

KIC 010590857

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})
010590857-01	OBS	No	0.573047	132.049213	89.0	1.670	10.8	9.9	3.04	7773	2.98	108109.26
010590857-02	OBS	No	3.851303	131.839545	143.3	16.696	9.1	10.7	3.04	7773	4.22	8523.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010590857-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
010590857-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

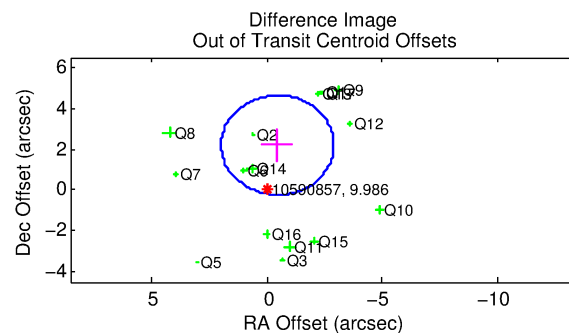
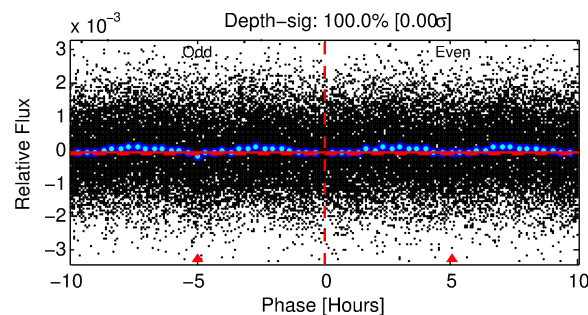
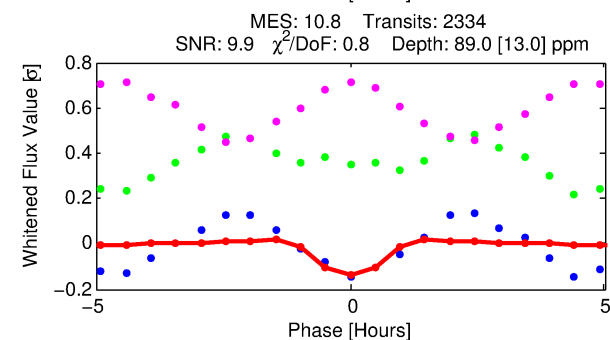
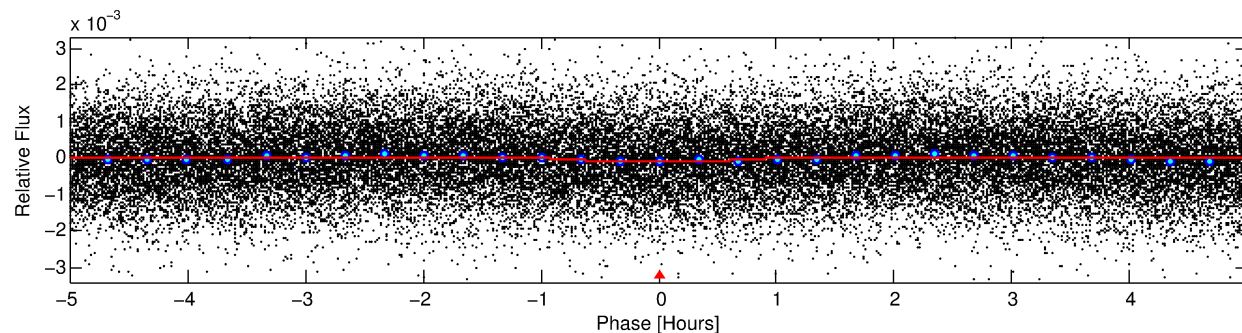
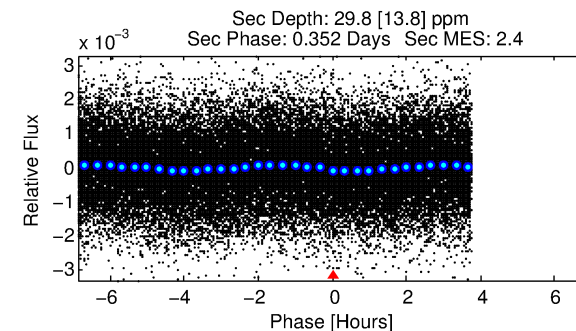
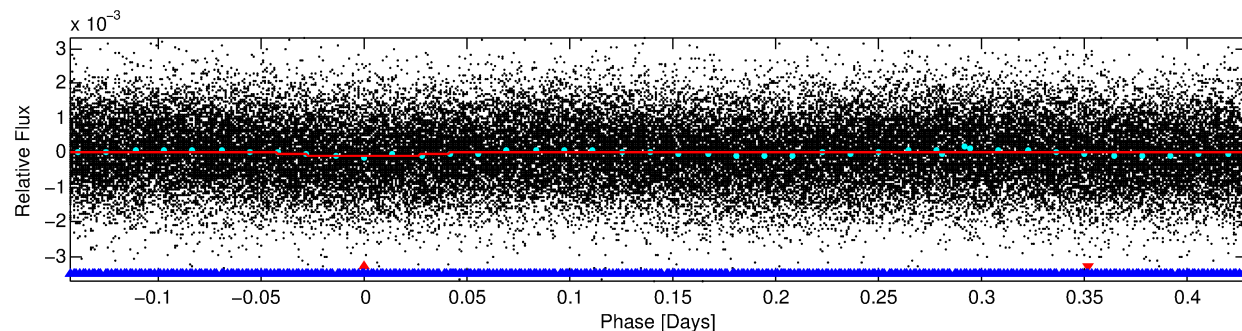
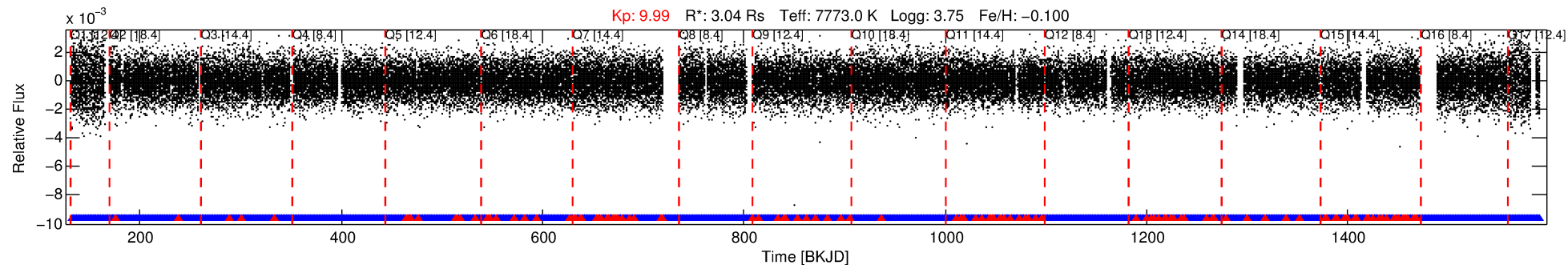
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010590857-01

No Significant Match Found

DV One-Page Summary

KIC: 10590857 Candidate: 1 of 2 Period: 0.573 d



DV Fit Results:

Period = 0.57305 [0.00001] d
Epoch = 132.0492 [0.0026] BKJD
Rp/R* = 0.0090 [0.0051]
a/R* = 2.41 [6.47]
b = 0.50 [4.90]
Seff = 108109.26 [73184.87]
Teq = 4624 [783] K
Rp = 2.98 [2.12] Re
a = 0.0167 [0.0069] AU
Ag = 0.52 [0.72] [-0.68σ]
Teffp = 6059 [1867] K [0.71σ]

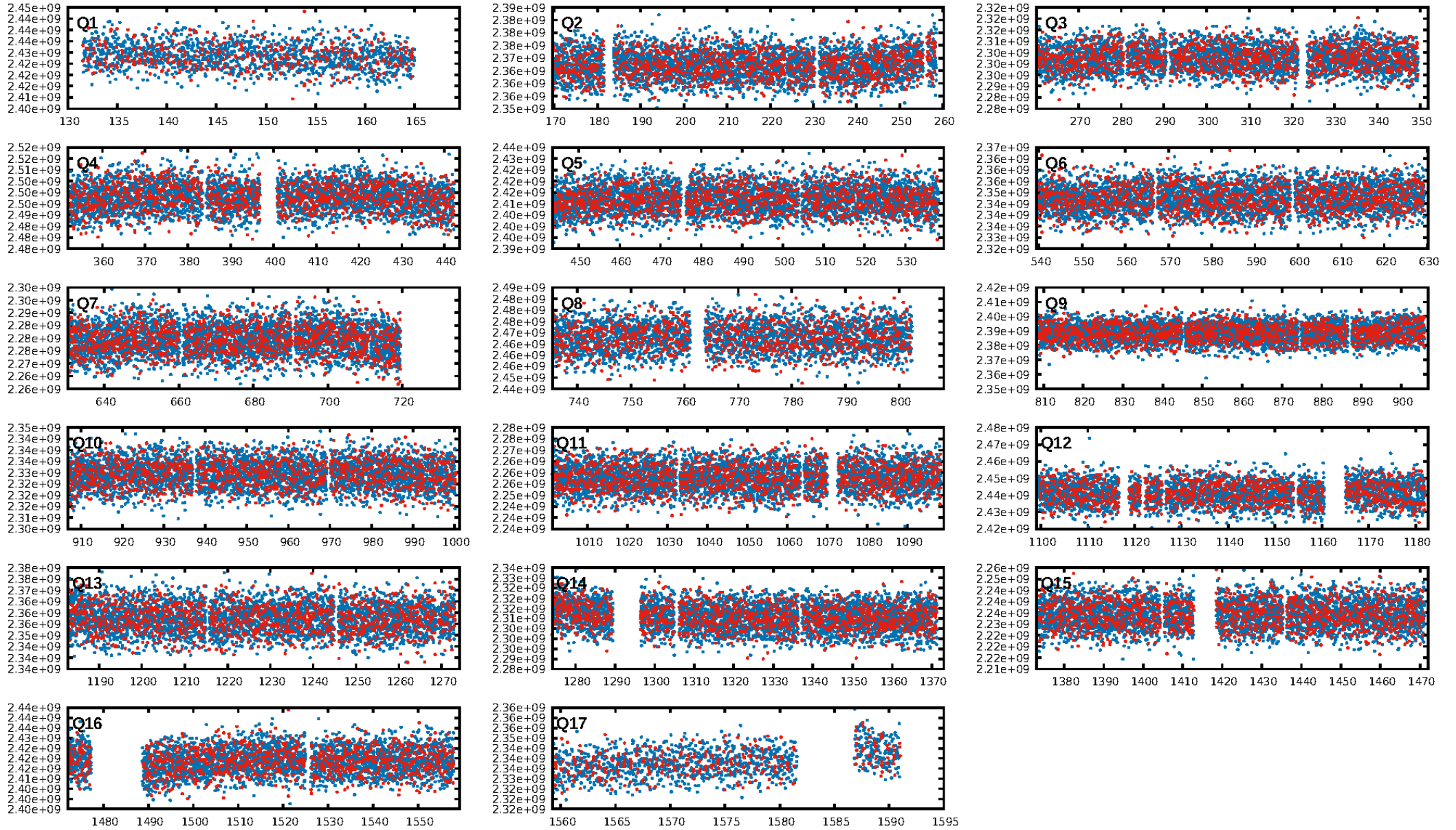
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [4.69σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 3.84e-23
RollingBand-fgt: 0.95 [2106/2228]
GhostDiagnostic-chr: N/A
Centroid-sig: 9.7%
Centroid-so: 0.628 arcsec [3.12σ]
OotOffset-rm: 2.247 arcsec [2.77σ]
KicOffset-rm: 2.062 arcsec [2.68σ]
OotOffset-st: 4/4/3/5 [16]
KicOffset-st: 4/4/3/5 [16]
DiffImageQuality-fgm: 0.00 [0/16]
DiffImageOverlap-fno: 1.00 [17/17]

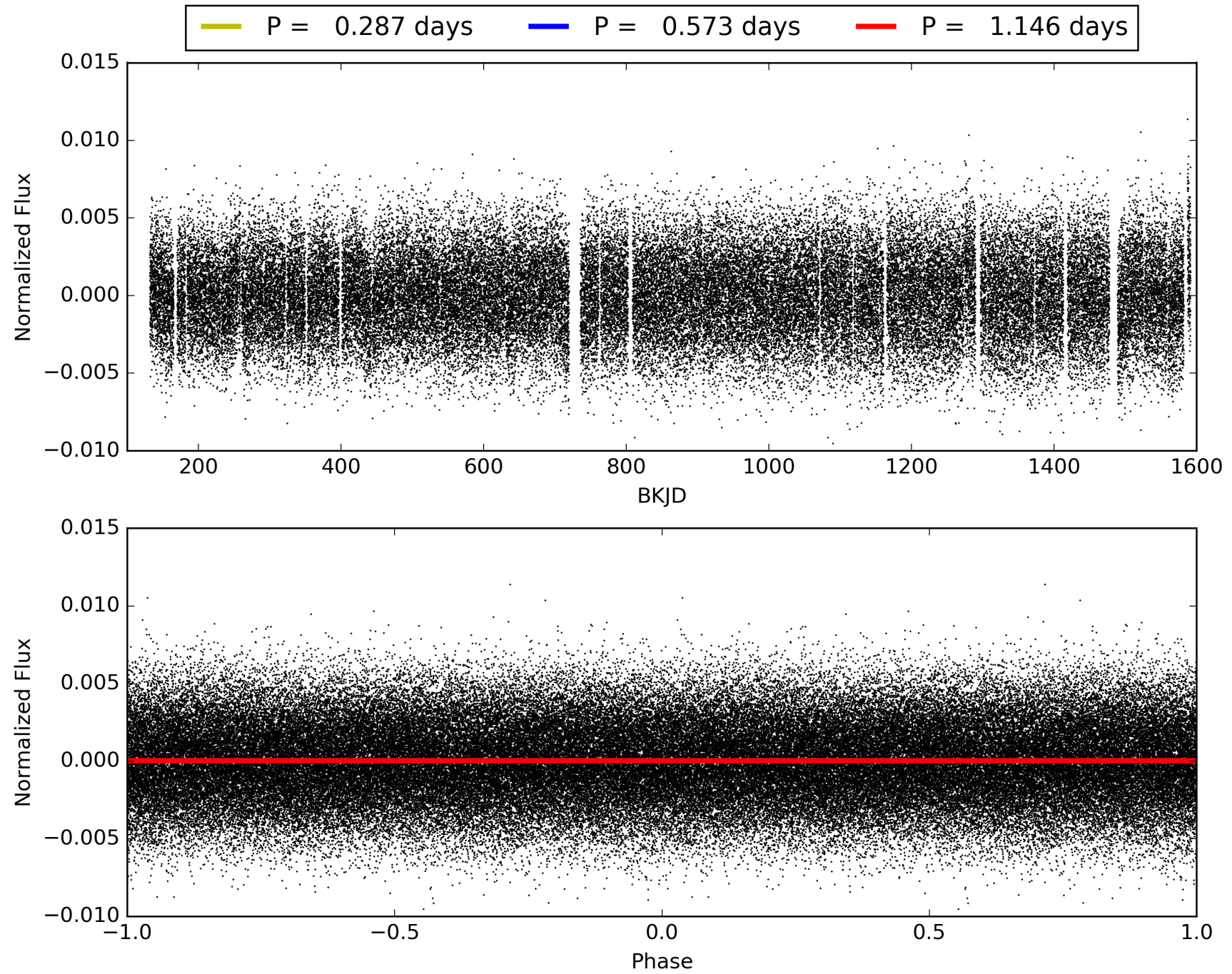
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:05:49 Z

