

KIC 005640438

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})
005640438-01	OBS	No	0.997320	132.079880	181.3	6.317	10.5	12.9	1.21	6847	3.06	6632.69
005640438-03	OBS	No	109.924969	139.747262	1454.6	2.581	10.7	6.7	1.21	6847	4.85	12.55
005640438-04	OBS	No	21.946630	150.794527	1499.4	17.781	9.2	8.0	1.21	6847	5.51	107.56
005640438-05	OBS	No	71.365018	145.448396	1545.5	10.485	8.5	7.3	1.21	6847	5.87	22.33
005640438-07	OBS	No	99.907008	170.355191	320.7	4.500	8.7	-1.0	1.21	6847	2.19	14.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005640438-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
005640438-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
005640438-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT
005640438-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005640438-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

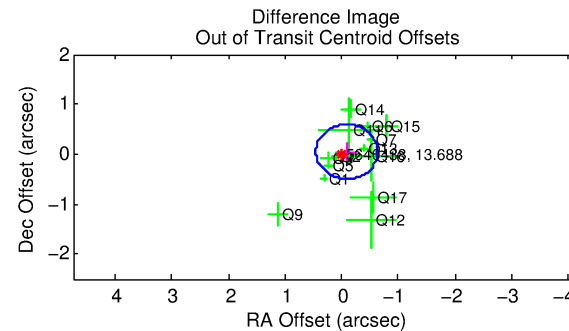
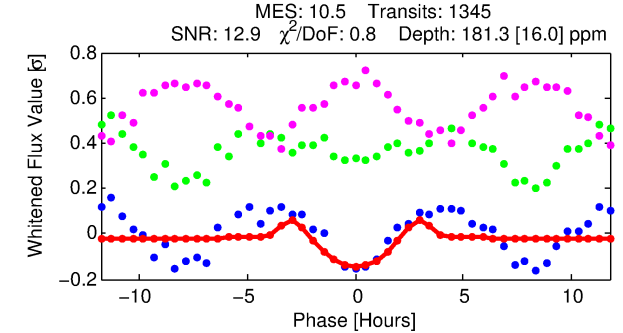
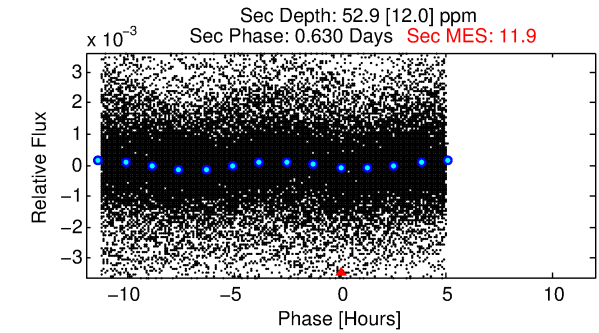
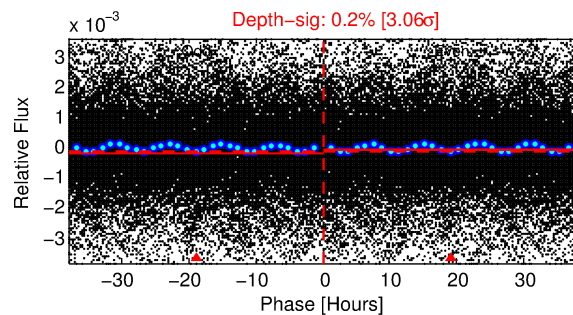
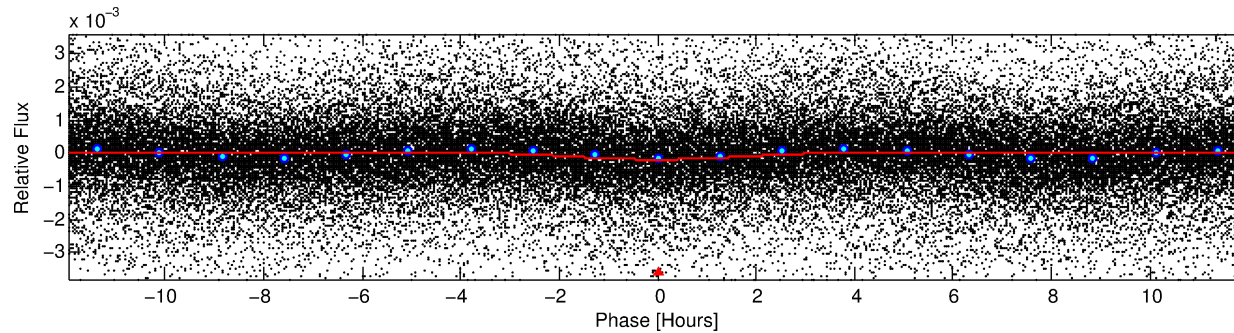
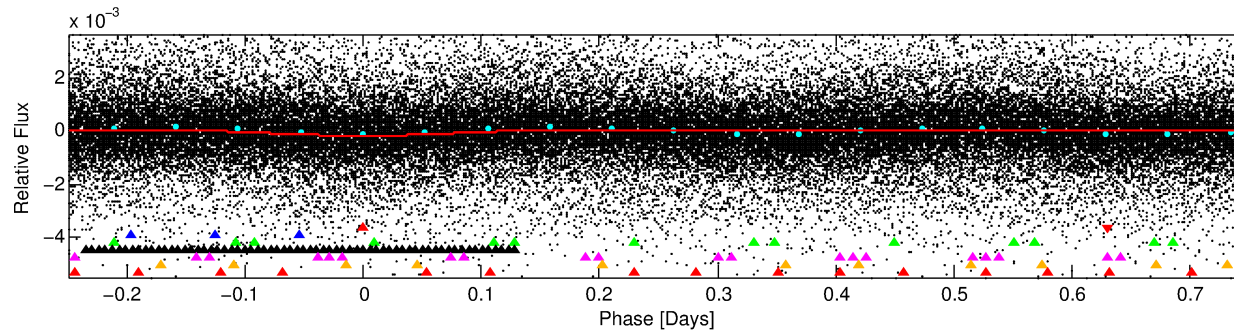
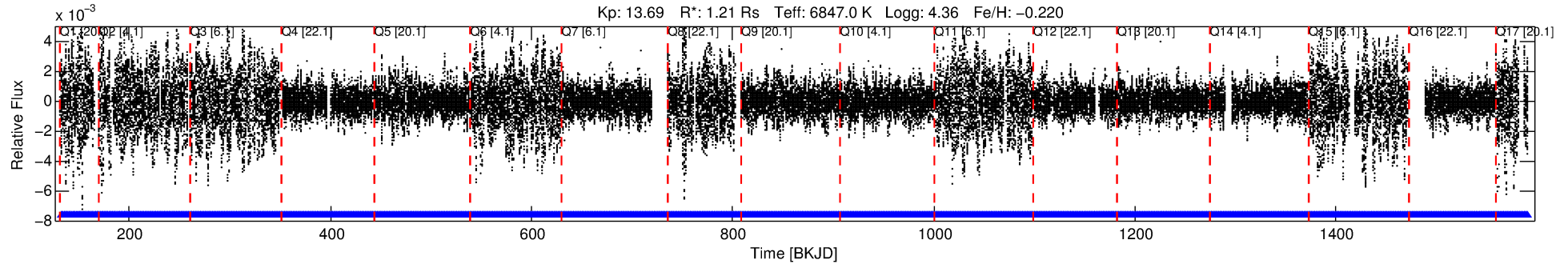
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005640438-01

No Significant Match Found

DV One-Page Summary

KIC: 5640438 Candidate: 1 of 7 Period: 0.997 d



DV Fit Results:

Period = 0.99732 [0.00001] d
Epoch = 132.0799 [0.0037] BKJD
Rp/R* = 0.0231 [0.0114]
a/R* = 1.04 [0.01]
b = 1.00 [0.02]
Seff = 6632.69 [2989.14]
Teq = 2301 [259] K
Rp = 3.06 [1.89] Re
a = 0.0209 [0.0063] AU
Ag = 1.36 [1.49] [0.24σ]
Teffp = 3840 [980] K [1.52σ]

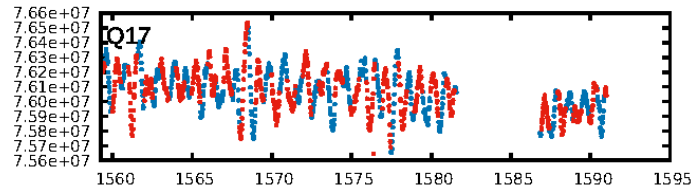
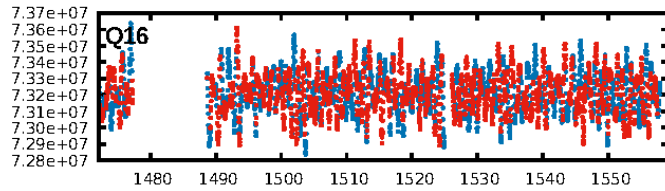
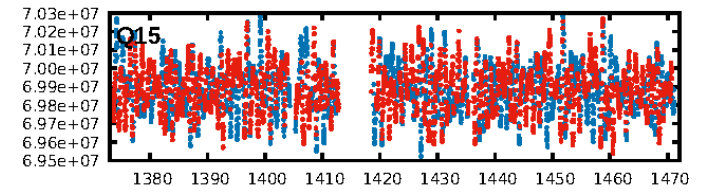
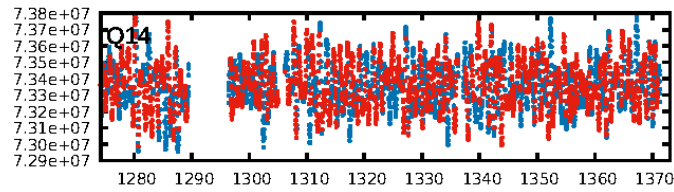
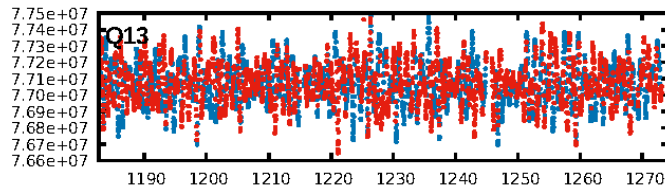
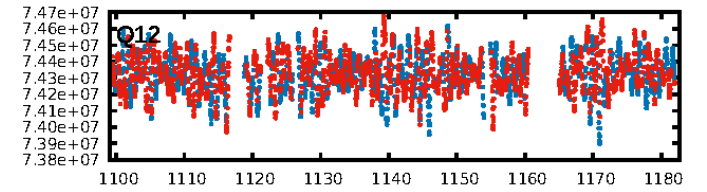
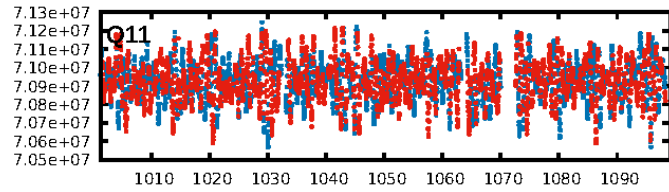
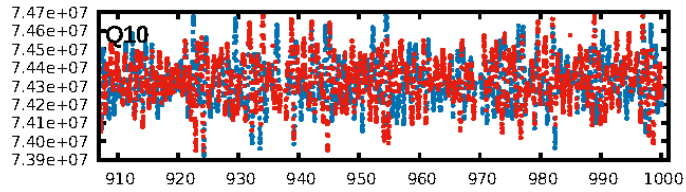
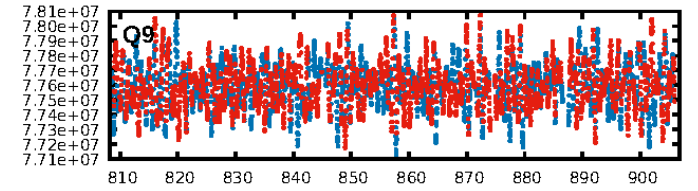
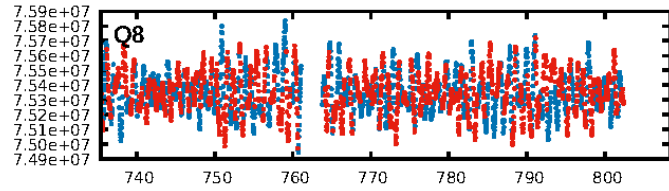
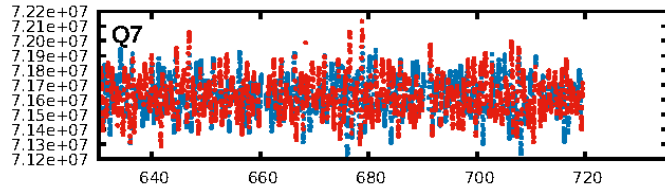
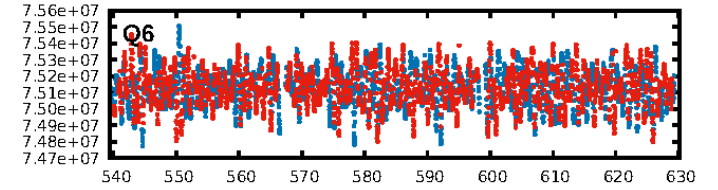
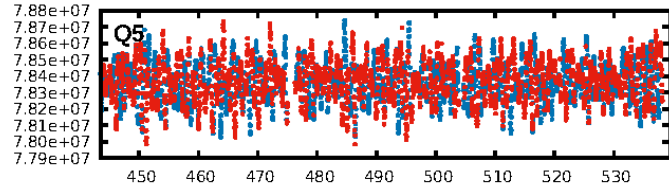
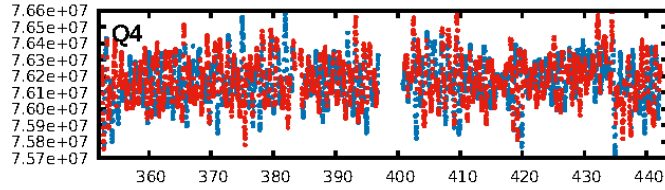
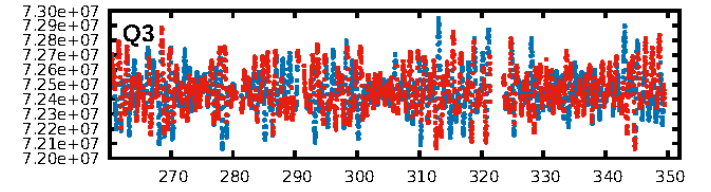
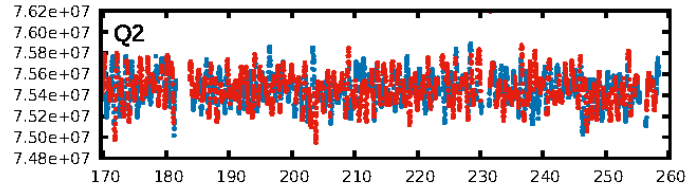
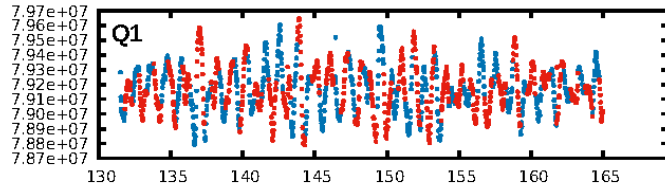
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [26.64σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1284/1284]
GhostDiagnostic-chr: 0.8254
Centroid-sig: 2.1%
Centroid-so: 0.868 arcsec [4.15σ]
OotOffset-rm: 0.100 arcsec [0.55σ]
KicOffset-rm: 0.249 arcsec [1.30σ]
OotOffset-st: 3/4/2/5 [14]
KicOffset-st: 3/4/2/5 [14]
DiffImageQuality-fgm: 0.86 [12/14]
DiffImageOverlap-fno: 1.00 [17/17]

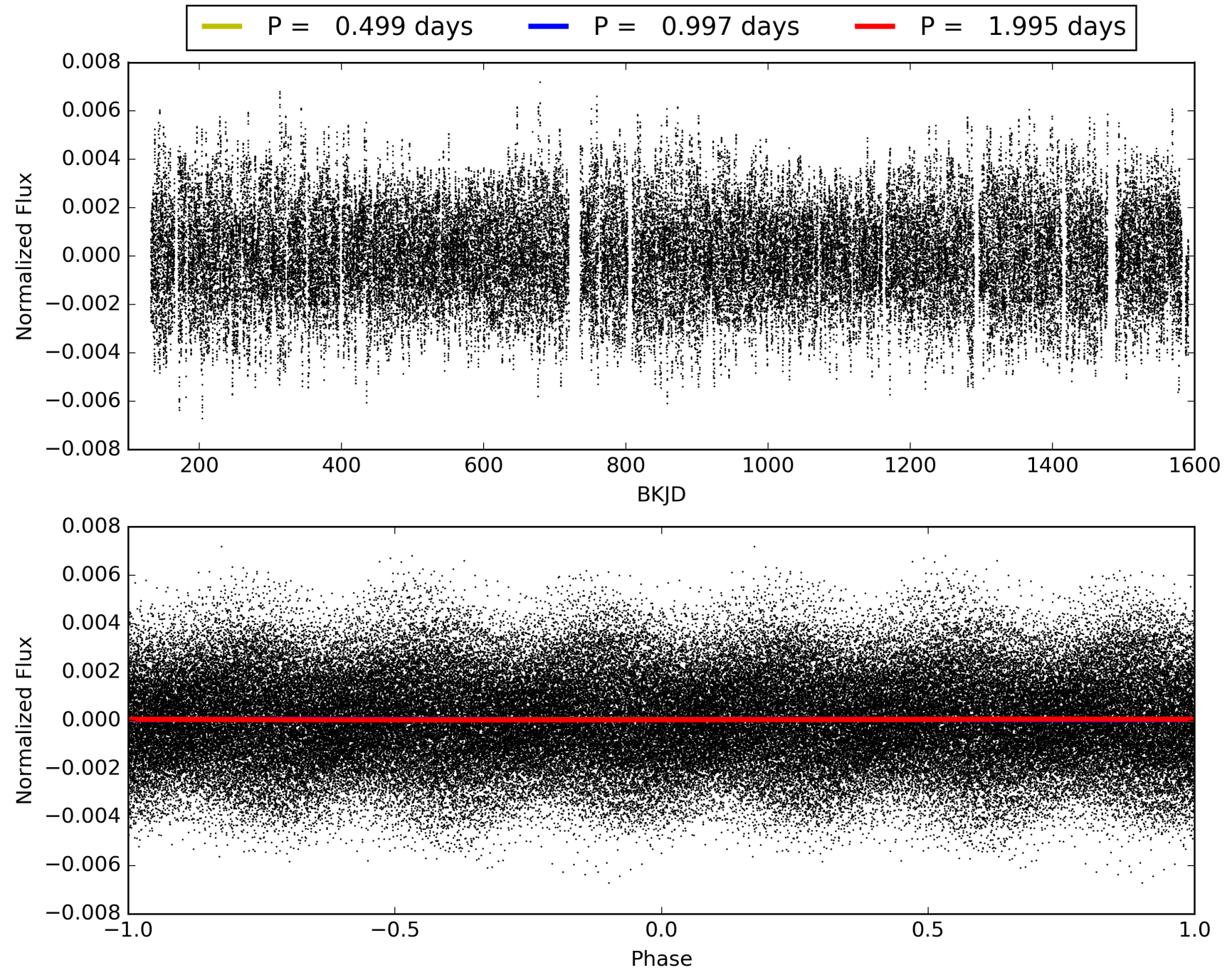
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:38:06 Z

