

KIC 009405541

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})
009405541-01	OBS	3788.01	11.105253	137.634699	1212.0	4.032	711.0	505.1	116.97	3306	895.27	0.00
009405541-02	OBS	No	11.105244	132.082196	117.5	3.295	71.3	68.8	116.97	3306	116.22	0.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009405541-01	OBS	FP	0.00	0	1	0	0	PLANET_IN_STAR—MOD_SEC_DV—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_SATURATED
009405541-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—CENT_SATURATED

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

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

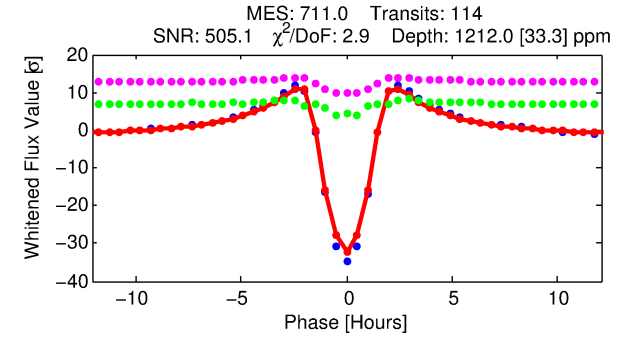
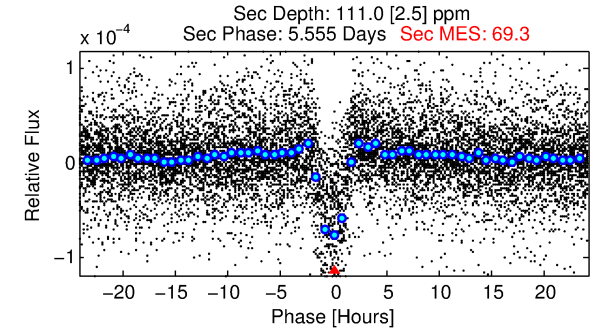
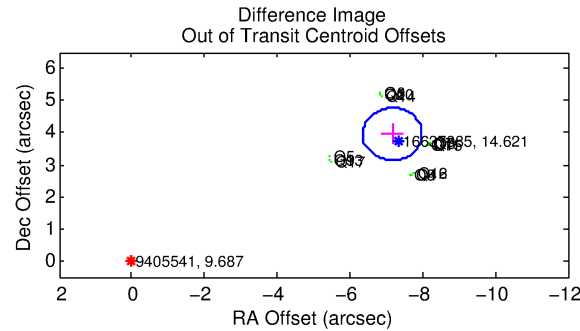
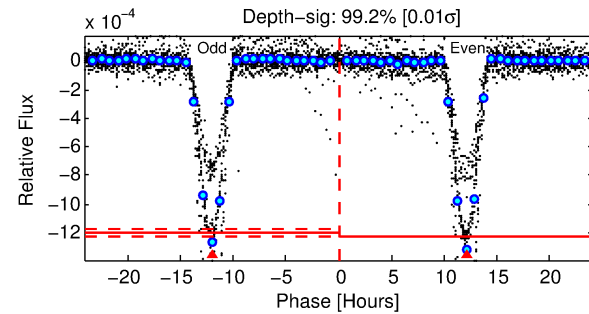
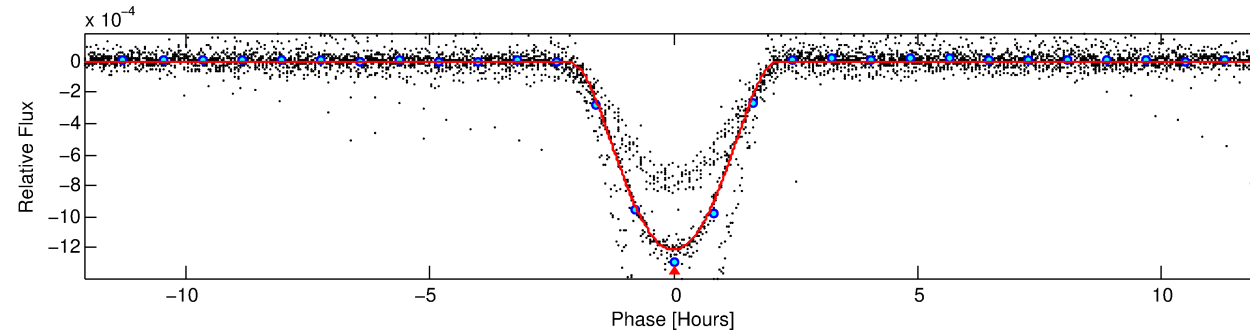
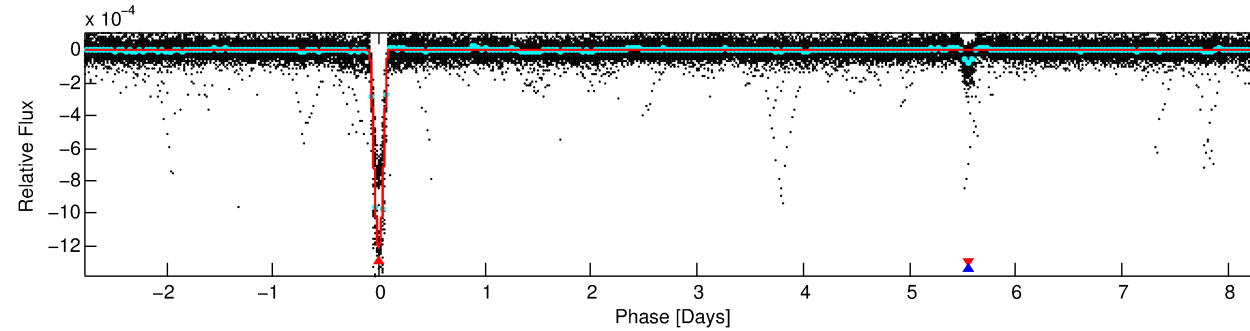
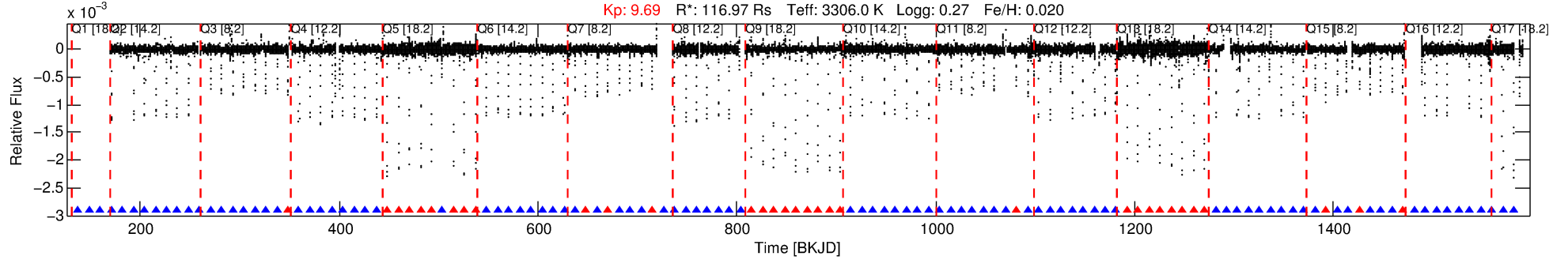
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009405541-01

No Significant Match Found

DV One-Page Summary

KIC: 9405541 Candidate: 1 of 2 Period: 11.105 d
KOI: K03788 Corr: No Ephemeris Match



DV Fit Results:

Period = 11.10525 [0.00000] d
Epoch = 137.6347 [0.0002] BKJD
 R_p/R^* = 0.0701 [0.0096]
 a/R^* = 8.09 [0.23]
 b = 1.00 [0.01]
 Seff = N/A
 Teq = N/A
 R_p = 895.27 [281.45] Re
 a = N/A
 Ag = N/A
 Teffp = N/A

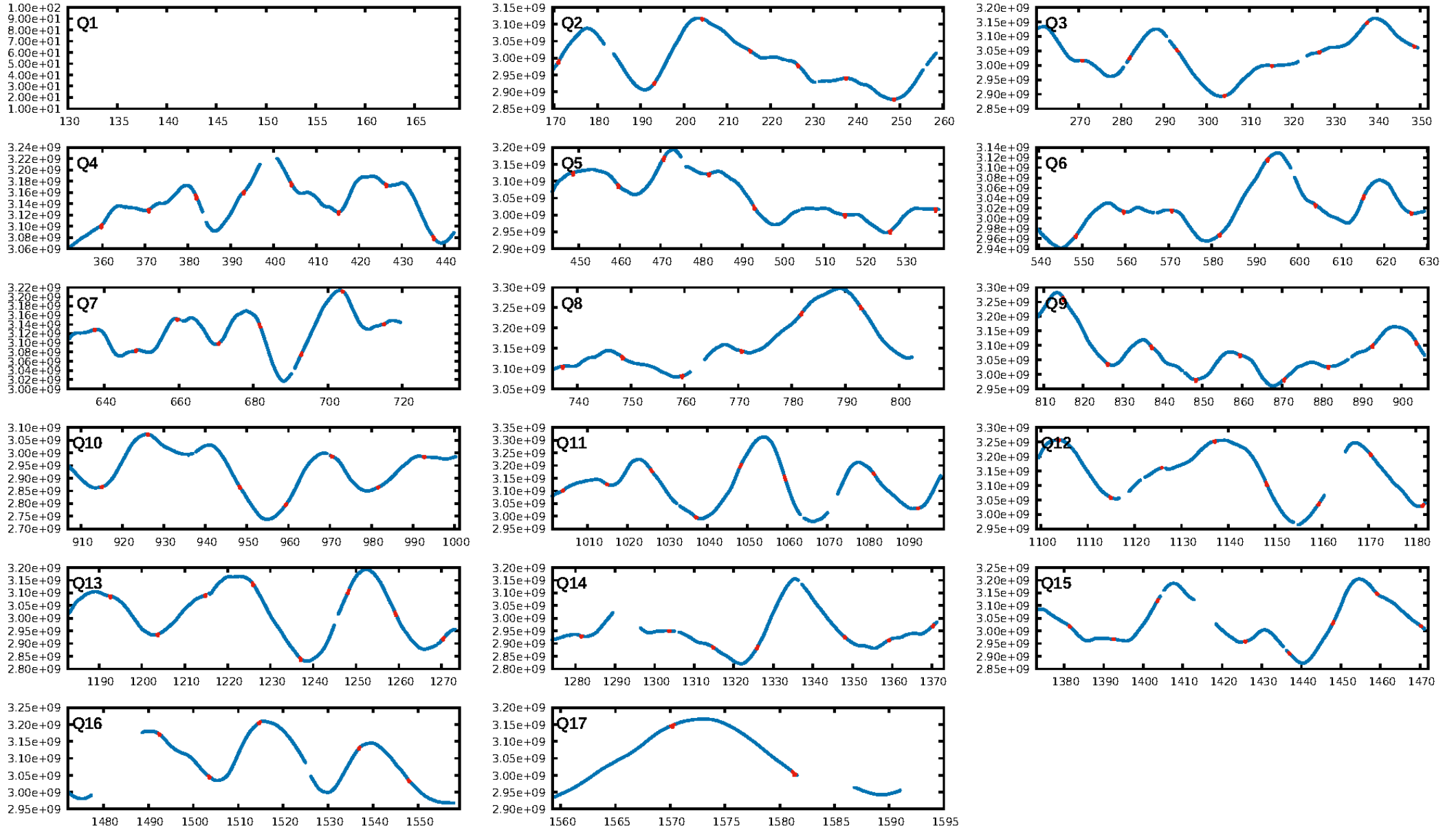
DV Diagnostic Results:

ShortPeriod-sig: 0.0% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 0.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.71 [79/112]
GhostDiagnostic-chr: N/A
Centroid-sig: 0.0%
Centroid-so: 17.753 arcsec [267.00 σ]
OotOffset-rm: 8.181 arcsec [29.97 σ]
KicOffset-rm: 8.264 arcsec [121.87 σ]
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]

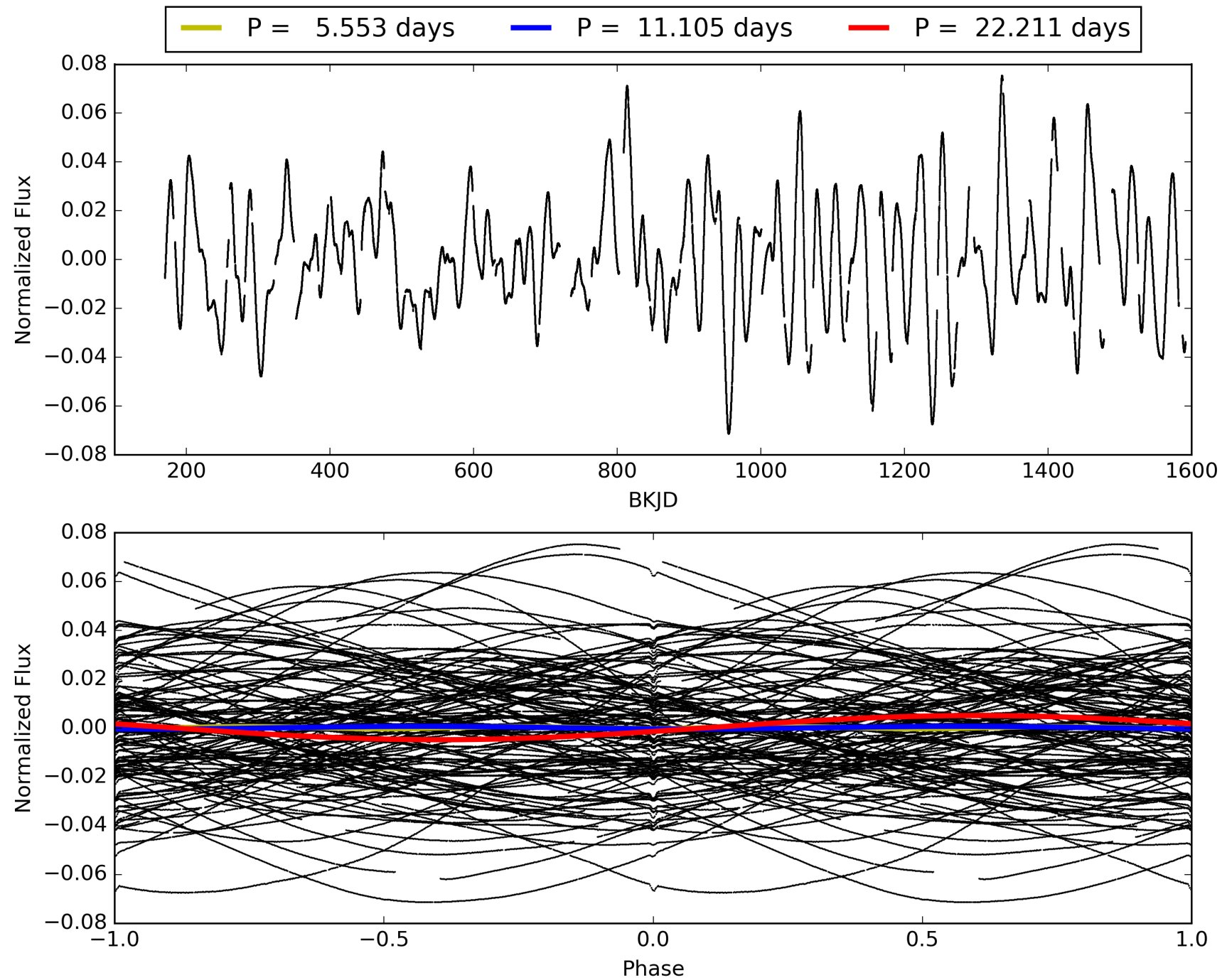
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:52:41 Z

