

KIC 004249725

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})
004249725-01	OBS	0222.01	6.312513	132.653753	1279.9	2.910	92.9	98.9	0.57	4090	2.31	25.98
004249725-02	OBS	0222.02	12.794548	143.561055	792.1	3.568	42.4	45.0	0.57	4090	1.80	10.13

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004249725-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
004249725-02	OBS	PC	1.00	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.

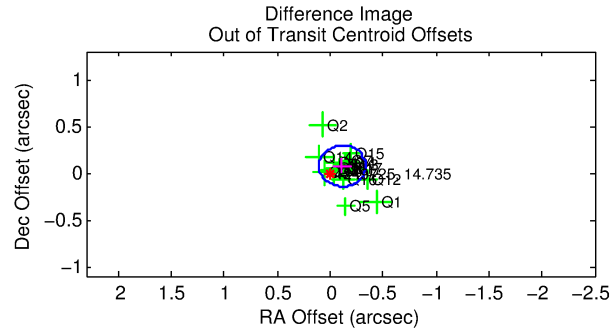
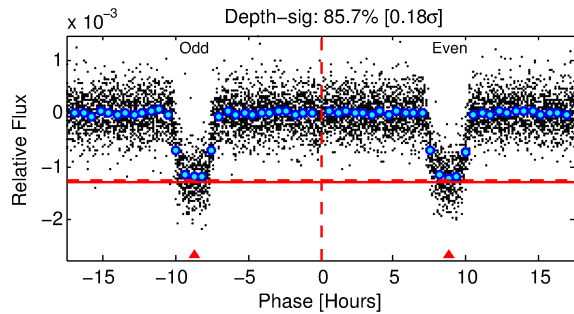
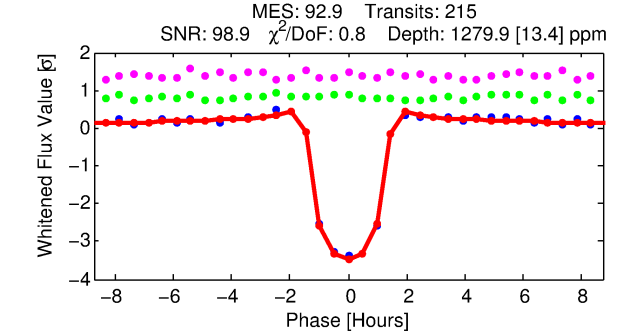
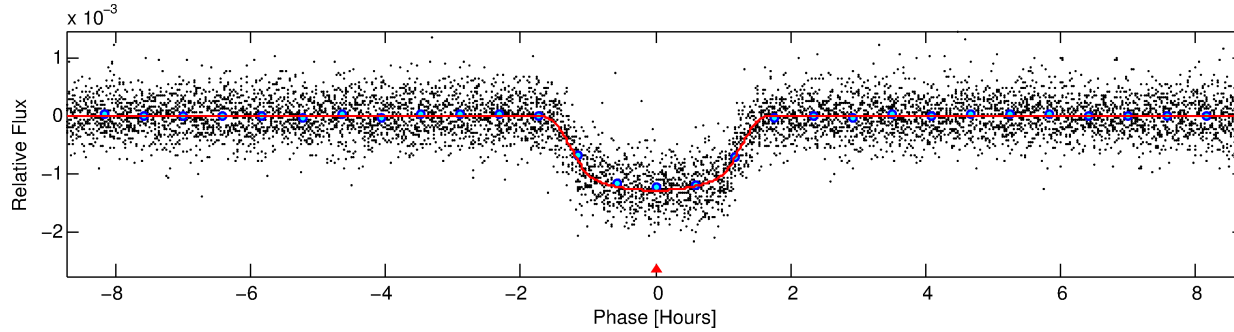
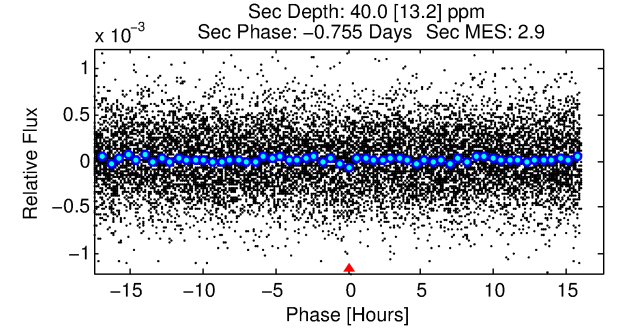
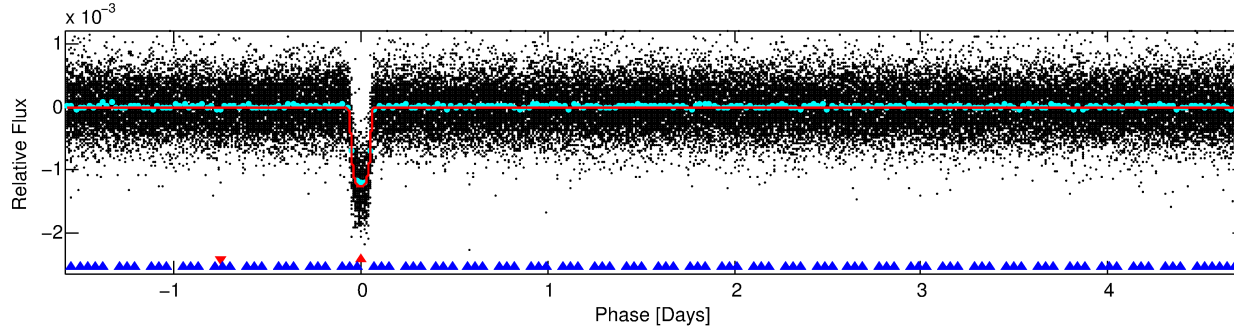
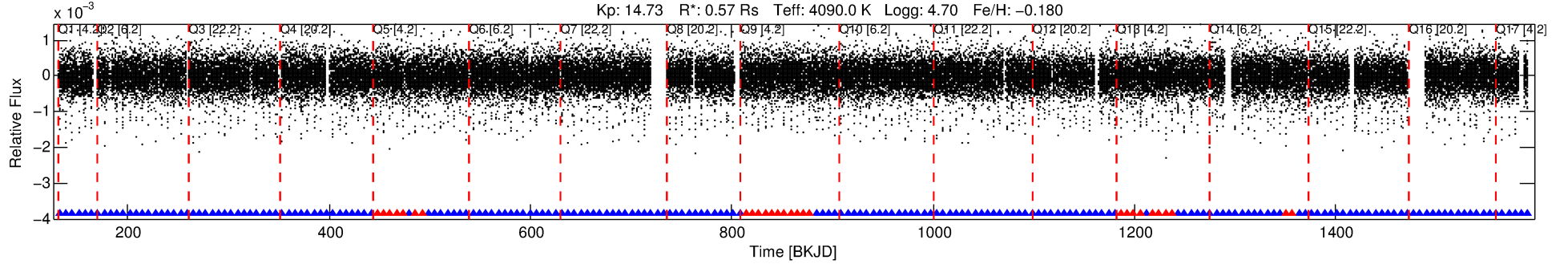
Ephemeris Match Information For 004249725-01

No Significant Match Found

DV One-Page Summary

KIC: 4249725 Candidate: 1 of 2 Period: 6.313 d
KOI: K00222.01 Name: Kepler-120b Corr: 0.972

Kp: 14.73 R*: 0.57 Rs Teff: 4090.0 K Logg: 4.70 Fe/H: -0.180



DV Fit Results:

Period = 6.31251 [0.00000] d
Epoch = 132.6538 [0.0005] BKJD
Rp/R* = 0.0371 [0.0018]
a/R* = 10.51 [1.99]
b = 0.82 [0.08]
Seff = 25.98 [12.17]
Teq = 576 [67] K
Rp = 2.31 [0.39] Re
a = 0.0561 [0.0071] AU
Ag = 12.96 [4.97] [2.41σ]
Teffp = 1689 [235] K [4.55σ]

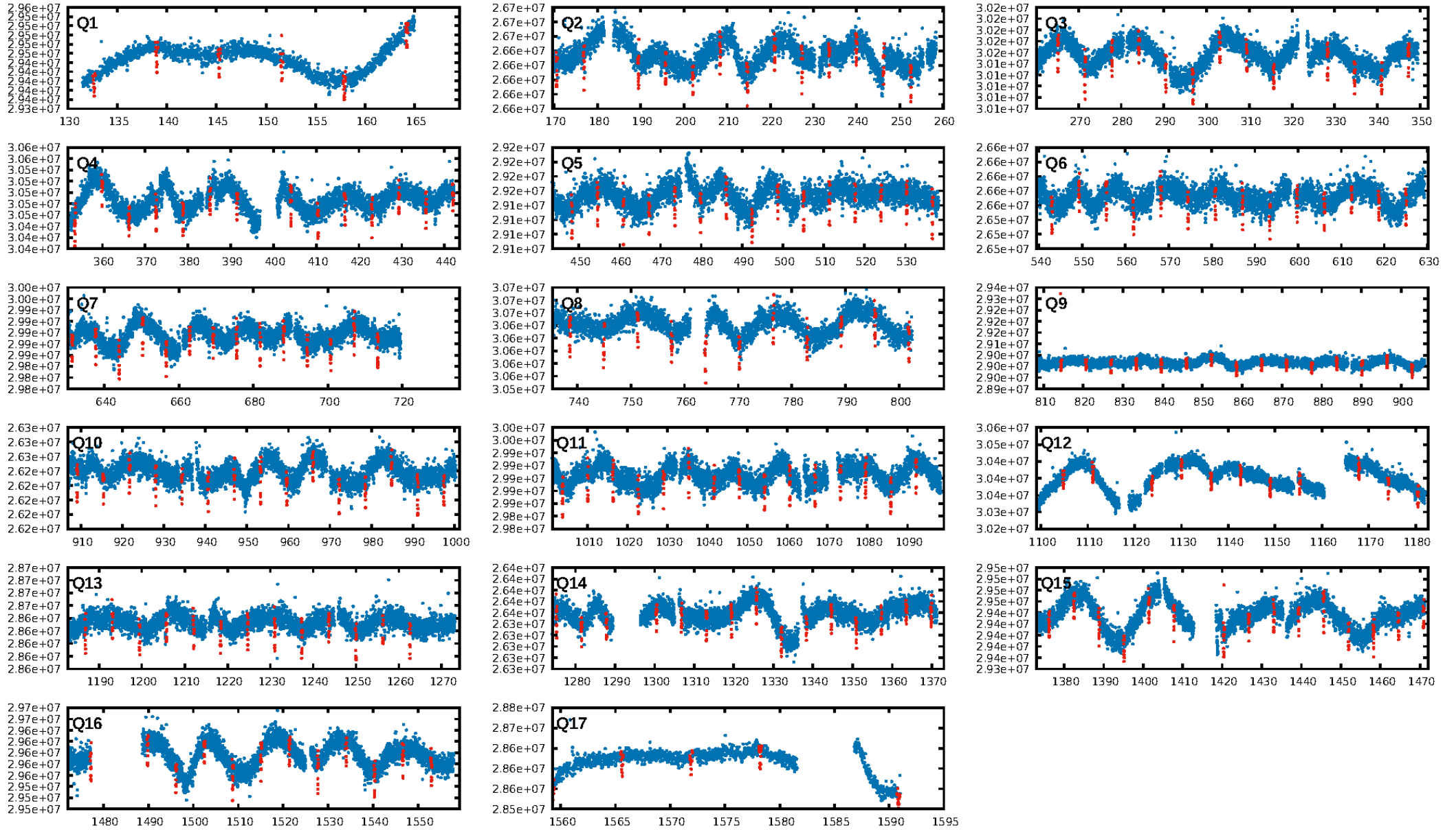
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [33.79σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.86 [176/204]
GhostDiagnostic-chr: 5.075
Centroid-sig: 0.2%
Centroid-so: 0.262 arcsec [2.33σ]
OotOffset-rm: 0.137 arcsec [1.87σ]
KicOffset-rm: 0.276 arcsec [3.70σ]
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]

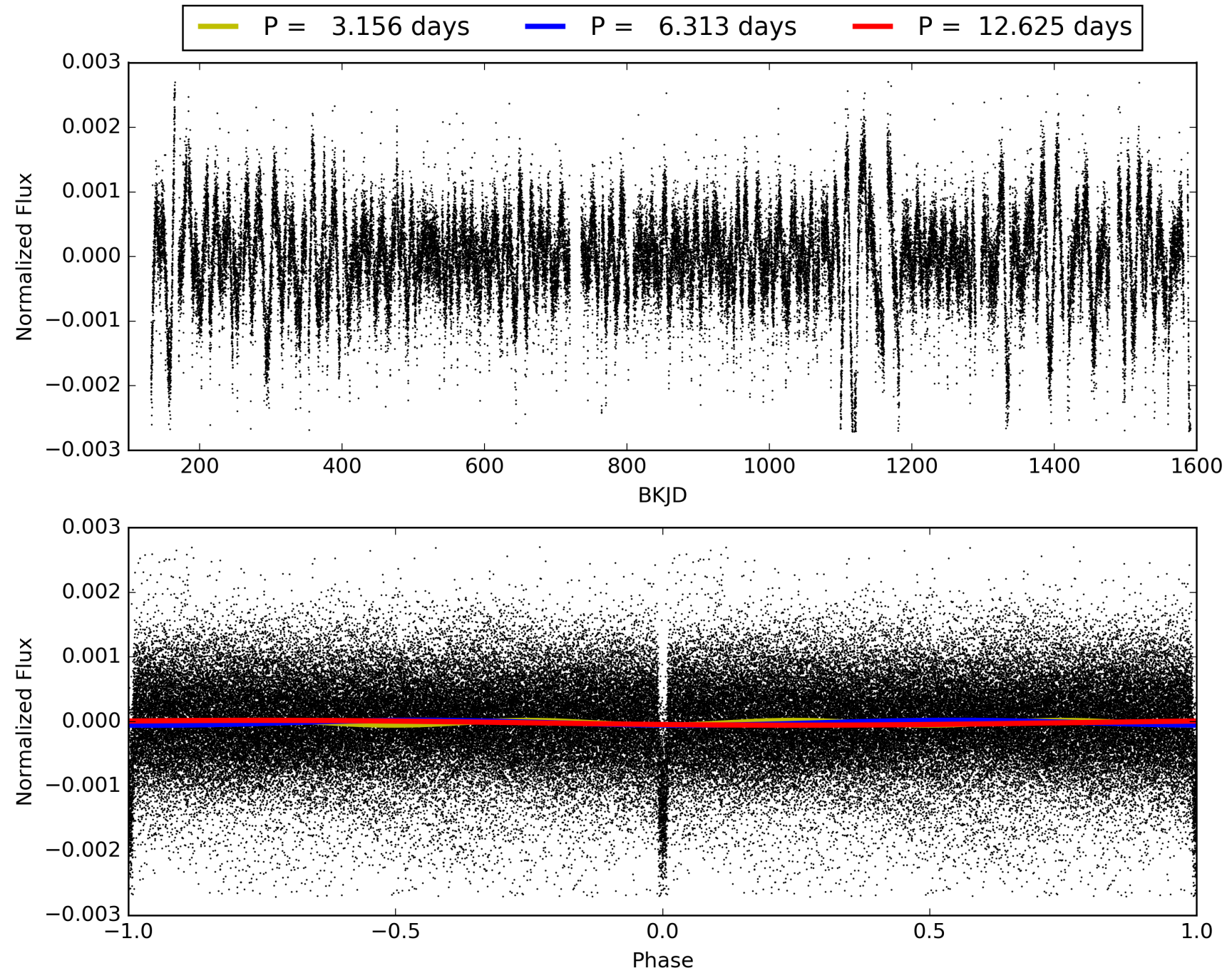
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 19:51:08 Z

