

KIC 009455556

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})
009455556-01	OBS	1396.01	6.626433	137.602565	830.1	3.324	32.7	35.8	0.90	5616	2.88	151.83
009455556-02	OBS	1396.02	3.701191	132.162220	321.2	2.696	15.1	16.9	0.90	5616	1.91	330.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009455556-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009455556-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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.

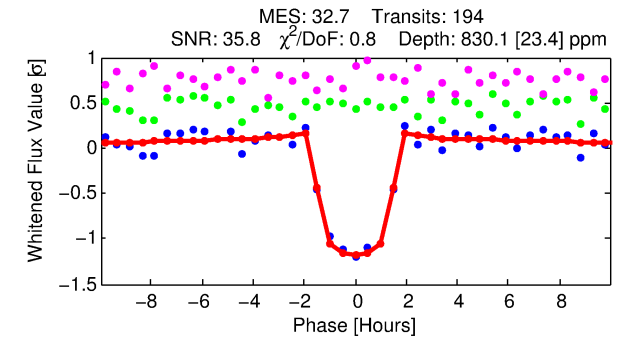
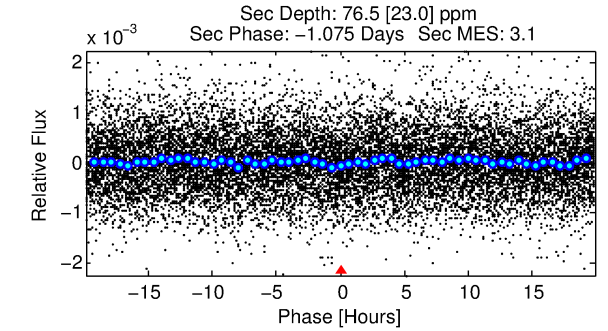
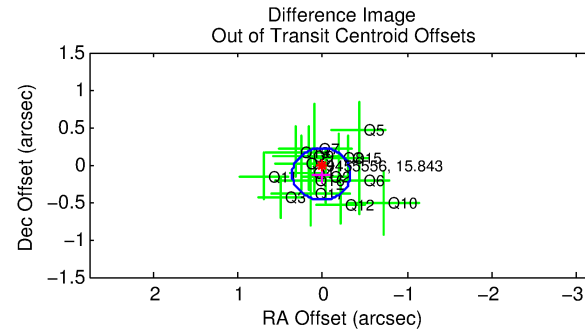
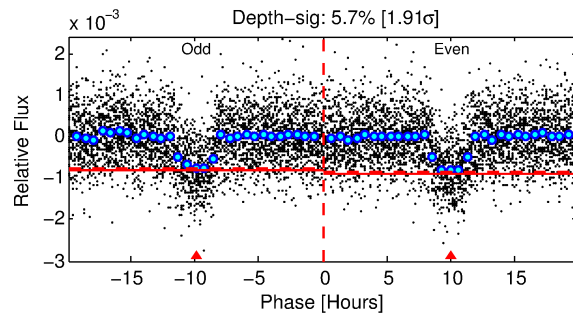
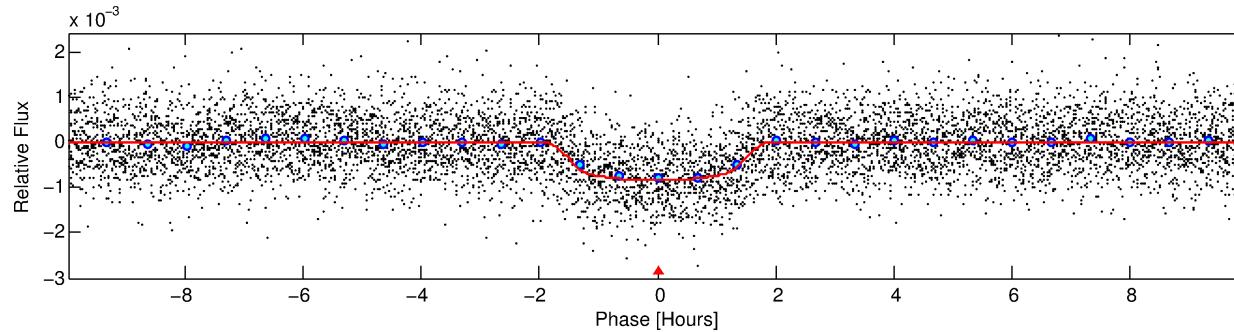
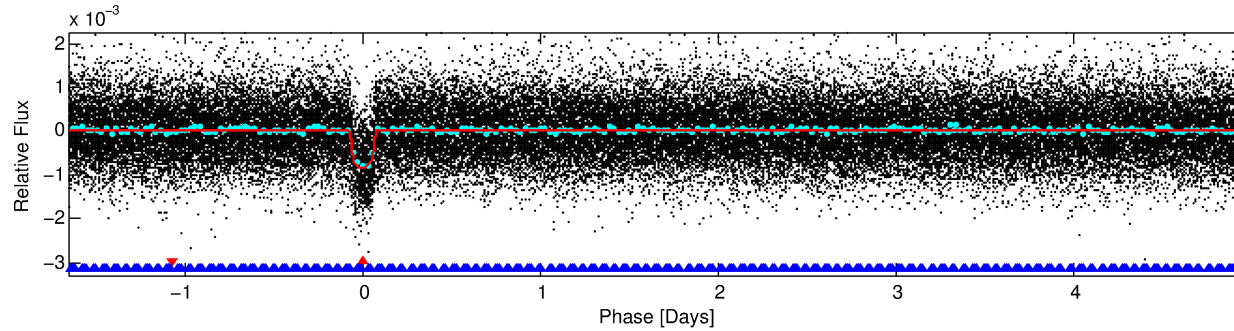
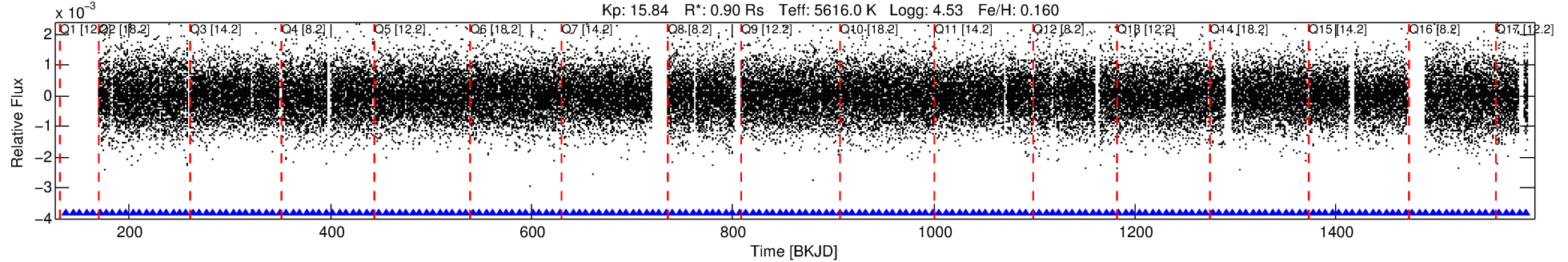
Ephemeris Match Information For 009455556-01

No Significant Match Found

DV One-Page Summary

KIC: 9455556 Candidate: 1 of 2 Period: 6.626 d
KOI: K01396.01 Name: Kepler-294c Corr: 0.982

Kp: 15.84 R*: 0.90 Rs Teff: 5616.0 K Logg: 4.53 Fe/H: 0.160



DV Fit Results:

Period = 6.62643 [0.00001] d
Epoch = 137.6026 [0.0017] BKJD
Rp/R* = 0.0292 [0.0056]
a/R* = 10.17 [7.95]
b = 0.79 [0.39]
Seff = 151.83 [28.23]
Teq = 895 [42] K
Rp = 2.88 [0.65] Re
a = 0.0692 [0.0078] AU
Ag = 24.35 [12.59] [1.85σ]
Teffp = 3074 [376] K [5.75σ]

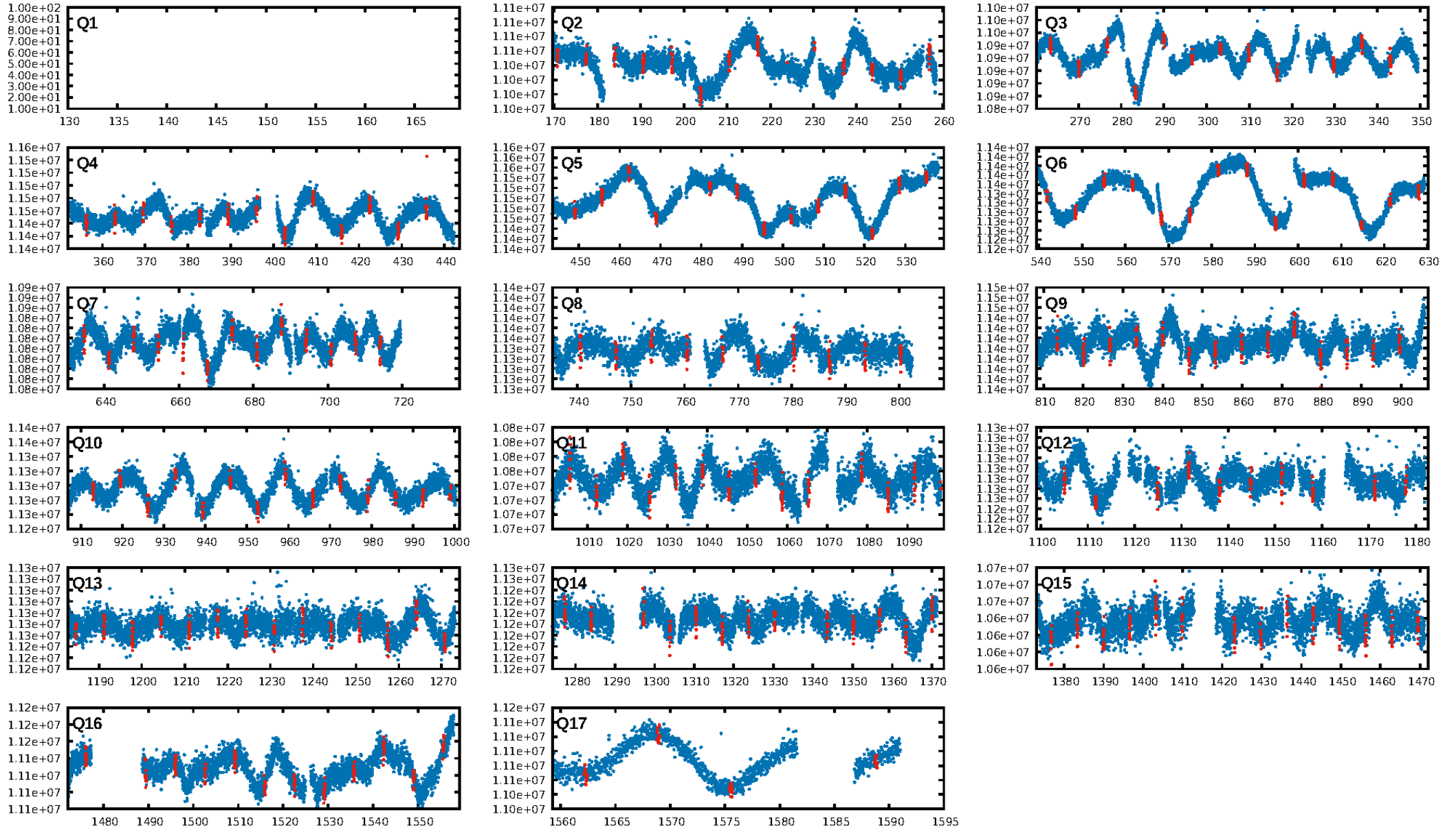
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [16.40σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.24e-220
RollingBand-fgt: 1.00 [190/190]
GhostDiagnostic-chr: 8.589
Centroid-sig: 3.0%
Centroid-so: 0.891 arcsec [2.47σ]
OotOffset-rm: 0.127 arcsec [1.10σ]
KicOffset-rm: 0.287 arcsec [2.54σ]
OotOffset-st: 4/4/4/4 [16]
KicOffset-st: 4/4/4/4 [16]
DiffImageQuality-fgm: 1.00 [16/16]
DiffImageOverlap-fno: 1.00 [16/16]

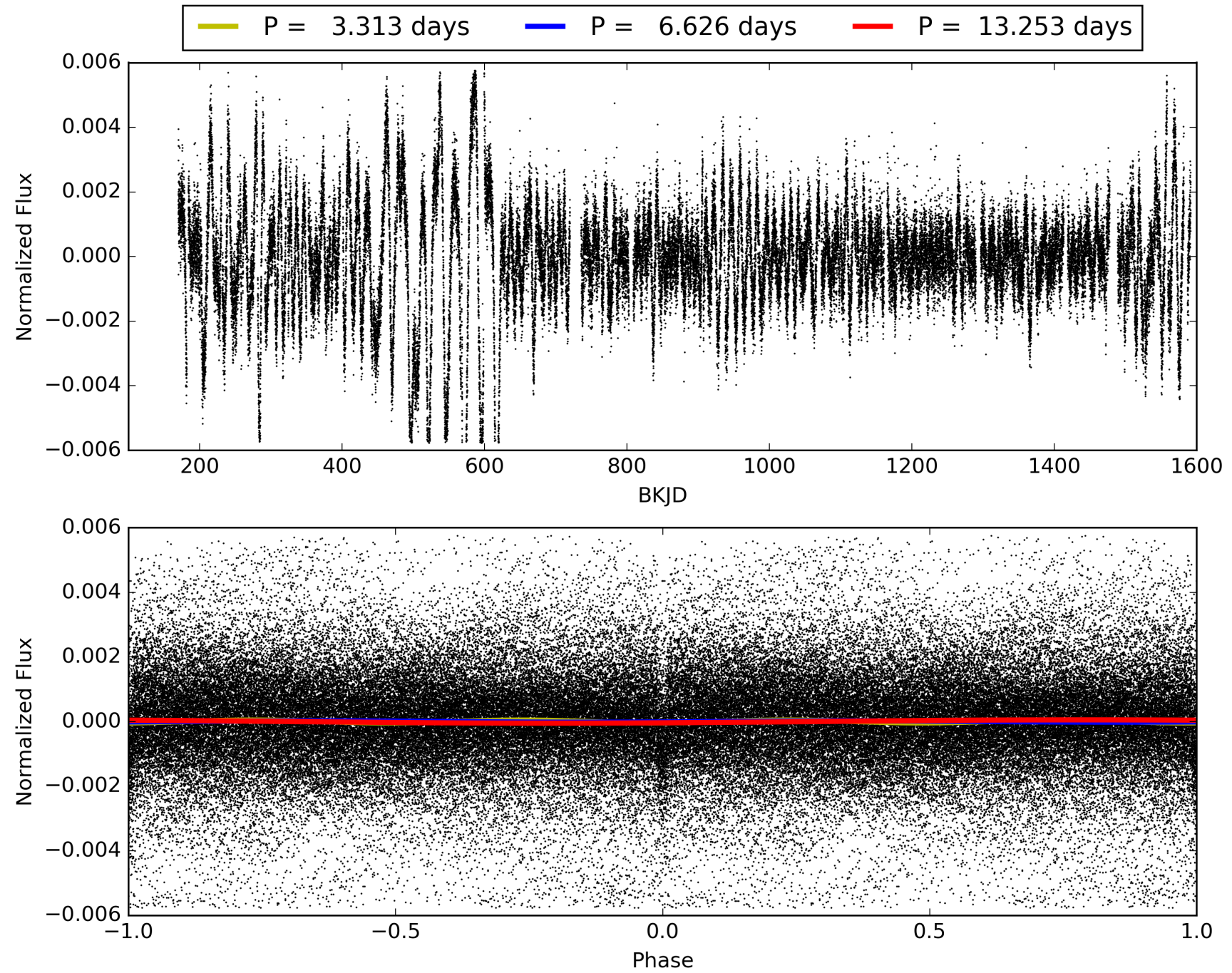
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 04:11:41 Z

