

KIC 002720354

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})
002720354-01	OBS	6292.01	2.821326	131.680486	62763.7	4.864	1867.4	1763.0	1.51	6701	39.25	2527.74
002720354-02	OBS	No	1.410693	131.674538	843.7	4.496	32.6	39.7	1.51	6701	5.15	6369.31
002720354-03	OBS	No	5.642986	136.776041	96.0	15.000	9.0	-1.0	1.51	6701	1.49	1003.05
002720354-04	OBS	No	242.598638	252.821742	3198.3	29.057	8.0	8.2	1.51	6701	9.58	6.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002720354-01	OBS	FP	0.01	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
002720354-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
002720354-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—RESIDUAL_TCE—CENT_NOFITS
002720354-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT

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 for comment definitions.

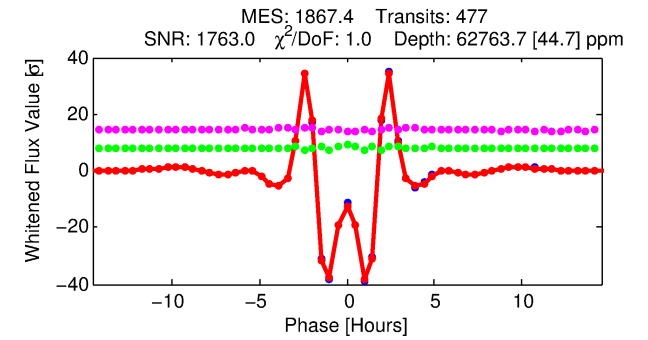
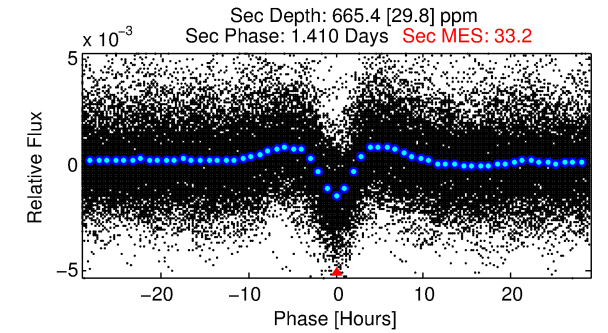
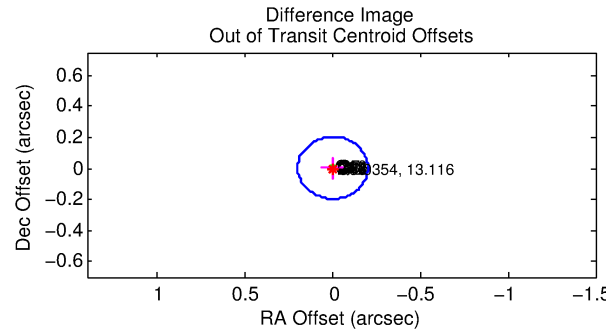
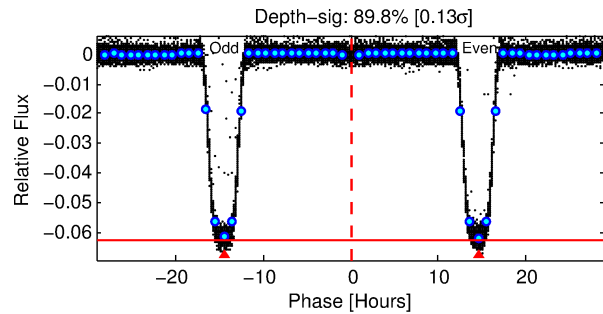
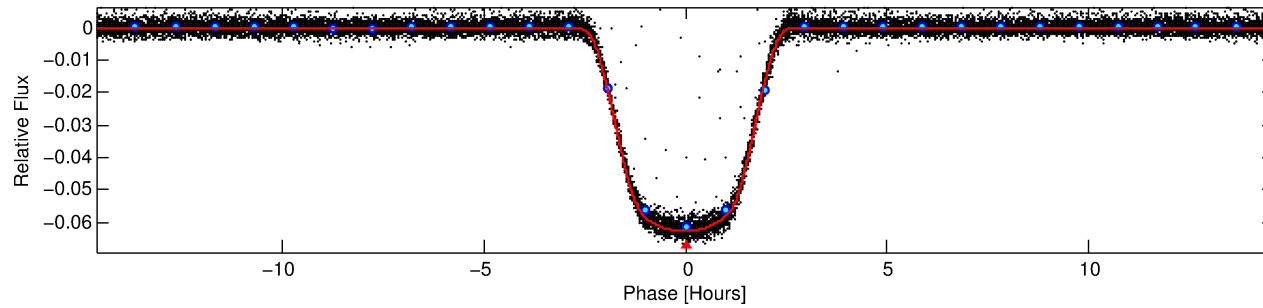
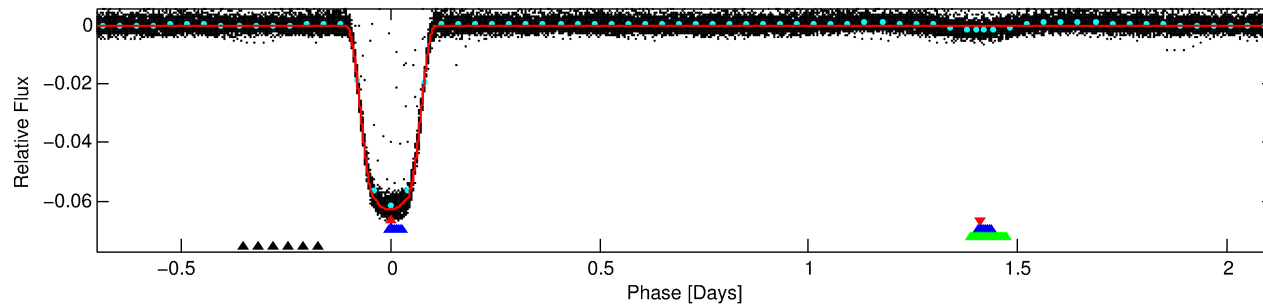
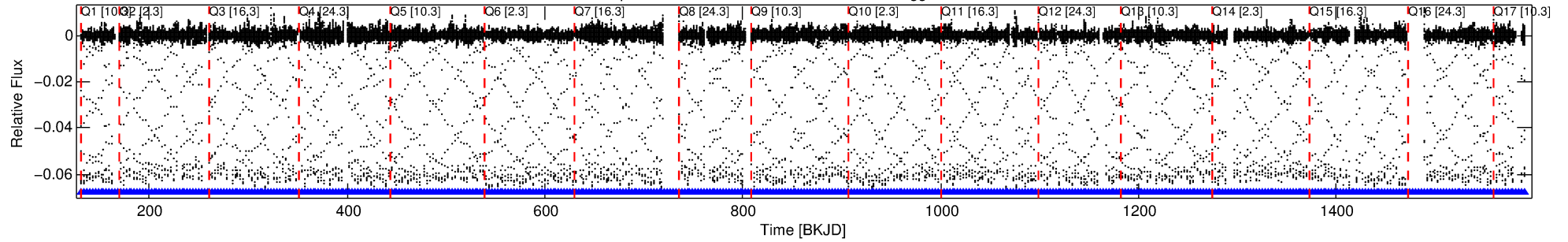
Ephemeris Match Information For 002720354-01

No Significant Match Found

DV One-Page Summary

KIC: 2720354 Candidate: 1 of 4 Period: 2.821 d
KOI: K06292.01 Corr: 0.984

Kp: 13.12 R*: 1.51 Rs Teff: 6701.0 K Logg: 4.12 Fe/H: -0.540



DV Fit Results:

Period = 2.82133 [0.00000] d
Epoch = 131.6805 [0.0000] BKJD
Rp/R* = 0.2388 [0.0001]
a/R* = 5.08 [0.00]
b = 0.50 [0.00]
Seff = 2527.74 [733.51]
Teq = 1808 [131] K
Rp = 39.25 [7.30] Re
a = 0.0403 [0.0072] AU
Ag = 0.39 [0.11] [-5.51σ]
Teffp = 2202 [36] K [2.90σ]

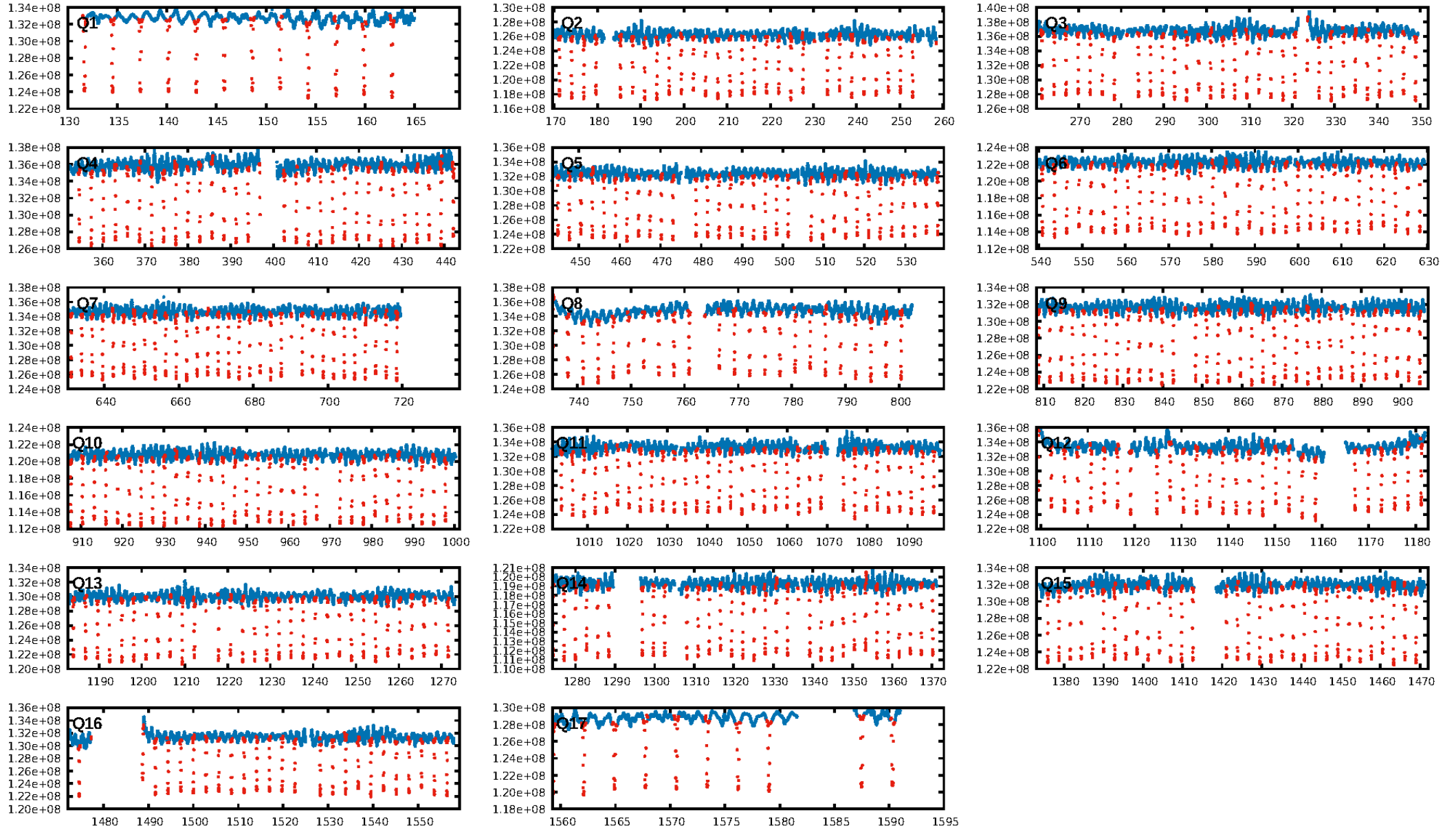
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [5.11σ]
LongPeriod-sig: 100.0% [4.29σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [455/455]
GhostDiagnostic-chr: 1.65
Centroid-sig: 0.0%
Centroid-so: 0.292 arcsec [246.25σ]
OotOffset-rm: 0.004 arcsec [0.07σ]
KicOffset-rm: 0.078 arcsec [1.16σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

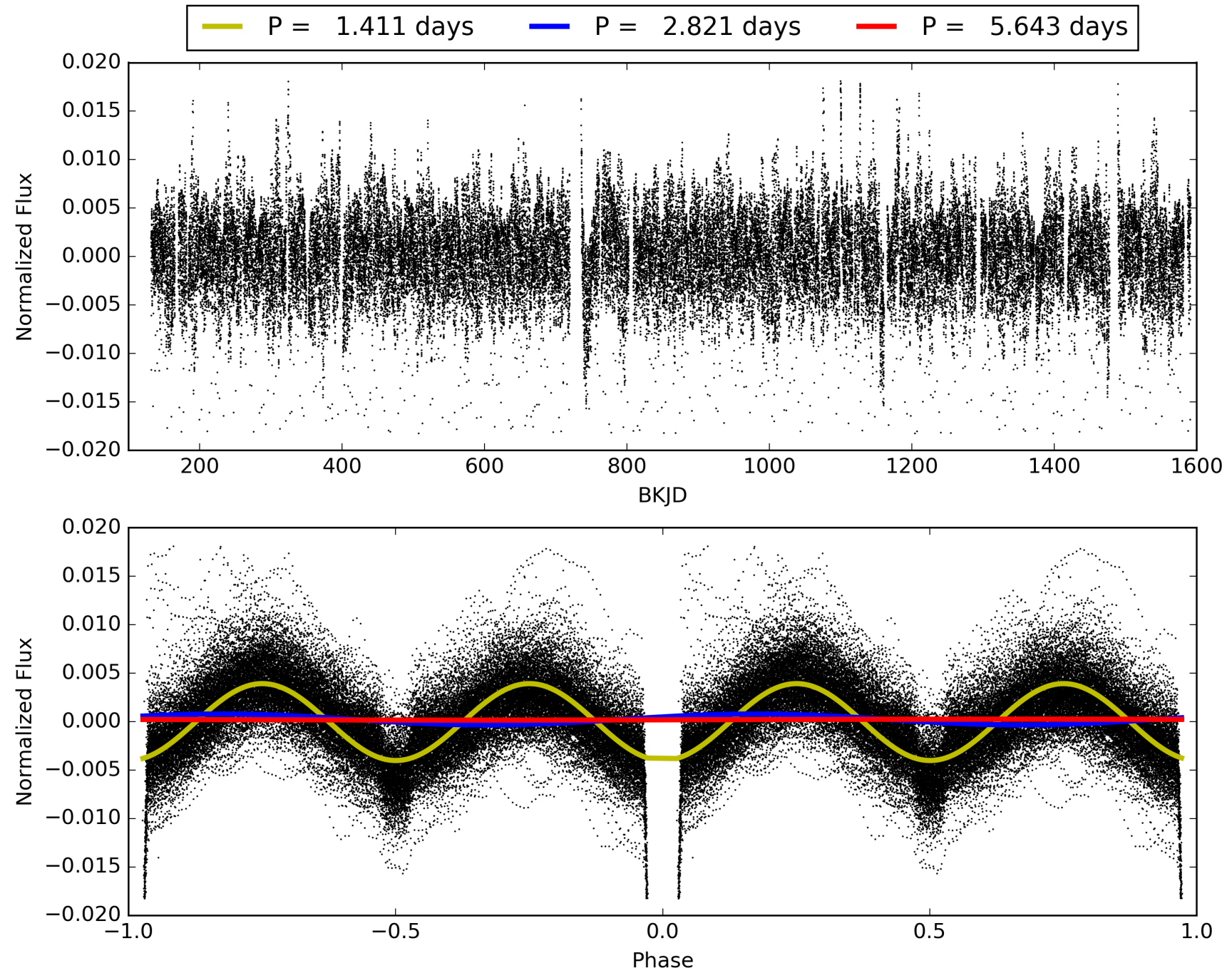
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:12:35 Z

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

TCE 002720354-01, PDC Light Curves

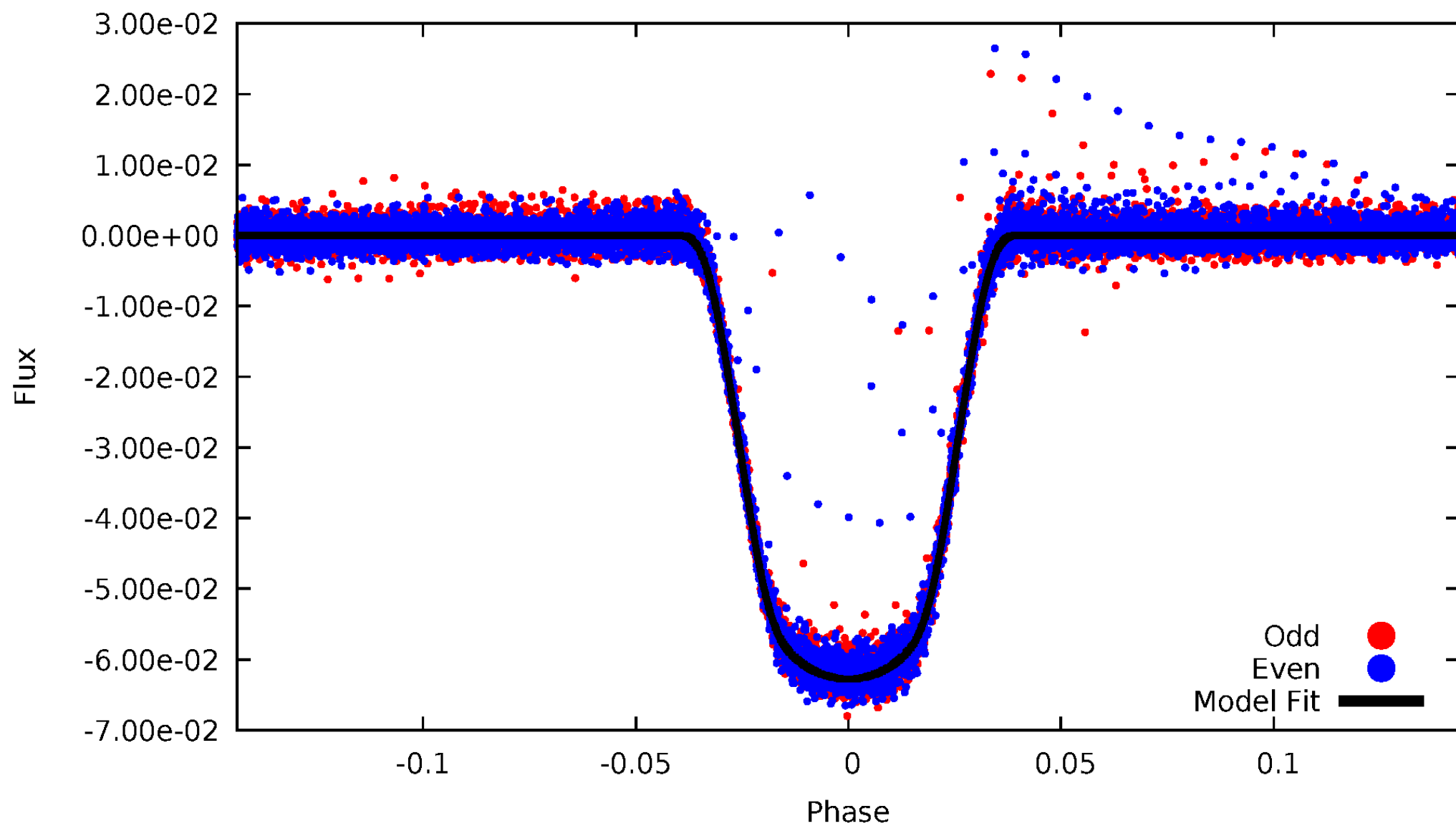


TCE 002720354-01



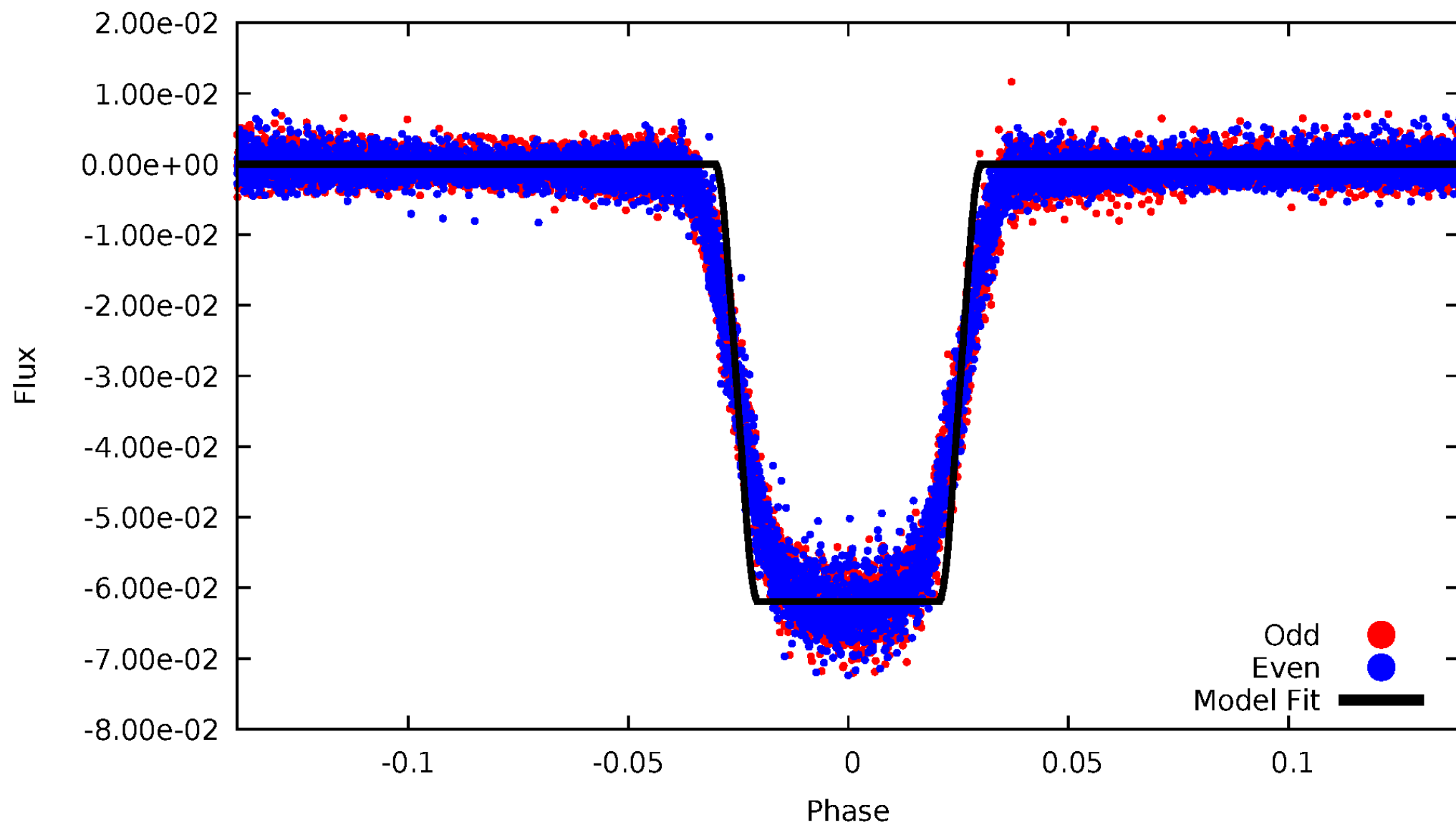
DV Odd/Even

TCE 002720354-01



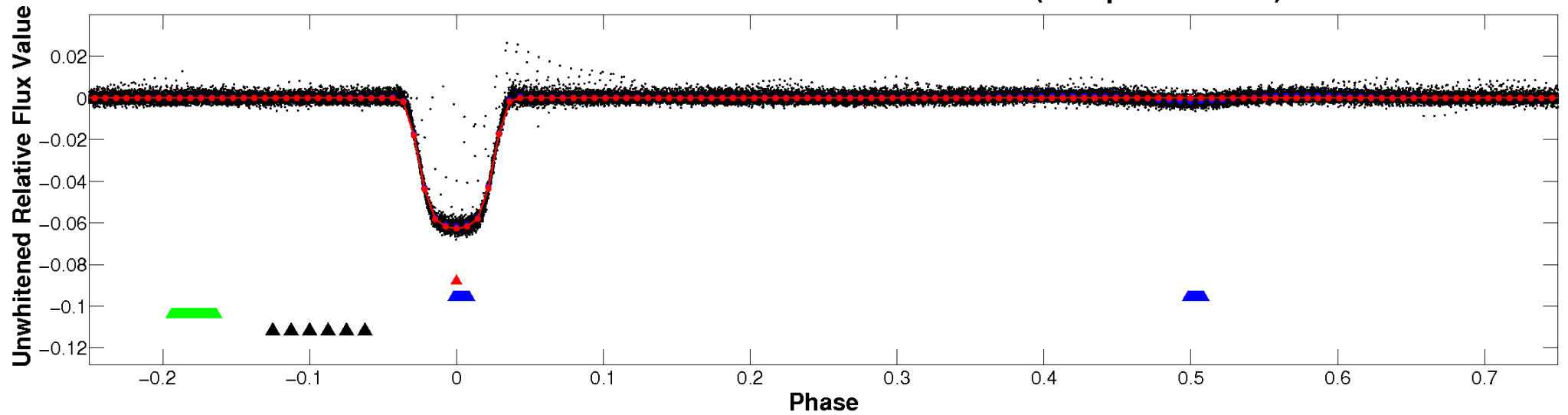
ALT Odd/Even

TCE 002720354-01

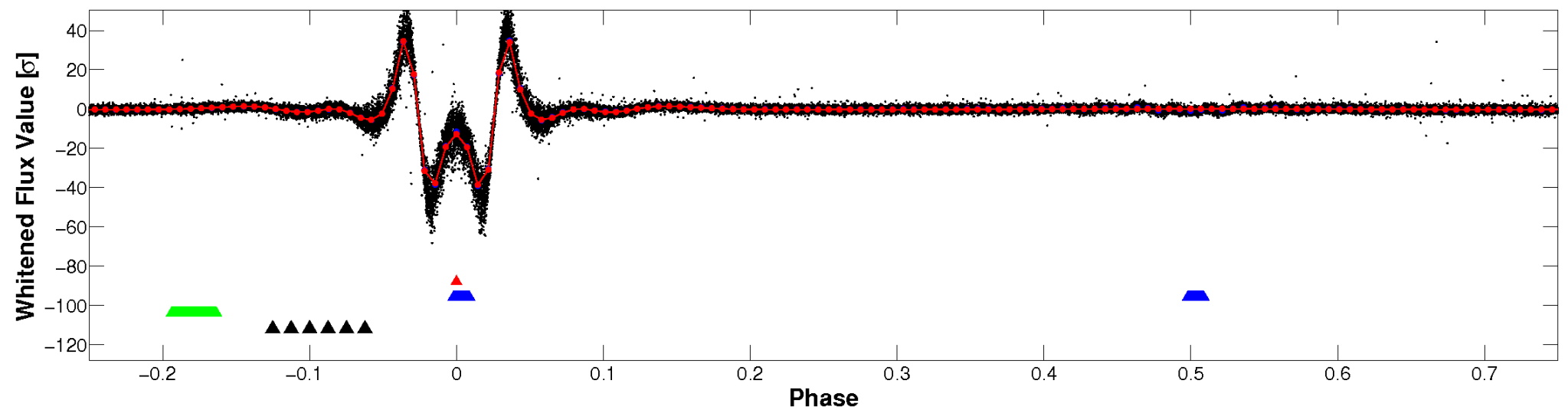


Non-Whitened Vs. Whitened Light Curve

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

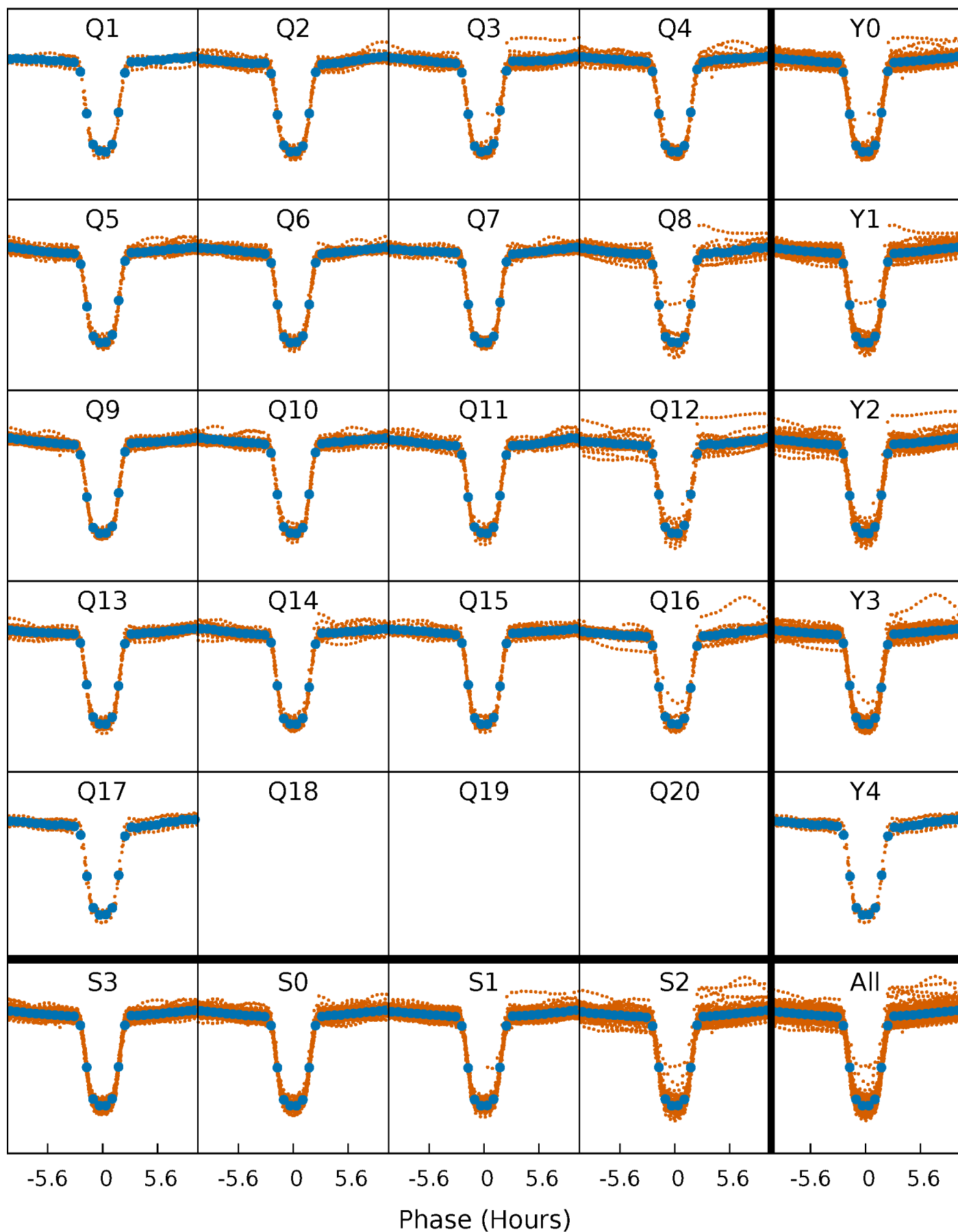


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



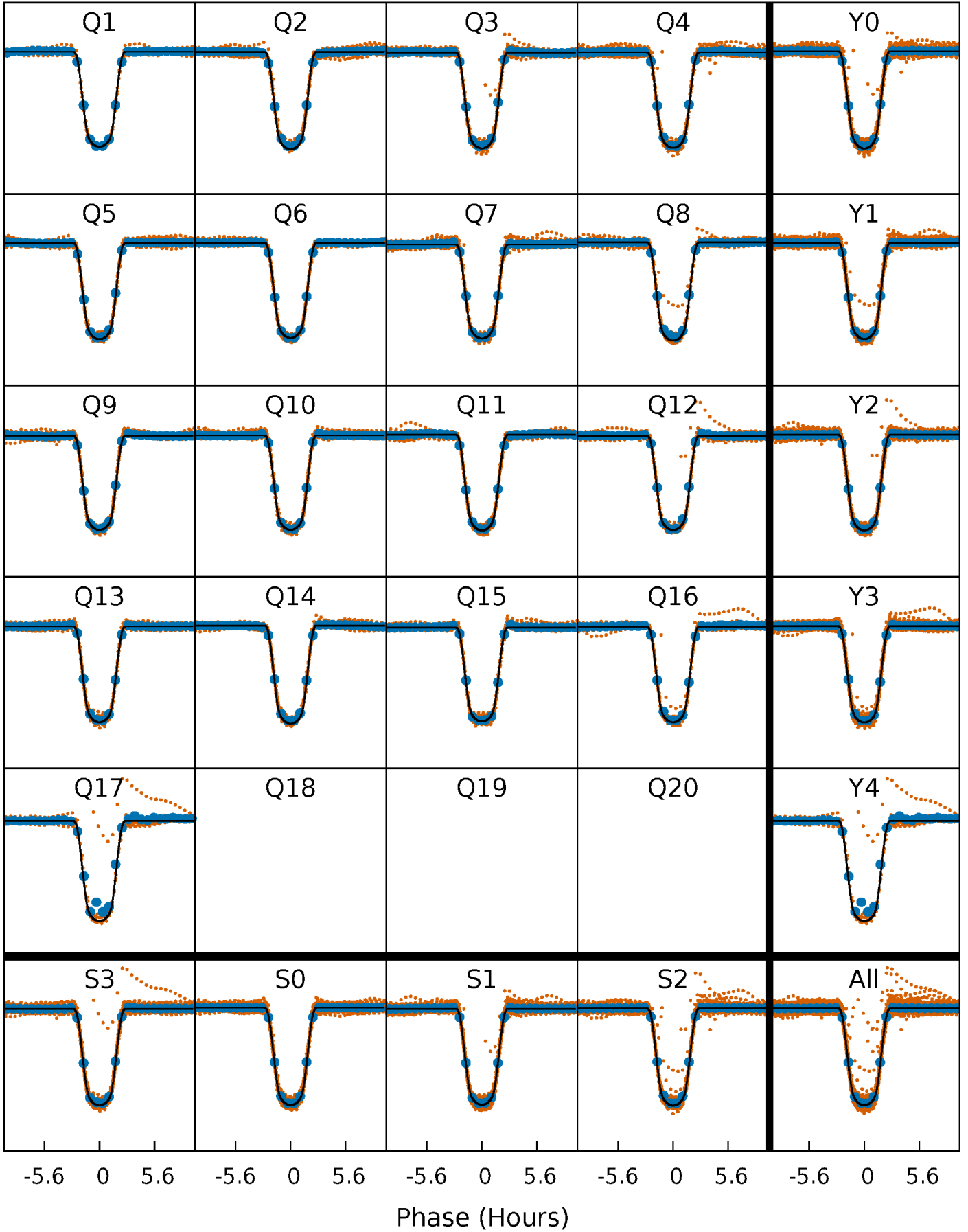
PDC Quarter-Phased Transit Curves

TCE 002720354-01 P= 2.821326 Days $T_0=131.680486$ (BKJD)



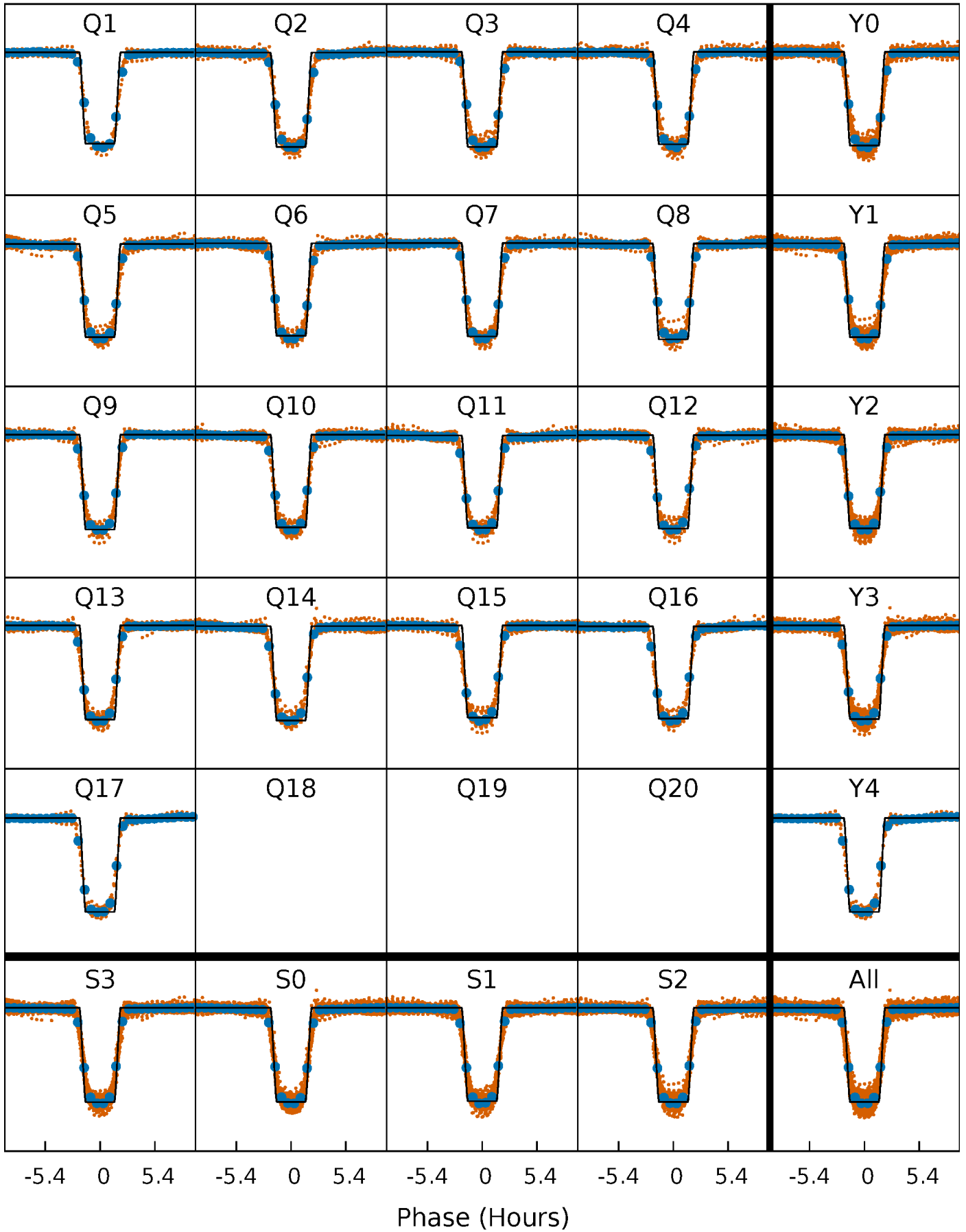
DV Quarter-Phased Transit Curves

TCE 002720354-01 P= 2.821326 Days $T_0=131.680486$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

