

KIC 009530945

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})
009530945-01	OBS	0708.01	17.406645	136.193848	585.0	7.238	57.1	63.1	1.22	6086	3.33	104.21
009530945-02	OBS	0708.02	7.693613	138.037441	291.9	5.329	41.4	45.9	1.22	6086	2.44	309.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009530945-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009530945-02	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.

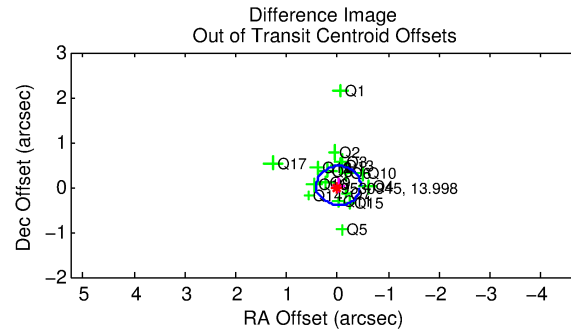
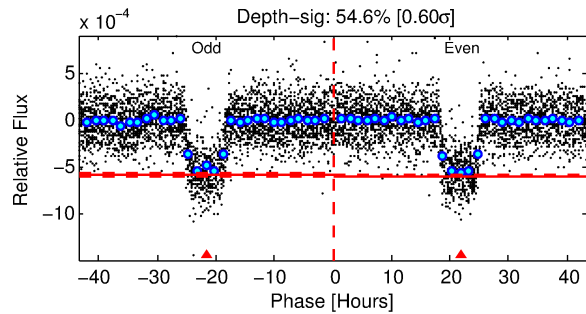
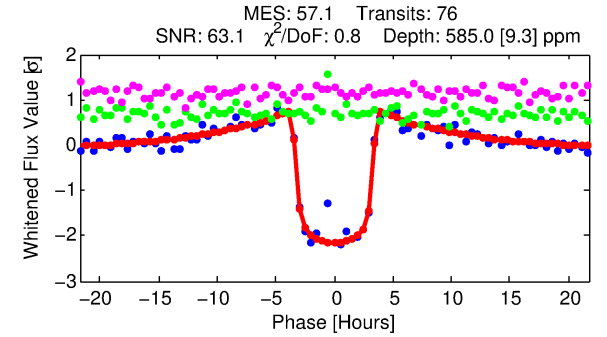
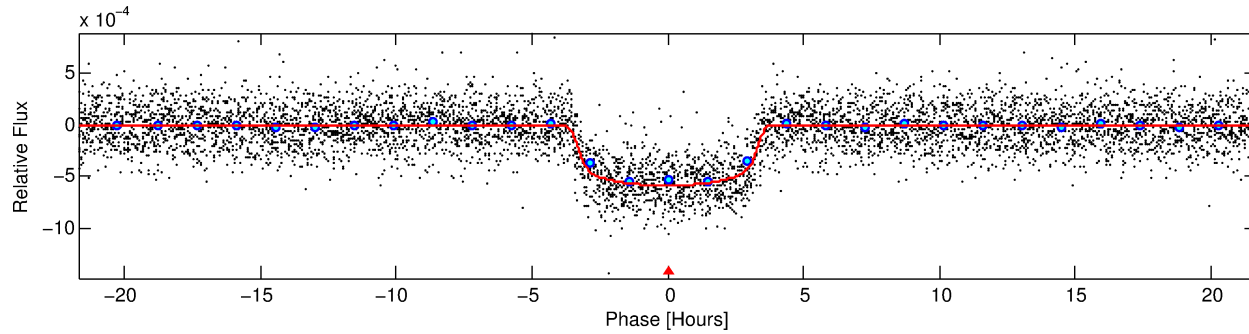
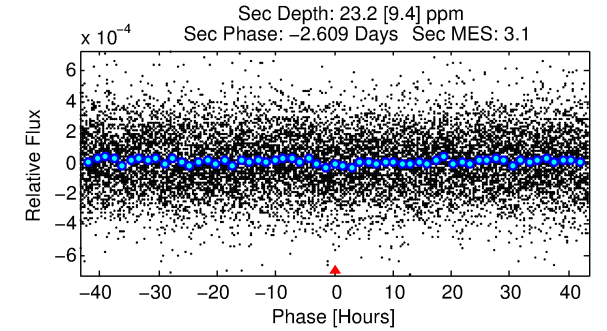
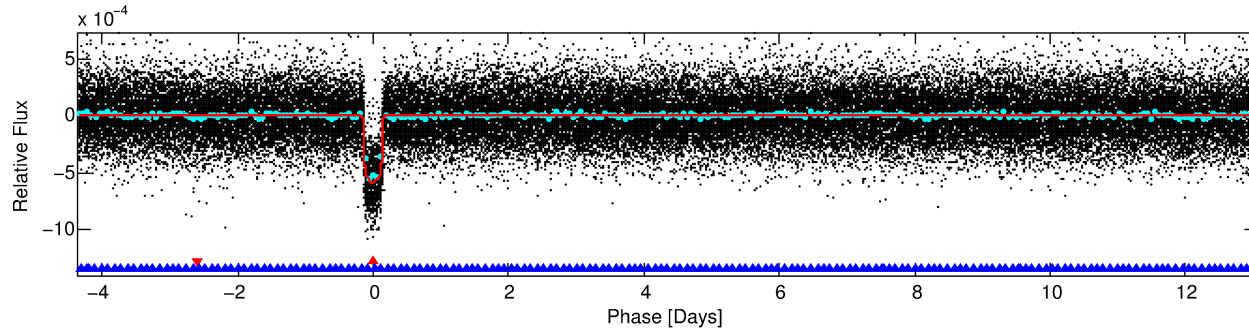
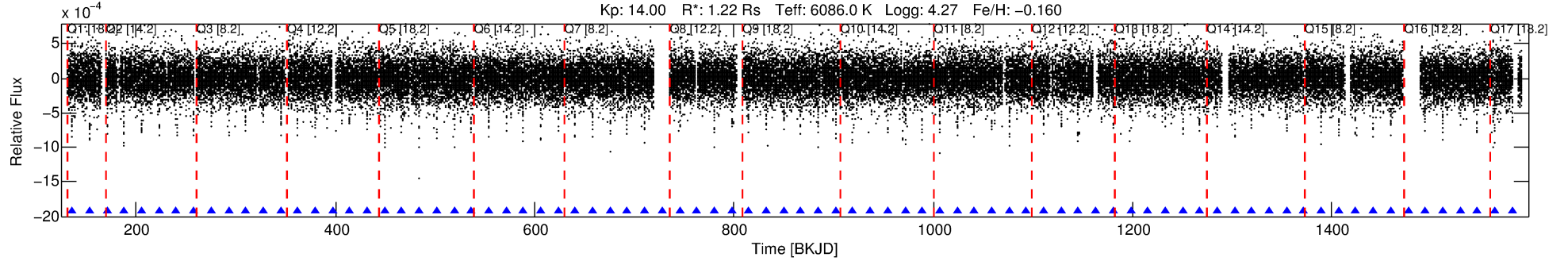
Ephemeris Match Information For 009530945-01

No Significant Match Found

DV One-Page Summary

KIC: 9530945 Candidate: 1 of 2 Period: 17.407 d
KOI: K00708.01 Name: Kepler-216c Corr: 0.973

Kp: 14.00 R*: 1.22 Rs Teff: 6086.0 K Logg: 4.27 Fe/H: -0.160



DV Fit Results:

Period = 17.40665 [0.00004] d
Epoch = 136.1938 [0.0017] BKJD
Rp/R* = 0.0251 [0.0007]
a/R* = 10.74 [1.39]
b = 0.84 [0.05]
Seff = 104.21 [27.34]
Teff = 815 [53] K
Rp = 3.33 [0.57] Re
a = 0.1321 [0.0209] AU
Ag = 20.12 [9.59] [1.99σ]
Teffp = 2668 [278] K [6.55σ]

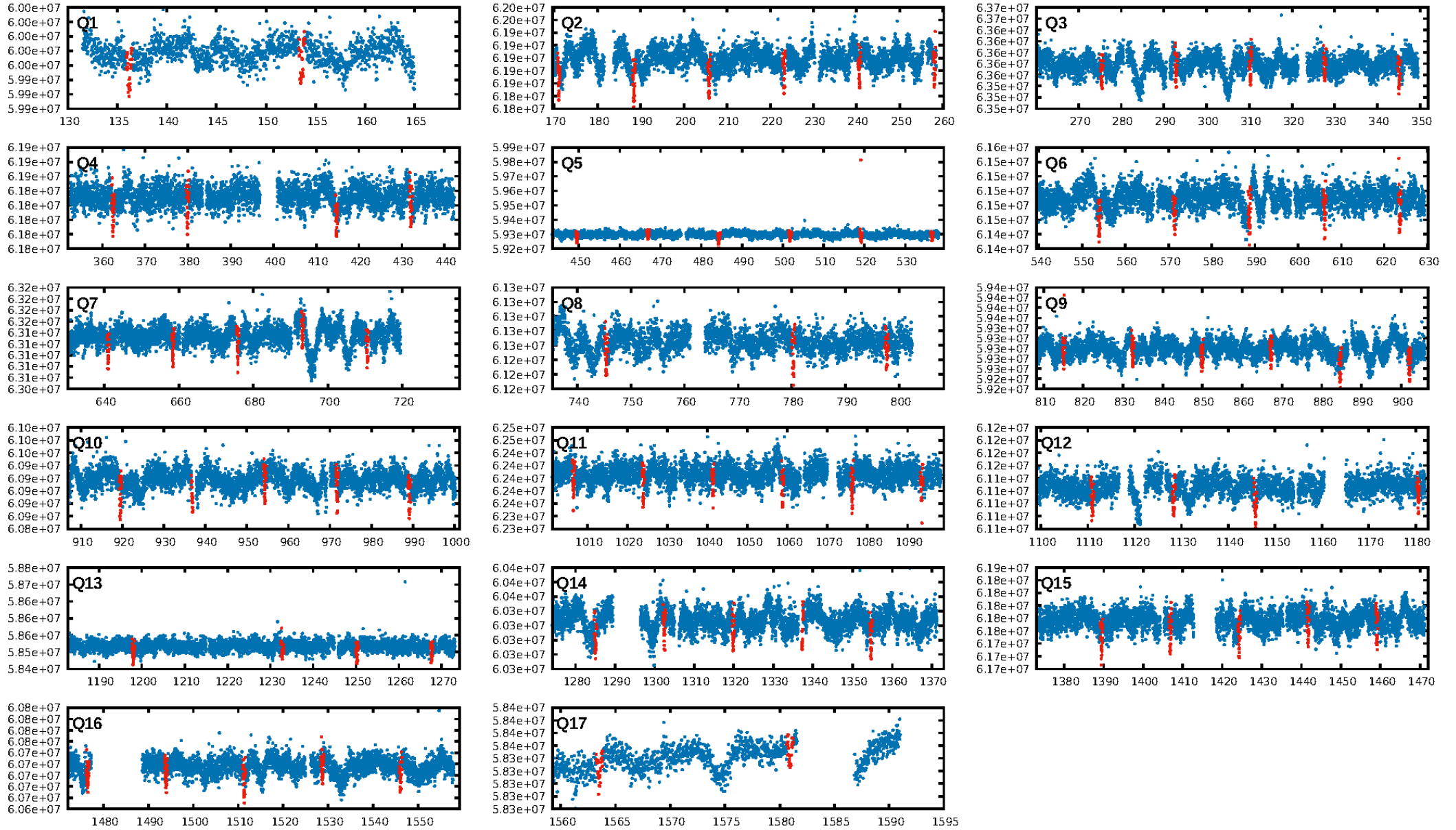
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [25.93σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 60.1%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [72/72]
GhostDiagnostic-chr: 5.27
Centroid-sig: 0.2%
Centroid-so: 0.011 arcsec [0.07σ]
OotOffset-rm: 0.039 arcsec [0.27σ]
KicOffset-rm: 0.098 arcsec [0.61σ]
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]

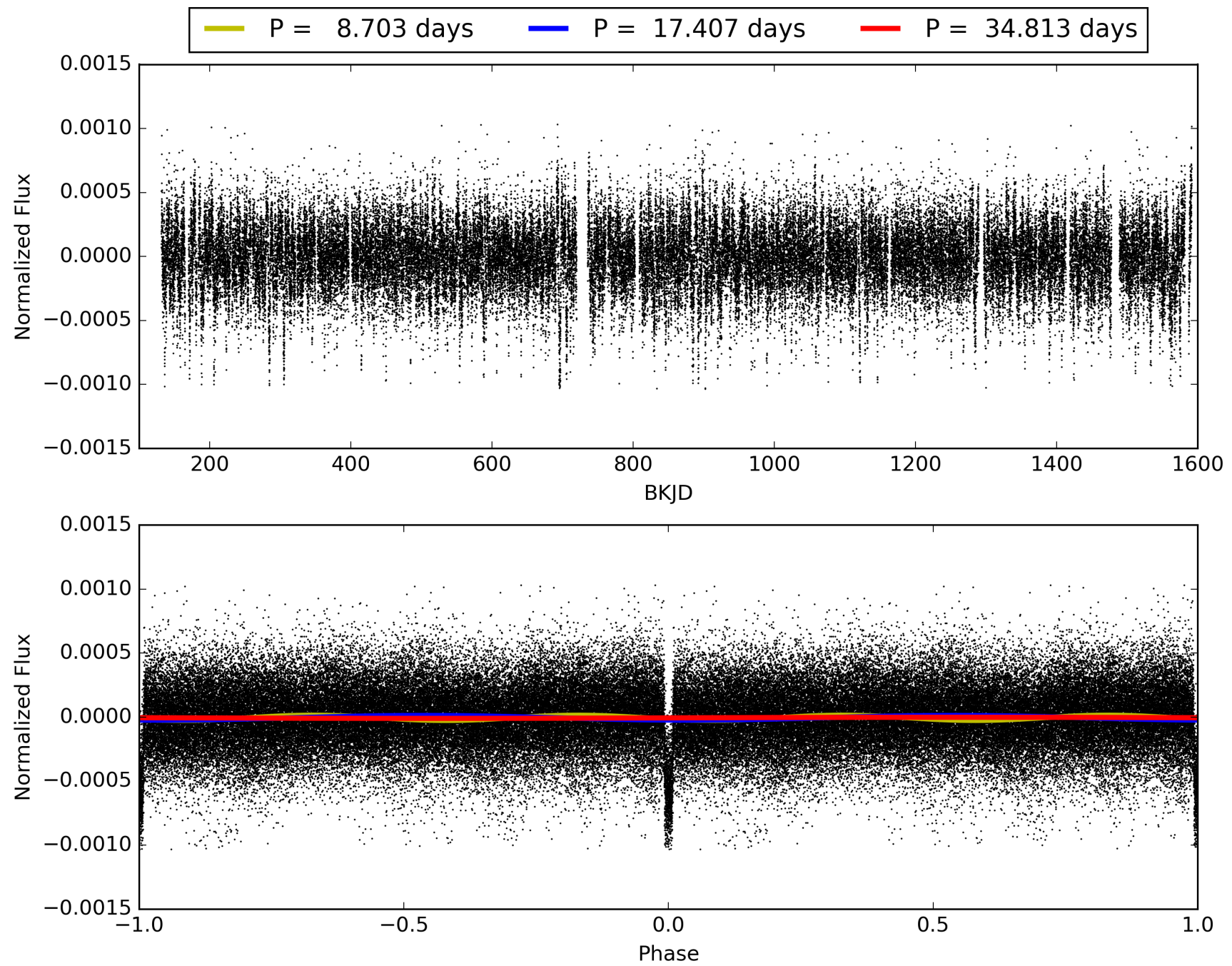
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 20:56:11 Z

