

# KIC 006307537

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006307537-01	OBS	1120.01	29.744531	157.404378	165809.8	26.013	5430.7	2549.1	0.79	4889	31.14	10.11
006307537-02	OBS	No	29.744594	142.640431	68973.0	23.312	2113.6	1576.0	0.79	4889	20.47	10.11

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006307537-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—HAS_SEC_TCE
006307537-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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 006307537-01

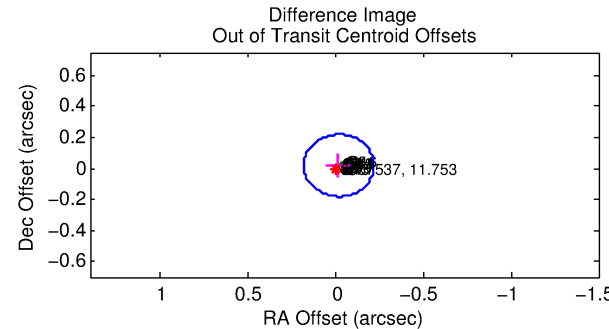
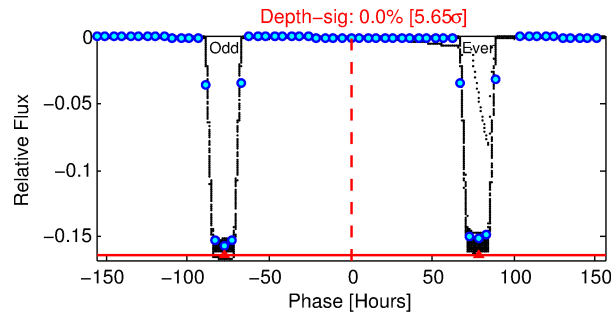
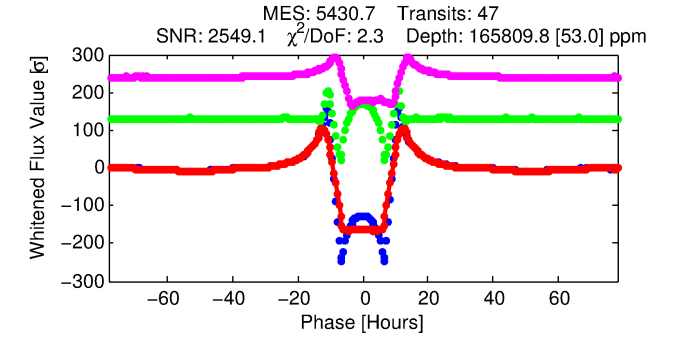
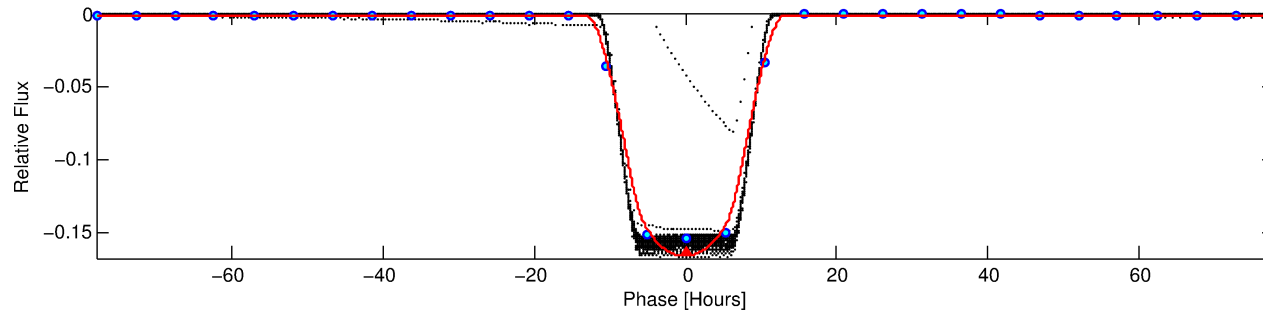
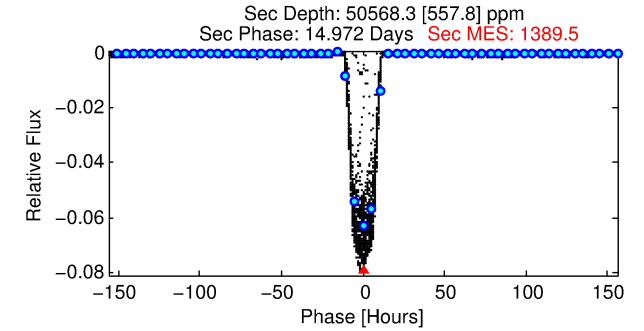
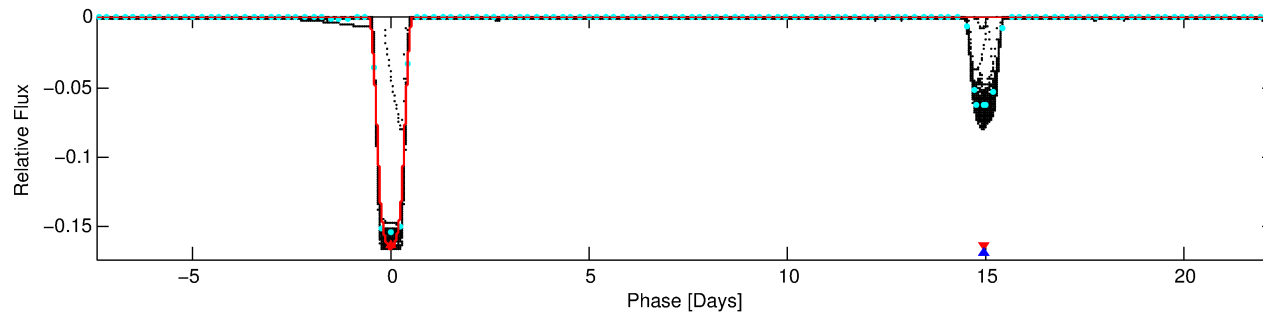
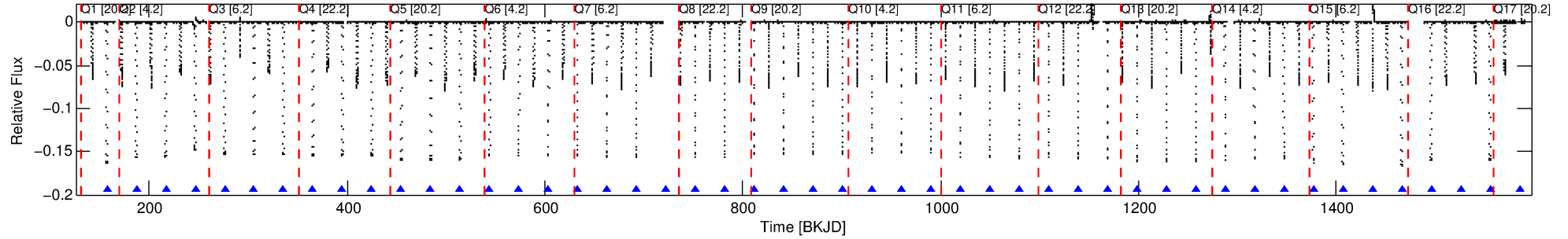
No Significant Match Found

# DV One-Page Summary

KIC: 6307537 Candidate: 1 of 2 Period: 29.745 d

KOI: K01120 Corr: No Ephemeris Match

Kp: 11.75 R\*: 0.79 Rs Teff: 4889.0 K Logg: 4.57 Fe/H: 0.300



## DV Fit Results:

Period = 29.74453 [0.00000] d  
Epoch = 157.4044 [0.0001] BKJD  
Rp/R\* = 0.3621 [0.0001]  
a/R\* = 11.92 [0.00]  
b = 0.00 [1.60]  
Seff = 10.11 [1.83]  
Teff = 455 [21] K  
Rp = 31.14 [2.45] Re  
a = 0.1773 [0.0119] AU  
Ag = 901.71 [89.01] [10.12σ]  
Teffp = 3853 [147] K [22.90σ]

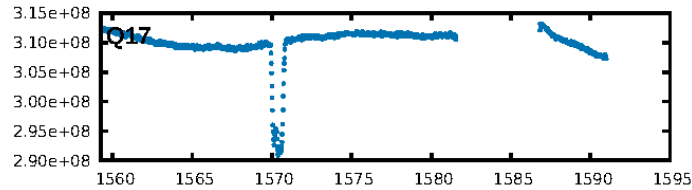
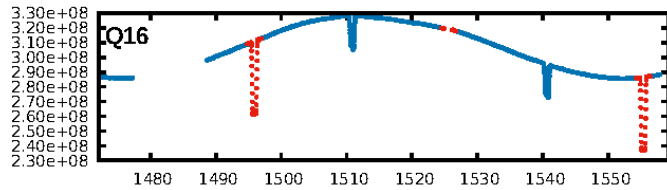
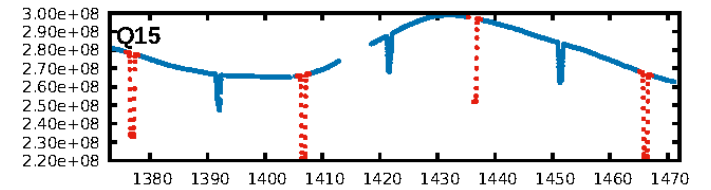
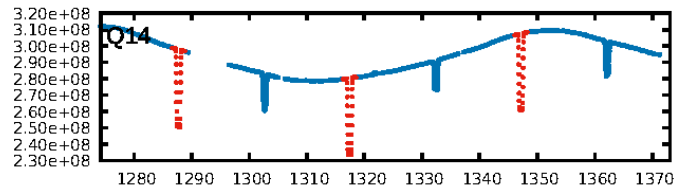
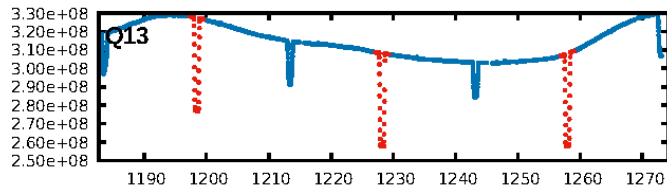
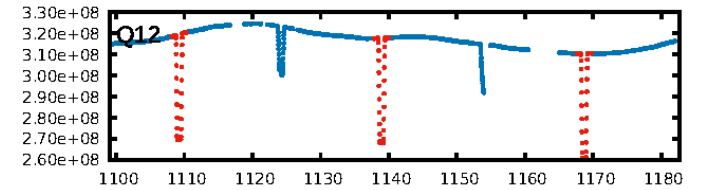
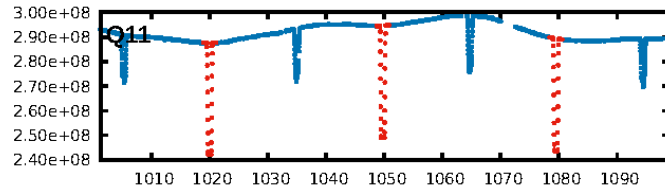
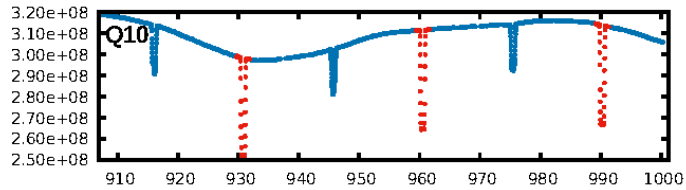
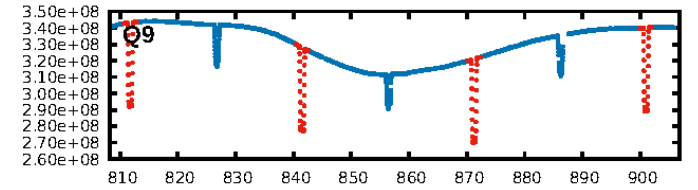
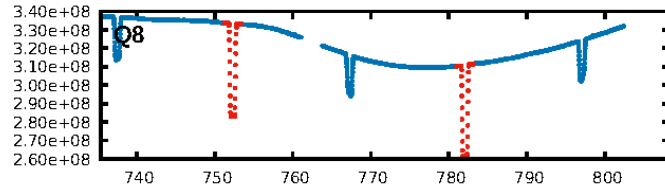
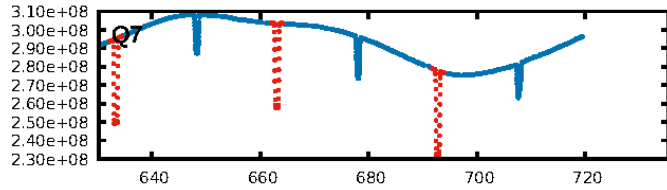
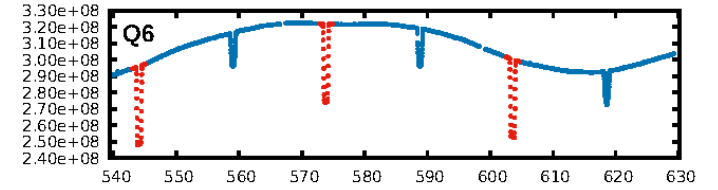
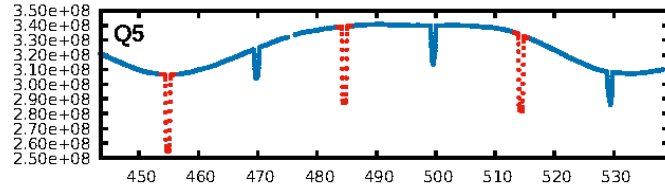
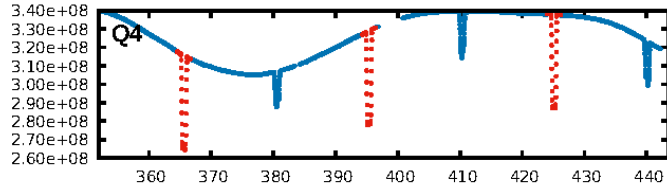
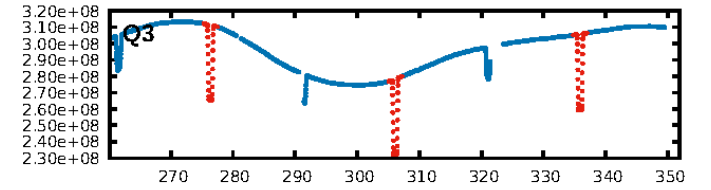
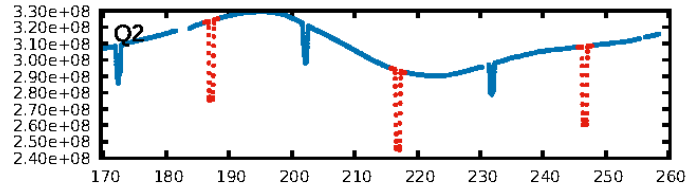
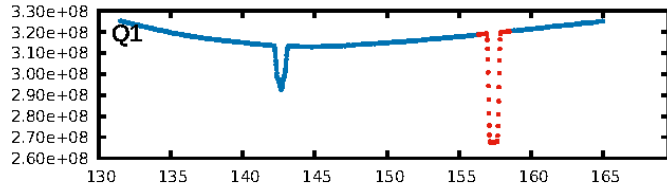
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 0.0% [0.00σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGoF-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [46/46]  
GhostDiagnostic-chr: 1.34  
Centroid-sig: N/A  
Centroid-so: 0.060 arcsec [112.96σ]  
OotOffset-rm: 0.026 arcsec [0.39σ]  
KicOffset-rm: 0.052 arcsec [0.76σ]  
OotOffset-st: 4/3/4/4 [15]  
KicOffset-st: 4/3/4/4 [15]  
DiffImageQuality-fgm: 1.00 [15/15]  
DiffImageOverlap-fno: 1.00 [15/15]

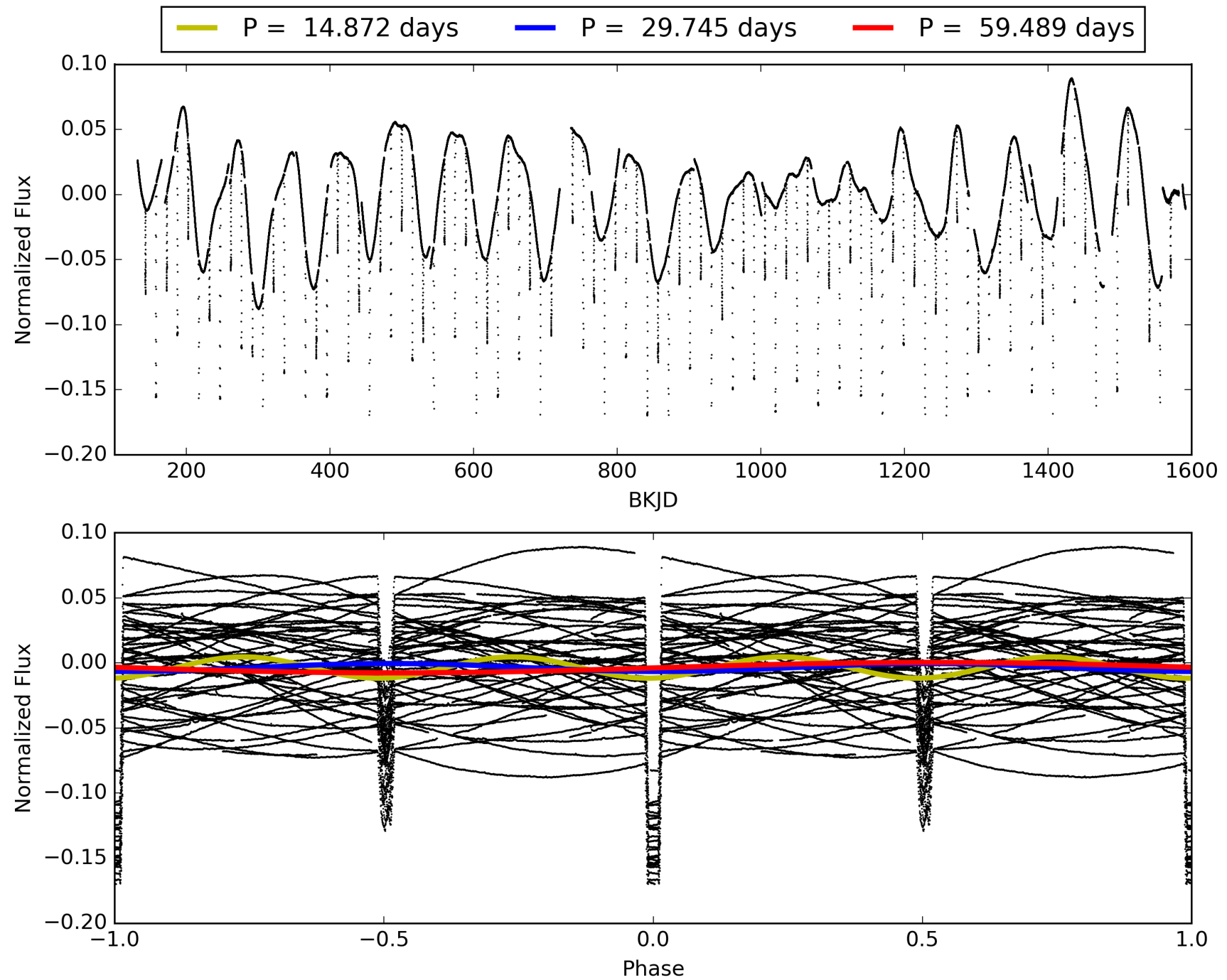
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 05:46:47 Z

