

KIC 008164257

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})
008164257-01	OBS	2073.02	6.475387	137.582864	515.1	2.772	24.0	25.4	0.83	4954	2.19	93.55
008164257-02	OBS	2073.01	49.500384	139.043019	919.7	6.553	22.3	22.3	0.83	4954	3.10	6.21
008164257-03	OBS	2073.03	16.858194	142.345413	774.6	2.051	17.5	20.0	0.83	4954	2.68	26.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008164257-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
008164257-02	OBS	PC	0.99	0	0	0	0	CENT_KIC_POS
008164257-03	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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.

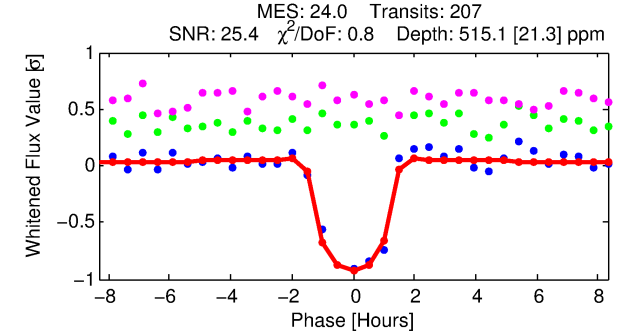
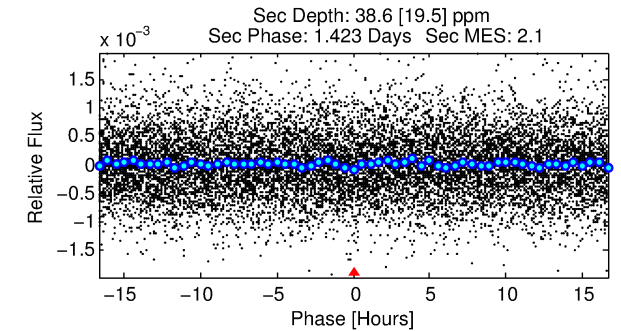
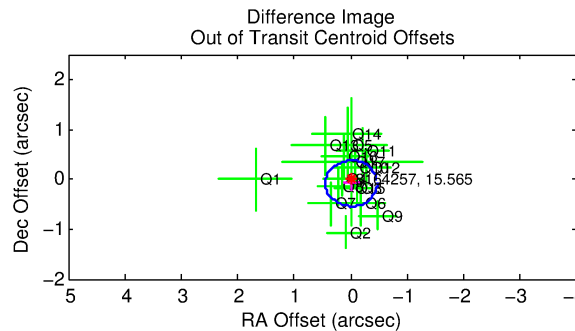
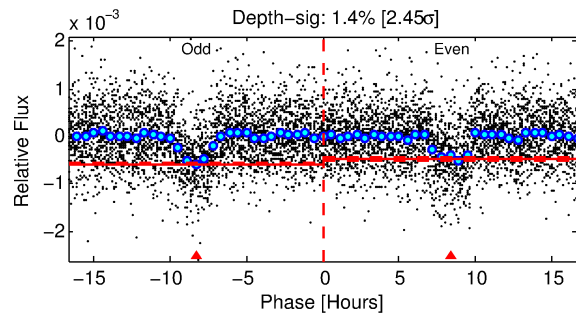
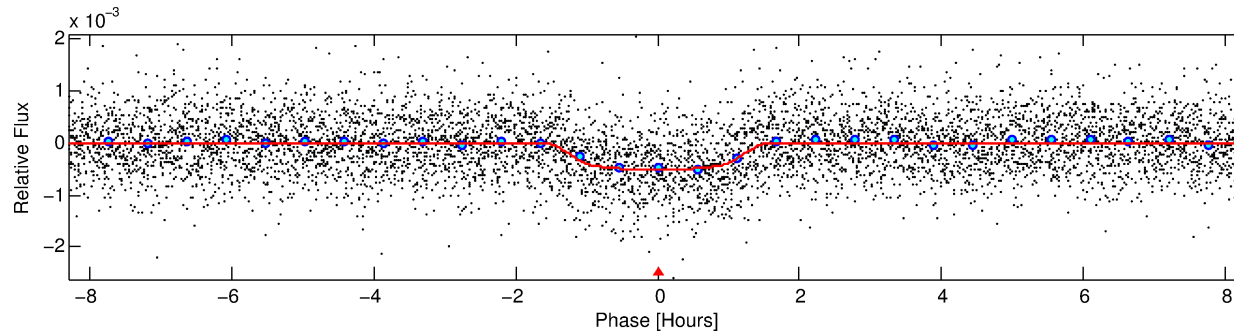
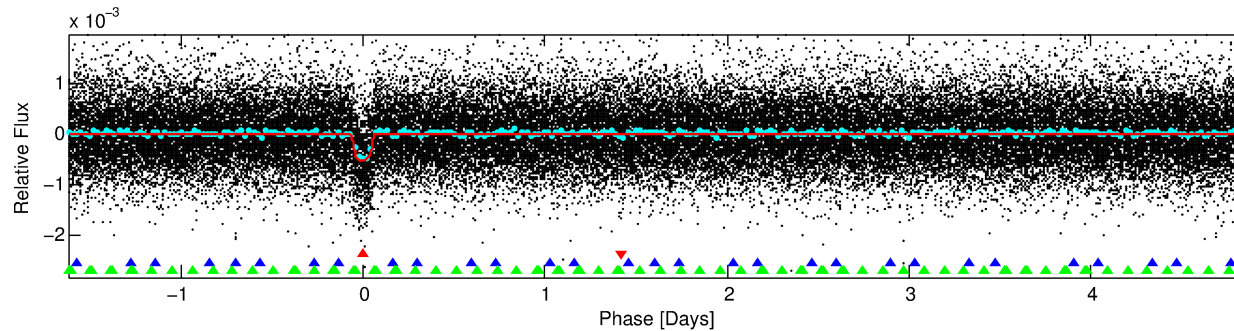
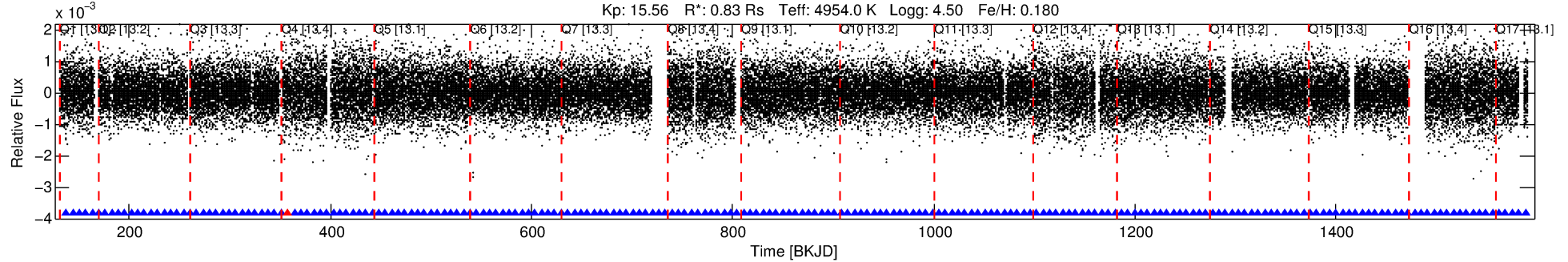
Ephemeris Match Information For 008164257-01

No Significant Match Found

DV One-Page Summary

KIC: 8164257 Candidate: 1 of 3 Period: 6.475 d
KOI: K02073.02 Name: Kepler-357b Corr: 0.980

Kp: 15.56 R*: 0.83 Rs Teff: 4954.0 K Logg: 4.50 Fe/H: 0.180



DV Fit Results:

Period = 6.47539 [0.00002] d
Epoch = 137.5829 [0.0021] BKJD
Rp/R* = 0.0242 [0.0079]
a/R* = 10.19 [11.92]
b = 0.85 [0.39]
Seff = 93.55 [12.90]
Teq = 793 [27] K
Rp = 2.19 [0.73] Re
a = 0.0629 [0.0048] AU
Ag = 17.49 [14.52] [1.14σ]
Teffp = 2507 [516] K [3.32σ]

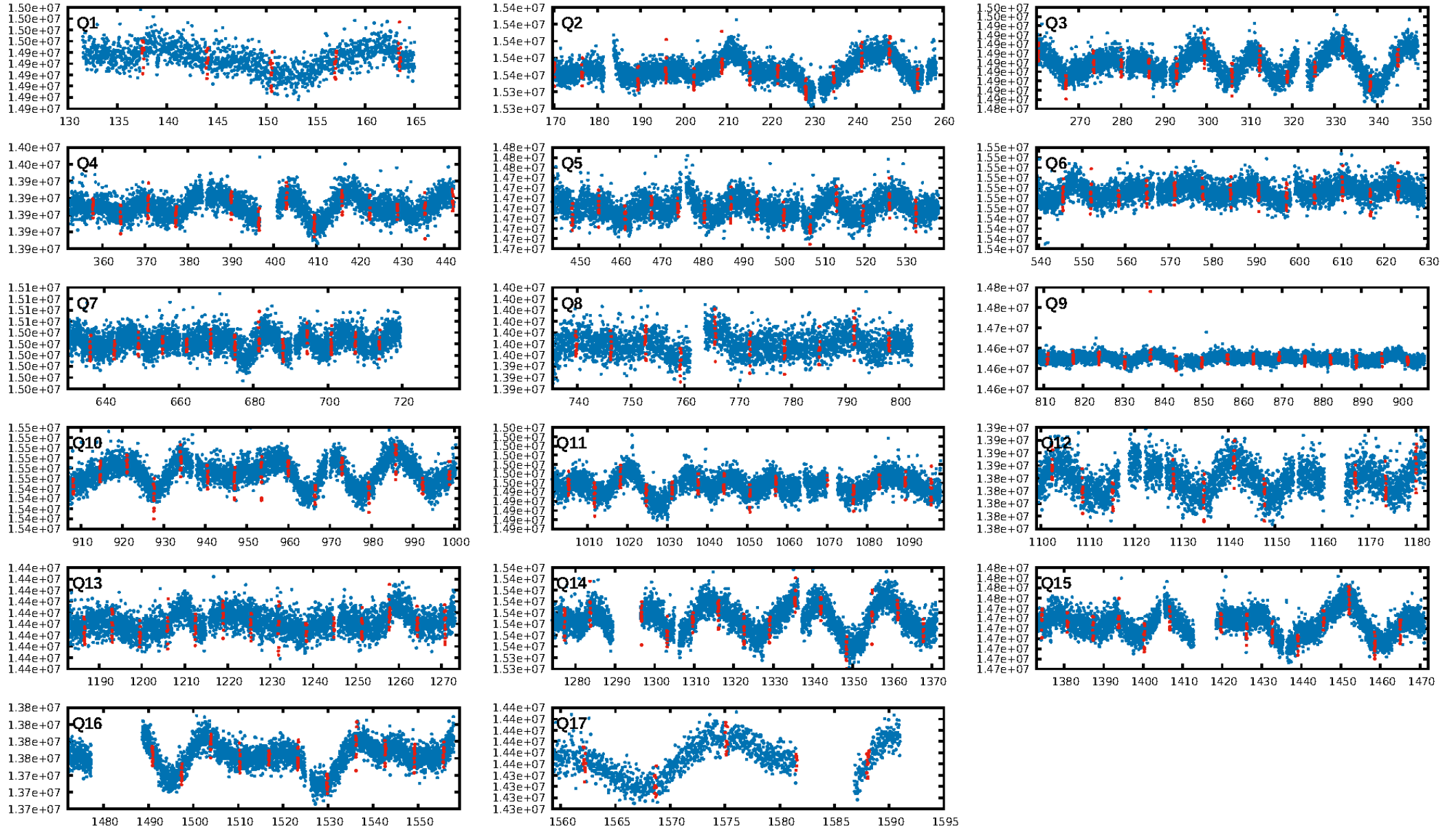
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [72.27σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.01e-122
RollingBand-fgt: 0.99 [196/197]
GhostDiagnostic-chr: 1.995
Centroid-sig: 85.0%
Centroid-so: 0.378 arcsec [0.71σ]
OotOffset-rm: 0.084 arcsec [0.55σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.460 arcsec [3.15σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 1.00 [17/17]

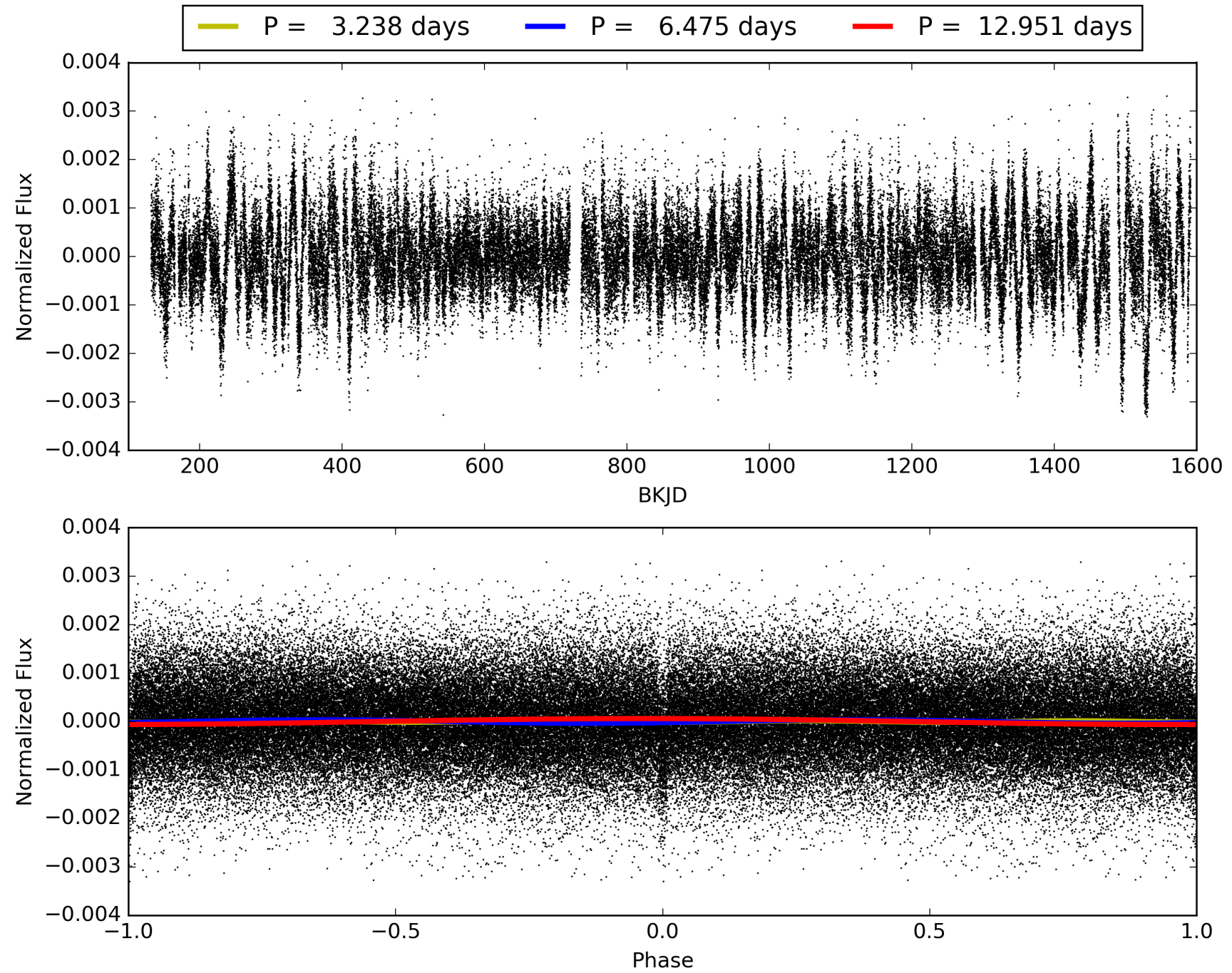
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:46:35 Z