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

TCE 009530945-01, PDC Light Curves

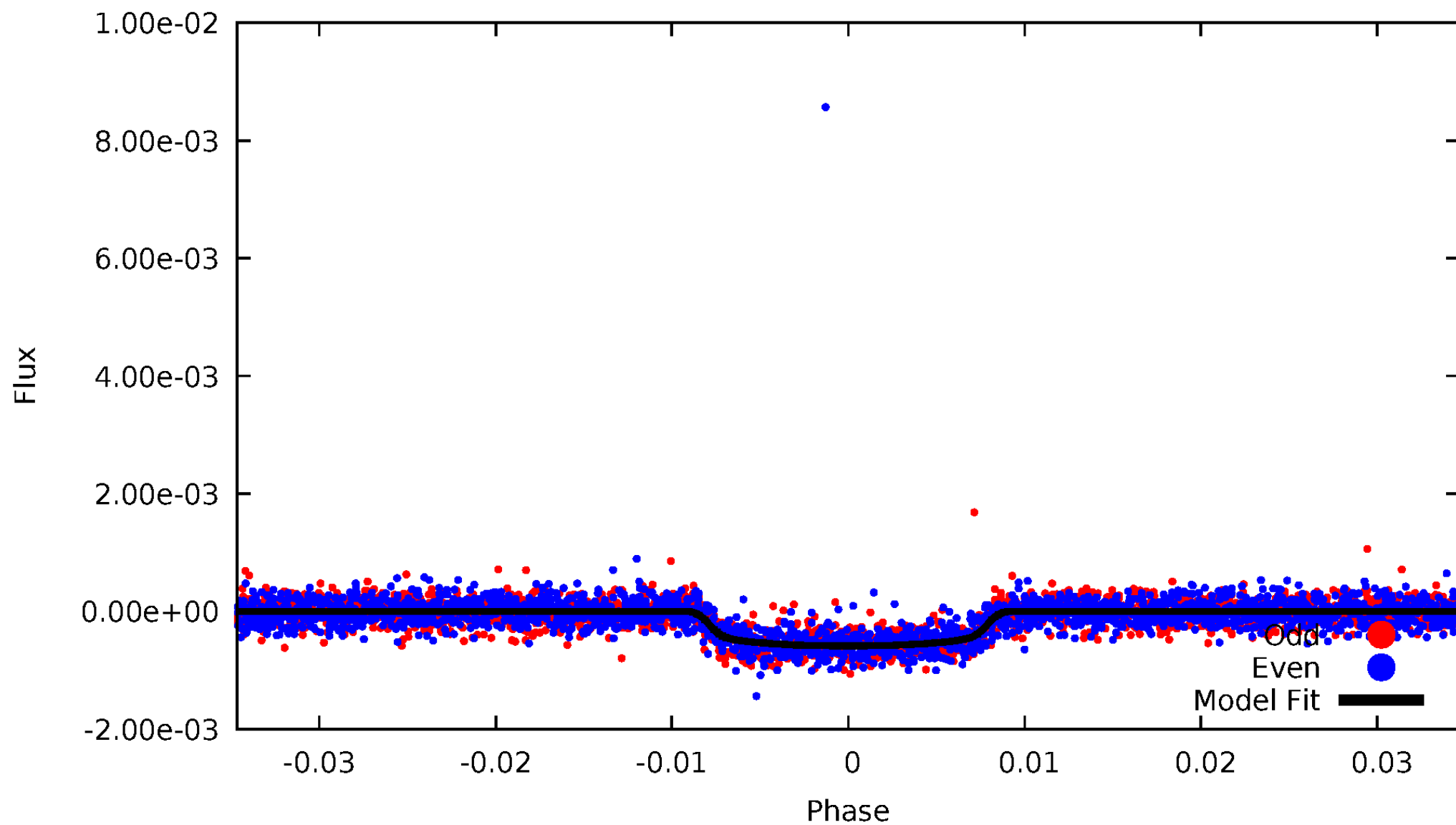


TCE 009530945-01



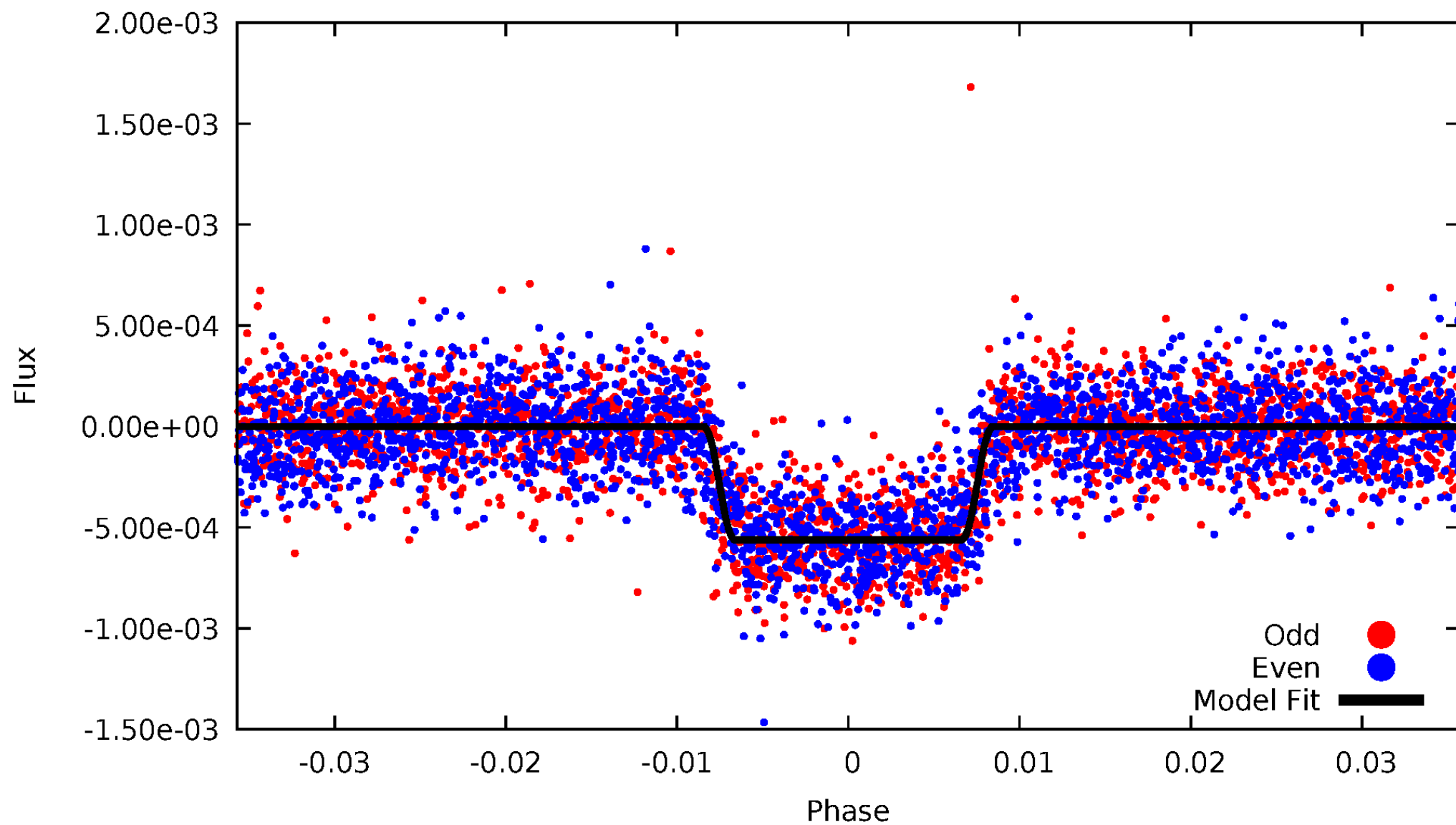
DV Odd/Even

TCE 009530945-01

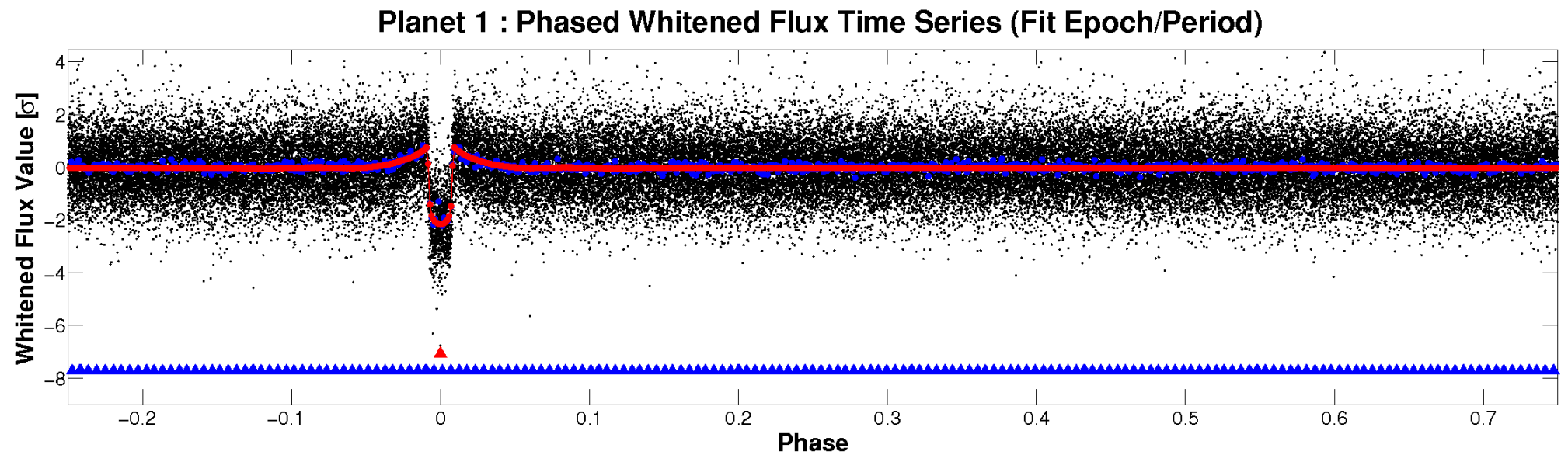
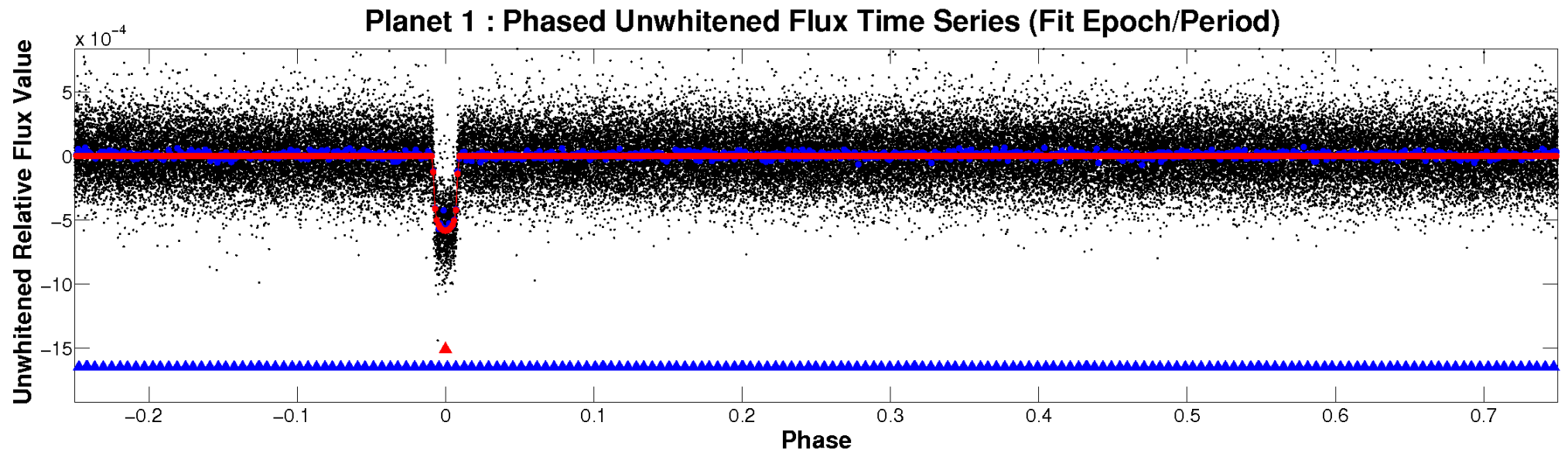


ALT Odd/Even

TCE 009530945-01

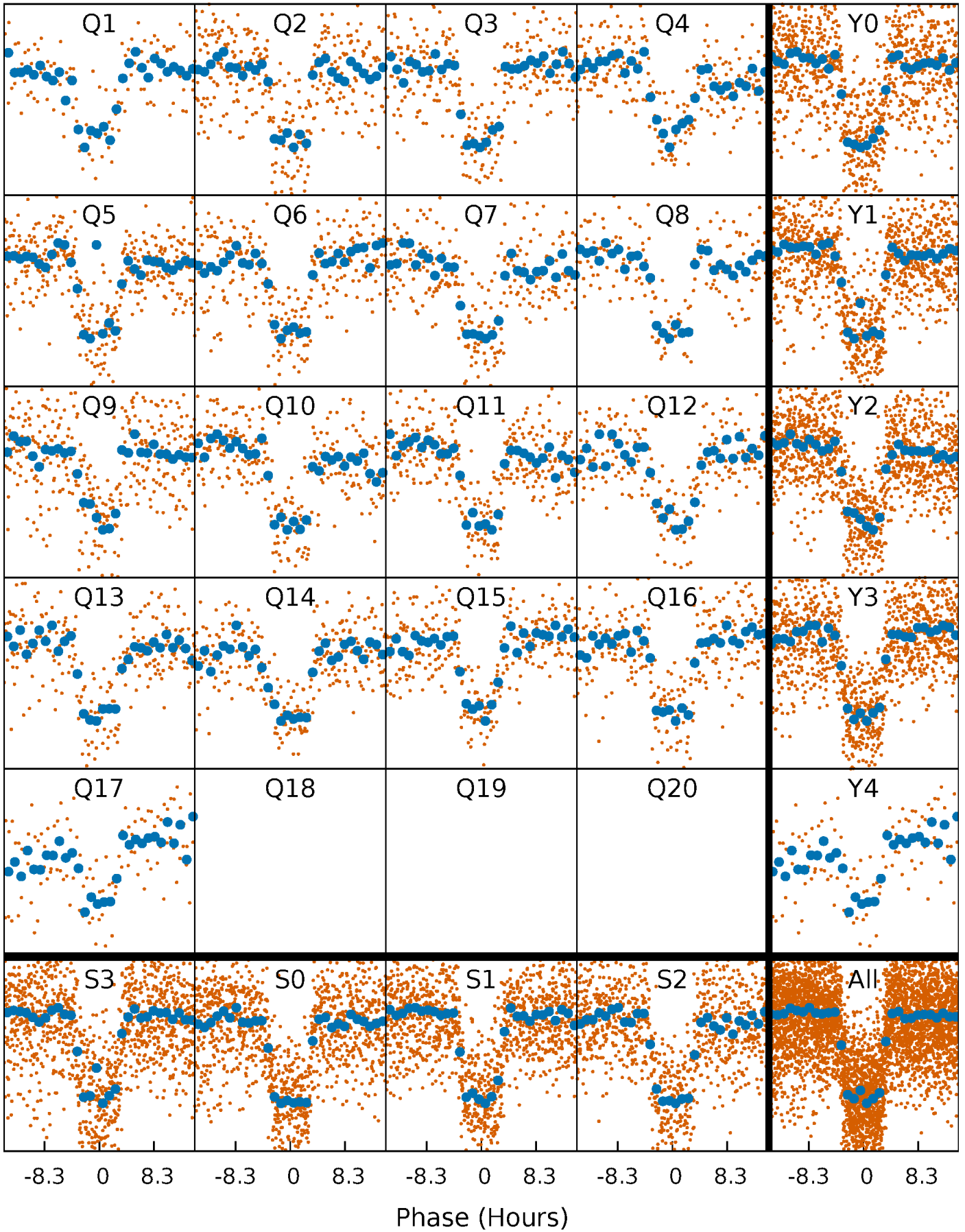


Non-Whitened Vs. Whitened Light Curve



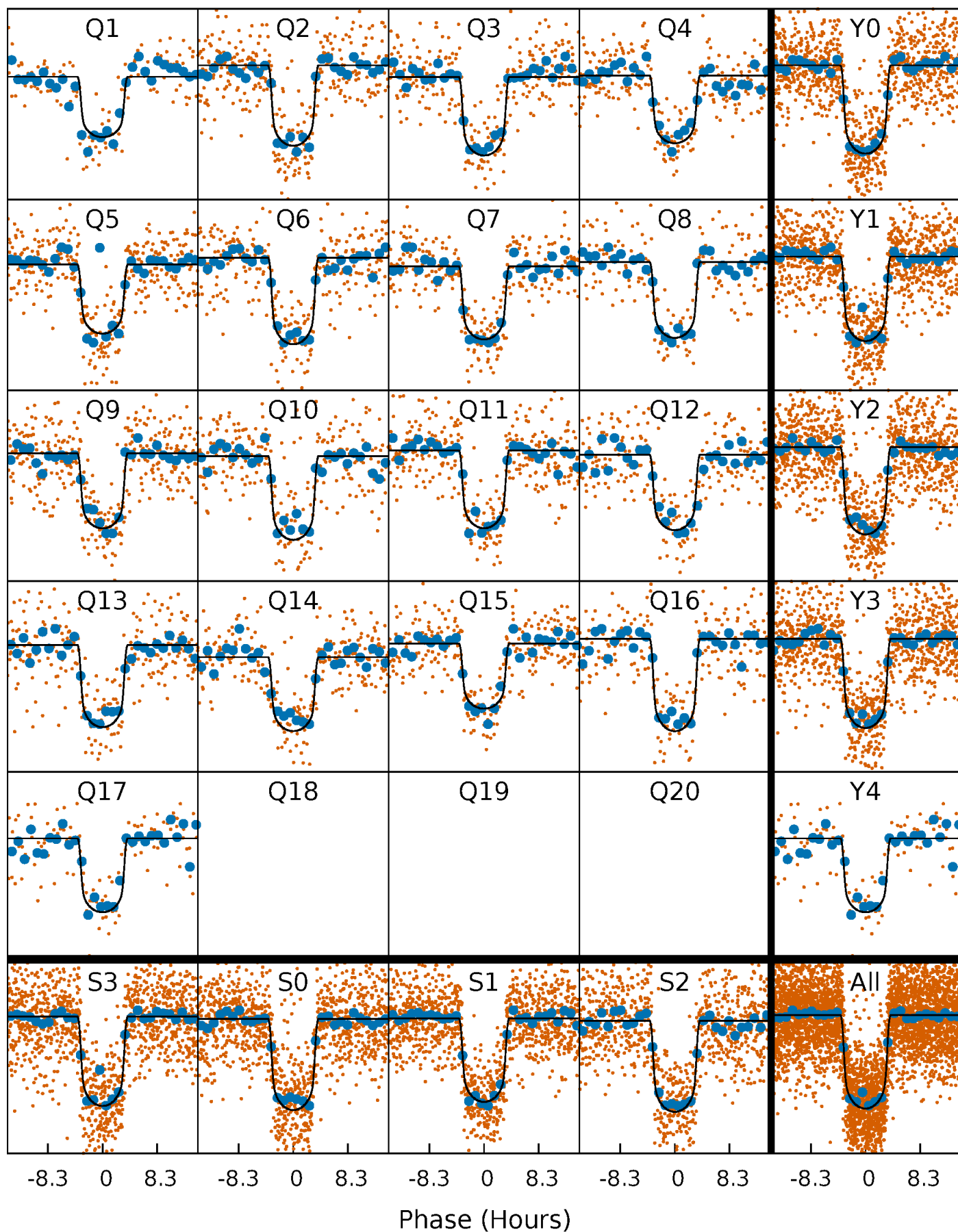
PDC Quarter-Phased Transit Curves

TCE 009530945-01 P= 17.406645 Days $T_0=136.193848$ (BKJD)



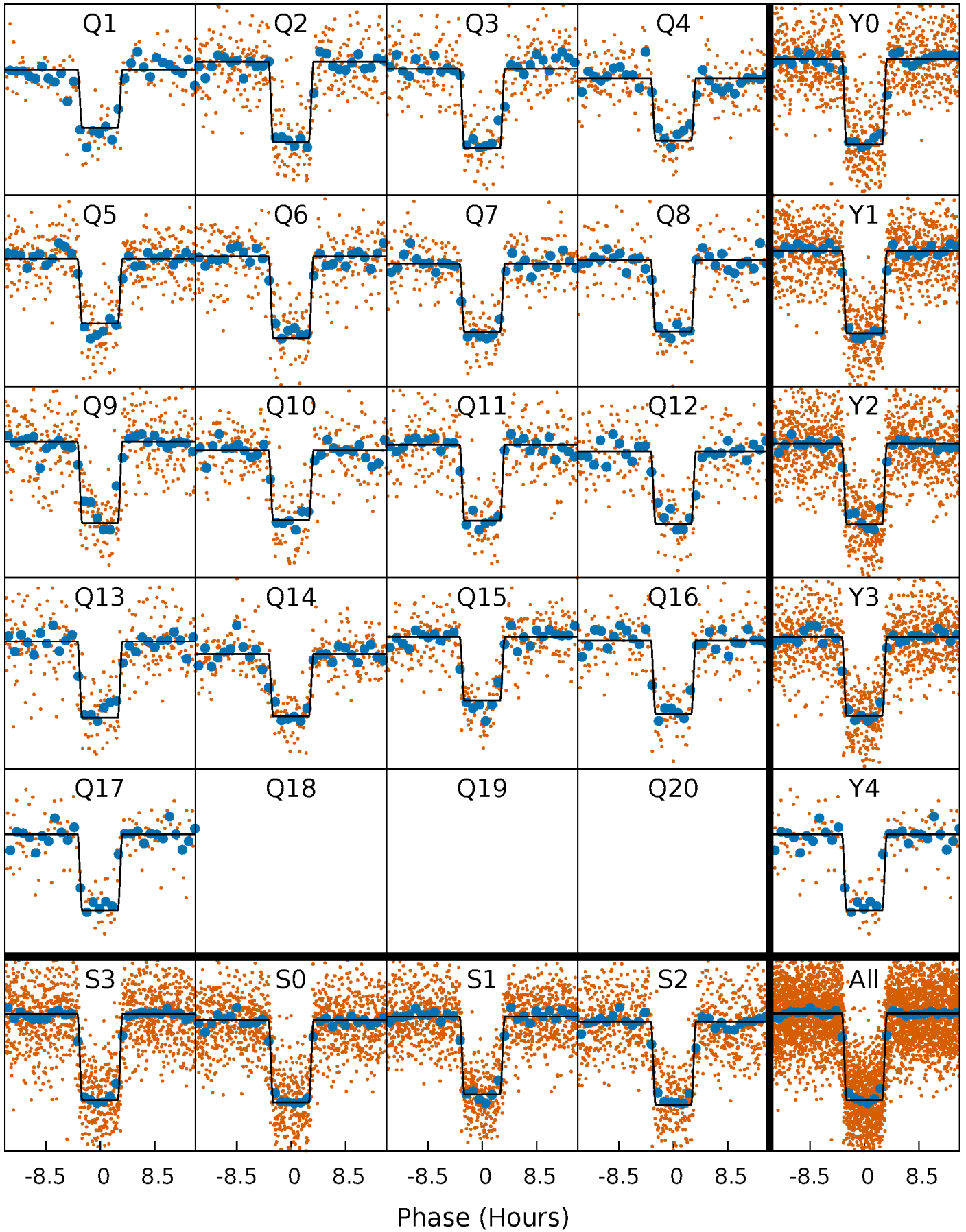
DV Quarter-Phased Transit Curves

TCE 009530945-01 P= 17.406645 Days $T_0=136.193848$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