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

TCE 004249725-01, PDC Light Curves

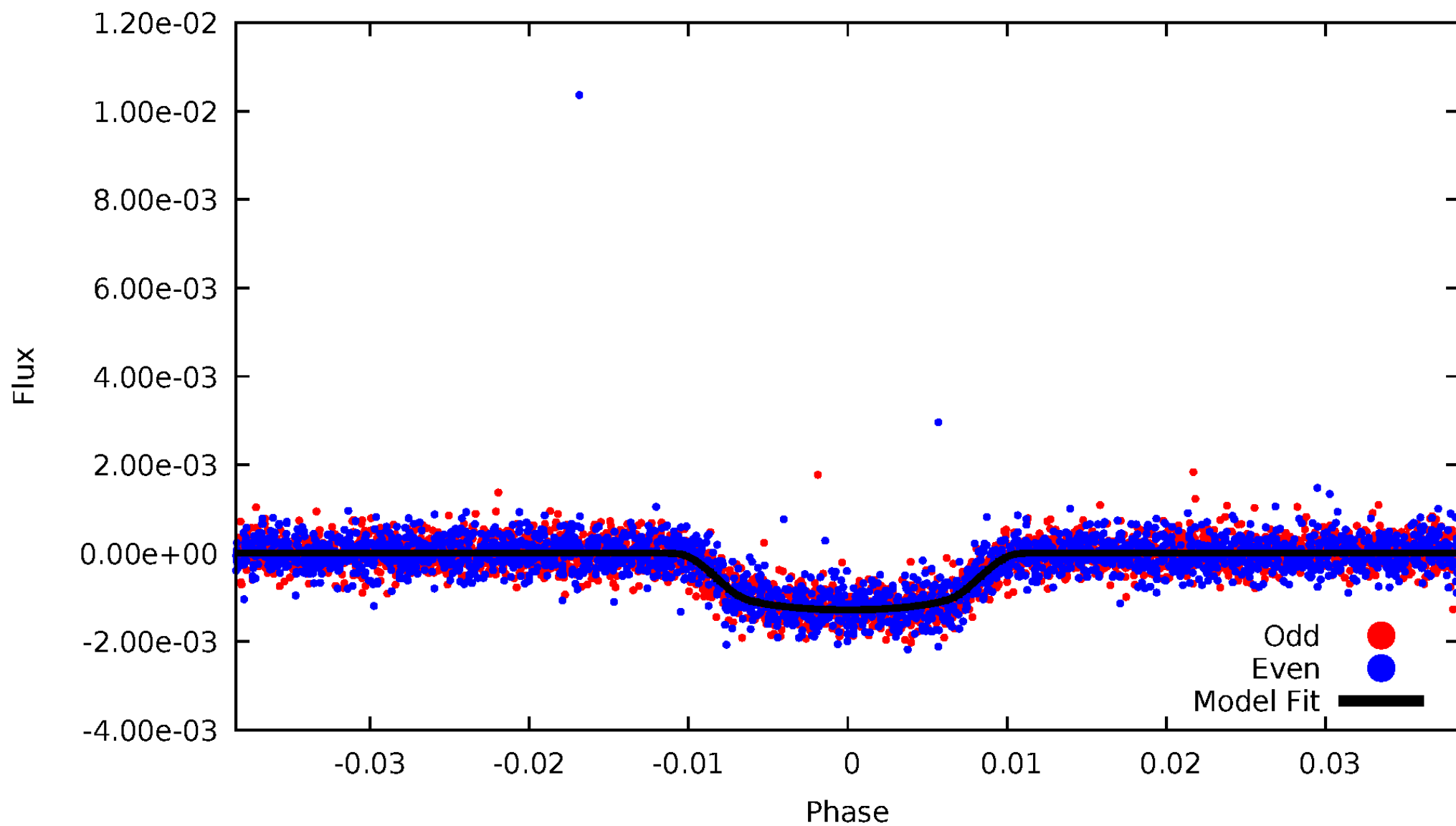


TCE 004249725-01



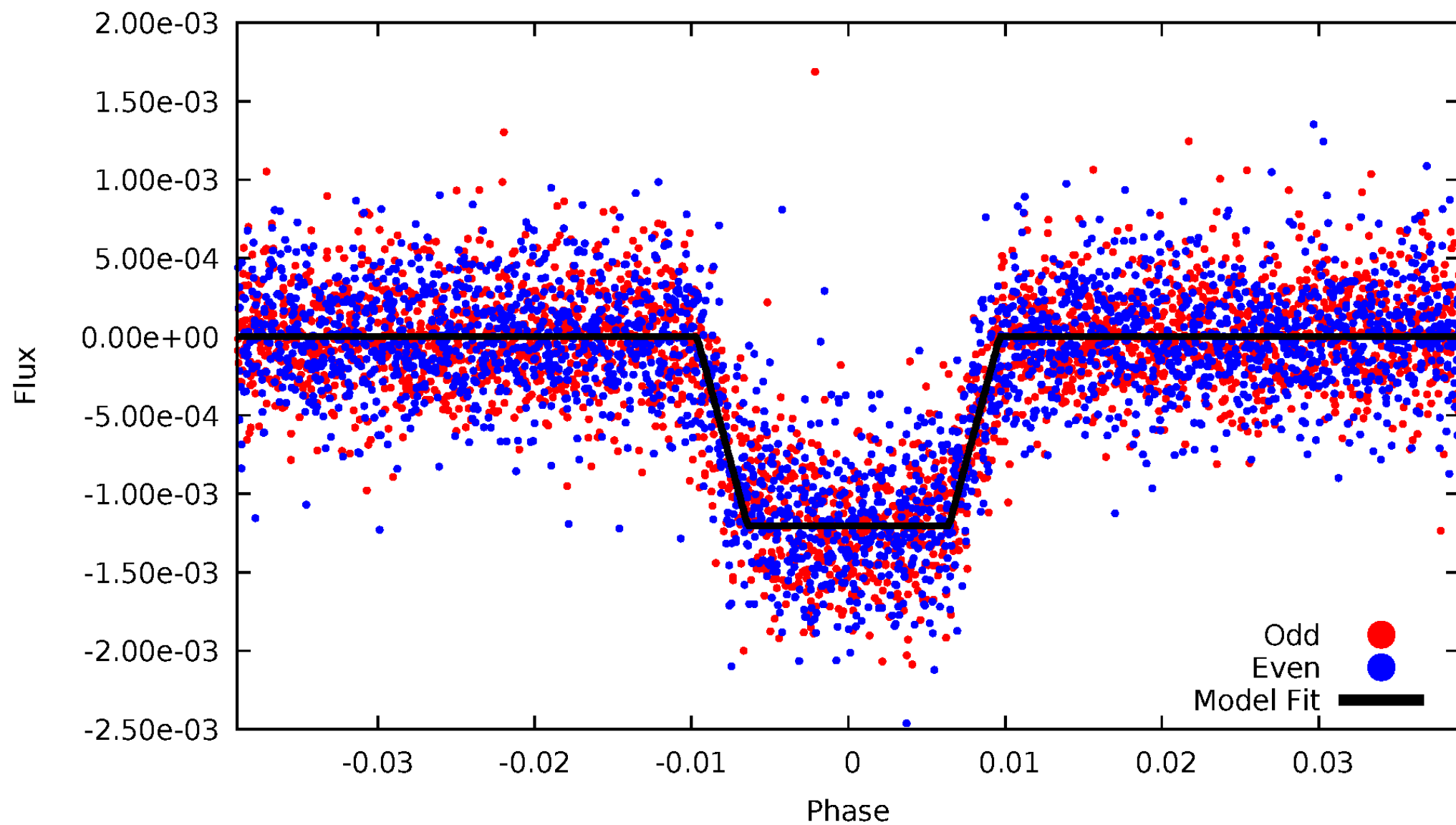
DV Odd/Even

TCE 004249725-01



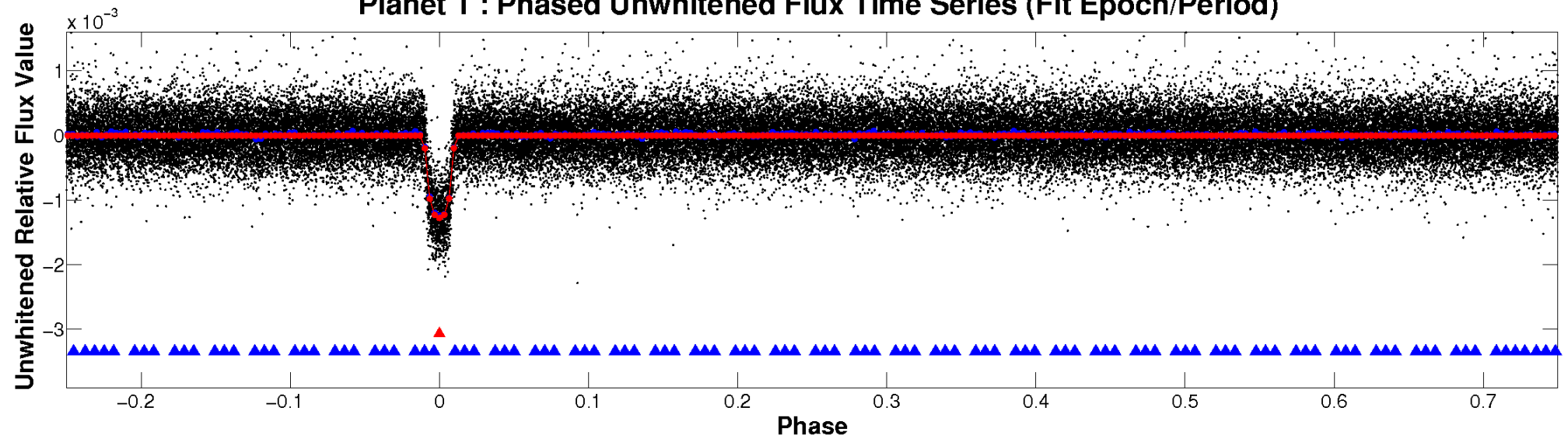
ALT Odd/Even

TCE 004249725-01

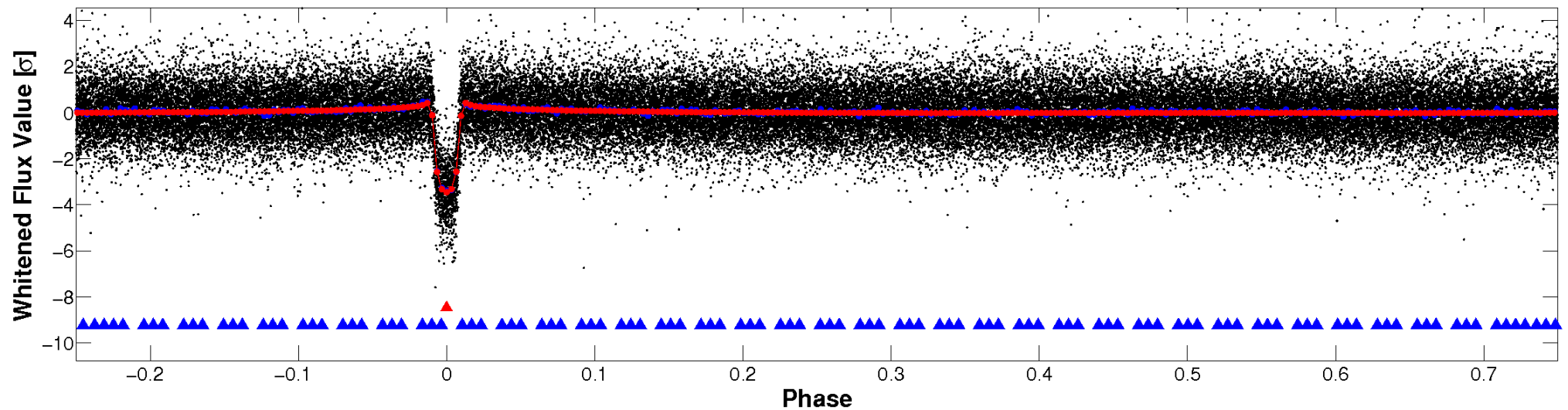


Non-Whitened Vs. Whitened Light Curve

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

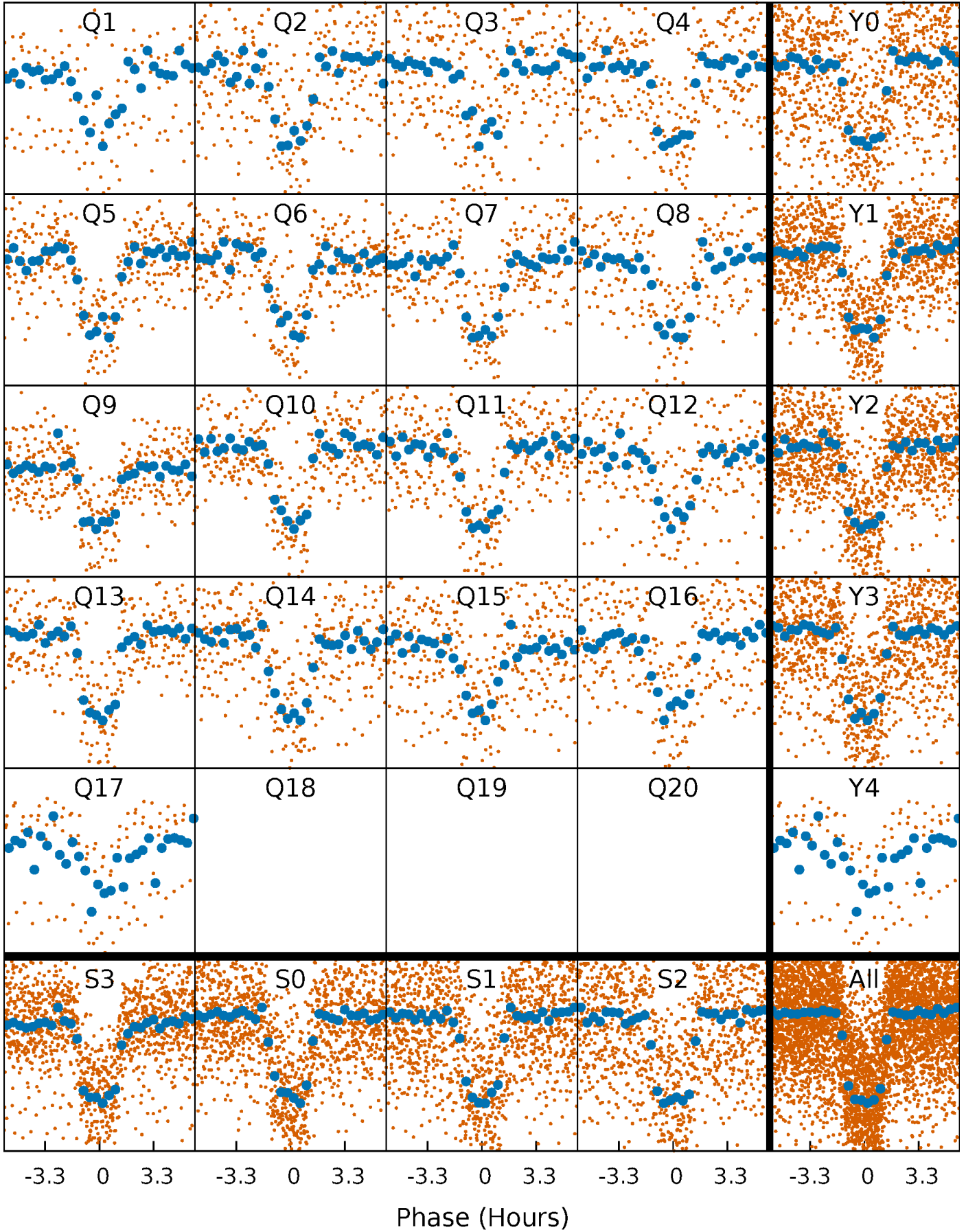


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



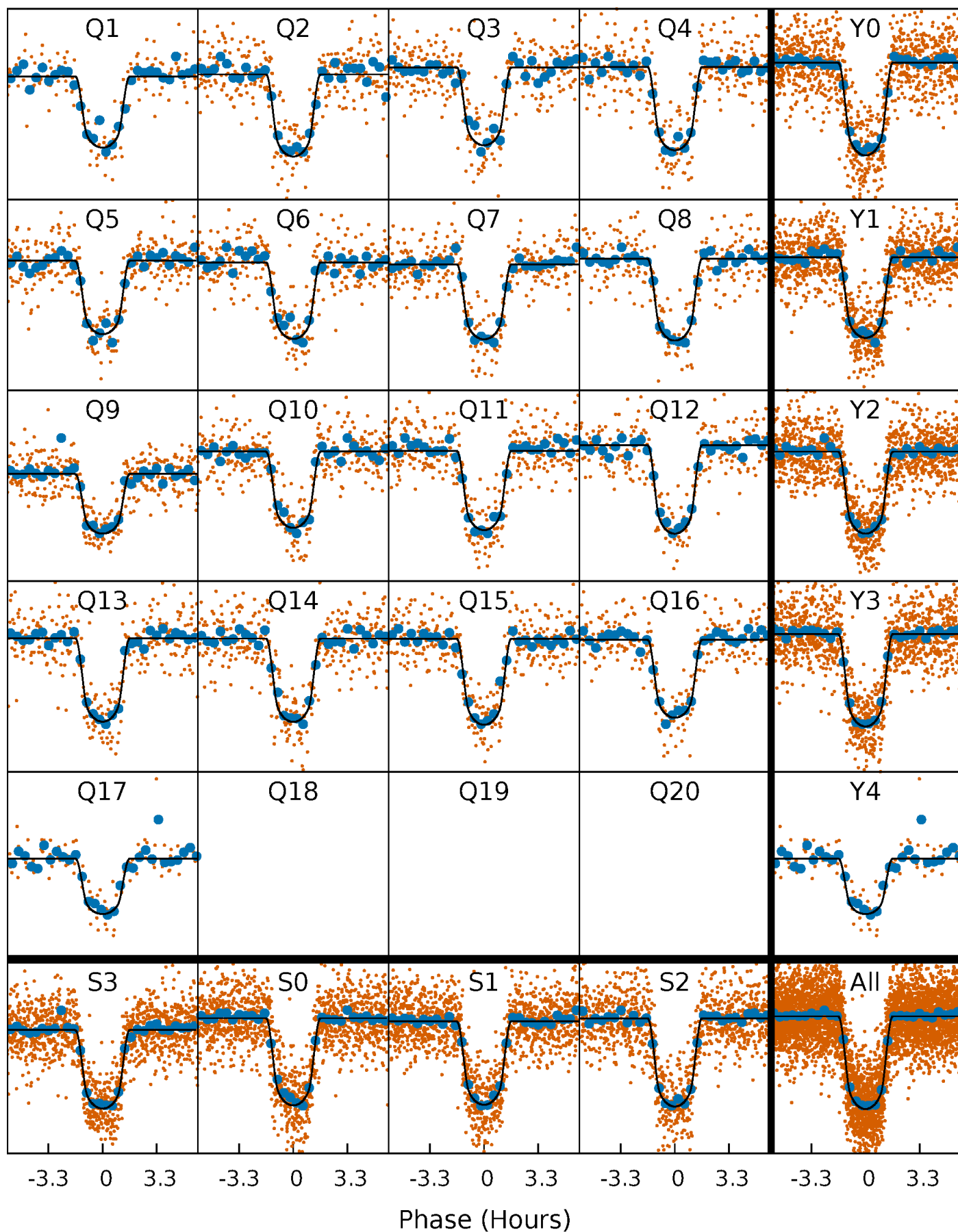
PDC Quarter-Phased Transit Curves

TCE 004249725-01 P= 6.312513 Days $T_0=132.653753$ (BKJD)



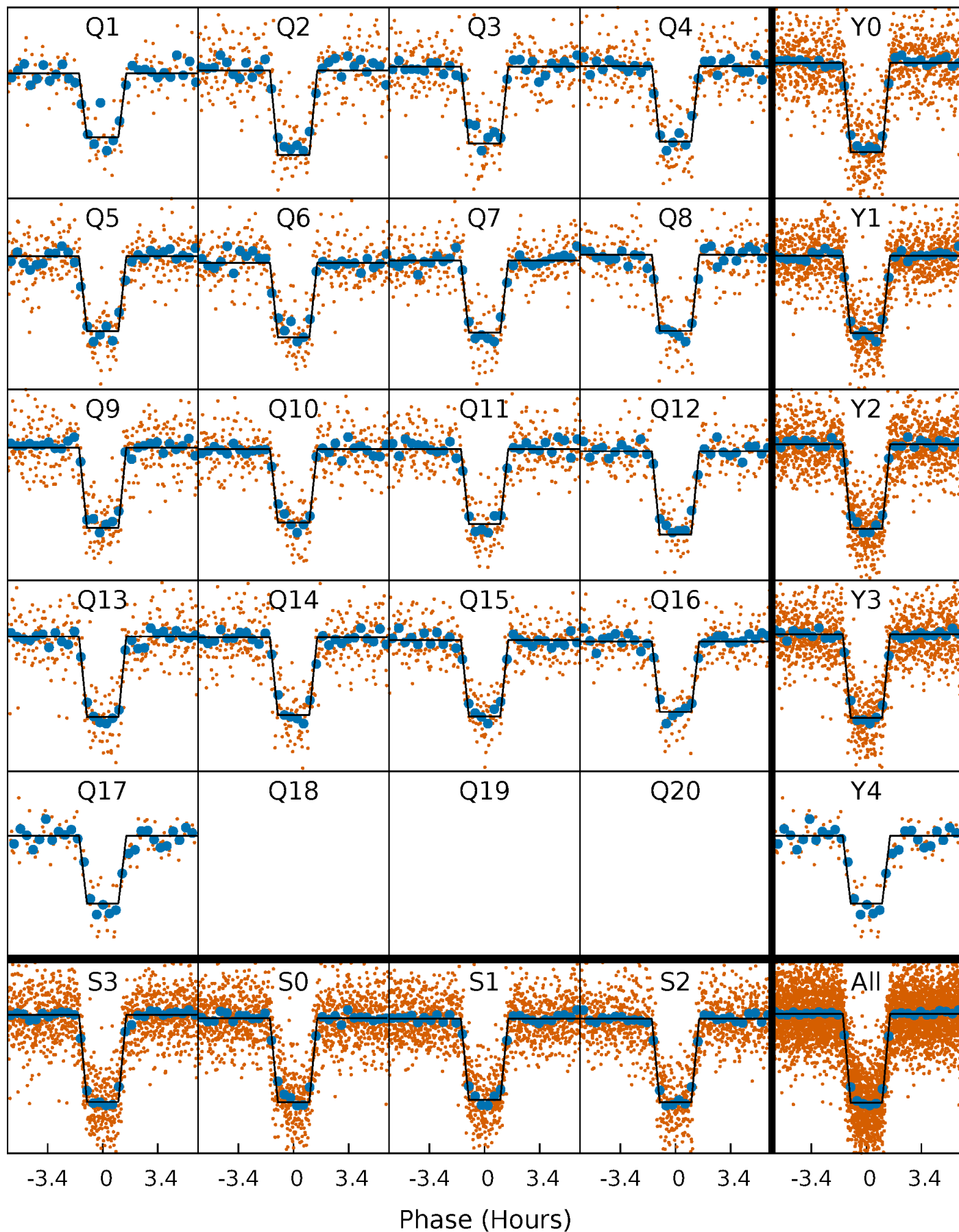
DV Quarter-Phased Transit Curves

TCE 004249725-01 P= 6.312513 Days $T_0=132.653753$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

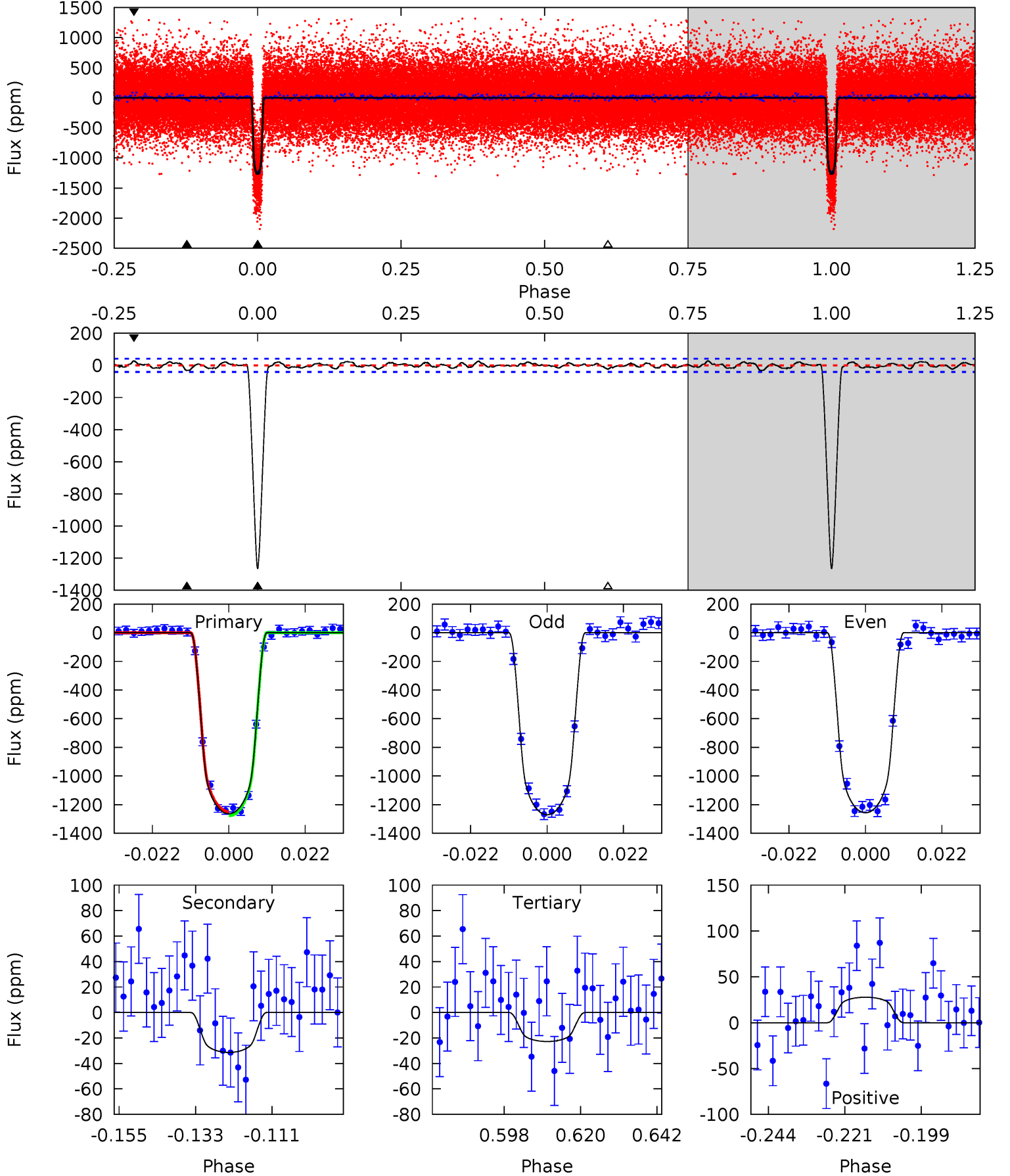
TCE 004249725-01 P= 6.312501 Days $T_0=132.655258$ (BKJD)



