

# KIC 006302589

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006302589-01	OBS	No	0.704086	132.195363	190.1	1.744	9.9	11.0	2.85	7691	4.53	67735.27
006302589-02	OBS	No	1.314399	132.417247	384.8	8.957	9.7	12.7	2.85	7691	5.67	29467.69
006302589-03	OBS	No	1.443305	131.558672	203.3	4.500	13.4	-1.0	2.85	7691	4.11	26011.85
006302589-04	OBS	No	7.216522	136.645572	1480.9	13.866	9.4	11.5	2.85	7691	14.00	3042.37

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006302589-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006302589-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT
006302589-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_NOFITS
006302589-04	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

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

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

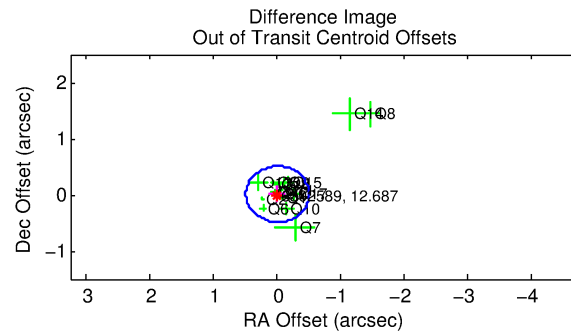
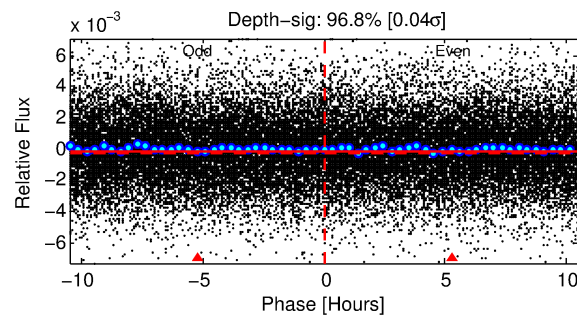
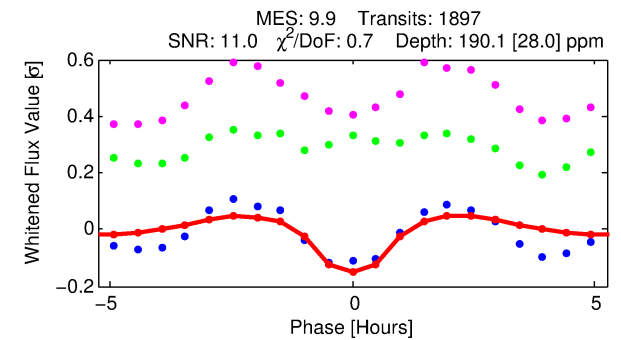
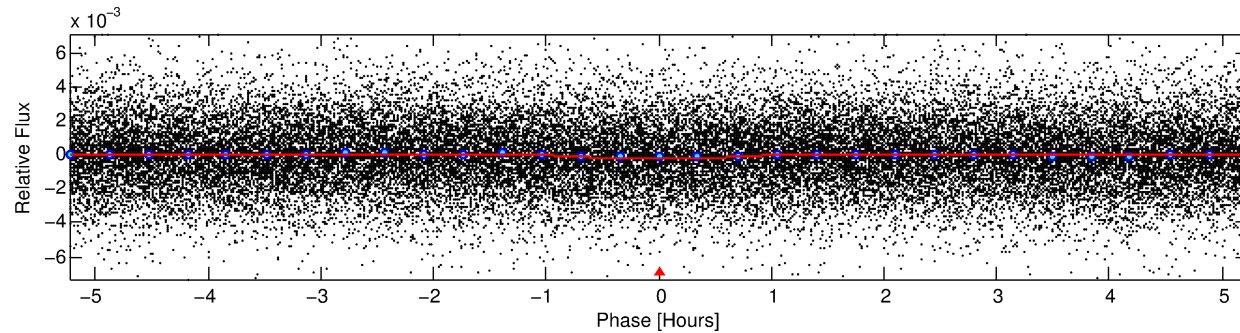
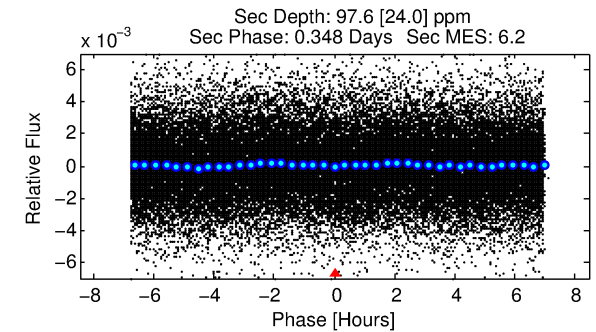
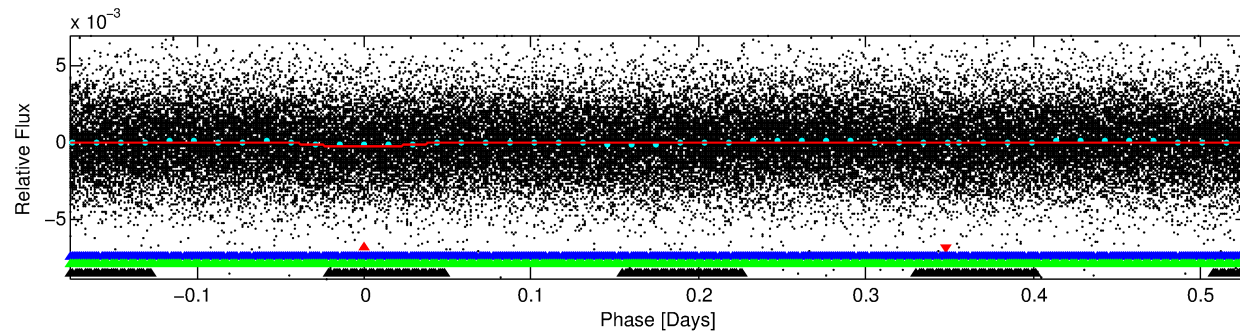
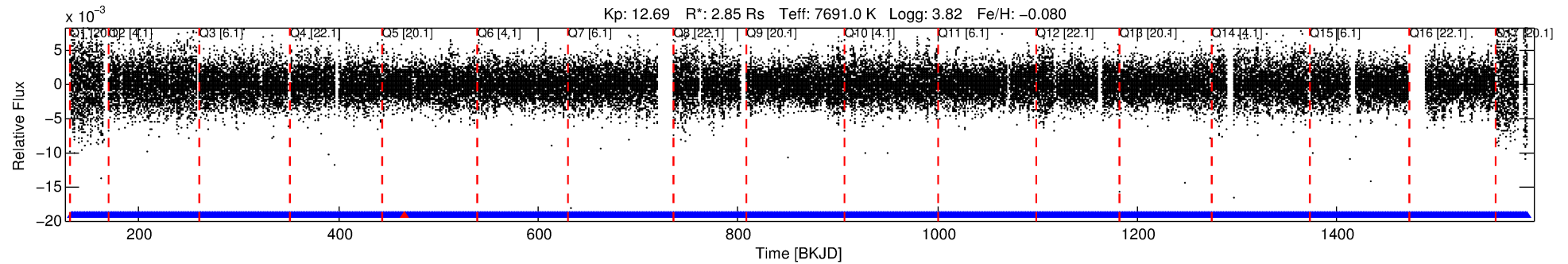
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006302589-01

No Significant Match Found

# DV One-Page Summary

KIC: 6302589 Candidate: 1 of 4 Period: 0.704 d



## DV Fit Results:

Period = 0.70409 [0.00001] d  
Epoch = 132.1954 [0.0023] BKJD  
Rp/R\* = 0.0146 [0.0120]  
a/R\* = 1.77 [6.23]  
b = 0.89 [1.22]  
Seff = 67735.27 [42598.45]  
Teq = 4114 [647] K  
Rp = 4.53 [4.17] Re  
a = 0.0194 [0.0075] AU  
Ag = 0.98 [1.74] [-0.01 $\sigma$ ]  
Teffp = 6329 [2643] K [0.81 $\sigma$ ]

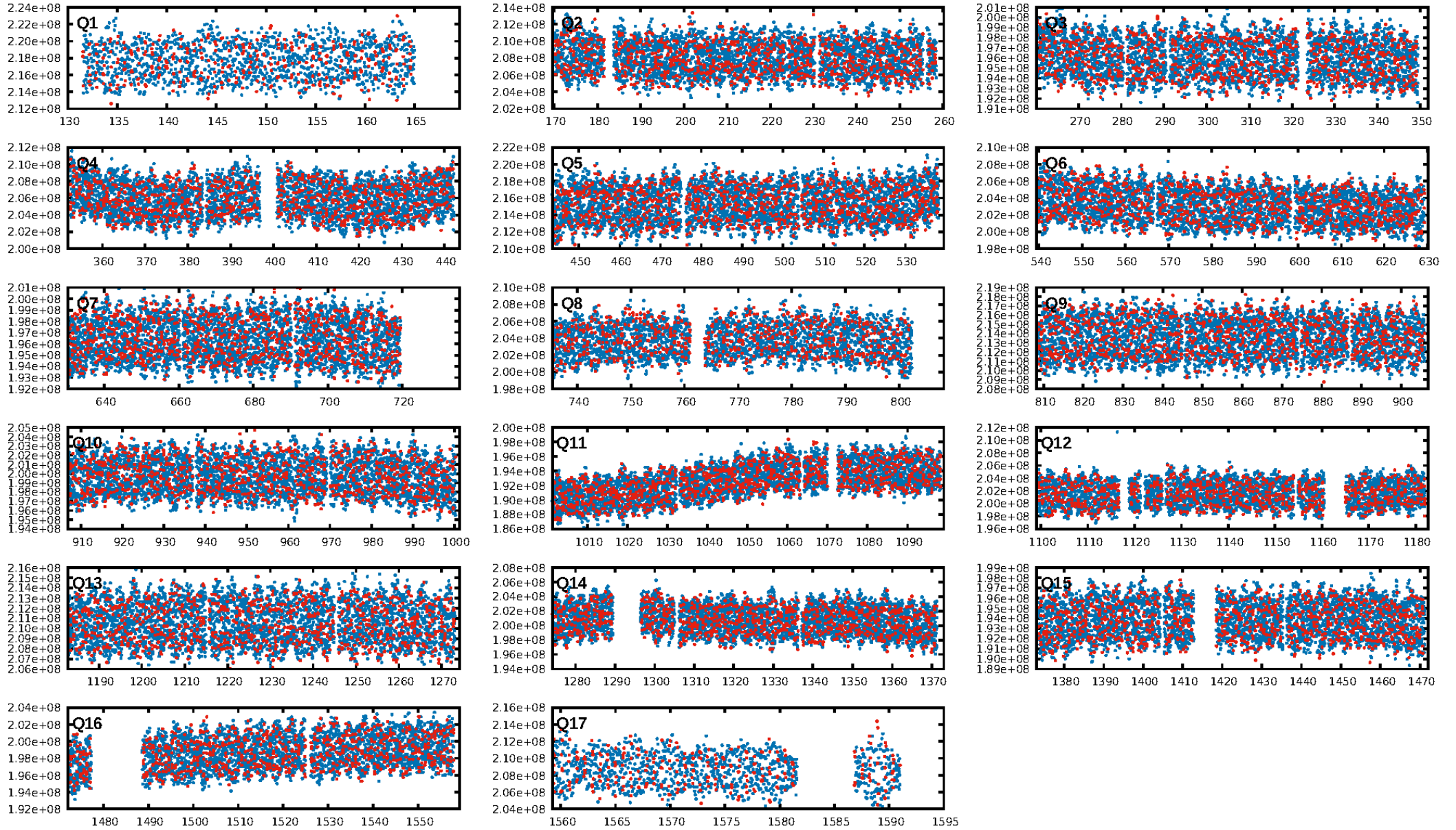
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 89.2% [1.61 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [1810/1811]  
GhostDiagnostic-chr: 1.115  
Centroid-sig: 46.1%  
Centroid-so: 0.089 arcsec [0.96 $\sigma$ ]  
OotOffset-rm: 0.013 arcsec [0.08 $\sigma$ ]  
KicOffset-rm: 0.088 arcsec [0.73 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.88 [15/17]  
DiffImageOverlap-fno: 1.00 [17/17]

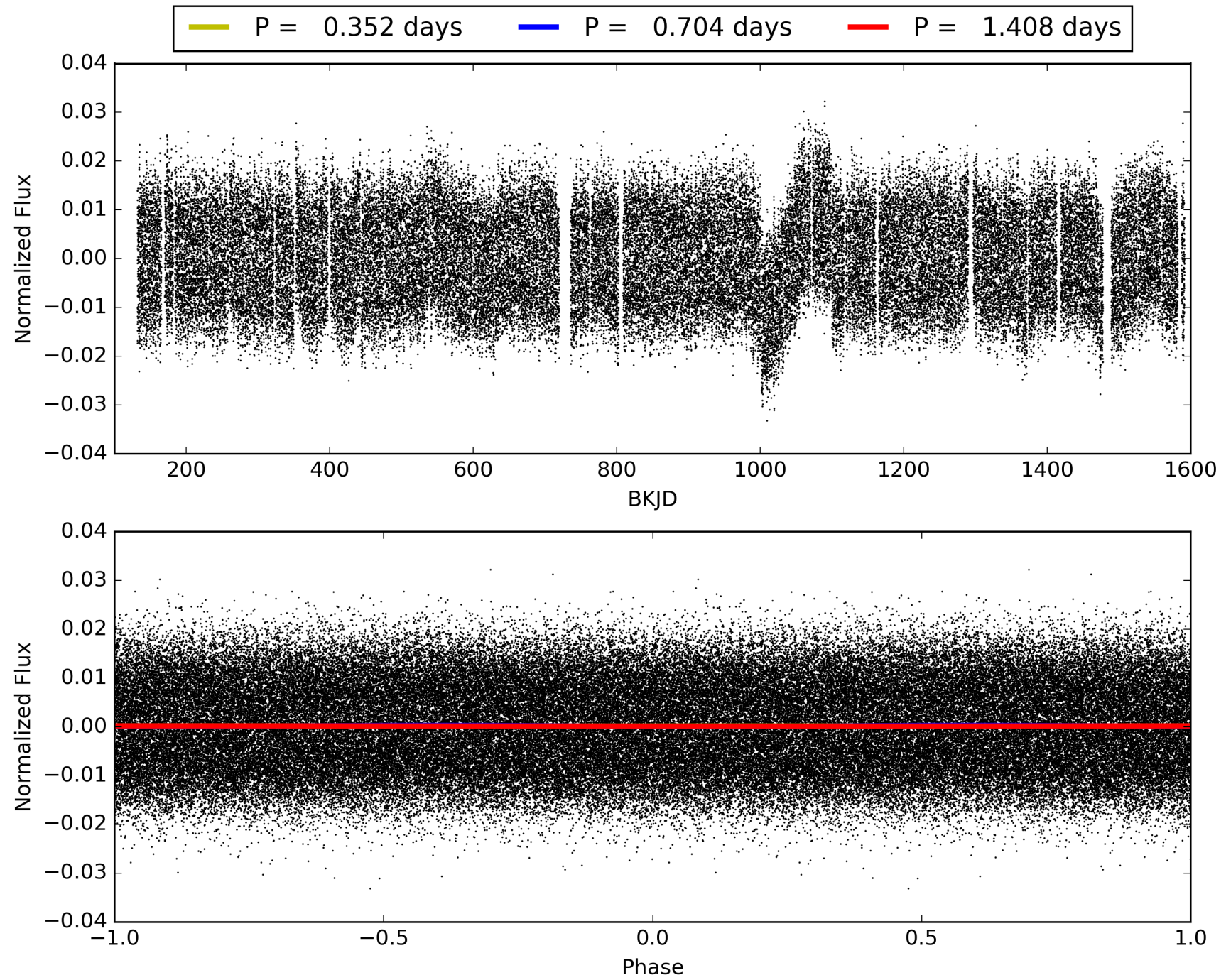
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:23:30 Z

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

# TCE 006302589-01, PDC Light Curves

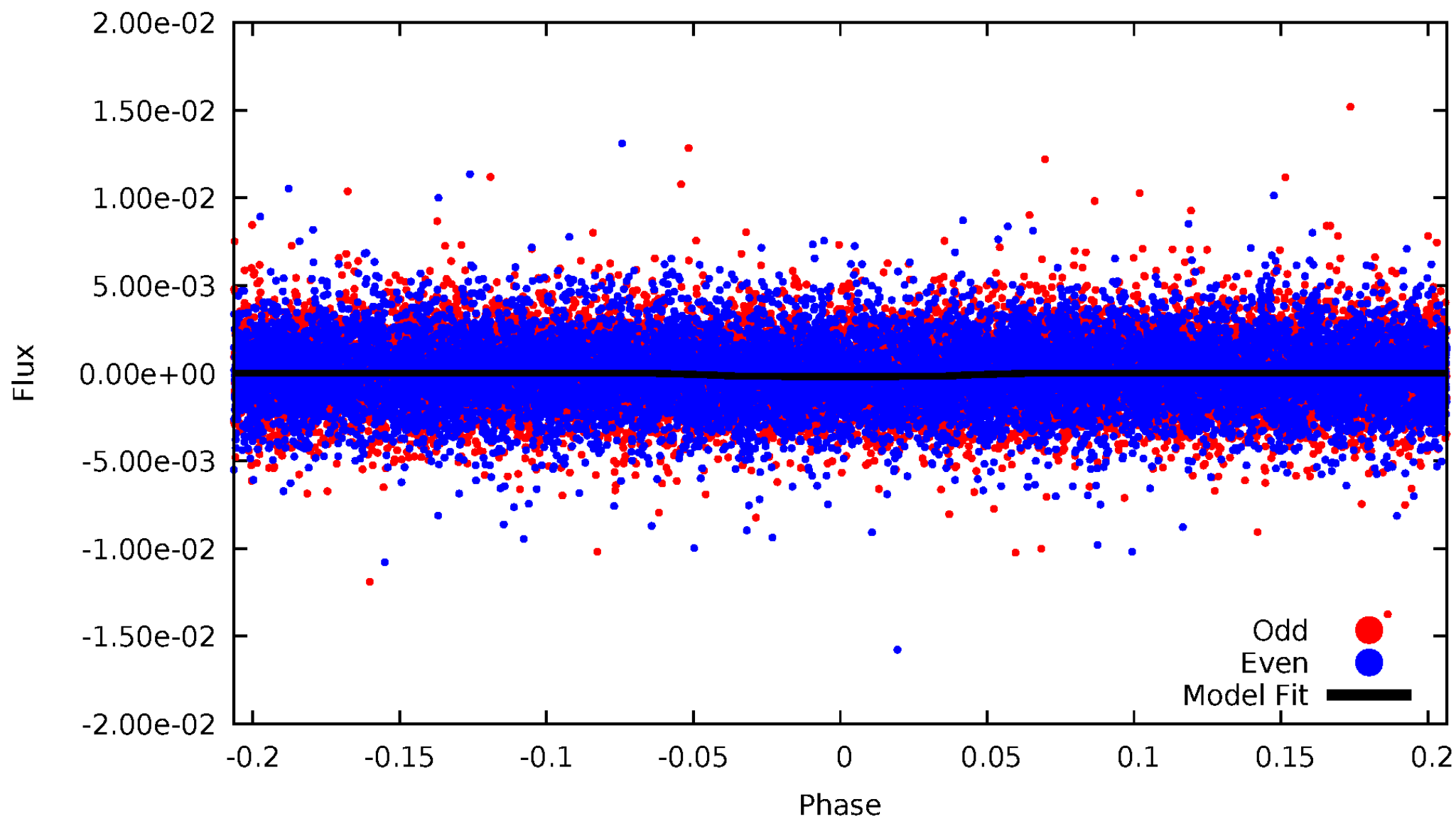


TCE 006302589-01



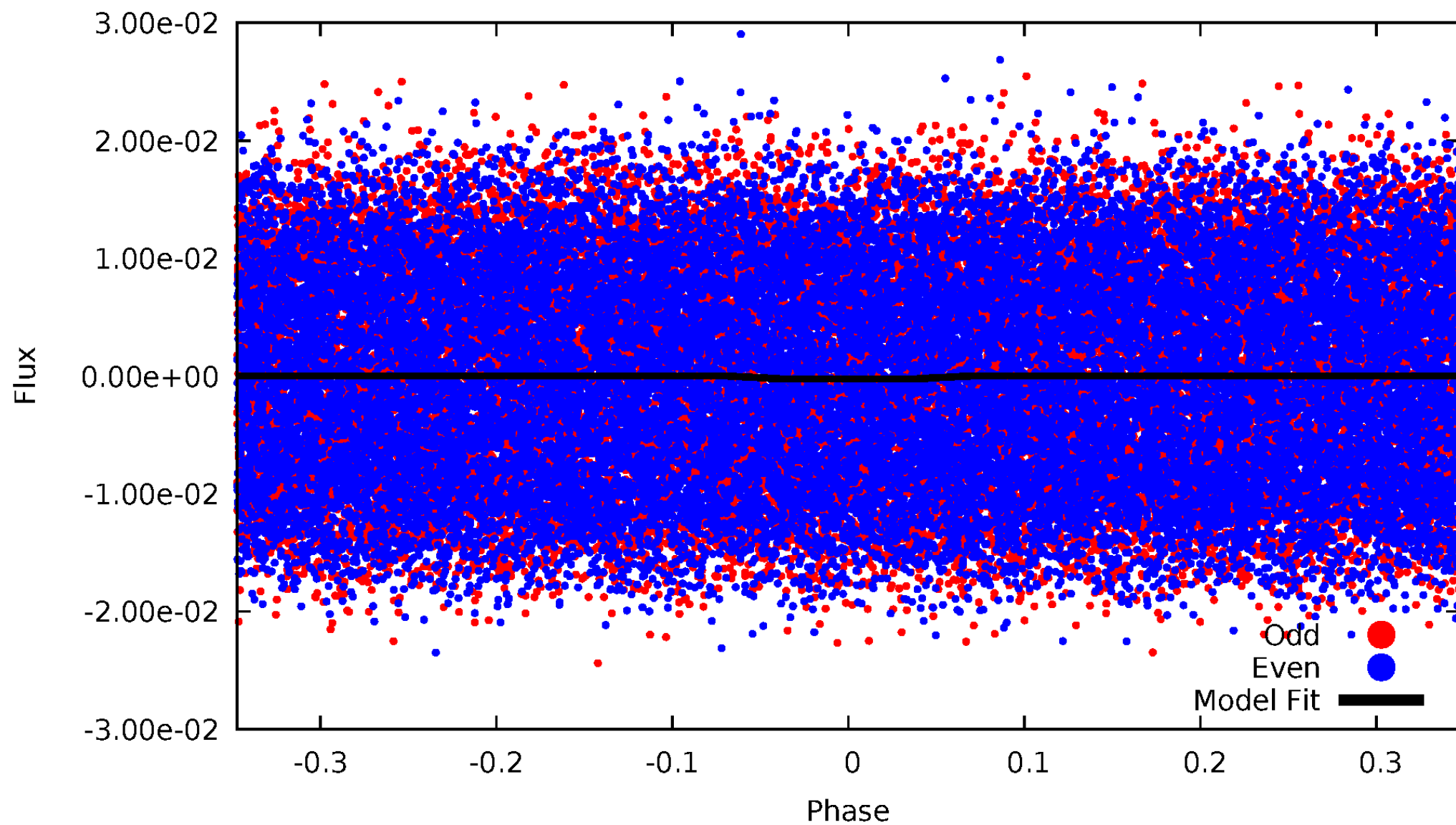
# DV Odd/Even

TCE 006302589-01



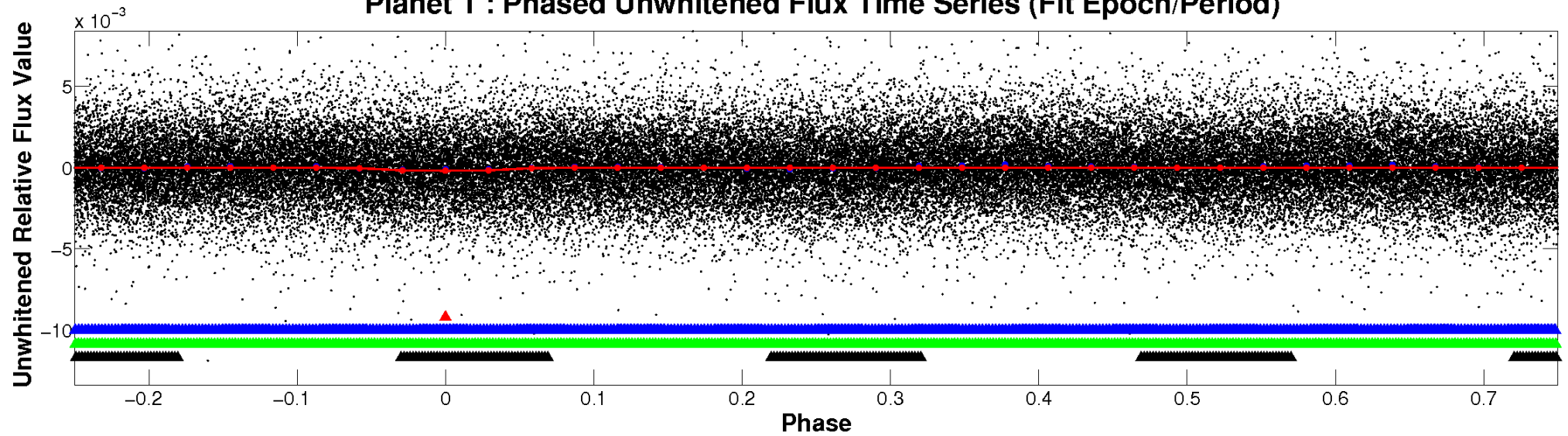
# ALT Odd/Even

TCE 006302589-01

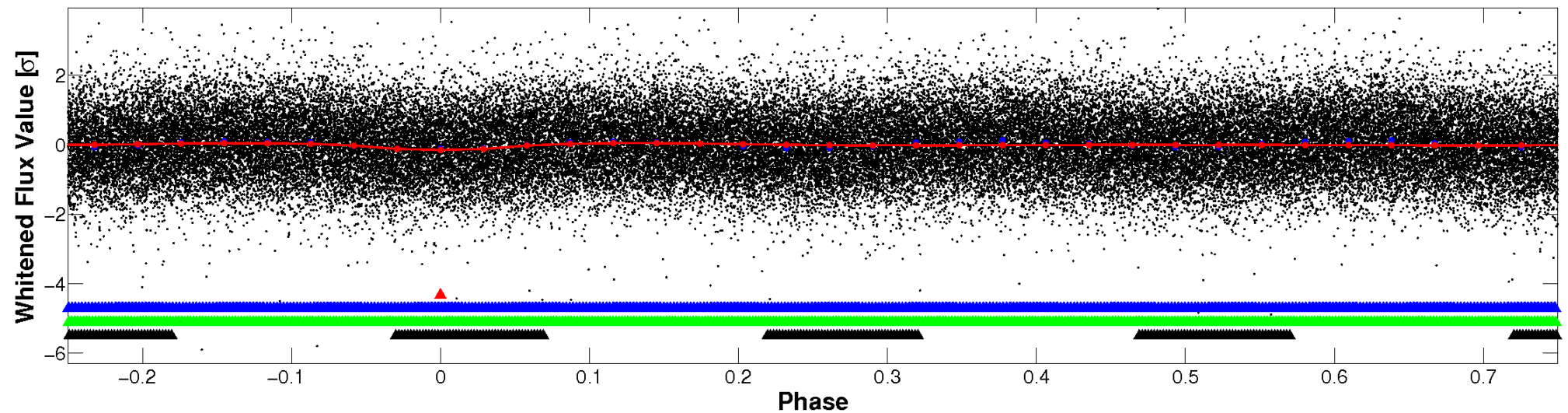


# Non-Whitened Vs. Whitened Light Curve

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

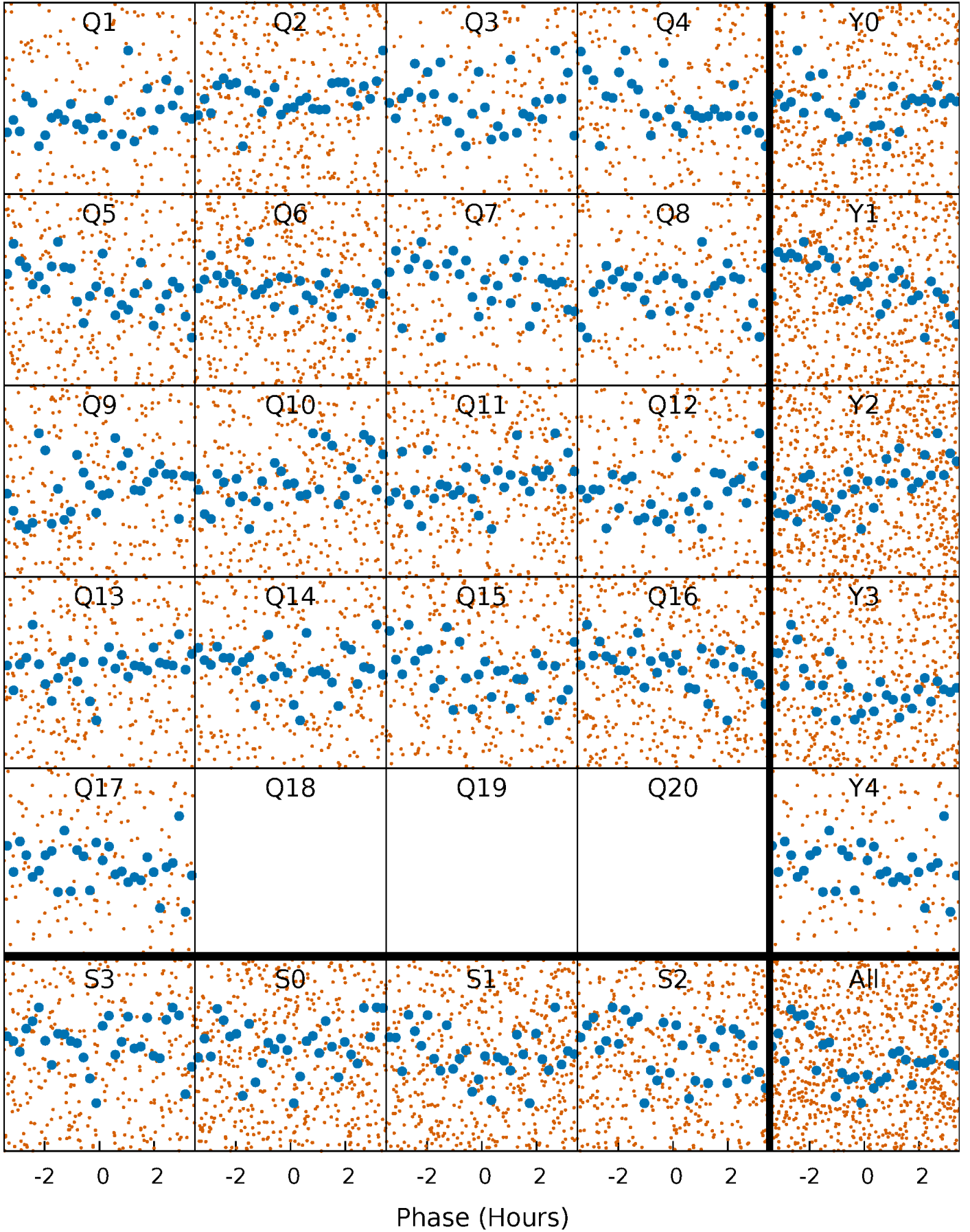


## Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



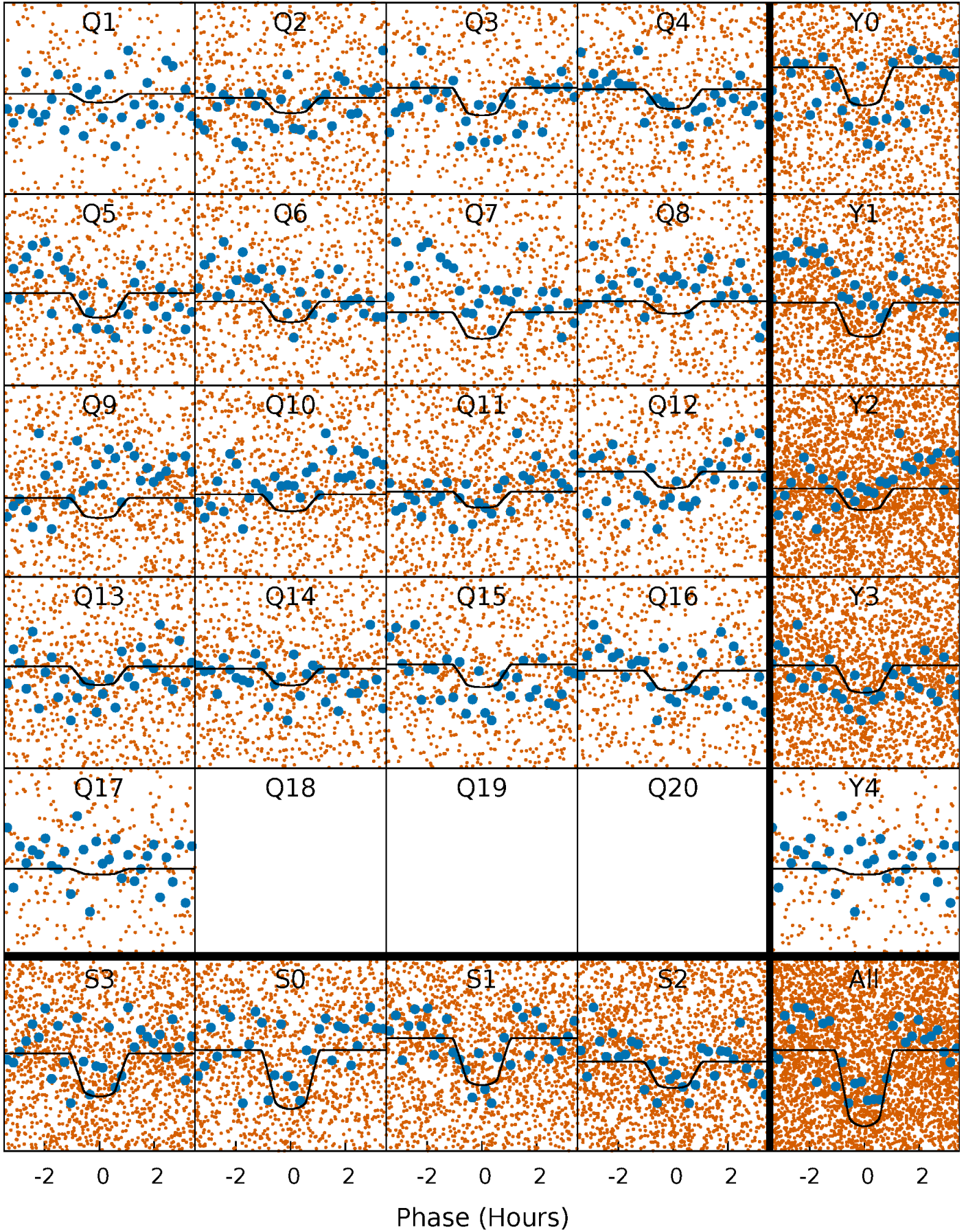
# PDC Quarter-Phased Transit Curves

TCE 006302589-01   P= 0.704086 Days    $T_0=132.195363$  (BKJD)