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

TCE 009405541-01, PDC Light Curves

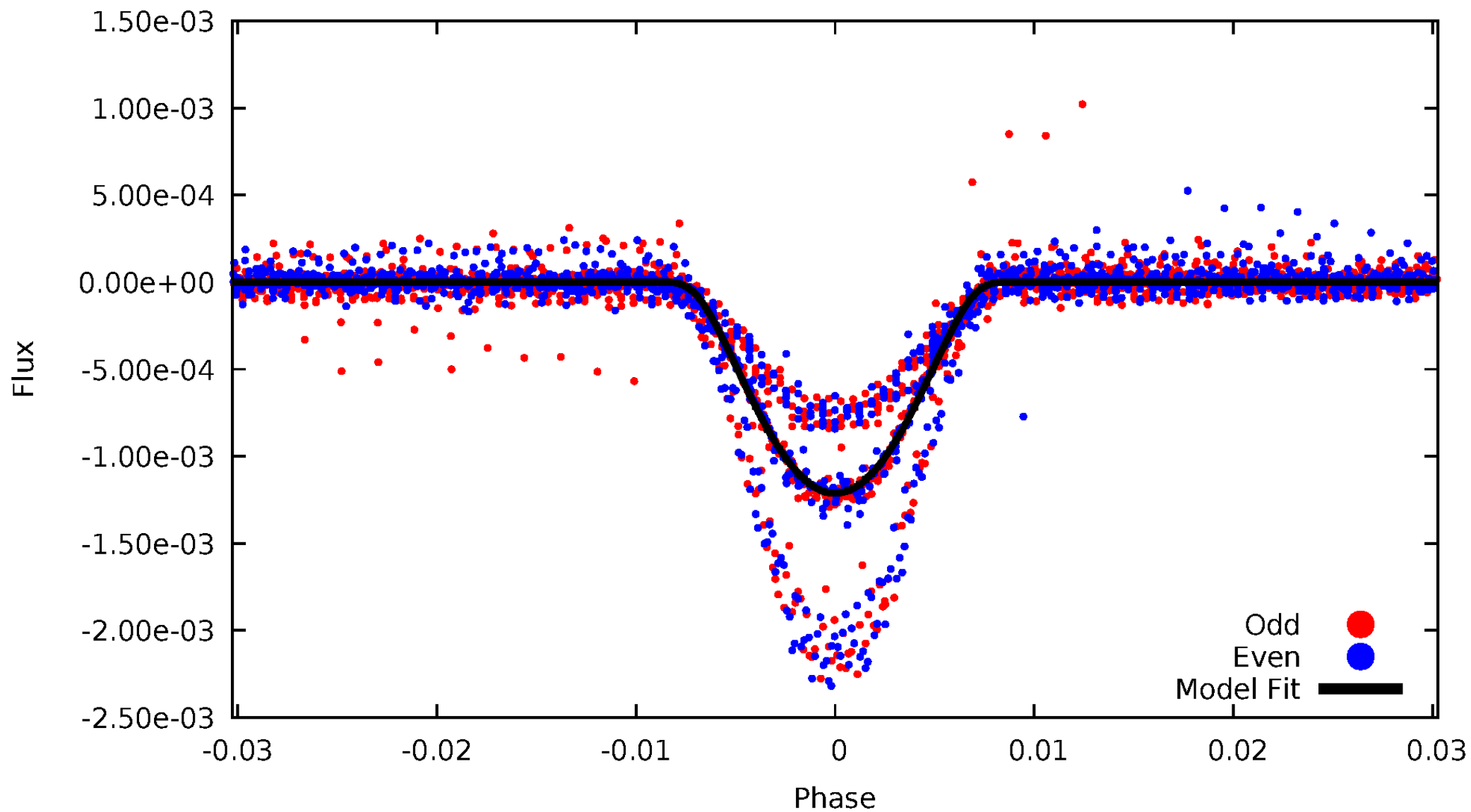


TCE 009405541-01



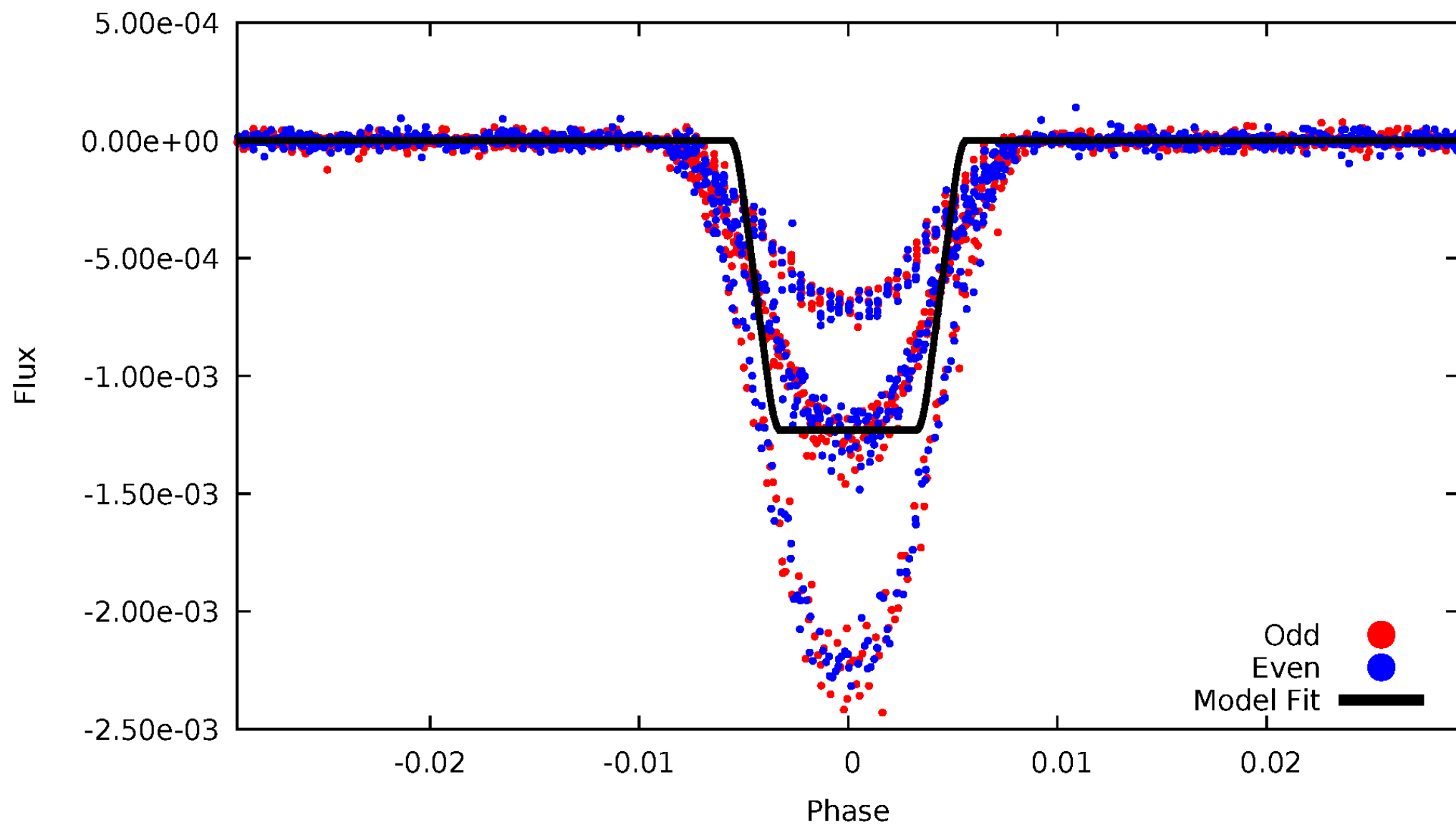
DV Odd/Even

TCE 009405541-01



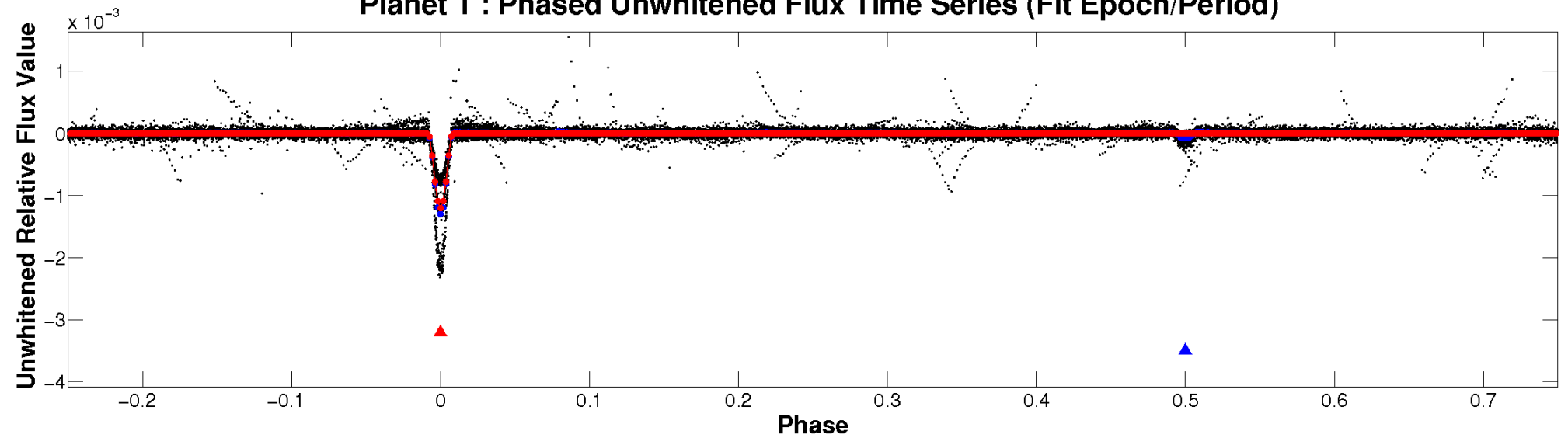
ALT Odd/Even

TCE 009405541-01

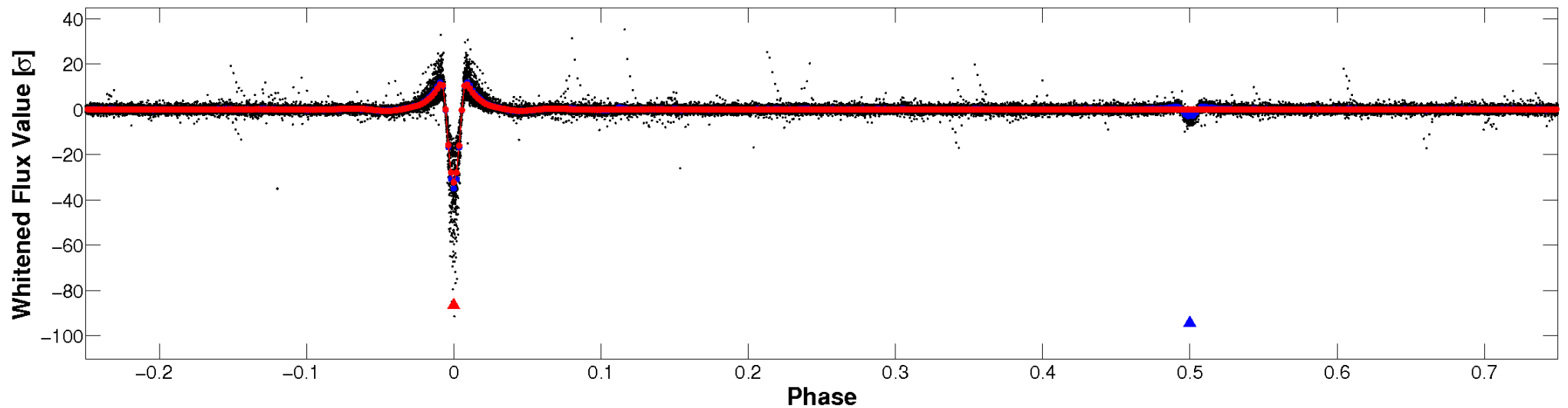


Non-Whitened Vs. Whitened Light Curve

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

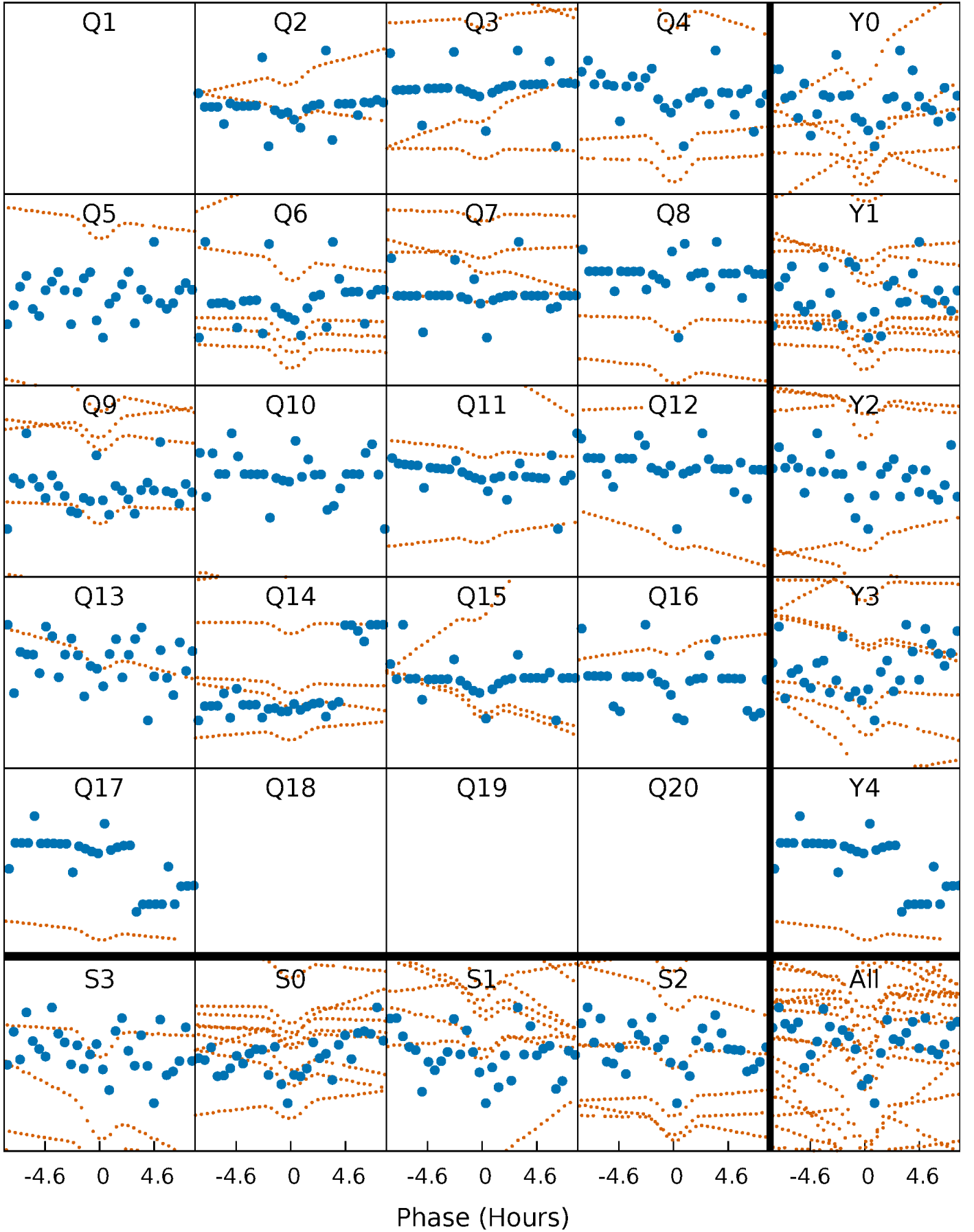


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



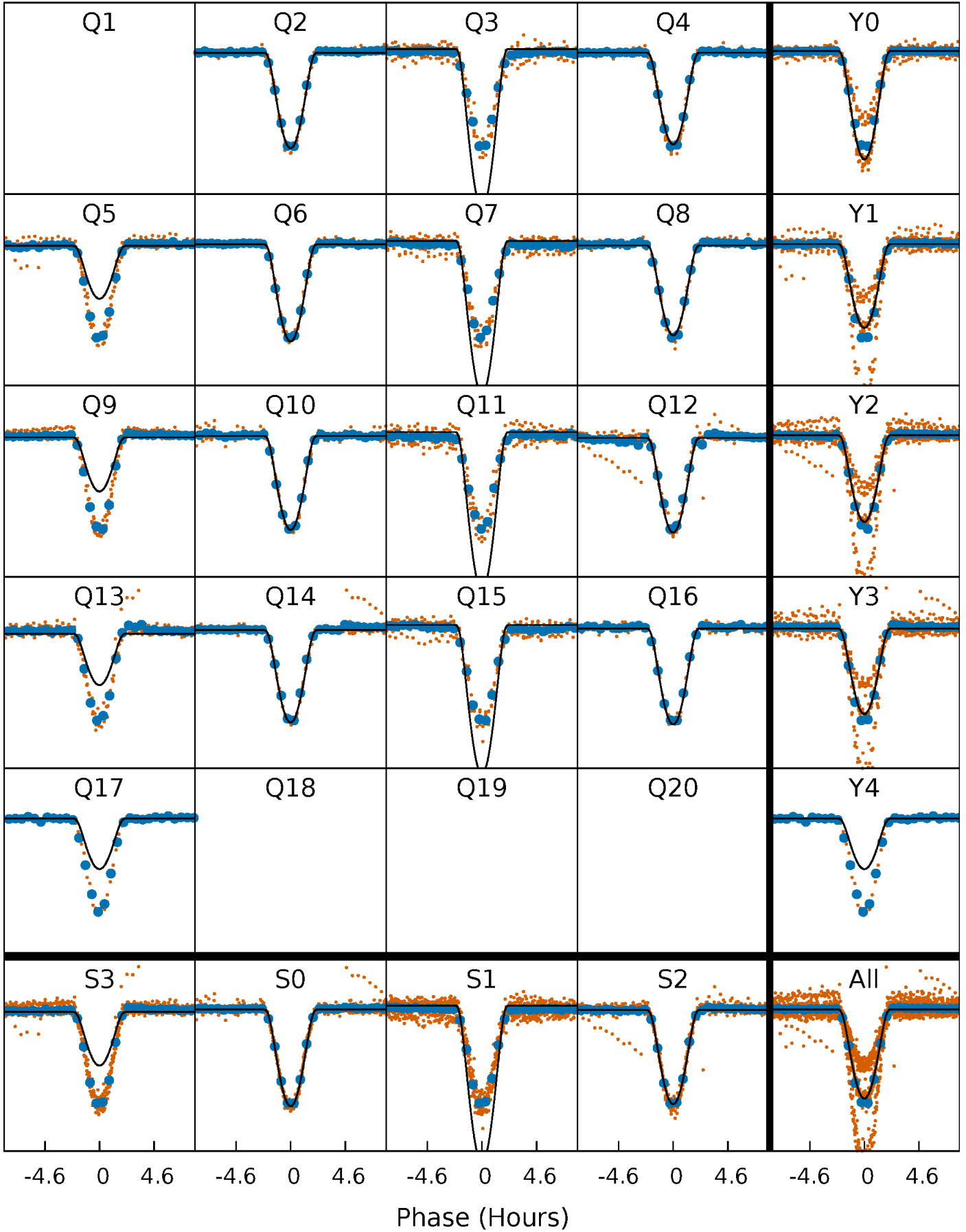
PDC Quarter-Phased Transit Curves

TCE 009405541-01 P= 11.105253 Days $T_0=137.634699$ (BKJD)



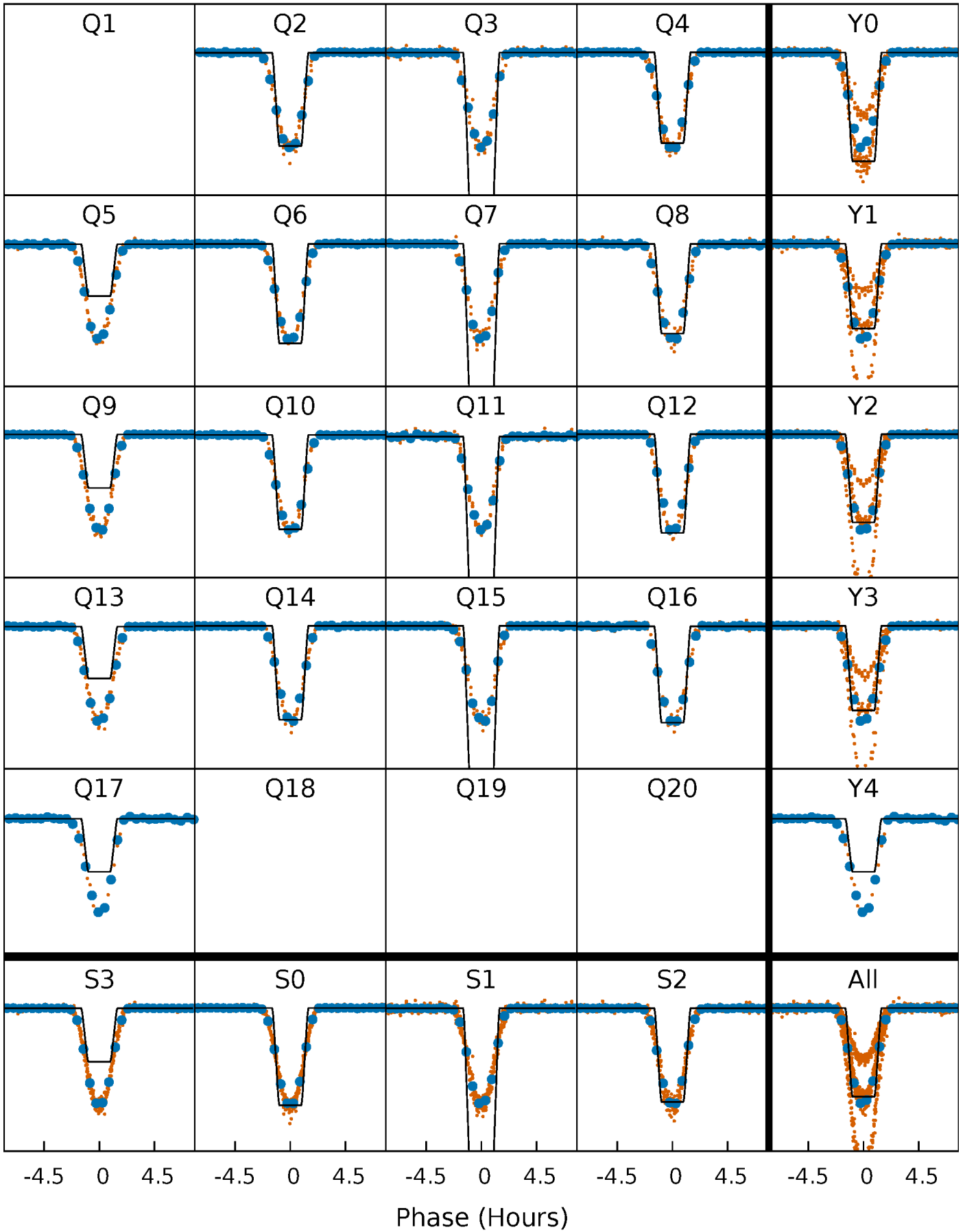
DV Quarter-Phased Transit Curves

TCE 009405541-01 P= 11.105253 Days $T_0=137.634699$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