DV Model-Shift Uniqueness Test

004249725-01, P = 6.312513 Days, E = 126.341240 Days

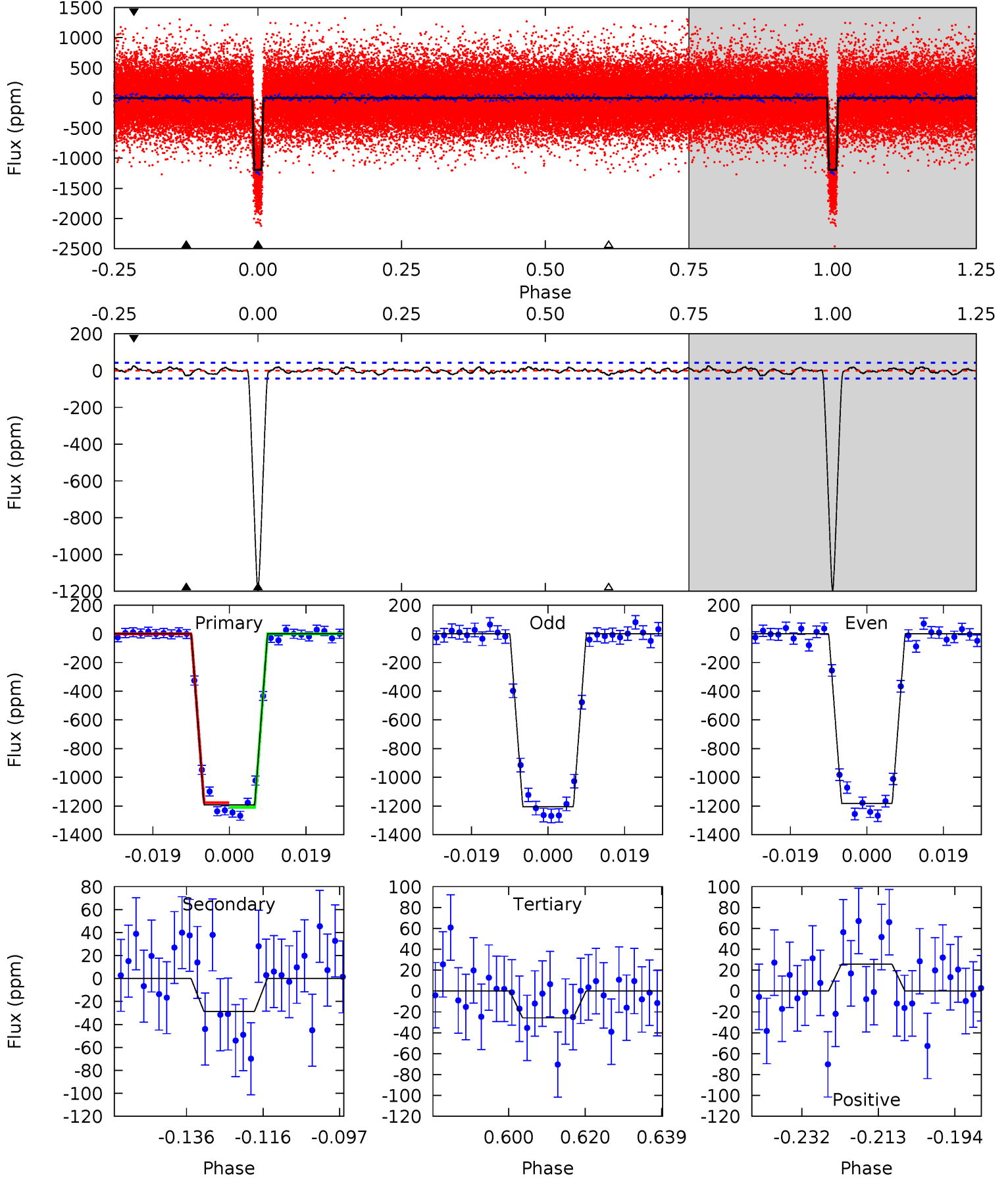
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
150.2	3.73	2.71	3.30	4.87	2.29	1.27	147.5	146.9	1.02	0.42	0.83	0.99	0.02	1.68



Alt Model-Shift Uniqueness Test

004249725-01, P = 6.312501 Days, E = 126.342757 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
134.9	3.24	2.91	2.90	4.90	2.34	1.10	132.0	132.0	0.33	0.34	1.25	0.98	0.02	1.77



Stellar Parameters For KIC 004249725

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4090^{+447}_{-335}	$4.696^{+0.084}_{-0.056}$	$-0.180^{+0.150}_{-0.100}$	$0.571^{+0.076}_{-0.093}$	$0.591^{+0.089}_{-0.089}$	$4.477^{+2.019}_{-0.983}$
	+11%/-8%	+2%/-1%	+83%/-56%	+13%/-16%	+15%/-15%	+45%/-22%
Source	SPE5	SPE5	SPE5	DSEP		

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

Secondary Eclipse Parameters for KIC 004249725-01 / KOI 0222.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-31 ± 8	$2.29^{+0.22}_{-0.22}$	805^{+88}_{-75}	2366^{+166}_{-150}	10^{+3}_{-3}
Alt.	-29 ± 9	$2.15^{+0.21}_{-0.23}$	798^{+92}_{-69}	2375^{+188}_{-171}	11^{+4}_{-3}

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 $A_{\text{obs}} \gg 1.0$

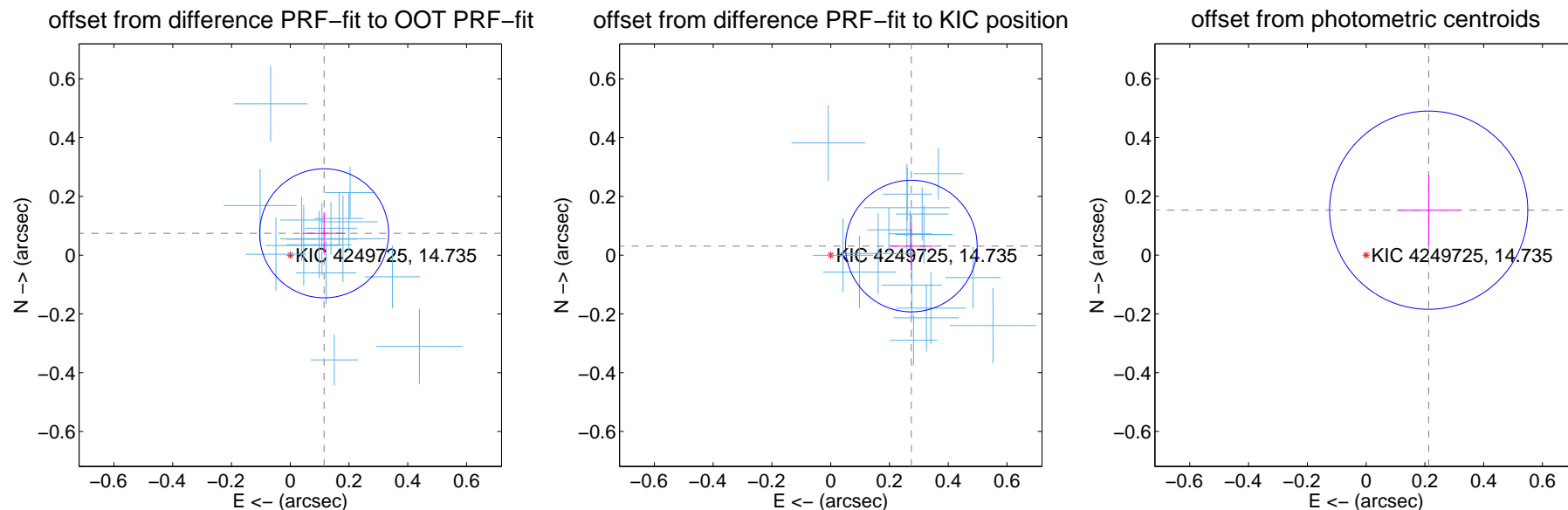
DV Centroid Data

Supplemental centroid analysis for 004249725-01. Kepler magnitude: 14.73. Transit SNR 98.94

There are 17 quarters with good PRF difference image offsets

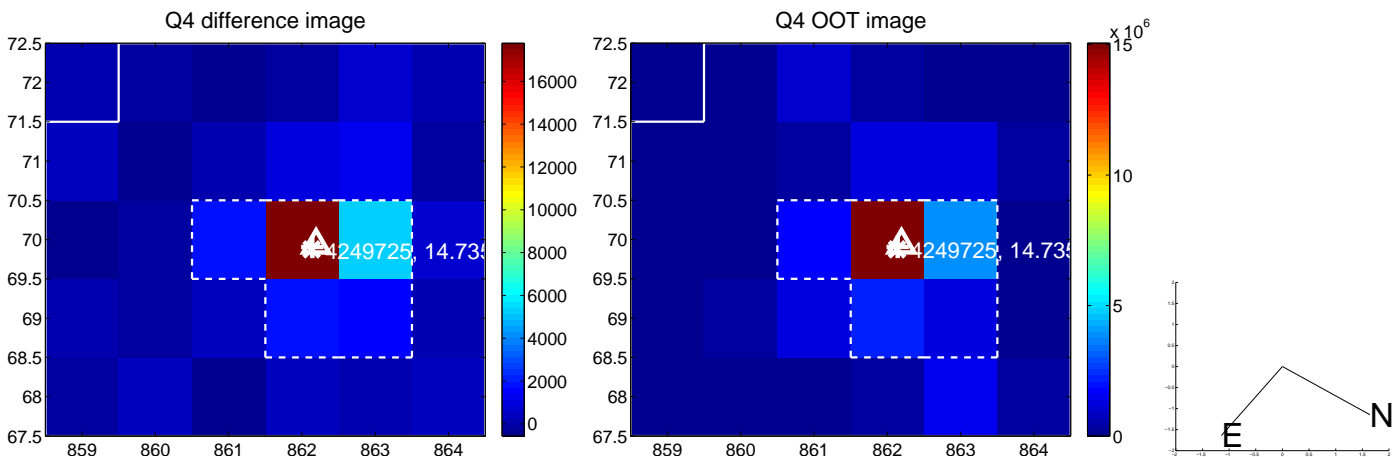
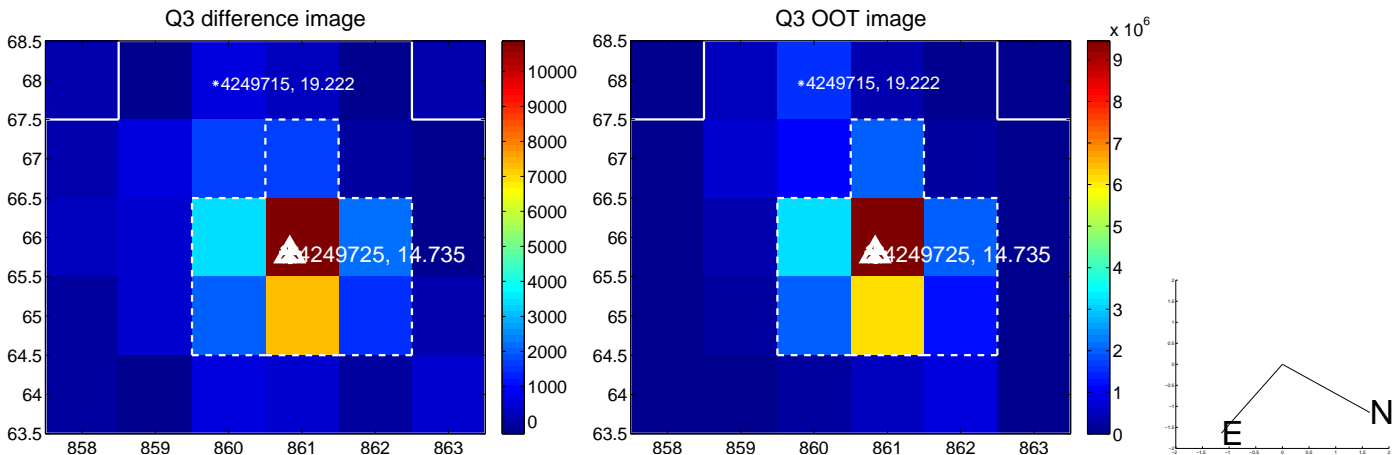
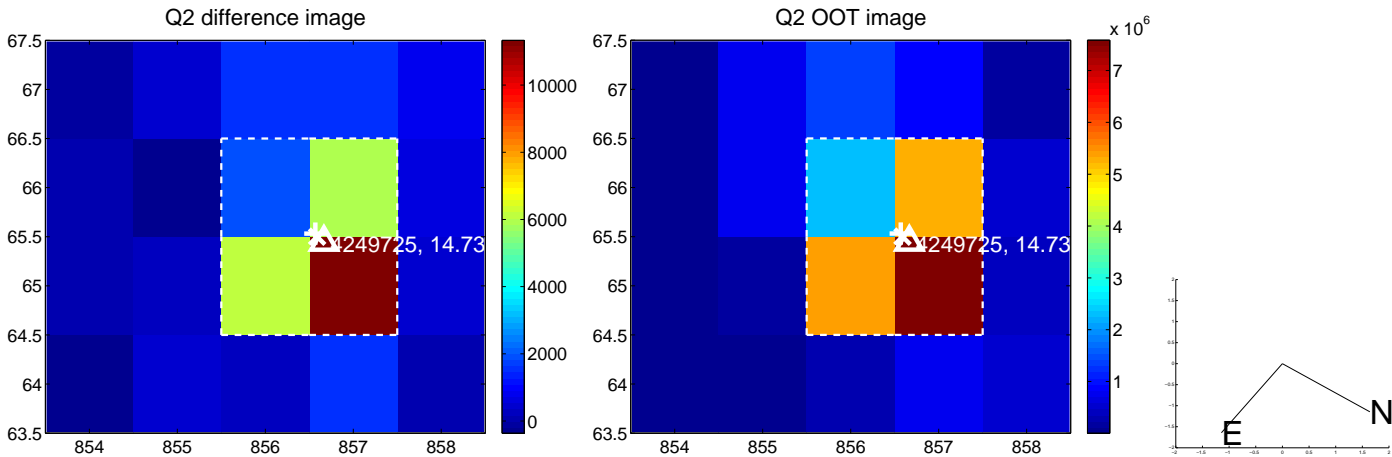
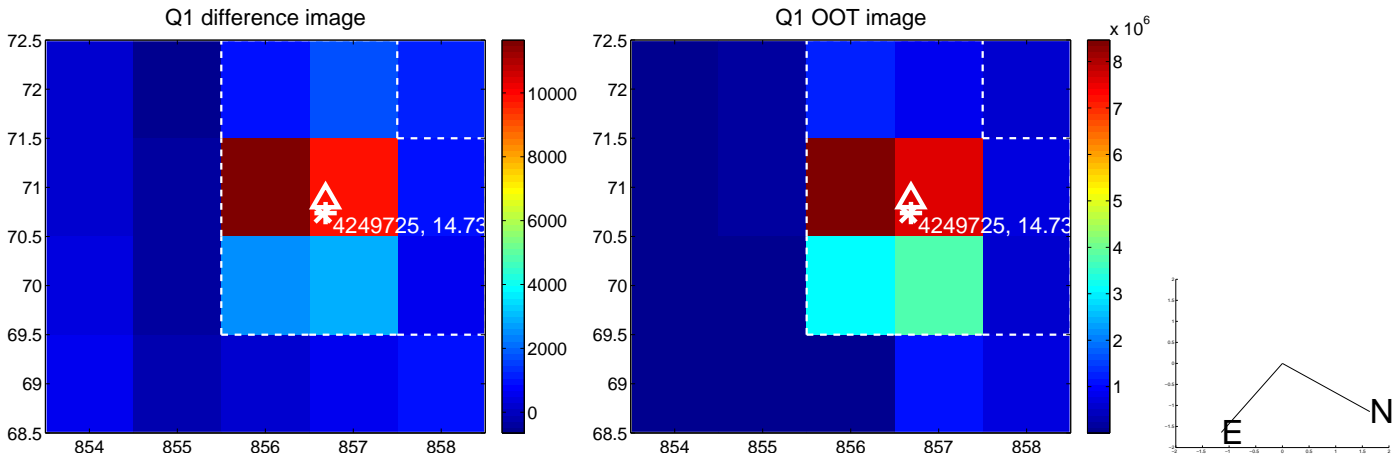
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.137 ± 0.073	1.87	-0.115 ± 0.073	0.074 ± 0.073
PRF-fit source offset from KIC position	0.276 ± 0.075	3.70	-0.274 ± 0.075	0.031 ± 0.082
photometric centroid source offset	0.26 ± 0.11	2.33	-0.21 ± 0.11	0.15 ± 0.12

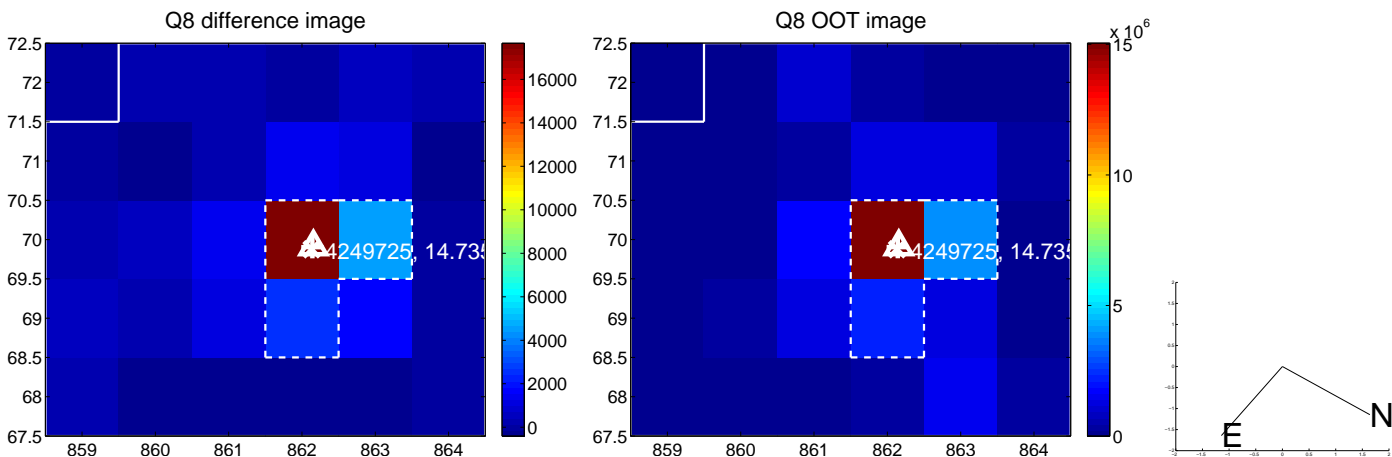
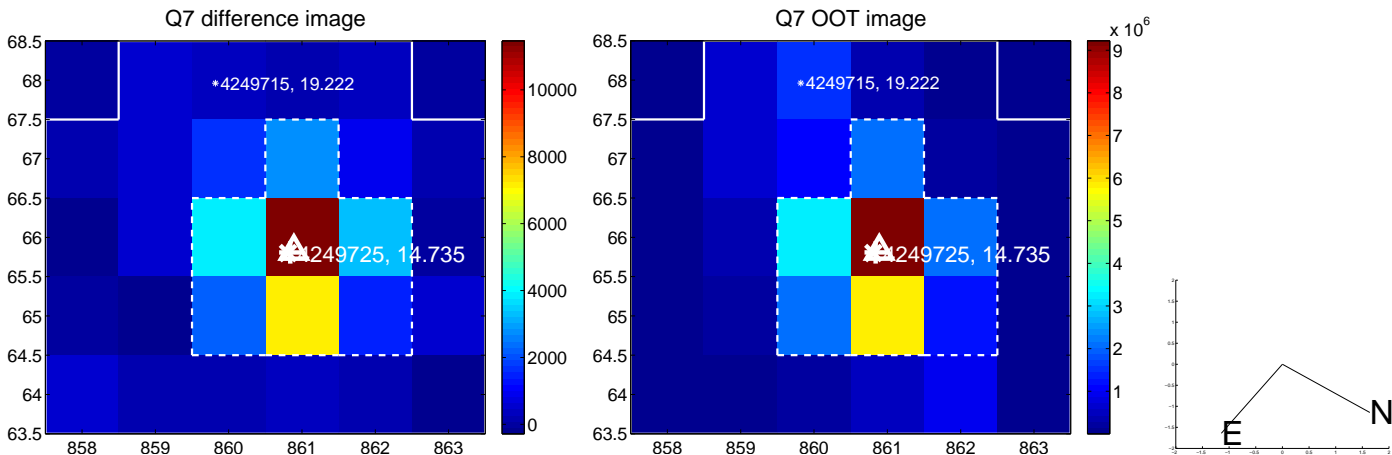
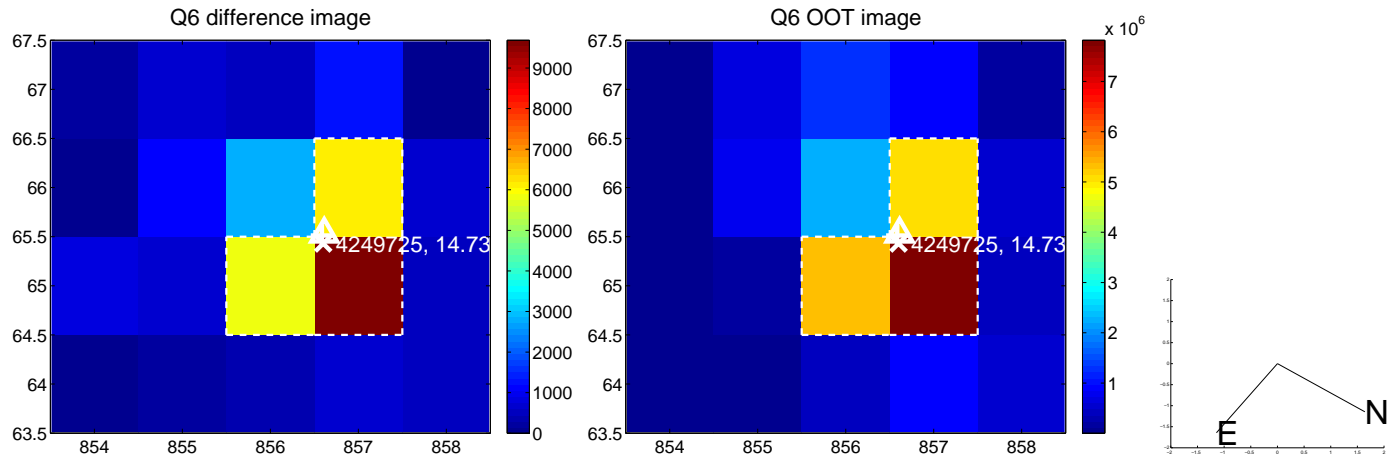
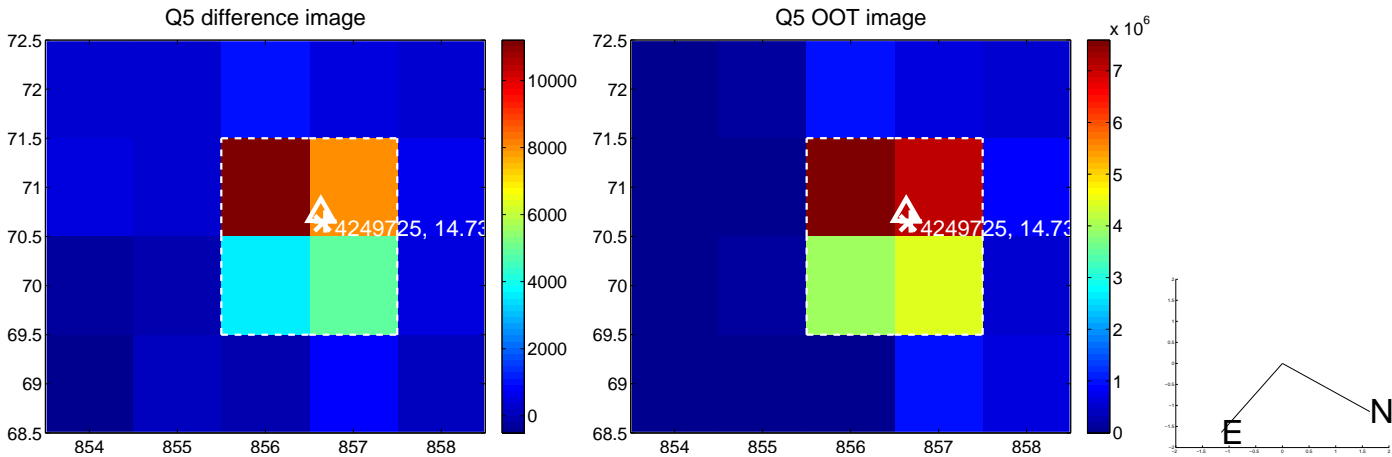