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

TCE 008164257-01, PDC Light Curves

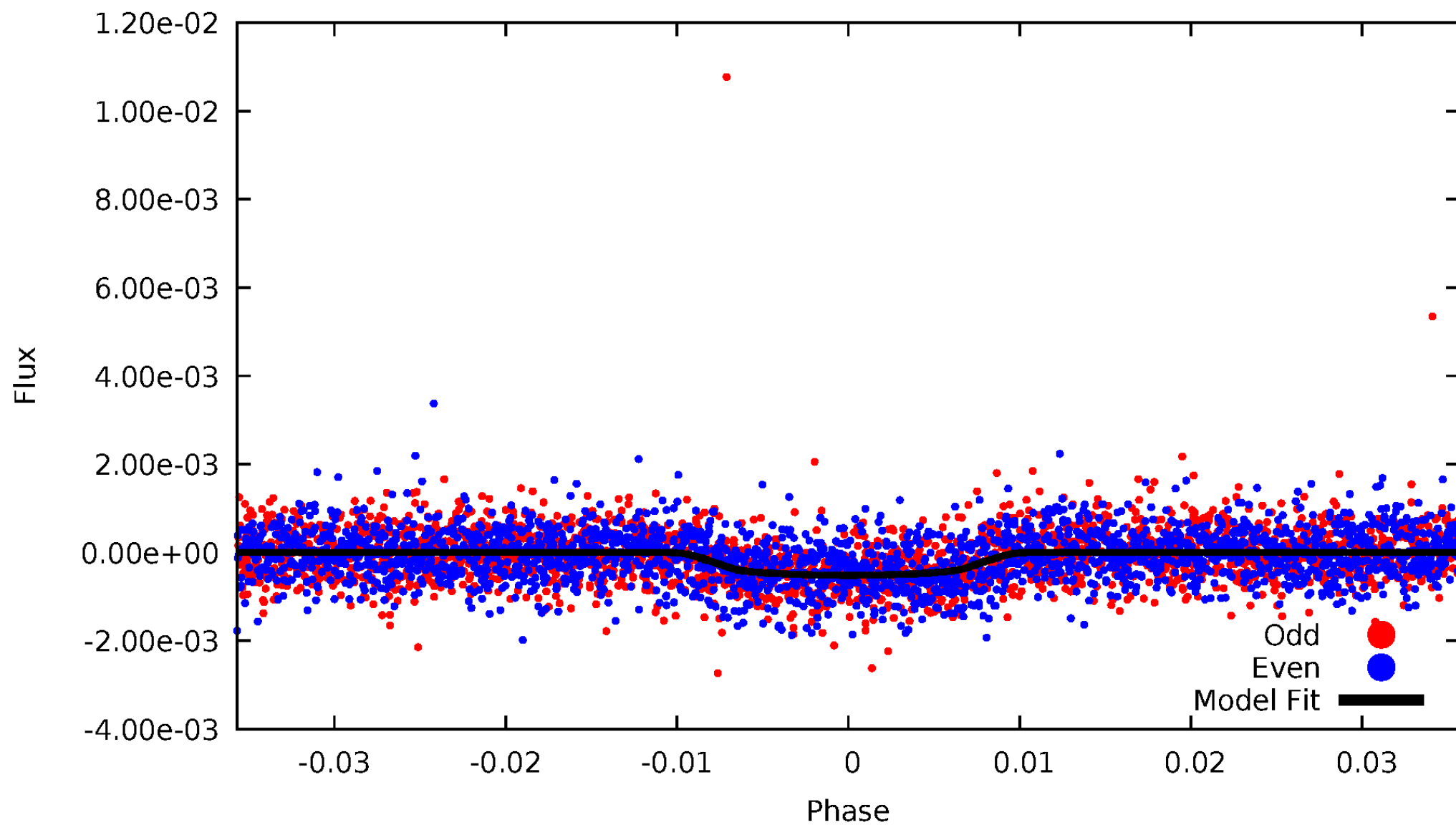


TCE 008164257-01



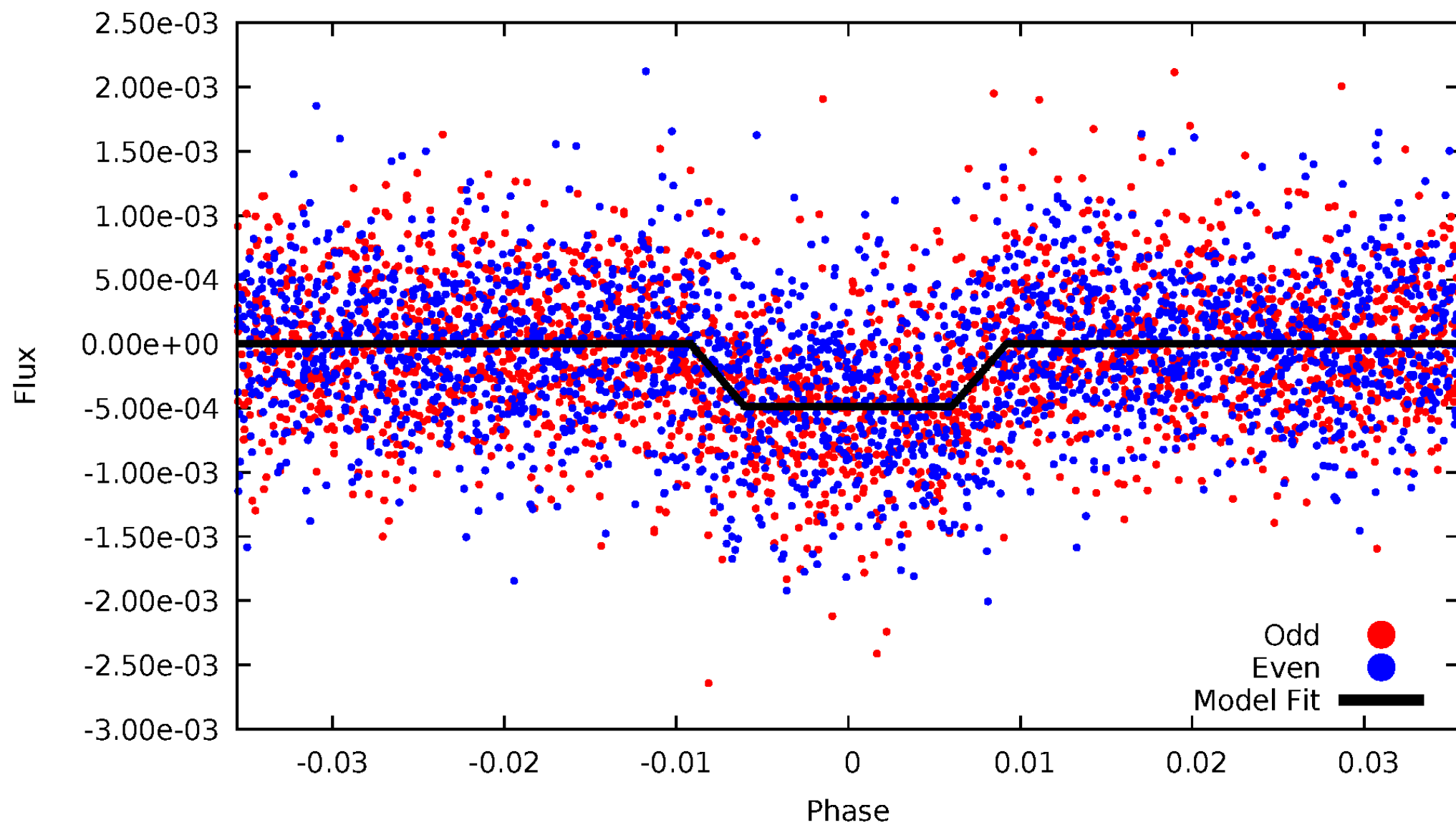
DV Odd/Even

TCE 008164257-01



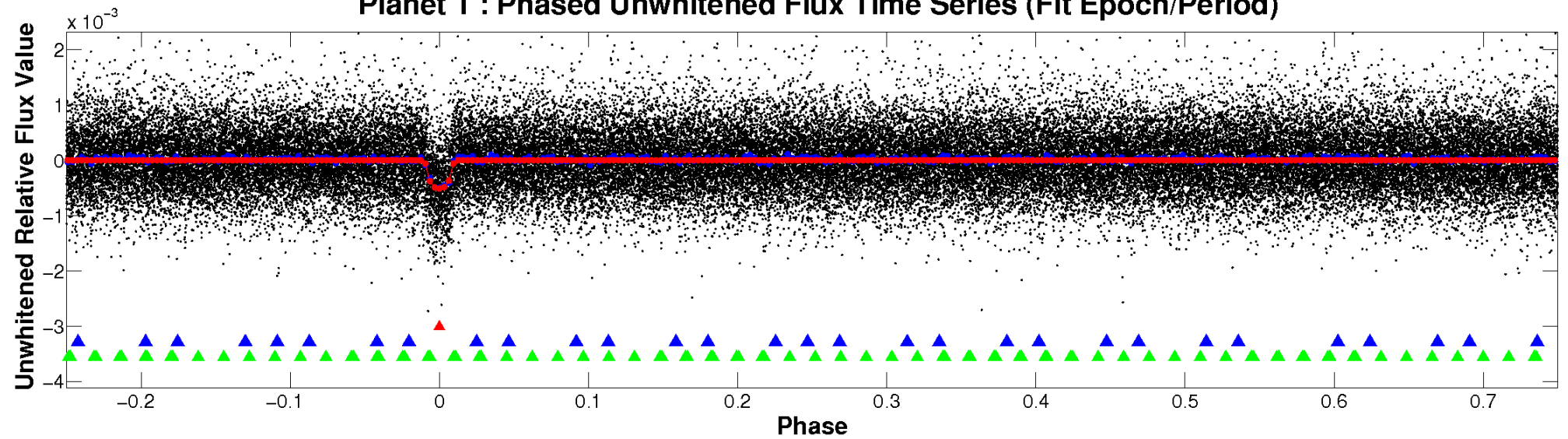
ALT Odd/Even

TCE 008164257-01

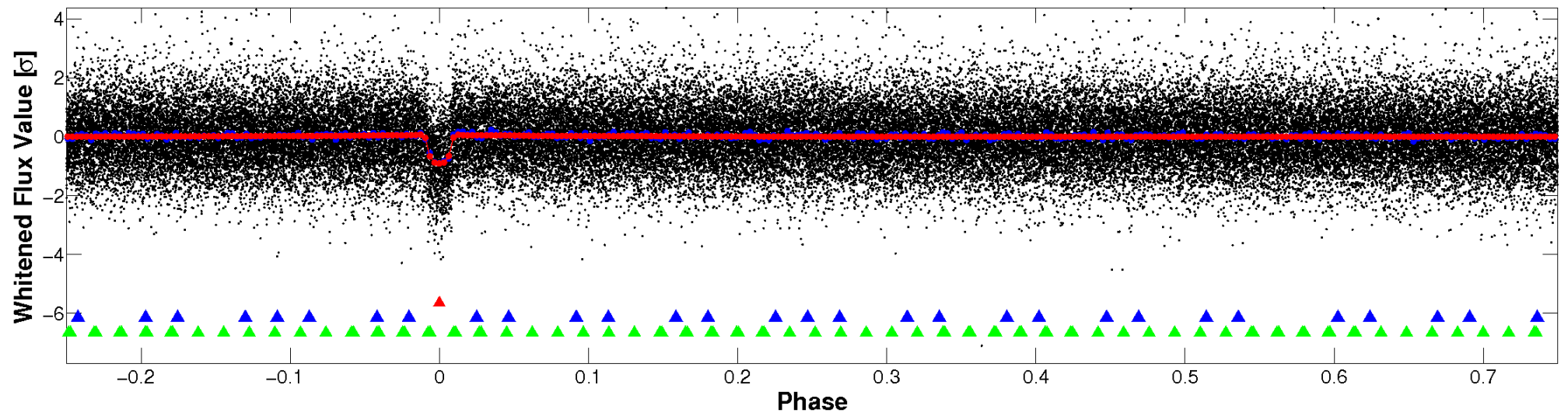


Non-Whitened Vs. Whitened Light Curve

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

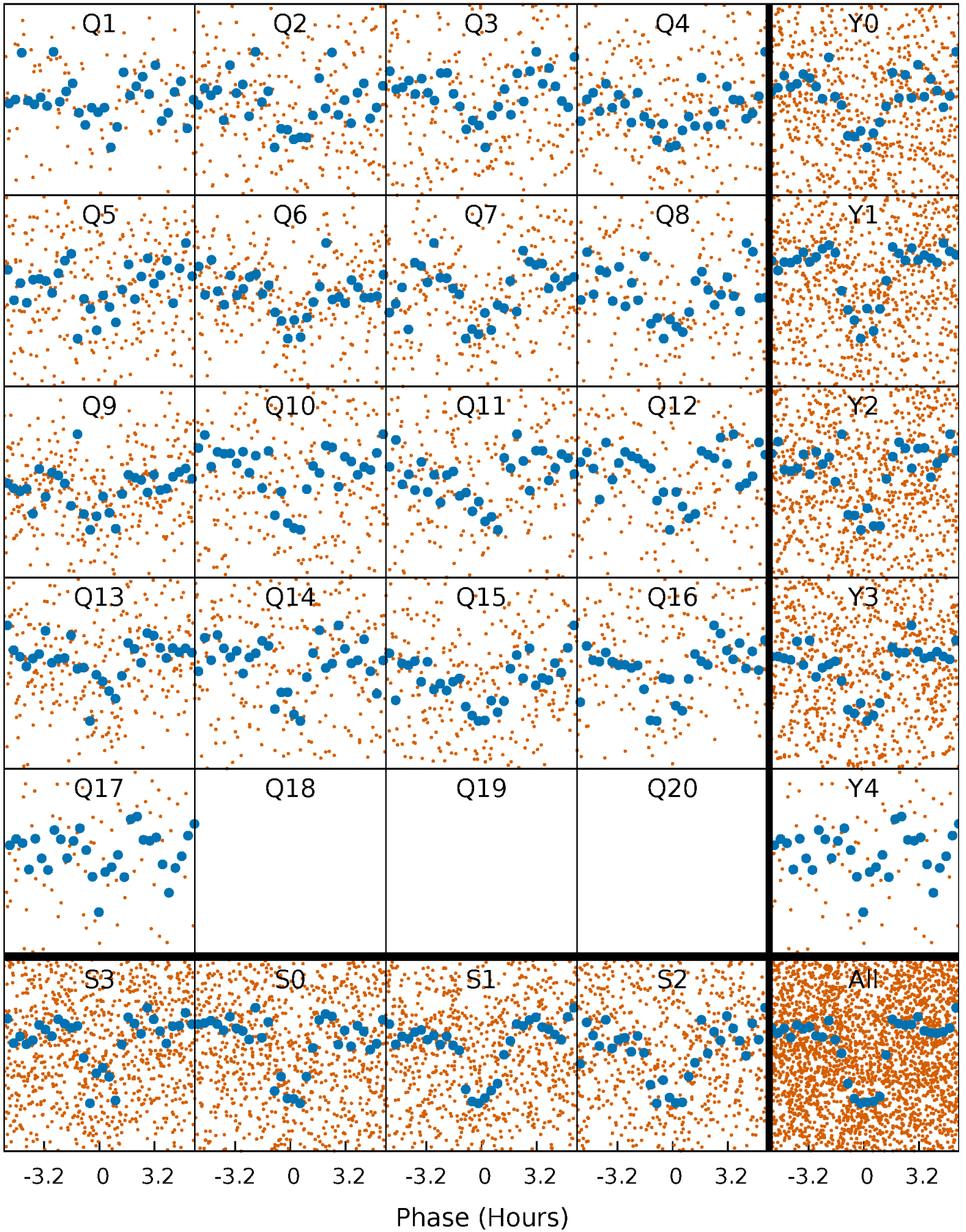


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



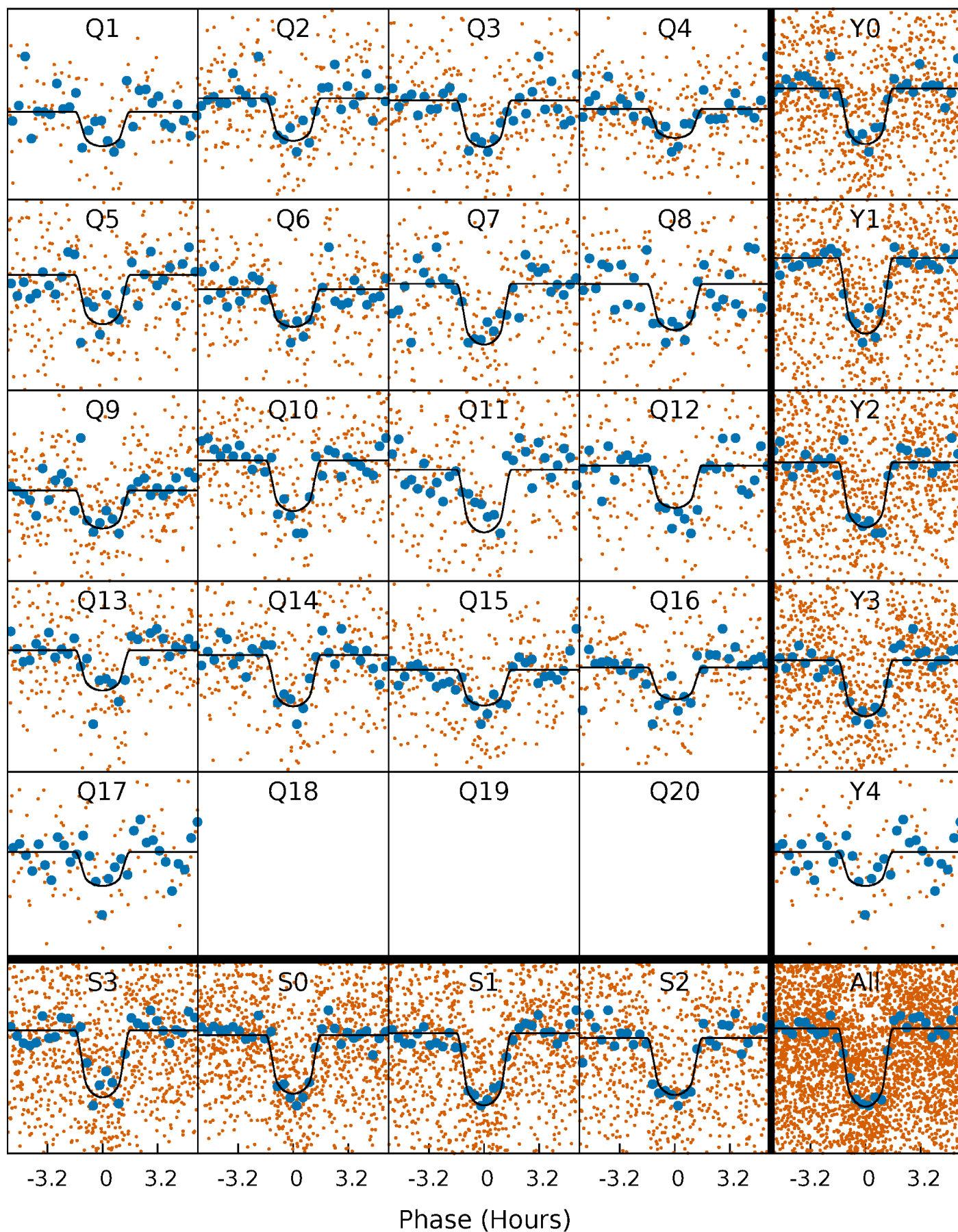
PDC Quarter-Phased Transit Curves

TCE 008164257-01 P= 6.475387 Days $T_0=137.582864$ (BKJD)



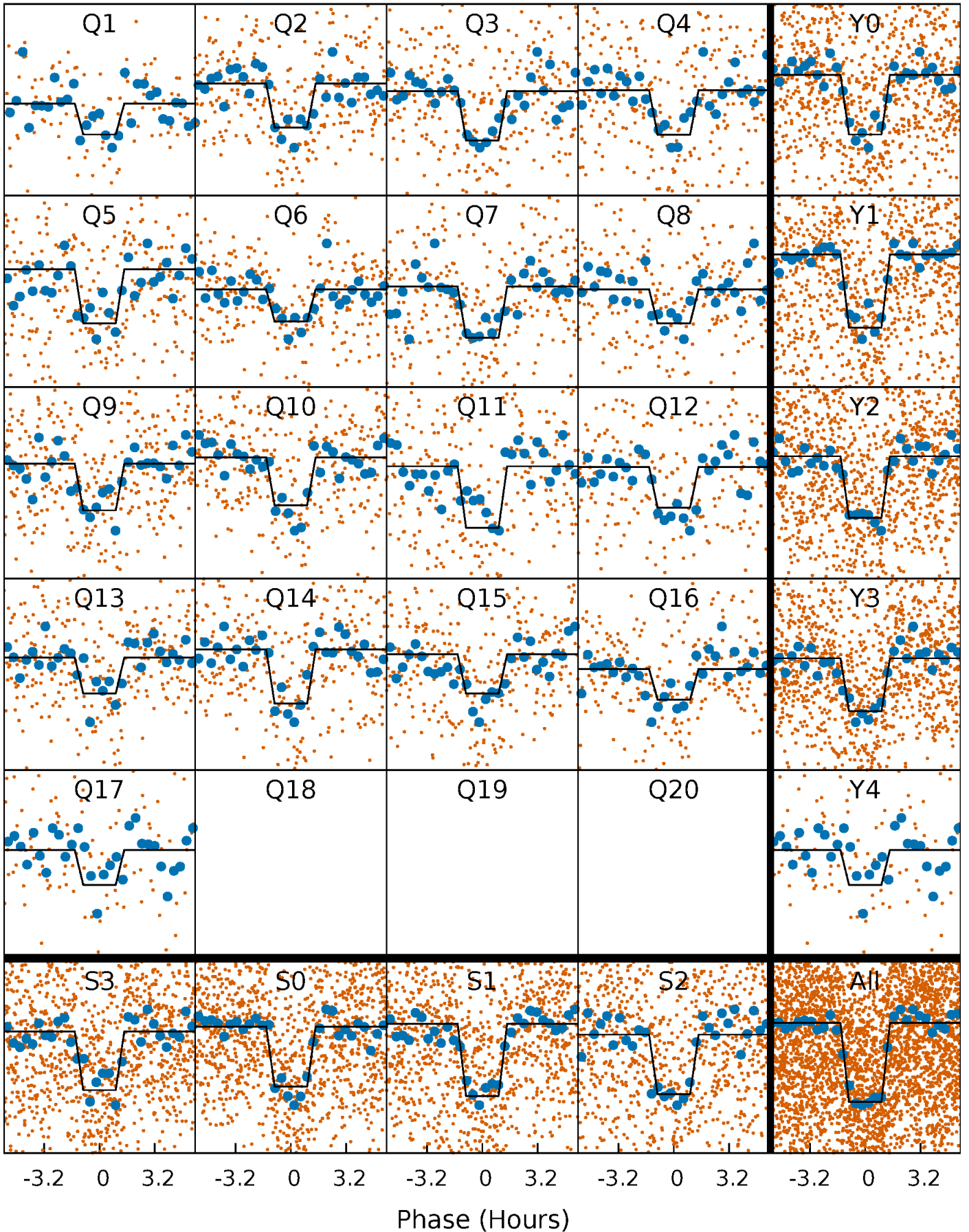
DV Quarter-Phased Transit Curves

TCE 008164257-01 P= 6.475387 Days $T_0=137.582864$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

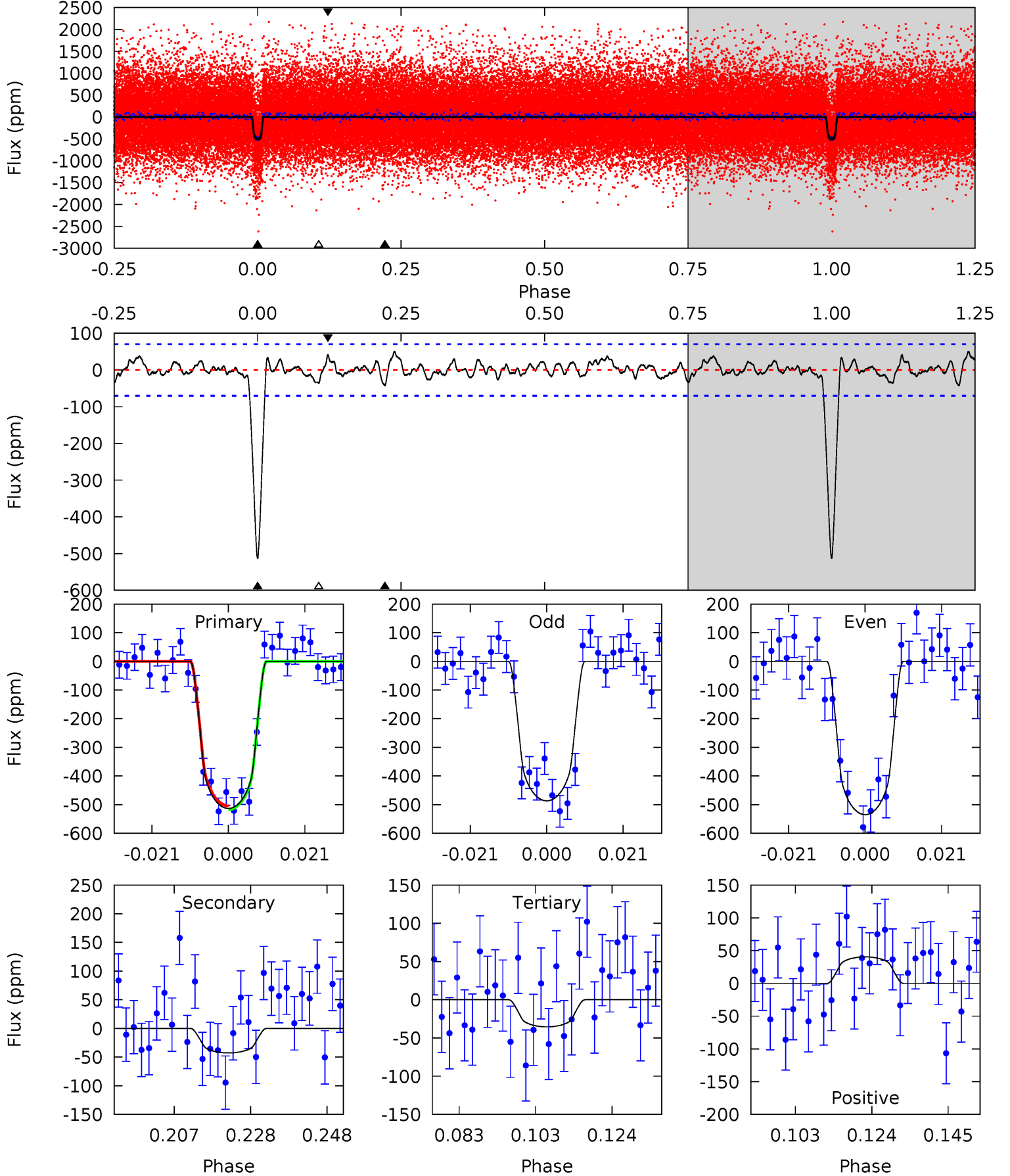
TCE 008164257-01 P= 6.475418 Days $T_0=137.579554$ (BKJD)



DV Model-Shift Uniqueness Test

008164257-01, P = 6.475387 Days, E = 131.107477 Days

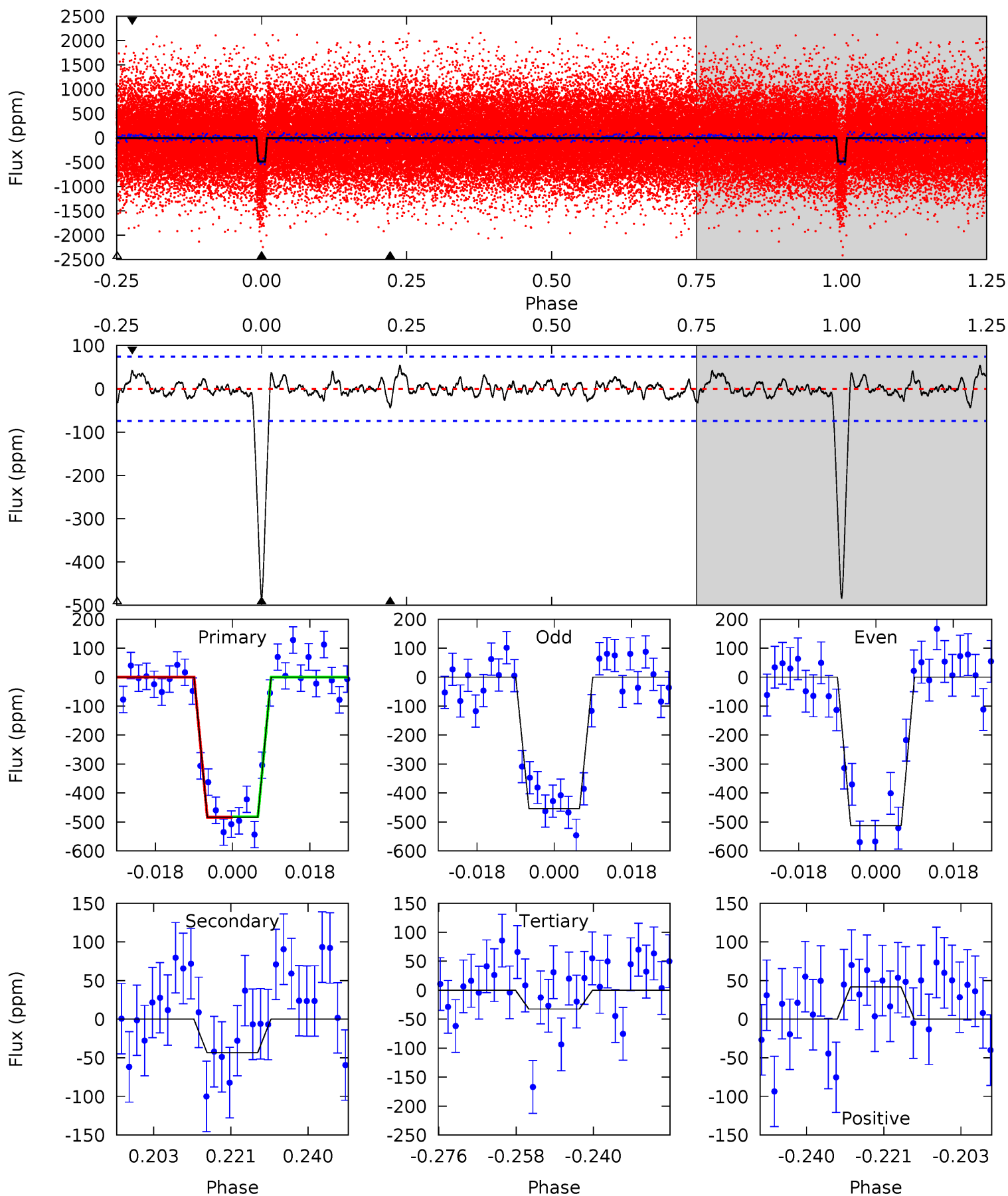
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.7	2.97	2.47	2.81	4.88	2.31	1.01	33.2	32.9	0.51	0.16	1.68	1.02	0.09	0.44



Alt Model-Shift Uniqueness Test

008164257-01, P = 6.475418 Days, E = 131.104136 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
32.0	2.87	2.15	2.75	4.91	2.36	0.89	29.8	29.2	0.73	0.12	1.93	1.02	0.10	0.04



Stellar Parameters For KIC 008164257

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4954^{+79}_{-79}	$4.500^{+0.072}_{-0.023}$	$0.180^{+0.150}_{-0.150}$	$0.828^{+0.032}_{-0.065}$	$0.791^{+0.050}_{-0.029}$	$1.964^{+0.537}_{-0.163}$
	+2%/-2%	+2%/-1%	+83%/-83%	+4%/-8%	+6%/-4%	+27%/-8%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 008164257-01 / KOI 2073.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-43 ± 14	$2.17^{+0.71}_{-0.73}$	1101^{+24}_{-27}	3112^{+432}_{-297}	19^{+25}_{-10}
Alt.	-43 ± 15	$1.99^{+0.74}_{-0.66}$	1100^{+24}_{-30}	3212^{+481}_{-331}	23^{+33}_{-12}

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 $A_{obs} \gg 1.0$

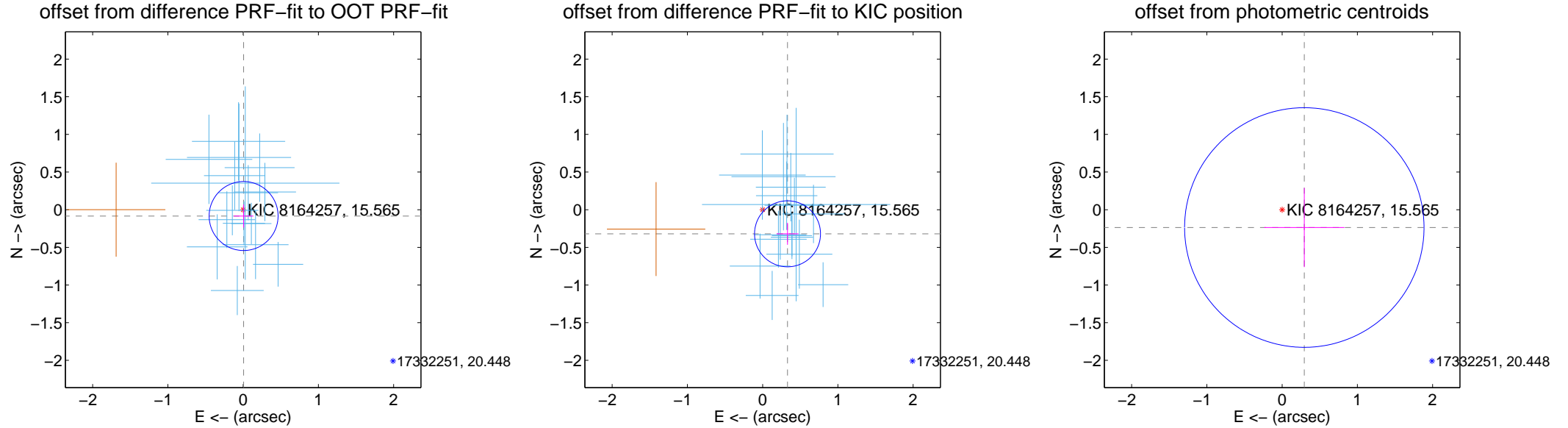
DV Centroid Data

Supplemental centroid analysis for 008164257-01. Kepler magnitude: 15.56. Transit SNR 25.40

There are 16 quarters with good PRF difference image offsets

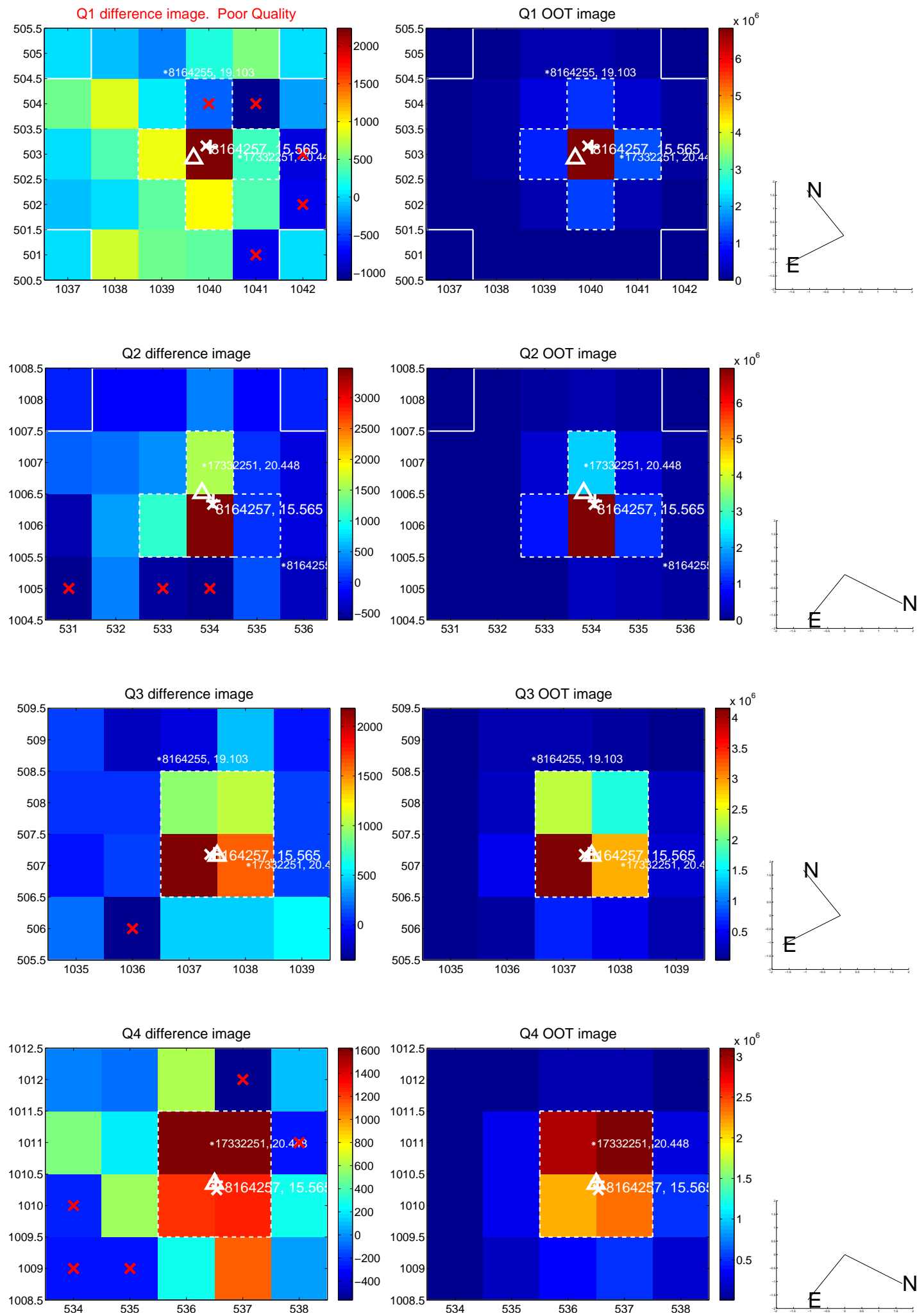
The direct PRF centroid is offset from the target star catalog position by about 0.50 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.084 ± 0.153	0.55	-0.006 ± 0.130	-0.084 ± 0.153
PRF-fit source offset from KIC position	0.460 ± 0.146	3.15	-0.331 ± 0.146	-0.320 ± 0.146
photometric centroid source offset	0.38 ± 0.53	0.71	-0.29 ± 0.53	-0.24 ± 0.53

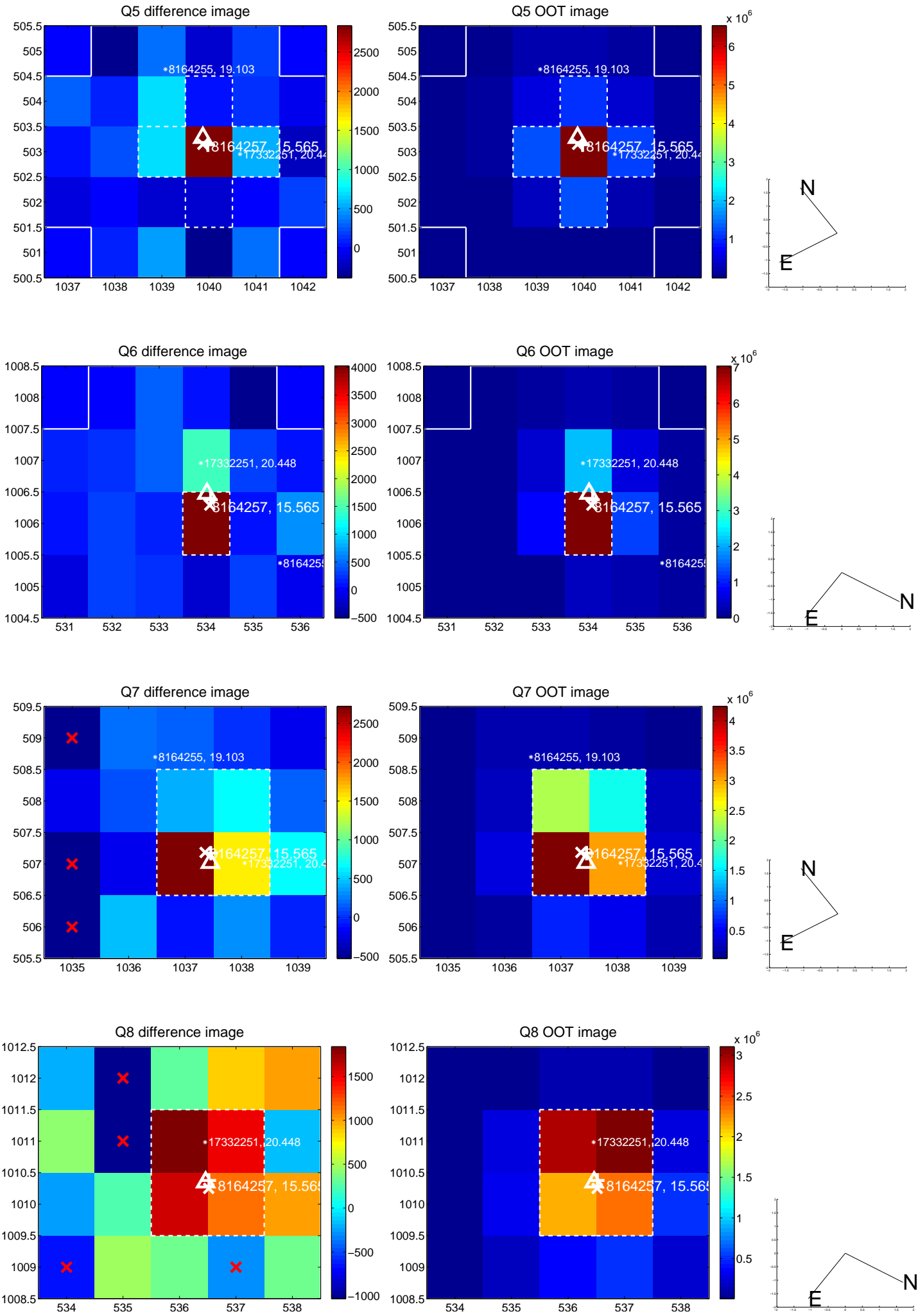


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

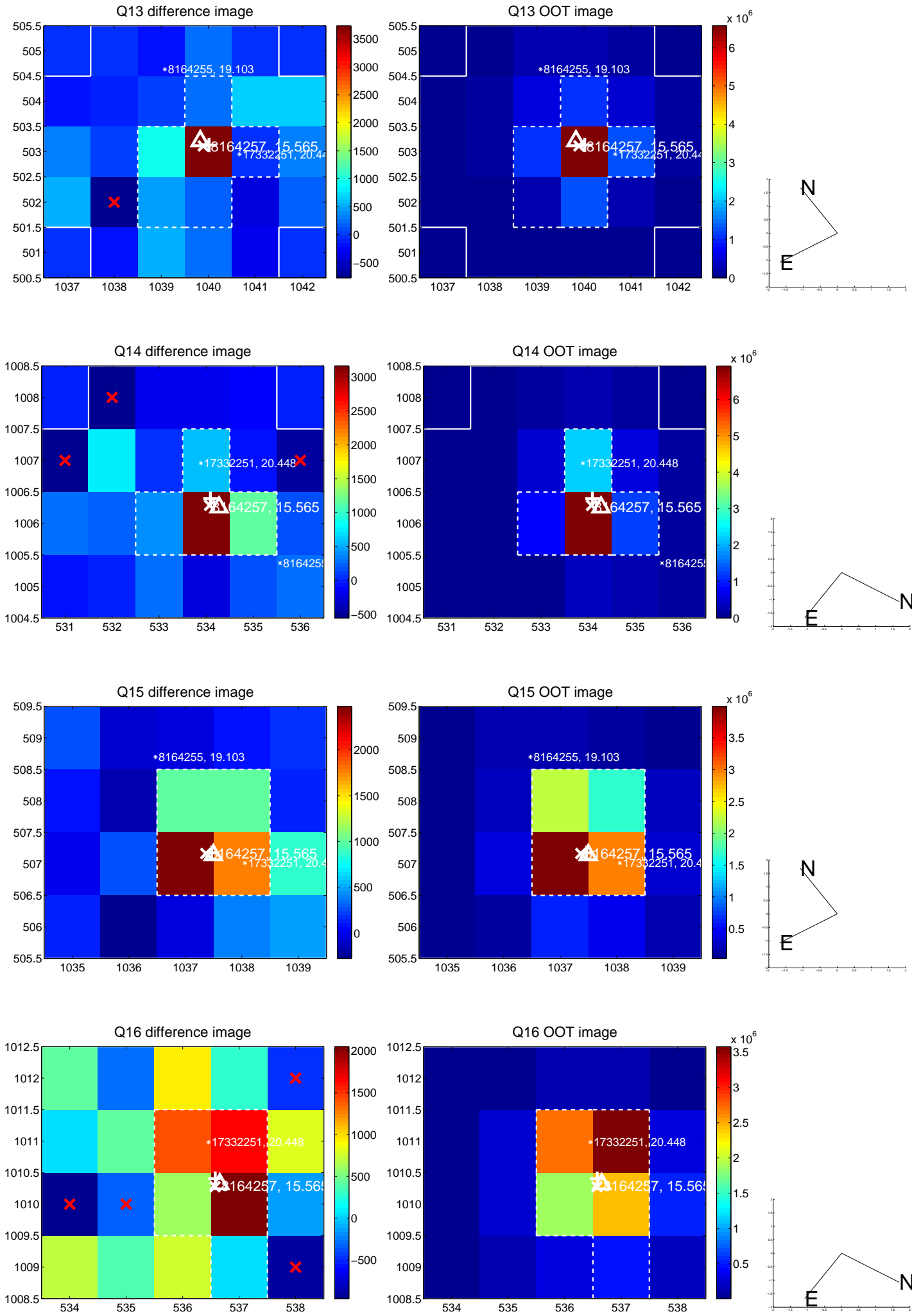
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