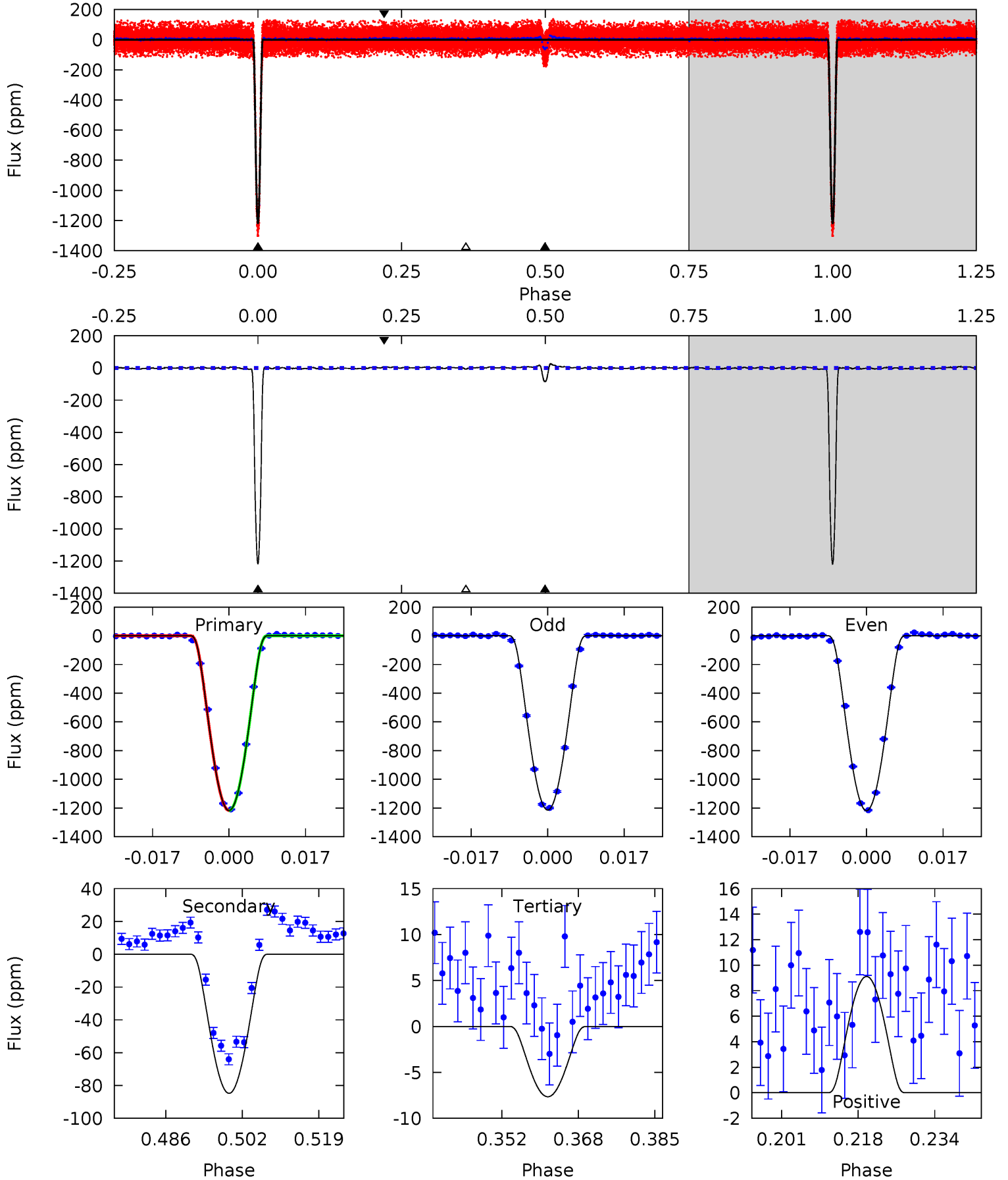
TCE 009405541-01 P= 11.105211 Days $T_0=137.637652$ (BKJD)



DV Model-Shift Uniqueness Test

009405541-01, P = 11.105253 Days, E = 137.634699 Days

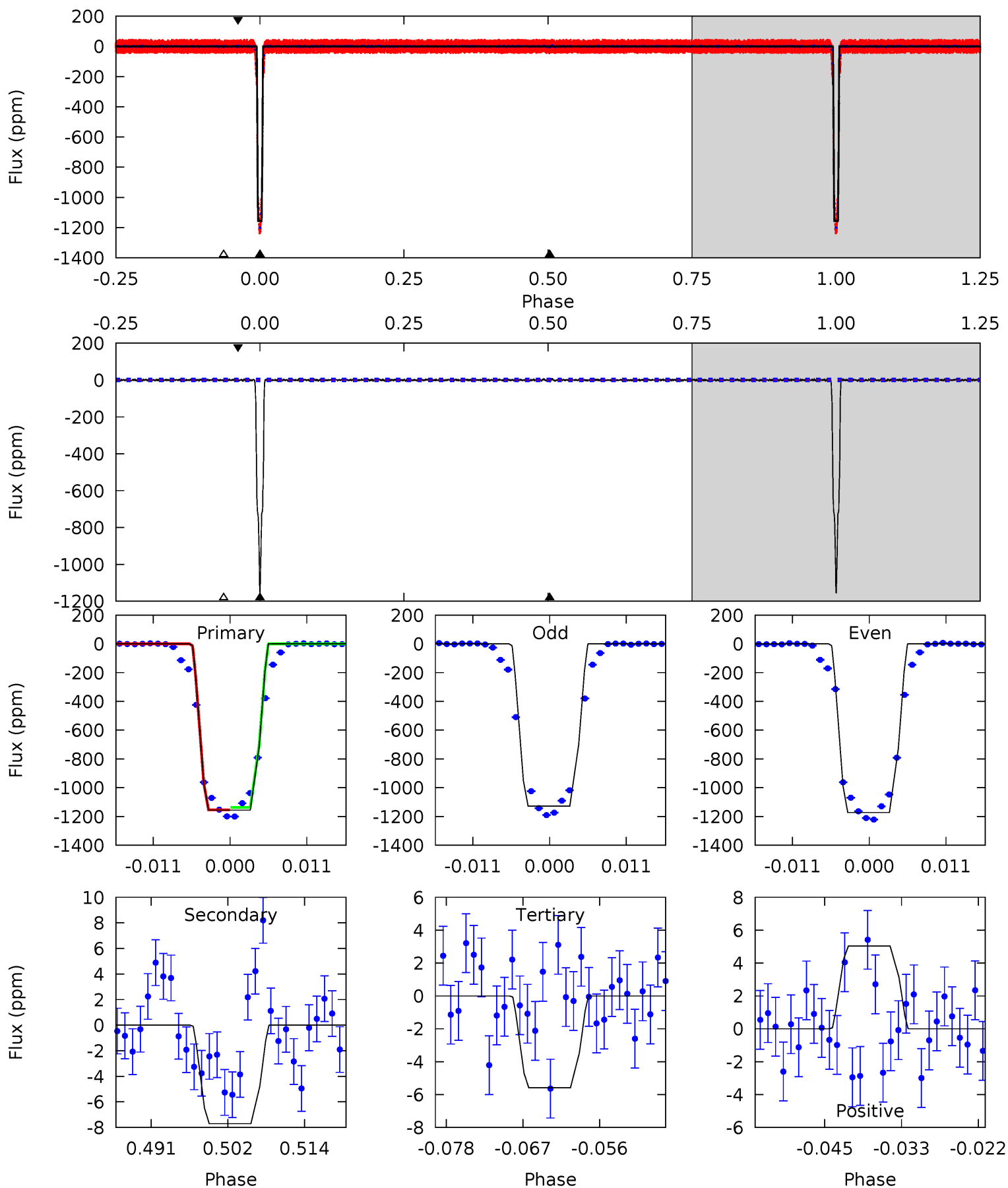
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
913.9	63.7	5.75	6.84	4.93	2.39	2.44	908.1	907.0	57.9	56.8	1.78	1.07	0.02	0



Alt Model-Shift Uniqueness Test

009405541-01, P = 11.105211 Days, E = 137.637652 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
839.8	5.60	4.06	3.66	5.01	2.54	1.14	835.7	836.1	1.54	1.94	16.3	1.08	0.01	0



Stellar Parameters For KIC 009405541

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3306^{+81}_{-73}	$0.273^{+0.208}_{-0.112}$	$0.020^{+0.250}_{-0.150}$	$116.965^{+33.091}_{-22.061}$	$0.935^{+0.373}_{-0.020}$	$0.000^{+0.000}_{-0.000}$
	+2%/-2%	+76%/-41%	+1250%/-750%	+28%/-19%	+40%/-2%	+89%/-40%
Source	SPE14	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009405541-01 / KOI 3788.01

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-85 ± 1	$886.20^{+191.48}_{-158.92}$	7055^{+448}_{-438}	-4909^{+283}_{-292}	$0.001^{+0.000}_{-0.000}$
Alt.	-8 ± 1	$431.51^{+145.92}_{-126.72}$	7028^{+421}_{-482}	-4885^{+287}_{-290}	$0.000^{+0.000}_{-0.000}$

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

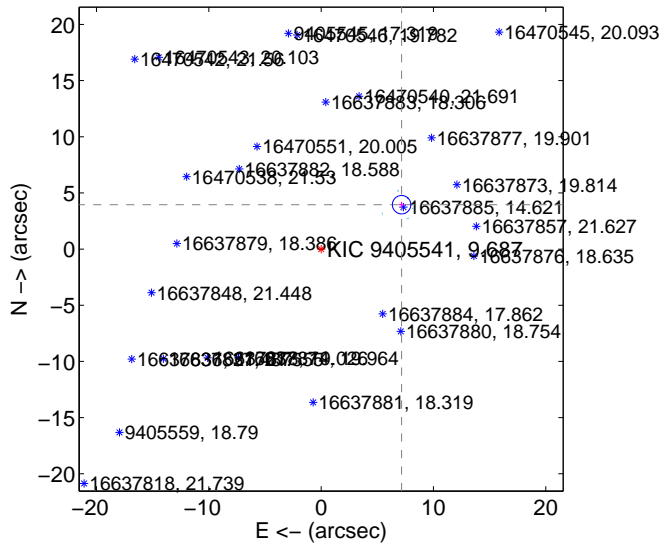
Supplemental centroid analysis for 009405541-01. **Kepler magnitude: 9.69.** Transit SNR 505.07

There are 16 quarters with good PRF difference image offsets

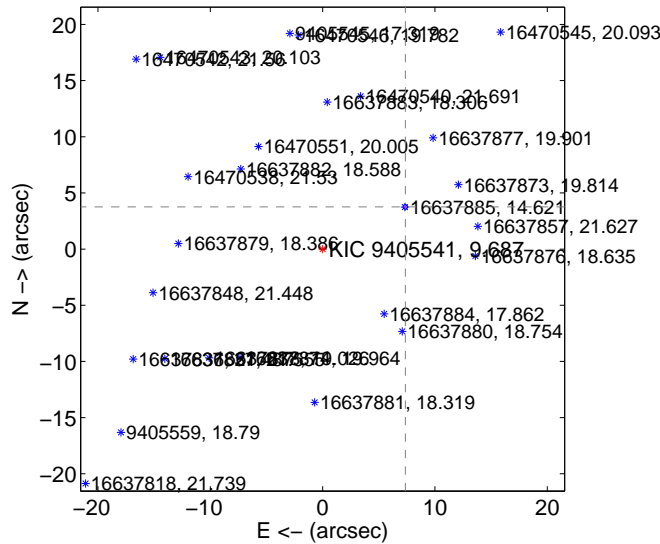
The OOT PRF centroid is offset from the target star catalog position by about 2.00 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	8.181 ± 0.273	29.97	-7.163 ± 0.273	3.953 ± 0.275
PRF-fit source offset from KIC position	8.264 ± 0.068	121.87	-7.361 ± 0.068	3.756 ± 0.069
photometric centroid source offset	17.75 ± 0.07	267.00	-15.64 ± 0.07	8.40 ± 0.05

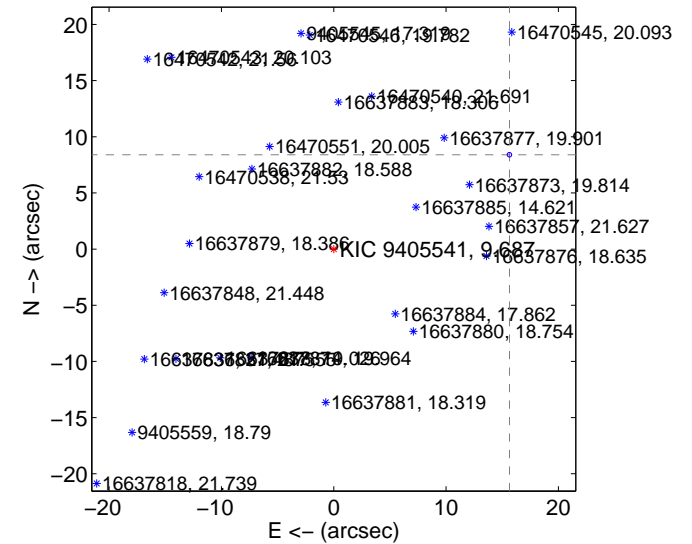
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

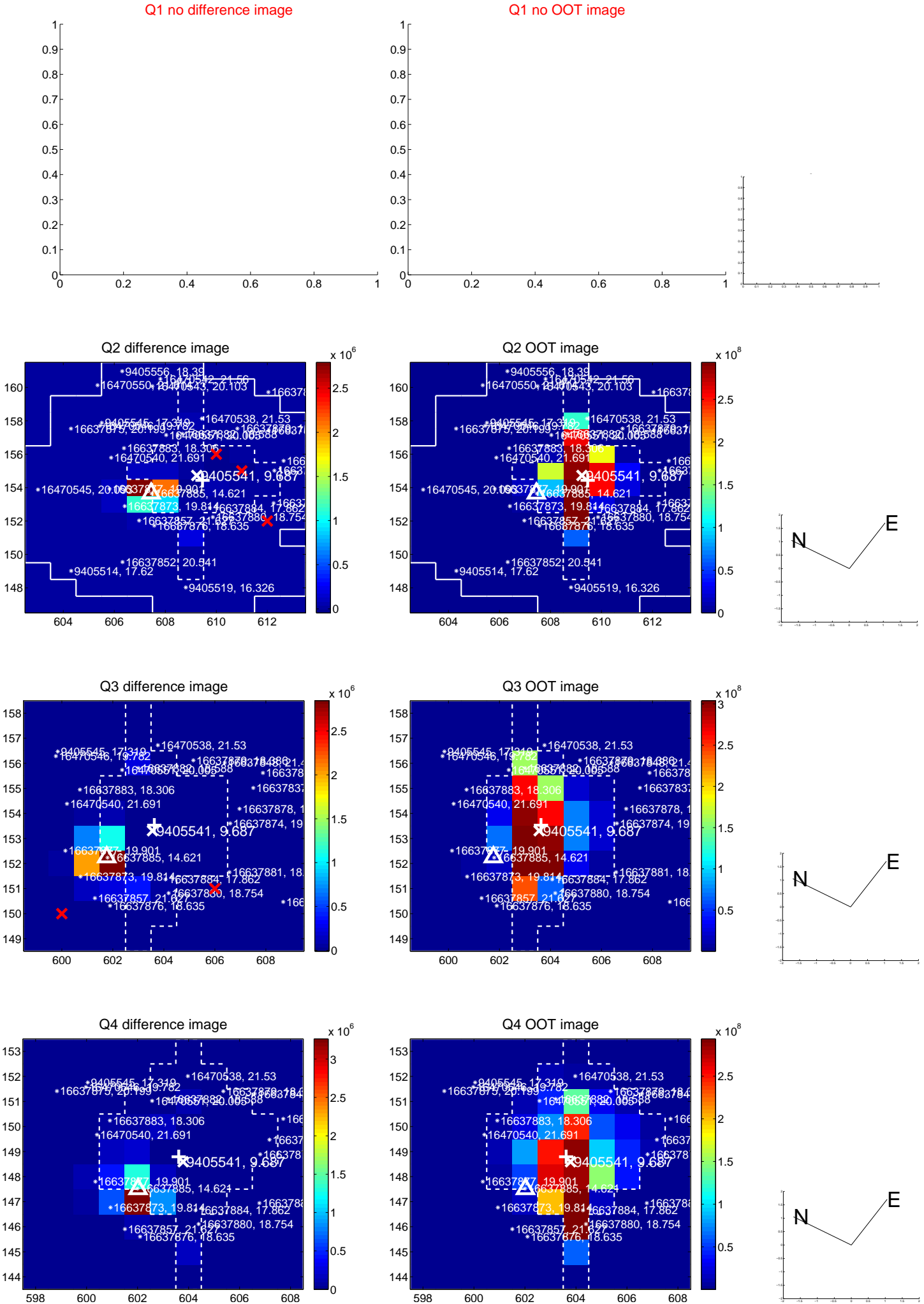


offset from photometric centroids

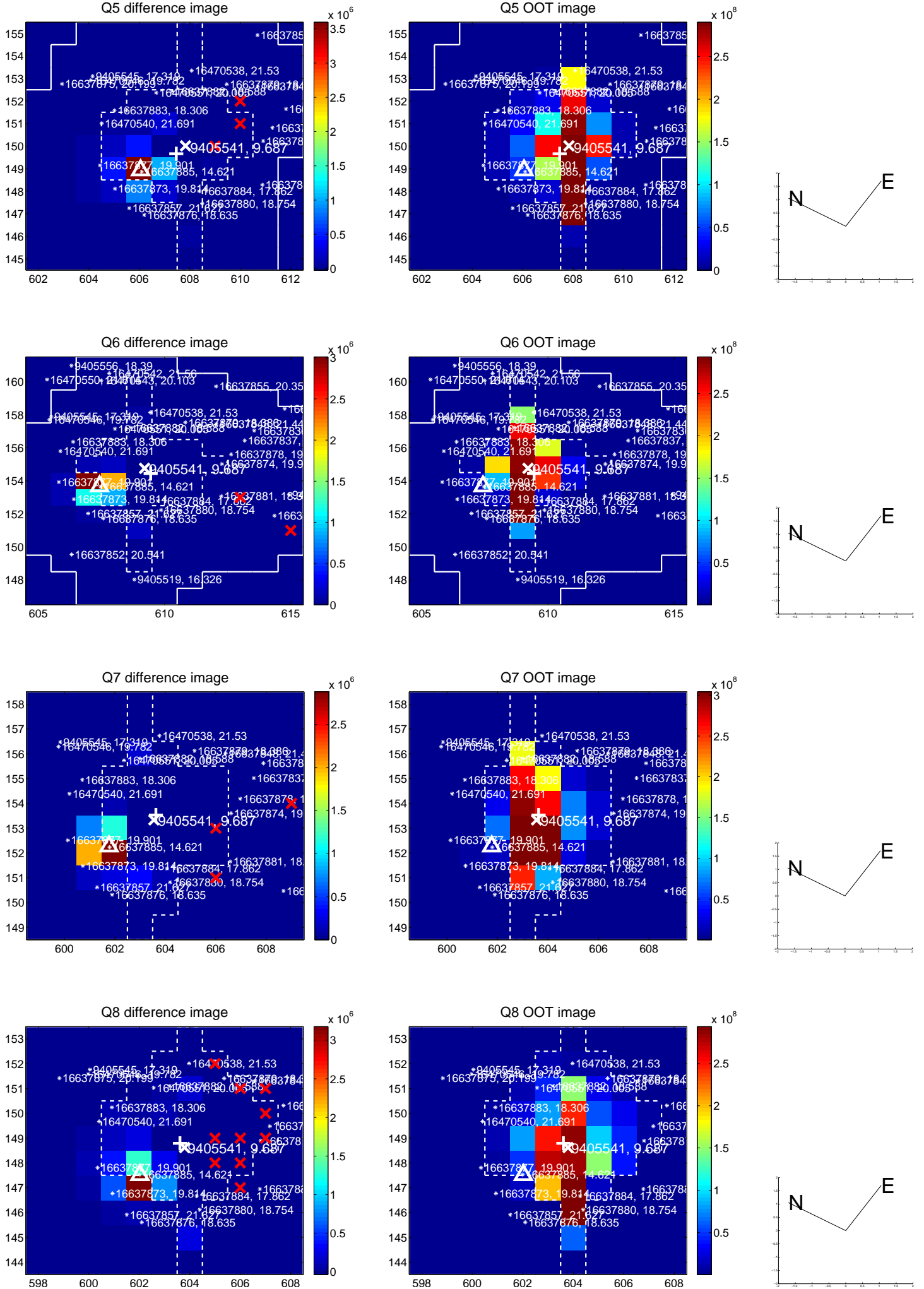


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ . Red *: target star. Blue *: Other stars. Text next to a star gives its KIC ID and kepmag. KIC IDs > 15,000,000 are from the UKIRT catalog.