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

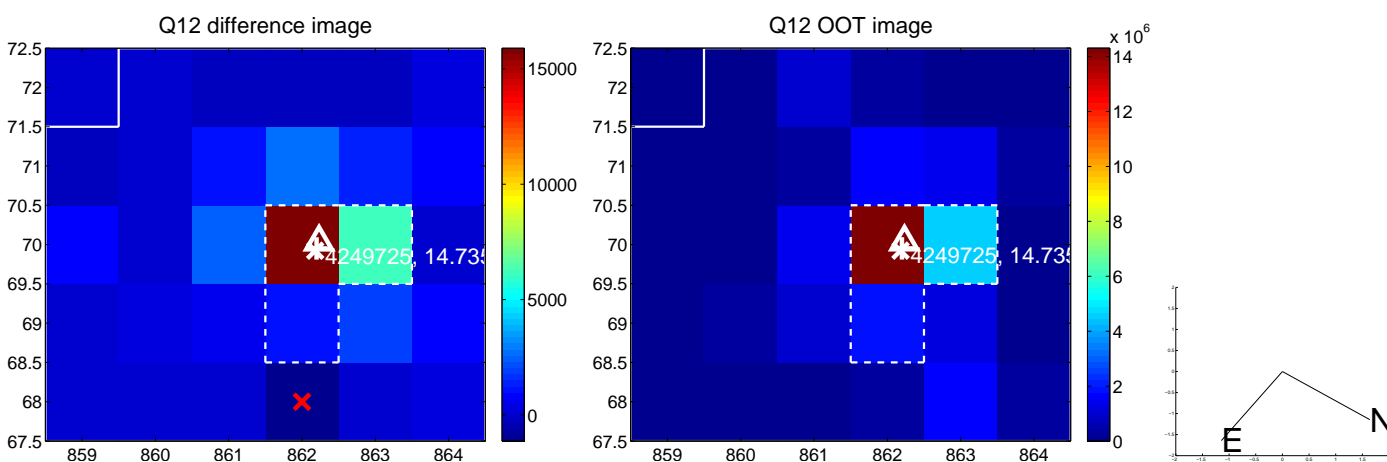
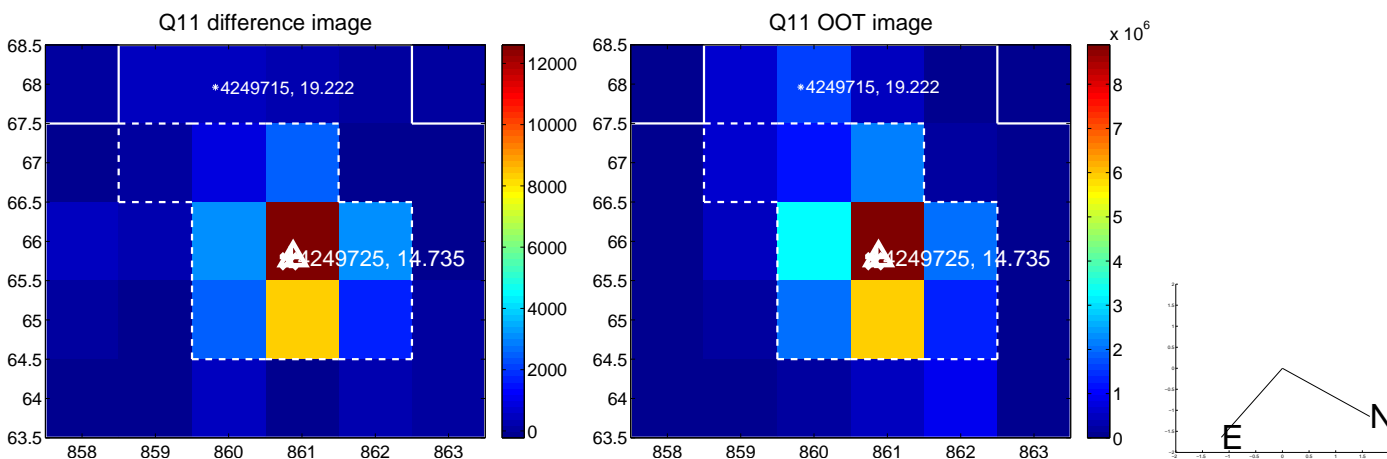
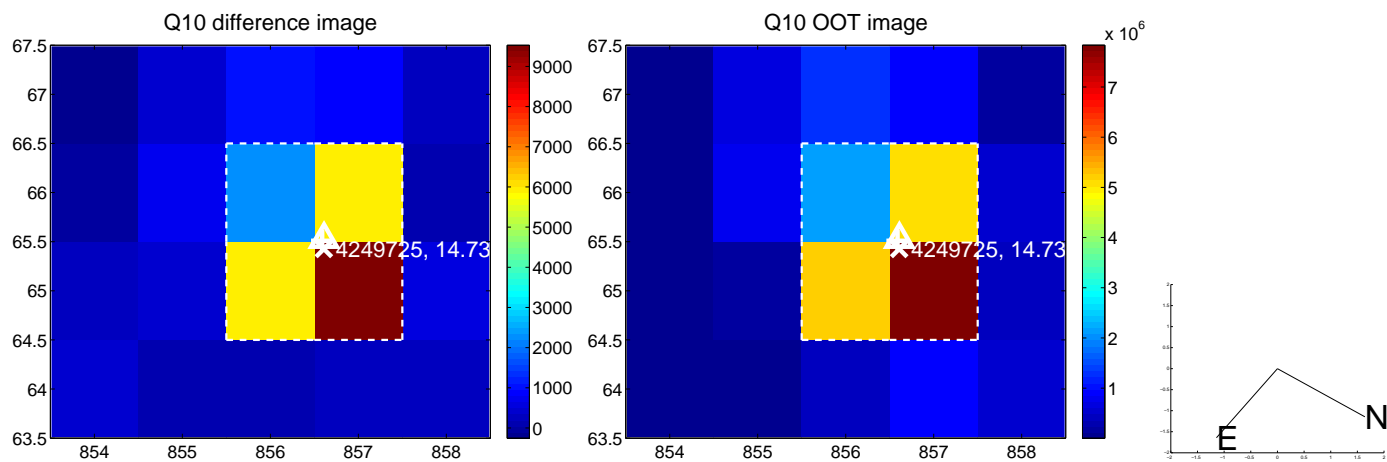
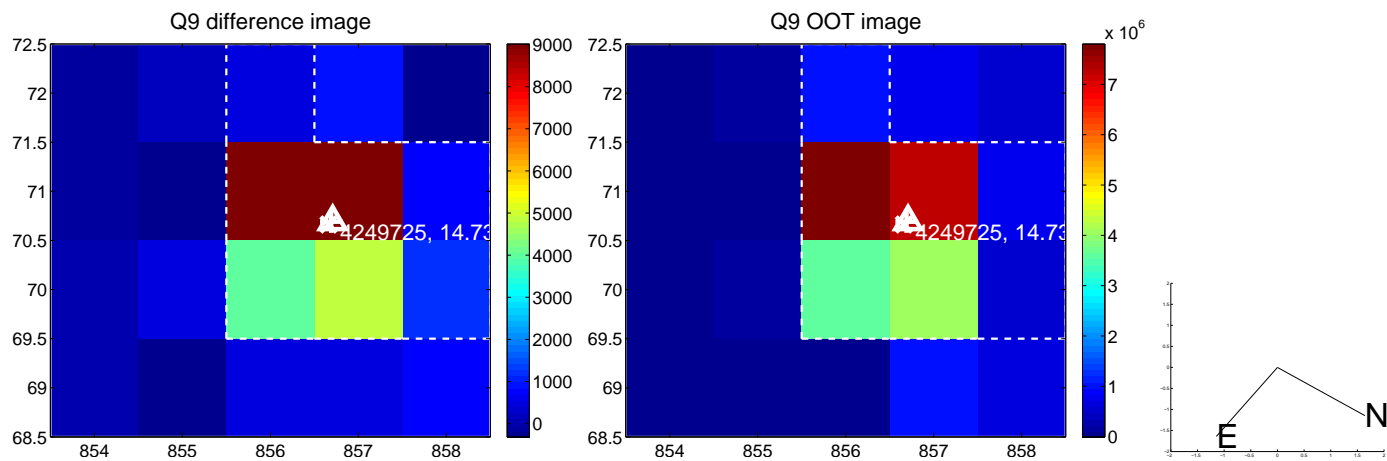
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



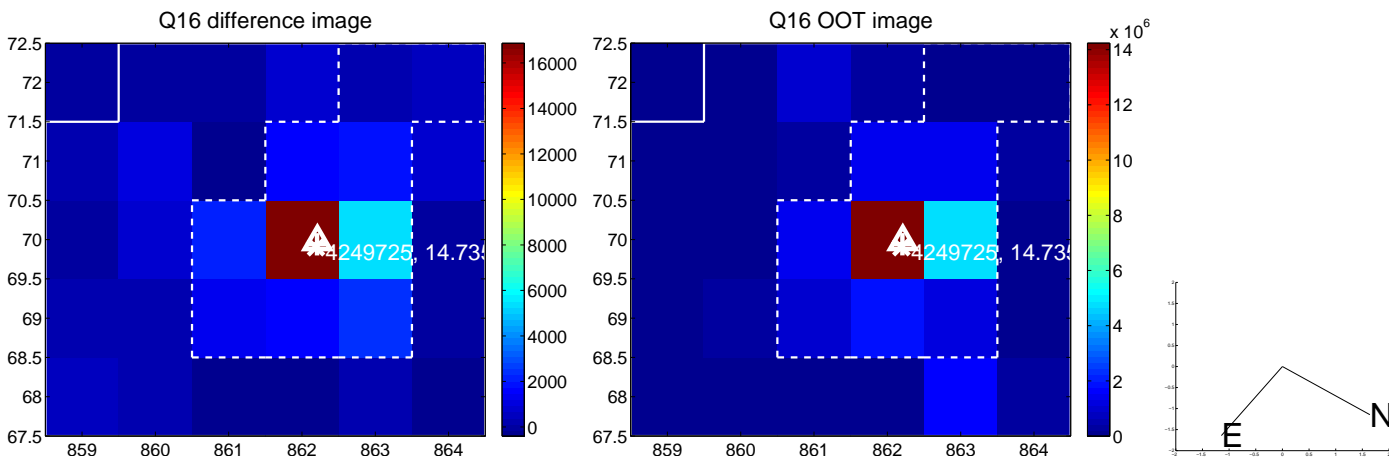
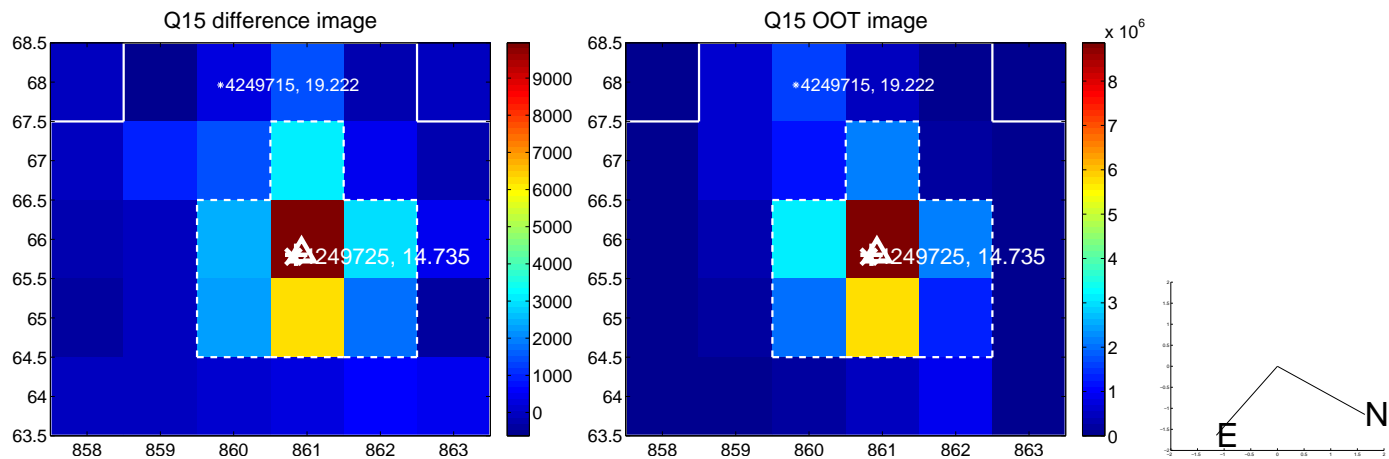
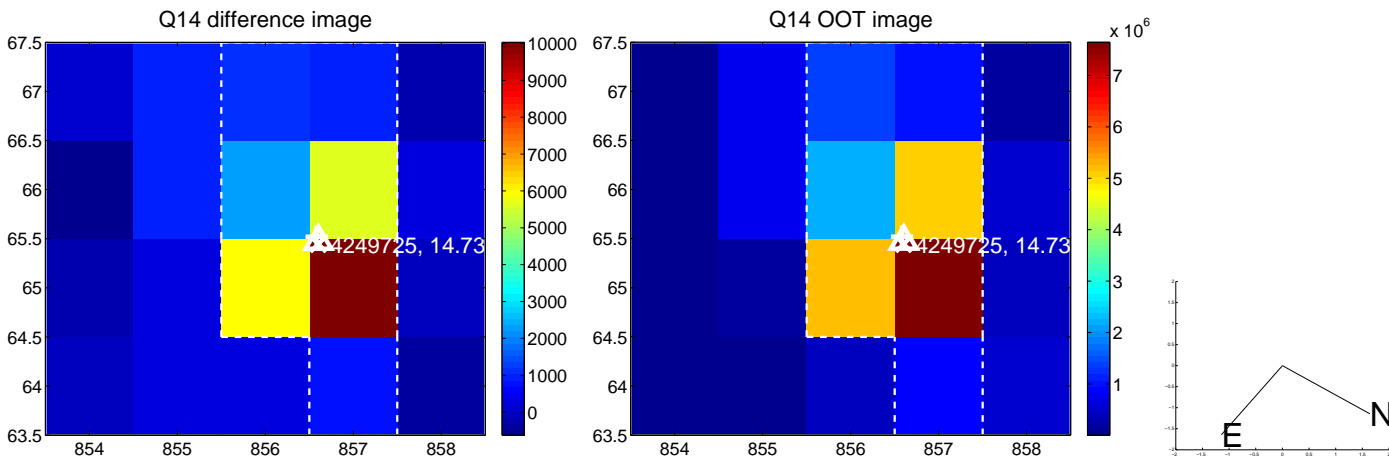
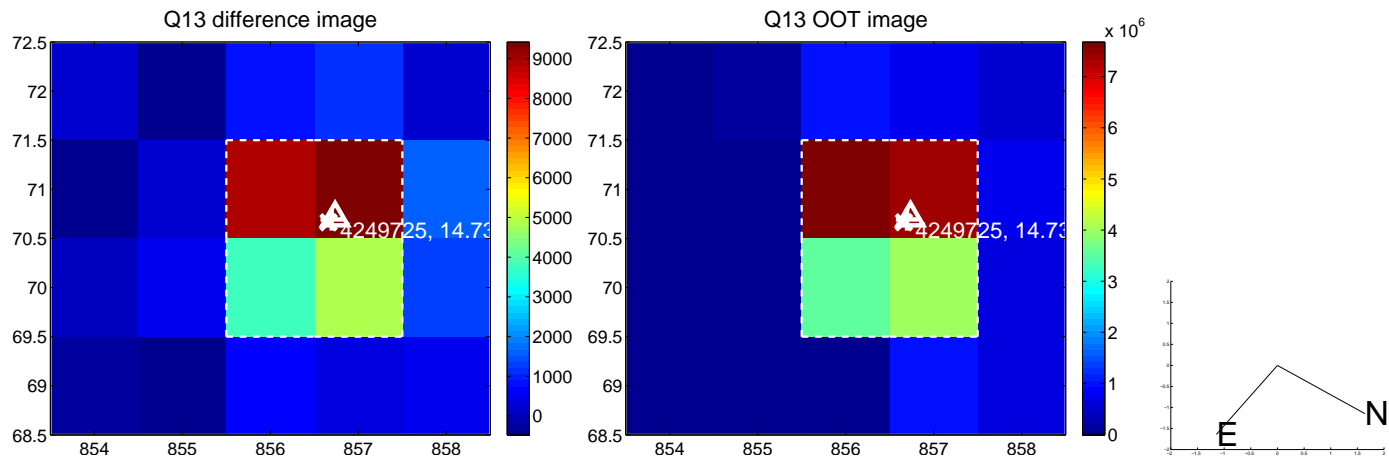
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



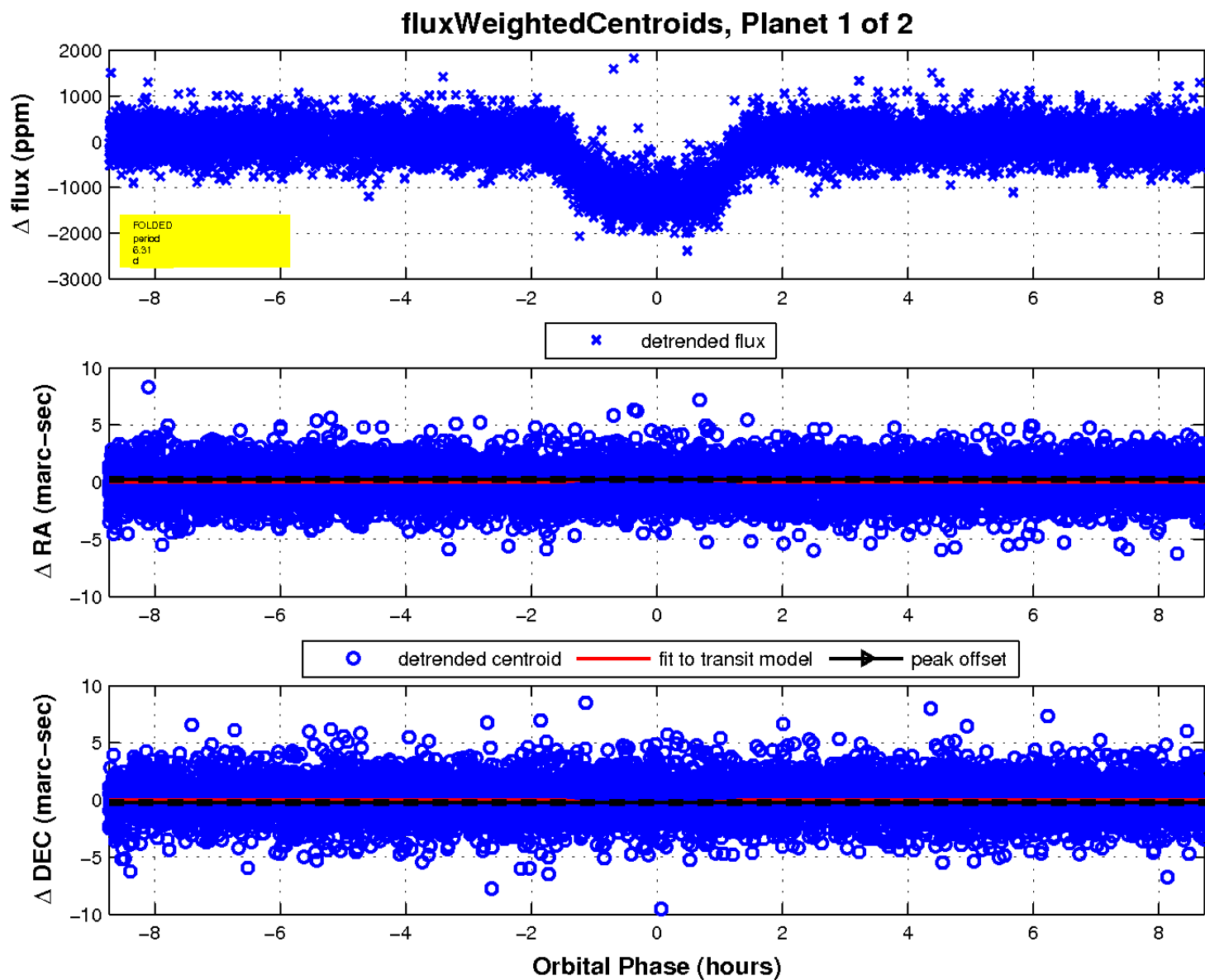
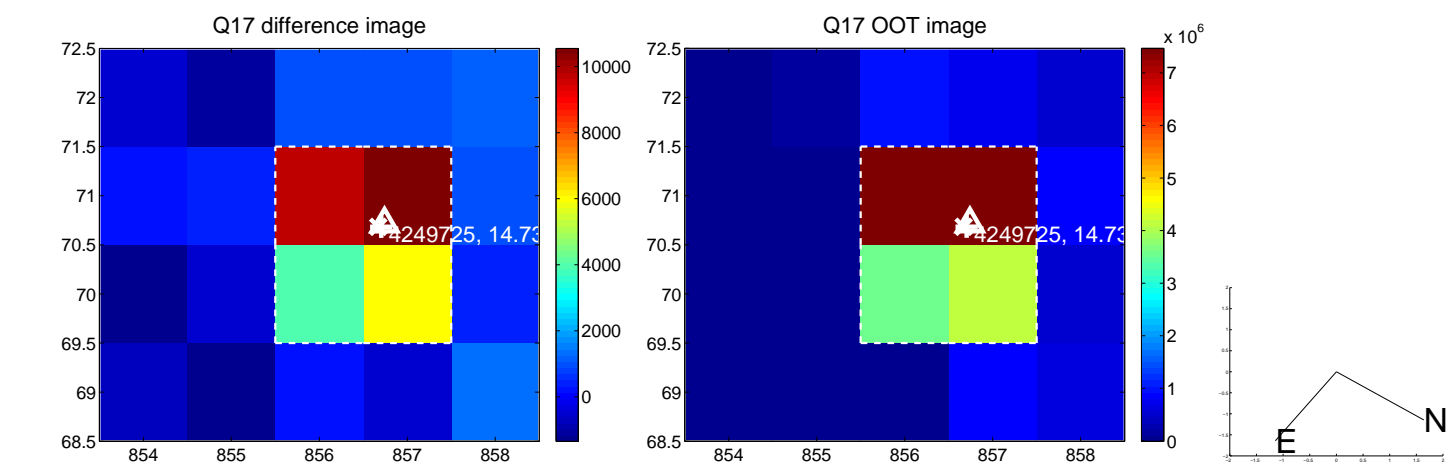
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

