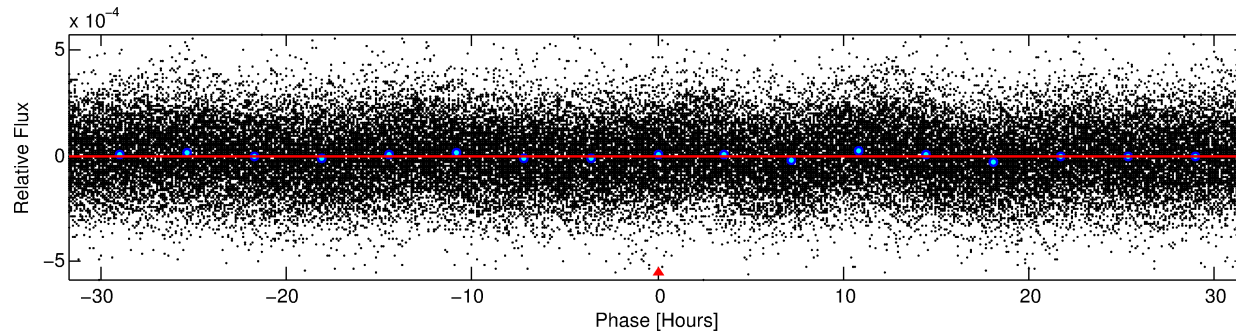
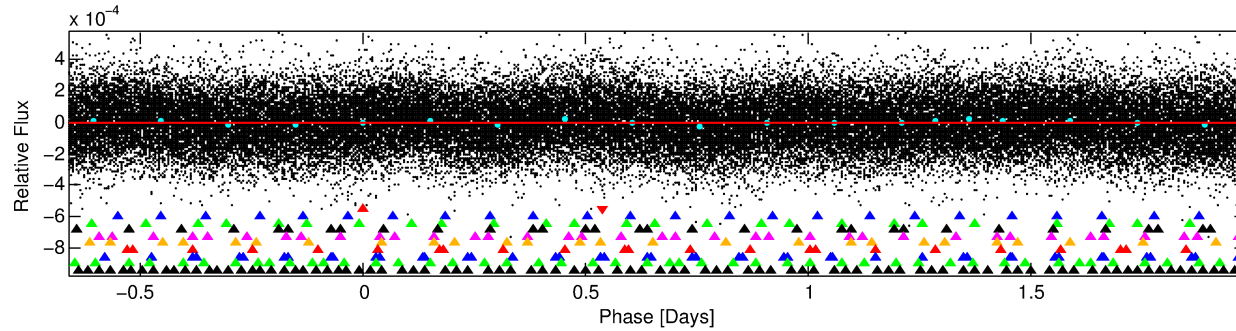
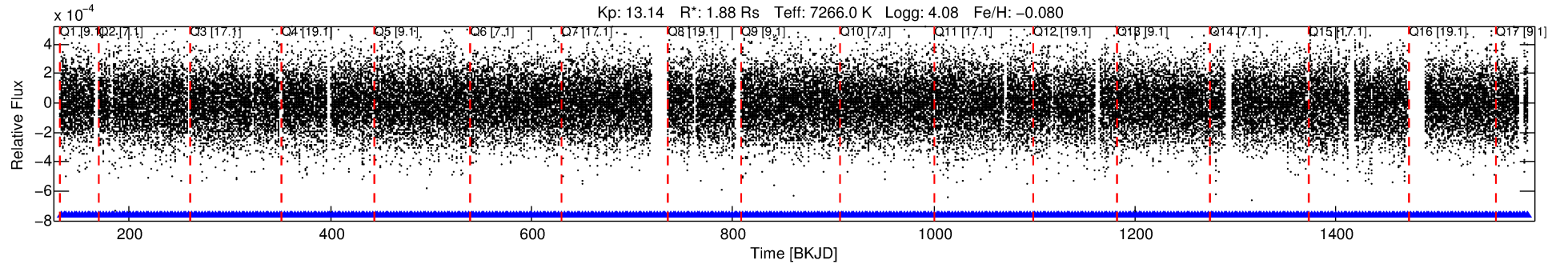
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006113656-01

No Significant Match Found

# DV One-Page Summary

KIC: 6113656 Candidate: 1 of 10 Period: 2.646 d



## DV Fit Results:

Period = 2.64624 [0.00014] d  
Epoch = 132.4475 [0.0278] BKJD  
Rp/R\* = 0.0022 [0.0026]  
a/R\* = 1.23 [2.94]  
b = 0.47 [11.96]  
Seff = 4677.99 [1716.53]  
Teff = 2109 [193] K  
Rp = 0.46 [0.55] Re  
a = 0.0433 [0.0100] AU  
Ag = 97.83 [231.73] [0.42 $\sigma$ ]  
Teffp = 10254 [6032] K [1.35 $\sigma$ ]

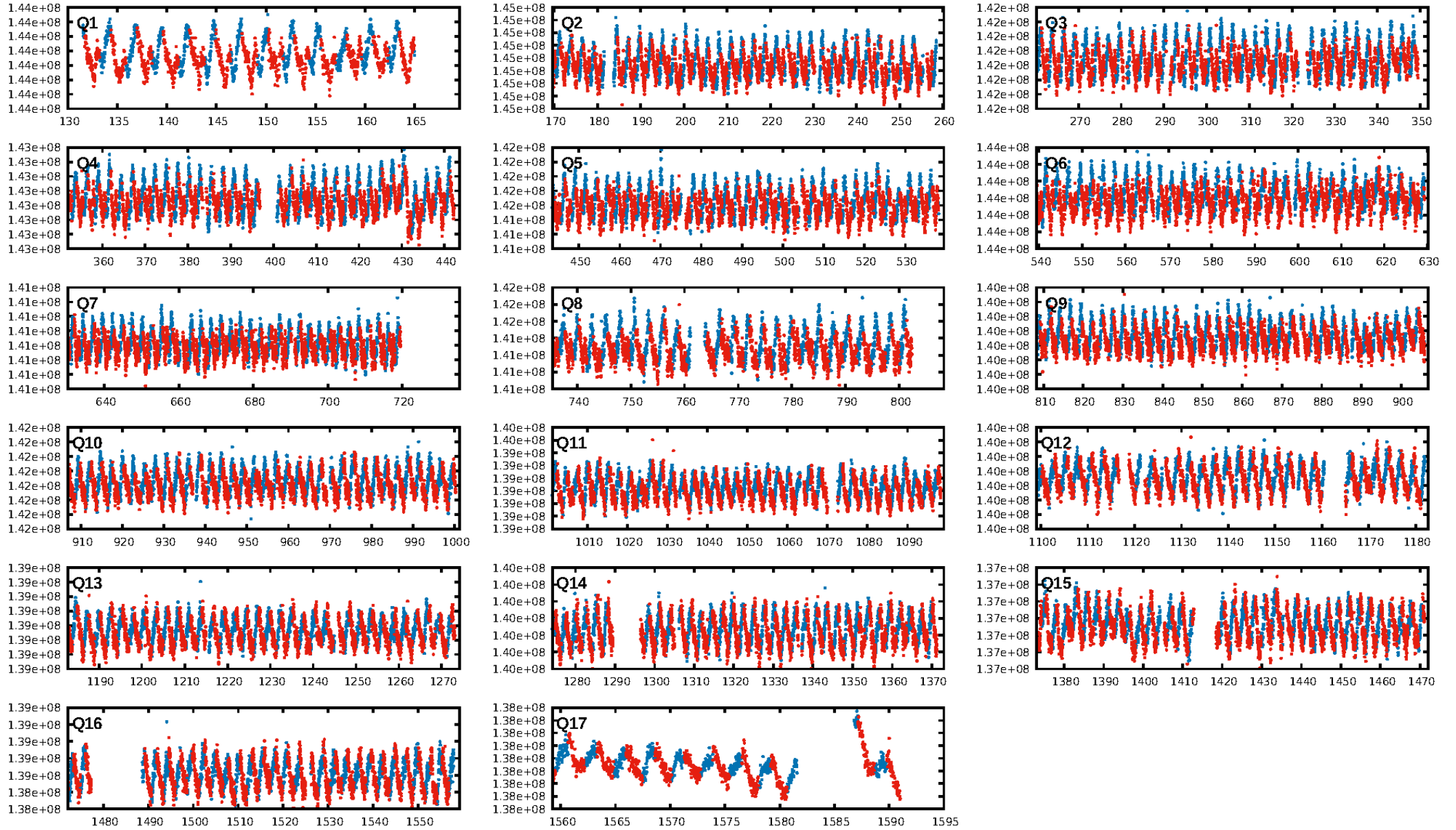
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [15.65 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [499/499]  
**GhostDiagnostic-chr: 0.4113**  
Centroid-sig: 27.5%  
Centroid-so: 1.900 arcsec [0.79 $\sigma$ ]  
OotOffset-rm: 0.078 arcsec [0.46 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 0.119 arcsec [1.03 $\sigma$ ]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 1.00 [17/17]

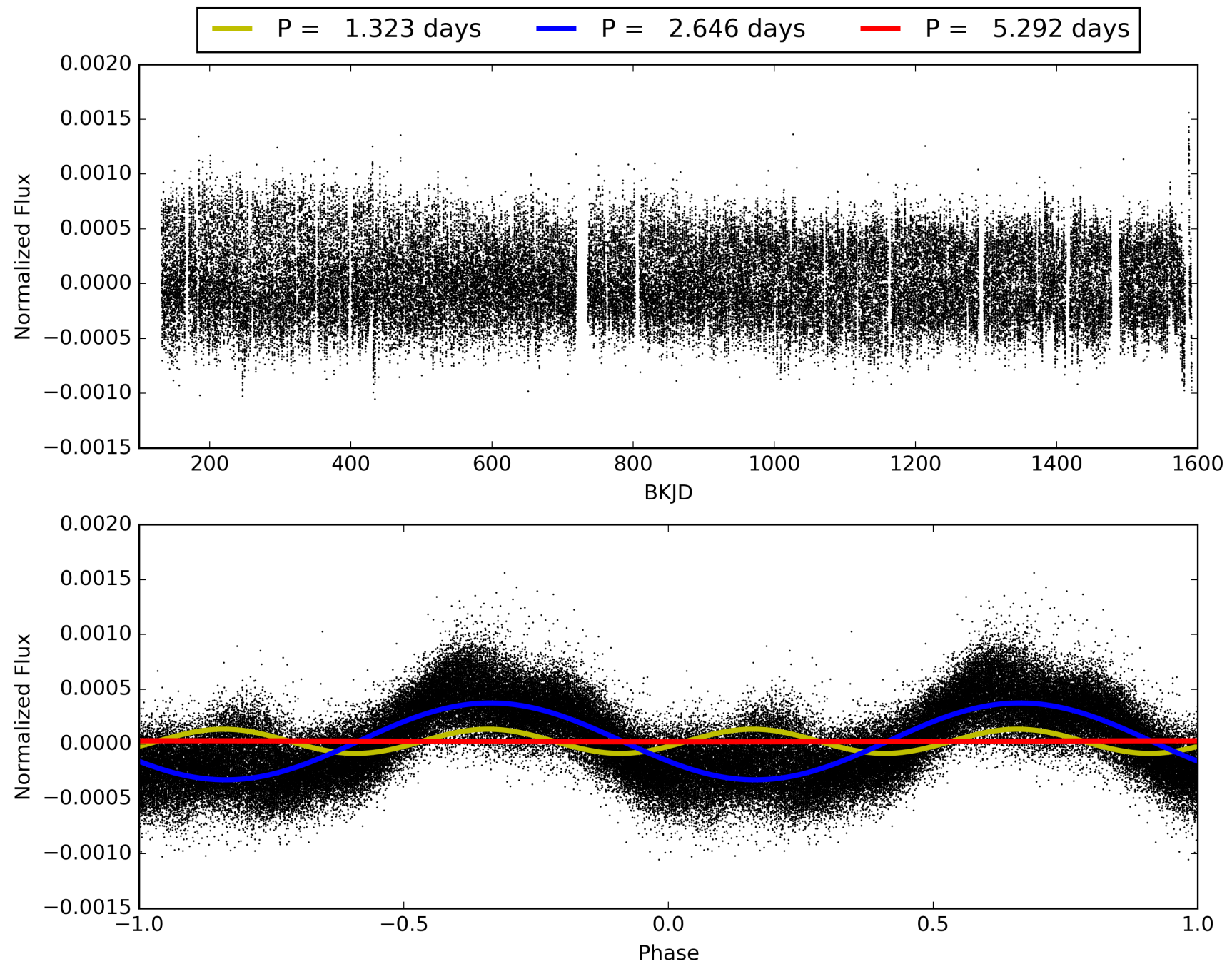
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:02 Z

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

# TCE 006113656-01, PDC Light Curves



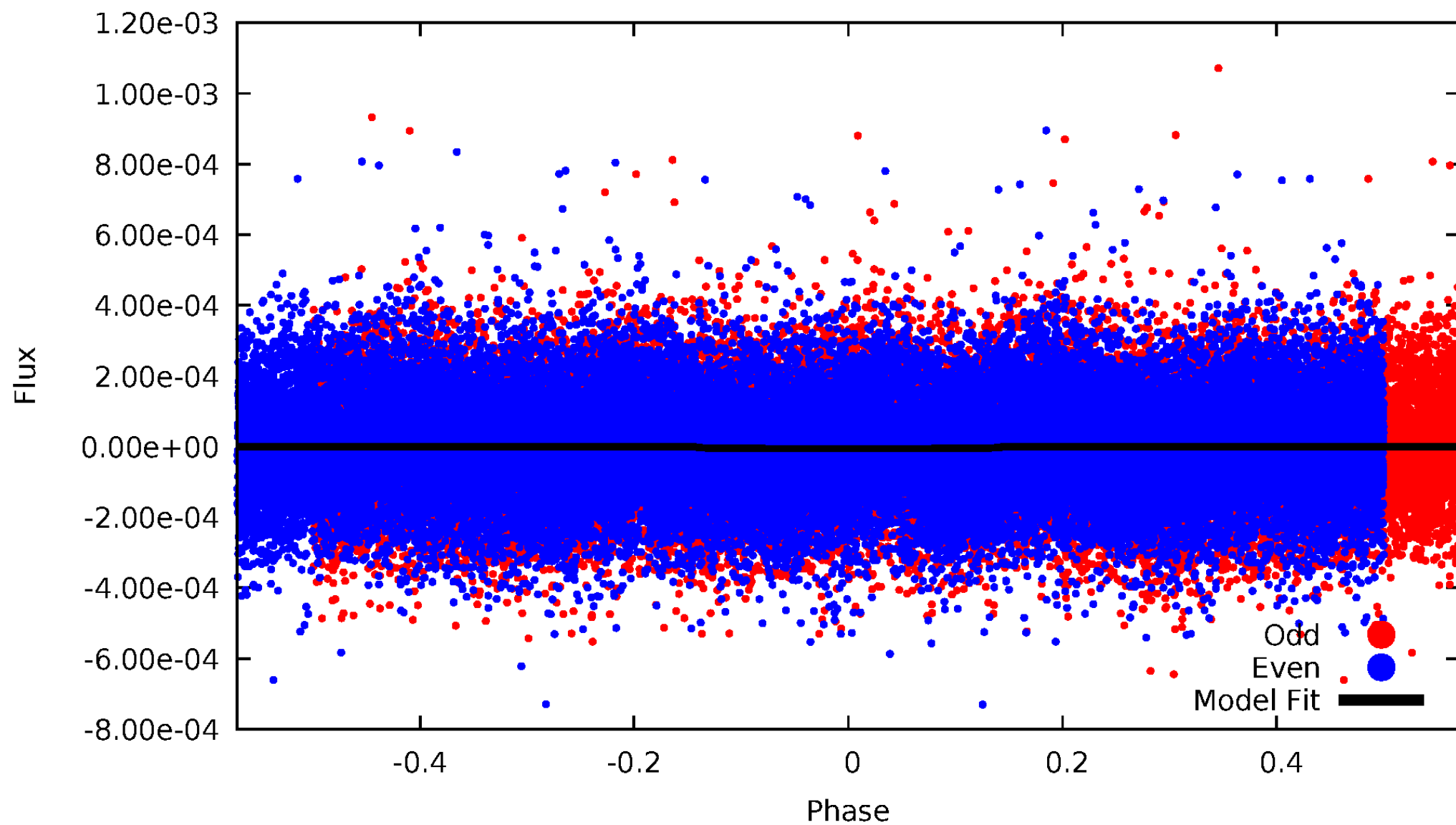
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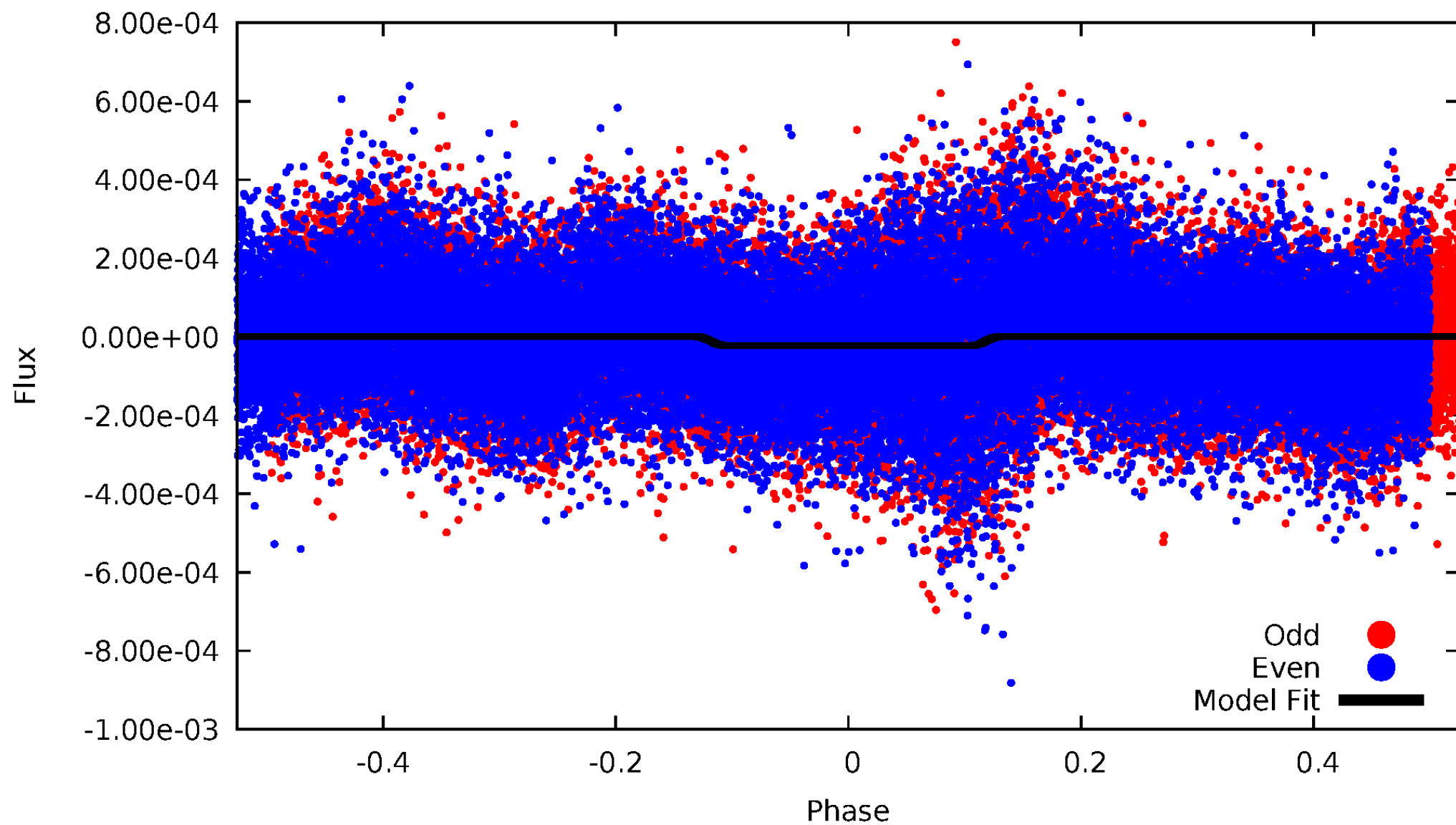
# DV Odd/Even

TCE 006113656-01

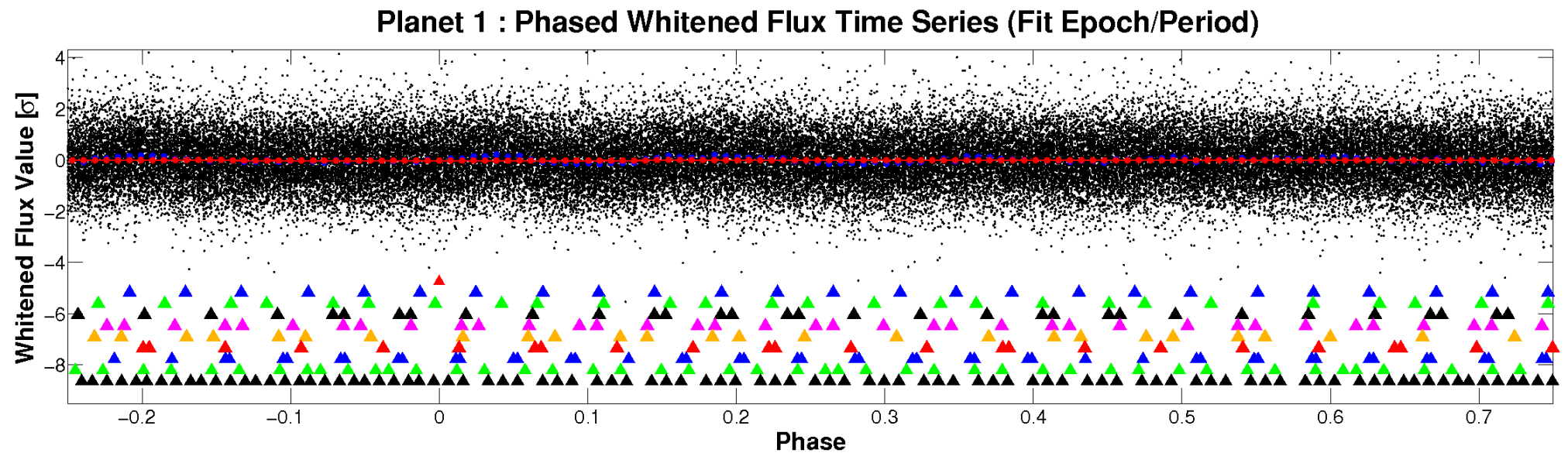
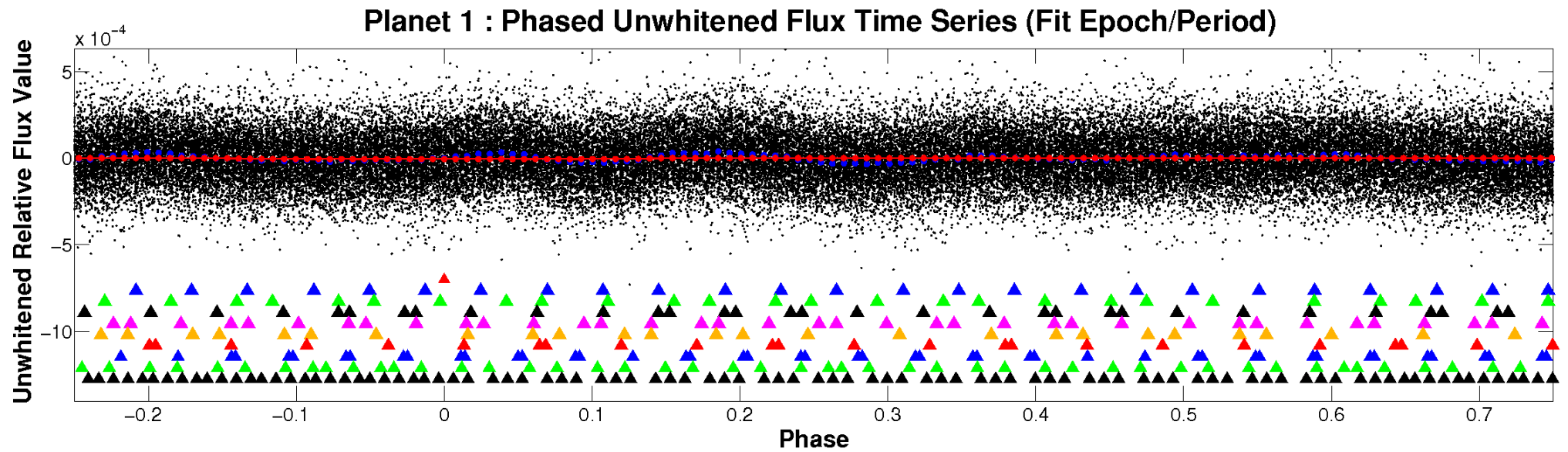


# ALT Odd/Even

TCE 006113656-01

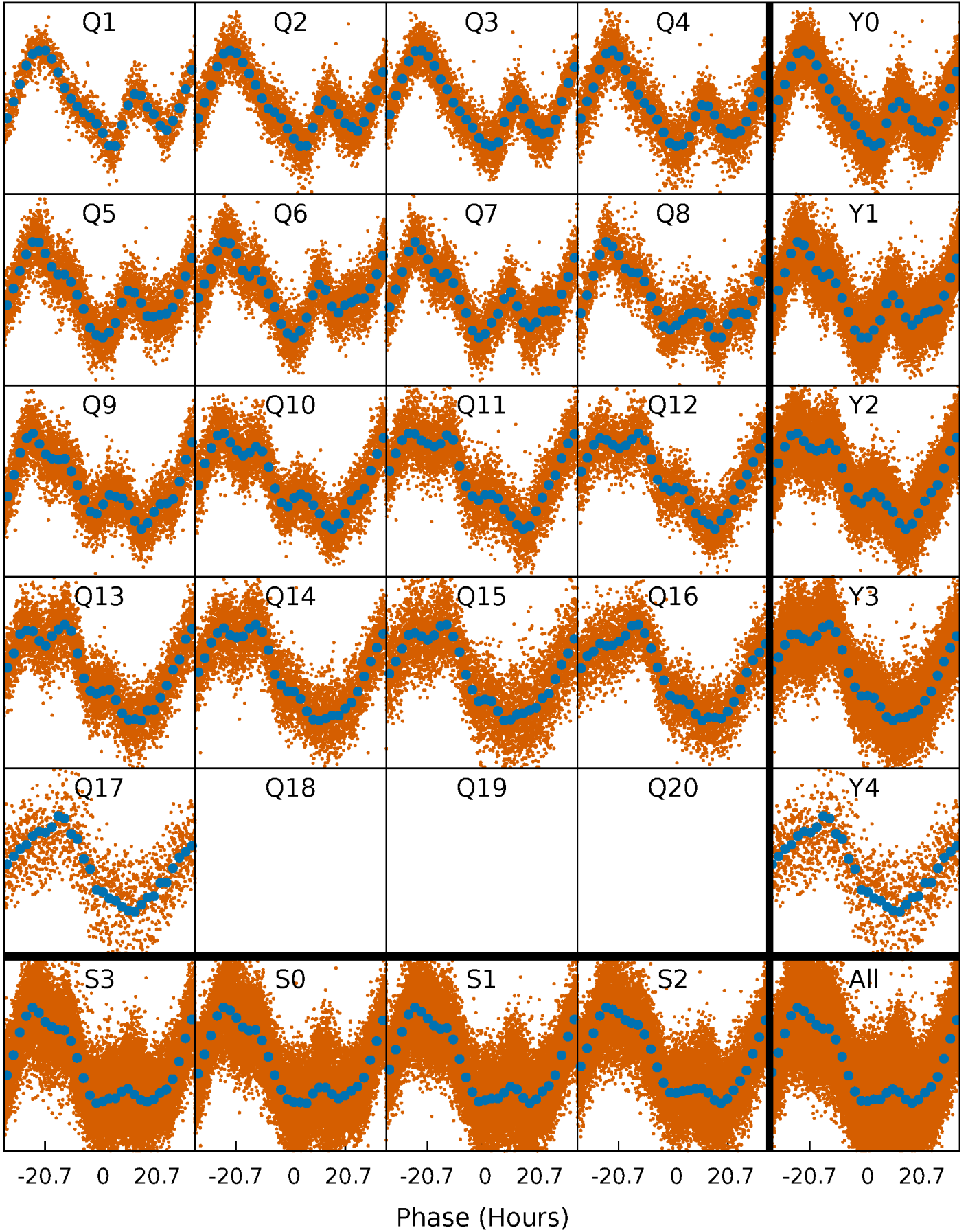


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

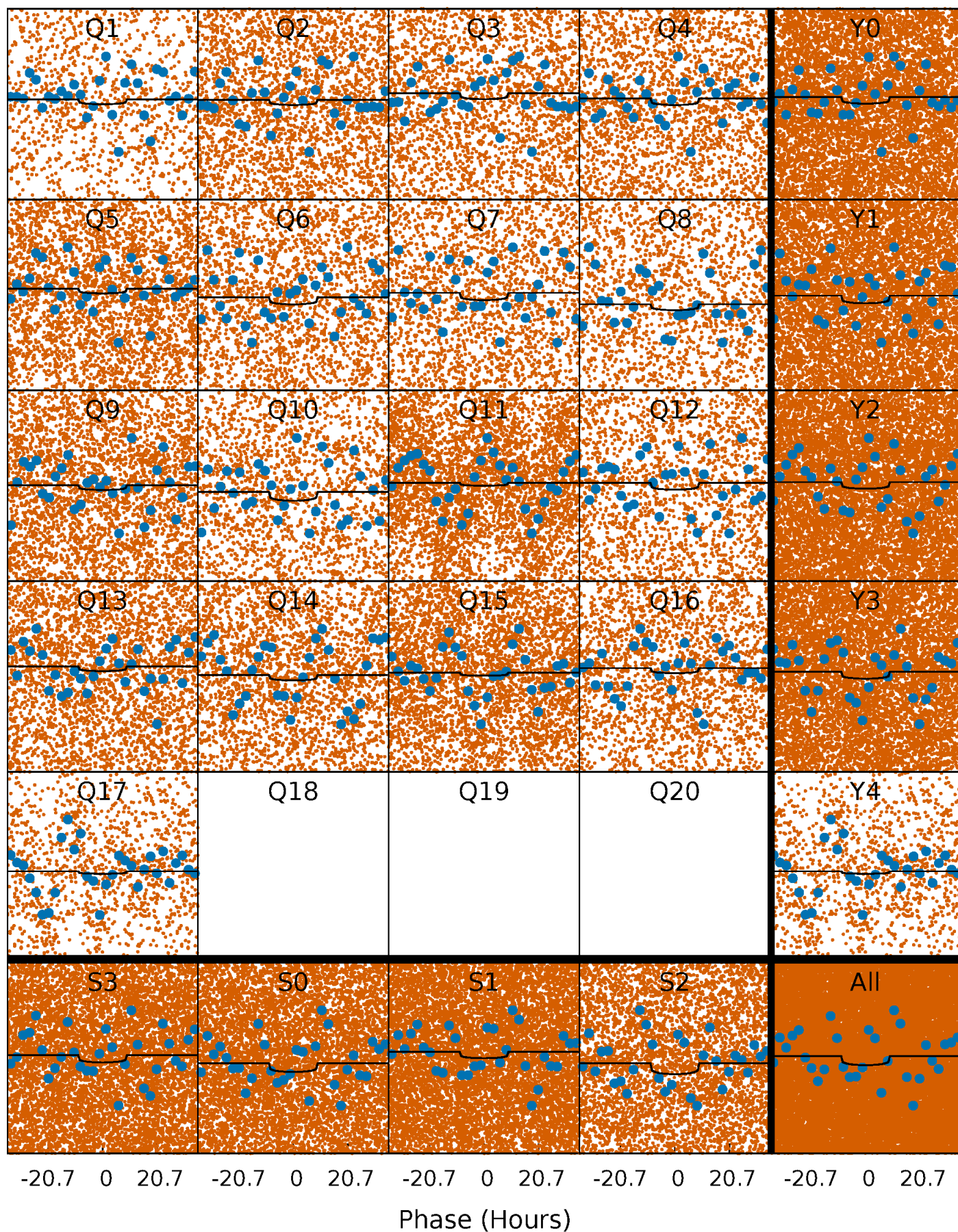
TCE 006113656-01   P= 2.646238 Days    $T_0=132.447489$  (BKJD)





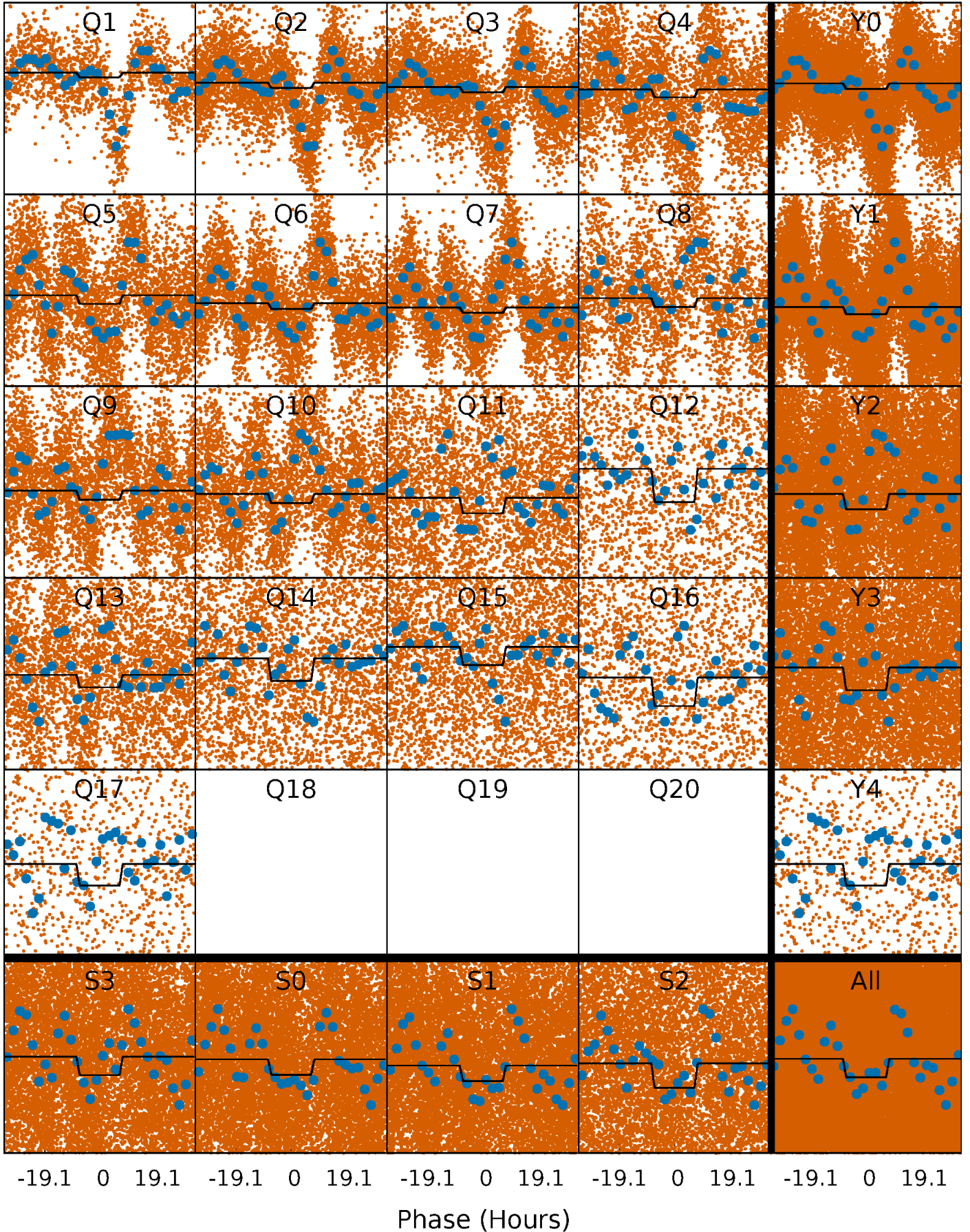
# DV Quarter-Phased Transit Curves

TCE 006113656-01 P= 2.646238 Days  $T_0=132.447489$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006113656-01 P= 2.646498 Days  $T_0=132.403994$  (BKJD)

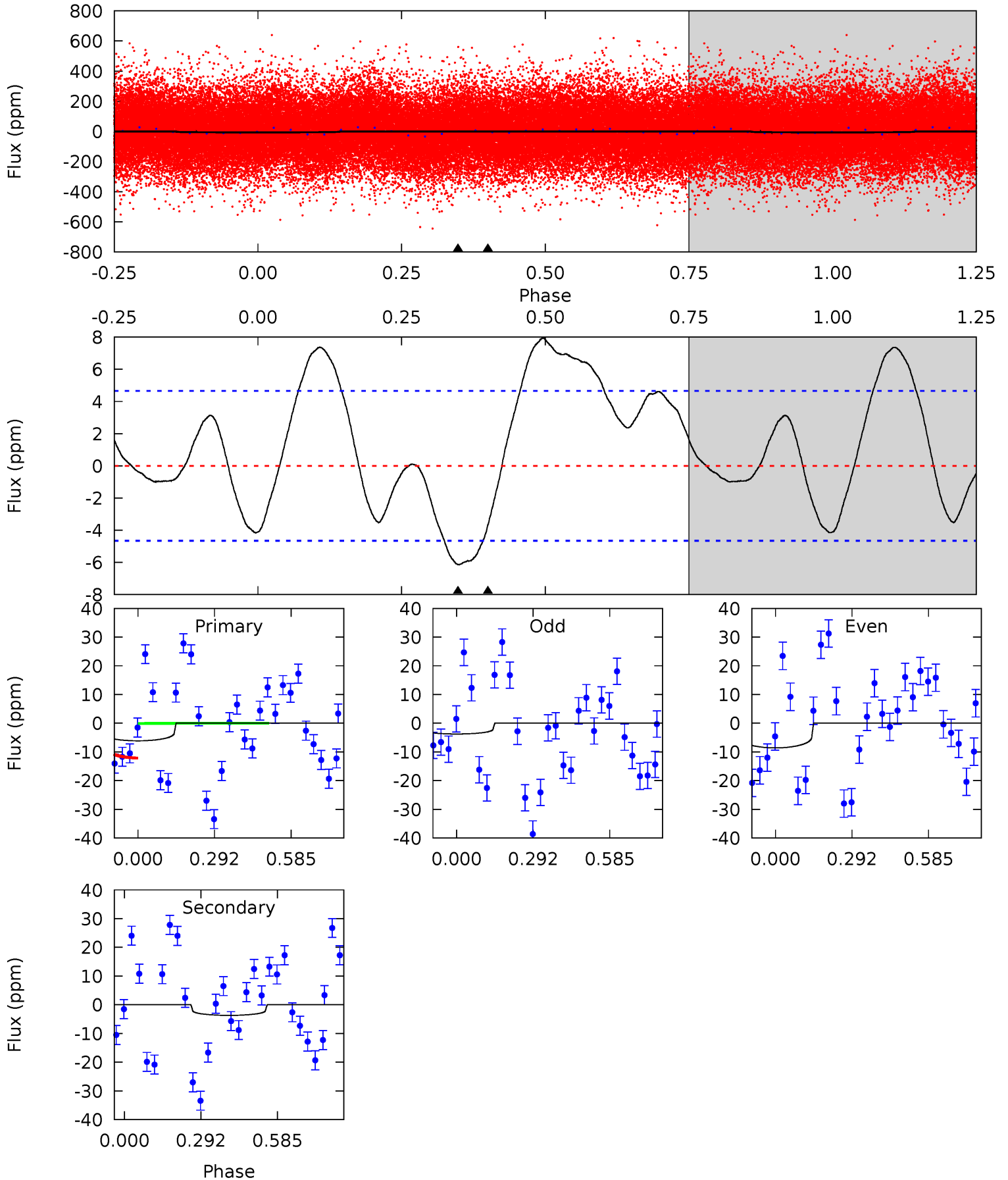




# DV Model-Shift Uniqueness Test

006113656-01, P = 2.646238 Days, E = 129.801251 Days

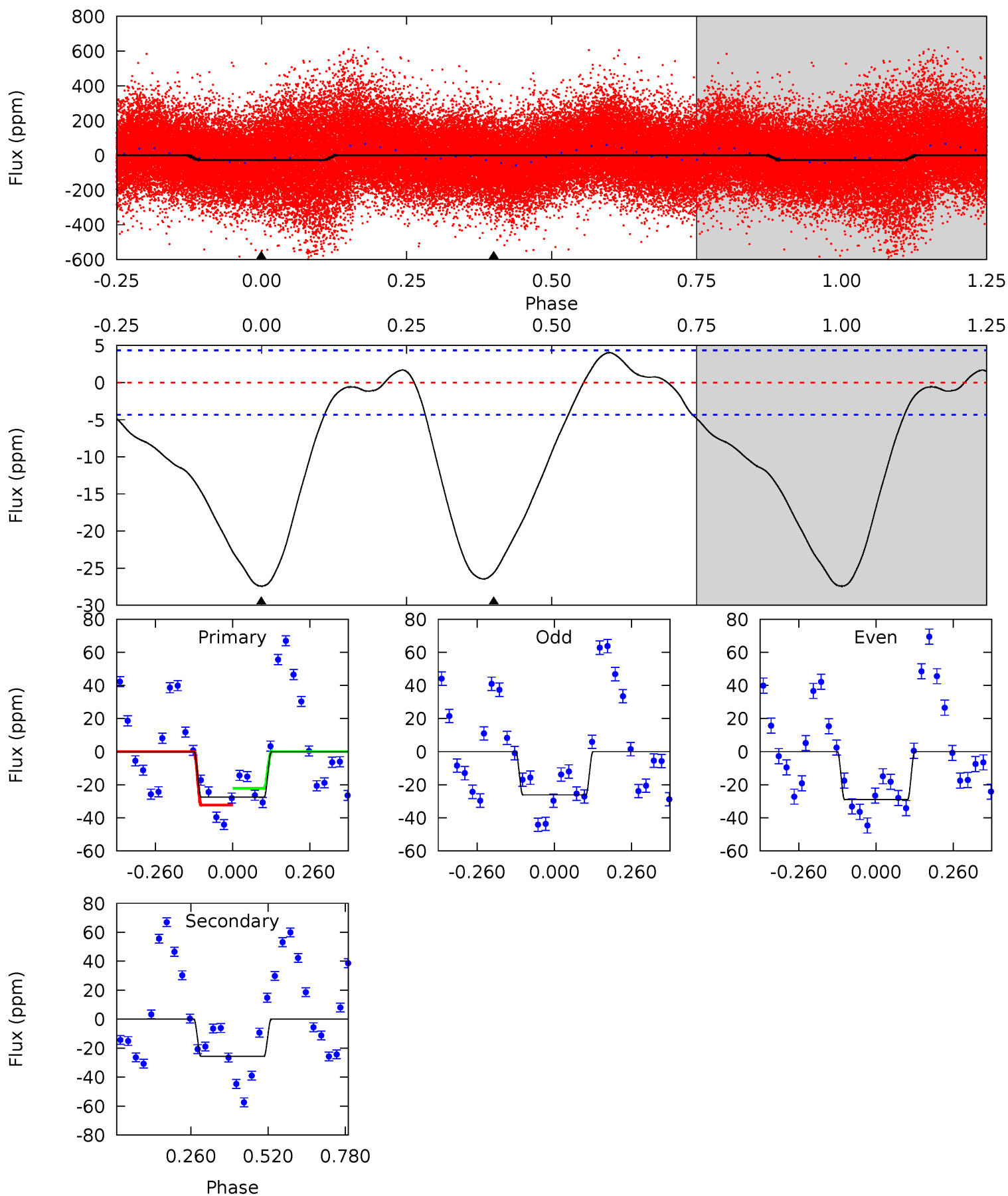
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.72	3.44	0	0	4.33	1.05	2.16	5.72	5.72	3.44	3.44	2.23	1.20	0.56	5.56



# Alt Model-Shift Uniqueness Test

006113656-01, P = 2.646498 Days, E = 129.757496 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
27.5	25.7	0	0	4.36	1.13	1.87	27.5	27.5	25.7	25.7	1.44	1.52	0.13	4.26





### Stellar Parameters For KIC 006113656

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-4 \pm 1$	$0.58^{+0.49}_{-0.39}$	$2943^{+216}_{-218}$	$5807^{+5715}_{-1384}$	$11^{+87}_{-8}$
Alt.	$-26 \pm 1$	$0.97^{+0.59}_{-0.50}$	$2944^{+223}_{-221}$	$7393^{+4768}_{-1540}$	$28^{+90}_{-17}$

$T_{max}$  = 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

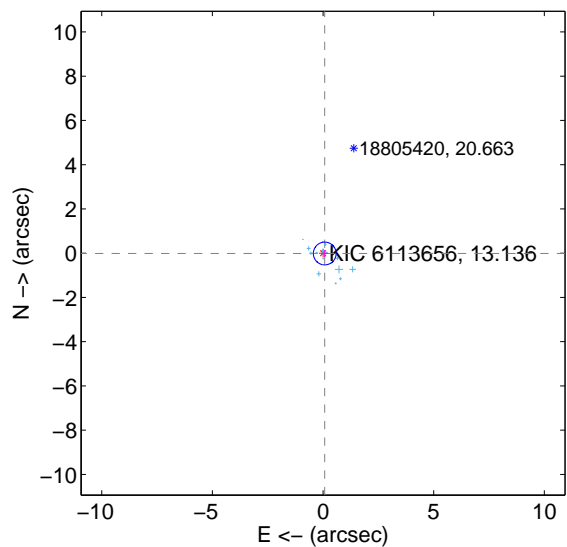
Supplemental centroid analysis for 006113656-01. Kepler magnitude: 13.14. Transit SNR 2.96

There are 17 quarters with good PRF difference image offsets

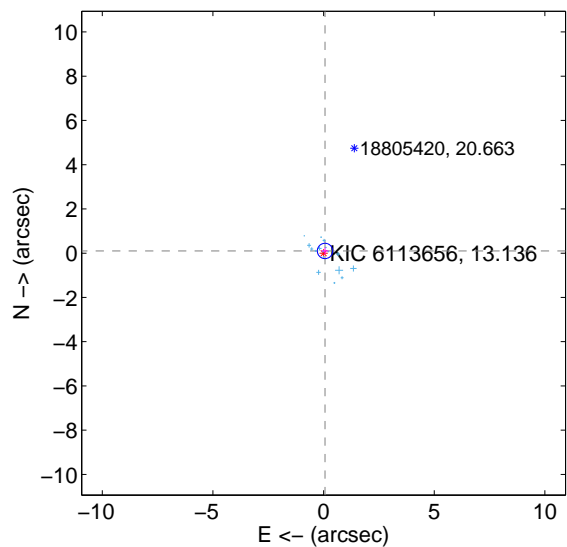
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.078 \pm 0.172$	0.46	$-0.077 \pm 0.156$	$-0.014 \pm 0.156$
PRF-fit source offset from KIC position	$0.119 \pm 0.116$	1.03	$-0.065 \pm 0.152$	$0.100 \pm 0.160$
photometric centroid source offset	$1.90 \pm 2.40$	0.79	$0.22 \pm 2.06$	$-1.89 \pm 2.41$

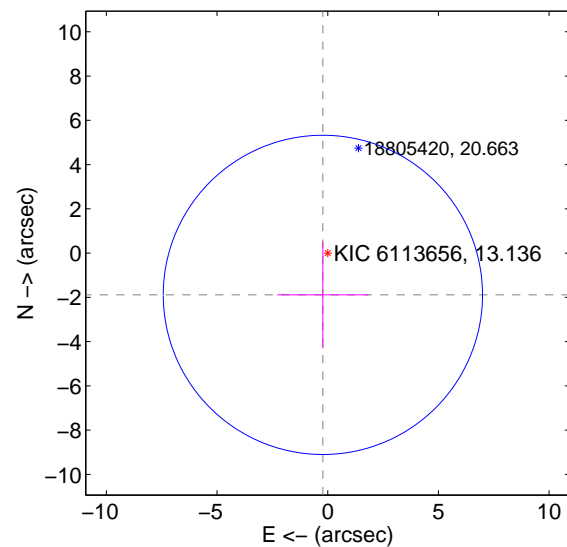
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

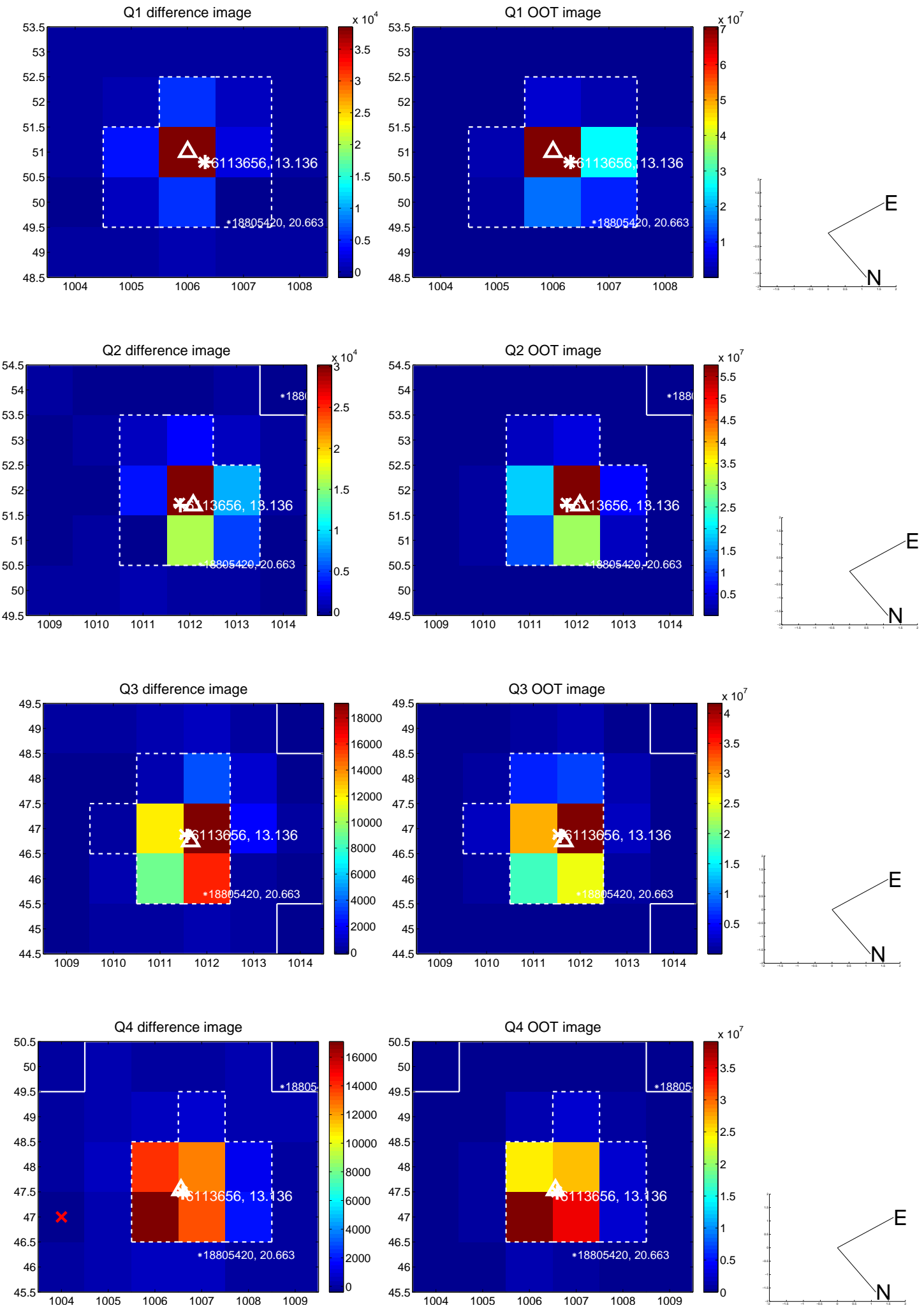


offset from photometric centroids

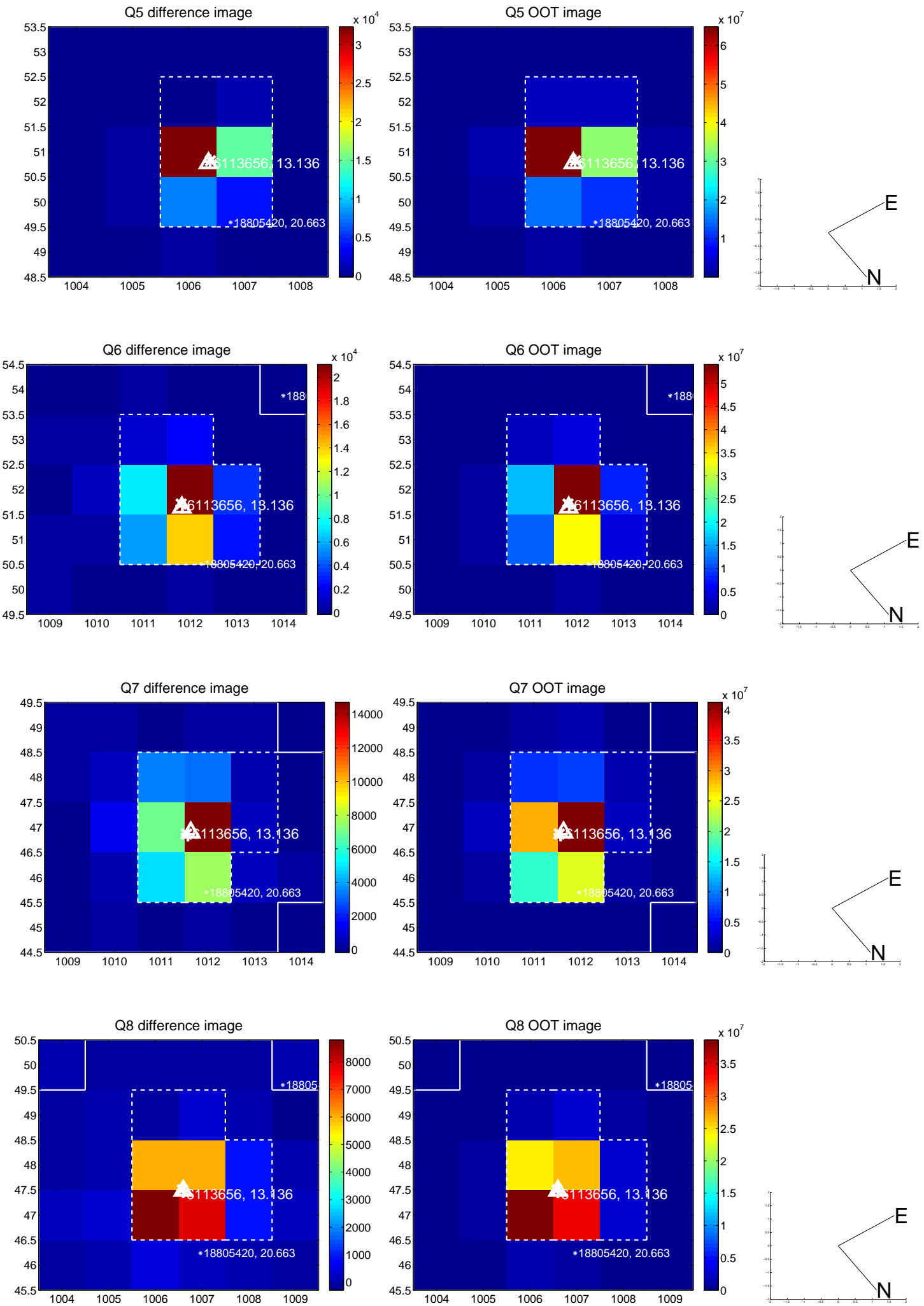


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

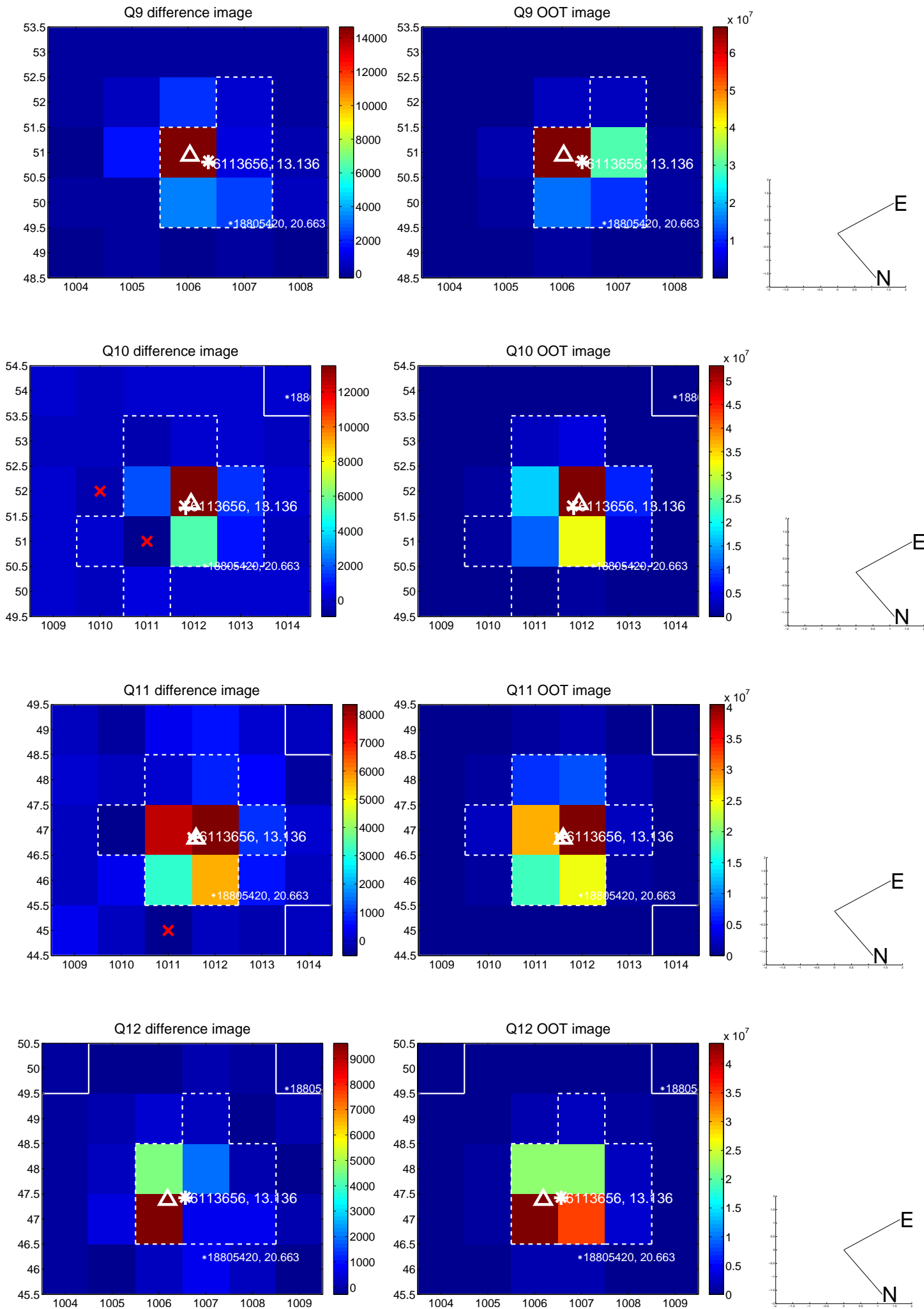


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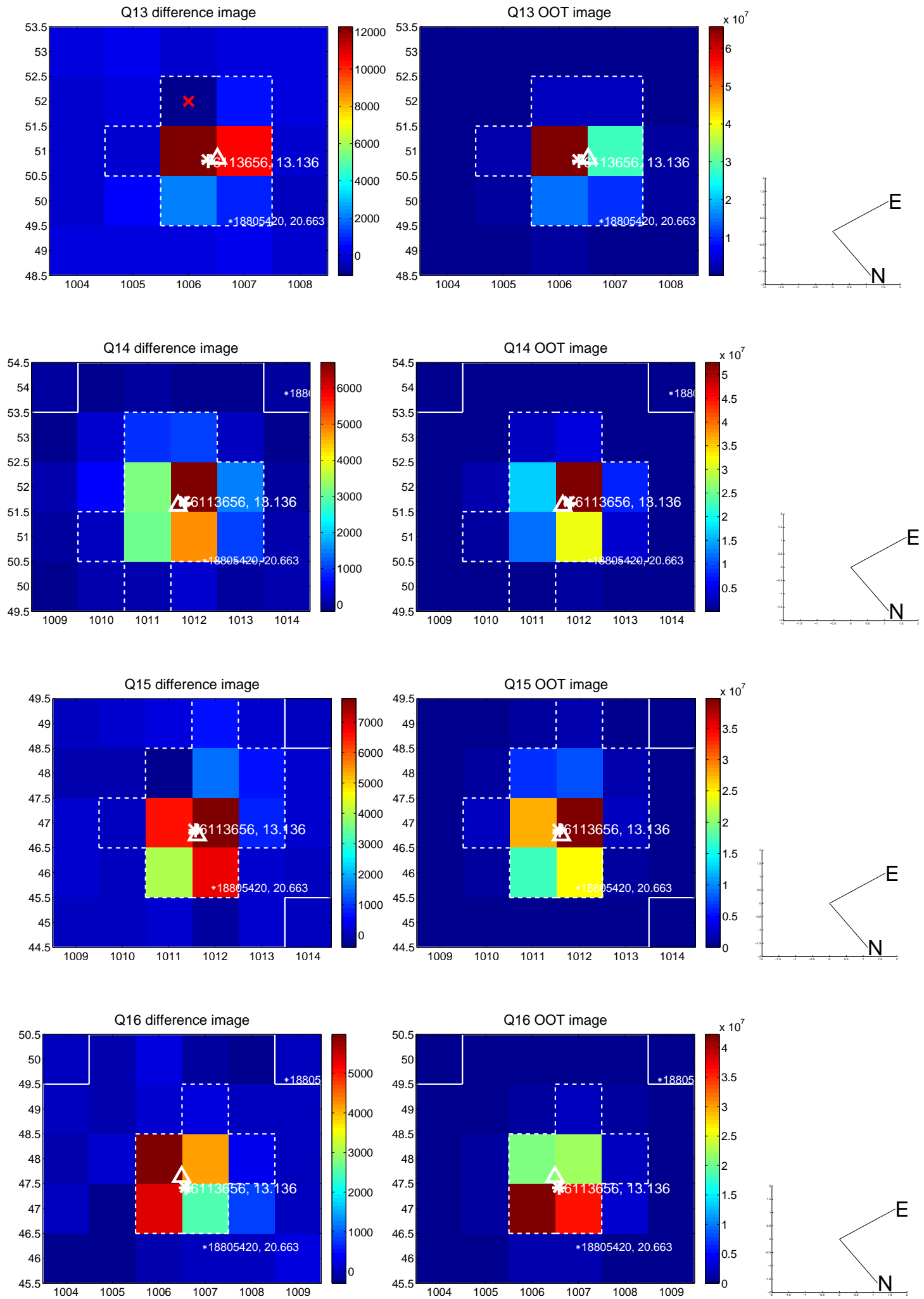




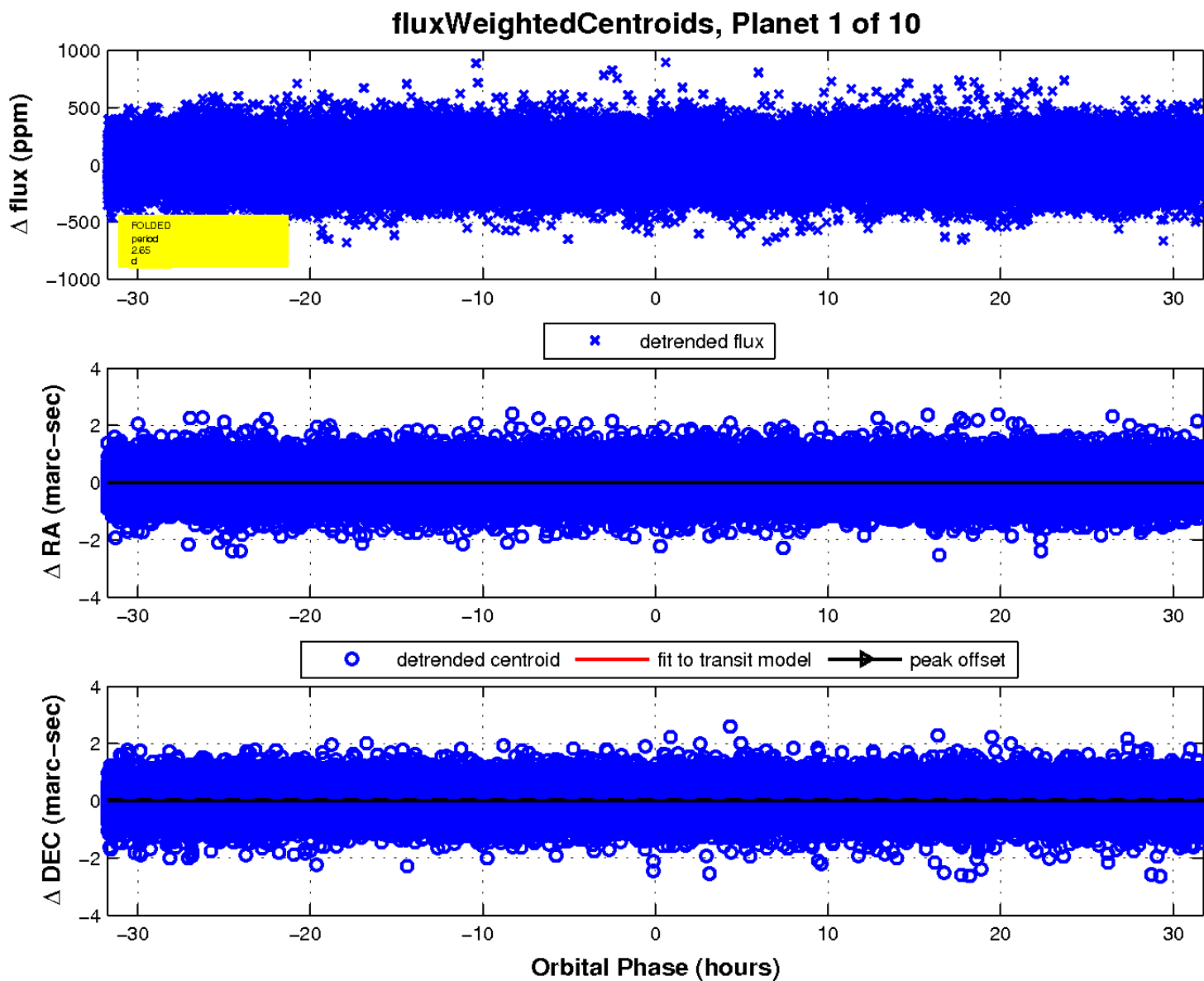
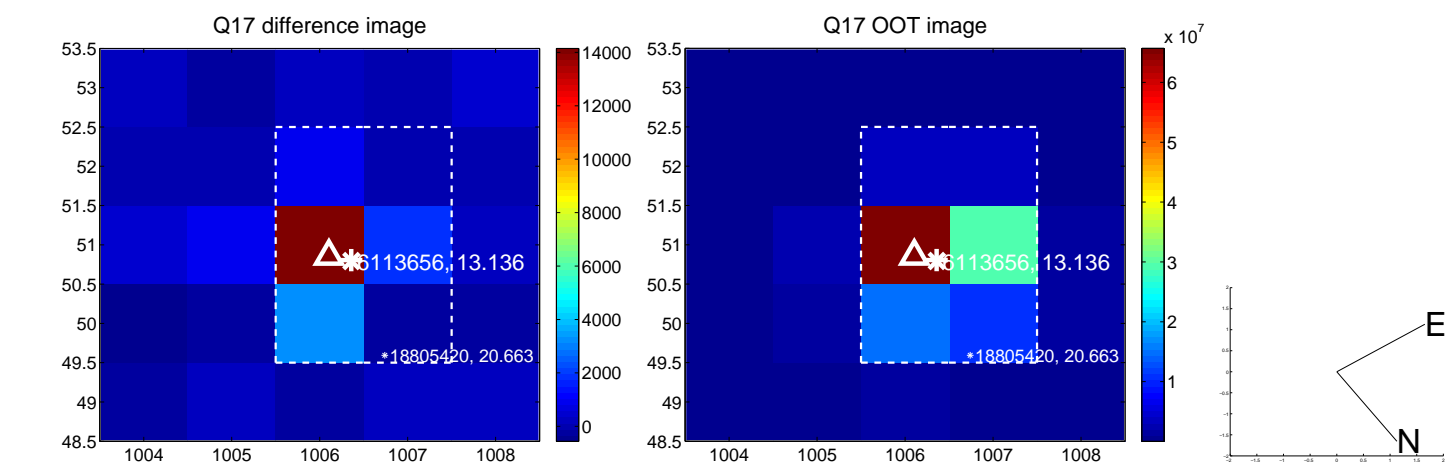
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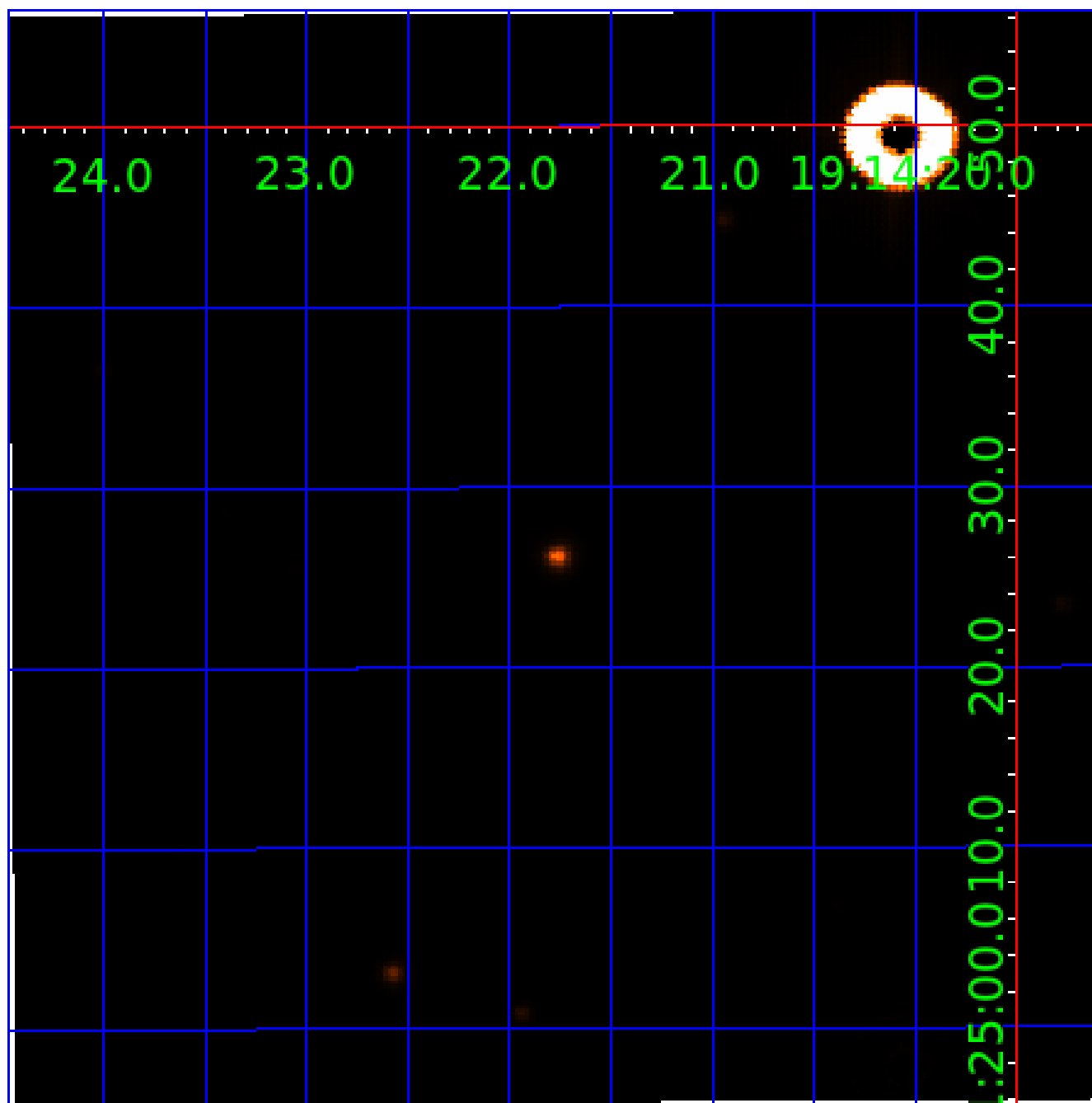


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UKIRT Image

Declination



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006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
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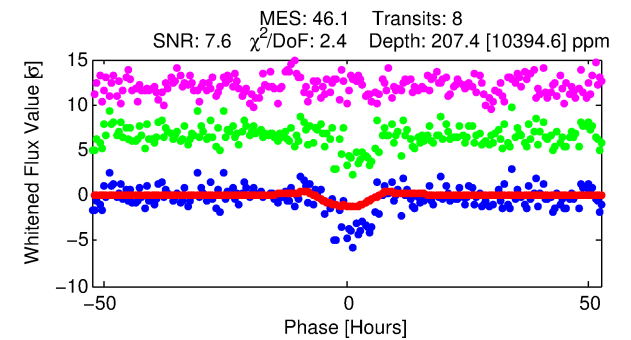
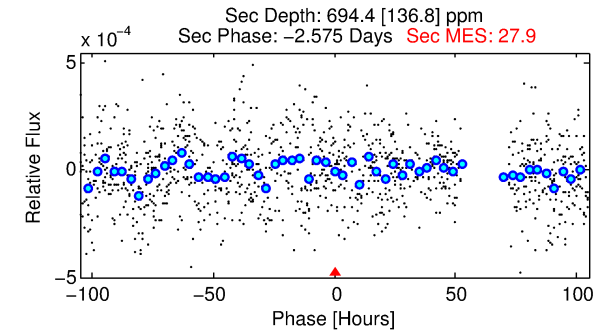
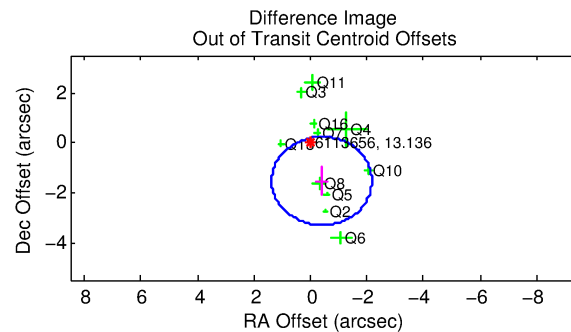
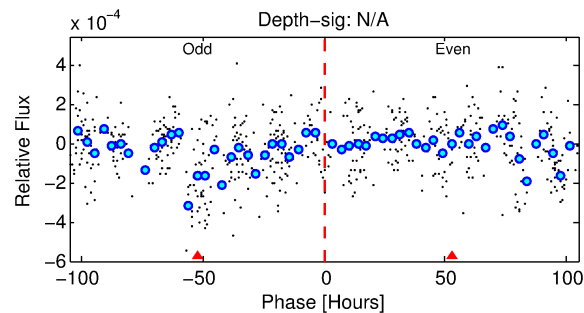
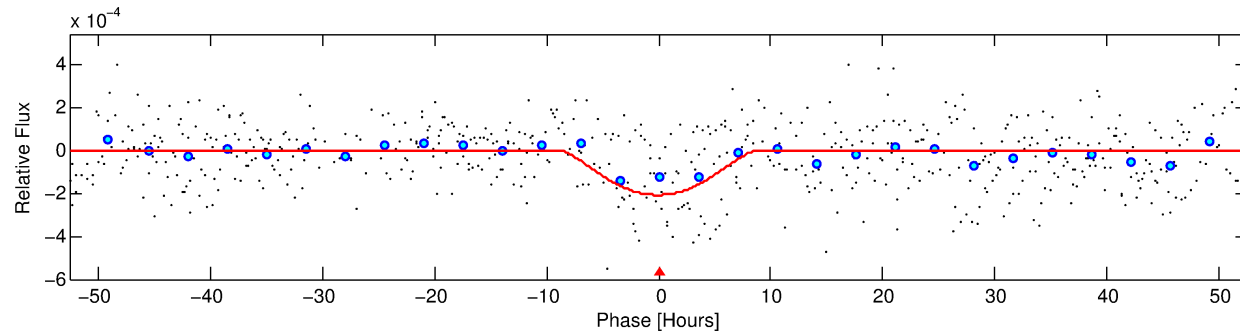
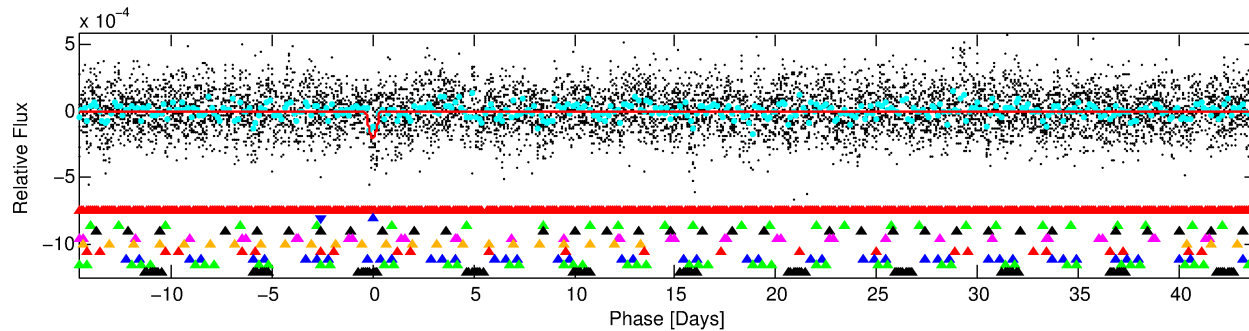
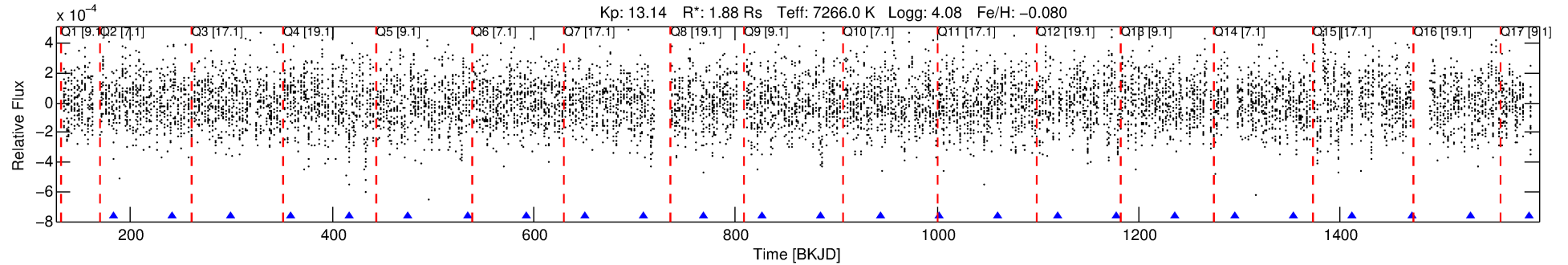
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006113656-02

No Significant Match Found

# DV One-Page Summary

KIC: 6113656 Candidate: 2 of 10 Period: 58.536 d



## DV Fit Results:

Period = 58.53558 [0.00518] d  
Epoch = 182.7914 [0.0812] BKJD  
Rp/R\* = 0.0256 [0.1034]  
a/R\* = 5.89 [6.26]  
b = 1.00 [0.74]  
Seff = 75.34 [27.64]  
Teq = 751 [69] K  
Rp = 5.23 [21.22] Re  
a = 0.3416 [0.0789] AU  
Ag = 1628.33 [13192.26] [0.12] $\sigma$   
Teffp = 7378 [14936] K [0.44] $\sigma$

## DV Diagnostic Results:

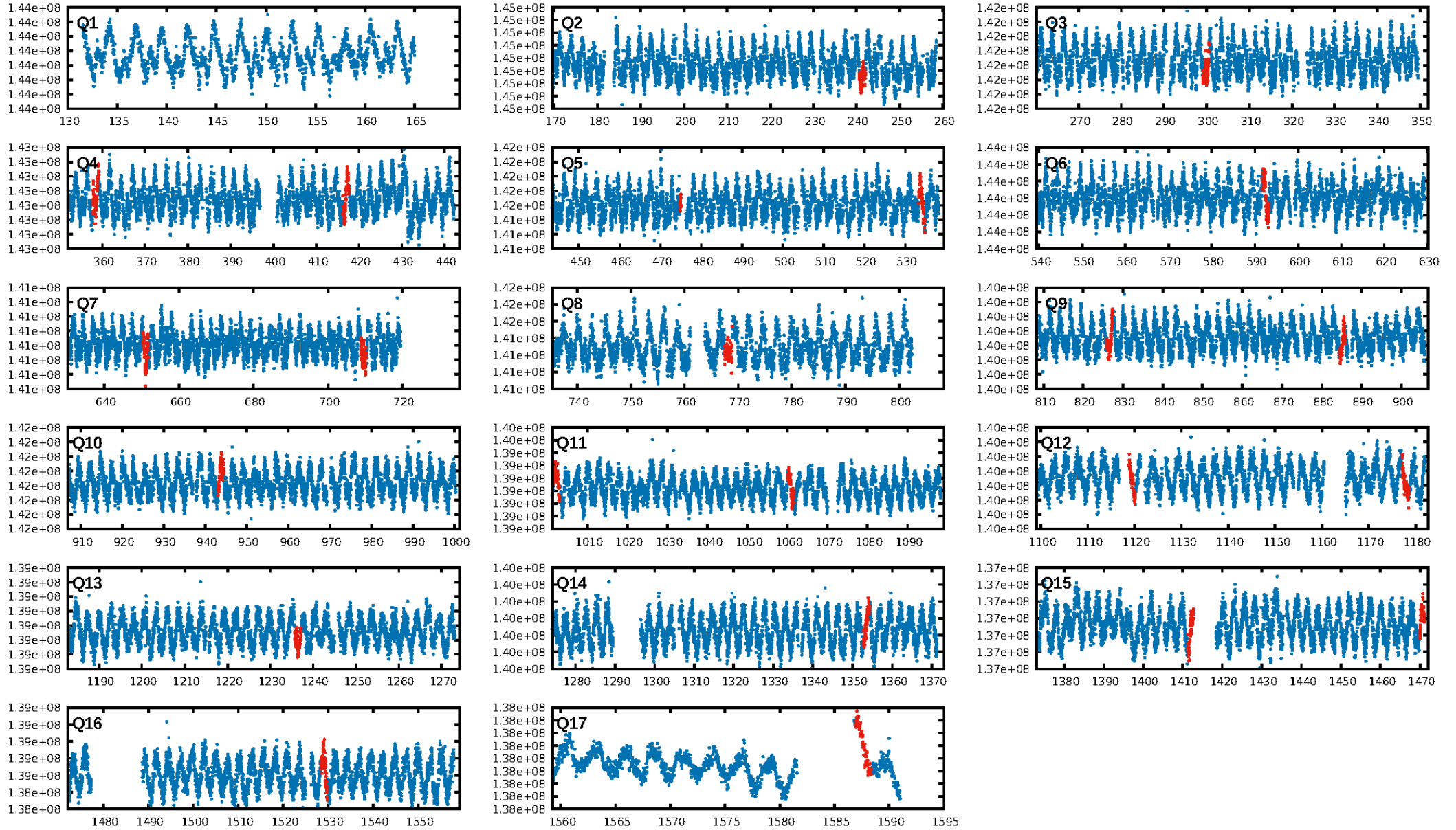
ShortPeriod-sig: 89.4% [1.62] $\sigma$   
LongPeriod-sig: 100.0% [4.47] $\sigma$   
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [8/8]  
GhostDiagnostic-chr: -0.04555  
Centroid-sig: 19.3%  
Centroid-so: 0.542 arcsec [1.42] $\sigma$   
OotOffset-rm: 1.584 arcsec [2.68] $\sigma$   
OotOffset-st: 3/3/3/2 [11]  
KicOffset-rm: 1.487 arcsec [2.49] $\sigma$   
KicOffset-st: 3/3/3/2 [11]  
DiffImageQuality-fgm: 0.45 [5/11]  
DiffImageOverlap-fno: 0.00 [0/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:13 Z

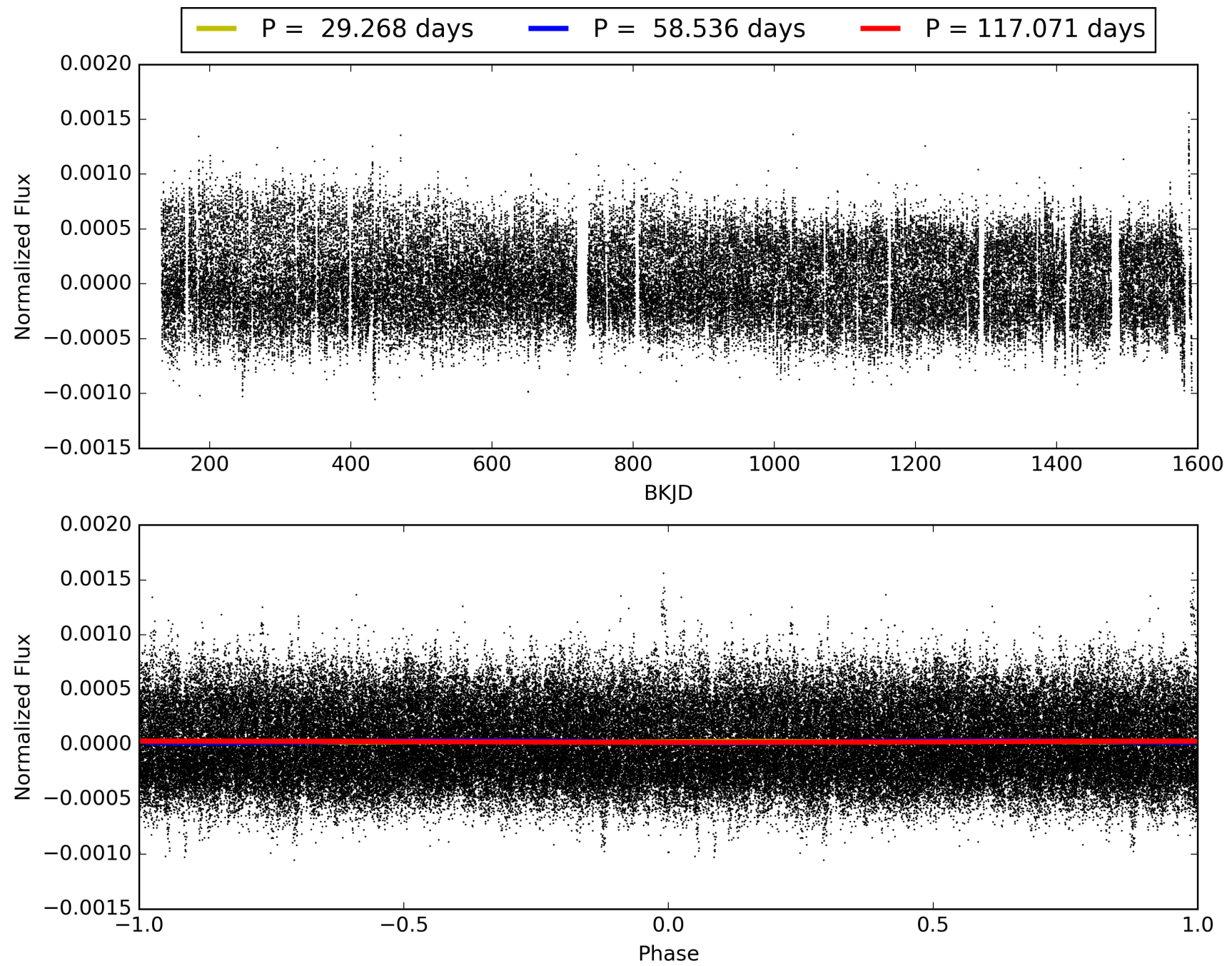
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006113656-02, PDC Light Curves

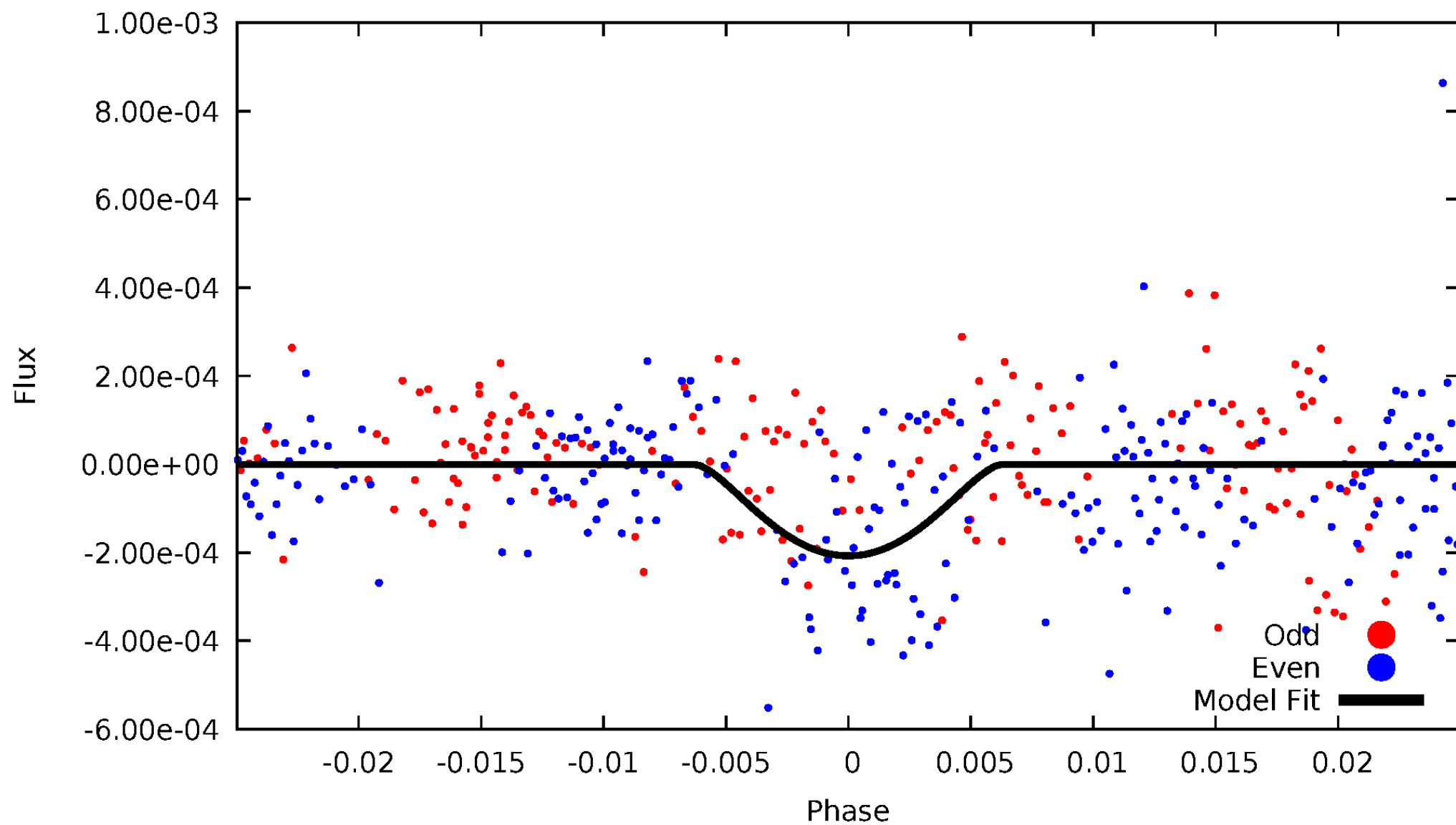


# TCE 006113656-02



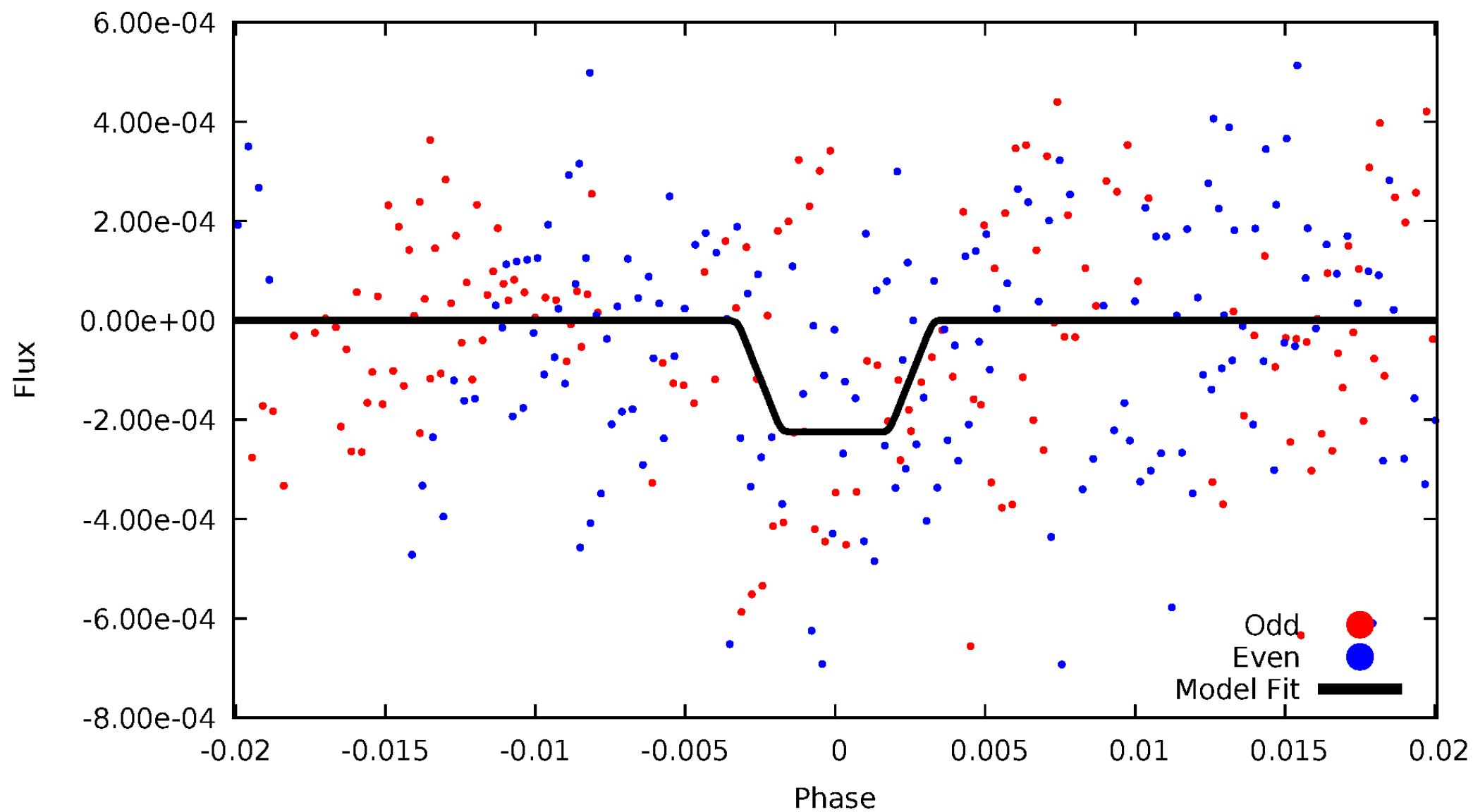
# DV Odd/Even

TCE 006113656-02



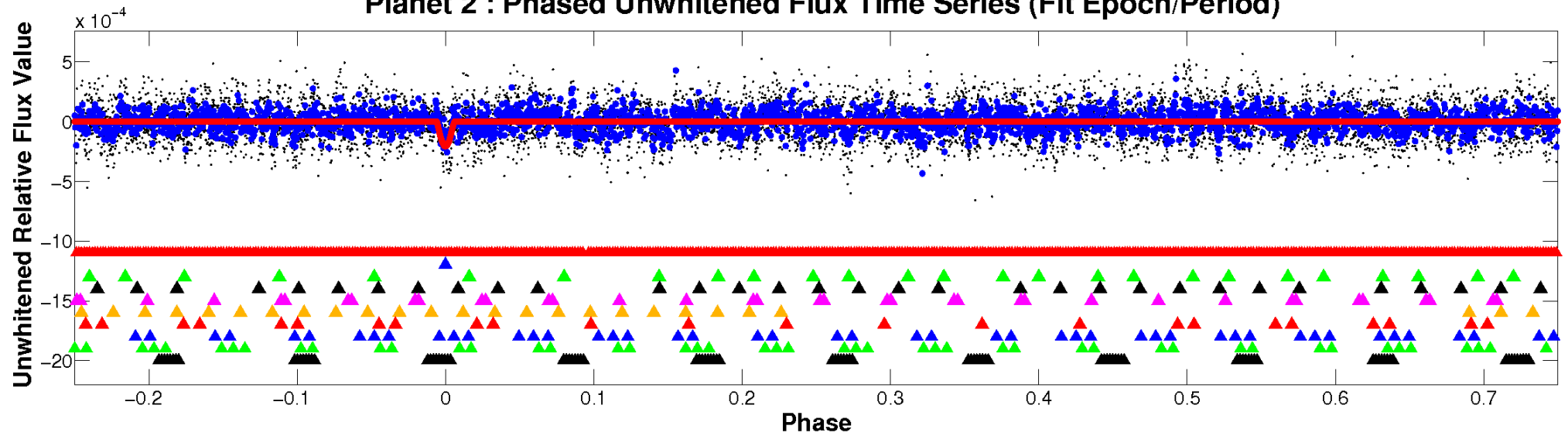
# ALT Odd/Even

TCE 006113656-02

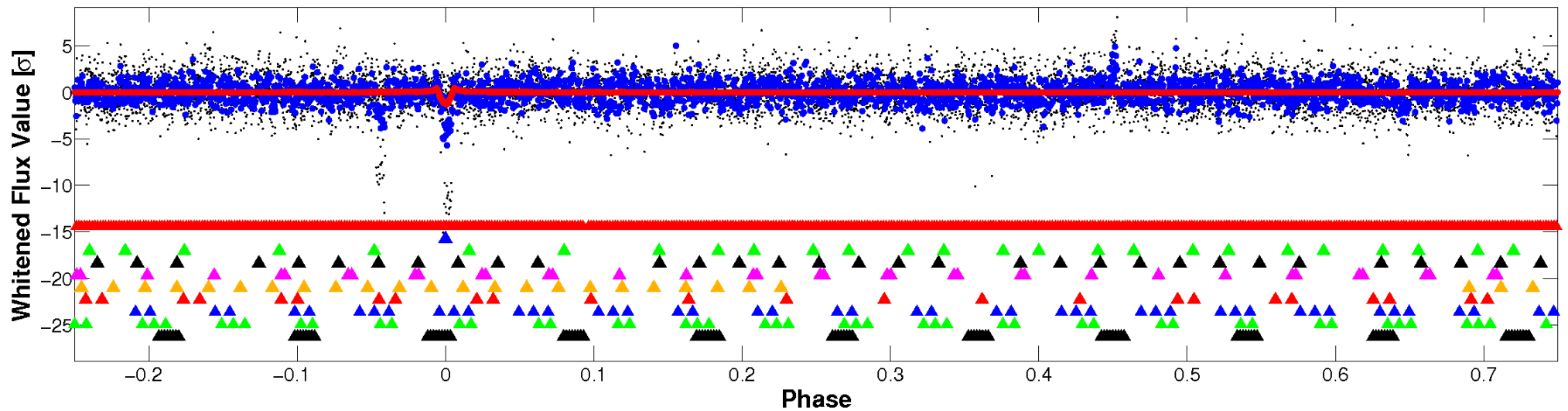


# Non-Whitened Vs. Whitened Light Curve

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



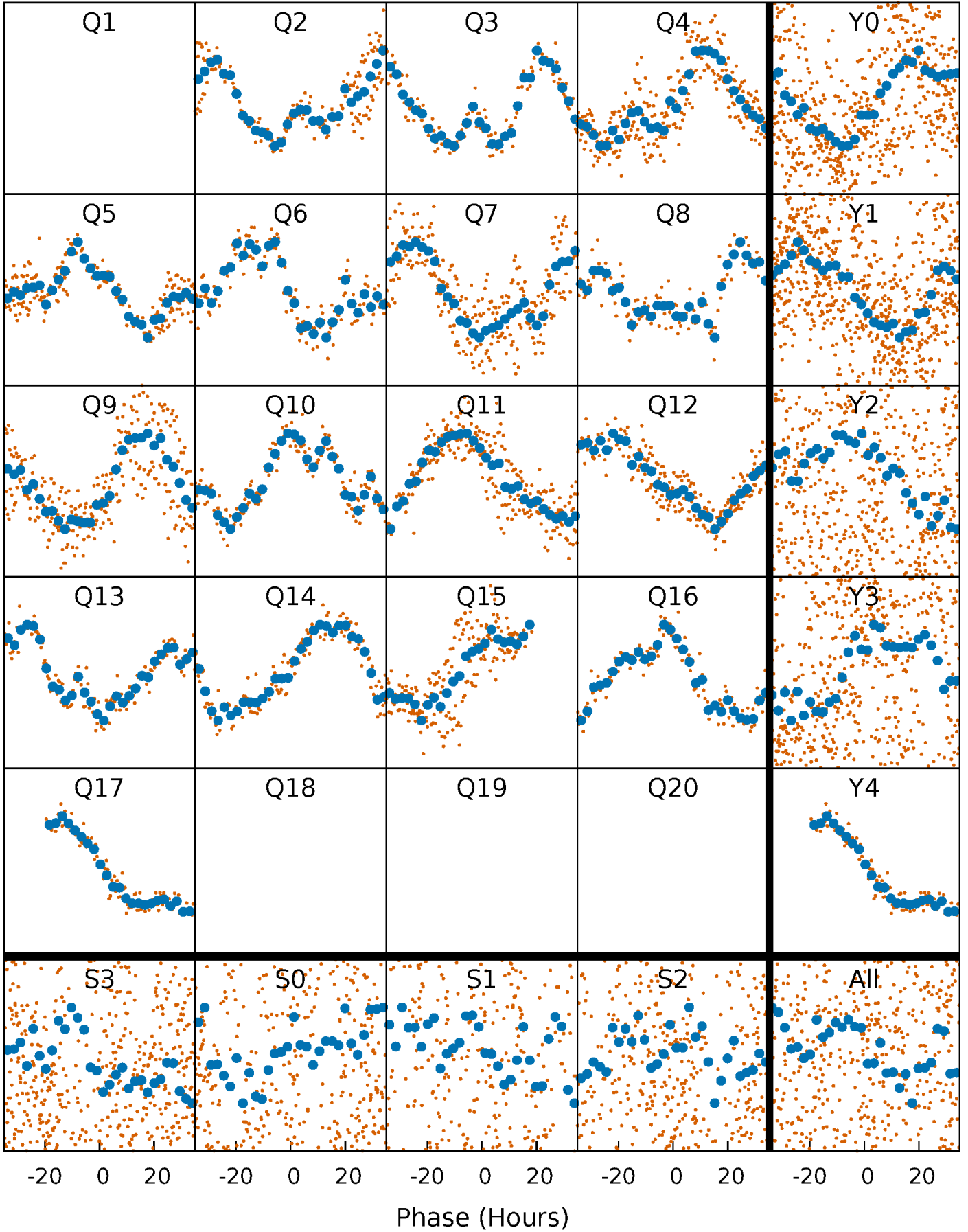
## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)