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

TCE 005640438-01, PDC Light Curves

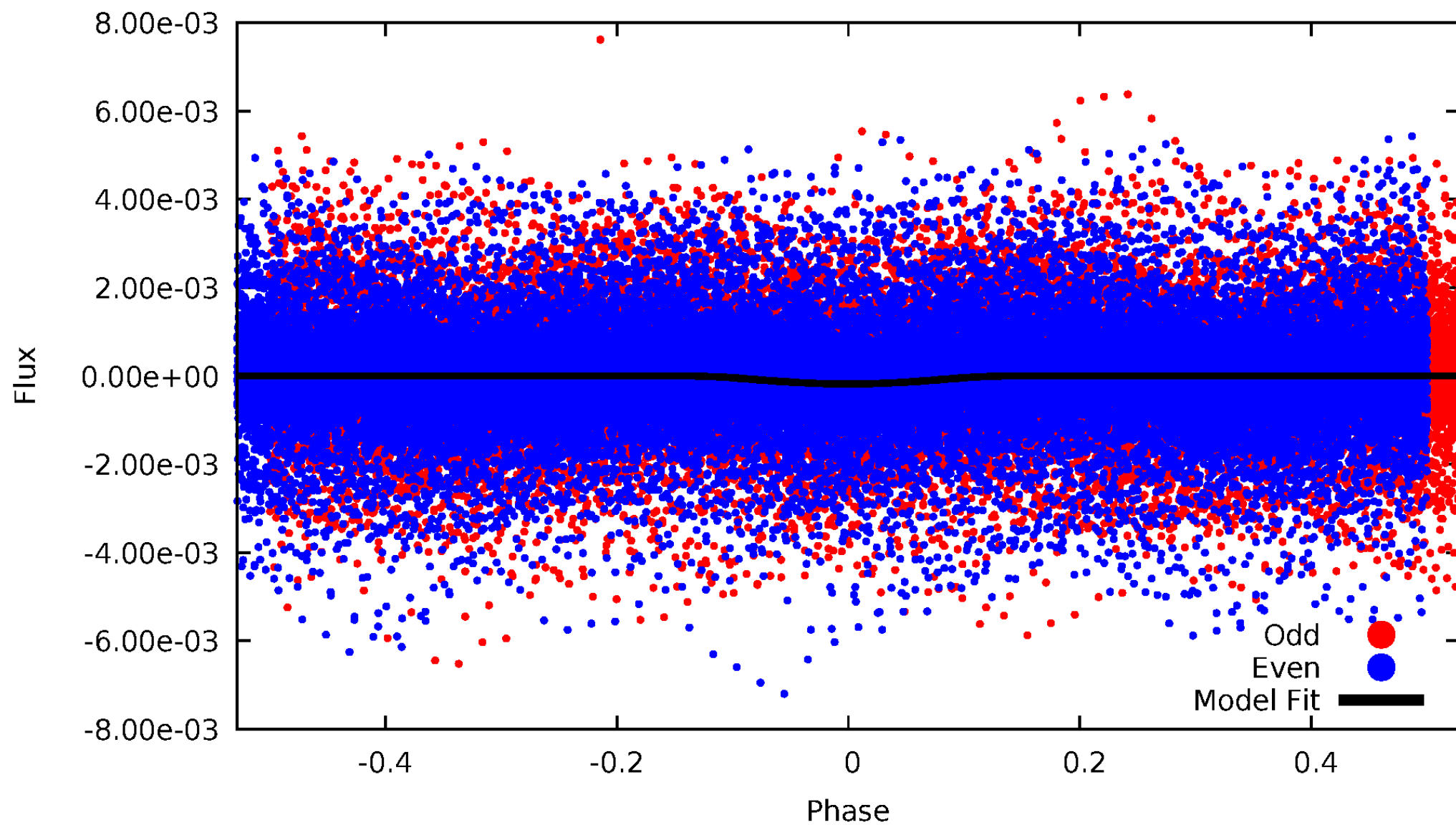


TCE 005640438-01



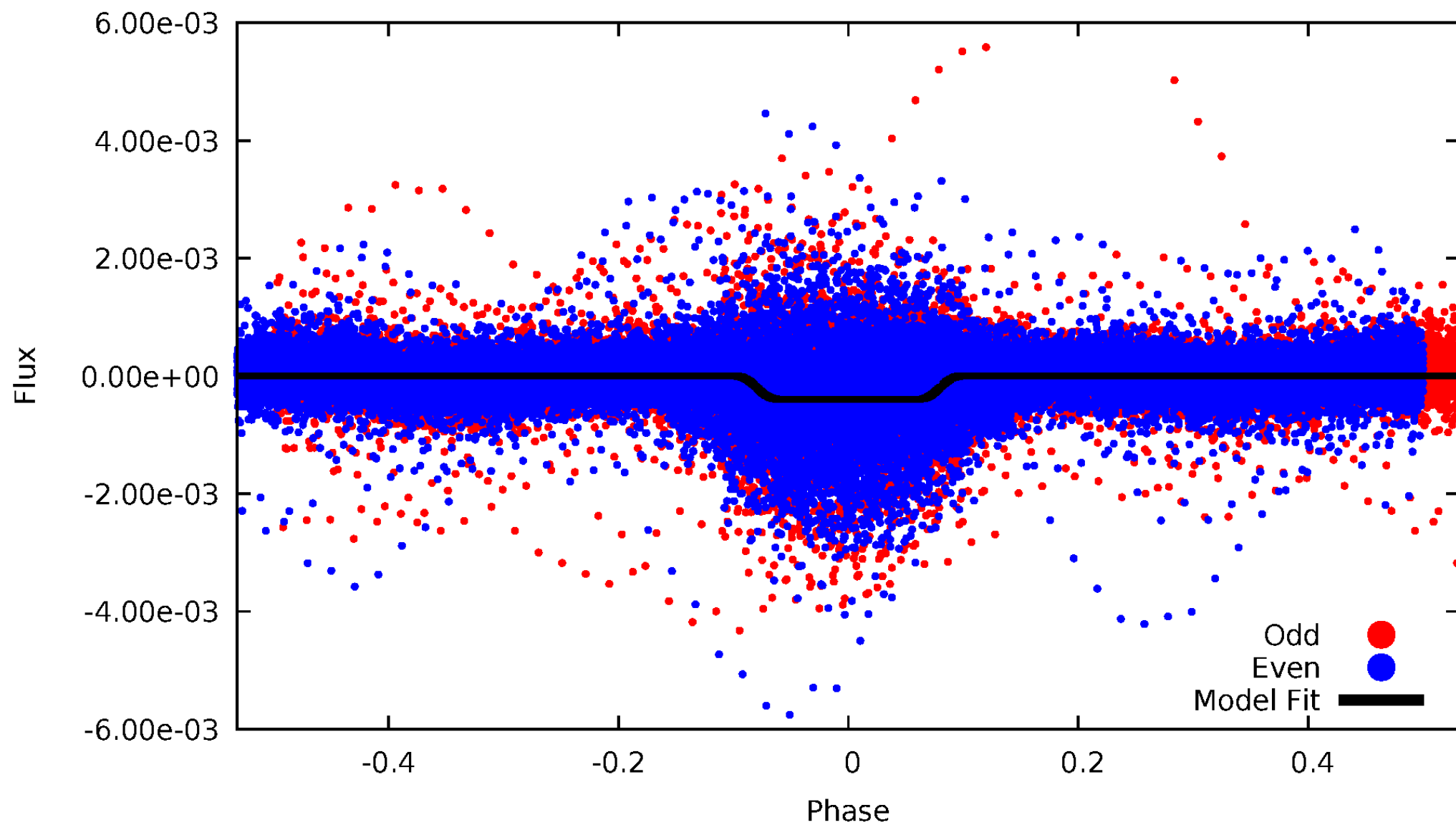
DV Odd/Even

TCE 005640438-01



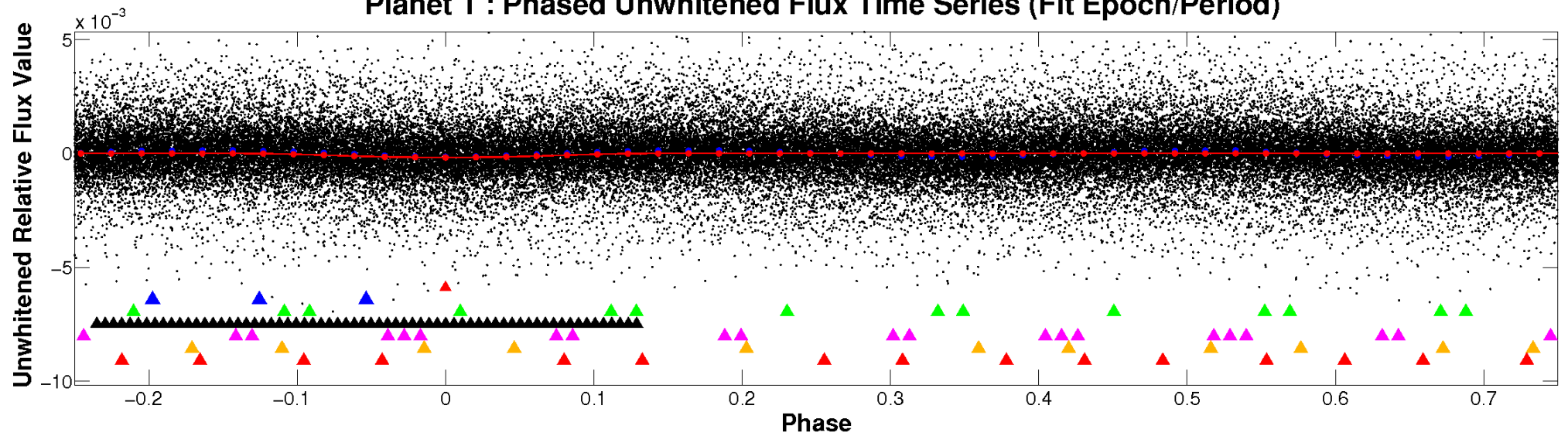
ALT Odd/Even

TCE 005640438-01

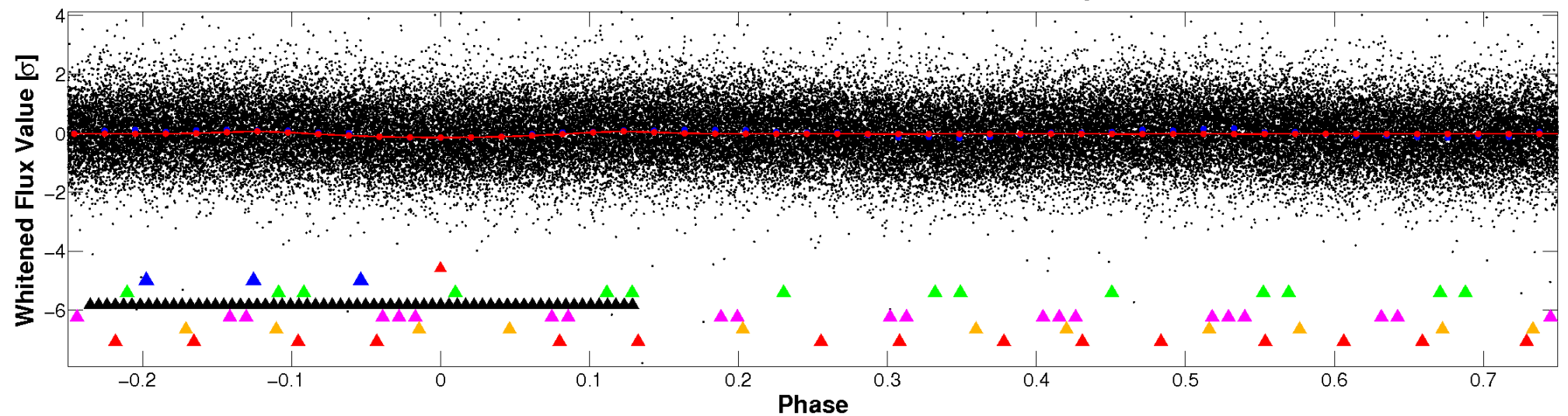


Non-Whitened Vs. Whitened Light Curve

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

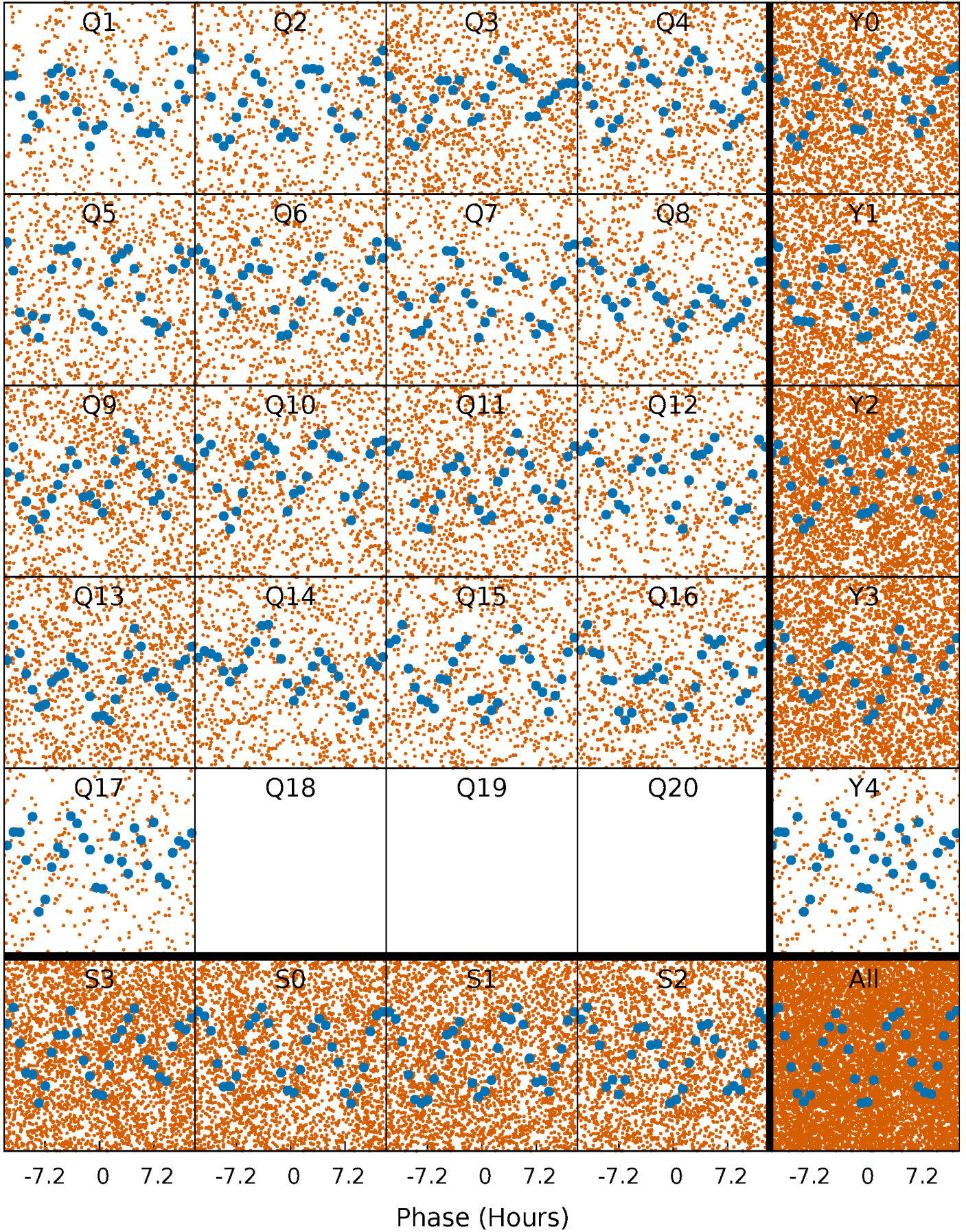


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



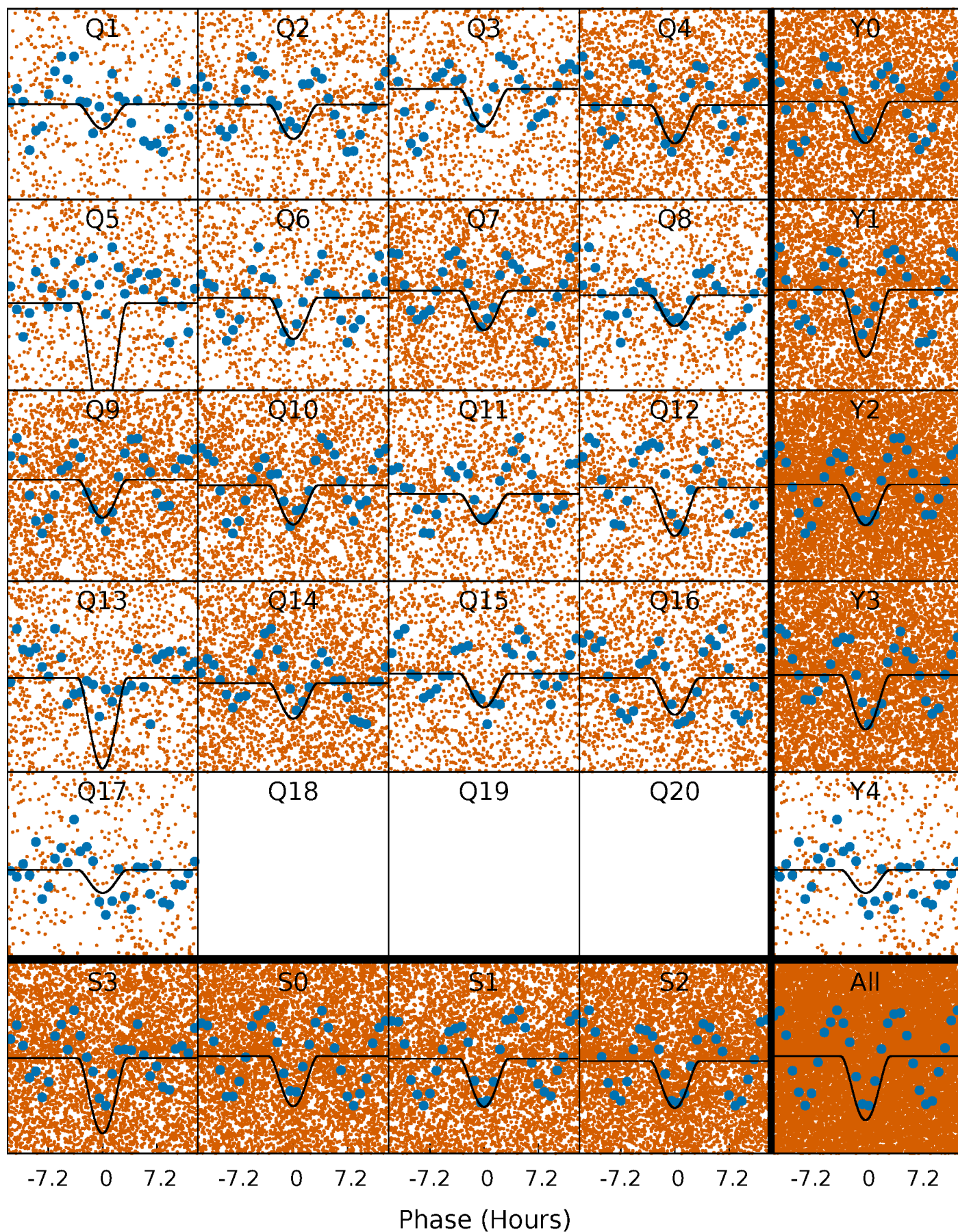
PDC Quarter-Phased Transit Curves

TCE 005640438-01 P= 0.997320 Days $T_0=132.079881$ (BKJD)



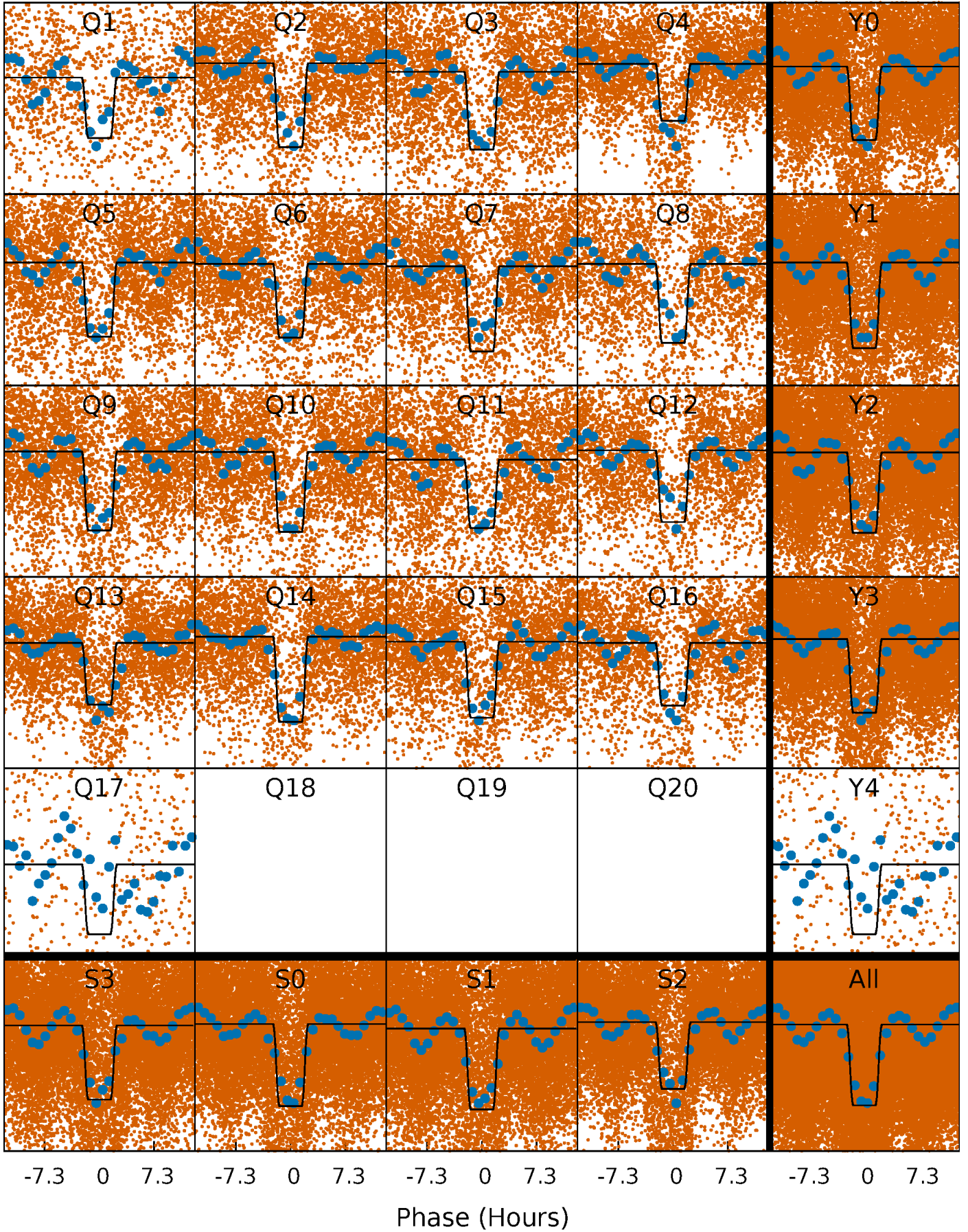
DV Quarter-Phased Transit Curves

TCE 005640438-01 P= 0.997320 Days $T_0=132.079881$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

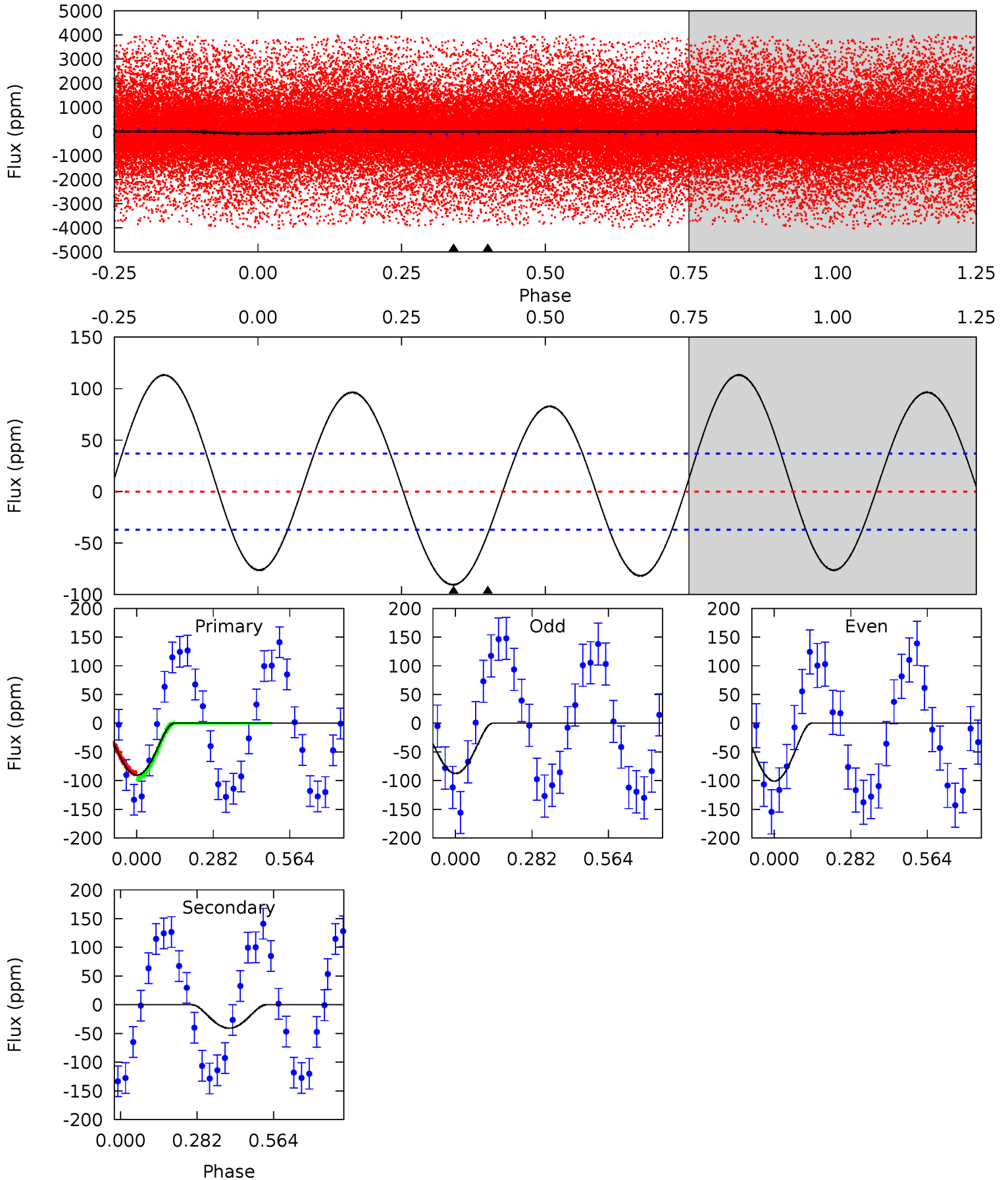
TCE 005640438-01 P= 0.997371 Days $T_0=132.046005$ (BKJD)



DV Model-Shift Uniqueness Test

005640438-01, P = 0.997320 Days, E = 131.082561 Days

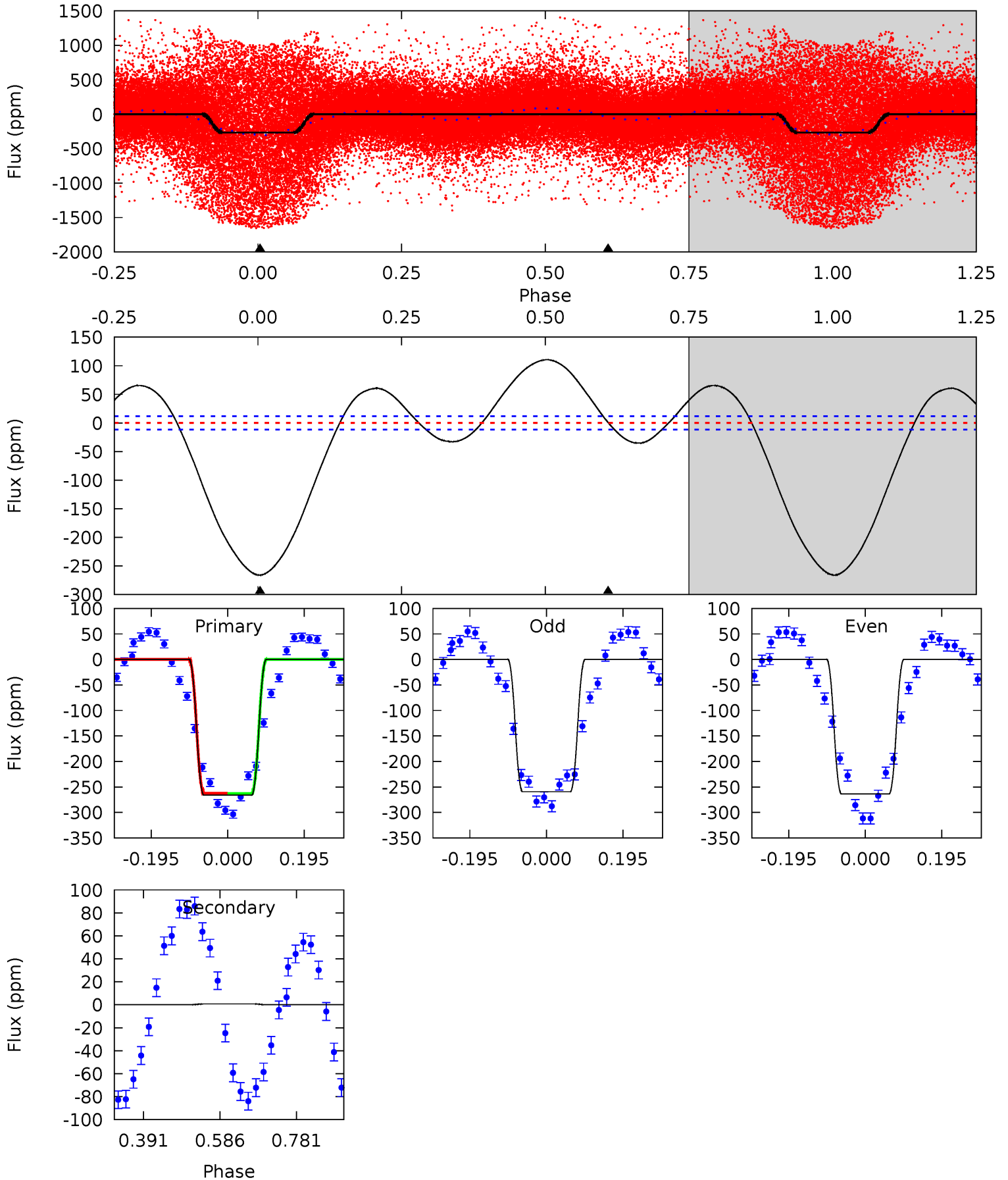
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.6	4.80	0	0	4.34	1.08	7.94	10.6	10.6	4.80	4.80	0.79	0.87	0.56	0.53