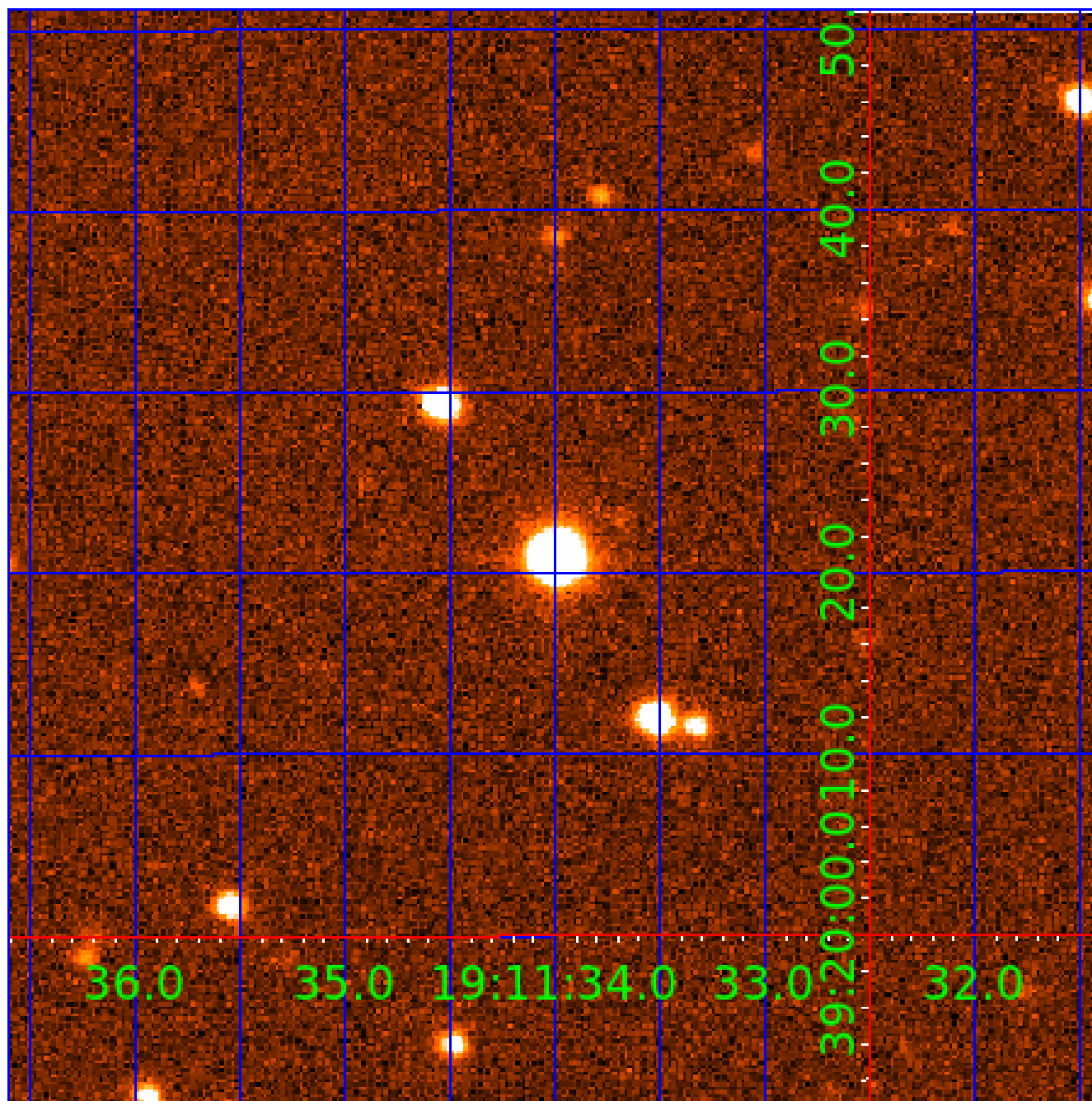


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004249725

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})
004249725-01	OBS	0222.01	6.312513	132.653753	1279.9	2.910	92.9	98.9	0.57	4090	2.31	25.98
004249725-02	OBS	0222.02	12.794548	143.561055	792.1	3.568	42.4	45.0	0.57	4090	1.80	10.13

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004249725-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
004249725-02	OBS	PC	1.00	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.

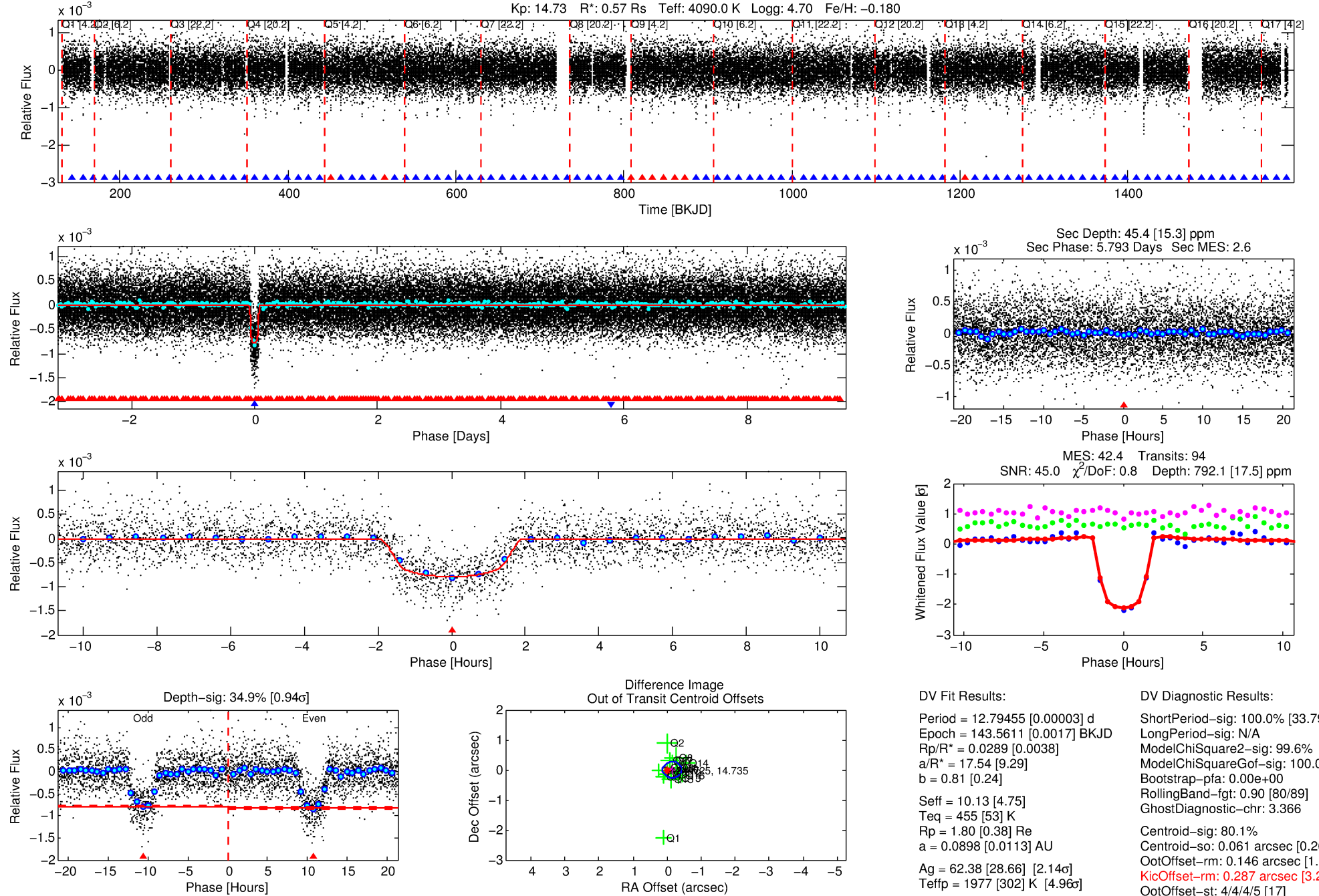
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004249725-02

No Significant Match Found

DV One-Page Summary

KIC: 4249725 Candidate: 2 of 2 Period: 12.795 d
KOI: K00222.02 Name: Kepler-120c Corr: 0.977



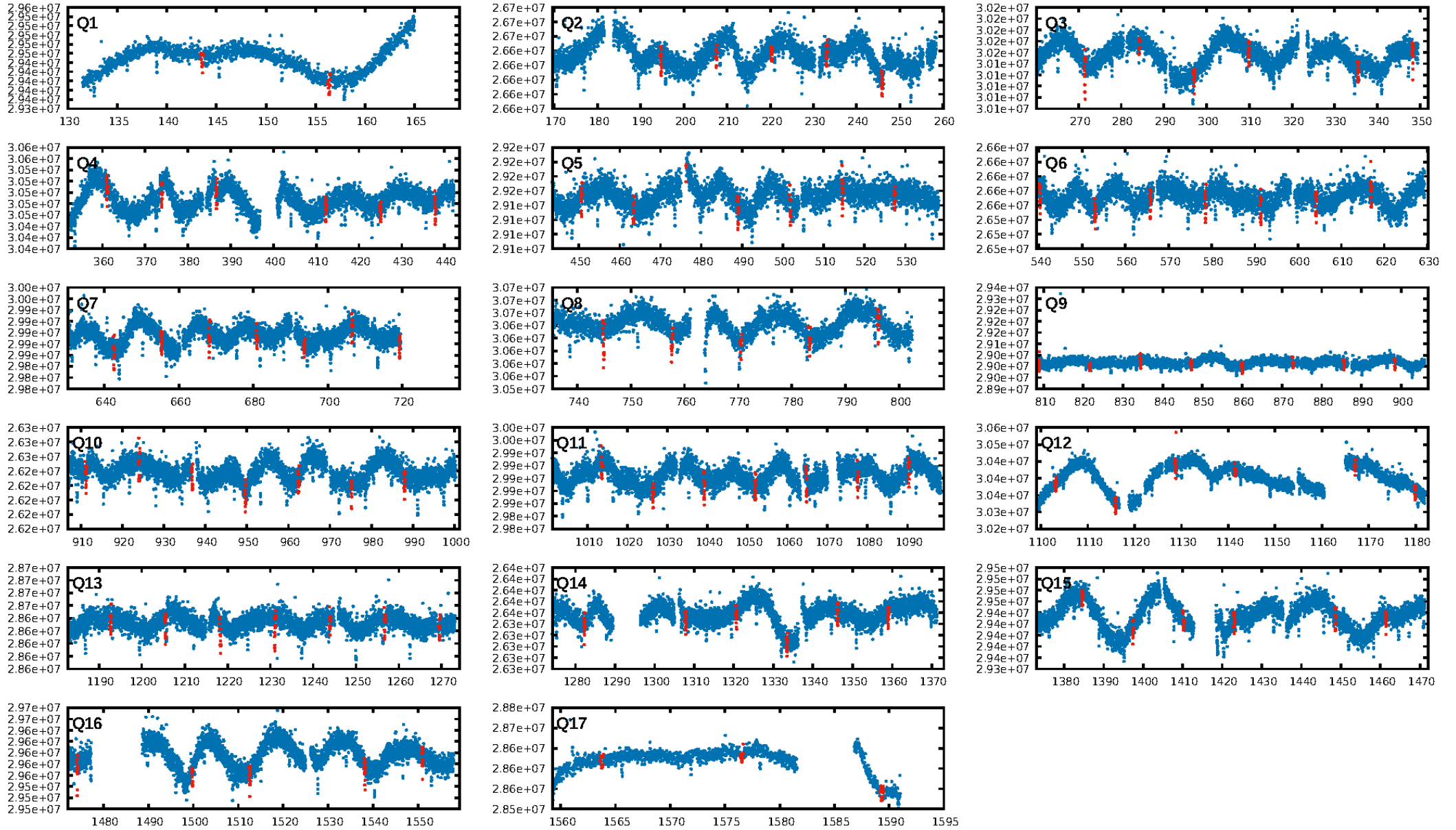
DV Fit Results:

Period = 12.79455 [0.00003] d
Epoch = 143.5611 [0.0017] BKJD
Rp/R* = 0.0289 [0.0038]
a/R* = 17.54 [9.29]
b = 0.81 [0.24]
Seff = 10.13 [4.75]
Teff = 455 [53] K
Rp = 1.80 [0.38] Re
a = 0.0898 [0.0113] AU
Ag = 62.38 [28.66] [2.14 σ]
Teffp = 1977 [302] K [4.96 σ]

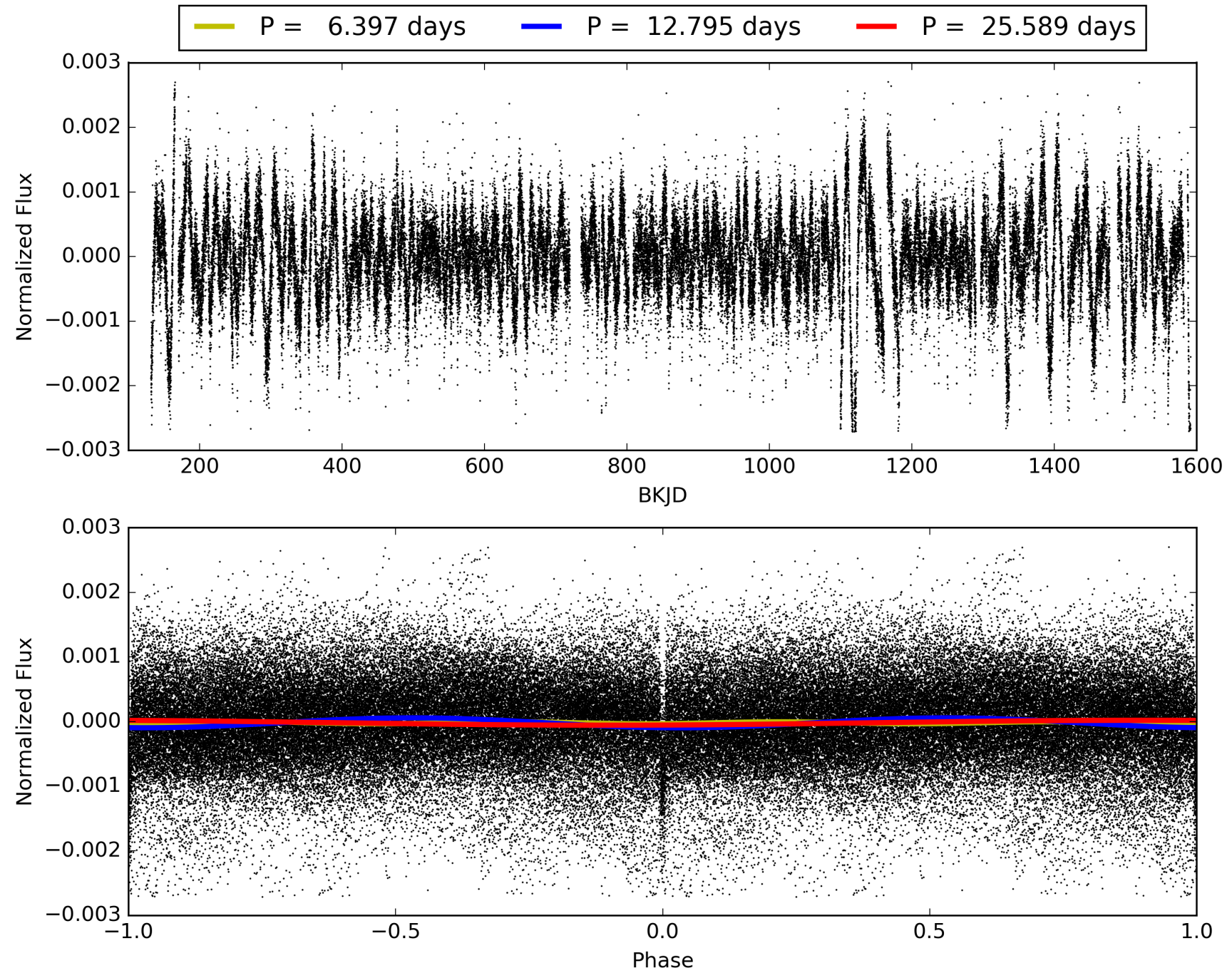
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [33.79 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 99.6%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.90 [80/89]
GhostDiagnostic-chr: 3.366
Centroid-sig: 80.1%
Centroid-so: 0.061 arcsec [0.26 σ]
OotOffset-rm: 0.146 arcsec [1.62 σ]
KicOffset-rm: 0.287 arcsec [3.22 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.94 [16/17]

