

## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007971540-01	OBS	No	51.011313	166.181425	52.5	1.002	29.8	20.5	1.77	6516	1.30	64.75
007971540-02	OBS	No	52.291113	159.026037	53.9	1.214	18.0	16.2	1.77	6516	1.46	62.65
007971540-03	OBS	No	34.530503	153.062724	23.2	2.413	14.7	7.2	1.77	6516	1.02	108.94
007971540-04	OBS	No	42.975481	146.899876	56.8	0.683	13.6	15.7	1.77	6516	1.38	81.38
007971540-05	OBS	No	60.934308	143.610155	48.2	1.035	15.8	19.4	1.77	6516	1.40	51.09
007971540-06	OBS	No	71.174769	162.031760	41.4	7.231	14.7	16.6	1.77	6516	1.30	41.53
007971540-07	OBS	No	49.509656	174.313640	54.0	12.534	13.5	16.9	1.77	6516	1.52	67.38
007971540-08	OBS	No	262.610321	259.184059	26.0	18.558	13.9	4.7	1.77	6516	1.08	7.28
007971540-09	OBS	No	28.835527	150.649599	19.5	11.693	12.6	9.8	1.77	6516	0.97	138.54
007971540-10	OBS	No	59.432161	172.524554	131.2	9.000	11.7	-1.0	1.77	6516	2.04	52.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007971540-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
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007971540-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-04	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-06	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST
007971540-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007971540-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007971540-09	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007971540-10	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

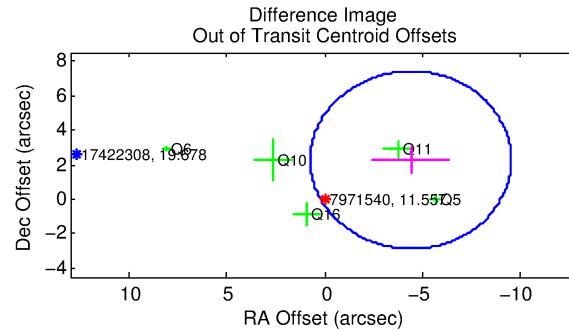
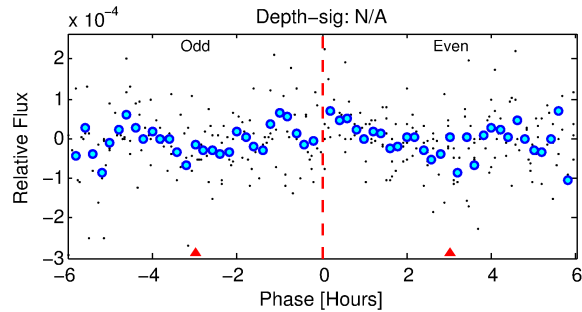
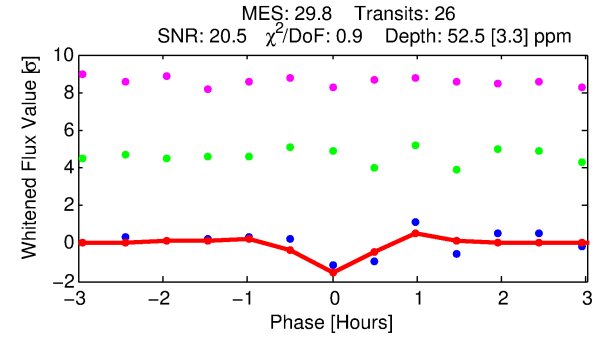
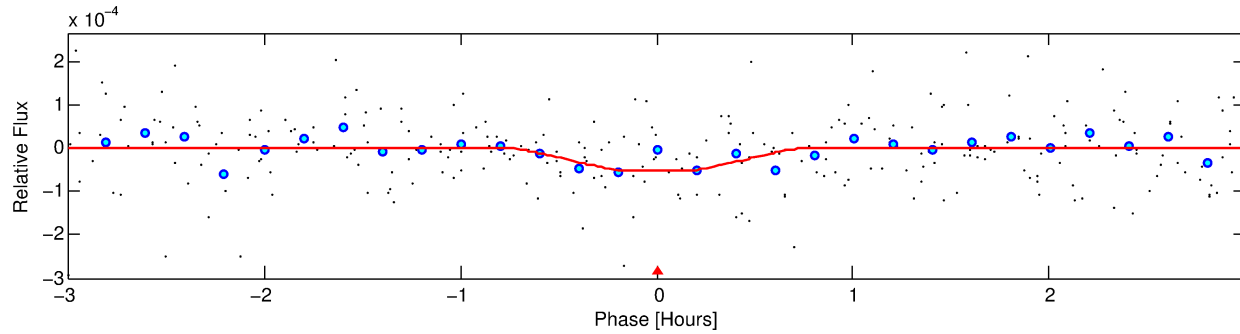
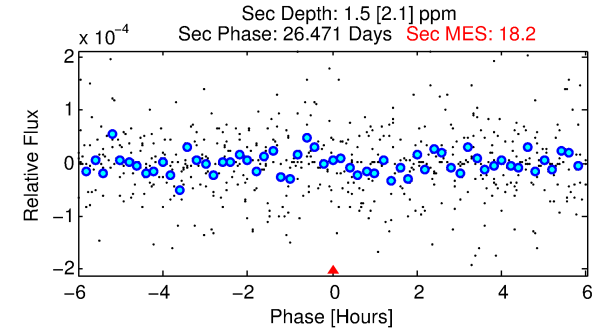
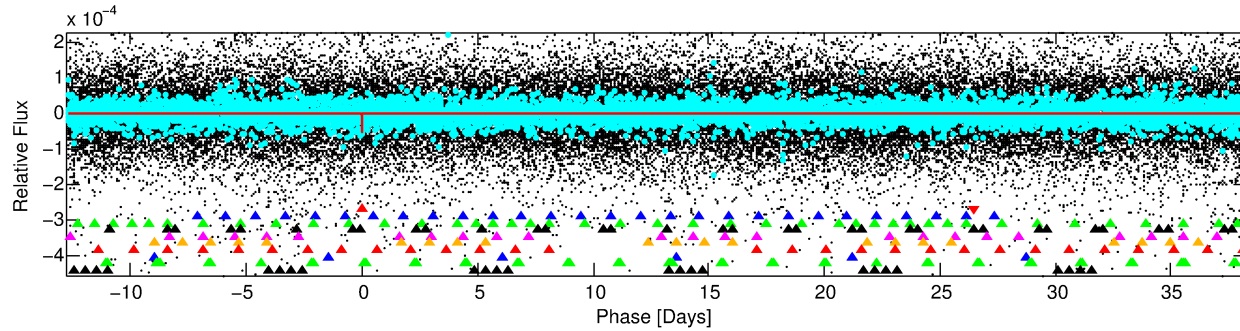
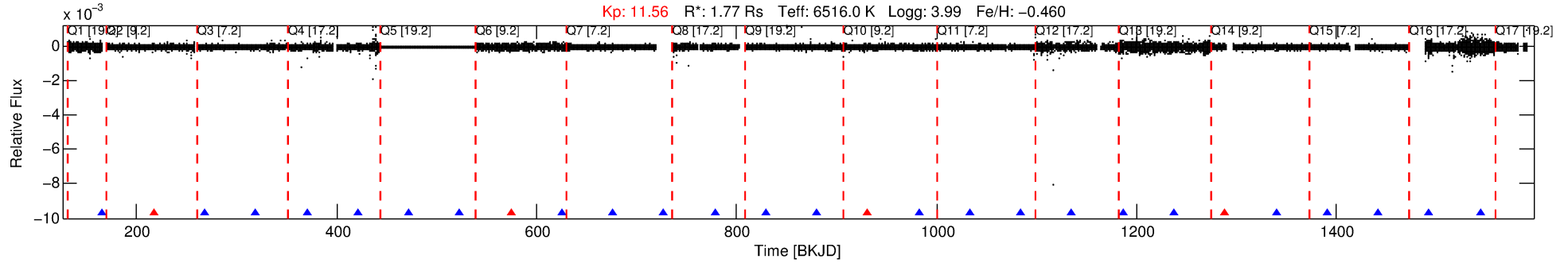
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-01

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 1 of 10 Period: 51.011 d



## DV Fit Results:

Period = 51.01131 [0.00028] d  
Epoch = 166.1814 [0.0017] BKJD  
Rp/R\* = 0.0067 [0.0104]  
a/R\* = 390.30 [3181.83]  
b = 0.08 [105.90]  
Seff = 64.75 [31.21]  
Teq = 723 [87] K  
Rp = 1.30 [2.05] Re  
a = 0.2795 [0.0807] AU  
Ag = 37.70 [129.63] [0.28σ]  
Teffp = 2771 [2362] K [0.87σ]

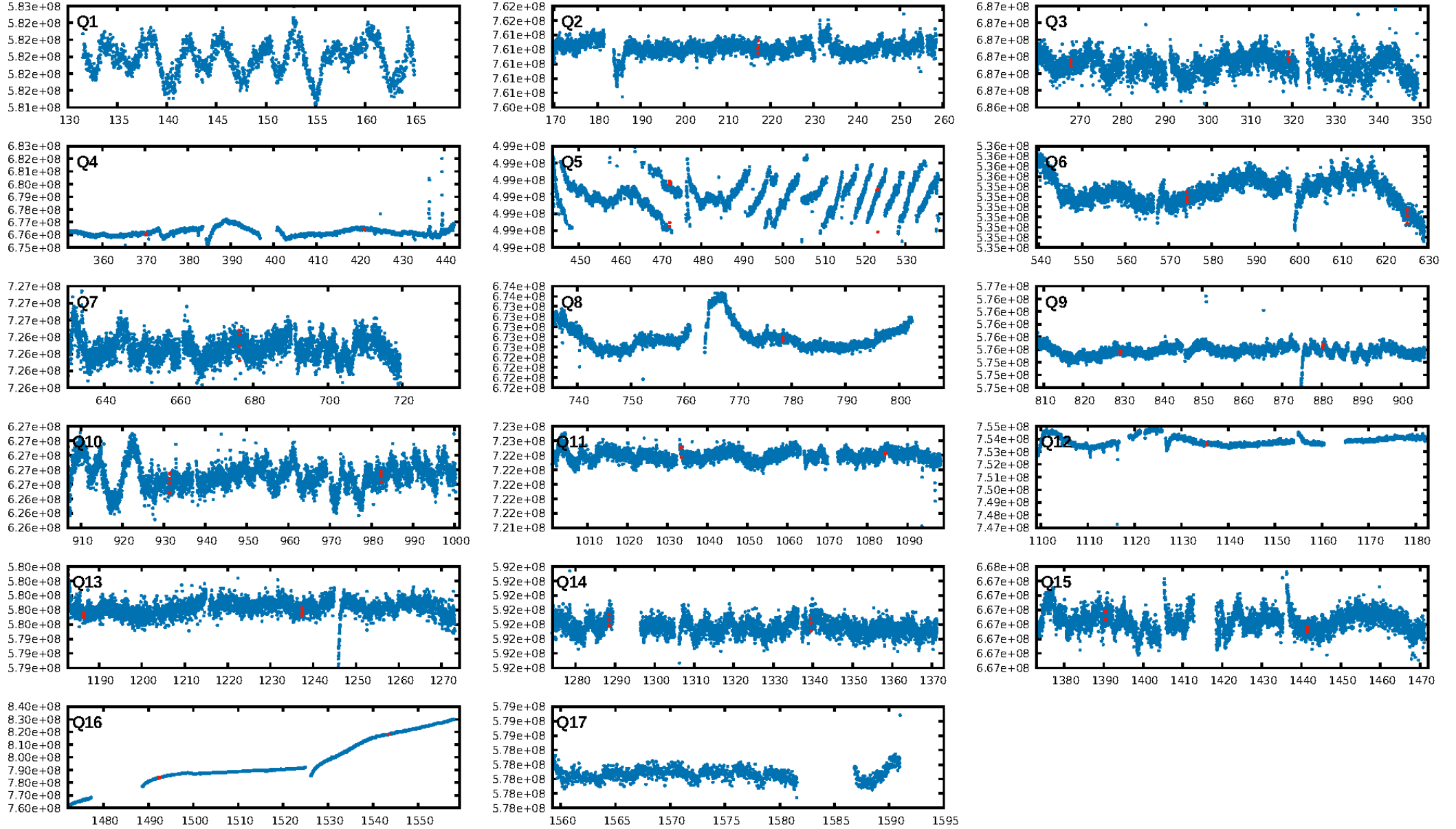
## DV Diagnostic Results:

ShortPeriod-sig: 99.6% [2.87σ]  
LongPeriod-sig: 100.0% [19.51σ]  
ModelChiSquare2-sig: 63.2%  
ModelChiSquareGof-sig: 99.5%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.85 [22/26]  
GhostDiagnostic-chr: 2.561  
Centroid-sig: N/A  
Centroid-so: 2.887 arcsec [1.66σ]  
OotOffset-rm: 4.949 arcsec [2.89σ]  
KicOffset-rm: 4.348 arcsec [2.67σ]  
OotOffset-st: 2/1/1/1 [5]  
KicOffset-st: 2/1/1/1 [5]  
DiffImageQuality-fgm: 0.20 [1/5]  
DiffImageOverlap-fno: 0.93 [14/15]

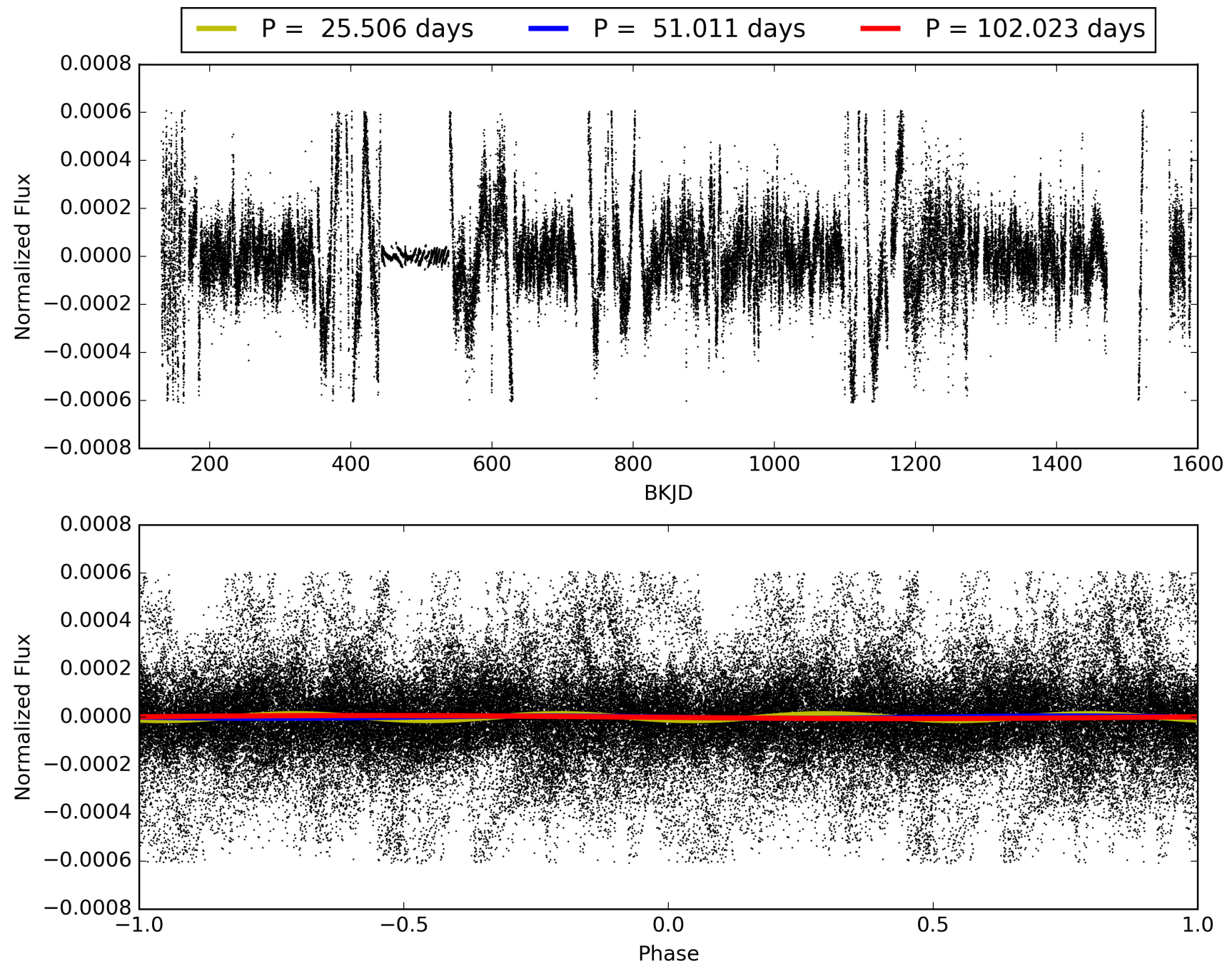
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:56:10 Z

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

# TCE 007971540-01, PDC Light Curves



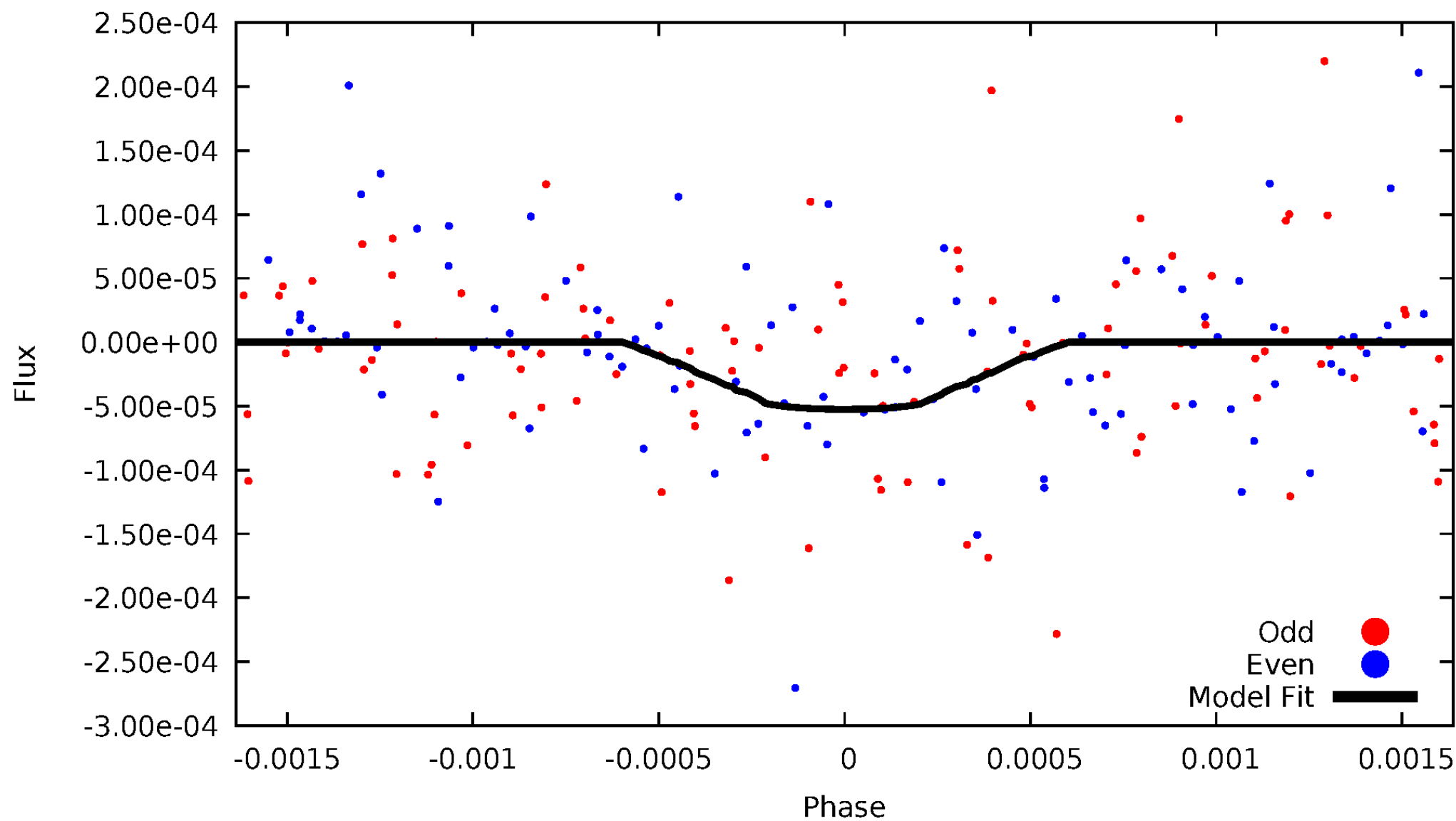
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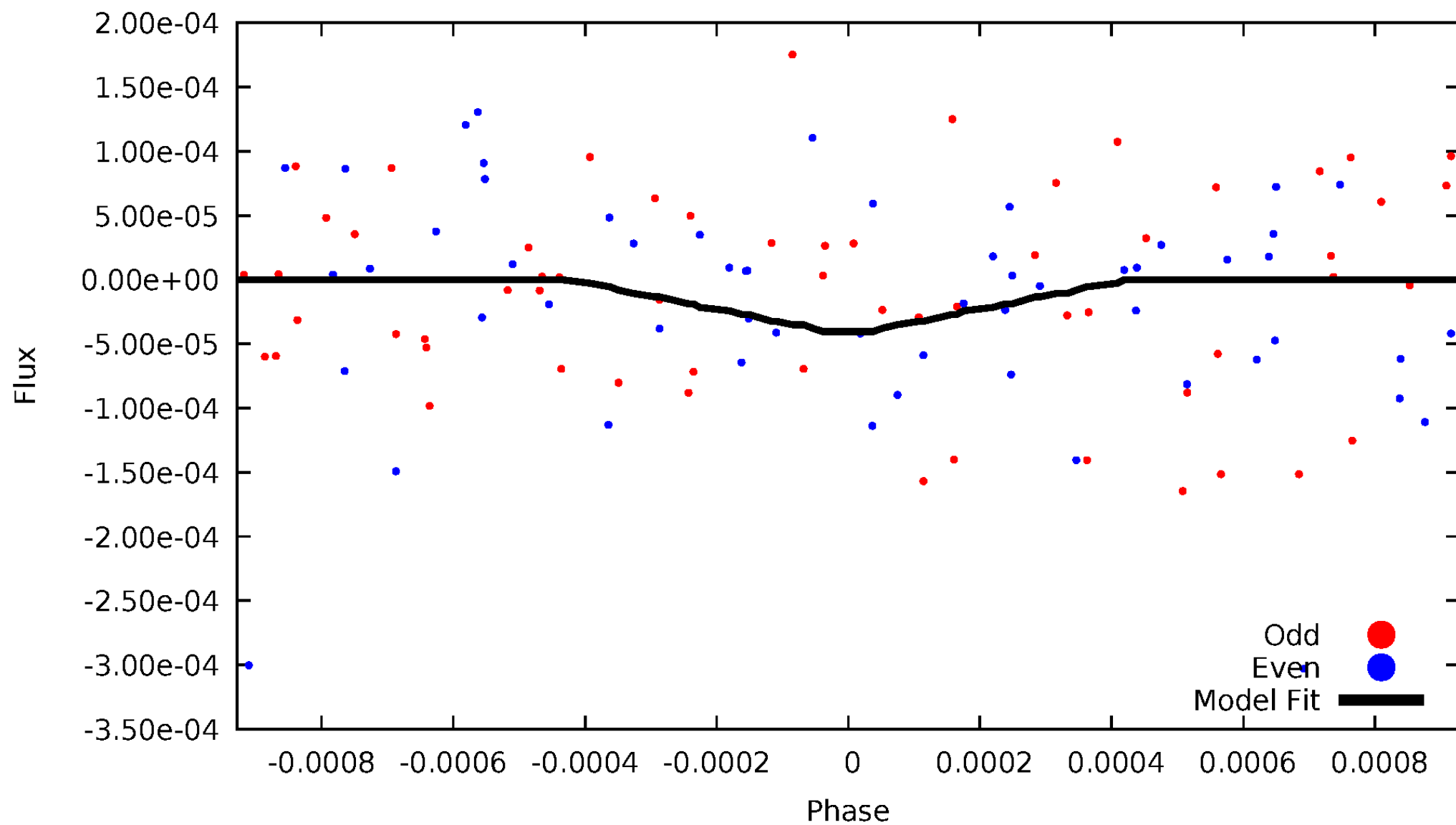
# DV Odd/Even

TCE 007971540-01

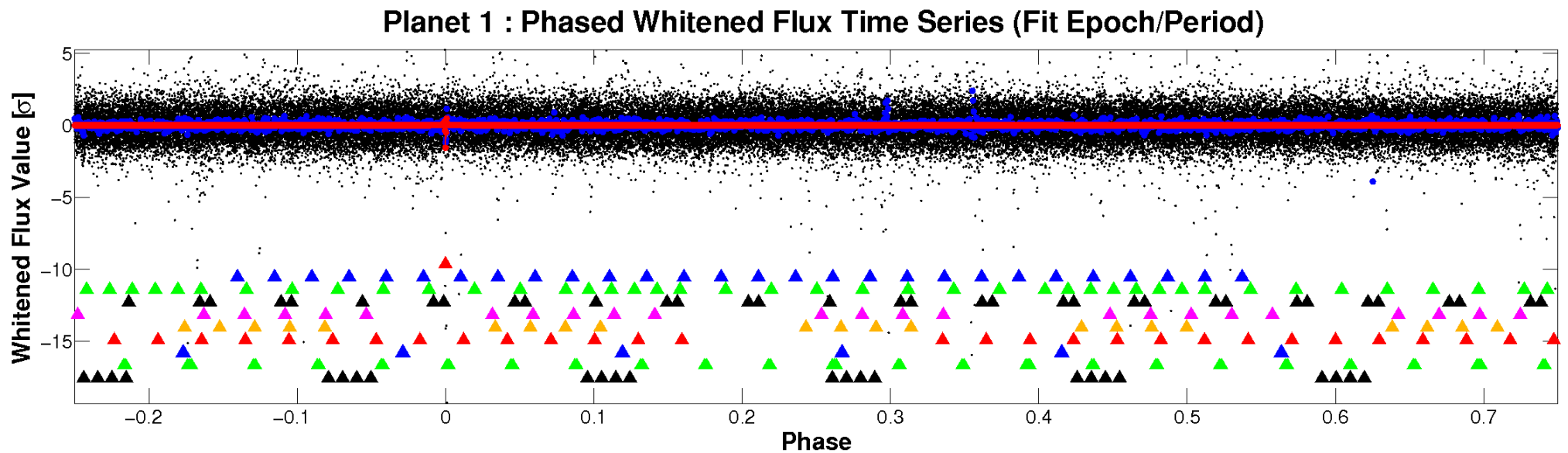
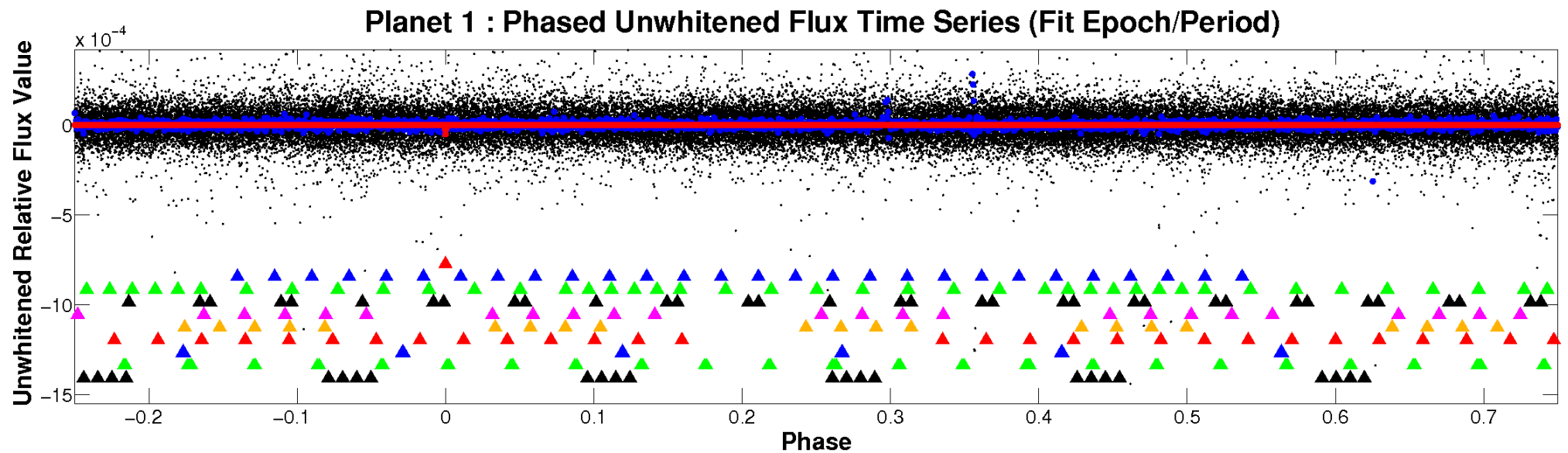


# ALT Odd/Even

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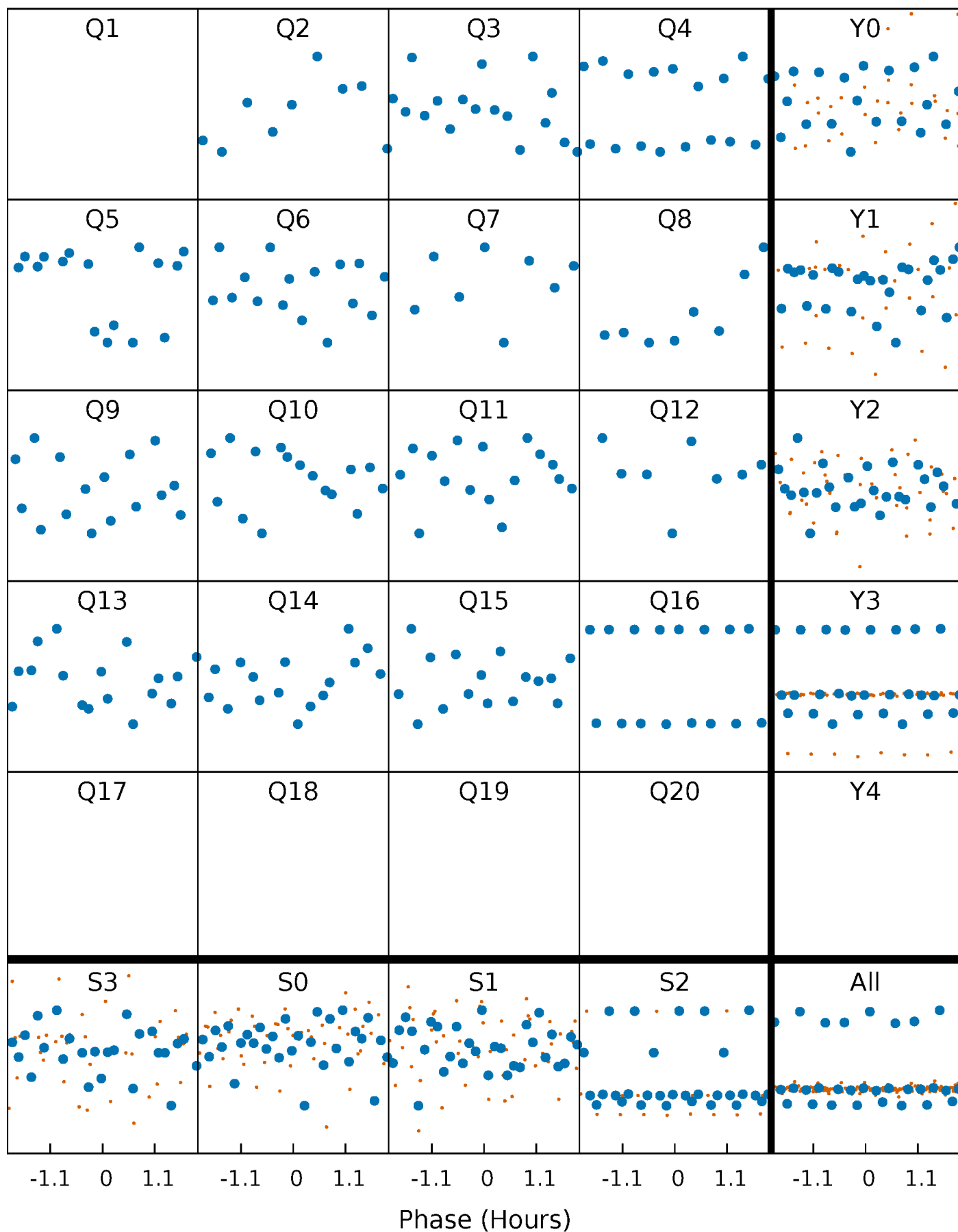


# Non-Whitened Vs. Whitened Light Curve



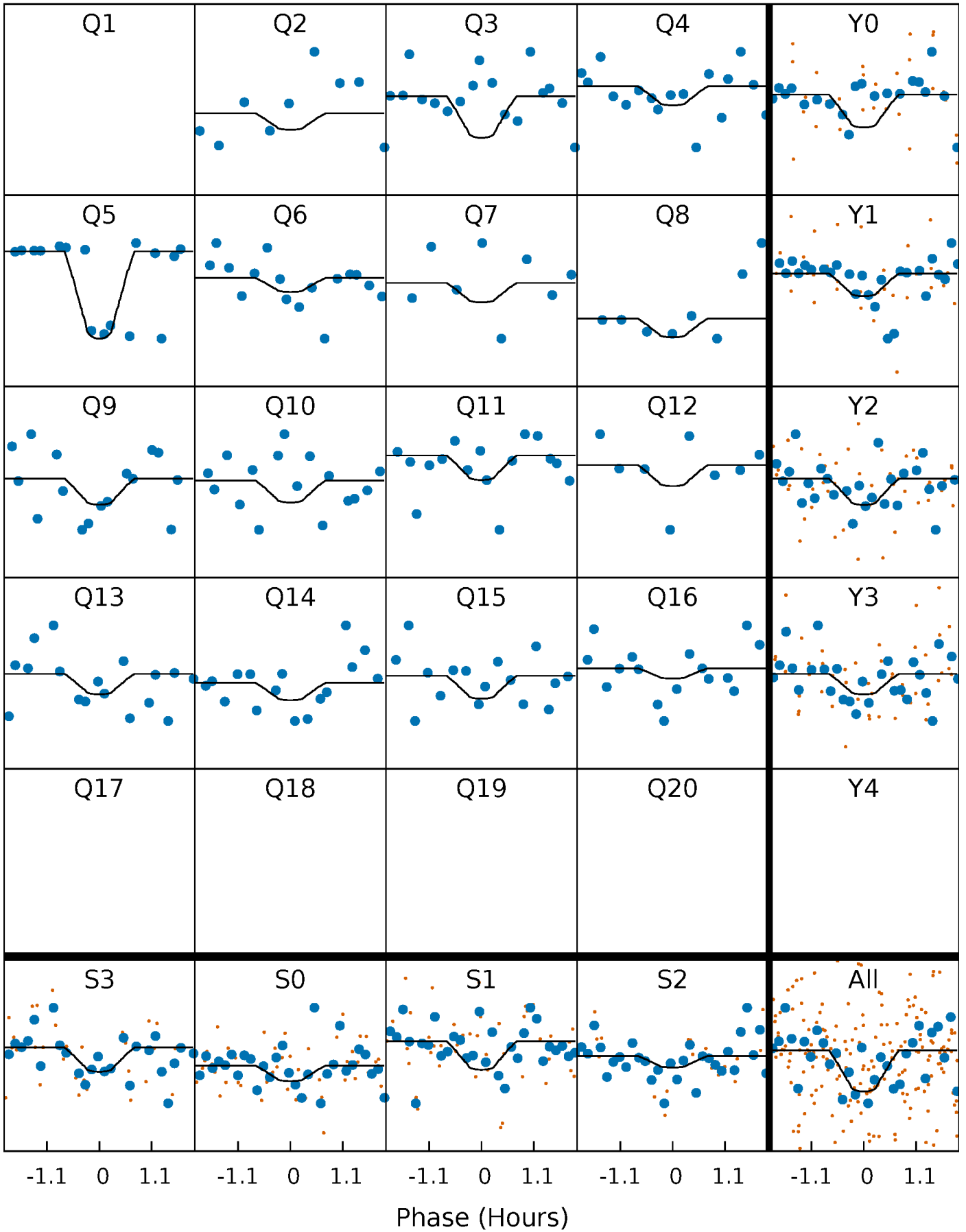
# PDC Quarter-Phased Transit Curves

TCE 007971540-01 P= 51.011313 Days  $T_0=166.181425$  (BKJD)



# DV Quarter-Phased Transit Curves

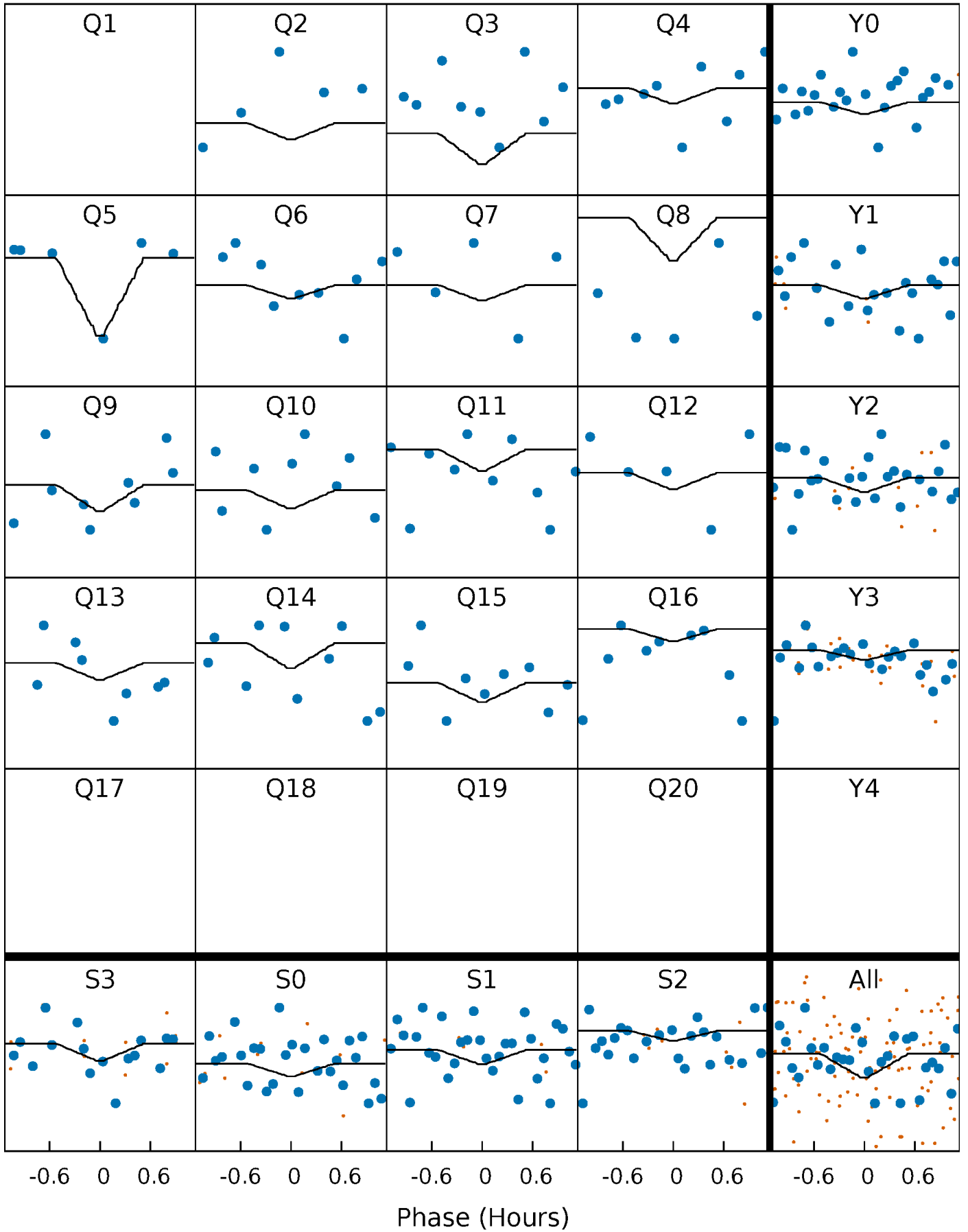
TCE 007971540-01 P= 51.011313 Days  $T_0=166.181425$  (BKJD)





# Alt. Detrend Quarter-Phased Transit Curves

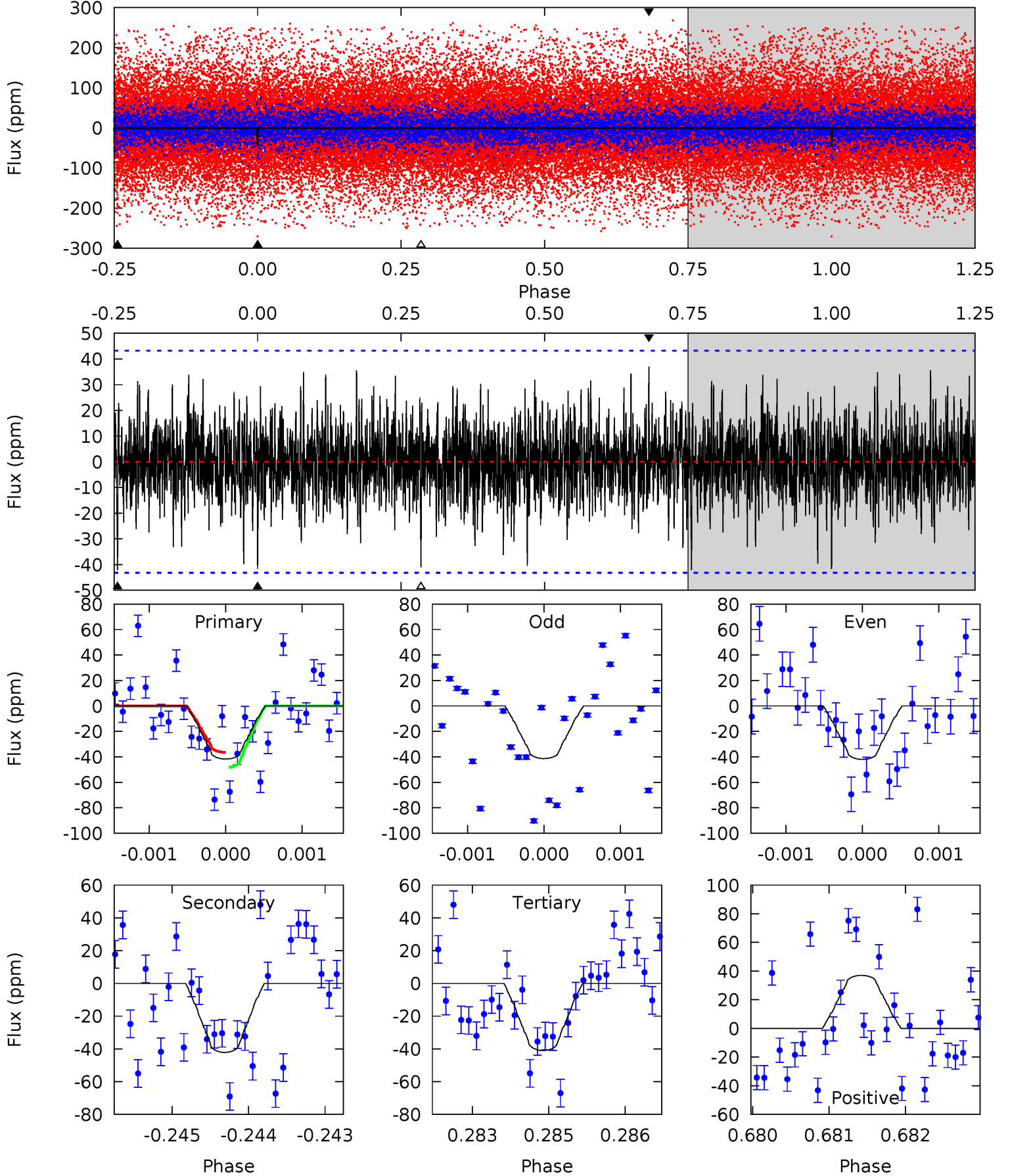
TCE 007971540-01 P= 51.008650 Days  $T_0=166.208614$  (BKJD)



# DV Model-Shift Uniqueness Test

007971540-01,  $P = 51.011313$  Days,  $E = 115.170112$  Days

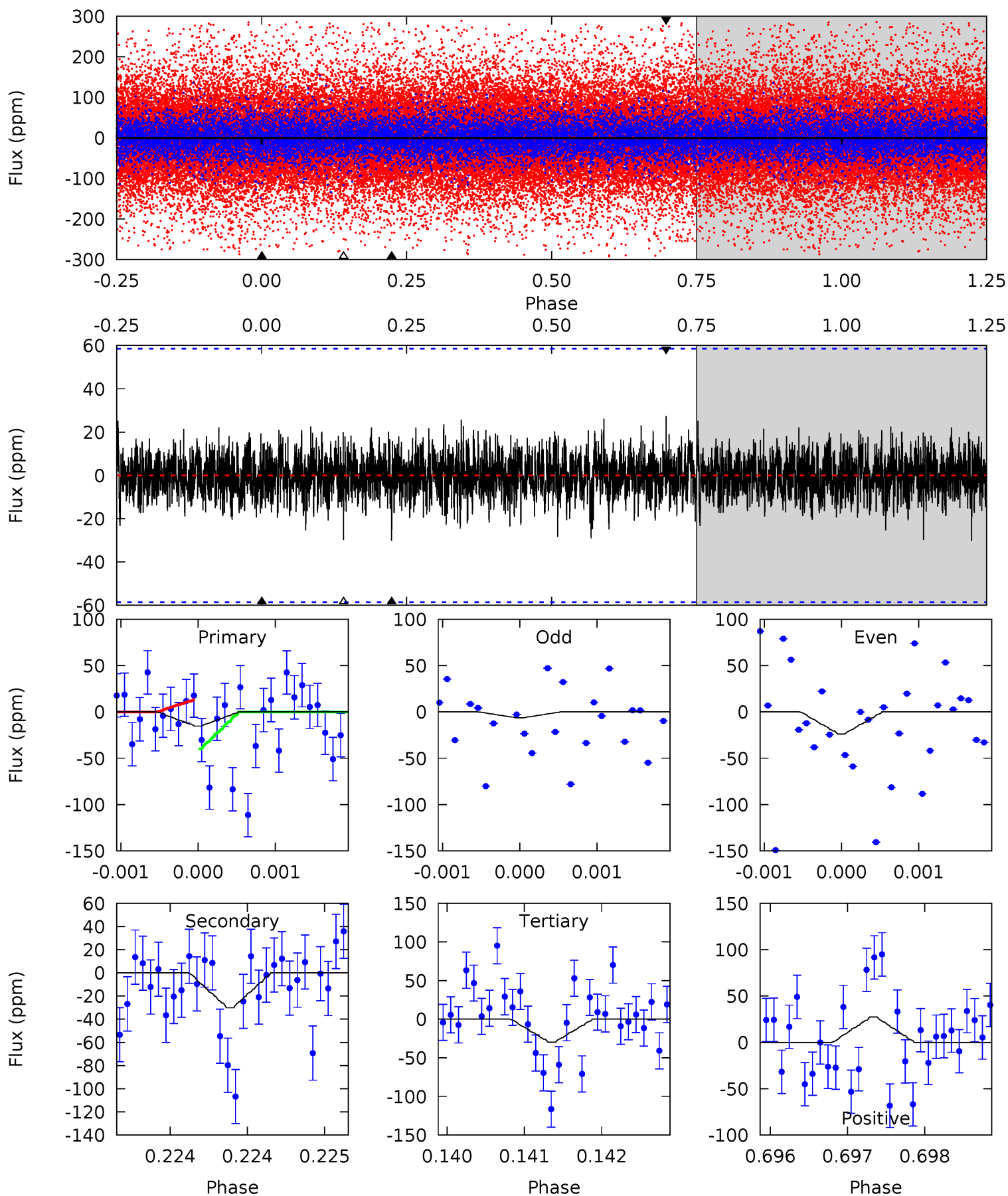
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.23	5.29	5.15	4.65	5.42	3.25	1.35	0.09	0.59	0.15	0.65	0.04	0.90	0.47	0.75



# Alt Model-Shift Uniqueness Test

007971540-01, P = 51.008650 Days, E = 115.199964 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
1.44	2.83	2.80	2.56	5.49	3.35	0.73	-1.36	-1.12	0.03	0.27	0.82	0.73	0.48	1.24



### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M$ ( $M_{\odot}$ )	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-01 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-42 \pm 8$	$1.86^{+1.75}_{-1.24}$	$997^{+64}_{-83}$	$5296^{+4344}_{-1262}$	$529^{+4229}_{-389}$
Alt.	$-30 \pm 11$	$1.79^{+1.93}_{-1.24}$	$996^{+65}_{-83}$	$5004^{+4376}_{-1246}$	$400^{+4084}_{-310}$

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

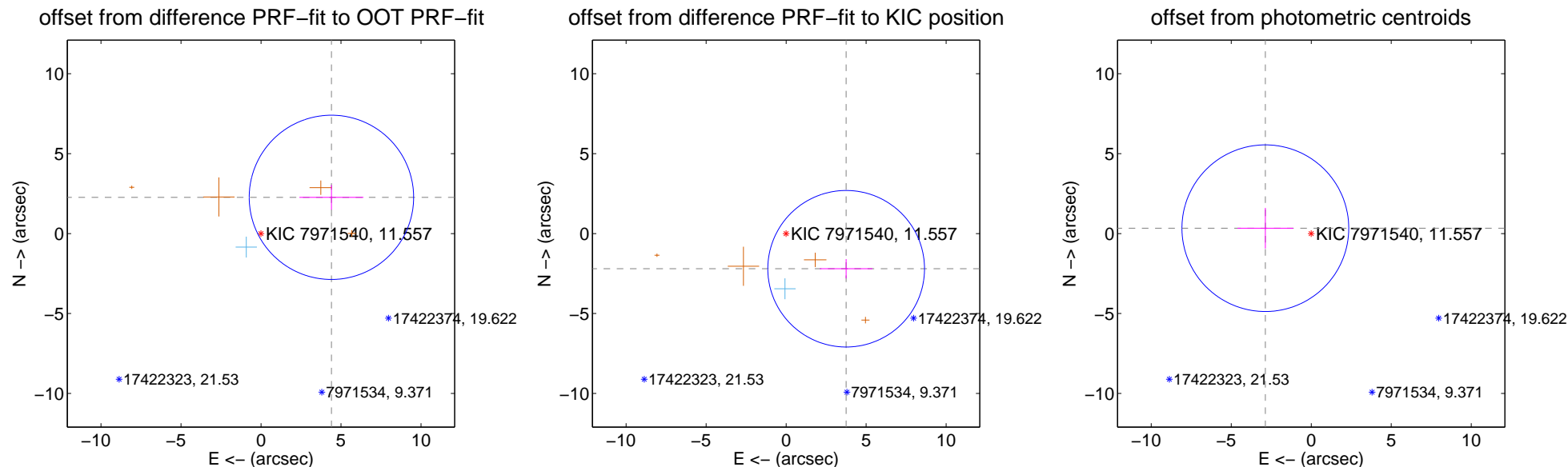
## DV Centroid Data

Supplemental centroid analysis for 007971540-01. **Kepler magnitude: 11.56.** Transit SNR 20.53

There are 1 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 2.74 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

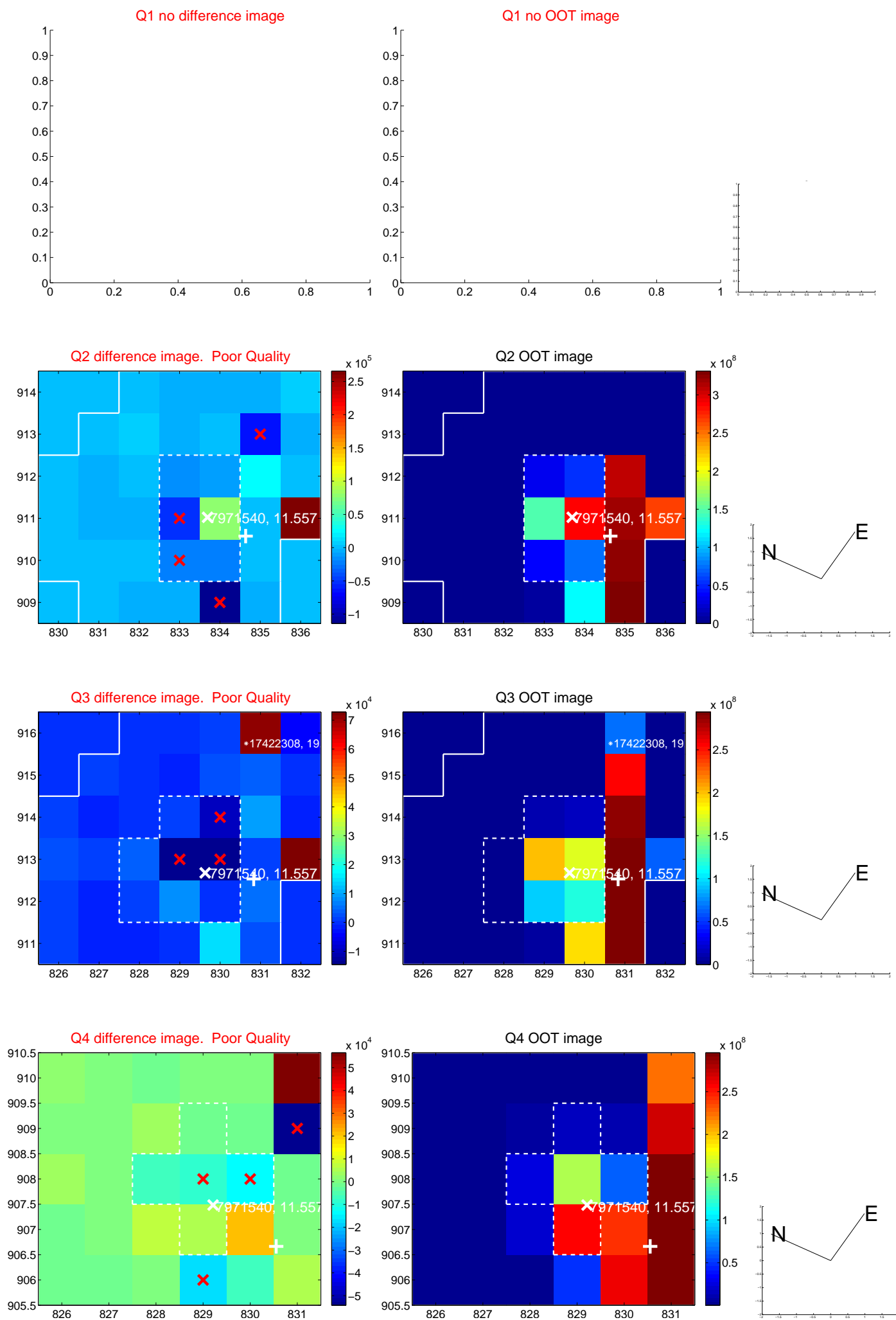
	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.949 \pm 1.712$	2.89	$-4.400 \pm 2.002$	$2.267 \pm 0.773$
PRF-fit source offset from KIC position	$4.348 \pm 1.631$	2.67	$-3.751 \pm 1.644$	$-2.199 \pm 0.604$
photometric centroid source offset	$2.89 \pm 1.74$	1.66	$2.87 \pm 1.74$	$0.34 \pm 1.27$



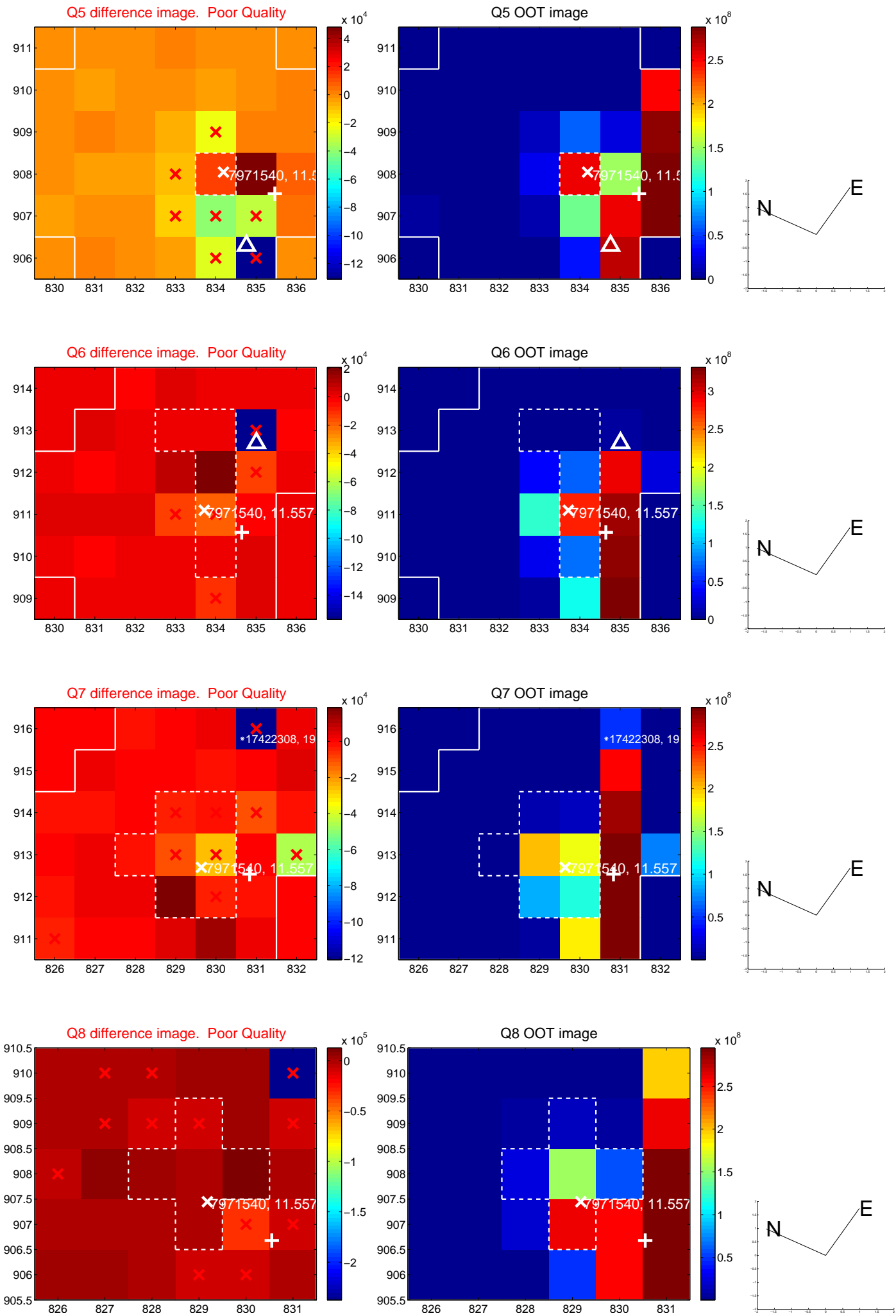
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



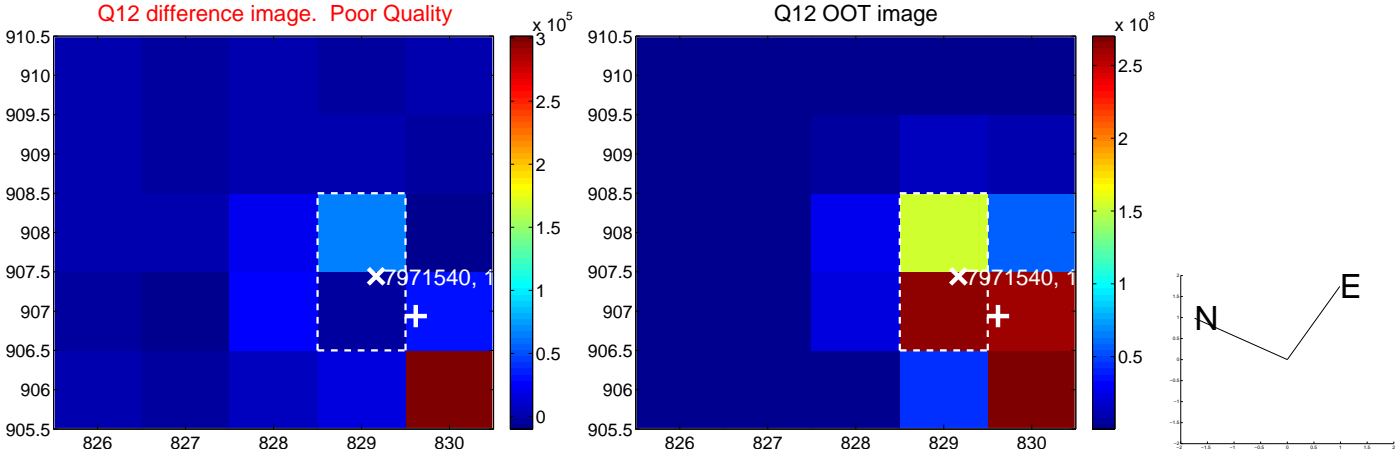
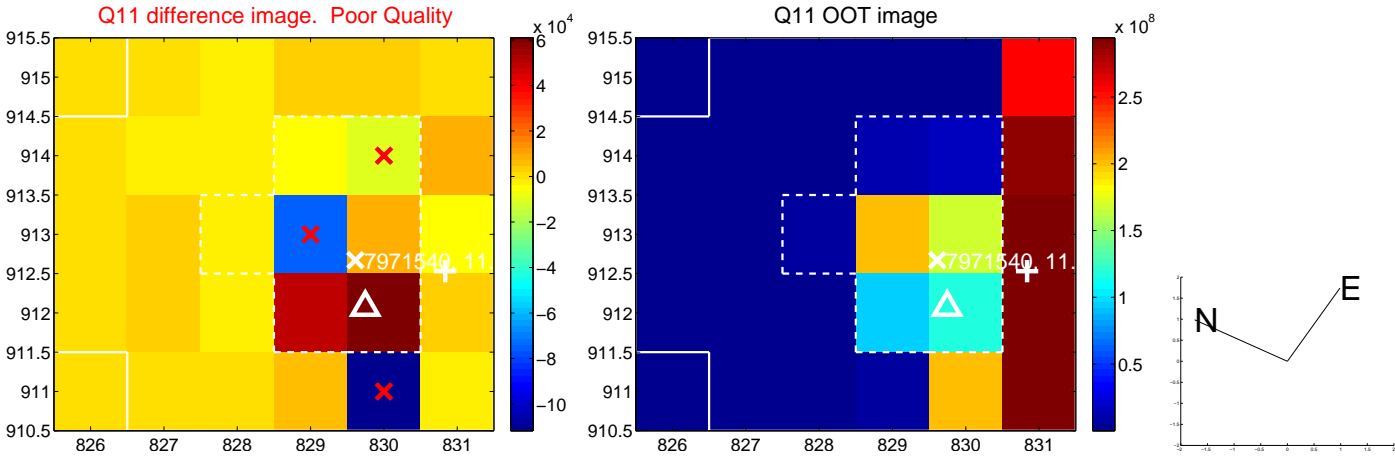
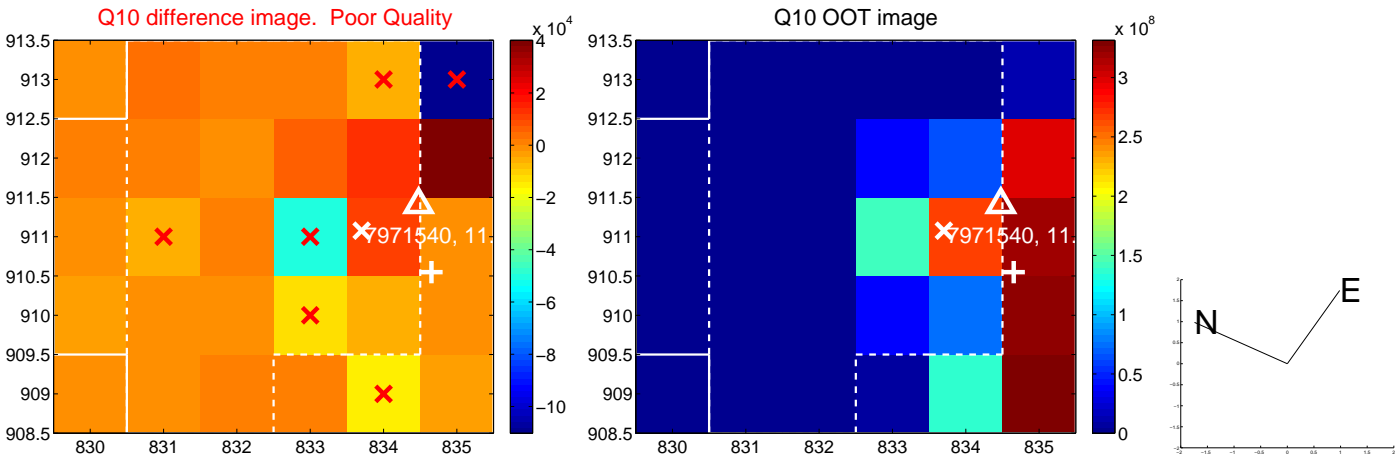
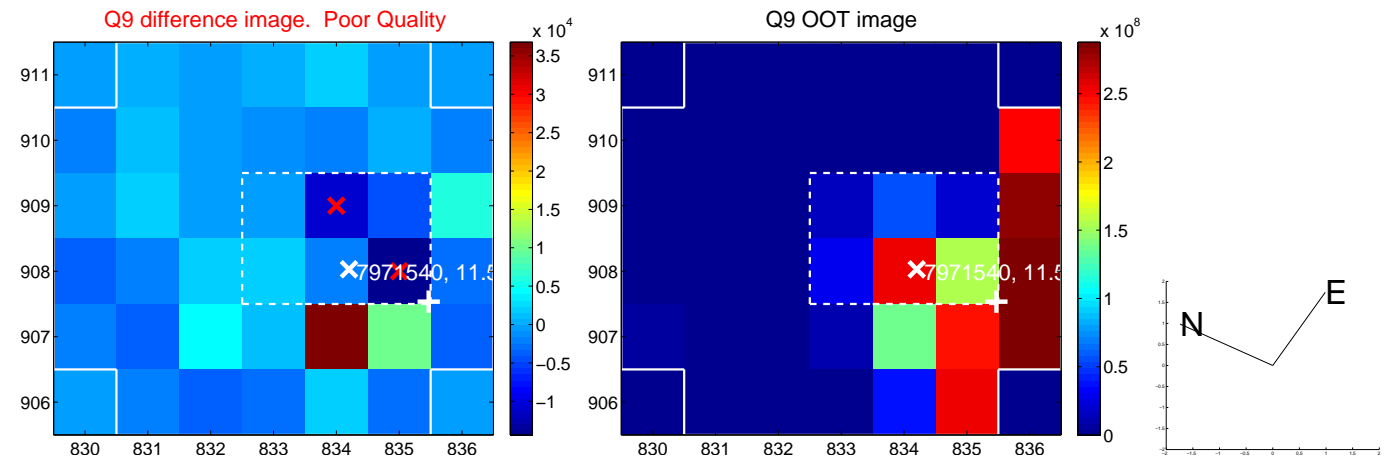
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



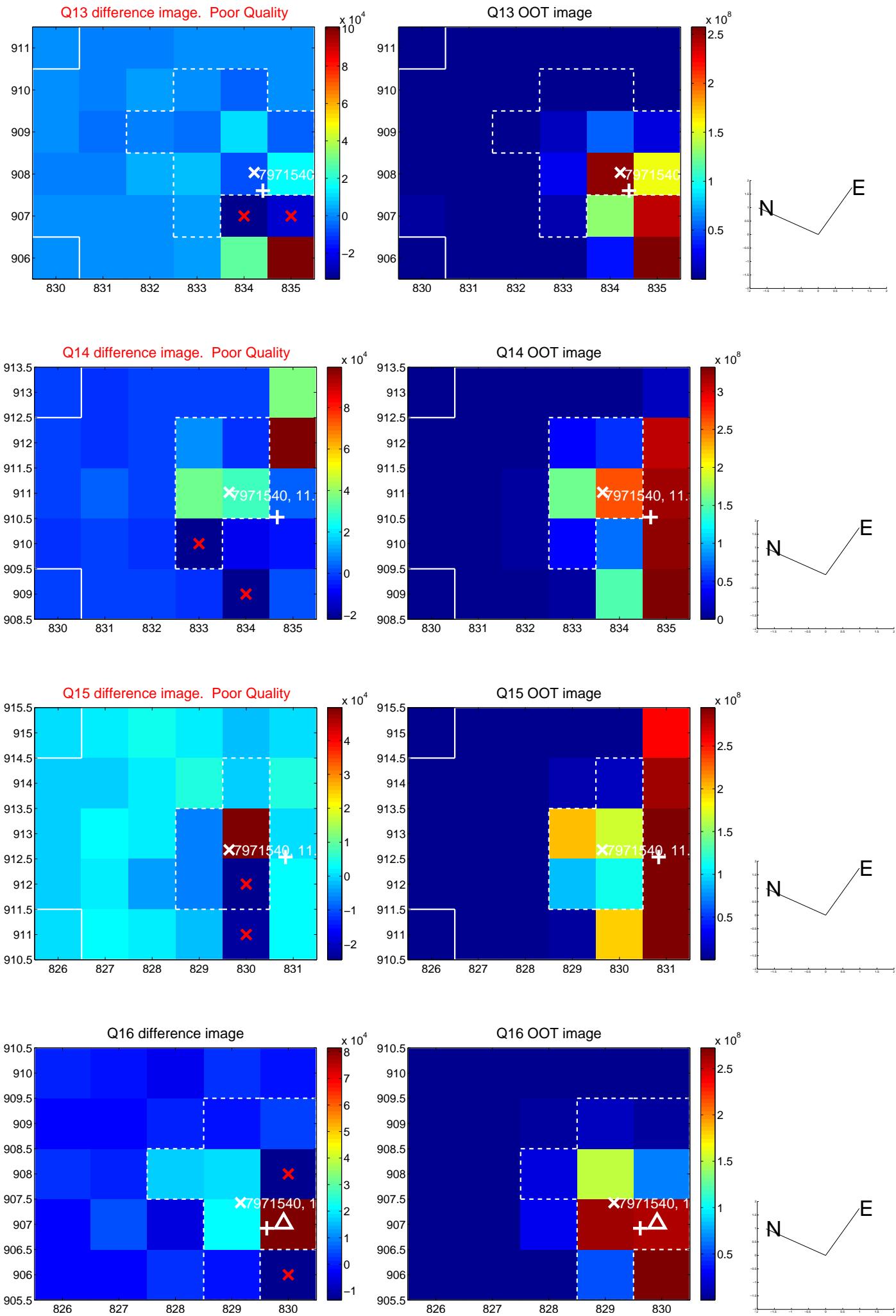
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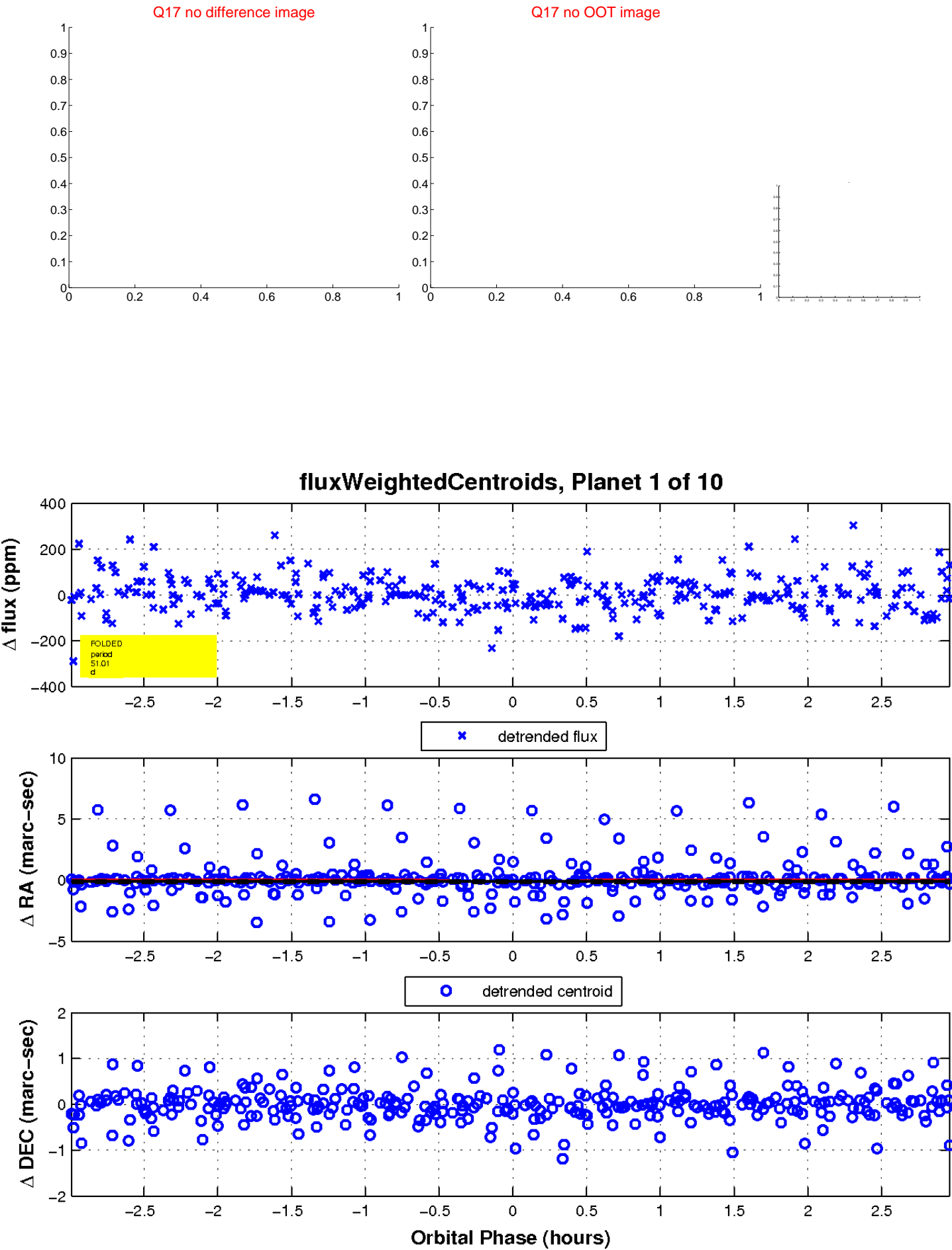
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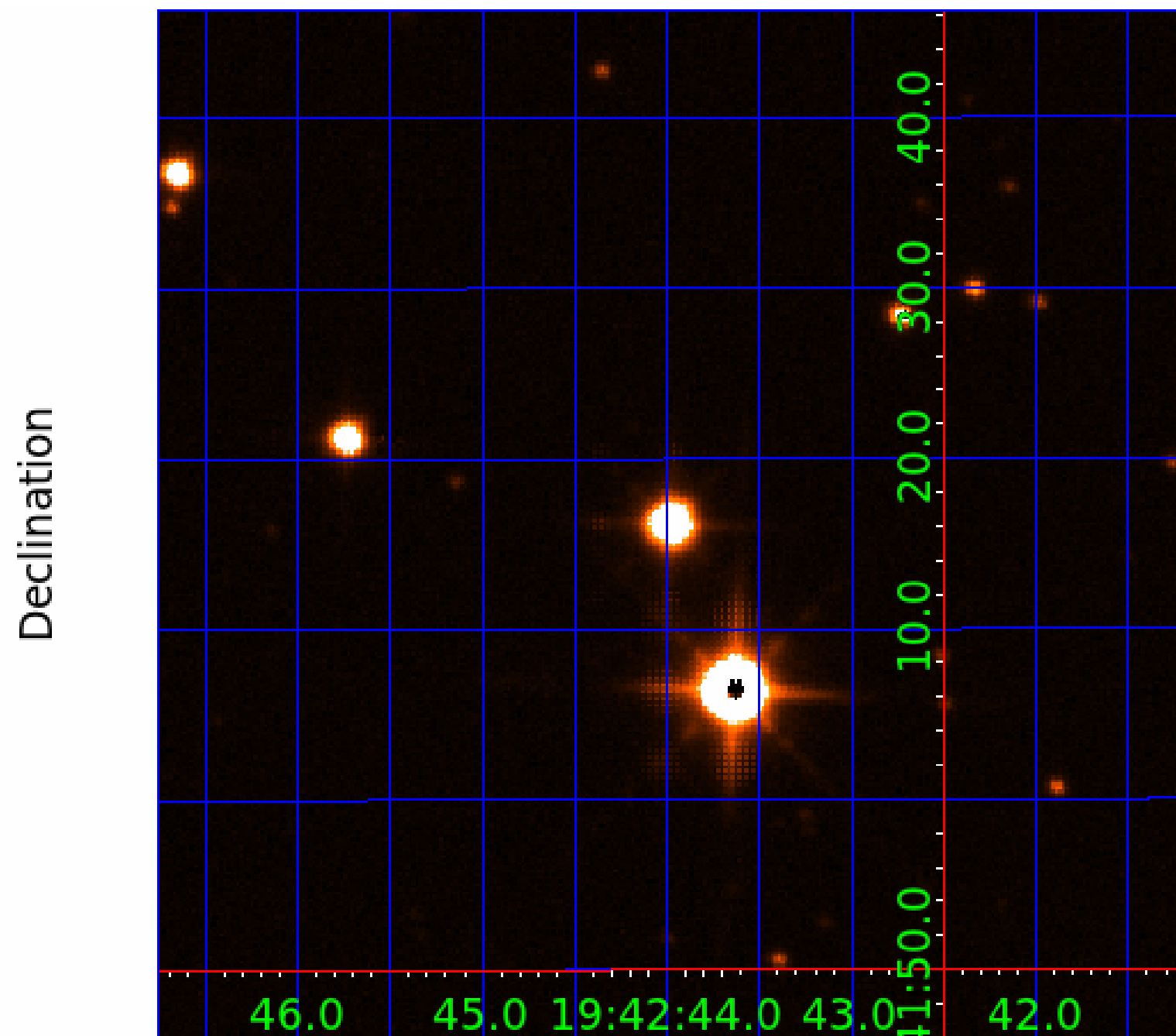


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UKIRT Image



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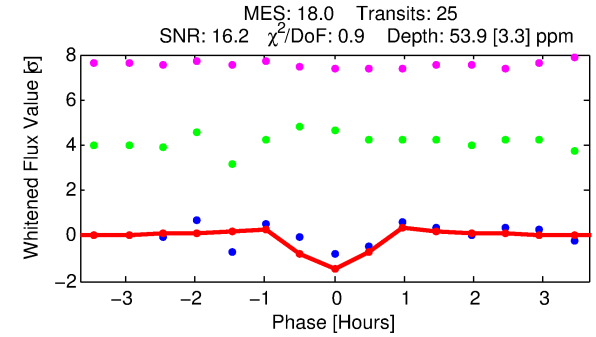
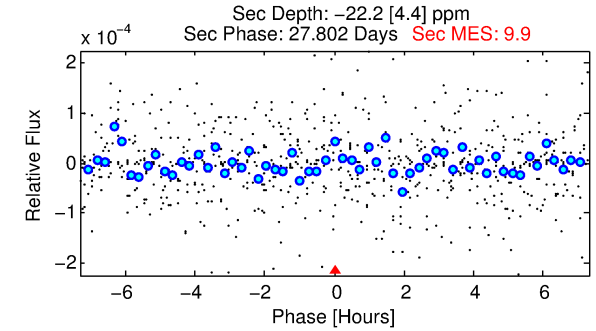
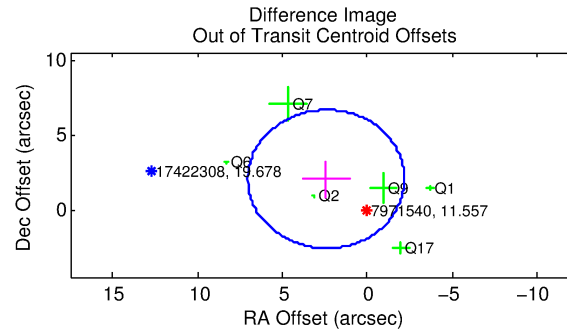
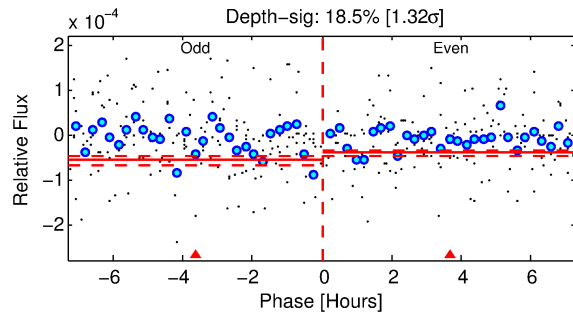
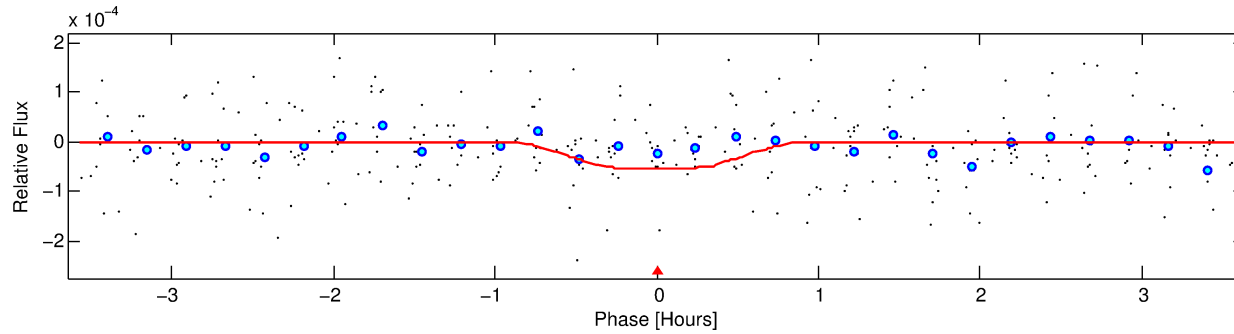
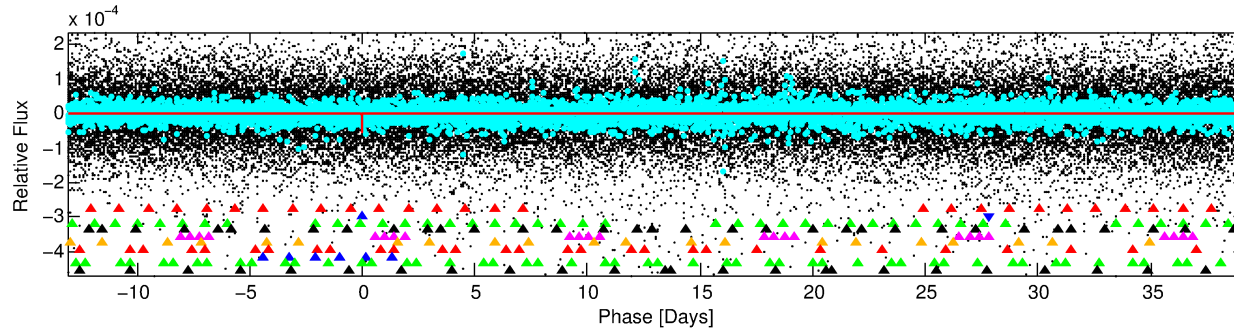
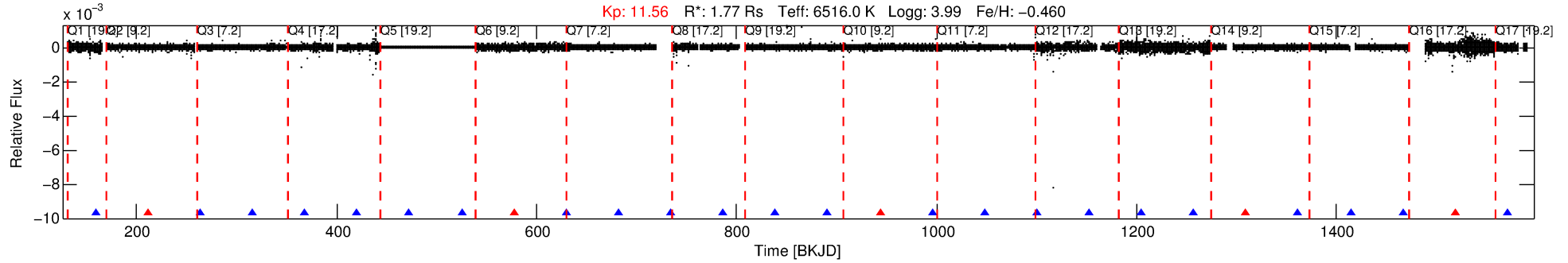
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-02

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 2 of 10 Period: 52.291 d



## DV Fit Results:

Period = 52.29111 [0.00036] d  
Epoch = 159.0260 [0.0023] BKJD  
Rp/R\* = 0.0076 [0.0038]  
a/R\* = 185.73 [544.33]  
b = 0.83 [1.06]  
Seff = 62.65 [30.19]  
Teq = 717 [86] K  
Rp = 1.46 [0.86] Re  
a = 0.2842 [0.0820] AU  
Ag = N/A  
Teffp = N/A

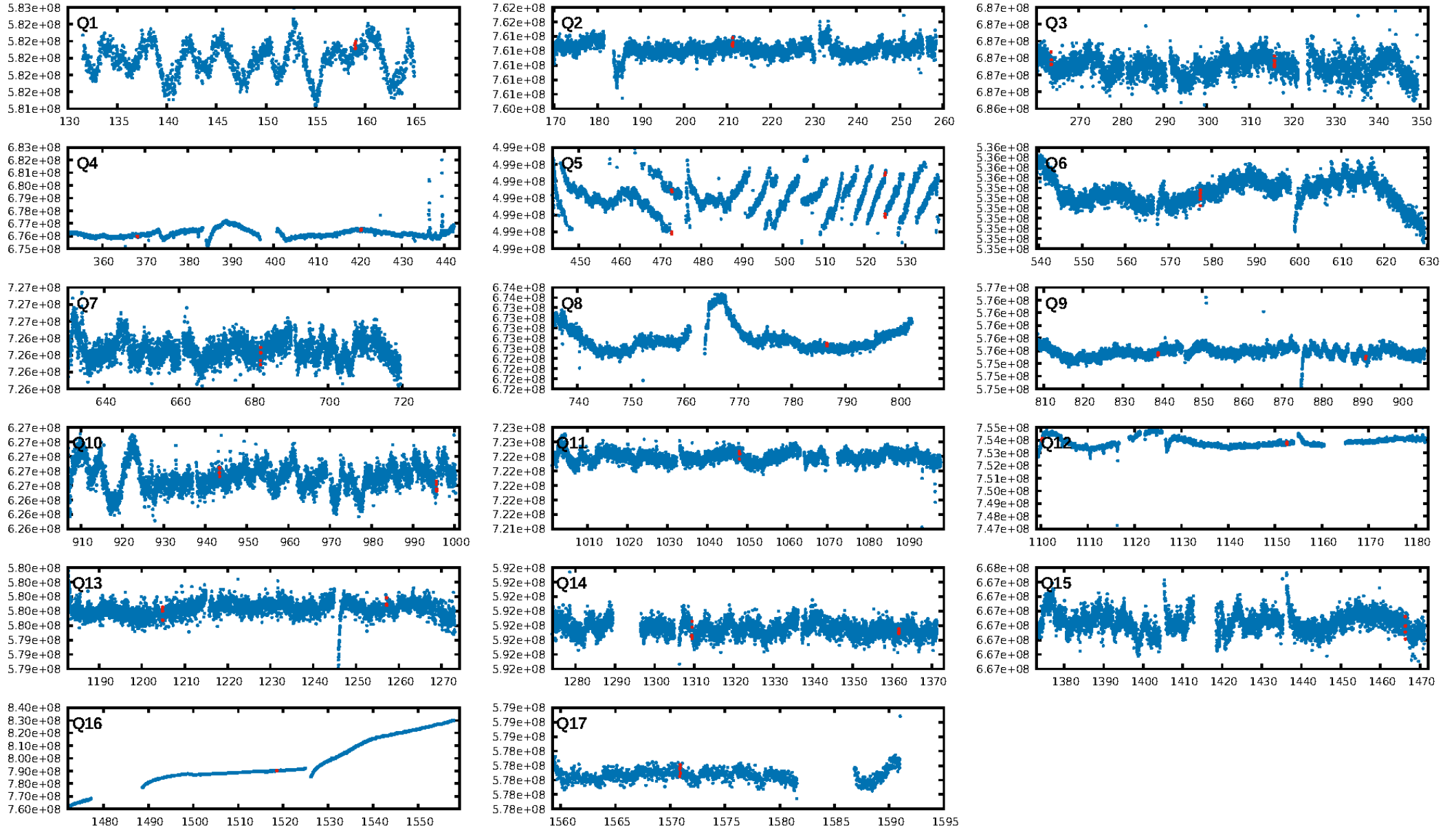
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [19.51 $\sigma$ ]  
LongPeriod-sig: 100.0% [18.87 $\sigma$ ]  
ModelChiSquare2-sig: 39.2%  
ModelChiSquareGof-sig: 99.1%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.78 [18/23]  
GhostDiagnostic-chr: 22.11  
Centroid-sig: N/A  
Centroid-so: 2.599 arcsec [2.02 $\sigma$ ]  
OotOffset-rm: 3.156 arcsec [2.05 $\sigma$ ]  
KicOffset-rm: 4.542 arcsec [4.44 $\sigma$ ]  
OotOffset-st: 2/1/0/3 [6]  
KicOffset-st: 2/1/0/3 [6]  
DiffImageQuality-fgm: 0.67 [4/6]  
DiffImageOverlap-fno: 0.94 [16/17]

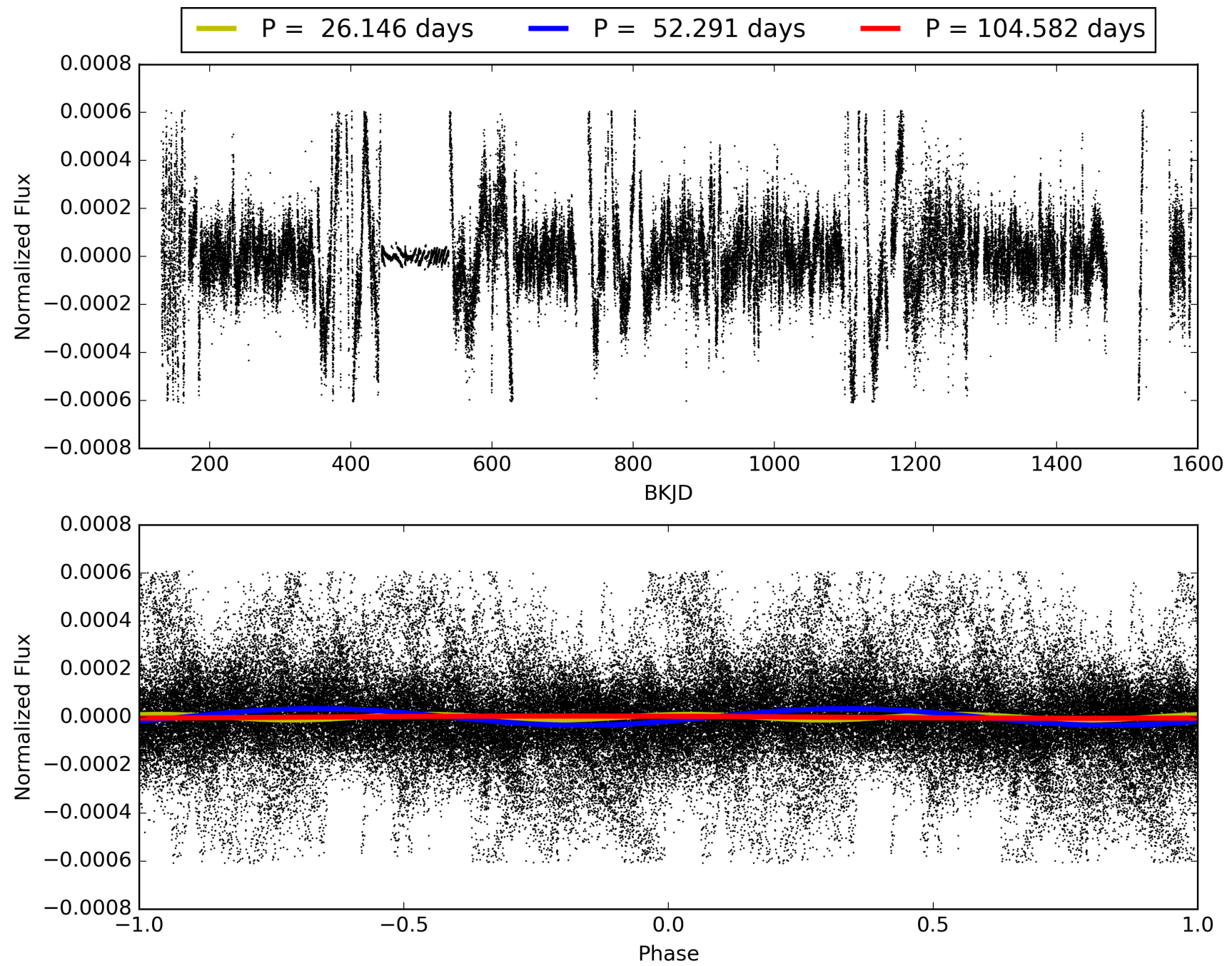
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:56:20 Z