Alt Model-Shift Uniqueness Test

005640438-01, P = 0.997371 Days, E = 131.048634 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
100.2	-0.28	0	0	4.42	1.29	12.2	100.2	100.2	-0.28	-0.28	0.80	1.21	0.29	0.21



Stellar Parameters For KIC 005640438

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6847^{+191}_{-262}	$4.358^{+0.056}_{-0.224}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.451}_{-0.141}$	$1.239^{+0.195}_{-0.178}$	$0.977^{+0.305}_{-0.546}$
	+3%/-4%	+1%/-5%	+114%/-136%	+37%/-12%	+16%/-14%	+31%/-56%
Source	PHO1	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 005640438-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-41 ± 9	$3.30^{+1.65}_{-1.56}$	3292^{+261}_{-185}	3623^{+1229}_{-909}	$0.878^{+2.362}_{-0.498}$
Alt.	1 ± 3	$2.92^{+1.73}_{-1.48}$	3284^{+270}_{-176}	-3302^{+222}_{-237}	$-0.014^{+0.070}_{-0.132}$

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

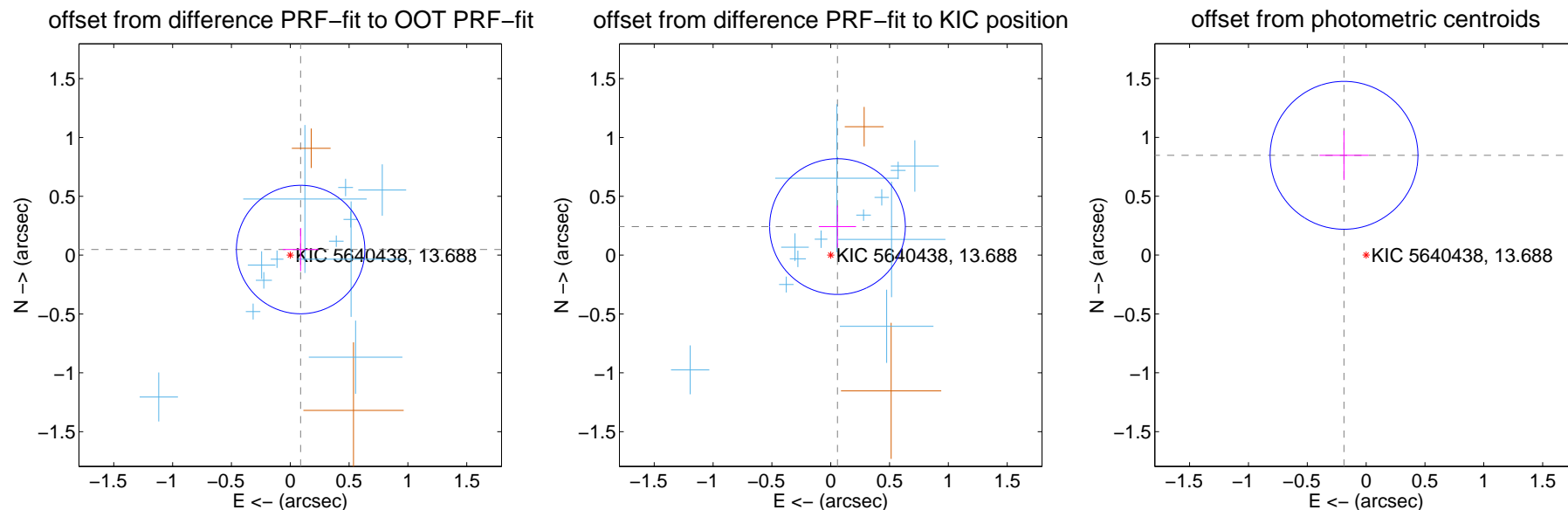
DV Centroid Data

Supplemental centroid analysis for 005640438-01. Kepler magnitude: 13.69. Transit SNR 12.92

There are 12 quarters with good PRF difference image offsets

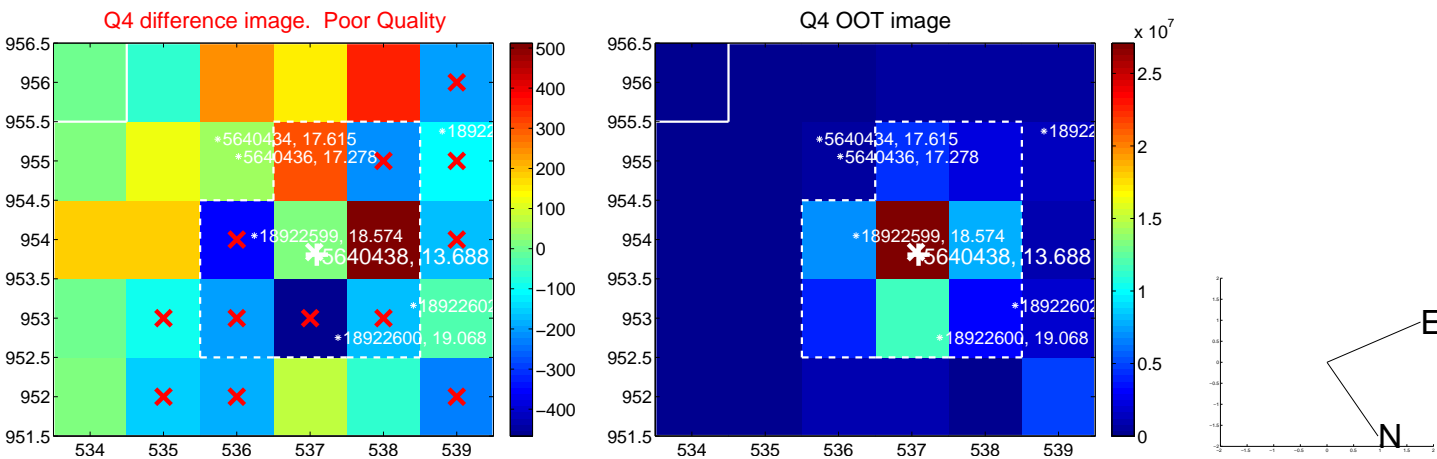
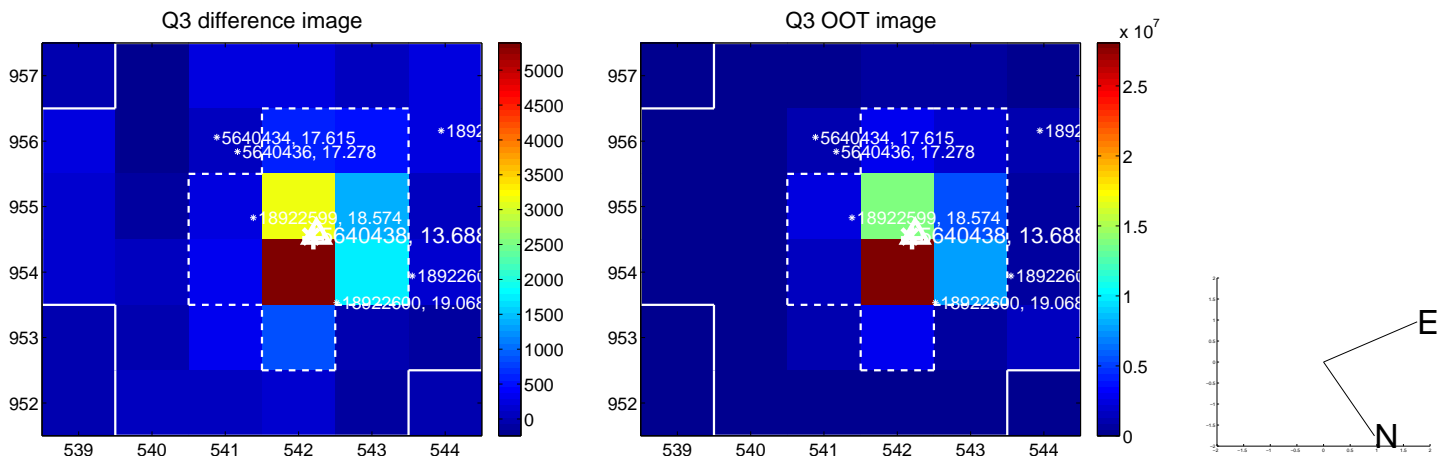
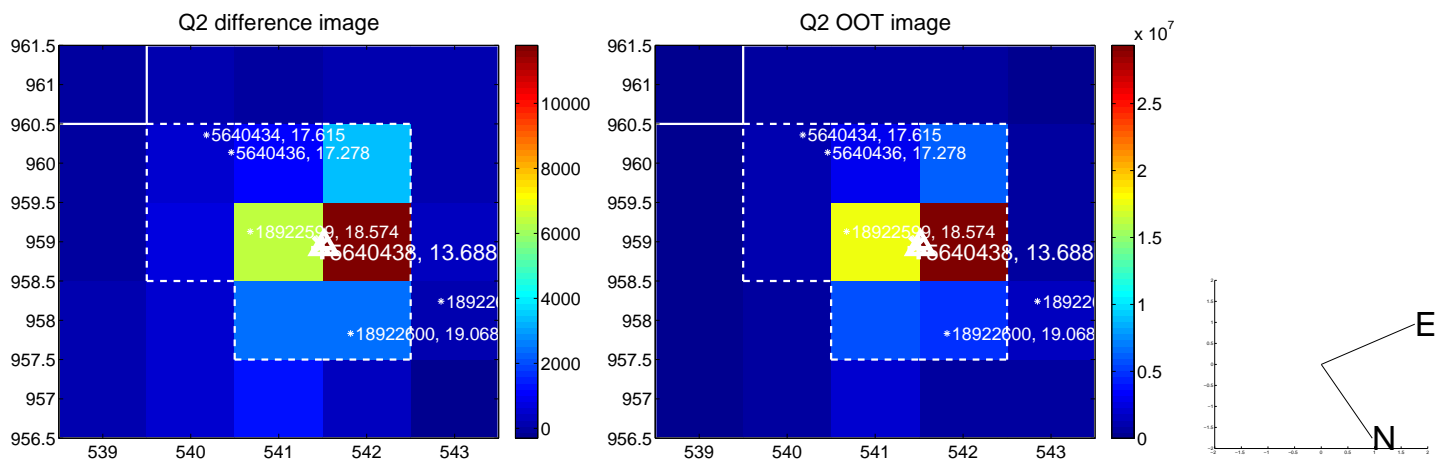
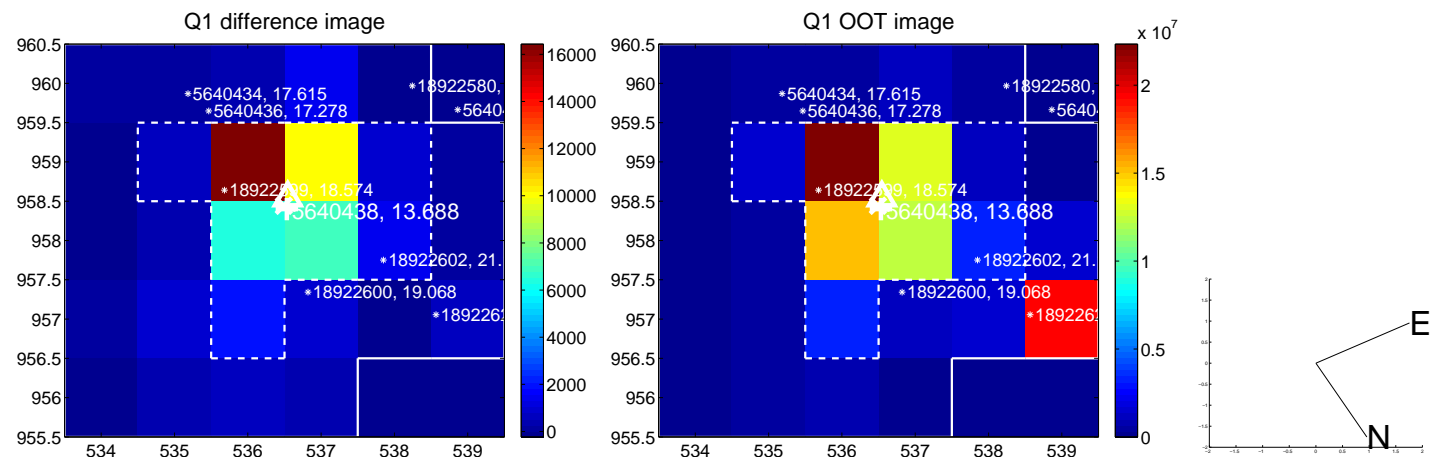
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.100 ± 0.182	0.55	-0.088 ± 0.152	0.048 ± 0.183
PRF-fit source offset from KIC position	0.249 ± 0.192	1.30	-0.057 ± 0.158	0.243 ± 0.179
photometric centroid source offset	0.87 ± 0.21	4.15	0.19 ± 0.21	0.85 ± 0.21

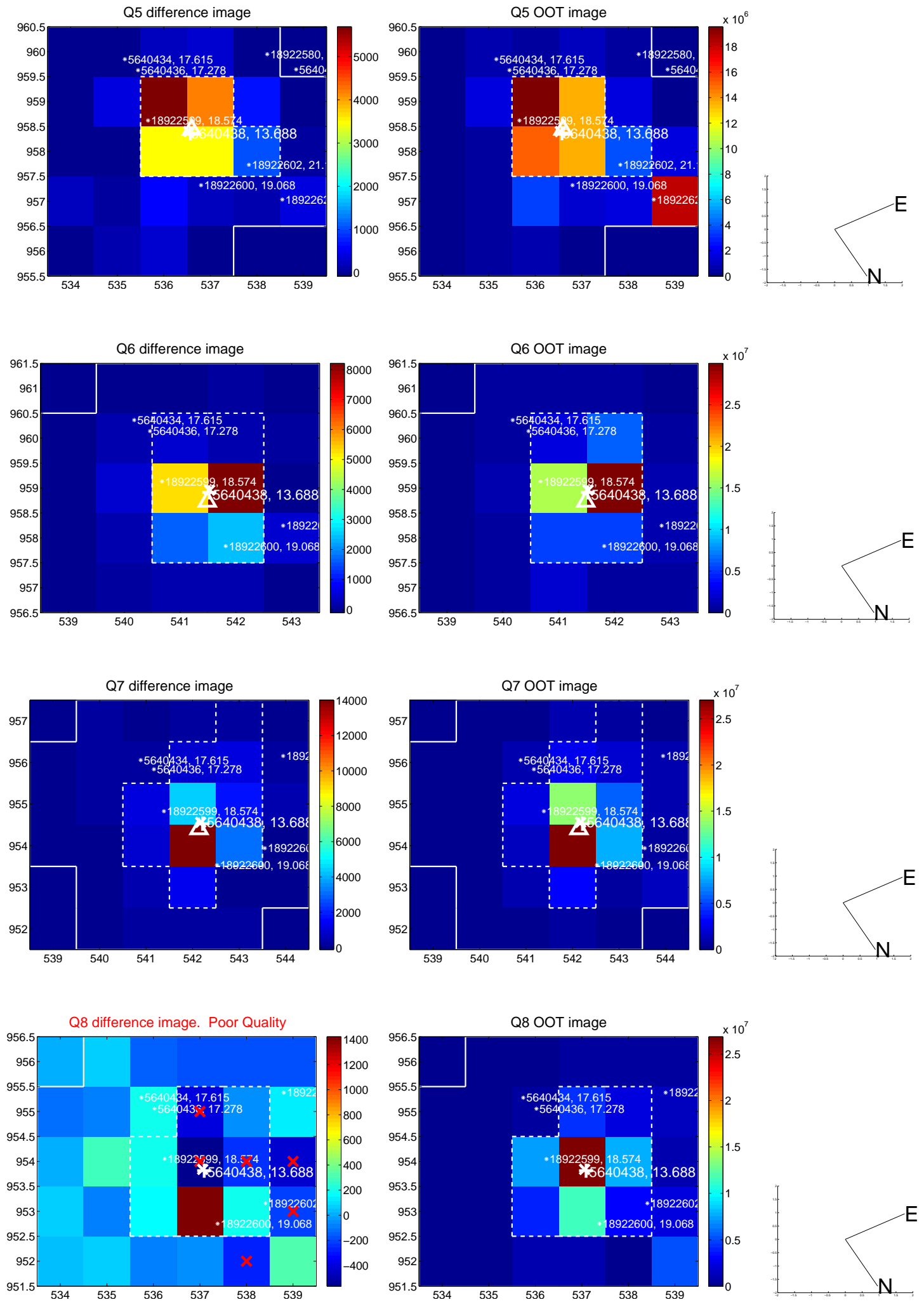


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

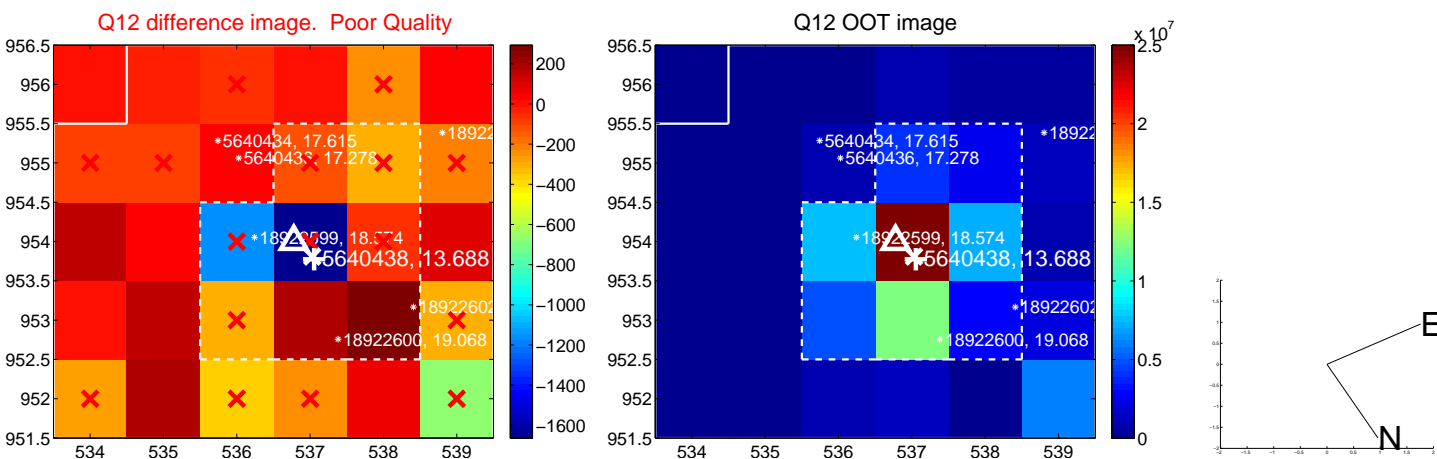
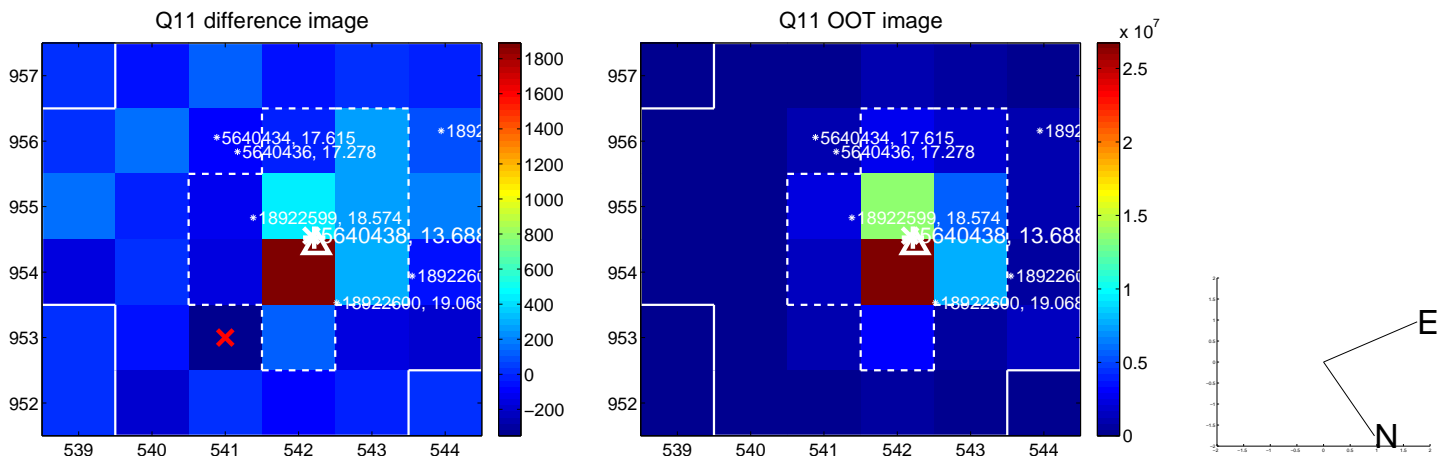
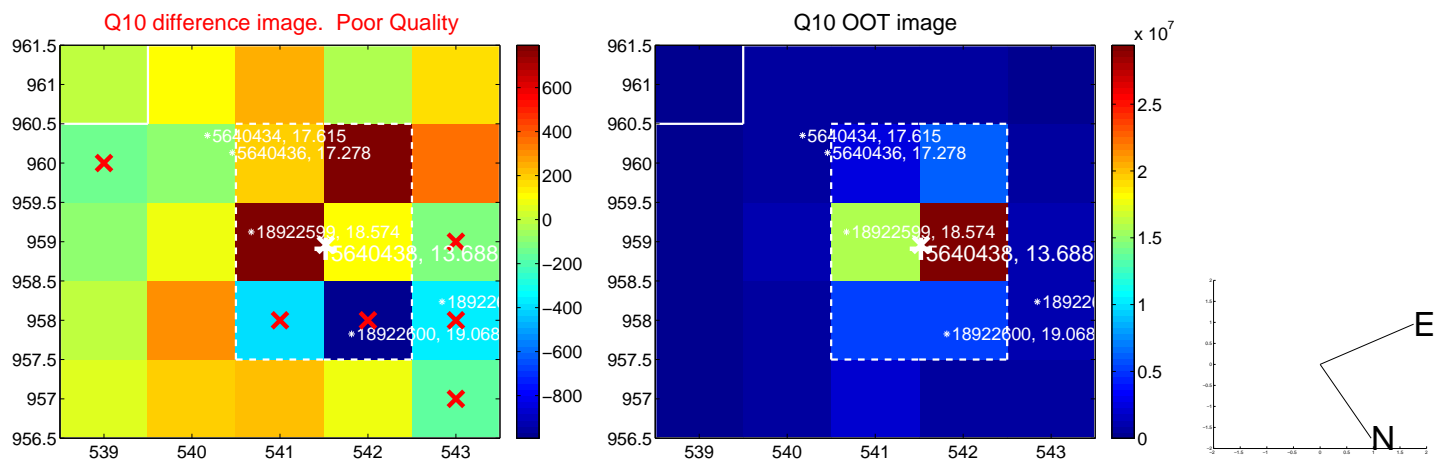
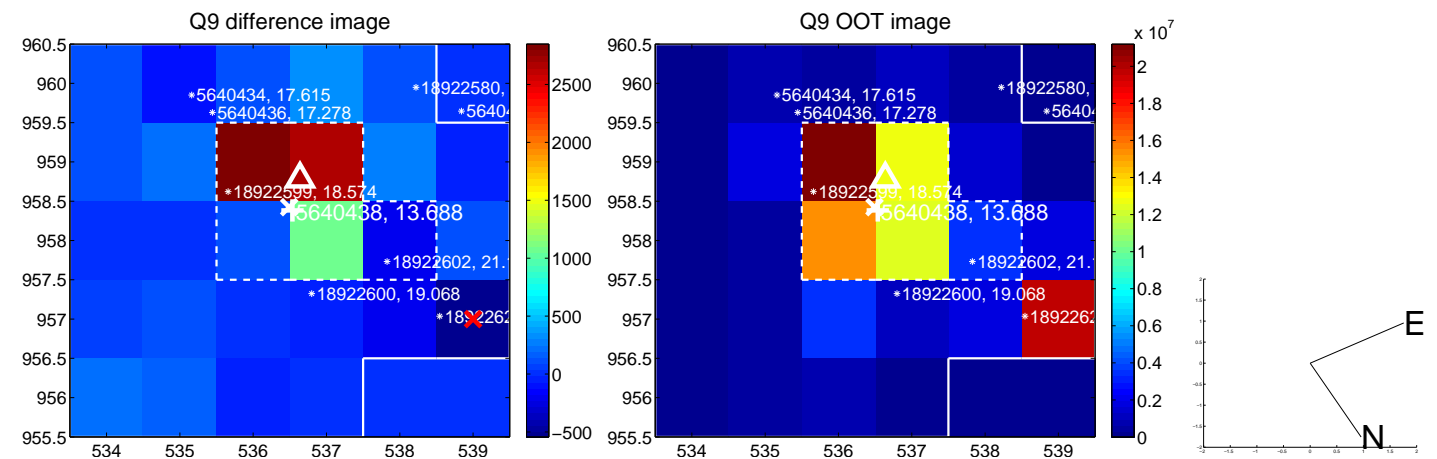
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