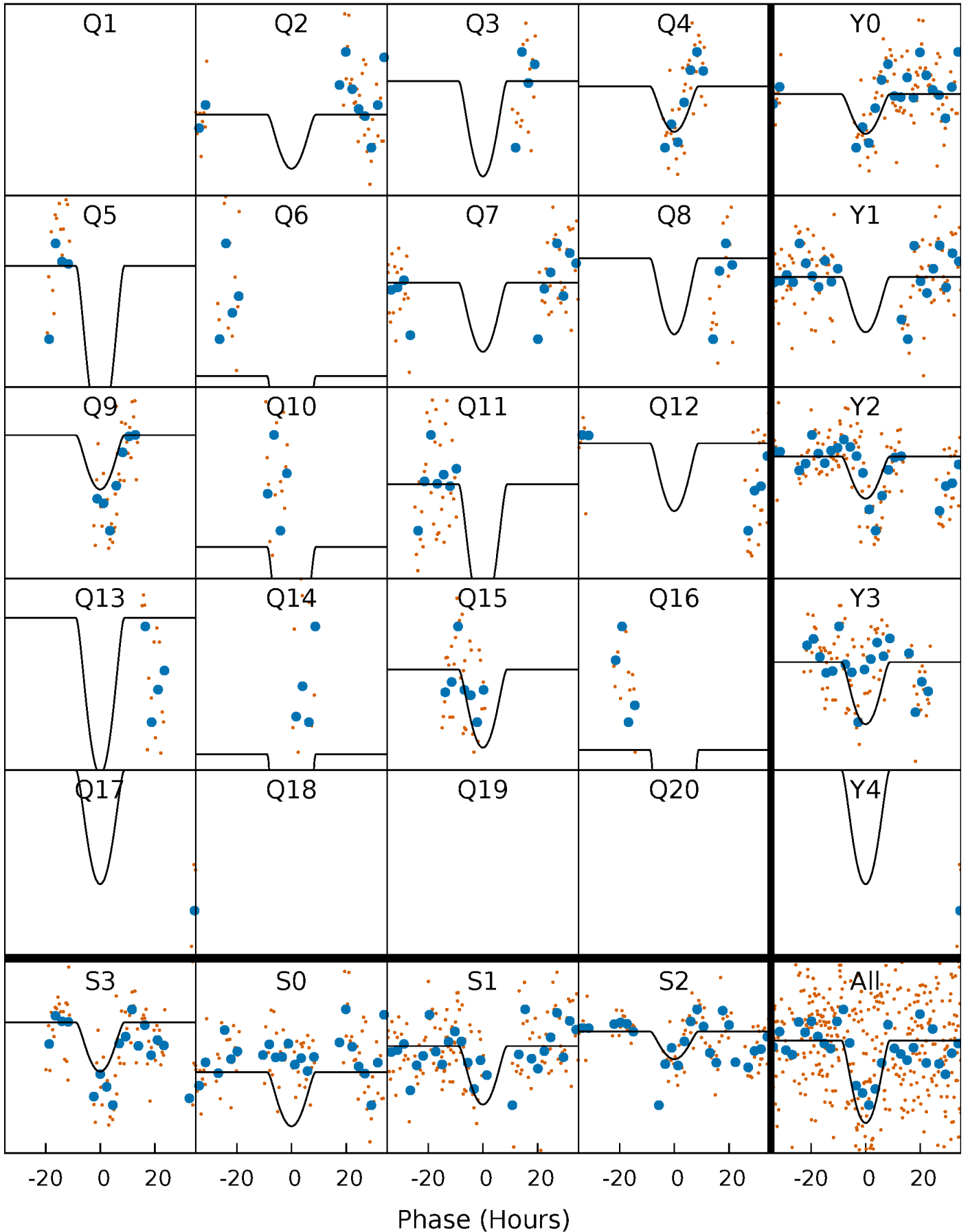
# PDC Quarter-Phased Transit Curves

TCE 006113656-02   P= 58.535580 Days    $T_0=182.791356$  (BKJD)



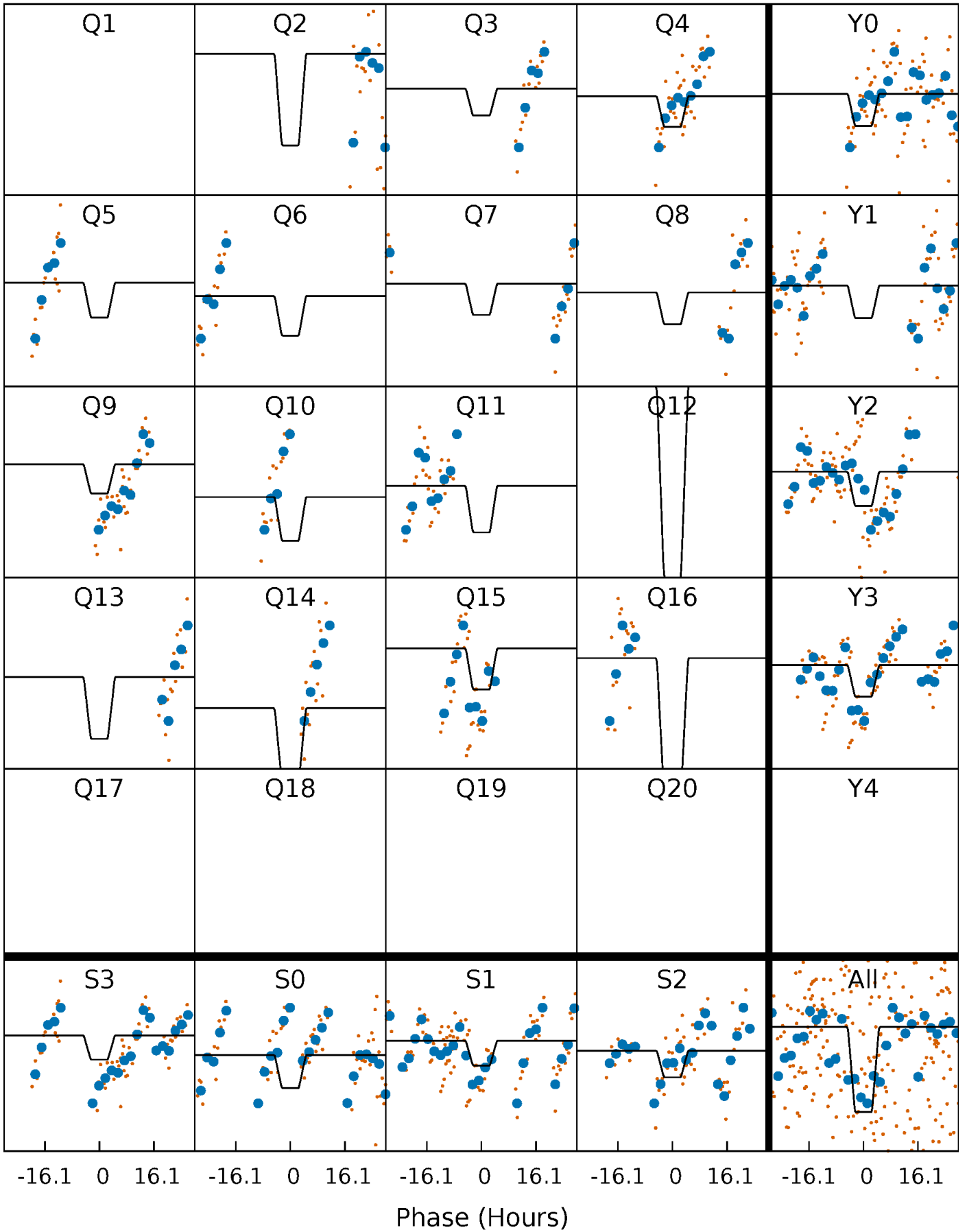
# DV Quarter-Phased Transit Curves

TCE 006113656-02 P= 58.535580 Days  $T_0=182.791356$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

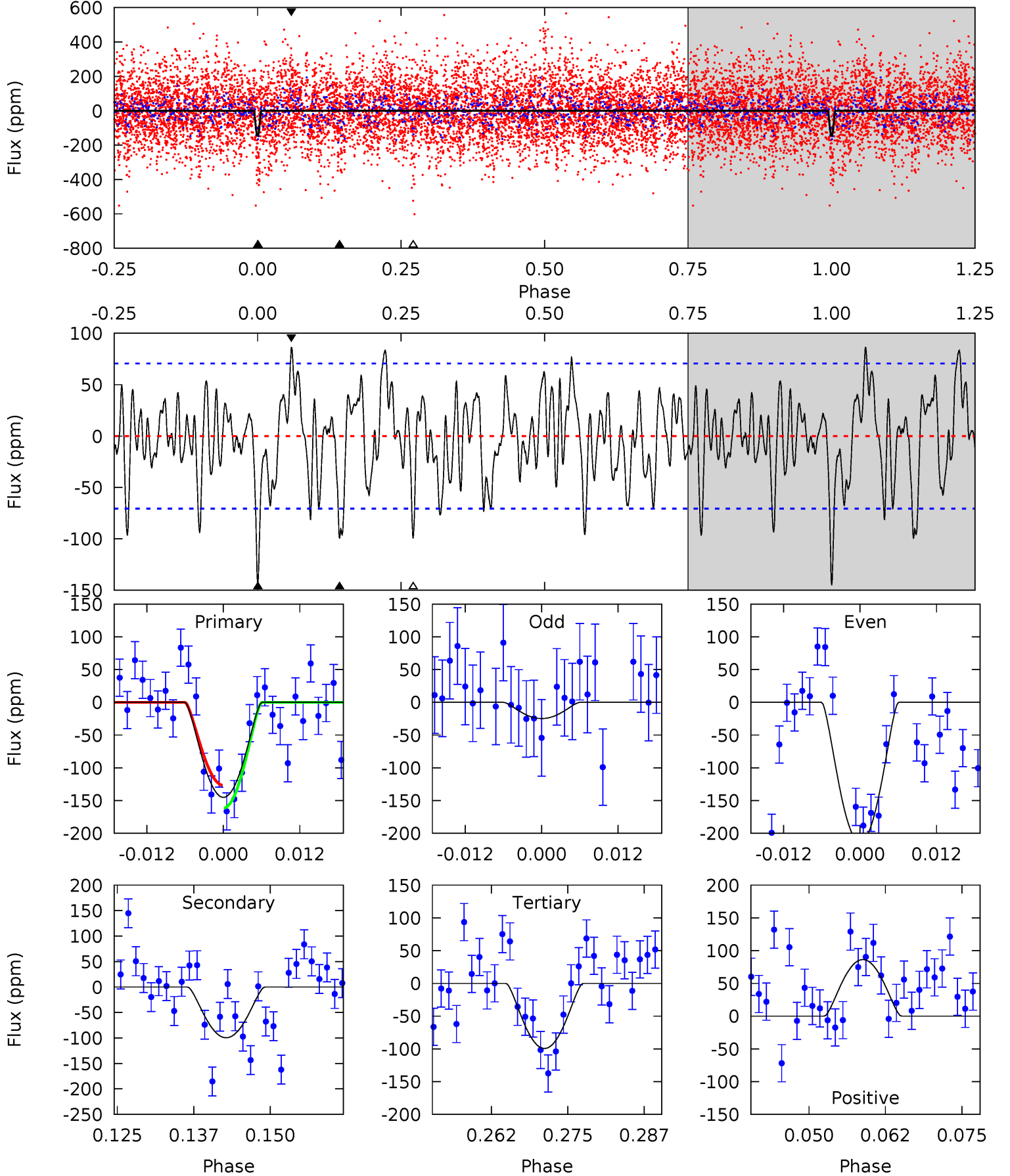
TCE 006113656-02 P= 58.527863 Days  $T_0=182.836285$  (BKJD)



# DV Model-Shift Uniqueness Test

006113656-02, P = 58.535580 Days, E = 124.255776 Days

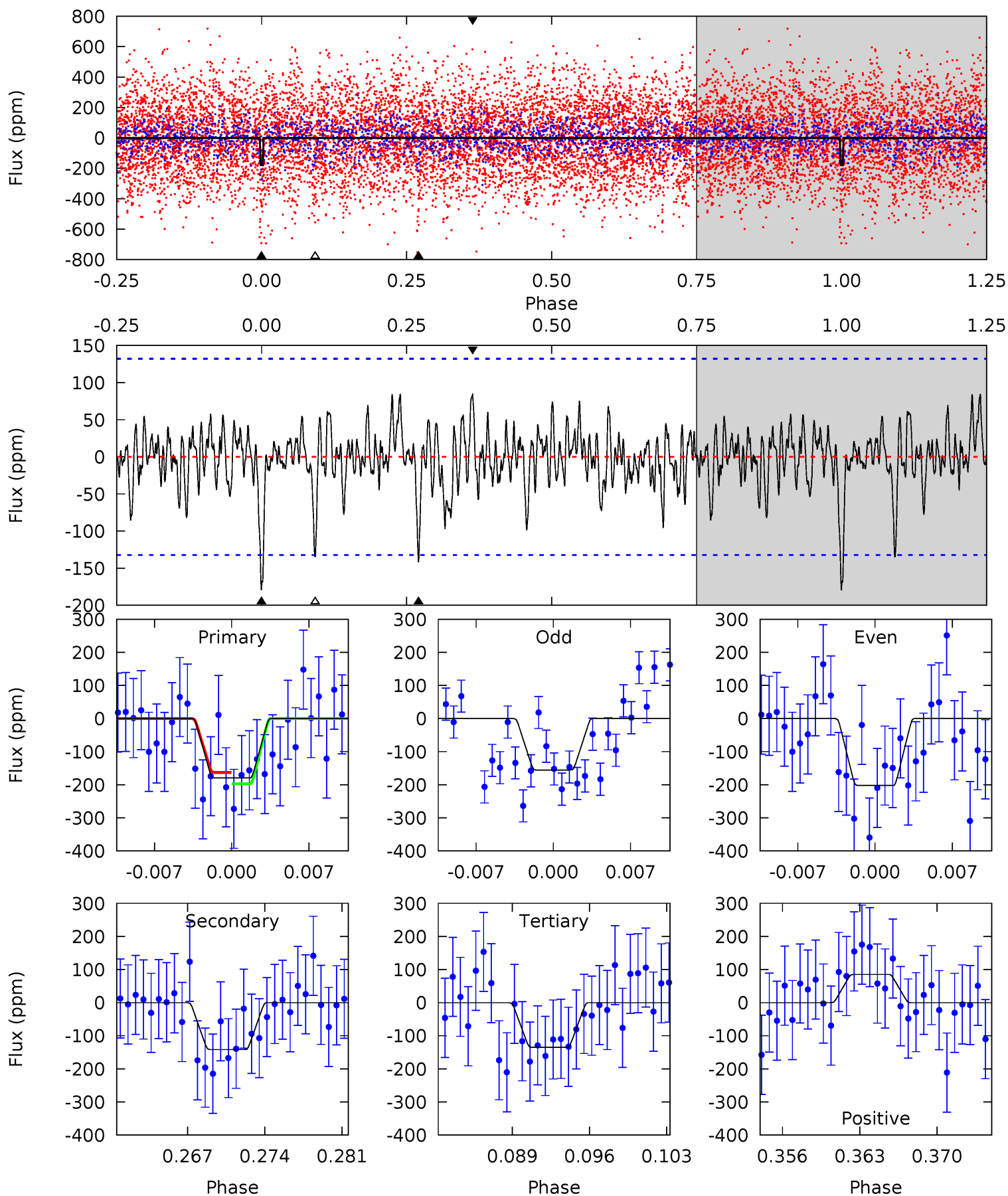
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.2	7.02	7.01	6.09	4.98	2.50	2.45	3.23	4.15	0.01	0.93	6.72	2.20	0.37	1.22



# Alt Model-Shift Uniqueness Test

006113656-02, P = 58.527863 Days, E = 124.308422 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.92	5.47	5.20	3.28	5.10	2.70	1.24	1.72	3.64	0.26	2.19	0.91	0.98	0.32	0.66





### Stellar Parameters For KIC 006113656

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-100 \pm 14$	$15.95^{+17.54}_{-10.88}$	$1045^{+77}_{-73}$	$3114^{+1572}_{-553}$	$25^{+214}_{-19}$
Alt.	$-142 \pm 26$	$14.27^{+16.25}_{-9.90}$	$1047^{+78}_{-78}$	$3450^{+1977}_{-720}$	$43^{+426}_{-34}$

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

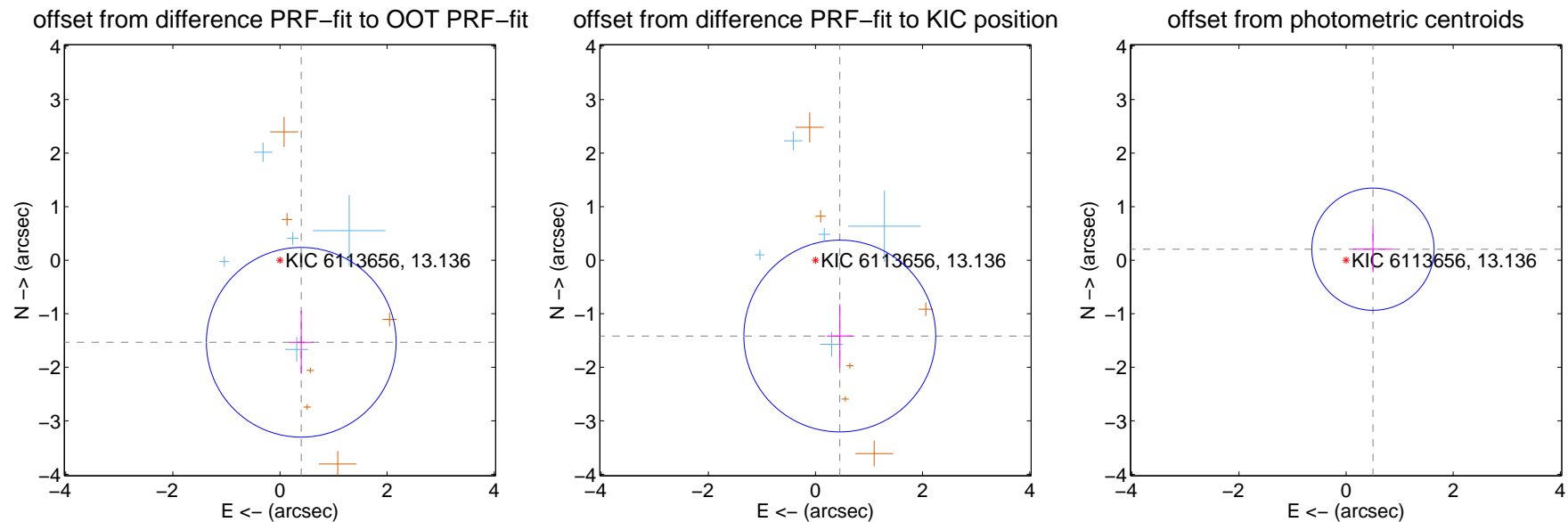
## DV Centroid Data

Supplemental centroid analysis for 006113656-02. Kepler magnitude: 13.14. Transit SNR 7.60

There are 5 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$1.584 \pm 0.590$	2.68	$-0.398 \pm 0.225$	$-1.533 \pm 0.589$
PRF-fit source offset from KIC position	$1.487 \pm 0.597$	2.49	$-0.454 \pm 0.241$	$-1.416 \pm 0.595$
photometric centroid source offset	$0.54 \pm 0.38$	1.42	$-0.50 \pm 0.37$	$0.21 \pm 0.43$



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.

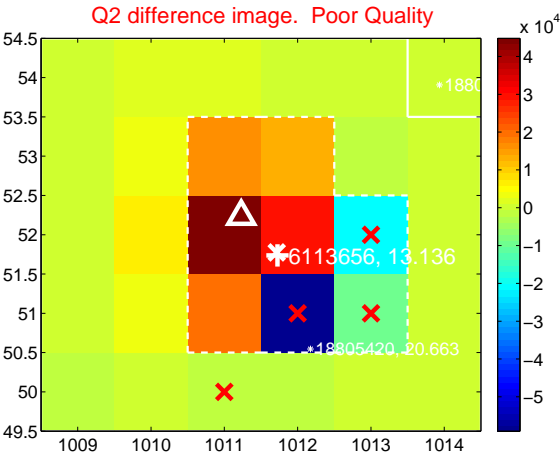
Q1 no difference image



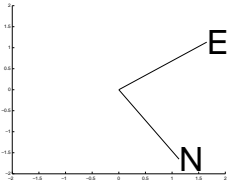
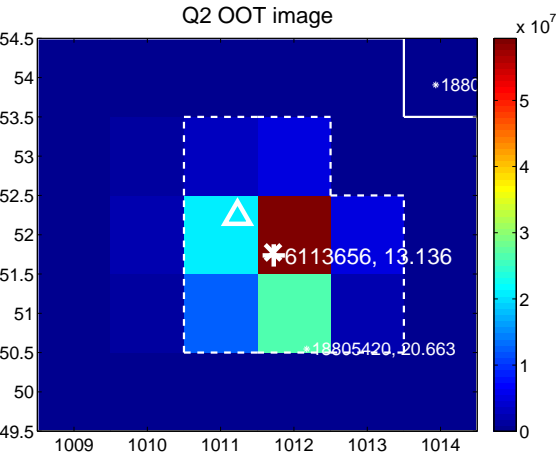
Q1 no OOT image



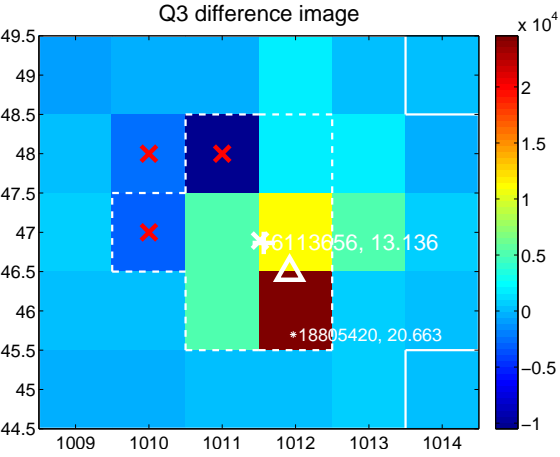
Q2 difference image. Poor Quality



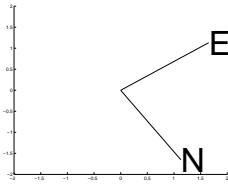
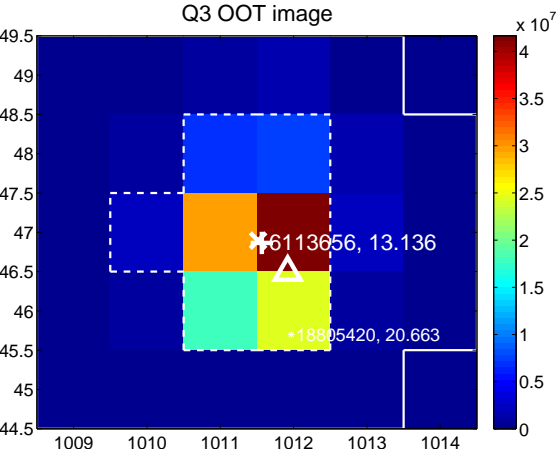
Q2 OOT image



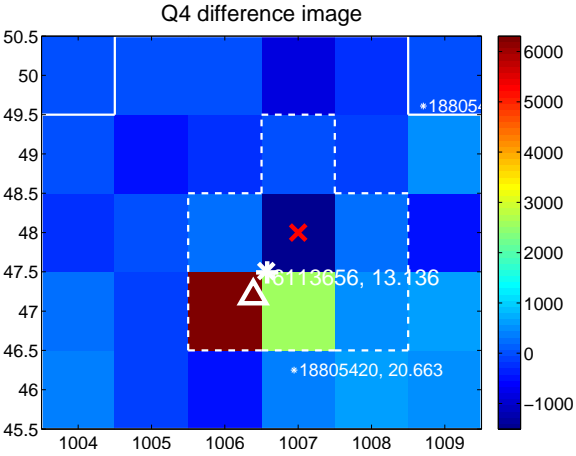
Q3 difference image



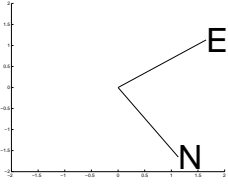
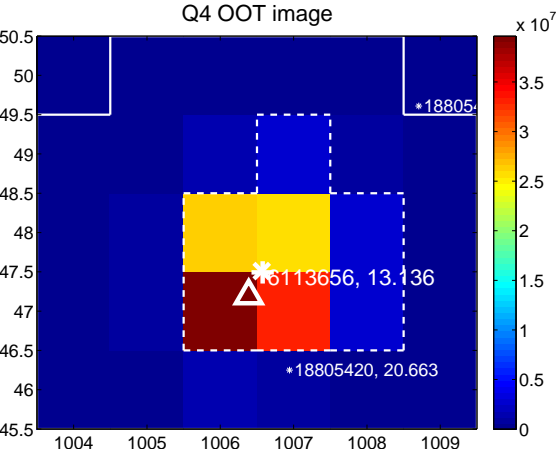
Q3 OOT image



Q4 difference image

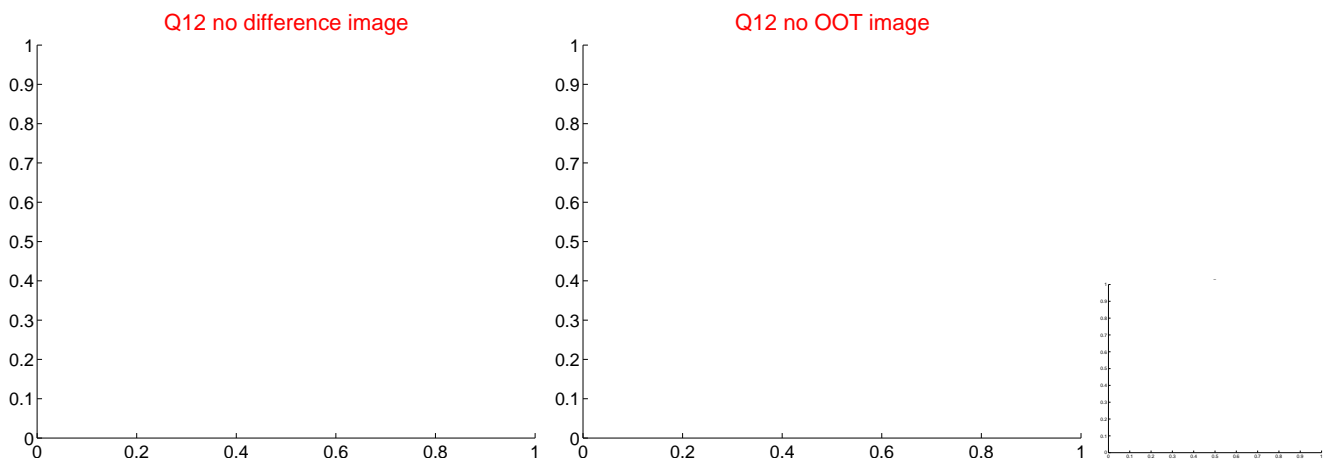
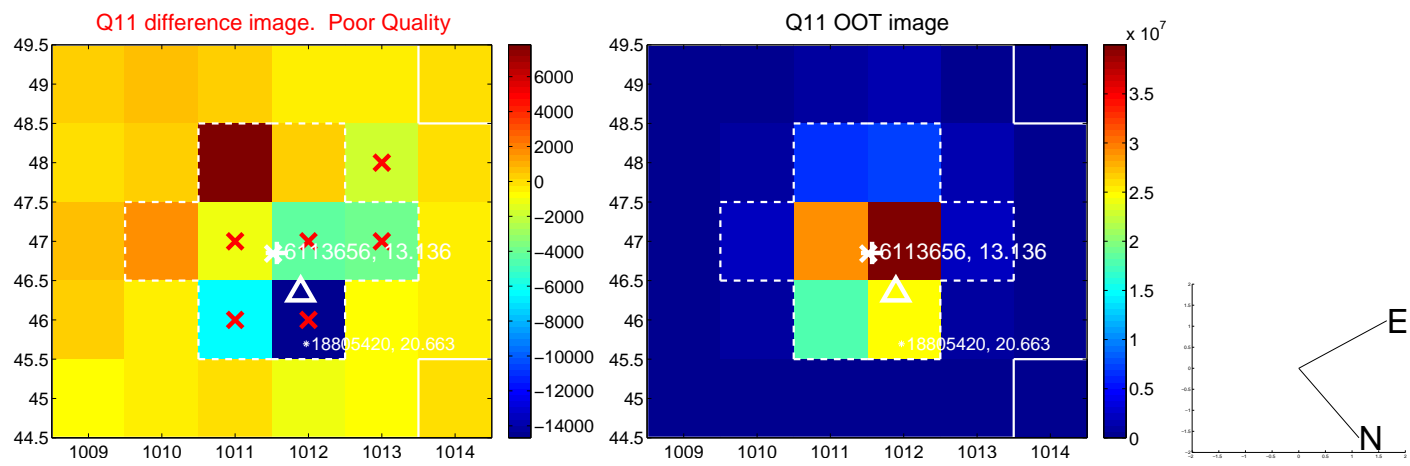
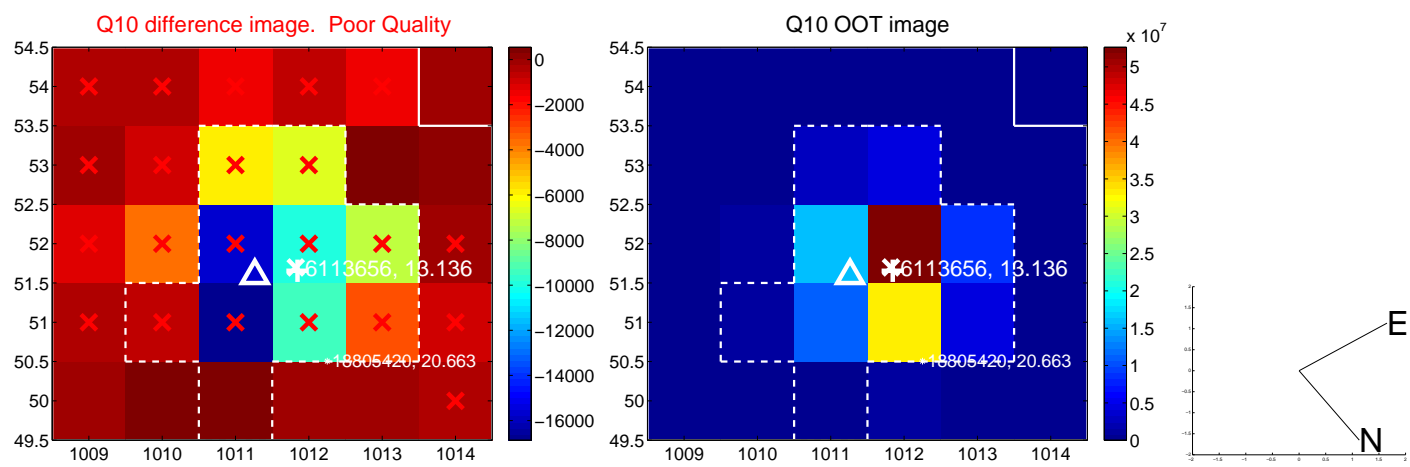
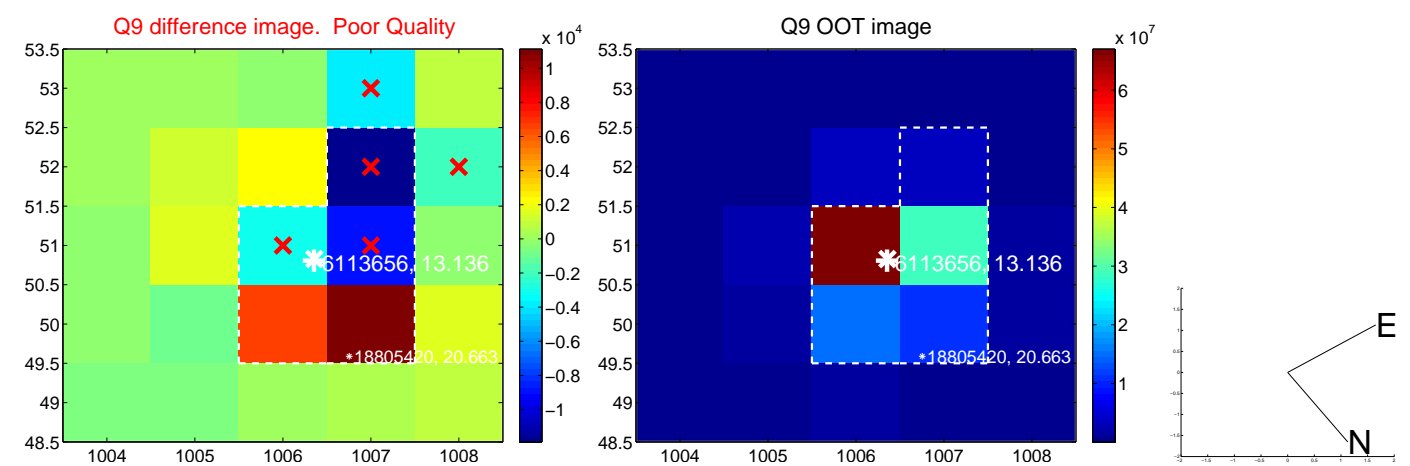


Q4 OOT image



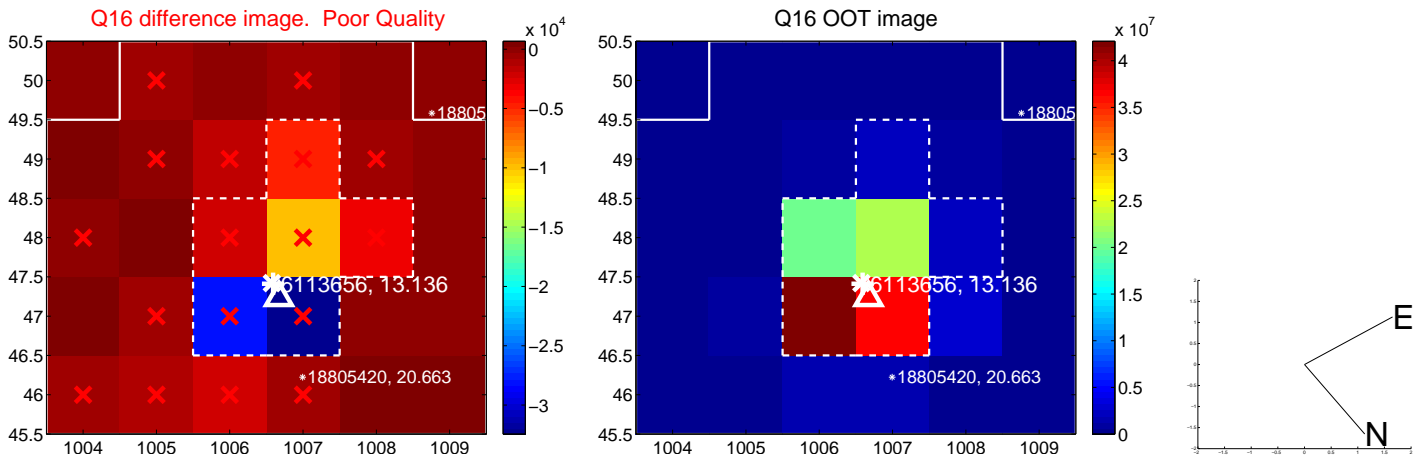
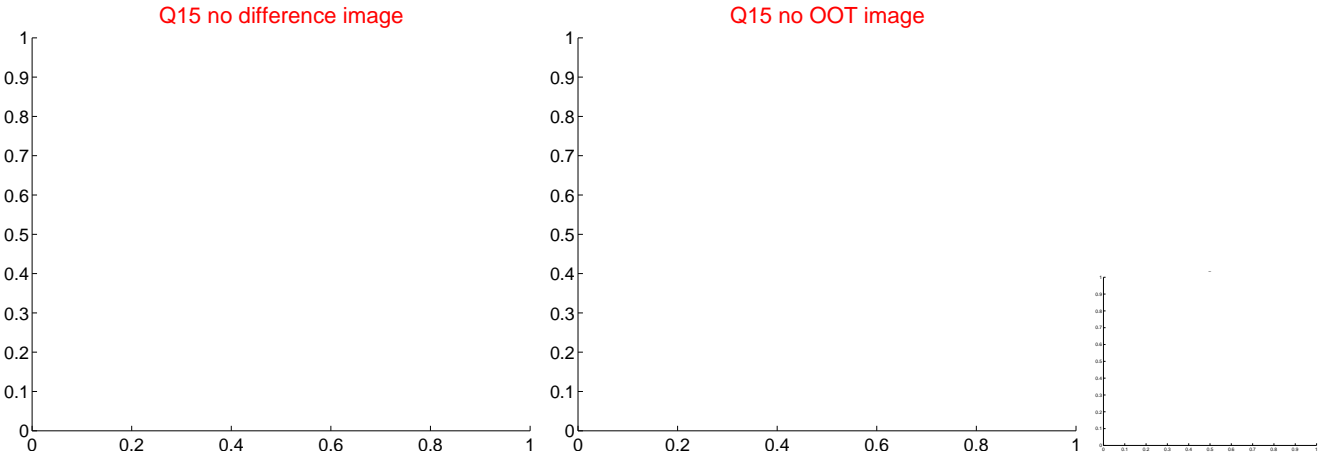
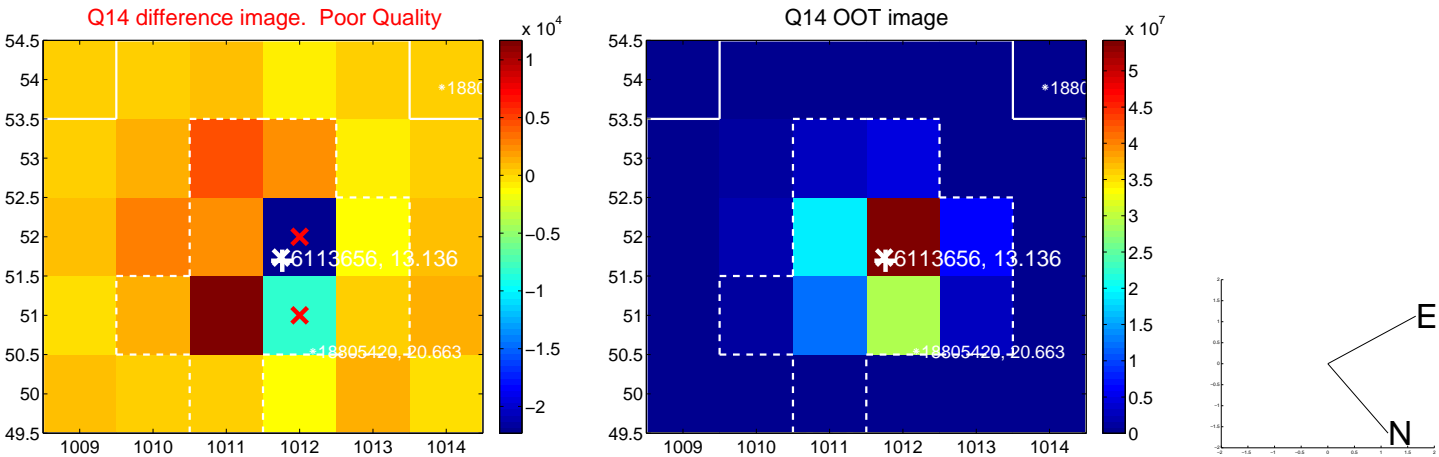
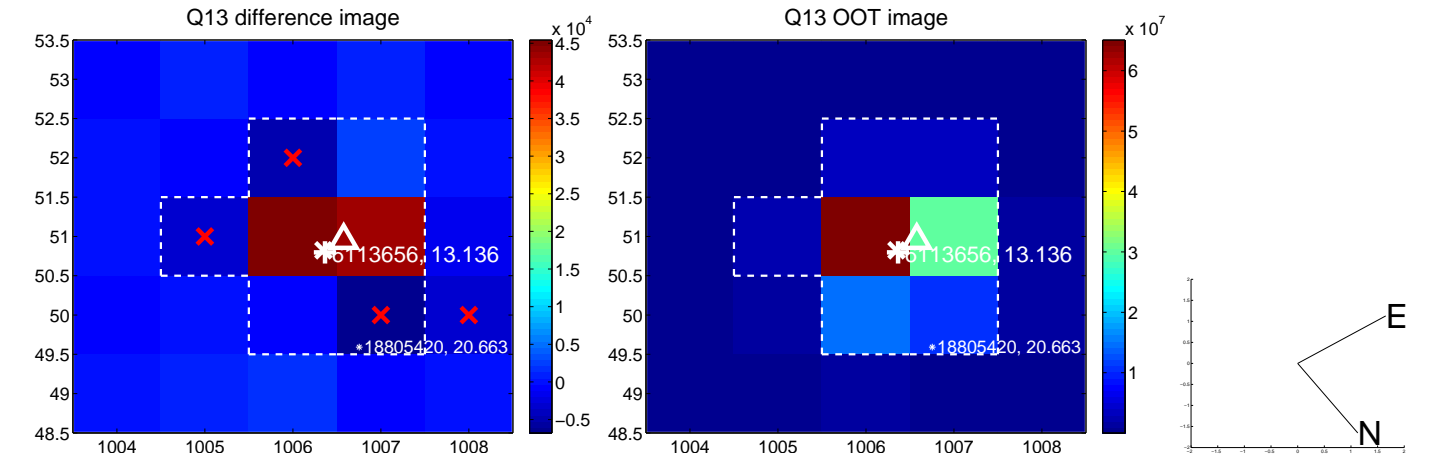


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

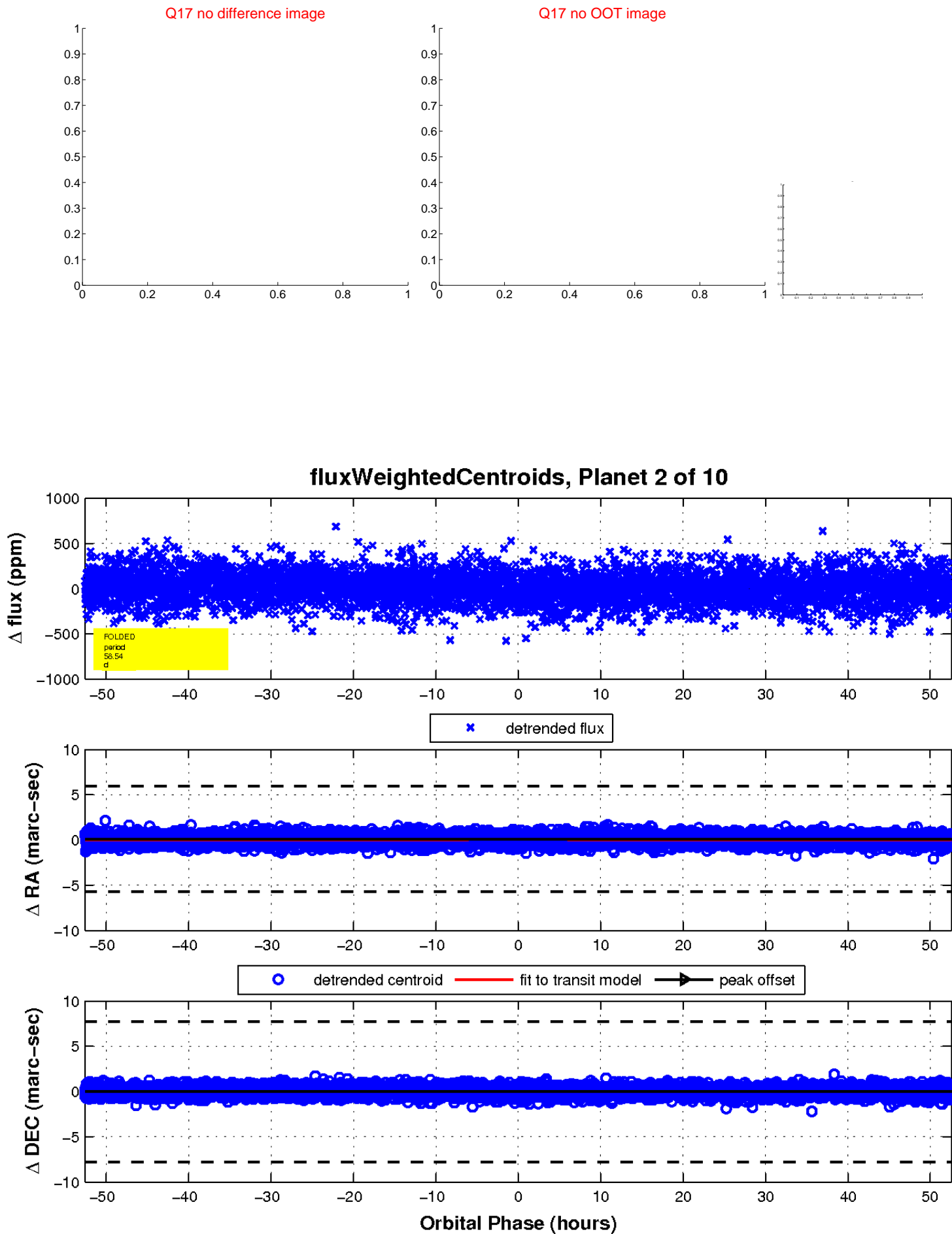




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

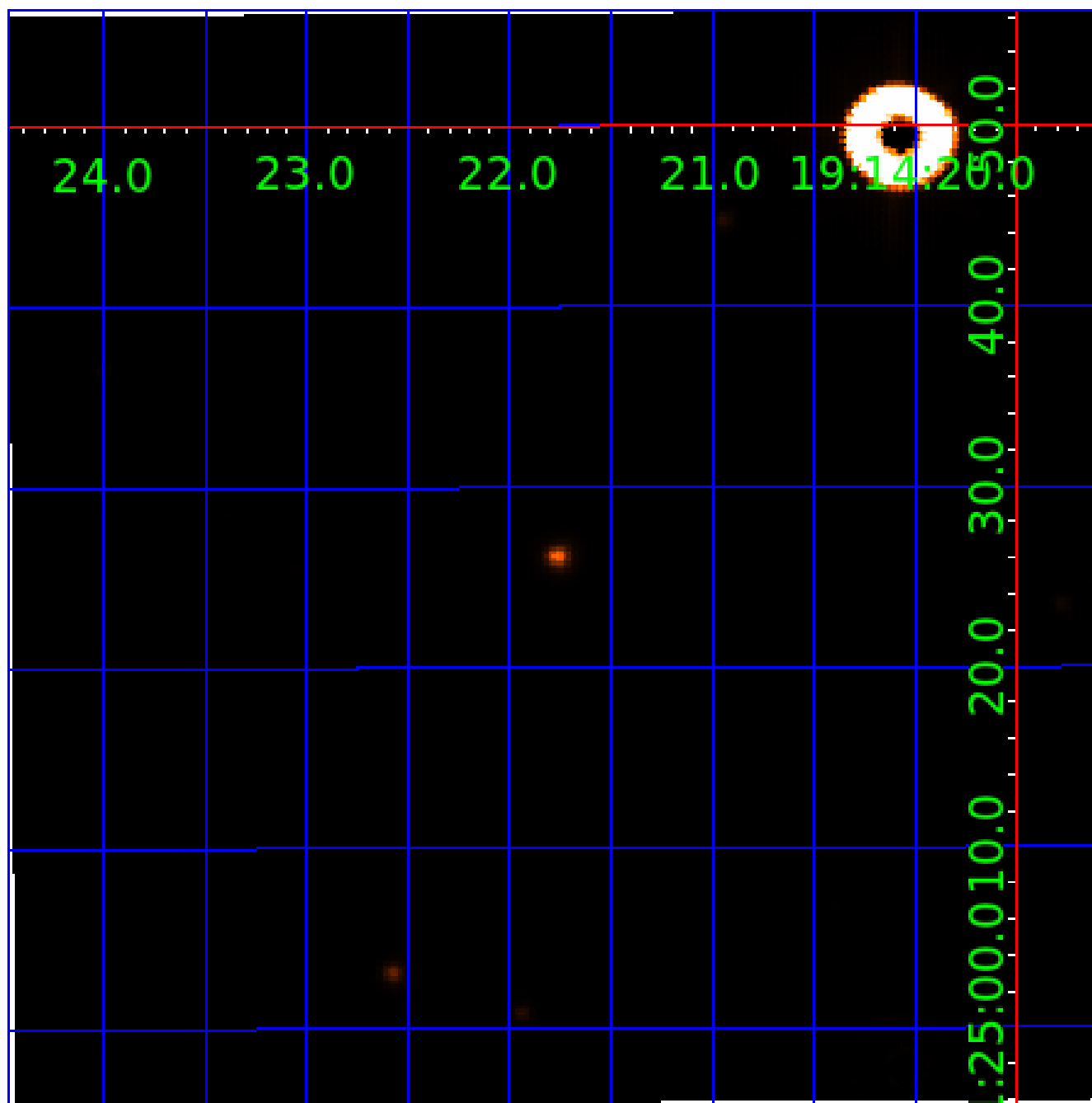


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## KIC 006113656

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113656-01	OBS	No	2.646238	132.447489	5.6	18.121	11.4	3.0	1.88	7266	0.46	4677.99
006113656-02	OBS	No	58.535580	182.791356	207.4	17.532	46.1	7.6	1.88	7266	5.23	75.34
006113656-03	OBS	No	54.788959	170.151339	184.7	12.850	20.9	9.7	1.88	7266	2.58	82.28
006113656-04	OBS	No	44.294861	175.427489	174.4	6.797	11.3	10.5	1.88	7266	2.78	109.25
006113656-05	OBS	No	39.904031	136.547656	166.1	4.552	11.1	10.6	1.88	7266	2.77	125.57
006113656-06	OBS	No	57.280460	137.501760	190.8	6.317	11.1	11.6	1.88	7266	2.88	77.55
006113656-07	OBS	No	62.394926	153.799040	161.0	11.070	11.8	8.4	1.88	7266	2.70	69.19
006113656-08	OBS	No	30.838567	148.567220	249.9	2.104	10.9	10.1	1.88	7266	3.01	177.05
006113656-09	OBS	No	30.832288	161.442836	130.4	9.084	9.9	10.9	1.88	7266	2.38	177.10
006113656-10	OBS	No	15.974468	134.165876	100.7	9.468	10.0	7.9	1.88	7266	2.01	425.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113656-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
006113656-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
006113656-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
006113656-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

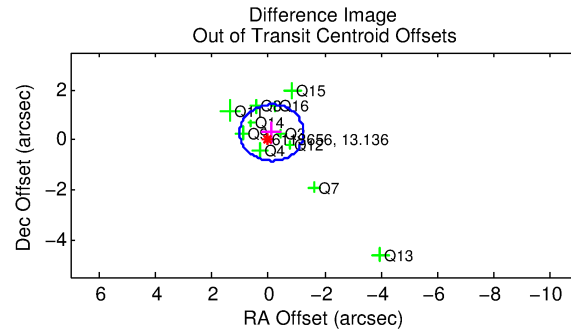
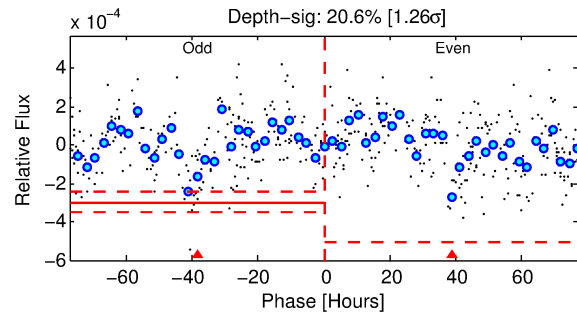
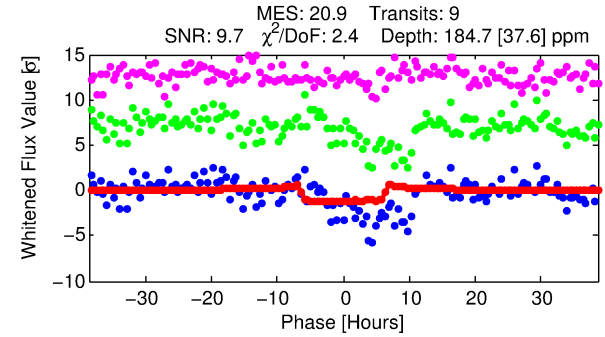
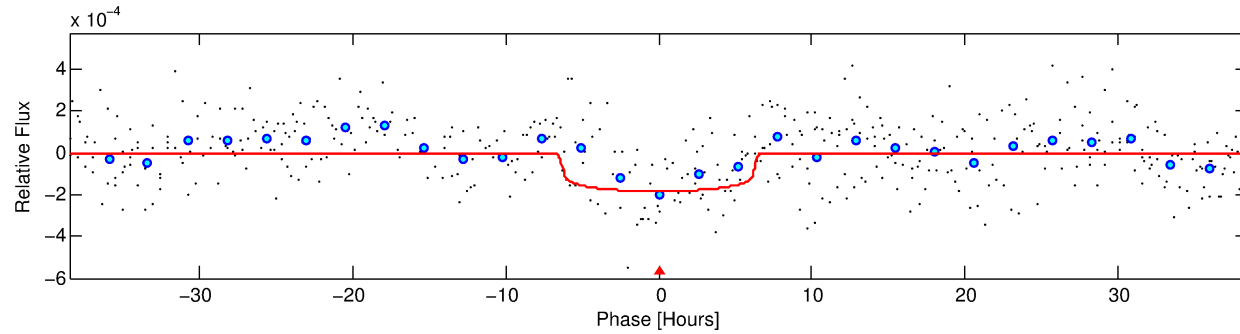
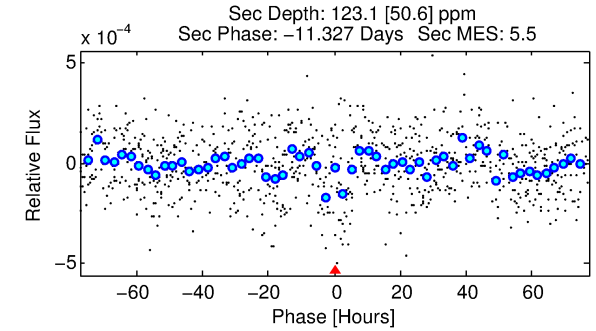
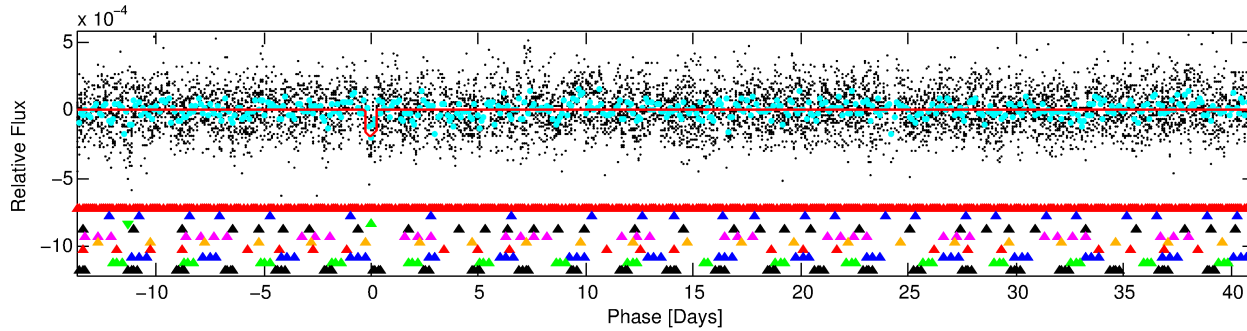
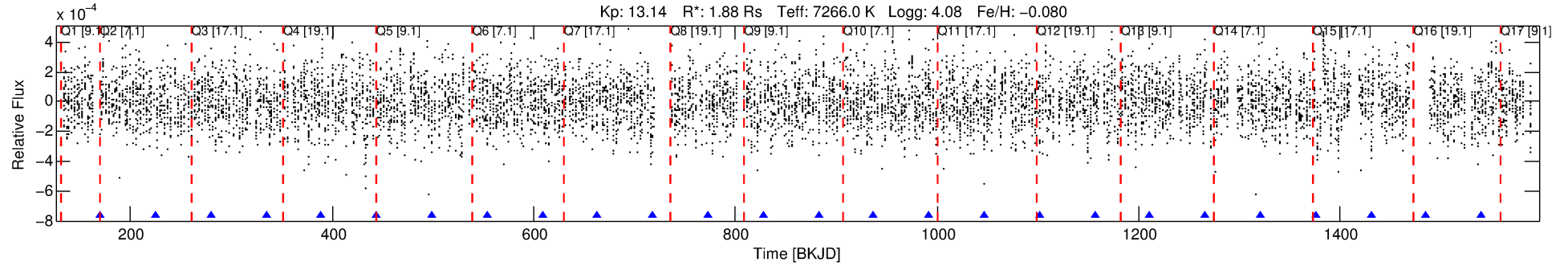
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006113656-03

No Significant Match Found

# DV One-Page Summary

KIC: 6113656 Candidate: 3 of 10 Period: 54.789 d



## DV Fit Results:

Period = 54.78896 [0.00108] d  
Epoch = 170.1513 [0.0152] BKJD  
Rp/R\* = 0.0126 [0.0191]  
a/R\* = 32.98 [296.81]  
b = 0.02 [552.80]  
Seff = 82.28 [30.19]  
Teq = 768 [70] K  
Rp = 2.58 [3.98] Re  
a = 0.3268 [0.0755] AU  
Ag = 1085.27 [3339.97] [0.32 $\sigma$ ]  
Teffp = 6815 [5223] K [1.16 $\sigma$ ]

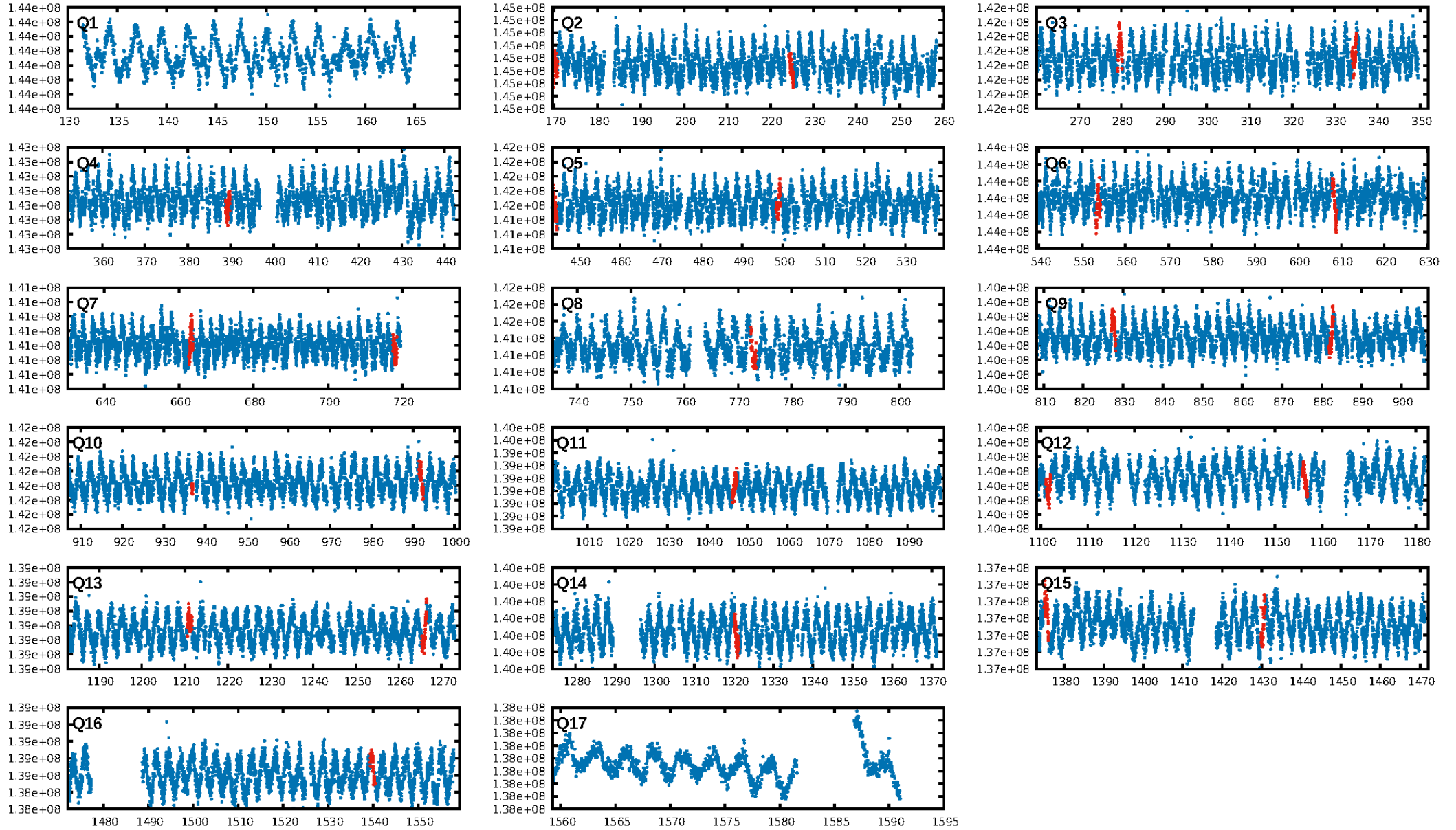
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [17.33 $\sigma$ ]  
LongPeriod-sig: 100.0% [4.18 $\sigma$ ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [9/9]  
GhostDiagnostic-chr: 3.785  
Centroid-sig: 35.1%  
Centroid-so: 0.368 arcsec [0.90 $\sigma$ ]  
OotOffset-rm: 0.304 arcsec [0.81 $\sigma$ ]  
OotOffset-st: 1/4/4/2 [11]  
KicOffset-rm: 0.404 arcsec [0.90 $\sigma$ ]  
KicOffset-st: 1/4/4/2 [11]  
DiffImageQuality-fgm: 0.45 [5/11]  
DiffImageOverlap-fno: 0.00 [0/15]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:17 Z

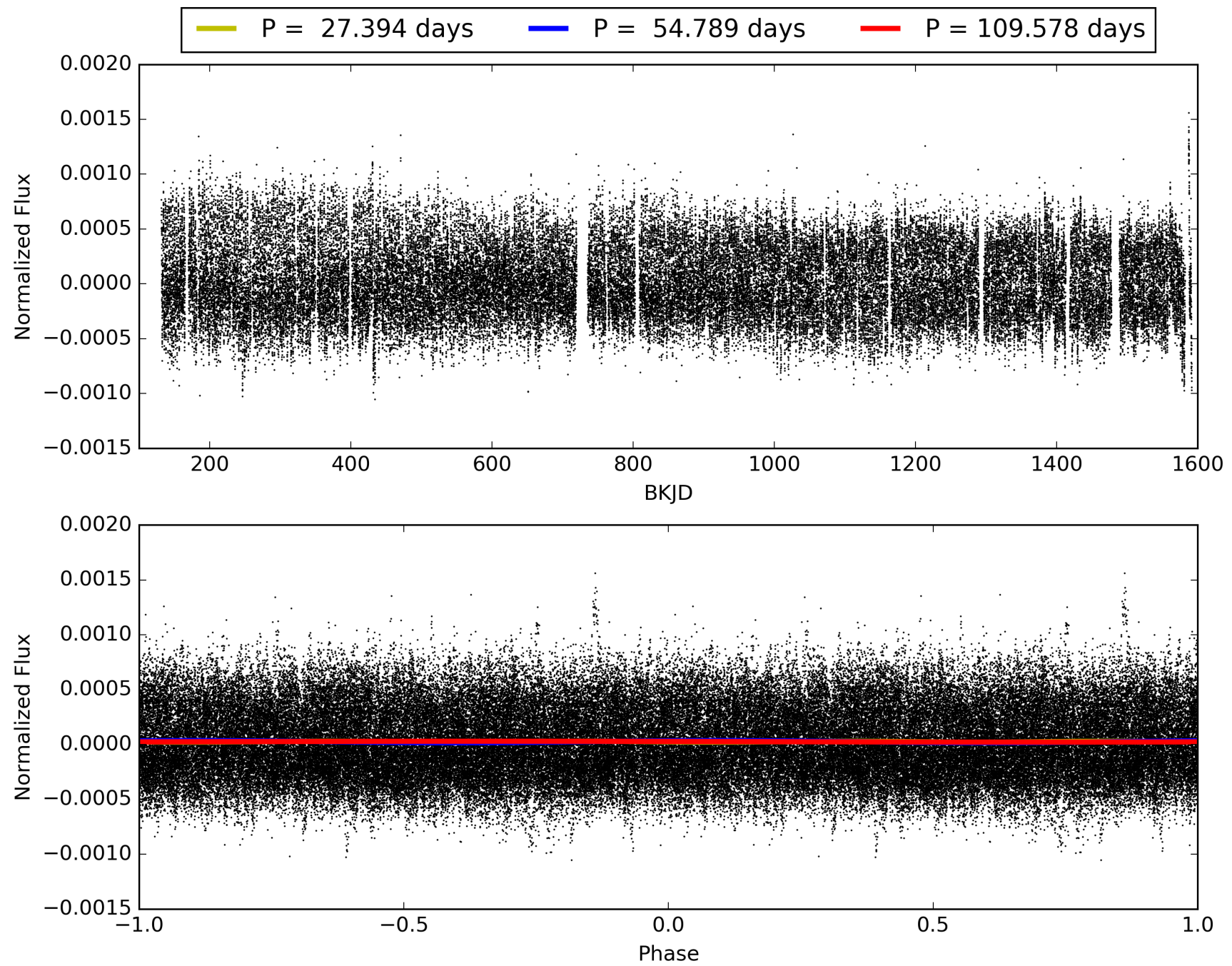
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006113656-03, PDC Light Curves



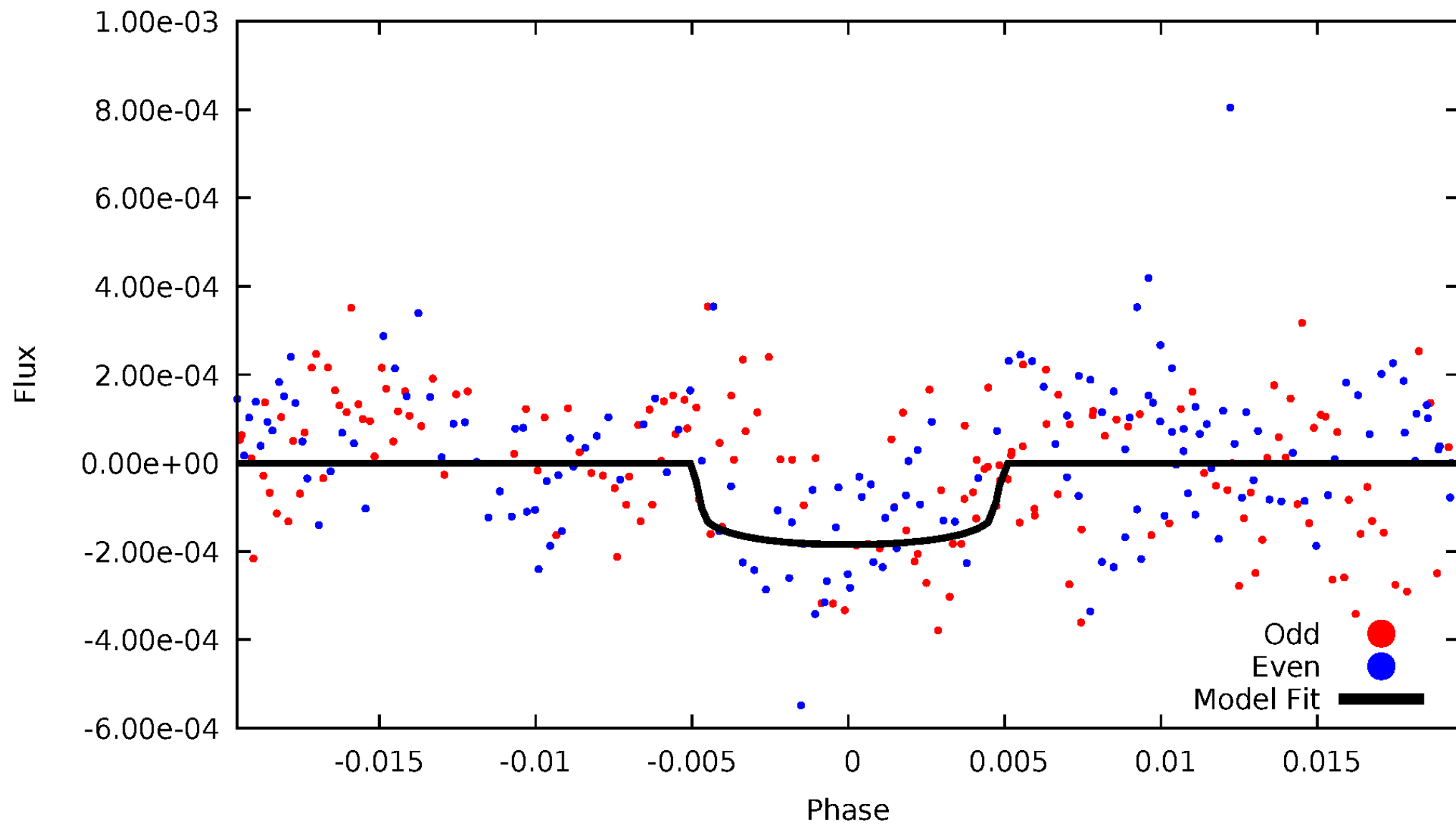


TCE 006113656-03



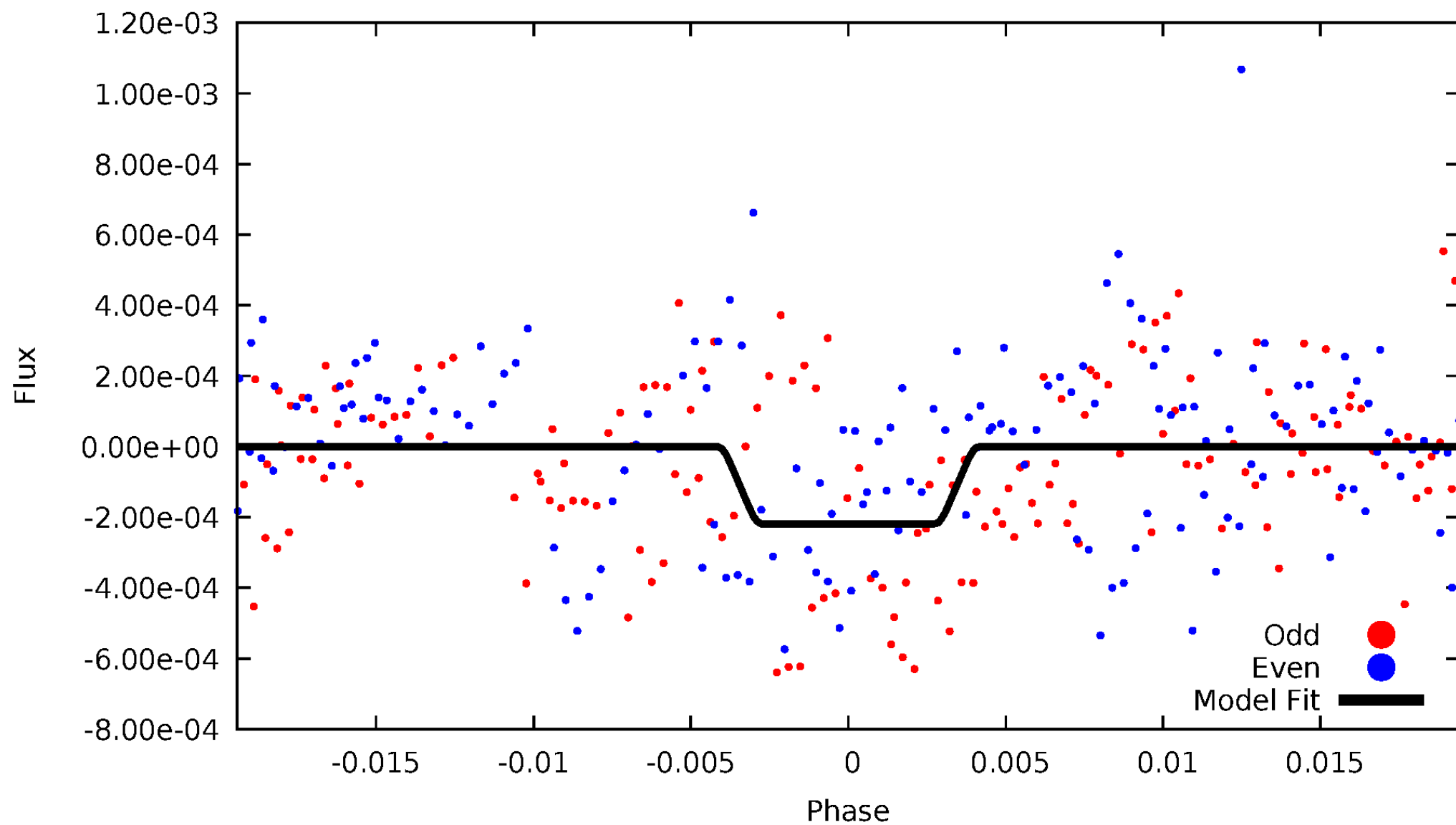
# DV Odd/Even

TCE 006113656-03



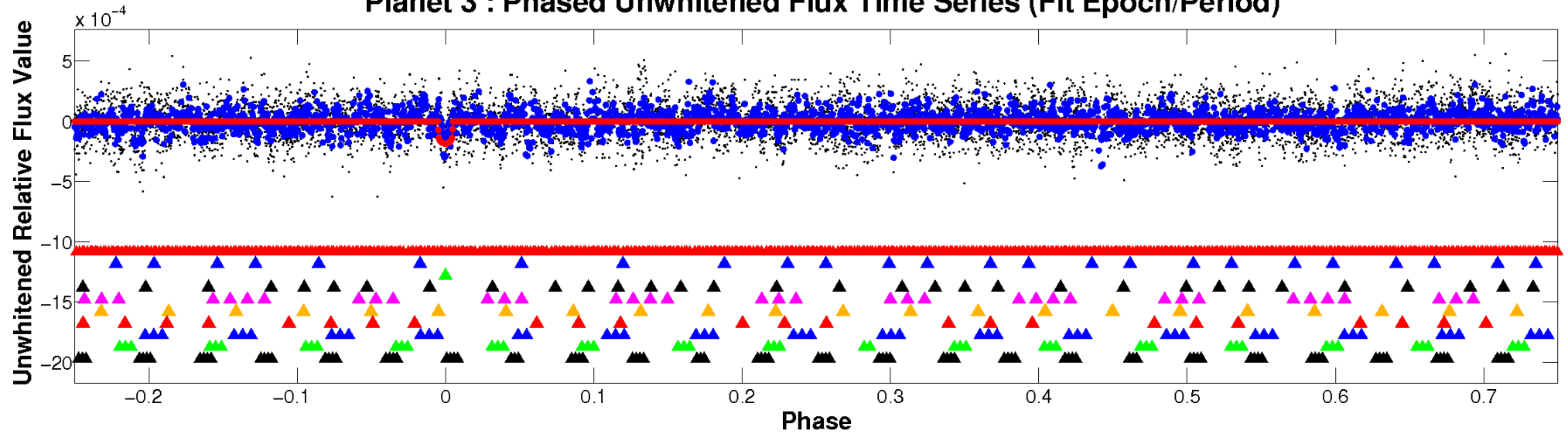
# ALT Odd/Even

TCE 006113656-03

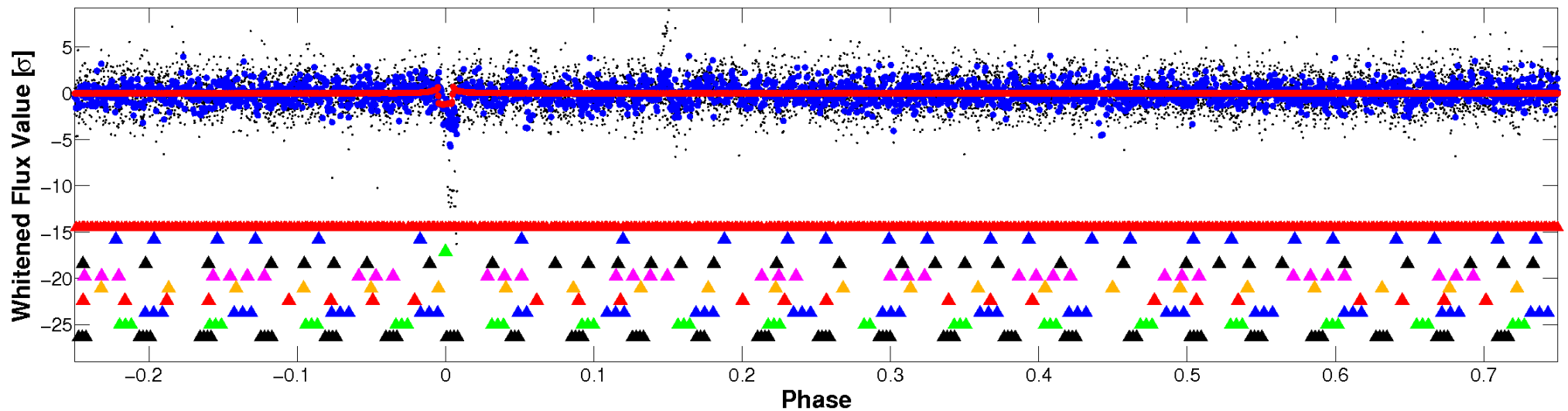


# Non-Whitened Vs. Whitened Light Curve

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

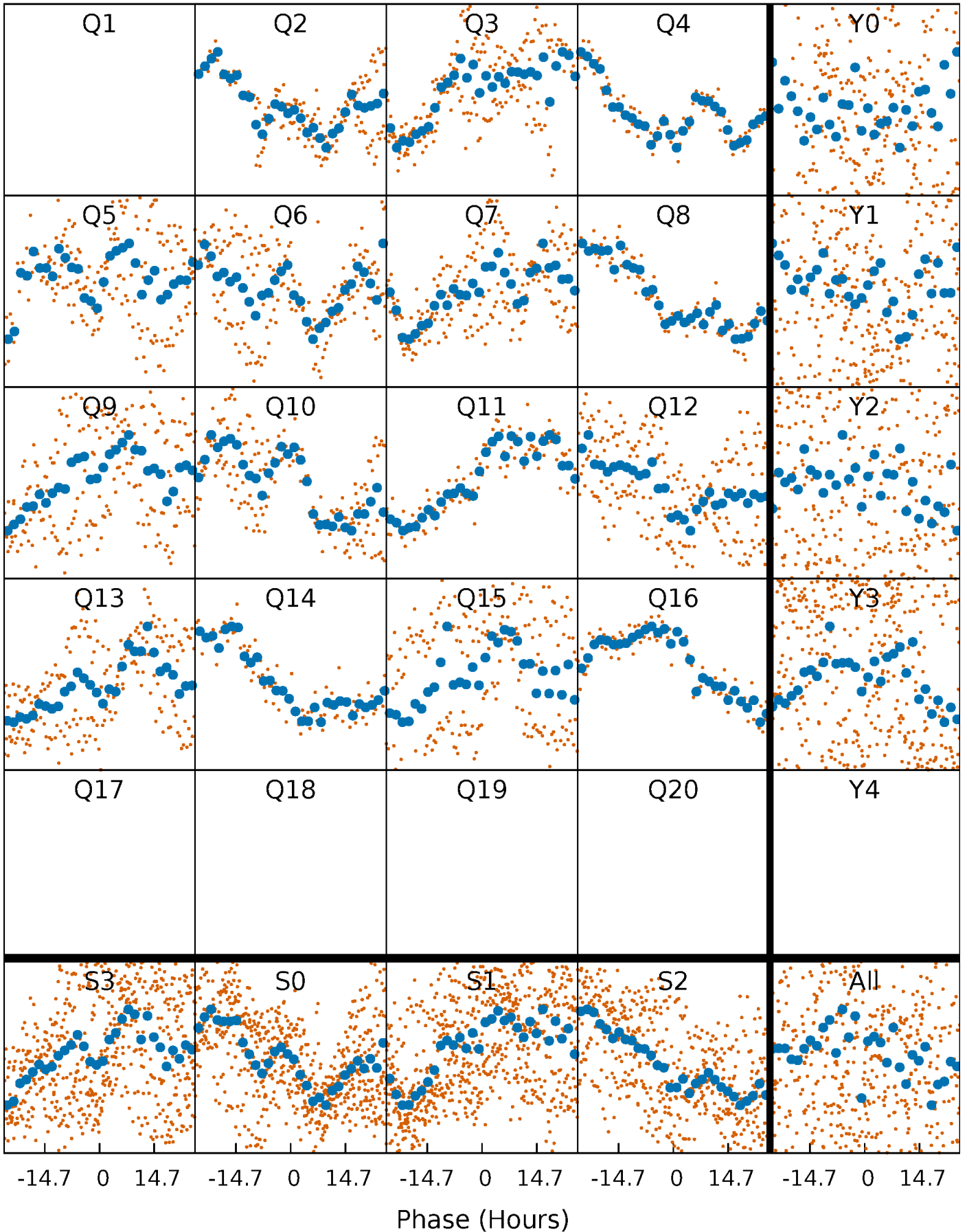


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



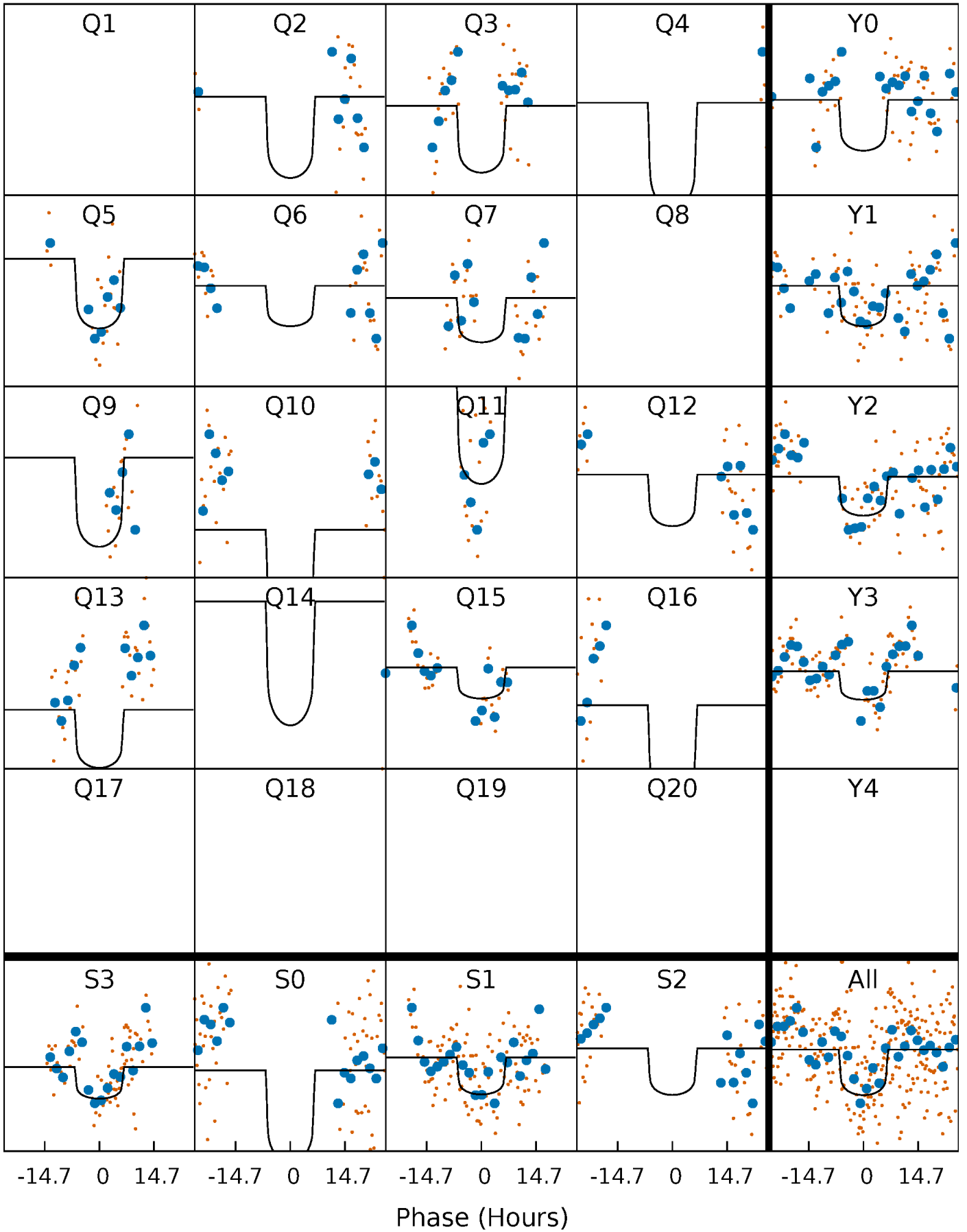
# PDC Quarter-Phased Transit Curves

TCE 006113656-03 P= 54.788959 Days  $T_0=170.151339$  (BKJD)



# DV Quarter-Phased Transit Curves

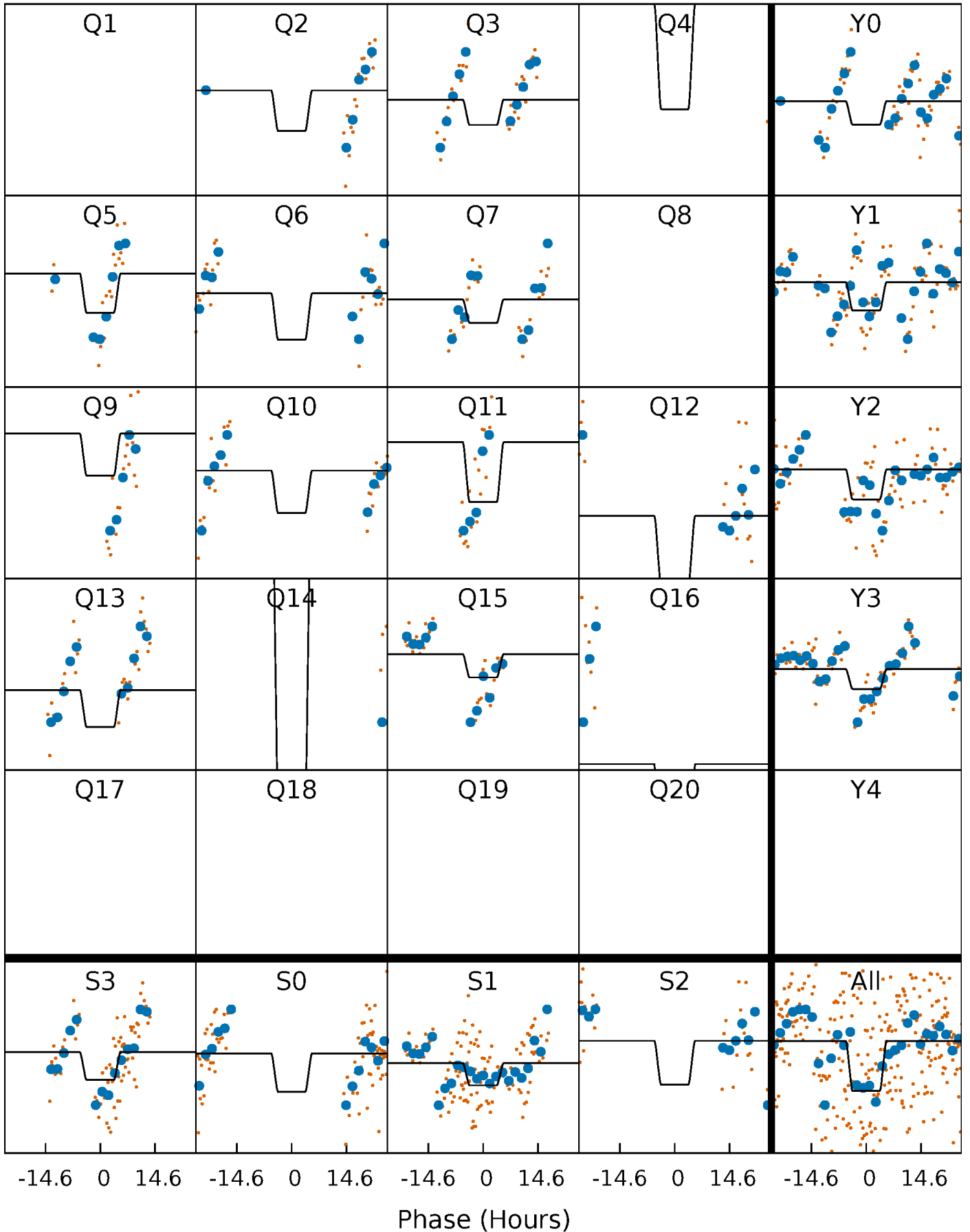
TCE 006113656-03   P= 54.788959 Days    $T_0=170.151339$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

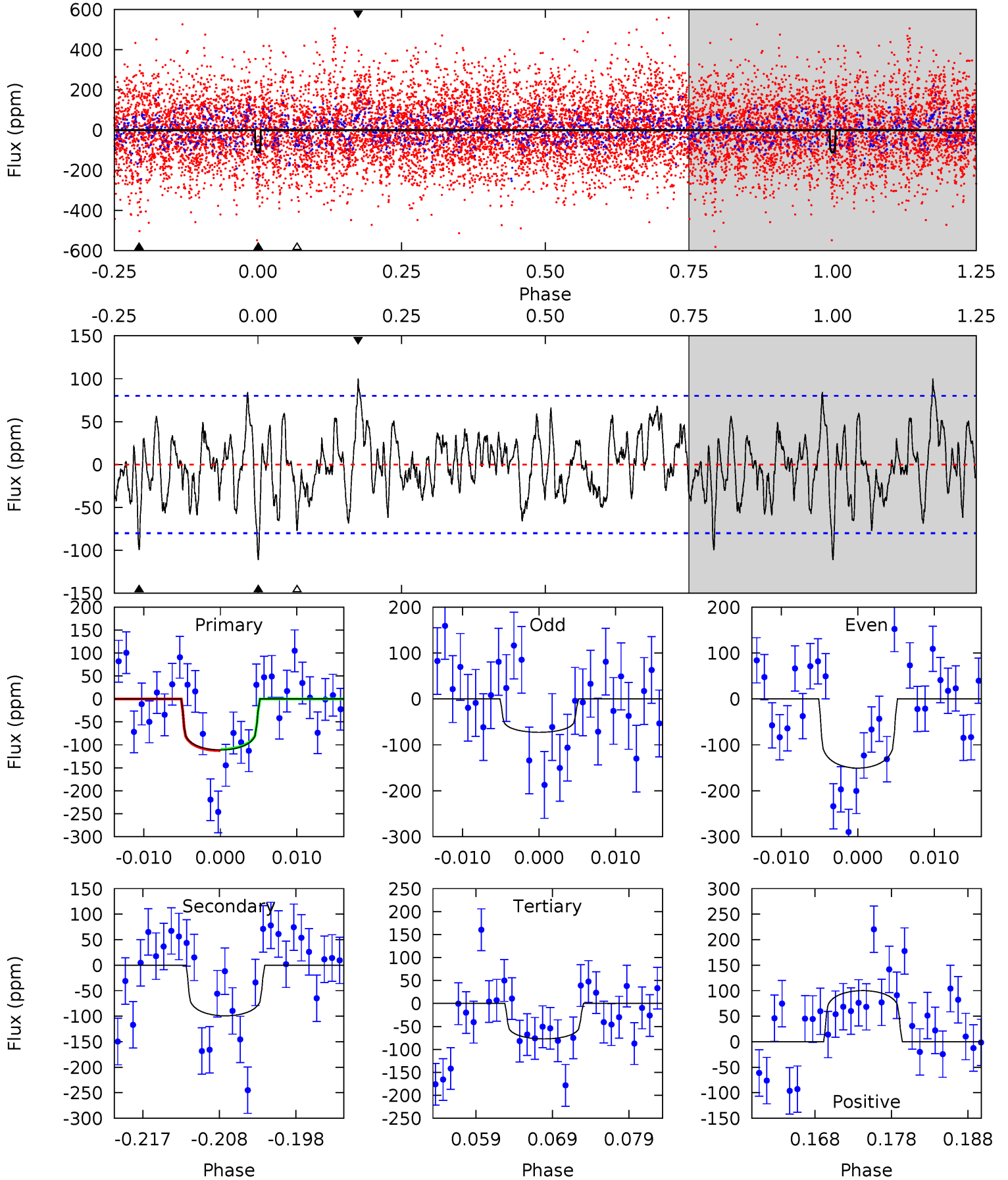
TCE 006113656-03 P= 54.796038 Days  $T_0=170.065861$  (BKJD)



# DV Model-Shift Uniqueness Test

006113656-03, P = 54.788959 Days, E = 115.362380 Days

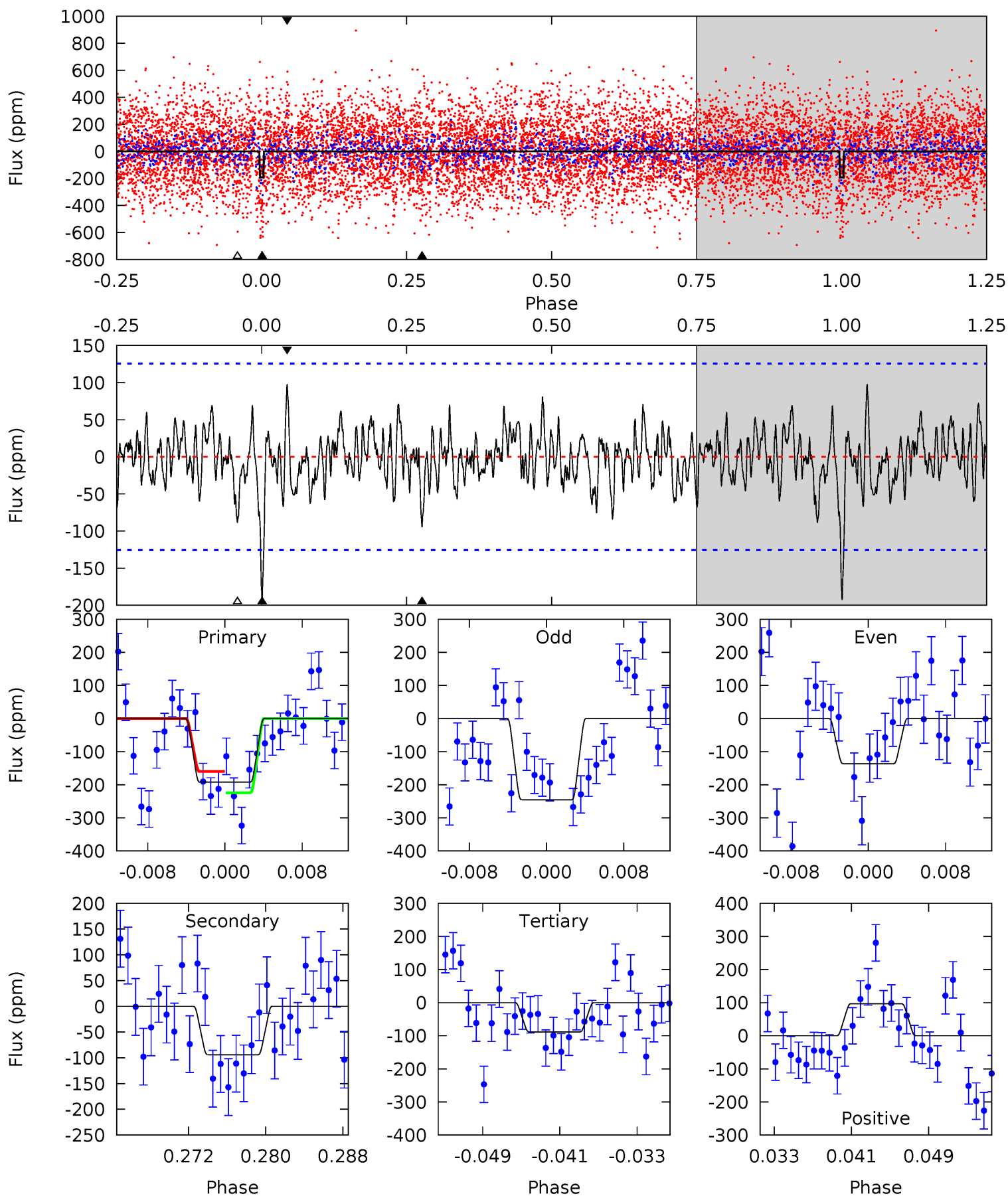
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.97	6.23	4.84	6.28	5.03	2.58	1.91	2.13	0.69	1.39	-0.05	2.44	-0.09	0.47	0.09



# Alt Model-Shift Uniqueness Test

006113656-03, P = 54.796038 Days, E = 115.269823 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
7.75	3.79	3.57	3.91	5.06	2.64	1.18	4.18	3.85	0.22	-0.12	2.19	0.79	0.34	1.29



### Stellar Parameters For KIC 006113656

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-99 \pm 16$	$3.80^{+3.44}_{-2.54}$	$1066^{+80}_{-71}$	$5245^{+4635}_{-1188}$	$386^{+3462}_{-280}$
Alt.	$-94 \pm 25$	$4.12^{+3.25}_{-2.60}$	$1066^{+86}_{-74}$	$4985^{+3064}_{-990}$	$317^{+1874}_{-223}$

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

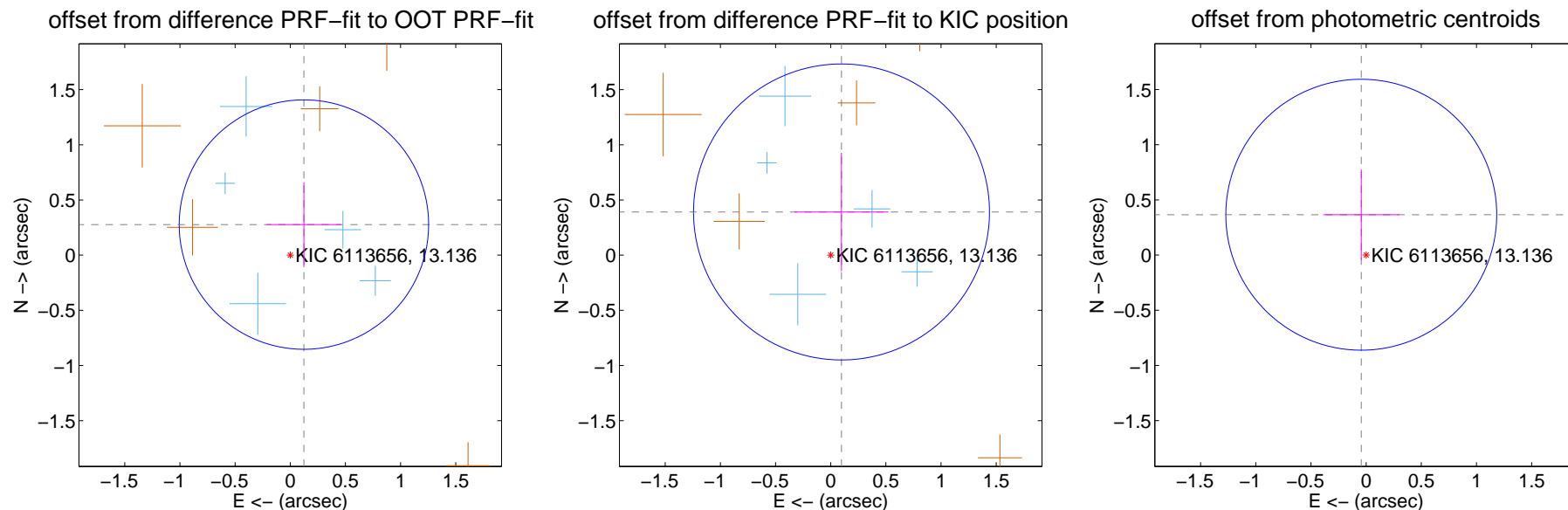
## DV Centroid Data

Supplemental centroid analysis for 006113656-03. Kepler magnitude: 13.14. Transit SNR 9.67

There are 5 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.304 \pm 0.377$	0.81	$-0.124 \pm 0.338$	$0.277 \pm 0.384$
PRF-fit source offset from KIC position	$0.404 \pm 0.447$	0.90	$-0.098 \pm 0.426$	$0.391 \pm 0.536$
photometric centroid source offset	$0.37 \pm 0.41$	0.90	$0.04 \pm 0.34$	$0.37 \pm 0.41$



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.