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

# TCE 006307537-01, PDC Light Curves

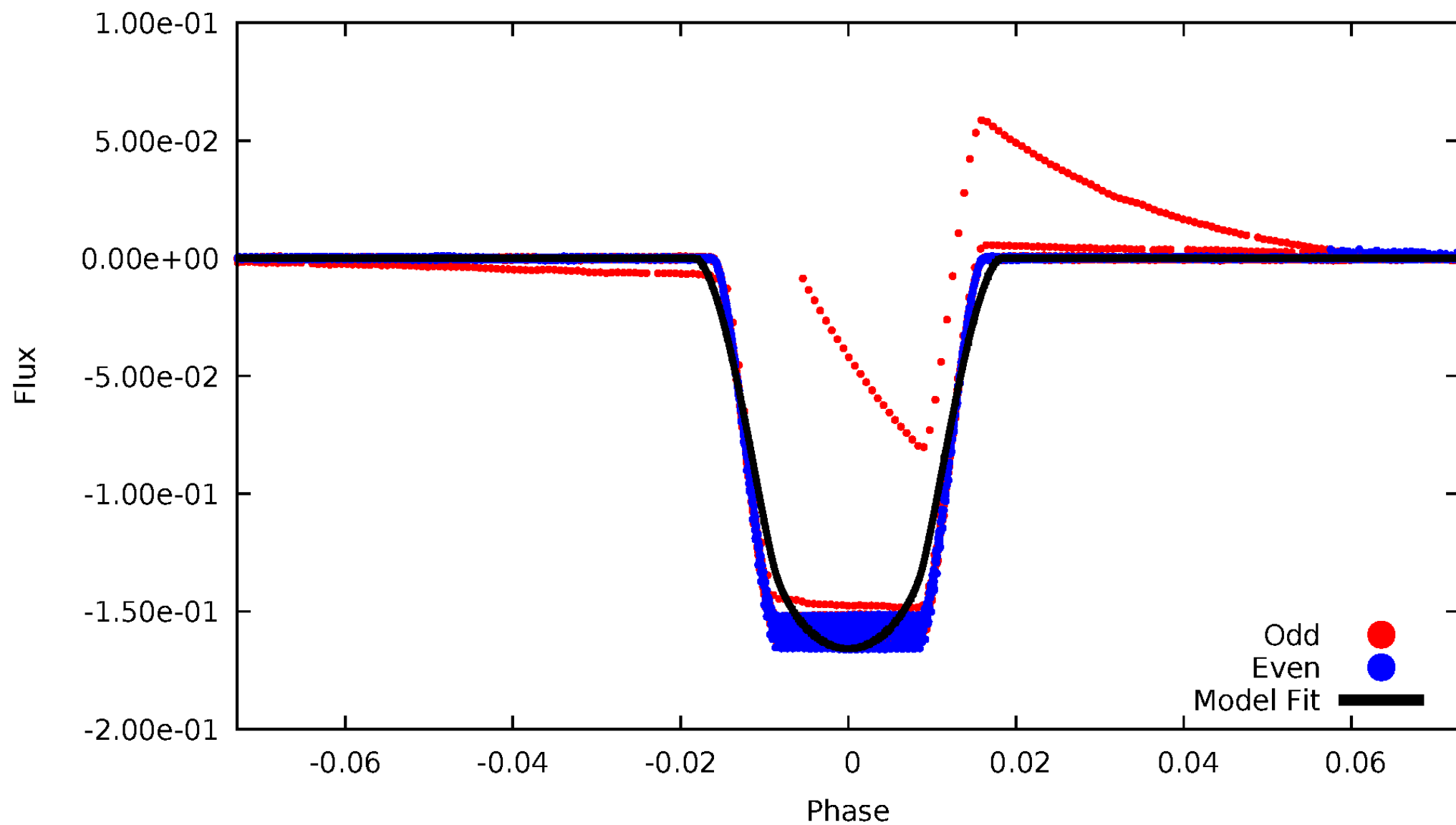


TCE 006307537-01



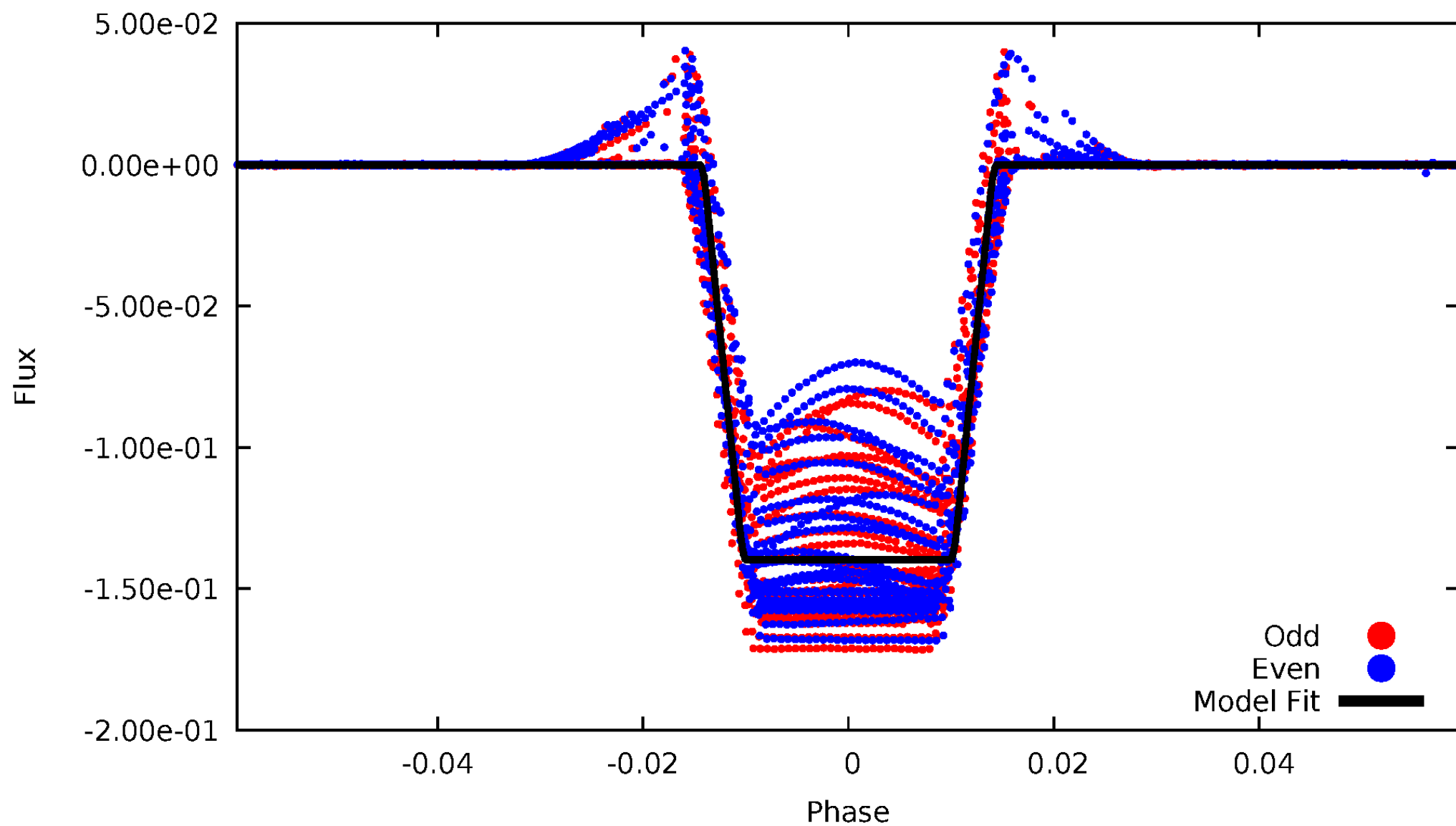
# DV Odd/Even

TCE 006307537-01



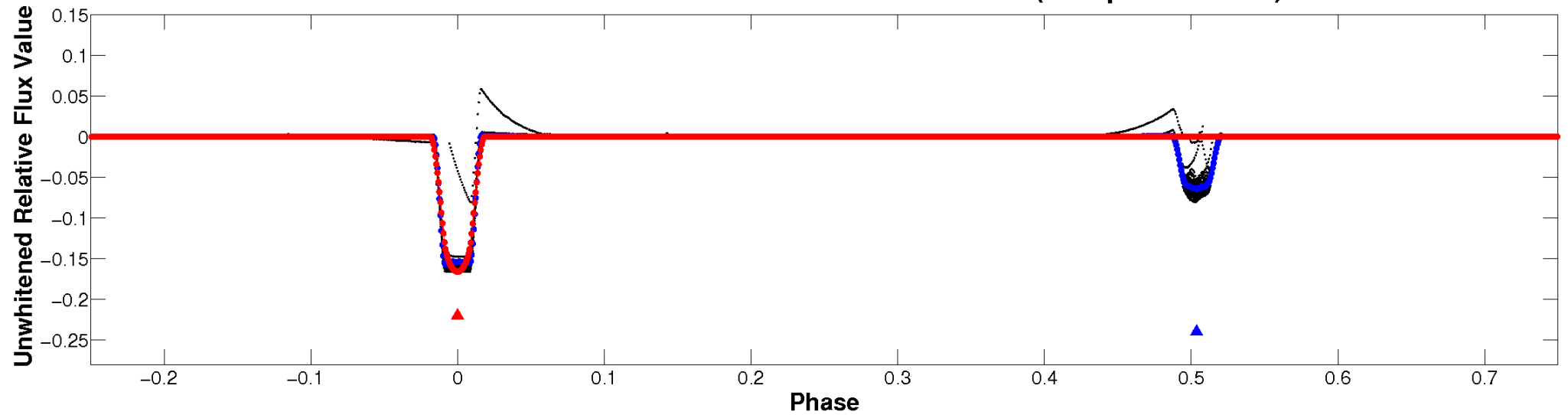
# ALT Odd/Even

TCE 006307537-01

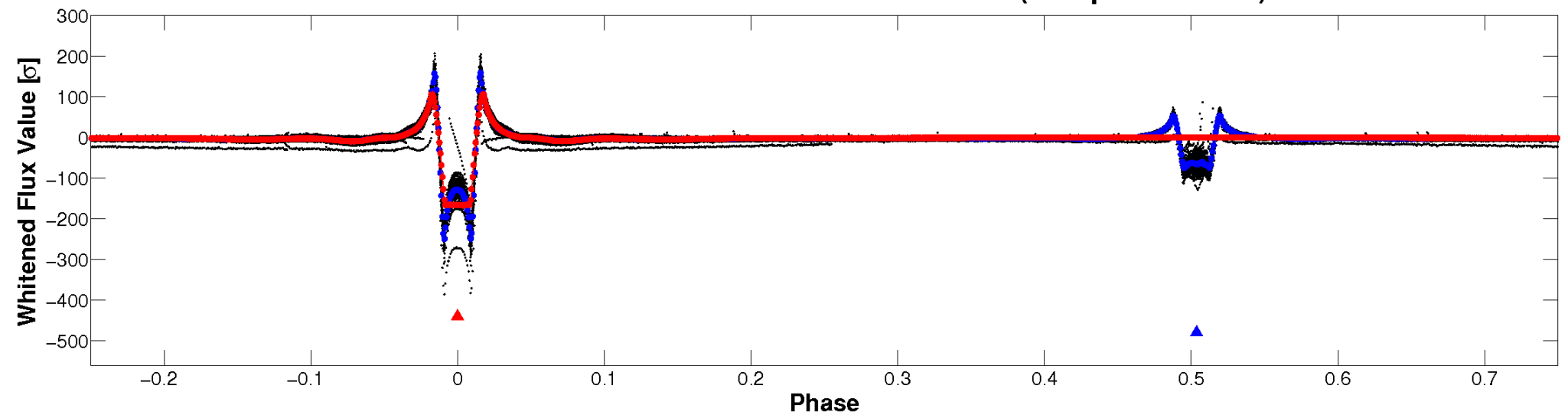


# Non-Whitened Vs. Whitened Light Curve

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

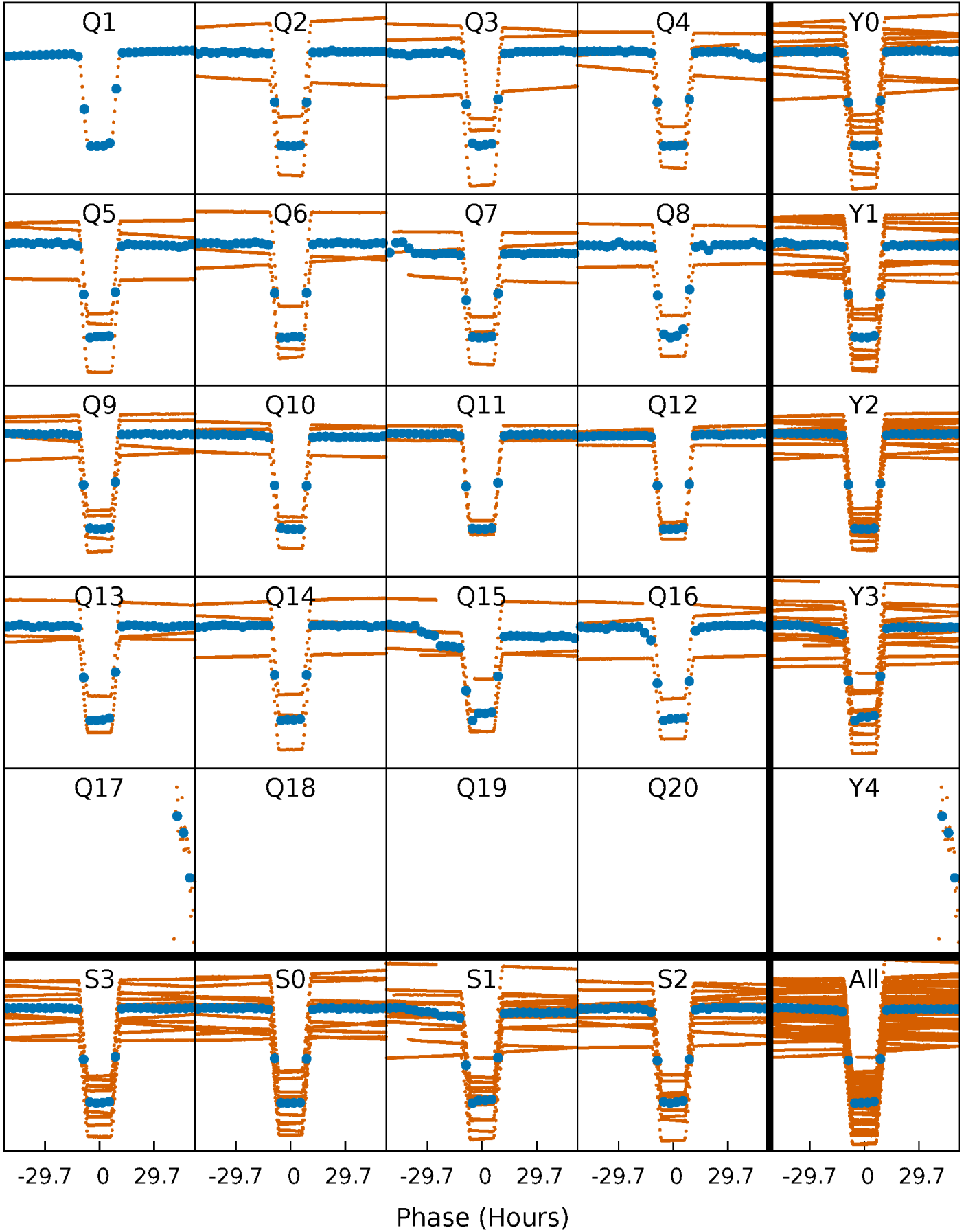


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

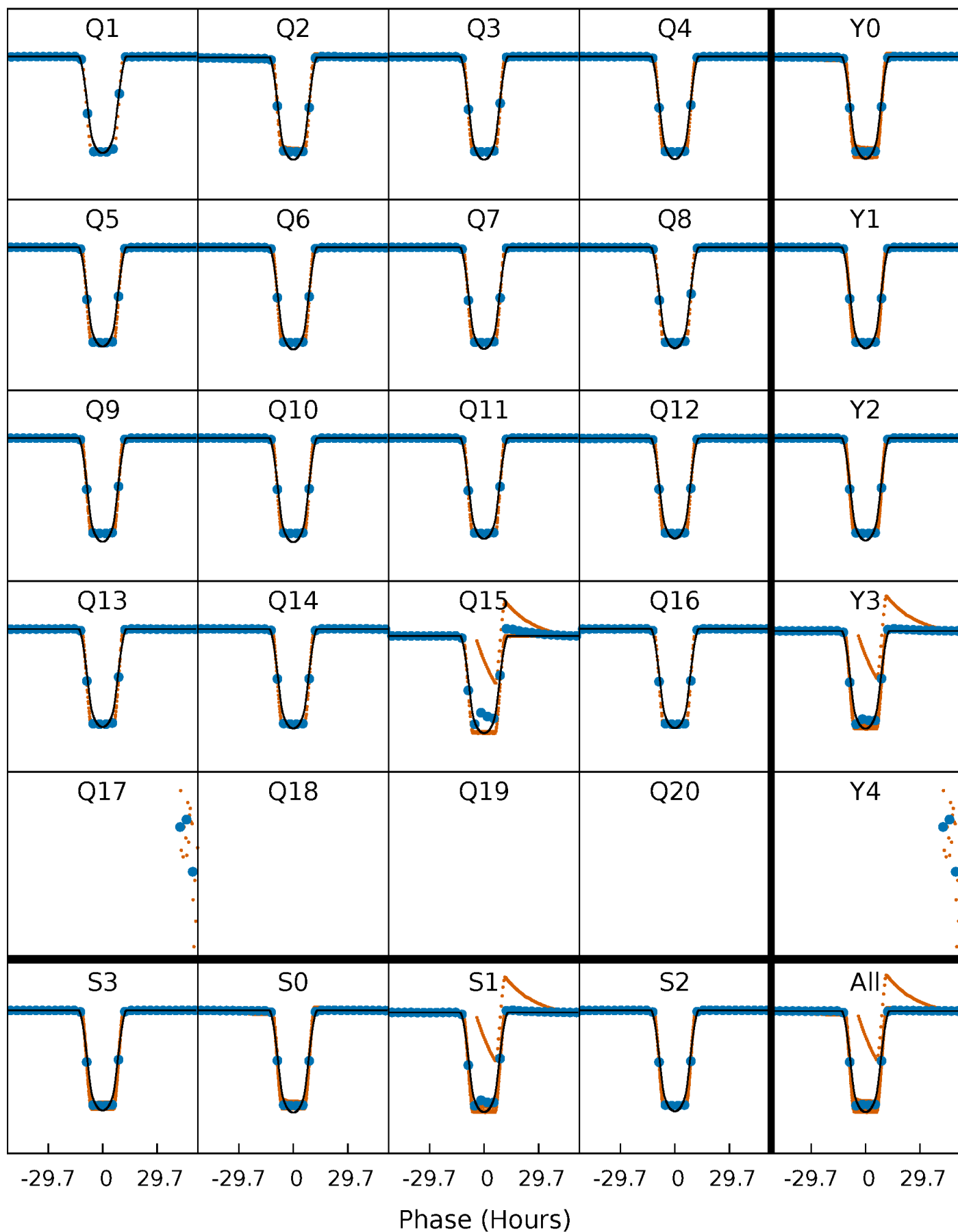
TCE 006307537-01 P= 29.744531 Days  $T_0=157.404378$  (BKJD)





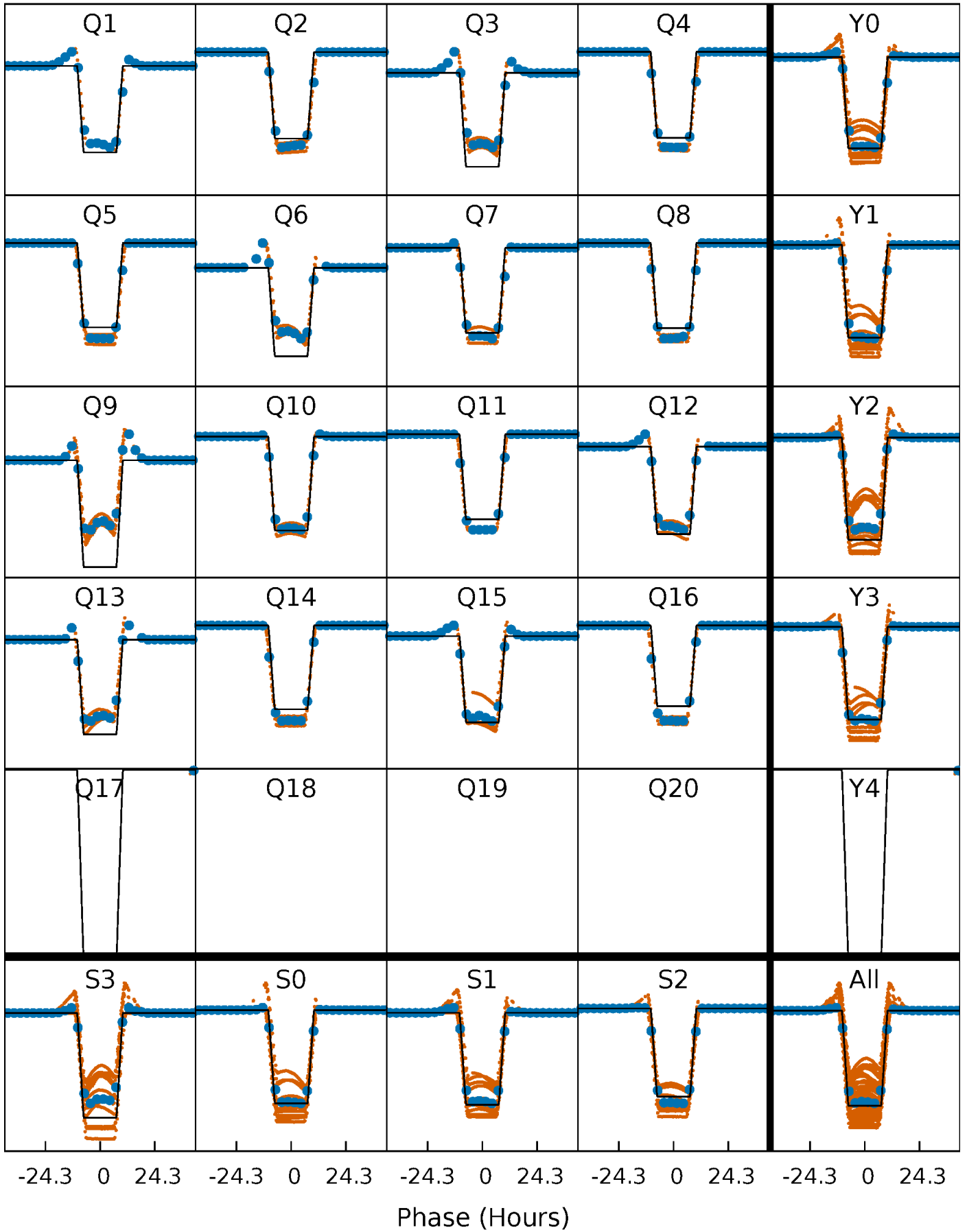
# DV Quarter-Phased Transit Curves

TCE 006307537-01 P= 29.744531 Days  $T_0=157.404378$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