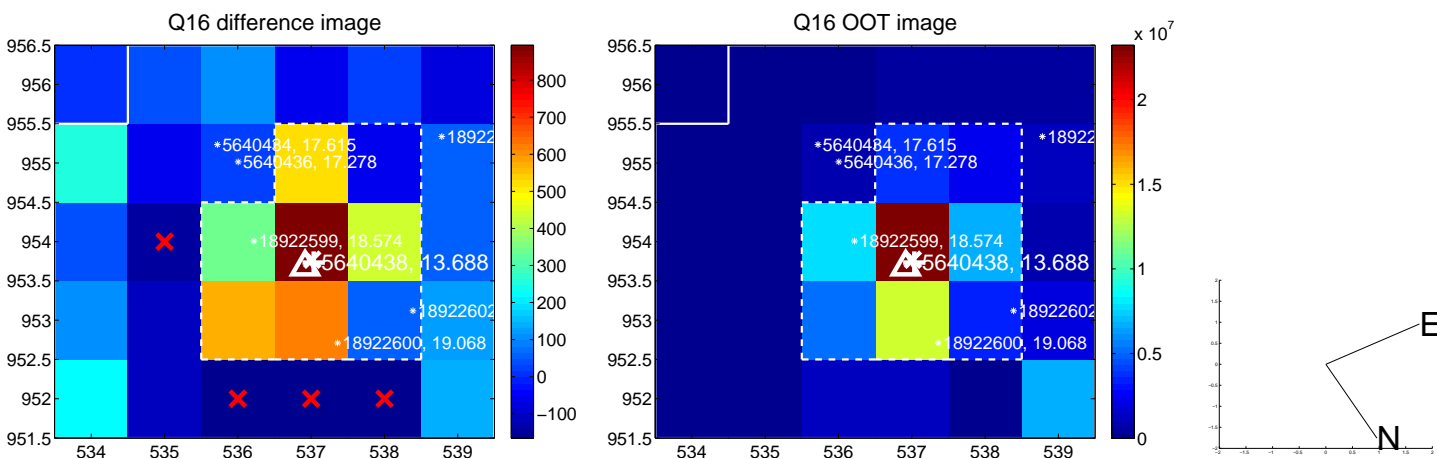
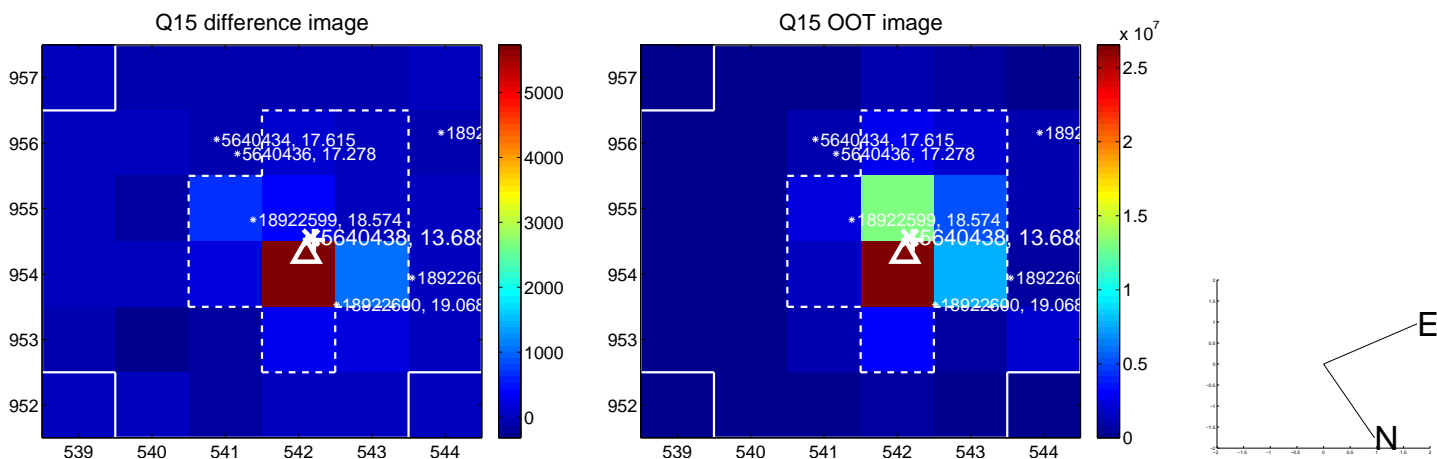
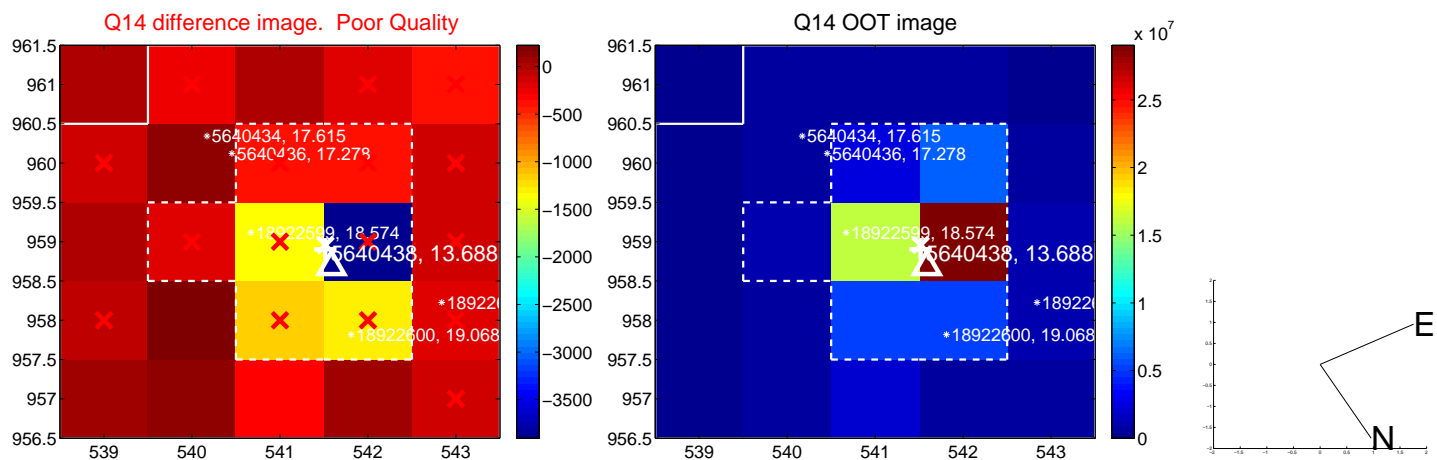
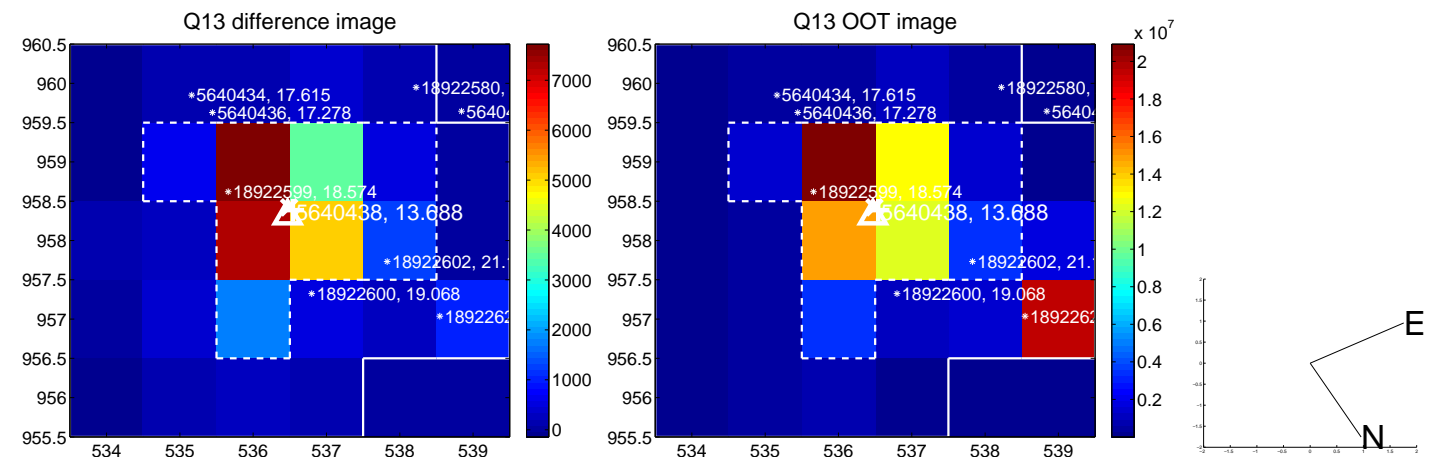
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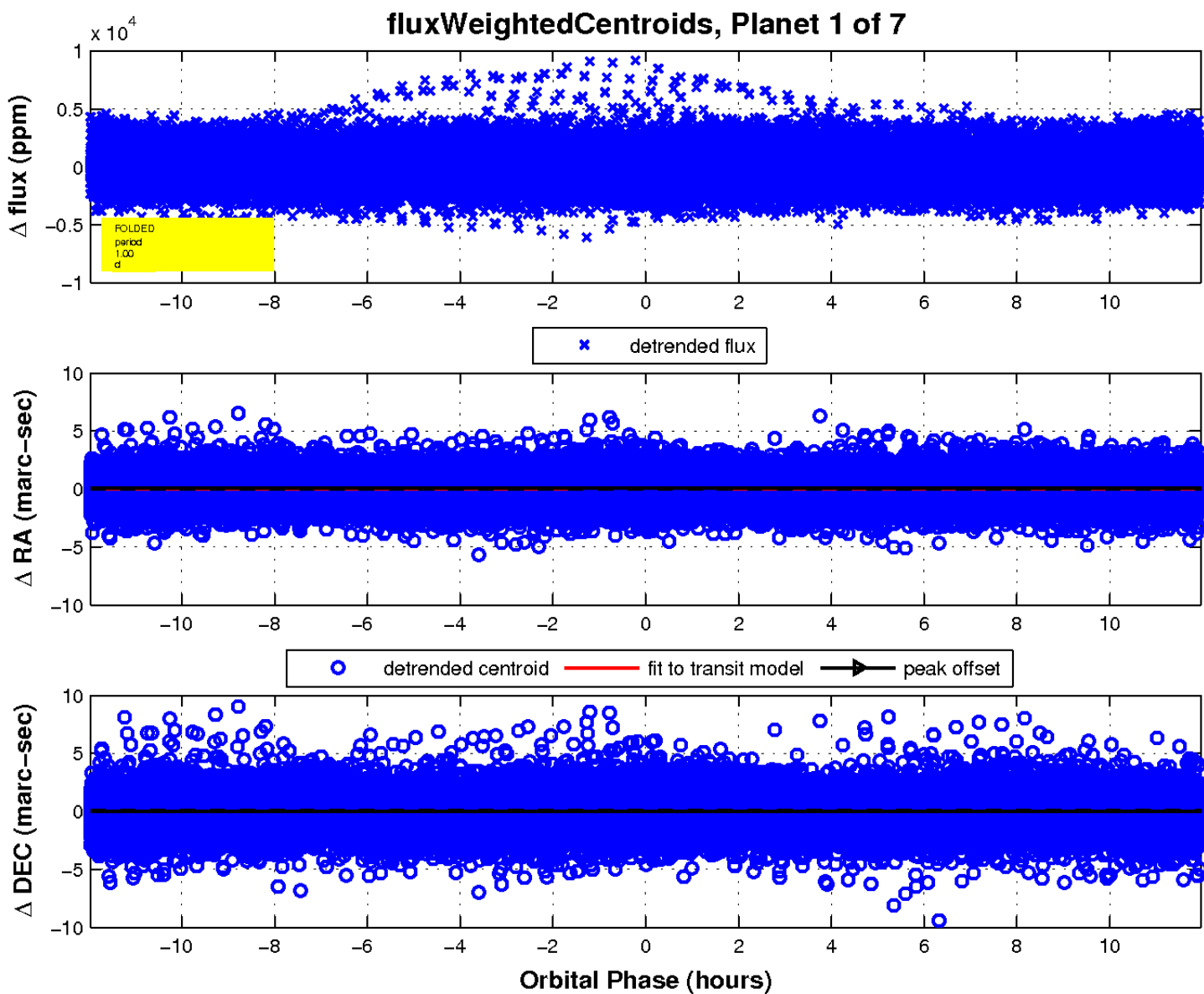
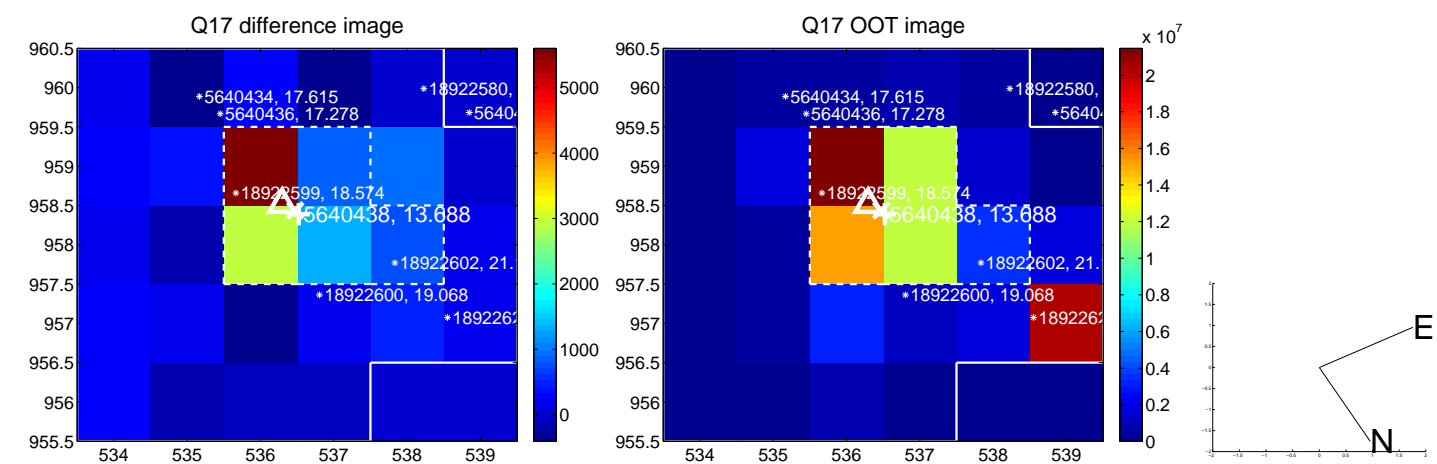
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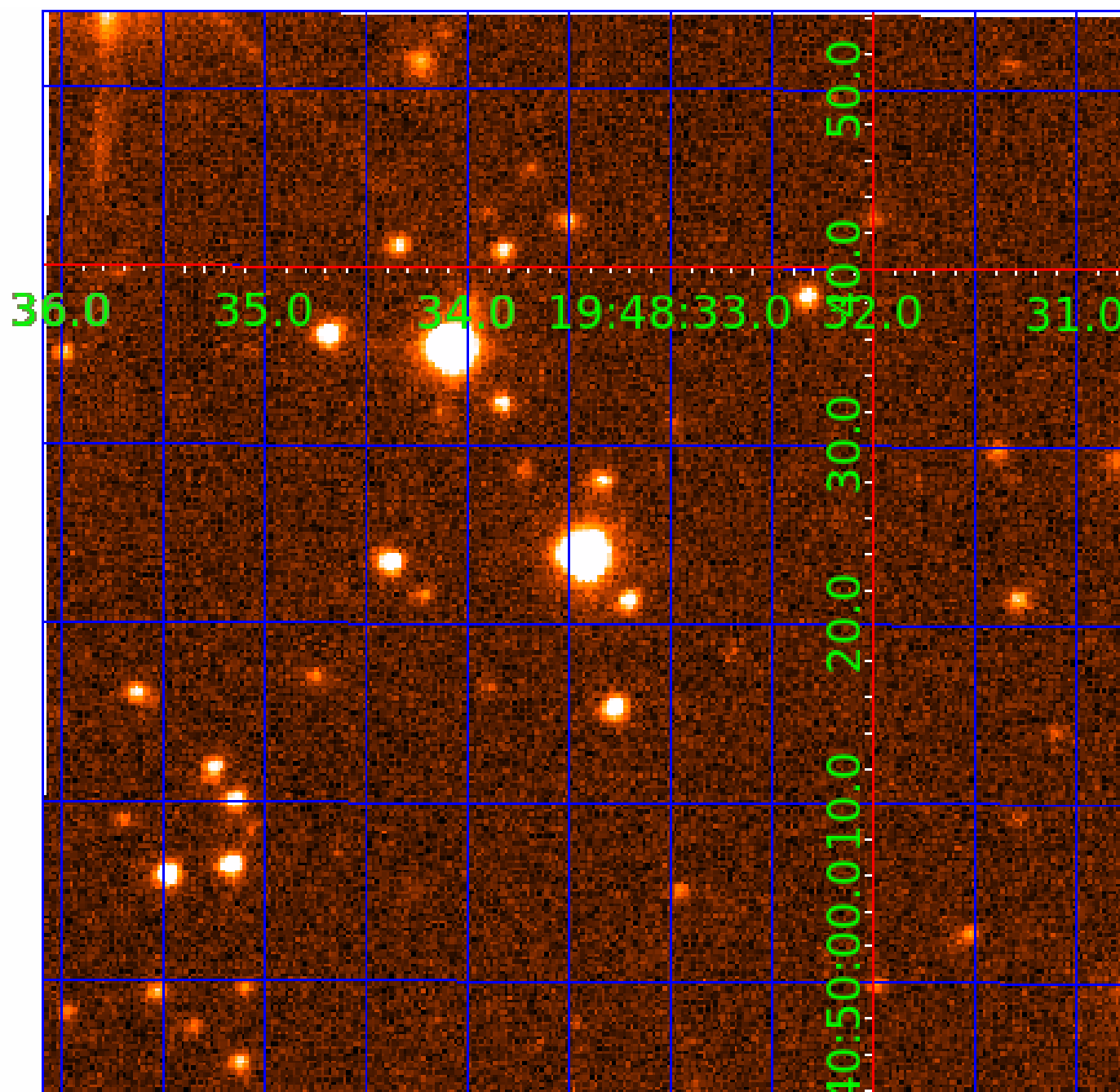


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UKIRT Image

Declination



KIC 005640438

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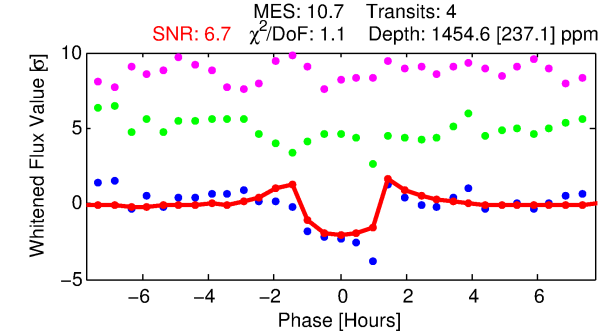
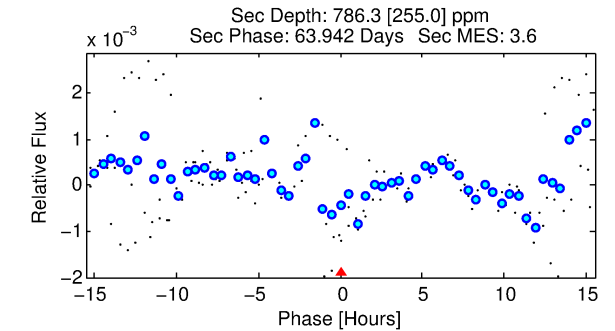
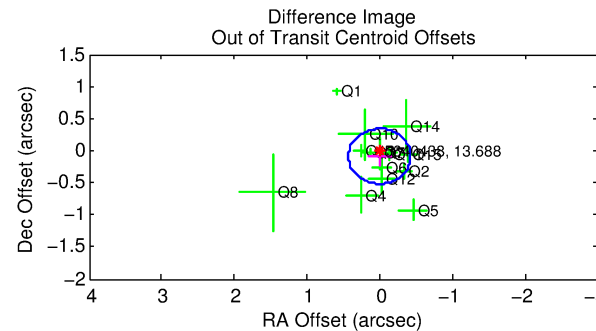
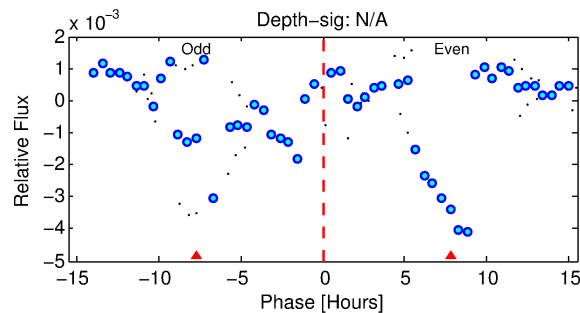
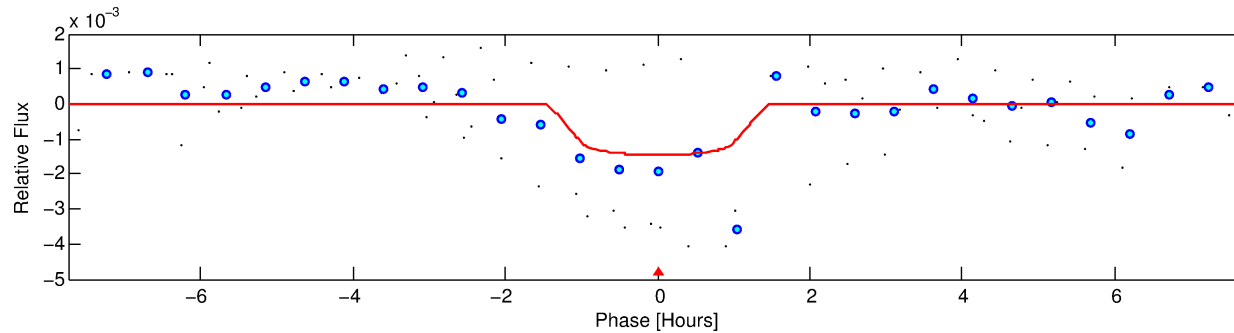
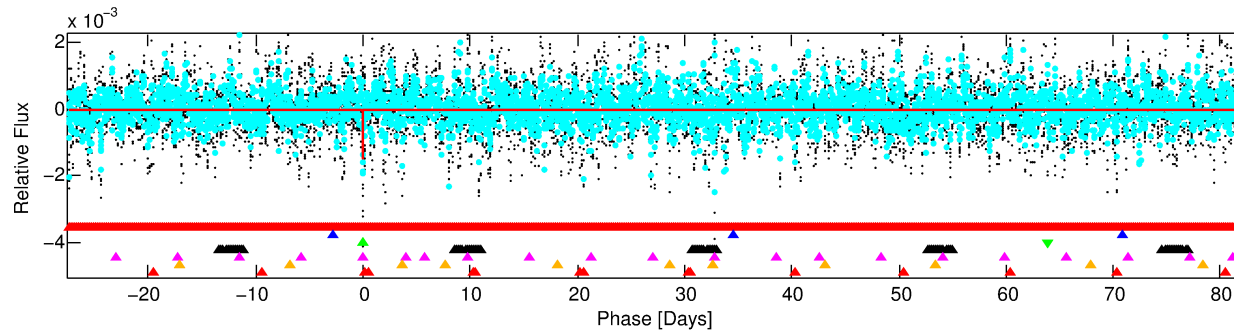
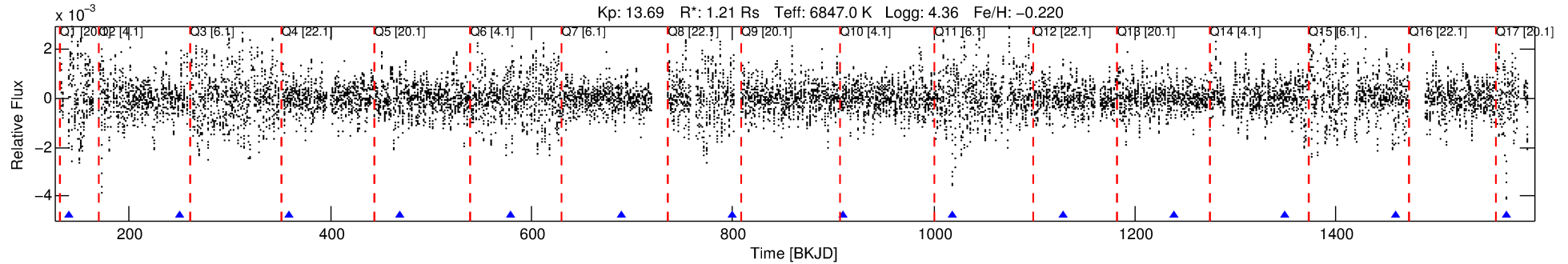
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005640438-03