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

TCE 00945556-01, PDC Light Curves

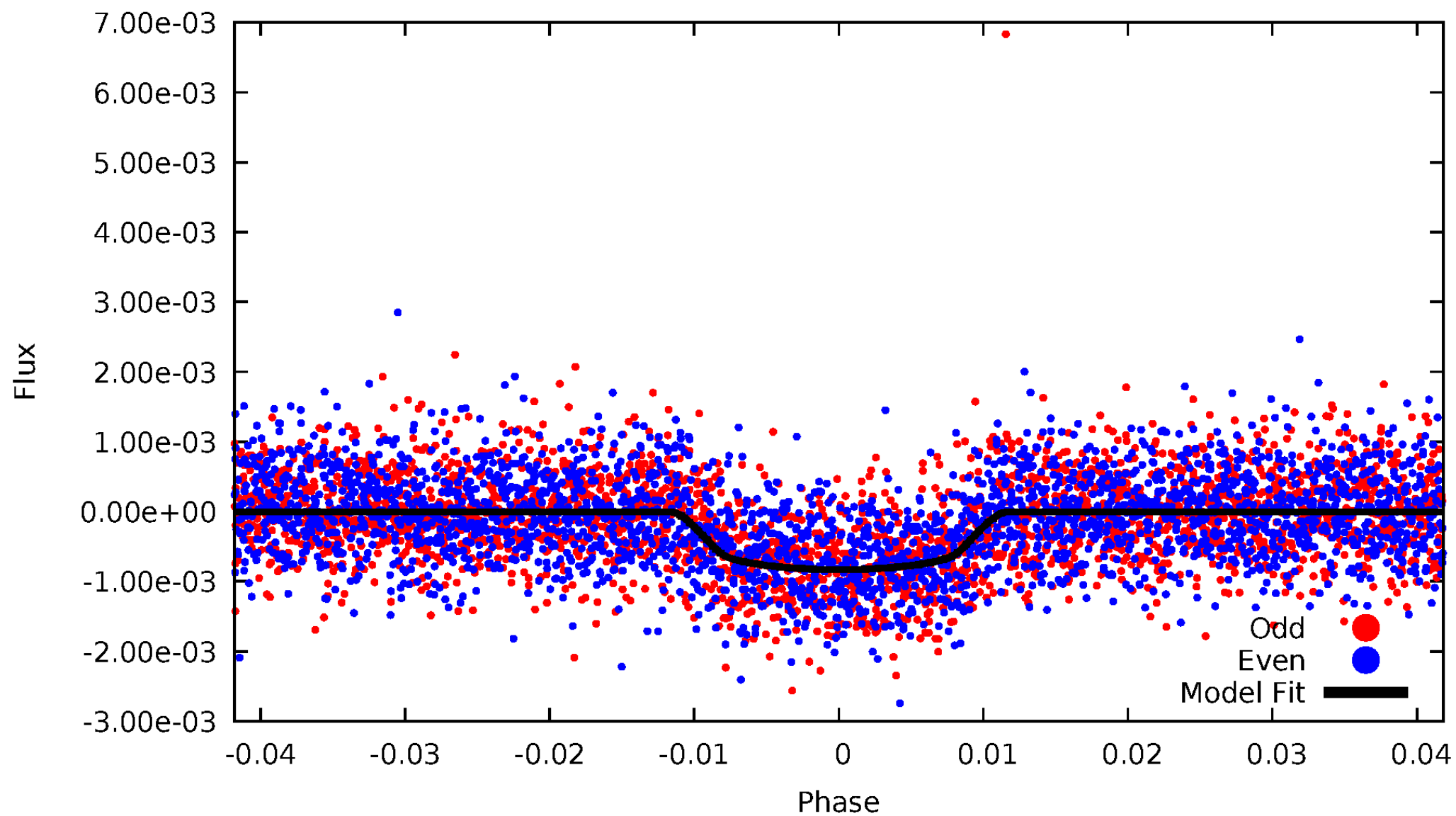


TCE 009455556-01



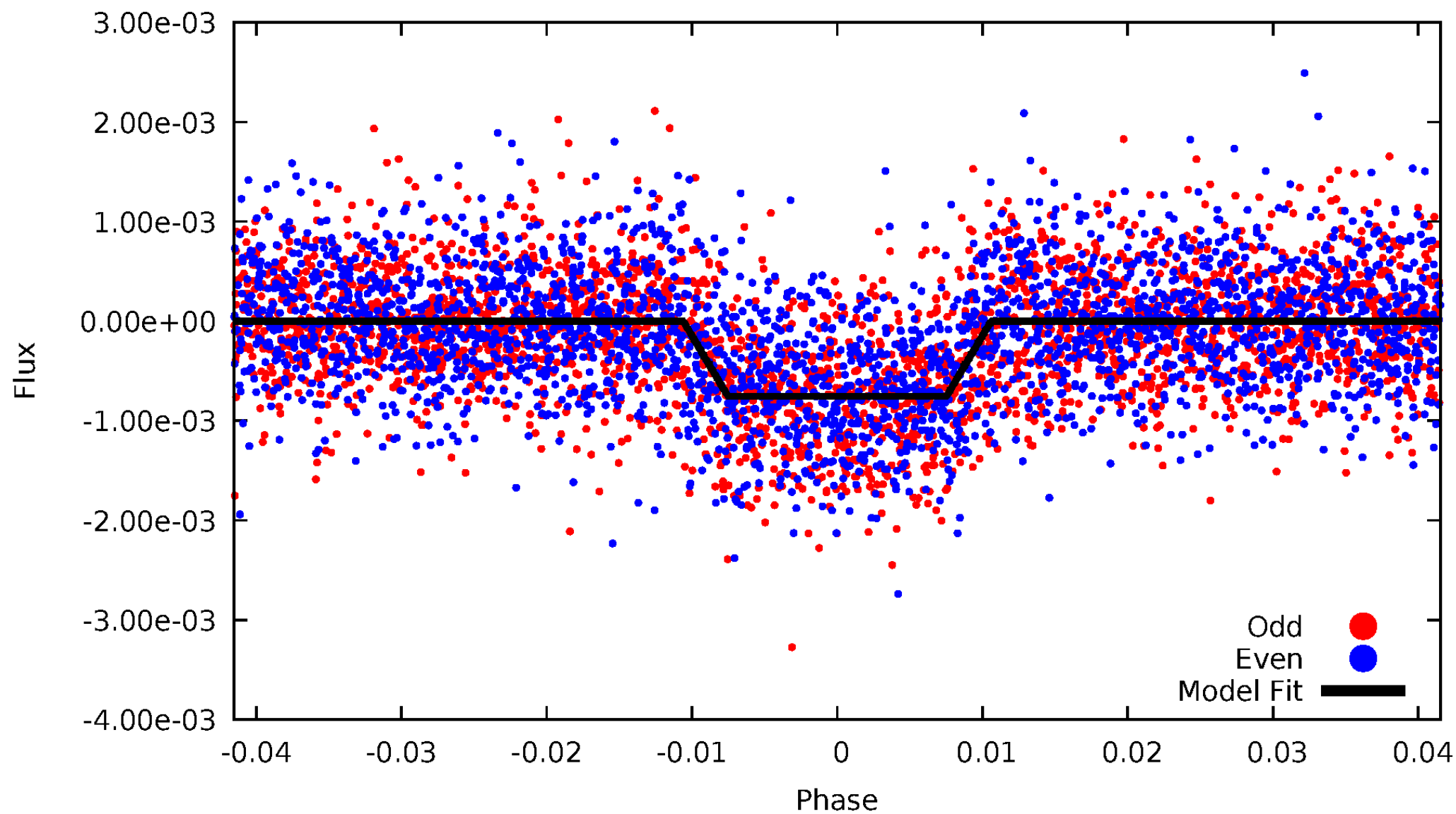
DV Odd/Even

TCE 009455556-01



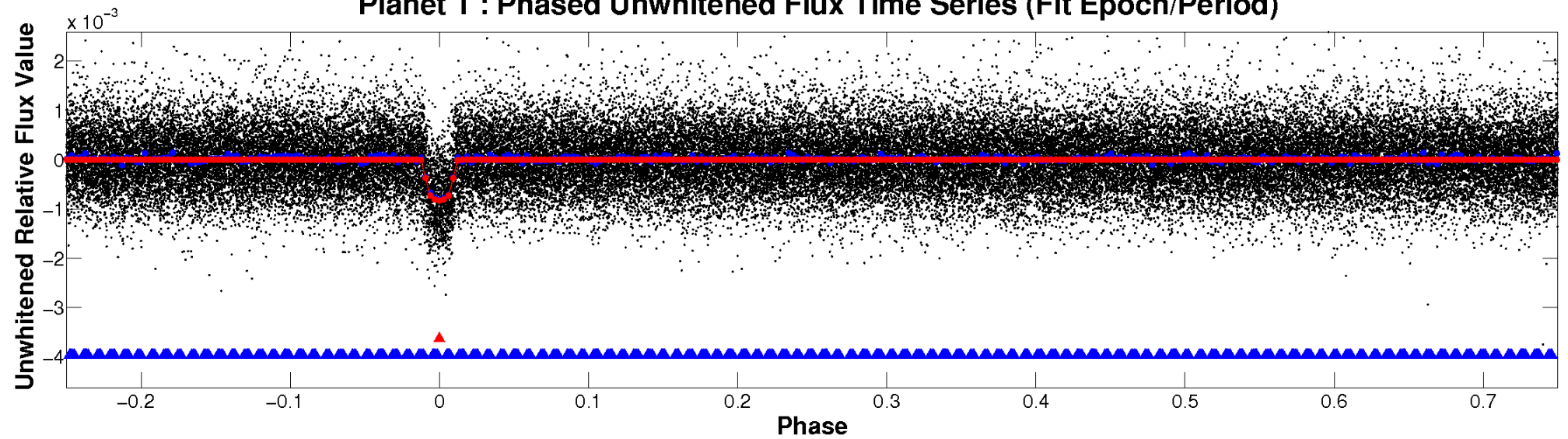
ALT Odd/Even

TCE 00945556-01

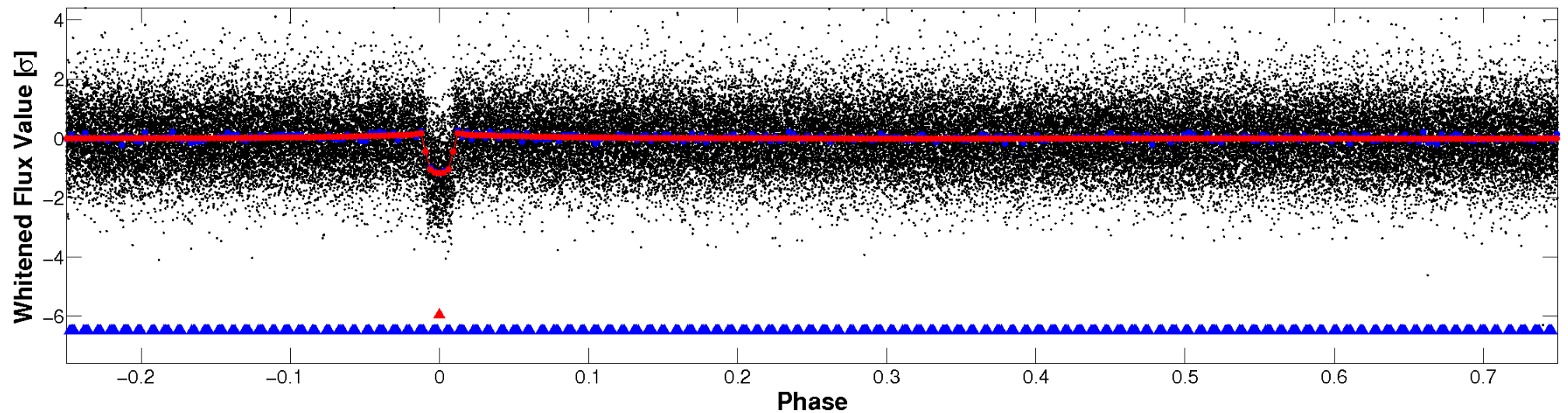


Non-Whitened Vs. Whitened Light Curve

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

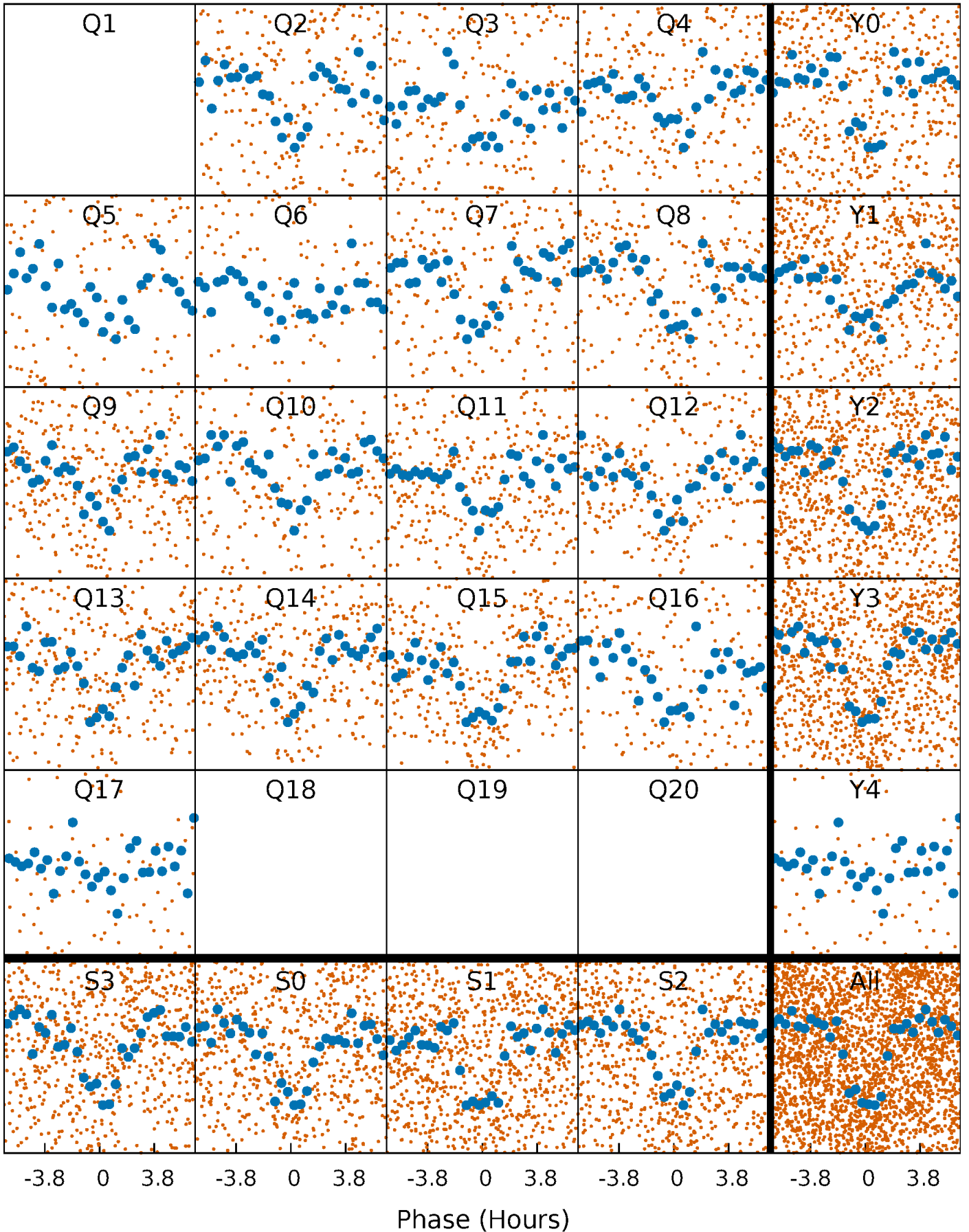


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



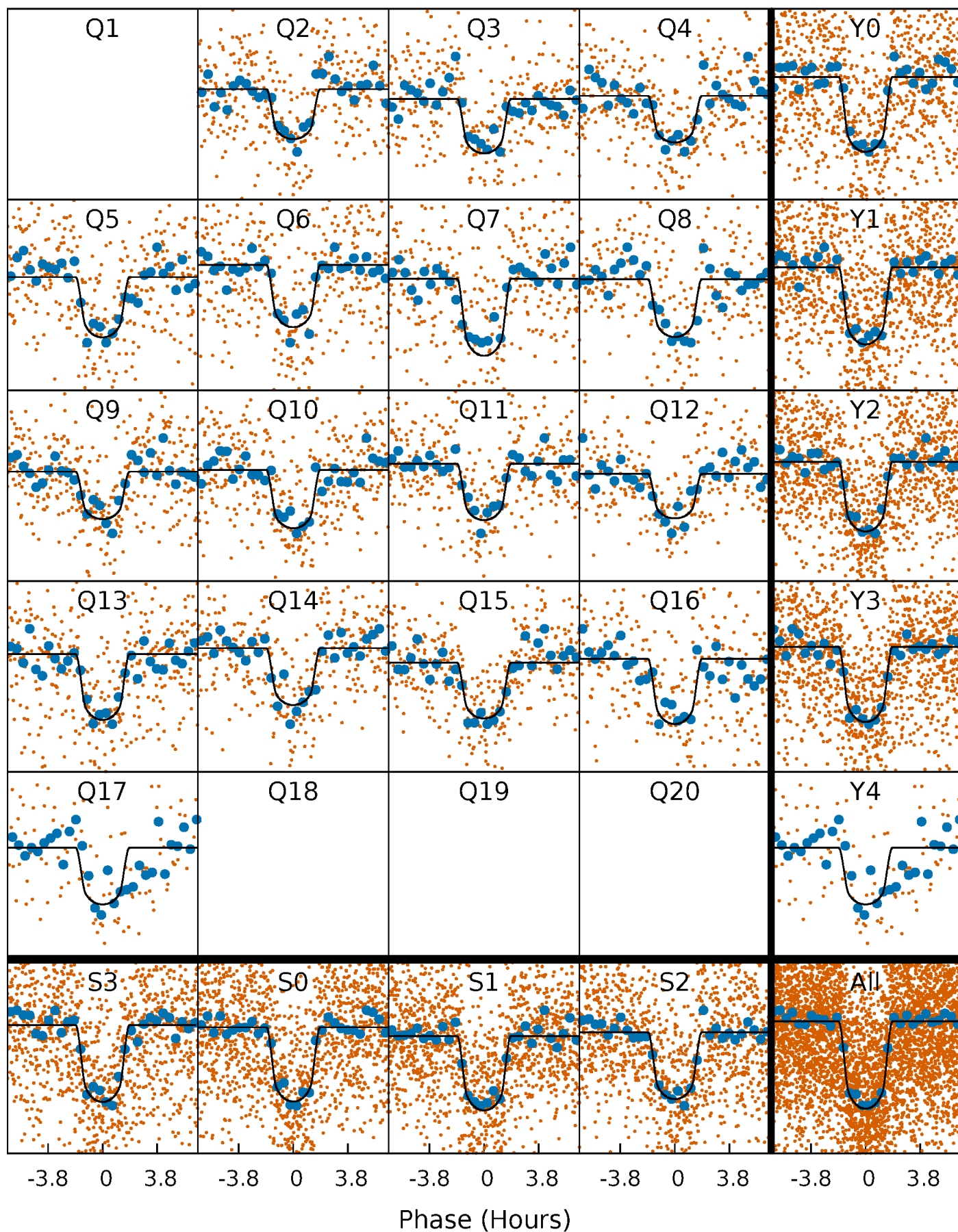
PDC Quarter-Phased Transit Curves

TCE 009455556-01 P= 6.626433 Days $T_0=137.602565$ (BKJD)



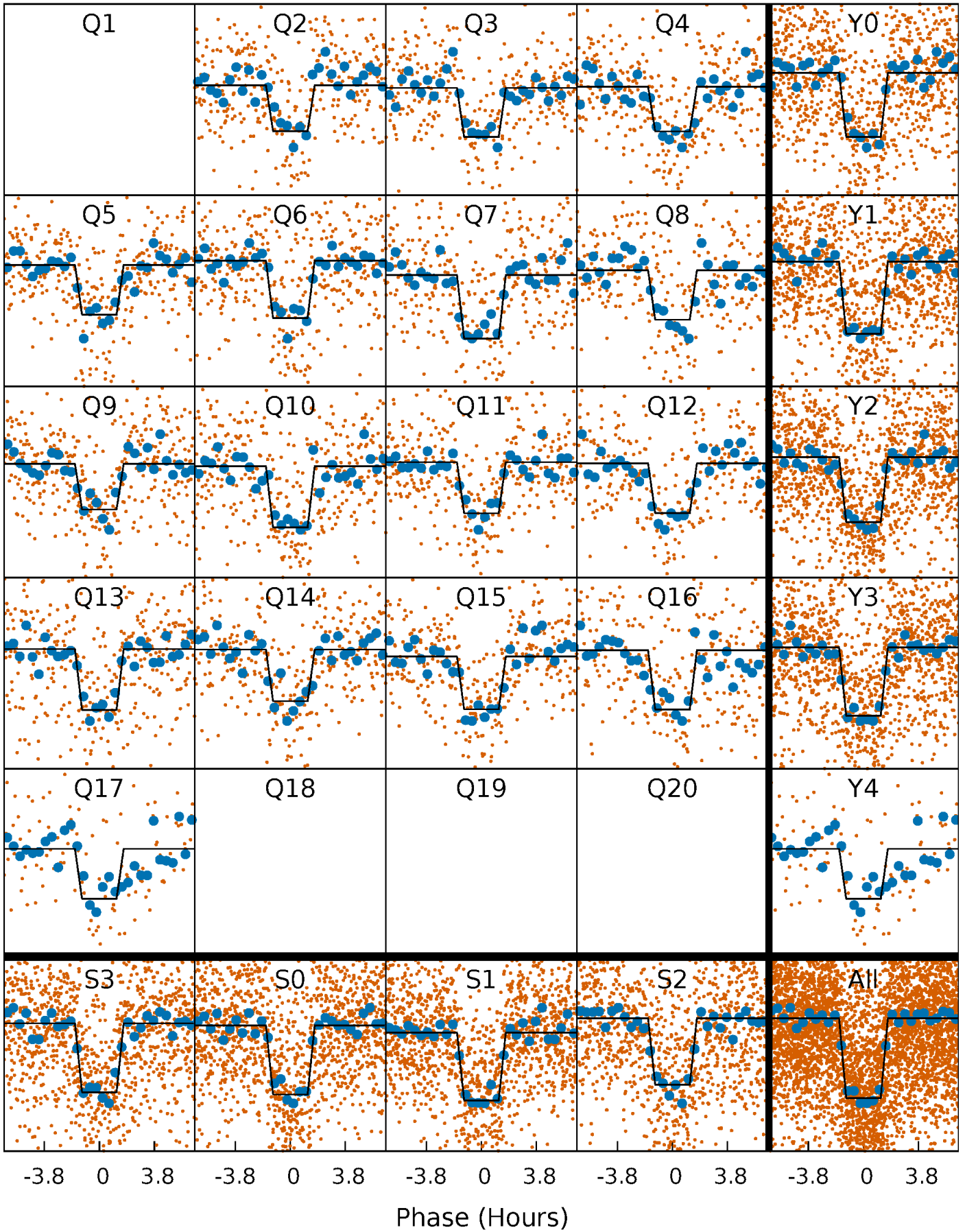
DV Quarter-Phased Transit Curves

TCE 009455556-01 P= 6.626433 Days $T_0=137.602565$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

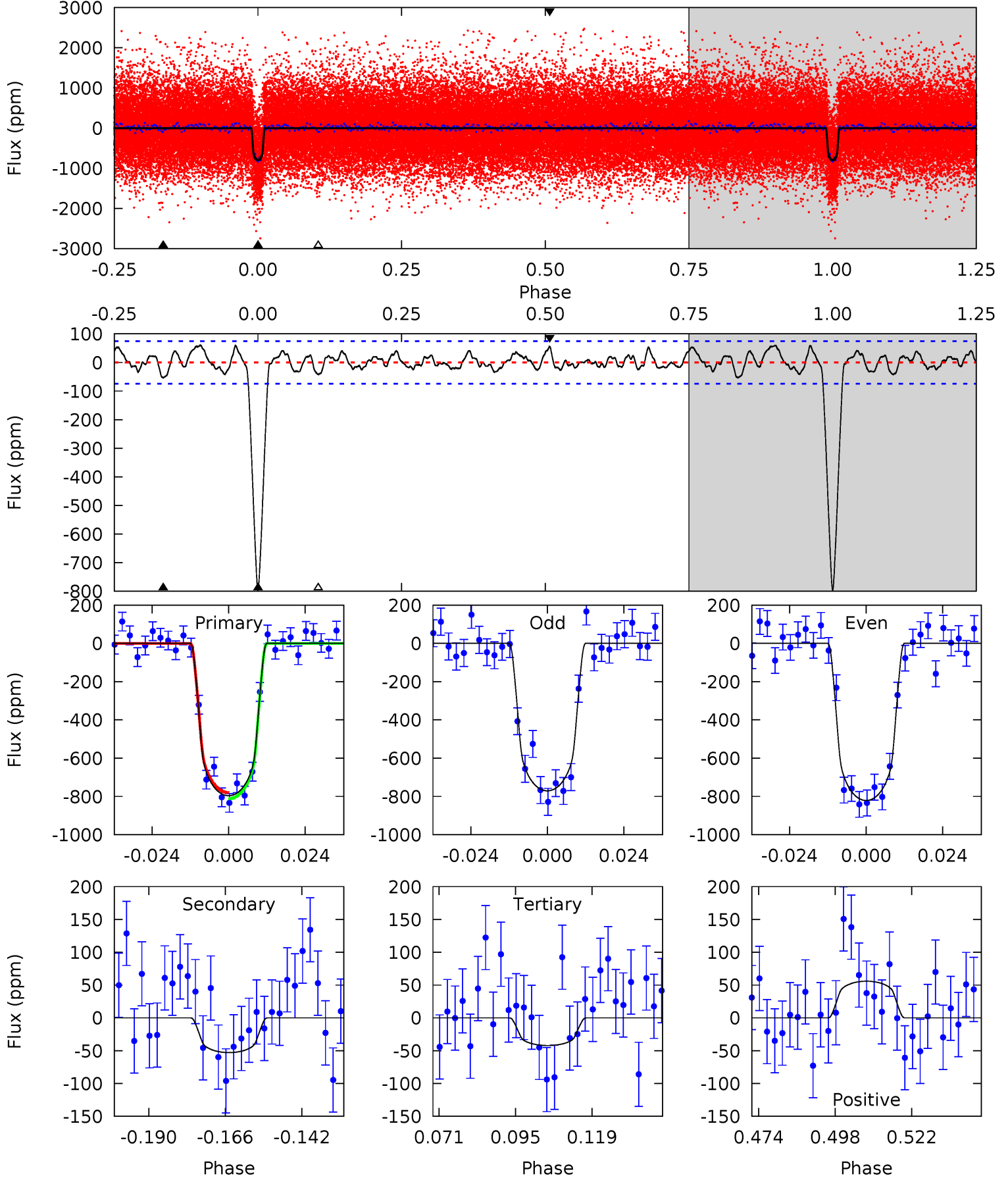
TCE 009455556-01 P= 6.626460 Days $T_0=137.599643$ (BKJD)