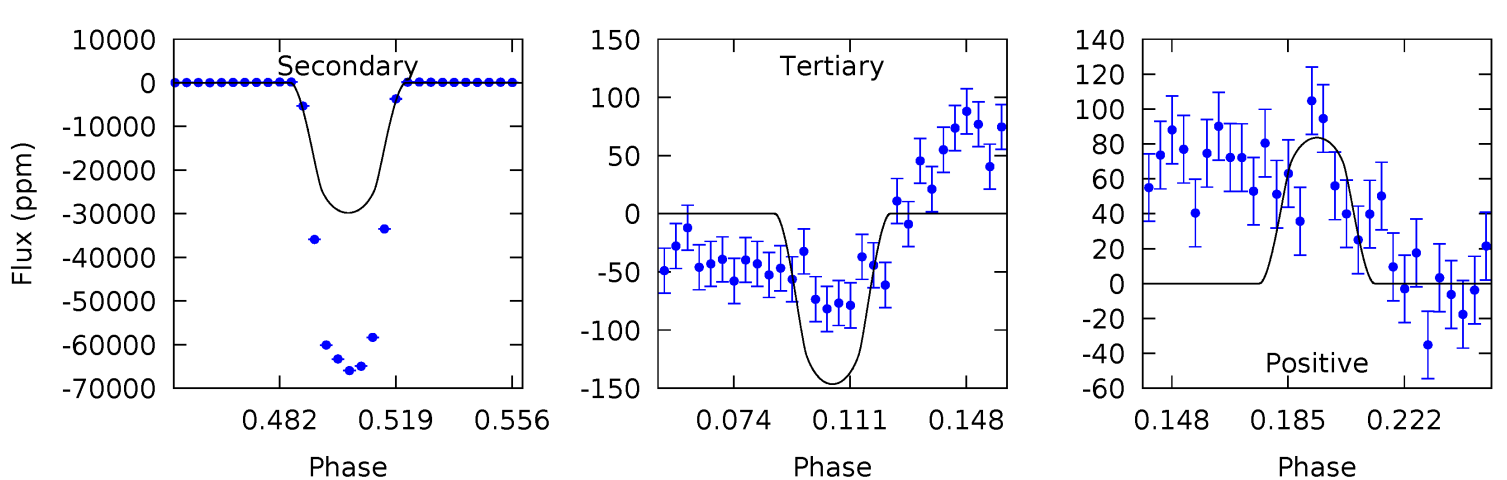
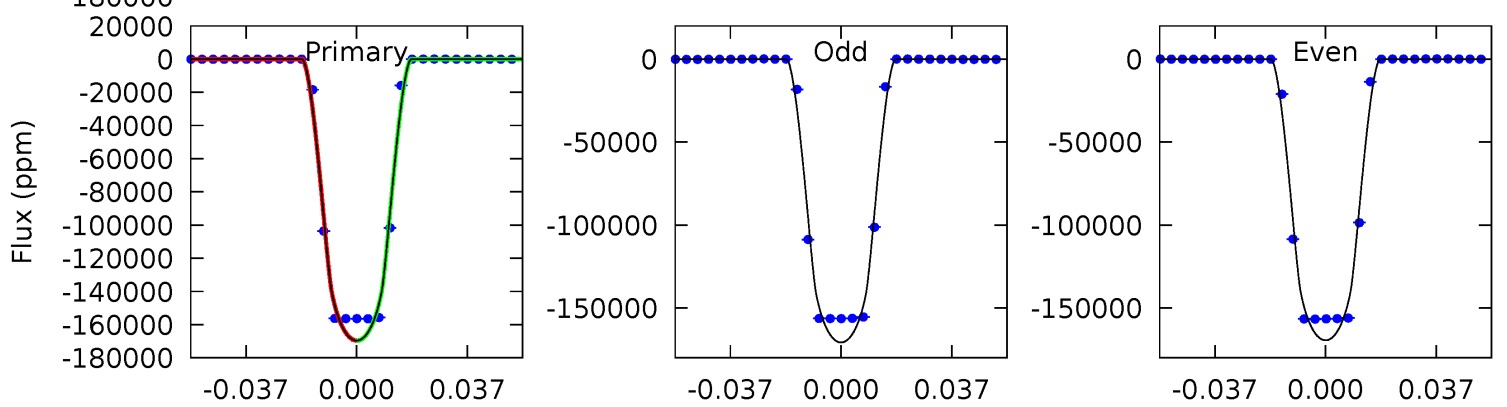
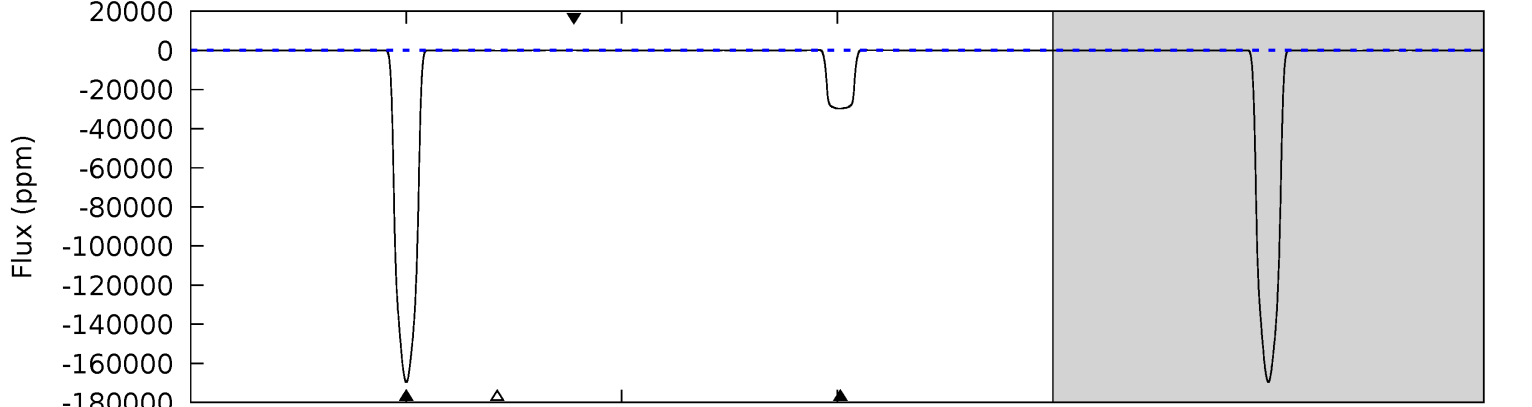
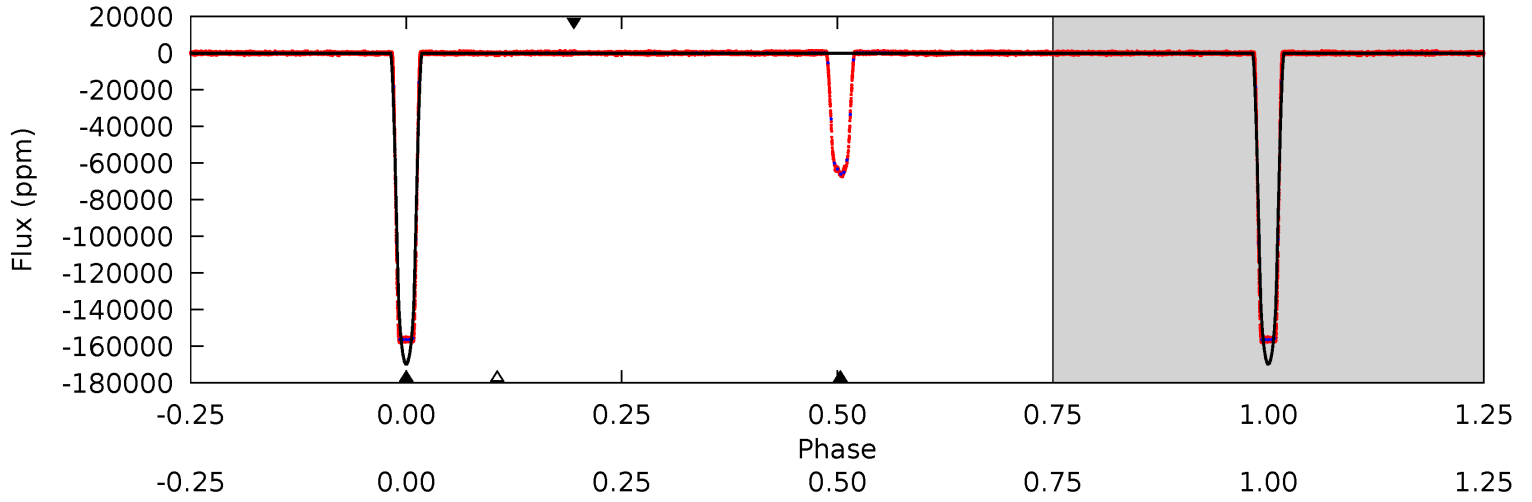
TCE 006307537-01 P= 29.745196 Days  $T_0=157.389940$  (BKJD)



# DV Model-Shift Uniqueness Test

006307537-01, P = 29.744531 Days, E = 127.659847 Days

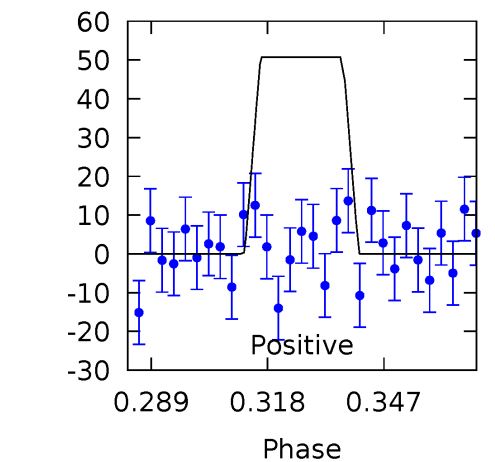
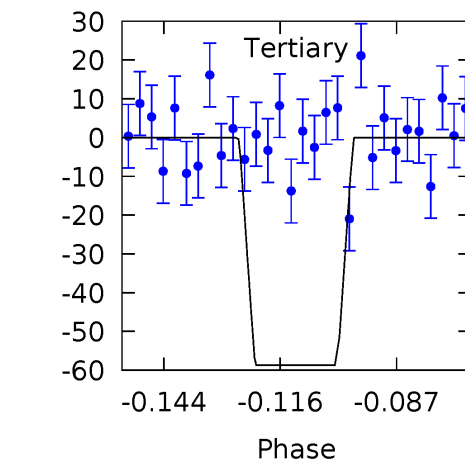
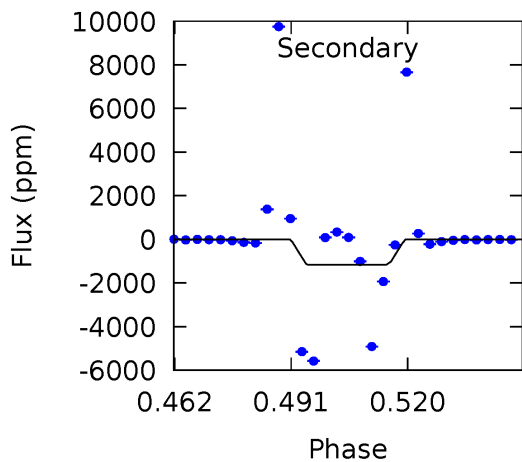
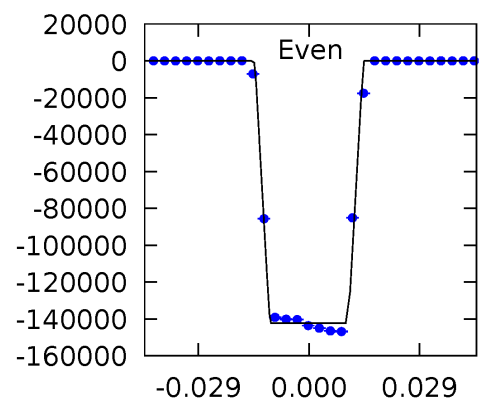
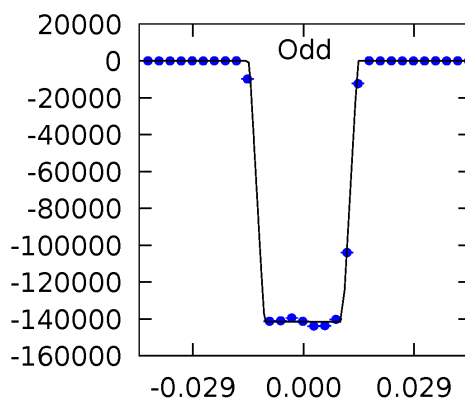
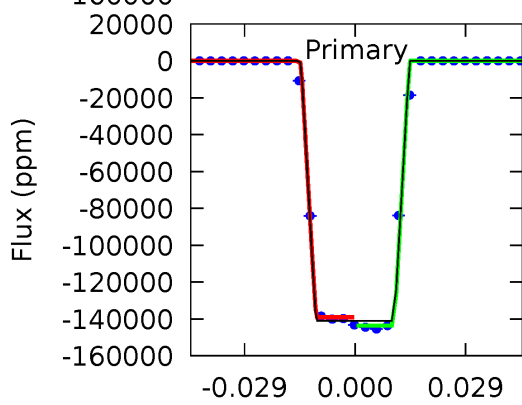
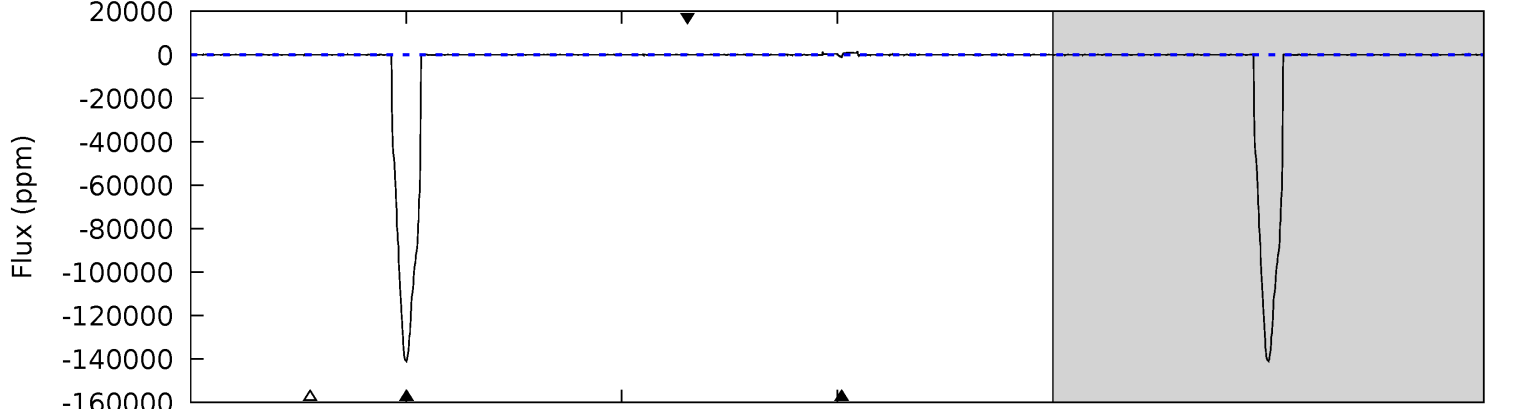
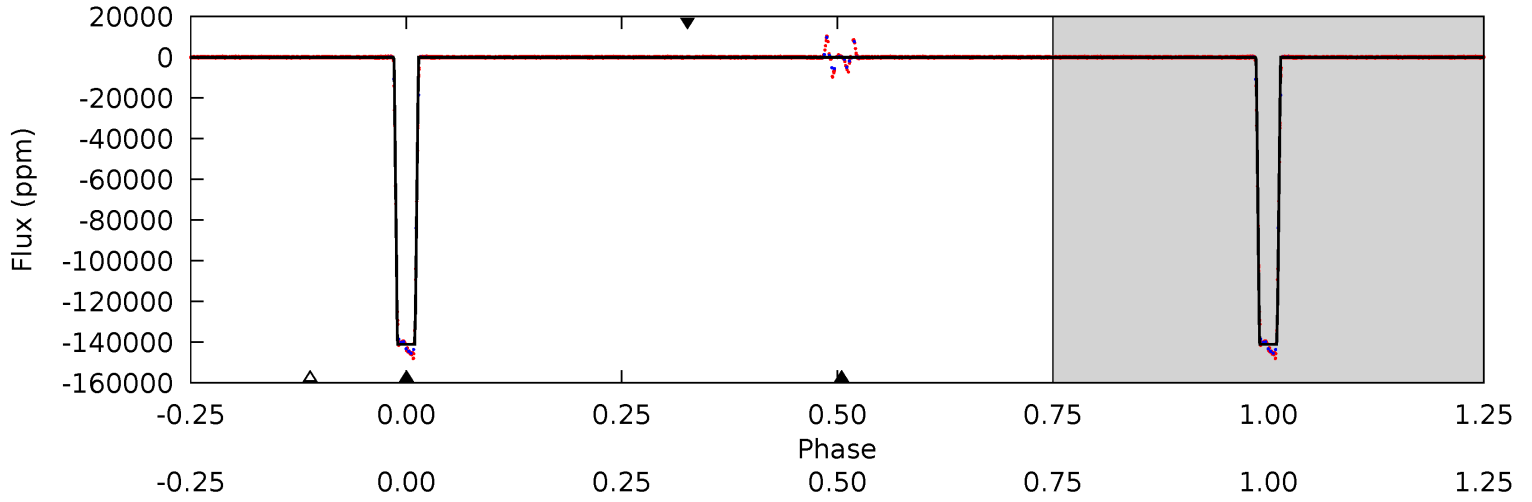
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19589	3442	16.9	9.65	4.77	2.09	6.33	19572	19580	3425	3433	73.1	0.97	0.00	0



# Alt Model-Shift Uniqueness Test

006307537-01, P = 29.745196 Days, E = 127.644744 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
10958	90.2	4.56	3.94	4.82	2.19	1.31	10953	10954	85.7	86.3	35.2	0.94	0.01	0



### Stellar Parameters For KIC 006307537

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4889^{+186}_{-169}$	$4.569^{+0.036}_{-0.054}$	$0.300^{+0.150}_{-0.300}$	$0.788^{+0.062}_{-0.062}$	$0.839^{+0.047}_{-0.073}$	$2.416^{+0.438}_{-0.446}$
	+4%/-3%	+1%/-1%	+50%/-100%	+8%/-8%	+6%/-9%	+18%/-18%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 006307537-01 / KOI 1120.01

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-29807 \pm 9$	$31.34^{+1.32}_{-1.42}$	$638^{+27}_{-26}$	$3725^{+117}_{-102}$	$540^{+37}_{-39}$
Alt.	$-1161 \pm 13$	$32.38^{+1.38}_{-1.55}$	$638^{+28}_{-25}$	$2345^{+51}_{-45}$	$19^{+1}_{-1}$

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

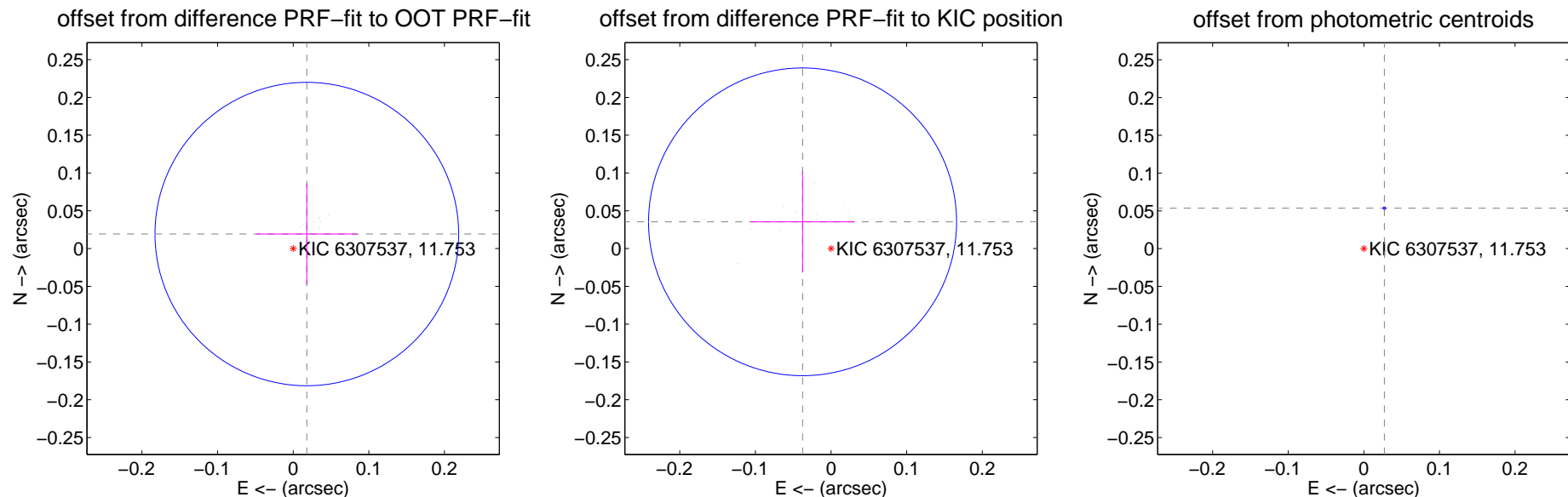
## DV Centroid Data

Supplemental centroid analysis for 006307537-01. **Kepler magnitude: 11.75.** Transit SNR 2549.11