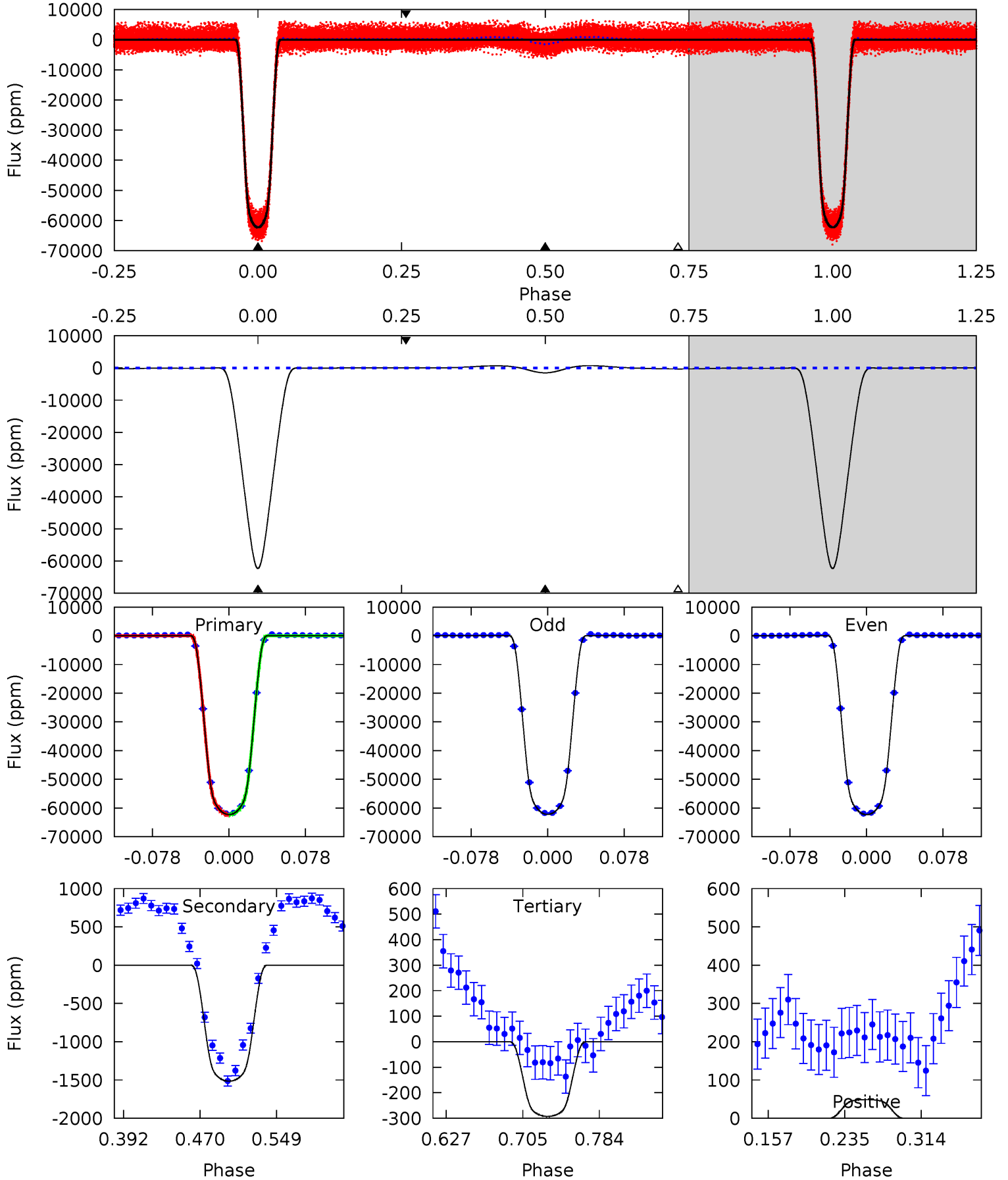
TCE 002720354-01 P= 2.821348 Days $T_0=131.675234$ (BKJD)



DV Model-Shift Uniqueness Test

002720354-01, P = 2.821326 Days, E = 128.859160 Days

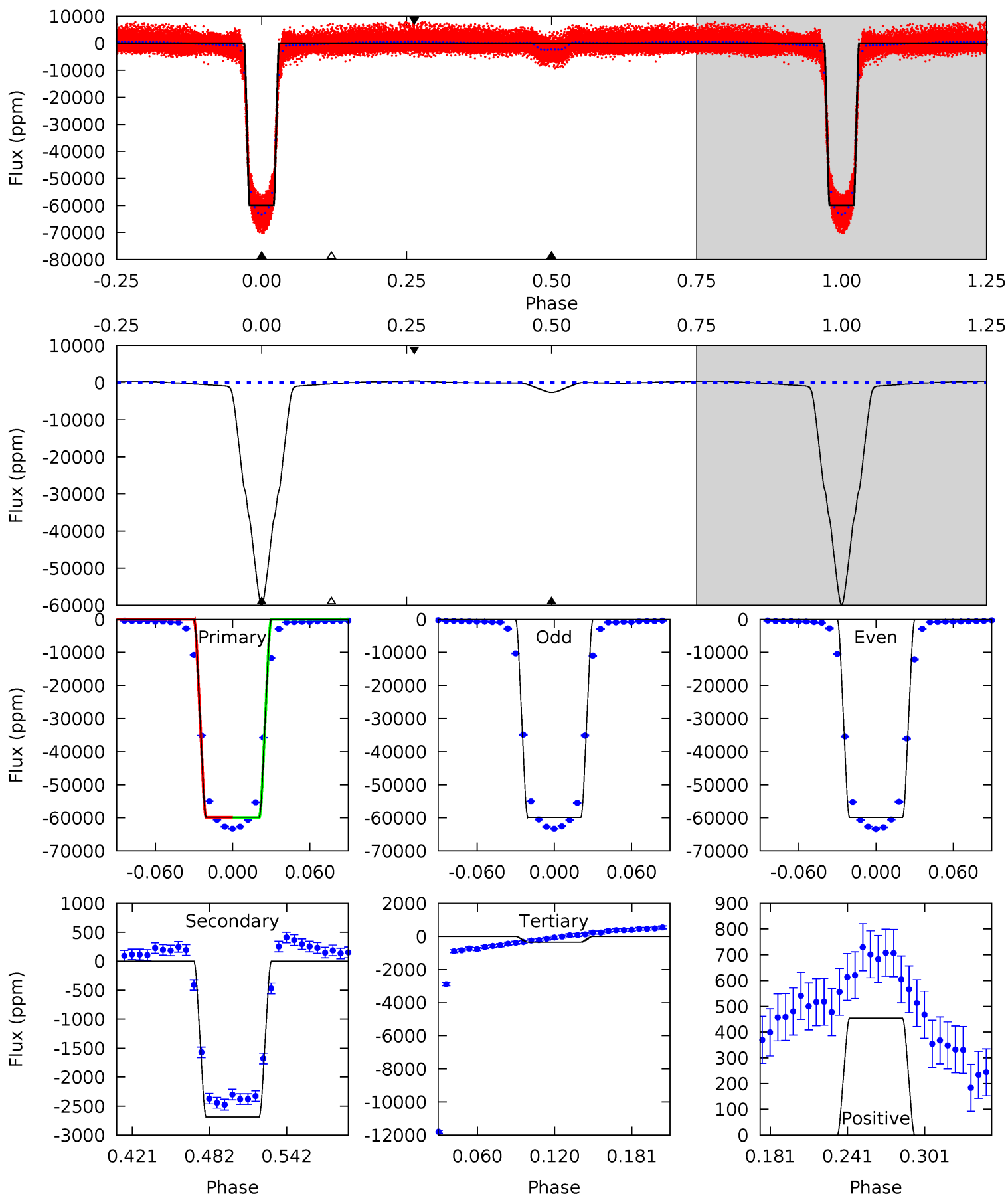
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2988	72.7	14.0	2.34	4.62	1.76	11.8	2974	2986	58.7	70.4	1.95	0.99	0.01	1.97



Alt Model-Shift Uniqueness Test

002720354-01, P = 2.821348 Days, E = 128.853886 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1933	86.8	11.0	14.6	4.67	1.88	11.0	1922	1918	75.8	72.2	0.21	1.00	0.01	1.36



Stellar Parameters For KIC 002720354

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6701^{+74}_{-81}	$4.121^{+0.168}_{-0.098}$	$-0.540^{+0.150}_{-0.150}$	$1.506^{+0.229}_{-0.280}$	$1.092^{+0.095}_{-0.067}$	$0.451^{+0.370}_{-0.148}$
	+1%/-1%	+4%/-2%	+28%/-28%	+15%/-19%	+9%/-6%	+82%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002720354-01 / KOI 6292.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1515 ± 21	$39.14^{+3.40}_{-4.15}$	2514^{+107}_{-131}	3079^{+45}_{-47}	$0.888^{+0.206}_{-0.127}$
Alt.	-2689 ± 31	$40.61^{+3.45}_{-4.14}$	2509^{+106}_{-128}	3405^{+33}_{-37}	$1.471^{+0.311}_{-0.212}$

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

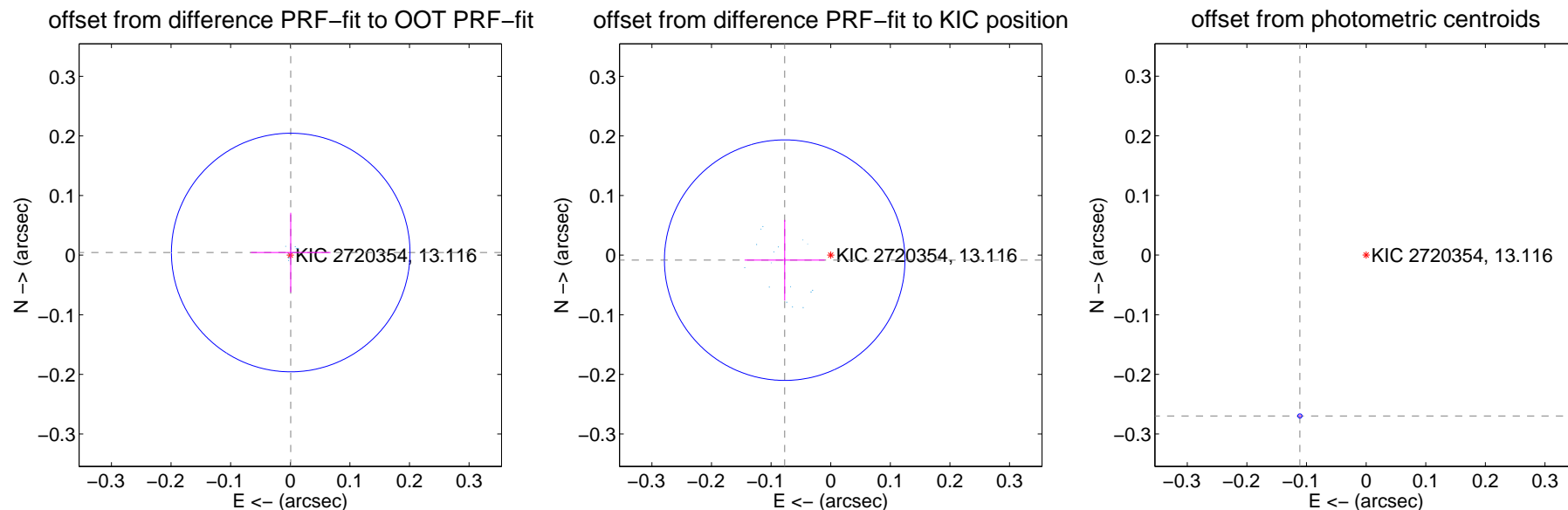
DV Centroid Data

Supplemental centroid analysis for 002720354-01. Kepler magnitude: 13.12. Transit SNR 1763.02

There are 17 quarters with good PRF difference image offsets

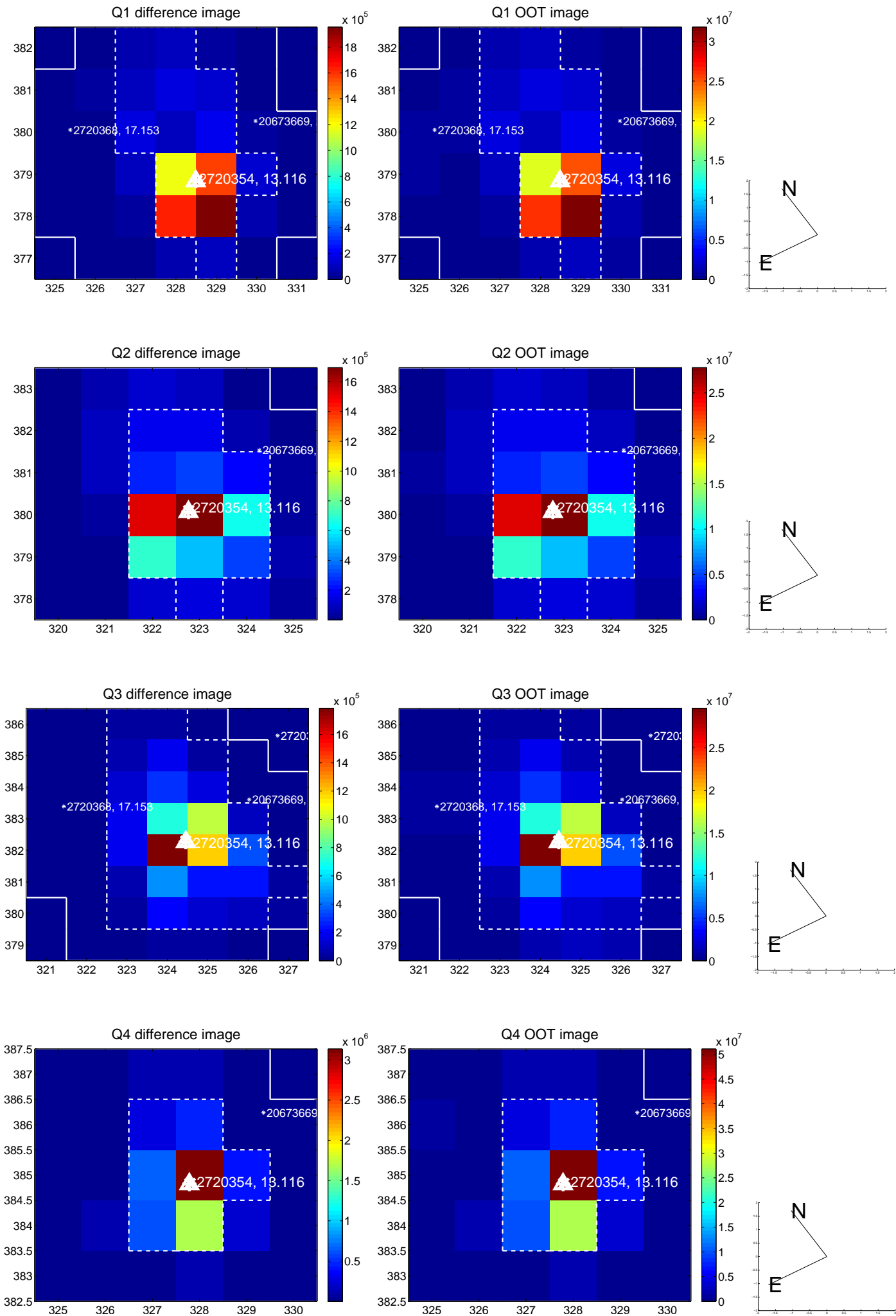
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.004 ± 0.067	0.07	-0.001 ± 0.067	0.004 ± 0.067
PRF-fit source offset from KIC position	0.078 ± 0.067	1.16	0.077 ± 0.067	-0.008 ± 0.068
photometric centroid source offset	0.29 ± 0.00	246.25	0.11 ± 0.00	-0.27 ± 0.00

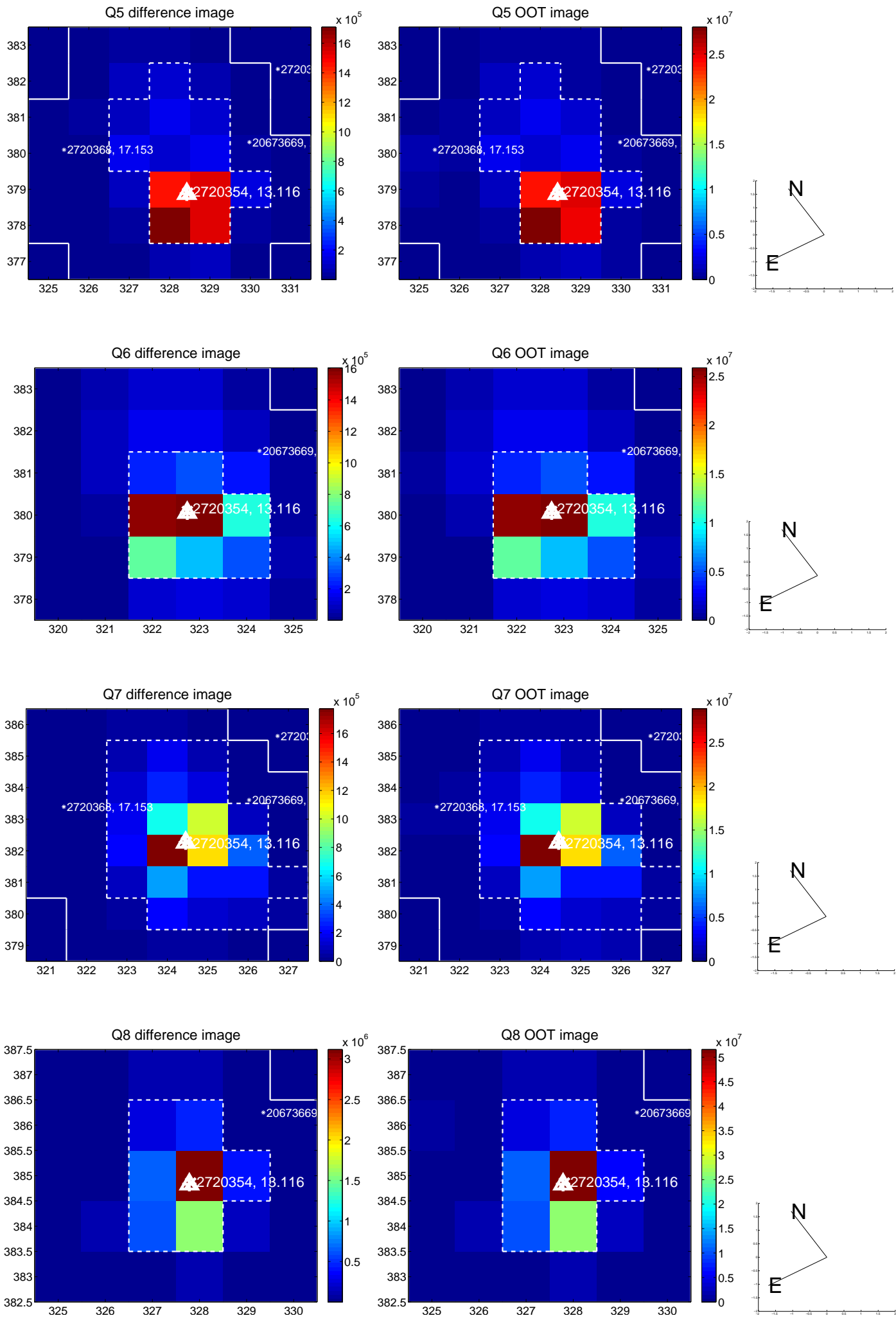


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

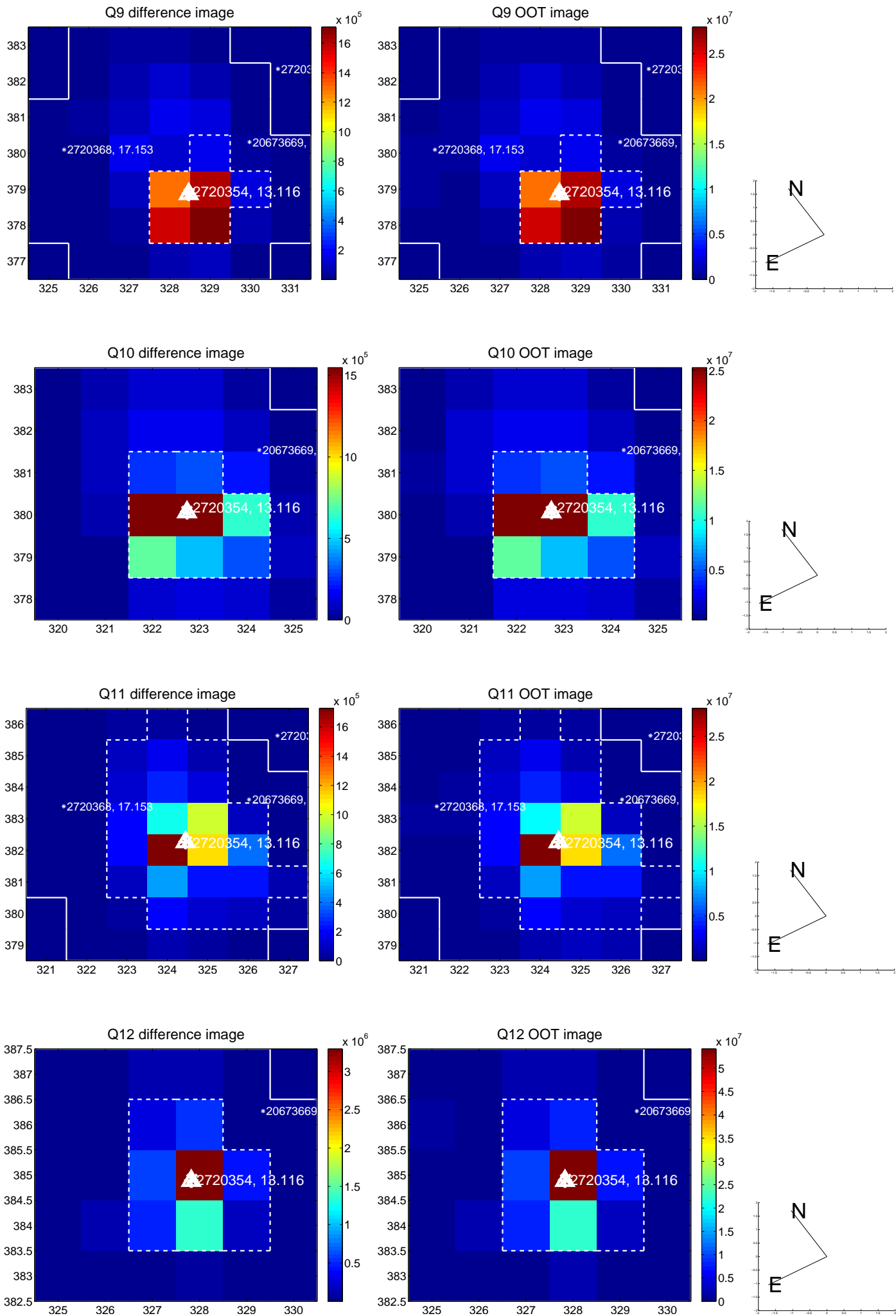
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



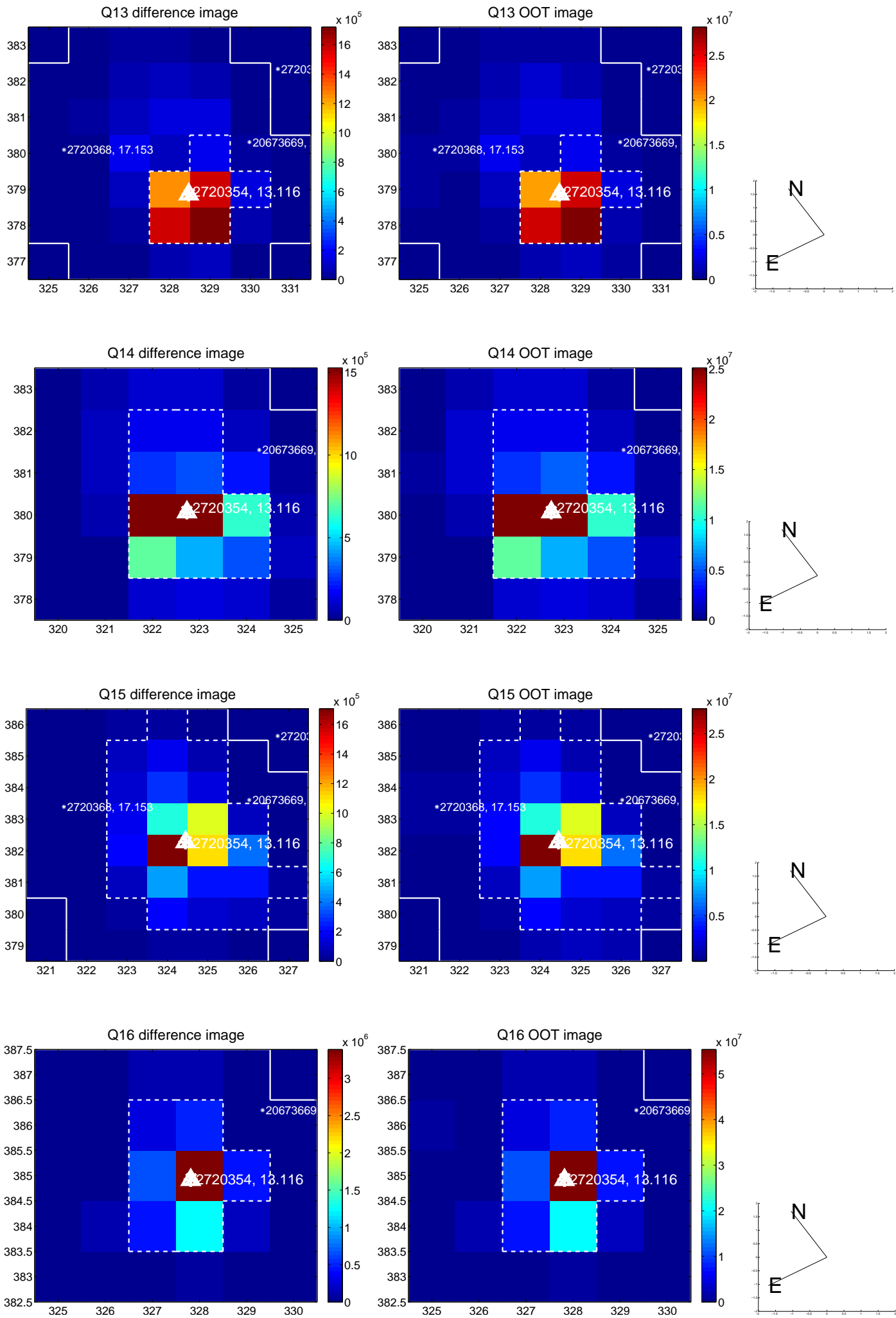
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



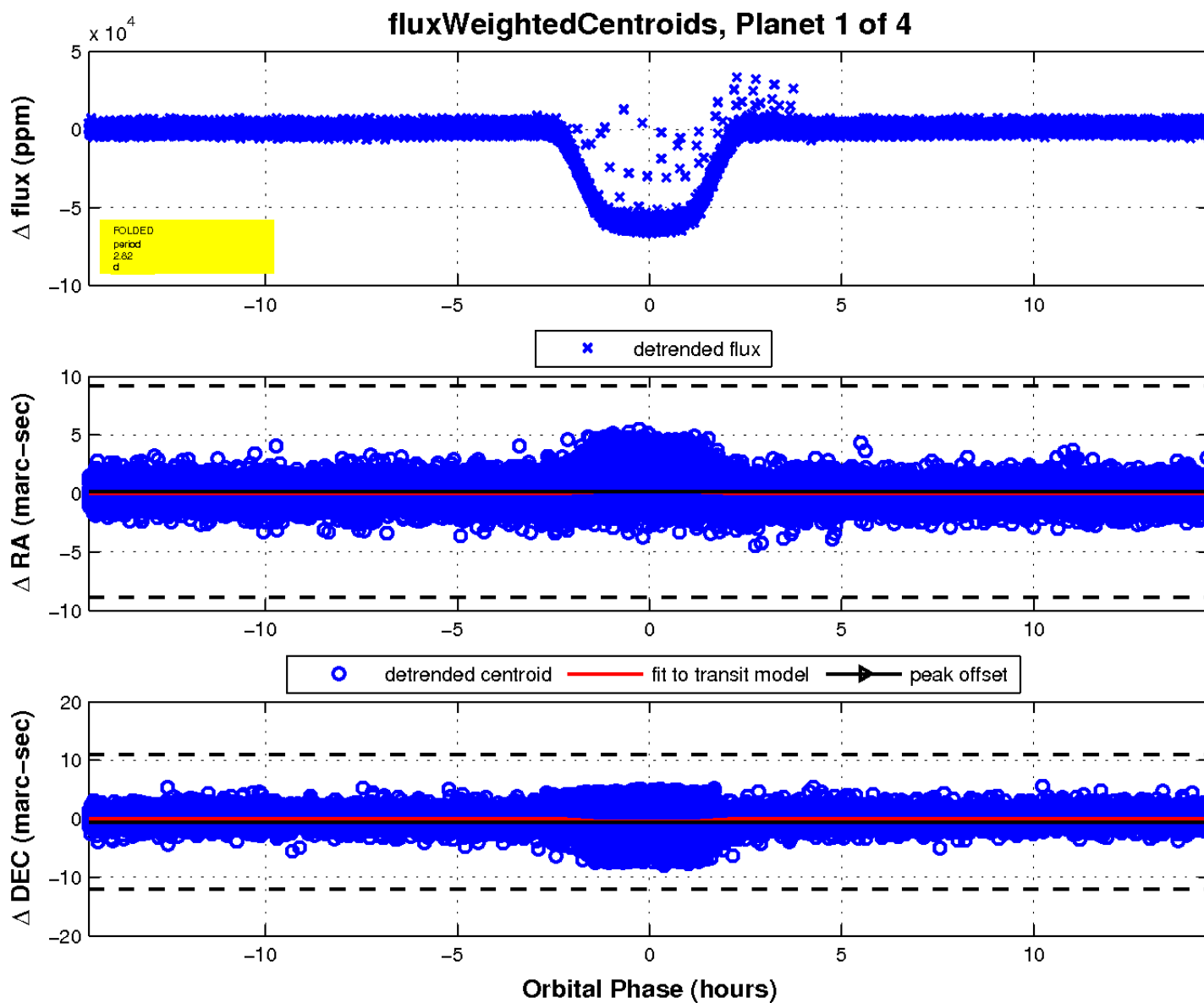
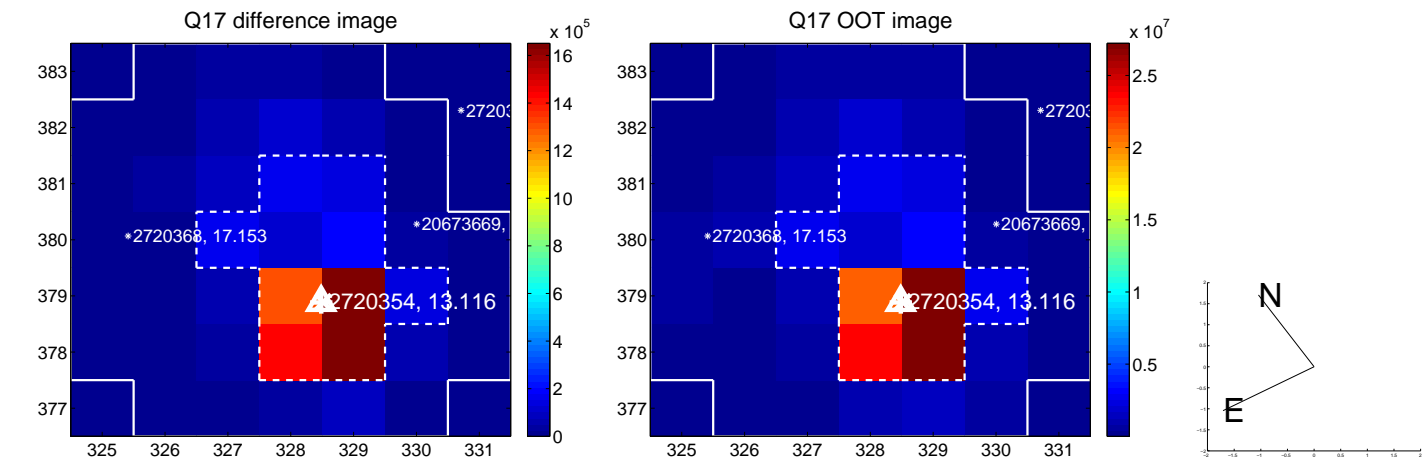
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

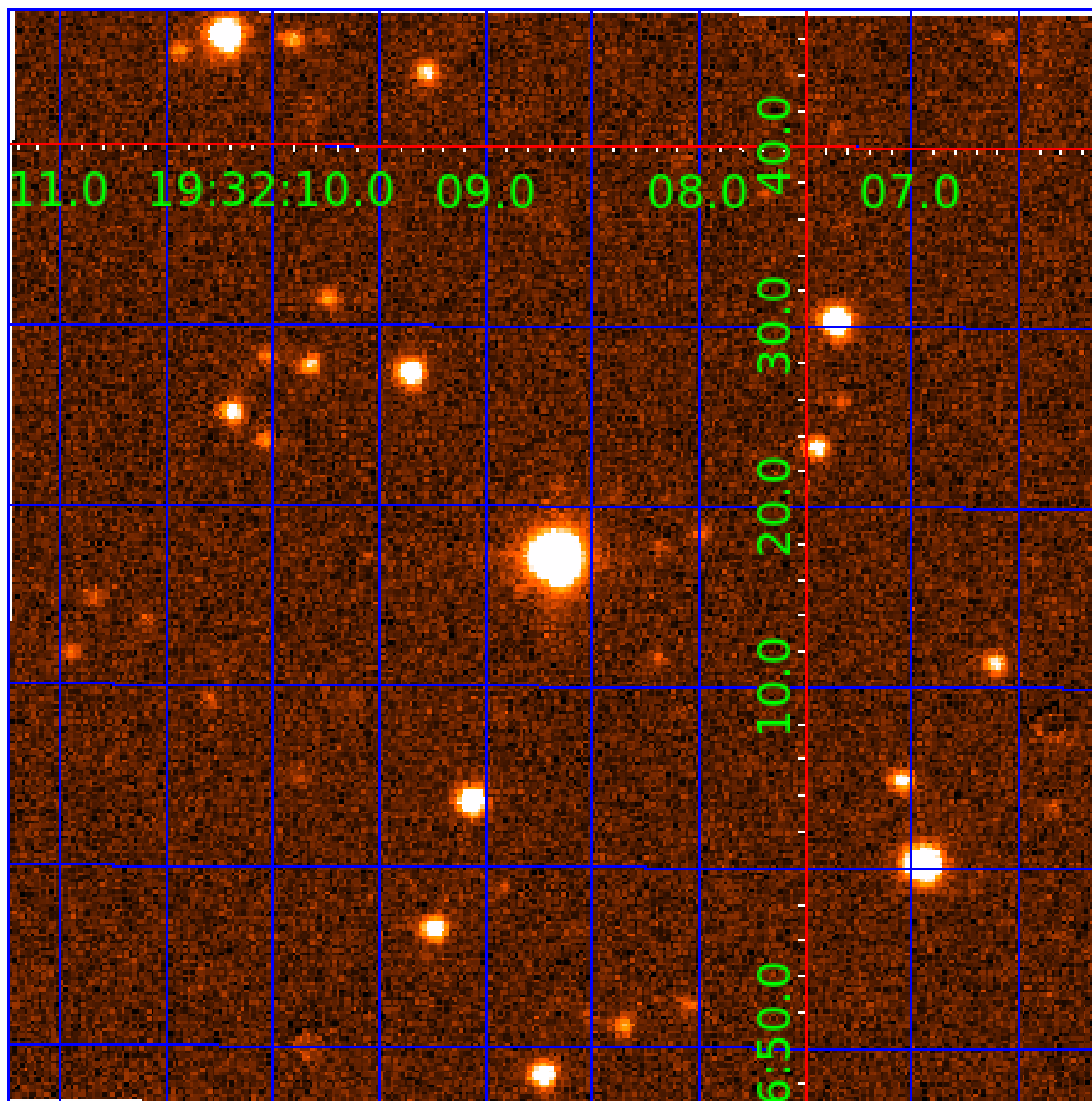


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002720354

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})
002720354-01	OBS	6292.01	2.821326	131.680486	62763.7	4.864	1867.4	1763.0	1.51	6701	39.25	2527.74
002720354-02	OBS	No	1.410693	131.674538	843.7	4.496	32.6	39.7	1.51	6701	5.15	6369.31
002720354-03	OBS	No	5.642986	136.776041	96.0	15.000	9.0	-1.0	1.51	6701	1.49	1003.05
002720354-04	OBS	No	242.598638	252.821742	3198.3	29.057	8.0	8.2	1.51	6701	9.58	6.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002720354-01	OBS	FP	0.01	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
002720354-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
002720354-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—RESIDUAL_TCE—CENT_NOFITS
002720354-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT

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 for comment definitions.