TCE 004249725-02, PDC Light Curves

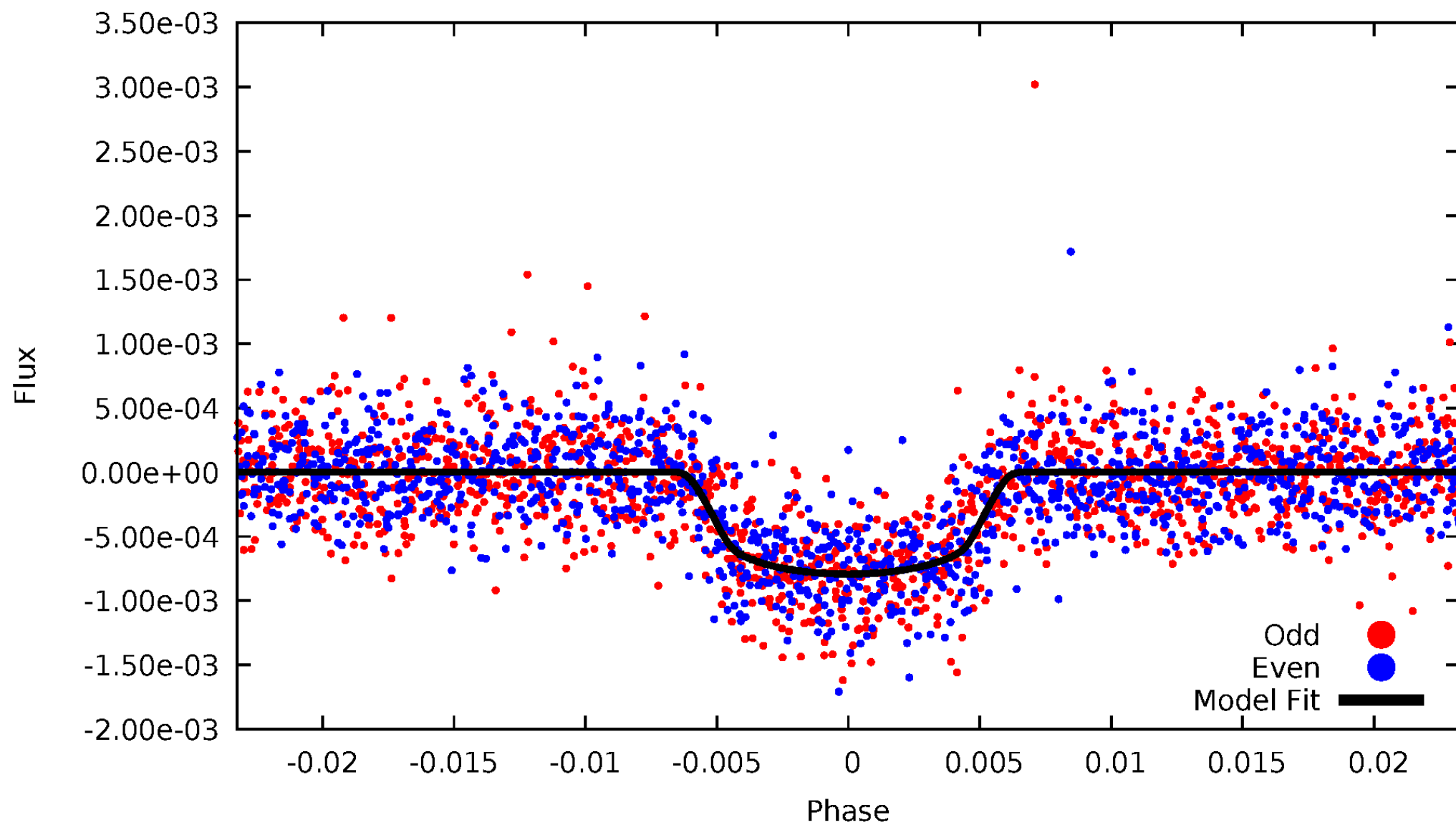


TCE 004249725-02



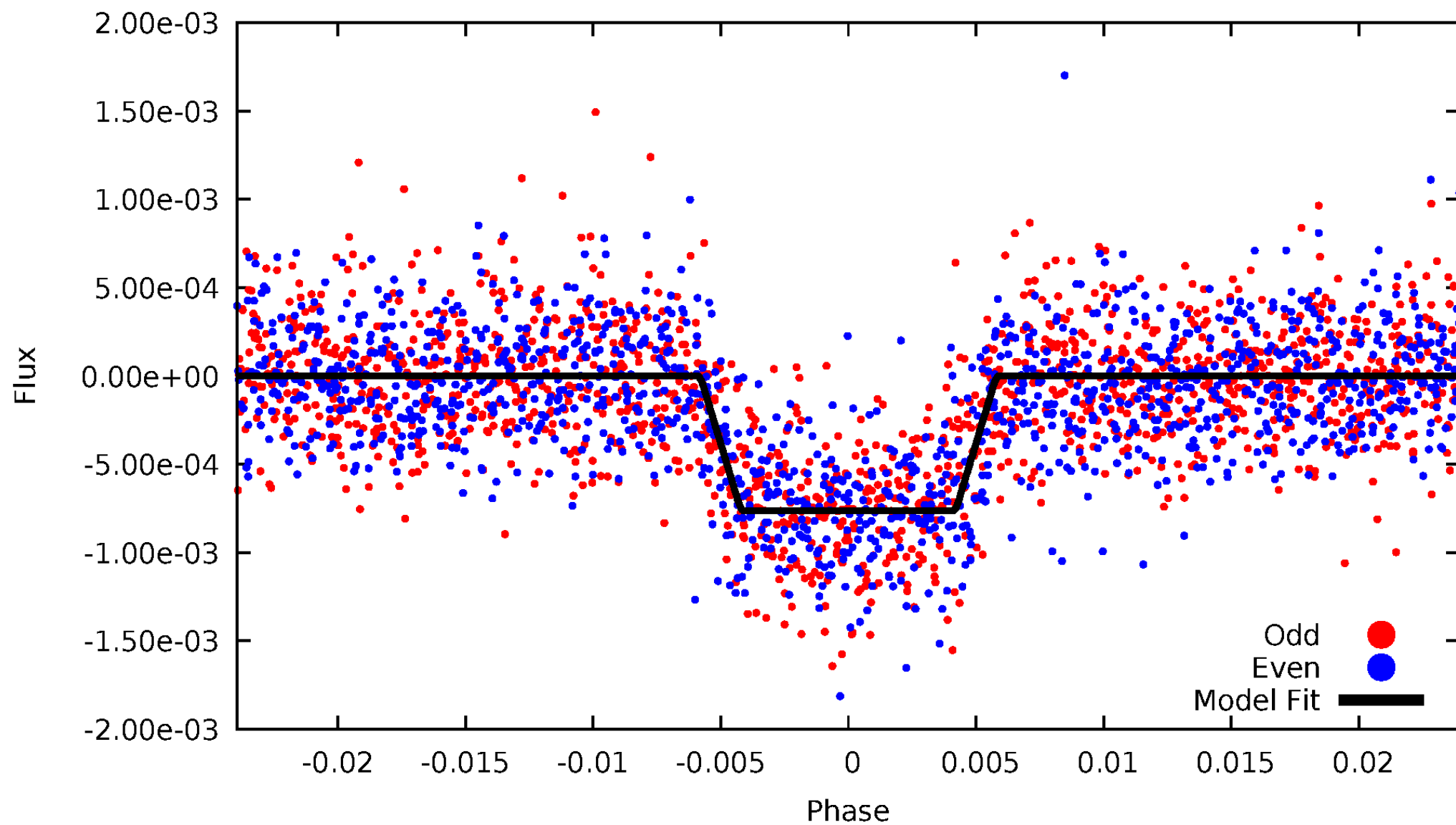
DV Odd/Even

TCE 004249725-02



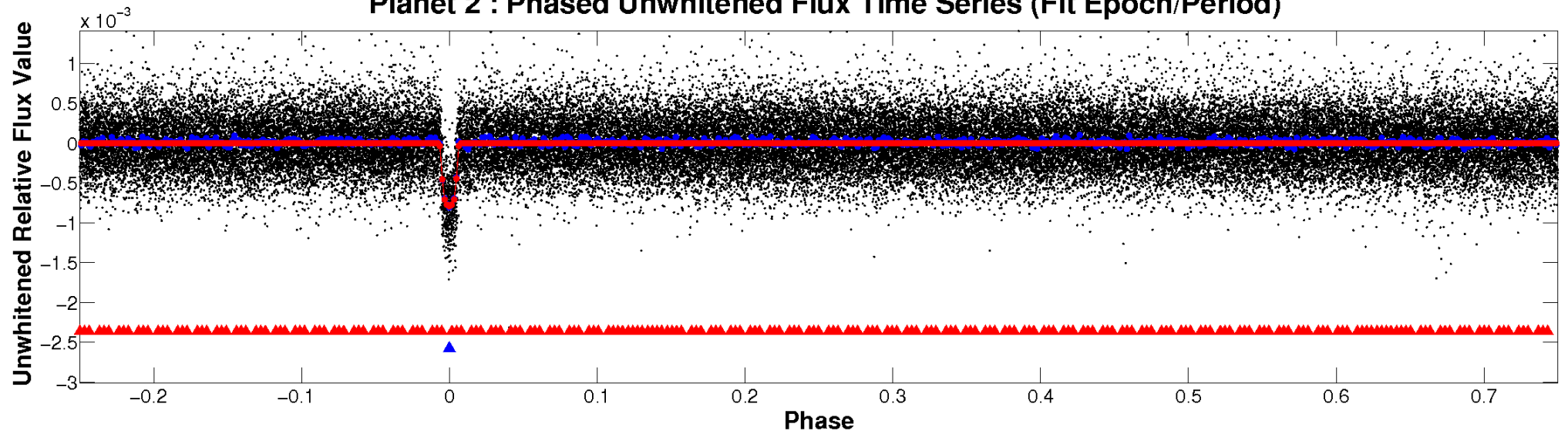
ALT Odd/Even

TCE 004249725-02

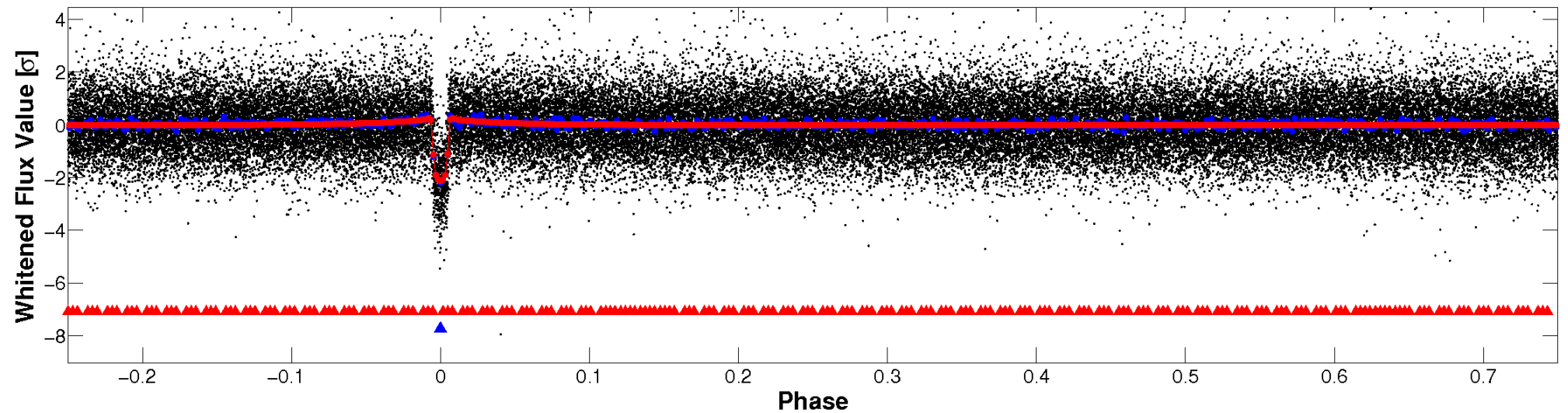


Non-Whitened Vs. Whitened Light Curve

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

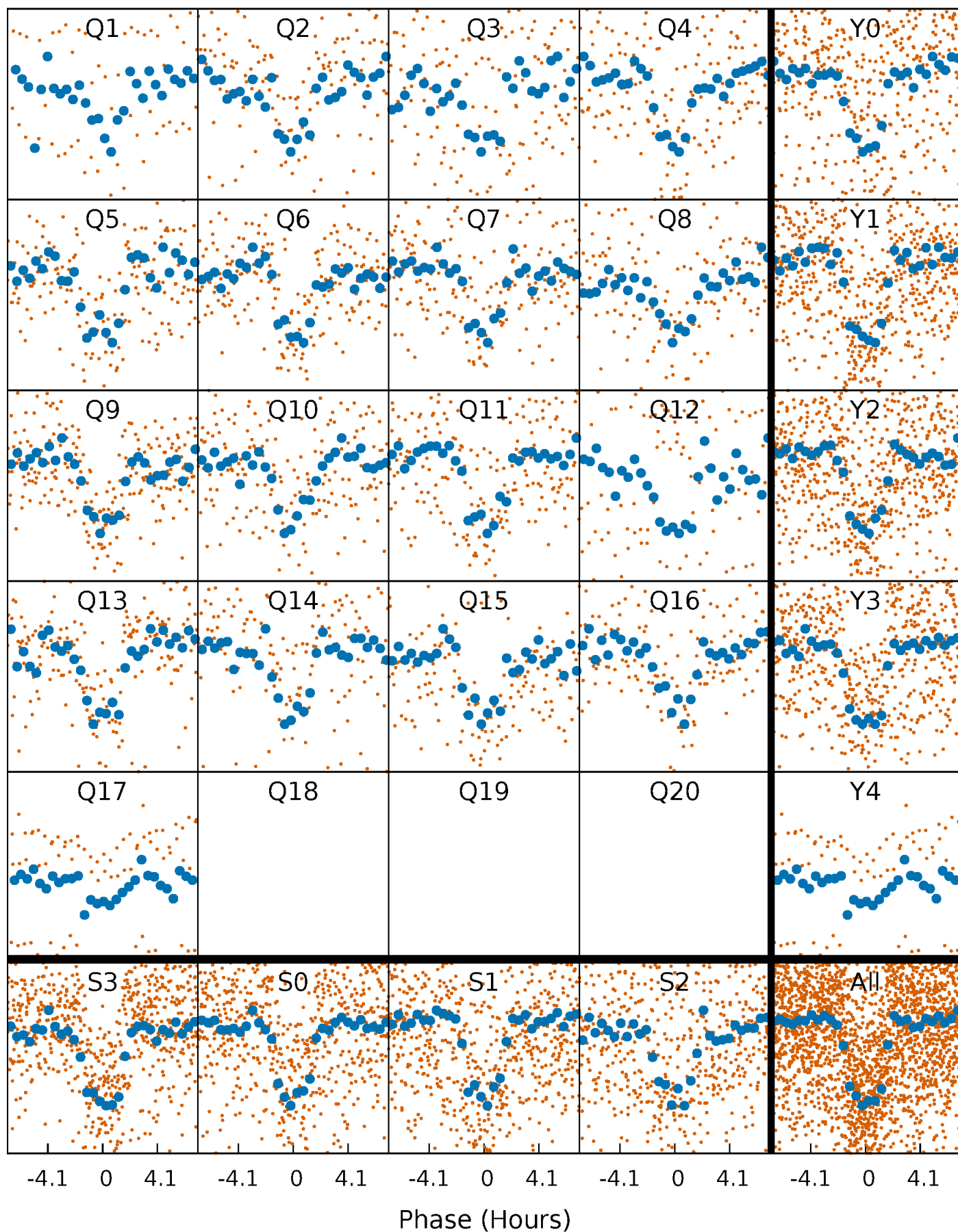


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



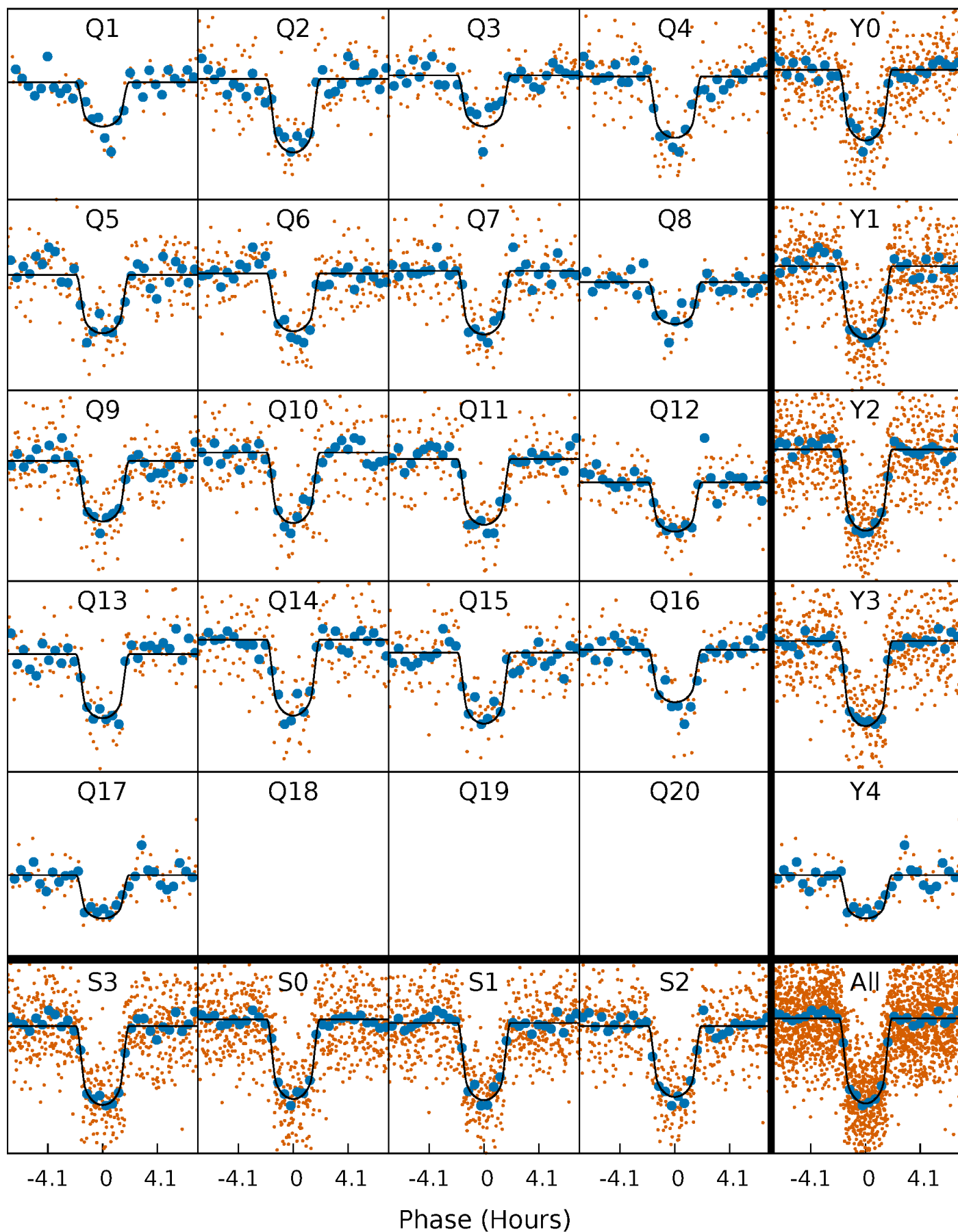
PDC Quarter-Phased Transit Curves

TCE 004249725-02 P= 12.794548 Days $T_0=143.561055$ (BKJD)



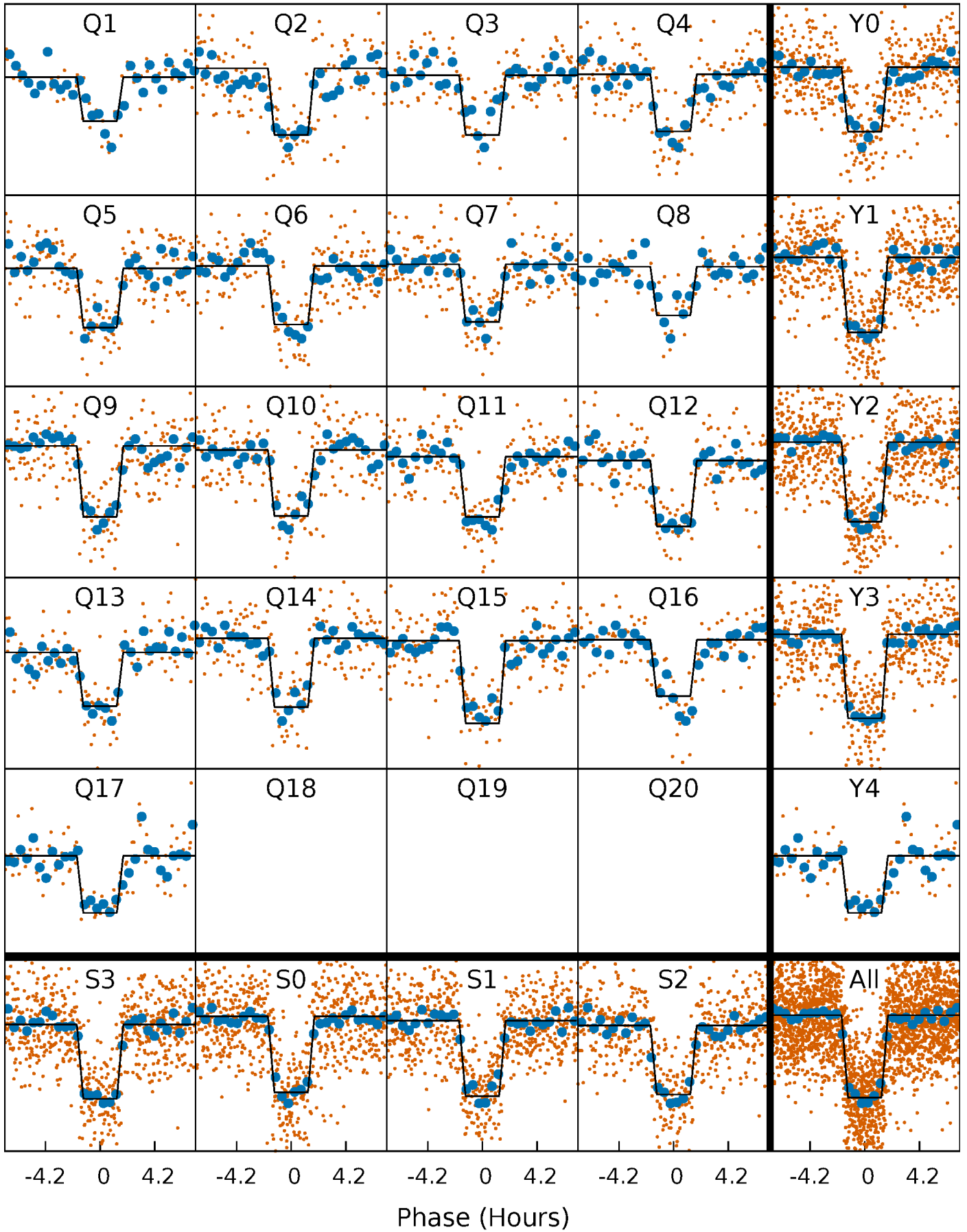
DV Quarter-Phased Transit Curves

TCE 004249725-02 P= 12.794548 Days $T_0=143.561055$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

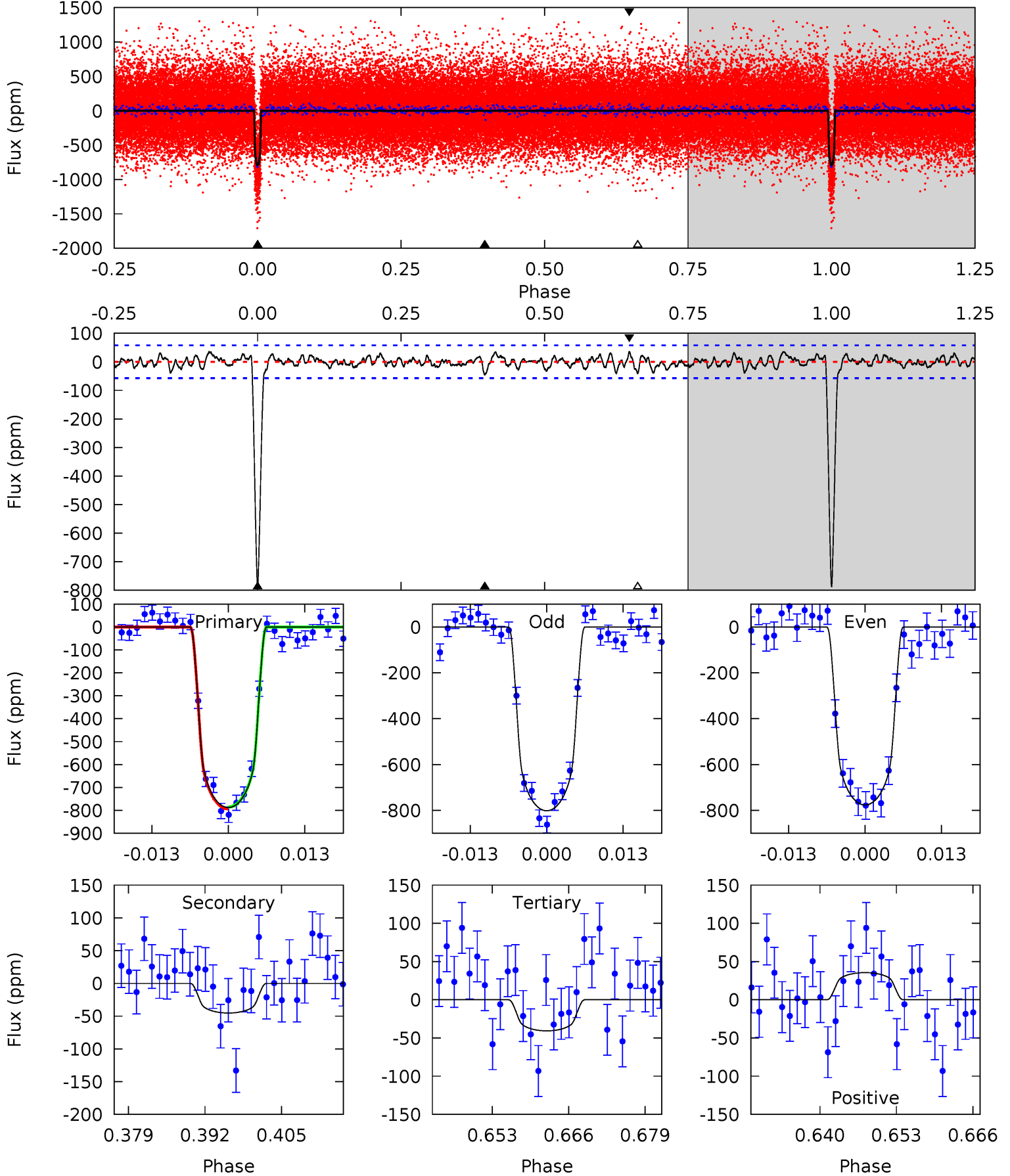
TCE 004249725-02 P= 12.794559 Days $T_0=143.560403$ (BKJD)