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

TCE 010590857-01, PDC Light Curves

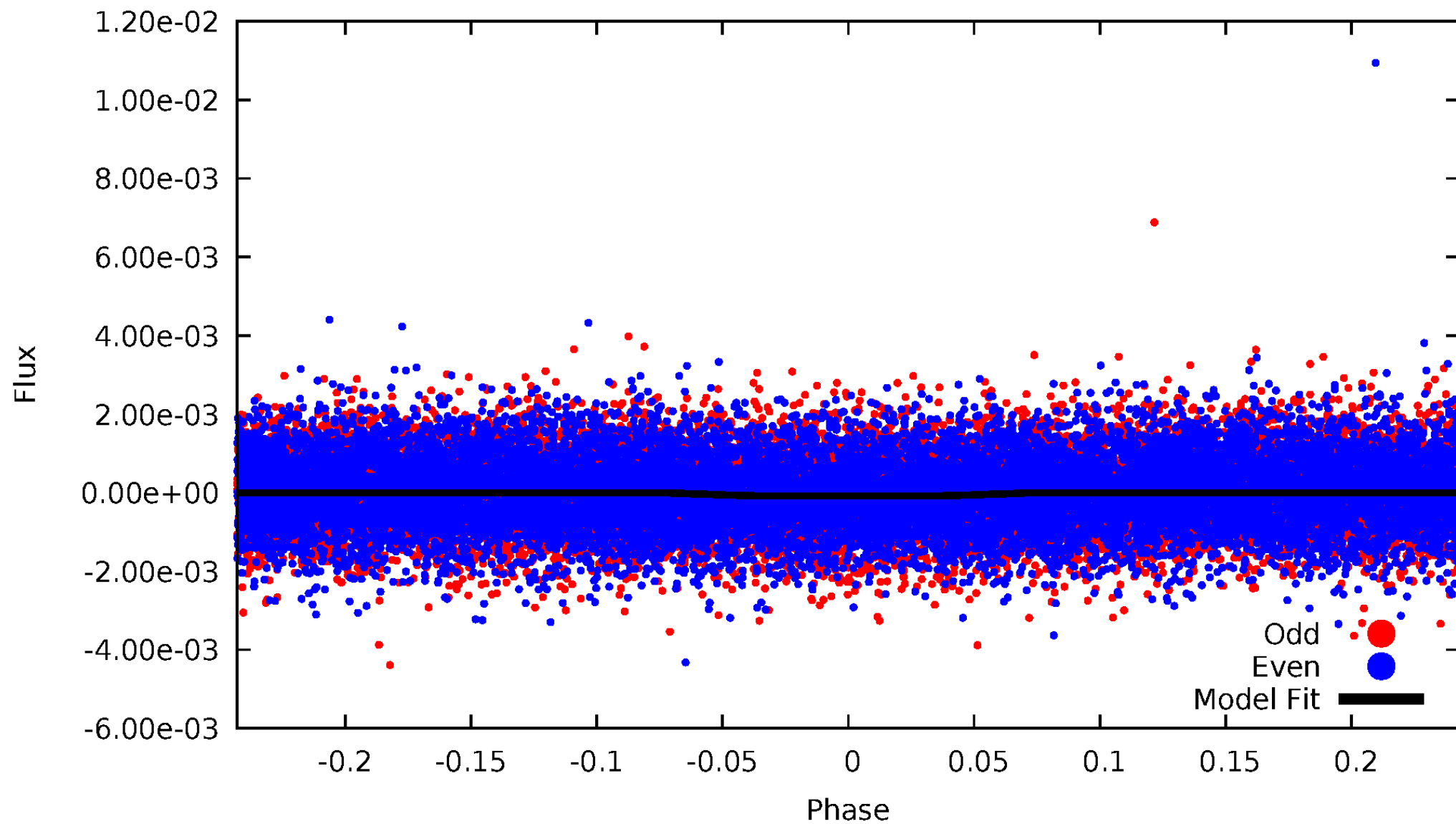


TCE 010590857-01



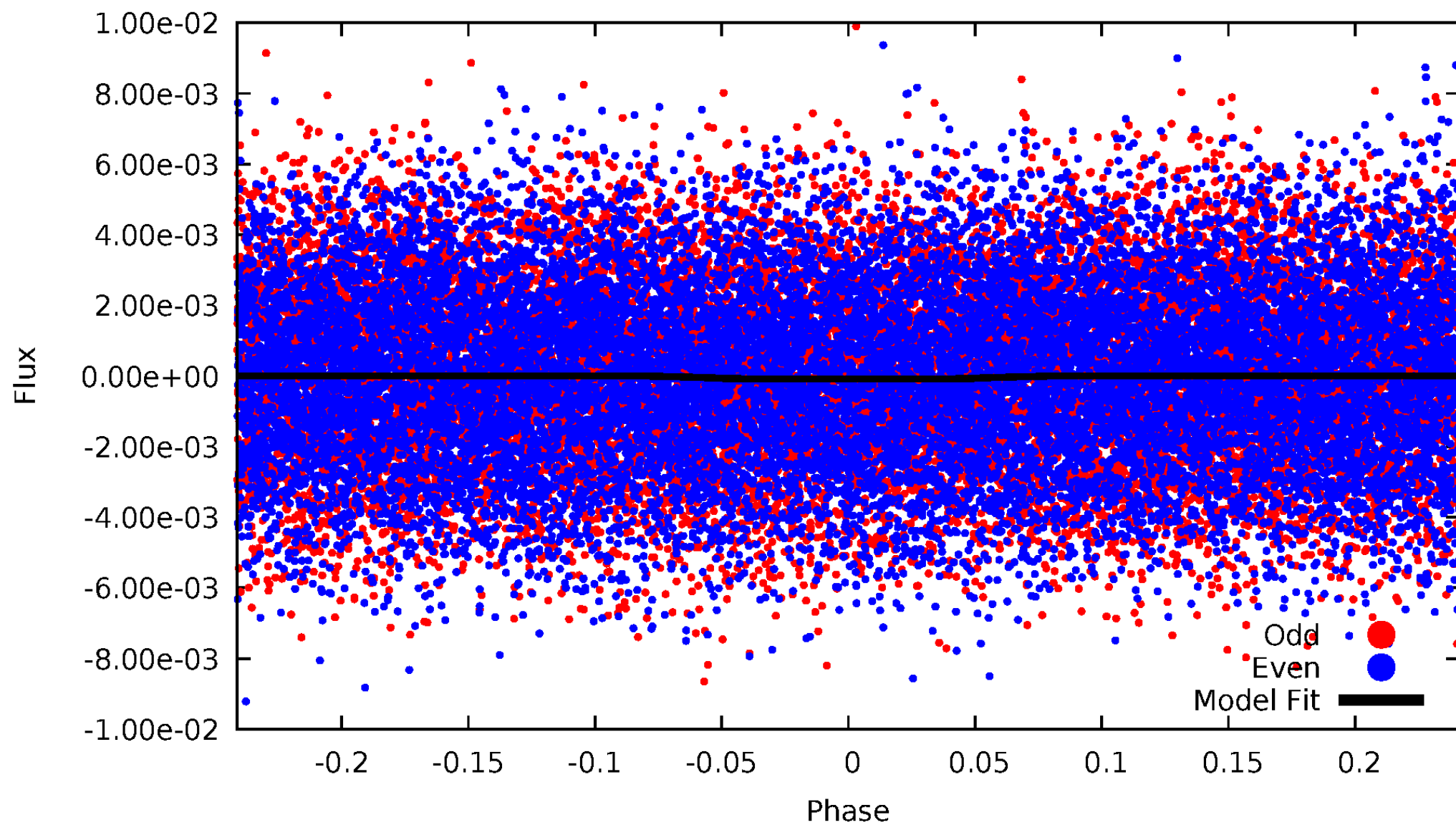
DV Odd/Even

TCE 010590857-01



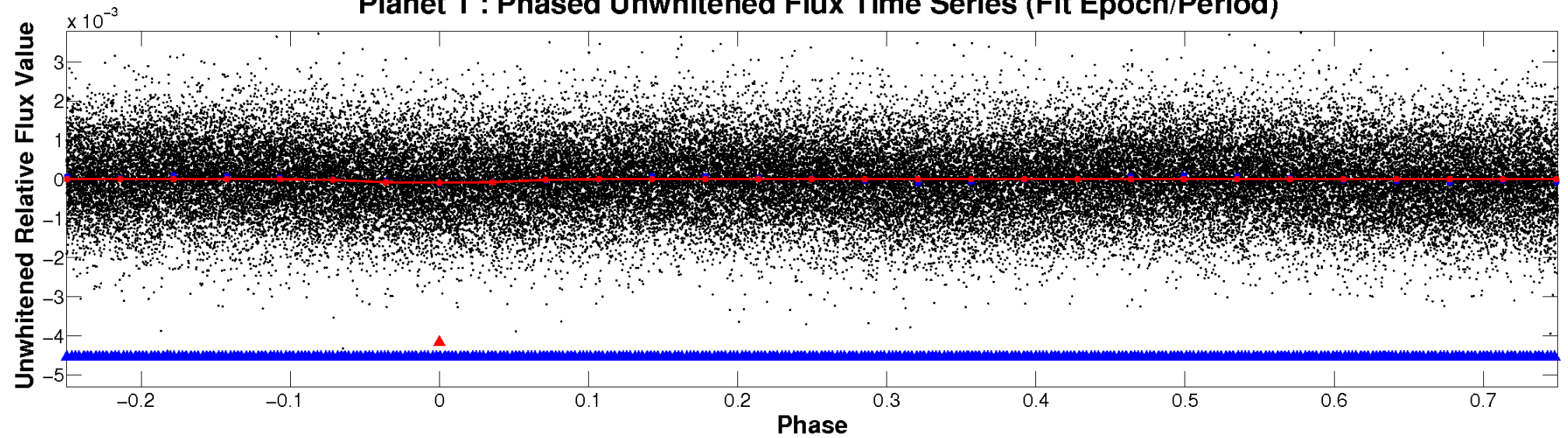
ALT Odd/Even

TCE 010590857-01

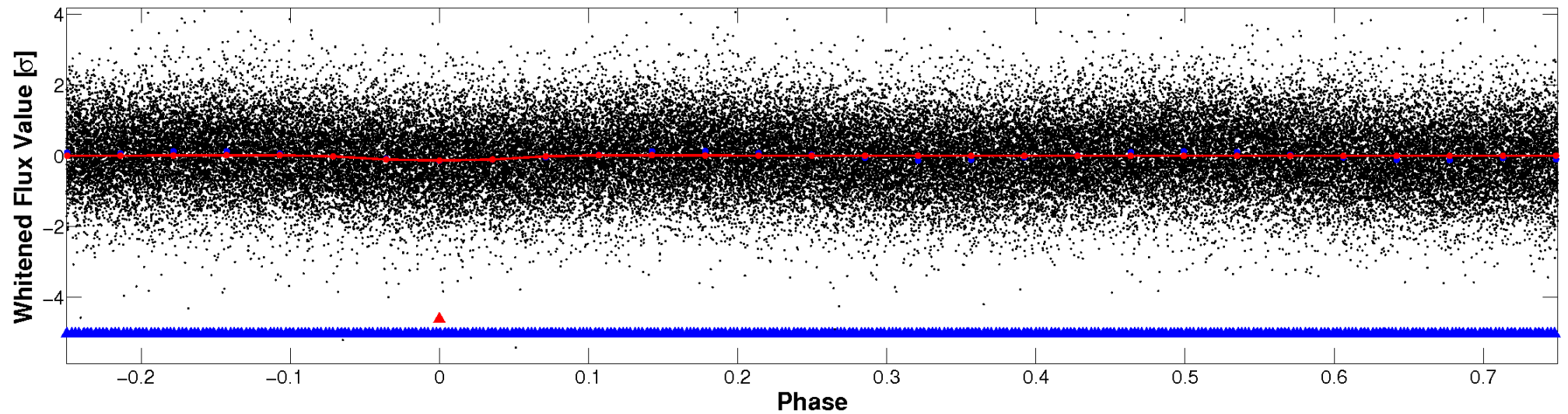


Non-Whitened Vs. Whitened Light Curve

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

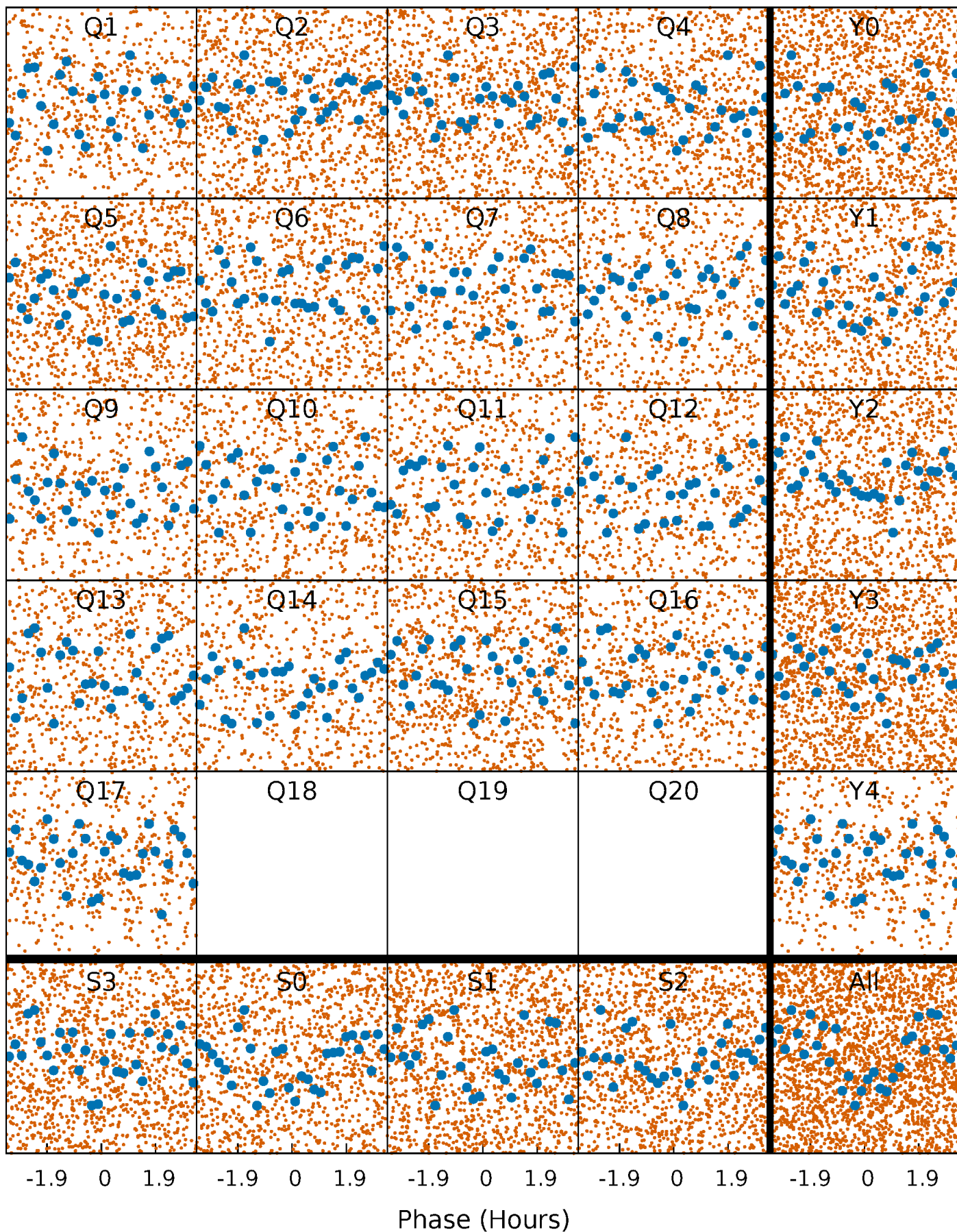


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



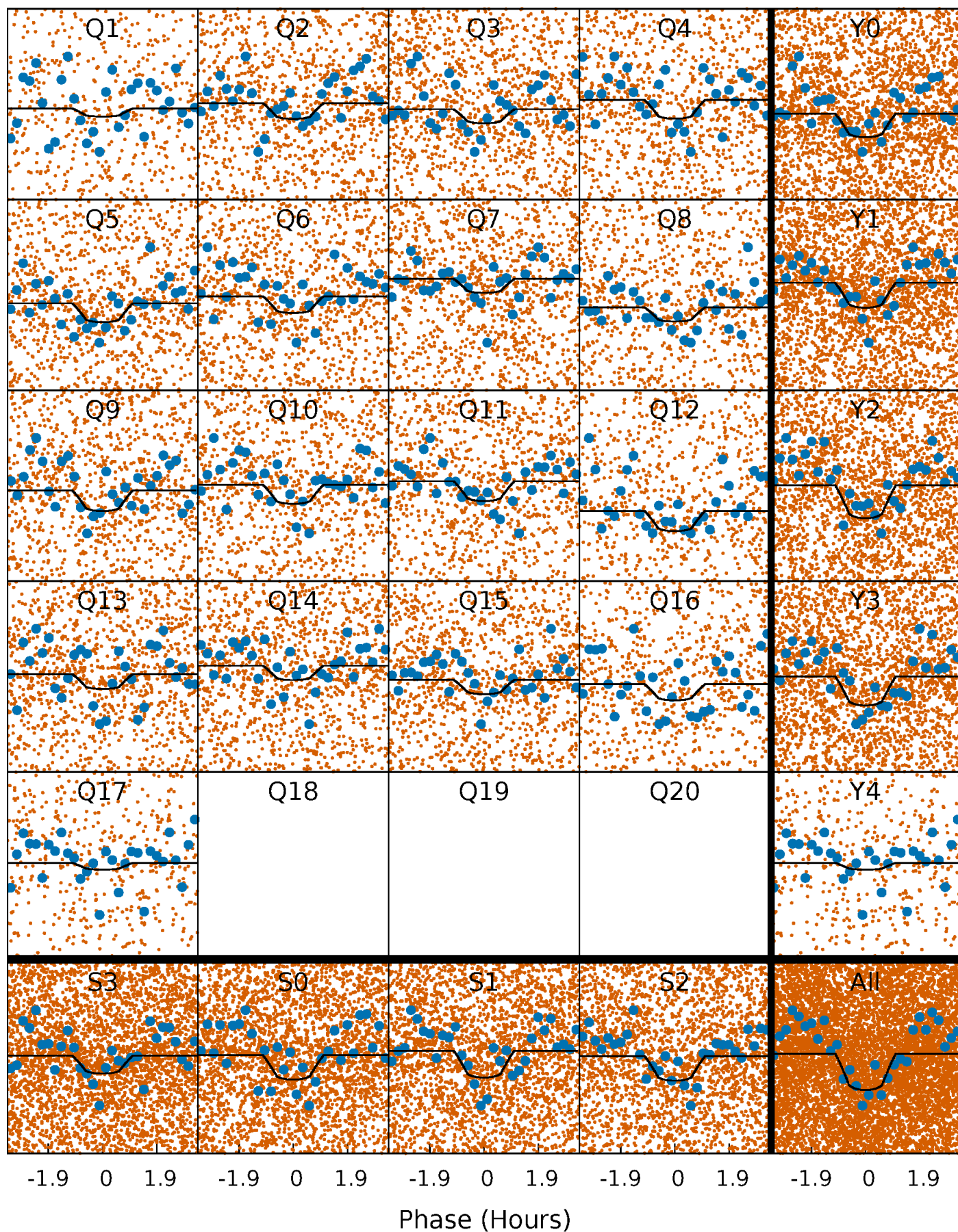
PDC Quarter-Phased Transit Curves

TCE 010590857-01 P= 0.573047 Days $T_0=132.049213$ (BKJD)