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

# TCE 007971540-02, PDC Light Curves



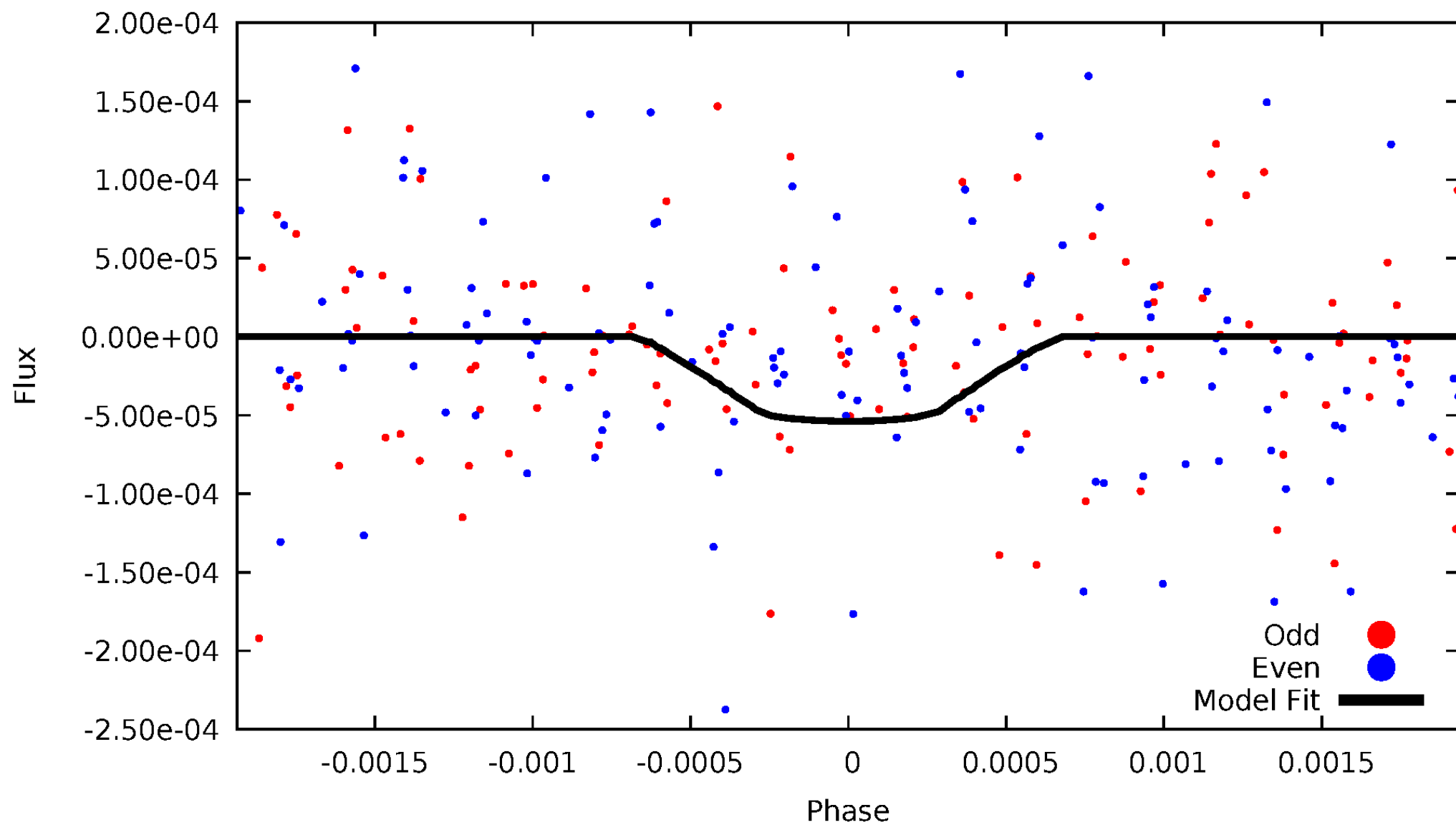
# TCE 007971540-02





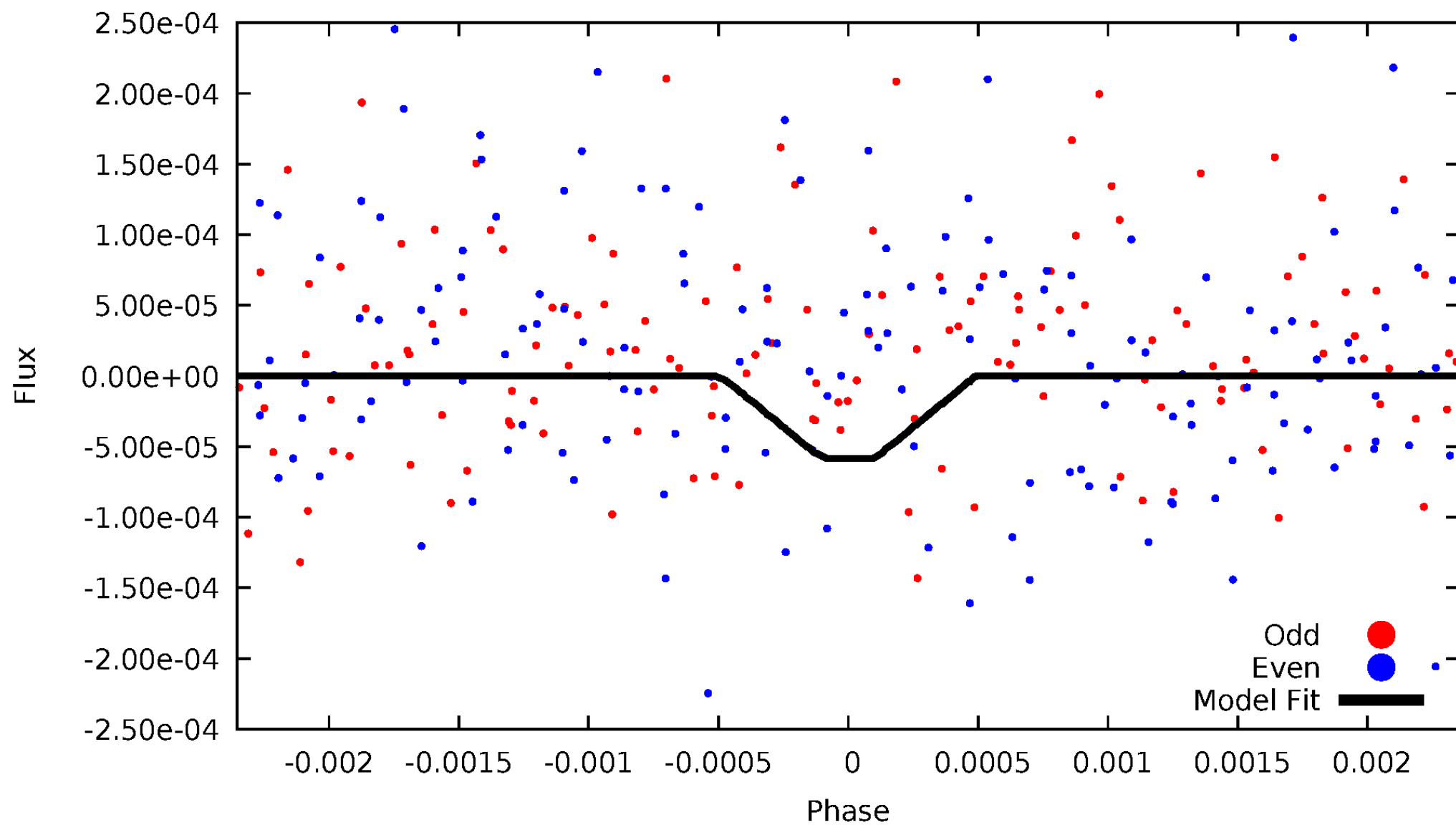
# DV Odd/Even

TCE 007971540-02



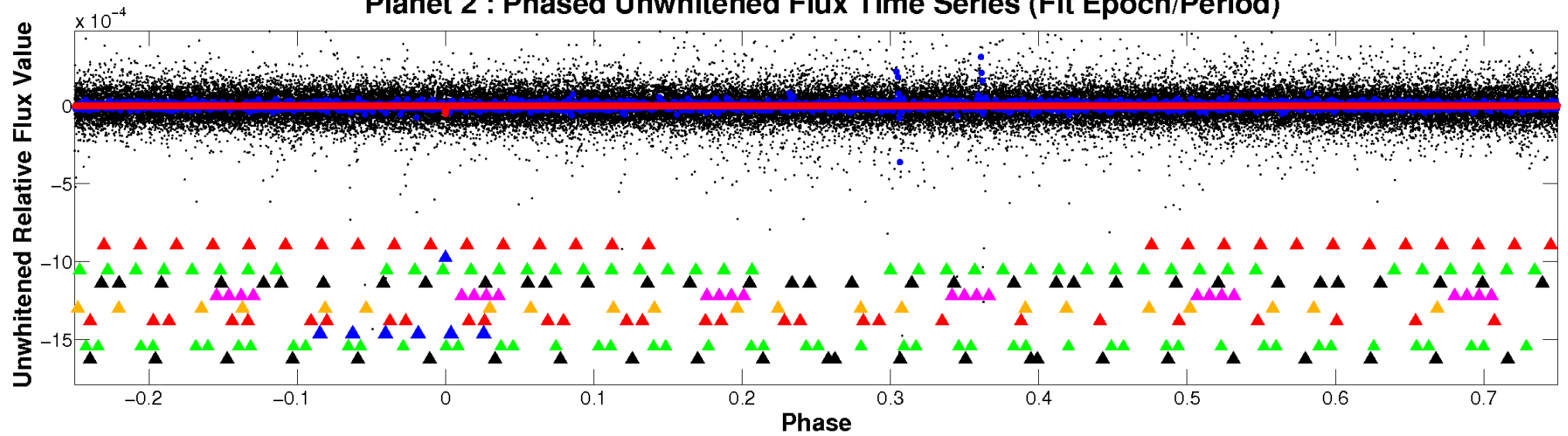
# ALT Odd/Even

TCE 007971540-02

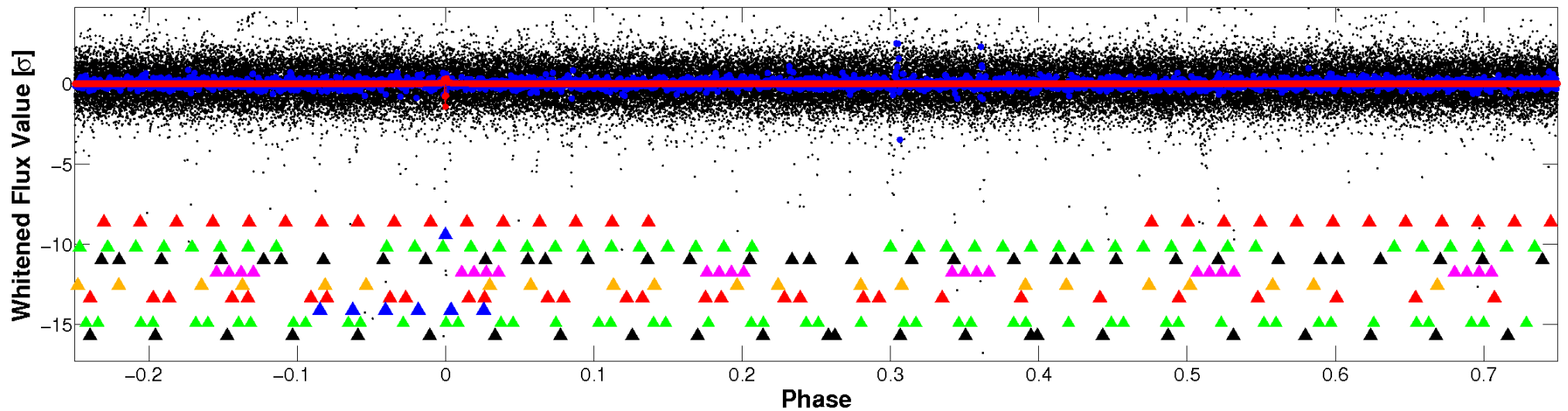


# Non-Whitened Vs. Whitened Light Curve

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

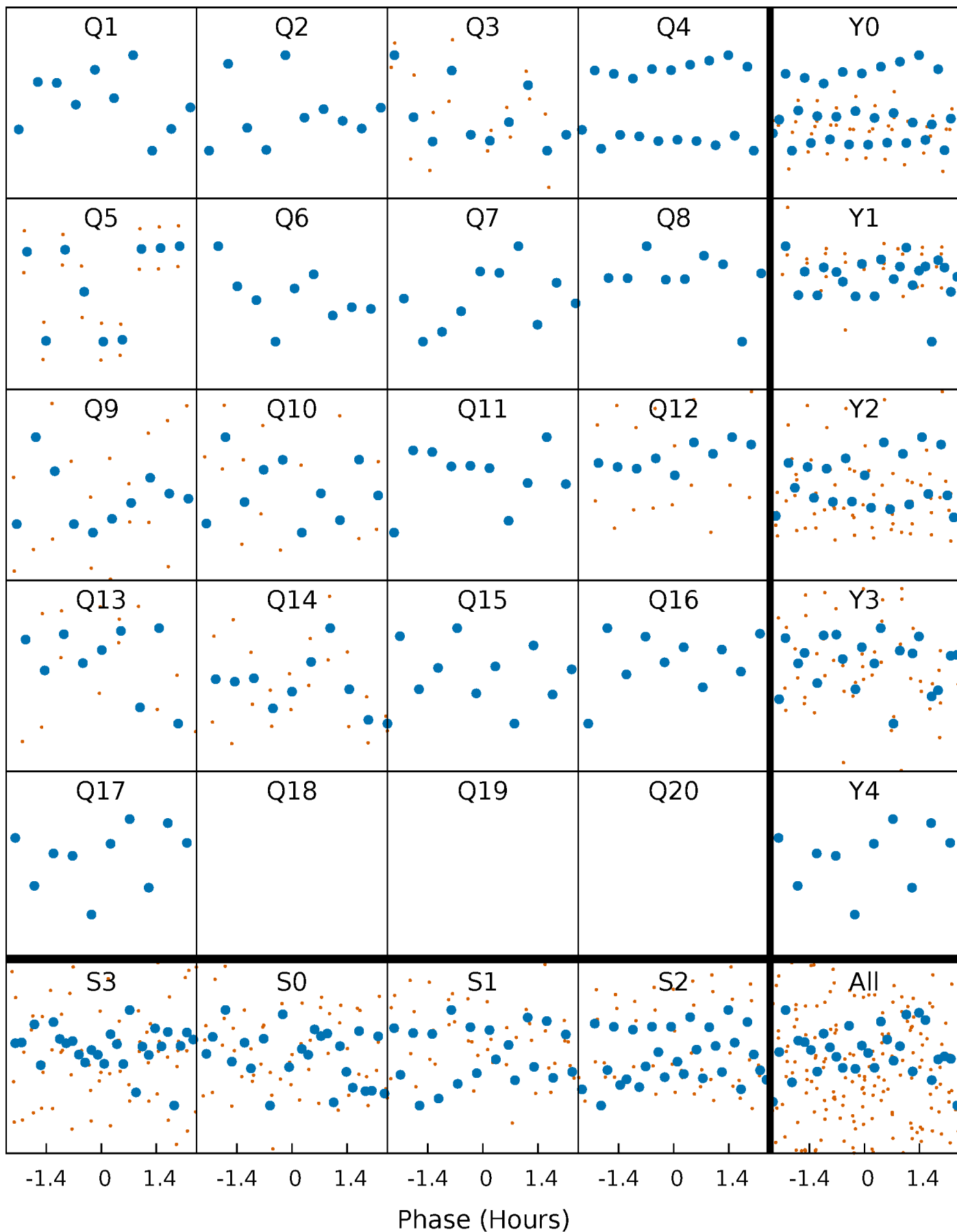


## Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



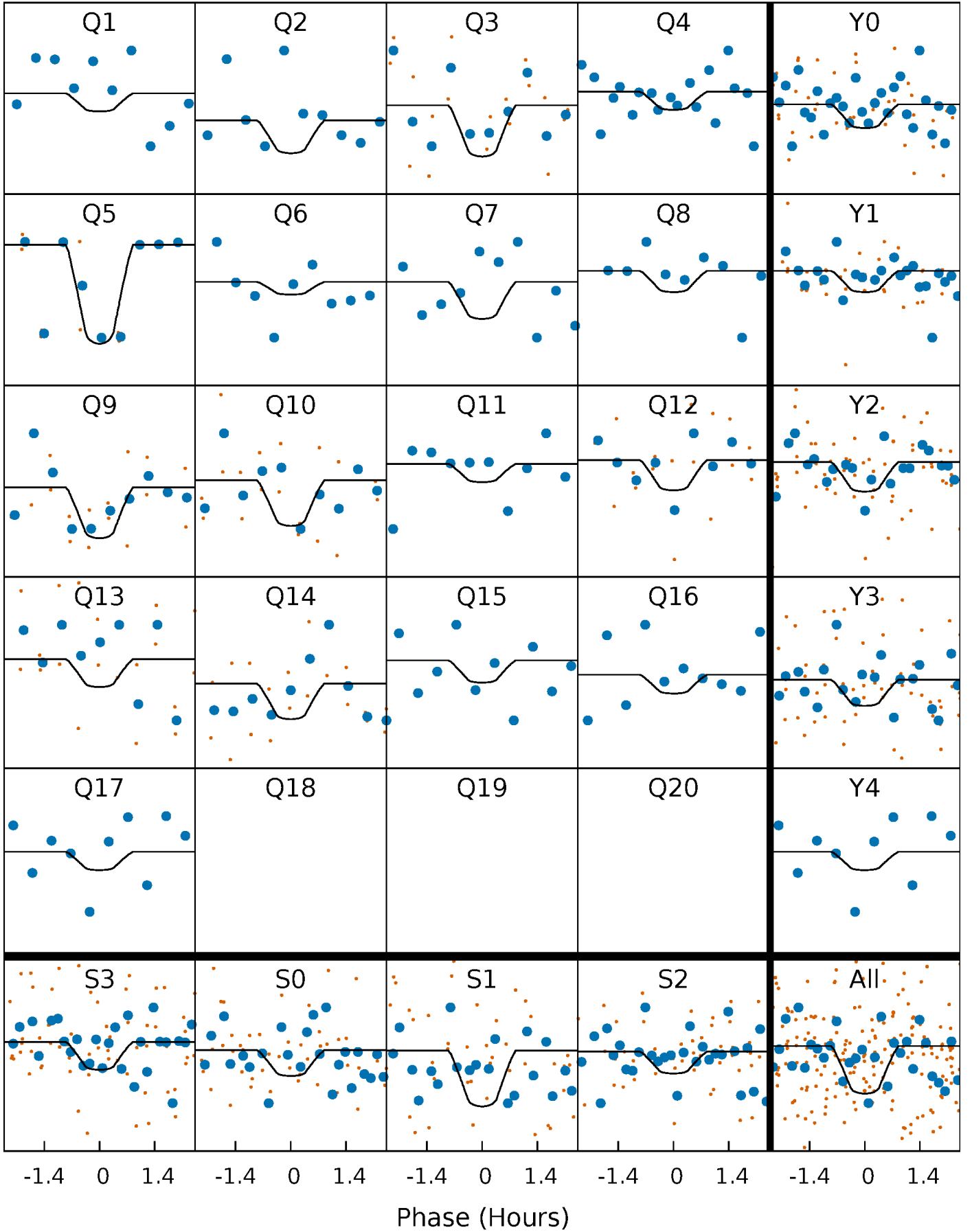
# PDC Quarter-Phased Transit Curves

TCE 007971540-02   P= 52.291113 Days    $T_0=159.026037$  (BKJD)



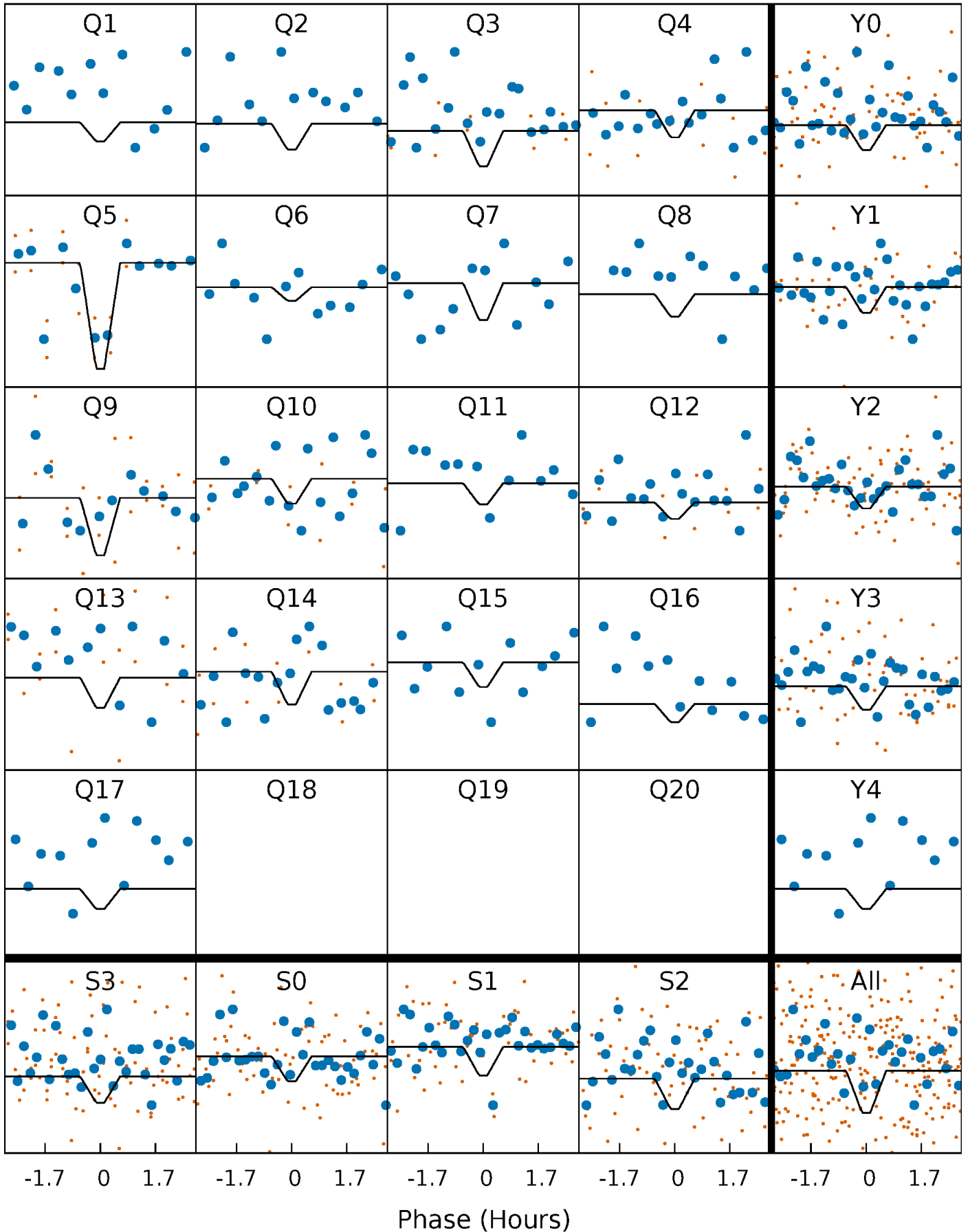
# DV Quarter-Phased Transit Curves

TCE 007971540-02   P= 52.291113 Days    $T_0=159.026037$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

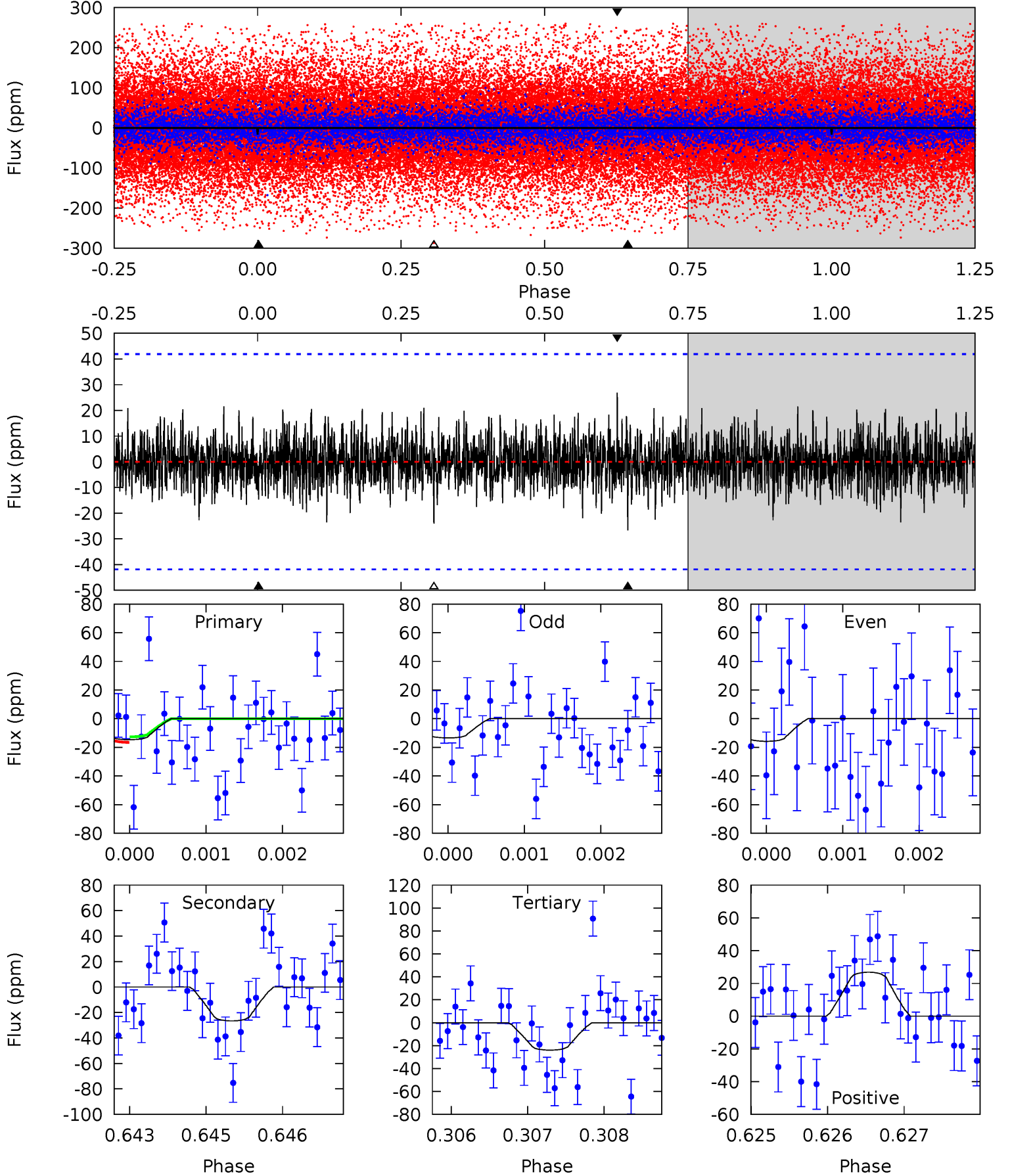
TCE 007971540-02 P= 52.291659 Days  $T_0=159.029585$  (BKJD)



# DV Model-Shift Uniqueness Test

007971540-02, P = 52.291113 Days, E = 106.734924 Days

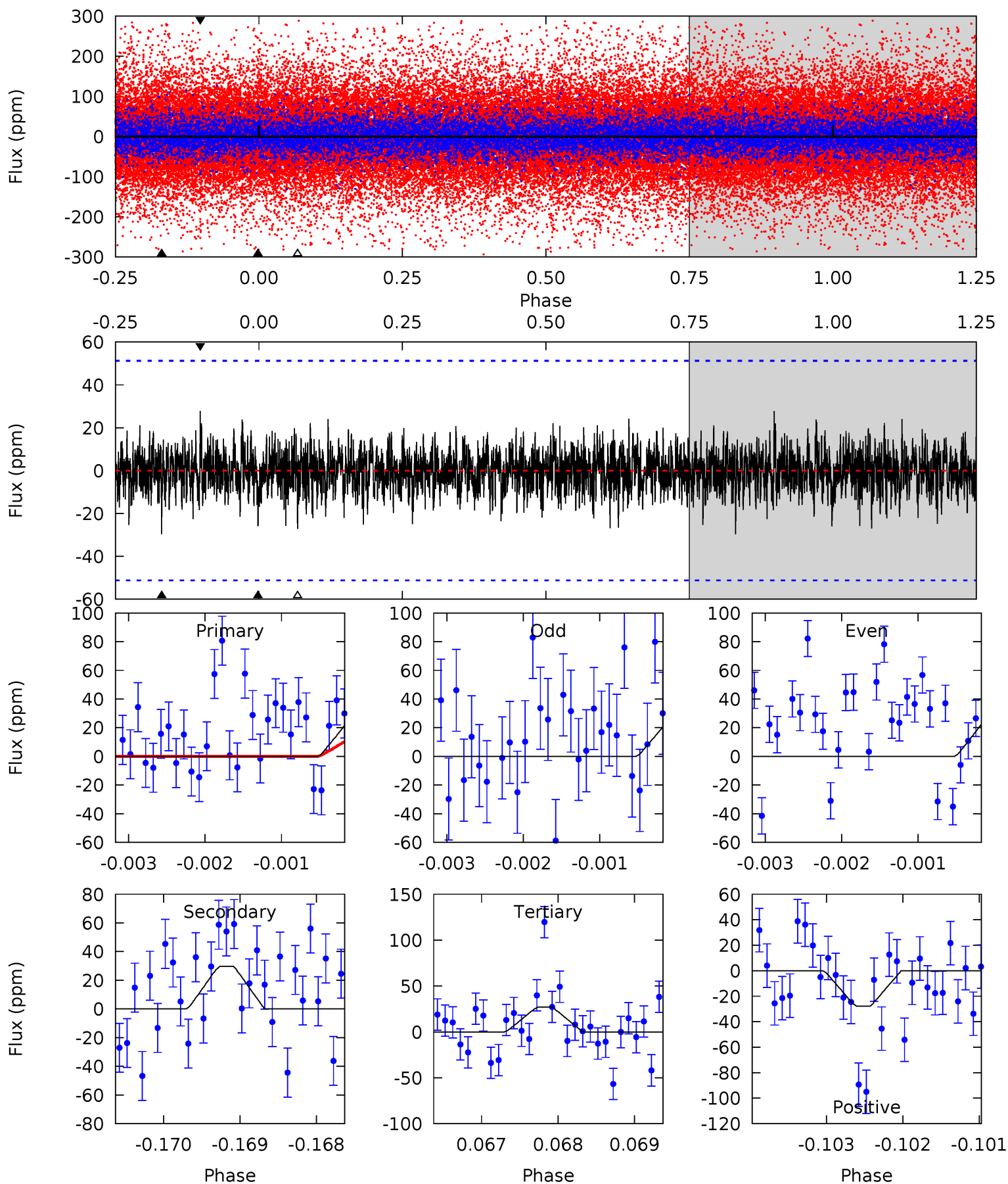
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.90	3.44	3.10	3.47	5.41	3.23	0.90	-1.20	-1.57	0.34	-0.03	0.16	0.76	0.50	0.25



# Alt Model-Shift Uniqueness Test

007971540-02, P = 52.291659 Days, E = 106.737926 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
2.76	3.16	2.88	2.96	5.46	3.30	0.82	-0.12	-0.19	0.28	0.20	0.11	1.34	0.48	1.57





### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-02 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-27 \pm 8$	$1.43^{+0.74}_{-0.71}$	$985^{+69}_{-84}$	$5351^{+2025}_{-874}$	$622^{+1470}_{-378}$
Alt.	$-30 \pm 9$	$1.36^{+0.80}_{-0.69}$	$986^{+68}_{-83}$	$5483^{+2292}_{-1005}$	$681^{+1967}_{-434}$

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

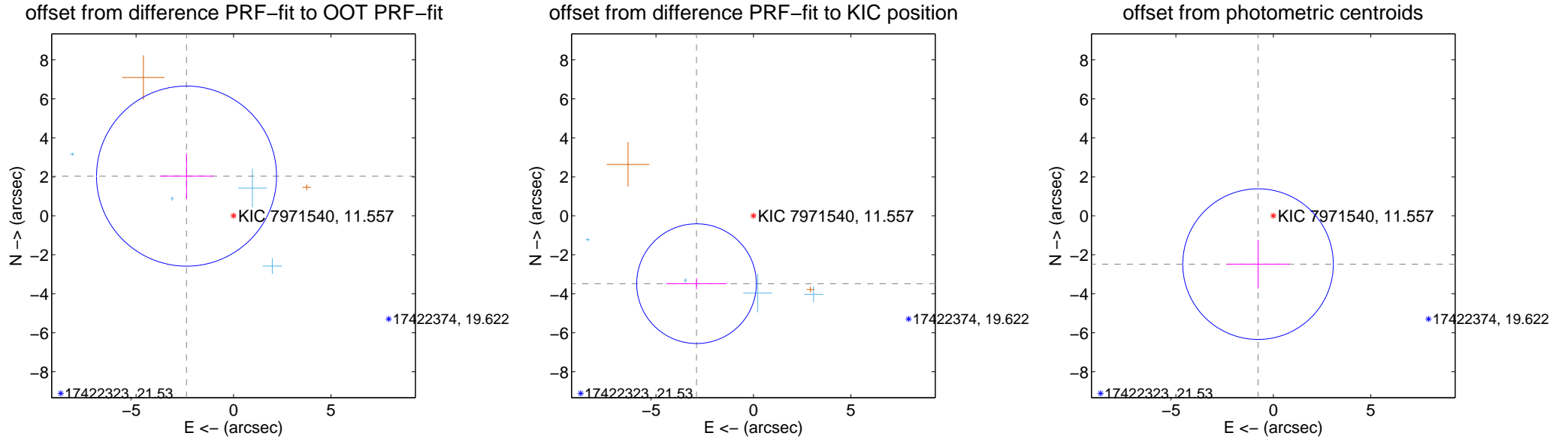
## DV Centroid Data

Supplemental centroid analysis for 007971540-02. **Kepler magnitude: 11.56.** Transit SNR 16.21

There are 4 quarters with good PRF difference image offsets

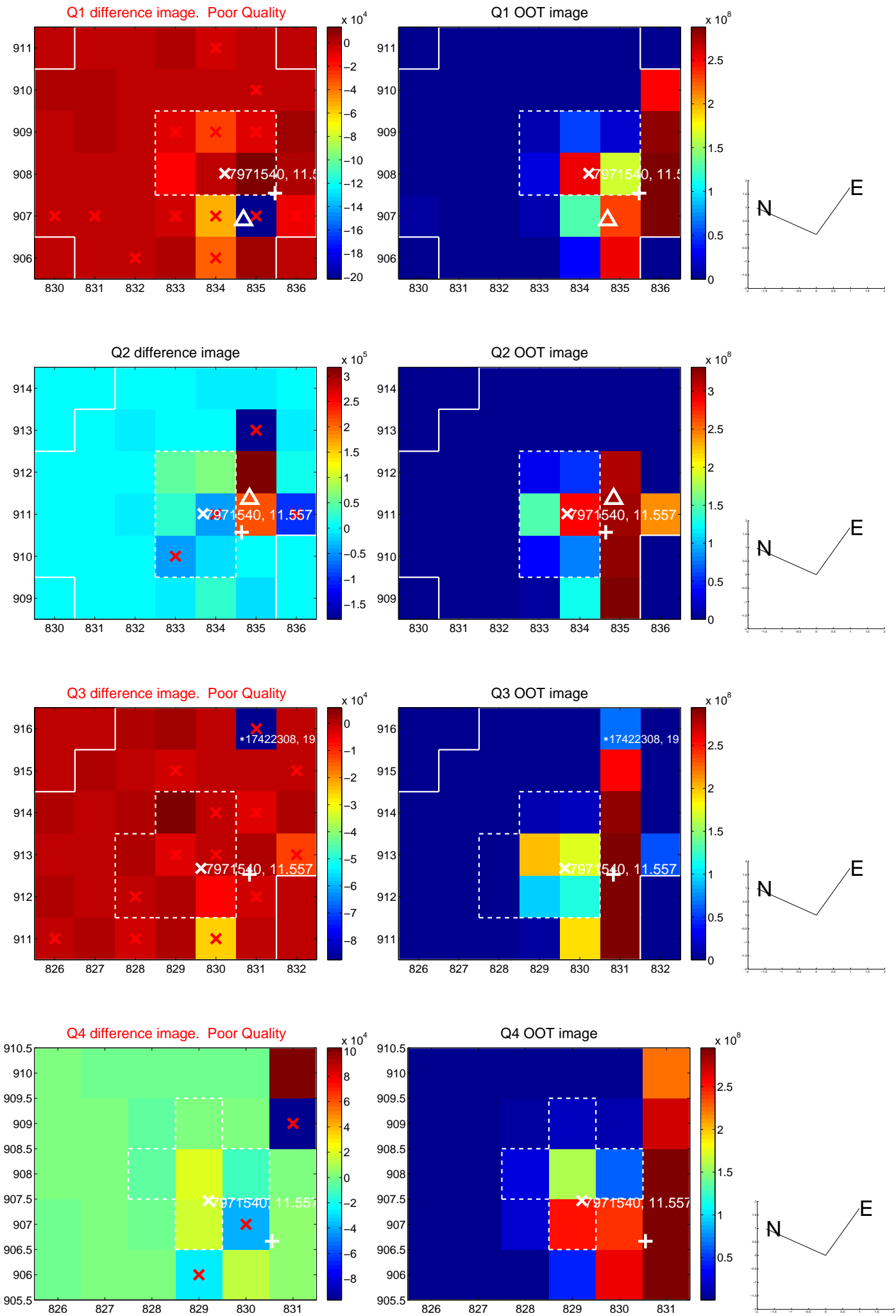
The direct PRF centroid is offset from the target star catalog position by about 1.82 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$3.156 \pm 1.539$	2.05	$2.411 \pm 1.376$	$2.036 \pm 1.172$
PRF-fit source offset from KIC position	<b><math>4.542 \pm 1.023</math></b>	<b>4.44</b>	$2.919 \pm 1.555$	$-3.480 \pm 0.287$
photometric centroid source offset	$2.60 \pm 1.29$	2.02	$0.78 \pm 1.62$	$-2.48 \pm 1.25$

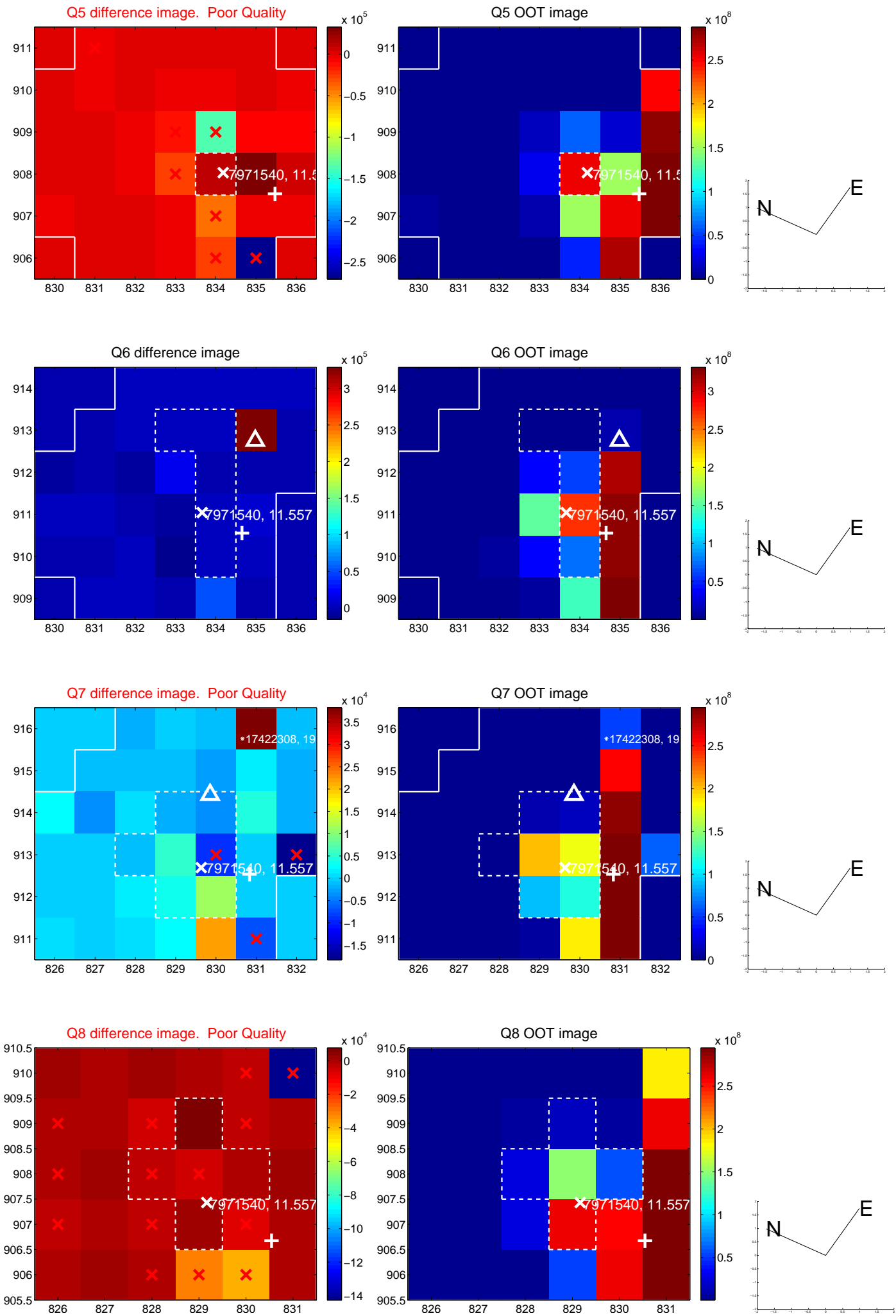


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

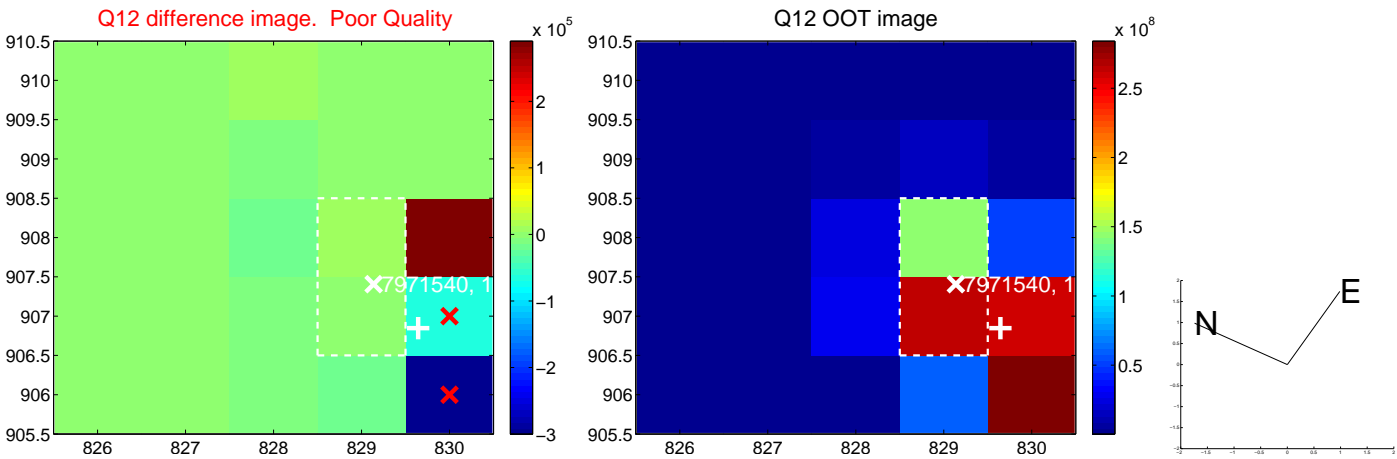
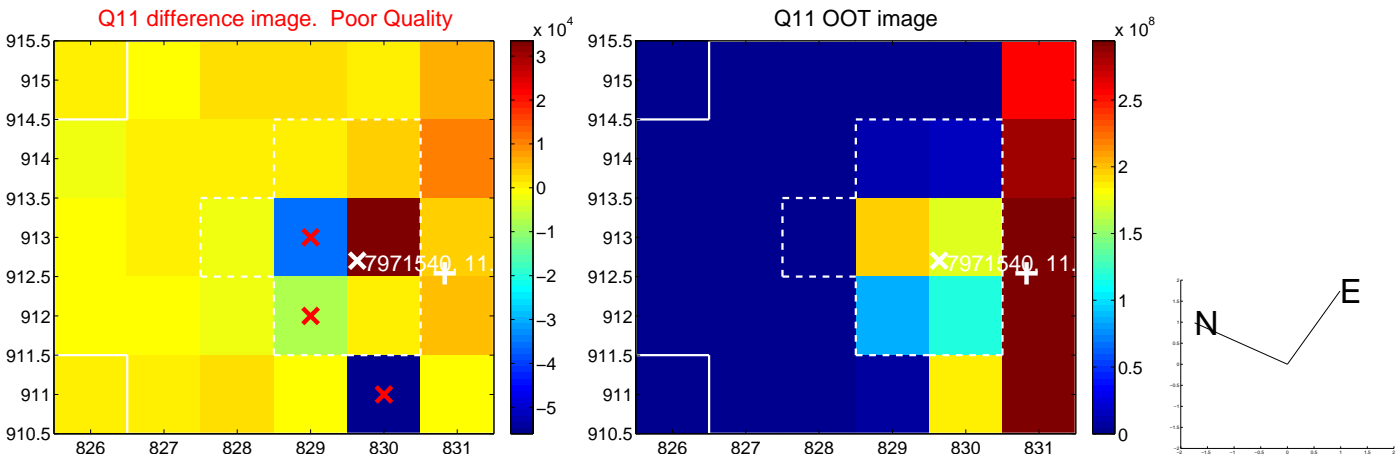
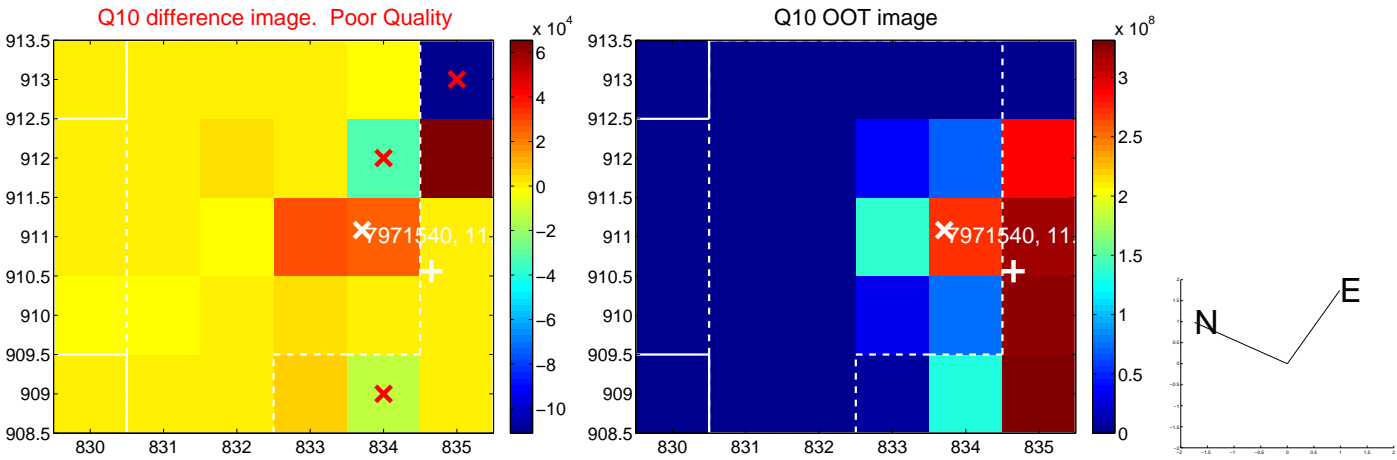
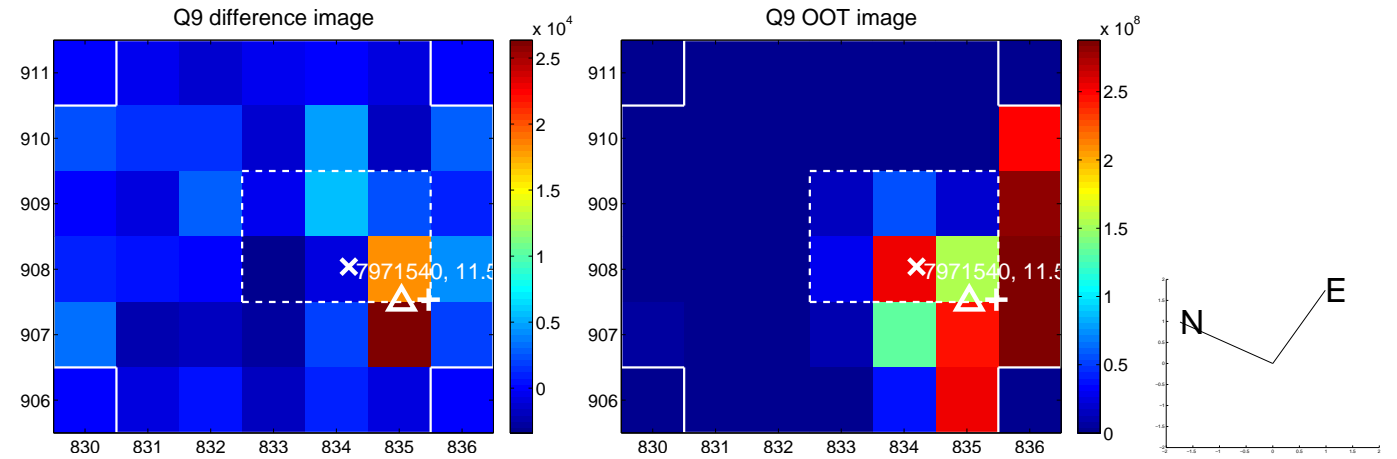
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



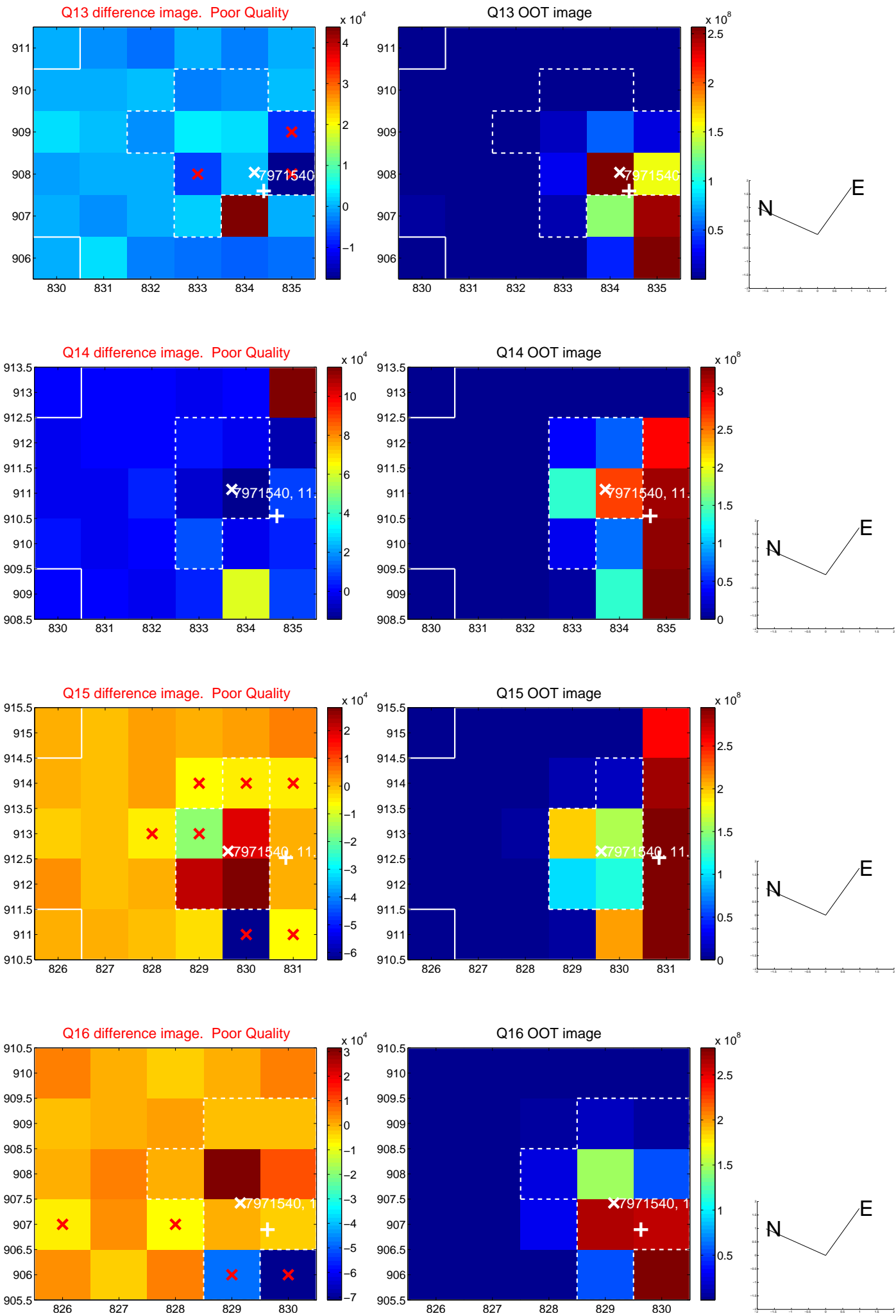
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



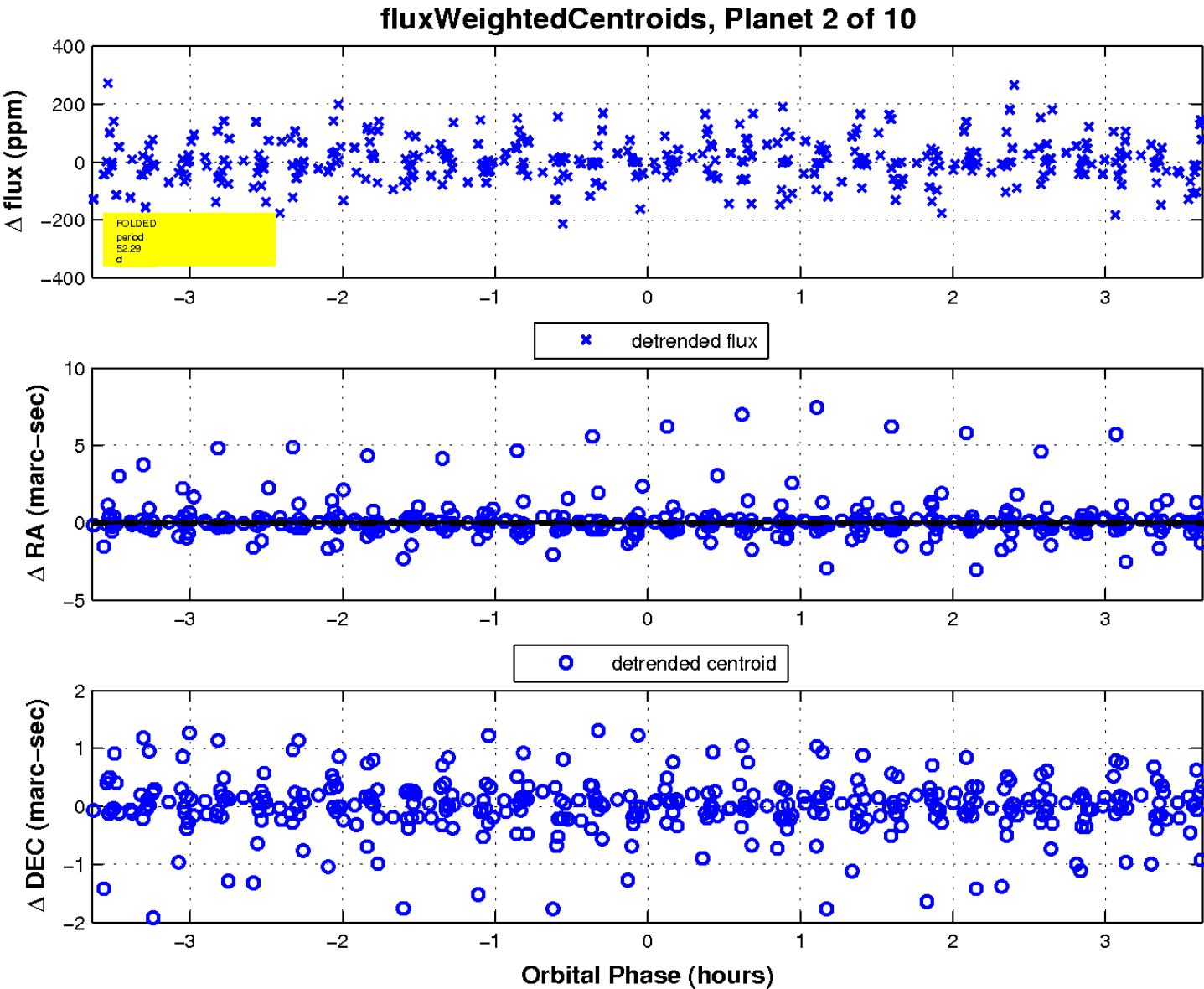
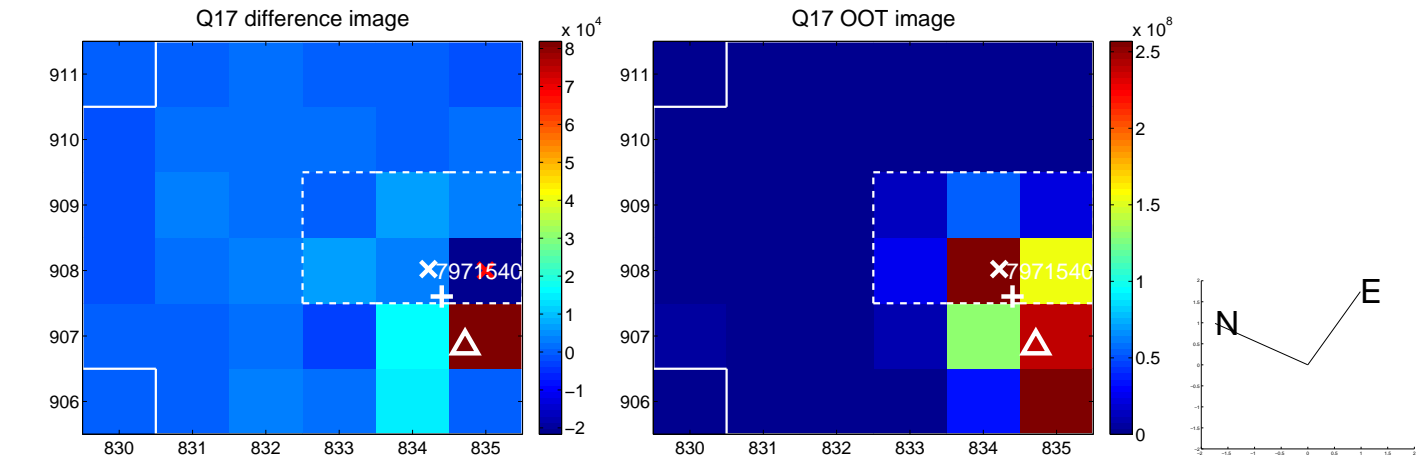
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



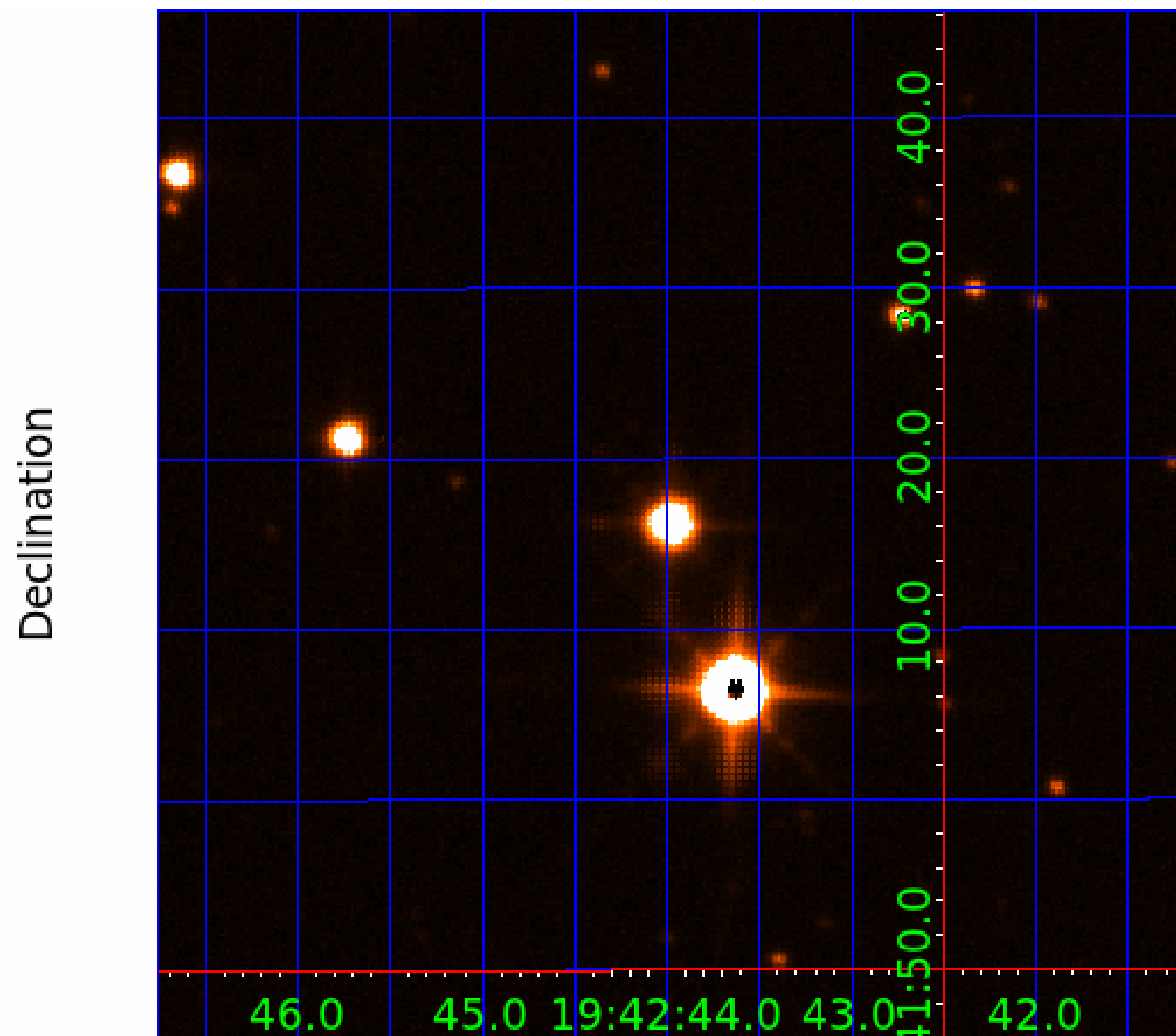
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007971540-01	OBS	No	51.011313	166.181425	52.5	1.002	29.8	20.5	1.77	6516	1.30	64.75
007971540-02	OBS	No	52.291113	159.026037	53.9	1.214	18.0	16.2	1.77	6516	1.46	62.65
007971540-03	OBS	No	34.530503	153.062724	23.2	2.413	14.7	7.2	1.77	6516	1.02	108.94
007971540-04	OBS	No	42.975481	146.899876	56.8	0.683	13.6	15.7	1.77	6516	1.38	81.38
007971540-05	OBS	No	60.934308	143.610155	48.2	1.035	15.8	19.4	1.77	6516	1.40	51.09
007971540-06	OBS	No	71.174769	162.031760	41.4	7.231	14.7	16.6	1.77	6516	1.30	41.53
007971540-07	OBS	No	49.509656	174.313640	54.0	12.534	13.5	16.9	1.77	6516	1.52	67.38
007971540-08	OBS	No	262.610321	259.184059	26.0	18.558	13.9	4.7	1.77	6516	1.08	7.28
007971540-09	OBS	No	28.835527	150.649599	19.5	11.693	12.6	9.8	1.77	6516	0.97	138.54
007971540-10	OBS	No	59.432161	172.524554	131.2	9.000	11.7	-1.0	1.77	6516	2.04	52.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007971540-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-04	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-06	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST
007971540-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007971540-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007971540-09	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007971540-10	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

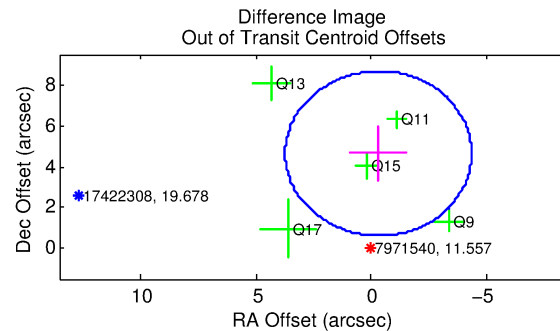
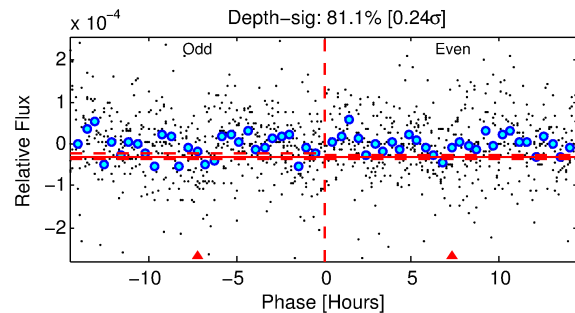
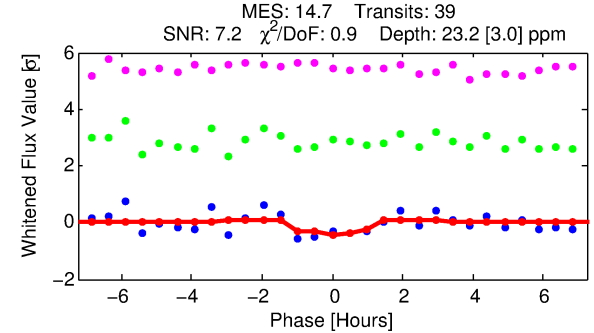
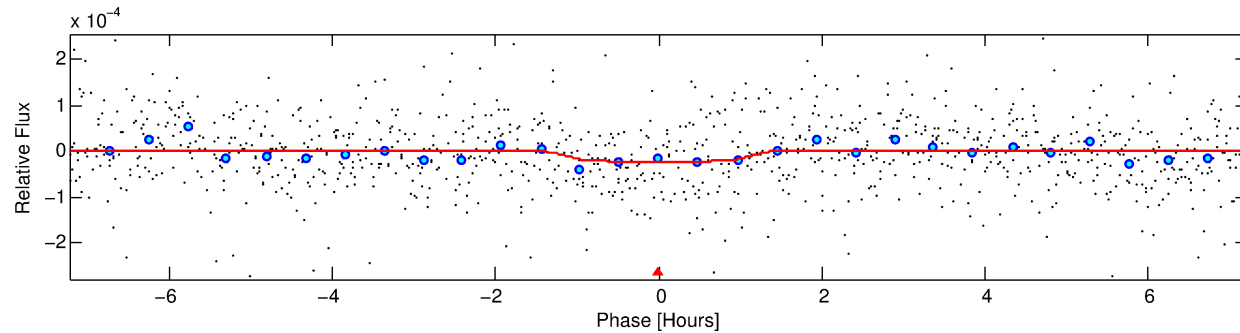
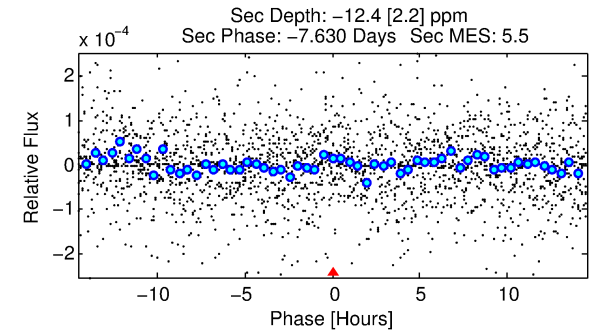
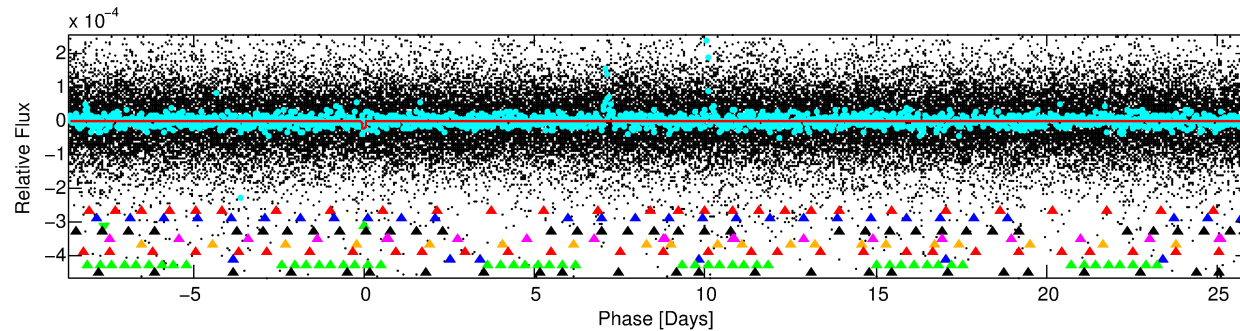
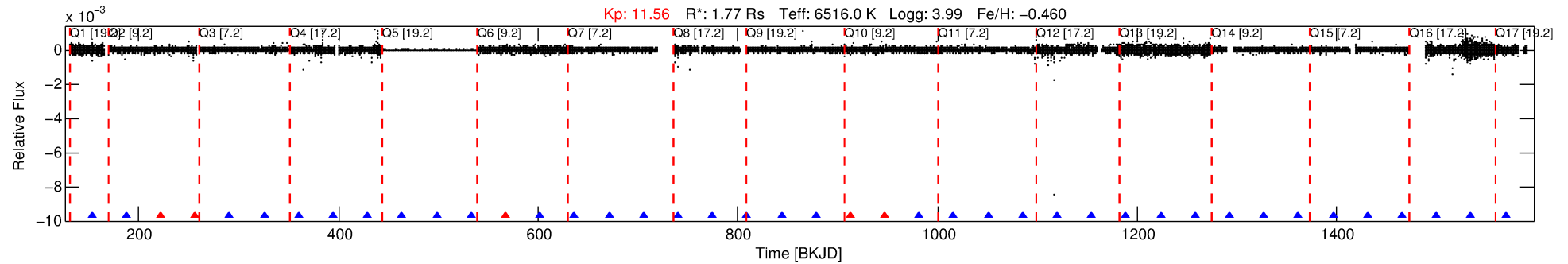
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-03

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 3 of 10 Period: 34.531 d



## DV Fit Results:

Period = 34.53050 [0.00053] d  
Epoch = 153.0627 [0.0062] BKJD  
Rp/R\* = 0.0053 [0.0012]  
a/R\* = 43.00 [64.86]  
b = 0.93 [0.23]  
Seff = 108.94 [52.50]  
Teq = 824 [99] K  
Rp = 1.02 [0.38] Re  
a = 0.2155 [0.0622] AU  
Ag = N/A  
Teffp = N/A

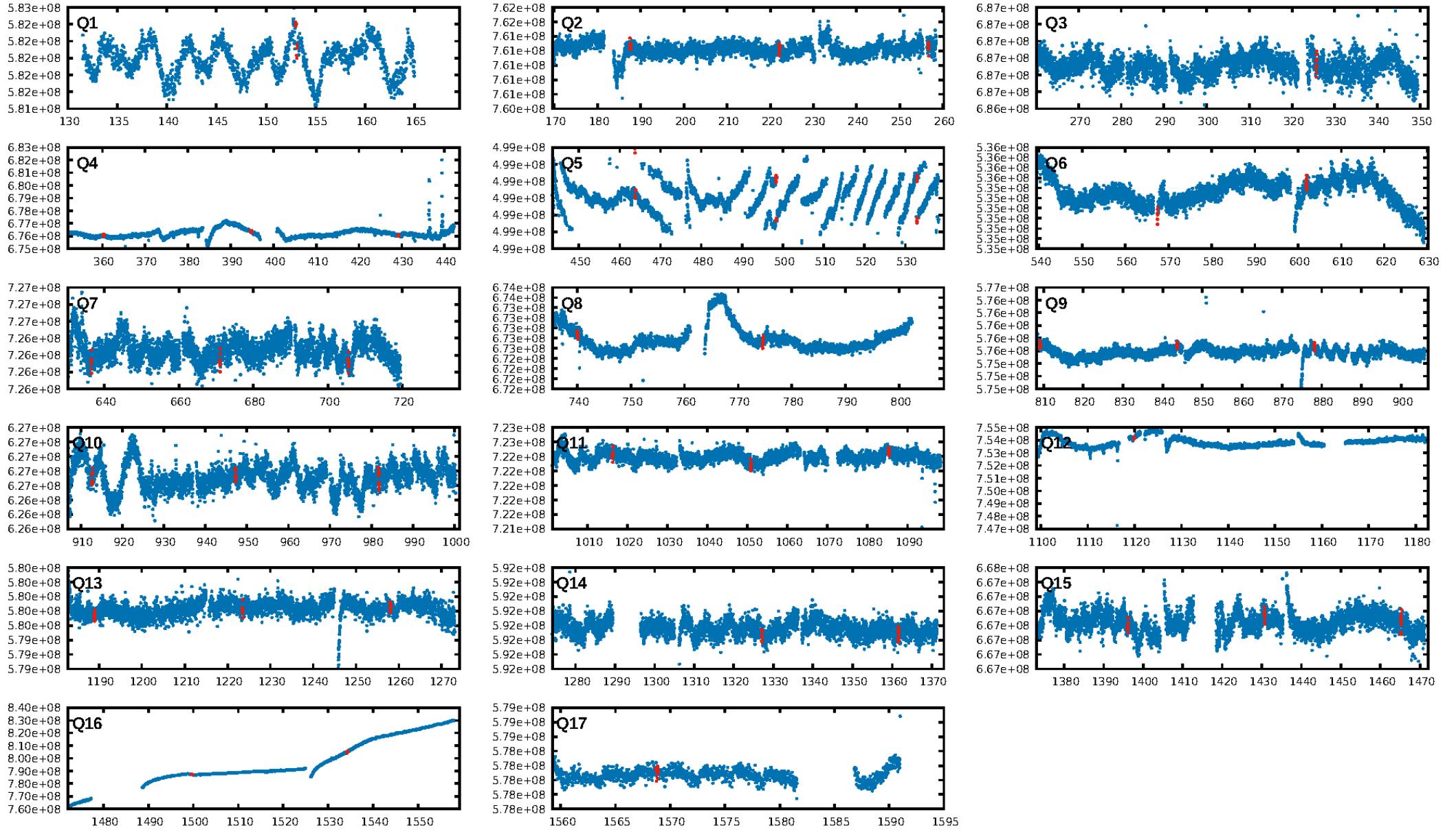
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [11.45σ]  
LongPeriod-sig: 100.0% [80.81σ]  
ModelChiSquare2-sig: 59.9%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.86 [32/37]  
GhostDiagnostic-chr: -1.272  
Centroid-sig: N/A  
Centroid-so: 1.704 arcsec [0.73σ]  
OotOffset-rm: 4.654 arcsec [3.47σ]  
KicOffset-rm: 1.158 arcsec [0.81σ]  
OotOffset-st: 0/2/0/3 [5]  
KicOffset-st: 0/2/0/3 [5]  
DiffImageQuality-fgm: 0.40 [2/5]  
DiffImageOverlap-fno: 1.00 [17/17]

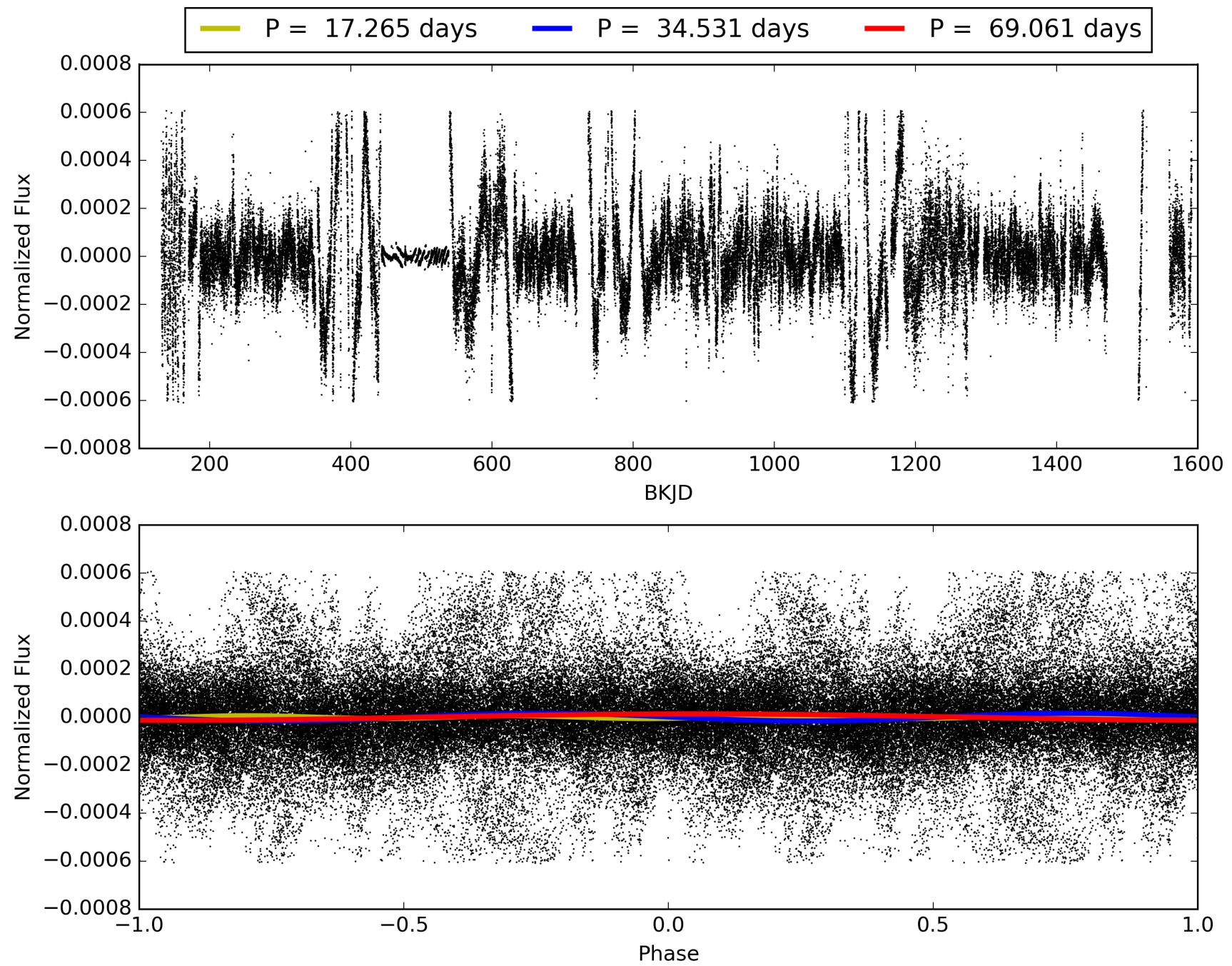
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:56:27 Z

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

# TCE 007971540-03, PDC Light Curves

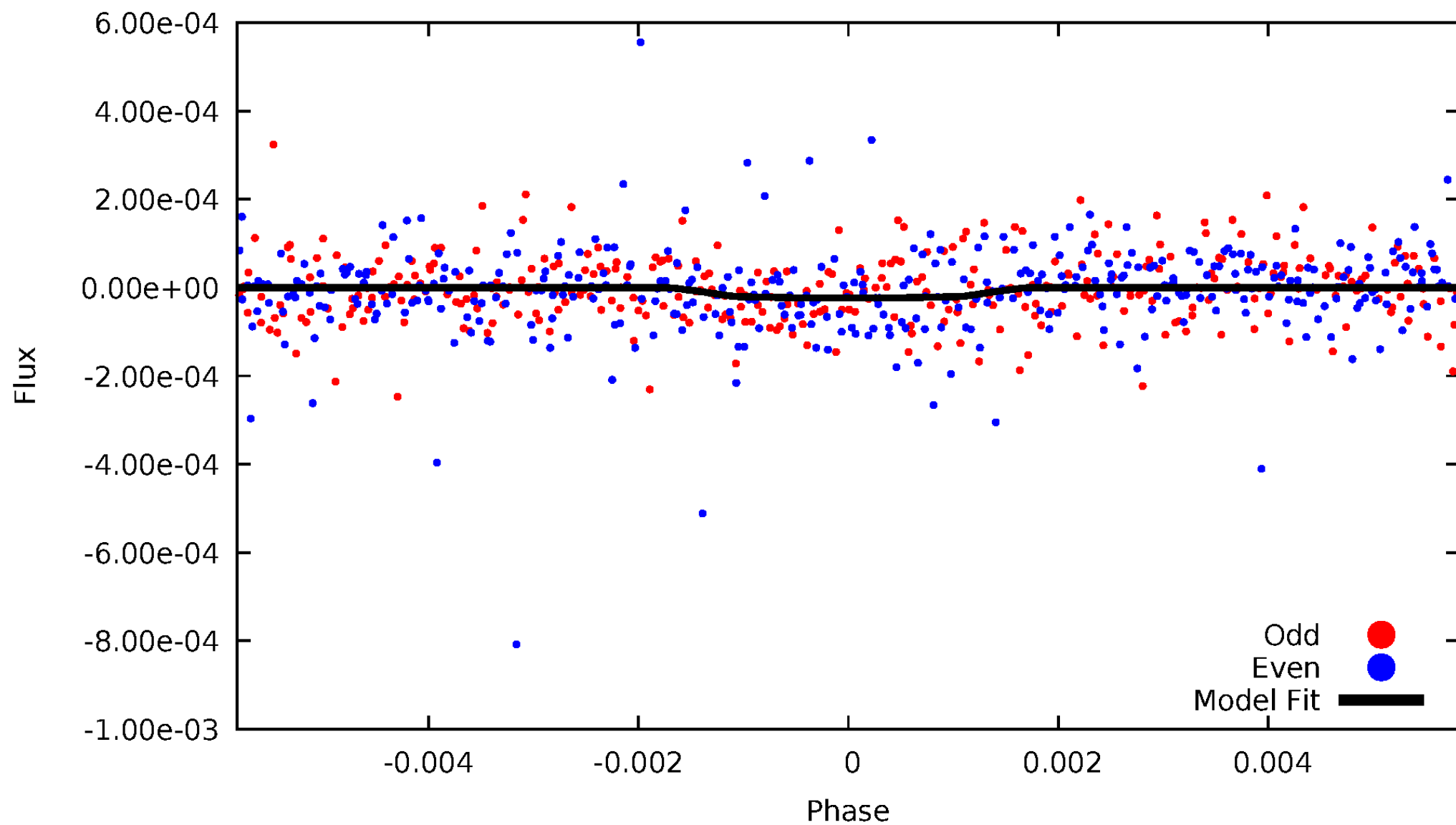


TCE 007971540-03



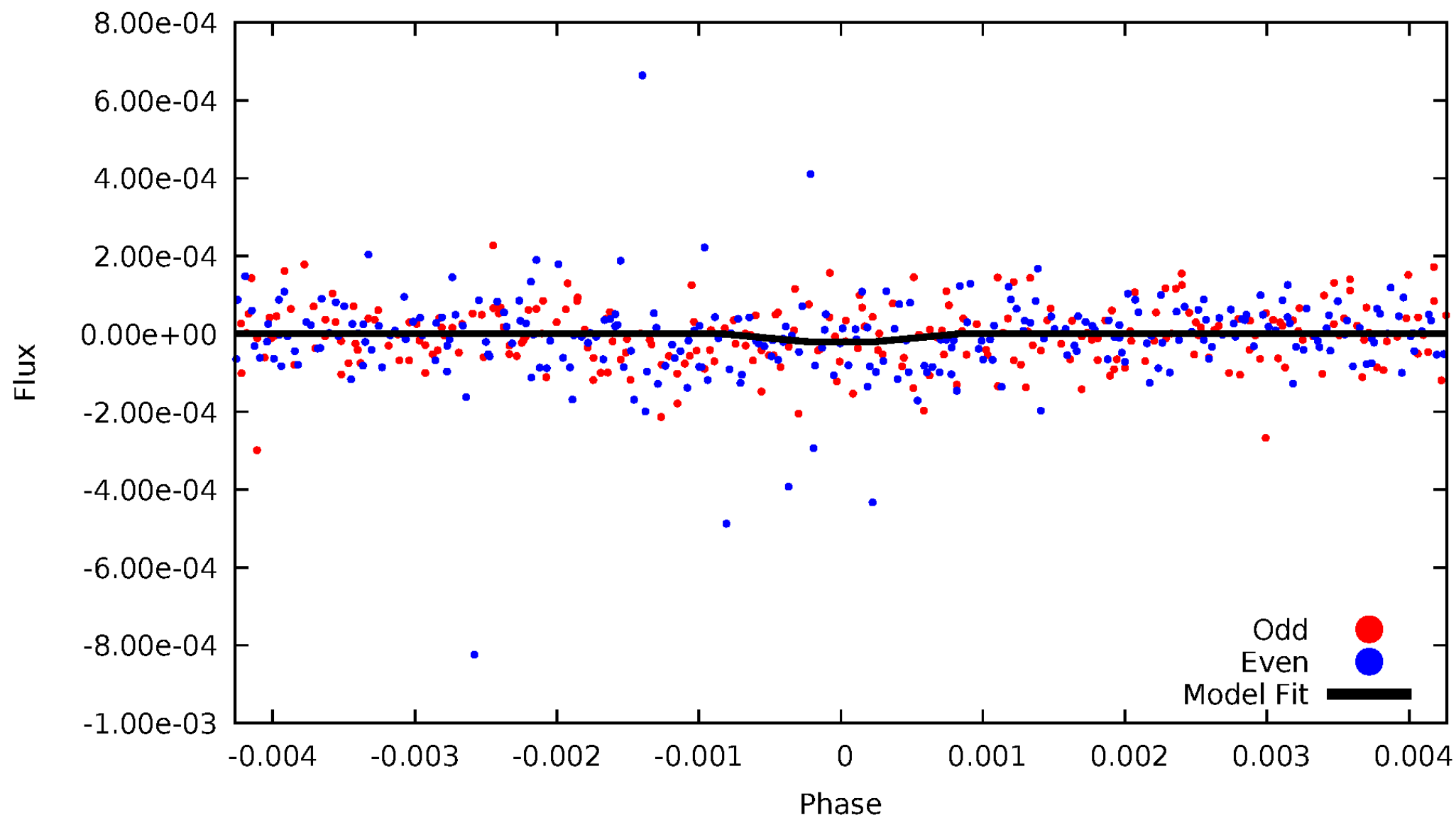
# DV Odd/Even

TCE 007971540-03



# ALT Odd/Even

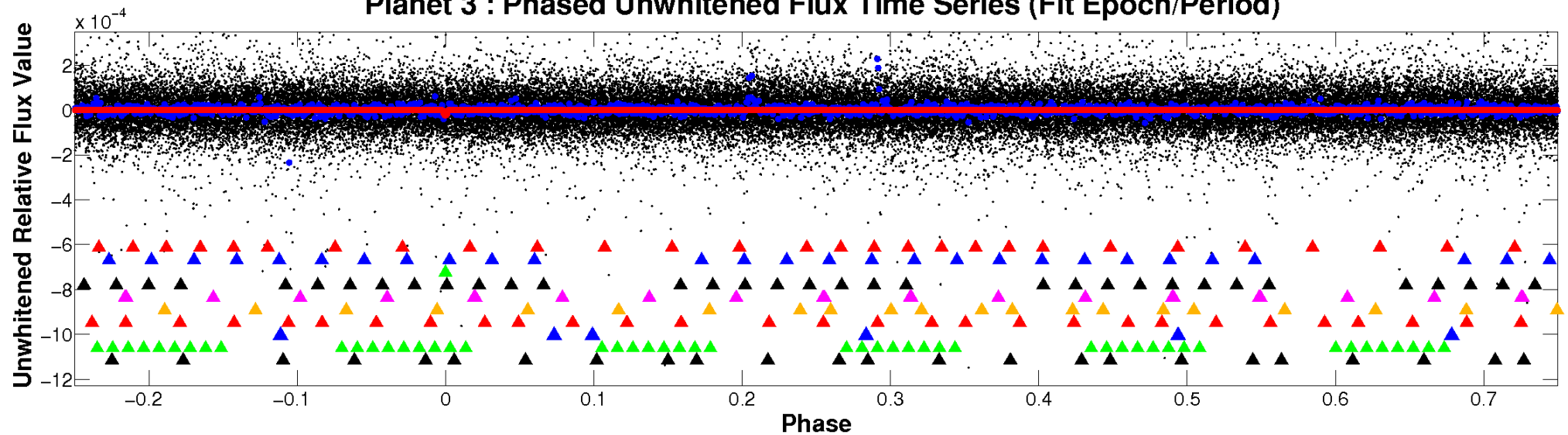
TCE 007971540-03



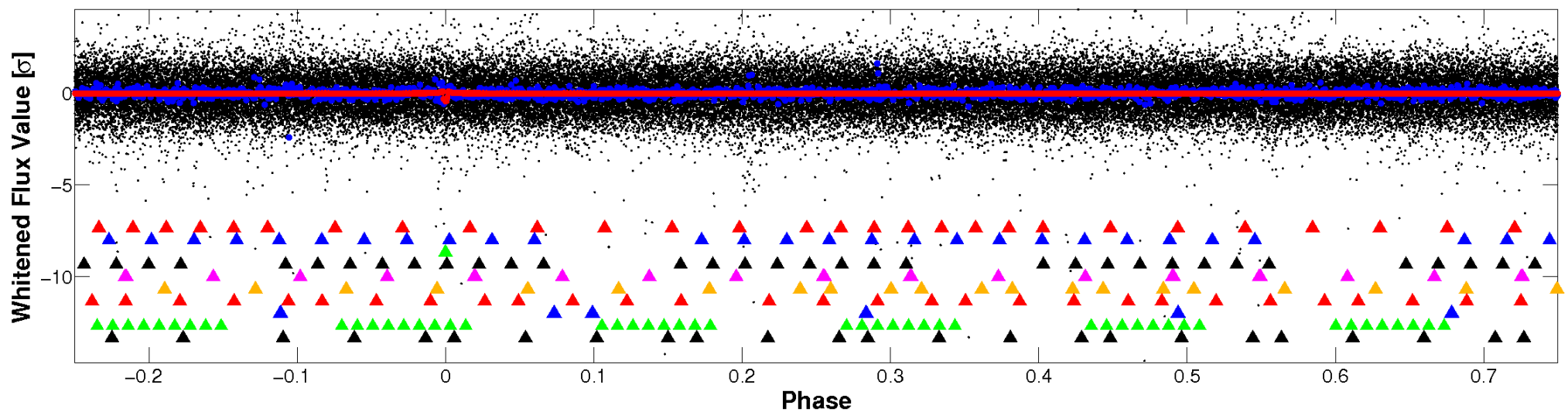


# Non-Whitened Vs. Whitened Light Curve

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

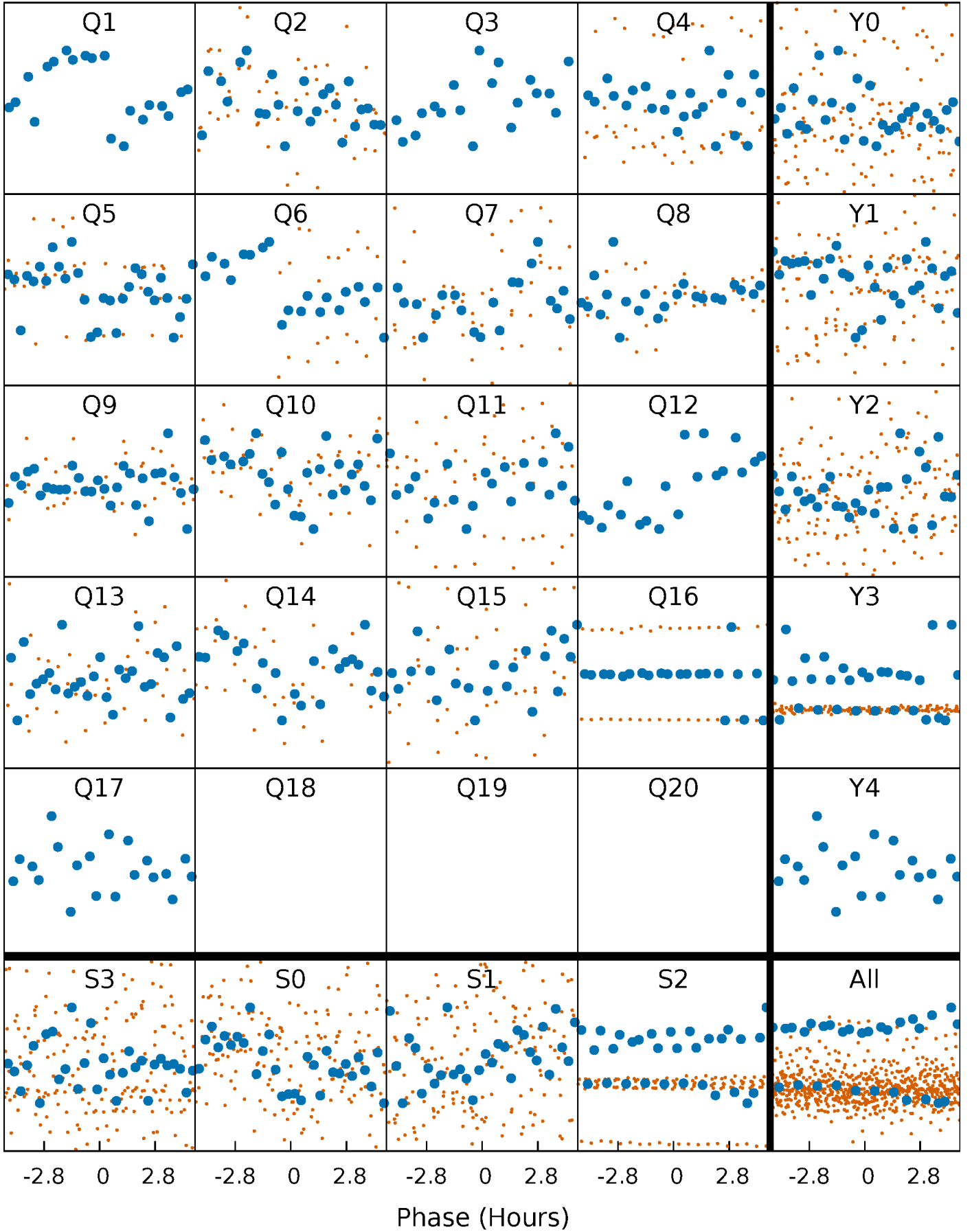


## Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

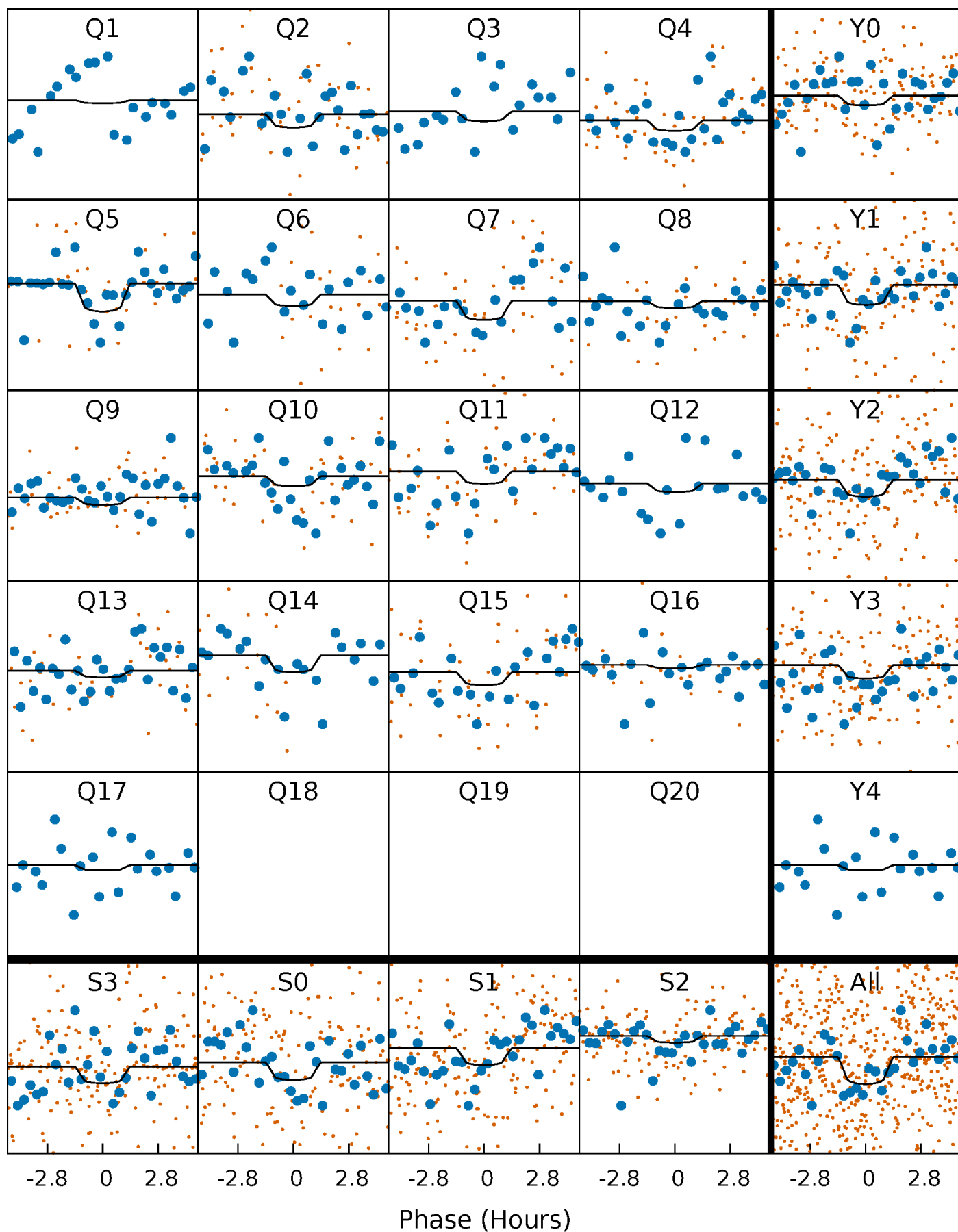
TCE 007971540-03   P= 34.530503 Days    $T_0=153.062724$  (BKJD)





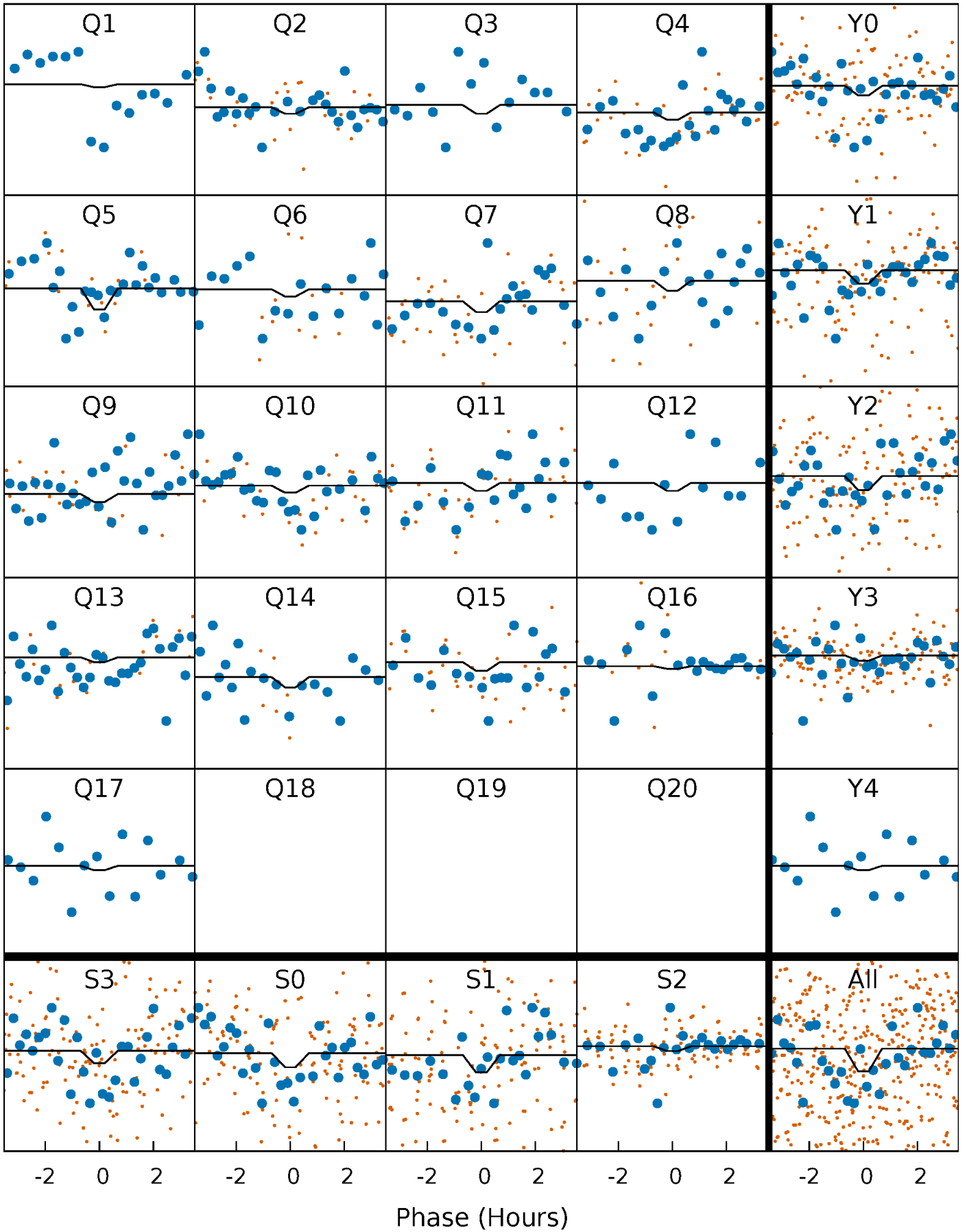
# DV Quarter-Phased Transit Curves

TCE 007971540-03 P= 34.530503 Days  $T_0=153.062724$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