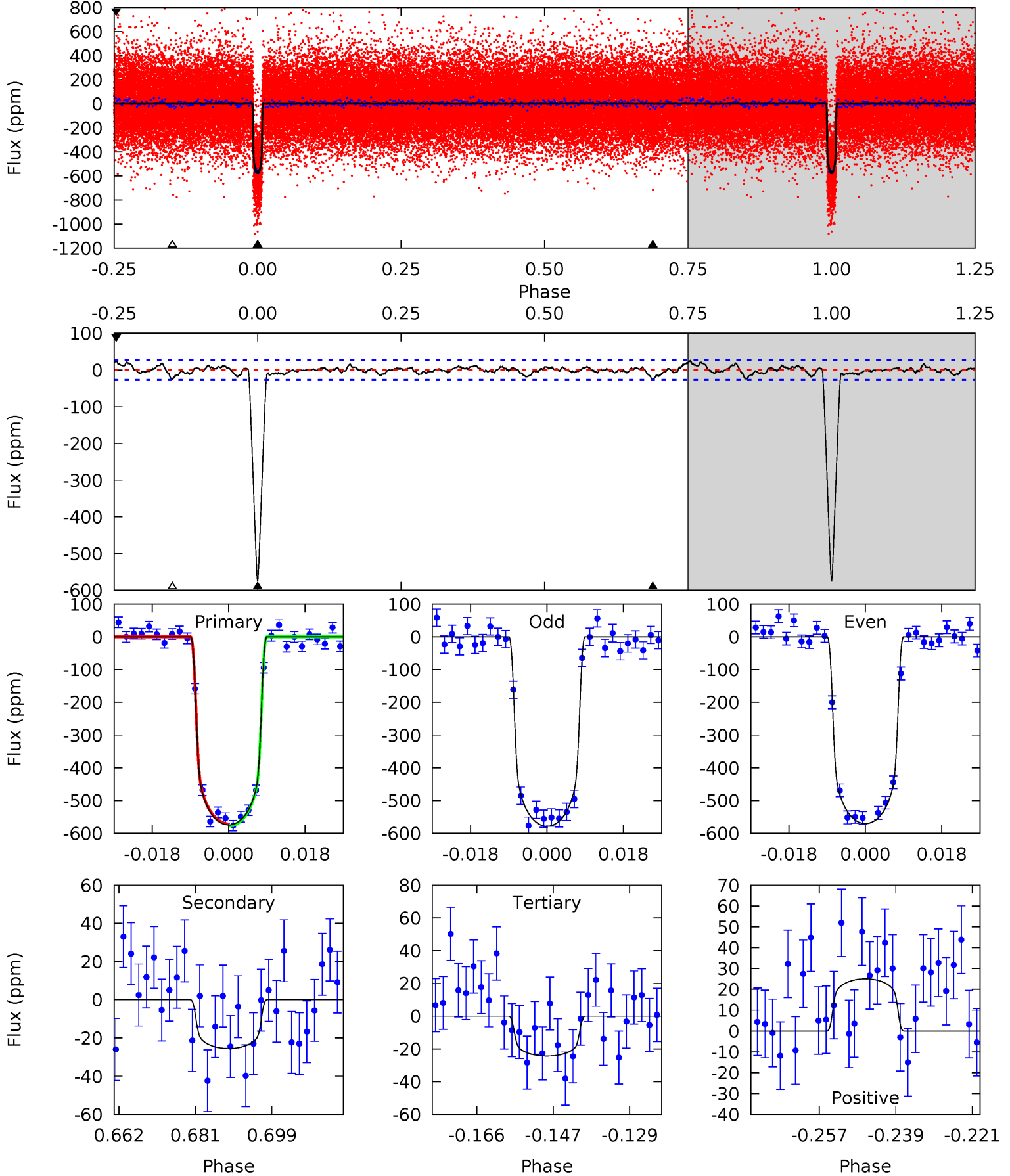
TCE 009530945-01 P= 17.406888 Days $T_0=136.184261$ (BKJD)



DV Model-Shift Uniqueness Test

009530945-01, $P = 17.406645$ Days, $E = 118.787203$ Days

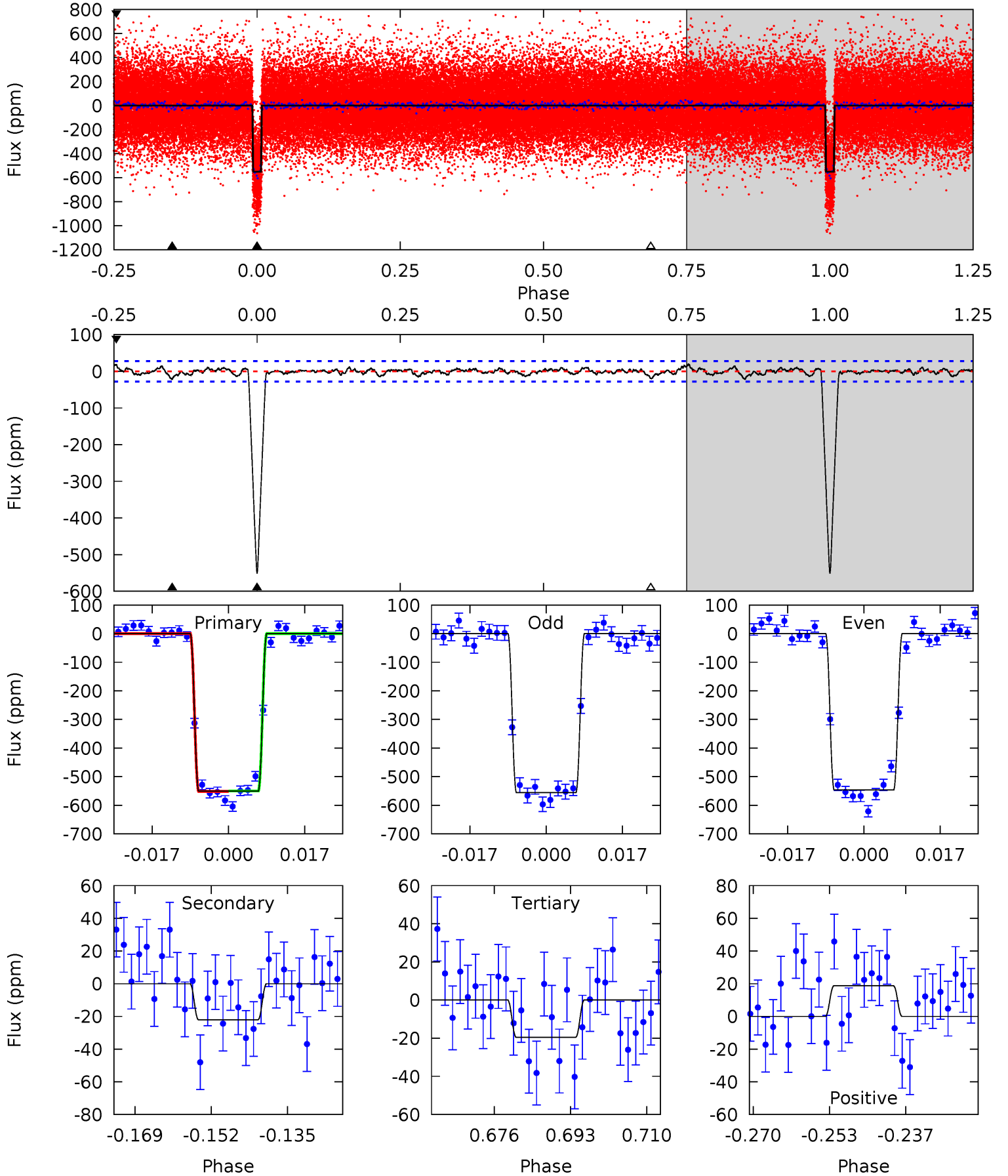
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
103.6	4.60	4.39	4.51	4.91	2.36	1.38	99.2	99.1	0.21	0.09	0.75	0.98	0.04	0.57



Alt Model-Shift Uniqueness Test

009530945-01, $P = 17.406888$ Days, $E = 118.777373$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
97.3	3.90	3.44	3.31	4.92	2.39	1.04	93.9	94.0	0.46	0.59	0.79	0.99	0.03	0.15



Stellar Parameters For KIC 009530945

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6086^{+134}_{-134}	$4.274^{+0.143}_{-0.117}$	$-0.160^{+0.200}_{-0.150}$	$1.216^{+0.207}_{-0.188}$	$1.013^{+0.093}_{-0.068}$	$0.793^{+0.510}_{-0.265}$
	+2%/-2%	+3%/-3%	+125%/-94%	+17%/-15%	+9%/-7%	+64%/-33%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 009530945-01 / KOI 0708.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-26 ± 6	$3.32^{+0.33}_{-0.29}$	1135^{+59}_{-54}	3287^{+118}_{-122}	22^{+7}_{-6}
Alt.	-22 ± 6	$3.15^{+0.31}_{-0.32}$	1137^{+59}_{-58}	3265^{+130}_{-135}	21^{+8}_{-6}

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

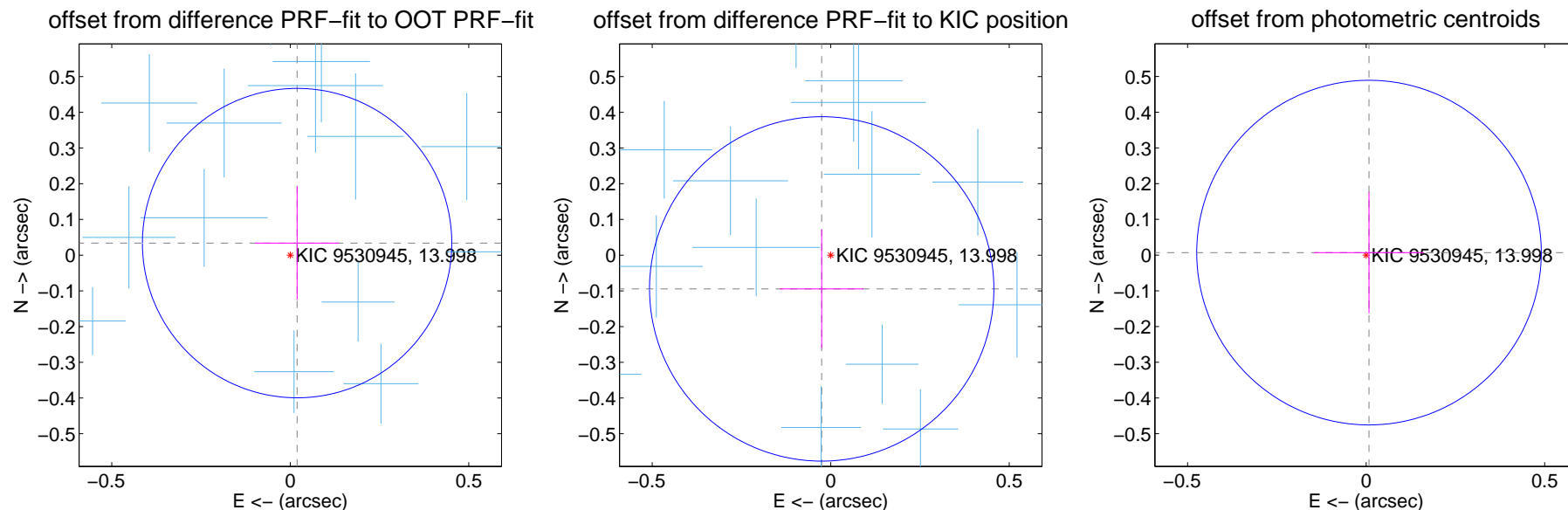
DV Centroid Data

Supplemental centroid analysis for 009530945-01. Kepler magnitude: 14.00. Transit SNR 63.10

There are 17 quarters with good PRF difference image offsets

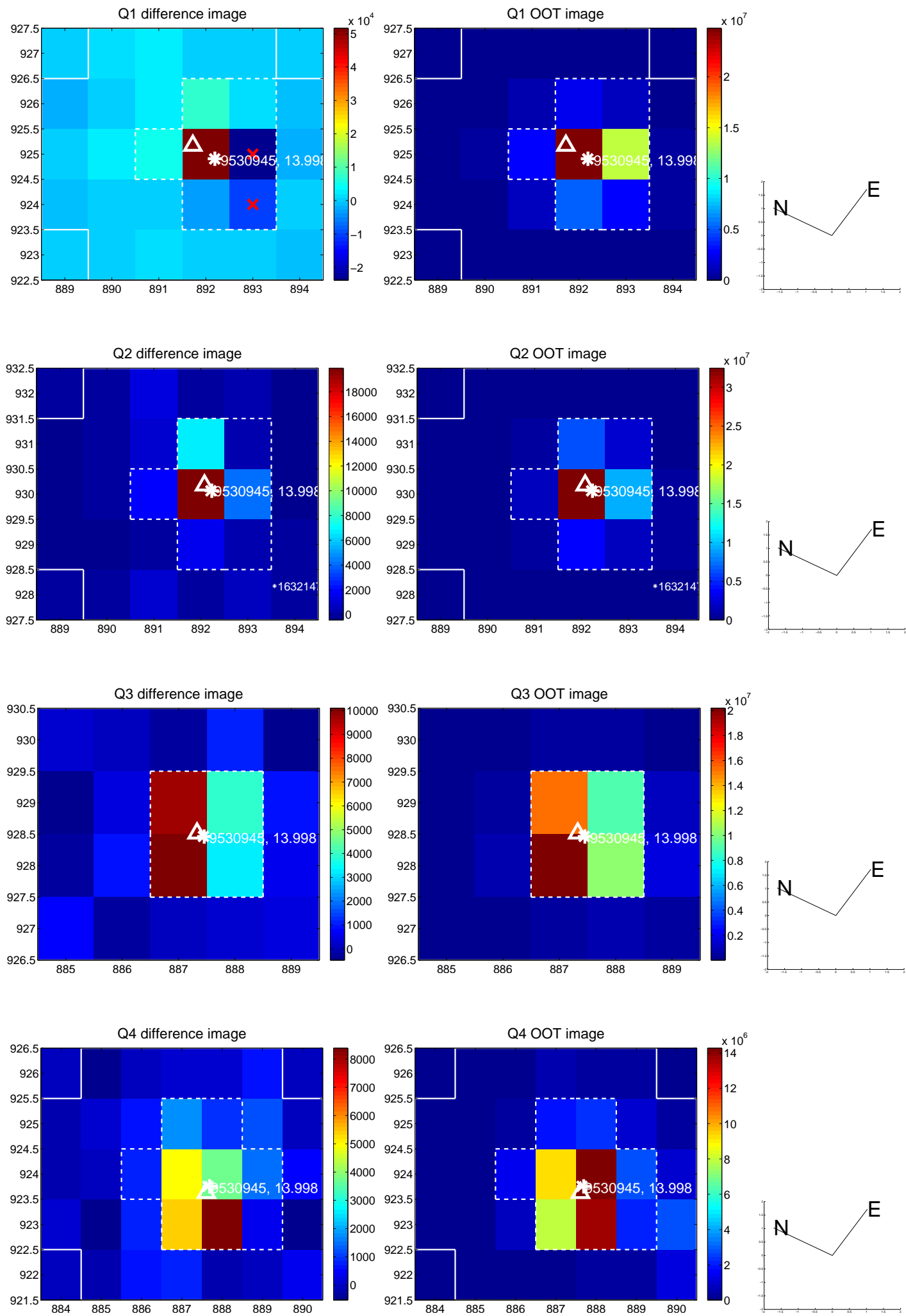
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.039 ± 0.144	0.27	-0.019 ± 0.118	0.034 ± 0.159
PRF-fit source offset from KIC position	0.098 ± 0.161	0.61	0.025 ± 0.117	-0.095 ± 0.166
photometric centroid source offset	0.01 ± 0.16	0.07	-0.01 ± 0.15	0.01 ± 0.17

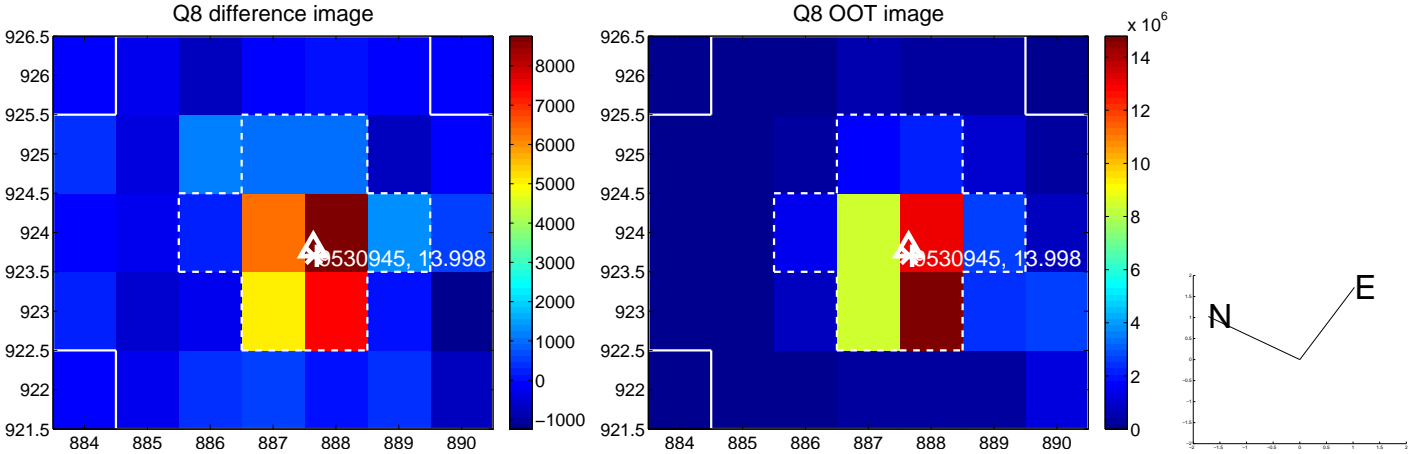
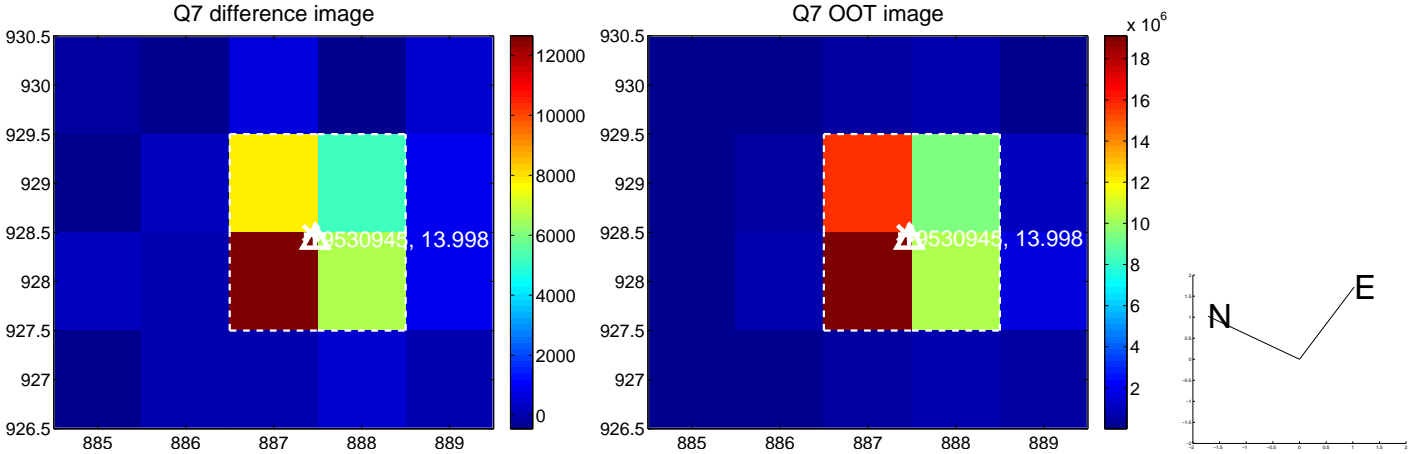
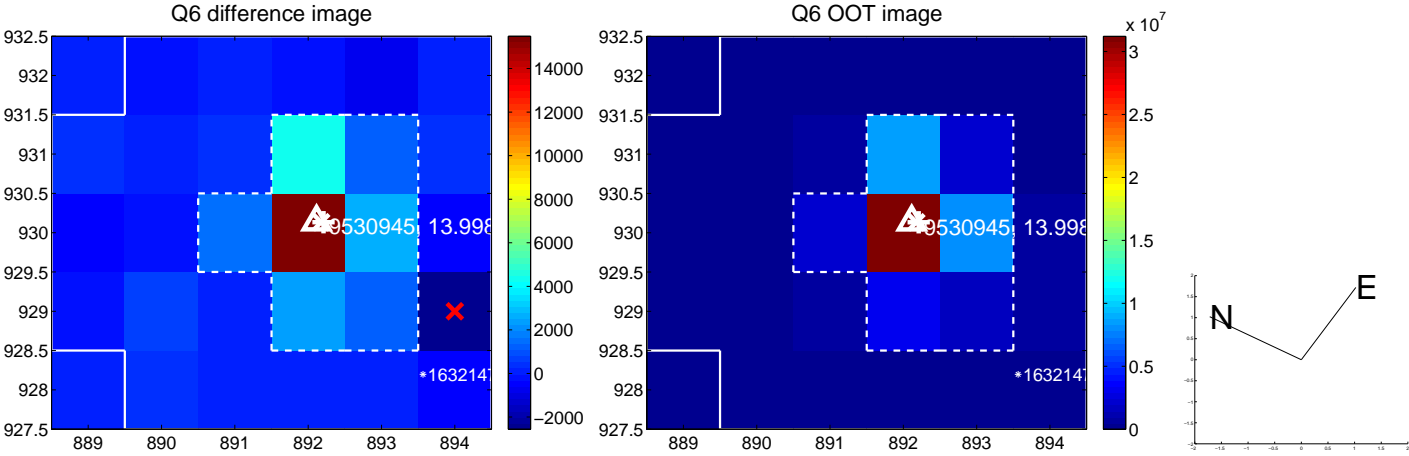
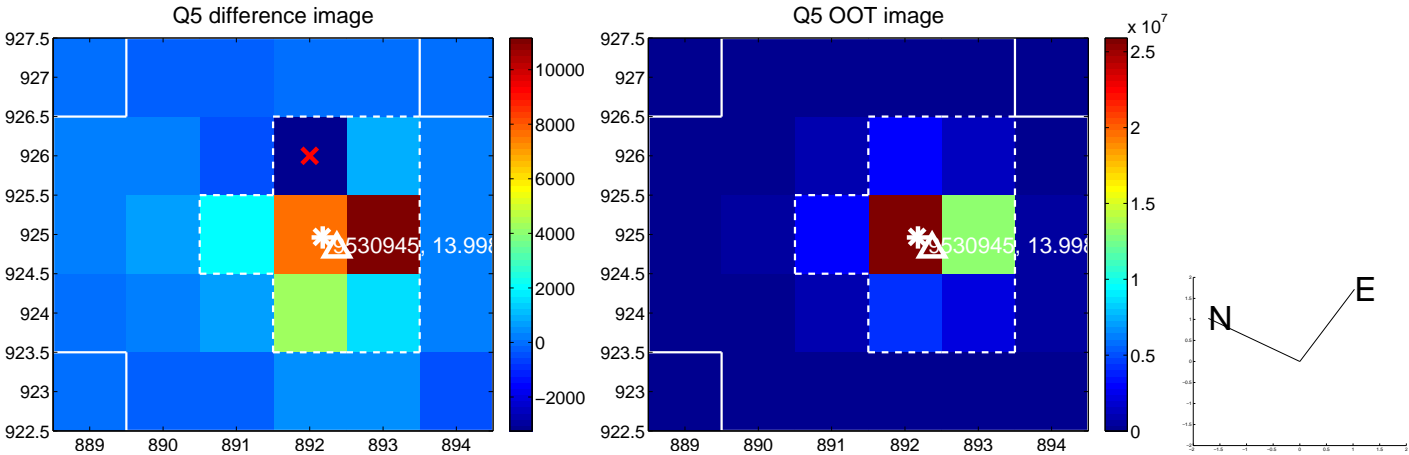