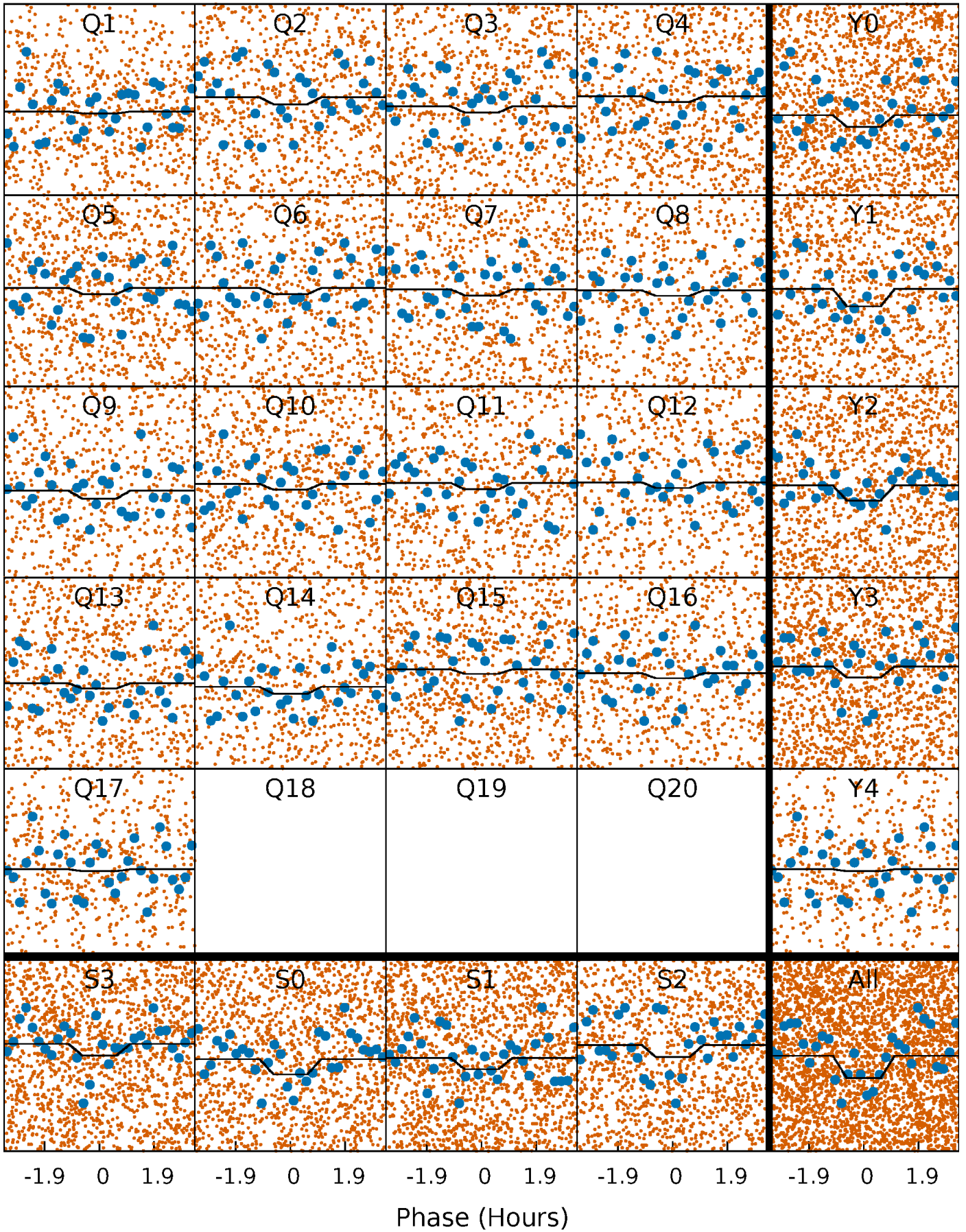
DV Quarter-Phased Transit Curves

TCE 010590857-01 P= 0.573047 Days $T_0=132.049213$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

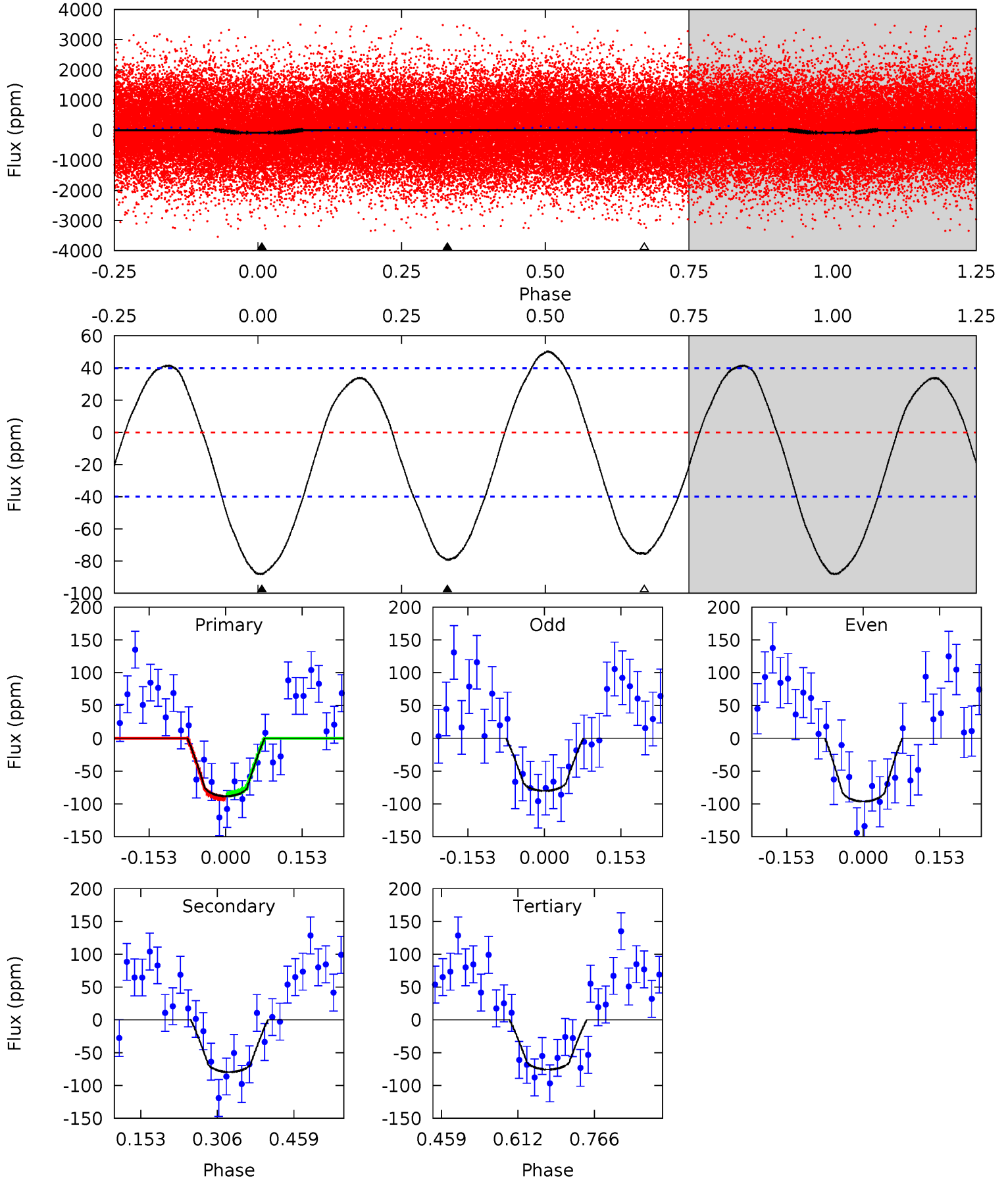
TCE 010590857-01 P= 0.573054 Days $T_0=132.052097$ (BKJD)



DV Model-Shift Uniqueness Test

010590857-01, P = 0.573047 Days, E = 131.476166 Days

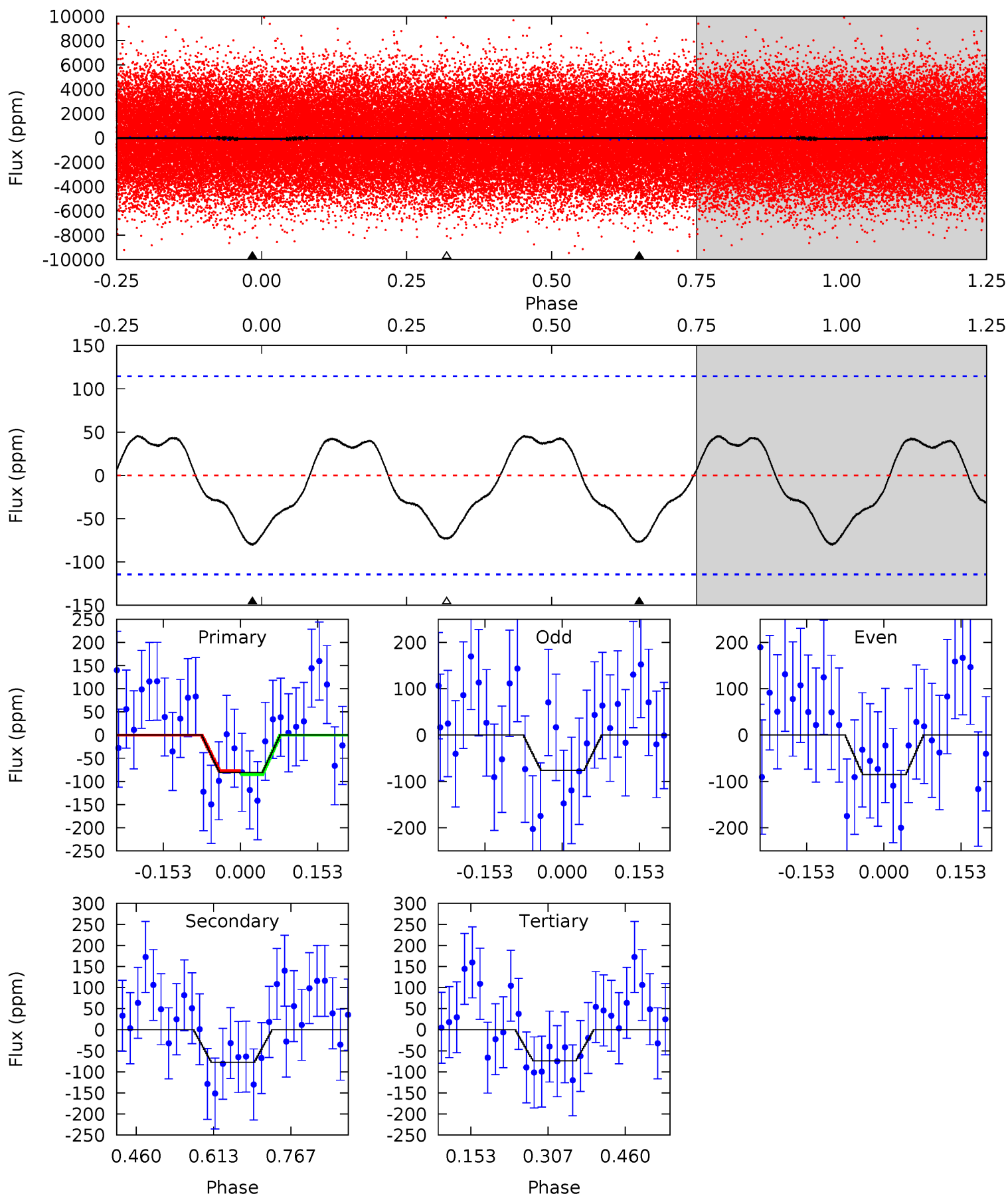
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.91	8.93	8.49	0	4.47	1.43	4.97	1.43	9.91	0.44	8.93	0.91	1.17	0.36	0.35



Alt Model-Shift Uniqueness Test

010590857-01, P = 0.573054 Days, E = 131.479043 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.17	3.04	2.89	0	4.47	1.43	1.55	0.28	3.17	0.15	3.04	0.18	1.02	0.36	0.17



Stellar Parameters For KIC 010590857

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7773^{+216}_{-324}	$3.750^{+0.384}_{-0.072}$	$-0.100^{+0.200}_{-0.350}$	$3.036^{+0.350}_{-1.312}$	$1.891^{+0.103}_{-0.413}$	$0.095^{+0.310}_{-0.030}$
	+3%/-4%	+10%/-2%	+200%/-350%	+12%/-43%	+5%/-22%	+326%/-31%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010590857-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-80 ± 9	$2.84^{+1.55}_{-1.44}$	6260^{+420}_{-667}	6879^{+4482}_{-1755}	$1.447^{+4.526}_{-0.828}$
Alt.	-78 ± 26	$2.67^{+1.70}_{-1.39}$	6255^{+410}_{-680}	6971^{+5060}_{-2125}	$1.524^{+5.351}_{-0.957}$

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 $A_{obs} \gg 1.0$

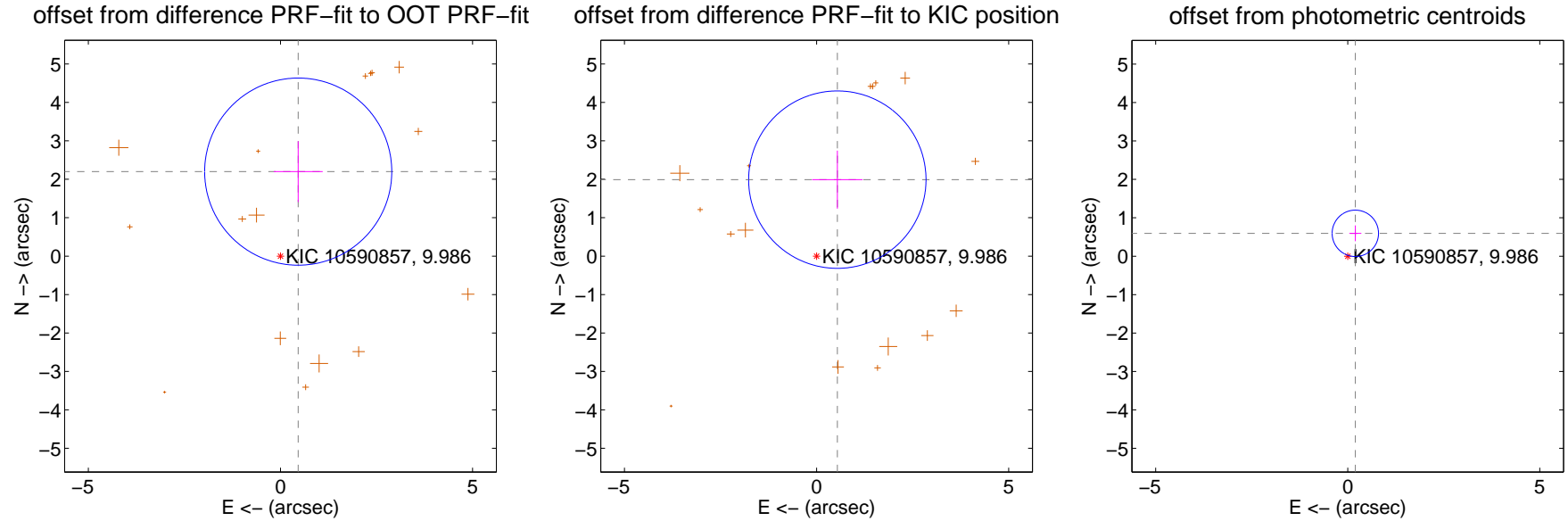
DV Centroid Data

Supplemental centroid analysis for 010590857-01. **Kepler magnitude: 9.99.** Transit SNR 9.86

There are 0 quarters with good PRF difference image offsets

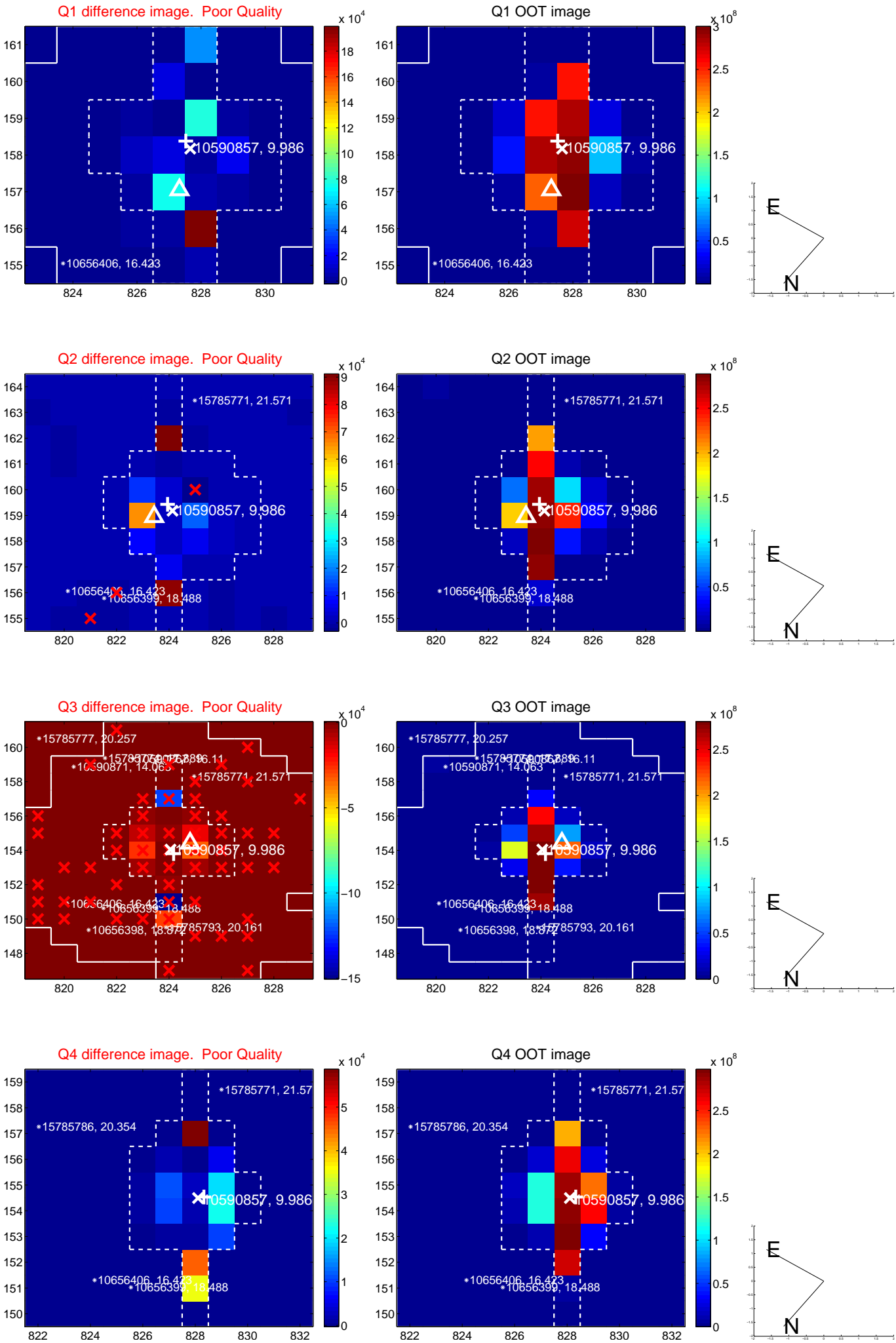
The direct PRF centroid is offset from the target star catalog position by about 0.84 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.247 ± 0.812	2.77	-0.462 ± 0.637	2.199 ± 0.791
PRF-fit source offset from KIC position	2.062 ± 0.769	2.68	-0.540 ± 0.656	1.990 ± 0.755
photometric centroid source offset	0.63 ± 0.20	3.12	-0.20 ± 0.16	0.60 ± 0.21