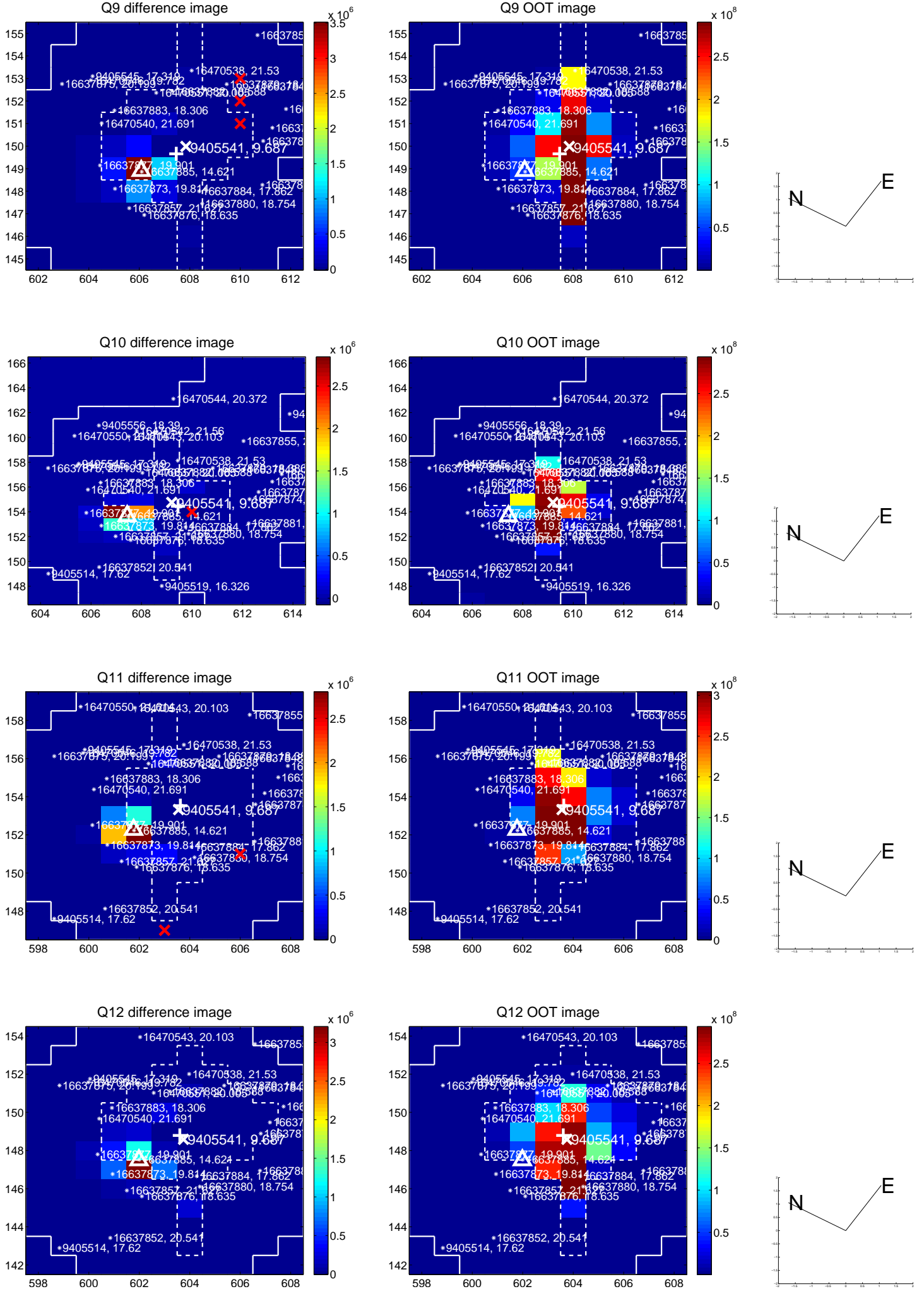
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



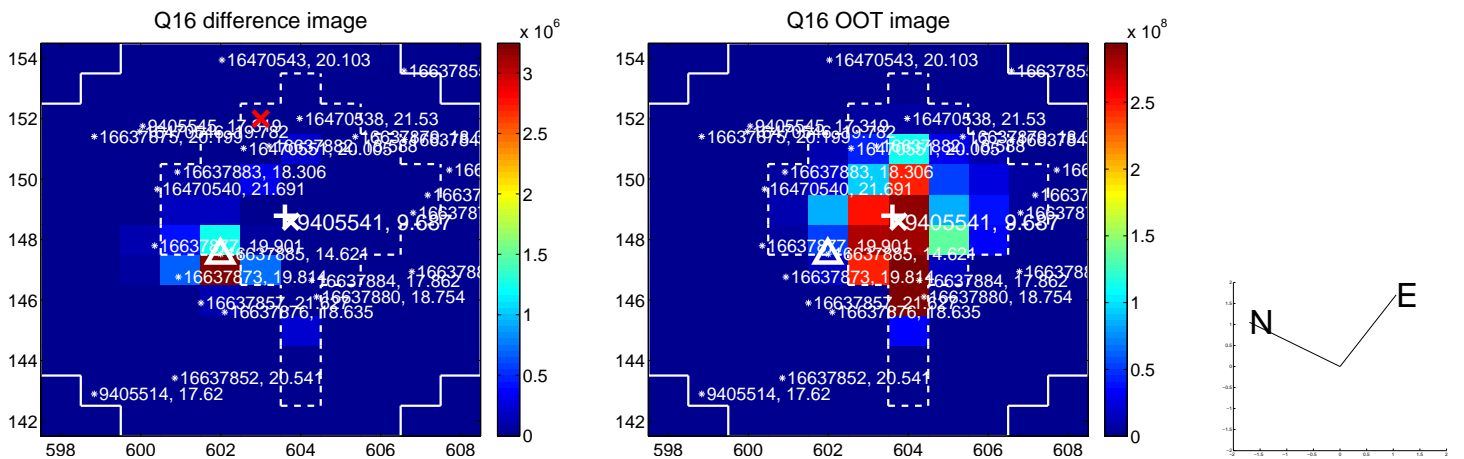
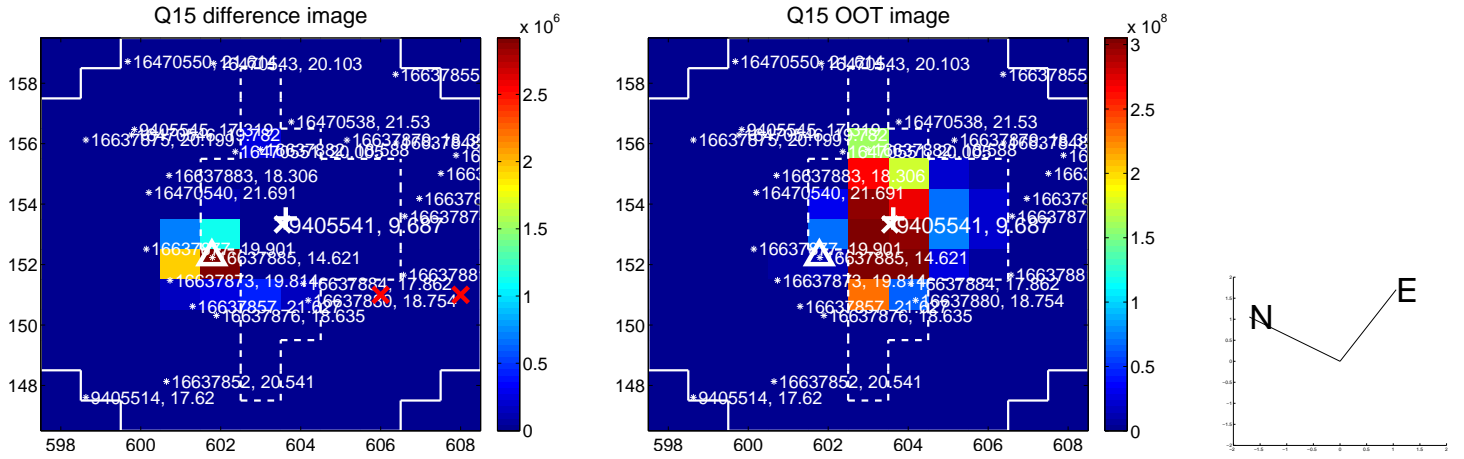
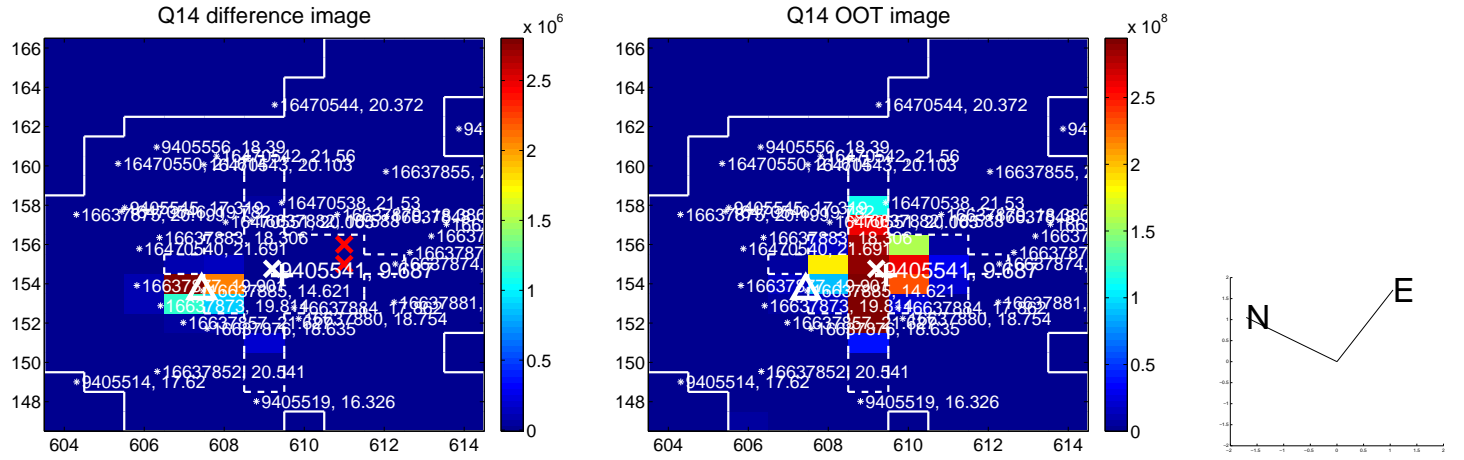
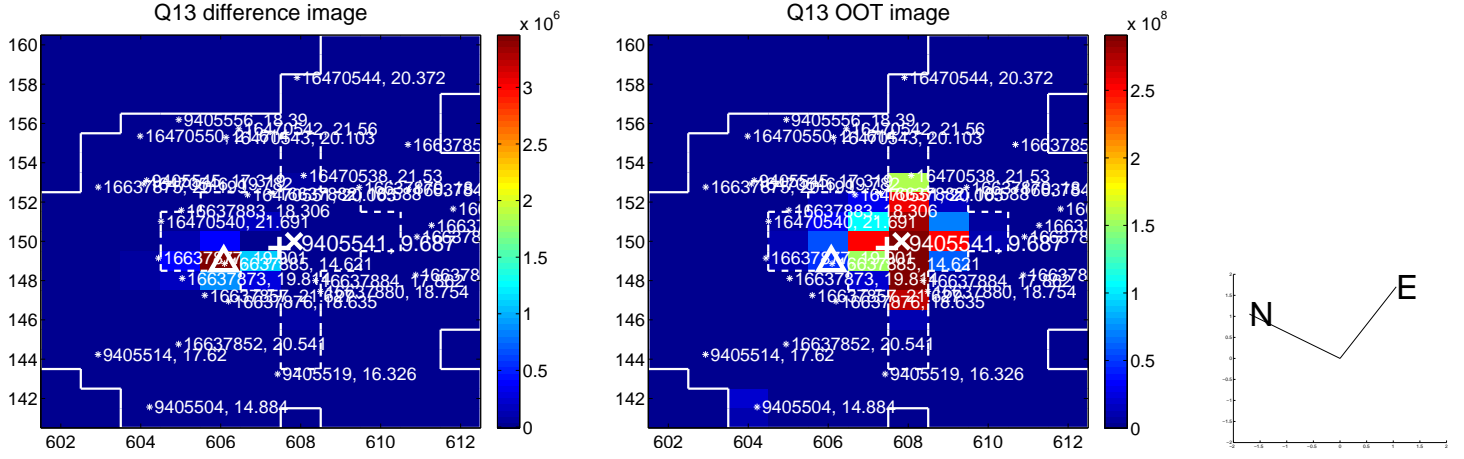
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



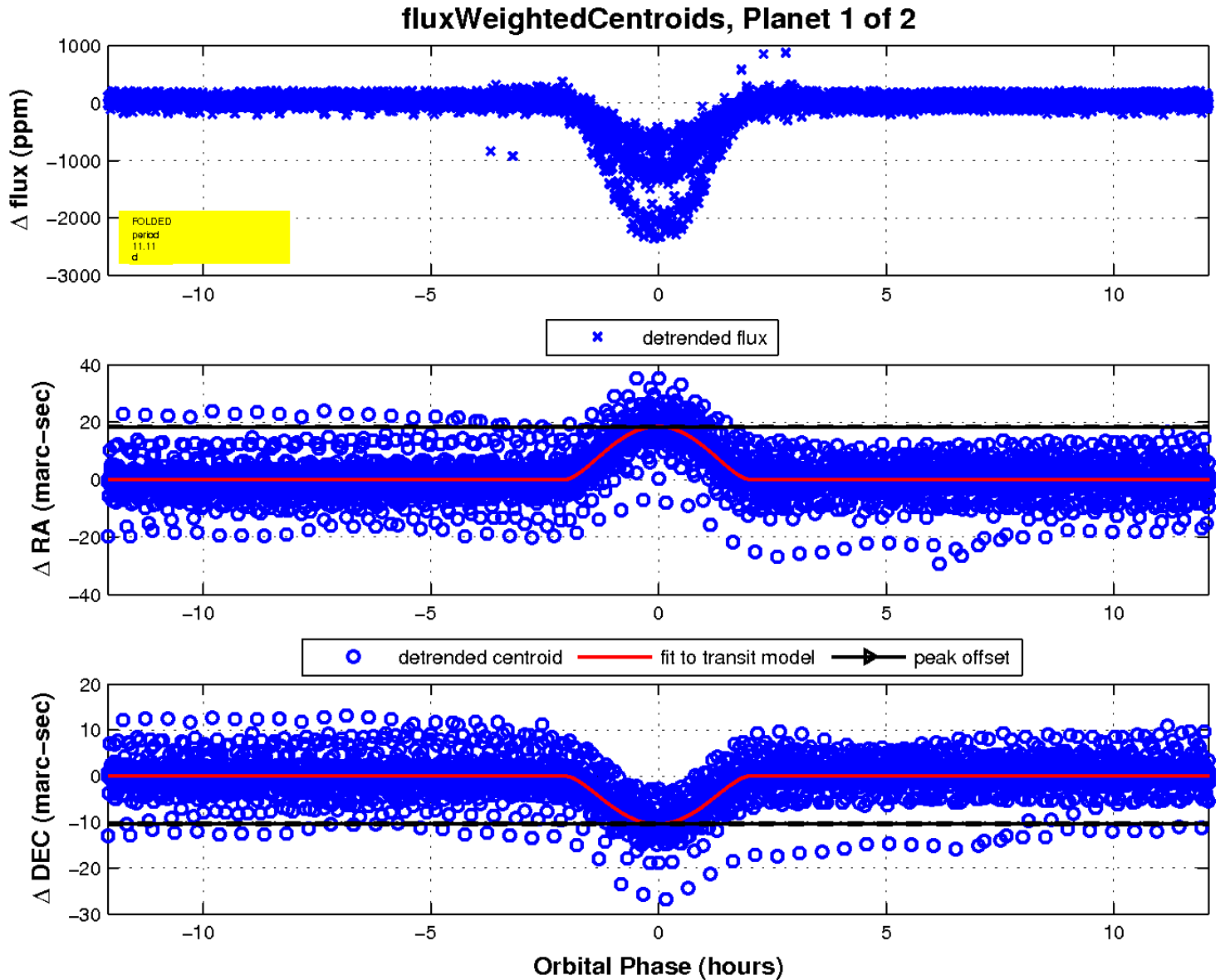
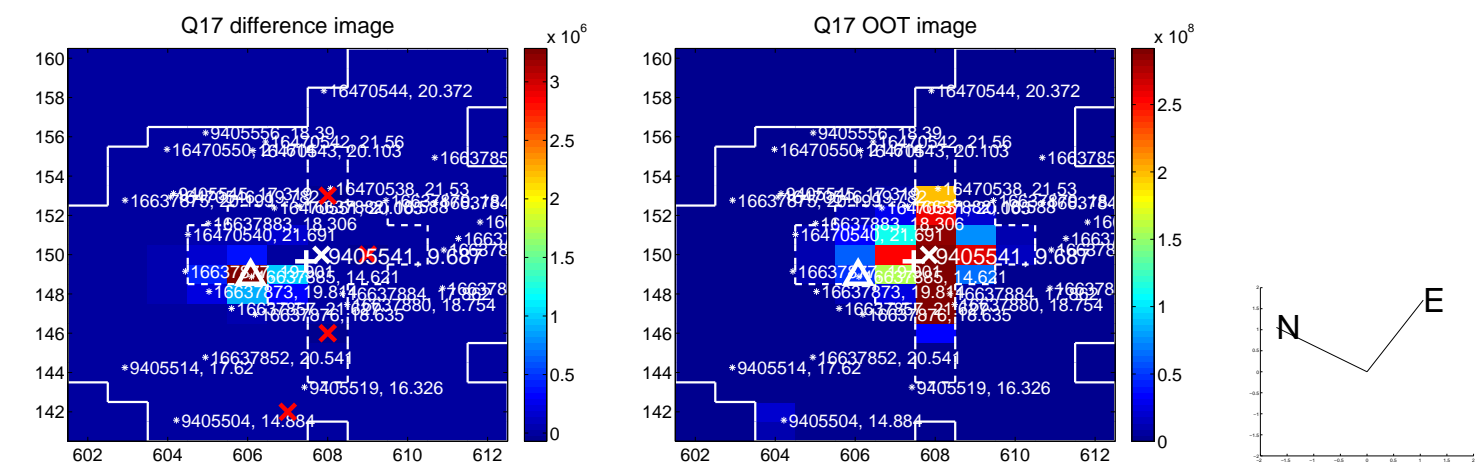
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