Ephemeris Match Information For 002720354-02

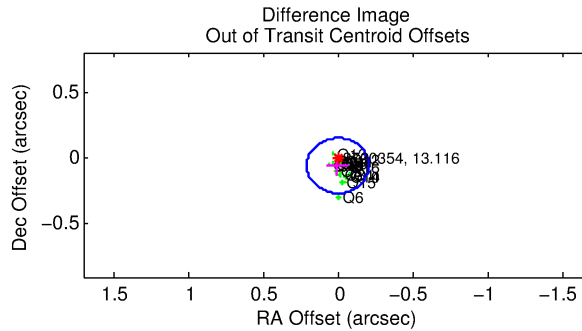
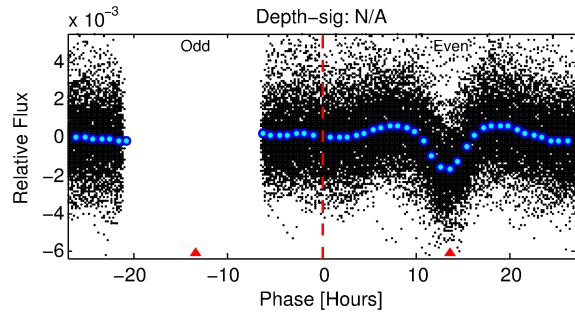
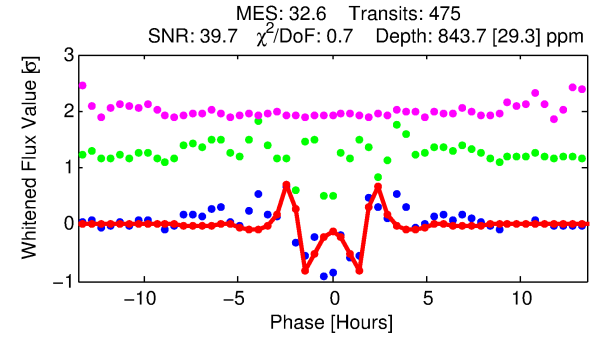
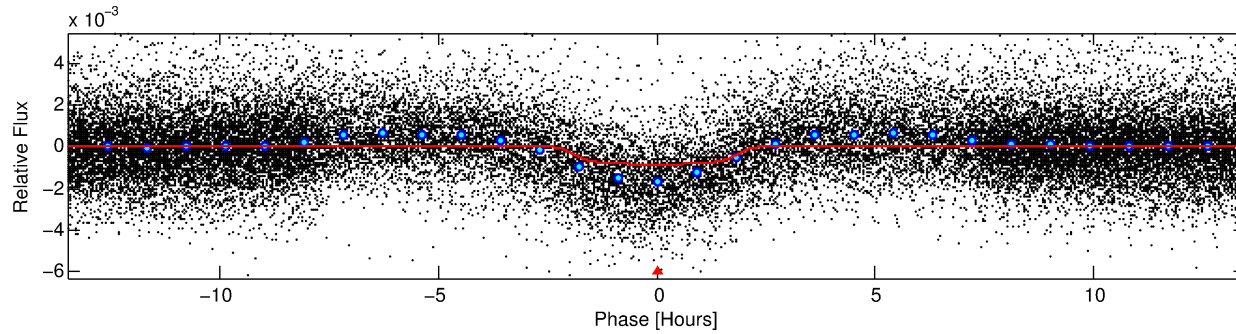
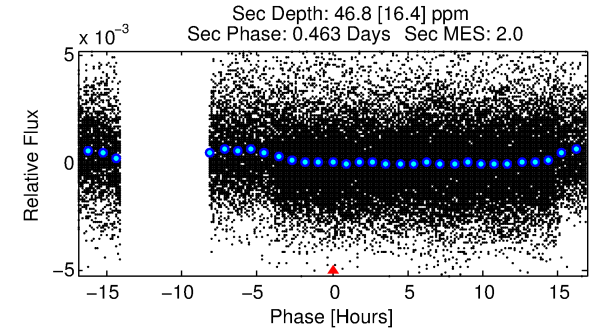
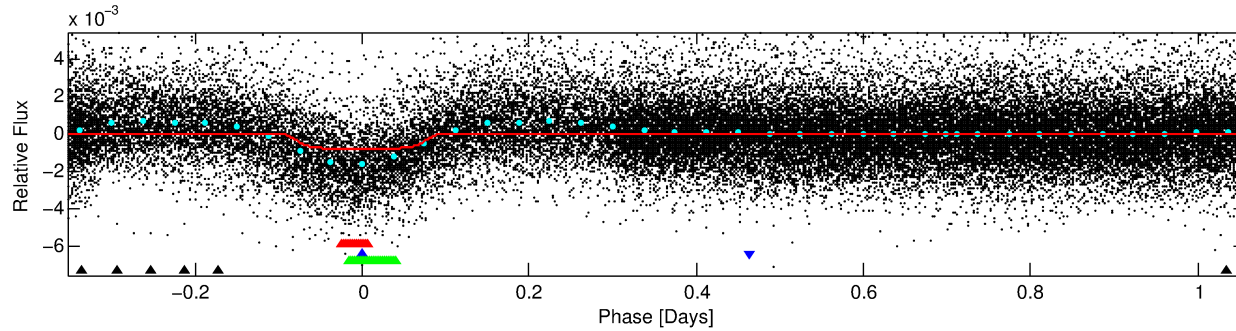
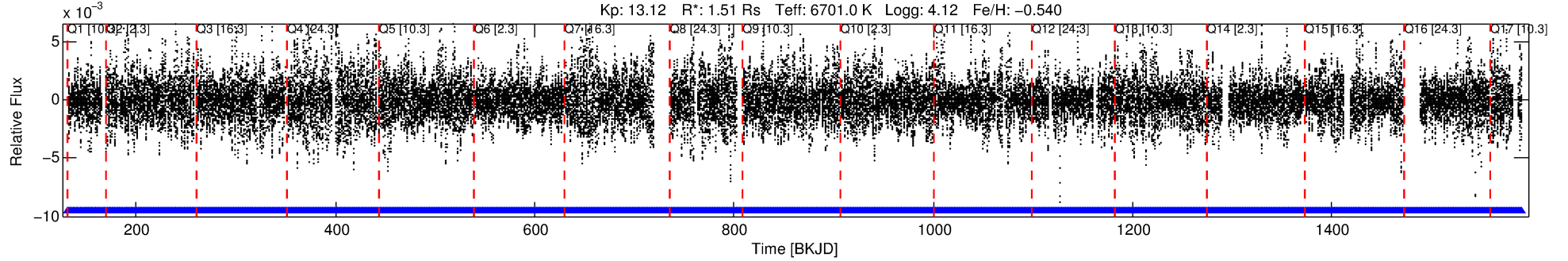
No Significant Match Found

DV One-Page Summary

KIC: 2720354 Candidate: 2 of 4 Period: 1.411 d

KOI: K06292 Corr: No Ephemeris Match

Kp: 13.12 R*: 1.51 Rs Teff: 6701.0 K Logg: 4.12 Fe/H: -0.540



DV Fit Results:

Period = 1.41069 [0.00000] d
Epoch = 131.6745 [0.0004] BKJD
Rp/R* = 0.0313 [0.0006]
a/R* = 1.50 [0.02]
b = 0.91 [0.01]
Seff = 6369.31 [1848.29]
Teq = 2278 [165] K
Rp = 5.15 [0.96] Re
a = 0.0254 [0.0045] AU
Ag = 0.63 [0.28] [-1.32σ]
Teffp = 3132 [278] K [2.64σ]

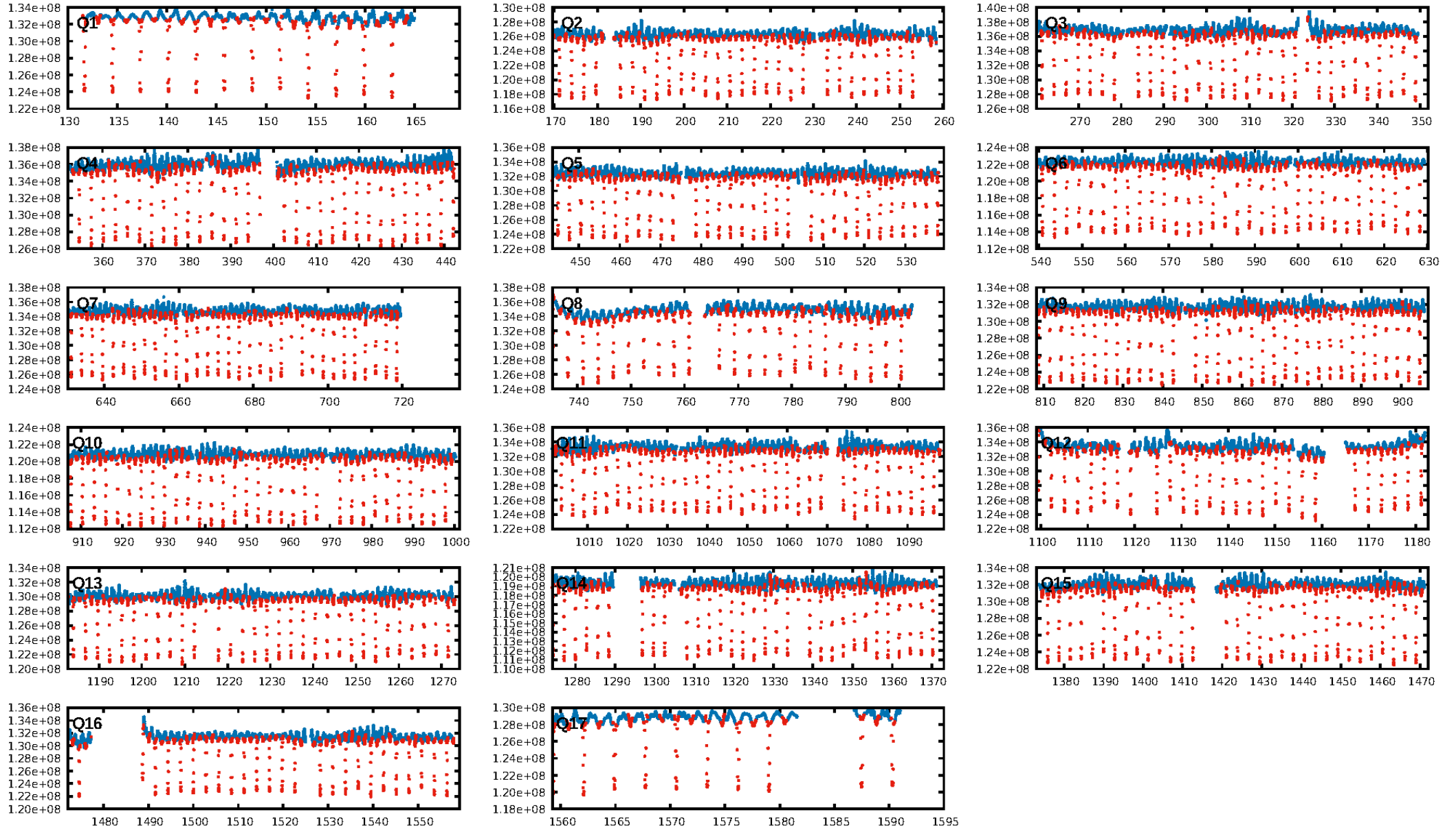
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [5.11σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.04e-222
RollingBand-fgt: 1.00 [454/454]
GhostDiagnostic-chr: 1.834
Centroid-sig: 0.0%
Centroid-so: 0.610 arcsec [10.37σ]
OotOffset-rm: 0.058 arcsec [0.83σ]
KicOffset-rm: 0.113 arcsec [1.64σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 1.00 [17/17]

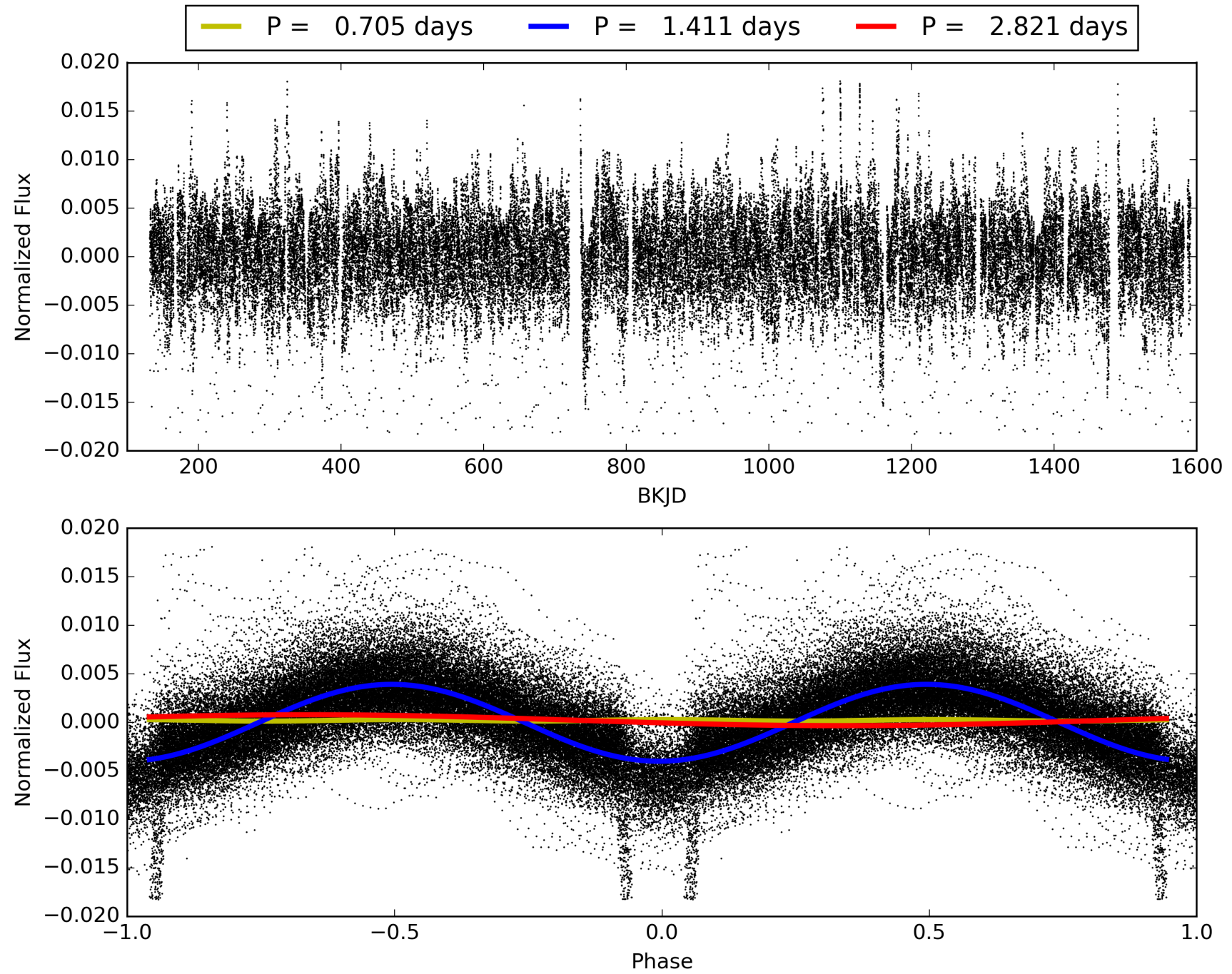
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 002720354-02, PDC Light Curves

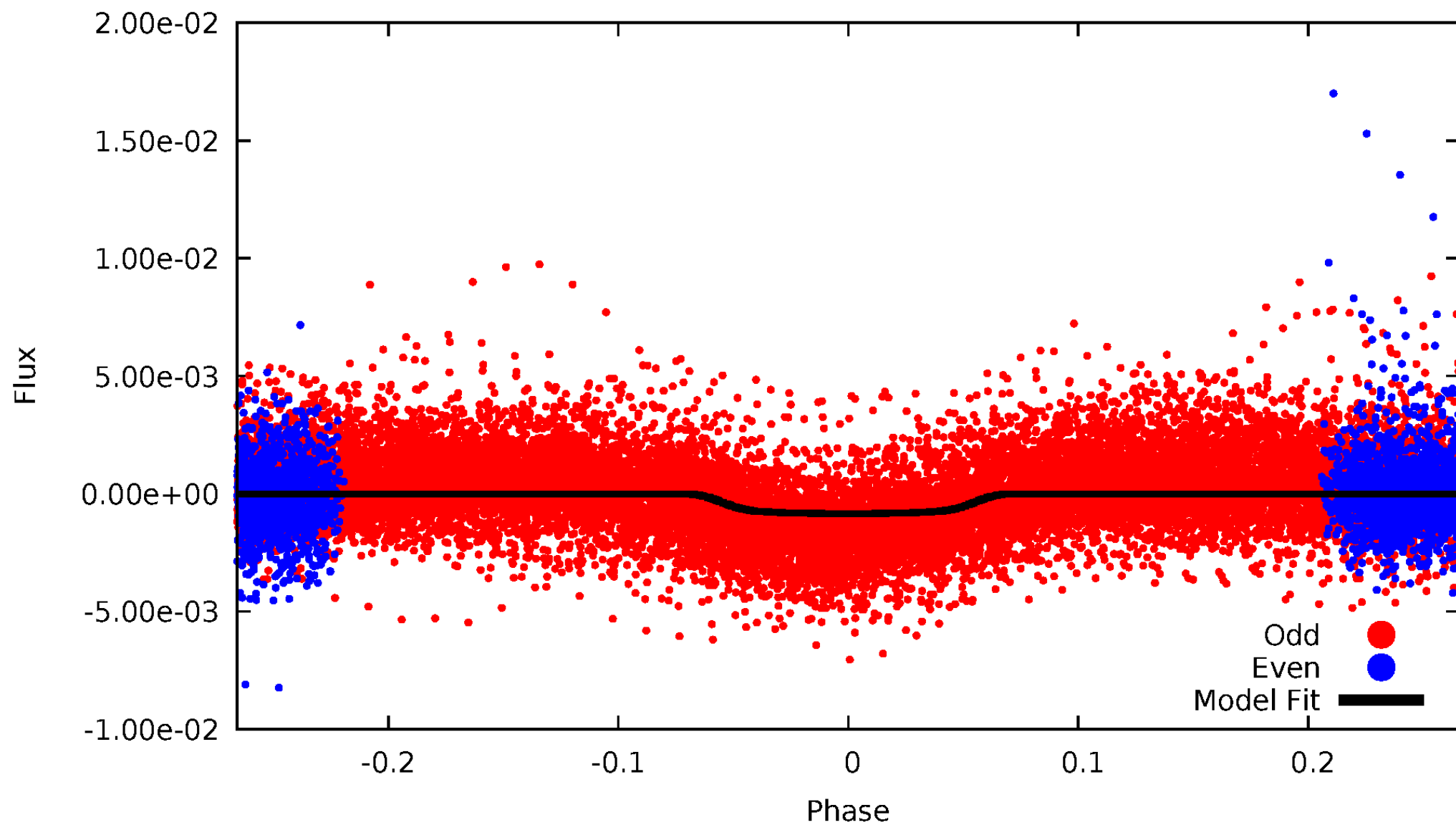


TCE 002720354-02



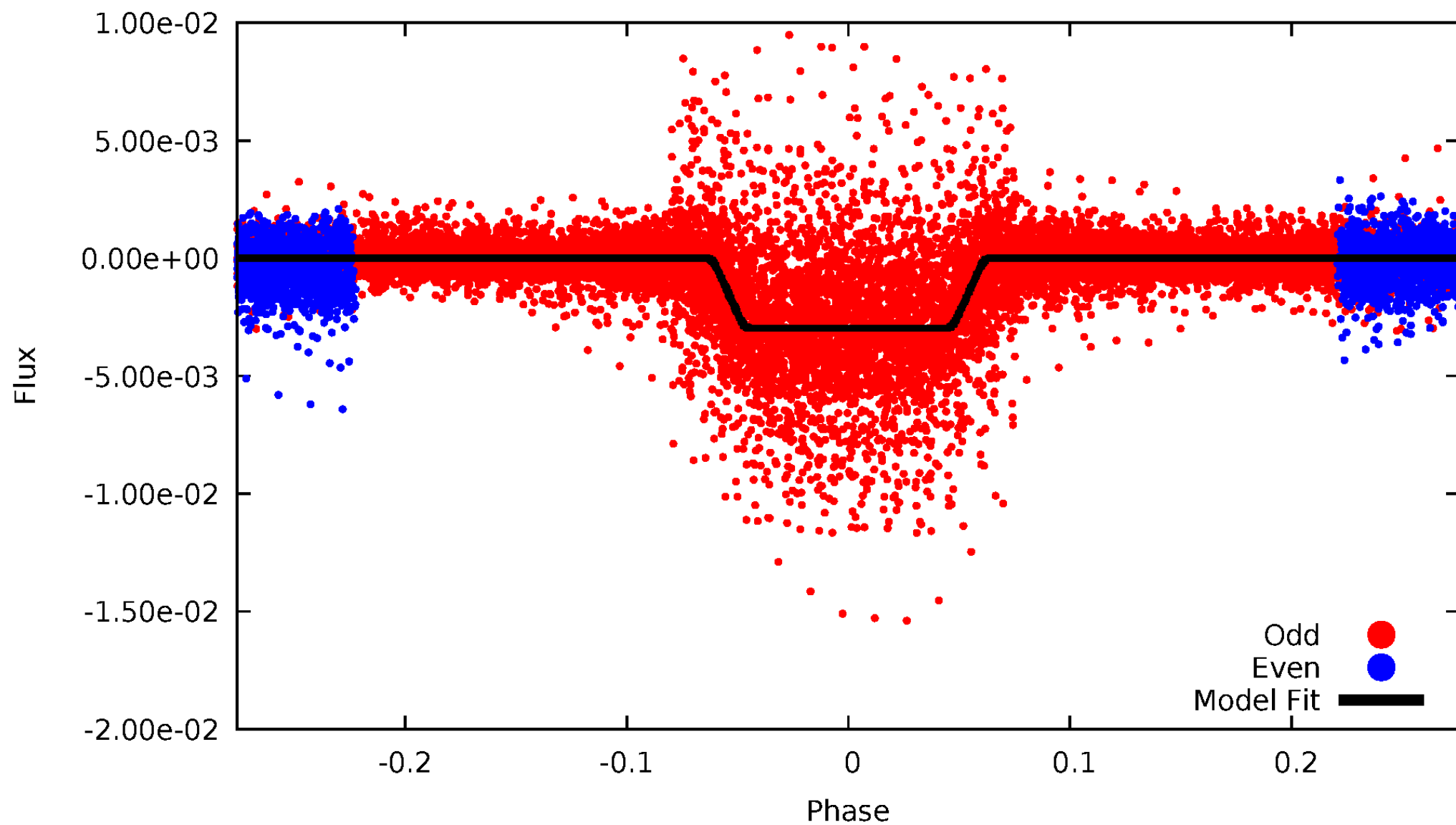
DV Odd/Even

TCE 002720354-02



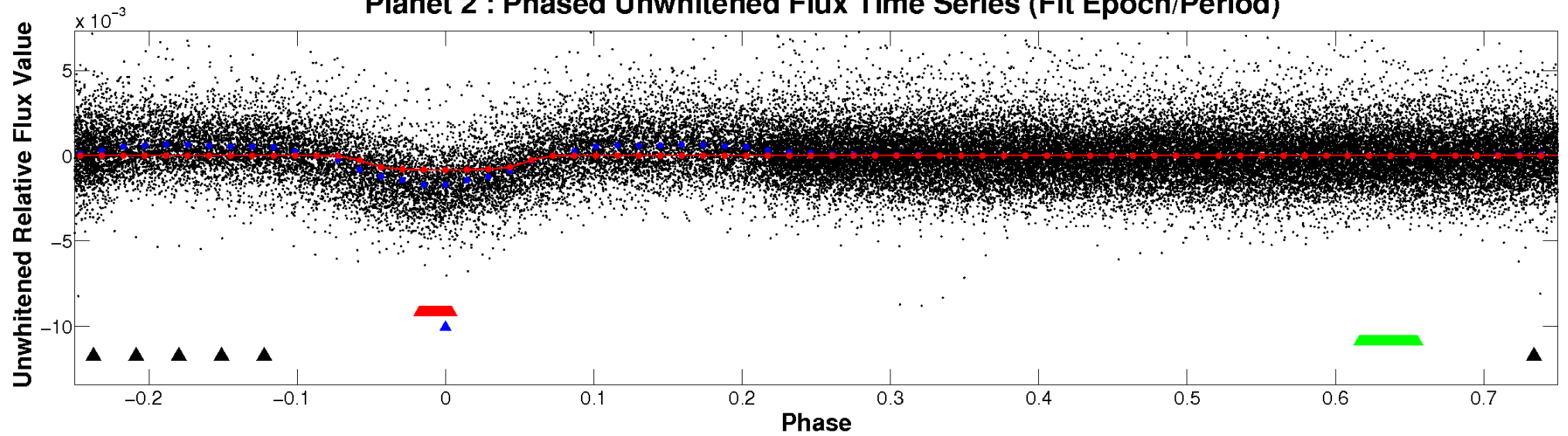
ALT Odd/Even

TCE 002720354-02

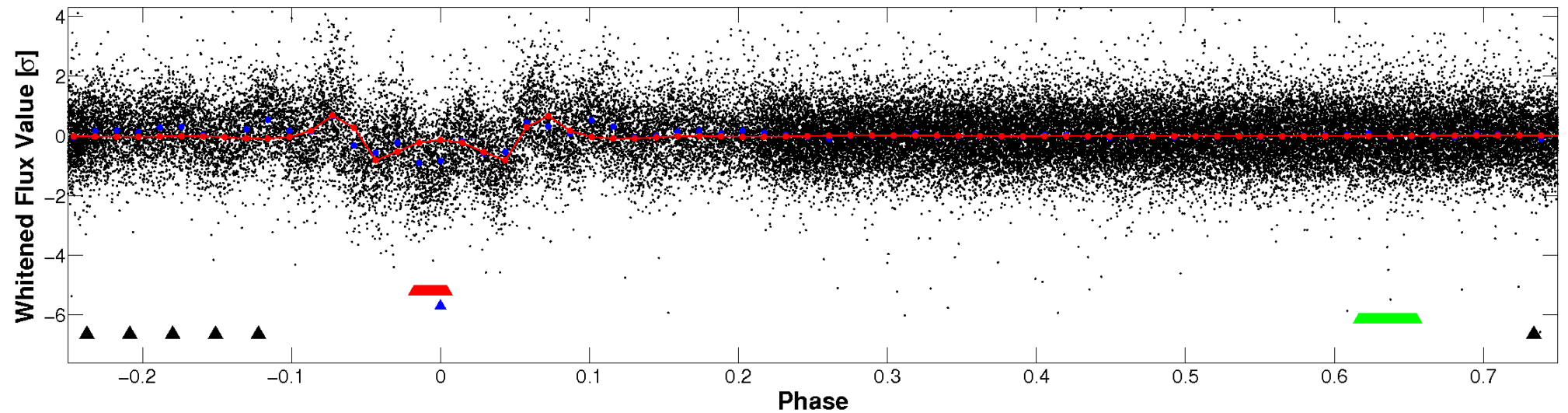


Non-Whitened Vs. Whitened Light Curve

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

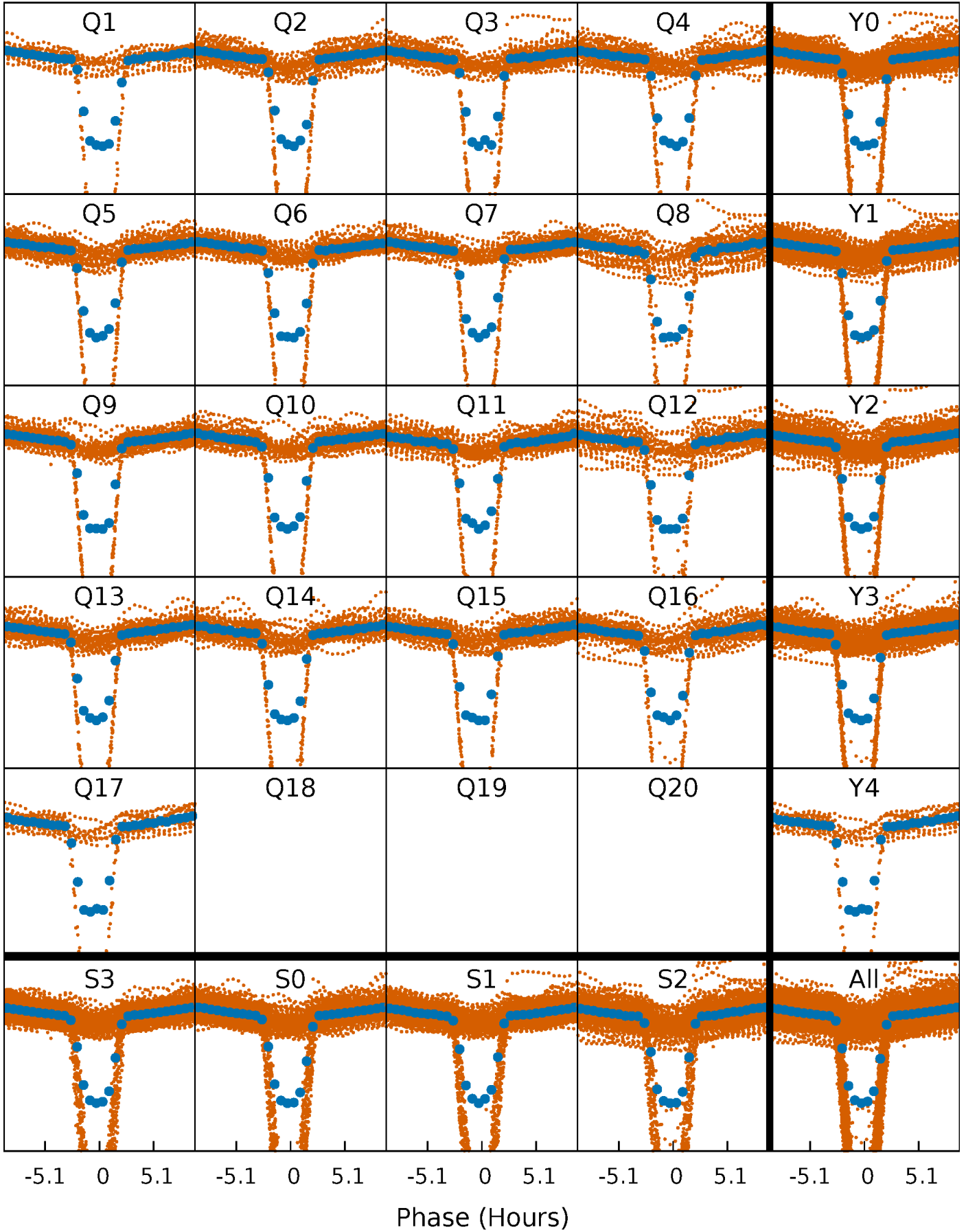


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



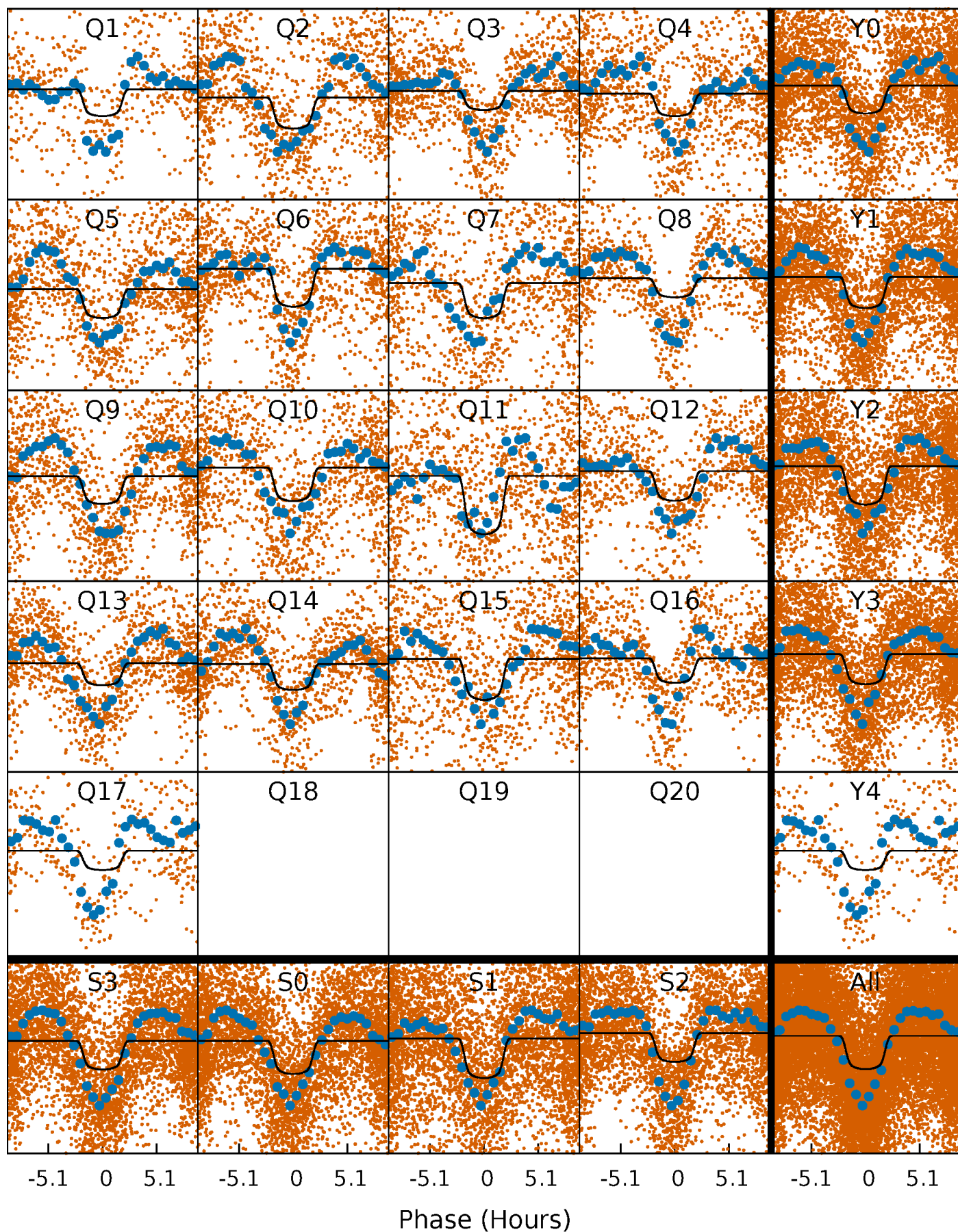
PDC Quarter-Phased Transit Curves

TCE 002720354-02 P= 1.410693 Days $T_0=131.674538$ (BKJD)



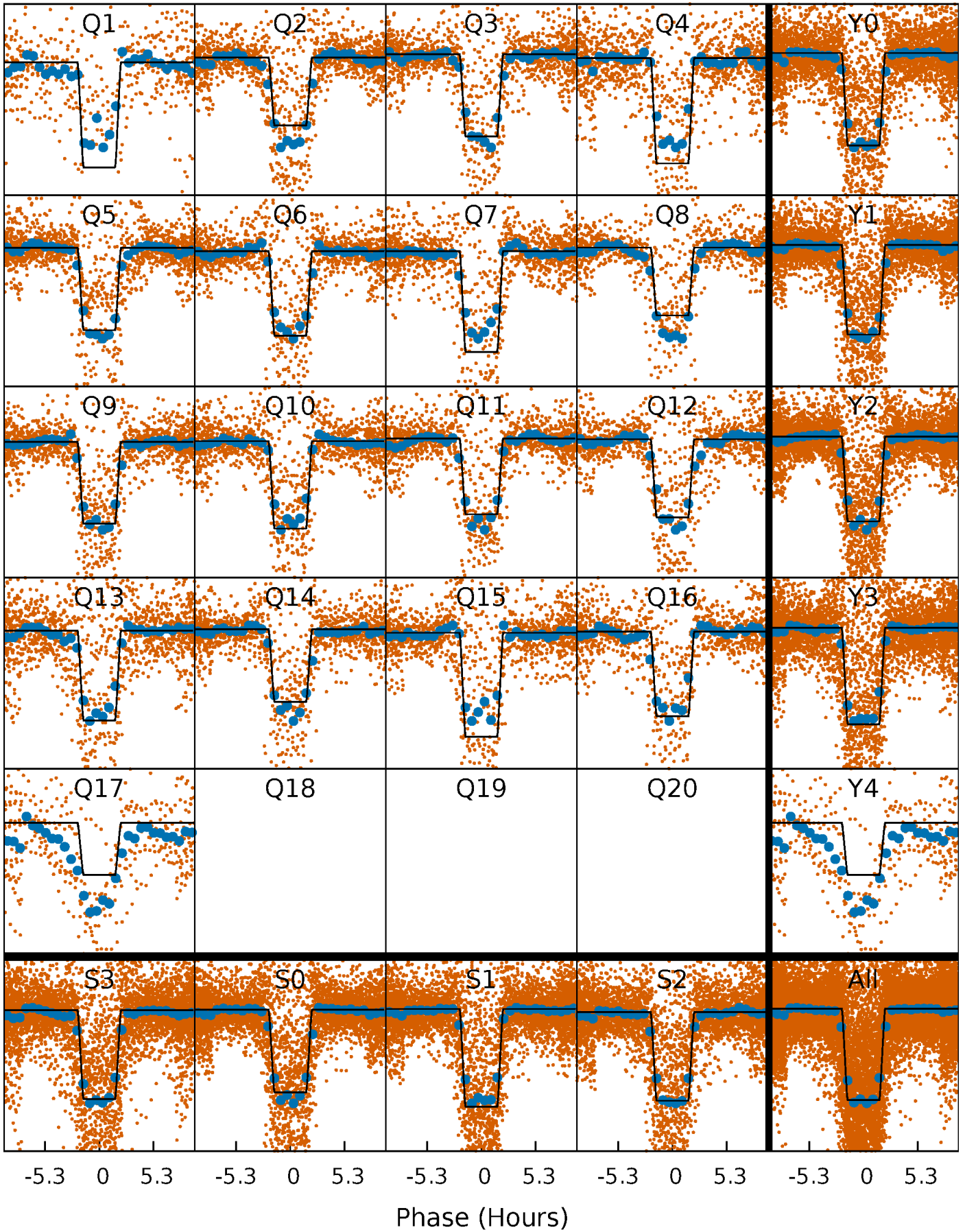
DV Quarter-Phased Transit Curves

TCE 002720354-02 P= 1.410693 Days $T_0=131.674538$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