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

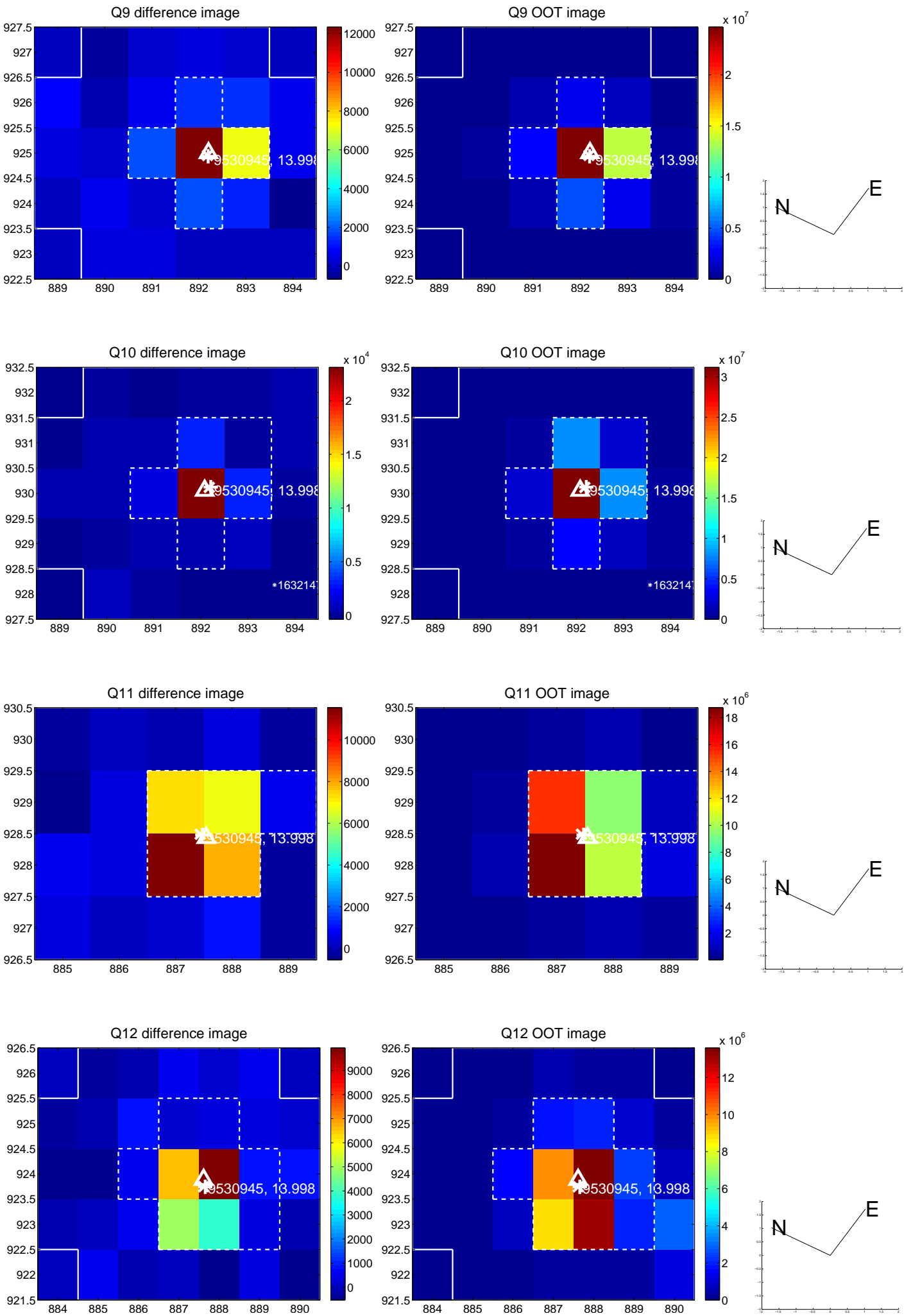
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



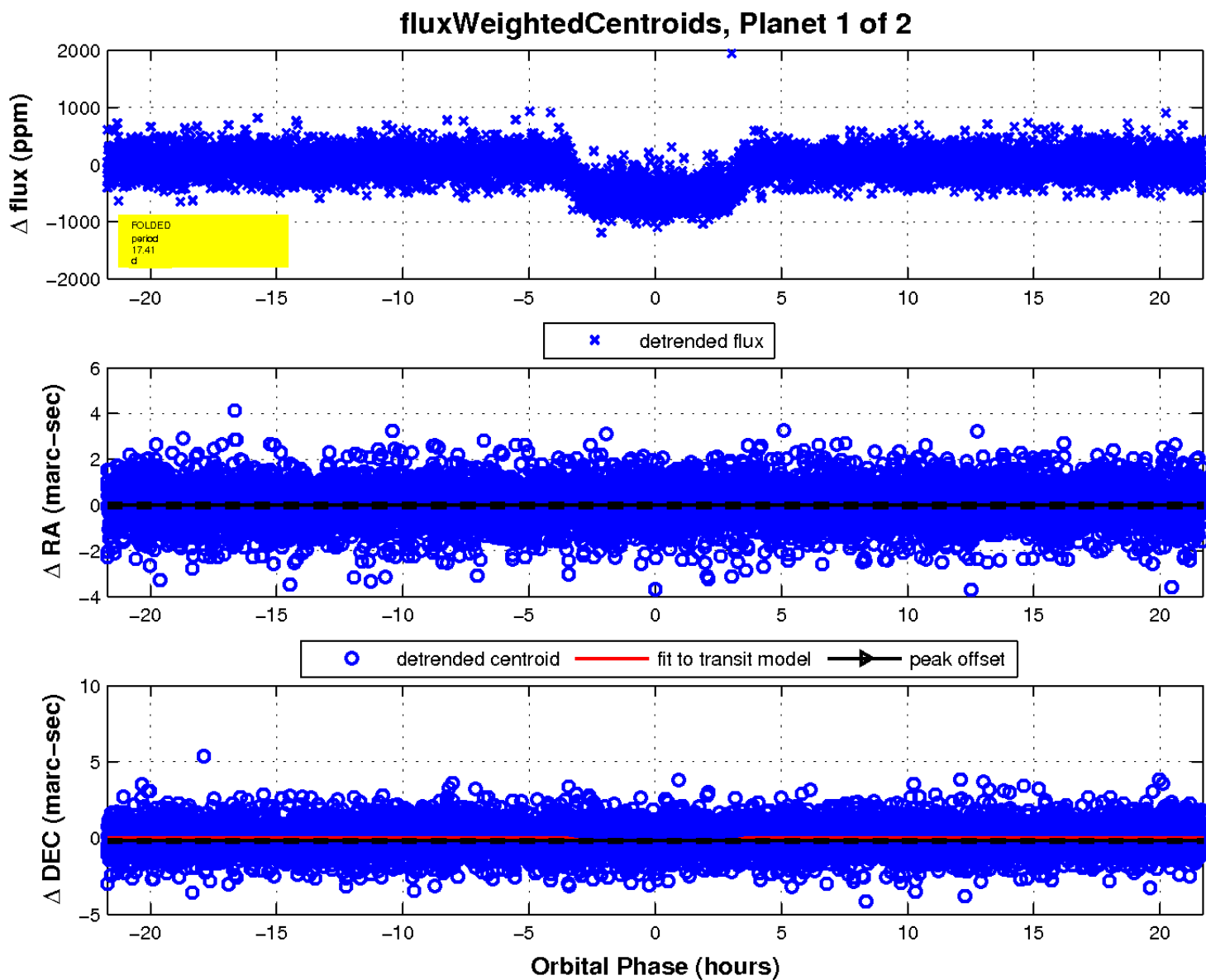
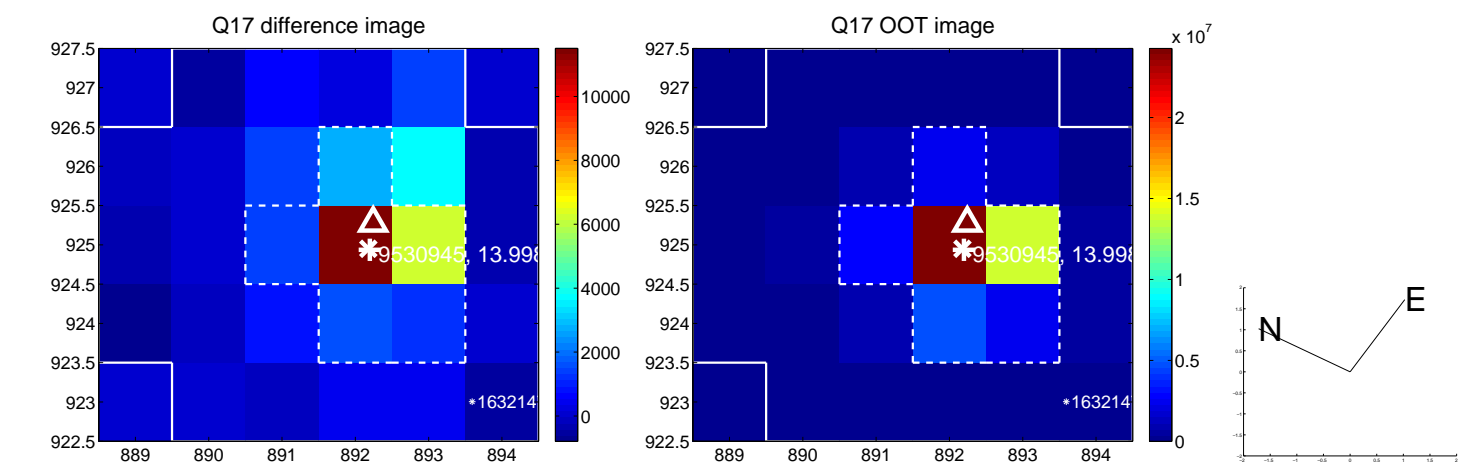
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

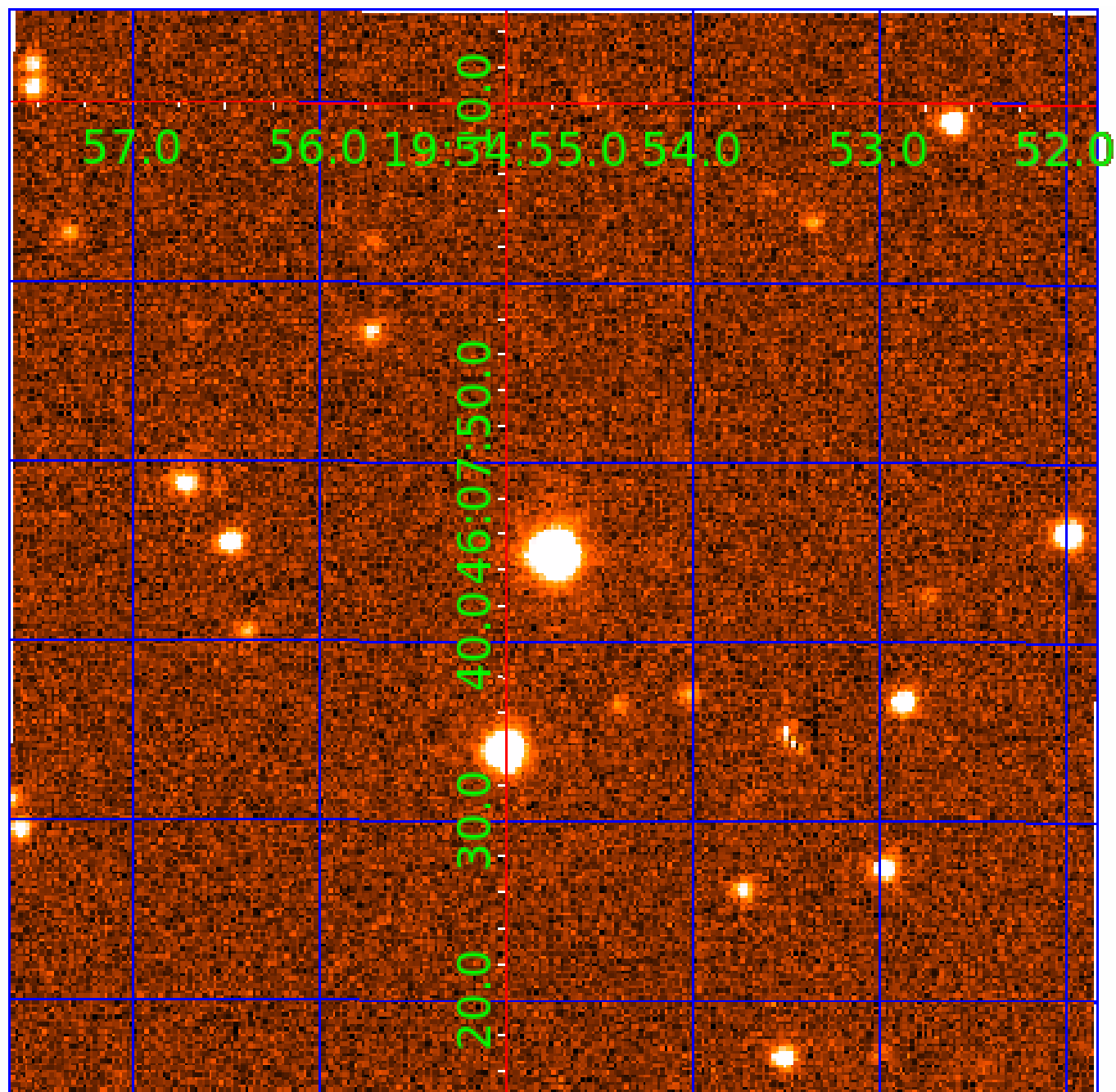


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009530945

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})
009530945-01	OBS	0708.01	17.406645	136.193848	585.0	7.238	57.1	63.1	1.22	6086	3.33	104.21
009530945-02	OBS	0708.02	7.693613	138.037441	291.9	5.329	41.4	45.9	1.22	6086	2.44	309.51

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009530945-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
009530945-02	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.