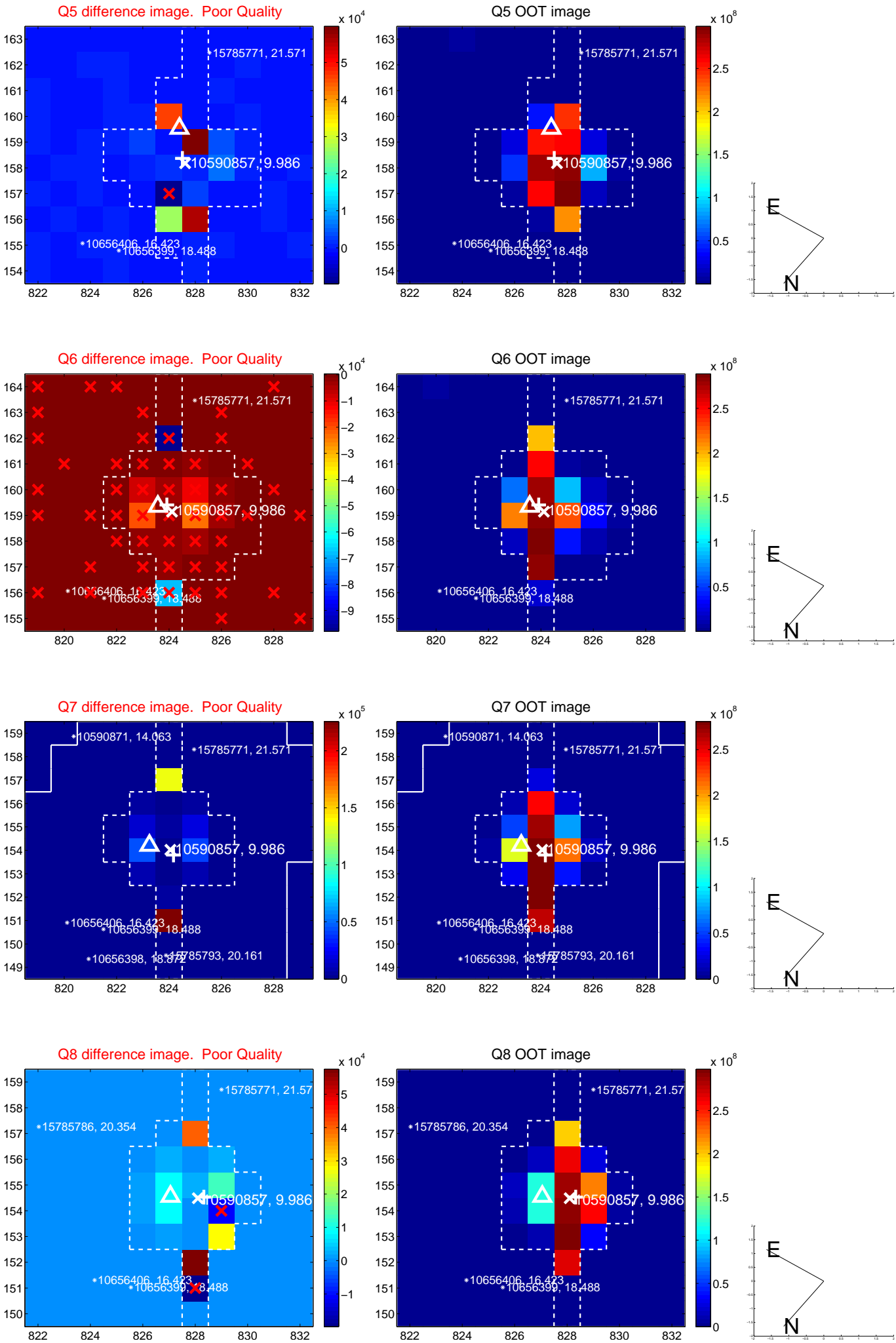


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

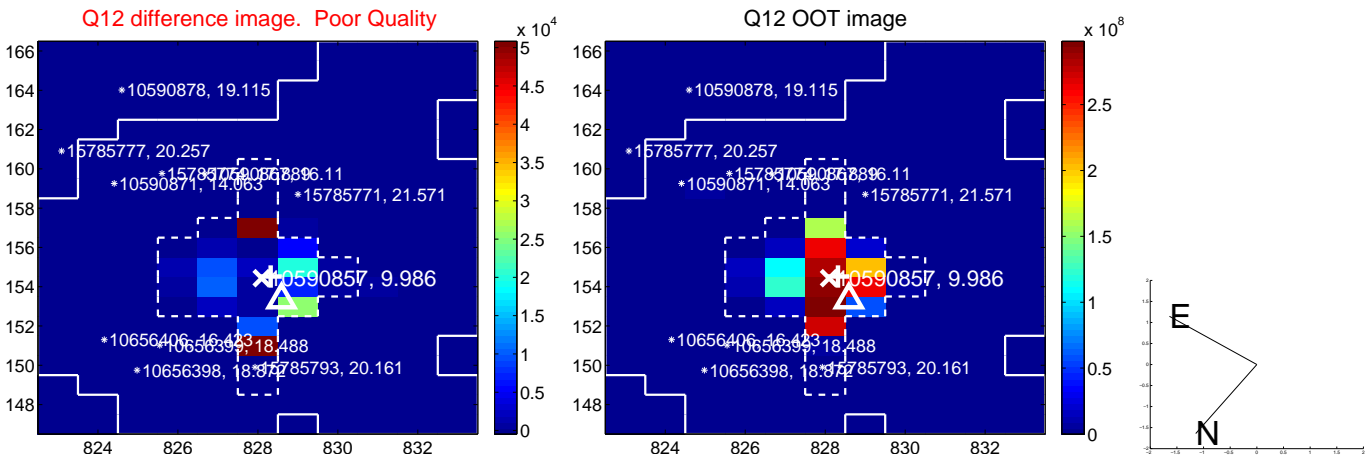
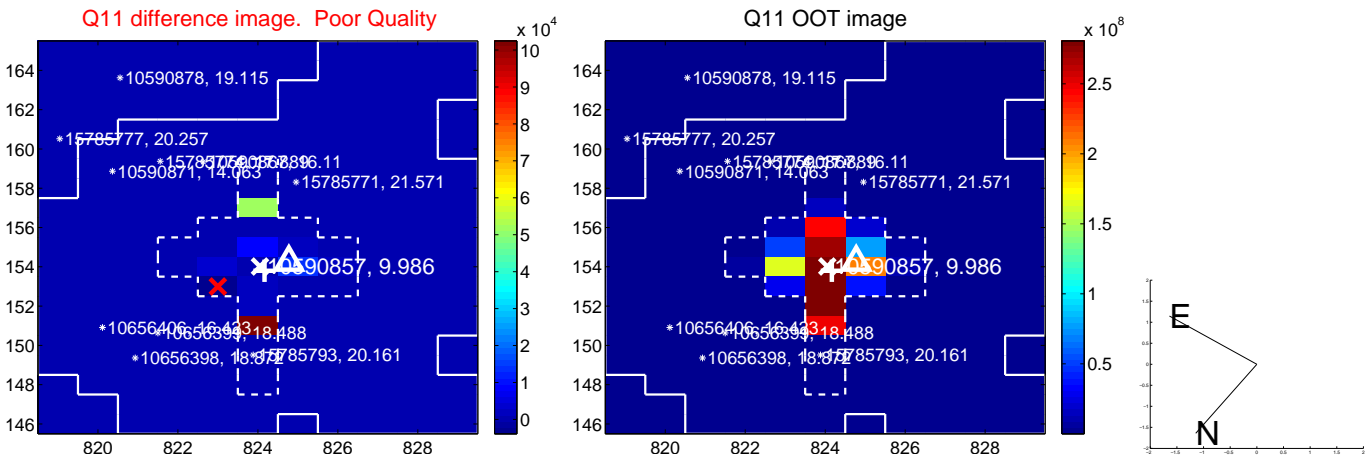
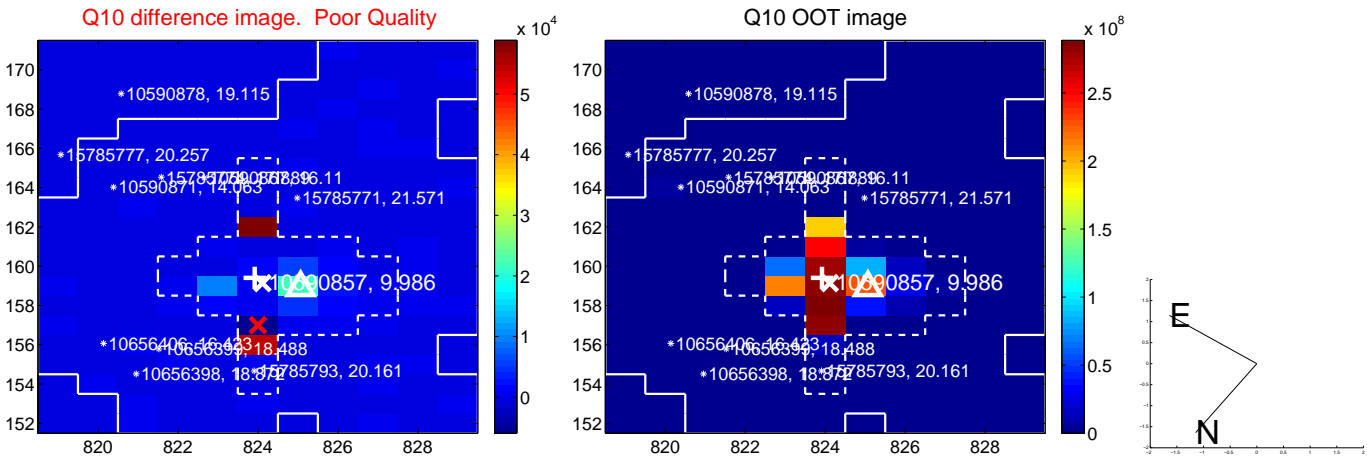
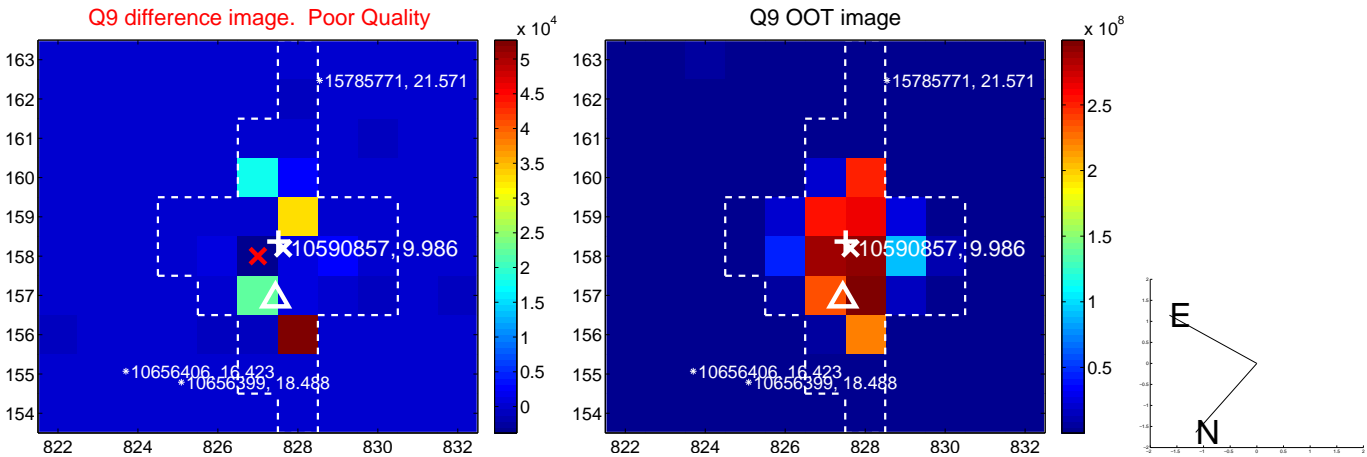
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

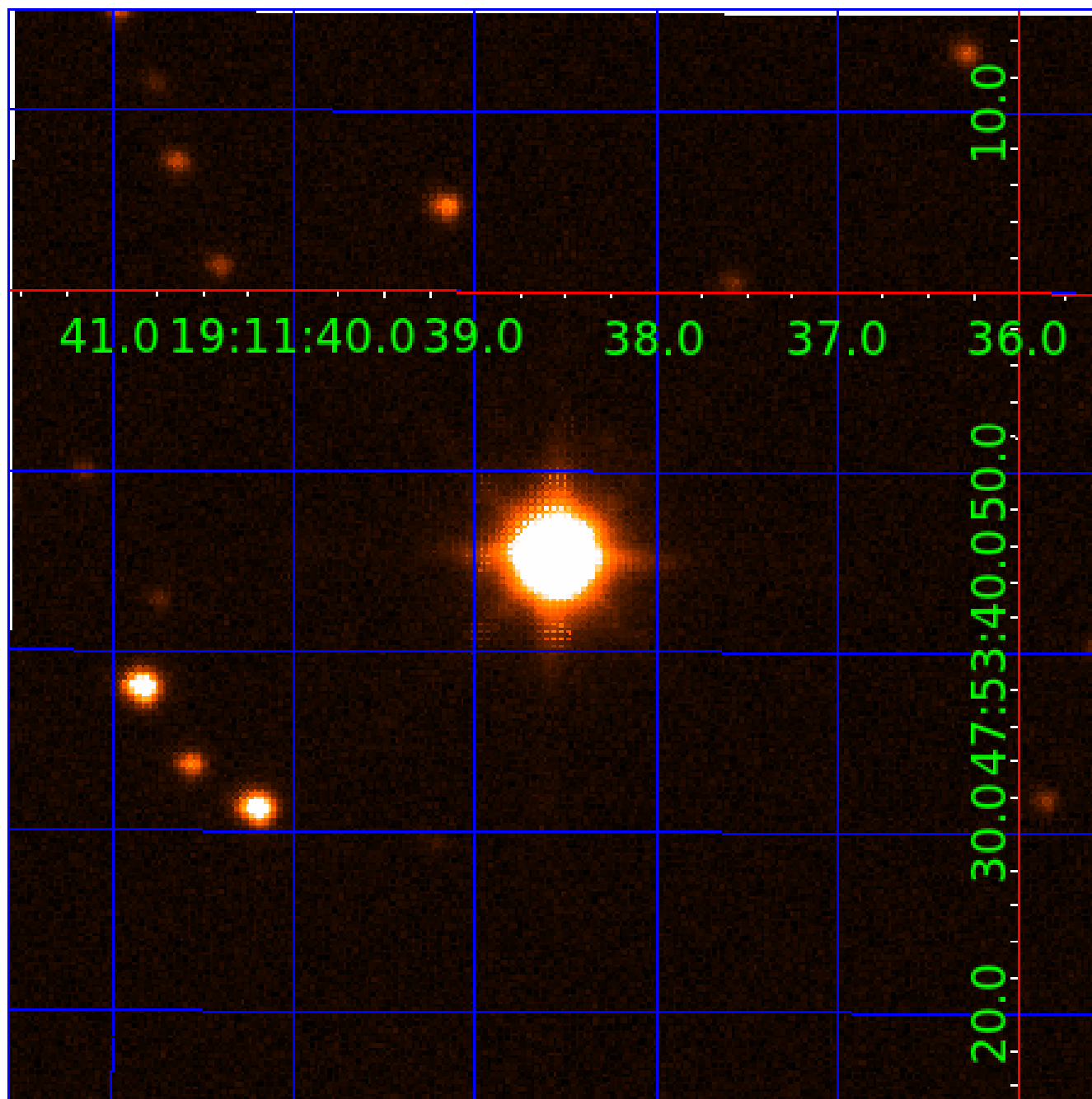


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010590857

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R _★ (R _☉)	T _★ (K)	R _p (R _⊕)	S _p (S _⊕)
010590857-01	OBS	No	0.573047	132.049213	89.0	1.670	10.8	9.9	3.04	7773	2.98	108109.26
010590857-02	OBS	No	3.851303	131.839545	143.3	16.696	9.1	10.7	3.04	7773	4.22	8523.93

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010590857-01	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—CENT_SATURATED
010590857-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—LPP_DV—LPP_ALT—CENT_SATURATED