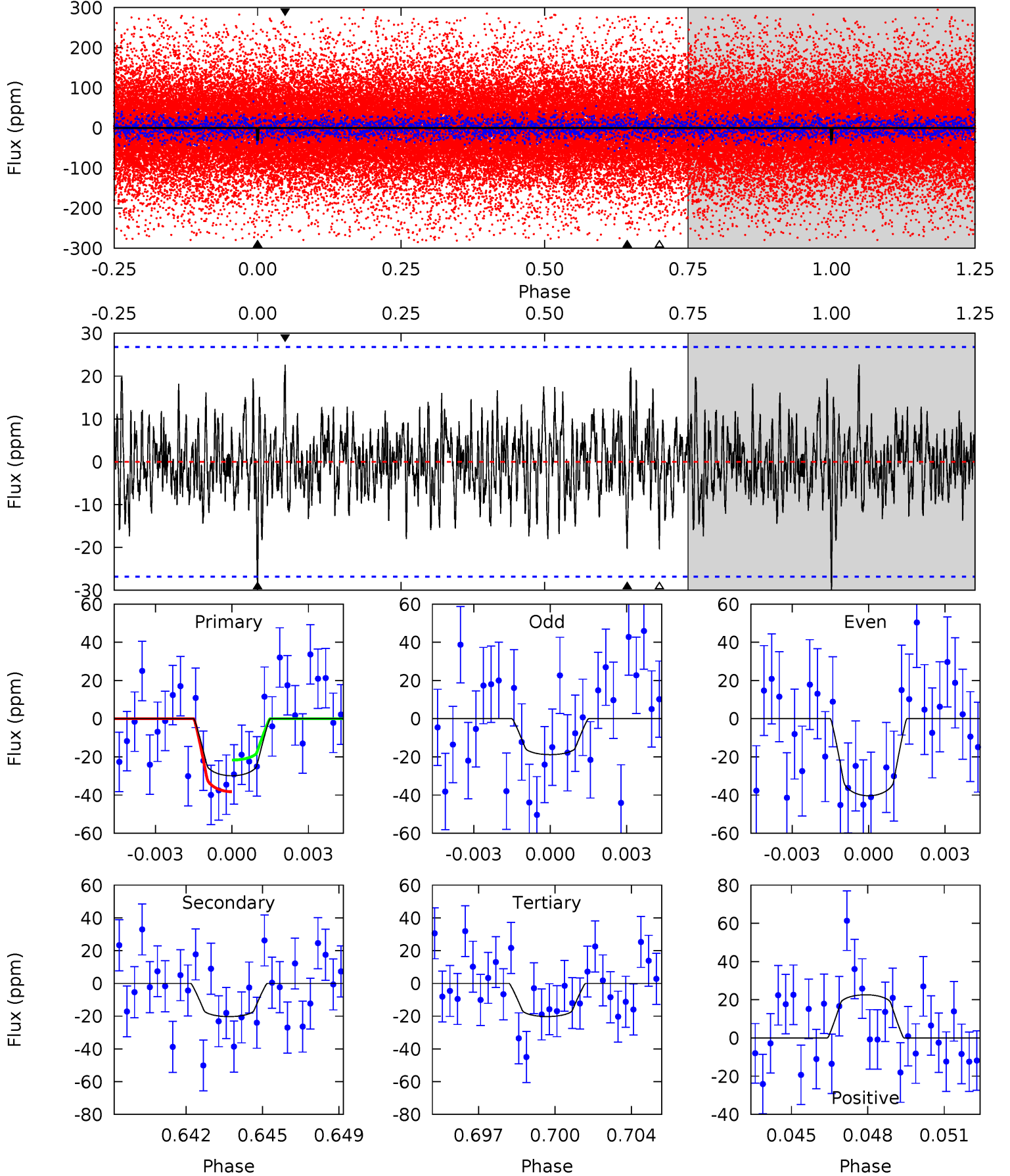
TCE 007971540-03 P= 34.528980 Days  $T_0=153.103525$  (BKJD)



# DV Model-Shift Uniqueness Test

007971540-03, P = 34.530503 Days, E = 118.532221 Days

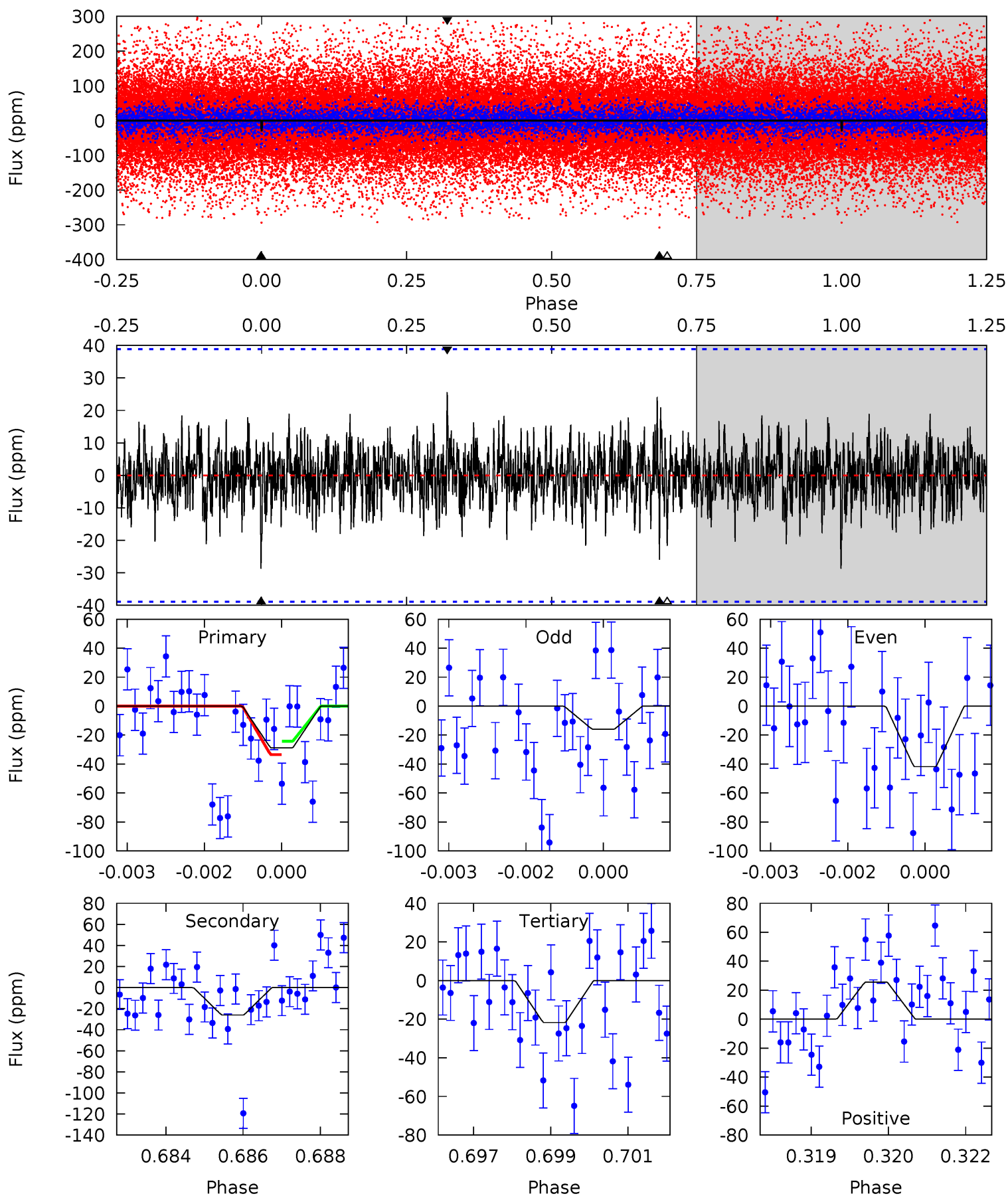
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.83	3.96	3.95	4.41	5.23	2.93	1.31	1.88	1.42	0.01	-0.45	2.11	0.80	0.43	1.63



# Alt Model-Shift Uniqueness Test

007971540-03, P = 34.528980 Days, E = 118.574545 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
3.97	3.59	2.99	3.53	5.36	3.15	0.93	0.97	0.44	0.59	0.06	1.80	1.22	0.47	0.64



### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-03 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-20 \pm 5$	$0.99^{+0.28}_{-0.27}$	$1132^{+77}_{-95}$	$5955^{+919}_{-646}$	$528^{+483}_{-224}$
Alt.	$-26 \pm 7$	$0.84^{+0.26}_{-0.24}$	$1132^{+74}_{-96}$	$6897^{+1513}_{-1007}$	$950^{+933}_{-451}$

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

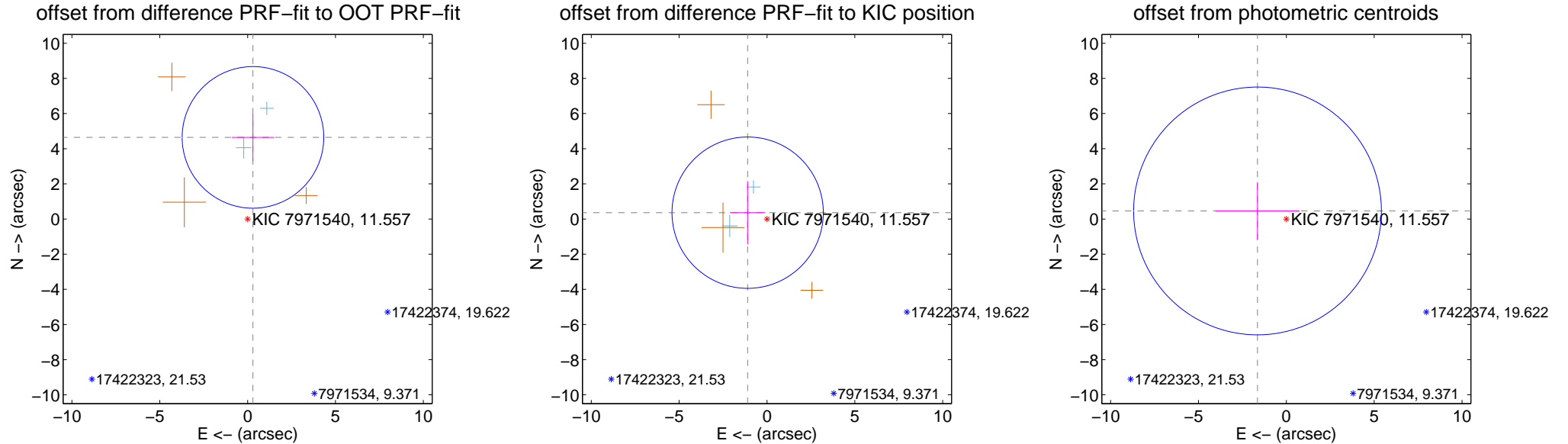
## DV Centroid Data

Supplemental centroid analysis for 007971540-03. **Kepler magnitude: 11.56.** Transit SNR 7.20

**There are 2 quarters with good PRF difference image offsets**

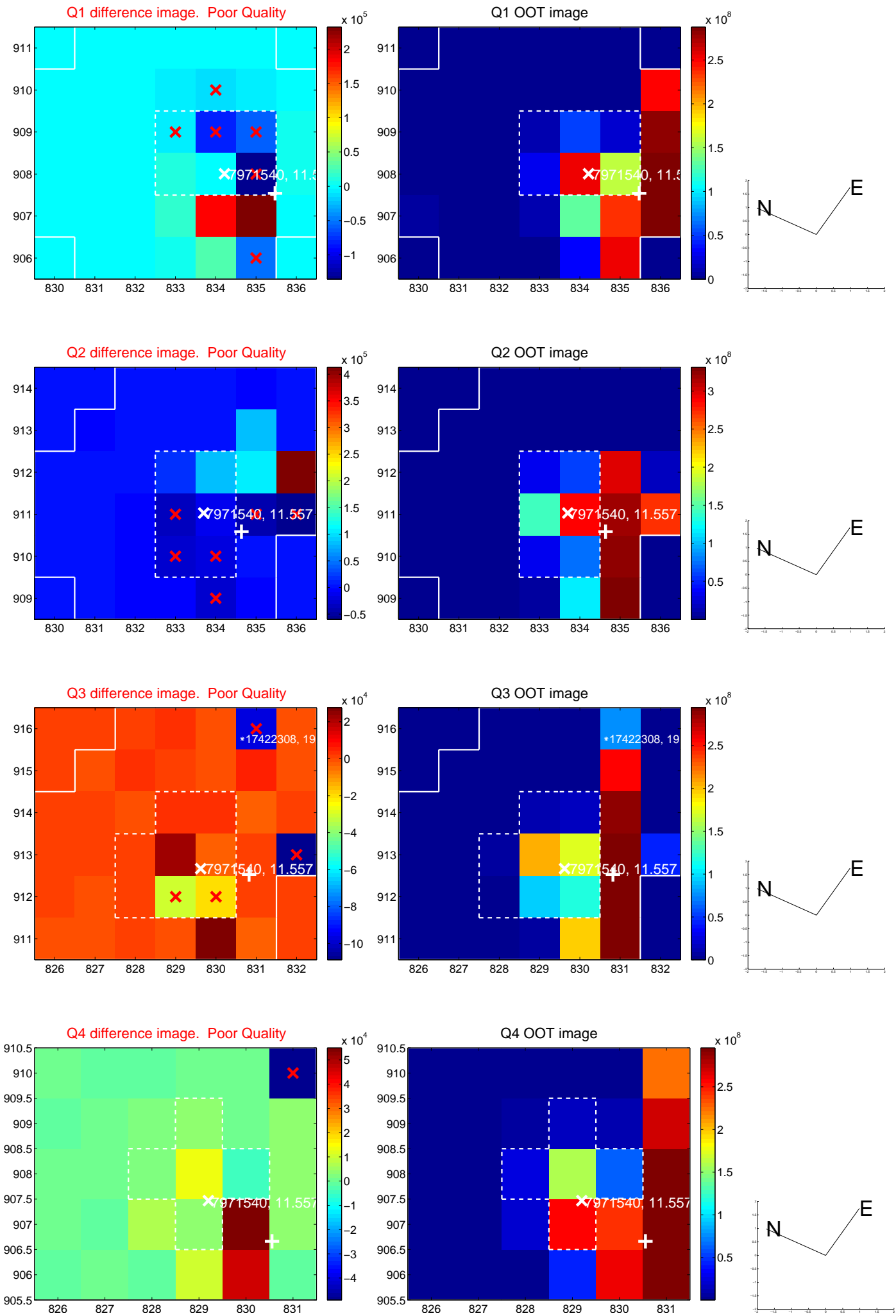
The direct PRF centroid is offset from the target star catalog position by about 1.81 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.654 \pm 1.343</math></b>	<b>3.47</b>	$-0.303 \pm 1.210$	$4.644 \pm 1.343$
PRF-fit source offset from KIC position	$1.158 \pm 1.435$	0.81	$1.100 \pm 1.009$	$0.362 \pm 1.799$
photometric centroid source offset	$1.70 \pm 2.35$	0.73	$1.64 \pm 2.40$	$0.46 \pm 1.64$

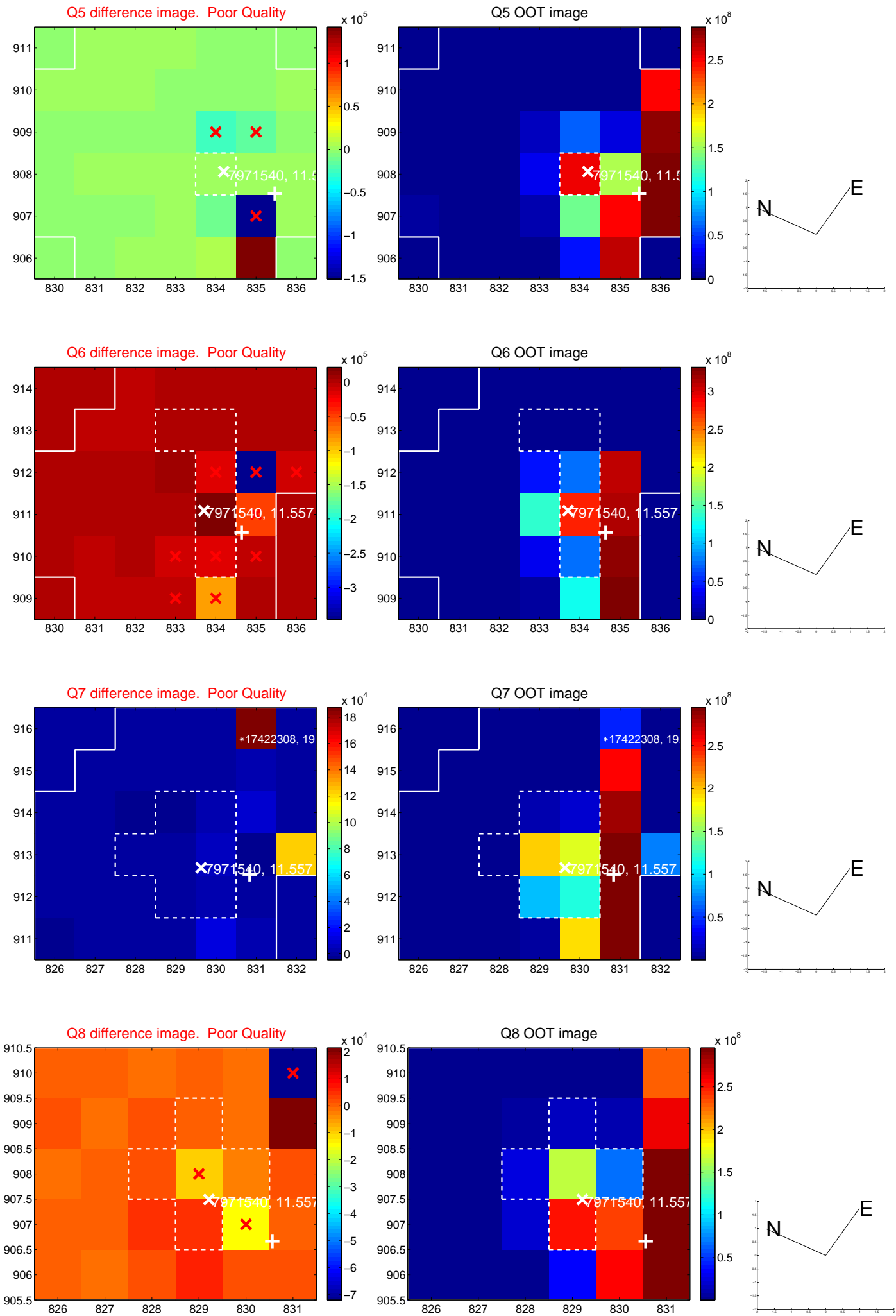


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

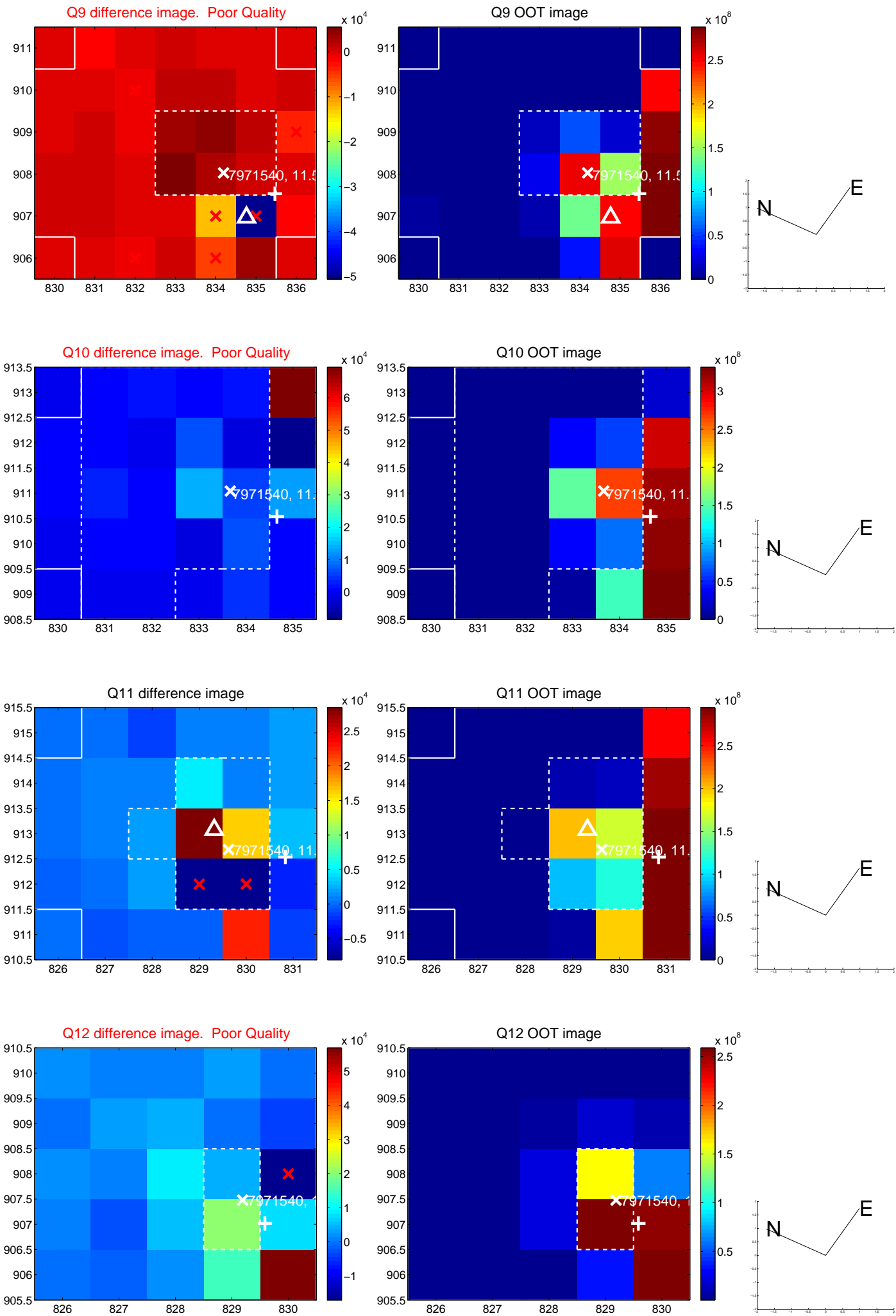


white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

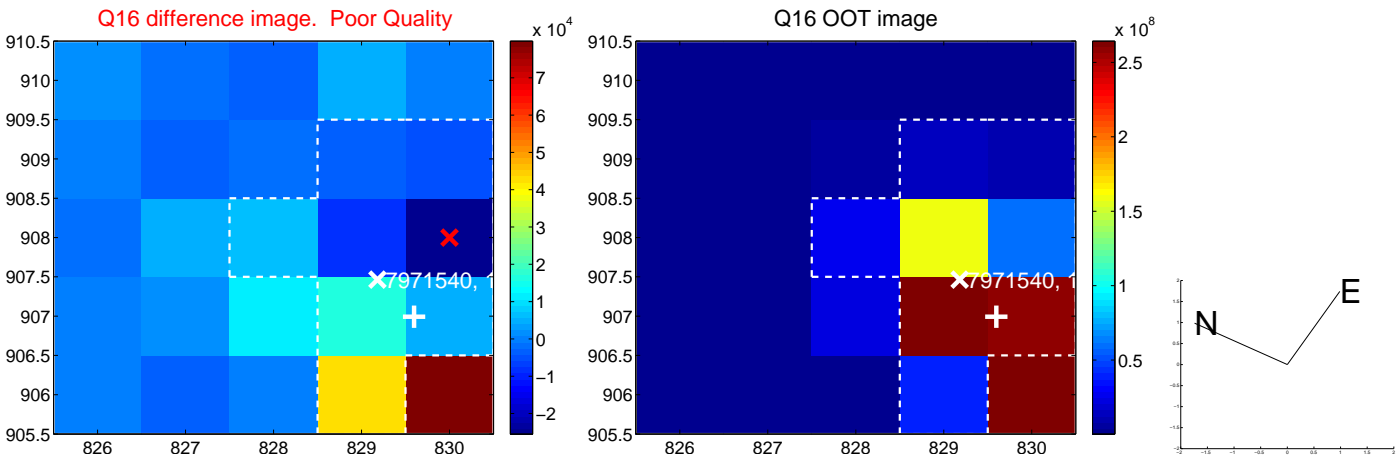
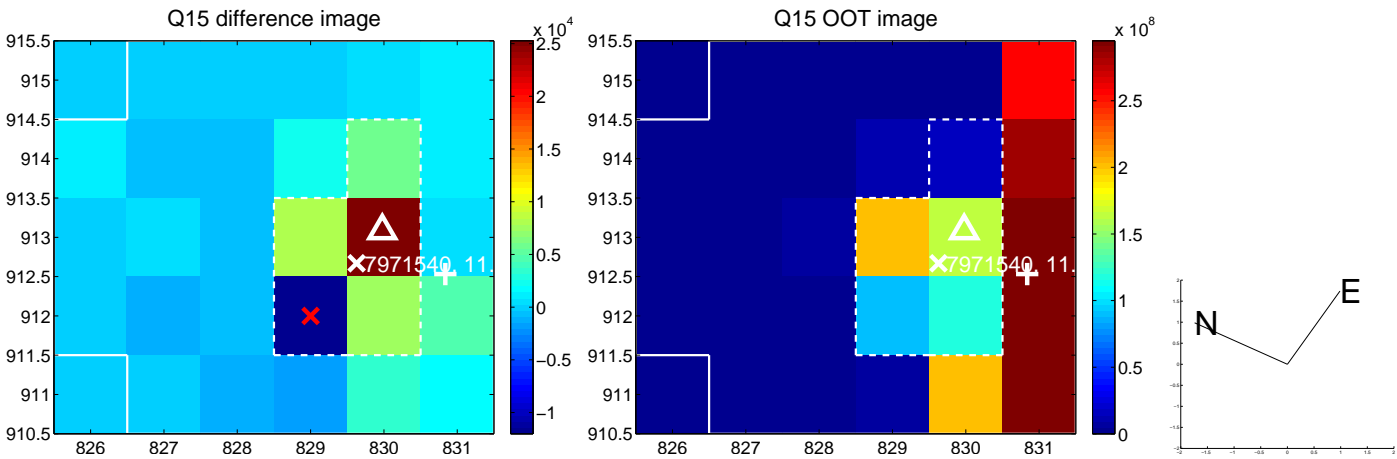
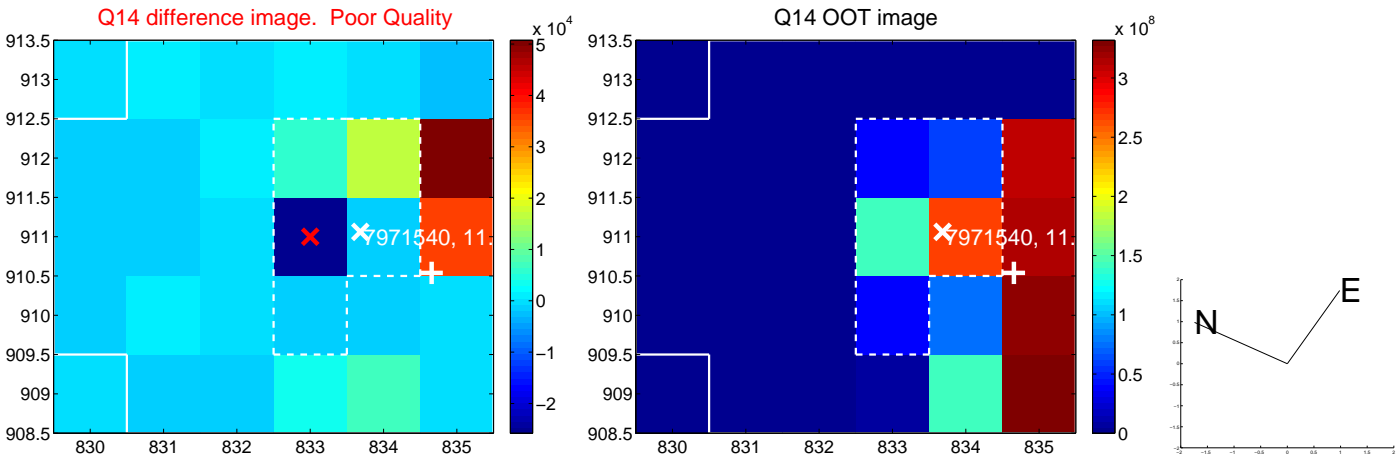
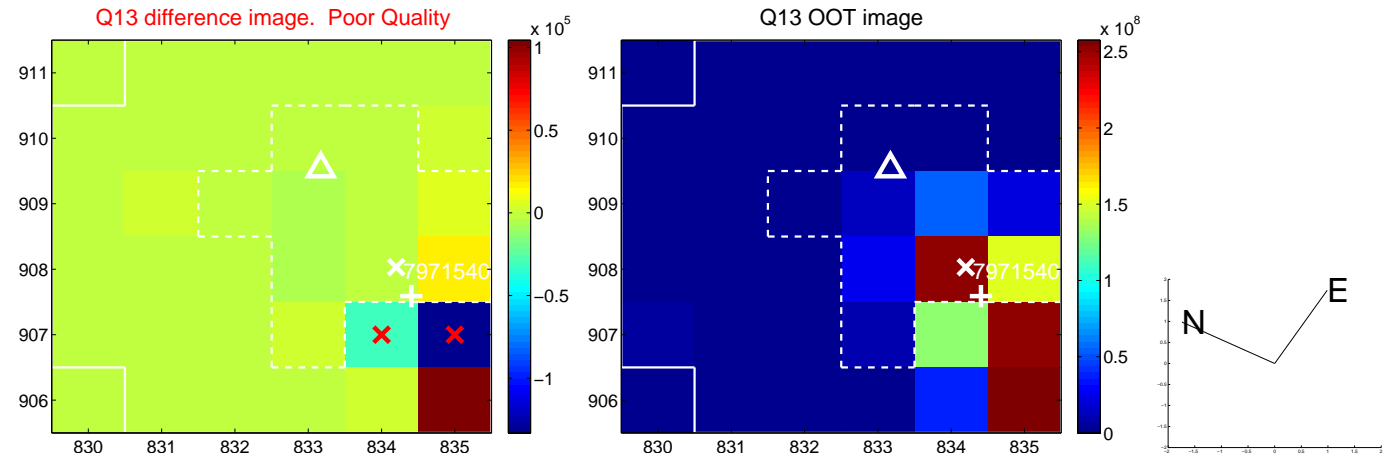




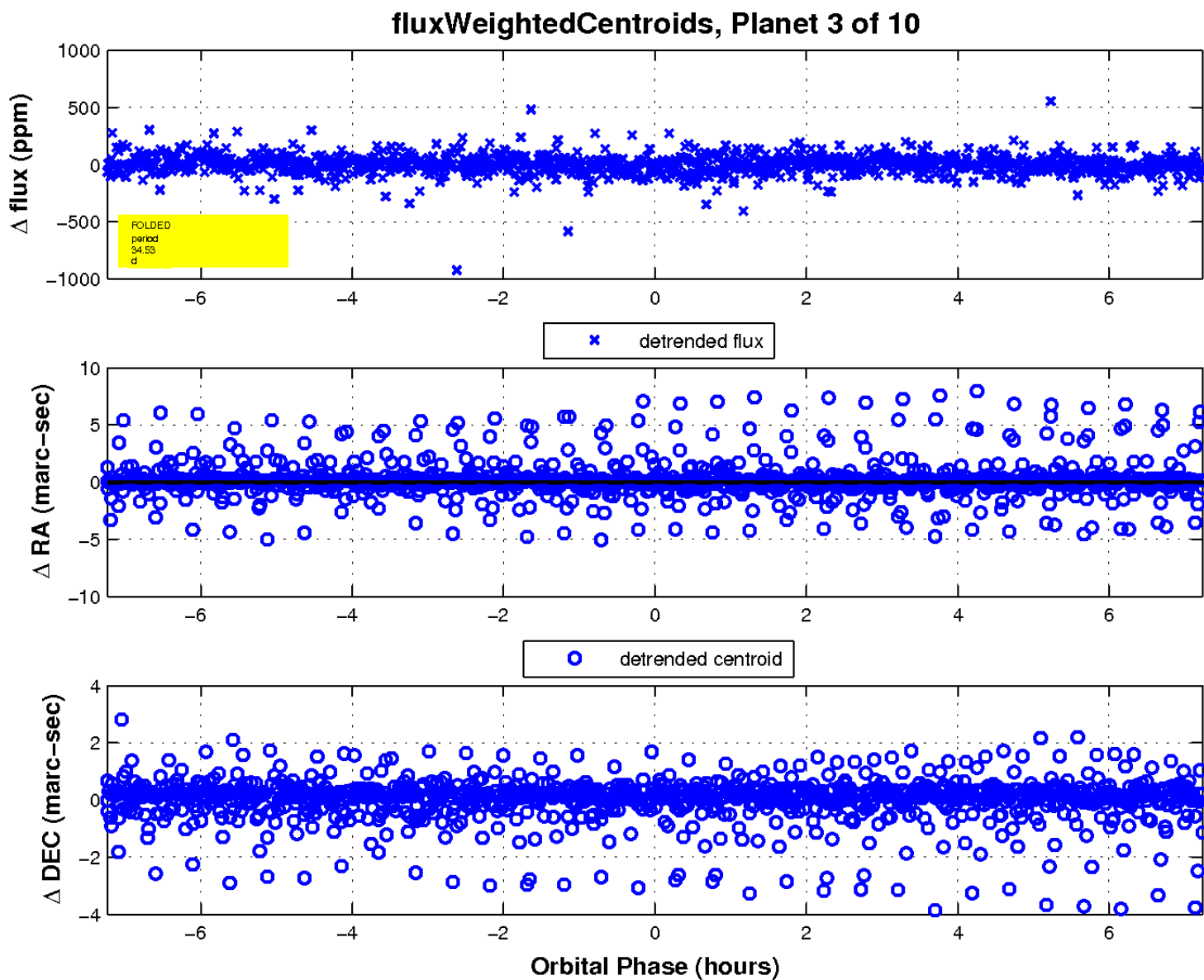
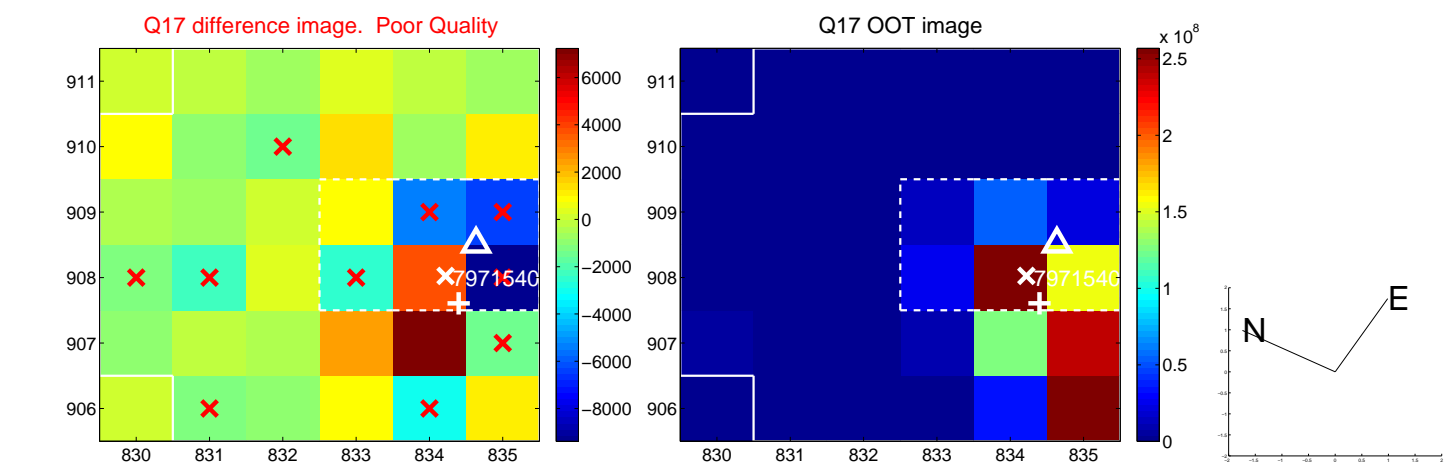
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



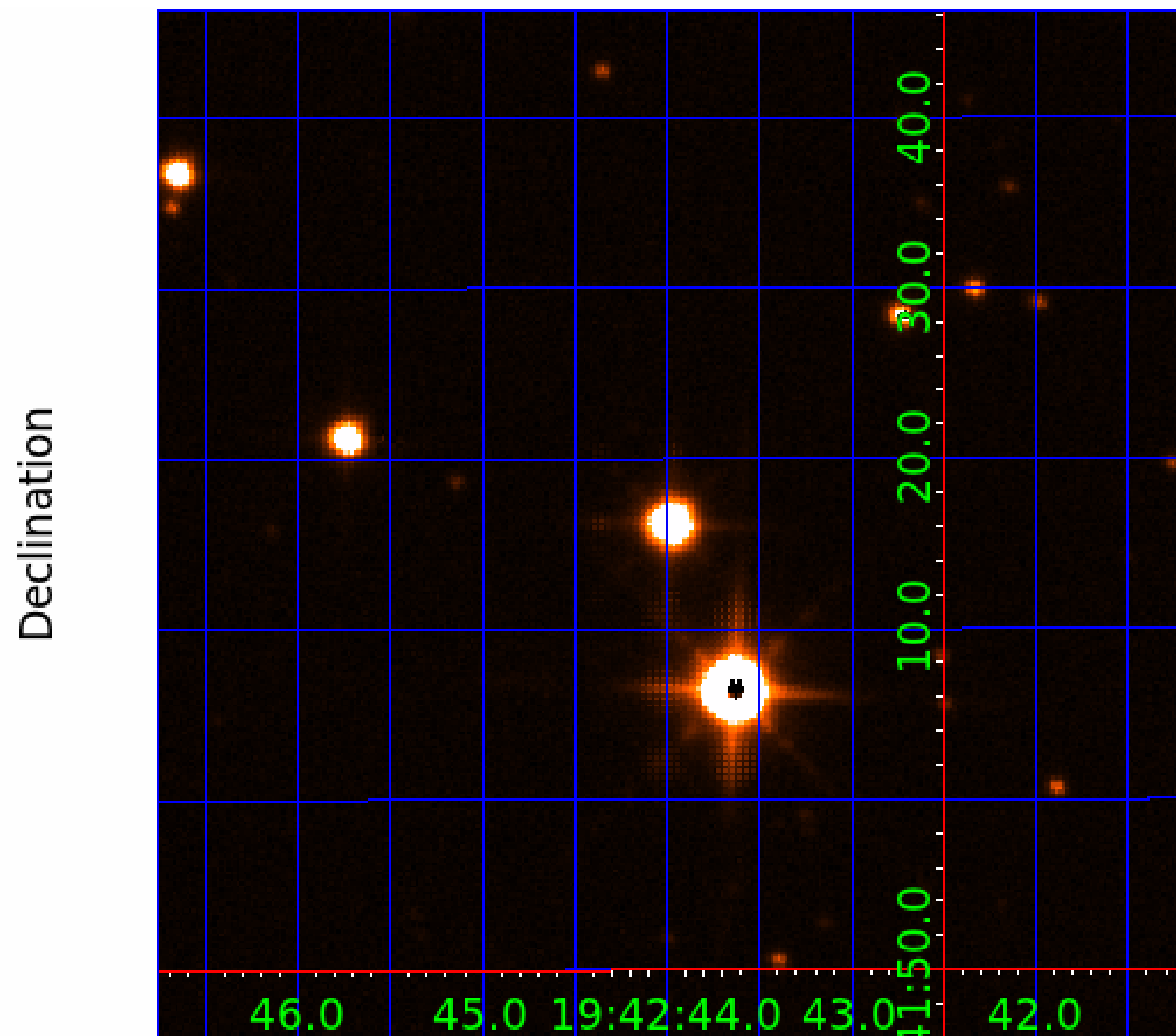
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007971540-01	OBS	No	51.011313	166.181425	52.5	1.002	29.8	20.5	1.77	6516	1.30	64.75
007971540-02	OBS	No	52.291113	159.026037	53.9	1.214	18.0	16.2	1.77	6516	1.46	62.65
007971540-03	OBS	No	34.530503	153.062724	23.2	2.413	14.7	7.2	1.77	6516	1.02	108.94
007971540-04	OBS	No	42.975481	146.899876	56.8	0.683	13.6	15.7	1.77	6516	1.38	81.38
007971540-05	OBS	No	60.934308	143.610155	48.2	1.035	15.8	19.4	1.77	6516	1.40	51.09
007971540-06	OBS	No	71.174769	162.031760	41.4	7.231	14.7	16.6	1.77	6516	1.30	41.53
007971540-07	OBS	No	49.509656	174.313640	54.0	12.534	13.5	16.9	1.77	6516	1.52	67.38
007971540-08	OBS	No	262.610321	259.184059	26.0	18.558	13.9	4.7	1.77	6516	1.08	7.28
007971540-09	OBS	No	28.835527	150.649599	19.5	11.693	12.6	9.8	1.77	6516	0.97	138.54
007971540-10	OBS	No	59.432161	172.524554	131.2	9.000	11.7	-1.0	1.77	6516	2.04	52.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007971540-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-04	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-06	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST
007971540-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007971540-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007971540-09	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007971540-10	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

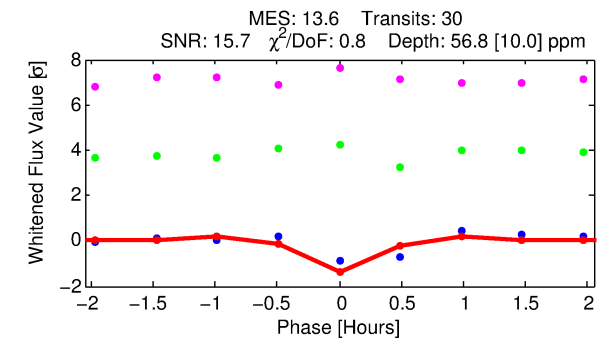
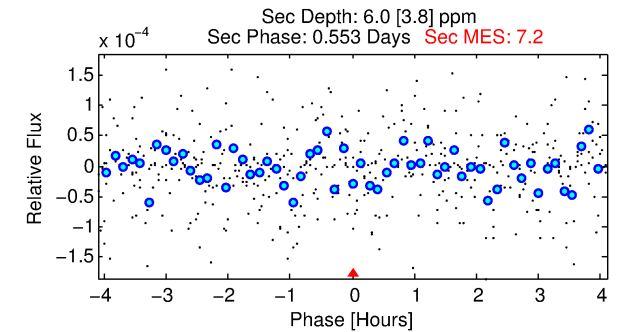
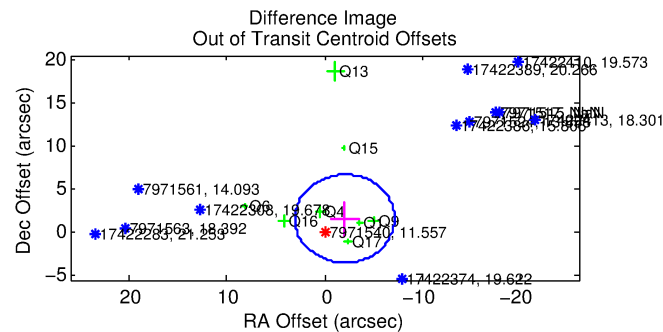
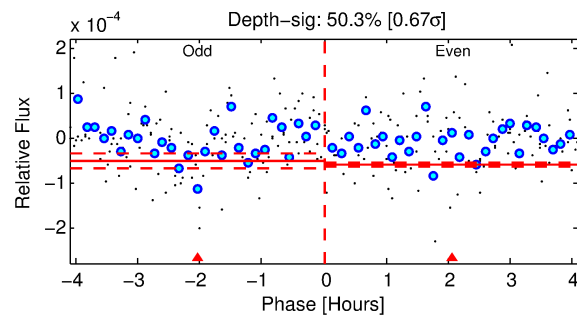
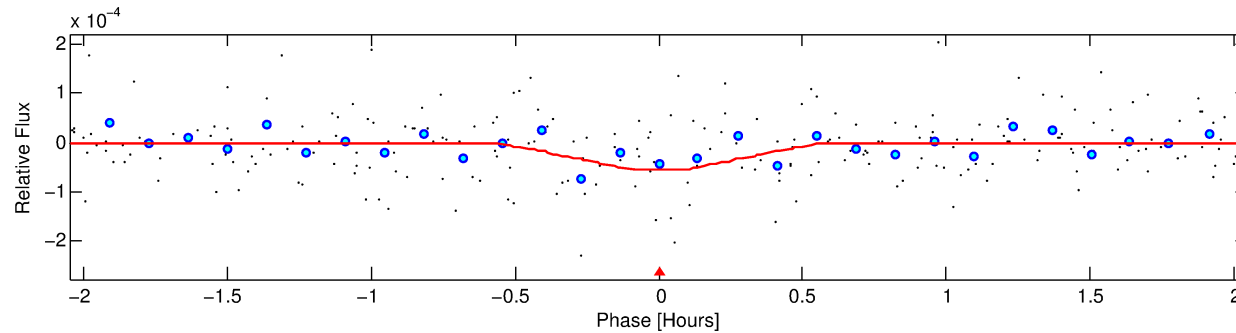
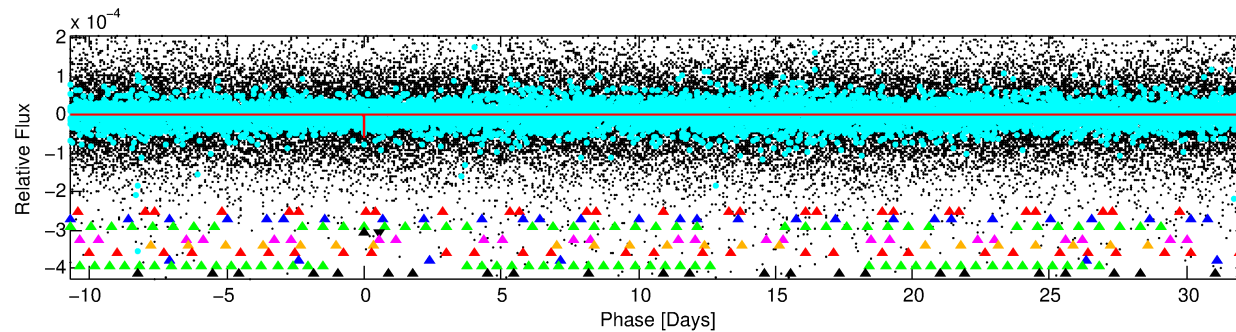
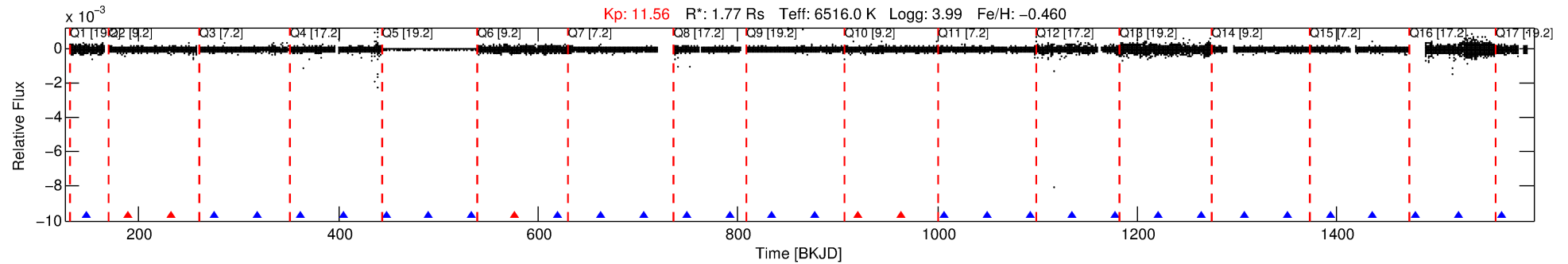
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-04

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 4 of 10 Period: 42.975 d



## DV Fit Results:

Period = 42.97548 [0.00026] d  
Epoch = 146.8999 [0.0026] BKJD  
Rp/R\* = 0.0071 [0.0038]  
a/R\* = 460.25 [1116.69]  
b = 0.31 [7.10]  
Seff = 81.38 [39.22]  
Teq = 766 [92] K  
Rp = 1.38 [0.84] Re  
a = 0.2494 [0.0720] AU  
Ag = 107.92 [142.64] [0.75 $\sigma$ ]  
Teffp = 3817 [1188] K [2.56 $\sigma$ ]

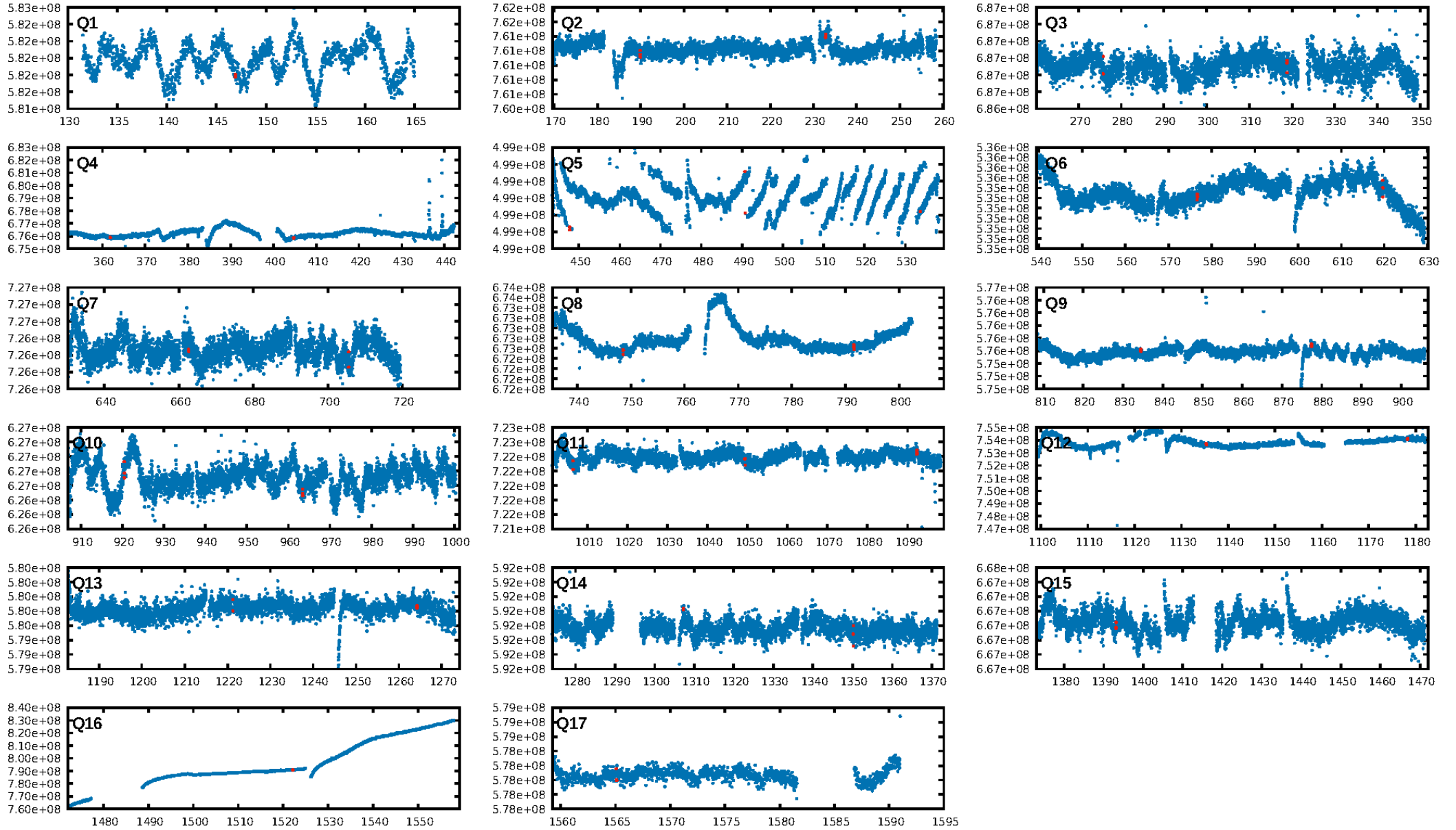
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [80.81 $\sigma$ ]  
LongPeriod-sig: 100.0% [12.49 $\sigma$ ]  
ModelChiSquare2-sig: 85.9%  
ModelChiSquareGof-sig: 98.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.82 [23/28]  
GhostDiagnostic-chr: 0.4789  
Centroid-sig: N/A  
Centroid-so: 4.495 arcsec [2.86 $\sigma$ ]  
OotOffset-rm: 2.589 arcsec [1.52 $\sigma$ ]  
KicOffset-rm: 2.550 arcsec [1.08 $\sigma$ ]  
OotOffset-st: 1/1/2/4 [8]  
KicOffset-st: 1/1/2/4 [8]  
DiffImageQuality-fgm: 0.25 [2/8]  
DiffImageOverlap-fno: 1.00 [16/16]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:56:38 Z

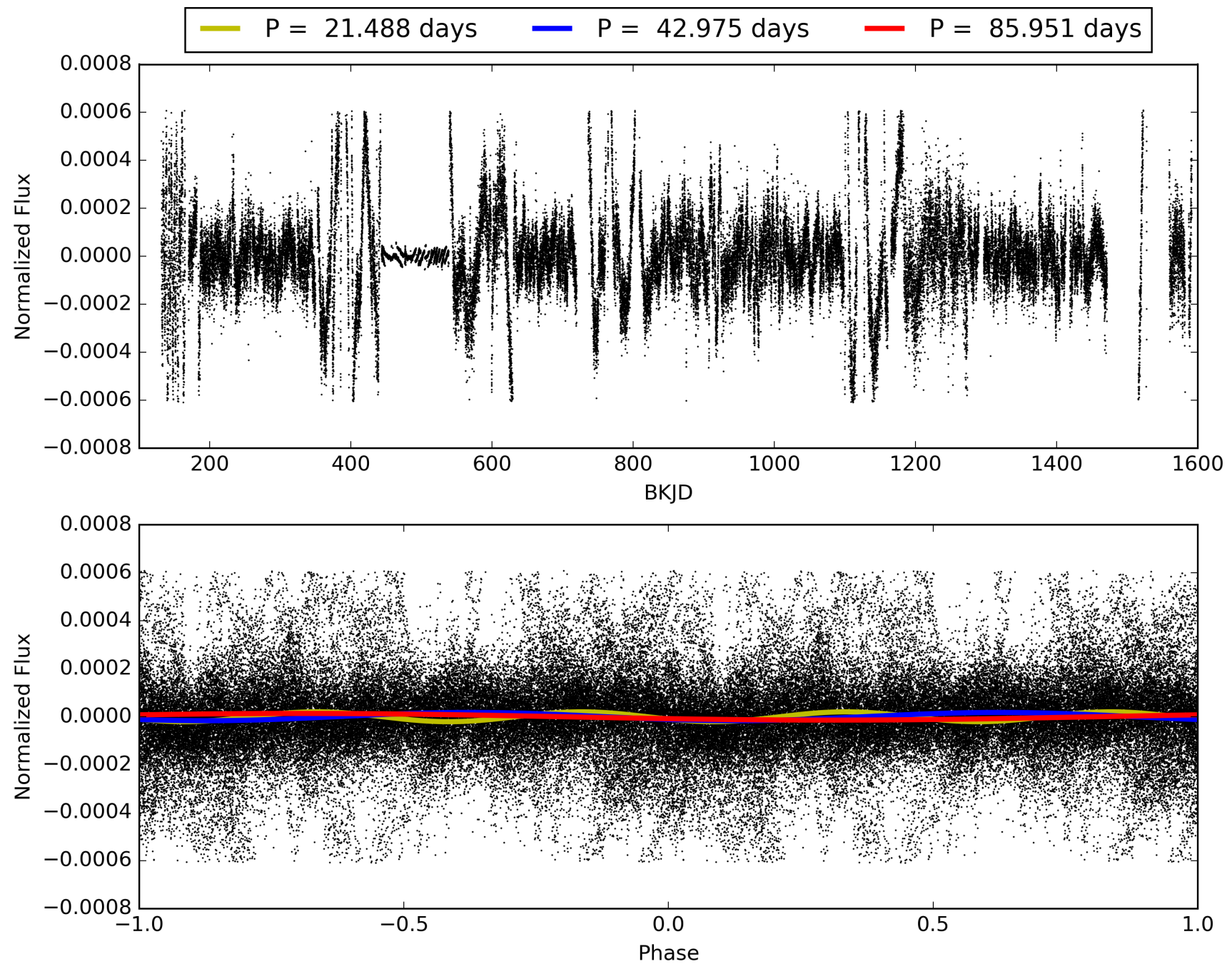
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007971540-04, PDC Light Curves





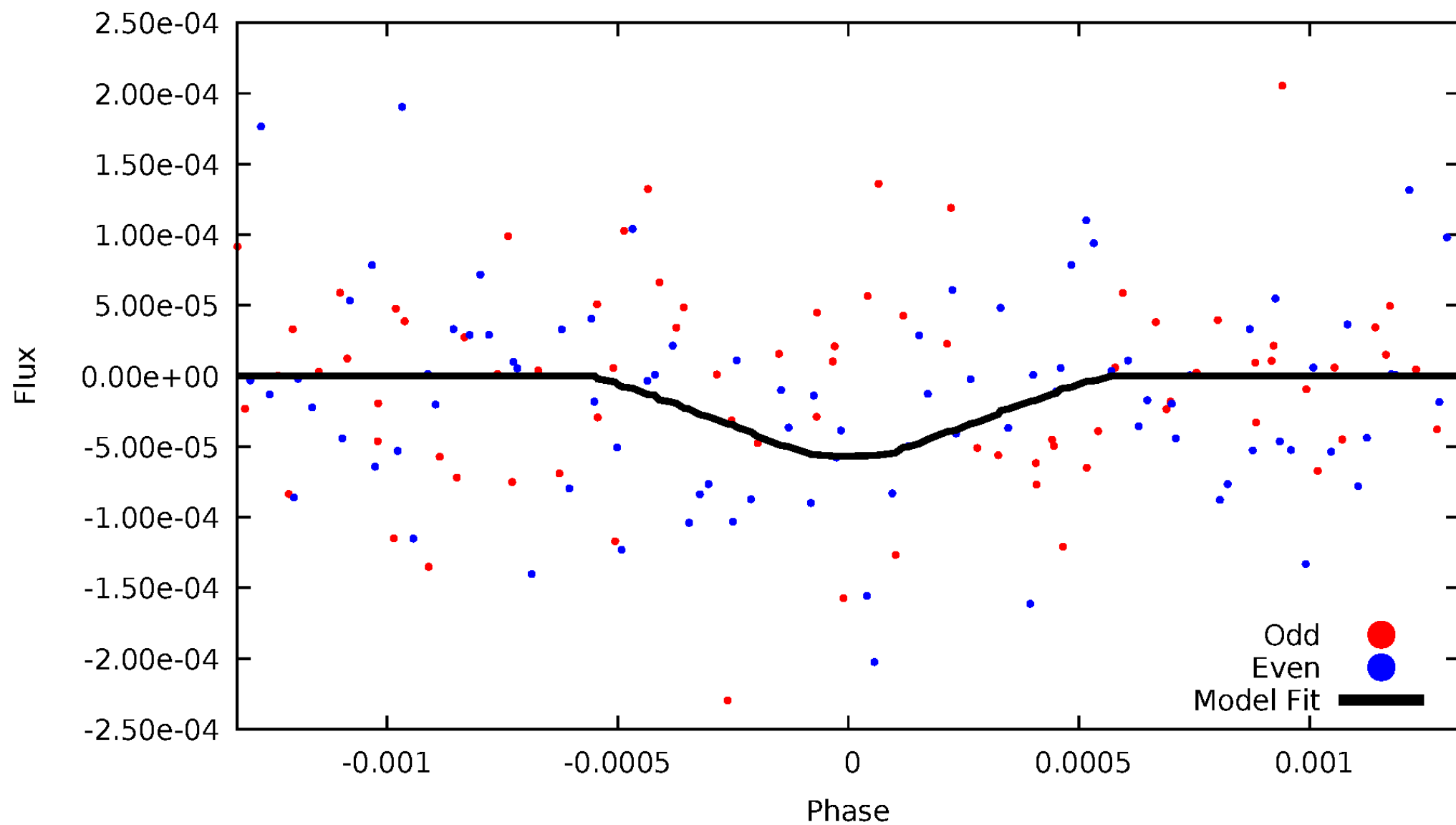
TCE 007971540-04





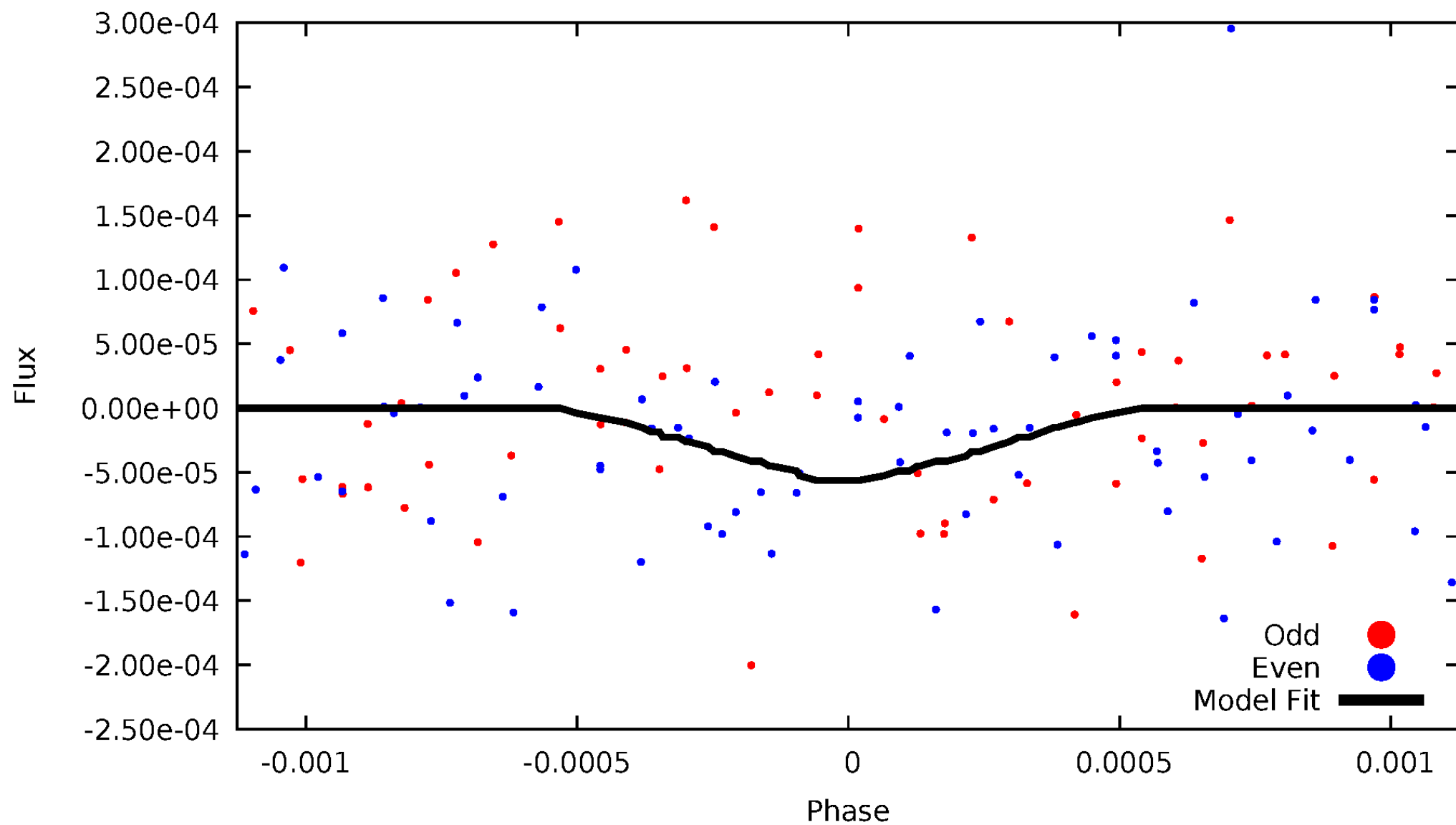
# DV Odd/Even

TCE 007971540-04



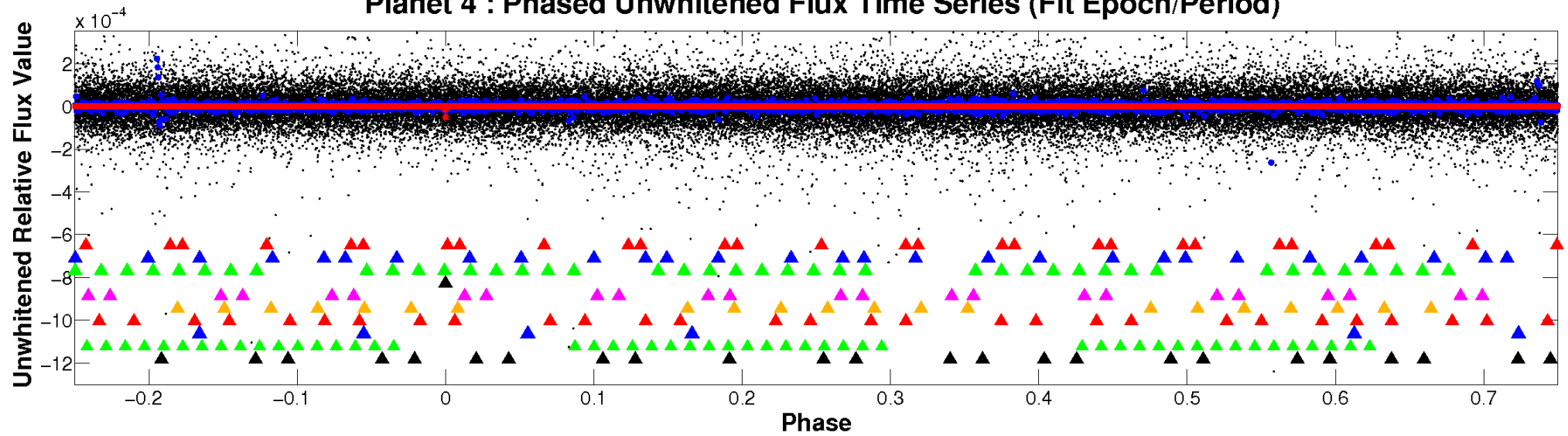
# ALT Odd/Even

TCE 007971540-04

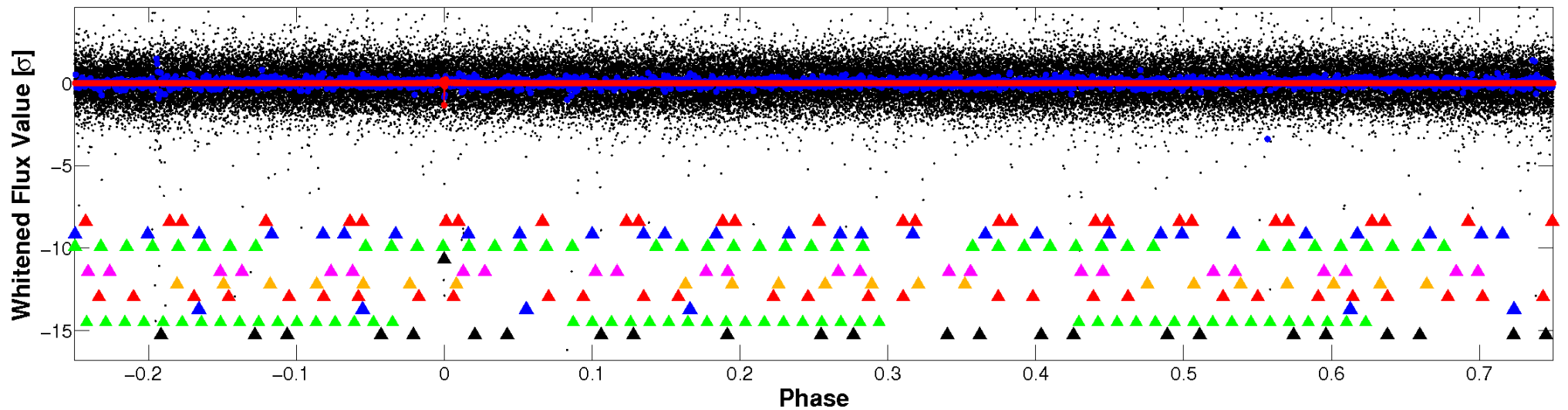


# Non-Whitened Vs. Whitened Light Curve

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

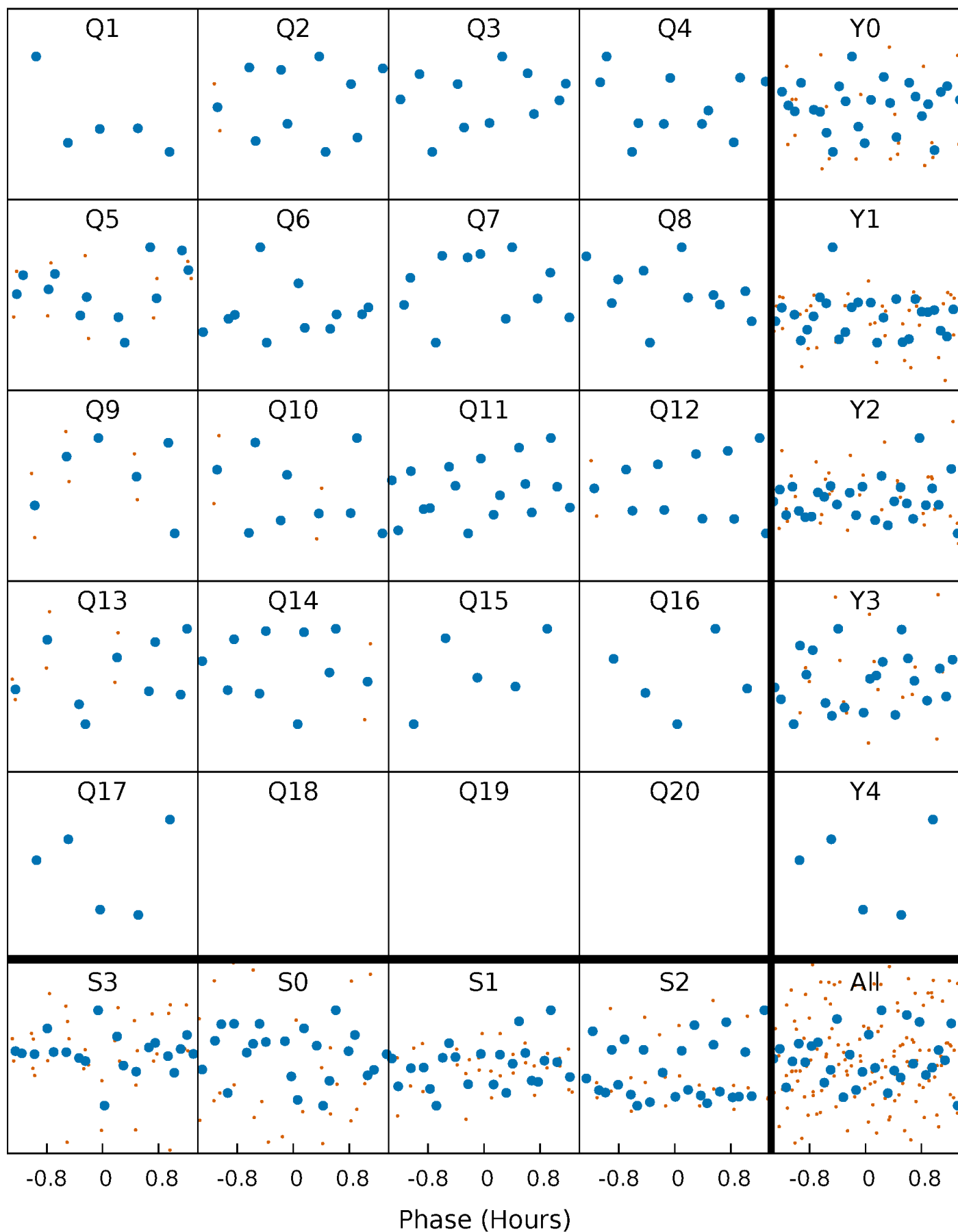


## Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



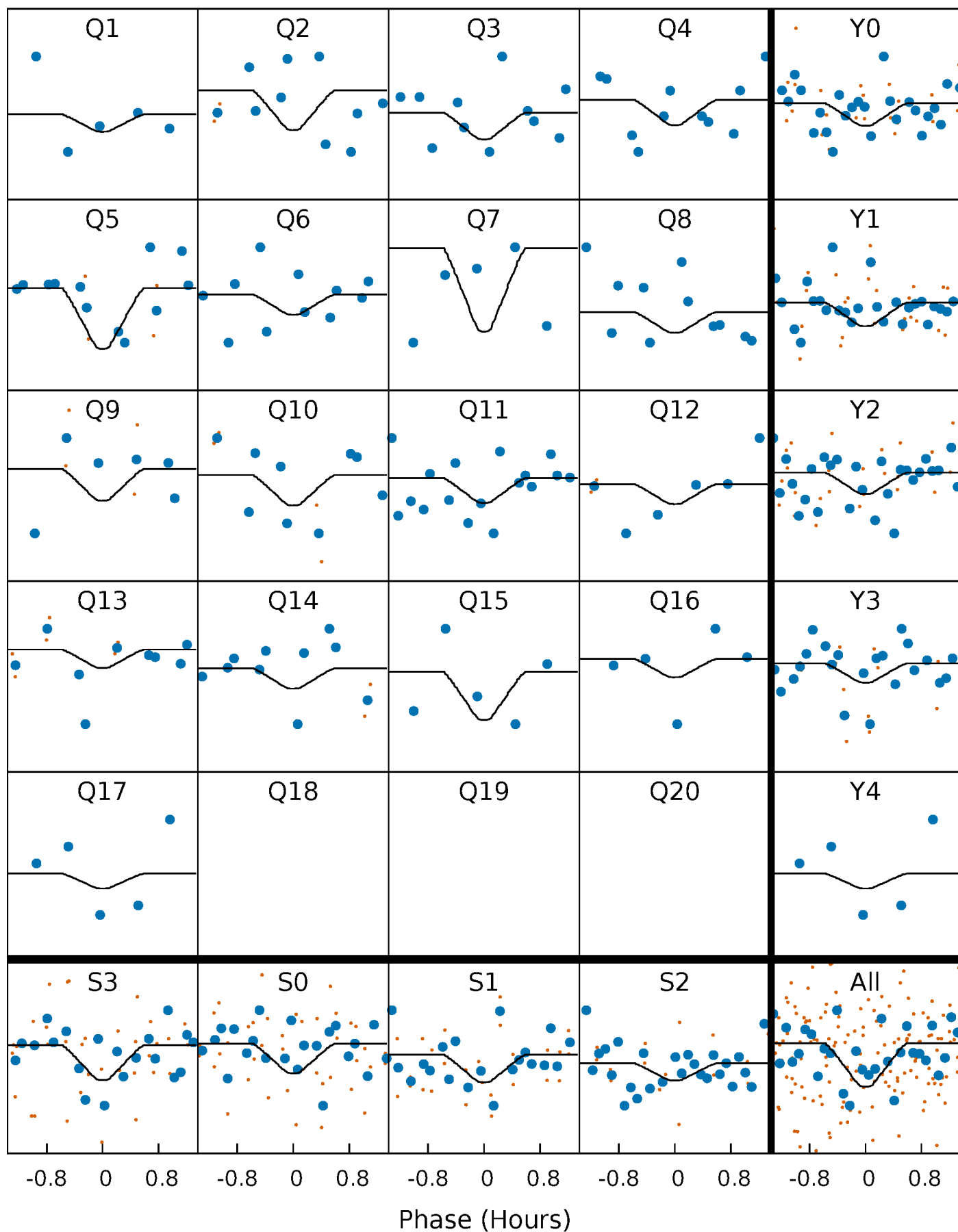
# PDC Quarter-Phased Transit Curves

TCE 007971540-04   P= 42.975481 Days    $T_0=146.899876$  (BKJD)



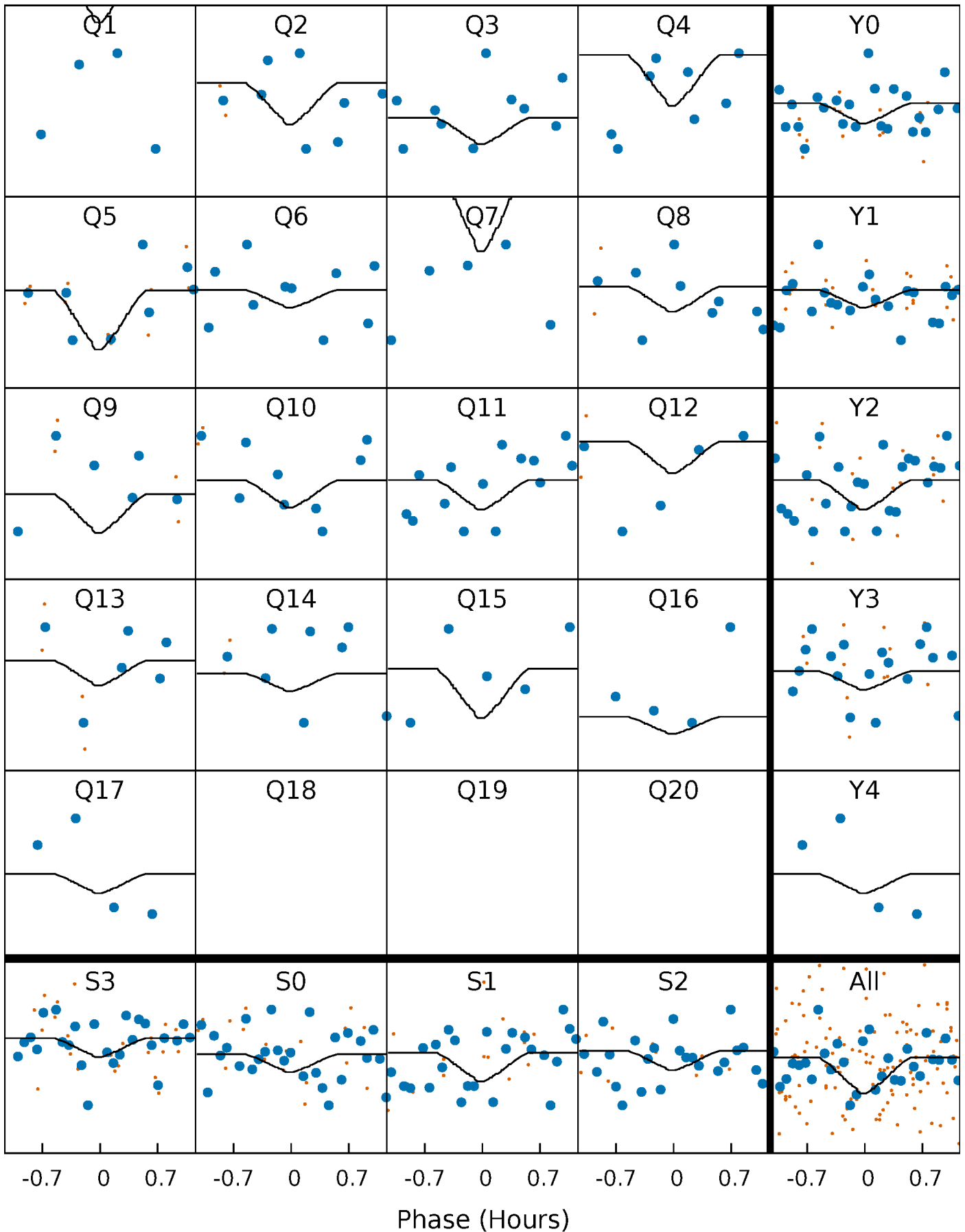
# DV Quarter-Phased Transit Curves

TCE 007971540-04 P= 42.975481 Days  $T_0=146.899876$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

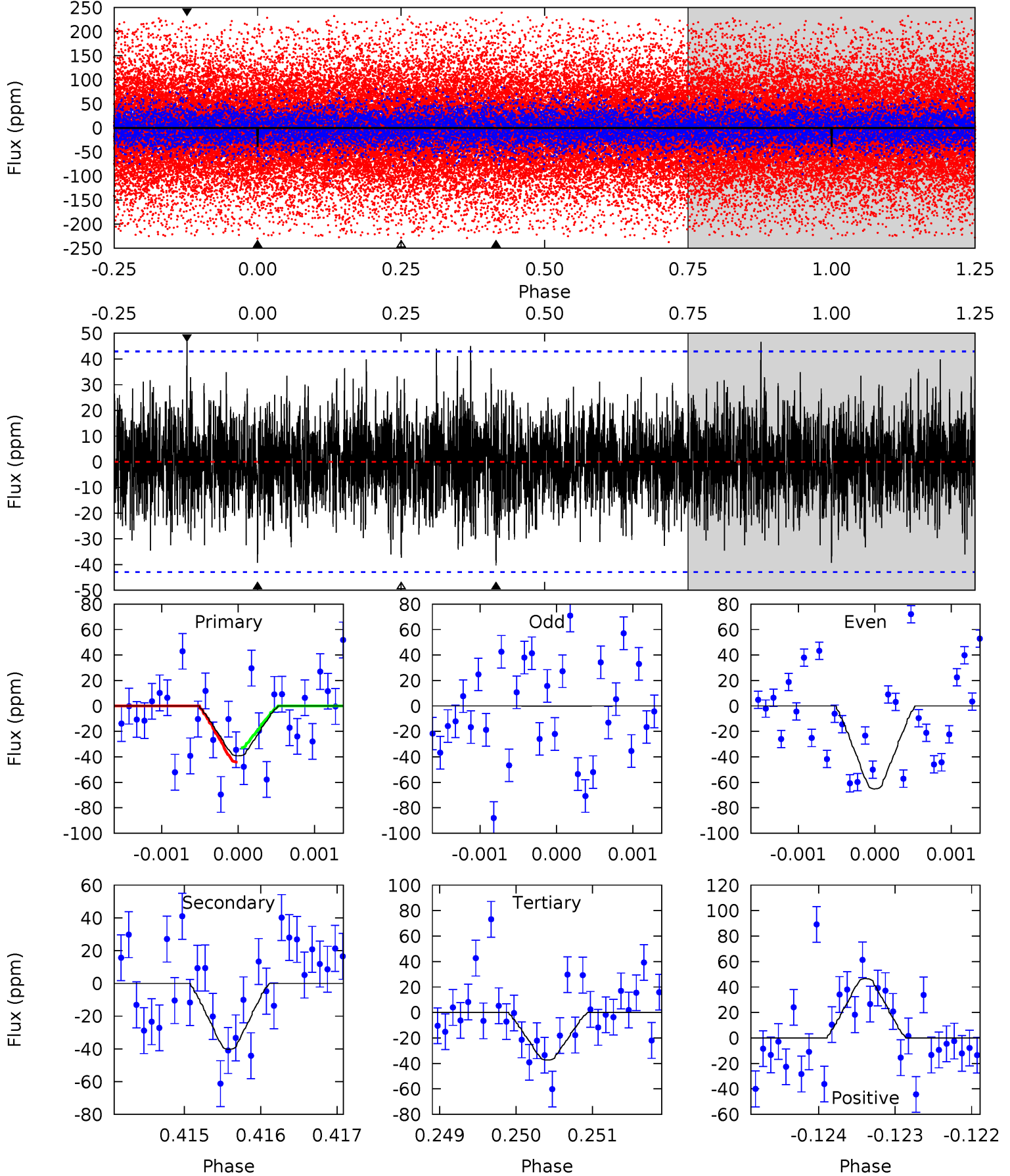
TCE 007971540-04 P= 42.974922 Days  $T_0=146.910308$  (BKJD)



# DV Model-Shift Uniqueness Test

007971540-04,  $P = 42.975481$  Days,  $E = 103.924395$  Days

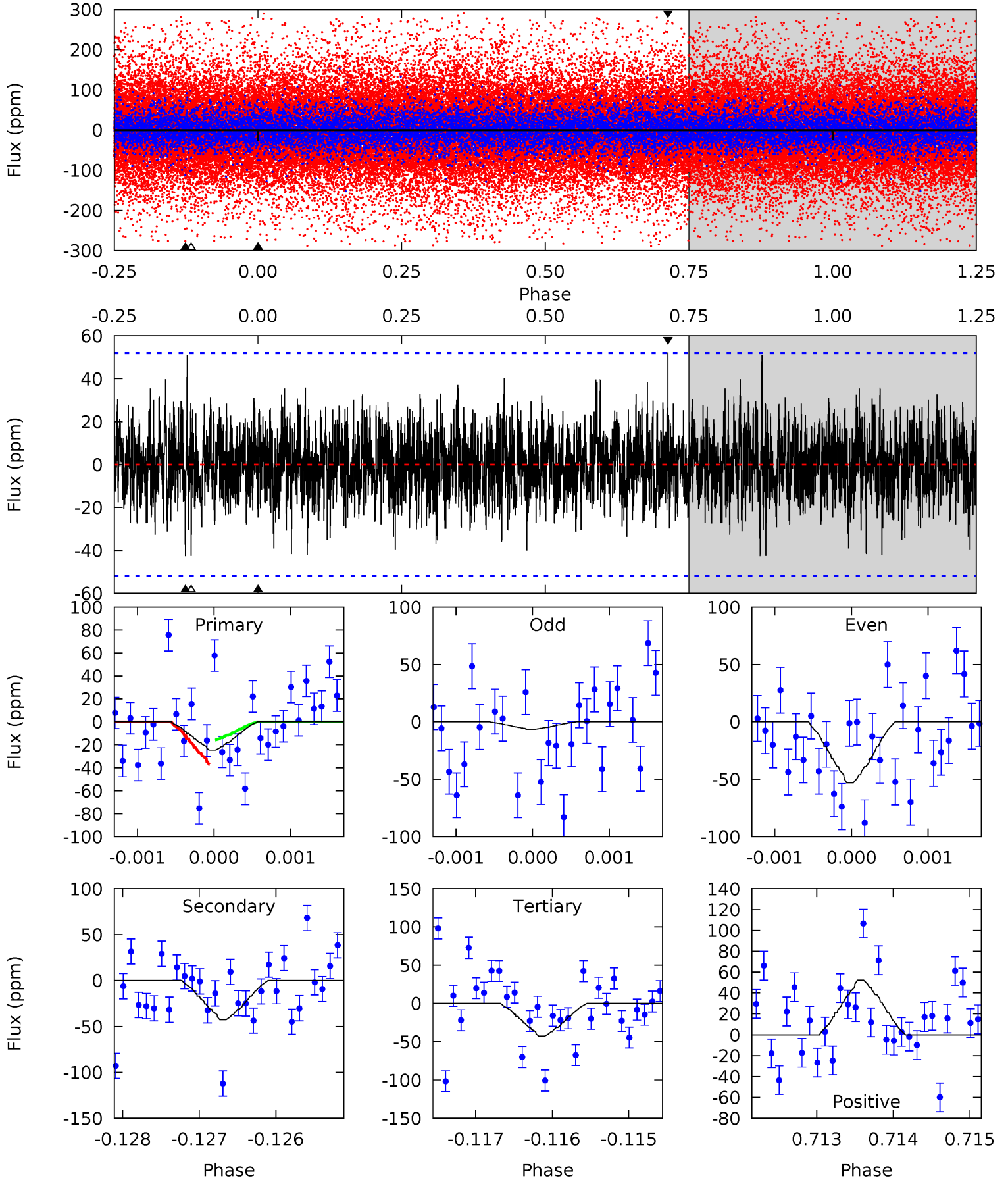
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.97	5.10	4.73	5.91	5.44	3.27	1.48	0.24	-0.94	0.37	-0.80	4.13	0.41	0.54	0.71



# Alt Model-Shift Uniqueness Test

007971540-04, P = 42.974922 Days, E = 103.935386 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
2.60	4.49	4.48	5.49	5.46	3.30	1.31	-1.88	-2.90	0.01	-1.00	2.47	0.19	0.55	1.13





### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-04 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-40 \pm 8$	$1.32^{+0.72}_{-0.68}$	$1052^{+68}_{-86}$	$6086^{+3157}_{-1113}$	$780^{+2483}_{-443}$
Alt.	$-43 \pm 10$	$1.40^{+0.71}_{-0.61}$	$1053^{+64}_{-91}$	$5948^{+2161}_{-964}$	$710^{+1593}_{-393}$

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

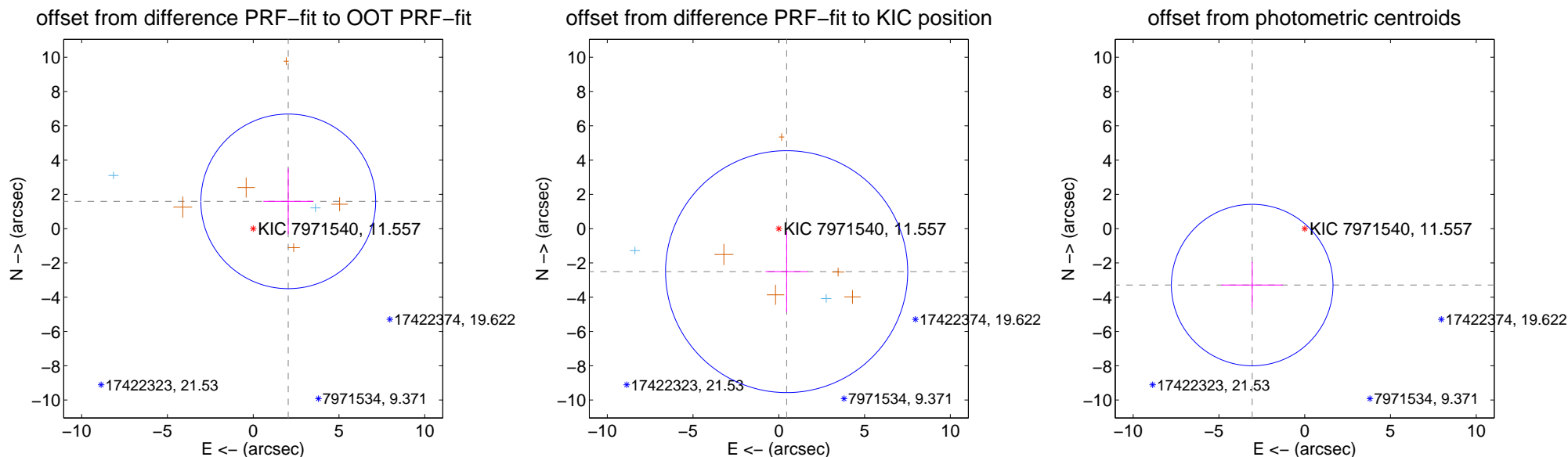
## DV Centroid Data

Supplemental centroid analysis for 007971540-04. **Kepler magnitude: 11.56.** Transit SNR 15.69

**There are 2 quarters with good PRF difference image offsets**

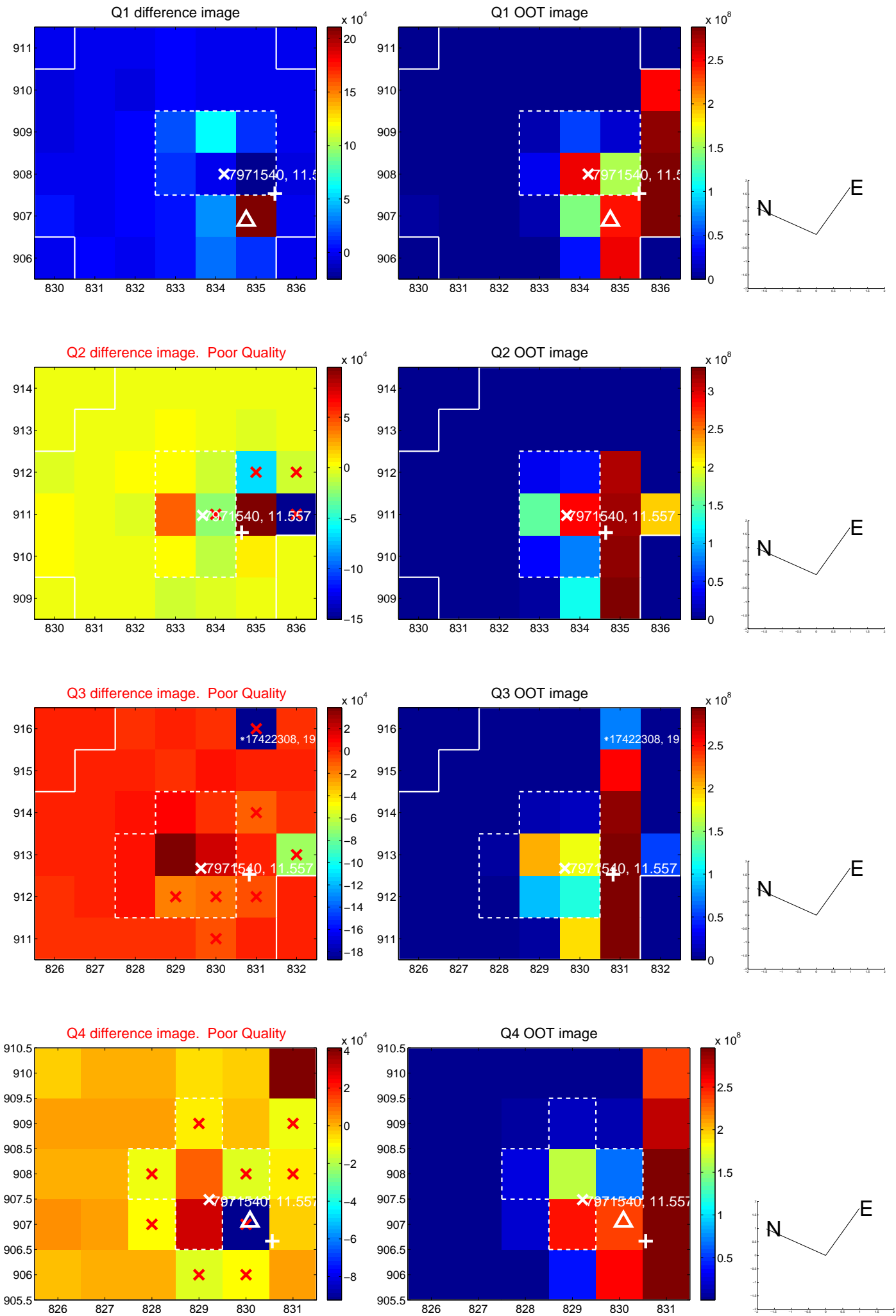
The direct PRF centroid is offset from the target star catalog position by about 1.80 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.589 \pm 1.698$	1.52	$-2.043 \pm 1.451$	$1.591 \pm 1.913$
PRF-fit source offset from KIC position	$2.550 \pm 2.352$	1.08	$-0.456 \pm 1.232$	$-2.509 \pm 2.369$
photometric centroid source offset	$4.49 \pm 1.57$	2.86	$3.06 \pm 1.79$	$-3.29 \pm 1.35$