DV Model-Shift Uniqueness Test

009455556-01, P = 6.626433 Days, E = 137.602565 Days

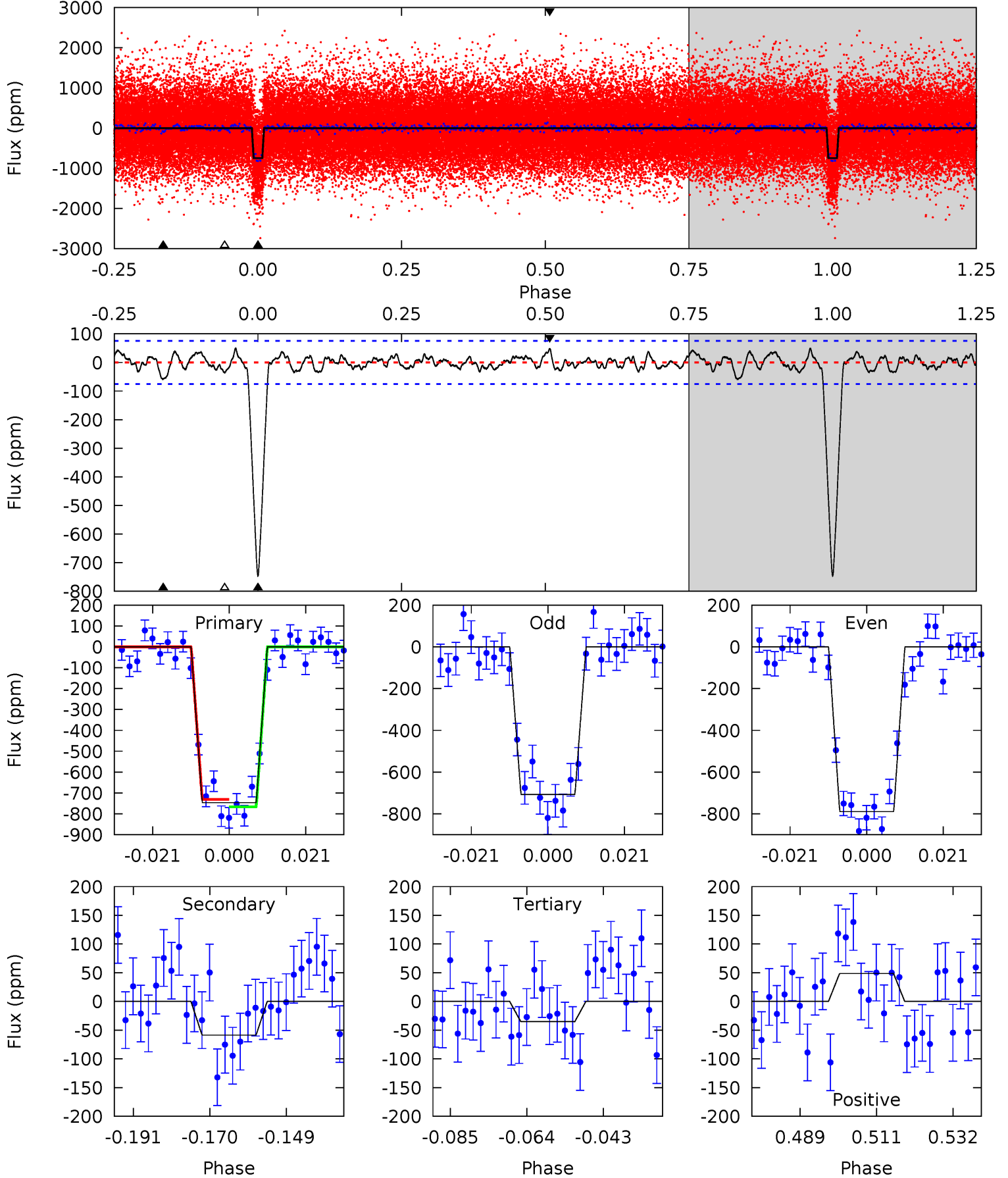
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
52.1	3.46	2.76	3.66	4.86	2.26	1.43	49.4	48.5	0.71	-0.19	1.66	0.99	0.07	1.07



Alt Model-Shift Uniqueness Test

009455556-01, P = 6.626460 Days, E = 137.599643 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
48.2	3.78	2.27	3.14	4.88	2.30	1.13	45.9	45.1	1.51	0.64	2.65	0.99	0.06	1.18



Stellar Parameters For KIC 009455556

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	5616^{+76}_{-84}	$4.529^{+0.018}_{-0.102}$	$0.160^{+0.150}_{-0.150}$	$0.903^{+0.109}_{-0.043}$	$1.006^{+0.036}_{-0.078}$	$1.922^{+0.176}_{-0.570}$
	+1%/-1%	+0%/-2%	+94%/-94%	+12%/-5%	+4%/-8%	+9%/-30%
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 009455556-01 / KOI 1396.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-53 ± 15	$2.91^{+0.61}_{-0.58}$	1267^{+39}_{-26}	3328^{+282}_{-243}	16^{+11}_{-6}
Alt.	-59 ± 15	$2.75^{+0.60}_{-0.55}$	1265^{+40}_{-28}	3434^{+322}_{-238}	19^{+14}_{-7}

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 $A_{obs} \gg 1.0$

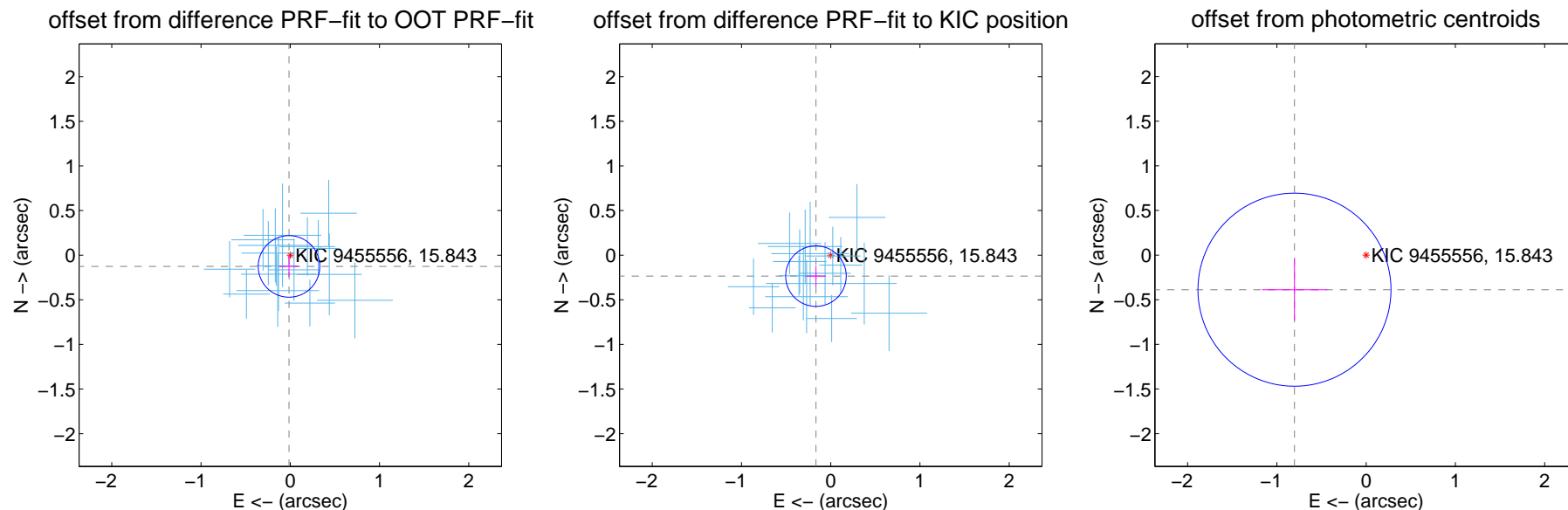
DV Centroid Data

Supplemental centroid analysis for 009455556-01. Kepler magnitude: 15.84. Transit SNR 35.79

There are 16 quarters with good PRF difference image offsets

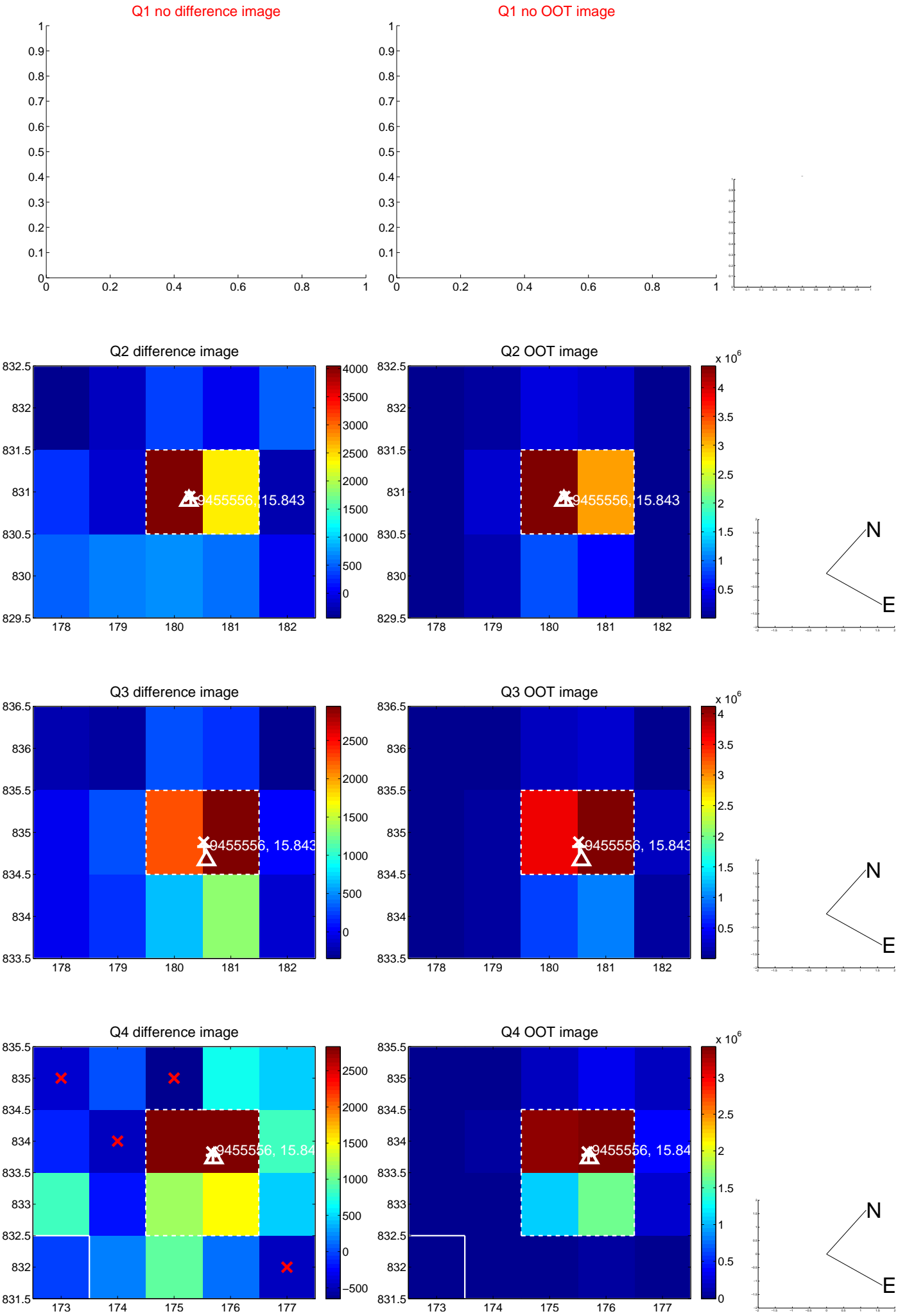
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.127 ± 0.115	1.10	0.014 ± 0.109	-0.126 ± 0.115
PRF-fit source offset from KIC position	0.287 ± 0.113	2.54	0.165 ± 0.109	-0.235 ± 0.115
photometric centroid source offset	0.89 ± 0.36	2.47	0.80 ± 0.36	-0.39 ± 0.34

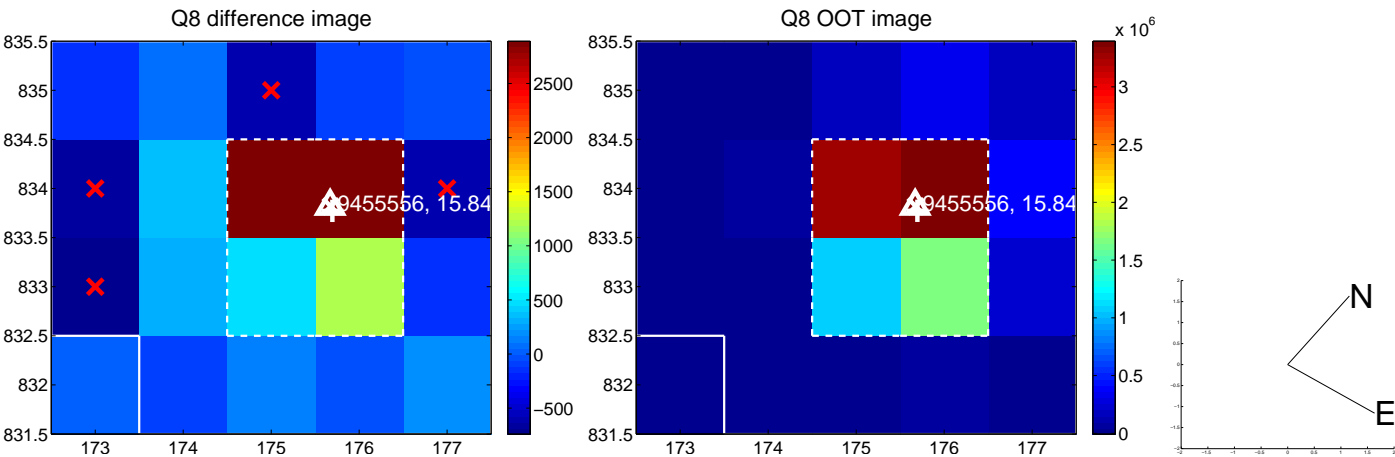
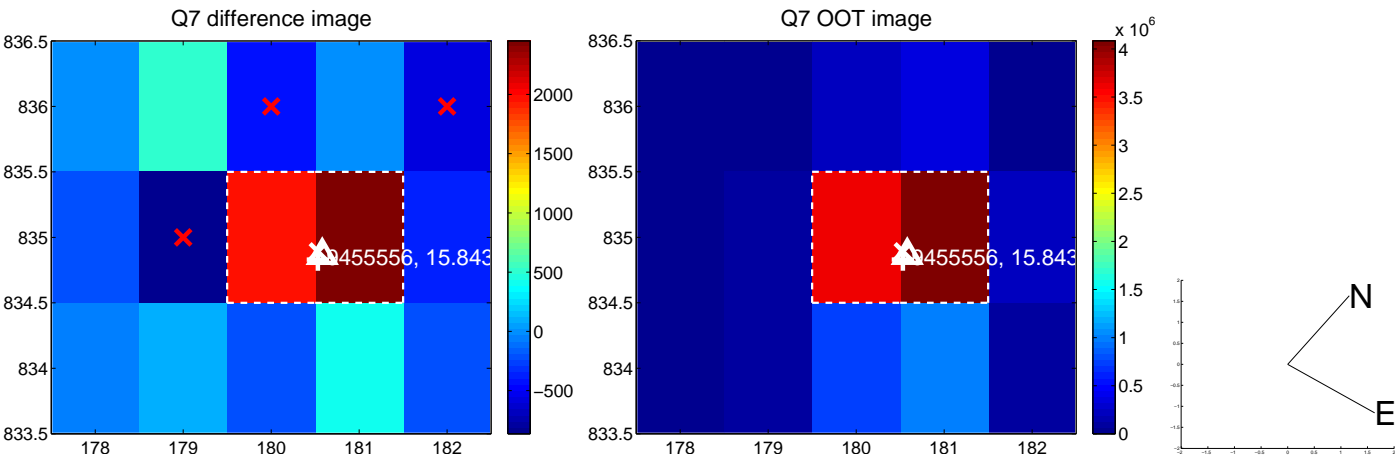
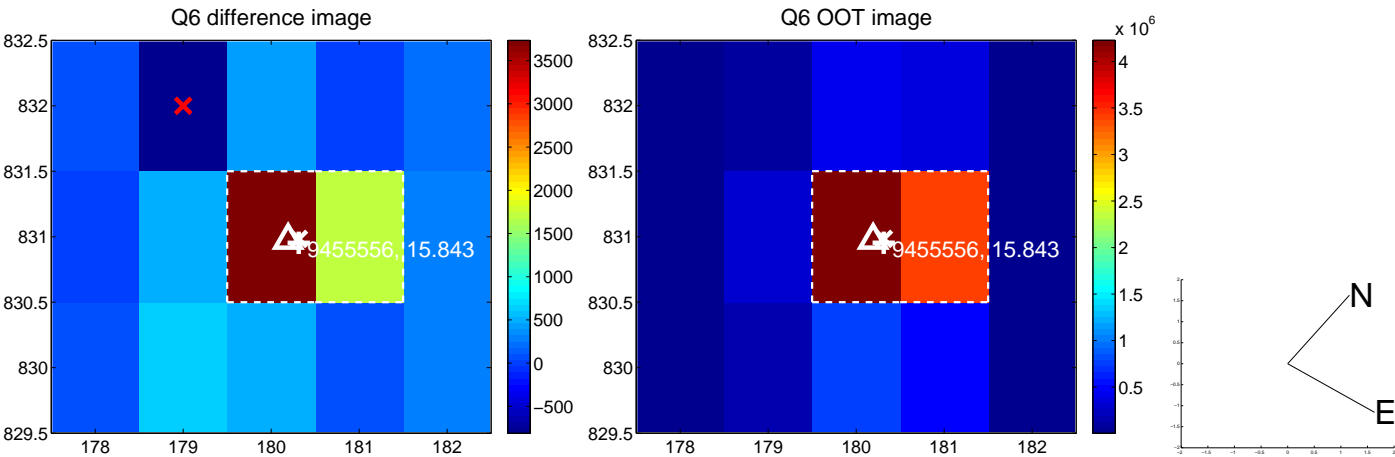
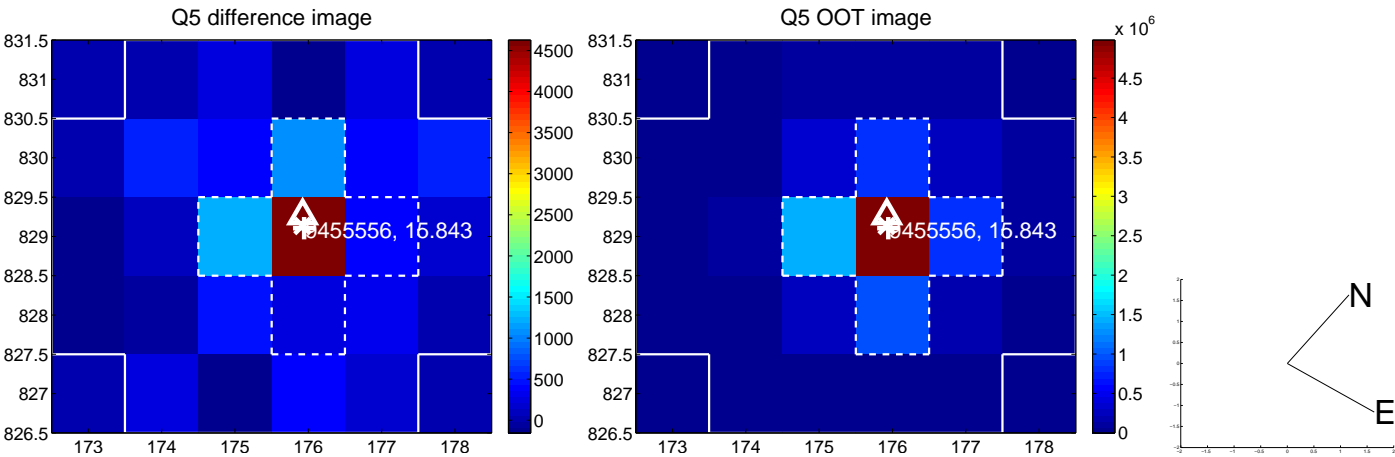