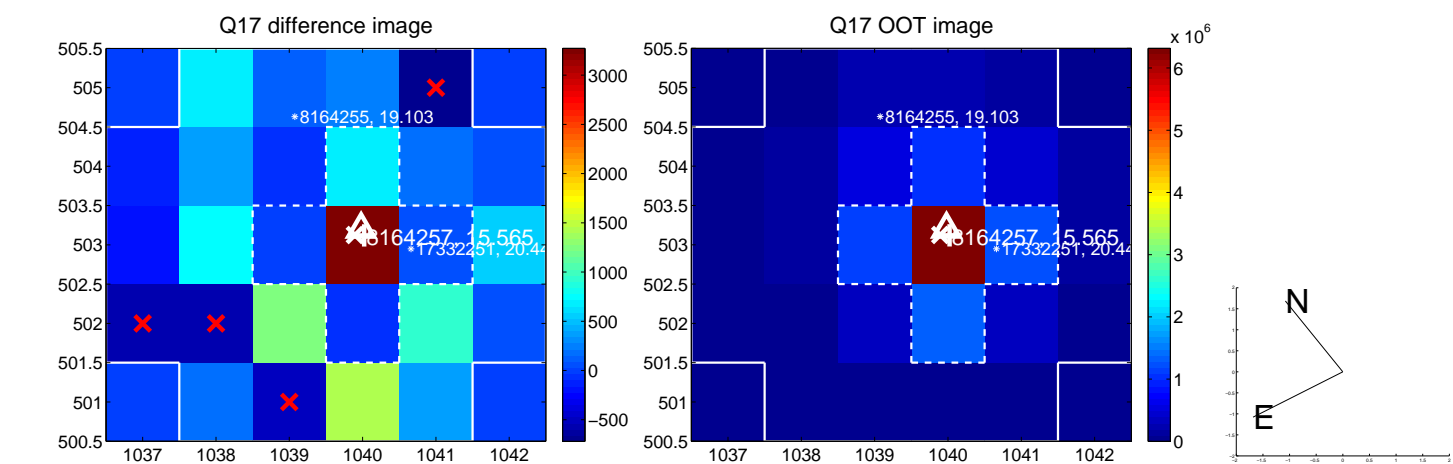
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



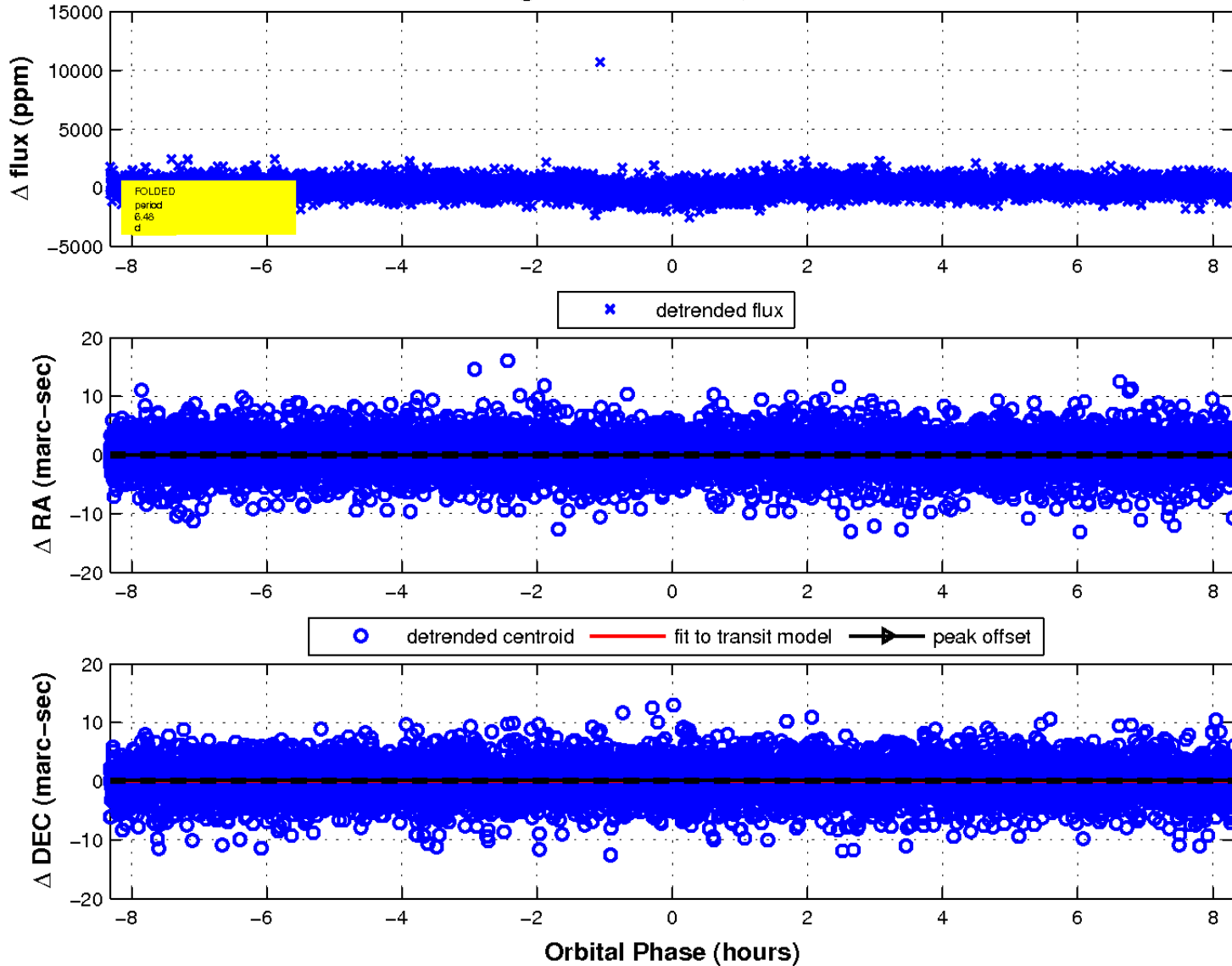
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

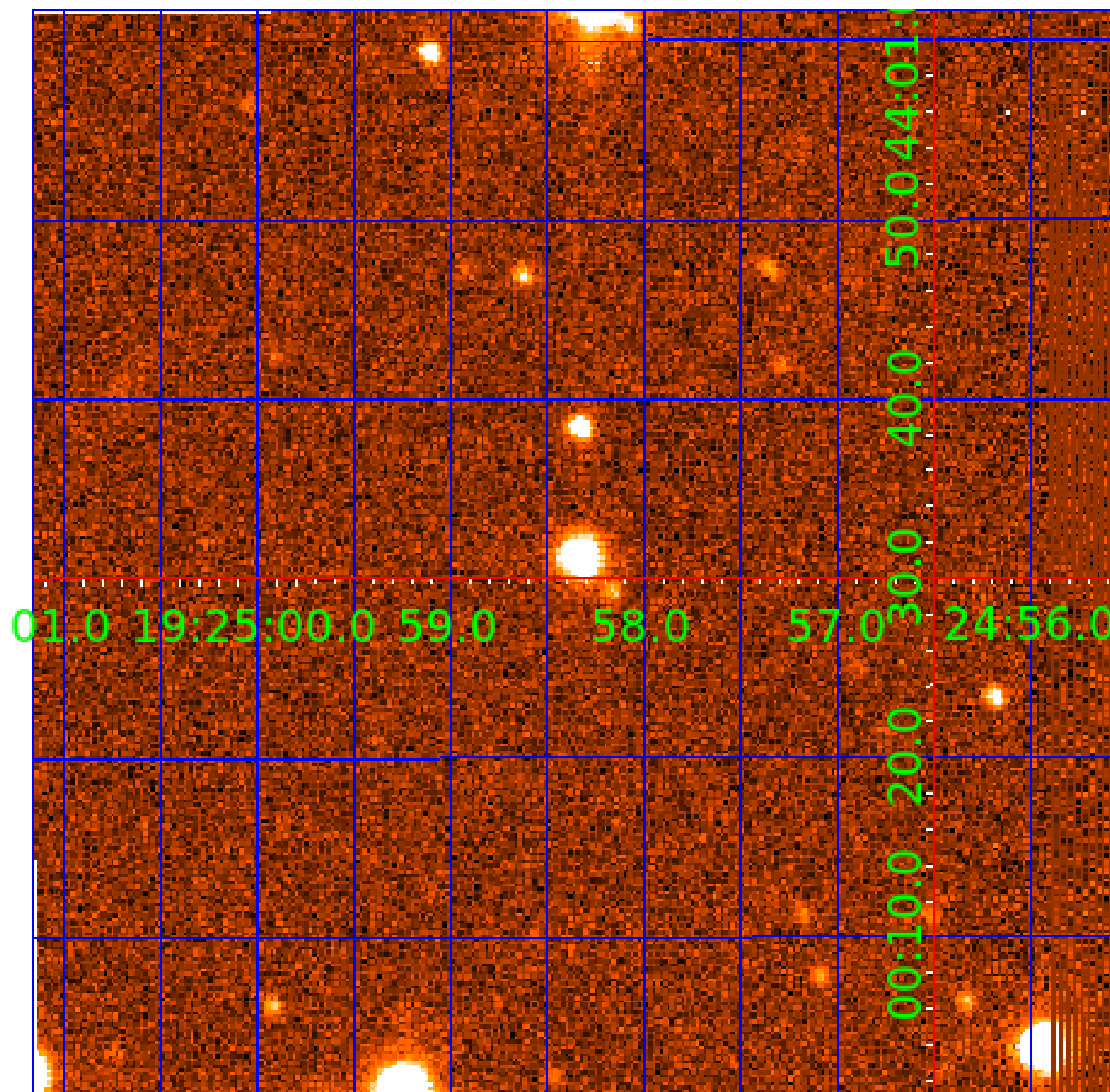


fluxWeightedCentroids, Planet 1 of 3



UKIRT Image

Declination



KIC 008164257

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})
008164257-01	OBS	2073.02	6.475387	137.582864	515.1	2.772	24.0	25.4	0.83	4954	2.19	93.55
008164257-02	OBS	2073.01	49.500384	139.043019	919.7	6.553	22.3	22.3	0.83	4954	3.10	6.21
008164257-03	OBS	2073.03	16.858194	142.345413	774.6	2.051	17.5	20.0	0.83	4954	2.68	26.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008164257-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
008164257-02	OBS	PC	0.99	0	0	0	0	CENT_KIC_POS
008164257-03	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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.

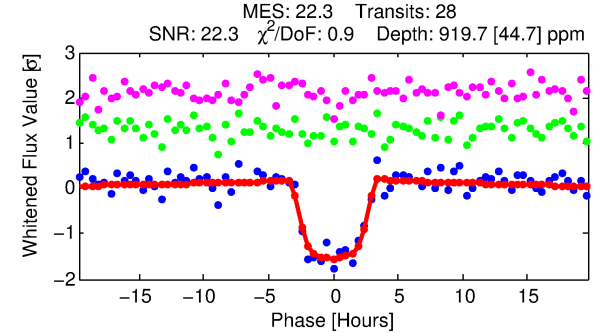
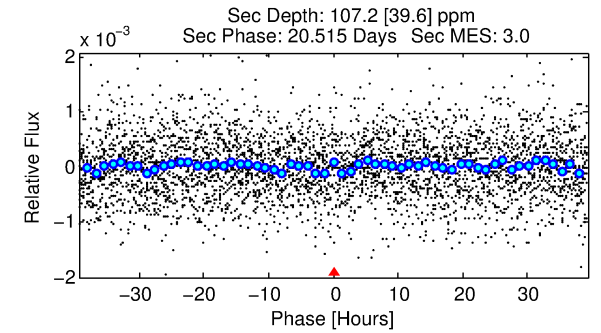
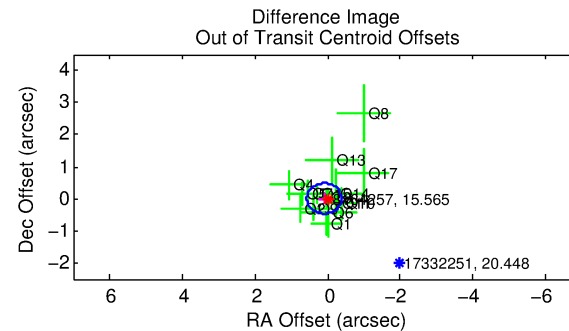
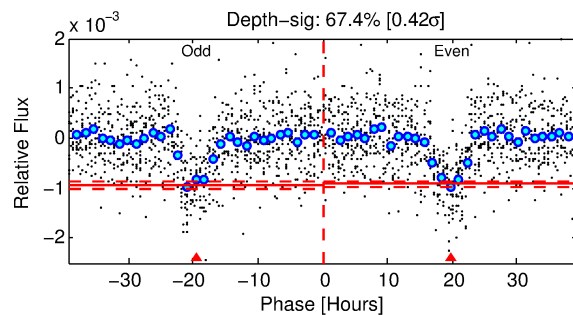
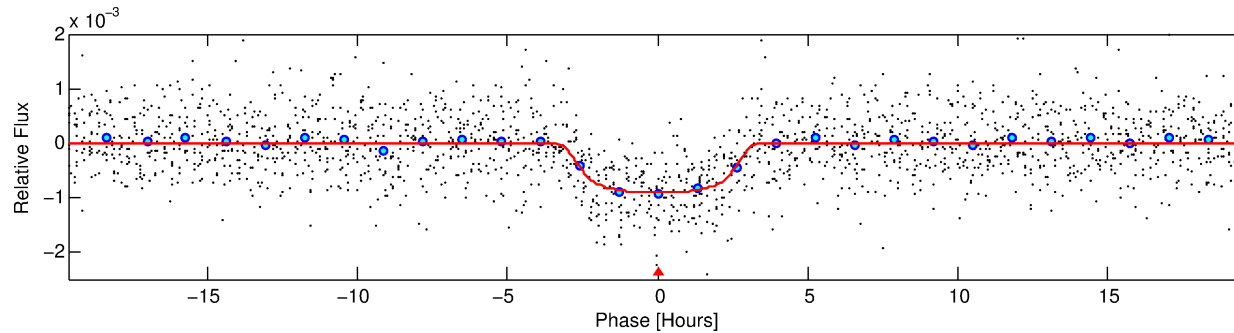
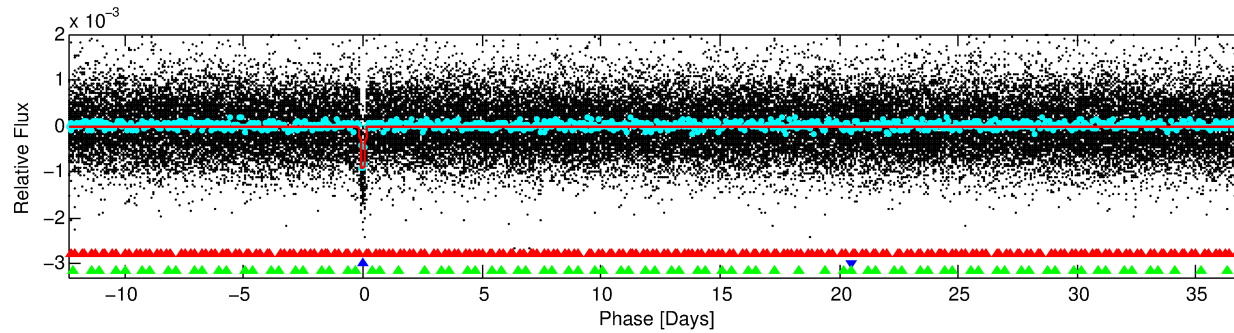
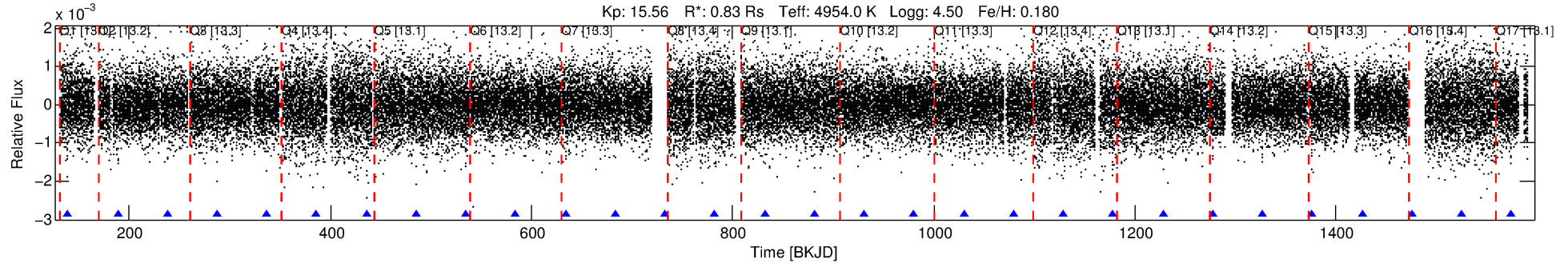
Ephemeris Match Information For 008164257-02

No Significant Match Found

DV One-Page Summary

KIC: 8164257 Candidate: 2 of 3 Period: 49.500 d
KOI: K02073.01 Name: Kepler-357d Corr: 0.982

Kp: 15.56 R*: 0.83 Rs Teff: 4954.0 K Logg: 4.50 Fe/H: 0.180



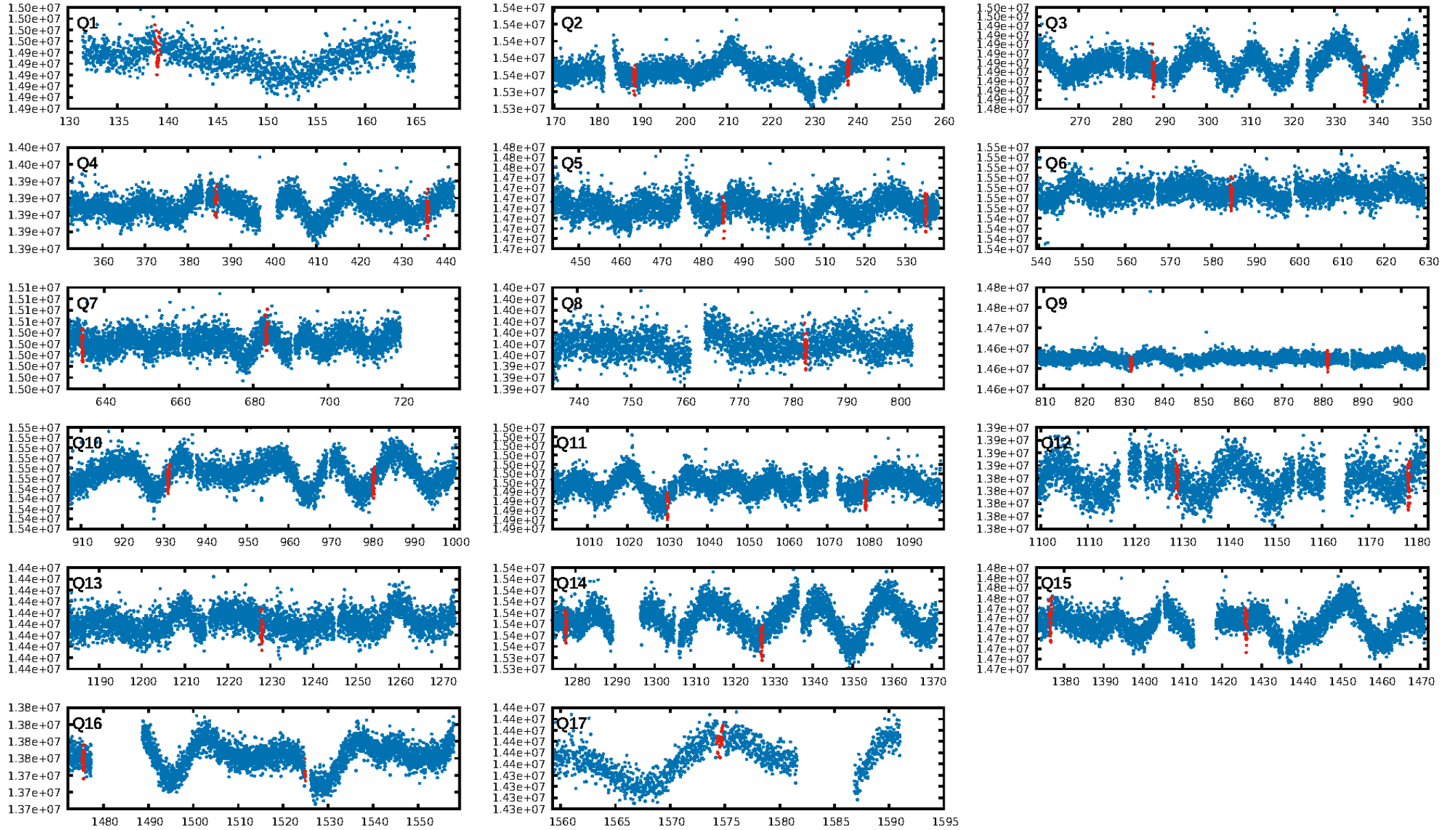
DV Fit Results:
Period = 49.50038 [0.00036] d
Epoch = 139.0430 [0.0058] BKJD
Rp/R* = 0.0343 [0.0022]
a/R* = 28.64 [5.96]
b = 0.91 [0.04]
Seff = 6.21 [0.86]
Teq = 403 [14] K
Rp = 3.10 [0.31] Re
a = 0.2440 [0.0186] AU
Ag = 365.70 [149.61] [2.44σ]
Teffp = 2722 [269] K [8.60σ]

DV Diagnostic Results:
ShortPeriod-sig: 100.0% [114.10σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 91.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 9.33e-107
RollingBand-fgt: 1.00 [26/26]
GhostDiagnostic-chr: 6.096
Centroid-sig: 1.1%
Centroid-so: 0.924 arcsec [1.62σ]
OotOffset-rm: 0.098 arcsec [0.62σ]
KicOffset-rm: 0.279 arcsec [1.79σ]
OotOffset-st: 4/4/2/5 [15]
KicOffset-st: 4/4/2/5 [15]
DiffImageQuality-fgm: 0.93 [14/15]
DiffImageOverlap-fno: 0.81 [13/16]

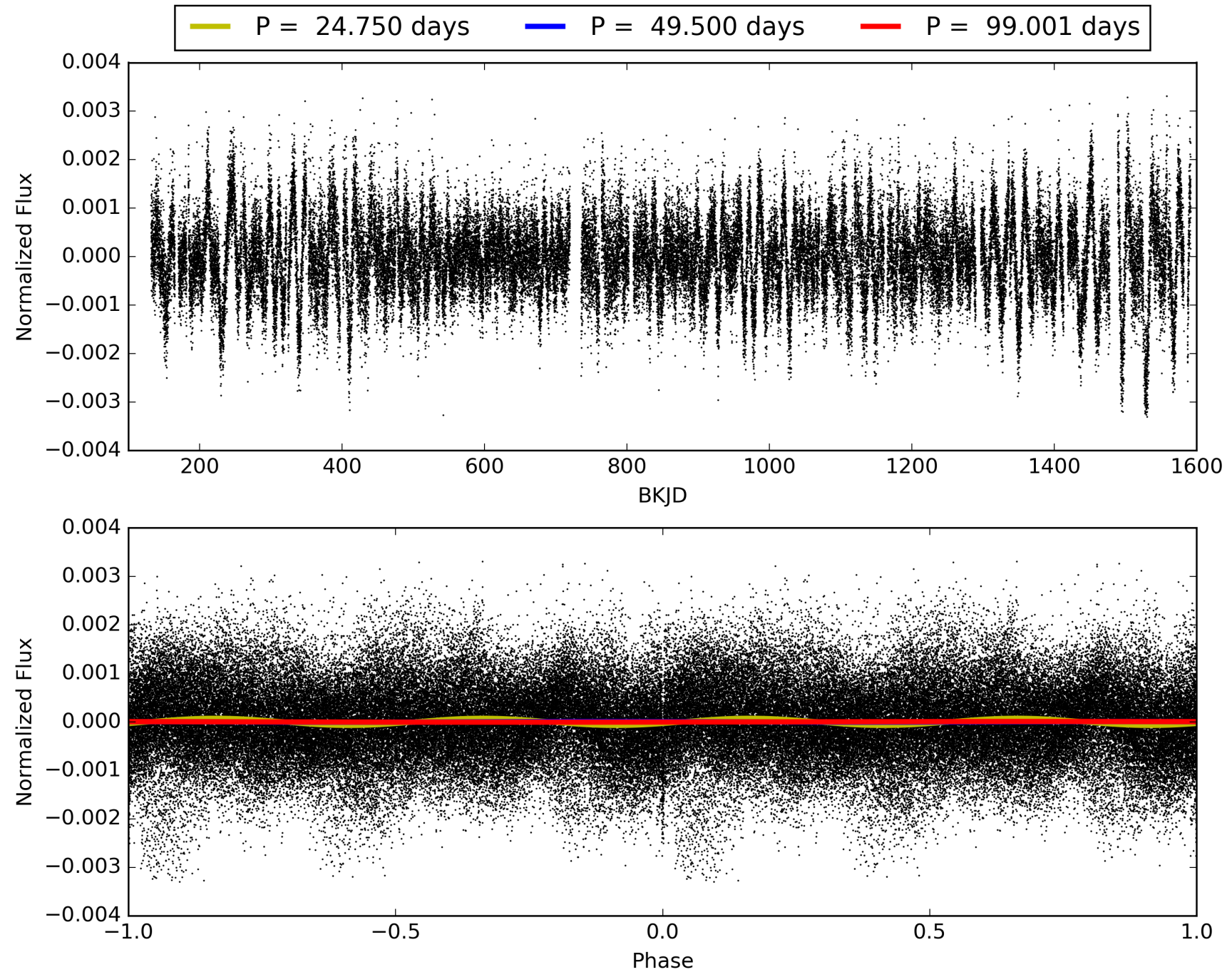
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:46:42 Z