DV Model-Shift Uniqueness Test

004249725-02, P = 12.794548 Days, E = 130.766507 Days

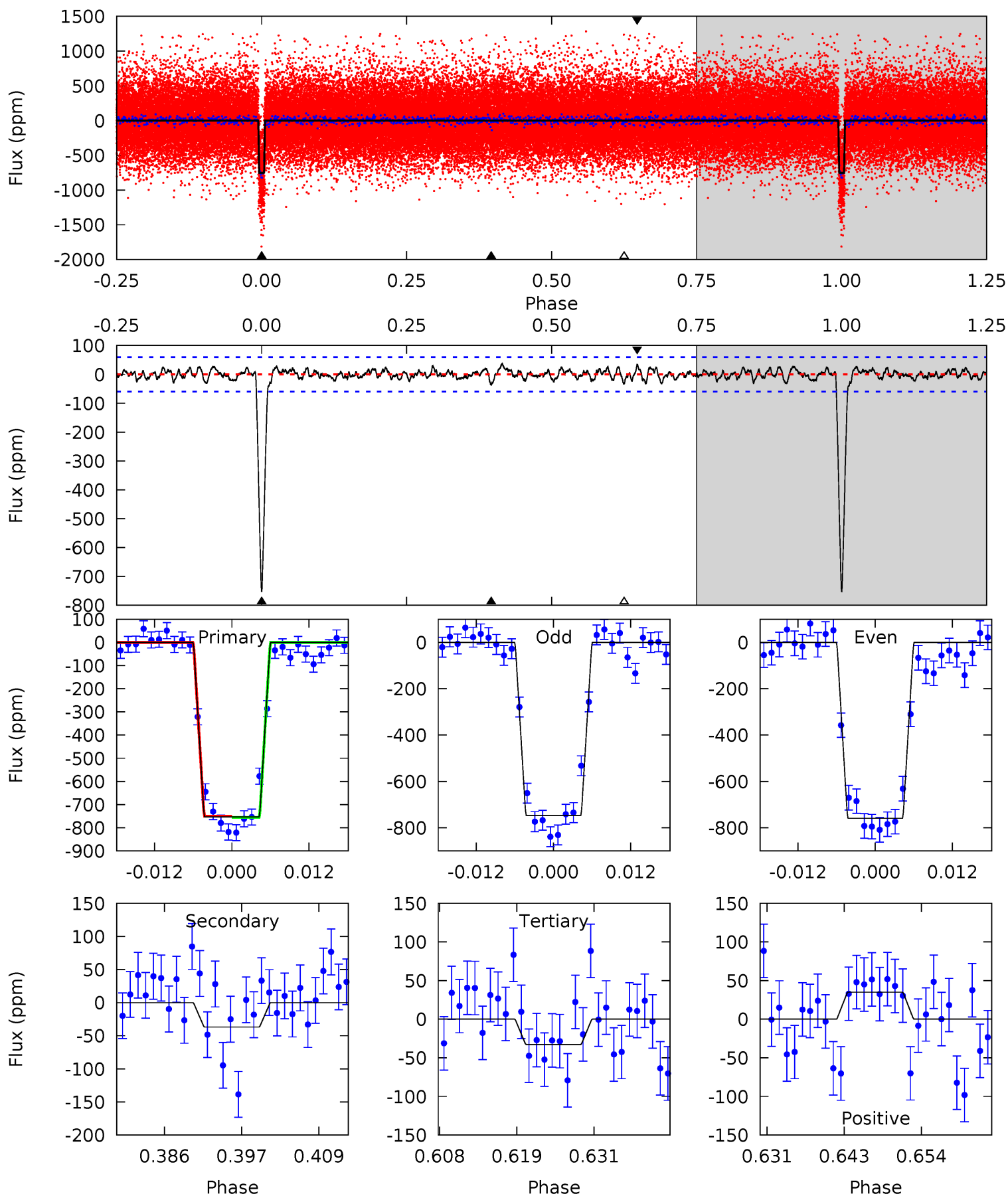
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
68.2	3.92	3.52	3.07	4.97	2.48	1.22	64.6	65.1	0.39	0.85	1.10	1.01	0.04	0.35



Alt Model-Shift Uniqueness Test

004249725-02, $P = 12.794559$ Days, $E = 130.765844$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
62.9	3.07	2.74	2.92	5.00	2.52	1.06	60.1	59.9	0.33	0.16	0.49	1.00	0.05	0.22



Stellar Parameters For KIC 004249725

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4090^{+447}_{-335}	$4.696^{+0.084}_{-0.056}$	$-0.180^{+0.150}_{-0.100}$	$0.571^{+0.076}_{-0.093}$	$0.591^{+0.089}_{-0.089}$	$4.477^{+2.019}_{-0.983}$
	+11%/-8%	+2%/-1%	+83%/-56%	+13%/-16%	+15%/-15%	+45%/-22%
Source	SPE5	SPE5	SPE5	DSEP		

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

Secondary Eclipse Parameters for KIC 004249725-02 / KOI 0222.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-45 ± 12	$1.79^{+0.29}_{-0.26}$	633^{+67}_{-57}	2635^{+235}_{-210}	63^{+27}_{-20}
Alt.	-37 ± 12	$1.69^{+0.29}_{-0.25}$	630^{+76}_{-55}	2591^{+252}_{-217}	56^{+32}_{-21}

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 $A_{\text{obs}} \gg 1.0$

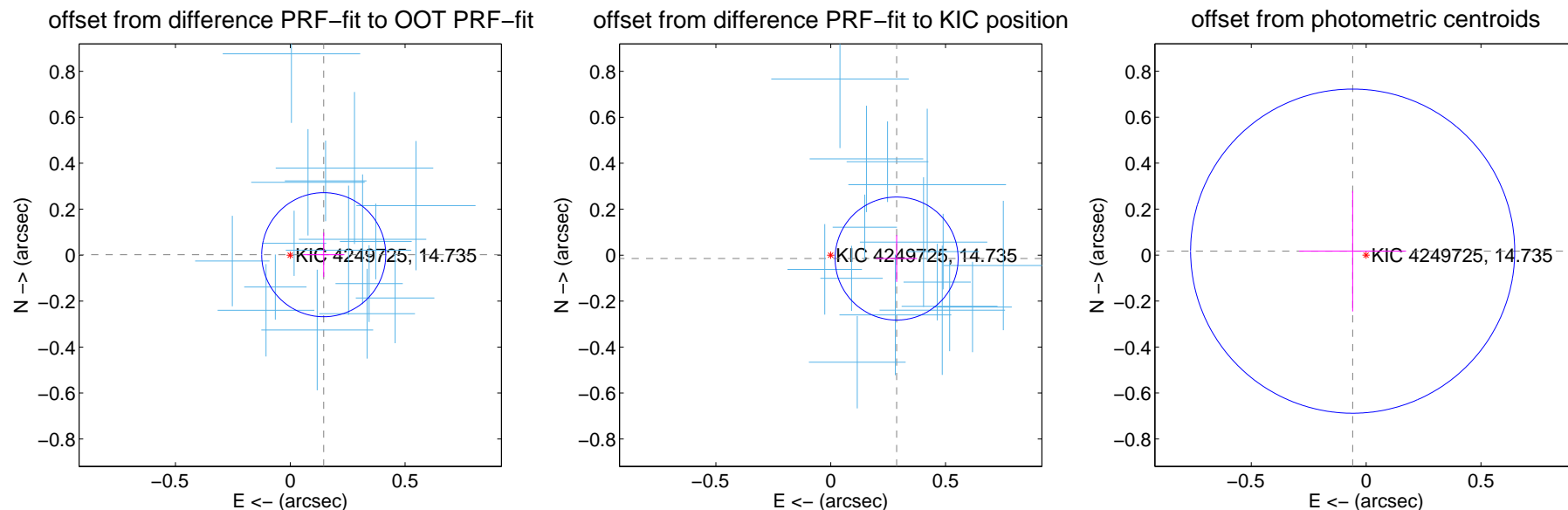
DV Centroid Data

Supplemental centroid analysis for 004249725-02. Kepler magnitude: 14.73. Transit SNR 45.04

There are 17 quarters with good PRF difference image offsets

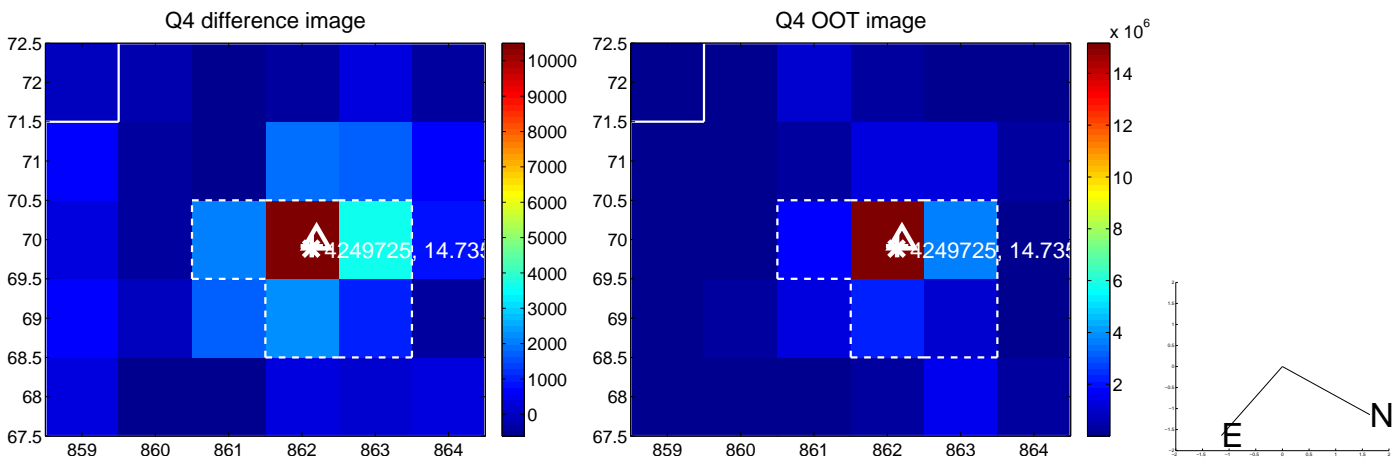
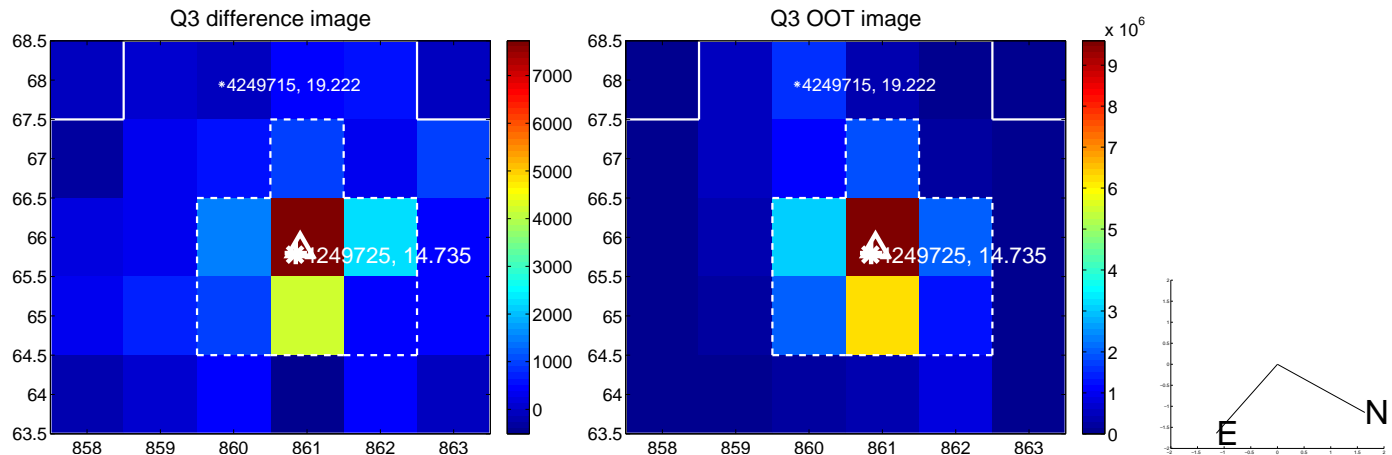
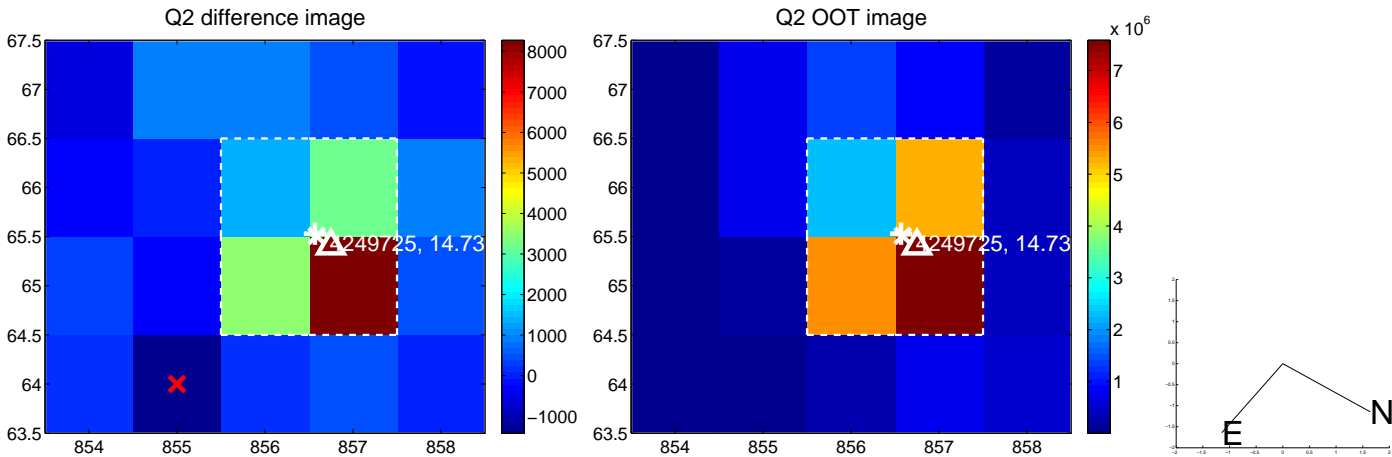
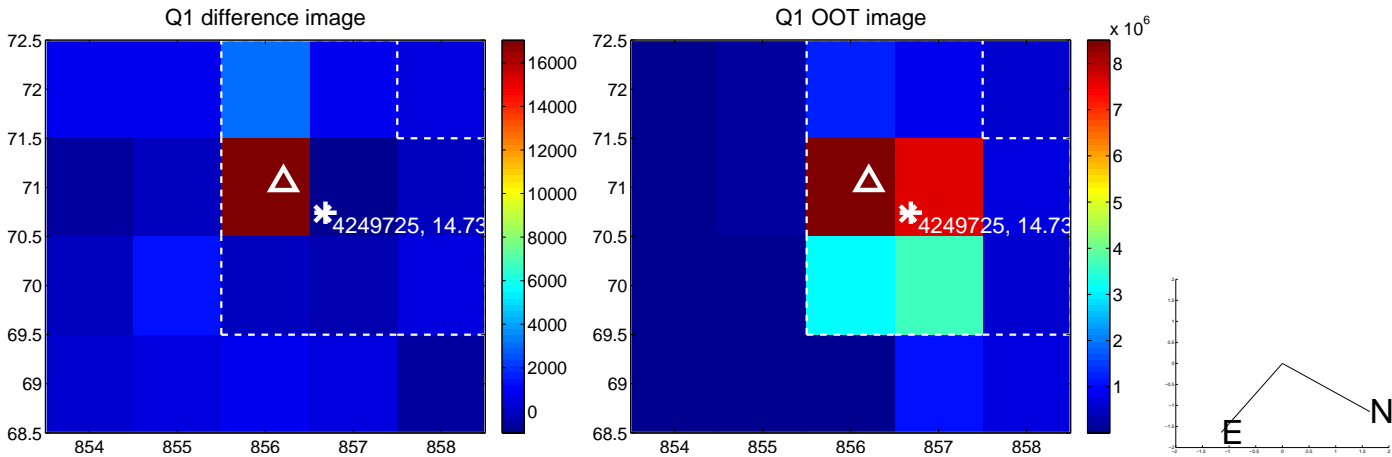
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.146 ± 0.090	1.62	-0.146 ± 0.090	0.002 ± 0.096
PRF-fit source offset from KIC position	0.287 ± 0.089	3.22	-0.287 ± 0.089	-0.015 ± 0.102
photometric centroid source offset	0.06 ± 0.24	0.26	0.06 ± 0.23	0.02 ± 0.26