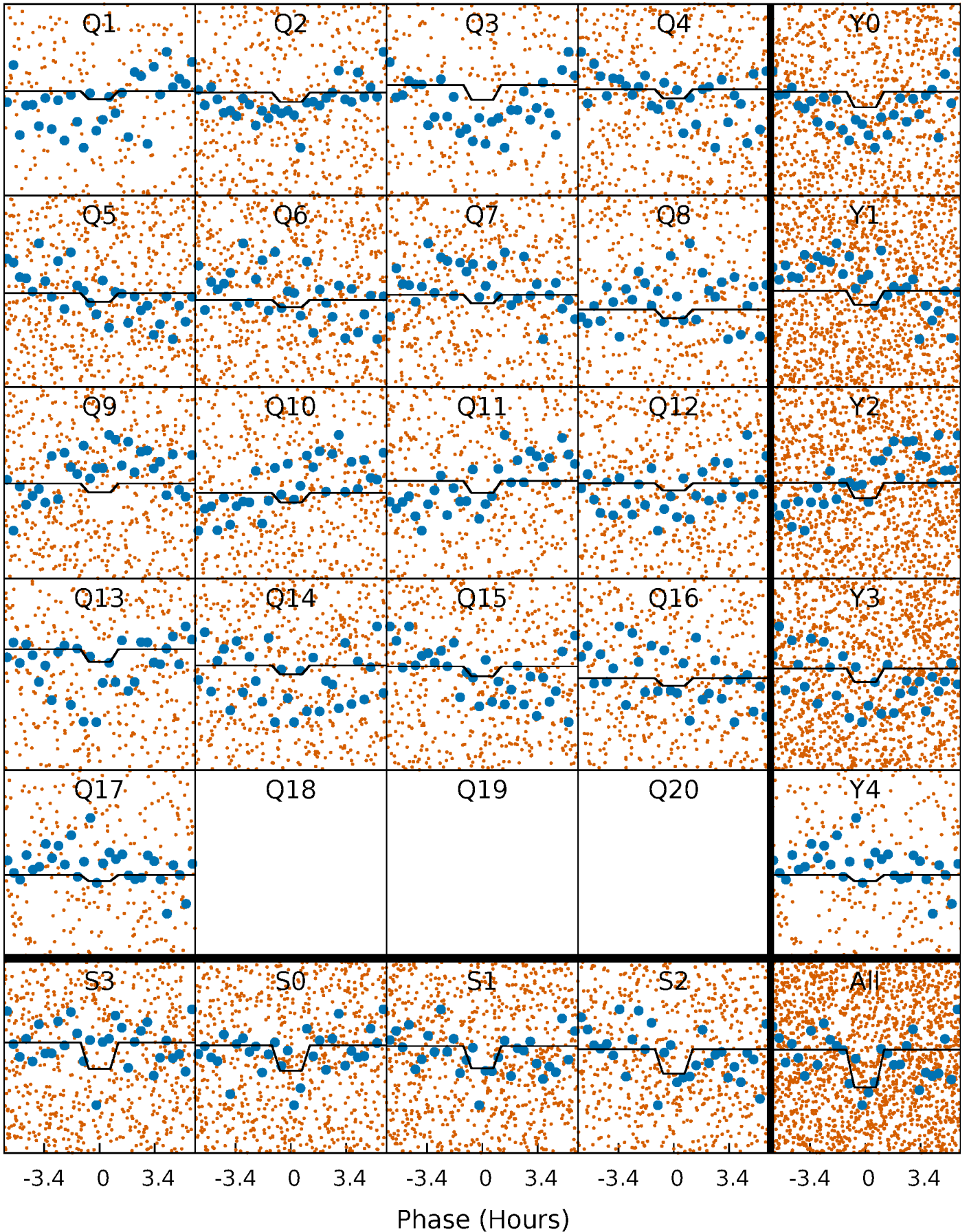
# DV Quarter-Phased Transit Curves

TCE 006302589-01     $P = 0.704086$  Days     $T_0 = 132.195363$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

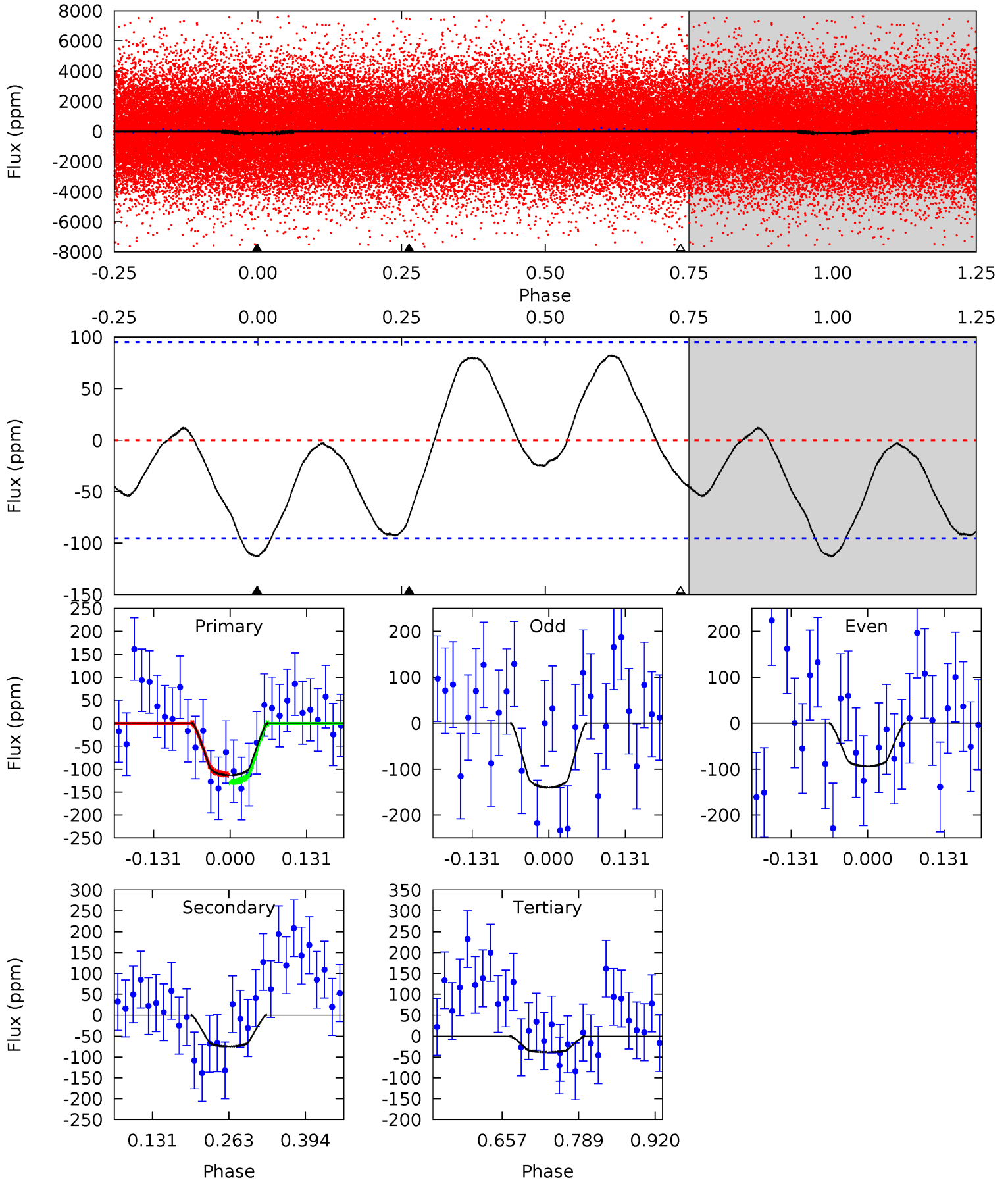
TCE 006302589-01 P= 0.704076 Days  $T_0=132.205278$  (BKJD)



# DV Model-Shift Uniqueness Test

006302589-01, P = 0.704086 Days, E = 131.491277 Days

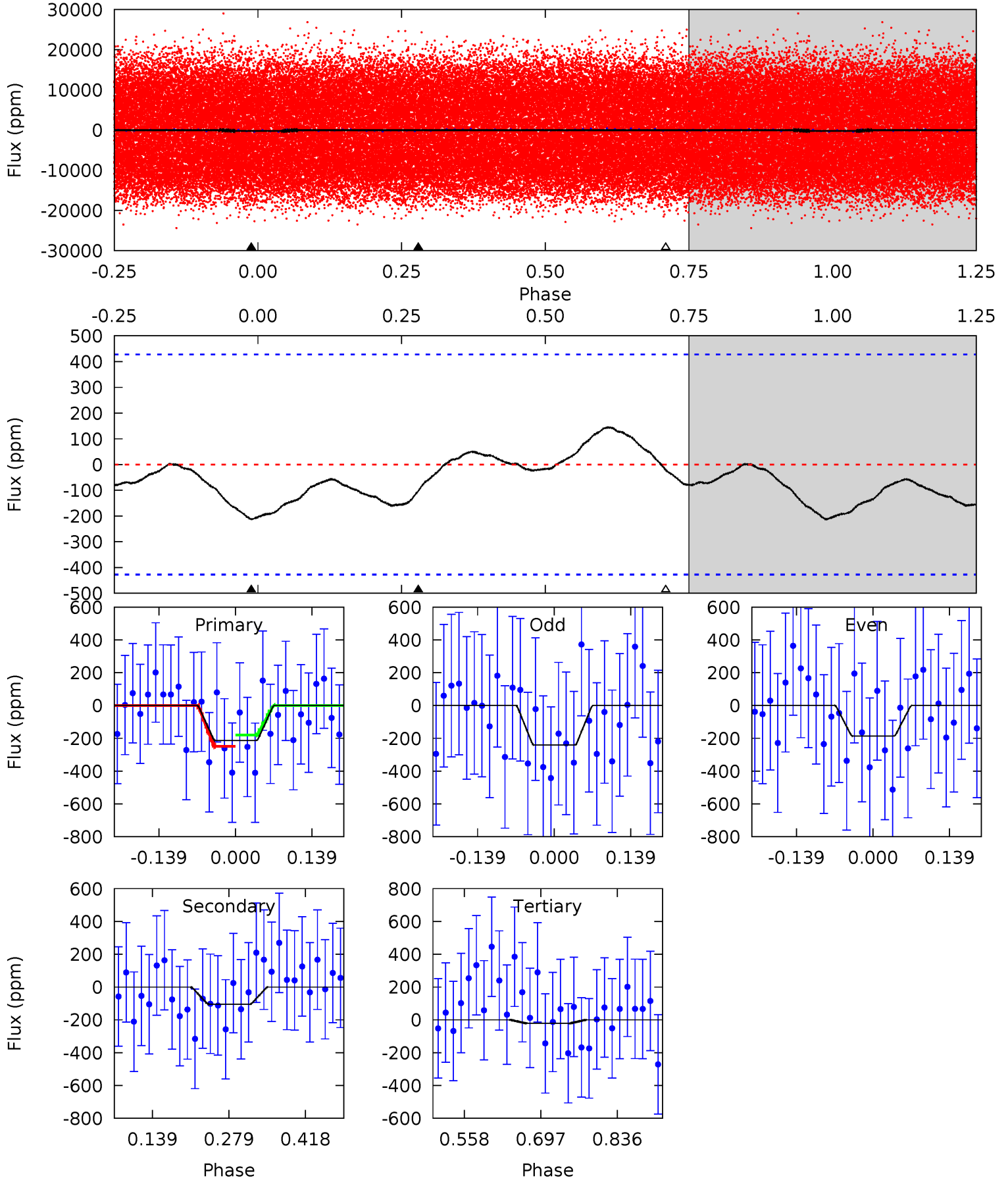
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.35	3.54	1.81	0	4.51	1.51	1.90	3.53	5.35	1.73	3.54	1.10	1.42	0.42	0.39



# Alt Model-Shift Uniqueness Test

006302589-01, P = 0.704076 Days, E = 131.501202 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
2.25	1.10	0.23	0	4.49	1.48	0.70	2.02	2.25	0.87	1.10	0.28	1.13	0.41	0.36



### Stellar Parameters For KIC 006302589

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7691^{+211}_{-316}$	$3.820^{+0.352}_{-0.088}$	$-0.080^{+0.200}_{-0.350}$	$2.846^{+0.394}_{-1.181}$	$1.953^{+0.083}_{-0.471}$	$0.119^{+0.340}_{-0.035}$
	+3%/-4%	+9%/-2%	+250%/-438%	+14%/-41%	+4%/-24%	+285%/-29%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006302589-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	$A_{obs}$
DV	$-75 \pm 21$	$4.60^{+3.25}_{-2.79}$	$5573^{+378}_{-598}$	$4836^{+4060}_{-8477}$	$0.698^{+3.813}_{-0.480}$
Alt.	$-104 \pm 95$	$4.74^{+3.59}_{-2.79}$	$5588^{+366}_{-552}$	$4959^{+4412}_{-9434}$	$0.775^{+4.204}_{-0.737}$

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

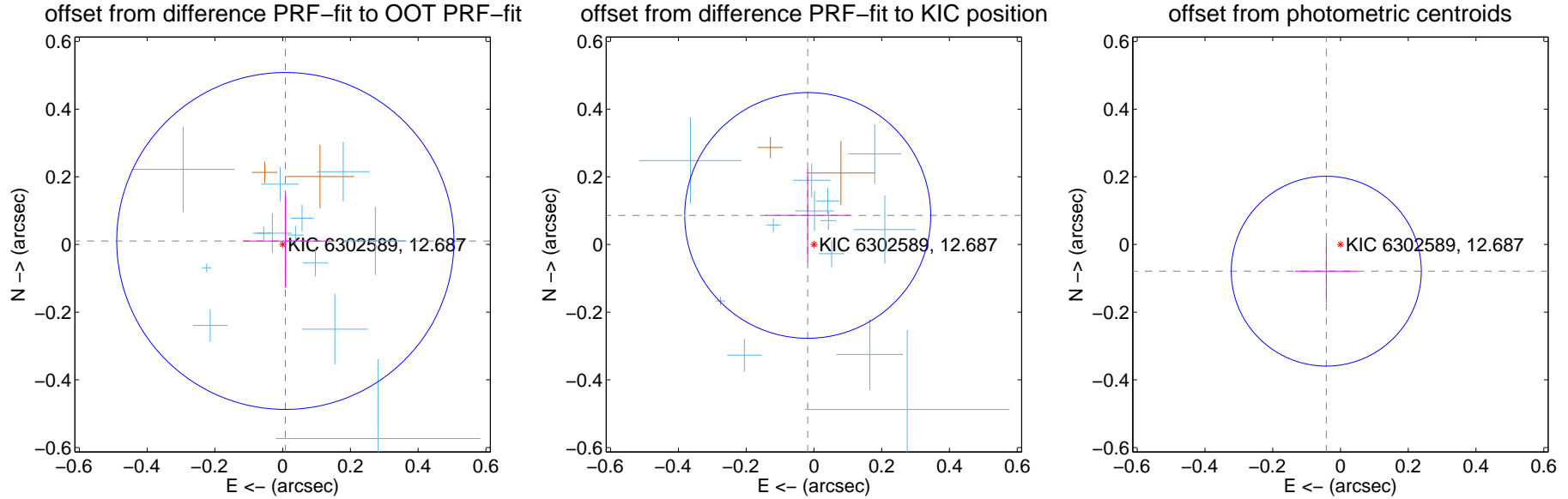
## DV Centroid Data

Supplemental centroid analysis for 006302589-01. Kepler magnitude: 12.69. Transit SNR 11.00

There are 15 quarters with good PRF difference image offsets

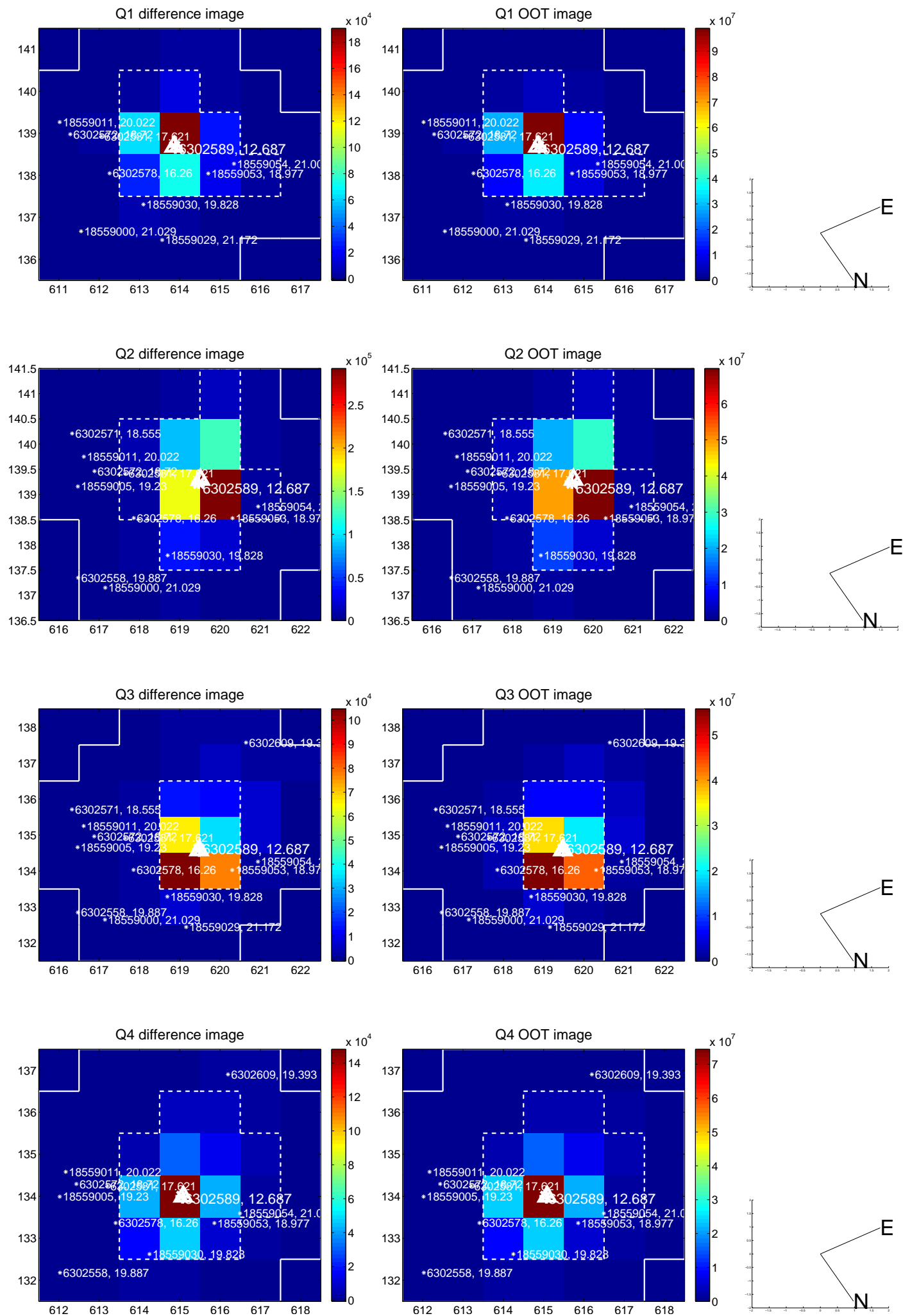
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.013 \pm 0.166$	0.08	$-0.008 \pm 0.124$	$0.010 \pm 0.137$
PRF-fit source offset from KIC position	$0.088 \pm 0.121$	0.73	$0.018 \pm 0.125$	$0.086 \pm 0.137$
photometric centroid source offset	$0.09 \pm 0.09$	0.96	$0.04 \pm 0.09$	$-0.08 \pm 0.09$

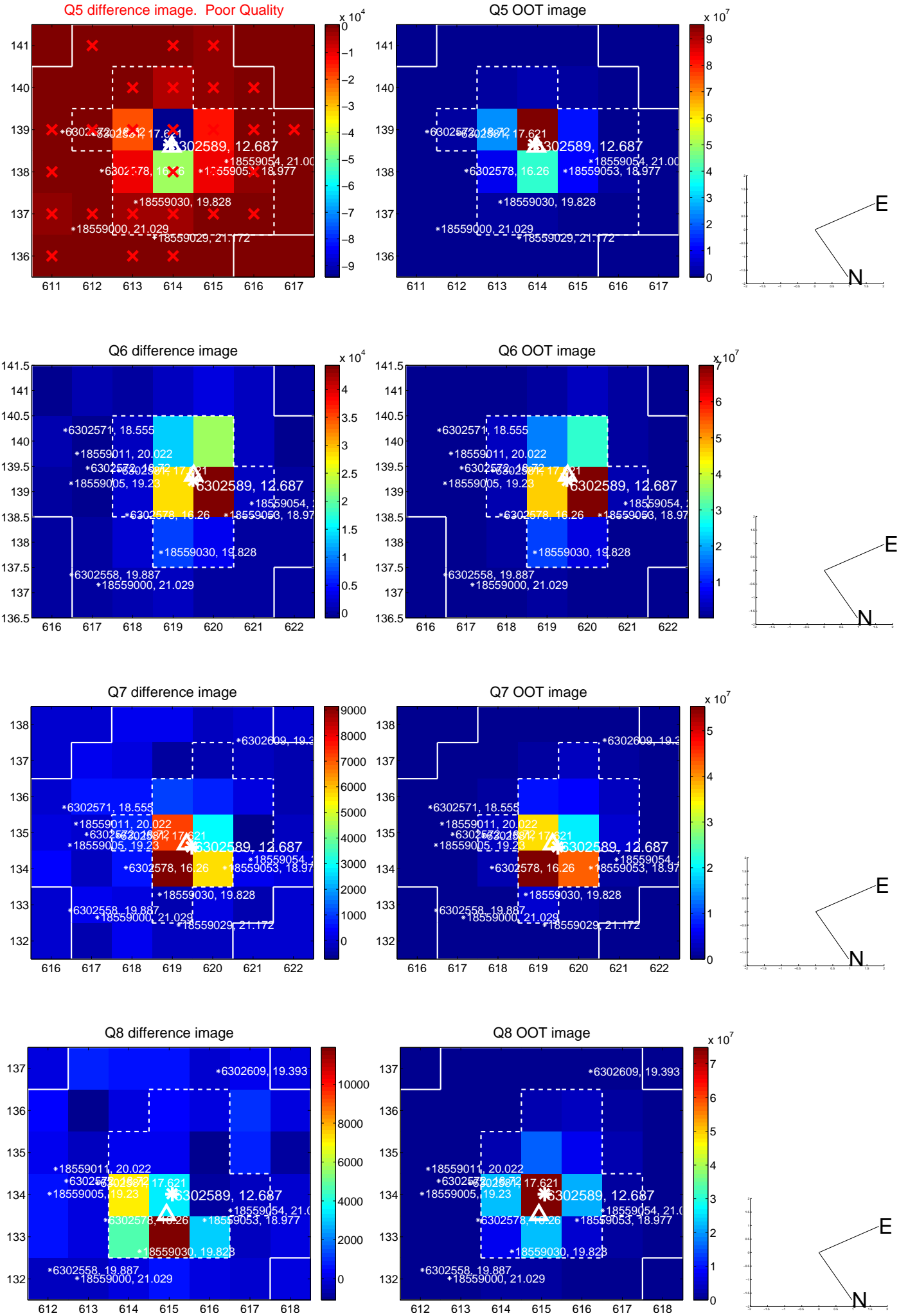


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

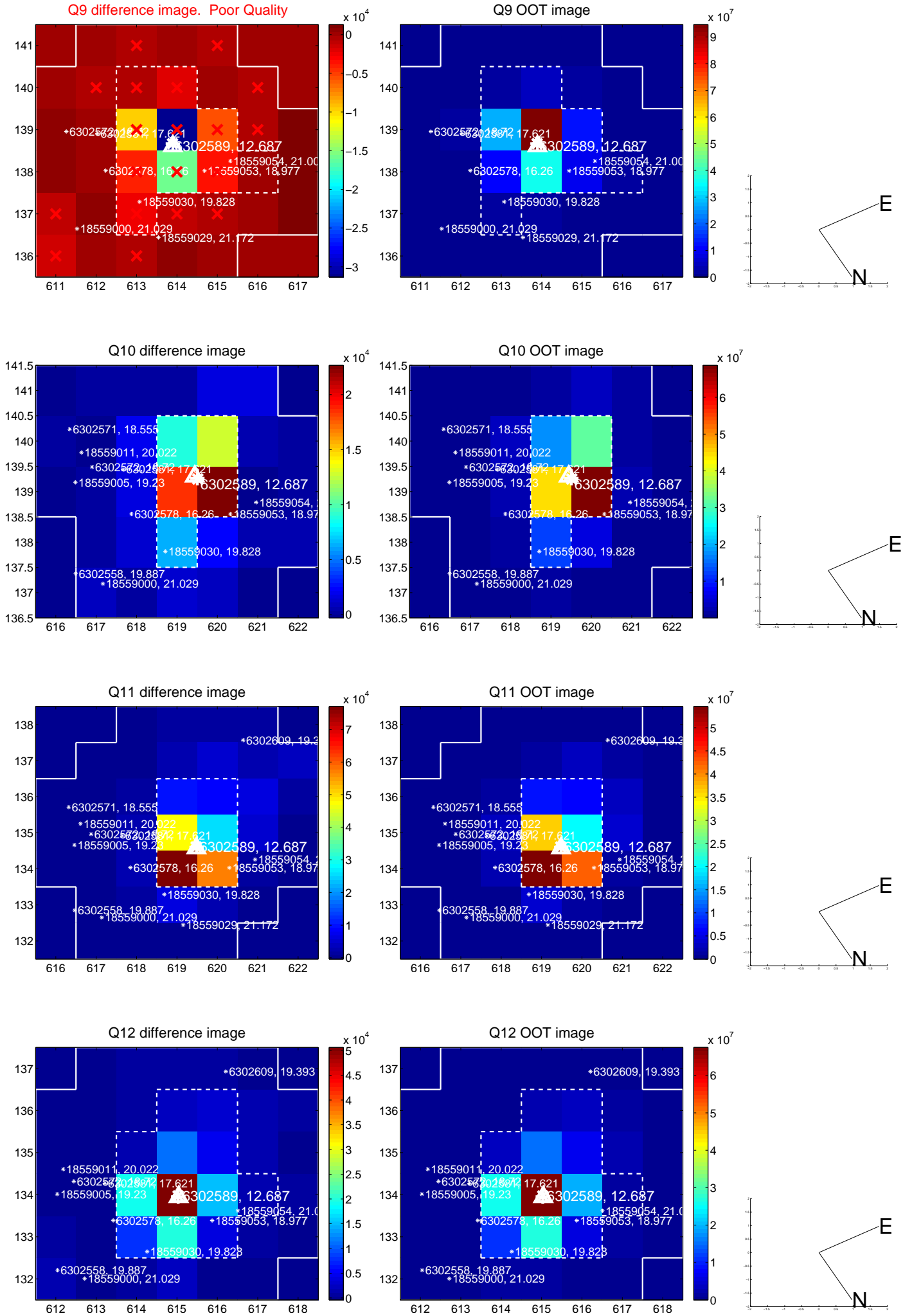
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



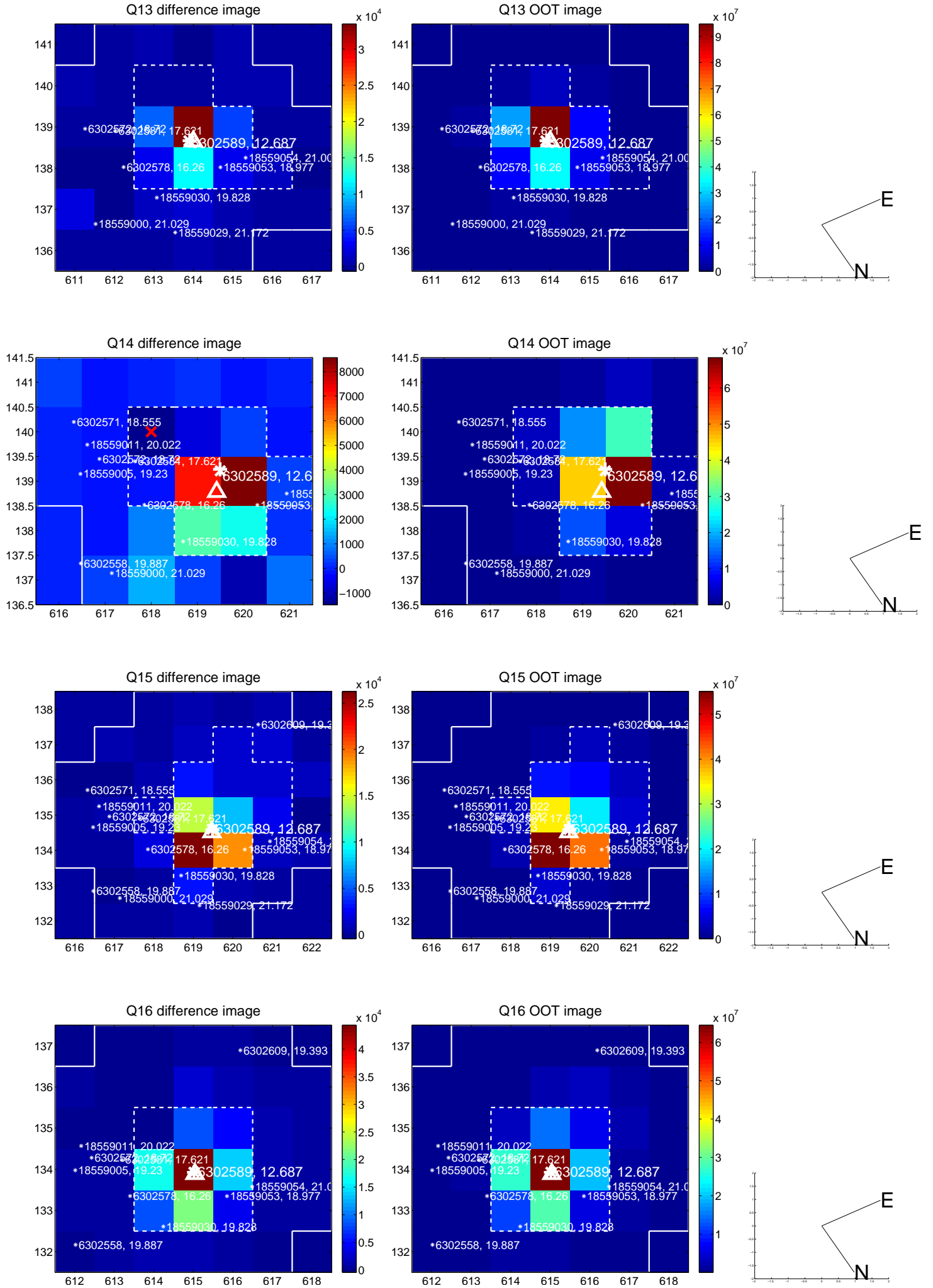
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



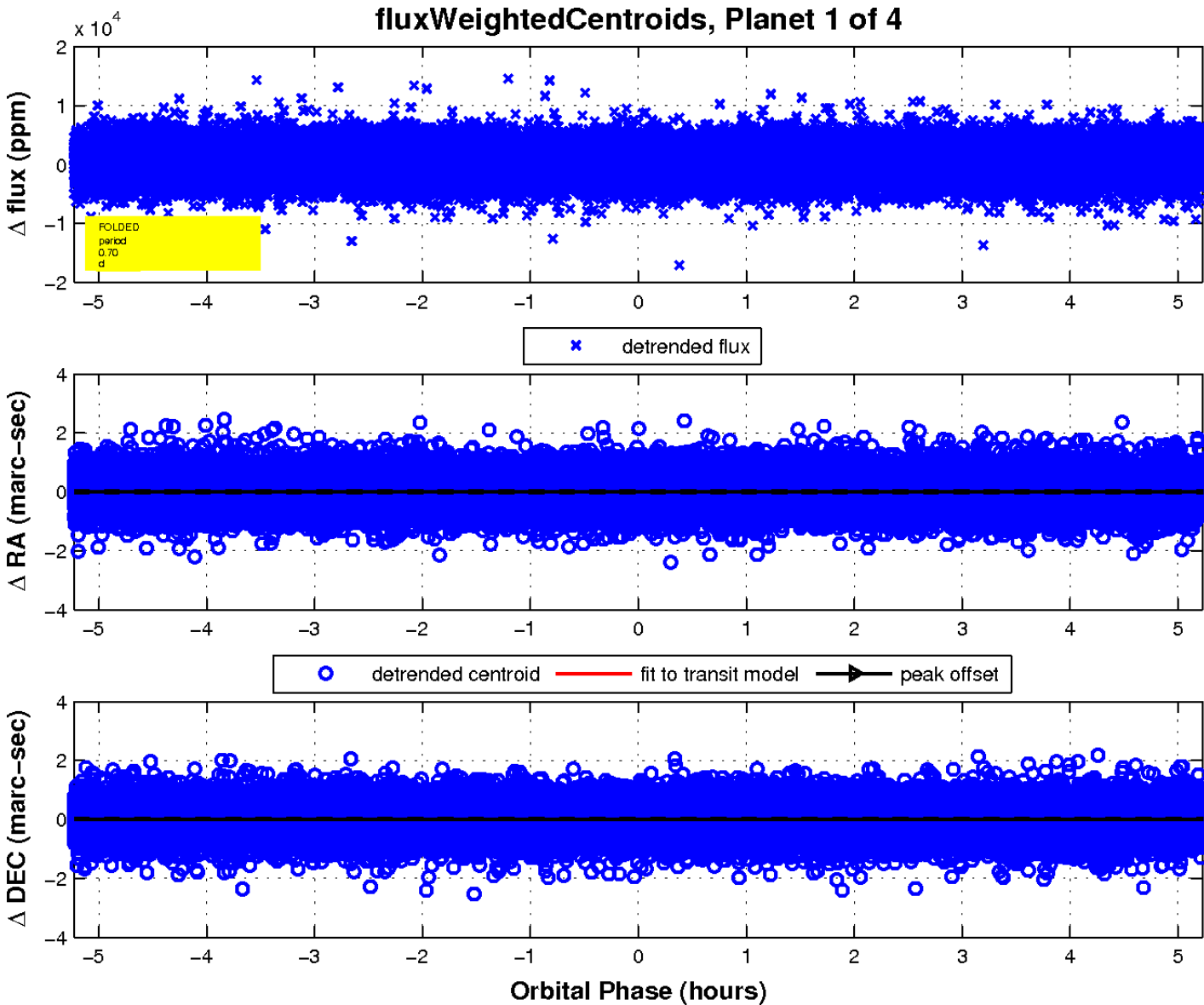
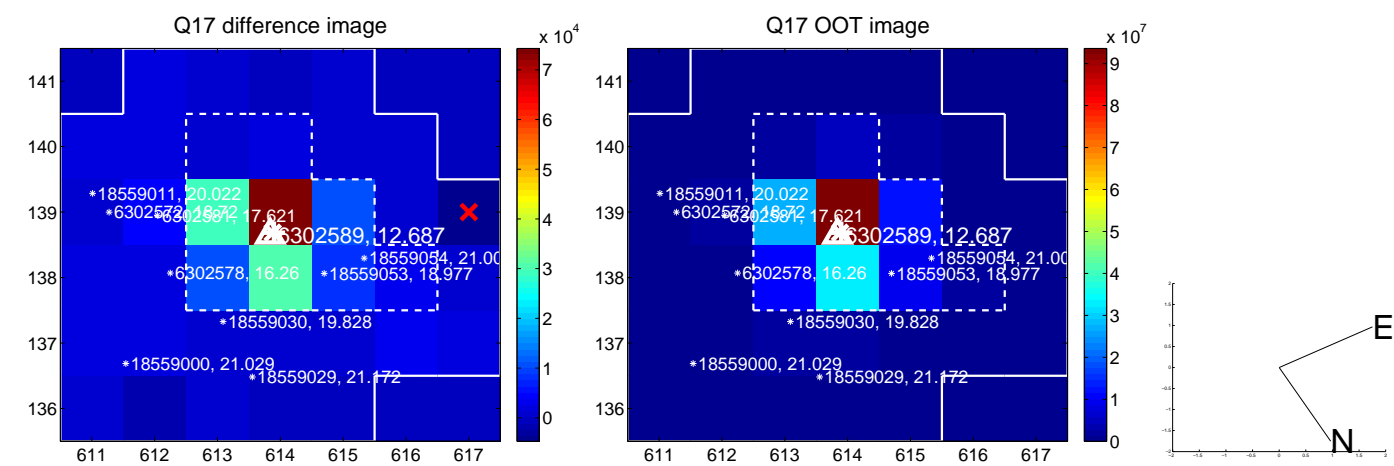
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



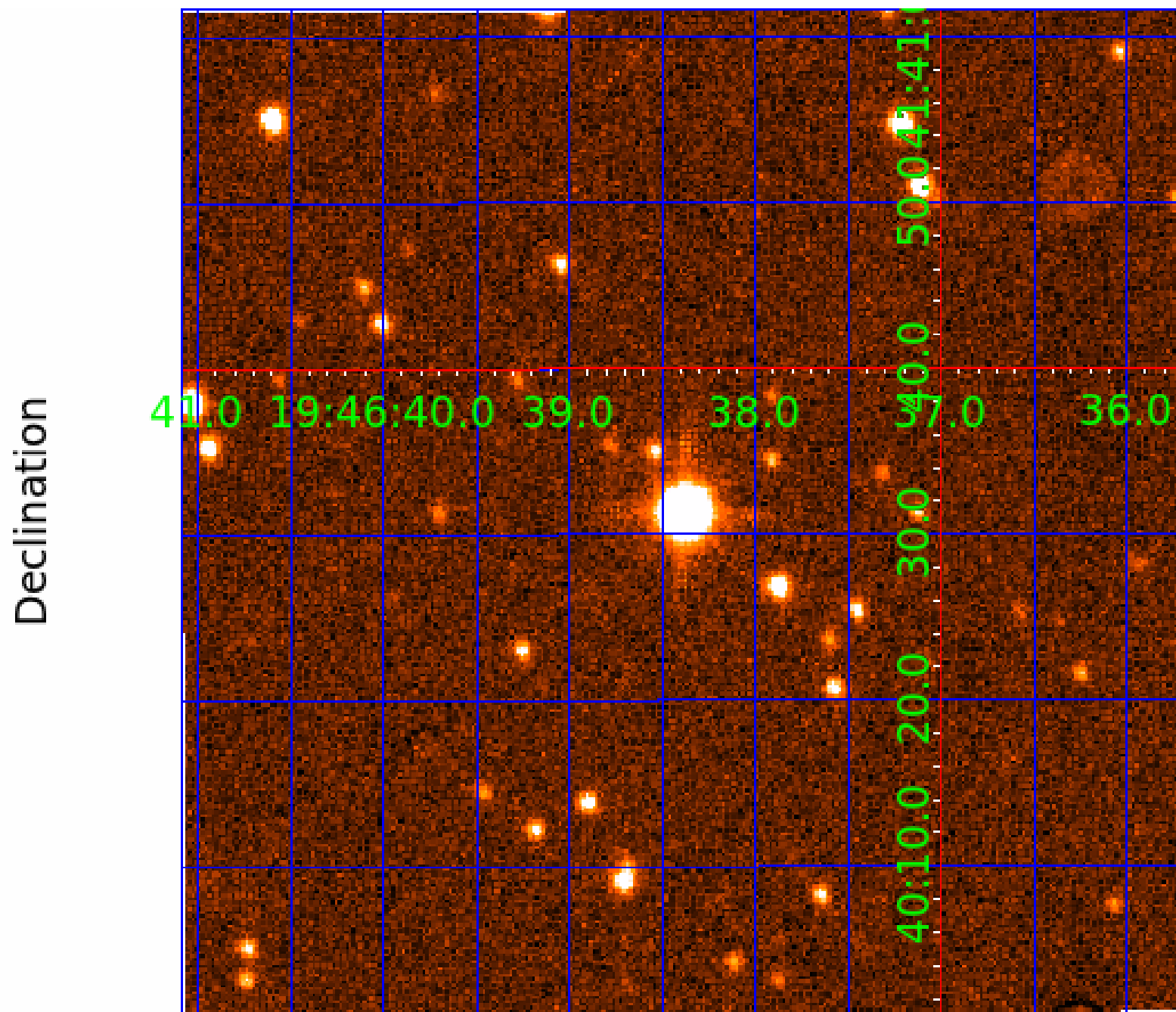
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 006302589