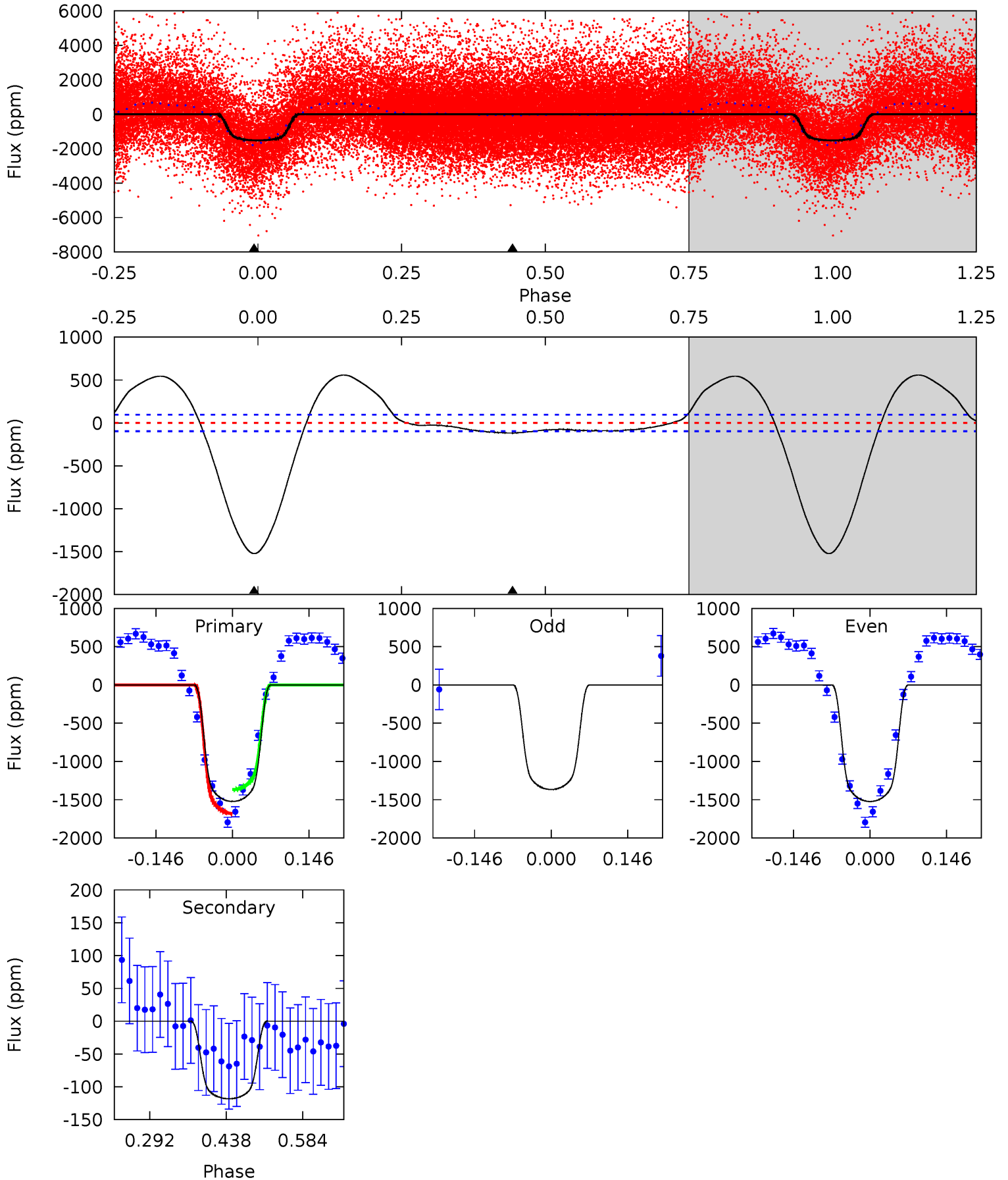
TCE 002720354-02 P= 1.410668 Days $T_0=131.678953$ (BKJD)



DV Model-Shift Uniqueness Test

002720354-02, P = 1.410693 Days, E = 131.674538 Days

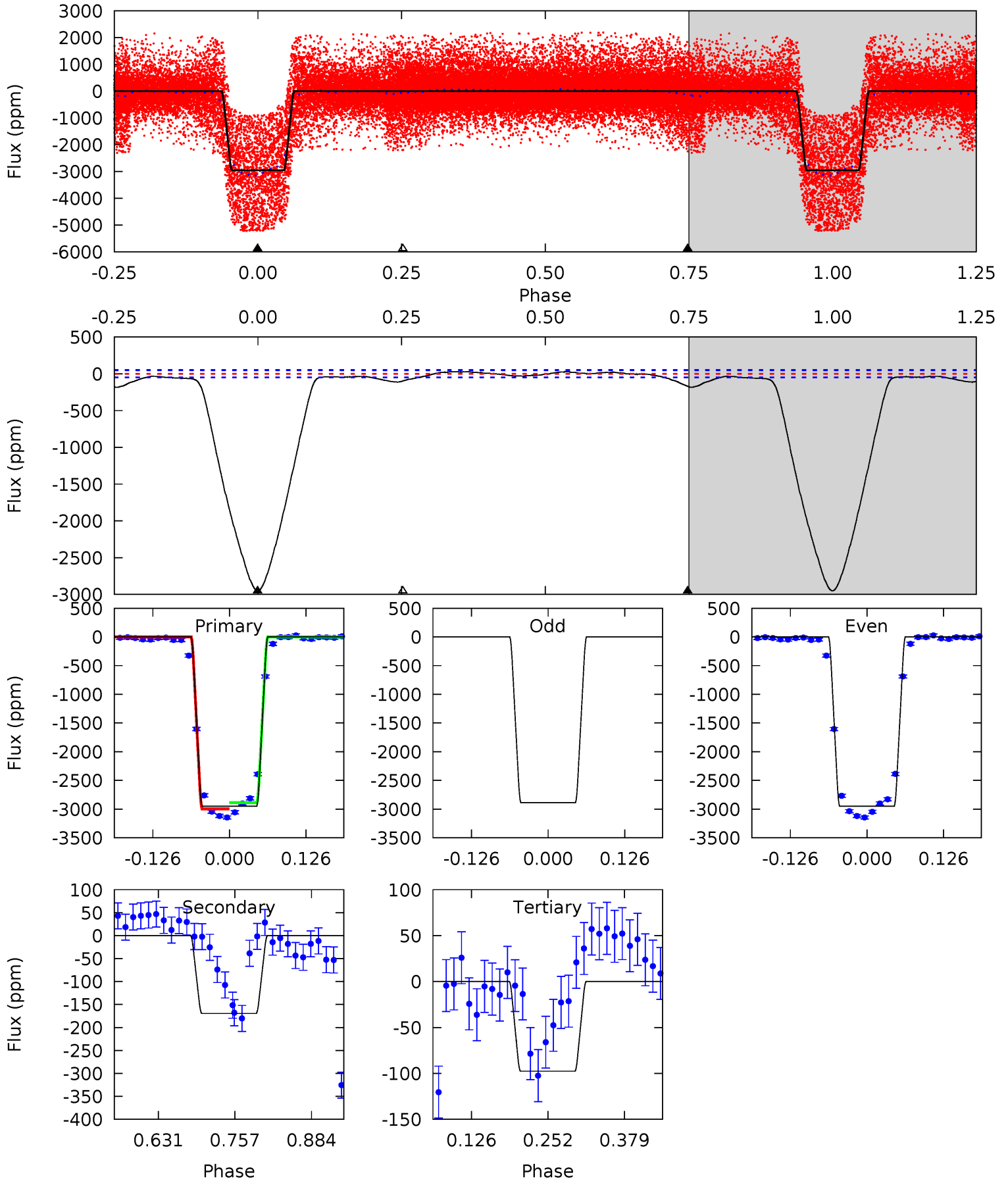
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
70.9	5.51	0	0	4.48	1.45	10.2	70.9	70.9	5.51	5.51	4.27	0.99	0.27	7.33



Alt Model-Shift Uniqueness Test

002720354-02, P = 1.410668 Days, E = 131.678953 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
268.9	15.4	8.90	0	4.52	1.53	3.36	260.0	268.9	6.54	15.4	3.29	0.99	0.01	4.72



Stellar Parameters For KIC 002720354

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6701^{+74}_{-81}	$4.121^{+0.168}_{-0.098}$	$-0.540^{+0.150}_{-0.150}$	$1.506^{+0.229}_{-0.280}$	$1.092^{+0.095}_{-0.067}$	$0.451^{+0.370}_{-0.148}$
	+1%/-1%	+4%/-2%	+28%/-28%	+15%/-19%	+9%/-6%	+82%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002720354-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-118 ± 21	$5.14^{+0.42}_{-0.51}$	3166^{+135}_{-155}	4042^{+168}_{-177}	$1.590^{+0.506}_{-0.350}$
Alt.	-169 ± 11	$8.90^{+0.85}_{-0.90}$	3169^{+141}_{-159}	3409^{+84}_{-100}	$0.759^{+0.196}_{-0.118}$

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

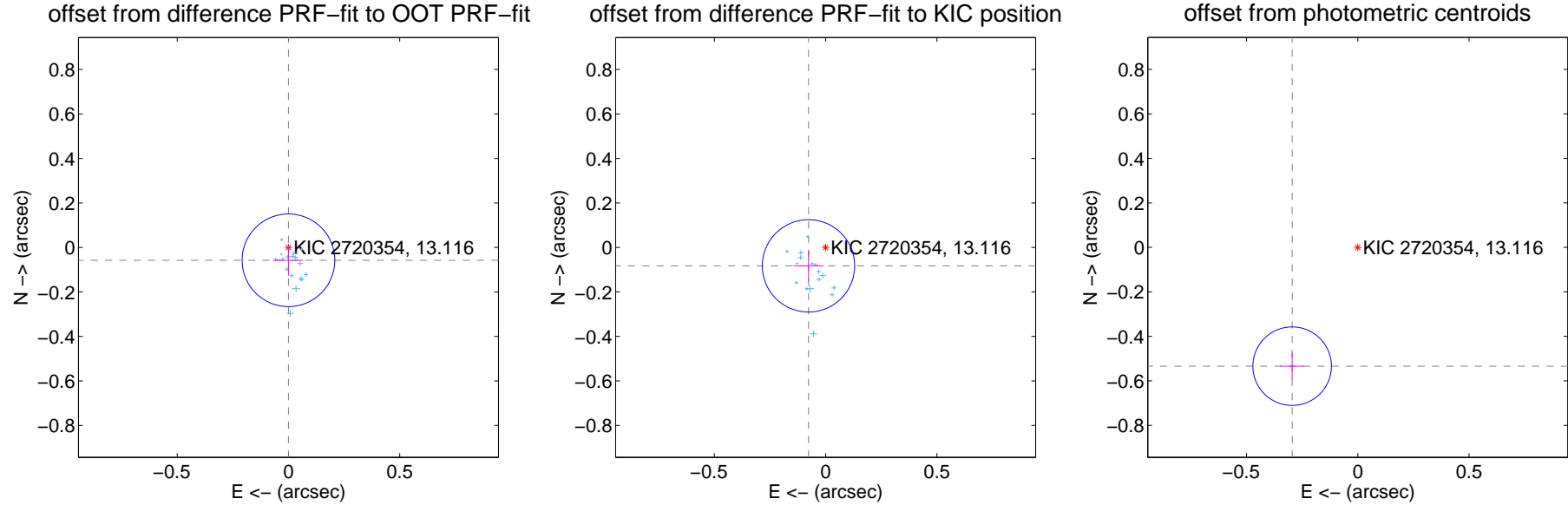
DV Centroid Data

Supplemental centroid analysis for 002720354-02. Kepler magnitude: 13.12. Transit SNR 39.75

There are 17 quarters with good PRF difference image offsets

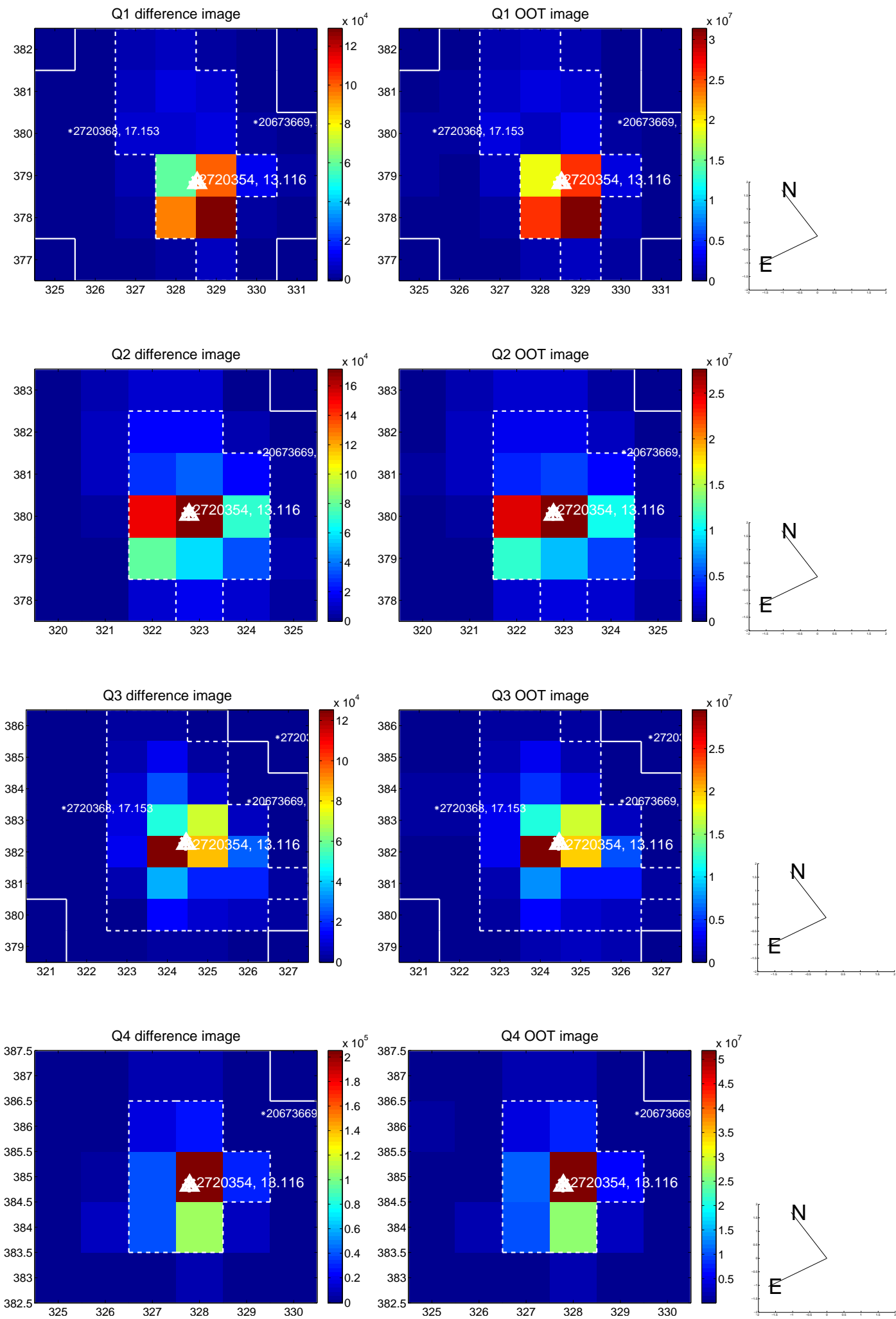
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.058 ± 0.069	0.83	0.000 ± 0.067	-0.058 ± 0.069
PRF-fit source offset from KIC position	0.113 ± 0.069	1.64	0.077 ± 0.068	-0.083 ± 0.070
photometric centroid source offset	0.61 ± 0.06	10.37	0.30 ± 0.06	-0.53 ± 0.06

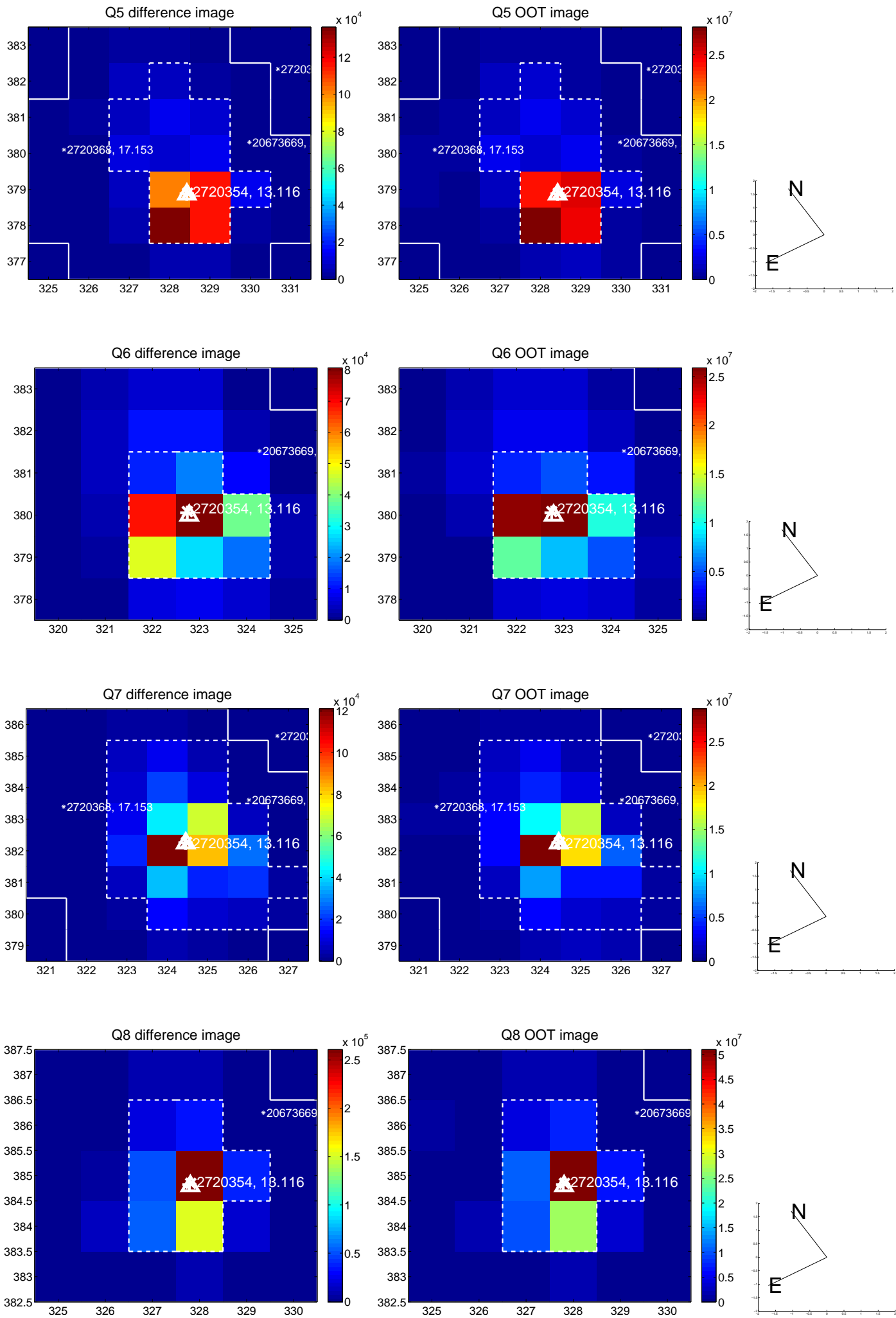


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

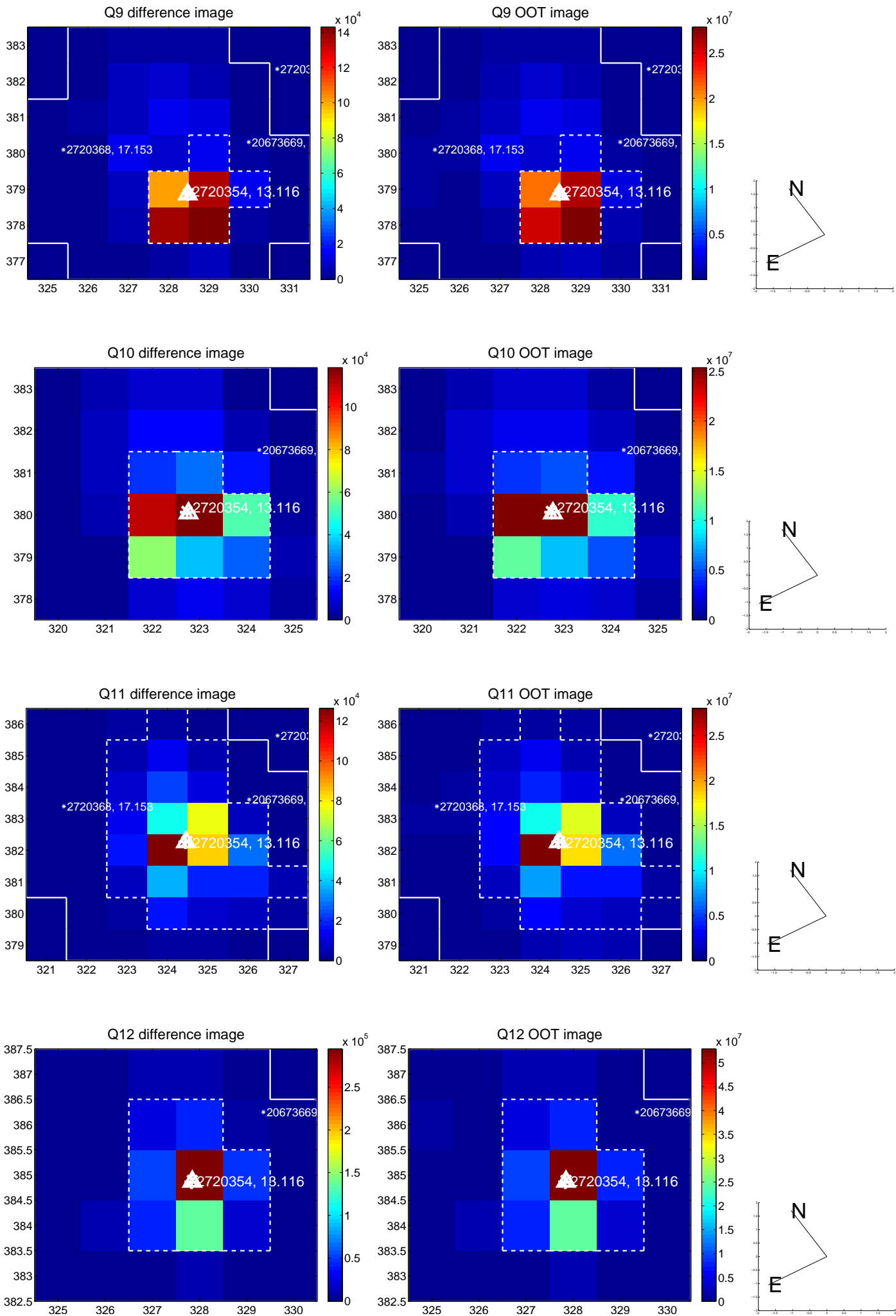
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



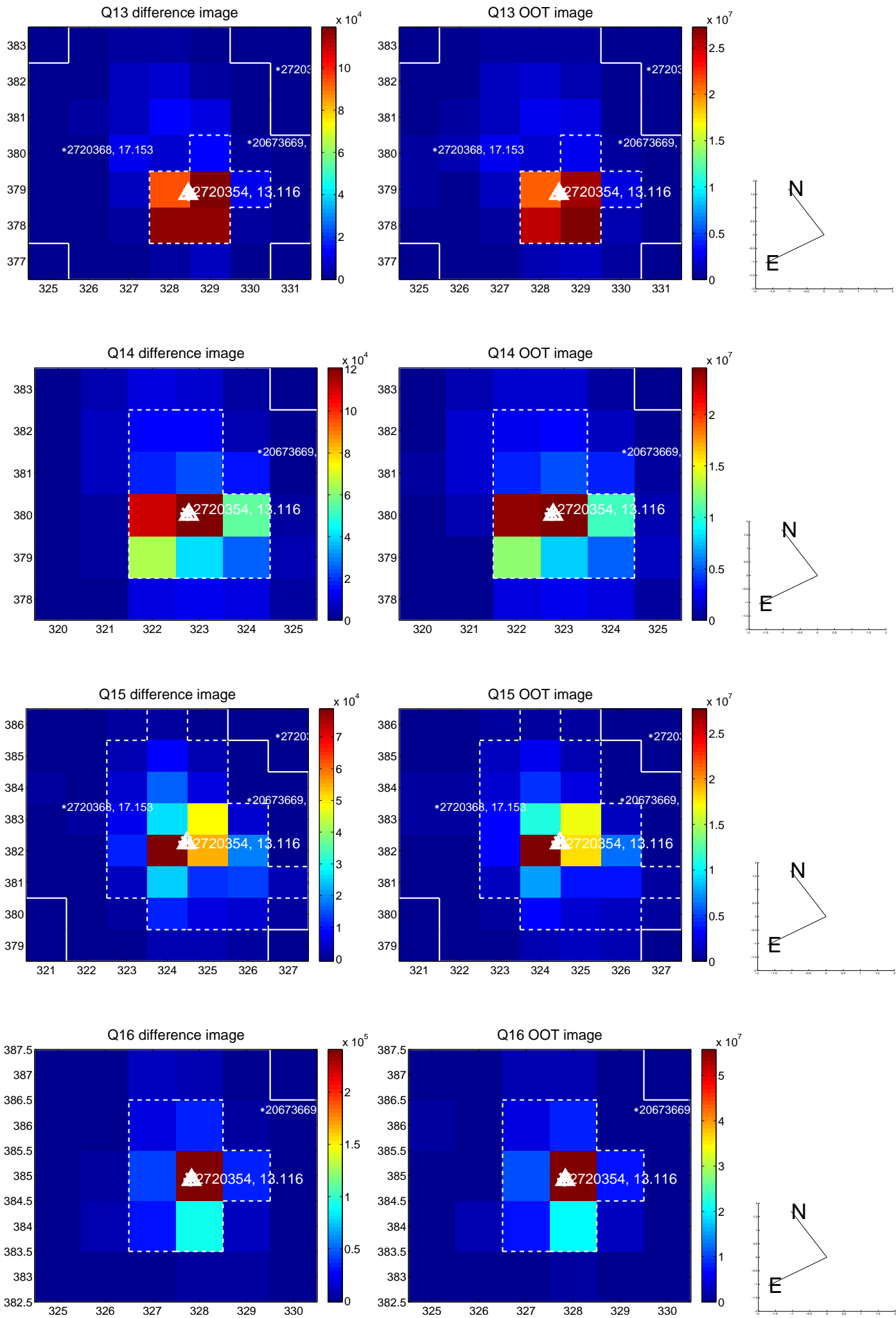
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



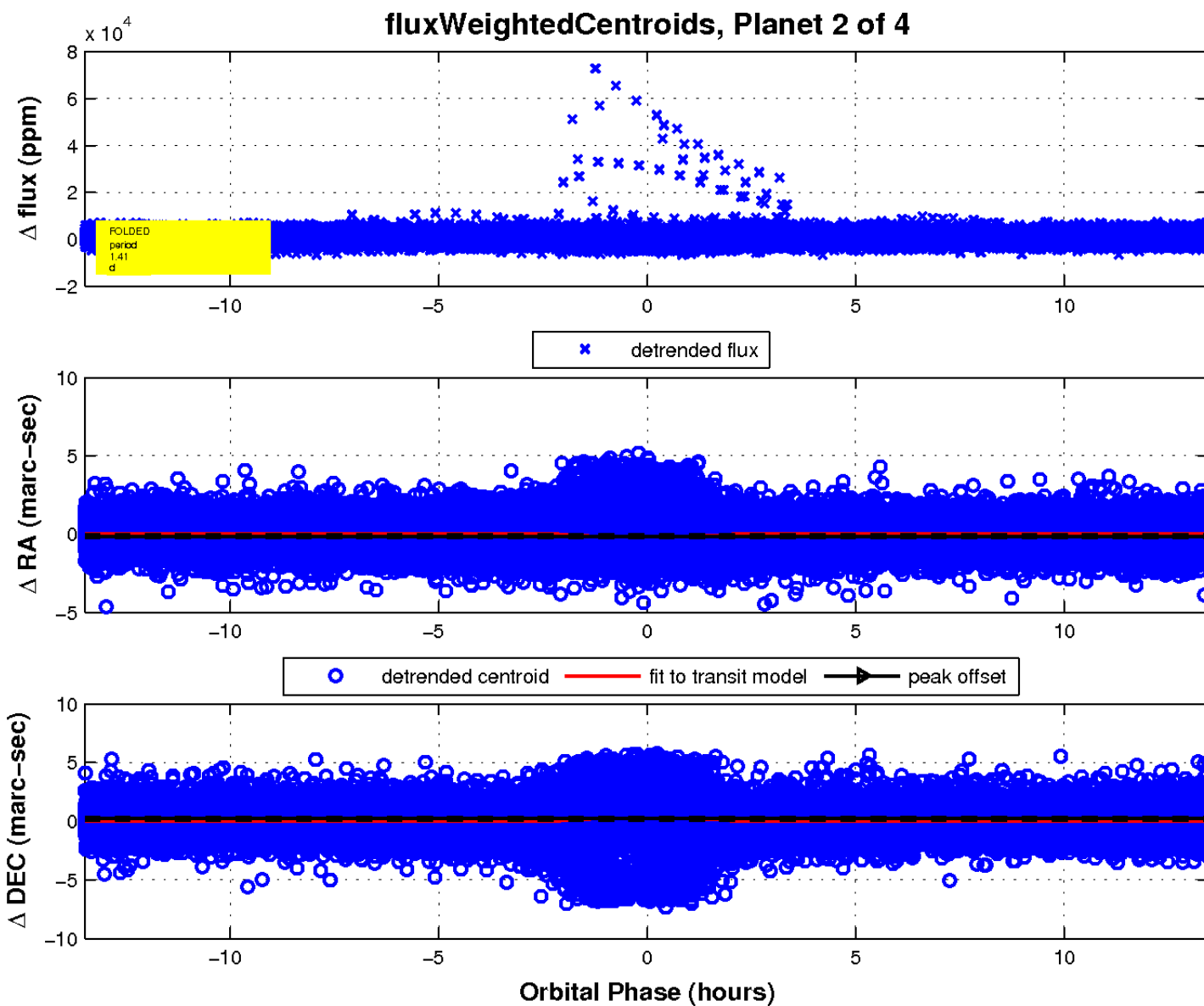
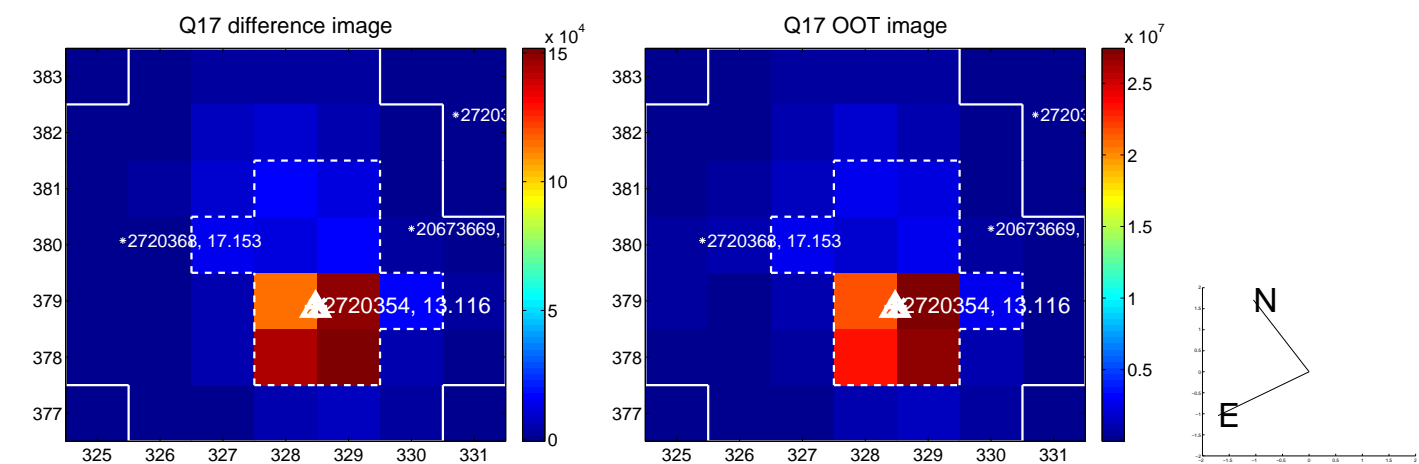
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

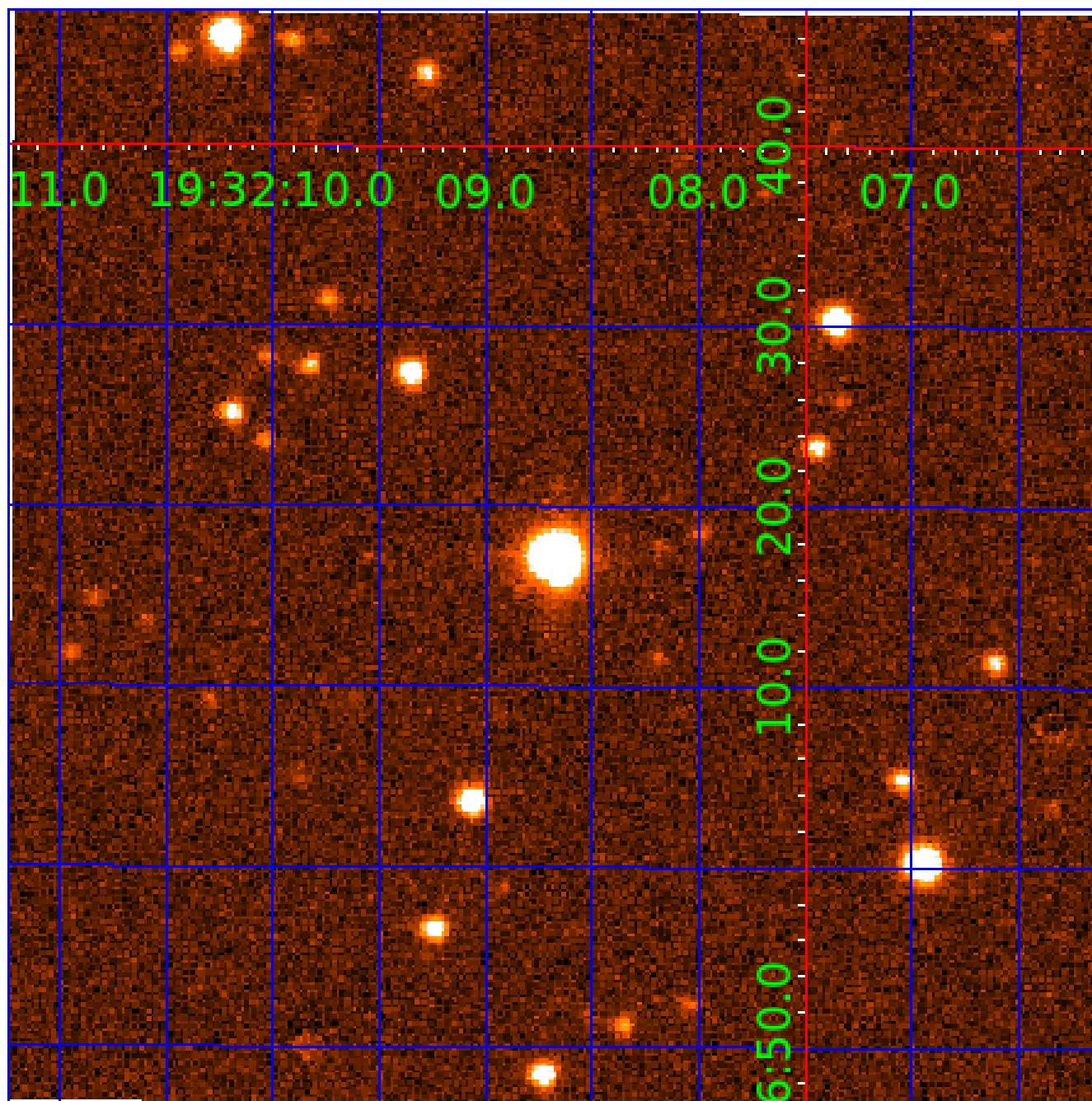


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002720354

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})
002720354-01	OBS	6292.01	2.821326	131.680486	62763.7	4.864	1867.4	1763.0	1.51	6701	39.25	2527.74
002720354-02	OBS	No	1.410693	131.674538	843.7	4.496	32.6	39.7	1.51	6701	5.15	6369.31
002720354-03	OBS	No	5.642986	136.776041	96.0	15.000	9.0	-1.0	1.51	6701	1.49	1003.05
002720354-04	OBS	No	242.598638	252.821742	3198.3	29.057	8.0	8.2	1.51	6701	9.58	6.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002720354-01	OBS	FP	0.01	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
002720354-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
002720354-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—RESIDUAL_TCE—CENT_NOFITS
002720354-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT

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 for comment definitions.