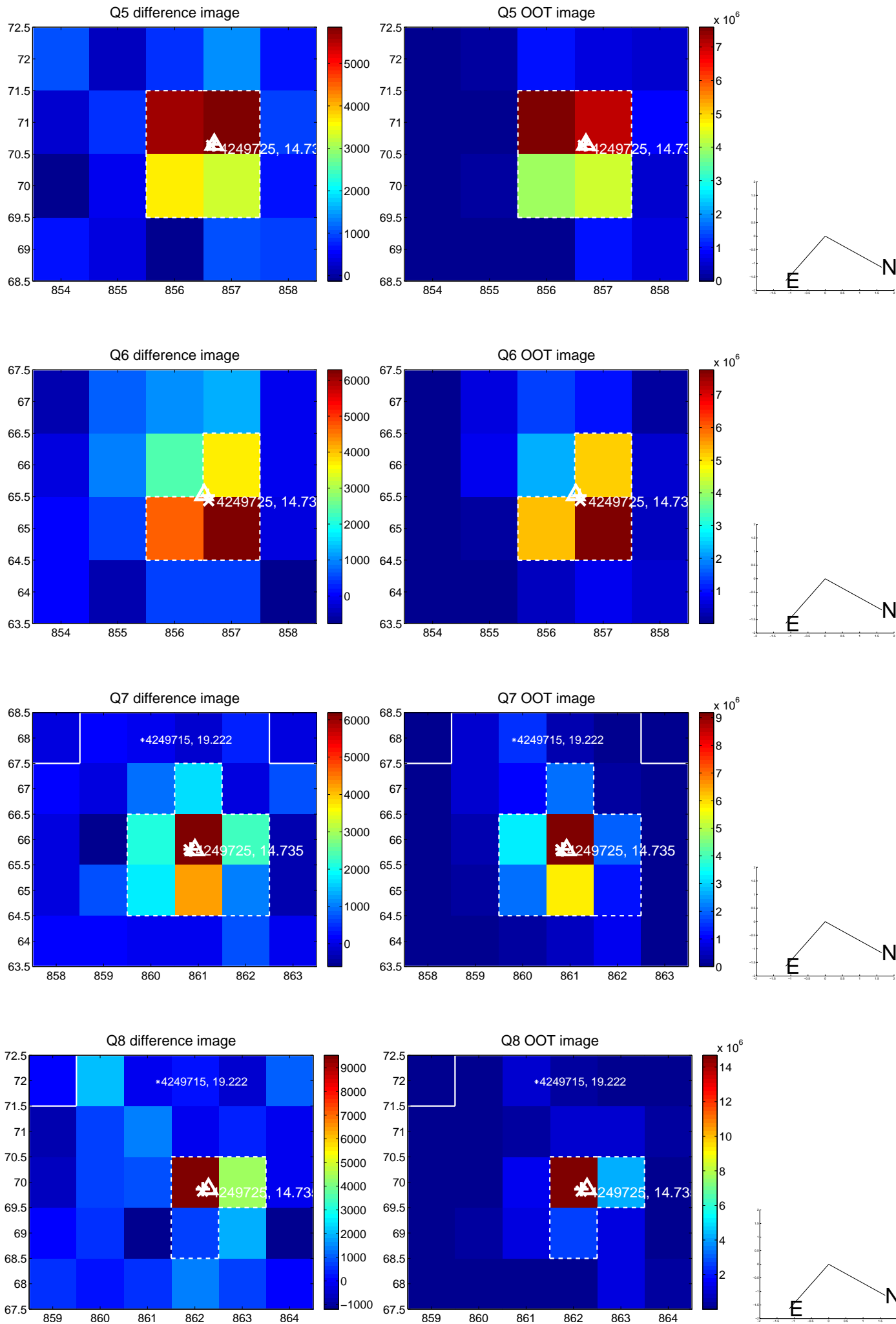


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

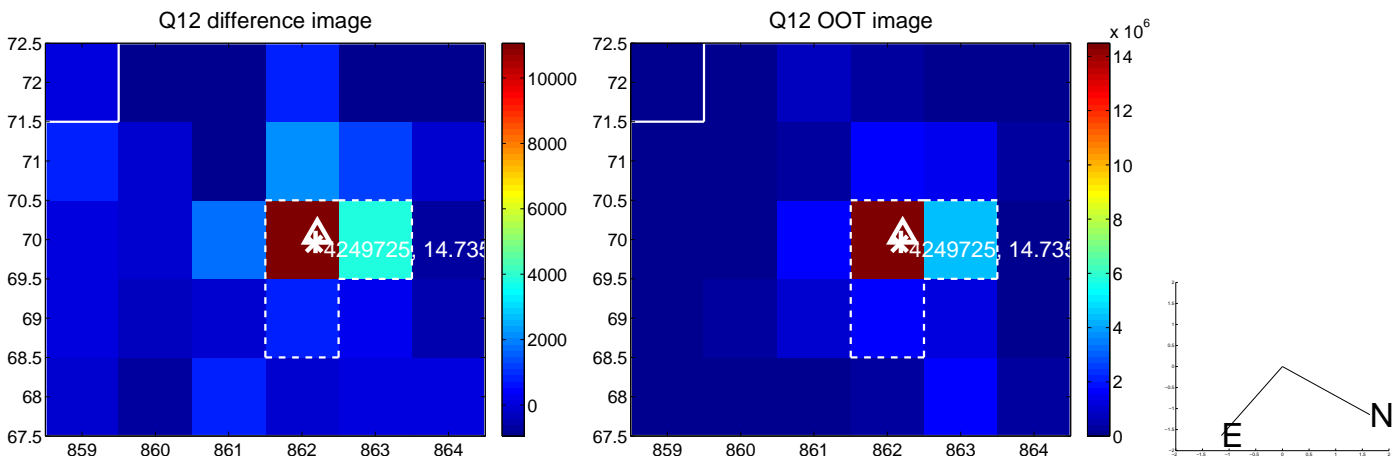
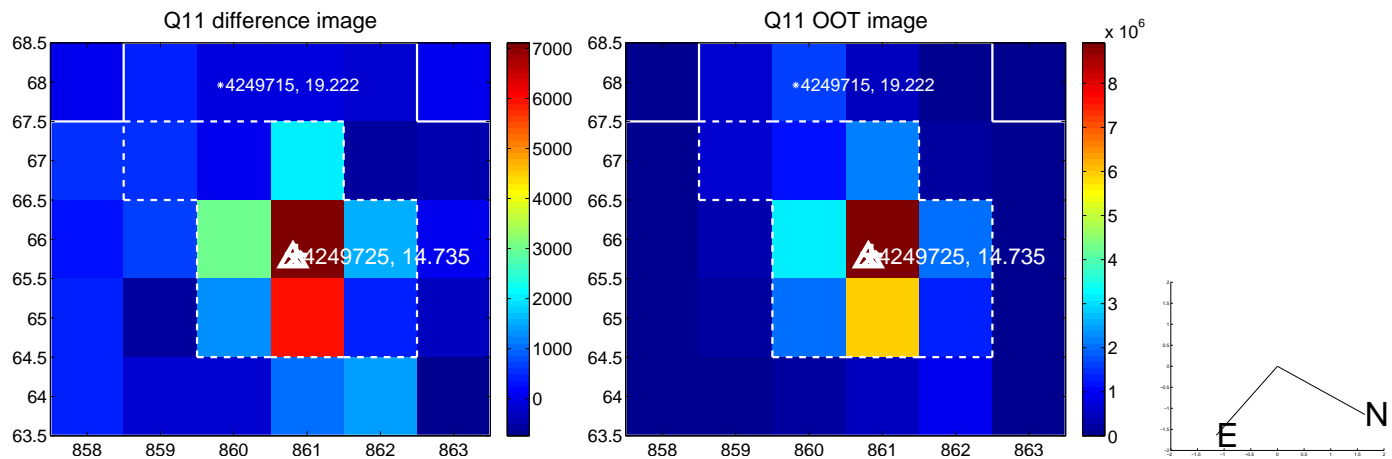
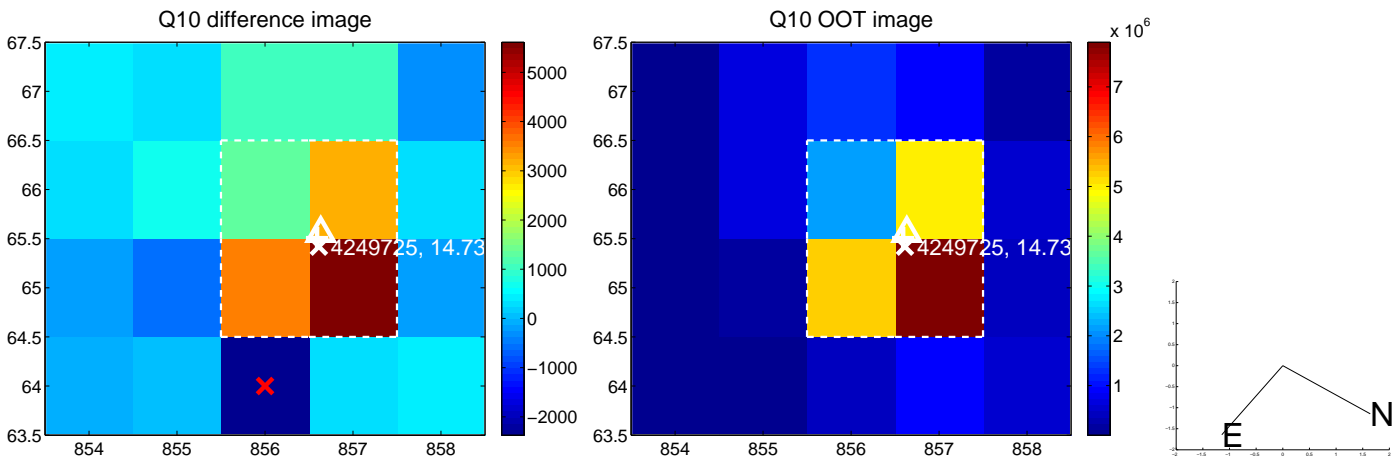
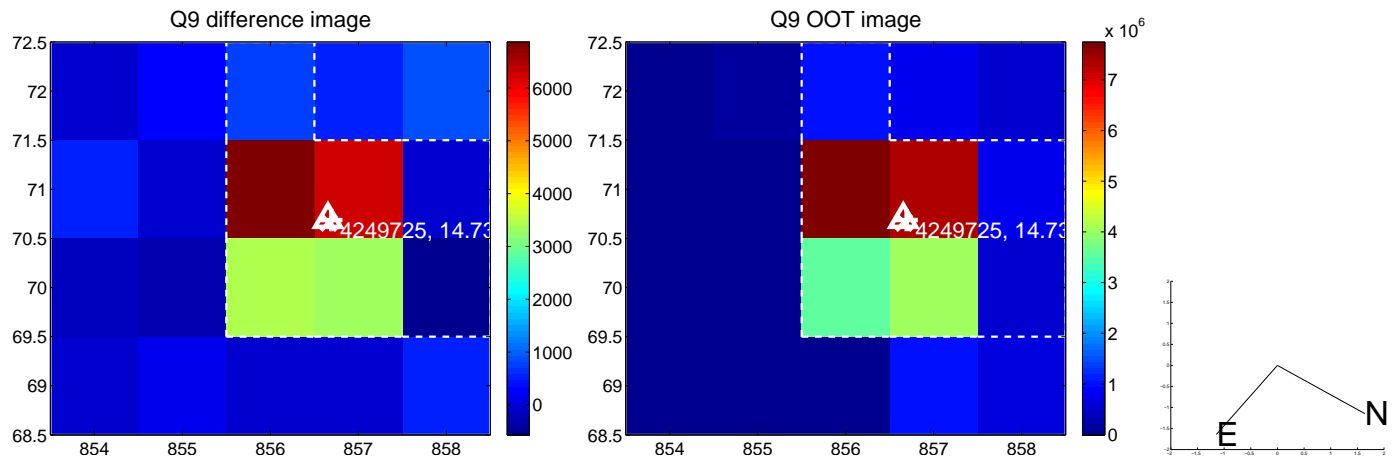
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



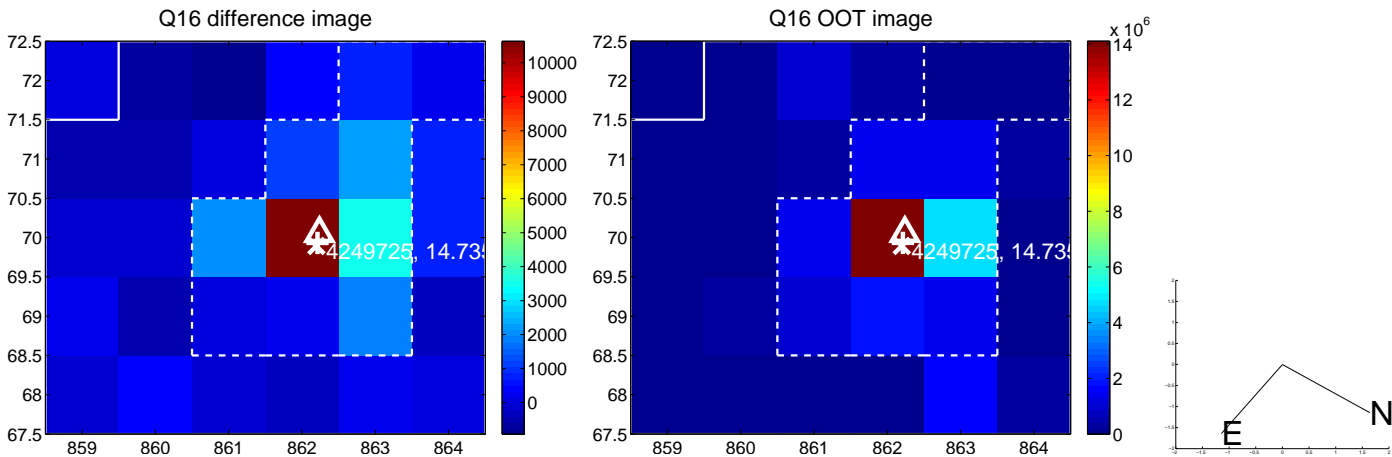
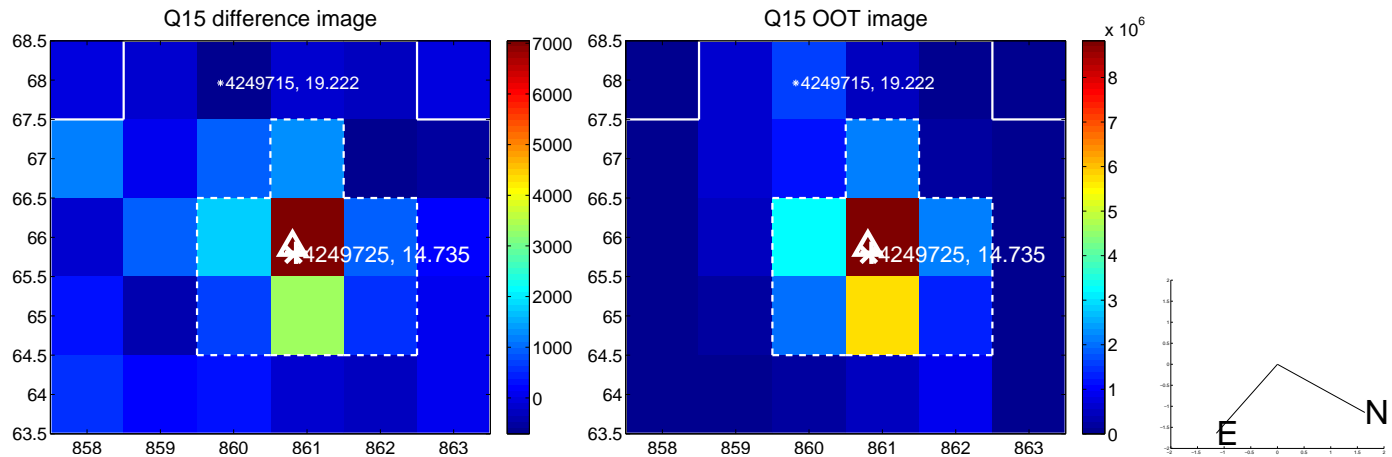
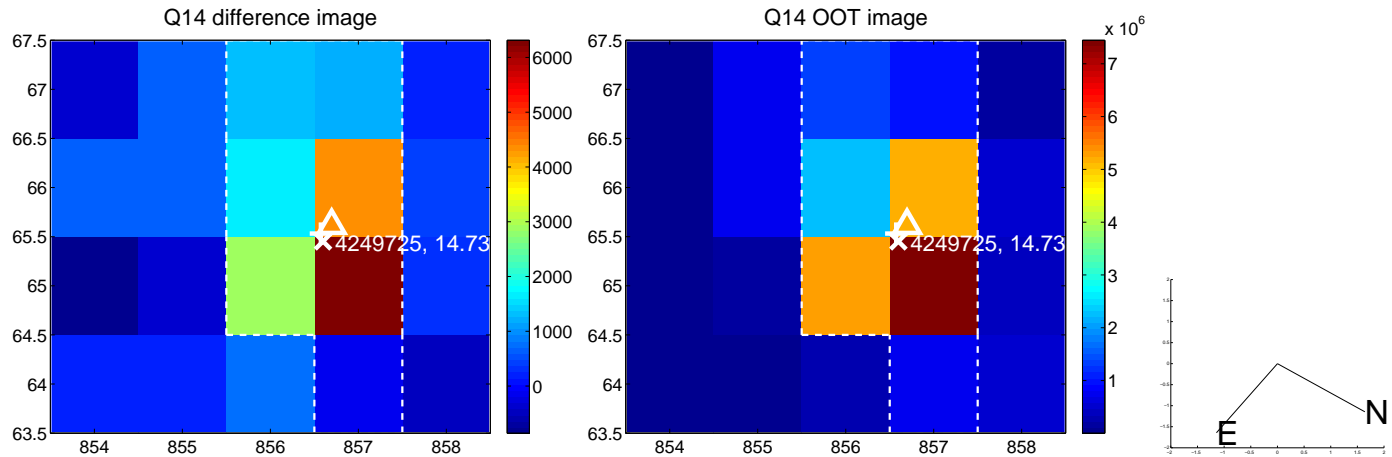
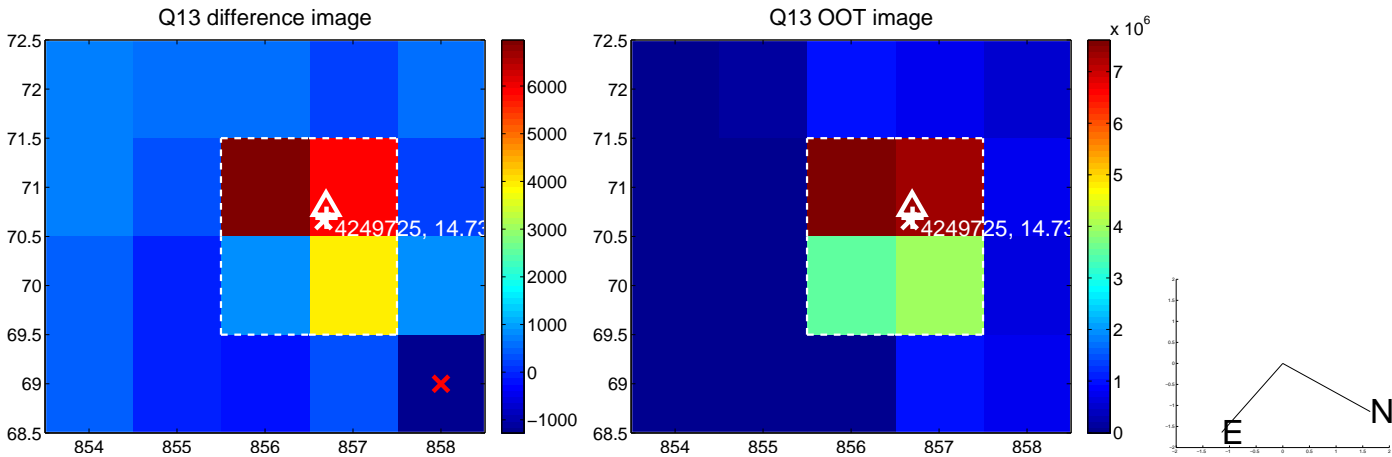
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



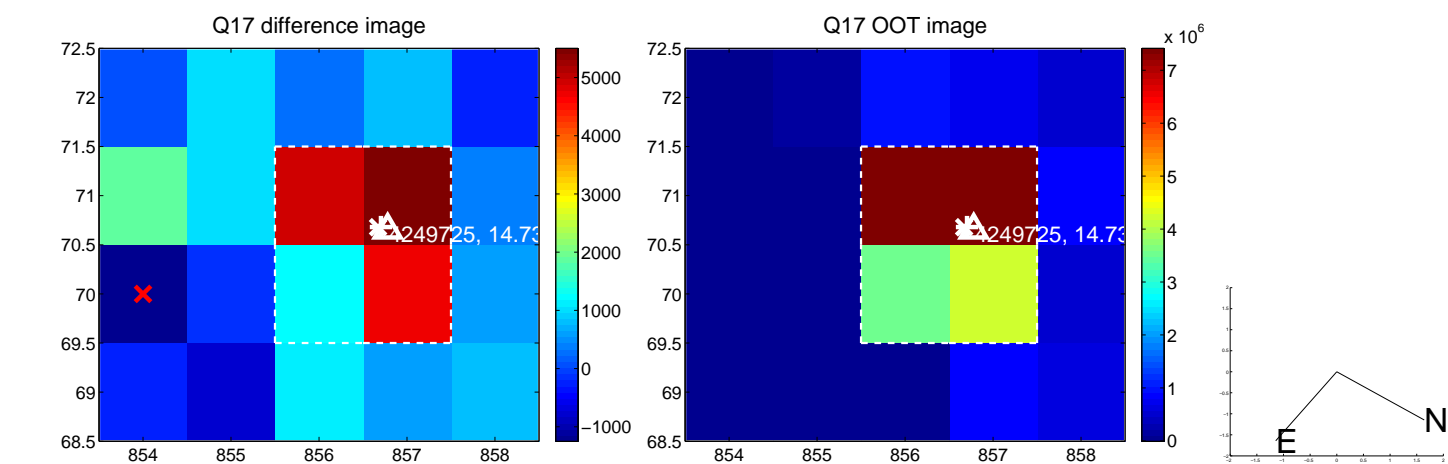
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



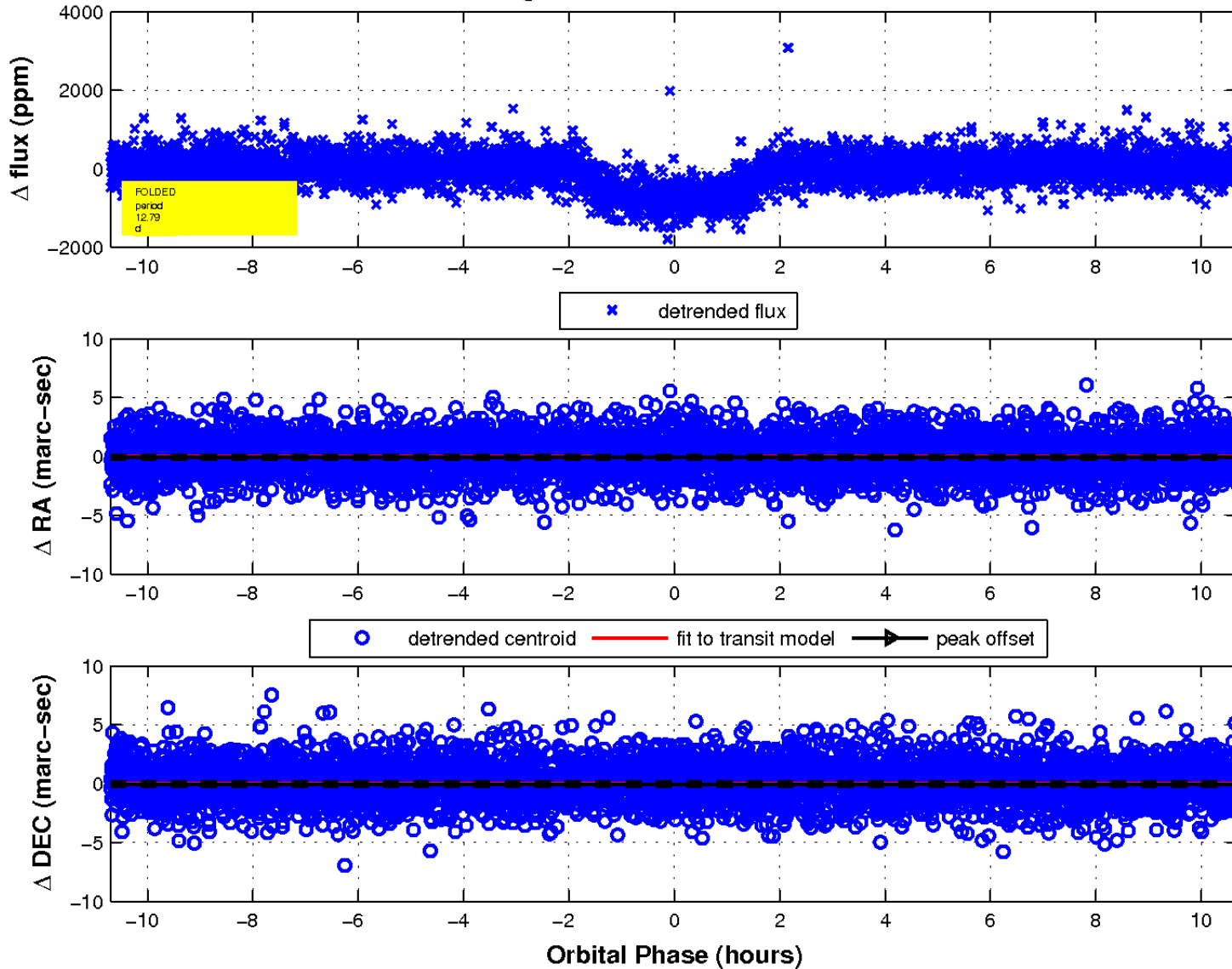
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