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

TCE 008164257-02, PDC Light Curves

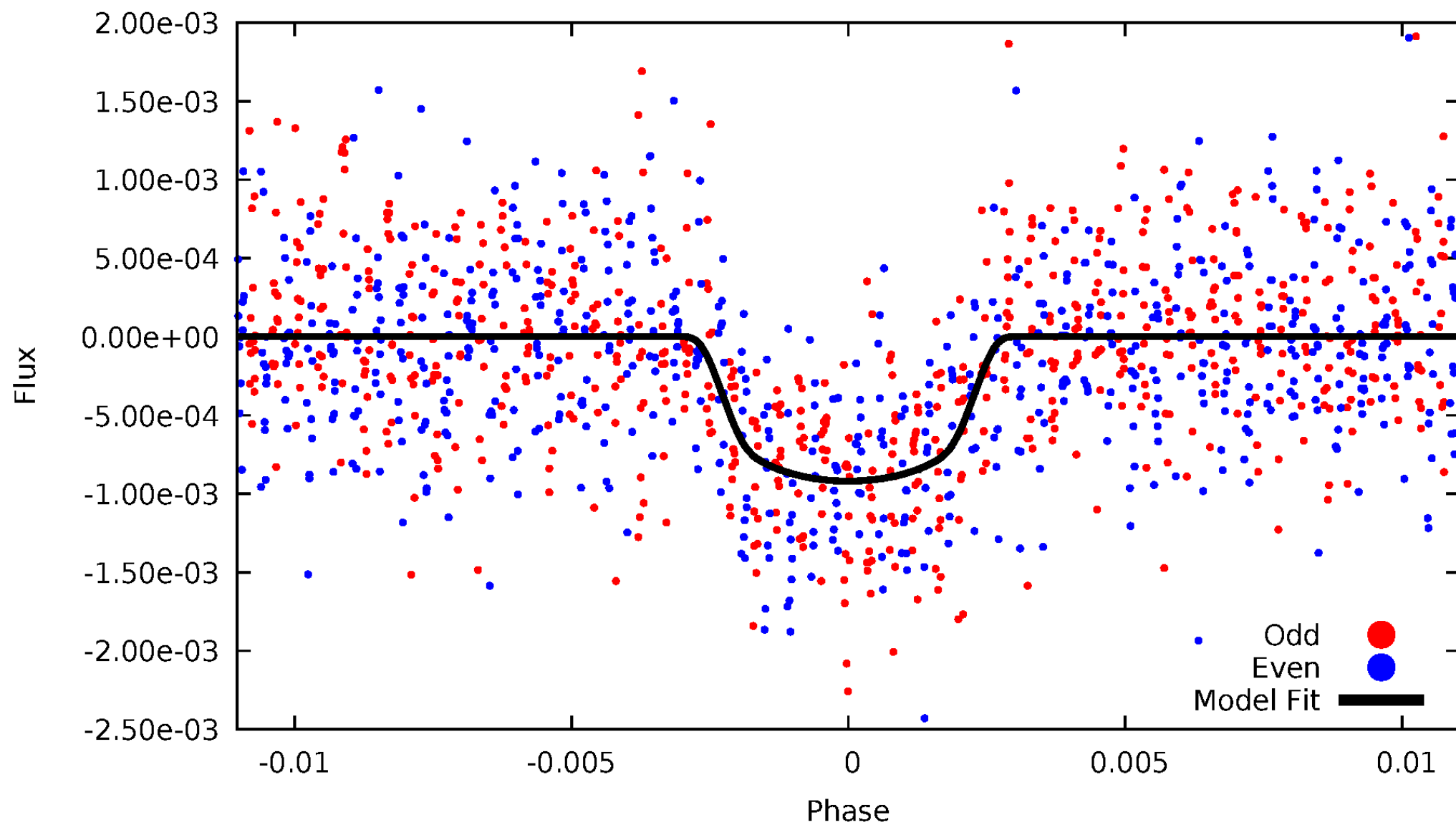


TCE 008164257-02



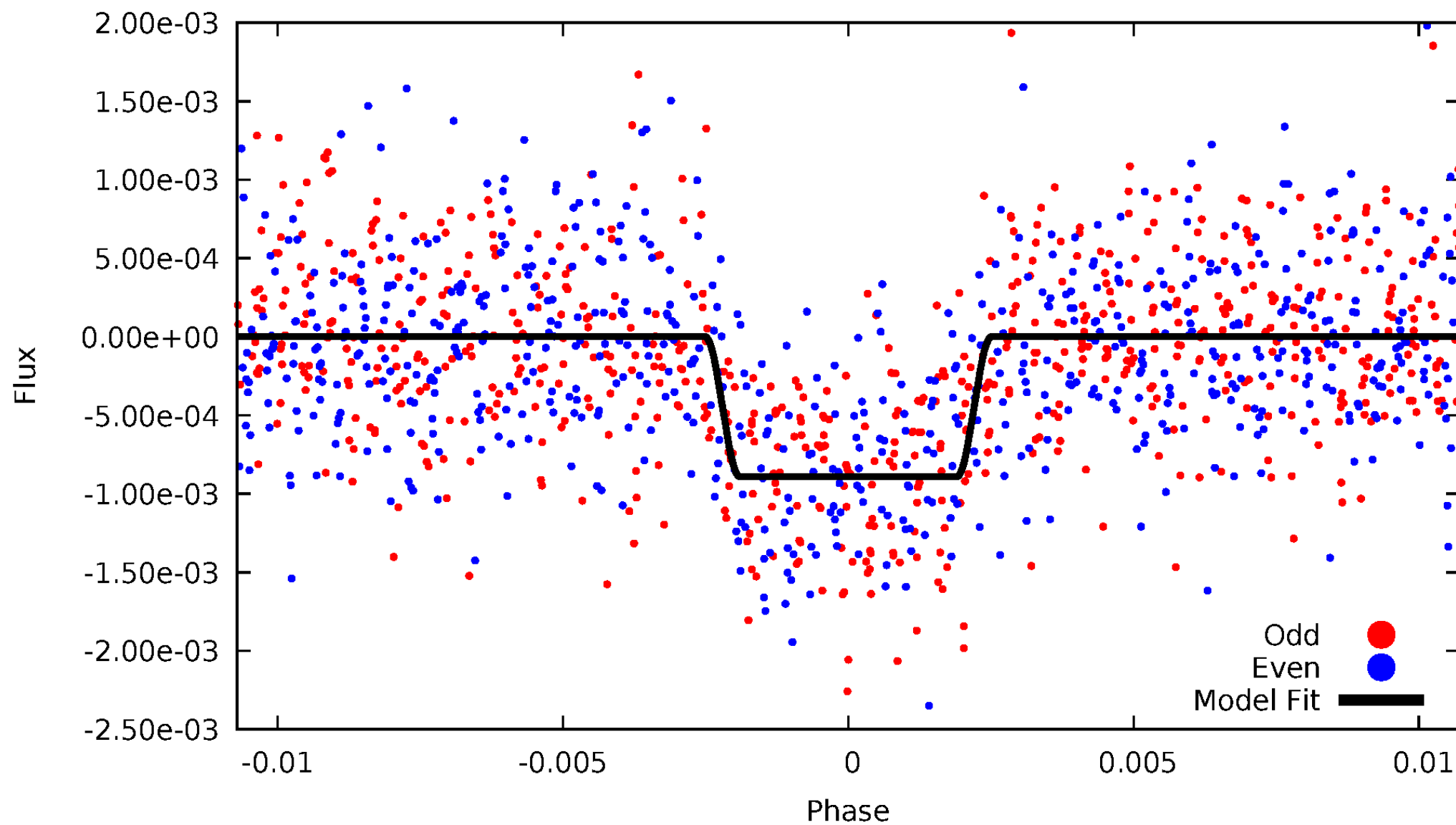
DV Odd/Even

TCE 008164257-02



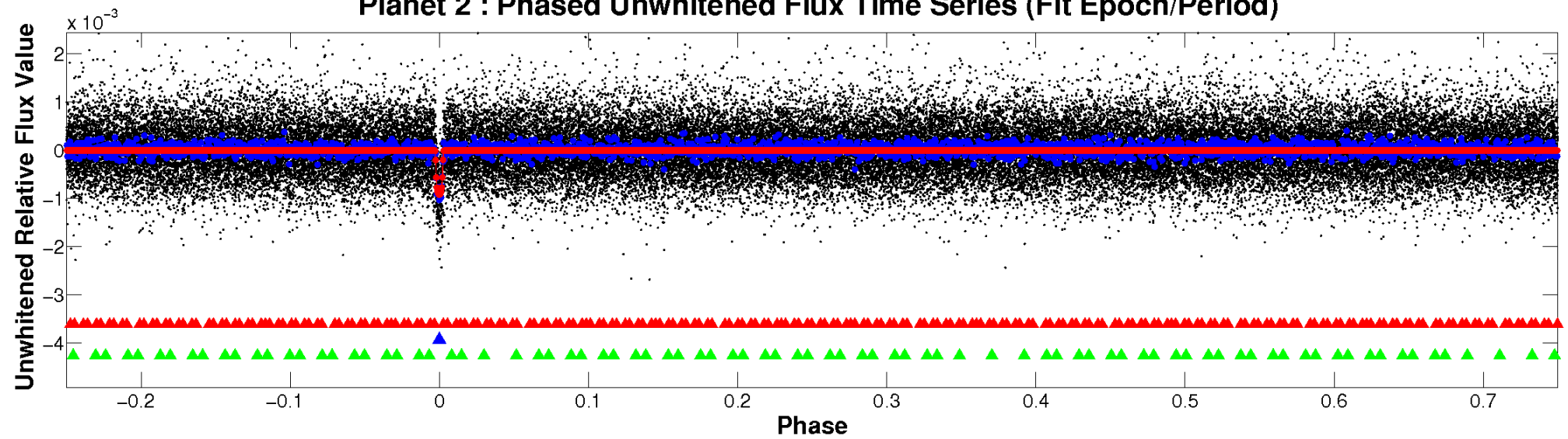
ALT Odd/Even

TCE 008164257-02

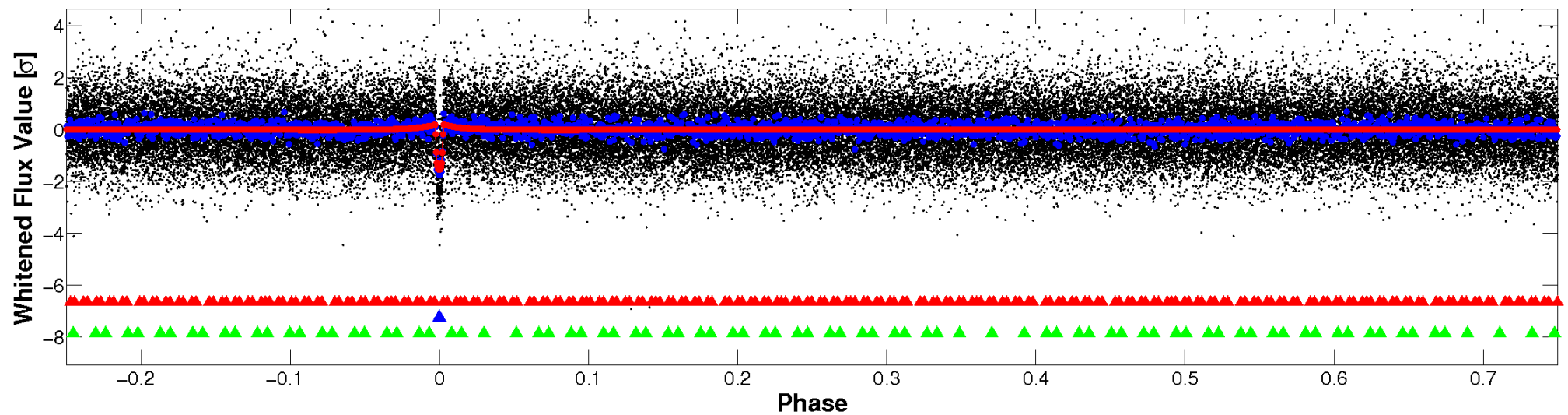


Non-Whitened Vs. Whitened Light Curve

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

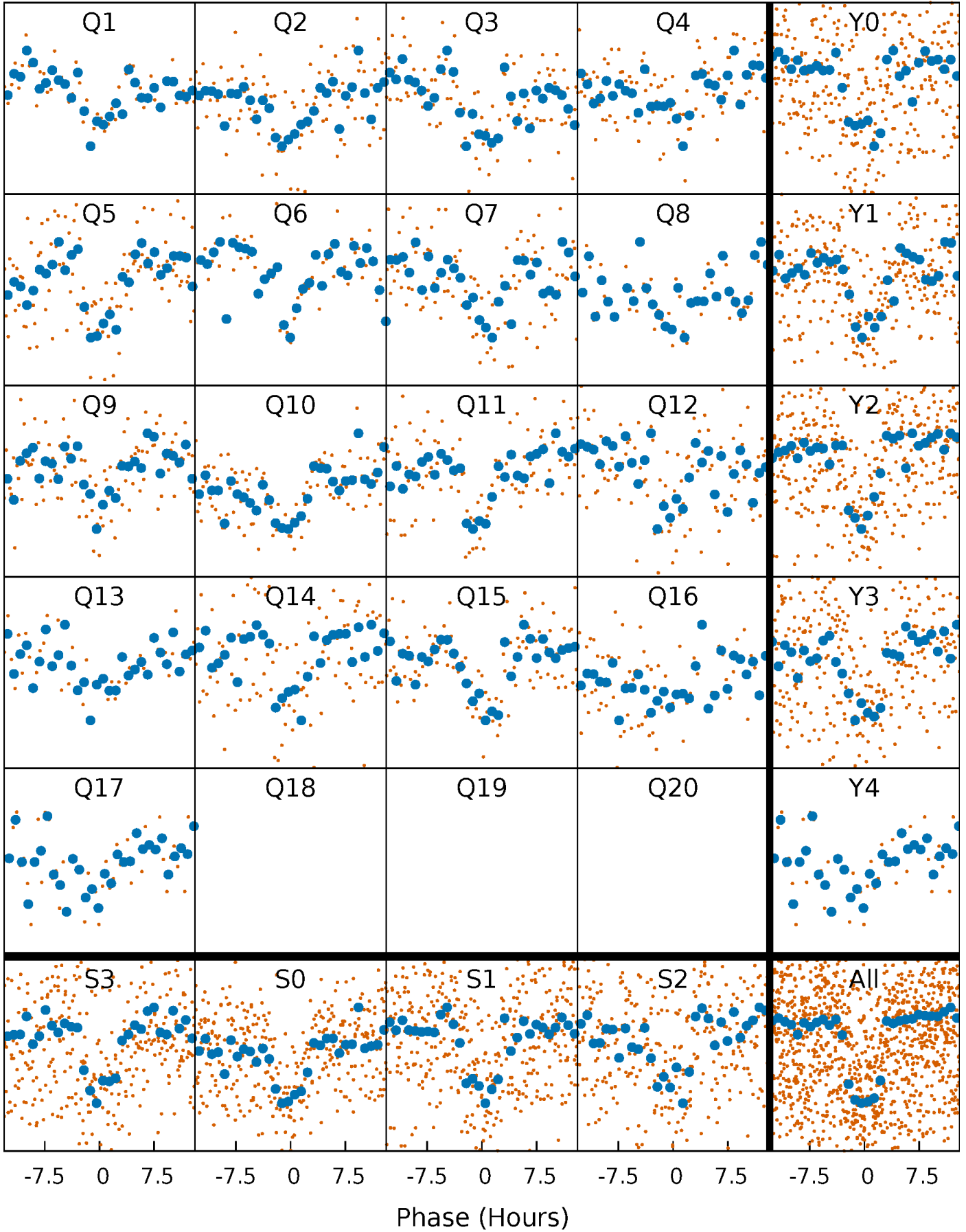


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



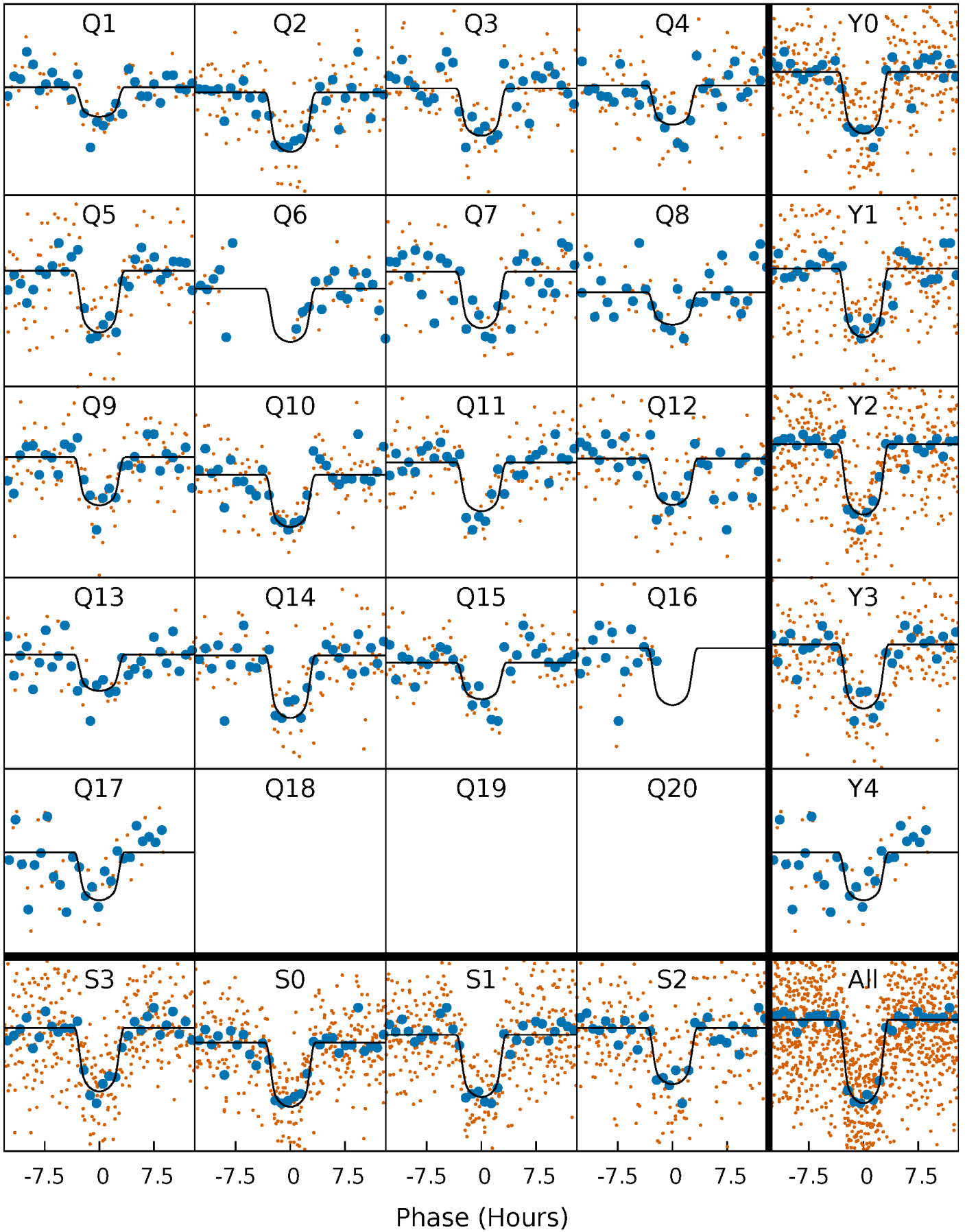
PDC Quarter-Phased Transit Curves

TCE 008164257-02 P= 49.500384 Days $T_0=139.043019$ (BKJD)



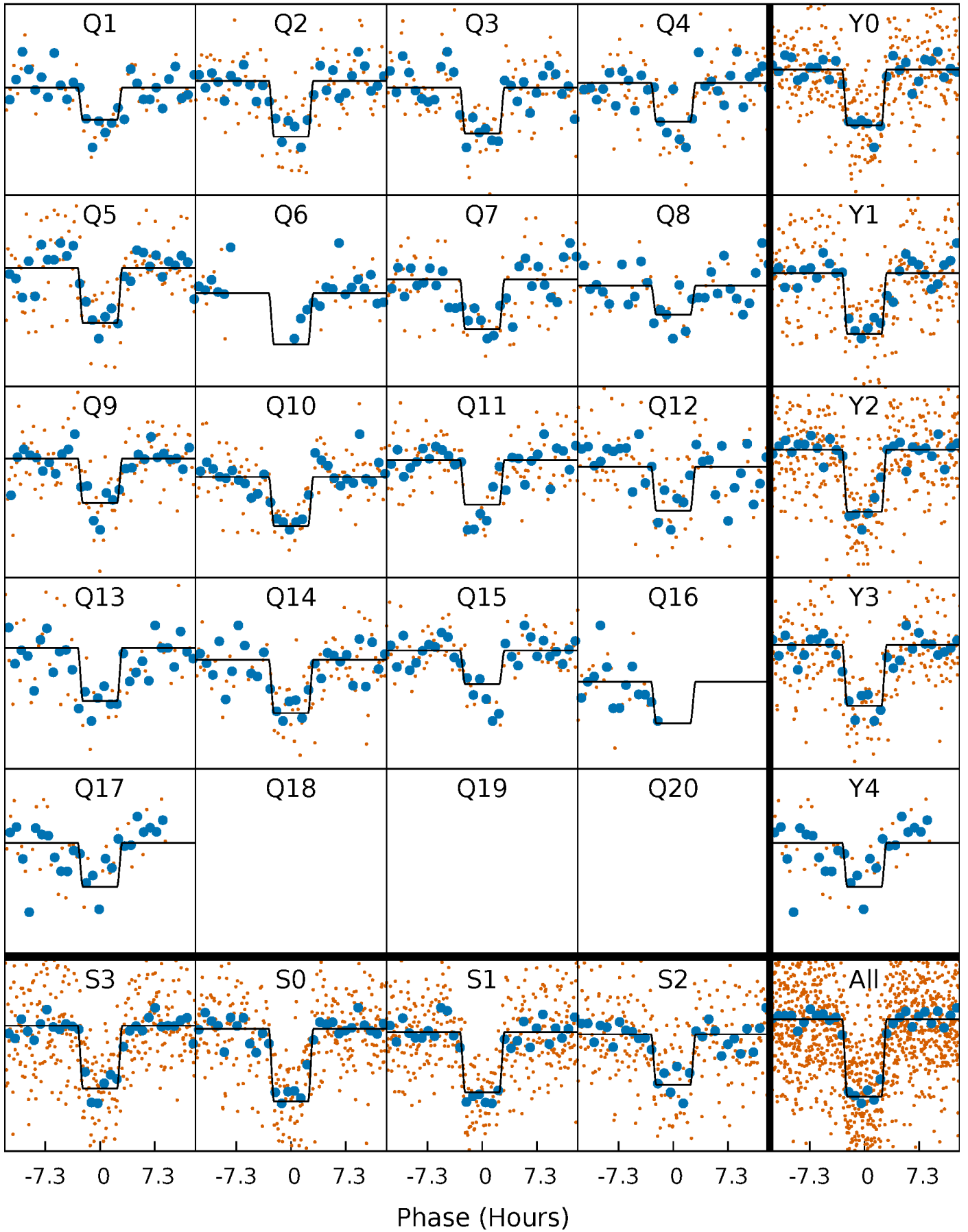
DV Quarter-Phased Transit Curves

TCE 008164257-02 P= 49.500384 Days $T_0=139.043019$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

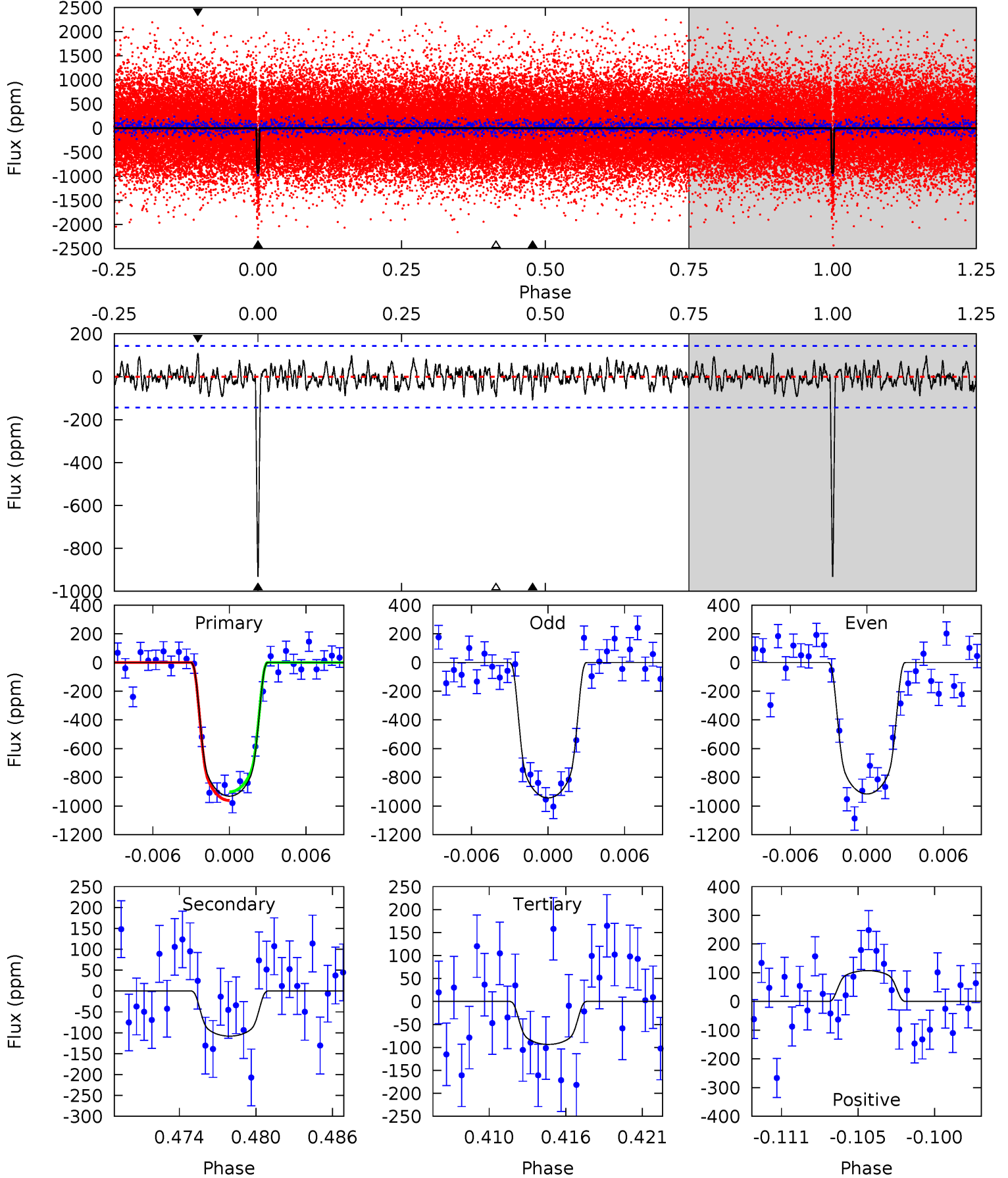
TCE 008164257-02 P= 49.500612 Days $T_0=139.039900$ (BKJD)



DV Model-Shift Uniqueness Test

008164257-02, P = 49.500384 Days, E = 89.542635 Days

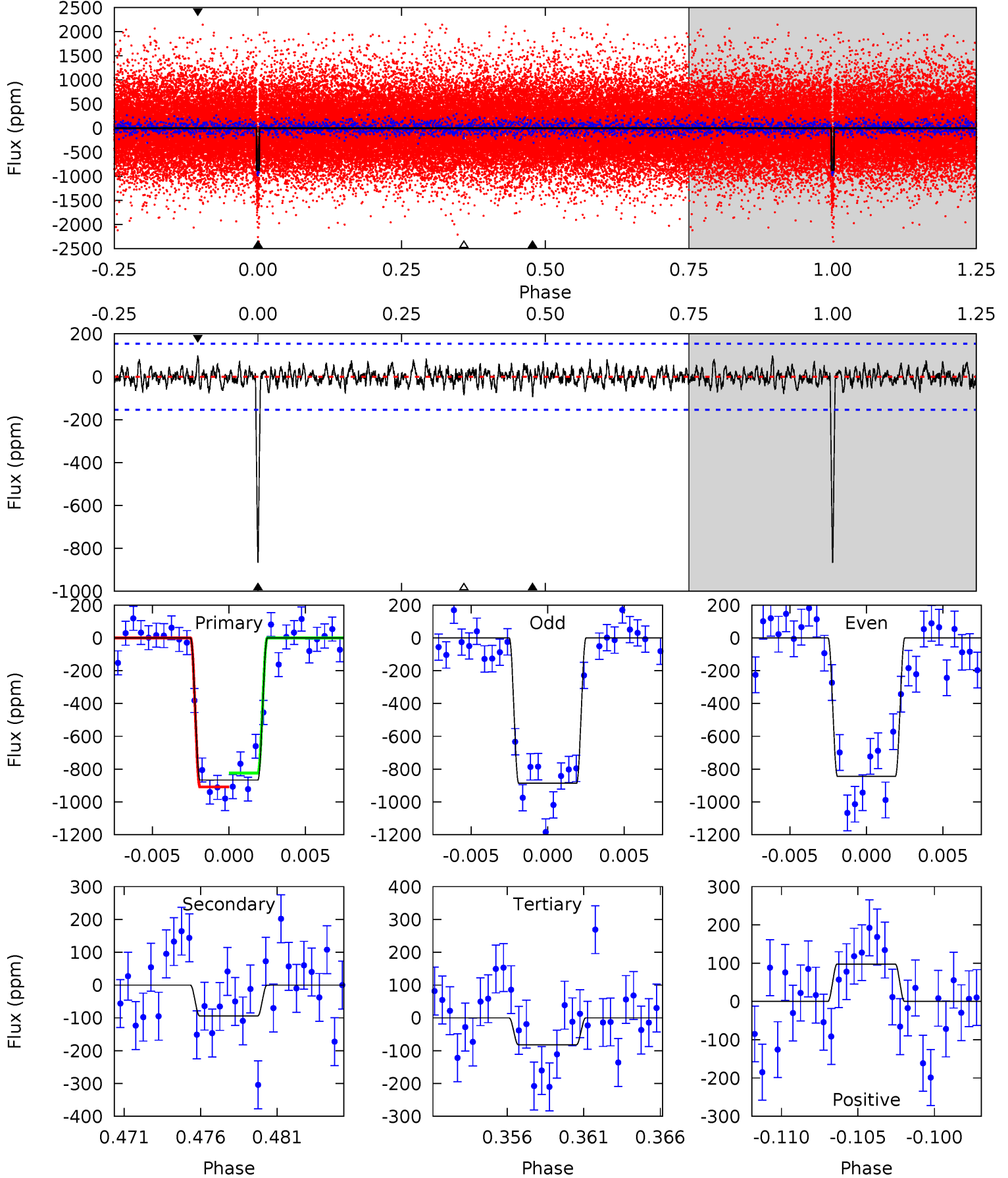
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
33.3	3.87	3.35	3.84	5.13	2.76	1.25	30.0	29.5	0.52	0.03	0.49	0.95	0.10	1.08



Alt Model-Shift Uniqueness Test

008164257-02, P = 49.500612 Days, E = 89.539288 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
29.0	3.16	2.75	3.27	5.16	2.81	0.96	26.3	25.7	0.41	-0.11	0.69	0.99	0.10	1.43



Stellar Parameters For KIC 008164257

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4954^{+79}_{-79}	$4.500^{+0.072}_{-0.023}$	$0.180^{+0.150}_{-0.150}$	$0.828^{+0.032}_{-0.065}$	$0.791^{+0.050}_{-0.029}$	$1.964^{+0.537}_{-0.163}$
	+2%/-2%	+2%/-1%	+83%/-83%	+4%/-8%	+6%/-4%	+27%/-8%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 008164257-02 / KOI 2073.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-108 ± 28	$3.07^{+0.25}_{-0.24}$	558^{+12}_{-14}	3244^{+144}_{-151}	376^{+124}_{-102}
Alt.	-94 ± 30	$2.68^{+0.21}_{-0.21}$	559^{+12}_{-13}	3307^{+184}_{-200}	429^{+164}_{-151}

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

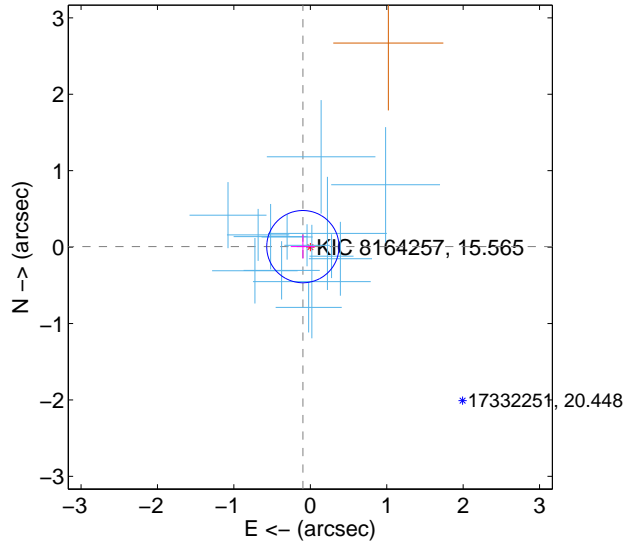
Supplemental centroid analysis for 008164257-02. Kepler magnitude: 15.56. Transit SNR 22.30