There are 15 quarters with good PRF difference image offsets

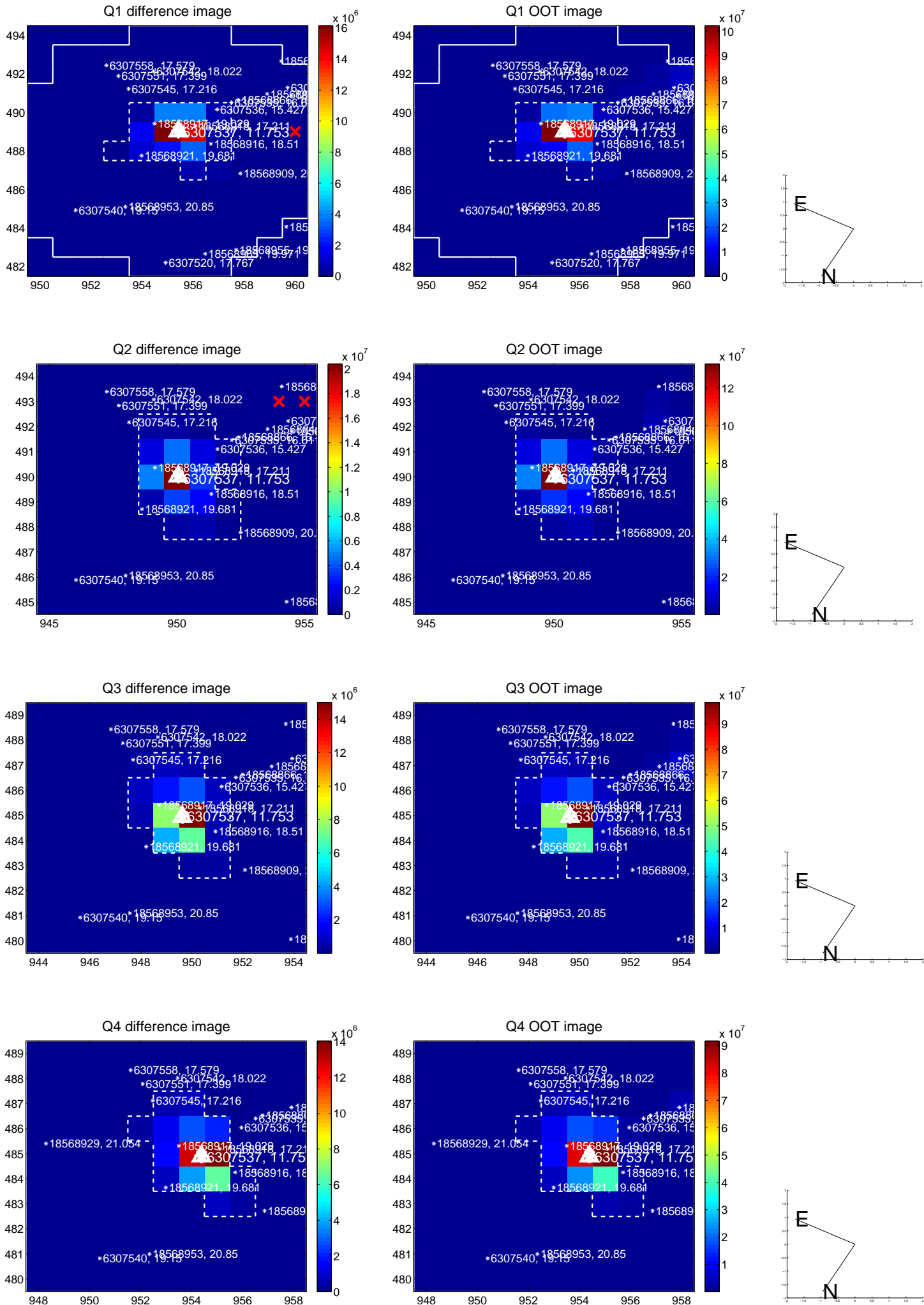
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.026 \pm 0.067$	0.39	$-0.018 \pm 0.067$	$0.019 \pm 0.067$
PRF-fit source offset from KIC position	$0.052 \pm 0.068$	0.76	$0.038 \pm 0.069$	$0.035 \pm 0.067$
photometric centroid source offset	<b><math>0.06 \pm 0.00</math></b>	<b>112.96</b>	$-0.03 \pm 0.00$	$0.05 \pm 0.00$

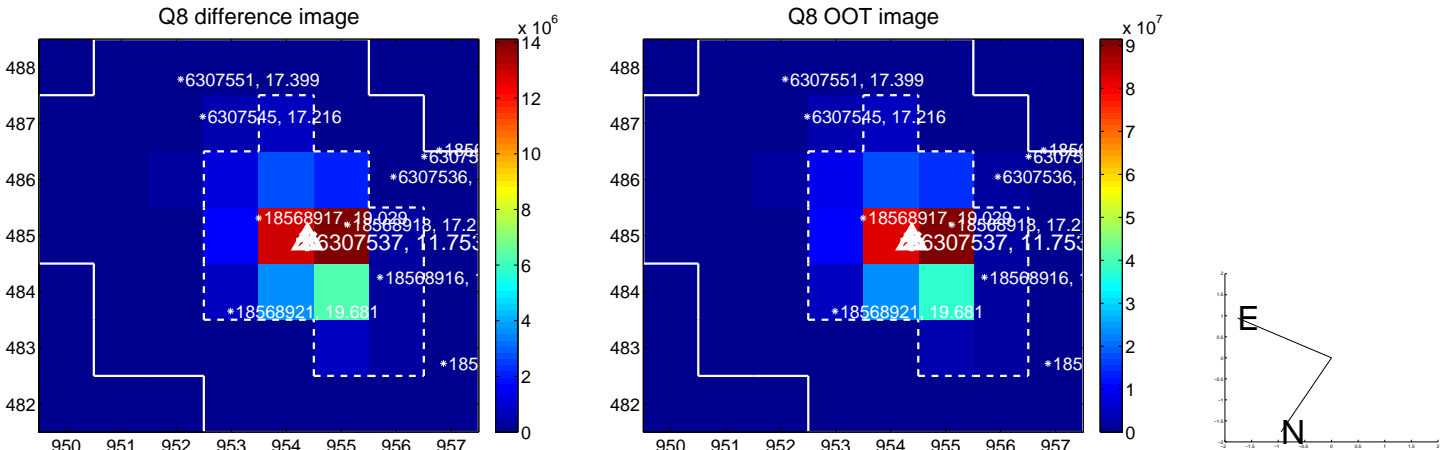
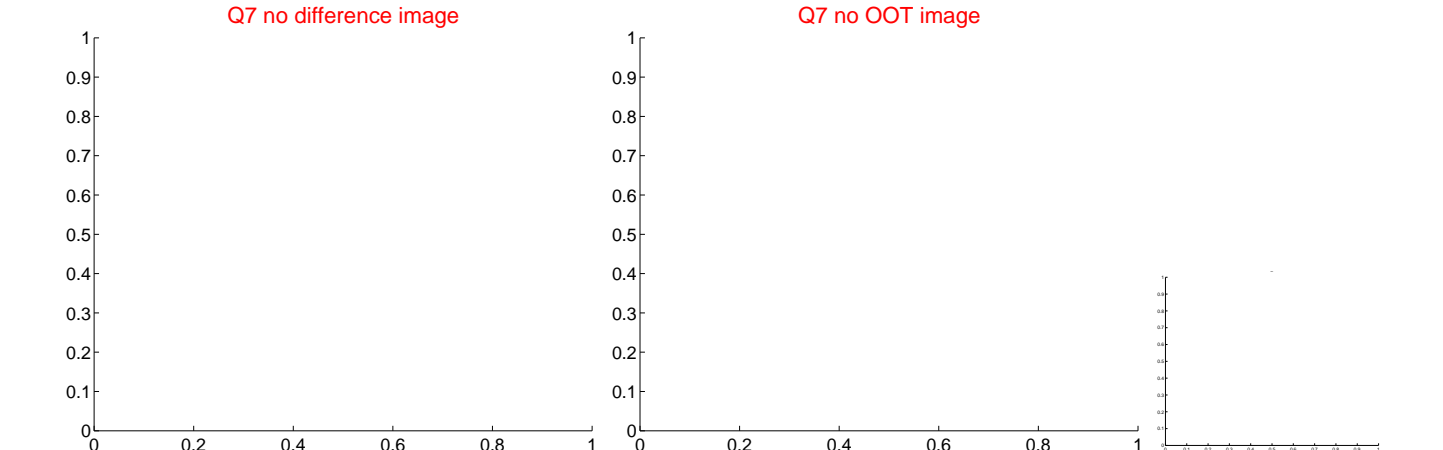
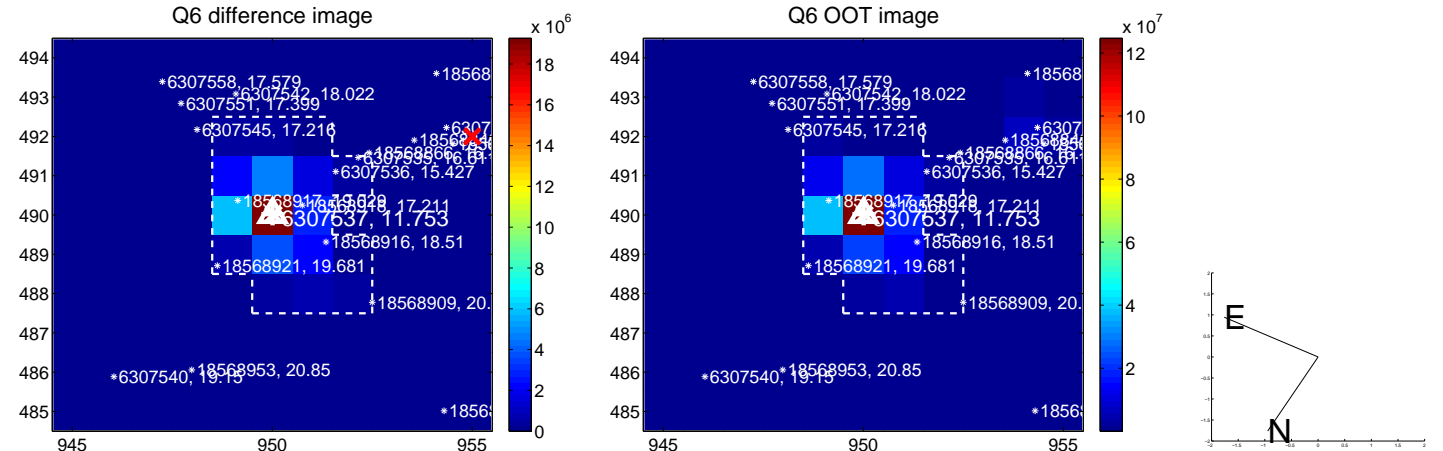
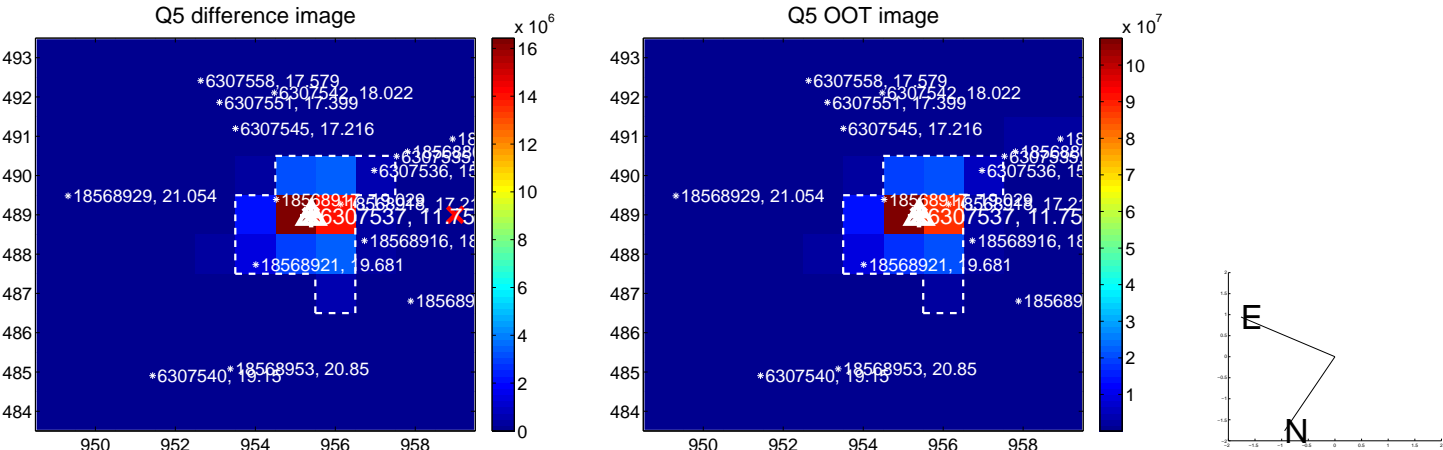


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

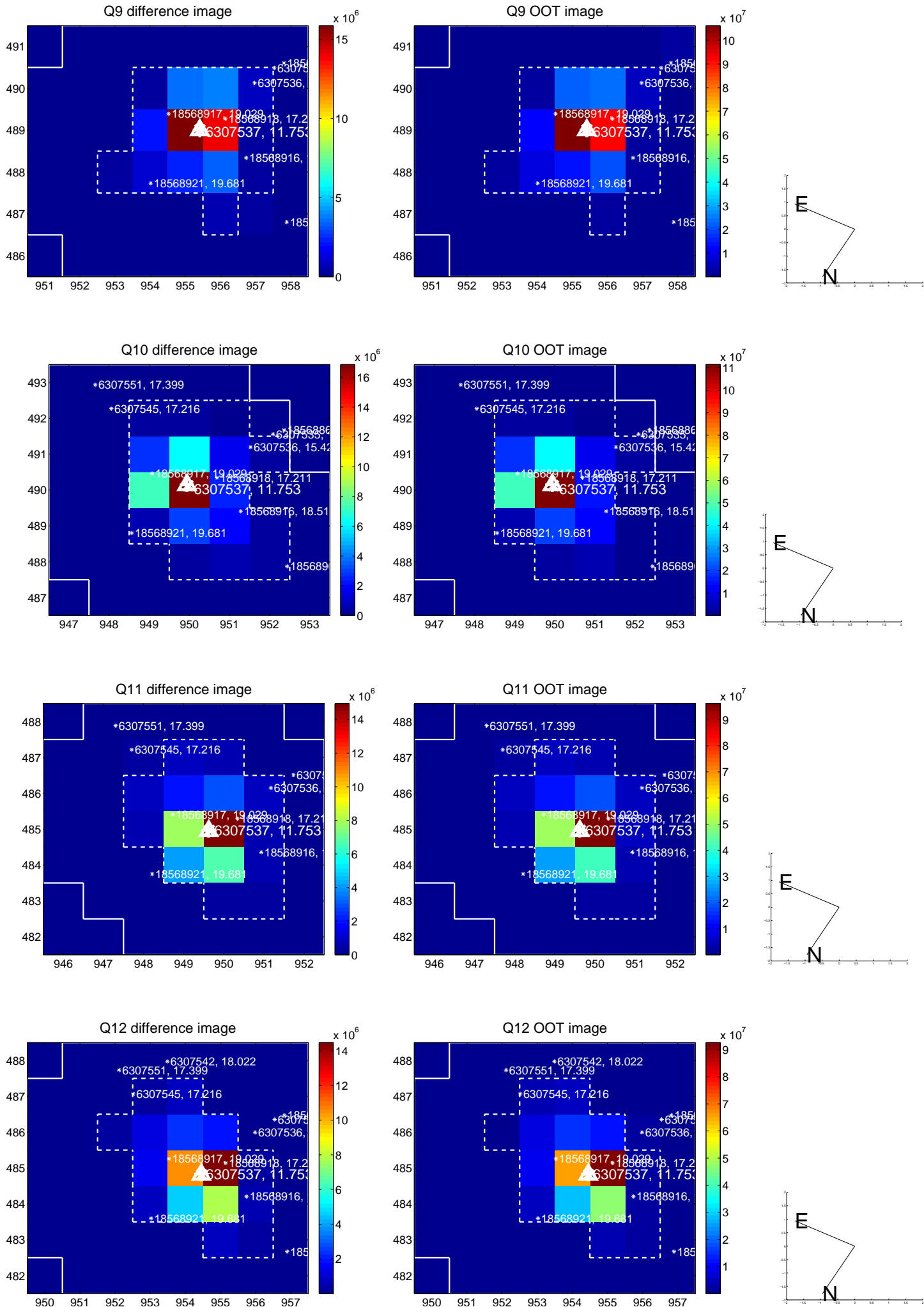


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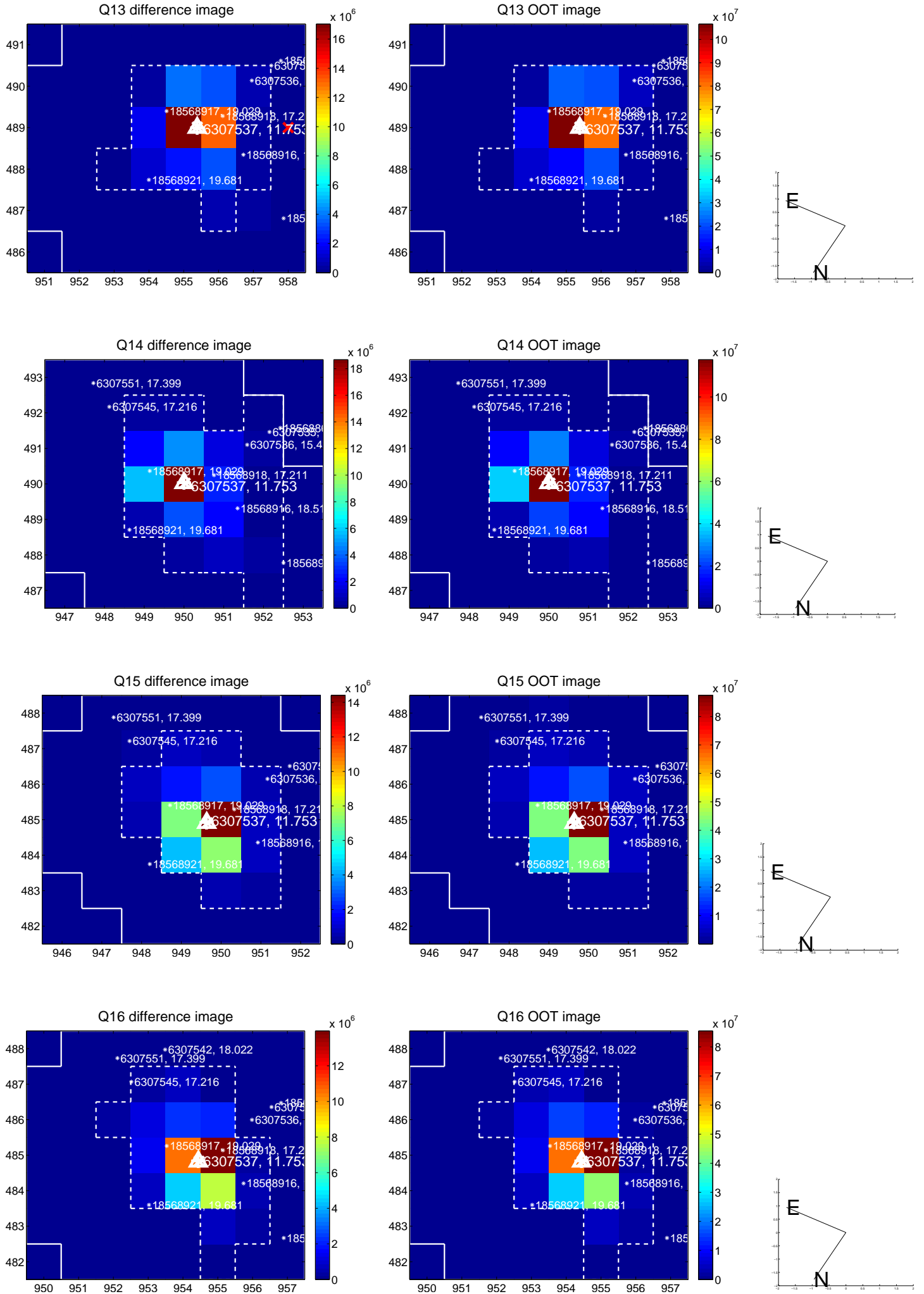