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

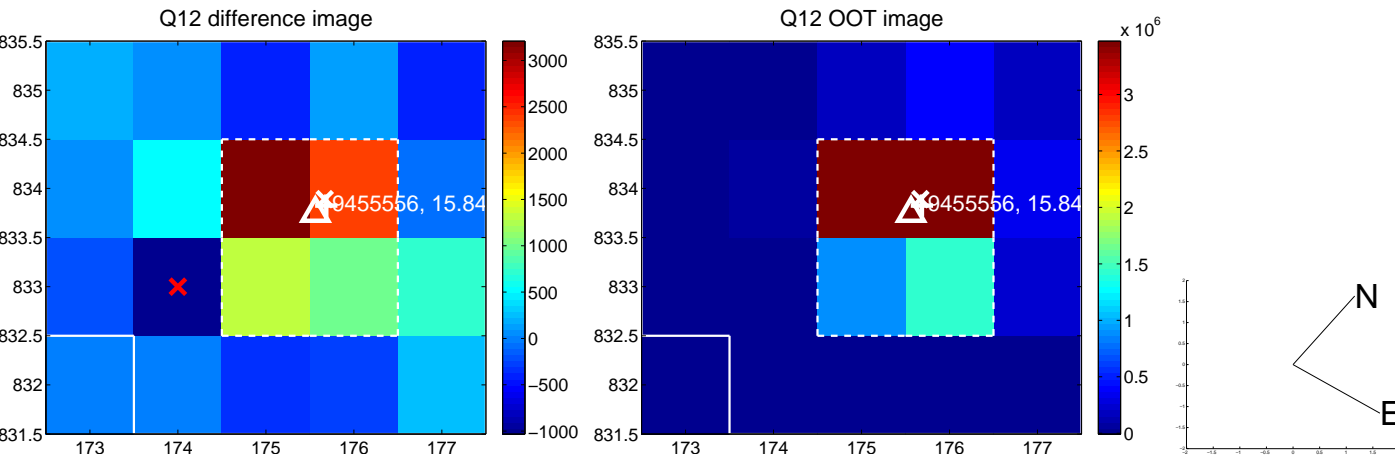
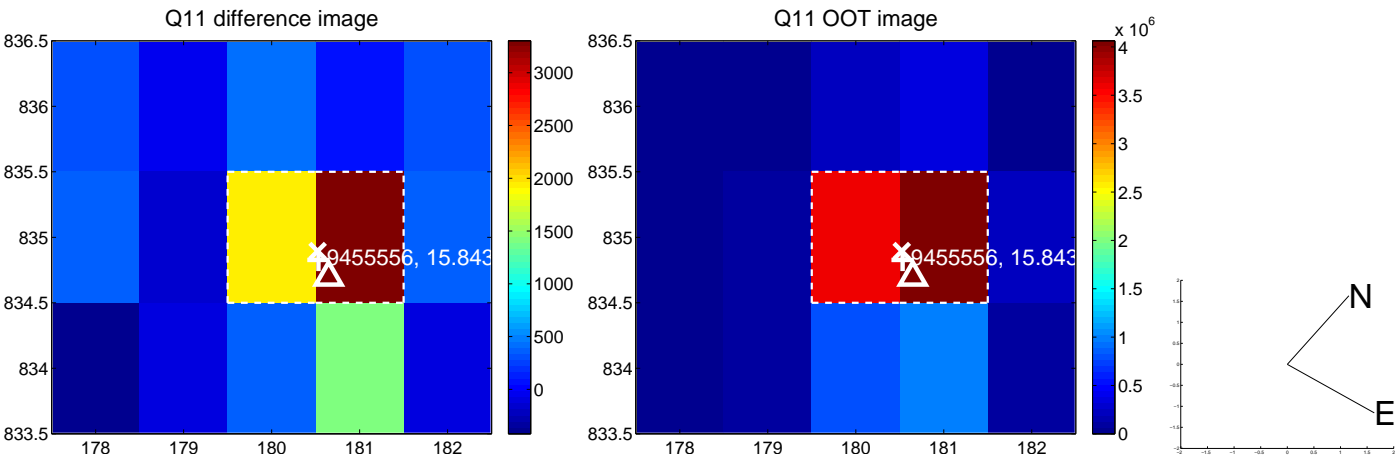
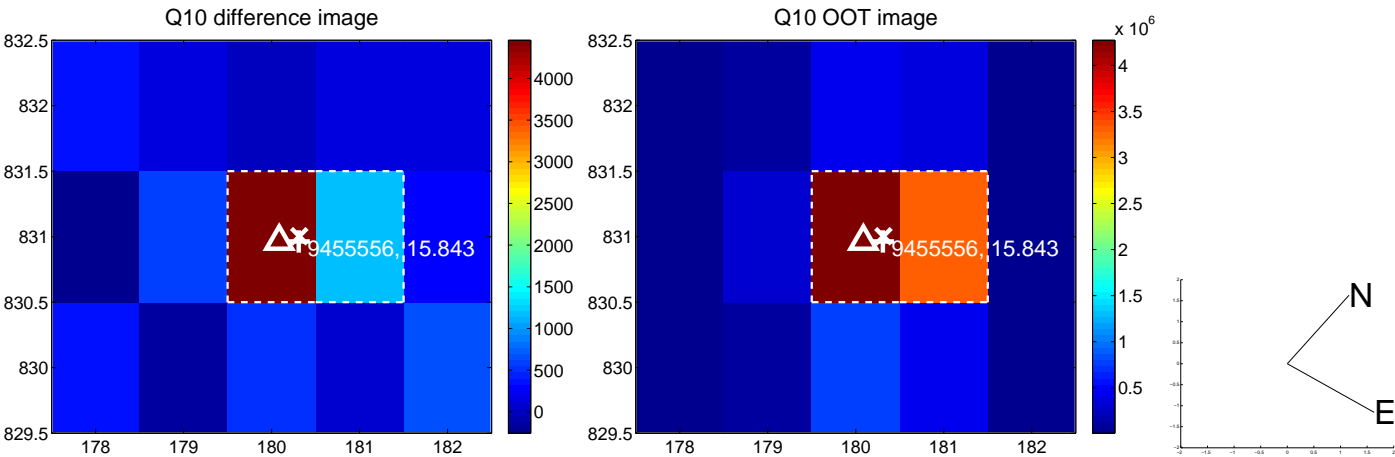
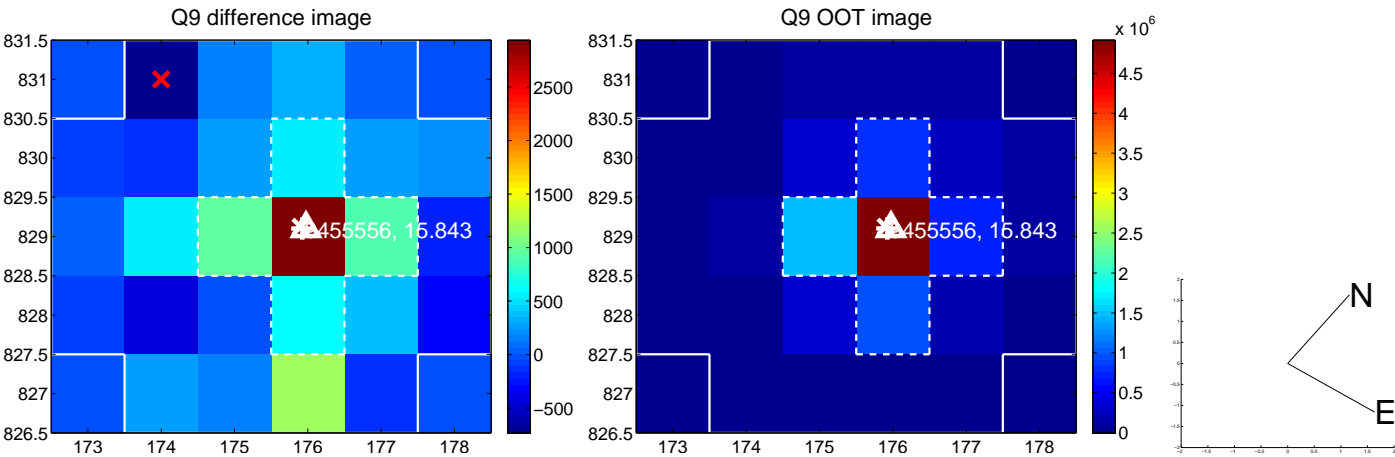
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



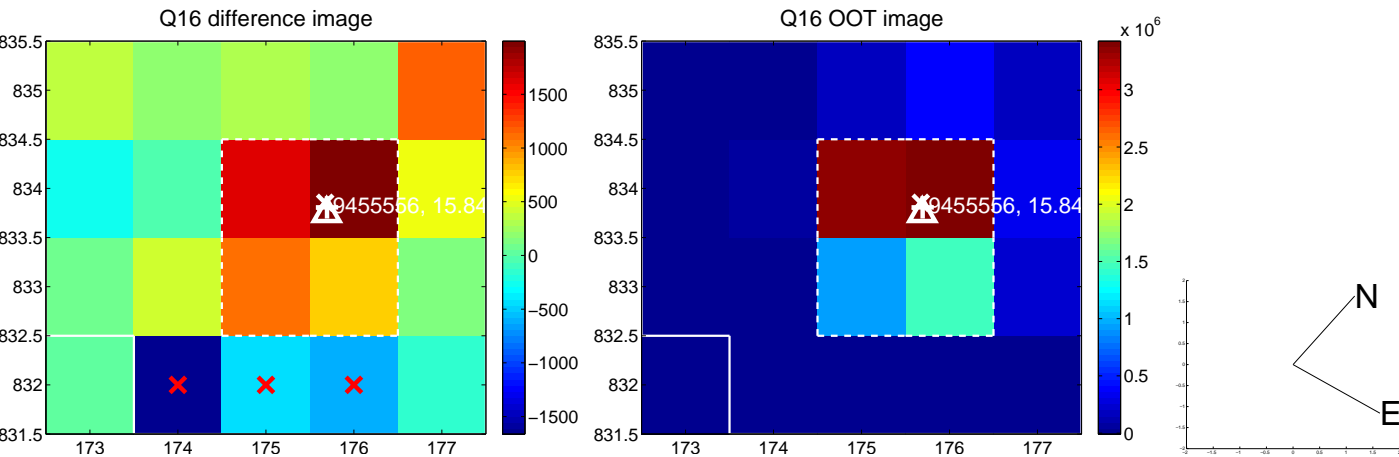
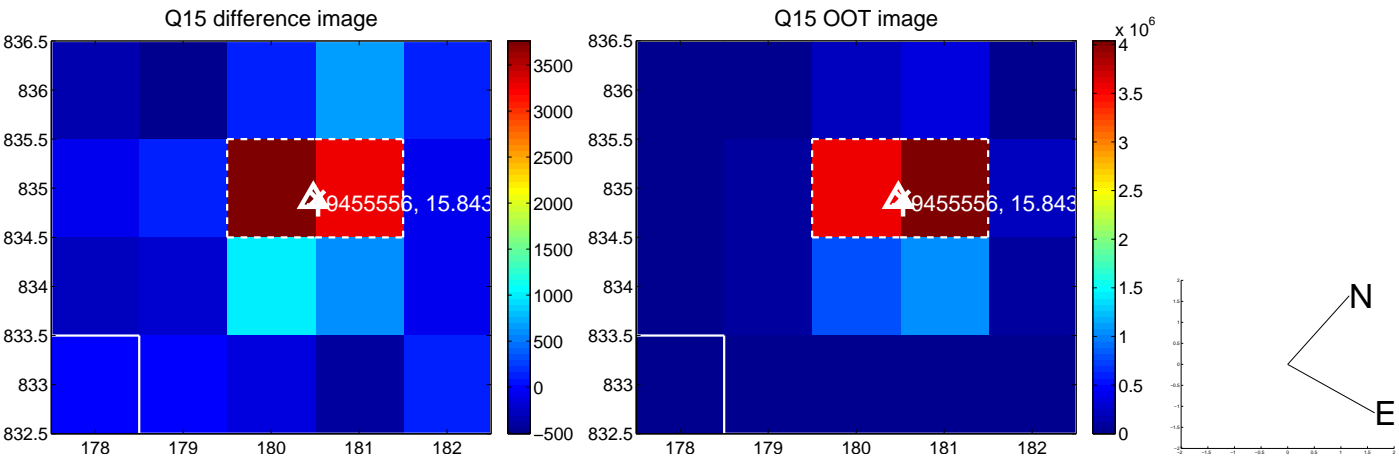
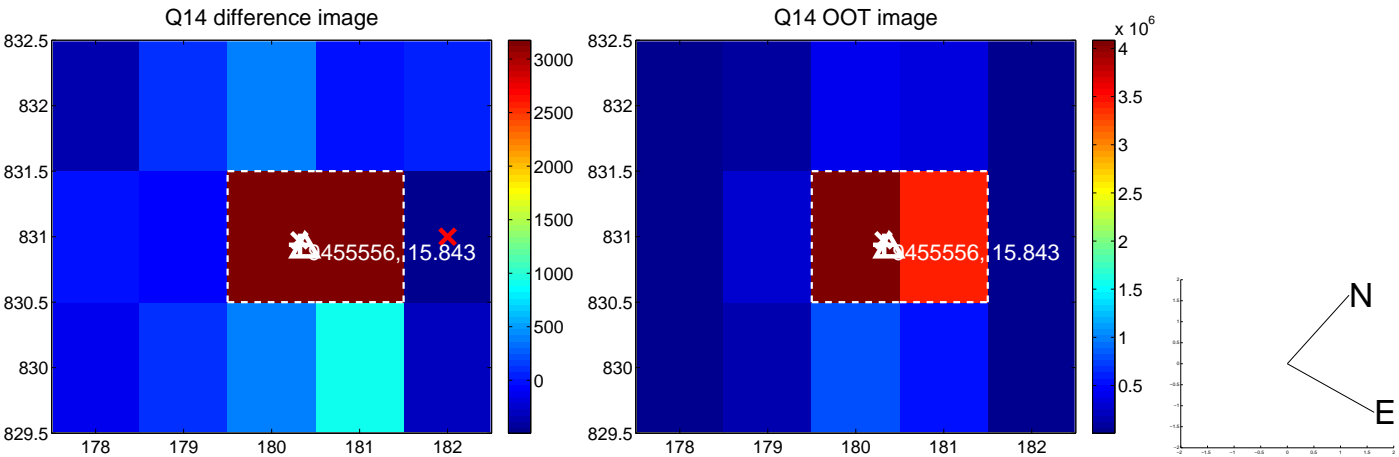
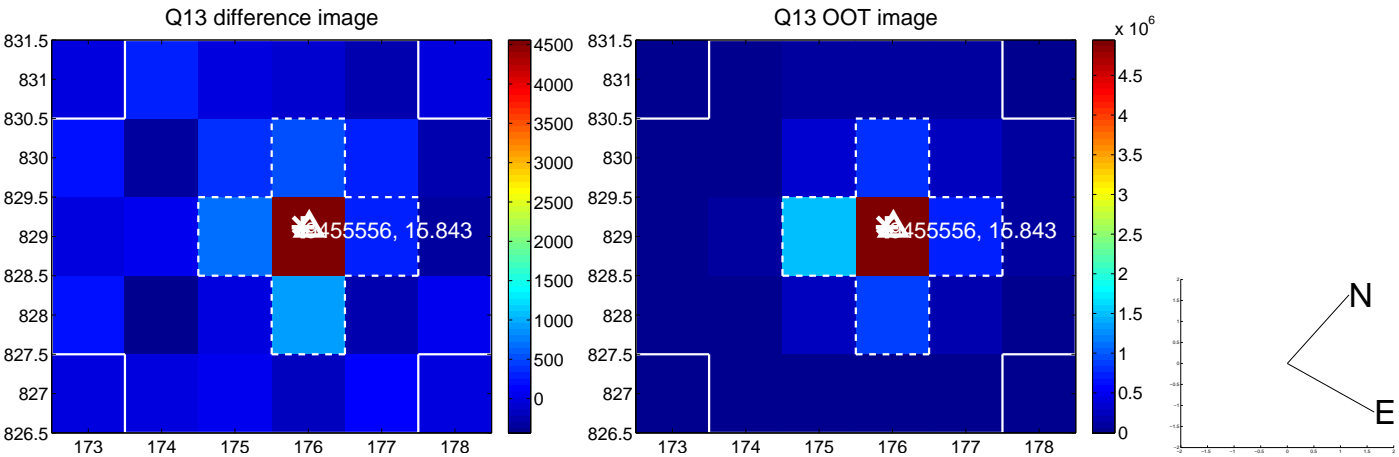
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



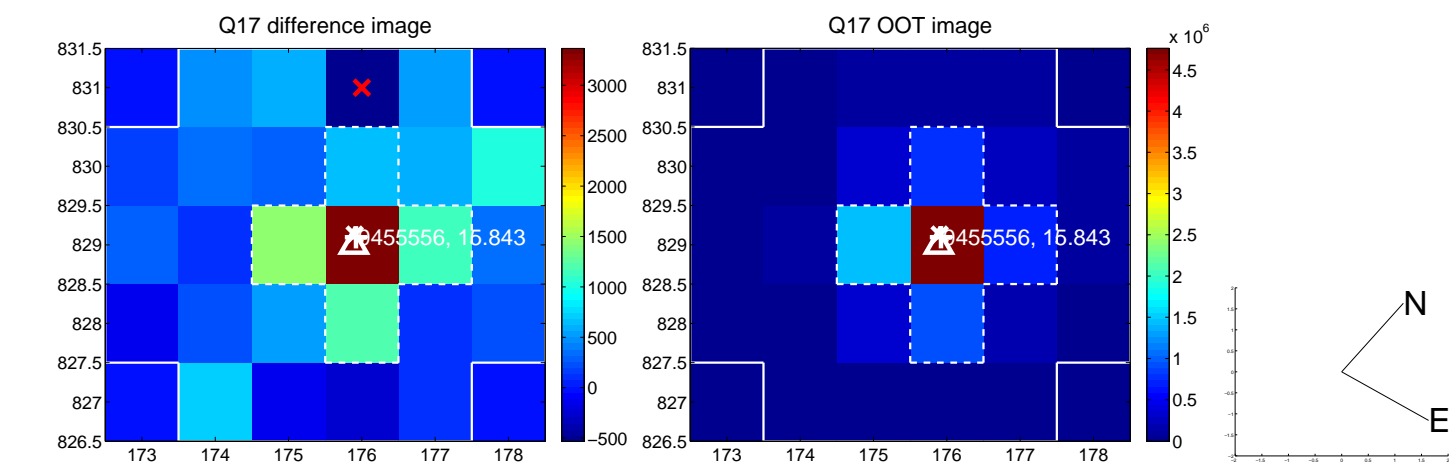
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



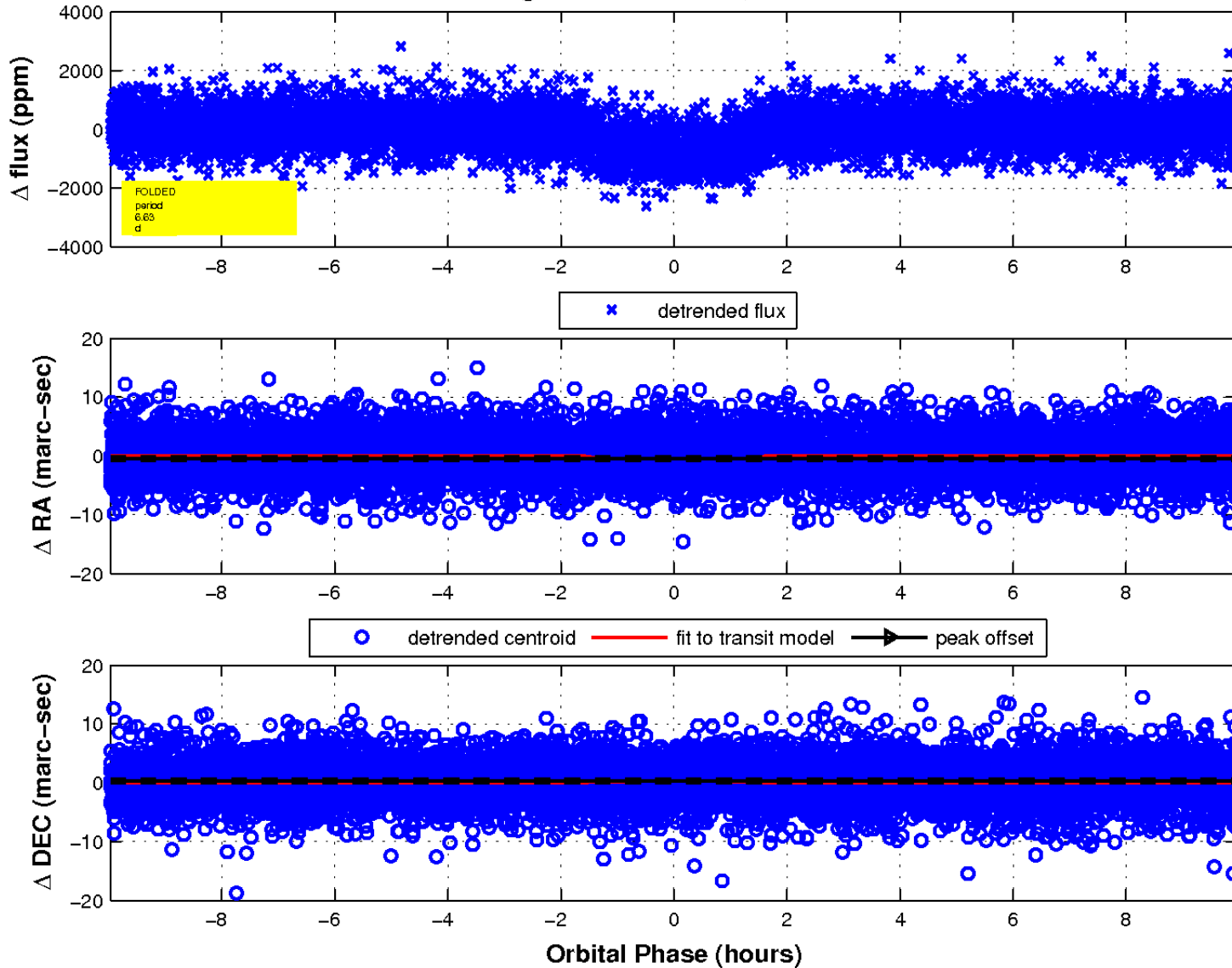
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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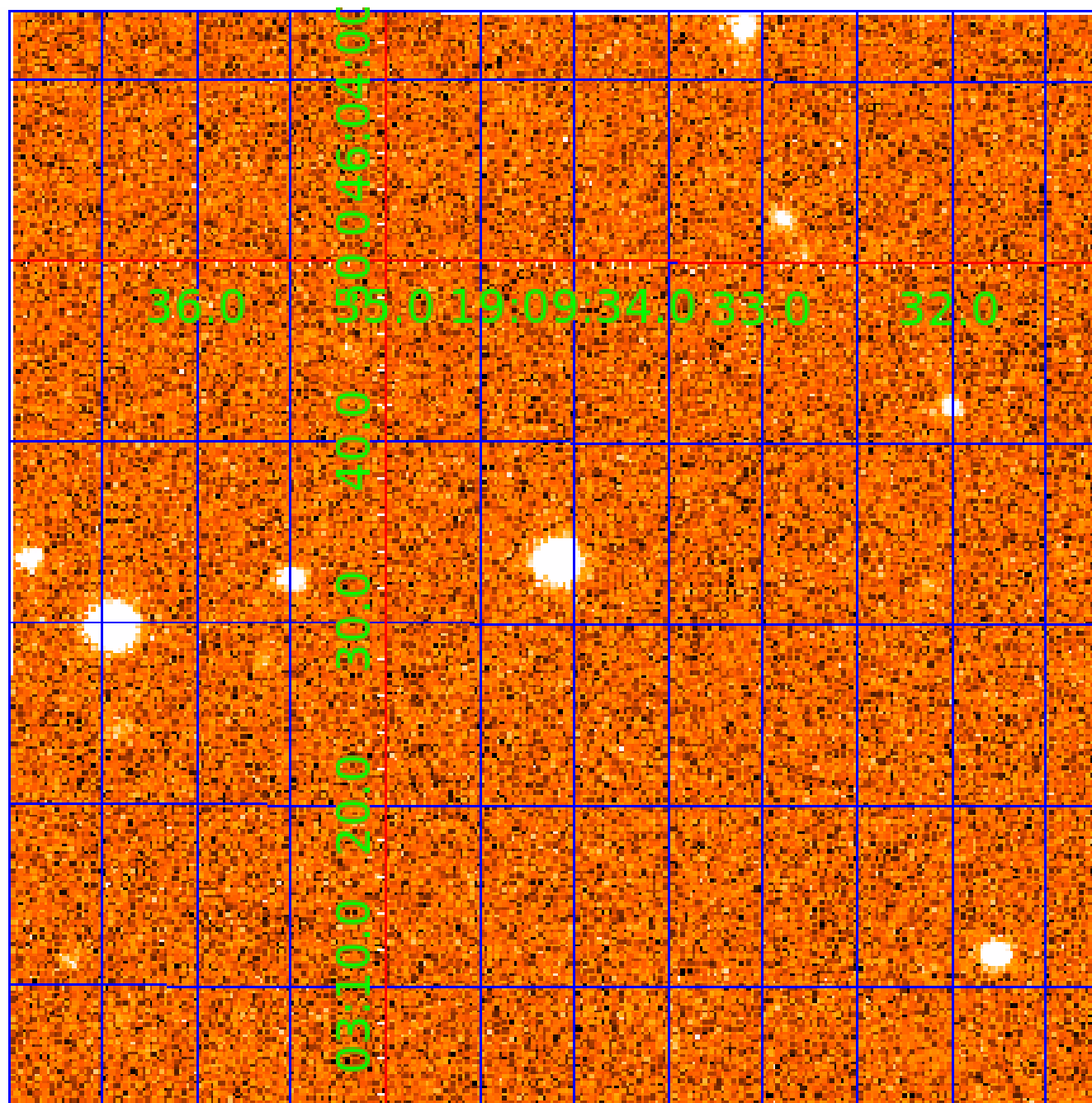


fluxWeightedCentroids, Planet 1 of 2



UKIRT Image

Declination



KIC 009455556

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})
009455556-01	OBS	1396.01	6.626433	137.602565	830.1	3.324	32.7	35.8	0.90	5616	2.88	151.83
009455556-02	OBS	1396.02	3.701191	132.162220	321.2	2.696	15.1	16.9	0.90	5616	1.91	330.07

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009455556-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009455556-02	OBS	PC	0.99	0	0	0	0	NO_COMMENT

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.