There are 14 quarters with good PRF difference image offsets

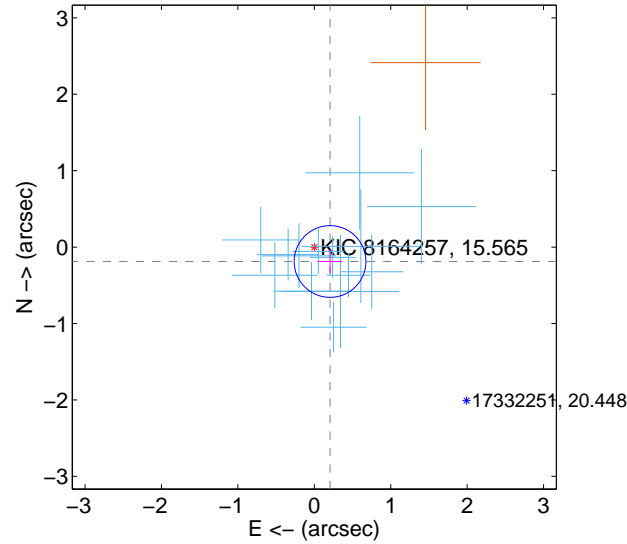
The direct PRF centroid is offset from the target star catalog position by about 0.51 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.098 ± 0.158	0.62	0.097 ± 0.158	0.006 ± 0.155
PRF-fit source offset from KIC position	0.279 ± 0.156	1.79	-0.206 ± 0.158	-0.189 ± 0.155
photometric centroid source offset	0.92 ± 0.57	1.62	-0.39 ± 0.56	0.84 ± 0.57

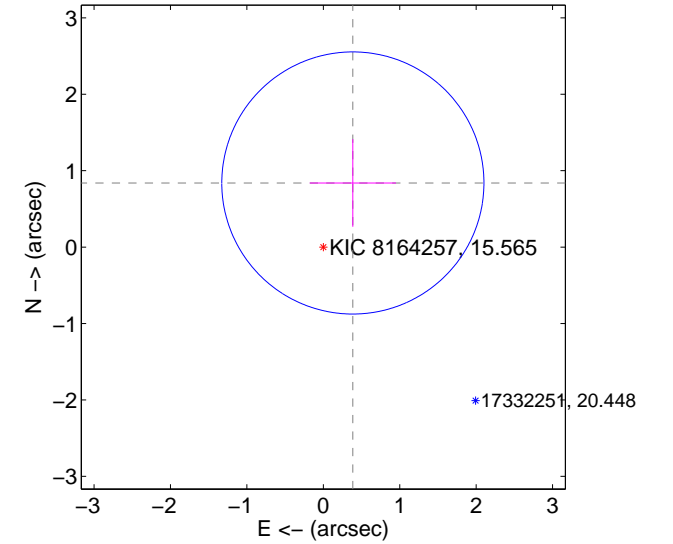
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

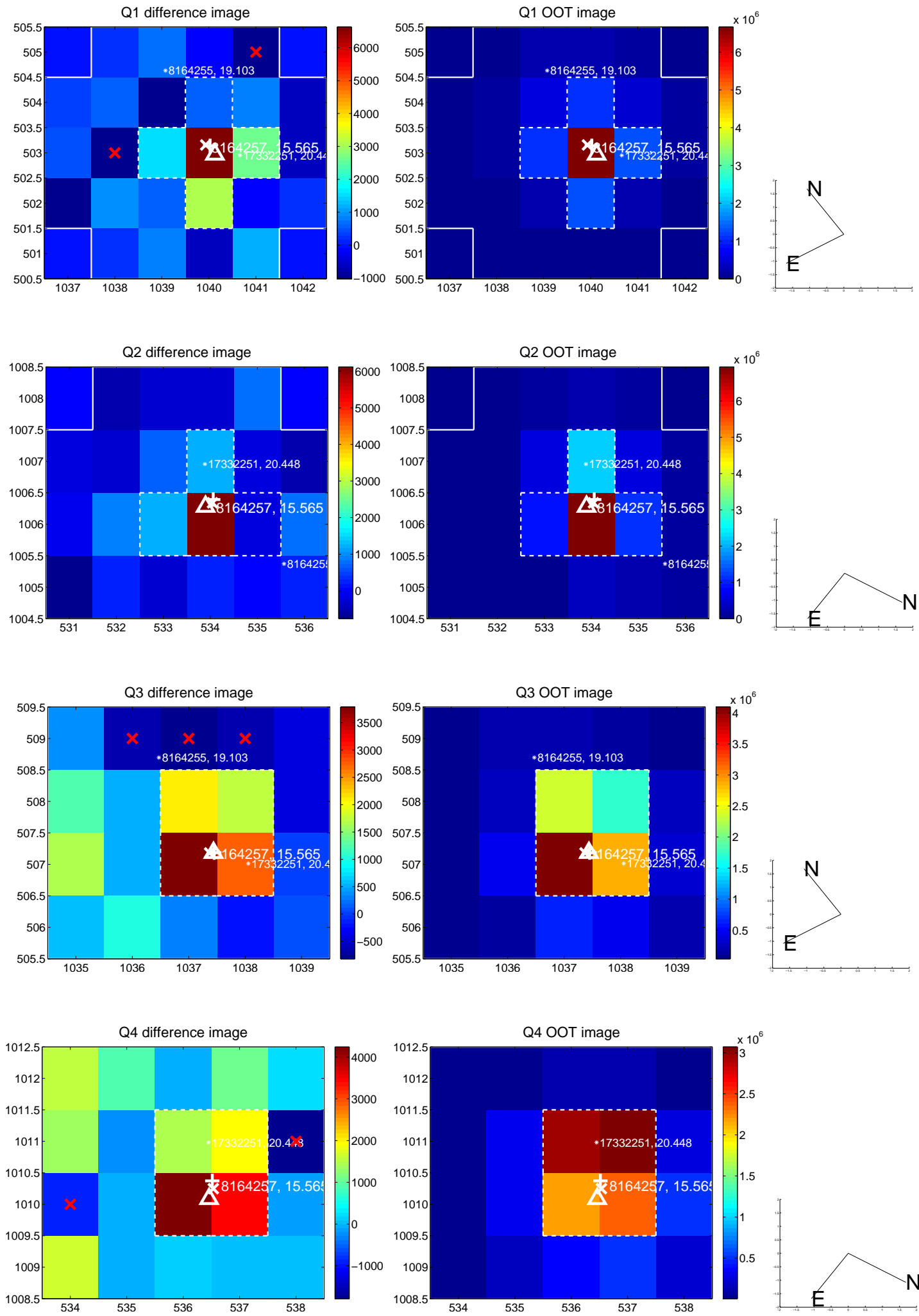


offset from photometric centroids

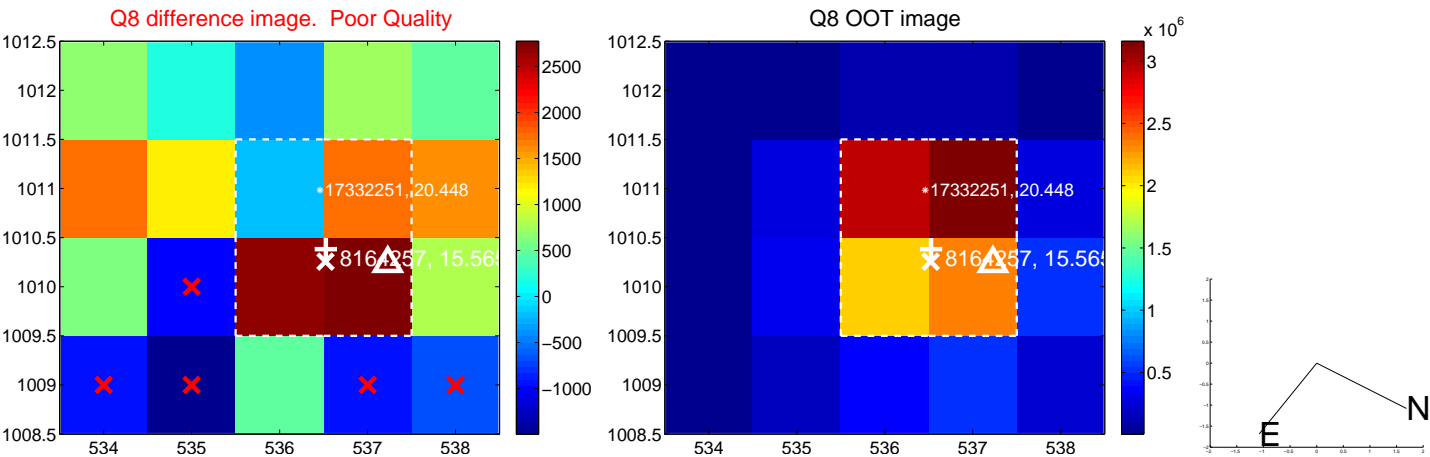
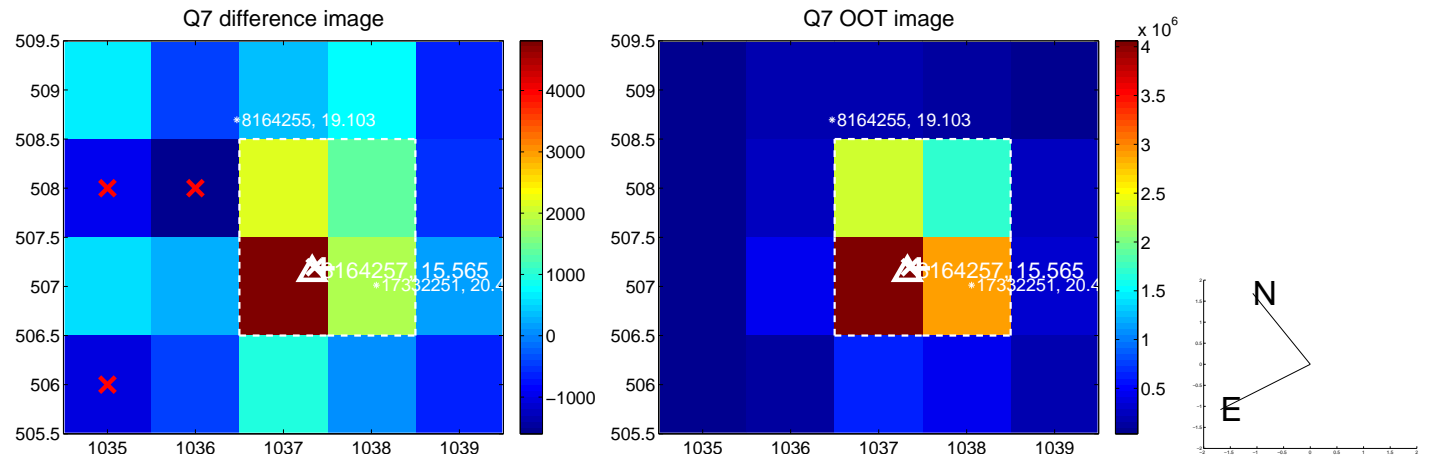
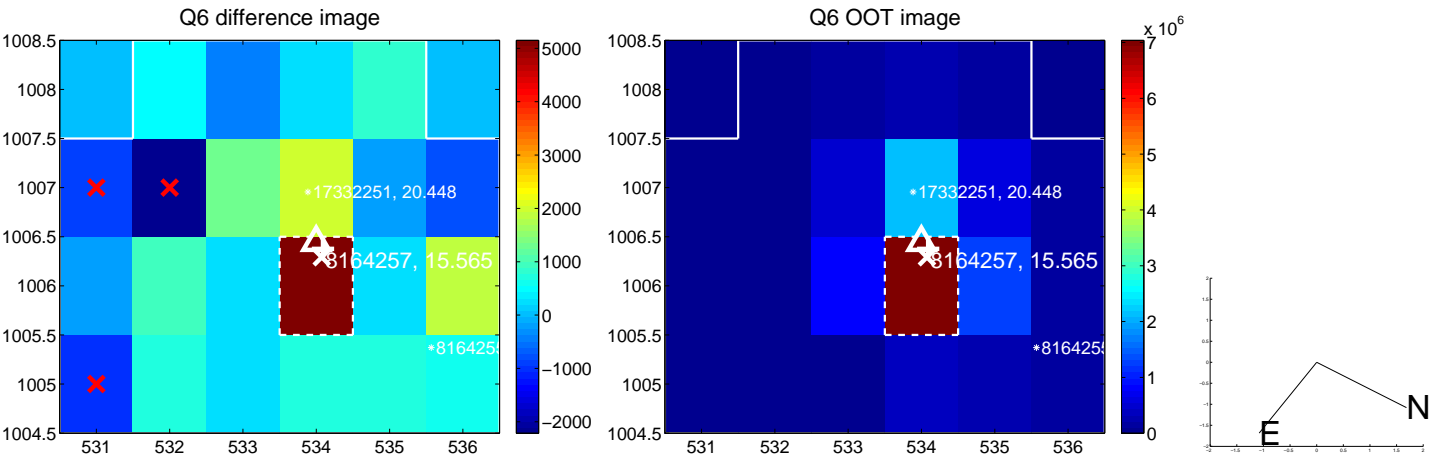
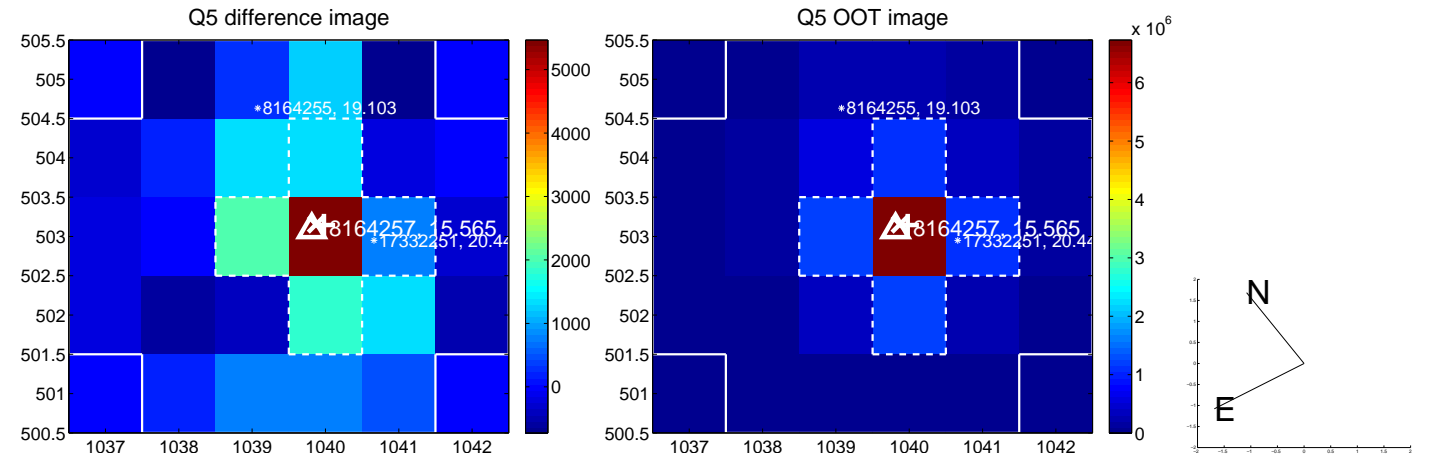


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

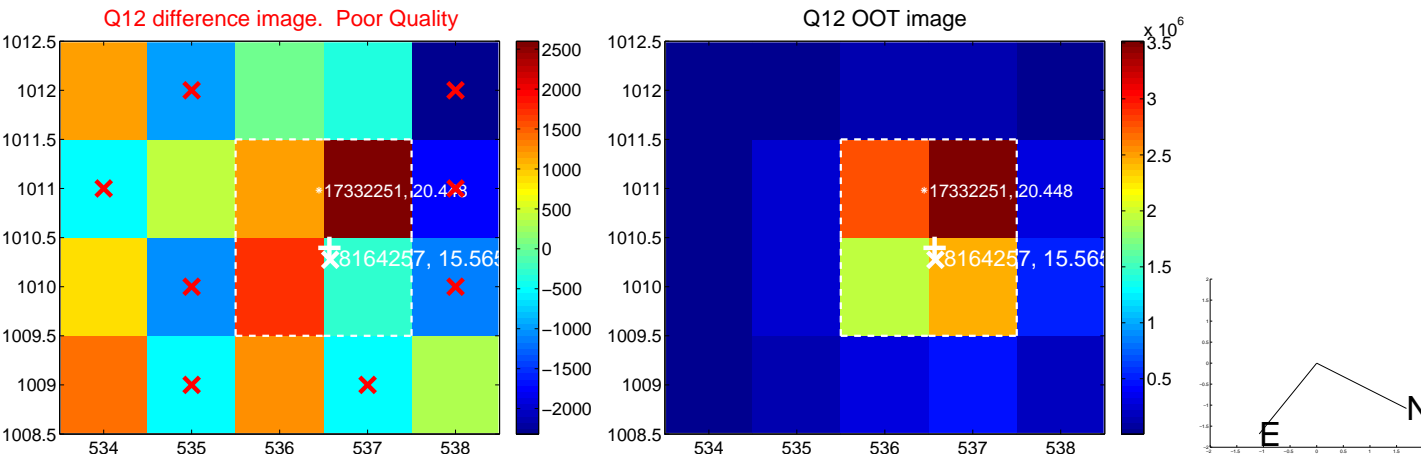
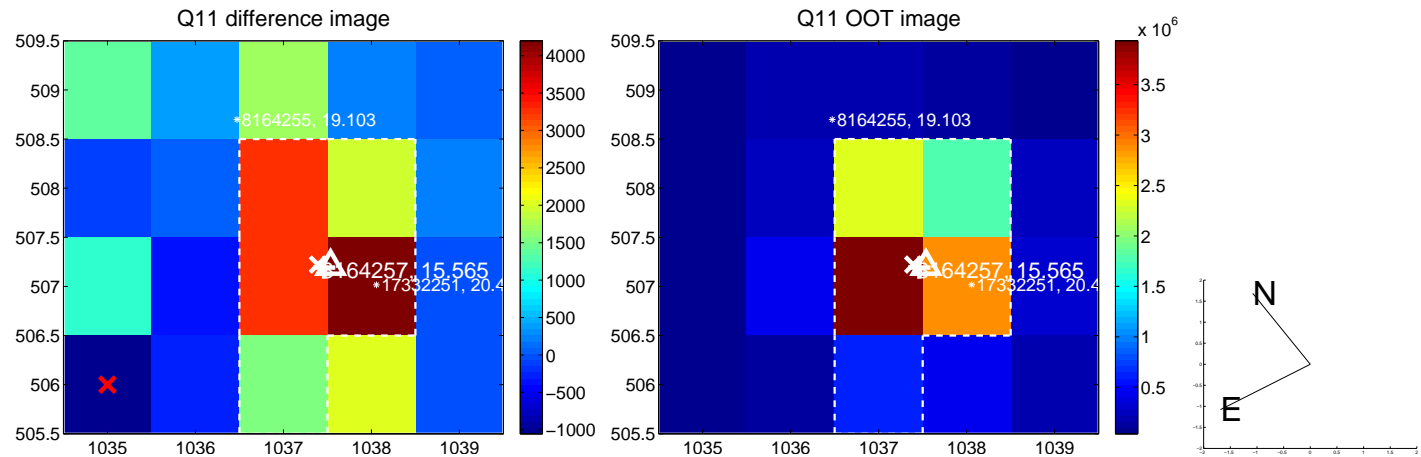
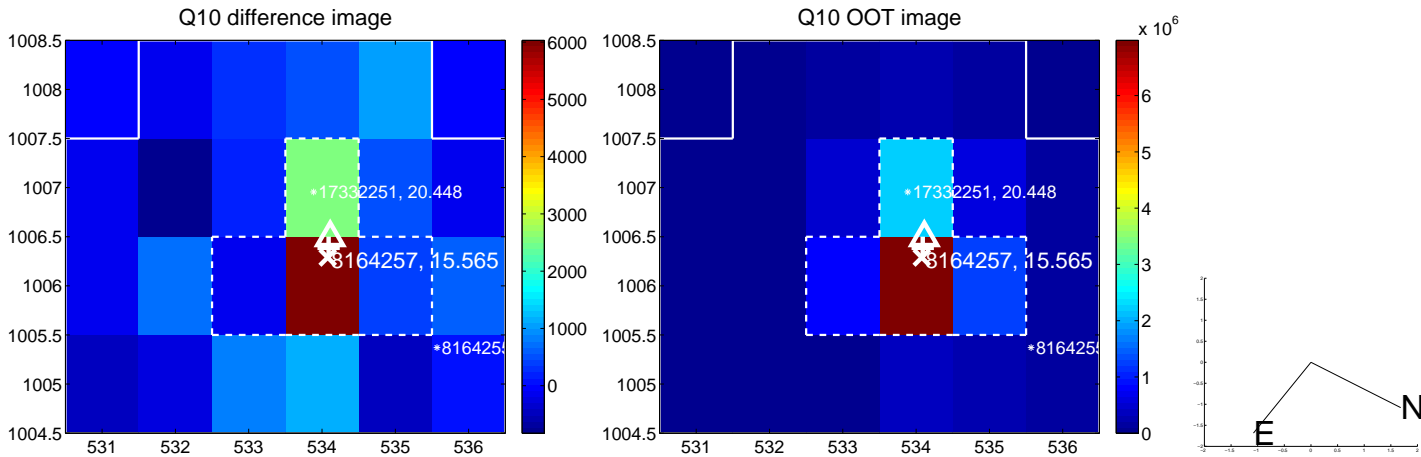
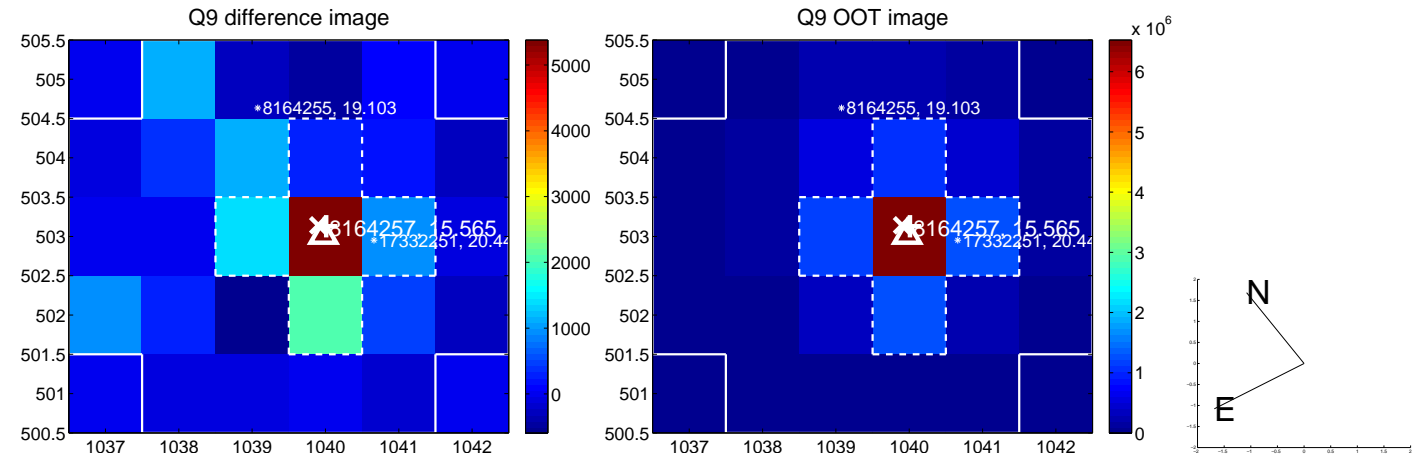
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



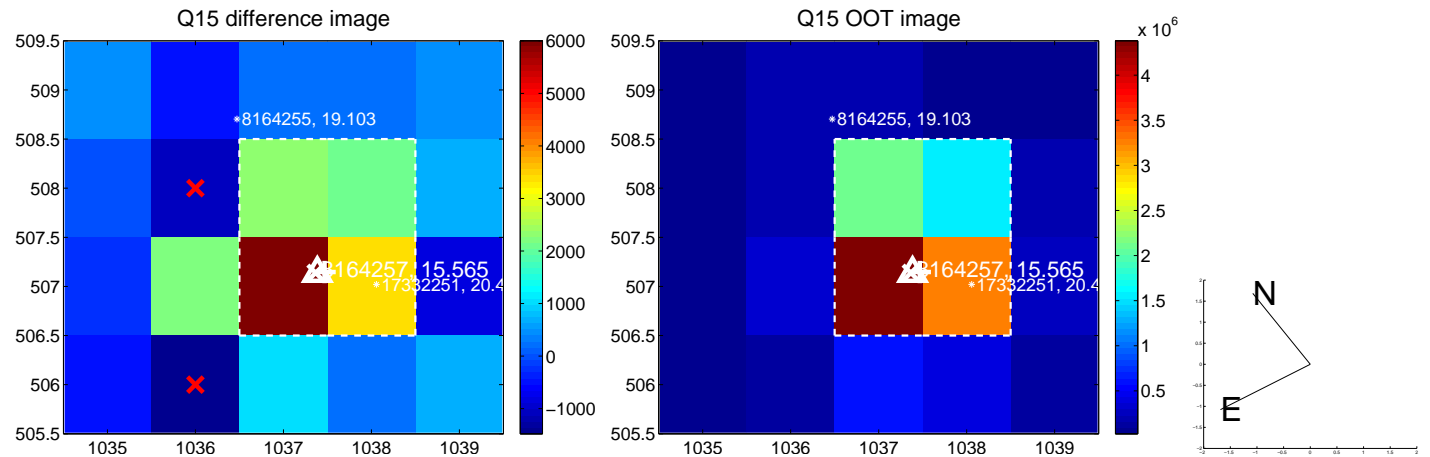
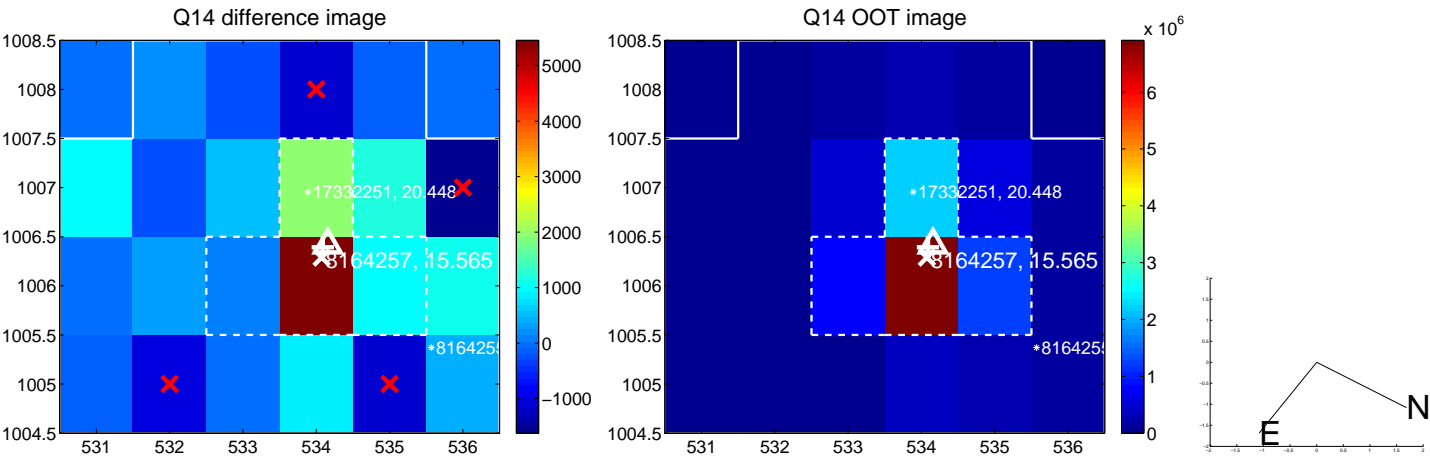
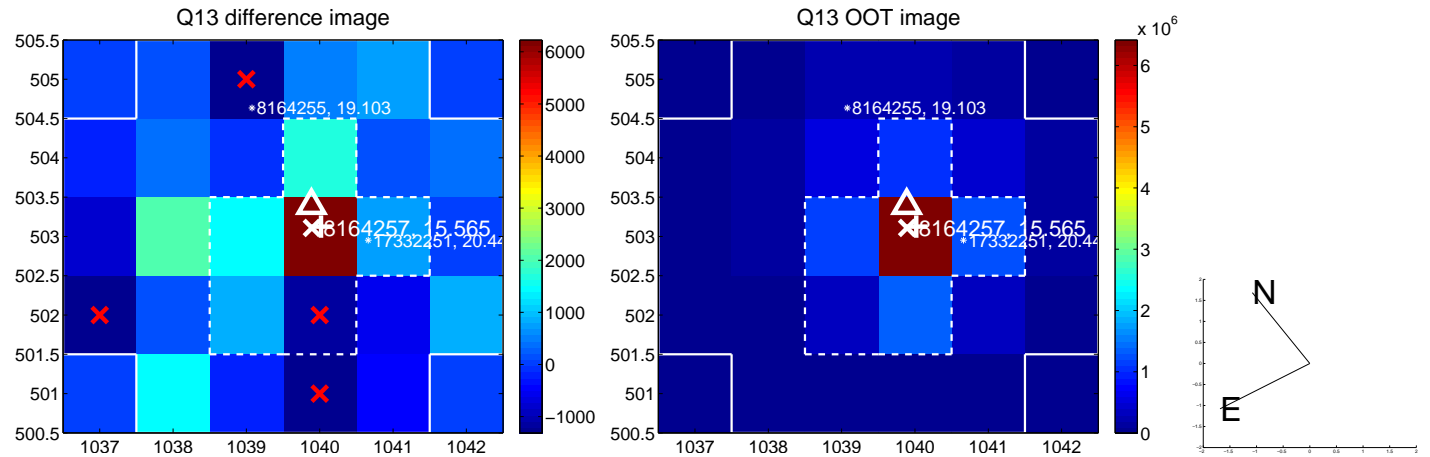
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



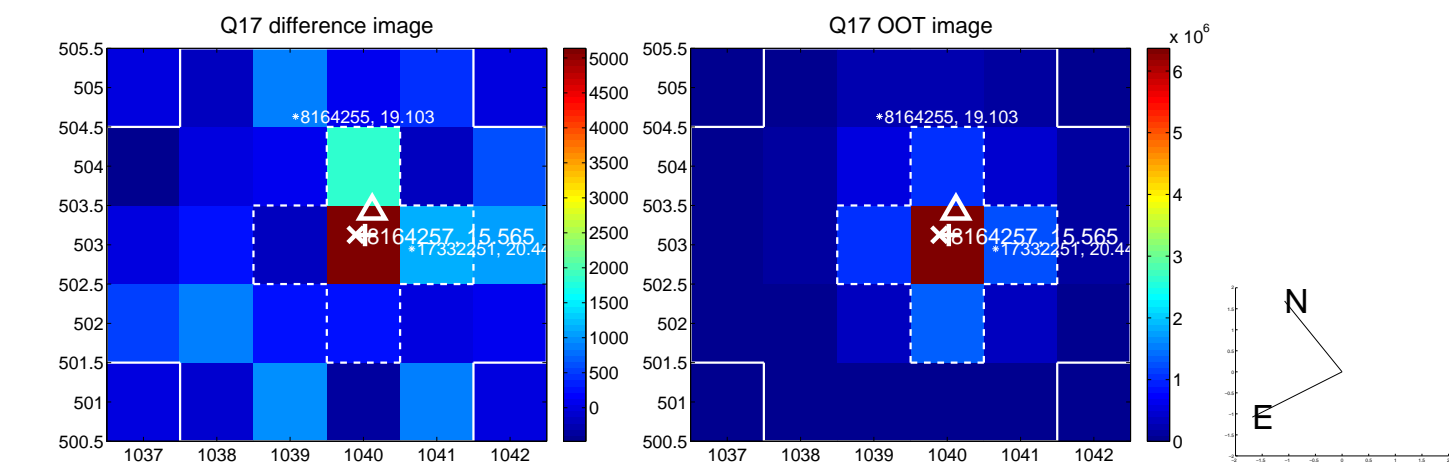
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