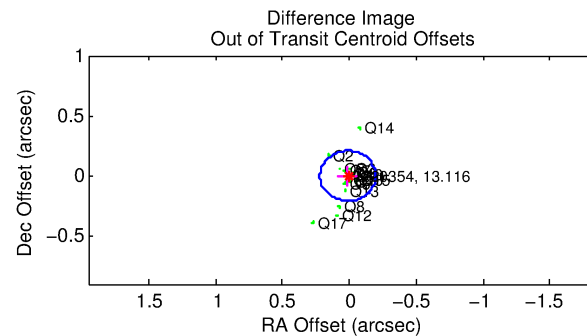
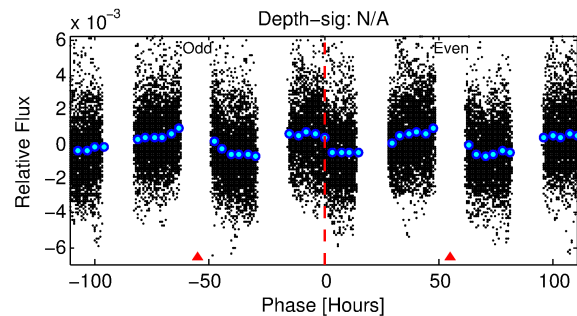
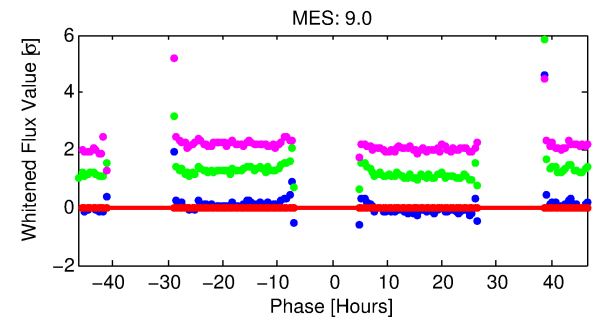
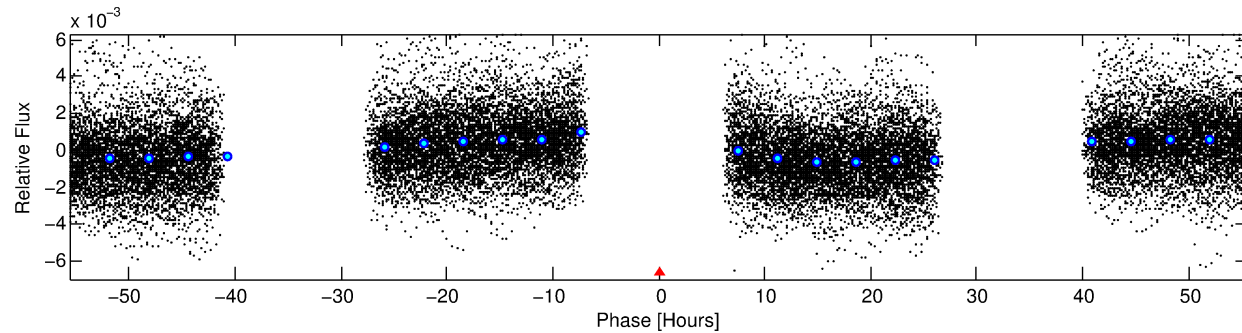
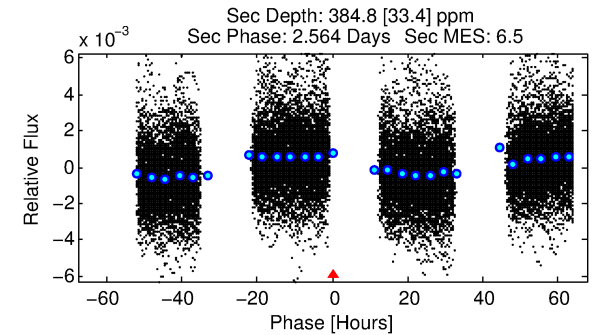
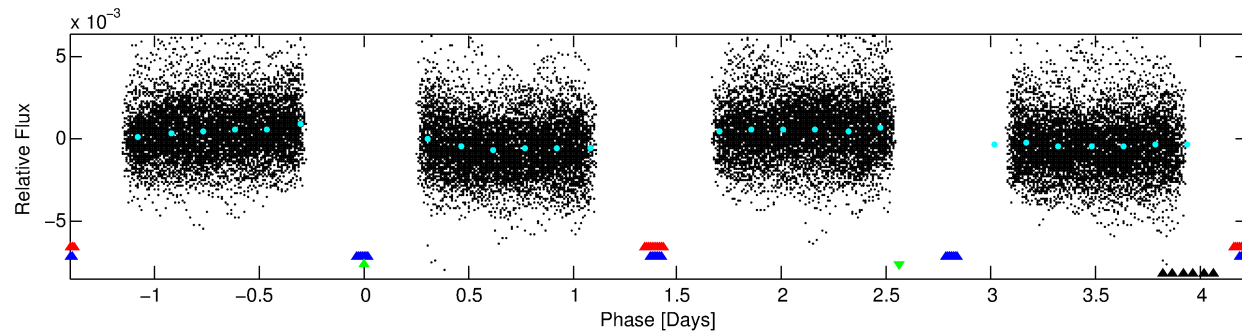
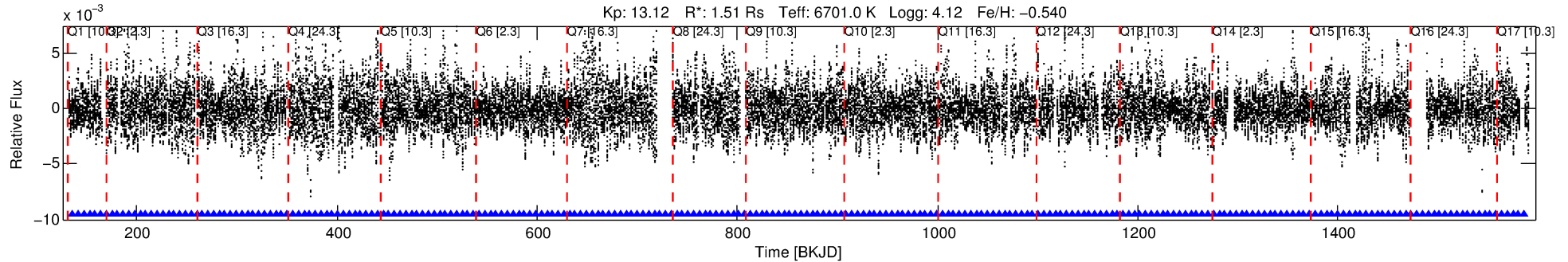
Ephemeris Match Information For 002720354-03

No Significant Match Found

DV One-Page Summary

KIC: 2720354 Candidate: 3 of 4 Period: 5.643 d
KOI: K06292 Corr: No Ephemeris Match

Kp: 13.12 R*: 1.51 Rs Teff: 6701.0 K Logg: 4.12 Fe/H: -0.540



TPS TCE Results:

Period = 5.64299 d
Epoch = 136.7760 BKJD

DV fit results are unavailable

DV Diagnostic Results:

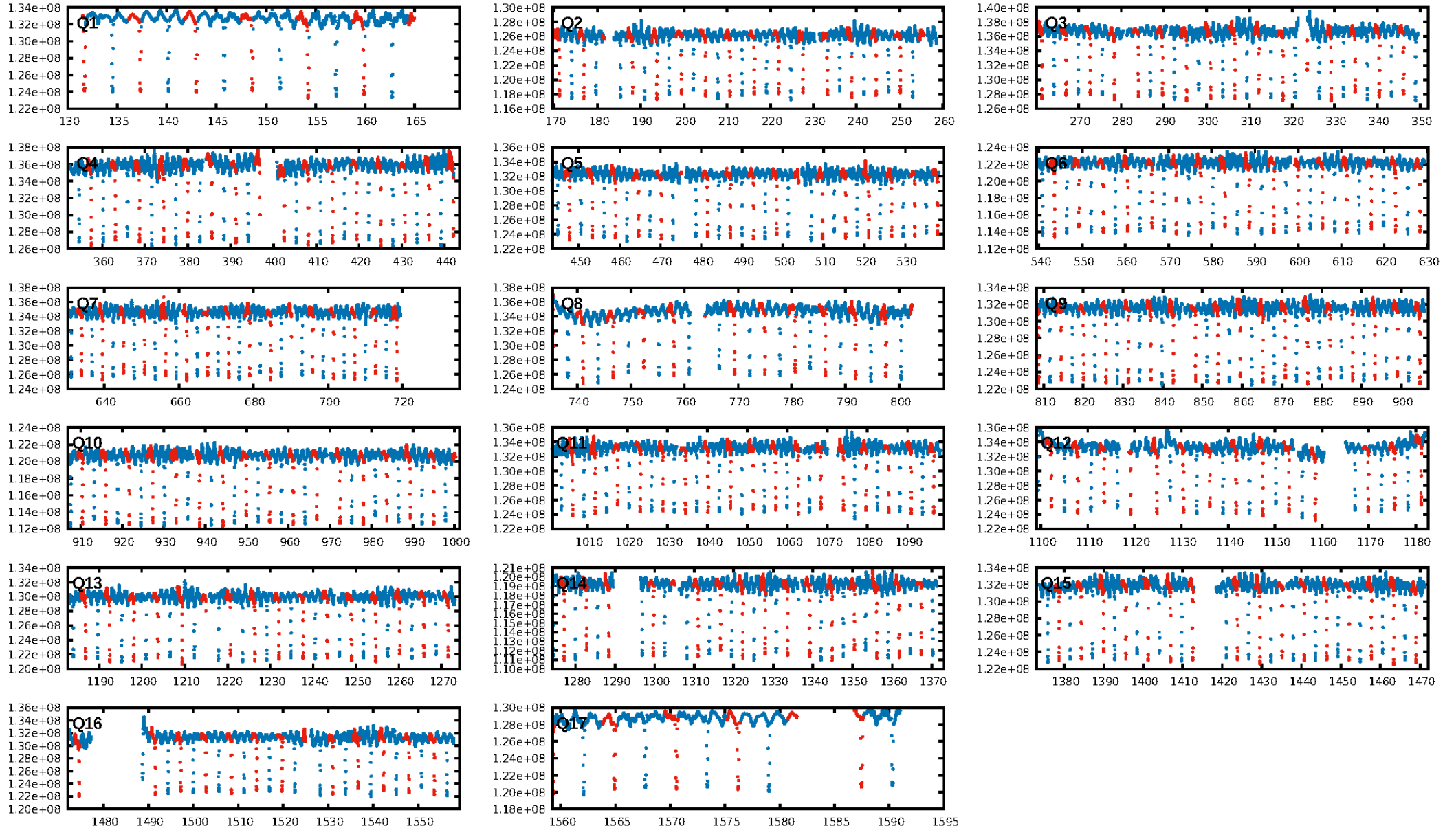
ShortPeriod-sig: 100.0% [4.29σ]
LongPeriod-sig: 100.0% [173.91σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.17e-13
RollingBand-fgt: 1.00 [233/233]
GhostDiagnostic-chr: 0.6861

Centroid-sig: 0.0%
Centroid-so: 0.183 arcsec [2.86σ]
OotOffset-rm: 0.011 arcsec [0.16σ]
KicOffset-rm: 0.107 arcsec [1.44σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

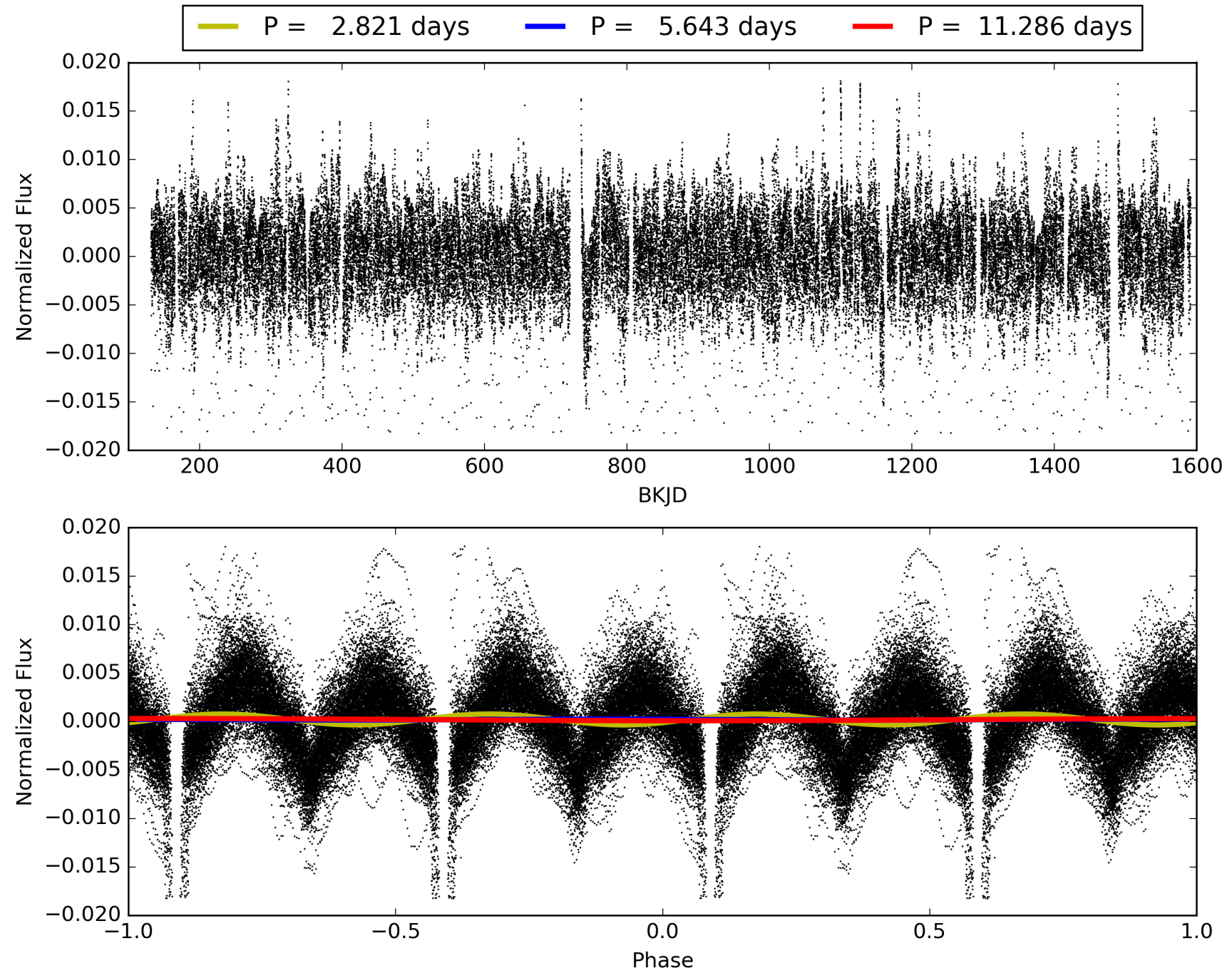
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:12:55 Z

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

TCE 002720354-03, PDC Light Curves

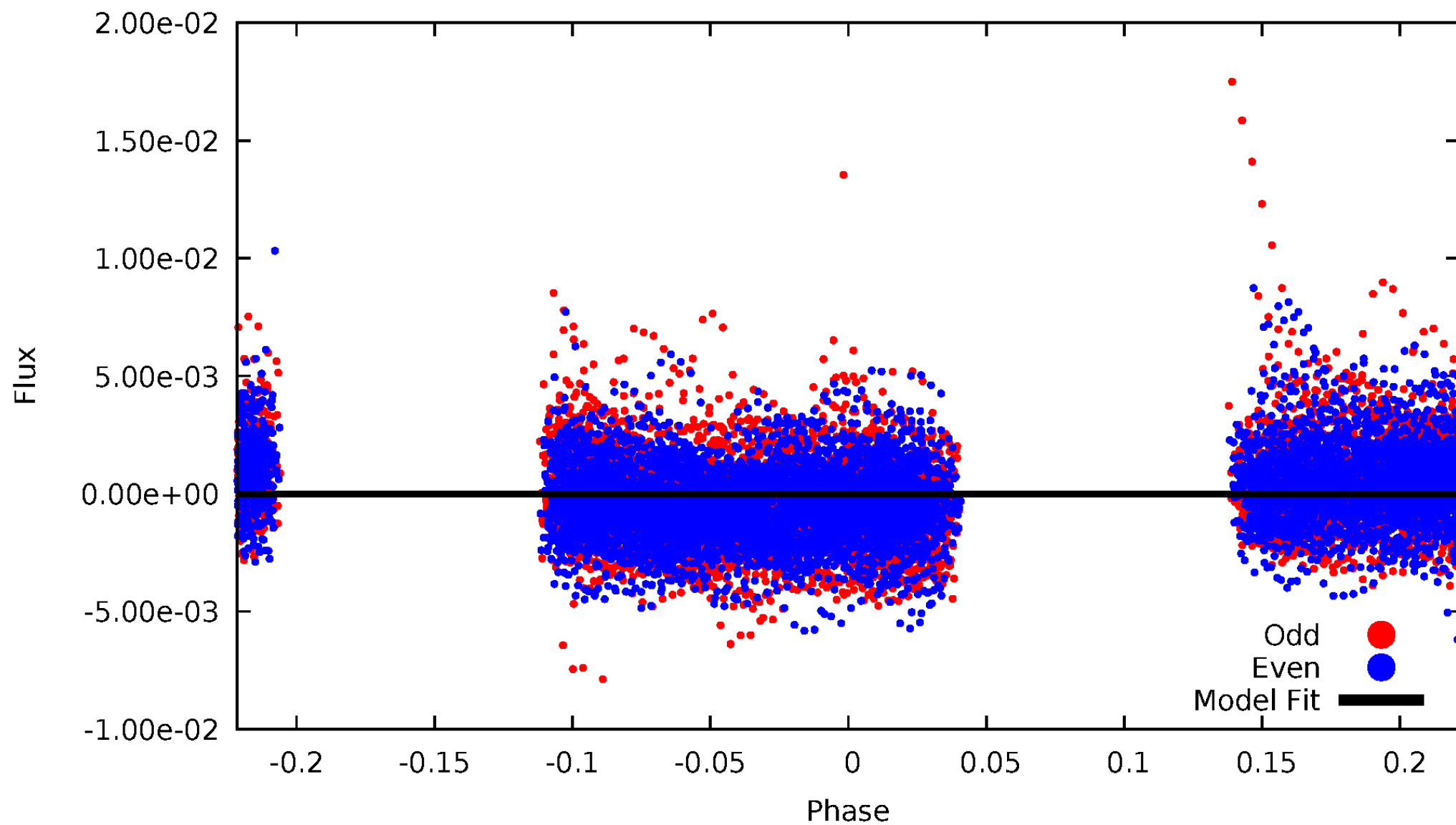


TCE 002720354-03



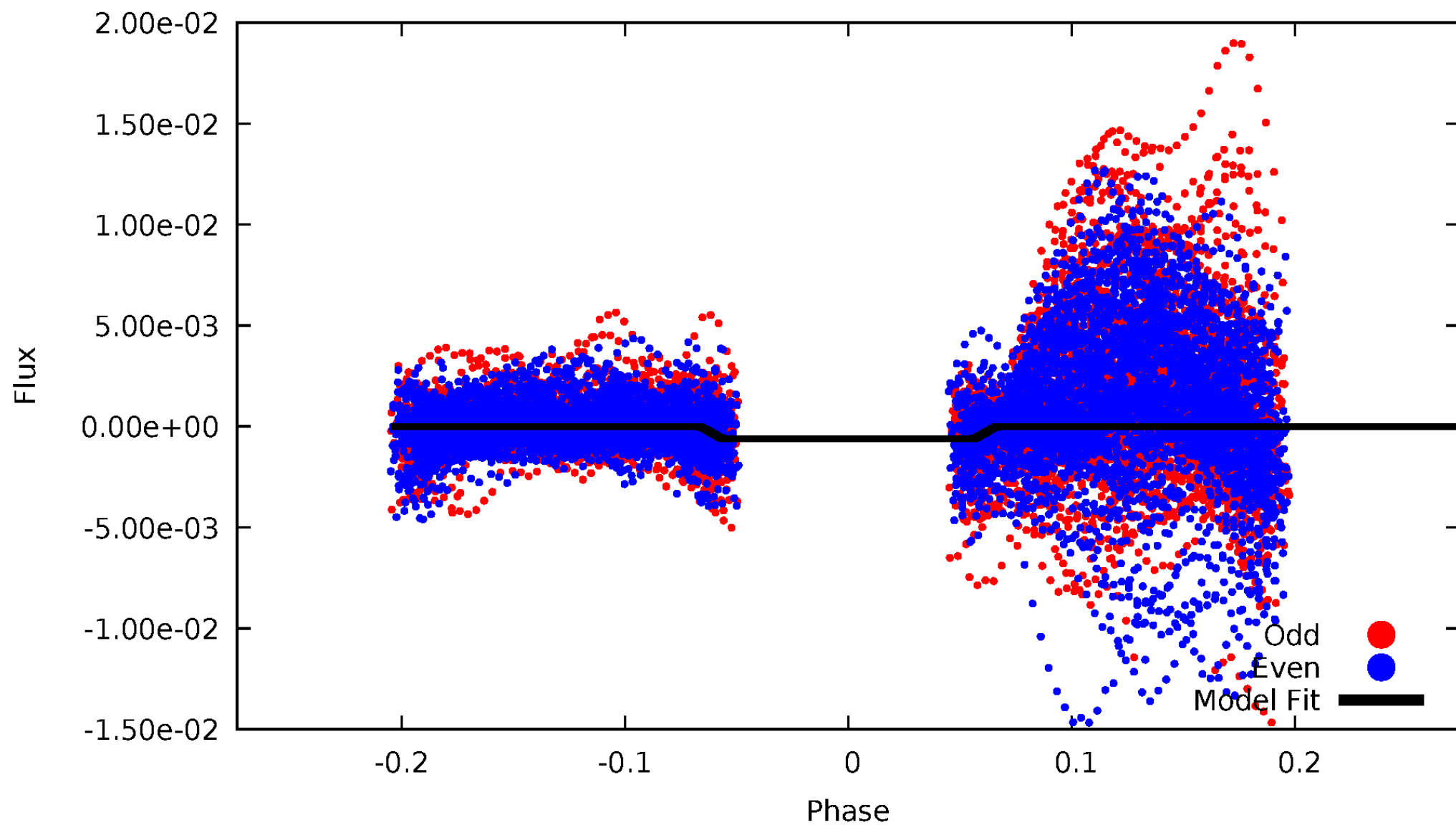
DV Odd/Even

TCE 002720354-03

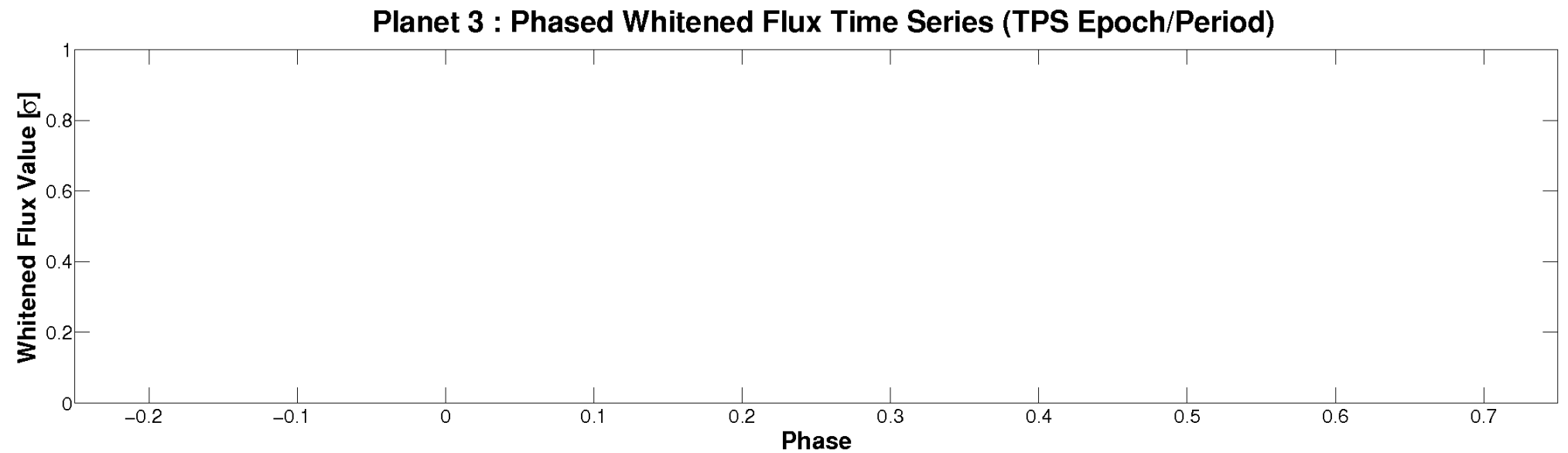
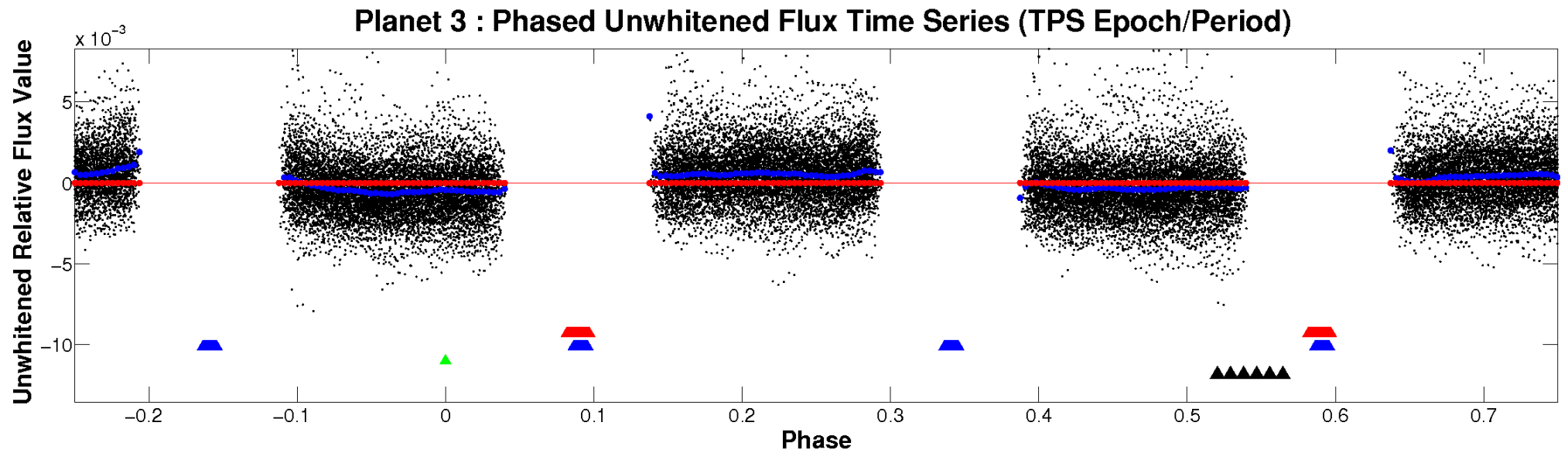


ALT Odd/Even

TCE 002720354-03

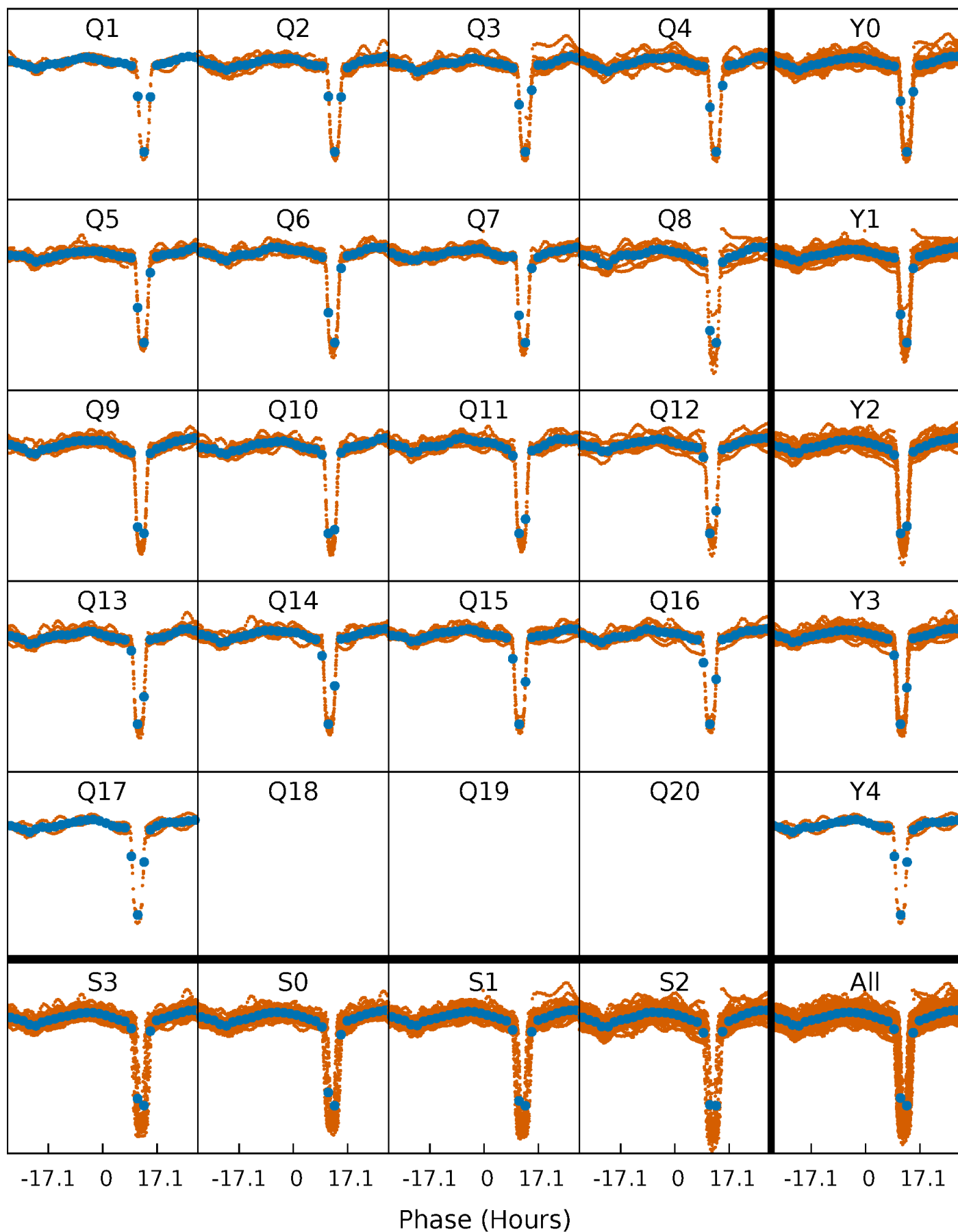


Non-Whitened Vs. Whitened Light Curve



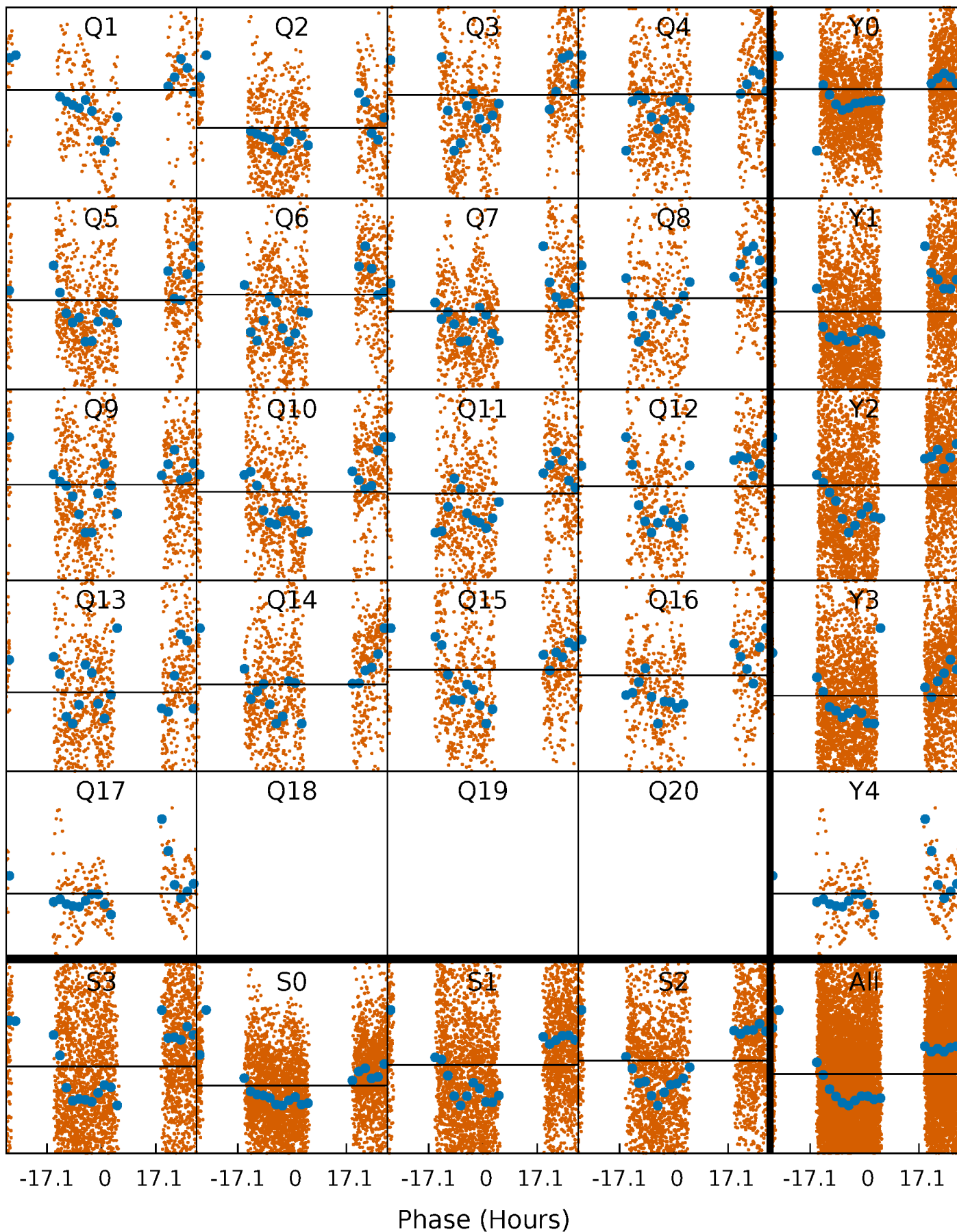
PDC Quarter-Phased Transit Curves

TCE 002720354-03 P= 5.642986 Days $T_0=136.776041$ (BKJD)



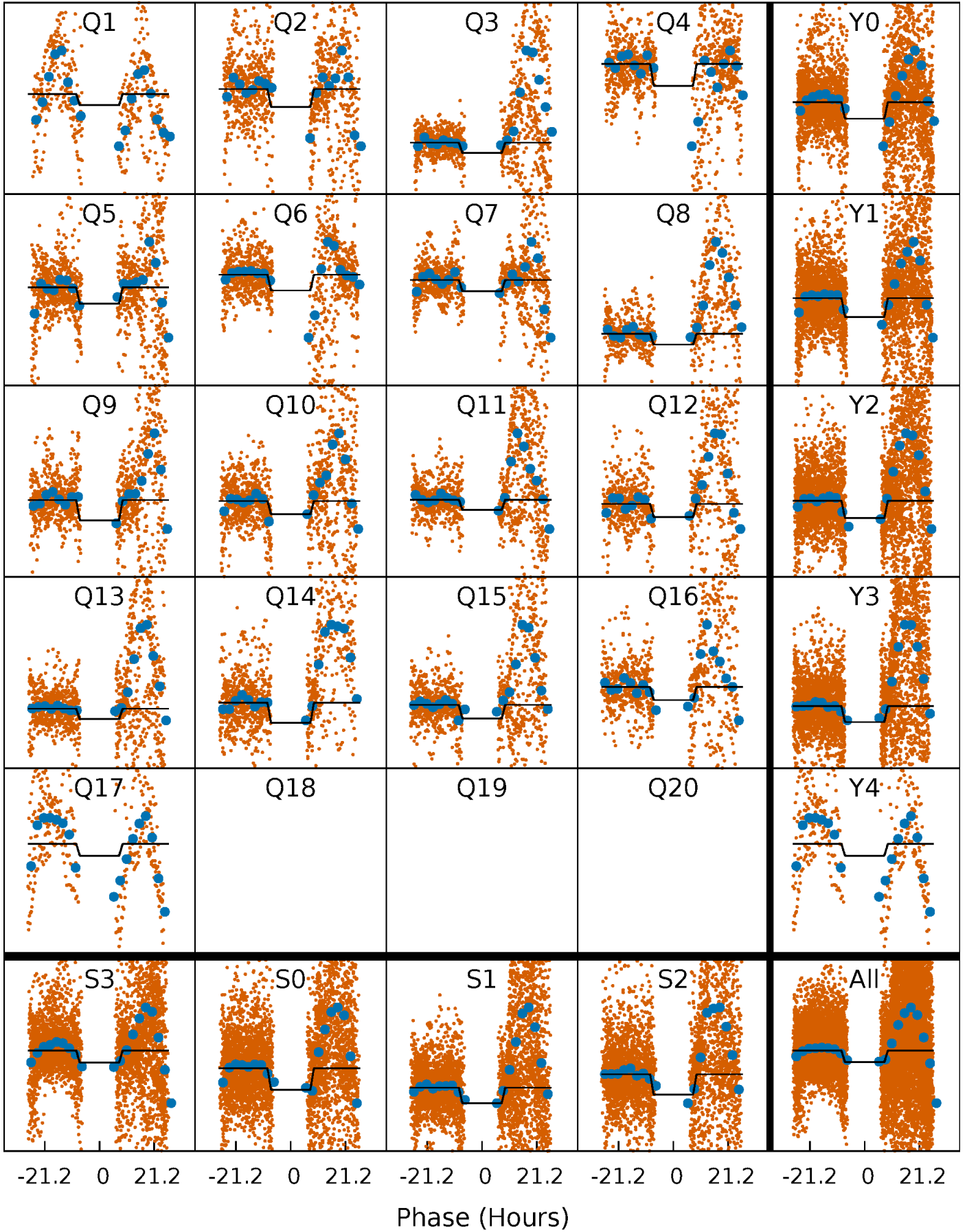
DV Quarter-Phased Transit Curves

TCE 002720354-03 P= 5.642986 Days $T_0=136.776041$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