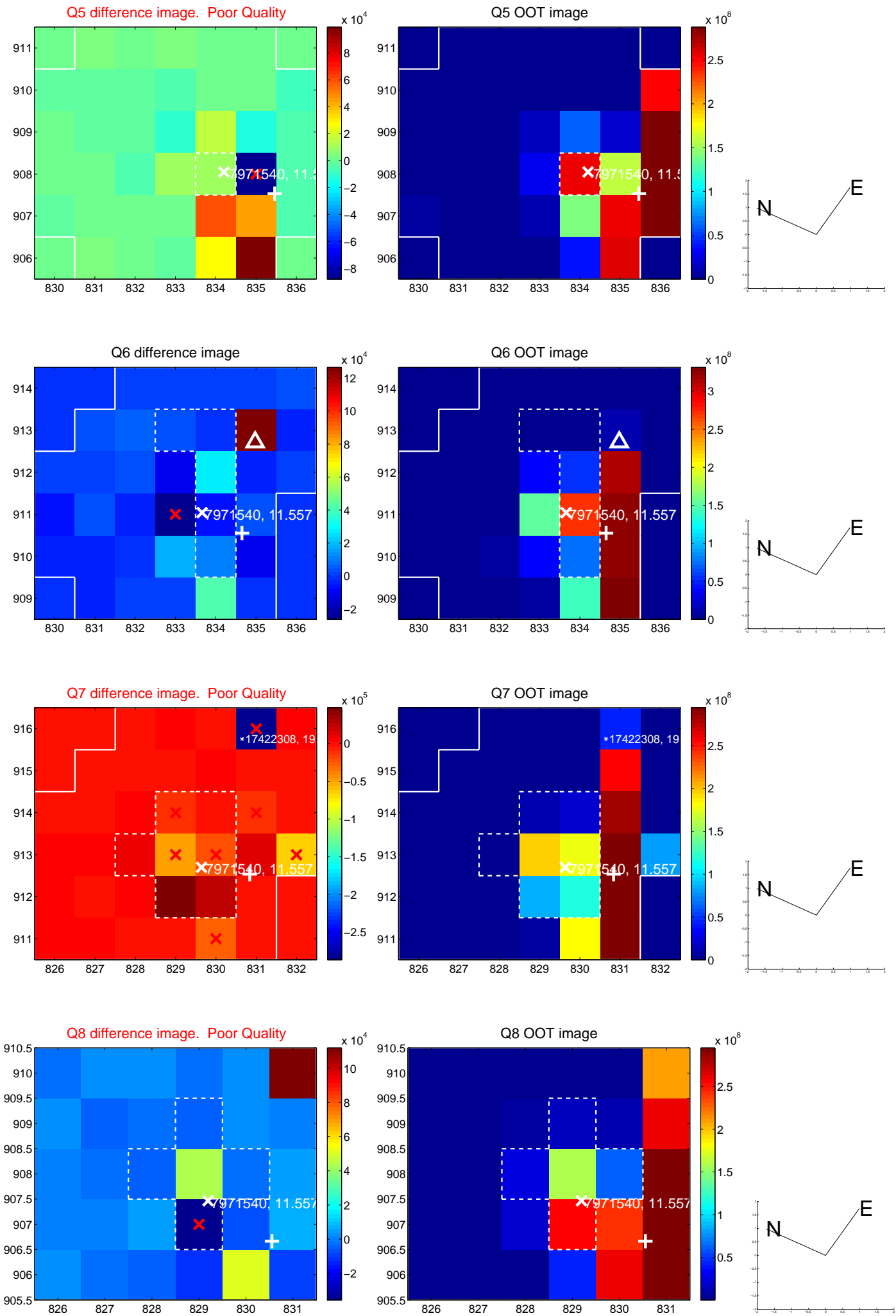


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

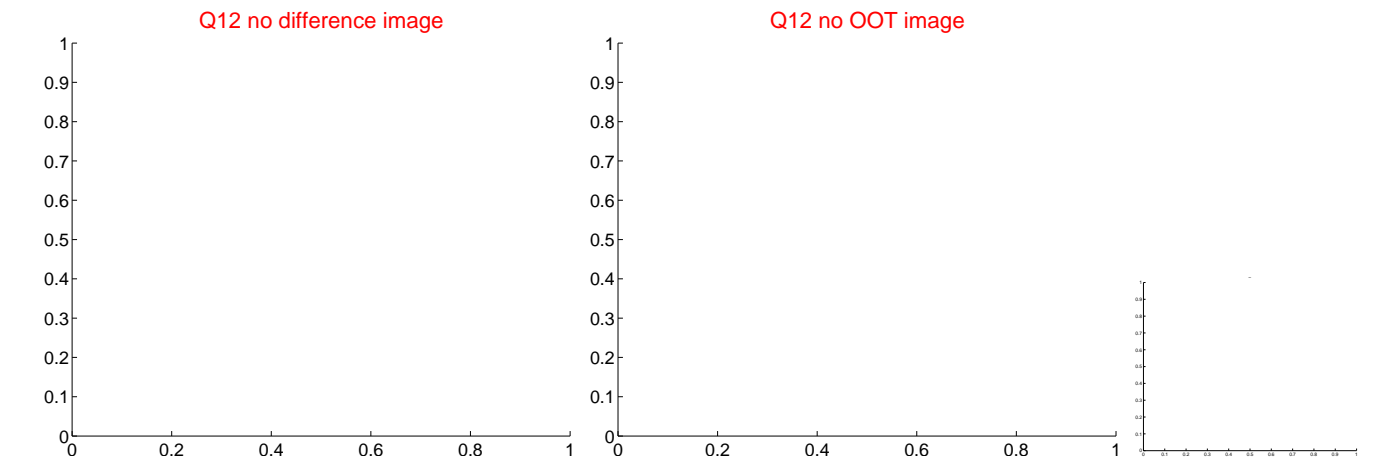
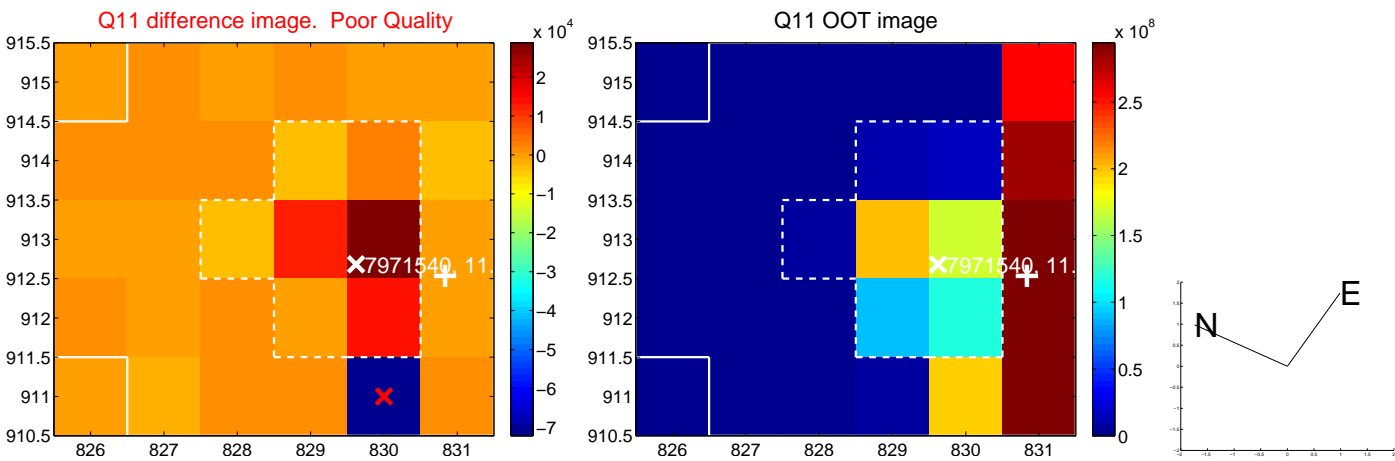
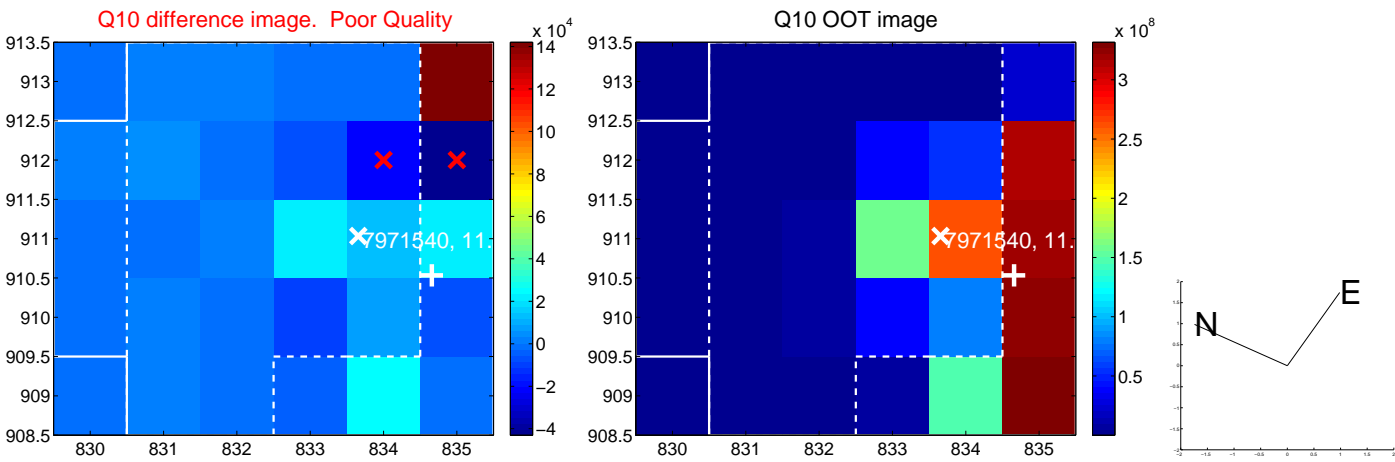
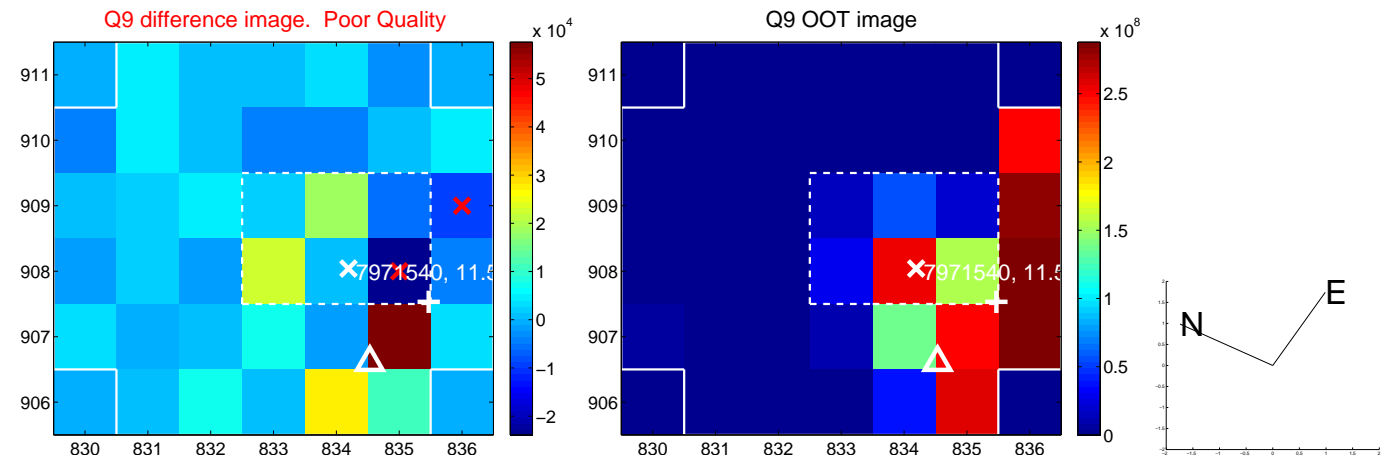
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



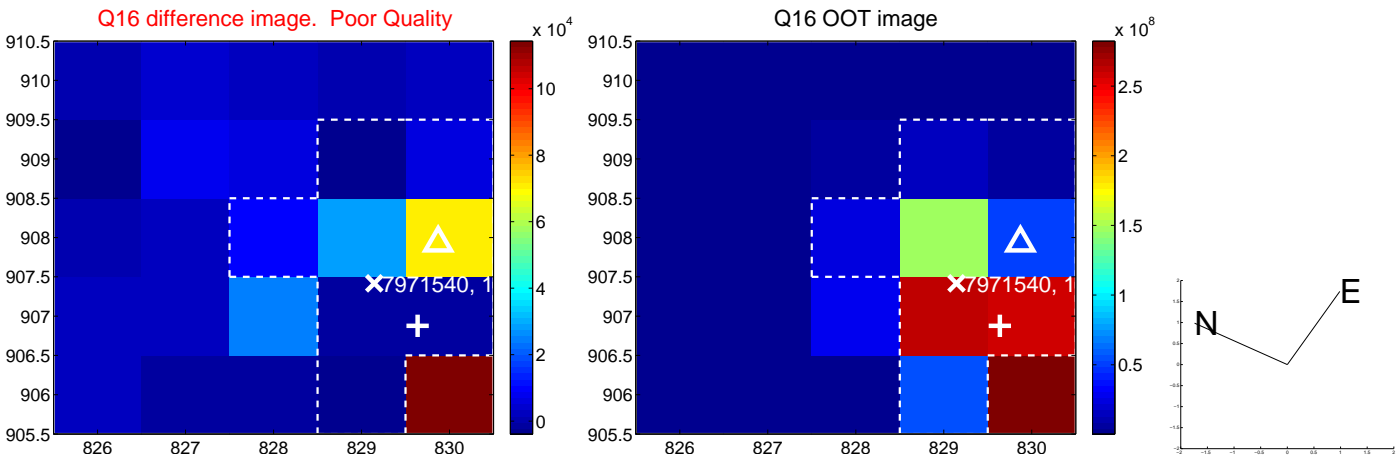
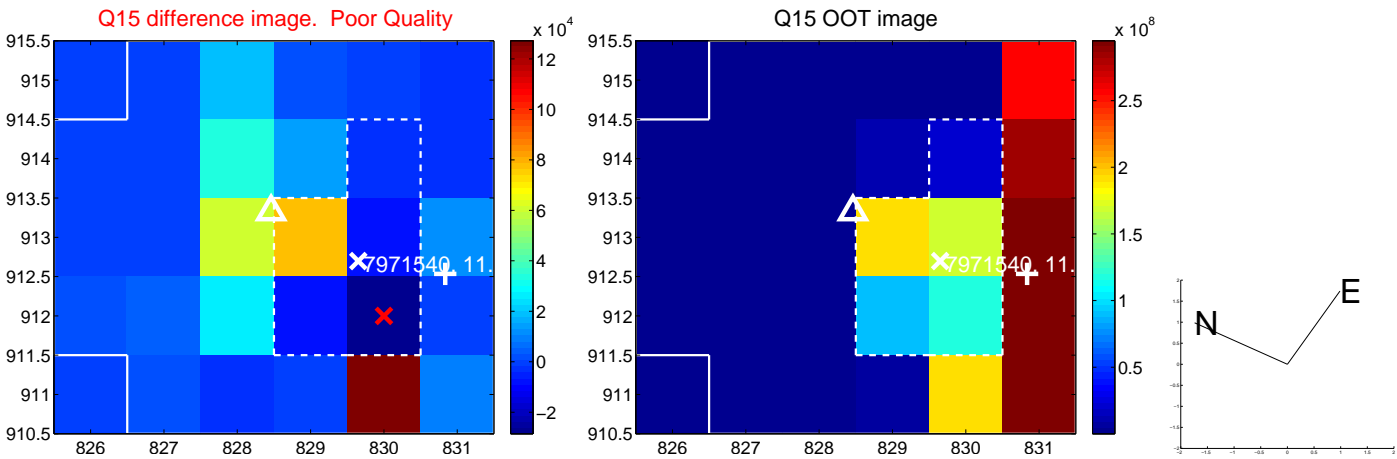
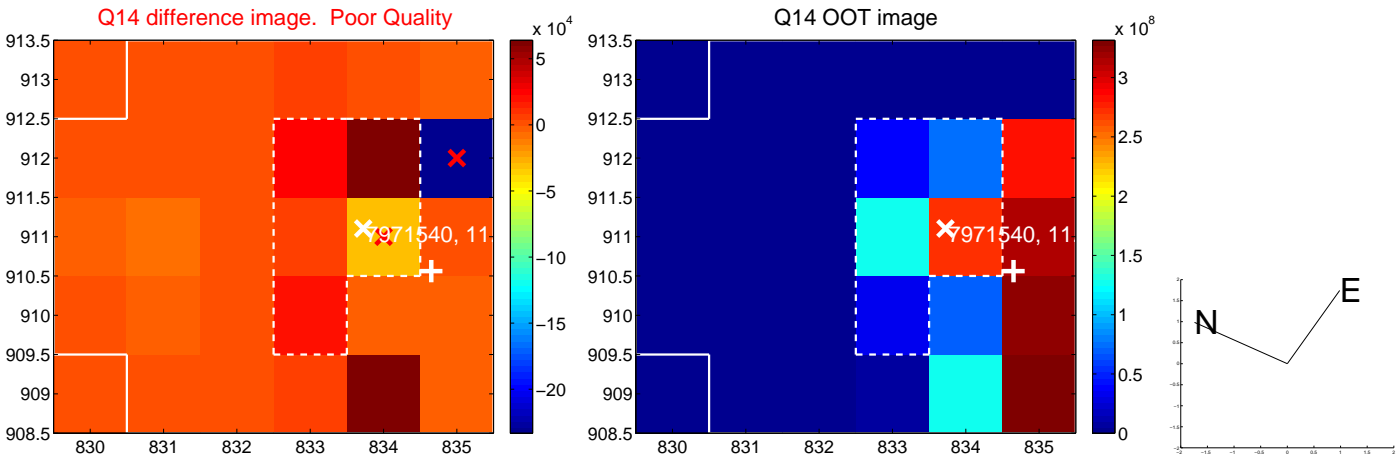
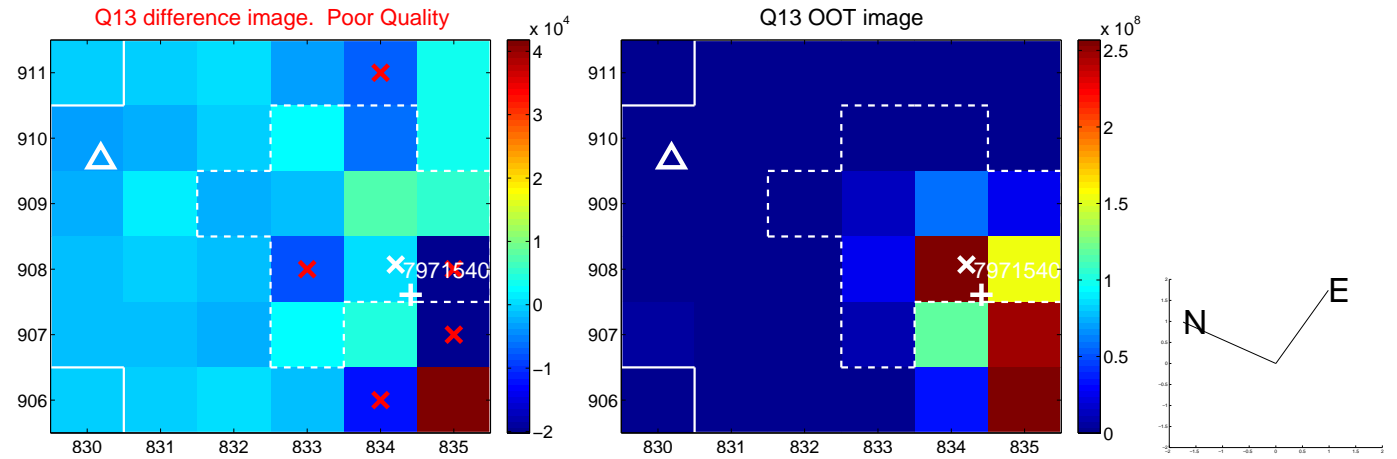
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



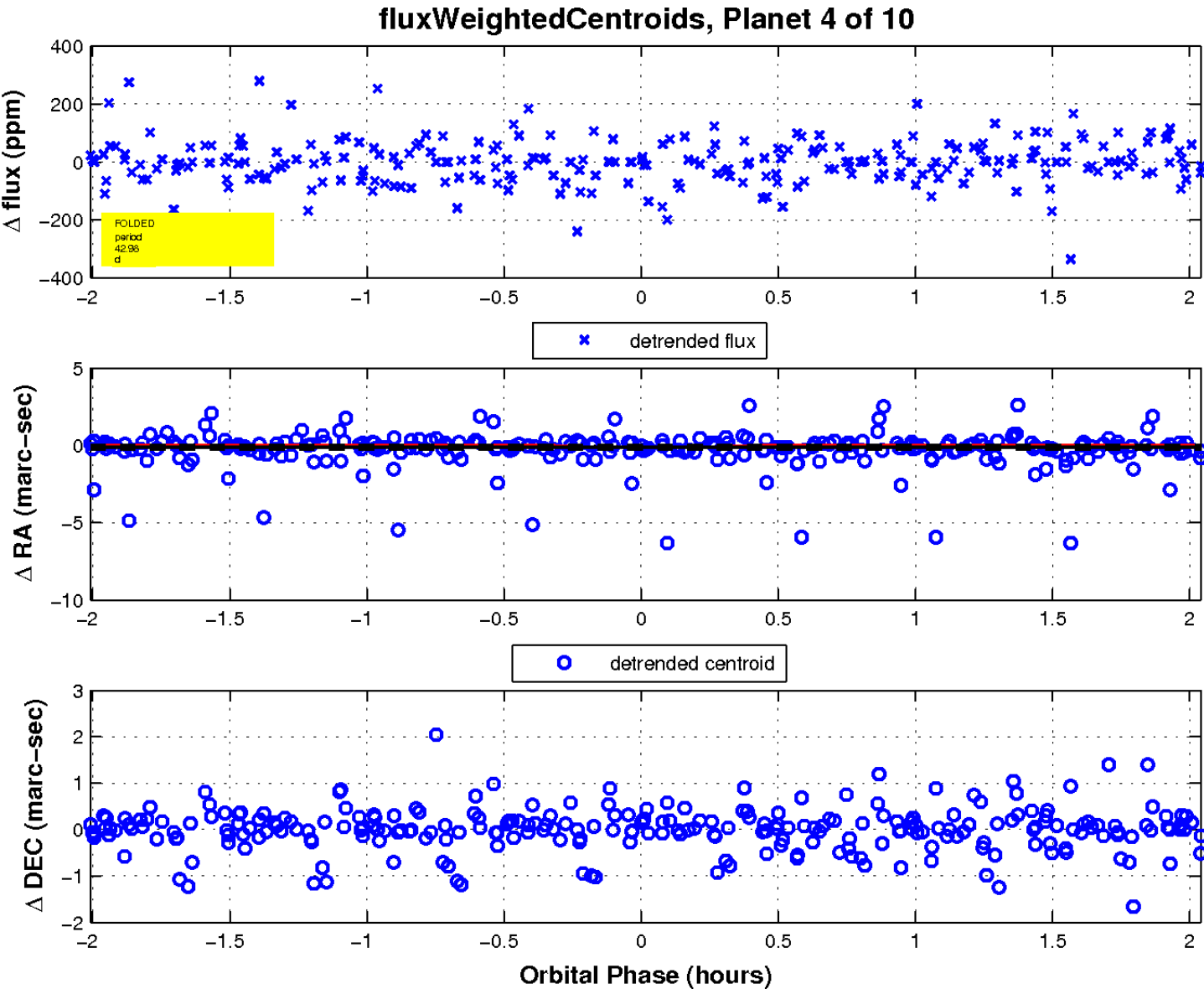
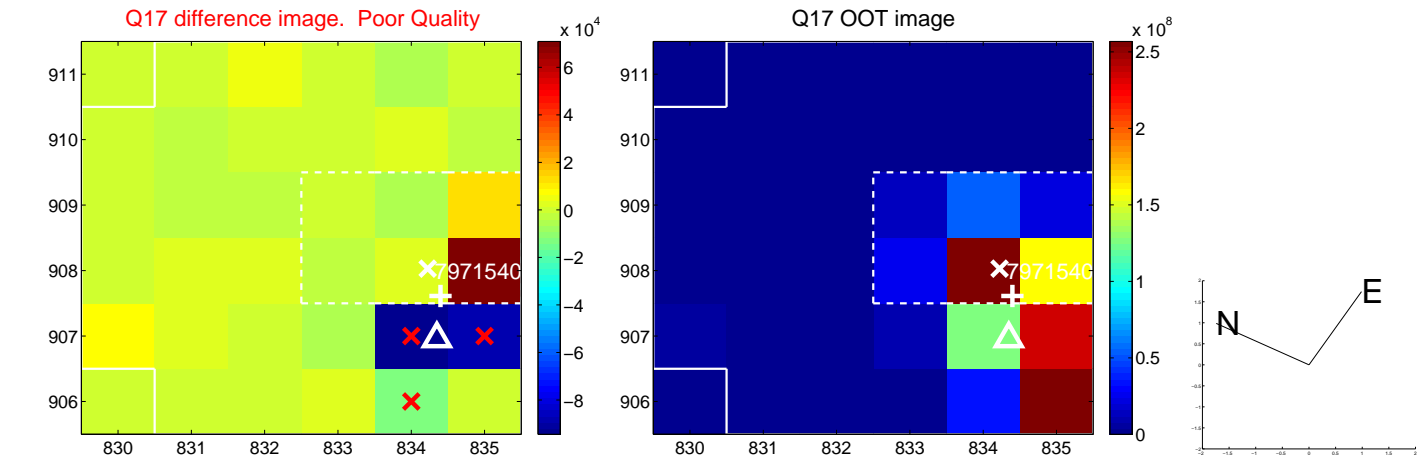
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



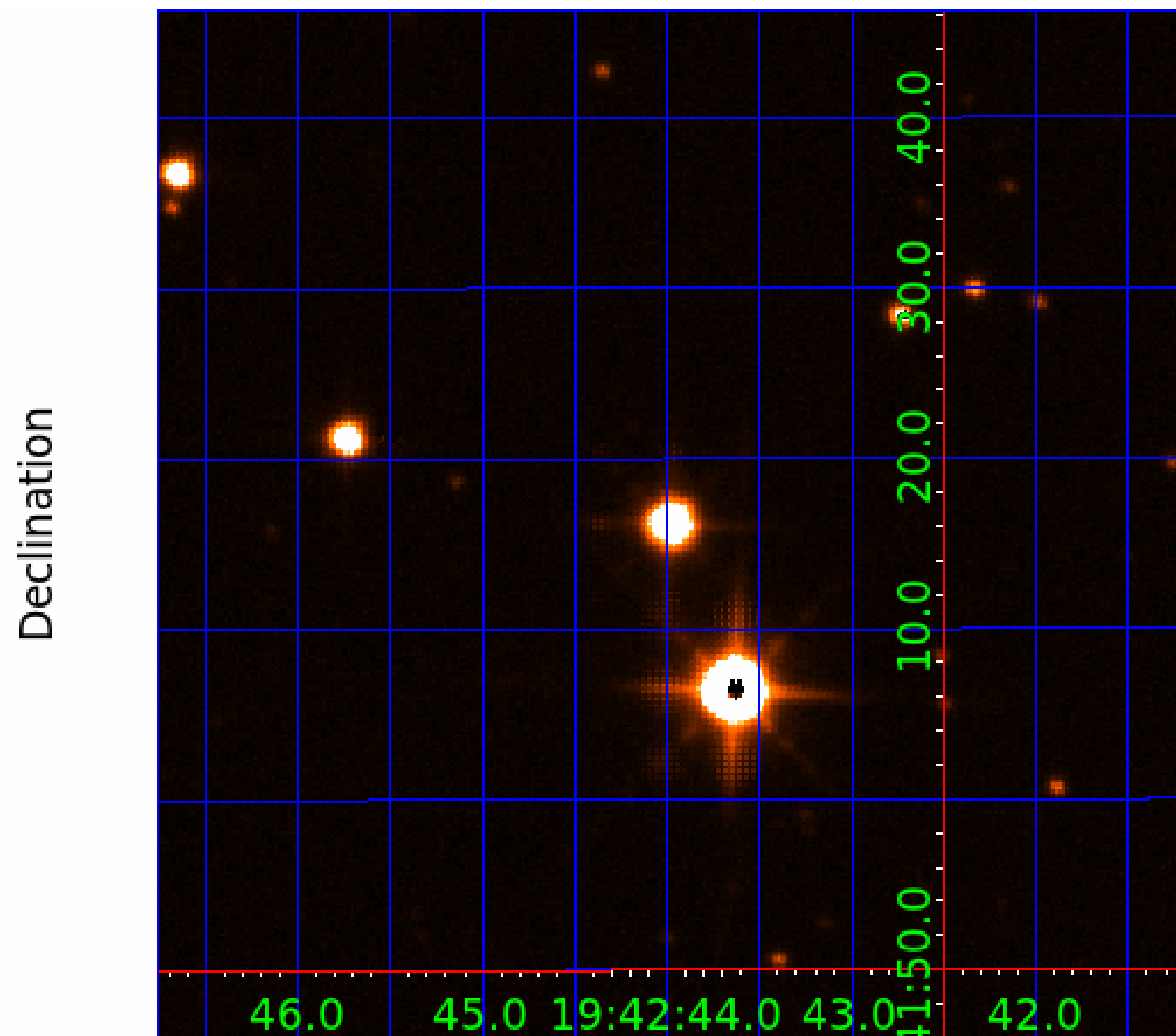
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007971540-01	OBS	No	51.011313	166.181425	52.5	1.002	29.8	20.5	1.77	6516	1.30	64.75
007971540-02	OBS	No	52.291113	159.026037	53.9	1.214	18.0	16.2	1.77	6516	1.46	62.65
007971540-03	OBS	No	34.530503	153.062724	23.2	2.413	14.7	7.2	1.77	6516	1.02	108.94
007971540-04	OBS	No	42.975481	146.899876	56.8	0.683	13.6	15.7	1.77	6516	1.38	81.38
007971540-05	OBS	No	60.934308	143.610155	48.2	1.035	15.8	19.4	1.77	6516	1.40	51.09
007971540-06	OBS	No	71.174769	162.031760	41.4	7.231	14.7	16.6	1.77	6516	1.30	41.53
007971540-07	OBS	No	49.509656	174.313640	54.0	12.534	13.5	16.9	1.77	6516	1.52	67.38
007971540-08	OBS	No	262.610321	259.184059	26.0	18.558	13.9	4.7	1.77	6516	1.08	7.28
007971540-09	OBS	No	28.835527	150.649599	19.5	11.693	12.6	9.8	1.77	6516	0.97	138.54
007971540-10	OBS	No	59.432161	172.524554	131.2	9.000	11.7	-1.0	1.77	6516	2.04	52.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007971540-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-04	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-06	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST
007971540-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007971540-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007971540-09	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007971540-10	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

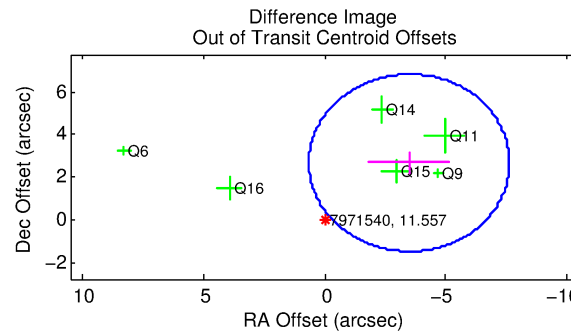
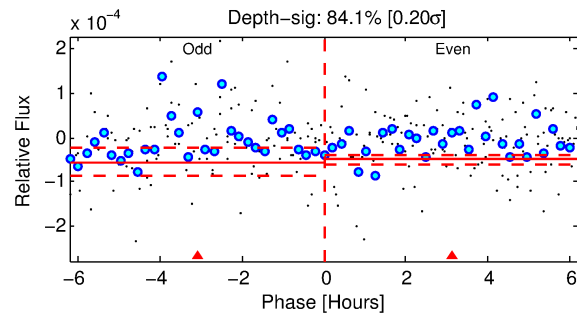
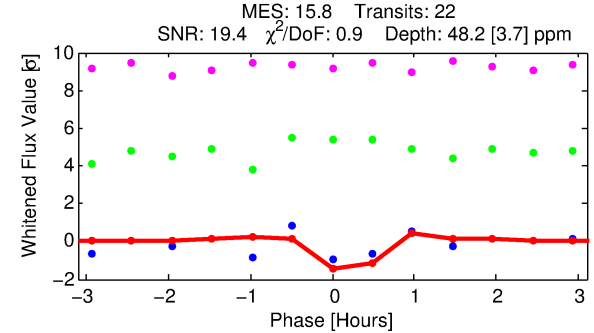
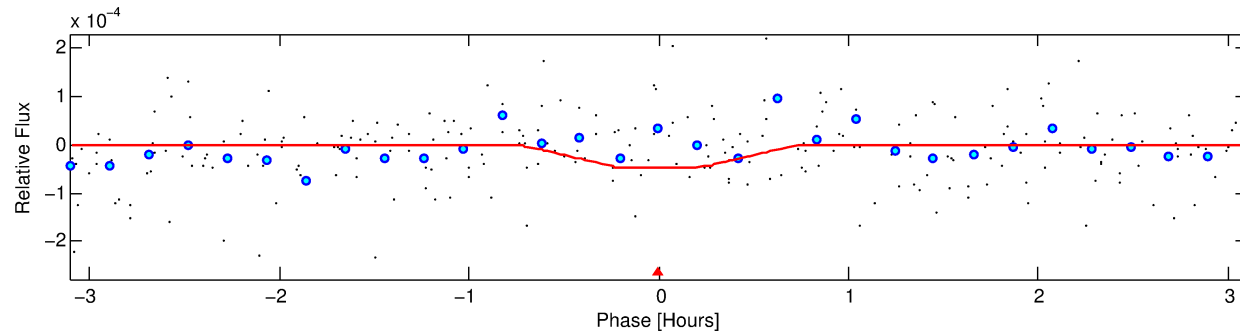
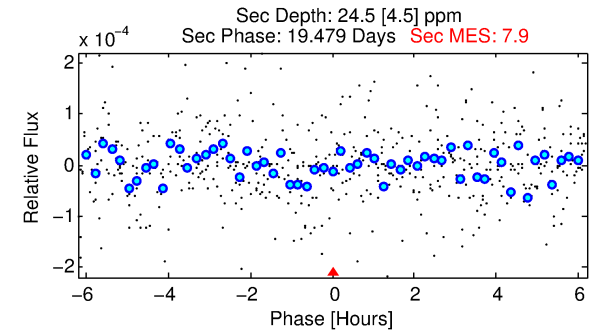
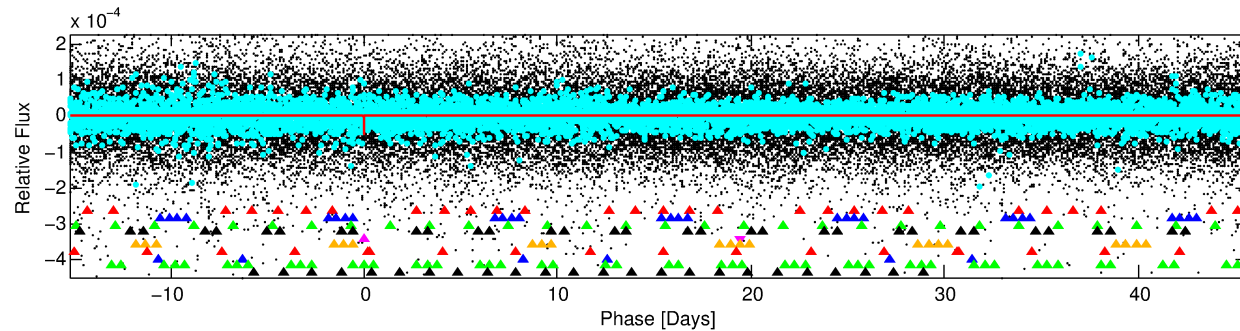
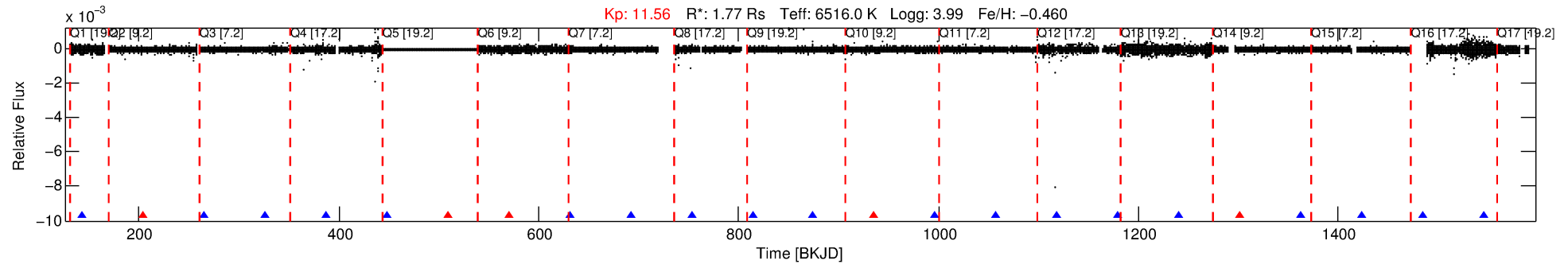
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-05

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 5 of 10 Period: 60.934 d



## DV Fit Results:

Period = 60.93431 [0.00027] d  
Epoch = 143.6102 [0.0017] BKJD  
Rp/R\* = 0.0072 [0.0011]  
a/R\* = 244.38 [183.86]  
b = 0.85 [0.26]  
Seff = 51.09 [24.62]  
Teff = 682 [82] K  
Rp = 1.40 [0.47] Re  
a = 0.3147 [0.0908] AU  
Ag = 685.53 [400.62] [1.71σ]  
Teffp = 5393 [511] K [9.10σ]

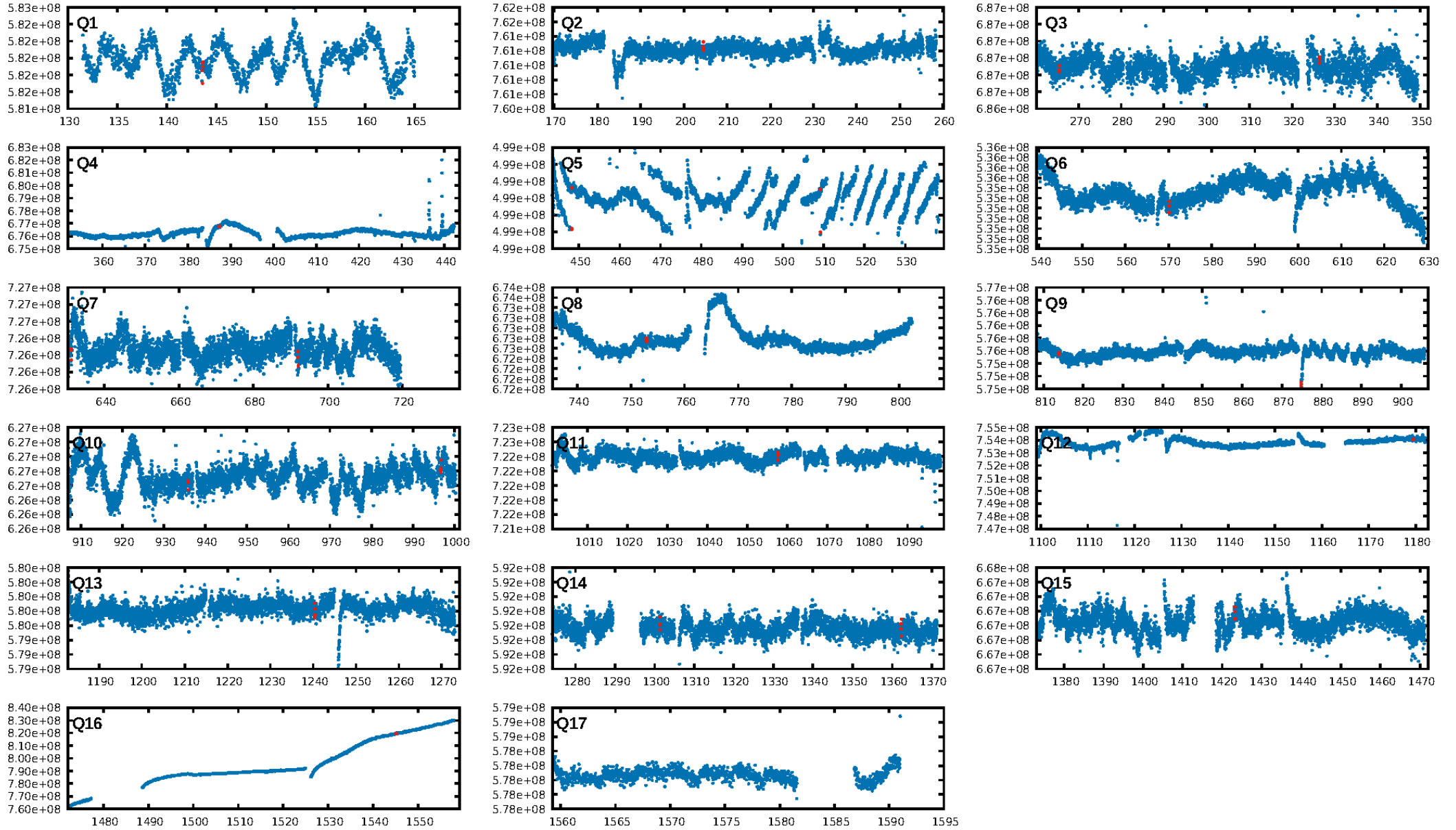
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [3.98σ]  
LongPeriod-sig: 100.0% [33.65σ]  
ModelChiSquare2-sig: 41.8%  
ModelChiSquareGof-sig: 99.9%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.76 [16/21]  
GhostDiagnostic-chr: 1.085  
Centroid-sig: N/A  
Centroid-so: 4.737 arcsec [3.04σ]  
OotOffset-rm: 4.400 arcsec [3.19σ]  
KicOffset-rm: 3.016 arcsec [2.05σ]  
OotOffset-st: 2/2/1/1 [6]  
KicOffset-st: 2/2/1/1 [6]  
DiffImageQuality-fgm: 0.00 [0/6]  
DiffImageOverlap-fno: 0.80 [12/15]

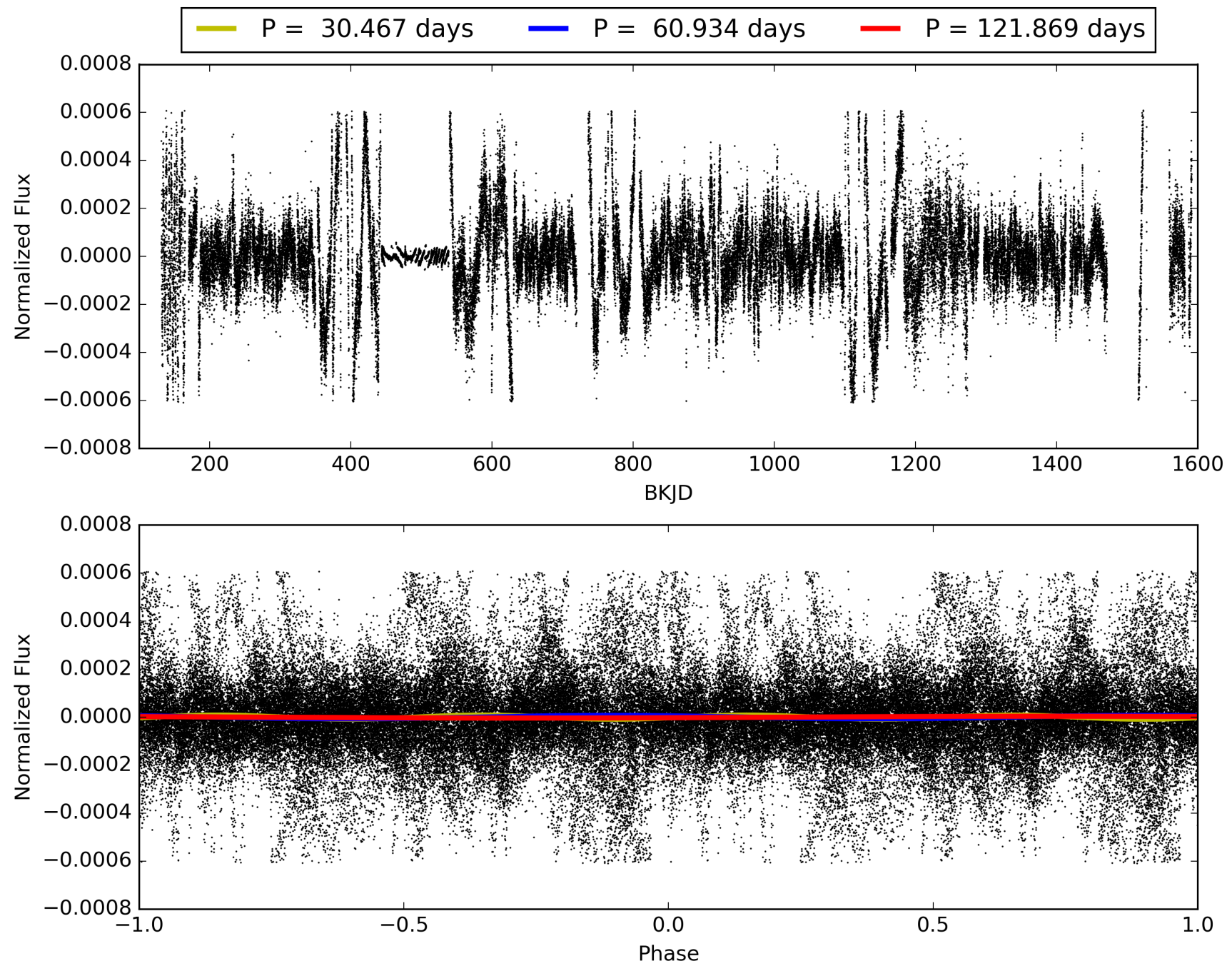
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:56:50 Z

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

# TCE 007971540-05, PDC Light Curves

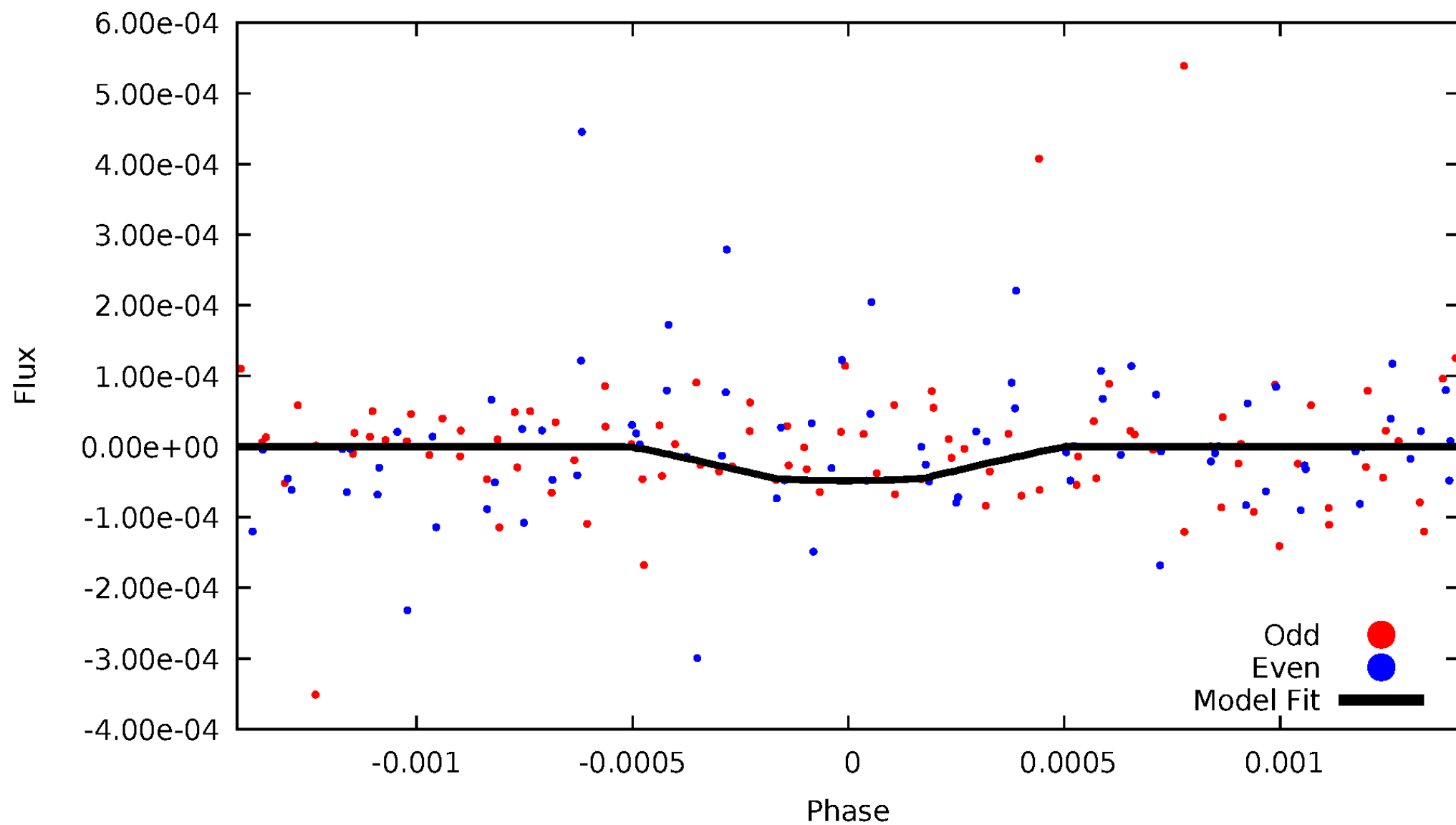


TCE 007971540-05



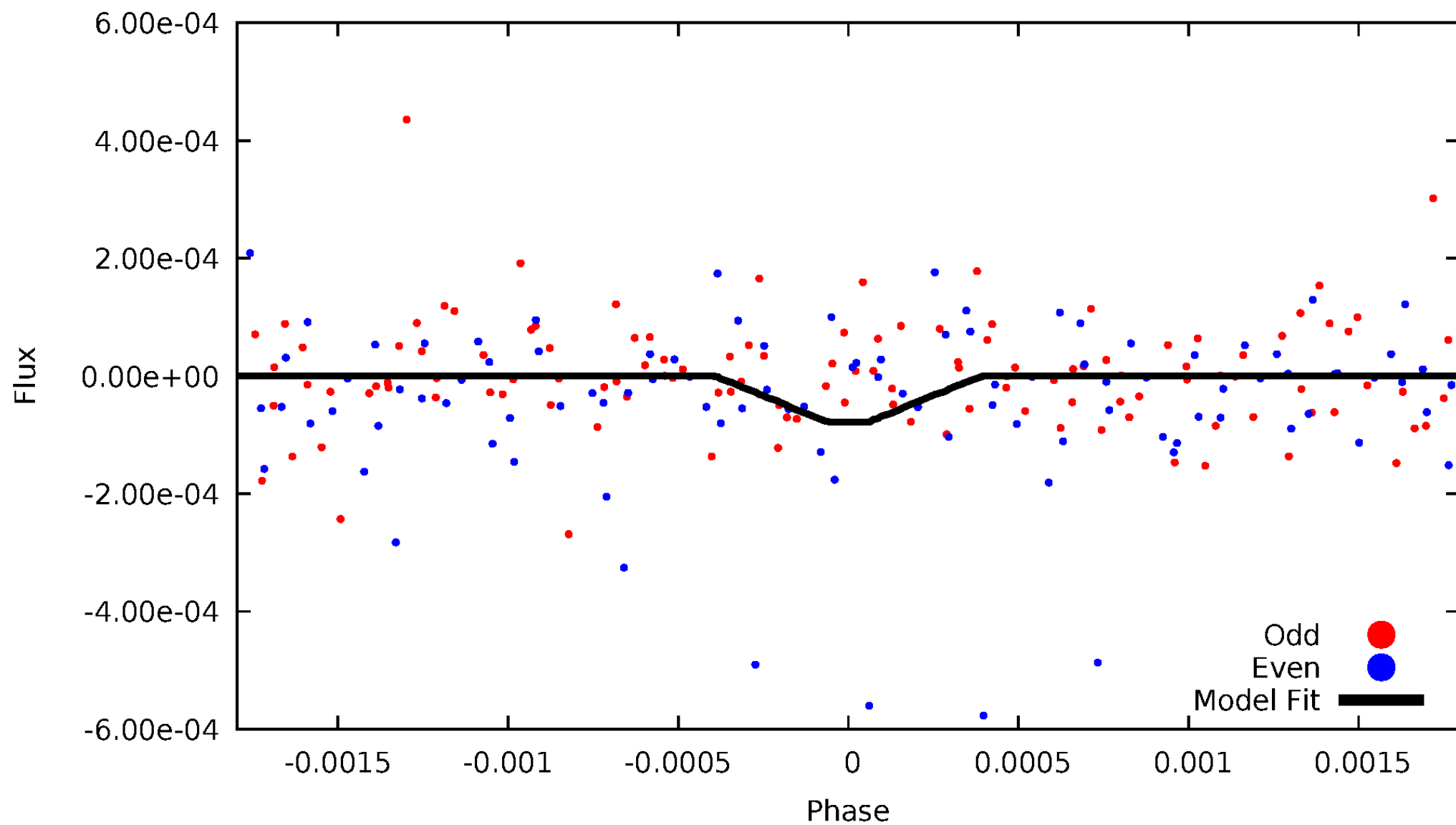
# DV Odd/Even

TCE 007971540-05



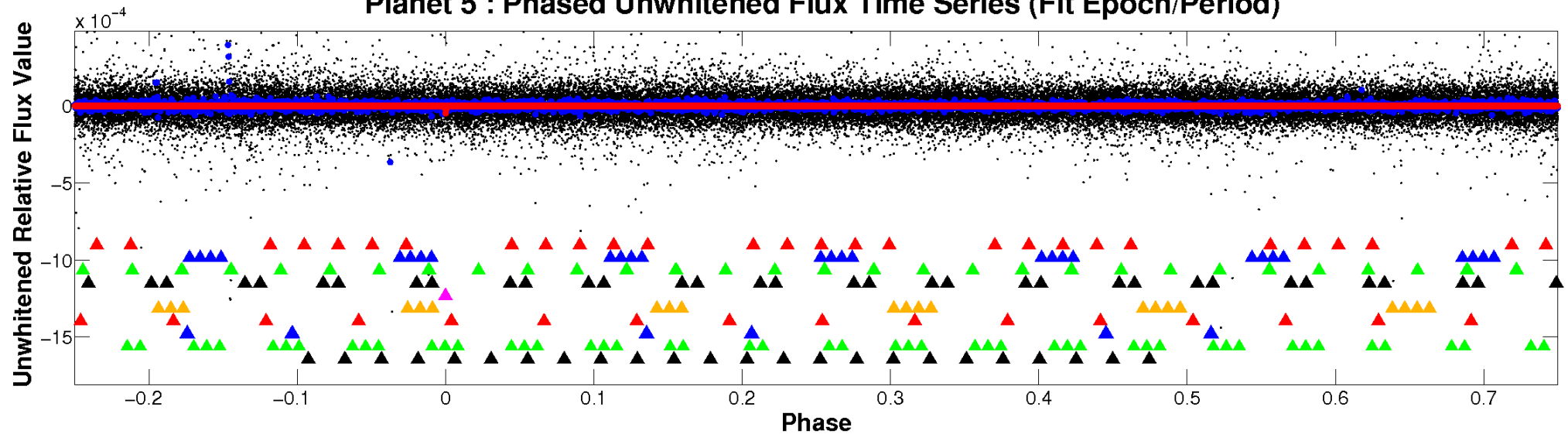
# ALT Odd/Even

TCE 007971540-05

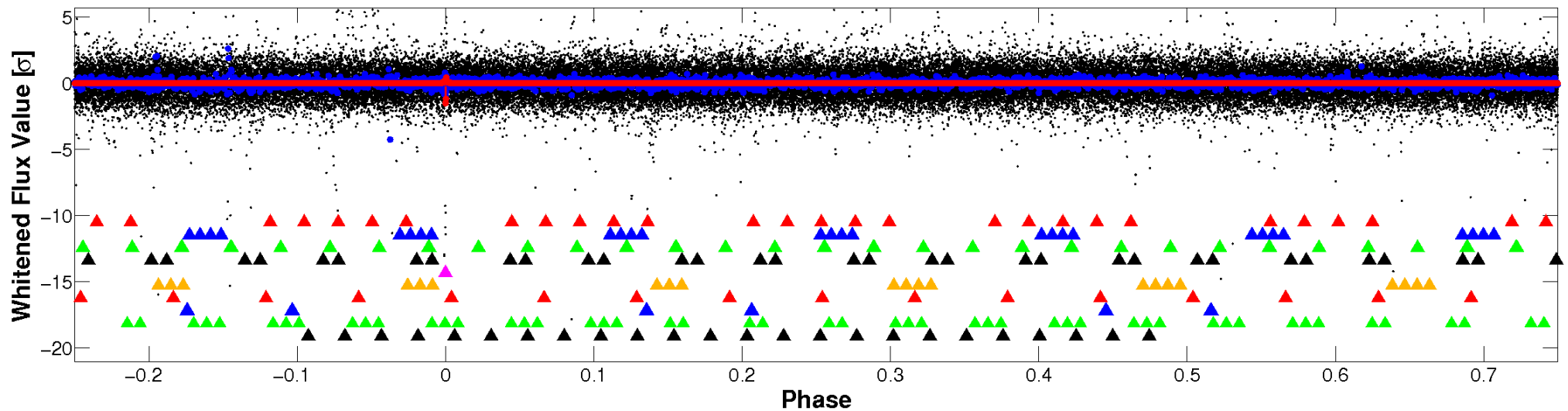


# Non-Whitened Vs. Whitened Light Curve

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



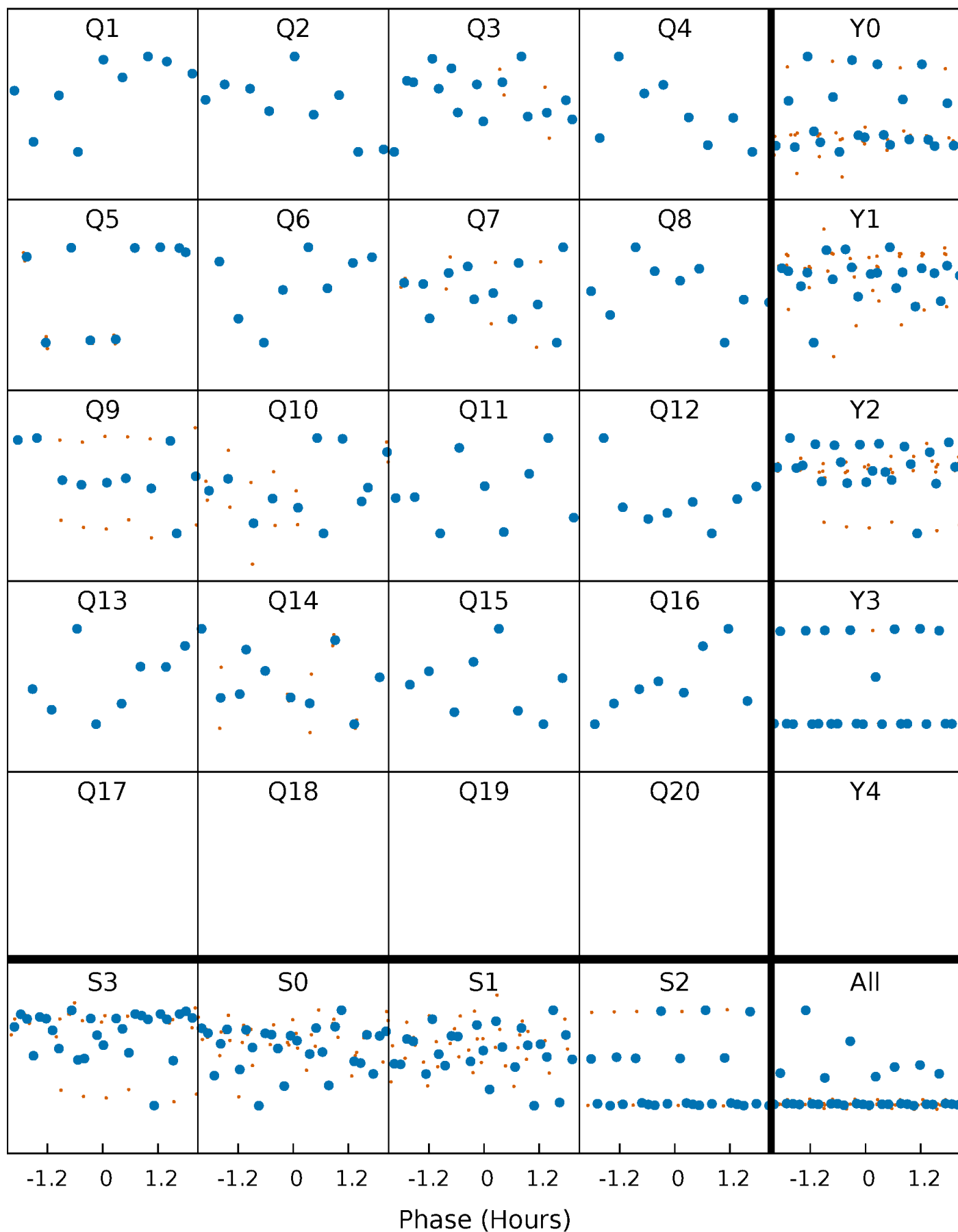
## Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)





# PDC Quarter-Phased Transit Curves

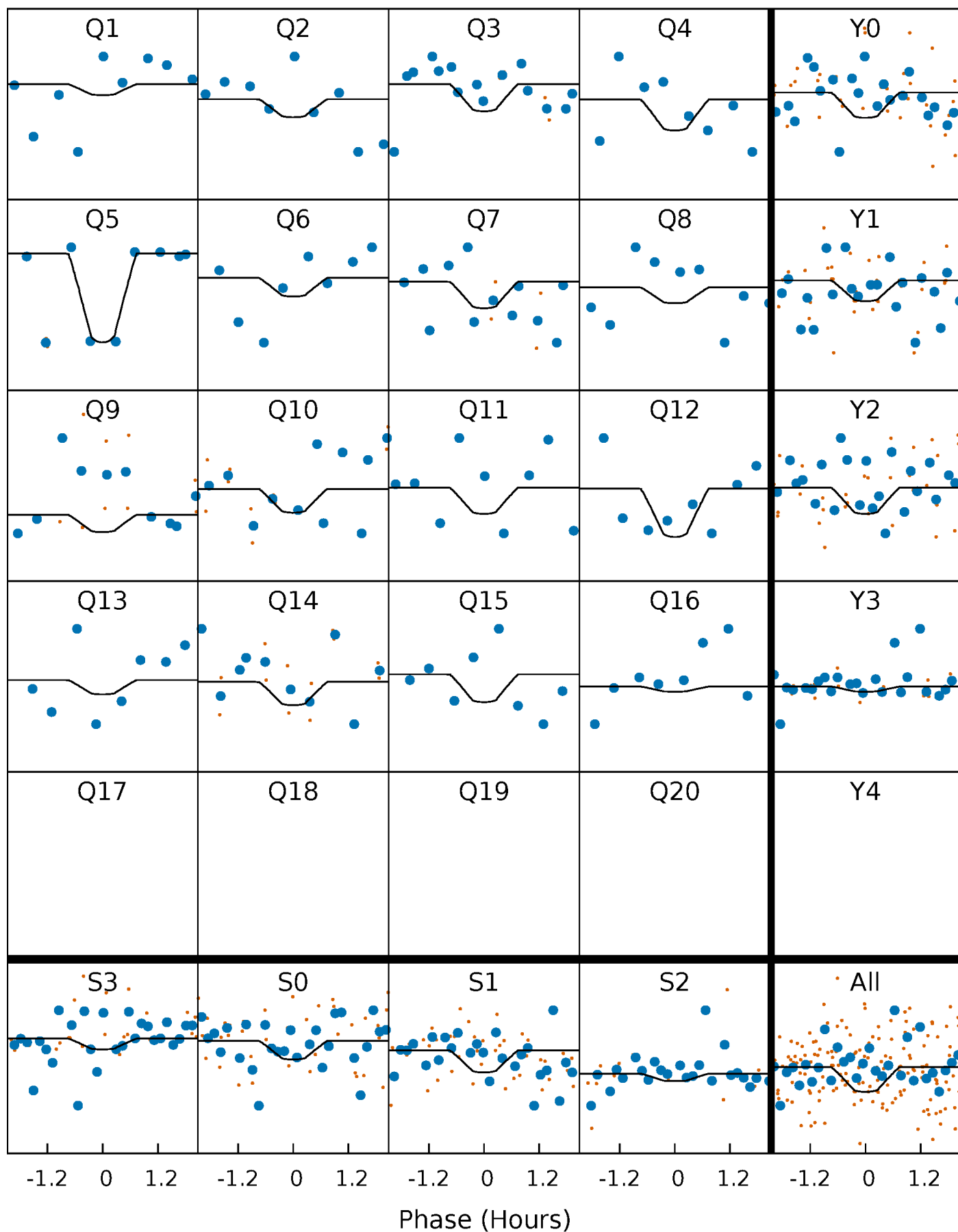
TCE 007971540-05     $P = 60.934308$  Days     $T_0 = 143.610155$  (BKJD)





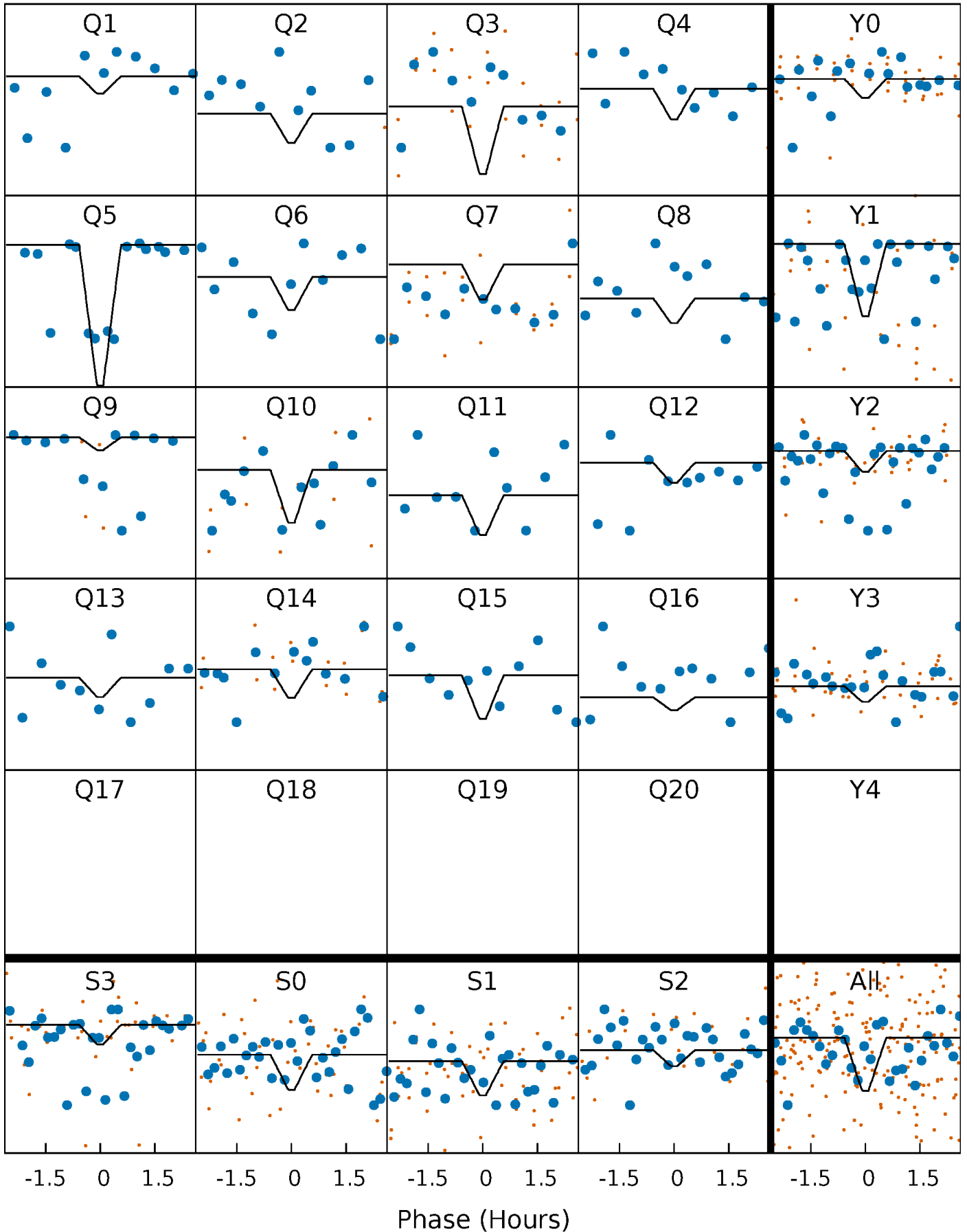
# DV Quarter-Phased Transit Curves

TCE 007971540-05   P= 60.934308 Days    $T_0=143.610155$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

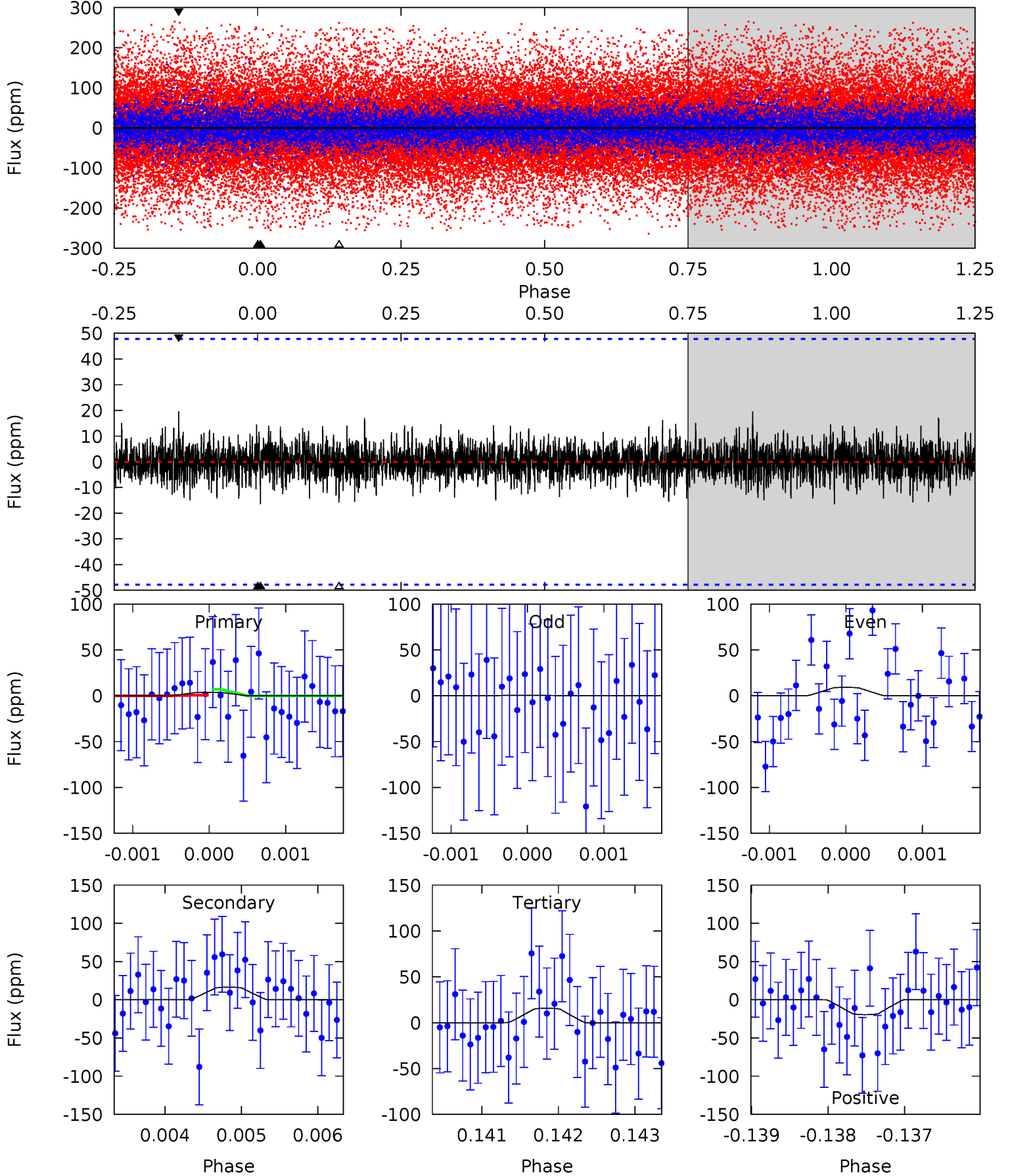
TCE 007971540-05     $P = 60.930994$  Days     $T_0 = 143.628979$  (BKJD)



# DV Model-Shift Uniqueness Test

007971540-05, P = 60.934308 Days, E = 82.675847 Days

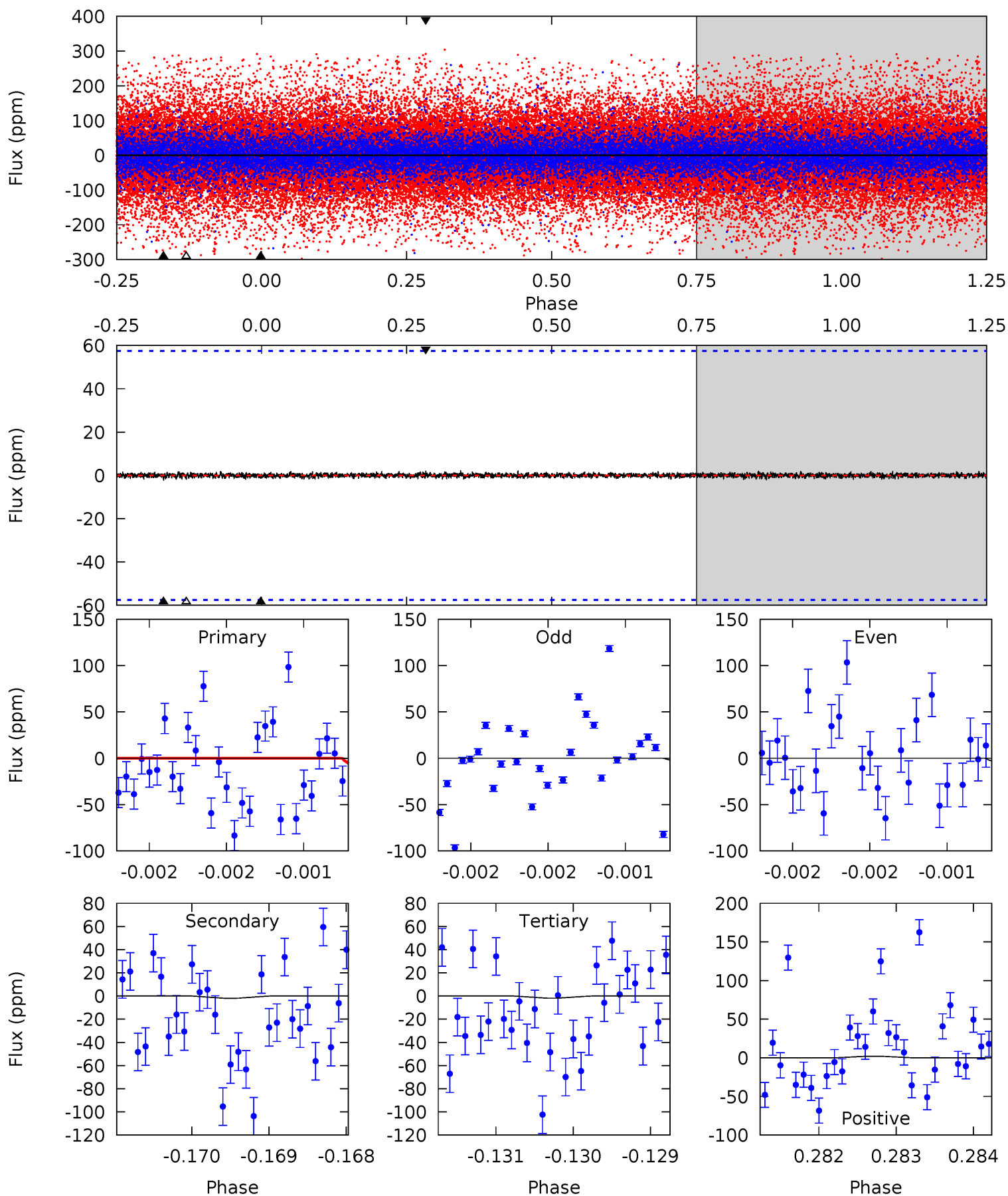
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.43	1.89	1.80	2.23	5.45	3.29	0.53	-1.37	-1.80	0.08	-0.34	0.49	-6.56	0.54	0.38



# Alt Model-Shift Uniqueness Test

007971540-05, P = 60.930994 Days, E = 82.697985 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
0.13	0.19	0.18	0.20	5.49	3.36	0.05	-0.05	-0.07	0.02	-0.01	0.32	-5.77	0.51	0.20



### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-05 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-17 \pm 9$	$1.36^{+0.28}_{-0.29}$	$936^{+65}_{-75}$	$5003^{+667}_{-744}$	$505^{+458}_{-279}$
Alt.	$-2 \pm 10$	$1.66^{+0.30}_{-0.32}$	$936^{+59}_{-75}$	$3063^{+1218}_{-7148}$	$28^{+218}_{-203}$

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

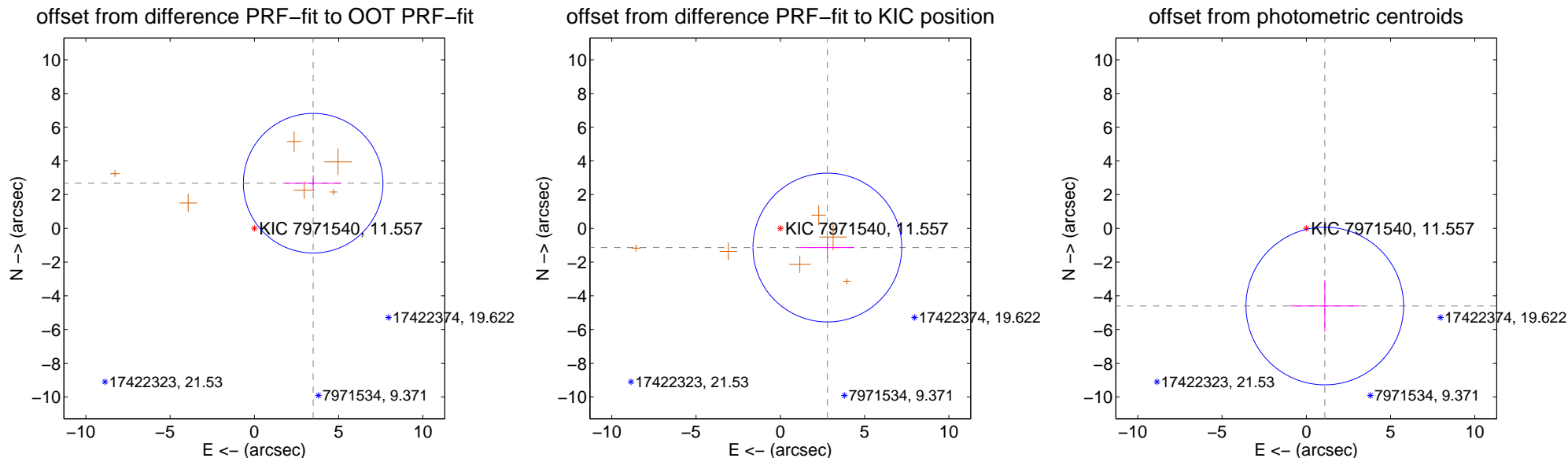
## DV Centroid Data

Supplemental centroid analysis for 007971540-05. **Kepler magnitude: 11.56.** Transit SNR 19.43

There are 0 quarters with good PRF difference image offsets

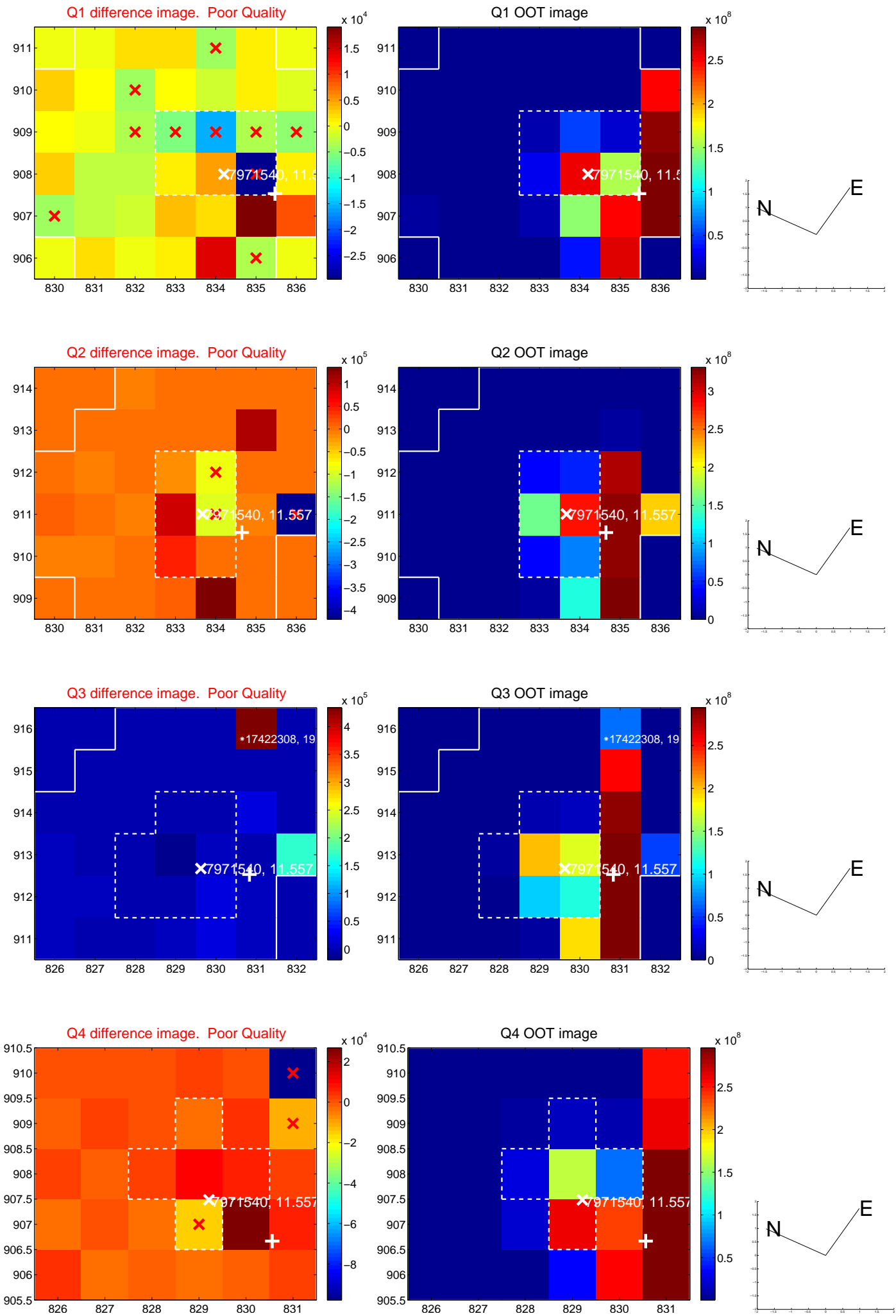
The OOT PRF centroid is offset from the target star catalog position by about 2.99 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.400 \pm 1.381$	<b>3.19</b>	$-3.490 \pm 1.660$	$2.679 \pm 0.460$
PRF-fit source offset from KIC position	$3.016 \pm 1.472$	2.05	$-2.792 \pm 1.597$	$-1.140 \pm 0.612$
photometric centroid source offset	$4.74 \pm 1.56$	<b>3.04</b>	$-1.10 \pm 2.08$	$-4.61 \pm 1.52$

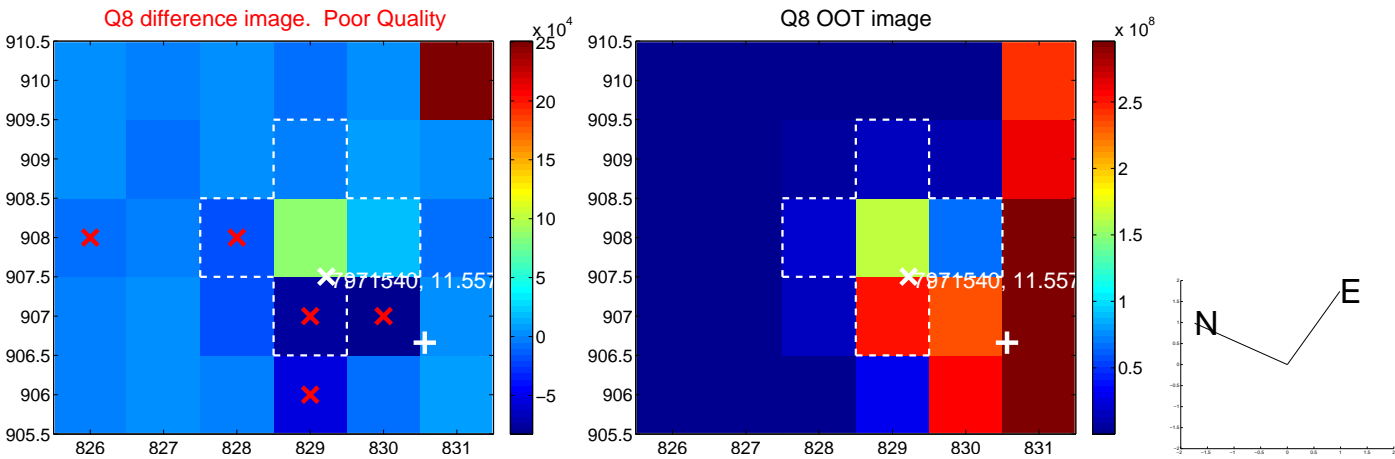
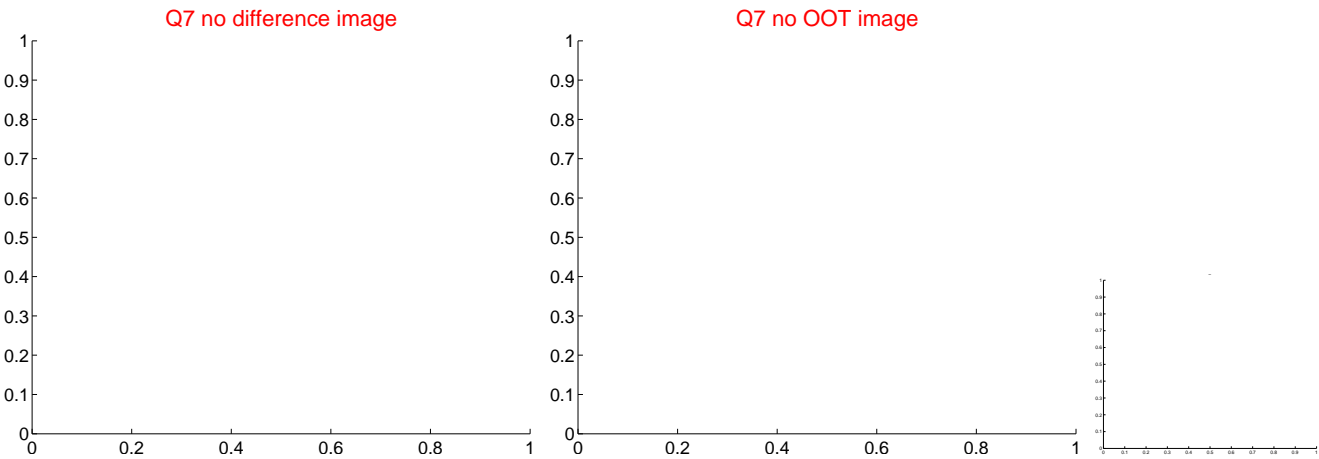
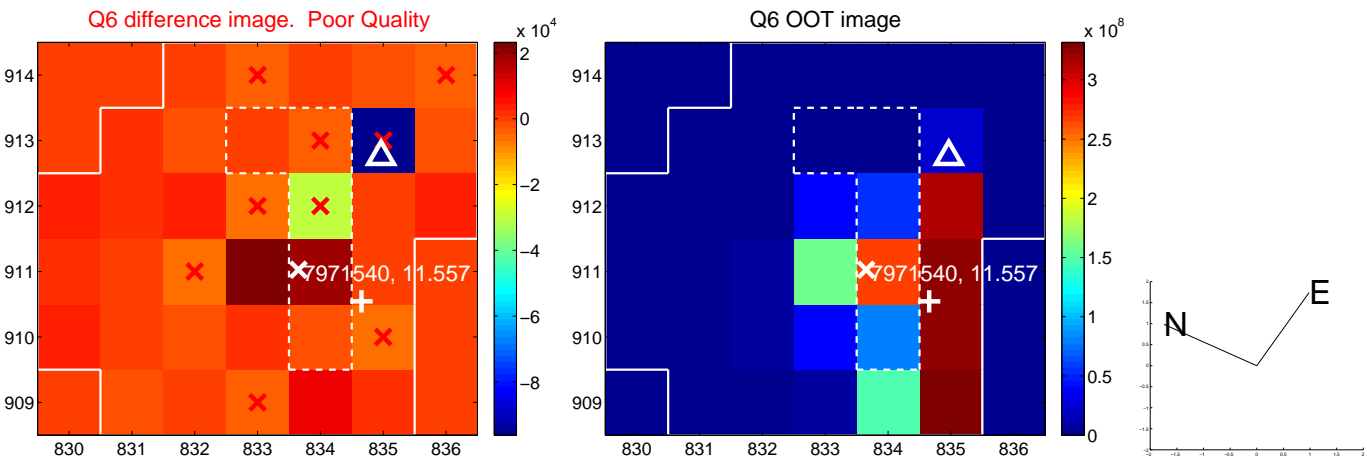
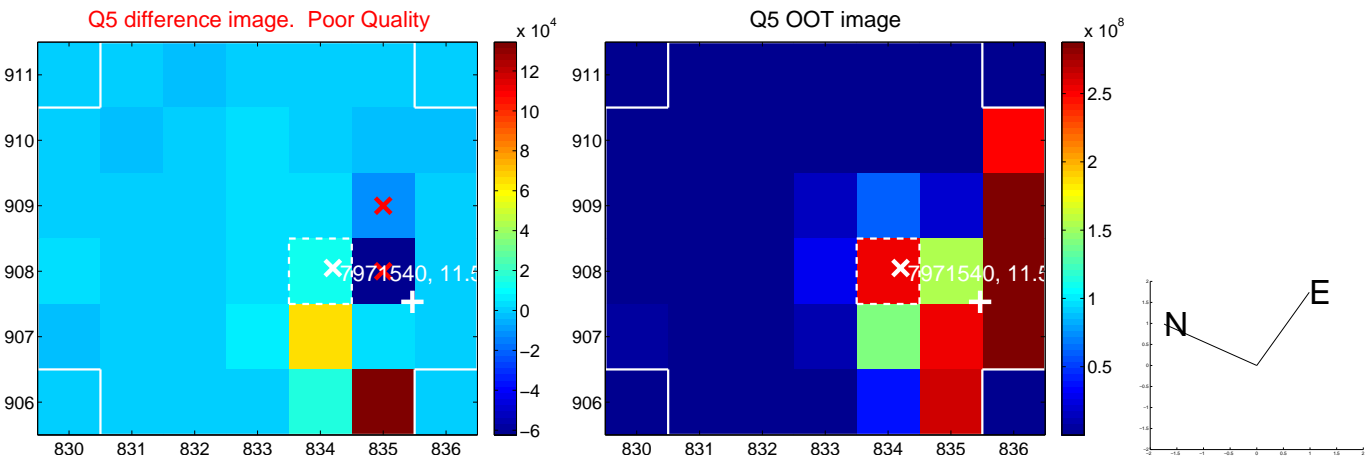


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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



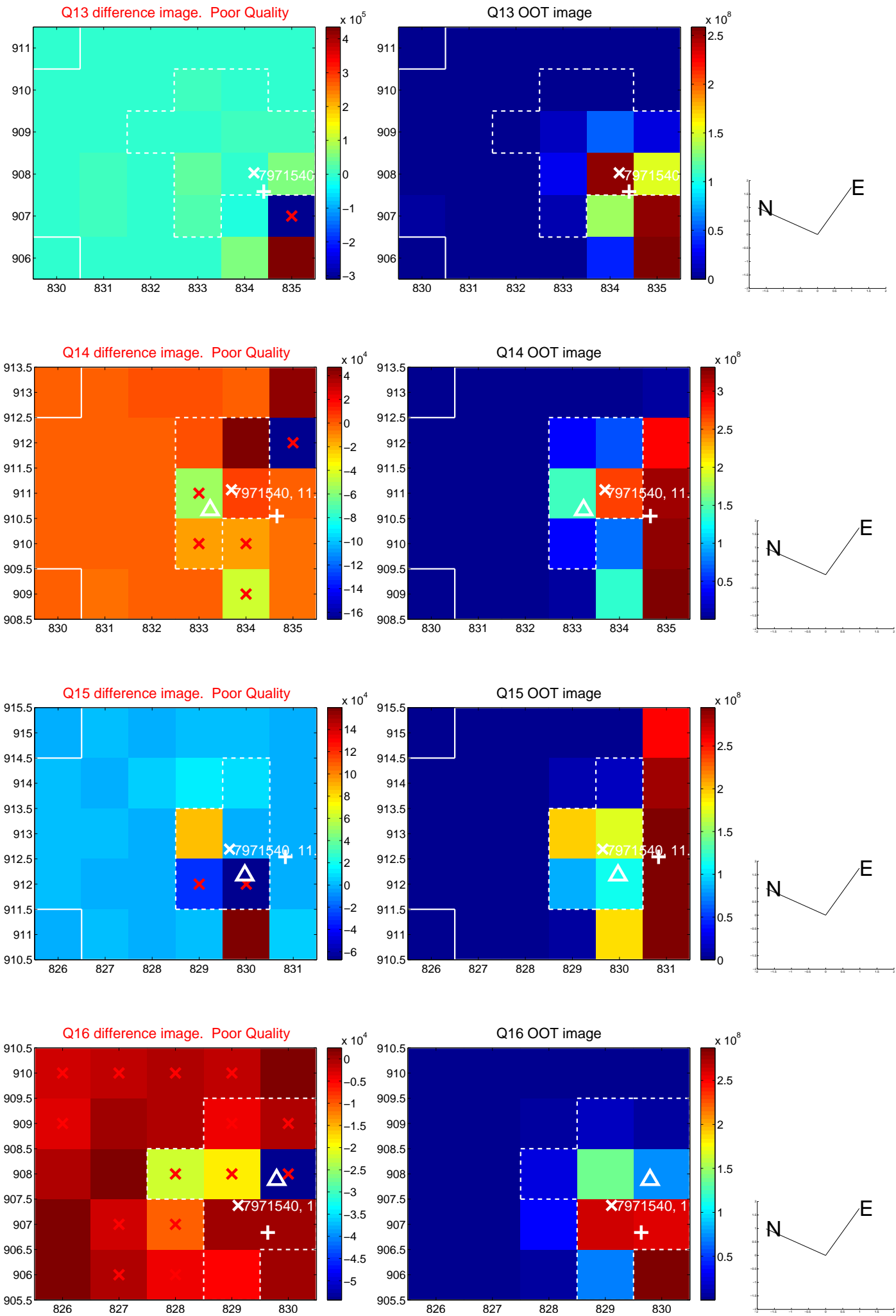
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



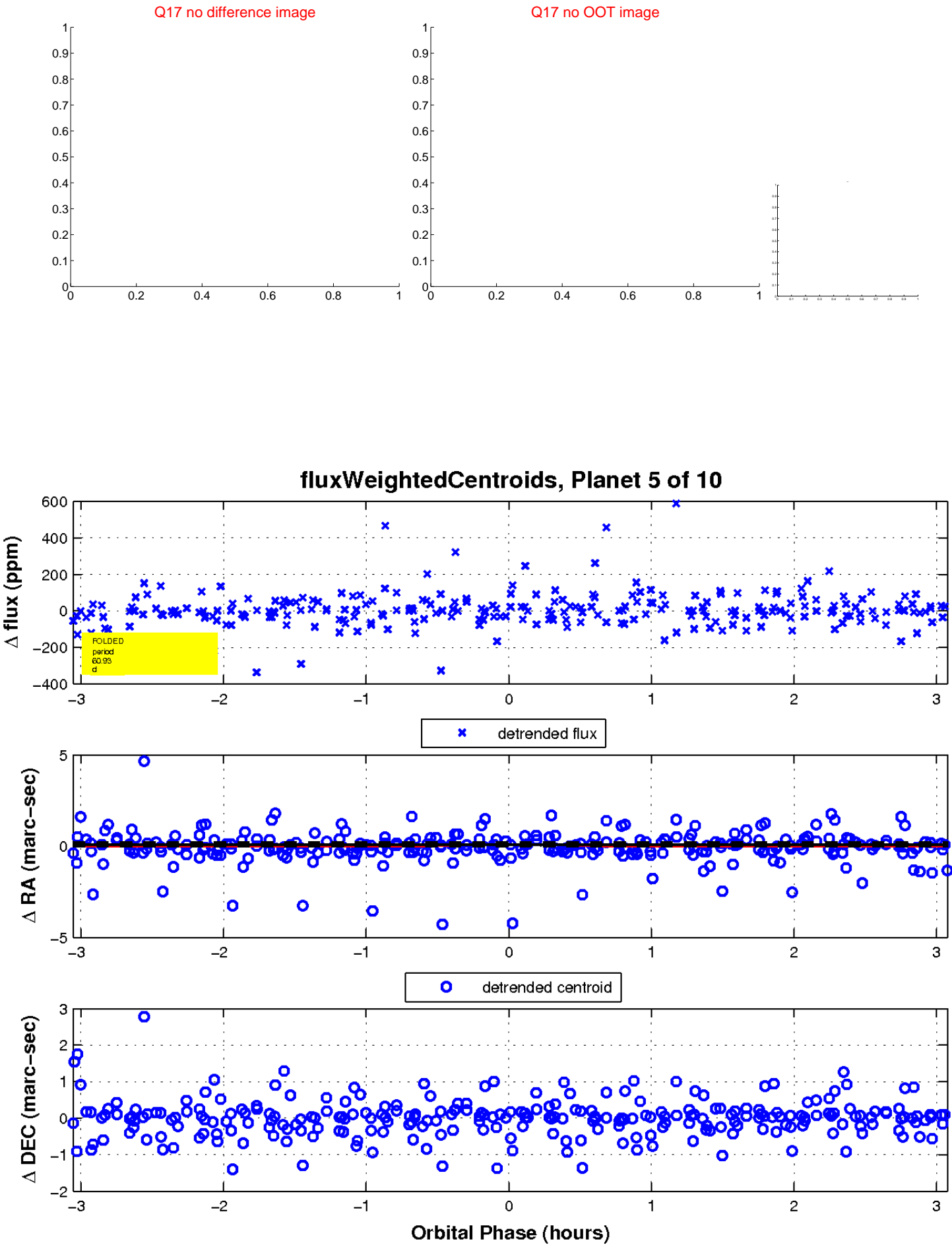




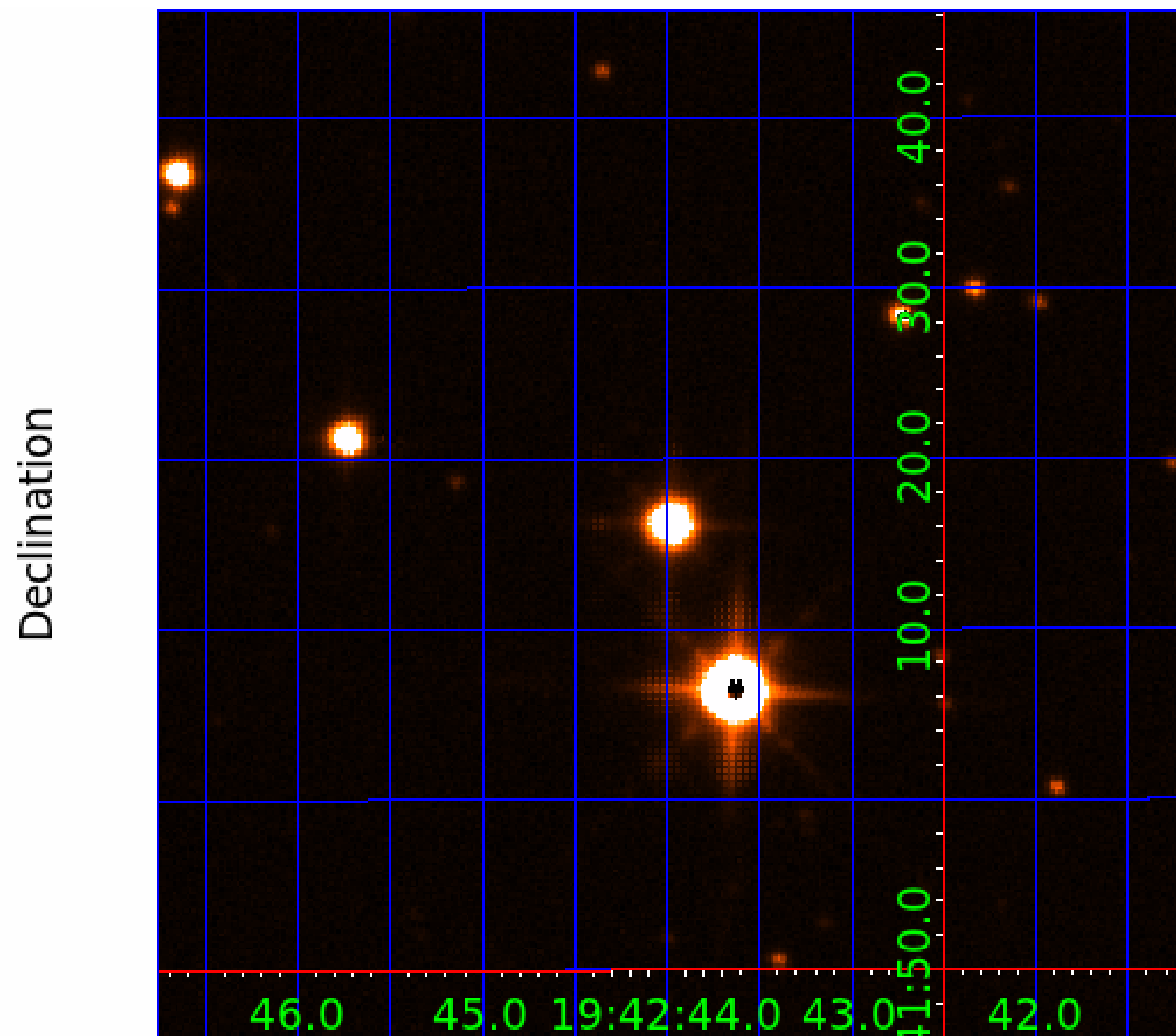
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007971540-01	OBS	No	51.011313	166.181425	52.5	1.002	29.8	20.5	1.77	6516	1.30	64.75
007971540-02	OBS	No	52.291113	159.026037	53.9	1.214	18.0	16.2	1.77	6516	1.46	62.65
007971540-03	OBS	No	34.530503	153.062724	23.2	2.413	14.7	7.2	1.77	6516	1.02	108.94
007971540-04	OBS	No	42.975481	146.899876	56.8	0.683	13.6	15.7	1.77	6516	1.38	81.38
007971540-05	OBS	No	60.934308	143.610155	48.2	1.035	15.8	19.4	1.77	6516	1.40	51.09
007971540-06	OBS	No	71.174769	162.031760	41.4	7.231	14.7	16.6	1.77	6516	1.30	41.53
007971540-07	OBS	No	49.509656	174.313640	54.0	12.534	13.5	16.9	1.77	6516	1.52	67.38
007971540-08	OBS	No	262.610321	259.184059	26.0	18.558	13.9	4.7	1.77	6516	1.08	7.28
007971540-09	OBS	No	28.835527	150.649599	19.5	11.693	12.6	9.8	1.77	6516	0.97	138.54
007971540-10	OBS	No	59.432161	172.524554	131.2	9.000	11.7	-1.0	1.77	6516	2.04	52.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007971540-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-04	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-06	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST
007971540-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007971540-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007971540-09	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007971540-10	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