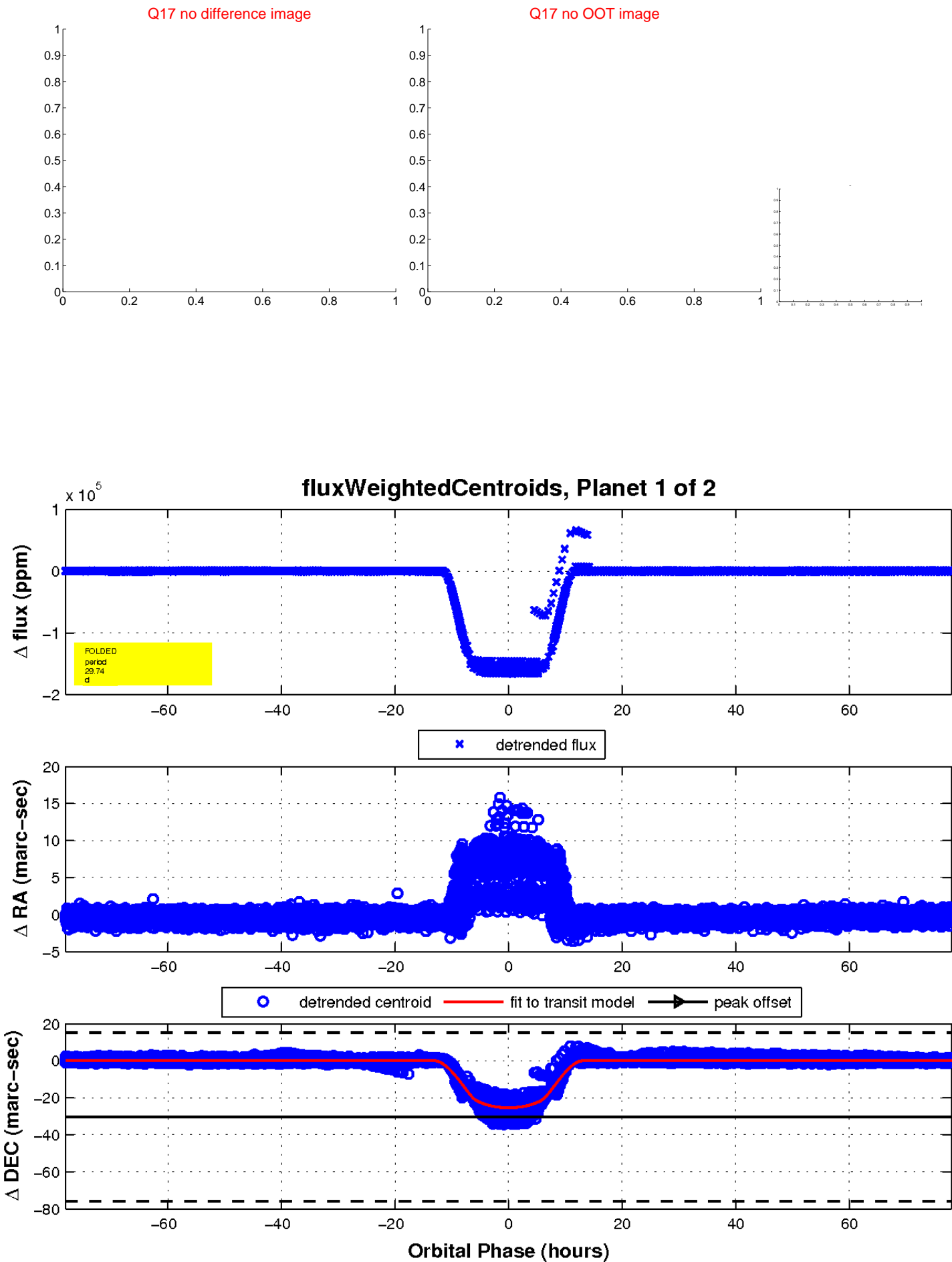
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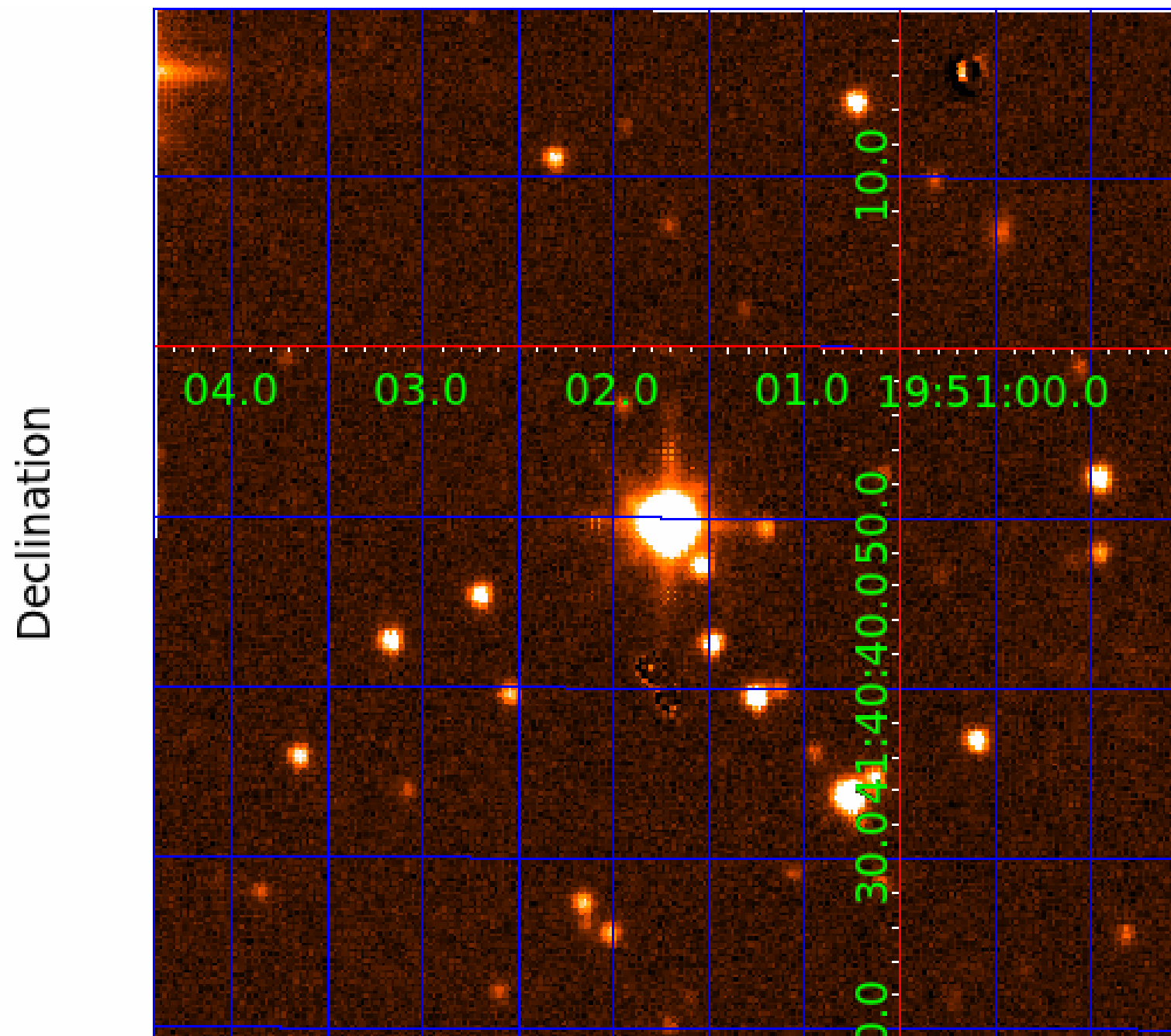
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 006307537

## Q1-17 DR25 TCE Parameters

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## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006307537-01	OBS	FP	0.00	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—MOD_ODDEVEN_DV—MOD_ODDEVEN_ALT—HAS_SEC_TCE
006307537-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE

**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.

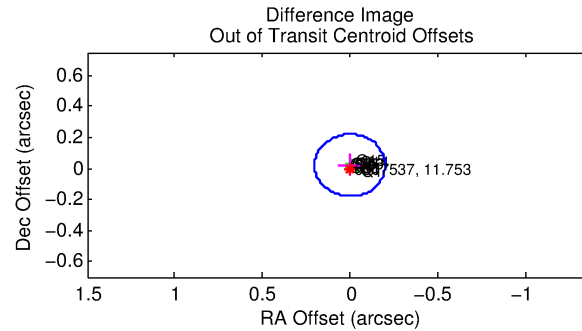
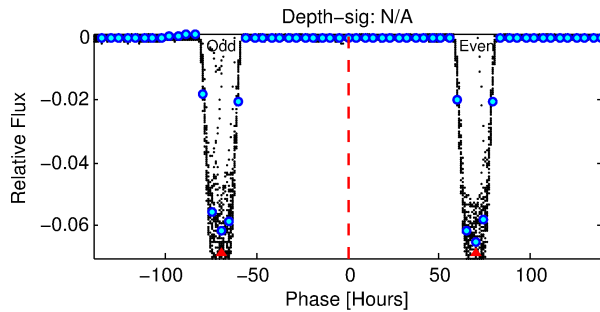
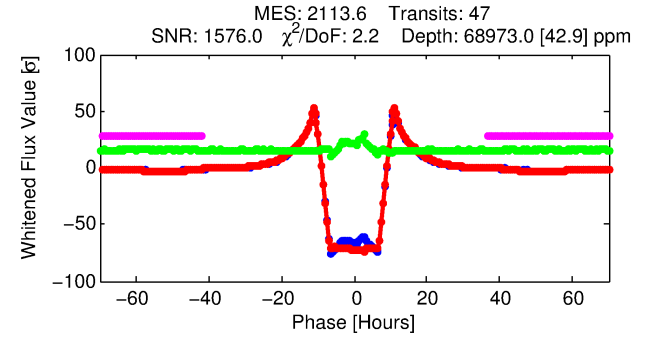
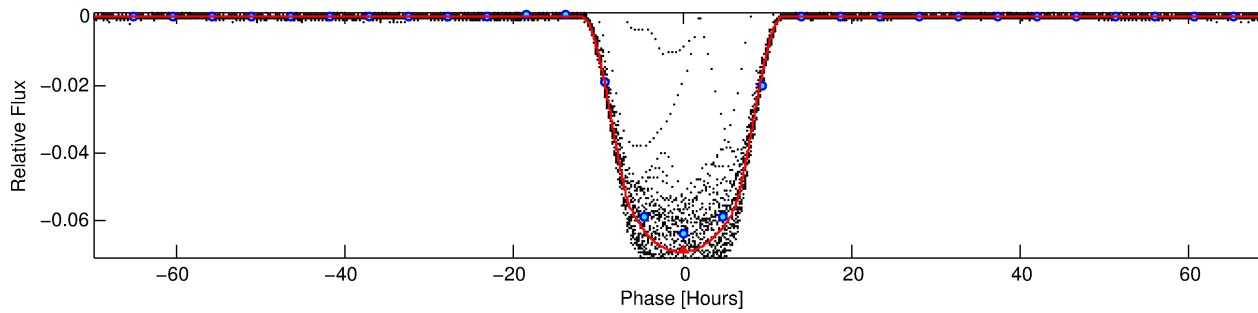
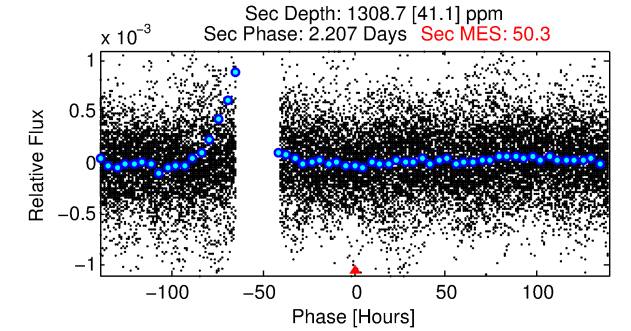
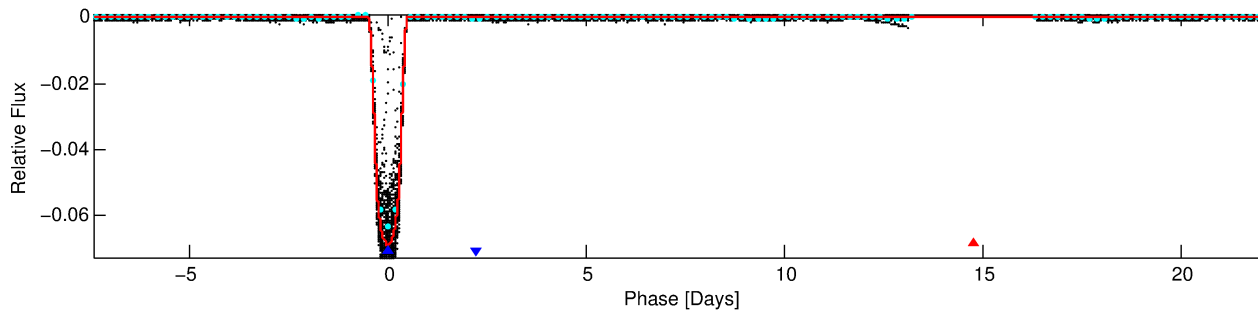
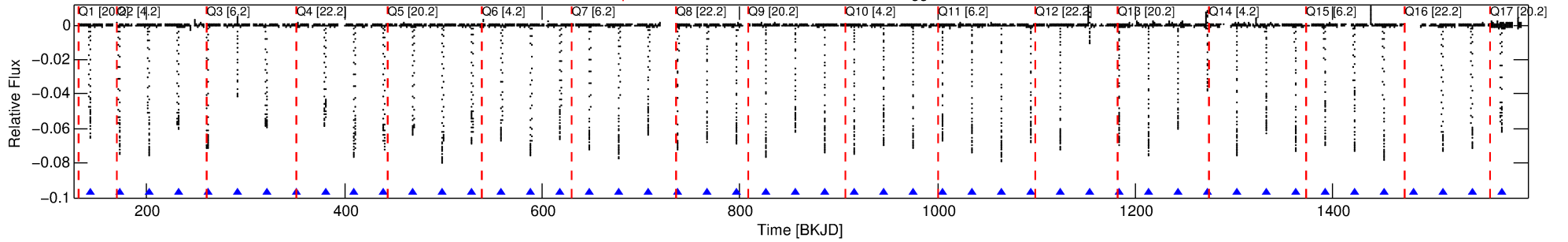
## Ephemeris Match Information For 006307537-02

No Significant Match Found

# DV One-Page Summary

KIC: 6307537 Candidate: 2 of 2 Period: 29.745 d  
KOI: K01120.01 Corr: 0.990

Kp: 11.75 R\*: 0.79 Rs Teff: 4889.0 K Logg: 4.57 Fe/H: 0.300



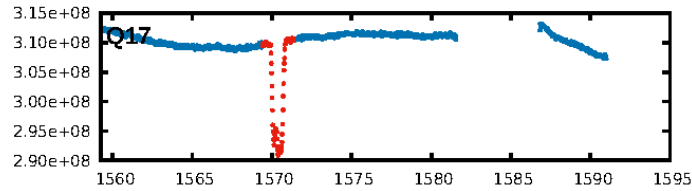
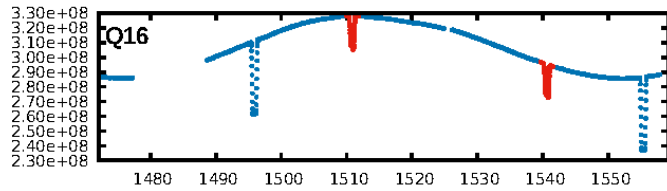
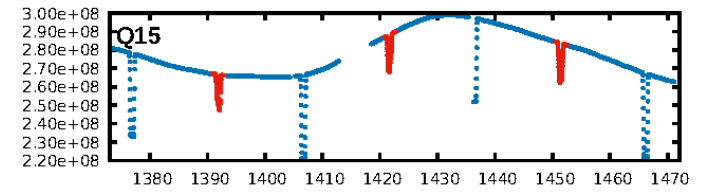
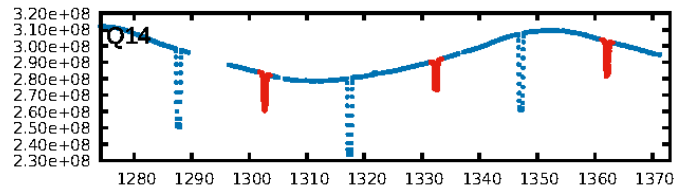
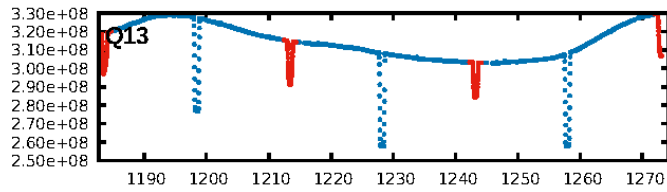
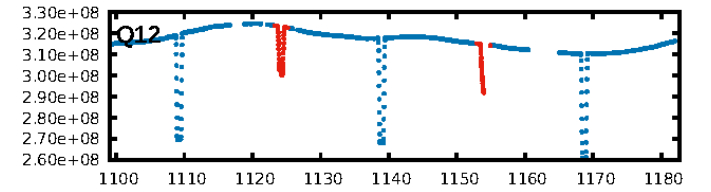
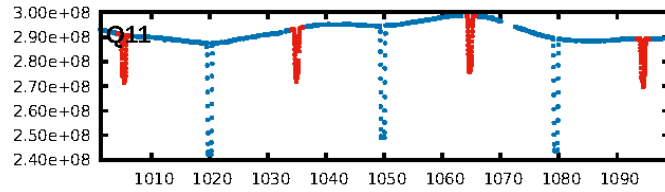
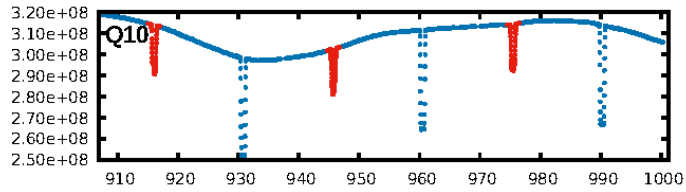
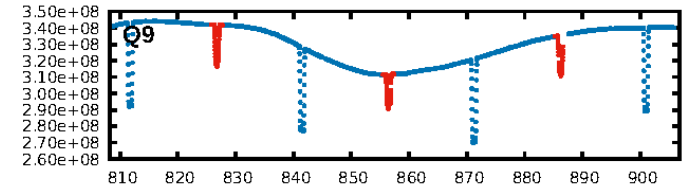
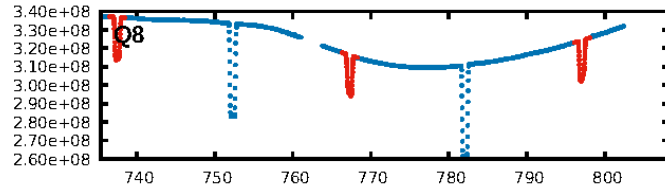
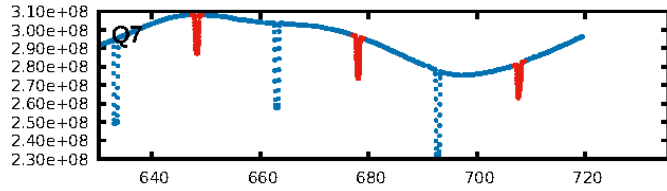
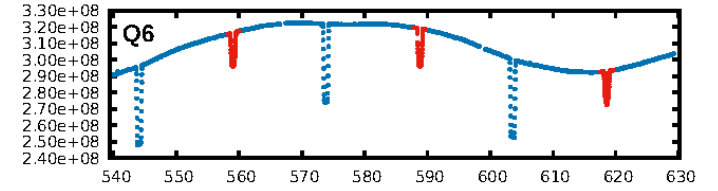
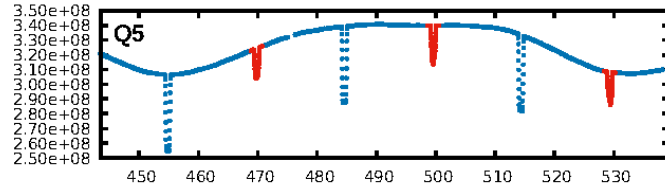
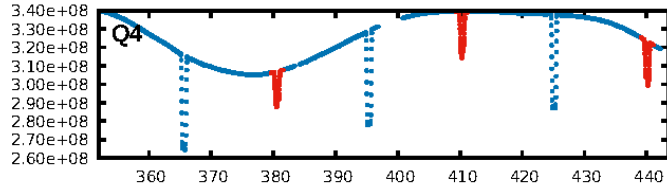
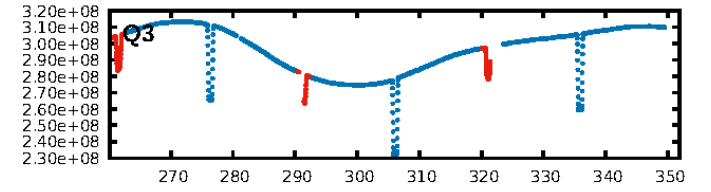
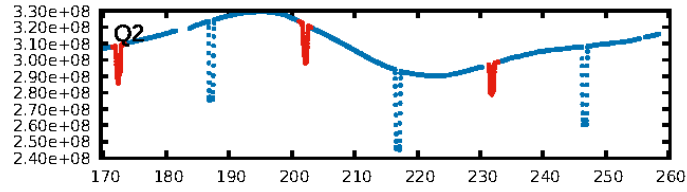
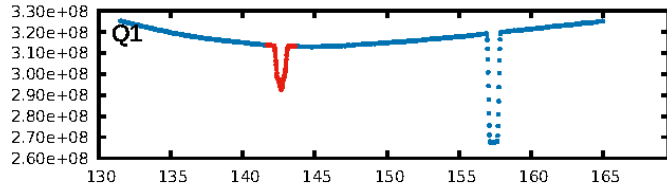
## DV Fit Results:

Period = 29.74459 [0.00001] d  
Epoch = 142.6404 [0.0002] BKJD  
Rp/R\* = 0.2380 [0.0001]  
a/R\* = 11.53 [0.01]  
b = 0.37 [0.00]  
Seff = 10.11 [1.83]  
Teff = 455 [21] K  
Rp = 20.47 [1.61] Re  
a = 0.1773 [0.0119] AU  
Ag = 54.00 [5.56] [9.53σ]  
Teffp = 1906 [74] K [18.88σ]

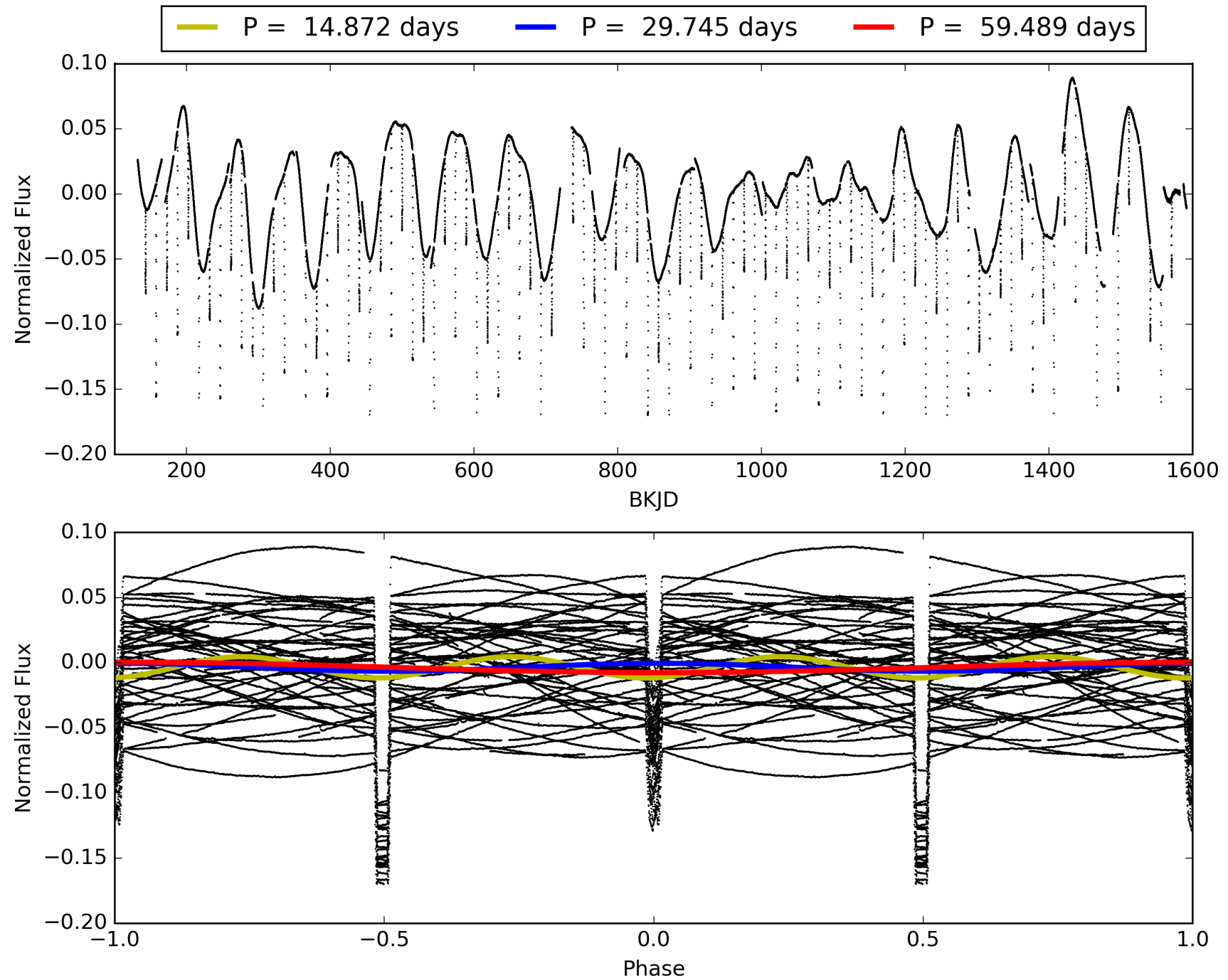
## DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 0.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [45/45]  
GhostDiagnostic-chr: 1.799  
Centroid-sig: N/A  
Centroid-so: 0.026 arcsec [22.61σ]  
OotOffset-rm: 0.021 arcsec [0.32σ]  
KicOffset-rm: 0.066 arcsec [0.96σ]  
OotOffset-st: 4/2/3/5 [14]  
KicOffset-st: 4/2/3/5 [14]  
DiffImageQuality-fgm: 1.00 [14/14]  
DiffImageOverlap-fno: 1.00 [14/14]