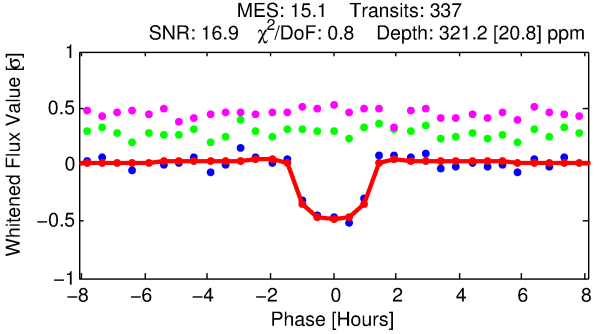
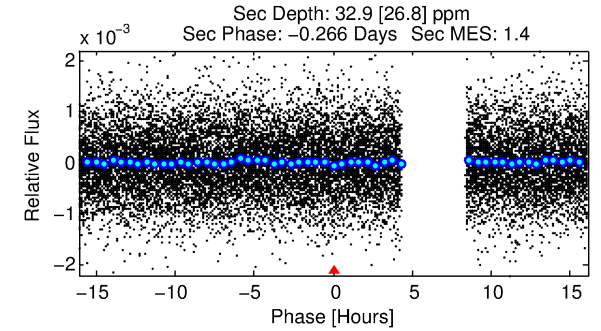
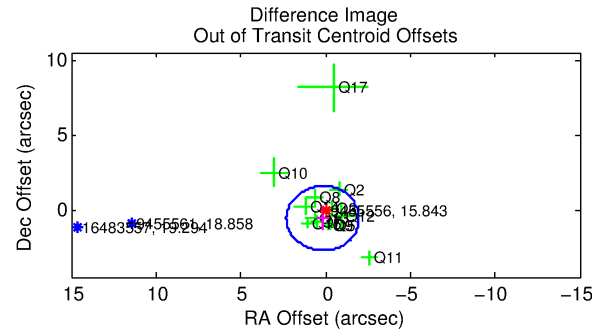
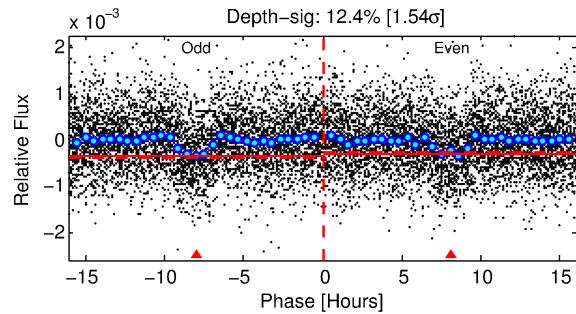
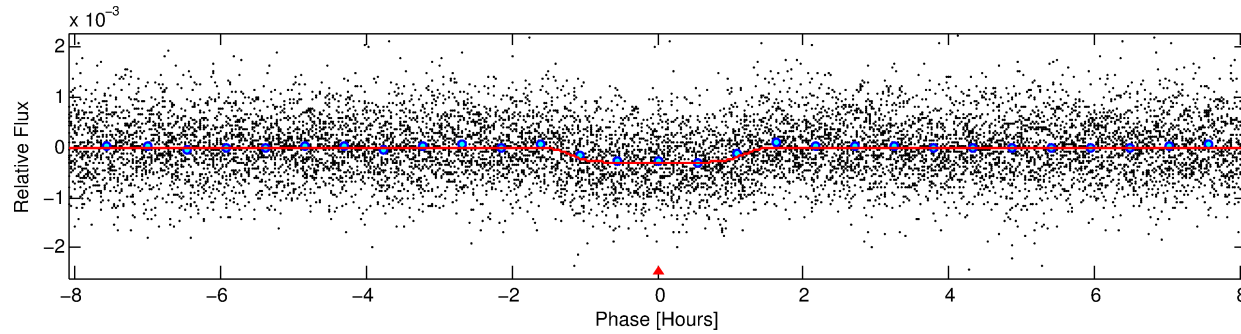
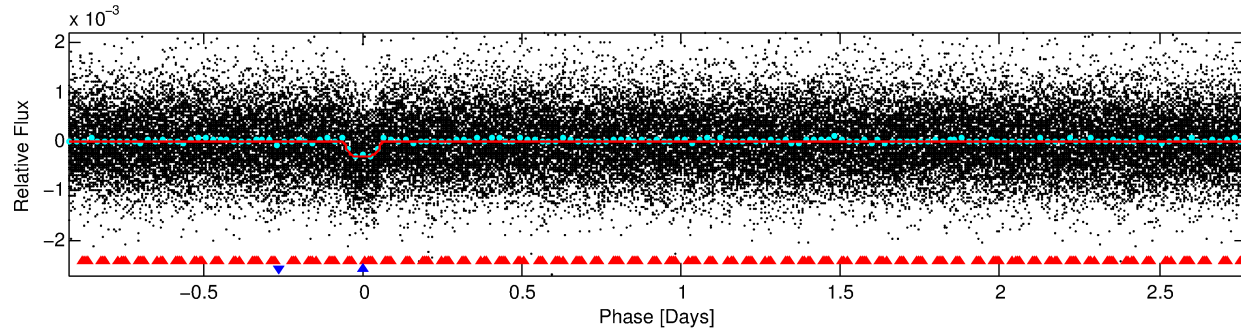
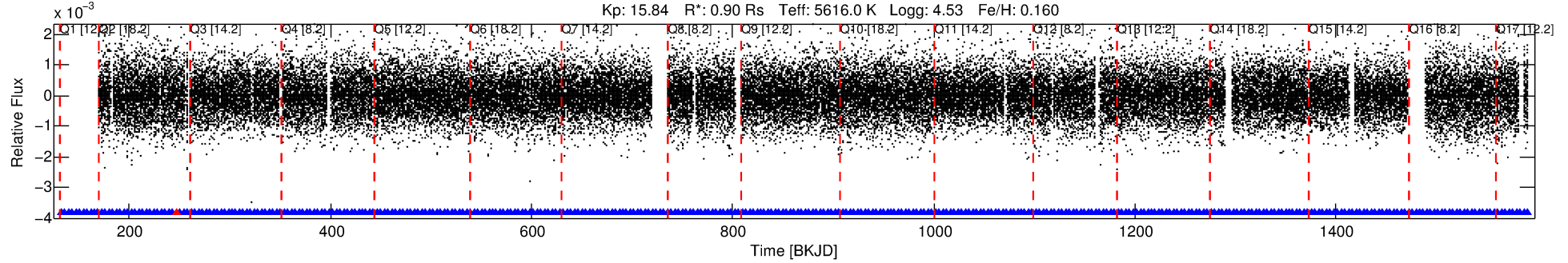
Ephemeris Match Information For 009455556-02

No Significant Match Found

DV One-Page Summary

KIC: 9455556 Candidate: 2 of 2 Period: 3.701 d
KOI: K01396.02 Name: Kepler-294b Corr: 0.956

Kp: 15.84 R*: 0.90 Rs Teff: 5616.0 K Logg: 4.53 Fe/H: 0.160



DV Fit Results:

Period = 3.70119 [0.00001] d
Epoch = 132.1622 [0.0025] BKJD
Rp/R* = 0.0194 [0.0068]
a/R* = 5.40 [8.02]
b = 0.88 [0.39]
Seff = 330.07 [61.37]
Teq = 1087 [51] K
Rp = 1.91 [0.71] Re
a = 0.0469 [0.0053] AU
Ag = 10.93 [11.89] [0.84σ]
Teff = 3056 [821] K [2.39σ]

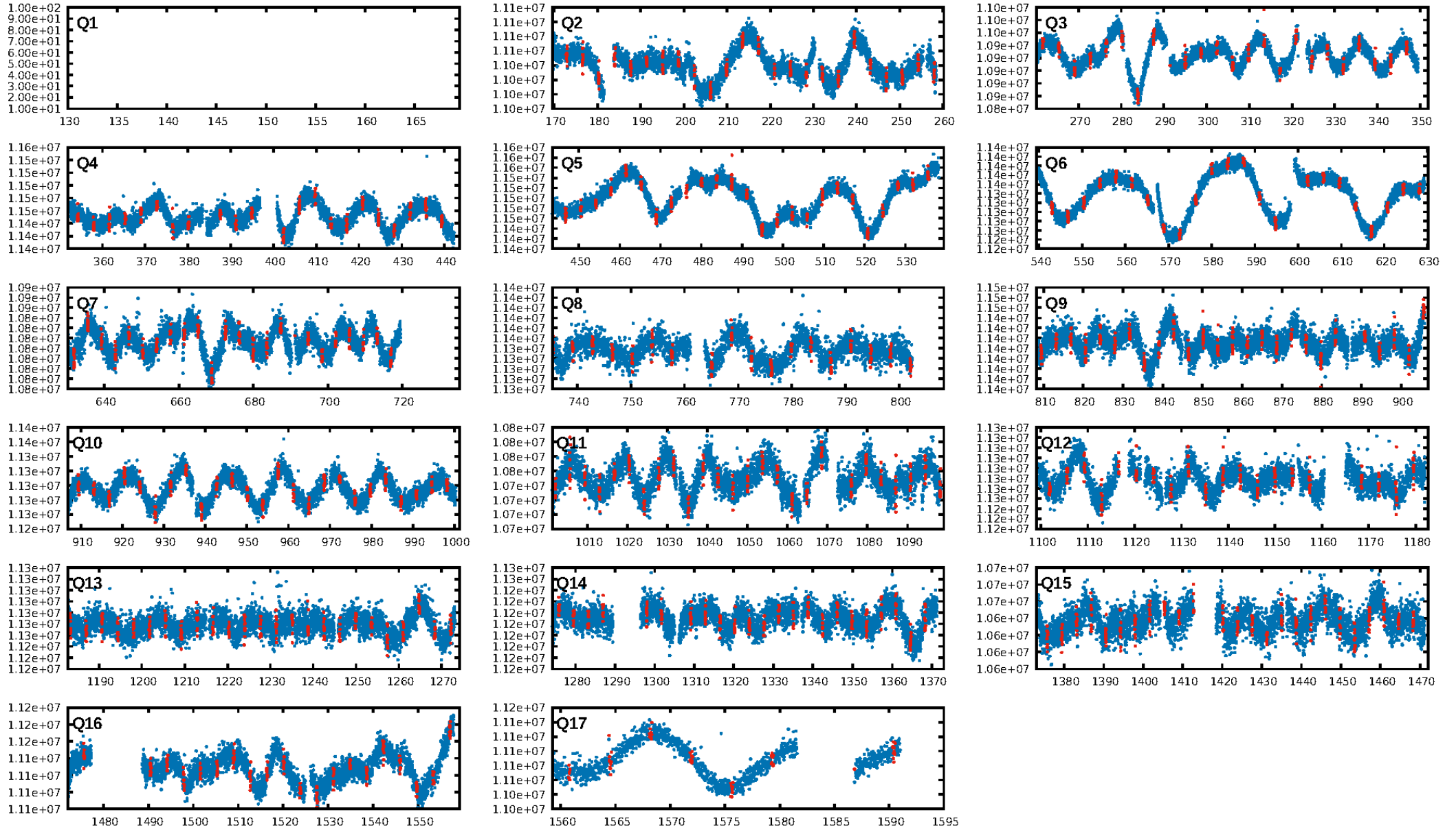
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [16.40σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.41e-49
RollingBand-fgt: 1.00 [330/331]
GhostDiagnostic-chr: 4.07
Centroid-sig: 1.4%
Centroid-so: 1.912 arcsec [2.49σ]
OotOffset-rm: 0.601 arcsec [0.84σ]
KicOffset-rm: 0.746 arcsec [1.13σ]
OotOffset-st: 3/4/2/4 [13]
KicOffset-st: 3/4/2/4 [13]
DiffImageQuality-fgm: 0.77 [10/13]
DiffImageOverlap-fno: 1.00 [16/16]

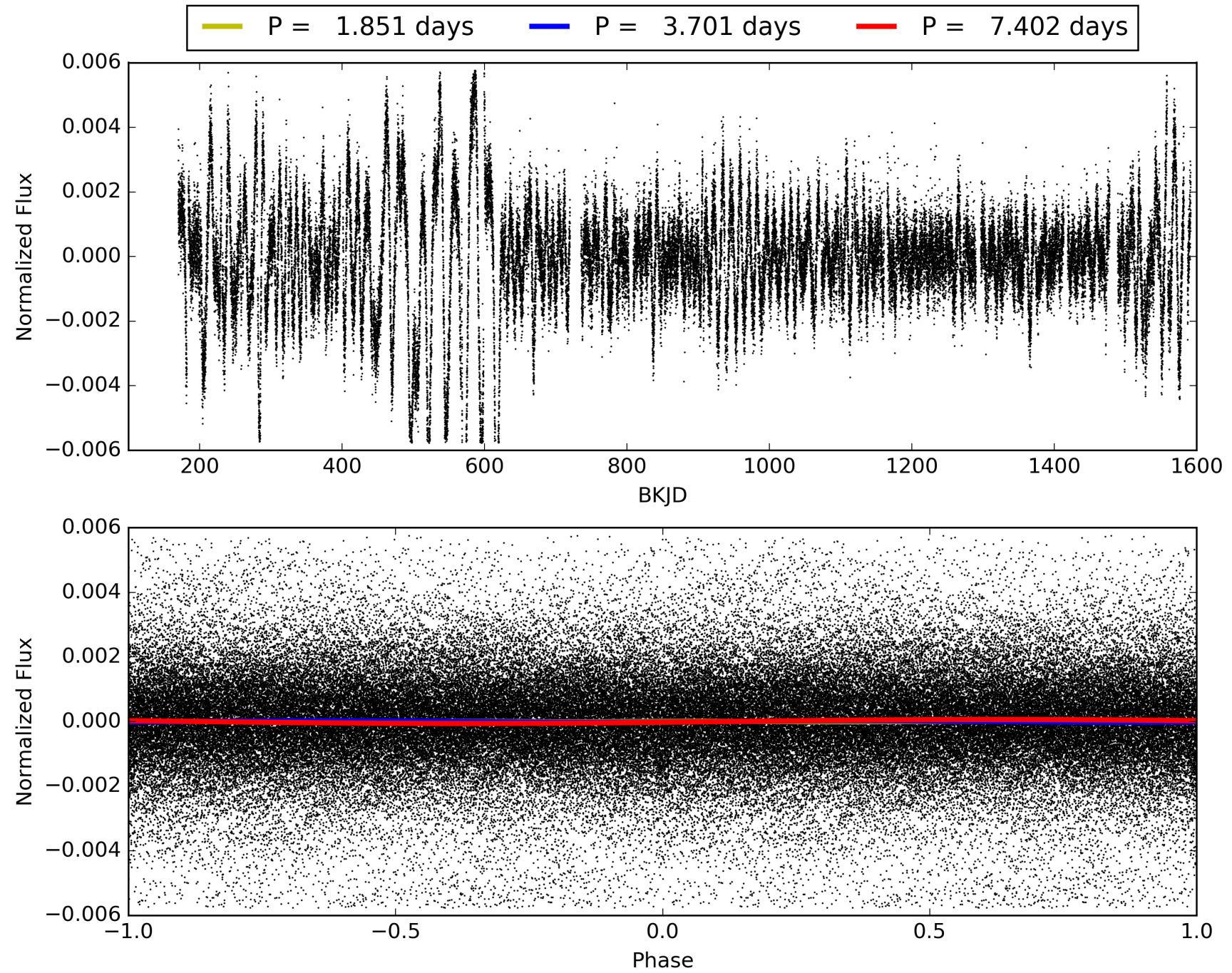
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 009455556-02, PDC Light Curves