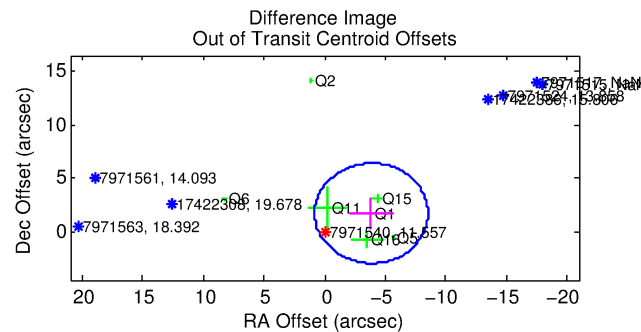
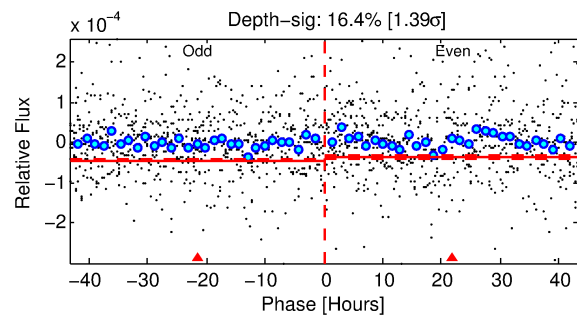
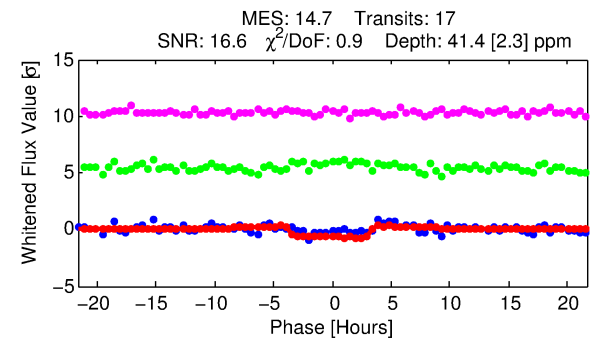
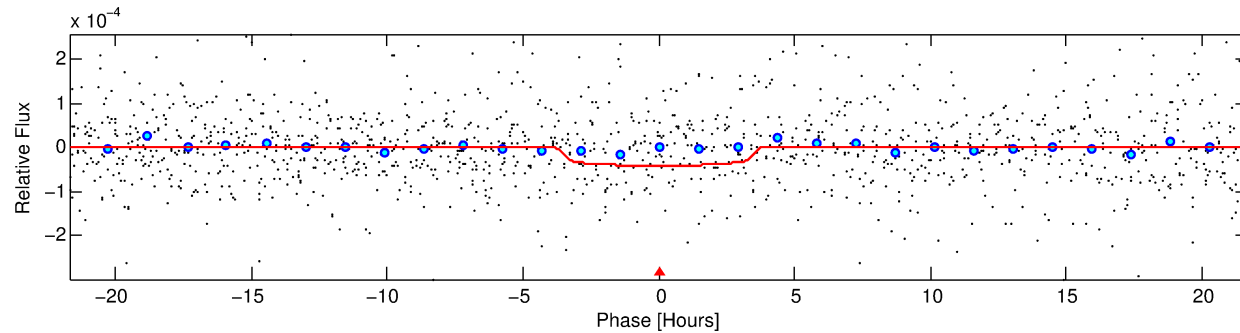
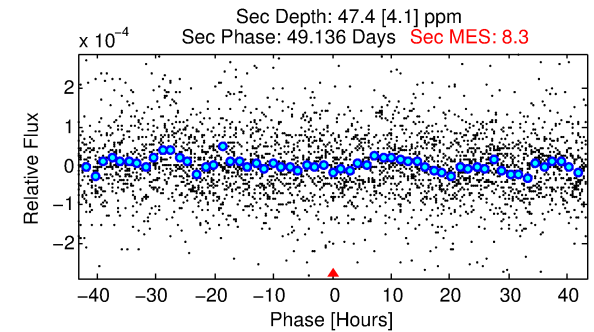
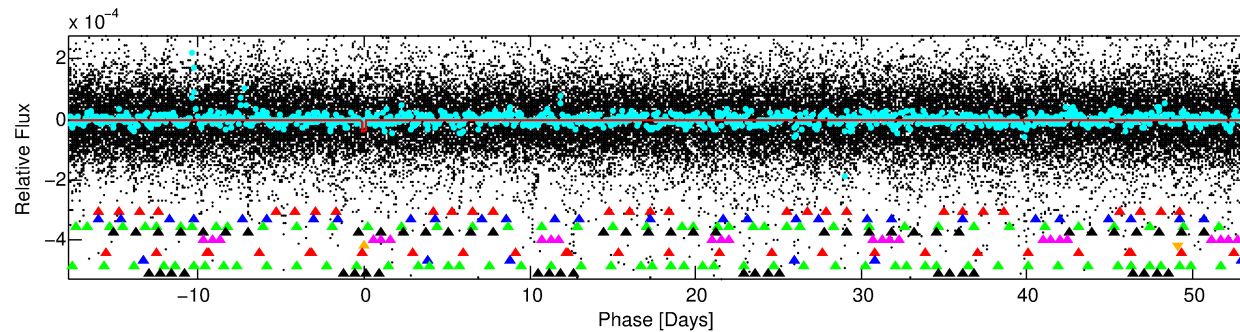
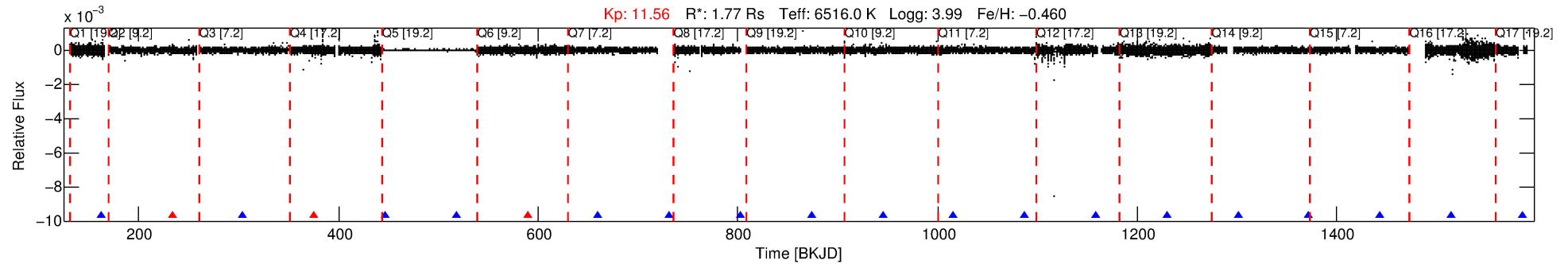
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-06

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 6 of 10 Period: 71.175 d



## DV Fit Results:

Period = 71.17477 [0.00116] d  
Epoch = 162.0318 [0.0061] BKJD  
Rp/R\* = 0.0067 [0.0014]  
a/R\* = 38.08 [47.66]  
b = 0.87 [0.35]  
Seff = 41.53 [20.02]  
Teq = 647 [78] K  
Rp = 1.30 [0.48] Re  
a = 0.3491 [0.1007] AU  
Ag = 1878.36 [1199.21] [1.57σ]  
Teffp = 6589 [755] K [7.83σ]

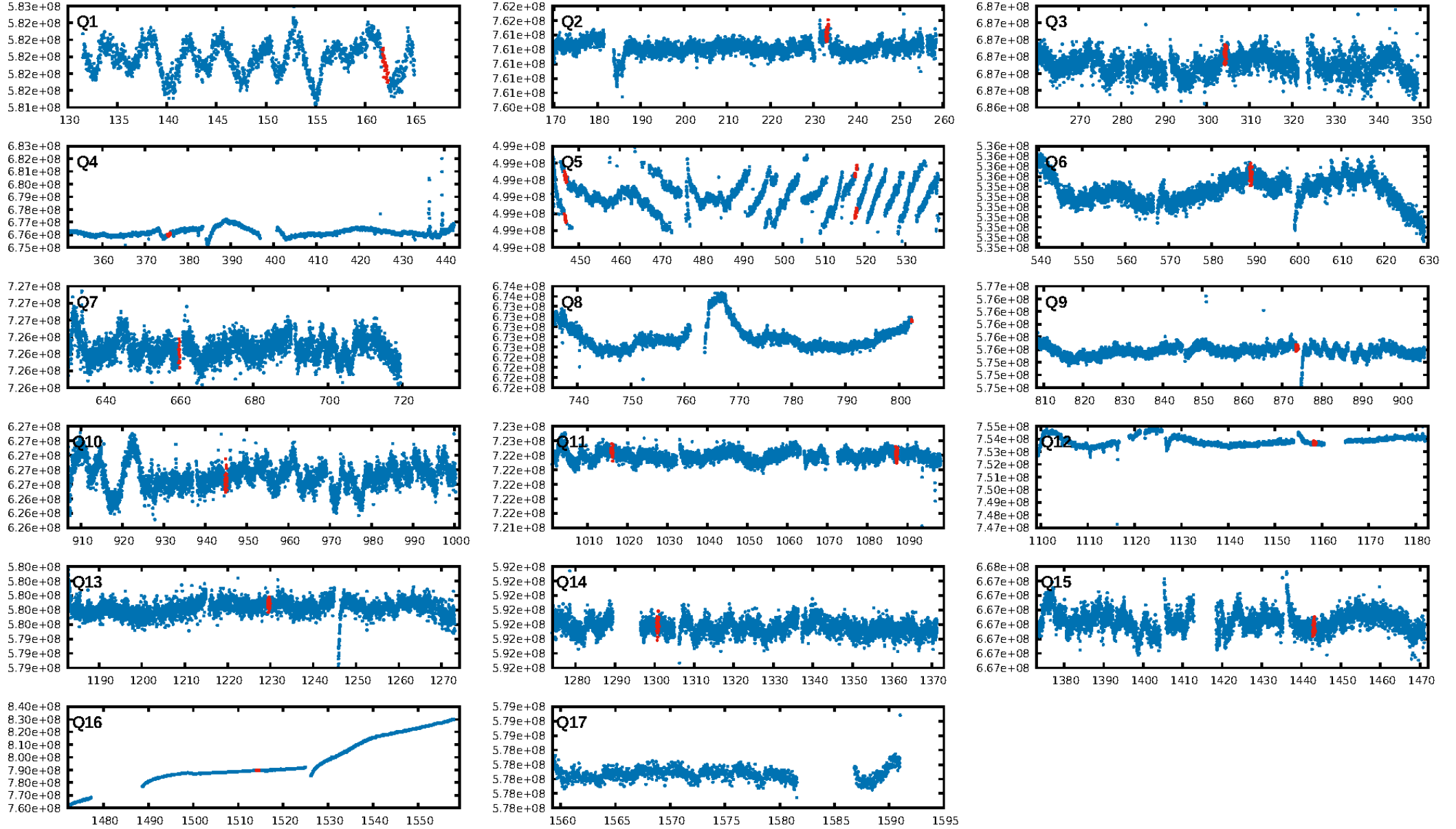
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [33.65σ]  
LongPeriod-sig: 100.0% [230.67σ]  
ModelChiSquare2-sig: 11.3%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.81 [13/16]  
GhostDiagnostic-chr: -0.009712  
Centroid-sig: N/A  
Centroid-so: 3.706 arcsec [3.11σ]  
OotOffset-rm: 4.217 arcsec [2.70σ]  
KicOffset-rm: 4.369 arcsec [2.34σ]  
OotOffset-st: 2/2/1/2 [7]  
KicOffset-st: 2/2/1/2 [7]  
DiffImageQuality-fgm: 0.29 [2/7]  
DiffImageOverlap-fno: 0.69 [9/13]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:56:56 Z

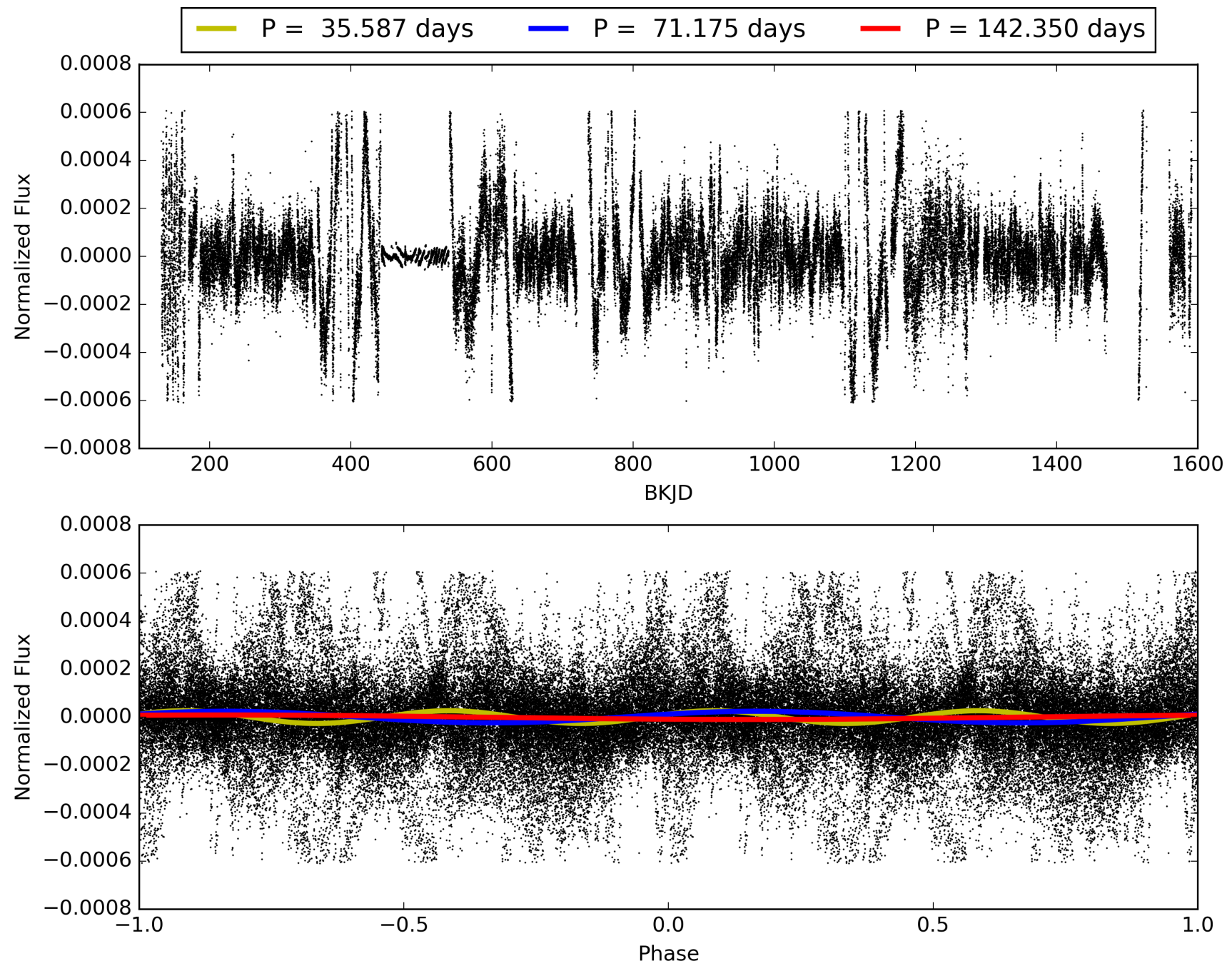
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007971540-06, PDC Light Curves





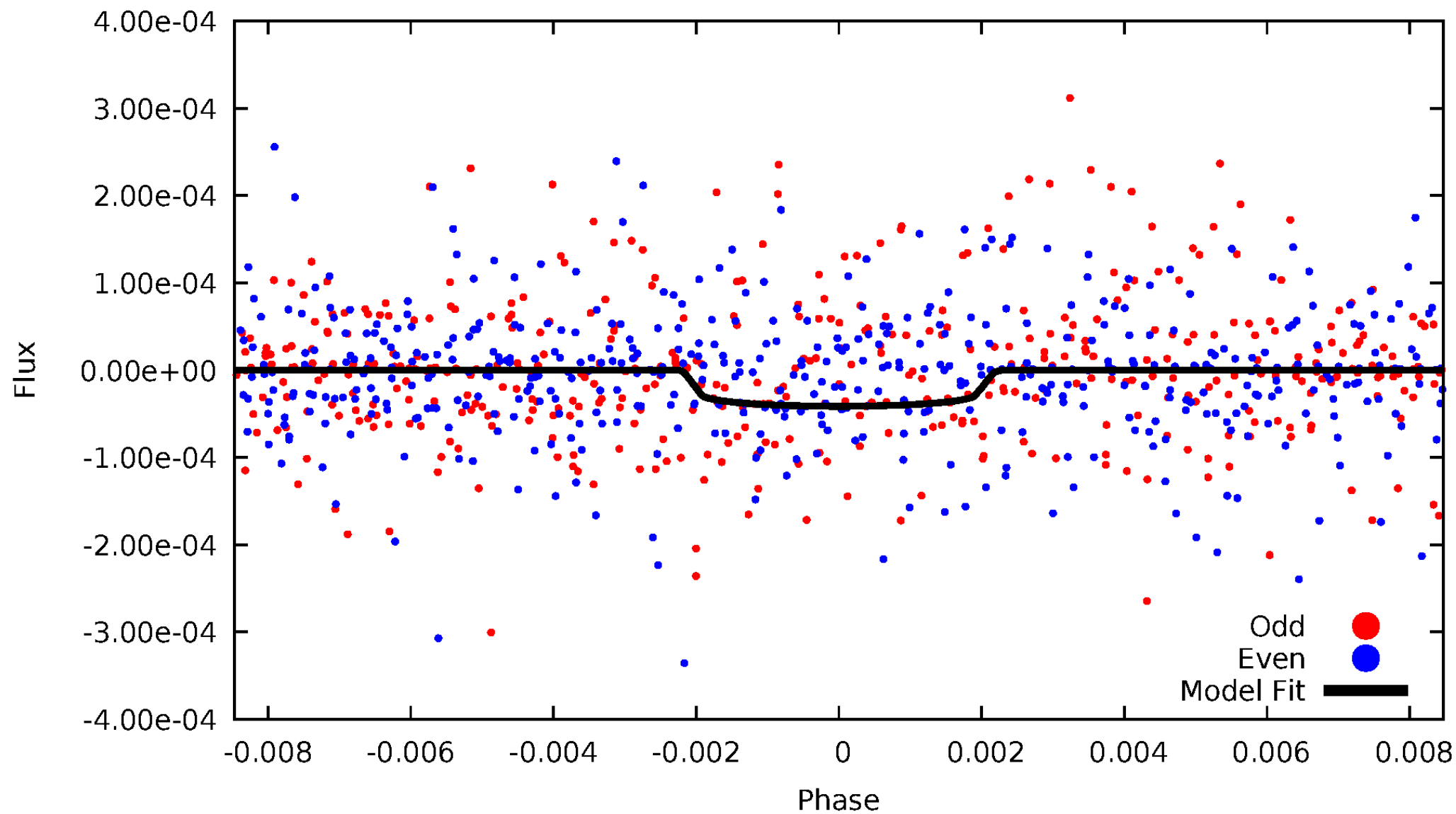
TCE 007971540-06





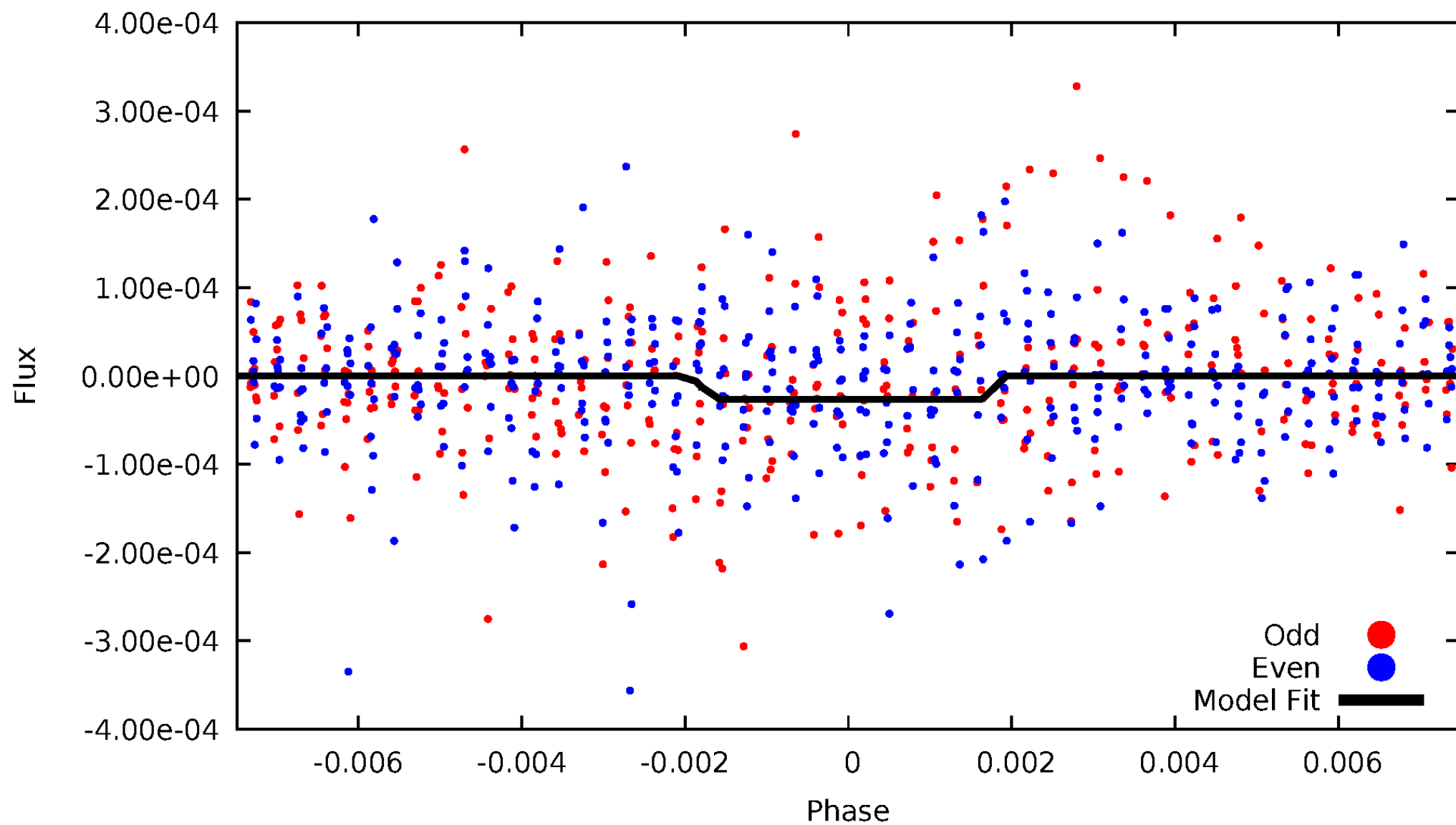
# DV Odd/Even

TCE 007971540-06



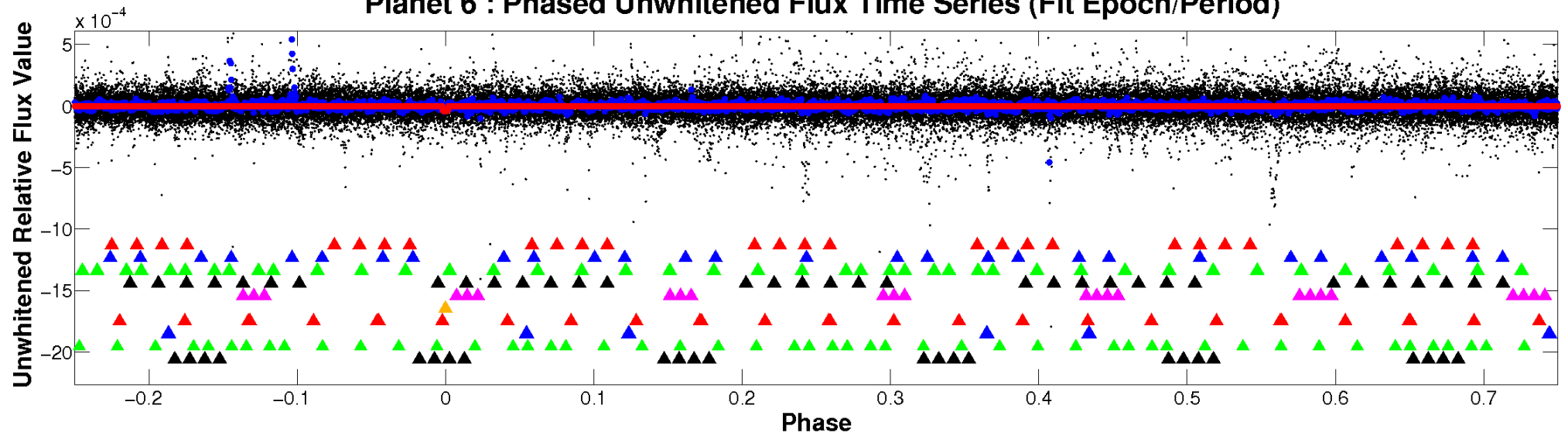
# ALT Odd/Even

TCE 007971540-06

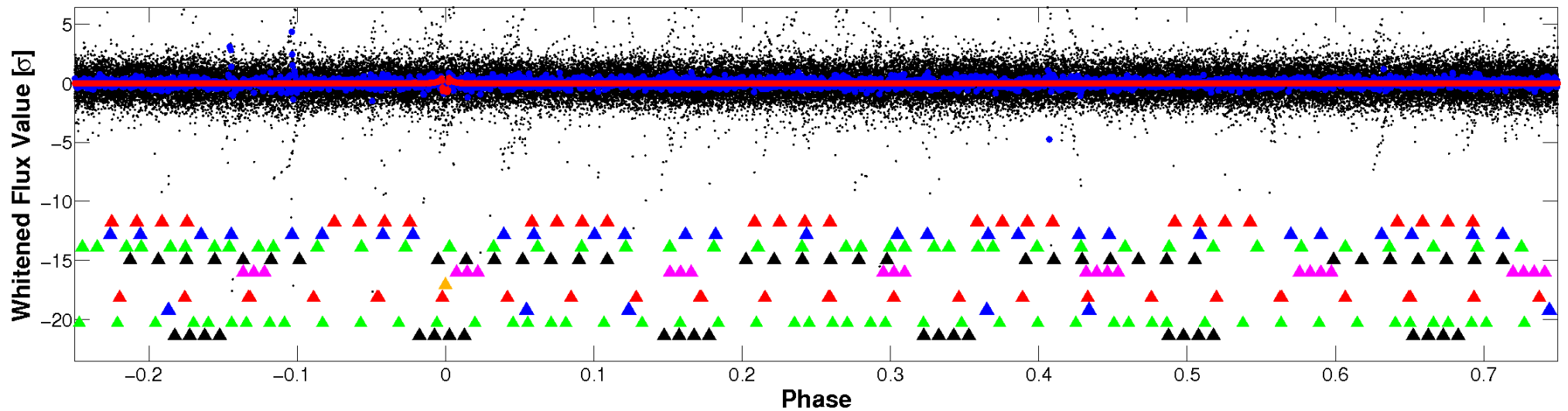


# Non-Whitened Vs. Whitened Light Curve

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

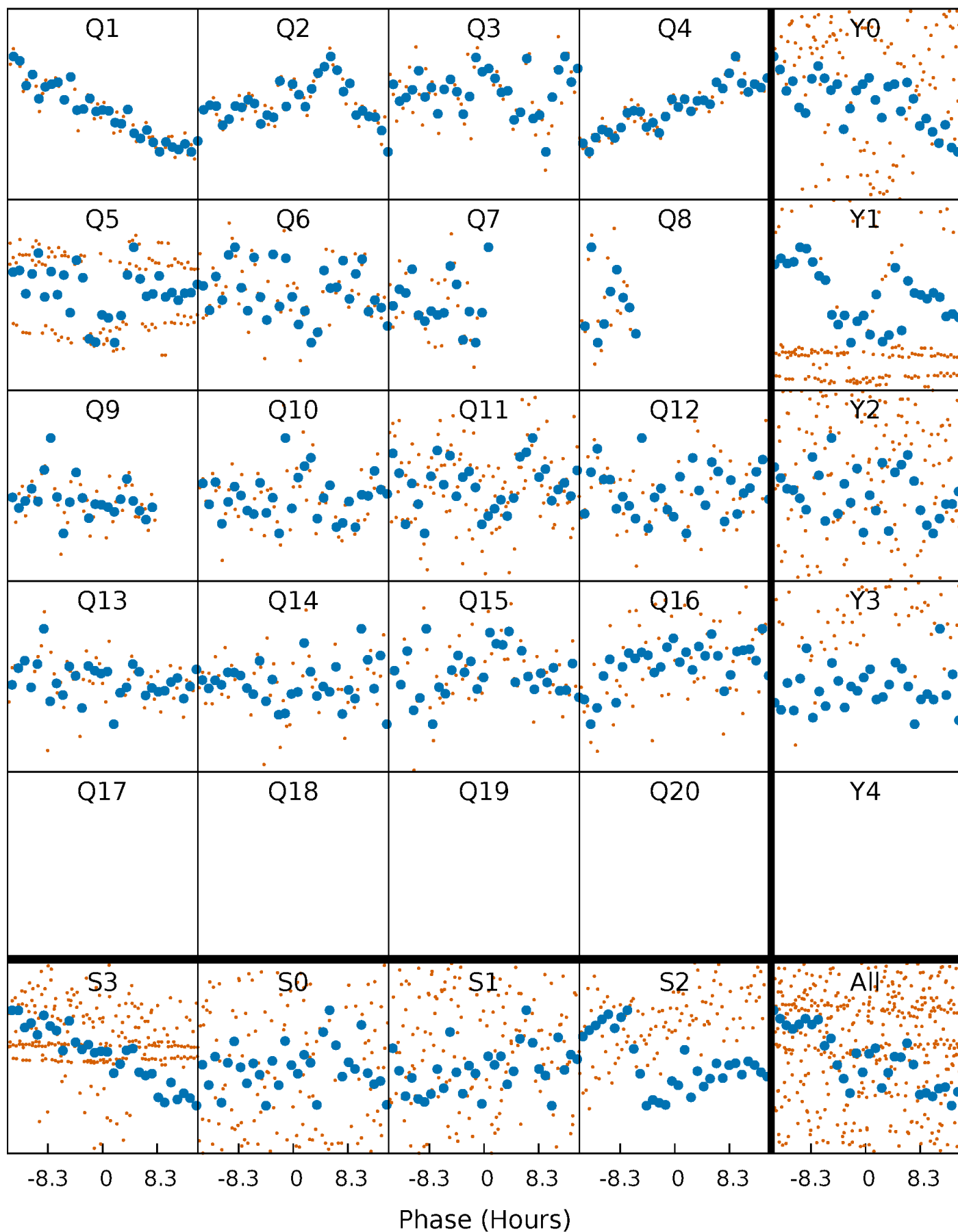


## Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



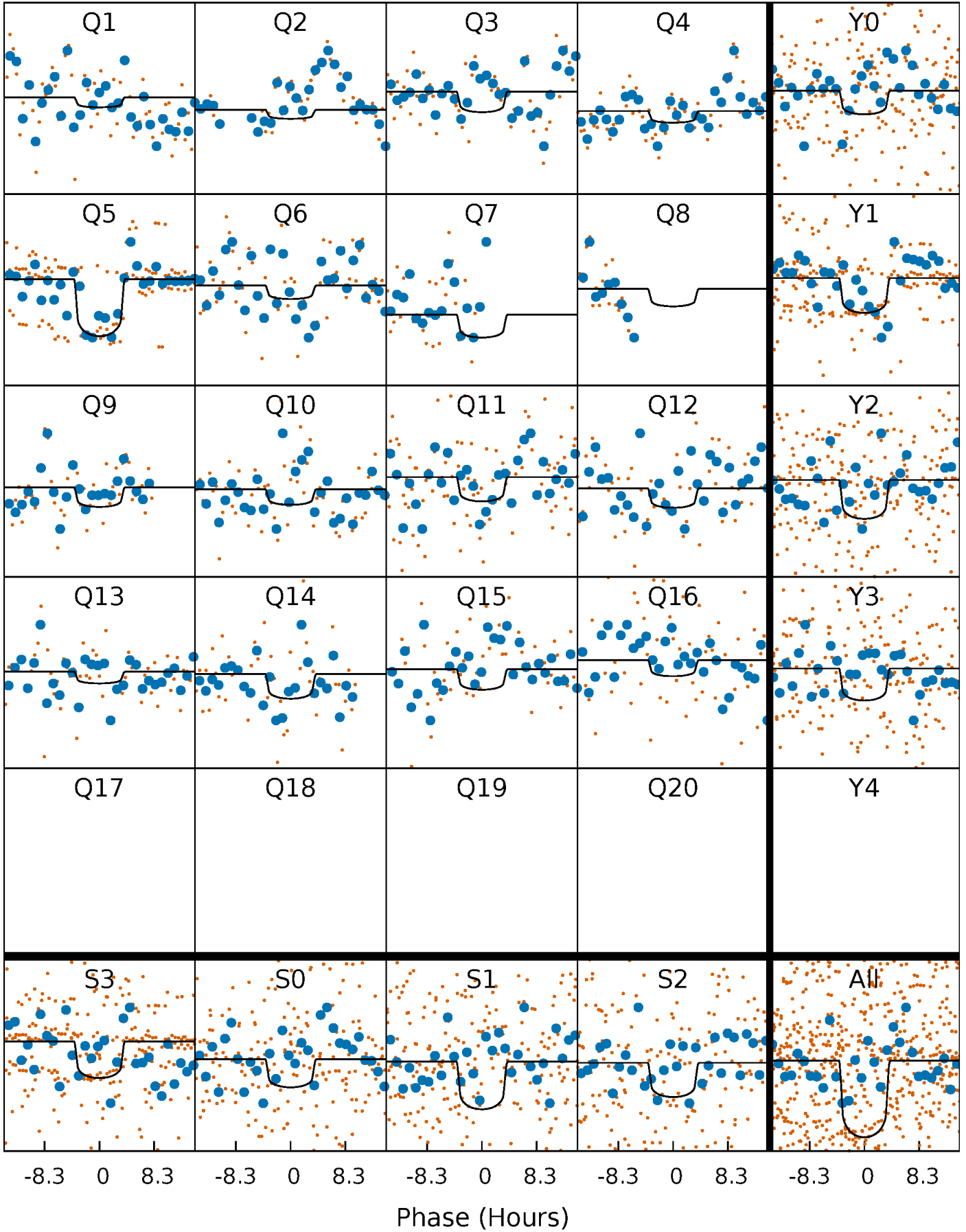
# PDC Quarter-Phased Transit Curves

TCE 007971540-06 P= 71.174769 Days  $T_0=162.031760$  (BKJD)



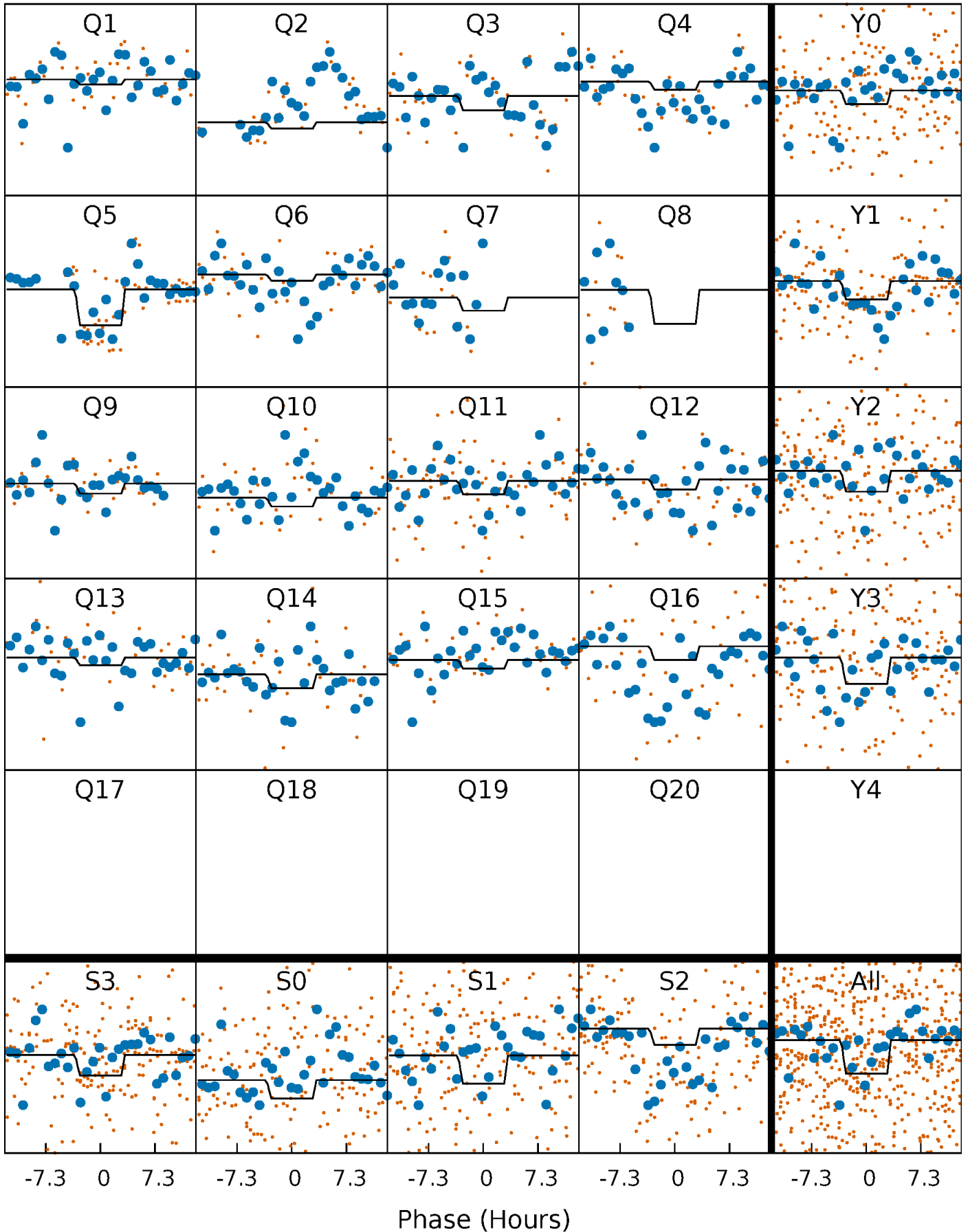
# DV Quarter-Phased Transit Curves

TCE 007971540-06 P= 71.174769 Days  $T_0=162.031760$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

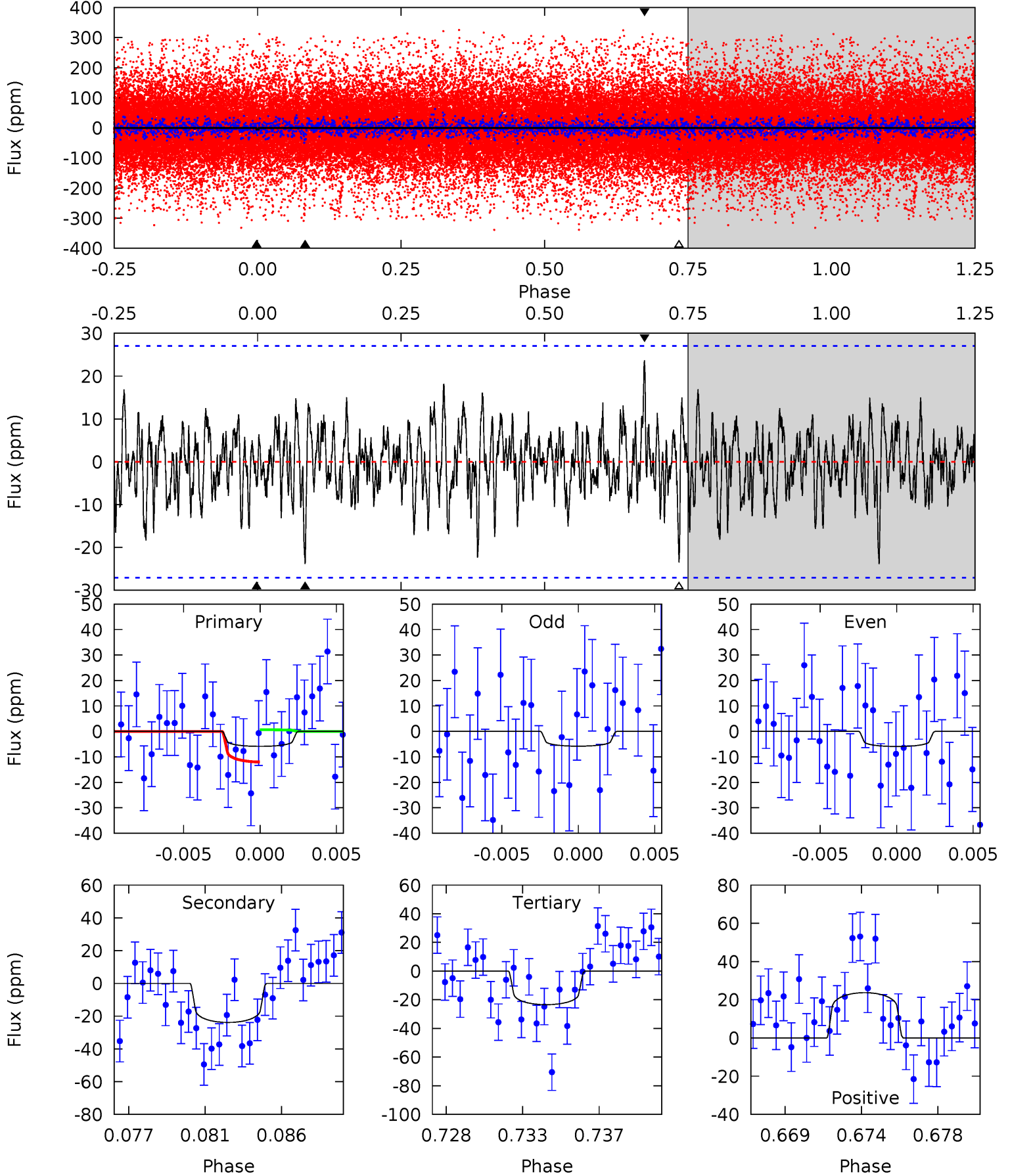
TCE 007971540-06 P= 71.170166 Days  $T_0=162.068044$  (BKJD)



# DV Model-Shift Uniqueness Test

007971540-06, P = 71.174769 Days, E = 90.856991 Days

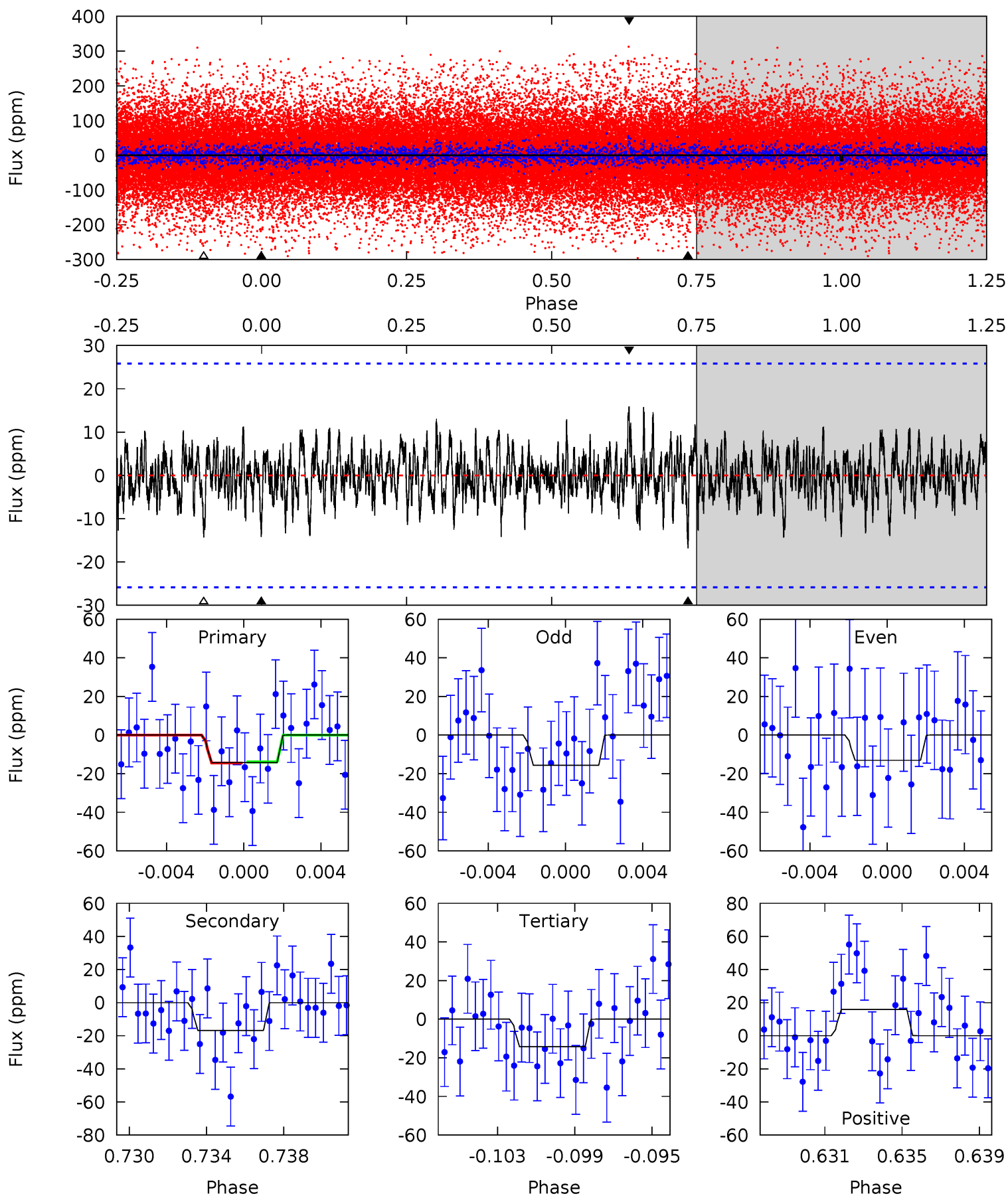
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.12	4.57	4.49	4.54	5.18	2.84	1.27	-3.36	-3.41	0.08	0.03	0.01	0.84	0.50	1.10



# Alt Model-Shift Uniqueness Test

007971540-06, P = 71.170166 Days, E = 90.897878 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
2.87	3.40	2.89	3.21	5.21	2.89	0.92	-0.02	-0.34	0.51	0.18	0.26	1.39	0.49	0.06





### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-06 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$-24 \pm 5$	$1.23^{+0.35}_{-0.29}$	$889^{+60}_{-69}$	$5574^{+726}_{-573}$	$1058^{+793}_{-455}$
Alt.	$-17 \pm 5$	$0.97^{+0.31}_{-0.32}$	$889^{+62}_{-68}$	$5761^{+1314}_{-735}$	$1194^{+1674}_{-571}$

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

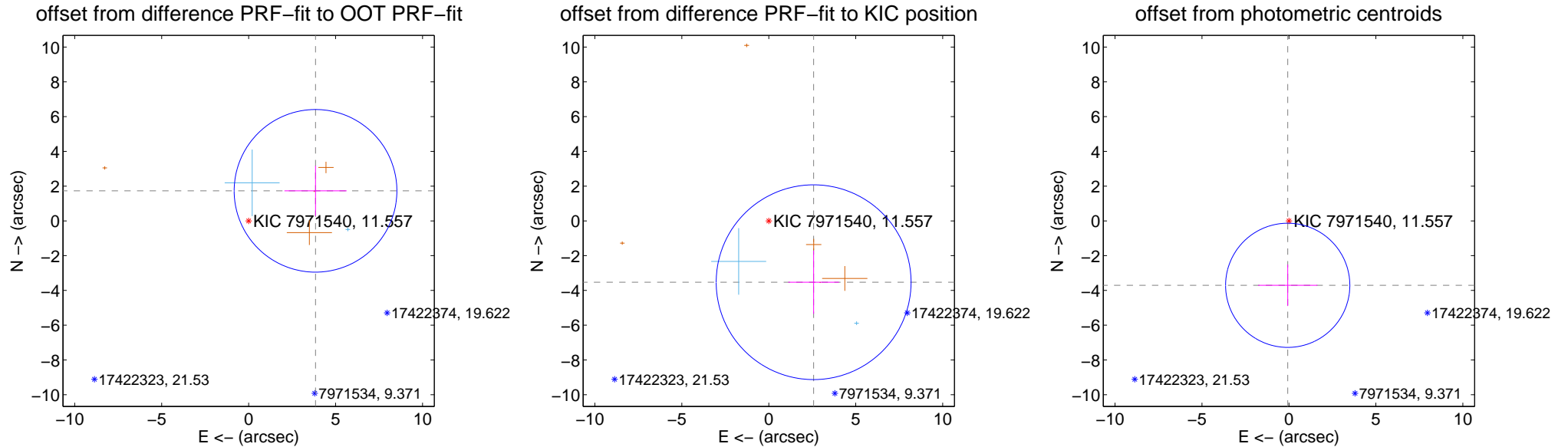
## DV Centroid Data

Supplemental centroid analysis for 007971540-06. **Kepler magnitude: 11.56.** Transit SNR 16.58

There are 2 quarters with good PRF difference image offsets

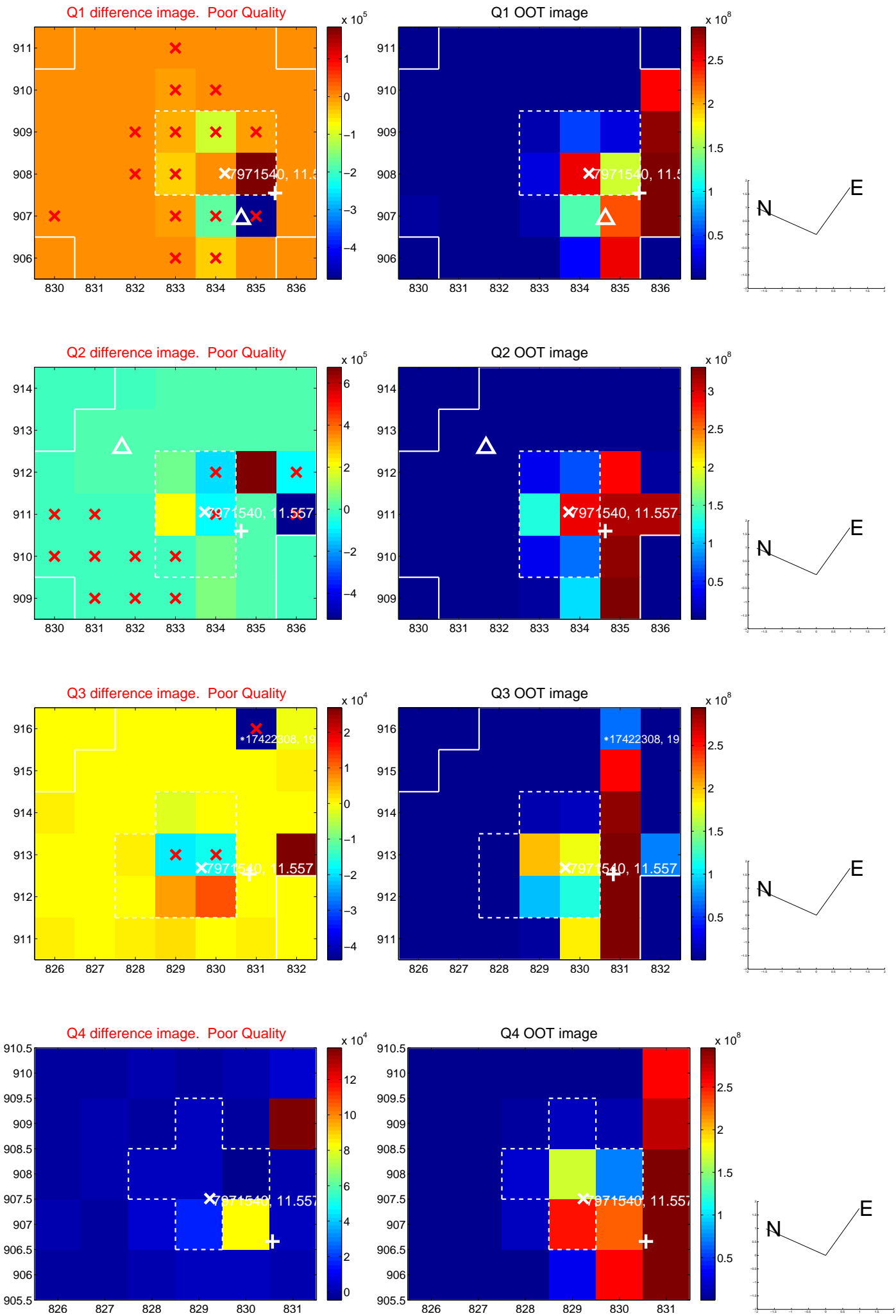
The OOT PRF centroid is offset from the target star catalog position by about 2.78 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$4.217 \pm 1.559$	2.70	$-3.846 \pm 1.789$	$1.729 \pm 1.445$
PRF-fit source offset from KIC position	$4.369 \pm 1.867$	2.34	$-2.579 \pm 1.459$	$-3.527 \pm 1.817$
photometric centroid source offset	$3.71 \pm 1.19$	3.11	$0.07 \pm 1.70$	$-3.71 \pm 1.19$

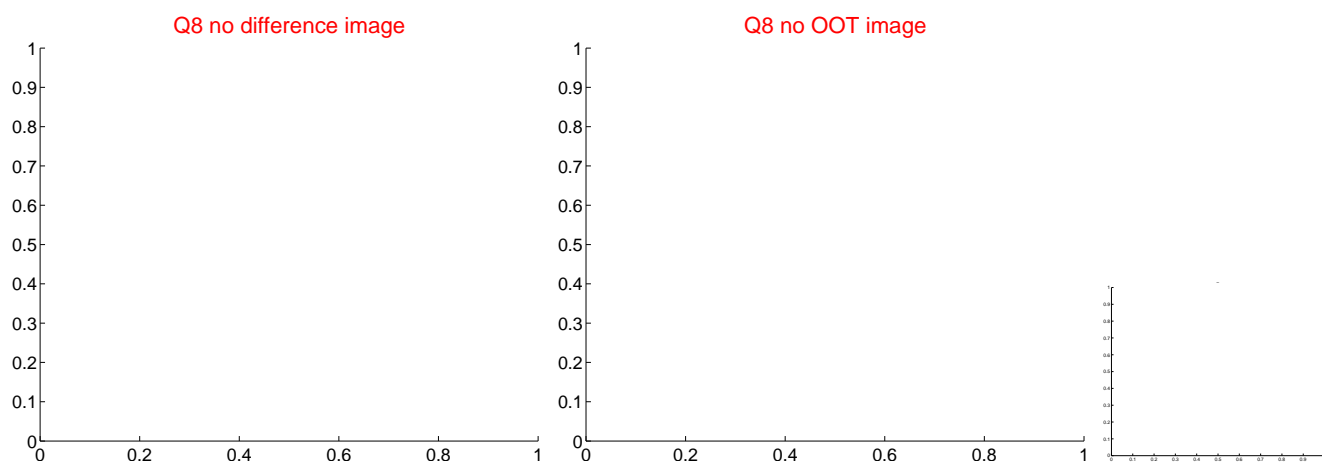
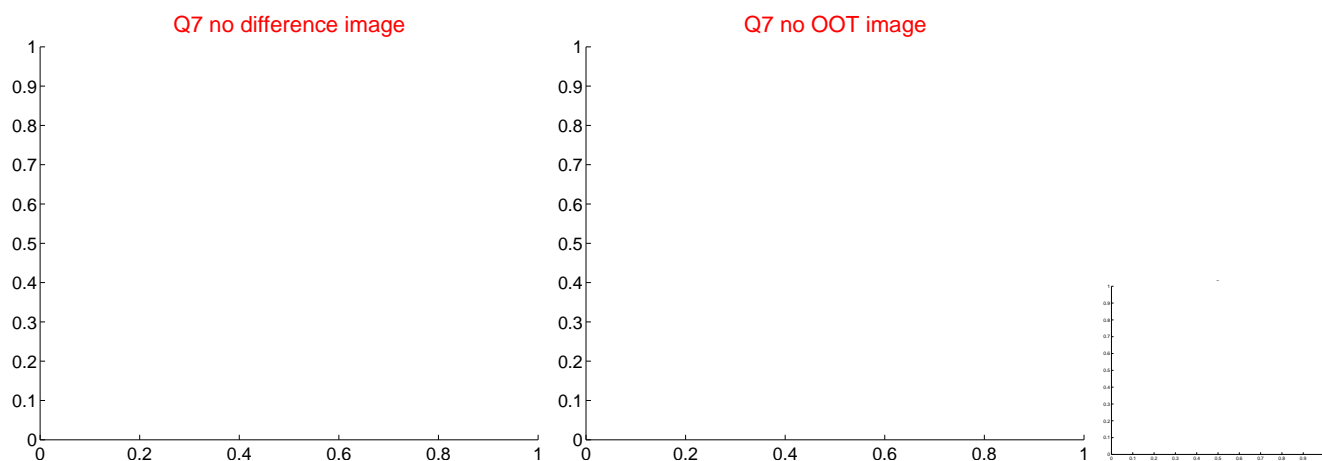
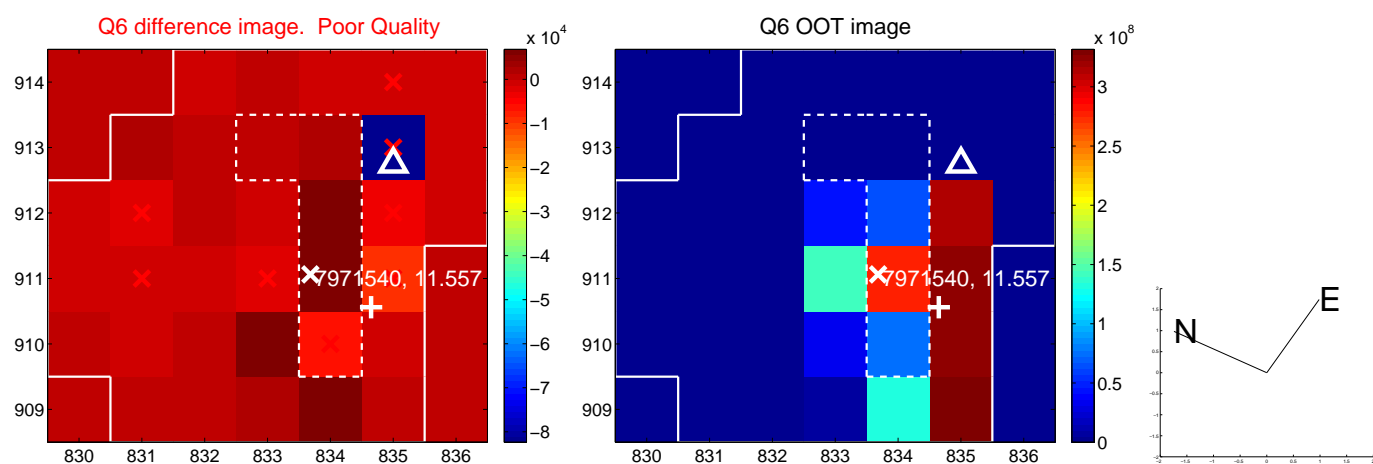
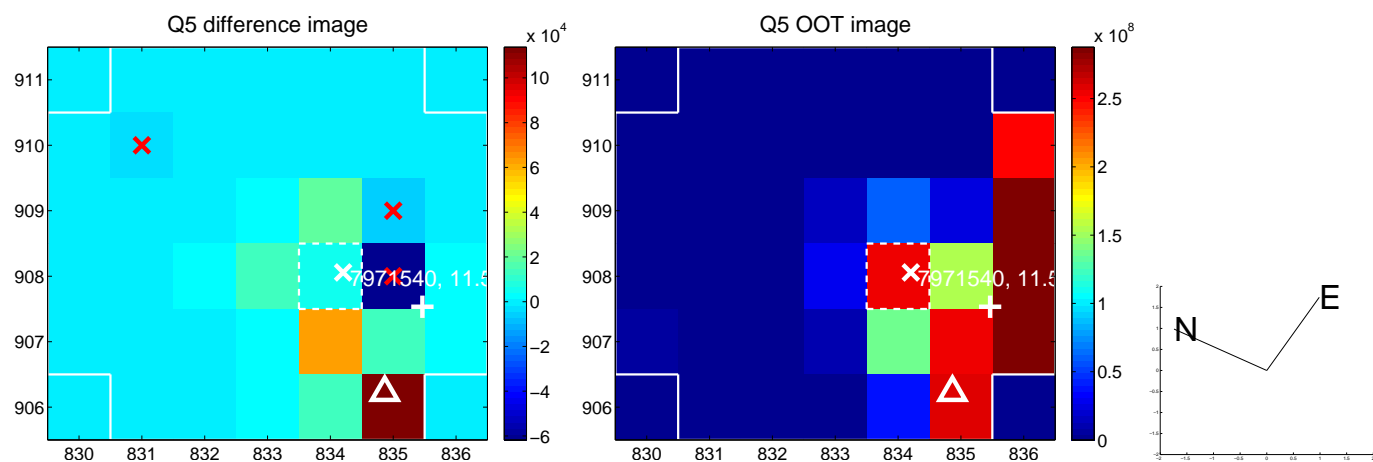


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

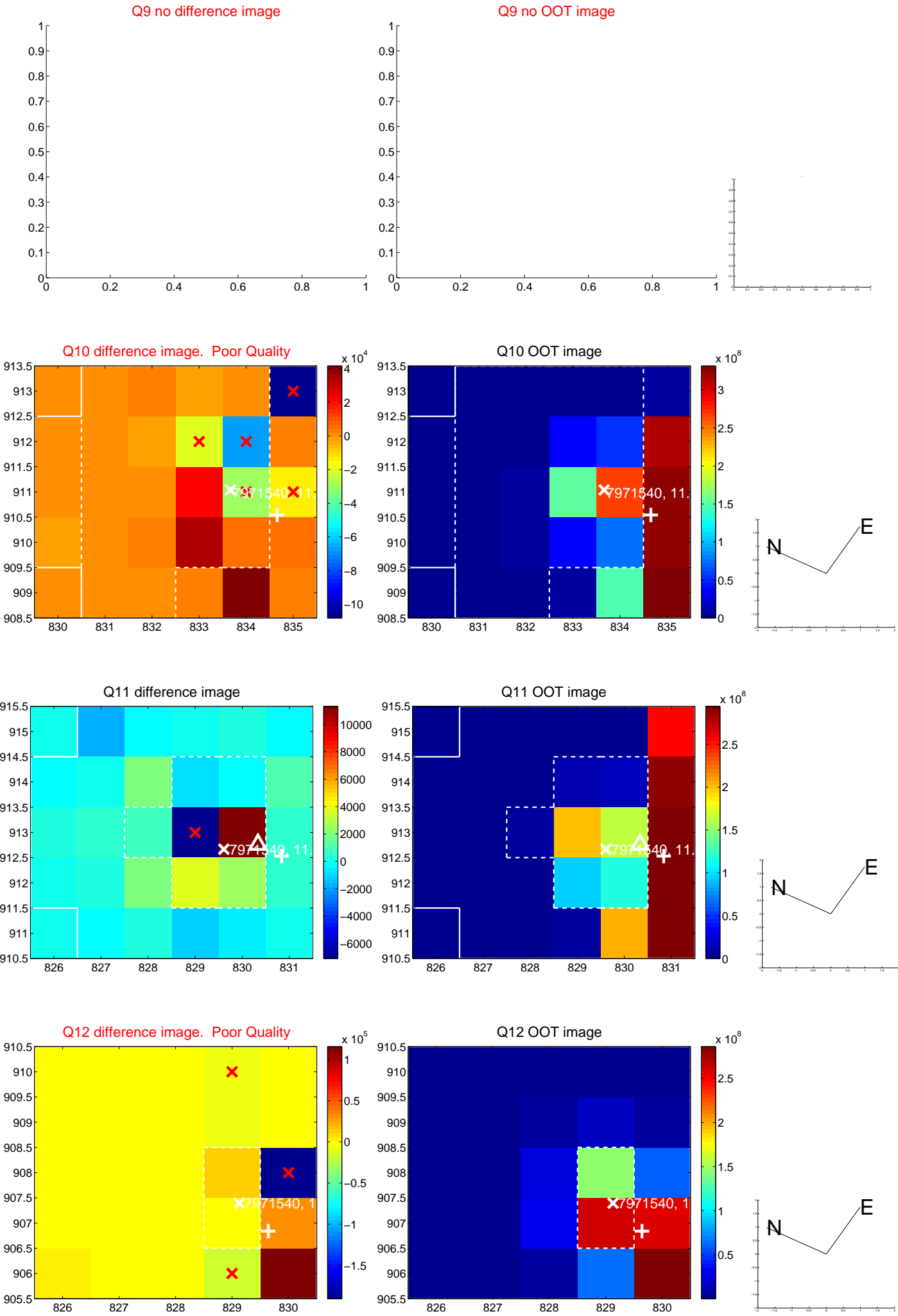
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



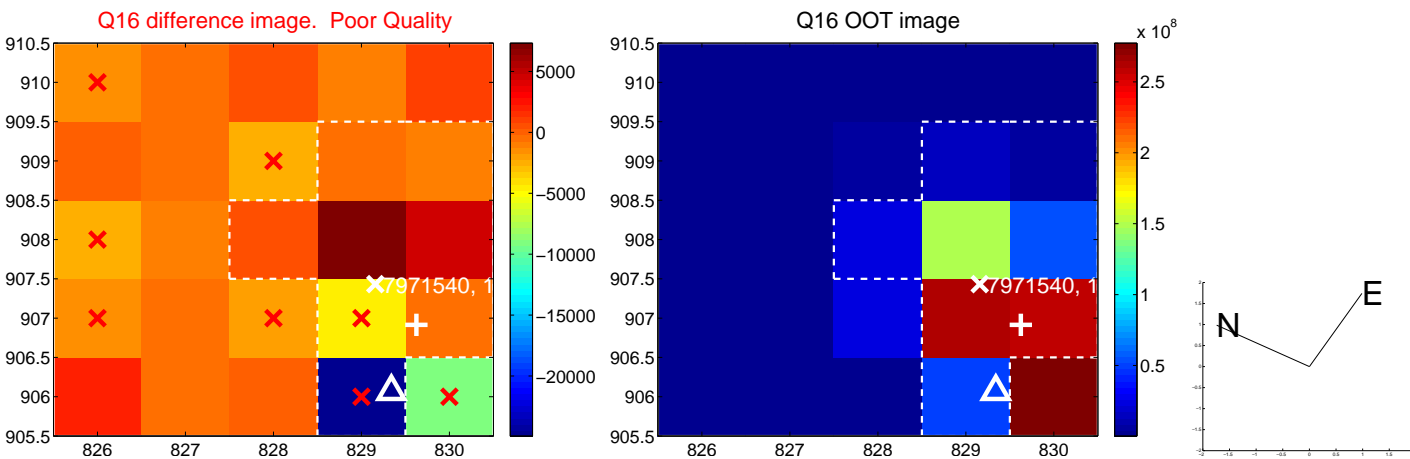
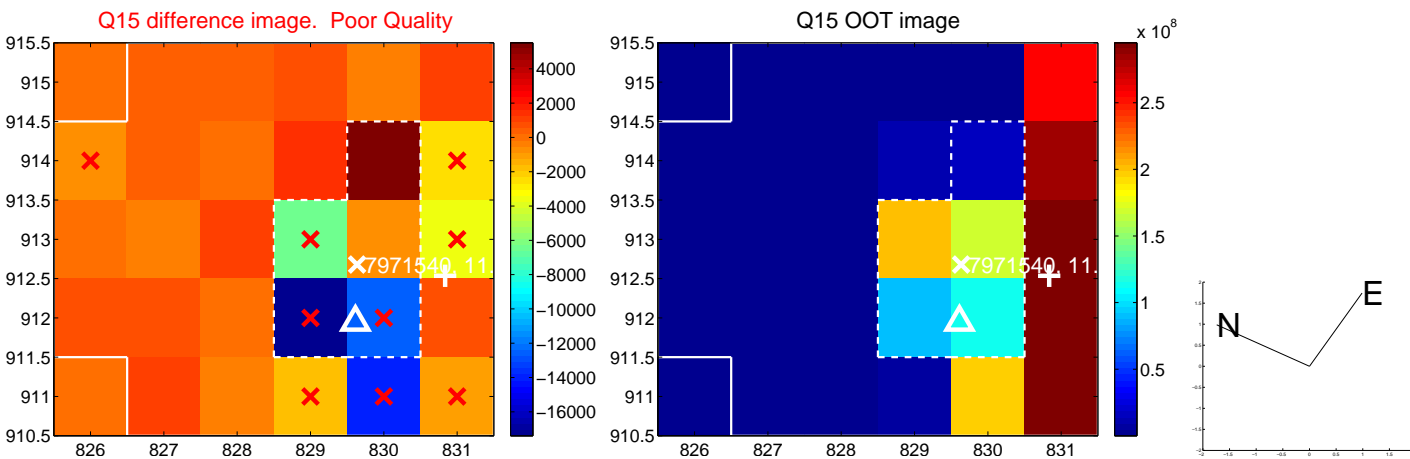
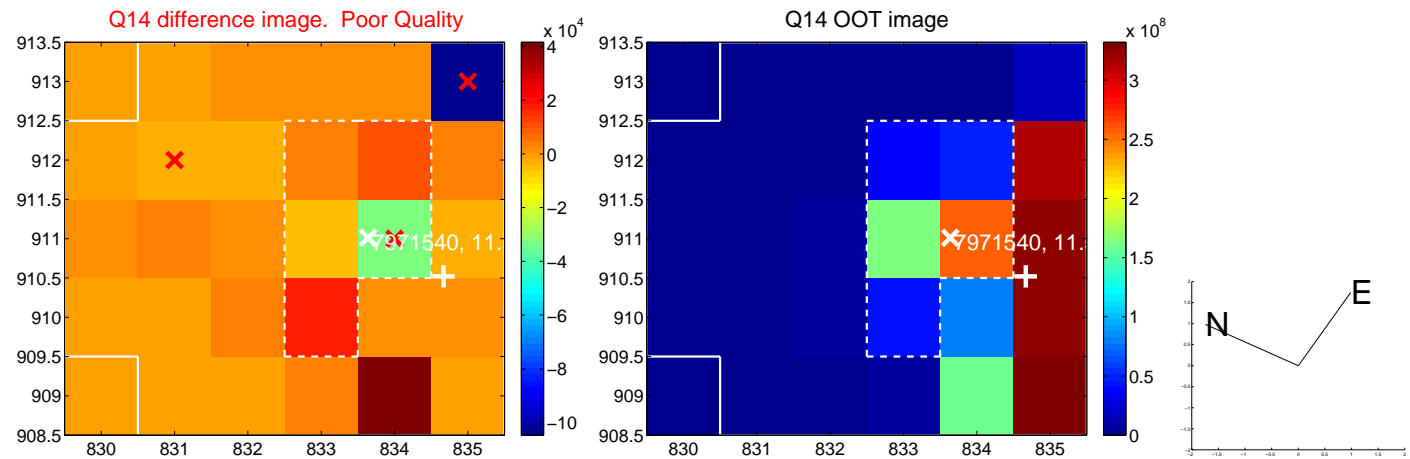
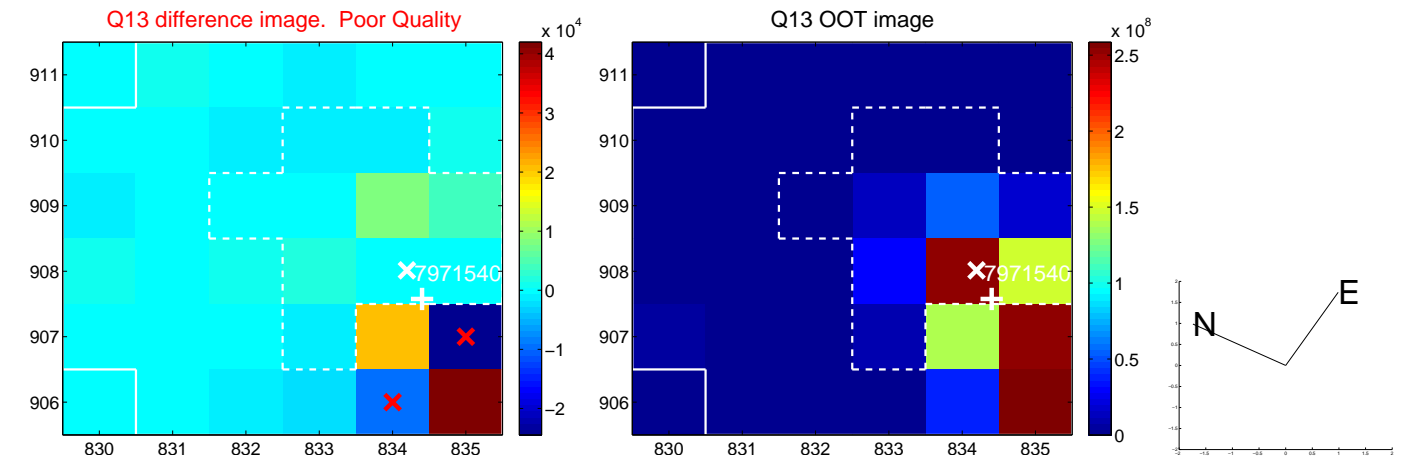
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



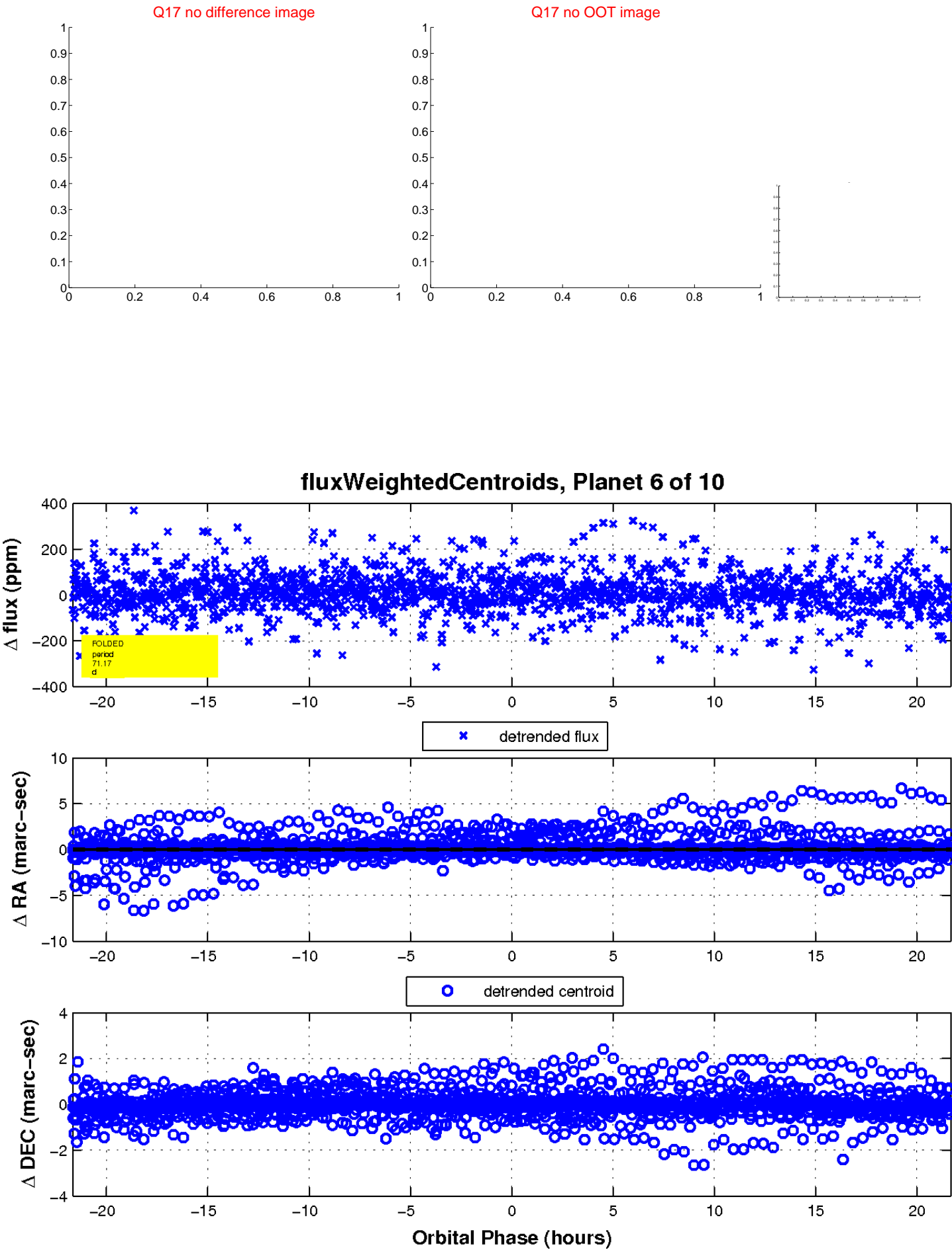
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



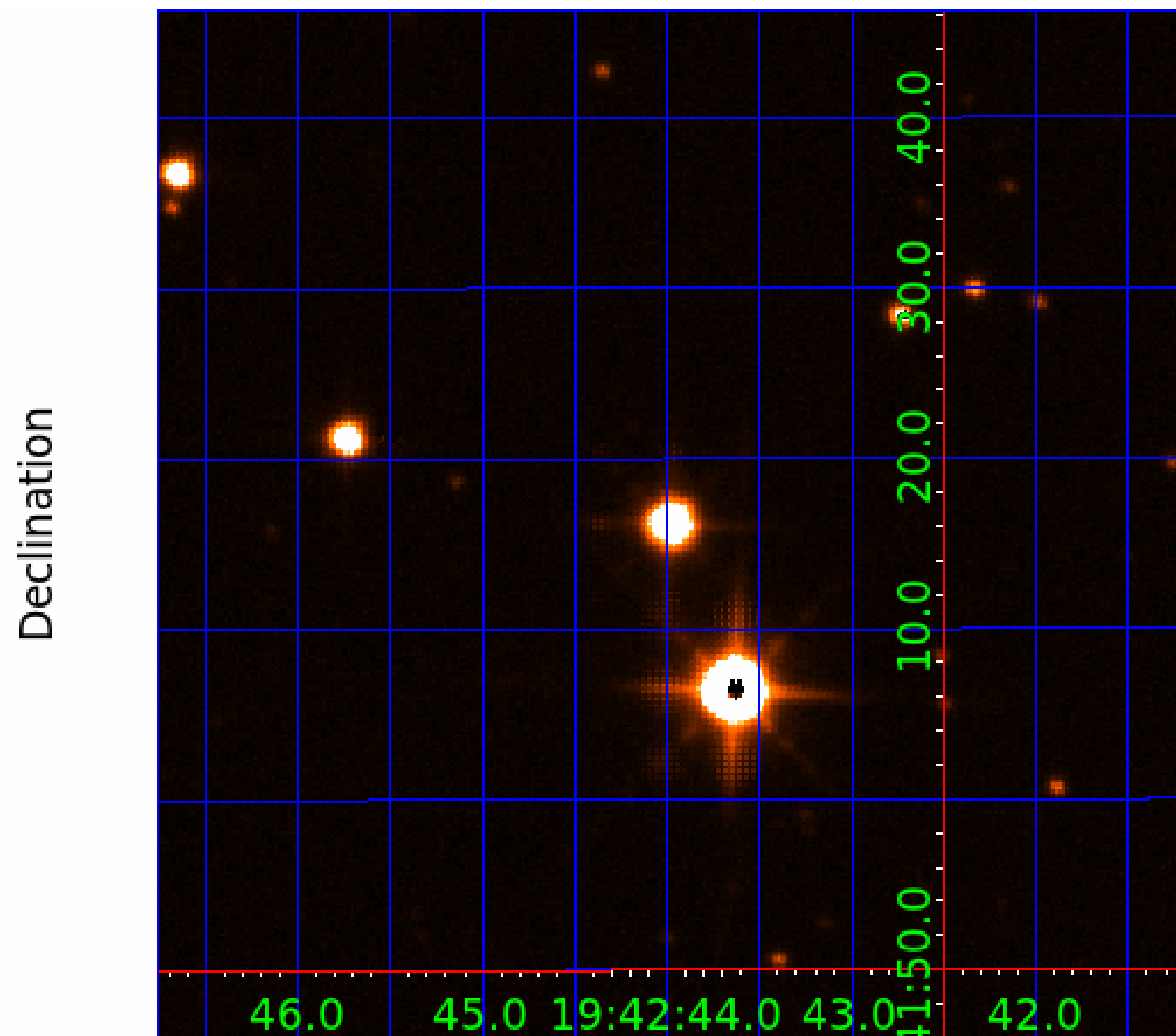
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image





## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007971540-01	OBS	No	51.011313	166.181425	52.5	1.002	29.8	20.5	1.77	6516	1.30	64.75
007971540-02	OBS	No	52.291113	159.026037	53.9	1.214	18.0	16.2	1.77	6516	1.46	62.65
007971540-03	OBS	No	34.530503	153.062724	23.2	2.413	14.7	7.2	1.77	6516	1.02	108.94
007971540-04	OBS	No	42.975481	146.899876	56.8	0.683	13.6	15.7	1.77	6516	1.38	81.38
007971540-05	OBS	No	60.934308	143.610155	48.2	1.035	15.8	19.4	1.77	6516	1.40	51.09
007971540-06	OBS	No	71.174769	162.031760	41.4	7.231	14.7	16.6	1.77	6516	1.30	41.53
007971540-07	OBS	No	49.509656	174.313640	54.0	12.534	13.5	16.9	1.77	6516	1.52	67.38
007971540-08	OBS	No	262.610321	259.184059	26.0	18.558	13.9	4.7	1.77	6516	1.08	7.28
007971540-09	OBS	No	28.835527	150.649599	19.5	11.693	12.6	9.8	1.77	6516	0.97	138.54
007971540-10	OBS	No	59.432161	172.524554	131.2	9.000	11.7	-1.0	1.77	6516	2.04	52.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007971540-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-04	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-06	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST
007971540-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007971540-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007971540-09	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007971540-10	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

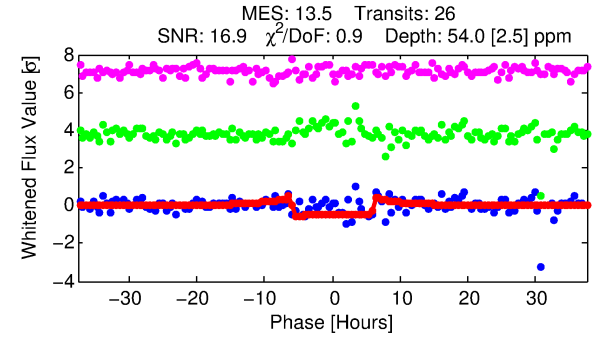
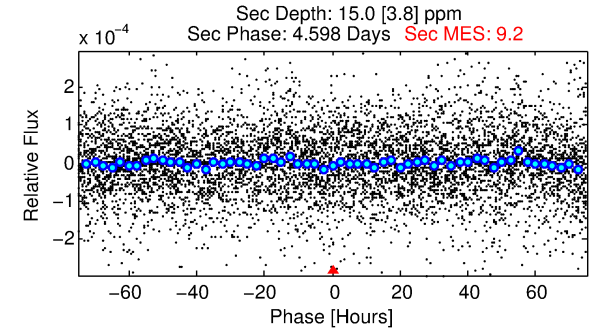
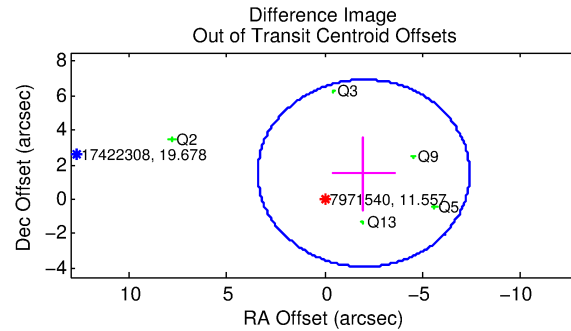
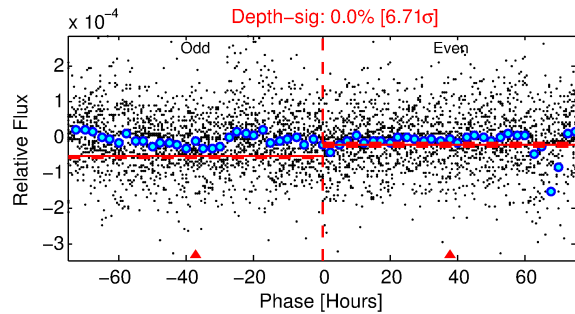
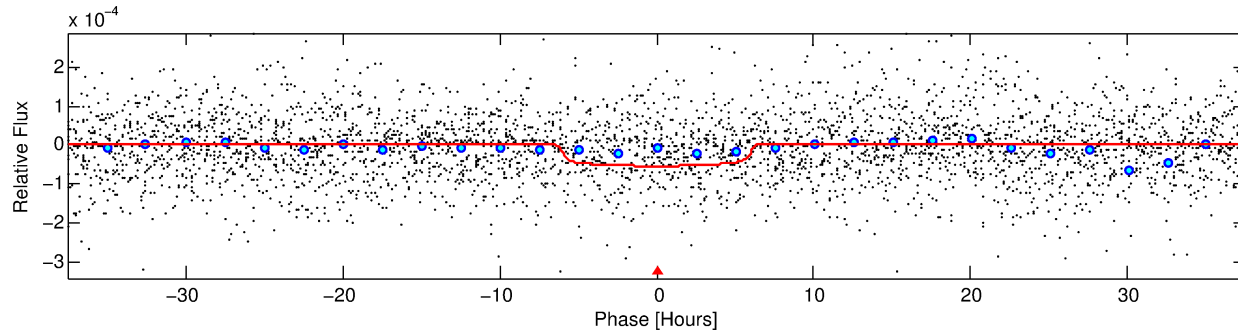
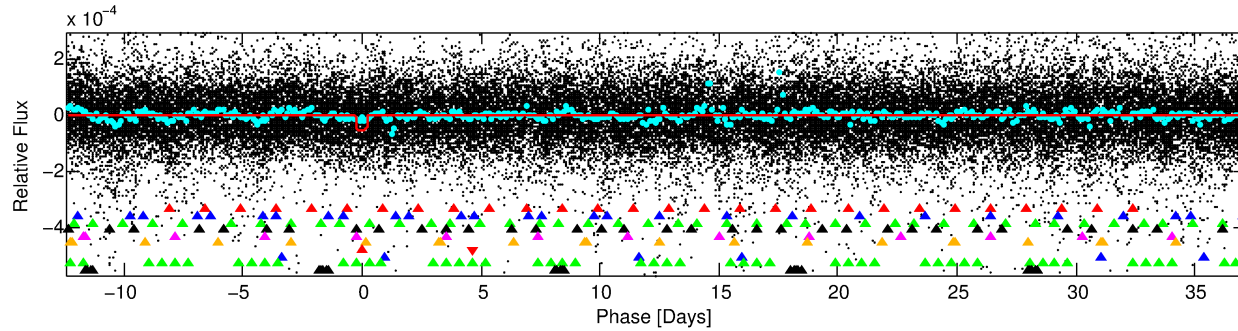
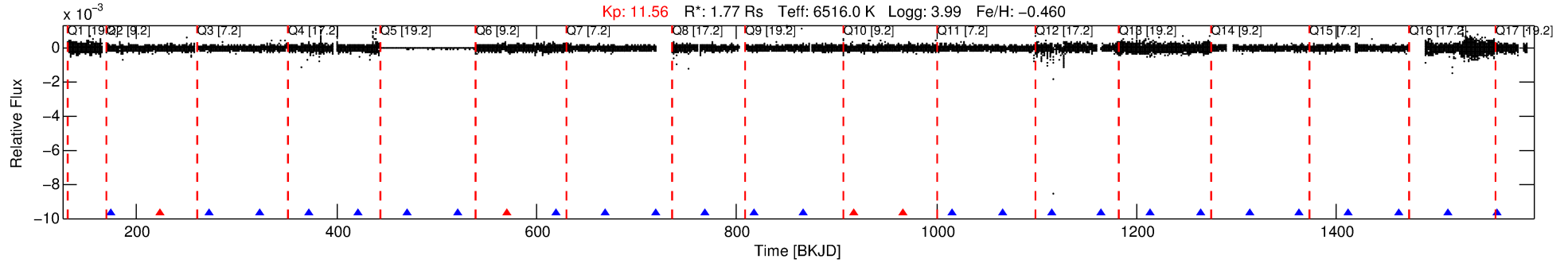
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-07

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 7 of 10 Period: 49.510 d



## DV Fit Results:

Period = 49.50966 [0.00066] d  
Epoch = 174.3136 [0.0051] BKJD  
Rp/R\* = 0.0079 [0.0003]  
a/R\* = 13.56 [2.18]  
b = 0.90 [0.03]  
Seff = 67.38 [32.48]  
Teq = 731 [88] K  
Rp = 1.52 [0.46] Re  
a = 0.2740 [0.0791] AU  
Ag = 268.38 [143.35] [1.87 $\sigma$ ]  
Teffp = 4572 [338] K [10.99 $\sigma$ ]

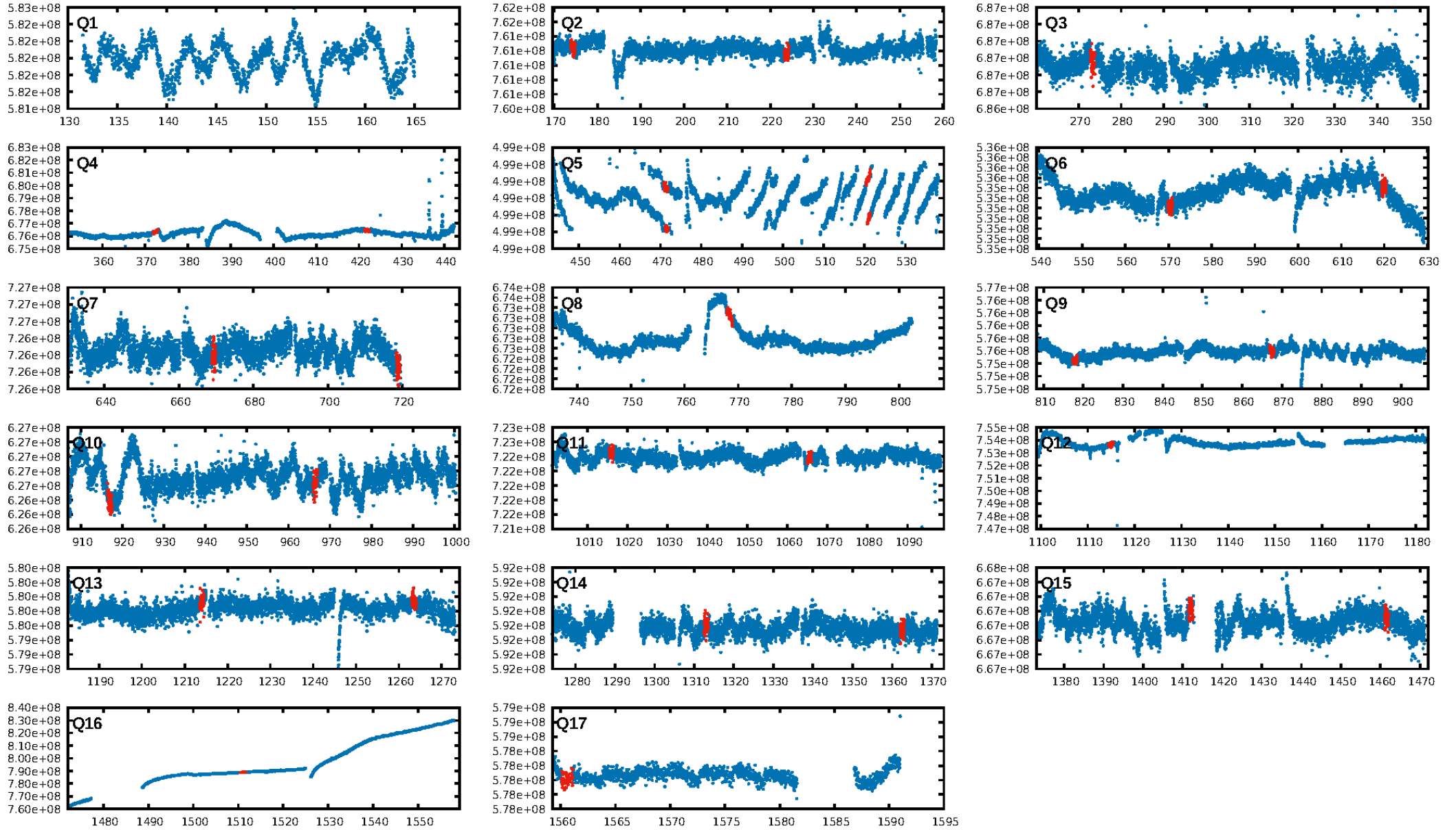
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [12.49 $\sigma$ ]  
LongPeriod-sig: 99.6% [2.87 $\sigma$ ]  
ModelChiSquare2-sig: 1.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.84 [21/25]  
GhostDiagnostic-chr: -2.741  
Centroid-sig: N/A  
Centroid-so: 3.712 arcsec [5.47 $\sigma$ ]  
OotOffset-rm: 2.500 arcsec [1.39 $\sigma$ ]  
KicOffset-rm: 3.063 arcsec [1.86 $\sigma$ ]  
OotOffset-st: 1/1/0/3 [5]  
KicOffset-st: 1/1/0/3 [5]  
DiffImageQuality-fgm: 0.00 [0/5]  
DiffImageOverlap-fno: 0.73 [11/15]