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006302589-01	OBS	No	0.704086	132.195363	190.1	1.744	9.9	11.0	2.85	7691	4.53	67735.27
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006302589-04	OBS	No	7.216522	136.645572	1480.9	13.866	9.4	11.5	2.85	7691	14.00	3042.37

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006302589-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006302589-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT
006302589-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_NOFITS
006302589-04	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

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

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

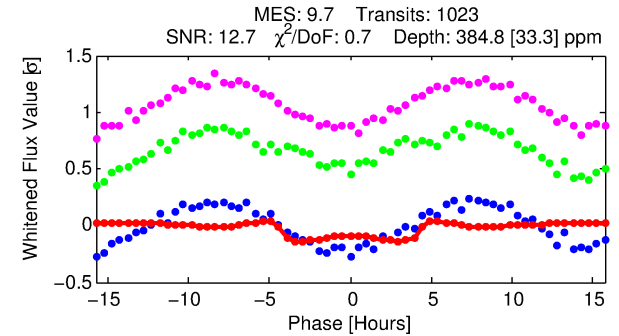
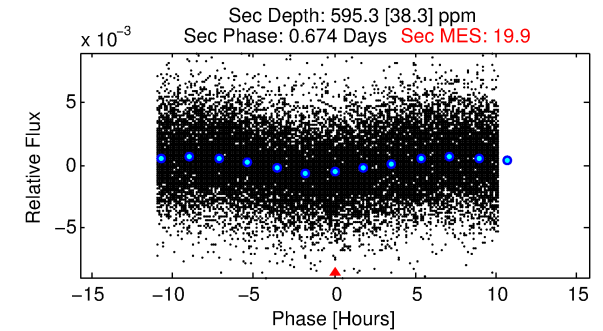
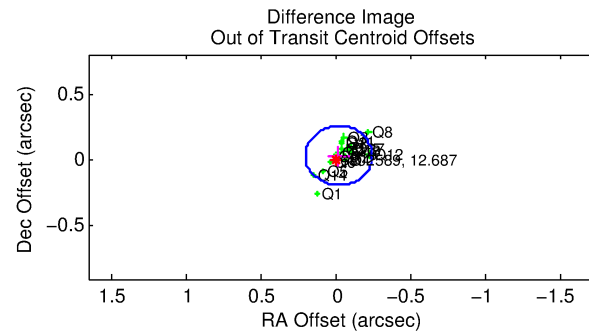
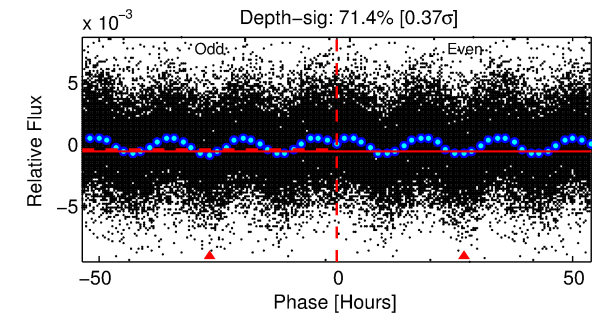
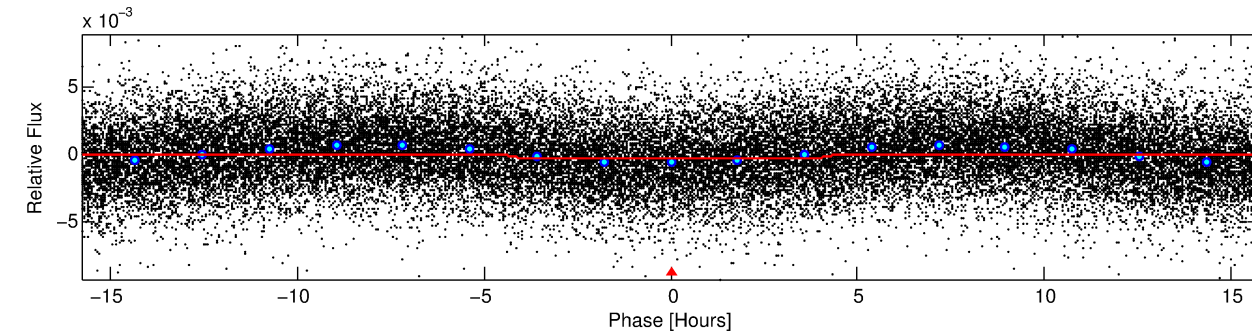
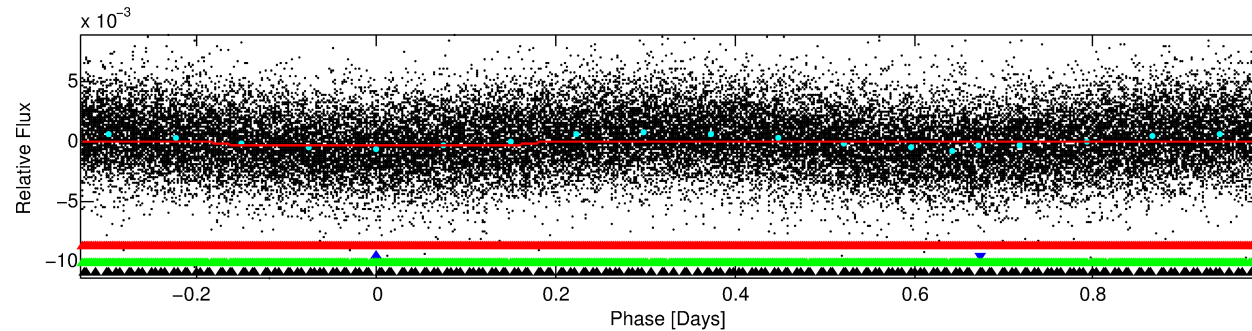
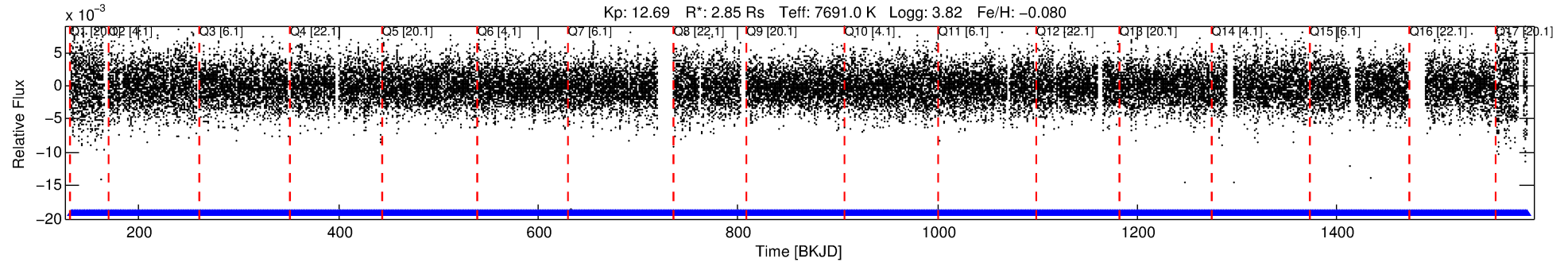
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006302589-02

No Significant Match Found

# DV One-Page Summary

KIC: 6302589 Candidate: 2 of 4 Period: 1.314 d



## DV Fit Results:

Period = 1.31440 [0.00001] d  
Epoch = 132.4172 [0.0042] BKJD  
Rp/R\* = 0.0182 [0.0098]  
a/R\* = 1.30 [1.66]  
b = 0.19 [16.33]  
Seff = 29467.69 [18532.12]  
Teff = 3341 [525] K  
Rp = 5.67 [3.84] Re  
a = 0.0294 [0.0114] AU  
Ag = 8.79 [10.83] [0.72 $\sigma$ ]  
Teffp = 8893 [2412] K [2.25 $\sigma$ ]

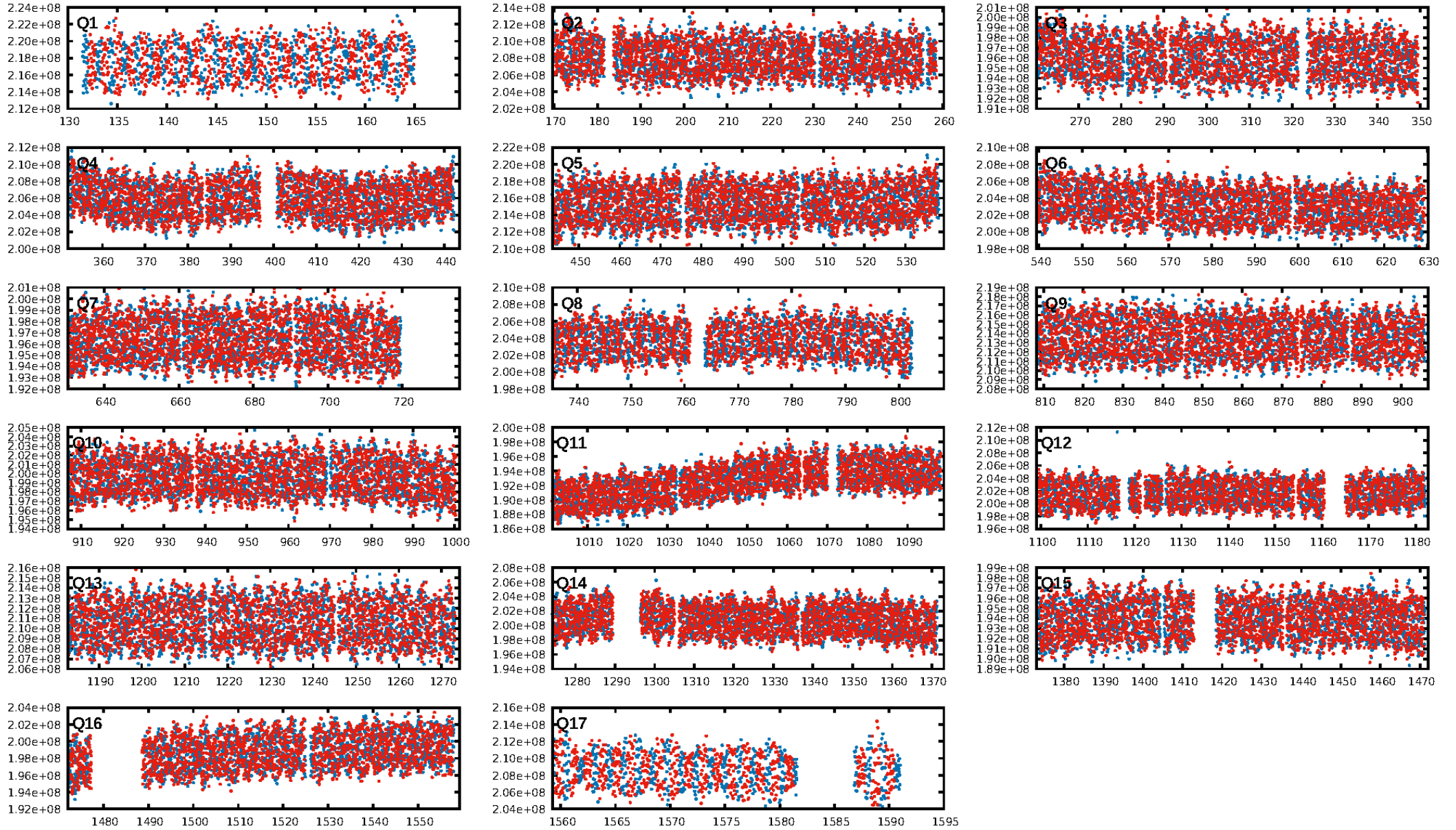
## DV Diagnostic Results:

ShortPeriod-sig: 89.2% [1.61 $\sigma$ ]  
LongPeriod-sig: 24.2% [0.31 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [978/978]  
GhostDiagnostic-chr: 0.9327  
Centroid-sig: 0.0%  
Centroid-so: 0.154 arcsec [4.65 $\sigma$ ]  
OotOffset-rm: 0.042 arcsec [0.56 $\sigma$ ]  
KicOffset-rm: 0.031 arcsec [0.41 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

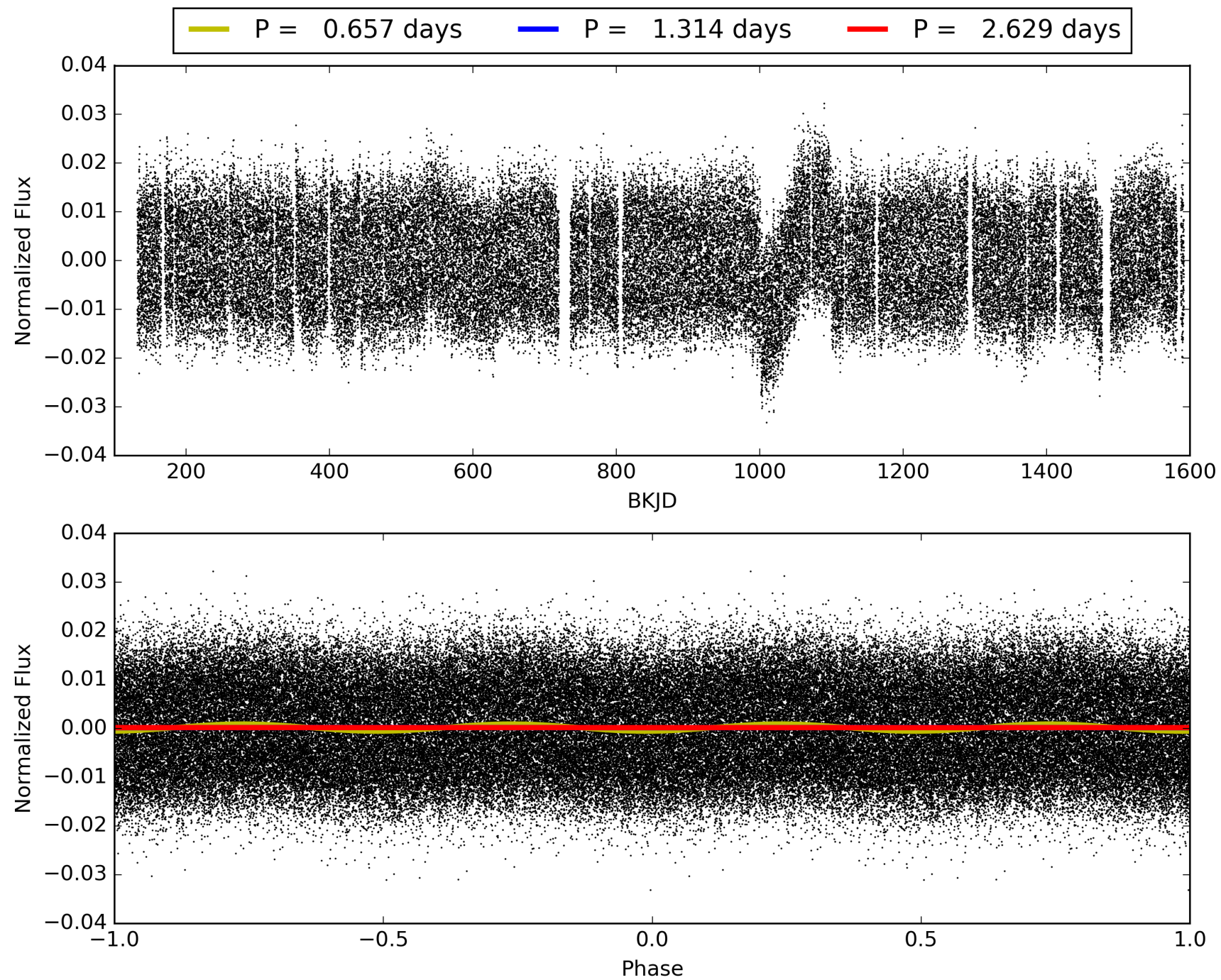
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:23:43 Z

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

# TCE 006302589-02, PDC Light Curves

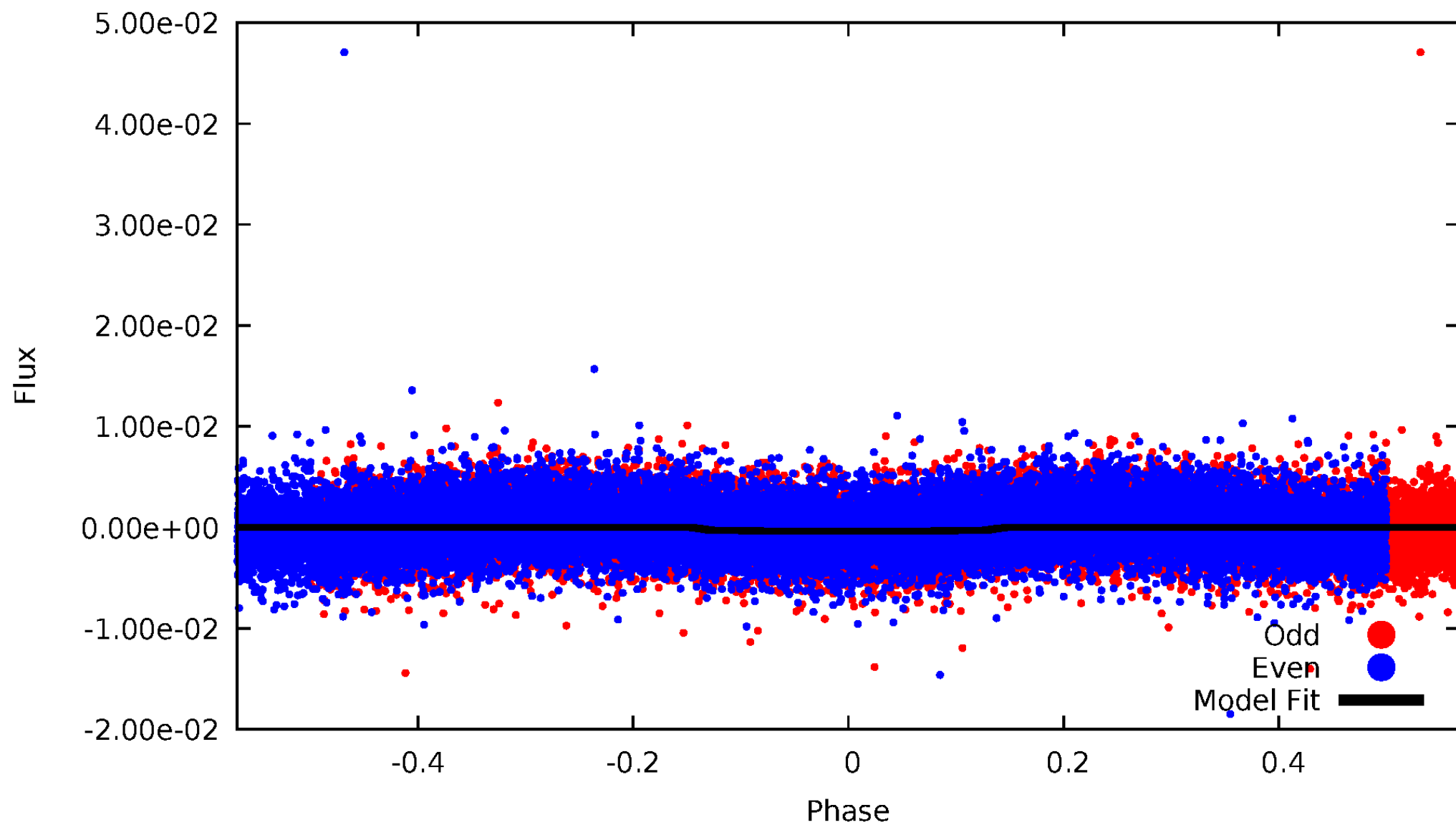


TCE 006302589-02



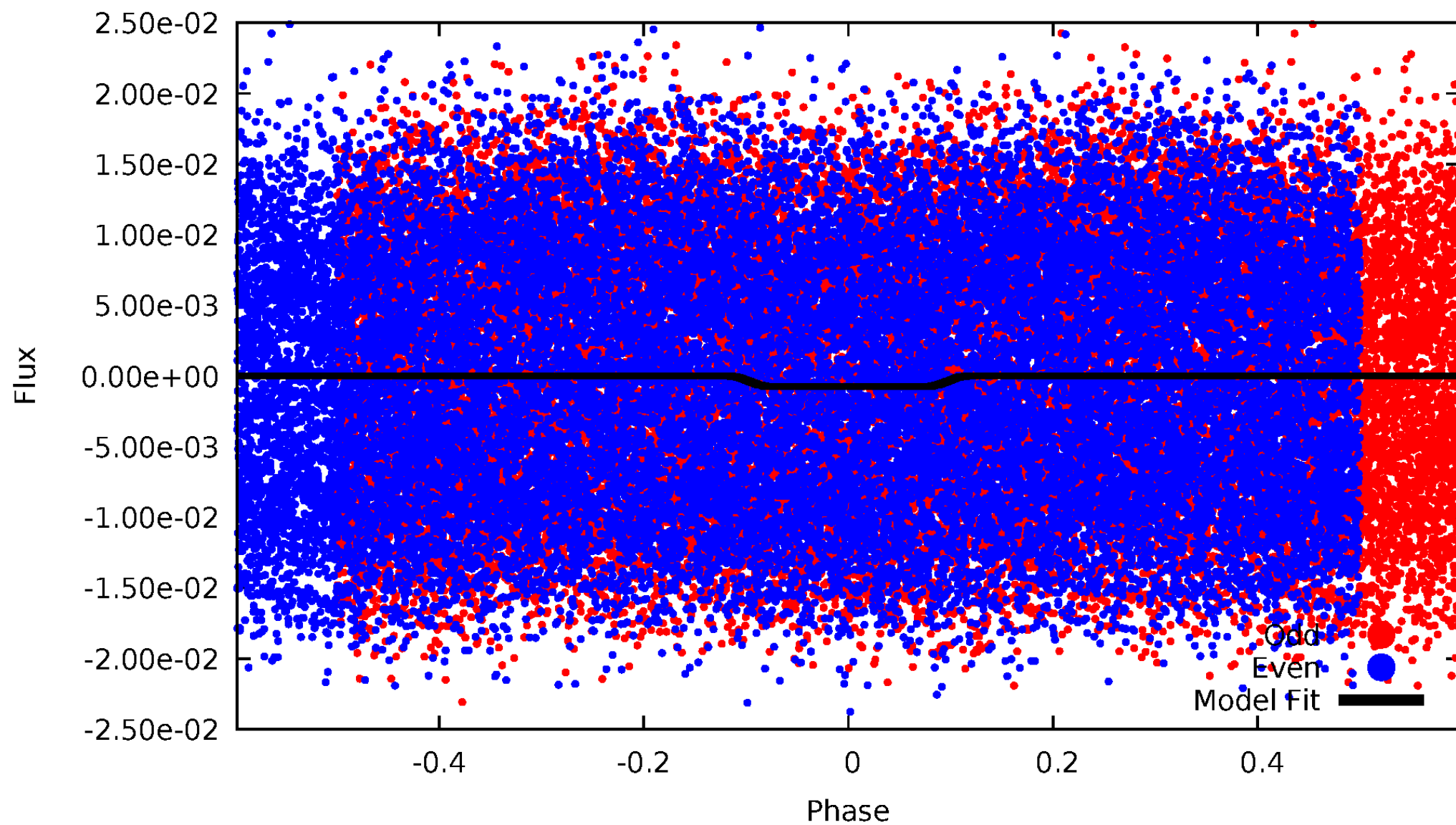
# DV Odd/Even

TCE 006302589-02



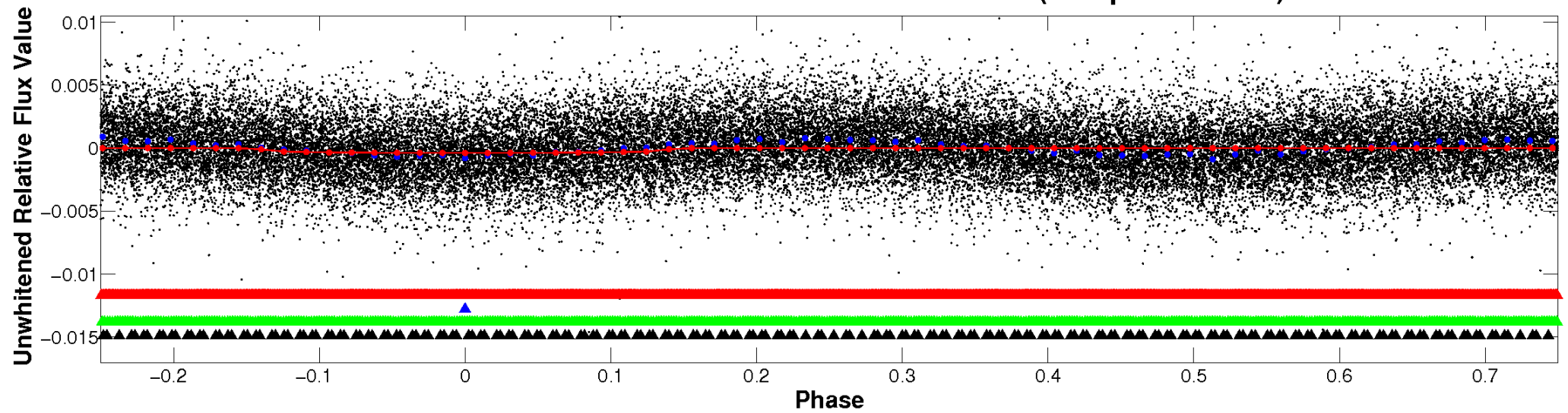
# ALT Odd/Even

TCE 006302589-02

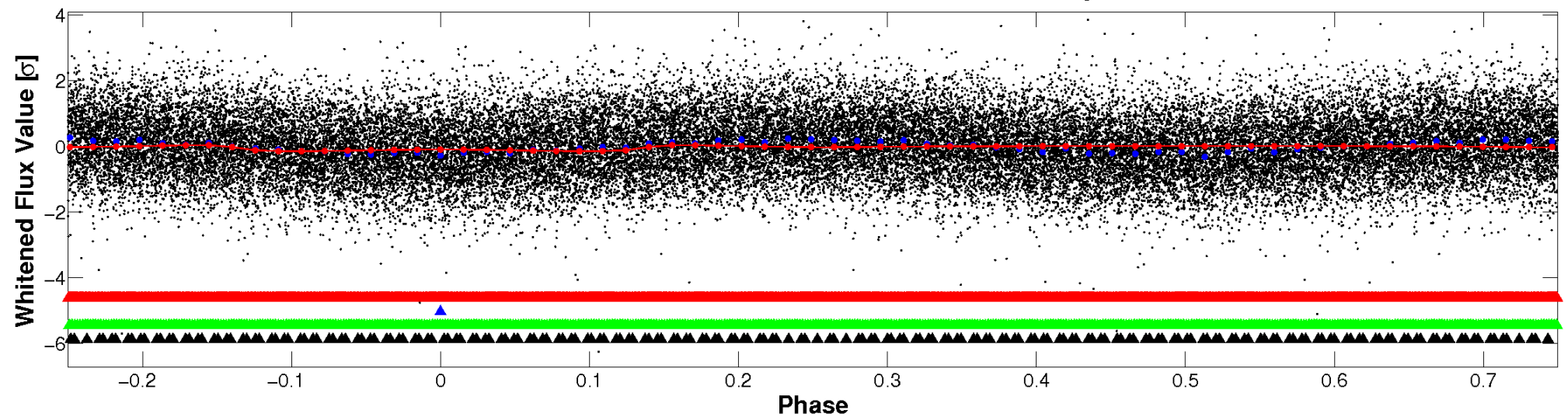


# Non-Whitened Vs. Whitened Light Curve

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

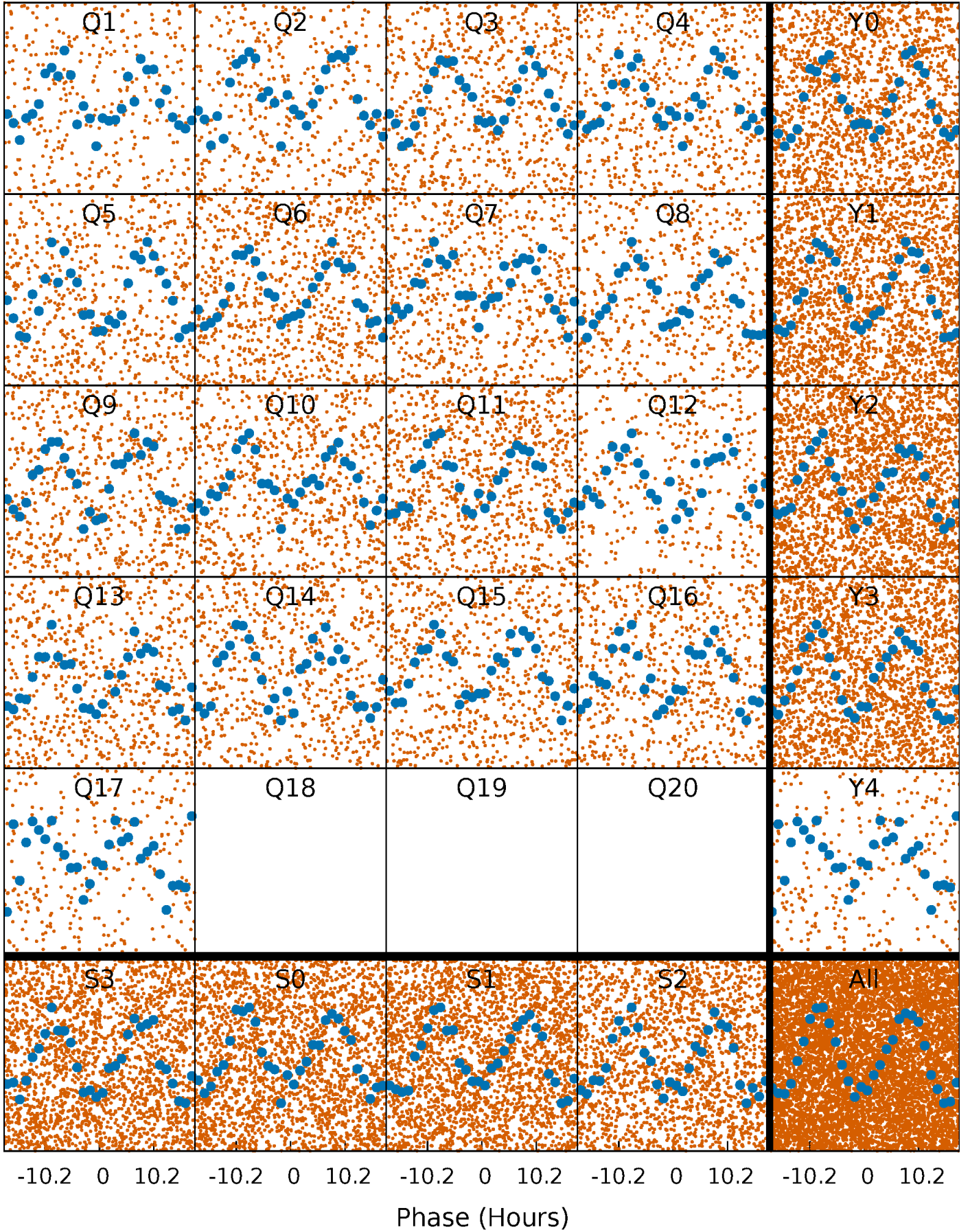


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



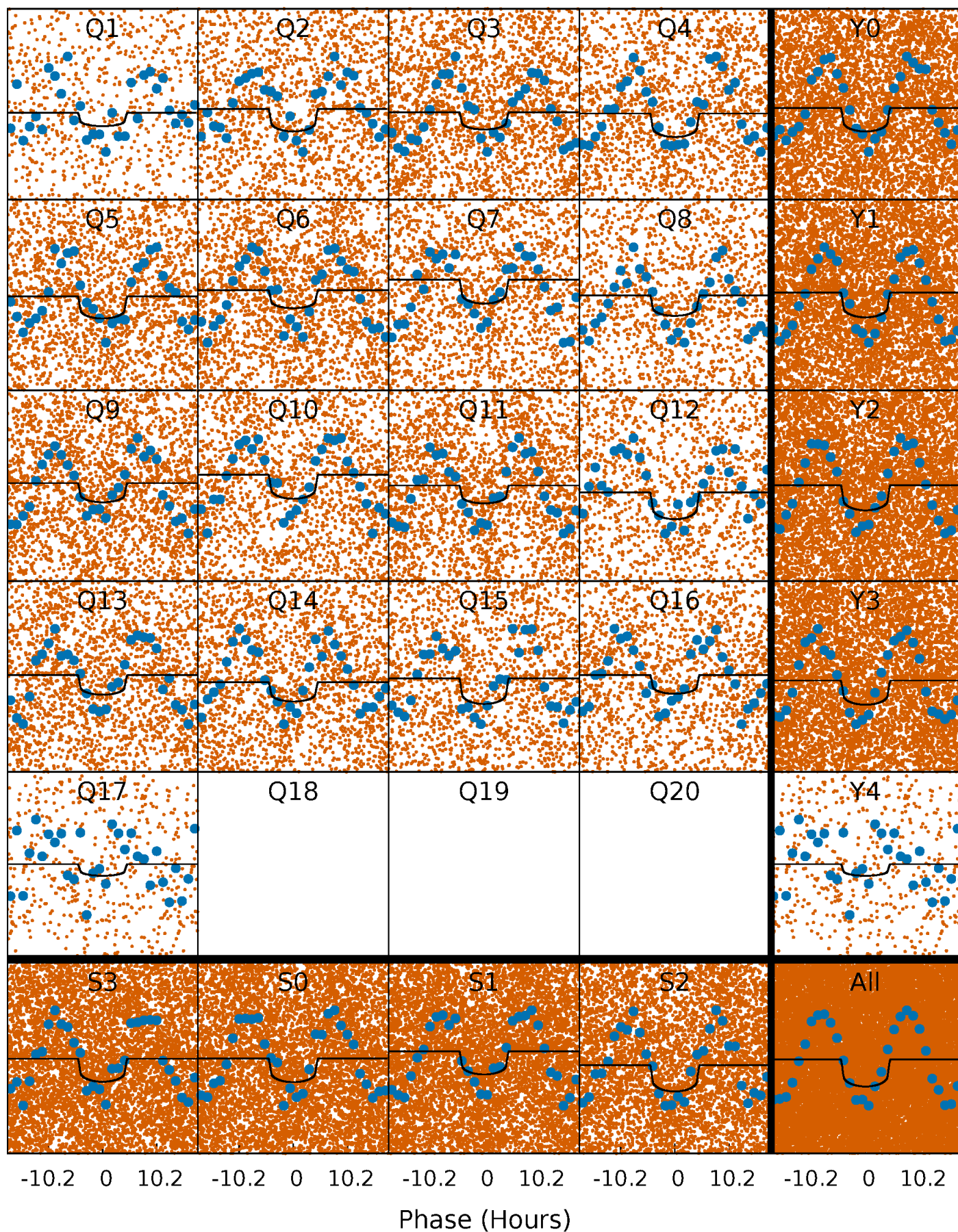
# PDC Quarter-Phased Transit Curves

TCE 006302589-02   P= 1.314399 Days    $T_0=132.417247$  (BKJD)