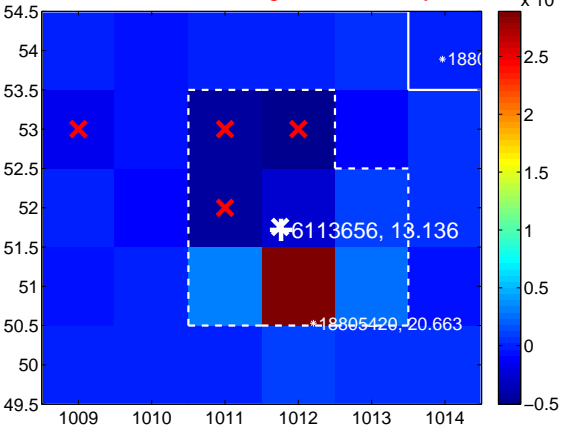
Q1 no difference image



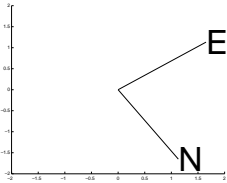
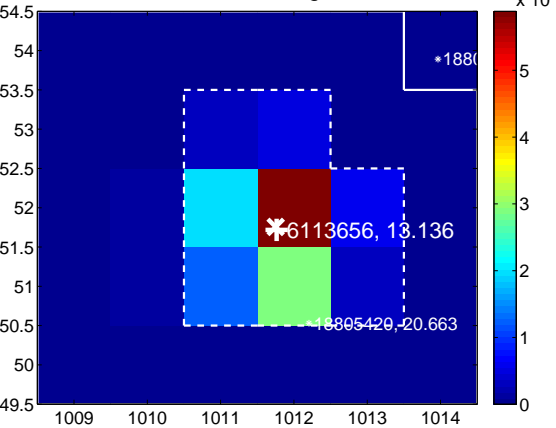
Q1 no OOT image



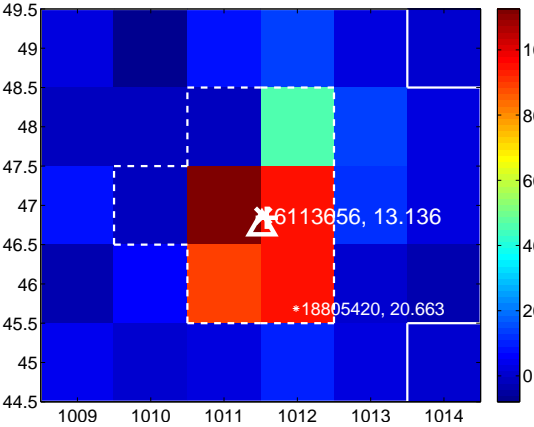
Q2 difference image. Poor Quality



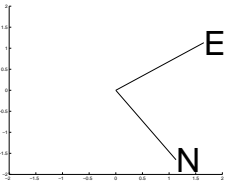
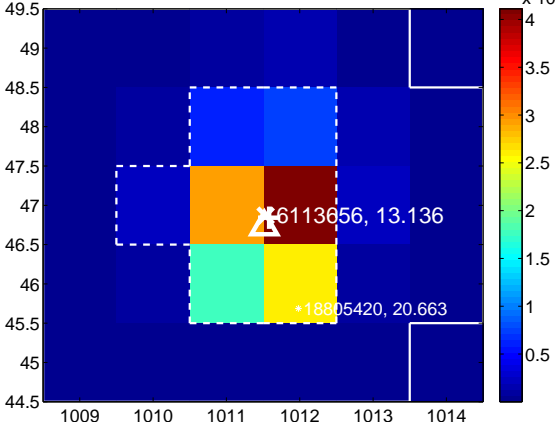
Q2 OOT image



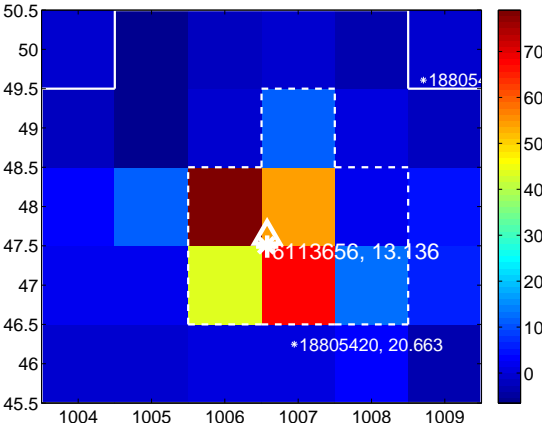
Q3 difference image



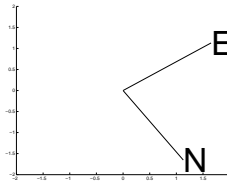
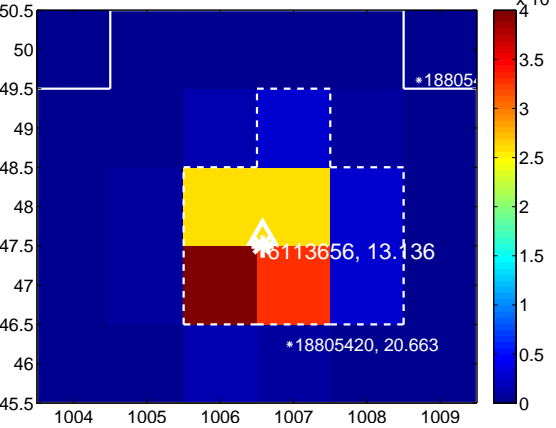
Q3 OOT image



Q4 difference image

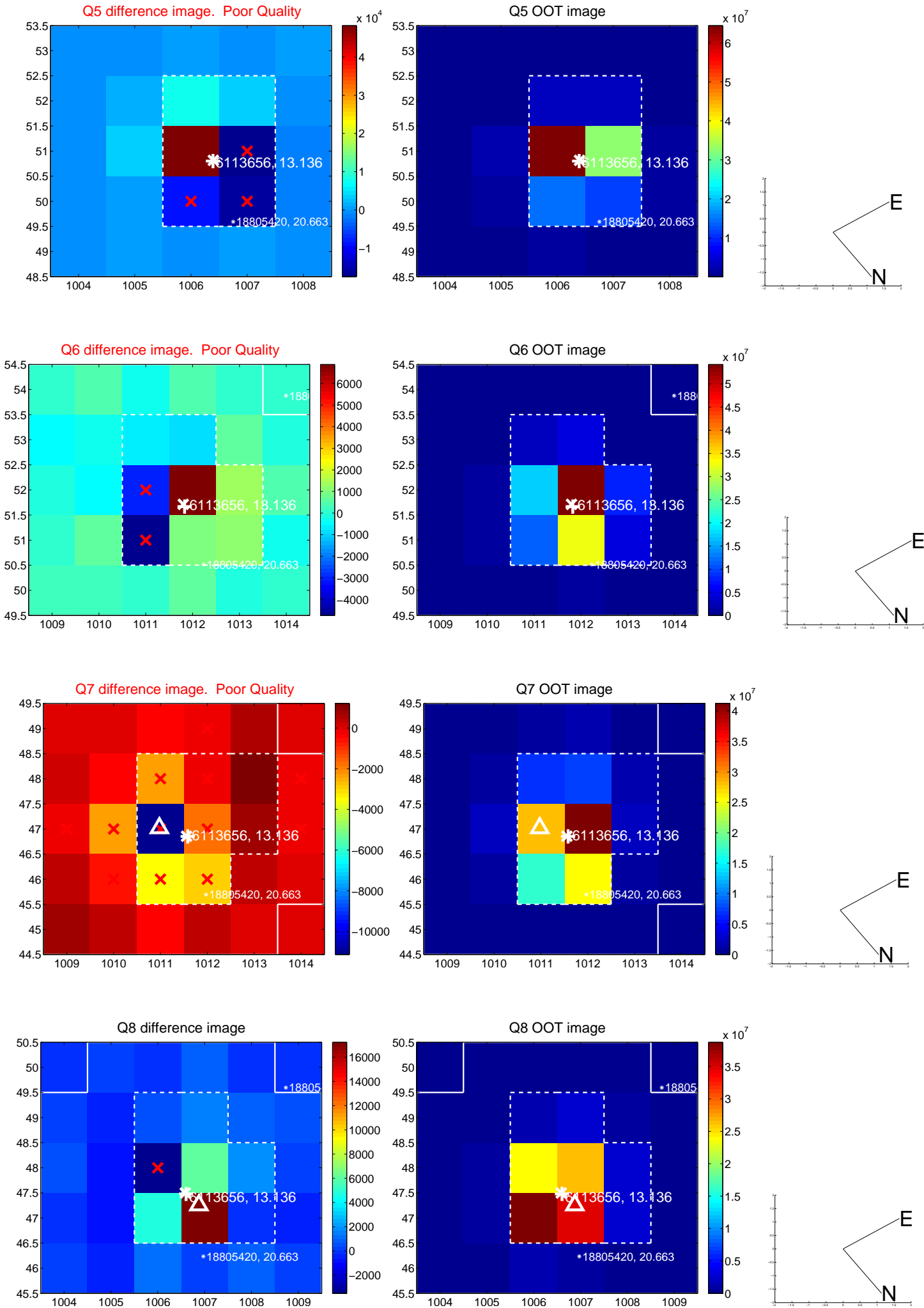


Q4 OOT image

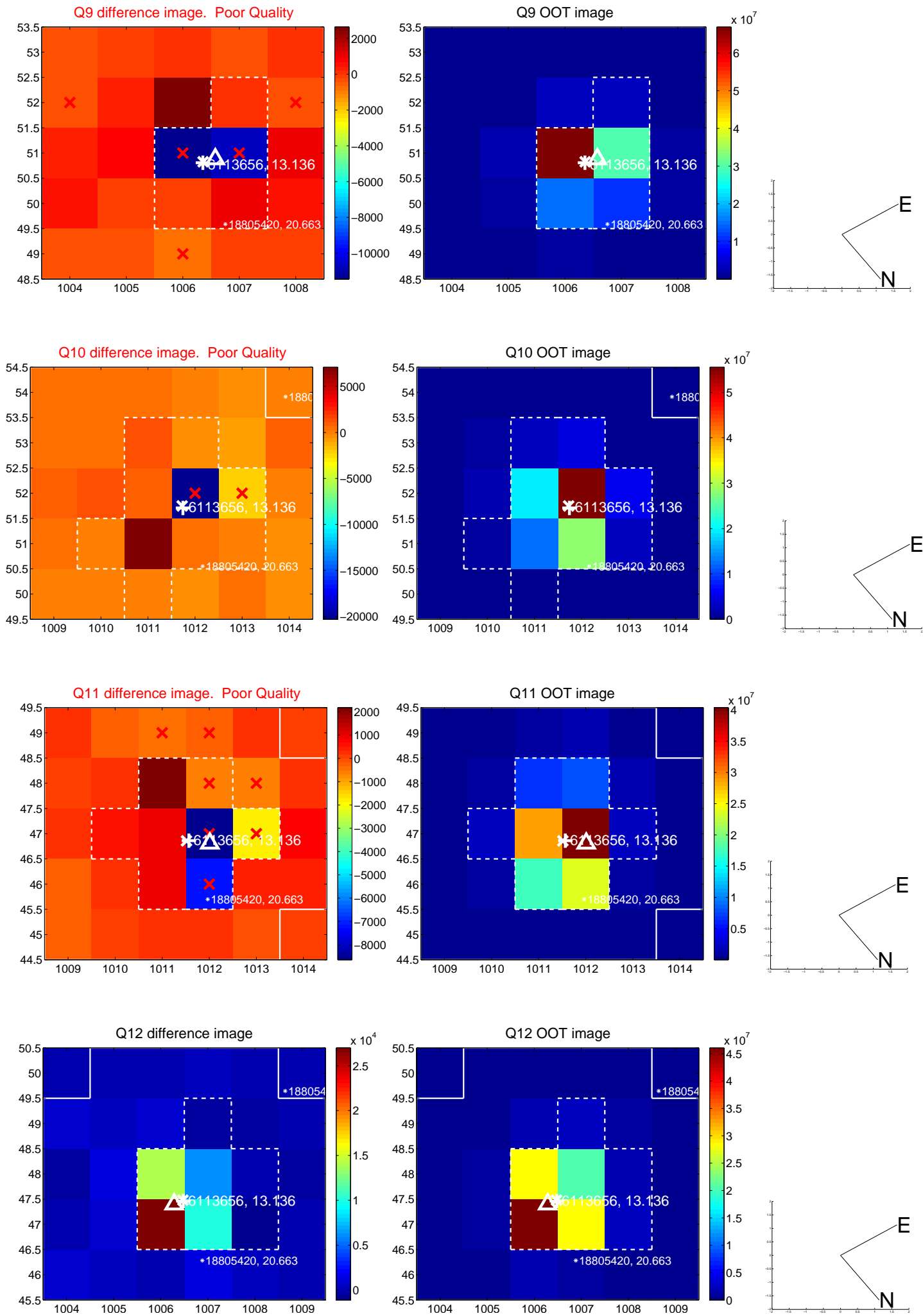




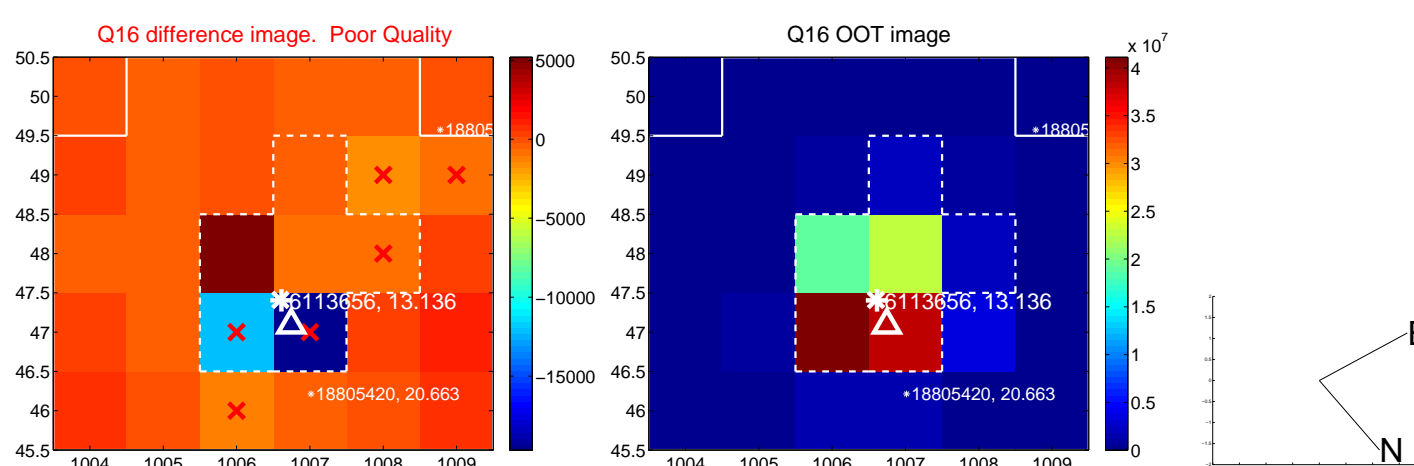
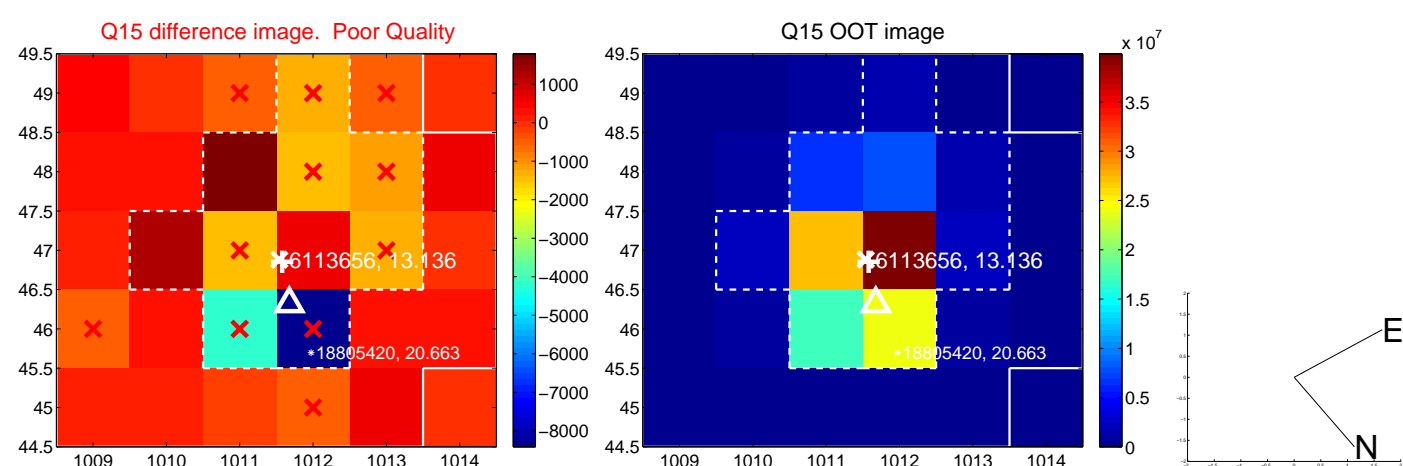
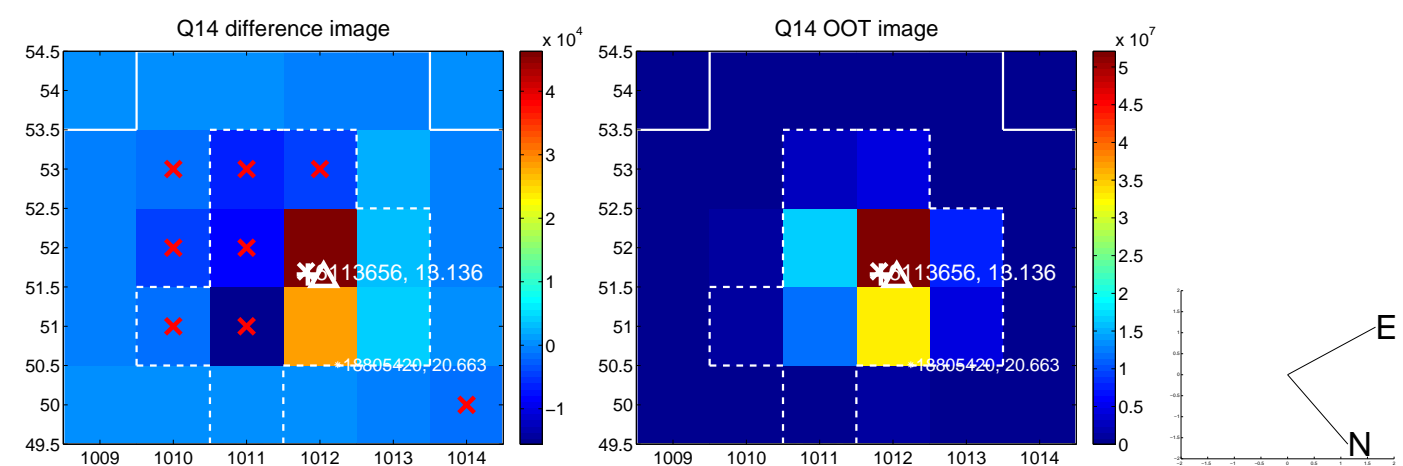
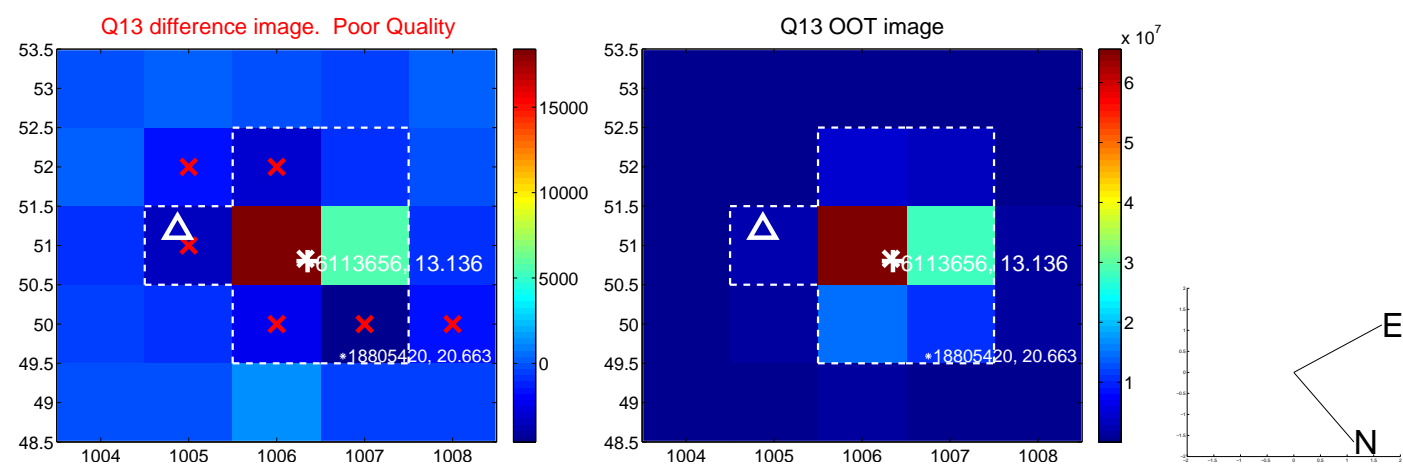
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



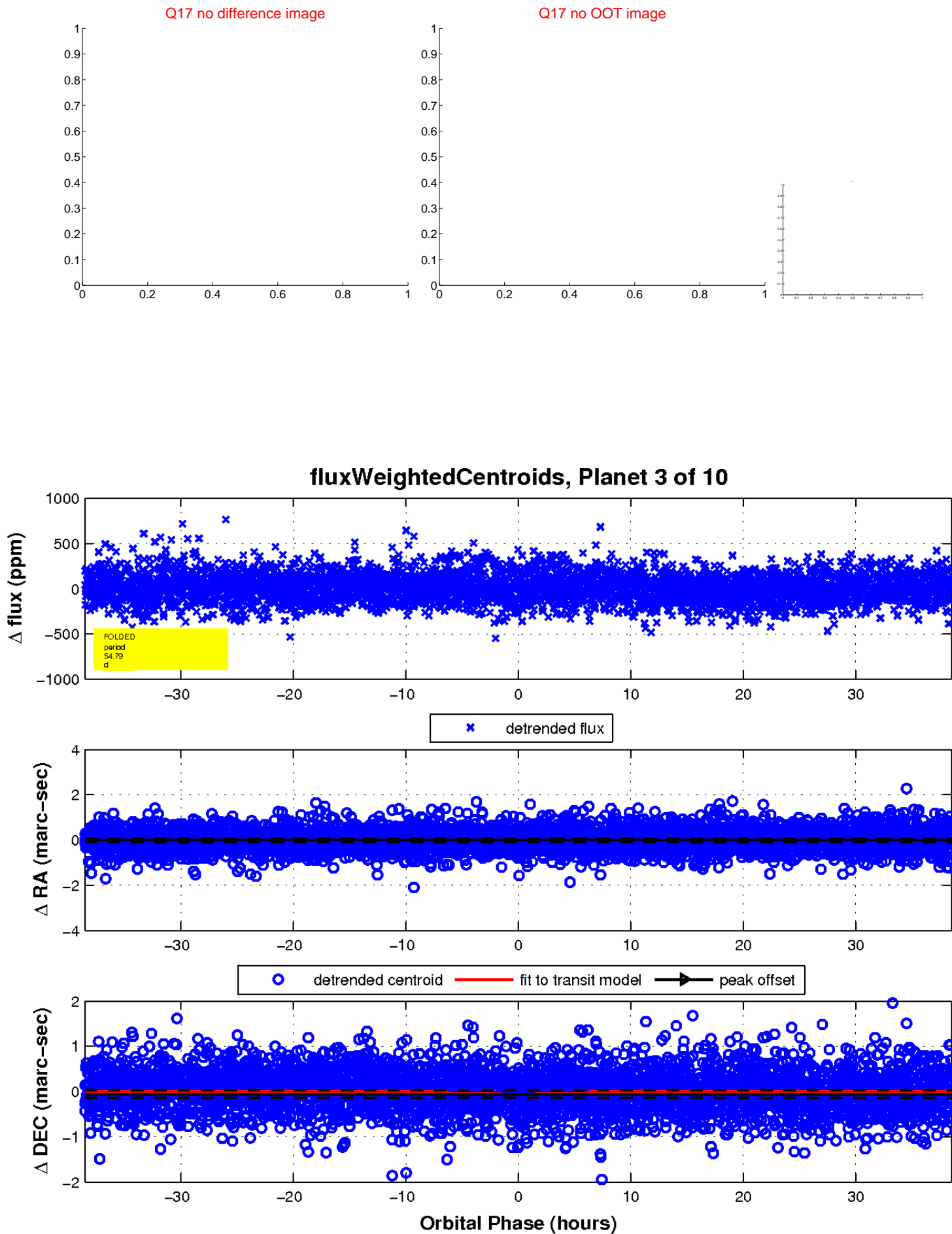
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

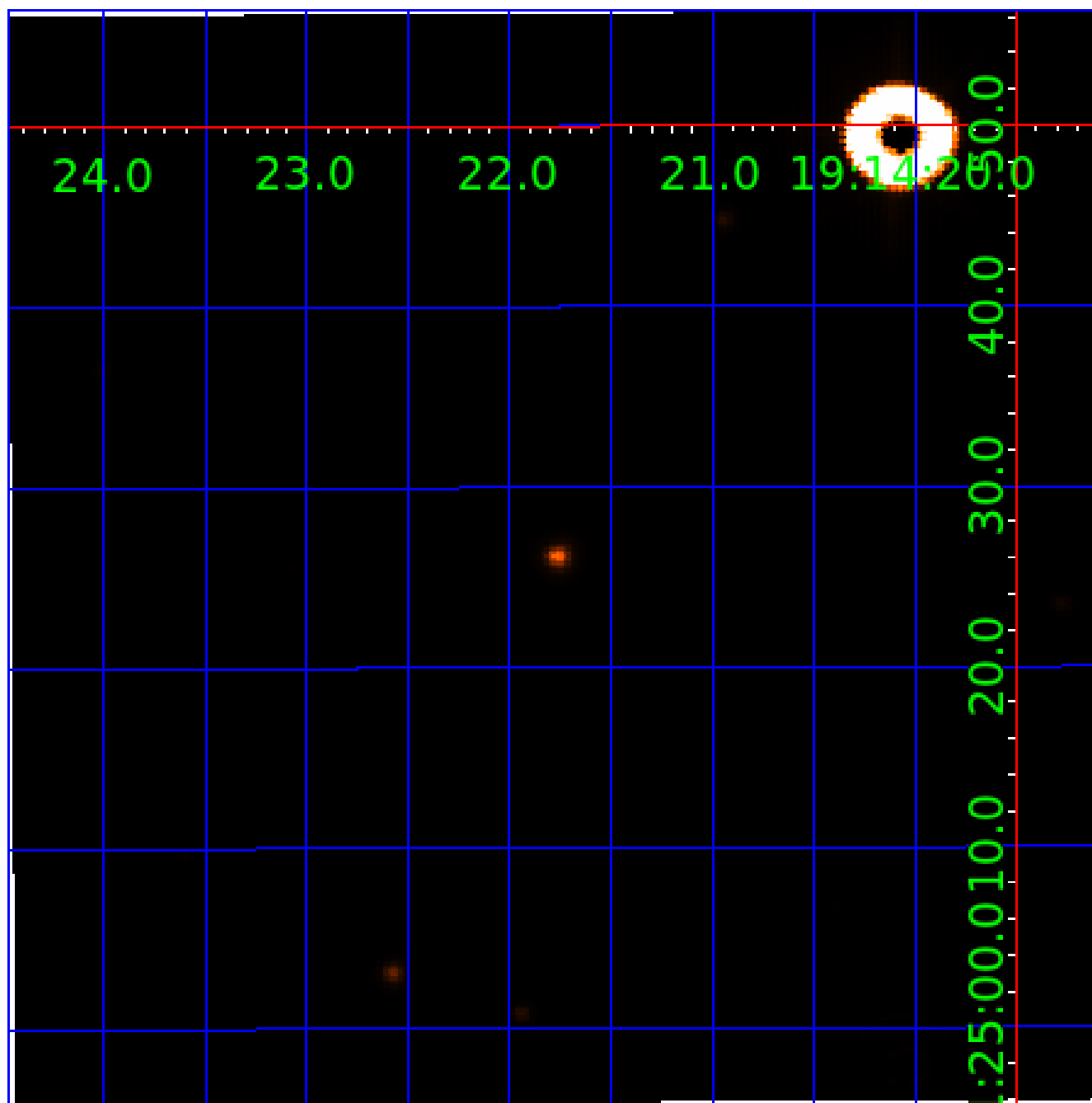


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006113656

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113656-01	OBS	No	2.646238	132.447489	5.6	18.121	11.4	3.0	1.88	7266	0.46	4677.99
006113656-02	OBS	No	58.535580	182.791356	207.4	17.532	46.1	7.6	1.88	7266	5.23	75.34
006113656-03	OBS	No	54.788959	170.151339	184.7	12.850	20.9	9.7	1.88	7266	2.58	82.28
006113656-04	OBS	No	44.294861	175.427489	174.4	6.797	11.3	10.5	1.88	7266	2.78	109.25
006113656-05	OBS	No	39.904031	136.547656	166.1	4.552	11.1	10.6	1.88	7266	2.77	125.57
006113656-06	OBS	No	57.280460	137.501760	190.8	6.317	11.1	11.6	1.88	7266	2.88	77.55
006113656-07	OBS	No	62.394926	153.799040	161.0	11.070	11.8	8.4	1.88	7266	2.70	69.19
006113656-08	OBS	No	30.838567	148.567220	249.9	2.104	10.9	10.1	1.88	7266	3.01	177.05
006113656-09	OBS	No	30.832288	161.442836	130.4	9.084	9.9	10.9	1.88	7266	2.38	177.10
006113656-10	OBS	No	15.974468	134.165876	100.7	9.468	10.0	7.9	1.88	7266	2.01	425.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113656-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
006113656-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
006113656-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
006113656-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

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

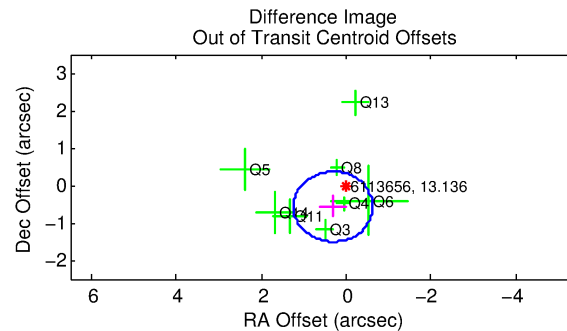
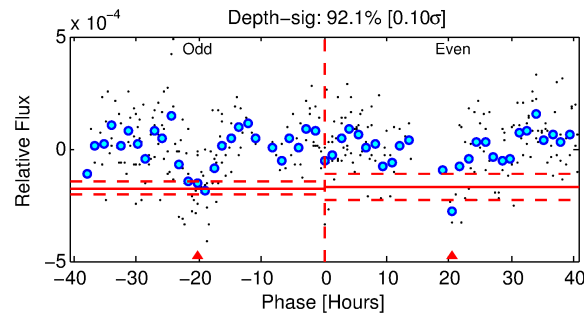
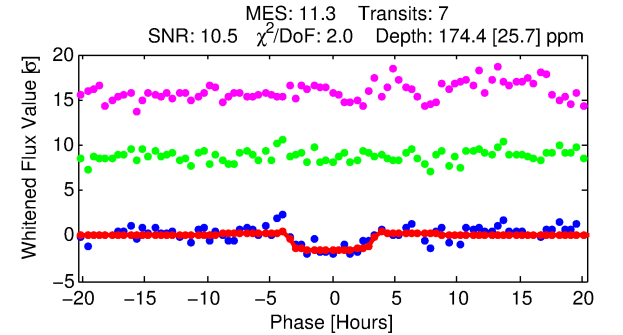
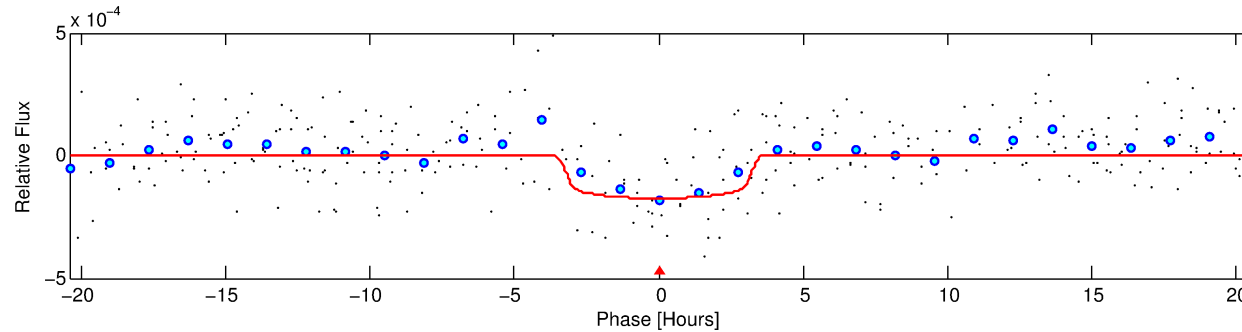
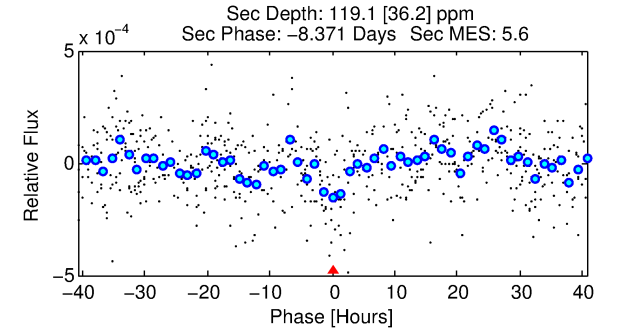
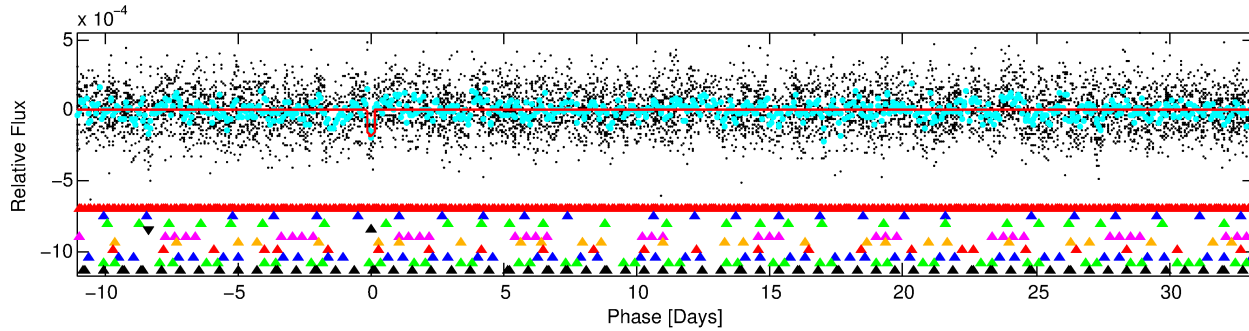
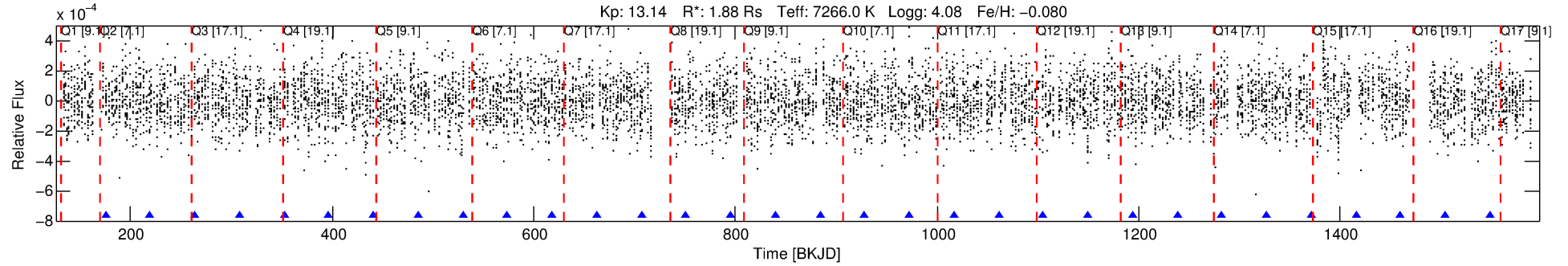
Ephemeris Match Information For 006113656-04

No Significant Match Found



# DV One-Page Summary

KIC: 6113656 Candidate: 4 of 10 Period: 44.295 d



## DV Fit Results:

Period = 44.29486 [0.00084] d  
Epoch = 175.4275 [0.0161] BKJD  
Rp/R\* = 0.0136 [0.0090]  
a/R\* = 27.95 [116.45]  
b = 0.84 [1.43]  
Seff = 109.25 [40.09]  
Teq = 824 [76] K  
Rp = 2.78 [2.01] Re  
a = 0.2836 [0.0655] AU  
Ag = 682.70 [953.92] [0.71σ]  
Teffp = 6515 [2232] K [2.55σ]

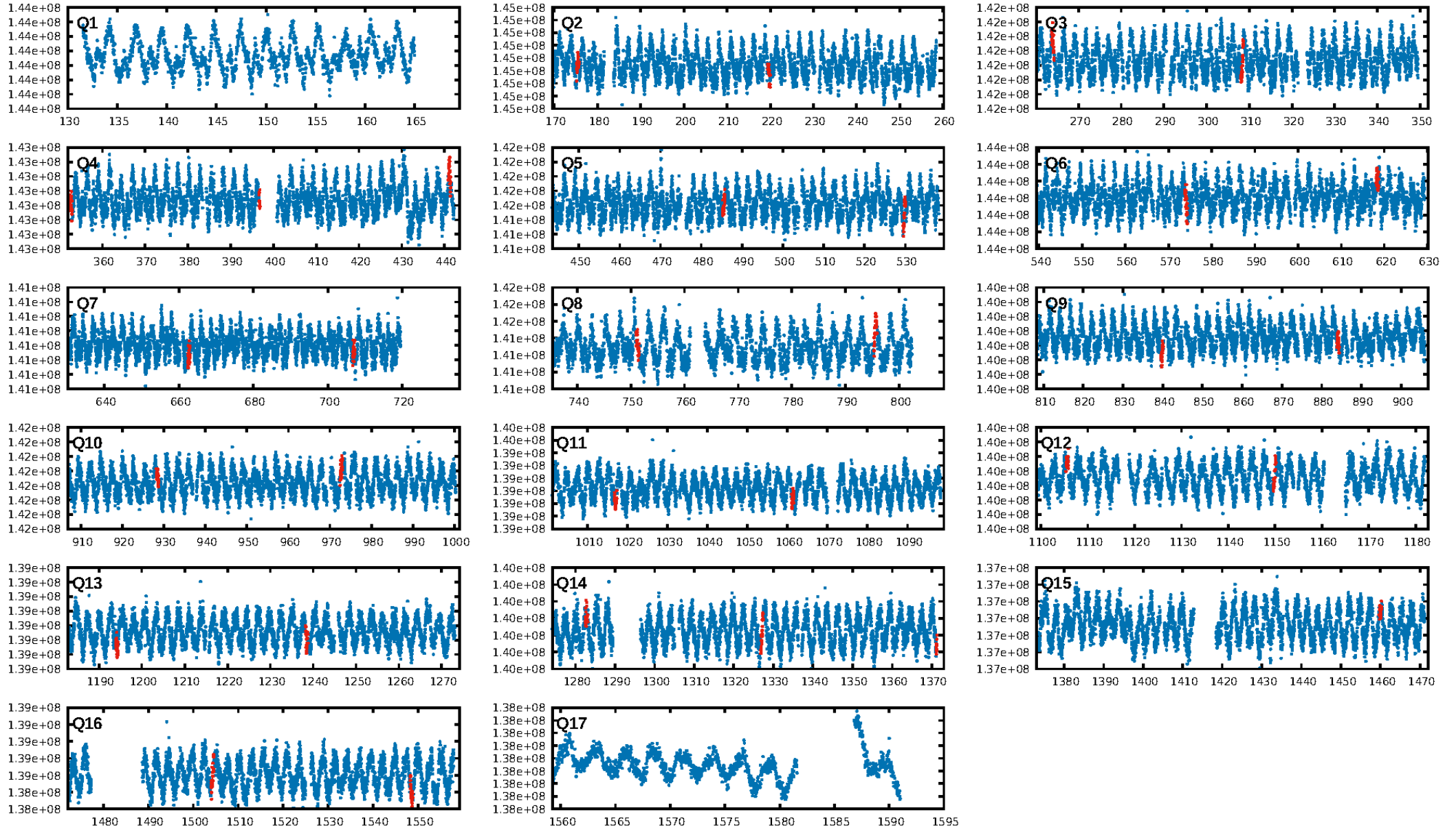
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.88σ]  
LongPeriod-sig: 100.0% [17.33σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 92.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: 2.047  
Centroid-sig: 51.1%  
Centroid-so: 0.362 arcsec [0.80σ]  
OotOffset-rm: 0.646 arcsec [2.07σ]  
OotOffset-st: 2/2/2 [8]  
KicOffset-rm: 0.600 arcsec [1.46σ]  
KicOffset-st: 2/2/2 [8]  
DiffImageQuality-fgm: 0.50 [4/8]  
DiffImageOverlap-fno: 0.47 [7/15]

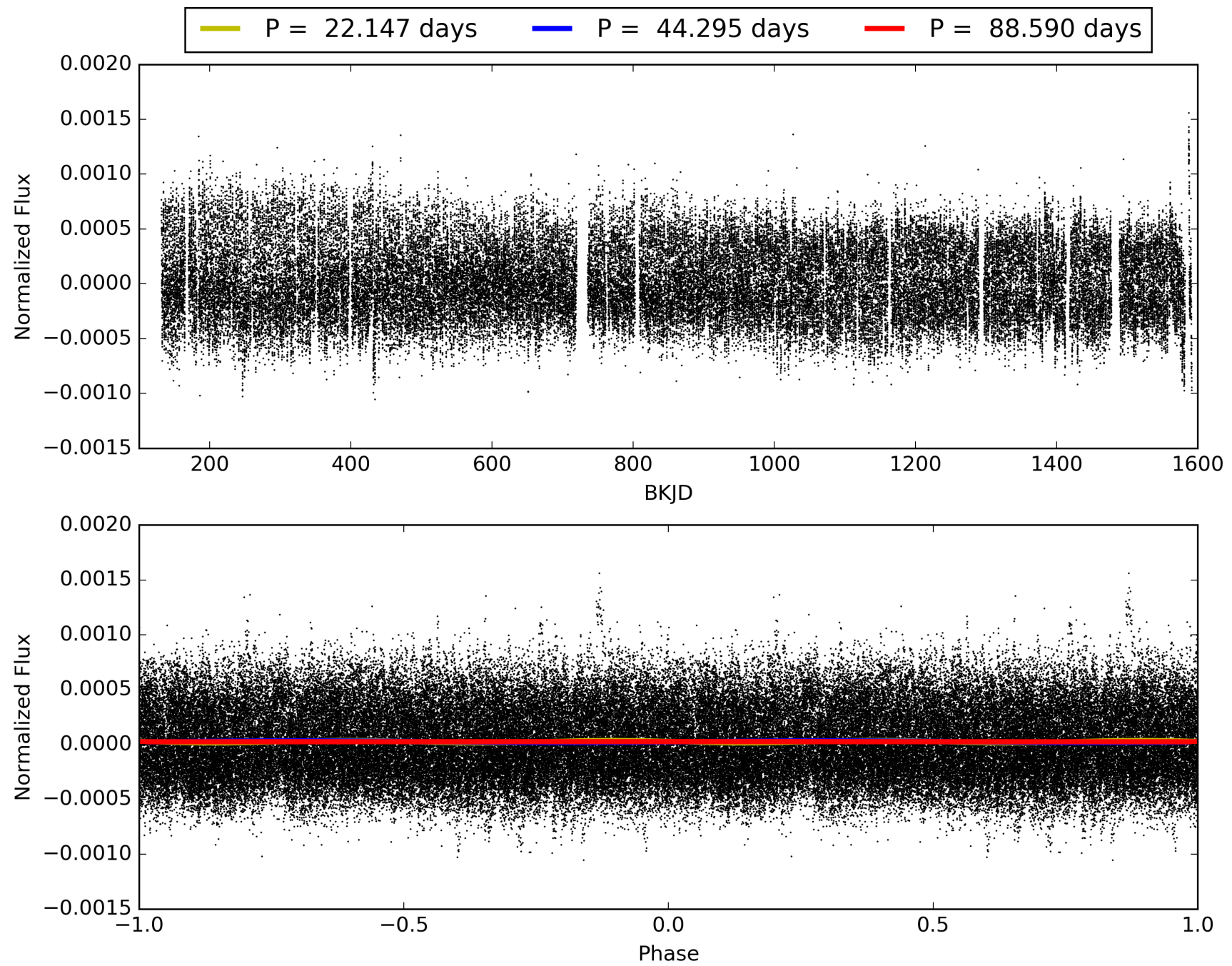
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:21 Z

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

# TCE 006113656-04, PDC Light Curves

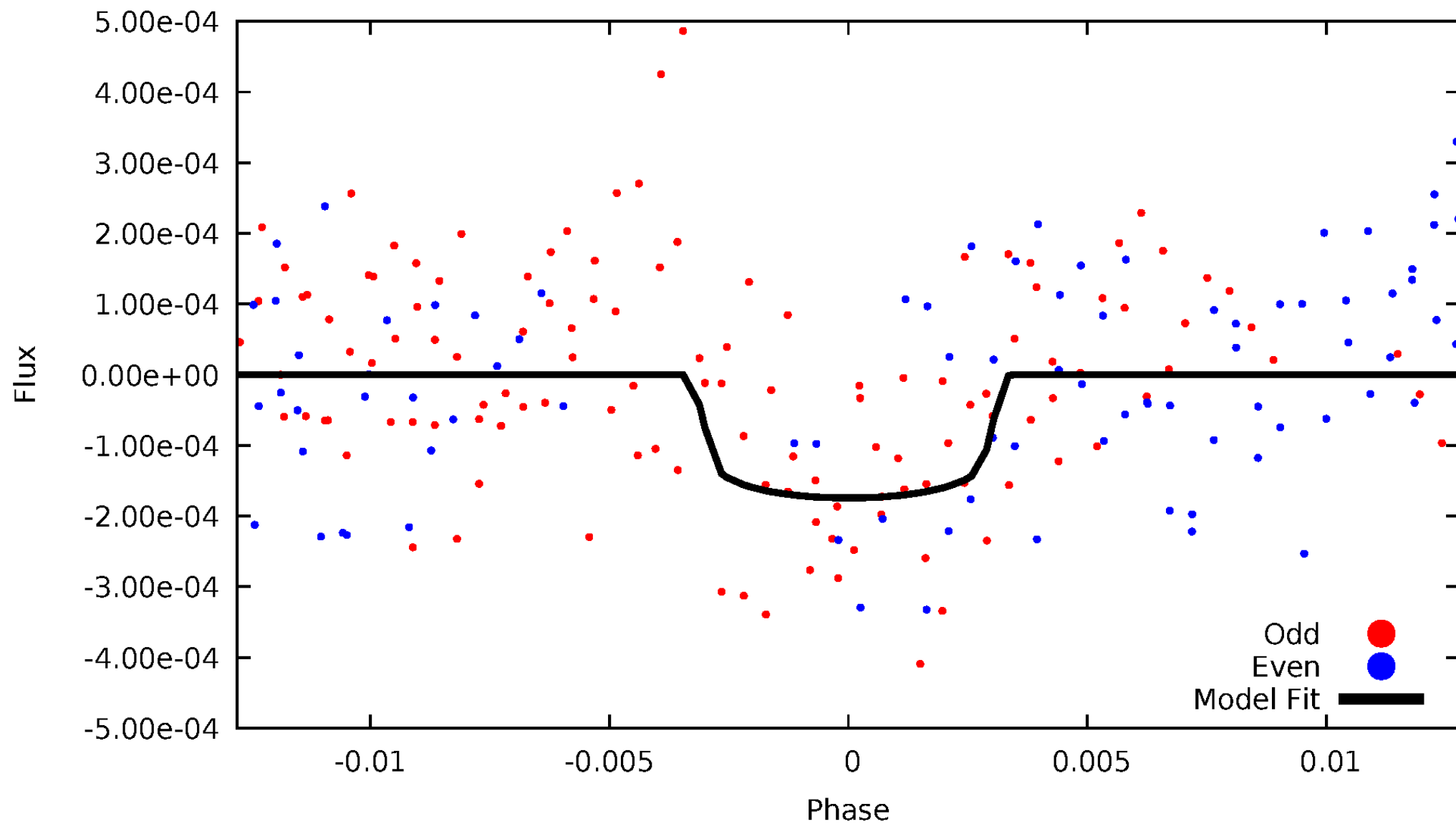


TCE 006113656-04



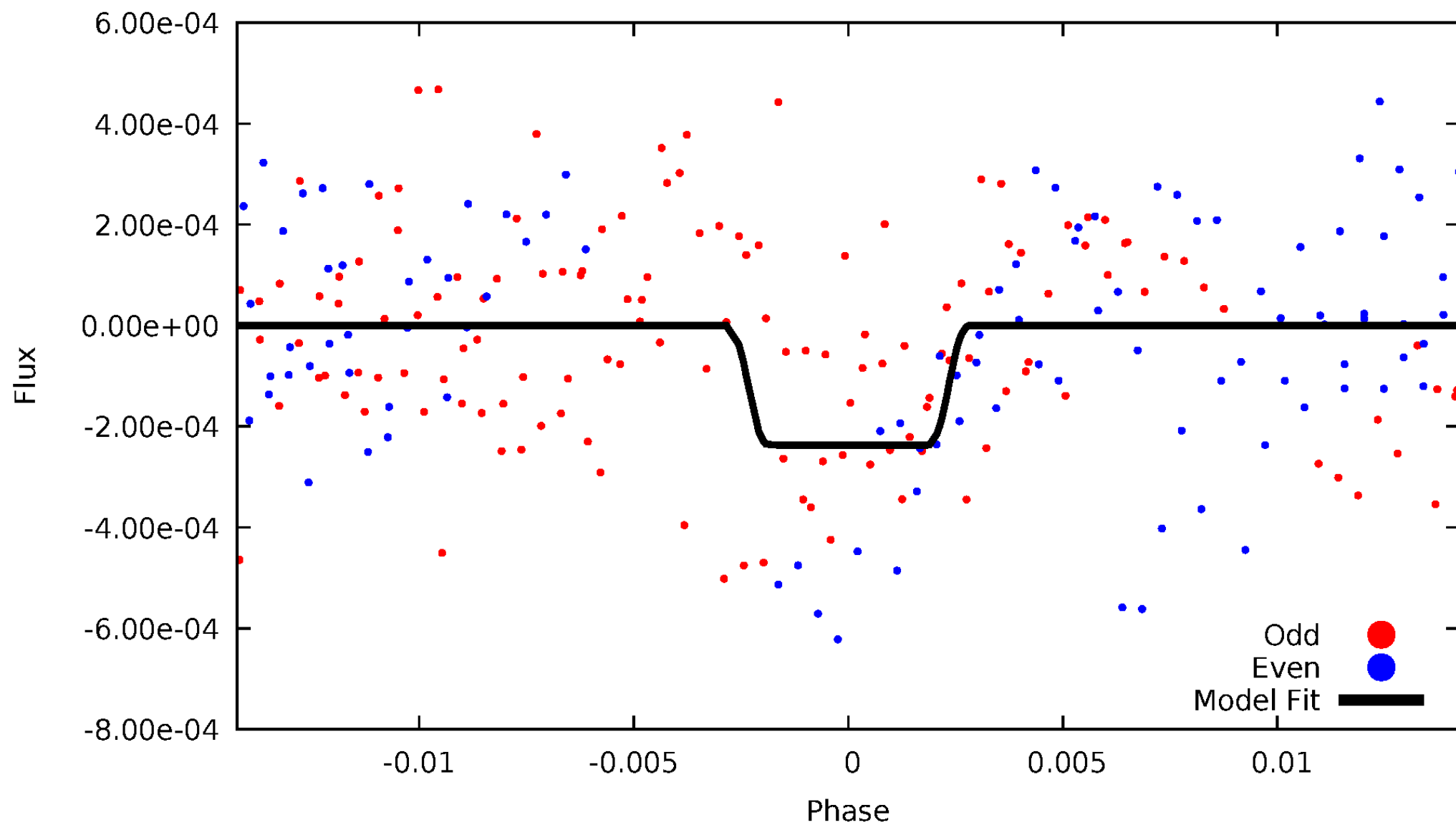
# DV Odd/Even

TCE 006113656-04



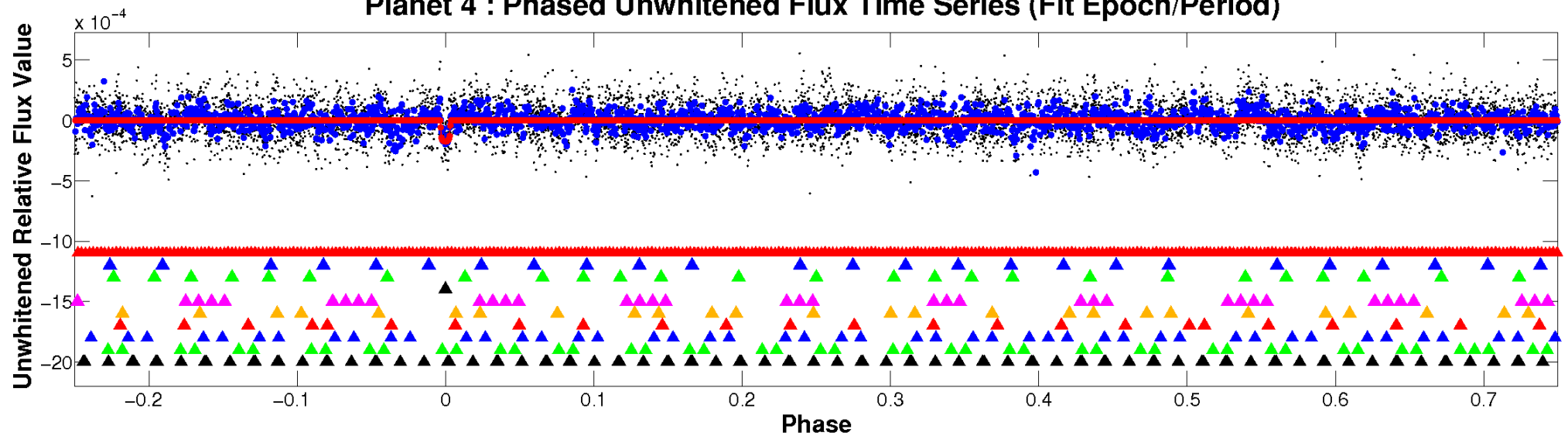
# ALT Odd/Even

TCE 006113656-04

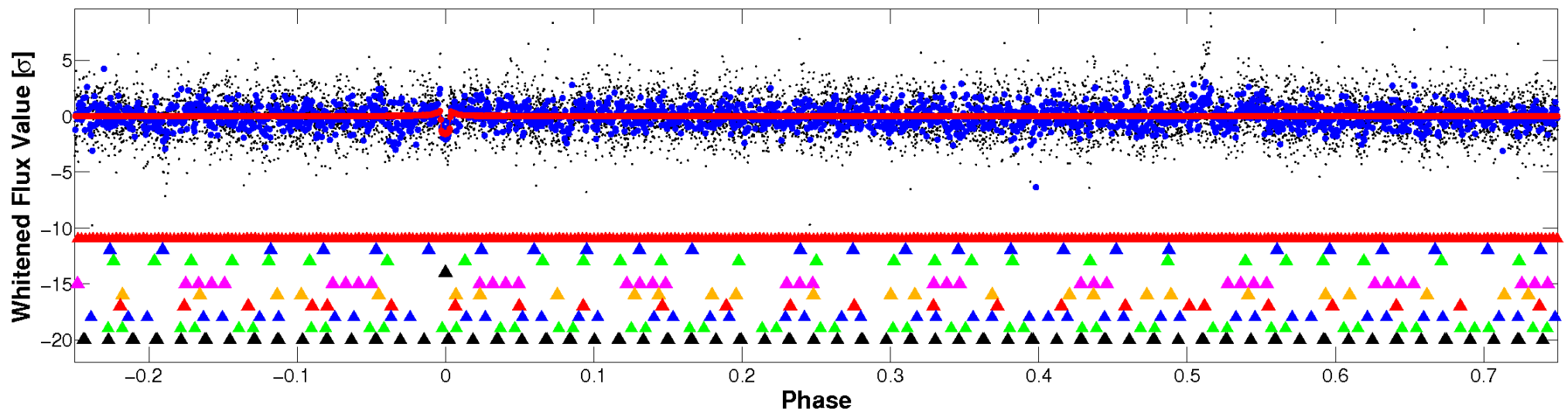


# Non-Whitened Vs. Whitened Light Curve

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



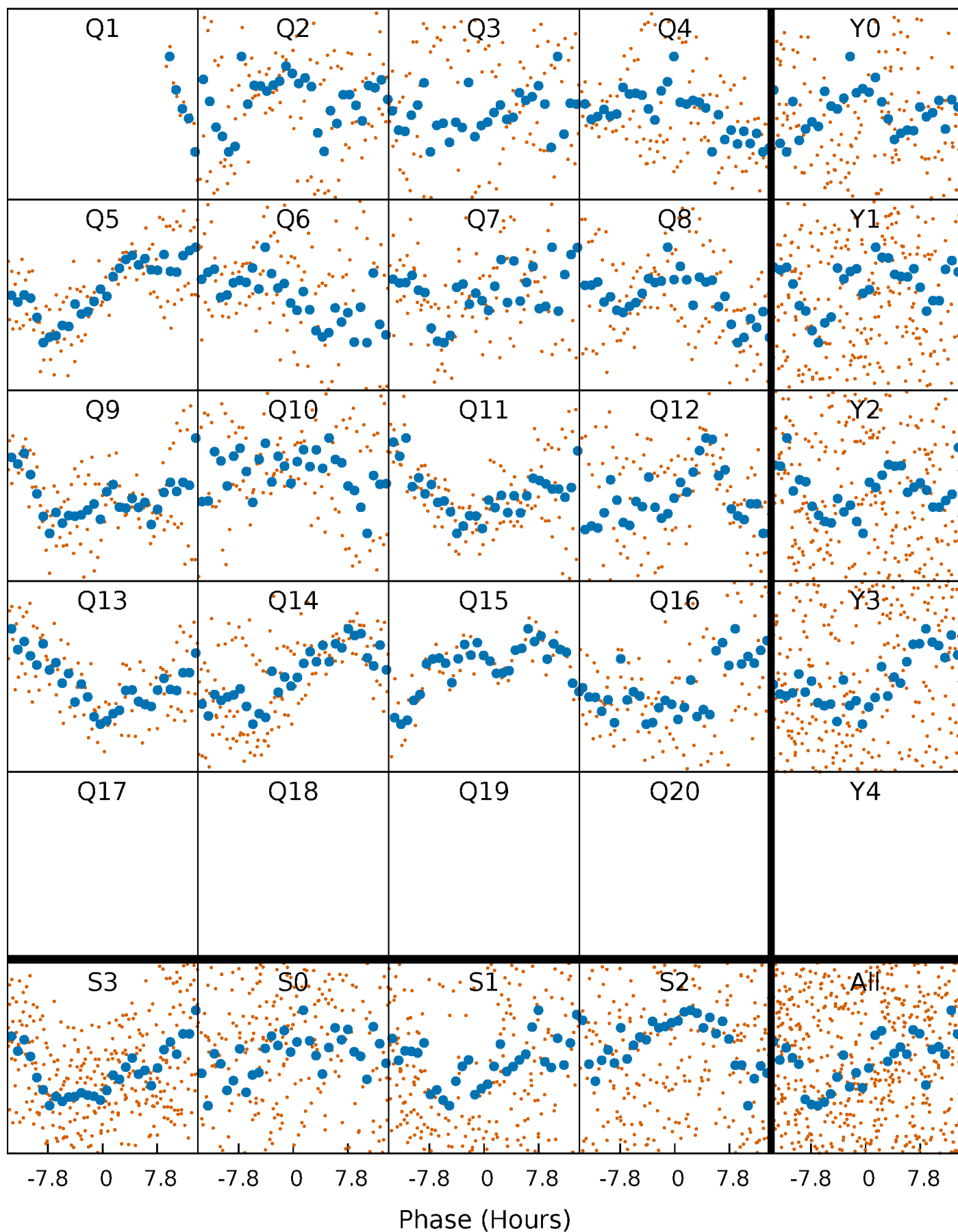
## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

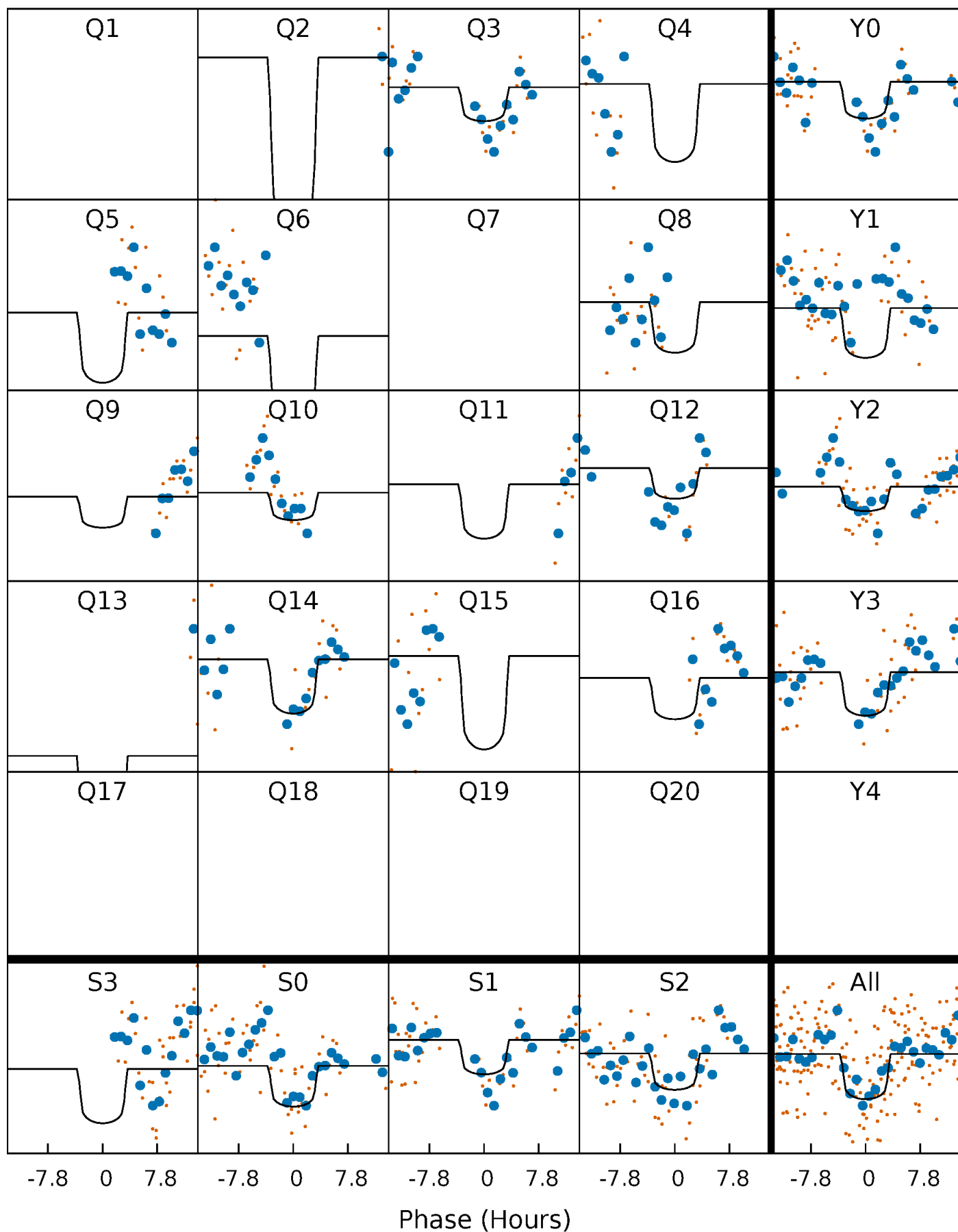
TCE 006113656-04 P= 44.294861 Days  $T_0=175.427489$  (BKJD)





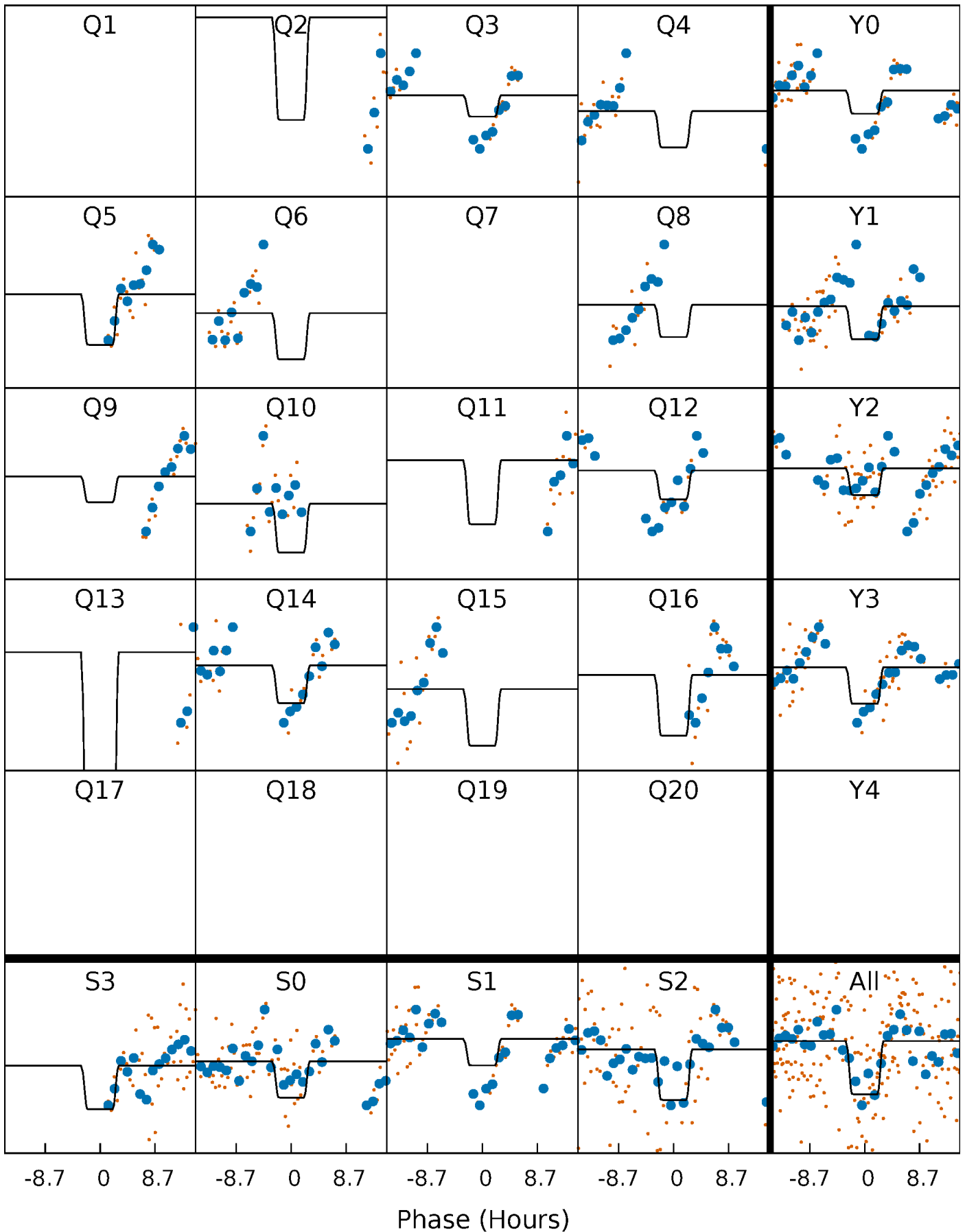
# DV Quarter-Phased Transit Curves

TCE 006113656-04 P= 44.294861 Days  $T_0=175.427489$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

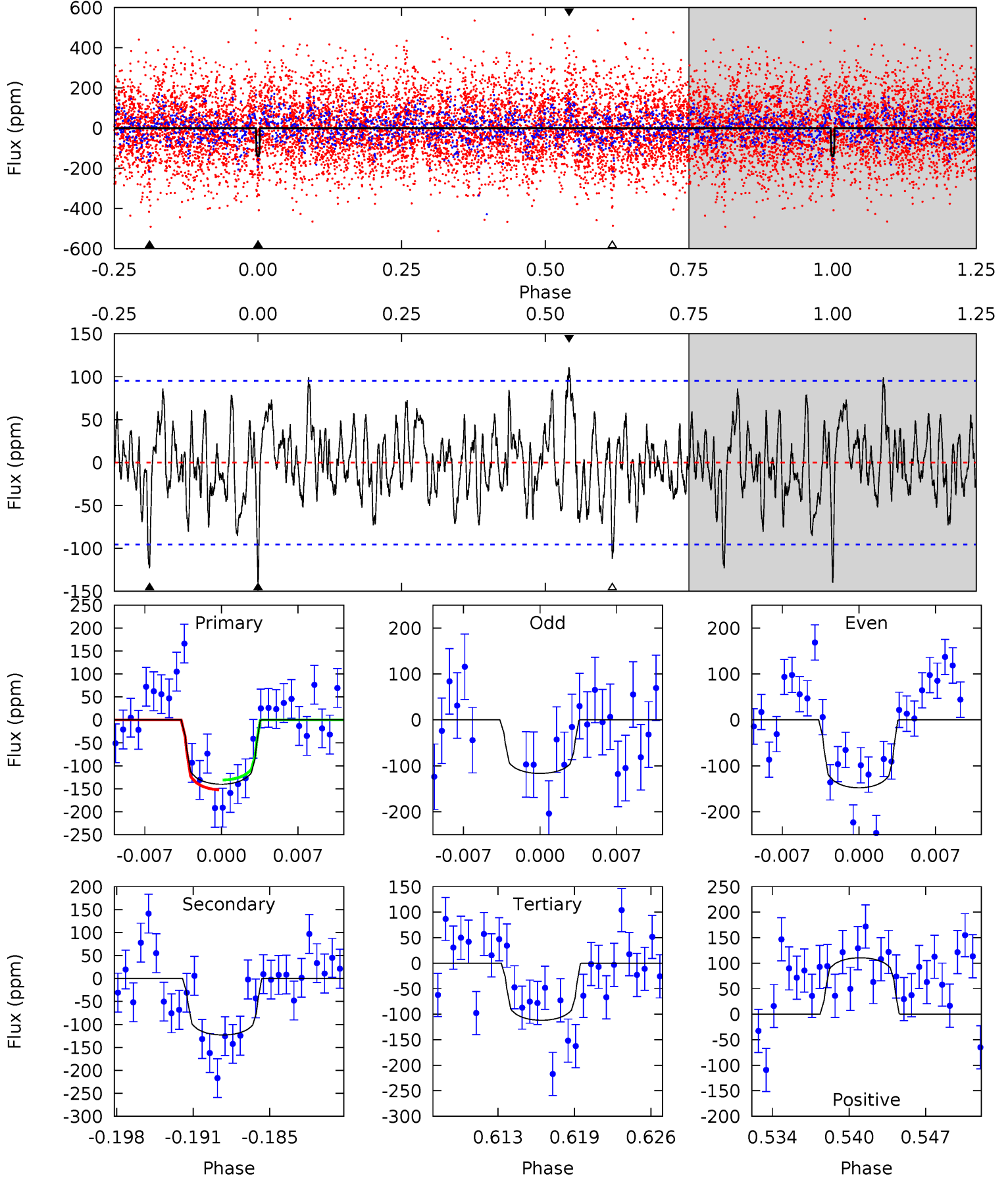
TCE 006113656-04   P= 44.294277 Days    $T_0=175.451430$  (BKJD)



# DV Model-Shift Uniqueness Test

006113656-04, P = 44.294861 Days, E = 131.132628 Days

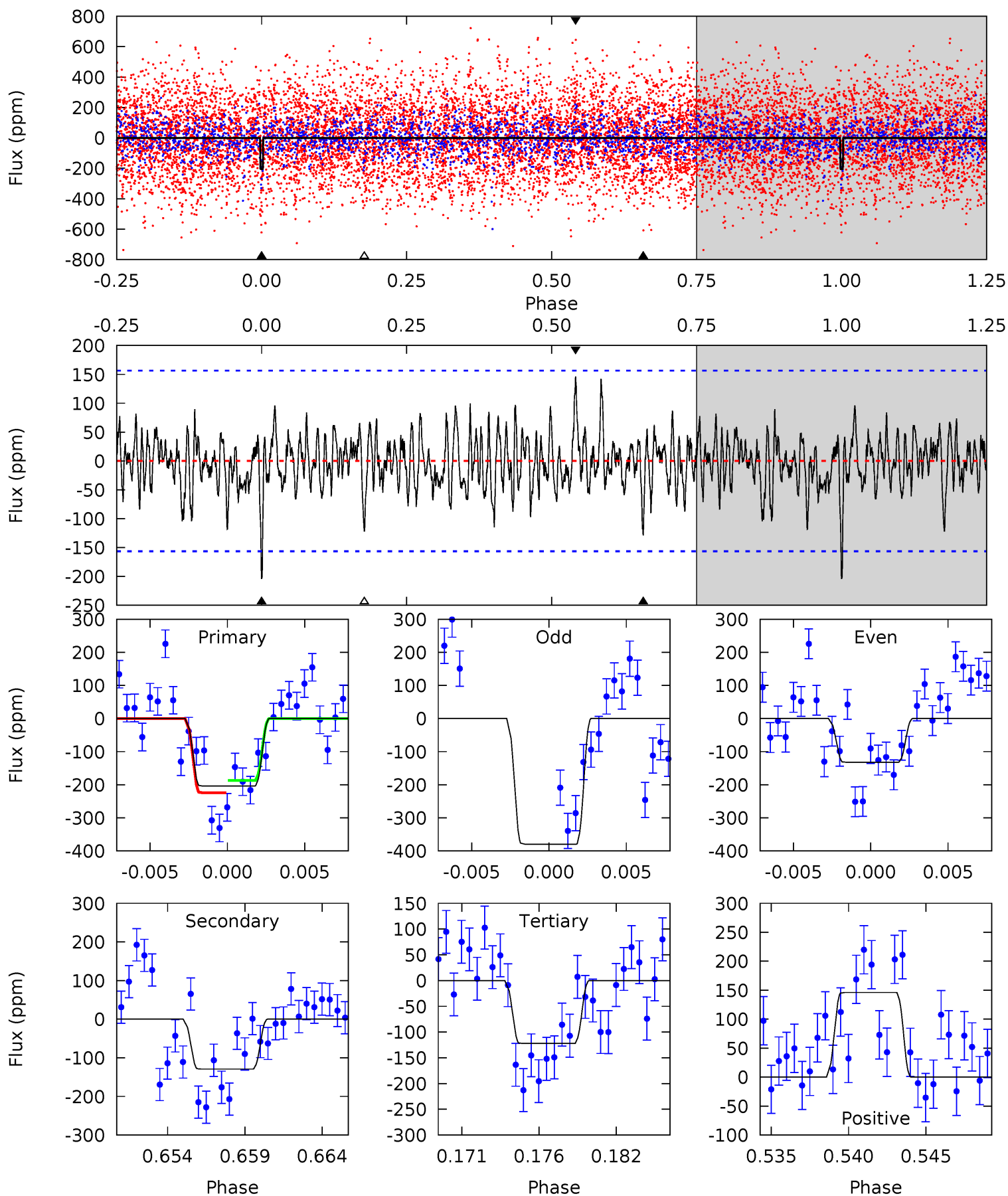
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.50	6.59	5.99	5.92	5.11	2.72	1.90	1.51	1.58	0.60	0.67	0.72	1.11	0.44	0.56



# Alt Model-Shift Uniqueness Test

006113656-04, P = 44.294277 Days, E = 131.157153 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.72	4.25	4.02	4.81	5.15	2.79	1.32	2.70	1.91	0.23	-0.56	3.74	0.68	0.42	0.60



### Stellar Parameters For KIC 006113656

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-123 \pm 19$	$2.72^{+2.01}_{-1.56}$	$1147^{+83}_{-75}$	$6497^{+4665}_{-1501}$	$733^{+3368}_{-502}$
Alt.	$-129 \pm 30$	$3.33^{+1.93}_{-1.71}$	$1151^{+82}_{-87}$	$5963^{+2907}_{-1086}$	$495^{+1601}_{-300}$

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

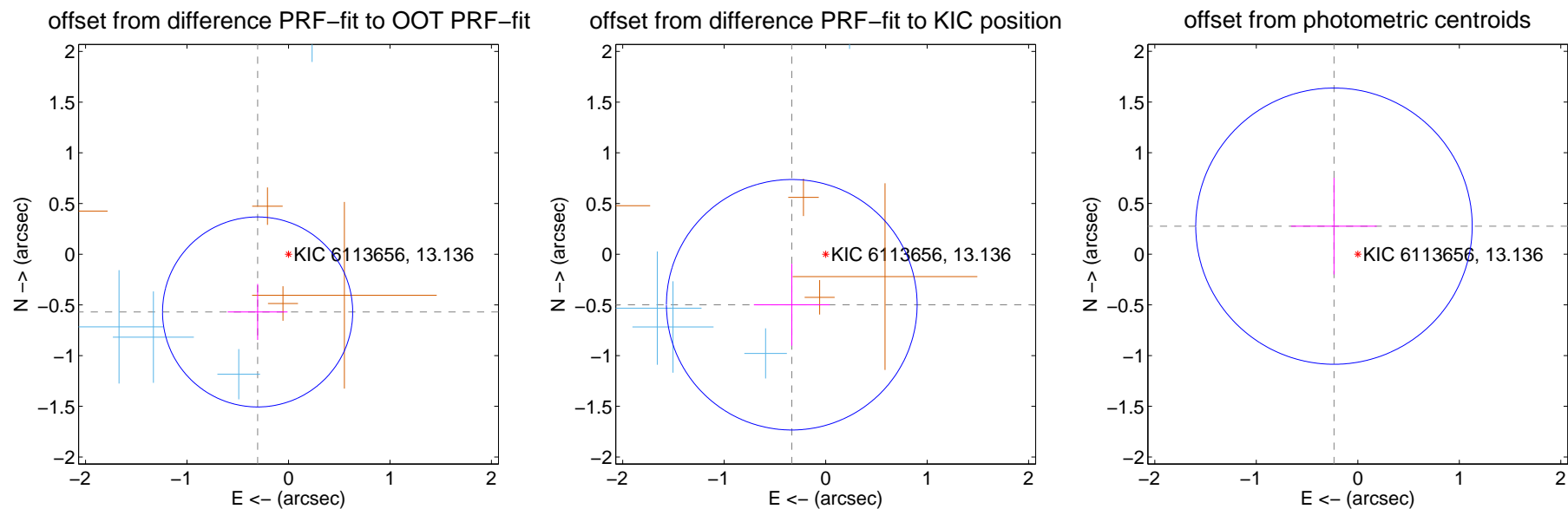
## DV Centroid Data

Supplemental centroid analysis for 006113656-04. Kepler magnitude: 13.14. Transit SNR 10.47

There are 4 quarters with good PRF difference image offsets

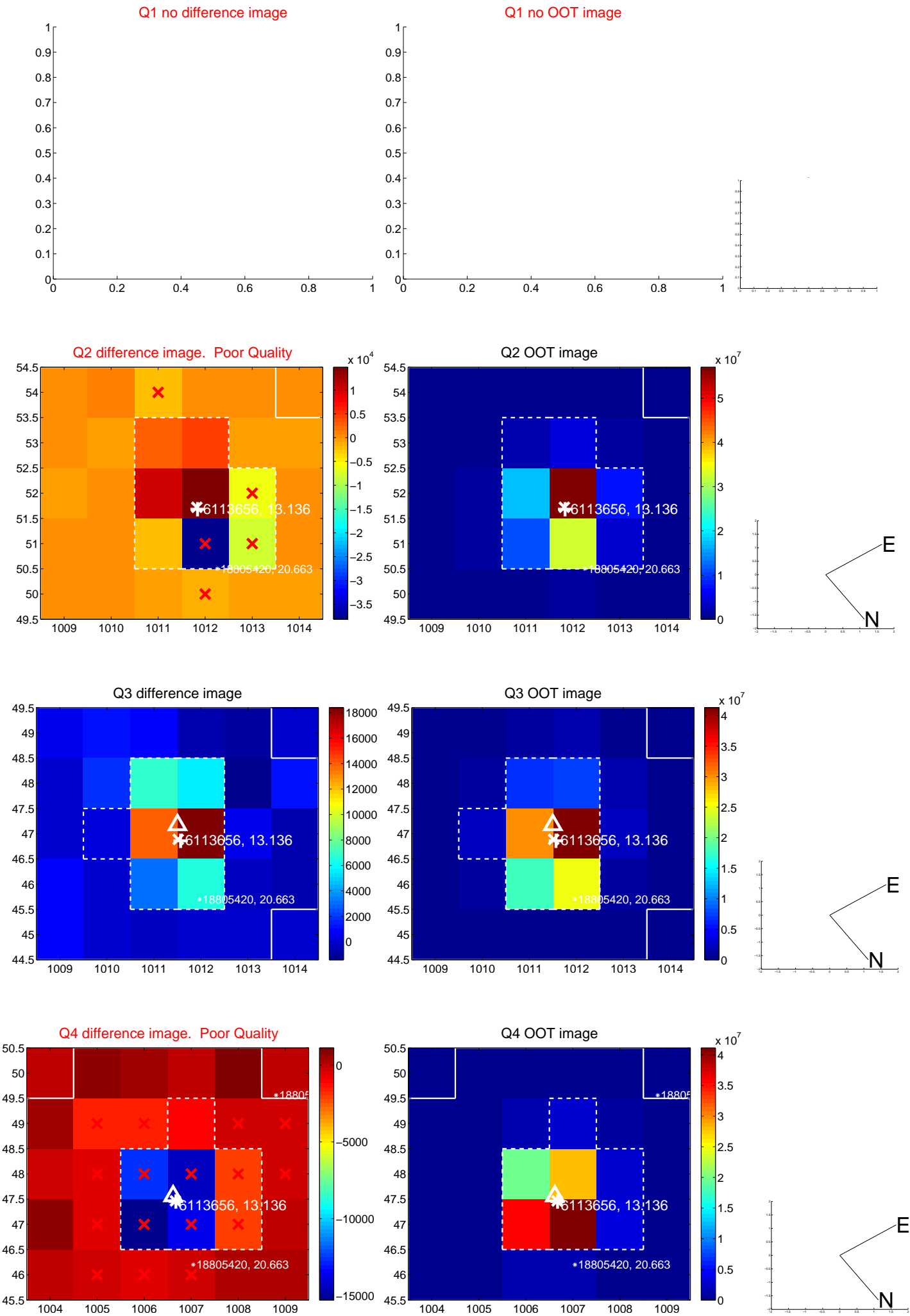
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.646 \pm 0.312$	2.07	$0.304 \pm 0.295$	$-0.569 \pm 0.276$
PRF-fit source offset from KIC position	$0.600 \pm 0.412$	1.46	$0.334 \pm 0.374$	$-0.498 \pm 0.404$
photometric centroid source offset	$0.36 \pm 0.45$	0.80	$0.23 \pm 0.42$	$0.28 \pm 0.48$



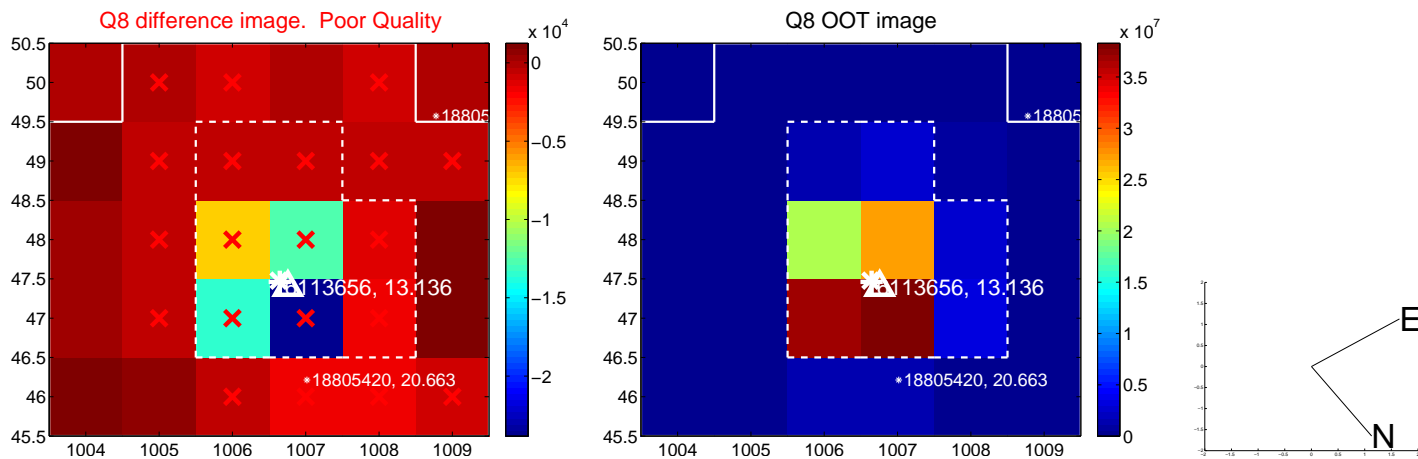
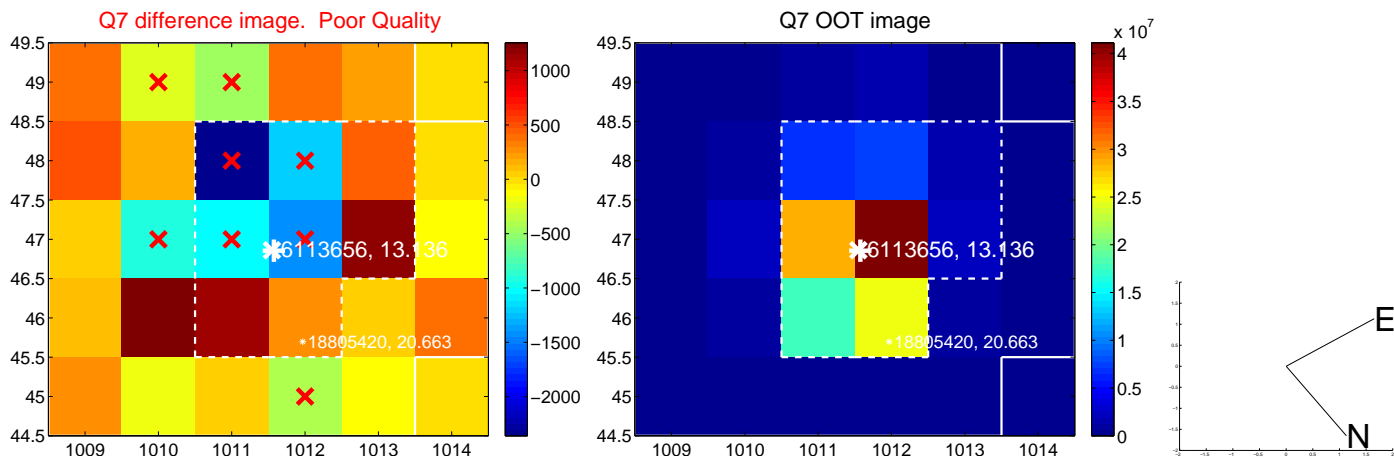
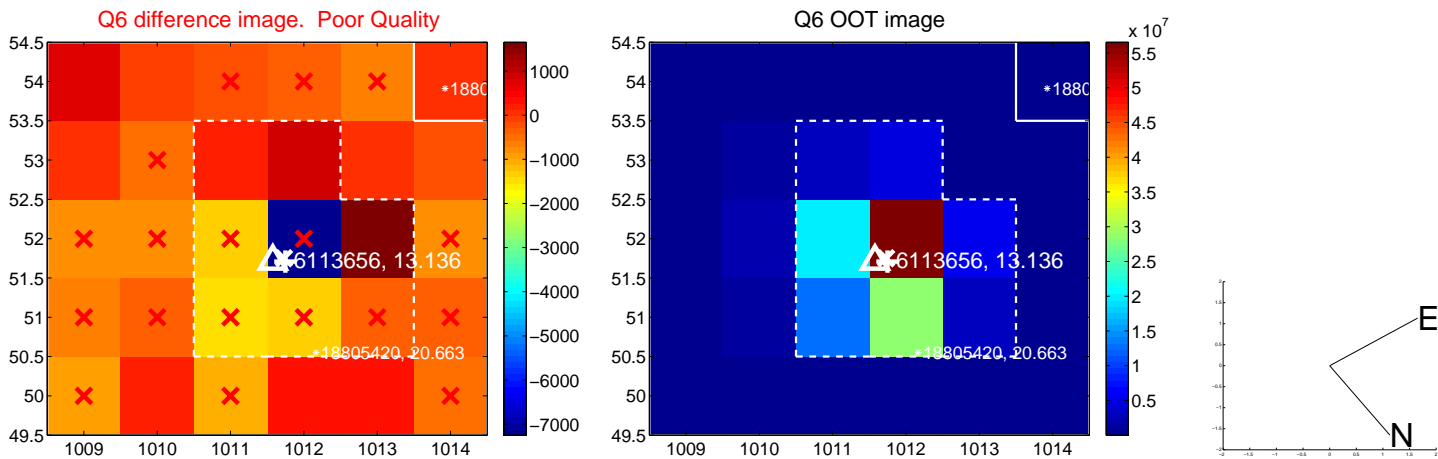
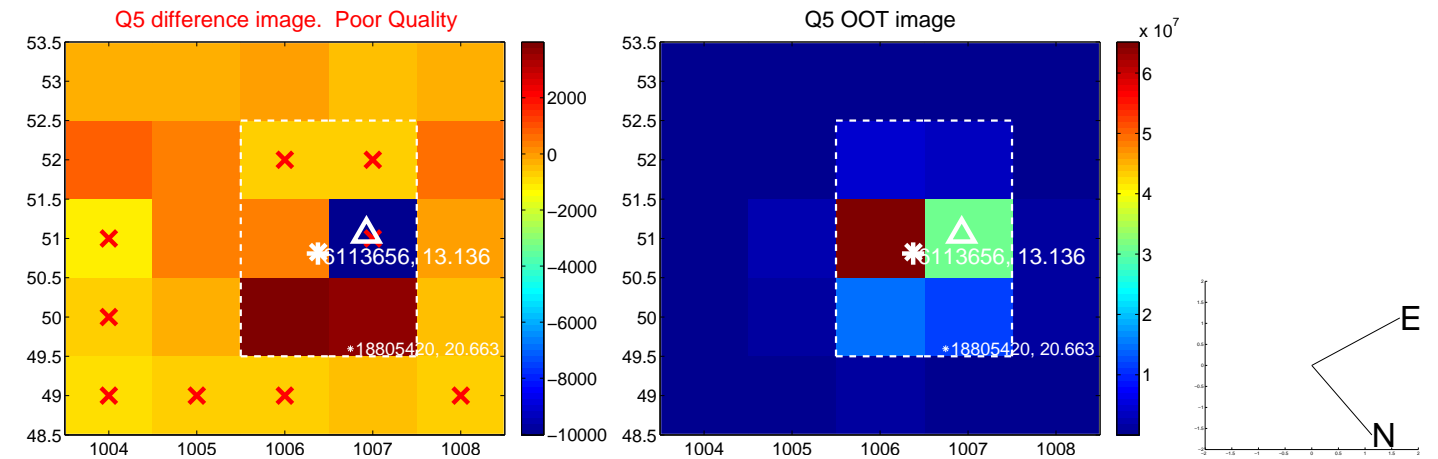
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