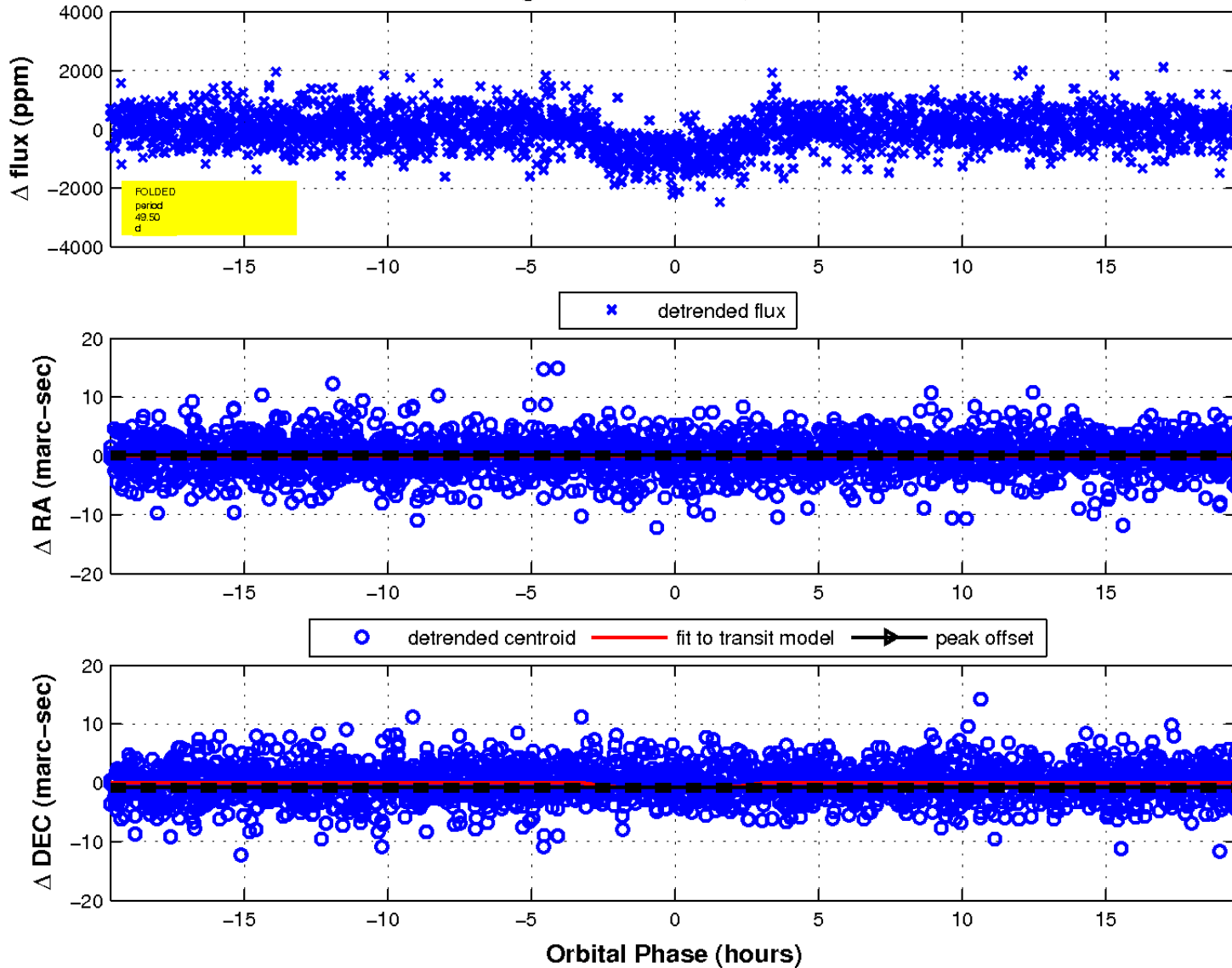
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

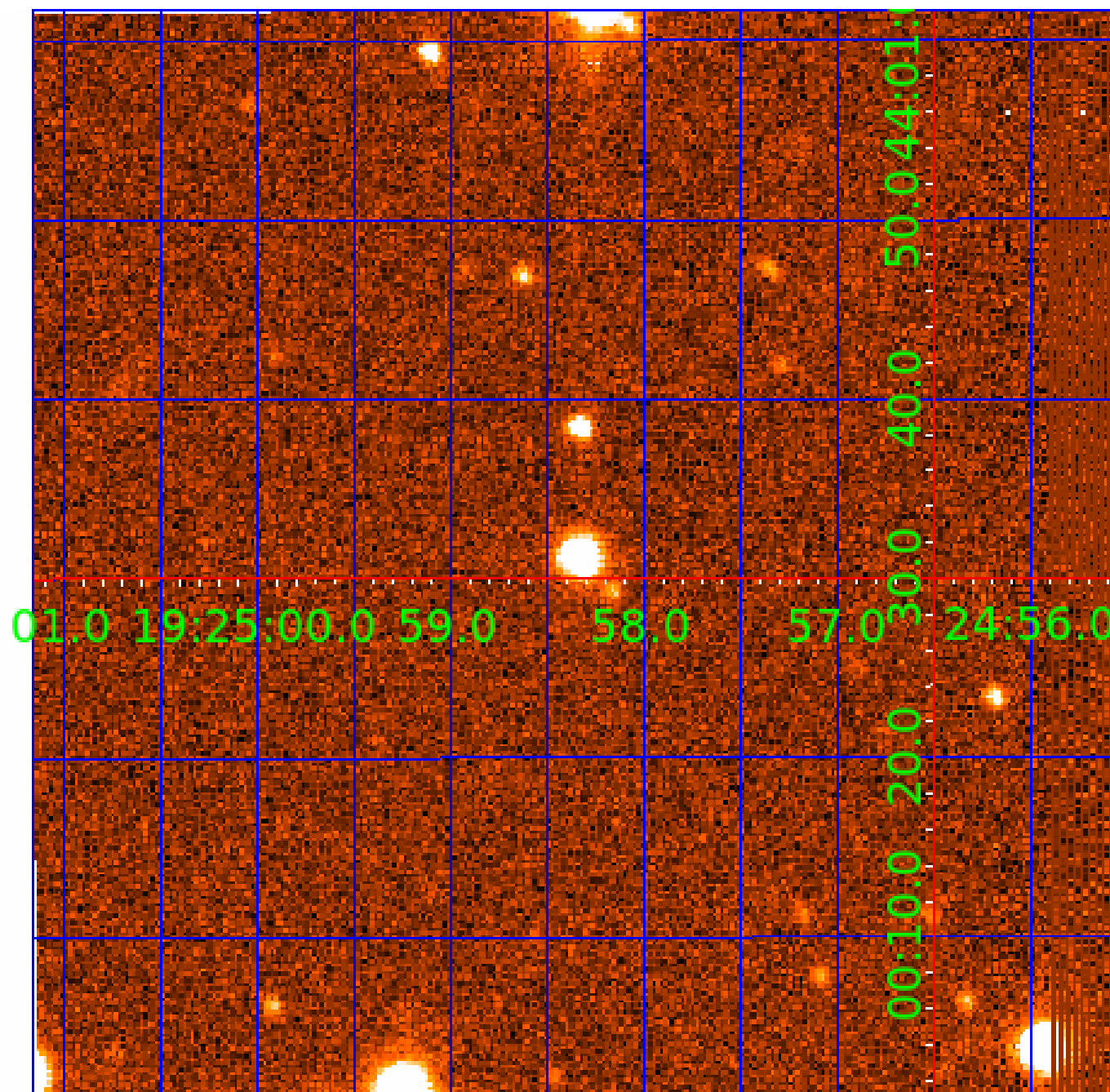


fluxWeightedCentroids, Planet 2 of 3



UKIRT Image

Declination



KIC 008164257

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})
008164257-01	OBS	2073.02	6.475387	137.582864	515.1	2.772	24.0	25.4	0.83	4954	2.19	93.55
008164257-02	OBS	2073.01	49.500384	139.043019	919.7	6.553	22.3	22.3	0.83	4954	3.10	6.21
008164257-03	OBS	2073.03	16.858194	142.345413	774.6	2.051	17.5	20.0	0.83	4954	2.68	26.12

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
008164257-01	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS
008164257-02	OBS	PC	0.99	0	0	0	0	CENT_KIC_POS
008164257-03	OBS	PC	1.00	0	0	0	0	CENT_KIC_POS

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.

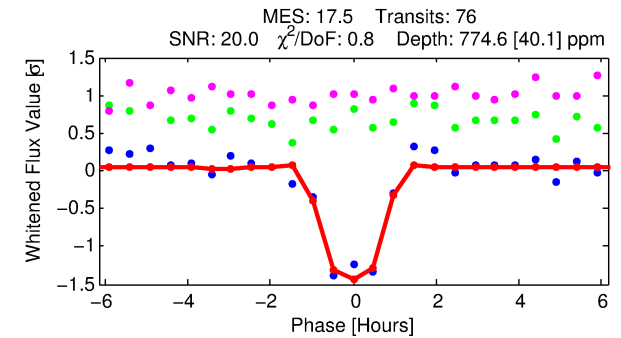
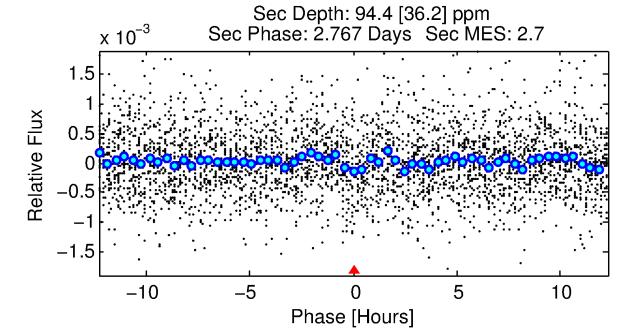
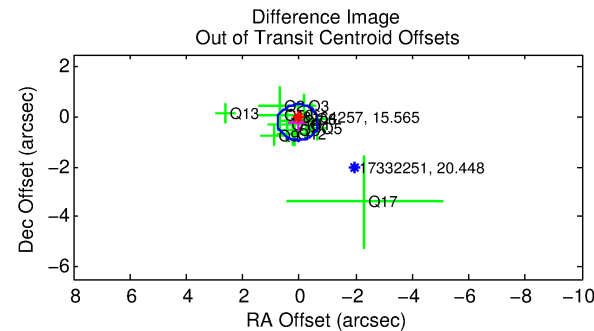
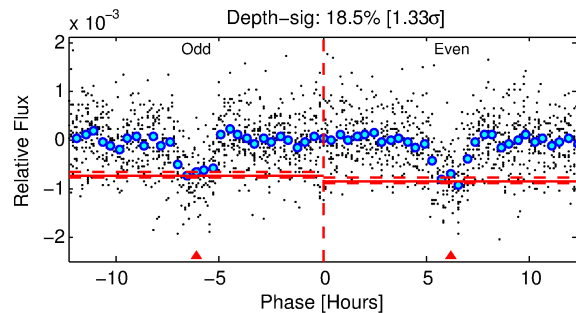
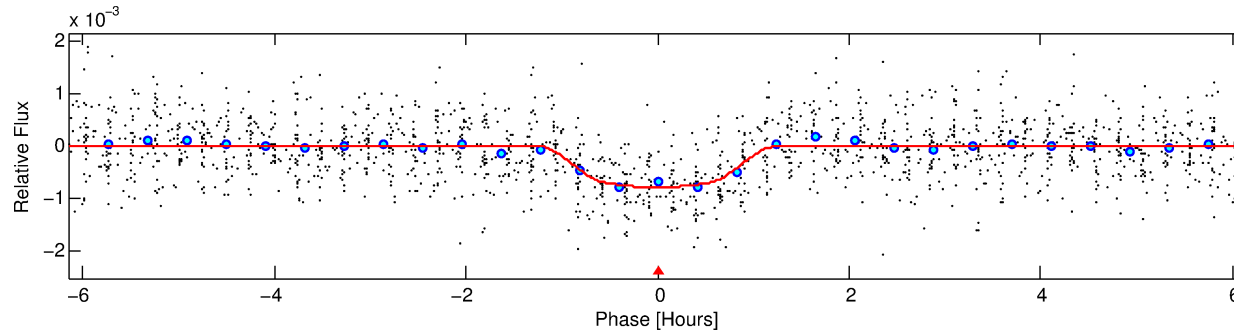
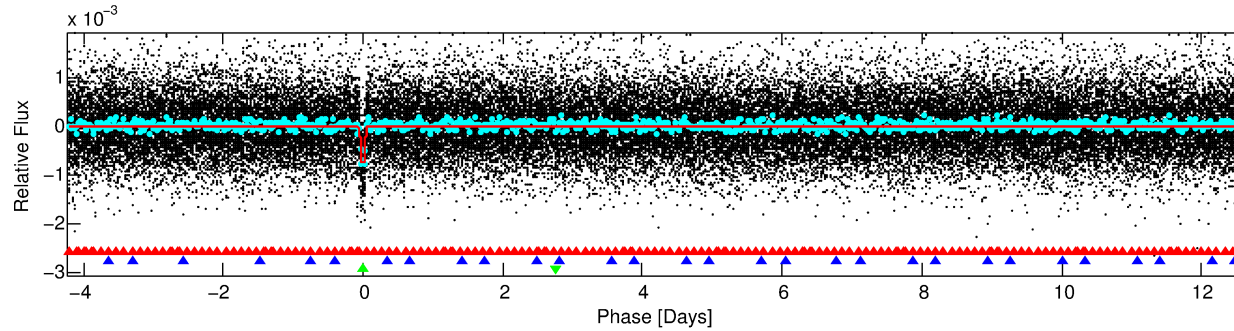
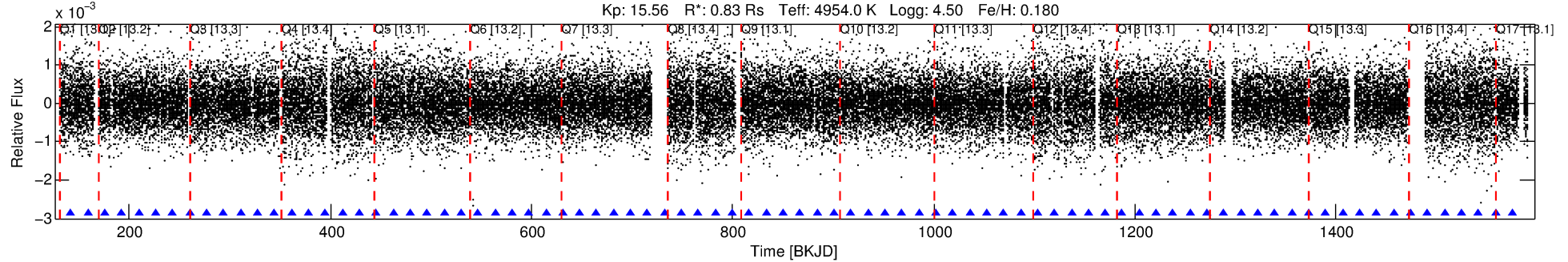
Ephemeris Match Information For 008164257-03

No Significant Match Found

DV One-Page Summary

KIC: 8164257 Candidate: 3 of 3 Period: 16.858 d
KOI: K02073.03 Name: Kepler-357c Corr: 0.974

Kp: 15.56 R*: 0.83 Rs Teff: 4954.0 K Logg: 4.50 Fe/H: 0.180



DV Fit Results:

Period = 16.85819 [0.00006] d
Epoch = 142.3454 [0.0026] BKJD
Rp/R* = 0.0297 [0.0135]
a/R* = 36.77 [59.59]
b = 0.85 [0.56]
Seff = 26.12 [3.60]
Teq = 576 [20] K
Rp = 2.68 [1.24] Re
a = 0.1190 [0.0091] AU
Ag = 102.36 [102.00] [0.99σ]
Teffp = 2835 [702] K [3.21σ]

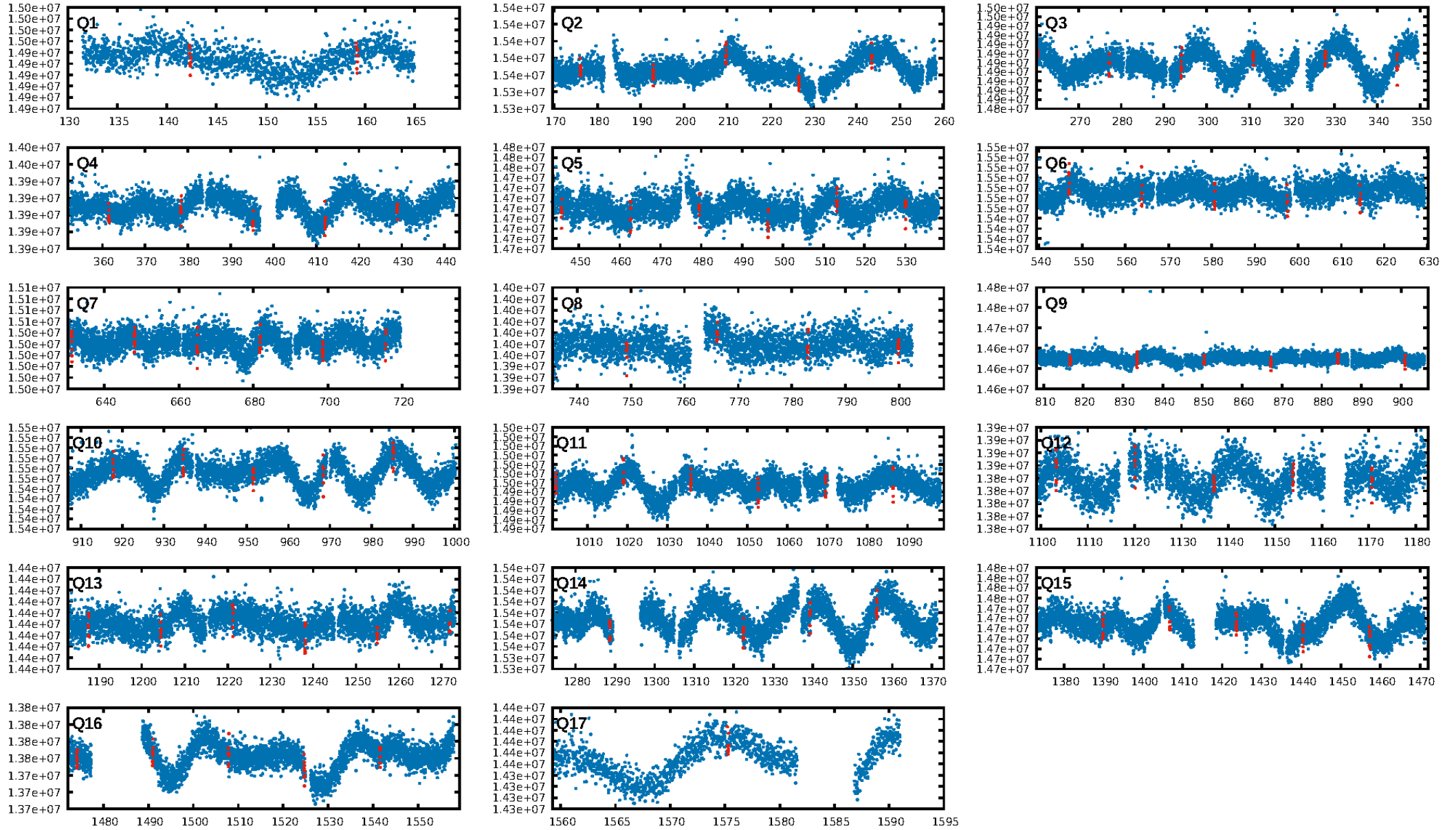
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [72.27σ]
LongPeriod-sig: 100.0% [114.10σ]
ModelChiSquare2-sig: 99.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 6.24e-66
RollingBand-fgt: 1.00 [73/73]
GhostDiagnostic-chr: 13.41
Centroid-sig: 22.8%
Centroid-so: 0.675 arcsec [1.04σ]
OotOffset-rm: 0.236 arcsec [0.98σ]
KicOffset-rm: 0.524 arcsec [1.35σ]
OotOffset-st: 3/3/2/5 [13]
KicOffset-st: 3/3/2/5 [13]
DiffImageQuality-fgm: 0.85 [11/13]
DiffImageOverlap-fno: 0.94 [16/17]

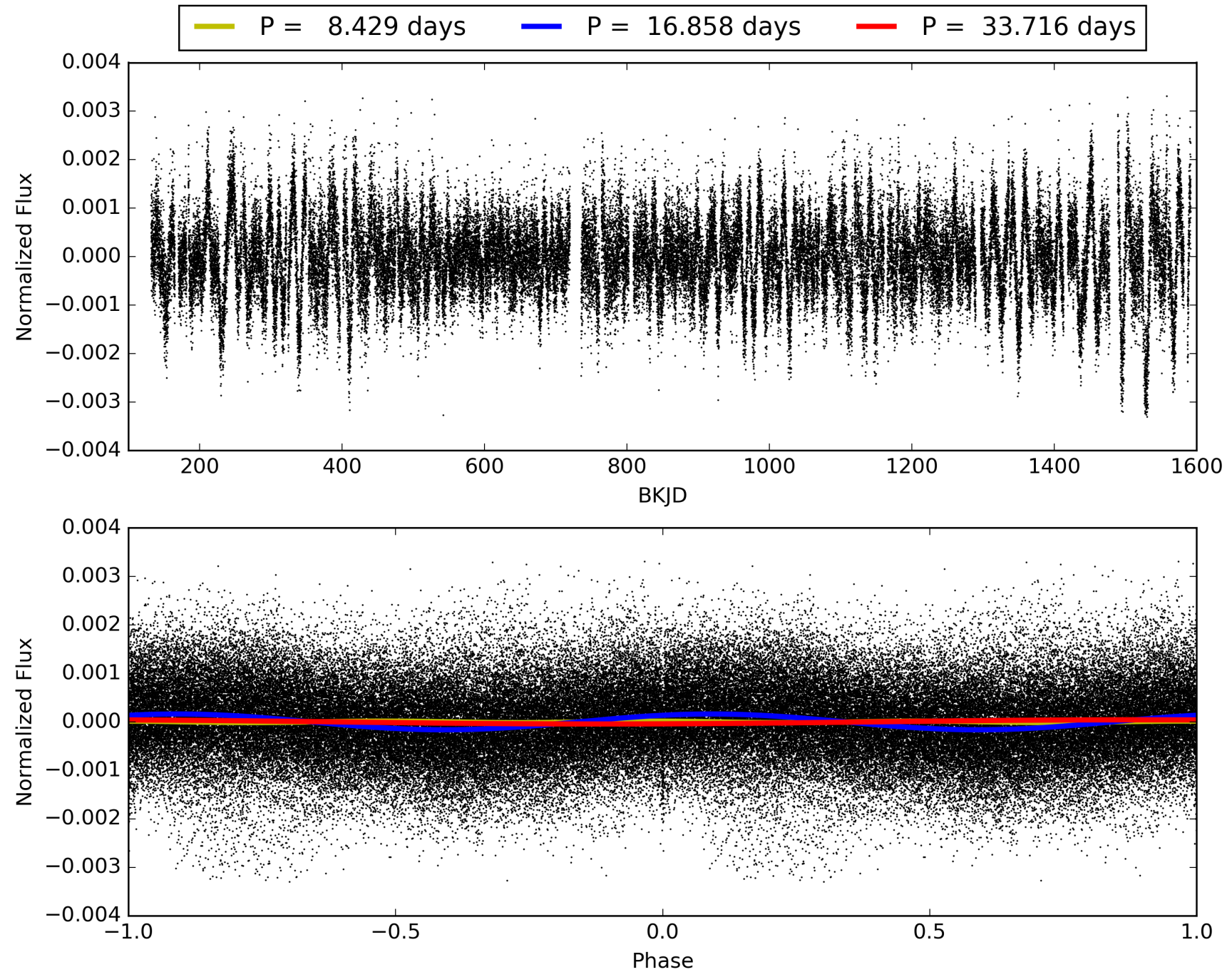
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 14:46:49 Z