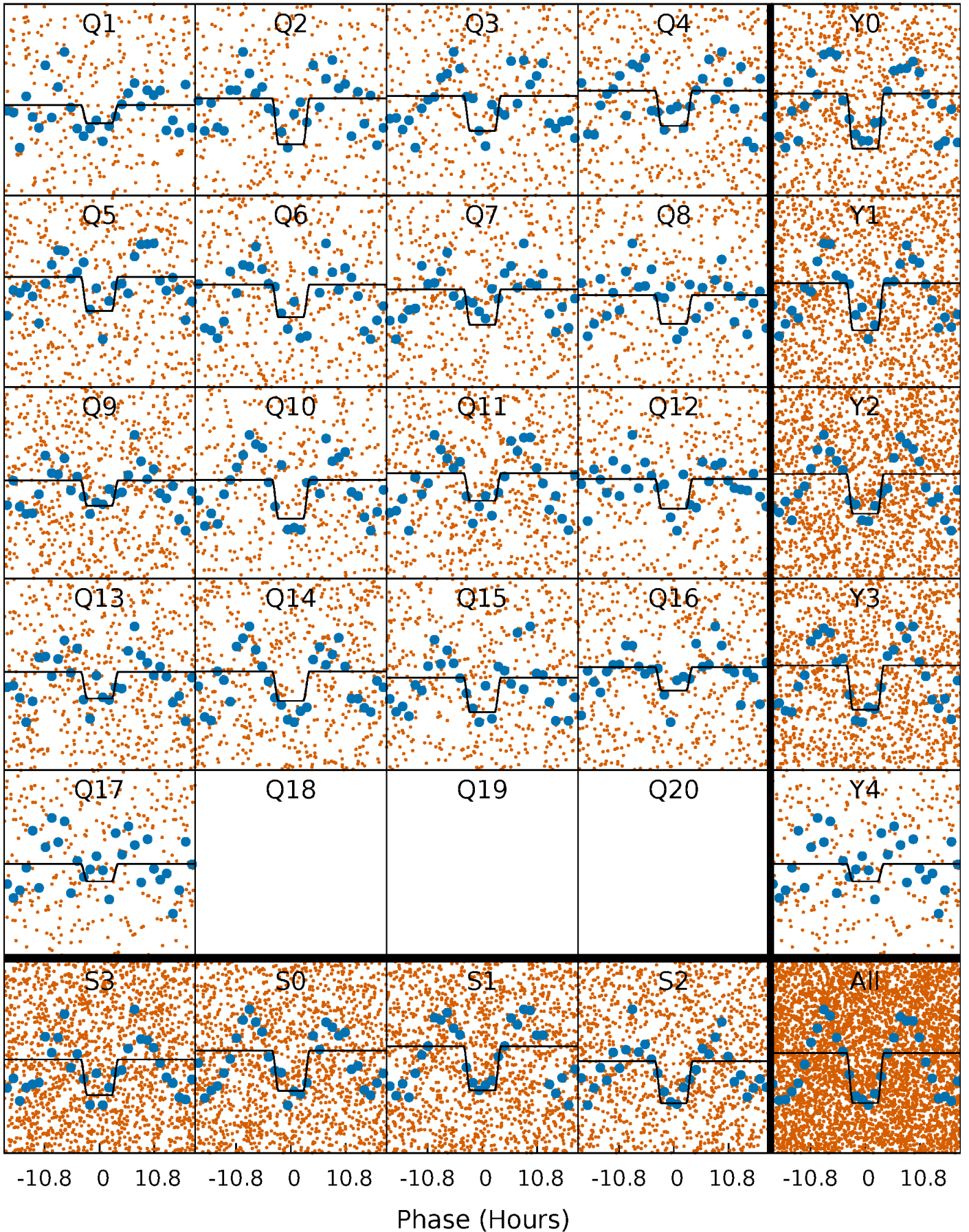
# DV Quarter-Phased Transit Curves

TCE 006302589-02   P= 1.314399 Days    $T_0=132.417247$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

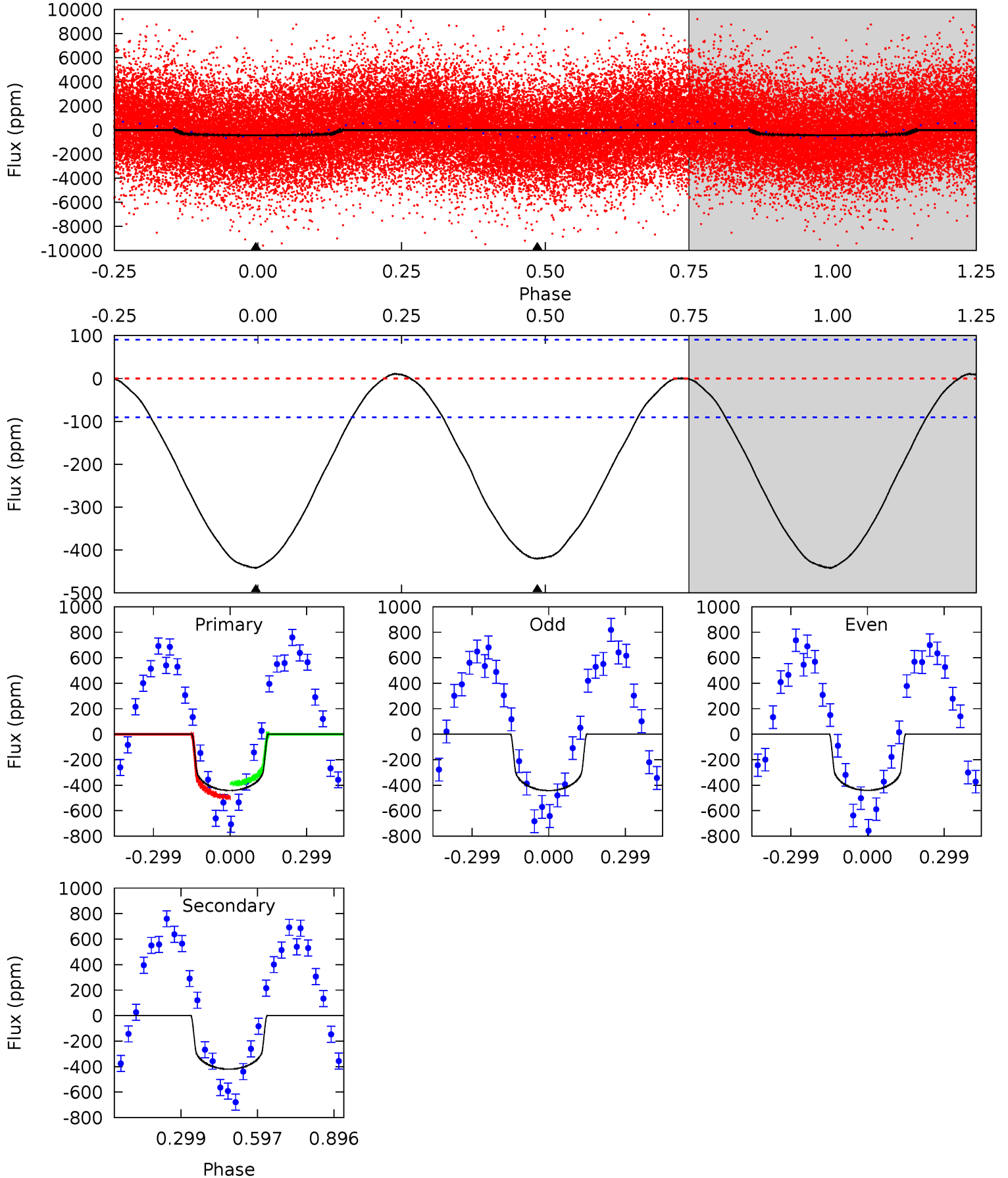
TCE 006302589-02   P= 1.314328 Days    $T_0=132.435415$  (BKJD)



# DV Model-Shift Uniqueness Test

006302589-02, P = 1.314399 Days, E = 131.102848 Days

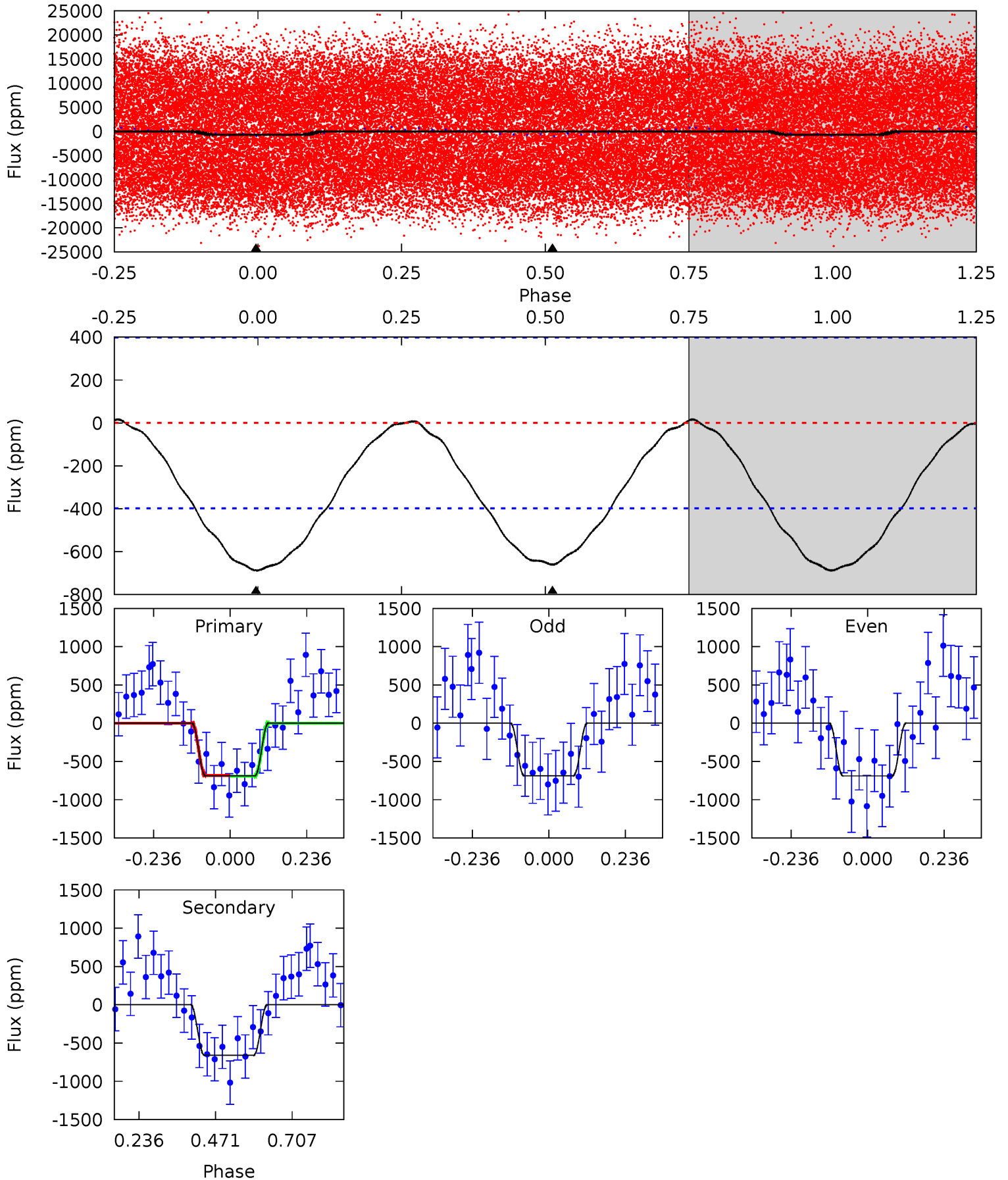
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.1	20.1	0	0	4.33	1.04	0.36	21.1	21.1	20.1	20.1	0.05	1.16	0.02	2.62



# Alt Model-Shift Uniqueness Test

006302589-02, P = 1.314328 Days, E = 131.121087 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
7.58	7.28	0	0	4.38	1.19	0.13	7.58	7.58	7.28	7.28	0.01	1.13	0.02	0.05



### Stellar Parameters For KIC 006302589

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7691^{+211}_{-316}$	$3.820^{+0.352}_{-0.088}$	$-0.080^{+0.200}_{-0.350}$	$2.846^{+0.394}_{-1.181}$	$1.953^{+0.083}_{-0.471}$	$0.119^{+0.340}_{-0.035}$
	+3%/-4%	+9%/-2%	+250%/-438%	+14%/-41%	+4%/-24%	+285%/-29%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006302589-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-420 \pm 21$	$5.35^{+2.86}_{-2.79}$	$4531^{+290}_{-466}$	$7876^{+4964}_{-1673}$	$6.770^{+21.171}_{-3.950}$
Alt.	$-660 \pm 91$	$7.53^{+3.41}_{-2.70}$	$4545^{+307}_{-451}$	$7267^{+2447}_{-1267}$	$5.234^{+7.995}_{-2.747}$

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

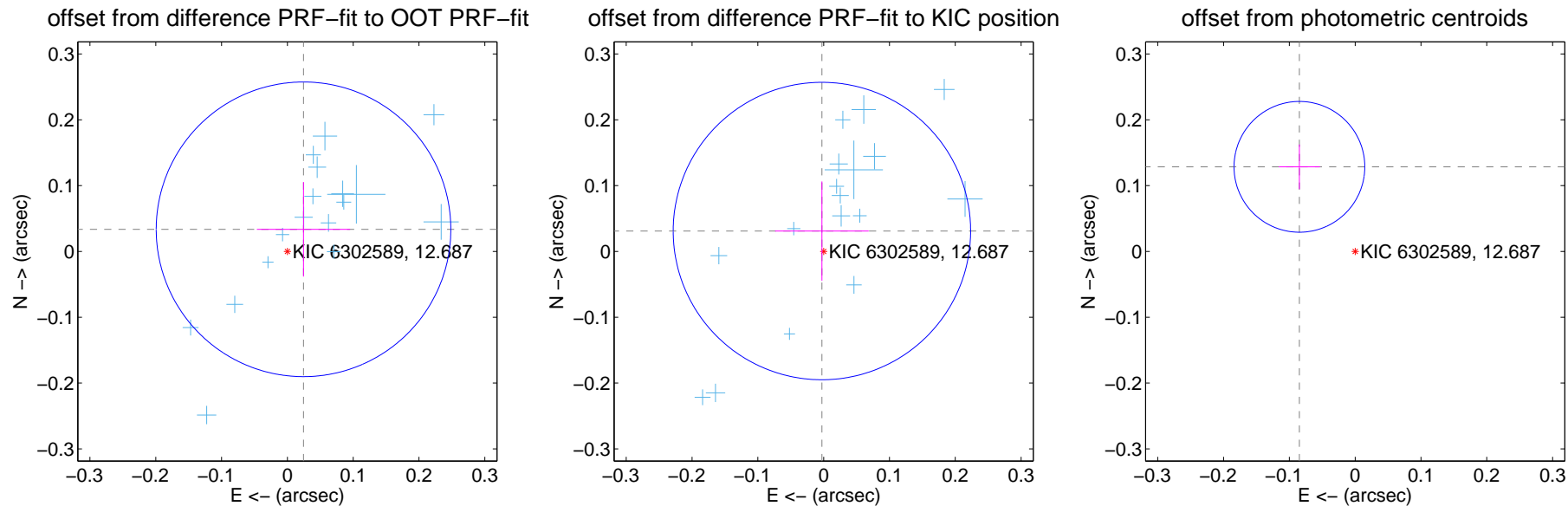
## DV Centroid Data

Supplemental centroid analysis for 006302589-02. Kepler magnitude: 12.69. Transit SNR 12.66

There are 17 quarters with good PRF difference image offsets

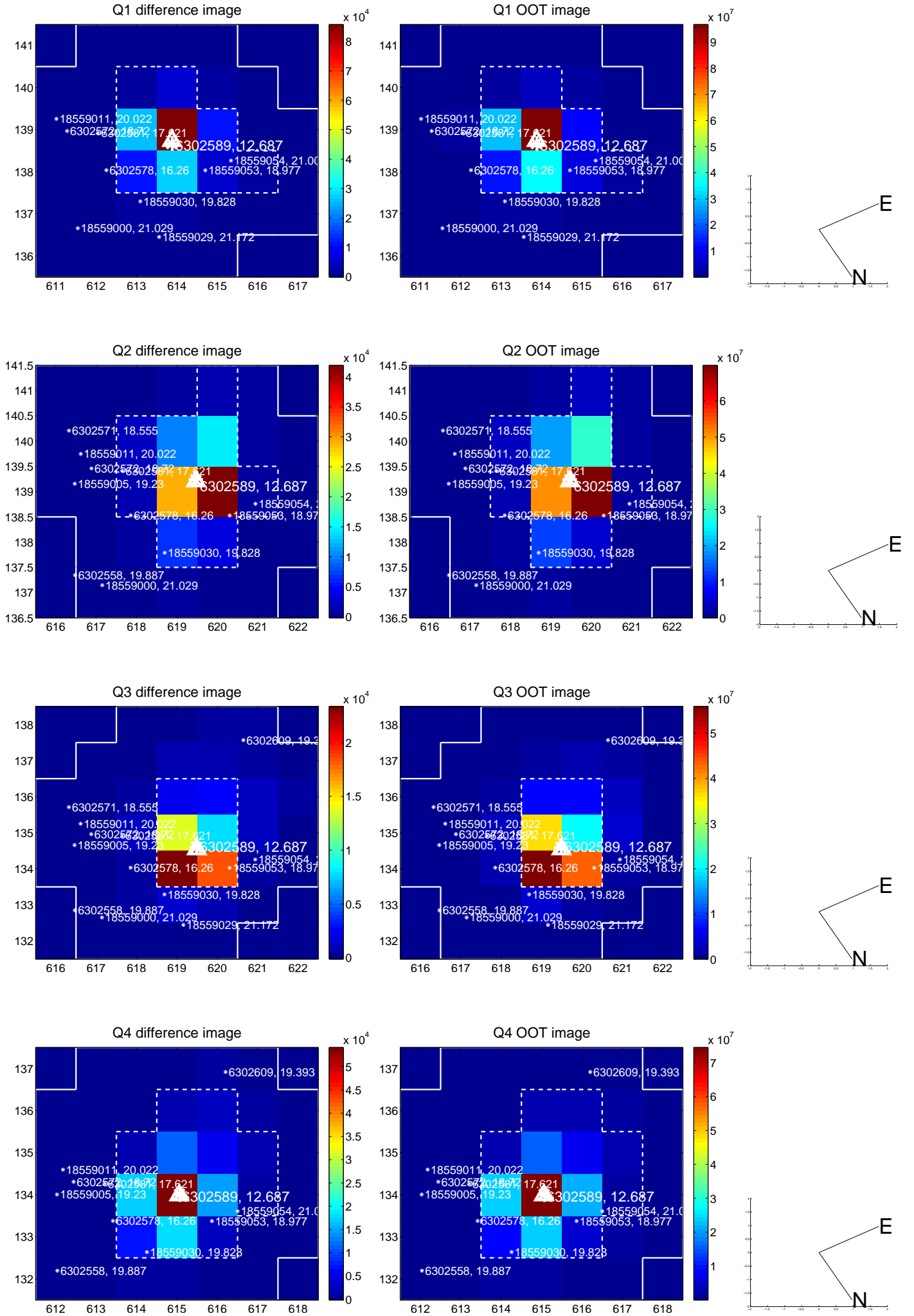
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.042 \pm 0.075$	0.56	$-0.025 \pm 0.071$	$0.034 \pm 0.072$
PRF-fit source offset from KIC position	$0.031 \pm 0.075$	0.41	$0.003 \pm 0.071$	$0.031 \pm 0.075$
photometric centroid source offset	$0.15 \pm 0.03$	4.65	$0.08 \pm 0.03$	$0.13 \pm 0.03$

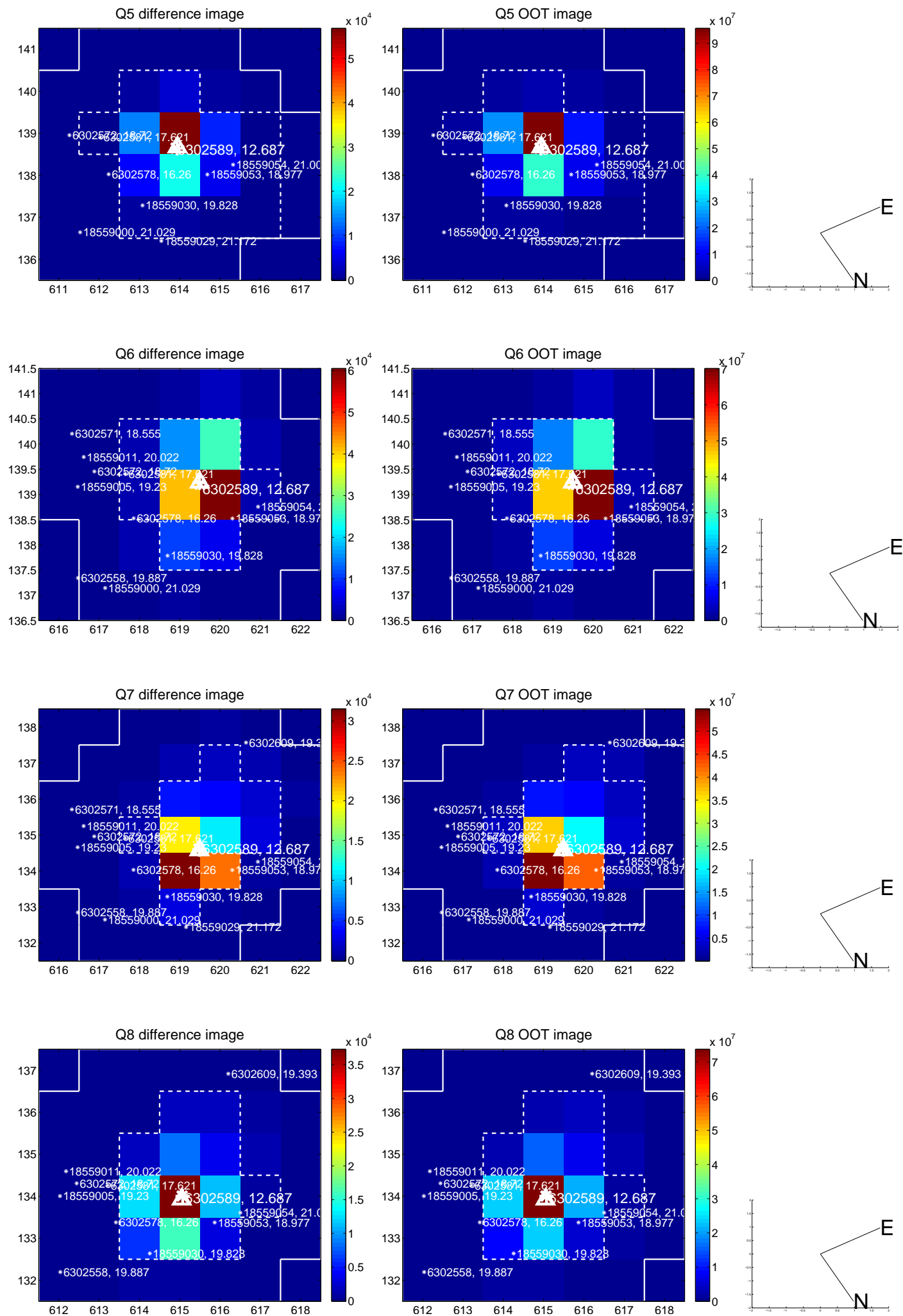


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

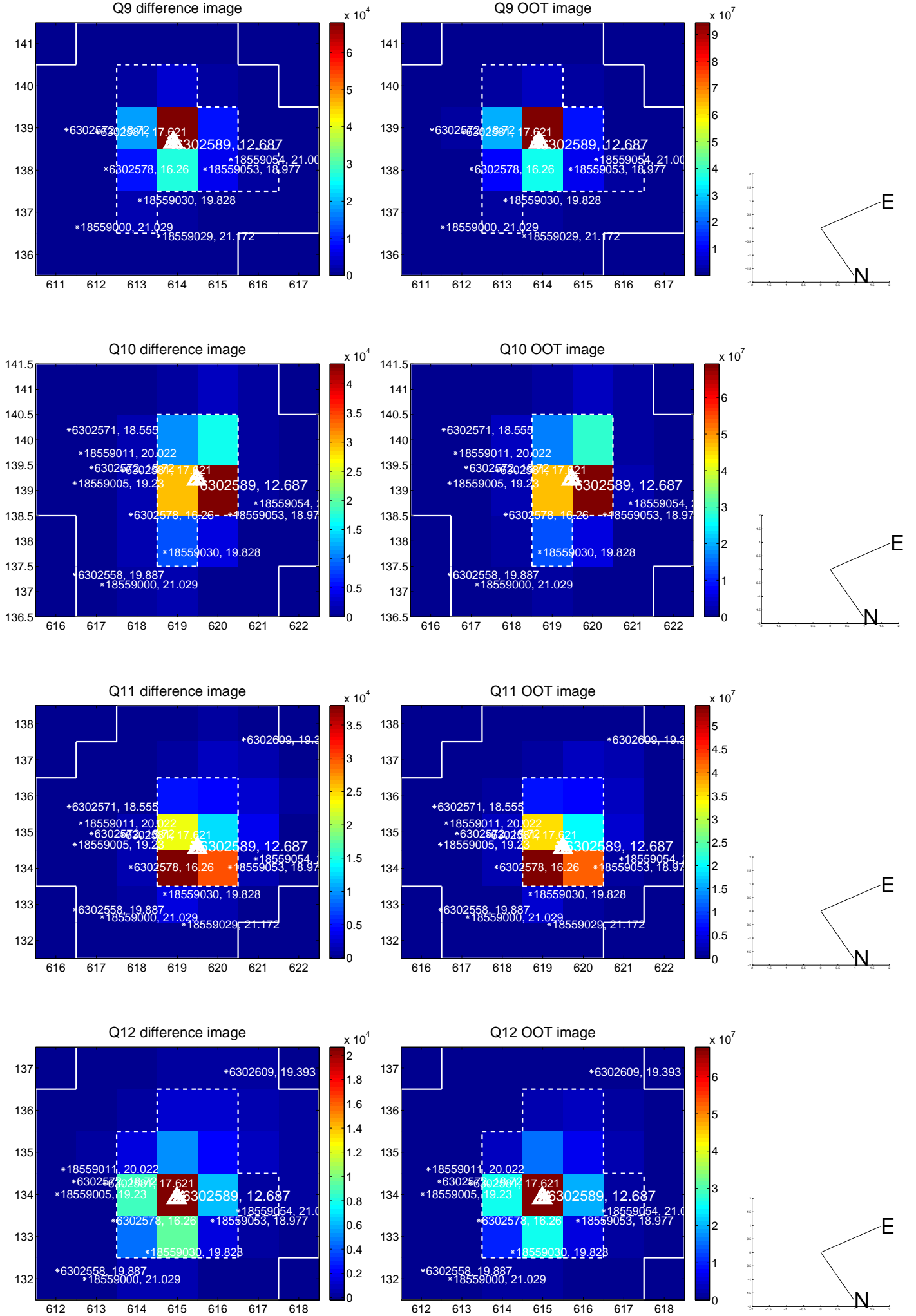
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



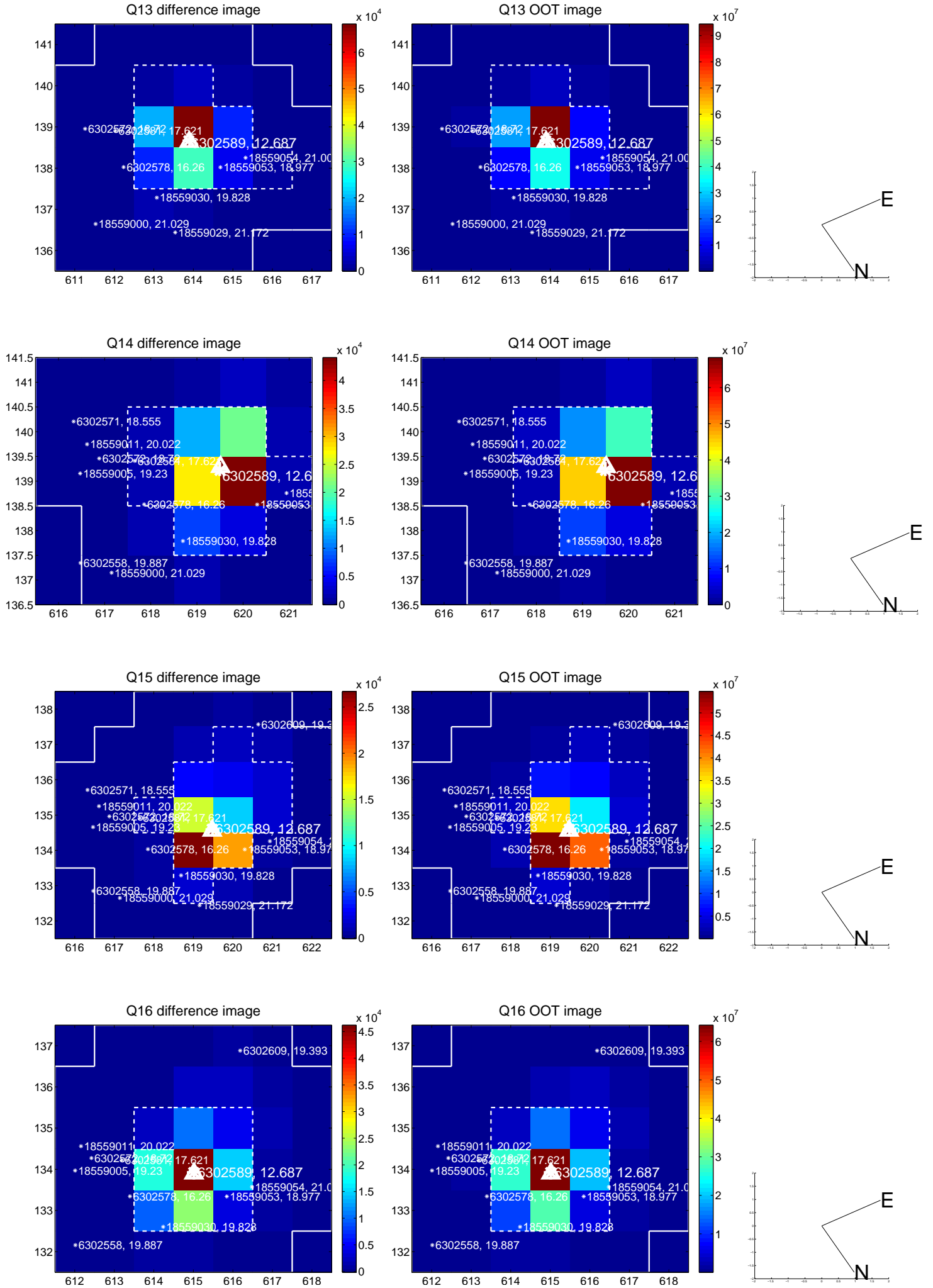
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



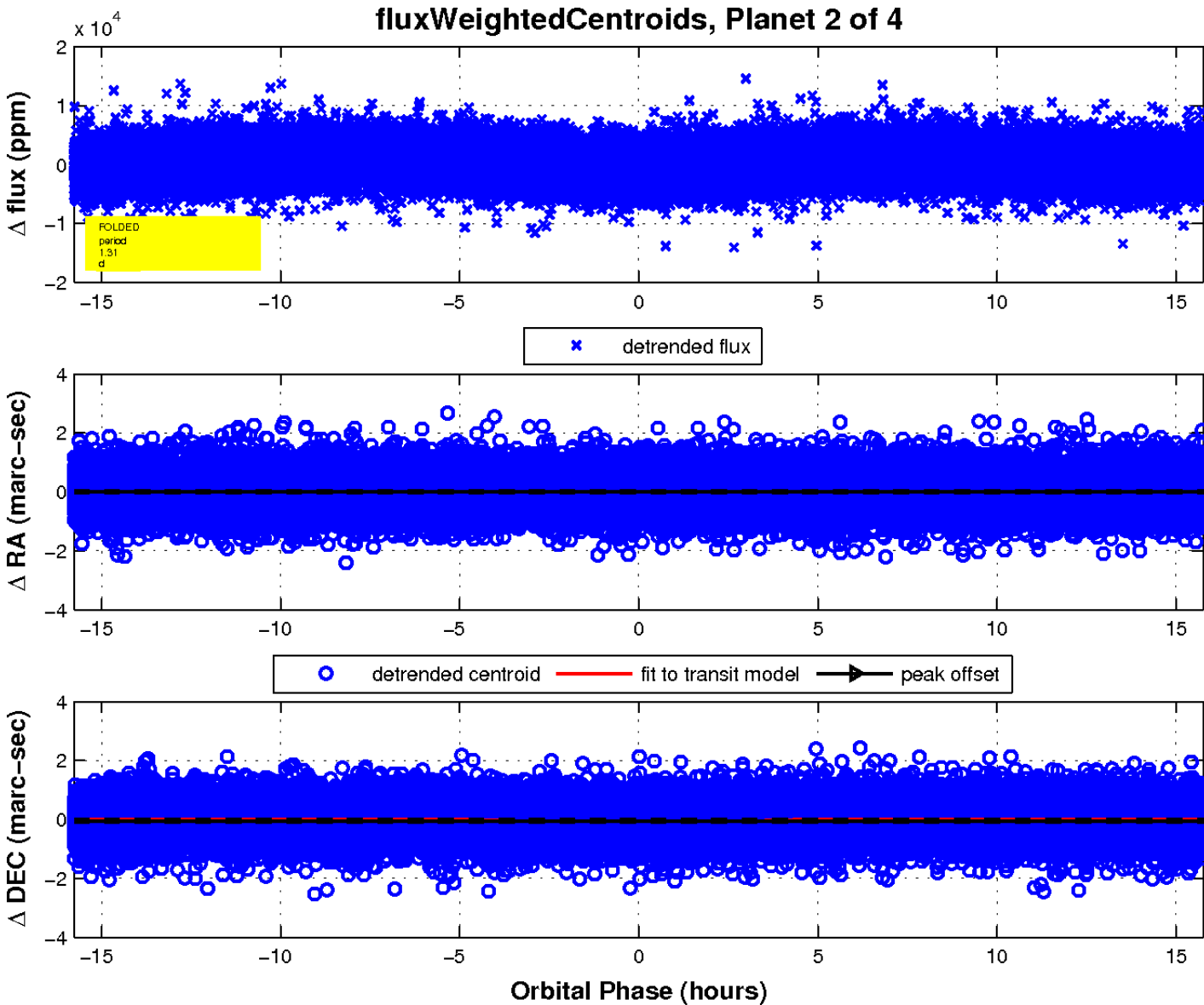
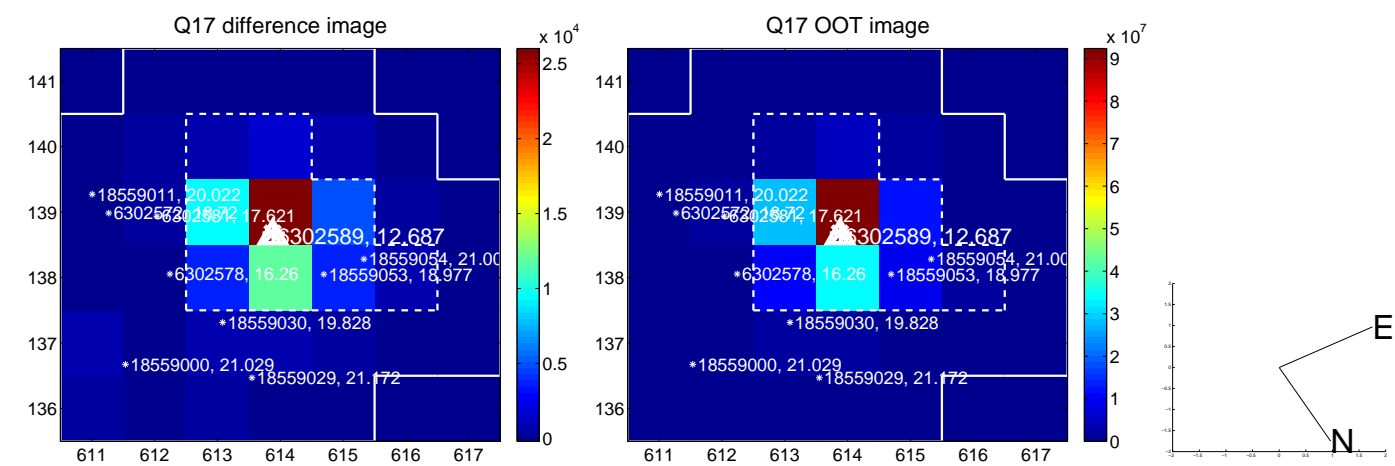
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