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

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

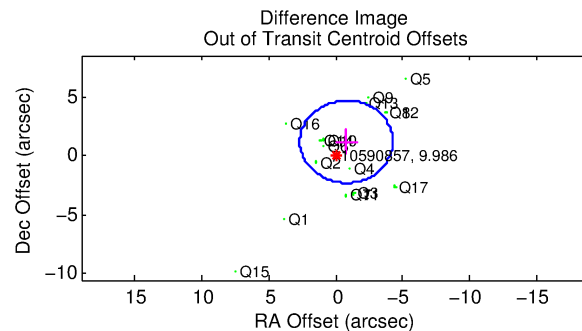
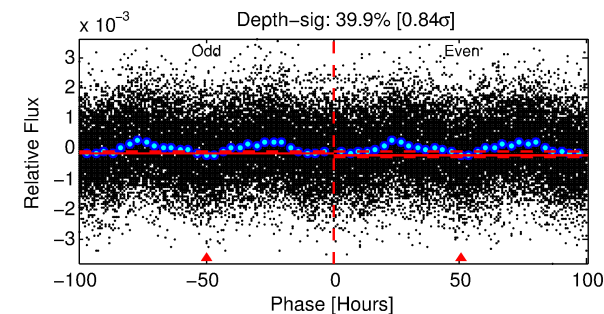
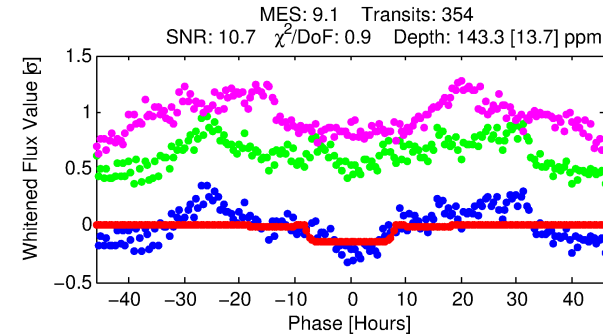
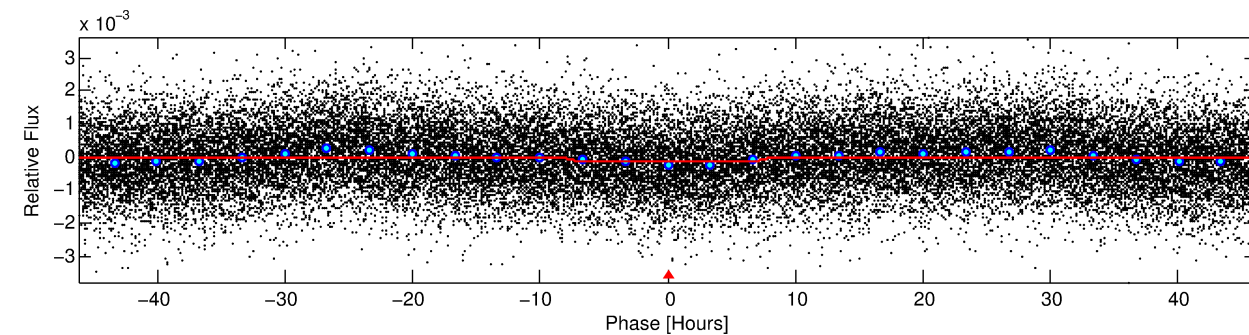
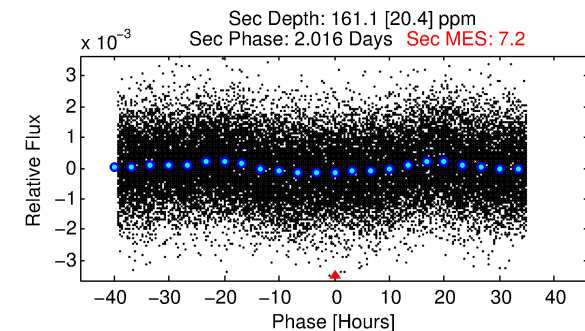
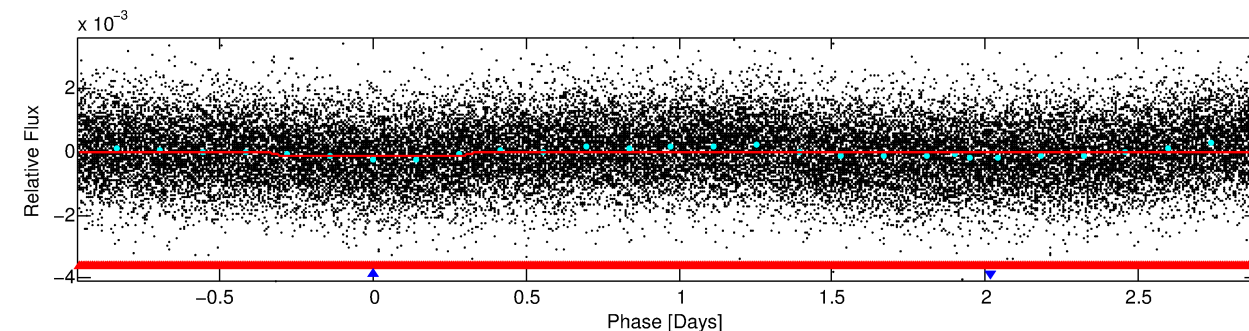
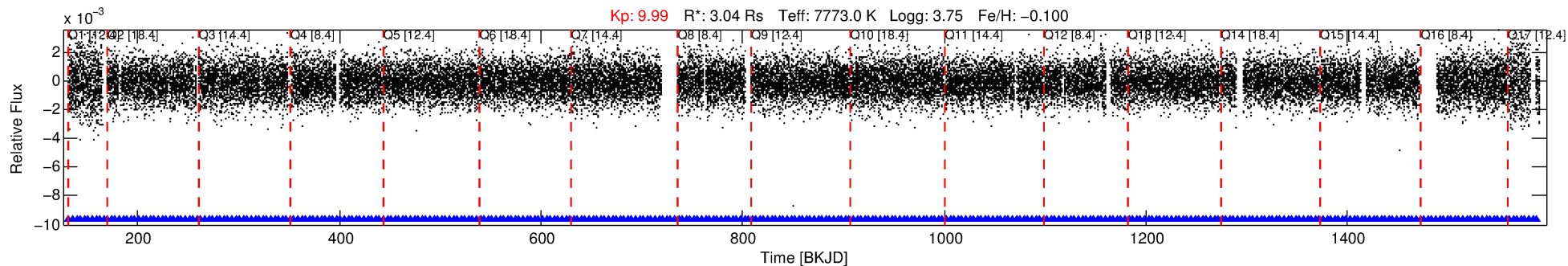
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010590857-02

No Significant Match Found

DV One-Page Summary

KIC: 10590857 Candidate: 2 of 2 Period: 3.851 d



DV Fit Results:

Period = 3.85130 [0.00010] d
Epoch = 131.8395 [0.0197] BKJD
Rp/R* = 0.0127 [0.0015]
a/R* = 1.25 [0.31]
b = 0.90 [0.15]
Seff = 8523.93 [5770.30]
Teq = 2450 [415] K
Rp = 4.22 [1.89] Re
a = 0.0595 [0.0245] AU
Ag = 17.58 [12.49] [1.33σ]
Teffp = 7757 [618] K [7.13σ]

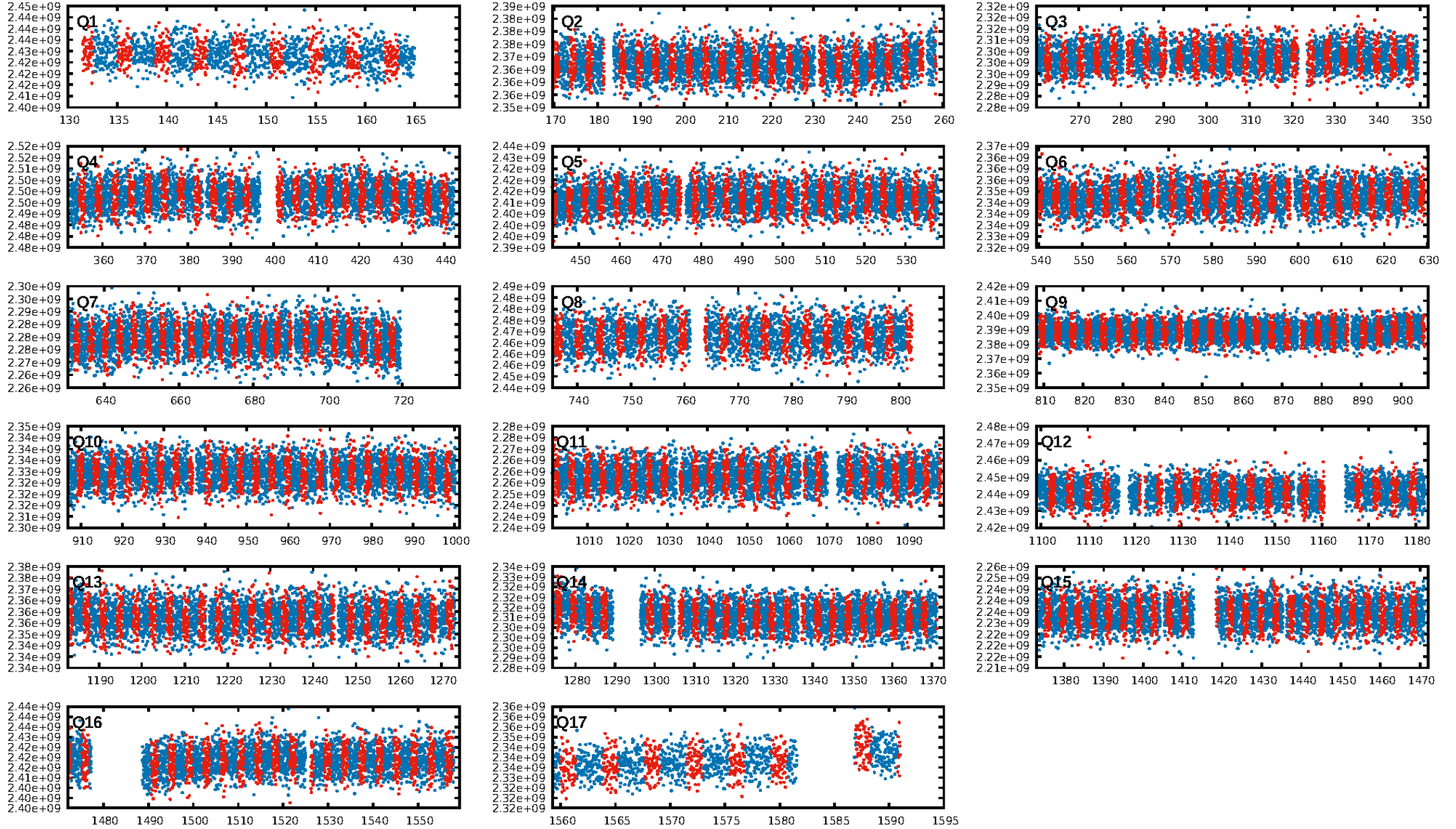
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [4.69σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 2.86e-12
RollingBand-fgt: 1.00 [338/338]
GhostDiagnostic-chr: N/A
Centroid-sig: 0.1%
Centroid-so: 0.751 arcsec [5.10σ]
OotOffset-rm: 1.426 arcsec [1.23σ]
KicOffset-rm: 1.296 arcsec [1.21σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.06 [1/17]
DiffImageOverlap-fno: 0.00 [0/17]

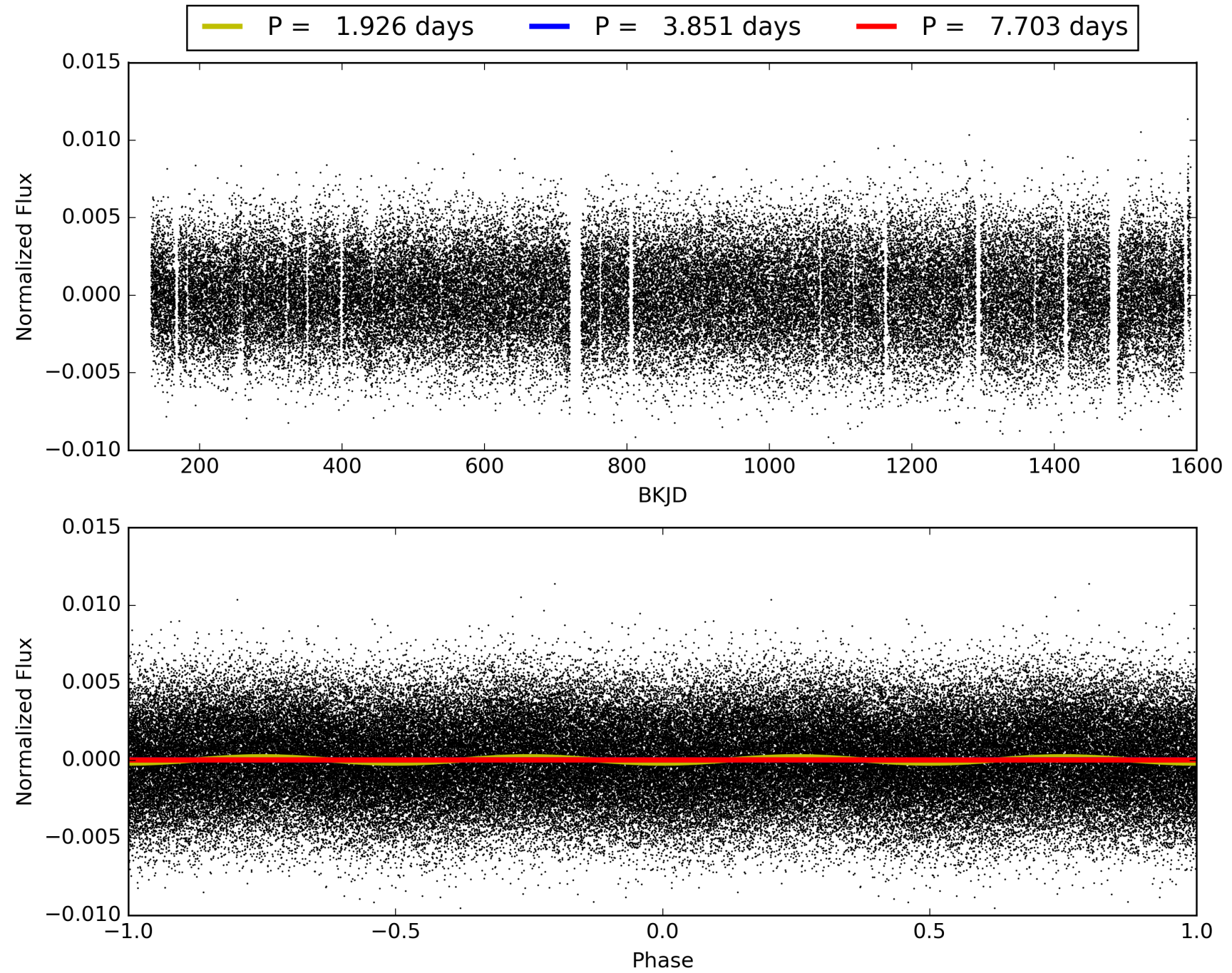
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 15:06:01 Z