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

TCE 008164257-03, PDC Light Curves

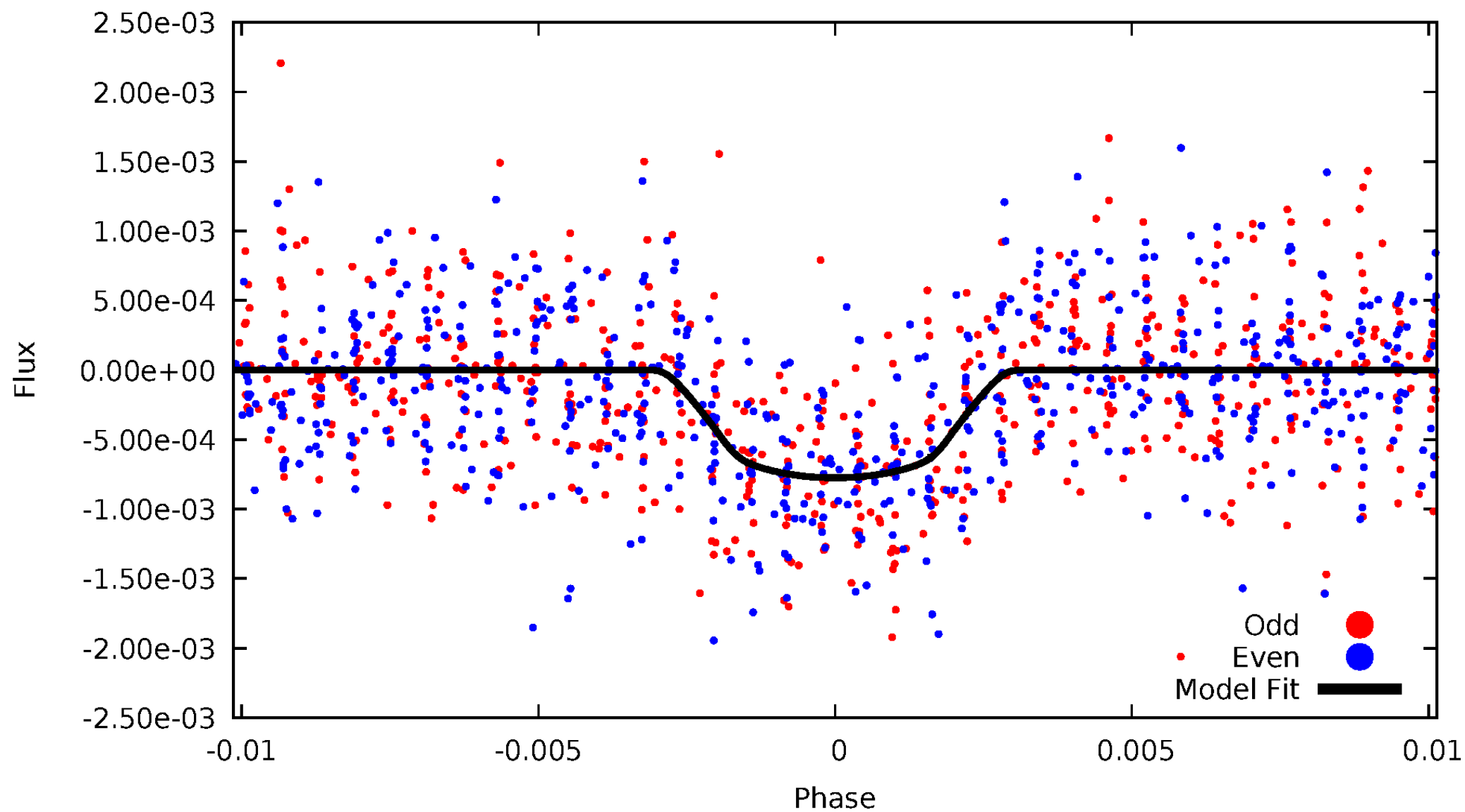


TCE 008164257-03



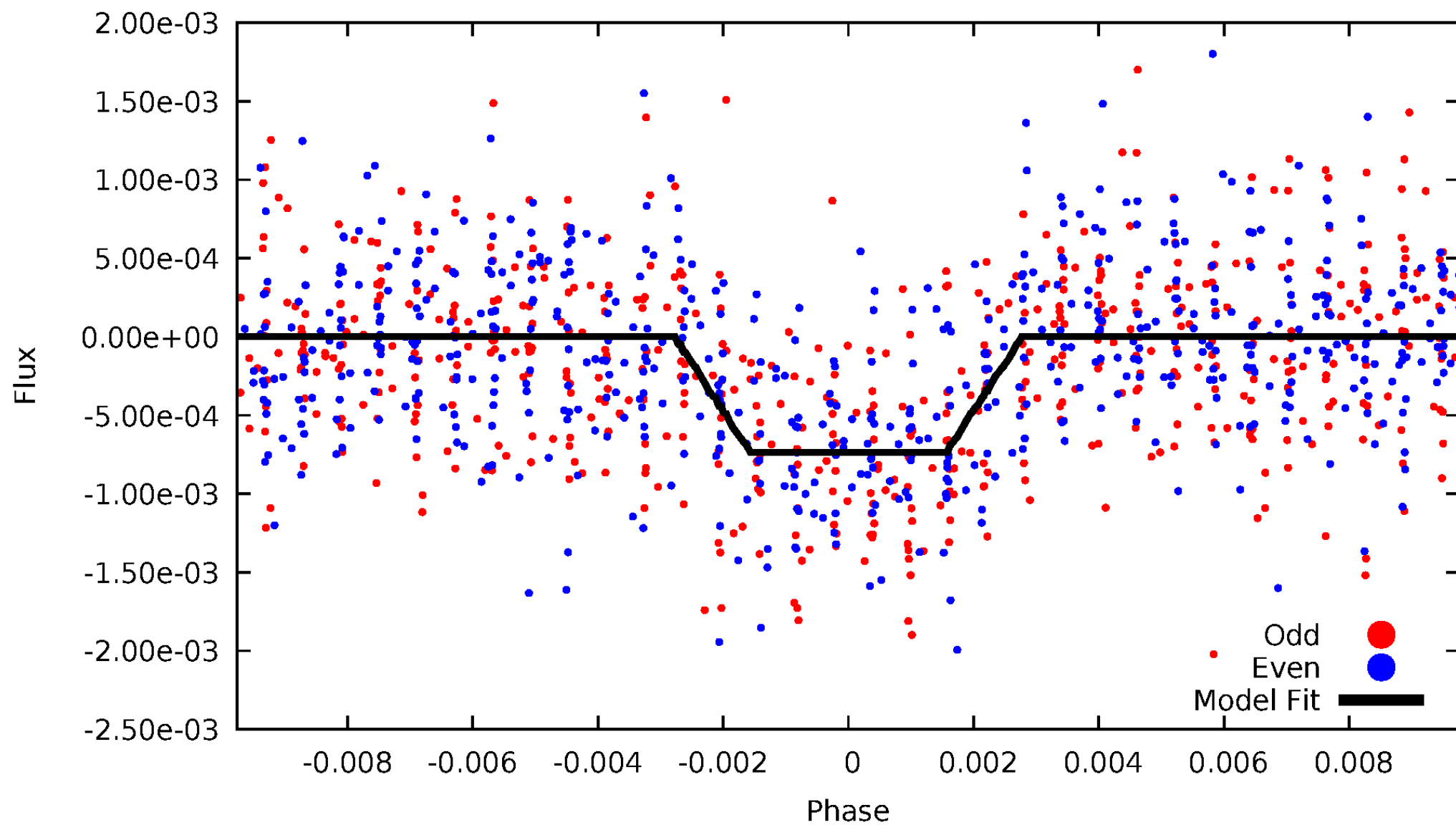
DV Odd/Even

TCE 008164257-03



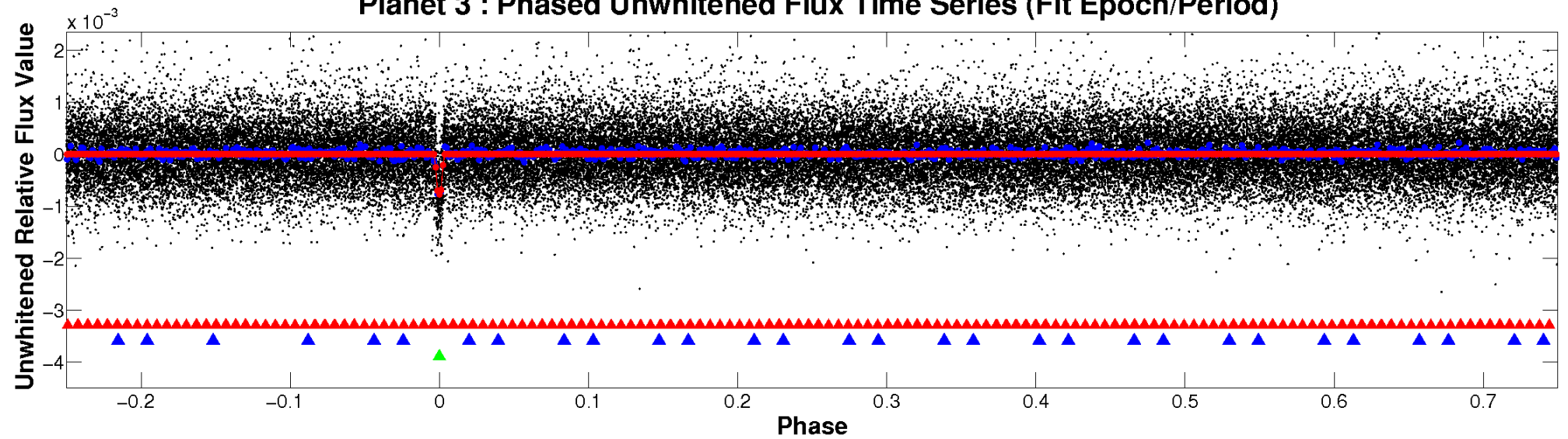
ALT Odd/Even

TCE 008164257-03

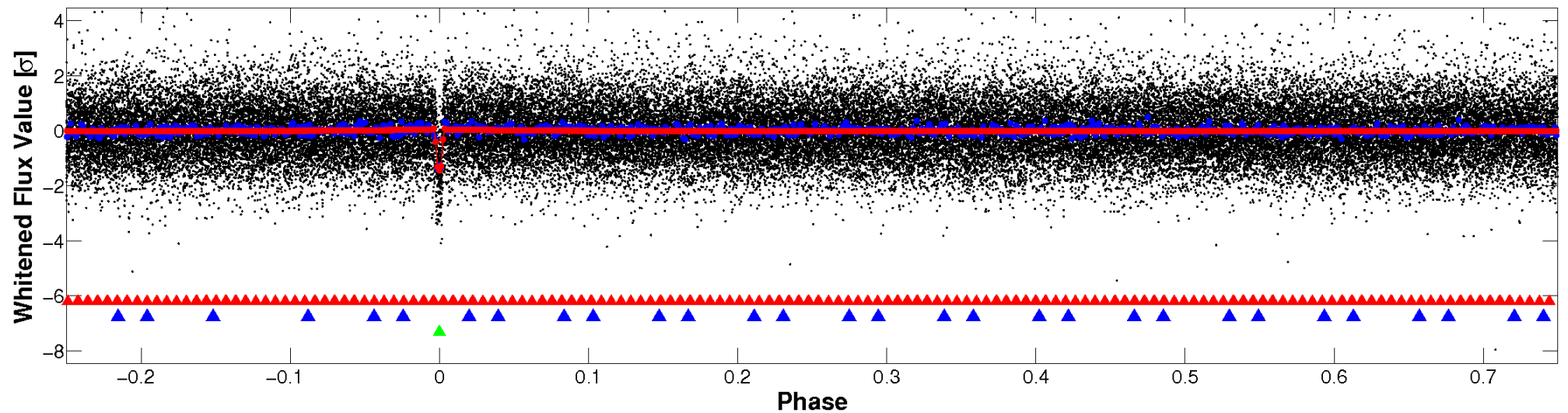


Non-Whitened Vs. Whitened Light Curve

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

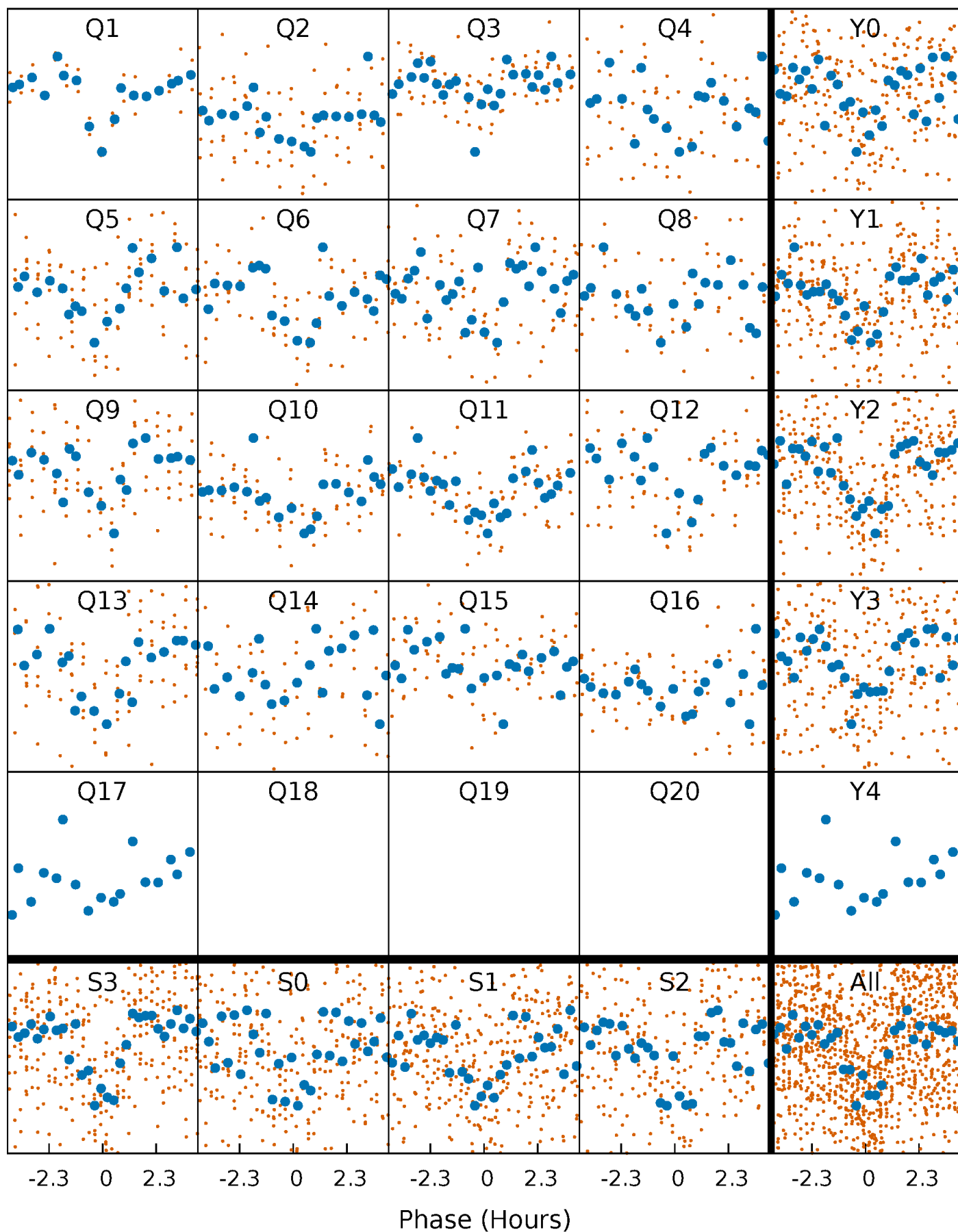


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



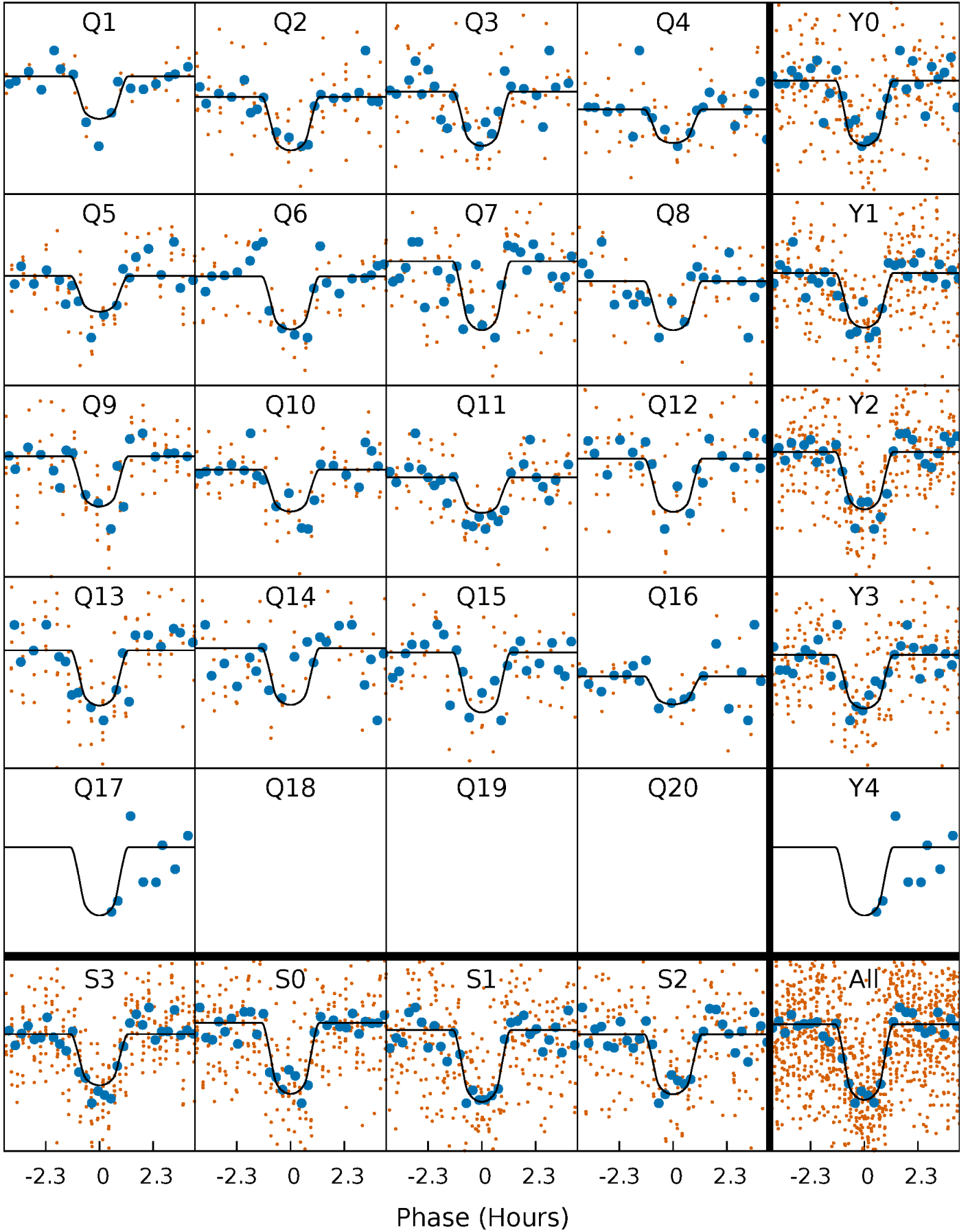
PDC Quarter-Phased Transit Curves

TCE 008164257-03 P= 16.858194 Days $T_0=142.345413$ (BKJD)



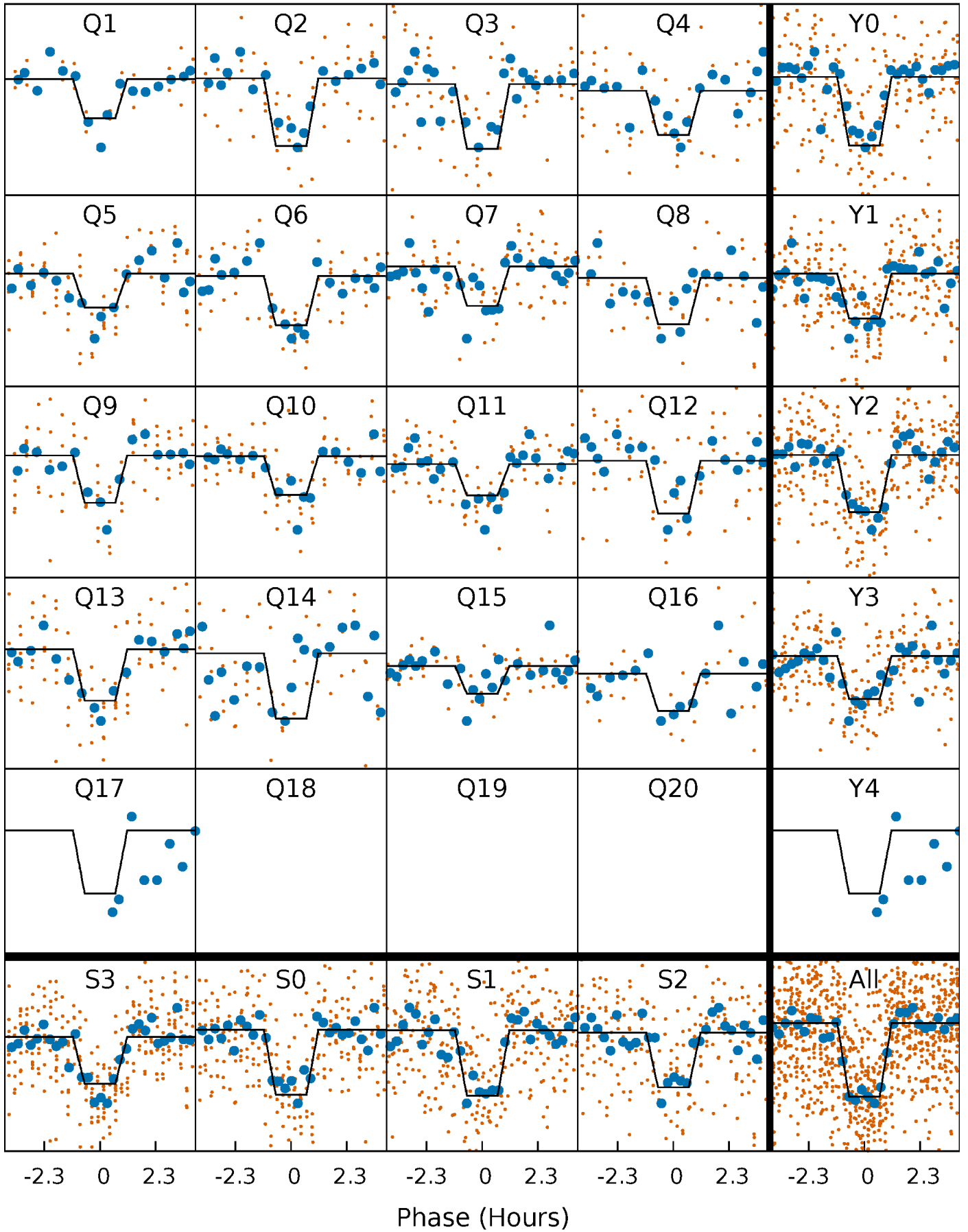
DV Quarter-Phased Transit Curves

TCE 008164257-03 P= 16.858194 Days $T_0=142.345413$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

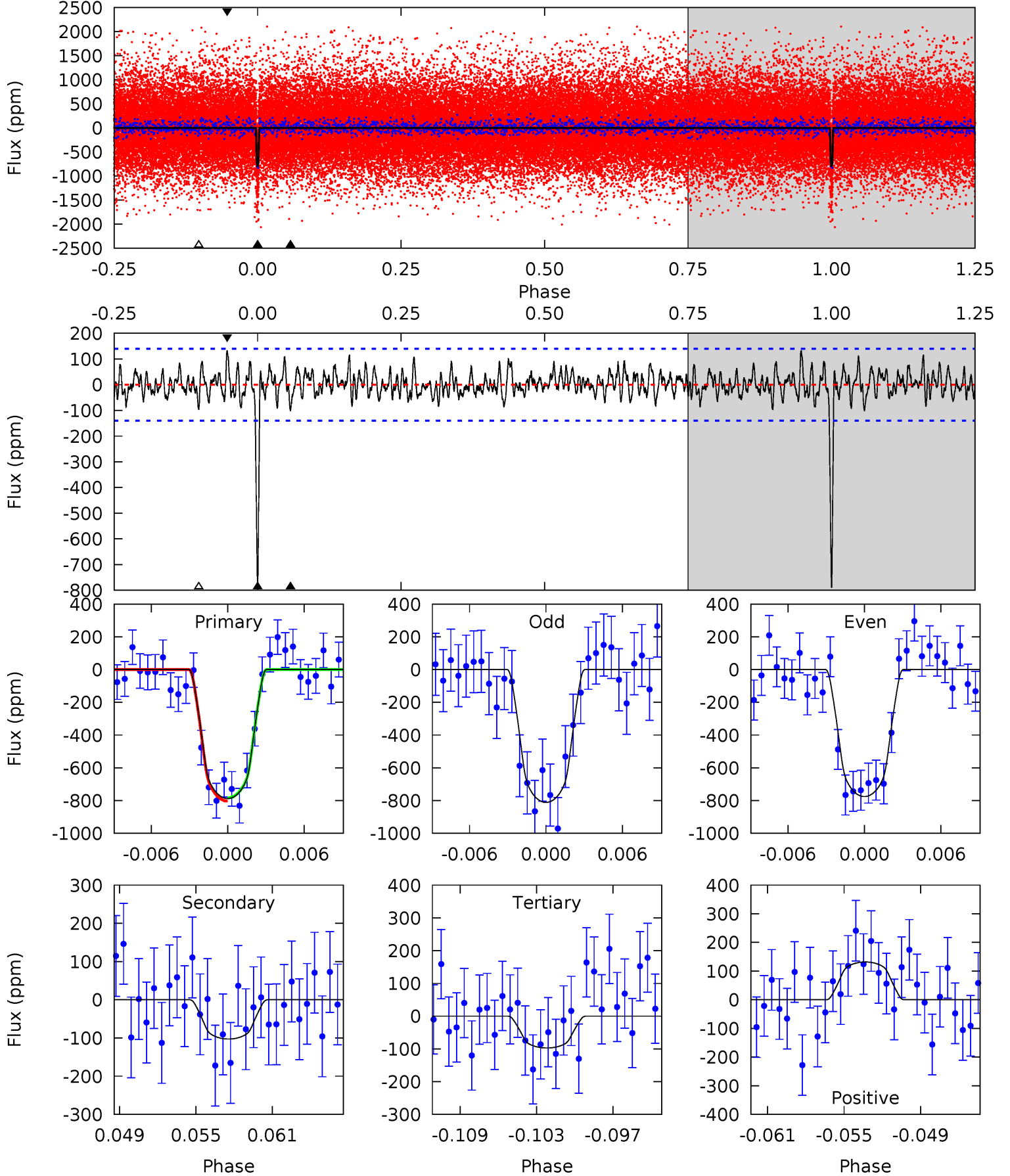
TCE 008164257-03 P= 16.858187 Days $T_0=142.345853$ (BKJD)



DV Model-Shift Uniqueness Test

008164257-03, $P = 16.858194$ Days, $E = 125.487219$ Days

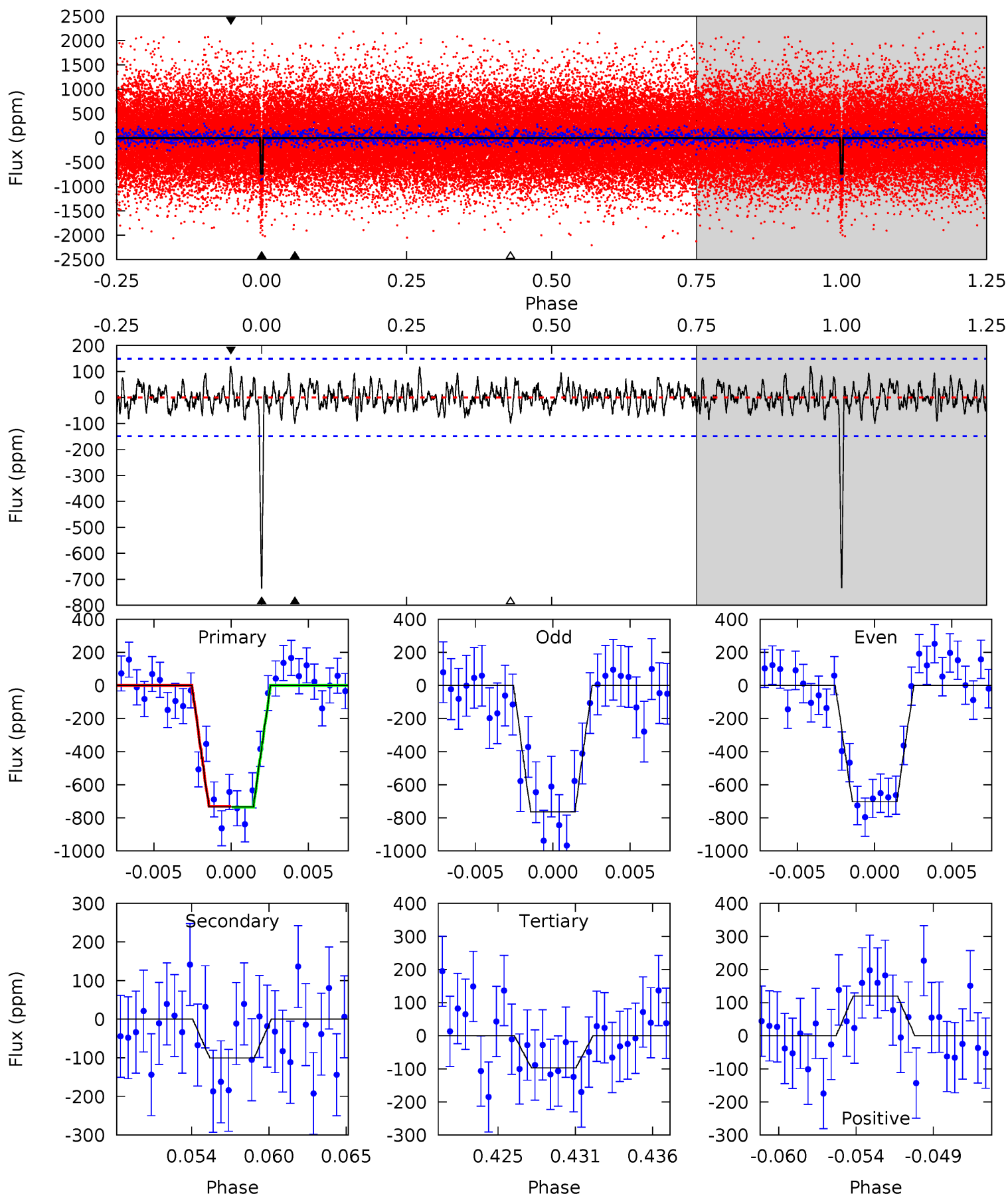
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.8	3.76	3.56	4.83	5.12	2.74	1.38	25.3	24.0	0.20	-1.07	0.66	0.98	0.14	0.36



Alt Model-Shift Uniqueness Test

008164257-03, P = 16.858187 Days, E = 125.487666 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.4	3.47	3.36	4.14	5.14	2.78	1.21	22.0	21.2	0.11	-0.67	1.05	0.98	0.14	0.10



Stellar Parameters For KIC 008164257

	$T_{\text{eff}}(K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4954^{+79}_{-79}	$4.500^{+0.072}_{-0.023}$	$0.180^{+0.150}_{-0.150}$	$0.828^{+0.032}_{-0.065}$	$0.791^{+0.050}_{-0.029}$	$1.964^{+0.537}_{-0.163}$
	+2%/-2%	+2%/-1%	+83%/-83%	+4%/-8%	+6%/-4%	+27%/-8%
Source	SPE90	SPE90	SPE90	DSEP		

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

Secondary Eclipse Parameters for KIC 008164257-03 / KOI 2073.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-103 ± 27	$2.67^{+1.14}_{-1.12}$	799^{+17}_{-19}	3351^{+711}_{-359}	116^{+245}_{-64}
Alt.	-100 ± 29	$2.39^{+1.20}_{-1.08}$	800^{+17}_{-22}	3451^{+835}_{-424}	134^{+338}_{-77}

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

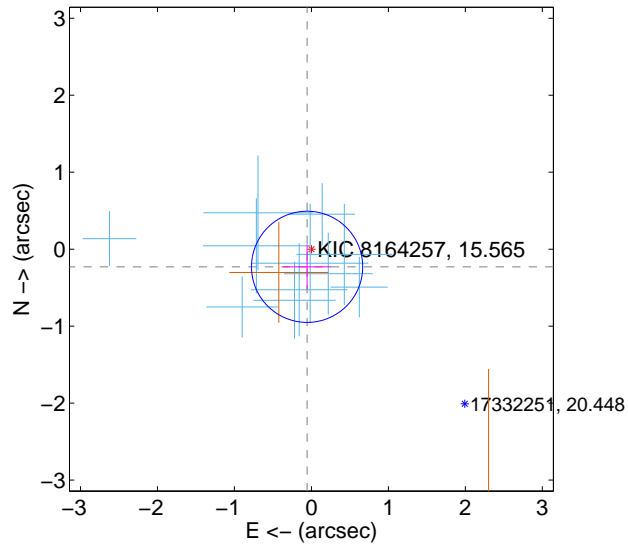
Supplemental centroid analysis for 008164257-03. Kepler magnitude: 15.56. Transit SNR 20.05

There are 11 quarters with good PRF difference image offsets

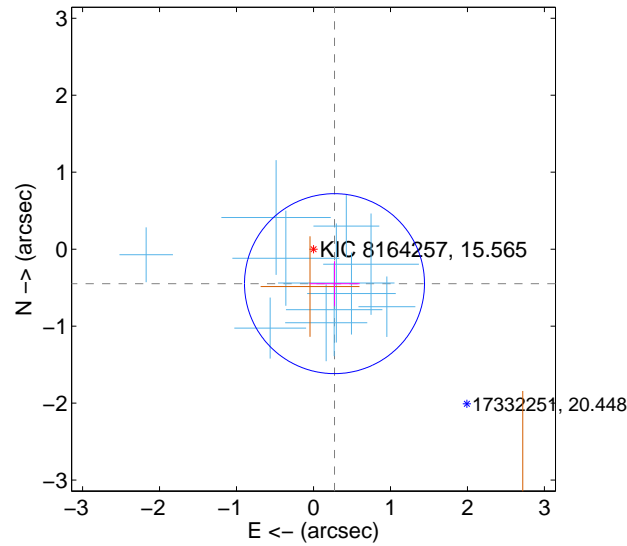
The direct PRF centroid is offset from the target star catalog position by about 0.50 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.236 ± 0.241	0.98	0.056 ± 0.311	-0.229 ± 0.291
PRF-fit source offset from KIC position	0.524 ± 0.390	1.35	-0.273 ± 0.326	-0.448 ± 0.292
photometric centroid source offset	0.67 ± 0.65	1.04	-0.16 ± 0.67	-0.66 ± 0.65

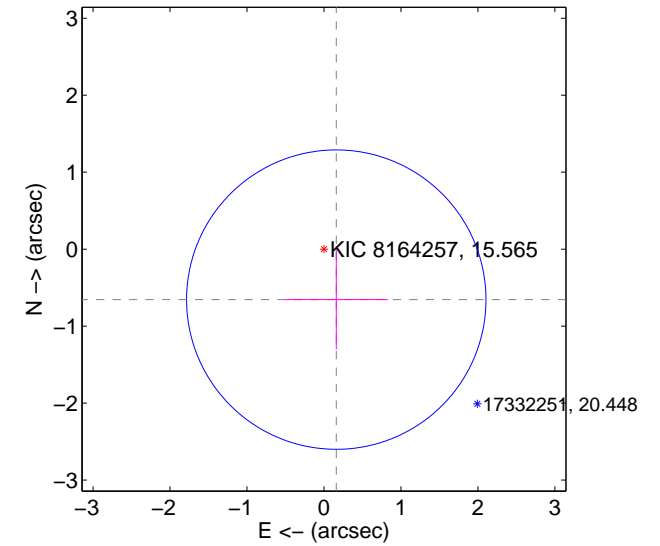
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