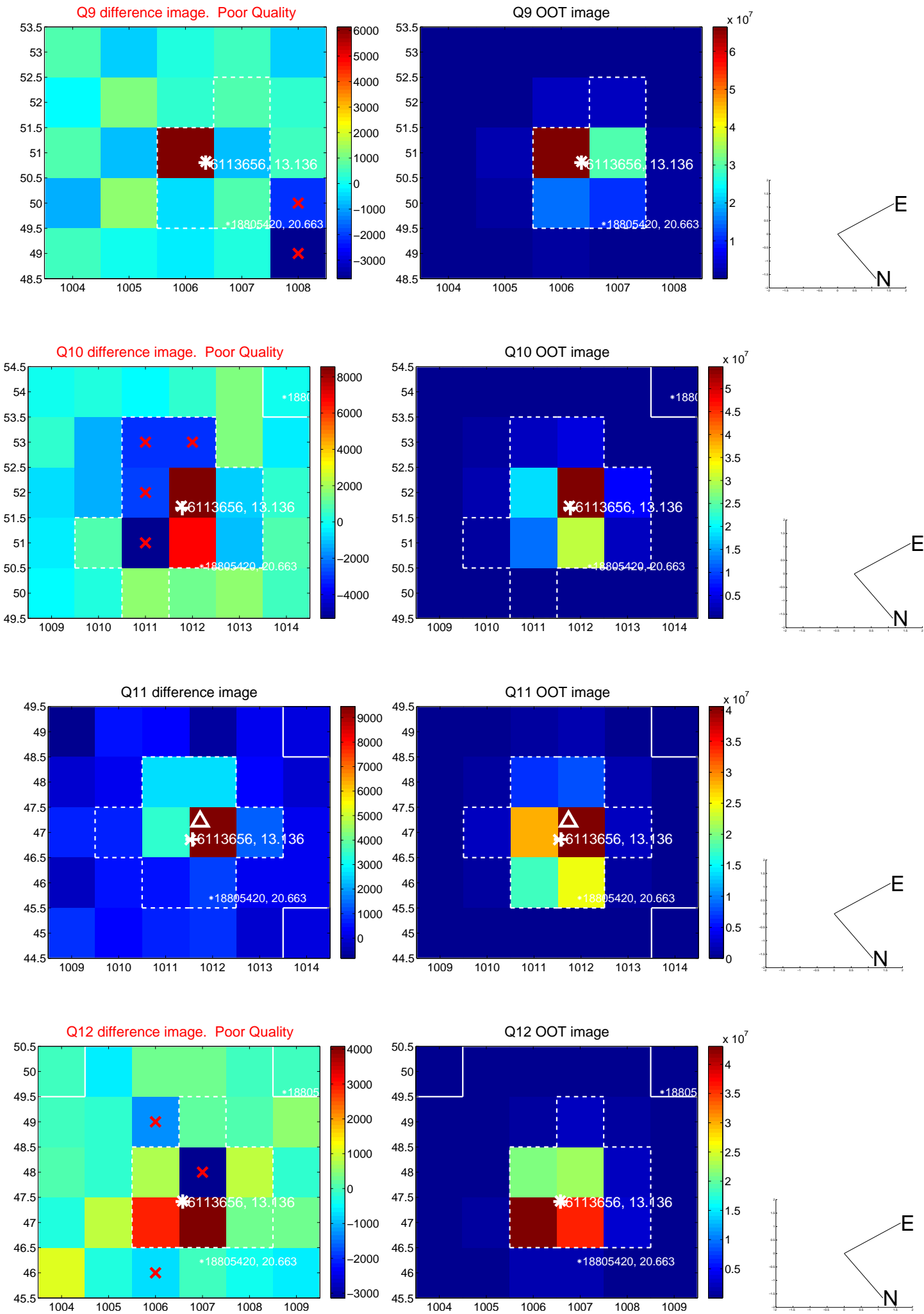




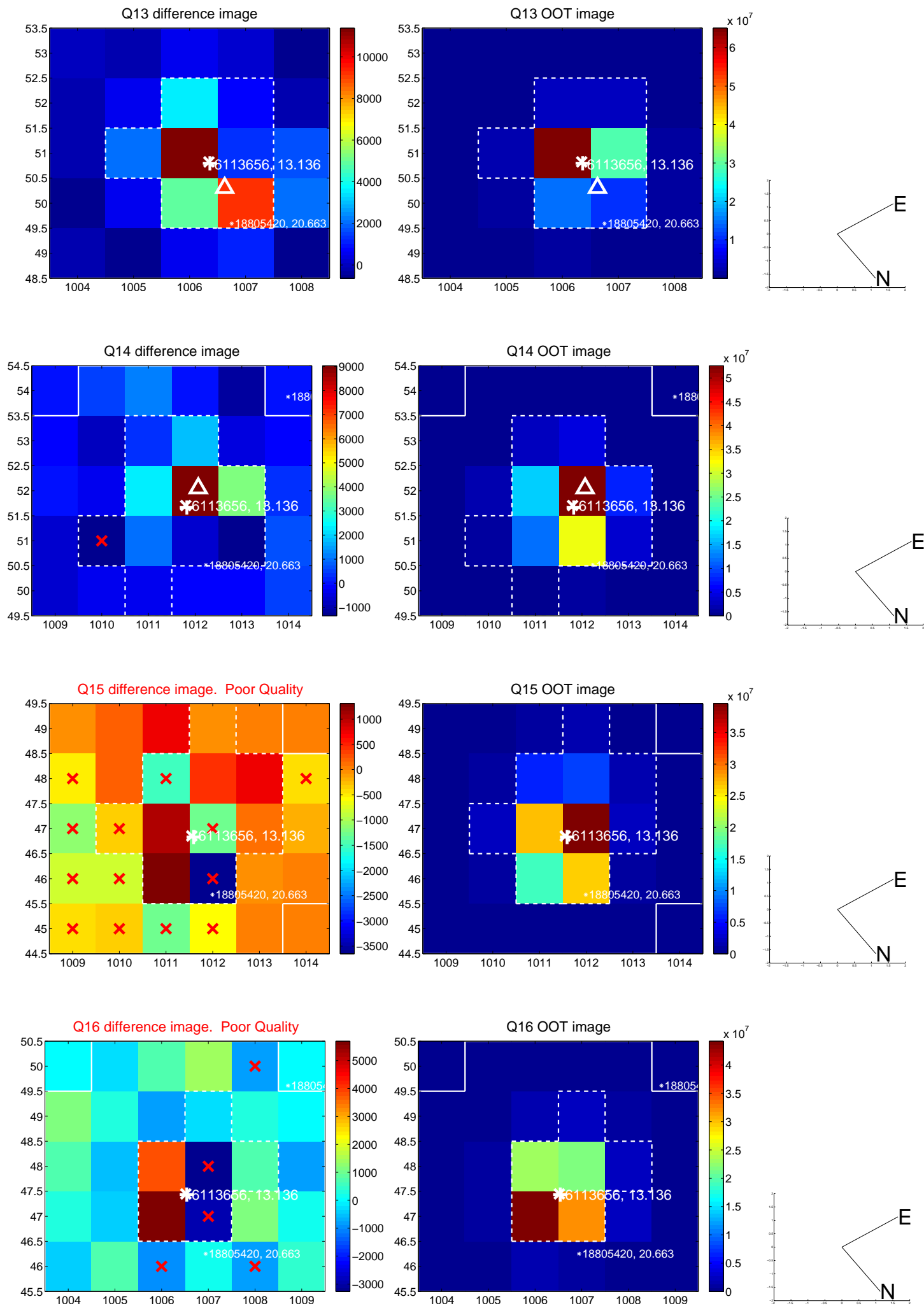
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



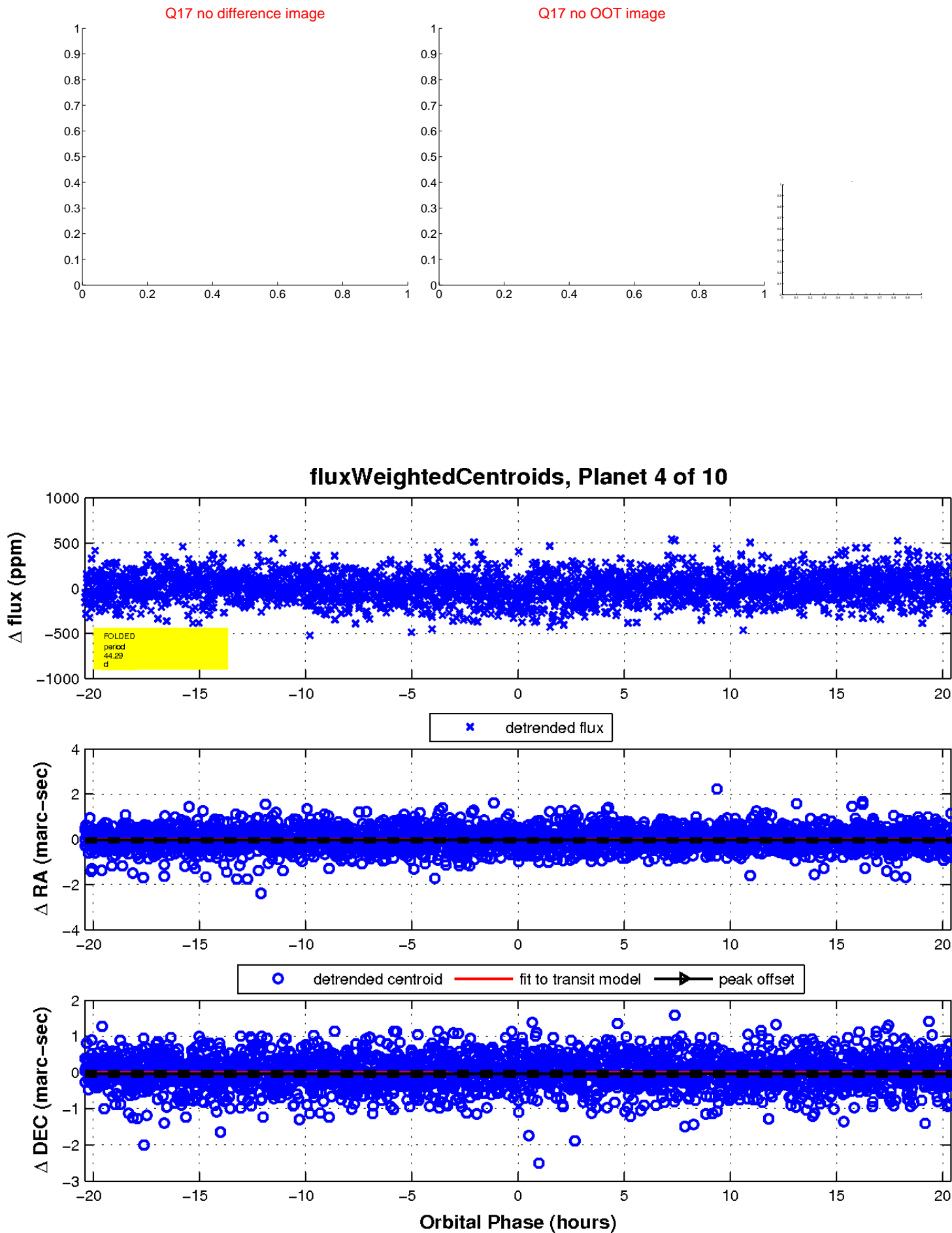
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

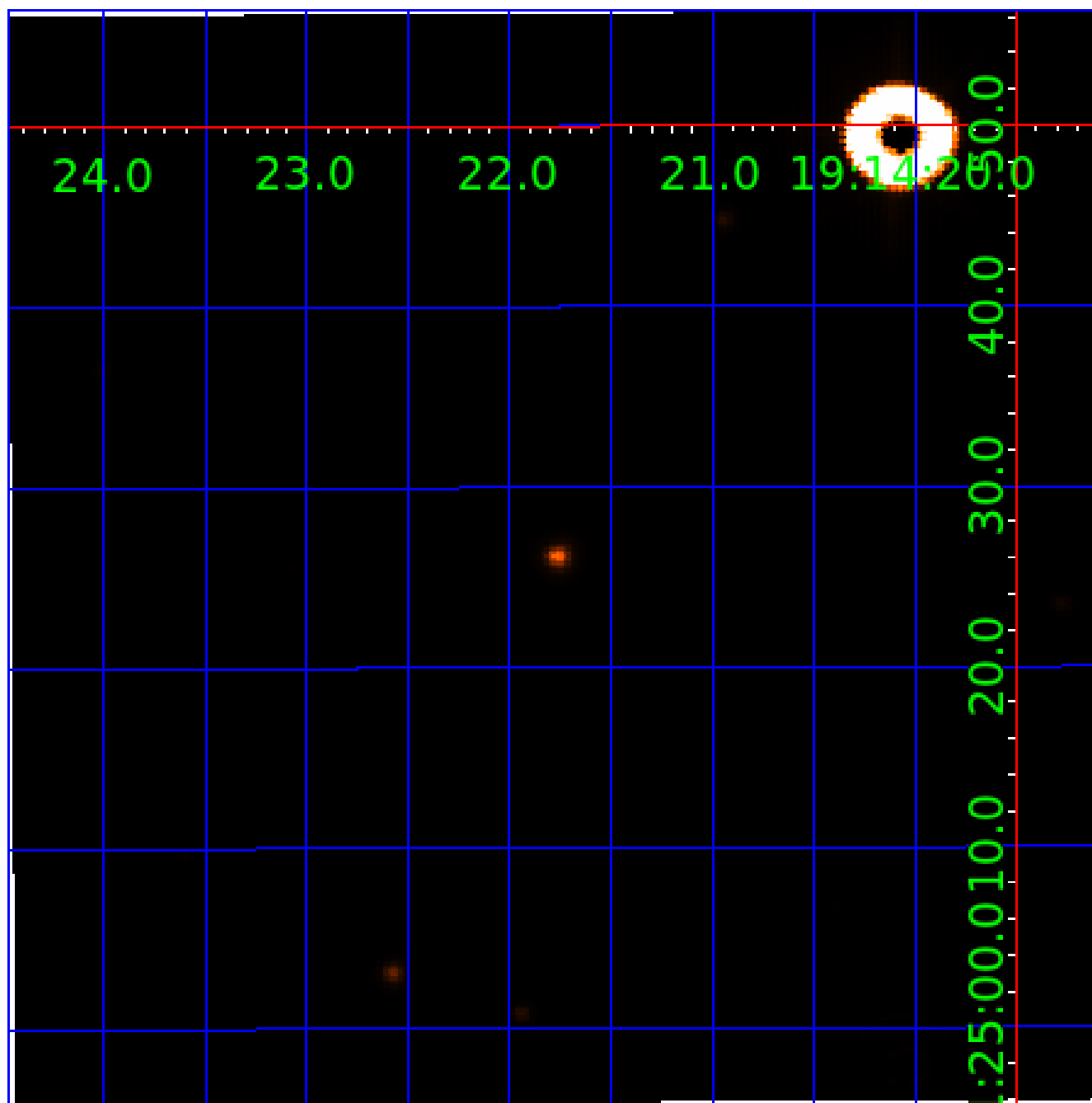


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006113656

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113656-01	OBS	No	2.646238	132.447489	5.6	18.121	11.4	3.0	1.88	7266	0.46	4677.99
006113656-02	OBS	No	58.535580	182.791356	207.4	17.532	46.1	7.6	1.88	7266	5.23	75.34
006113656-03	OBS	No	54.788959	170.151339	184.7	12.850	20.9	9.7	1.88	7266	2.58	82.28
006113656-04	OBS	No	44.294861	175.427489	174.4	6.797	11.3	10.5	1.88	7266	2.78	109.25
006113656-05	OBS	No	39.904031	136.547656	166.1	4.552	11.1	10.6	1.88	7266	2.77	125.57
006113656-06	OBS	No	57.280460	137.501760	190.8	6.317	11.1	11.6	1.88	7266	2.88	77.55
006113656-07	OBS	No	62.394926	153.799040	161.0	11.070	11.8	8.4	1.88	7266	2.70	69.19
006113656-08	OBS	No	30.838567	148.567220	249.9	2.104	10.9	10.1	1.88	7266	3.01	177.05
006113656-09	OBS	No	30.832288	161.442836	130.4	9.084	9.9	10.9	1.88	7266	2.38	177.10
006113656-10	OBS	No	15.974468	134.165876	100.7	9.468	10.0	7.9	1.88	7266	2.01	425.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113656-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
006113656-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
006113656-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
006113656-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

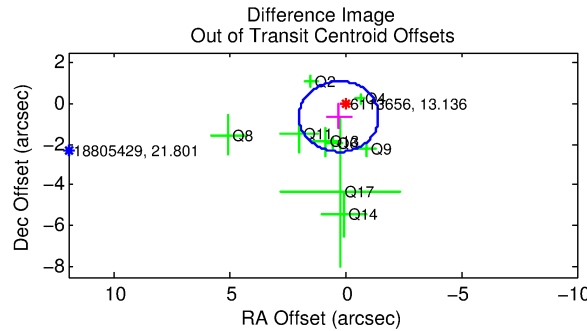
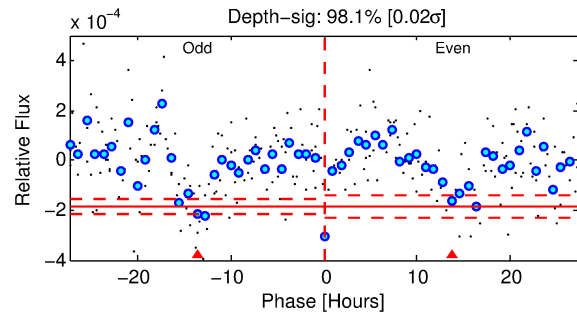
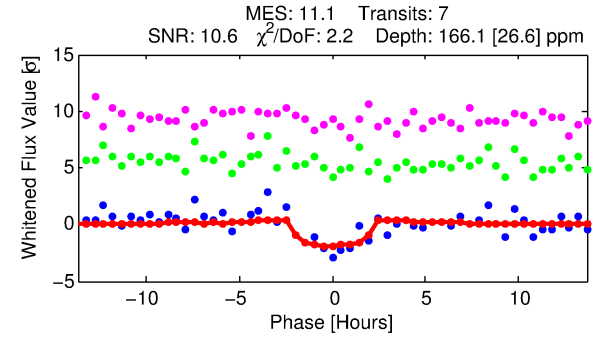
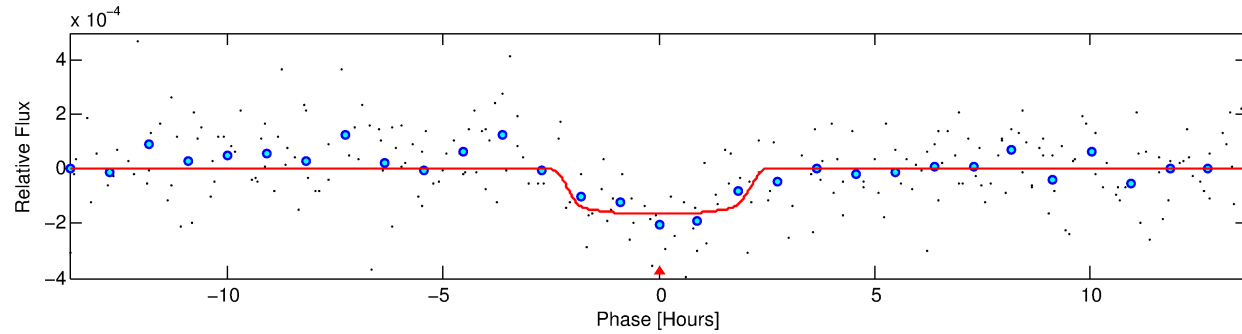
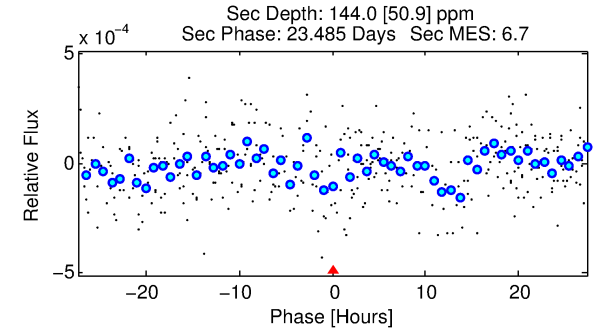
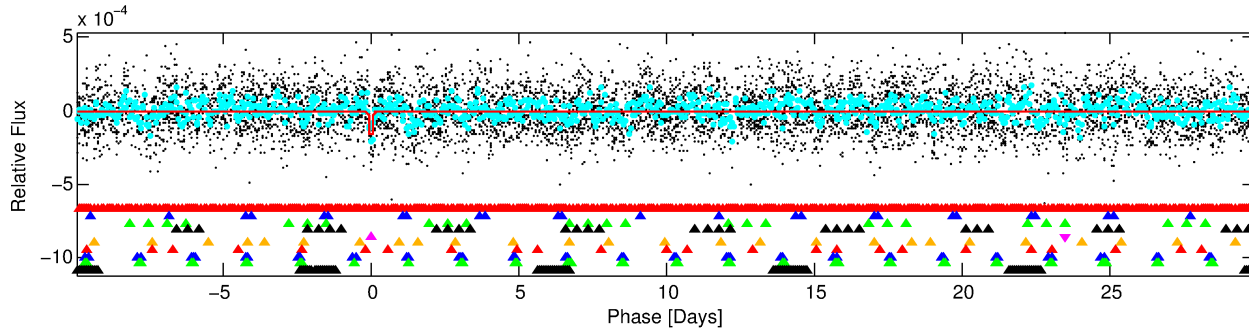
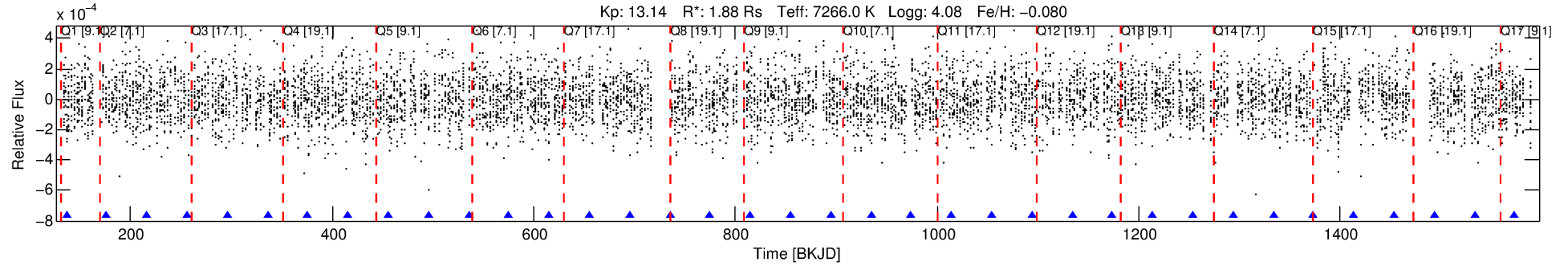
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006113656-05

No Significant Match Found

# DV One-Page Summary

KIC: 6113656 Candidate: 5 of 10 Period: 39.904 d



## DV Fit Results:

Period = 39.90403 [0.00064] d  
Epoch = 136.5477 [0.0126] BKJD  
Rp/R\* = 0.0135 [0.0088]  
a/R\* = 33.48 [135.32]  
b = 0.88 [1.04]  
Seff = 125.57 [46.08]  
Teq = 854 [78] K  
Rp = 2.77 [1.97] Re  
a = 0.2646 [0.0611] AU  
Ag = 723.70 [1004.94] [0.72σ]  
Teffp = 6845 [2330] K [2.57σ]

## DV Diagnostic Results:

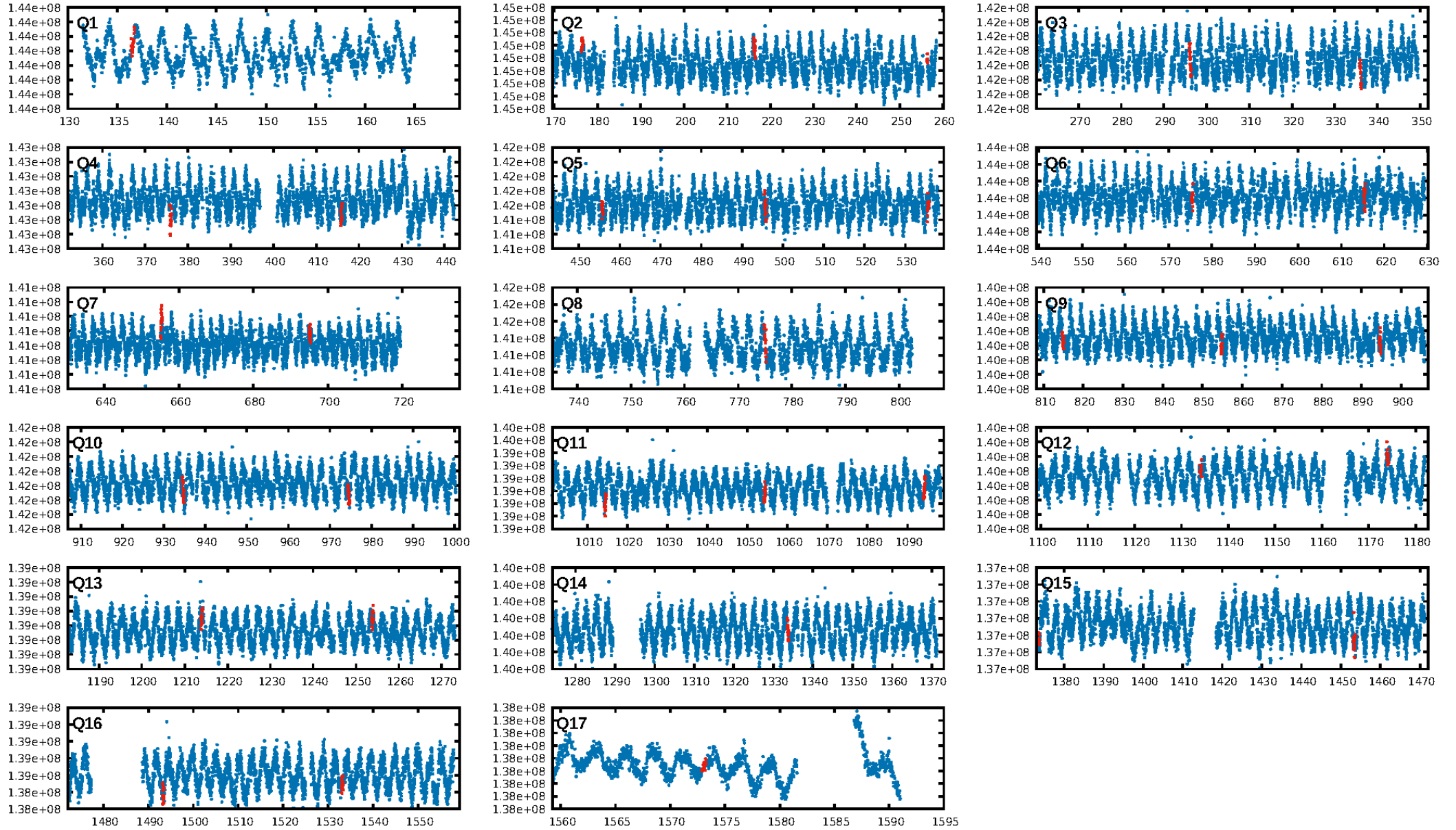
ShortPeriod-sig: 100.0% [43.38σ]  
LongPeriod-sig: 100.0% [12.88σ]  
ModelChiSquare2-sig: 2.5%  
ModelChiSquareGoF-sig: 67.4%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [5/5]  
GhostDiagnostic-chr: 10.23  
Centroid-sig: 3.8%  
Centroid-so: 0.862 arcsec [1.69σ]  
OotOffset-rm: 0.712 arcsec [1.24σ]  
KicOffset-rm: 0.594 arcsec [1.11σ]  
OotOffset-st: 3/1/2/3 [9]  
KicOffset-st: 3/1/2/3 [9]  
DiffImageQuality-fgm: 0.33 [3/9]  
DiffImageOverlap-fno: 0.53 [9/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:24 Z

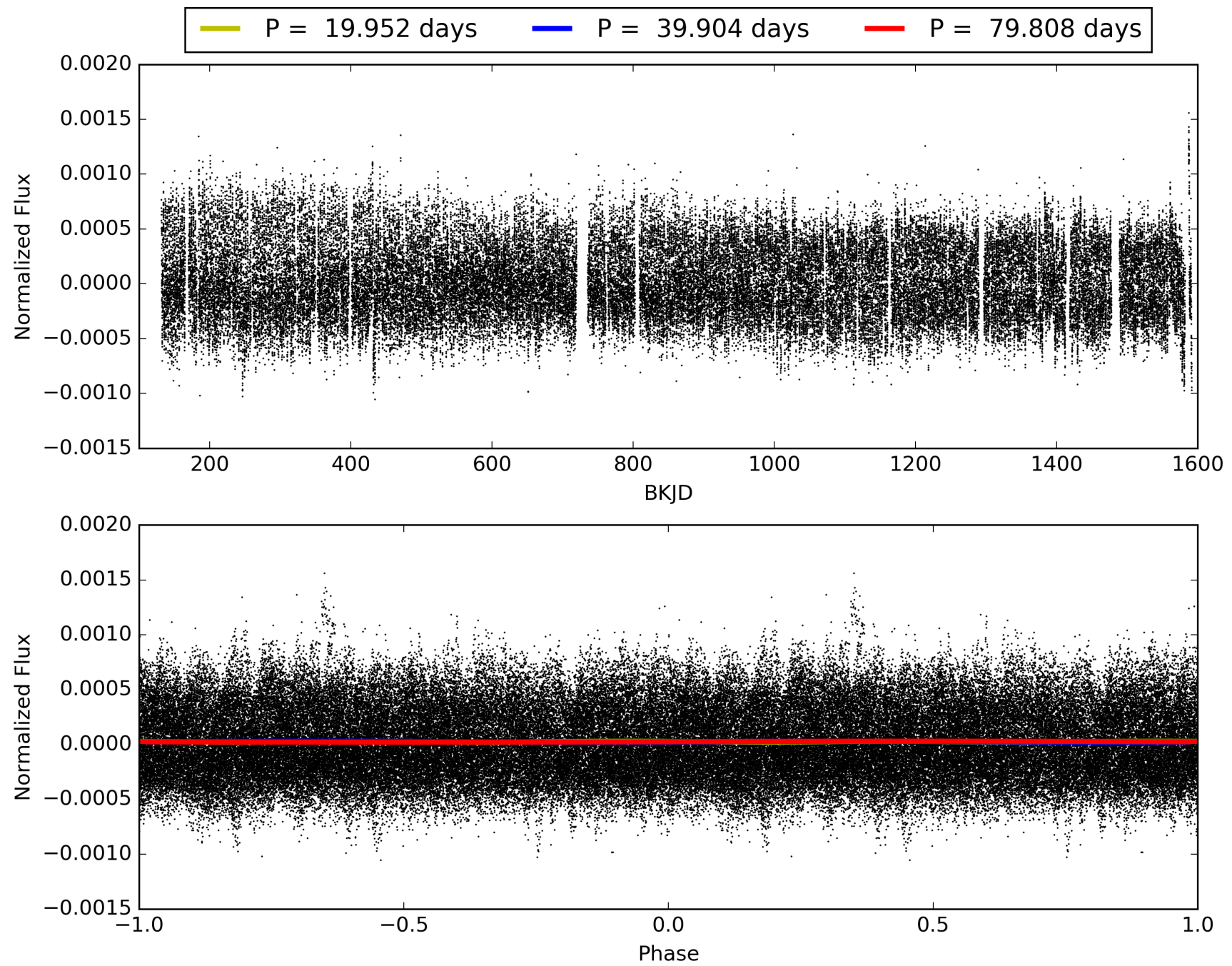
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center



# TCE 006113656-05, PDC Light Curves

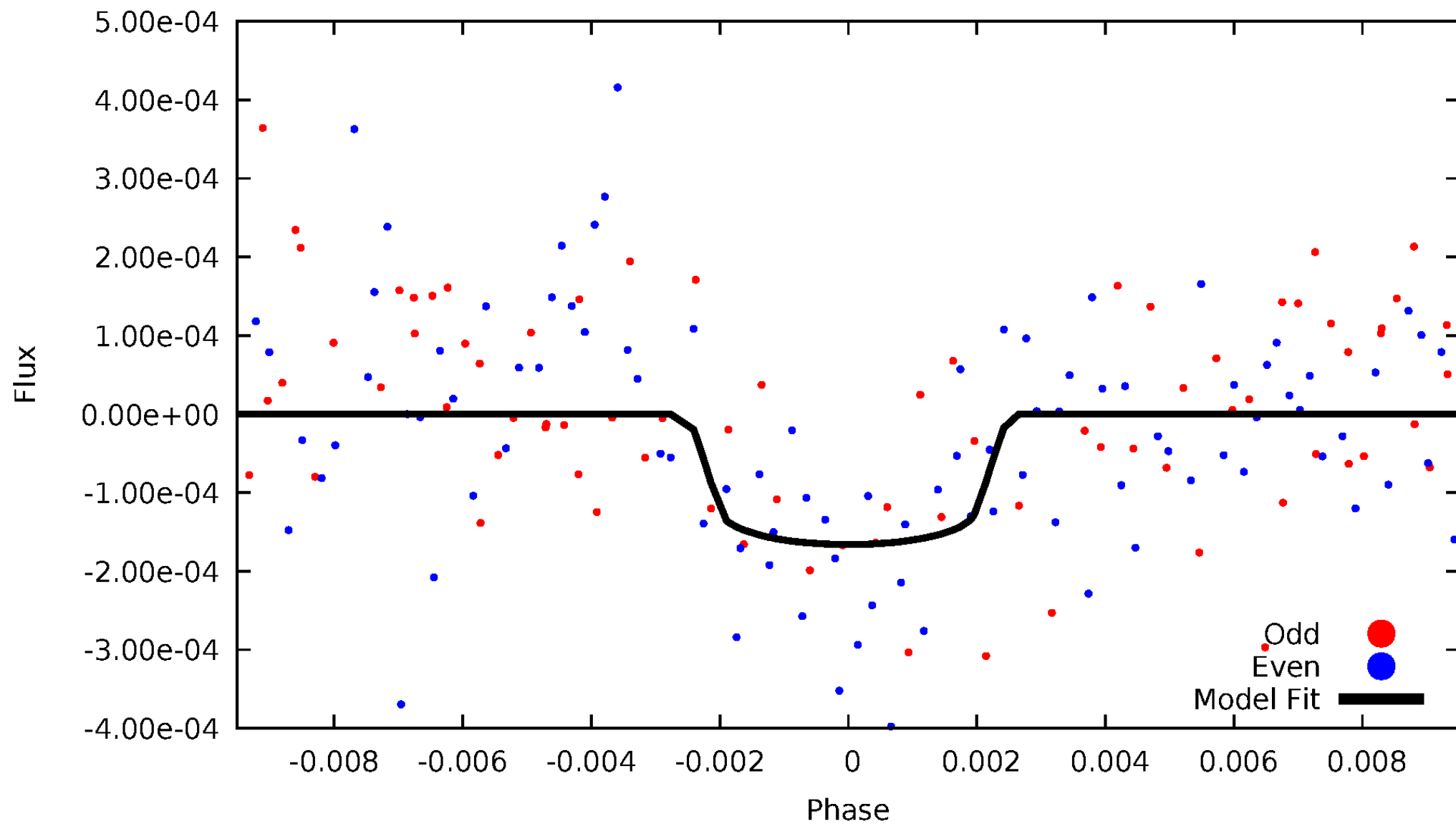


TCE 006113656-05



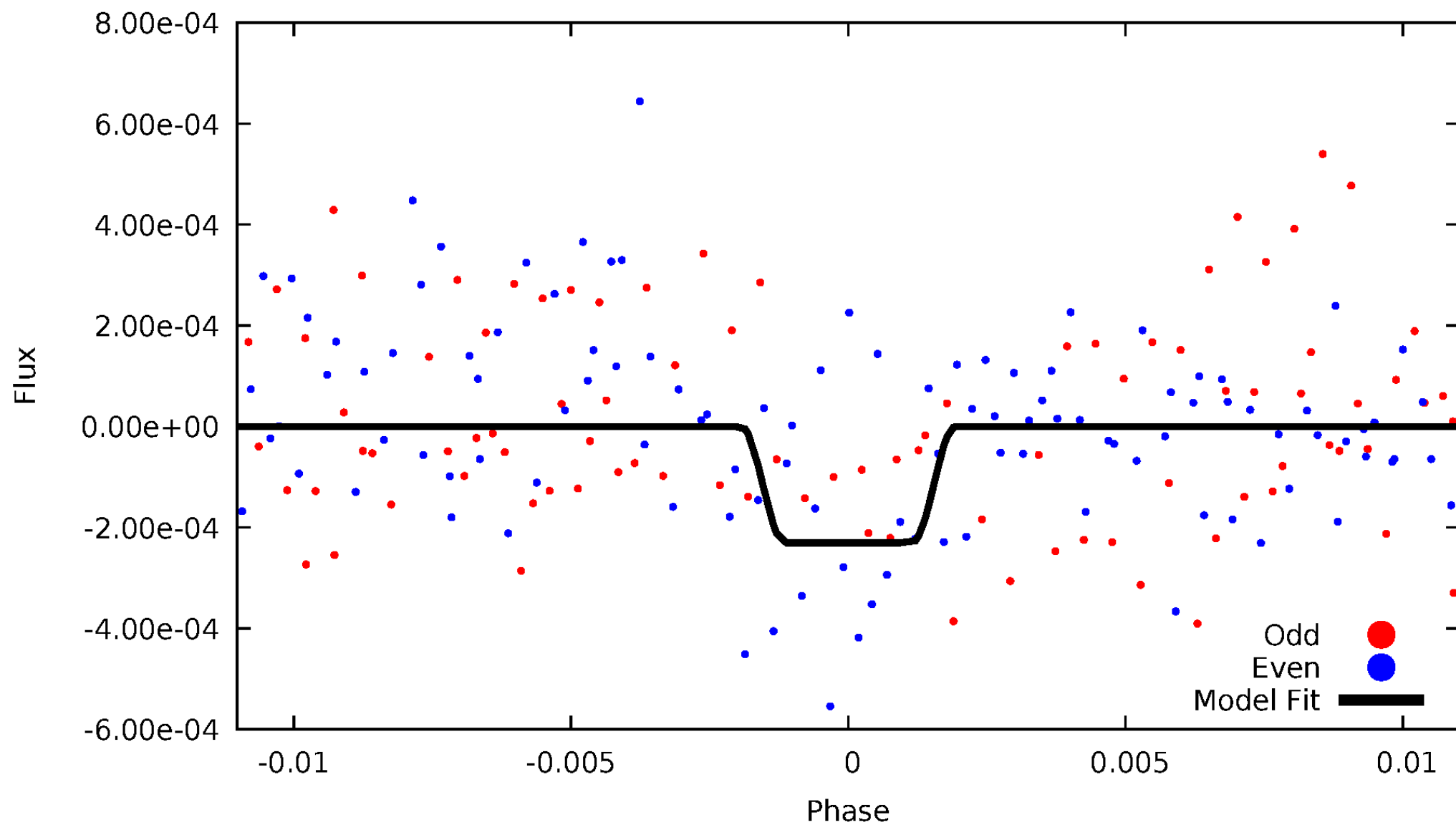
# DV Odd/Even

TCE 006113656-05



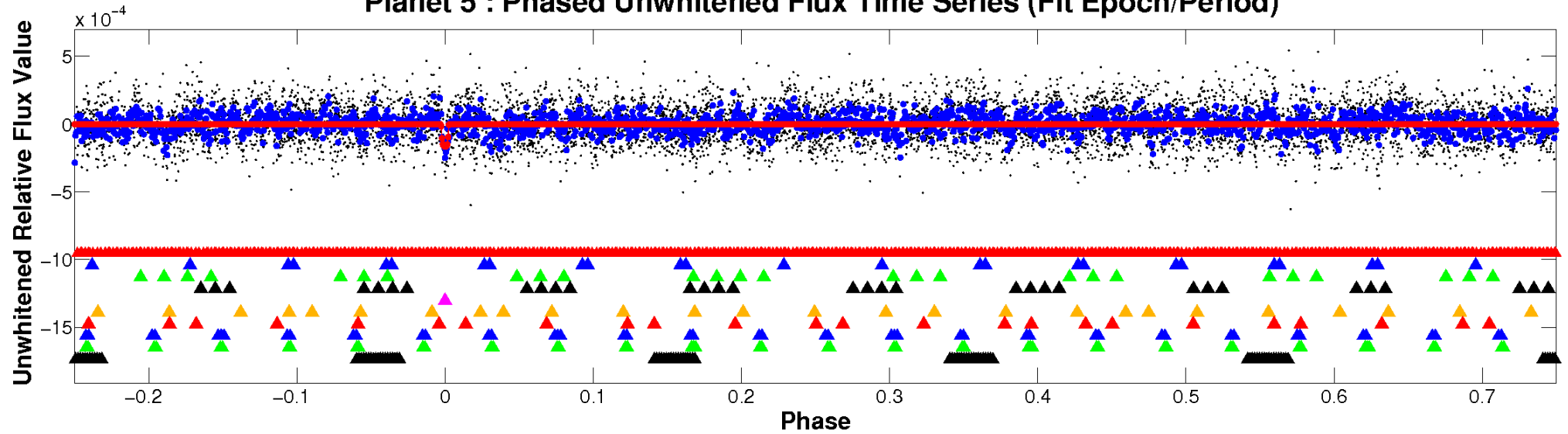
# ALT Odd/Even

TCE 006113656-05

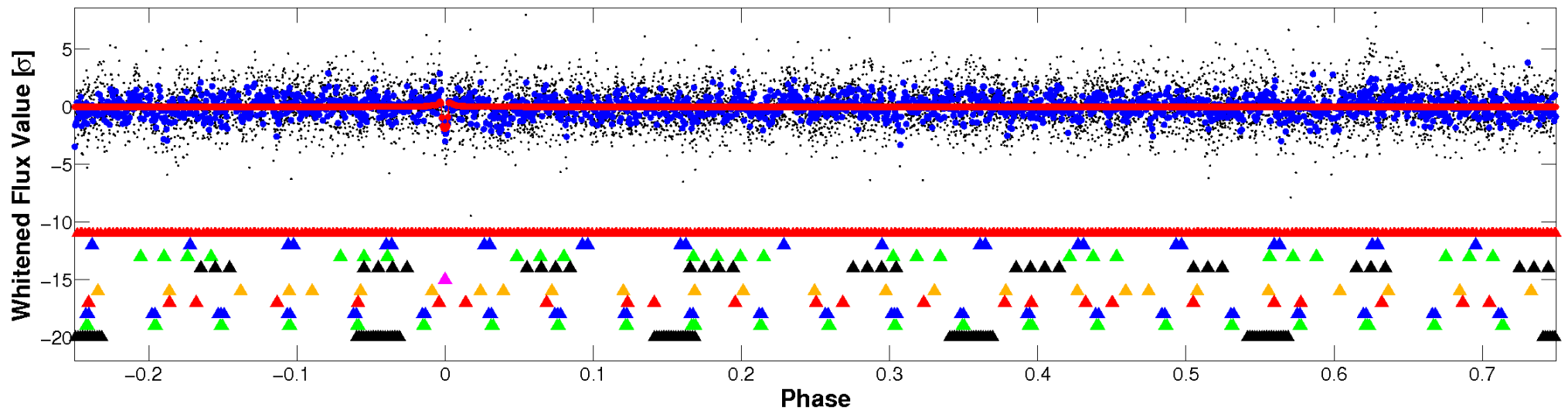


# Non-Whitened Vs. Whitened Light Curve

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

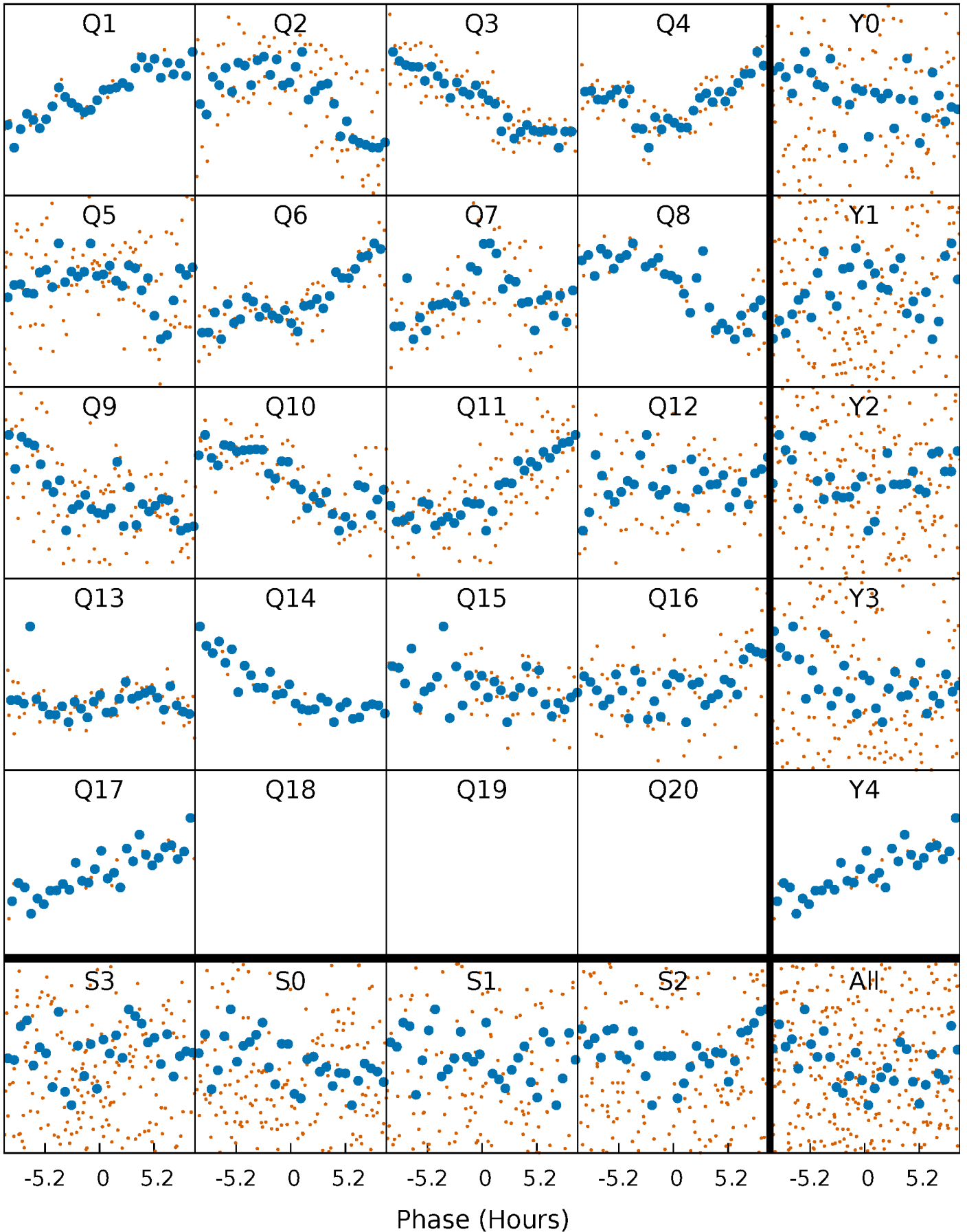


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



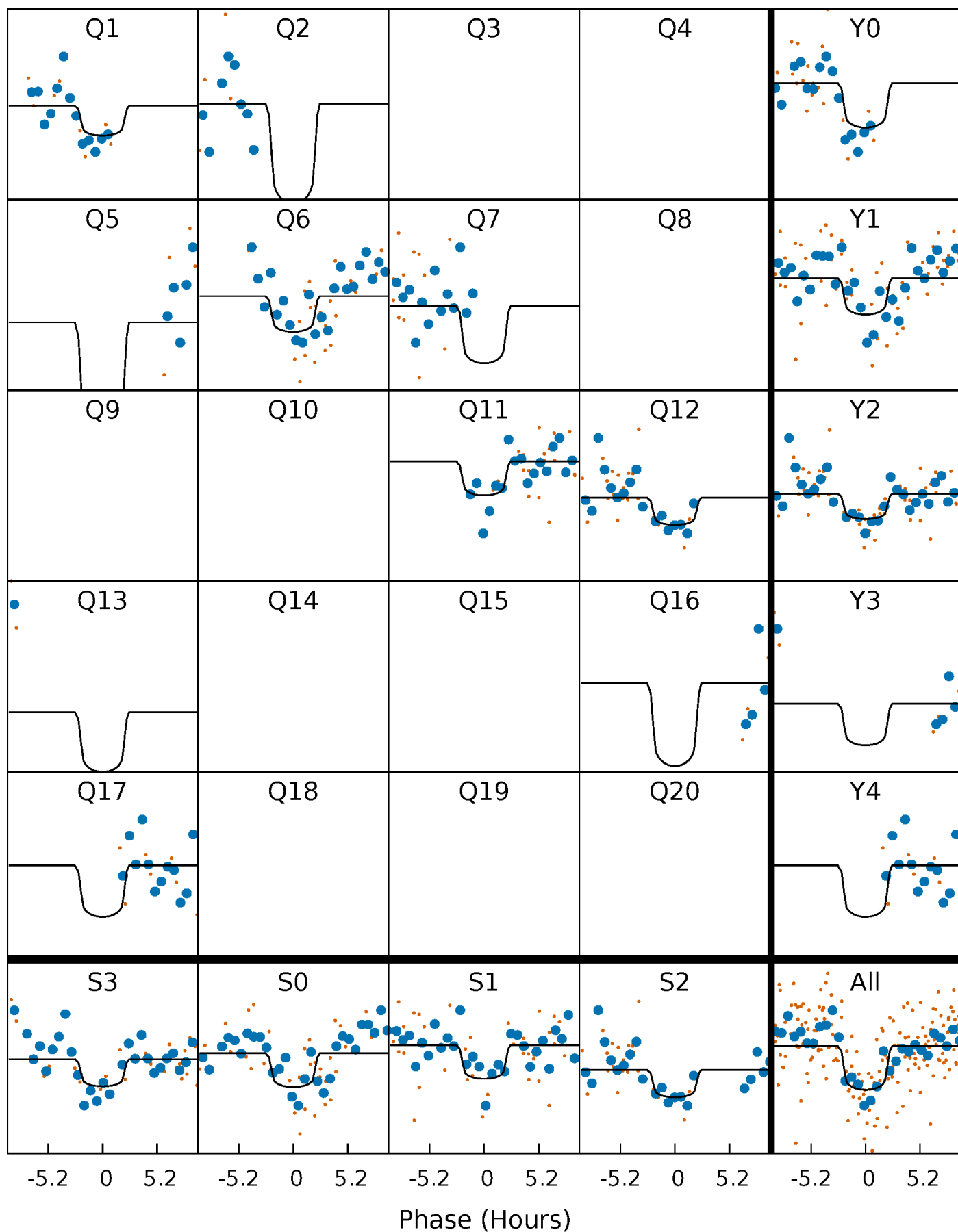
# PDC Quarter-Phased Transit Curves

TCE 006113656-05   P= 39.904031 Days    $T_0=136.547656$  (BKJD)



# DV Quarter-Phased Transit Curves

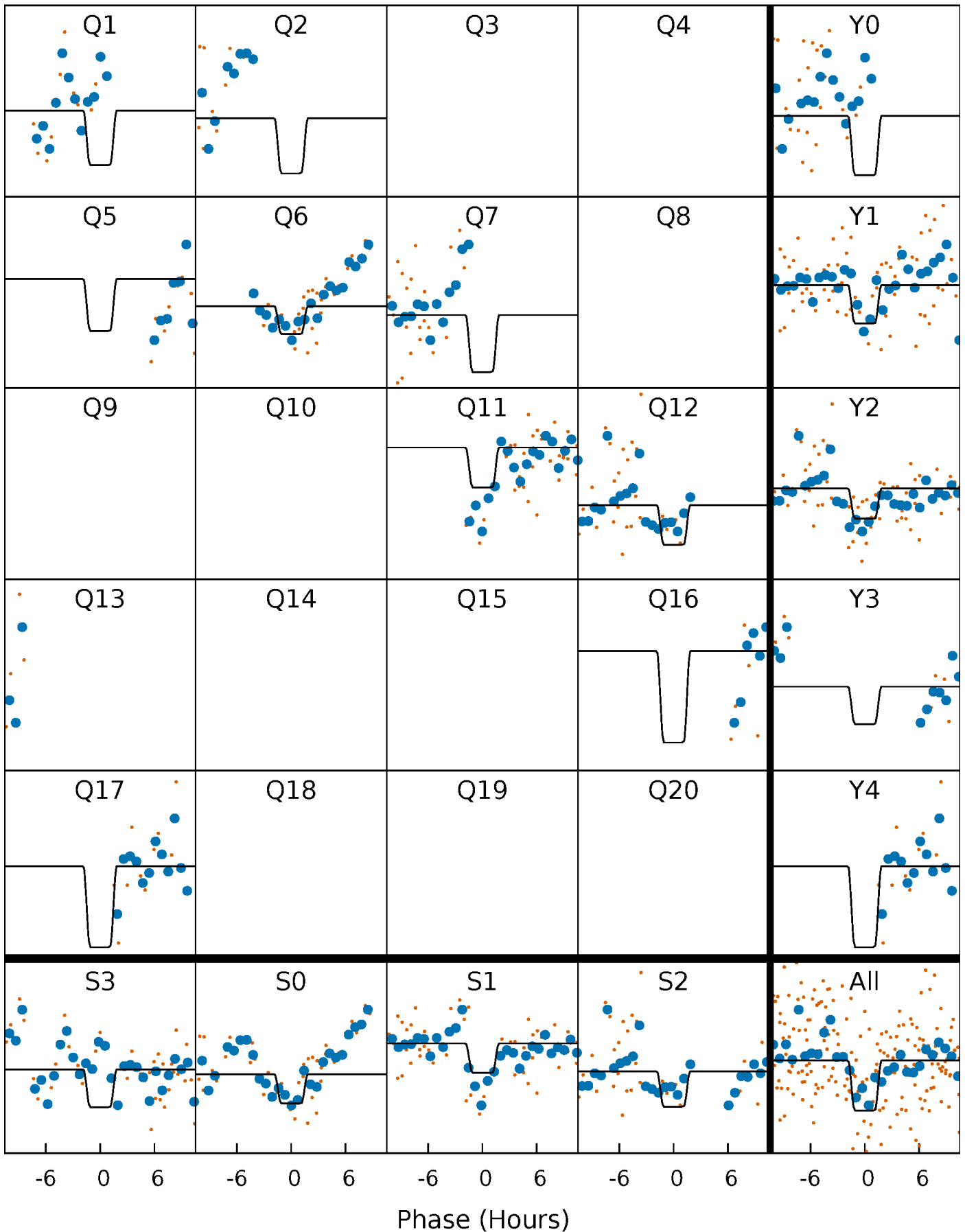
TCE 006113656-05     $P = 39.904031$  Days     $T_0 = 136.547656$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

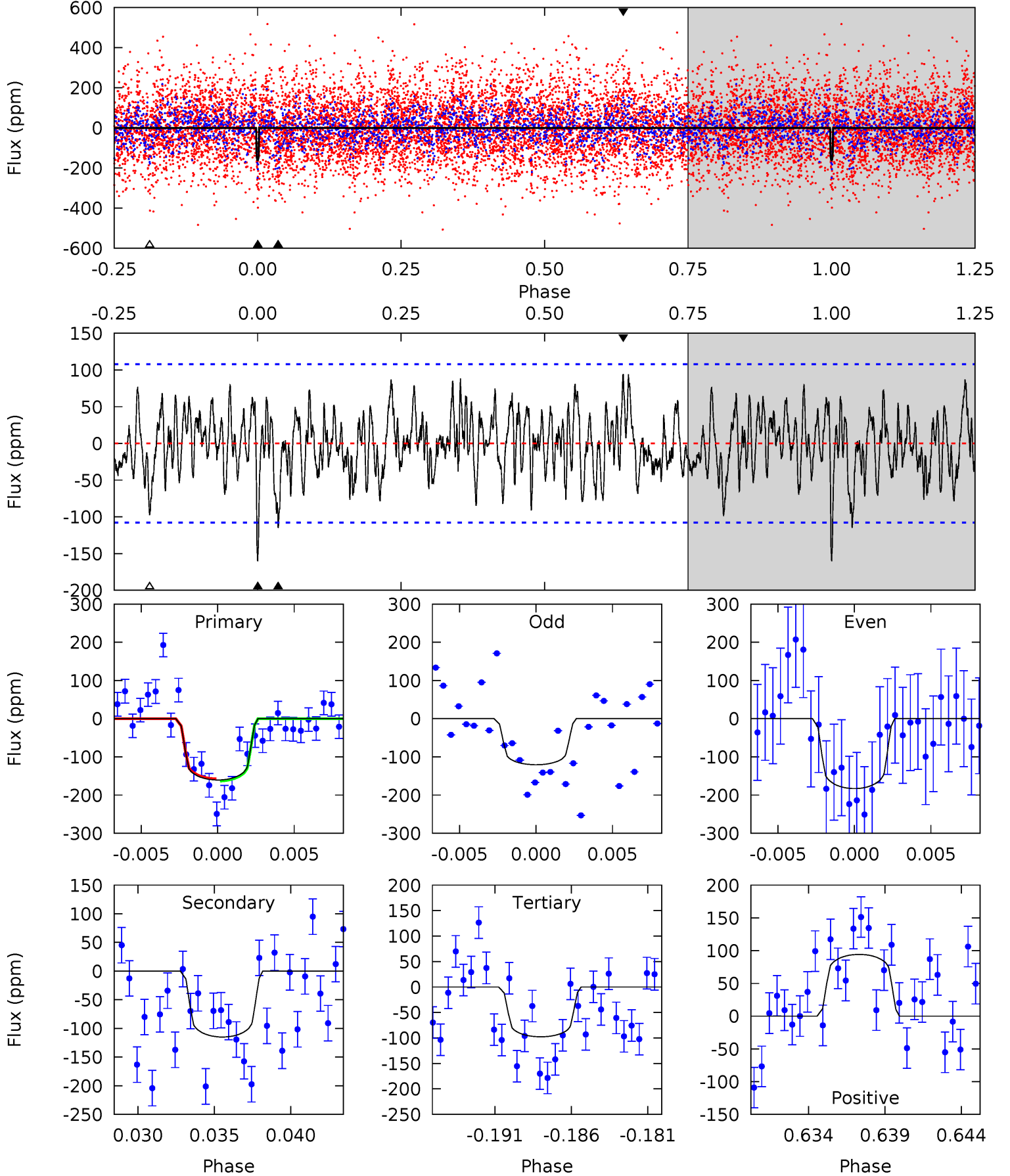
TCE 006113656-05     $P = 39.903848$  Days     $T_0 = 136.559424$  (BKJD)



# DV Model-Shift Uniqueness Test

006113656-05, P = 39.904031 Days, E = 96.643625 Days

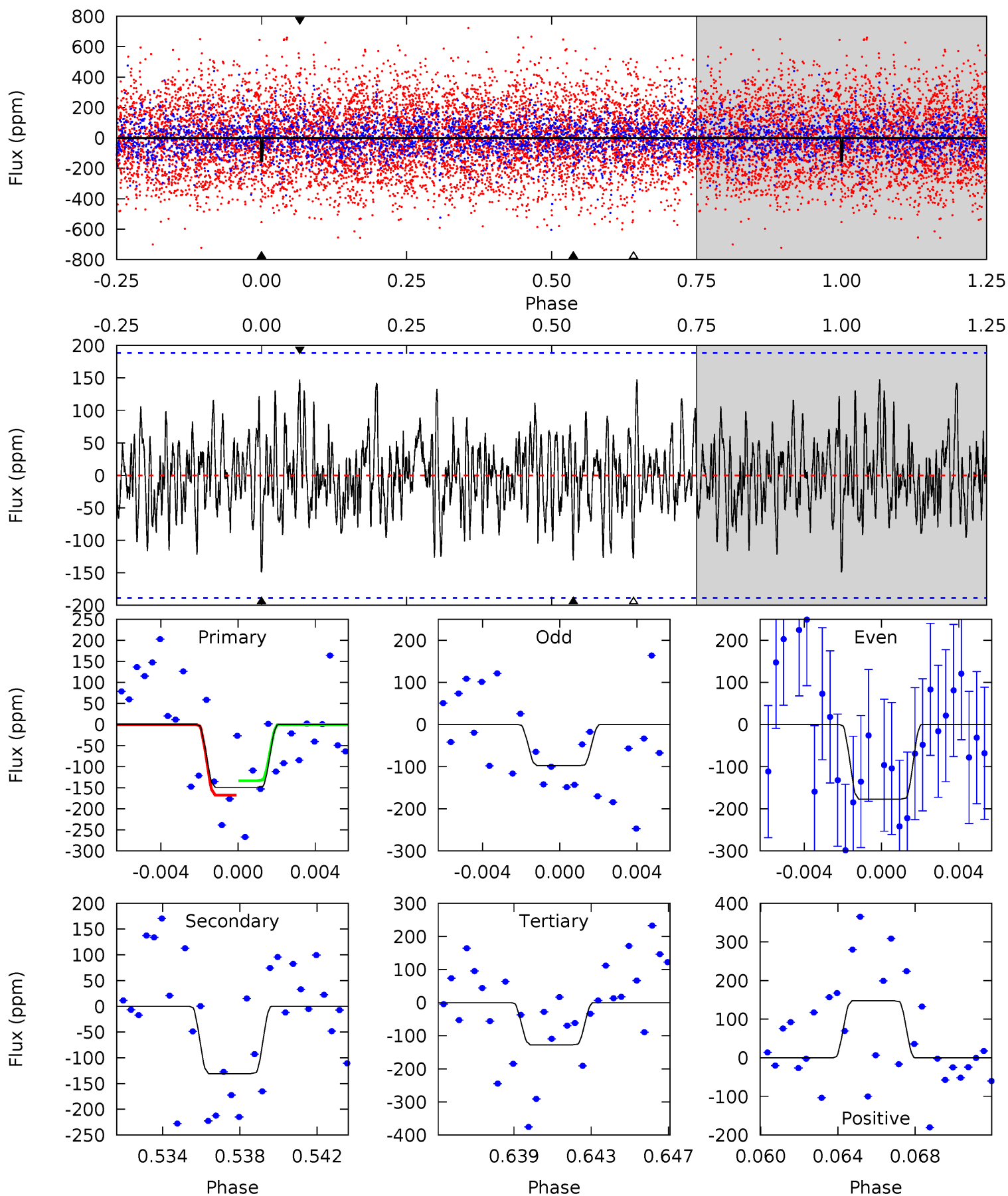
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.67	5.50	4.67	4.50	5.16	2.81	1.68	3.00	3.17	0.83	0.99	1.43	0.64	0.37	0.13



# Alt Model-Shift Uniqueness Test

006113656-05, P = 39.903848 Days, E = 96.655576 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
4.12	3.61	3.52	4.08	5.21	2.90	1.28	0.60	0.04	0.09	-0.46	1.08	1.20	0.50	0.48



### Stellar Parameters For KIC 006113656

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-115 \pm 21$	$2.84^{+1.71}_{-1.53}$	$1190^{+89}_{-84}$	$6295^{+3669}_{-1267}$	$544^{+1939}_{-345}$
Alt.	$-131 \pm 36$	$3.23^{+1.73}_{-1.72}$	$1185^{+83}_{-85}$	$6006^{+3370}_{-1063}$	$465^{+1737}_{-273}$

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

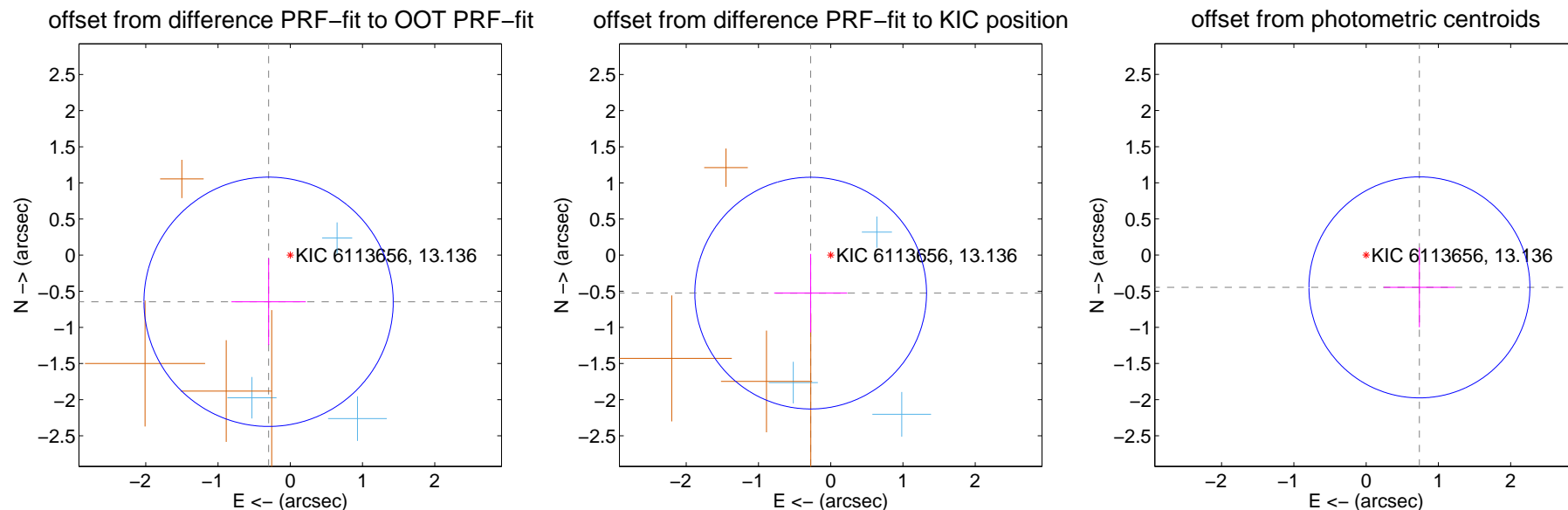
## DV Centroid Data

Supplemental centroid analysis for 006113656-05. Kepler magnitude: 13.14. Transit SNR 10.65

There are 3 quarters with good PRF difference image offsets

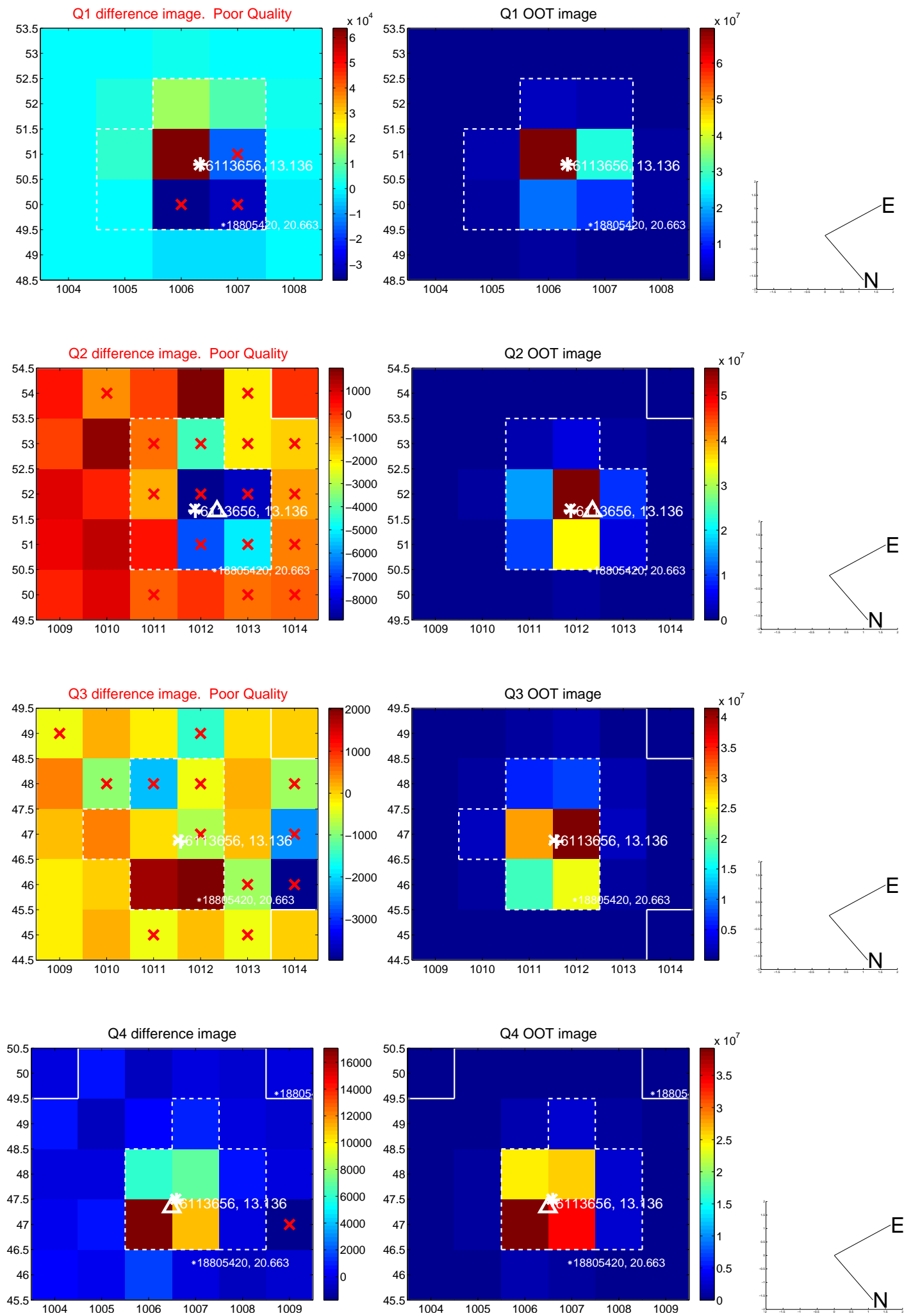
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.712 \pm 0.575$	1.24	$0.300 \pm 0.515$	$-0.645 \pm 0.598$
PRF-fit source offset from KIC position	$0.594 \pm 0.535$	1.11	$0.277 \pm 0.505$	$-0.525 \pm 0.542$
photometric centroid source offset	$0.86 \pm 0.51$	1.69	$-0.74 \pm 0.49$	$-0.45 \pm 0.55$

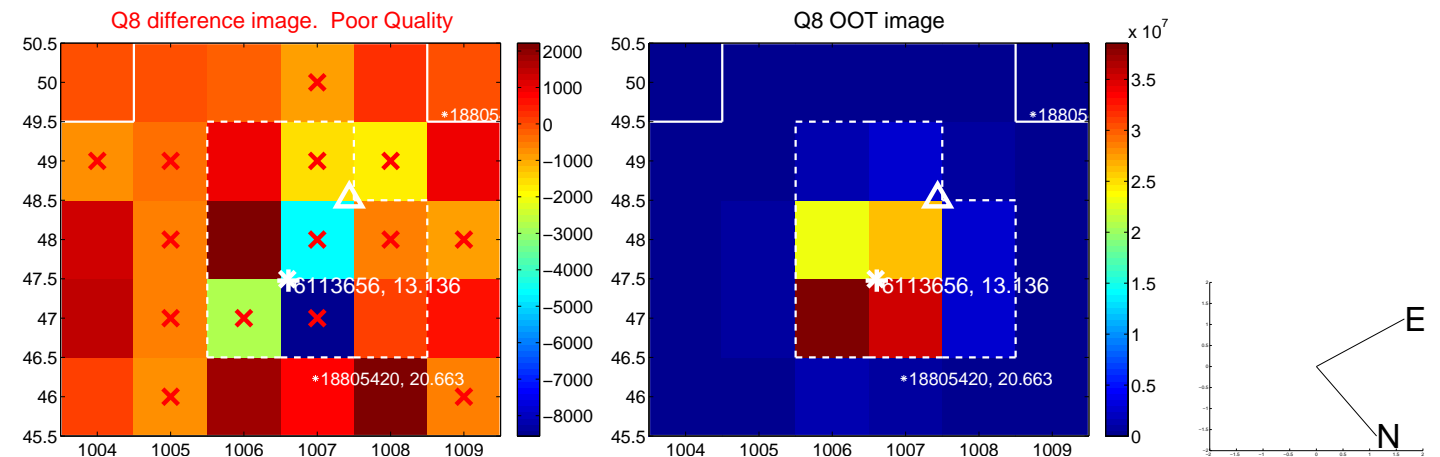
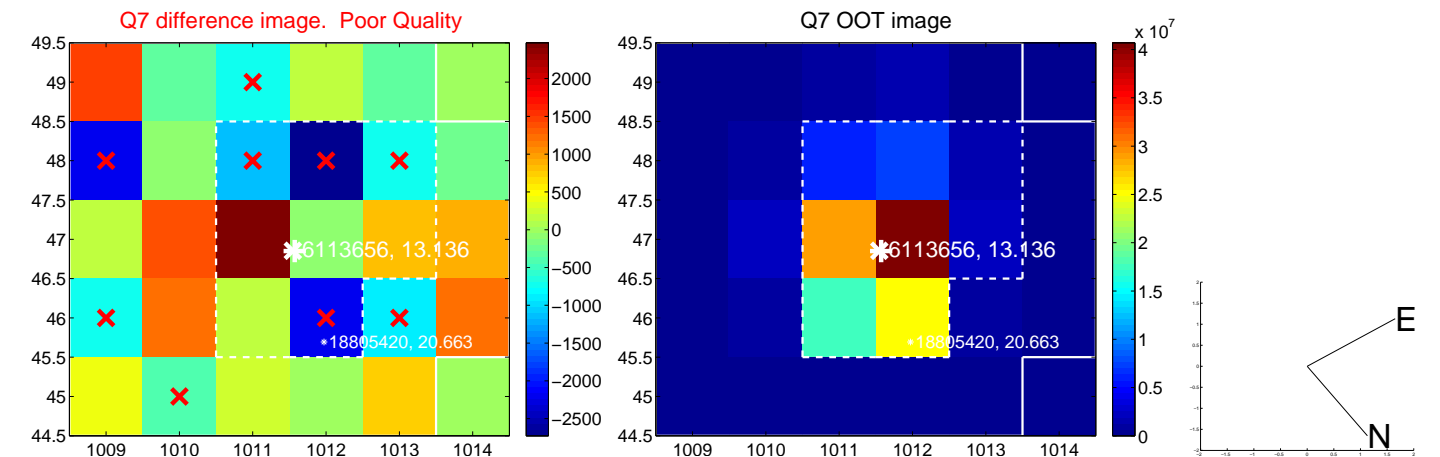
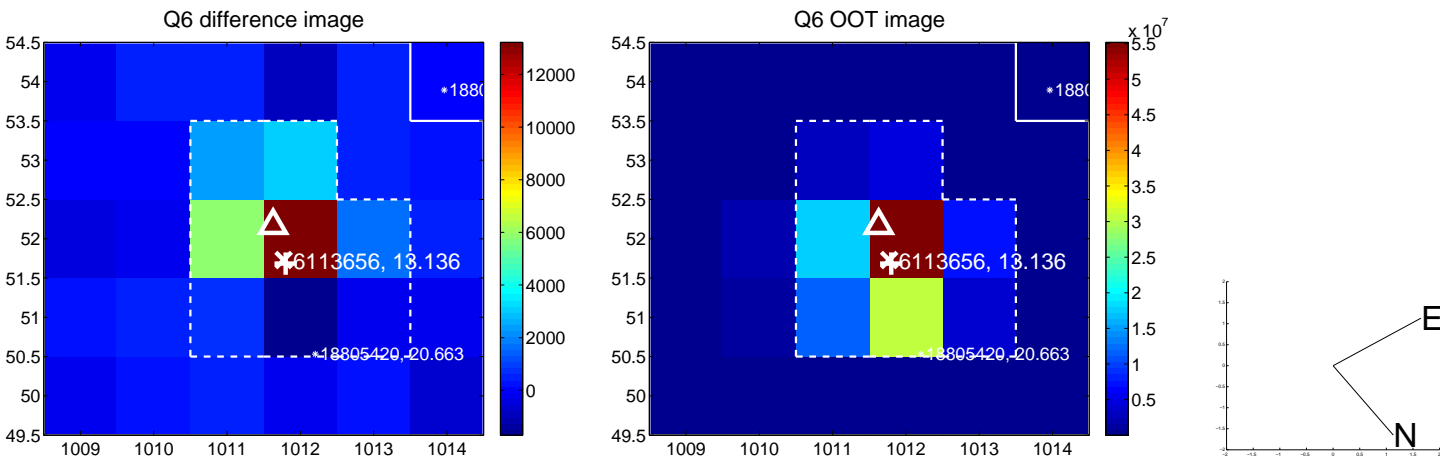
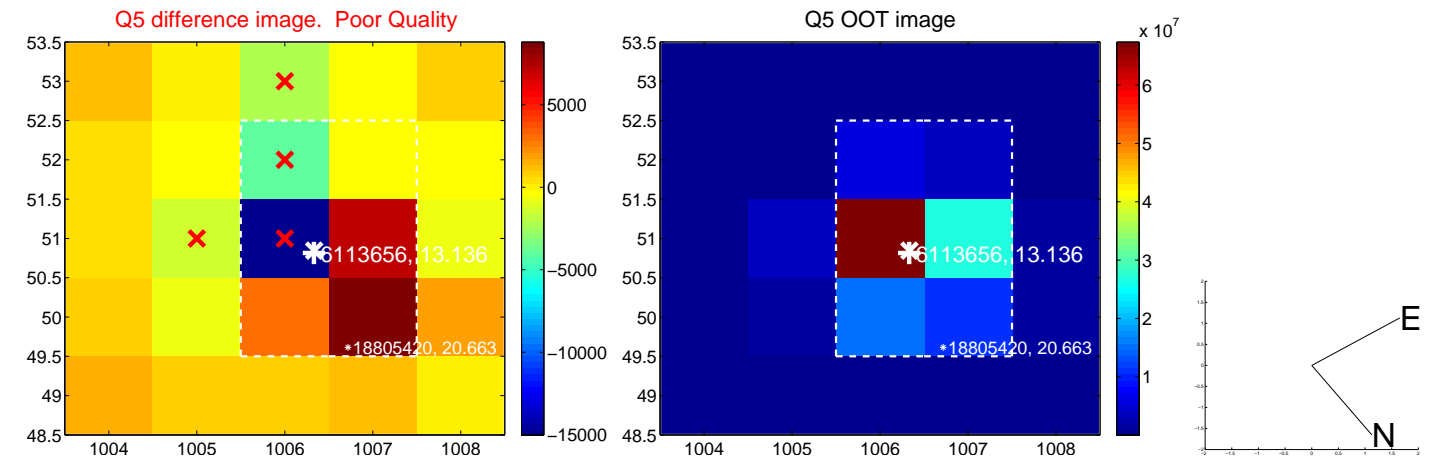


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

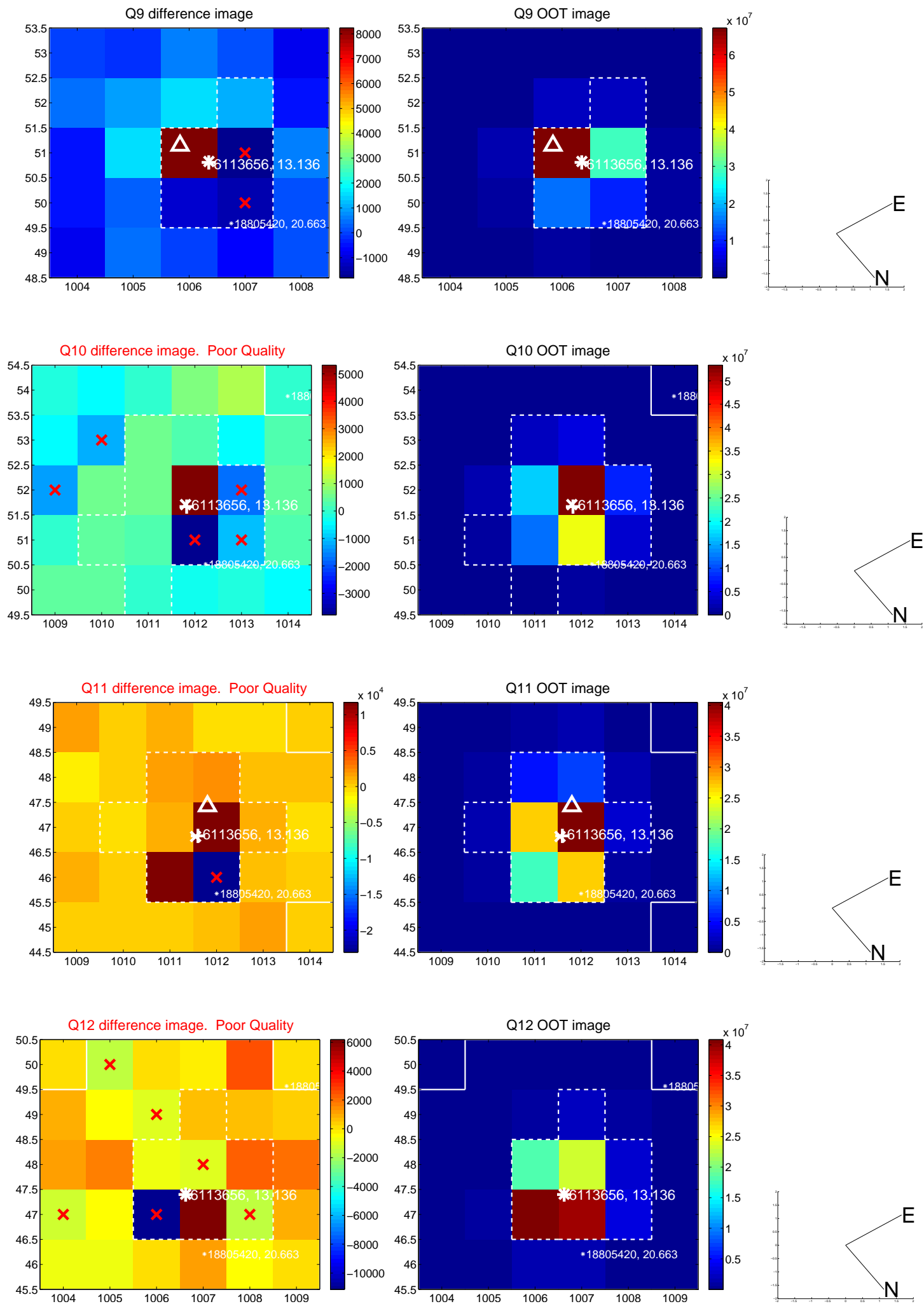


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

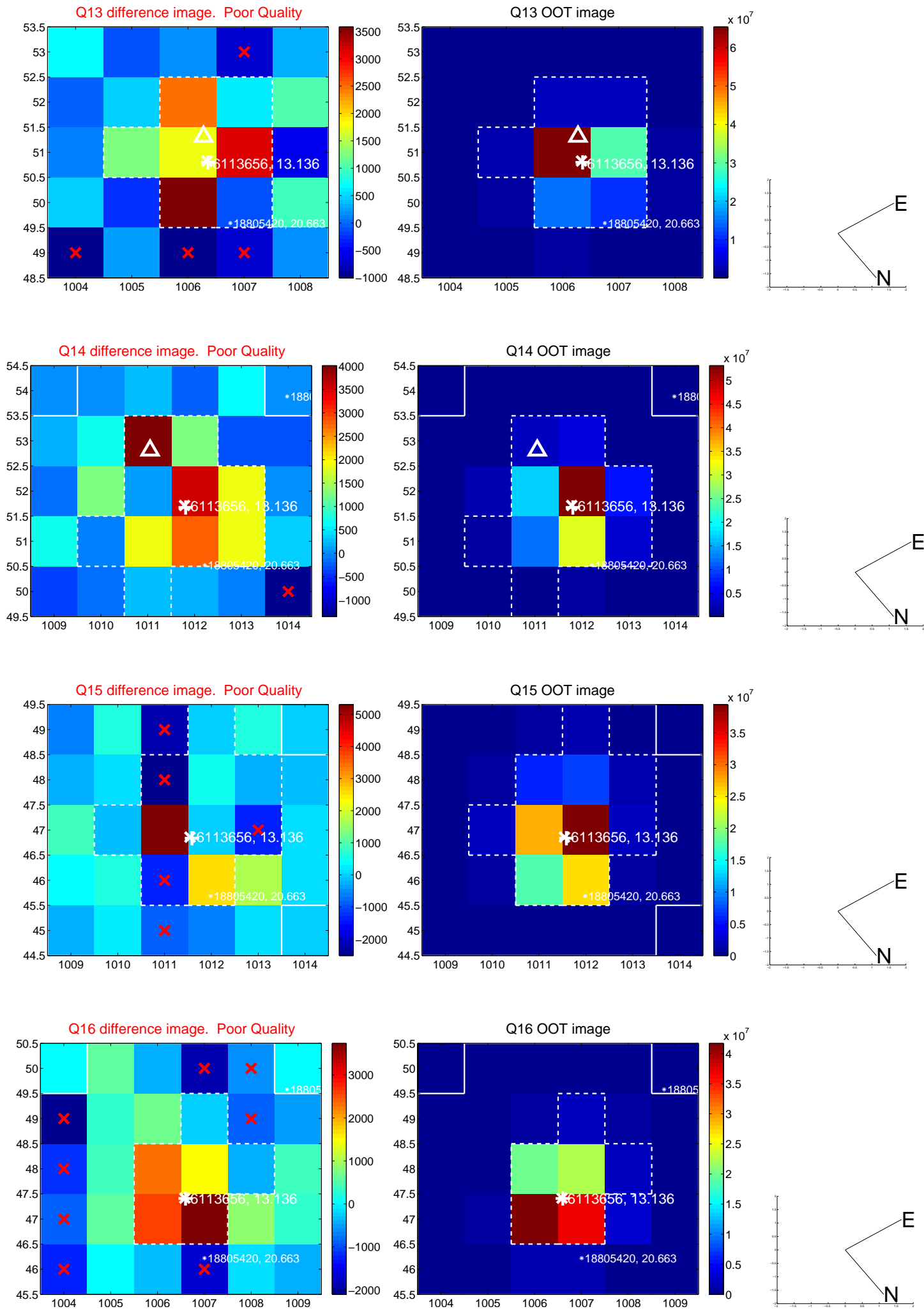




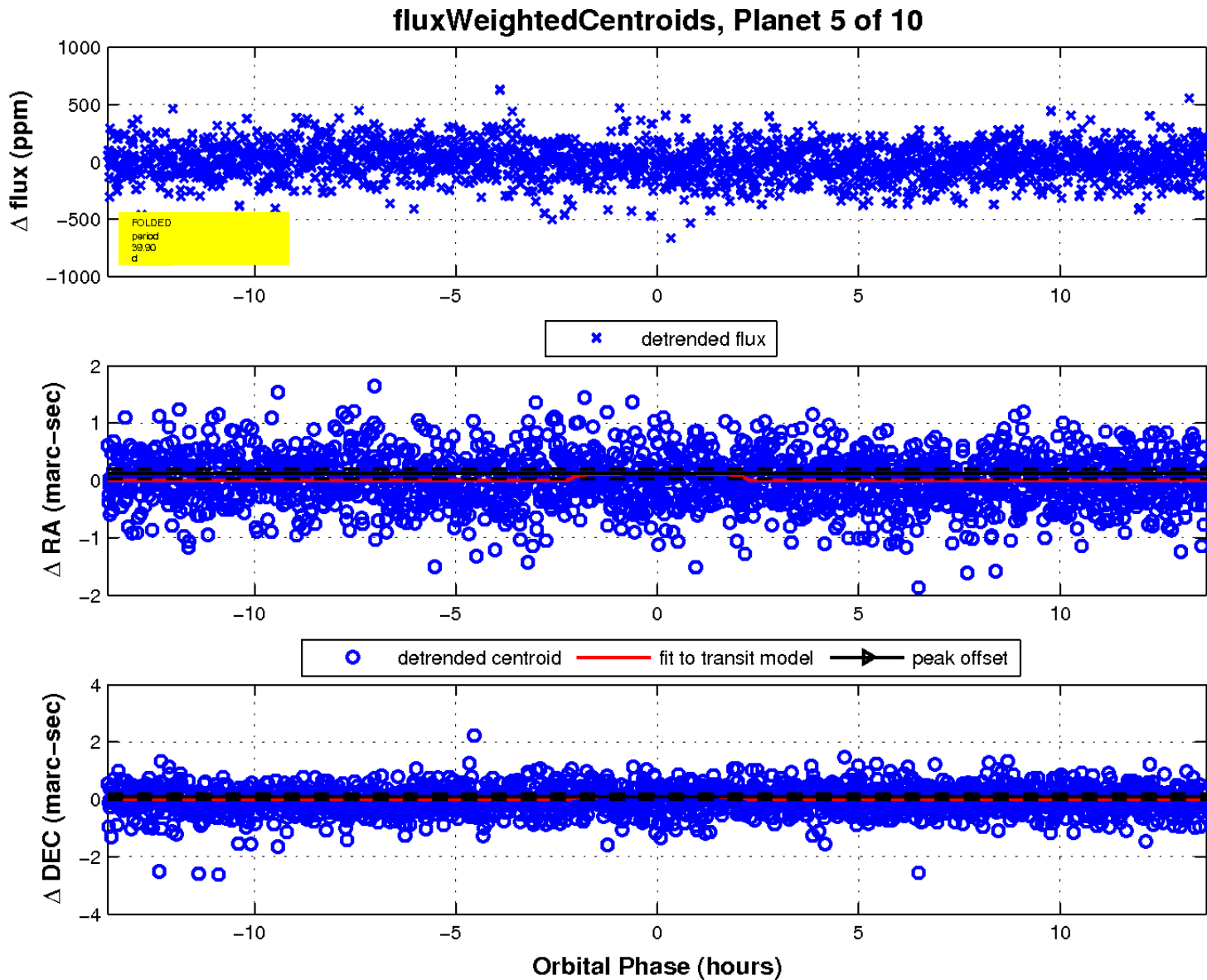
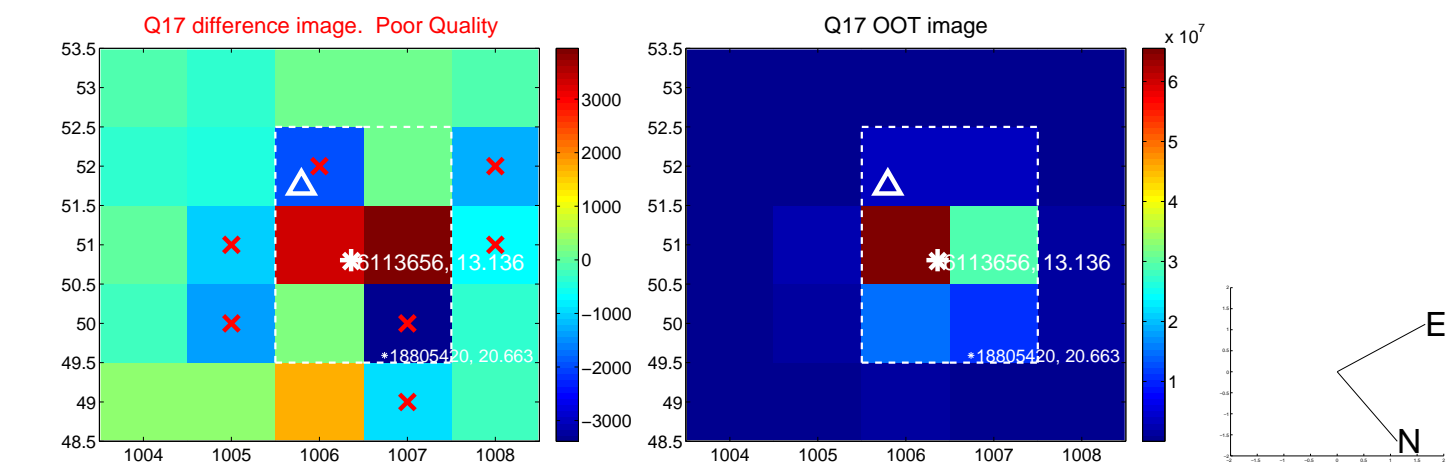
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

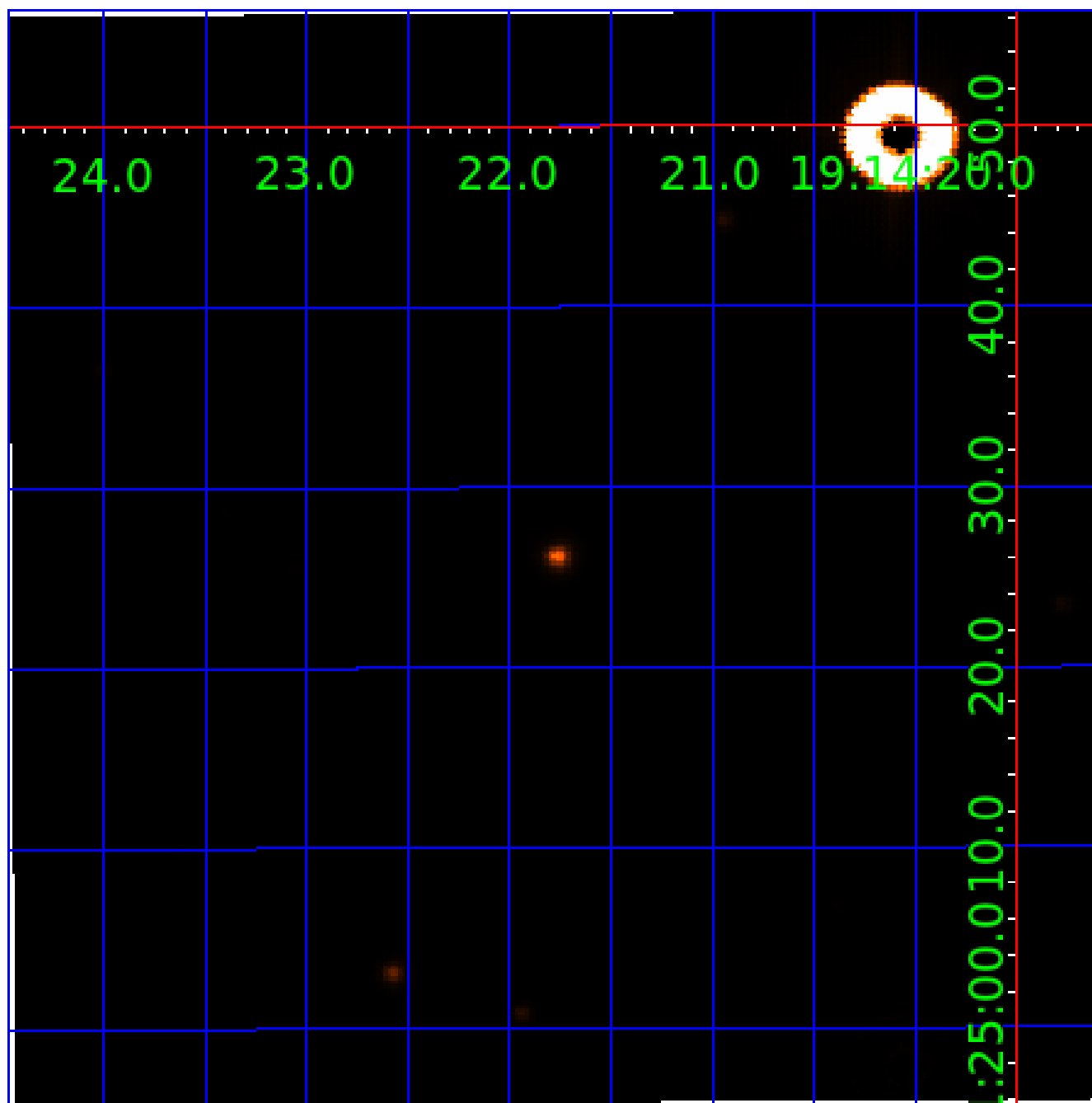


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006113656

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113656-01	OBS	No	2.646238	132.447489	5.6	18.121	11.4	3.0	1.88	7266	0.46	4677.99
006113656-02	OBS	No	58.535580	182.791356	207.4	17.532	46.1	7.6	1.88	7266	5.23	75.34
006113656-03	OBS	No	54.788959	170.151339	184.7	12.850	20.9	9.7	1.88	7266	2.58	82.28
006113656-04	OBS	No	44.294861	175.427489	174.4	6.797	11.3	10.5	1.88	7266	2.78	109.25
006113656-05	OBS	No	39.904031	136.547656	166.1	4.552	11.1	10.6	1.88	7266	2.77	125.57
006113656-06	OBS	No	57.280460	137.501760	190.8	6.317	11.1	11.6	1.88	7266	2.88	77.55
006113656-07	OBS	No	62.394926	153.799040	161.0	11.070	11.8	8.4	1.88	7266	2.70	69.19
006113656-08	OBS	No	30.838567	148.567220	249.9	2.104	10.9	10.1	1.88	7266	3.01	177.05
006113656-09	OBS	No	30.832288	161.442836	130.4	9.084	9.9	10.9	1.88	7266	2.38	177.10
006113656-10	OBS	No	15.974468	134.165876	100.7	9.468	10.0	7.9	1.88	7266	2.01	425.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113656-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
006113656-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
006113656-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
006113656-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