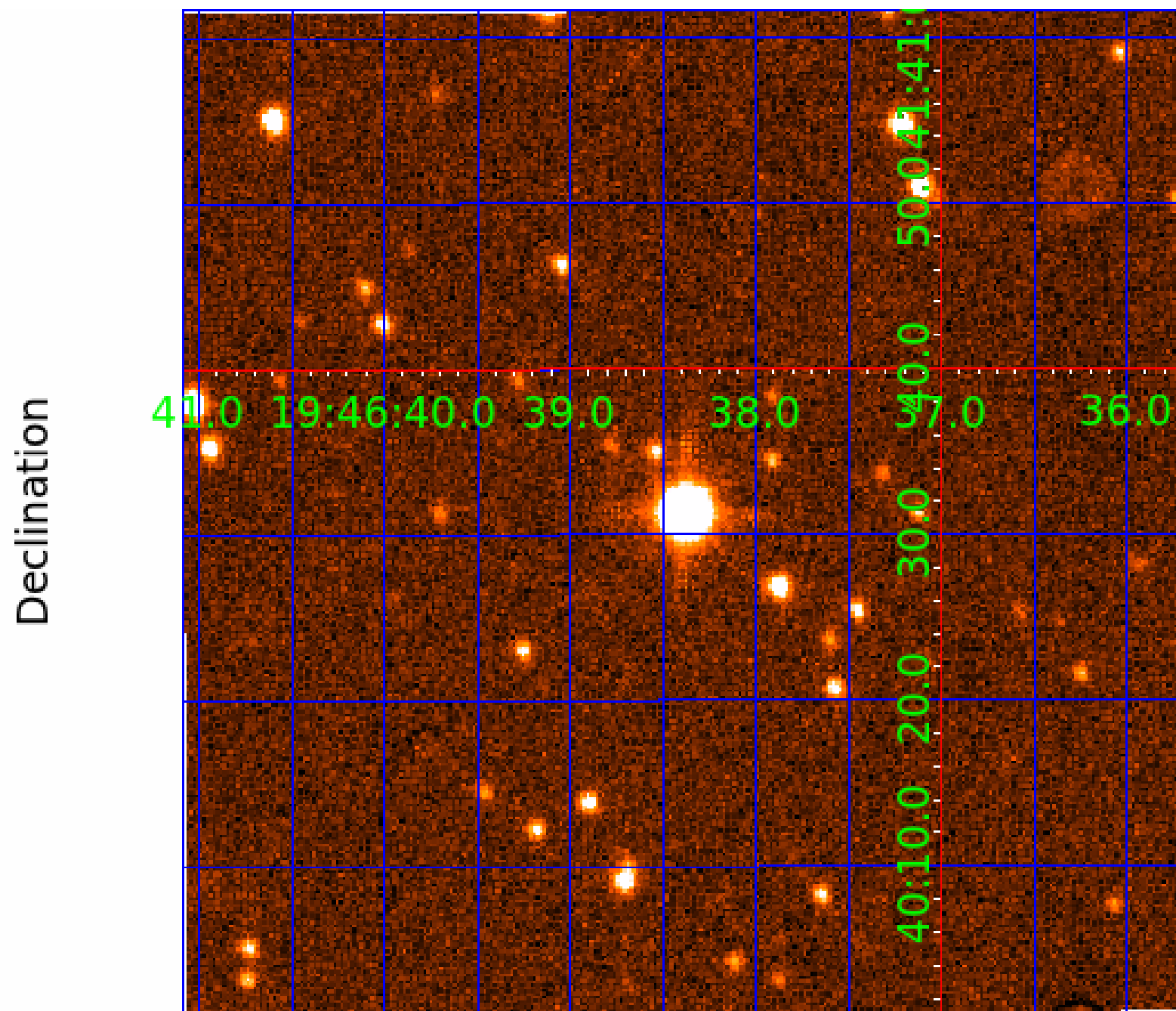
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 006302589

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006302589-01	OBS	No	0.704086	132.195363	190.1	1.744	9.9	11.0	2.85	7691	4.53	67735.27
006302589-02	OBS	No	1.314399	132.417247	384.8	8.957	9.7	12.7	2.85	7691	5.67	29467.69
006302589-03	OBS	No	1.443305	131.558672	203.3	4.500	13.4	-1.0	2.85	7691	4.11	26011.85
006302589-04	OBS	No	7.216522	136.645572	1480.9	13.866	9.4	11.5	2.85	7691	14.00	3042.37

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006302589-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006302589-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT
006302589-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_NOFITS
006302589-04	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

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

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

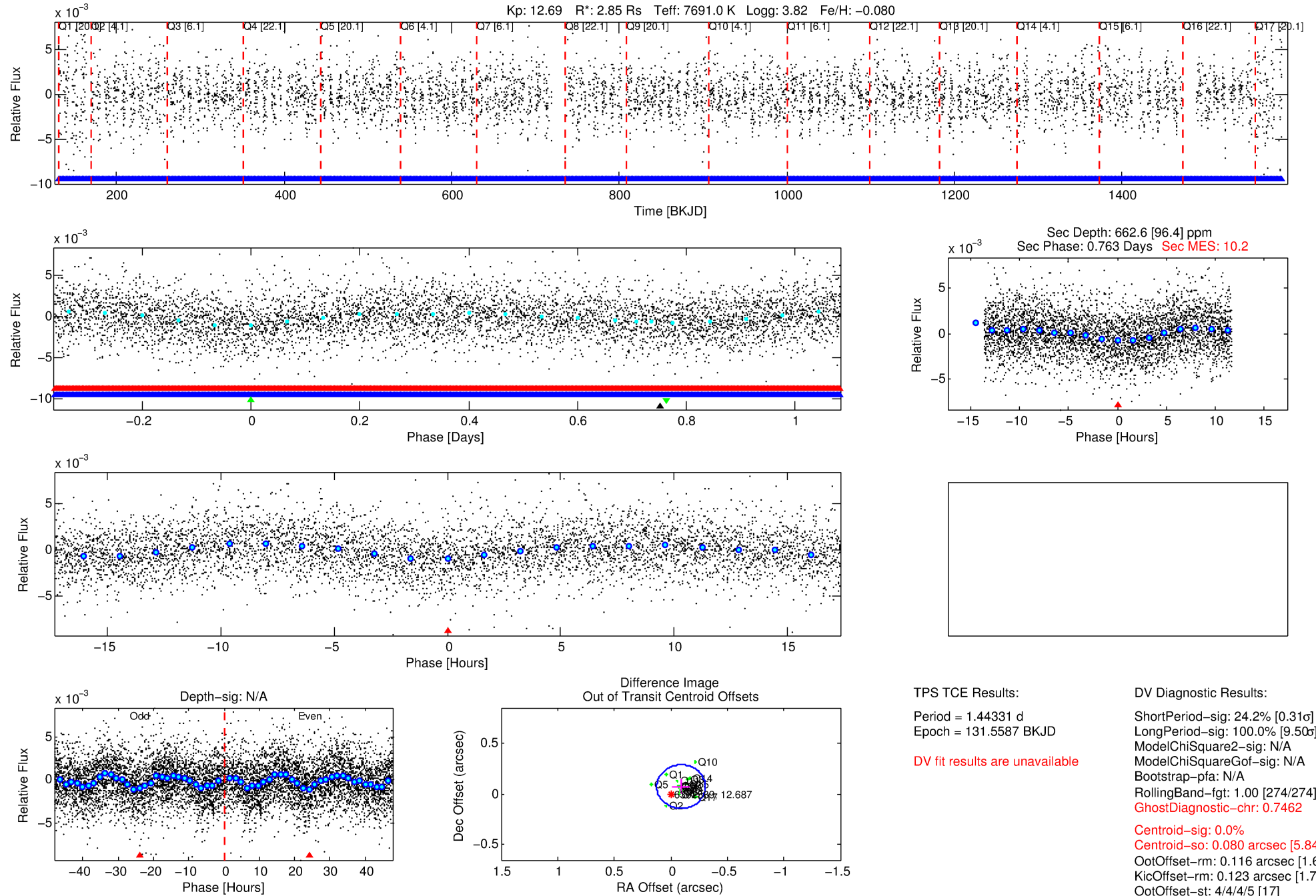
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006302589-03

No Significant Match Found

# DV One-Page Summary

KIC: 6302589 Candidate: 3 of 4 Period: 1.443 d



## TPS TCE Results:

Period = 1.44331 d  
Epoch = 131.5587 BKJD

**DV fit results are unavailable**

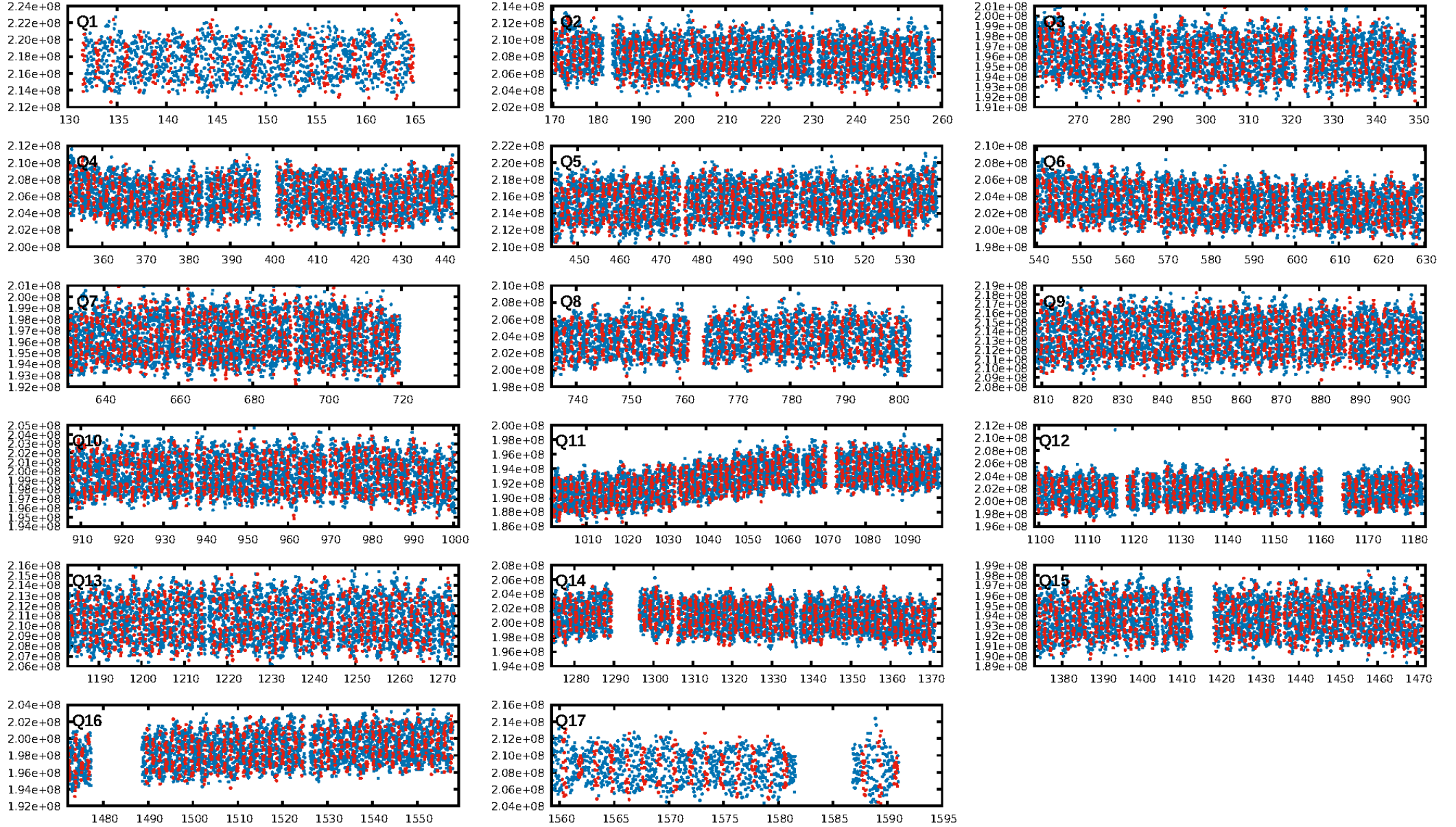
## DV Diagnostic Results:

ShortPeriod-sig: 24.2% [0.31 $\sigma$ ]  
LongPeriod-sig: 100.0% [9.50 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [274/274]  
**GhostDiagnostic-chr: 0.7462**  
**Centroid-sig: 0.0%**  
**Centroid-so: 0.080 arcsec [5.84 $\sigma$ ]**  
OotOffset-rm: 0.116 arcsec [1.62 $\sigma$ ]  
KicOffset-rm: 0.123 arcsec [1.72 $\sigma$ ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 1.00 [17/17]  
DiffImageOverlap-fno: 0.00 [0/17]

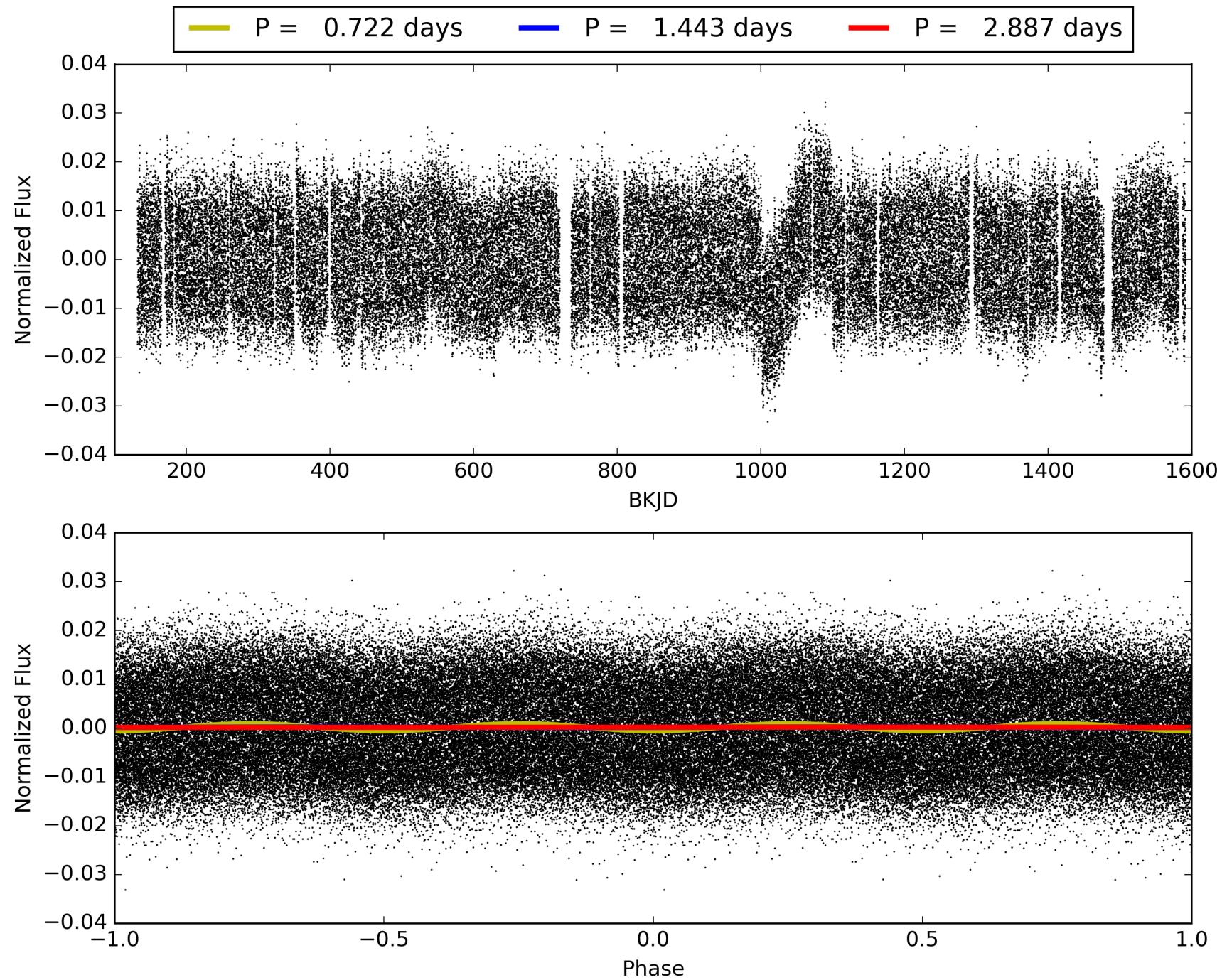
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:23:55 Z

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

# TCE 006302589-03, PDC Light Curves

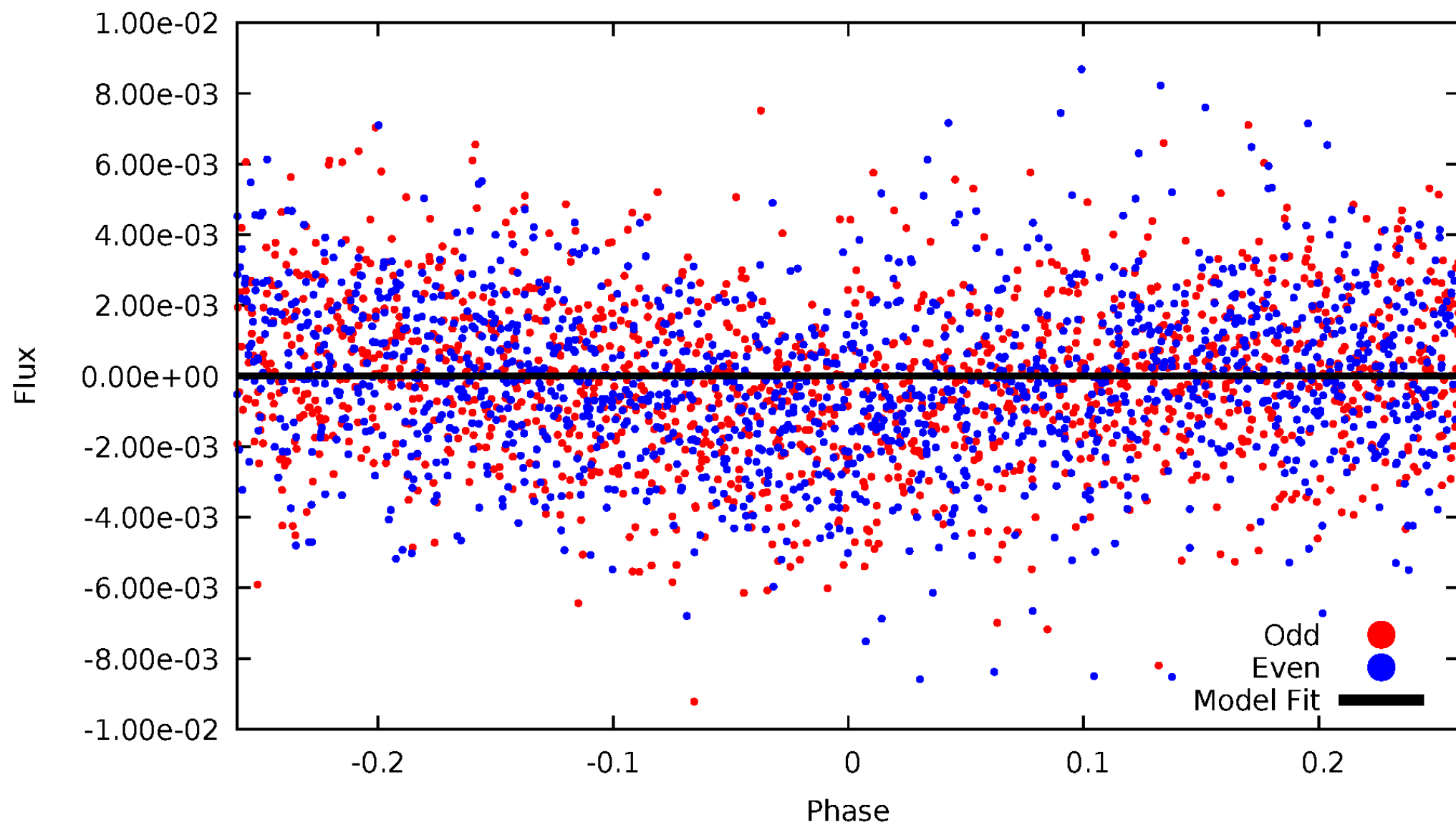


TCE 006302589-03



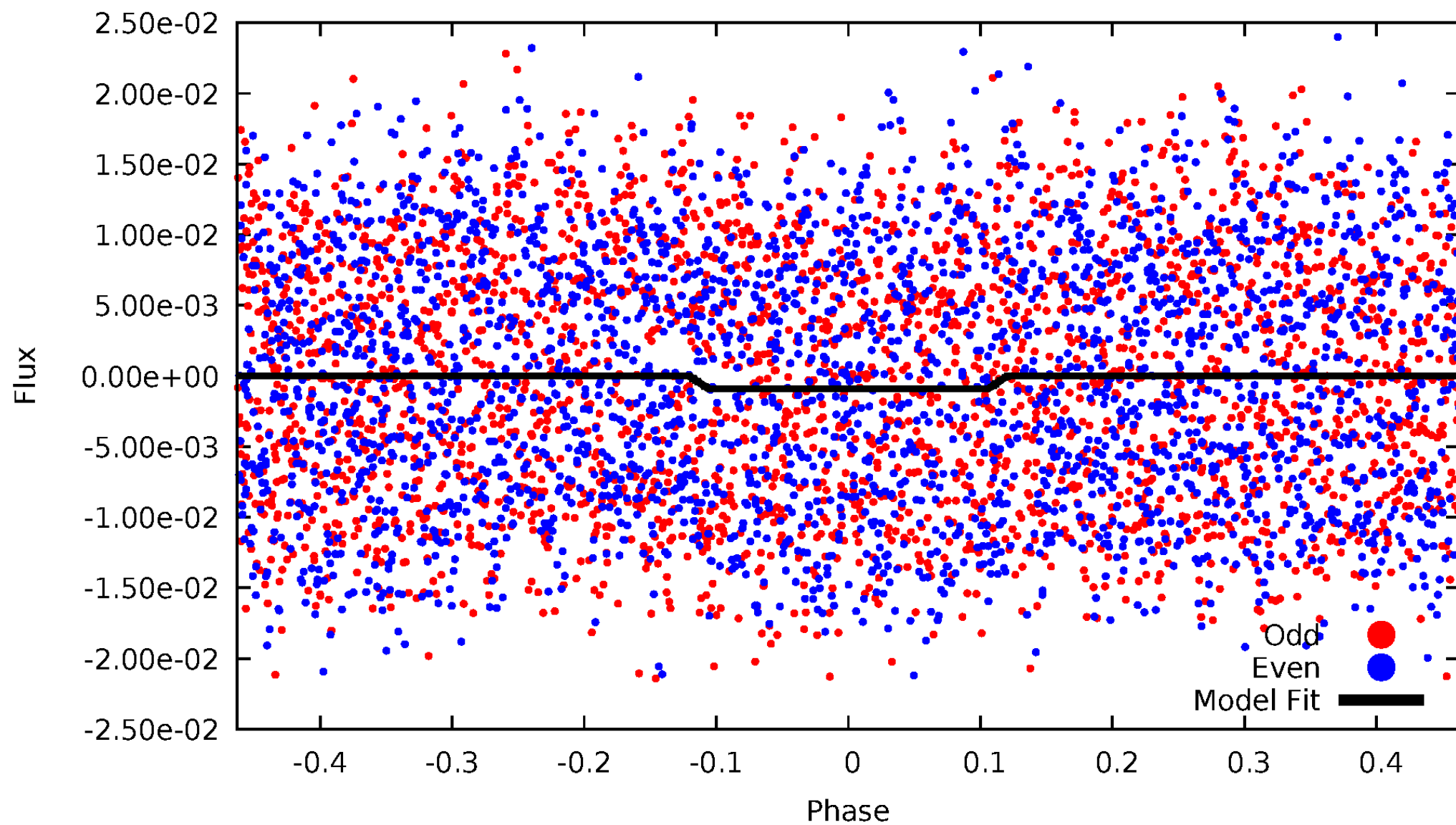
# DV Odd/Even

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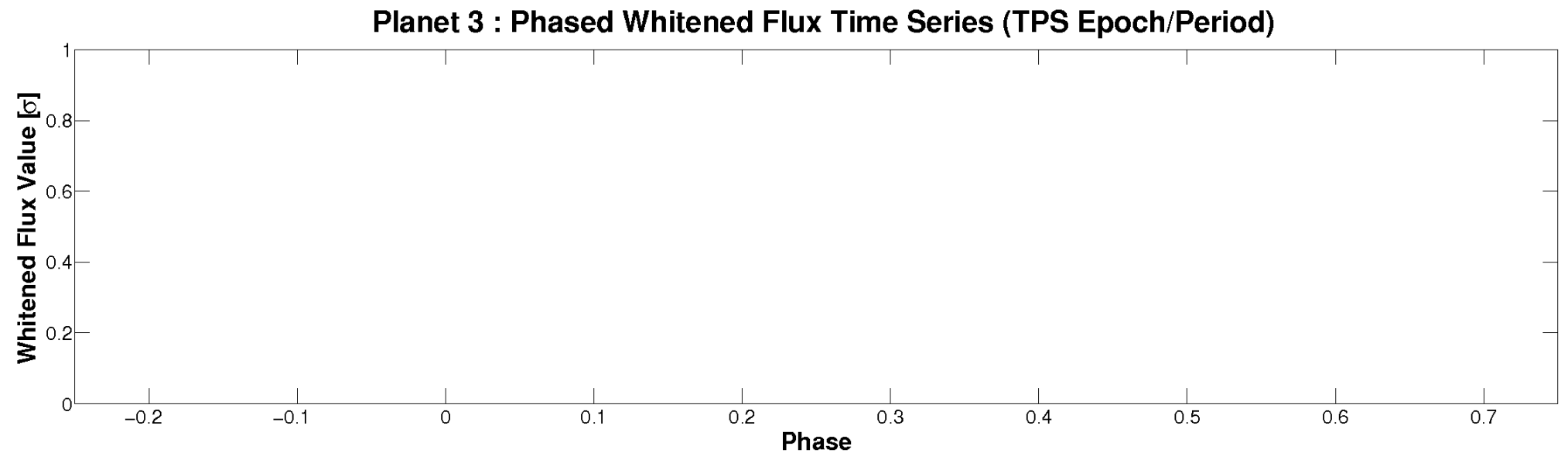
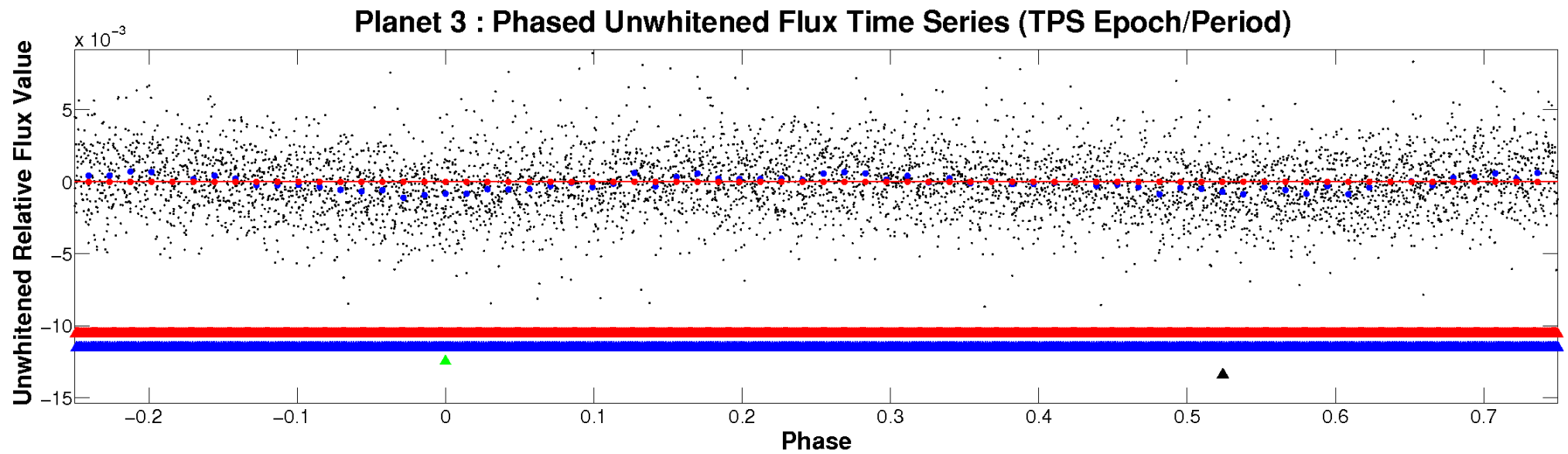


# ALT Odd/Even

TCE 006302589-03

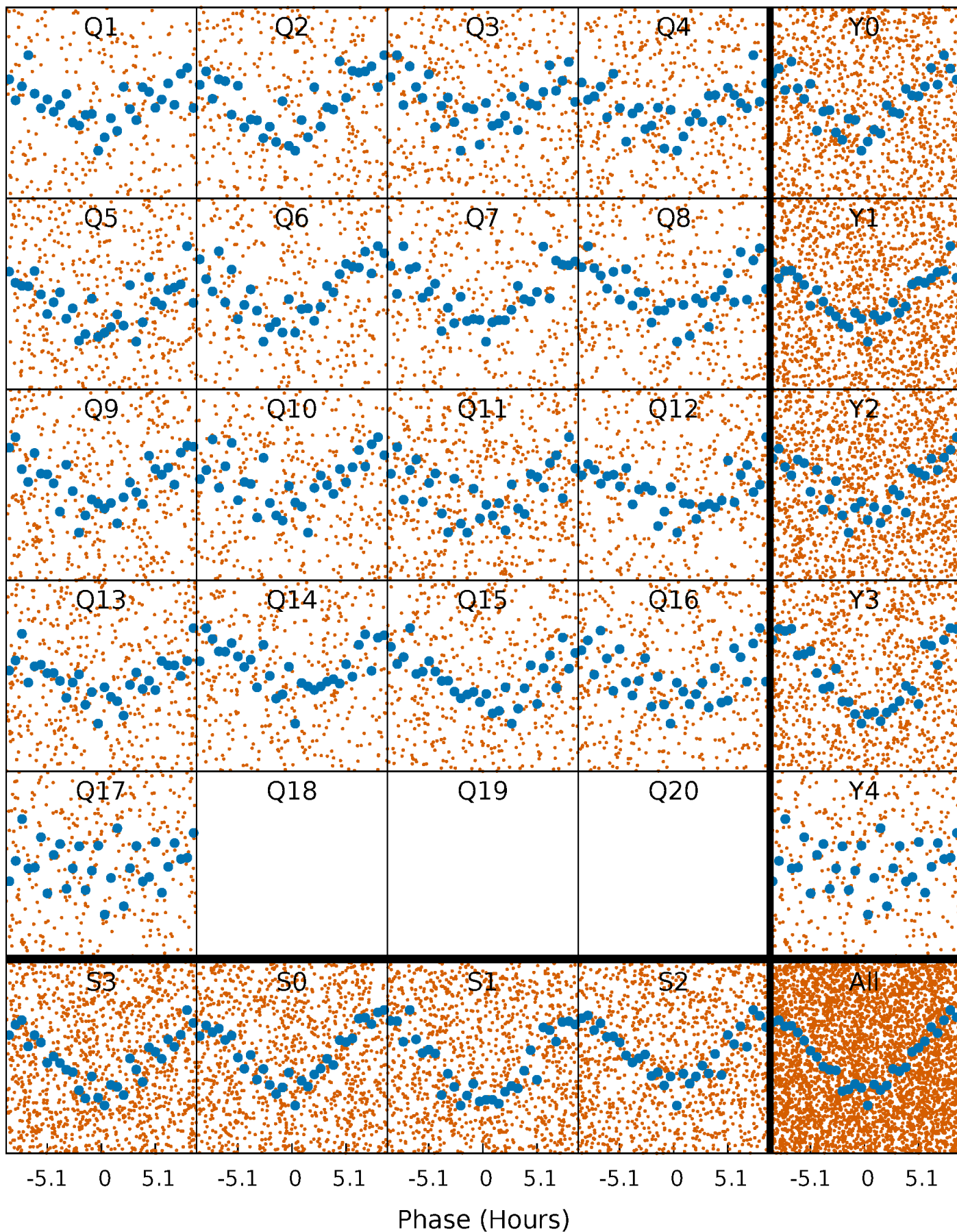


# Non-Whitened Vs. Whitened Light Curve



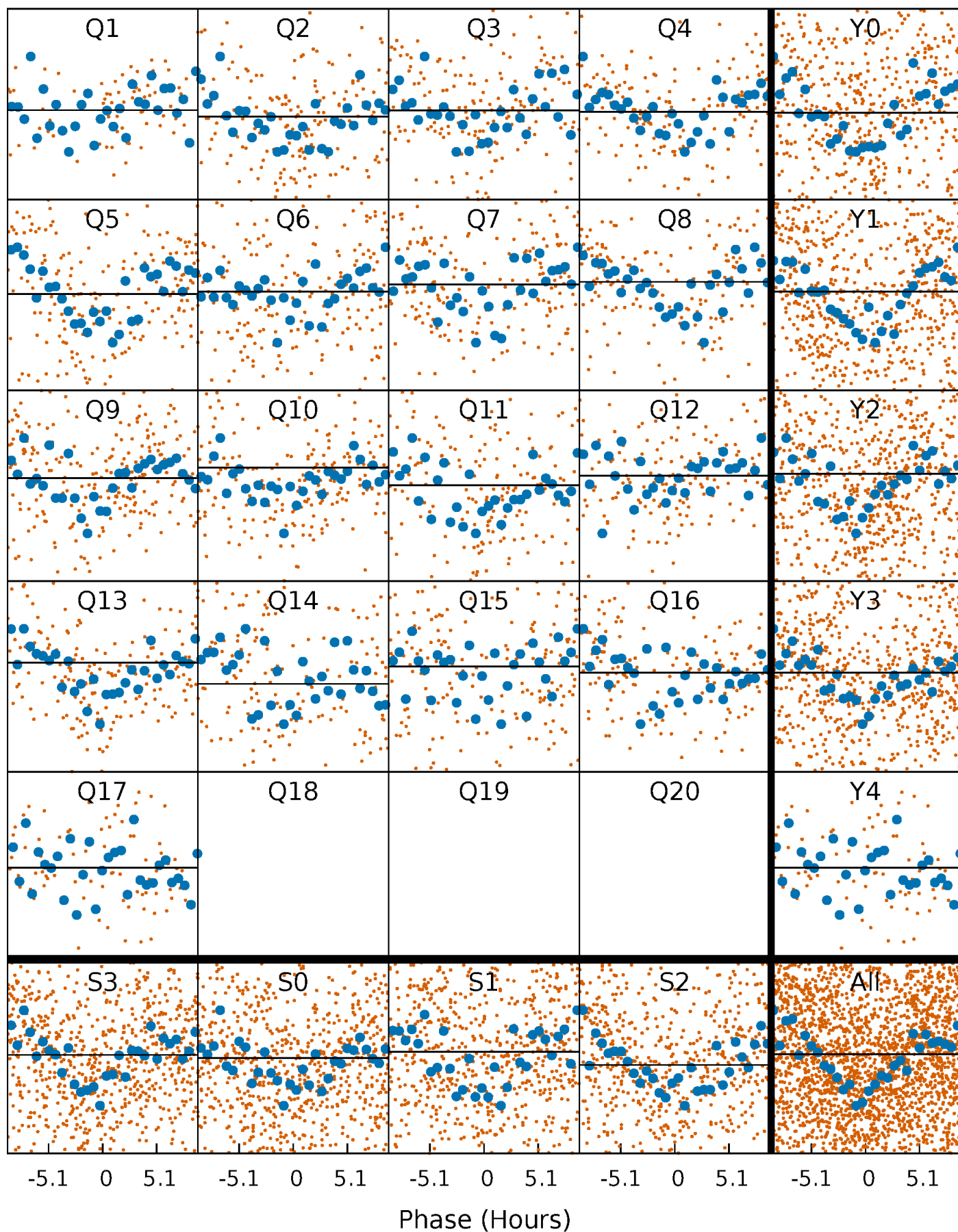
# PDC Quarter-Phased Transit Curves

TCE 006302589-03 P= 1.443305 Days  $T_0=131.558672$  (BKJD)