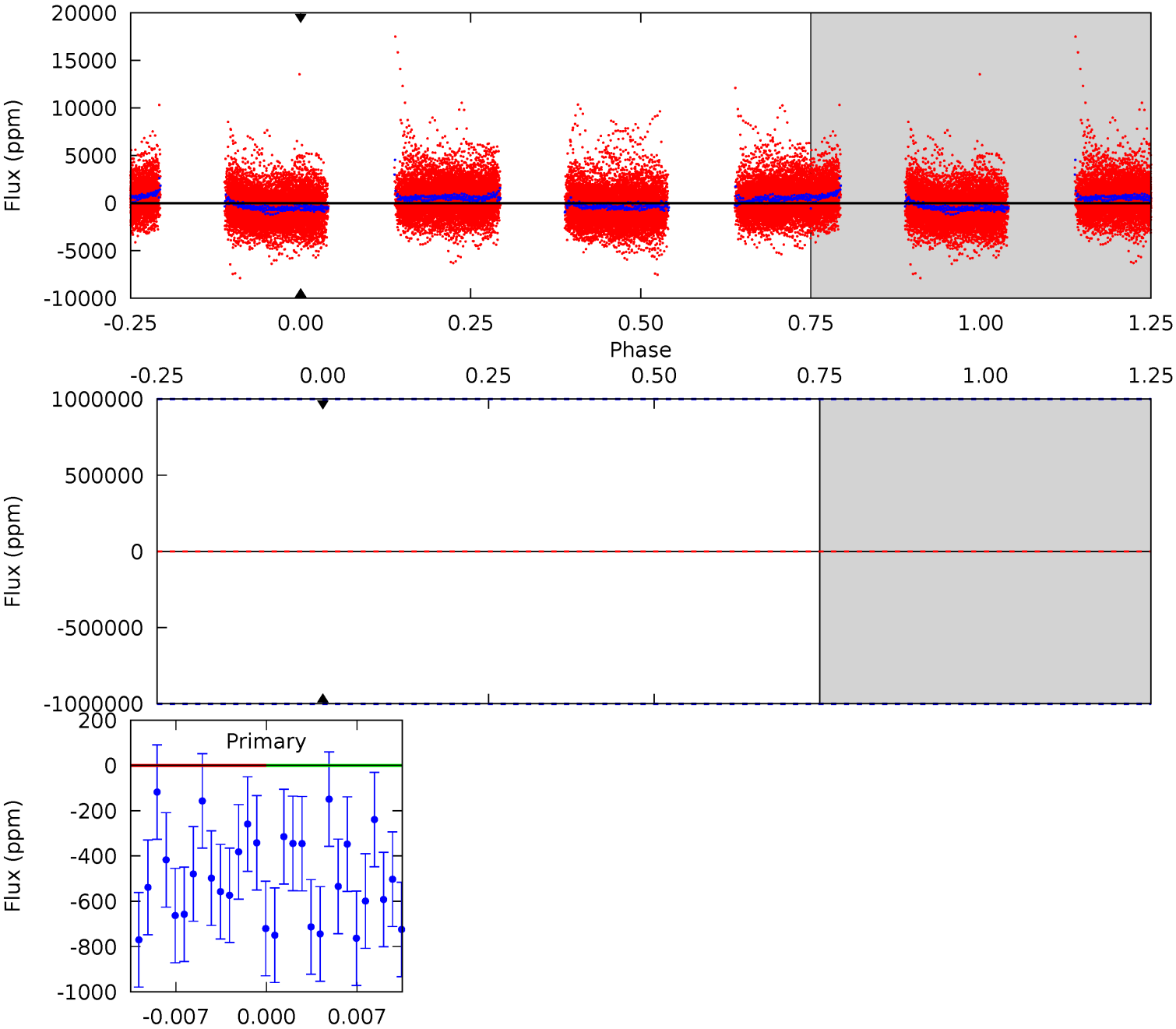
TCE 002720354-03 P= 5.642986 Days $T_0=135.891290$ (BKJD)



DV Model-Shift Uniqueness Test

002720354-03, P = 5.642986 Days, E = 131.133055 Days

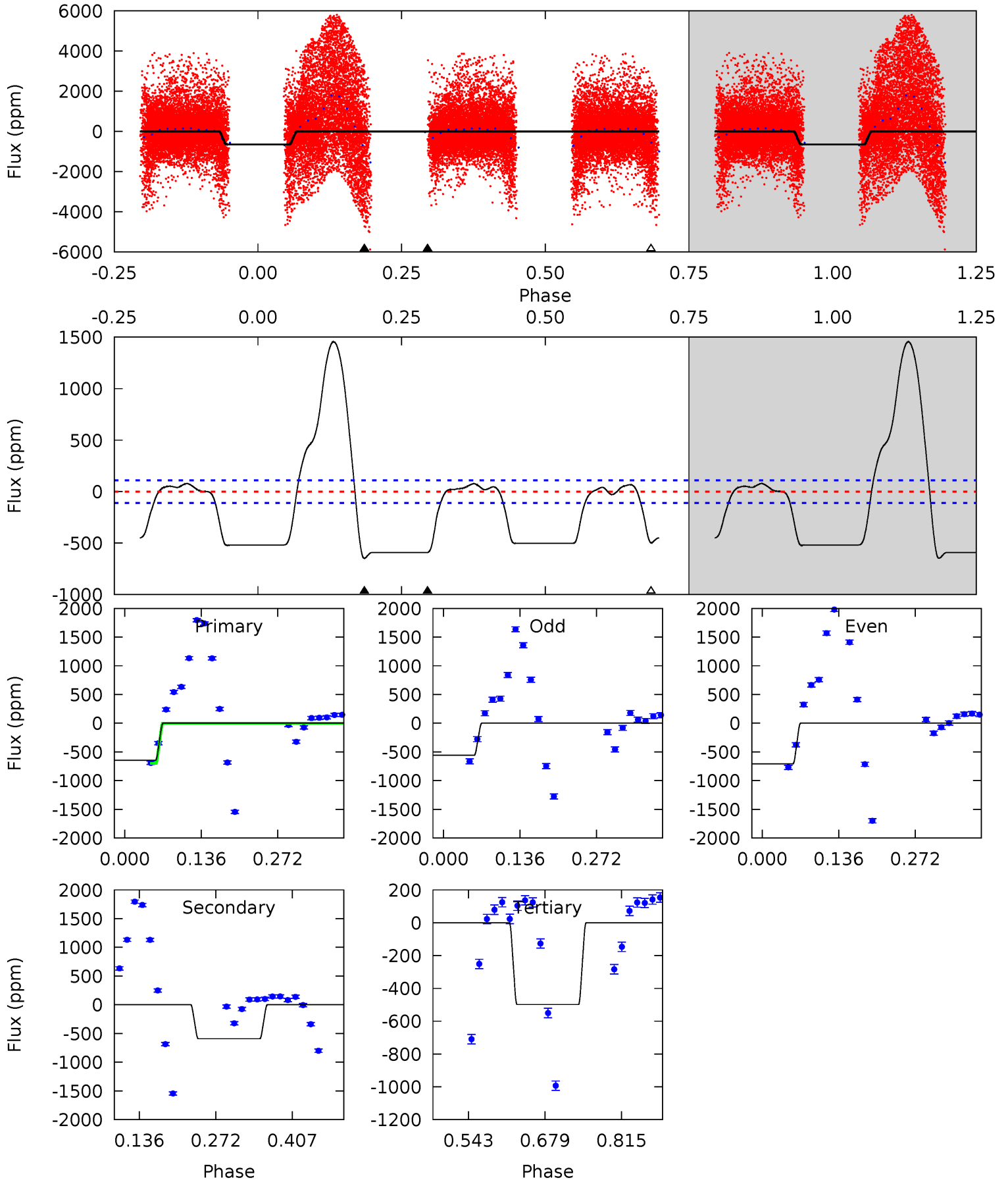
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

002720354-03, P = 5.642986 Days, E = 130.248304 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.6	24.3	20.5	0	4.50	1.49	7.52	6.12	26.6	3.83	24.3	3.02	1.62	0.69	2.17



Stellar Parameters For KIC 002720354

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6701^{+74}_{-81}	$4.121^{+0.168}_{-0.098}$	$-0.540^{+0.150}_{-0.150}$	$1.506^{+0.229}_{-0.280}$	$1.092^{+0.095}_{-0.067}$	$0.451^{+0.370}_{-0.148}$
	+1%/-1%	+4%/-2%	+28%/-28%	+15%/-19%	+9%/-6%	+82%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002720354-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$11.65^{+12.98}_{-7.85}$	2001^{+78}_{-102}	3733^{+28404}_{-28438}	$5.729^{+3166.818}_{-2191.118}$
Alt.	-591 ± 24	$12.29^{+13.31}_{-8.44}$	1994^{+92}_{-98}	4054^{+2627}_{-906}	$8.845^{+81.499}_{-6.780}$

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 $A_{obs} \gg 1.0$

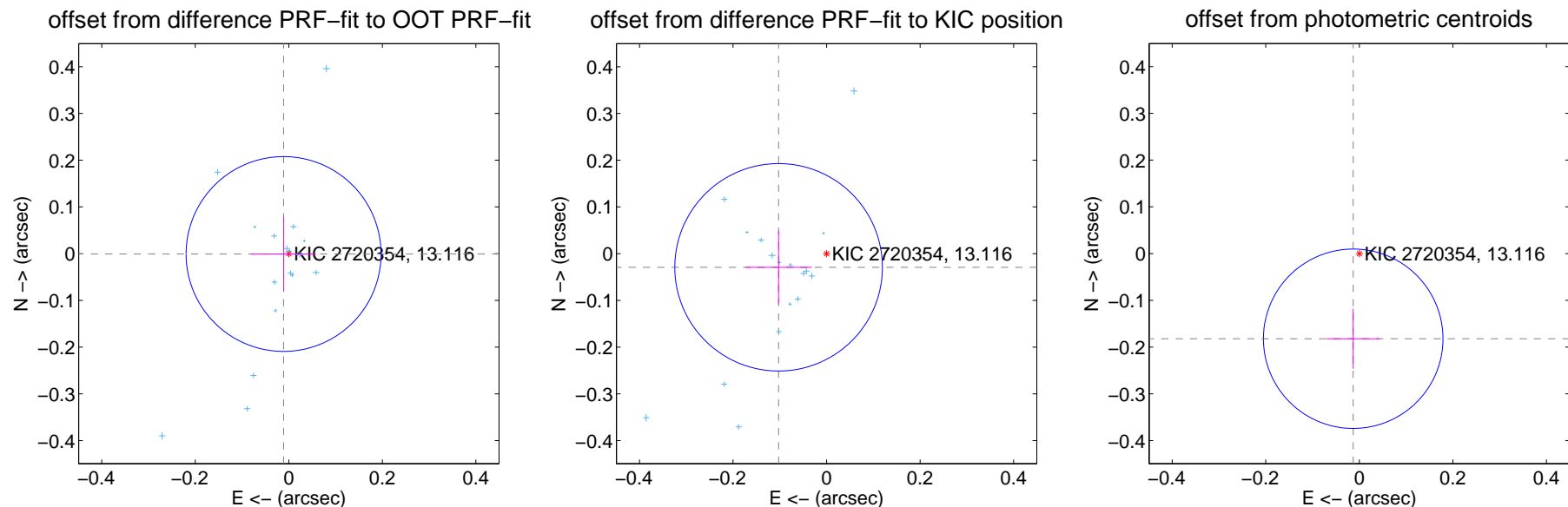
DV Centroid Data

Supplemental centroid analysis for 002720354-03. Kepler magnitude: 13.12. Transit SNR -1.00

There are 17 quarters with good PRF difference image offsets

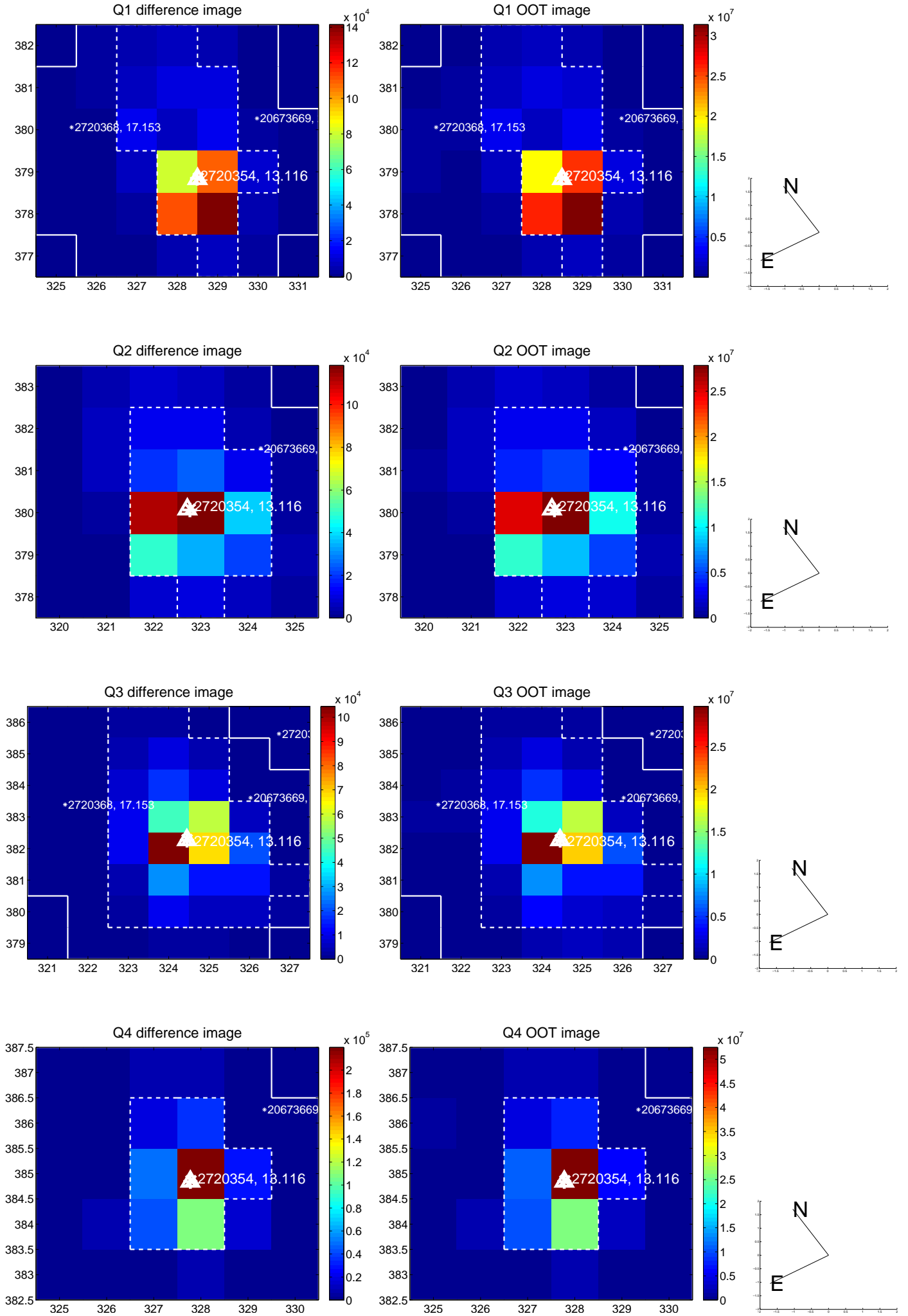
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.011 ± 0.069	0.16	0.011 ± 0.069	-0.001 ± 0.079
PRF-fit source offset from KIC position	0.107 ± 0.074	1.44	0.103 ± 0.071	-0.029 ± 0.078
photometric centroid source offset	0.18 ± 0.06	2.86	0.01 ± 0.06	-0.18 ± 0.06

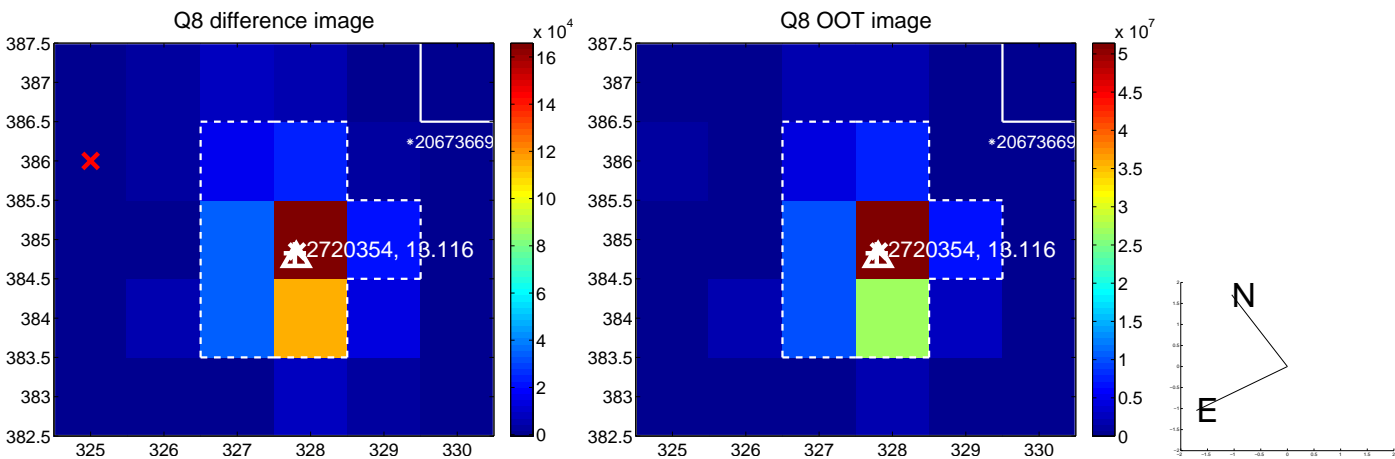
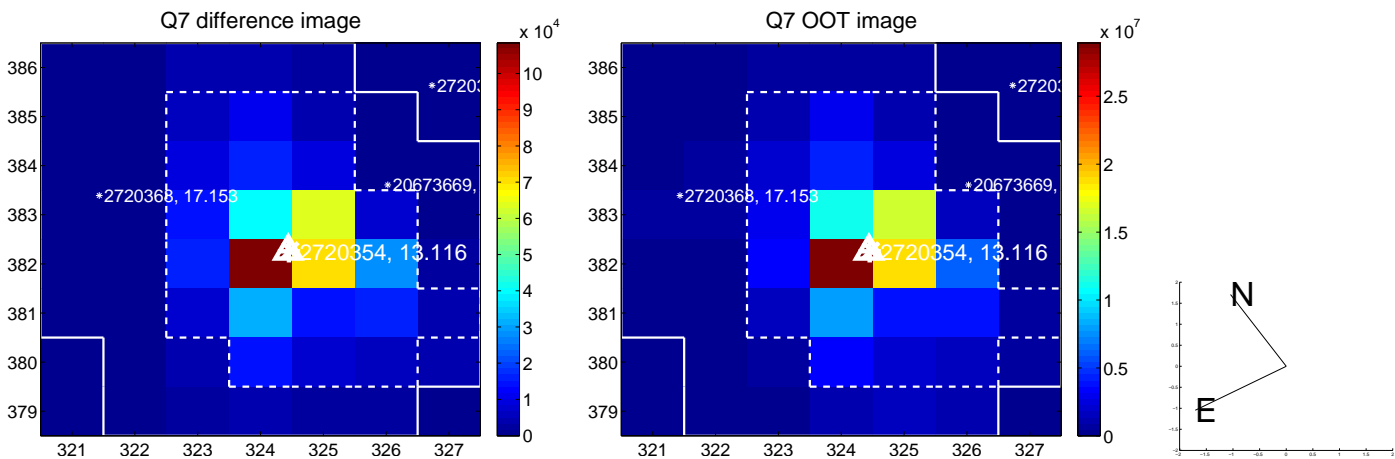
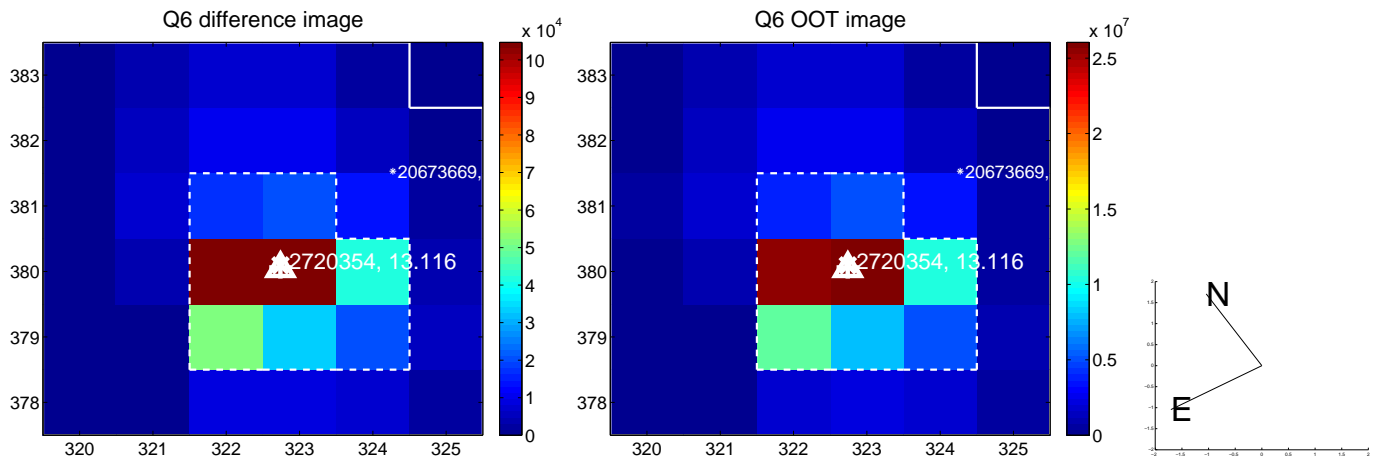
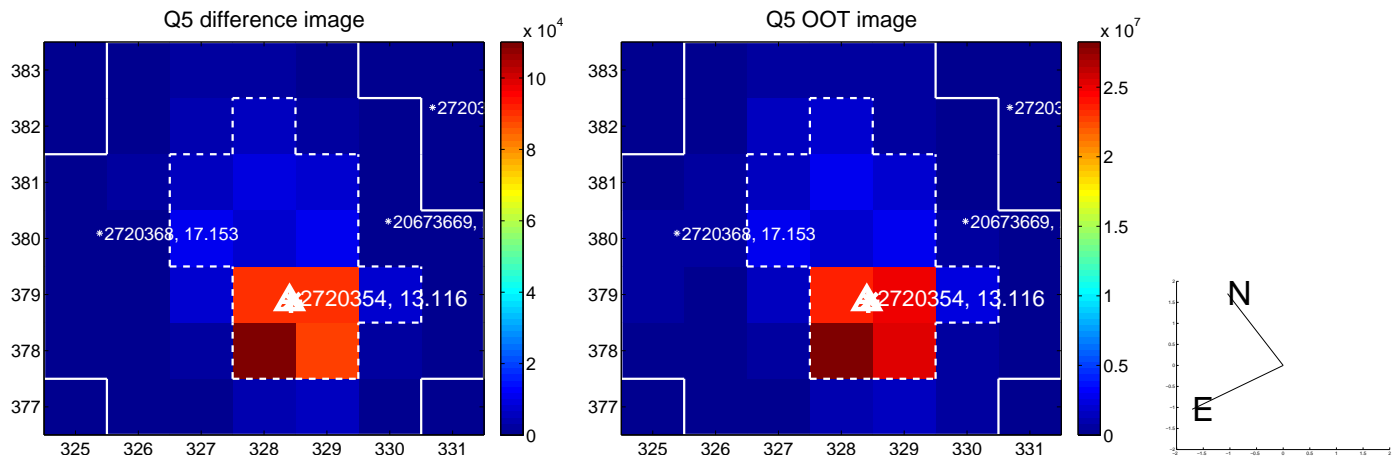


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

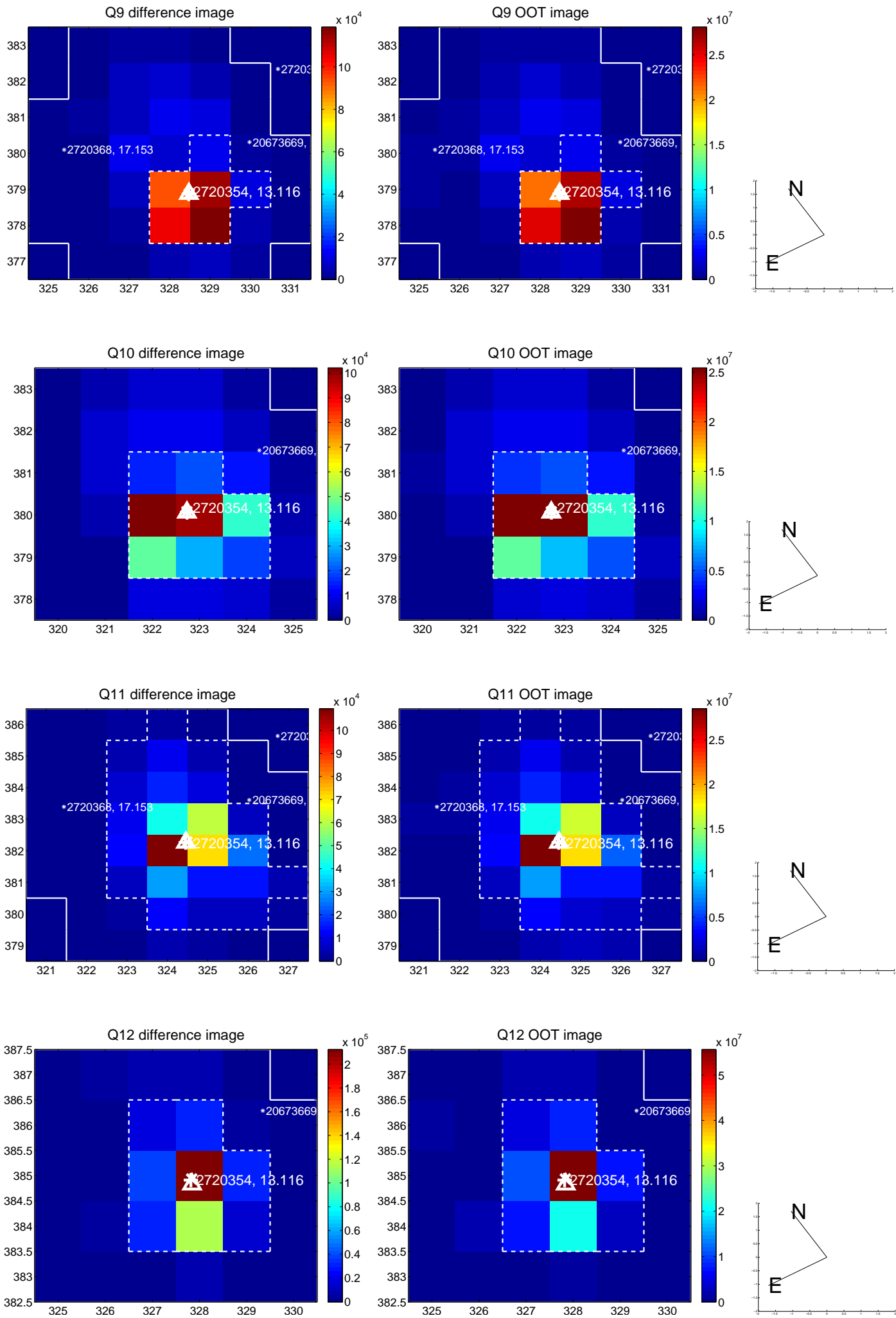
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



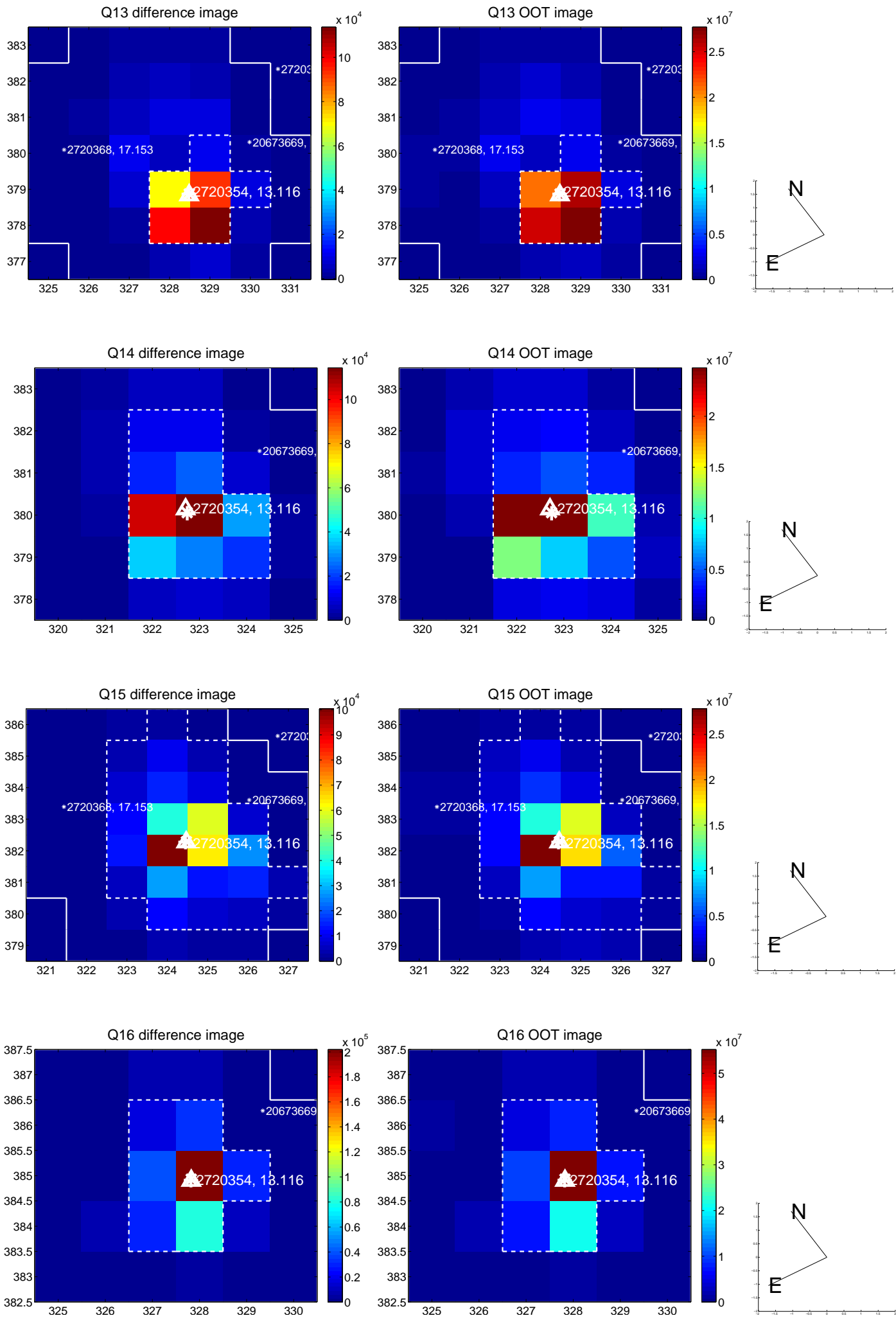
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



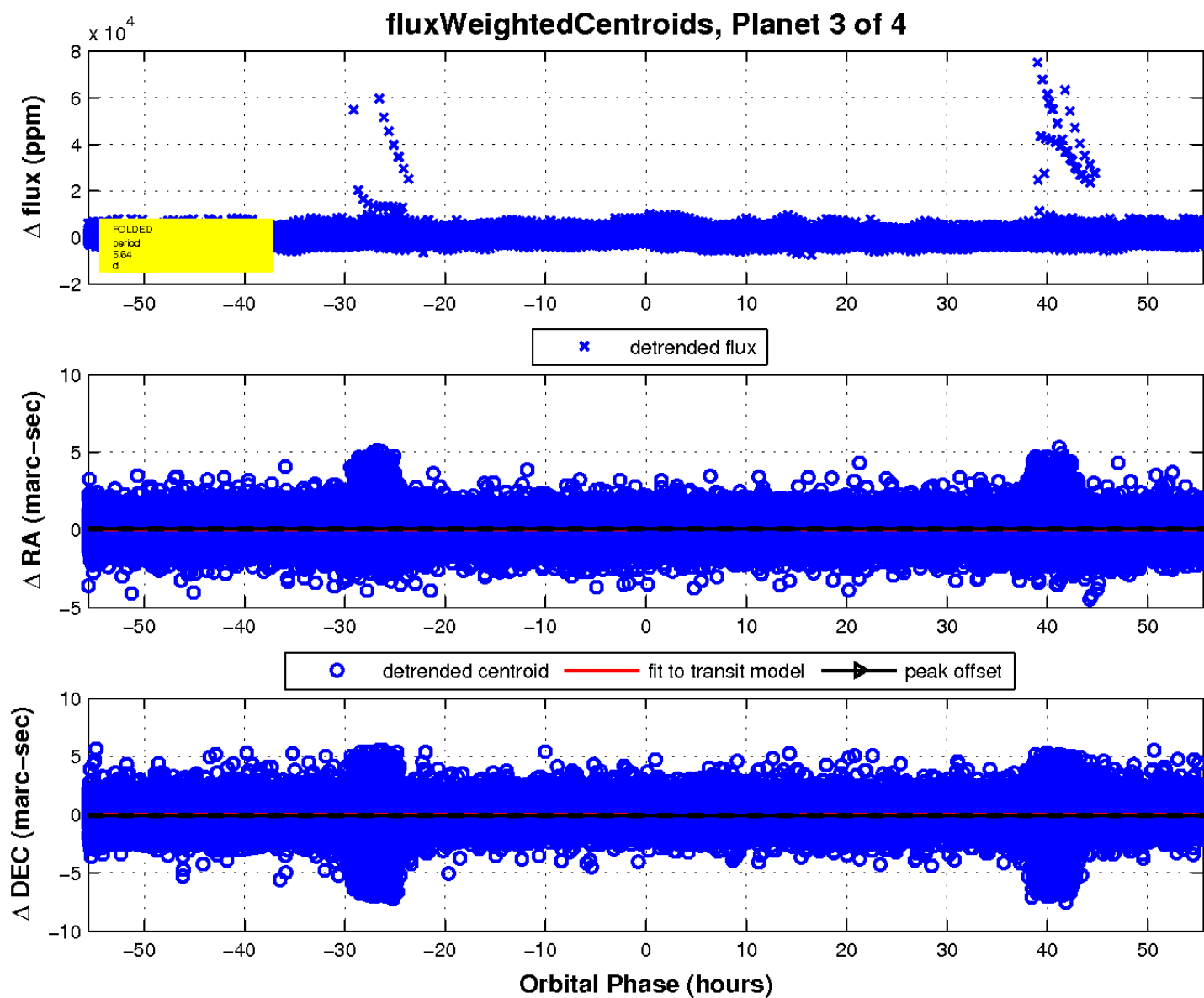
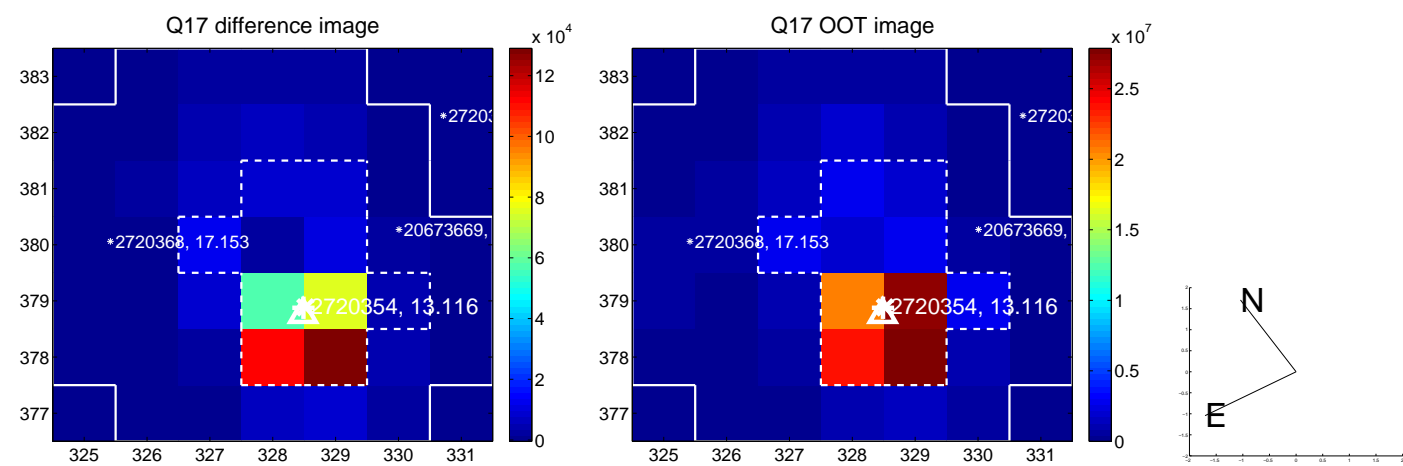
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

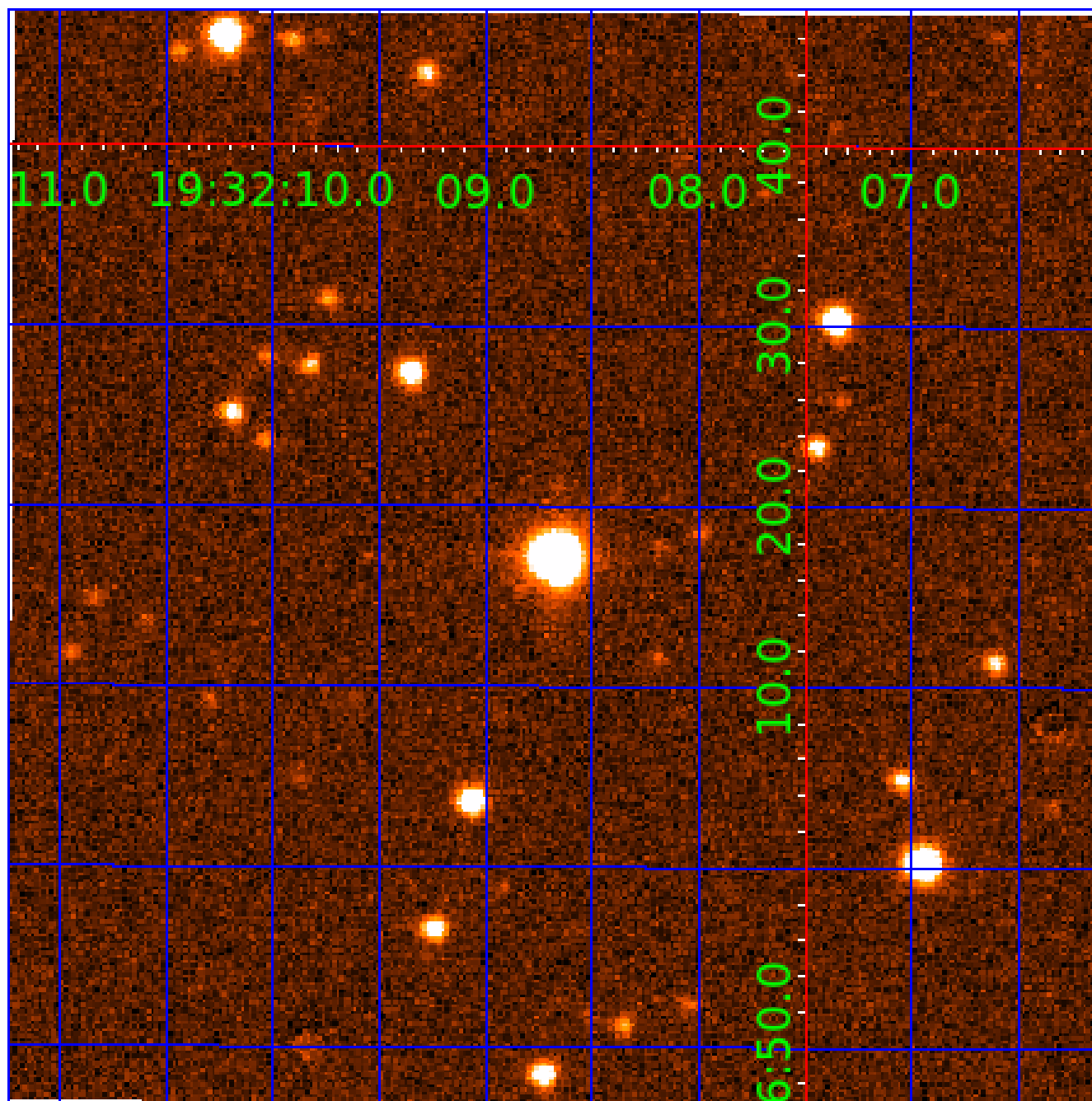


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002720354

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})
002720354-01	OBS	6292.01	2.821326	131.680486	62763.7	4.864	1867.4	1763.0	1.51	6701	39.25	2527.74
002720354-02	OBS	No	1.410693	131.674538	843.7	4.496	32.6	39.7	1.51	6701	5.15	6369.31
002720354-03	OBS	No	5.642986	136.776041	96.0	15.000	9.0	-1.0	1.51	6701	1.49	1003.05
002720354-04	OBS	No	242.598638	252.821742	3198.3	29.057	8.0	8.2	1.51	6701	9.58	6.66

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002720354-01	OBS	FP	0.01	0	1	0	0	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE
002720354-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE
002720354-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—RESIDUAL_TCE—CENT_NOFITS
002720354-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—LPP_DV—MOD_NONUNIQ_ALT

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 for comment definitions.