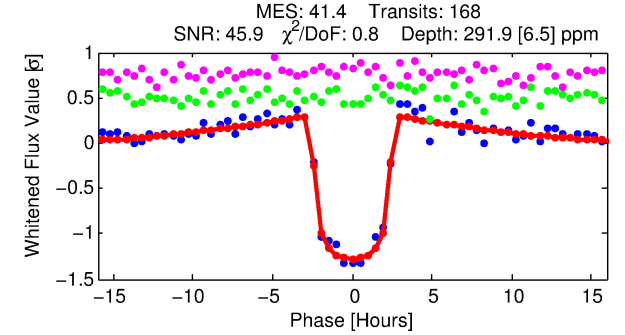
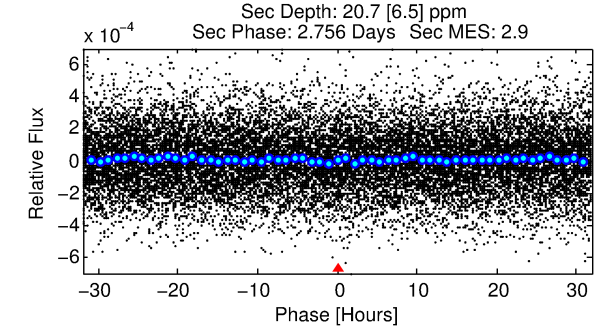
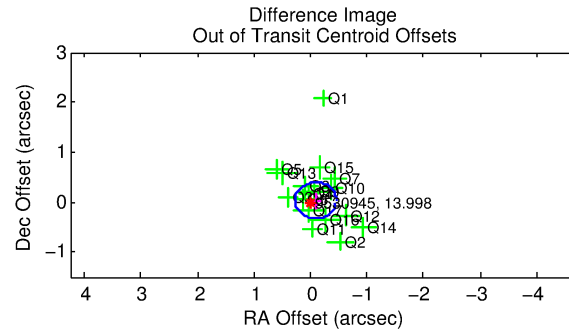
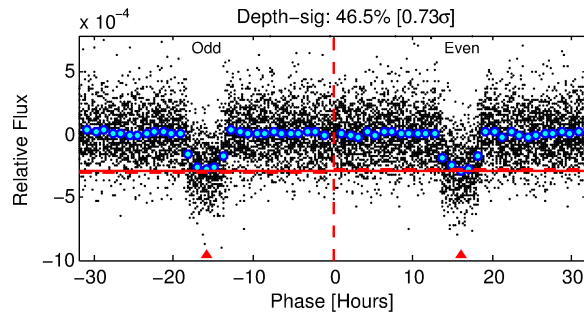
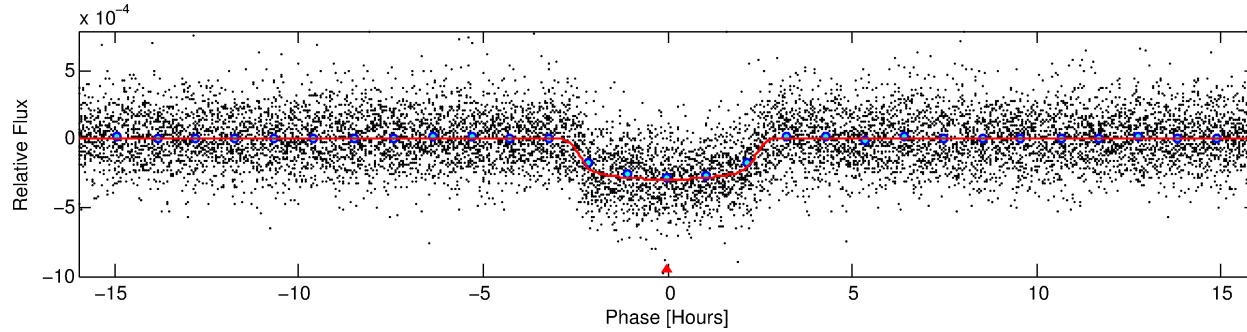
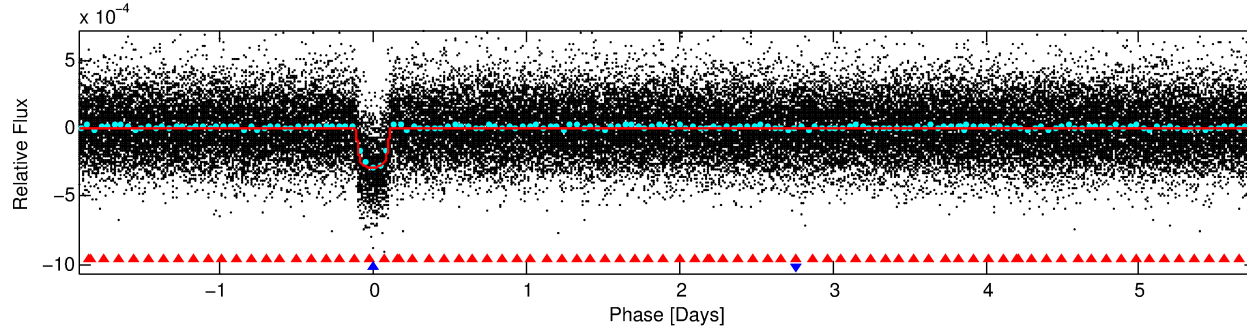
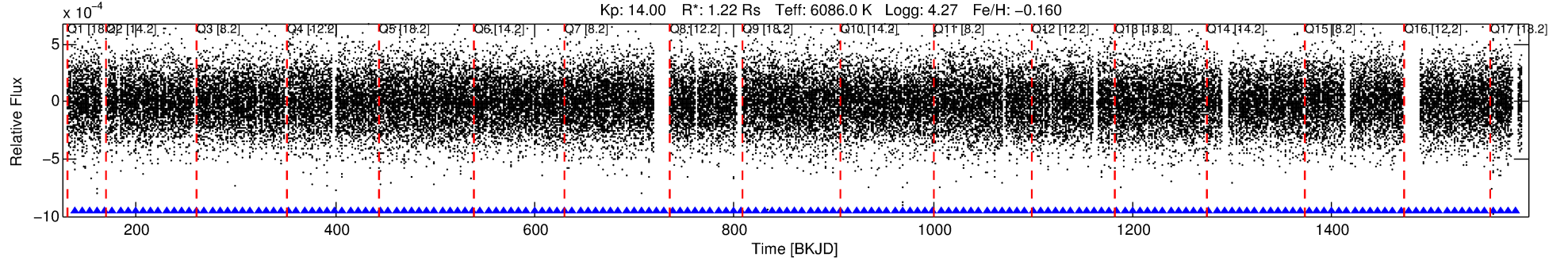
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009530945-02

No Significant Match Found

DV One-Page Summary

KIC: 9530945 Candidate: 2 of 2 Period: 7.694 d
KOI: K00708.02 Name: Kepler-216b Corr: 0.978



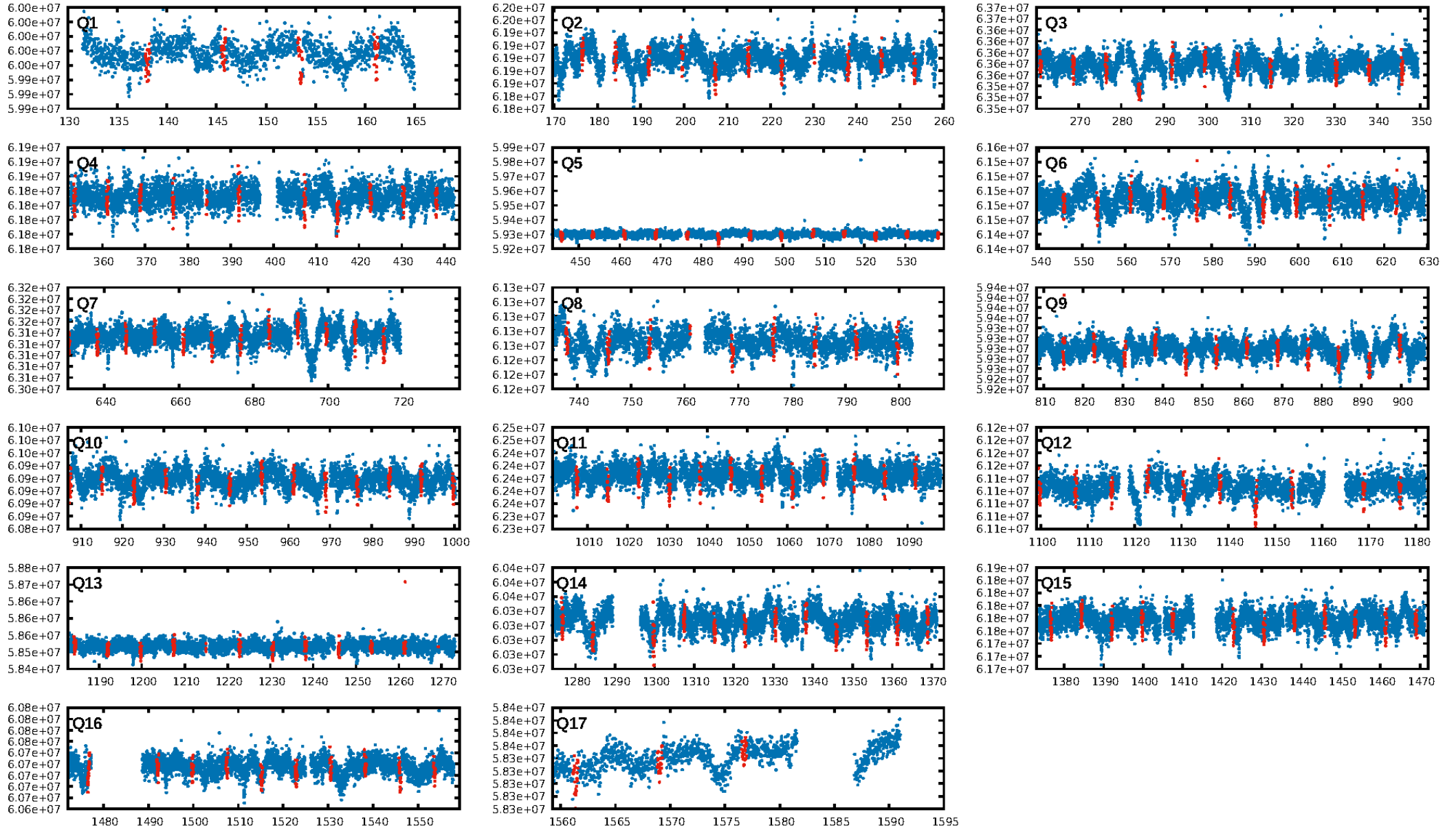
DV Fit Results:

Period = 7.69361 [0.00002] d
Epoch = 138.0374 [0.0019] BKJD
Rp/R* = 0.0184 [0.0009]
a/R* = 5.34 [1.24]
b = 0.90 [0.05]
Seff = 309.51 [81.20]
Teq = 1070 [70] K
Rp = 2.44 [0.43] Re
a = 0.0766 [0.0121] AU
Ag = 11.17 [4.61] [2.21 σ]
Teffp = 3023 [258] K [7.30 σ]

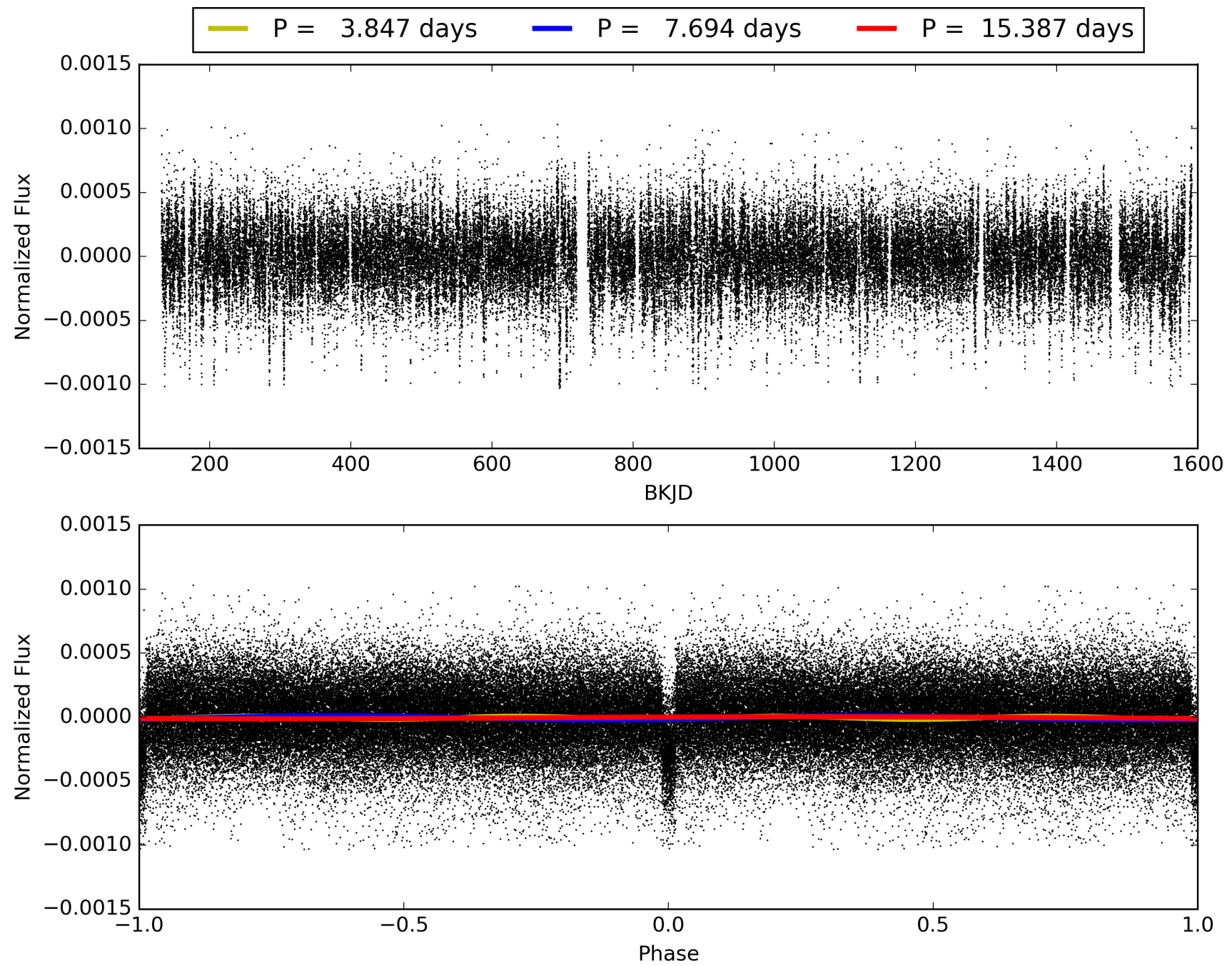
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [25.93 σ]
ModelChiSquare2-sig: 99.2%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [162/162]
GhostDiagnostic-chr: 5.722
Centroid-sig: 31.3%
Centroid-so: 0.381 arcsec [1.58 σ]
OotOffset-rm: 0.092 arcsec [0.76 σ]
KicOffset-rm: 0.098 arcsec [0.56 σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
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TCE 009530945-02, PDC Light Curves