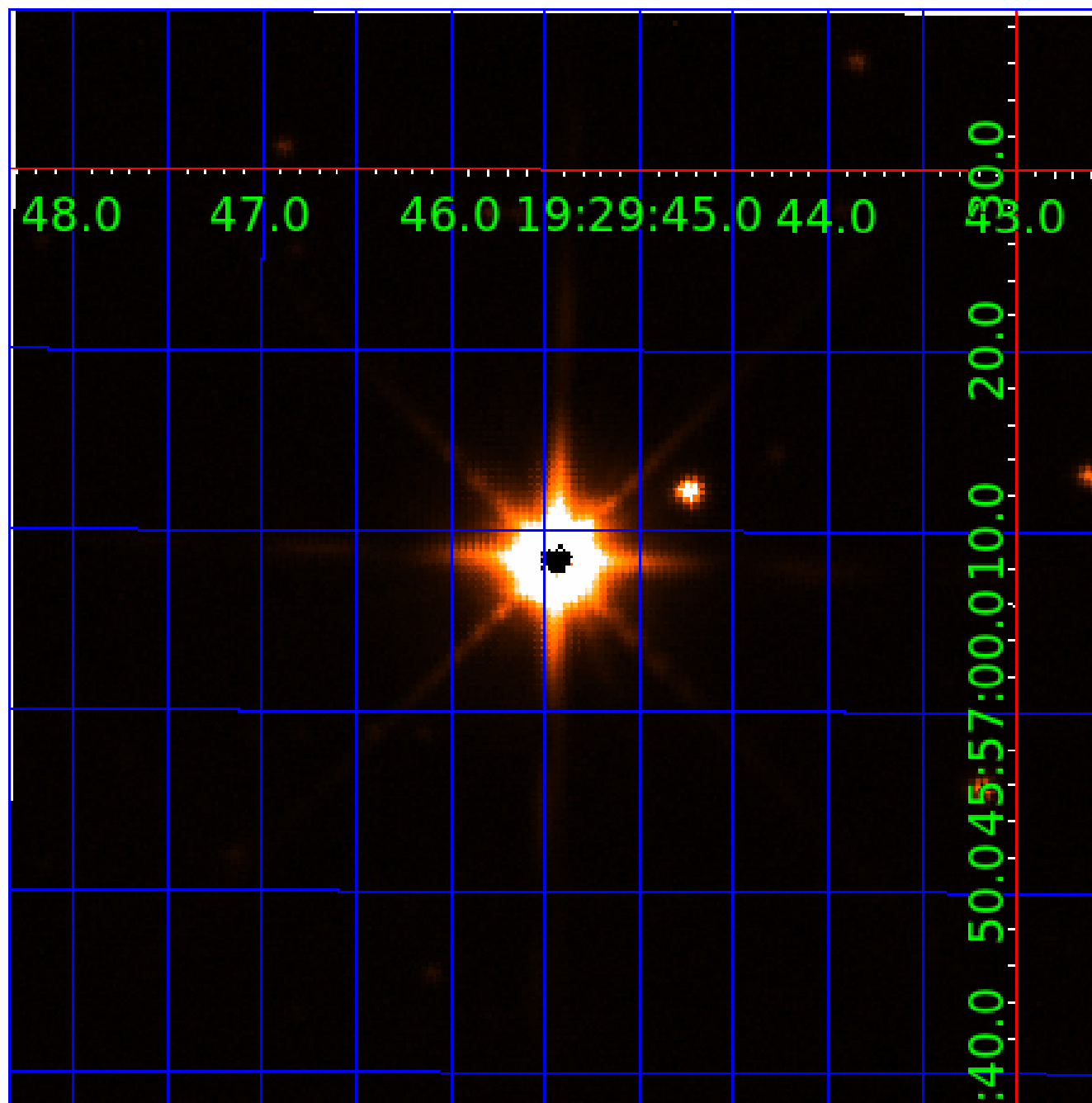


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009405541

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})
009405541-01	OBS	3788.01	11.105253	137.634699	1212.0	4.032	711.0	505.1	116.97	3306	895.27	0.00
009405541-02	OBS	No	11.105244	132.082196	117.5	3.295	71.3	68.8	116.97	3306	116.22	0.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009405541-01	OBS	FP	0.00	0	1	0	0	PLANET_IN_STAR—MOD_SEC_DV—DEEP_V_SHAPED—HAS_SEC_TCE—SEASONAL_DEPTH_DV—SEASONAL_DEPTH_ALT—CENT_SATURATED
009405541-02	OBS	FP	0.00	1	1	0	0	IS_SEC_TCE—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.

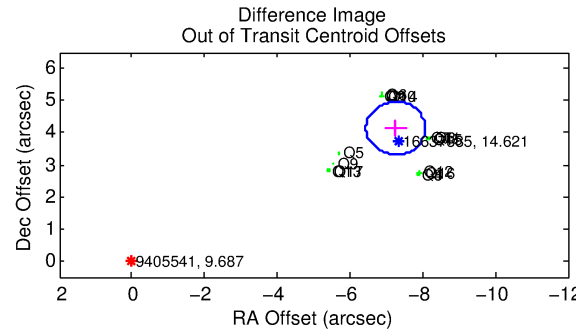
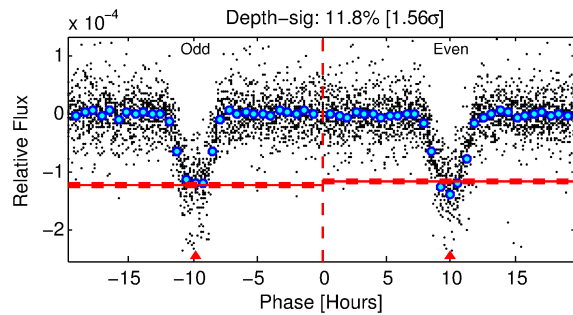
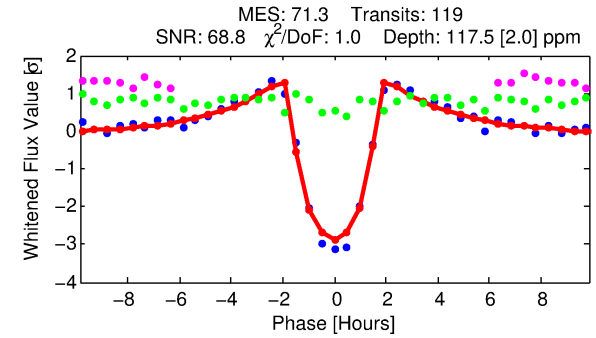
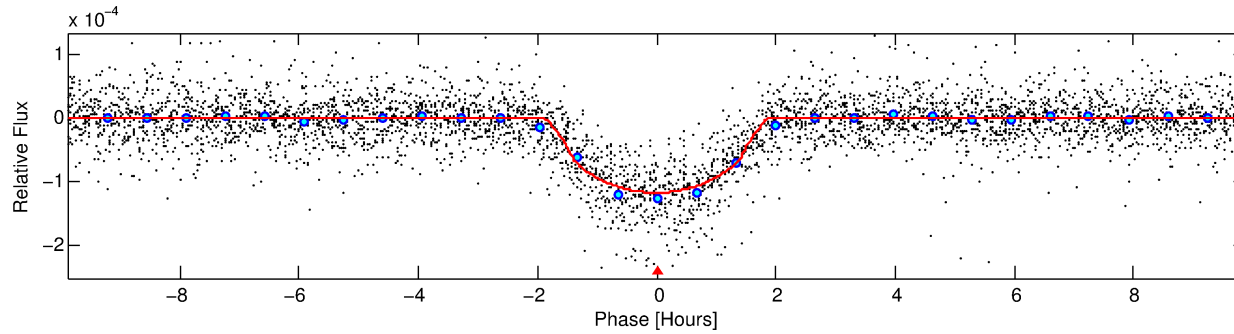
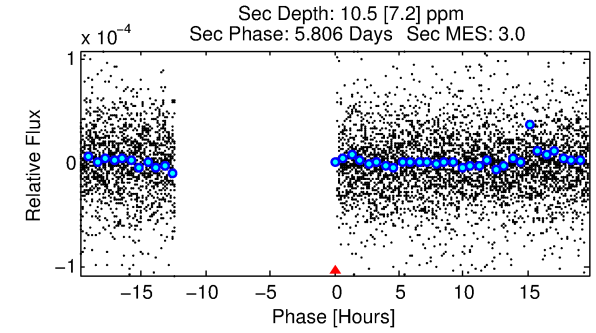
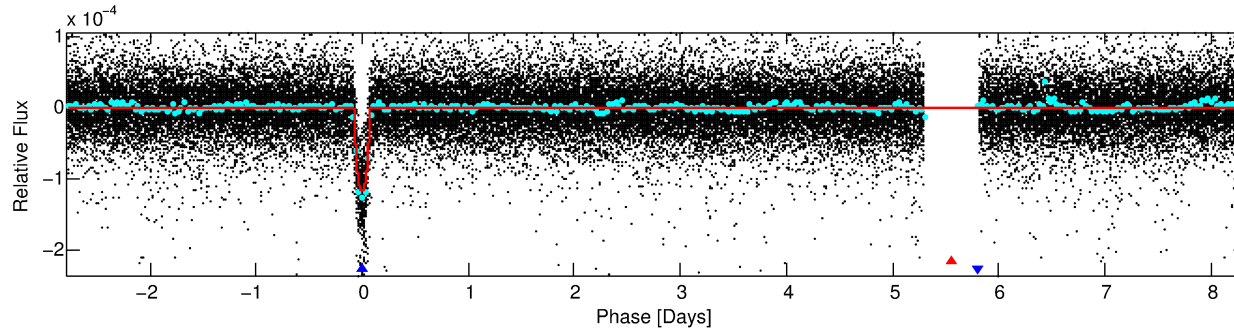
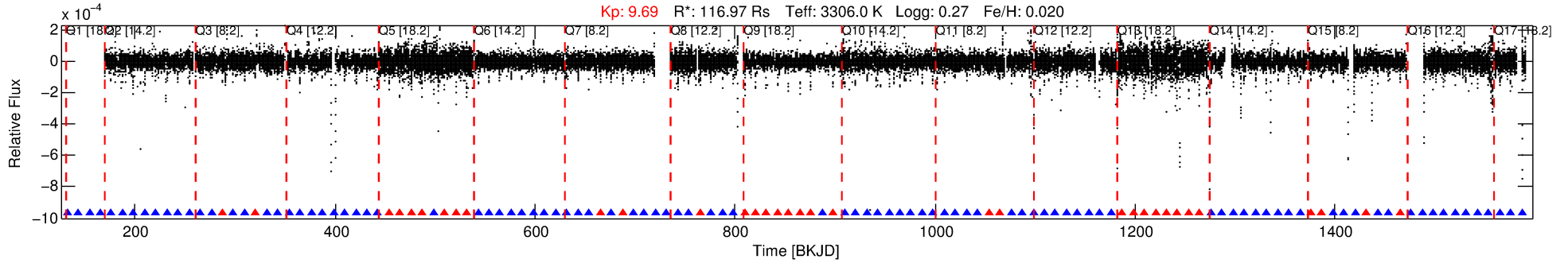
Ephemeris Match Information For 009405541-02

No Significant Match Found

DV One-Page Summary

KIC: 9405541 Candidate: 2 of 2 Period: 11.105 d
KOI: K03788 Corr: No Ephemeris Match

Kp: 9.69 R*: 116.97 Rs Teff: 3306.0 K Logg: 0.27 Fe/H: 0.020



DV Fit Results:

Period = 11.10524 [0.00001] d
Epoch = 132.0822 [0.0010] BKJD
Rp/R* = 0.0091 [0.0008]
a/R* = 25.99 [4.59]
b = 0.01 [14.74]
Seff = N/A
Teq = N/A
Rp = 116.22 [34.53] Re
a = N/A
Ag = N/A
Teffp = N/A

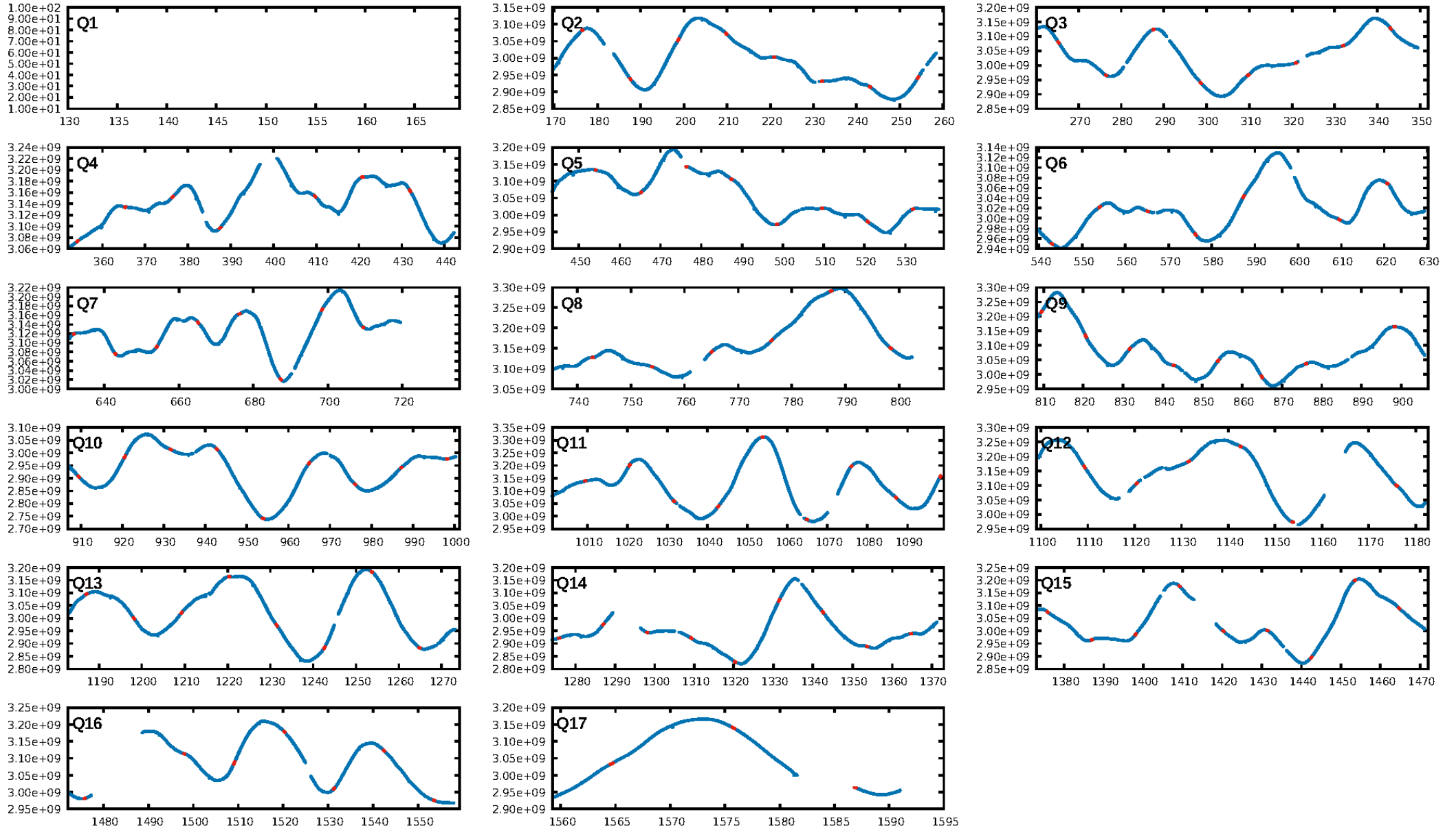
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.0% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 0.71 [82/116]
GhostDiagnostic-chr: N/A
Centroid-sig: 0.0%
Centroid-so: 16.645 arcsec [27.99σ]
OotOffset-rm: 8.352 arcsec [30.53σ]
KicOffset-rm: 8.320 arcsec [111.37σ]
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]

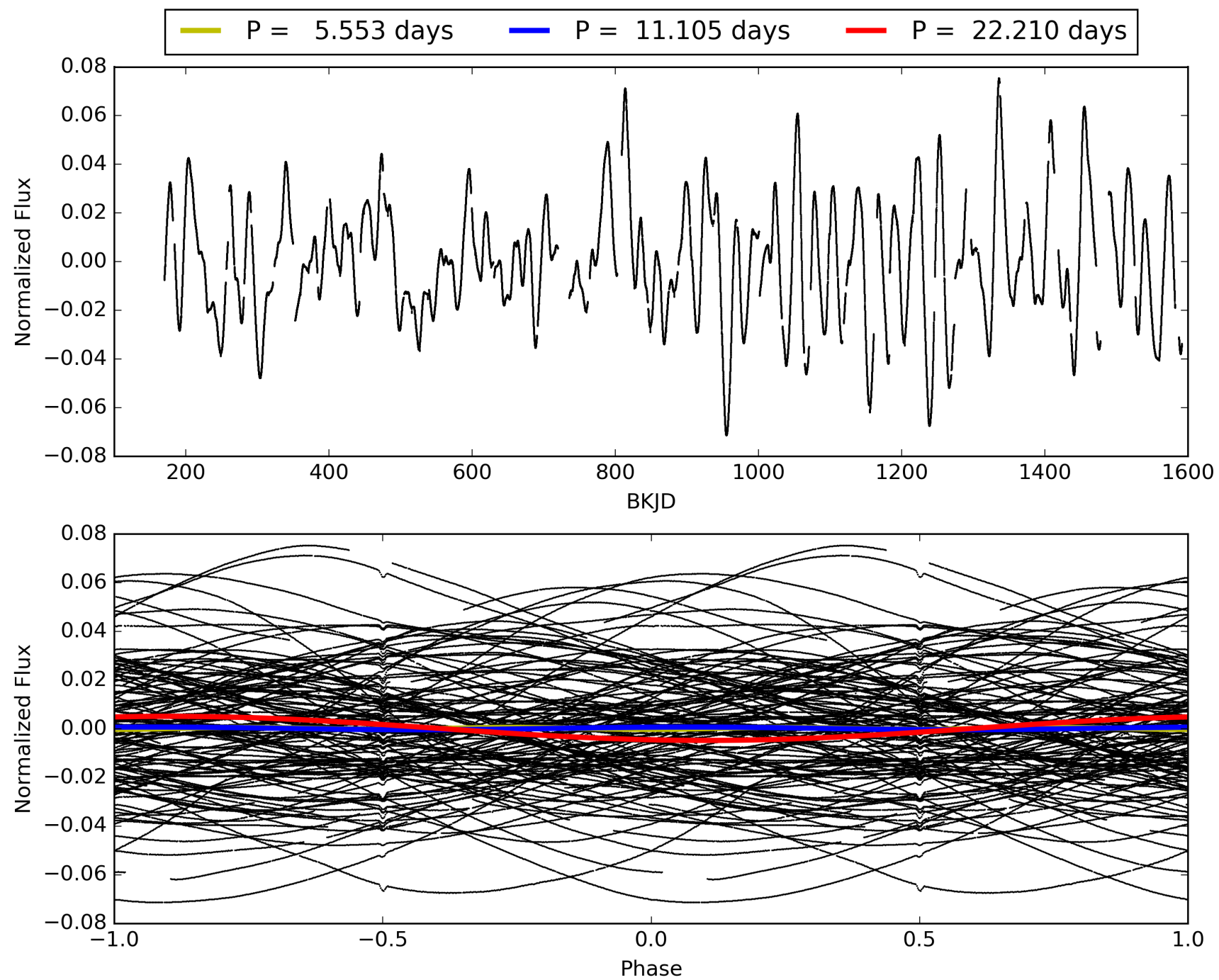
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31-Jan-2016 00:52:47 Z