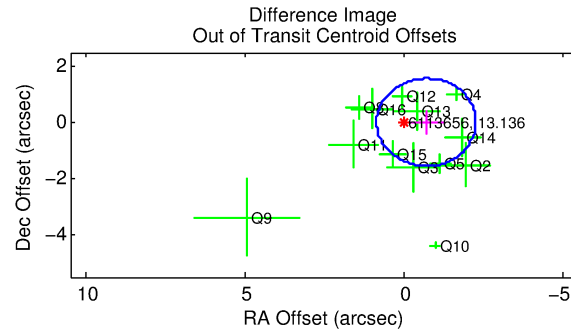
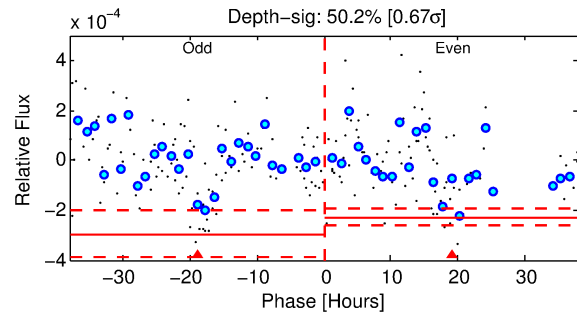
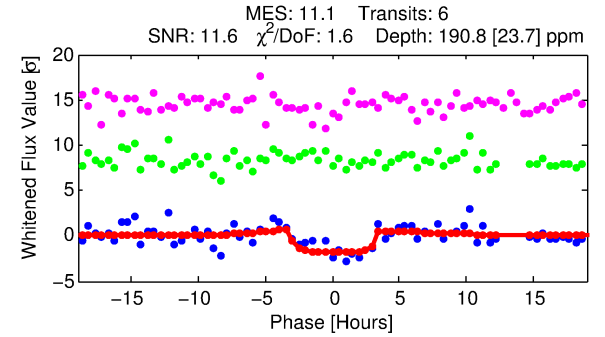
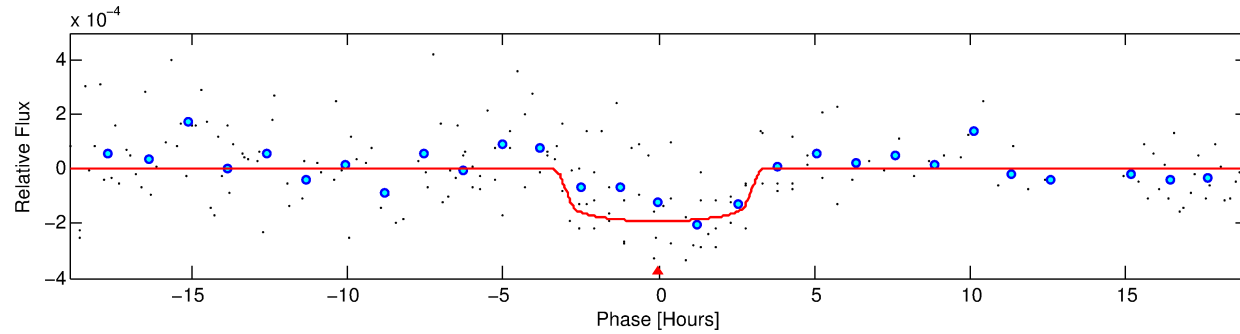
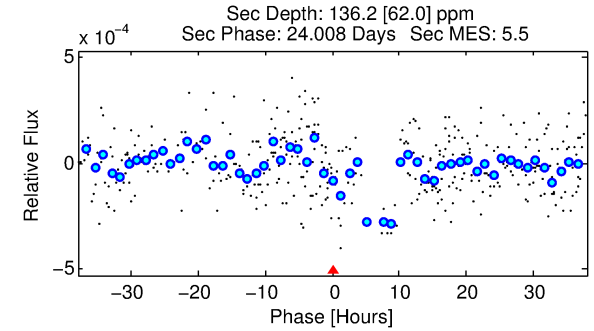
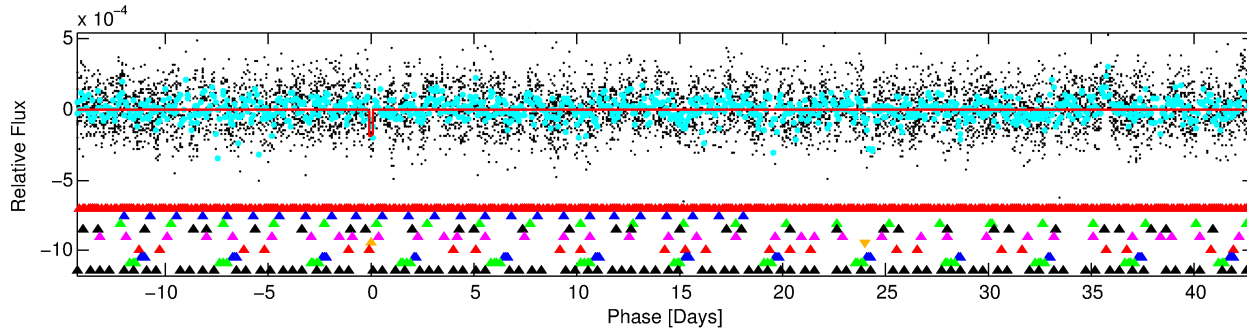
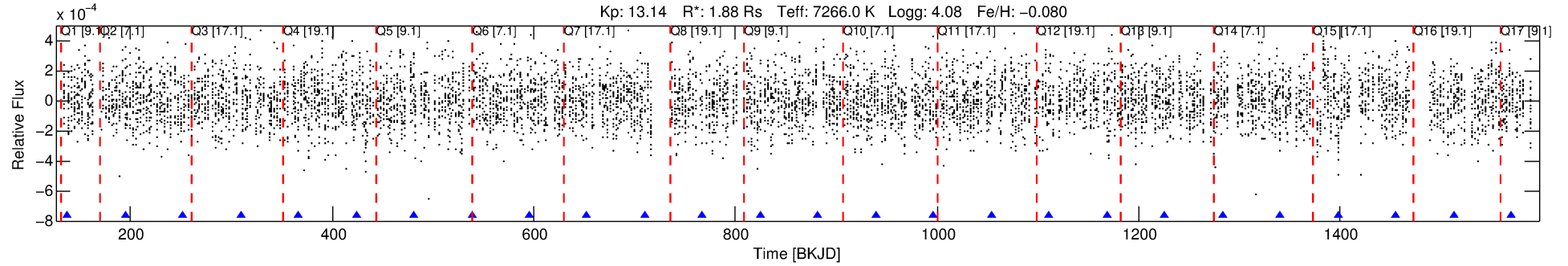
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006113656-06

No Significant Match Found

# DV One-Page Summary

KIC: 6113656 Candidate: 6 of 10 Period: 57.280 d



## DV Fit Results:

Period = 57.28046 [0.00093] d  
Epoch = 137.5018 [0.0143] BKJD  
Rp/R\* = 0.0141 [0.0058]  
a/R\* = 40.88 [104.11]  
b = 0.82 [0.98]  
Seff = 77.55 [28.45]  
Teq = 757 [69] K  
Rp = 2.88 [1.44] Re  
a = 0.3367 [0.0777] AU  
Ag = 1022.07 [1014.08] [1.01σ]  
Teffp = 6615 [1578] K [3.71σ]

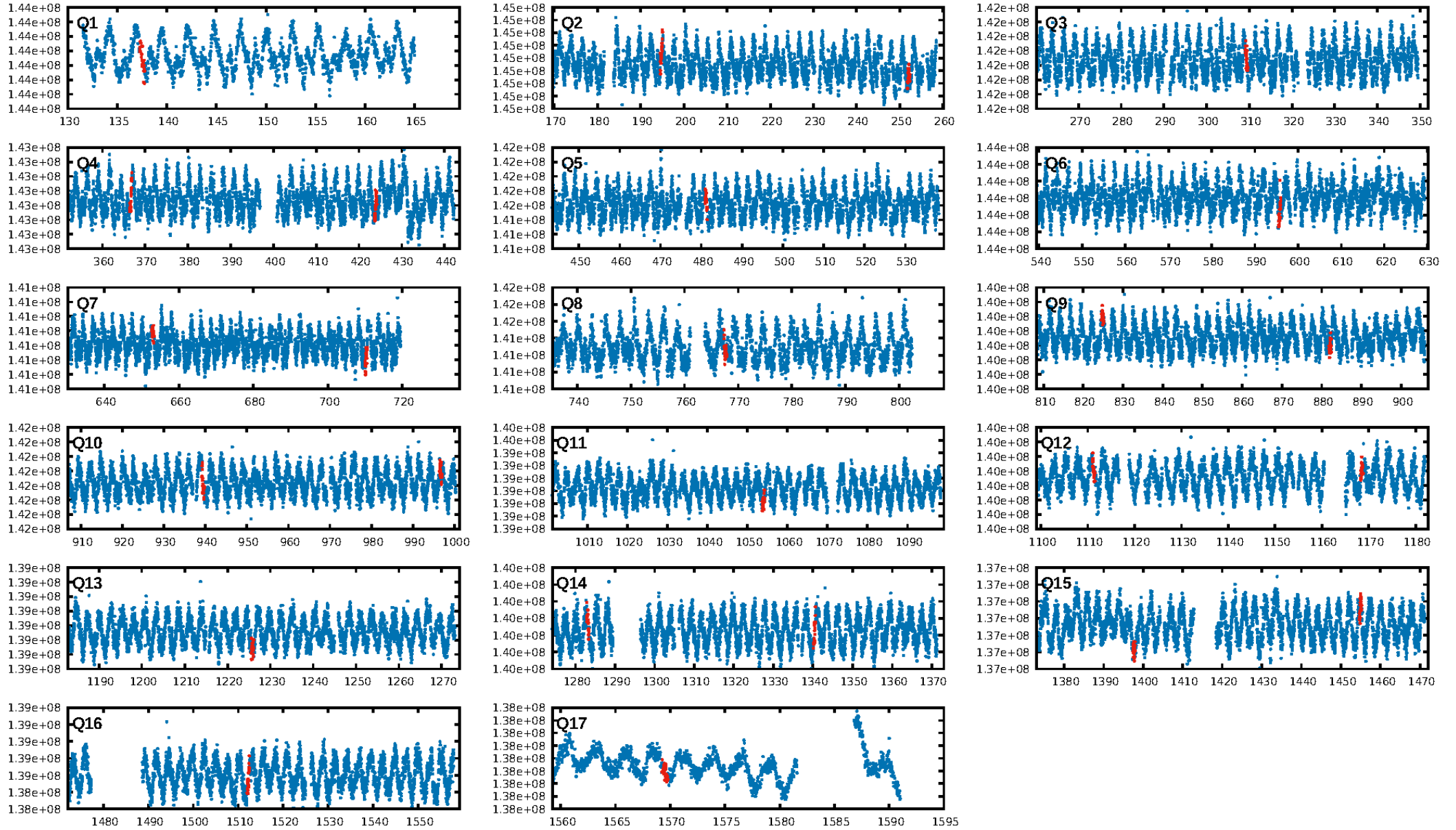
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.18σ]  
LongPeriod-sig: 89.4% [1.62σ]  
ModelChiSquare2-sig: 3.3%  
ModelChiSquareGof-sig: 98.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [6/6]  
GhostDiagnostic-chr: -0.6336  
Centroid-sig: 11.1%  
Centroid-so: 0.592 arcsec [1.24σ]  
OotOffset-rm: 0.695 arcsec [1.34σ]  
OotOffset-st: 3/3/4/3 [13]  
KicOffset-rm: 0.708 arcsec [1.35σ]  
KicOffset-st: 3/3/4/3 [13]  
DiffImageQuality-fgm: 0.46 [6/13]  
DiffImageOverlap-fno: 0.29 [5/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:28 Z

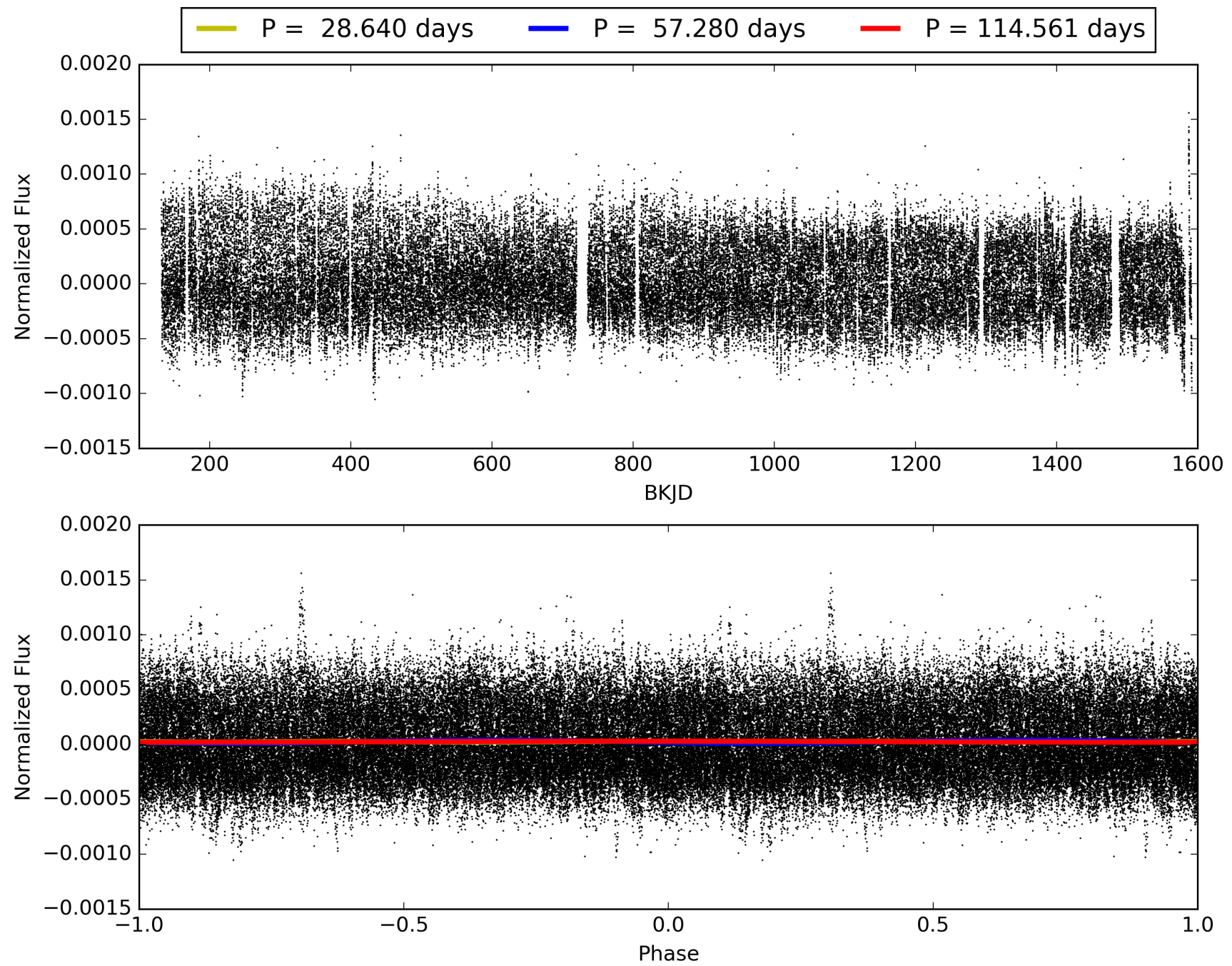
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006113656-06, PDC Light Curves



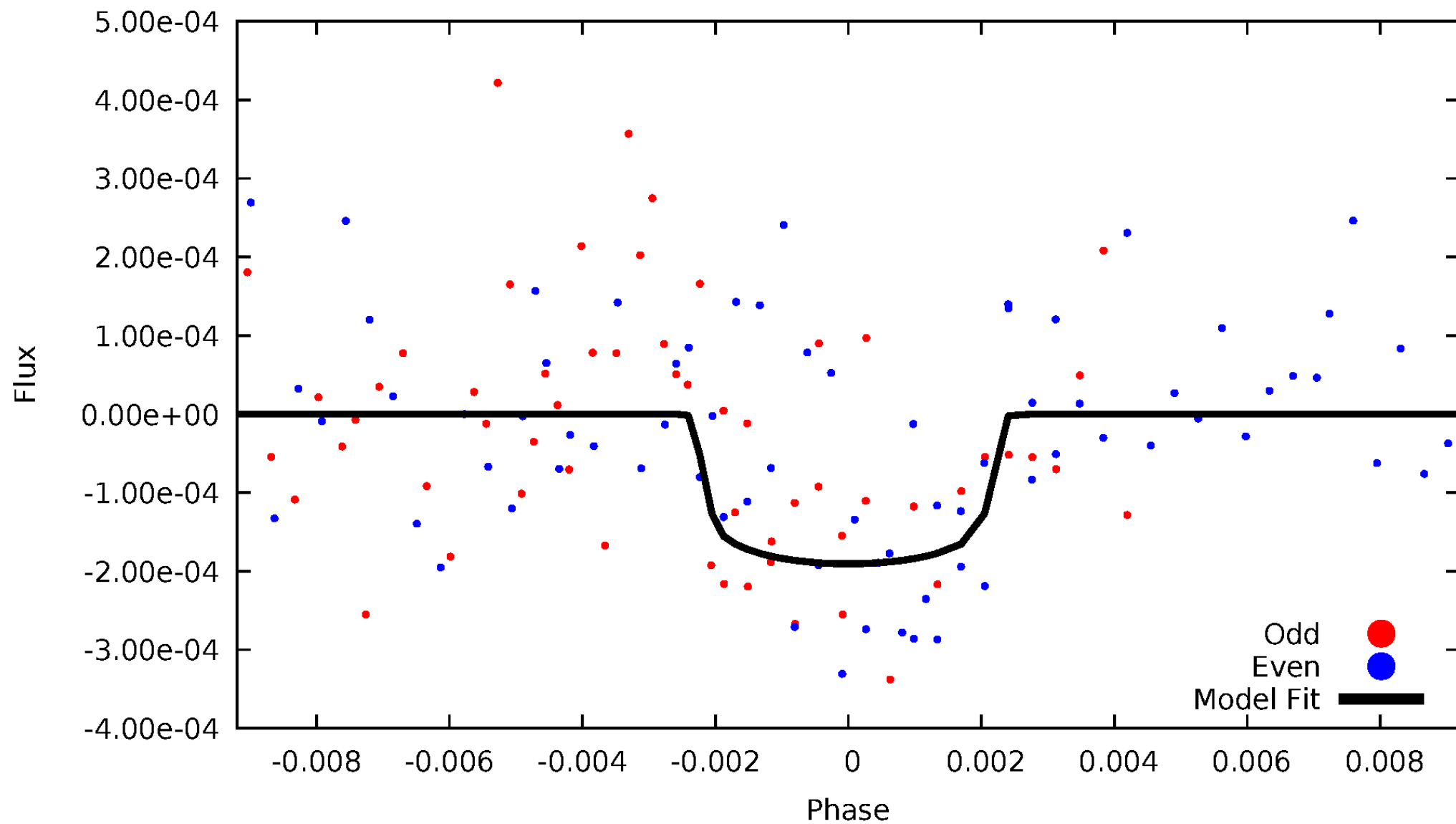


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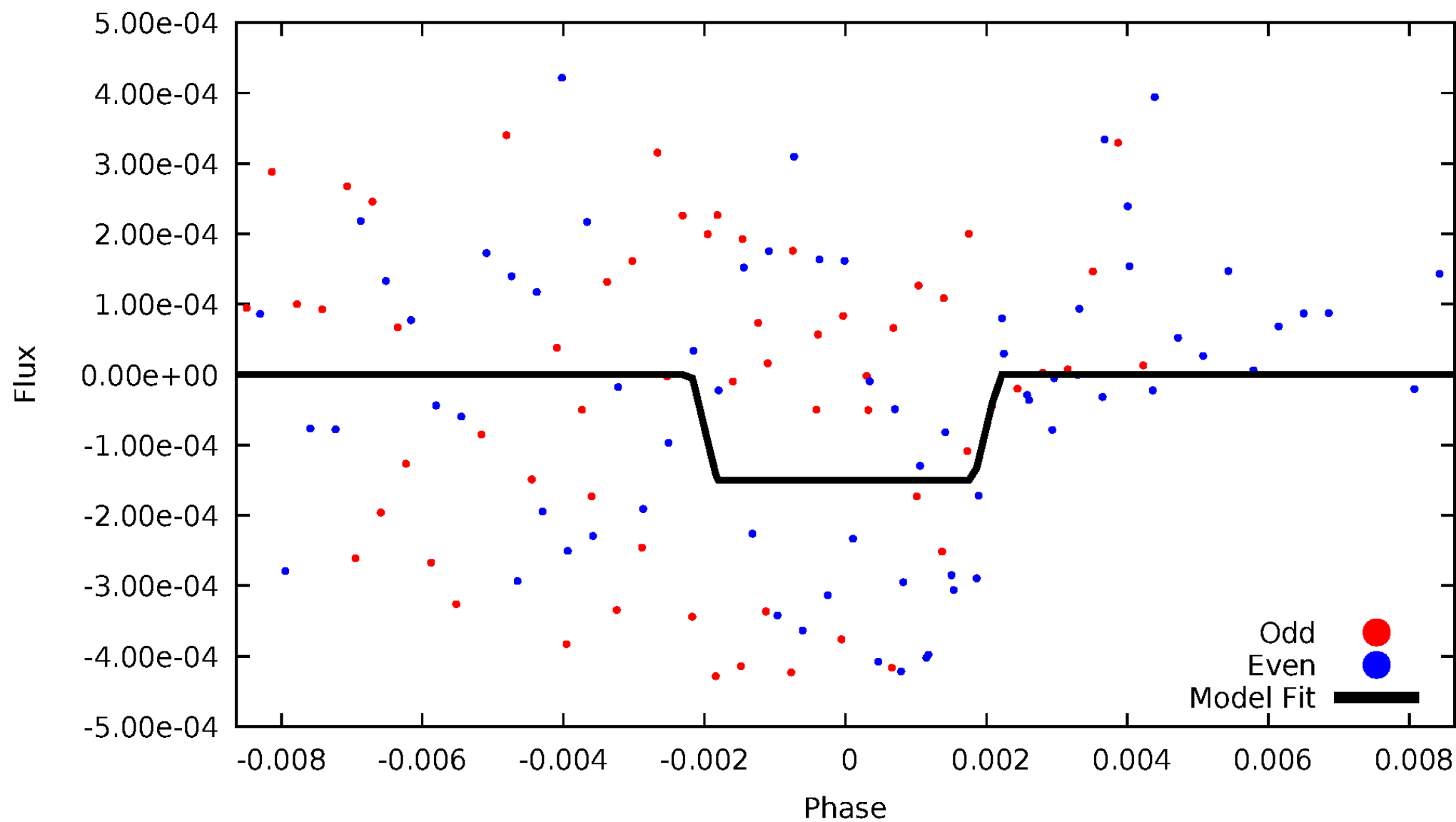
# DV Odd/Even

TCE 006113656-06



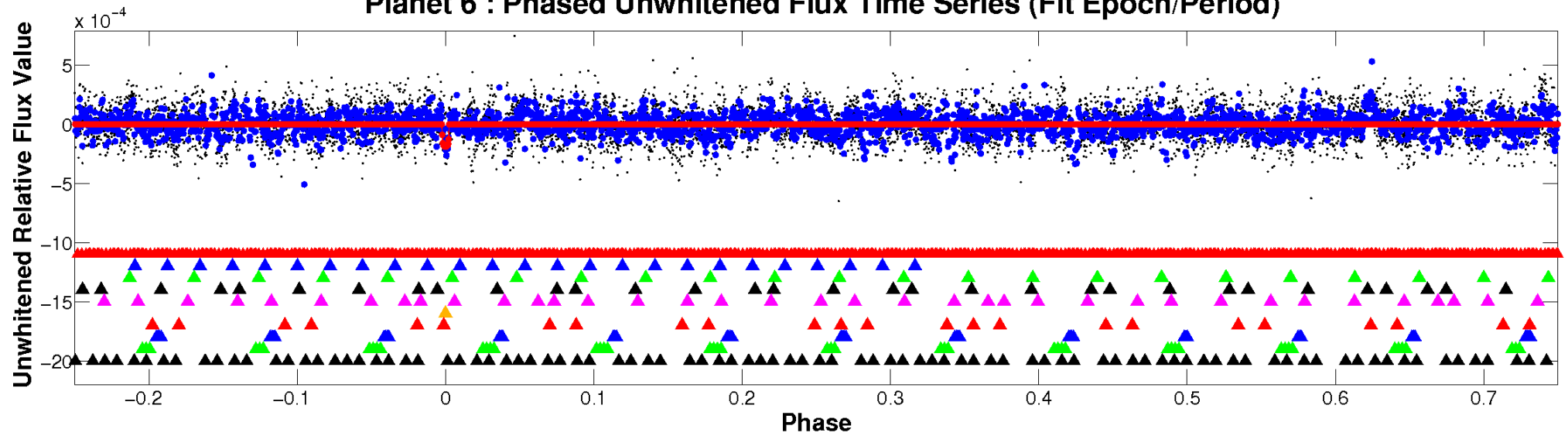
# ALT Odd/Even

TCE 006113656-06

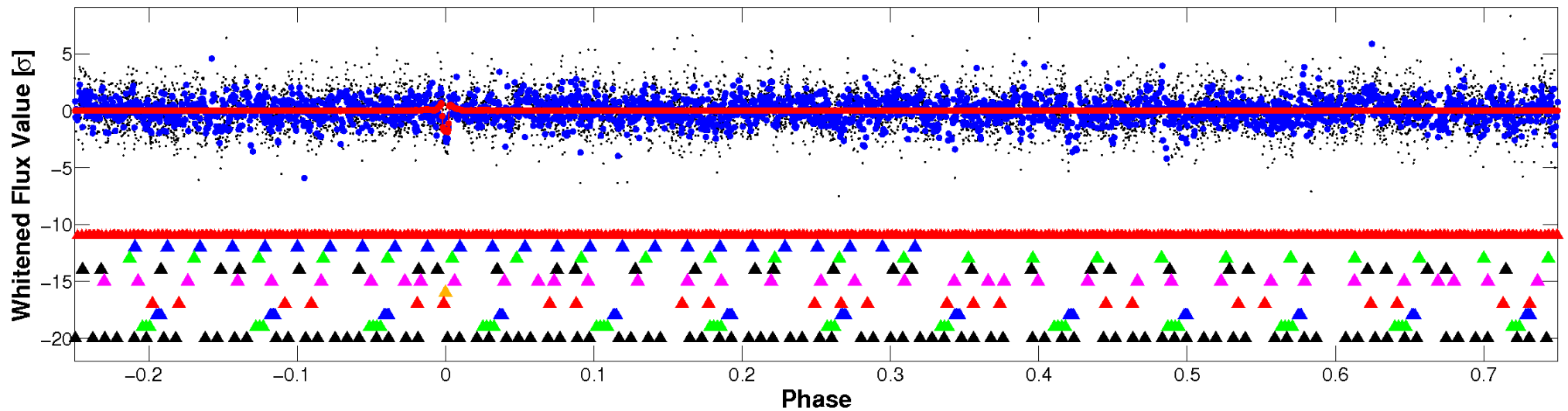


# Non-Whitened Vs. Whitened Light Curve

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

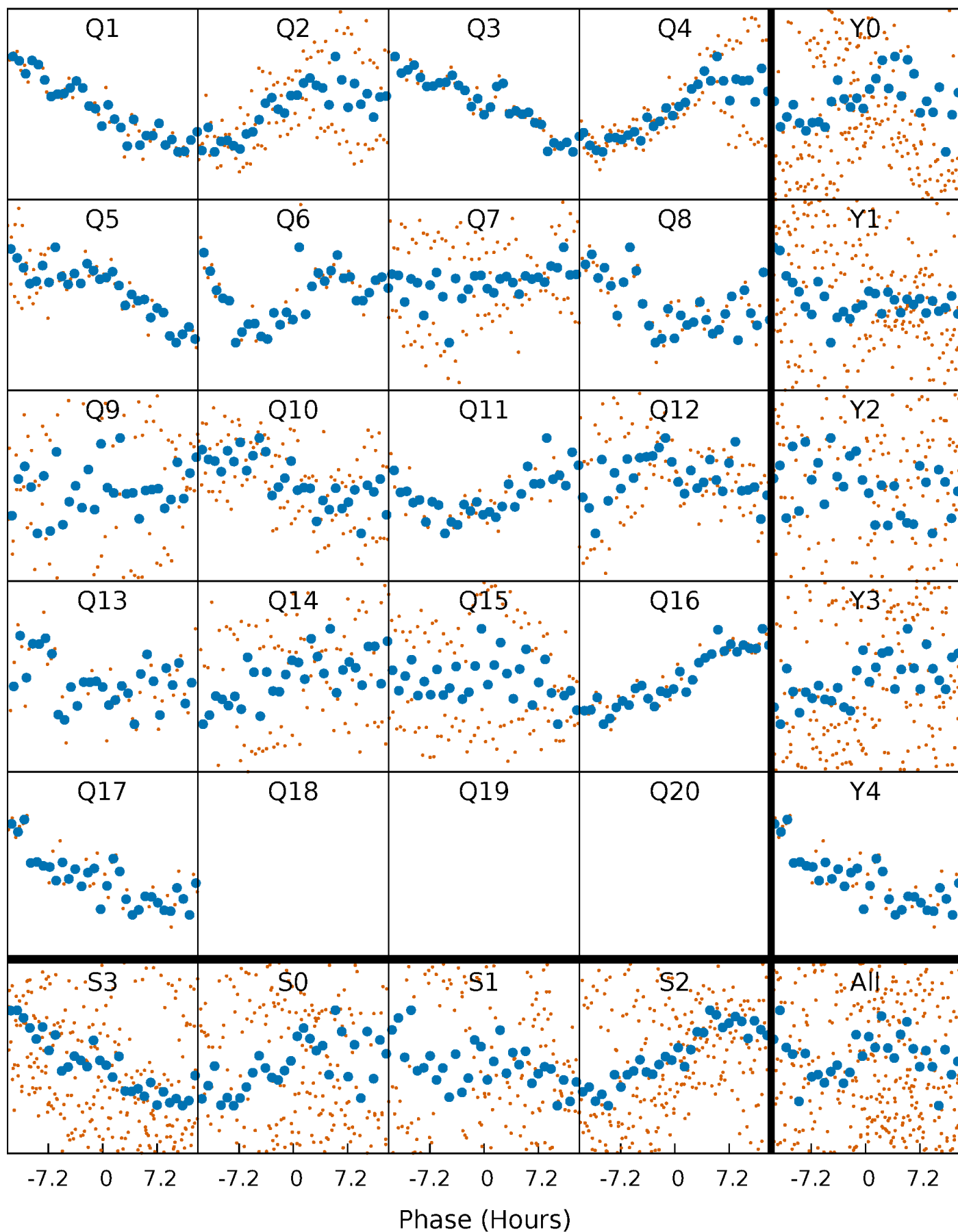


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



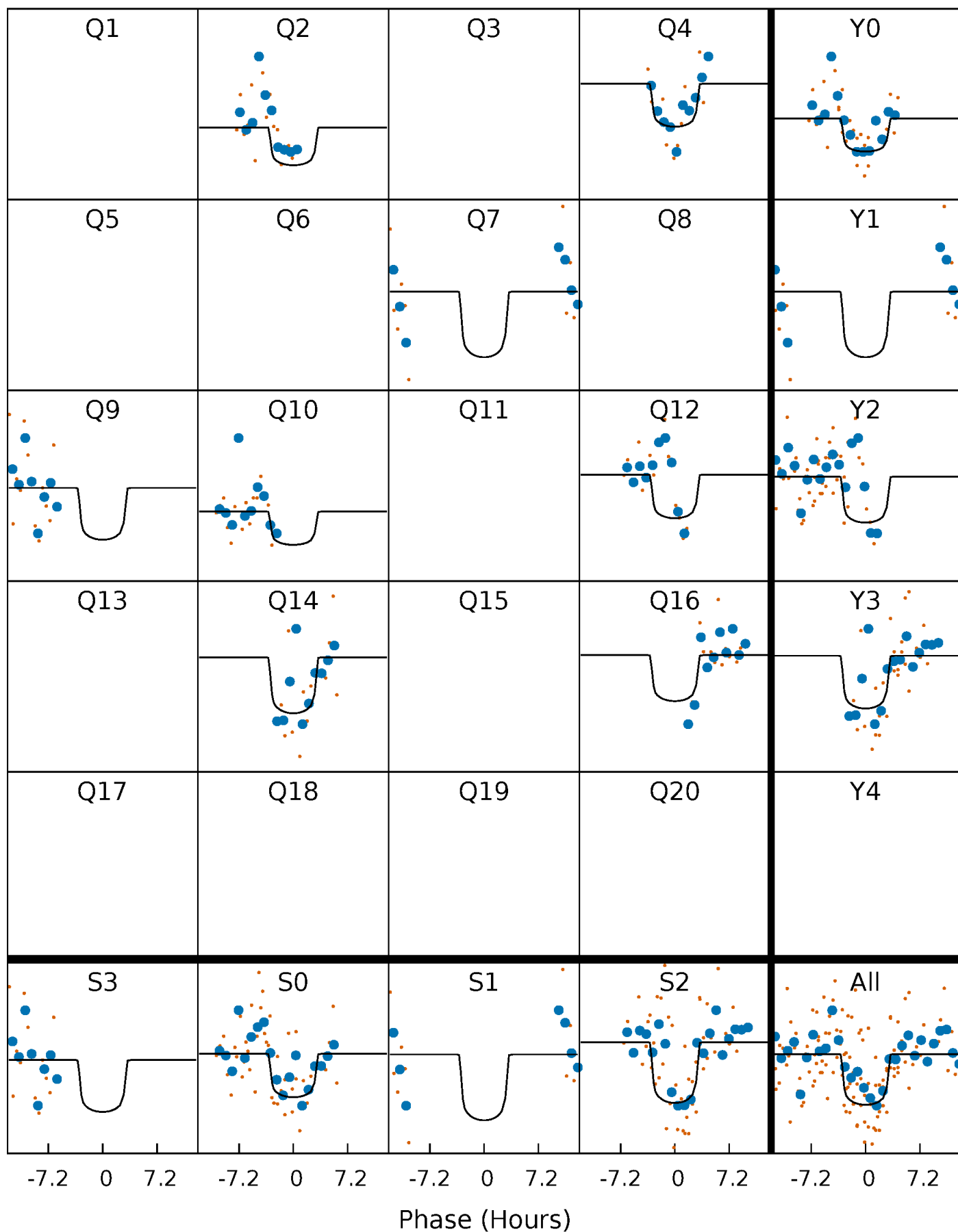
# PDC Quarter-Phased Transit Curves

TCE 006113656-06 P= 57.280460 Days  $T_0=137.501760$  (BKJD)



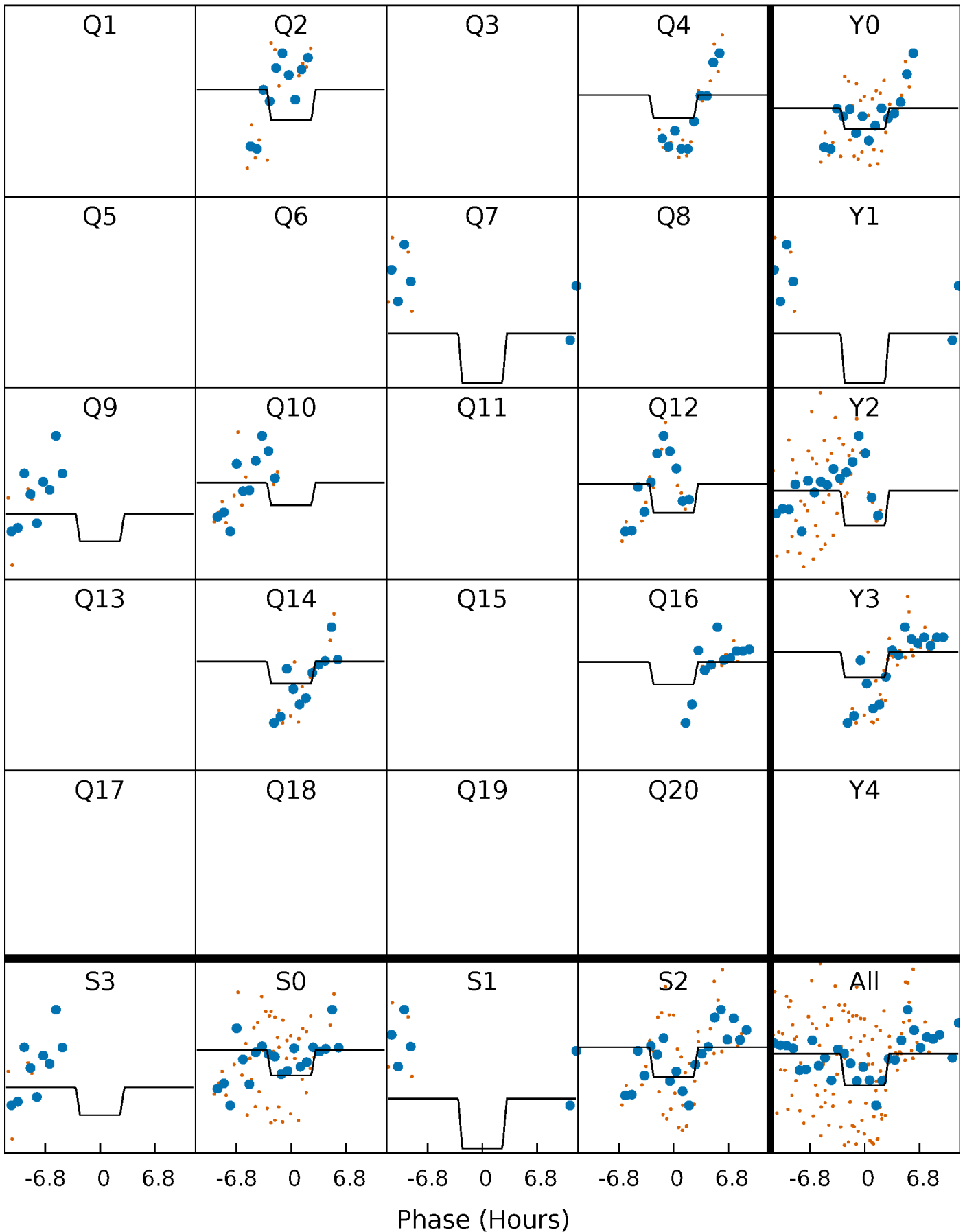
# DV Quarter-Phased Transit Curves

TCE 006113656-06 P= 57.280460 Days  $T_0=137.501760$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006113656-06 P= 57.284642 Days  $T_0=137.412334$  (BKJD)

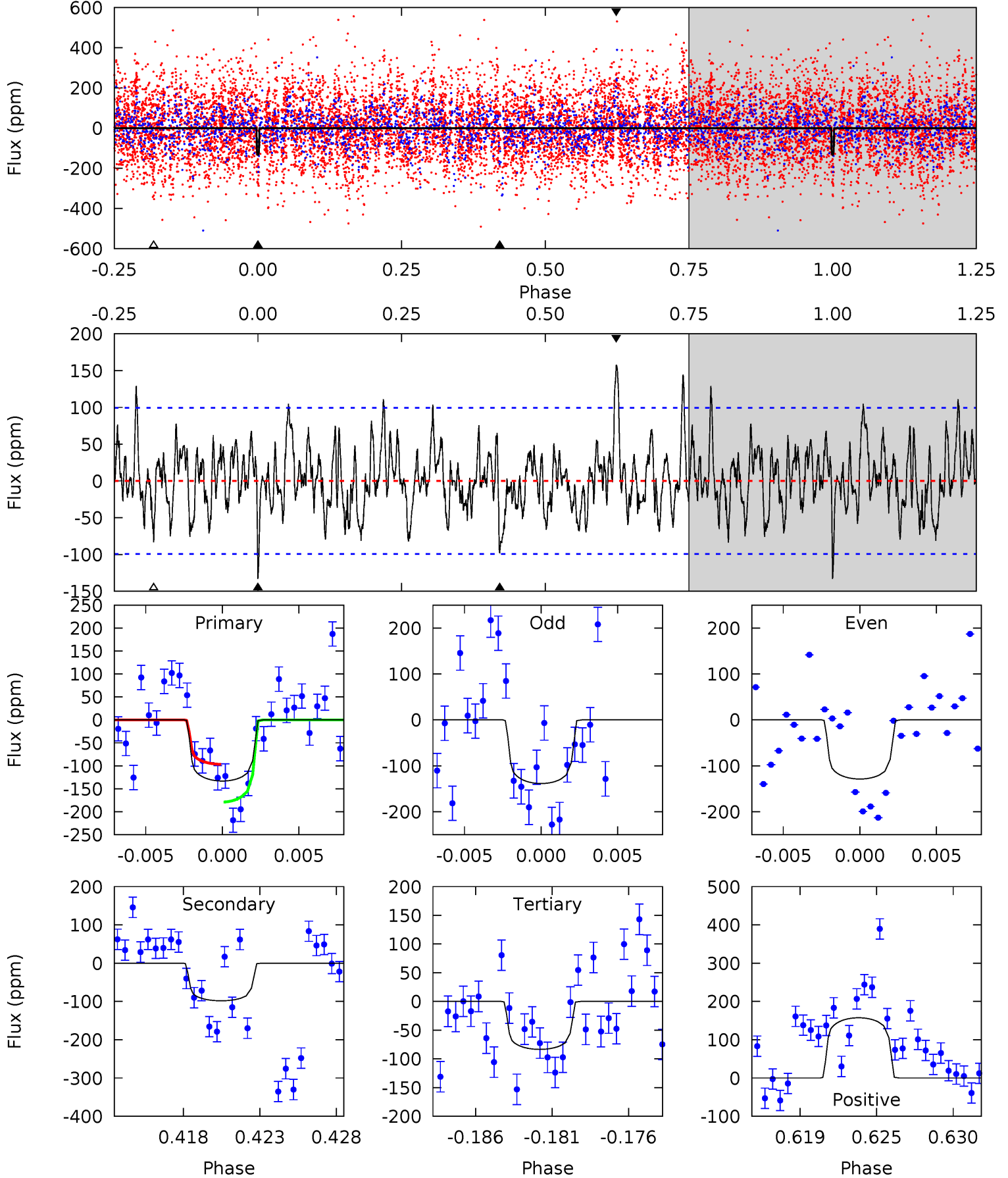




# DV Model-Shift Uniqueness Test

006113656-06, P = 57.280460 Days, E = 80.221300 Days

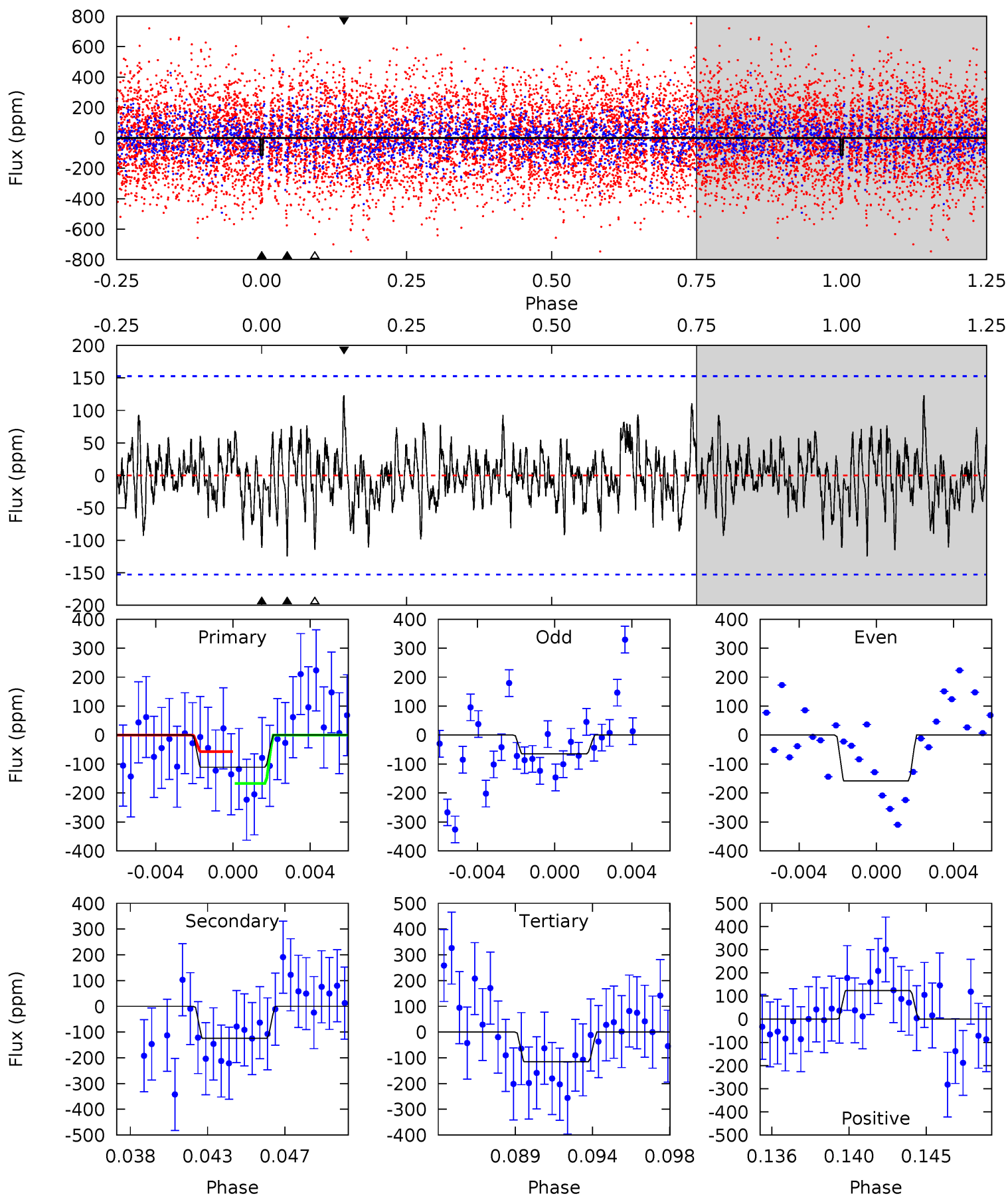
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.91	5.10	4.33	8.17	5.15	2.80	2.01	2.58	-1.26	0.77	-3.07	0.25	0.94	0.54	2.12



# Alt Model-Shift Uniqueness Test

006113656-06, P = 57.284642 Days, E = 80.127692 Days

Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.77	4.23	3.90	4.19	5.19	2.86	1.27	-0.13	-0.42	0.34	0.04	1.59	1.13	0.50	1.87



### Stellar Parameters For KIC 006113656

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-98 \pm 19$	$2.82^{+1.30}_{-1.09}$	$1051^{+77}_{-72}$	$5994^{+1798}_{-847}$	$758^{+1295}_{-407}$
Alt.	$-125 \pm 29$	$2.56^{+1.30}_{-1.14}$	$1054^{+77}_{-73}$	$6830^{+2702}_{-1266}$	$1191^{+2568}_{-680}$

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

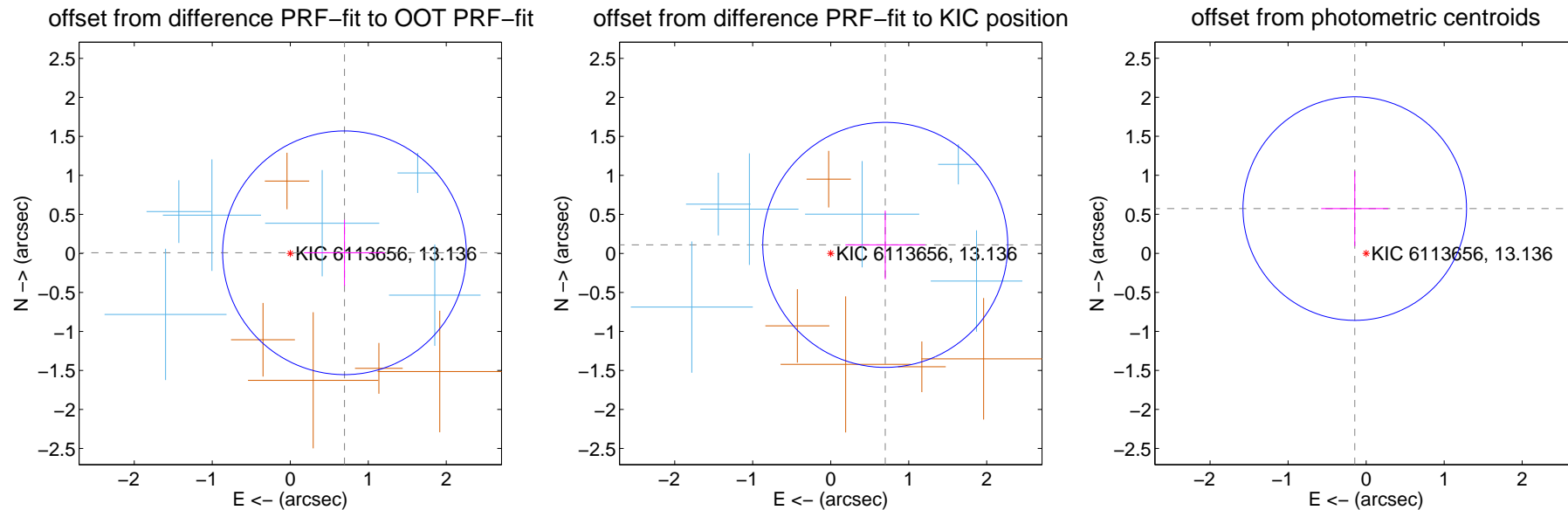
## DV Centroid Data

Supplemental centroid analysis for 006113656-06. Kepler magnitude: 13.14. Transit SNR 11.57

There are 6 quarters with good PRF difference image offsets

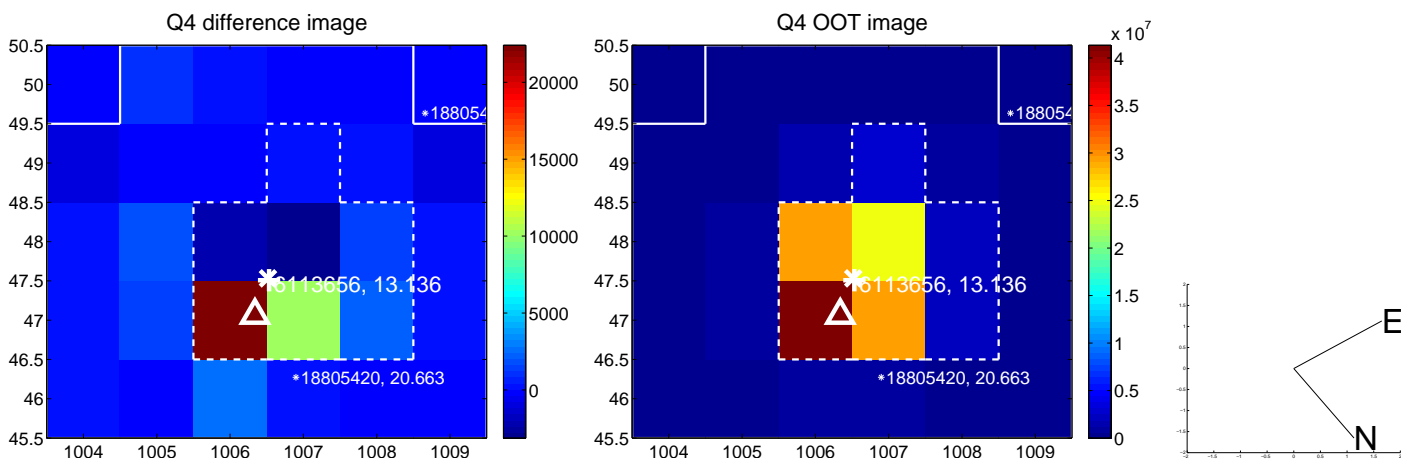
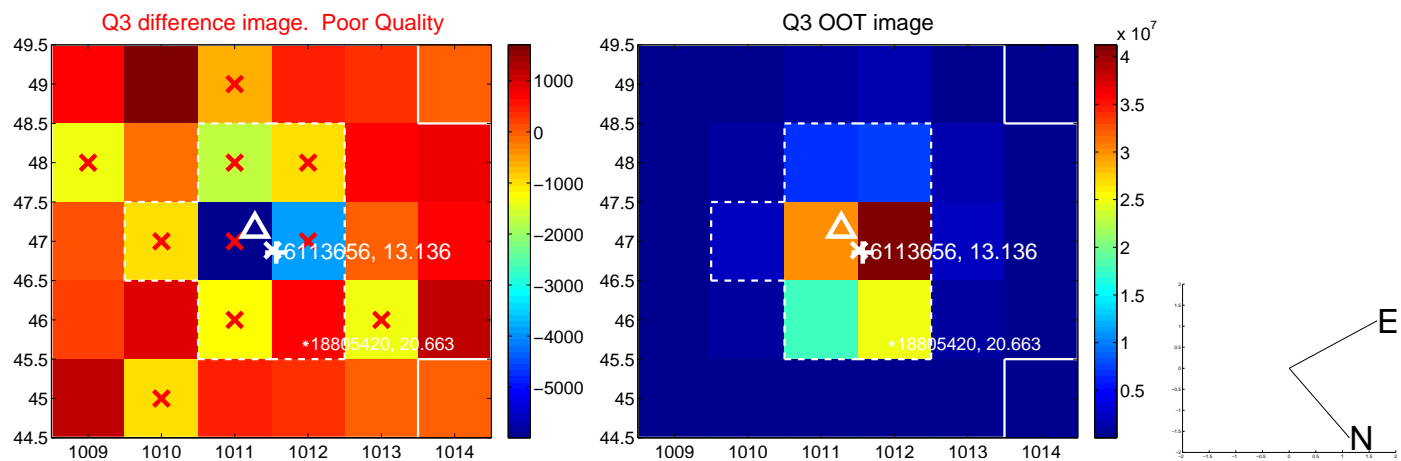
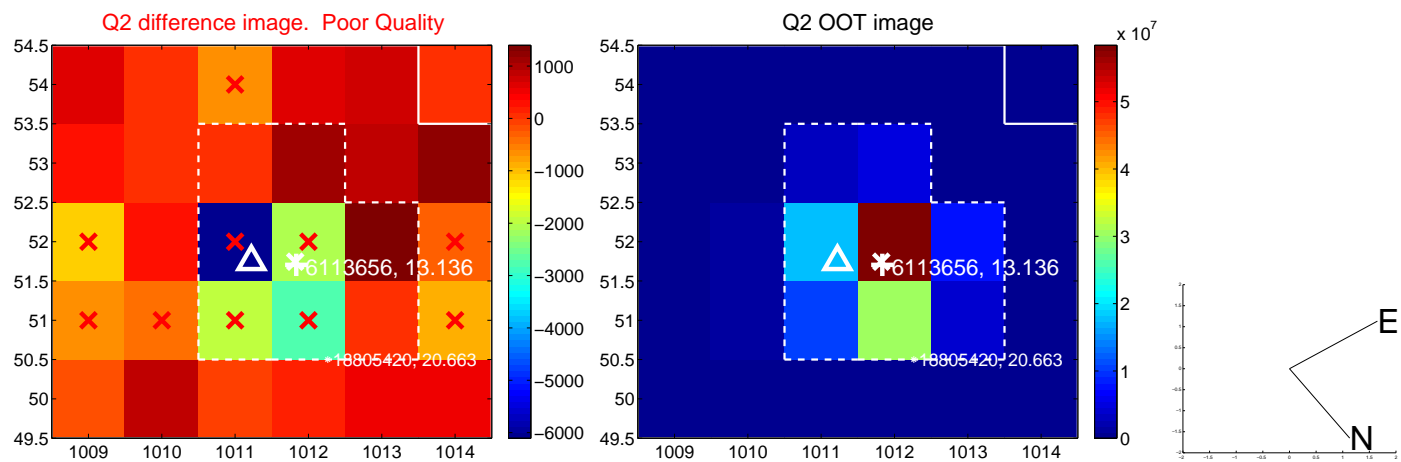
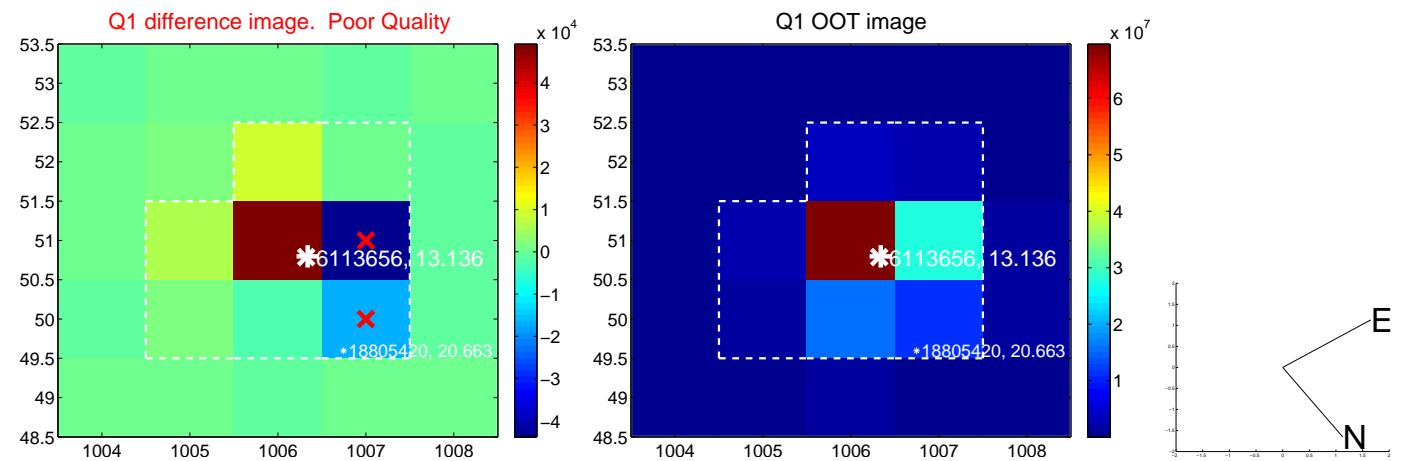
The direct PRF centroid is offset from the target star catalog position by about 0.09 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.695 \pm 0.521$	1.34	$-0.695 \pm 0.519$	$0.008 \pm 0.423$
PRF-fit source offset from KIC position	$0.708 \pm 0.523$	1.35	$-0.699 \pm 0.511$	$0.109 \pm 0.440$
photometric centroid source offset	$0.59 \pm 0.48$	1.24	$0.15 \pm 0.43$	$0.57 \pm 0.48$

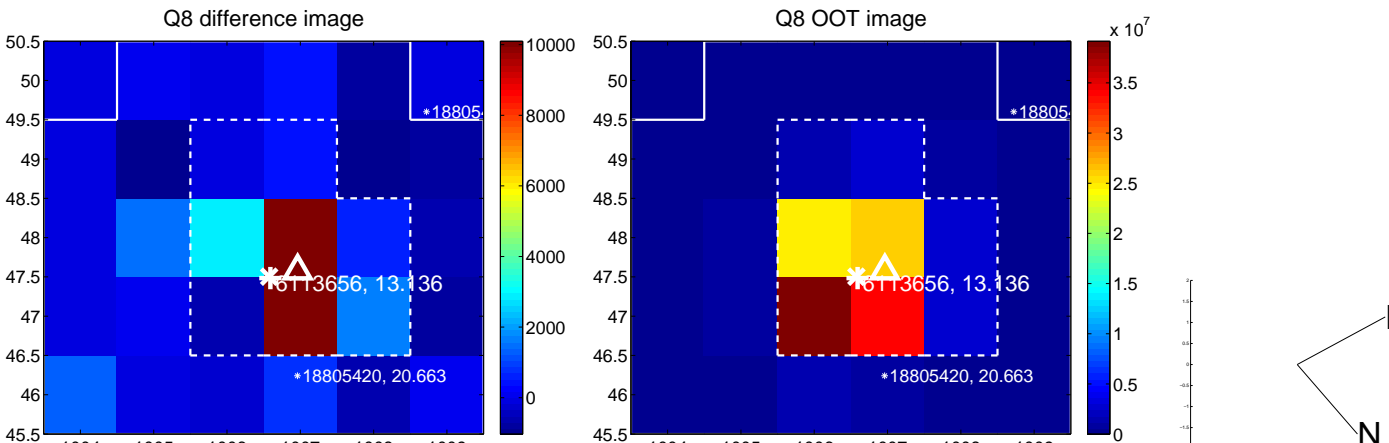
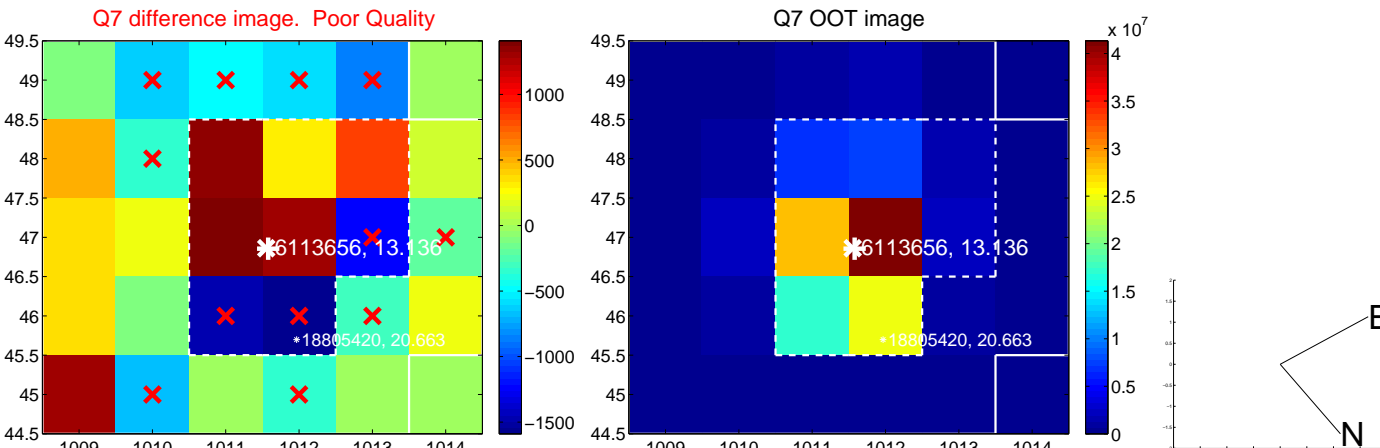
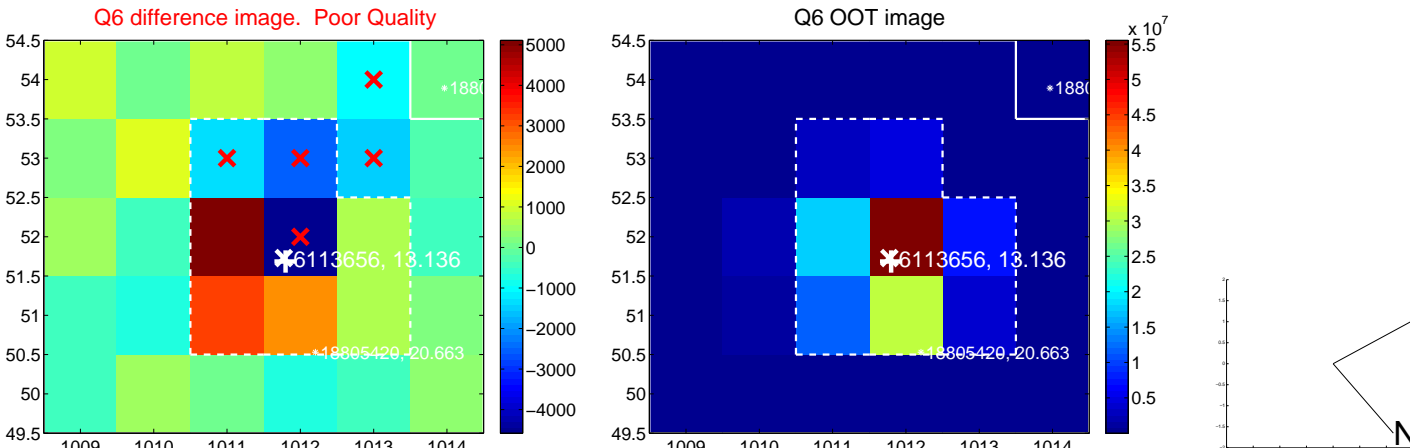
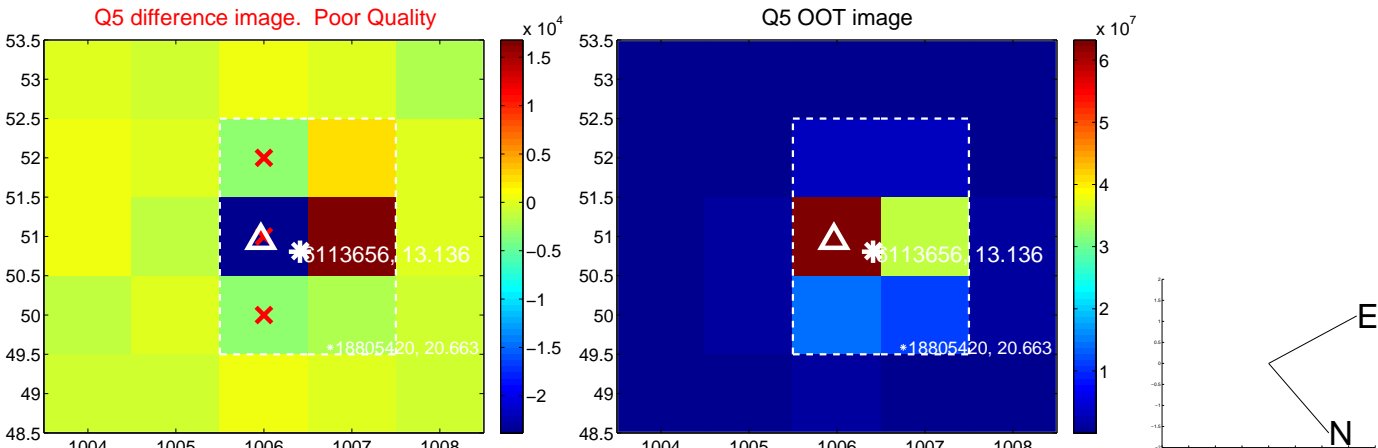


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

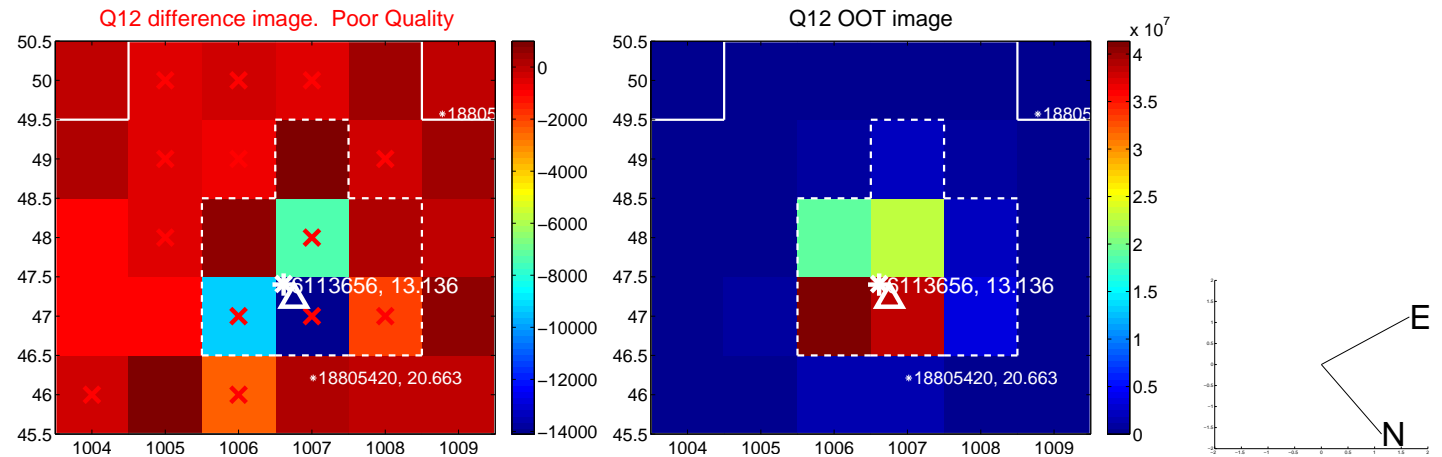
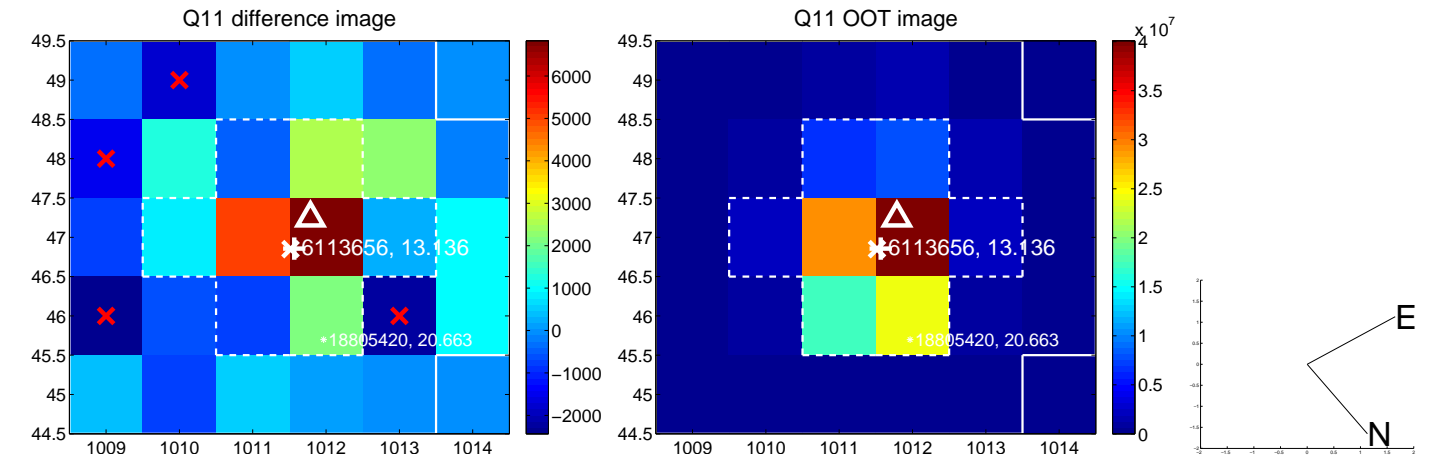
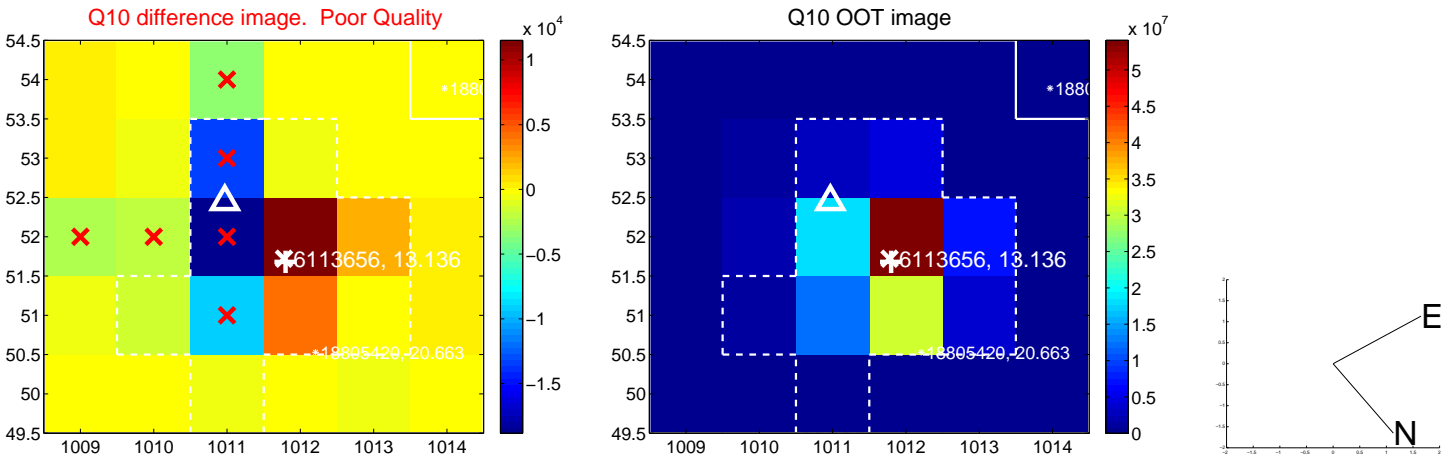
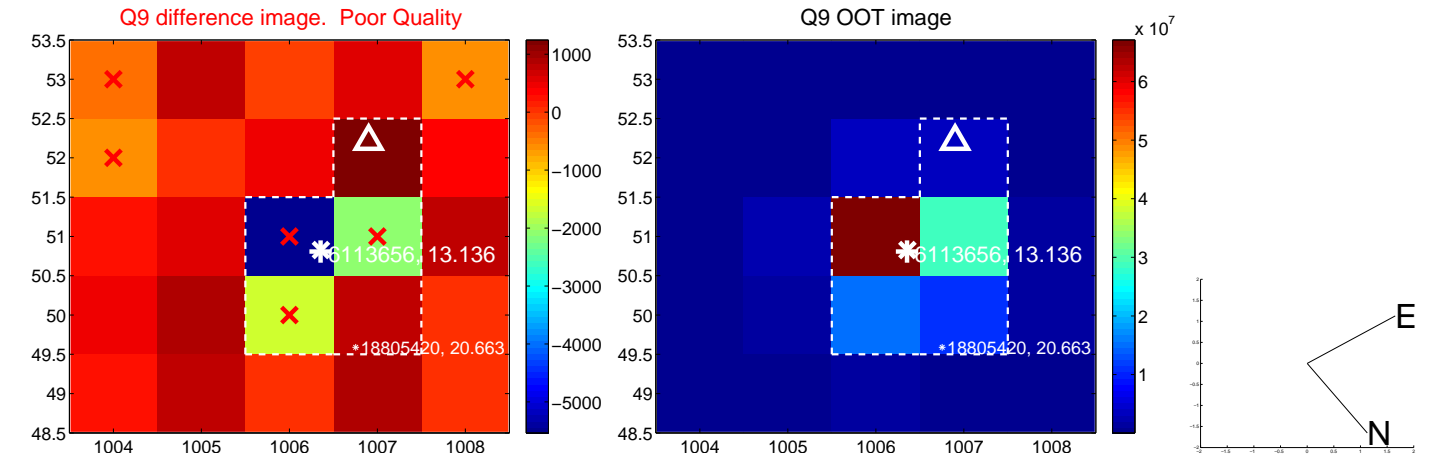
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

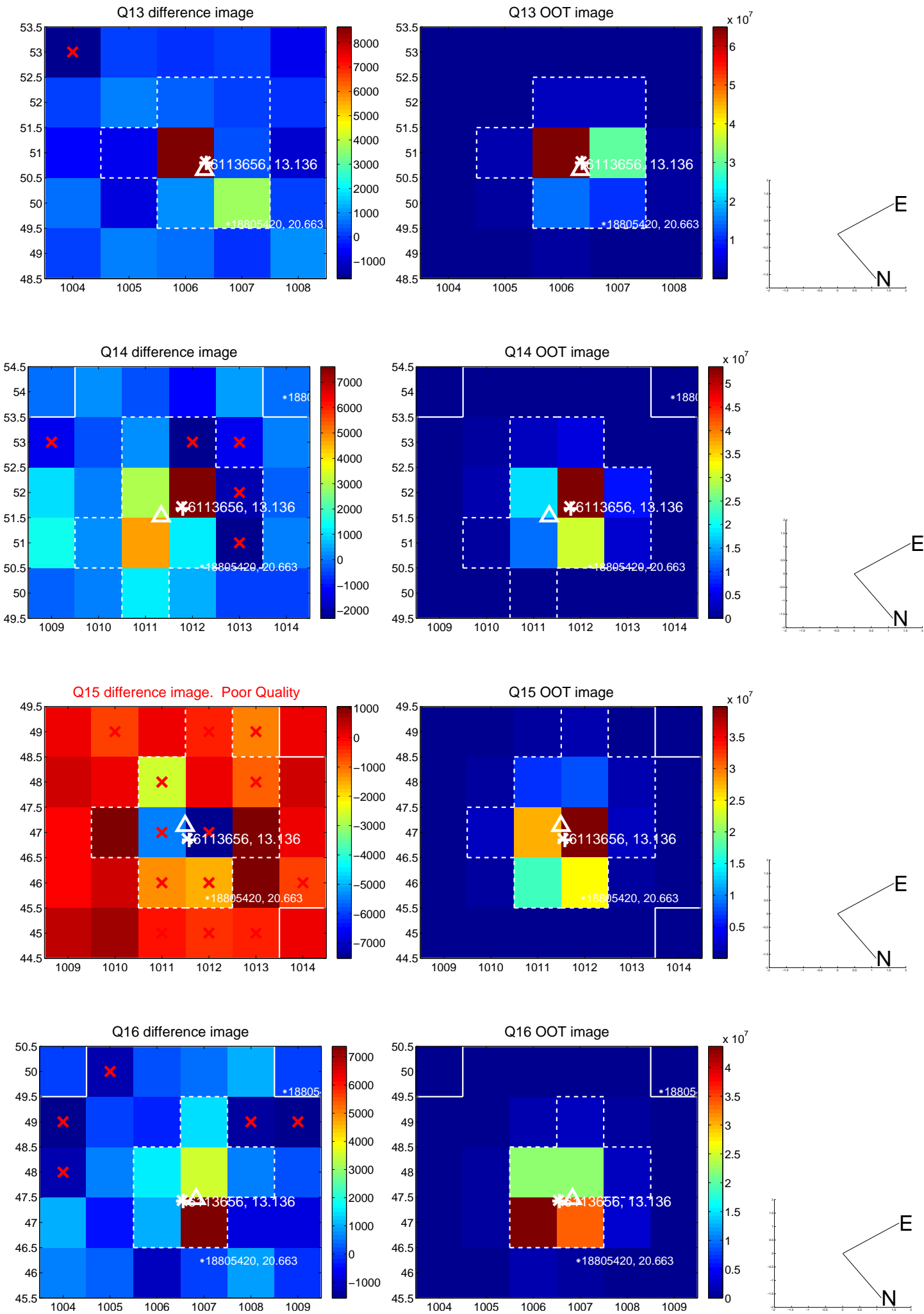


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

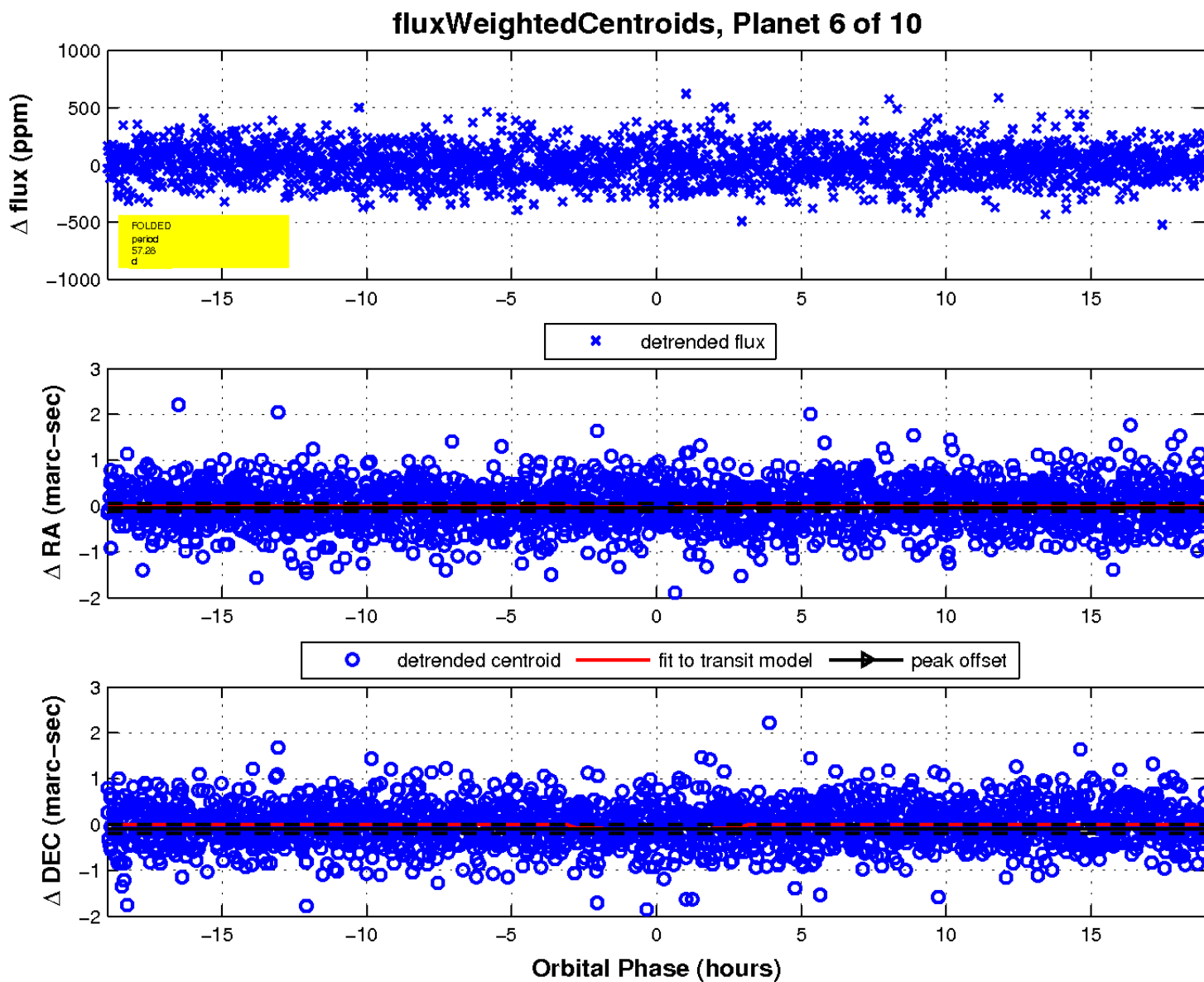
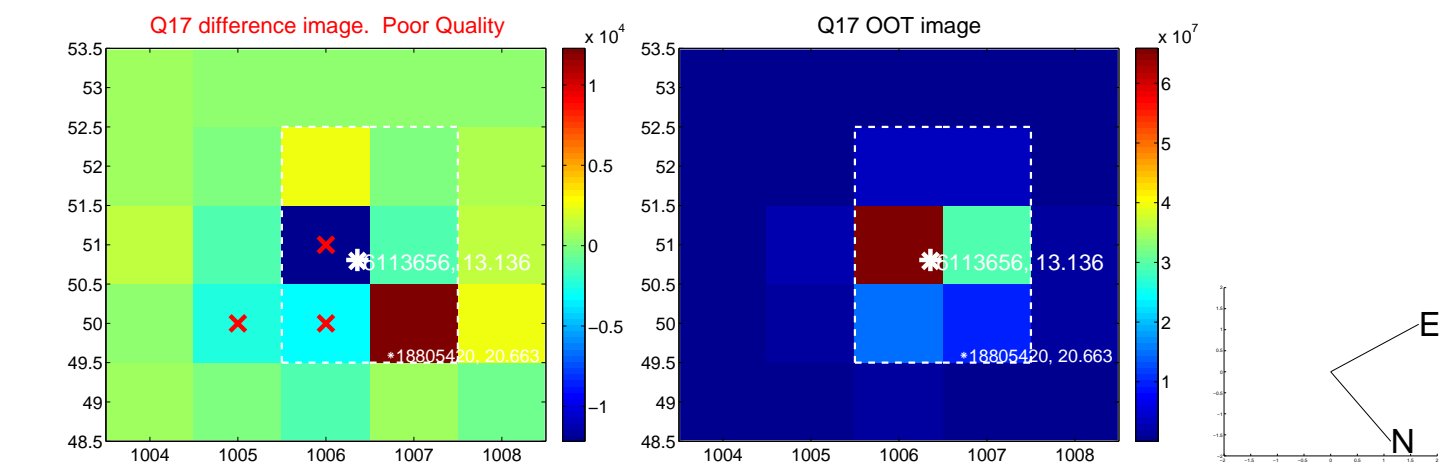




white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

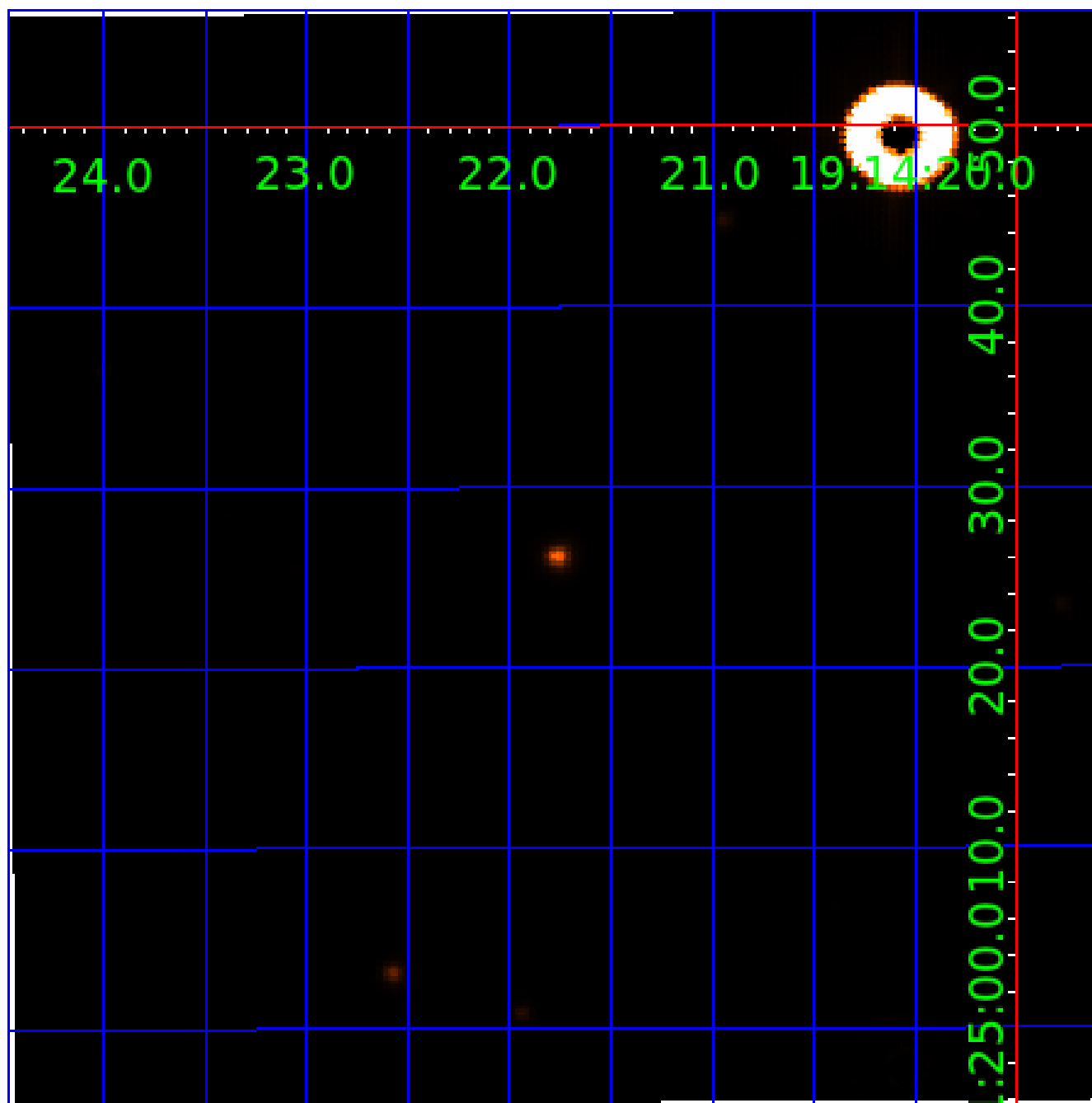


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



# KIC 006113656

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113656-01	OBS	No	2.646238	132.447489	5.6	18.121	11.4	3.0	1.88	7266	0.46	4677.99
006113656-02	OBS	No	58.535580	182.791356	207.4	17.532	46.1	7.6	1.88	7266	5.23	75.34
006113656-03	OBS	No	54.788959	170.151339	184.7	12.850	20.9	9.7	1.88	7266	2.58	82.28
006113656-04	OBS	No	44.294861	175.427489	174.4	6.797	11.3	10.5	1.88	7266	2.78	109.25
006113656-05	OBS	No	39.904031	136.547656	166.1	4.552	11.1	10.6	1.88	7266	2.77	125.57
006113656-06	OBS	No	57.280460	137.501760	190.8	6.317	11.1	11.6	1.88	7266	2.88	77.55
006113656-07	OBS	No	62.394926	153.799040	161.0	11.070	11.8	8.4	1.88	7266	2.70	69.19
006113656-08	OBS	No	30.838567	148.567220	249.9	2.104	10.9	10.1	1.88	7266	3.01	177.05
006113656-09	OBS	No	30.832288	161.442836	130.4	9.084	9.9	10.9	1.88	7266	2.38	177.10
006113656-10	OBS	No	15.974468	134.165876	100.7	9.468	10.0	7.9	1.88	7266	2.01	425.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113656-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
006113656-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
006113656-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
006113656-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

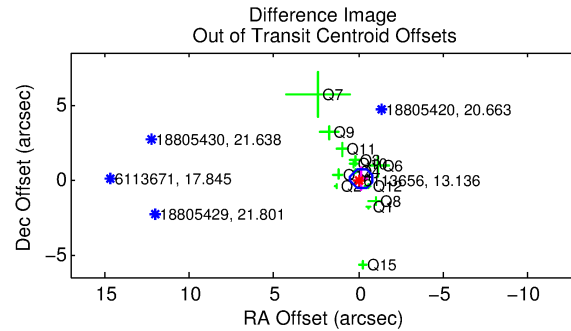
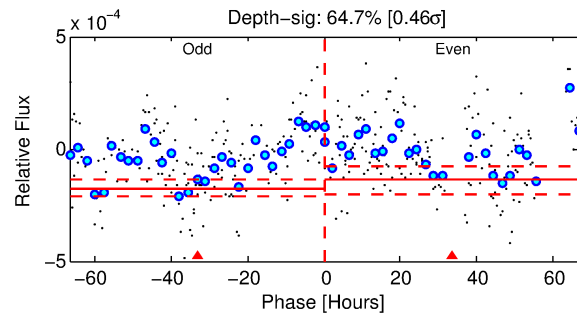
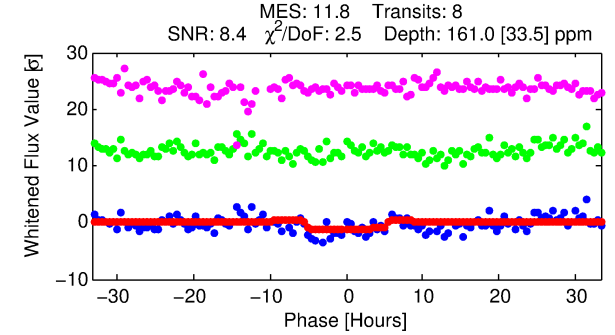
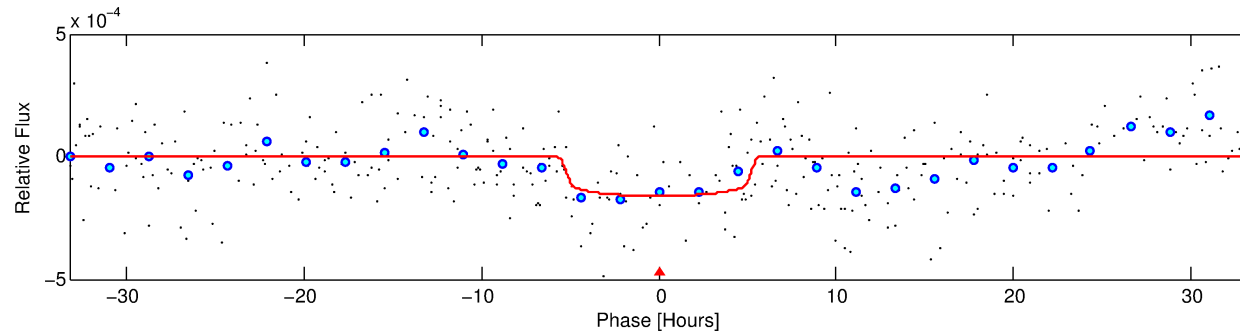
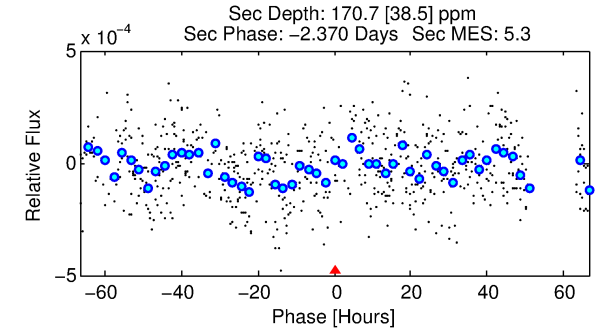
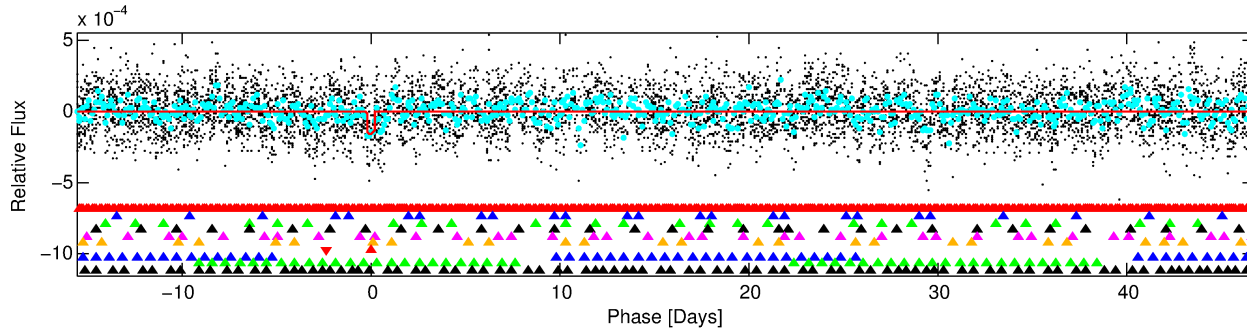
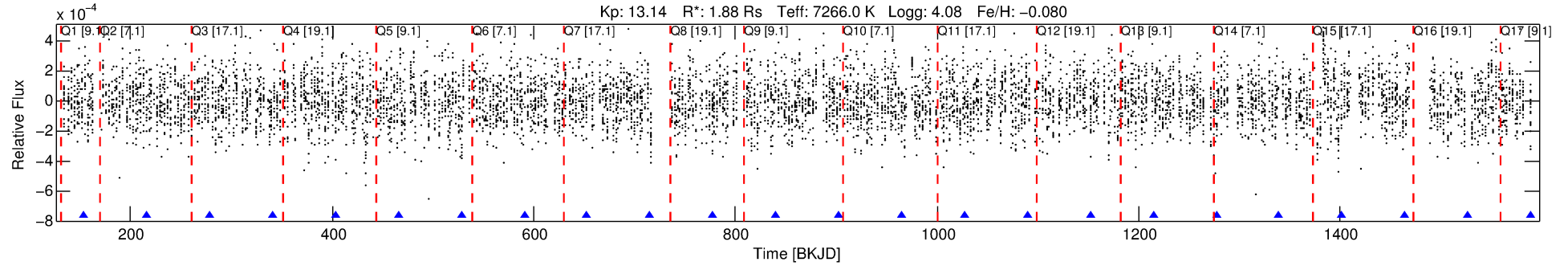
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006113656-07