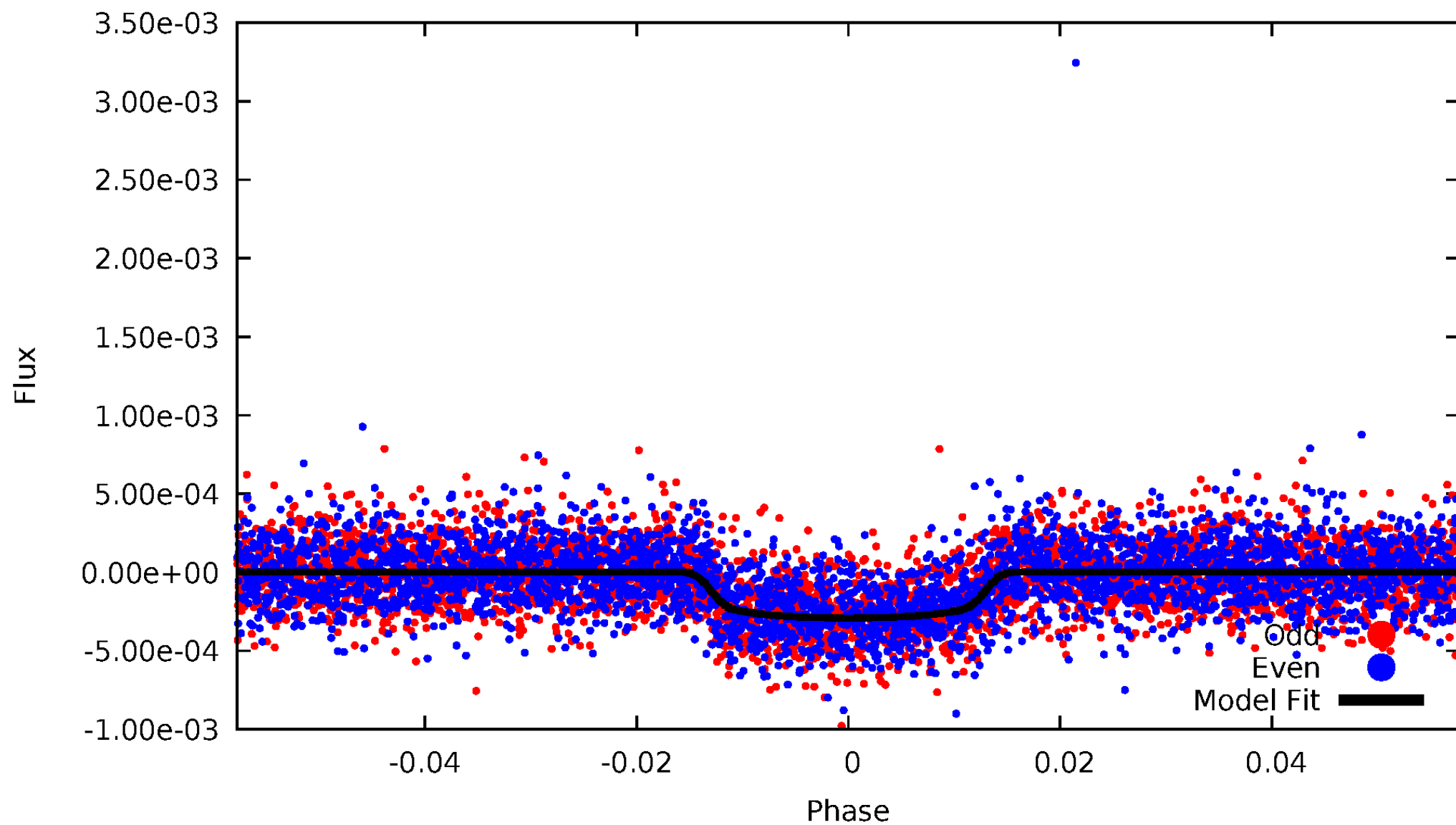


TCE 009530945-02



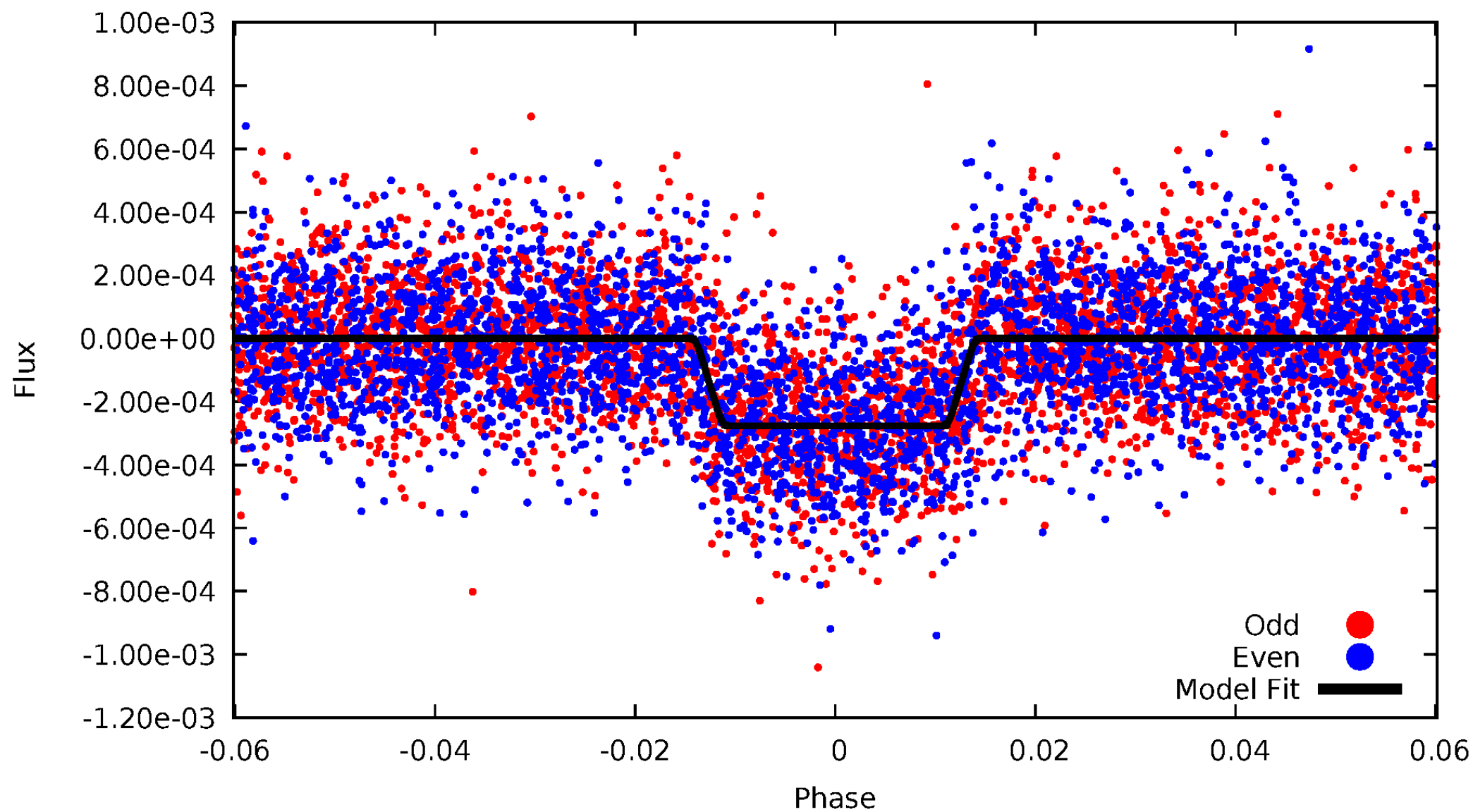
DV Odd/Even

TCE 009530945-02



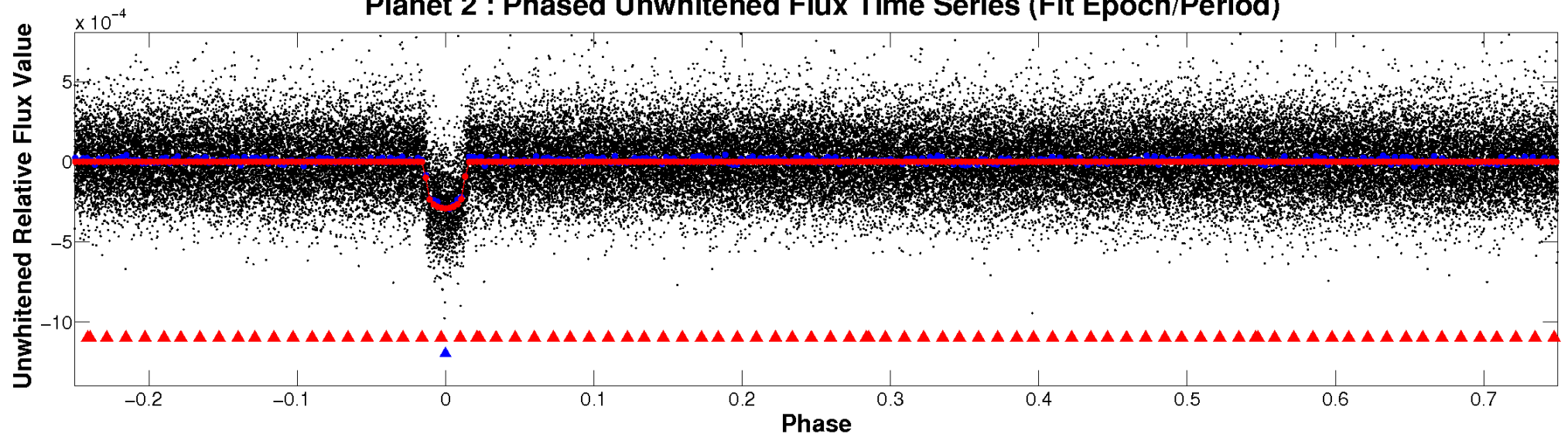
ALT Odd/Even

TCE 009530945-02

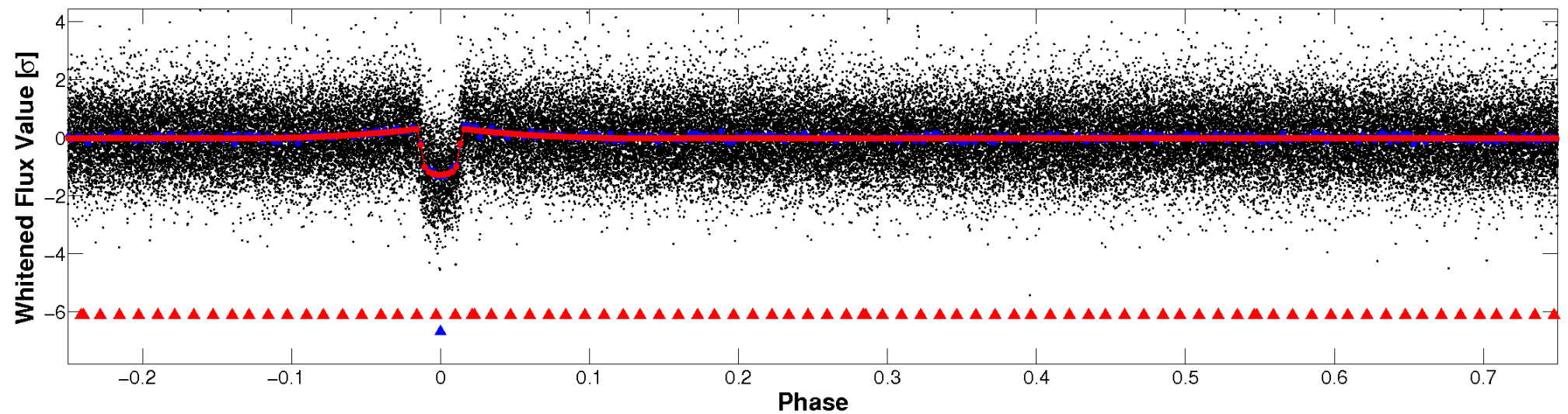


Non-Whitened Vs. Whitened Light Curve

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

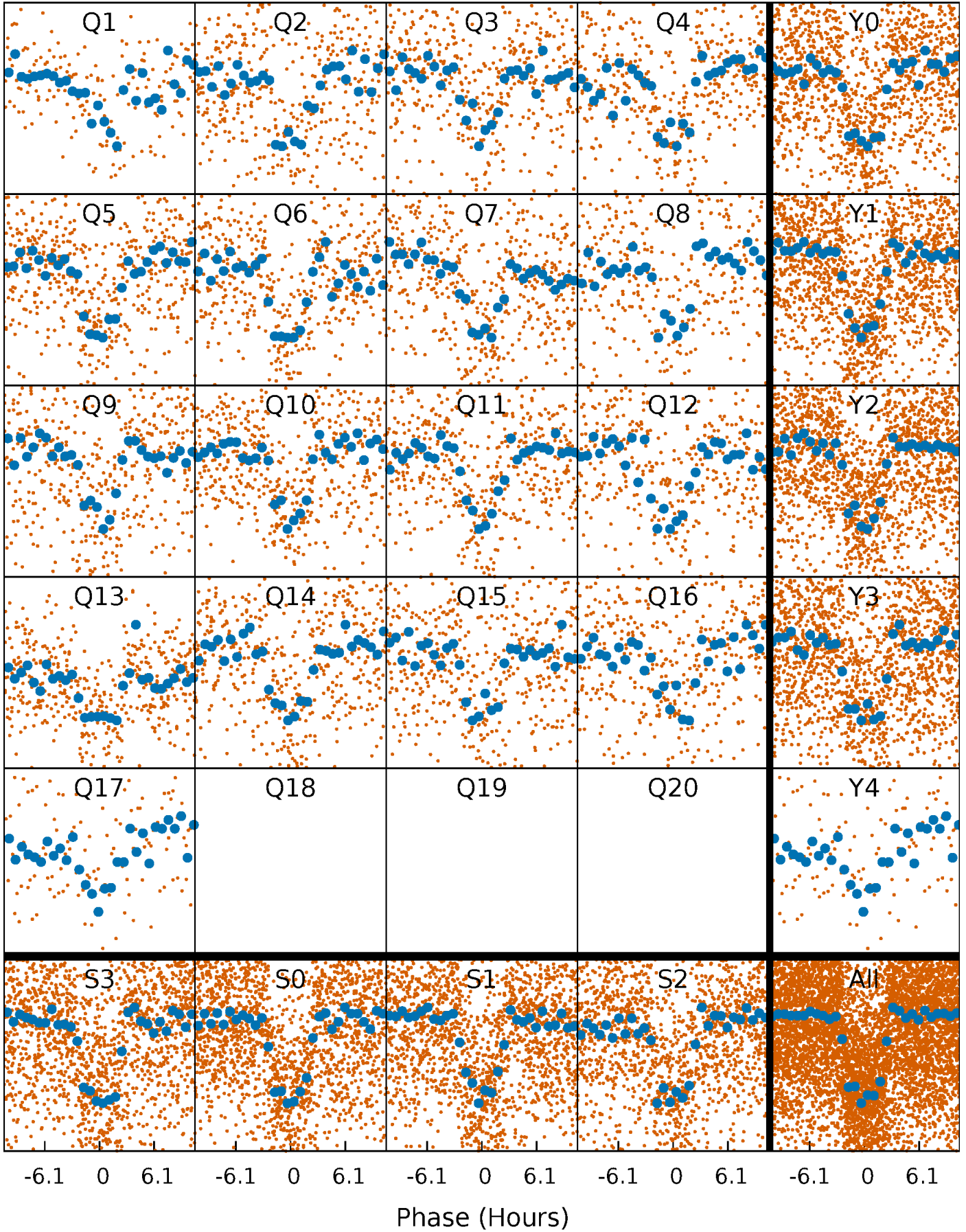


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



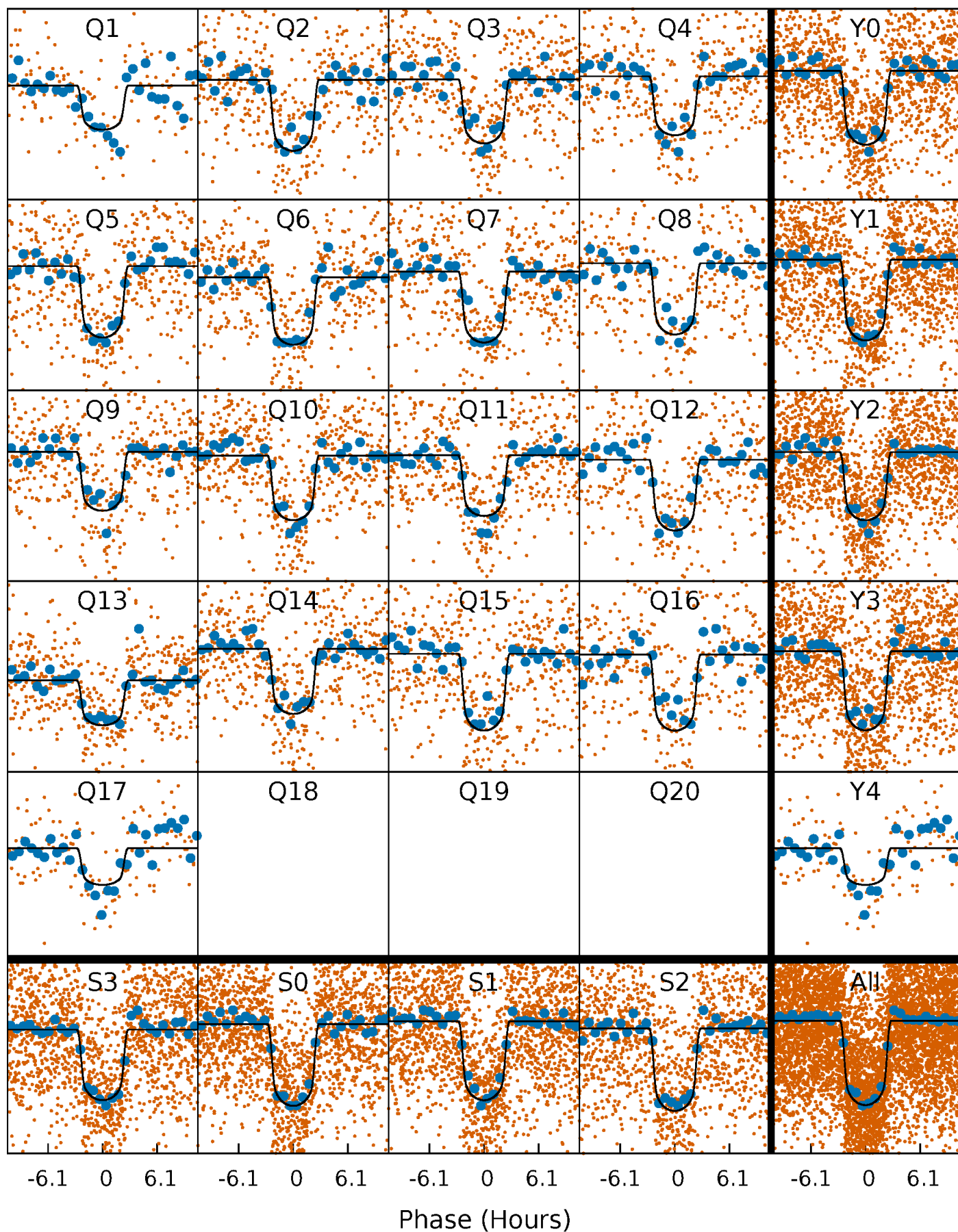
PDC Quarter-Phased Transit Curves

TCE 009530945-02 P= 7.693613 Days $T_0=138.037441$ (BKJD)



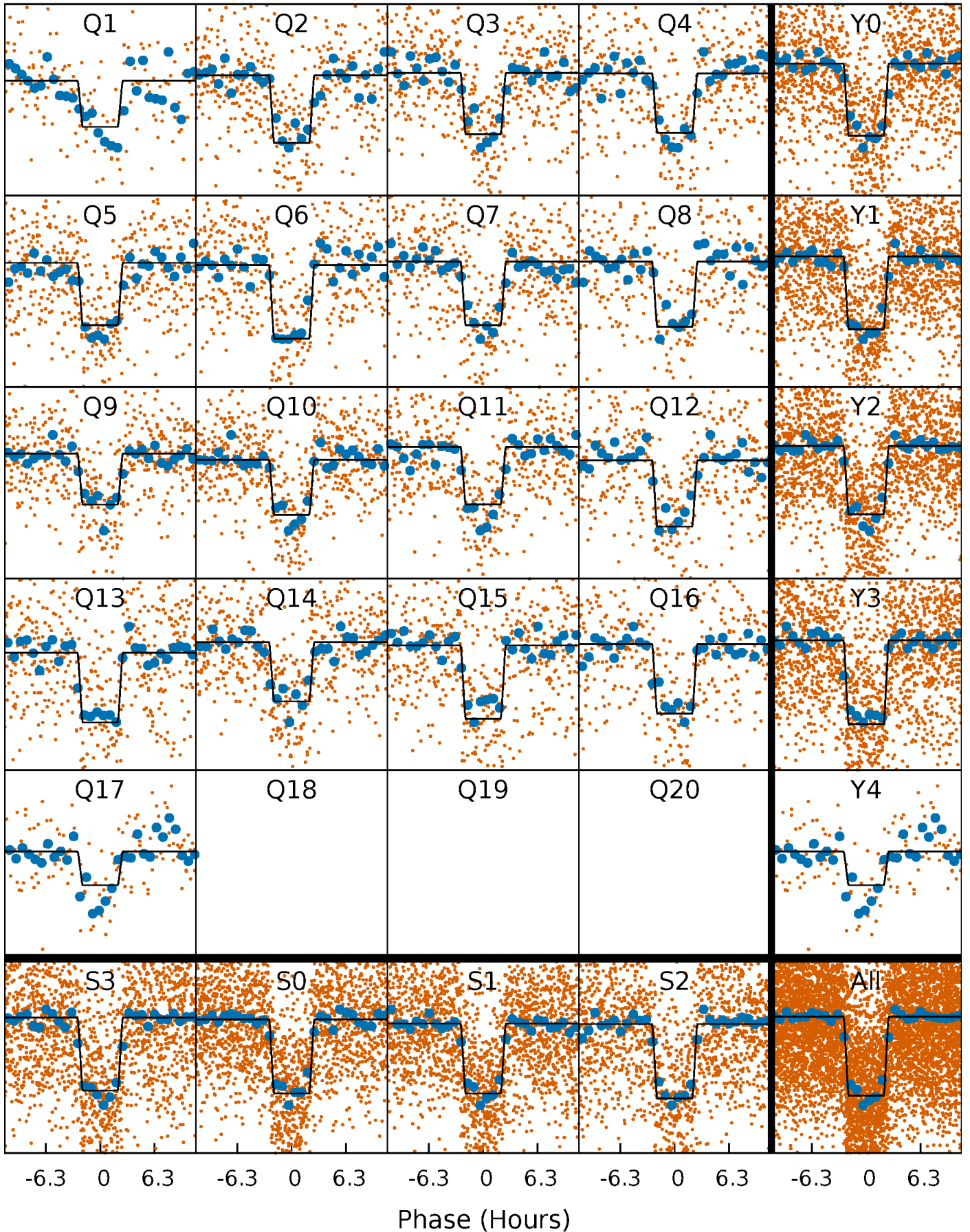
DV Quarter-Phased Transit Curves

TCE 009530945-02 P= 7.693613 Days $T_0=138.037441$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

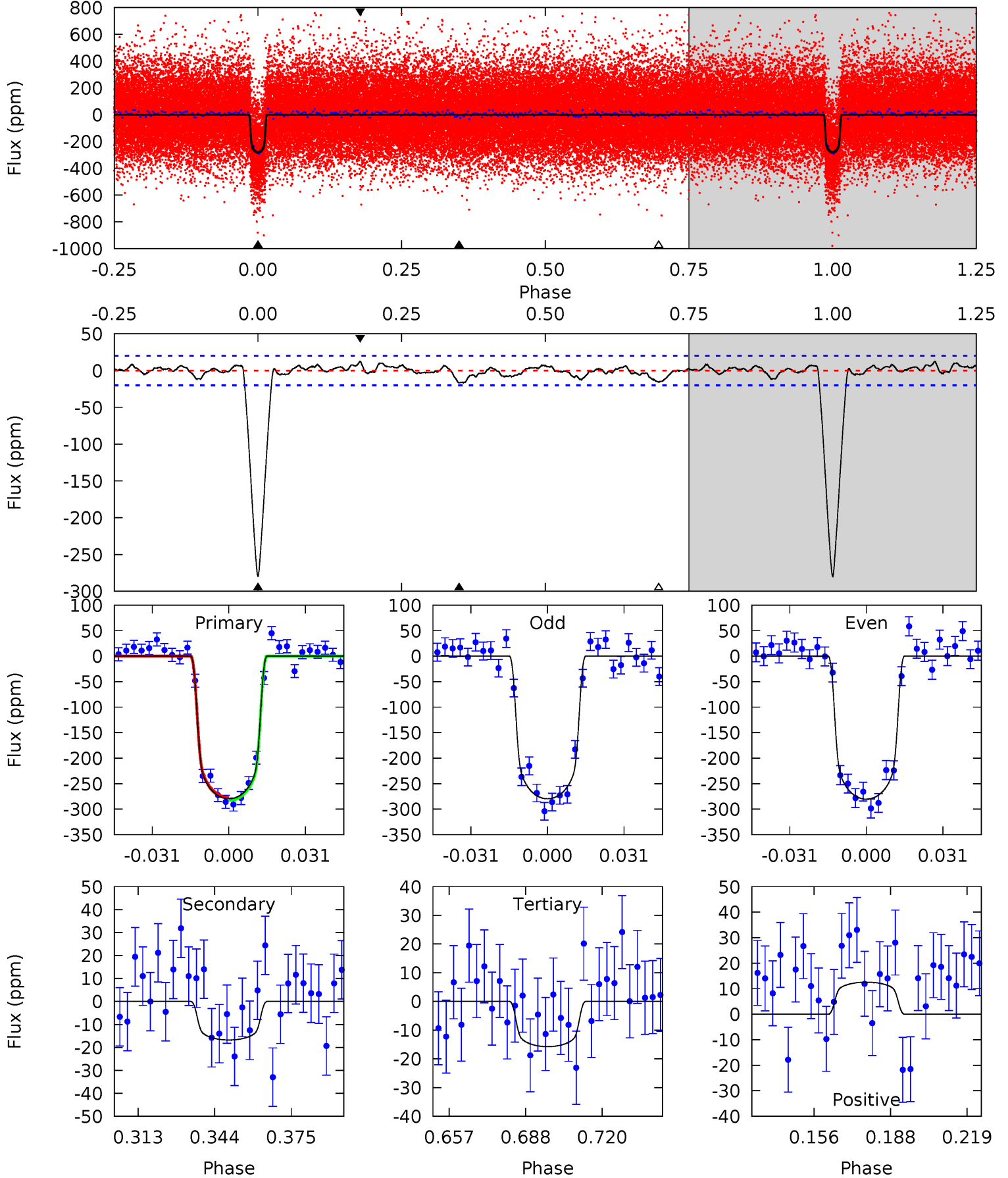
TCE 009530945-02 P= 7.693716 Days $T_0=138.026898$ (BKJD)