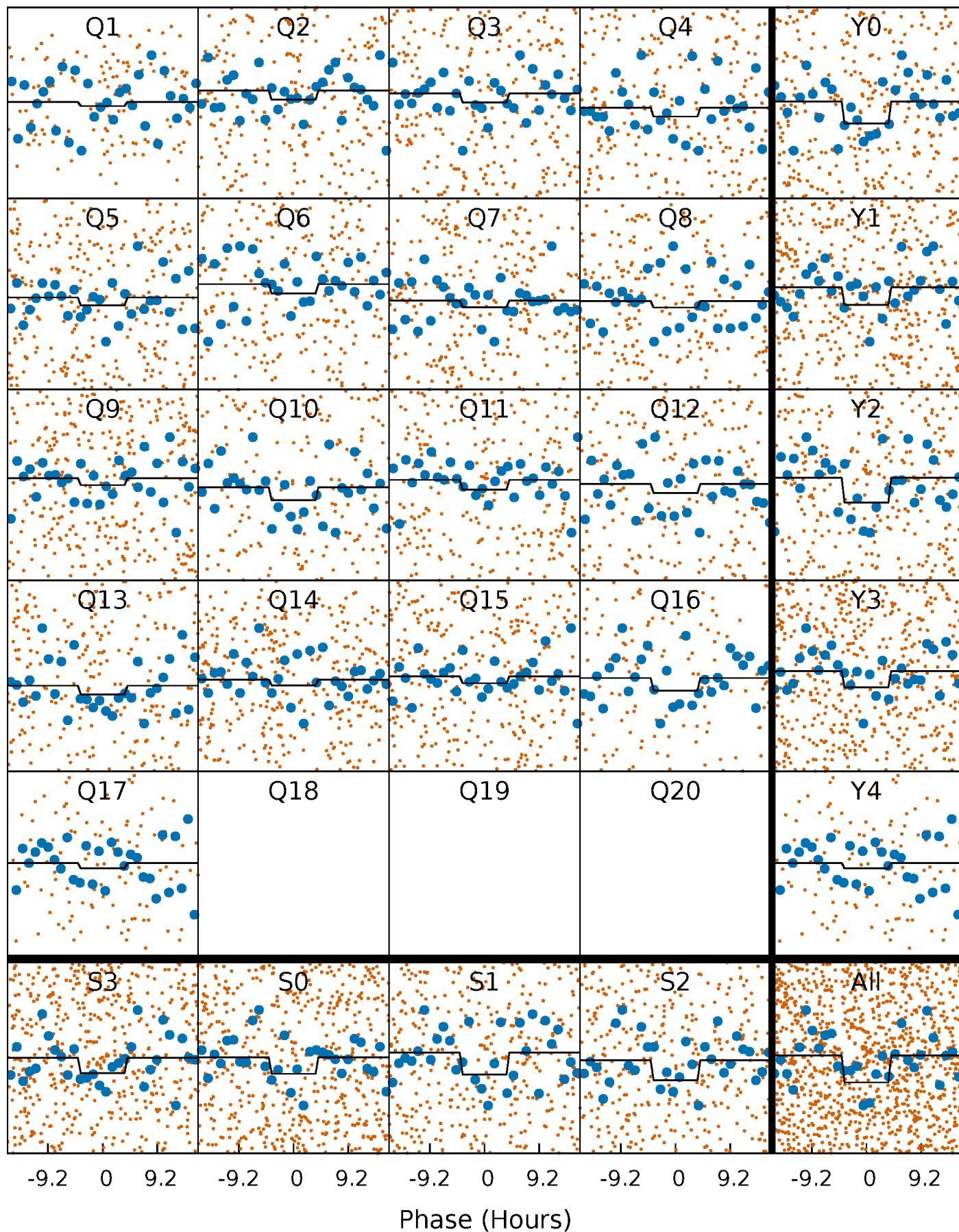
# DV Quarter-Phased Transit Curves

TCE 006302589-03 P= 1.443305 Days  $T_0=131.558672$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

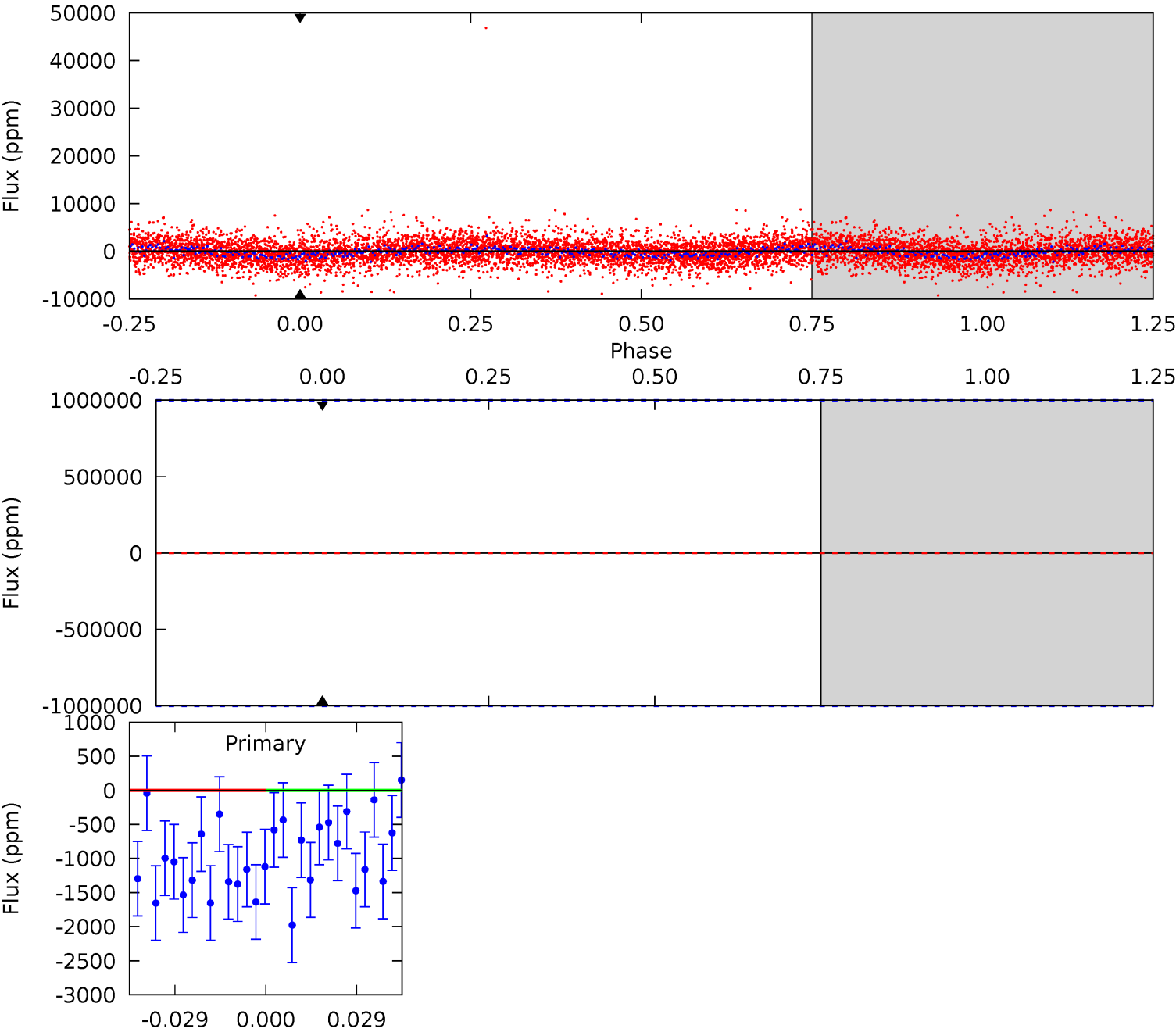
TCE 006302589-03 P= 1.443305 Days  $T_0=131.563323$  (BKJD)



# DV Model-Shift Uniqueness Test

006302589-03, P = 1.443305 Days, E = 131.558672 Days

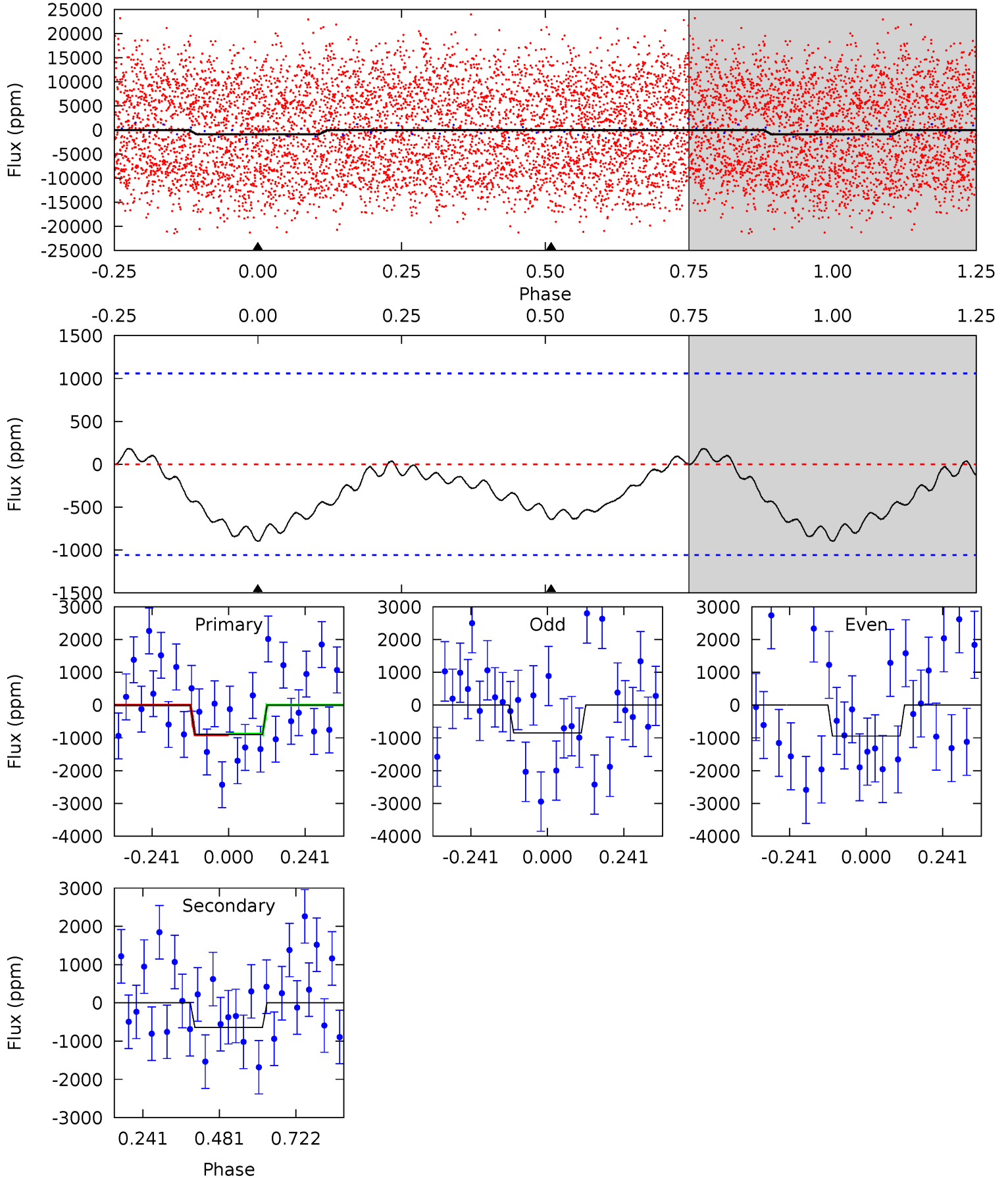
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

006302589-03, P = 1.443305 Days, E = 131.563323 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
3.71	2.66	0	0	4.38	1.17	0.35	3.71	3.71	2.66	2.66	0.20	1.01	0.17	0.05



### Stellar Parameters For KIC 006302589

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7691^{+211}_{-316}$	$3.820^{+0.352}_{-0.088}$	$-0.080^{+0.200}_{-0.350}$	$2.846^{+0.394}_{-1.181}$	$1.953^{+0.083}_{-0.471}$	$0.119^{+0.340}_{-0.035}$
	+3%/-4%	+9%/-2%	+250%/-438%	+14%/-41%	+4%/-24%	+285%/-29%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006302589-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$20.90^{+22.86}_{-15.25}$	$4380^{+317}_{-469}$	$5211^{+35067}_{-45441}$	$1.937^{+215.914}_{-200.992}$
Alt.	$-644 \pm 242$	$21.93^{+23.49}_{-15.71}$	$4408^{+290}_{-436}$	$3997^{+4092}_{-7502}$	$0.676^{+6.714}_{-0.525}$

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

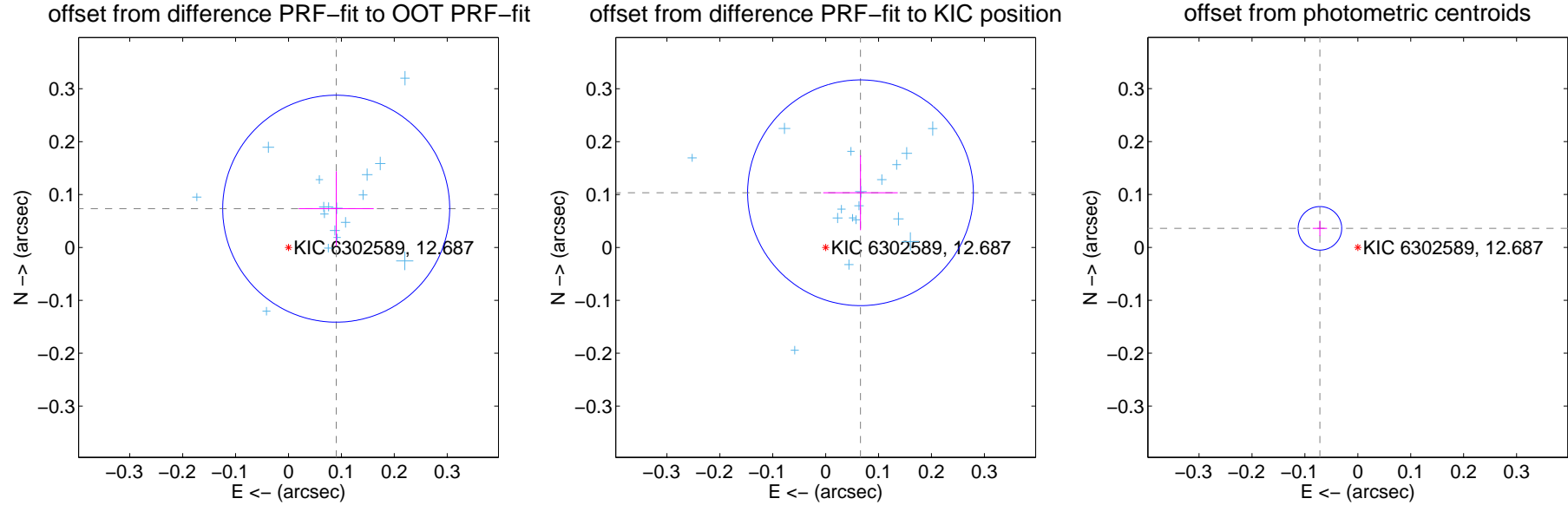
## DV Centroid Data

Supplemental centroid analysis for 006302589-03. Kepler magnitude: 12.69. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

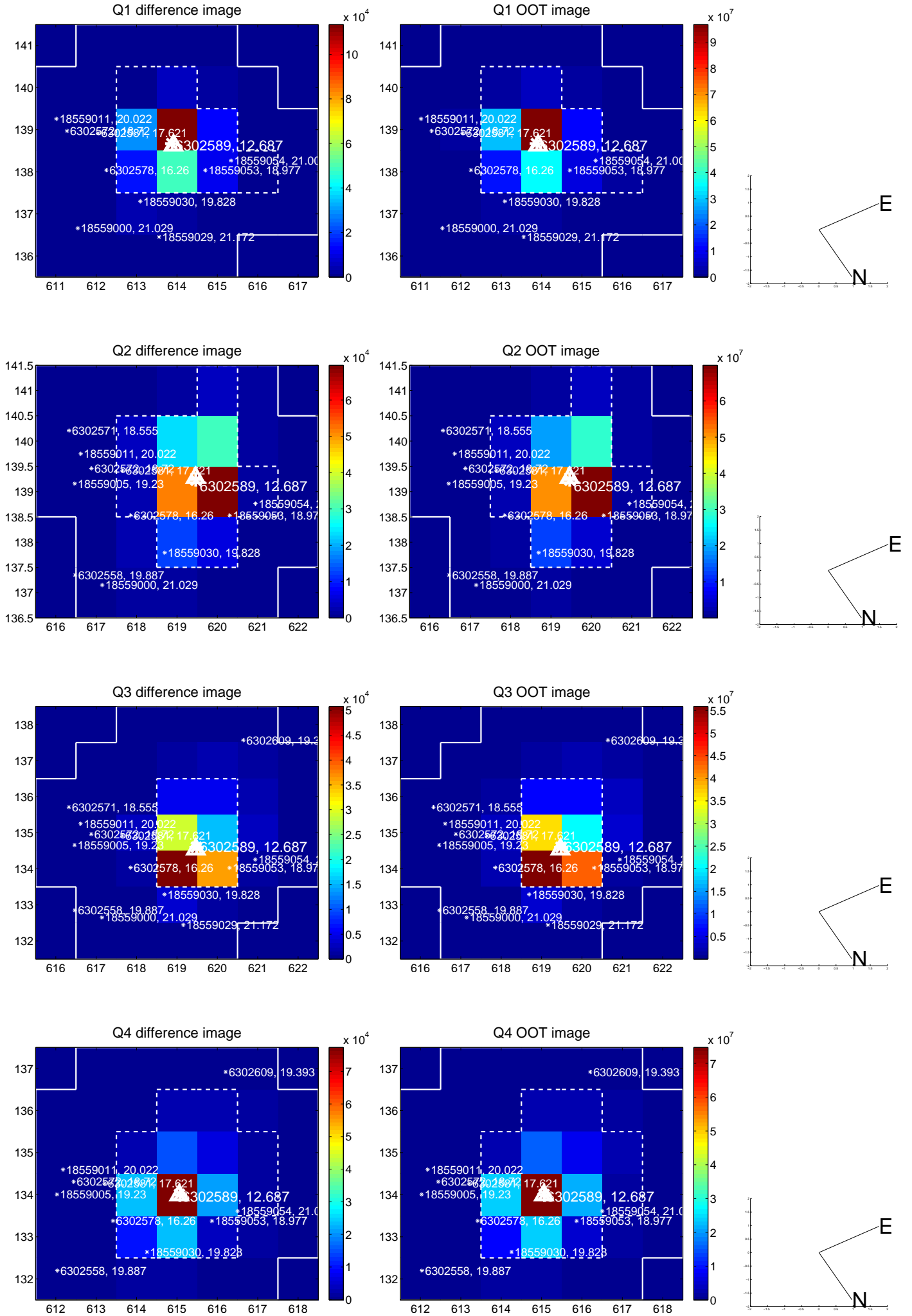
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.116 \pm 0.072$	1.62	$-0.090 \pm 0.071$	$0.073 \pm 0.071$
PRF-fit source offset from KIC position	$0.123 \pm 0.071$	1.72	$-0.066 \pm 0.070$	$0.103 \pm 0.071$
photometric centroid source offset	$0.08 \pm 0.01$	5.84	$0.07 \pm 0.01$	$0.04 \pm 0.01$

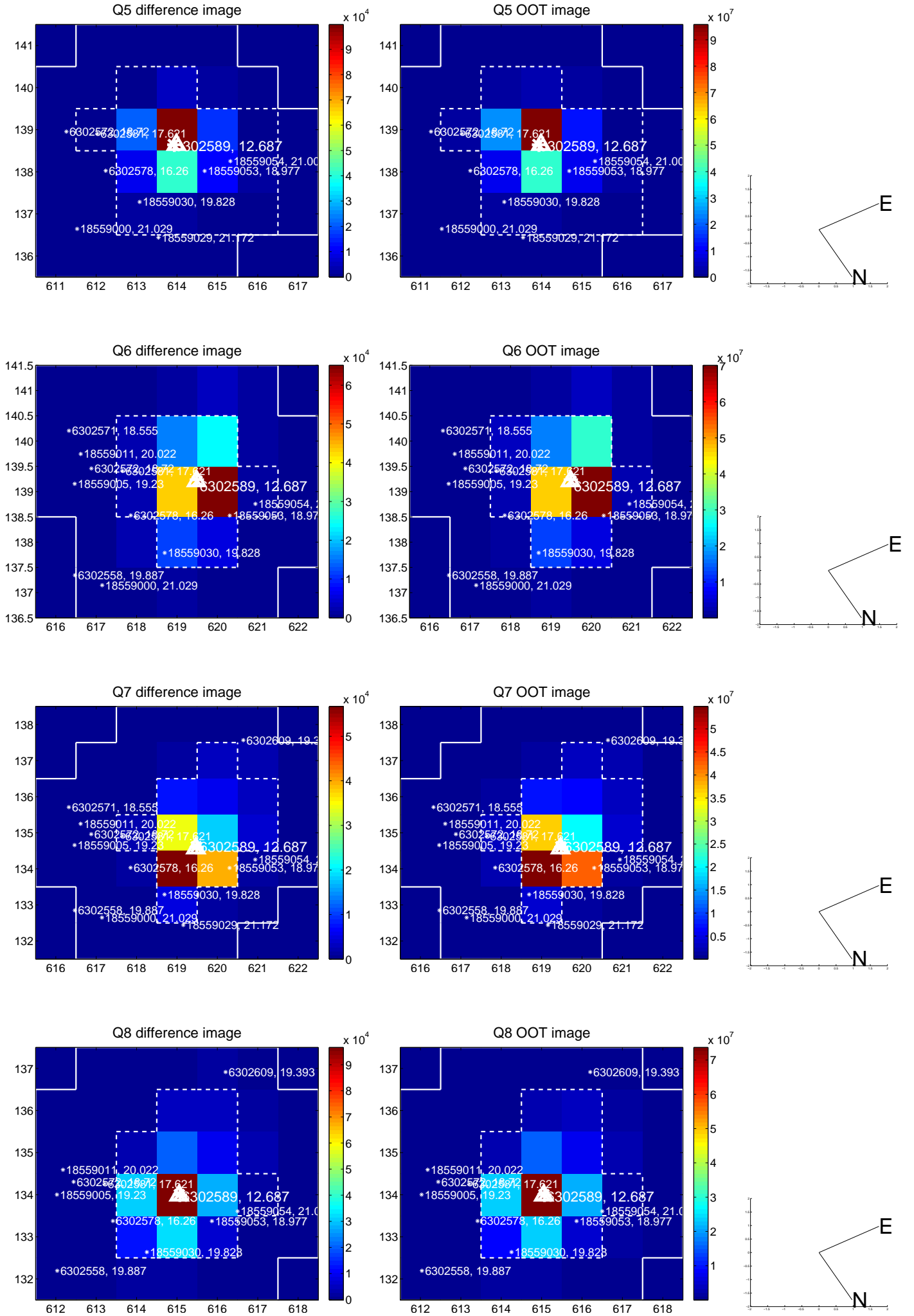


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

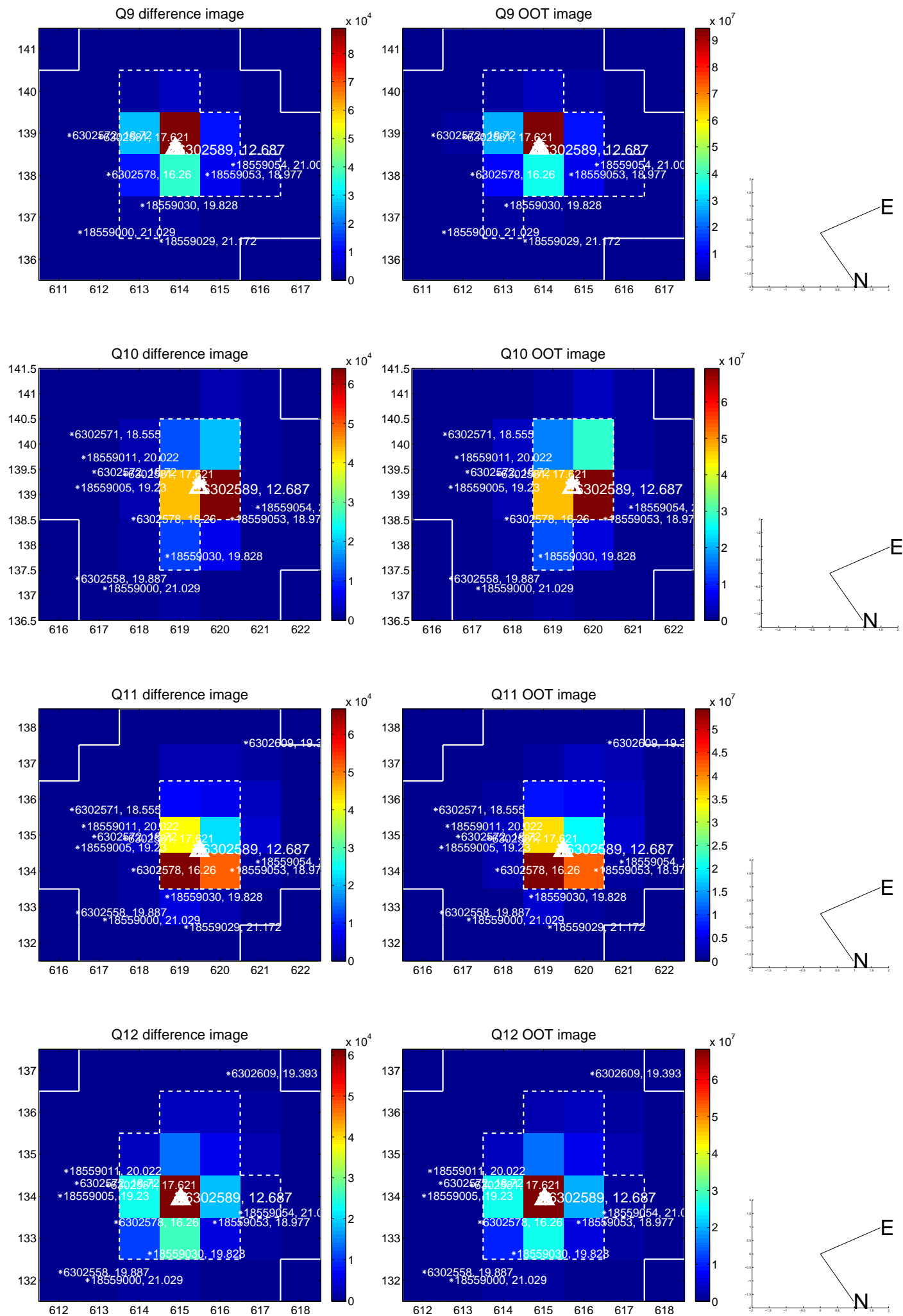
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



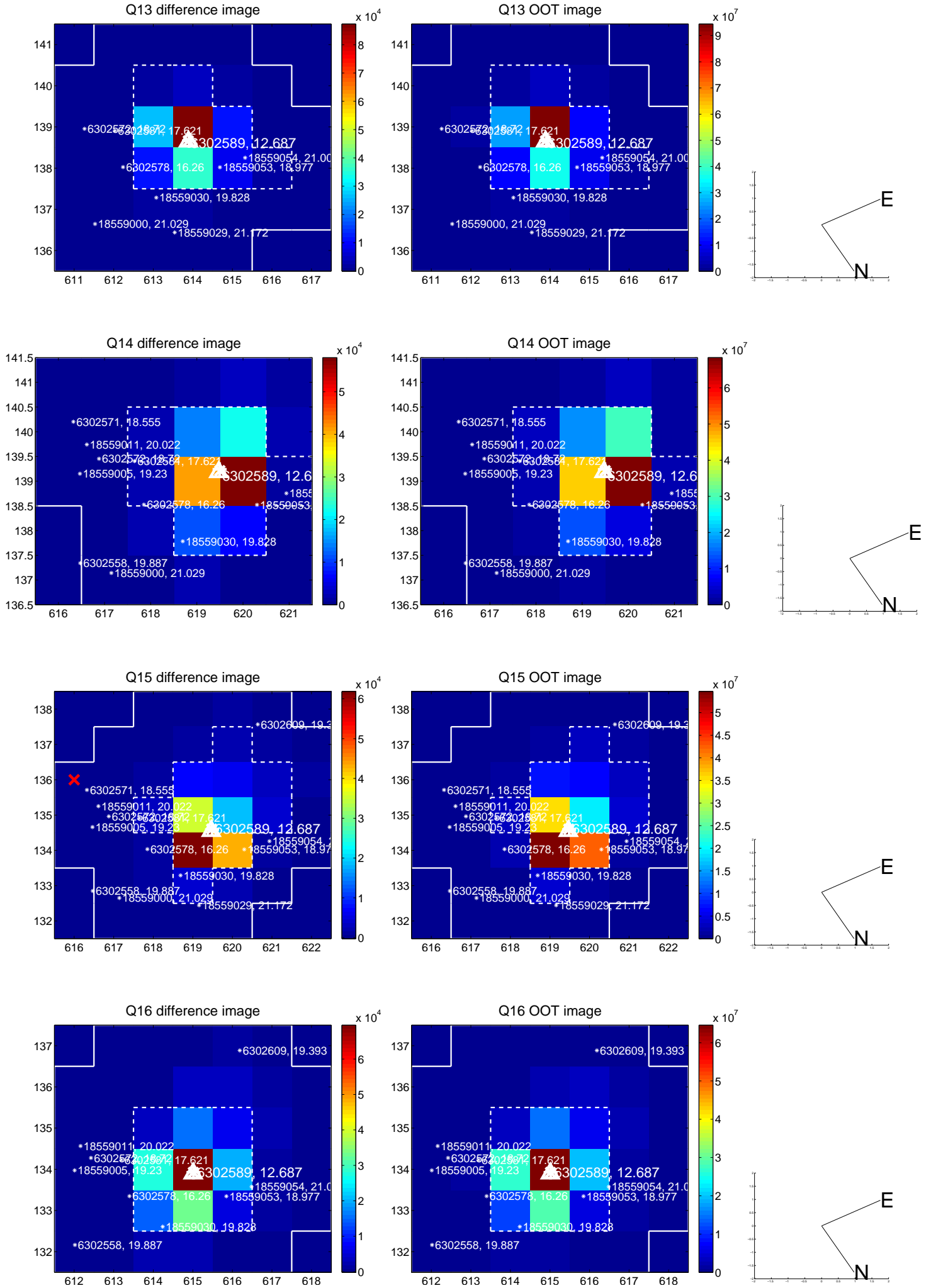
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



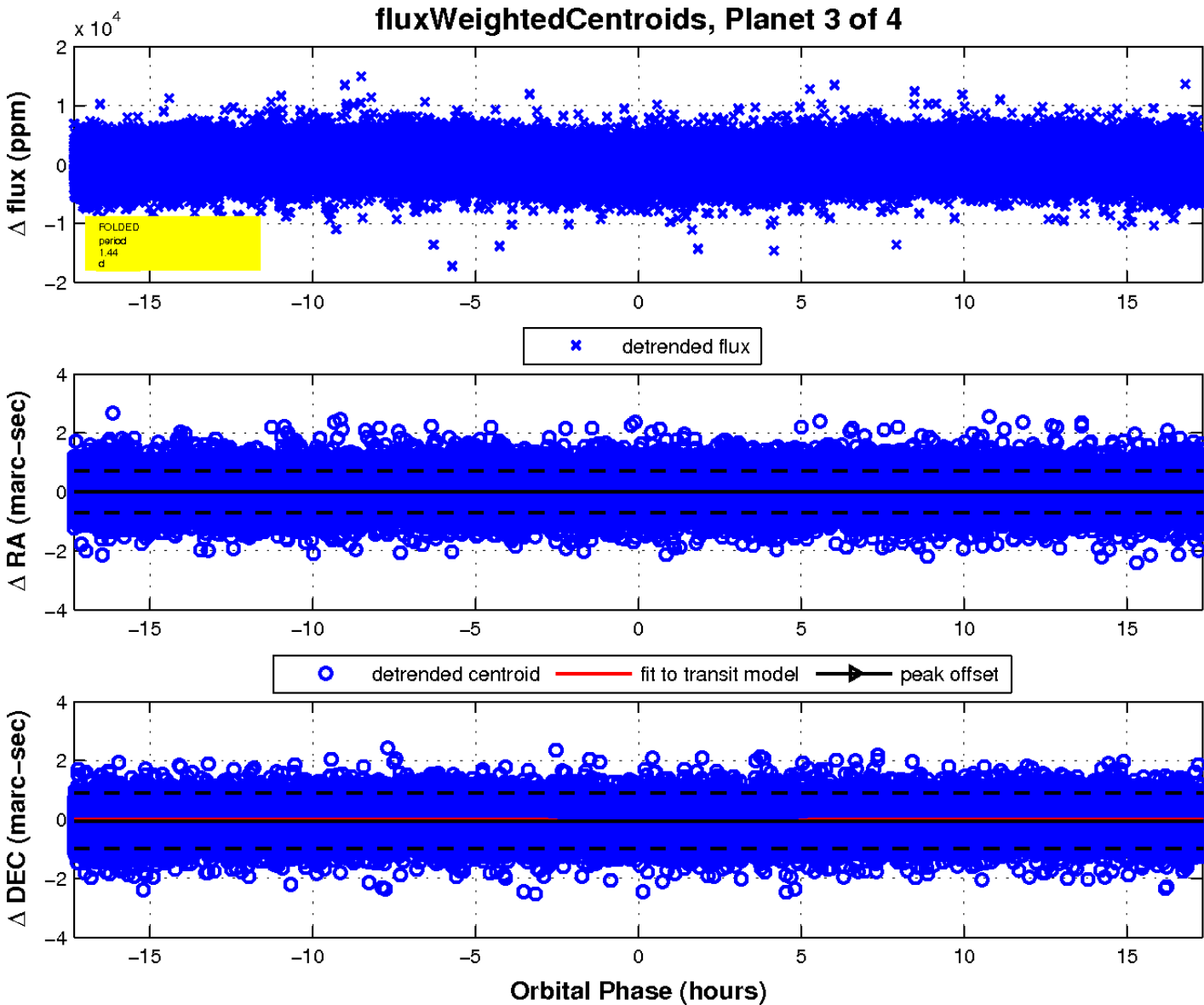
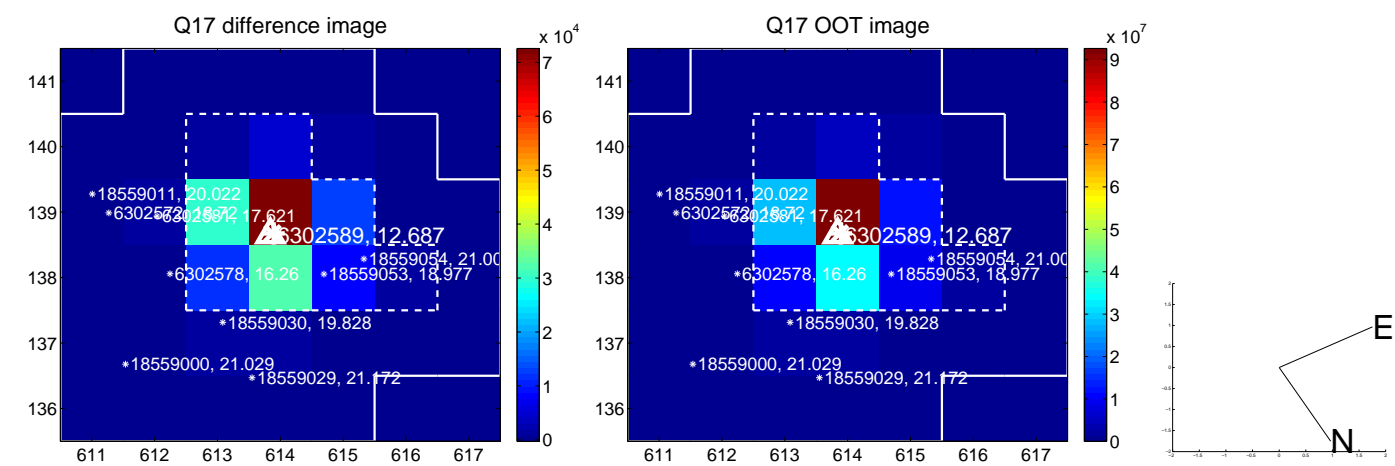
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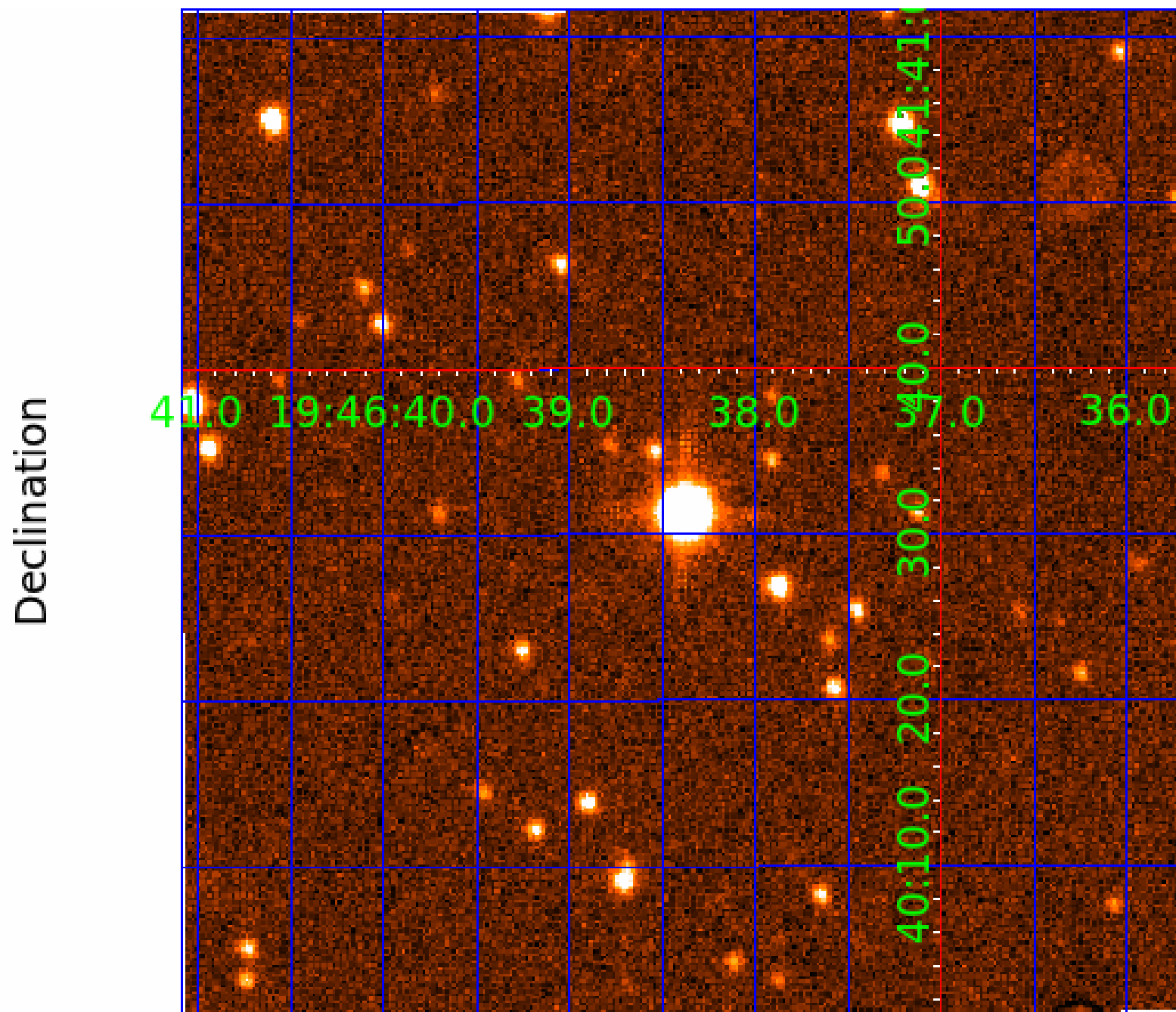
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