No Significant Match Found

DV One-Page Summary

KIC: 5640438 Candidate: 3 of 7 Period: 109.925 d



DV Fit Results:

Period = 109.92497 [0.00143] d
Epoch = 139.7473 [0.0149] BKJD
Rp/R* = 0.0367 [0.0674]
a/R* = 278.22 [2890.40]
b = 0.59 [11.69]
Seff = 12.55 [5.66]
Teff = 480 [54] K
Rp = 4.85 [9.10] Re
a = 0.4805 [0.1449] AU
Ag = 4241.42 [15753.11] [0.27σ]
Teffp = 5988 [5529] K [1.00σ]

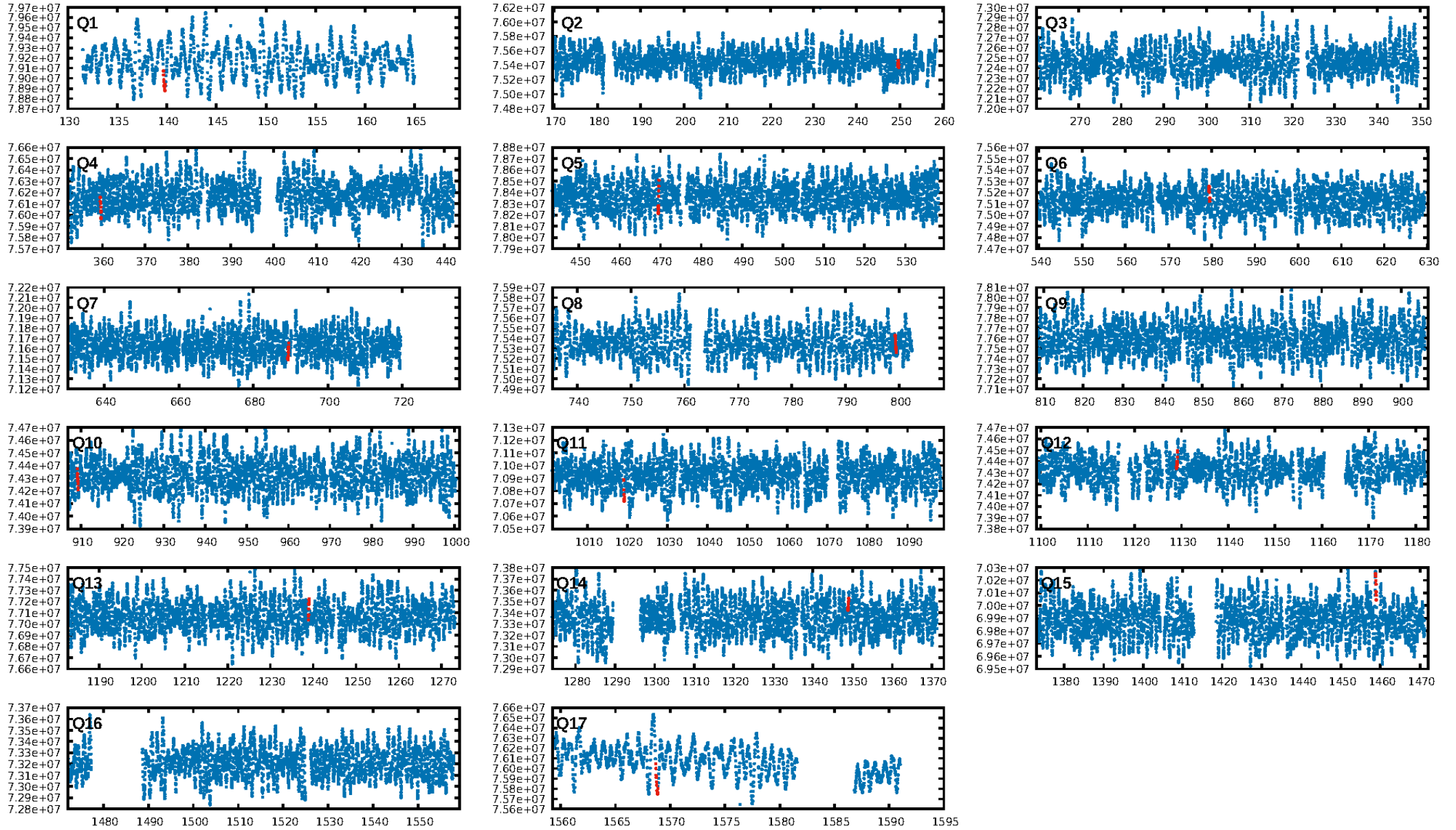
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [46.35σ]
LongPeriod-sig: 100.0% [89.59σ]
ModelChiSquare2-sig: 1.6%
ModelChiSquareGof-sig: 99.1%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -2.24
Centroid-sig: 9.8%
Centroid-so: 1.397 arcsec [4.94σ]
OotOffset-rm: 0.088 arcsec [0.62σ]
KicOffset-rm: 0.145 arcsec [0.99σ]
OotOffset-st: 4/3/3/4 [14]
KicOffset-st: 4/3/3/4 [14]
DiffImageQuality-fgm: 0.64 [9/14]
DiffImageOverlap-fno: 0.14 [2/14]

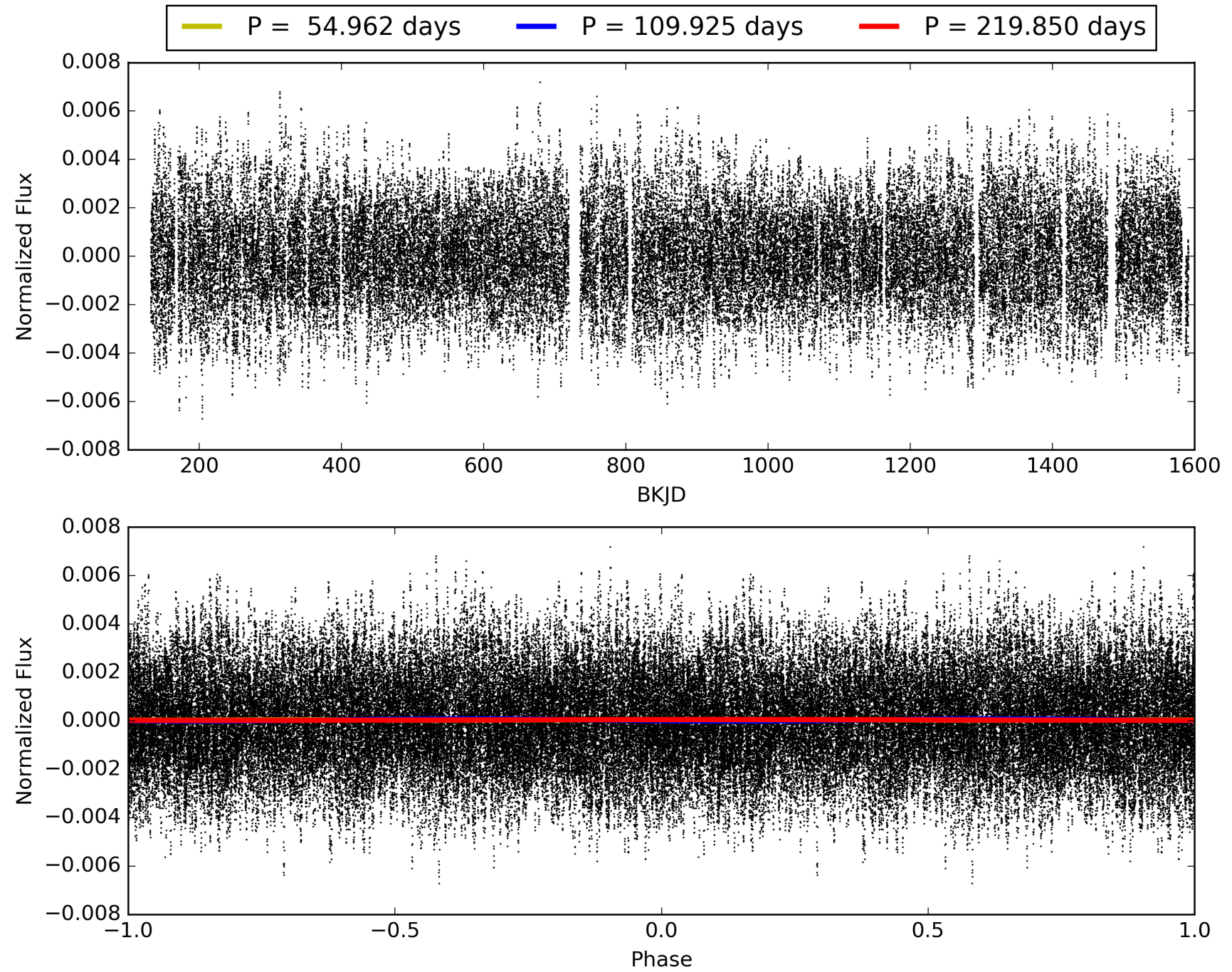
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:38:22 Z