DV Model-Shift Uniqueness Test

009530945-02, P = 7.693613 Days, E = 130.343828 Days

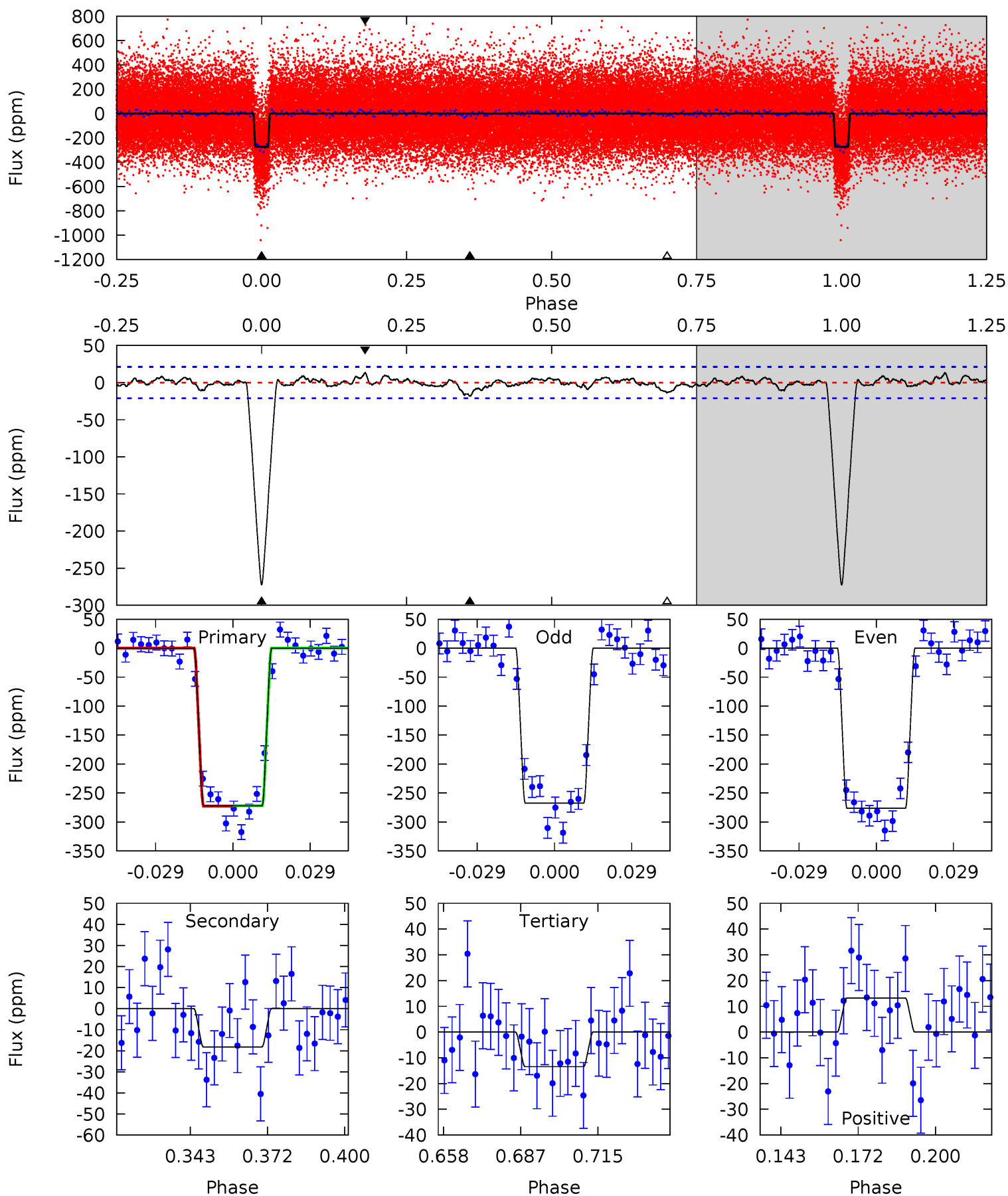
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
66.6	3.99	3.75	2.99	4.80	2.15	1.22	62.8	63.6	0.25	1.01	0.09	0.99	0.04	0.57



Alt Model-Shift Uniqueness Test

009530945-02, P = 7.693716 Days, E = 130.333182 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
62.3	4.16	3.07	3.02	4.82	2.19	1.02	59.2	59.3	1.09	1.14	1.02	1.00	0.05	0.10



Stellar Parameters For KIC 009530945

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6086^{+134}_{-134}	$4.274^{+0.143}_{-0.117}$	$-0.160^{+0.200}_{-0.150}$	$1.216^{+0.207}_{-0.188}$	$1.013^{+0.093}_{-0.068}$	$0.793^{+0.510}_{-0.265}$
	+2%/-2%	+3%/-3%	+125%/-94%	+17%/-15%	+9%/-7%	+64%/-33%
Source	SPE58	SPE58	SPE58	DSEP		

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

Secondary Eclipse Parameters for KIC 009530945-02 / KOI 0708.02

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-17 ± 4	$2.44^{+0.25}_{-0.24}$	1495^{+69}_{-78}	3389^{+143}_{-170}	$9.313^{+3.352}_{-2.776}$
Alt.	-18 ± 4	$2.21^{+0.27}_{-0.24}$	1494^{+75}_{-76}	3534^{+153}_{-161}	12^{+4}_{-4}

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

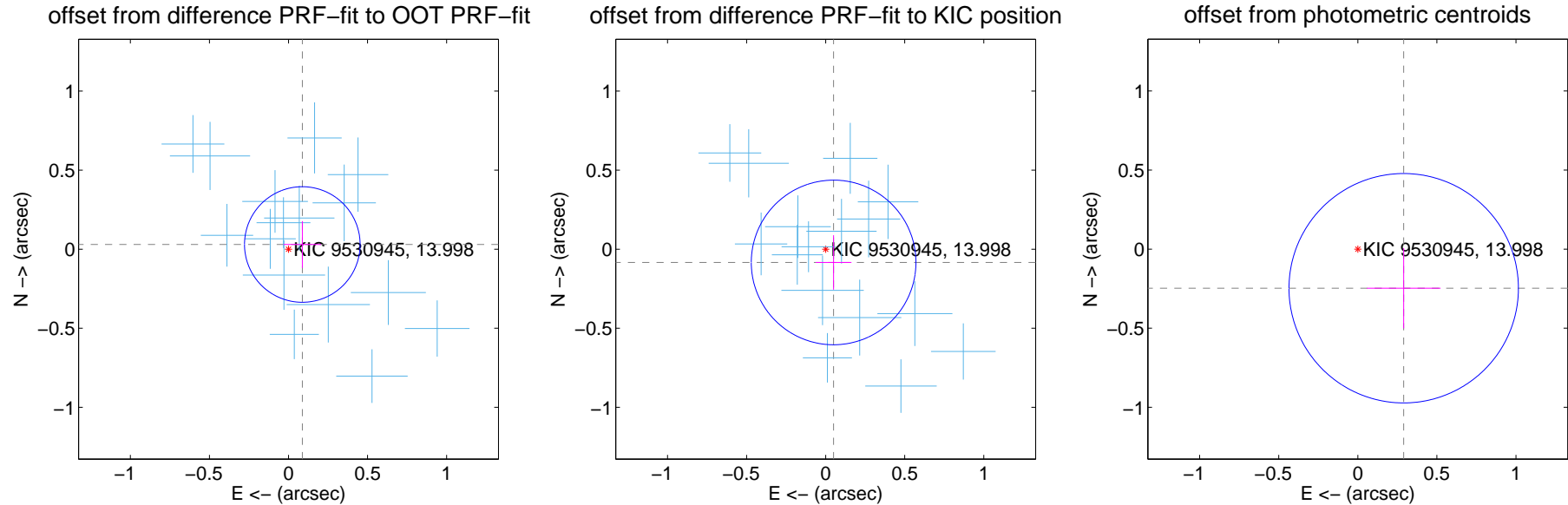
DV Centroid Data

Supplemental centroid analysis for 009530945-02. Kepler magnitude: 14.00. Transit SNR 45.86

There are 17 quarters with good PRF difference image offsets

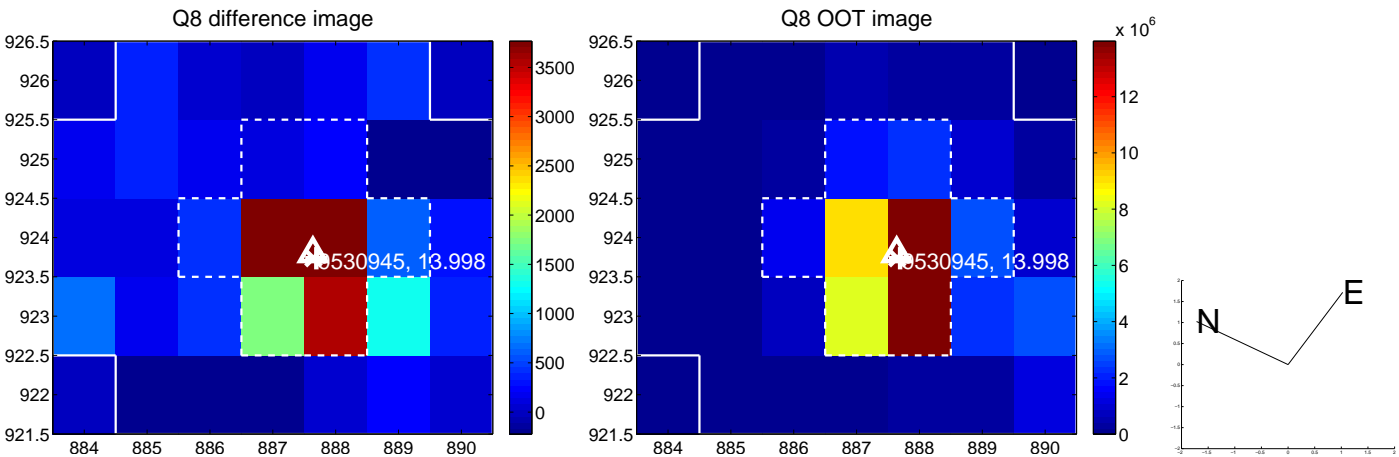
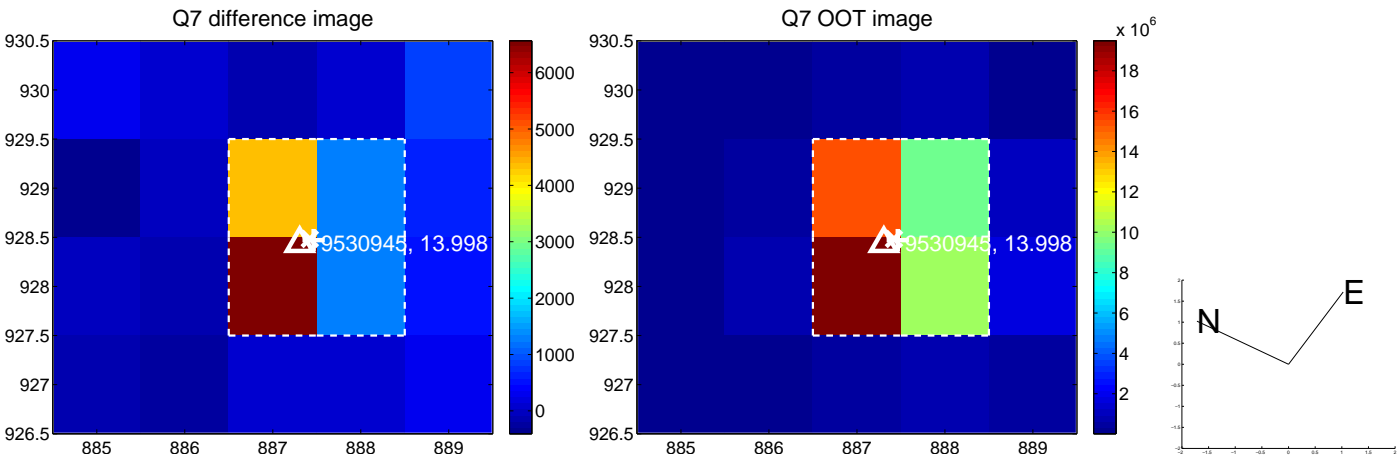
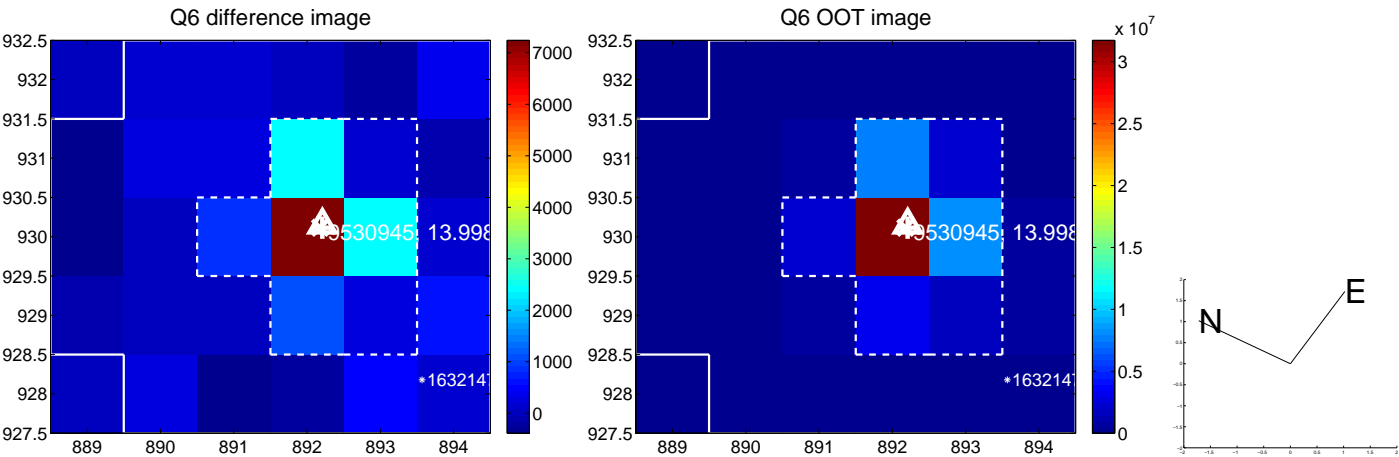
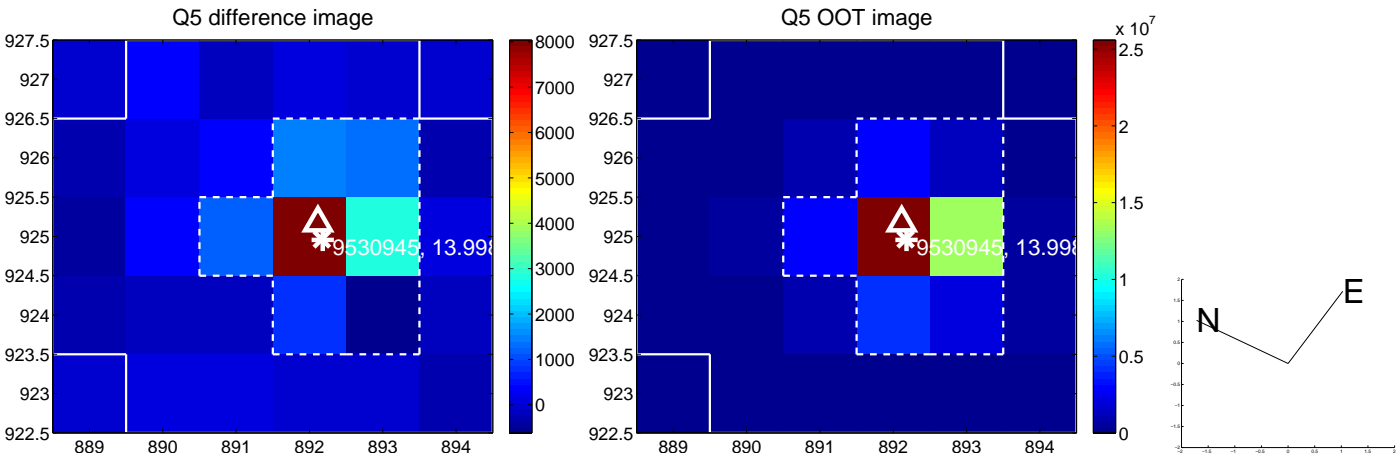
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.092 ± 0.122	0.76	-0.087 ± 0.118	0.030 ± 0.148
PRF-fit source offset from KIC position	0.098 ± 0.173	0.56	-0.050 ± 0.113	-0.084 ± 0.172
photometric centroid source offset	0.38 ± 0.24	1.58	-0.29 ± 0.23	-0.25 ± 0.25