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

TCE 010590857-02, PDC Light Curves

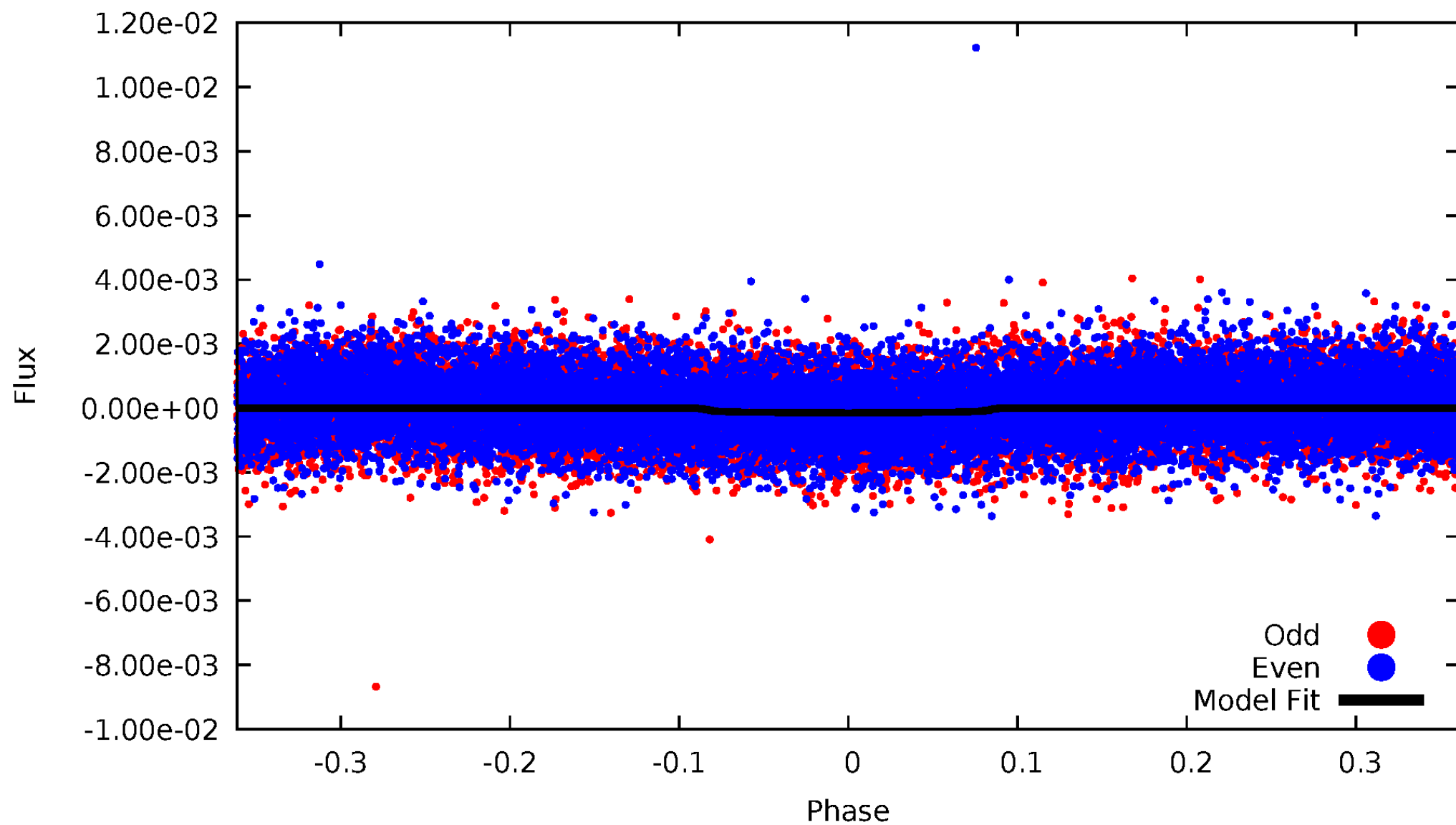


TCE 010590857-02



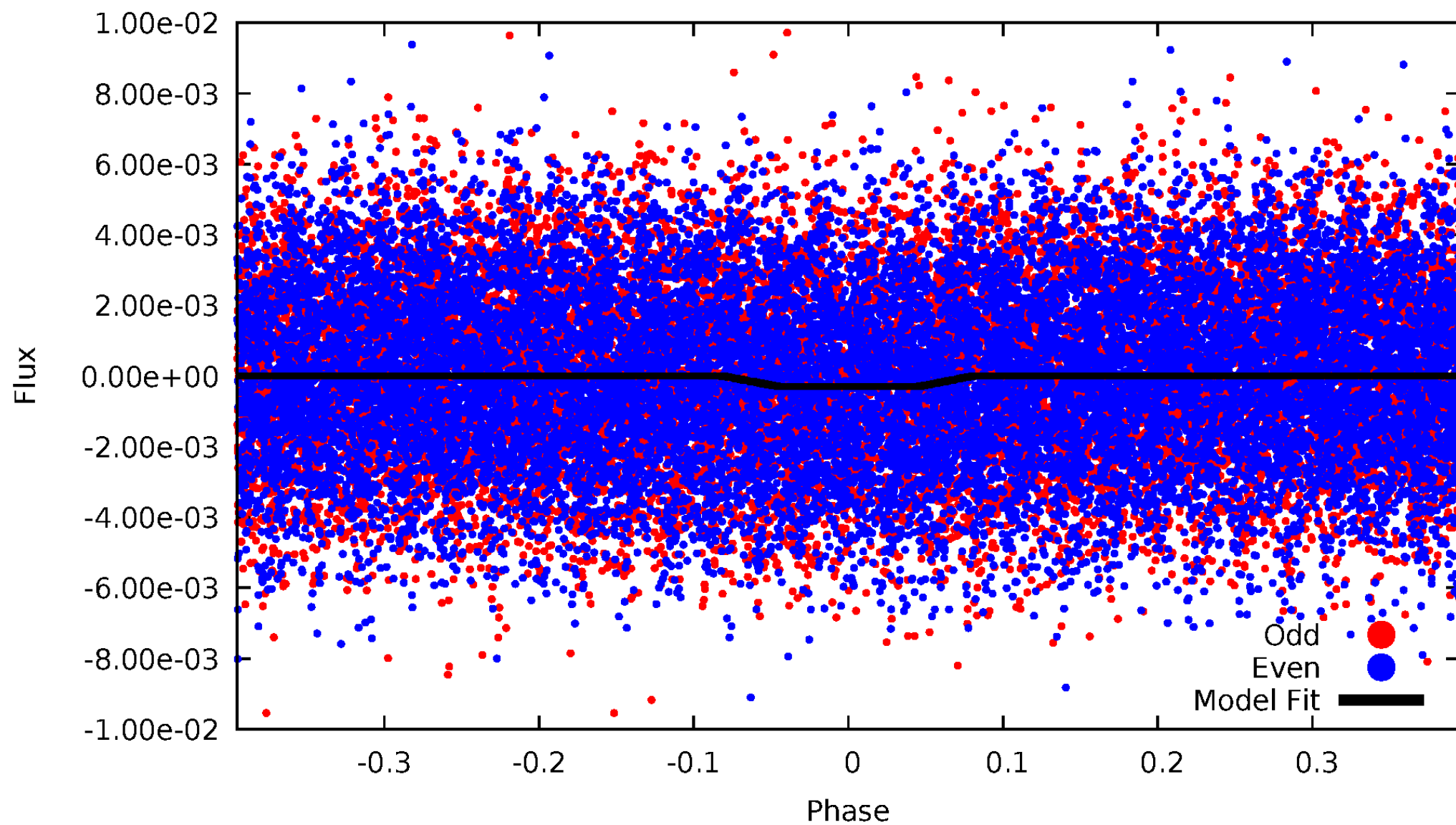
DV Odd/Even

TCE 010590857-02



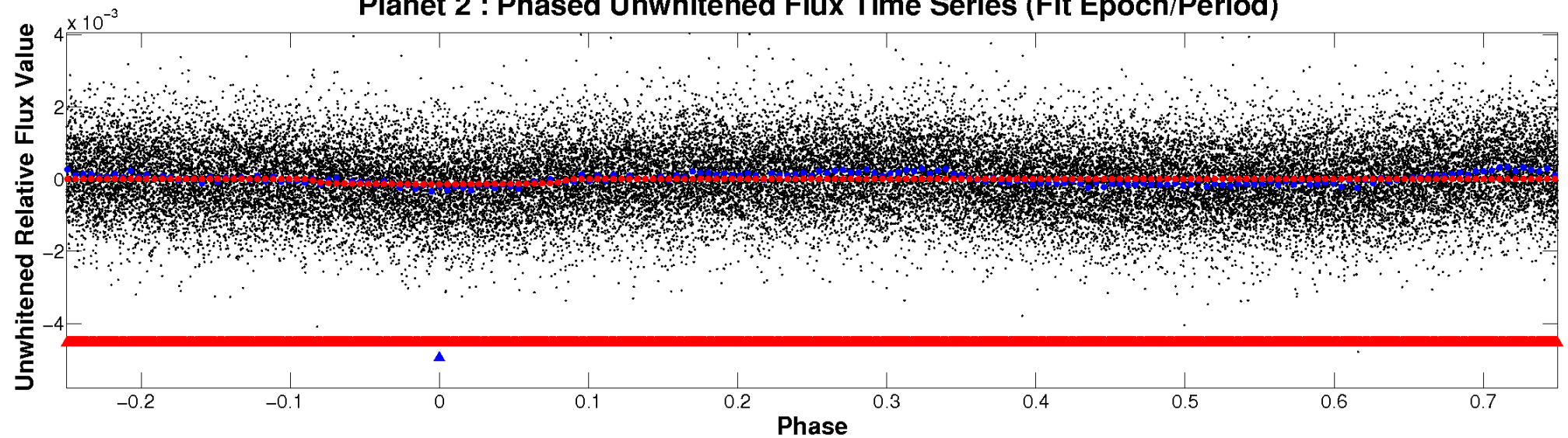
ALT Odd/Even

TCE 010590857-02

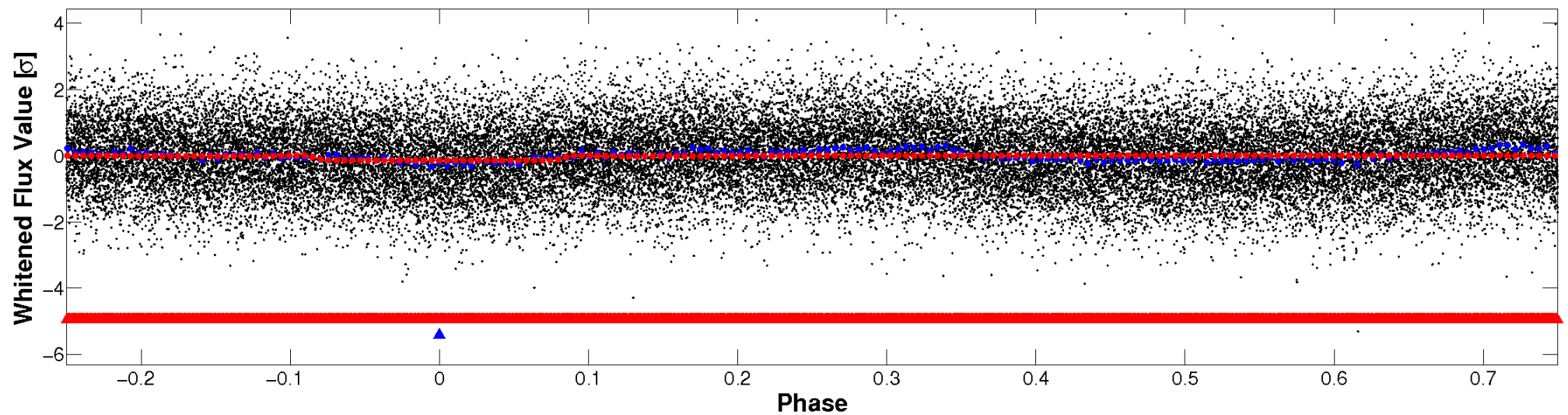


Non-Whitened Vs. Whitened Light Curve

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

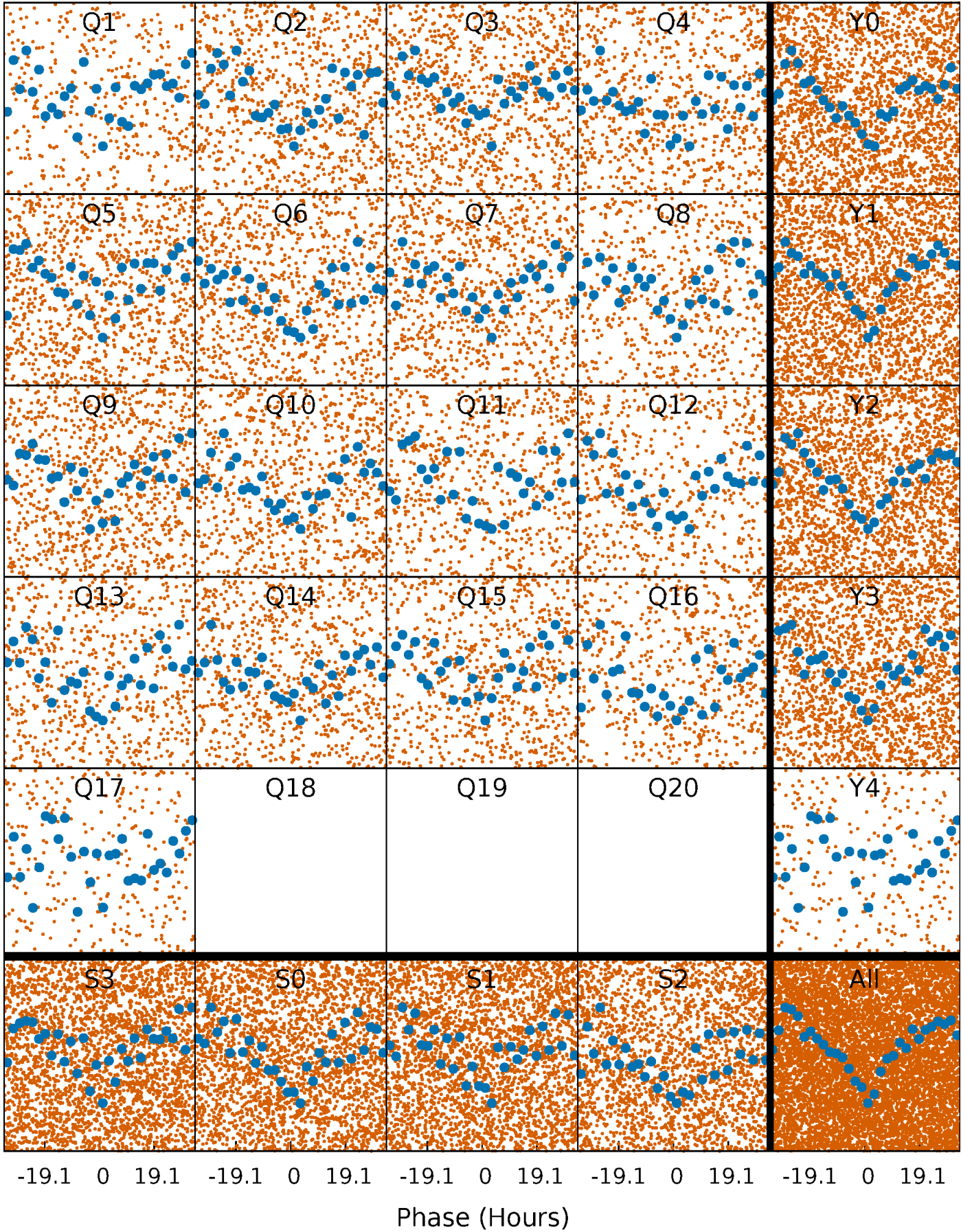


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



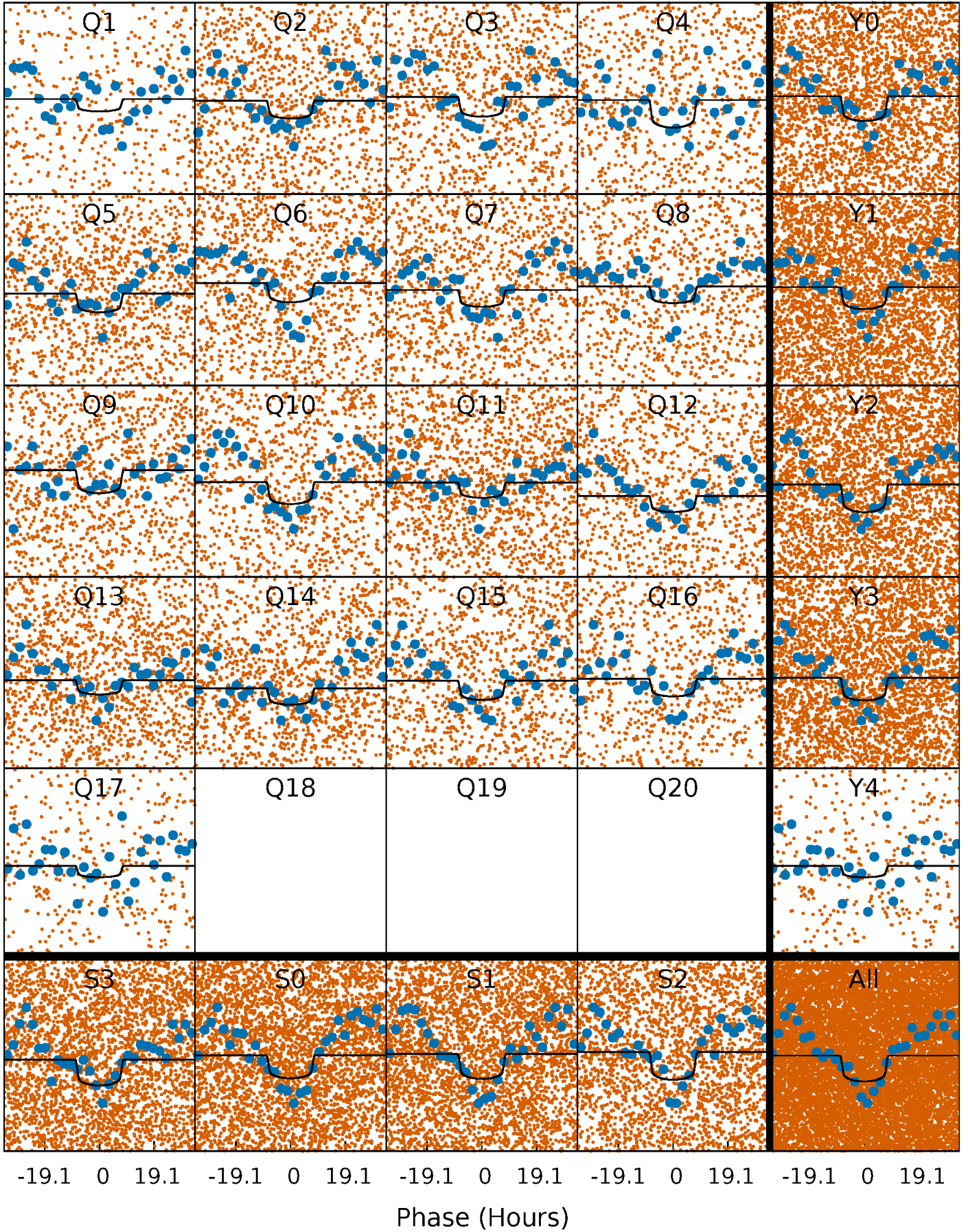
PDC Quarter-Phased Transit Curves

TCE 010590857-02 P= 3.851303 Days $T_0=131.839545$ (BKJD)