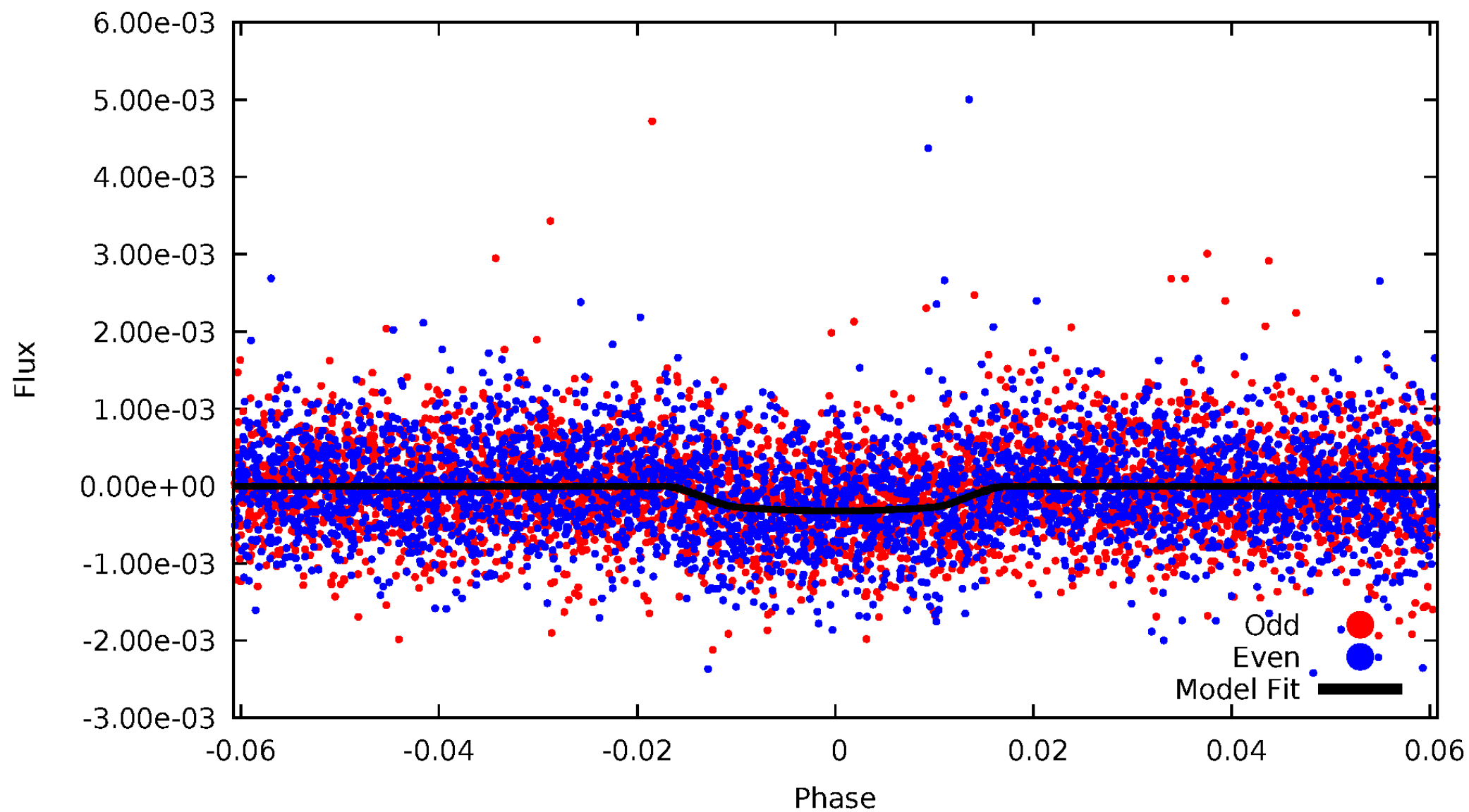


TCE 009455556-02



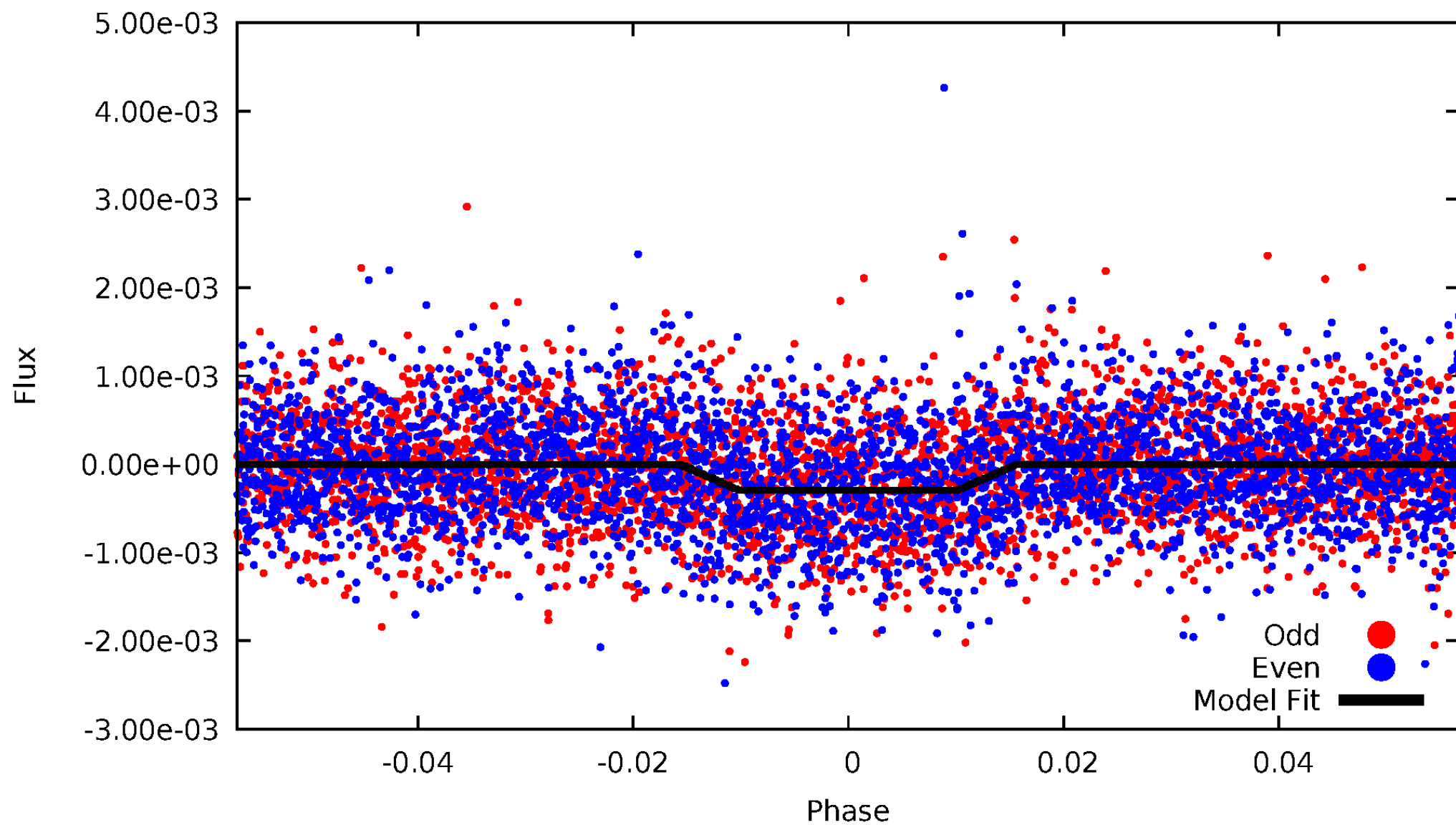
DV Odd/Even

TCE 00945556-02



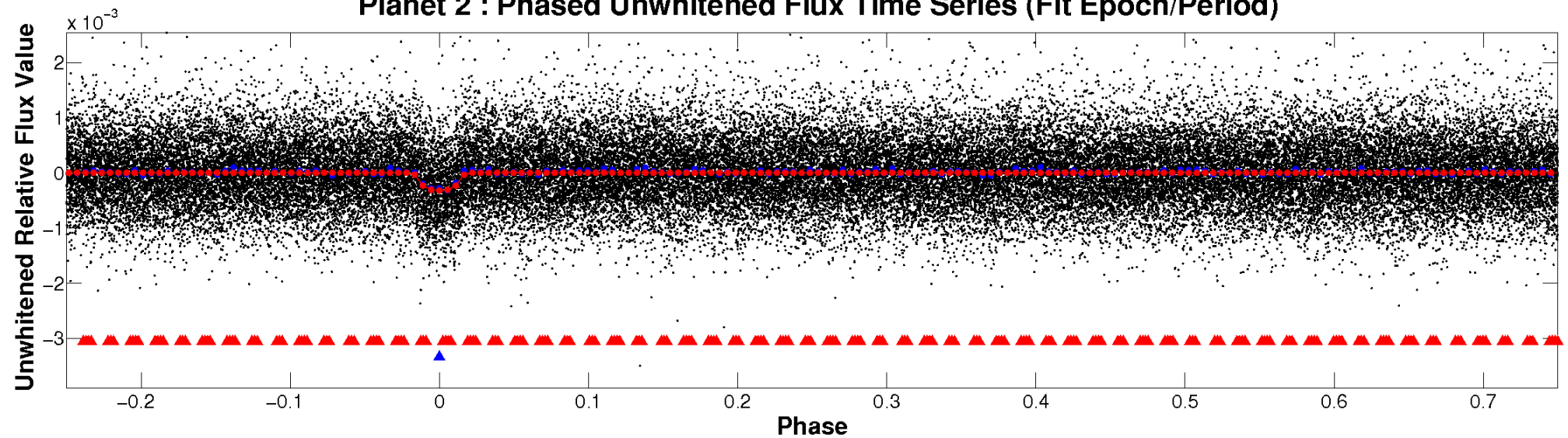
ALT Odd/Even

TCE 009455556-02

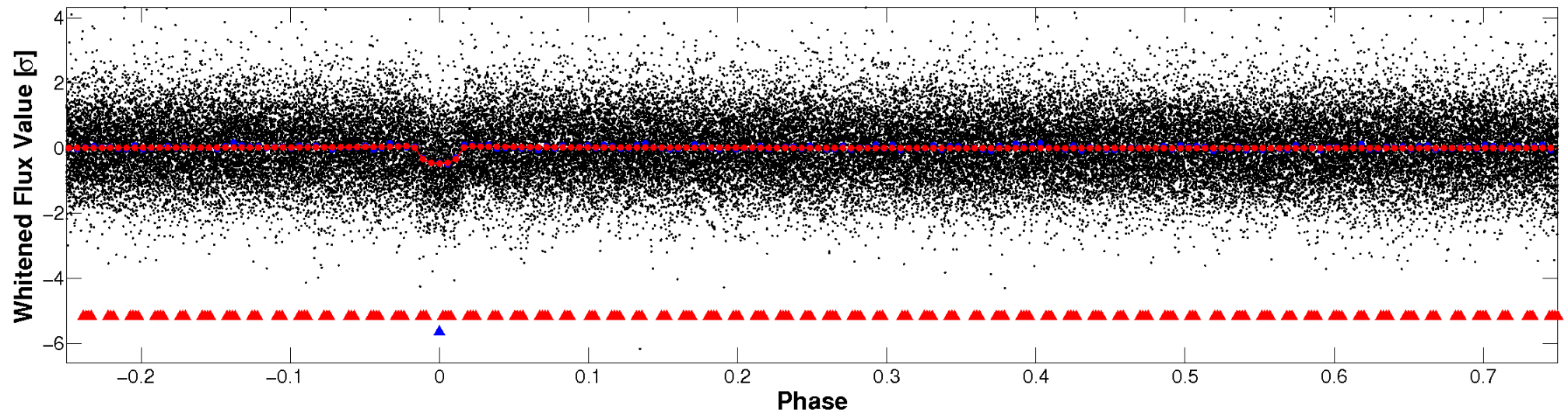


Non-Whitened Vs. Whitened Light Curve

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

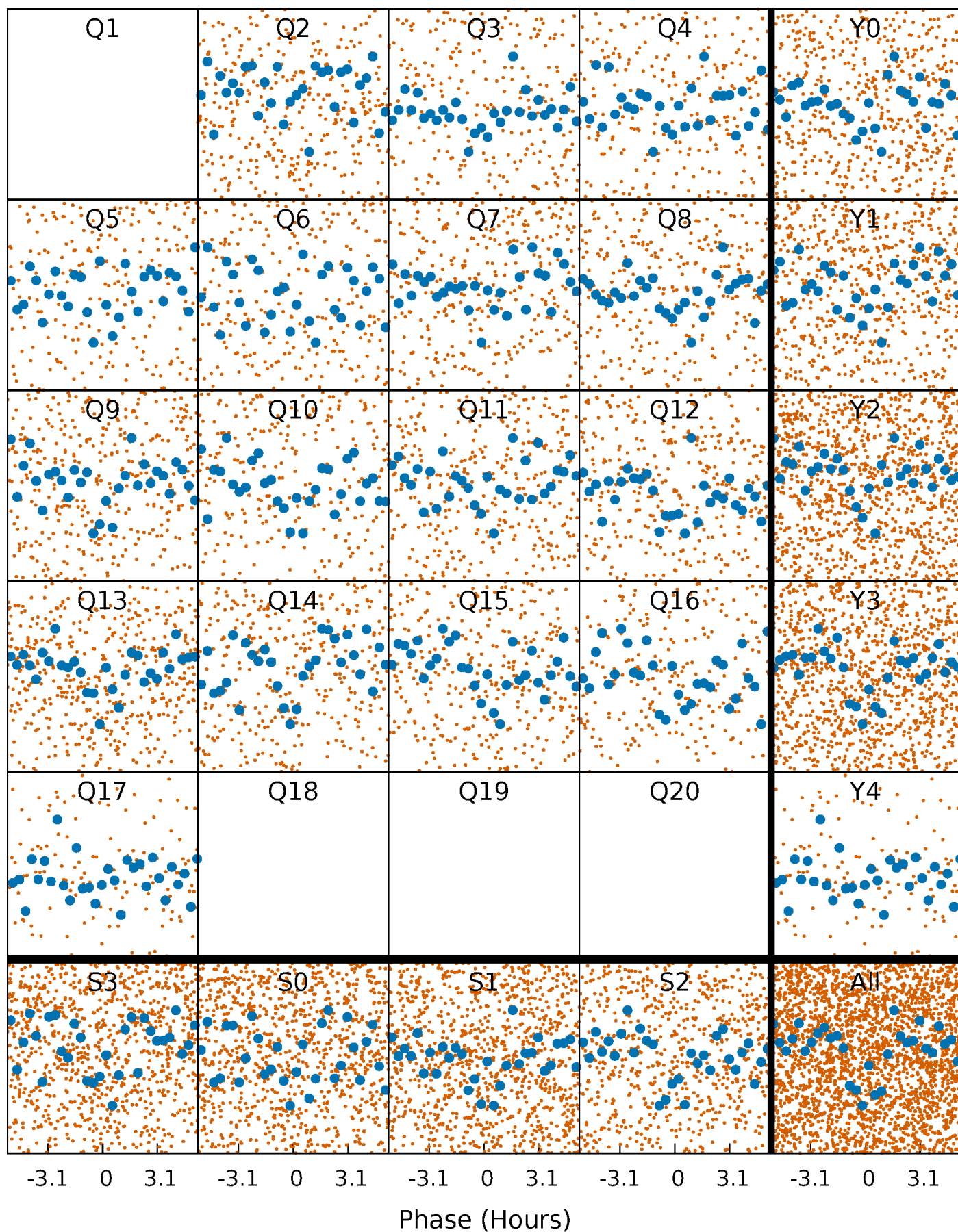


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



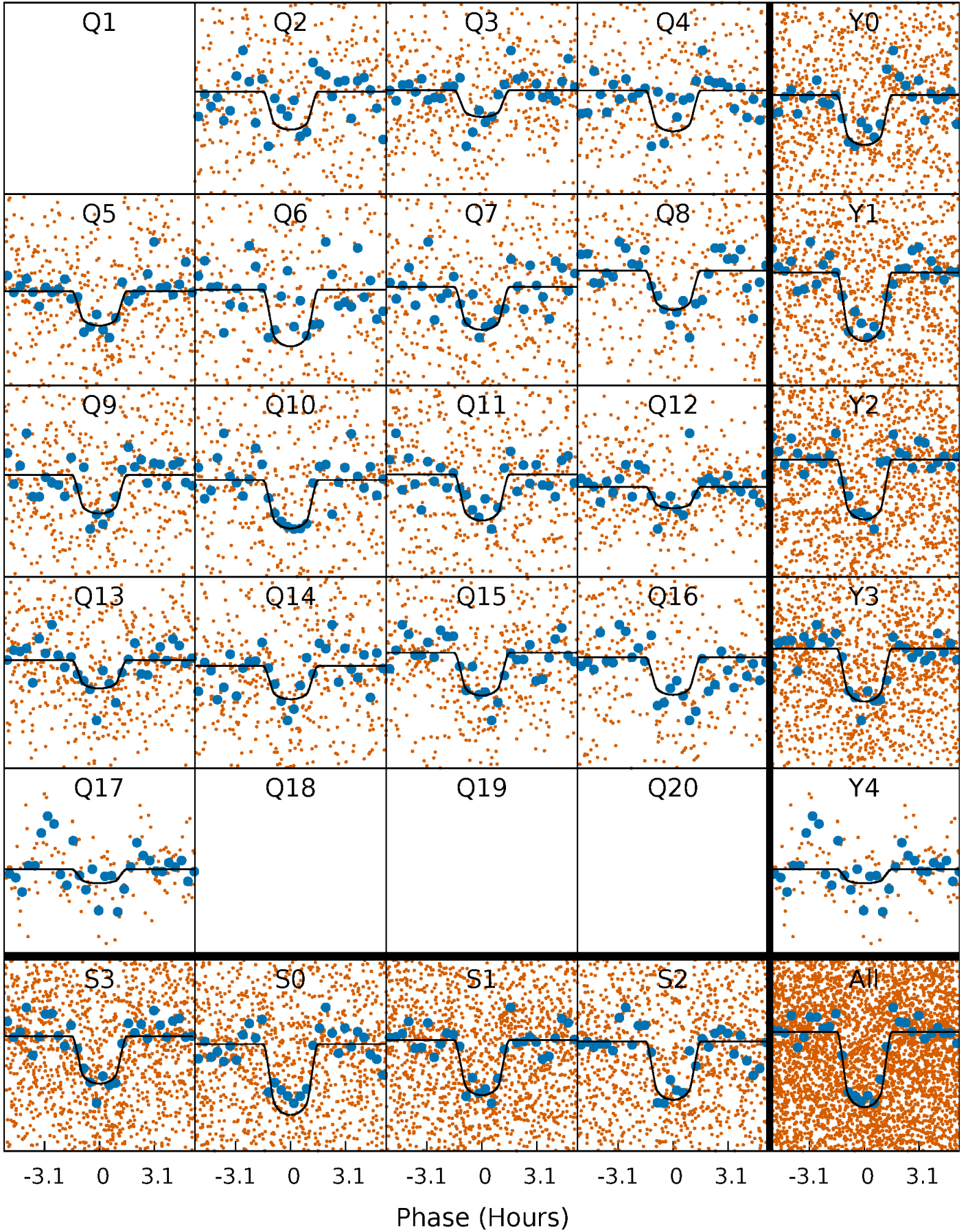
PDC Quarter-Phased Transit Curves

TCE 009455556-02 P= 3.701191 Days $T_0=132.162220$ (BKJD)



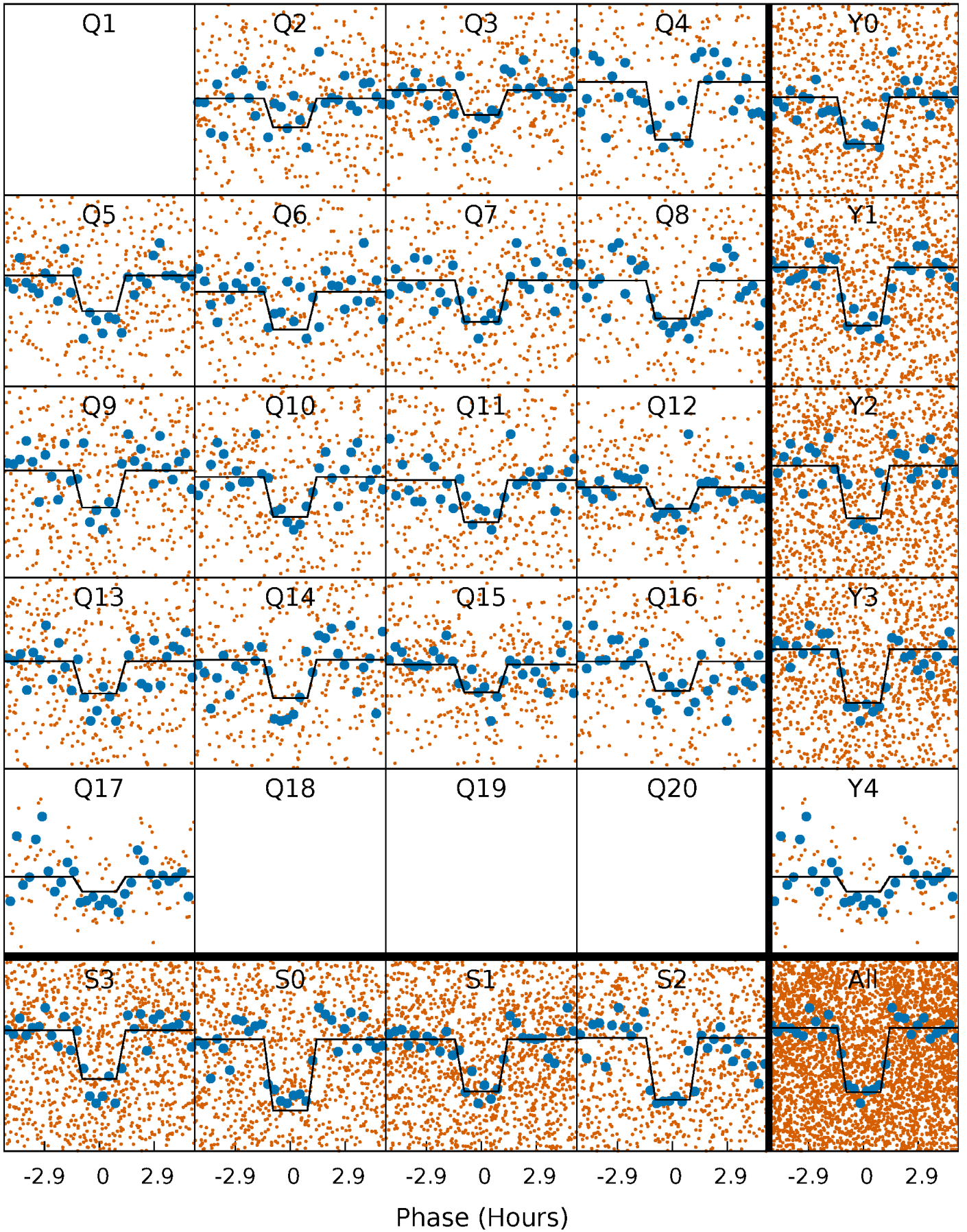
DV Quarter-Phased Transit Curves

TCE 009455556-02 P= 3.701191 Days $T_0=132.162220$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

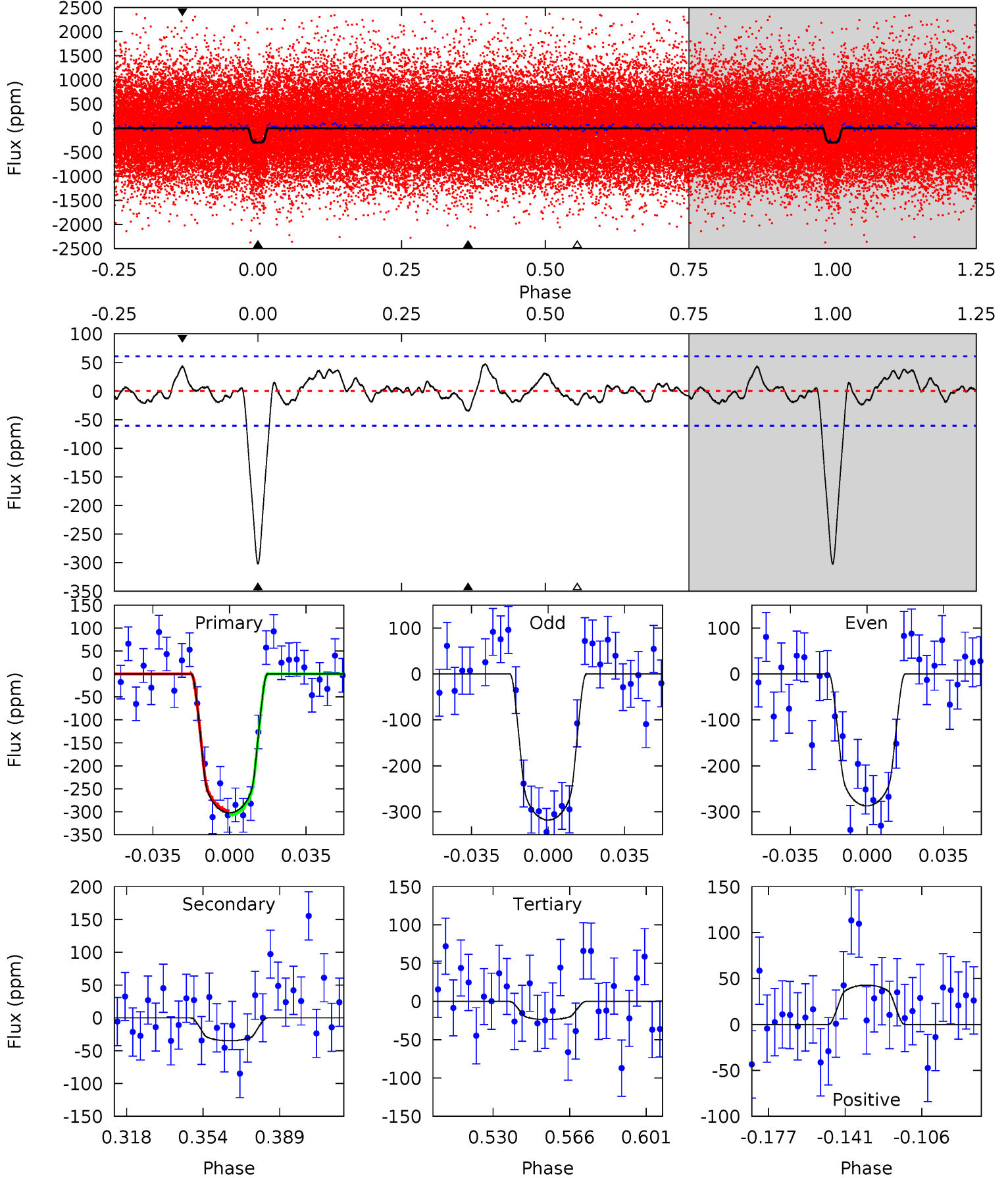
TCE 009455556-02 P= 3.701216 Days $T_0=132.156833$ (BKJD)