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

TCE 009405541-02, PDC Light Curves

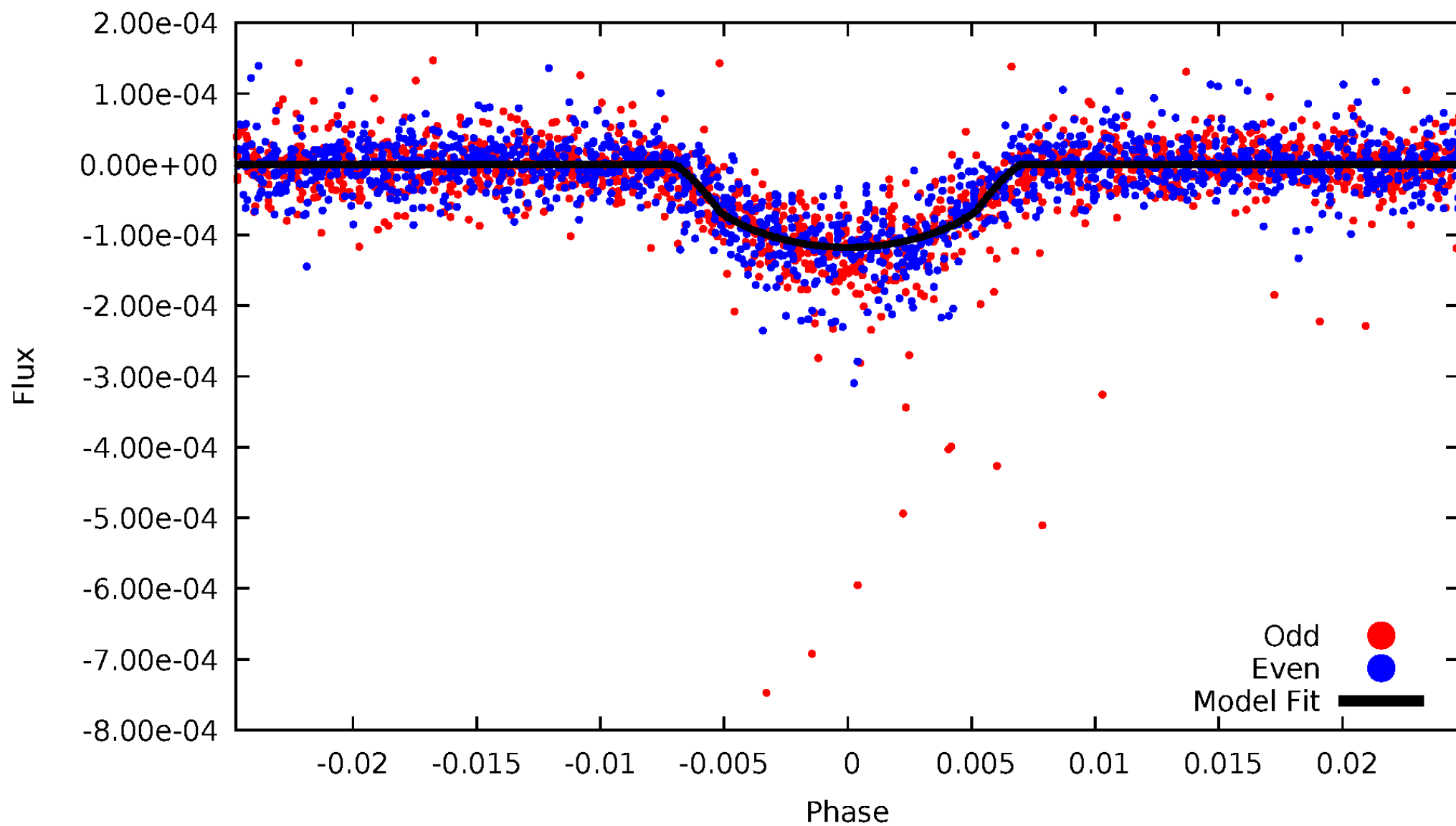


TCE 009405541-02



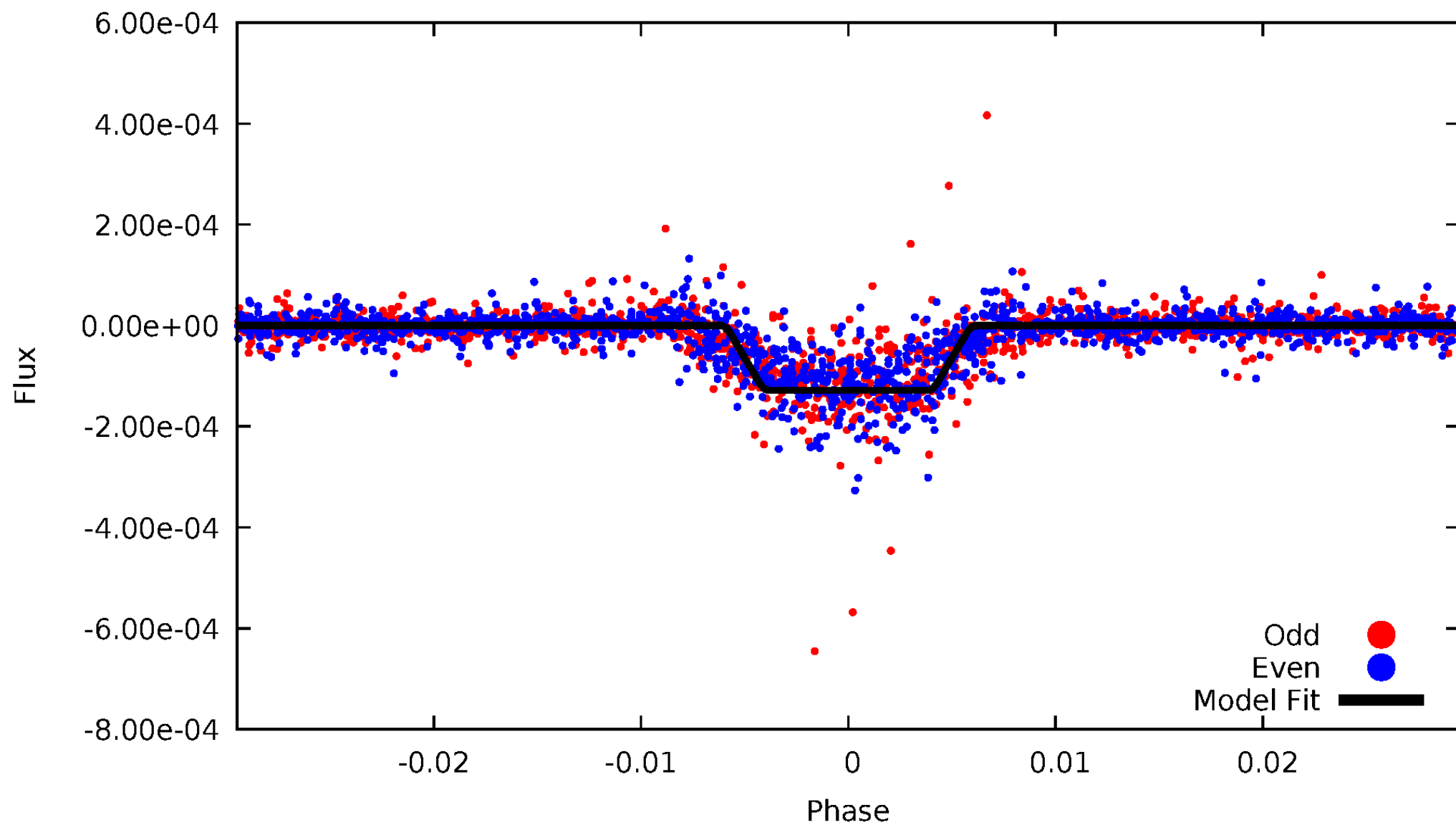
DV Odd/Even

TCE 009405541-02



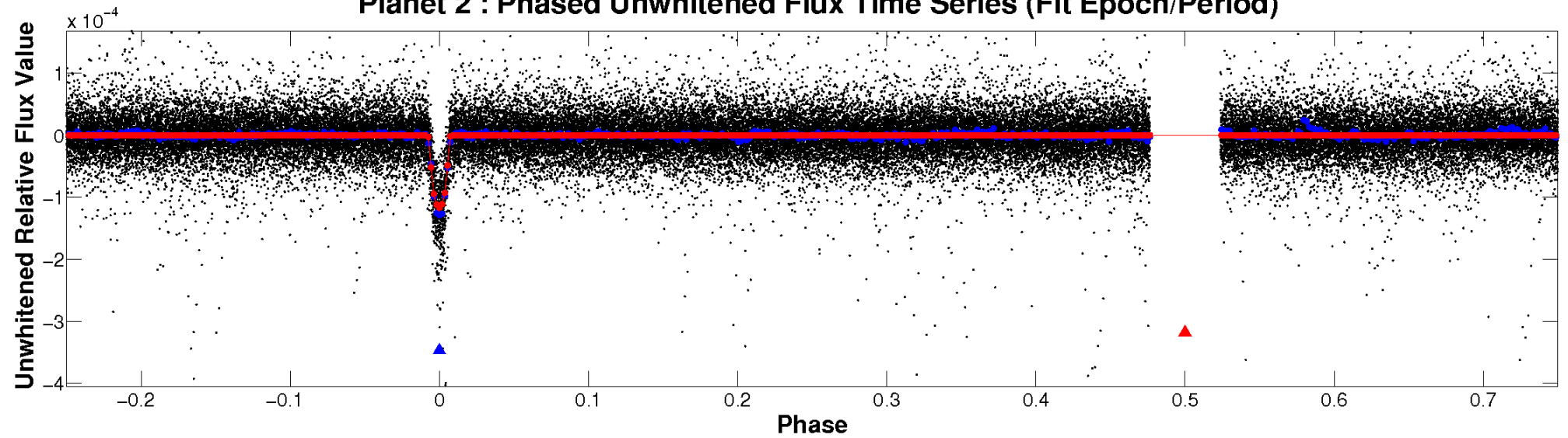
ALT Odd/Even

TCE 009405541-02

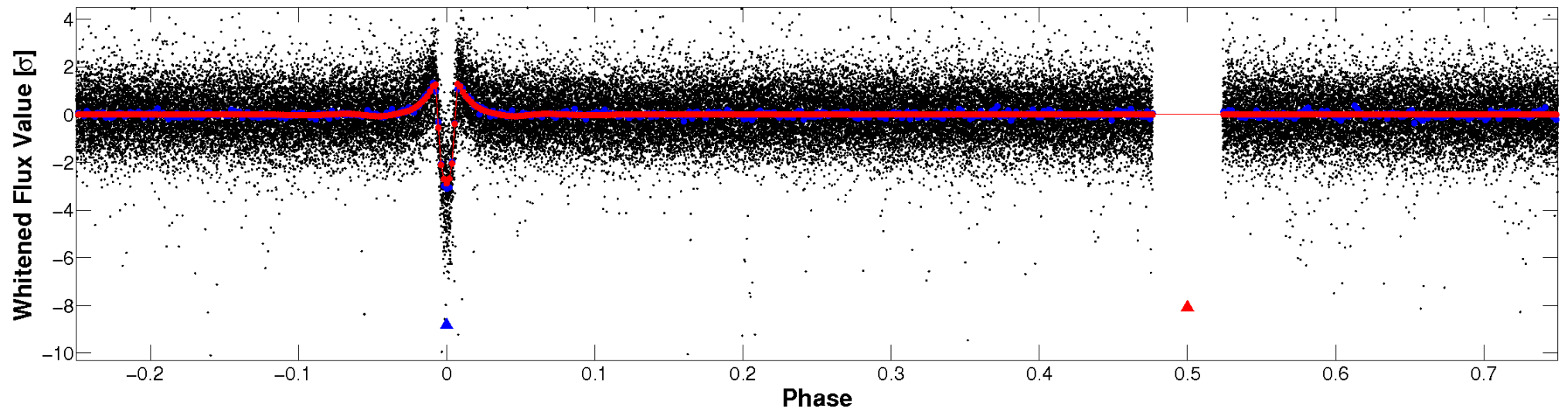


Non-Whitened Vs. Whitened Light Curve

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

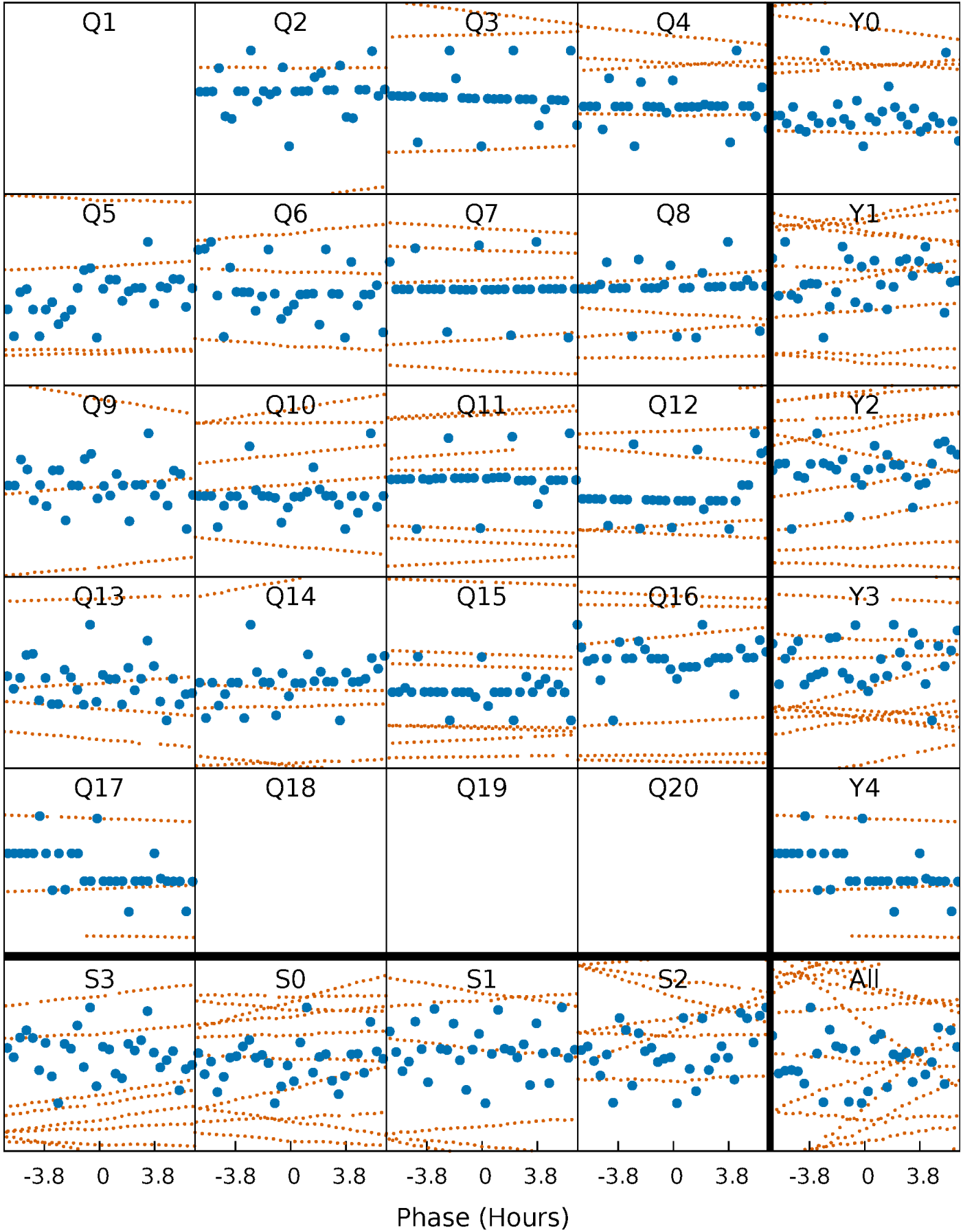


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



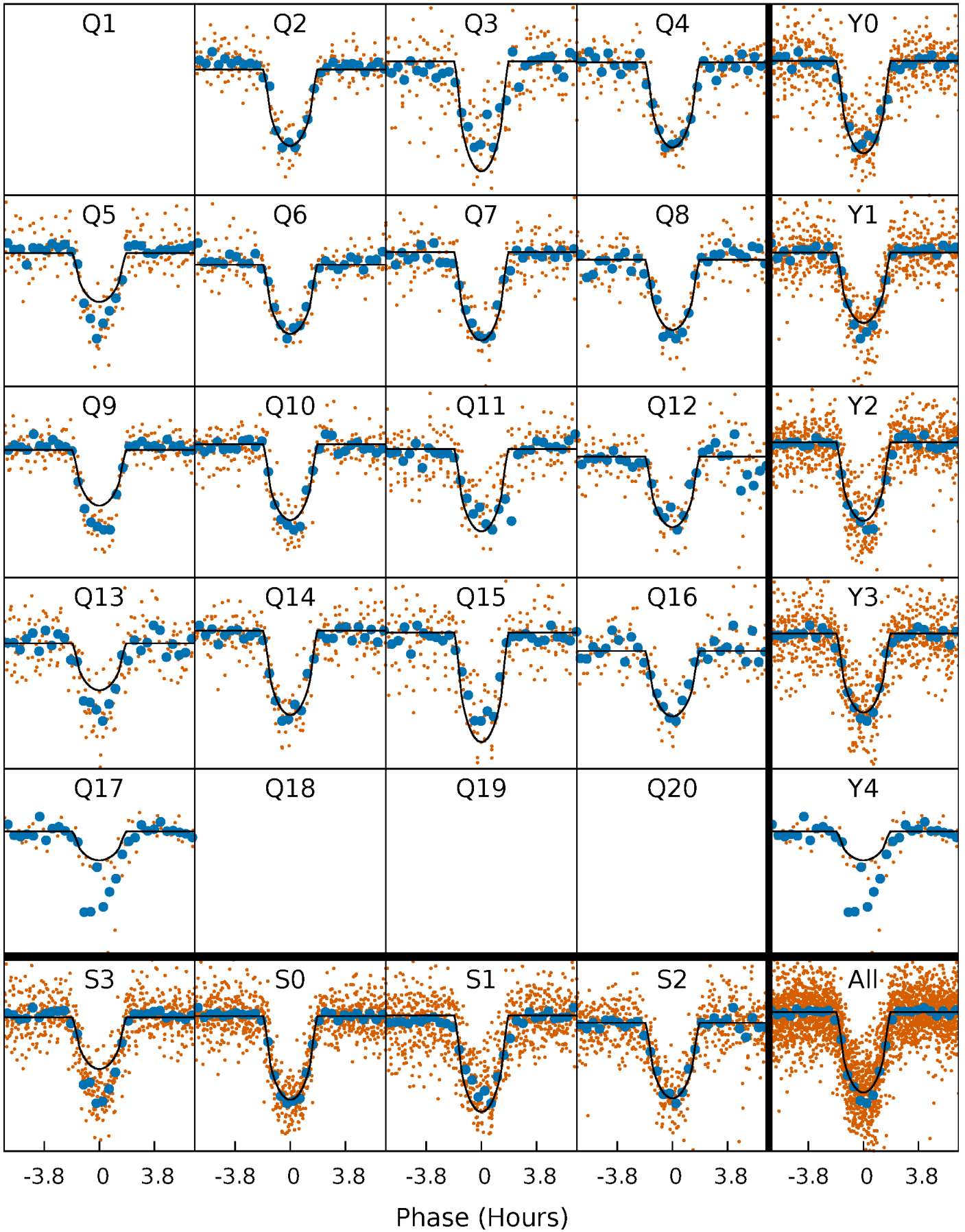
PDC Quarter-Phased Transit Curves

TCE 009405541-02 P= 11.105244 Days $T_0=132.082196$ (BKJD)