# KIC 006302589

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
006302589-01	OBS	No	0.704086	132.195363	190.1	1.744	9.9	11.0	2.85	7691	4.53	67735.27
006302589-02	OBS	No	1.314399	132.417247	384.8	8.957	9.7	12.7	2.85	7691	5.67	29467.69
006302589-03	OBS	No	1.443305	131.558672	203.3	4.500	13.4	-1.0	2.85	7691	4.11	26011.85
006302589-04	OBS	No	7.216522	136.645572	1480.9	13.866	9.4	11.5	2.85	7691	14.00	3042.37

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006302589-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT
006302589-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT
006302589-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—CENT_NOFITS
006302589-04	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

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

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

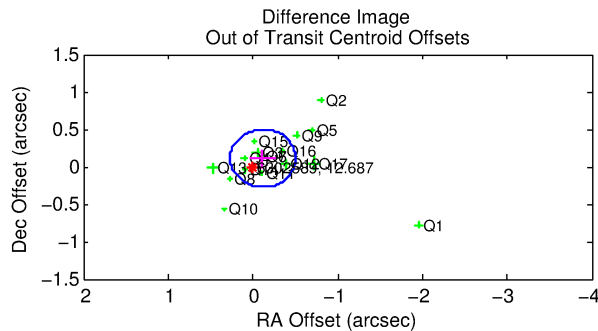
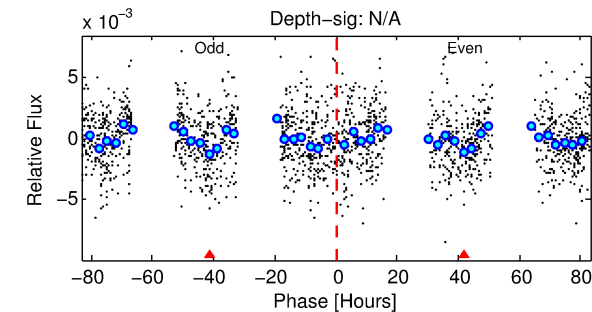
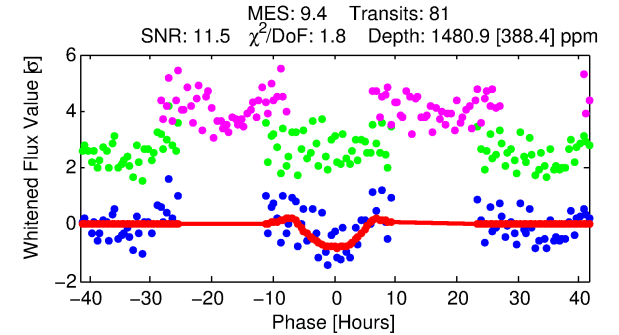
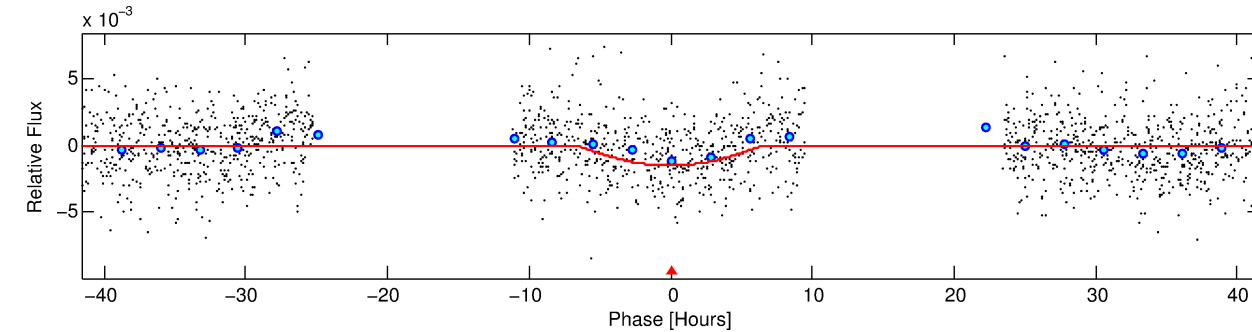
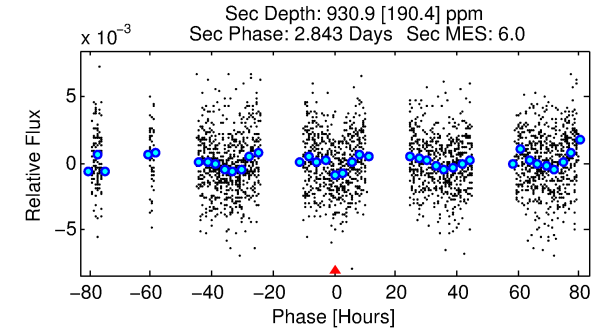
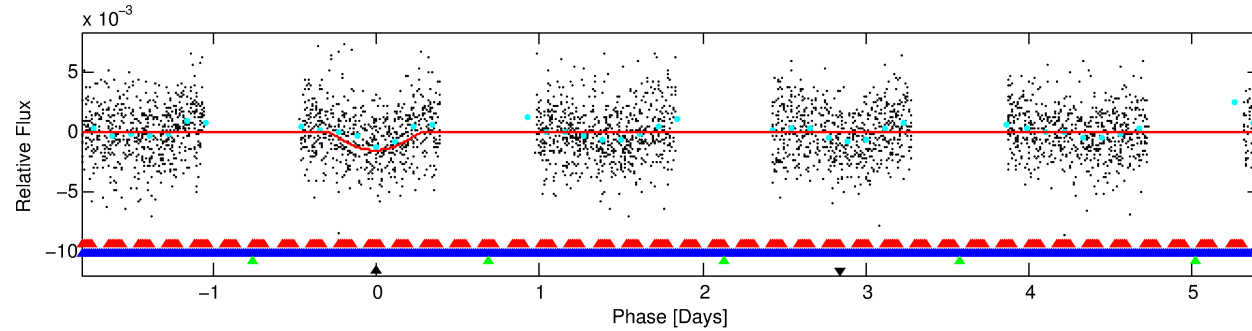
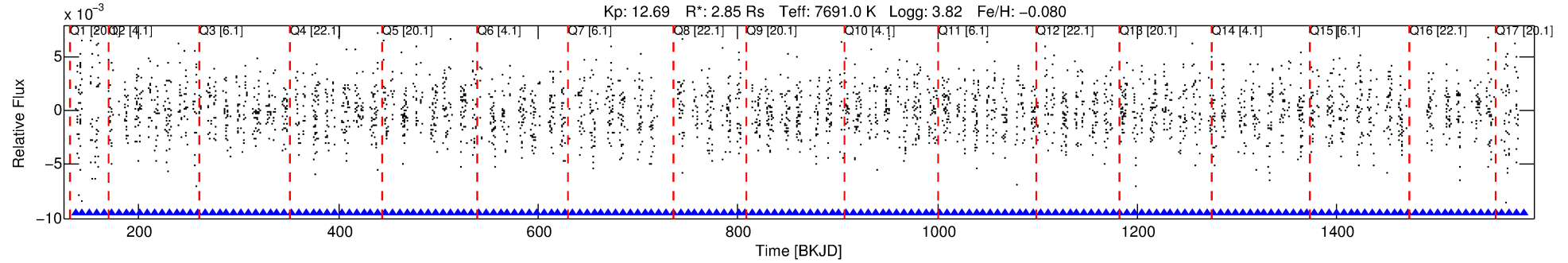
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 006302589-04

No Significant Match Found

# DV One-Page Summary

KIC: 6302589 Candidate: 4 of 4 Period: 7.217 d



## DV Fit Results:

Period = 7.21652 [0.00032] d  
Epoch = 136.6456 [0.0335] BKJD  
Rp/R\* = 0.0451 [0.0156]  
a/R\* = 1.90 [0.38]  
b = 0.96 [0.05]  
Seff = 3042.37 [1913.33]  
Teq = 1894 [298] K  
Rp = 14.00 [7.57] Re  
a = 0.0914 [0.0353] AU  
Ag = 21.80 [20.57] [1.01σ]  
Teffp = 6327 [1171] K [3.67σ]

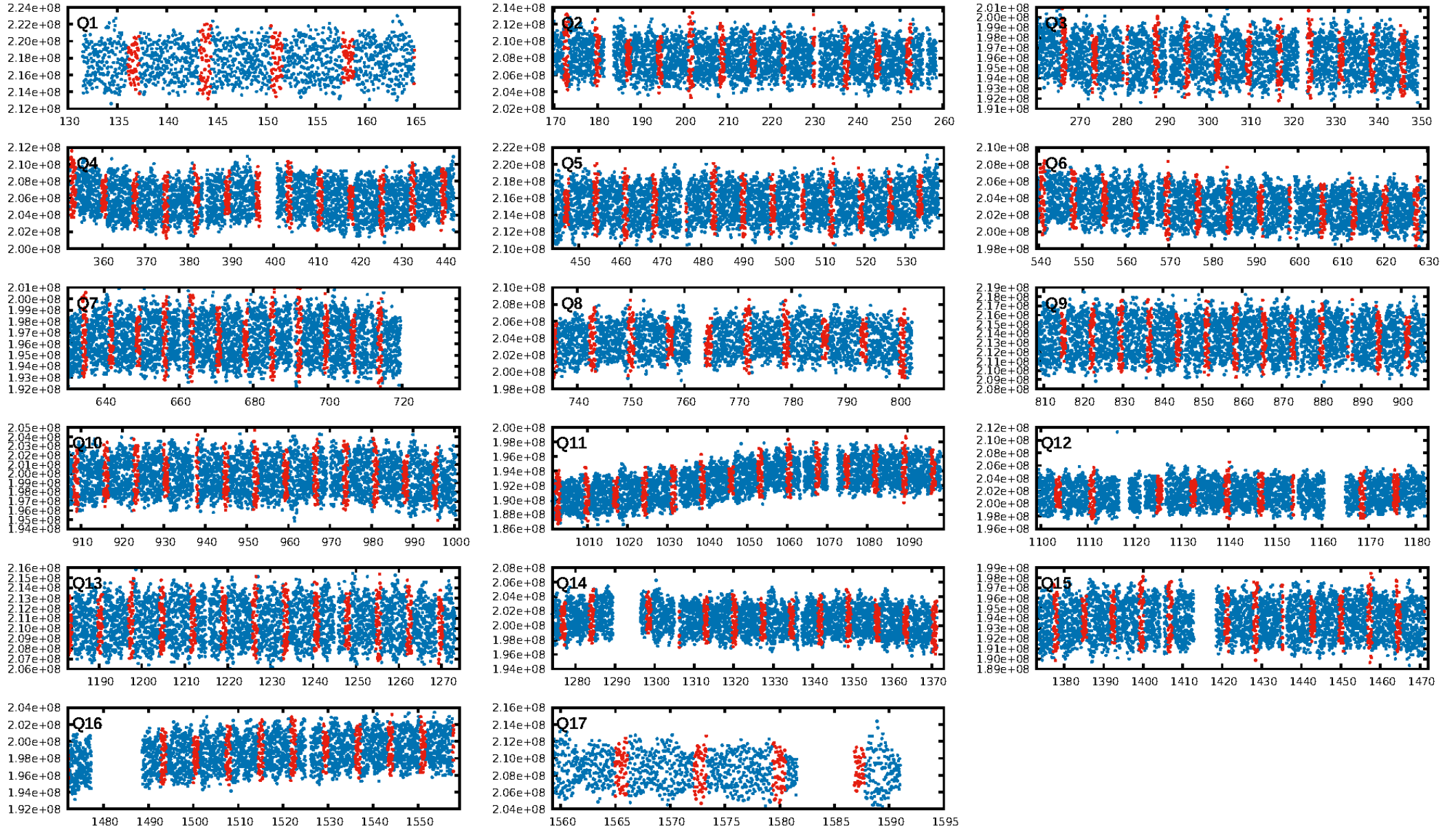
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [9.50σ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 1.6%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 1.00 [78/78]  
GhostDiagnostic-chr: 1.188  
Centroid-sig: 0.47.6%  
**Centroid-so: 0.065 arcsec [3.00σ]**  
OotOffset-rm: 0.162 arcsec [1.26σ]  
OotOffset-st: 4/4/4/5 [17]  
KicOffset-rm: 0.154 arcsec [1.19σ]  
KicOffset-st: 4/4/4/5 [17]  
DiffImageQuality-fgm: 0.76 [13/17]  
DiffImageOverlap-fno: 0.00 [0/17]

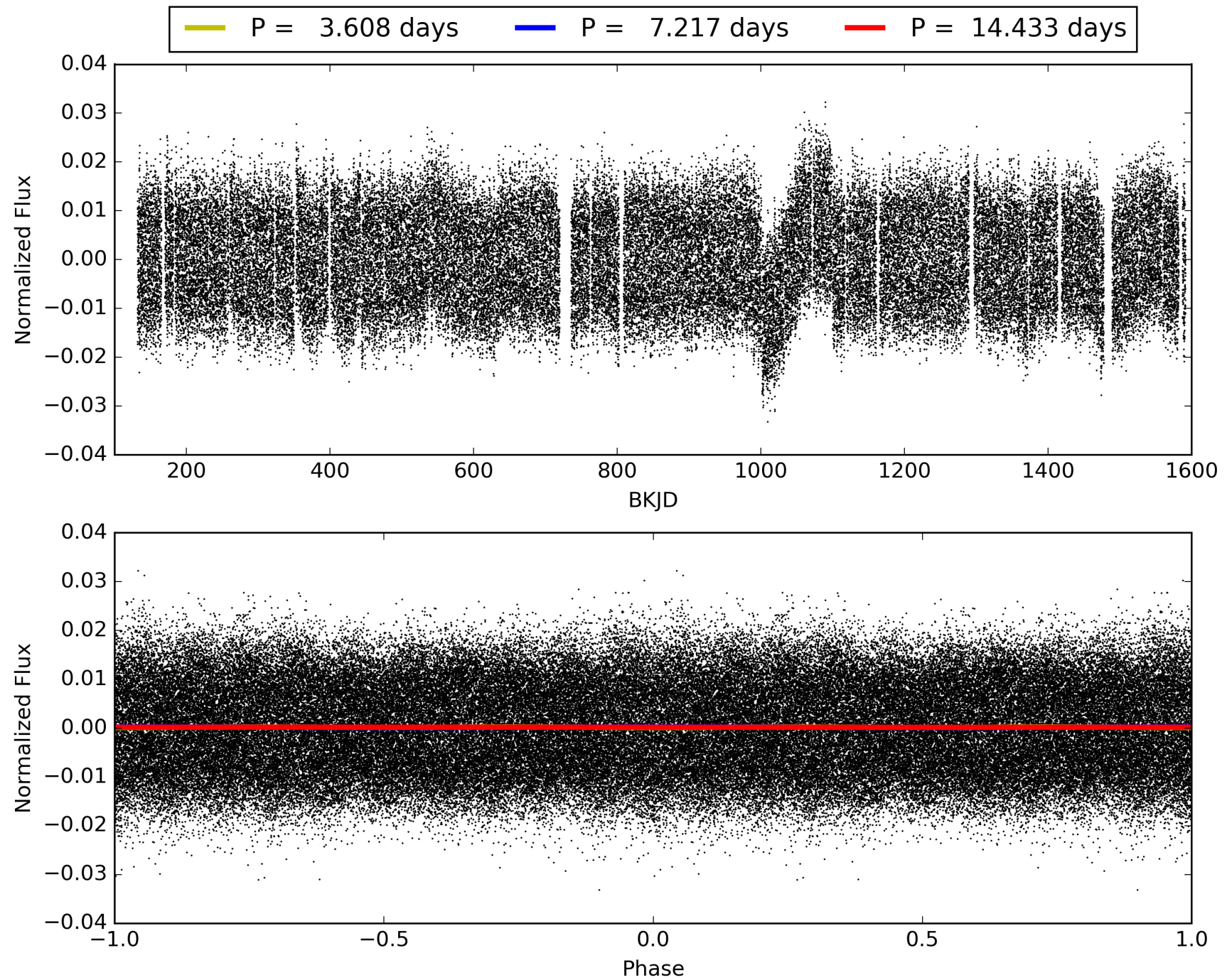
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:24:00 Z

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

# TCE 006302589-04, PDC Light Curves

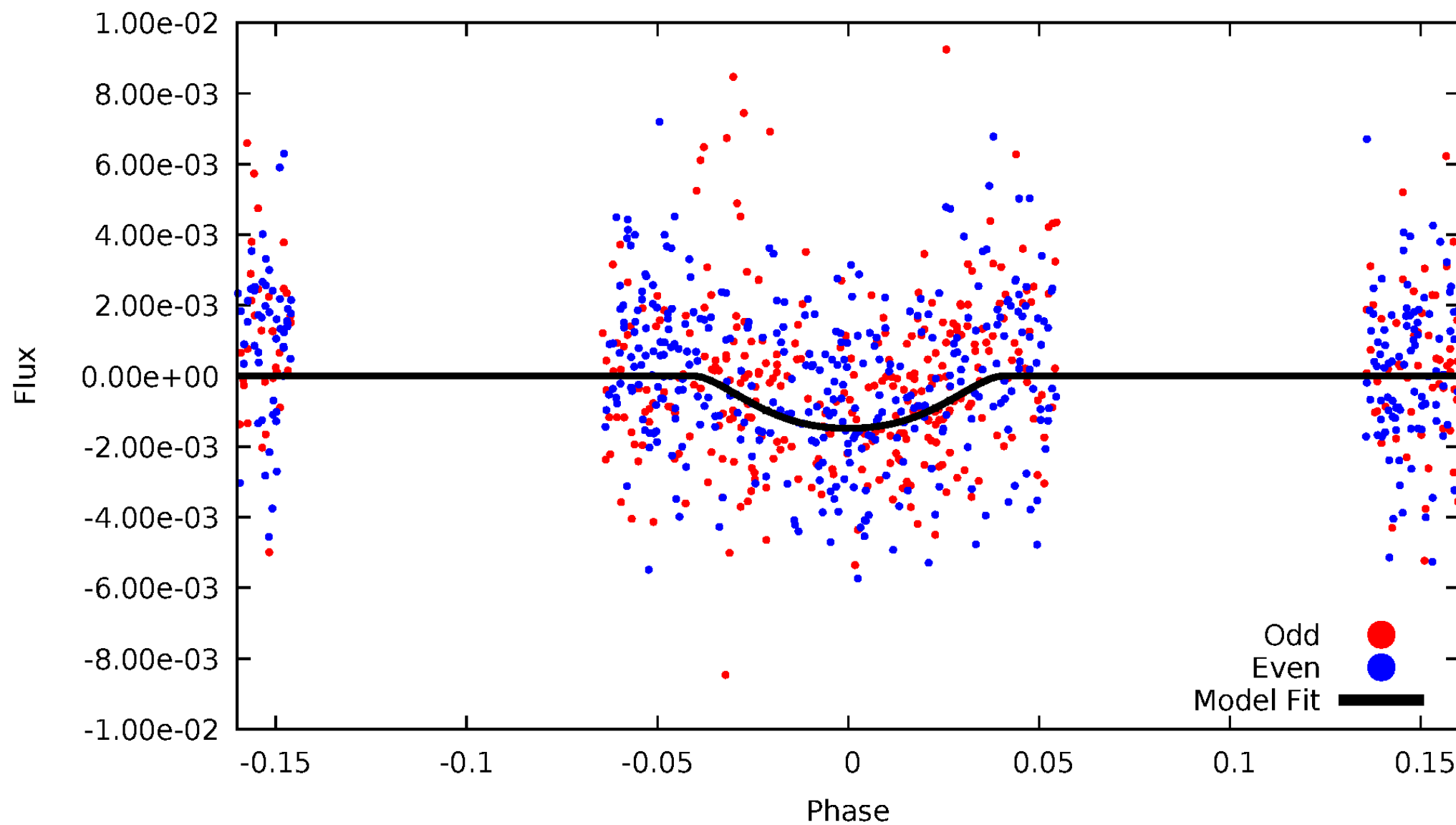


TCE 006302589-04



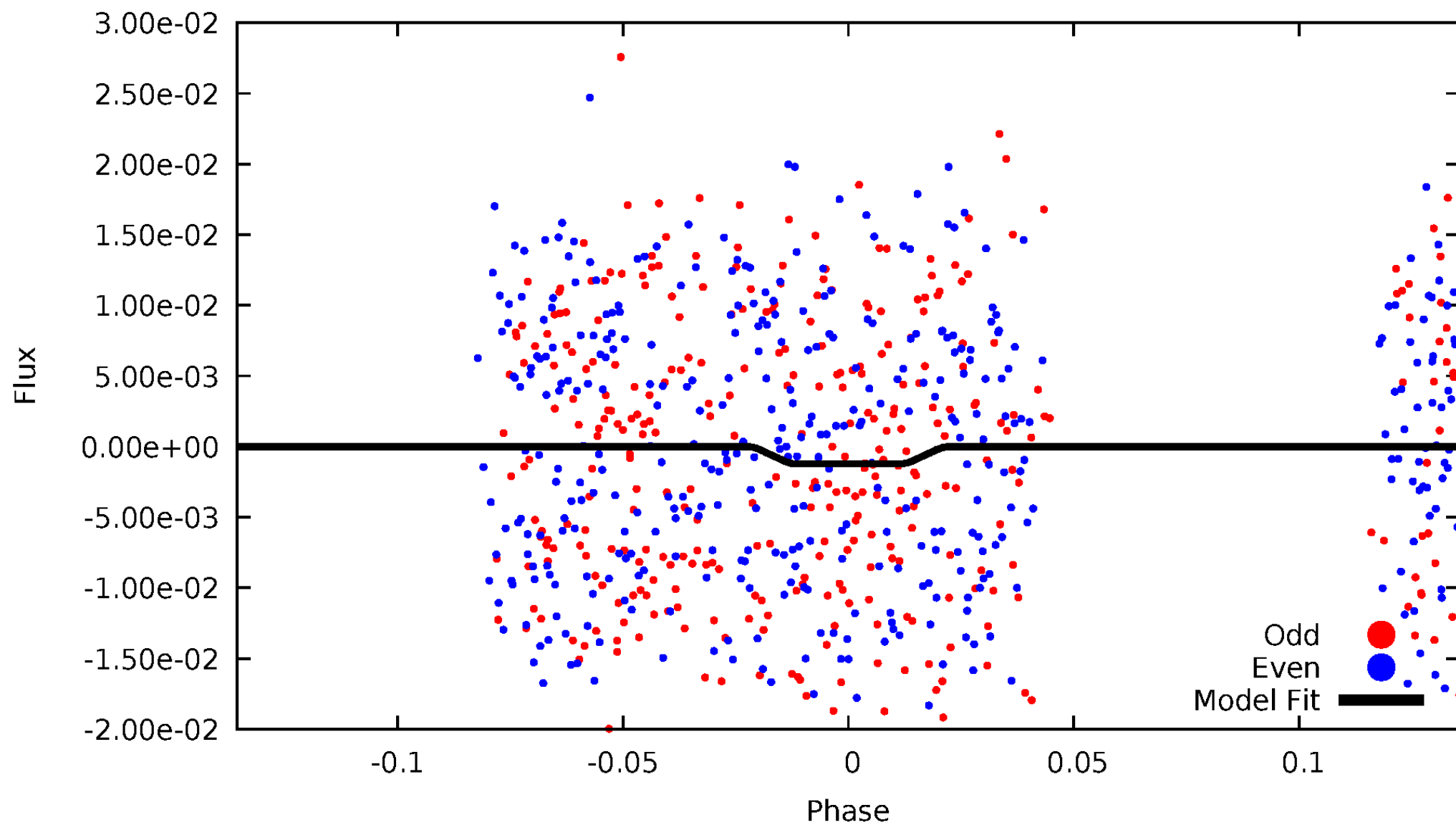
# DV Odd/Even

TCE 006302589-04



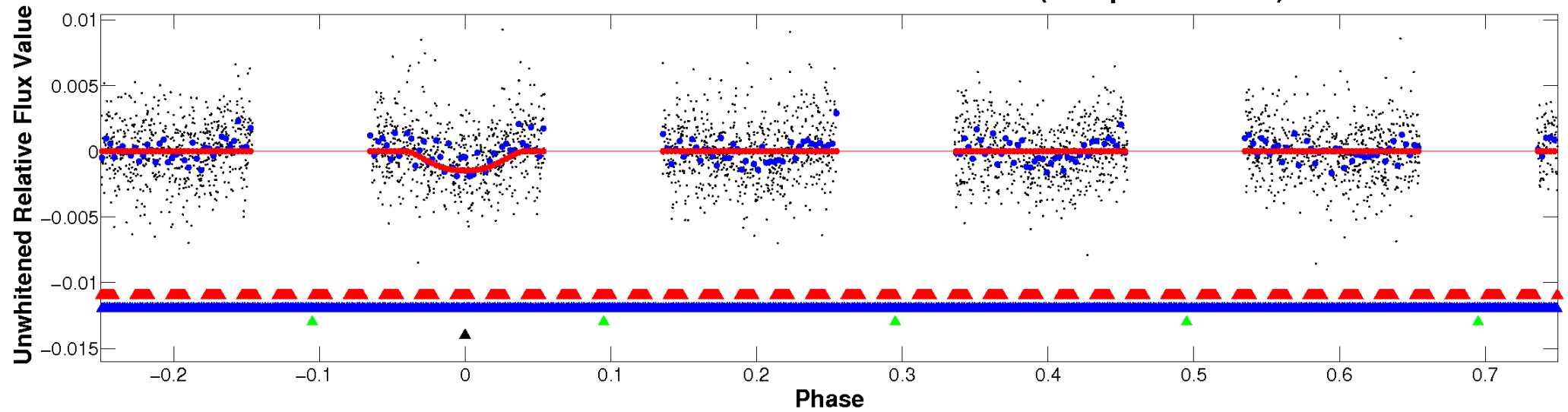
# ALT Odd/Even

TCE 006302589-04

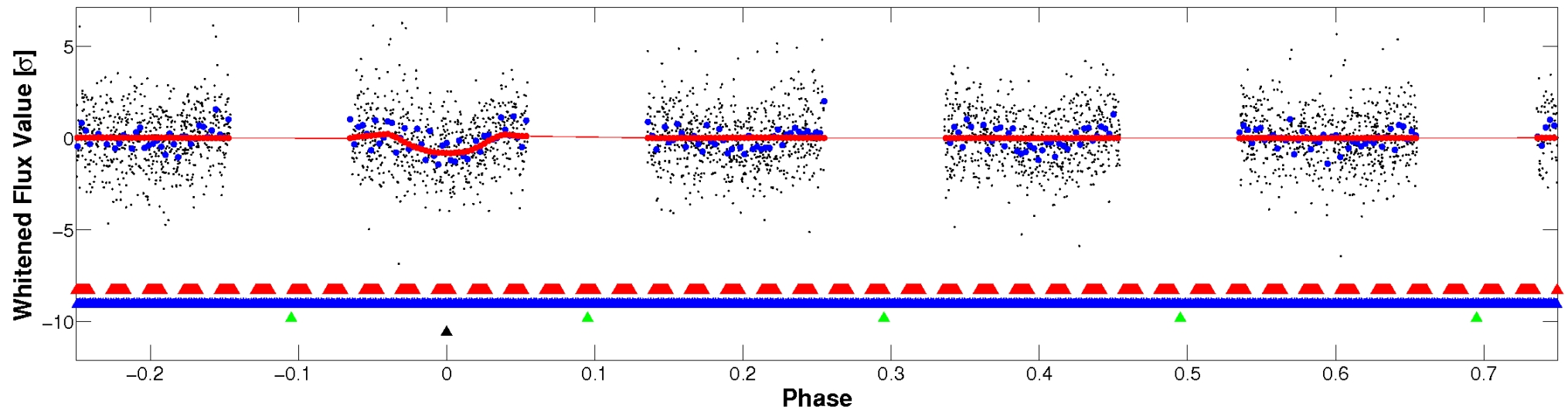


# Non-Whitened Vs. Whitened Light Curve

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

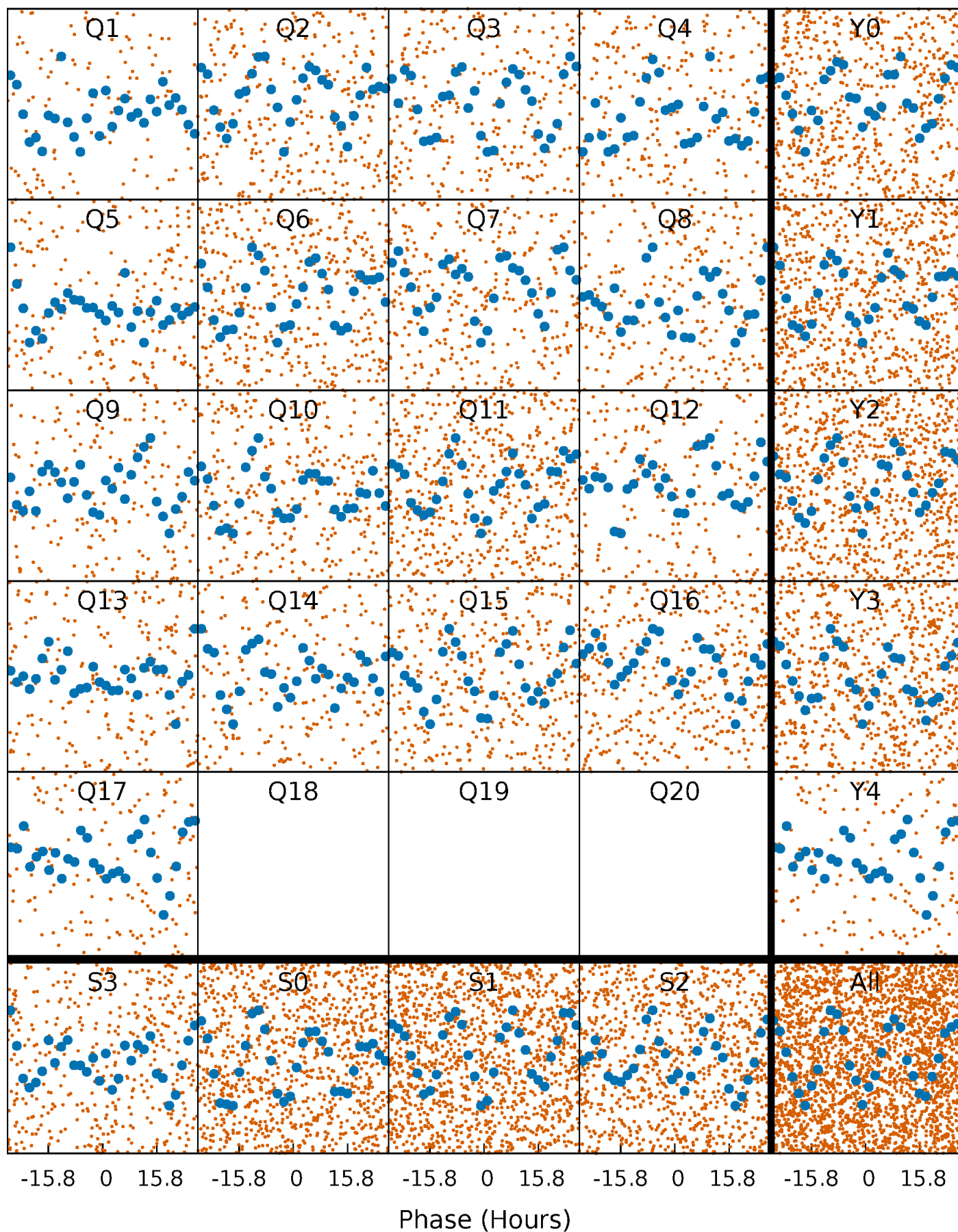


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



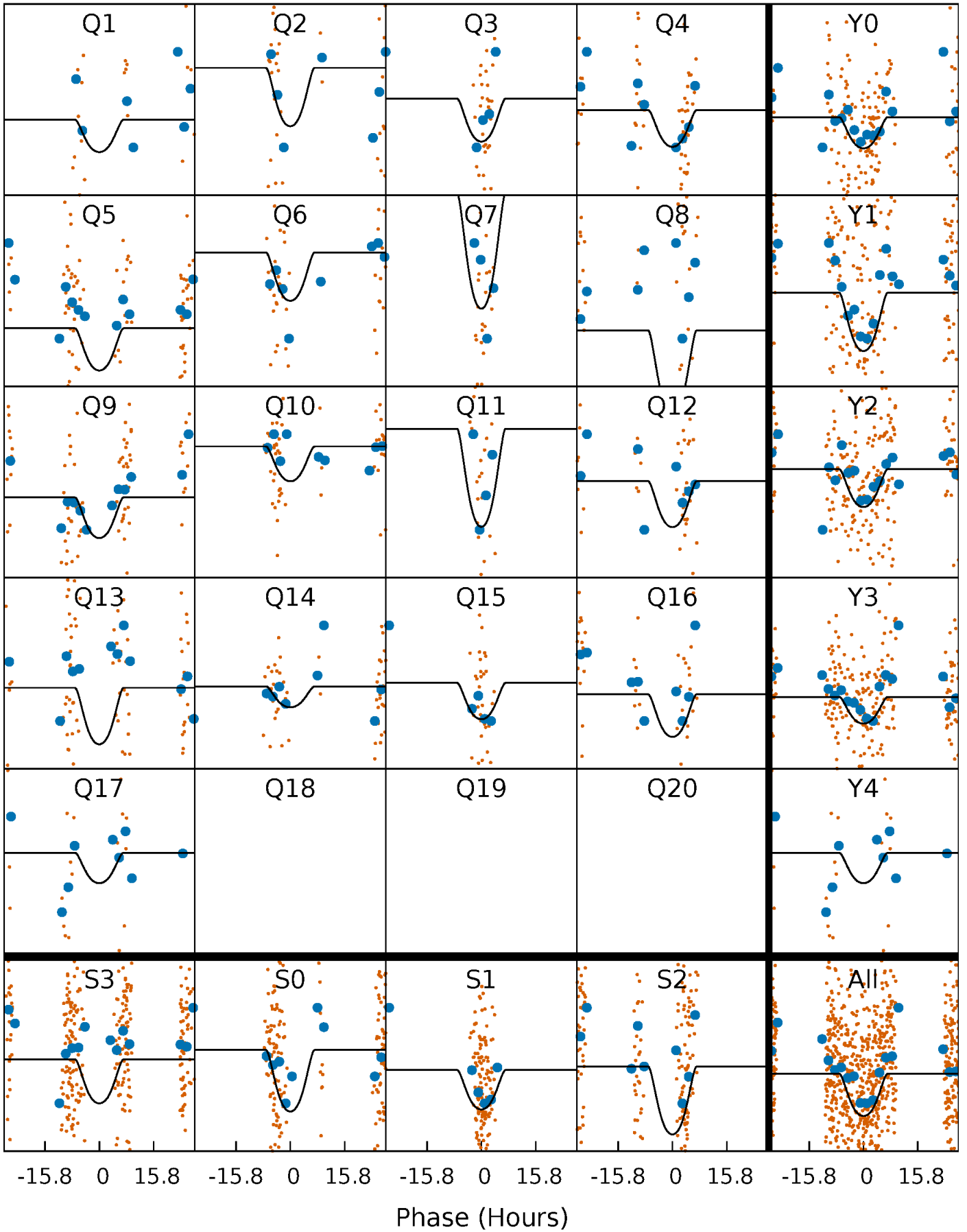
# PDC Quarter-Phased Transit Curves

TCE 006302589-04 P= 7.216522 Days  $T_0=136.645572$  (BKJD)