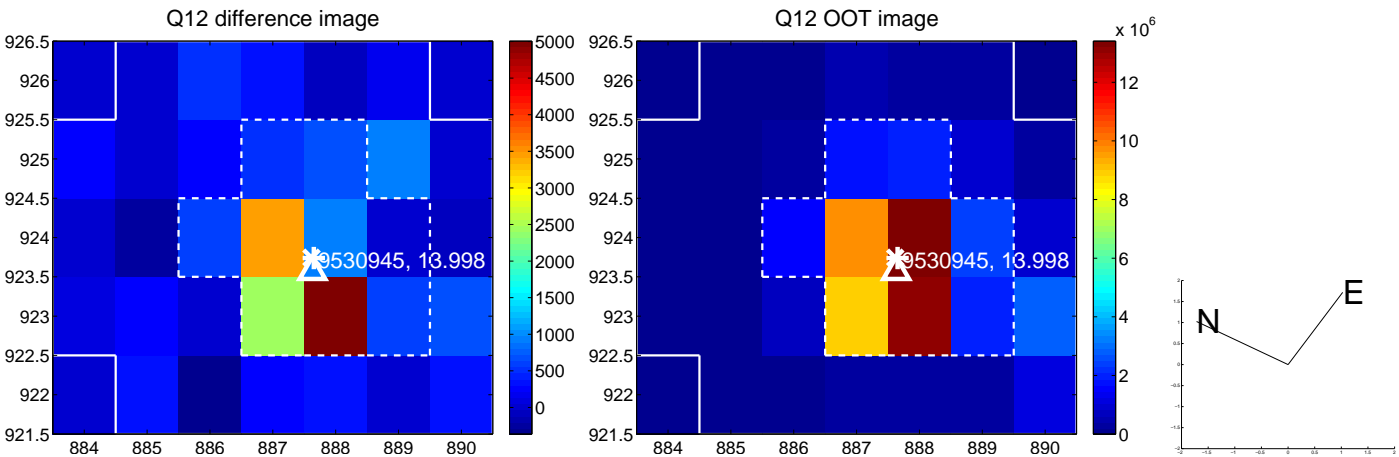
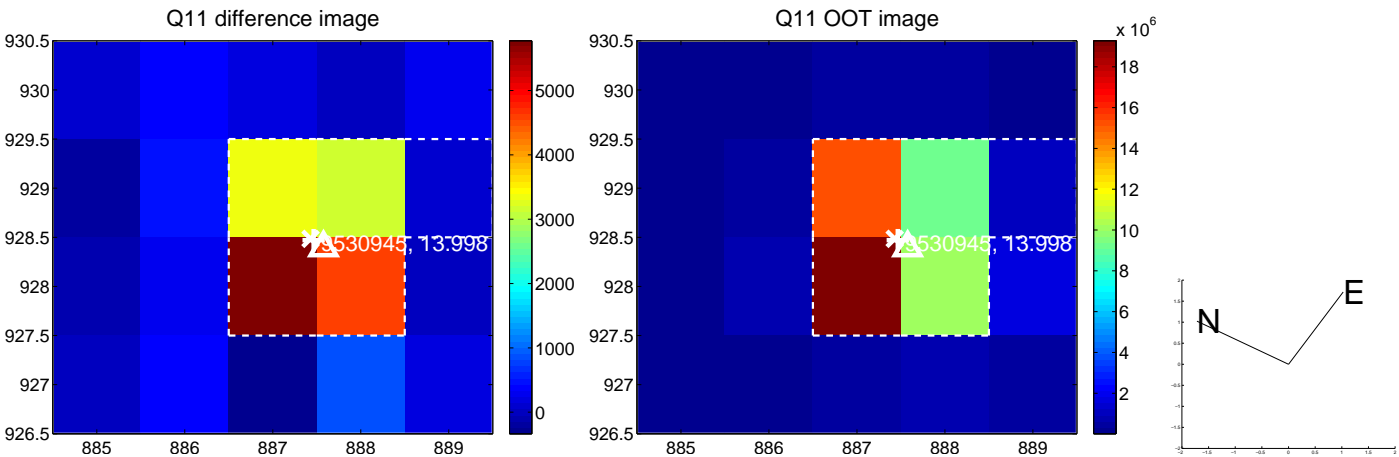
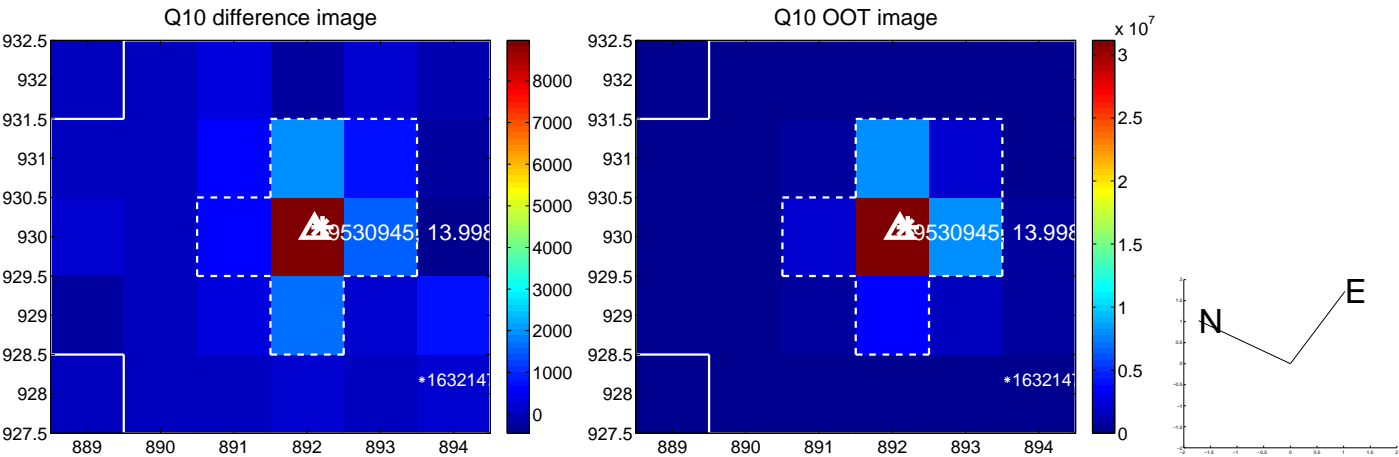
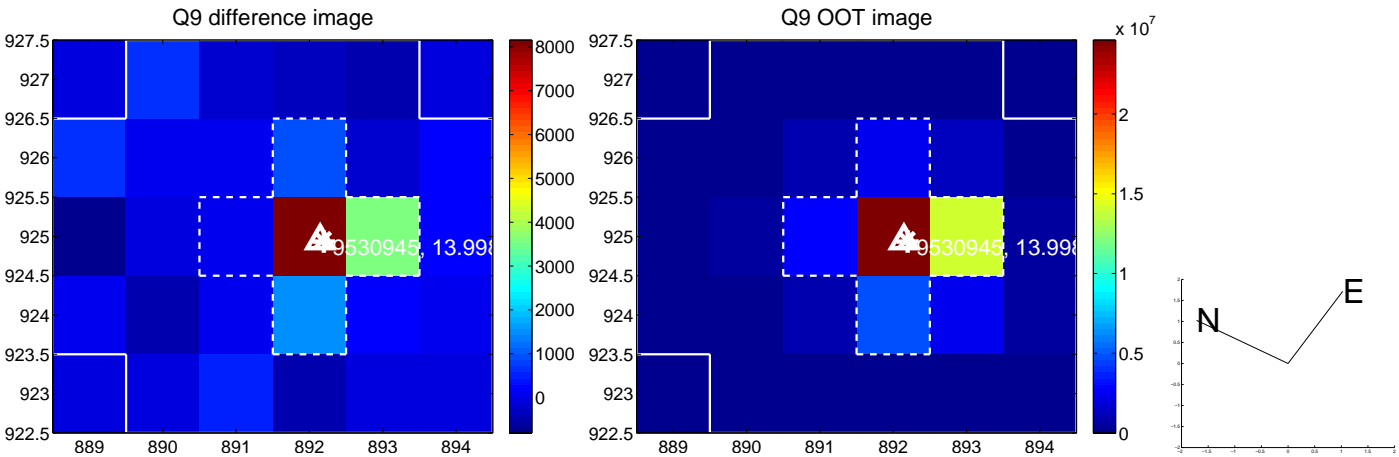


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

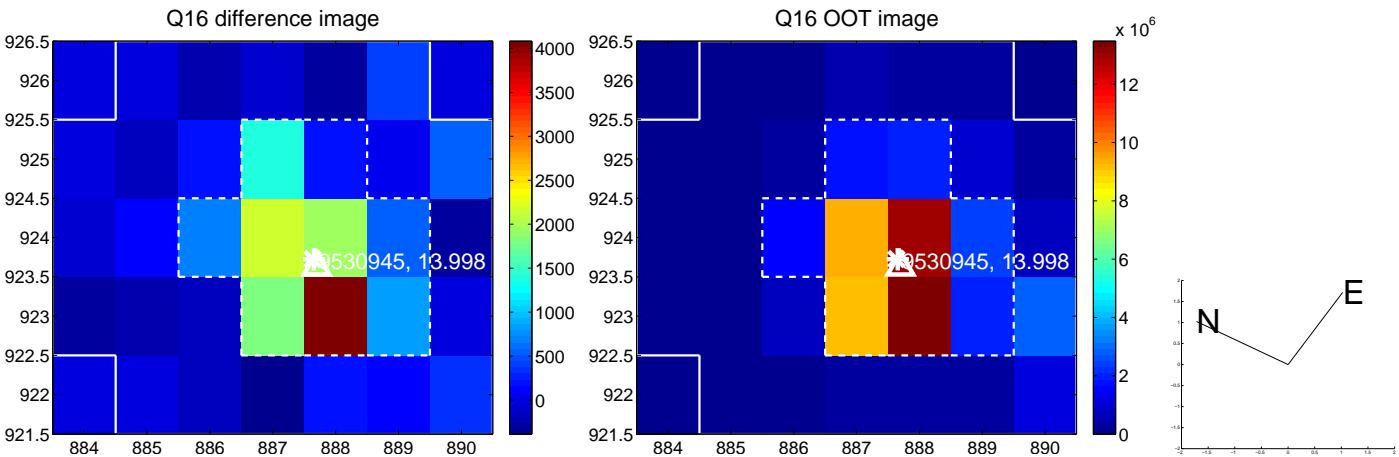
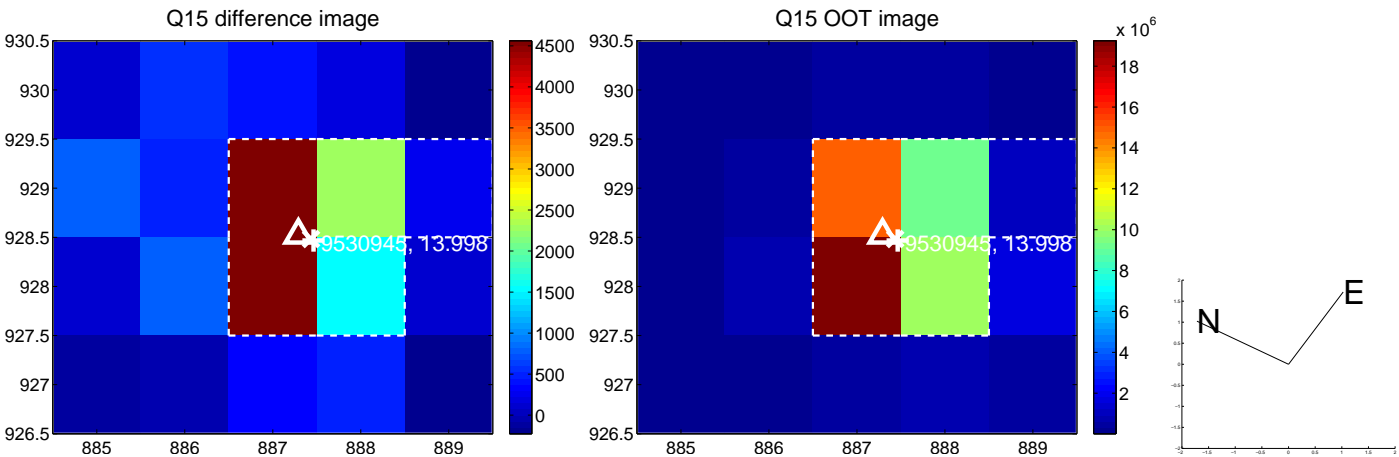
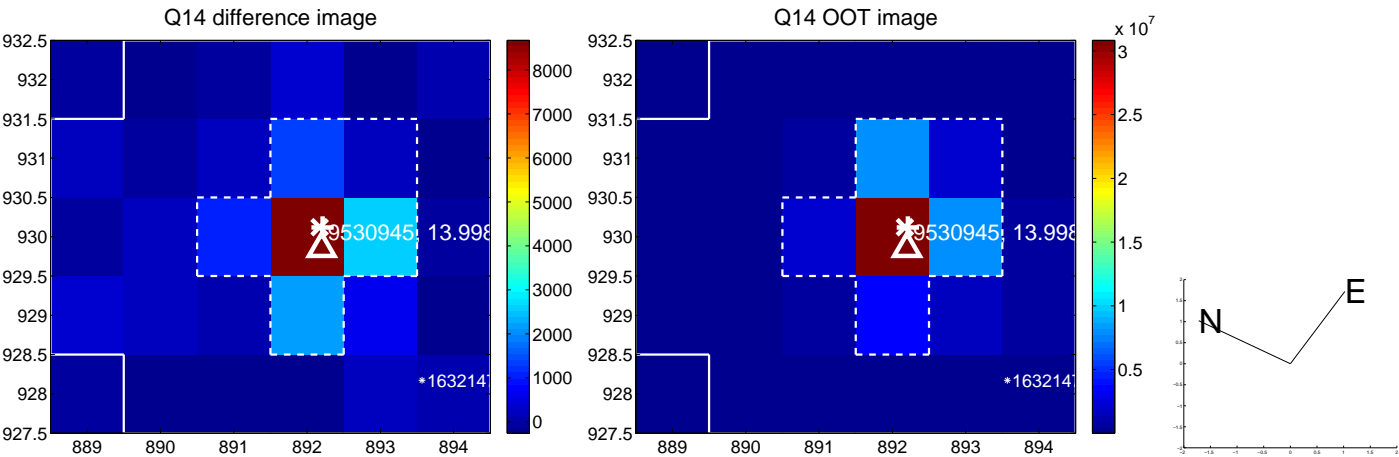
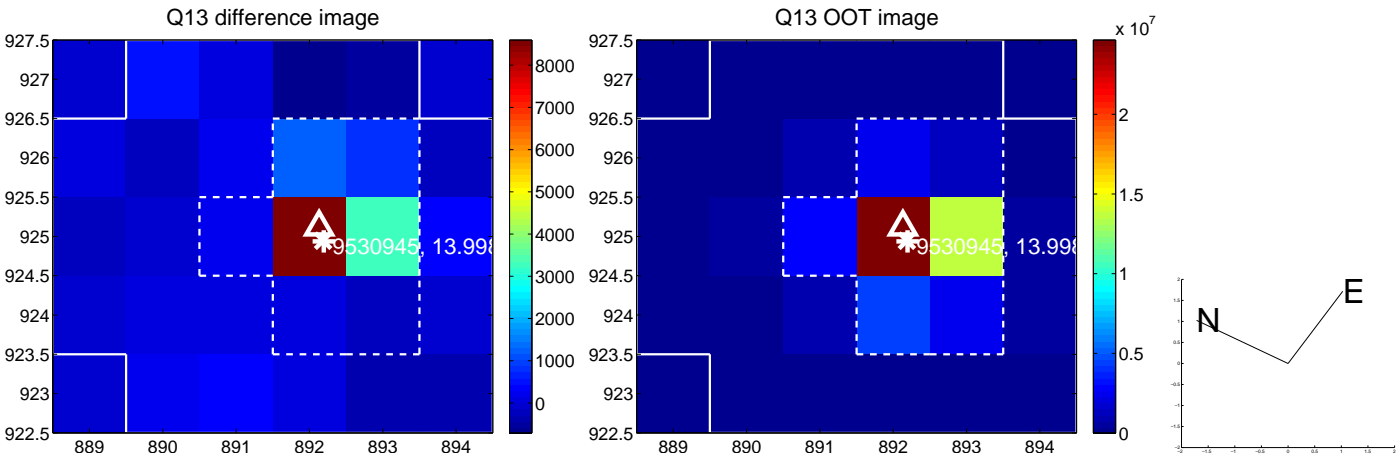
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



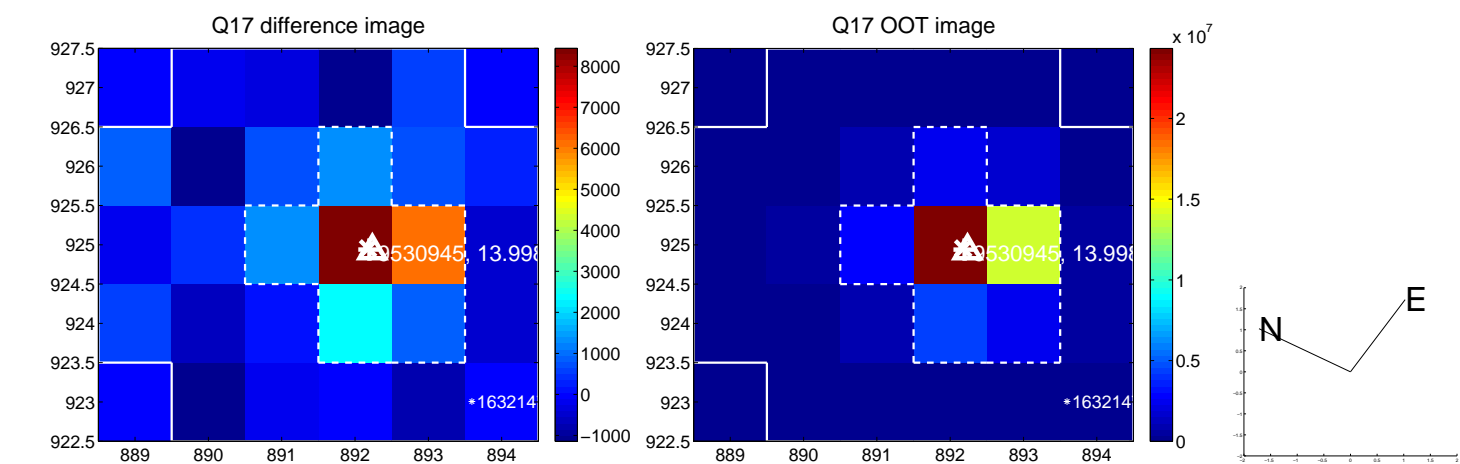
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



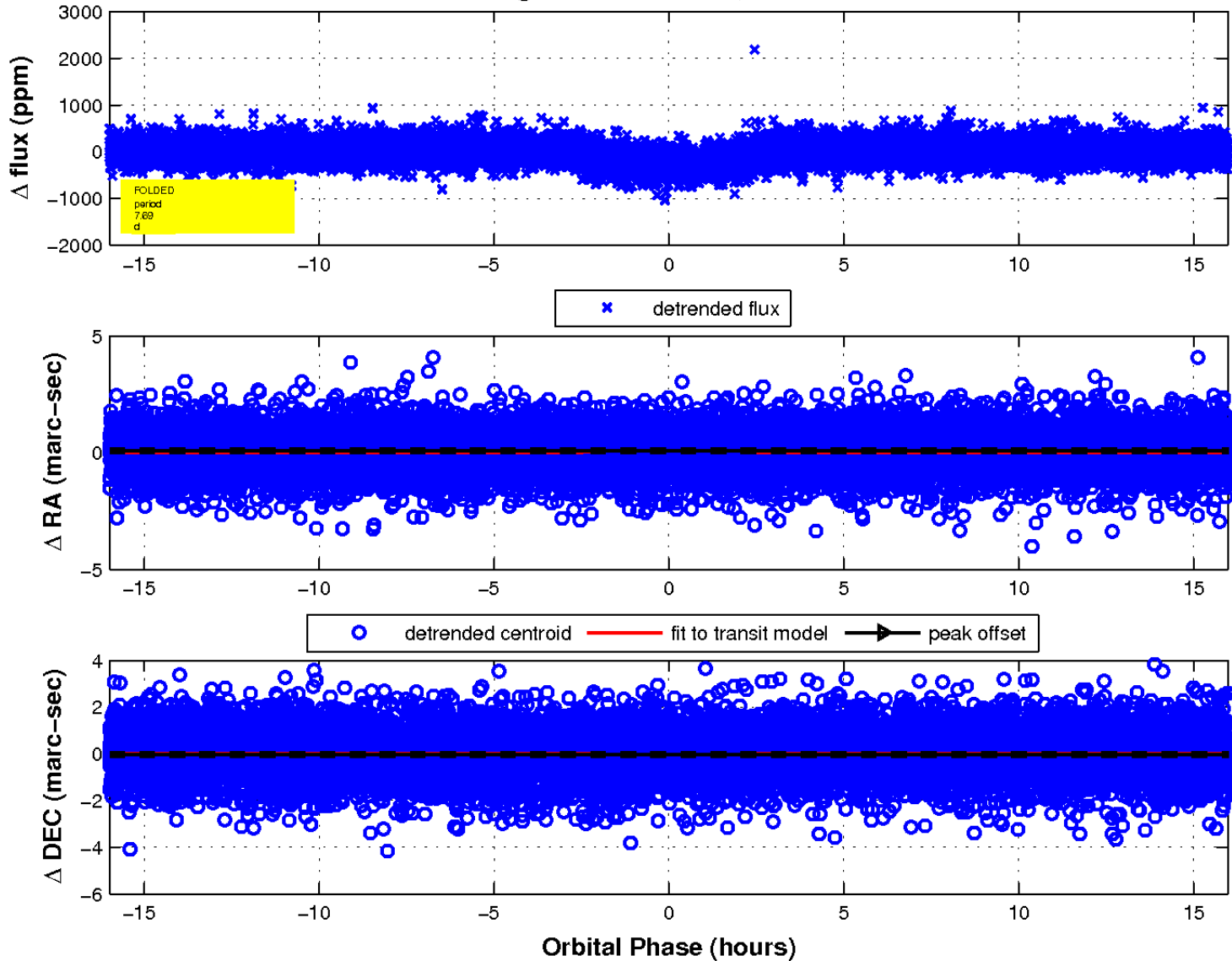
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 2 of 2



UKIRT Image

Declination