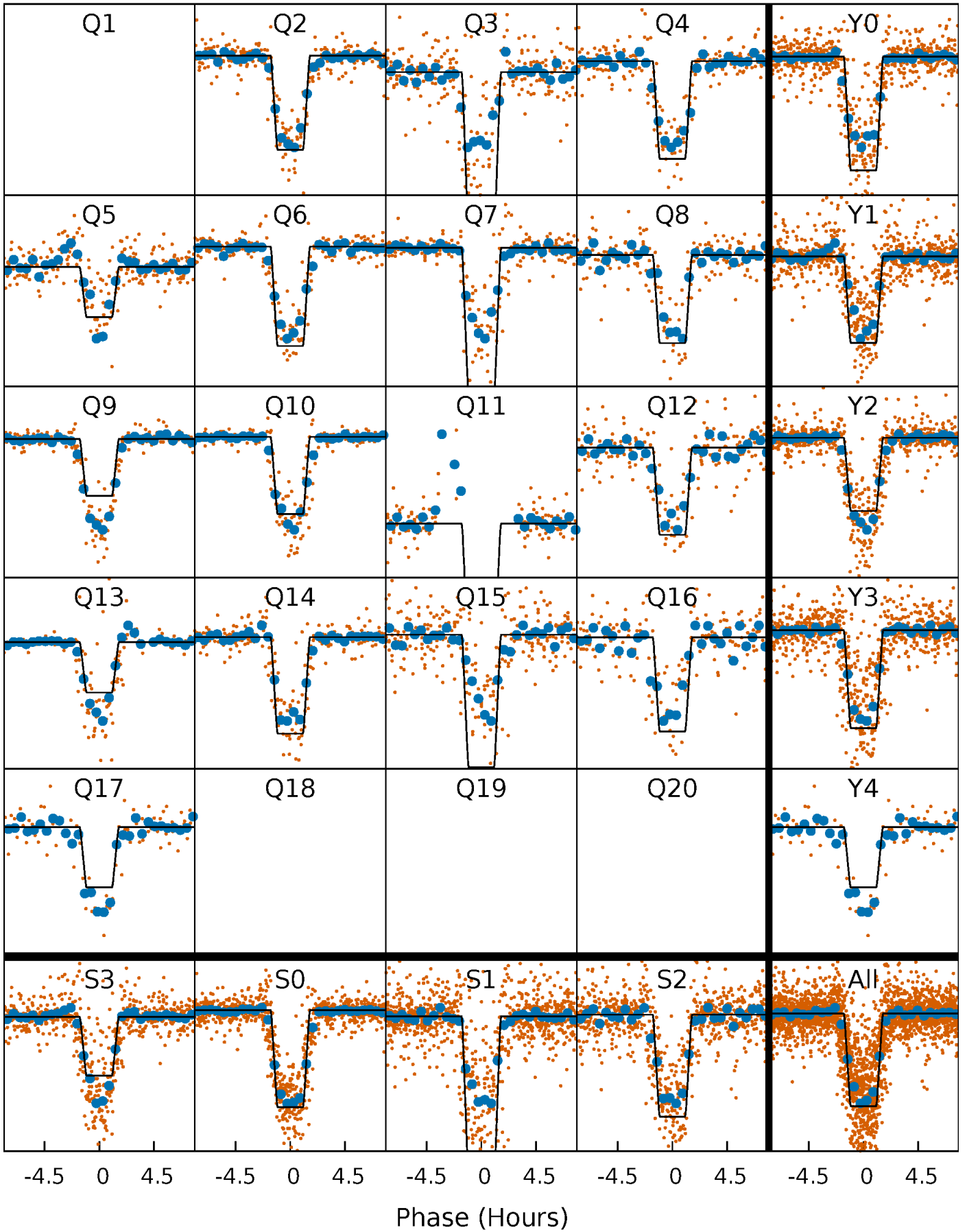
DV Quarter-Phased Transit Curves

TCE 009405541-02 P= 11.105244 Days $T_0=132.082196$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

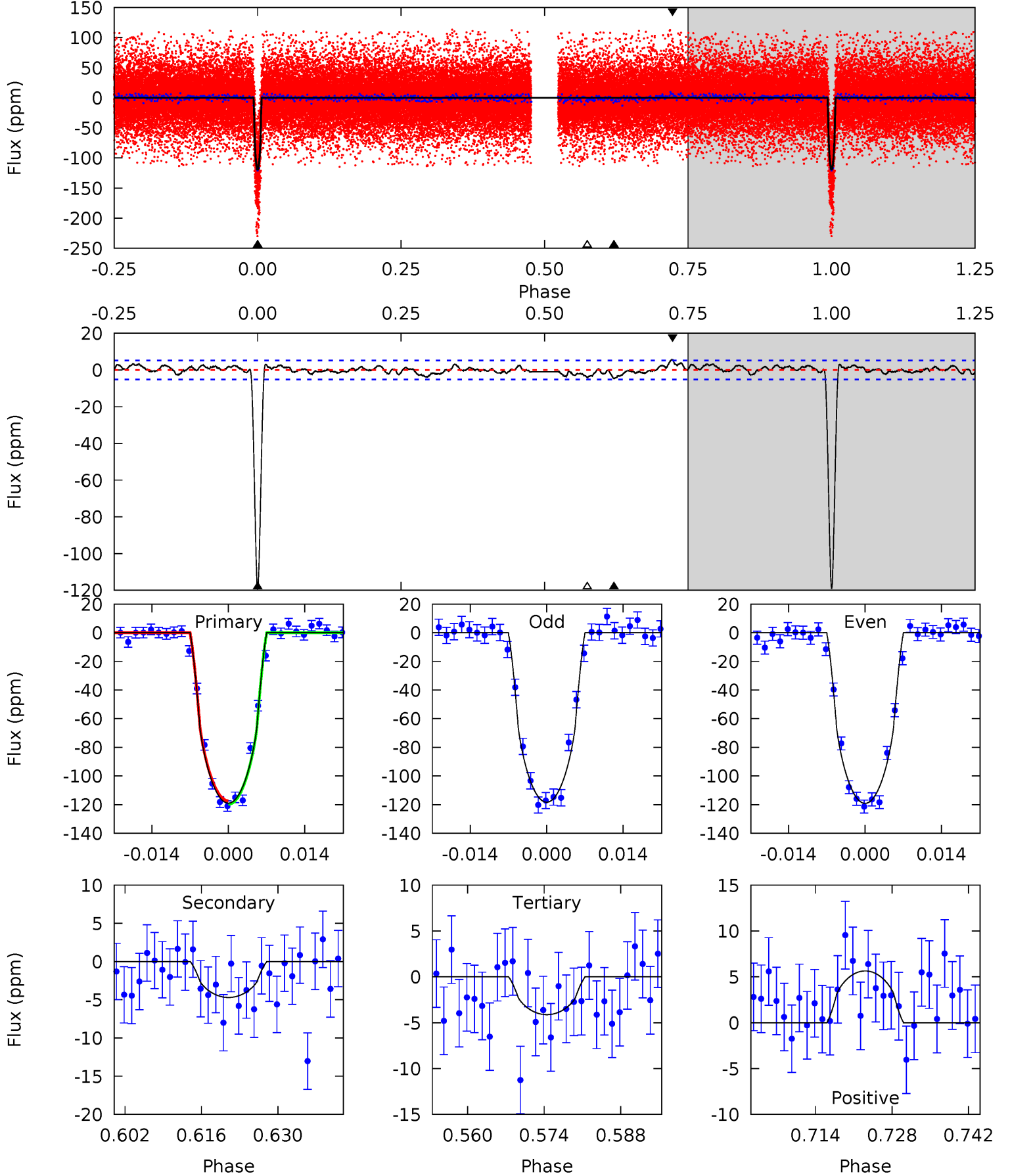
TCE 009405541-02 P= 11.105211 Days $T_0=132.084655$ (BKJD)



DV Model-Shift Uniqueness Test

009405541-02, $P = 11.105244$ Days, $E = 132.082196$ Days

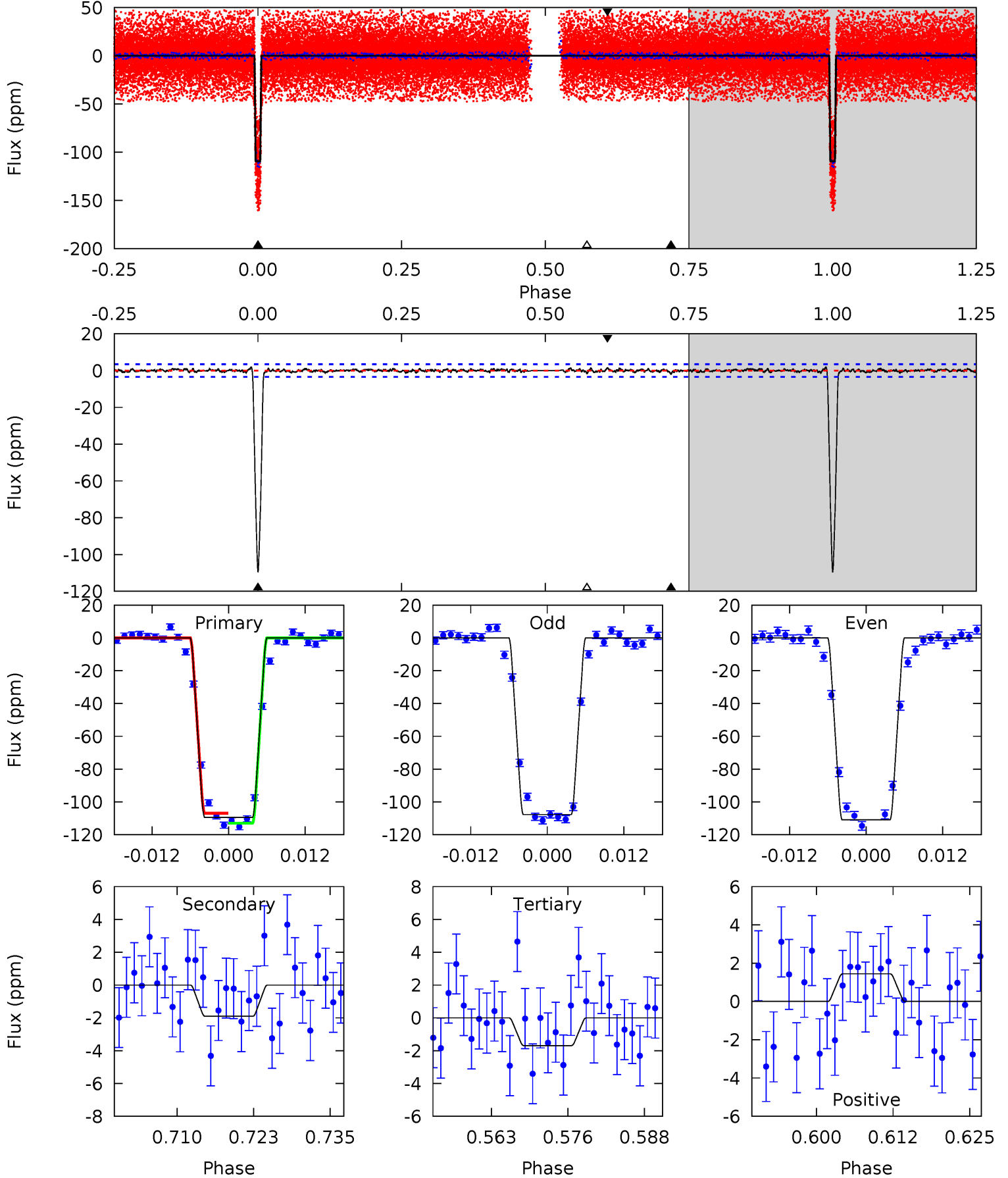
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
114.5	4.52	3.97	5.43	4.96	2.46	1.61	110.5	109.0	0.55	-0.91	0.39	1.08	0.05	1.12



Alt Model-Shift Uniqueness Test

009405541-02, P = 11.105211 Days, E = 132.084655 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
158.6	2.76	2.45	2.09	4.99	2.50	0.71	156.2	156.5	0.31	0.67	2.28	1.07	0.02	4.43



Stellar Parameters For KIC 009405541

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	3306^{+81}_{-73}	$0.273^{+0.208}_{-0.112}$	$0.020^{+0.250}_{-0.150}$	$116.965^{+33.091}_{-22.061}$	$0.935^{+0.373}_{-0.020}$	$0.000^{+0.000}_{-0.000}$
	+2%/-2%	+76%/-41%	+1250%/-750%	+28%/-19%	+40%/-2%	+89%/-40%
Source	SPE14	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 009405541-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-5 ± 1	$116.29^{+21.09}_{-16.96}$	7027^{+421}_{-467}	-4884^{+294}_{-272}	$0.002^{+0.001}_{-0.001}$
Alt.	-2 ± 1	$144.87^{+24.12}_{-20.51}$	7051^{+424}_{-452}	-4899^{+279}_{-287}	$0.000^{+0.000}_{-0.000}$

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

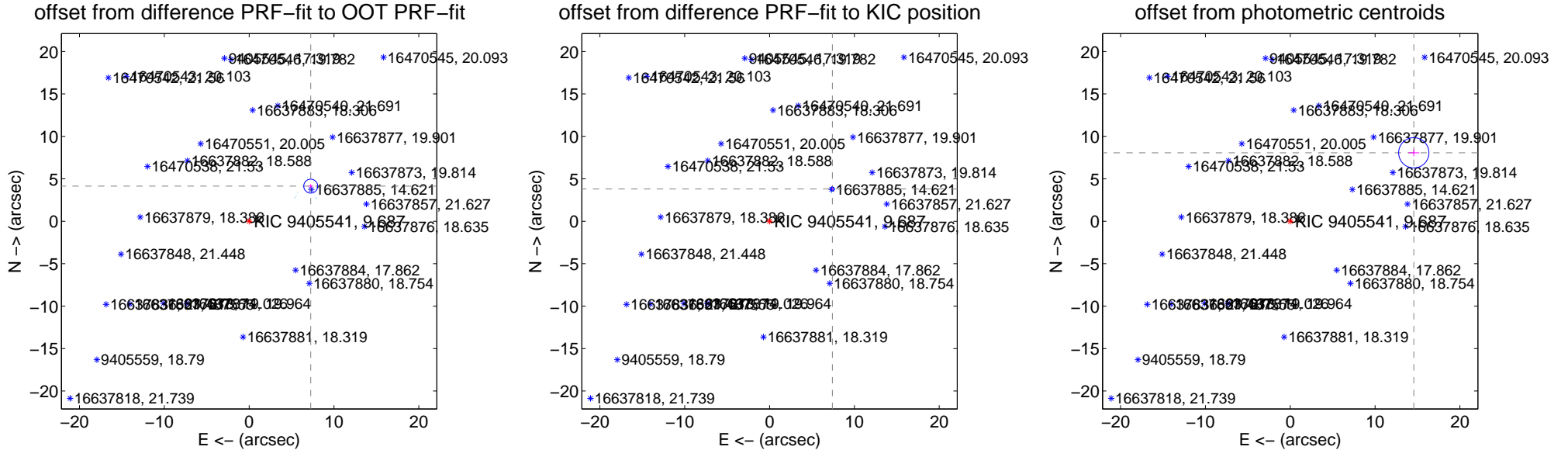
DV Centroid Data

Supplemental centroid analysis for 009405541-02. **Kepler magnitude: 9.69.** Transit SNR 68.77

There are 16 quarters with good PRF difference image offsets

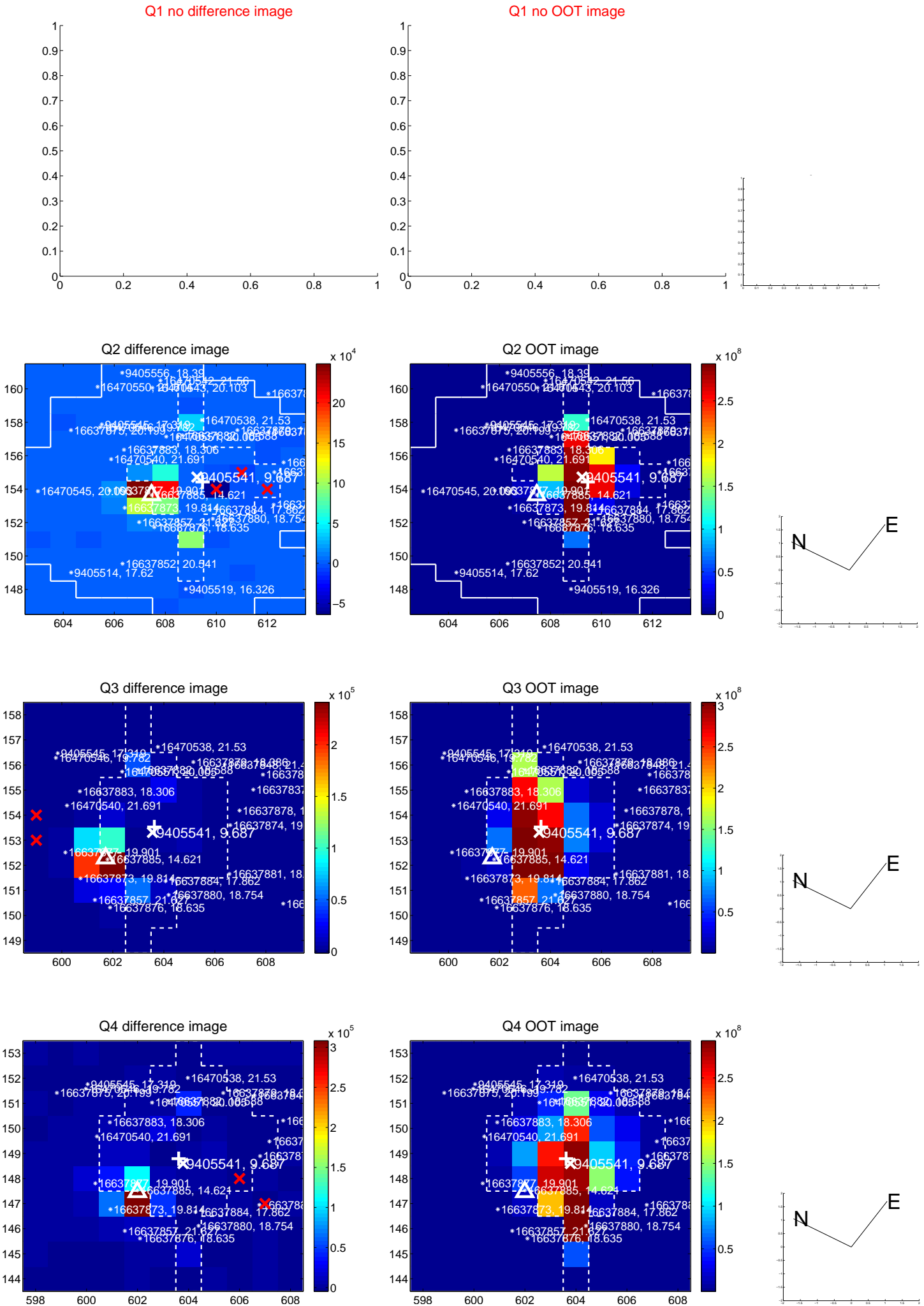
The direct PRF centroid is offset from the target star catalog position by about 1.99 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	8.352 ± 0.274	30.53	-7.255 ± 0.285	4.136 ± 0.231
PRF-fit source offset from KIC position	8.320 ± 0.075	111.37	-7.400 ± 0.073	3.803 ± 0.082
photometric centroid source offset	16.64 ± 0.59	27.99	-14.56 ± 0.64	8.06 ± 0.41