No Significant Match Found

# DV One-Page Summary

KIC: 6113656 Candidate: 7 of 10 Period: 62.395 d



## DV Fit Results:

Period = 62.39493 [0.00163] d  
Epoch = 153.7990 [0.0250] BKJD  
Rp/R\* = 0.0132 [0.0032]  
a/R\* = 22.60 [29.80]  
b = 0.87 [0.38]  
Seff = 69.19 [25.39]  
Teq = 735 [67] K  
Rp = 2.70 [1.02] Re  
a = 0.3564 [0.0823] AU  
Ag = 1635.32 [1030.09] [1.59 $\sigma$ ]  
Teffp = 7231 [1027] K [6.31 $\sigma$ ]

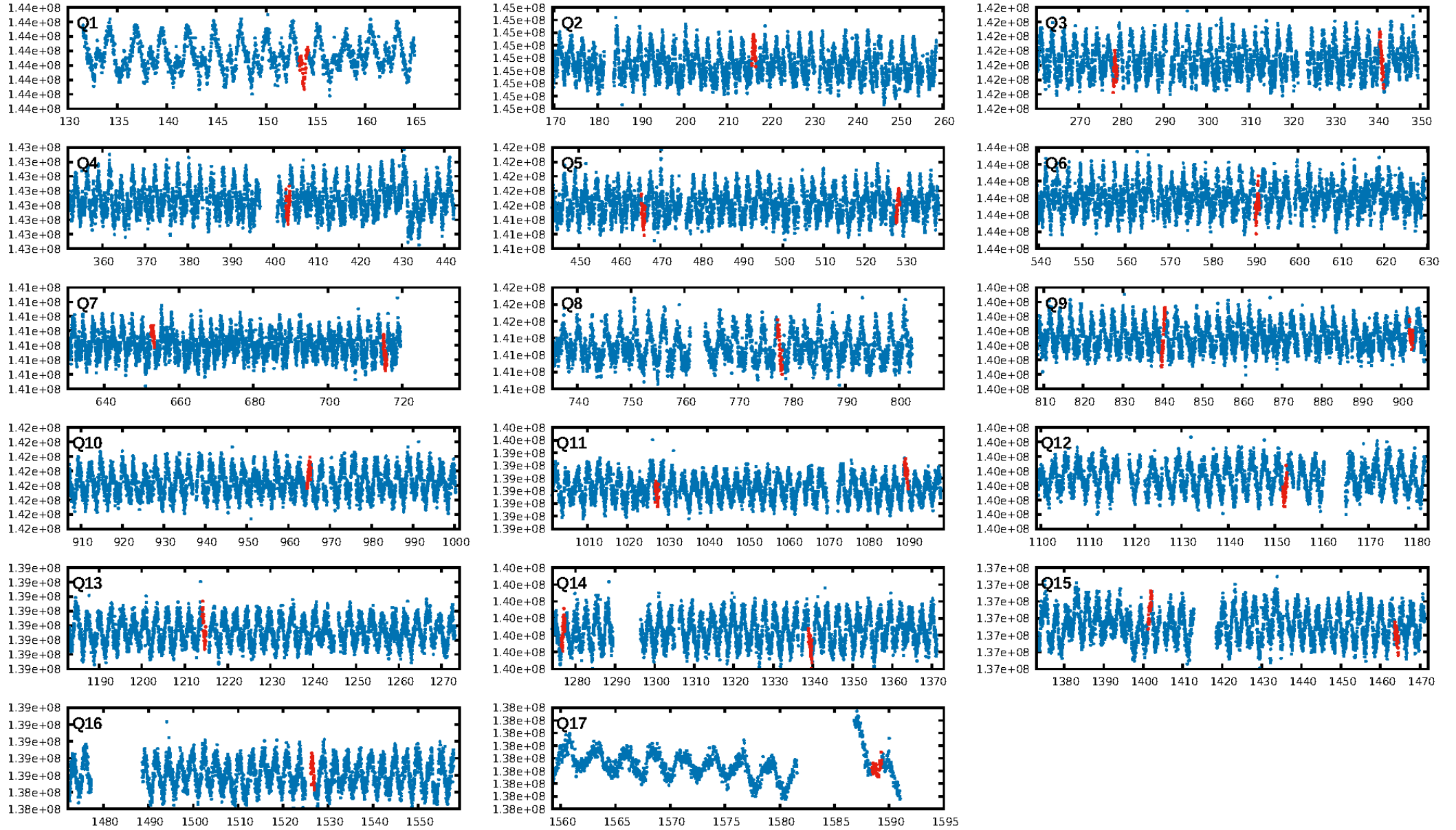
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.47 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [7/7]  
GhostDiagnostic-chr: -4.608  
Centroid-sig: 23.4%  
Centroid-so: 0.512 arcsec [1.11 $\sigma$ ]  
OotOffset-rm: 0.177 arcsec [0.83 $\sigma$ ]  
OotOffset-st: 4/4/3/2 [13]  
KicOffset-rm: 0.247 arcsec [0.52 $\sigma$ ]  
KicOffset-st: 4/4/3/2 [13]  
DiffImageQuality-fgm: 0.38 [5/13]  
DiffImageOverlap-fno: 0.13 [2/15]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:31 Z

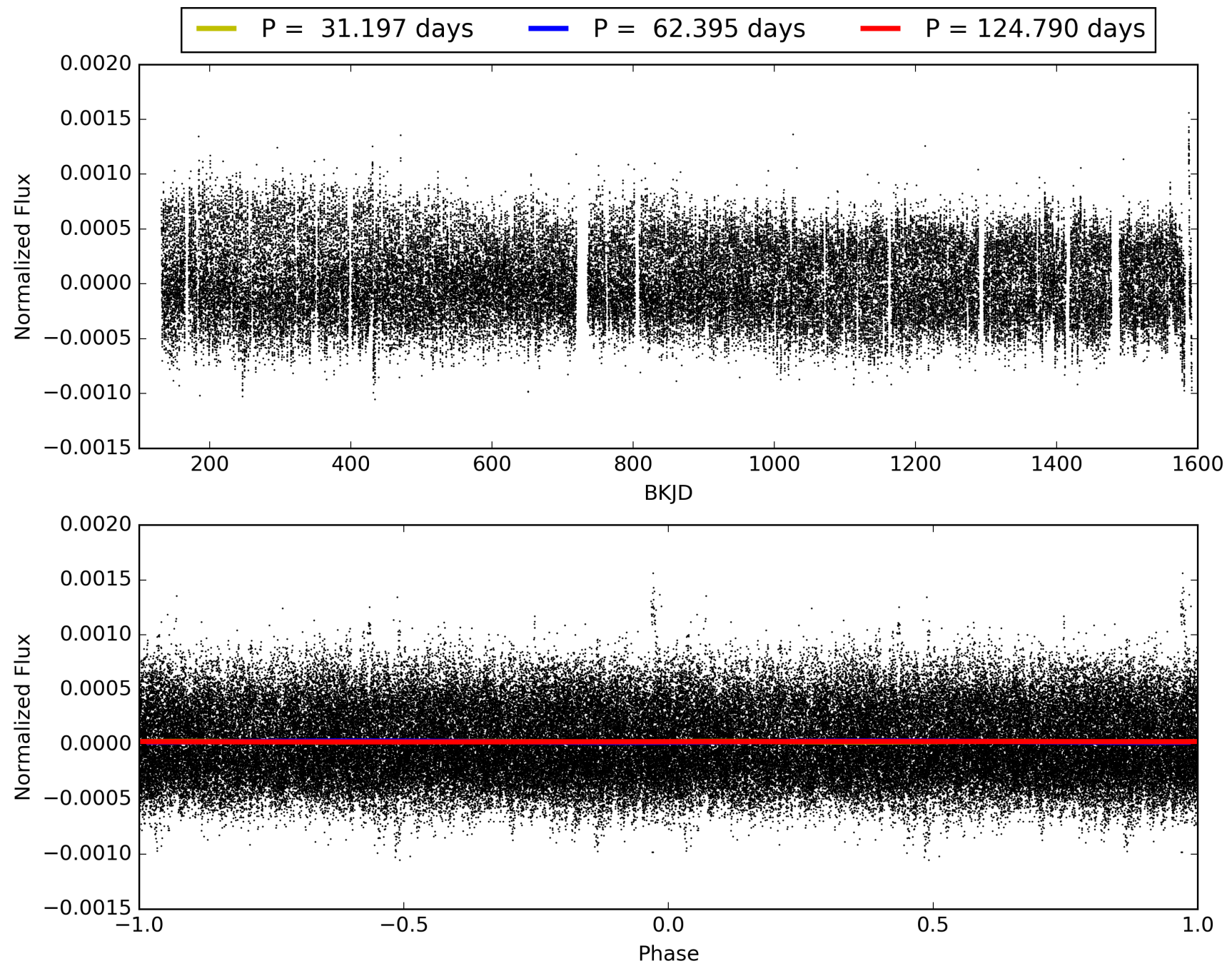
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006113656-07, PDC Light Curves





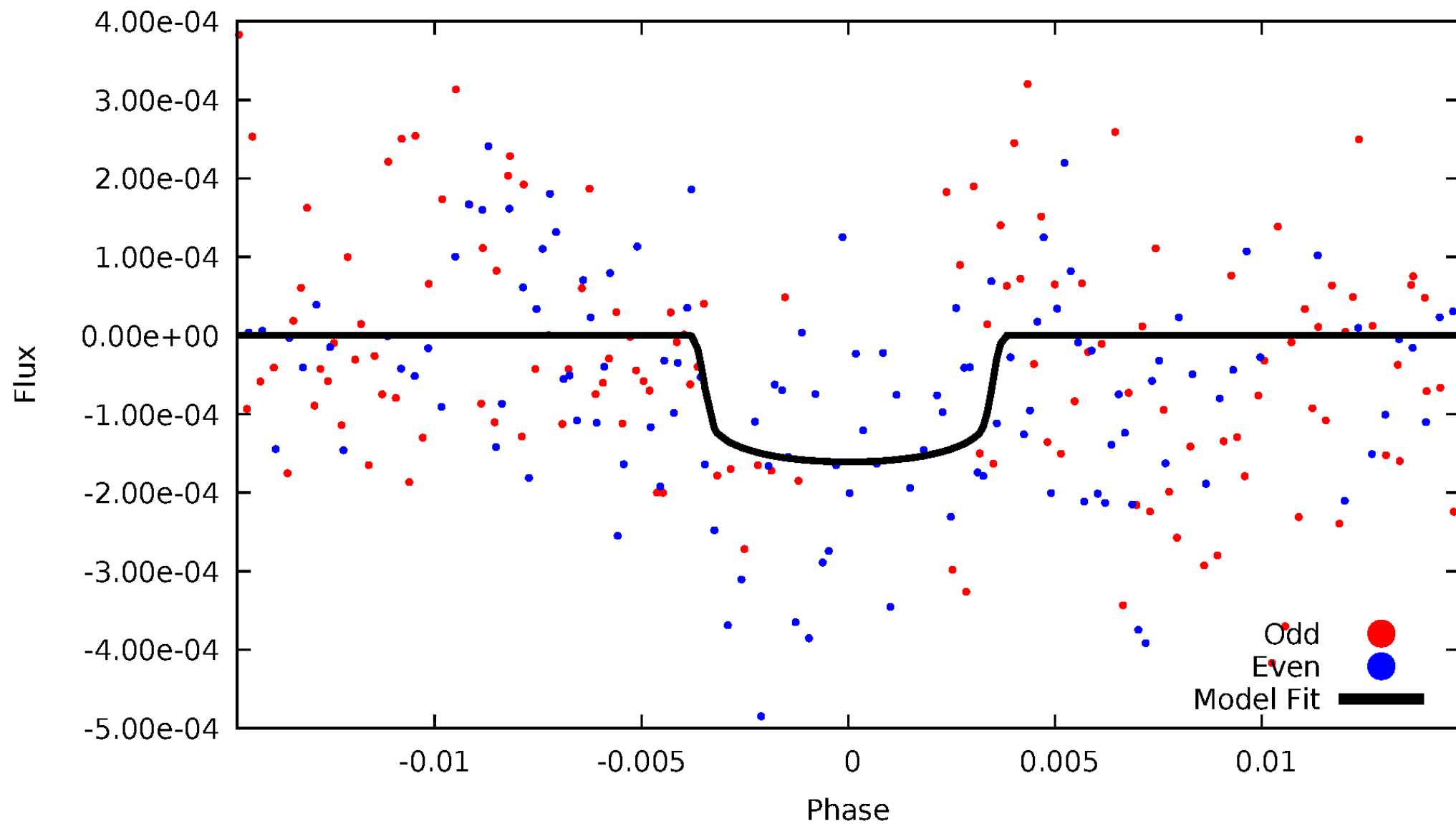
TCE 006113656-07





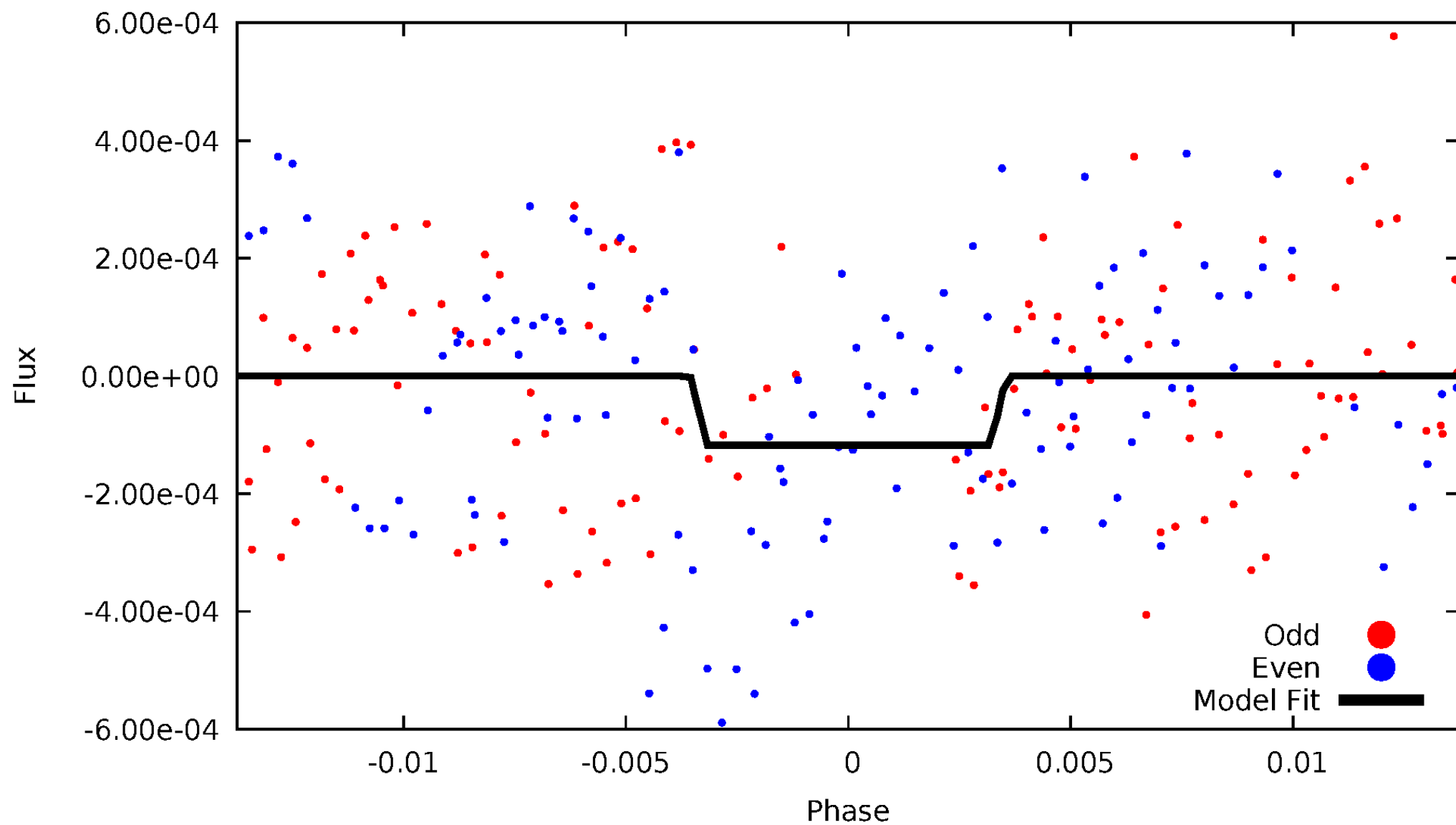
# DV Odd/Even

TCE 006113656-07



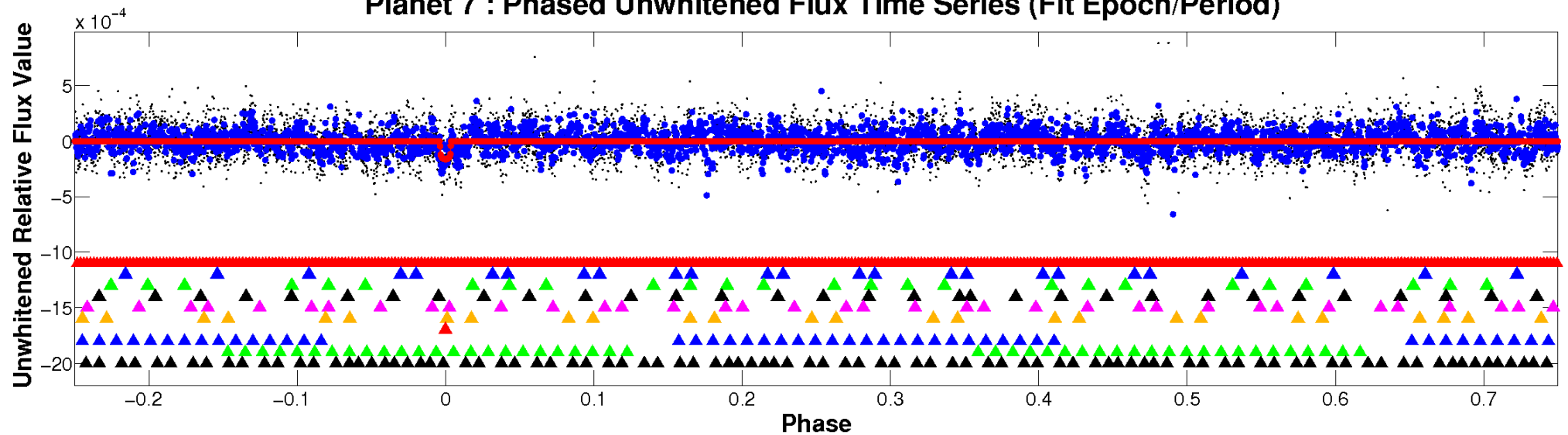
# ALT Odd/Even

TCE 006113656-07

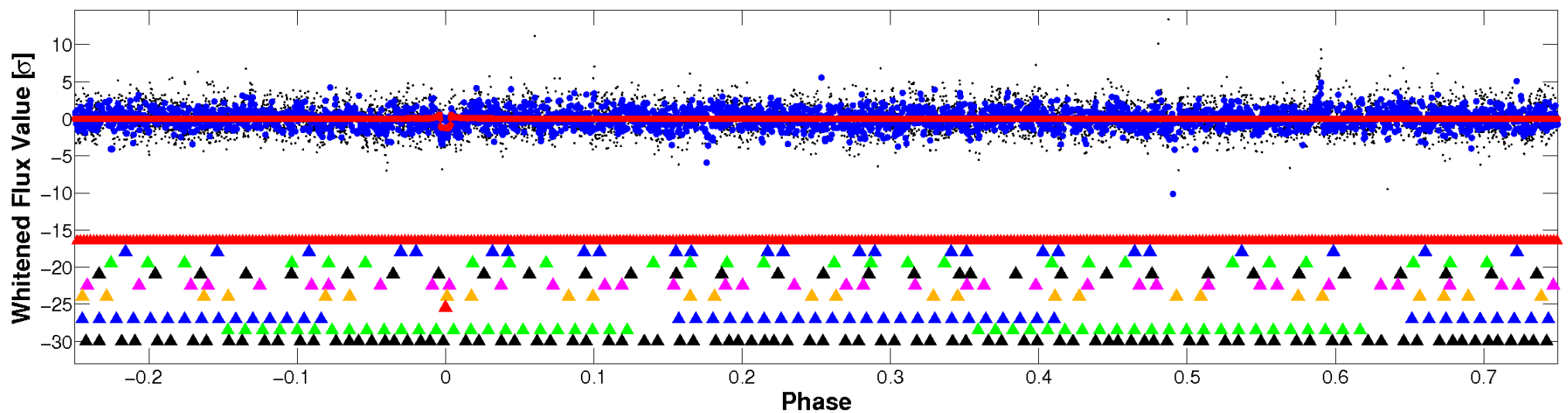


# Non-Whitened Vs. Whitened Light Curve

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

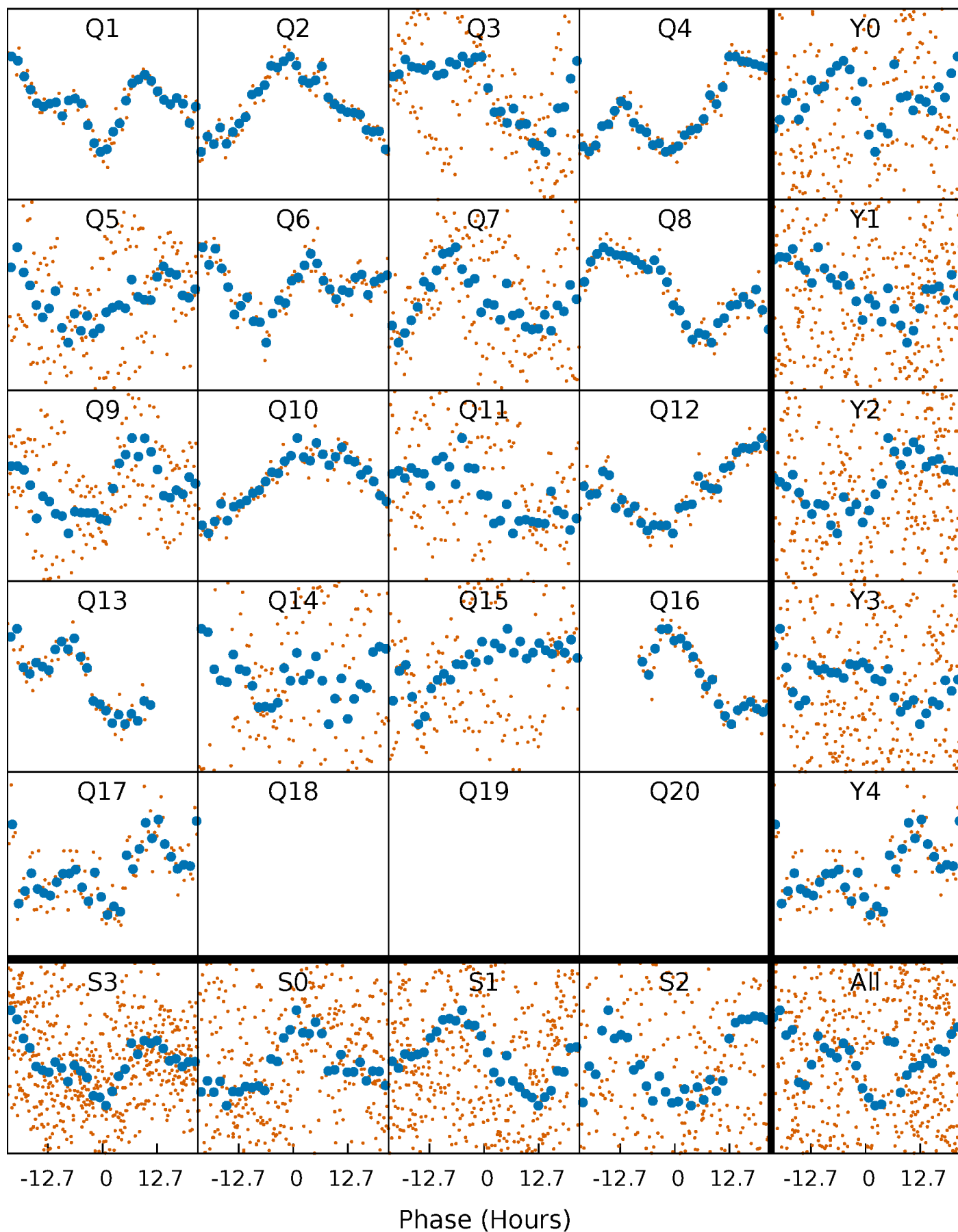


## Planet 7 : Phased Whitened Flux Time Series (Fit Epoch/Period)



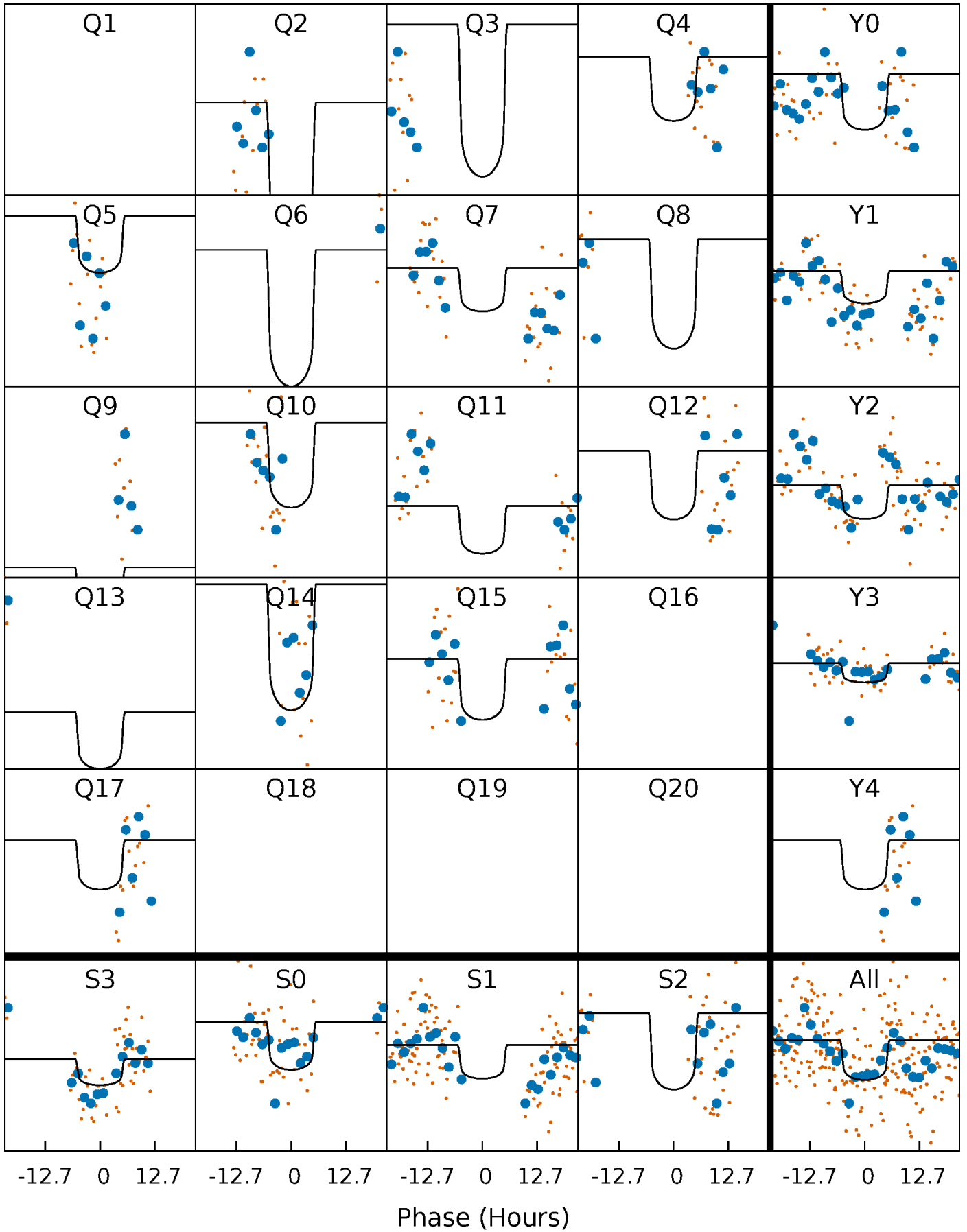
# PDC Quarter-Phased Transit Curves

TCE 006113656-07     $P = 62.394926$  Days     $T_0 = 153.799040$  (BKJD)



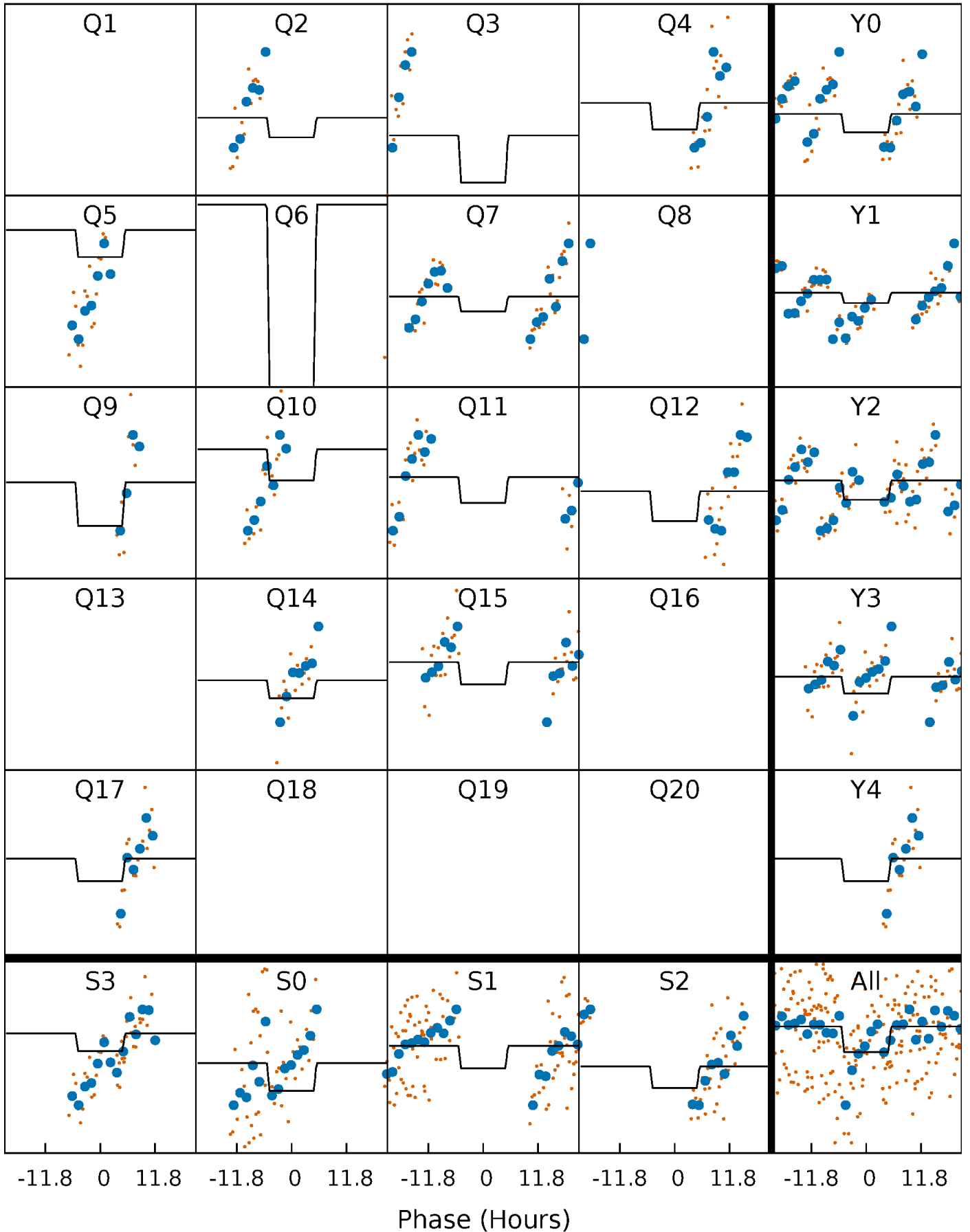
# DV Quarter-Phased Transit Curves

TCE 006113656-07     $P = 62.394926$  Days     $T_0 = 153.799040$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

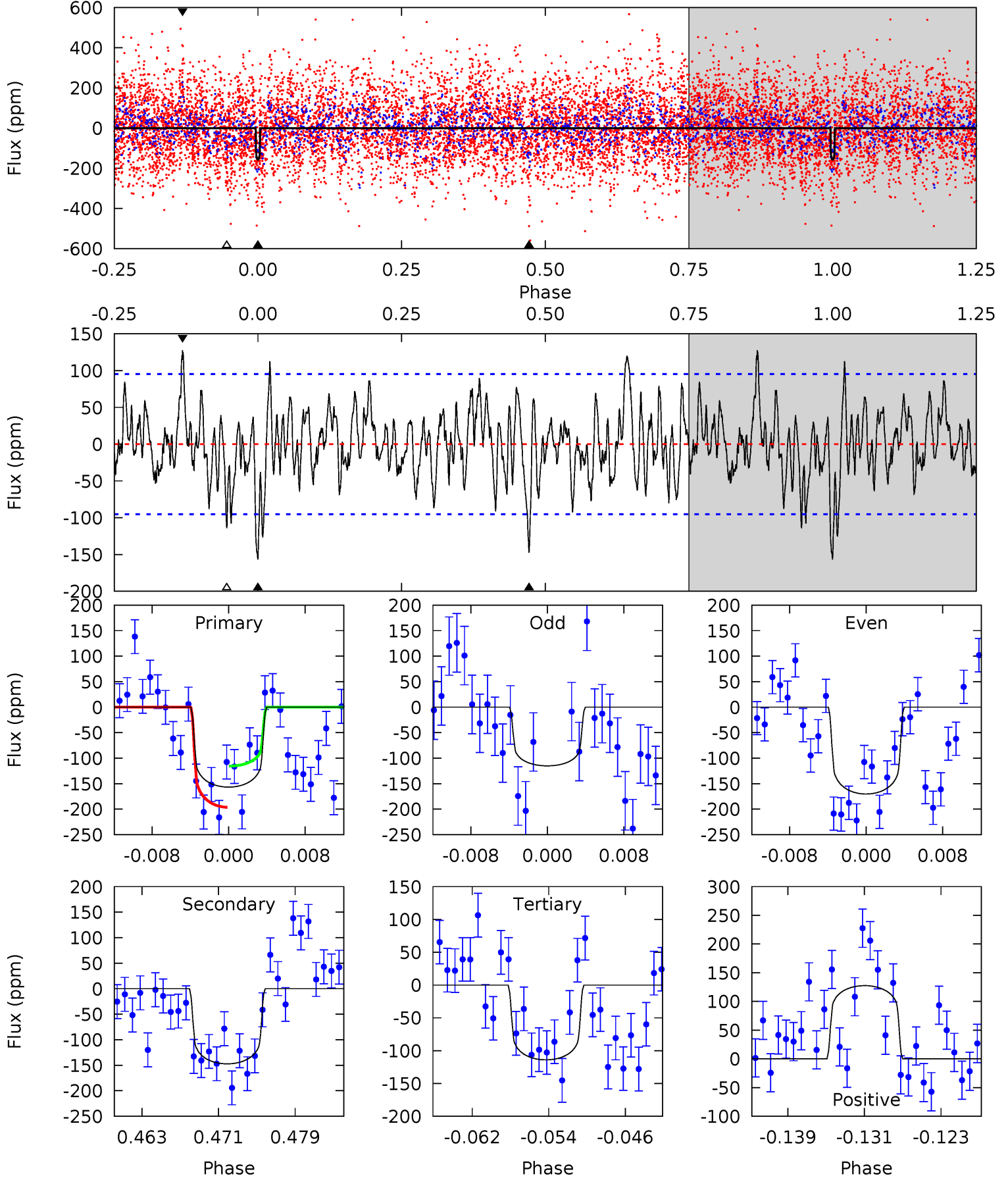
TCE 006113656-07     $P = 62.395316$  Days     $T_0 = 153.792130$  (BKJD)



# DV Model-Shift Uniqueness Test

006113656-07, P = 62.394926 Days, E = 91.404114 Days

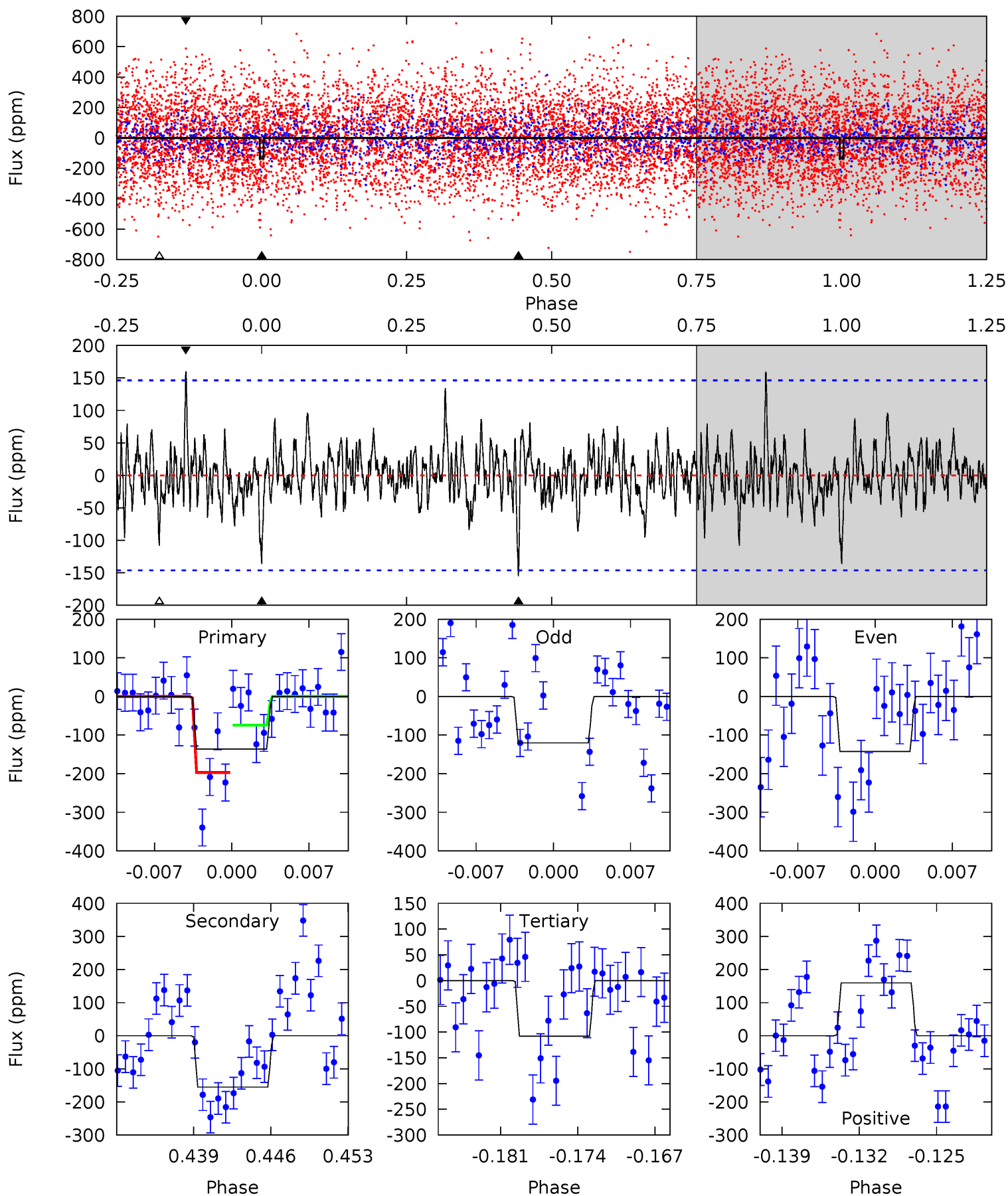
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.34	7.84	6.07	6.79	5.08	2.66	2.12	2.27	1.55	1.77	1.05	1.39	1.02	0.45	2.15



# Alt Model-Shift Uniqueness Test

006113656-07, P = 62.395316 Days, E = 91.396814 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
4.74	5.40	3.76	5.56	5.10	2.70	1.18	0.99	-0.81	1.65	-0.15	0.35	0.89	0.51	2.13





### Stellar Parameters For KIC 006113656

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-147 \pm 19$	$2.72^{+0.83}_{-0.75}$	$1023^{+76}_{-75}$	$6827^{+1317}_{-783}$	$1380^{+1245}_{-580}$
Alt.	$-155 \pm 29$	$2.28^{+0.70}_{-0.74}$	$1025^{+77}_{-72}$	$7752^{+2274}_{-1176}$	$2058^{+2705}_{-934}$

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

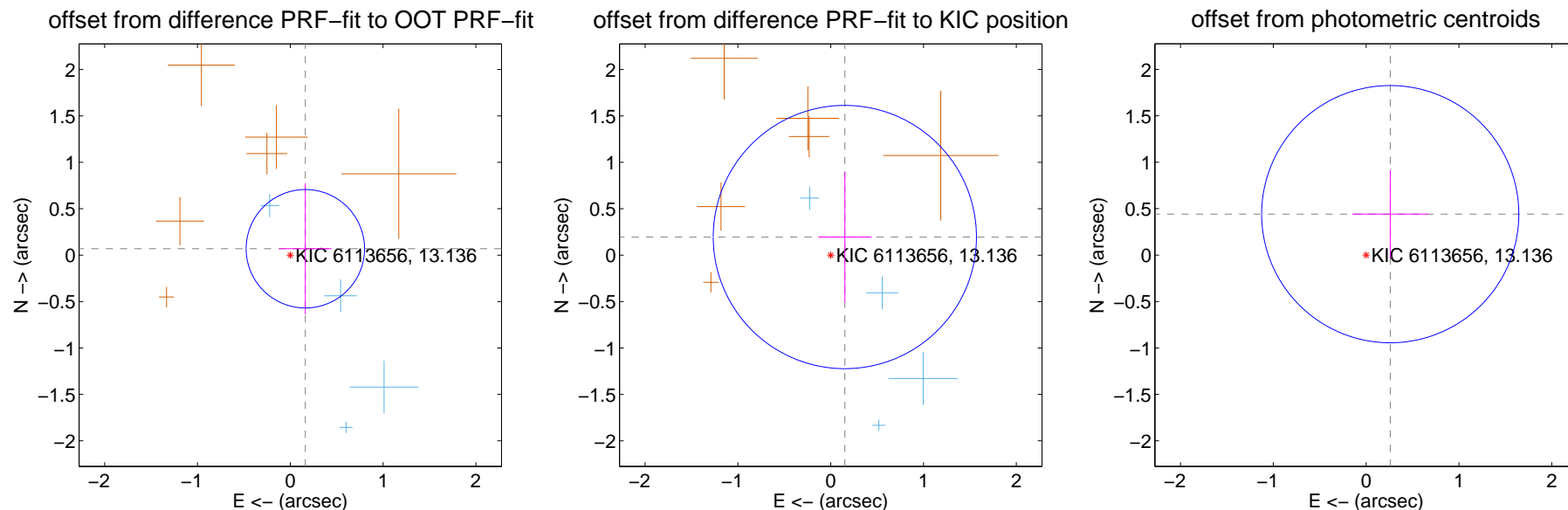
## DV Centroid Data

Supplemental centroid analysis for 006113656-07. Kepler magnitude: 13.14. Transit SNR 8.39

There are 5 quarters with good PRF difference image offsets

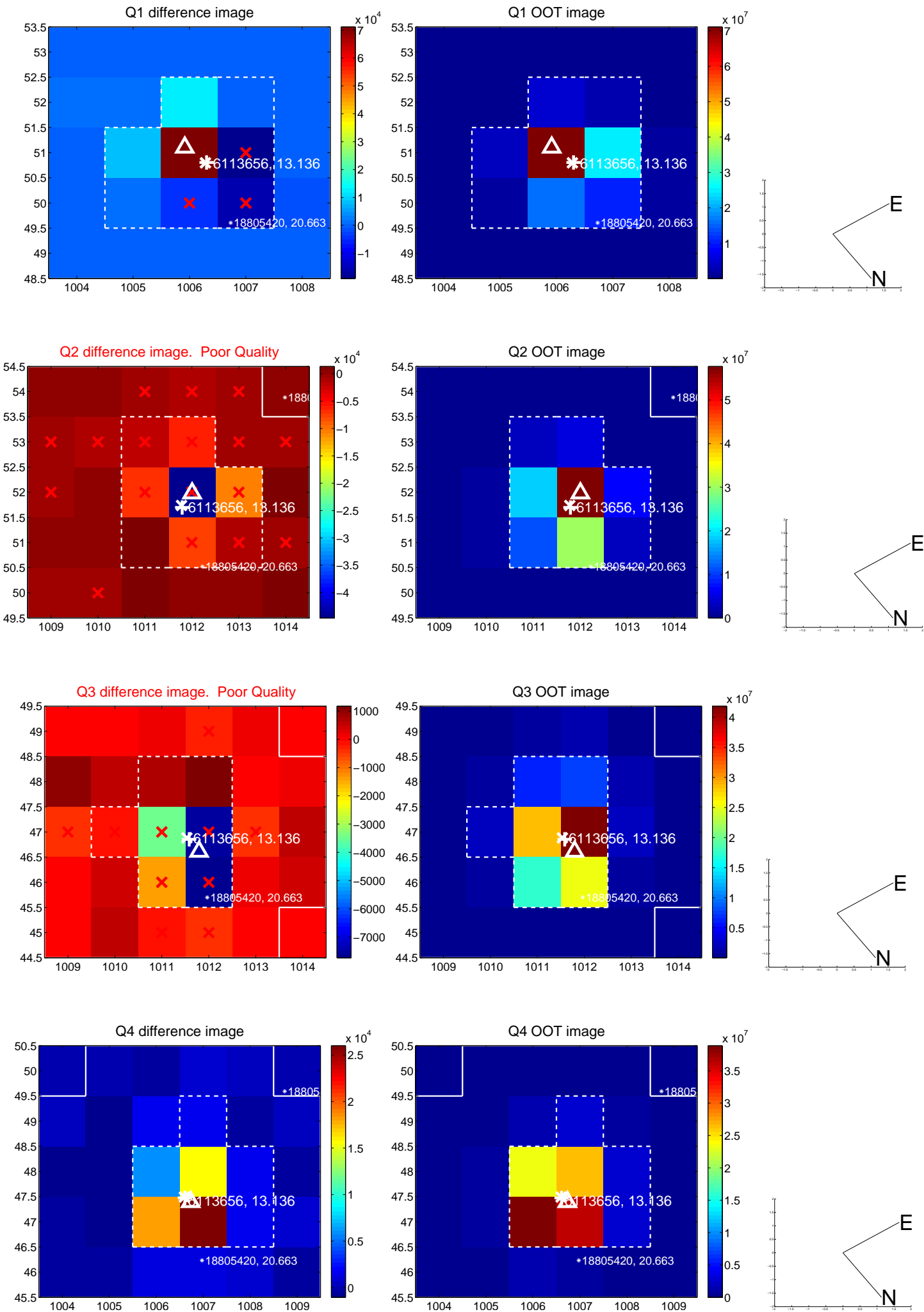
The direct PRF centroid is offset from the target star catalog position by about 0.19 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.177 \pm 0.213$	0.83	$-0.162 \pm 0.283$	$0.069 \pm 0.705$
PRF-fit source offset from KIC position	$0.247 \pm 0.473$	0.52	$-0.152 \pm 0.286$	$0.195 \pm 0.702$
photometric centroid source offset	$0.51 \pm 0.46$	1.11	$-0.26 \pm 0.41$	$0.44 \pm 0.48$

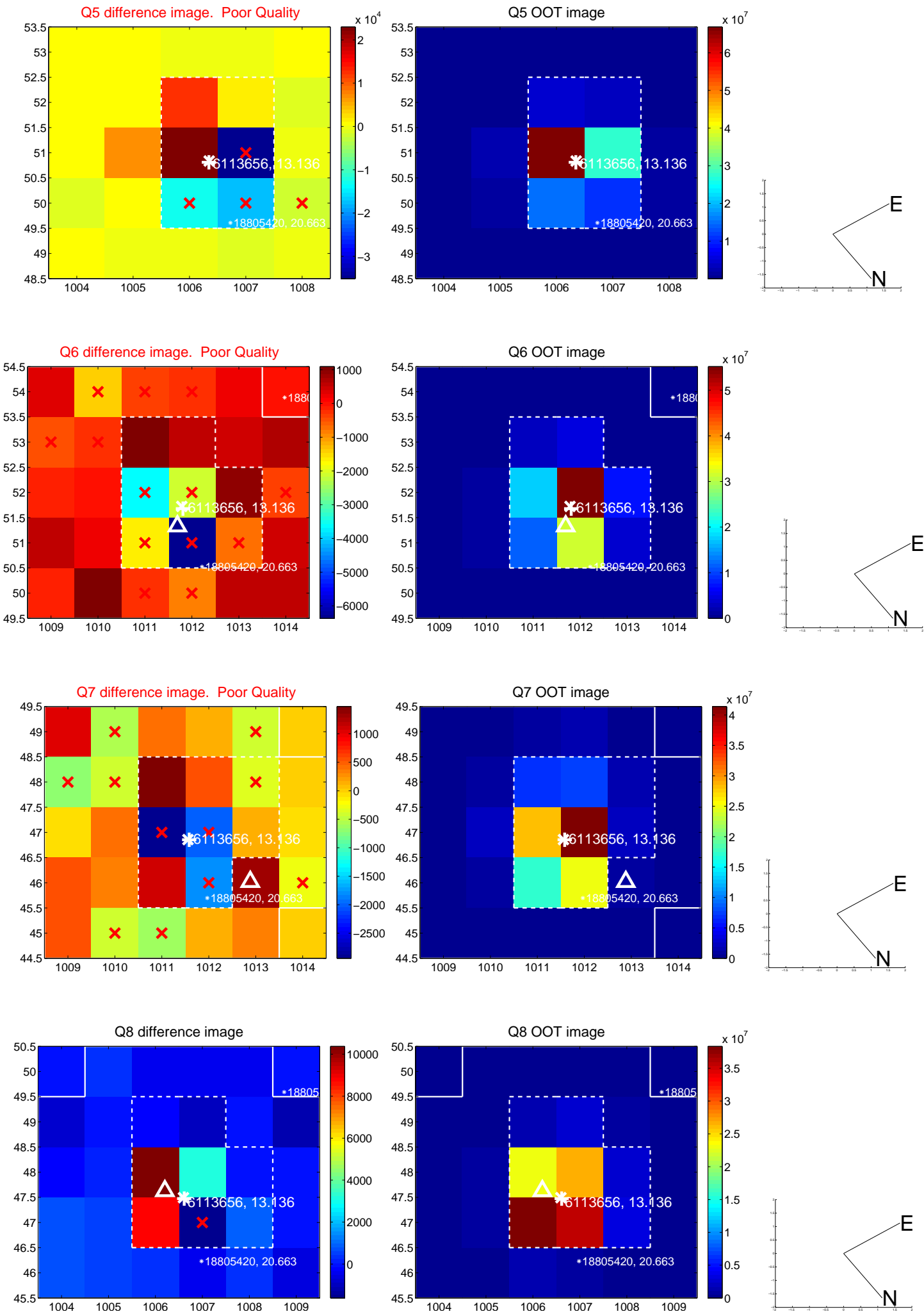


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

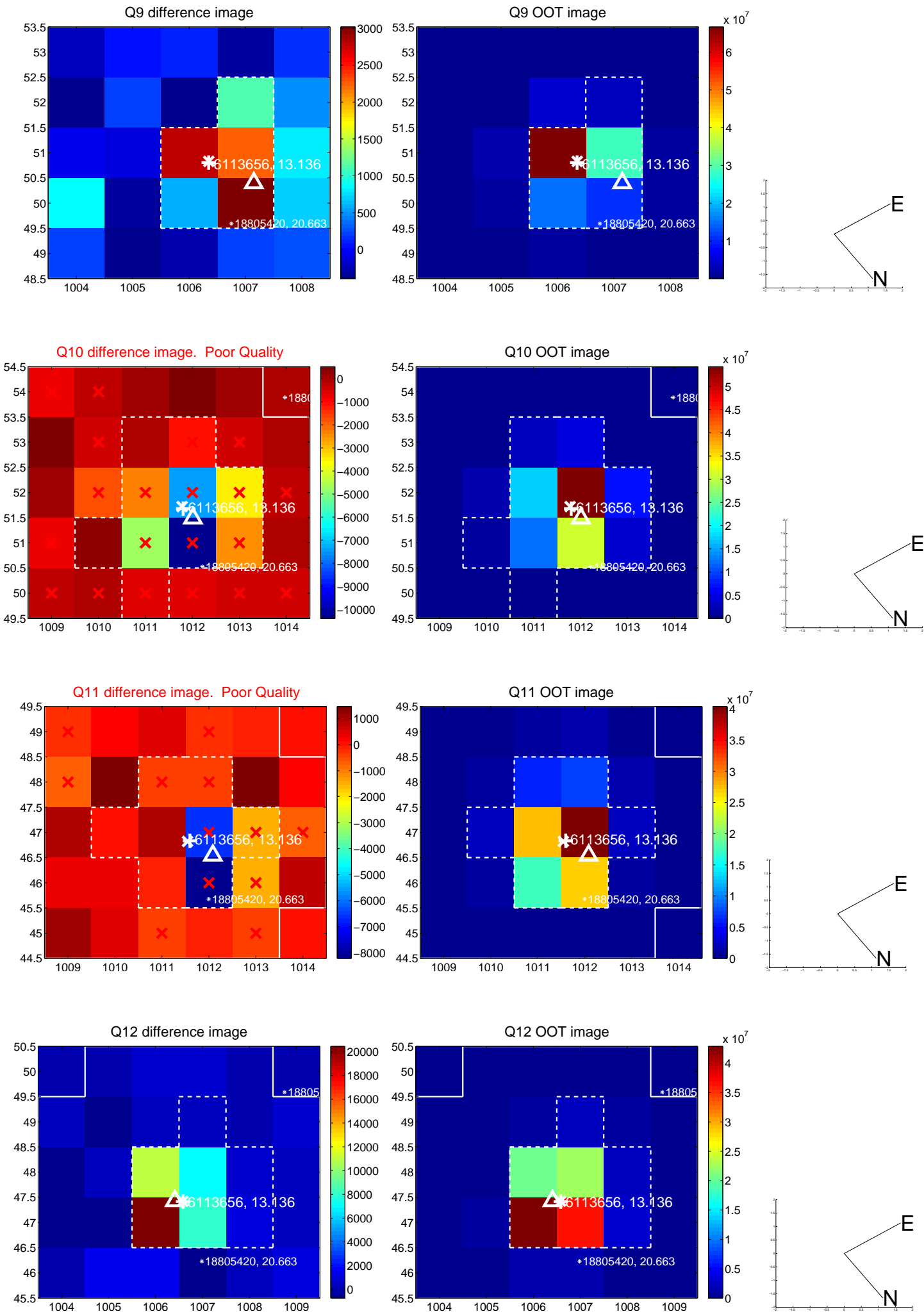
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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.

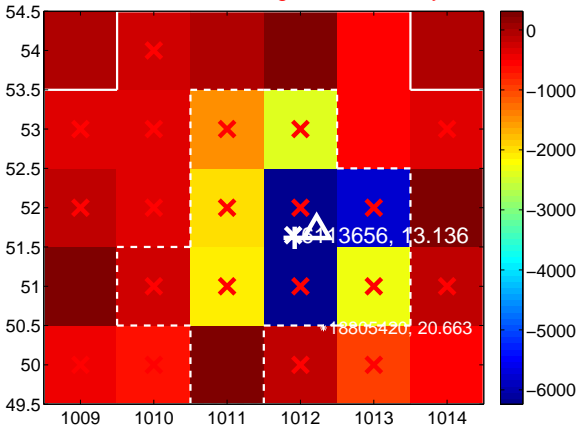
Q13 no difference image



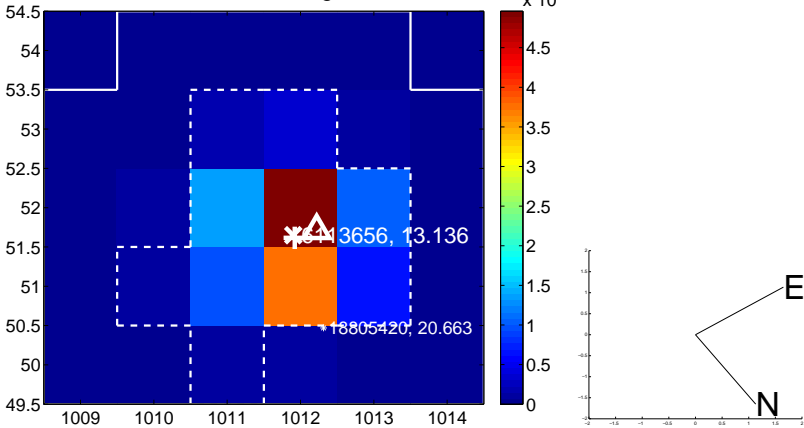
Q13 no OOT image



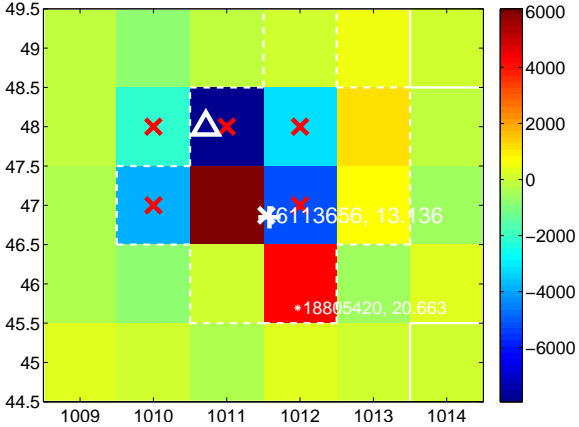
Q14 difference image. Poor Quality



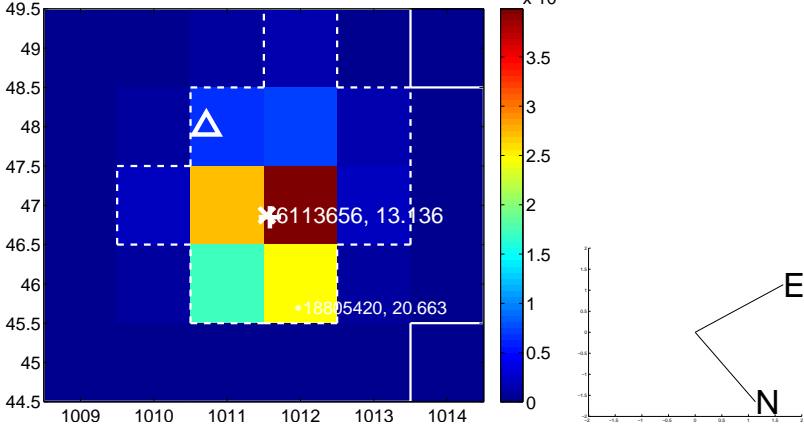
Q14 OOT image



Q15 difference image. Poor Quality



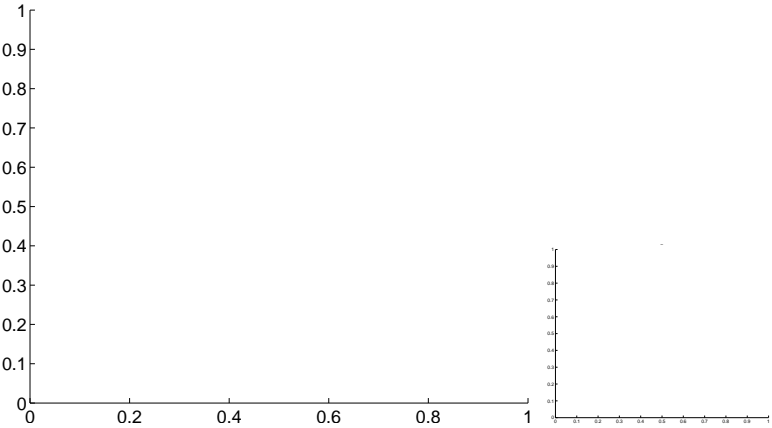
Q15 OOT image



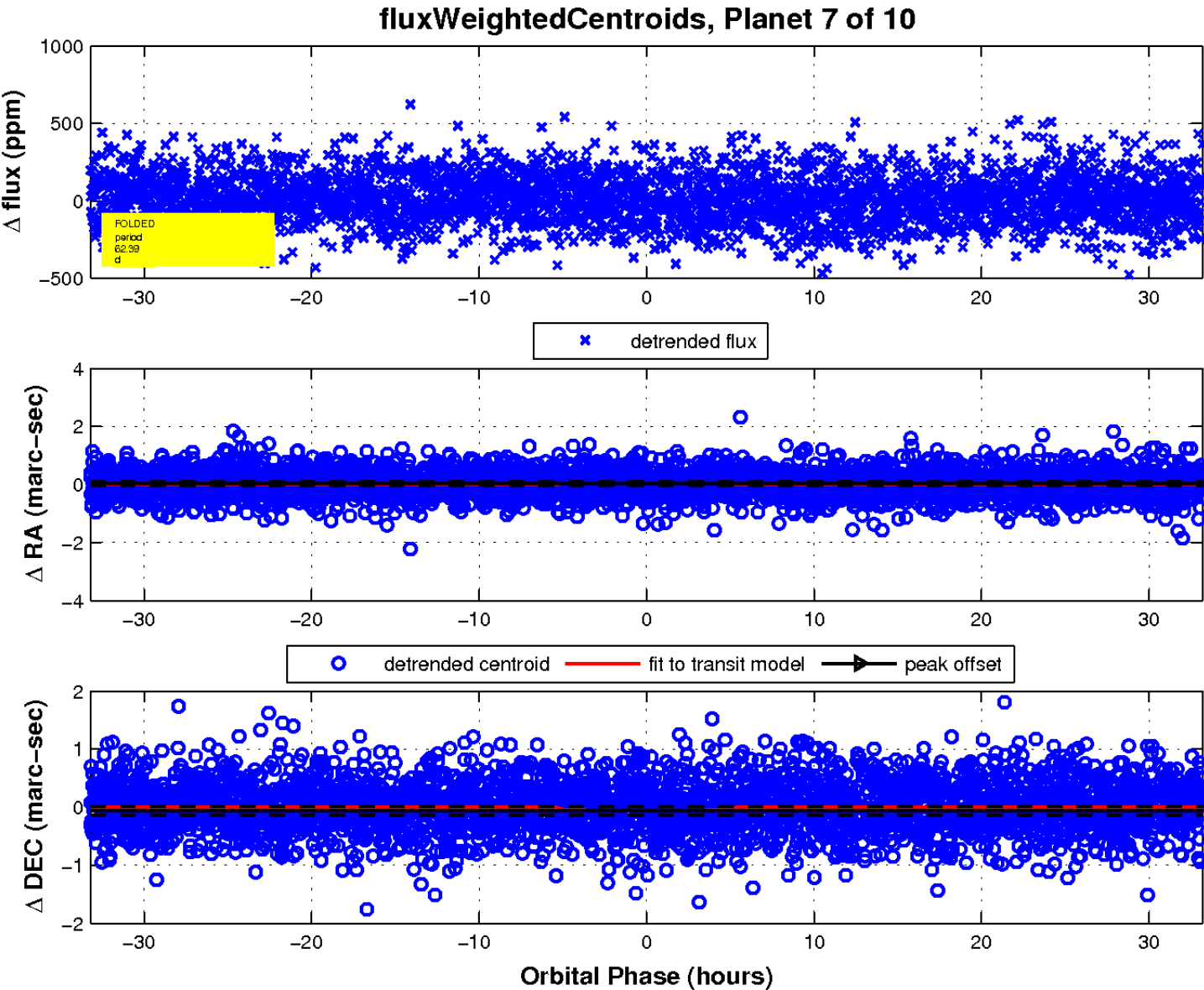
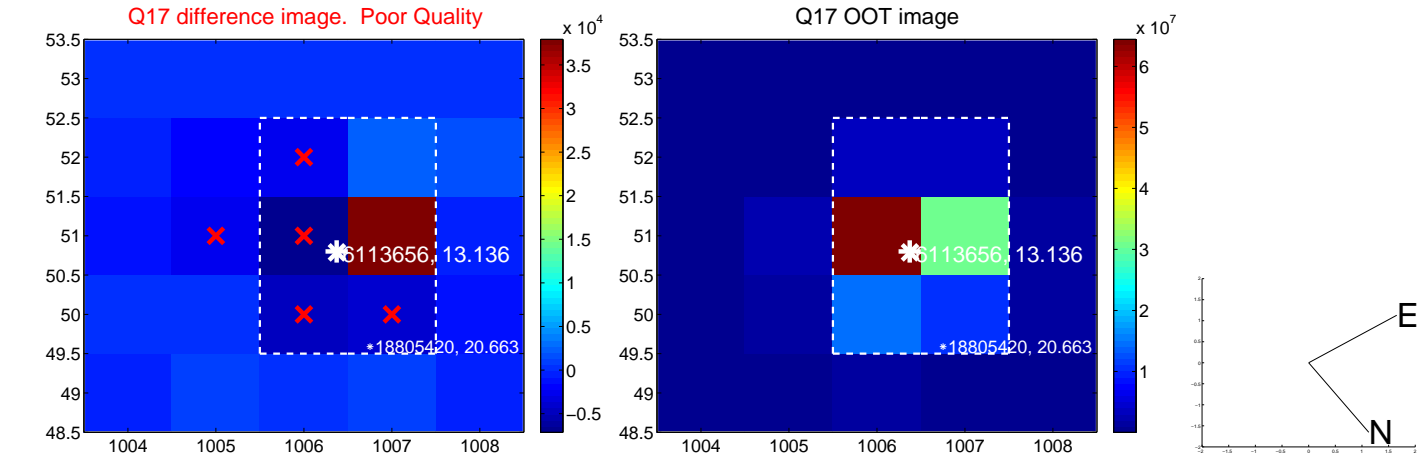
Q16 no difference image



Q16 no OOT image

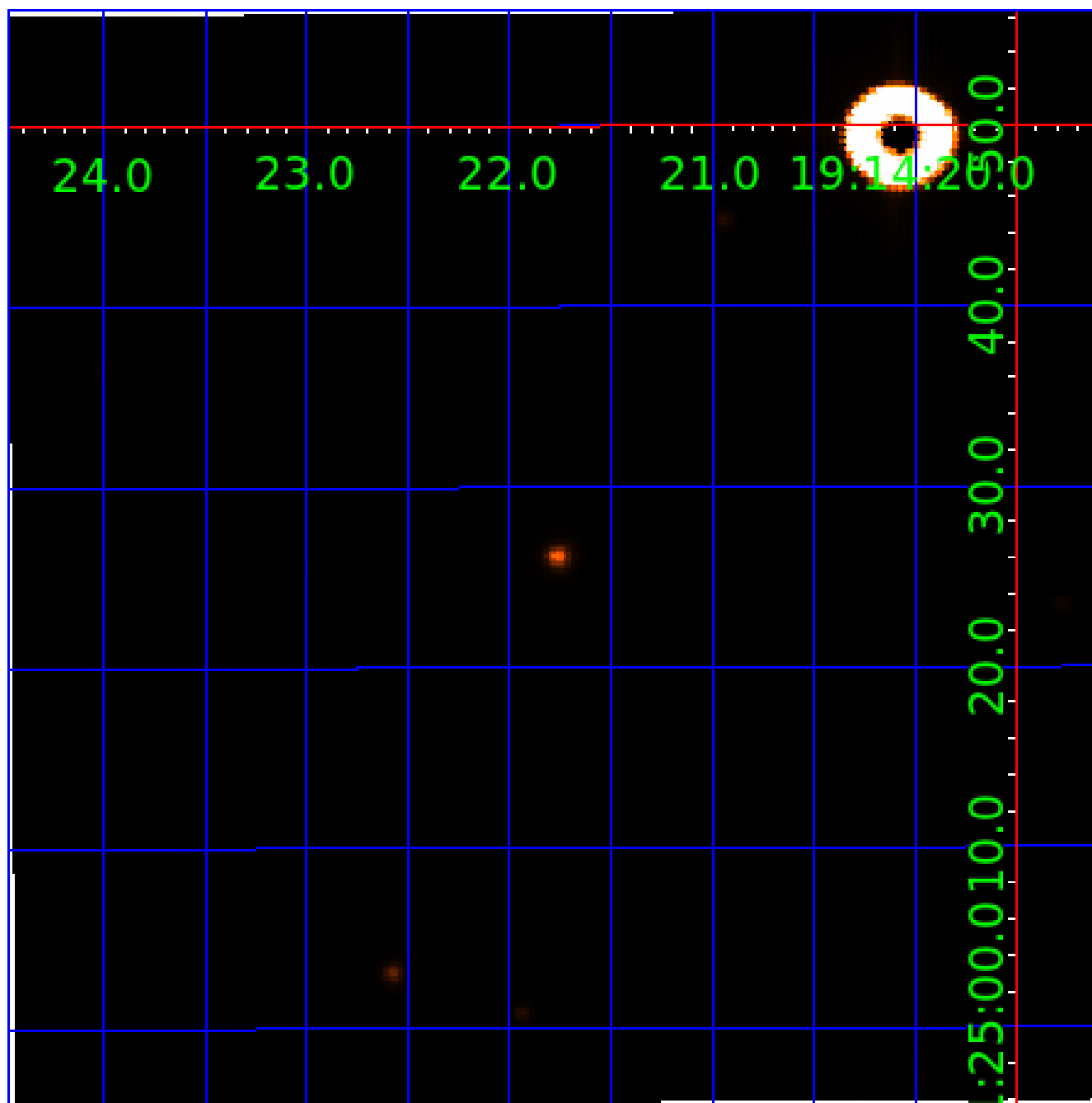


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination





# KIC 006113656

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113656-01	OBS	No	2.646238	132.447489	5.6	18.121	11.4	3.0	1.88	7266	0.46	4677.99
006113656-02	OBS	No	58.535580	182.791356	207.4	17.532	46.1	7.6	1.88	7266	5.23	75.34
006113656-03	OBS	No	54.788959	170.151339	184.7	12.850	20.9	9.7	1.88	7266	2.58	82.28
006113656-04	OBS	No	44.294861	175.427489	174.4	6.797	11.3	10.5	1.88	7266	2.78	109.25
006113656-05	OBS	No	39.904031	136.547656	166.1	4.552	11.1	10.6	1.88	7266	2.77	125.57
006113656-06	OBS	No	57.280460	137.501760	190.8	6.317	11.1	11.6	1.88	7266	2.88	77.55
006113656-07	OBS	No	62.394926	153.799040	161.0	11.070	11.8	8.4	1.88	7266	2.70	69.19
006113656-08	OBS	No	30.838567	148.567220	249.9	2.104	10.9	10.1	1.88	7266	3.01	177.05
006113656-09	OBS	No	30.832288	161.442836	130.4	9.084	9.9	10.9	1.88	7266	2.38	177.10
006113656-10	OBS	No	15.974468	134.165876	100.7	9.468	10.0	7.9	1.88	7266	2.01	425.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113656-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
006113656-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
006113656-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
006113656-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

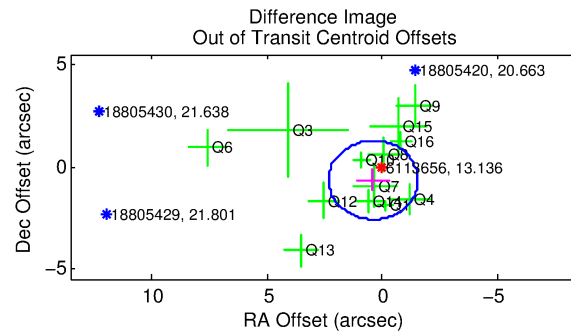
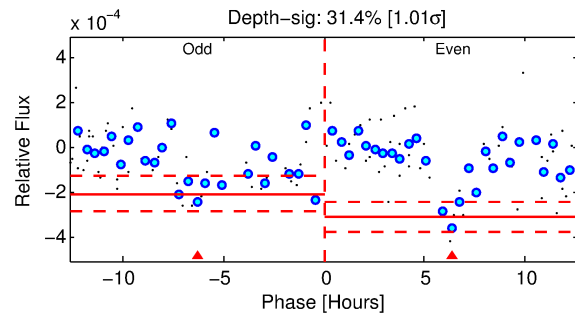
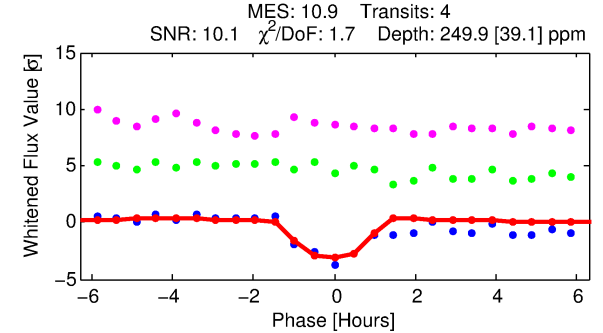
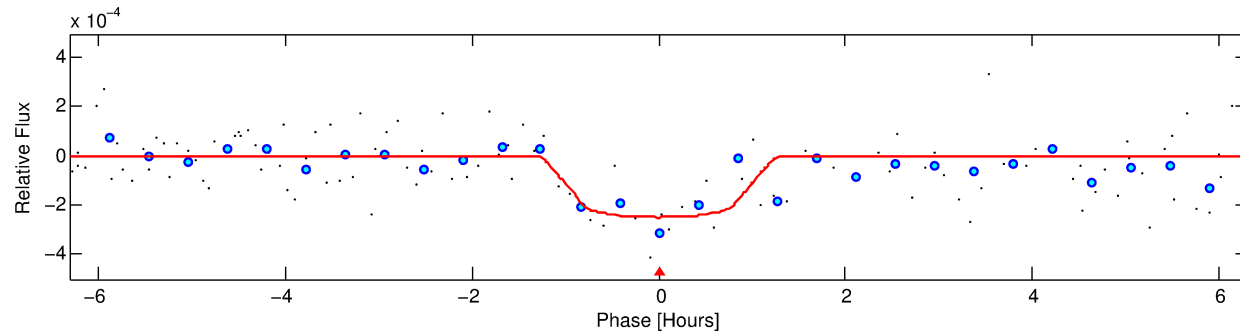
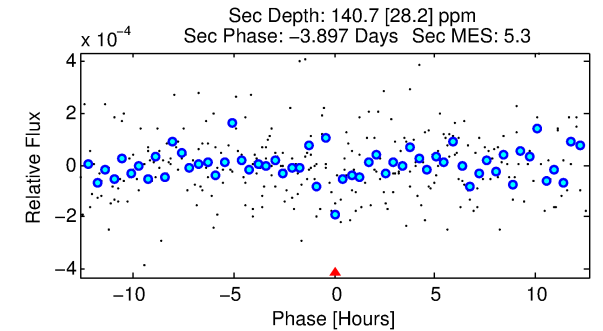
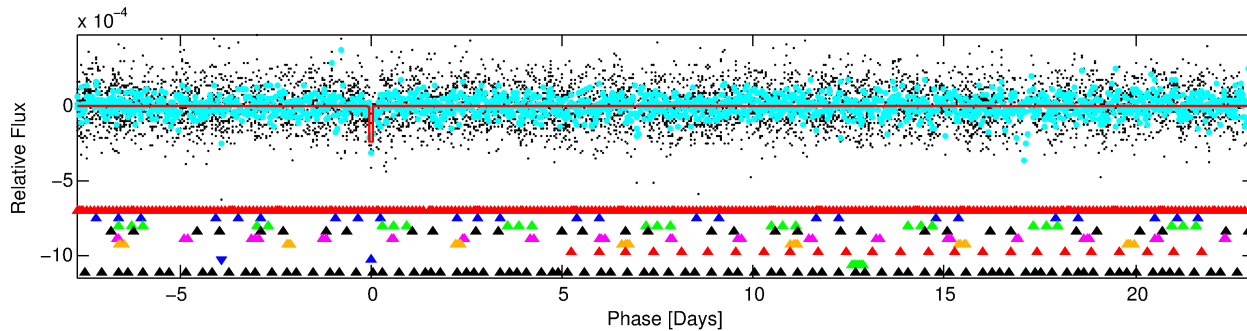
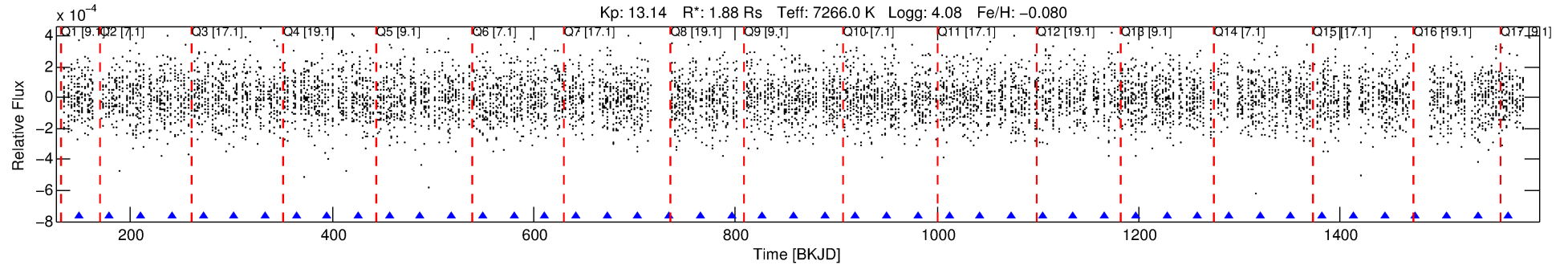
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006113656-08

No Significant Match Found

# DV One-Page Summary

KIC: 6113656 Candidate: 8 of 10 Period: 30.839 d



## DV Fit Results:

Period = 30.83857 [0.00035] d  
Epoch = 148.5672 [0.0128] BKJD  
Rp/R\* = 0.0147 [0.0208]  
a/R\* = 113.58 [933.61]  
b = 0.02 [369.10]  
Seff = 177.05 [64.97]  
Teq = 930 [85] K  
Rp = 3.01 [4.34] Re  
a = 0.2228 [0.0514] AU  
Ag = 424.55 [1212.53] [0.35σ]  
Teffp = 6528 [4640] K [1.21σ]

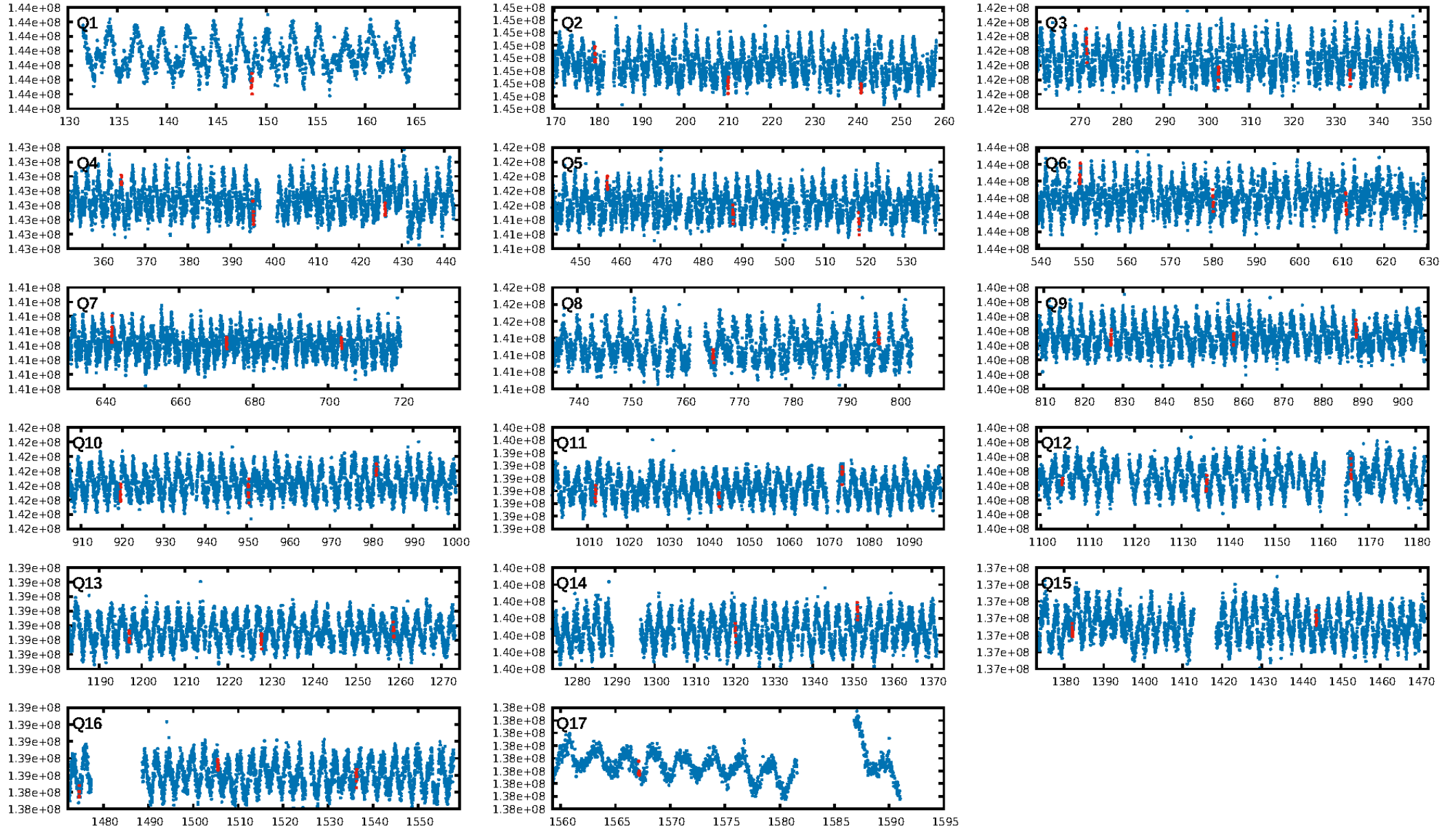
## DV Diagnostic Results:

ShortPeriod-sig: 1.3% [0.02σ]  
LongPeriod-sig: 100.0% [43.38σ]  
ModelChiSquare2-sig: 5.8%  
ModelChiSquareGof-sig: 54.6%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [4/4]  
**GhostDiagnostic-chr: 0.3424**  
Centroid-sig: 13.5%  
Centroid-so: 0.676 arcsec [1.63σ]  
OotOffset-rm: 0.770 arcsec [1.20σ]  
OotOffset-st: 3/3/4/3 [13]  
KicOffset-rm: 0.659 arcsec [1.05σ]  
KicOffset-st: 3/3/4/3 [13]  
DiffImageQuality-fgm: 0.46 [6/13]  
DiffImageOverlap-fno: 0.76 [13/17]

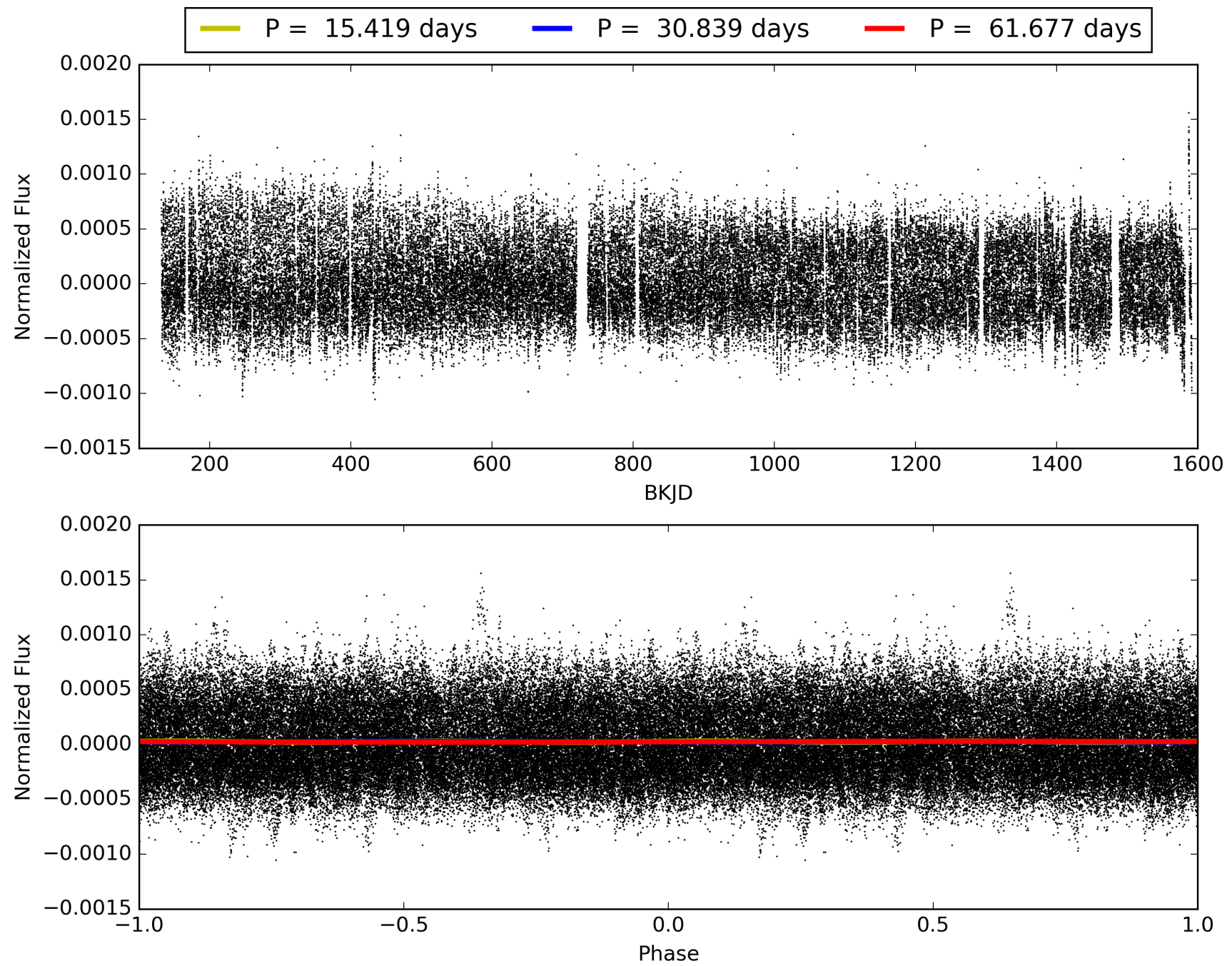
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:35 Z

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

# TCE 006113656-08, PDC Light Curves

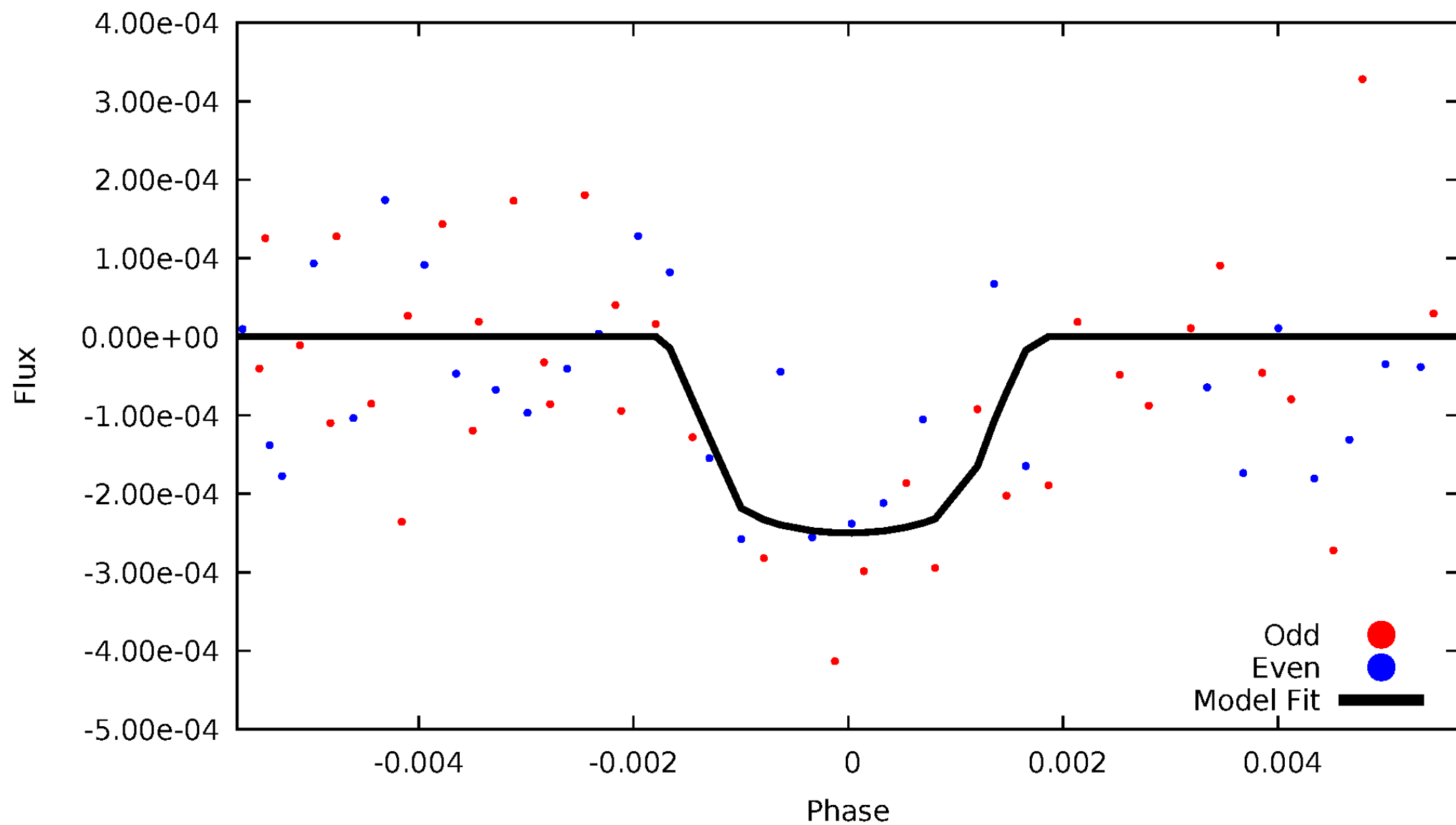


# TCE 006113656-08



# DV Odd/Even

TCE 006113656-08





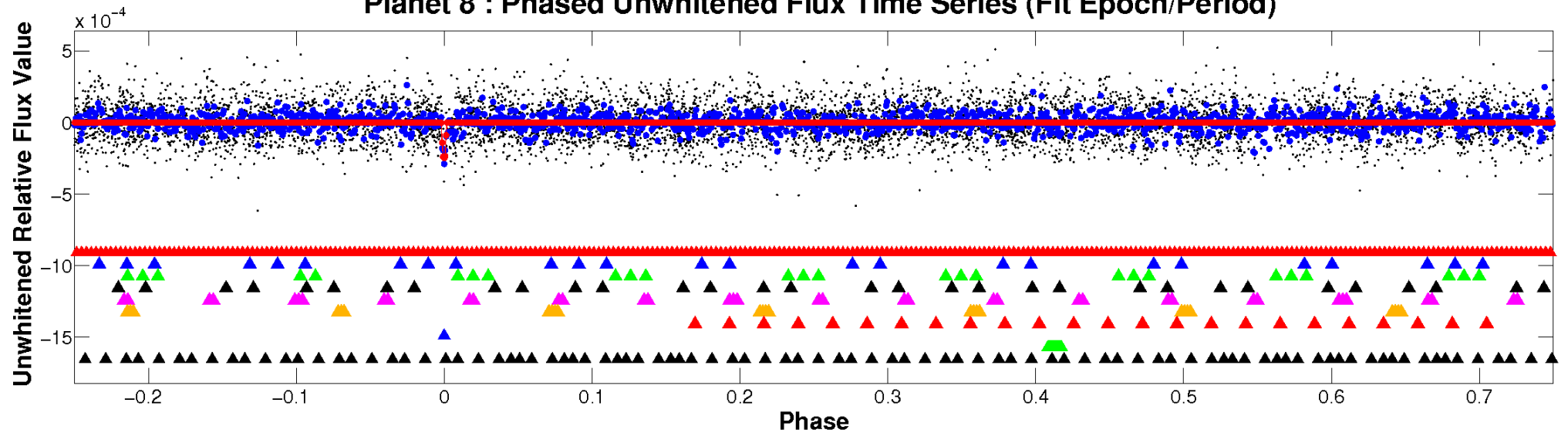
ALT Odd/Even

This plot does not exist for this TCE.