DV Model-Shift Uniqueness Test

009455556-02, P = 3.701191 Days, E = 132.162220 Days

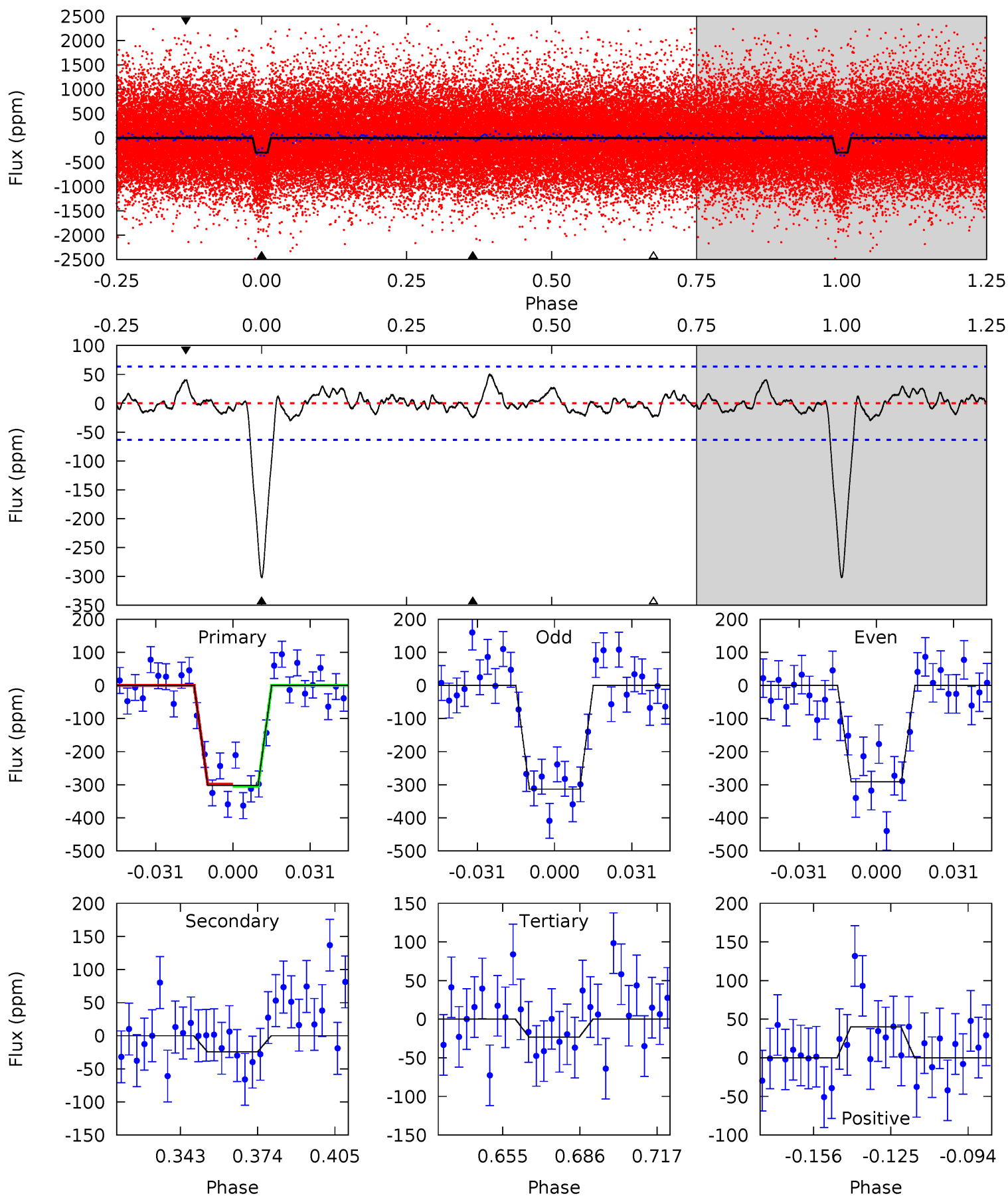
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.8	2.75	1.87	3.37	4.78	2.10	1.16	21.9	20.4	0.87	-0.62	1.21	1.02	0.13	0.35



Alt Model-Shift Uniqueness Test

009455556-02, P = 3.701216 Days, E = 132.156833 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
22.8	1.84	1.76	3.03	4.80	2.15	1.00	21.1	19.8	0.08	-1.19	0.84	1.00	0.14	0.24



Stellar Parameters For KIC 009455556

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5616^{+76}_{-84}	$4.529^{+0.018}_{-0.102}$	$0.160^{+0.150}_{-0.150}$	$0.903^{+0.109}_{-0.043}$	$1.006^{+0.036}_{-0.078}$	$1.922^{+0.176}_{-0.570}$
	+1%/-1%	+0%/-2%	+94%/-94%	+12%/-5%	+4%/-8%	+9%/-30%
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 009455556-02 / KOI 1396.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-35 ± 13	$1.91^{+0.74}_{-0.72}$	1539^{+46}_{-35}	3538^{+689}_{-416}	11^{+19}_{-6}
Alt.	-24 ± 13	$1.74^{+0.66}_{-0.69}$	1538^{+49}_{-34}	3464^{+725}_{-533}	$9.666^{+19.005}_{-6.451}$

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 $A_{obs} \gg 1.0$

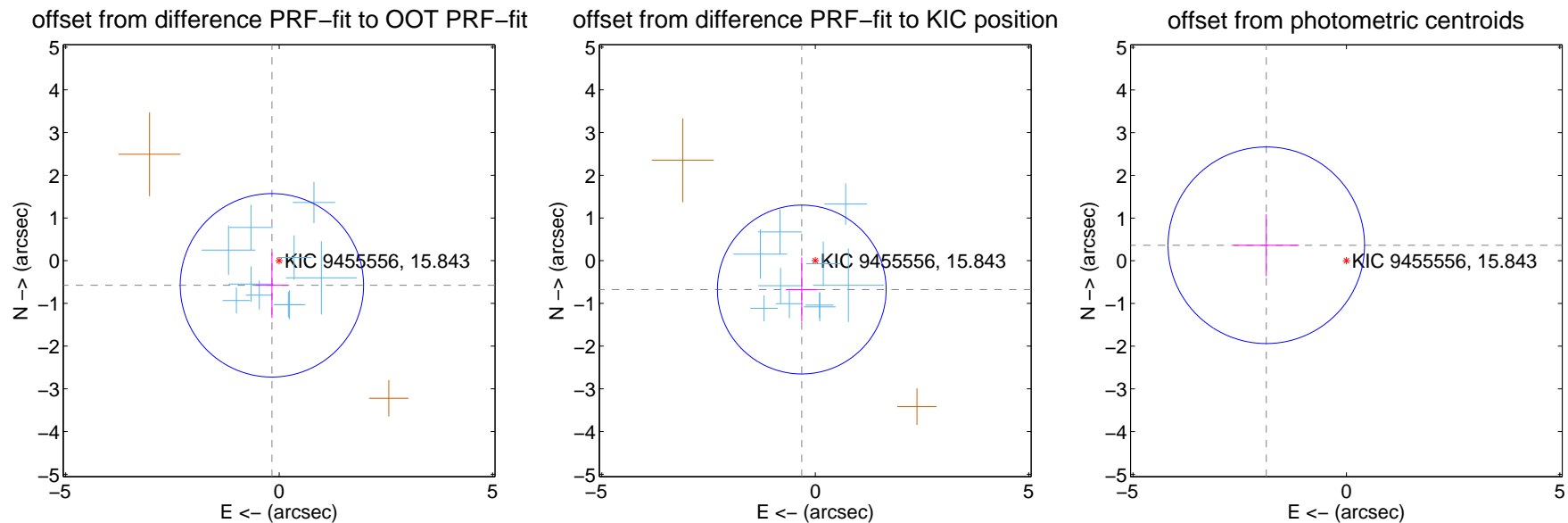
DV Centroid Data

Supplemental centroid analysis for 009455556-02. Kepler magnitude: 15.84. Transit SNR 16.91

There are 10 quarters with good PRF difference image offsets

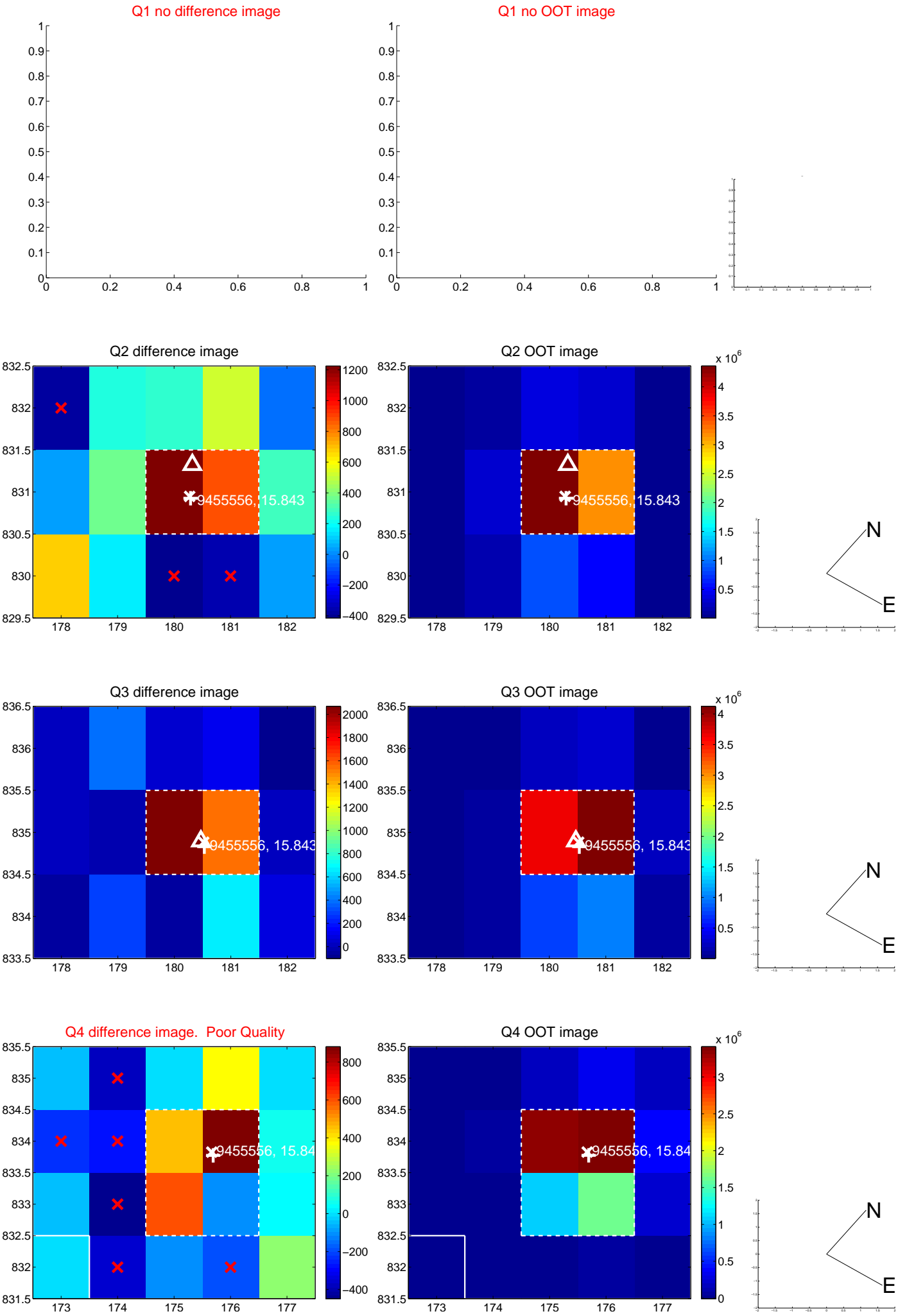
The direct PRF centroid is offset from the target star catalog position by about 0.15 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.601 ± 0.716	0.84	0.170 ± 0.375	-0.577 ± 0.766
PRF-fit source offset from KIC position	0.746 ± 0.659	1.13	0.316 ± 0.371	-0.675 ± 0.752
photometric centroid source offset	1.91 ± 0.77	2.49	1.88 ± 0.77	0.36 ± 0.72

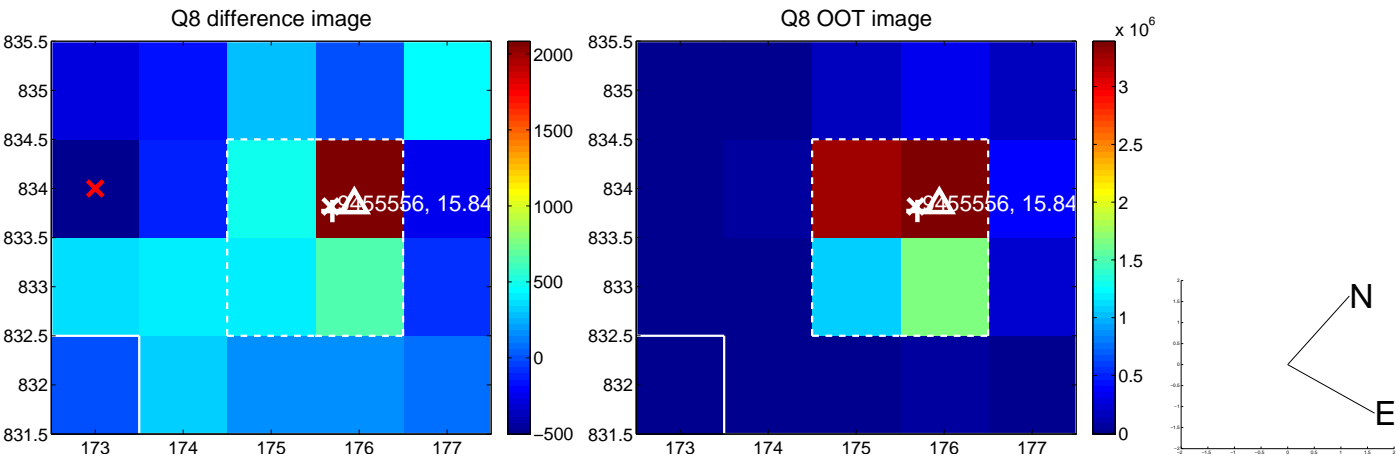
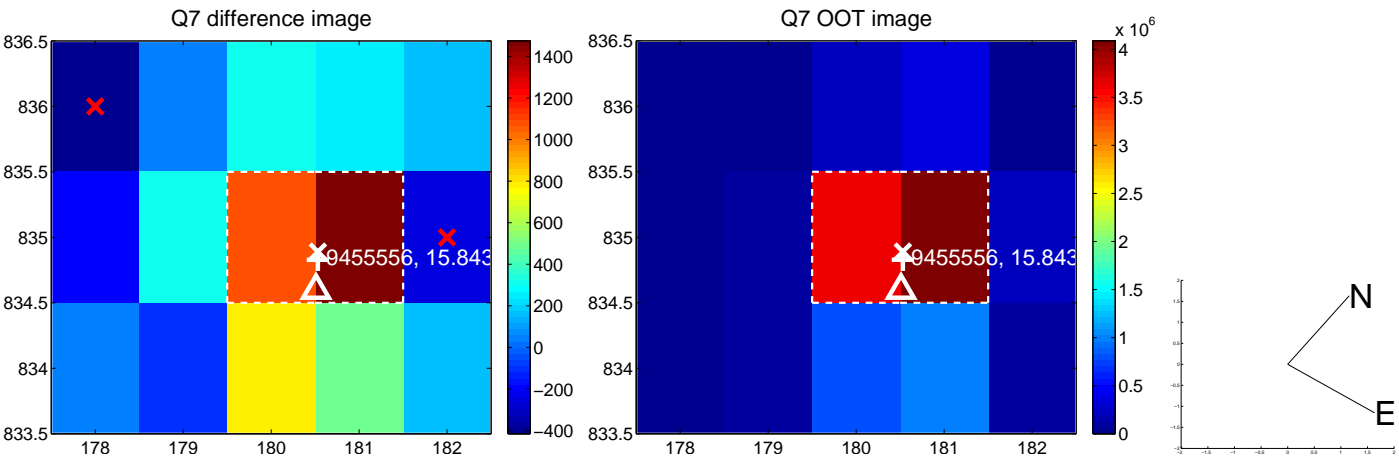
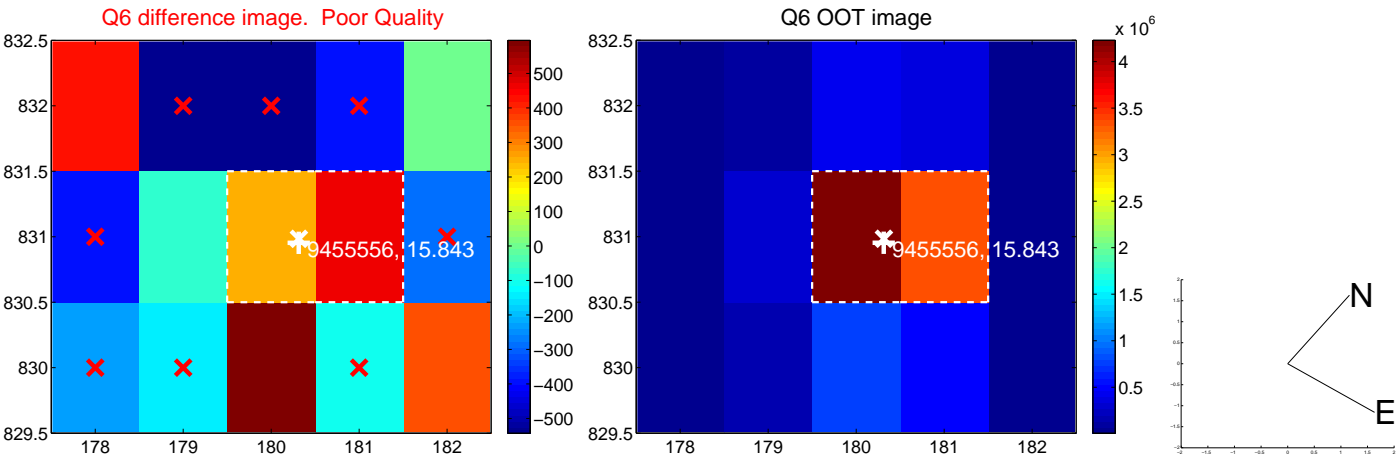
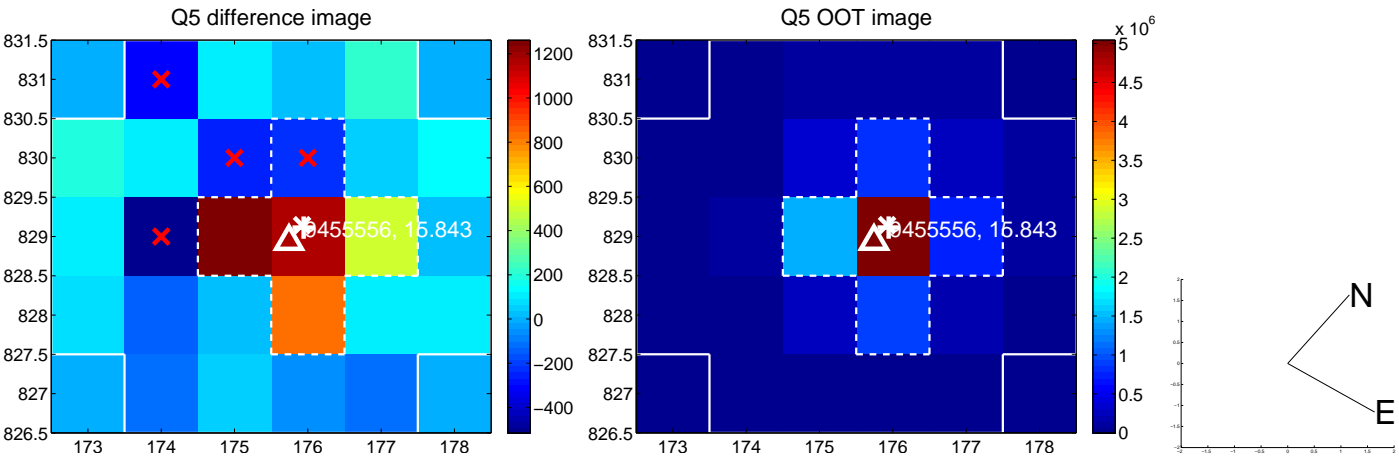