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

TCE 005640438-03, PDC Light Curves

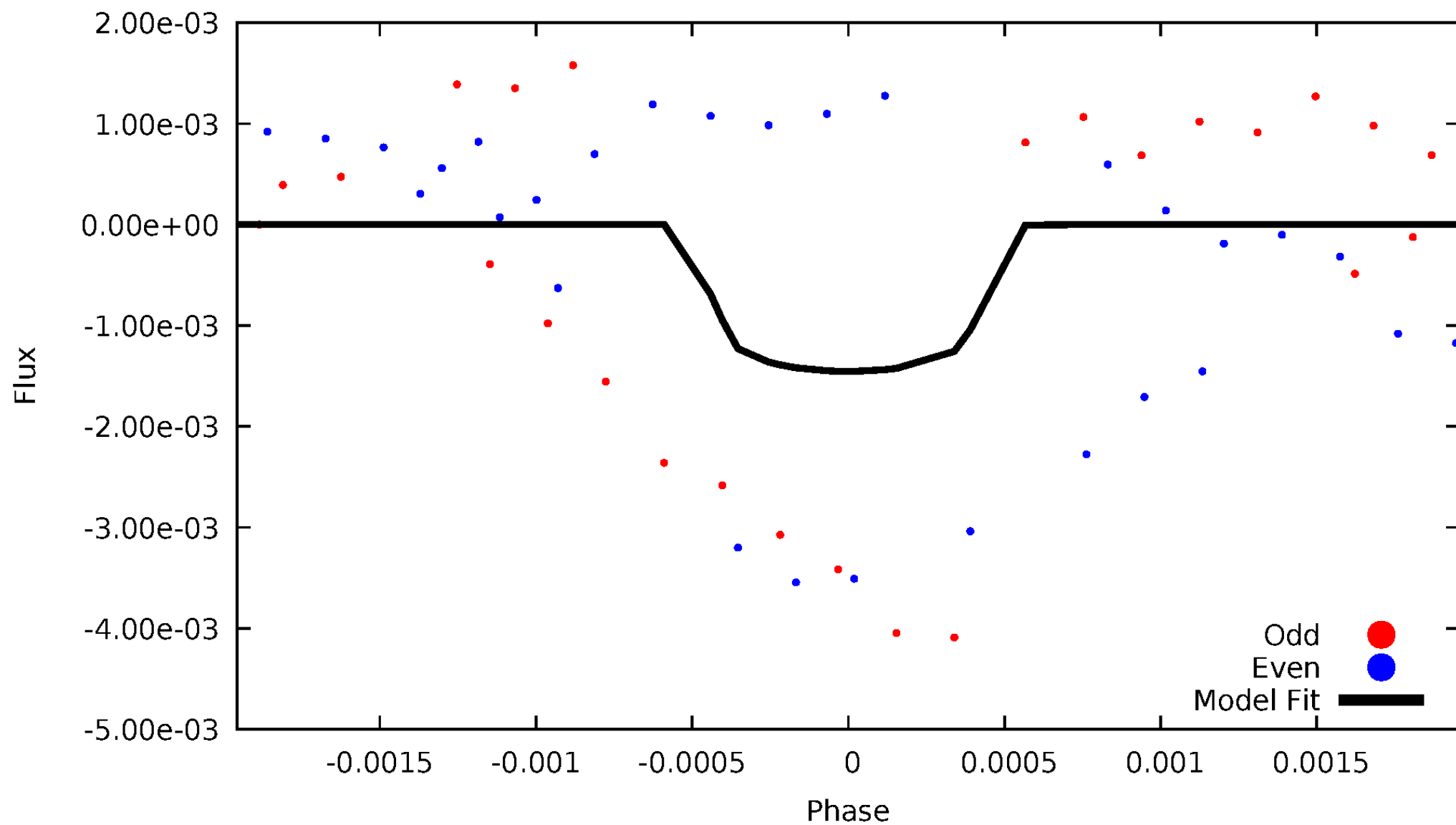


TCE 005640438-03



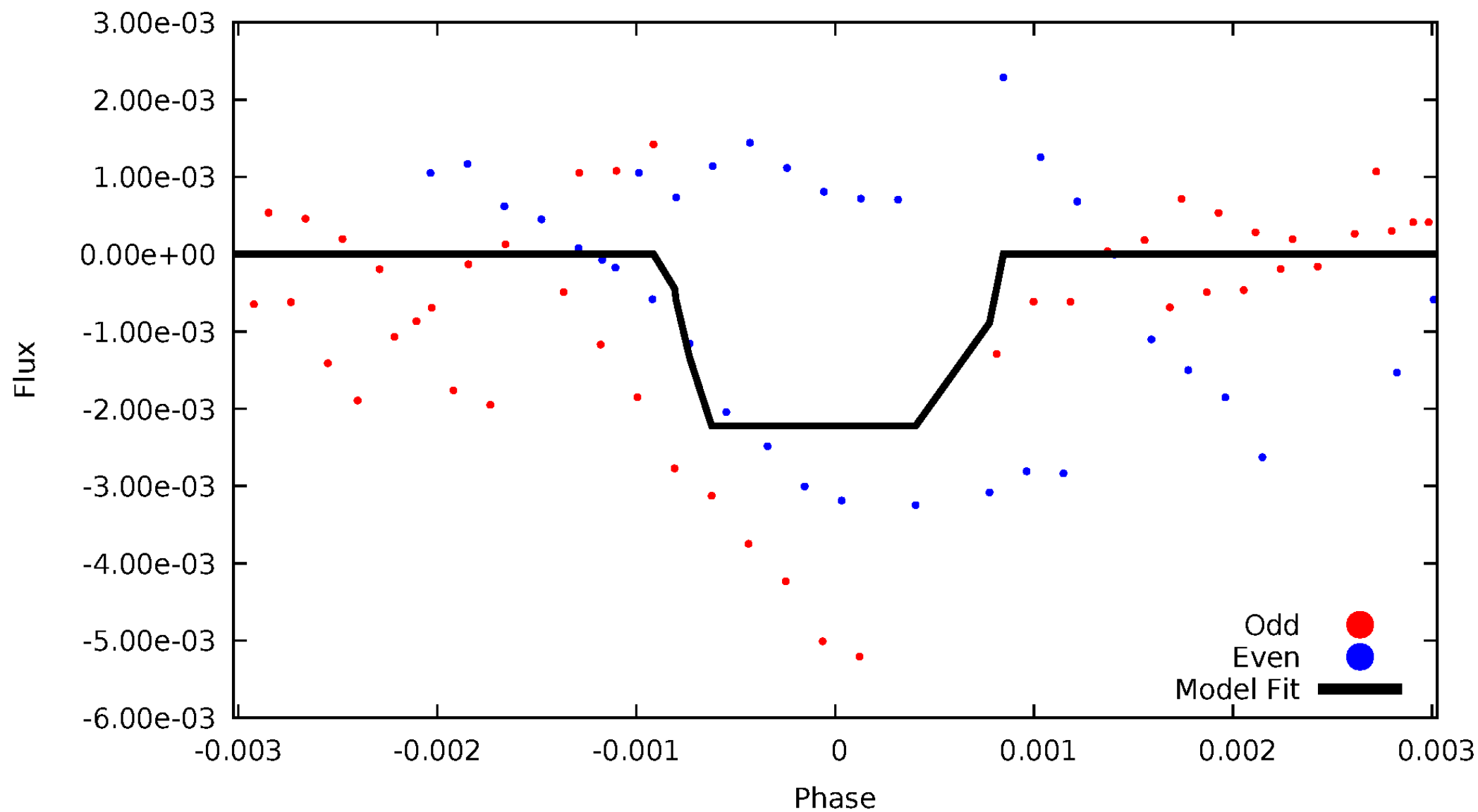
DV Odd/Even

TCE 005640438-03



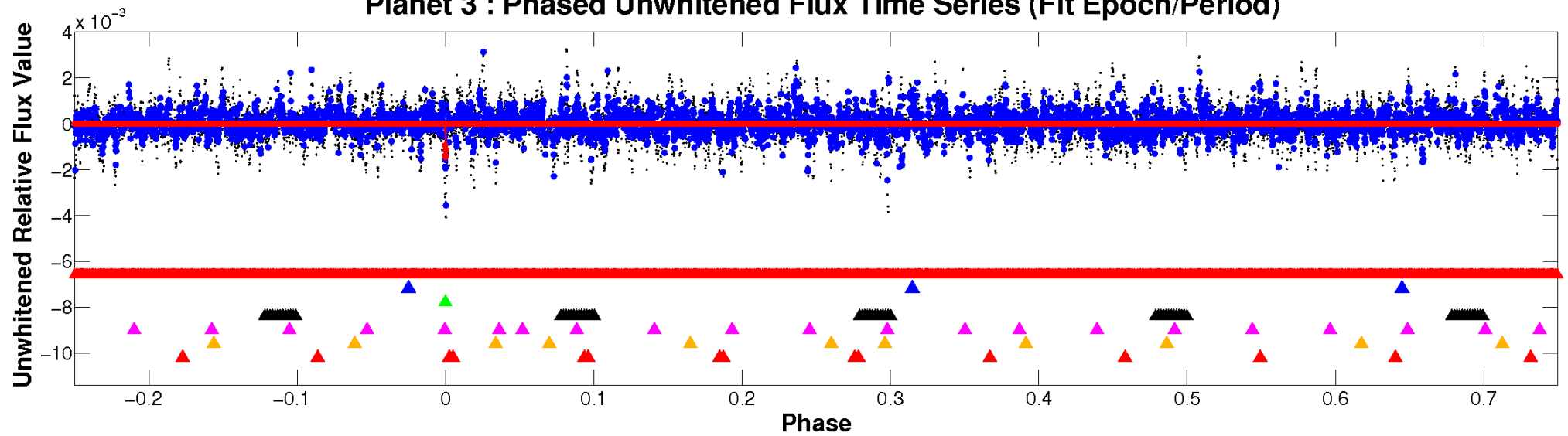
ALT Odd/Even

TCE 005640438-03

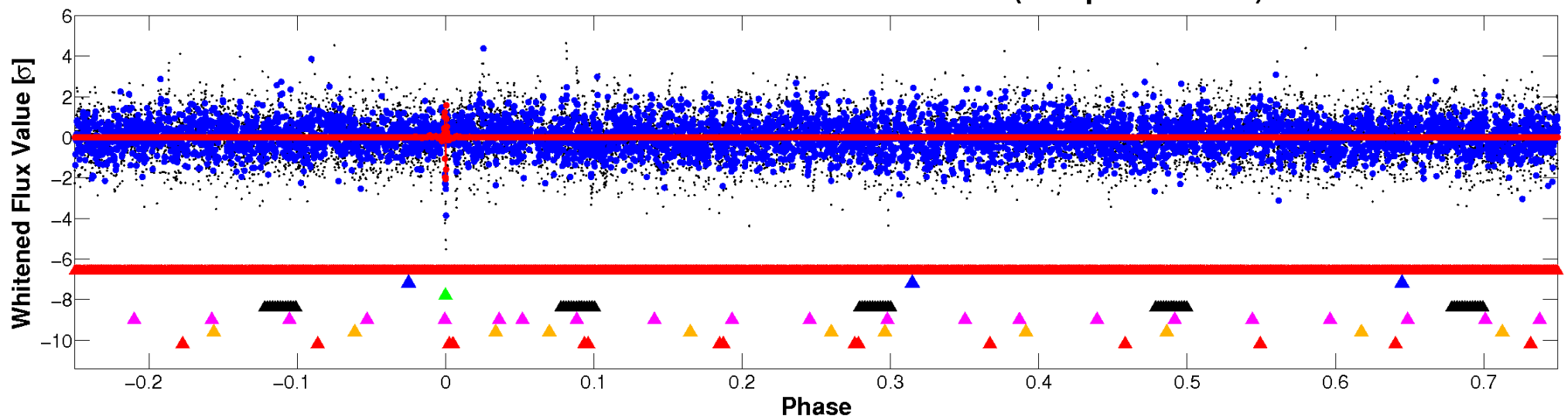


Non-Whitened Vs. Whitened Light Curve

Planet 3 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

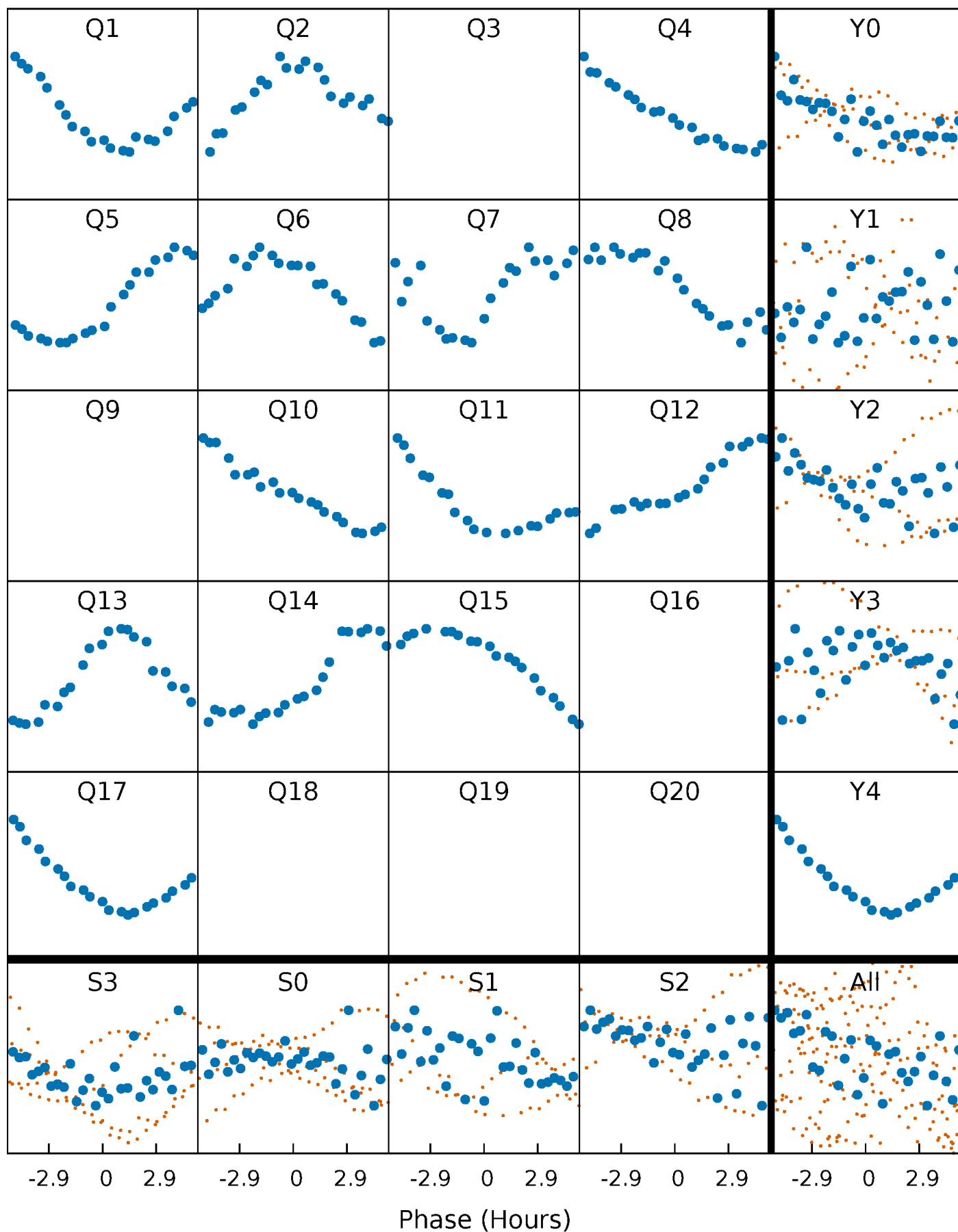


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



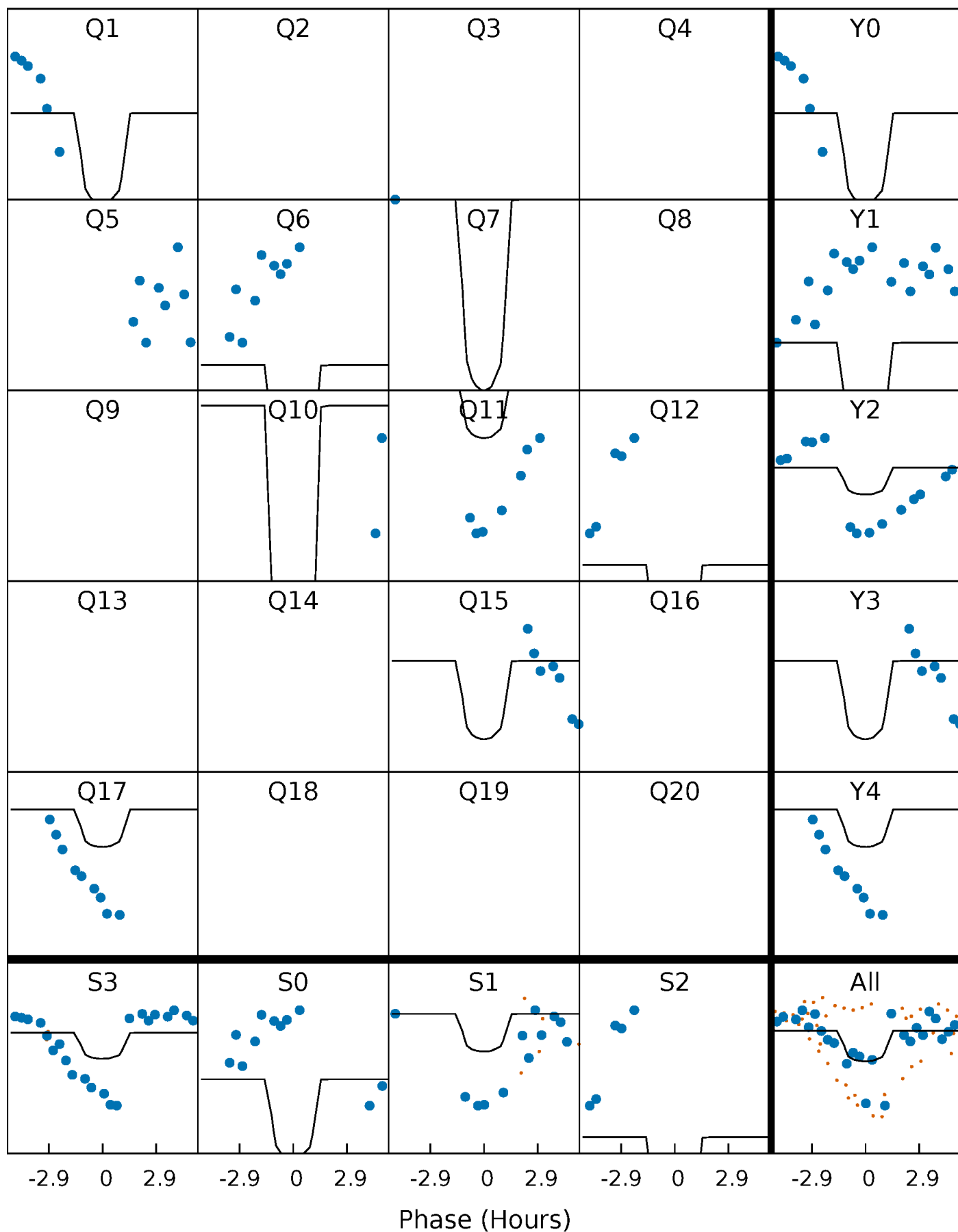
PDC Quarter-Phased Transit Curves

TCE 005640438-03 P=109.924969 Days $T_0=139.747262$ (BKJD)



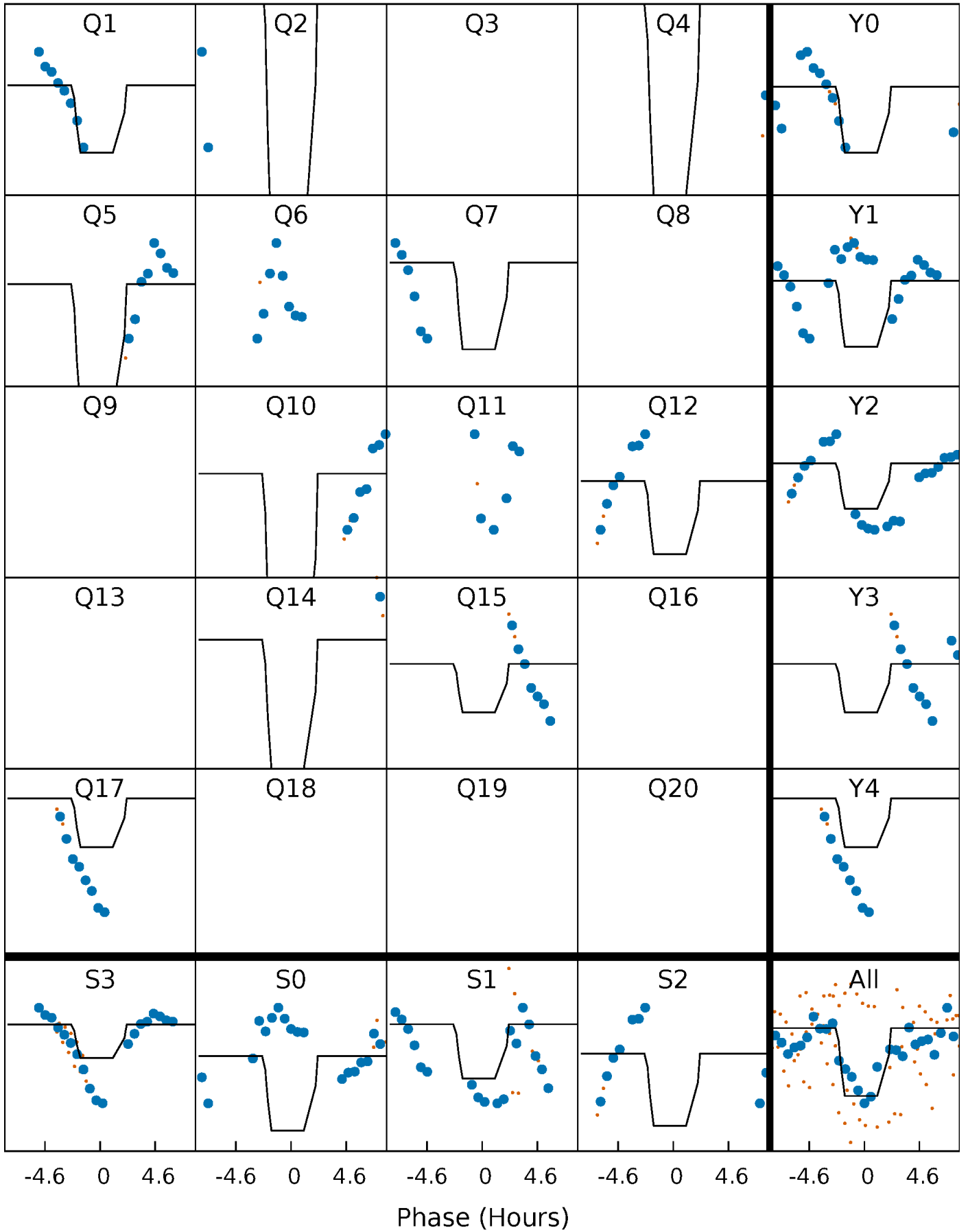
DV Quarter-Phased Transit Curves

TCE 005640438-03 P=109.924969 Days $T_0=139.747262$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

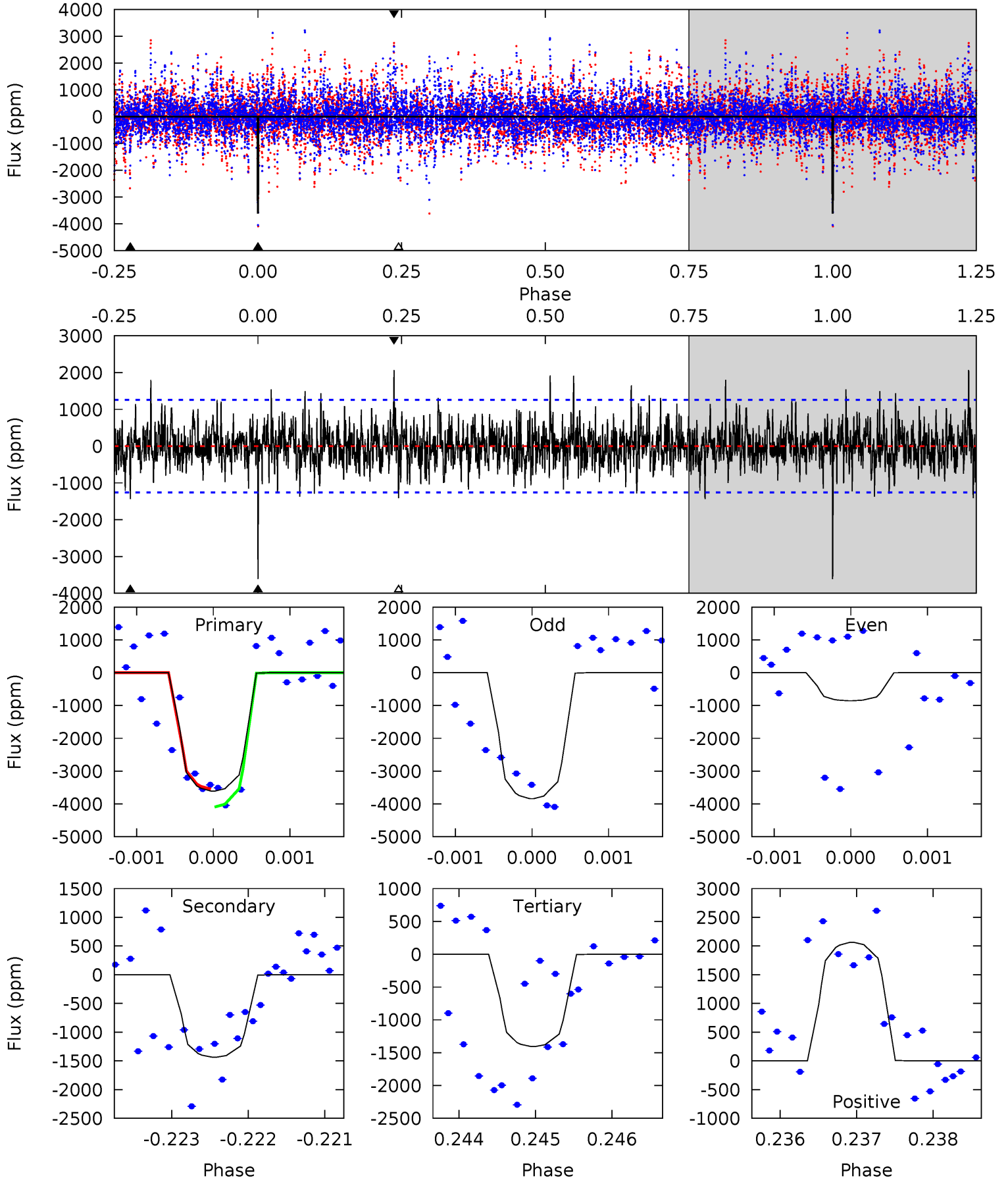
TCE 005640438-03 P=109.930044 Days $T_0=139.705196$ (BKJD)



DV Model-Shift Uniqueness Test

005640438-03, P = 109.924969 Days, E = 29.822293 Days

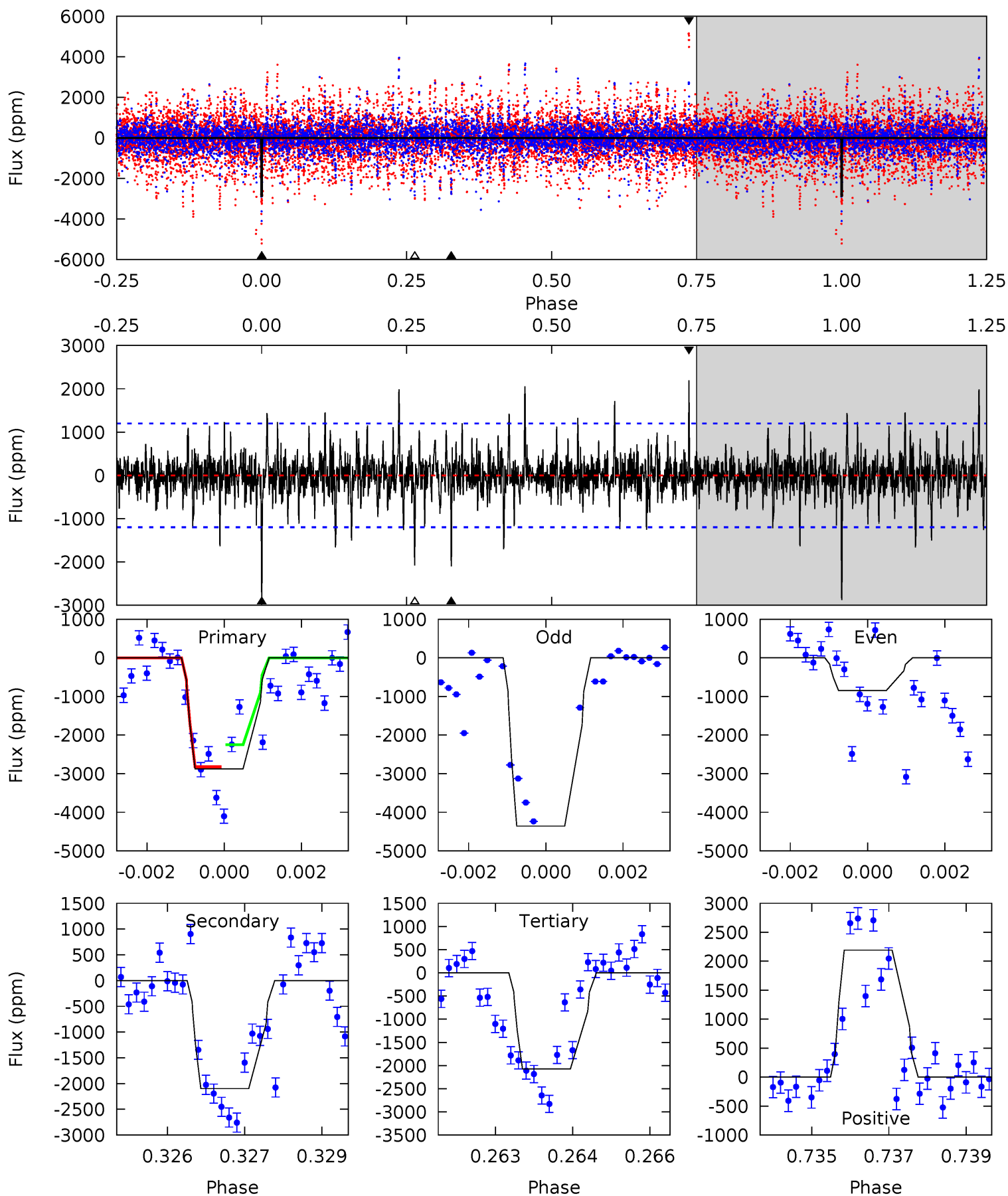
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.6	6.22	6.09	8.94	5.45	3.29	1.85	9.53	6.68	0.13	-2.72	7.08	0.57	0.36	1.17



Alt Model-Shift Uniqueness Test

005640438-03, P = 109.930044 Days, E = 29.775152 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
12.9	9.38	9.28	9.80	5.36	3.15	1.70	3.58	3.05	0.10	-0.42	8.21	0.82	0.43	1.30



Stellar Parameters For KIC 005640438

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6847^{+191}_{-262}	$4.358^{+0.056}_{-0.224}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.451}_{-0.141}$	$1.239^{+0.195}_{-0.178}$	$0.977^{+0.305}_{-0.546}$
	+3%/-4%	+1%/-5%	+114%/-136%	+37%/-12%	+16%/-14%	+31%/-56%
Source	PHO1	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 005640438-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1437 ± 231	$8.38^{+8.24}_{-5.93}$	686^{+54}_{-37}	5483^{+5479}_{-1400}	2551^{+26459}_{-1915}
Alt.	-2098 ± 224	$9.48^{+8.52}_{-6.29}$	684^{+58}_{-35}	5694^{+4950}_{-1354}	2919^{+21775}_{-2111}

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 $A_{obs} \gg 1.0$

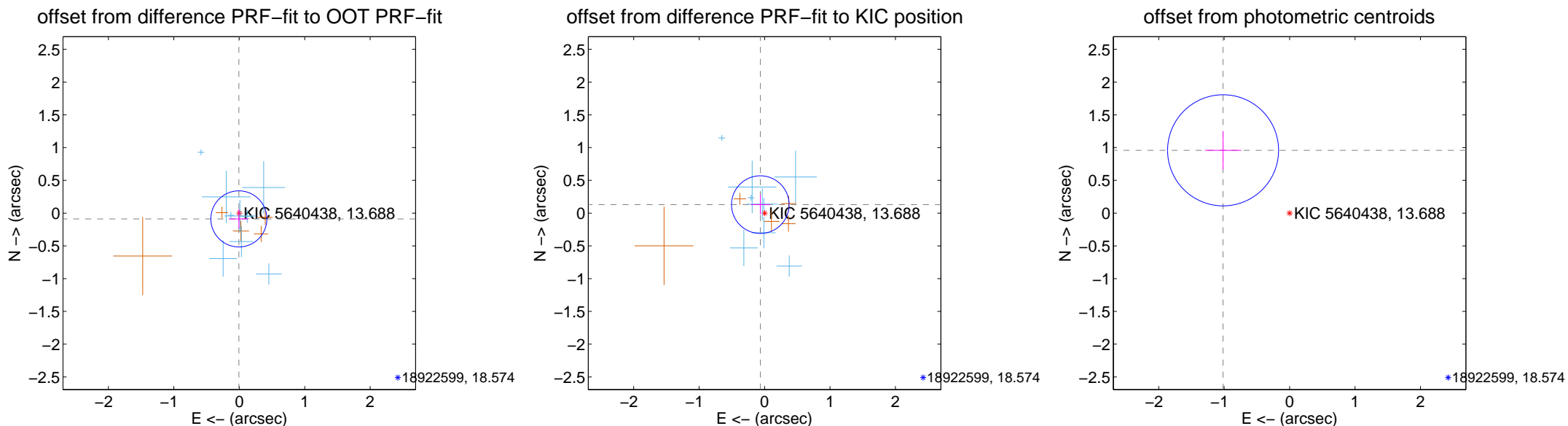
DV Centroid Data

Supplemental centroid analysis for 005640438-03. Kepler magnitude: 13.69. Transit SNR 6.73