# TCE 006307537-02, PDC Light Curves



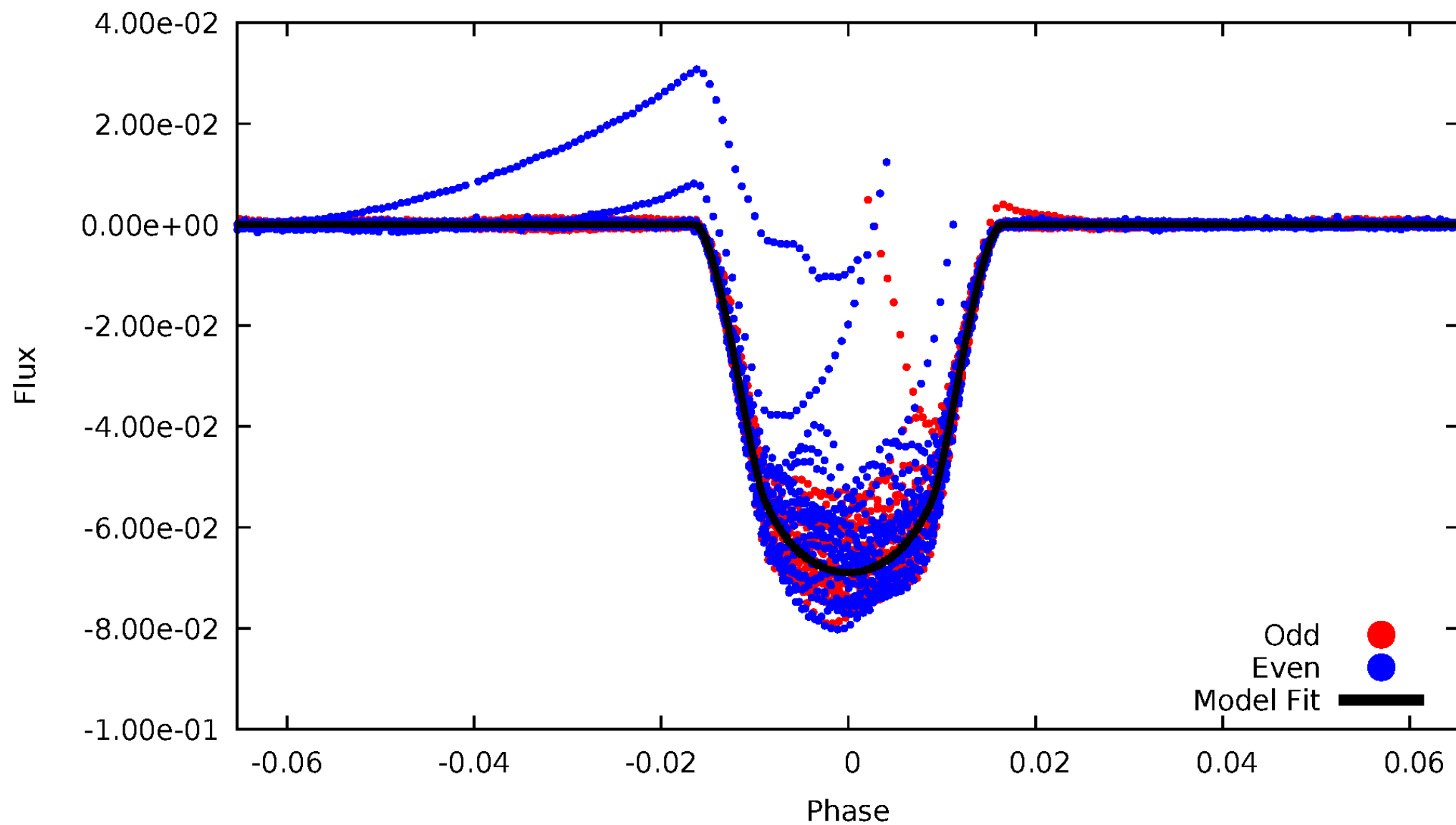
TCE 006307537-02





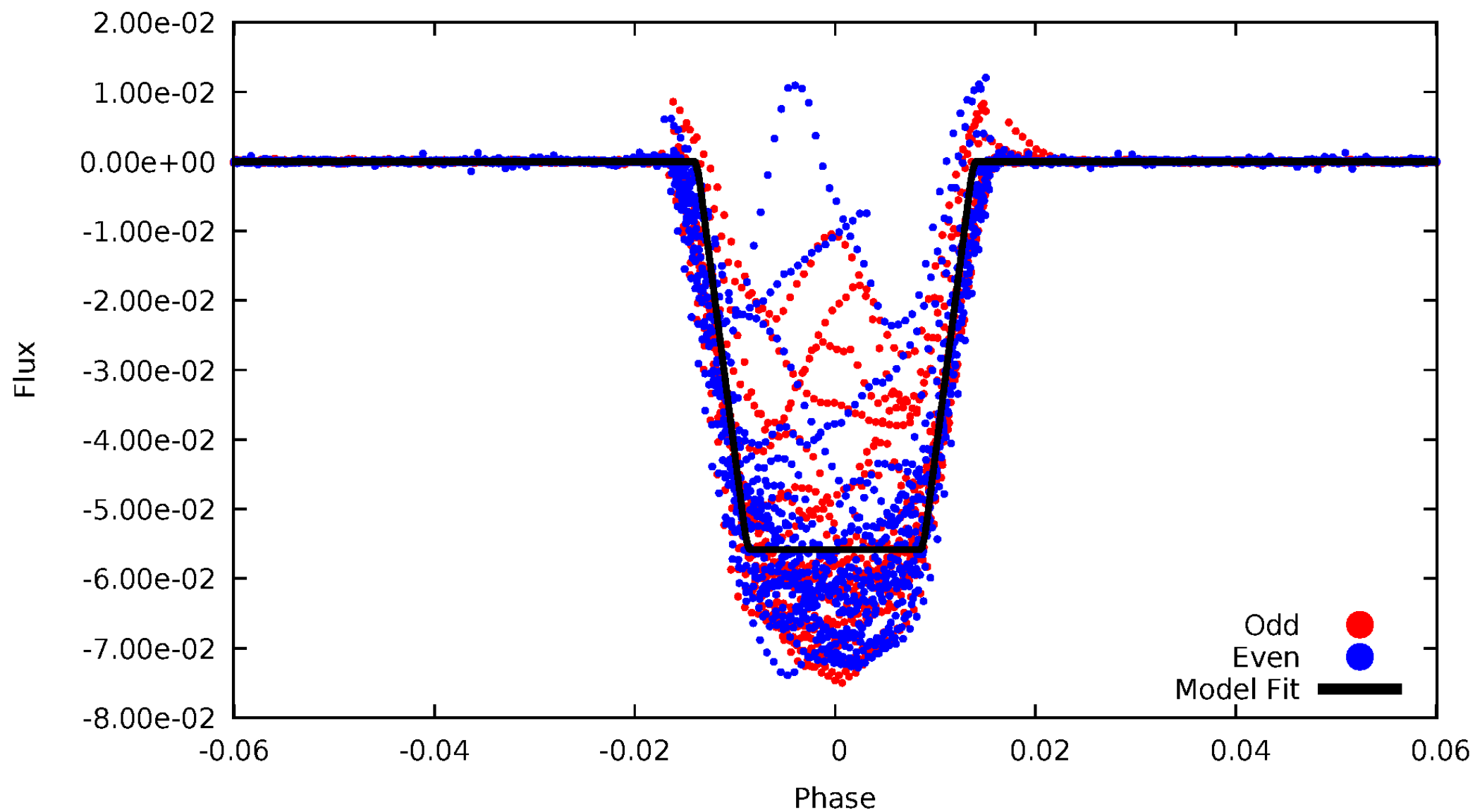
DV Odd/Even

TCE 006307537-02



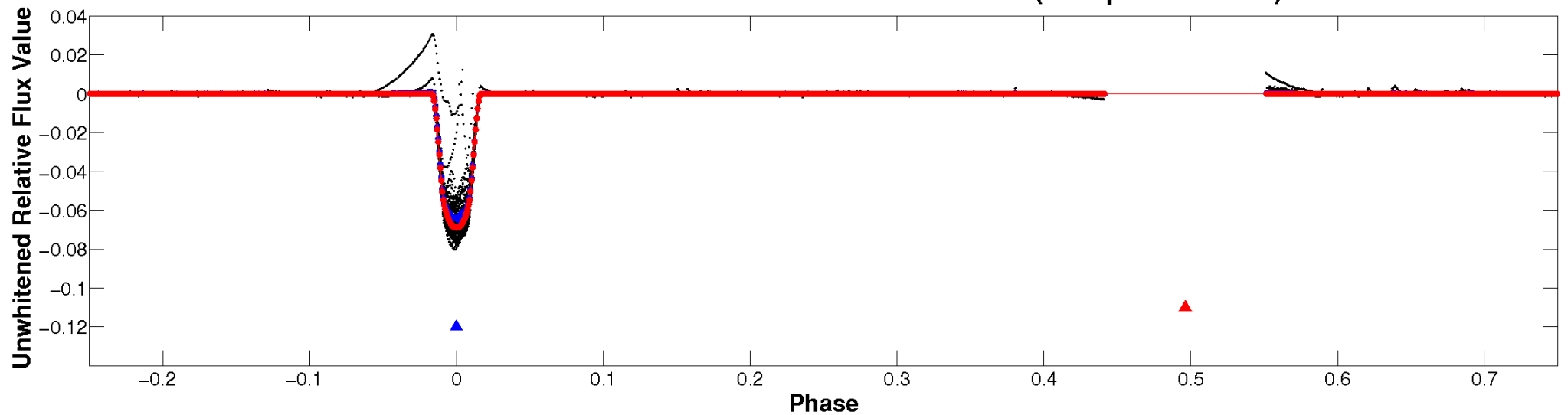
# ALT Odd/Even

TCE 006307537-02

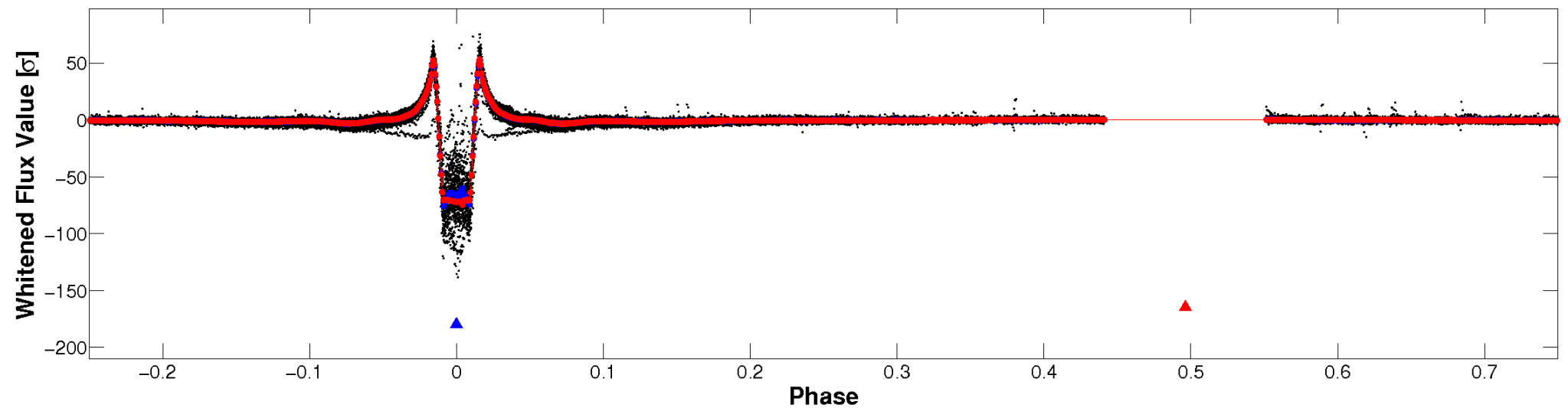


# Non-Whitened Vs. Whitened Light Curve

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

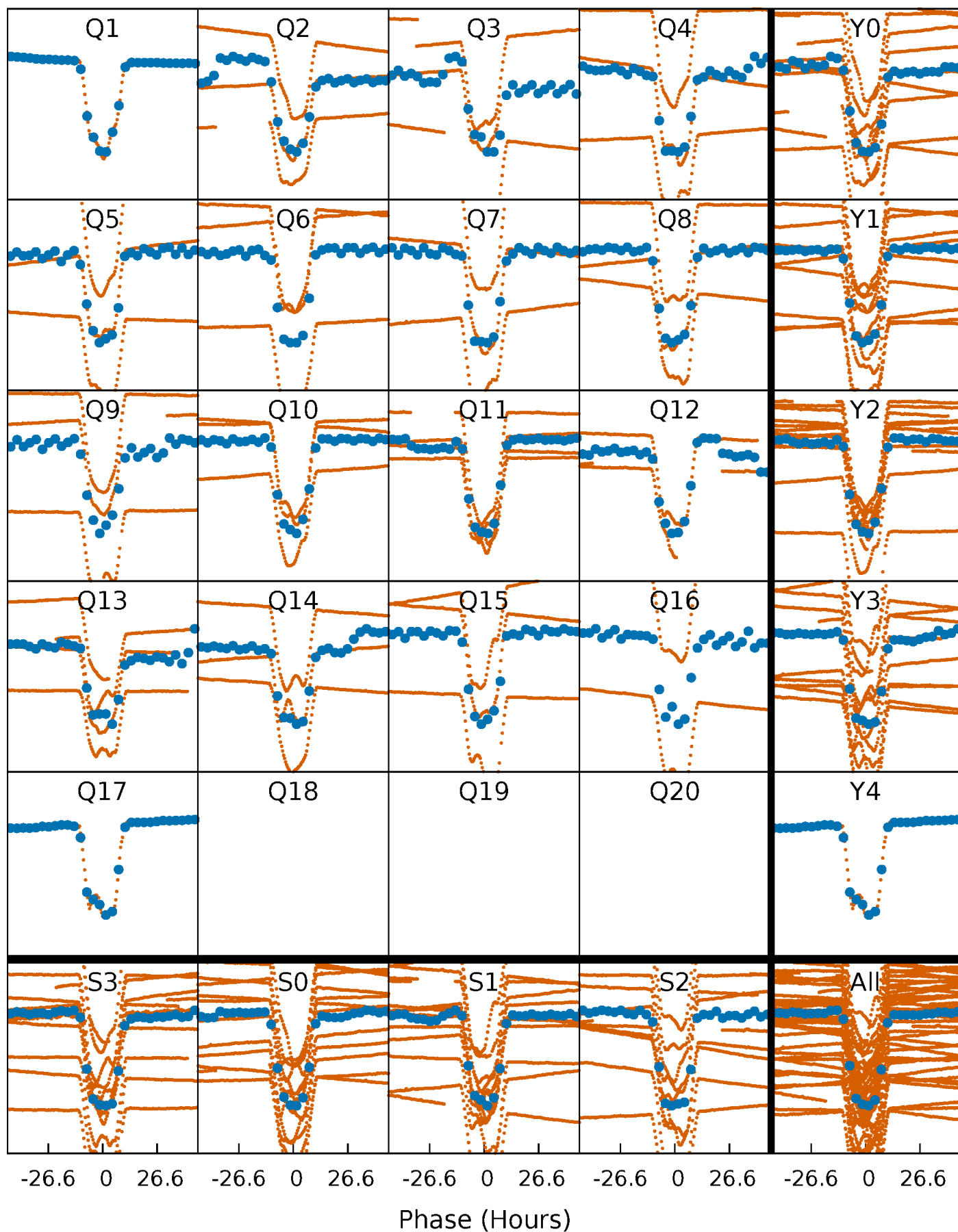


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



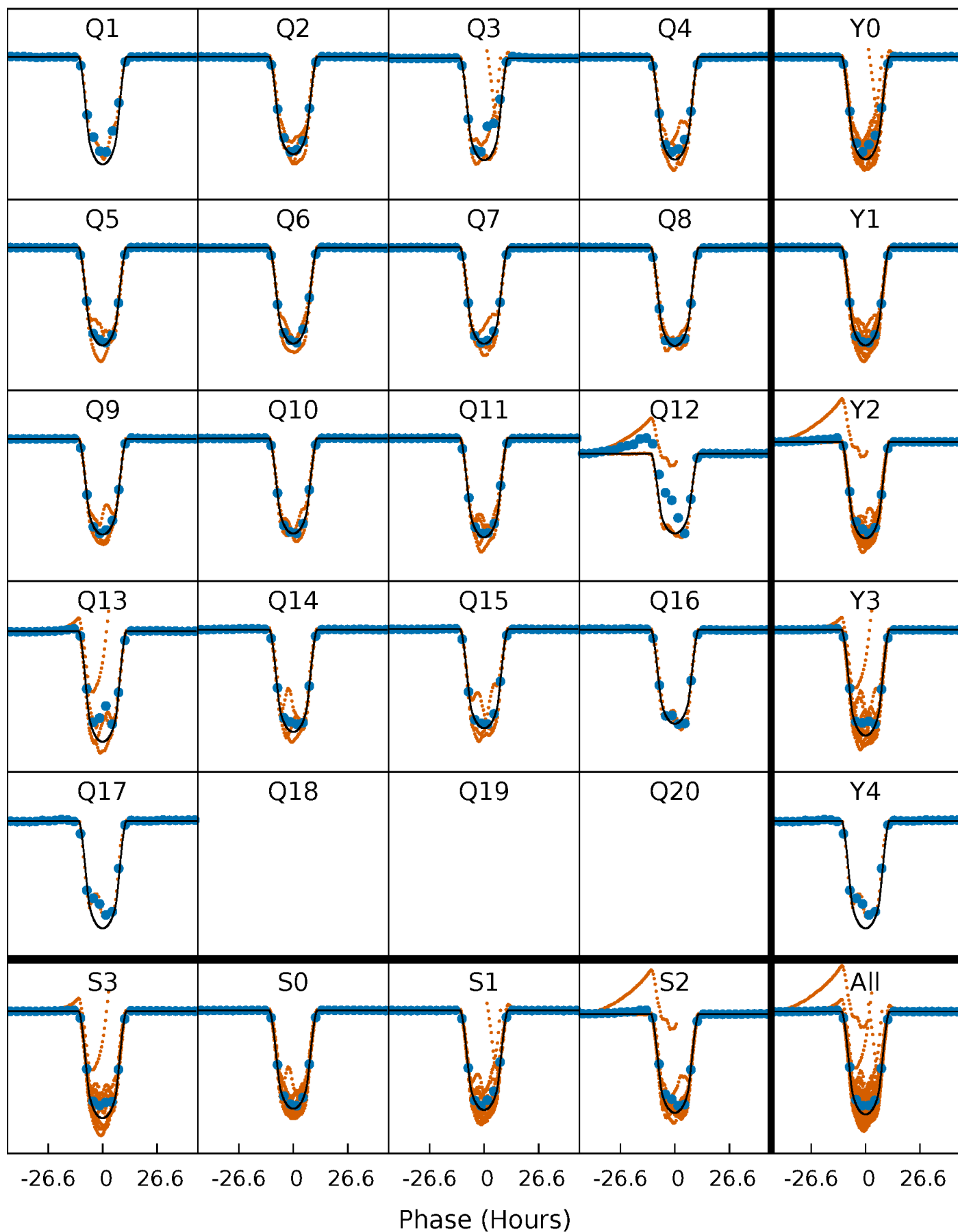
# PDC Quarter-Phased Transit Curves

TCE 006307537-02 P= 29.744594 Days  $T_0=142.640431$  (BKJD)



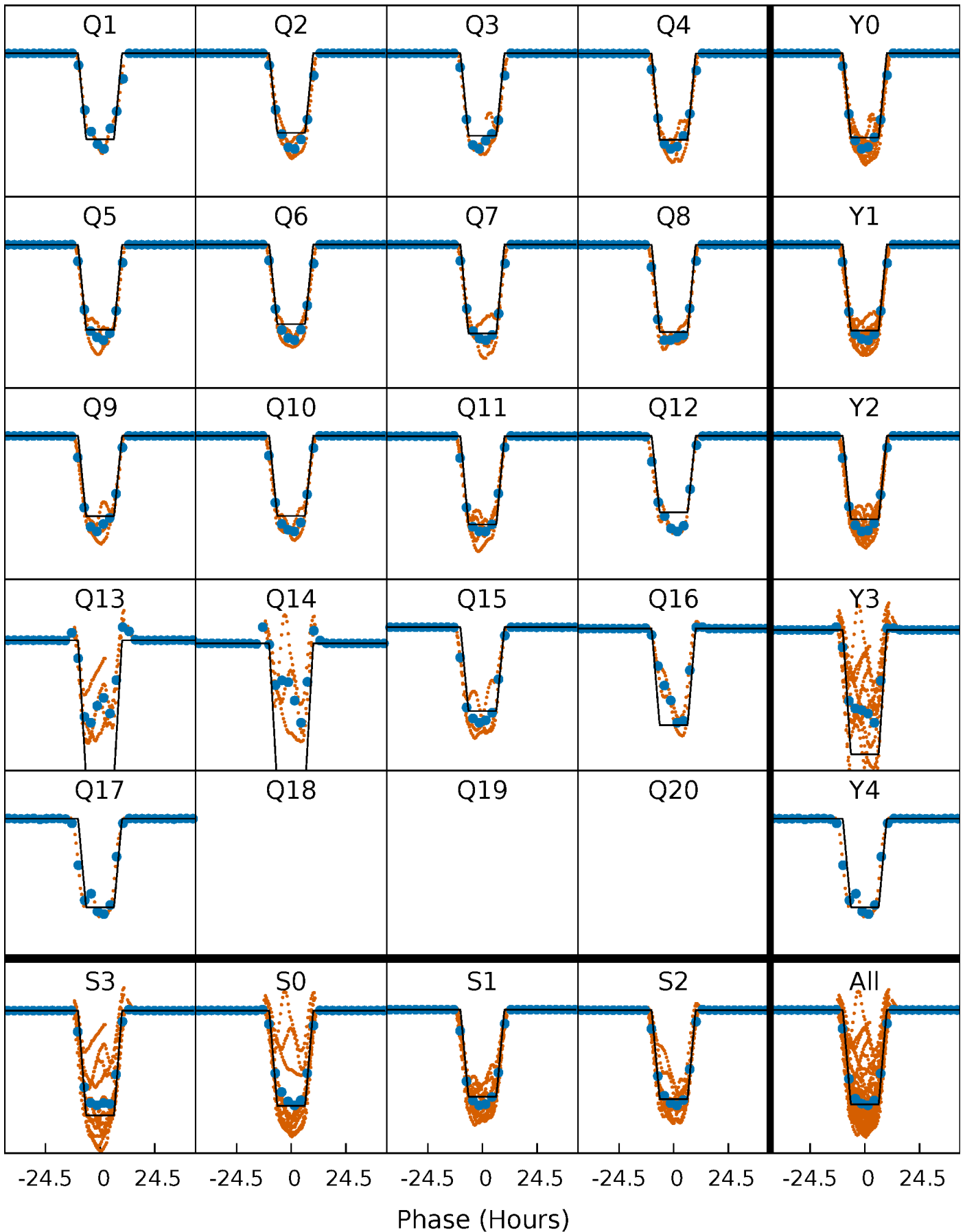
# DV Quarter-Phased Transit Curves

TCE 006307537-02 P= 29.744594 Days  $T_0=142.640431$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

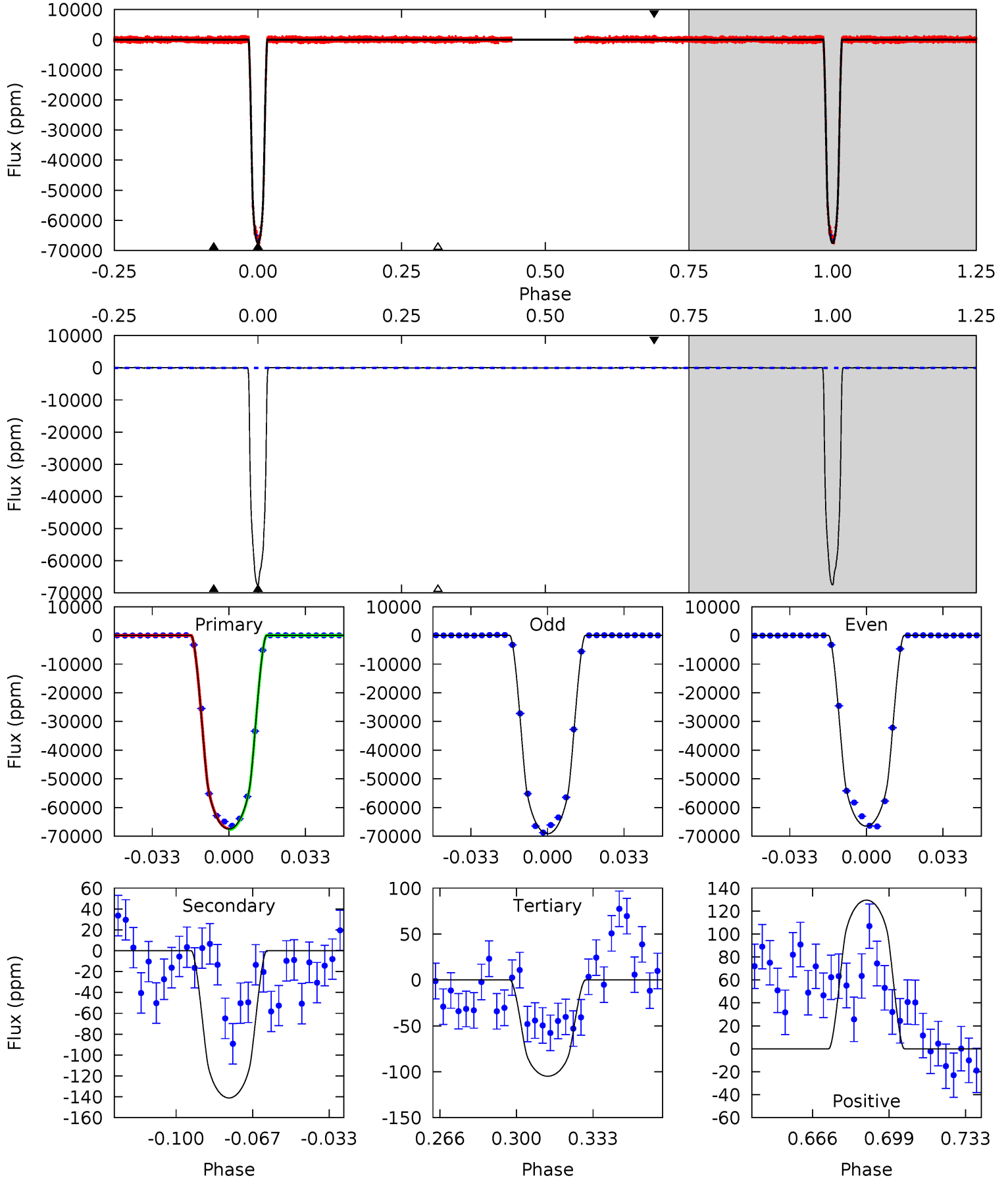
TCE 006307537-02 P= 29.745768 Days  $T_0=142.624052$  (BKJD)



# DV Model-Shift Uniqueness Test

006307537-02, P = 29.744594 Days, E = 112.895837 Days

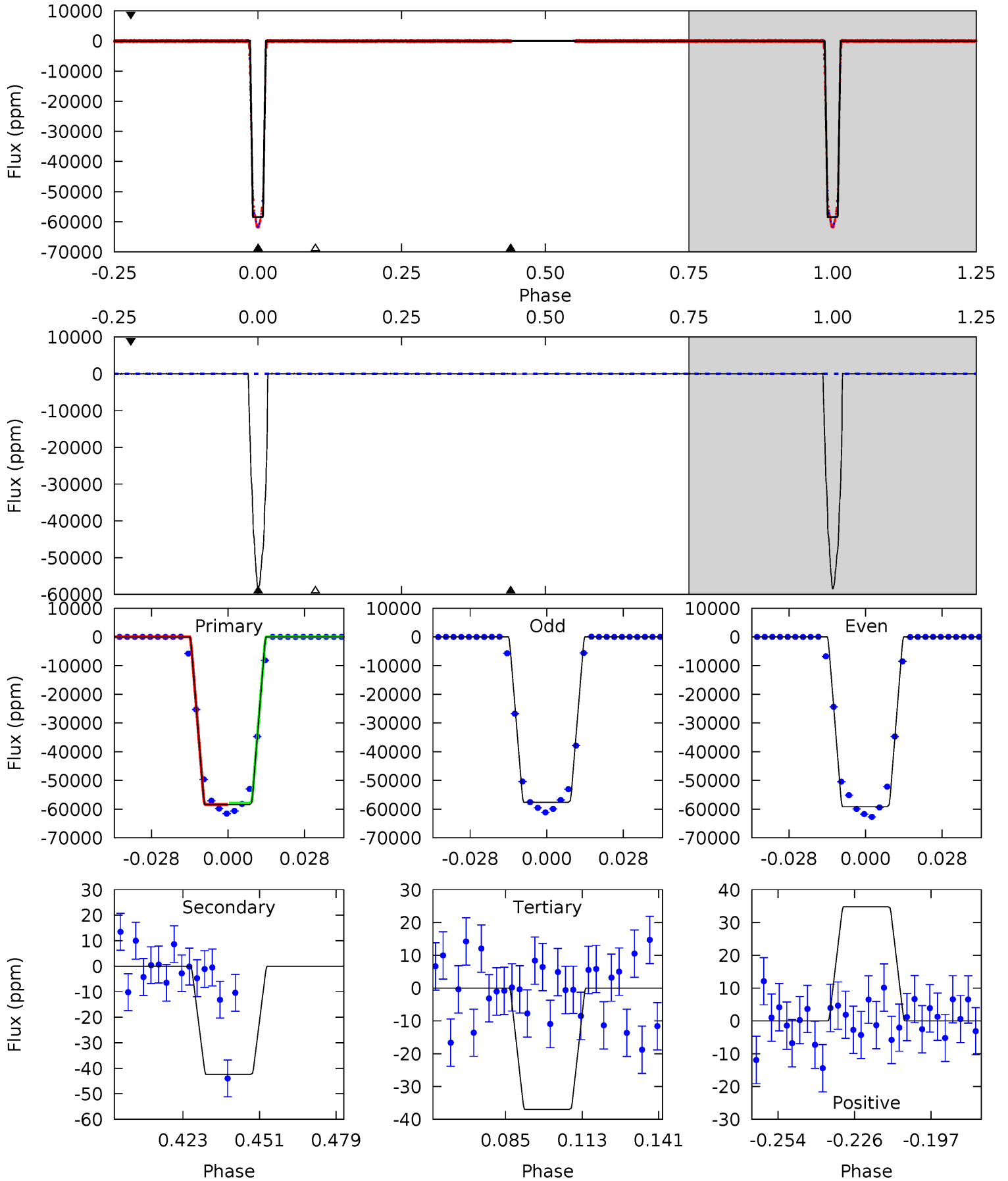
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5493	11.5	8.53	10.5	4.79	2.13	3.84	5484	5482	2.95	0.94	109.0	0.95	0.00	0



# Alt Model-Shift Uniqueness Test

006307537-02, P = 29.745768 Days, E = 112.878284 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
6210	4.50	3.93	3.70	4.82	2.19	1.32	6206	6206	0.58	0.80	88.9	0.92	0.00	0





### Stellar Parameters For KIC 006307537

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$4889^{+186}_{-169}$	$4.569^{+0.036}_{-0.054}$	$0.300^{+0.150}_{-0.300}$	$0.788^{+0.062}_{-0.062}$	$0.839^{+0.047}_{-0.073}$	$2.416^{+0.438}_{-0.446}$
	+4%/-3%	+1%/-1%	+50%/-100%	+8%/-8%	+6%/-9%	+18%/-18%
Source	PHO54	PHO54	PHO54	DSEP		

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

### Secondary Eclipse Parameters for KIC 006307537-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-141 \pm 12$	$20.60^{+0.92}_{-0.90}$	$638^{+26}_{-23}$	$2048^{+42}_{-42}$	$5.736^{+0.680}_{-0.612}$
Alt.	$-42 \pm 9$	$20.44^{+0.86}_{-0.93}$	$637^{+27}_{-23}$	$1798^{+52}_{-63}$	$1.745^{+0.431}_{-0.413}$

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

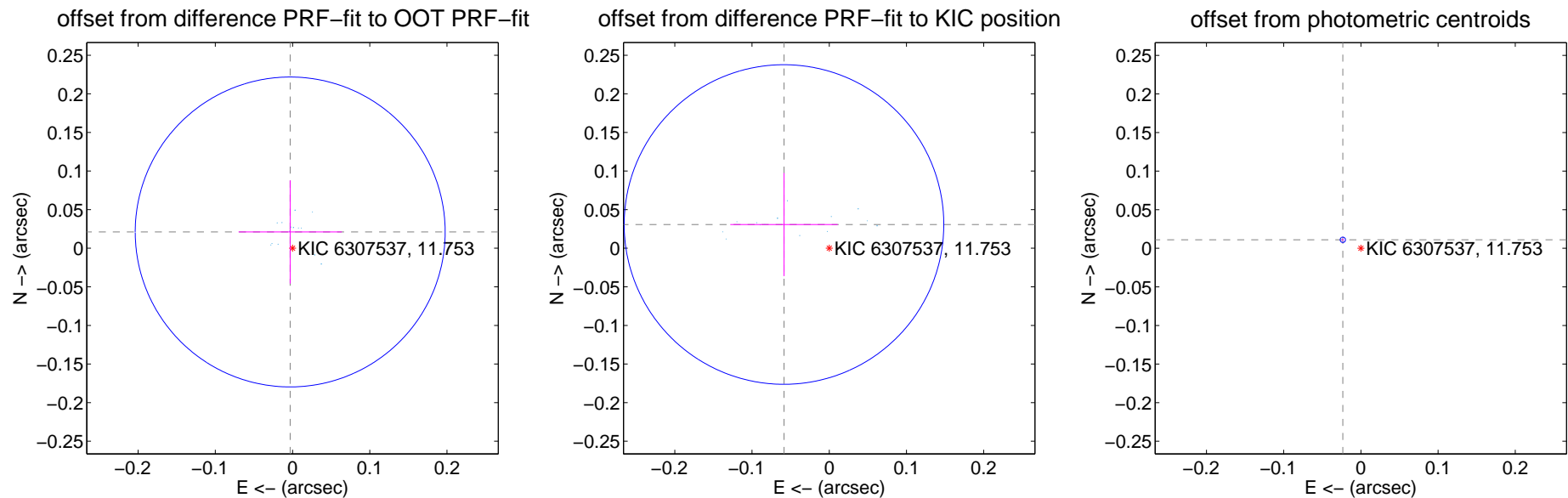
## DV Centroid Data

Supplemental centroid analysis for 006307537-02. **Kepler magnitude: 11.75**. Transit SNR 1576.01