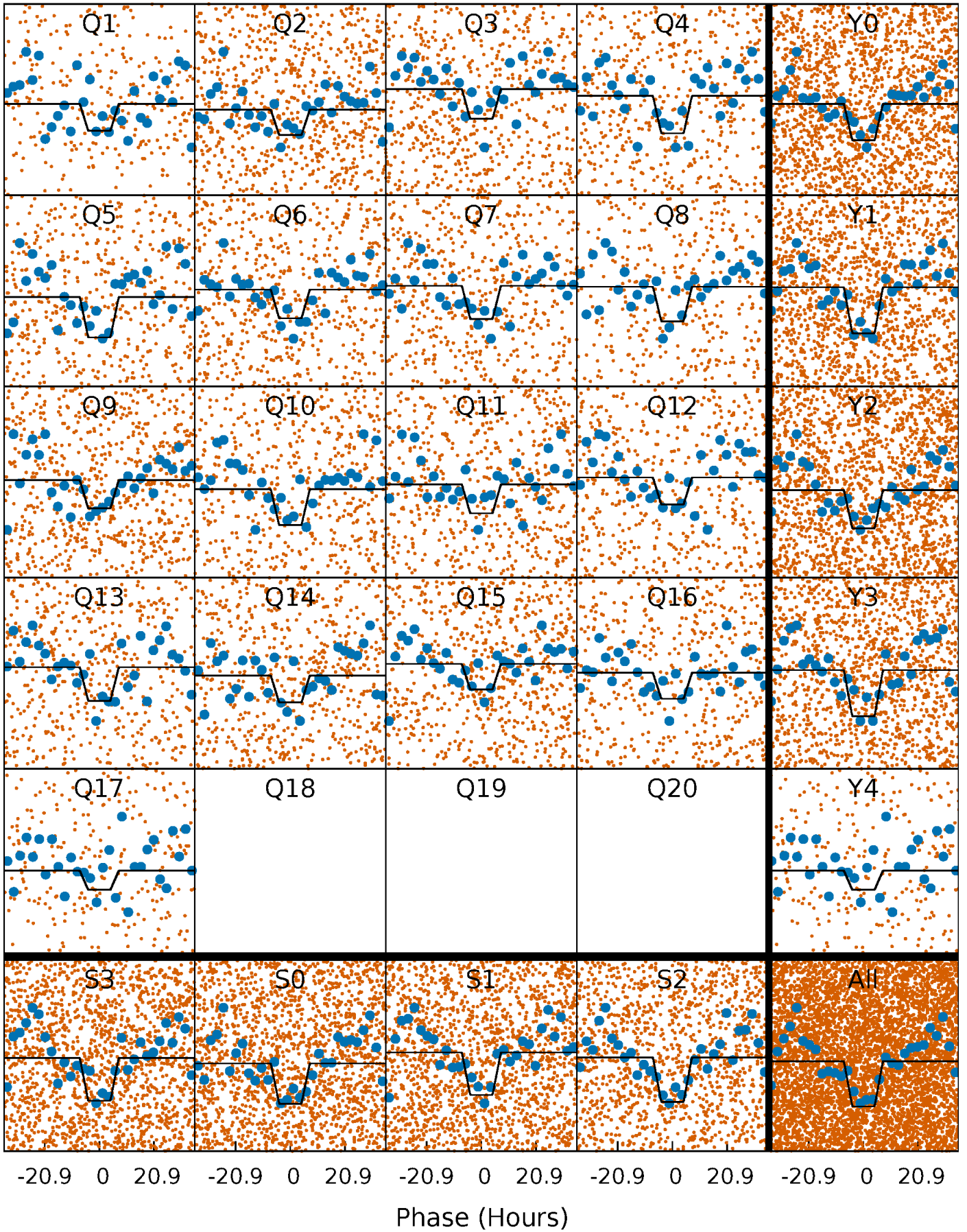
DV Quarter-Phased Transit Curves

TCE 010590857-02 P= 3.851303 Days $T_0=131.839545$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

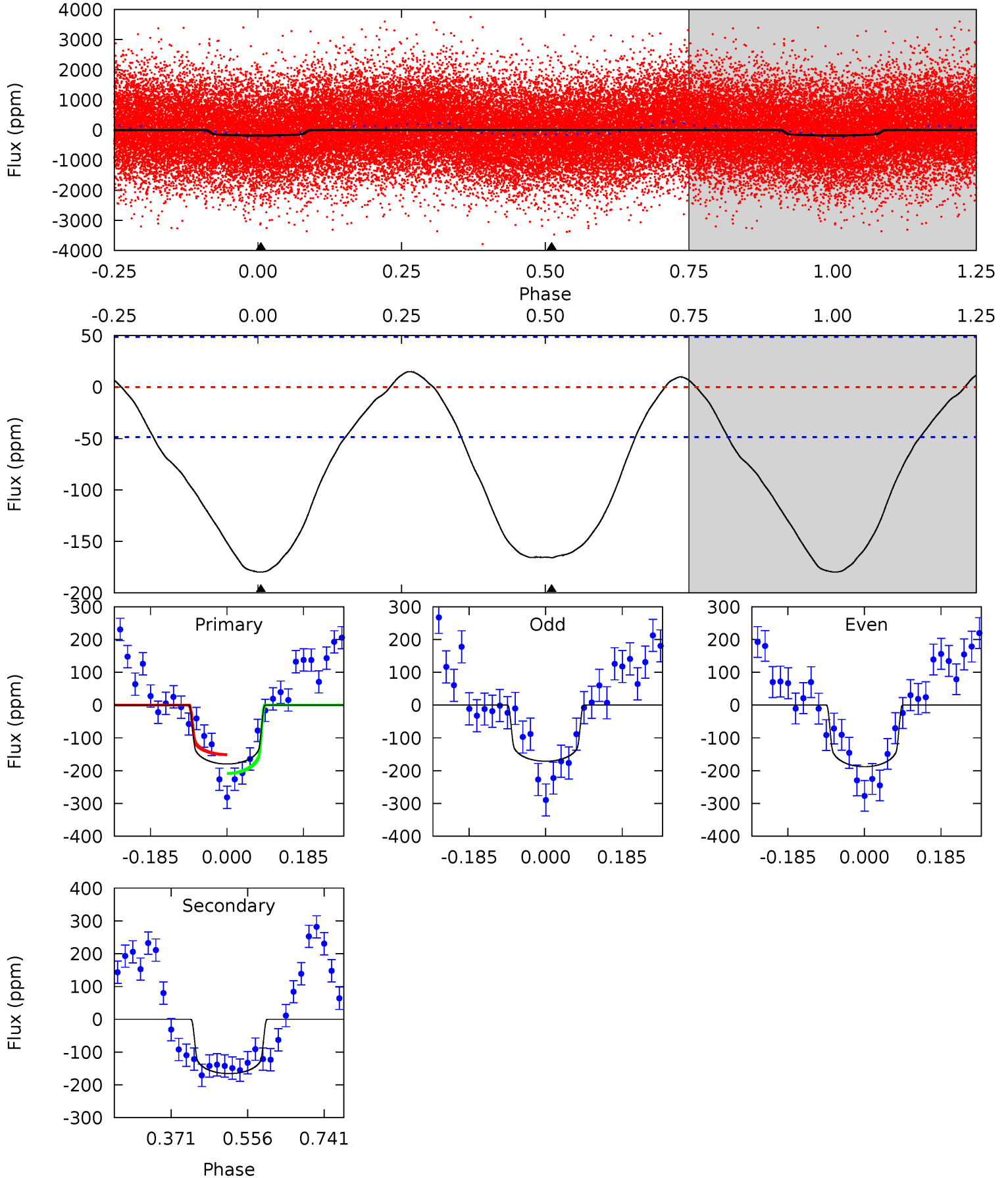
TCE 010590857-02 P= 3.851109 Days $T_0=131.878888$ (BKJD)



DV Model-Shift Uniqueness Test

010590857-02, P = 3.851303 Days, E = 127.988242 Days

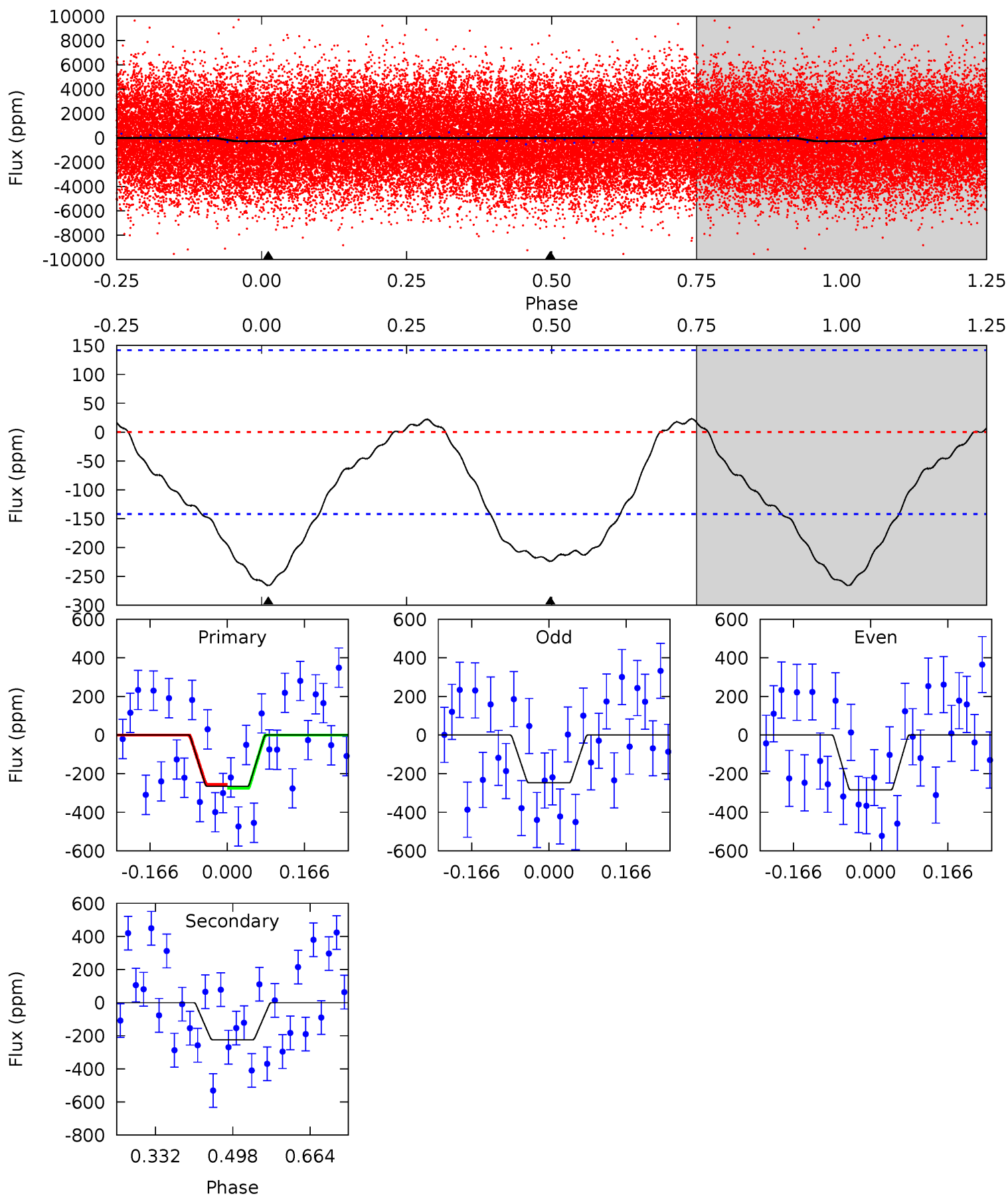
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.4	15.1	0	0	4.43	1.32	1.36	16.4	16.4	15.1	15.1	0.76	1.12	0.08	2.61



Alt Model-Shift Uniqueness Test

010590857-02, P = 3.851109 Days, E = 128.027779 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.35	7.03	0	0	4.46	1.38	1.00	8.35	8.35	7.03	7.03	0.58	0.85	0.08	0.31



Stellar Parameters For KIC 010590857

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	7773^{+216}_{-324}	$3.750^{+0.384}_{-0.072}$	$-0.100^{+0.200}_{-0.350}$	$3.036^{+0.350}_{-1.312}$	$1.891^{+0.103}_{-0.413}$	$0.095^{+0.310}_{-0.030}$
	+3%/-4%	+10%/-2%	+200%/-350%	+12%/-43%	+5%/-22%	+326%/-31%
Source	KIC0	KIC0	KIC0	DSEP		

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

Secondary Eclipse Parameters for KIC 010590857-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-166 ± 11	$3.94^{+0.73}_{-0.91}$	3311^{+229}_{-334}	7704^{+798}_{-545}	20^{+13}_{-6}
Alt.	-224 ± 32	$5.35^{+0.86}_{-1.19}$	3311^{+219}_{-375}	7112^{+612}_{-541}	16^{+9}_{-5}

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 $A_{obs} \gg 1.0$

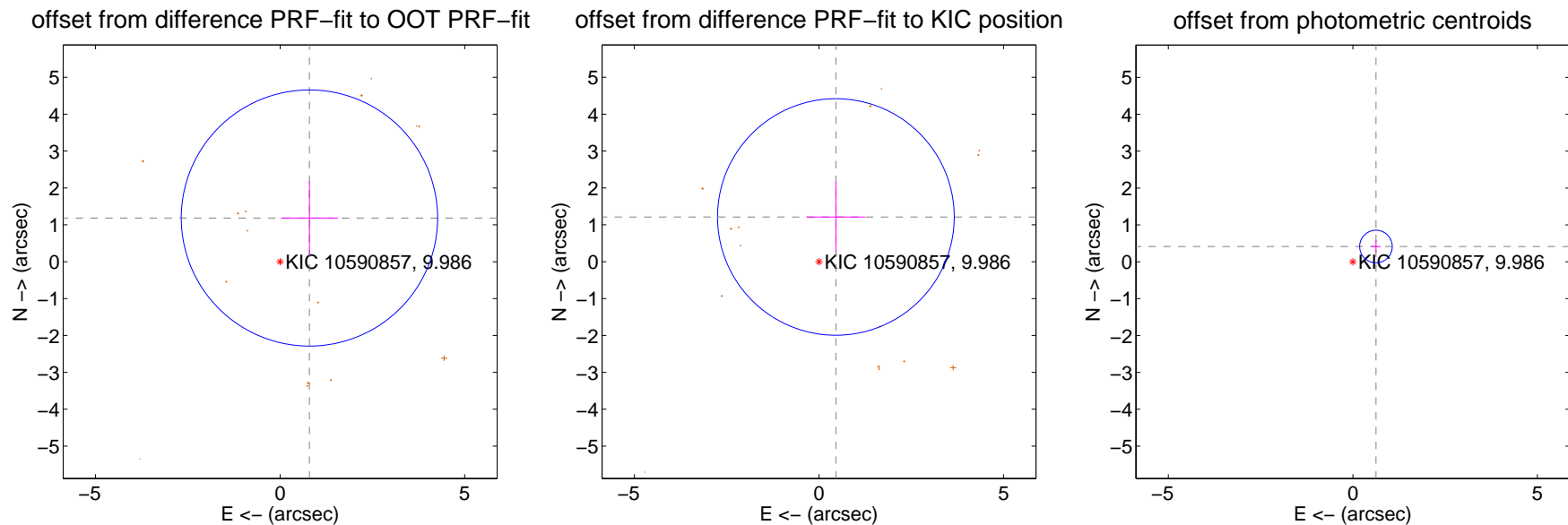
DV Centroid Data

Supplemental centroid analysis for 010590857-02. **Kepler magnitude: 9.99.** Transit SNR 10.68

There are 1 quarters with good PRF difference image offsets

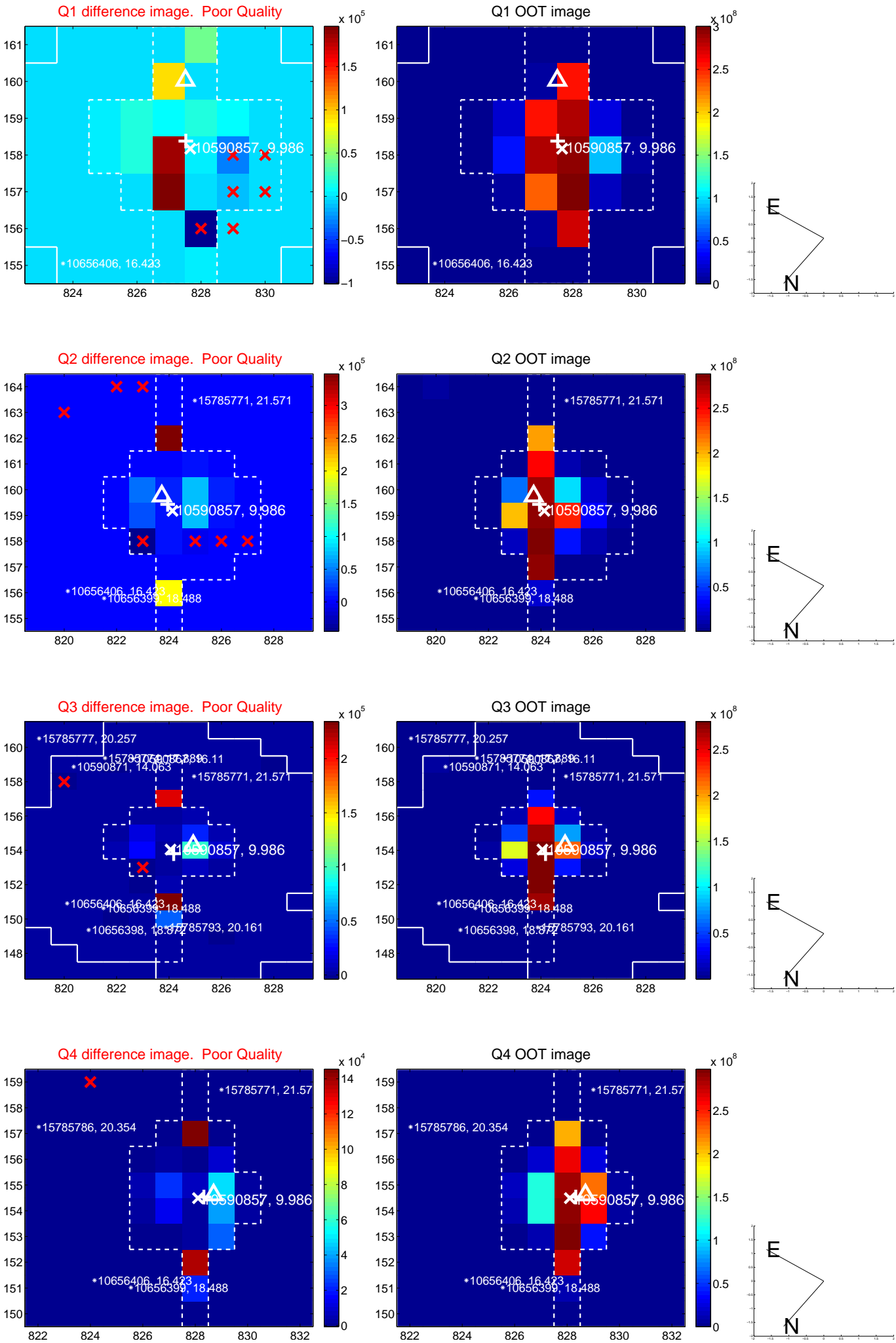
The direct PRF centroid is offset from the target star catalog position by about 0.85 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.426 ± 1.158	1.23	-0.794 ± 0.773	1.185 ± 0.996
PRF-fit source offset from KIC position	1.296 ± 1.069	1.21	-0.458 ± 0.795	1.213 ± 0.955
photometric centroid source offset	0.75 ± 0.15	5.10	-0.63 ± 0.13	0.41 ± 0.18