There are 9 quarters with good PRF difference image offsets

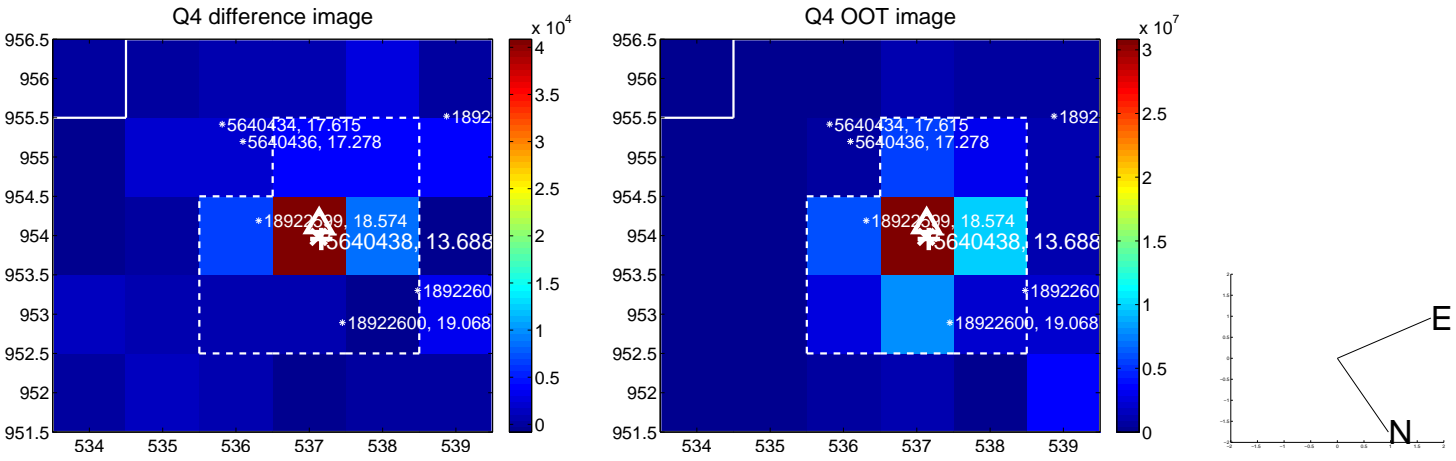
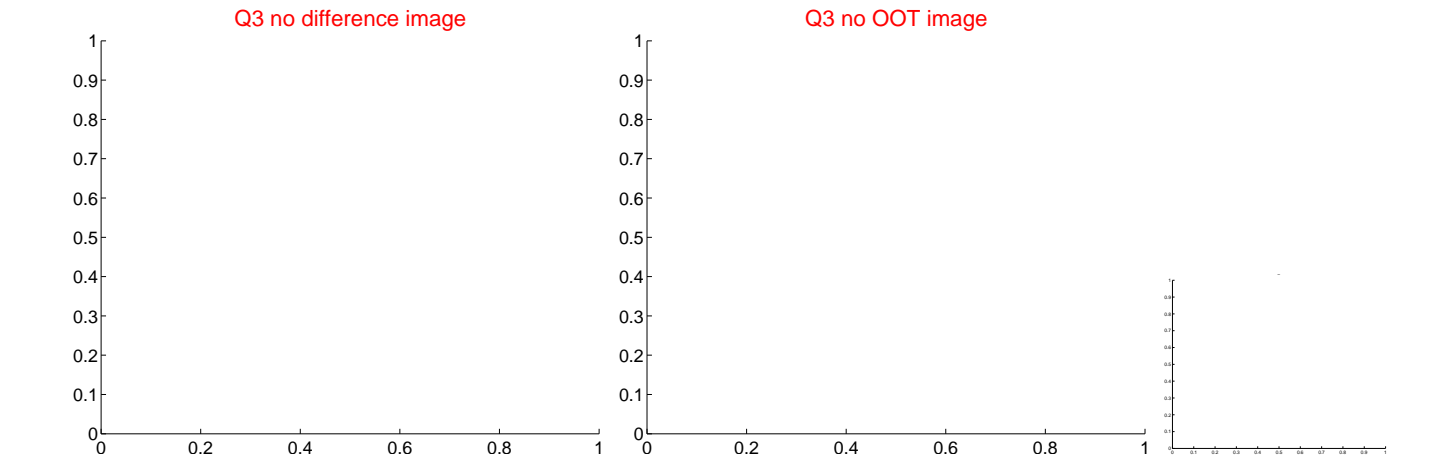
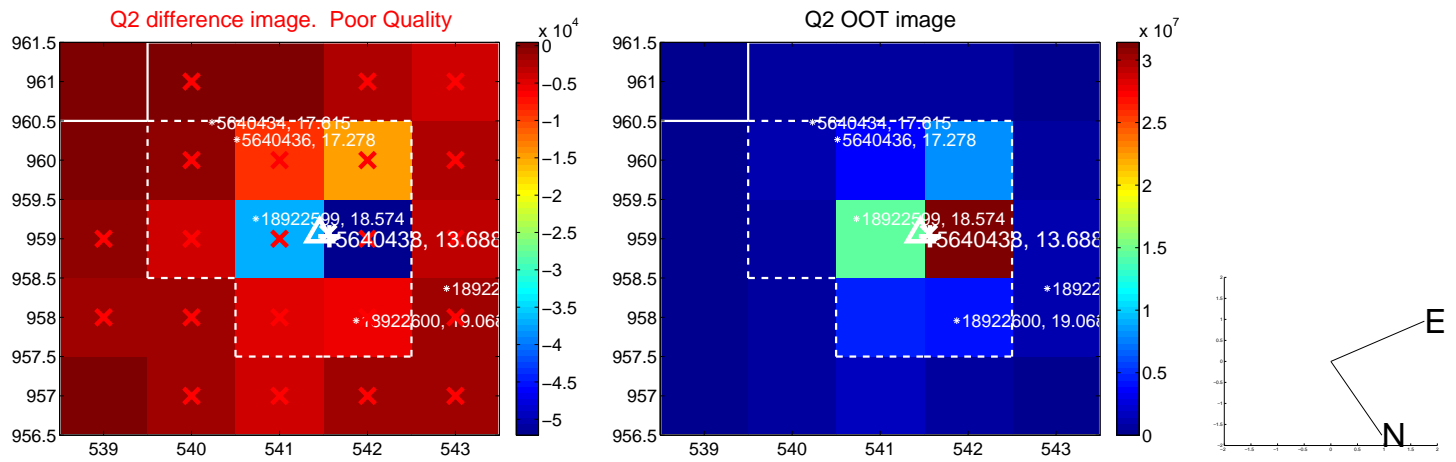
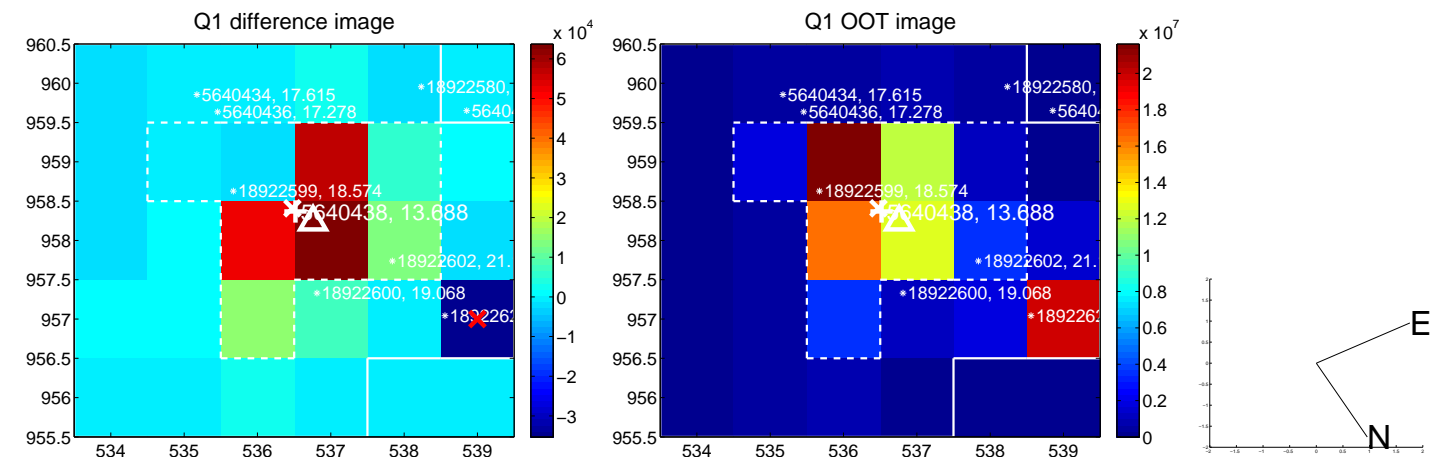
The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.088 ± 0.143	0.62	0.006 ± 0.152	-0.088 ± 0.144
PRF-fit source offset from KIC position	0.145 ± 0.147	0.99	0.065 ± 0.147	0.130 ± 0.152
photometric centroid source offset	1.40 ± 0.28	4.94	1.02 ± 0.28	0.96 ± 0.29

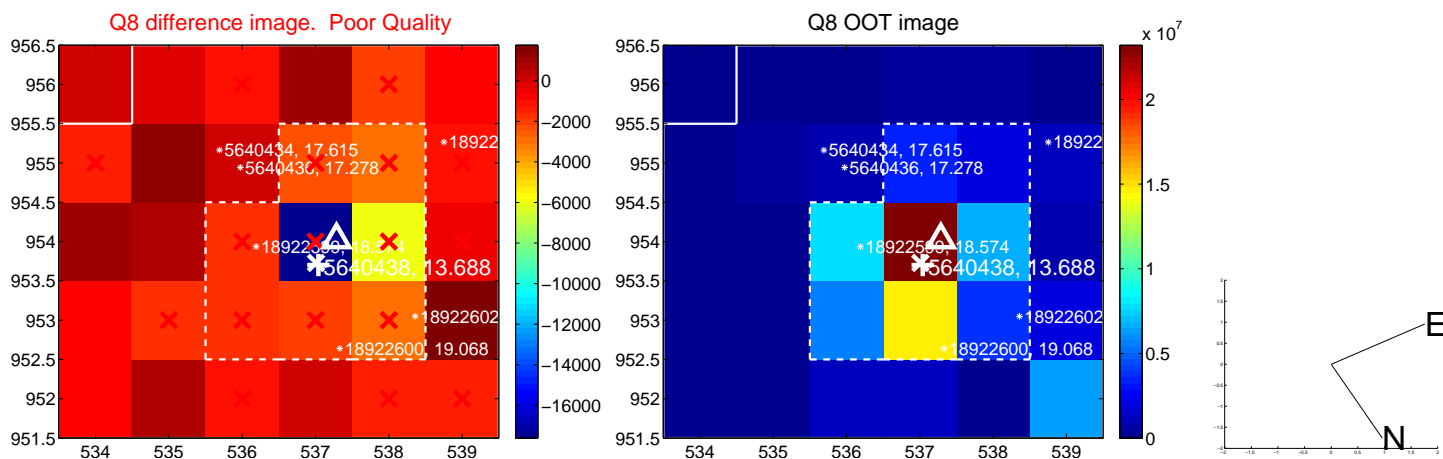
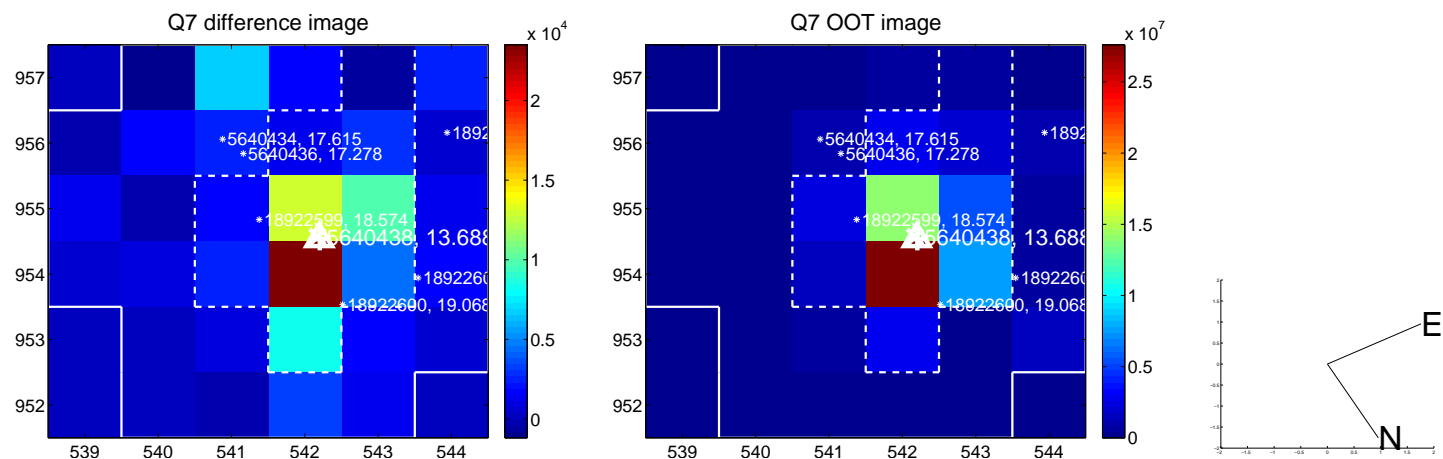
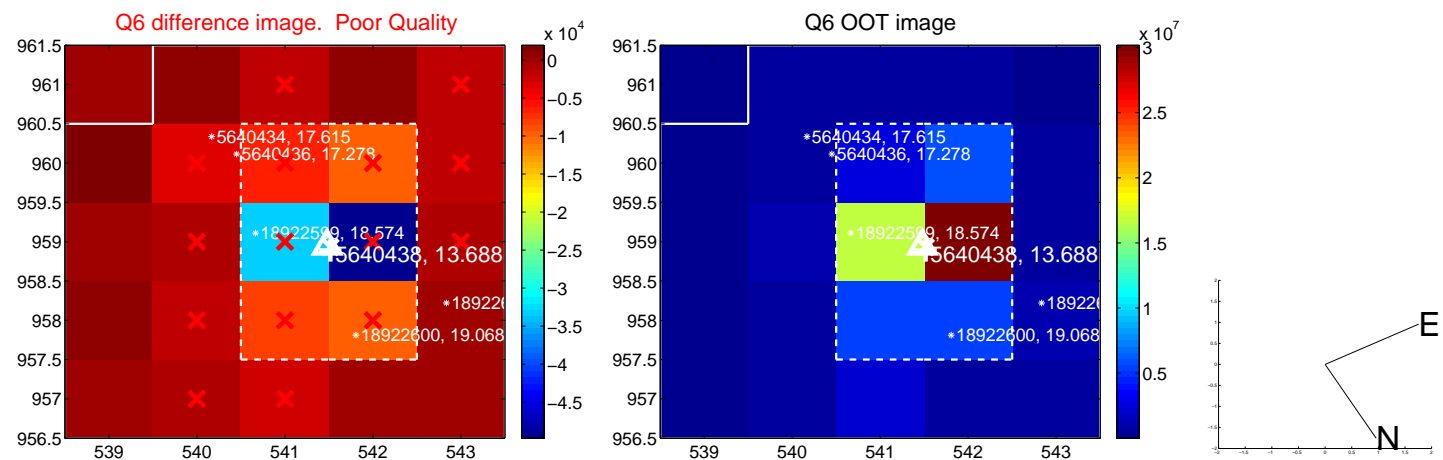
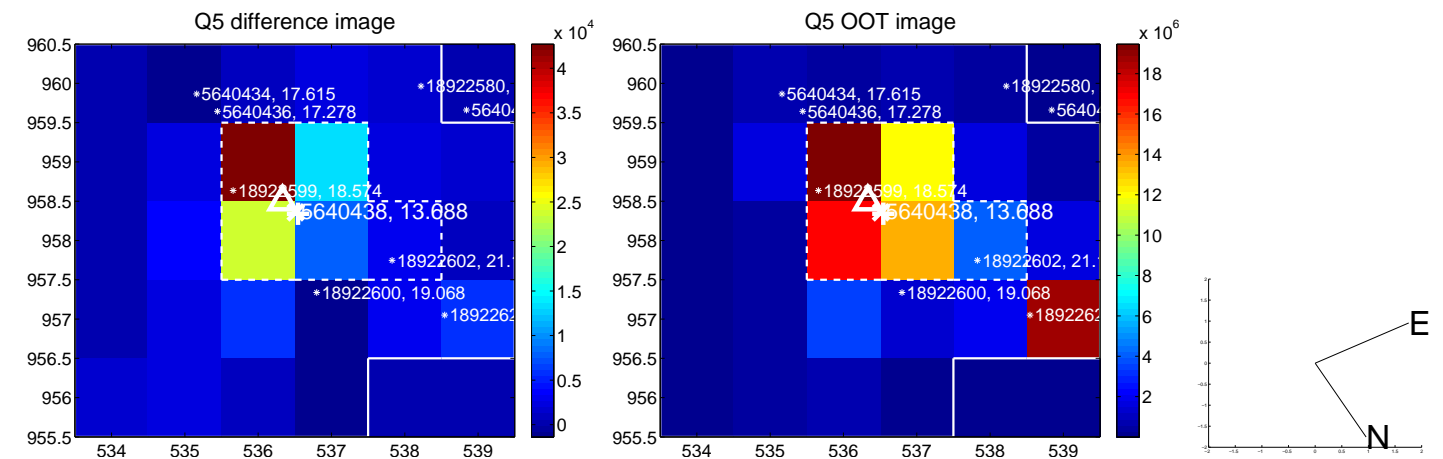


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

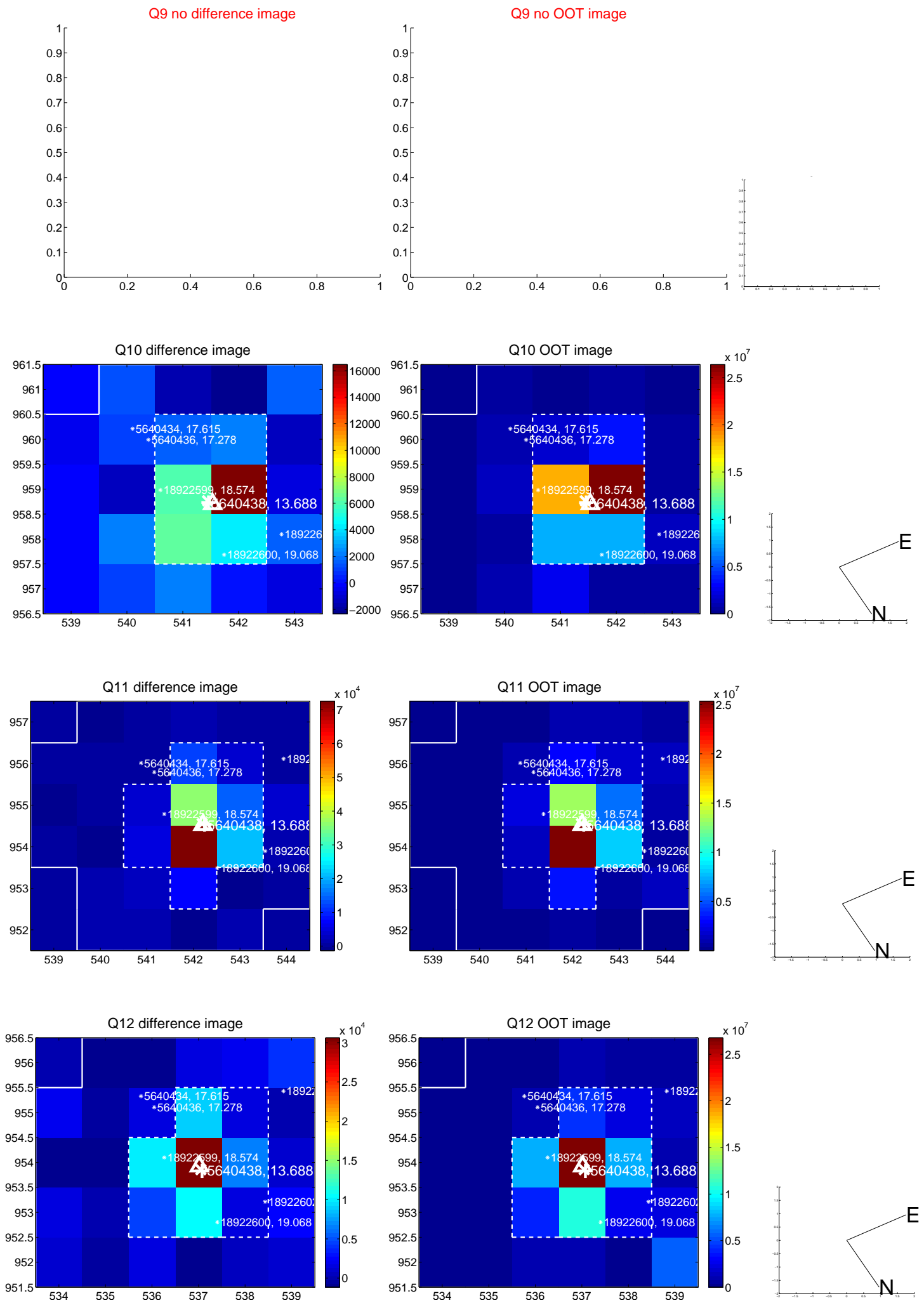
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



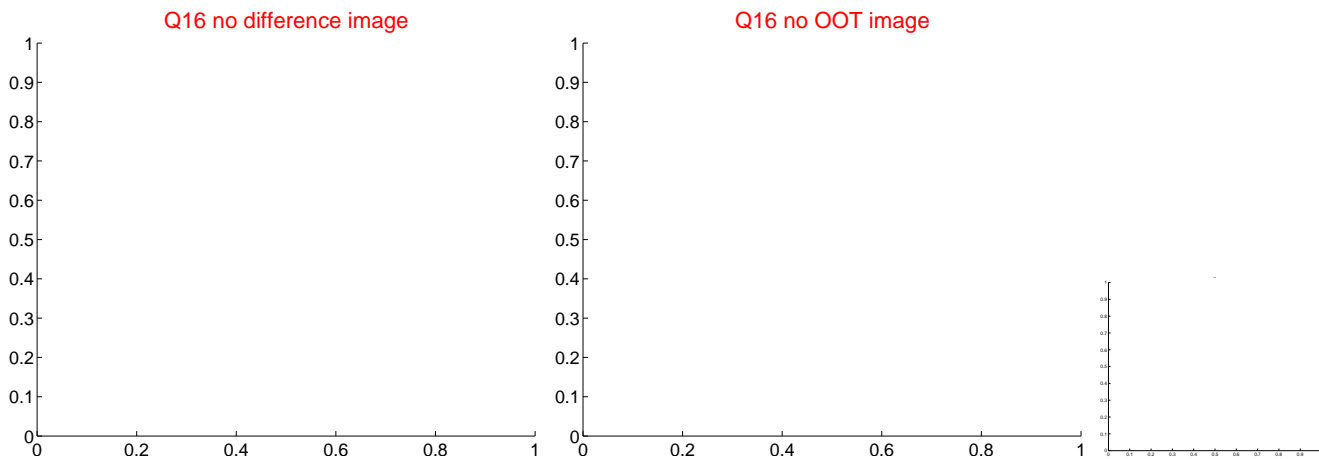
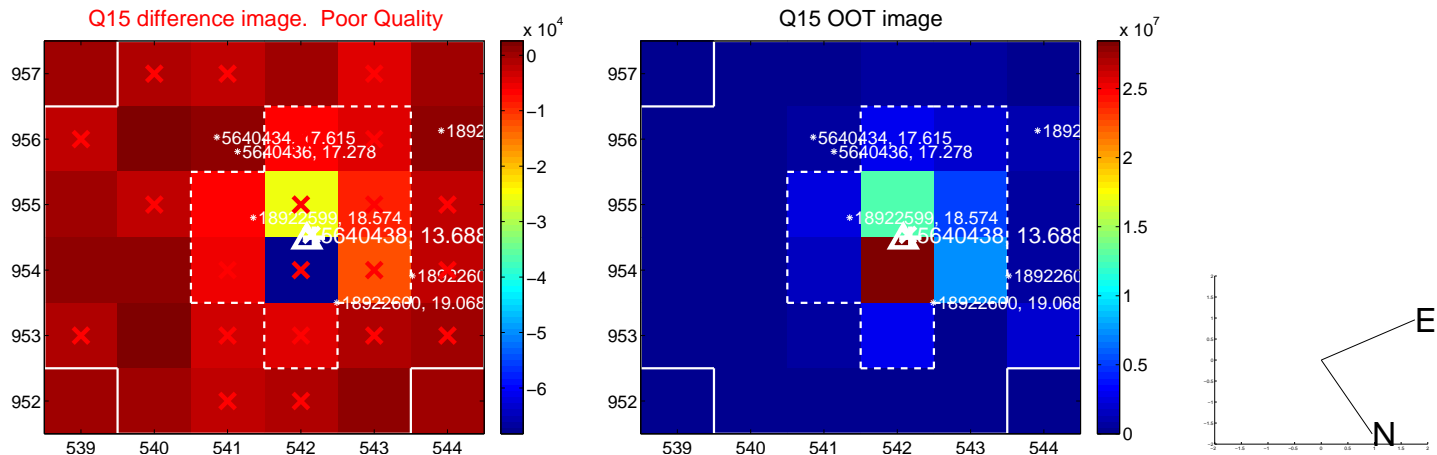
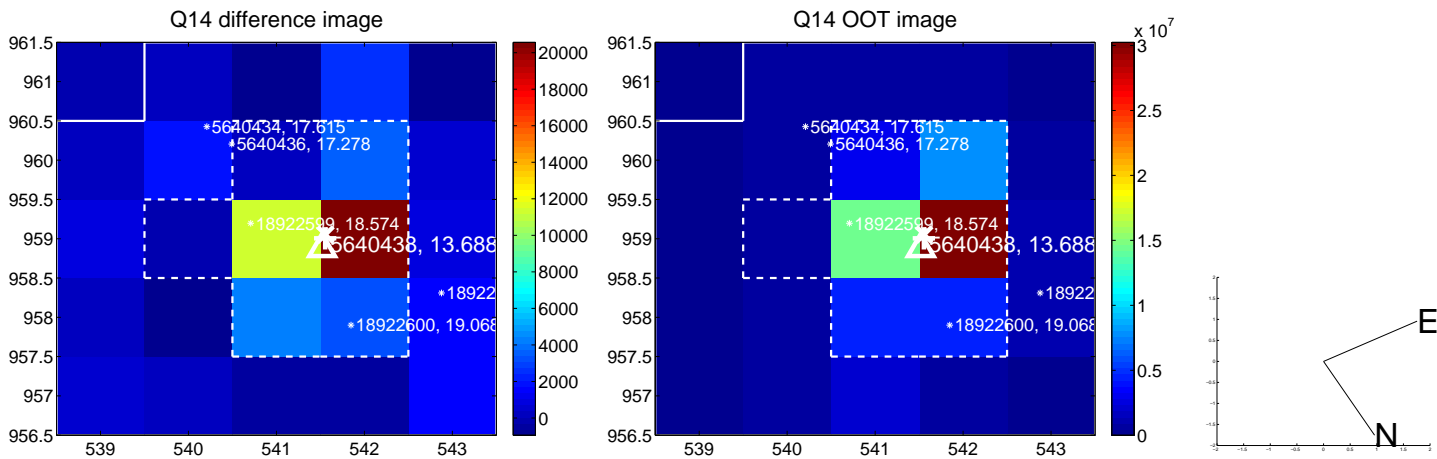
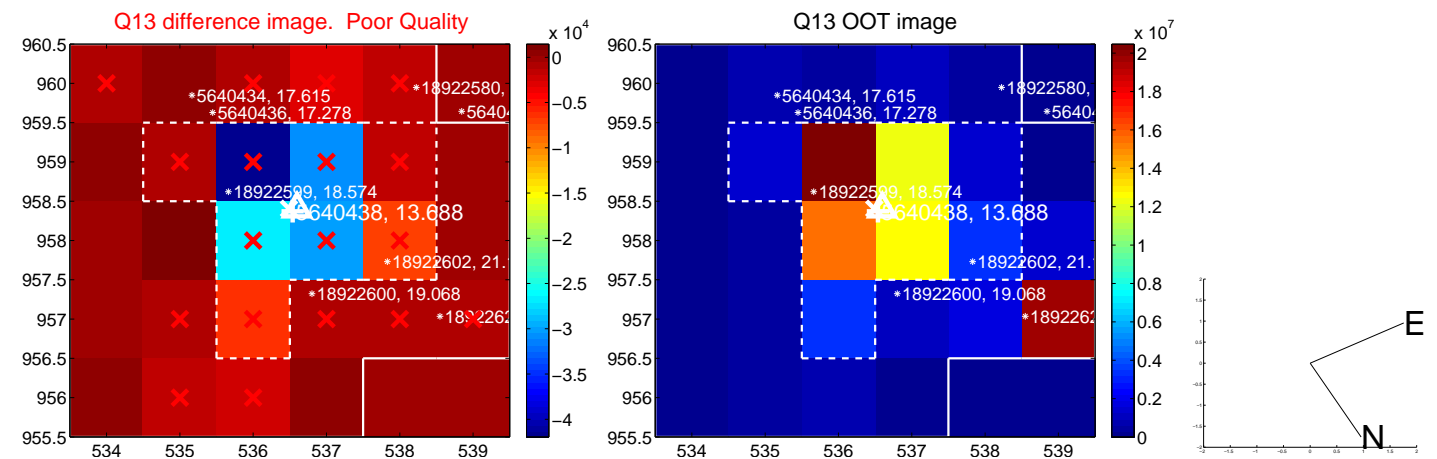
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