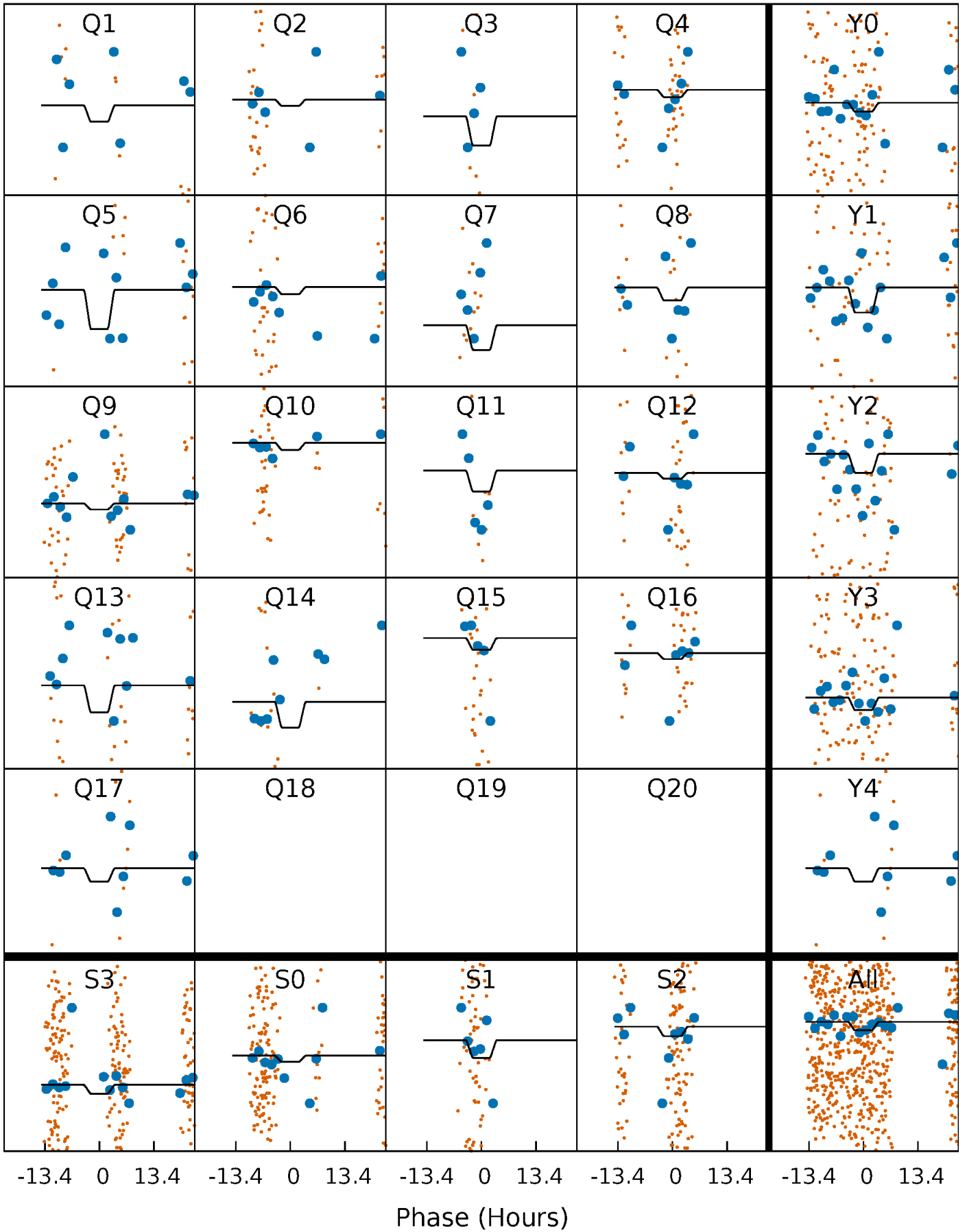
# DV Quarter-Phased Transit Curves

TCE 006302589-04   P= 7.216522 Days    $T_0=136.645572$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

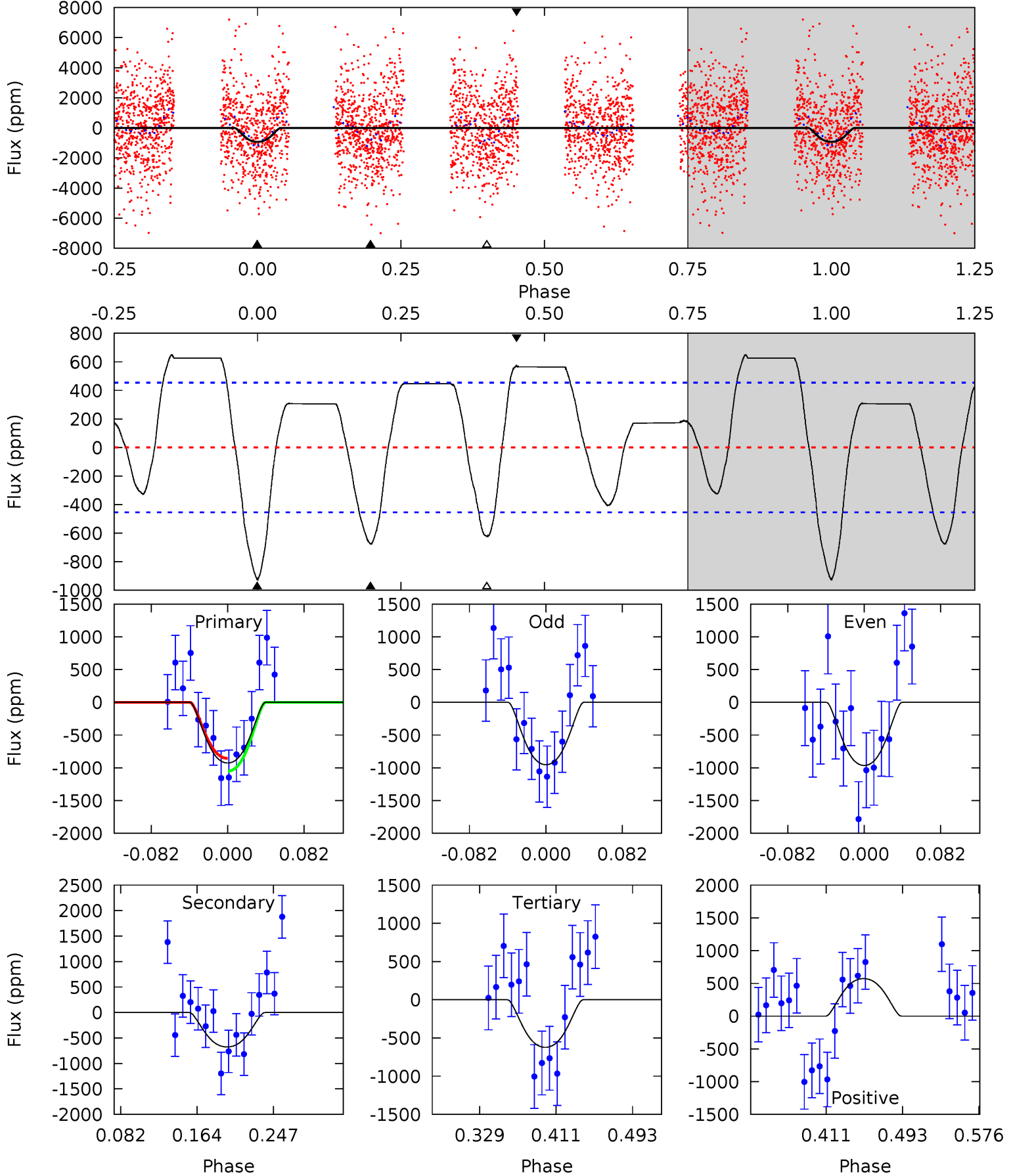
TCE 006302589-04   P= 7.216030 Days    $T_0=136.796931$  (BKJD)



# DV Model-Shift Uniqueness Test

006302589-04, P = 7.216522 Days, E = 136.645572 Days

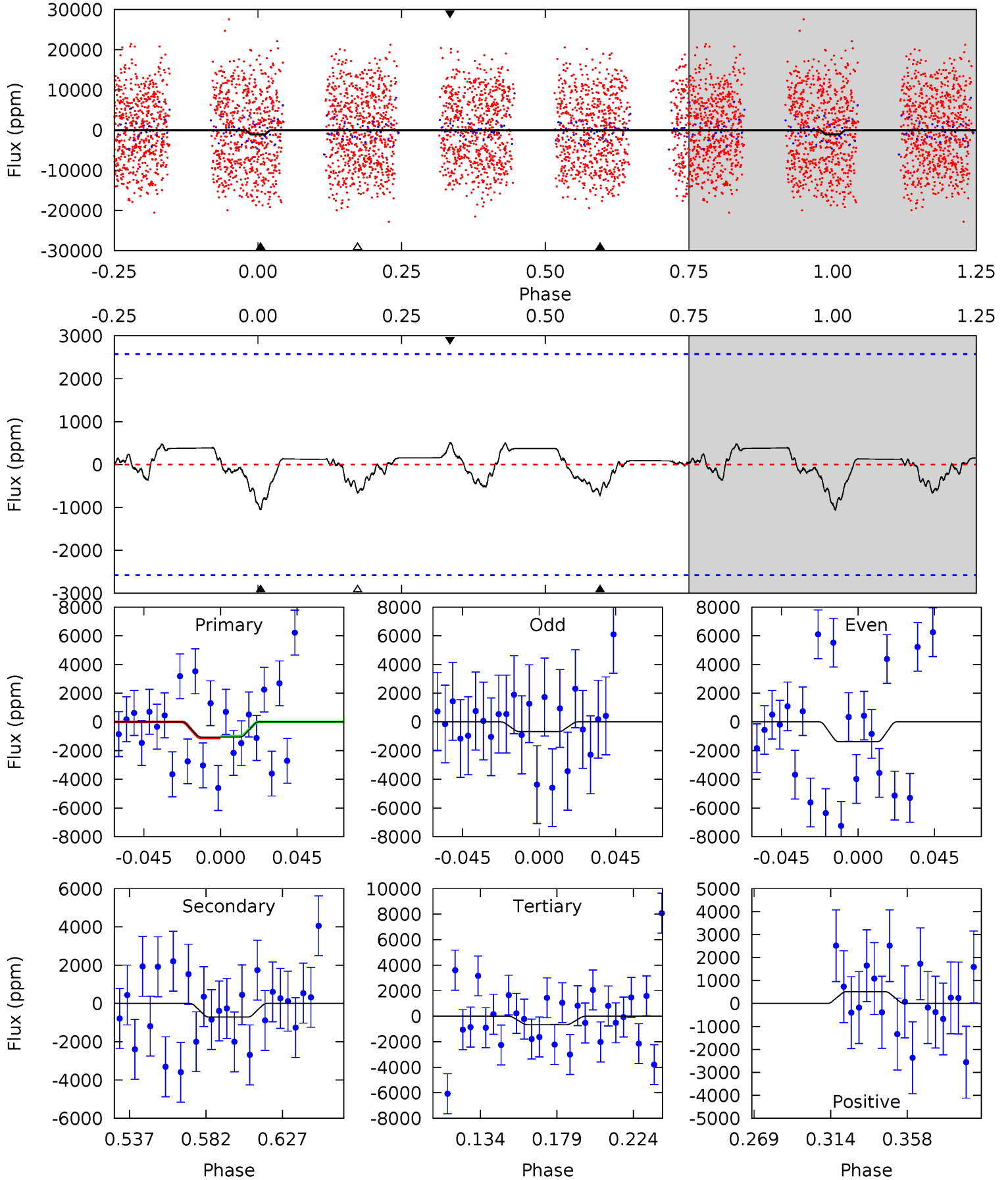
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.39	6.85	6.31	5.80	4.61	1.74	3.48	3.08	3.59	0.54	1.05	0.06	-0.75	0.41	0.95



# Alt Model-Shift Uniqueness Test

006302589-04, P = 7.216030 Days, E = 136.796931 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
1.94	1.31	1.21	0.94	4.73	2.01	0.49	0.73	1.01	0.10	0.38	0.64	-0.52	0.33	0.11



### Stellar Parameters For KIC 006302589

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	$7691^{+211}_{-316}$	$3.820^{+0.352}_{-0.088}$	$-0.080^{+0.200}_{-0.350}$	$2.846^{+0.394}_{-1.181}$	$1.953^{+0.083}_{-0.471}$	$0.119^{+0.340}_{-0.035}$
	+3%/-4%	+9%/-2%	+250%/-438%	+14%/-41%	+4%/-24%	+285%/-29%
Source	KIC0	KIC0	KIC0	DSEP		

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

### Secondary Eclipse Parameters for KIC 006302589-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	$A_{\text{obs}}$
DV	$-676 \pm 99$	$12.94^{+5.05}_{-4.67}$	$2566^{+183}_{-258}$	$5673^{+1251}_{-762}$	$18^{+23}_{-9}$
Alt.	$-714 \pm 544$	$9.77^{+5.45}_{-4.77}$	$2576^{+173}_{-277}$	$6406^{+3329}_{-1874}$	$28^{+108}_{-22}$

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

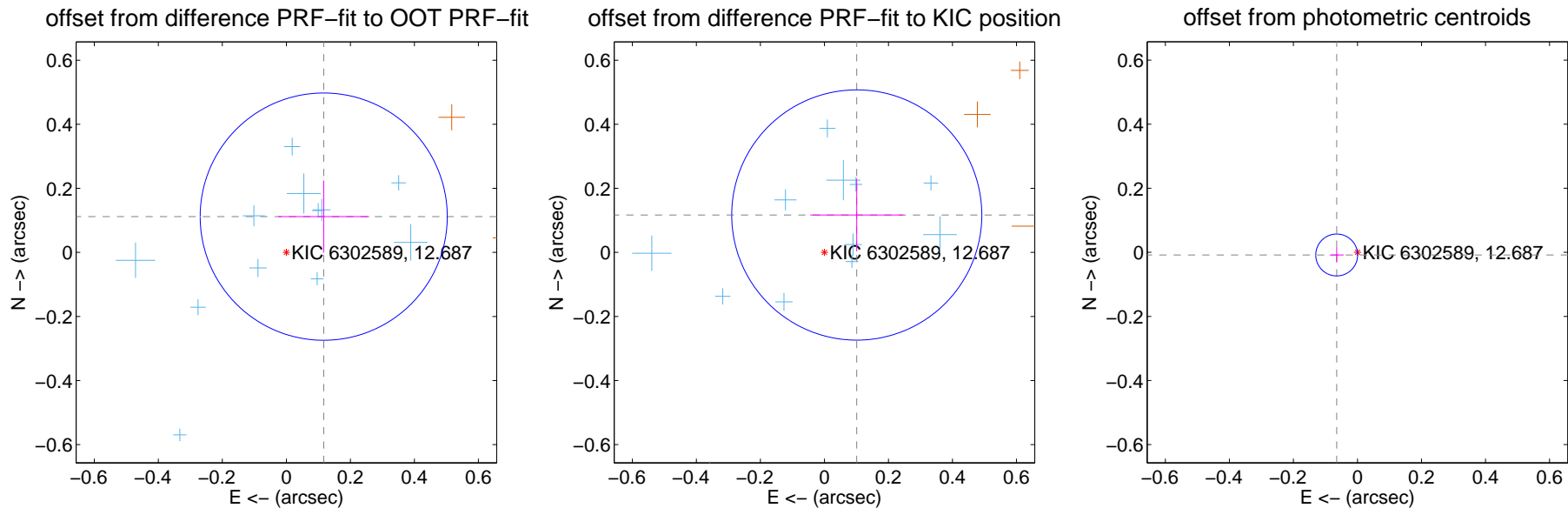
## DV Centroid Data

Supplemental centroid analysis for 006302589-04. Kepler magnitude: 12.69. Transit SNR 11.47

There are 13 quarters with good PRF difference image offsets

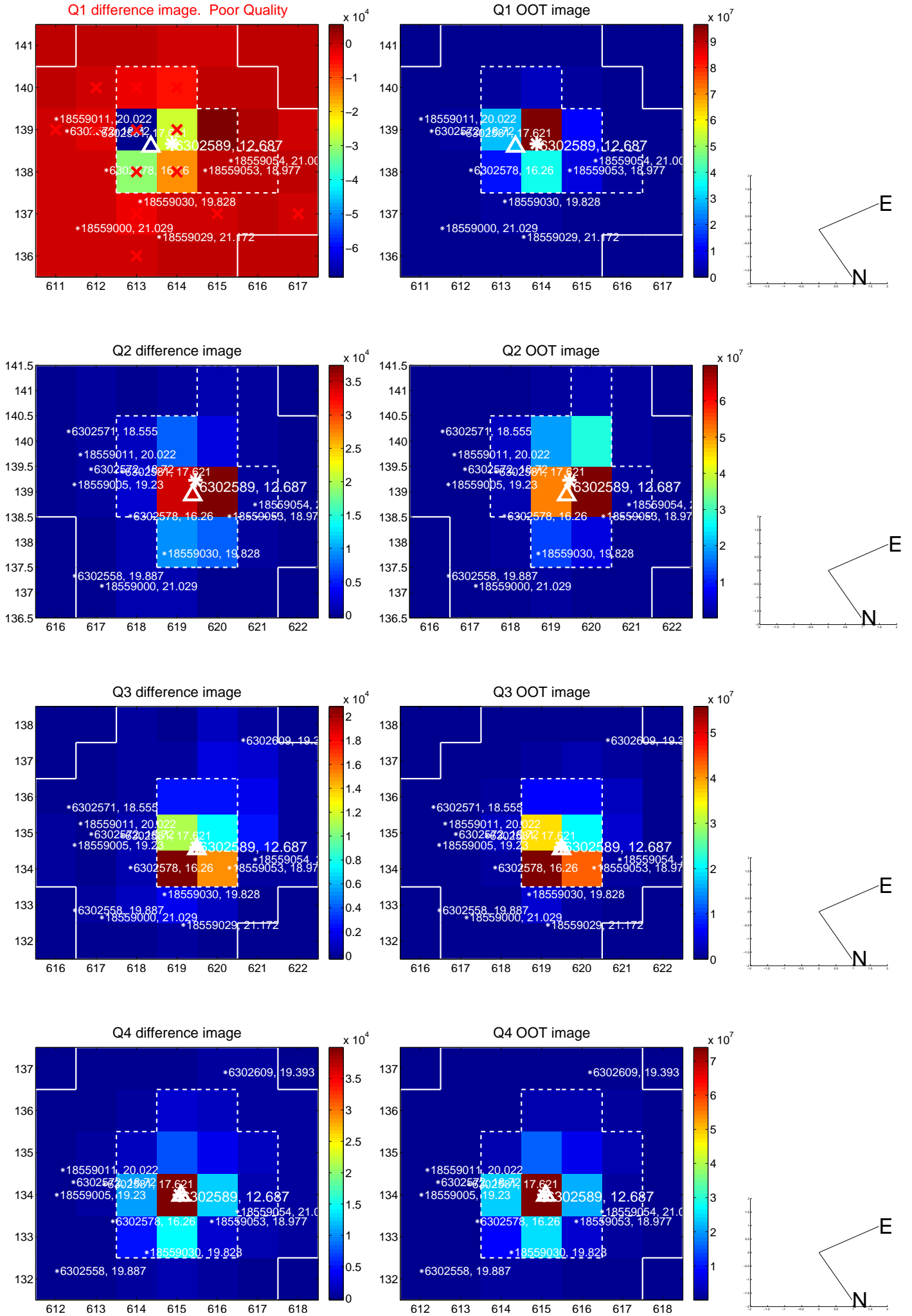
The direct PRF centroid is offset from the target star catalog position by about 0.07 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$0.162 \pm 0.129$	1.26	$-0.117 \pm 0.142$	$0.112 \pm 0.113$
PRF-fit source offset from KIC position	$0.154 \pm 0.130$	1.19	$-0.101 \pm 0.145$	$0.117 \pm 0.114$
photometric centroid source offset	$0.07 \pm 0.02$	3.00	$0.06 \pm 0.02$	$-0.01 \pm 0.02$

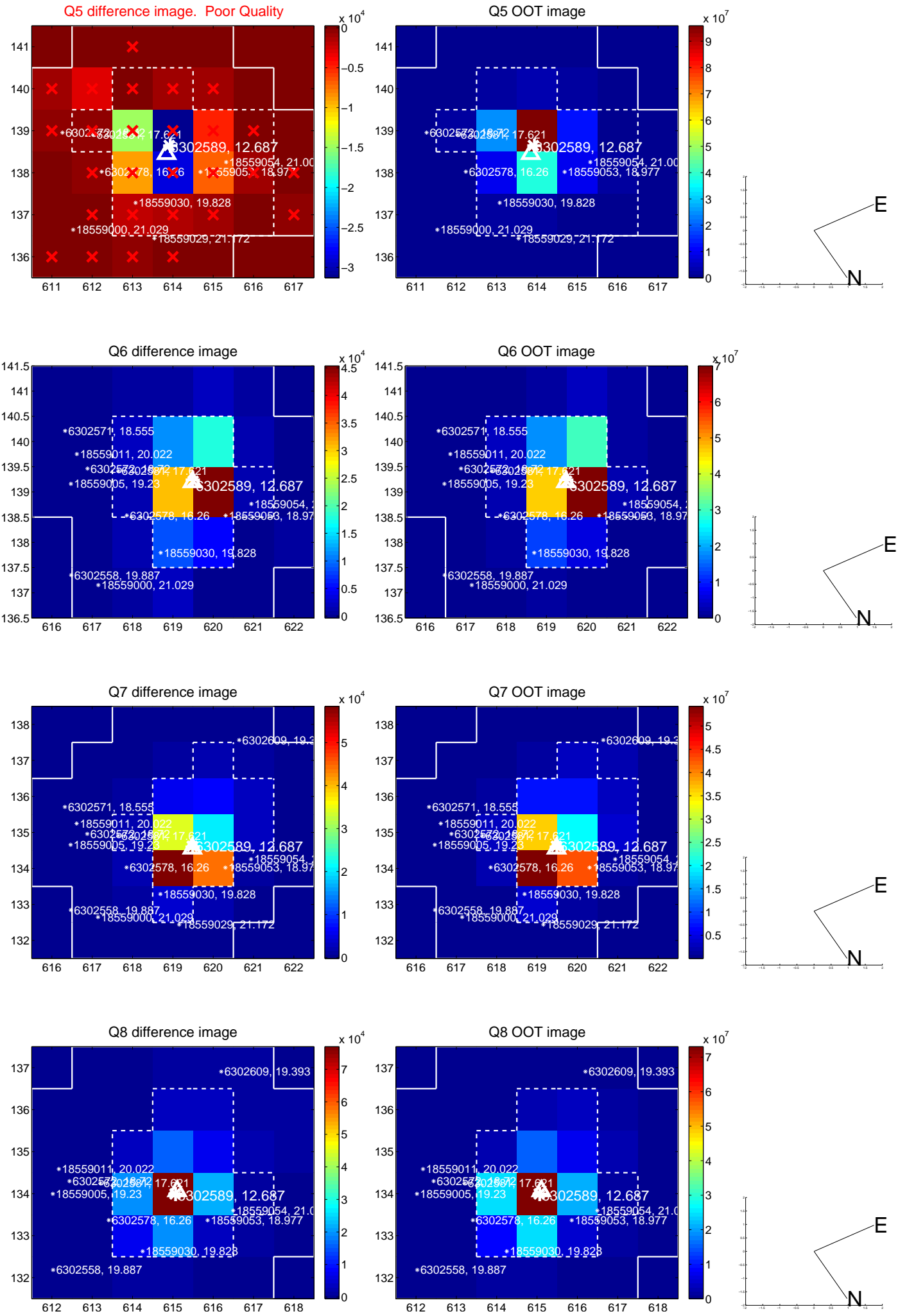


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

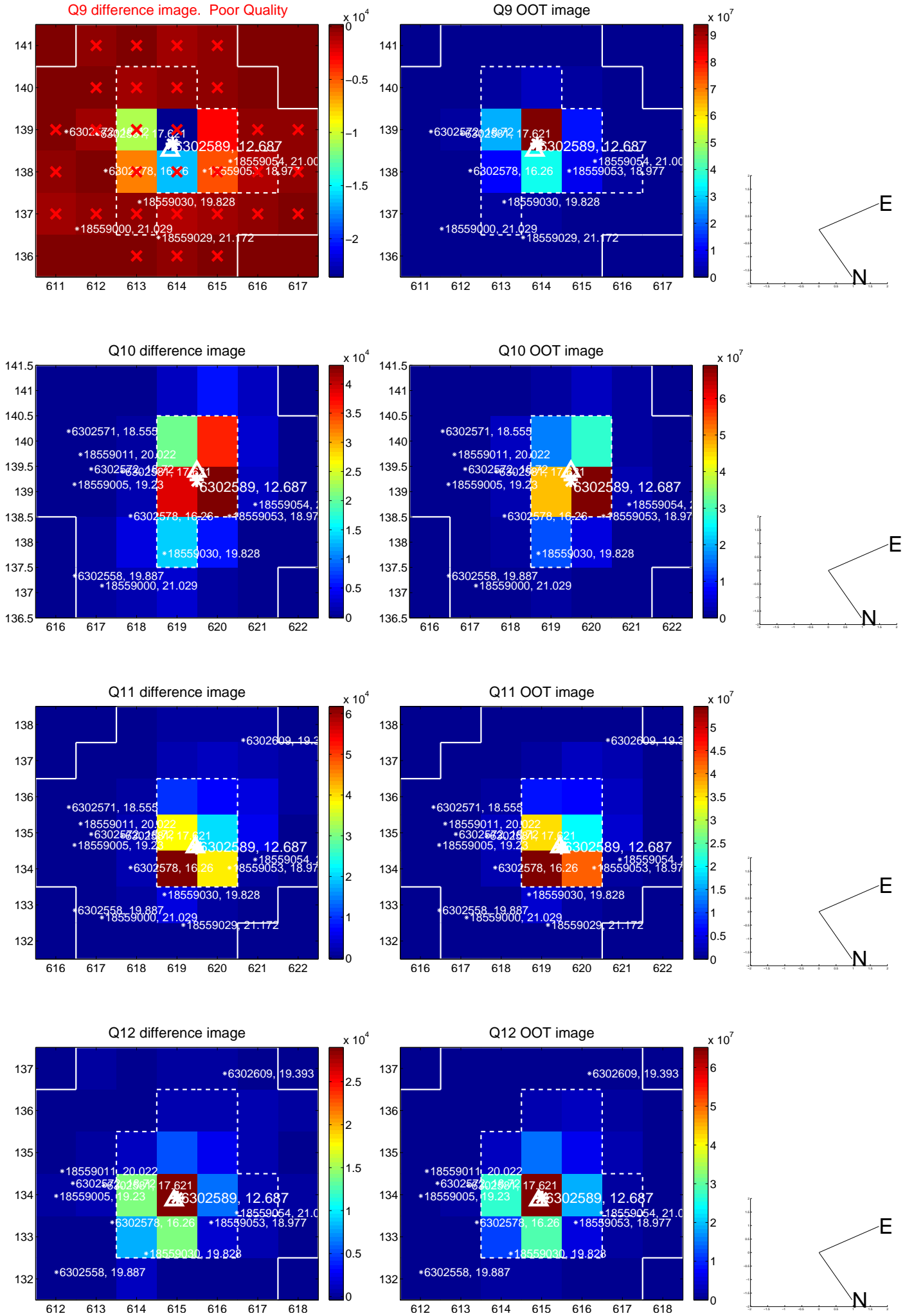
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



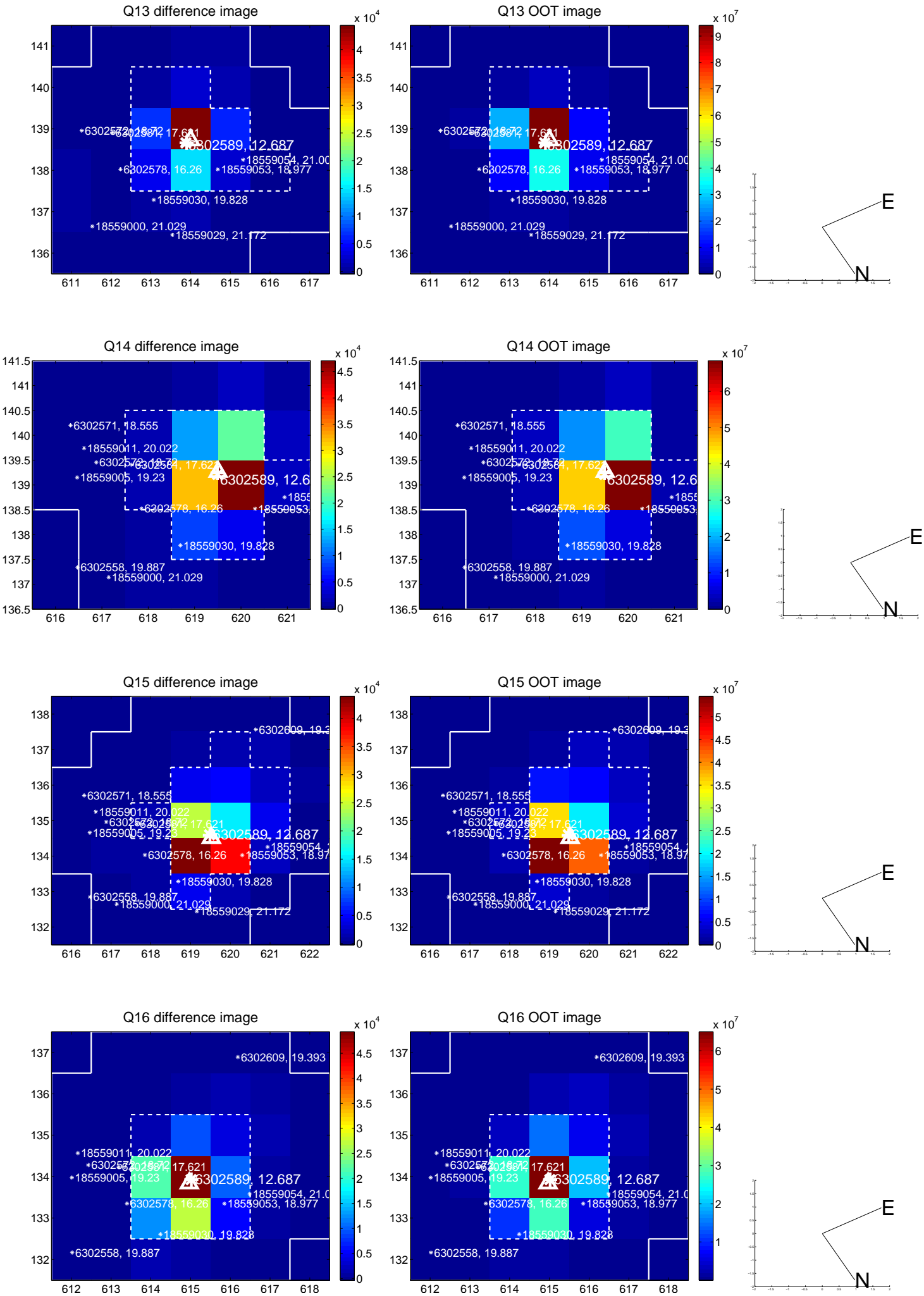
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



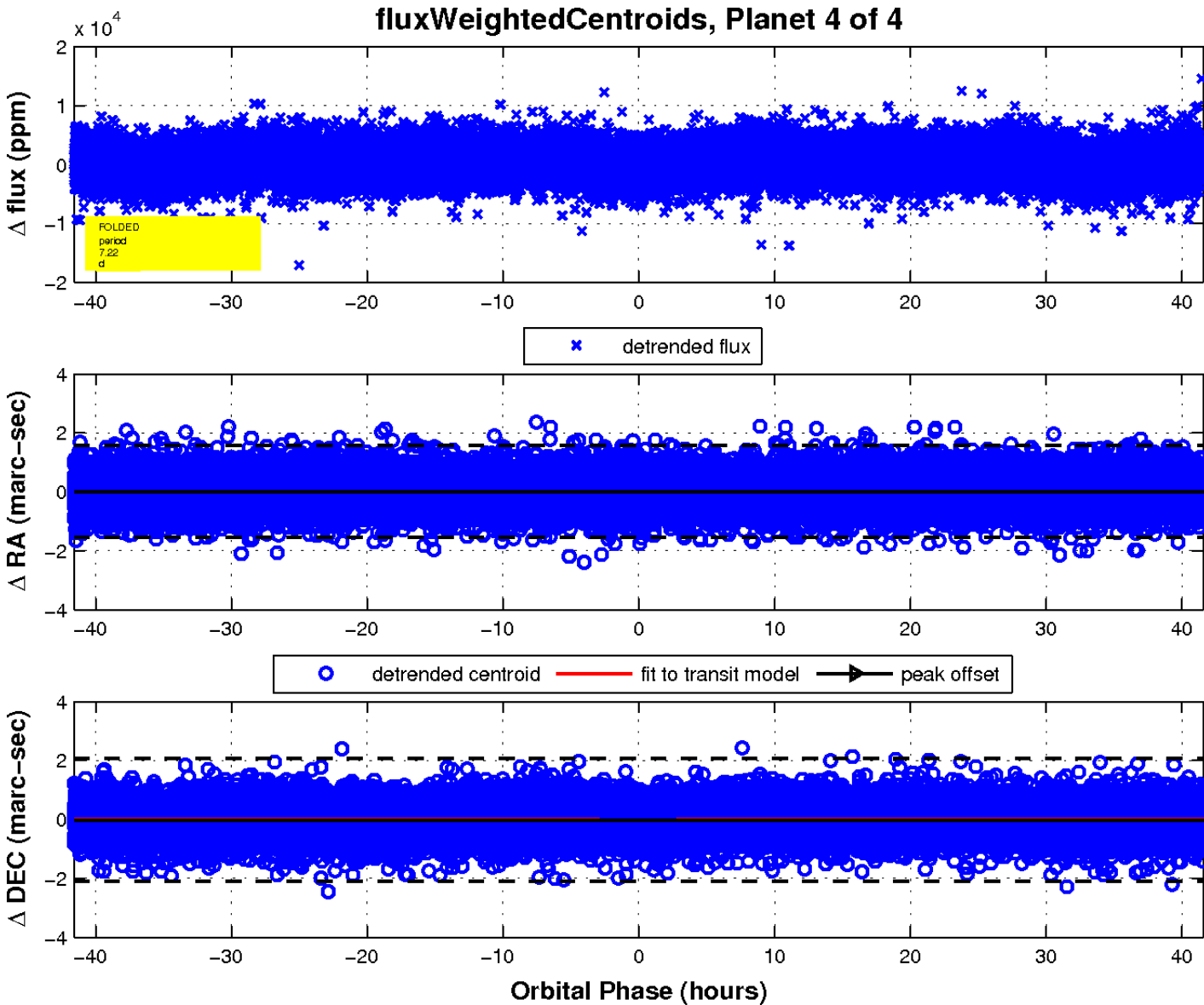
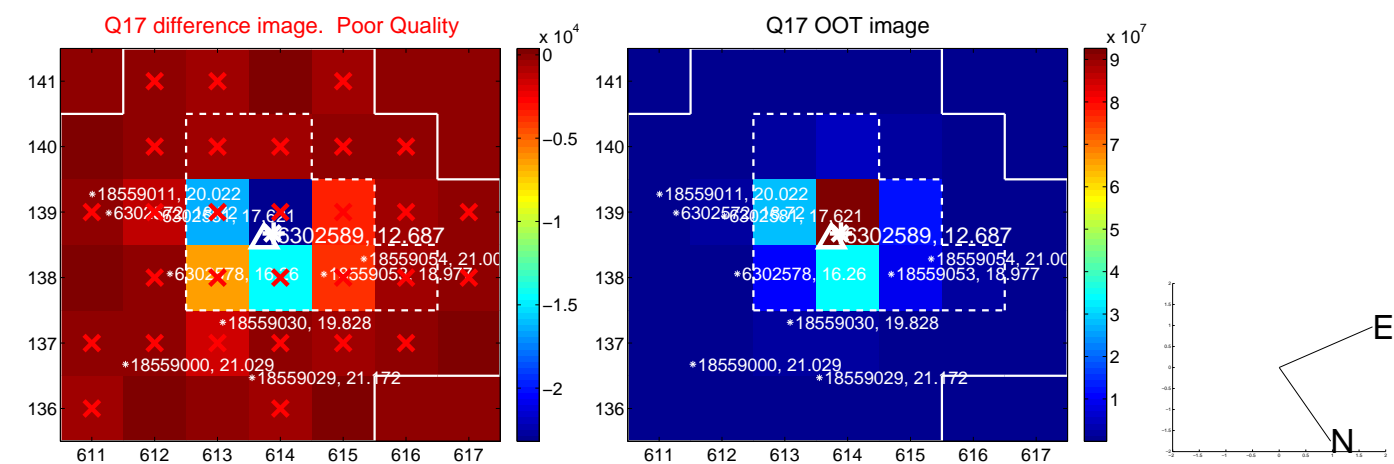
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