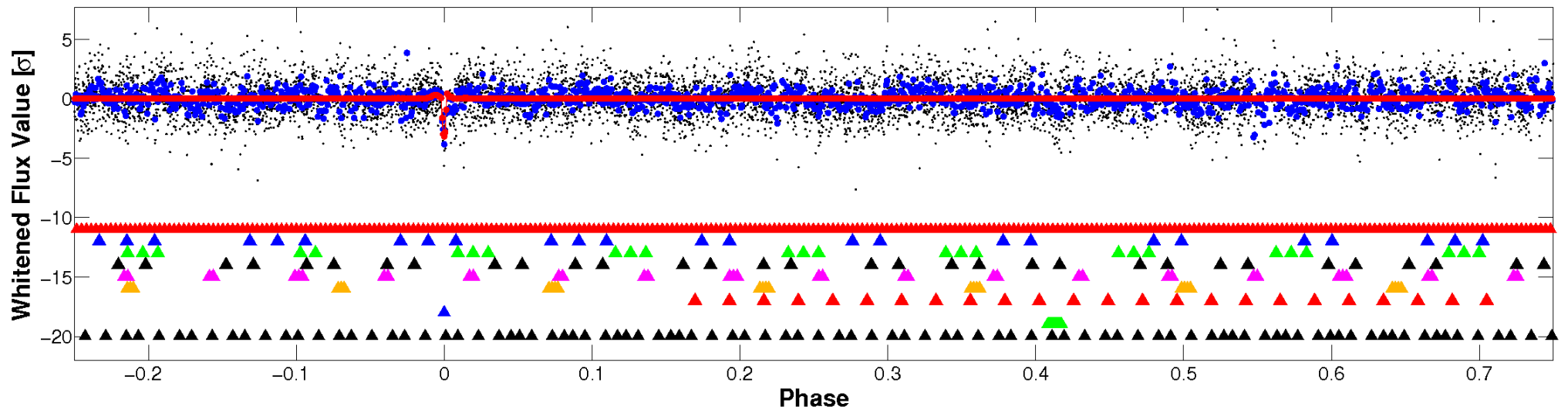


# Non-Whitened Vs. Whitened Light Curve

## Planet 8 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



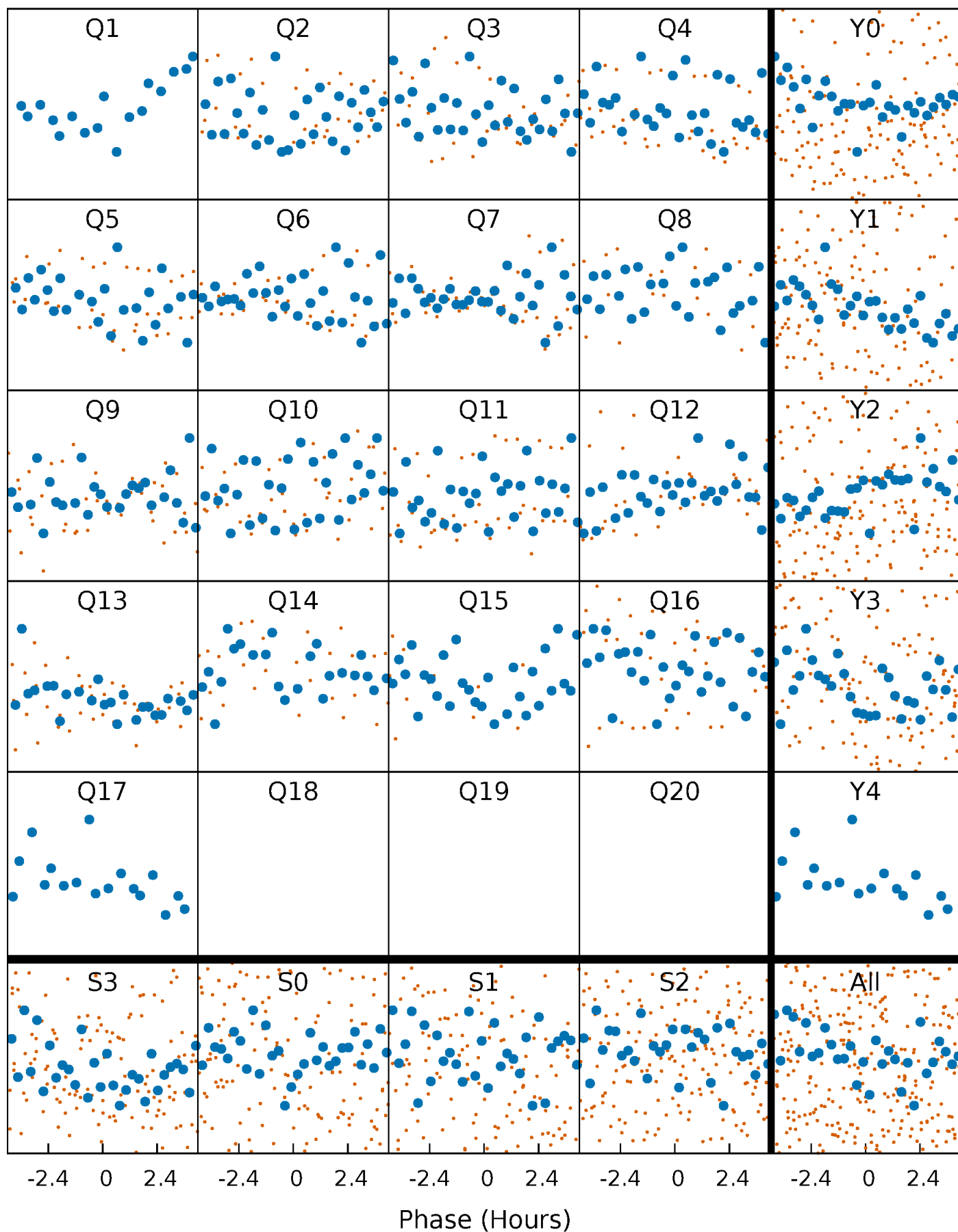
## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)





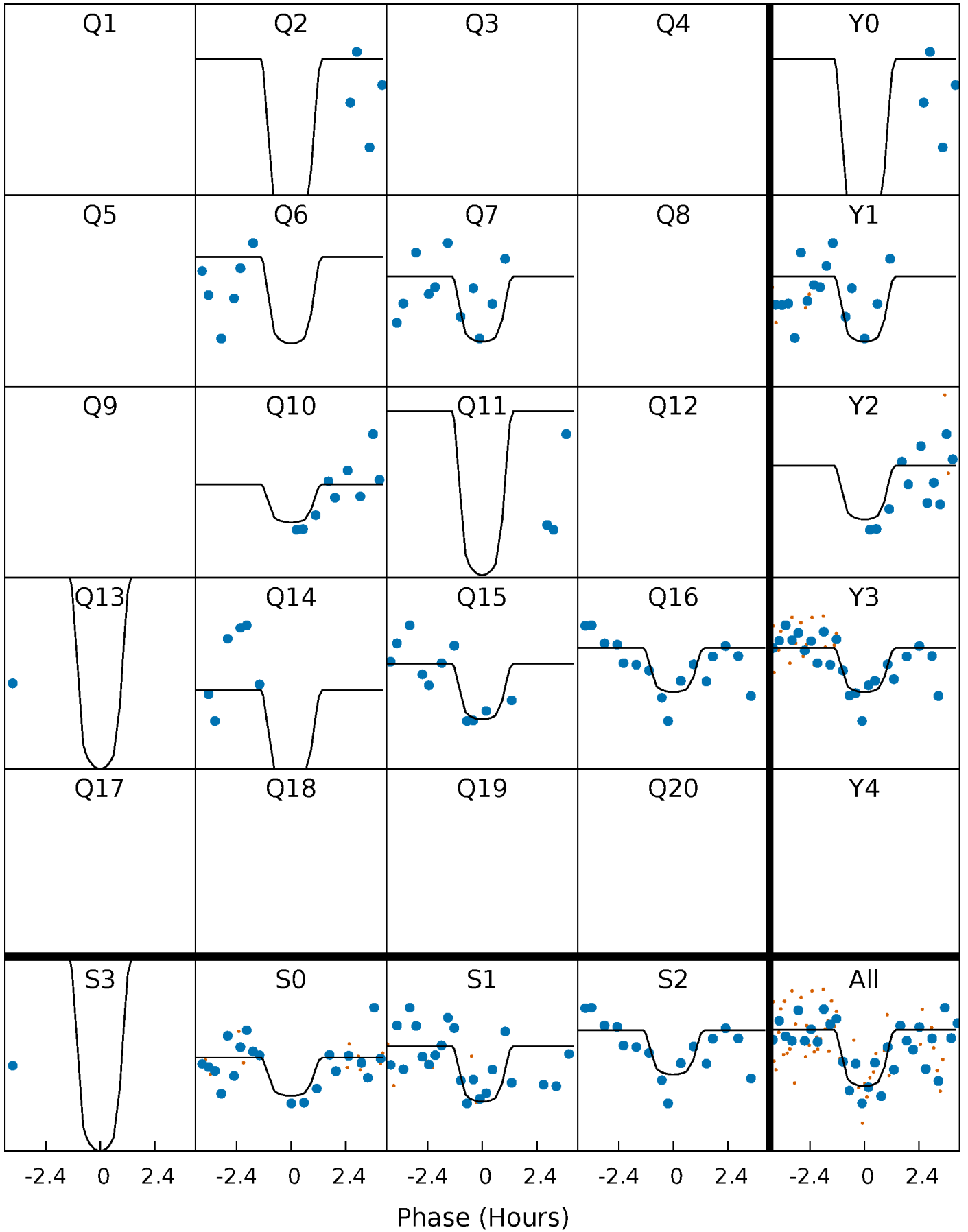
# PDC Quarter-Phased Transit Curves

TCE 006113656-08 P= 30.838567 Days  $T_0=148.567220$  (BKJD)



# DV Quarter-Phased Transit Curves

TCE 006113656-08 P= 30.838567 Days  $T_0=148.567220$  (BKJD)

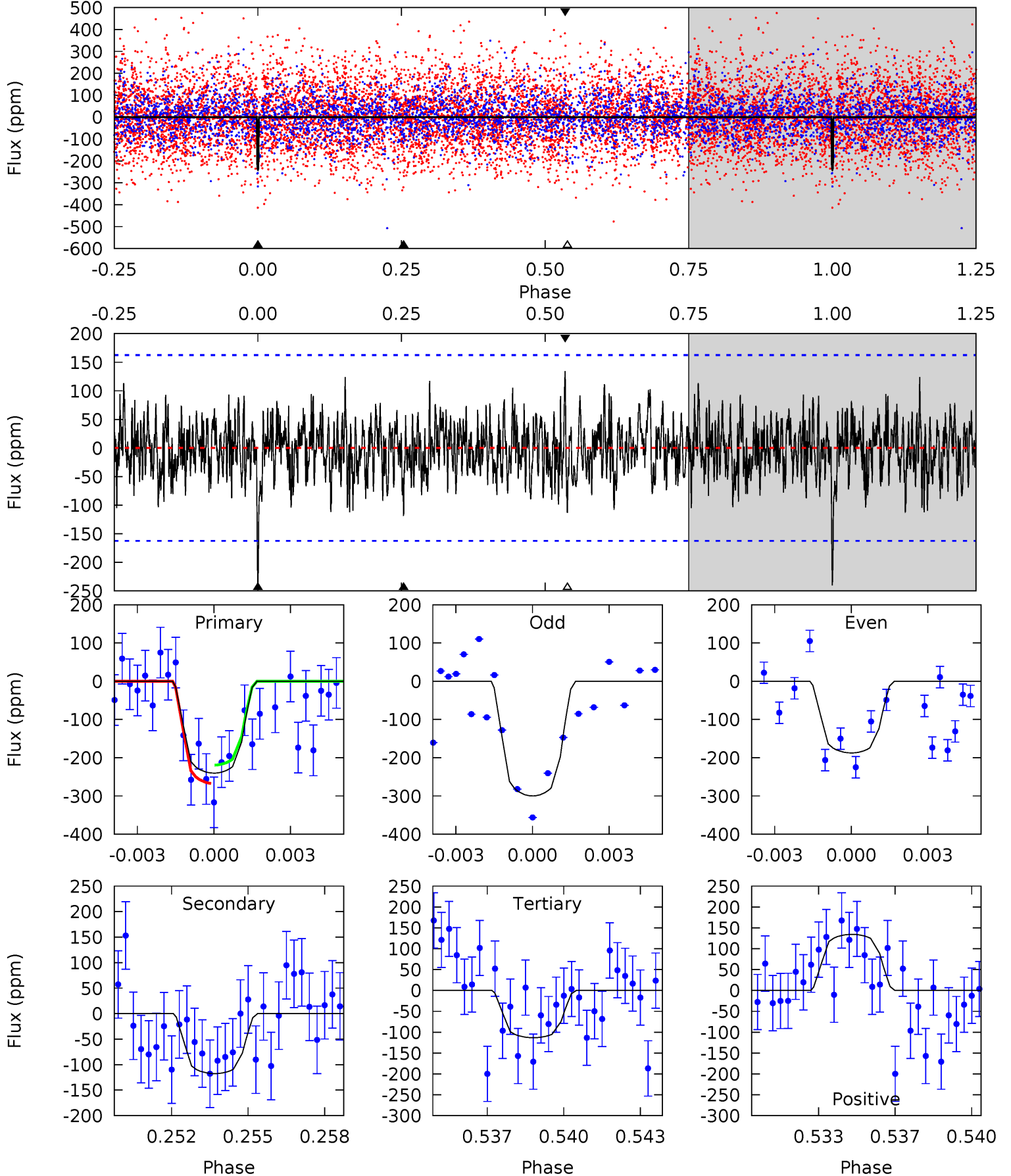


This plot does not exist for this TCE.

# DV Model-Shift Uniqueness Test

006113656-08, P = 30.838567 Days, E = 117.728653 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
7.74	3.79	3.65	4.33	5.23	2.94	1.28	4.10	3.41	0.14	-0.54	1.80	0.92	0.36	0.76



## Alt Model-Shift Uniqueness Test

This plot does not exist for this TCE.

### Stellar Parameters For KIC 006113656

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-08 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-118 \pm 31$	$4.17^{+3.98}_{-2.66}$	$1297^{+95}_{-89}$	$5249^{+3730}_{-1182}$	$185^{+1139}_{-137}$
Alt.	N/A	N/A	N/A	N/A	N/A

$T_{max}$  = Theoretical Maximum Planetary Temperature

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

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

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

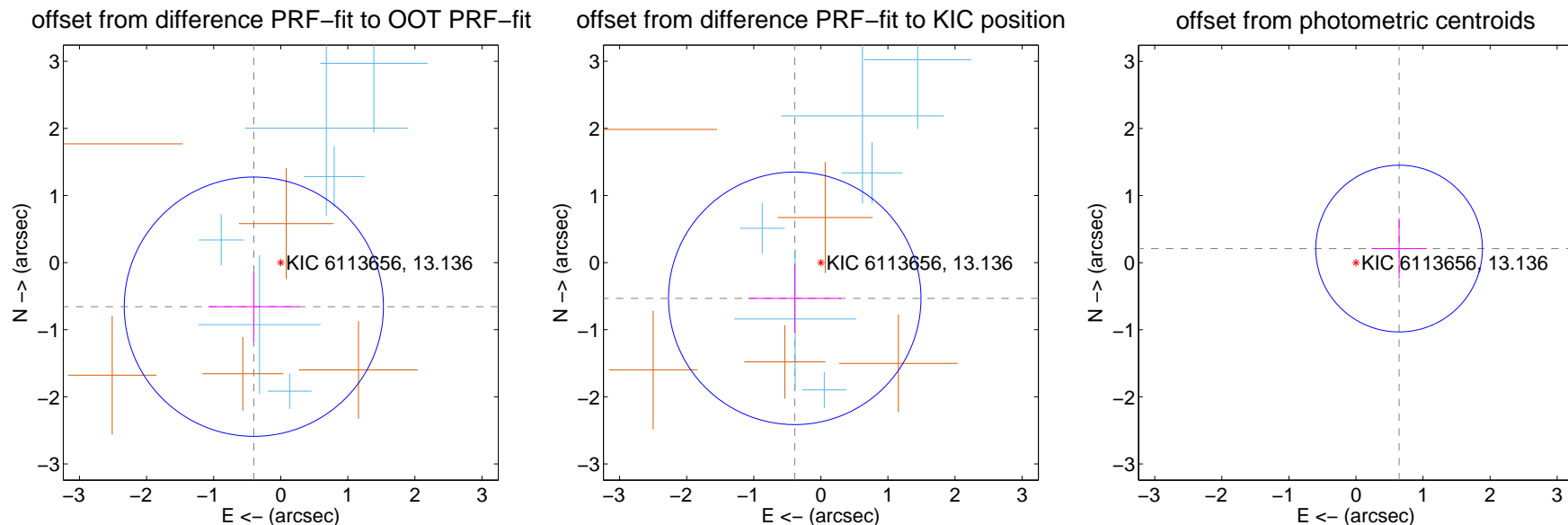
## DV Centroid Data

Supplemental centroid analysis for 006113656-08. Kepler magnitude: 13.14. Transit SNR 10.10

There are 6 quarters with good PRF difference image offsets

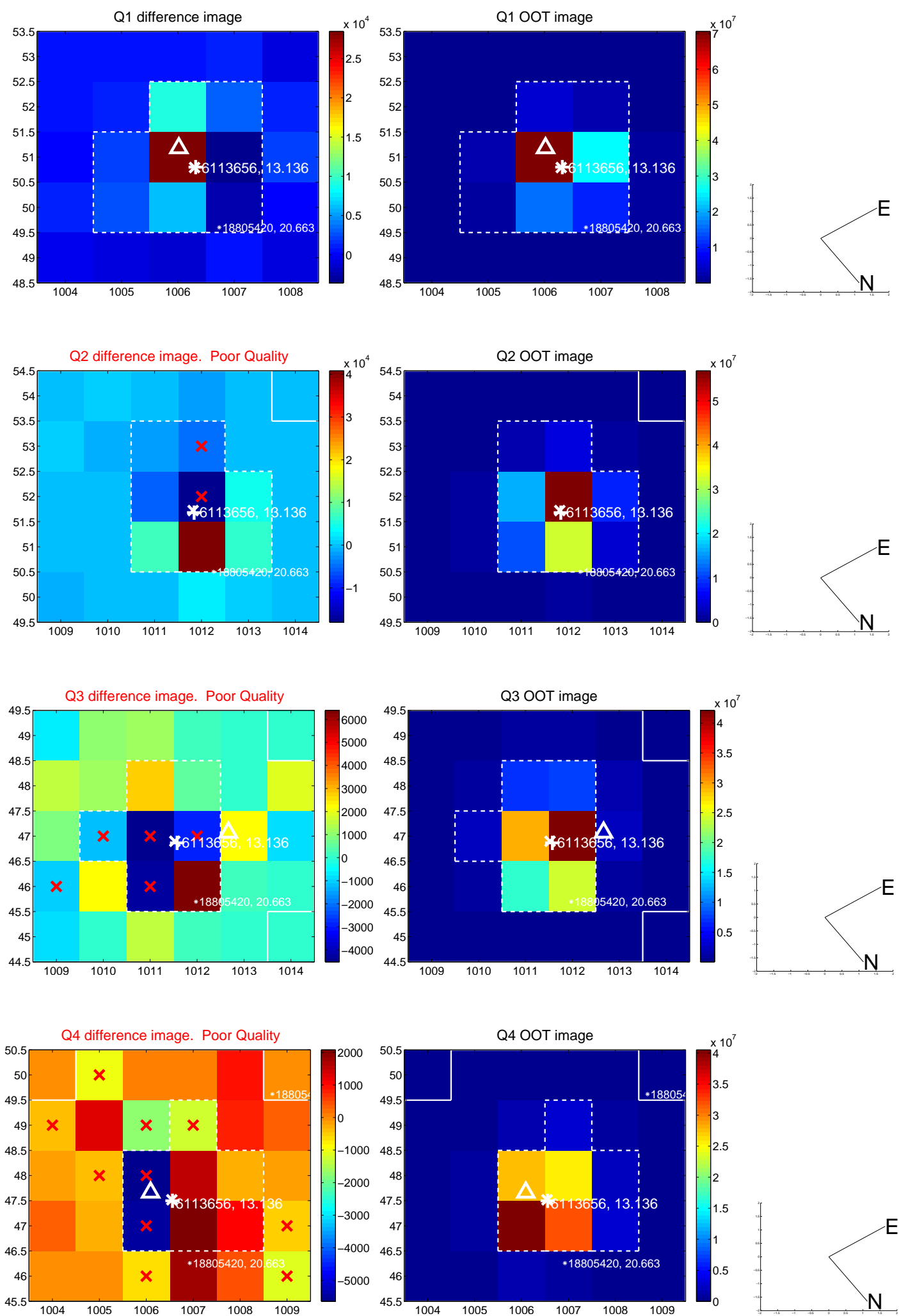
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.770 \pm 0.644$	1.20	$0.401 \pm 0.678$	$-0.657 \pm 0.522$
PRF-fit source offset from KIC position	$0.659 \pm 0.627$	1.05	$0.389 \pm 0.692$	$-0.532 \pm 0.518$
photometric centroid source offset	$0.68 \pm 0.41$	1.63	$-0.64 \pm 0.41$	$0.21 \pm 0.45$



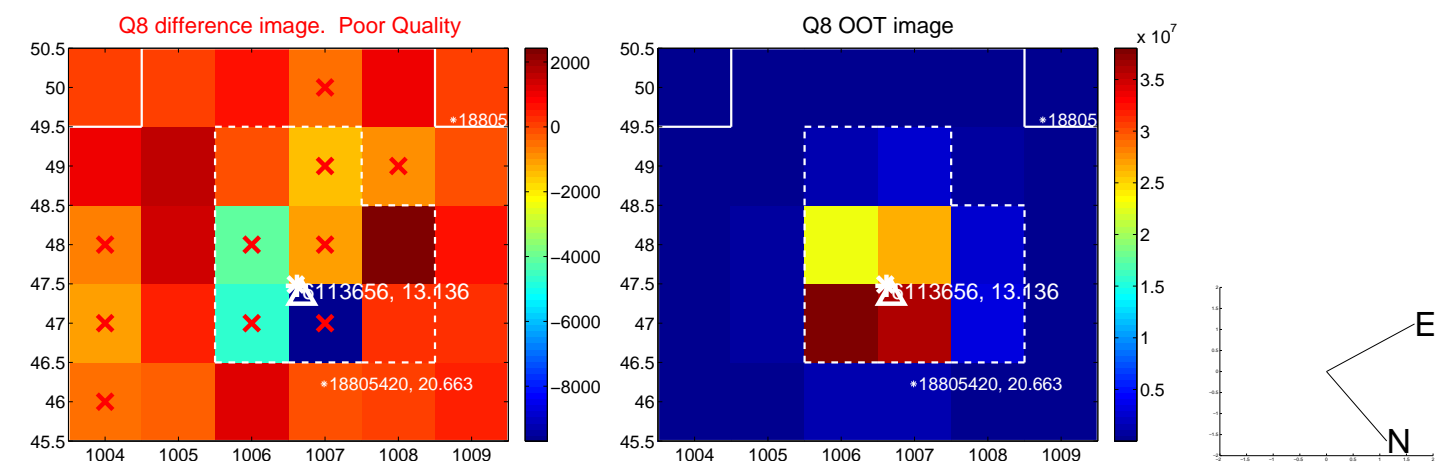
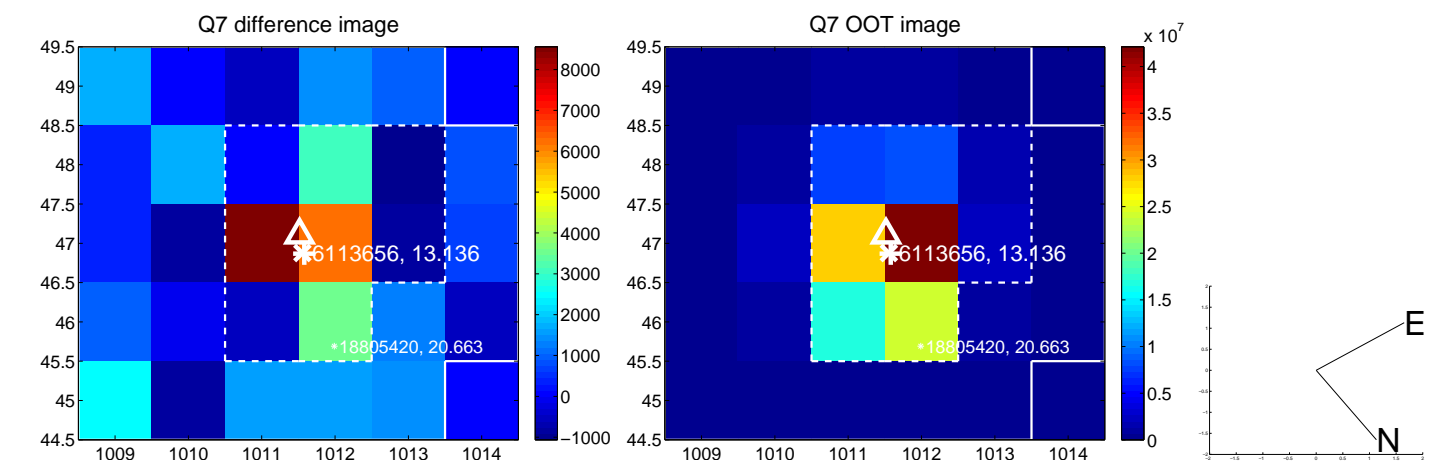
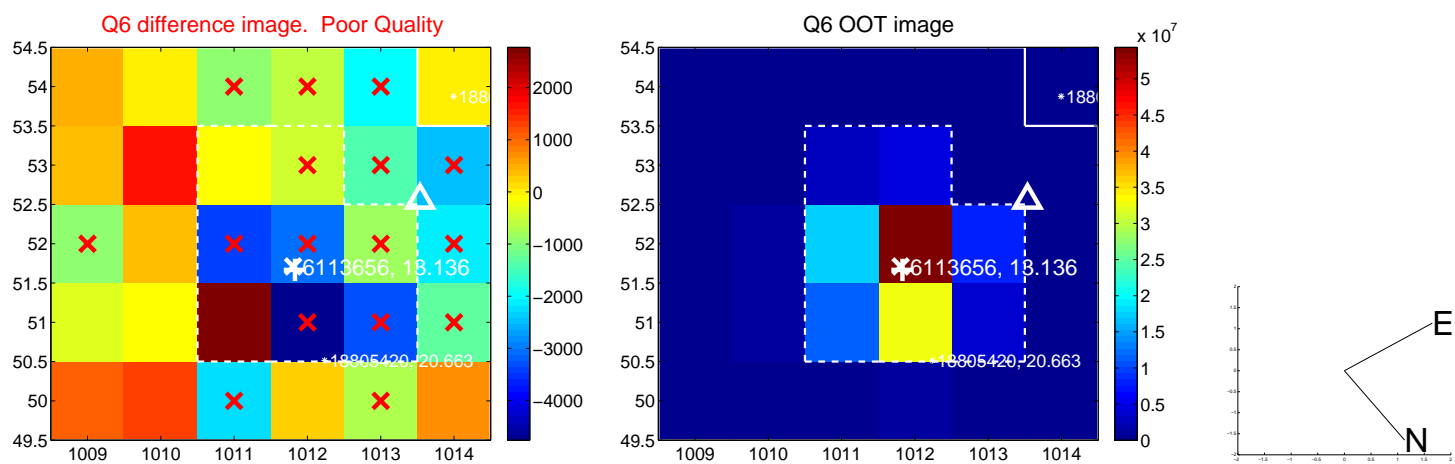
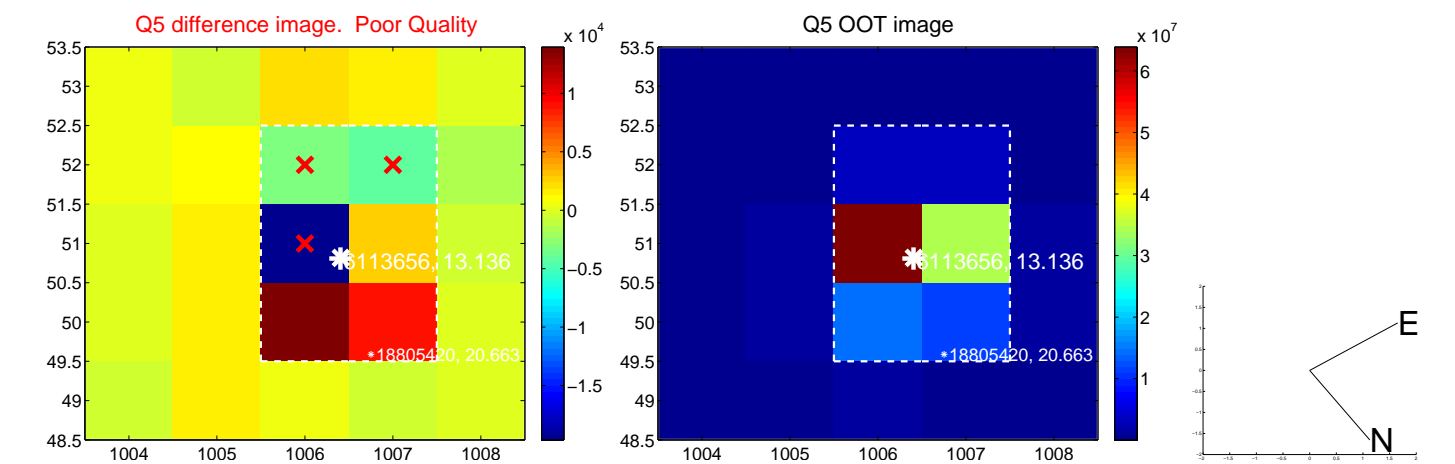
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

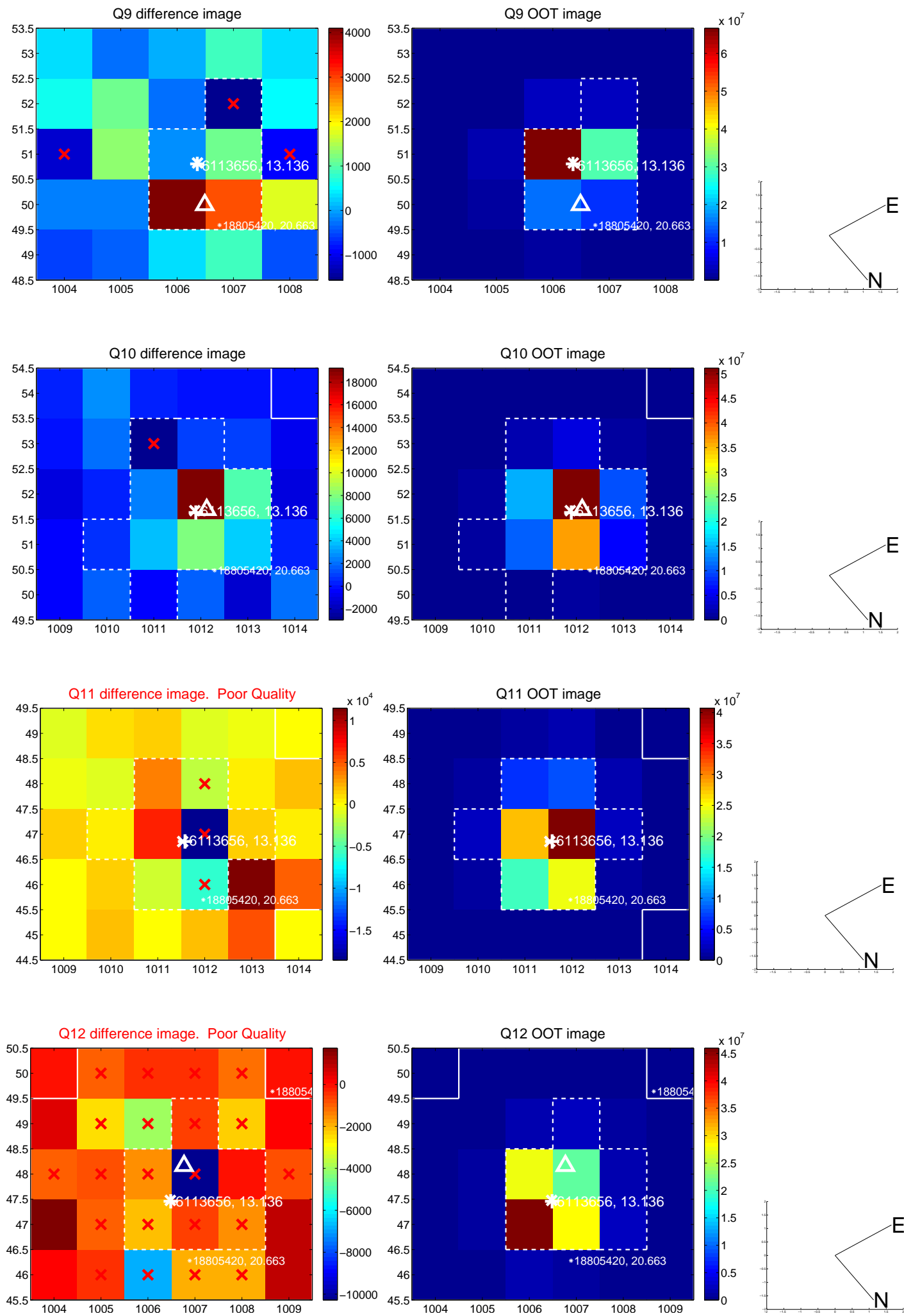




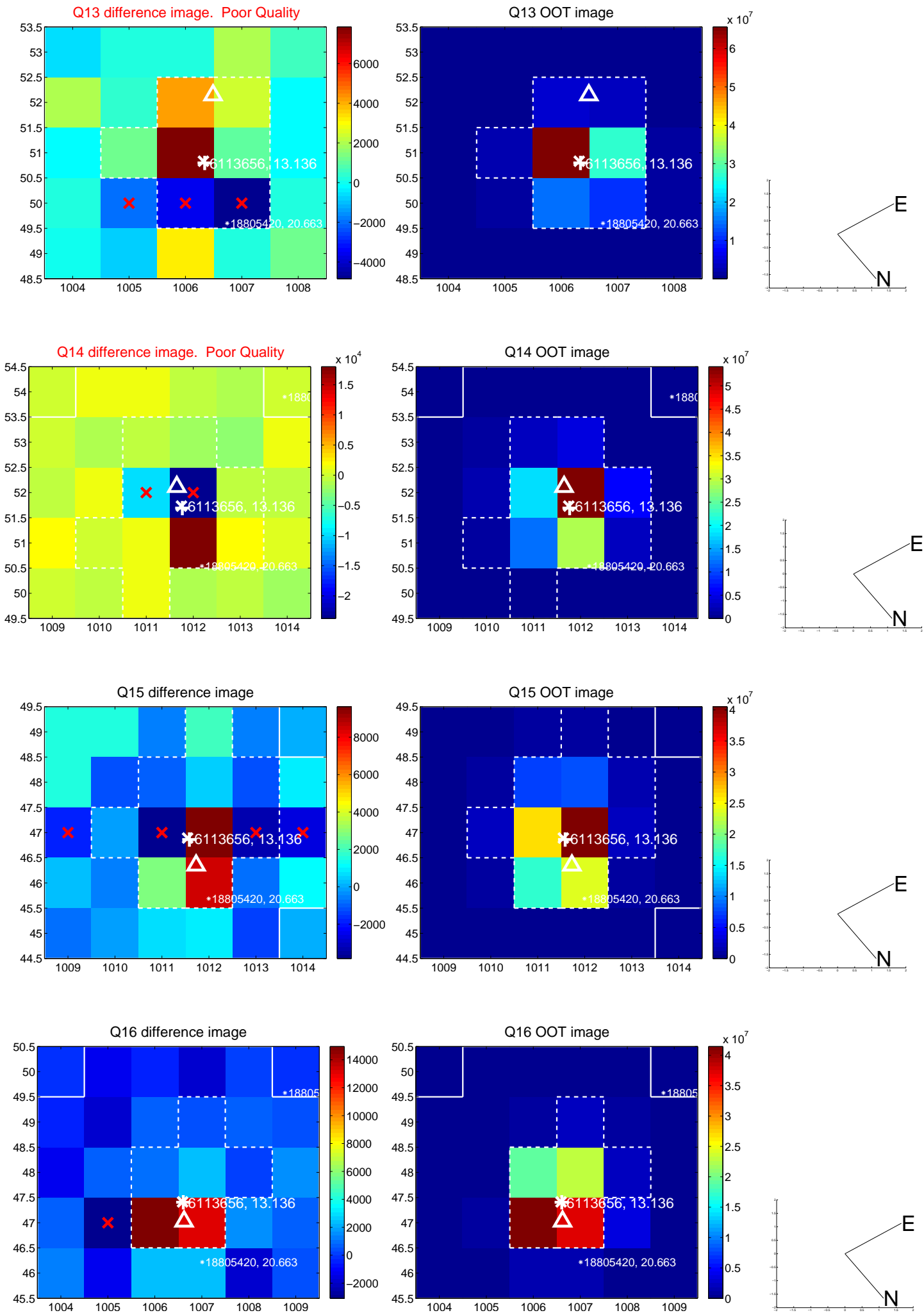
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



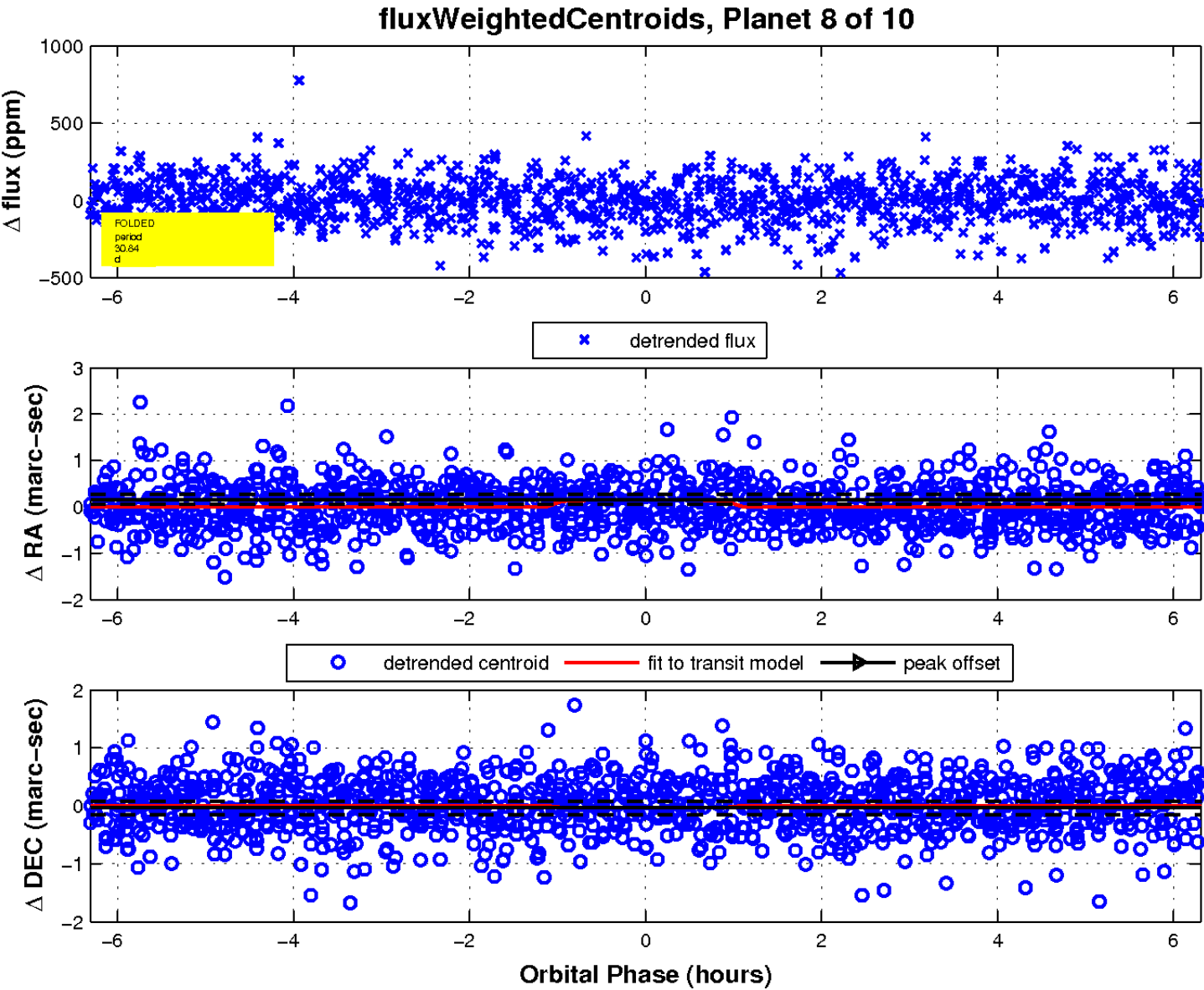
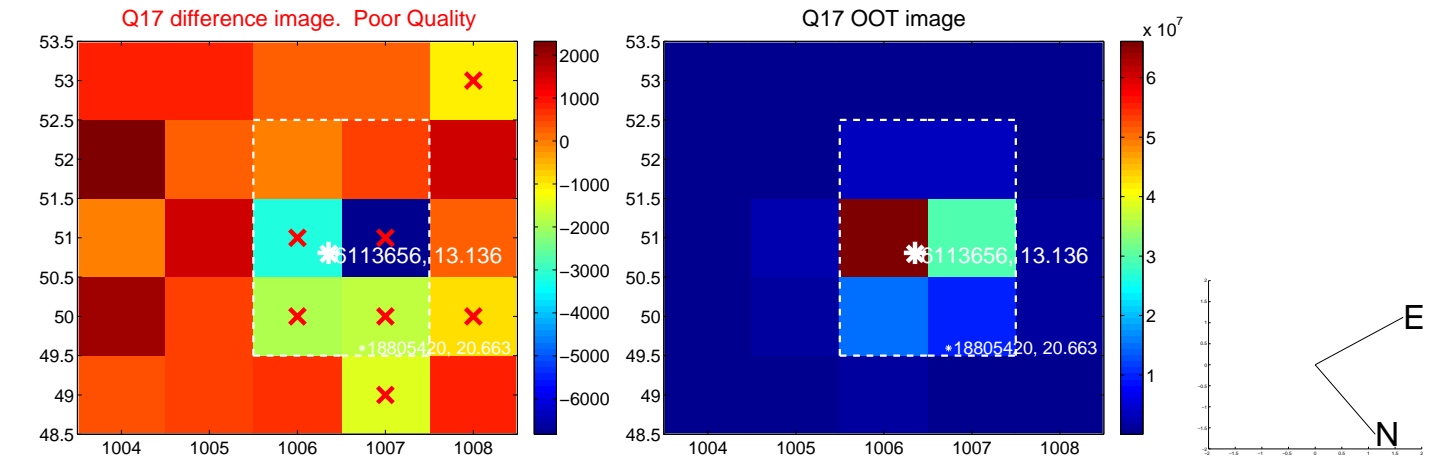
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

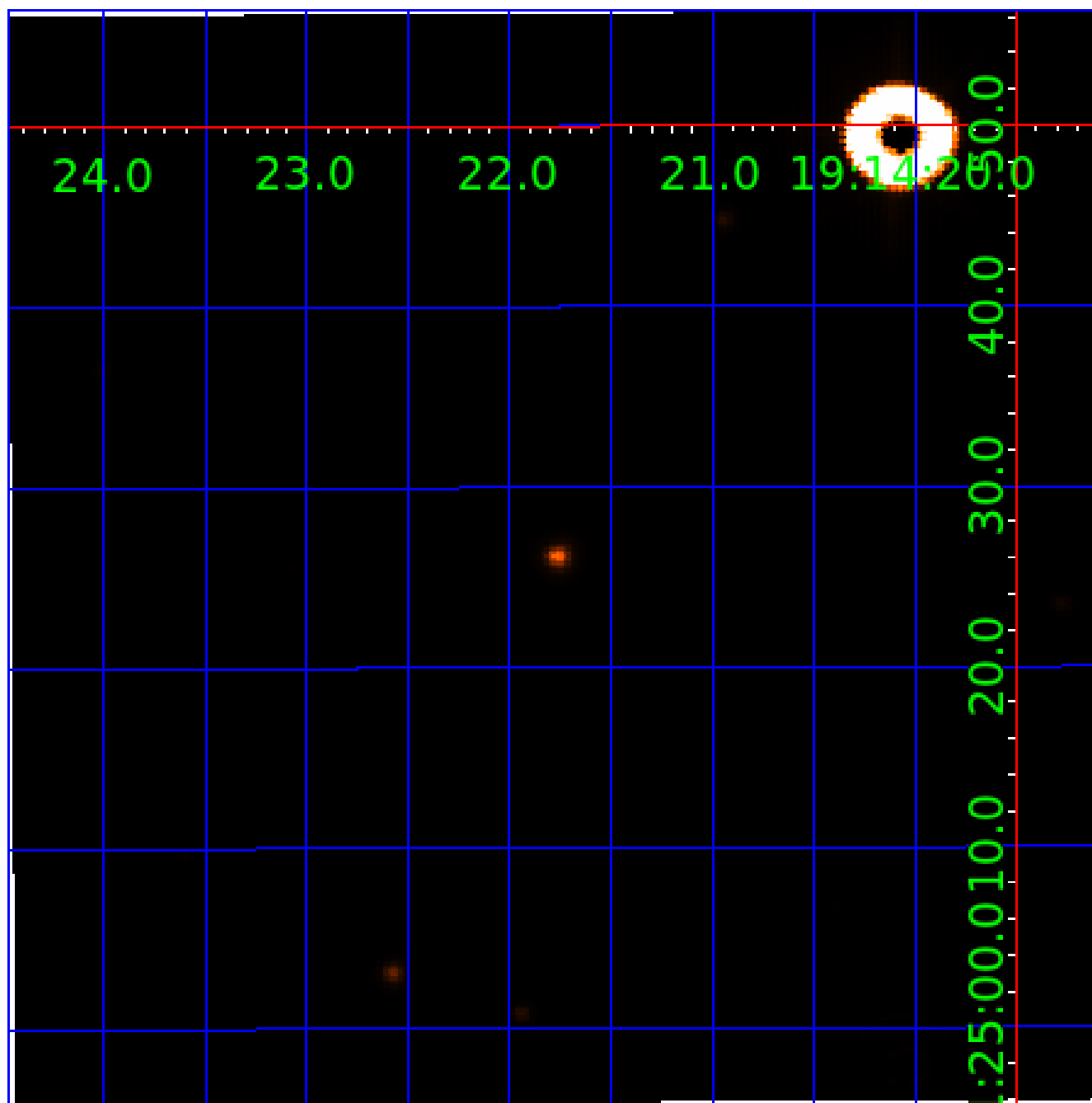


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



UKIRT Image

Declination



## KIC 006113656

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113656-01	OBS	No	2.646238	132.447489	5.6	18.121	11.4	3.0	1.88	7266	0.46	4677.99
006113656-02	OBS	No	58.535580	182.791356	207.4	17.532	46.1	7.6	1.88	7266	5.23	75.34
006113656-03	OBS	No	54.788959	170.151339	184.7	12.850	20.9	9.7	1.88	7266	2.58	82.28
006113656-04	OBS	No	44.294861	175.427489	174.4	6.797	11.3	10.5	1.88	7266	2.78	109.25
006113656-05	OBS	No	39.904031	136.547656	166.1	4.552	11.1	10.6	1.88	7266	2.77	125.57
006113656-06	OBS	No	57.280460	137.501760	190.8	6.317	11.1	11.6	1.88	7266	2.88	77.55
006113656-07	OBS	No	62.394926	153.799040	161.0	11.070	11.8	8.4	1.88	7266	2.70	69.19
006113656-08	OBS	No	30.838567	148.567220	249.9	2.104	10.9	10.1	1.88	7266	3.01	177.05
006113656-09	OBS	No	30.832288	161.442836	130.4	9.084	9.9	10.9	1.88	7266	2.38	177.10
006113656-10	OBS	No	15.974468	134.165876	100.7	9.468	10.0	7.9	1.88	7266	2.01	425.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113656-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
006113656-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
006113656-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
006113656-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

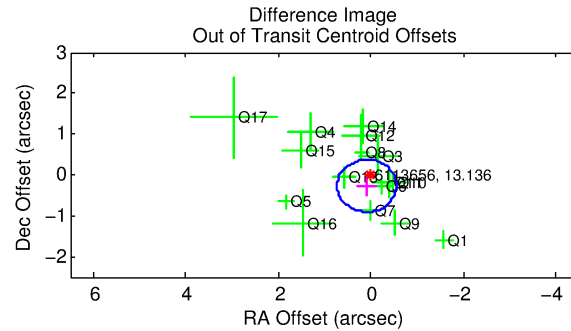
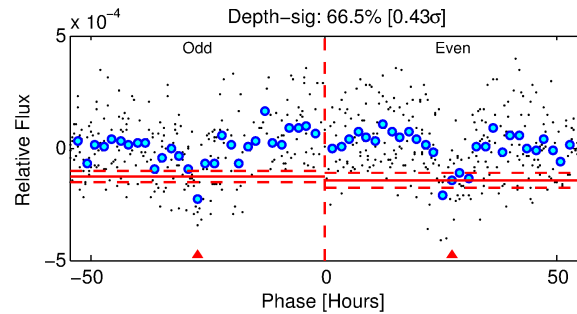
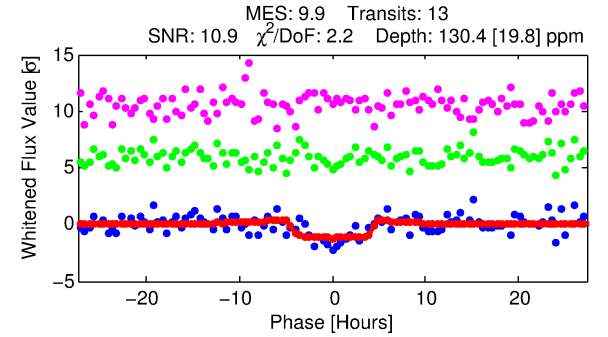
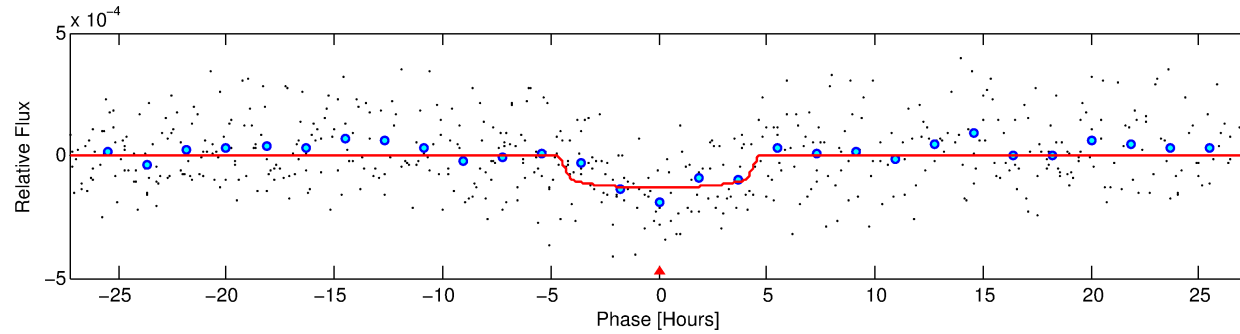
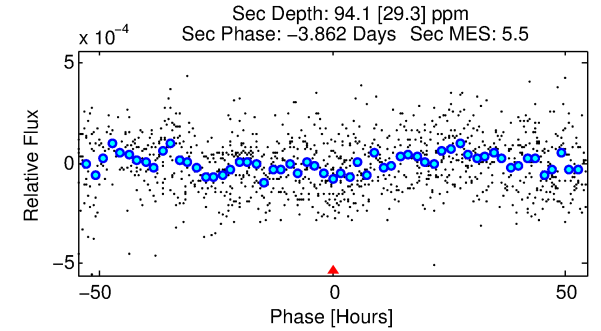
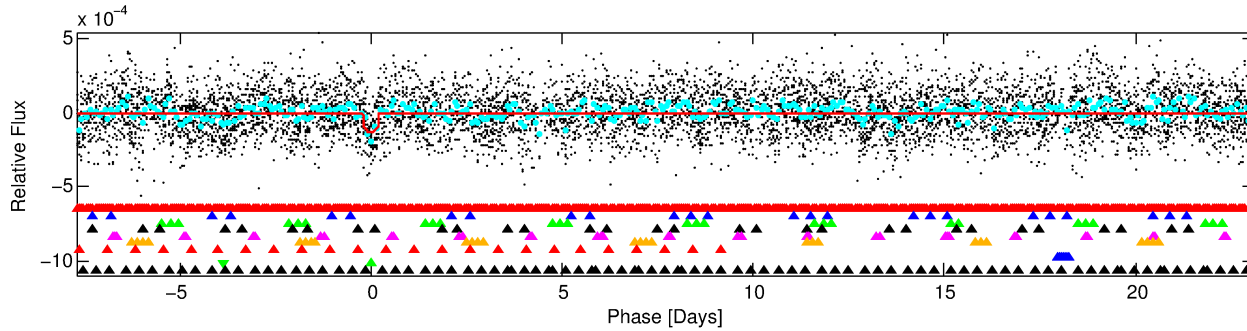
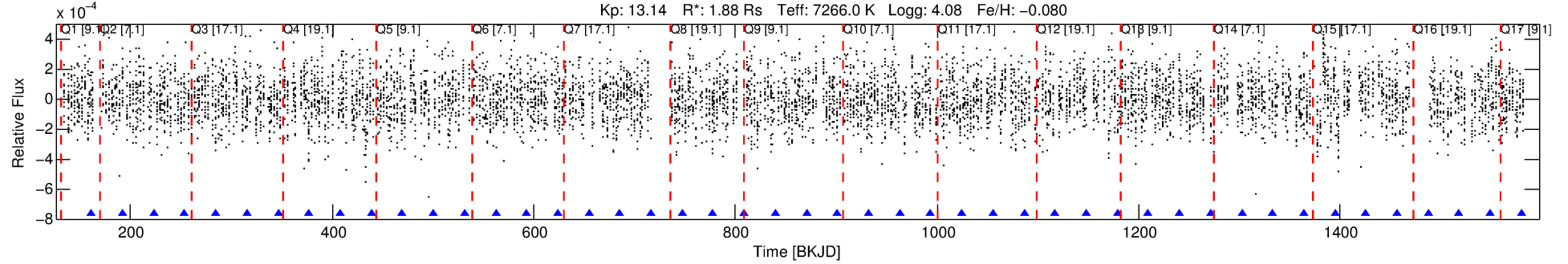
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006113656-09

No Significant Match Found

# DV One-Page Summary

KIC: 6113656 Candidate: 9 of 10 Period: 30.832 d



## DV Fit Results:

Period = 30.83229 [0.00066] d  
Epoch = 161.4428 [0.0171] BKJD  
Rp/R\* = 0.0116 [0.0040]  
a/R\* = 15.16 [31.43]  
b = 0.83 [0.80]  
Seff = 177.10 [64.99]  
Teff = 930 [85] K  
Rp = 2.38 [1.07] Re  
a = 0.2228 [0.0514] AU  
Ag = 451.95 [373.38] [1.21σ]  
Teffp = 6631 [1293] K [4.40σ]

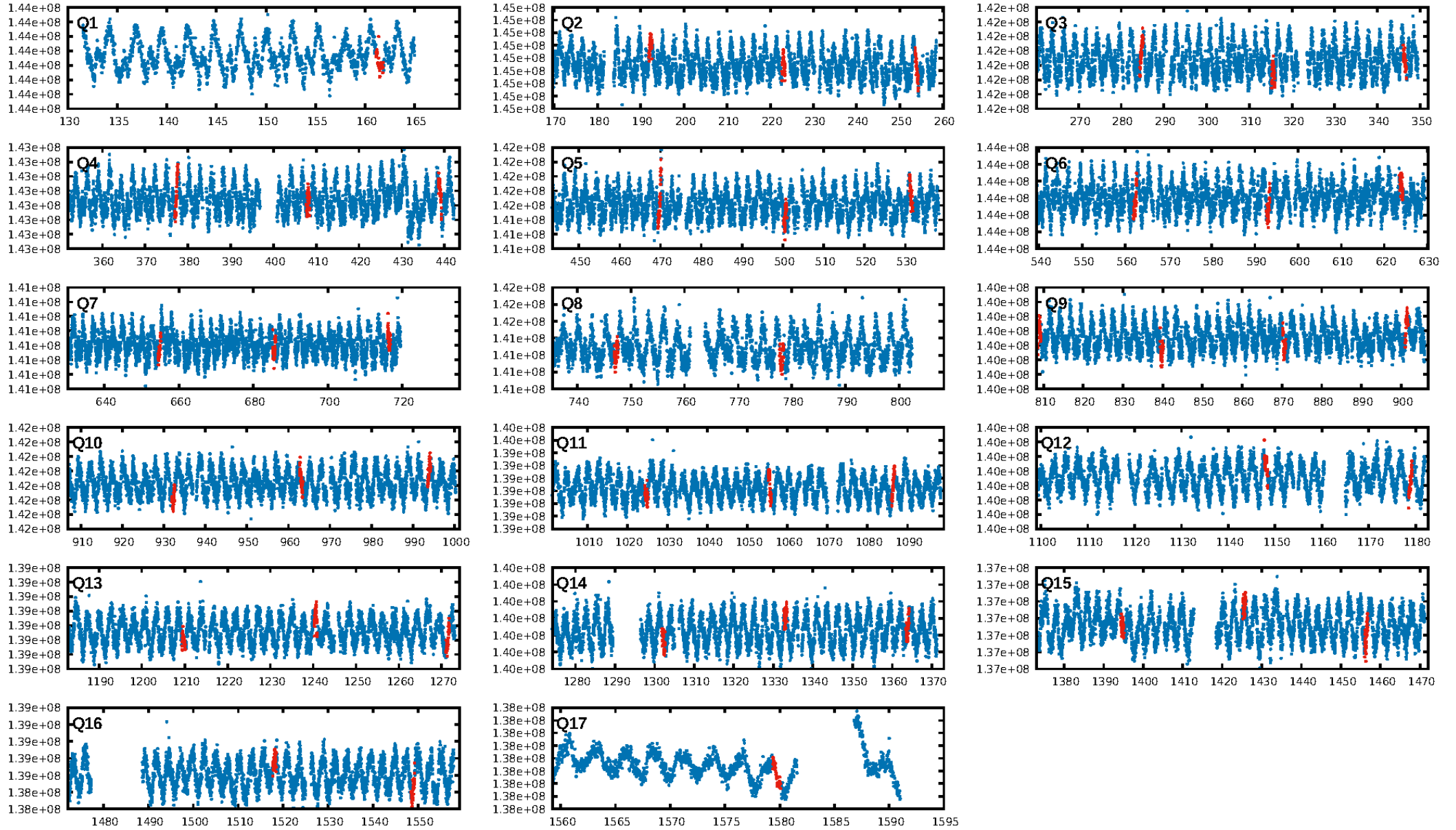
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [27.18σ]  
LongPeriod-sig: 1.3% [0.02σ]  
ModelChiSquare2-sig: 0.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [13/13]  
GhostDiagnostic-chr: 1.691  
Centroid-sig: 24.1%  
Centroid-so: 0.525 arcsec [1.28σ]  
OotOffset-rm: 0.286 arcsec [1.34σ]  
OotOffset-st: 3/4/4/5 [16]  
KicOffset-rm: 0.190 arcsec [0.88σ]  
KicOffset-st: 3/4/4/5 [16]  
DiffImageQuality-fgm: 0.62 [10/16]  
DiffImageOverlap-fno: 0.29 [5/17]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:38 Z

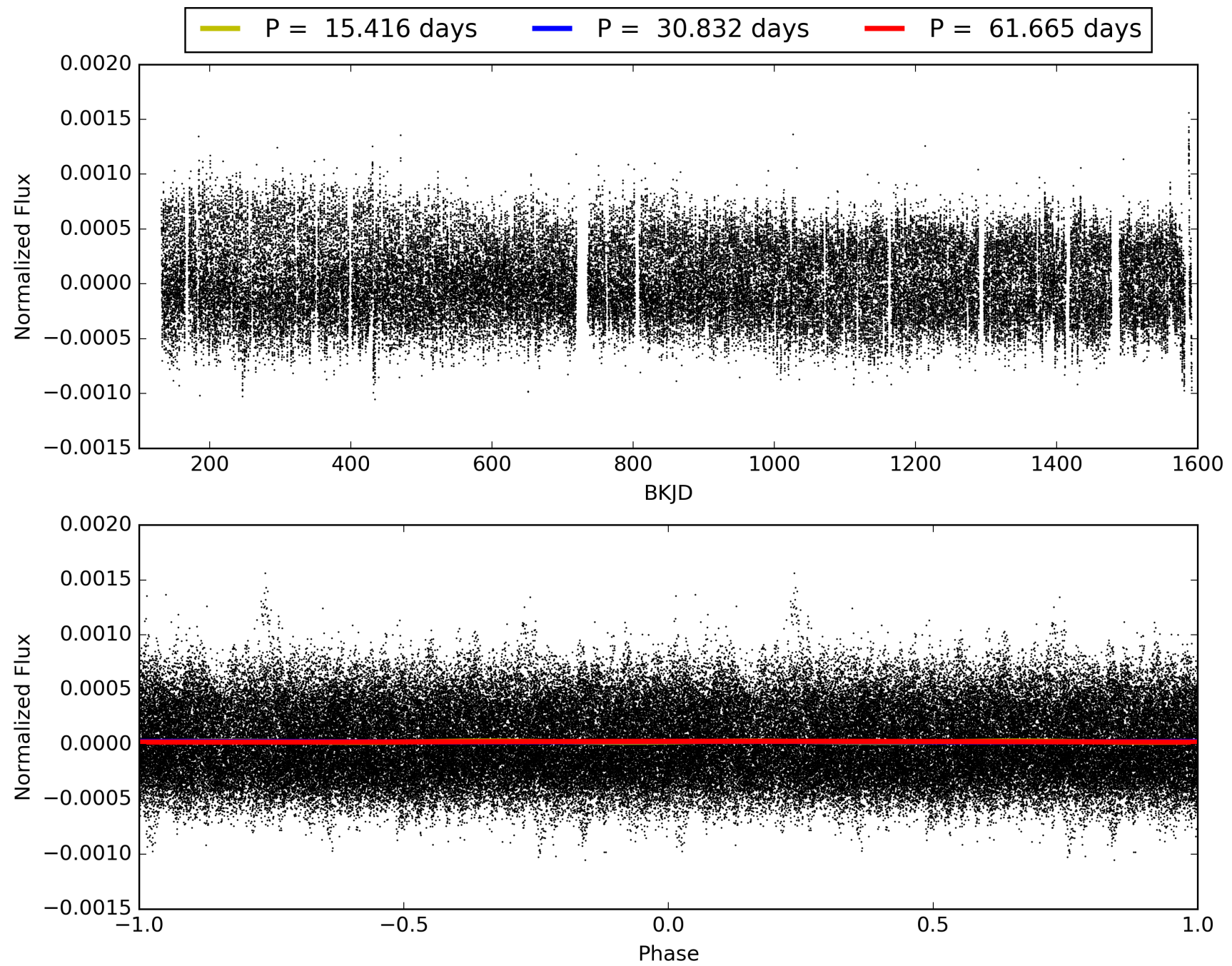
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 006113656-09, PDC Light Curves



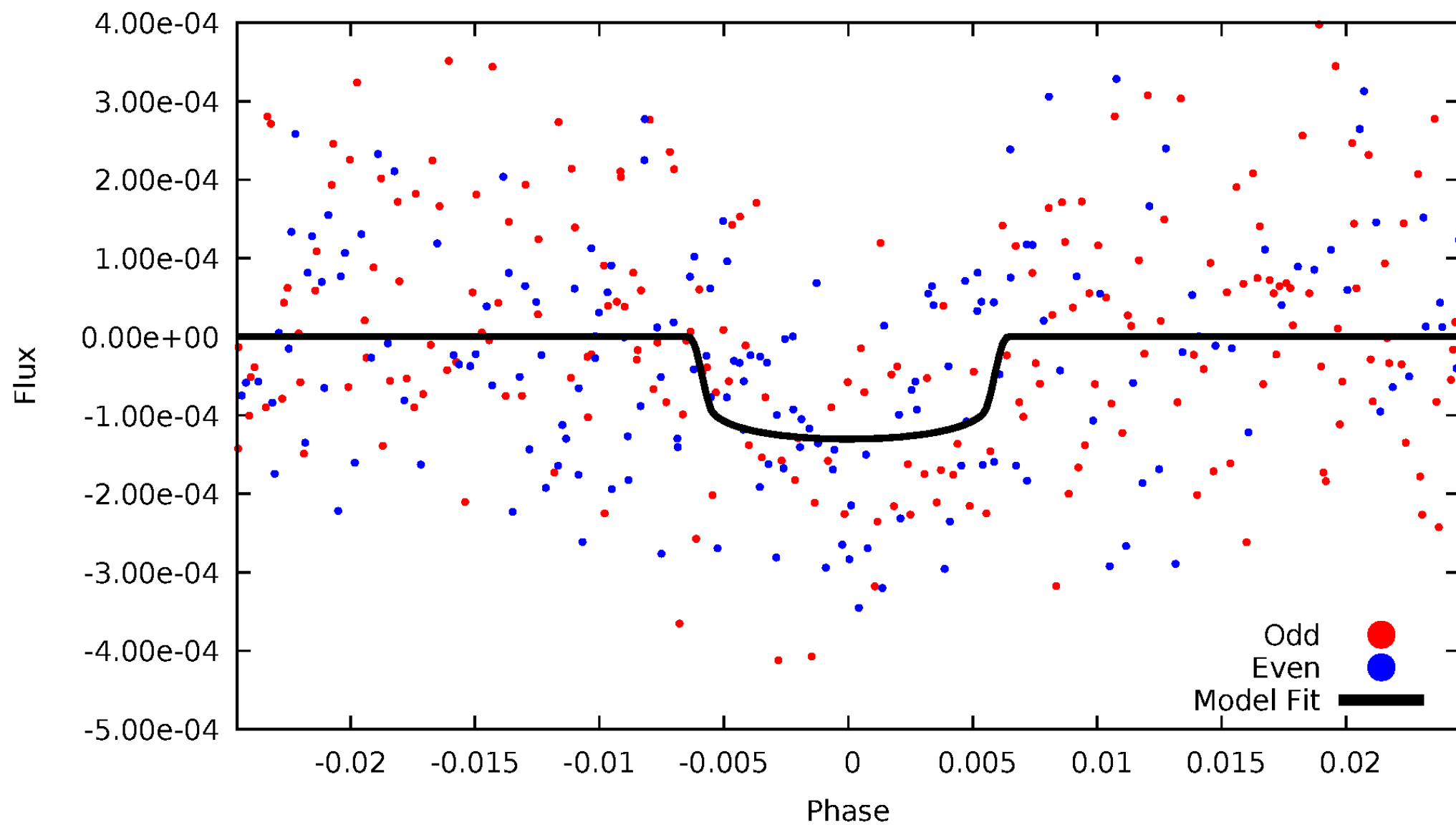


TCE 006113656-09



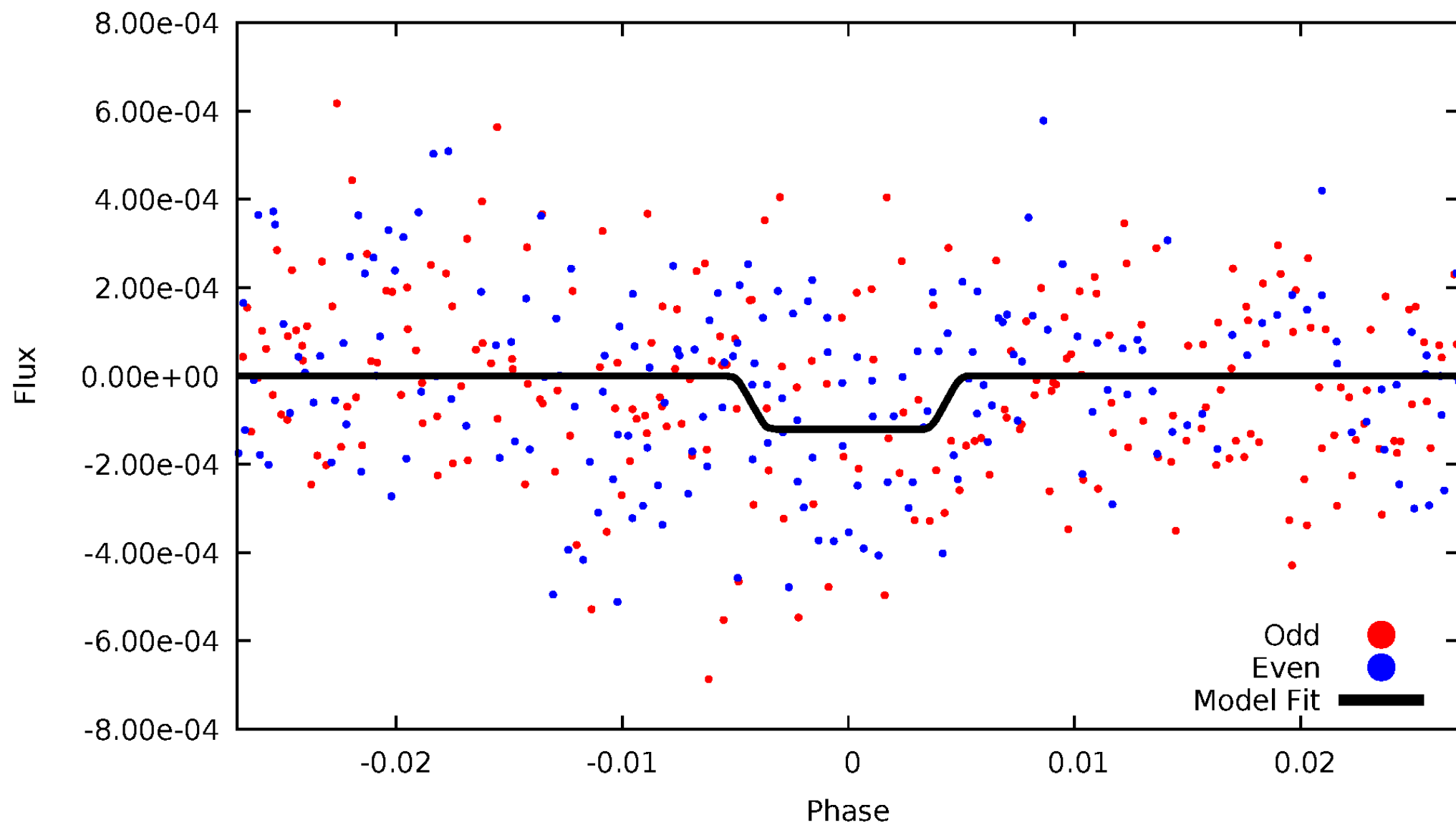
# DV Odd/Even

TCE 006113656-09

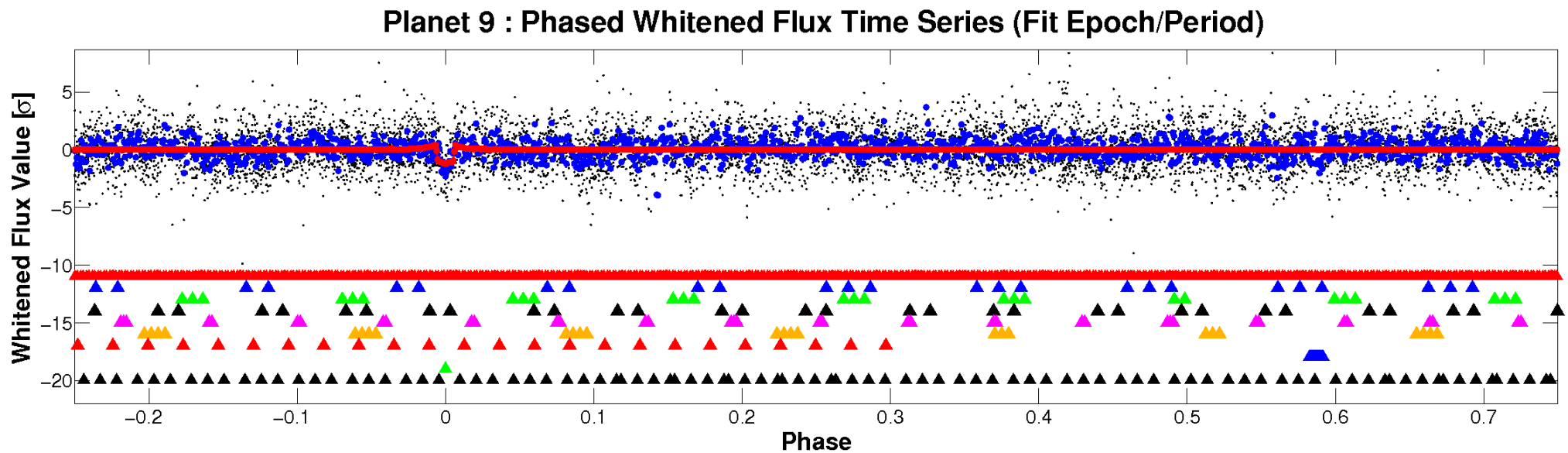
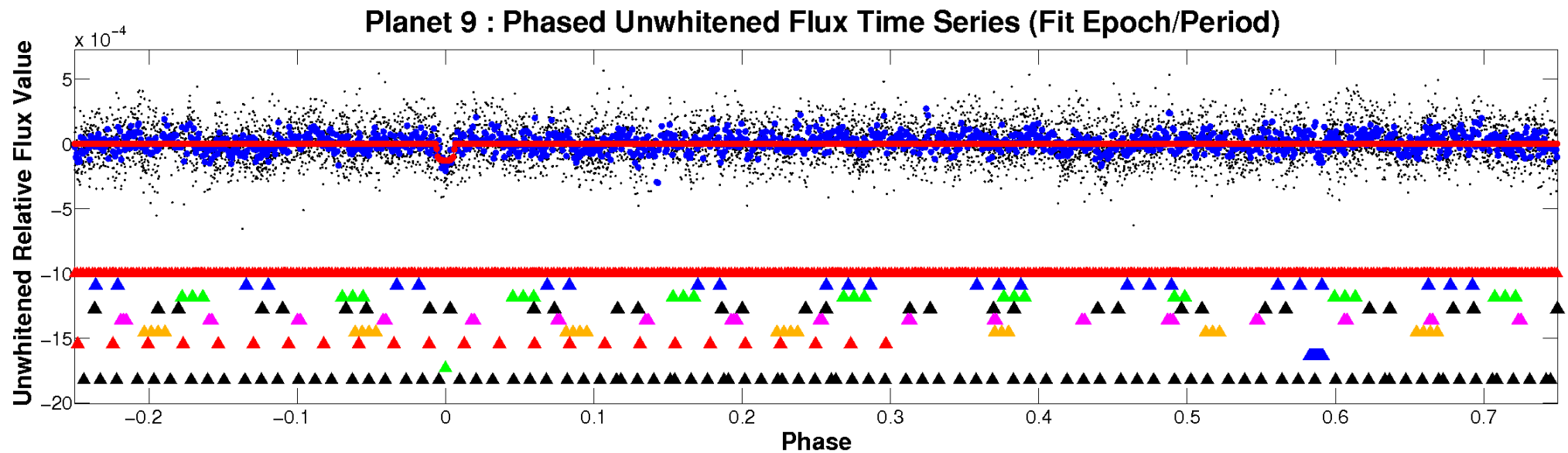


# ALT Odd/Even

TCE 006113656-09

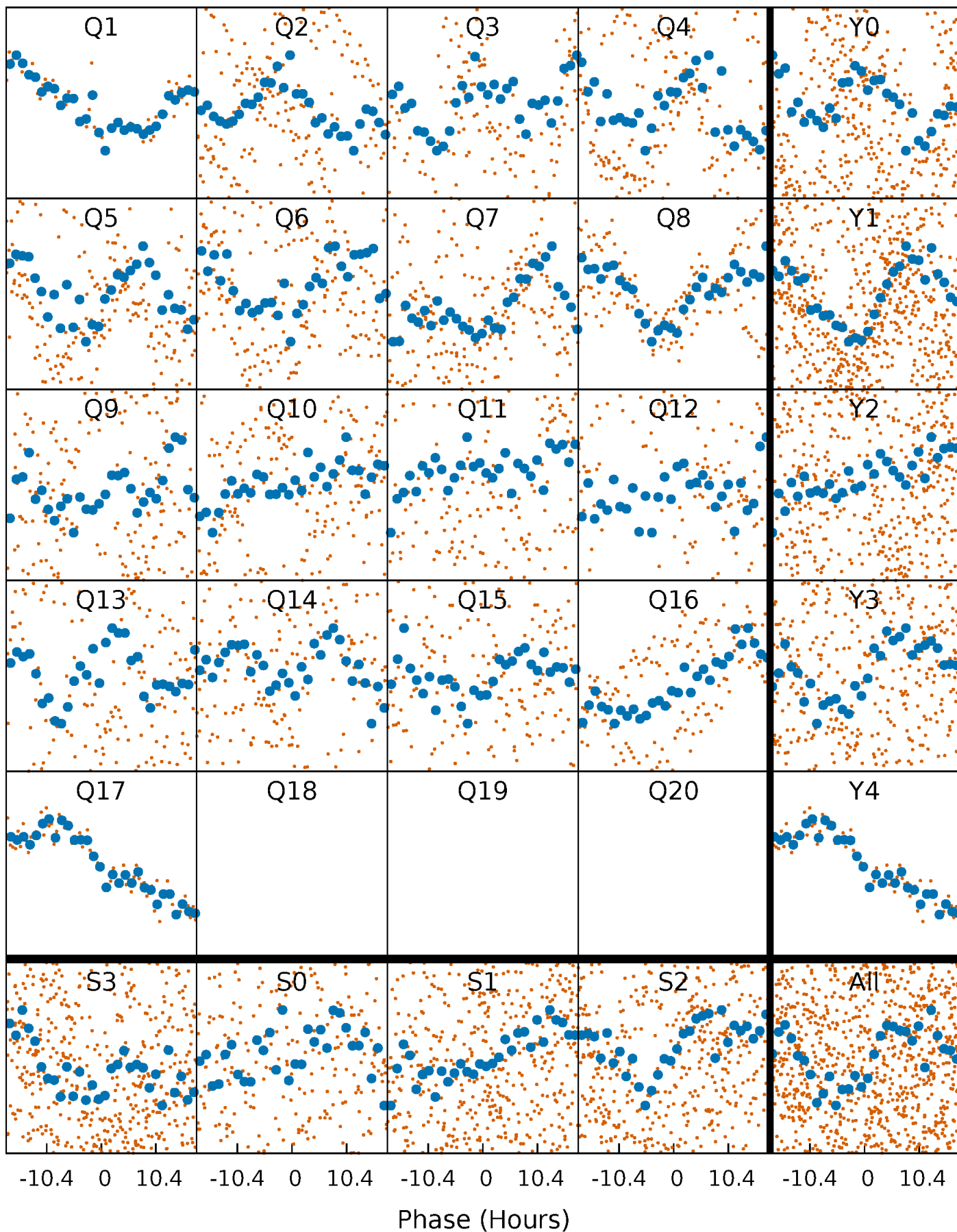


# Non-Whitened Vs. Whitened Light Curve



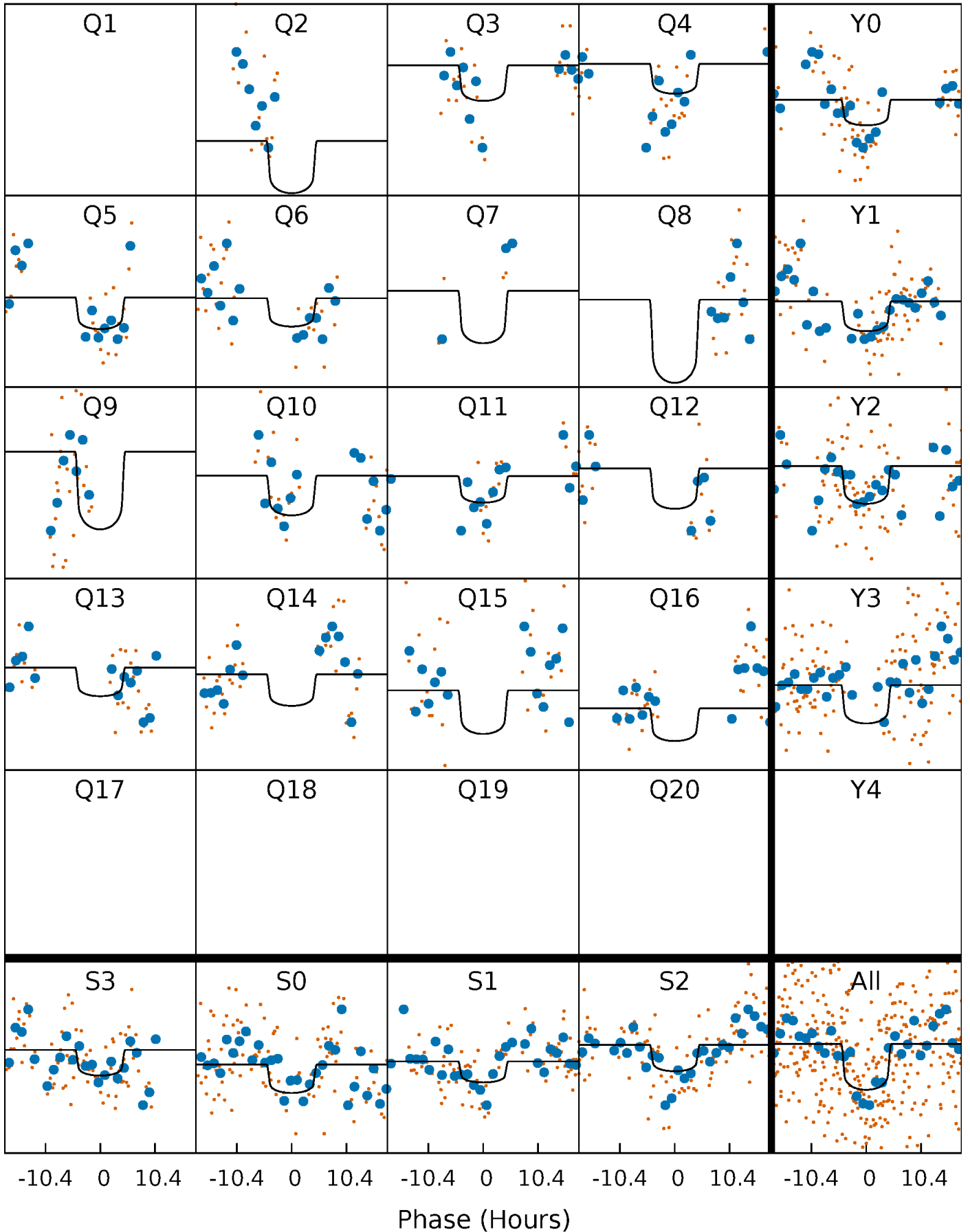
# PDC Quarter-Phased Transit Curves

TCE 006113656-09 P= 30.832288 Days  $T_0=161.442836$  (BKJD)



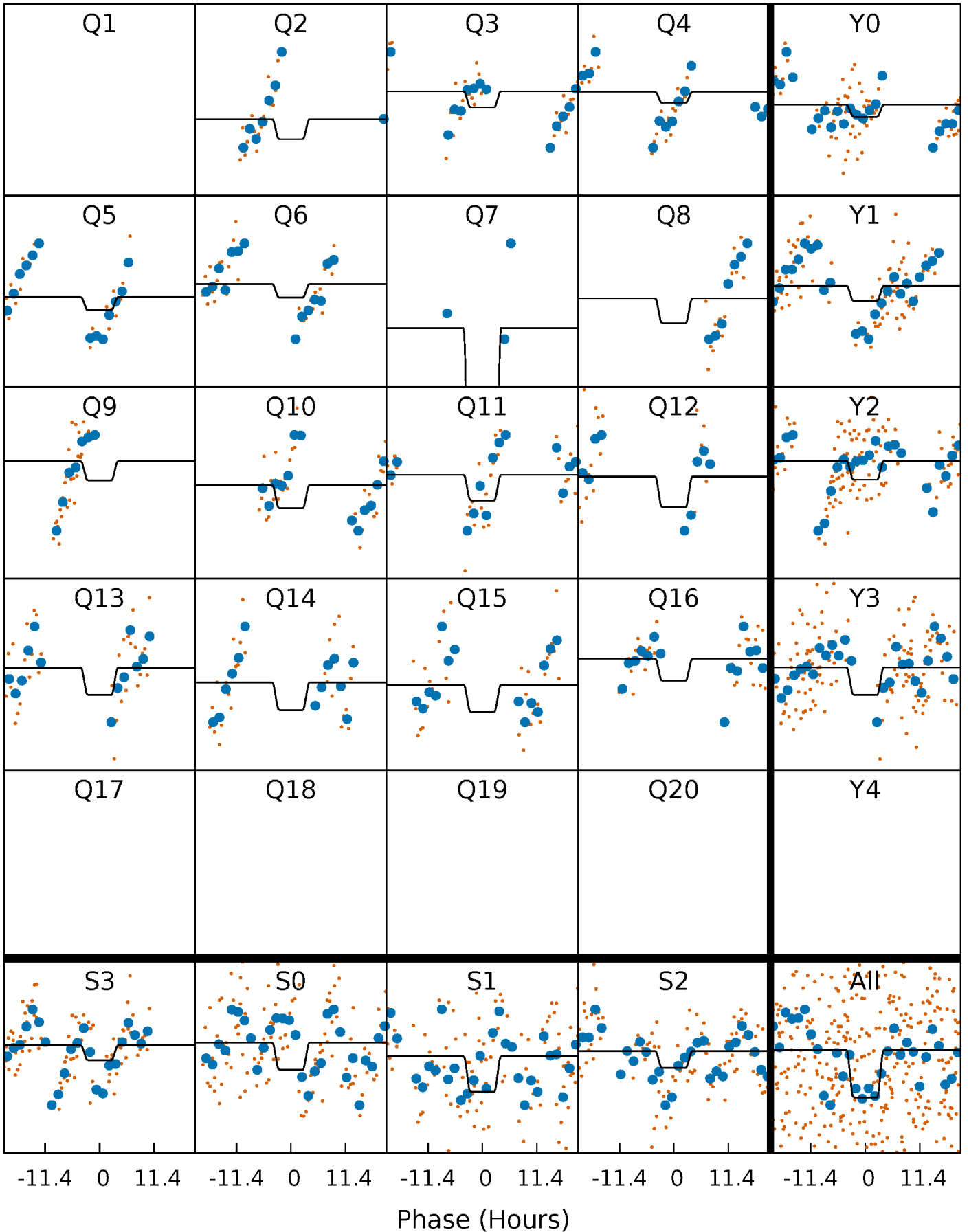
# DV Quarter-Phased Transit Curves

TCE 006113656-09   P= 30.832288 Days    $T_0=161.442836$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

TCE 006113656-09   P= 30.832607 Days    $T_0=161.422003$  (BKJD)

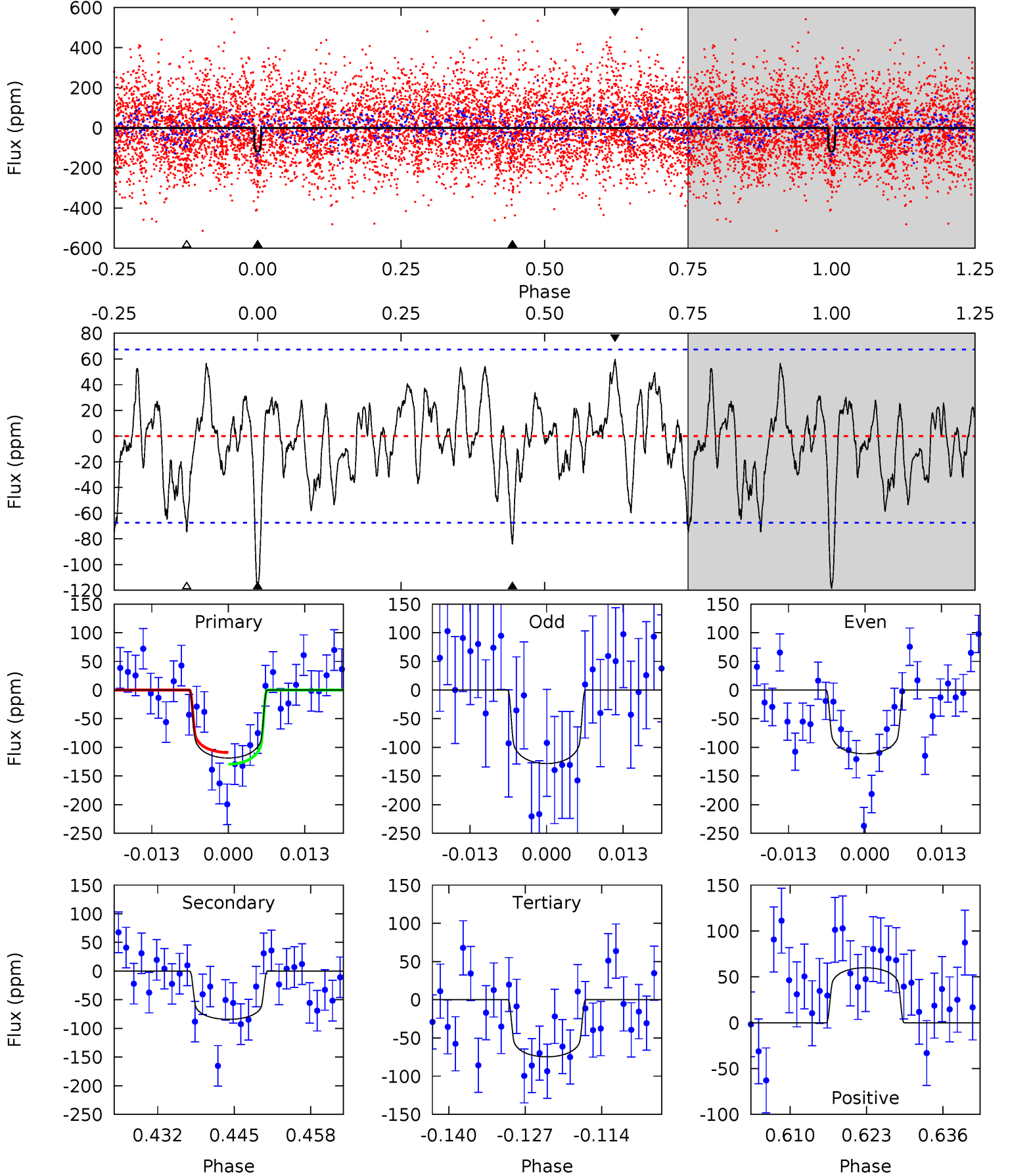




# DV Model-Shift Uniqueness Test

006113656-09, P = 30.832288 Days, E = 130.610548 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
8.77	6.22	5.52	4.43	4.98	2.49	1.97	3.25	4.34	0.70	1.80	0.63	0.85	0.34	0.76

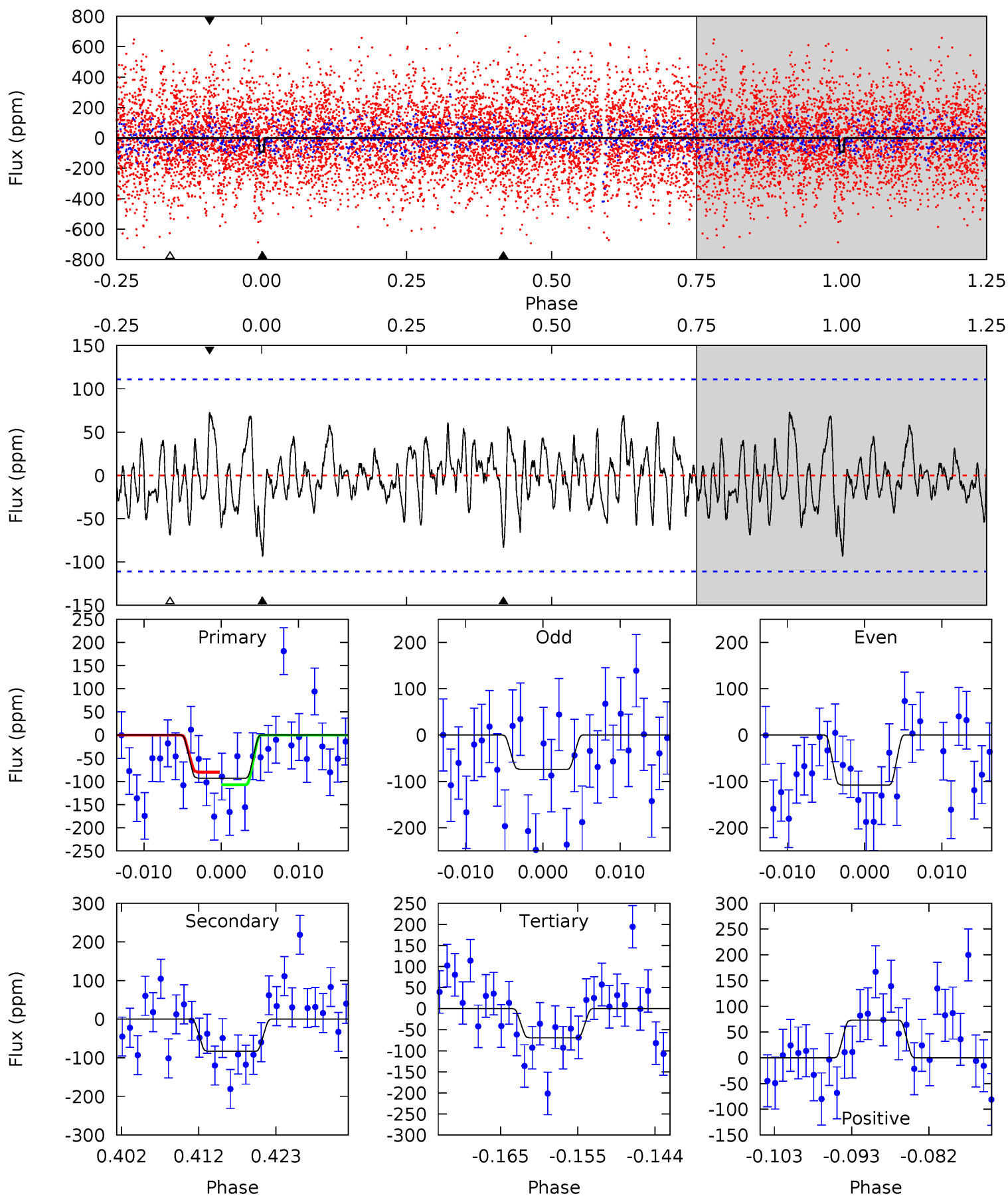




# Alt Model-Shift Uniqueness Test

006113656-09, P = 30.832607 Days, E = 130.589396 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
4.20	3.76	3.13	3.31	5.02	2.57	1.25	1.07	0.90	0.63	0.46	0.76	0.60	0.44	0.62



### Stellar Parameters For KIC 006113656

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-09 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-84 \pm 14$	$2.32^{+0.92}_{-0.79}$	$1293^{+95}_{-94}$	$6397^{+1718}_{-940}$	$410^{+557}_{-198}$
Alt.	$-83 \pm 22$	$2.22^{+0.95}_{-0.79}$	$1282^{+102}_{-87}$	$6449^{+2046}_{-1072}$	$464^{+674}_{-268}$

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

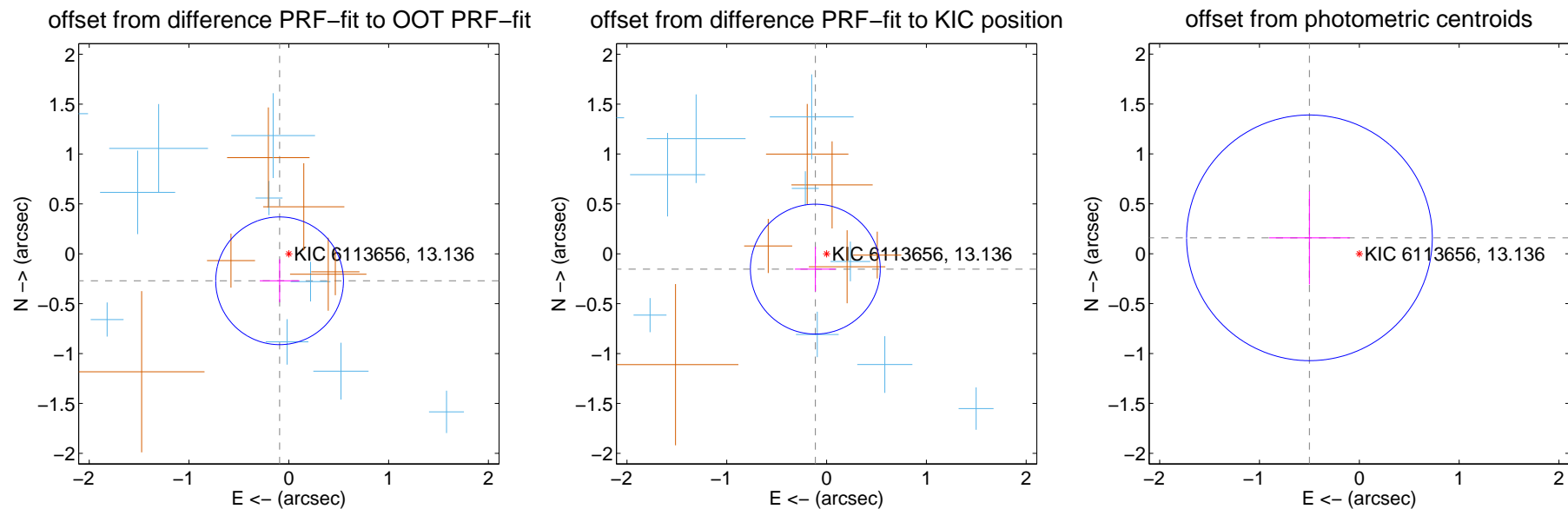
## DV Centroid Data

Supplemental centroid analysis for 006113656-09. Kepler magnitude: 13.14. Transit SNR 10.92

There are 10 quarters with good PRF difference image offsets

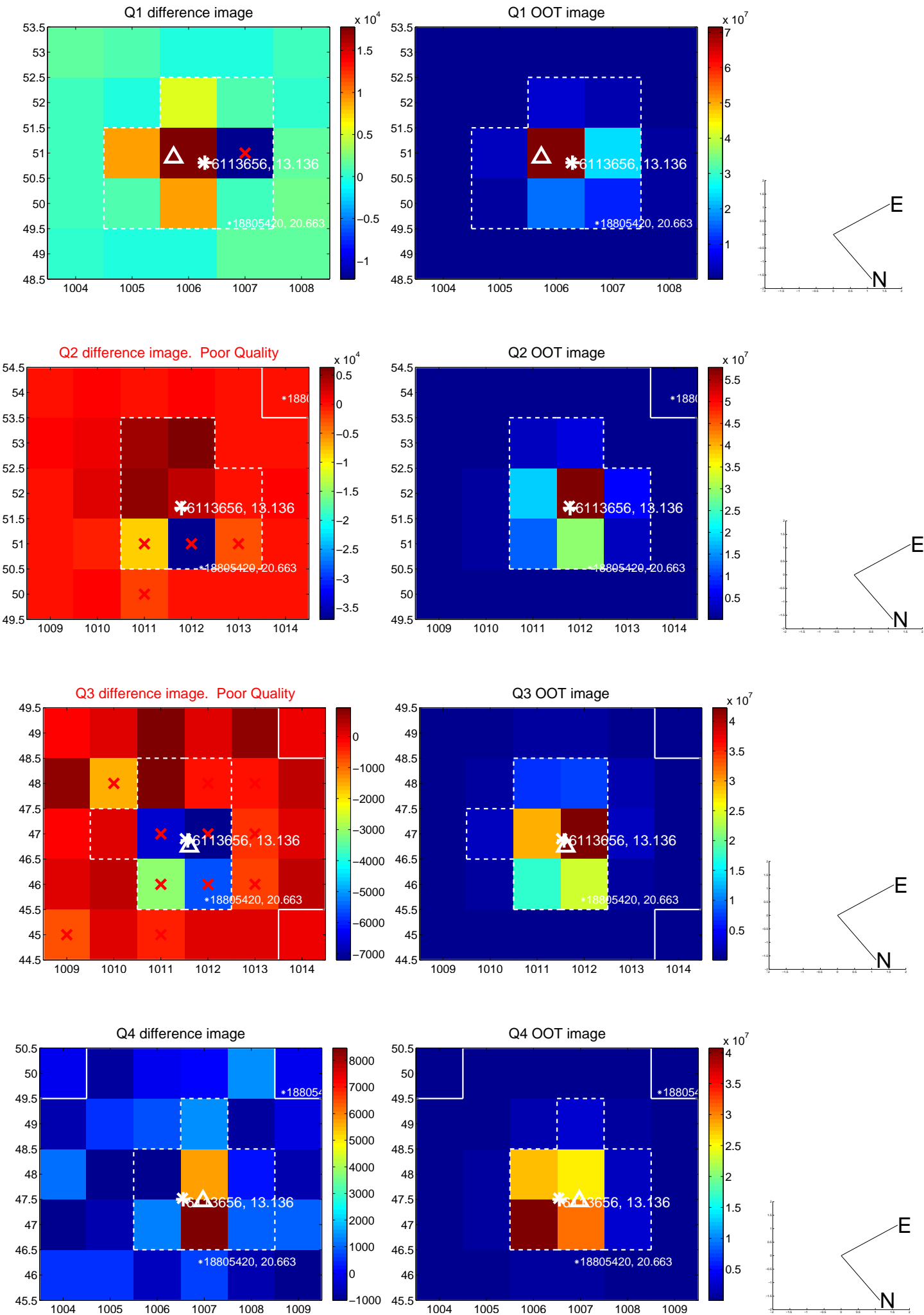
The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.286 \pm 0.213$	1.34	$0.093 \pm 0.199$	$-0.271 \pm 0.215$
PRF-fit source offset from KIC position	$0.190 \pm 0.217$	0.88	$0.113 \pm 0.204$	$-0.154 \pm 0.224$
photometric centroid source offset	$0.52 \pm 0.41$	1.28	$0.50 \pm 0.40$	$0.16 \pm 0.47$