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

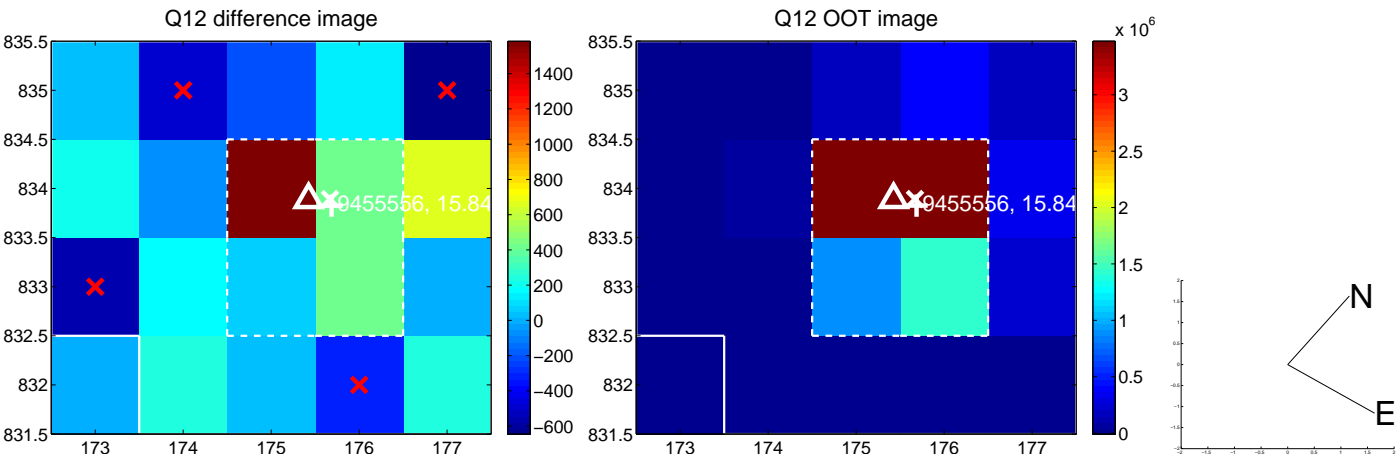
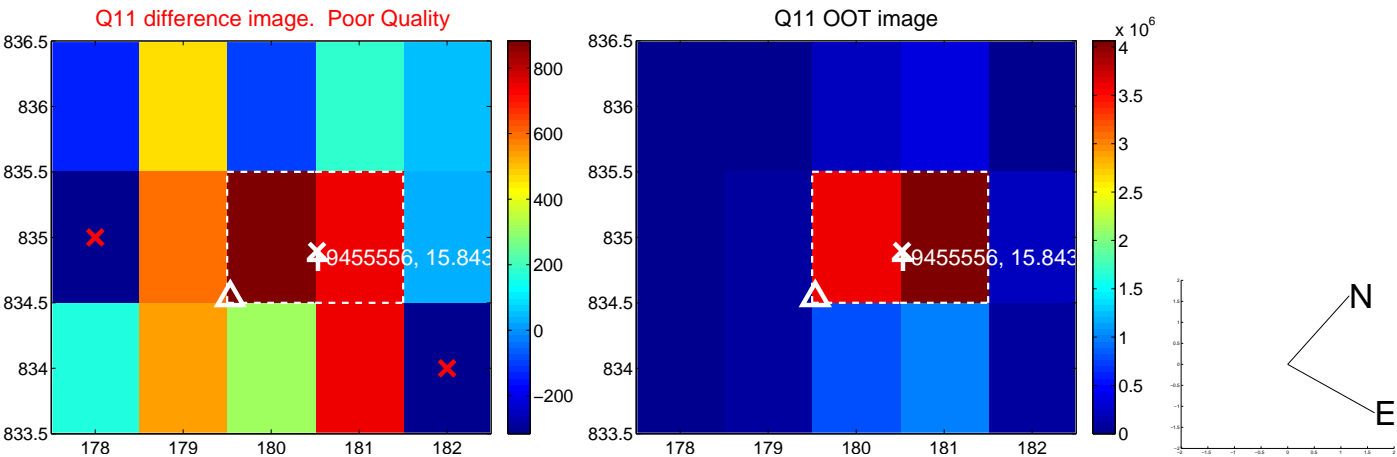
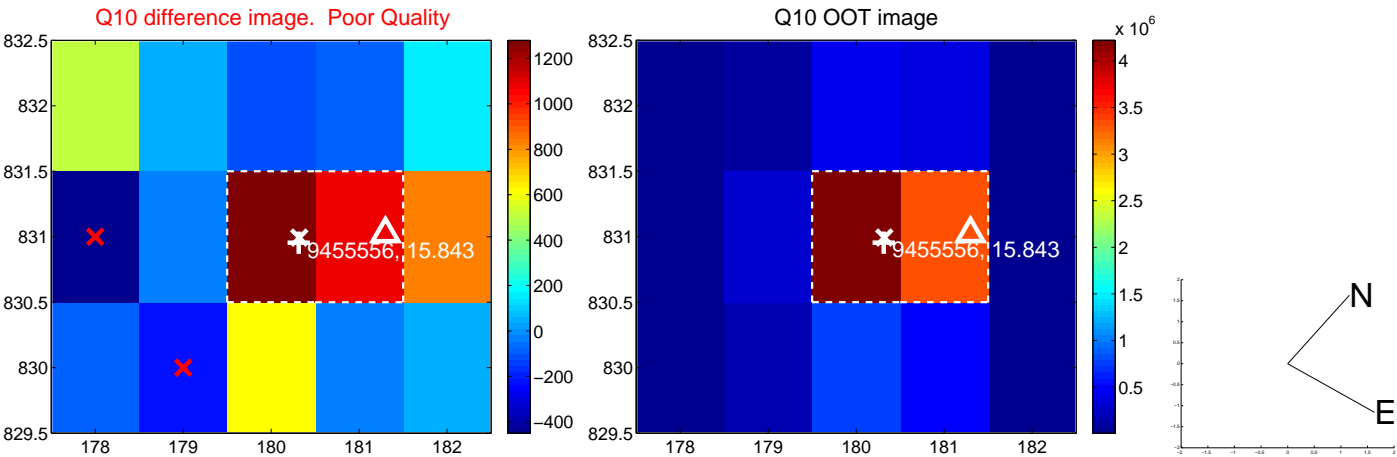
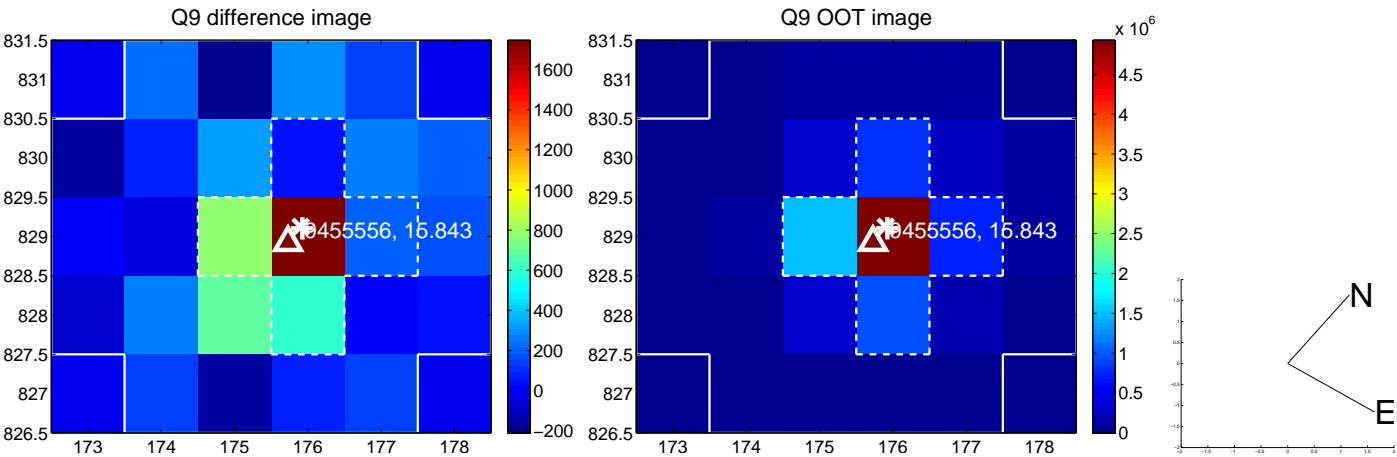
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



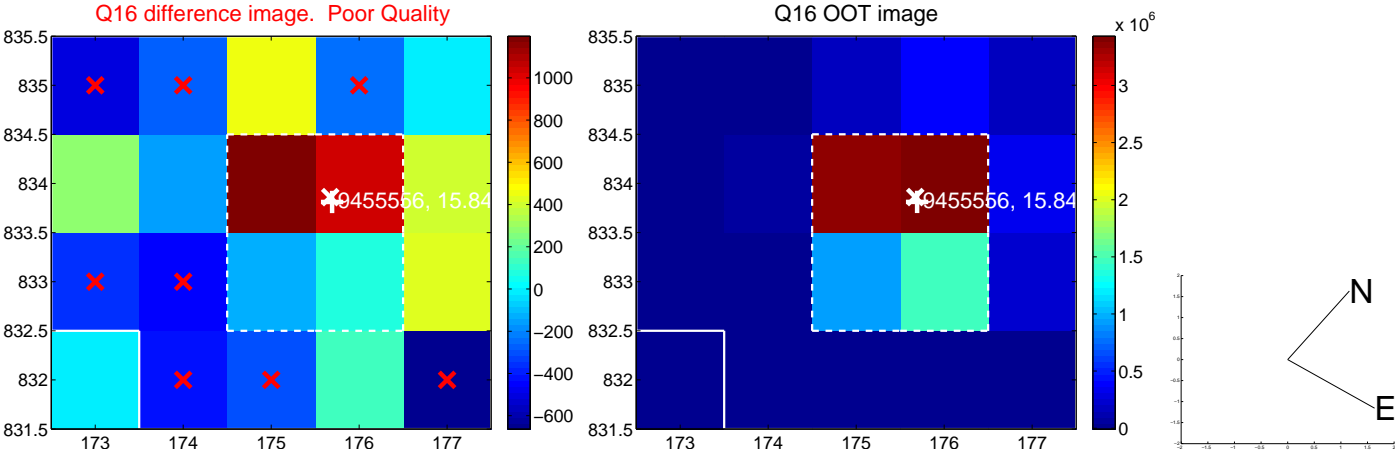
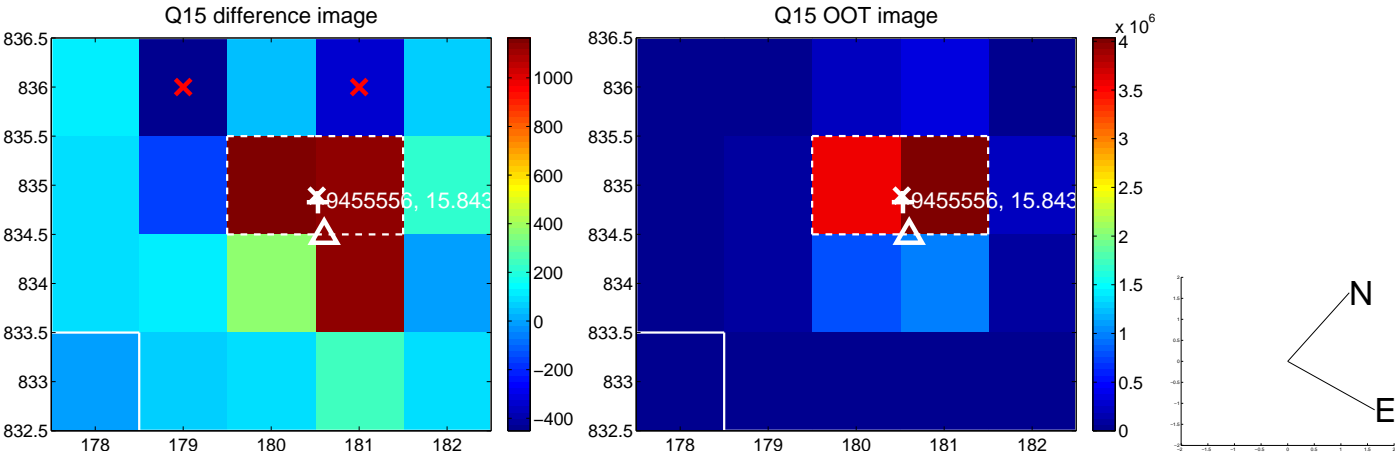
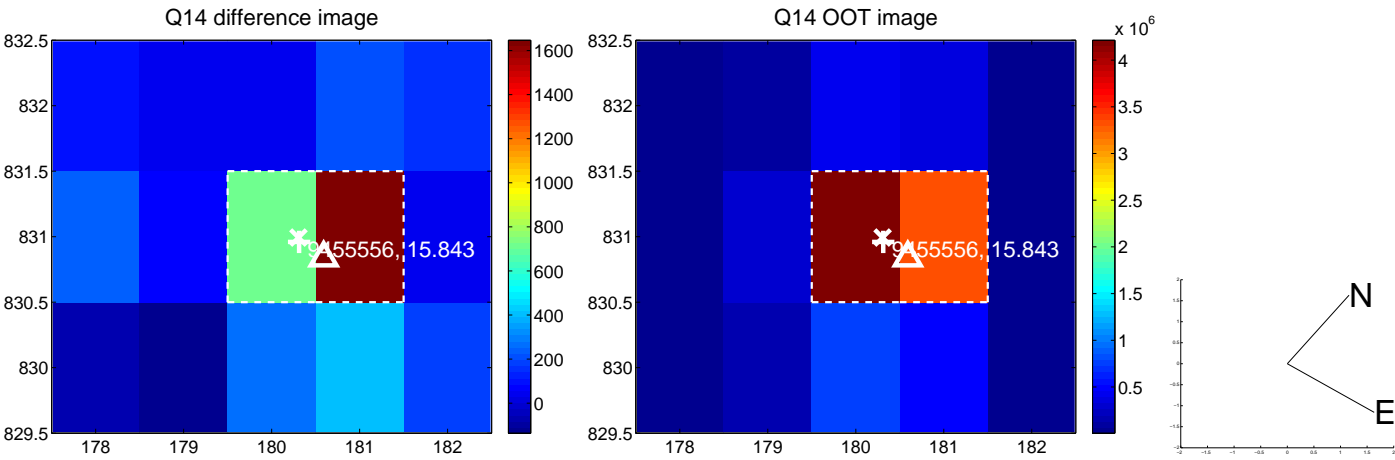
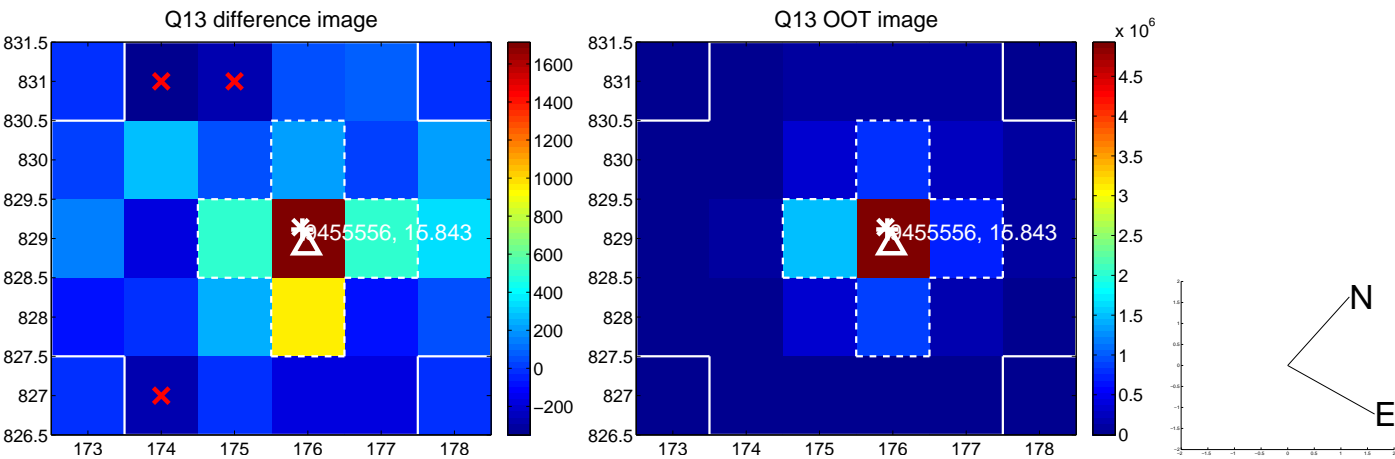
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



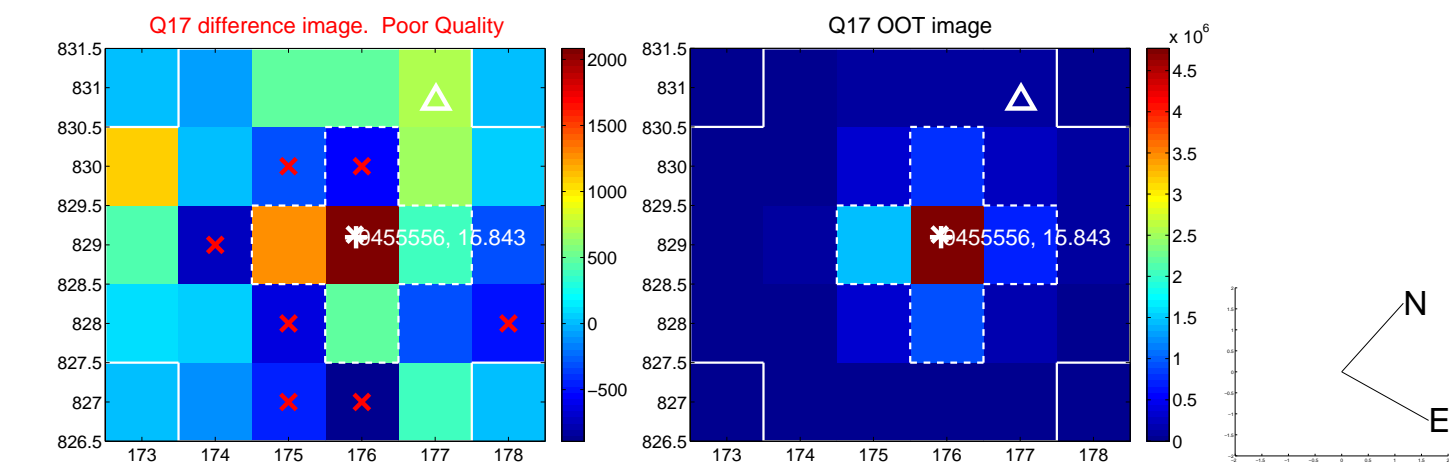
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



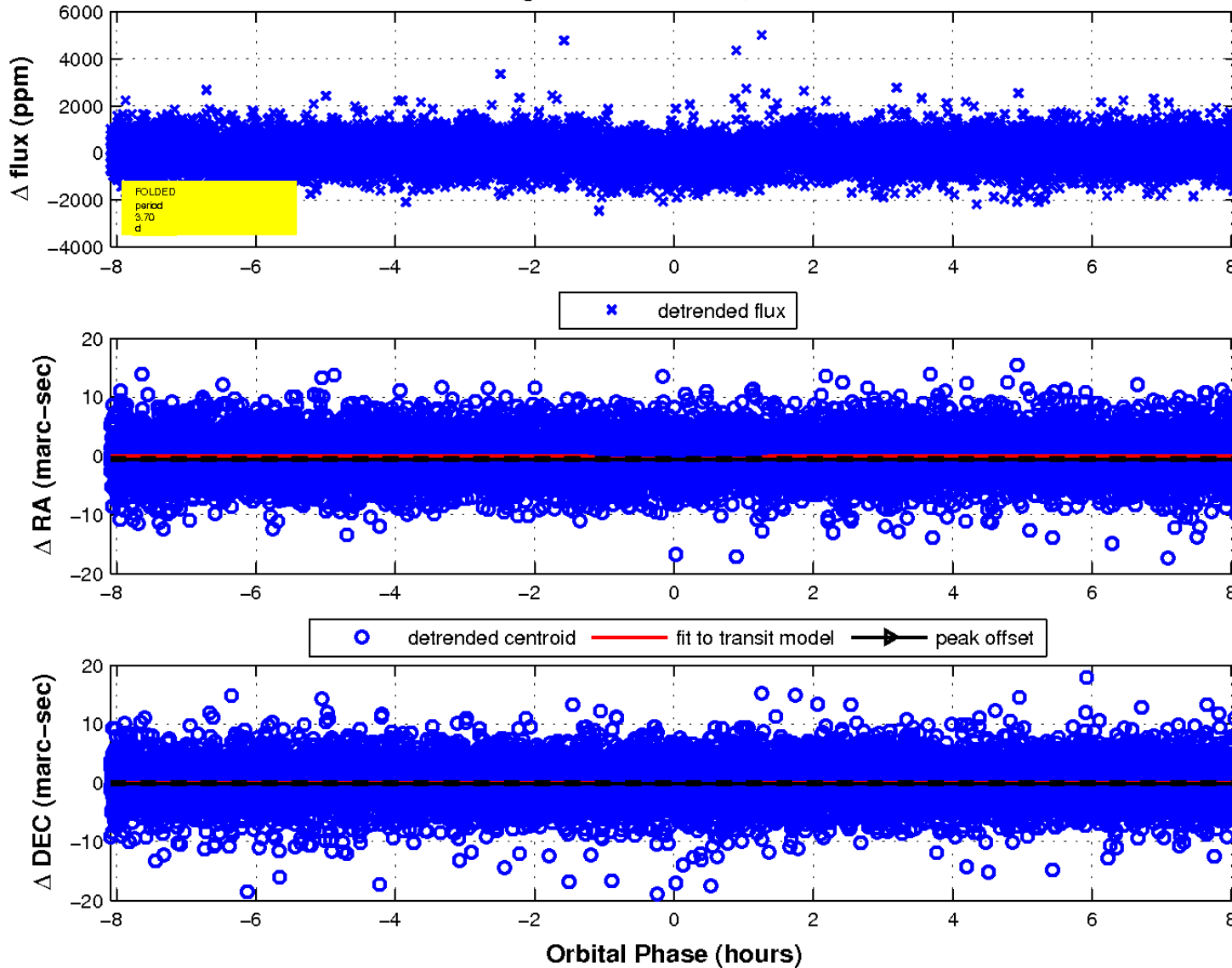
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