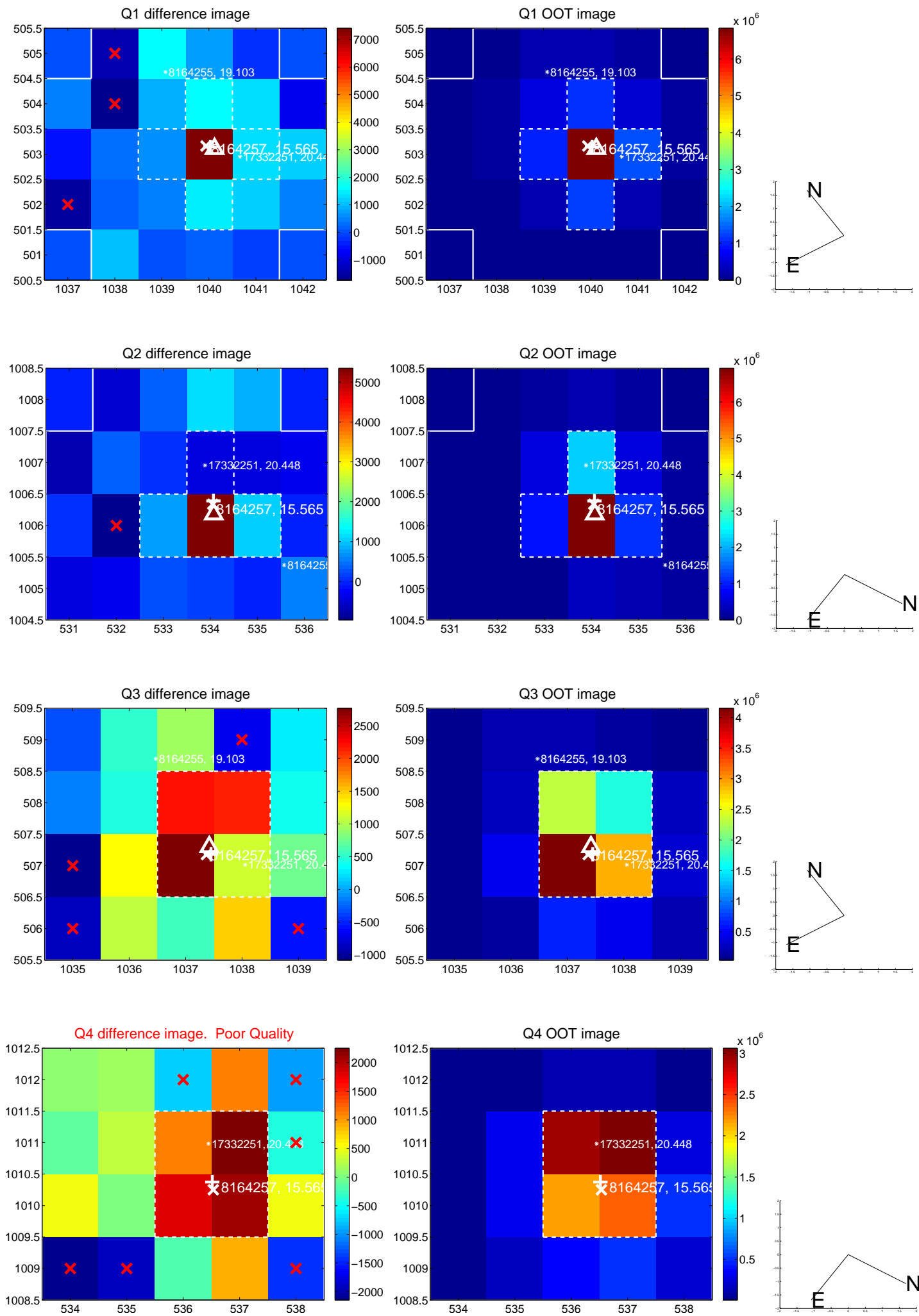


offset from photometric centroids

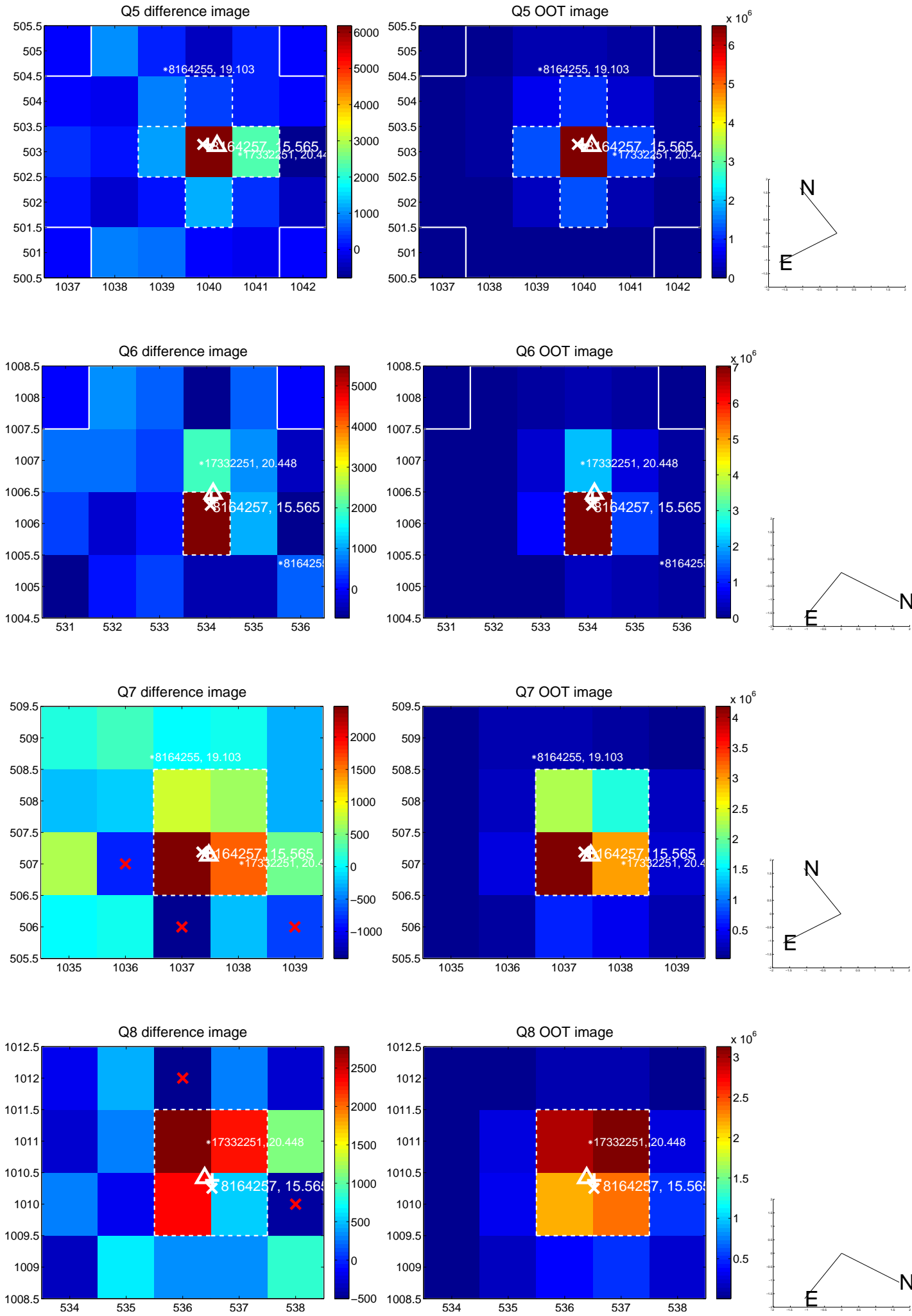


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

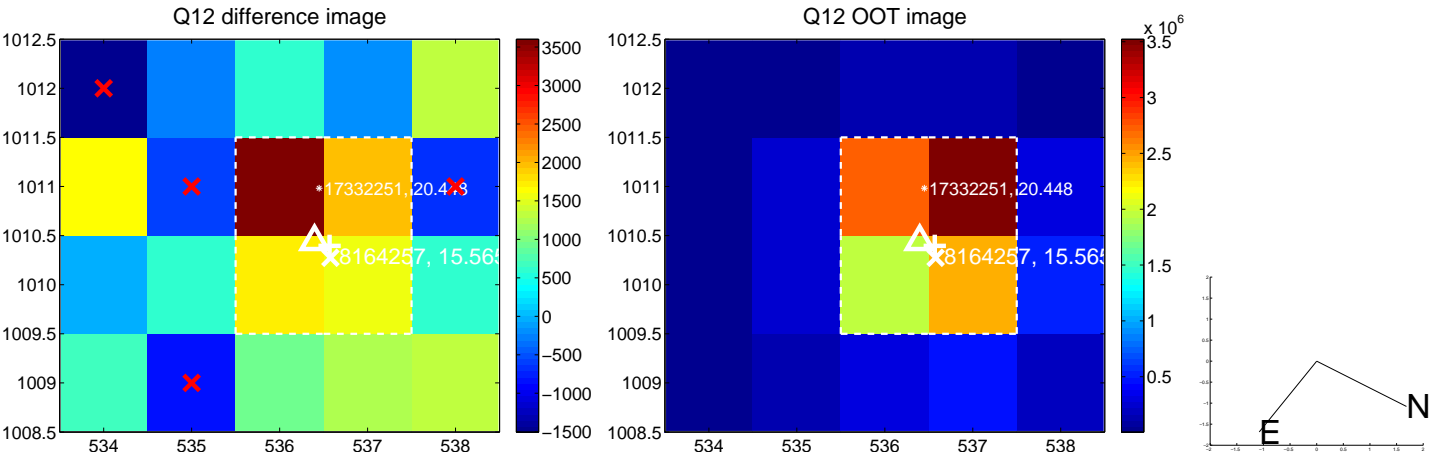
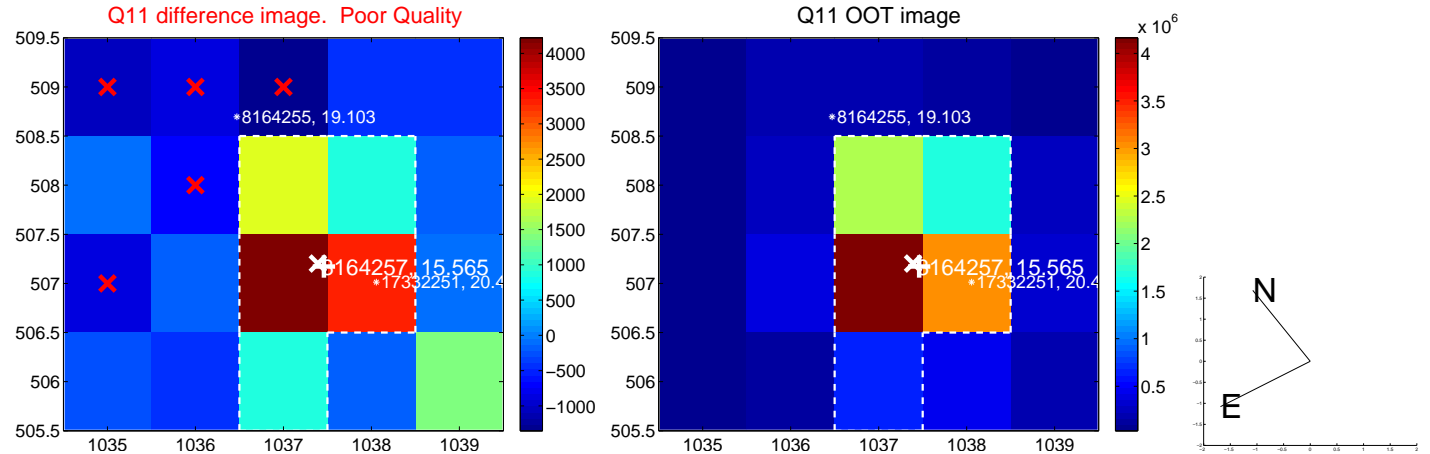
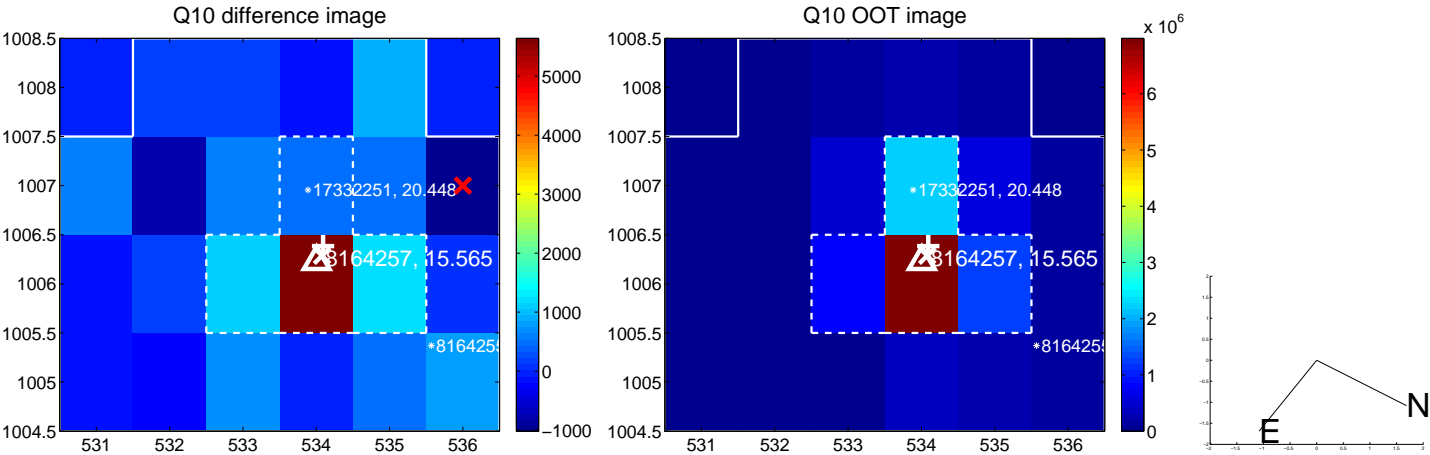
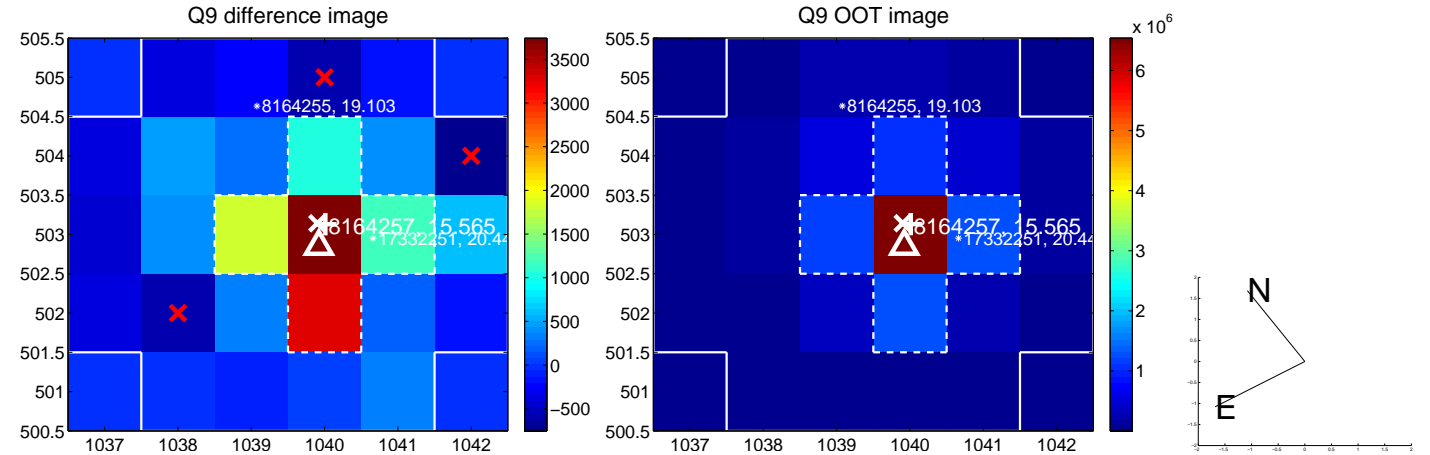
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



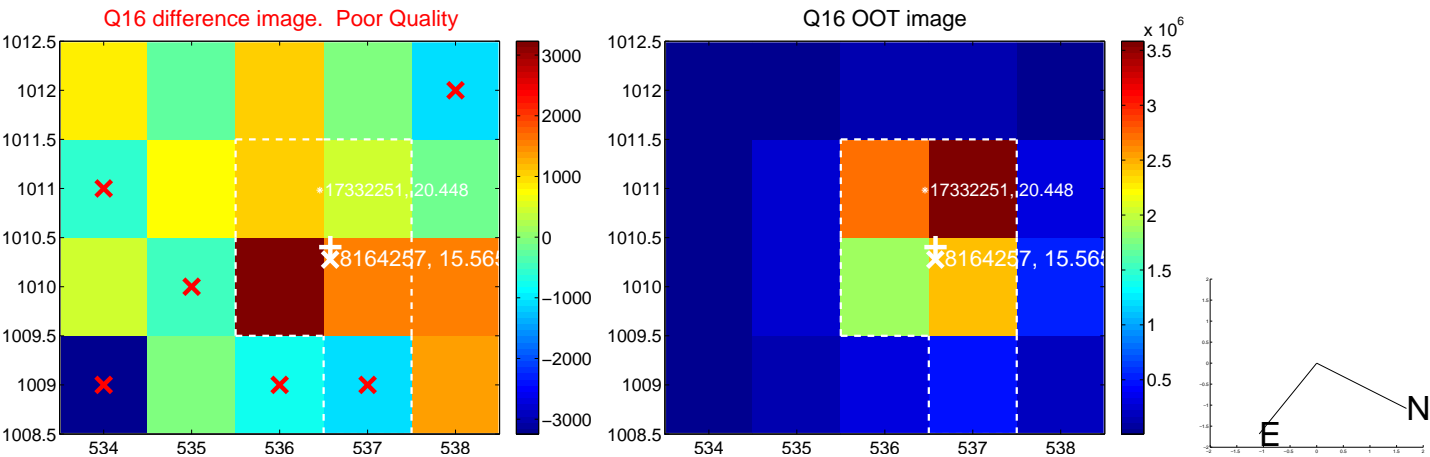
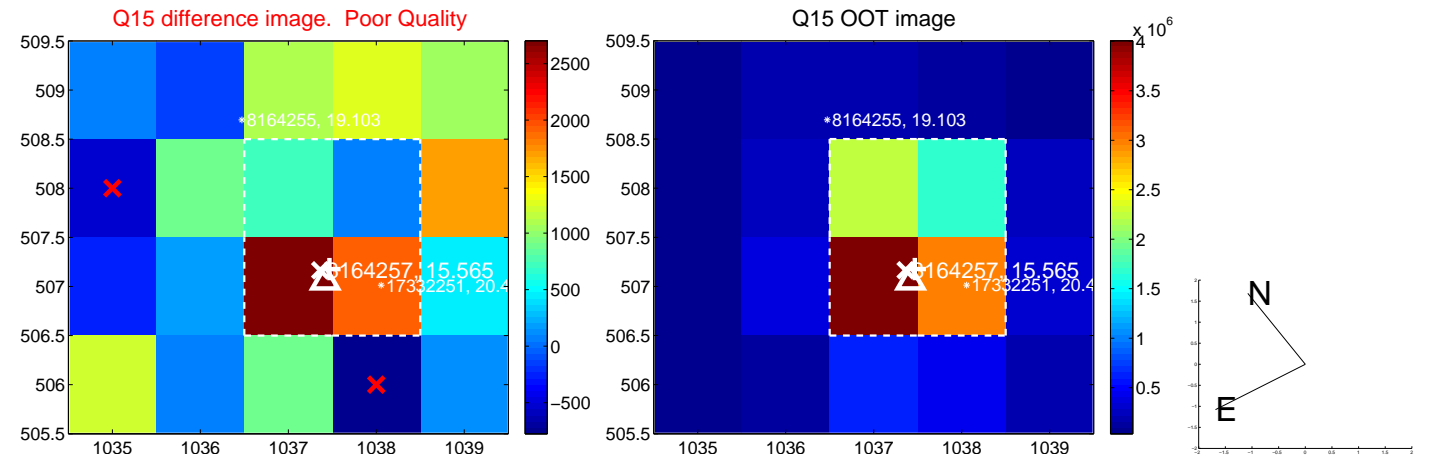
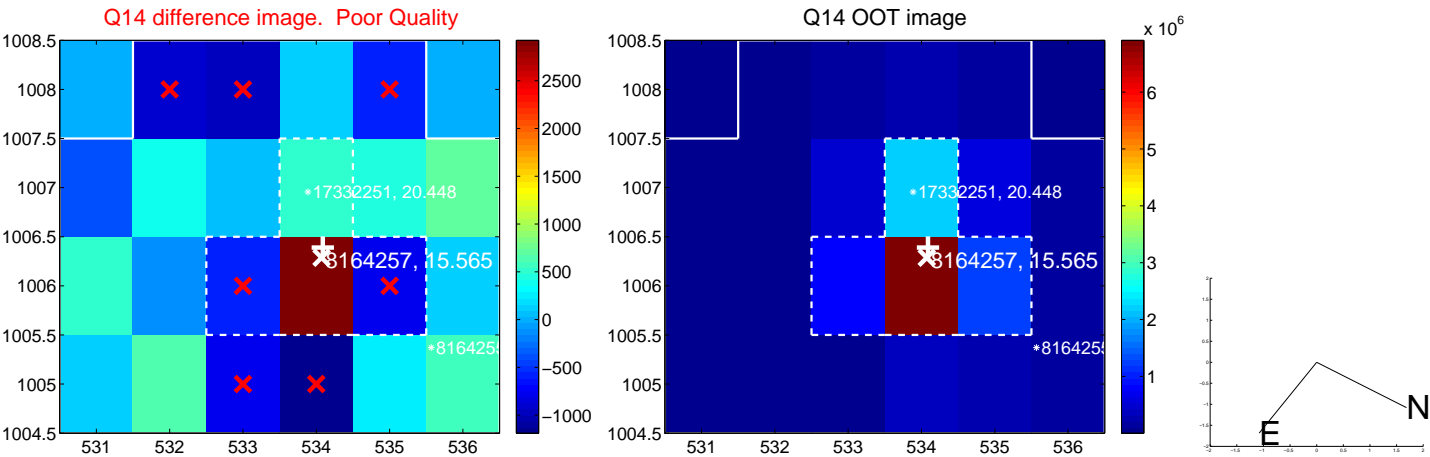
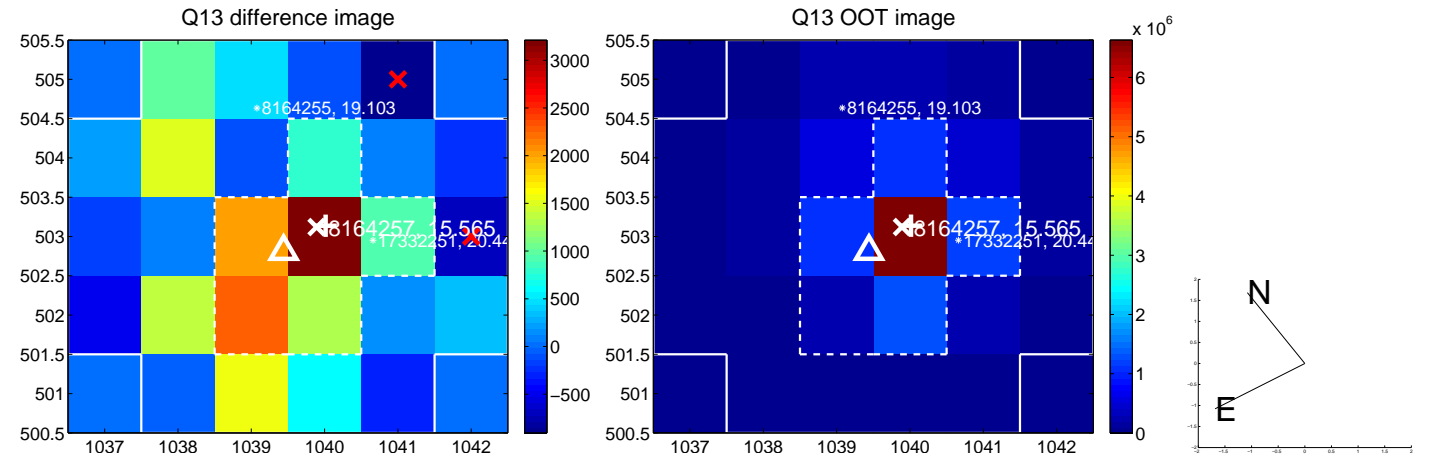
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



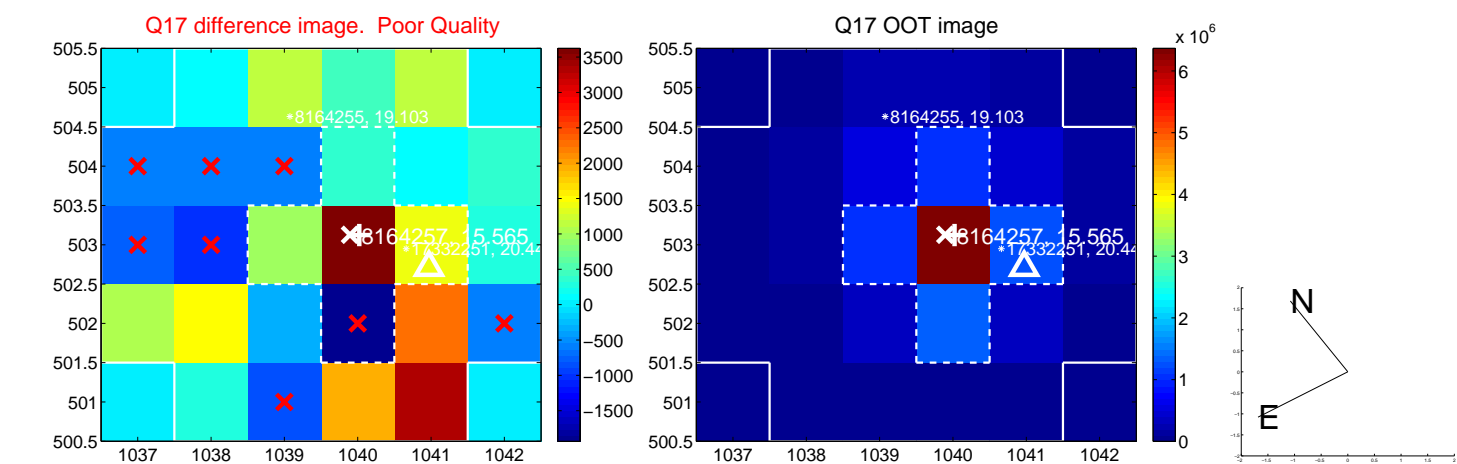
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



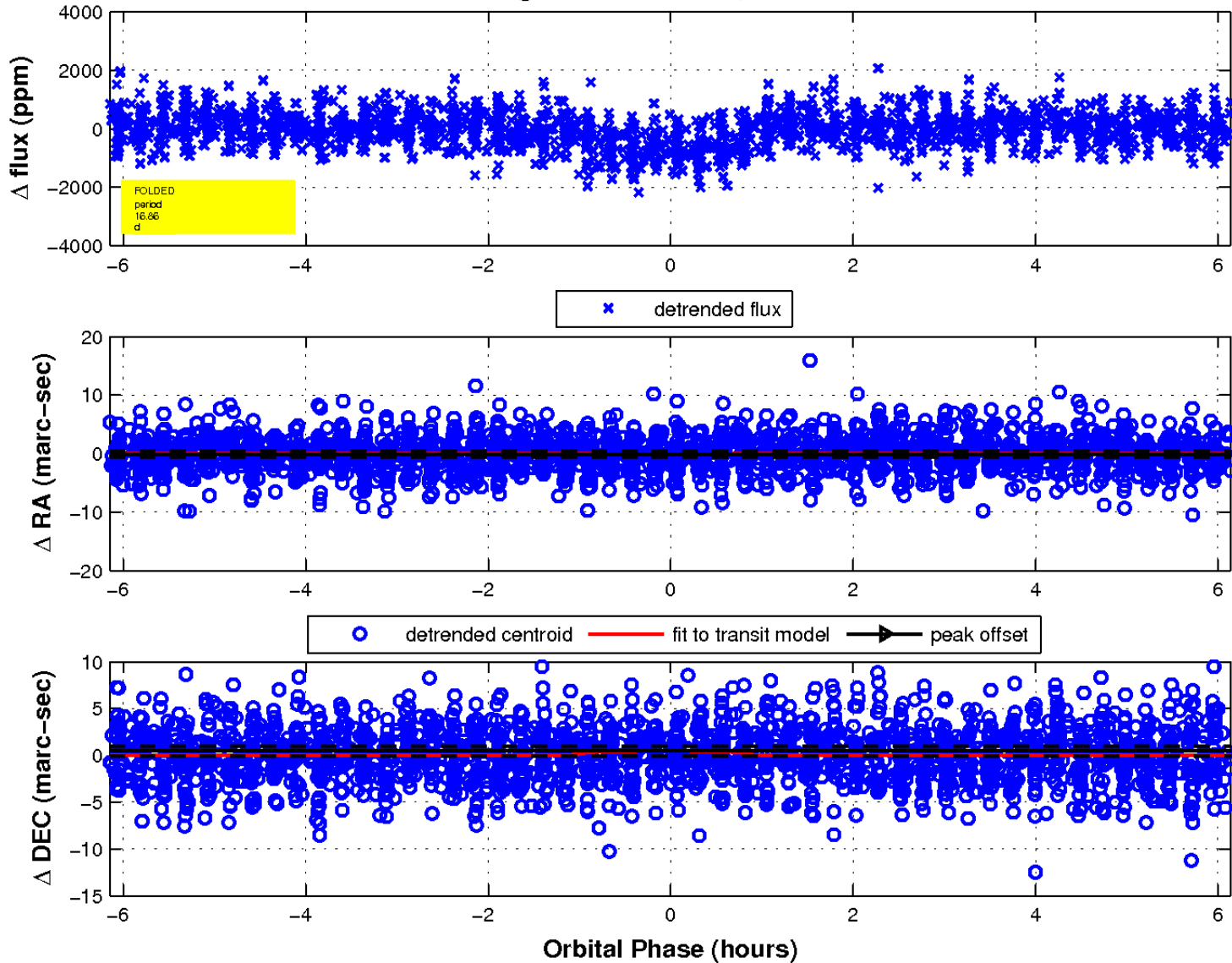
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 3 of 3



UKIRT Image

Declination