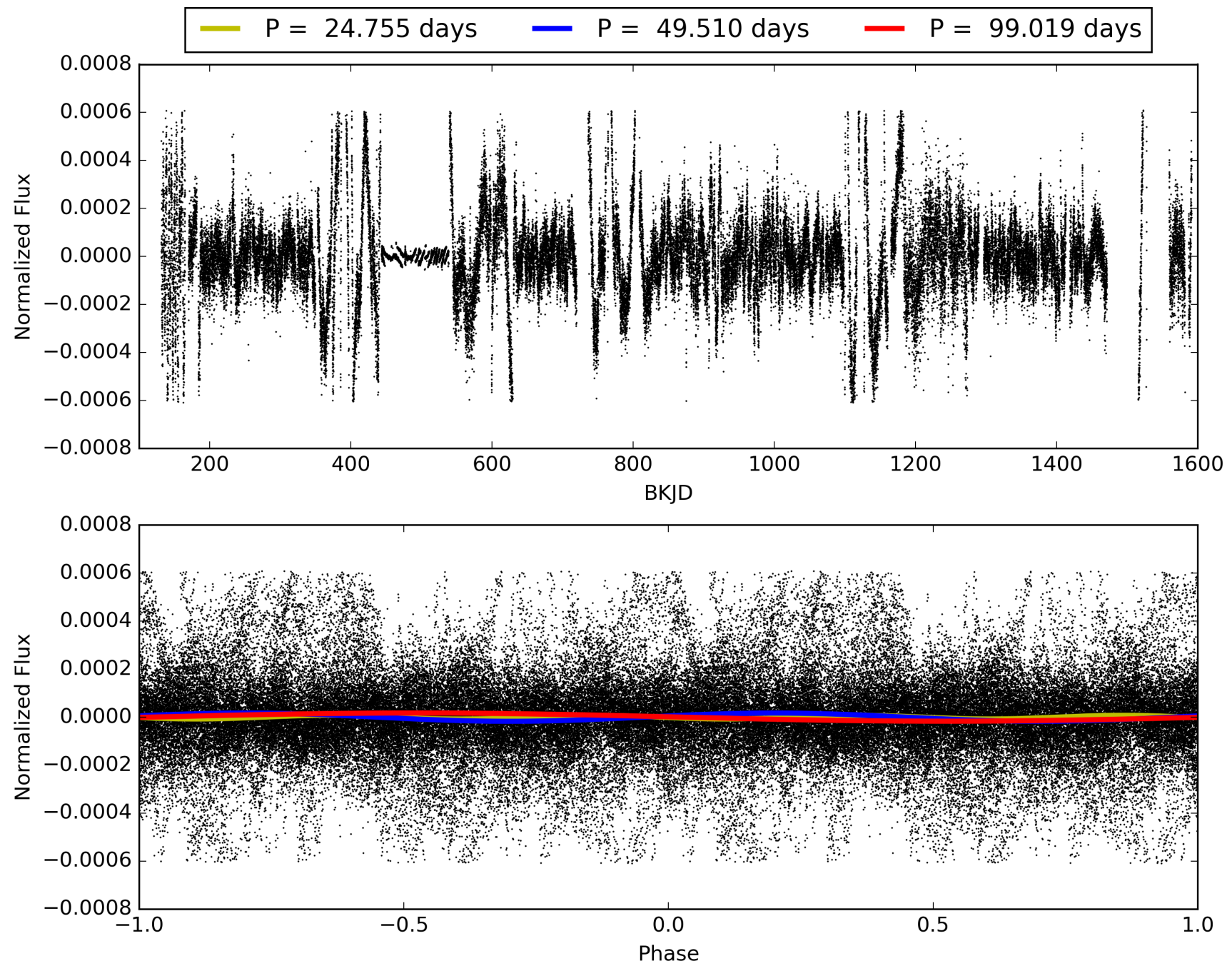
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:57:02 Z

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

# TCE 007971540-07, PDC Light Curves

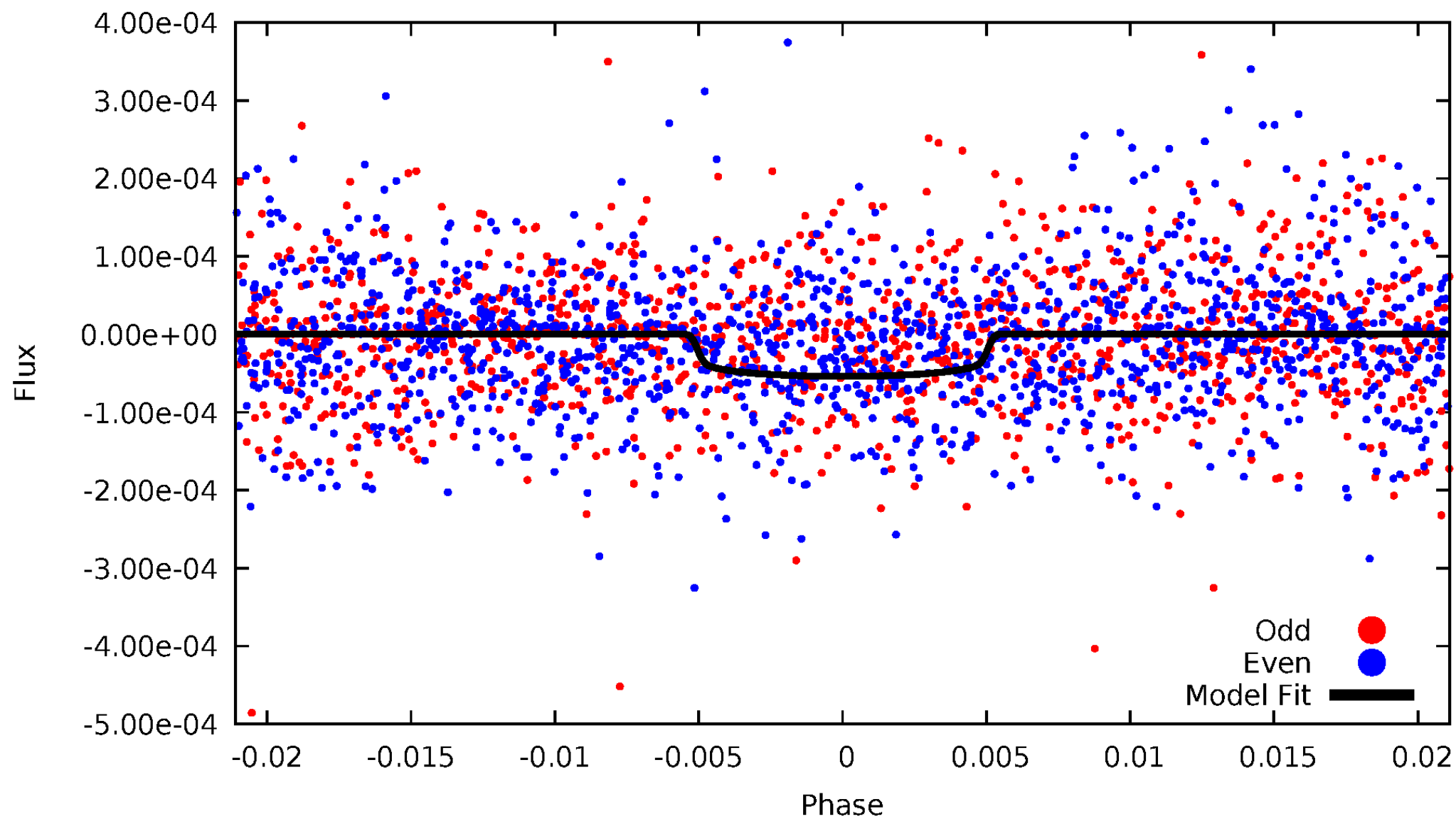


TCE 007971540-07



# DV Odd/Even

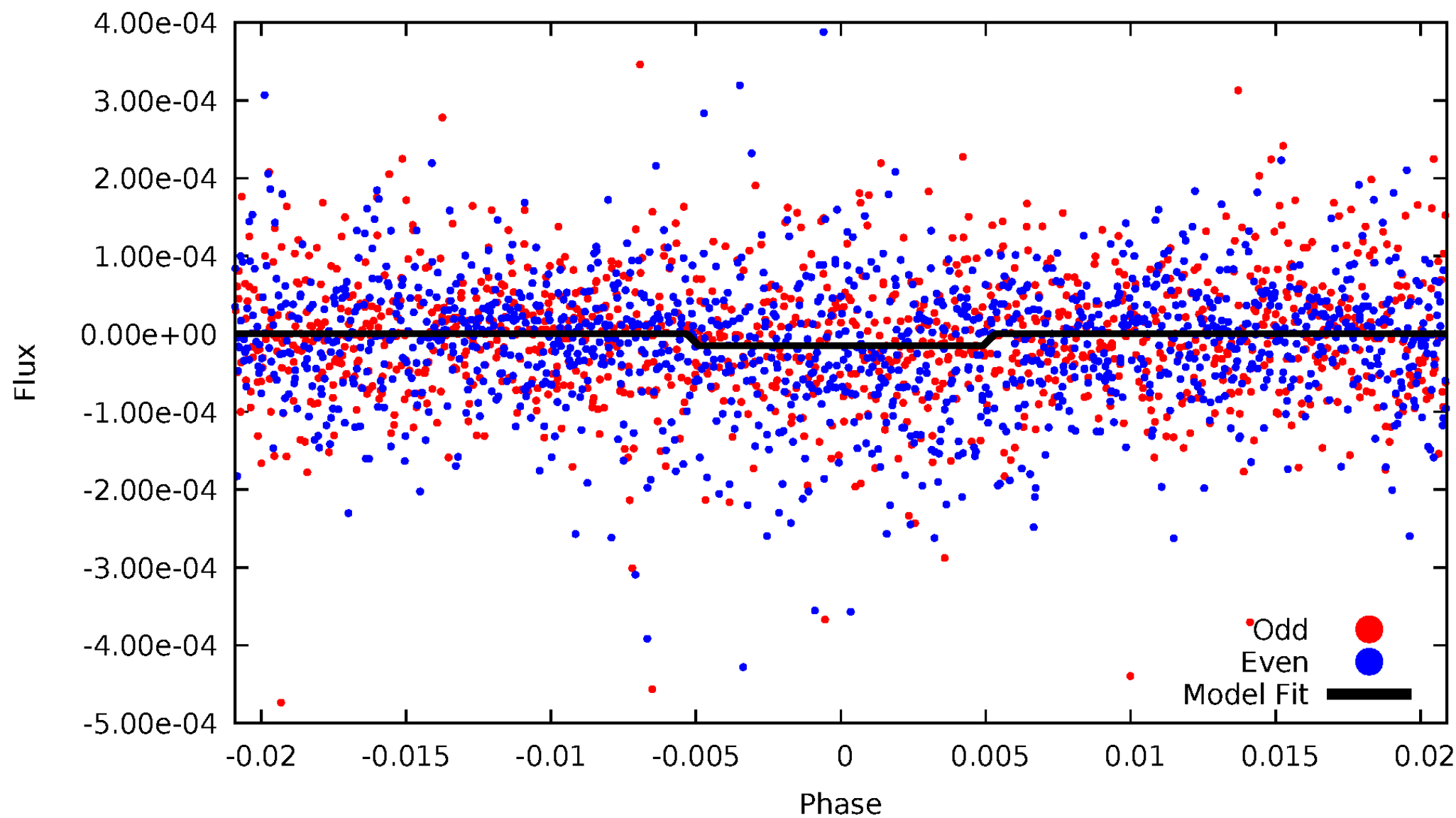
TCE 007971540-07



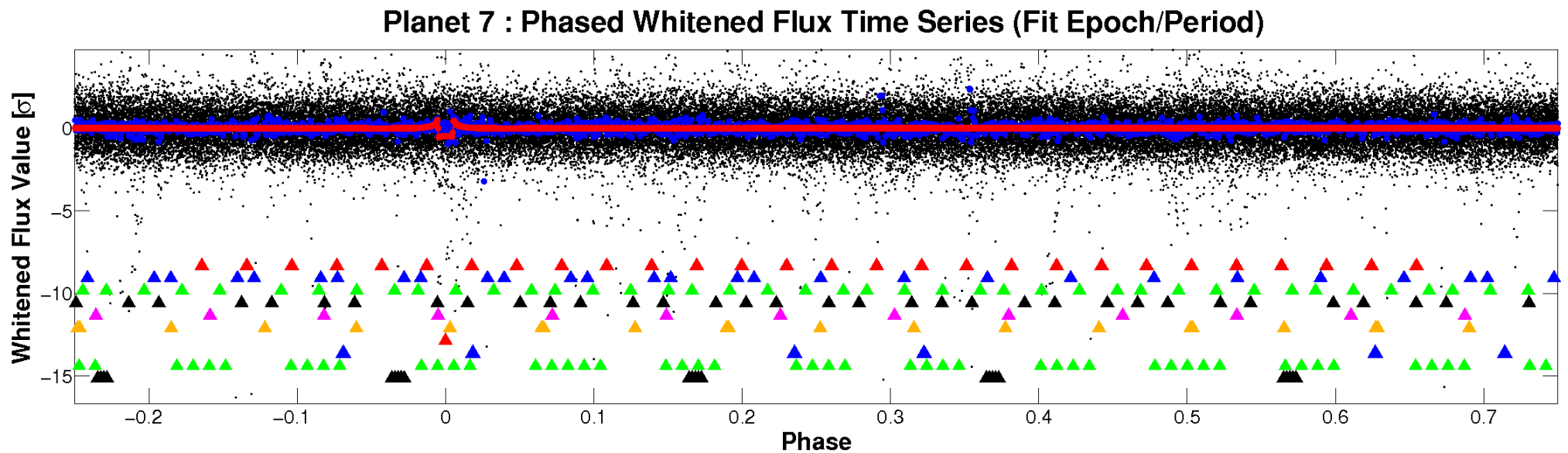
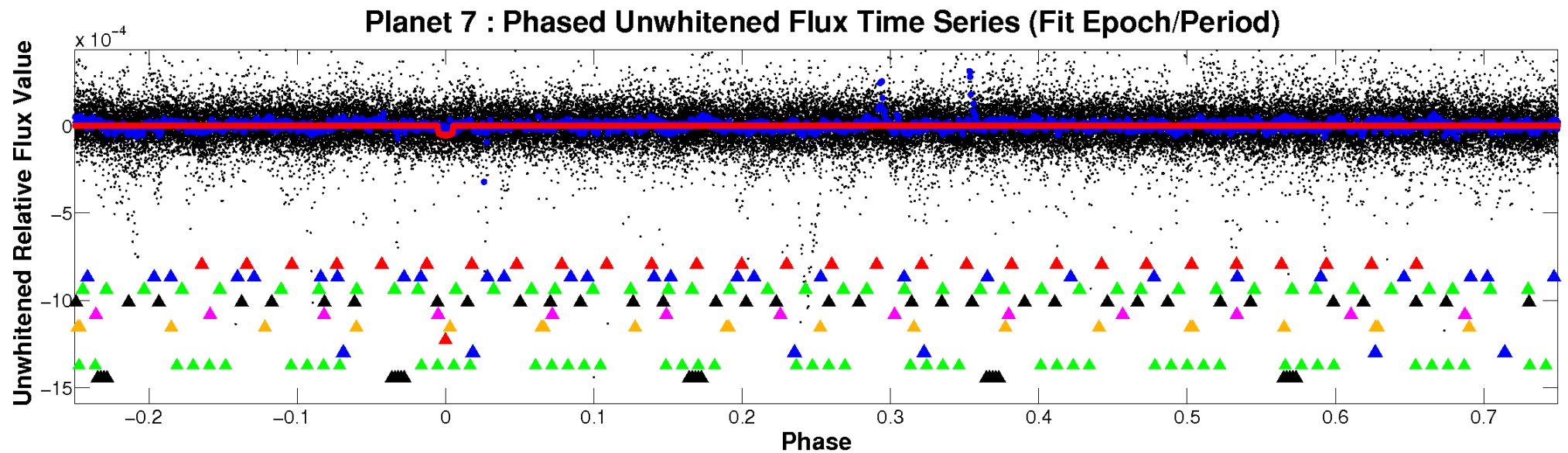


# ALT Odd/Even

TCE 007971540-07

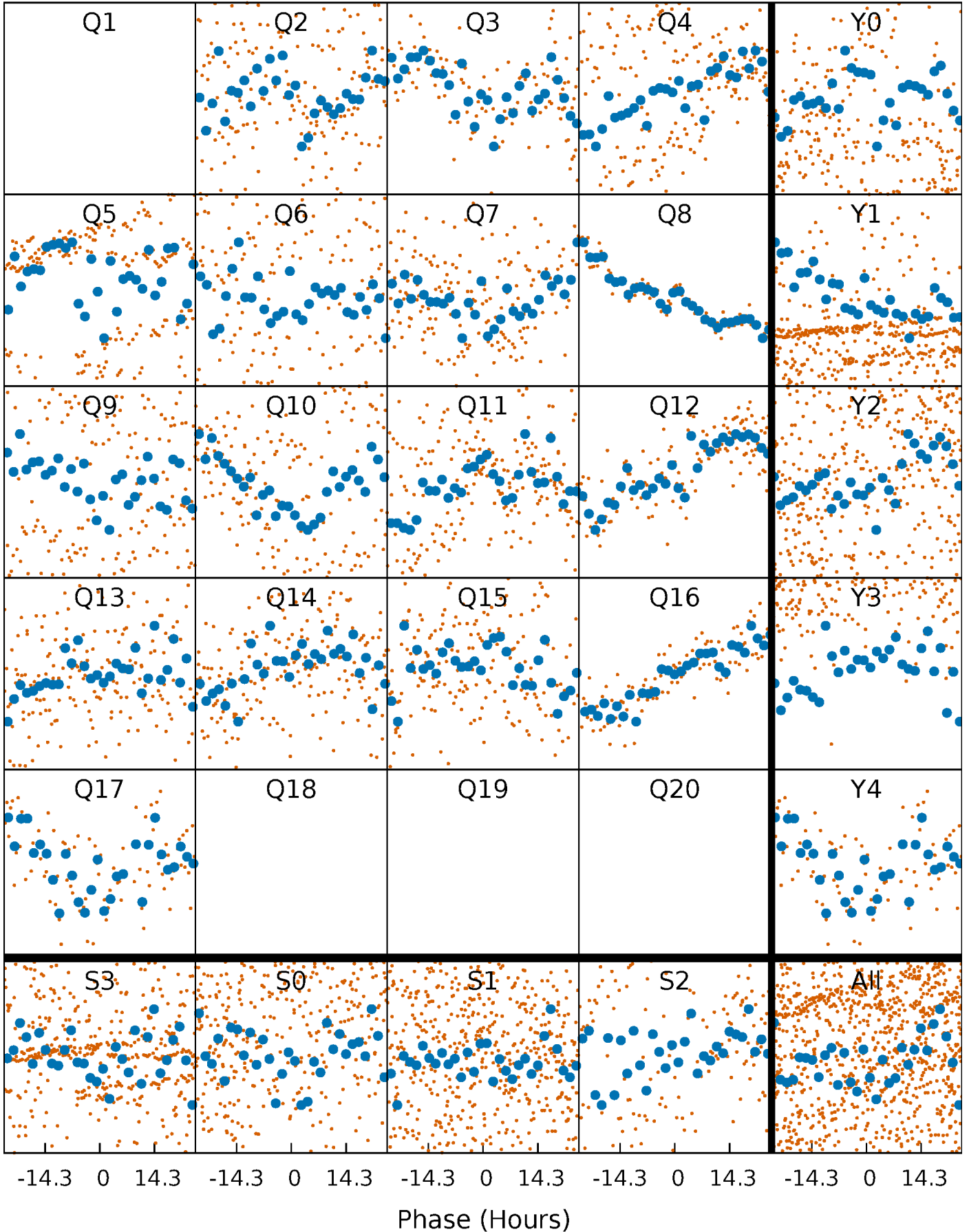


# Non-Whitened Vs. Whitened Light Curve



# PDC Quarter-Phased Transit Curves

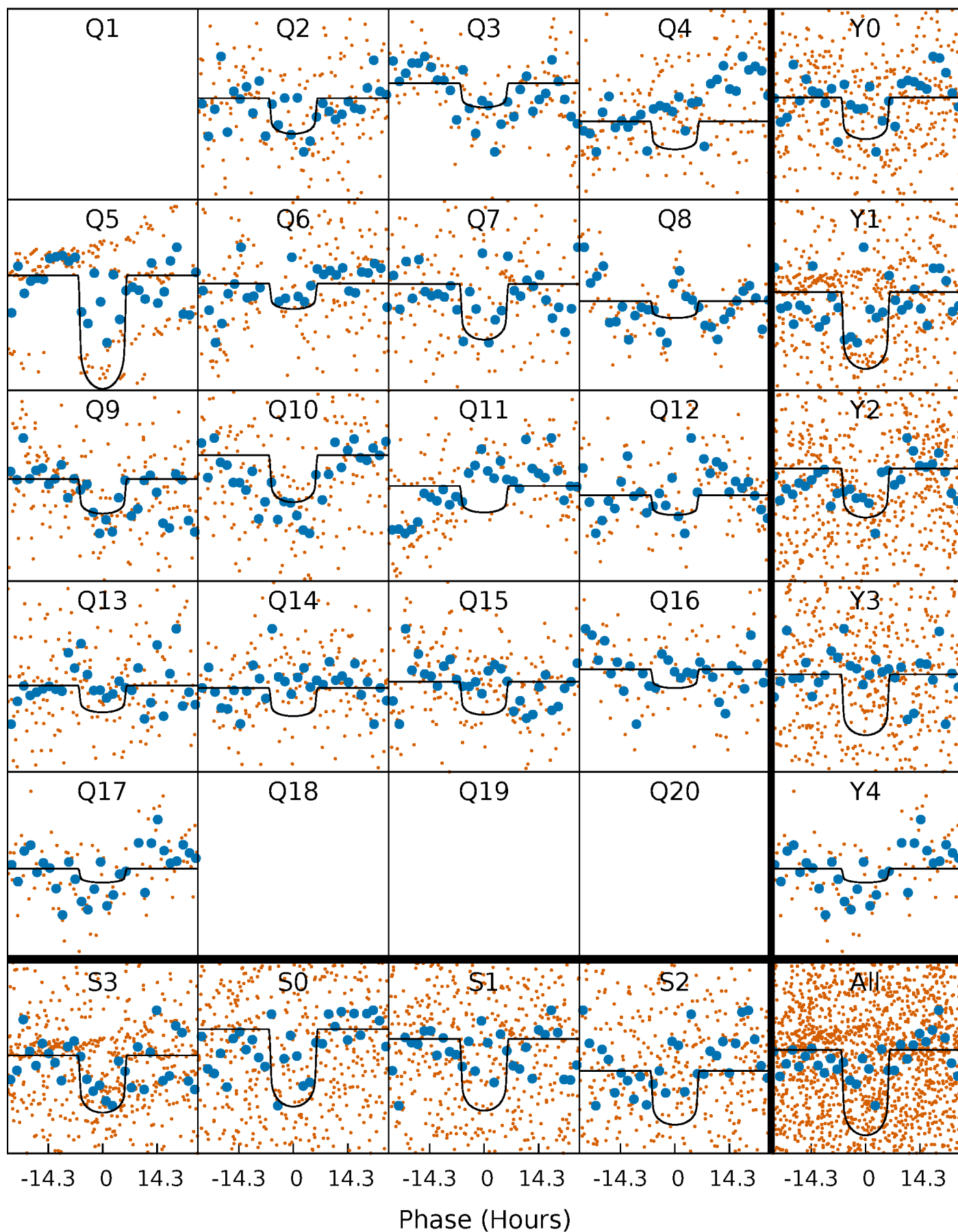
TCE 007971540-07   P= 49.509656 Days    $T_0=174.313639$  (BKJD)





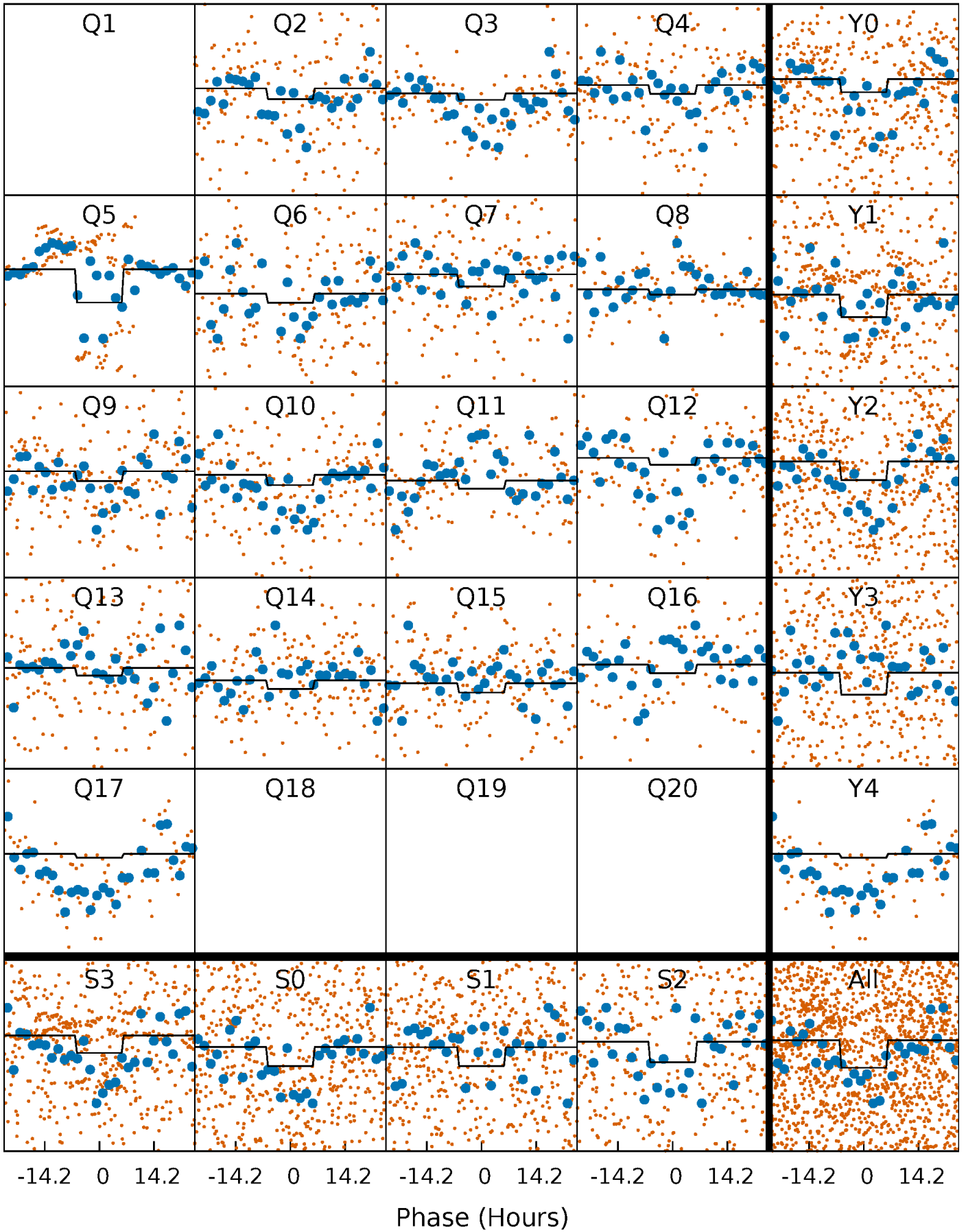
# DV Quarter-Phased Transit Curves

TCE 007971540-07     $P = 49.509656$  Days     $T_0 = 174.313639$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

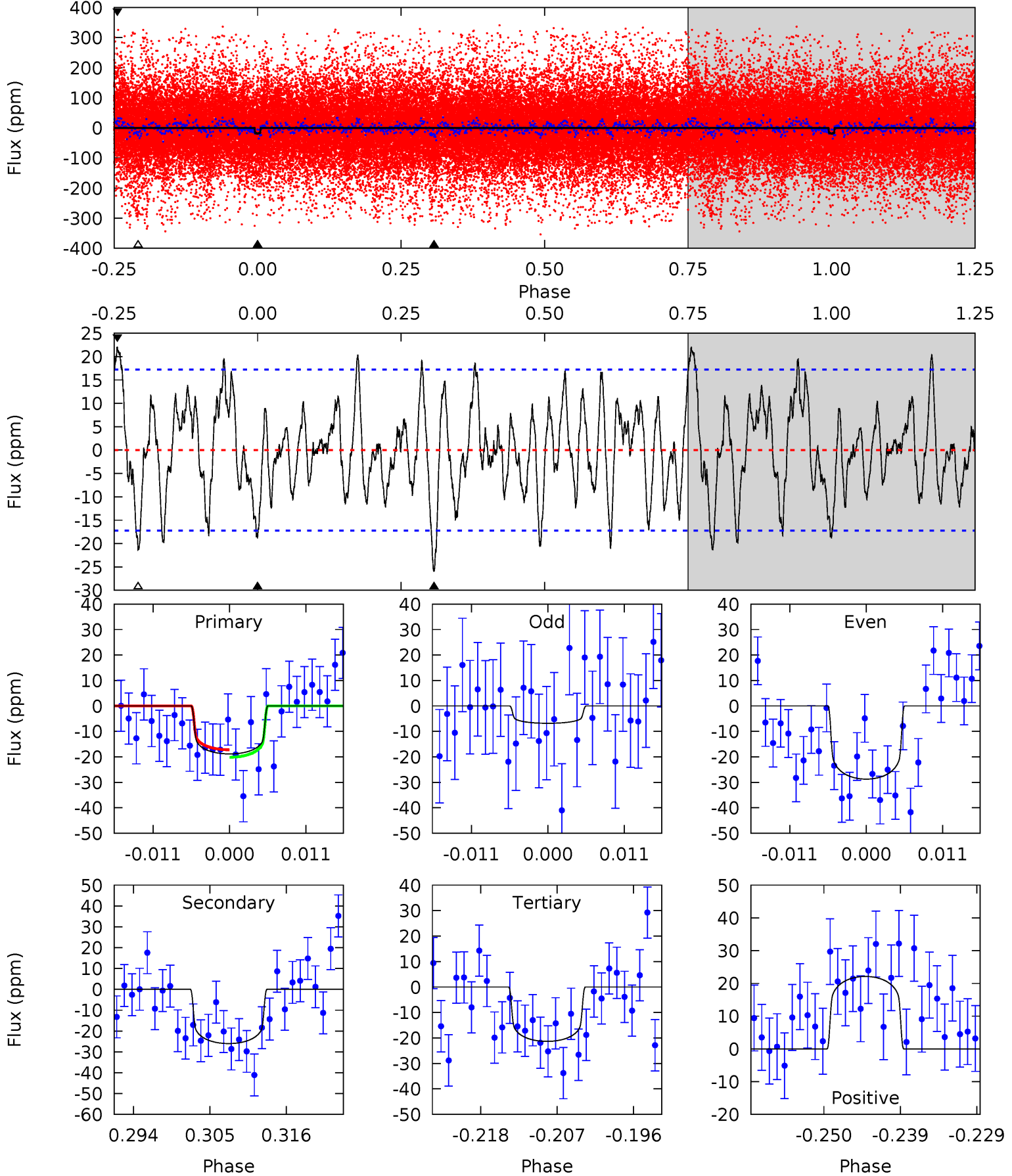
TCE 007971540-07     $P = 49.505764$  Days     $T_0 = 174.334871$  (BKJD)



# DV Model-Shift Uniqueness Test

007971540-07, P = 49.509656 Days, E = 124.803983 Days

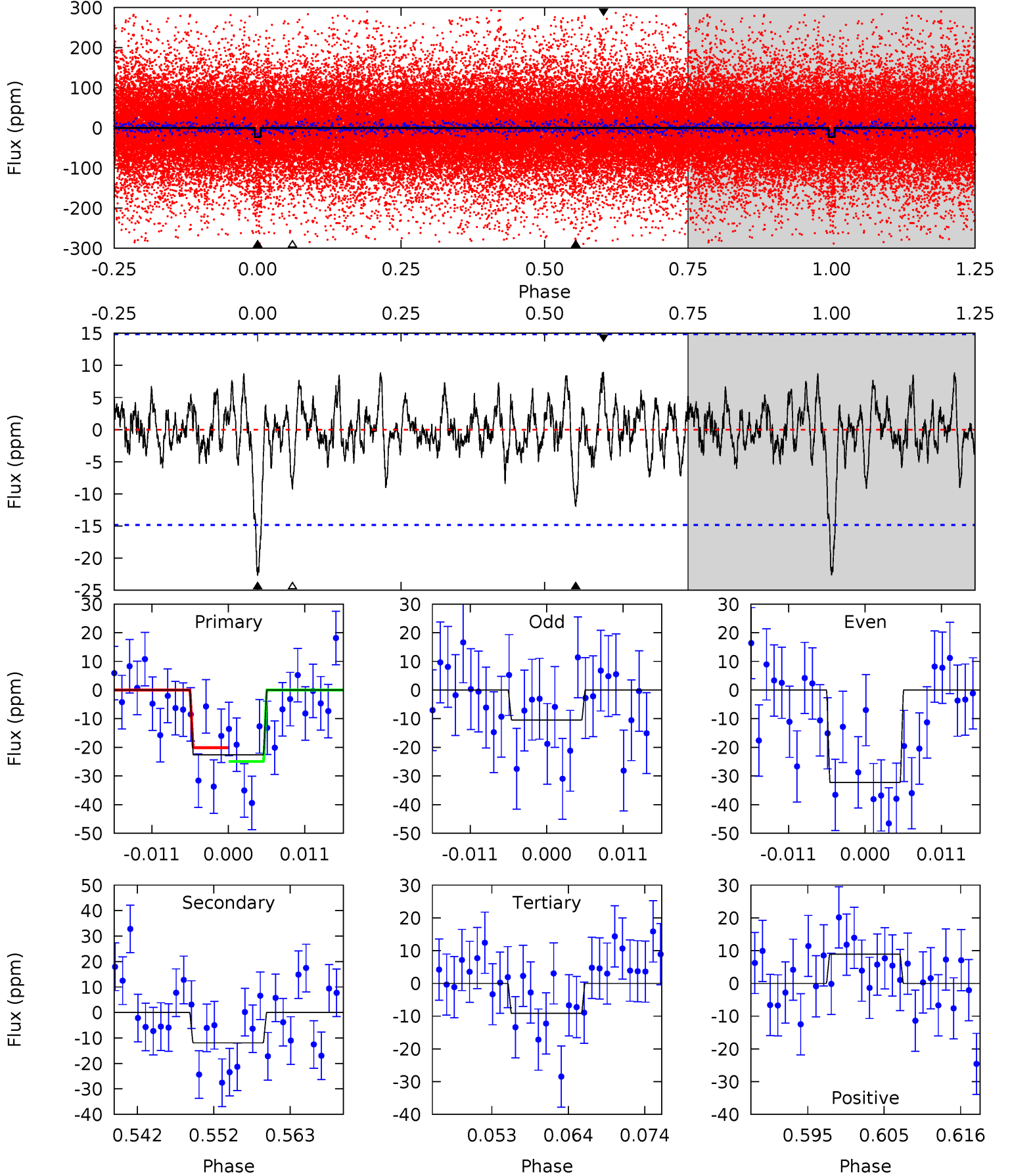
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
5.48	7.57	6.20	6.43	5.01	2.55	2.47	-0.72	-0.95	1.36	1.14	3.19	1.11	0.46	0.43



# Alt Model-Shift Uniqueness Test

007971540-07,  $P = 49.505764$  Days,  $E = 124.829107$  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
7.65	4.03	3.10	3.02	5.01	2.56	1.04	4.55	4.63	0.93	1.01	3.69	1.22	0.28	0.81



### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-07 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-26 \pm 3$	$1.49^{+0.21}_{-0.24}$	$1004^{+65}_{-79}$	$5278^{+237}_{-228}$	$493^{+207}_{-116}$
Alt.	$-12 \pm 3$	$0.74^{+0.12}_{-0.12}$	$1005^{+66}_{-87}$	$6133^{+453}_{-499}$	$941^{+481}_{-315}$

$T_{max}$  = 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

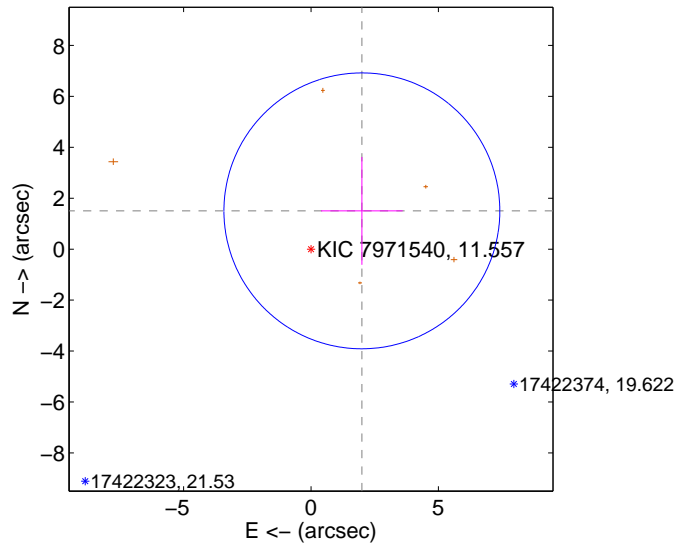
Supplemental centroid analysis for 007971540-07. **Kepler magnitude: 11.56.** Transit SNR 16.90

**There are 0 quarters with good PRF difference image offsets**

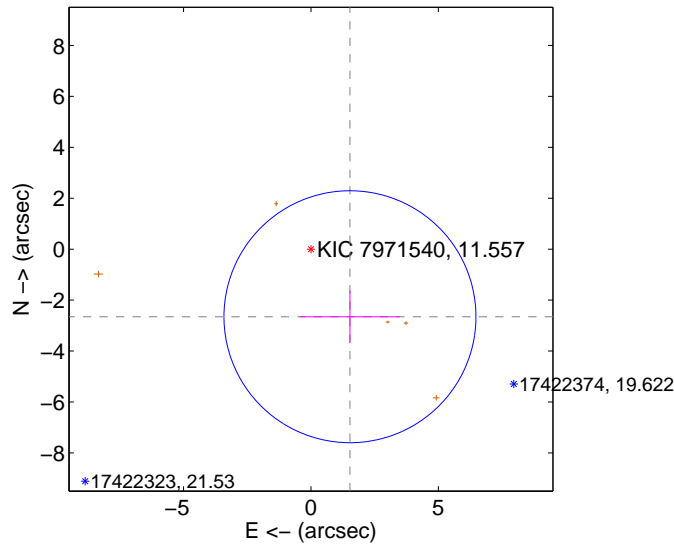
The direct PRF centroid is offset from the target star catalog position by about 1.89 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.500 \pm 1.805$	1.39	$-1.997 \pm 1.602$	$1.504 \pm 2.116$
PRF-fit source offset from KIC position	$3.063 \pm 1.649$	1.86	$-1.531 \pm 1.961$	$-2.653 \pm 1.028$
photometric centroid source offset	<b><math>3.71 \pm 0.68</math></b>	<b>5.47</b>	$-0.46 \pm 0.95$	$-3.68 \pm 0.67$

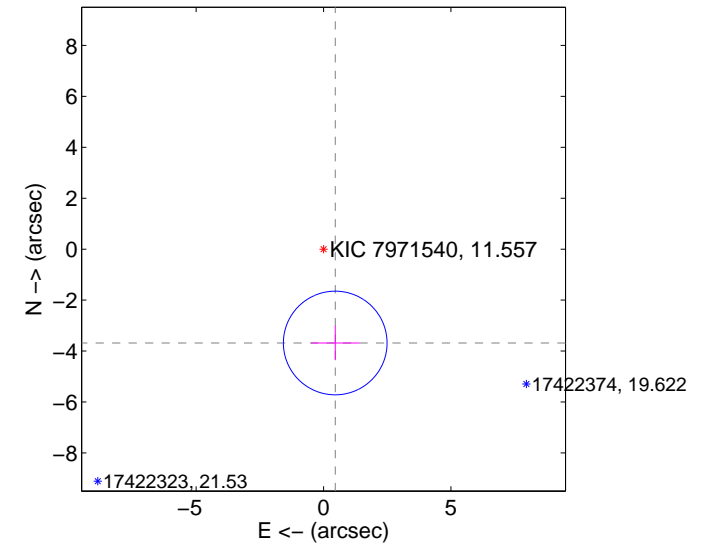
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

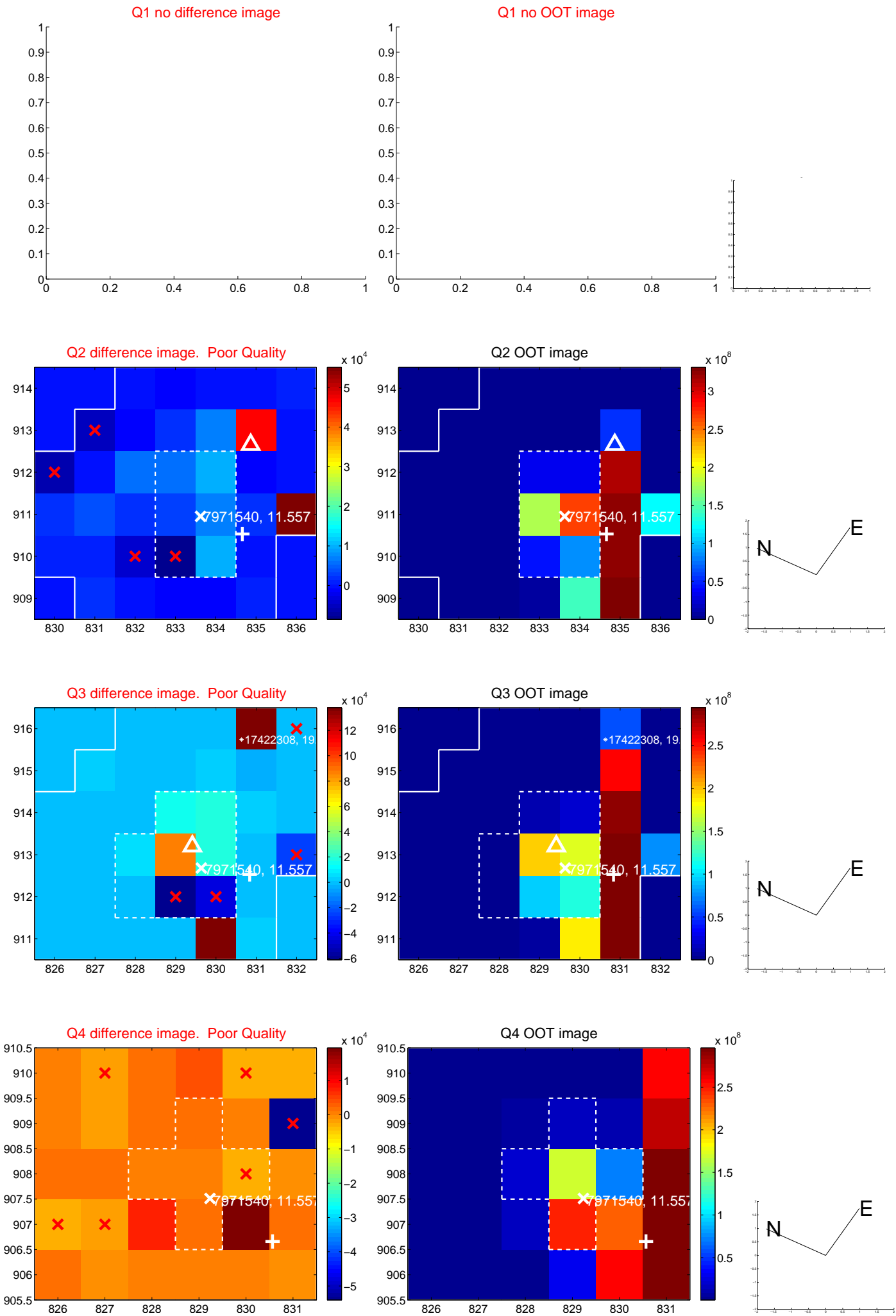


offset from photometric centroids

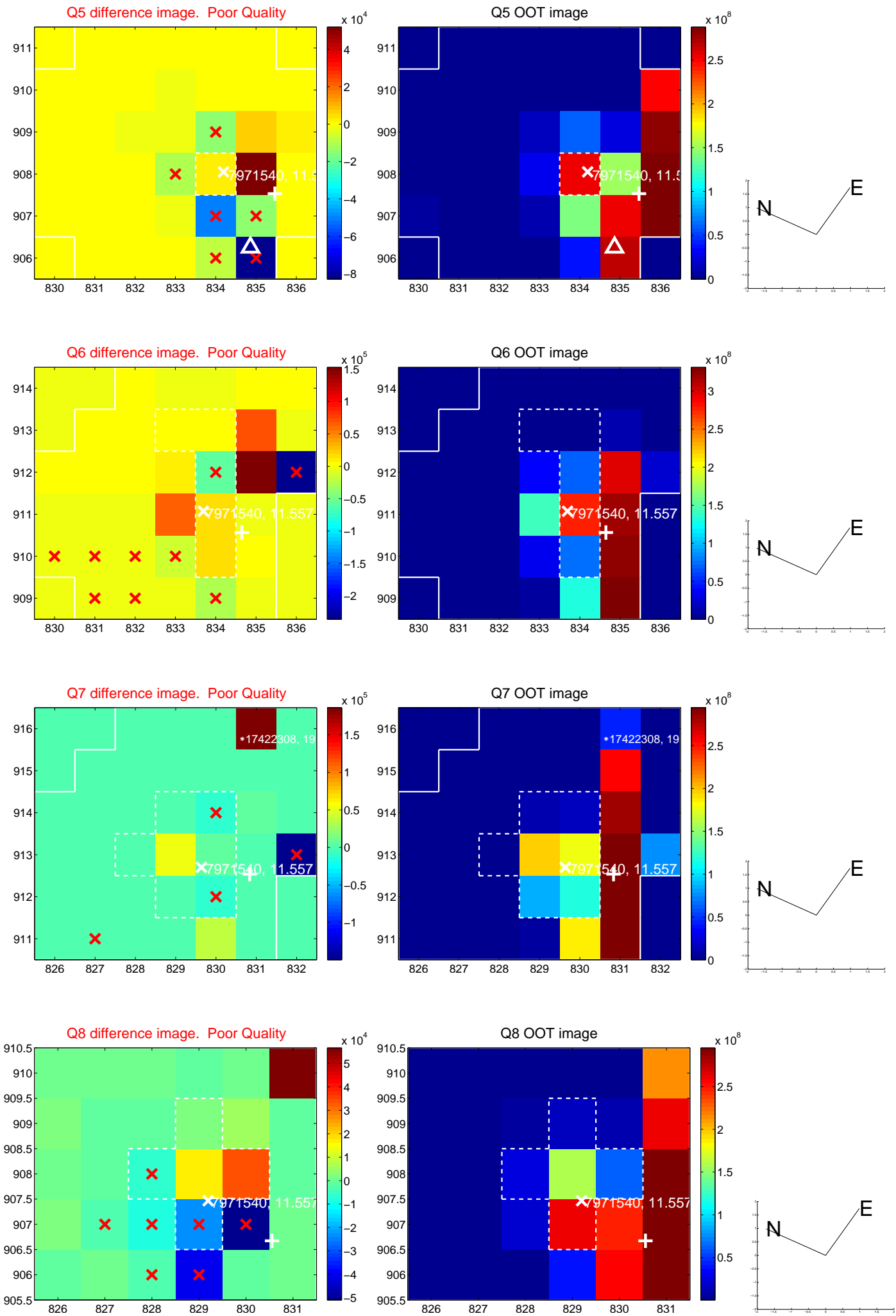


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

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

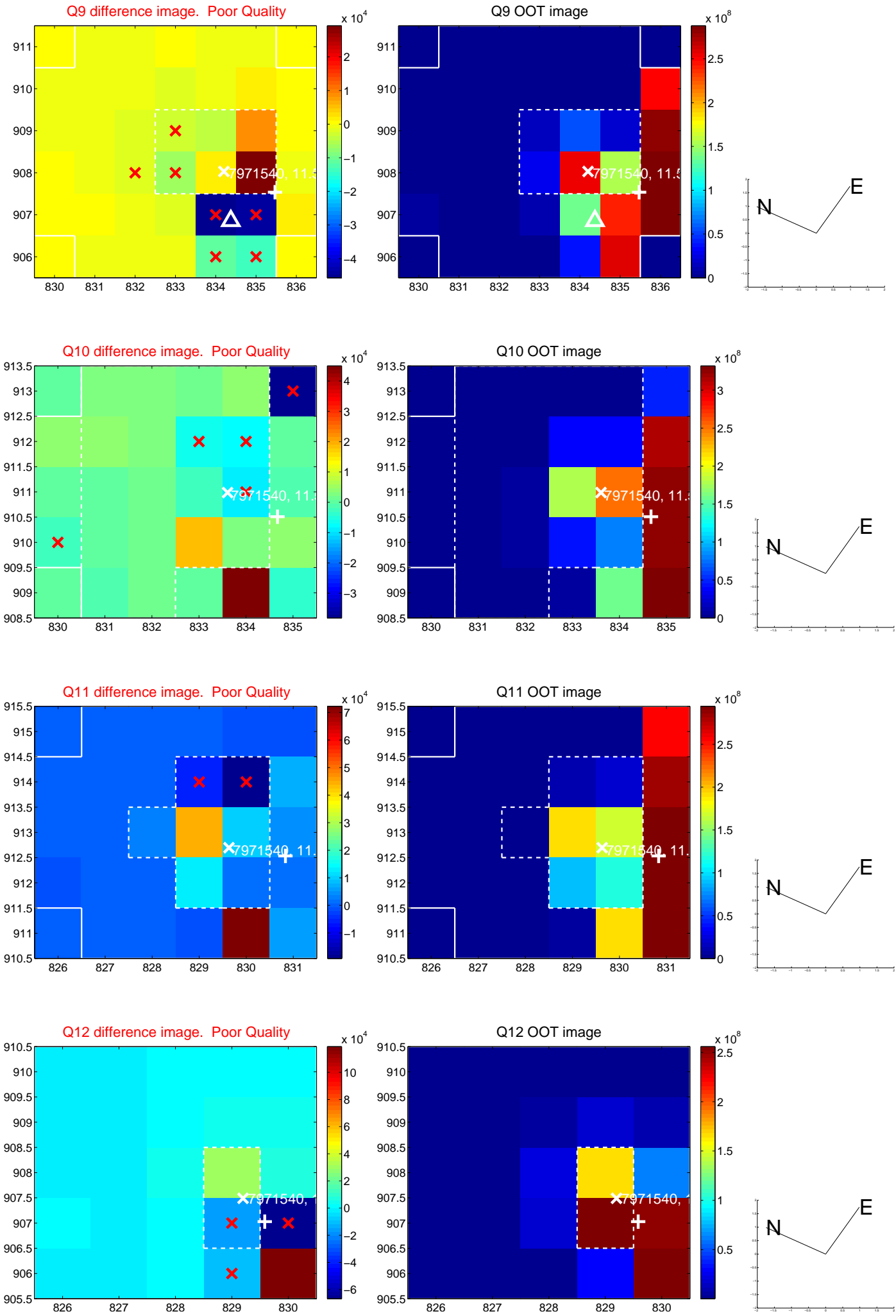


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

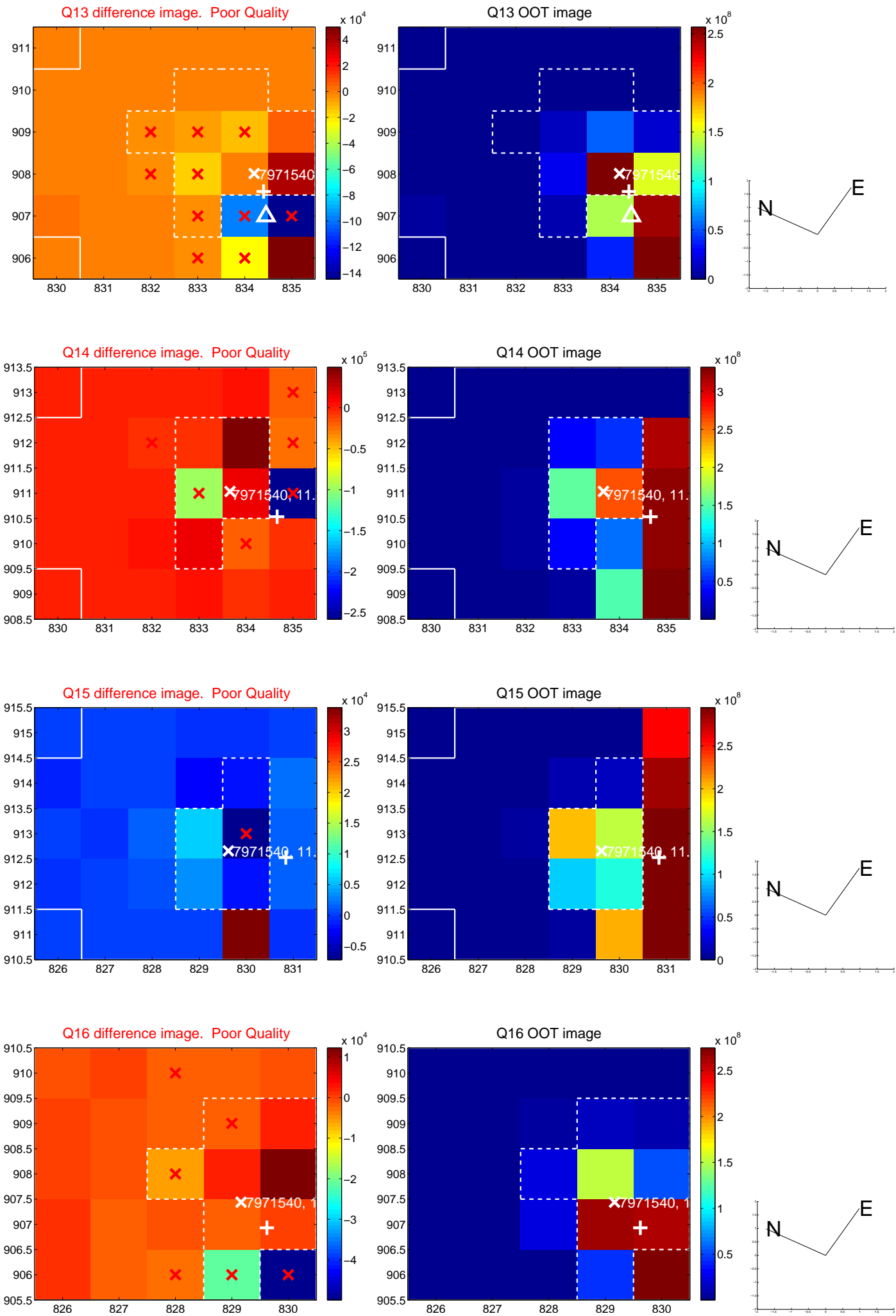




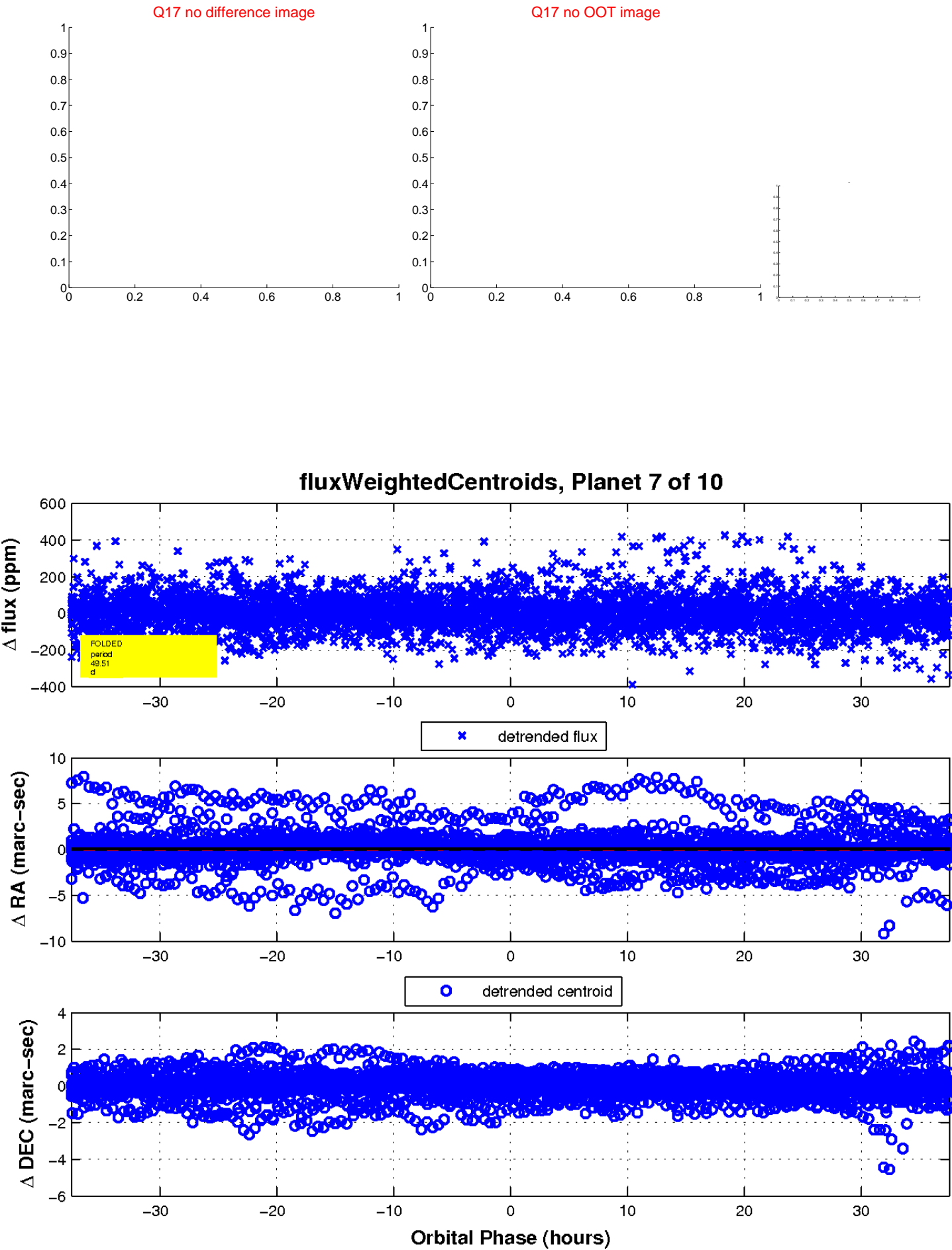
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



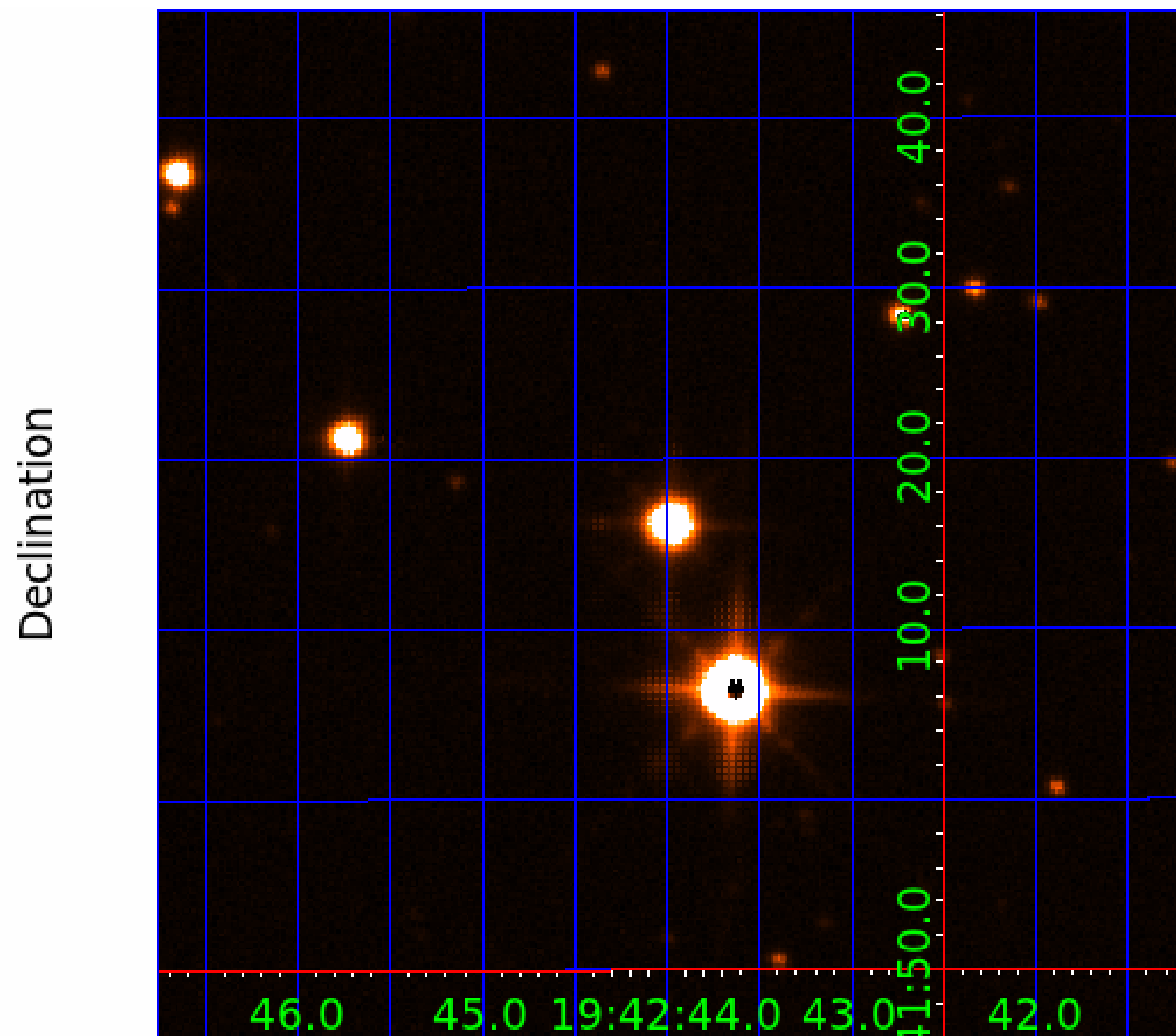
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007971540-01	OBS	No	51.011313	166.181425	52.5	1.002	29.8	20.5	1.77	6516	1.30	64.75
007971540-02	OBS	No	52.291113	159.026037	53.9	1.214	18.0	16.2	1.77	6516	1.46	62.65
007971540-03	OBS	No	34.530503	153.062724	23.2	2.413	14.7	7.2	1.77	6516	1.02	108.94
007971540-04	OBS	No	42.975481	146.899876	56.8	0.683	13.6	15.7	1.77	6516	1.38	81.38
007971540-05	OBS	No	60.934308	143.610155	48.2	1.035	15.8	19.4	1.77	6516	1.40	51.09
007971540-06	OBS	No	71.174769	162.031760	41.4	7.231	14.7	16.6	1.77	6516	1.30	41.53
007971540-07	OBS	No	49.509656	174.313640	54.0	12.534	13.5	16.9	1.77	6516	1.52	67.38
007971540-08	OBS	No	262.610321	259.184059	26.0	18.558	13.9	4.7	1.77	6516	1.08	7.28
007971540-09	OBS	No	28.835527	150.649599	19.5	11.693	12.6	9.8	1.77	6516	0.97	138.54
007971540-10	OBS	No	59.432161	172.524554	131.2	9.000	11.7	-1.0	1.77	6516	2.04	52.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007971540-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-04	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-06	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST
007971540-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007971540-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007971540-09	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007971540-10	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

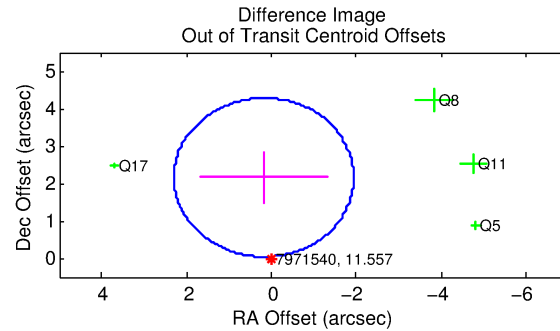
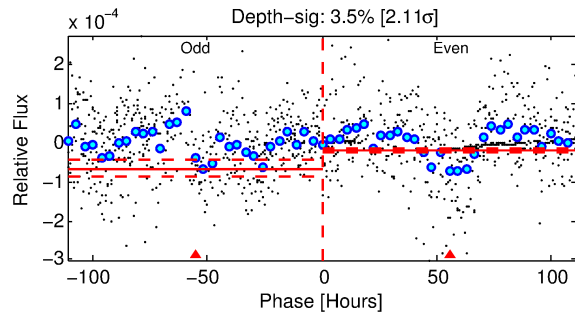
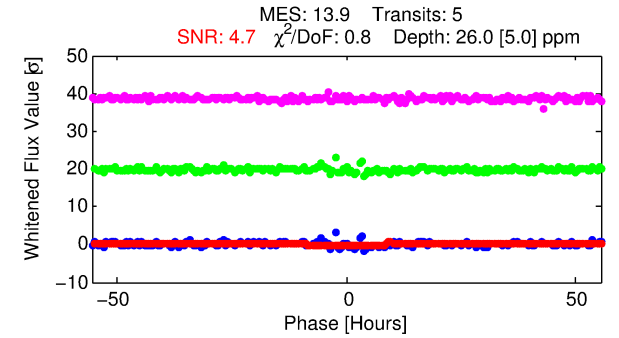
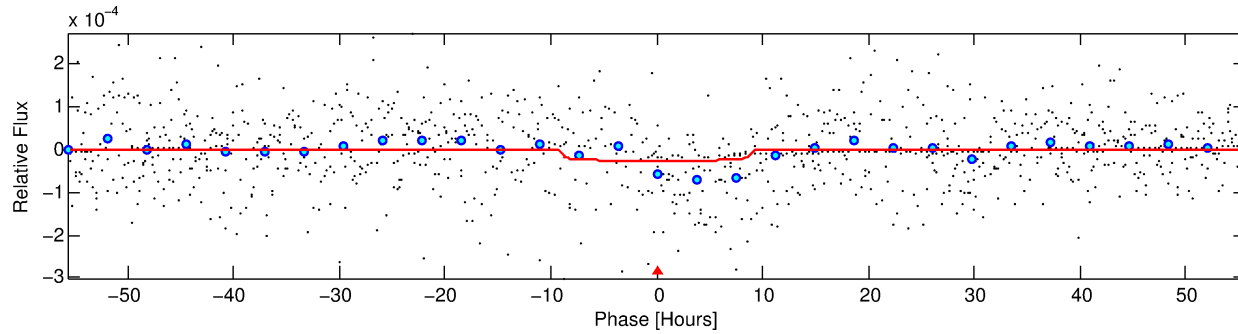
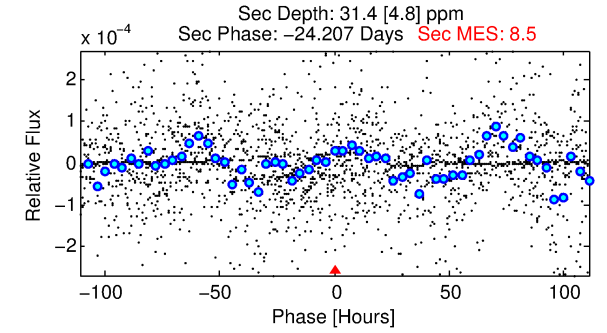
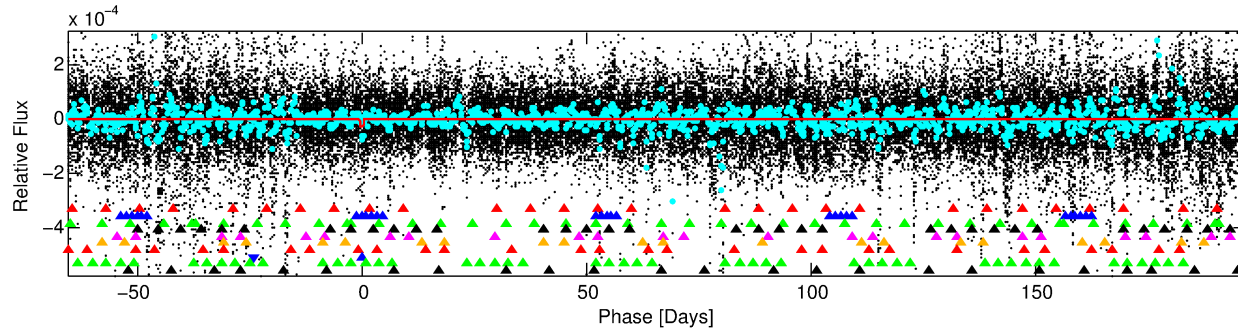
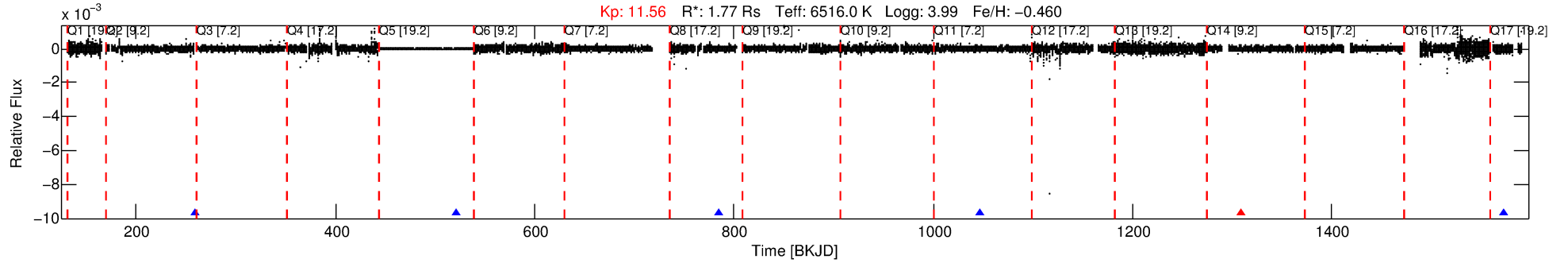
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-08

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 8 of 10 Period: 262.610 d



## DV Fit Results:

Period = 262.61032 [0.01650] d  
Epoch = 259.1841 [0.0434] BKJD  
Rp/R\* = 0.0056 [0.0008]  
a/R\* = 41.94 [20.21]  
b = 0.93 [0.06]  
Seff = 7.28 [3.51]  
Teq = 419 [50] K  
Rp = 1.08 [0.35] Re  
a = 0.8335 [0.2406] AU  
Ag = 10289.12 [5740.56] [1.79 $\sigma$ ]  
Teffp = 6523 [549] K [11.06 $\sigma$ ]

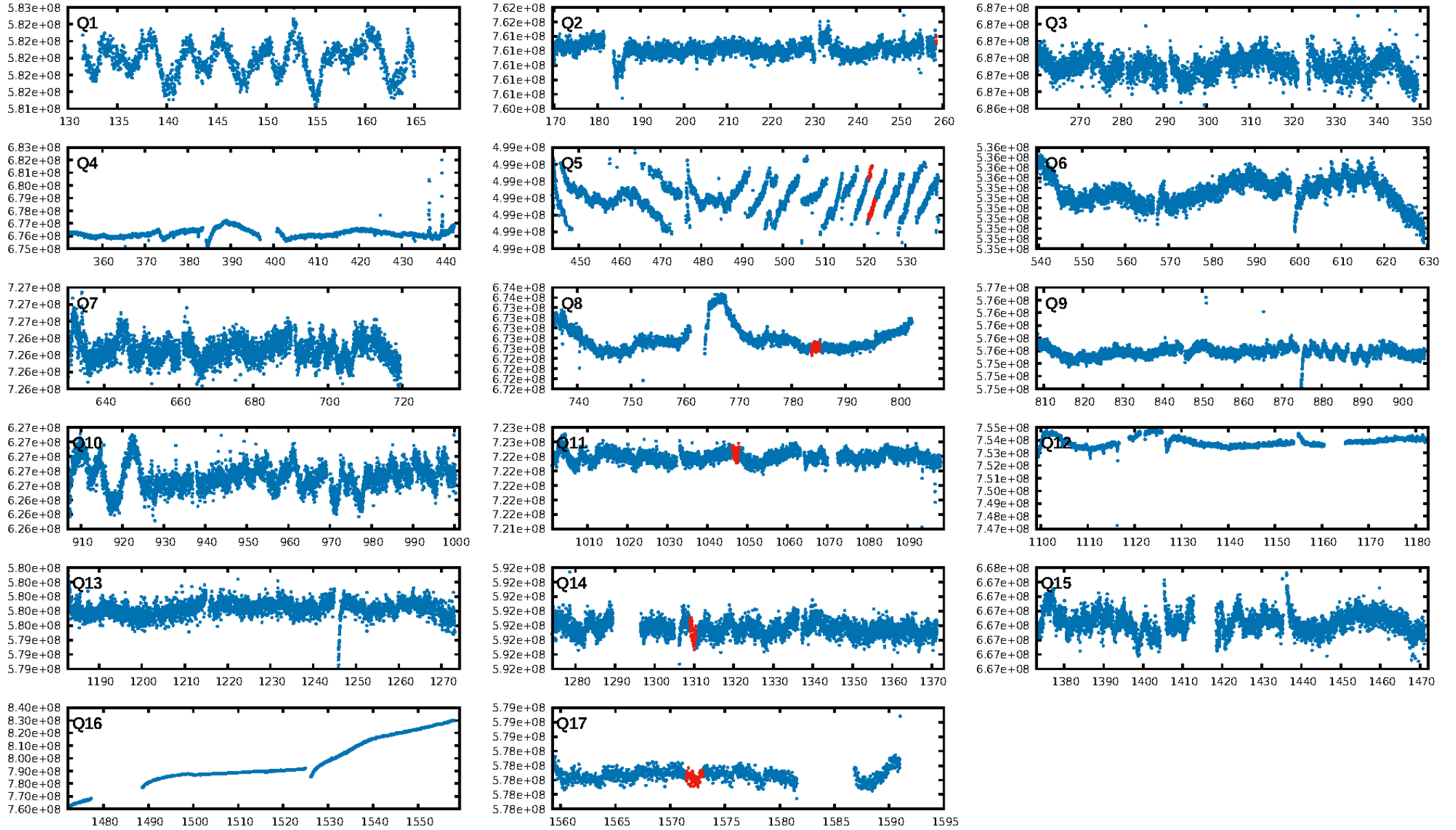
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [230.67 $\sigma$ ]  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 27.4%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.75 [3/4]  
GhostDiagnostic-chr: 21.5  
Centroid-sig: N/A  
Centroid-so: 6.197 arcsec [2.06 $\sigma$ ]  
OotOffset-rm: 2.163 arcsec [3.06 $\sigma$ ]  
KicOffset-rm: 0.502 arcsec [0.30 $\sigma$ ]  
OotOffset-st: 0/1/1/2 [4]  
KicOffset-st: 0/1/1/2 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.20 [1/5]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:57:09 Z

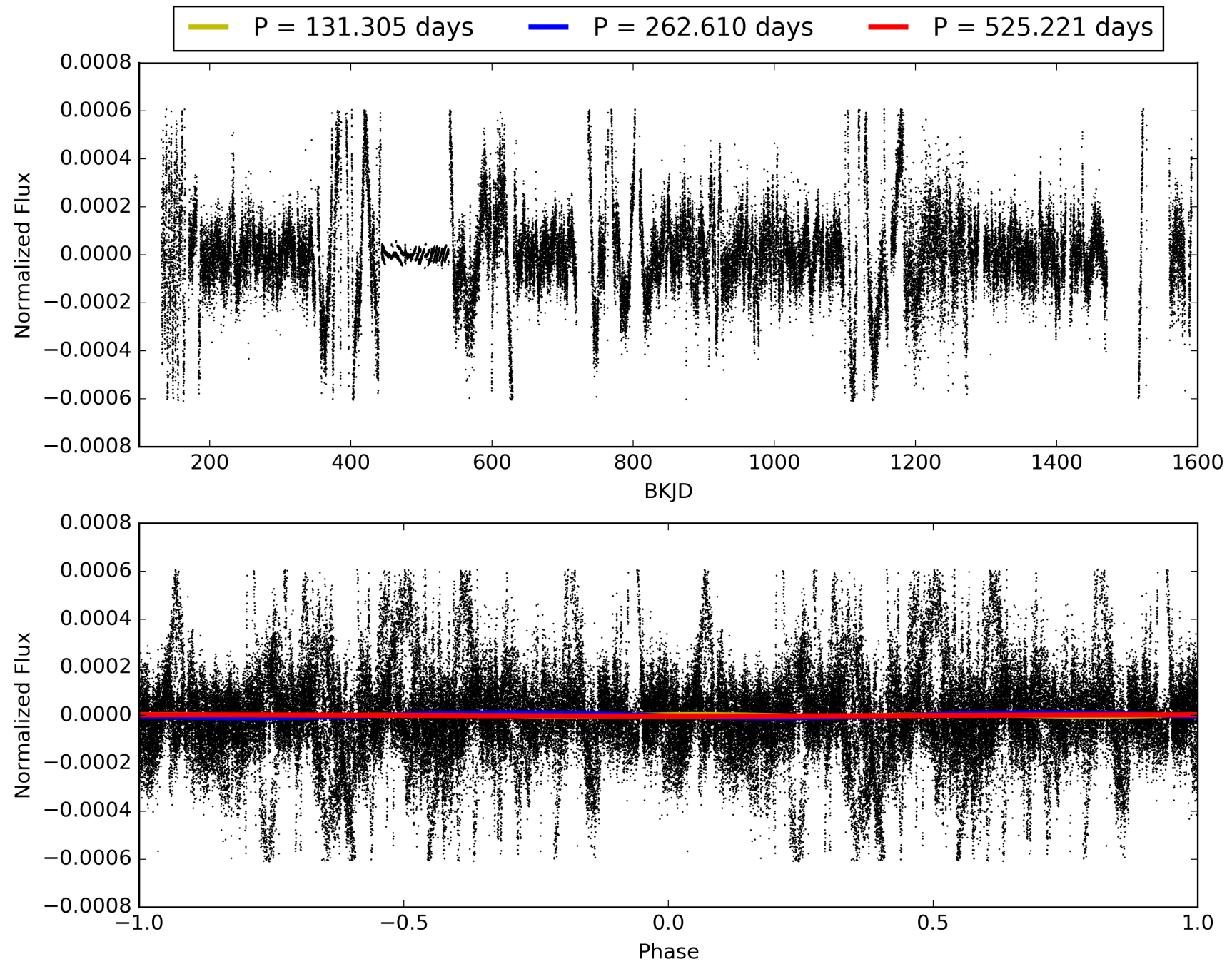
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007971540-08, PDC Light Curves





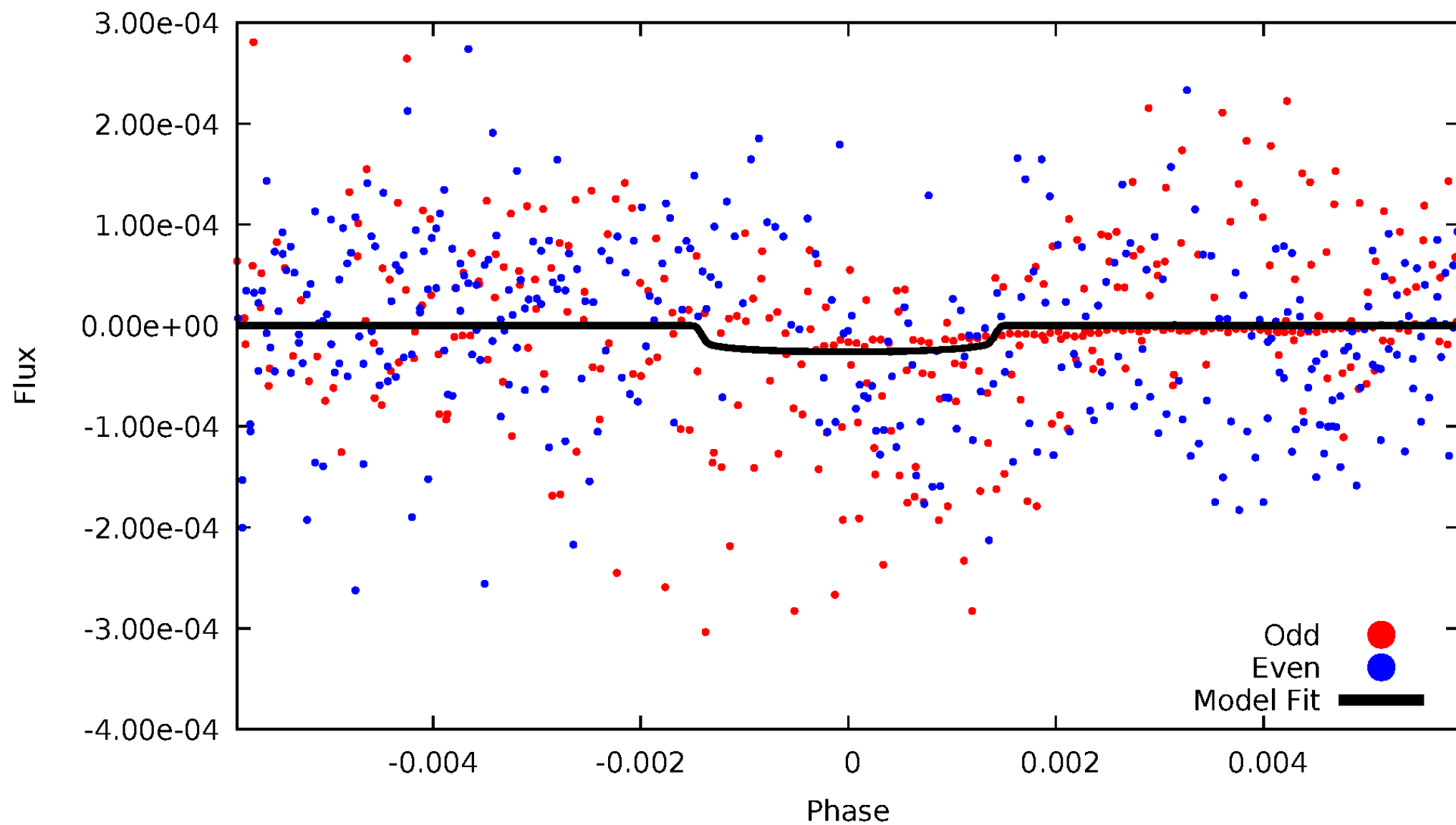
TCE 007971540-08





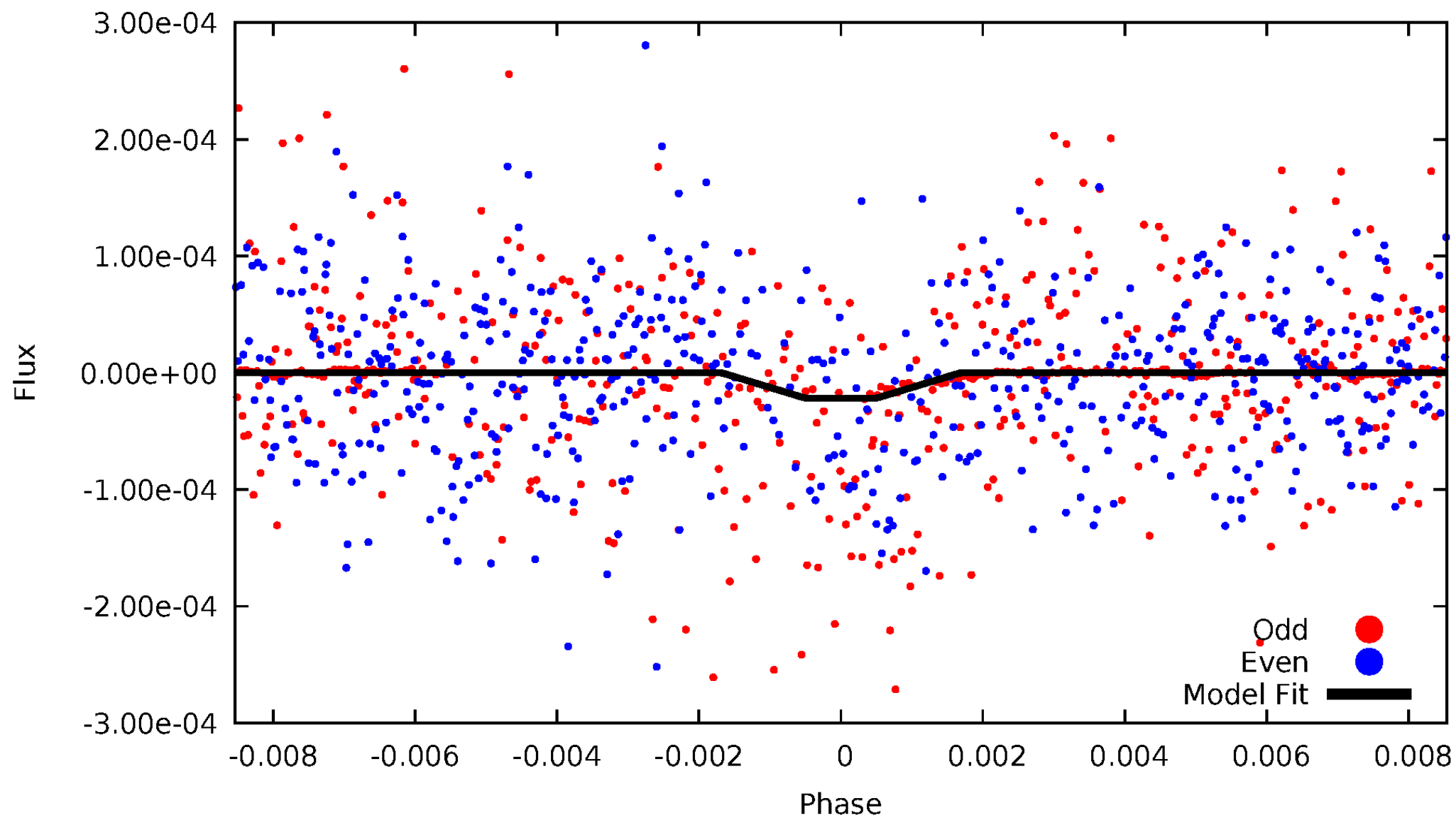
# DV Odd/Even

TCE 007971540-08



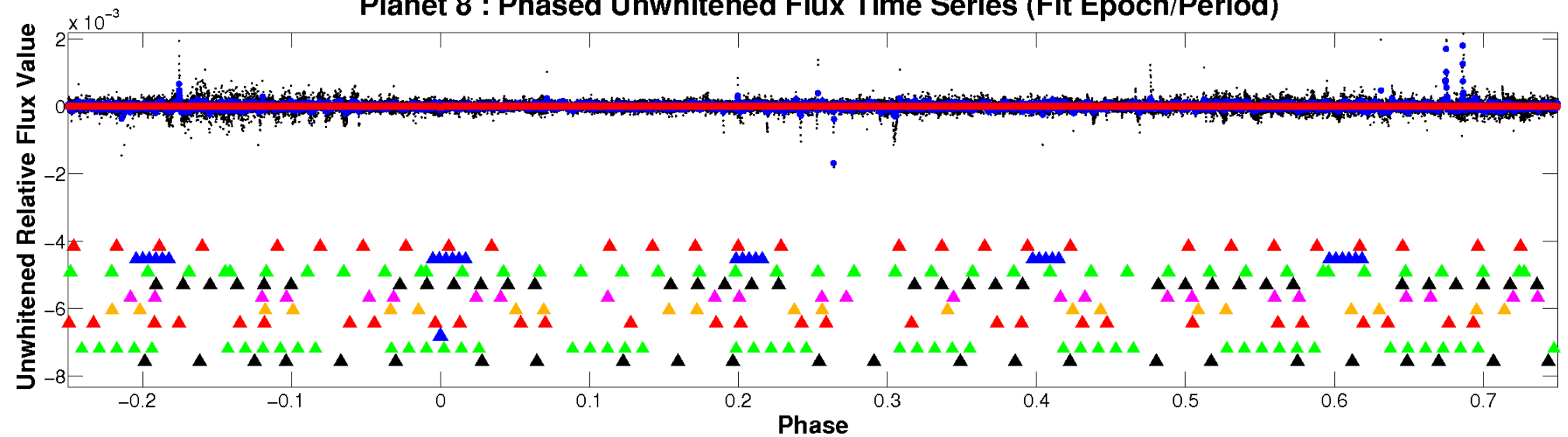
# ALT Odd/Even

TCE 007971540-08

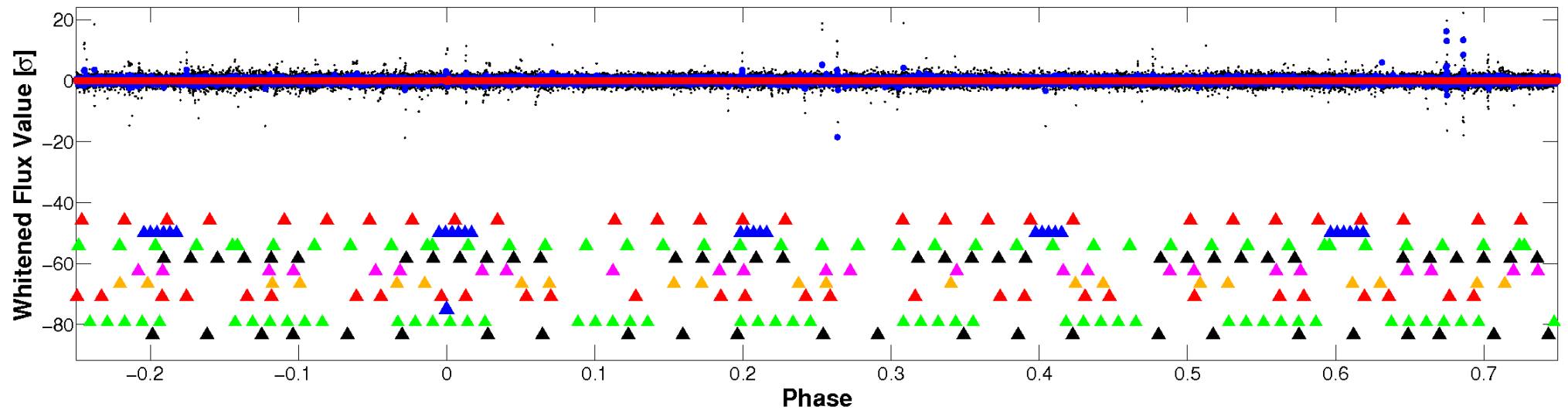


# Non-Whitened Vs. Whitened Light Curve

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

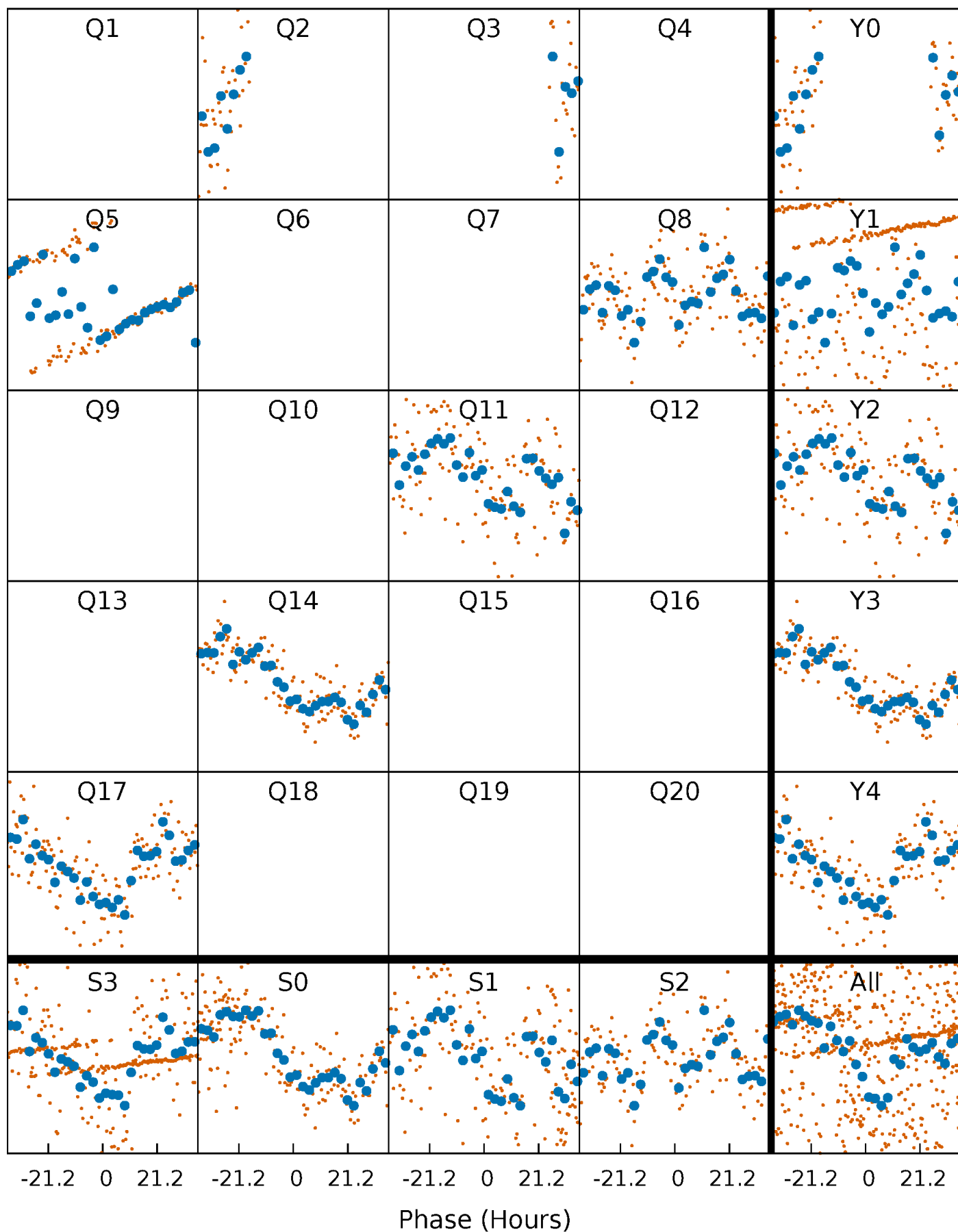


## Planet 8 : Phased Whitened Flux Time Series (Fit Epoch/Period)



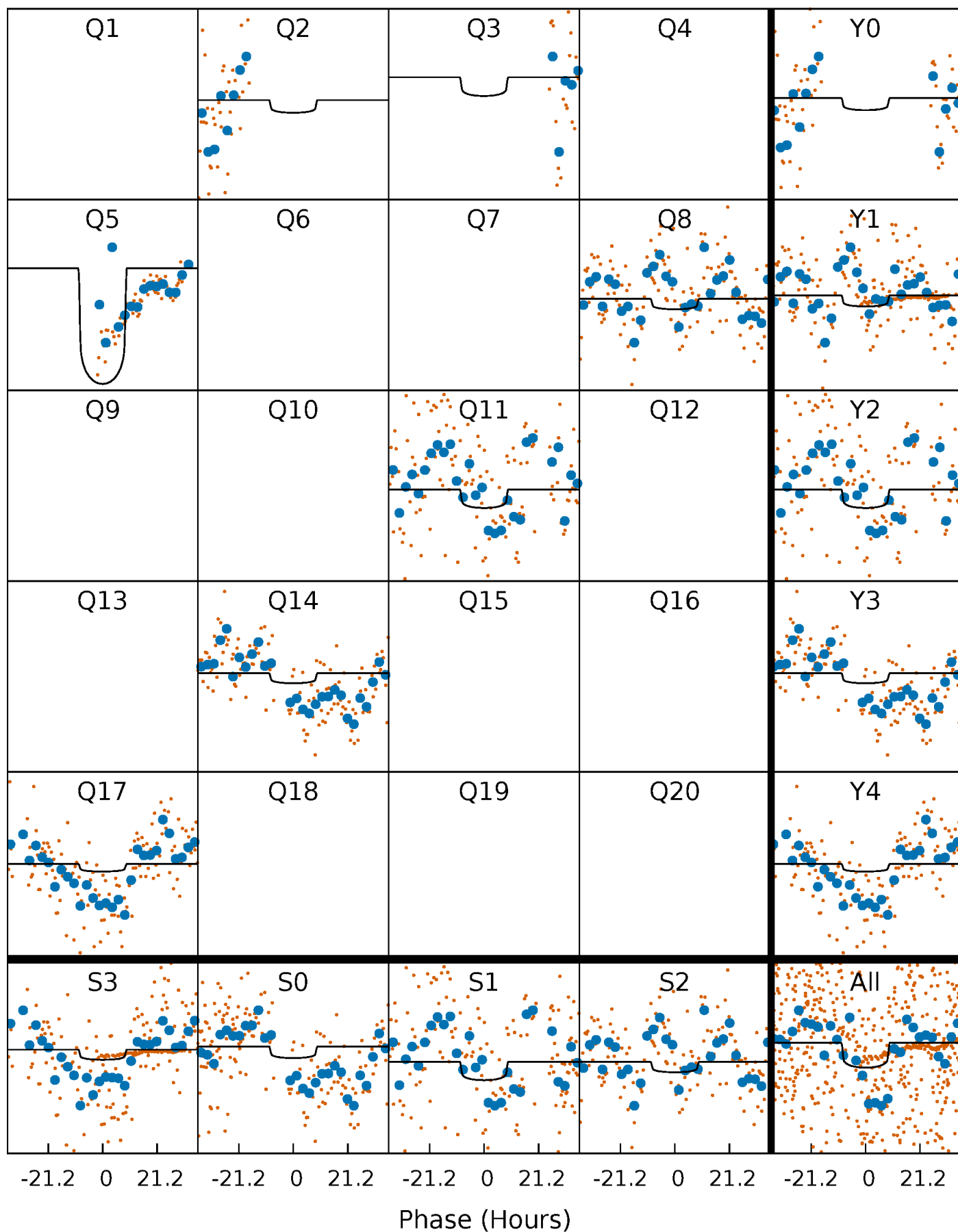
# PDC Quarter-Phased Transit Curves

TCE 007971540-08 P=262.610321 Days  $T_0=259.184059$  (BKJD)