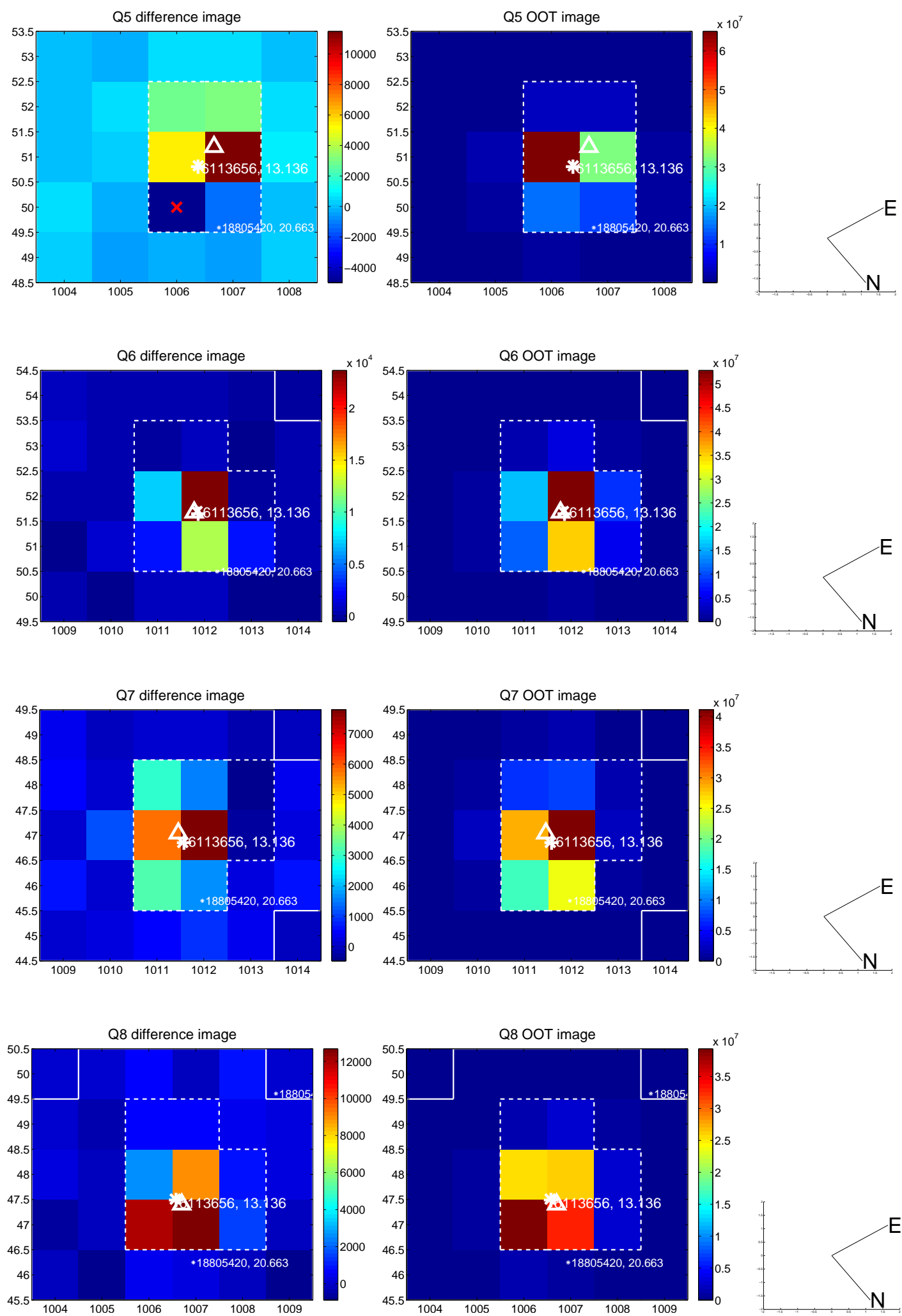


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

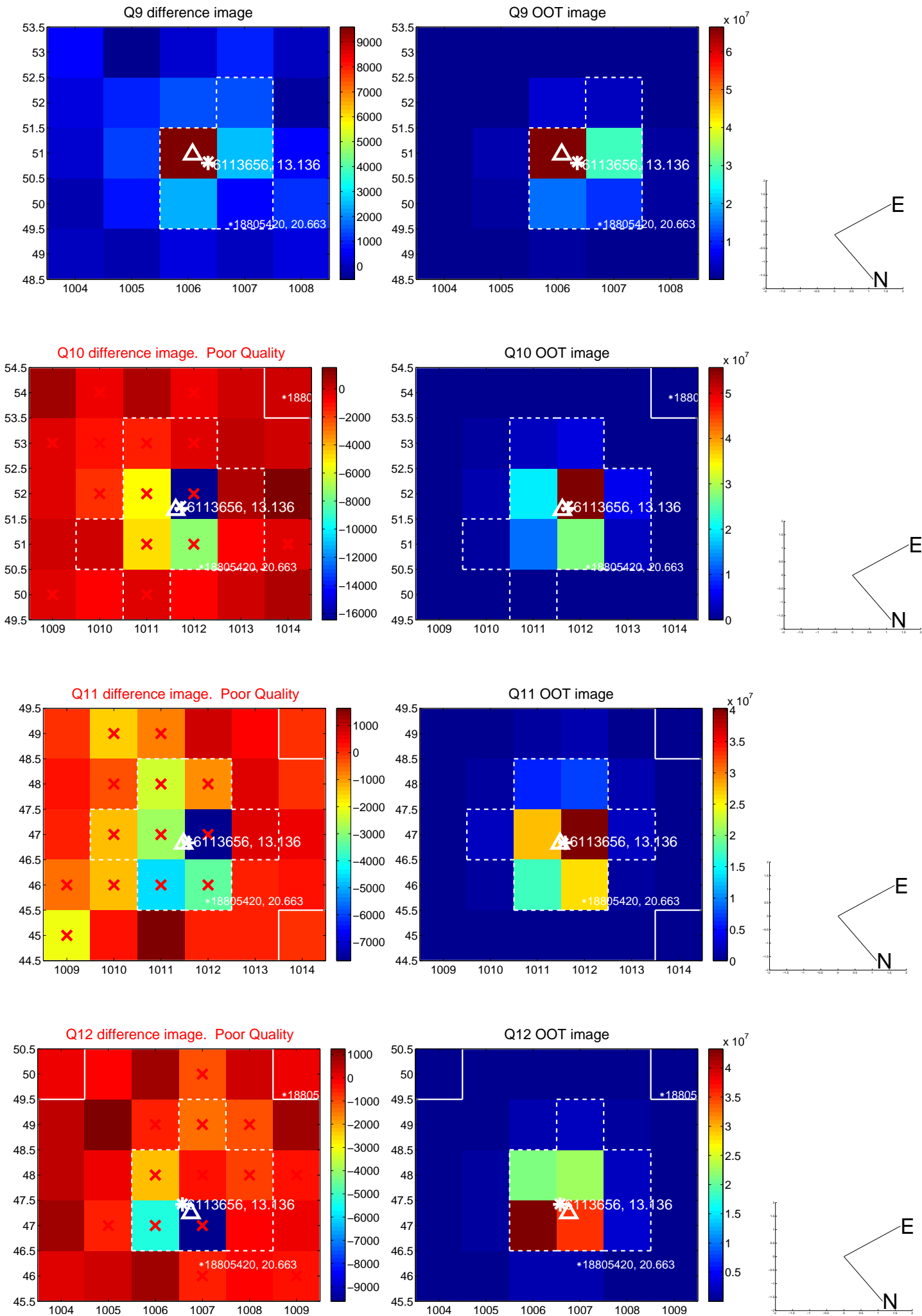
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



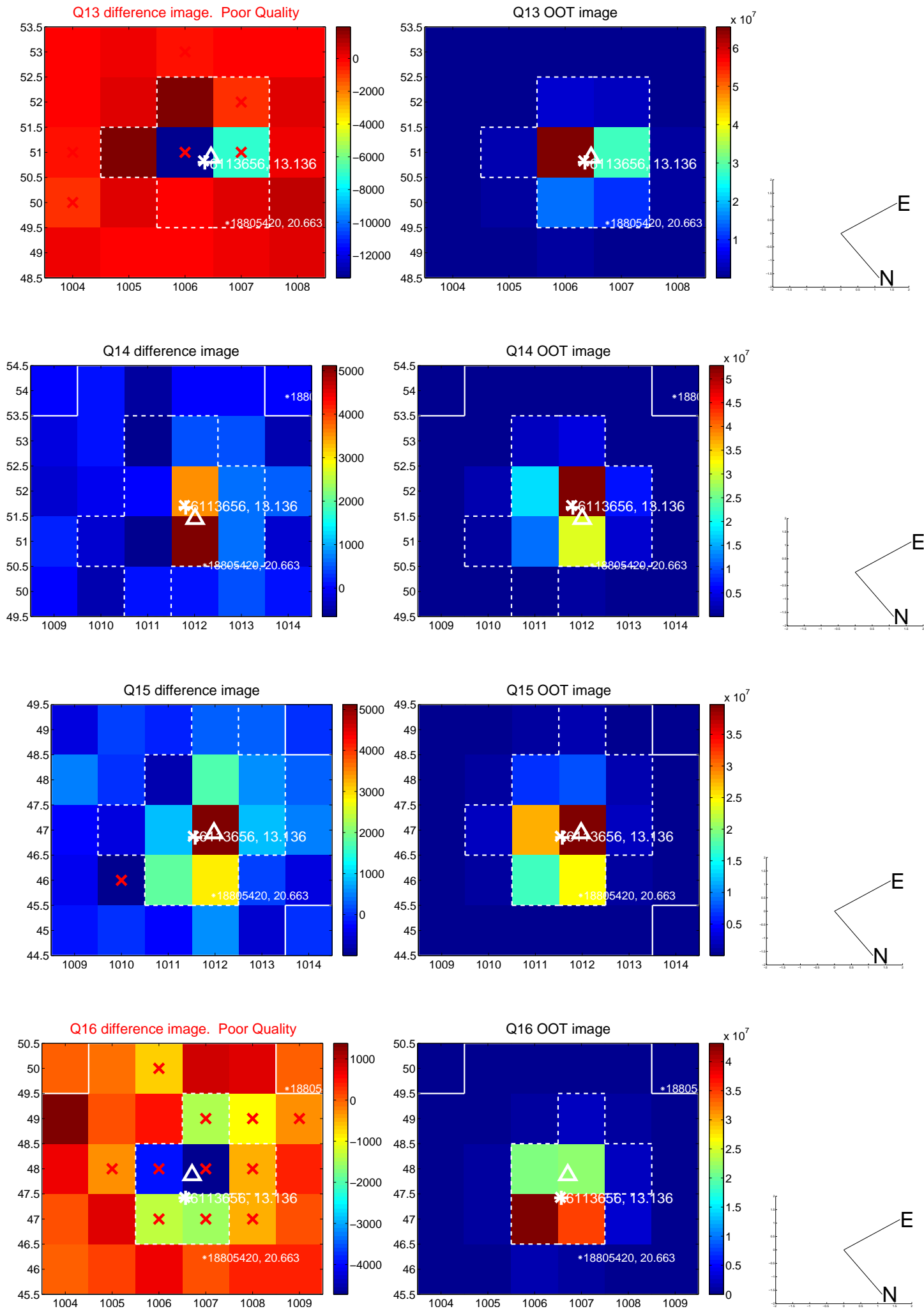
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



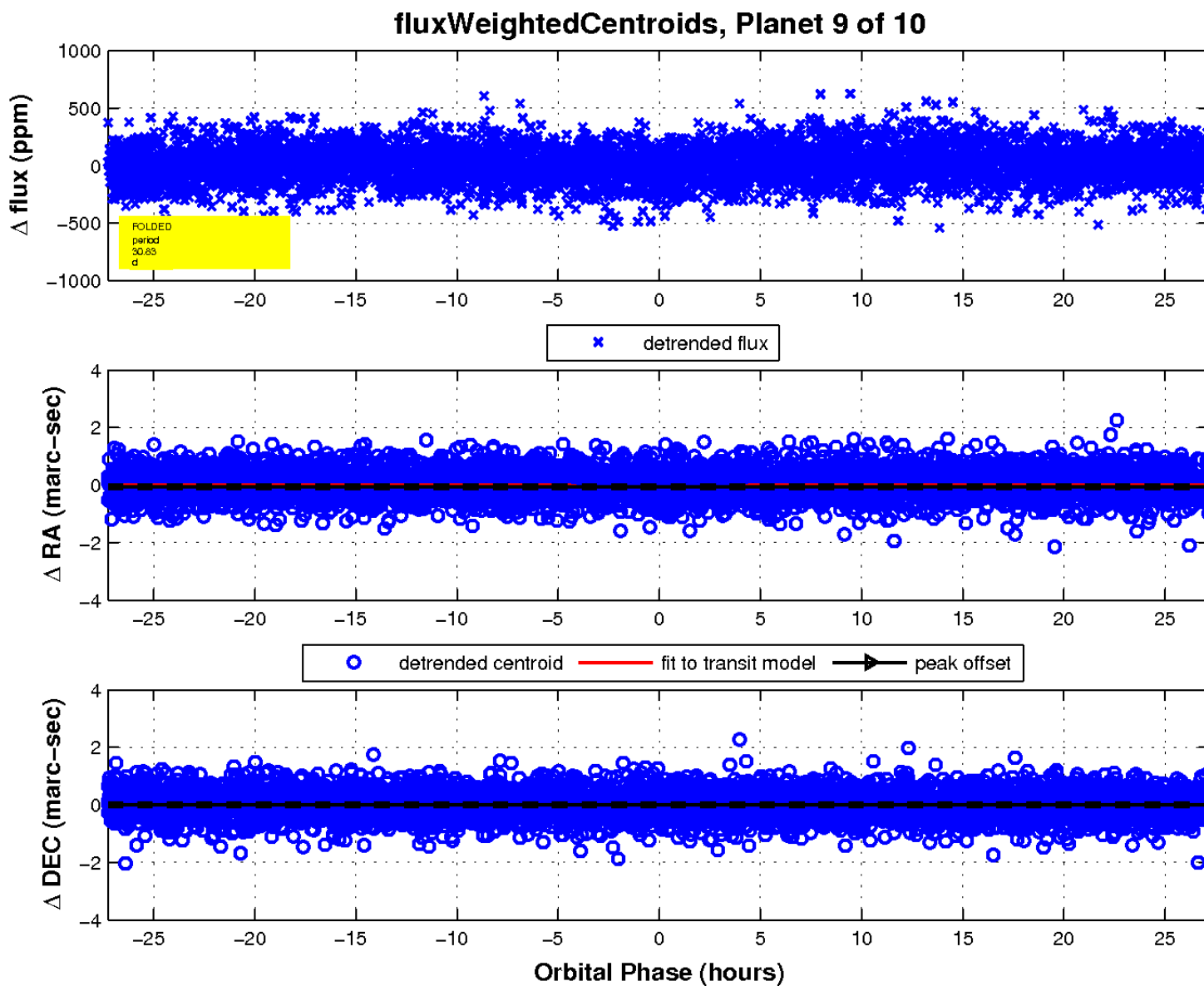
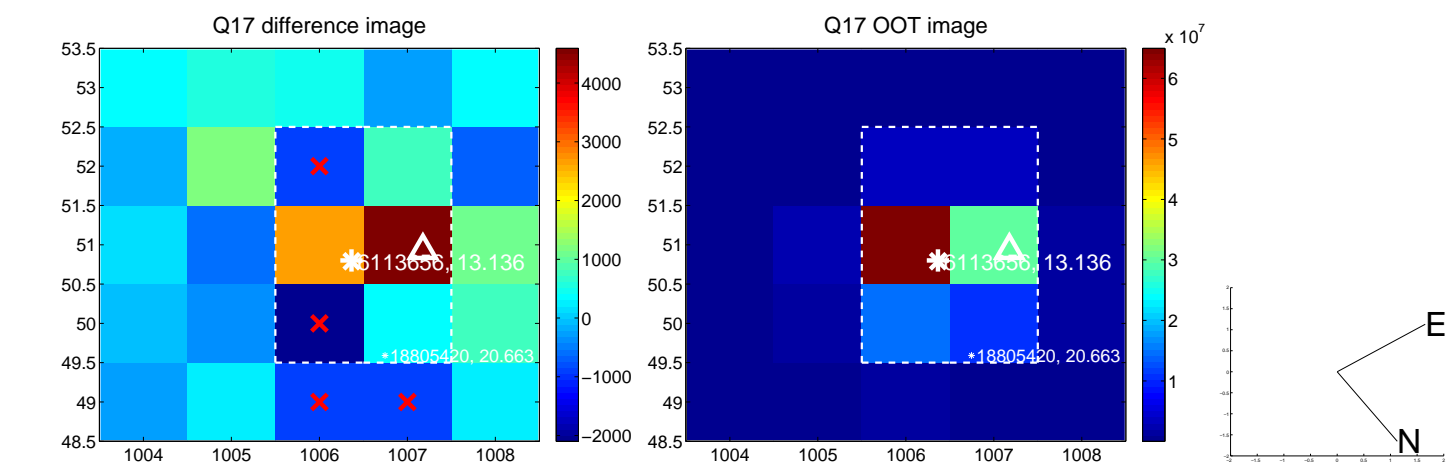
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



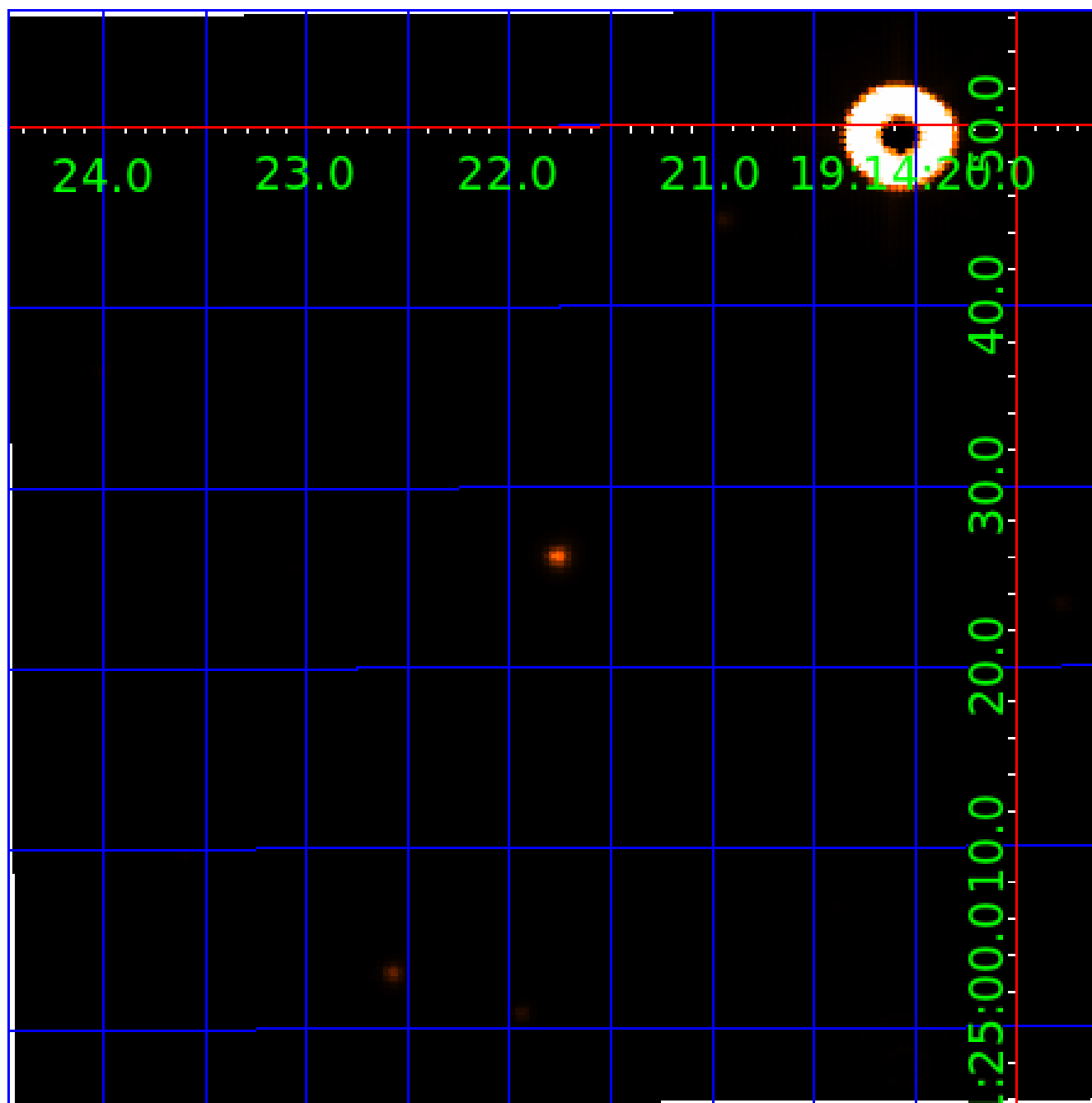
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.





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## KIC 006113656

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006113656-01	OBS	No	2.646238	132.447489	5.6	18.121	11.4	3.0	1.88	7266	0.46	4677.99
006113656-02	OBS	No	58.535580	182.791356	207.4	17.532	46.1	7.6	1.88	7266	5.23	75.34
006113656-03	OBS	No	54.788959	170.151339	184.7	12.850	20.9	9.7	1.88	7266	2.58	82.28
006113656-04	OBS	No	44.294861	175.427489	174.4	6.797	11.3	10.5	1.88	7266	2.78	109.25
006113656-05	OBS	No	39.904031	136.547656	166.1	4.552	11.1	10.6	1.88	7266	2.77	125.57
006113656-06	OBS	No	57.280460	137.501760	190.8	6.317	11.1	11.6	1.88	7266	2.88	77.55
006113656-07	OBS	No	62.394926	153.799040	161.0	11.070	11.8	8.4	1.88	7266	2.70	69.19
006113656-08	OBS	No	30.838567	148.567220	249.9	2.104	10.9	10.1	1.88	7266	3.01	177.05
006113656-09	OBS	No	30.832288	161.442836	130.4	9.084	9.9	10.9	1.88	7266	2.38	177.10
006113656-10	OBS	No	15.974468	134.165876	100.7	9.468	10.0	7.9	1.88	7266	2.01	425.59

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006113656-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV
006113656-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—HALO_GHOST
006113656-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006113656-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
006113656-08	OBS	FP	0.00	1	0	0	0	TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV
006113656-09	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—SAME_NTL_PERIOD
006113656-10	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—HALO_GHOST

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

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

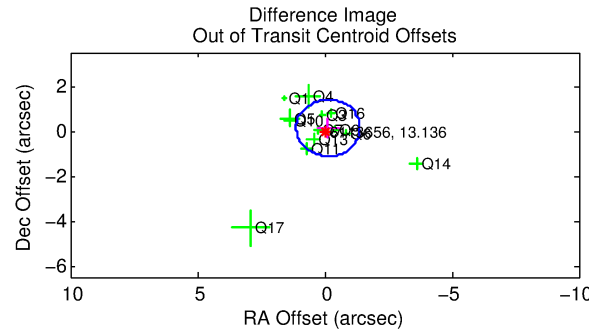
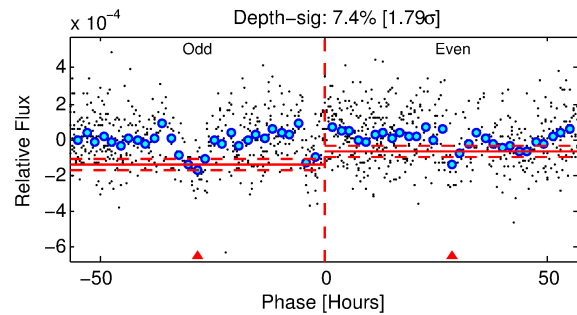
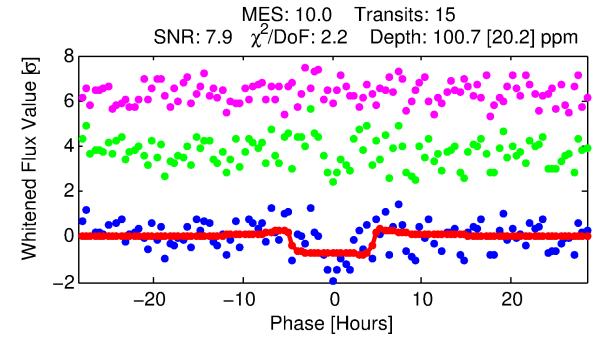
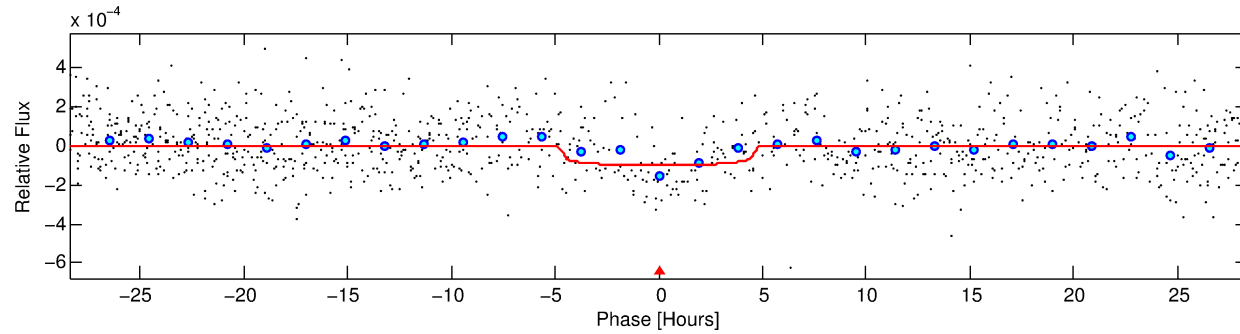
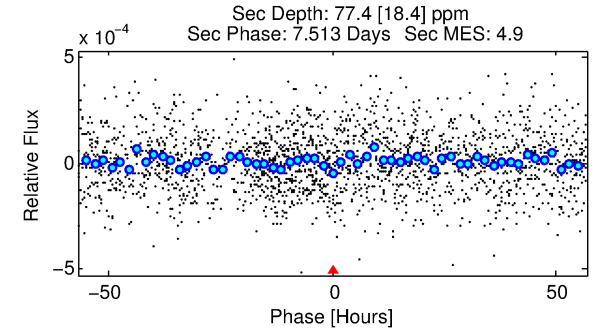
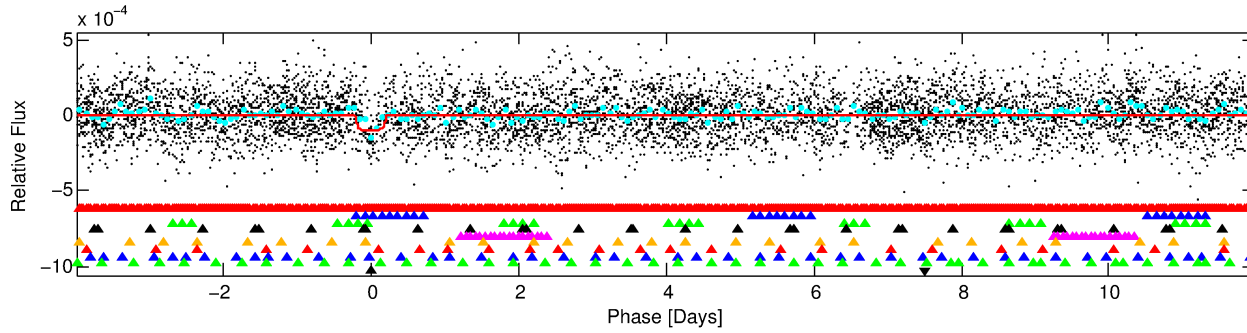
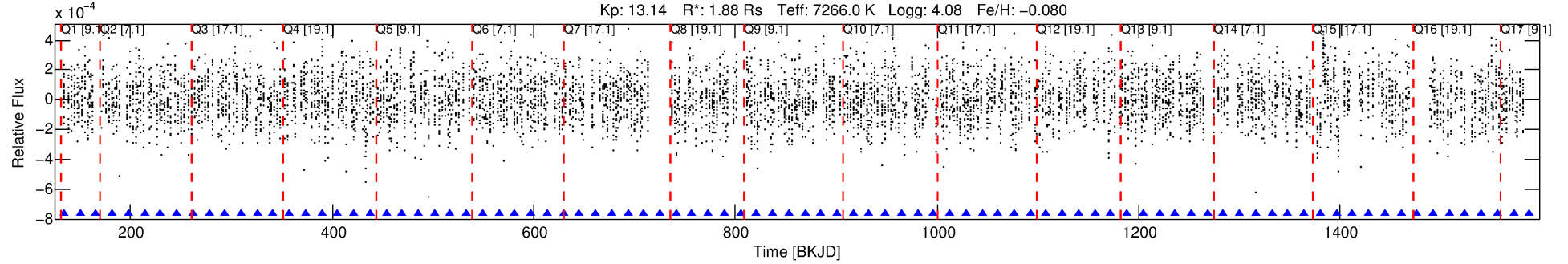
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006113656-10

No Significant Match Found

# DV One-Page Summary

KIC: 6113656 Candidate: 10 of 10 Period: 15.974 d



## DV Fit Results:

Period = 15.97447 [0.00042] d  
Epoch = 134.1659 [0.0241] BKJD  
Rp/R\* = 0.0098 [0.0062]  
a/R\* = 9.52 [35.58]  
b = 0.69 [2.88]  
Seff = 425.59 [156.17]  
Teq = 1158 [106] K  
Rp = 2.01 [1.39] Re  
a = 0.1437 [0.0332] AU  
Ag = 216.93 [285.75] [0.76σ]  
Teffp = 6872 [2214] K [2.58σ]

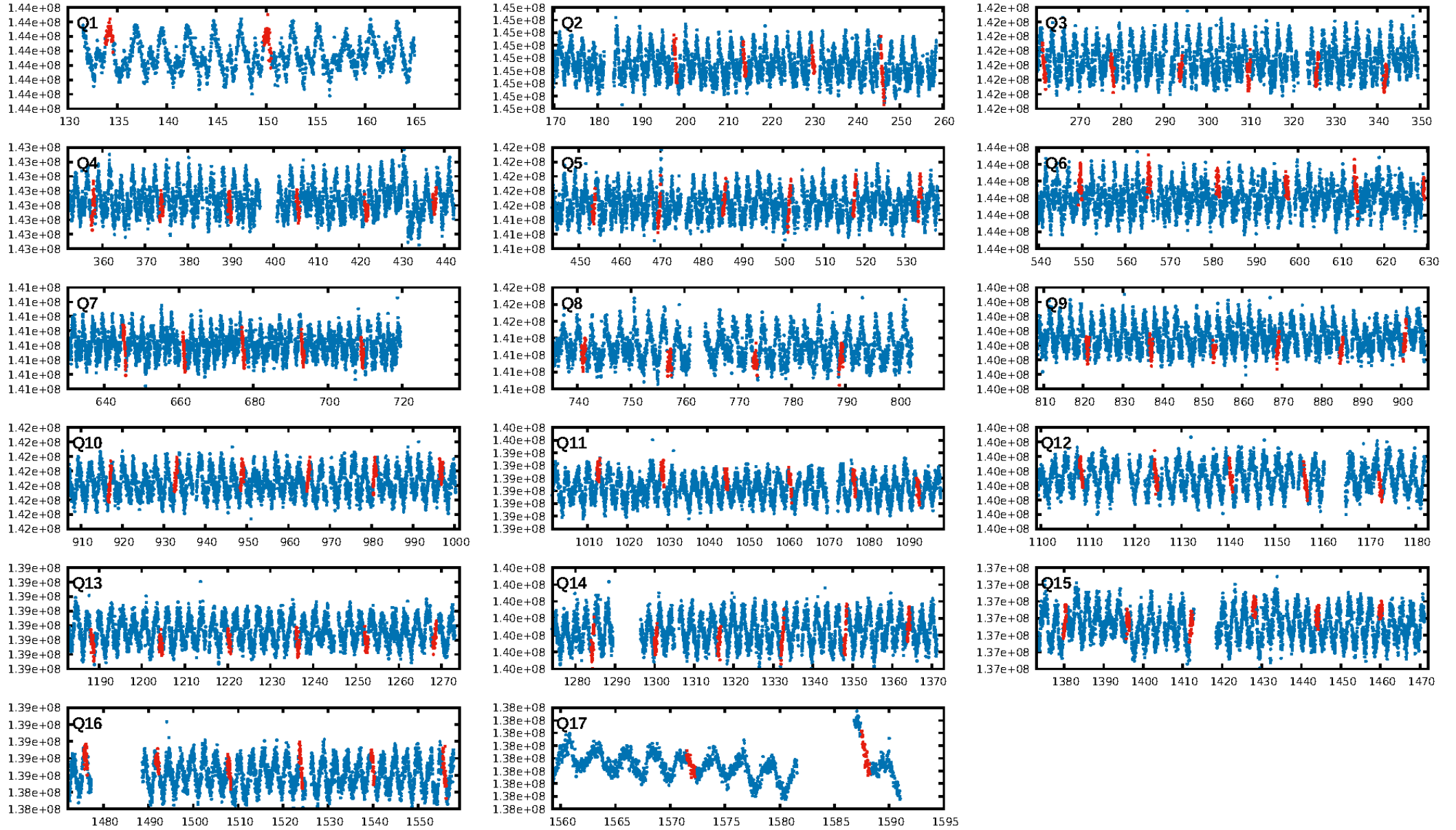
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [15.65σ]  
LongPeriod-sig: 100.0% [27.18σ]  
ModelChiSquare2-sig: 13.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [15/15]  
GhostDiagnostic-chr: -0.176  
Centroid-sig: 3.1%  
Centroid-so: 0.534 arcsec [1.30σ]  
OotOffset-rm: 0.191 arcsec [0.46σ]  
KicOffset-rm: 0.285 arcsec [0.69σ]  
OotOffset-st: 3/3/2/5 [13]  
KicOffset-st: 3/3/2/5 [13]  
DiffImageQuality-fgm: 0.46 [6/13]  
DiffImageOverlap-fno: 0.24 [4/17]

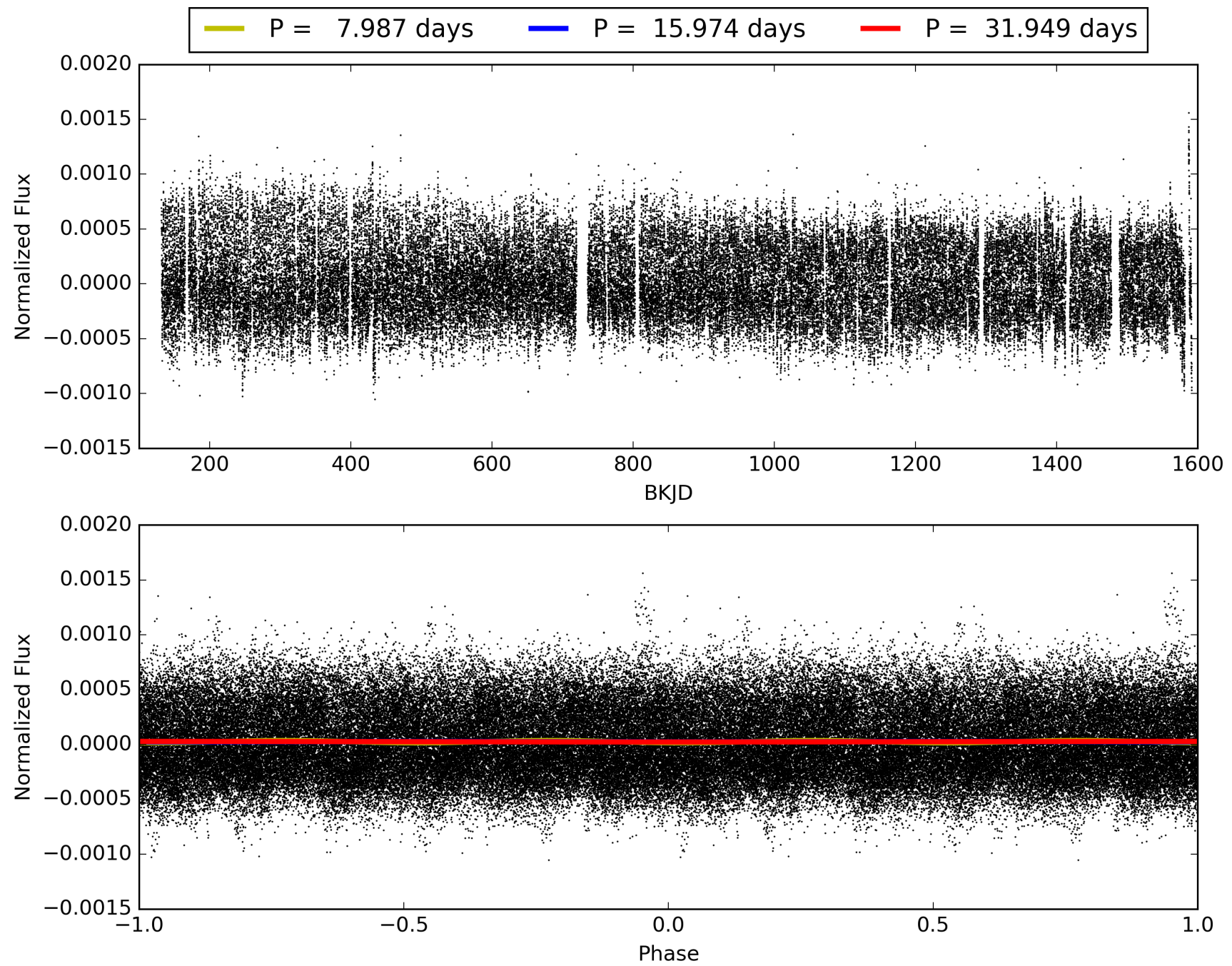
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 01:04:42 Z

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

# TCE 006113656-10, PDC Light Curves

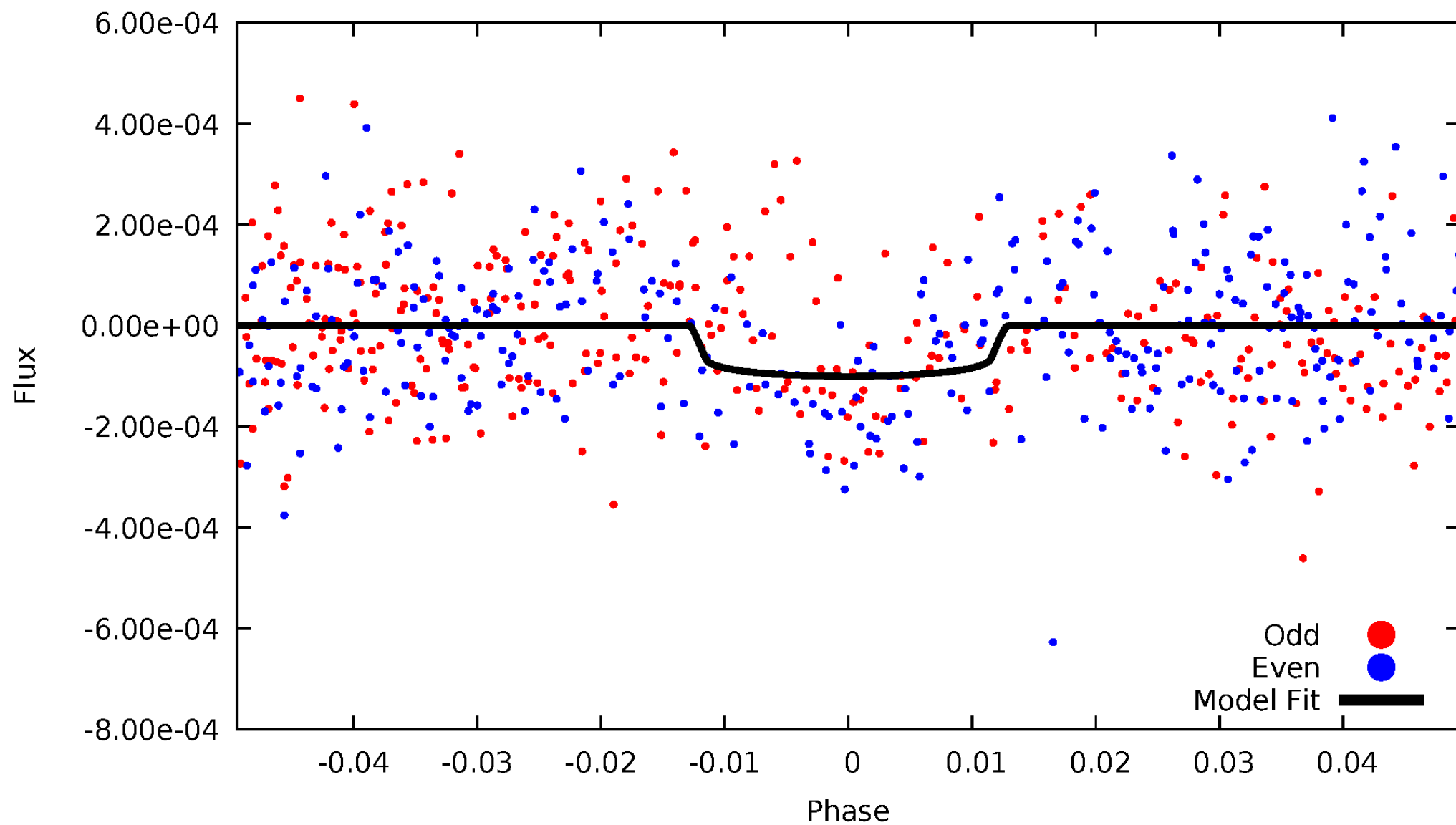


# TCE 006113656-10



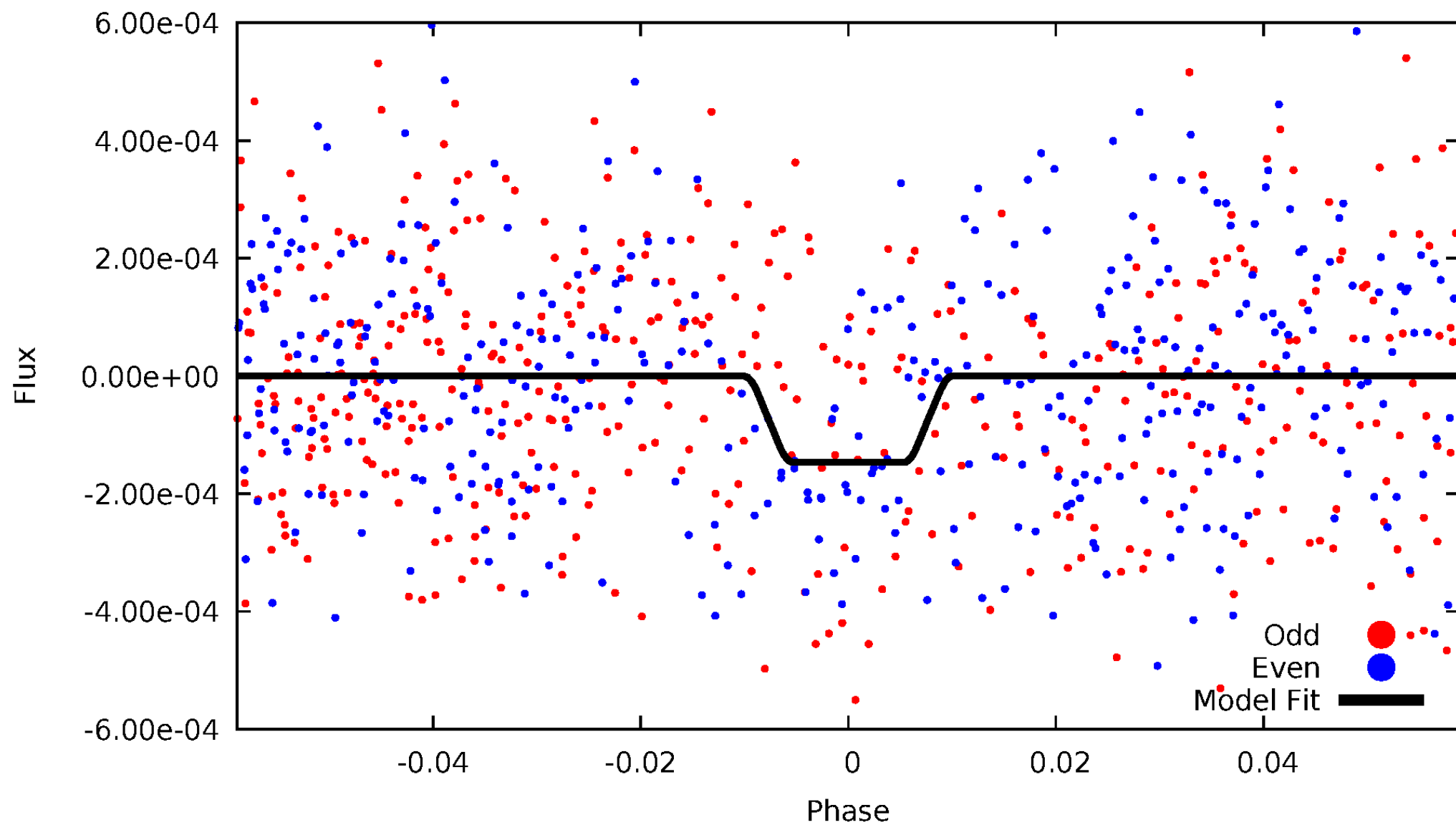
# DV Odd/Even

TCE 006113656-10



# ALT Odd/Even

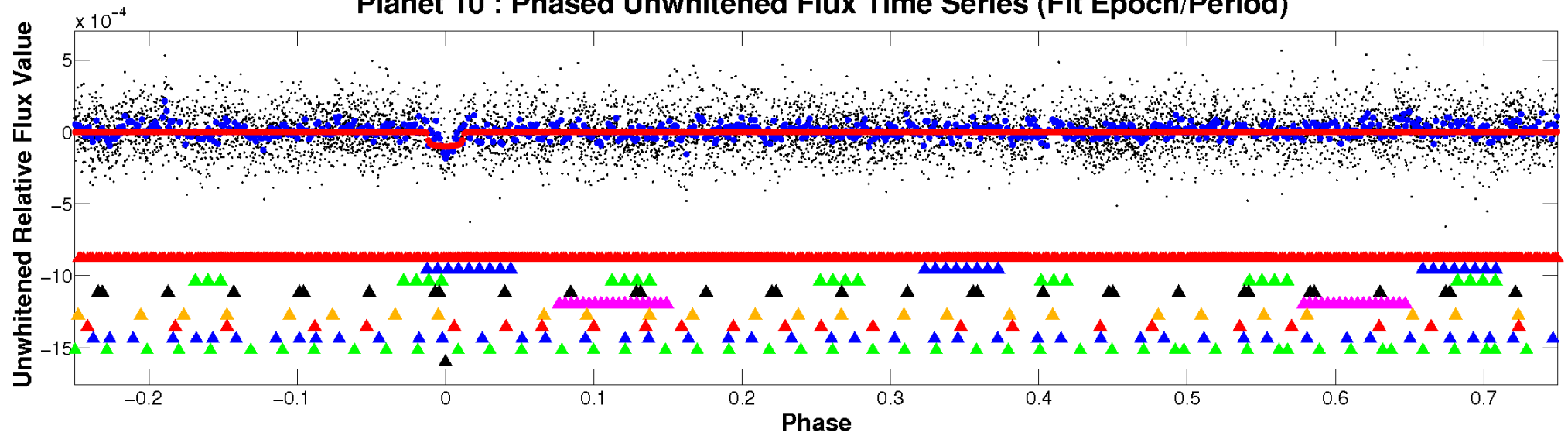
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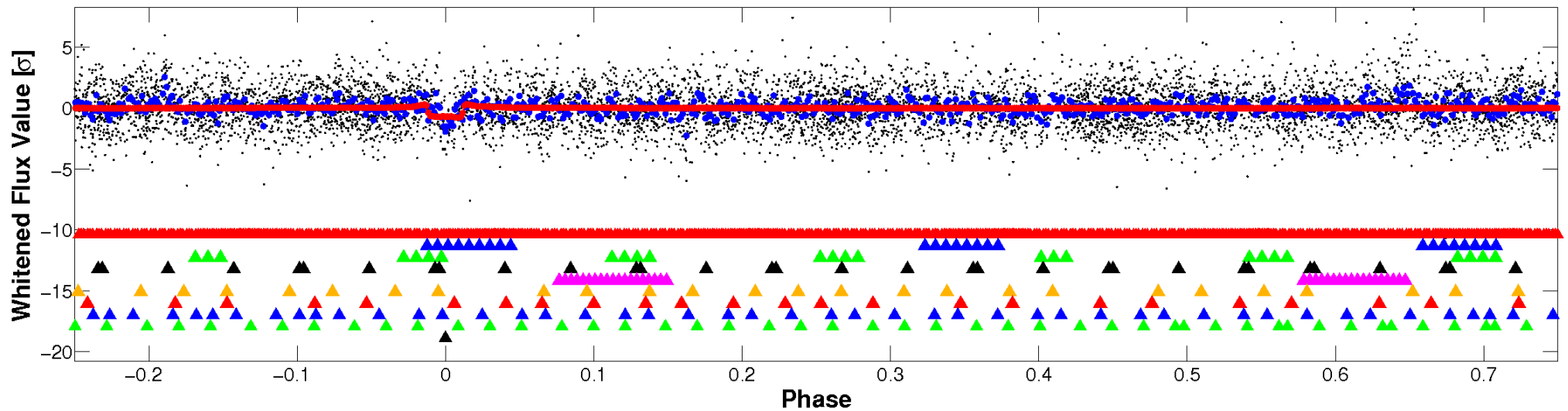


# Non-Whitened Vs. Whitened Light Curve

## Planet 10 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)



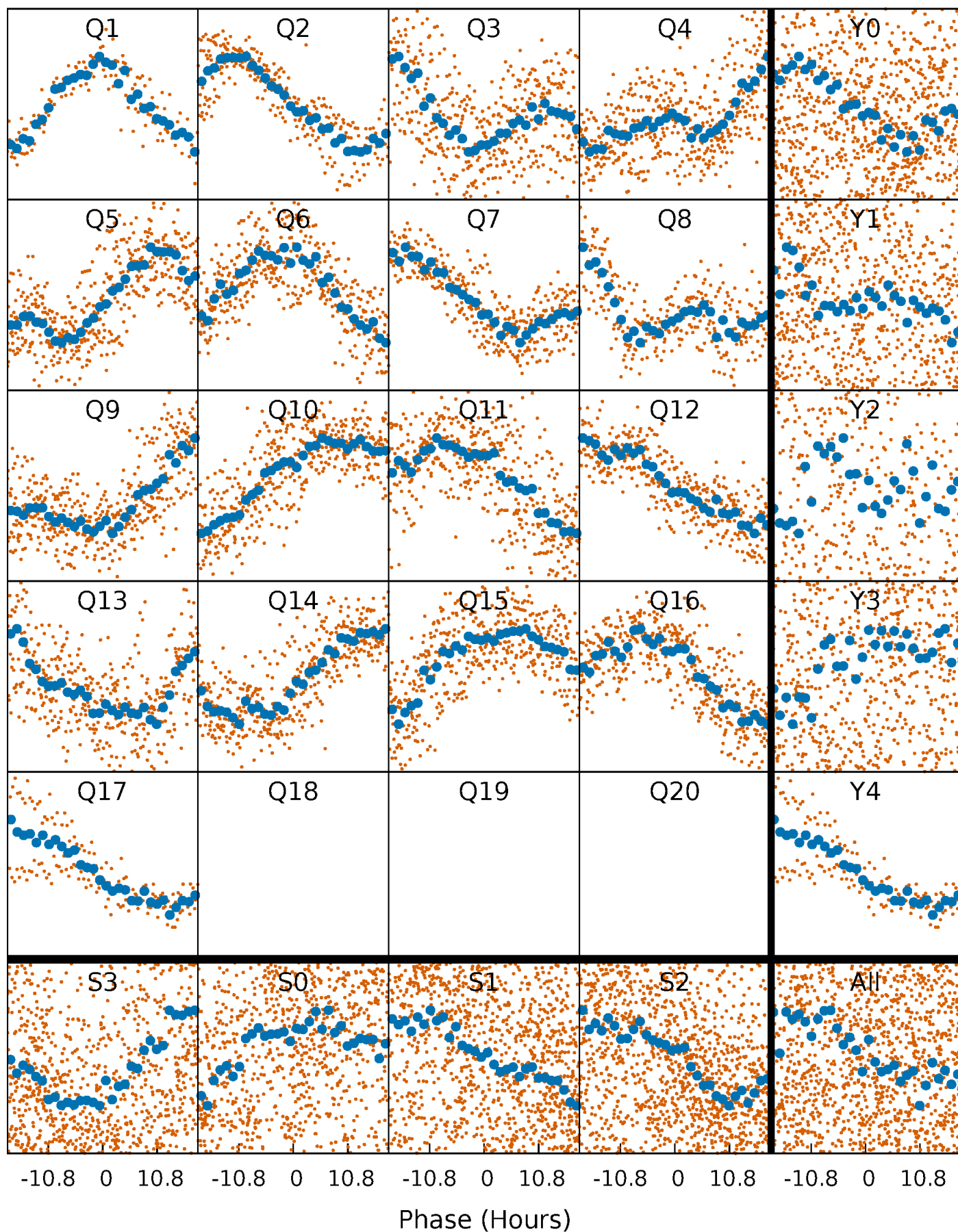
## Planet 10 : Phased Whitened Flux Time Series (Fit Epoch/Period)





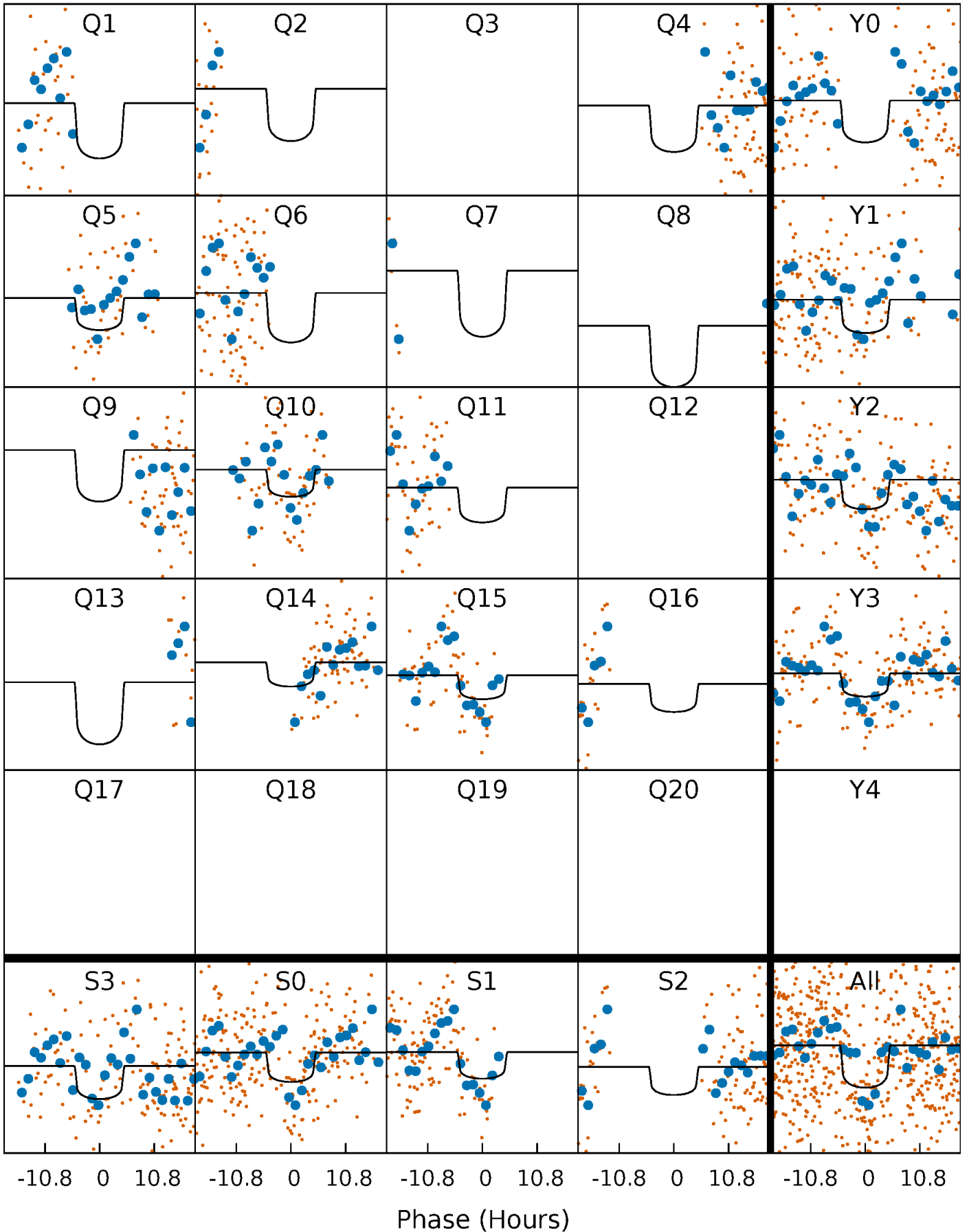
# PDC Quarter-Phased Transit Curves

TCE 006113656-10 P= 15.974468 Days  $T_0=134.165876$  (BKJD)



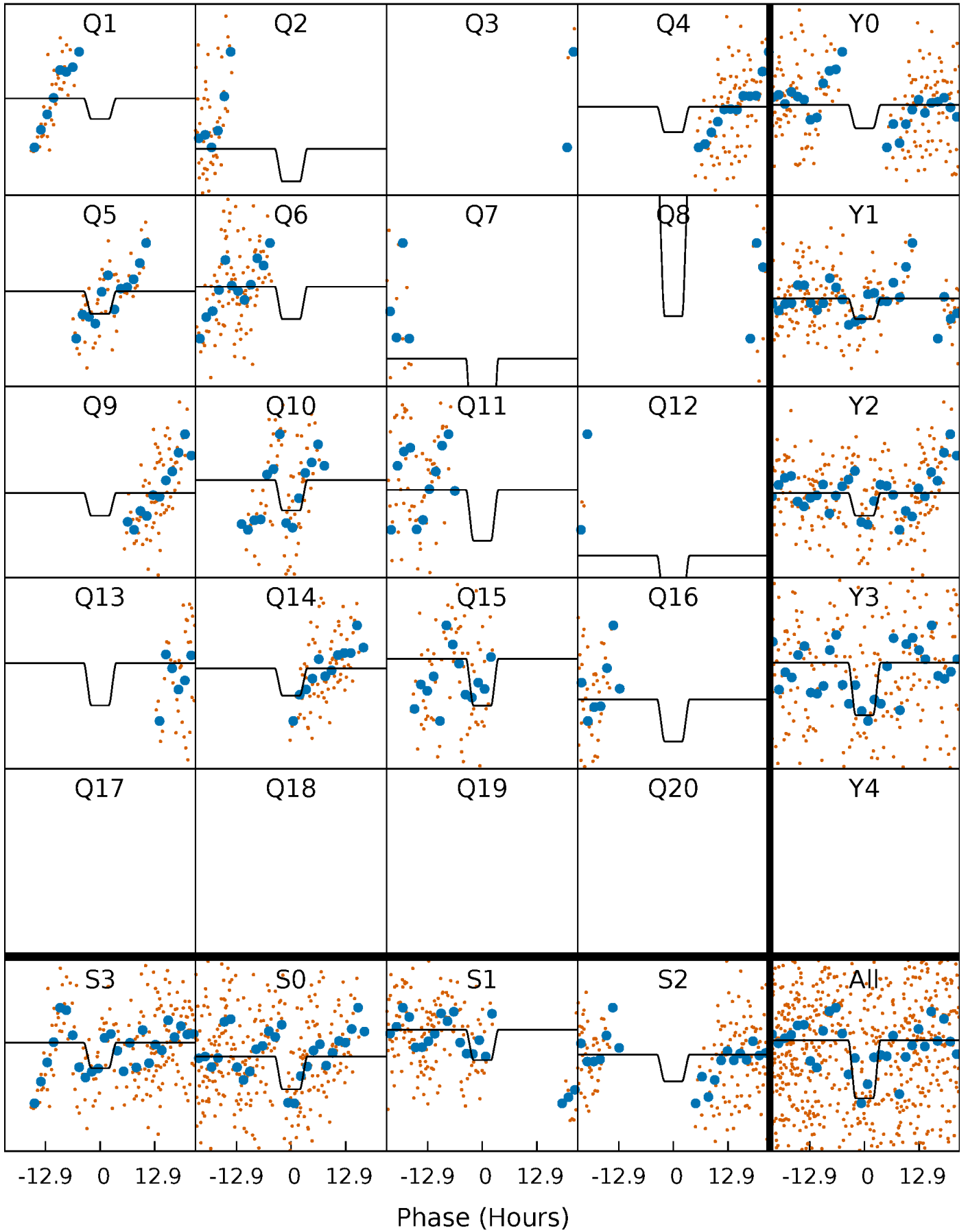
# DV Quarter-Phased Transit Curves

TCE 006113656-10 P= 15.974468 Days  $T_0=134.165876$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

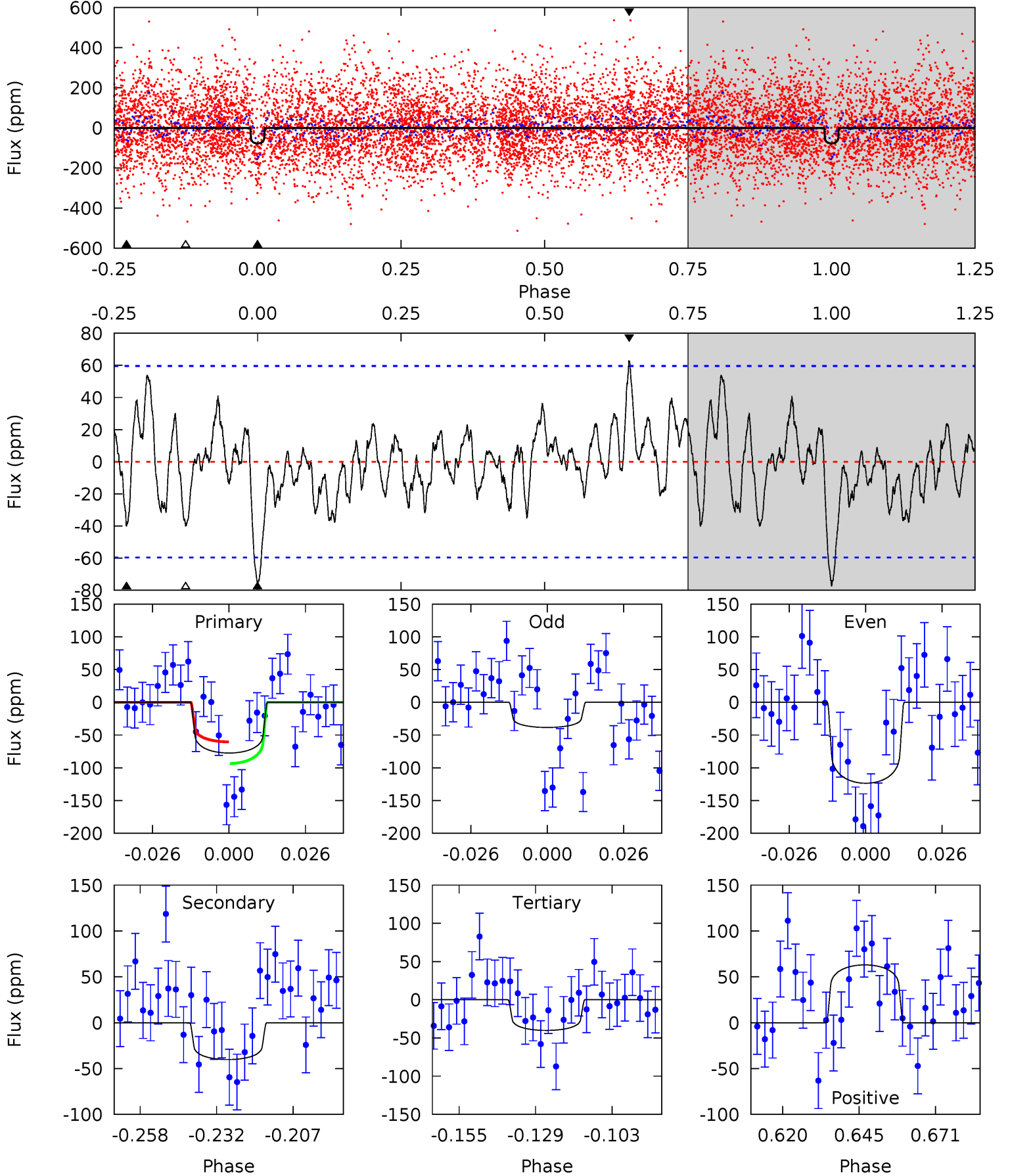
TCE 006113656-10 P= 15.974550 Days  $T_0=134.176714$  (BKJD)



# DV Model-Shift Uniqueness Test

006113656-10,  $P = 15.974468$  Days,  $E = 118.191408$  Days

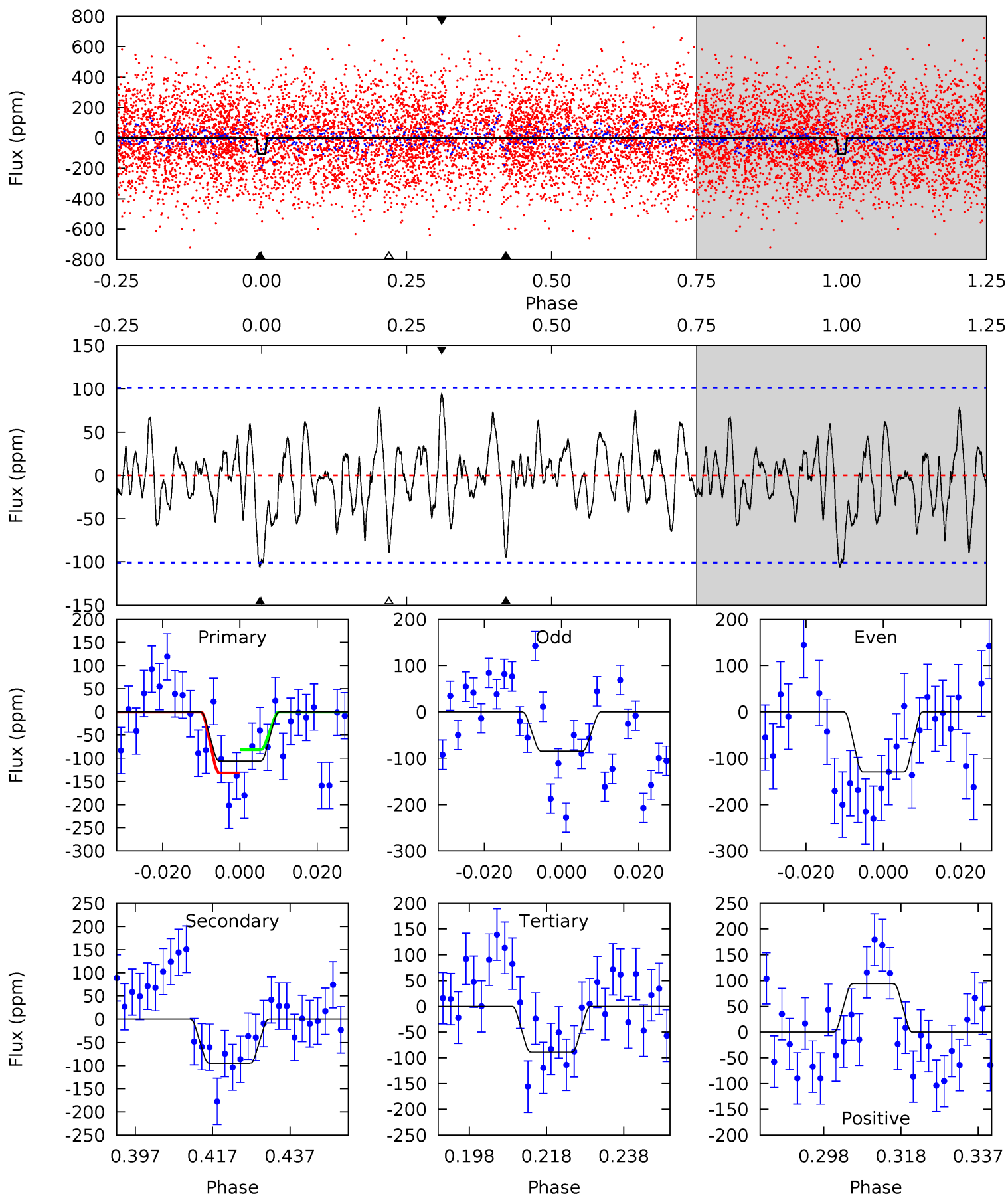
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.29	3.26	3.26	5.12	4.84	2.23	1.50	3.03	1.17	0.01	-1.85	3.48	0.80	0.45	1.35



# Alt Model-Shift Uniqueness Test

006113656-10, P = 15.974550 Days, E = 118.202164 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
5.16	4.60	4.30	4.55	4.89	2.33	1.44	0.85	0.61	0.30	0.05	1.10	0.94	0.47	1.22



### Stellar Parameters For KIC 006113656

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7266^{+201}_{-316}$	$4.082^{+0.170}_{-0.170}$	$-0.080^{+0.250}_{-0.350}$	$1.876^{+0.536}_{-0.439}$	$1.546^{+0.212}_{-0.259}$	$0.330^{+0.296}_{-0.153}$
	+3%/-4%	+4%/-4%	+312%/-438%	+29%/-23%	+14%/-17%	+90%/-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 006113656-10 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-40 \pm 12$	$2.09^{+1.37}_{-1.17}$	$1608^{+120}_{-117}$	$5559^{+3375}_{-1085}$	$99^{+458}_{-65}$
Alt.	$-95 \pm 21$	$2.49^{+1.33}_{-1.14}$	$1617^{+112}_{-108}$	$6433^{+2703}_{-1205}$	$177^{+411}_{-105}$

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

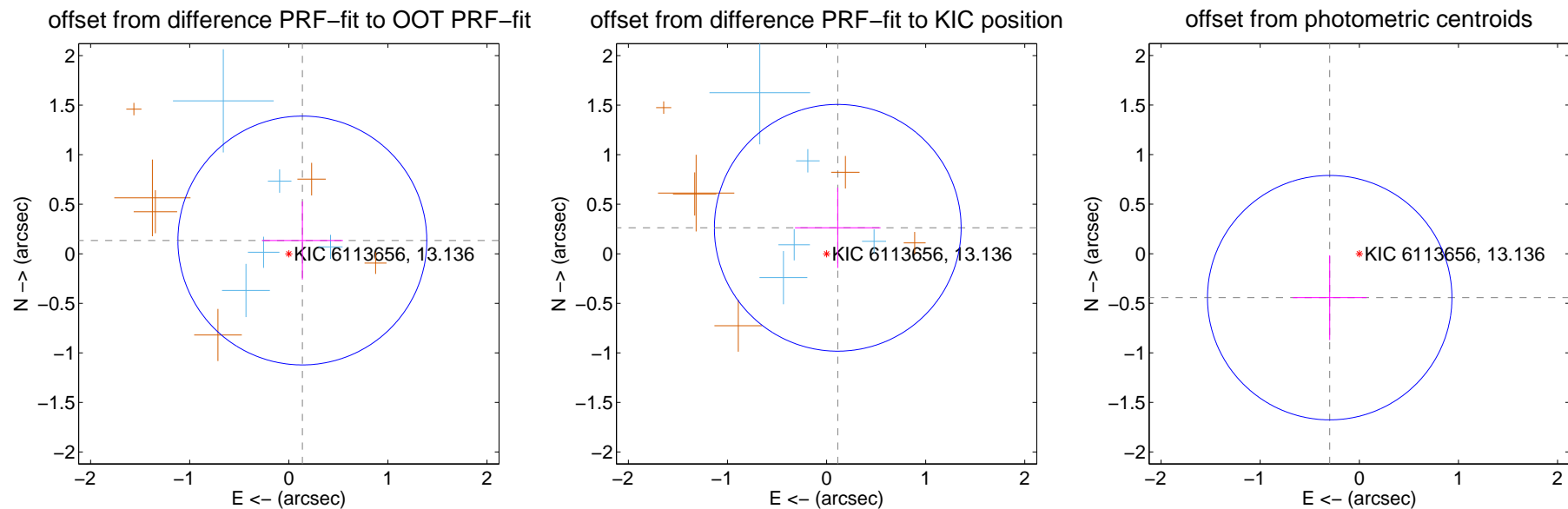
## DV Centroid Data

Supplemental centroid analysis for 006113656-10. Kepler magnitude: 13.14. Transit SNR 7.86

There are 6 quarters with good PRF difference image offsets

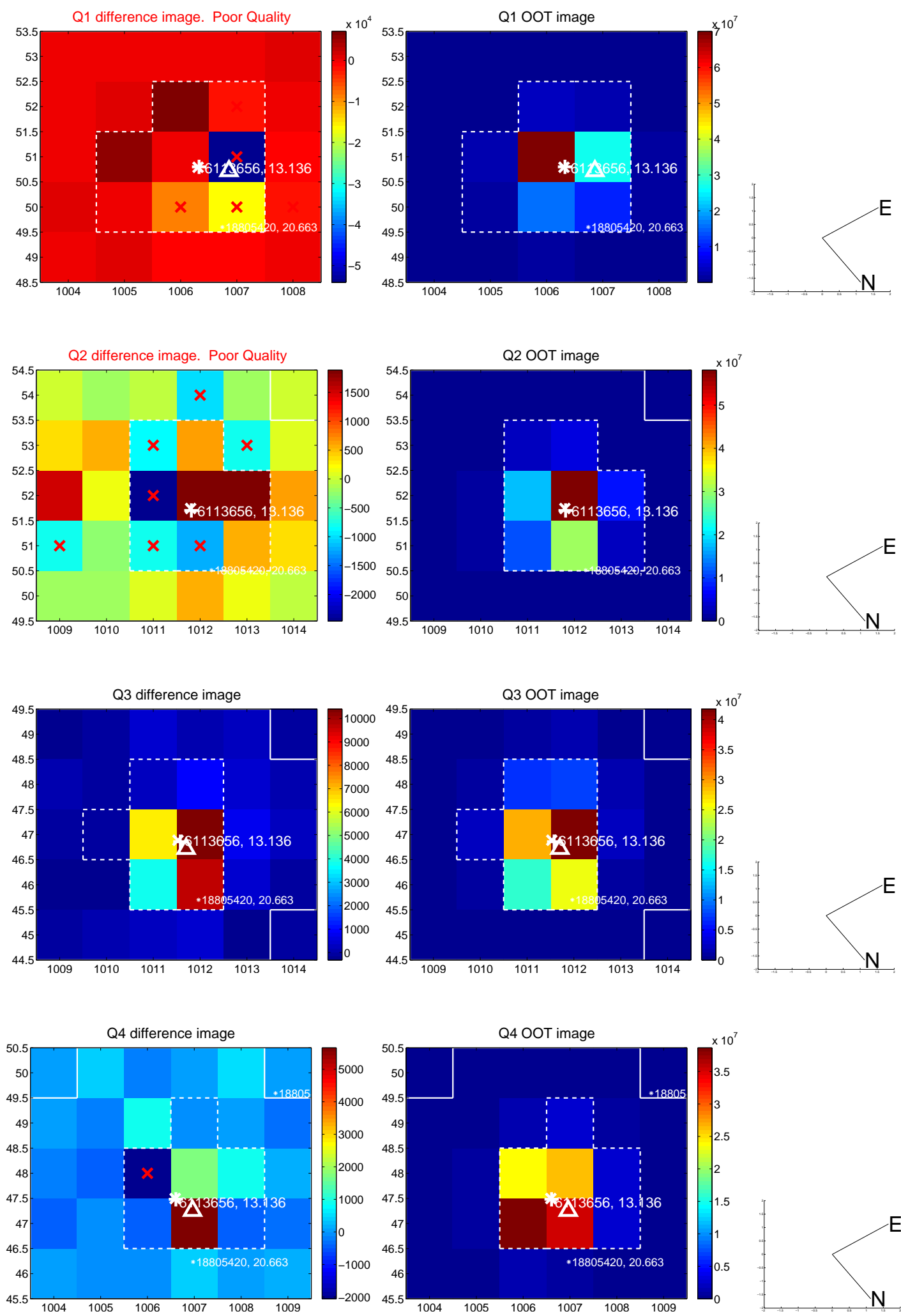
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.191 \pm 0.419$	0.46	$-0.137 \pm 0.409$	$0.134 \pm 0.394$
PRF-fit source offset from KIC position	$0.285 \pm 0.415$	0.69	$-0.113 \pm 0.432$	$0.262 \pm 0.405$
photometric centroid source offset	$0.53 \pm 0.41$	1.30	$0.30 \pm 0.37$	$-0.44 \pm 0.43$



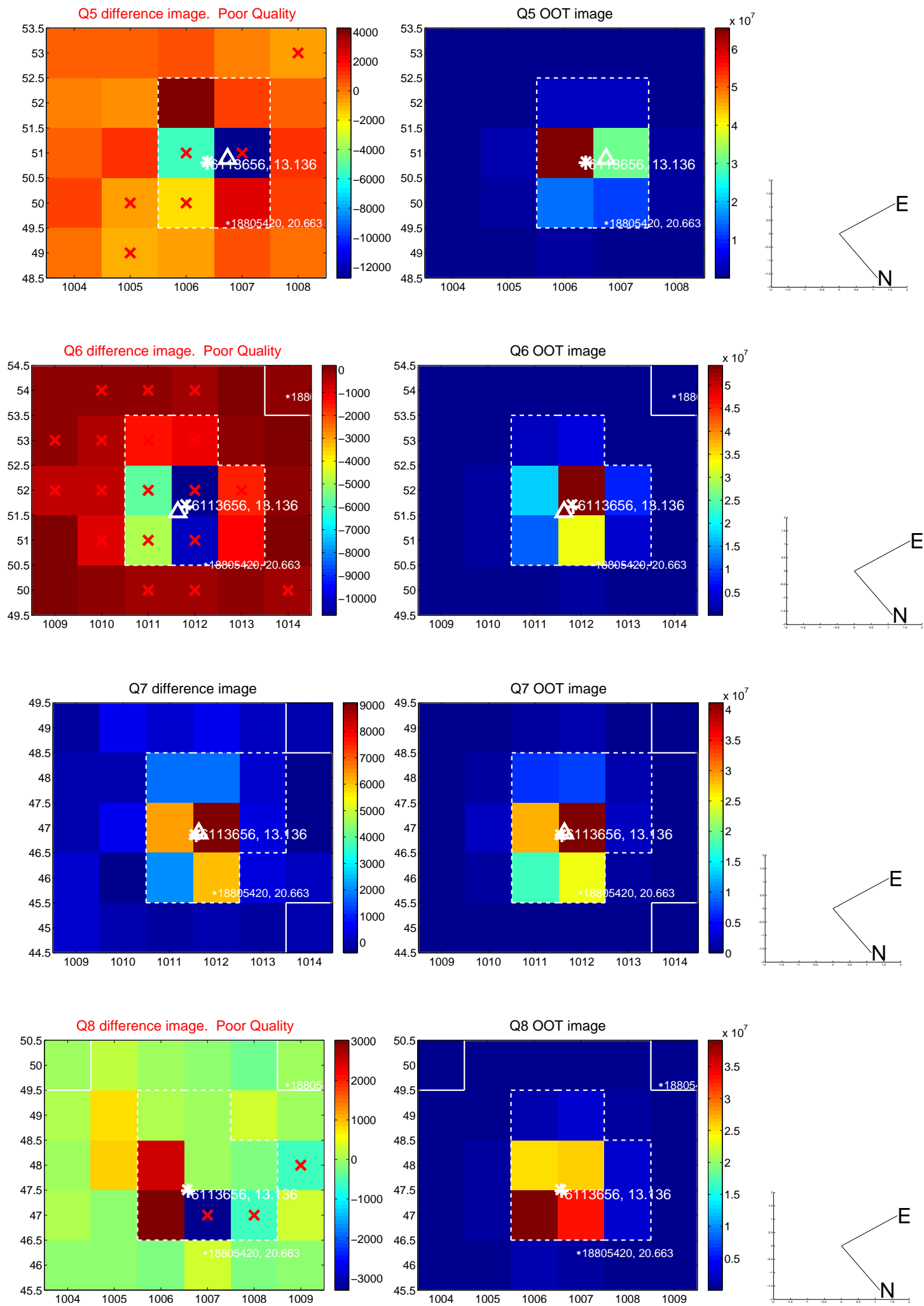
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

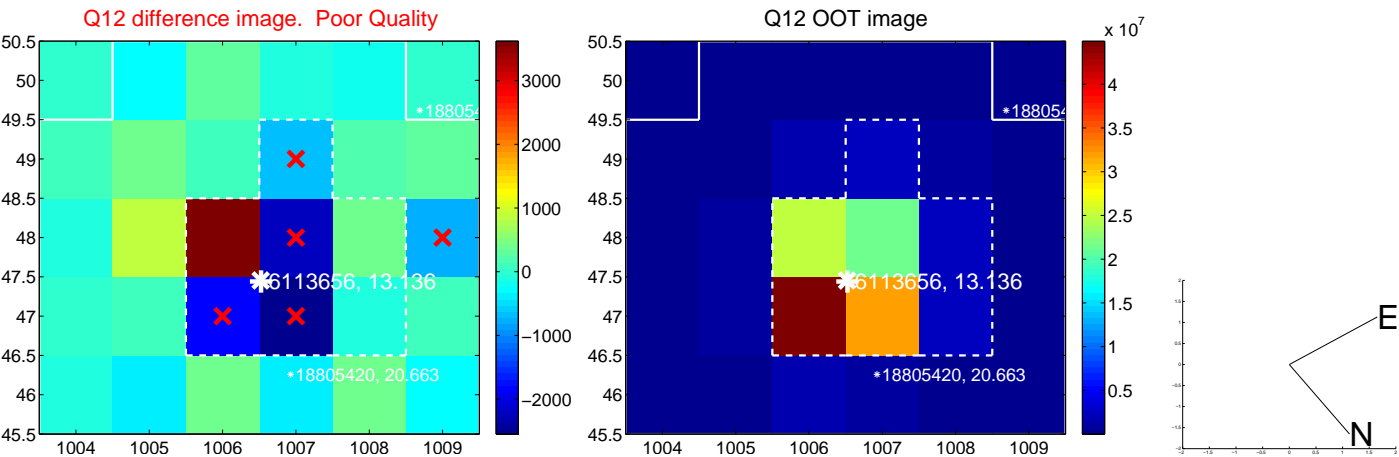
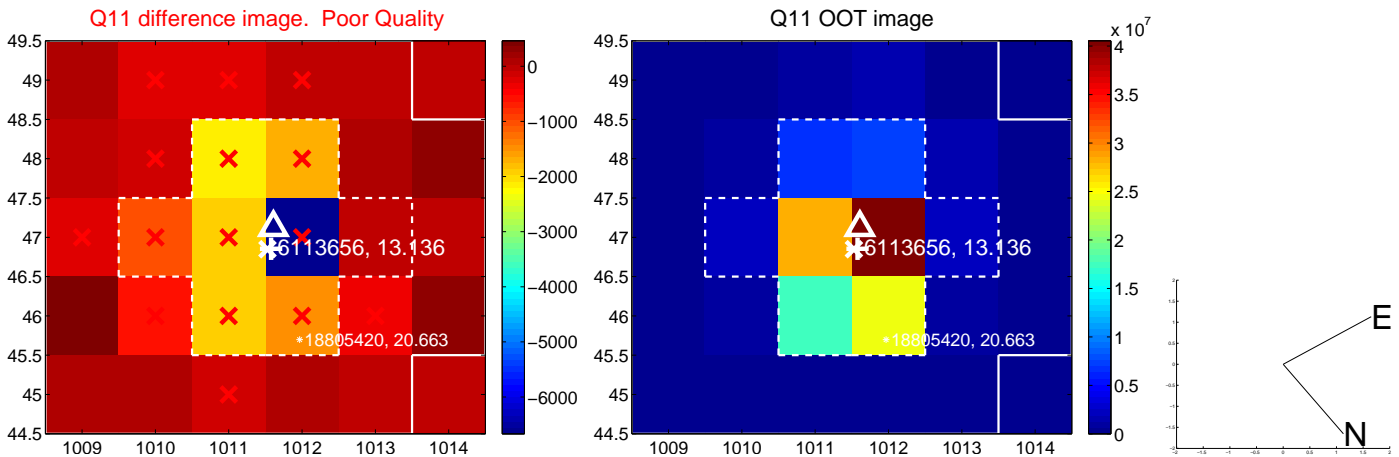
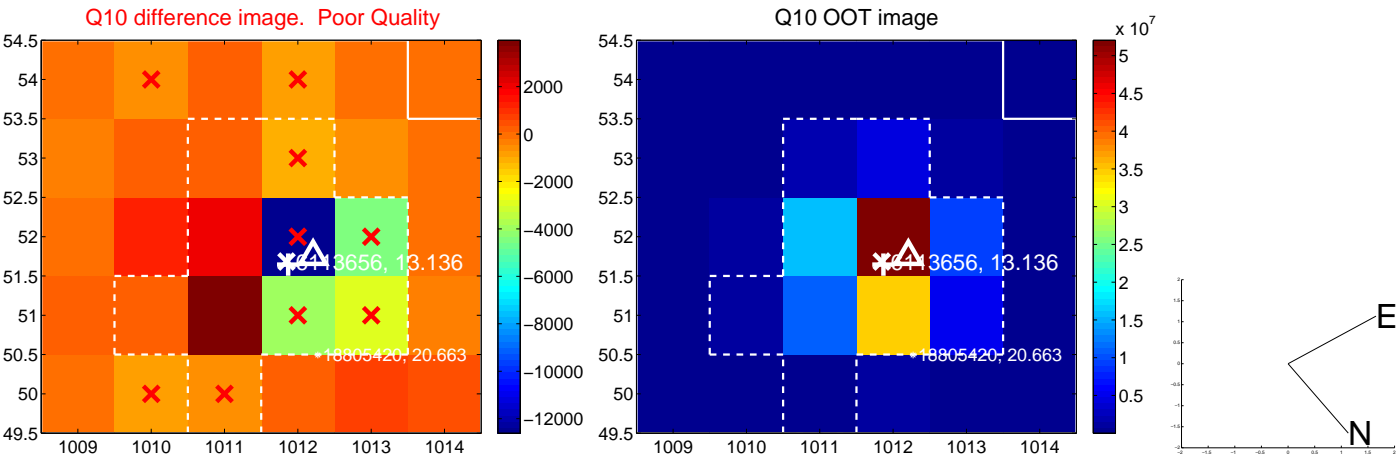
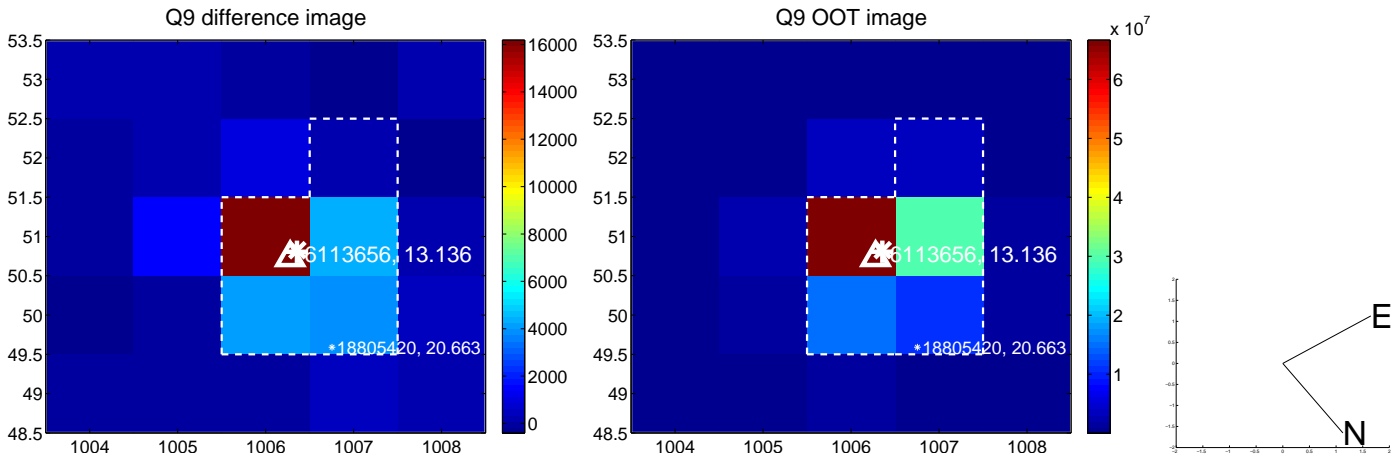




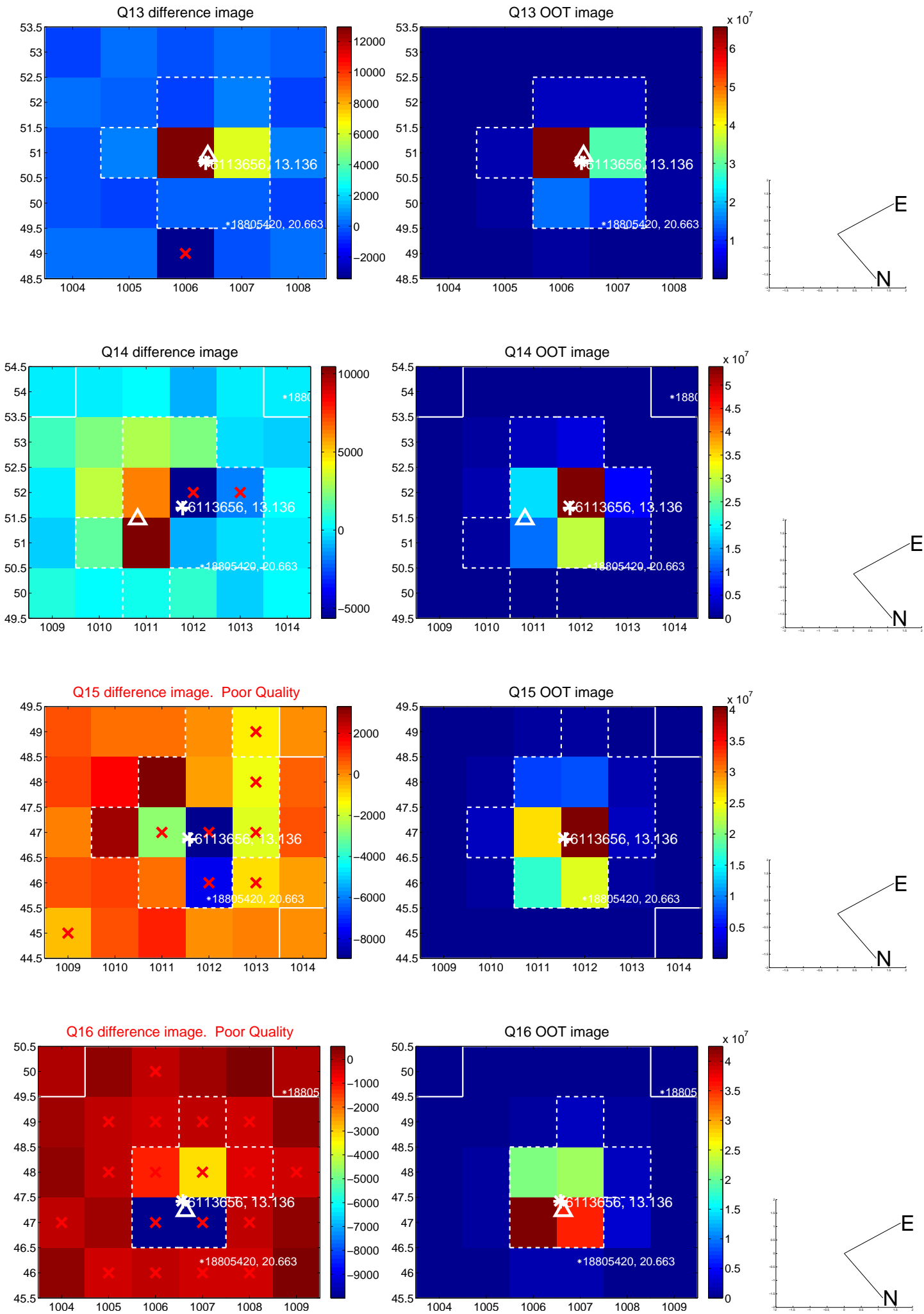
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



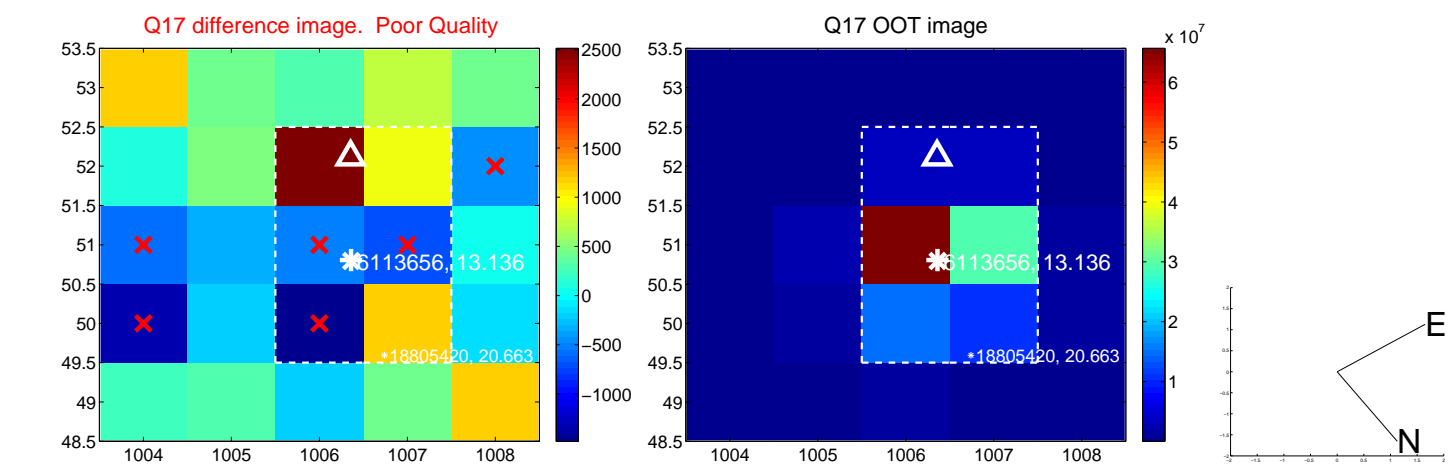
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



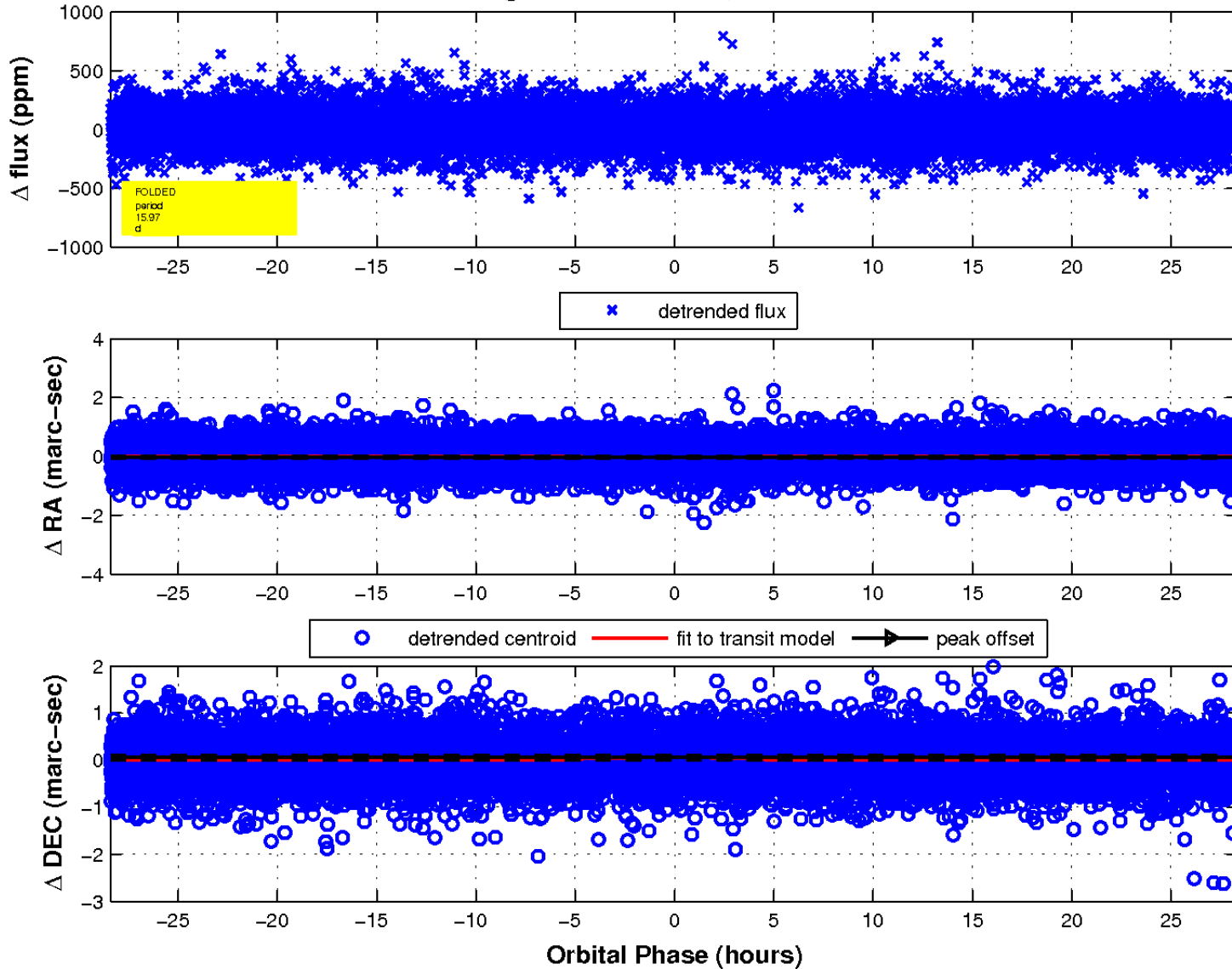
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



fluxWeightedCentroids, Planet 10 of 10



UKIRT Image

Declination