Ephemeris Match Information For 002720354-04

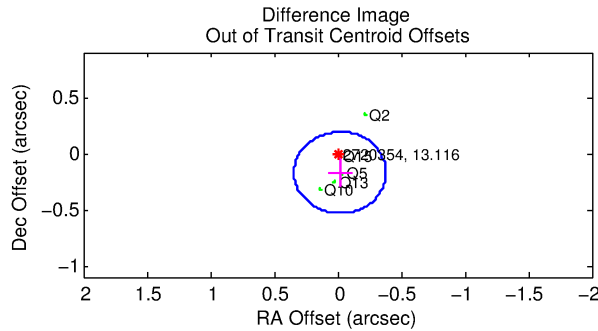
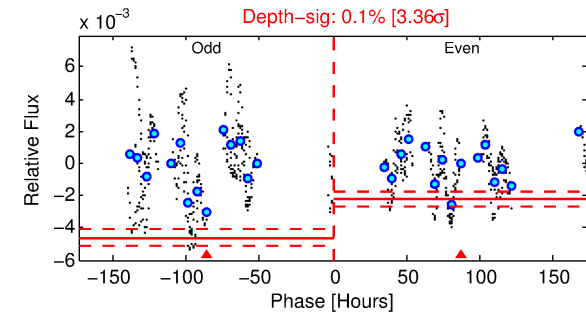
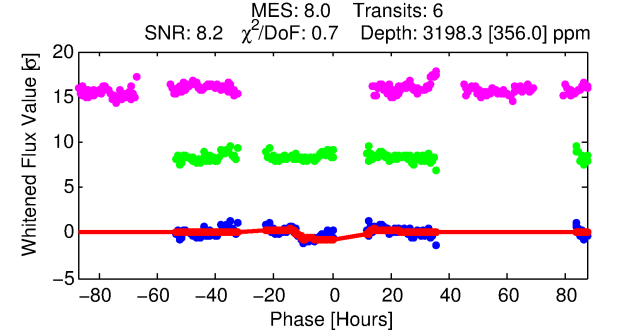
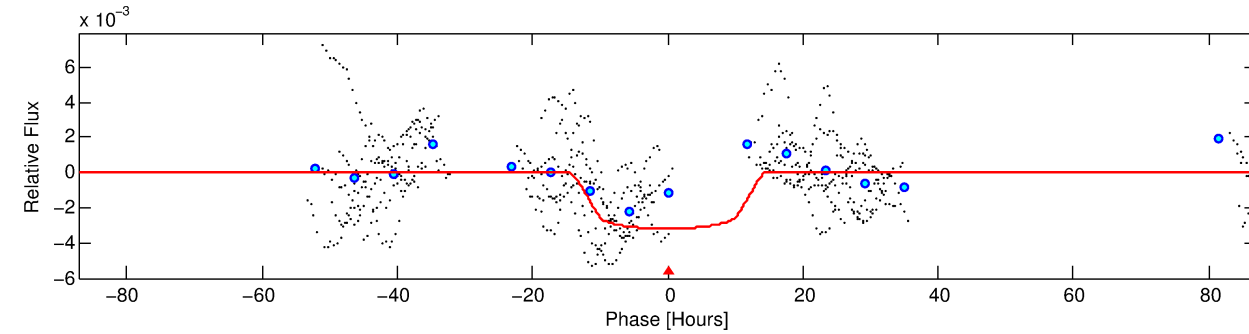
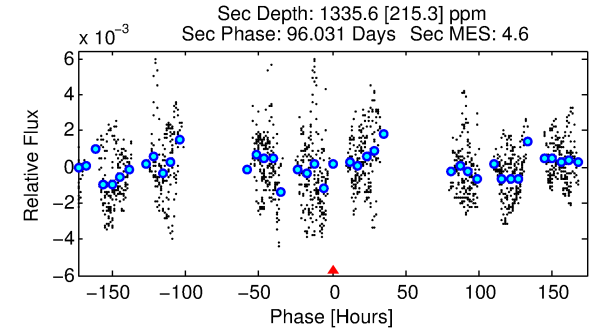
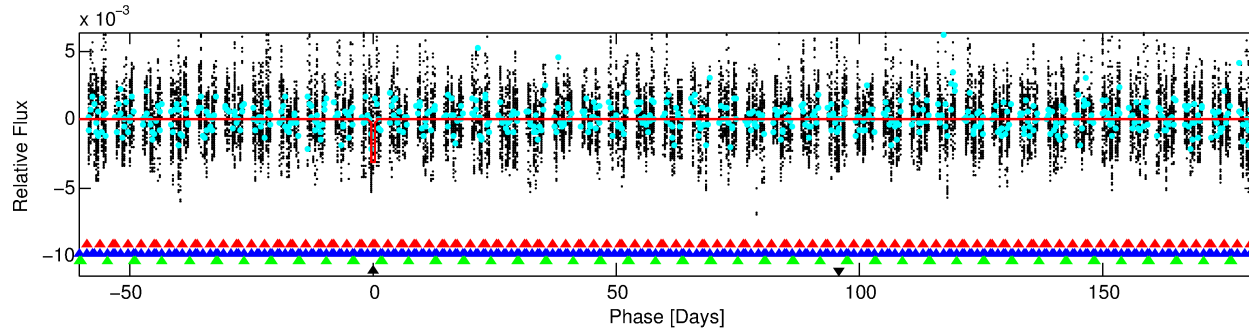
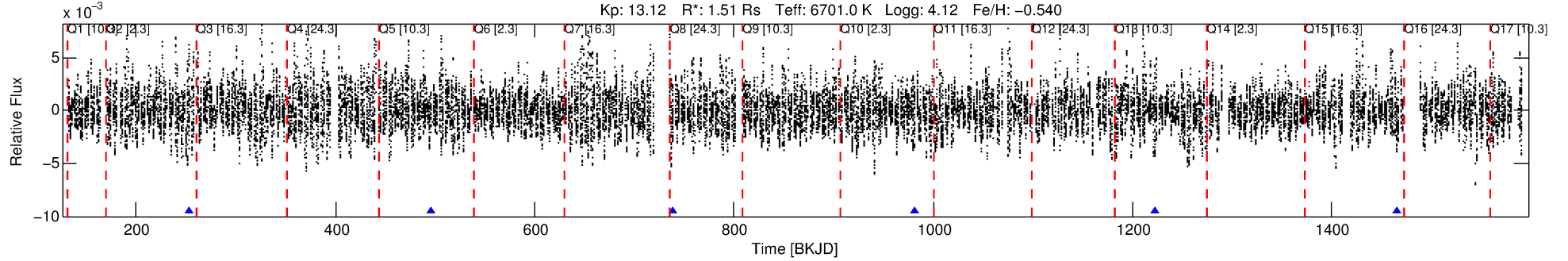
No Significant Match Found

DV One-Page Summary

KIC: 2720354 Candidate: 4 of 4 Period: 242.599 d

KOI: K06292 Corr: No Ephemeris Match

Kp: 13.12 R*: 1.51 Rs Teff: 6701.0 K Logg: 4.12 Fe/H: -0.540



DV Fit Results:

Period = 242.59864 [0.00973] d
Epoch = 252.8217 [0.0271] BKJD
Rp/R* = 0.0583 [0.0033]
a/R* = 40.95 [3.53]
b = 0.84 [0.04]
Seff = 6.66 [1.93]
Teq = 410 [30] K
Rp = 9.58 [1.86] Re
a = 0.7843 [0.1403] AU
Ag = 4925.48 [1713.32] [2.87σ]
Teffp = 5306 [270] K [18.02σ]

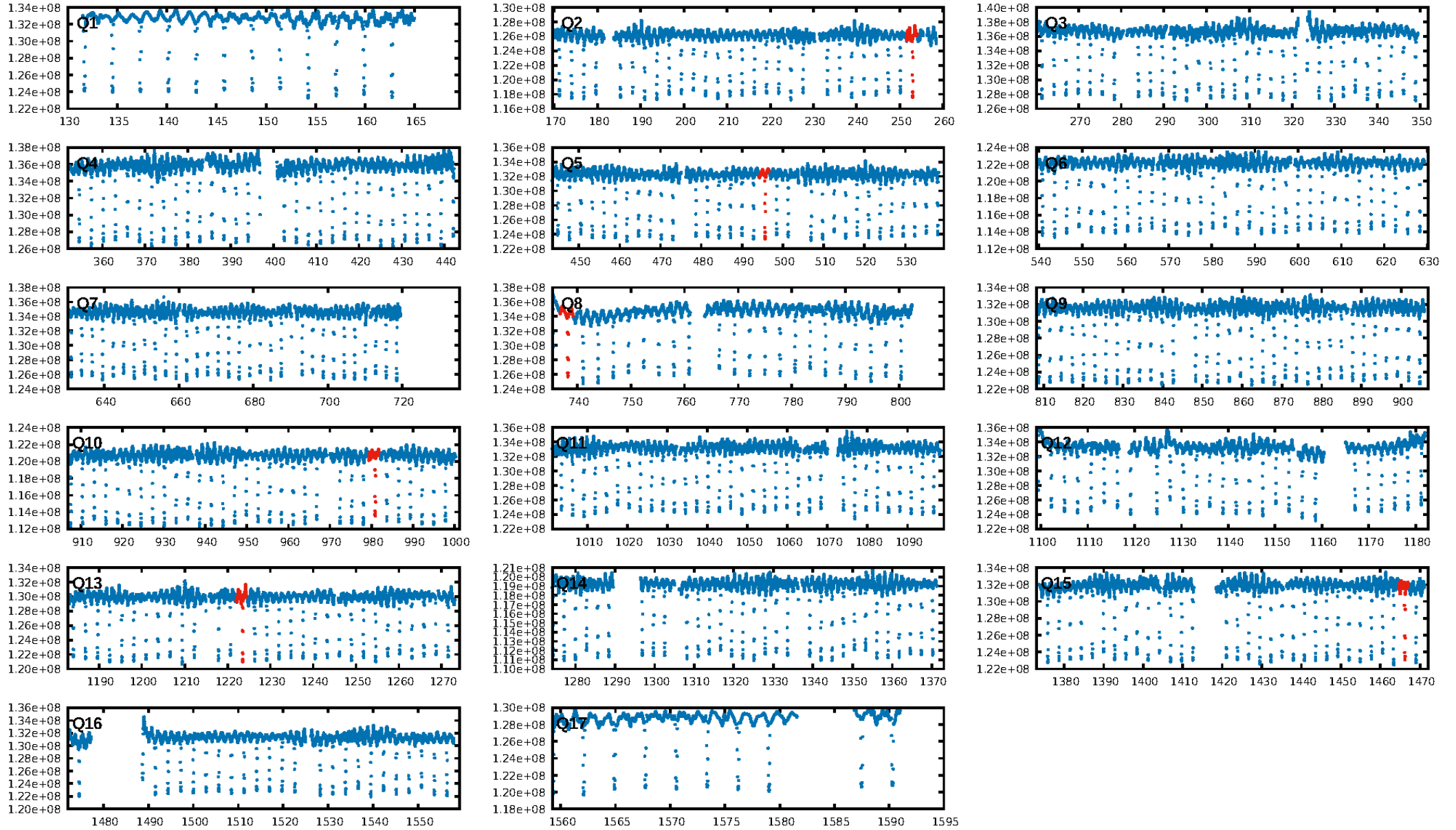
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [173.91σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 3.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.95e-10
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: -3.834
Centroid-sig: 16.0%
Centroid-so: 0.308 arcsec [4.39σ]
OotOffset-rm: 0.172 arcsec [1.43σ]
KicOffset-rm: 0.203 arcsec [1.46σ]
OotOffset-st: 2/1/0/2 [5]
KicOffset-st: 2/1/0/2 [5]
DiffImageQuality-fgm: 1.00 [5/5]
DiffImageOverlap-fno: 0.00 [0/5]

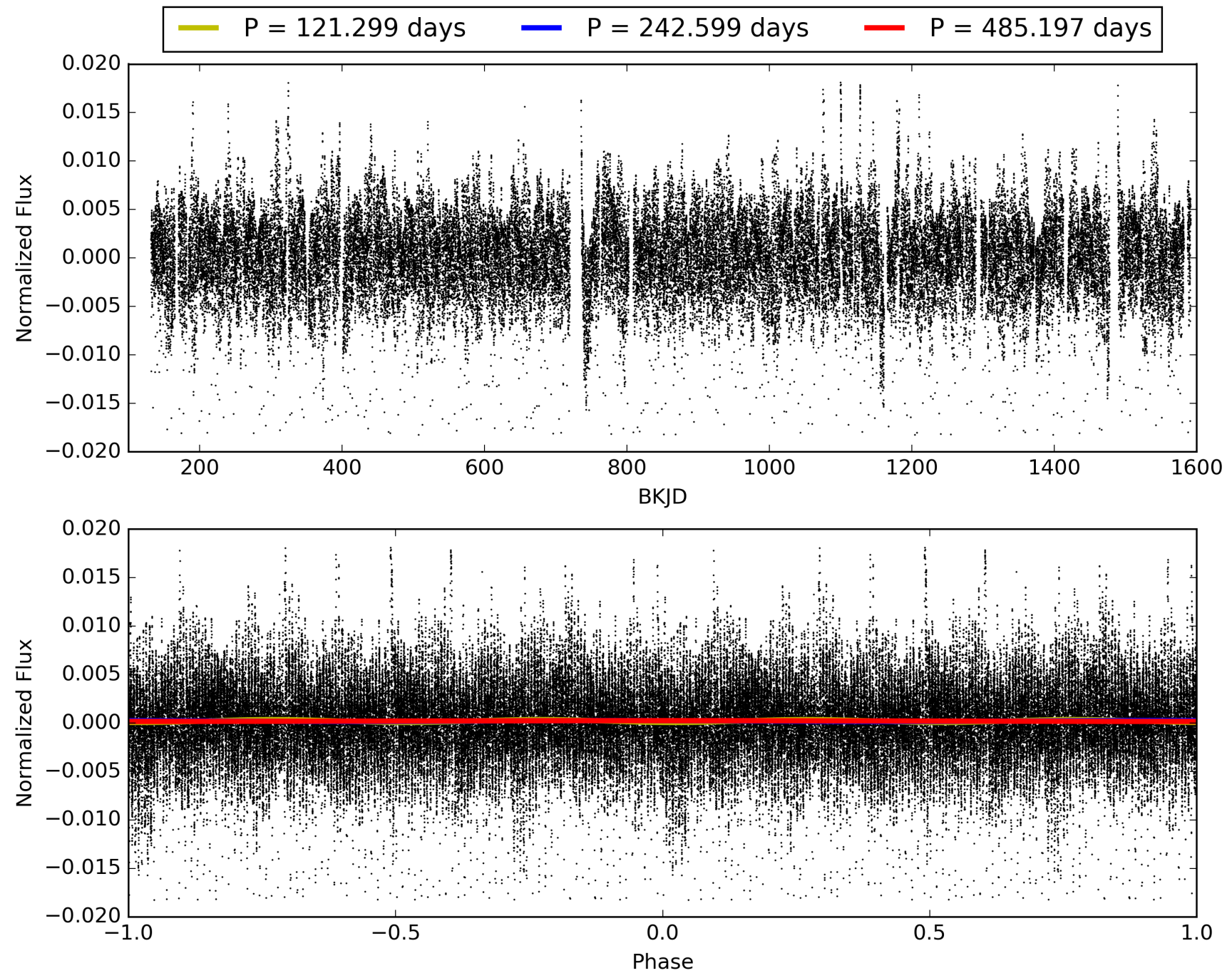
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 04:13:03 Z

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

TCE 002720354-04, PDC Light Curves

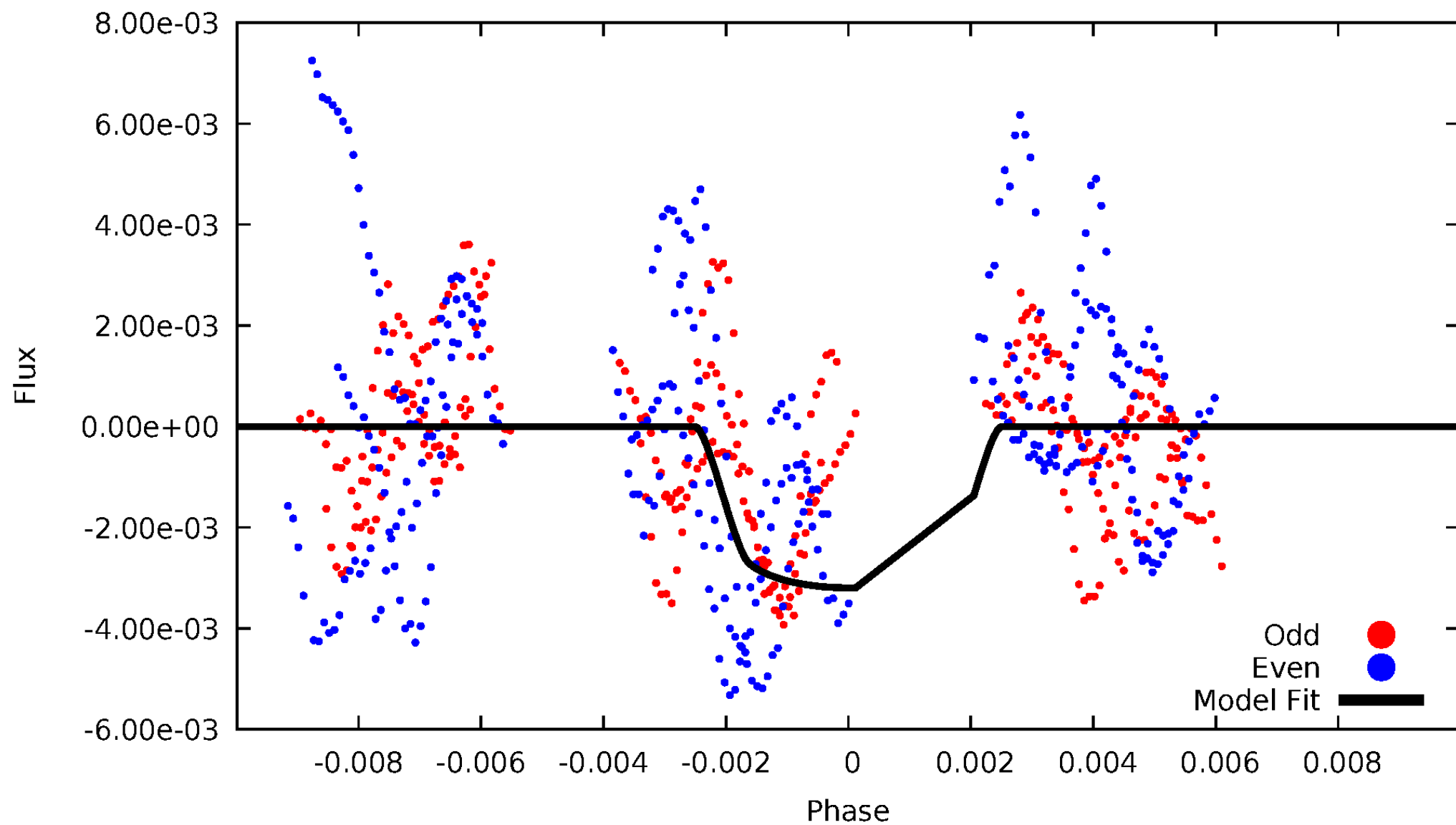


TCE 002720354-04



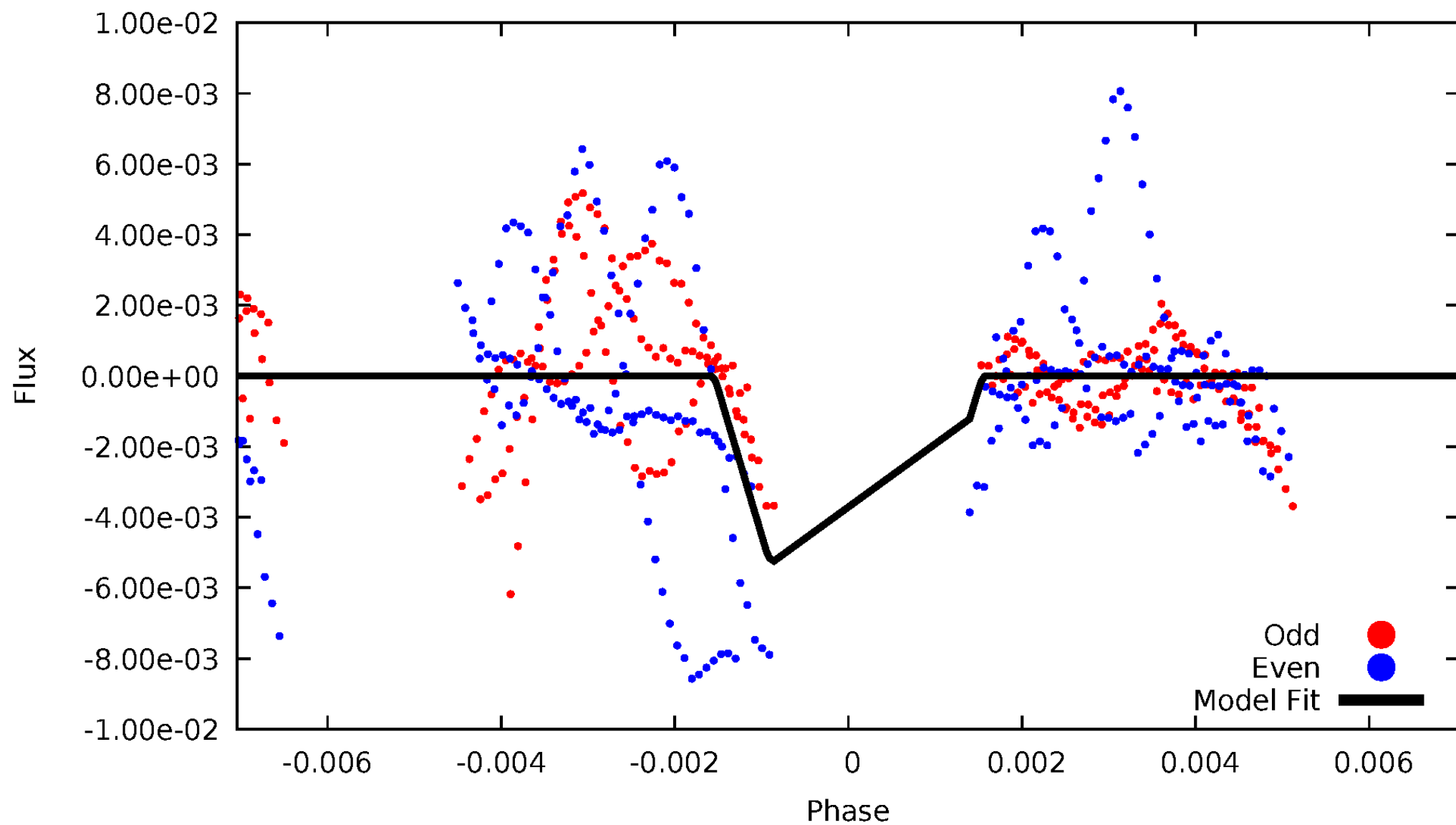
DV Odd/Even

TCE 002720354-04



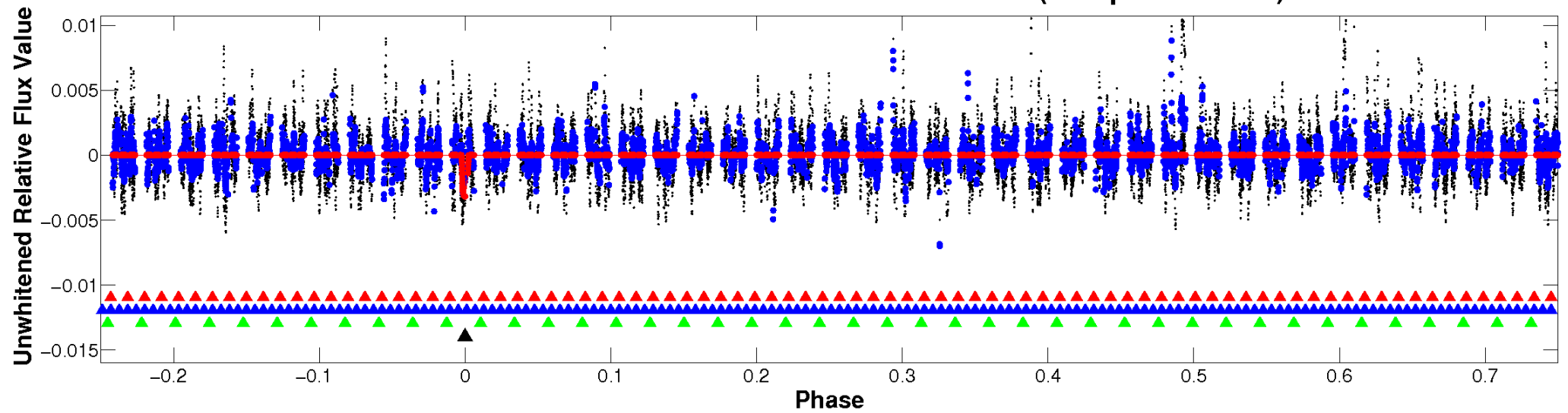
ALT Odd/Even

TCE 002720354-04

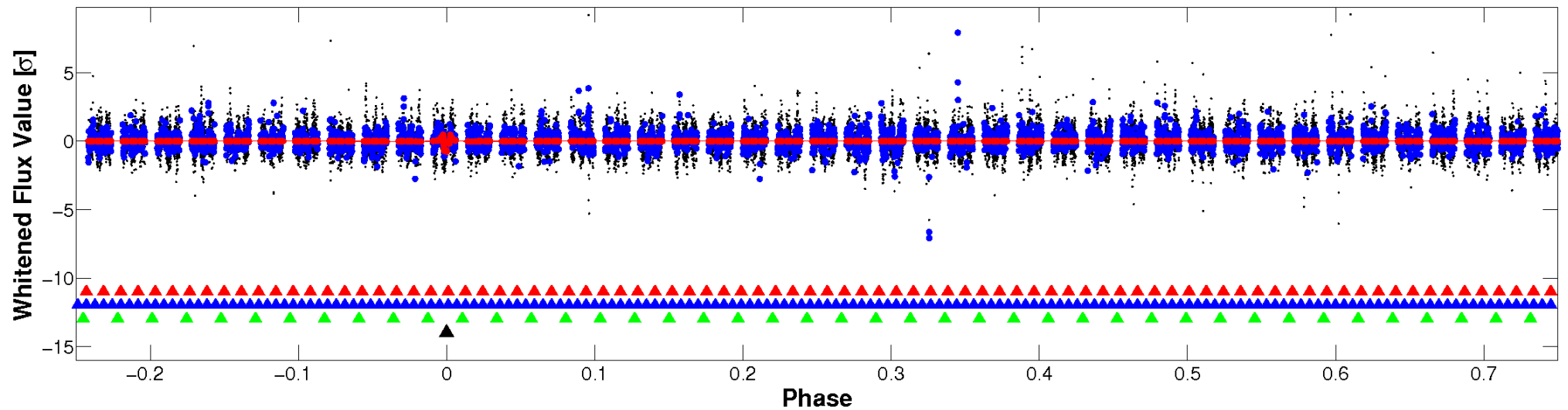


Non-Whitened Vs. Whitened Light Curve

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

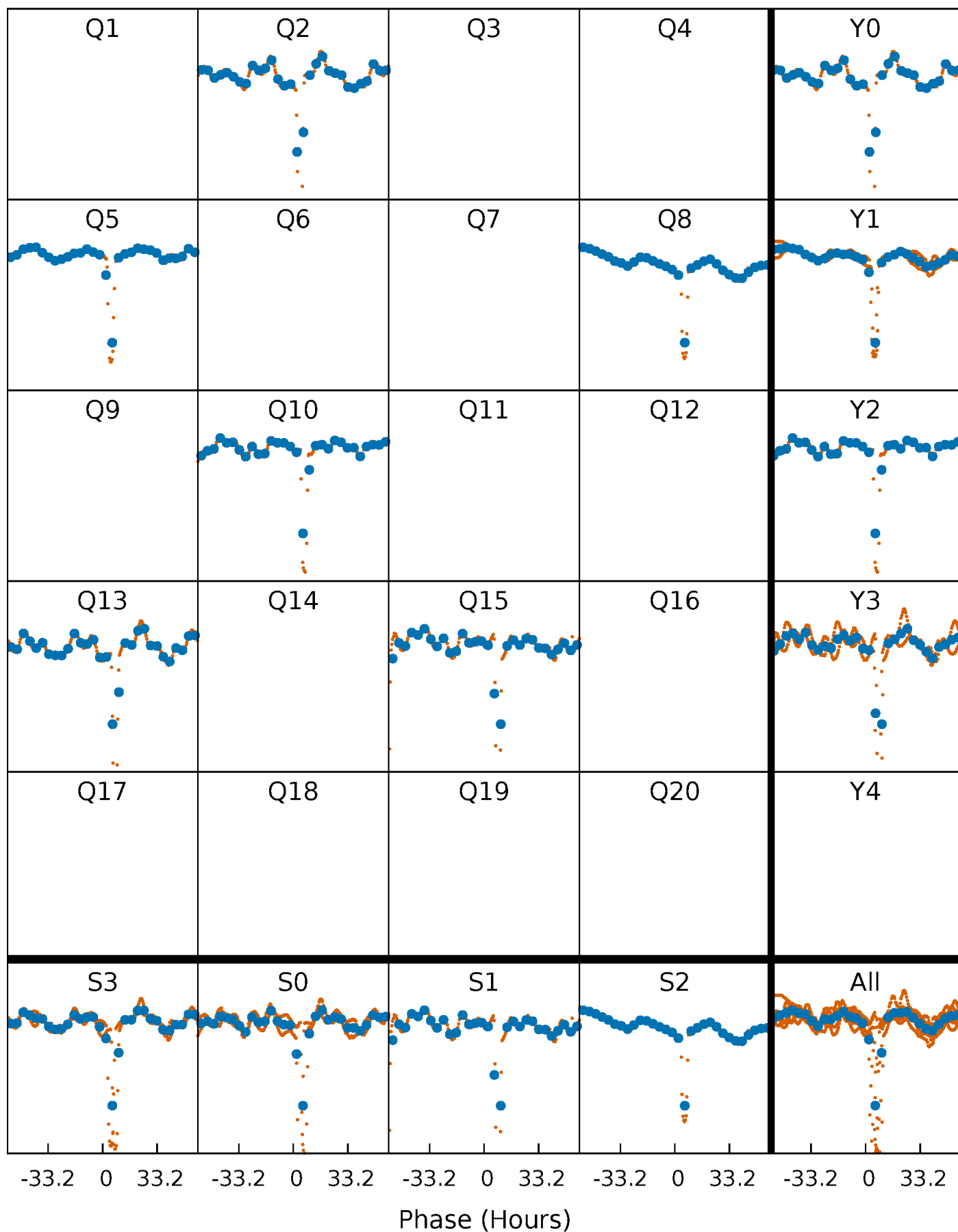


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



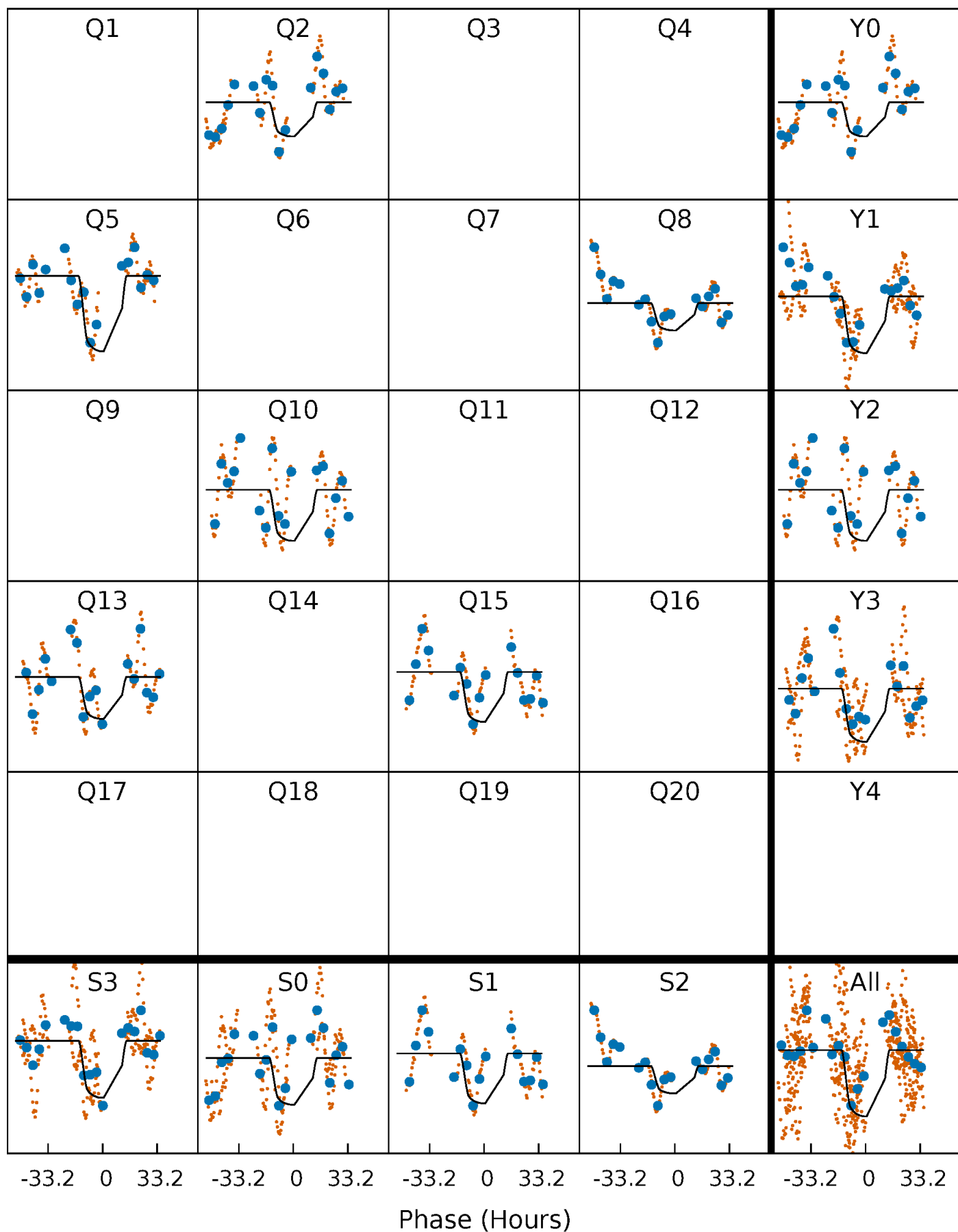
PDC Quarter-Phased Transit Curves

TCE 002720354-04 P=242.598638 Days $T_0=252.821742$ (BKJD)