There are 14 quarters with good PRF difference image offsets

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

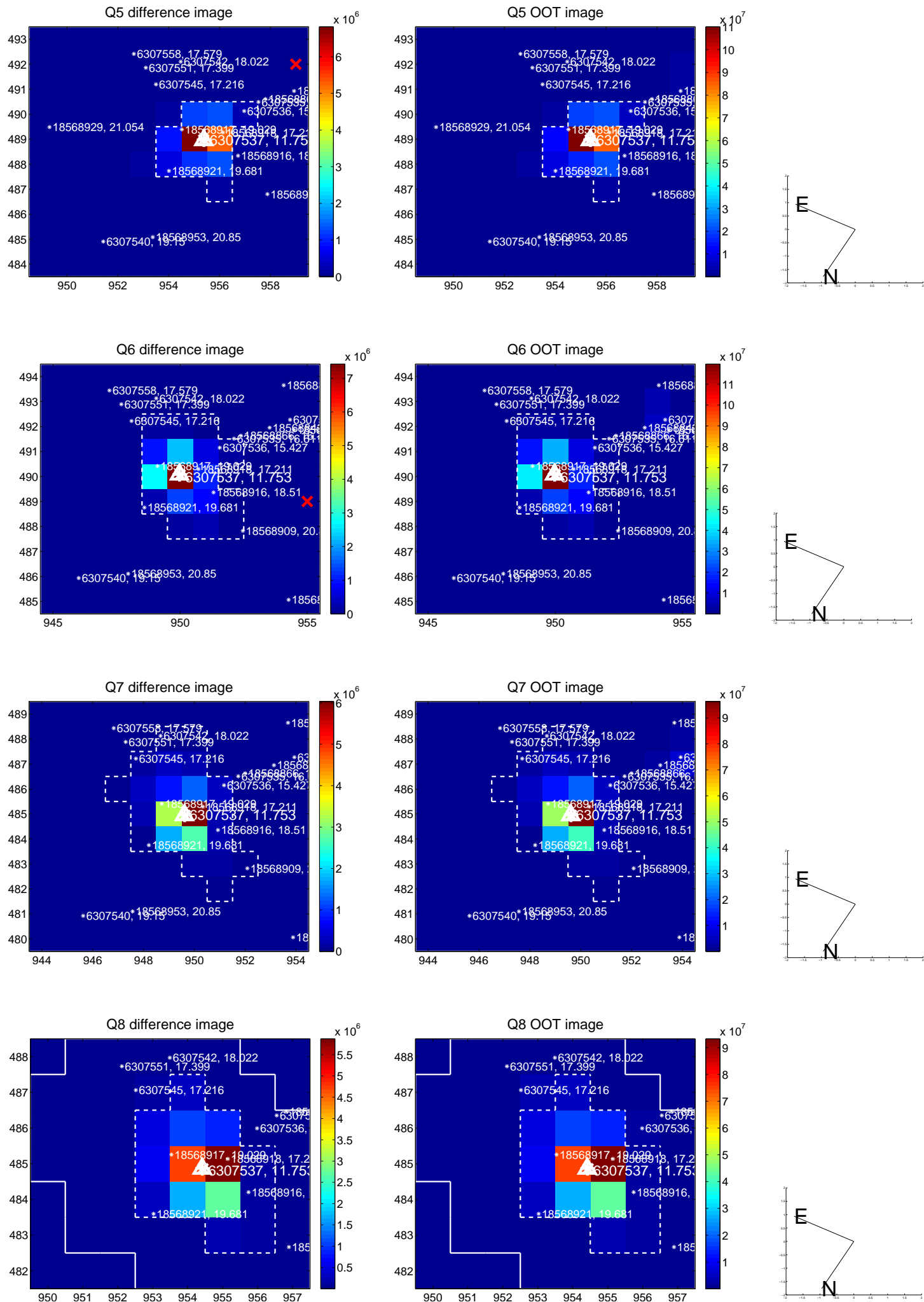
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.021 \pm 0.067$	0.32	$0.003 \pm 0.067$	$0.021 \pm 0.067$
PRF-fit source offset from KIC position	$0.066 \pm 0.069$	0.96	$0.059 \pm 0.070$	$0.031 \pm 0.067$
photometric centroid source offset	<b><math>0.03 \pm 0.00</math></b>	<b>22.61</b>	$0.02 \pm 0.00$	$0.01 \pm 0.00$



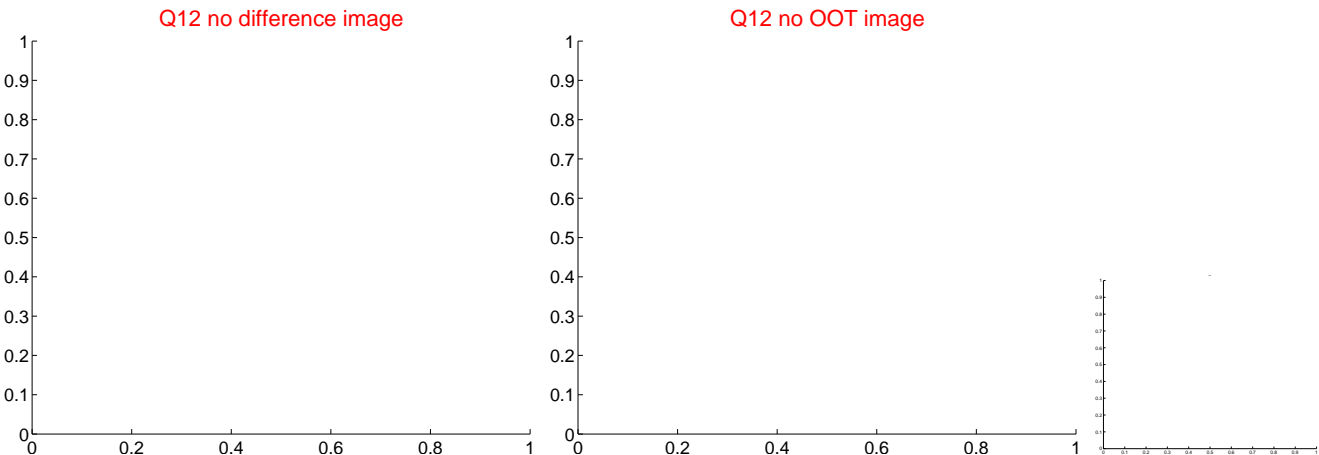
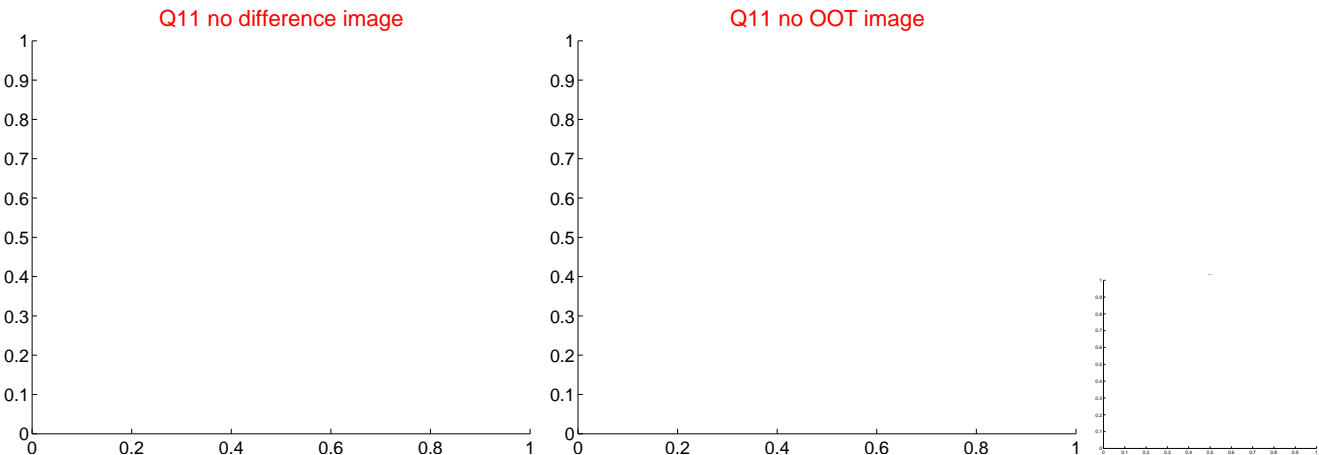
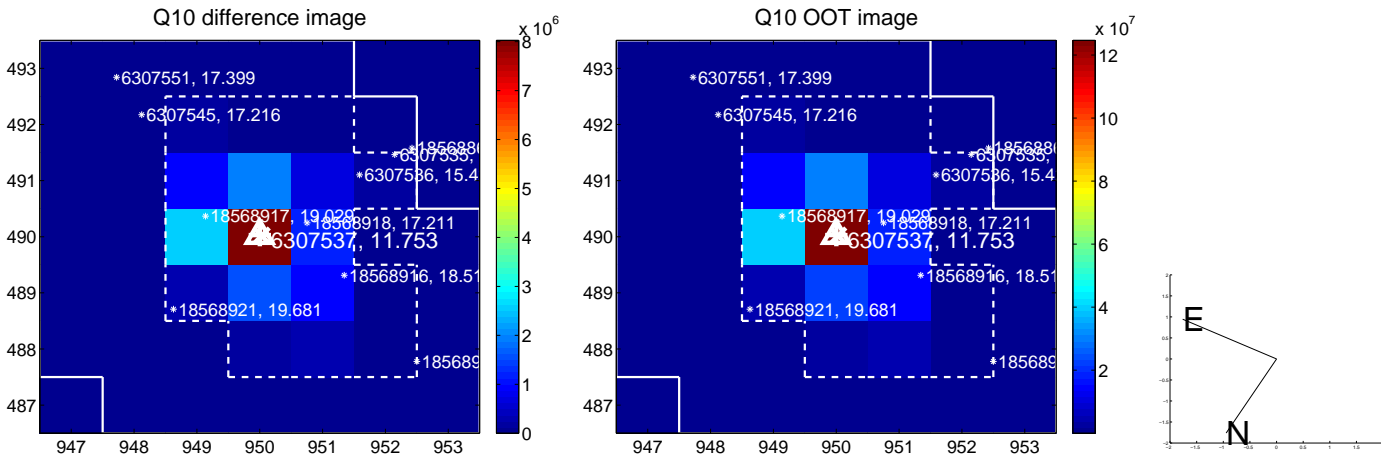
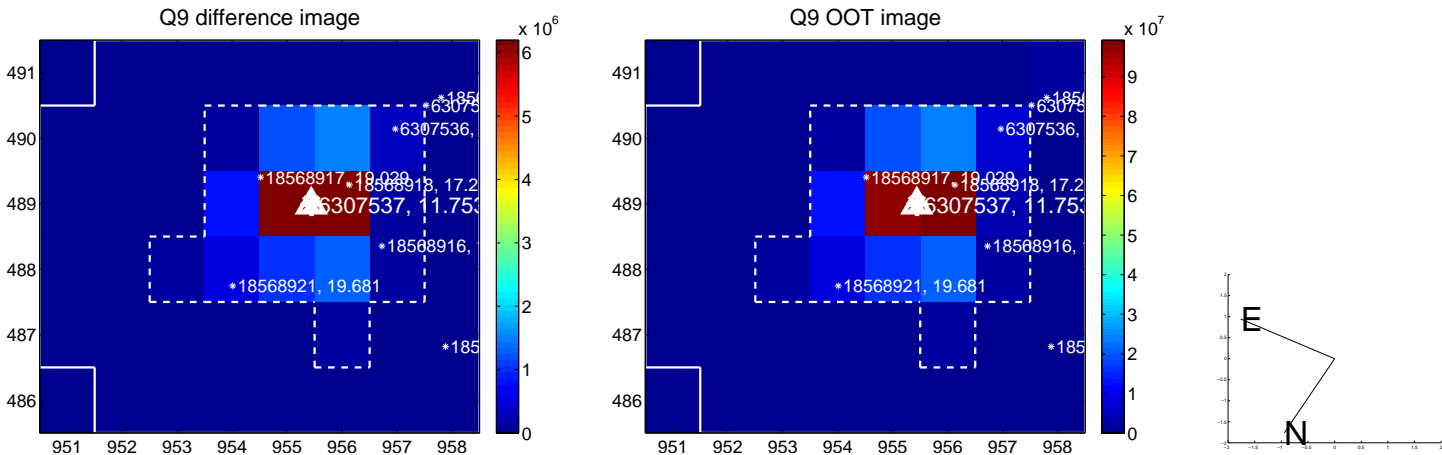
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



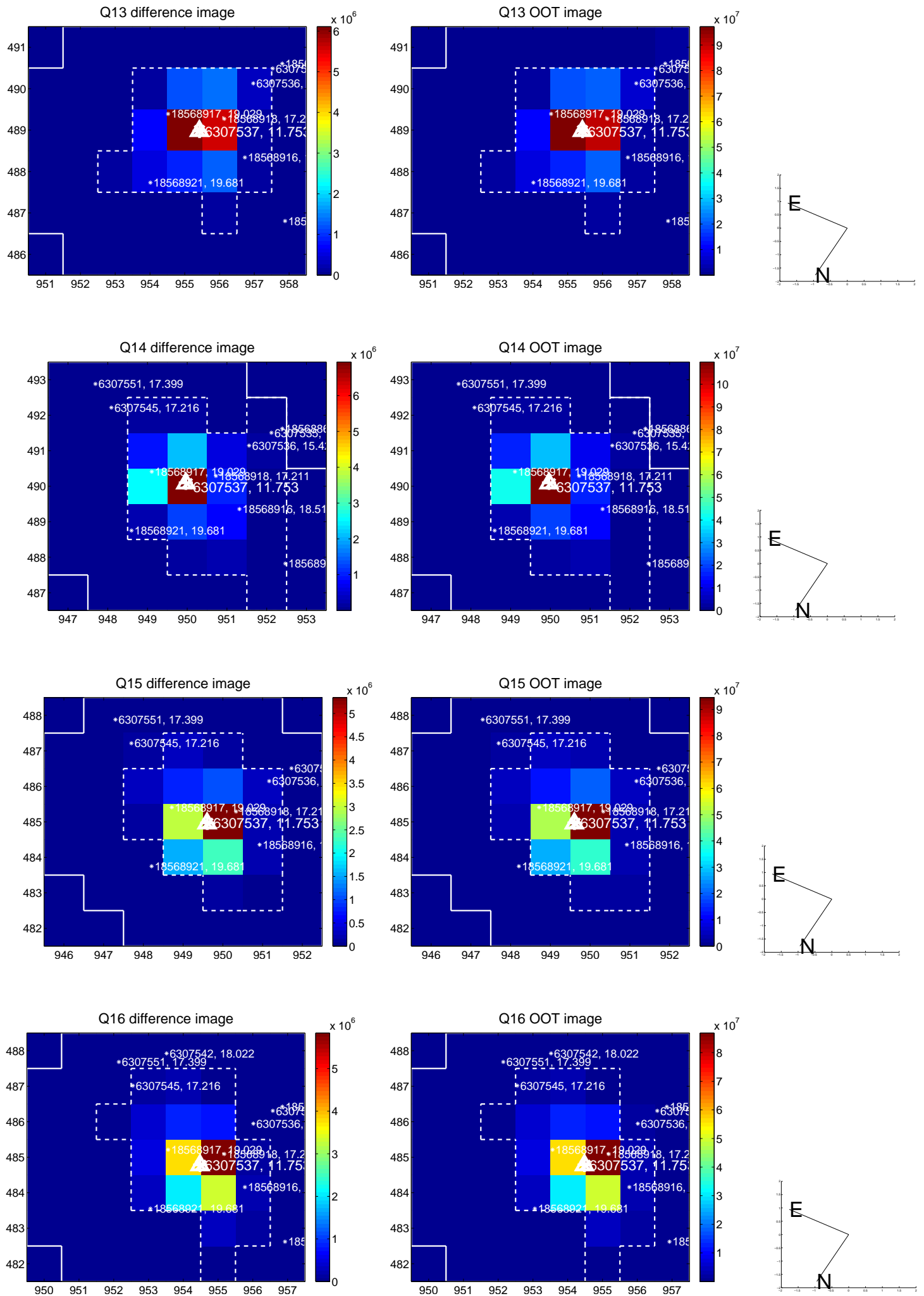
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



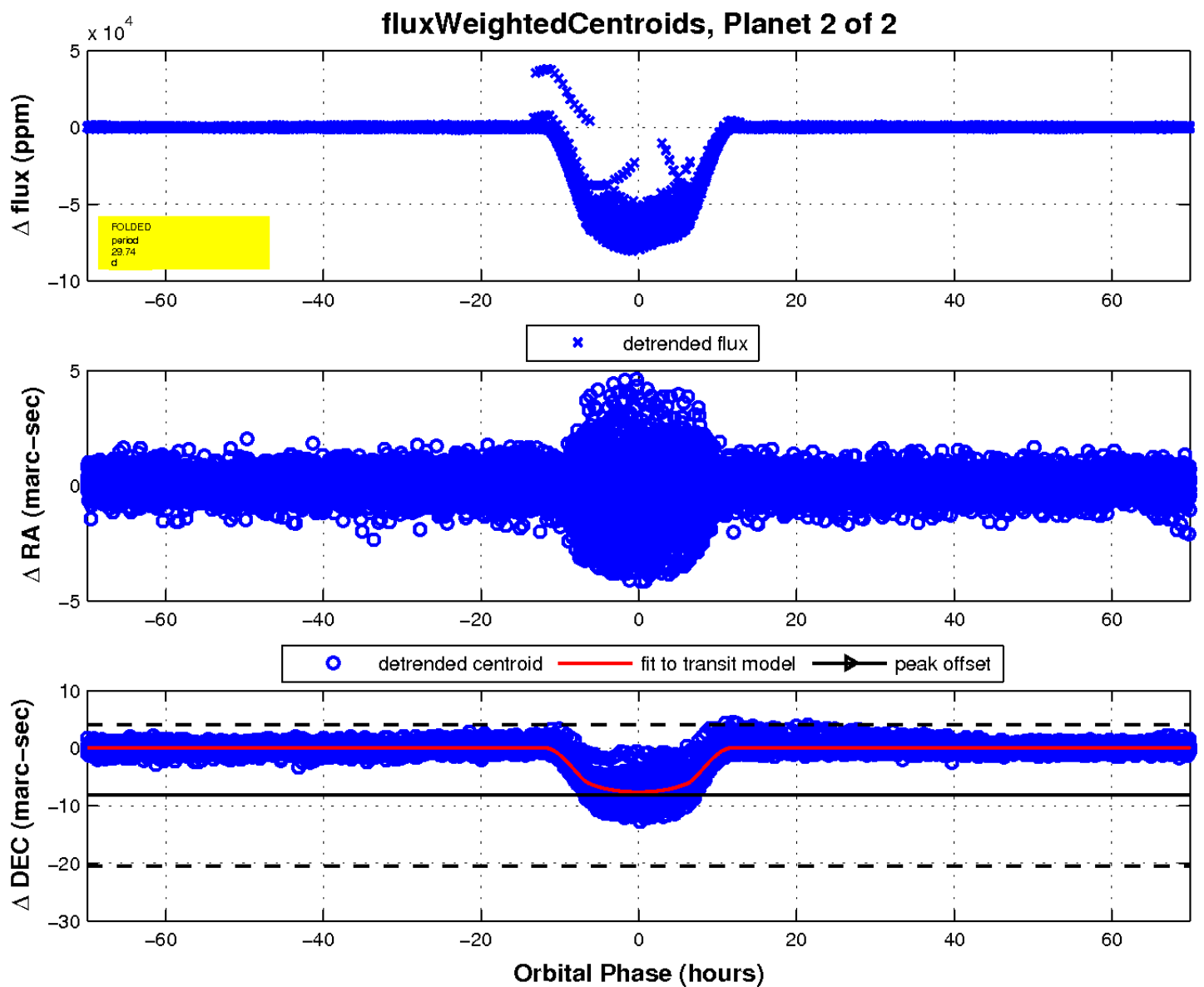
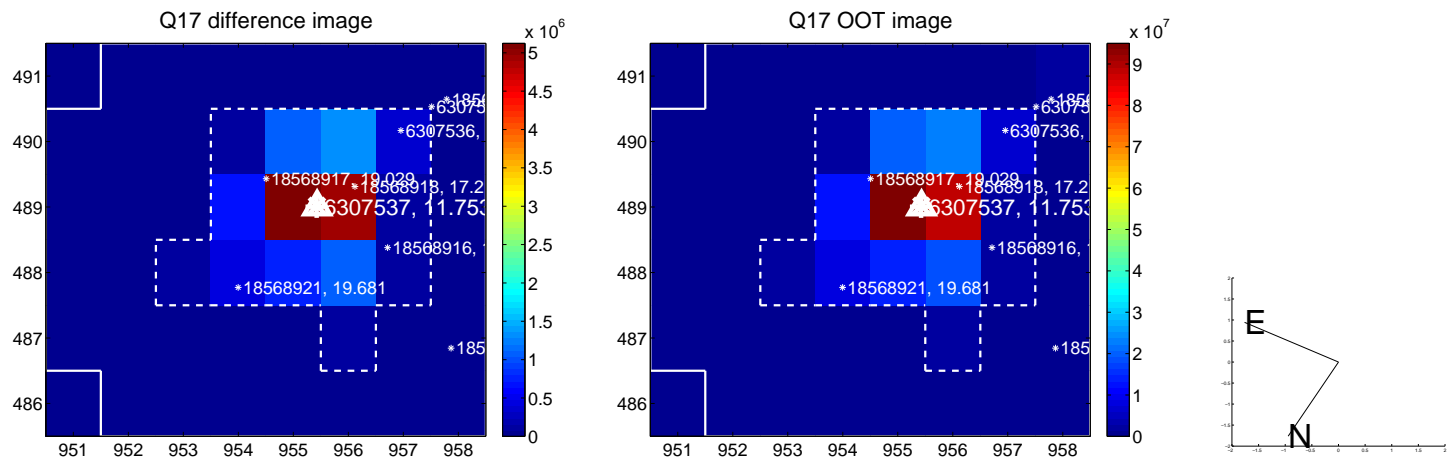
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



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



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



UKIRT Image