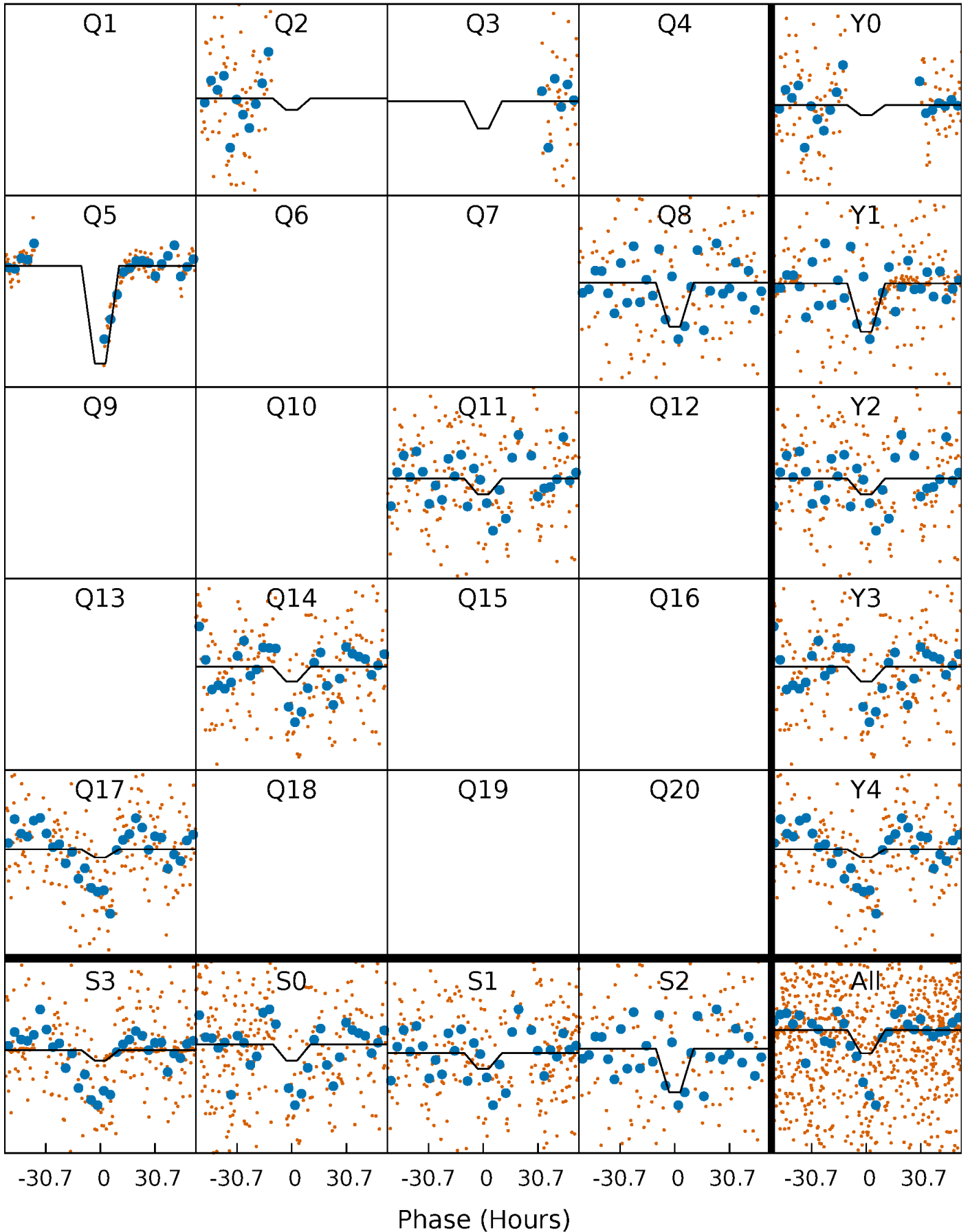
# DV Quarter-Phased Transit Curves

TCE 007971540-08     $P=262.610321$  Days     $T_0=259.184059$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

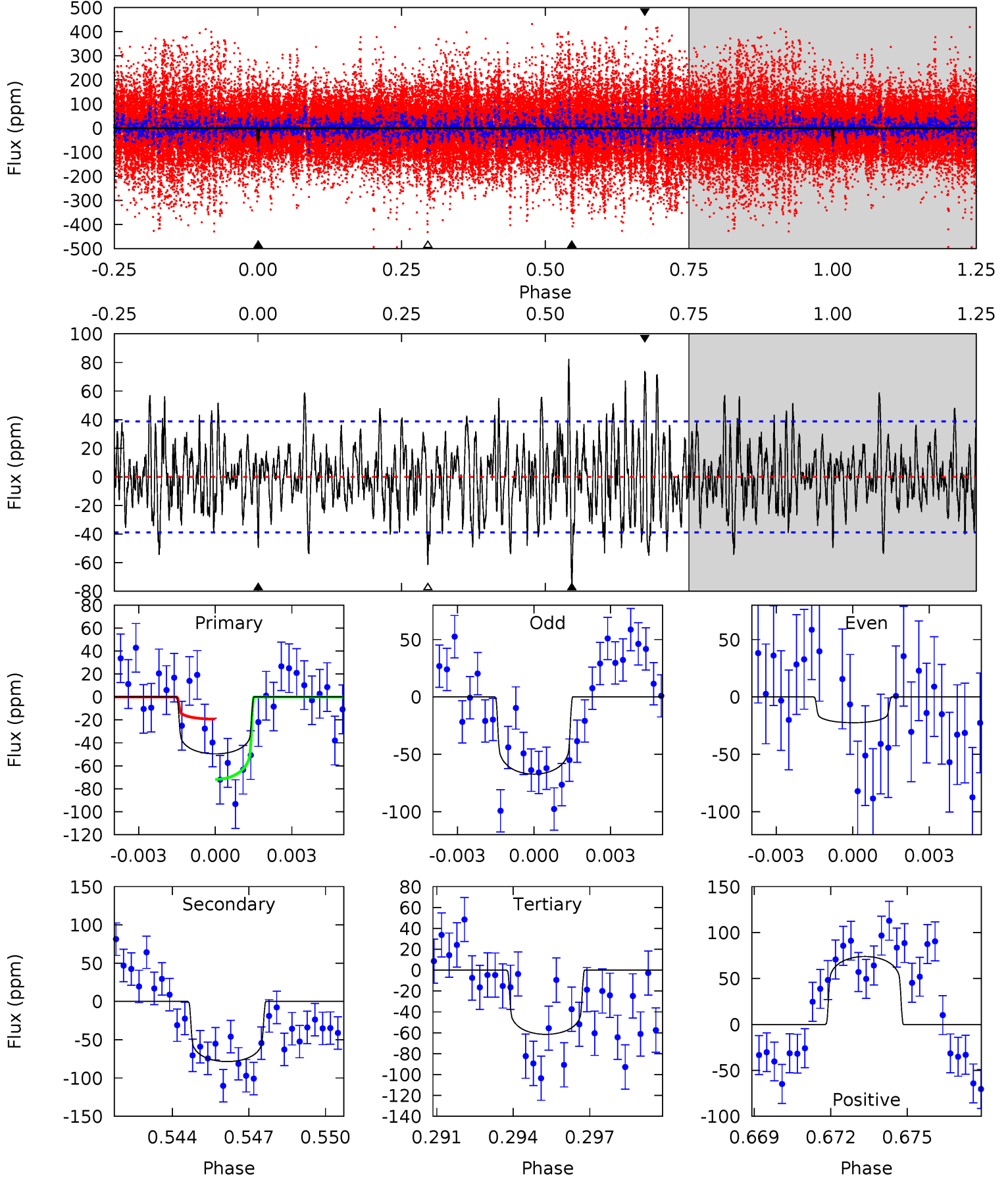
TCE 007971540-08 P=262.680225 Days  $T_0=258.945491$  (BKJD)



# DV Model-Shift Uniqueness Test

007971540-08, P = 262.610321 Days, E = 259.184059 Days

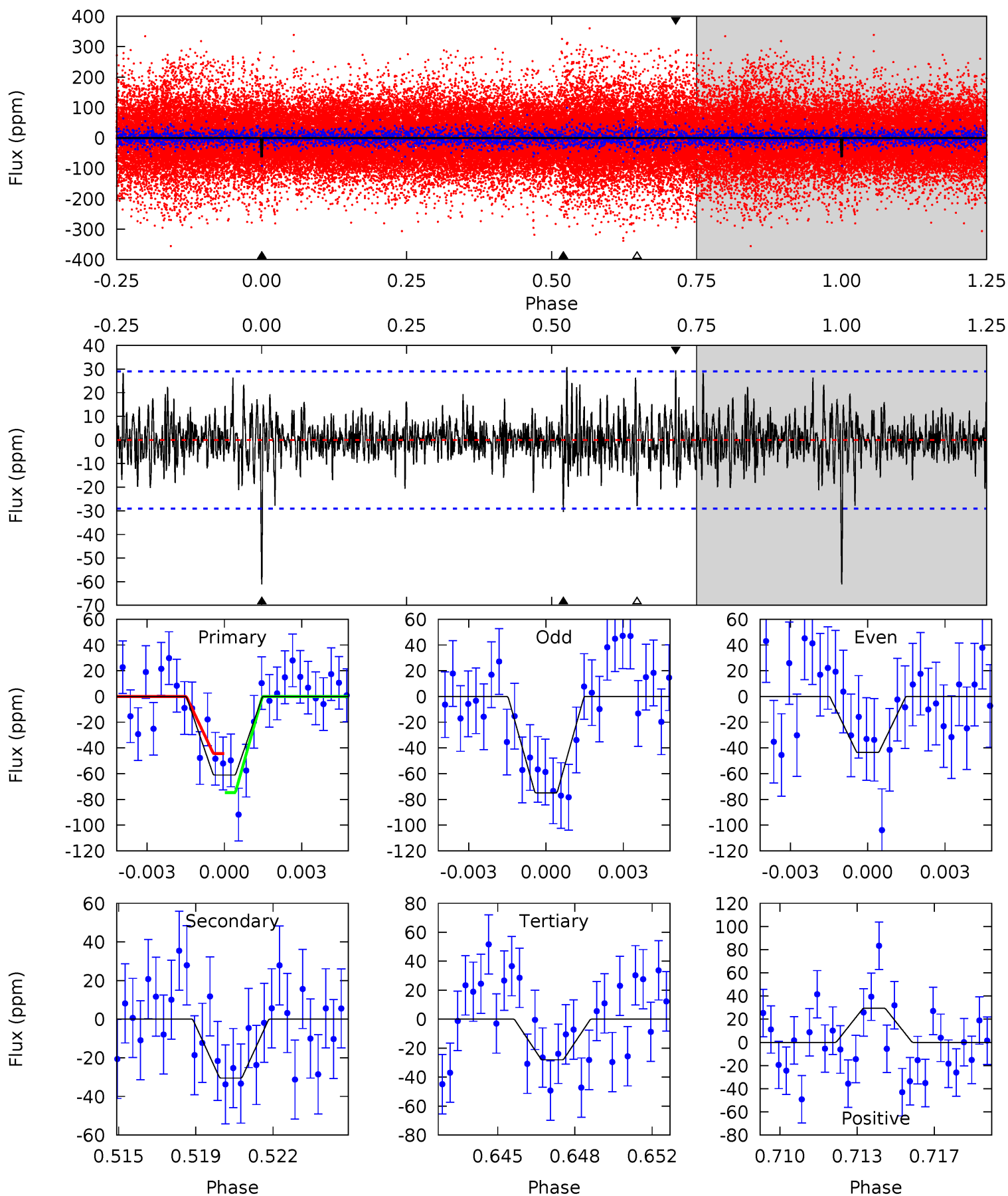
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.72	10.6	8.34	10.0	5.25	2.97	2.89	-1.61	-3.30	2.31	0.62	2.90	1.81	0.51	3.50



# Alt Model-Shift Uniqueness Test

007971540-08, P = 262.680225 Days, E = 258.945491 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
11.0	5.49	5.03	5.30	5.23	2.93	1.32	5.96	5.70	0.45	0.19	2.80	1.95	0.34	2.70





### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-08 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-79 \pm 7$	$1.04^{+0.22}_{-0.21}$	$576^{+37}_{-46}$	$8529^{+945}_{-790}$	$28089^{+15567}_{-8598}$
Alt.	$-30 \pm 6$	$0.87^{+0.20}_{-0.19}$	$573^{+39}_{-46}$	$7110^{+878}_{-710}$	$15424^{+10085}_{-5183}$

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

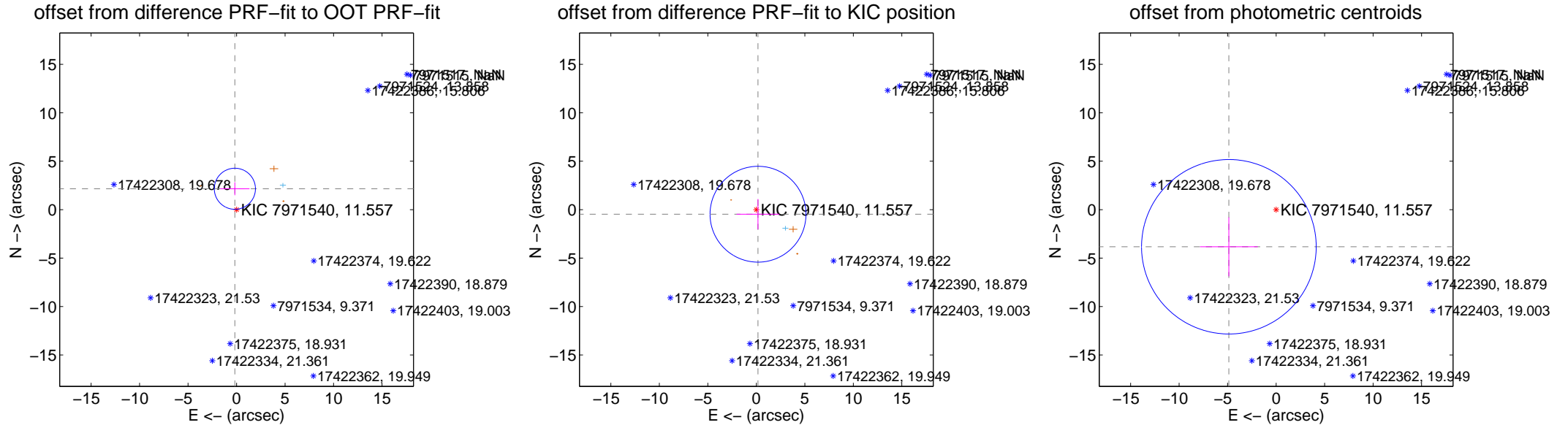
## DV Centroid Data

Supplemental centroid analysis for 007971540-08. **Kepler magnitude: 11.56.** Transit SNR 4.66

**There are 1 quarters with good PRF difference image offsets**

The direct PRF centroid is offset from the target star catalog position by about 1.82 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>2.163 \pm 0.707</math></b>	<b>3.06</b>	$0.175 \pm 1.510$	$2.156 \pm 0.667$
PRF-fit source offset from KIC position	$0.502 \pm 1.649$	0.30	$-0.172 \pm 2.206$	$-0.472 \pm 1.560$
photometric centroid source offset	$6.20 \pm 3.00$	2.06	$4.87 \pm 2.98$	$-3.83 \pm 3.04$

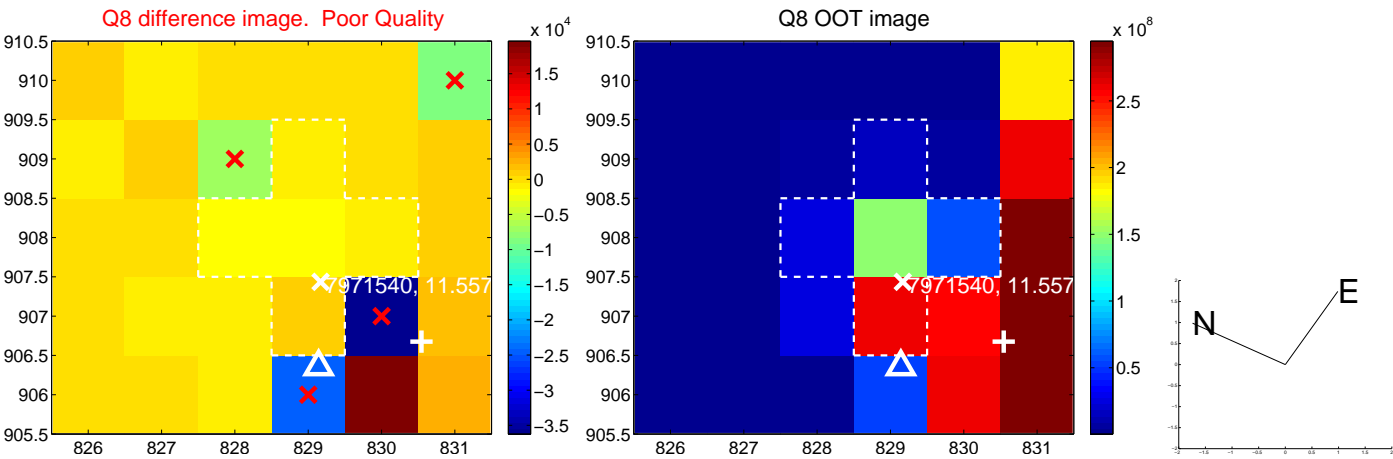
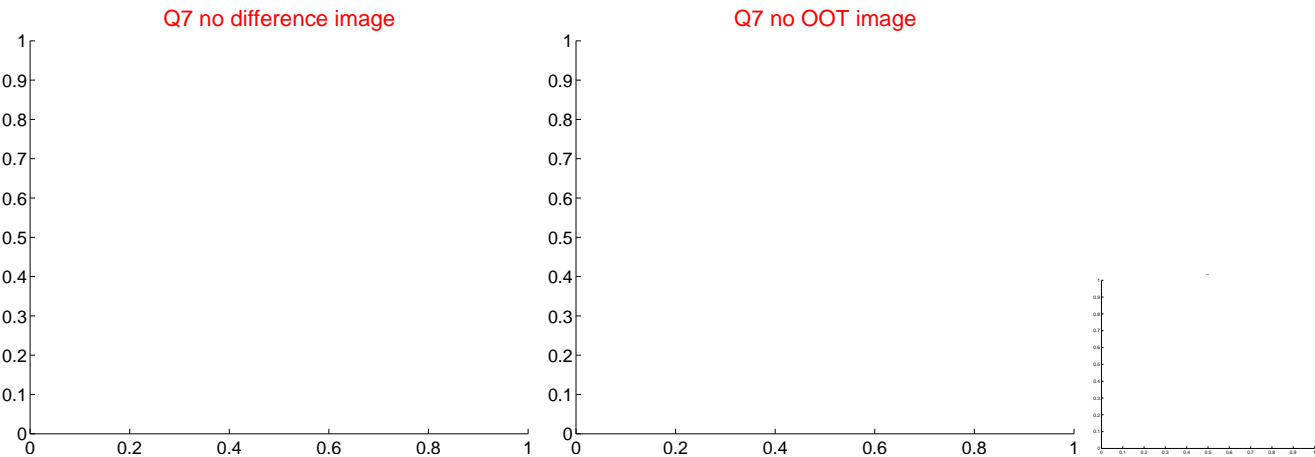
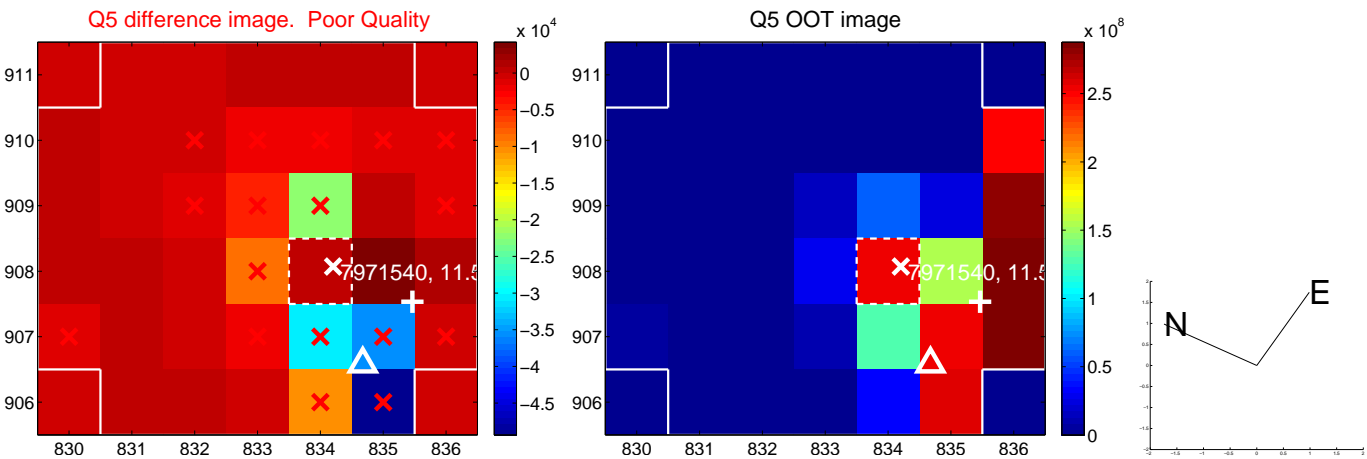


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

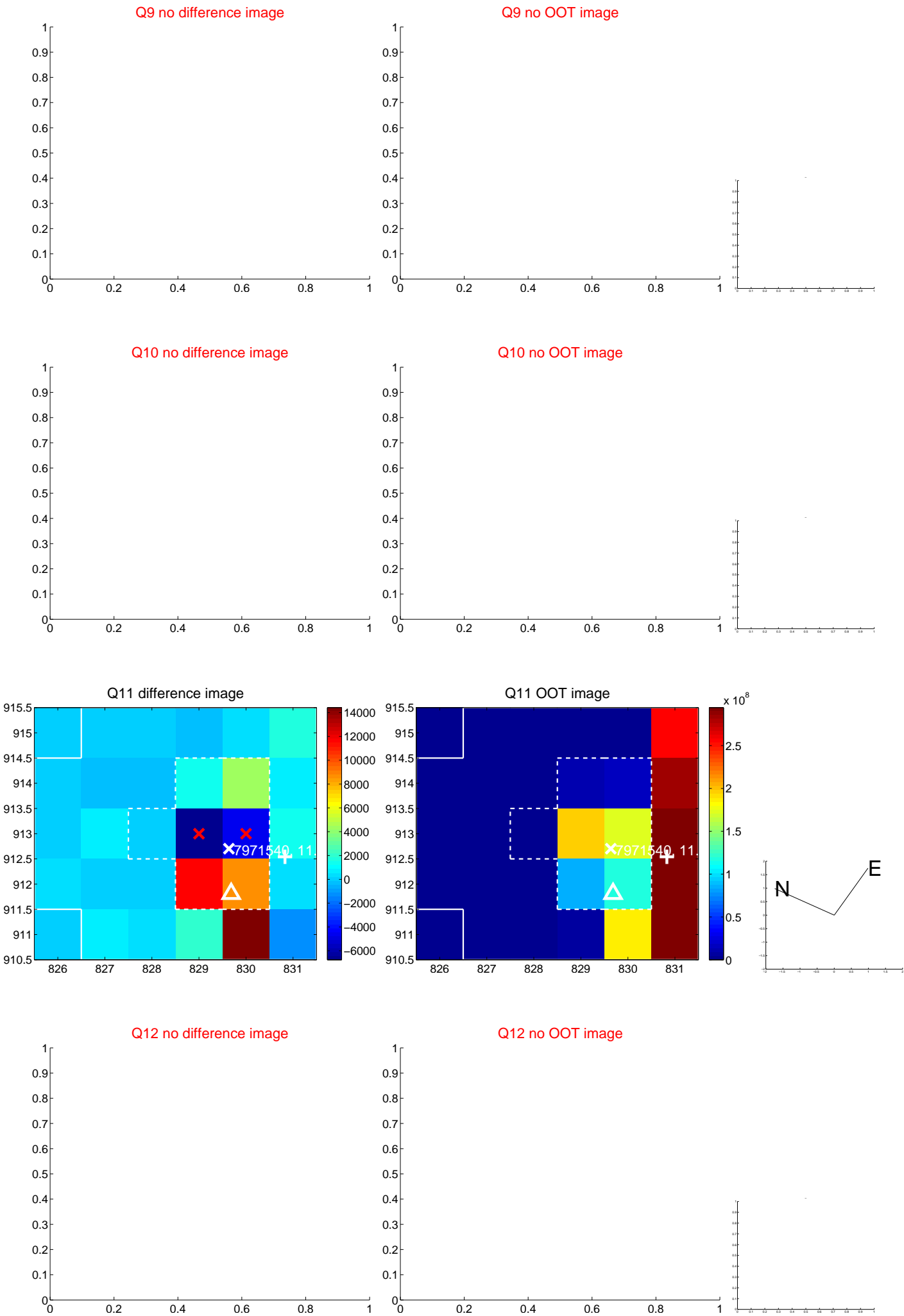
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



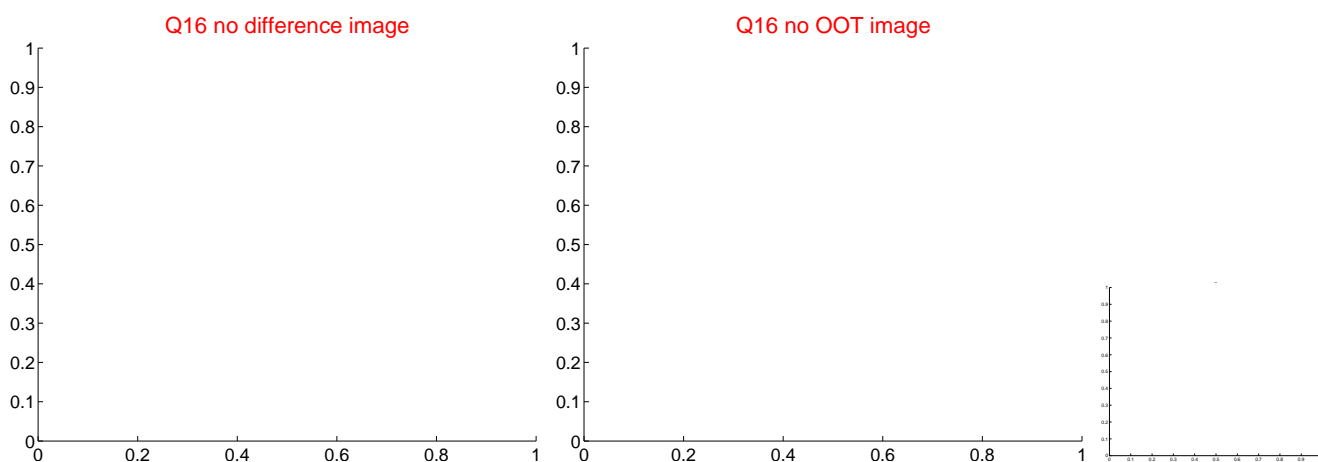
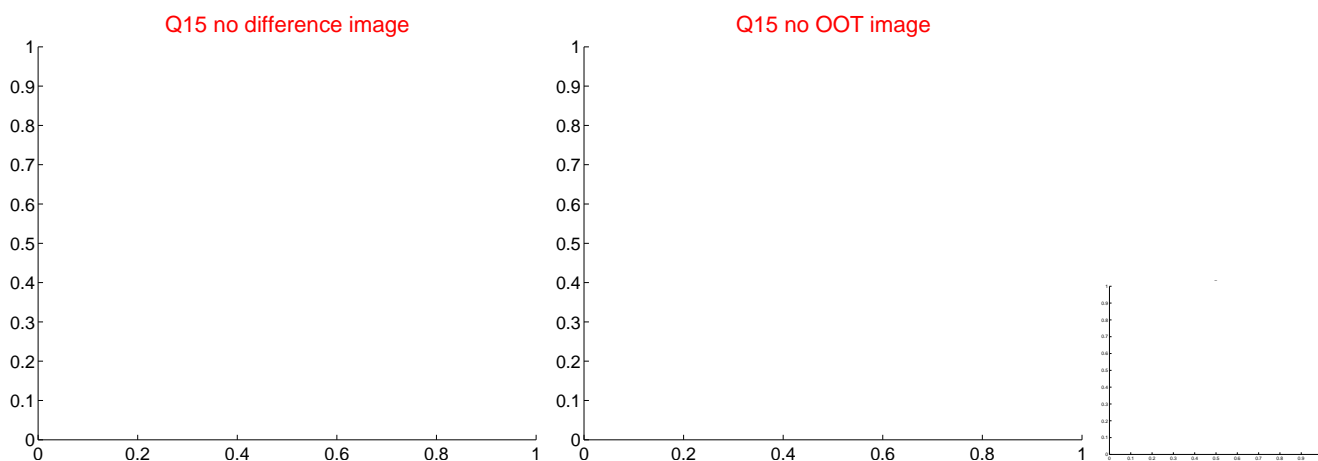
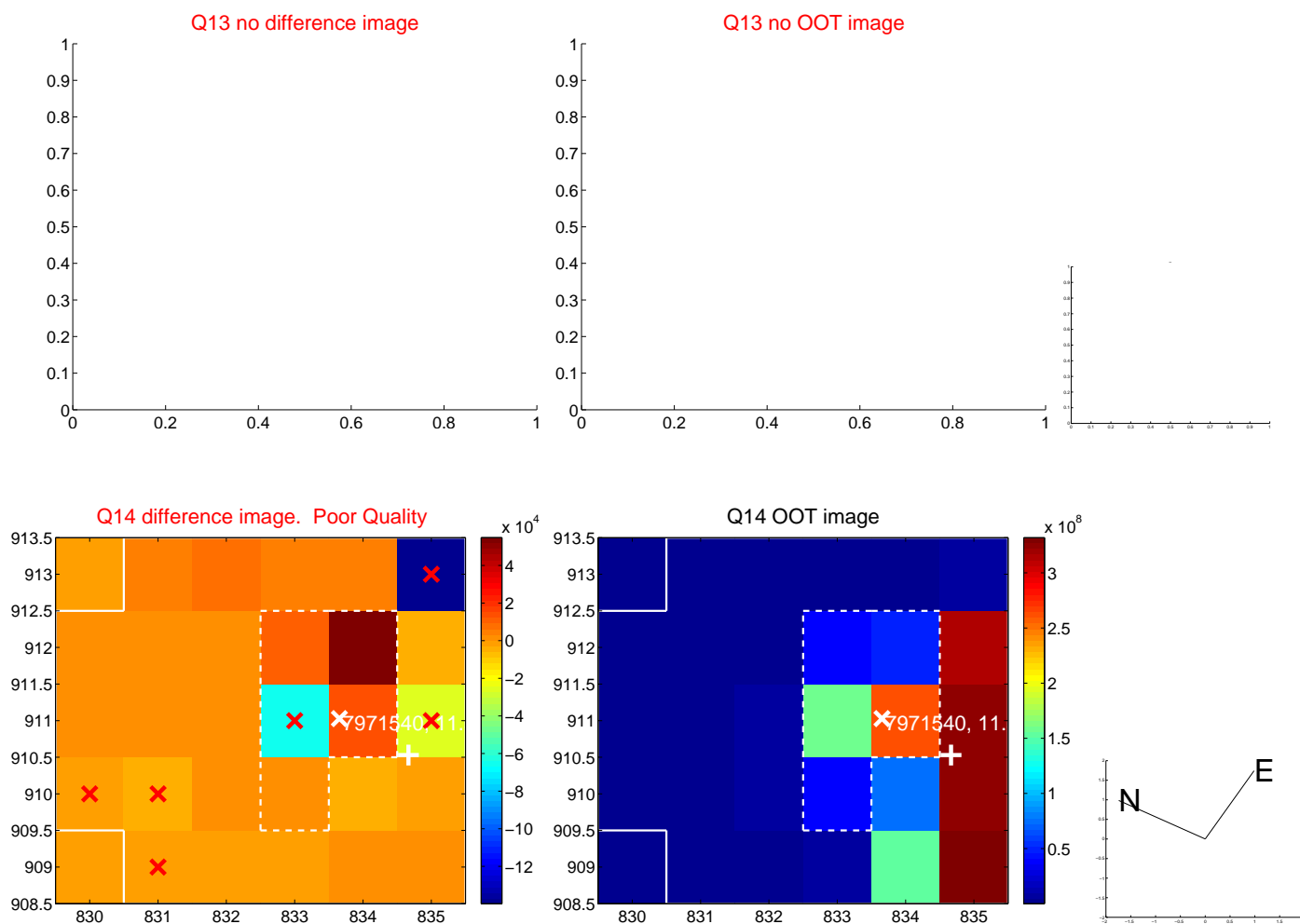
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



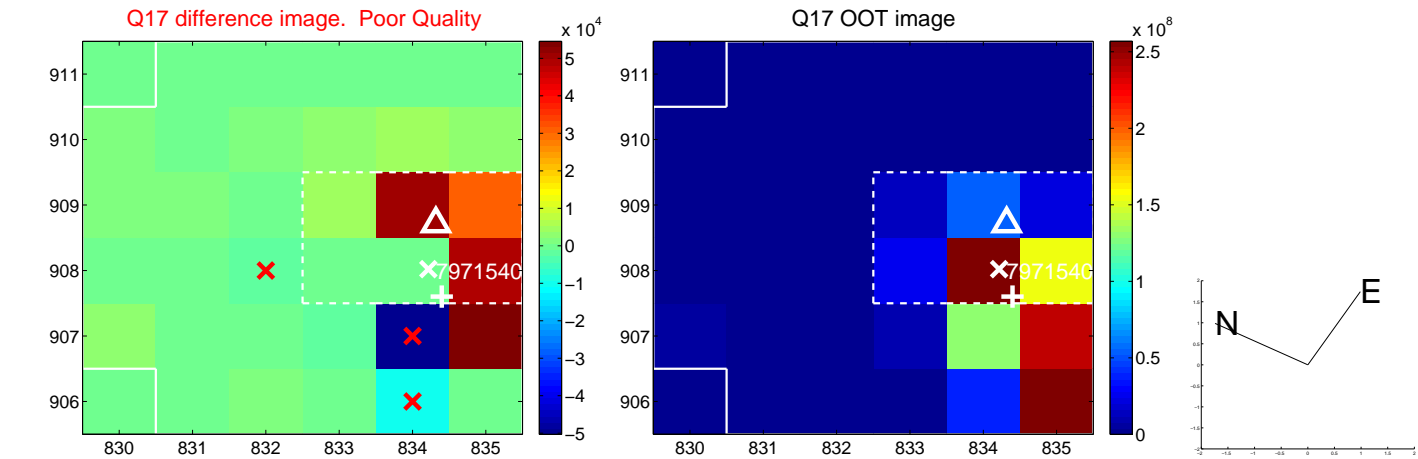
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



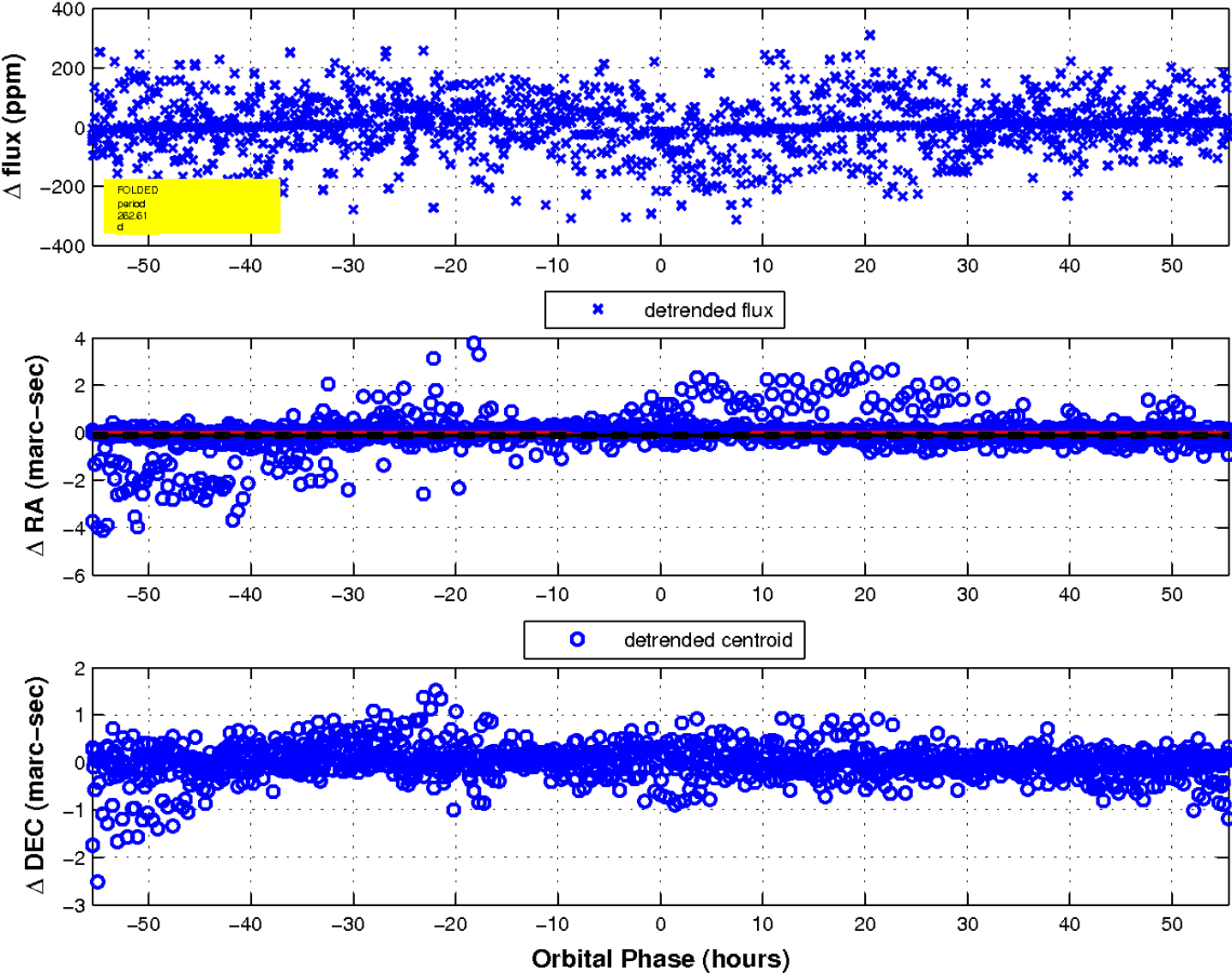
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value



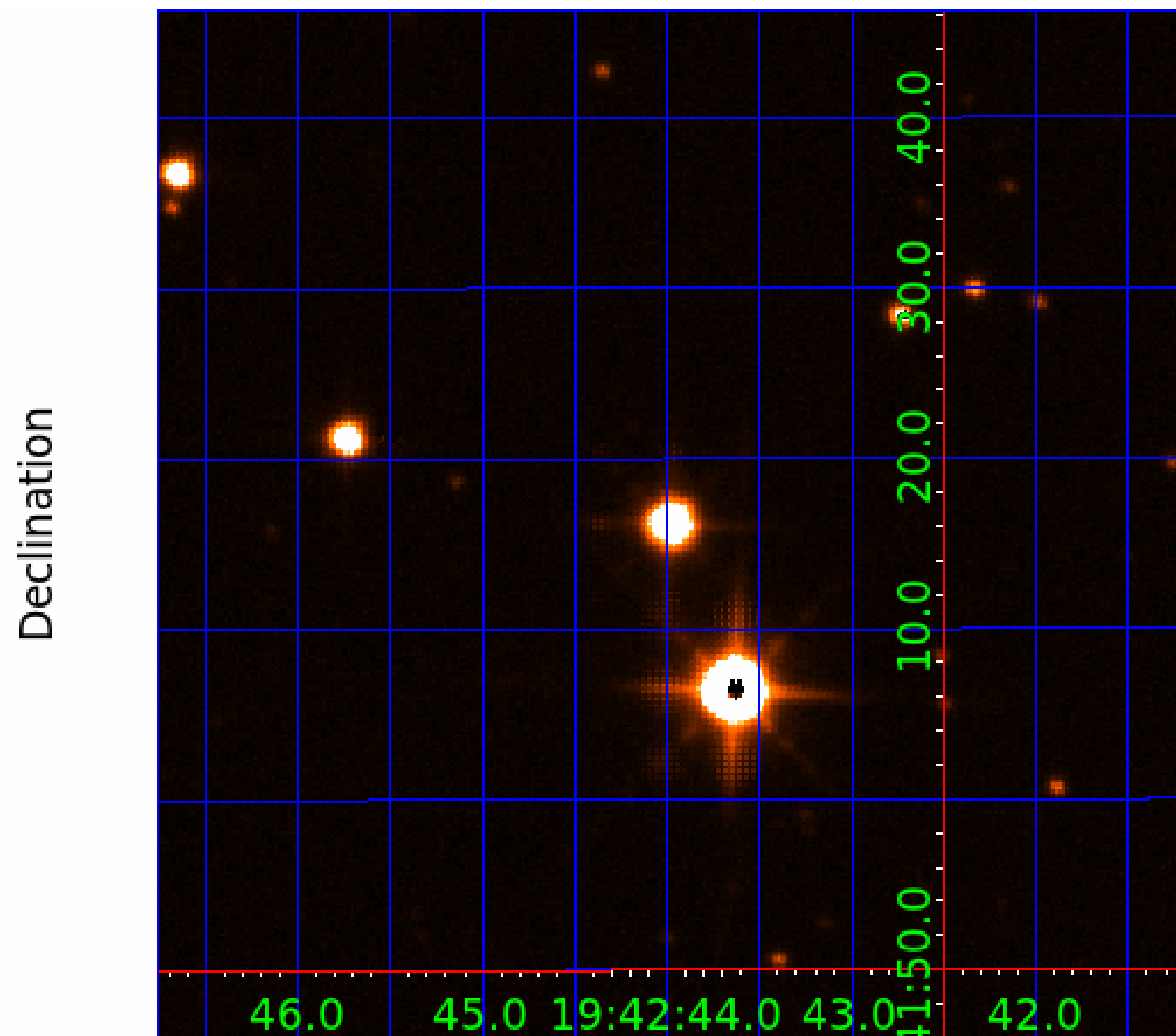
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



fluxWeightedCentroids, Planet 8 of 10



UKIRT Image





## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007971540-01	OBS	No	51.011313	166.181425	52.5	1.002	29.8	20.5	1.77	6516	1.30	64.75
007971540-02	OBS	No	52.291113	159.026037	53.9	1.214	18.0	16.2	1.77	6516	1.46	62.65
007971540-03	OBS	No	34.530503	153.062724	23.2	2.413	14.7	7.2	1.77	6516	1.02	108.94
007971540-04	OBS	No	42.975481	146.899876	56.8	0.683	13.6	15.7	1.77	6516	1.38	81.38
007971540-05	OBS	No	60.934308	143.610155	48.2	1.035	15.8	19.4	1.77	6516	1.40	51.09
007971540-06	OBS	No	71.174769	162.031760	41.4	7.231	14.7	16.6	1.77	6516	1.30	41.53
007971540-07	OBS	No	49.509656	174.313640	54.0	12.534	13.5	16.9	1.77	6516	1.52	67.38
007971540-08	OBS	No	262.610321	259.184059	26.0	18.558	13.9	4.7	1.77	6516	1.08	7.28
007971540-09	OBS	No	28.835527	150.649599	19.5	11.693	12.6	9.8	1.77	6516	0.97	138.54
007971540-10	OBS	No	59.432161	172.524554	131.2	9.000	11.7	-1.0	1.77	6516	2.04	52.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007971540-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-04	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-06	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST
007971540-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007971540-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007971540-09	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007971540-10	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

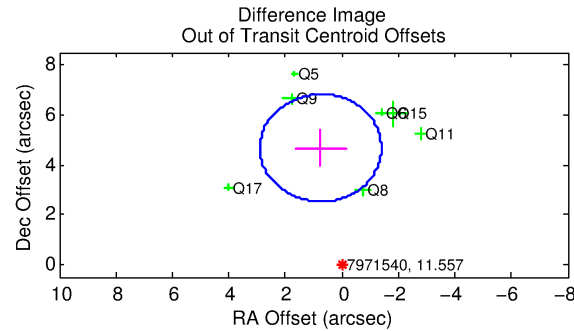
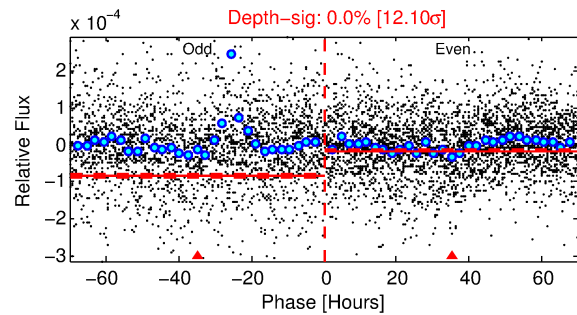
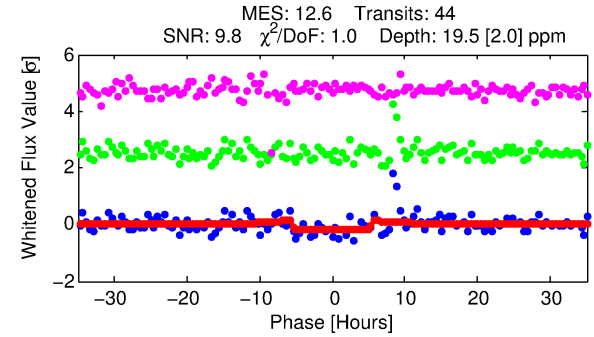
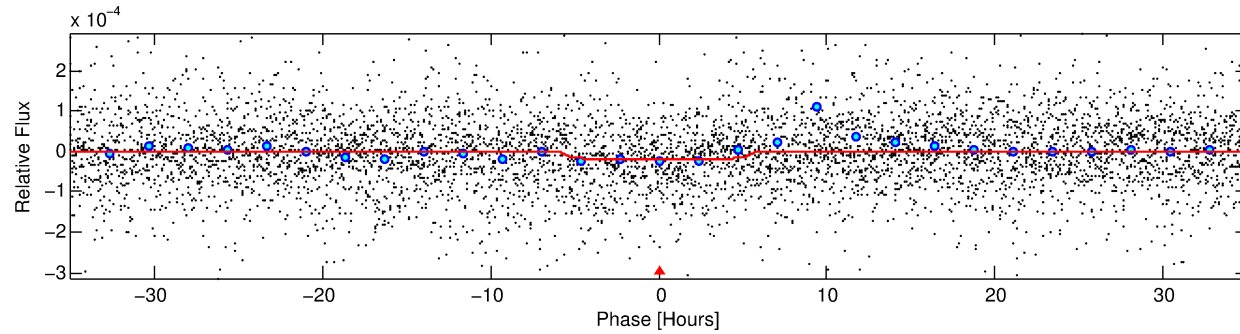
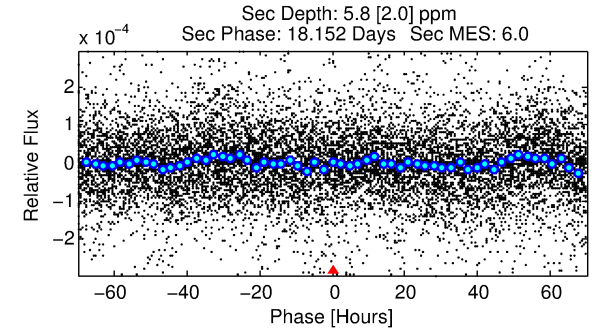
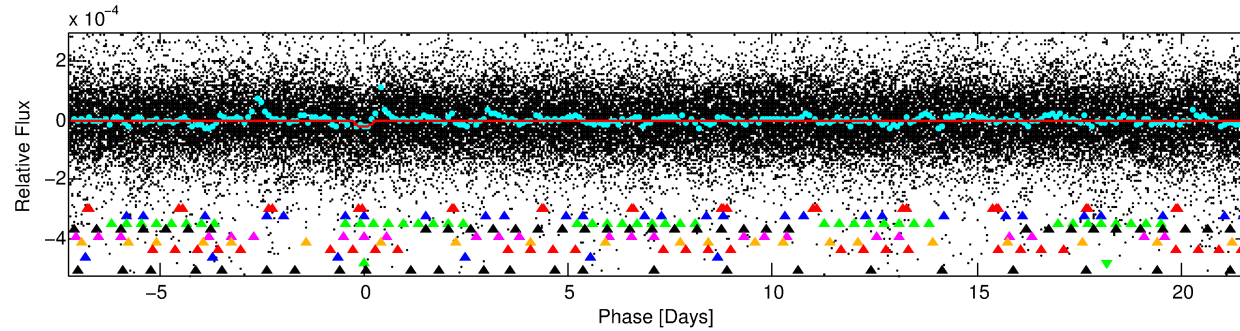
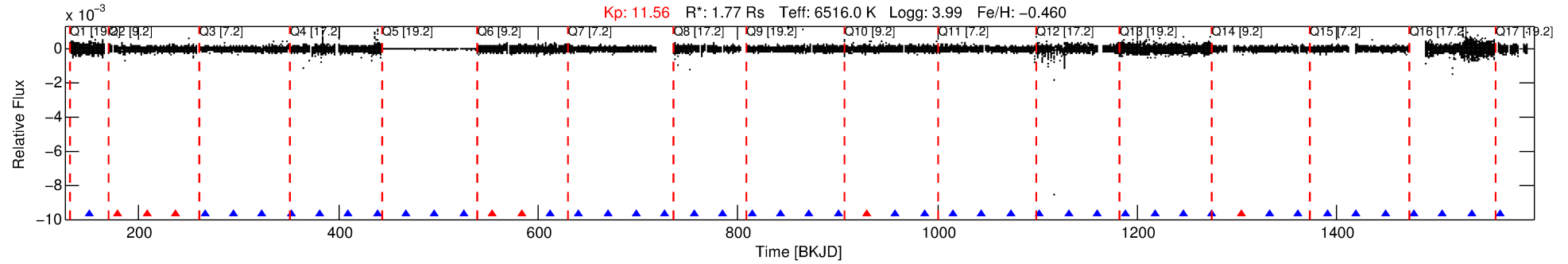
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-09

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 9 of 10 Period: 28.836 d



## DV Fit Results:

Period = 28.83553 [0.00090] d  
Epoch = 150.6496 [0.0129] BKJD  
Rp/R\* = 0.0050 [0.0003]  
a/R\* = 6.07 [1.49]  
b = 0.95 [0.02]  
Seff = 138.54 [66.77]  
Teq = 875 [105] K  
Rp = 0.97 [0.30] Re  
a = 0.1911 [0.0552] AU  
Ag = 124.77 [73.91] [1.67σ]  
Teffp = 4520 [442] K [8.02σ]

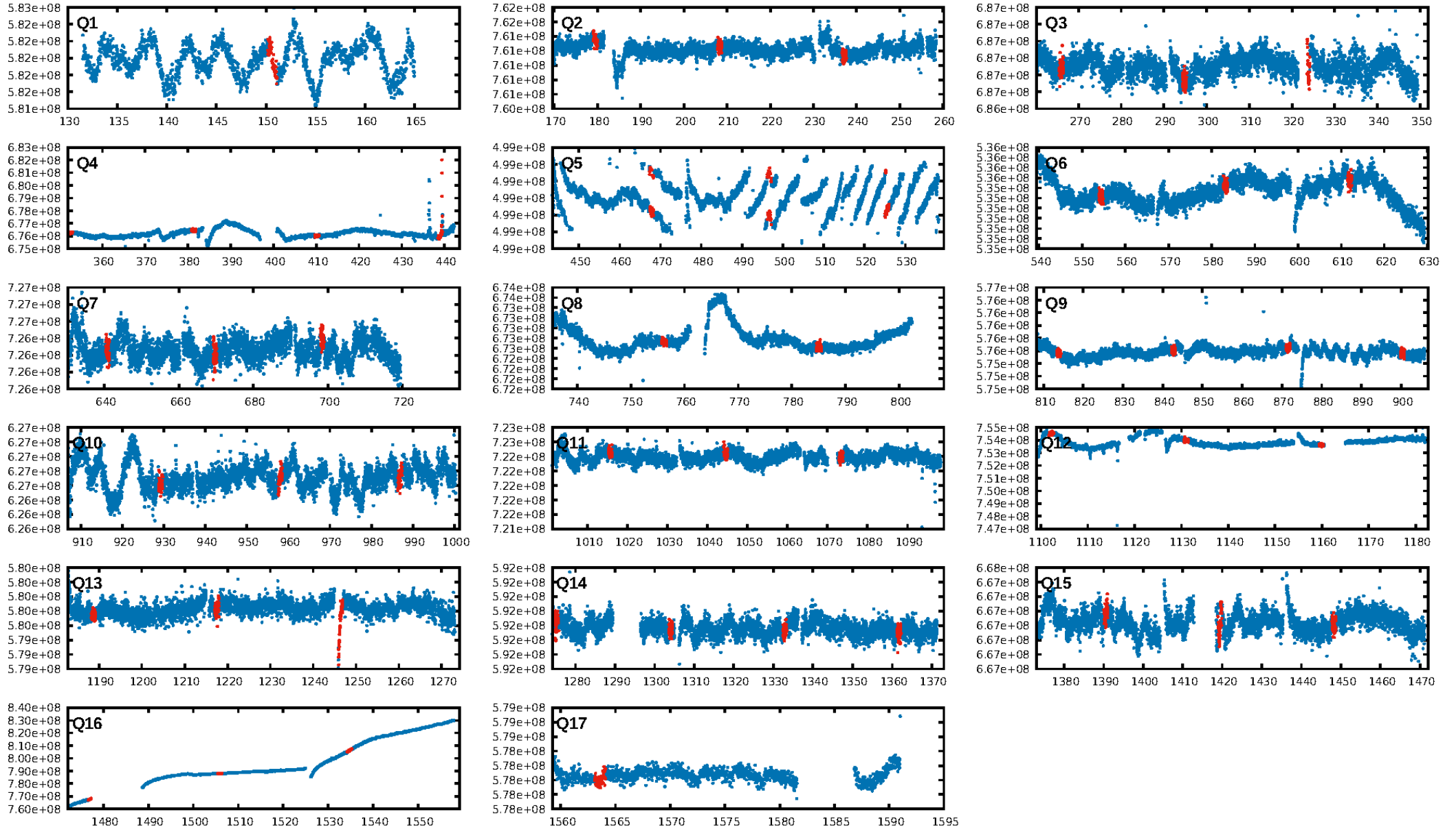
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: 100.0% [11.45σ]  
ModelChiSquare2-sig: 0.0%  
ModelChiSquareGof-sig: 100.0%  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.83 [35/42]  
GhostDiagnostic-chr: 1.689  
Centroid-sig: N/A  
Centroid-so: 5.673 arcsec [3.57σ]  
OotOffset-rm: 4.728 arcsec [6.60σ]  
KicOffset-rm: 1.942 arcsec [2.37σ]  
OotOffset-st: 1/2/1/3 [7]  
KicOffset-st: 1/2/1/3 [7]  
DiffImageQuality-fgm: 0.43 [3/7]  
DiffImageOverlap-fno: 0.94 [15/16]

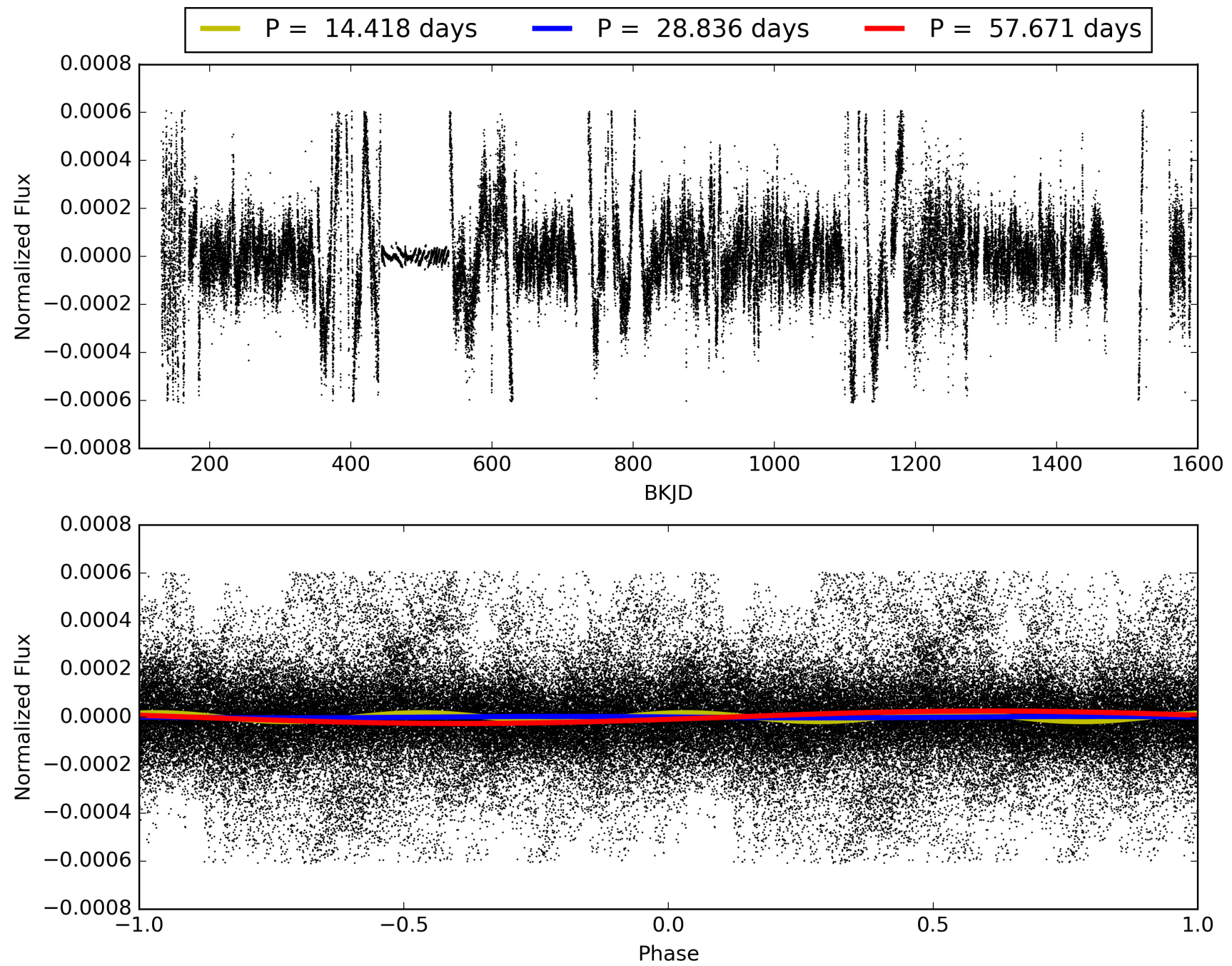
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:57:15 Z

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

# TCE 007971540-09, PDC Light Curves

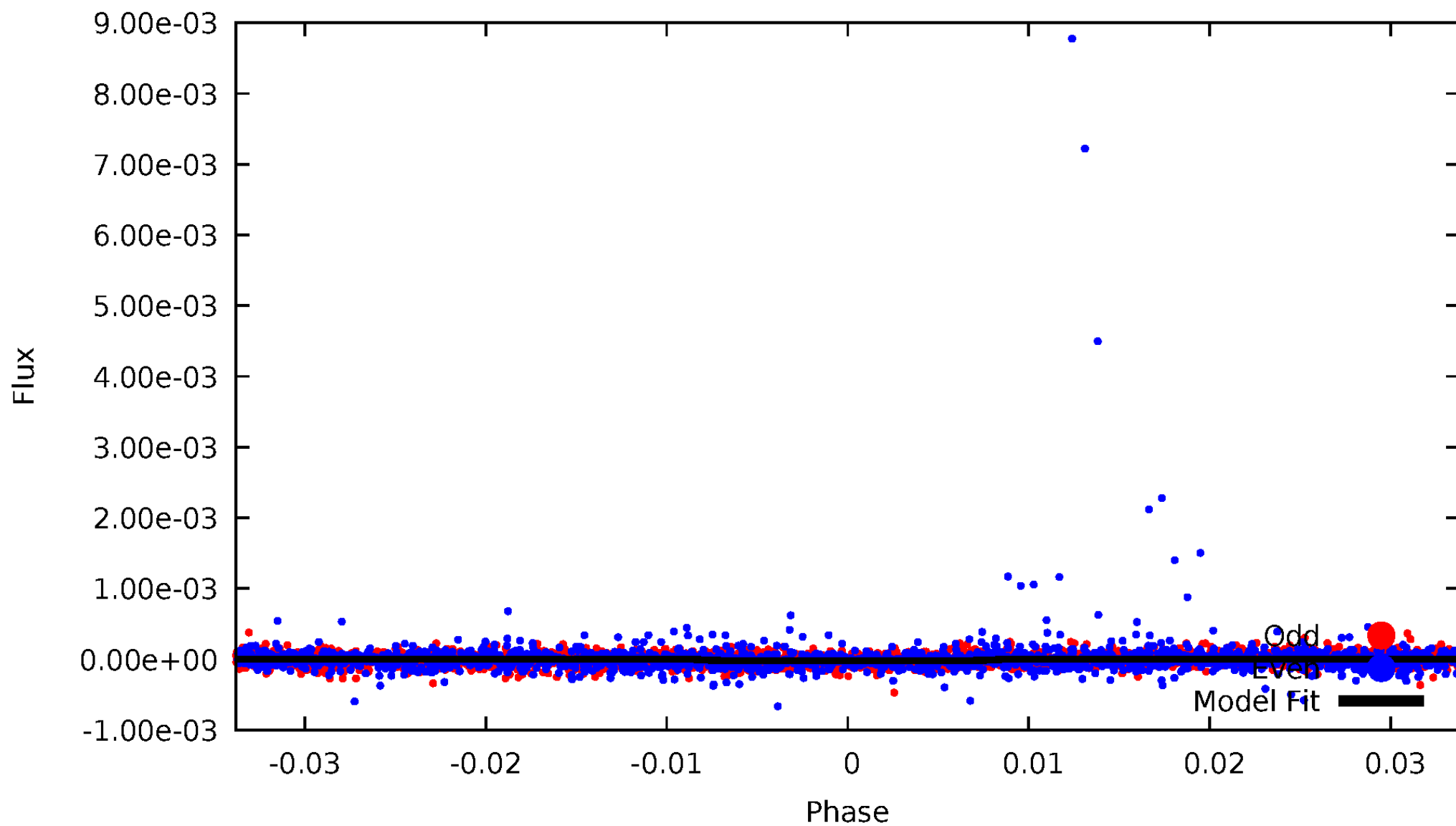


TCE 007971540-09



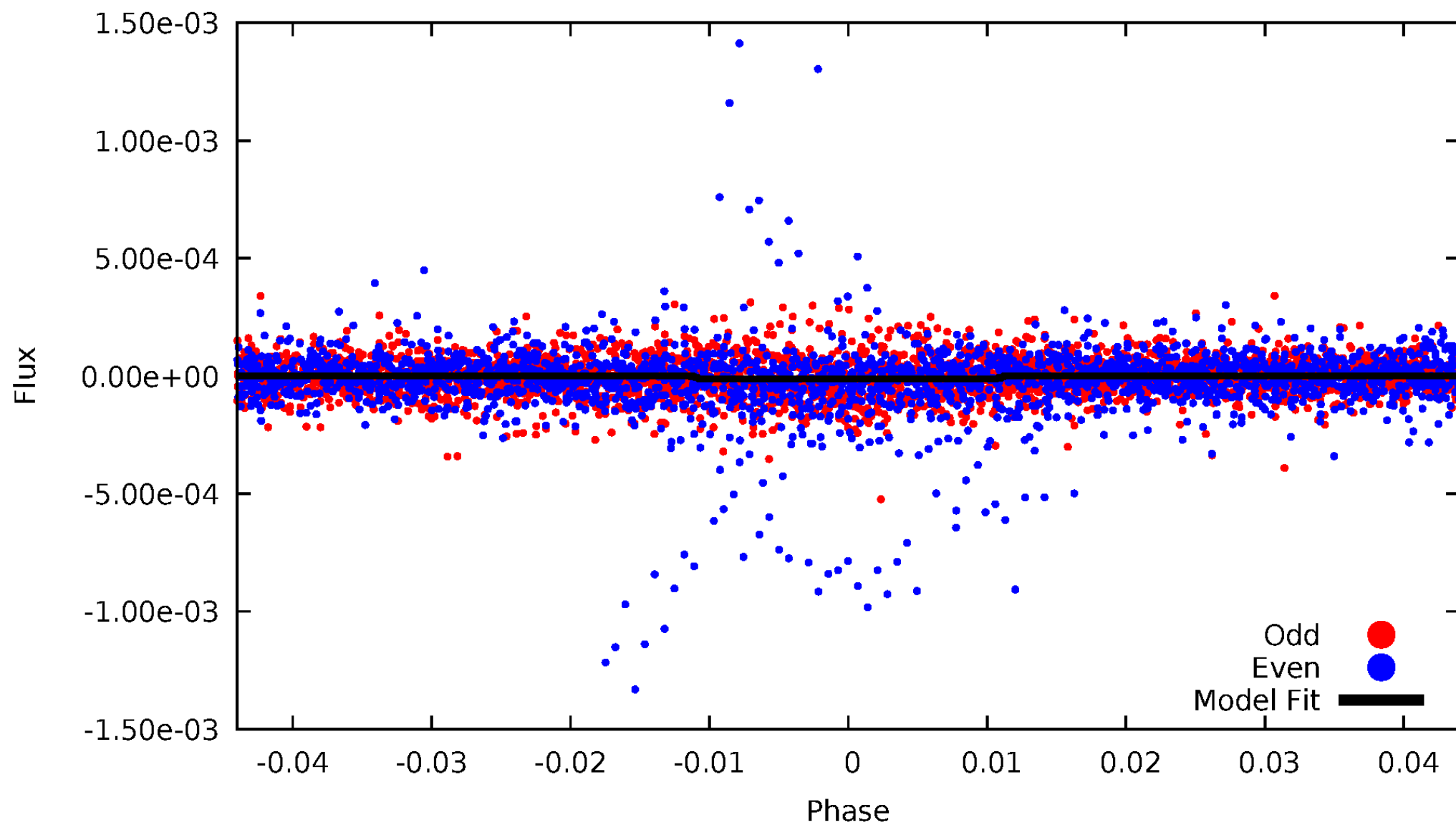
# DV Odd/Even

TCE 007971540-09



# ALT Odd/Even

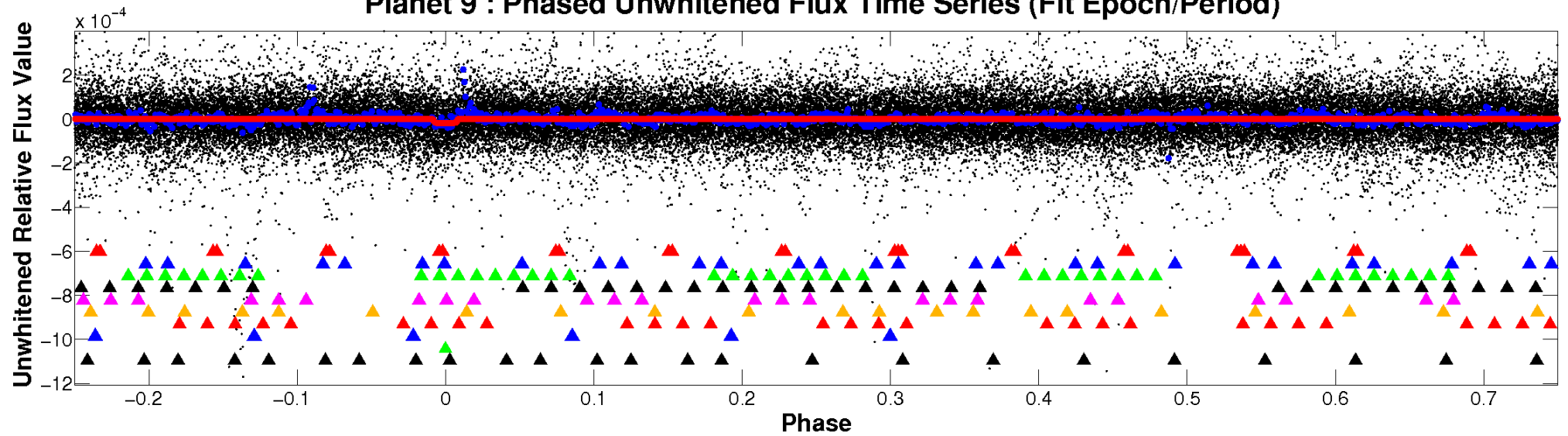
TCE 007971540-09



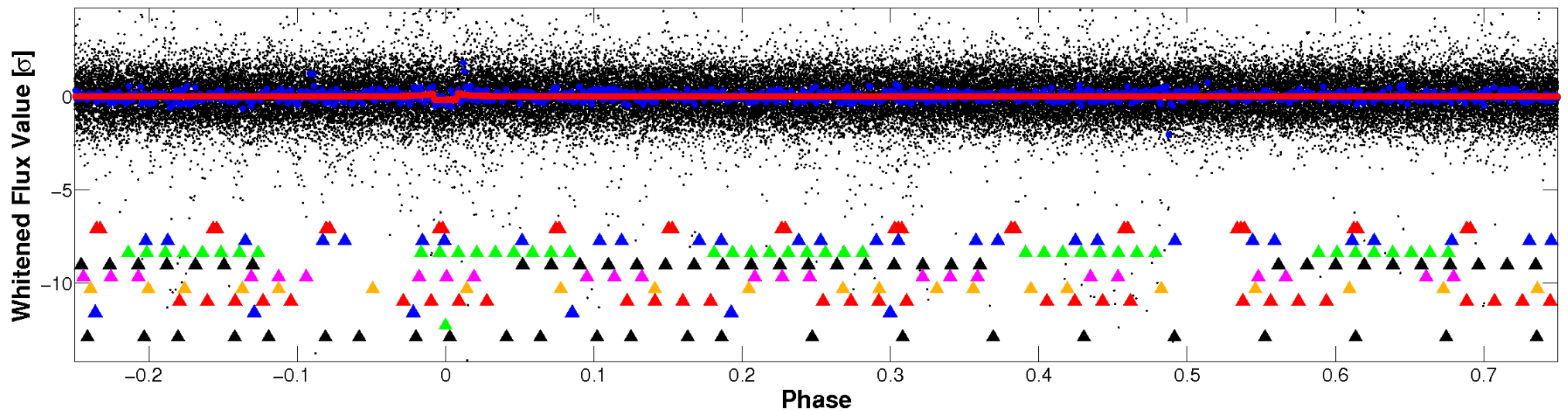


# Non-Whitened Vs. Whitened Light Curve

## Planet 9 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

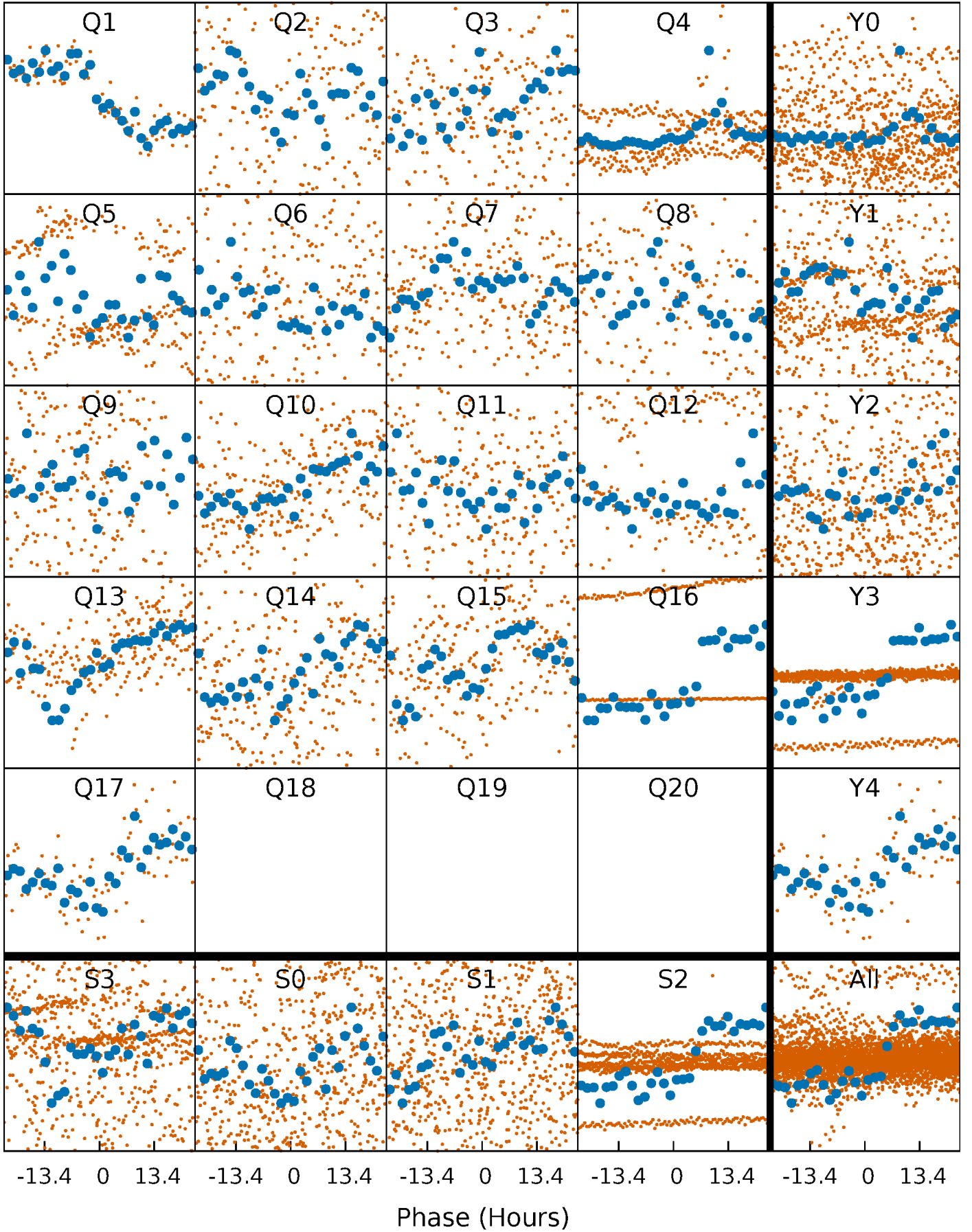


## Planet 9 : Phased Whitened Flux Time Series (Fit Epoch/Period)



# PDC Quarter-Phased Transit Curves

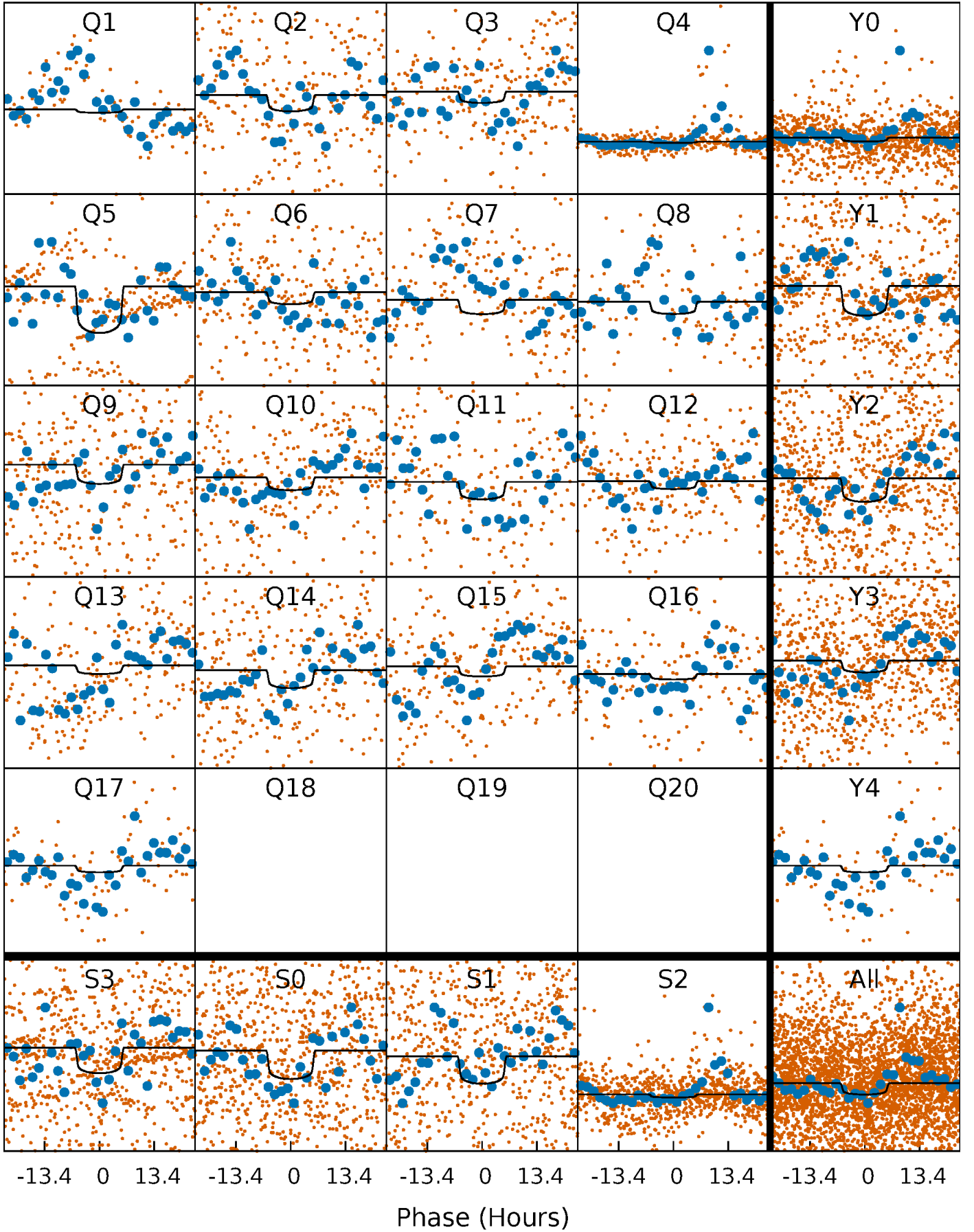
TCE 007971540-09   P= 28.835527 Days    $T_0=150.649599$  (BKJD)





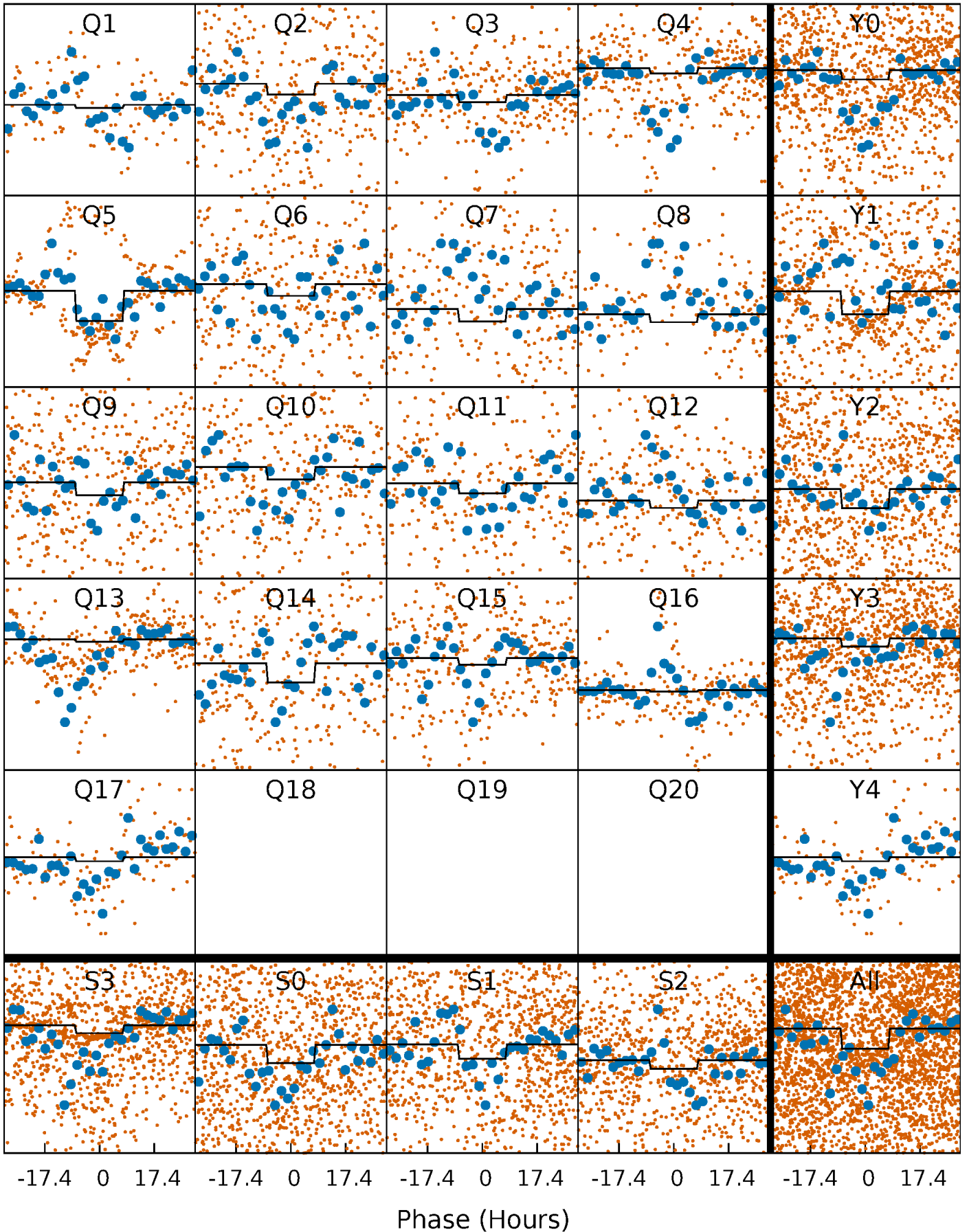
# DV Quarter-Phased Transit Curves

TCE 007971540-09     $P = 28.835527$  Days     $T_0 = 150.649599$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

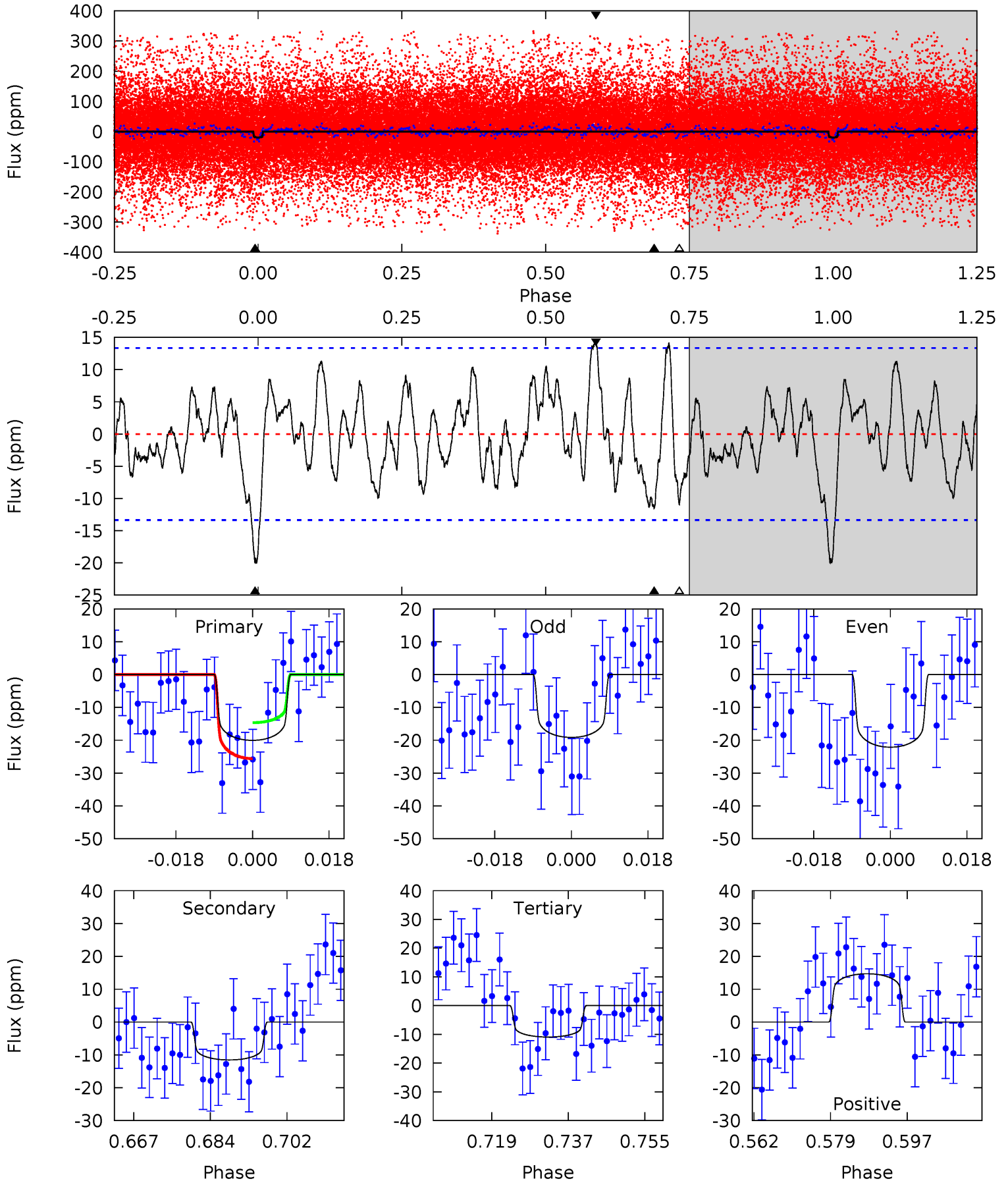
TCE 007971540-09     $P = 28.832353$  Days     $T_0 = 150.773810$  (BKJD)



## DV Model-Shift Uniqueness Test

007971540-09, P = 28.835527 Days, E = 121.814072 Days

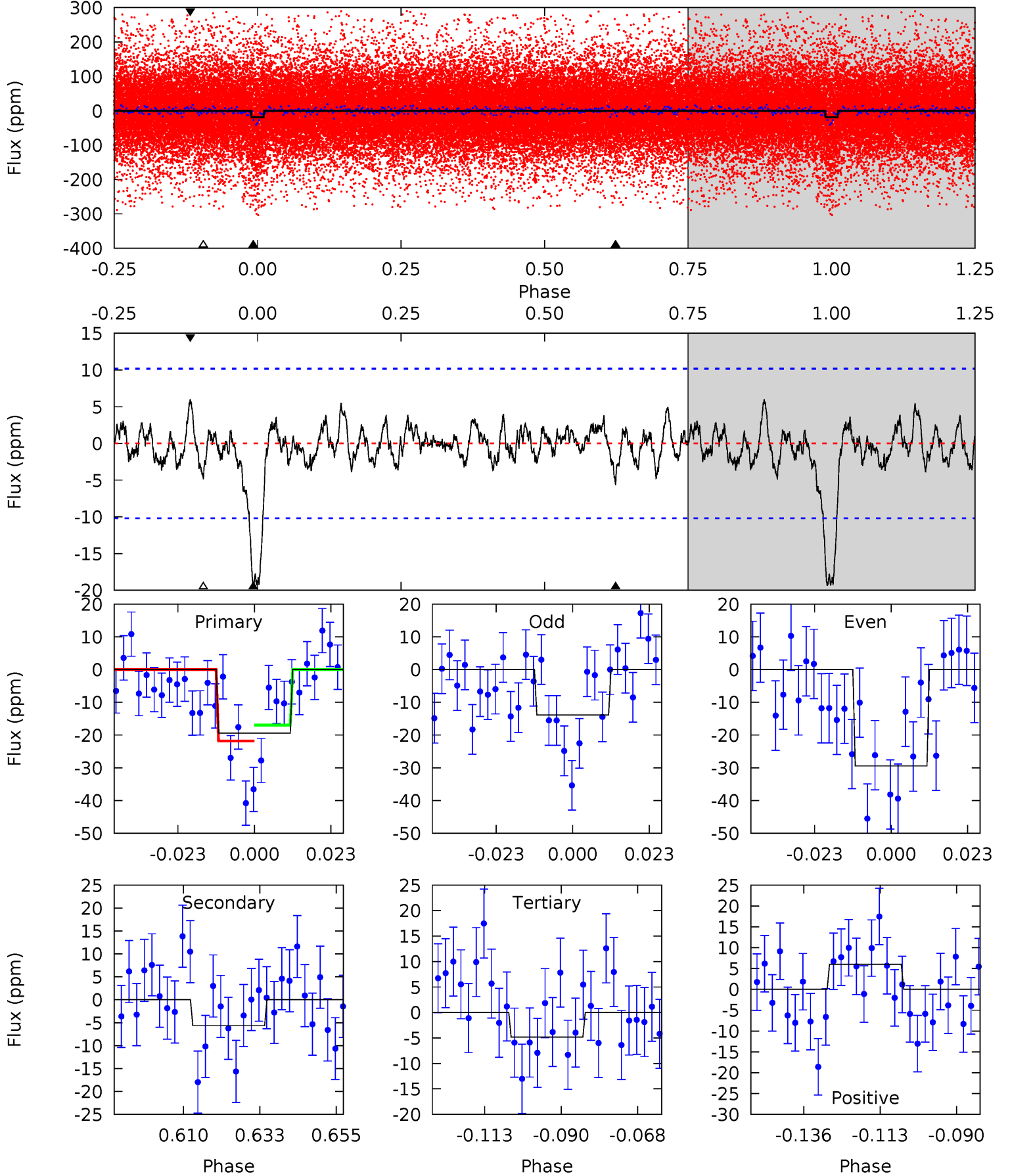
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.38	4.25	4.02	5.41	4.92	2.38	1.94	3.36	1.97	0.23	-1.16	0.54	0.99	0.42	2.03



# Alt Model-Shift Uniqueness Test

007971540-09, P = 28.832353 Days, E = 121.941457 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
9.26	2.70	2.30	2.86	4.87	2.28	0.88	6.96	6.39	0.41	-0.16	3.66	1.48	0.24	1.17



### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-09 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{max}$ (K)	$T_{obs}$ (K)	$A_{obs}$
DV	$-12 \pm 3$	$0.93^{+0.16}_{-0.17}$	$1199^{+85}_{-103}$	$5388^{+370}_{-376}$	$271^{+126}_{-89}$
Alt.	$-6 \pm 2$	$0.67^{+0.12}_{-0.12}$	$1202^{+83}_{-104}$	$5361^{+502}_{-546}$	$263^{+154}_{-108}$

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

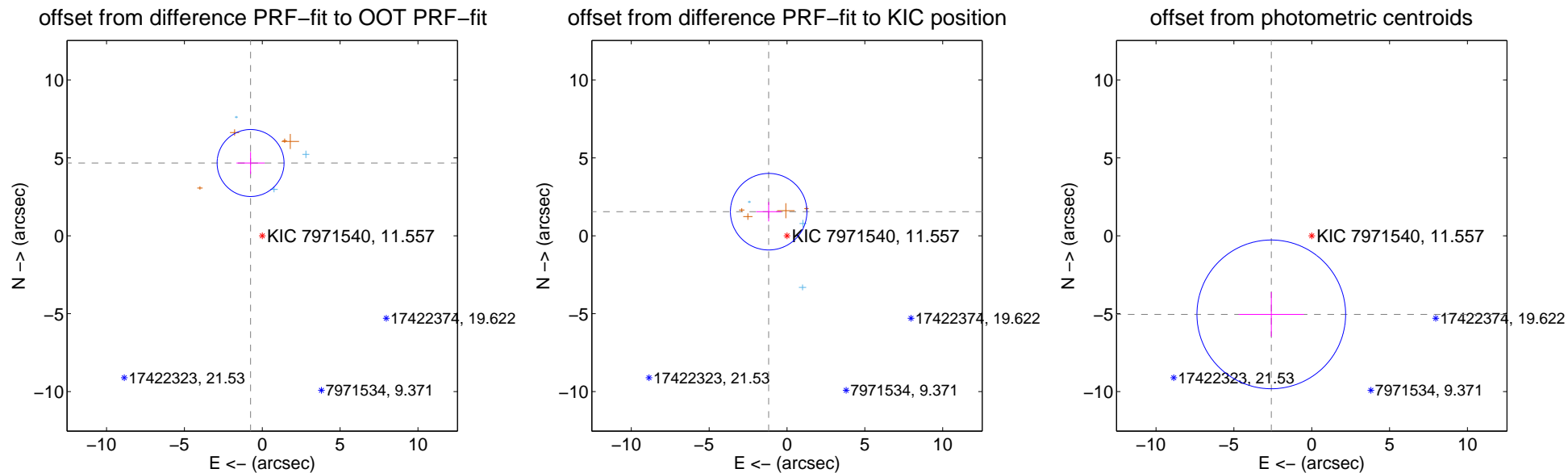
## DV Centroid Data

Supplemental centroid analysis for 007971540-09. **Kepler magnitude: 11.56.** Transit SNR 9.78

**There are 3 quarters with good PRF difference image offsets**

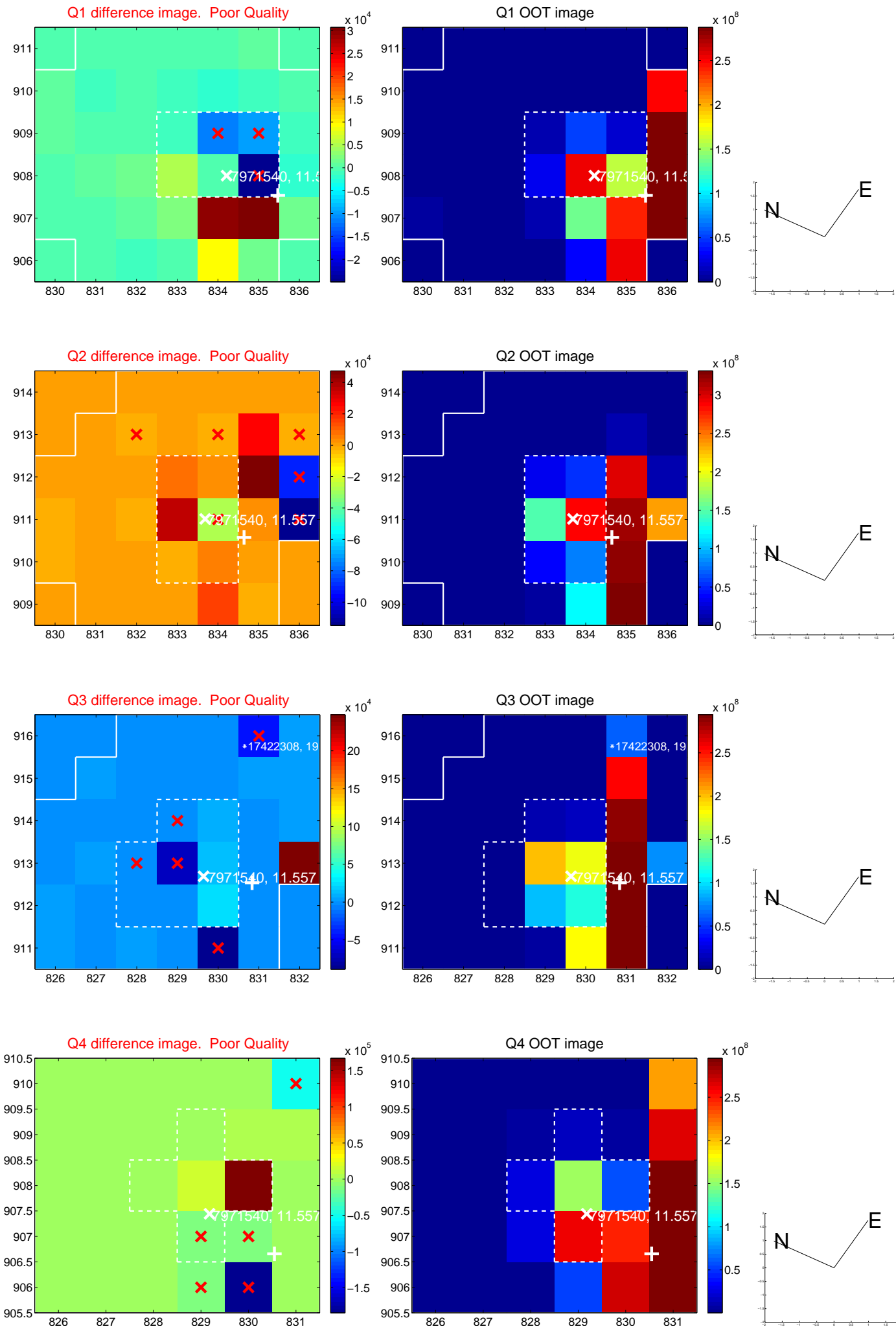
The direct PRF centroid is offset from the target star catalog position by about 1.79 arcsec

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	<b><math>4.728 \pm 0.716</math></b>	<b>6.60</b>	$0.750 \pm 0.903$	$4.669 \pm 0.711$
PRF-fit source offset from KIC position	$1.942 \pm 0.819$	2.37	$1.176 \pm 0.798$	$1.545 \pm 0.621$
photometric centroid source offset	<b><math>5.67 \pm 1.59</math></b>	<b>3.57</b>	$2.60 \pm 2.10$	$-5.04 \pm 1.43$



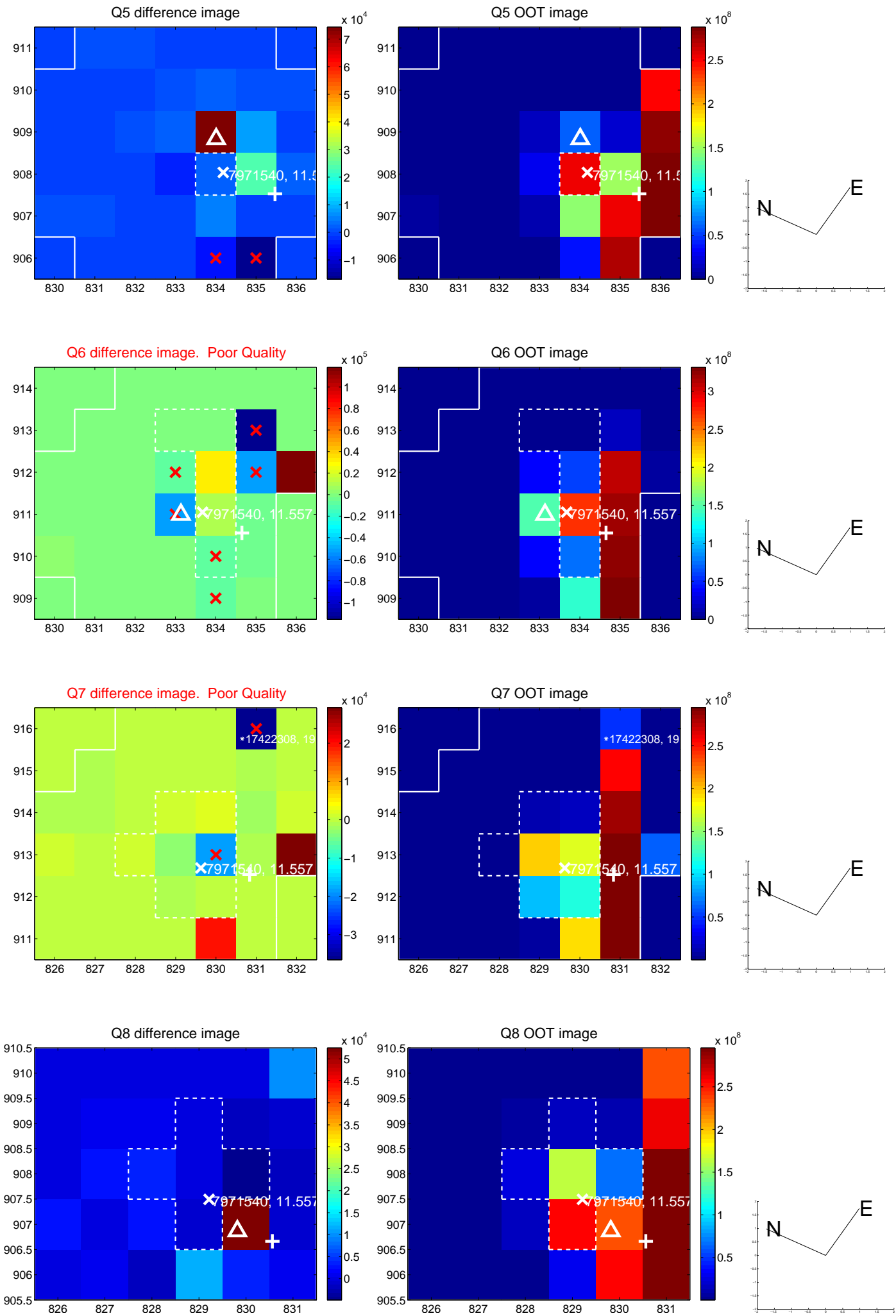
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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



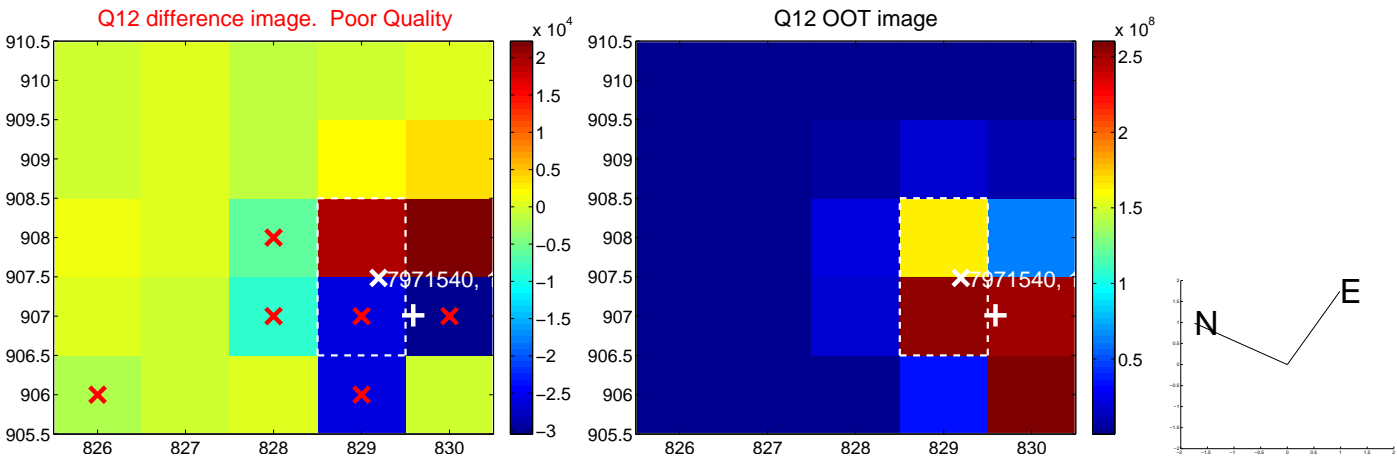
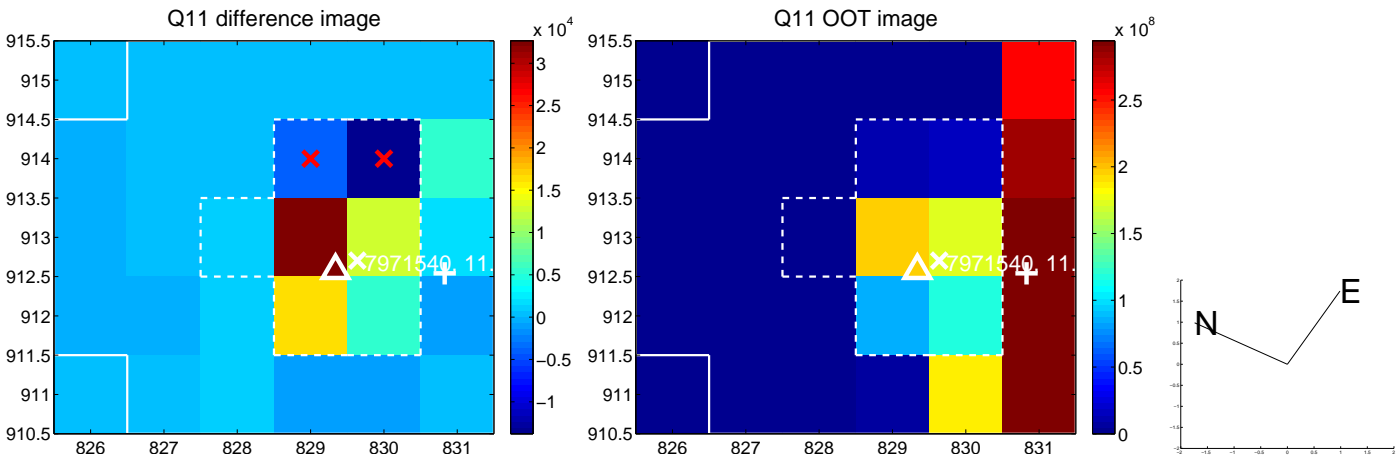
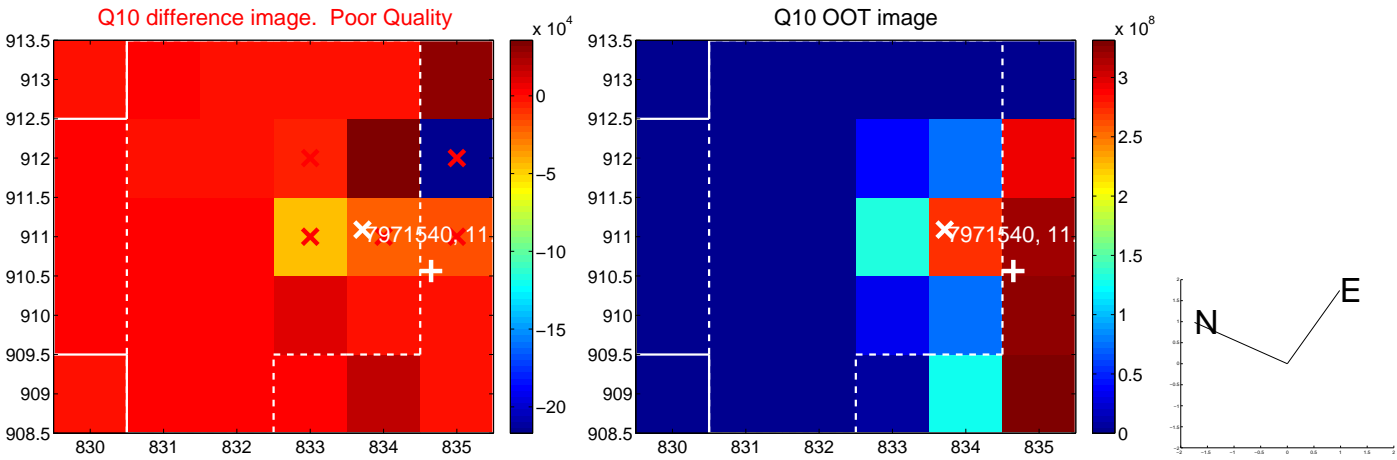
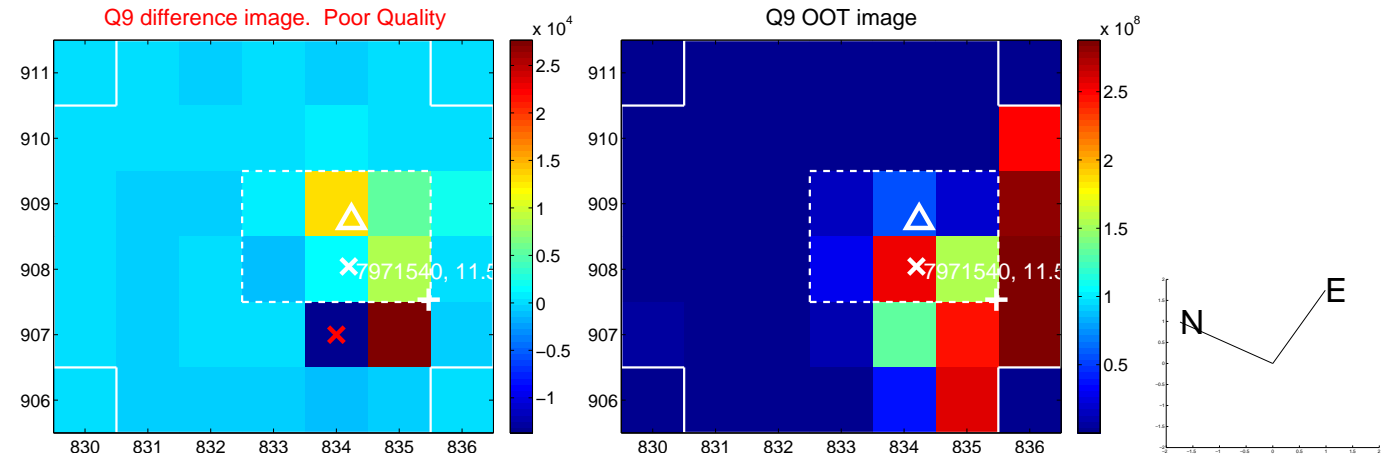


white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.