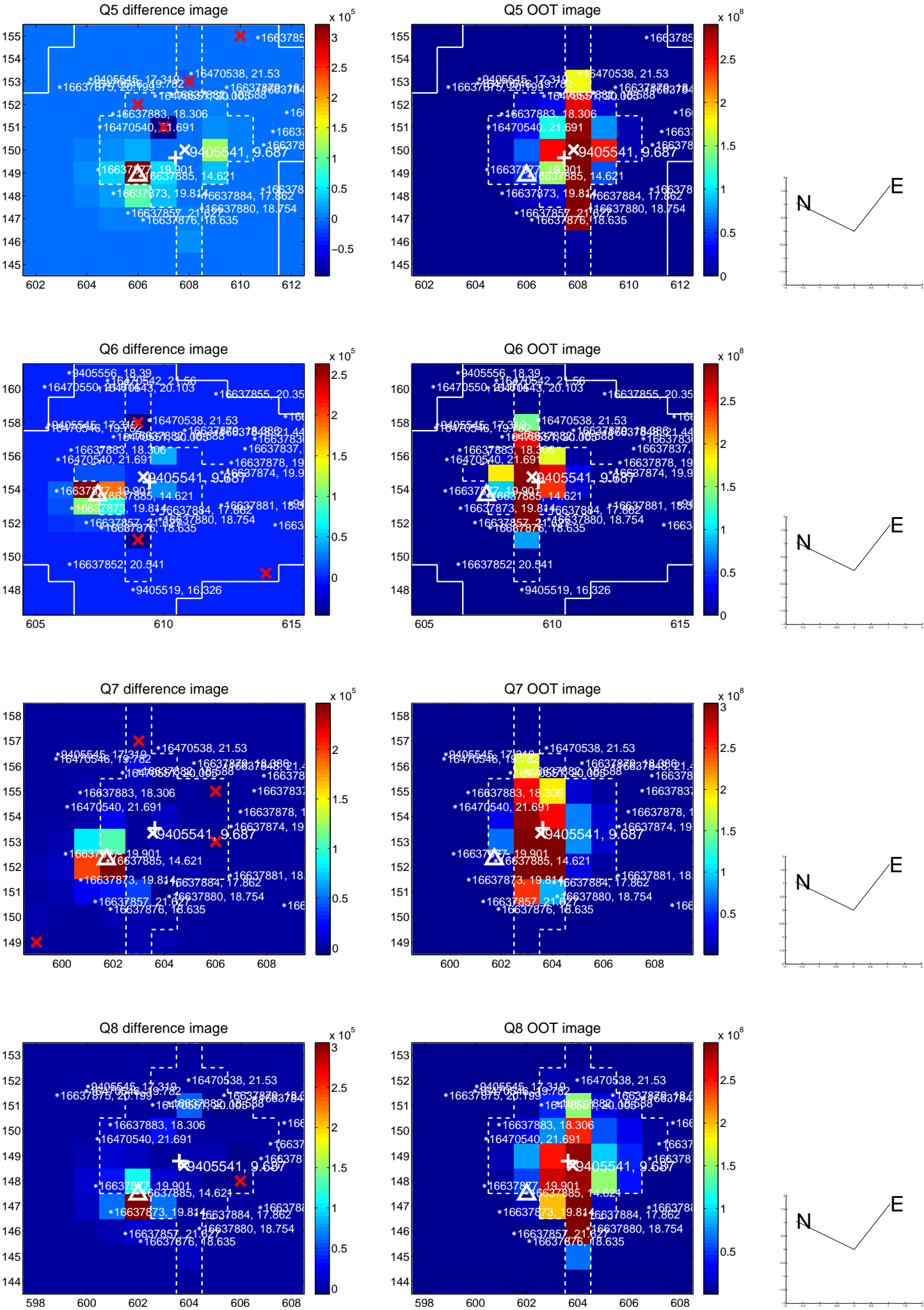


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

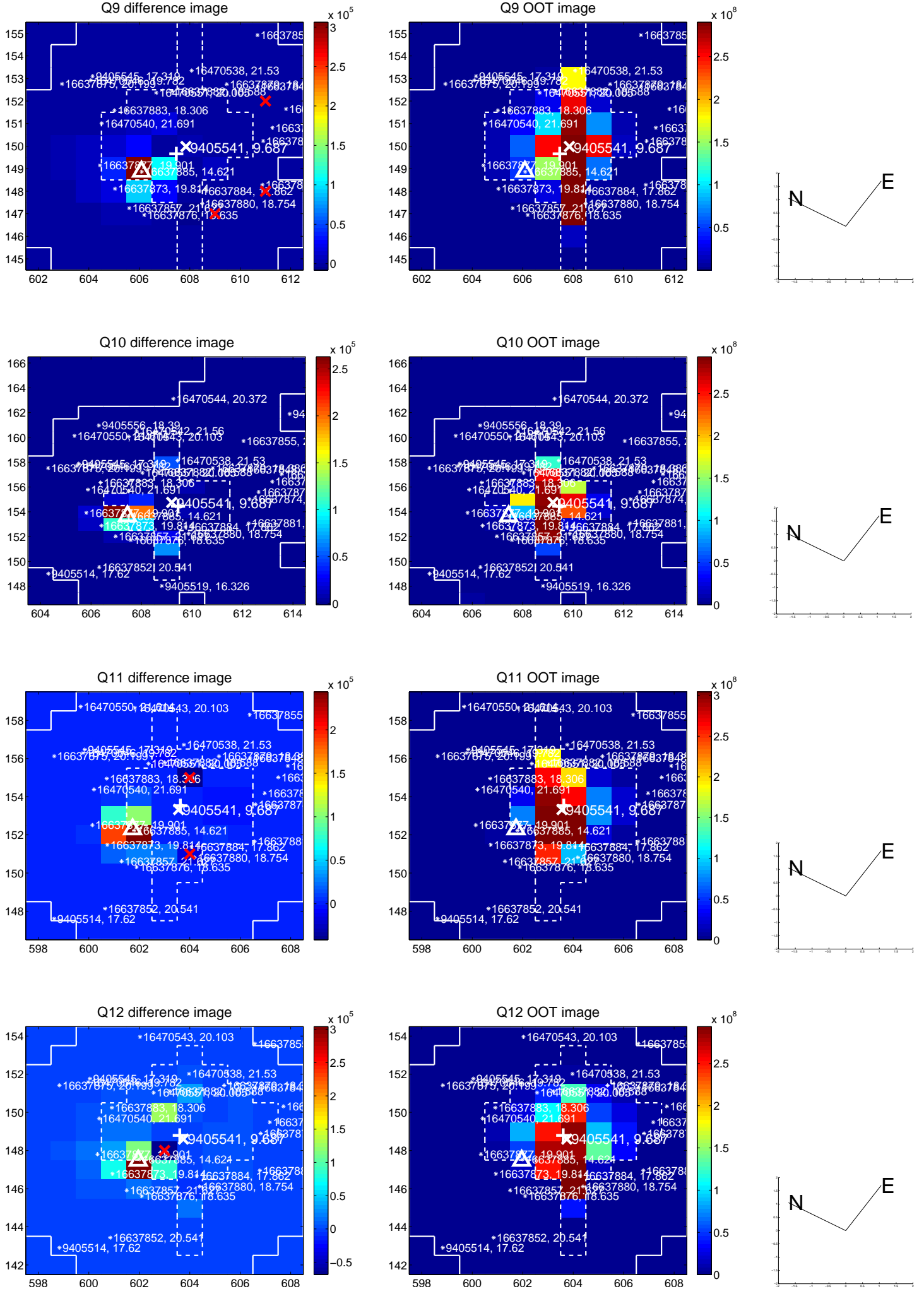
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



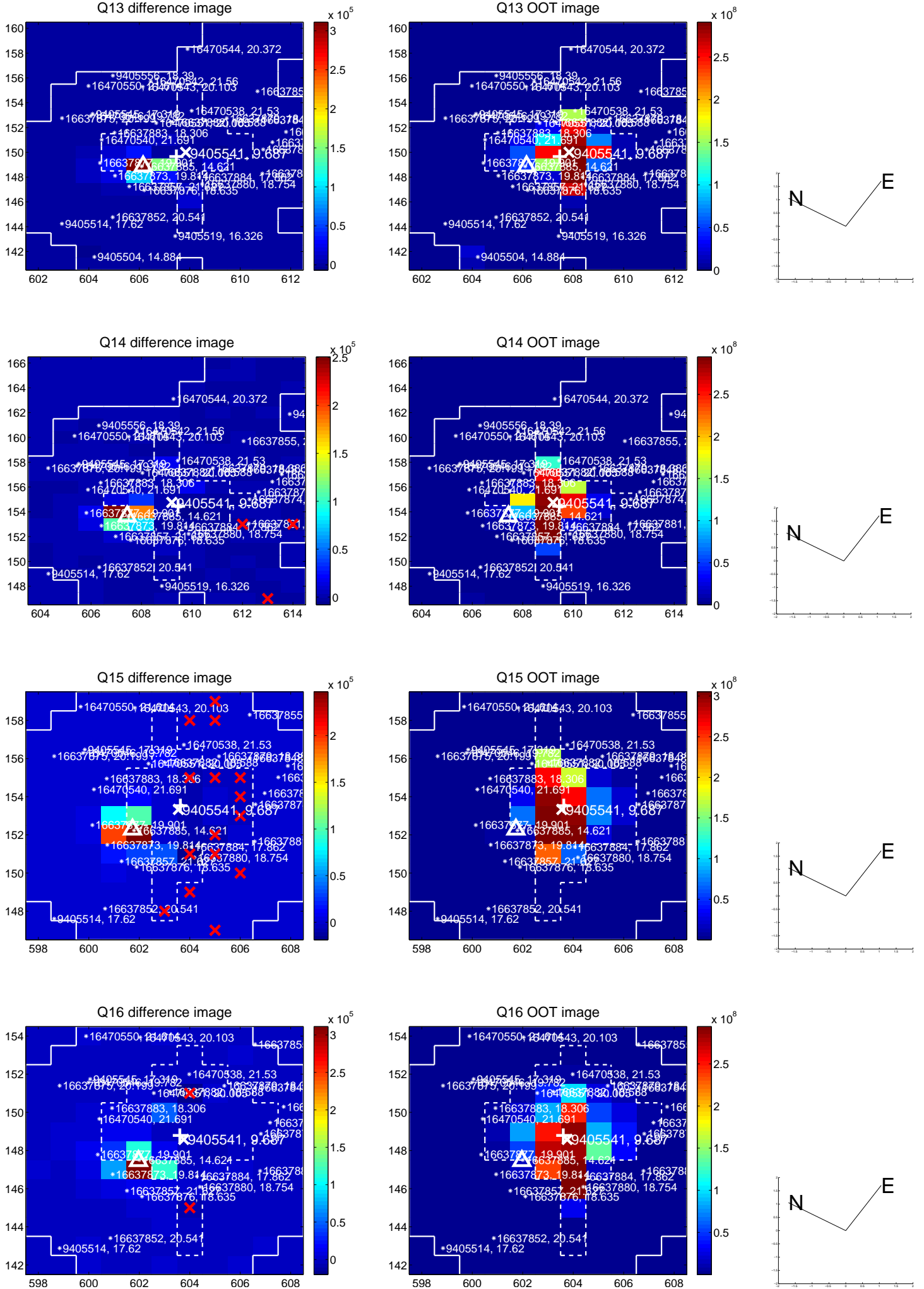
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



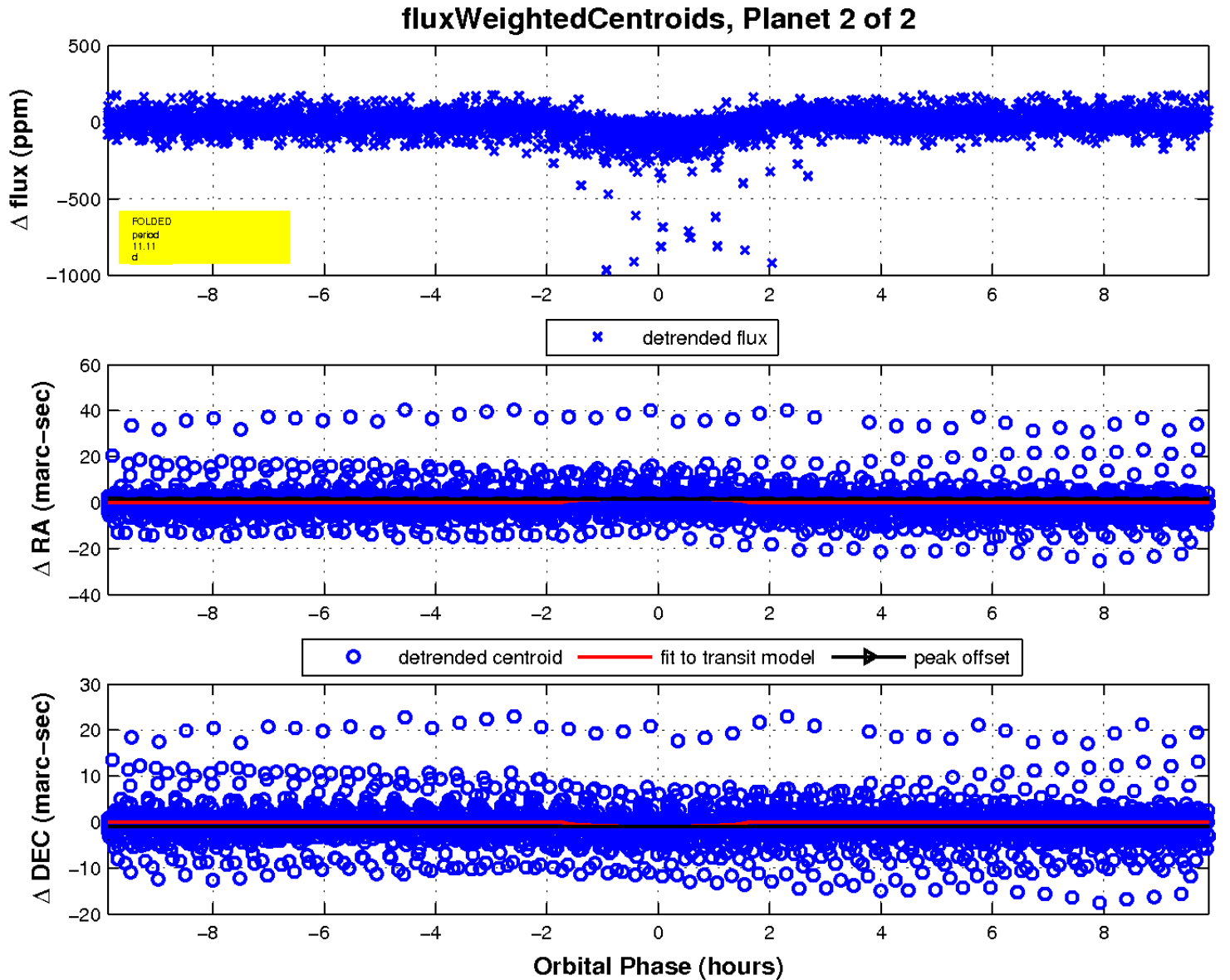
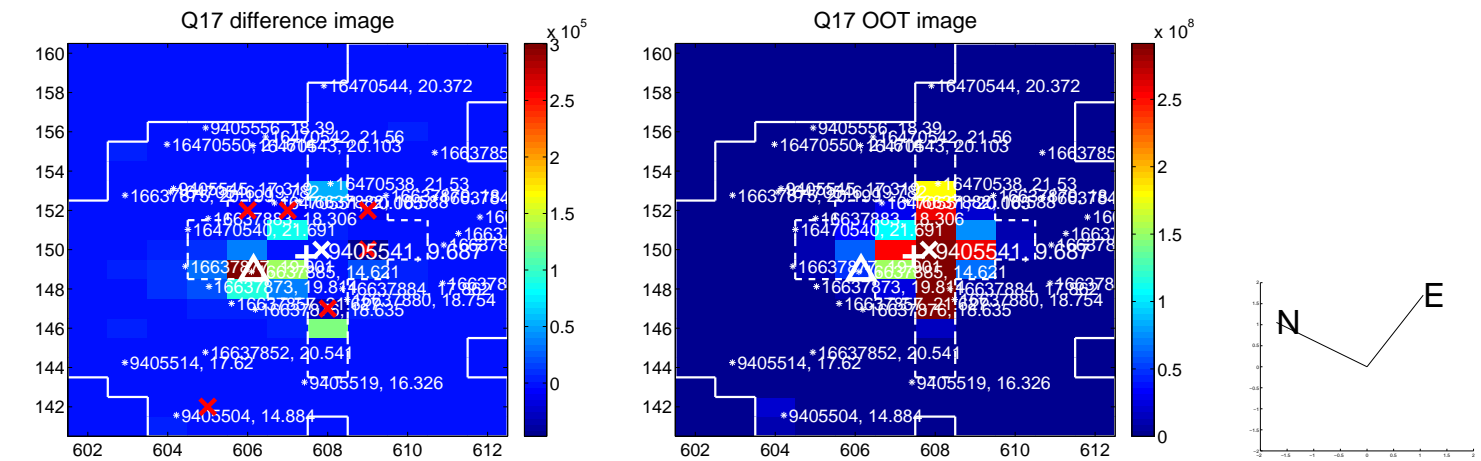
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