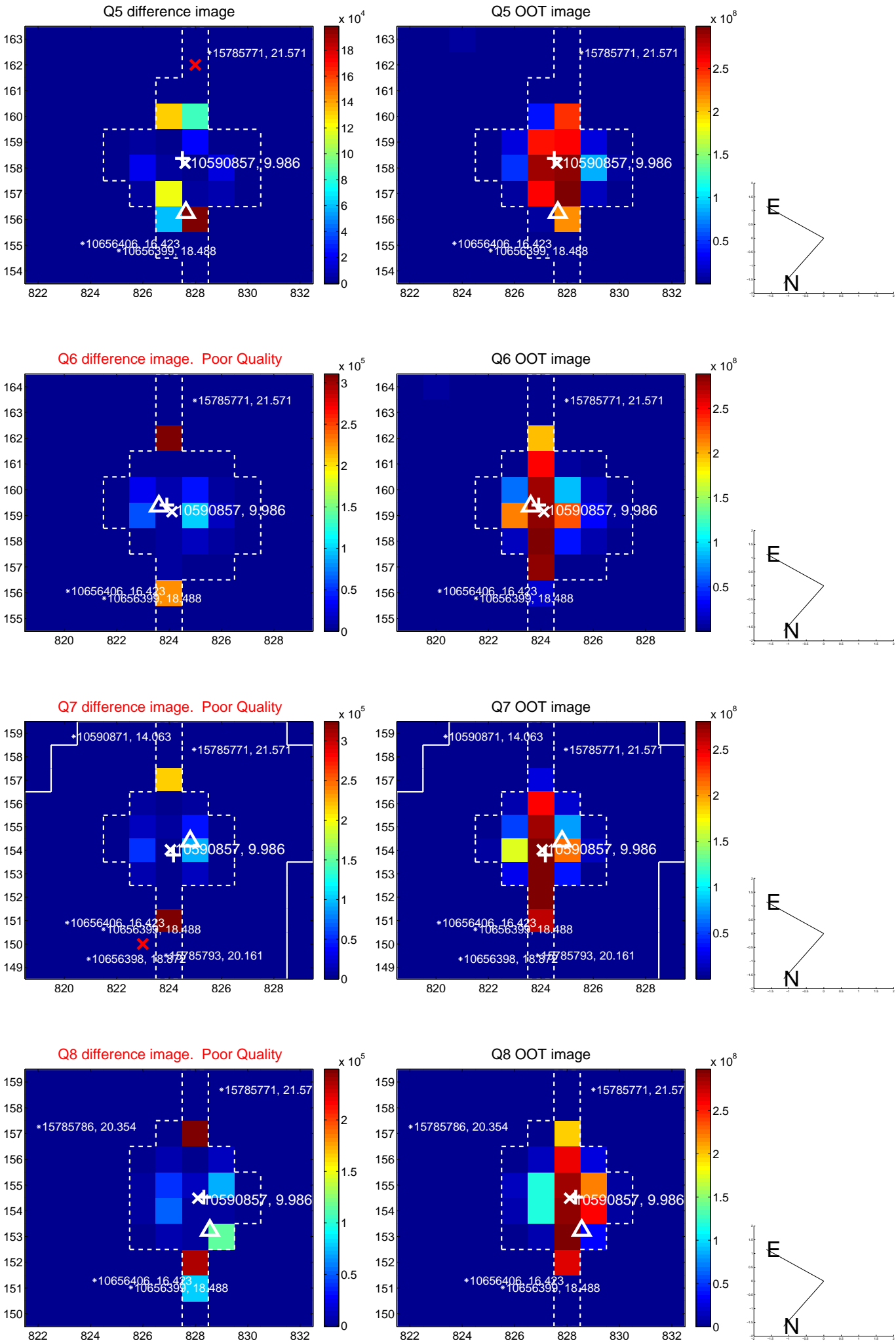


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

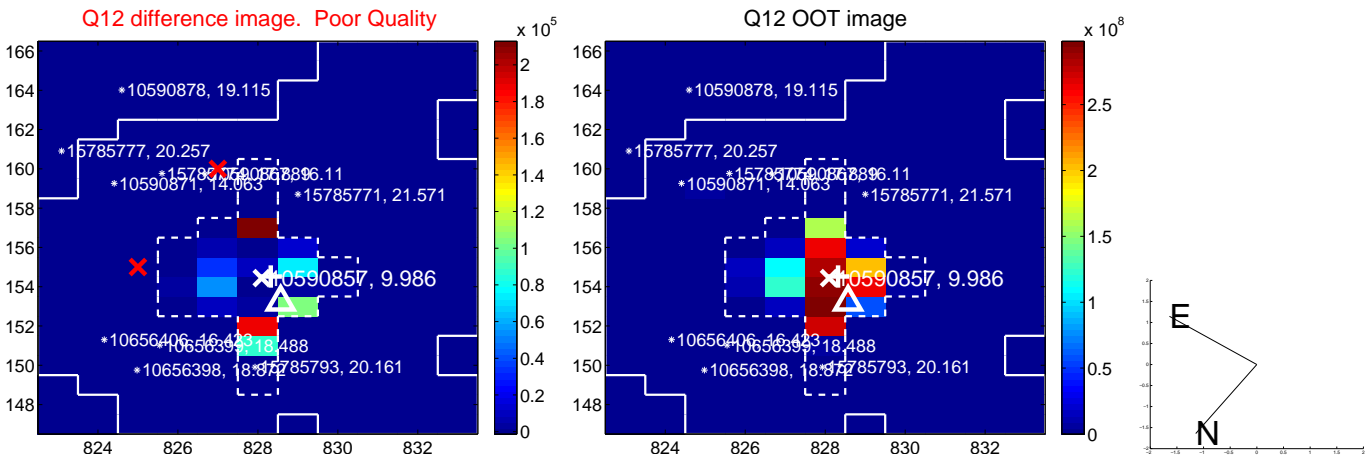
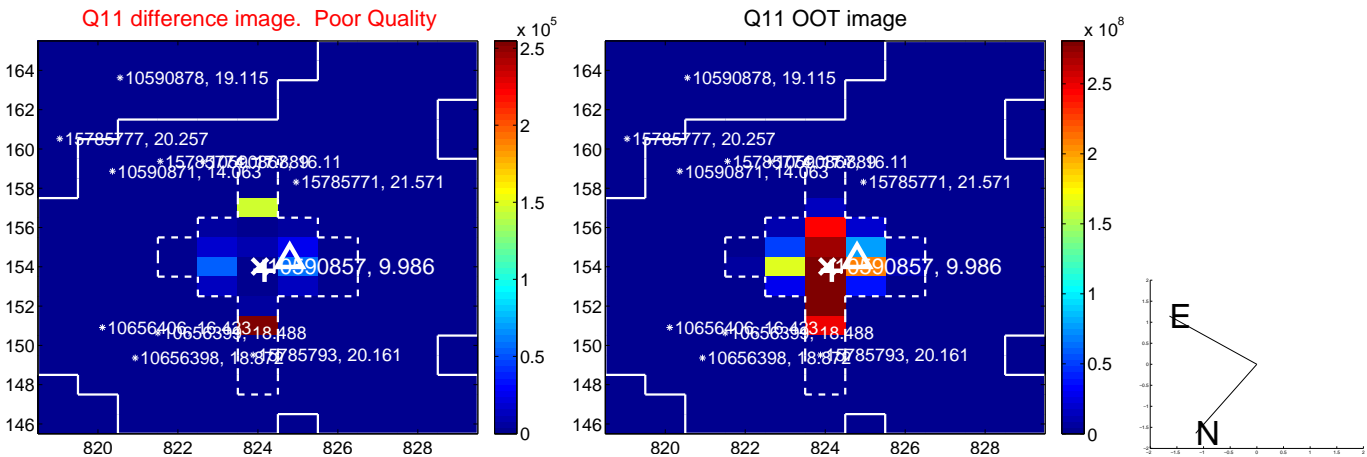
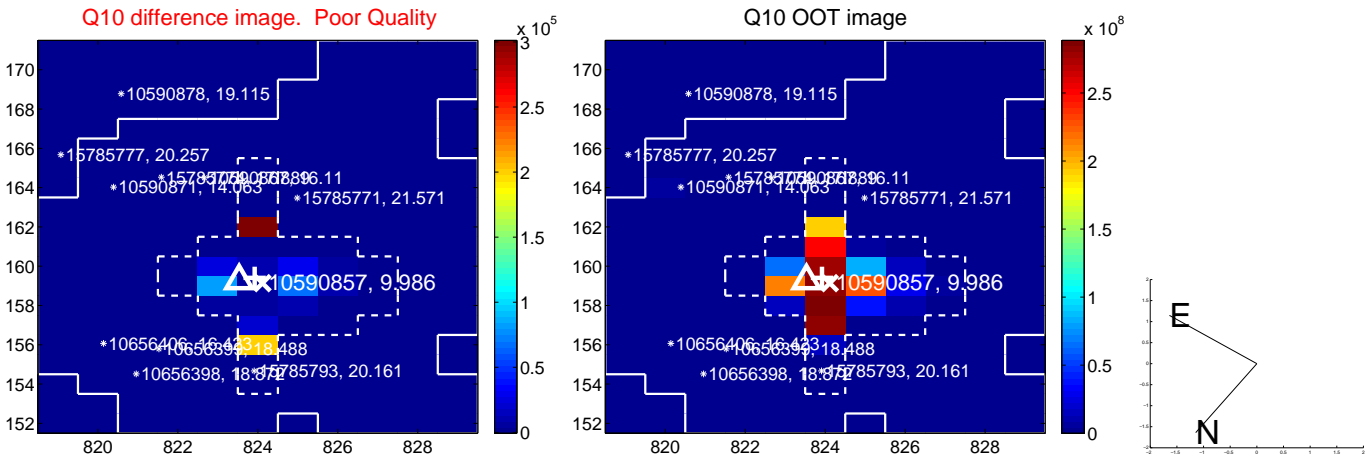
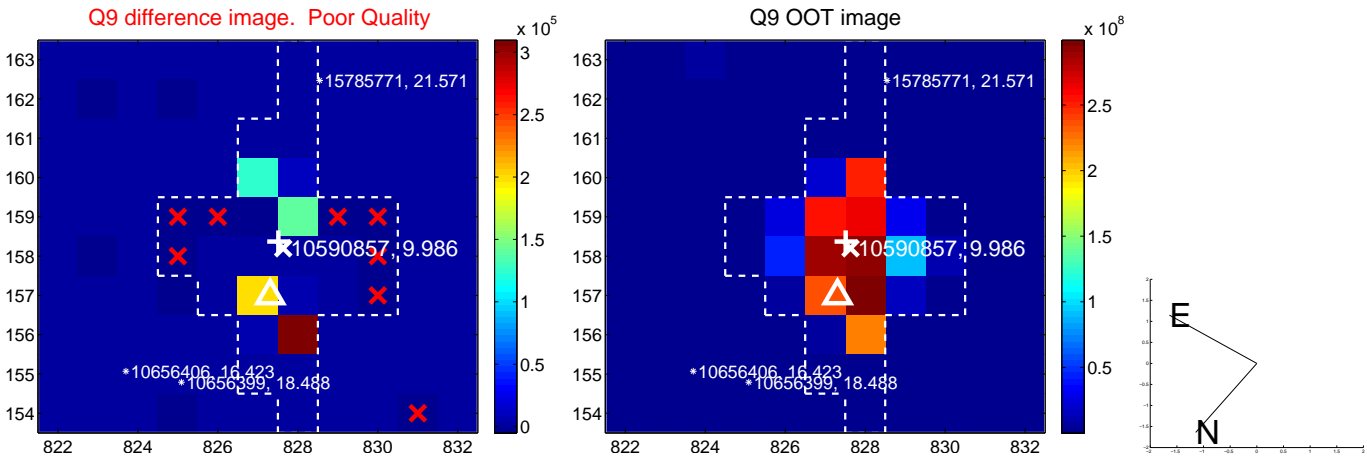
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



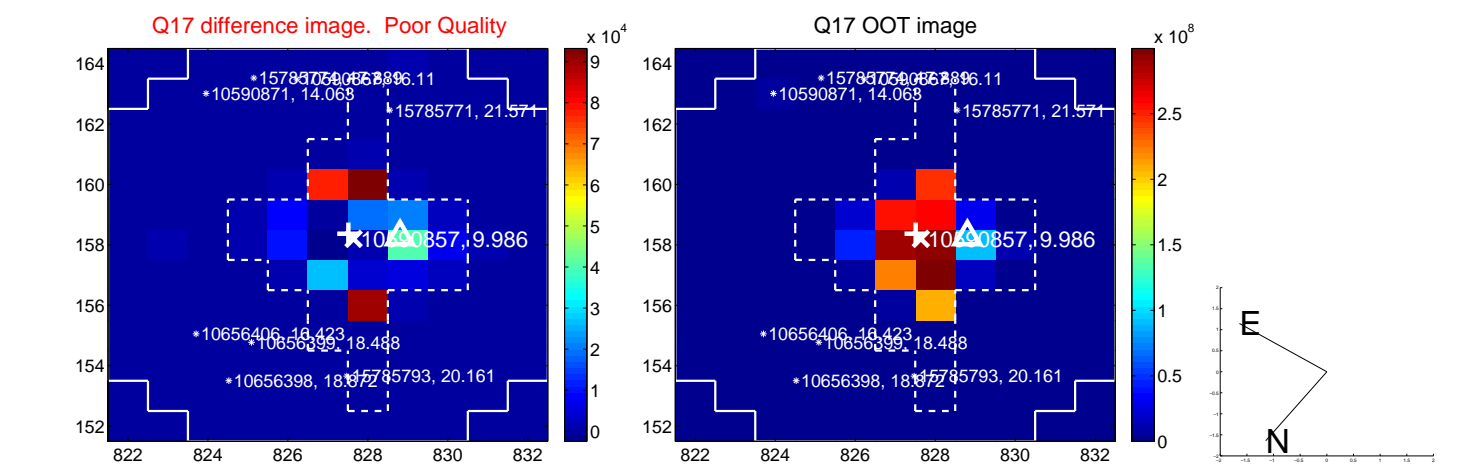
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



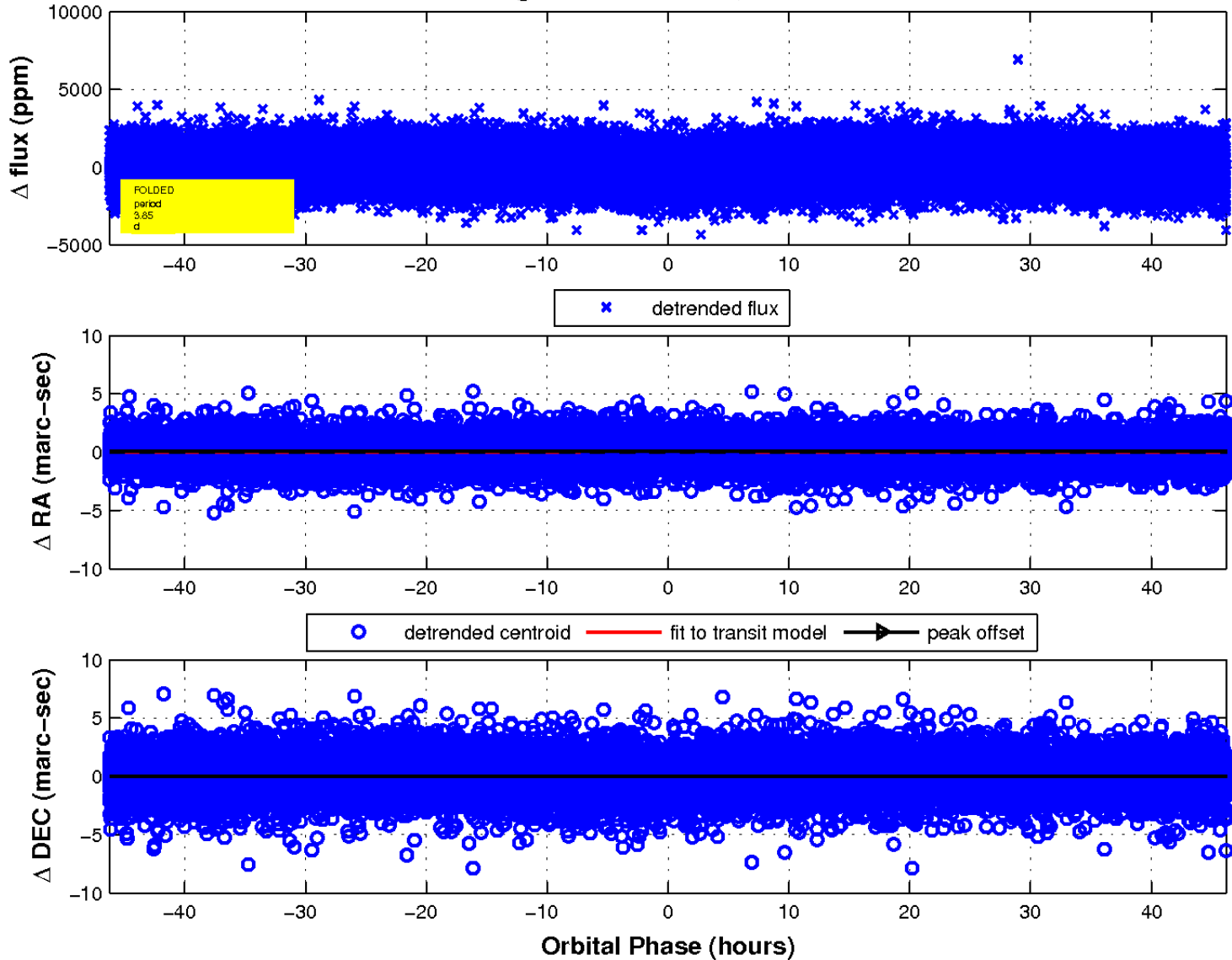
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