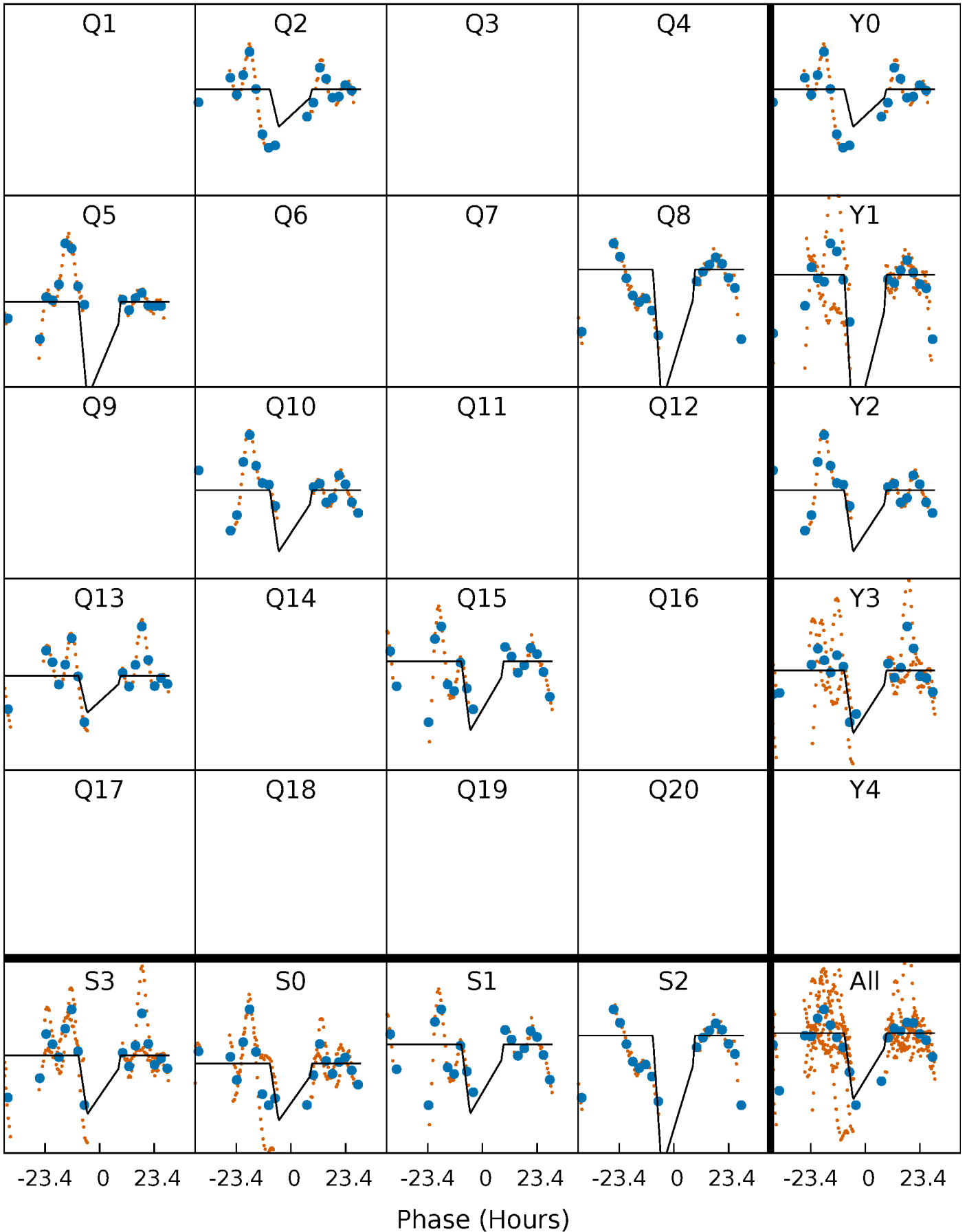
DV Quarter-Phased Transit Curves

TCE 002720354-04 P=242.598638 Days $T_0=252.821742$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

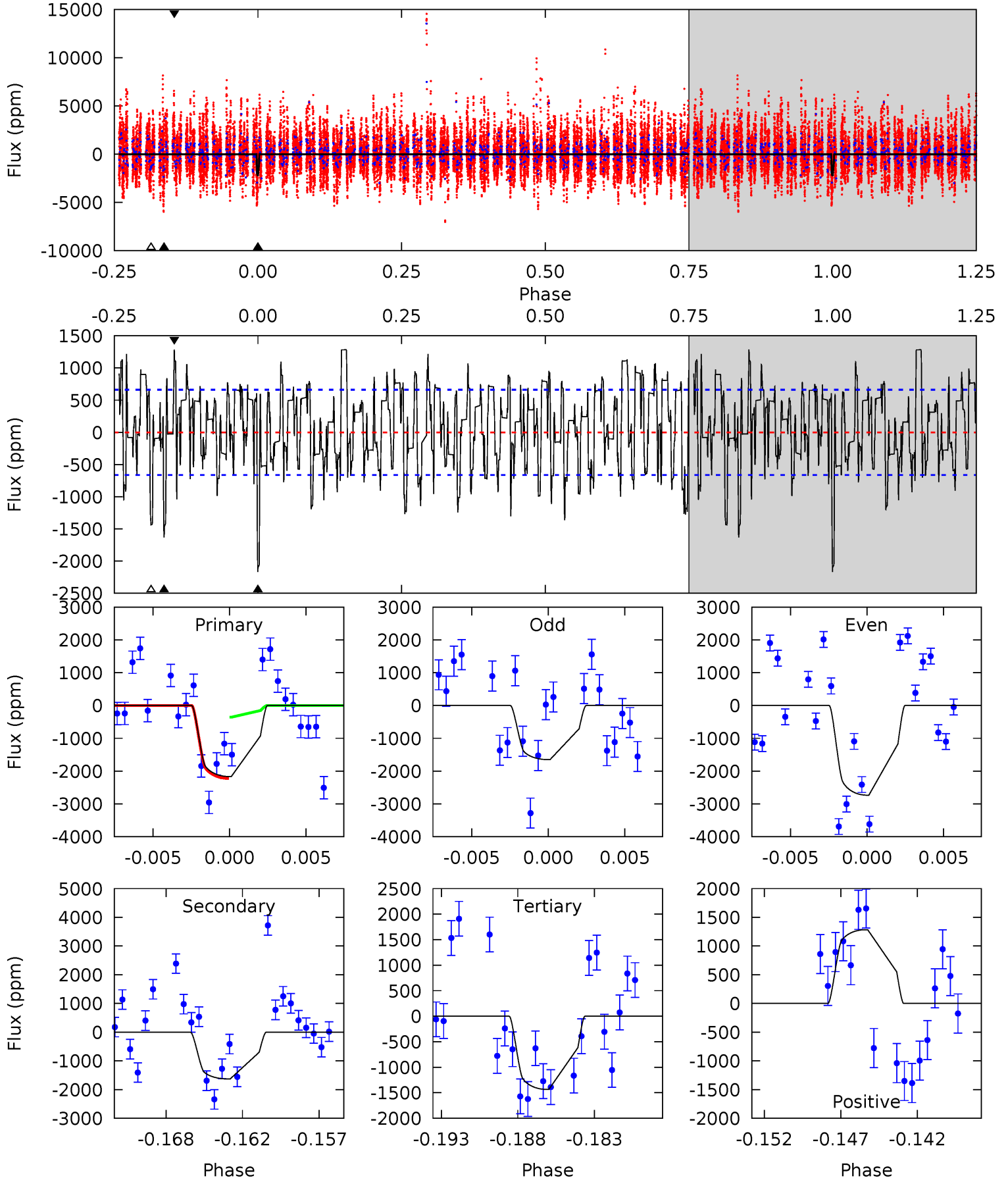
TCE 002720354-04 P=242.614469 Days $T_0=252.979891$ (BKJD)



DV Model-Shift Uniqueness Test

002720354-04, P = 242.598638 Days, E = 10.223104 Days

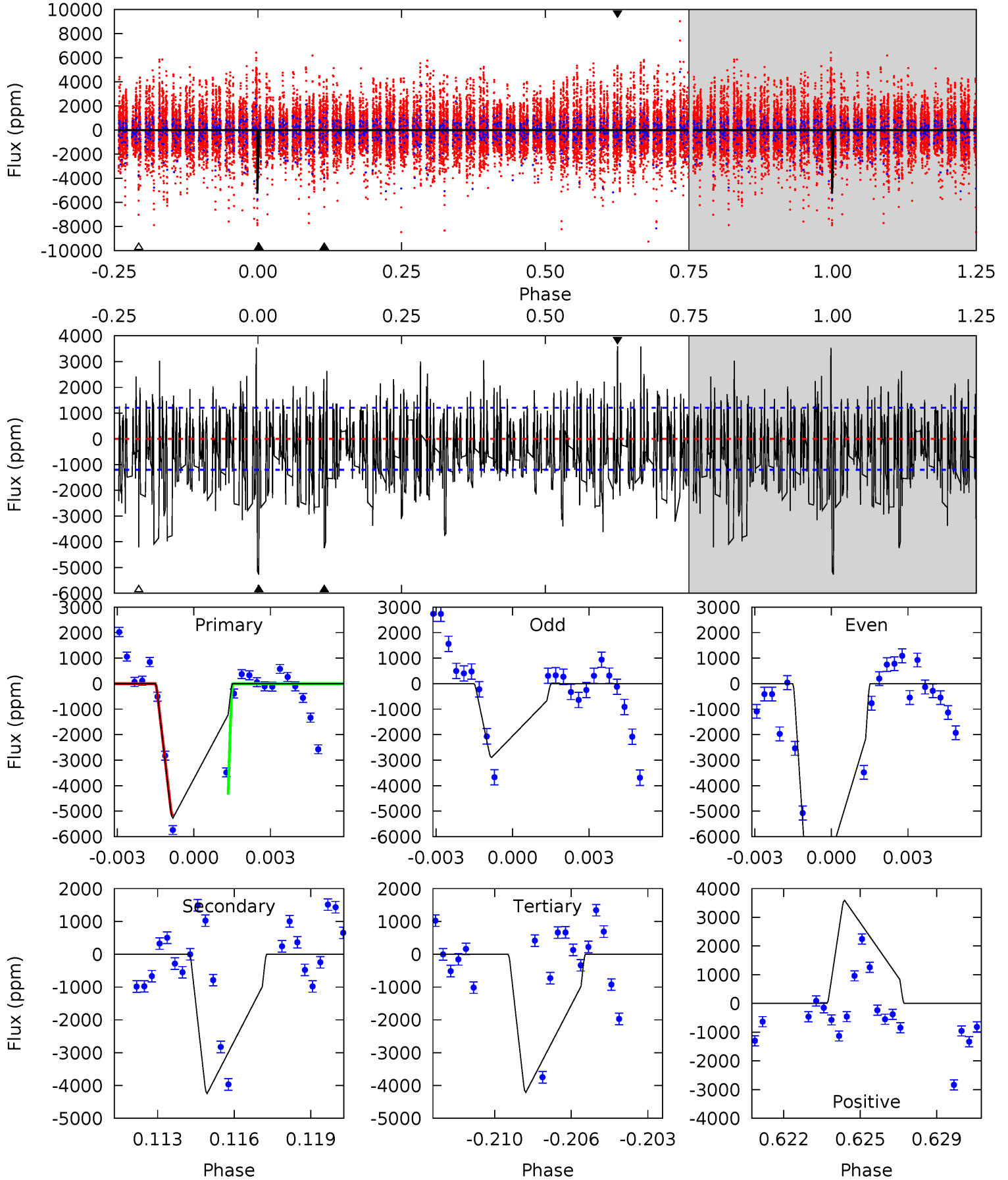
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.9	12.7	11.2	10.0	5.15	2.80	4.19	5.71	6.88	1.53	2.69	4.05	0.95	0.37	4.33



Alt Model-Shift Uniqueness Test

002720354-04, P = 242.614469 Days, E = 10.365422 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.9	18.5	18.3	15.6	5.24	2.95	4.25	4.61	7.31	0.15	2.85	13.7	1.72	0.41	1.18



Stellar Parameters For KIC 002720354

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6701^{+74}_{-81}	$4.121^{+0.168}_{-0.098}$	$-0.540^{+0.150}_{-0.150}$	$1.506^{+0.229}_{-0.280}$	$1.092^{+0.095}_{-0.067}$	$0.451^{+0.370}_{-0.148}$
	+1%/-1%	+4%/-2%	+28%/-28%	+15%/-19%	+9%/-6%	+82%/-33%
Source	SPE68	SPE68	SPE68	DSEP		

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

Secondary Eclipse Parameters for KIC 002720354-04 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1630 ± 128	$9.48^{+1.01}_{-1.03}$	569^{+25}_{-28}	5581^{+192}_{-180}	6250^{+1535}_{-1268}
Alt.	-4246 ± 230	$11.81^{+1.10}_{-1.33}$	569^{+23}_{-30}	6341^{+204}_{-178}	10519^{+2676}_{-1888}

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

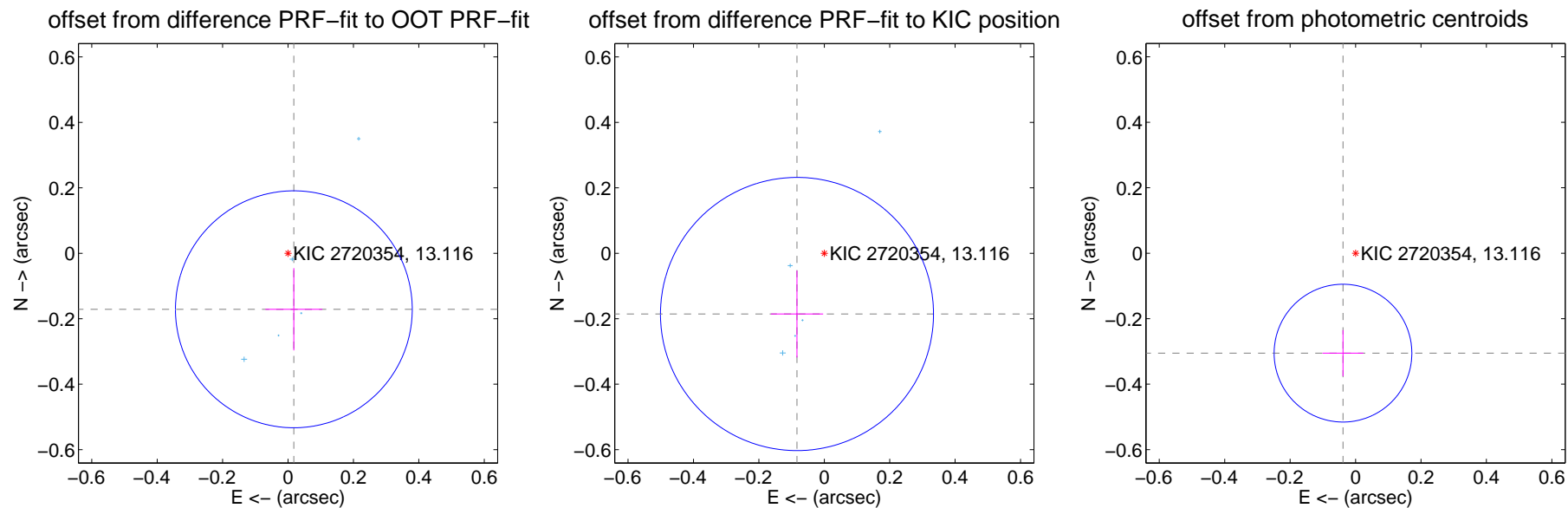
DV Centroid Data

Supplemental centroid analysis for 002720354-04. Kepler magnitude: 13.12. Transit SNR 8.25

There are 5 quarters with good PRF difference image offsets

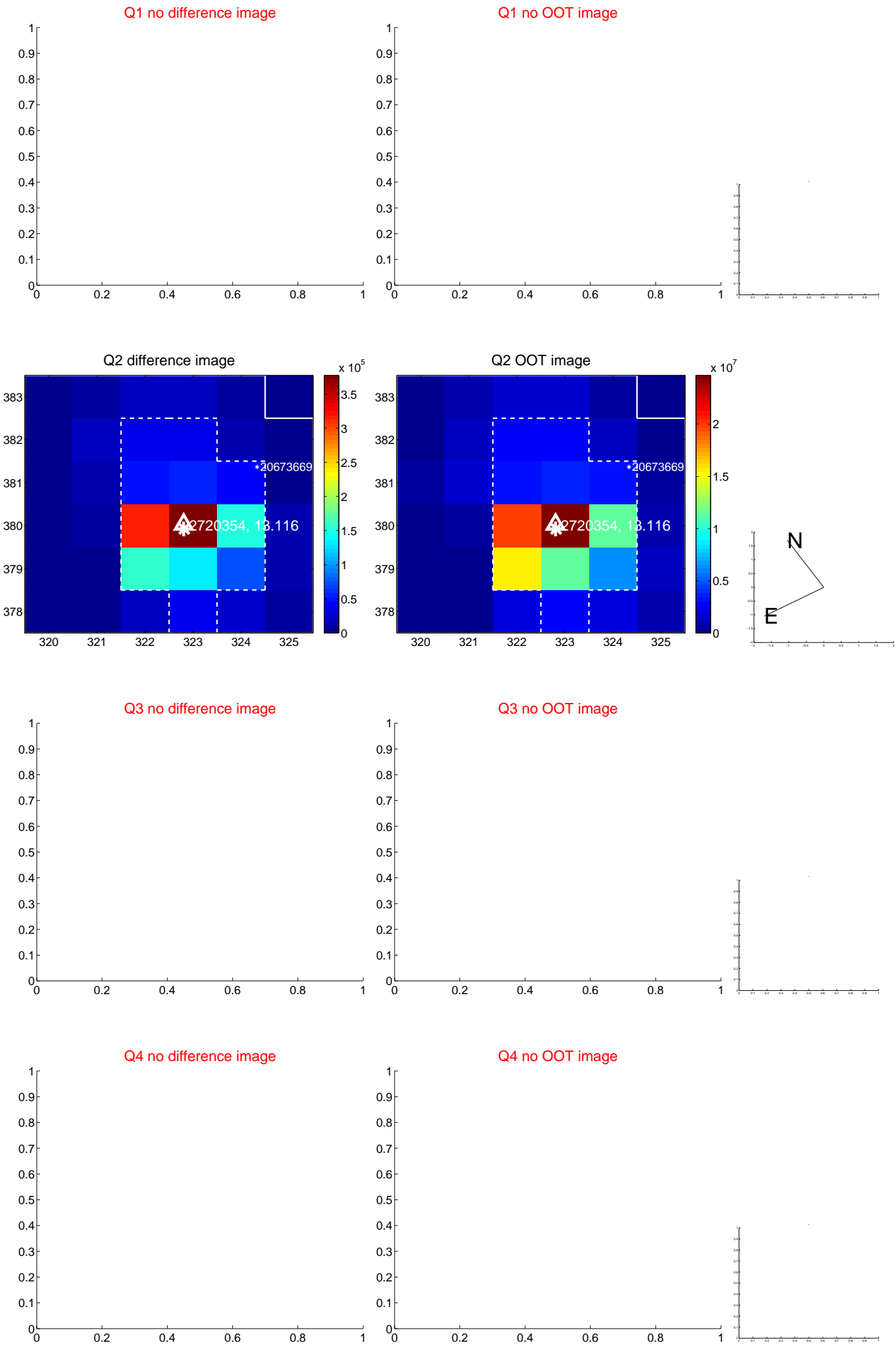
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.172 ± 0.121	1.43	-0.018 ± 0.087	-0.171 ± 0.126
PRF-fit source offset from KIC position	0.203 ± 0.139	1.46	0.083 ± 0.080	-0.185 ± 0.133
photometric centroid source offset	0.31 ± 0.07	4.39	0.04 ± 0.06	-0.31 ± 0.07

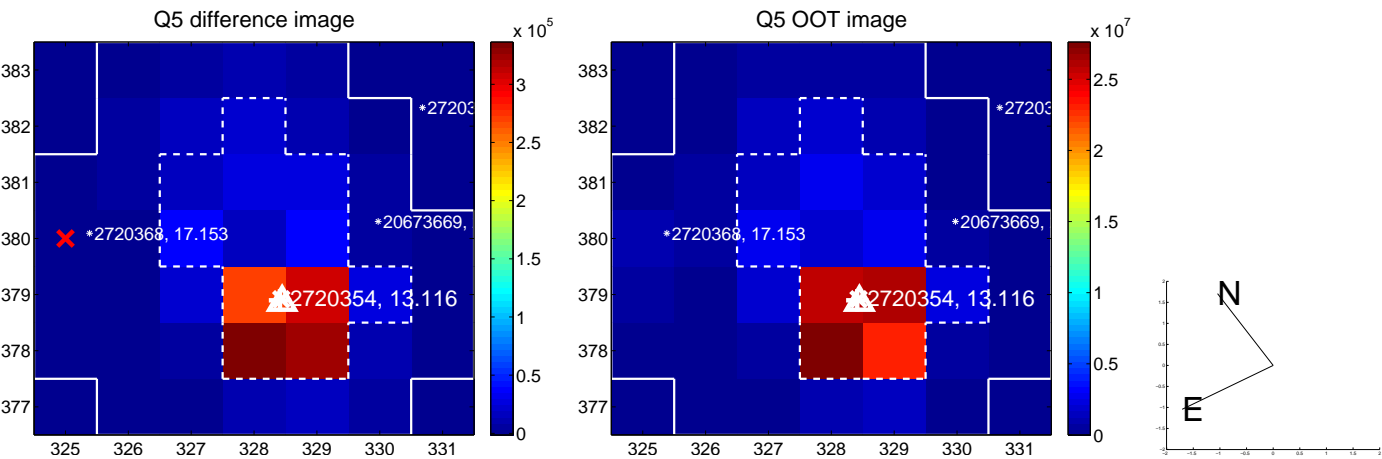


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

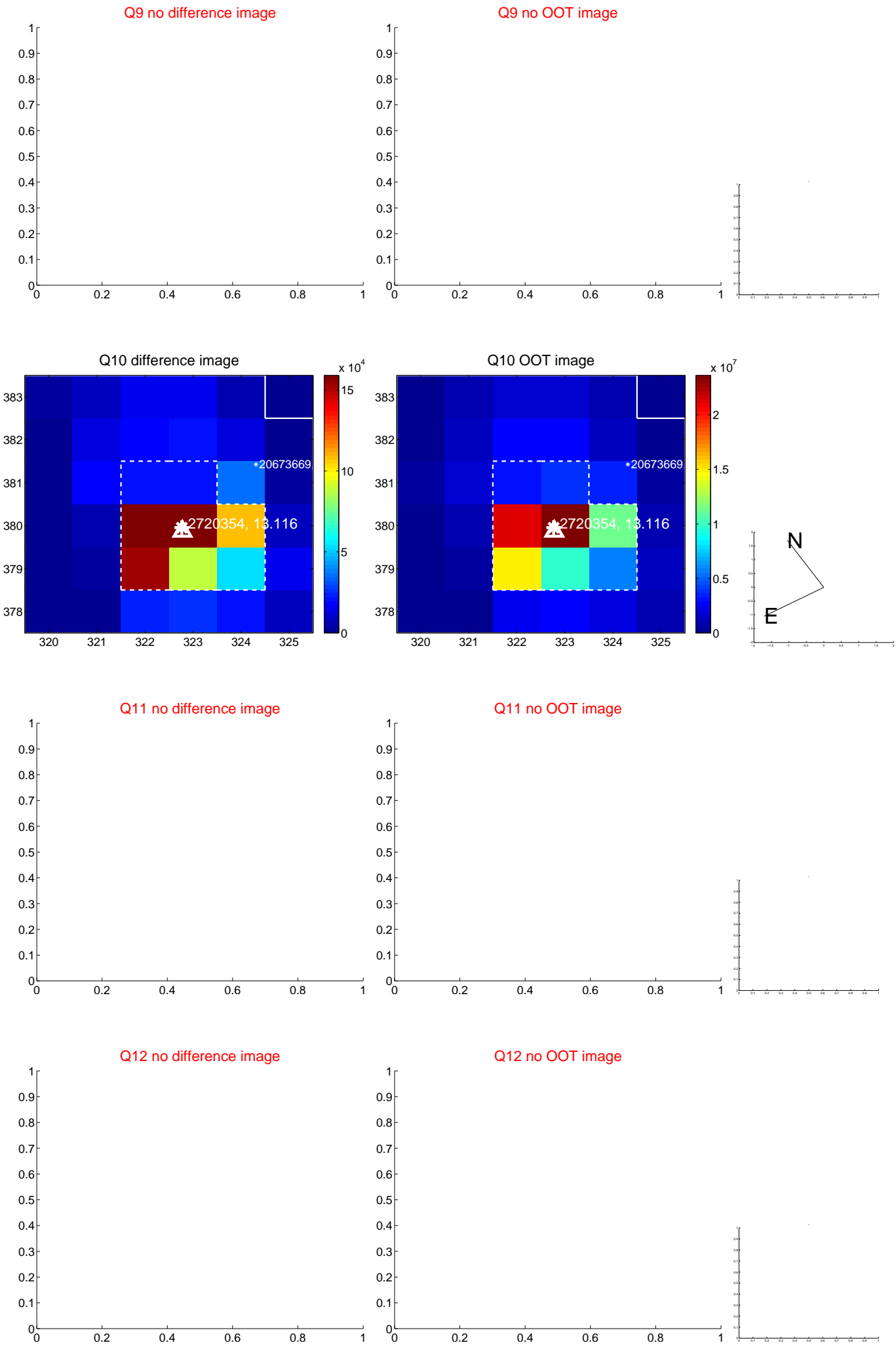
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



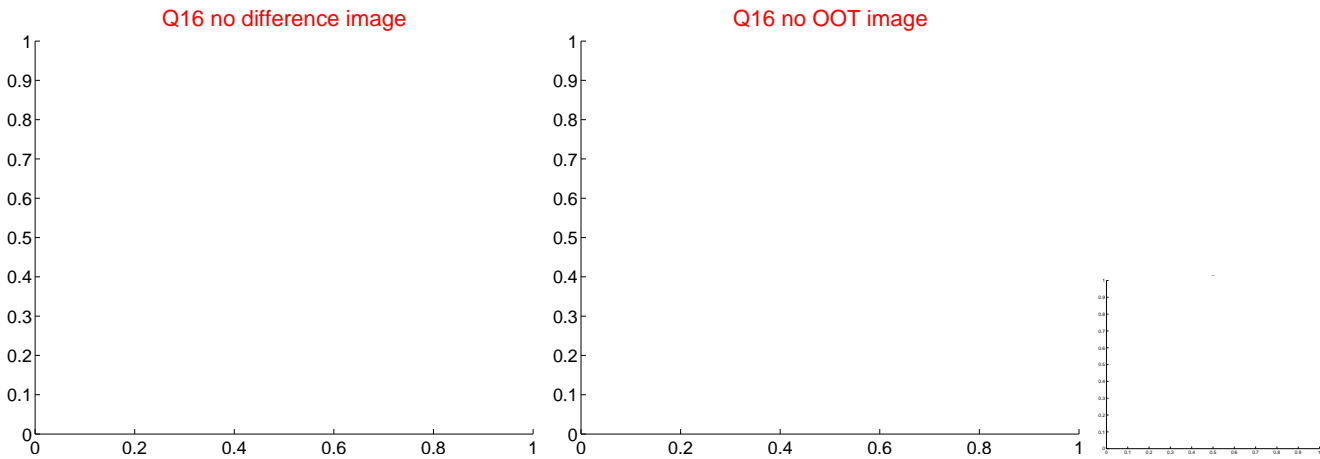
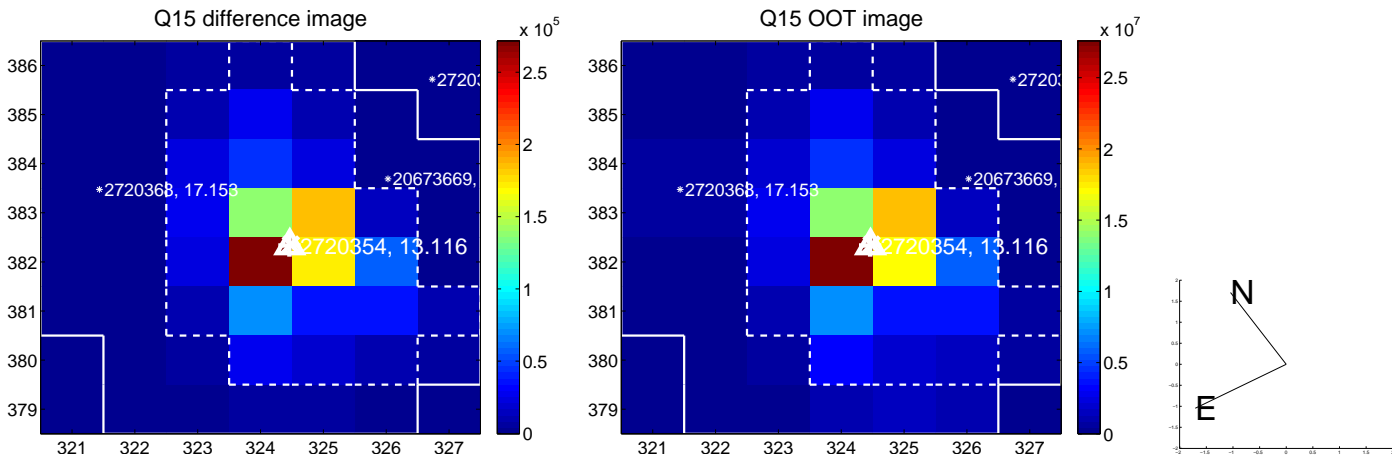
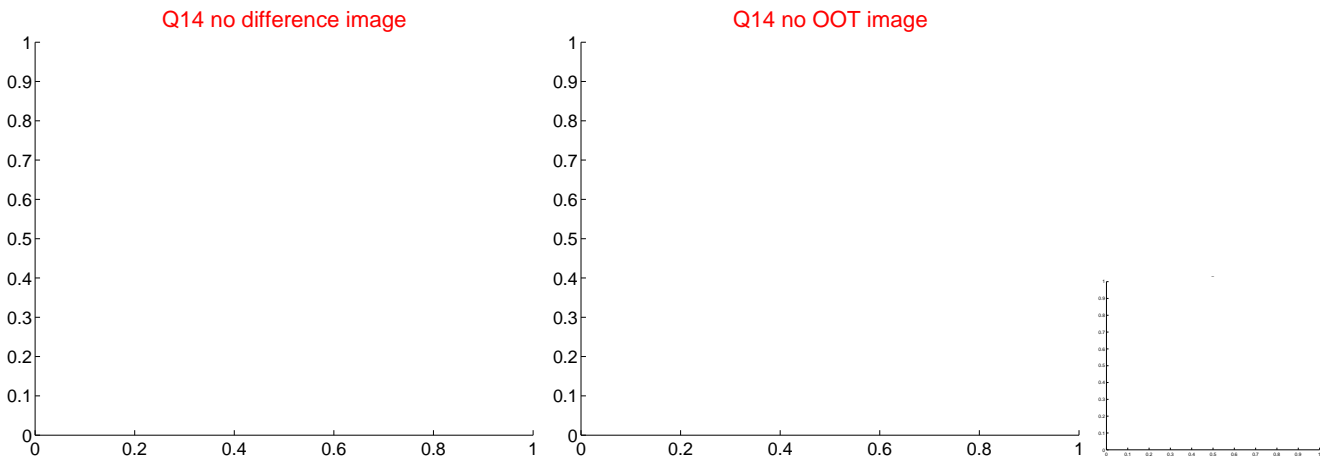
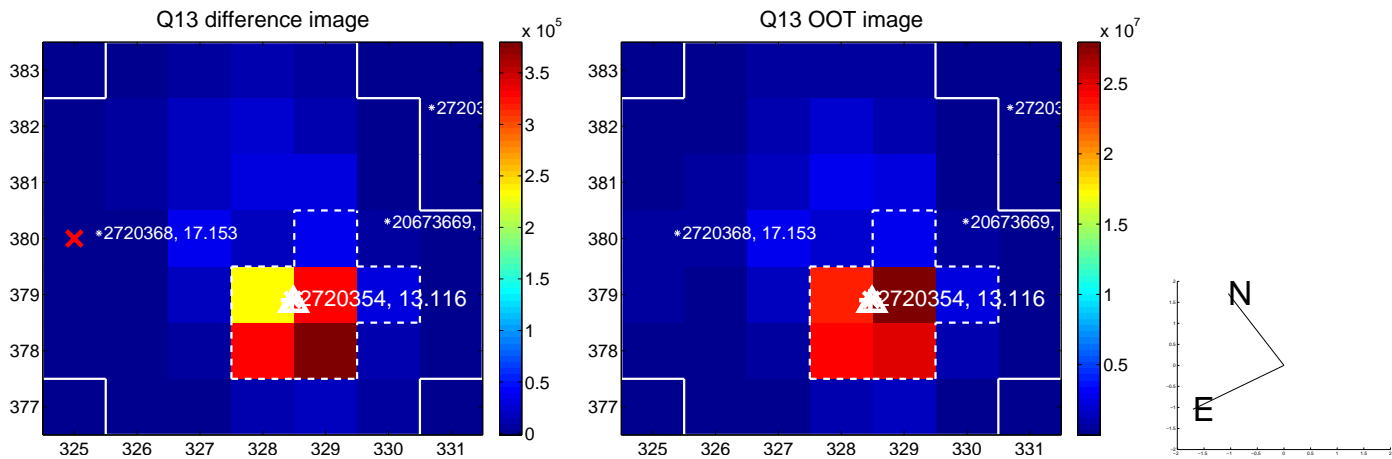
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



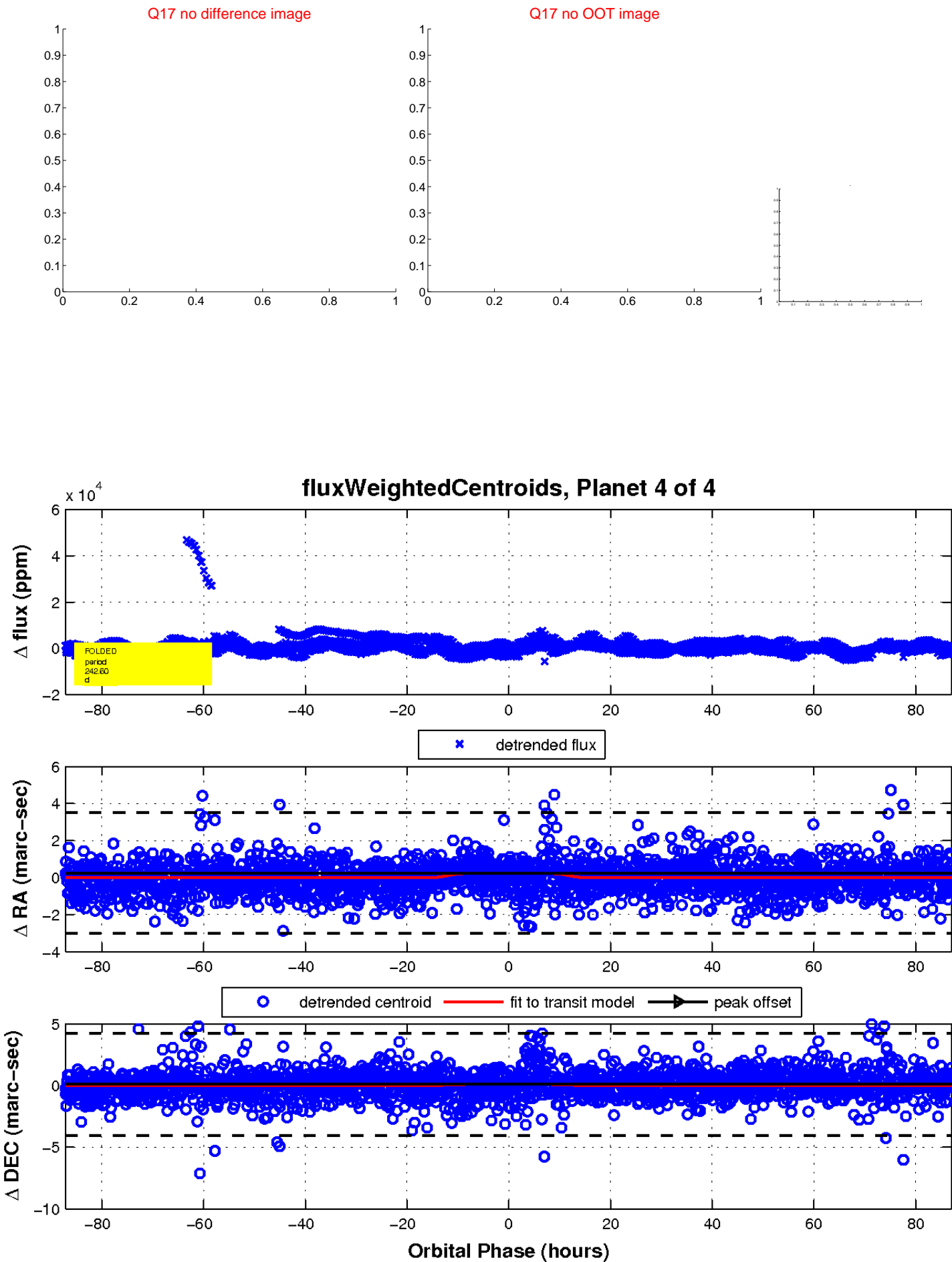
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



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



UKIRT Image

Declination