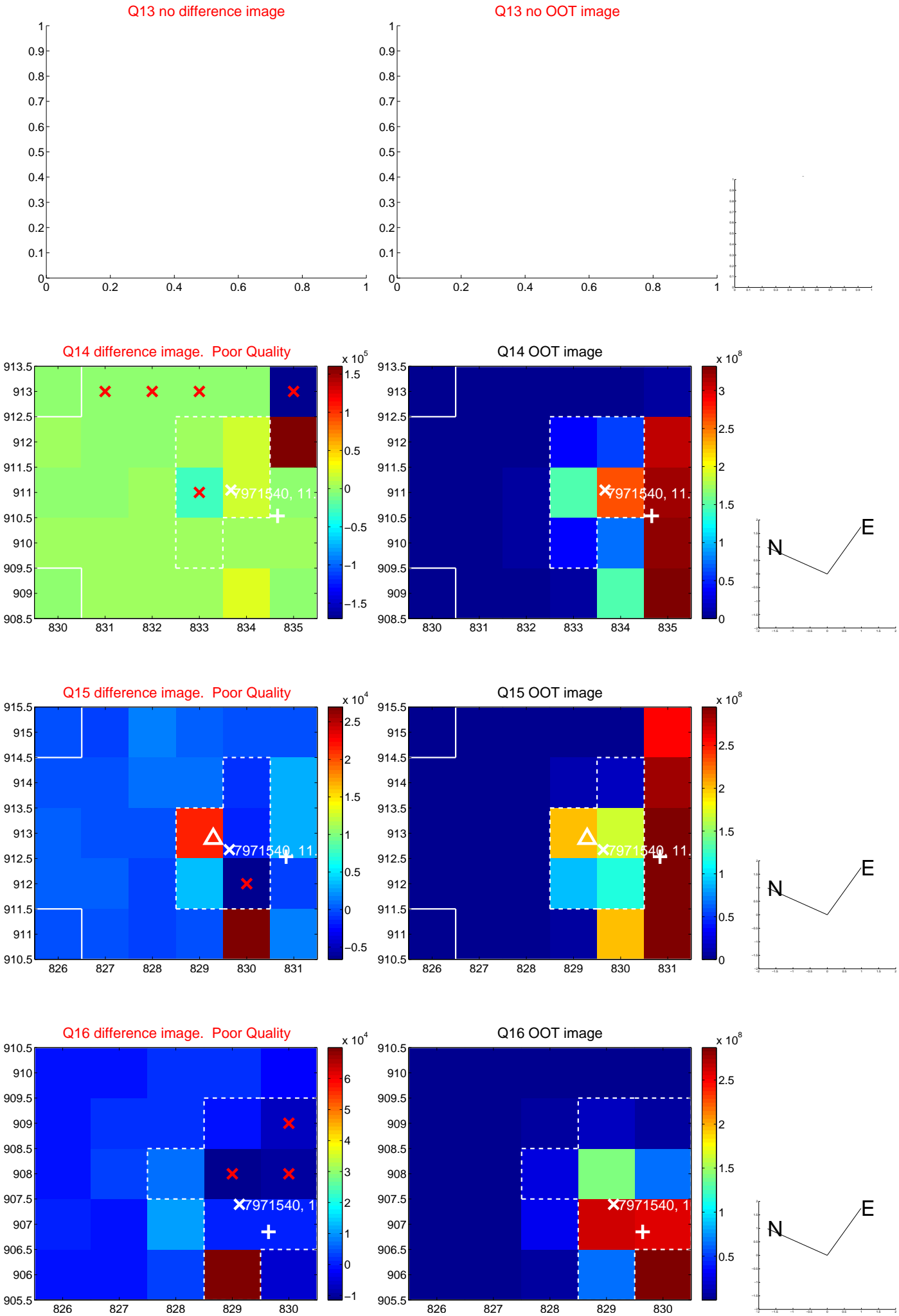




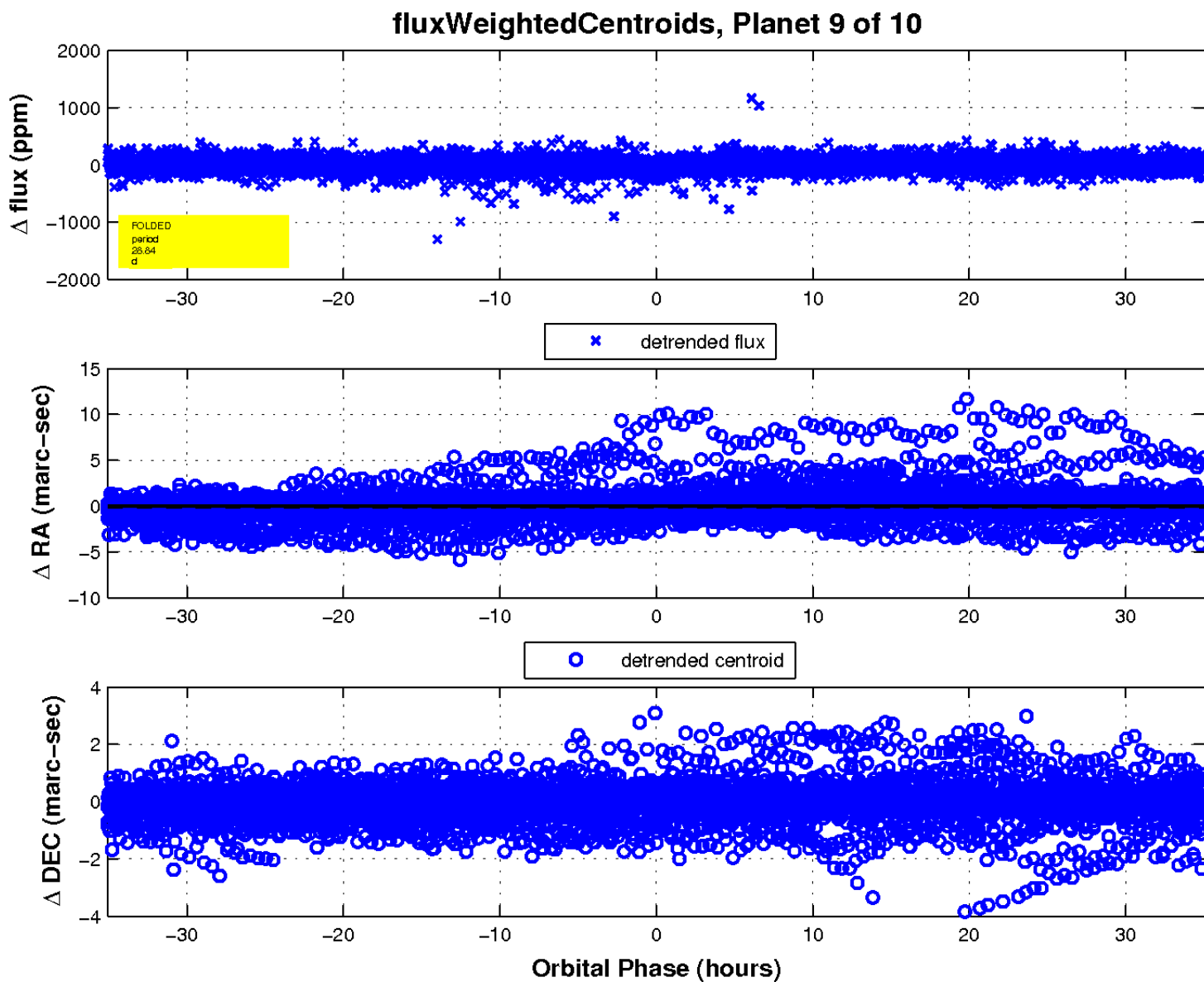
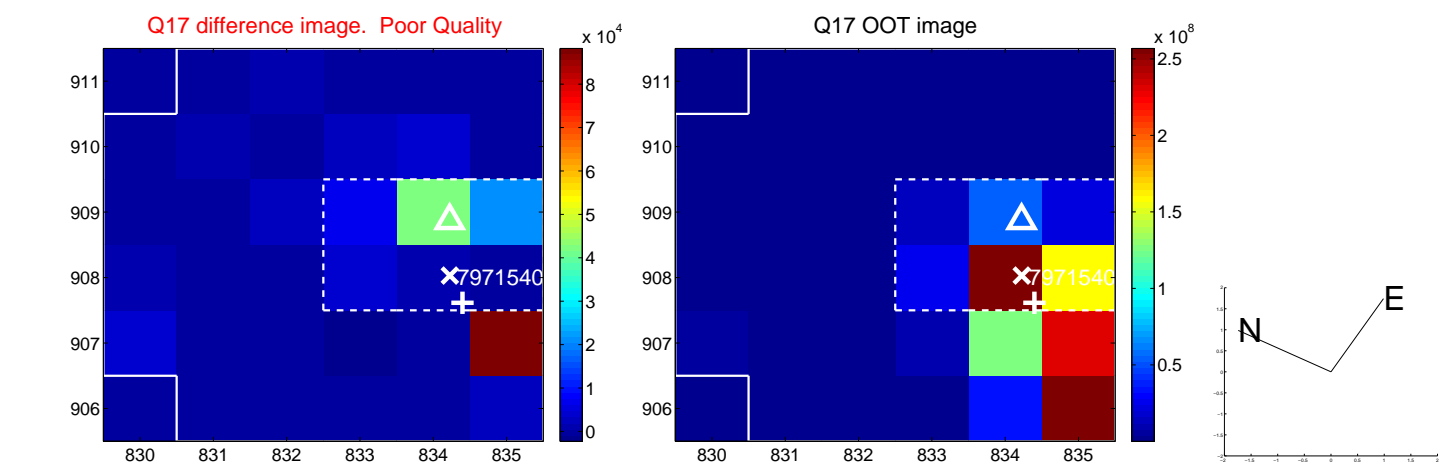
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



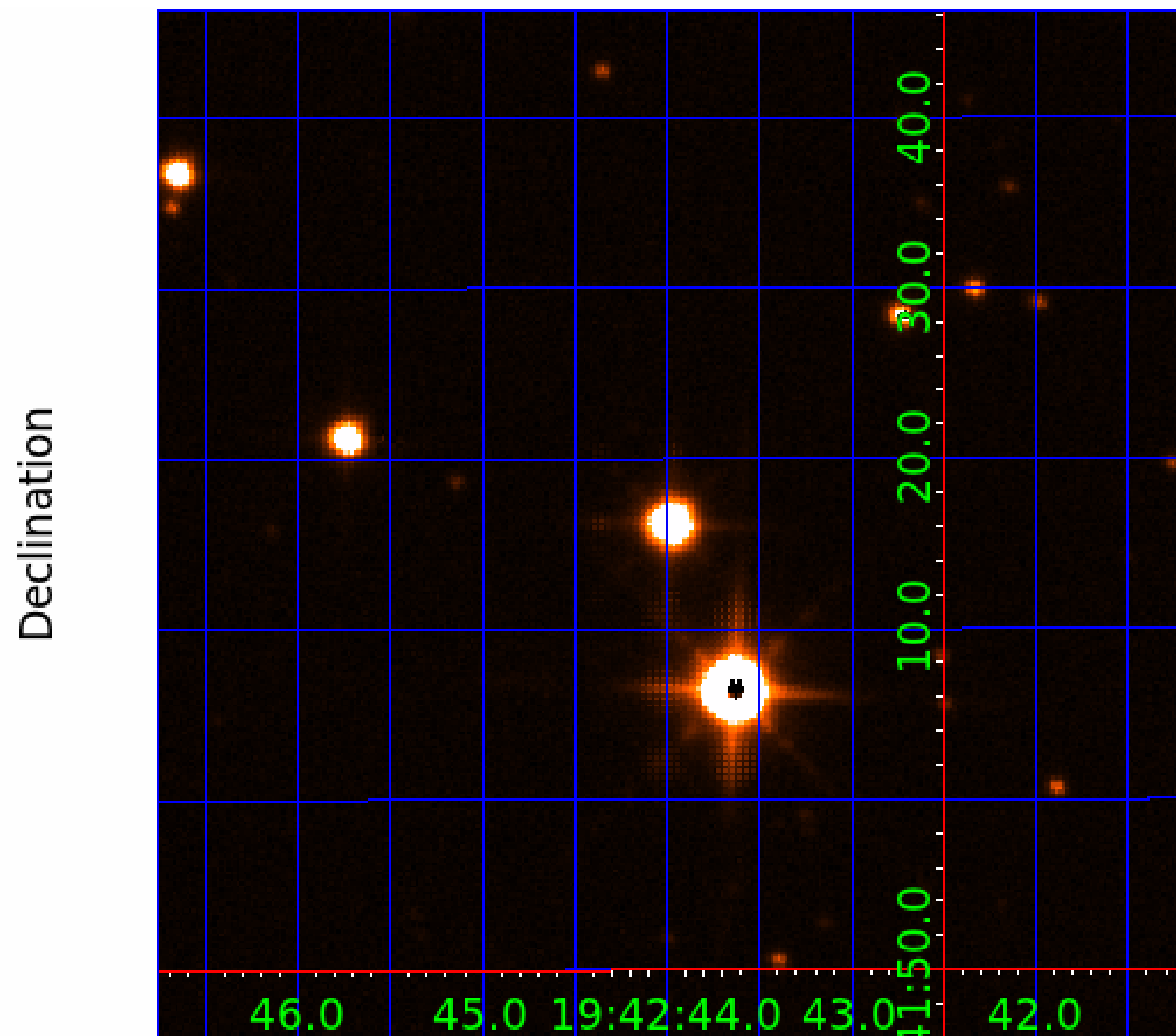
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image



## 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)	$R_p$ ( $R_{\oplus}$ )	$S_p$ ( $S_{\oplus}$ )
007971540-01	OBS	No	51.011313	166.181425	52.5	1.002	29.8	20.5	1.77	6516	1.30	64.75
007971540-02	OBS	No	52.291113	159.026037	53.9	1.214	18.0	16.2	1.77	6516	1.46	62.65
007971540-03	OBS	No	34.530503	153.062724	23.2	2.413	14.7	7.2	1.77	6516	1.02	108.94
007971540-04	OBS	No	42.975481	146.899876	56.8	0.683	13.6	15.7	1.77	6516	1.38	81.38
007971540-05	OBS	No	60.934308	143.610155	48.2	1.035	15.8	19.4	1.77	6516	1.40	51.09
007971540-06	OBS	No	71.174769	162.031760	41.4	7.231	14.7	16.6	1.77	6516	1.30	41.53
007971540-07	OBS	No	49.509656	174.313640	54.0	12.534	13.5	16.9	1.77	6516	1.52	67.38
007971540-08	OBS	No	262.610321	259.184059	26.0	18.558	13.9	4.7	1.77	6516	1.08	7.28
007971540-09	OBS	No	28.835527	150.649599	19.5	11.693	12.6	9.8	1.77	6516	0.97	138.54
007971540-10	OBS	No	59.432161	172.524554	131.2	9.000	11.7	-1.0	1.77	6516	2.04	52.82

## Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007971540-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-04	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_RESOLVED_OFFSET
007971540-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE_ZUMA_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS
007971540-06	OBS	FP	0.00	1	0	1	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_FEW_DIFFS—HALO_GHOST
007971540-07	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—CENT_FEW_DIFFS
007971540-08	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
007971540-09	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV—CENT_KIC_POS
007971540-10	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_NOFITS

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

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

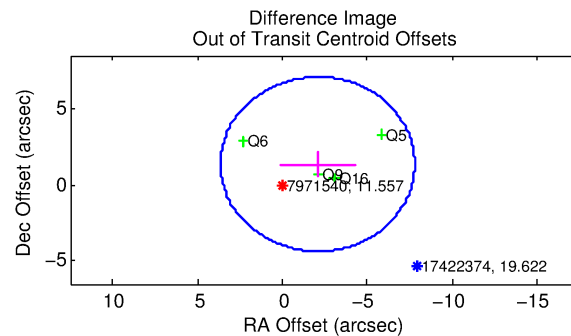
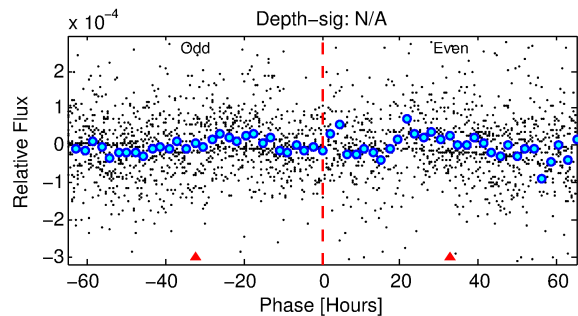
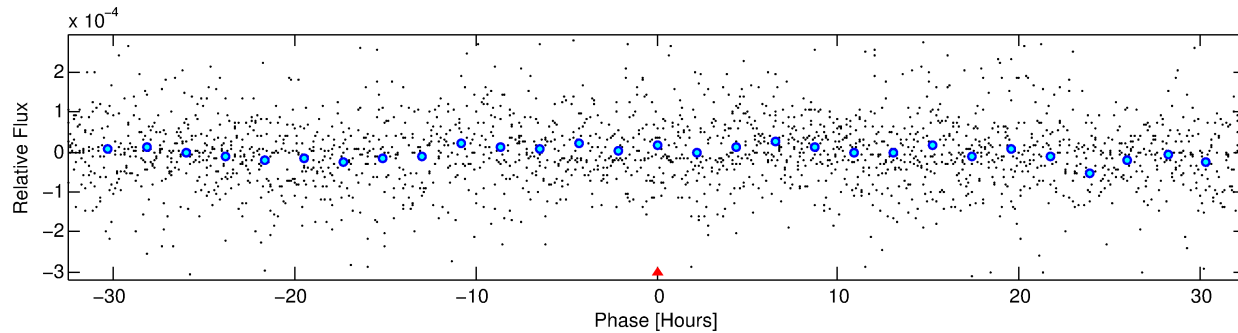
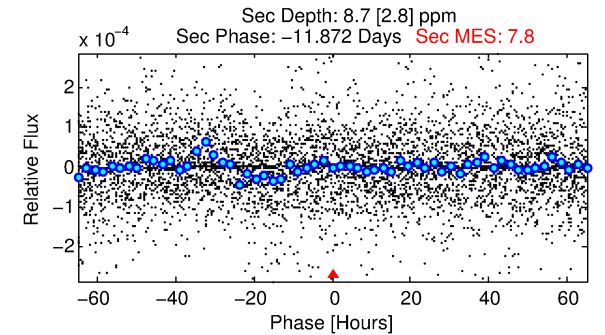
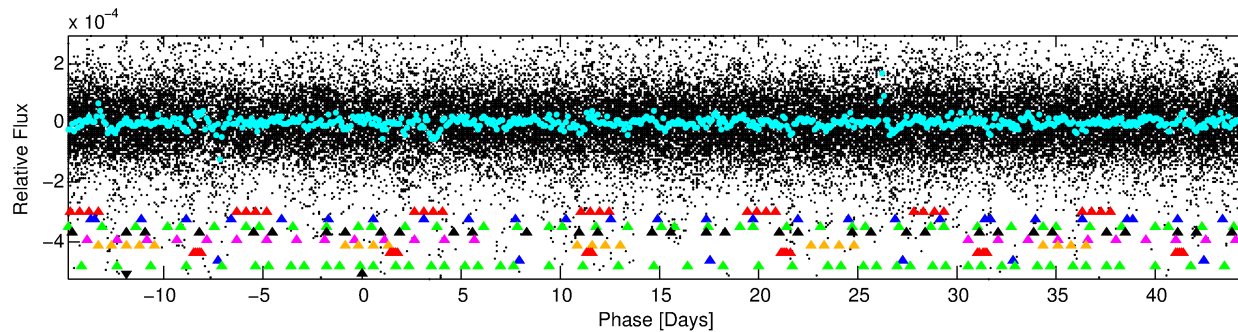
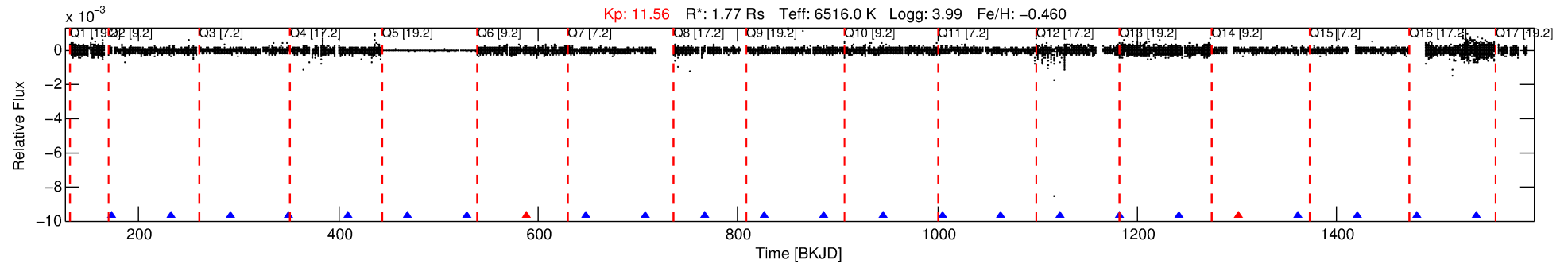
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

Ephemeris Match Information For 007971540-10

No Significant Match Found

# DV One-Page Summary

KIC: 7971540 Candidate: 10 of 10 Period: 59.432 d



## TPS TCE Results:

Period = 59.43216 d  
Epoch = 172.5246 BKJD

DV fit results are unavailable

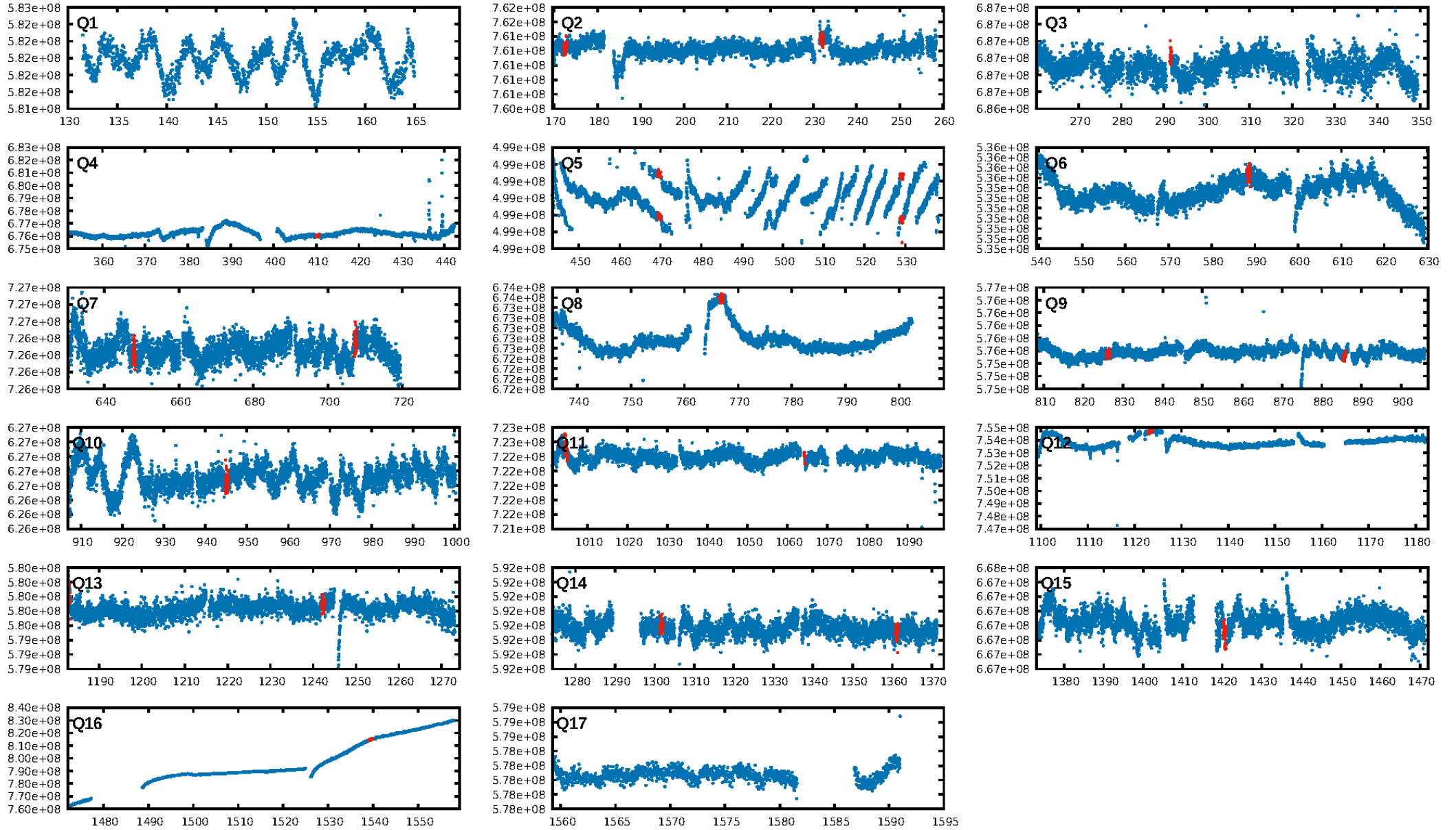
## DV Diagnostic Results:

ShortPeriod-sig: 100.0% [18.87 $\sigma$ ]  
LongPeriod-sig: 100.0% [3.98 $\sigma$ ]  
ModelChiSquare2-sig: N/A  
ModelChiSquareGof-sig: N/A  
Bootstrap-pfa: N/A  
RollingBand-fgt: 0.90 [18/20]  
GhostDiagnostic-chr: 2.855  
Centroid-sig: N/A  
**Centroid-so: 5.620 arcsec [3.14 $\sigma$ ]**  
OotOffset-rm: 2.497 arcsec [1.31 $\sigma$ ]  
KicOffset-rm: 2.716 arcsec [1.98 $\sigma$ ]  
OotOffset-st: 1/0/1/2 [4]  
KicOffset-st: 1/0/1/2 [4]  
DiffImageQuality-fgm: 0.25 [1/4]  
DiffImageOverlap-fno: 0.67 [8/12]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 10:57:21 Z

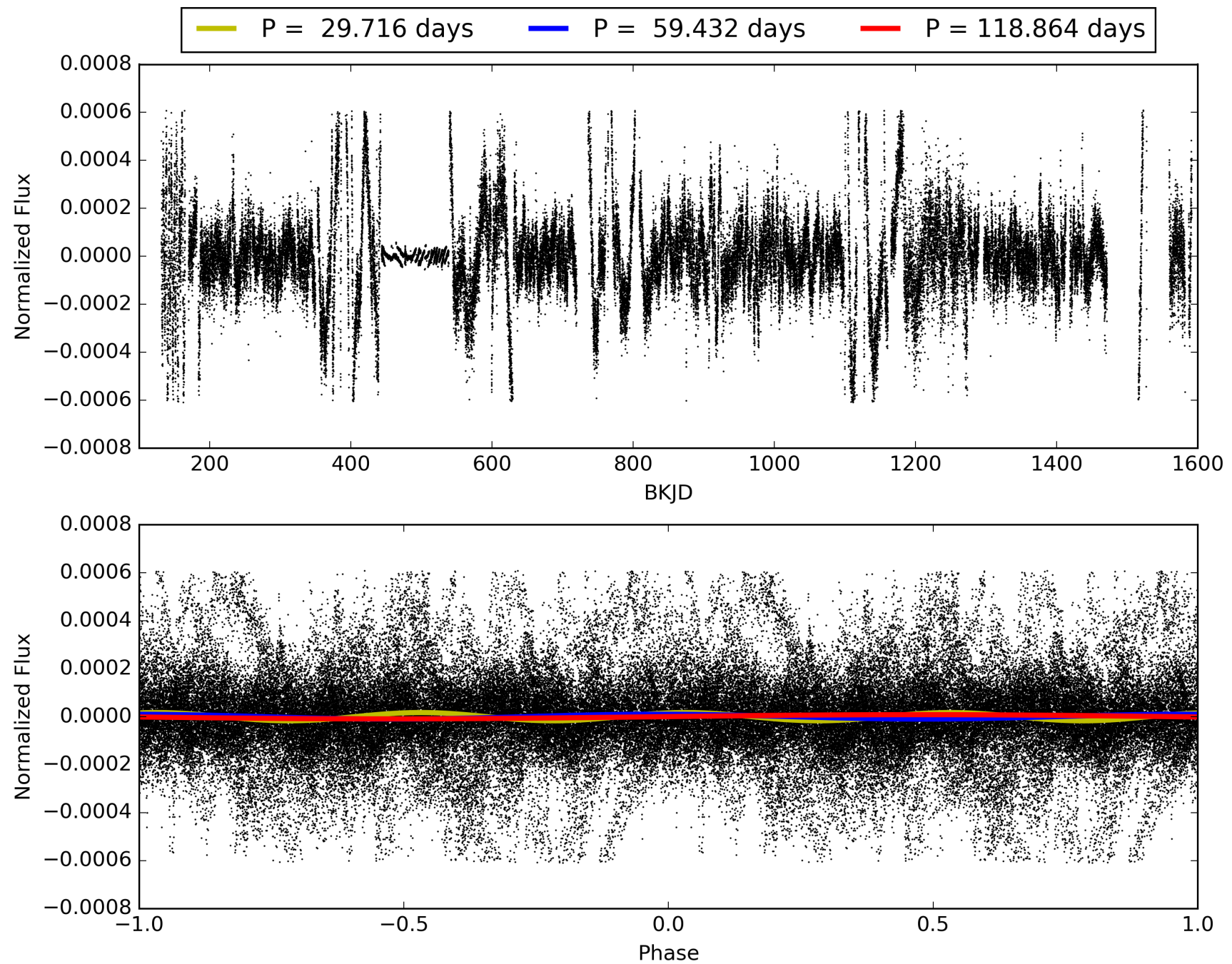
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

# TCE 007971540-10, PDC Light Curves





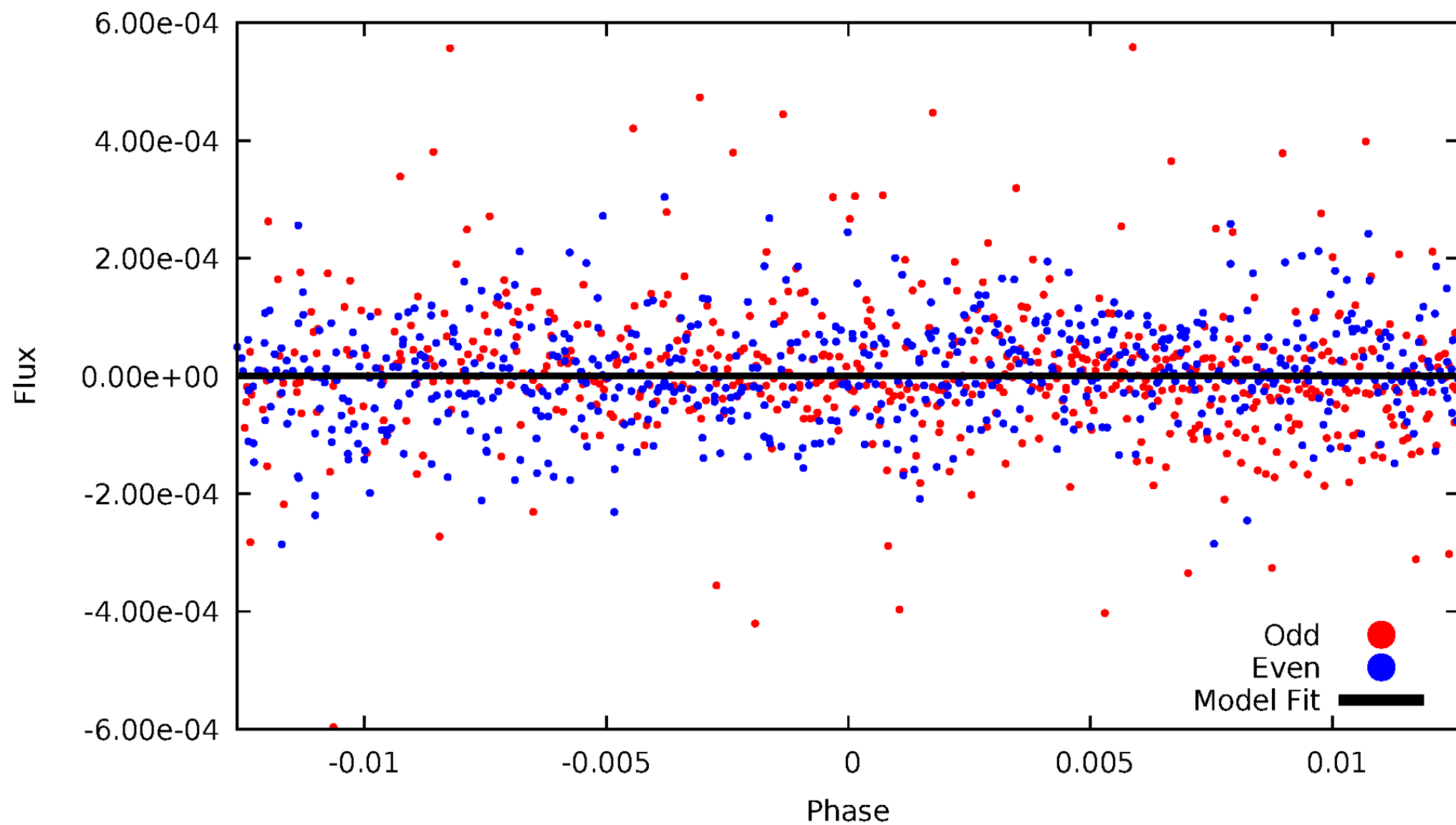
# TCE 007971540-10





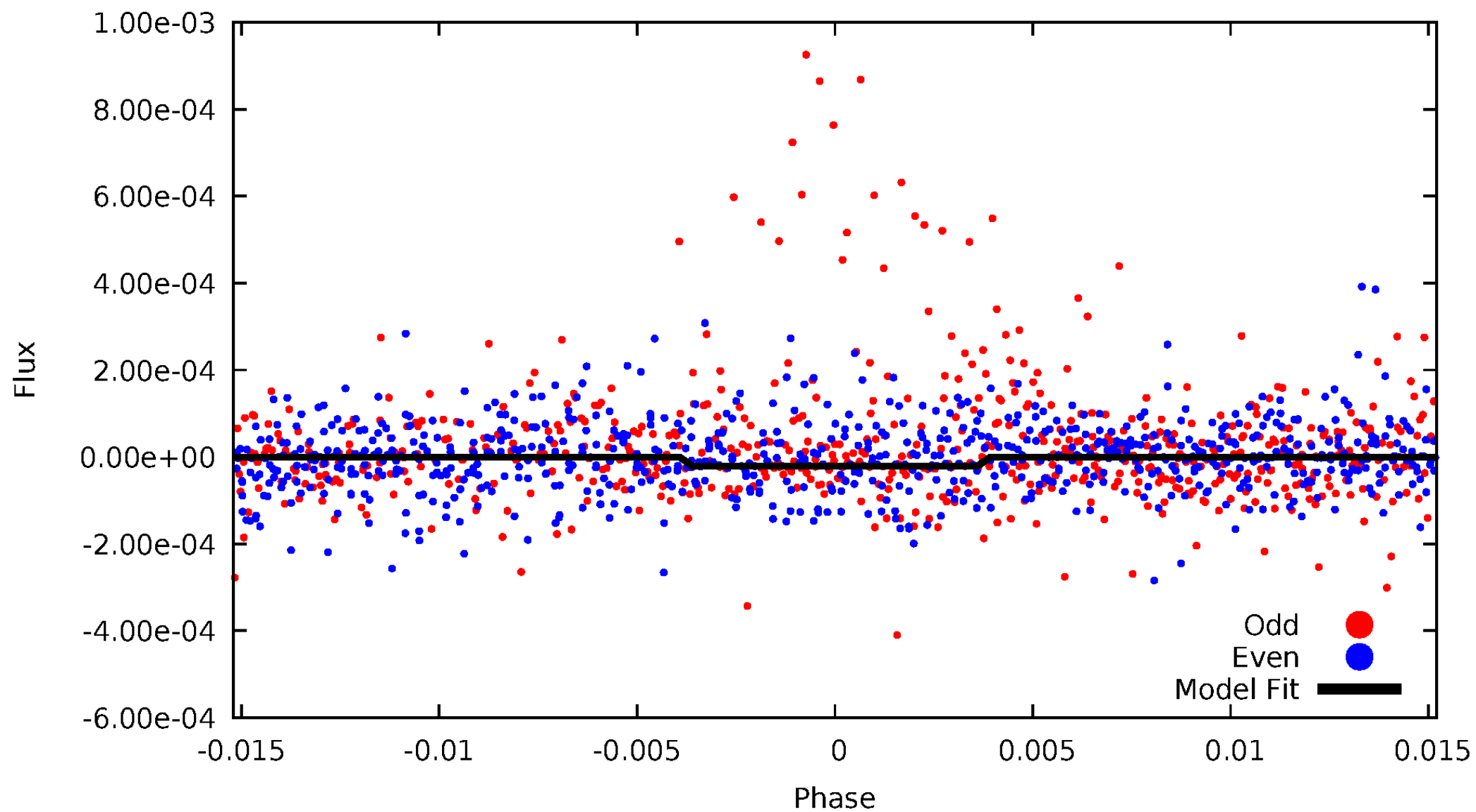
# DV Odd/Even

TCE 007971540-10



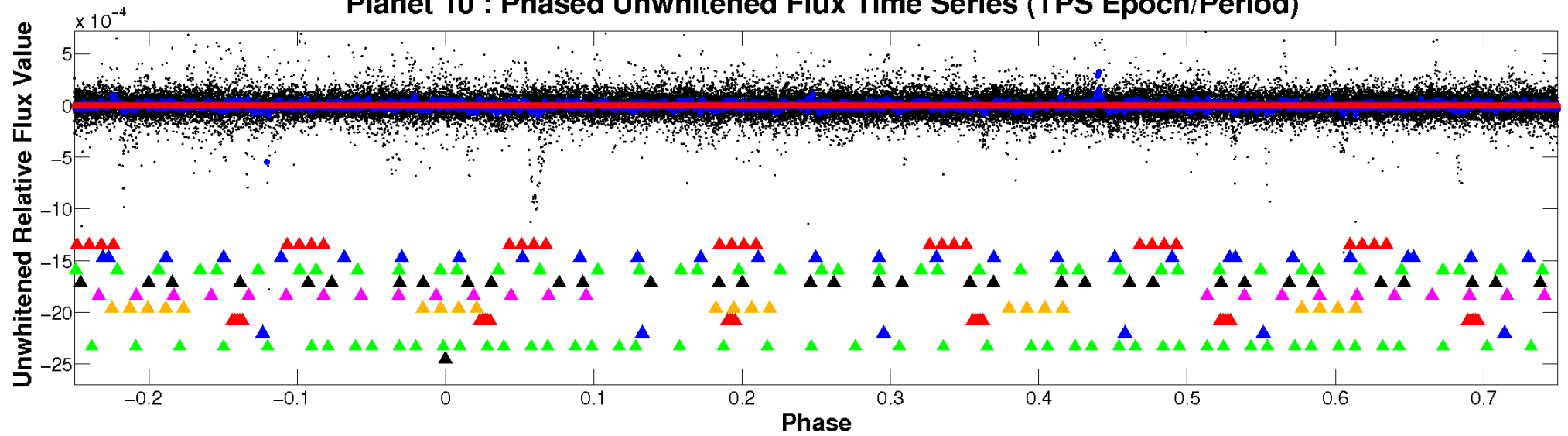
# ALT Odd/Even

TCE 007971540-10

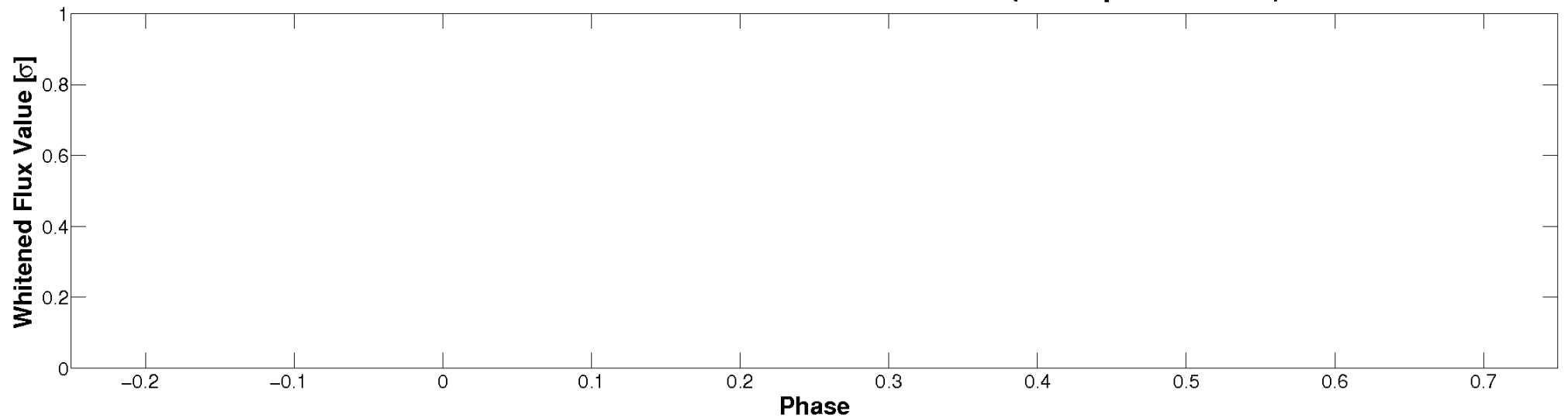


# Non-Whitened Vs. Whitened Light Curve

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

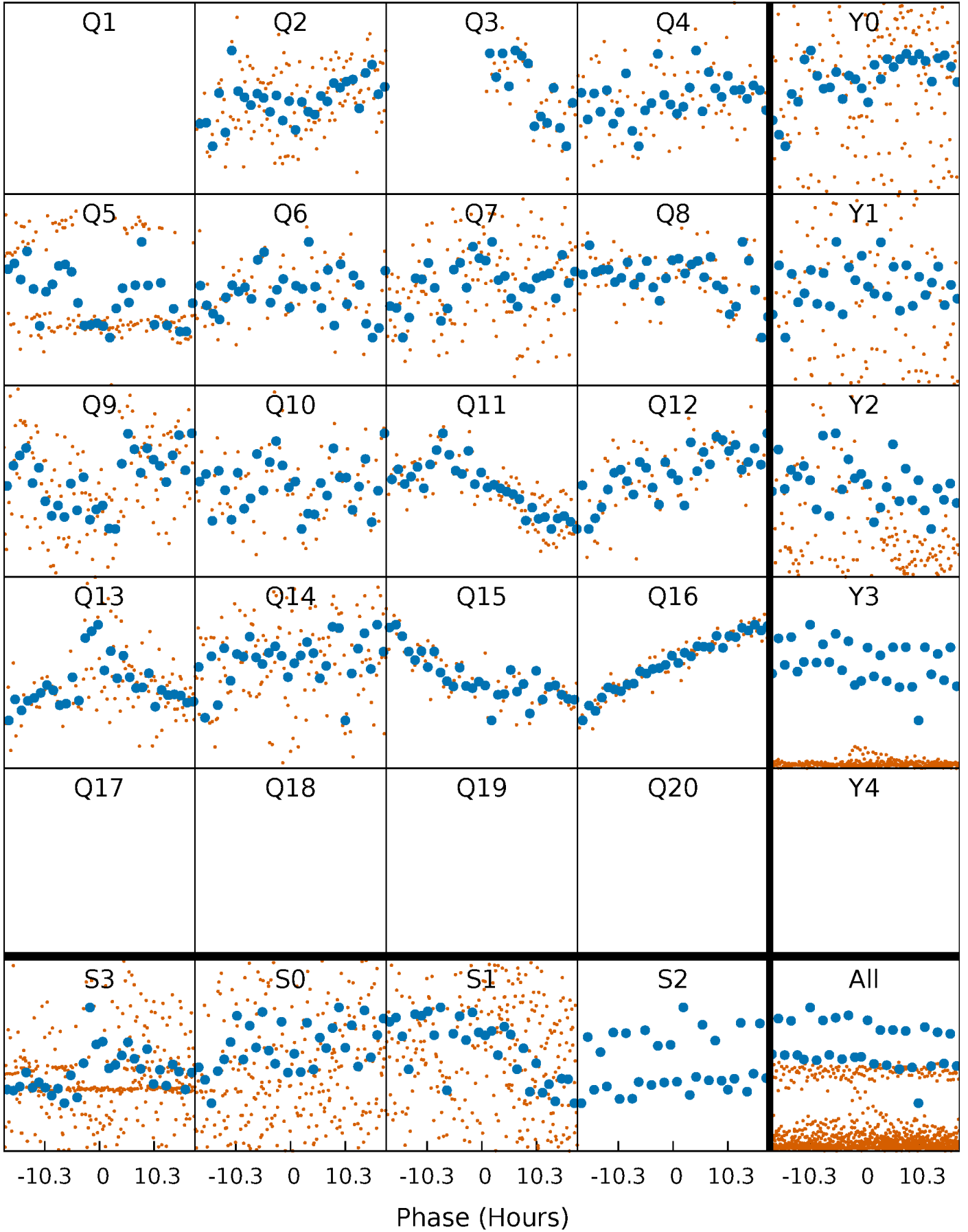


Planet 10 : Phased Whitened Flux Time Series (TPS Epoch/Period)



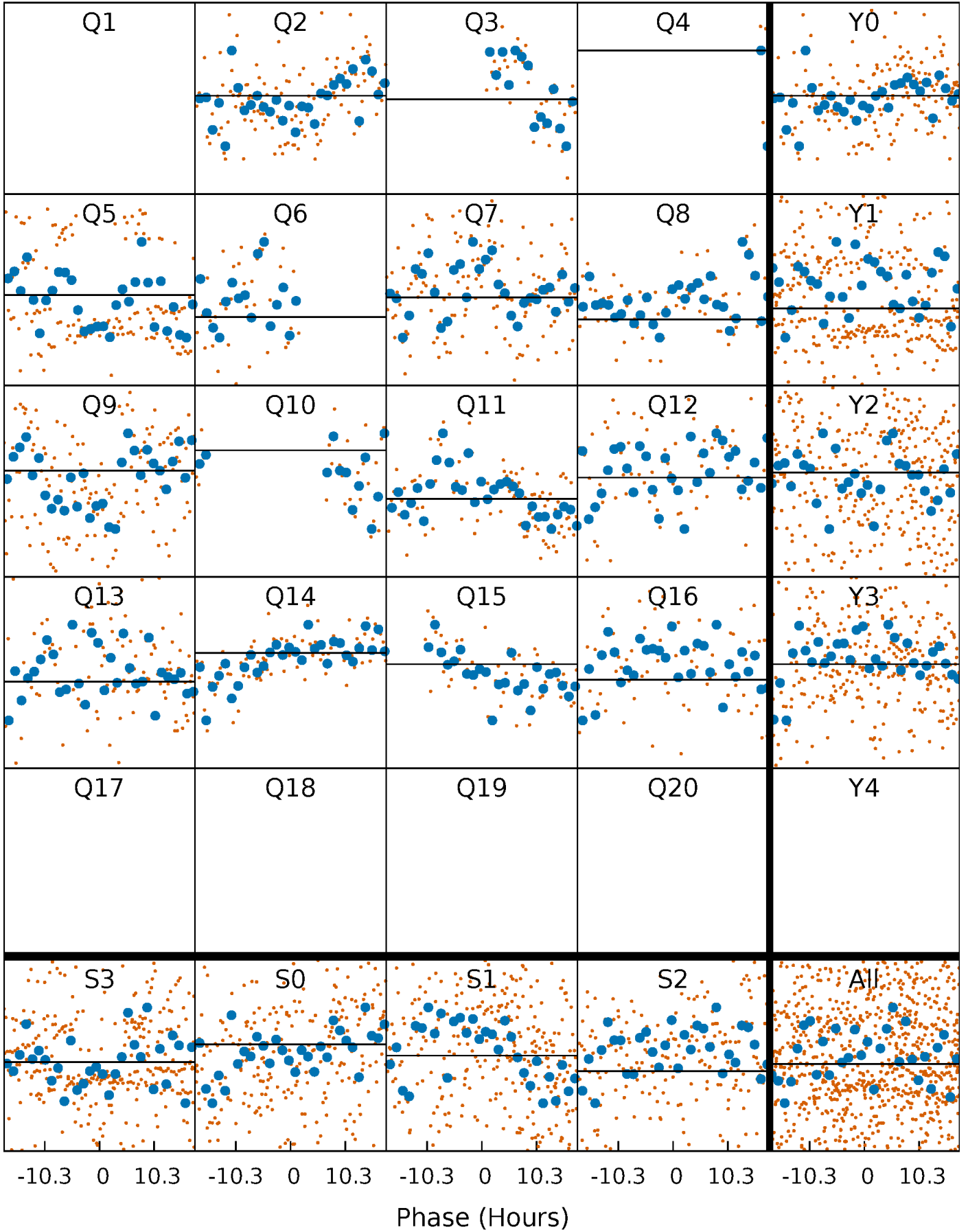
# PDC Quarter-Phased Transit Curves

TCE 007971540-10 P= 59.432161 Days  $T_0=172.524554$  (BKJD)



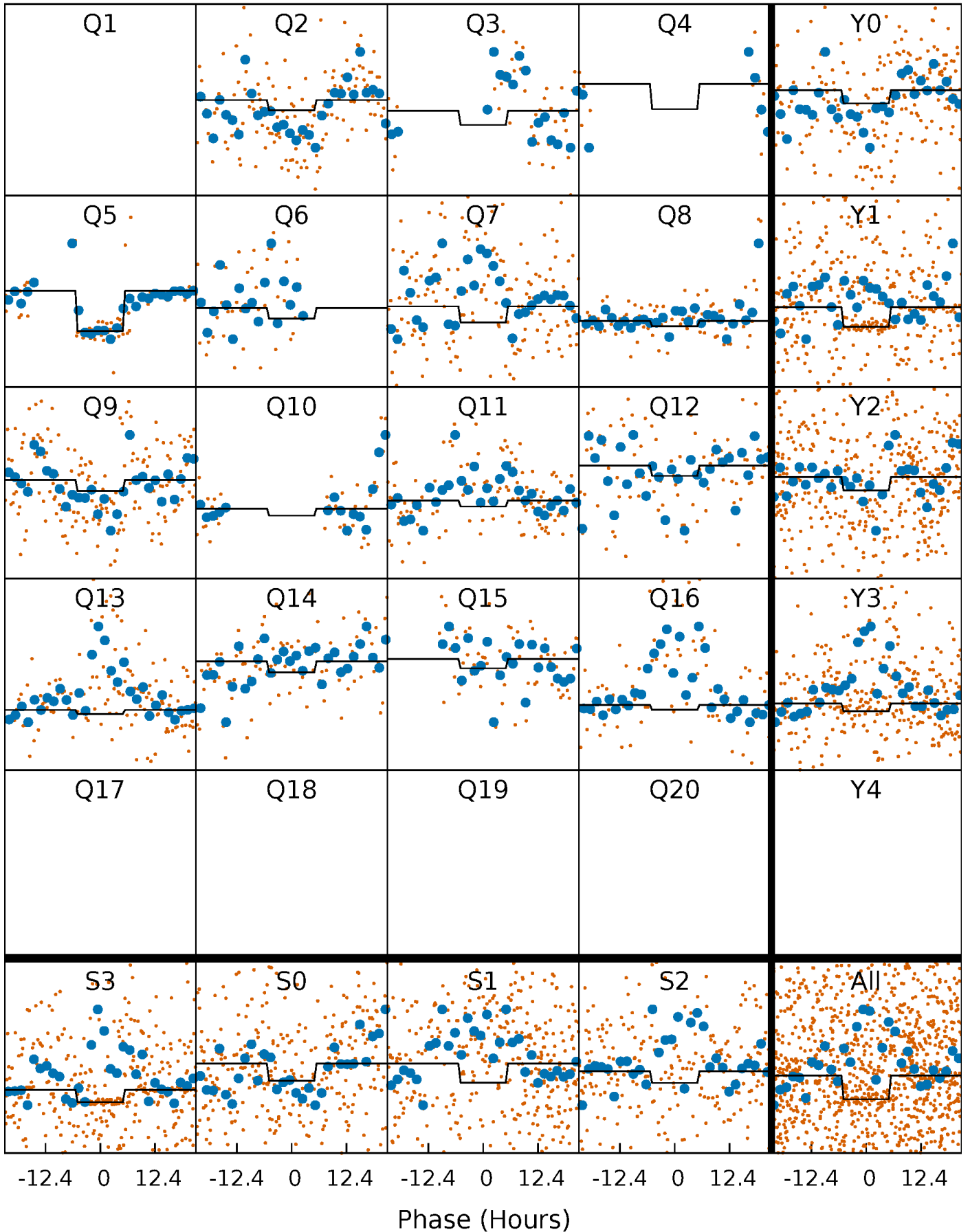
# DV Quarter-Phased Transit Curves

TCE 007971540-10    P= 59.432161 Days     $T_0=172.524554$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

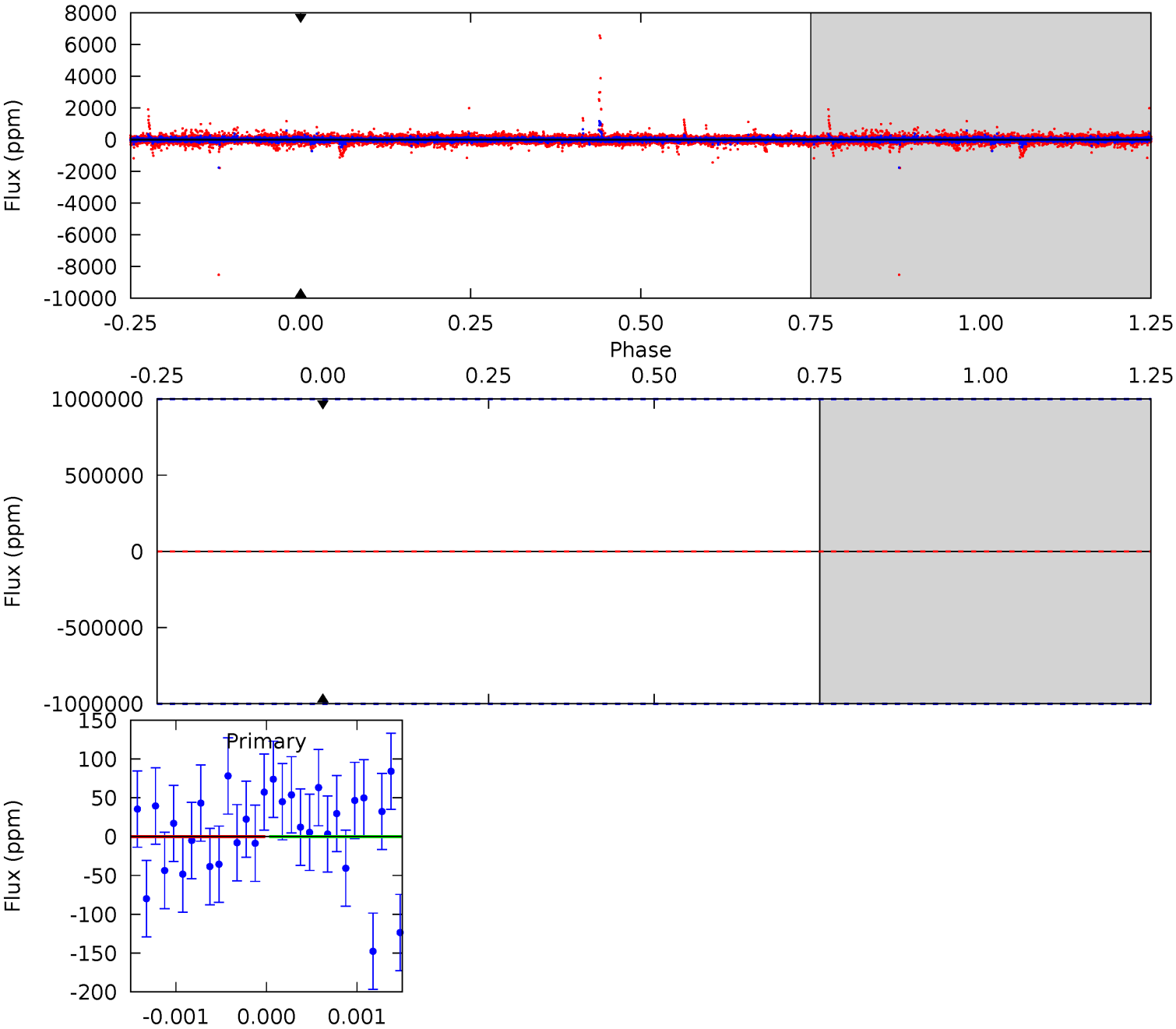
TCE 007971540-10 P= 59.432161 Days  $T_0=172.494229$  (BKJD)



DV Model-Shift Uniqueness Test

007971540-10, P = 59.432161 Days, E = 113.092393 Days

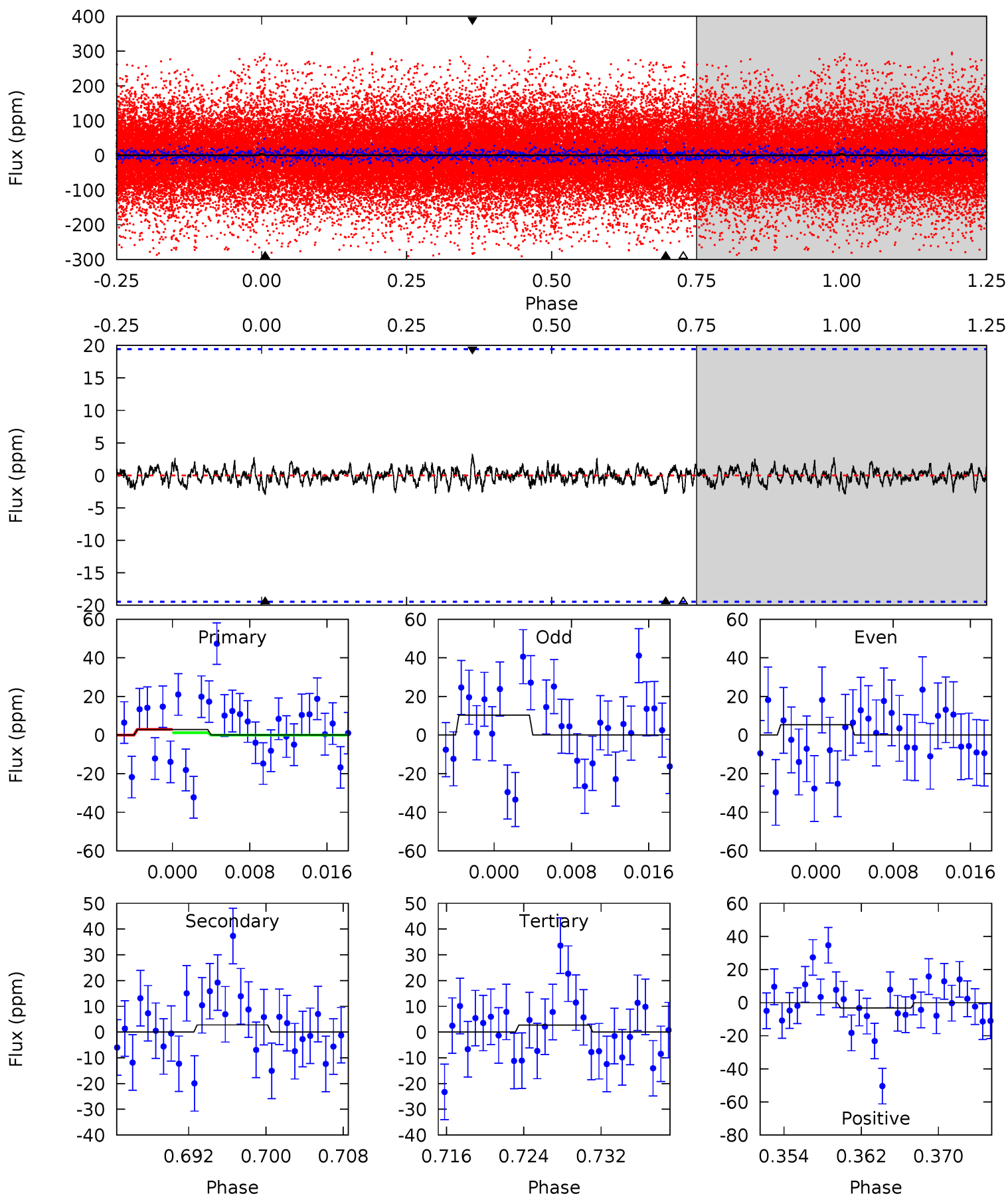
Pri	Sec	Ter	Pos	FA <sub>1</sub>	FA <sub>2</sub>	F <sub>Red</sub>	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



# Alt Model-Shift Uniqueness Test

007971540-10, P = 59.432161 Days, E = 113.062068 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
0.75	0.72	0.72	0.83	5.07	2.66	0.24	0.04	-0.08	0.00	-0.11	0.66	17.7	0.52	0.21





### Stellar Parameters For KIC 007971540

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R$ ( $R_{\odot}$ )	$M(M_{\odot})$	$p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ )
	$6516^{+194}_{-214}$	$3.991^{+0.273}_{-0.117}$	$-0.460^{+0.350}_{-0.250}$	$1.770^{+0.395}_{-0.527}$	$1.119^{+0.206}_{-0.150}$	$0.284^{+0.447}_{-0.115}$
	+3%/-3%	+7%/-3%	+76%/-54%	+22%/-30%	+18%/-13%	+157%/-40%
Source	PHO1	FLK73	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 007971540-10 / KOI

Detrend	Depth (ppm)	$R_p$ ( $R_{\oplus}$ )	$T_{\text{max}}$ (K)	$T_{\text{obs}}$ (K)	$A_{\text{obs}}$
DV	$0 \pm 1000000$	$13.34^{+13.88}_{-9.00}$	$944^{+63}_{-77}$	$-5328^{+32387}_{-22597}$	$-678.739^{+53040.000}_{-49859.057}$
Alt.	$-3 \pm 4$	$12.73^{+14.56}_{-9.30}$	$942^{+69}_{-78}$	$1795^{+768}_{-3704}$	$0.616^{+8.440}_{-0.826}$

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

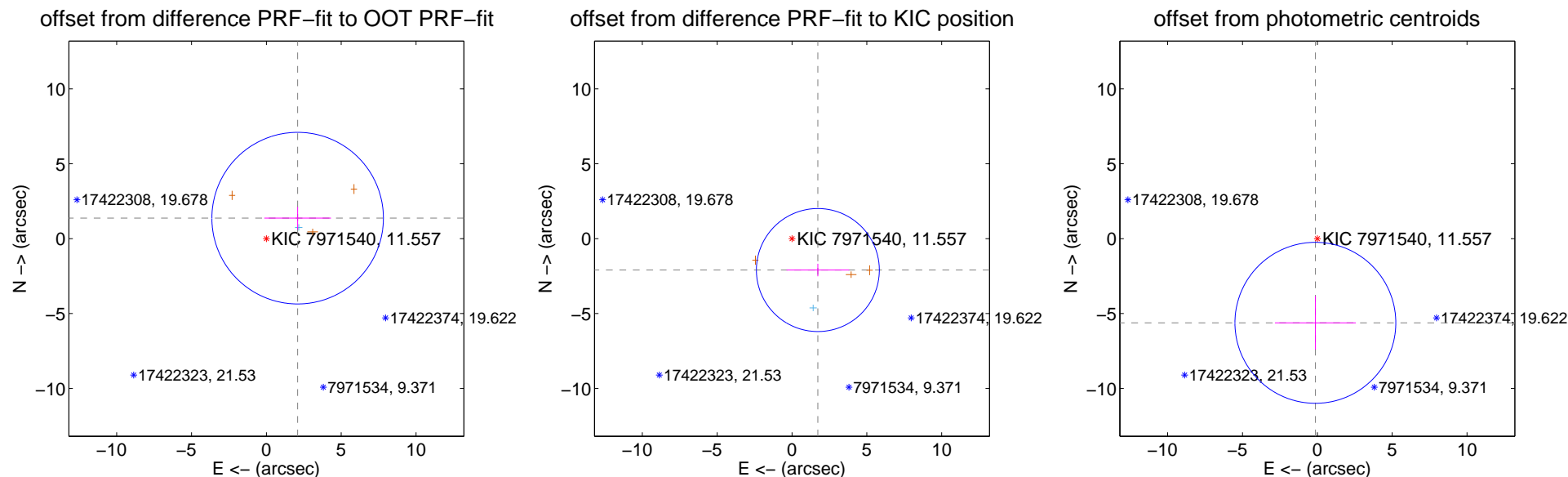
## DV Centroid Data

Supplemental centroid analysis for 007971540-10. **Kepler magnitude: 11.56.** Transit SNR -1.00

There are 1 quarters with good PRF difference image offsets

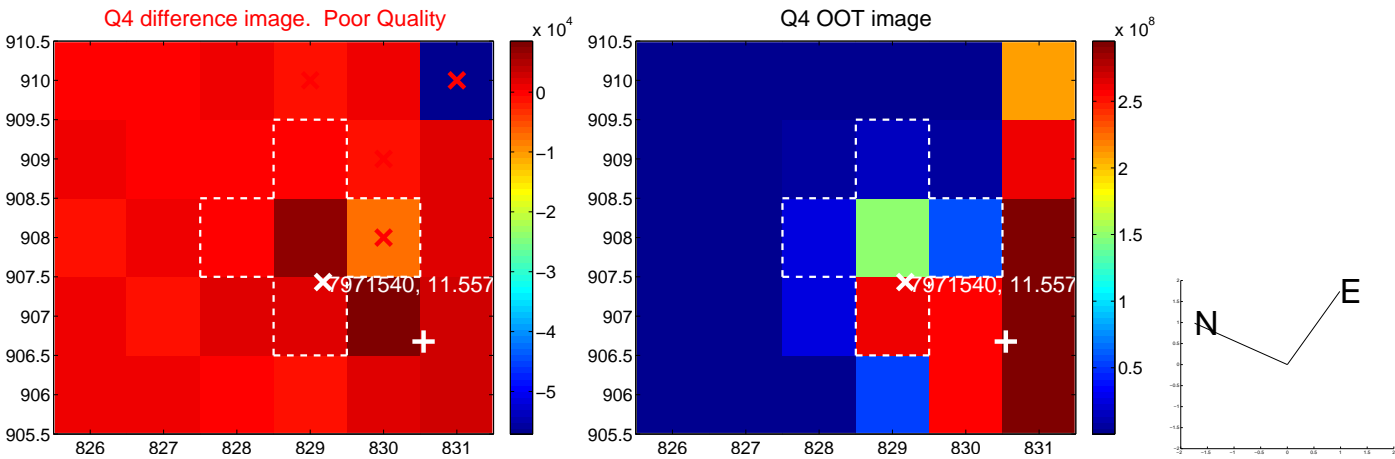
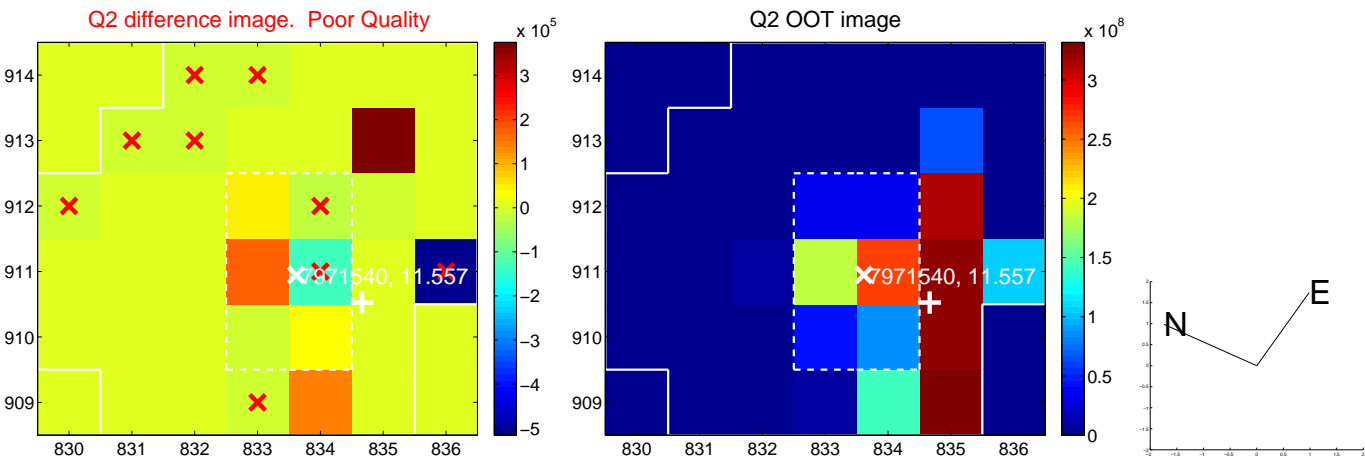
The OOT PRF centroid is offset from the target star catalog position by about 2.98 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / $\sigma$	$\Delta$ RA	$\Delta$ Dec
PRF-fit source offset from OOT	$2.497 \pm 1.909$	1.31	$-2.089 \pm 2.228$	$1.368 \pm 0.754$
PRF-fit source offset from KIC position	$2.716 \pm 1.368$	1.98	$-1.727 \pm 2.091$	$-2.096 \pm 0.417$
photometric centroid source offset	$5.62 \pm 1.79$	<b>3.14</b>	$0.13 \pm 2.70$	$-5.62 \pm 1.79$

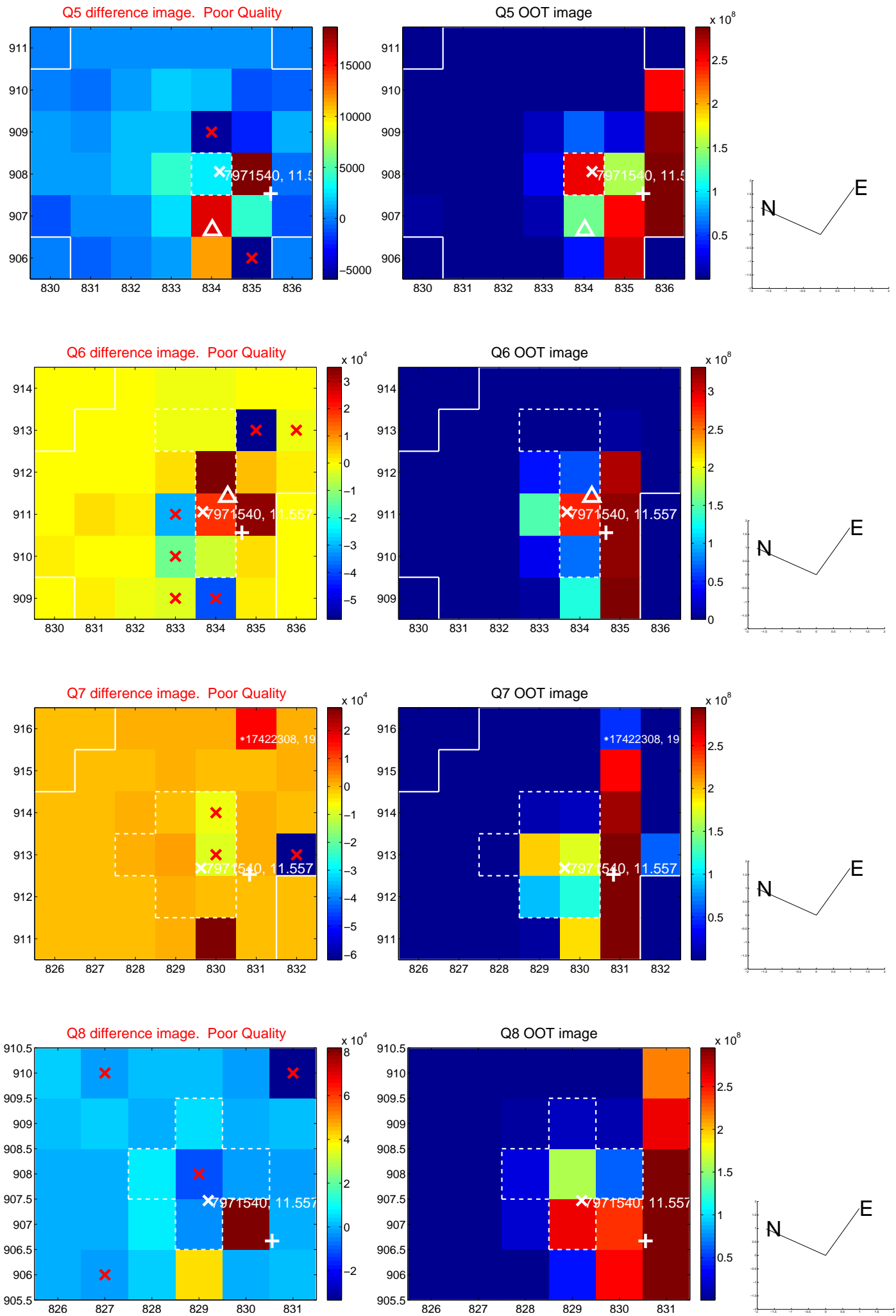


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: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

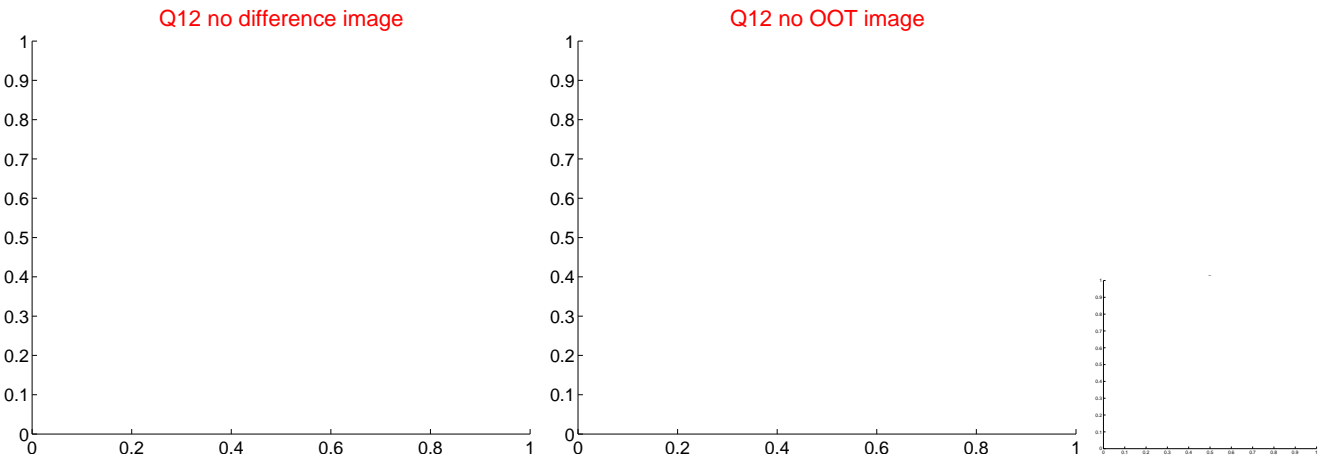
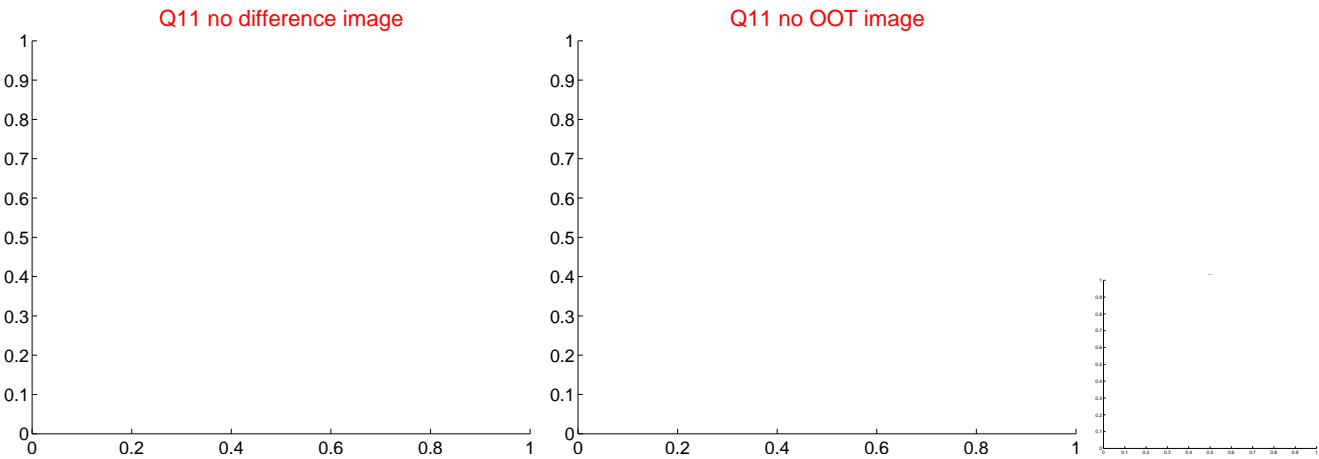
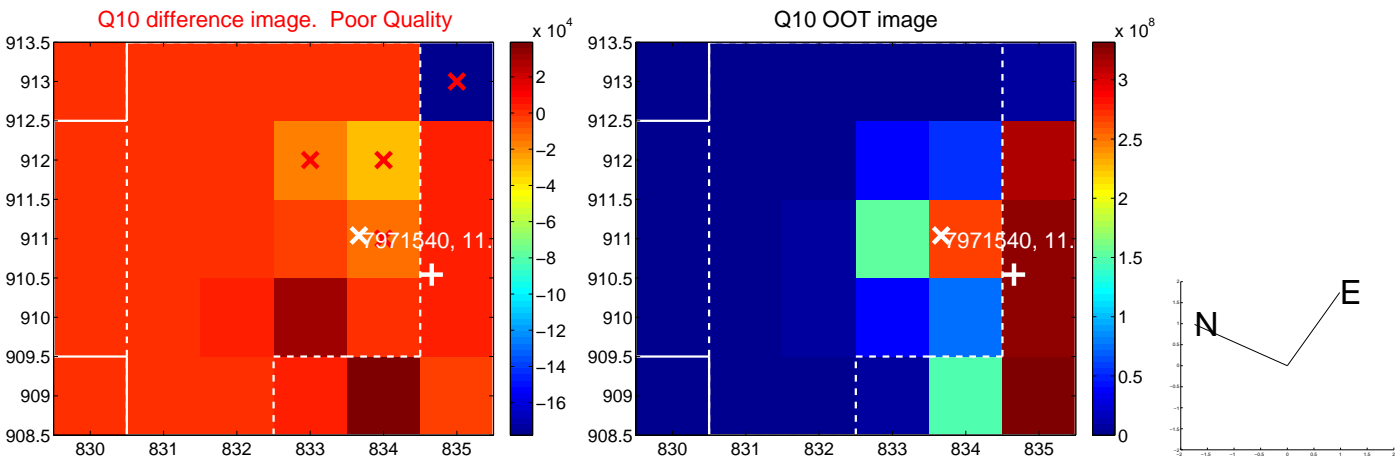
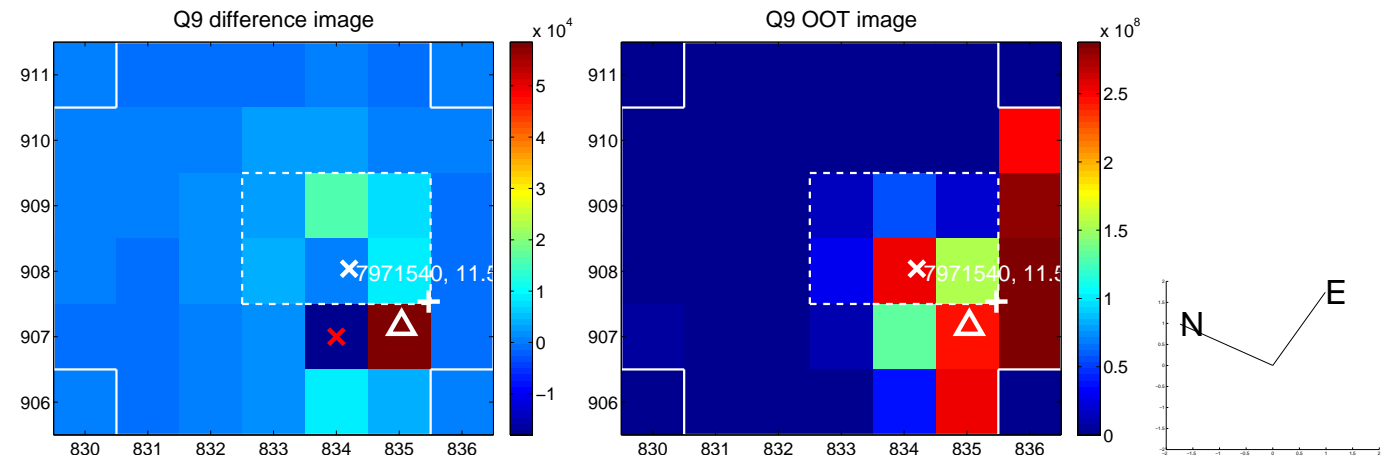
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



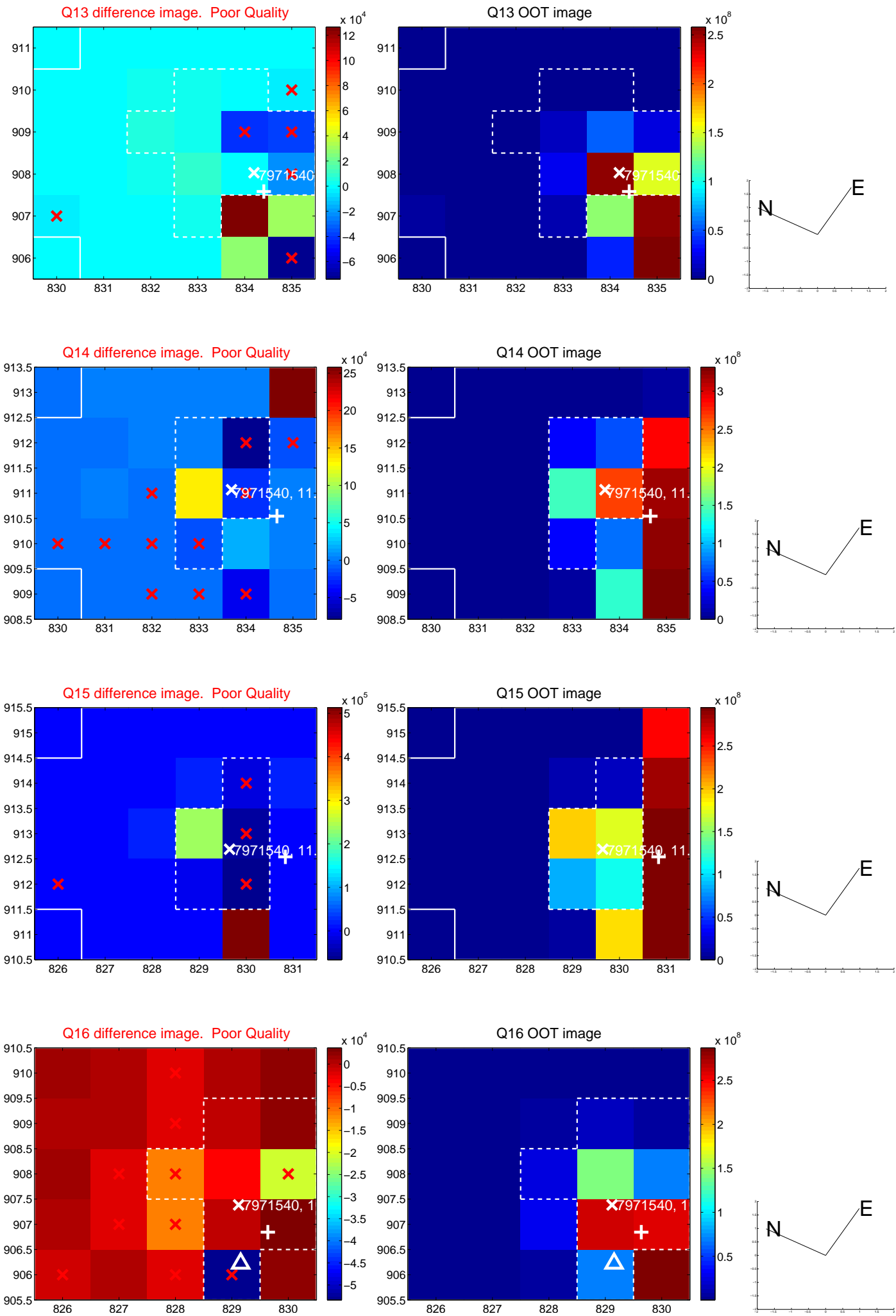
white  $\times$ : KIC target position; +: OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



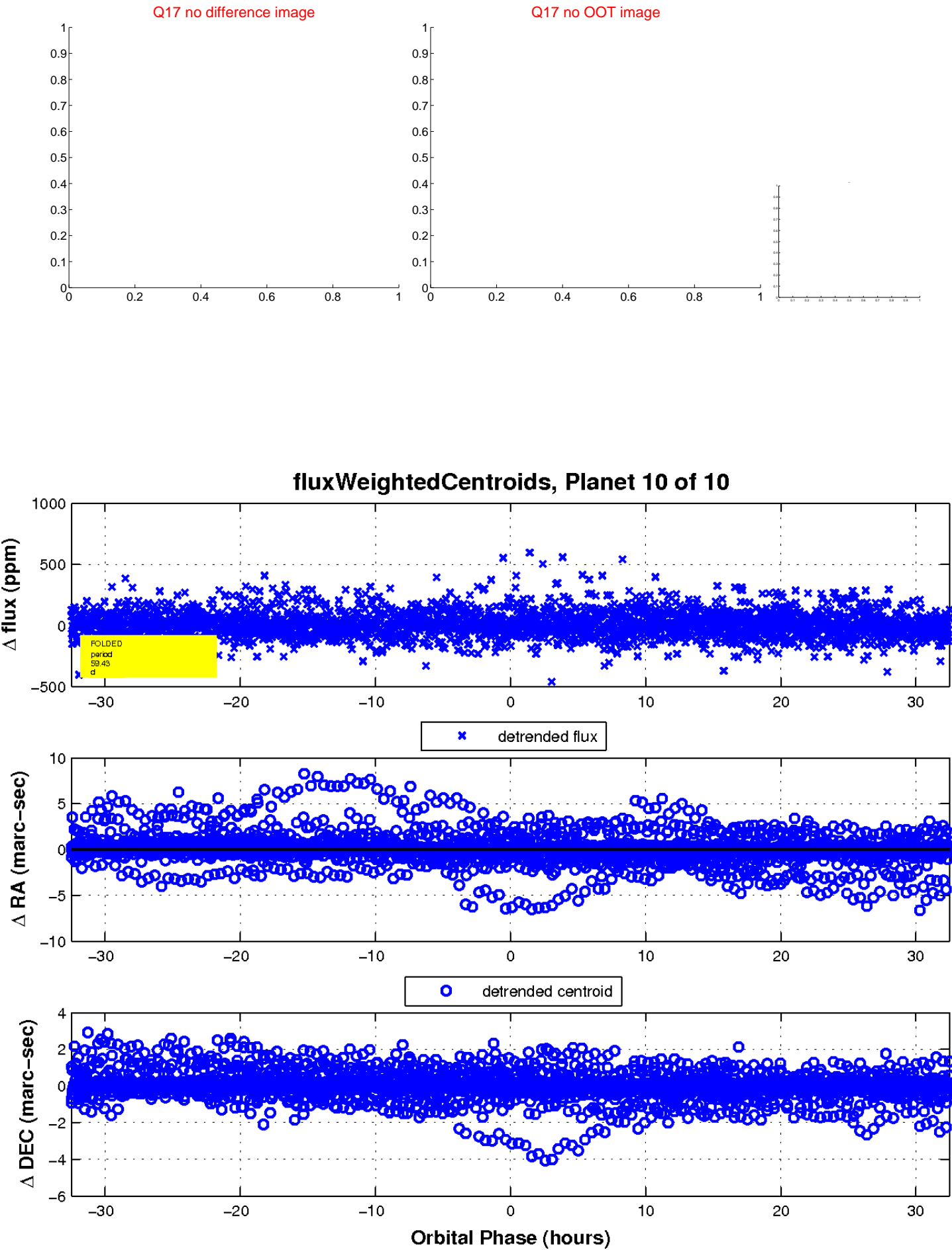
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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