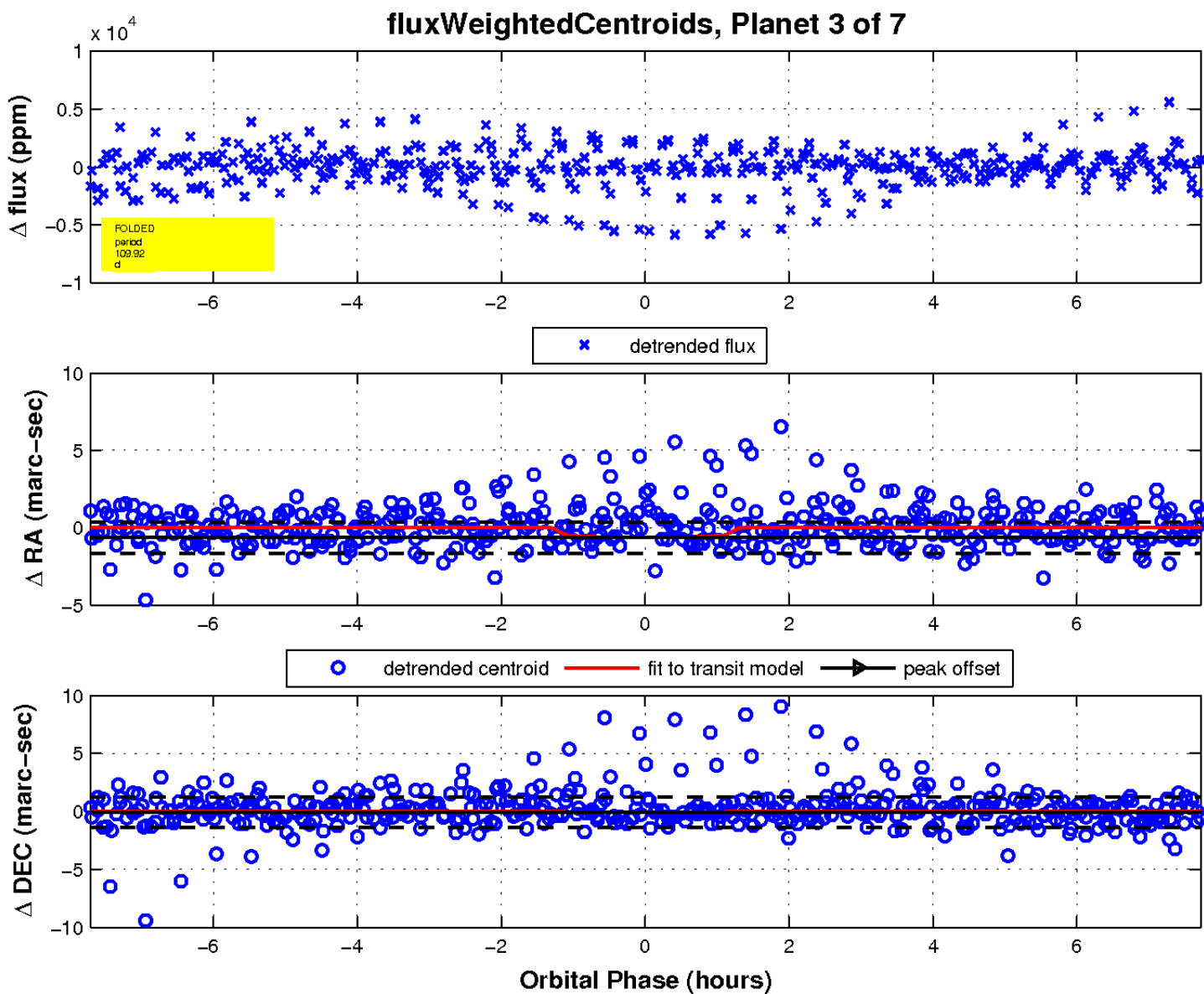
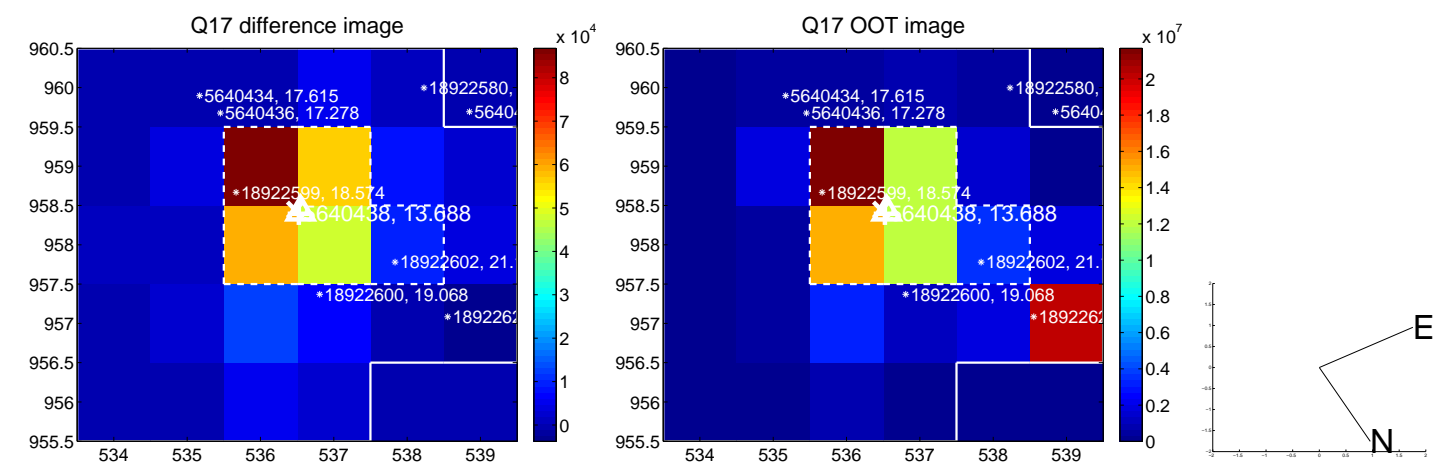
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

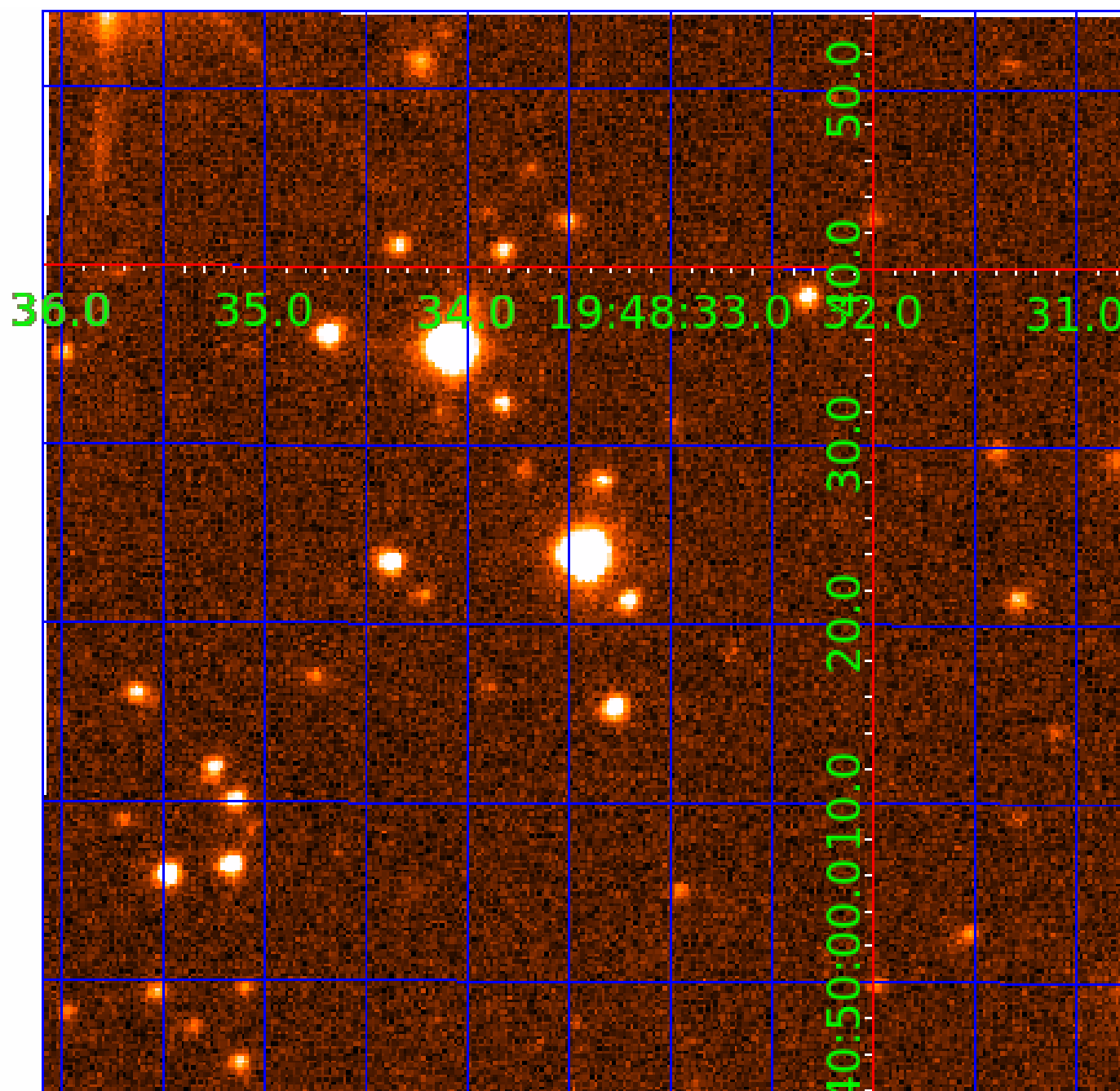


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005640438

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})
005640438-01	OBS	No	0.997320	132.079880	181.3	6.317	10.5	12.9	1.21	6847	3.06	6632.69
005640438-03	OBS	No	109.924969	139.747262	1454.6	2.581	10.7	6.7	1.21	6847	4.85	12.55
005640438-04	OBS	No	21.946630	150.794527	1499.4	17.781	9.2	8.0	1.21	6847	5.51	107.56
005640438-05	OBS	No	71.365018	145.448396	1545.5	10.485	8.5	7.3	1.21	6847	5.87	22.33
005640438-07	OBS	No	99.907008	170.355191	320.7	4.500	8.7	-1.0	1.21	6847	2.19	14.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005640438-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
005640438-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
005640438-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT
005640438-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005640438-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

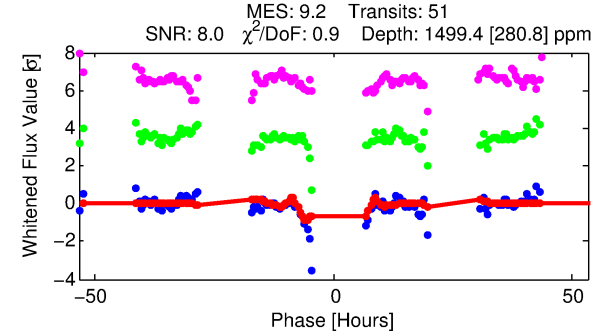
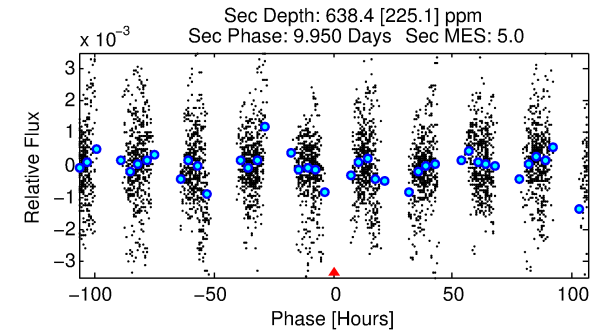
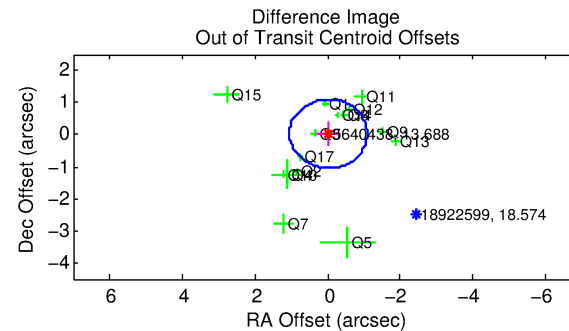
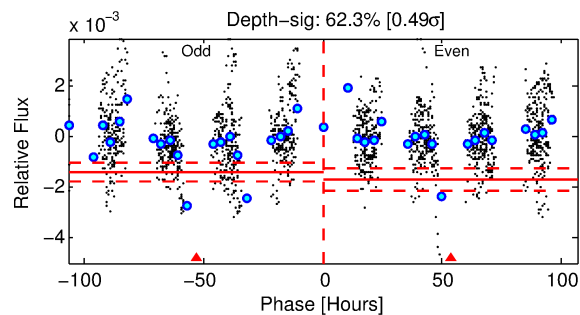
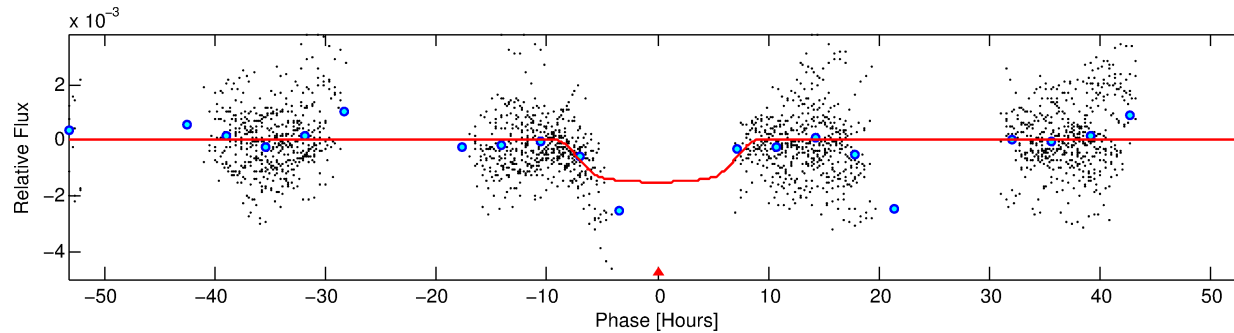
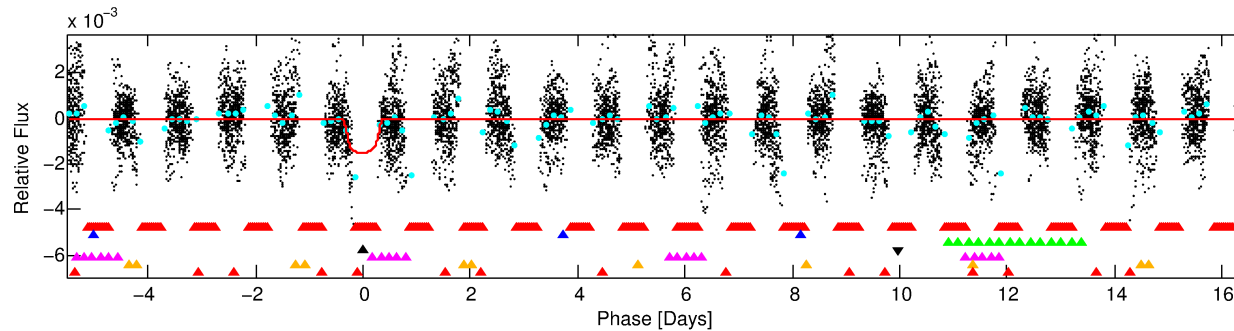
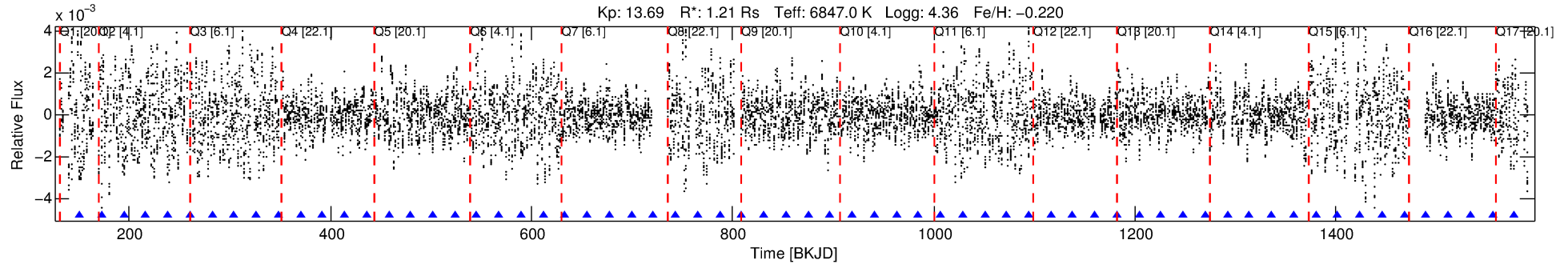
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005640438-04

No Significant Match Found

DV One-Page Summary

KIC: 5640438 Candidate: 4 of 7 Period: 21.947 d



DV Fit Results:

Period = 21.94663 [0.00060] d
Epoch = 150.7945 [0.0238] BKJD
Rp/R* = 0.0416 [0.0042]
a/R* = 4.89 [0.28]
b = 0.91 [0.02]
Seff = 107.56 [48.47]
Teq = 821 [93] K
Rp = 5.51 [2.12] Re
a = 0.1641 [0.0495] AU
Ag = 311.49 [182.75] [1.70 σ]
Teffp = 5334 [578] K [7.71 σ]

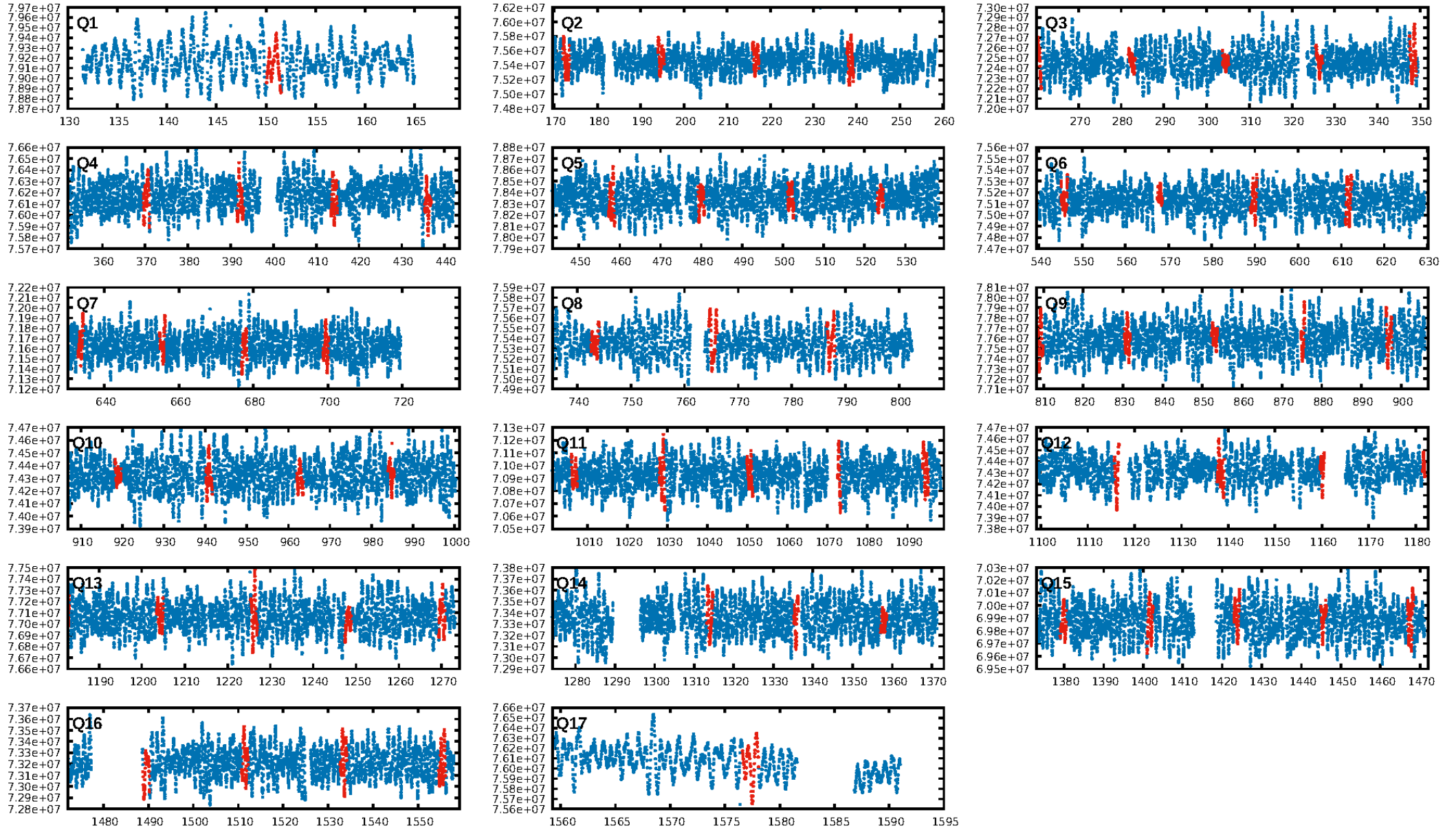
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [26.64 σ]
LongPeriod-sig: 100.0% [57.46 σ]
ModelChiSquare2-sig: 4.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [49/49]
GhostDiagnostic-chr: 0.6577
Centroid-sig: 3.2%
Centroid-so: 1.143 arcsec [16.67 σ]
OotOffset-rm: 0.034 arcsec [0.10 σ]
KicOffset-rm: 0.224 arcsec [0.62 σ]
OotOffset-st: 3/4/3/5 [15]
KicOffset-st: 3/4/3/5 [15]
DiffImageQuality-fgm: 0.60 [9/15]
DiffImageOverlap-fno: 0.00 [0/17]

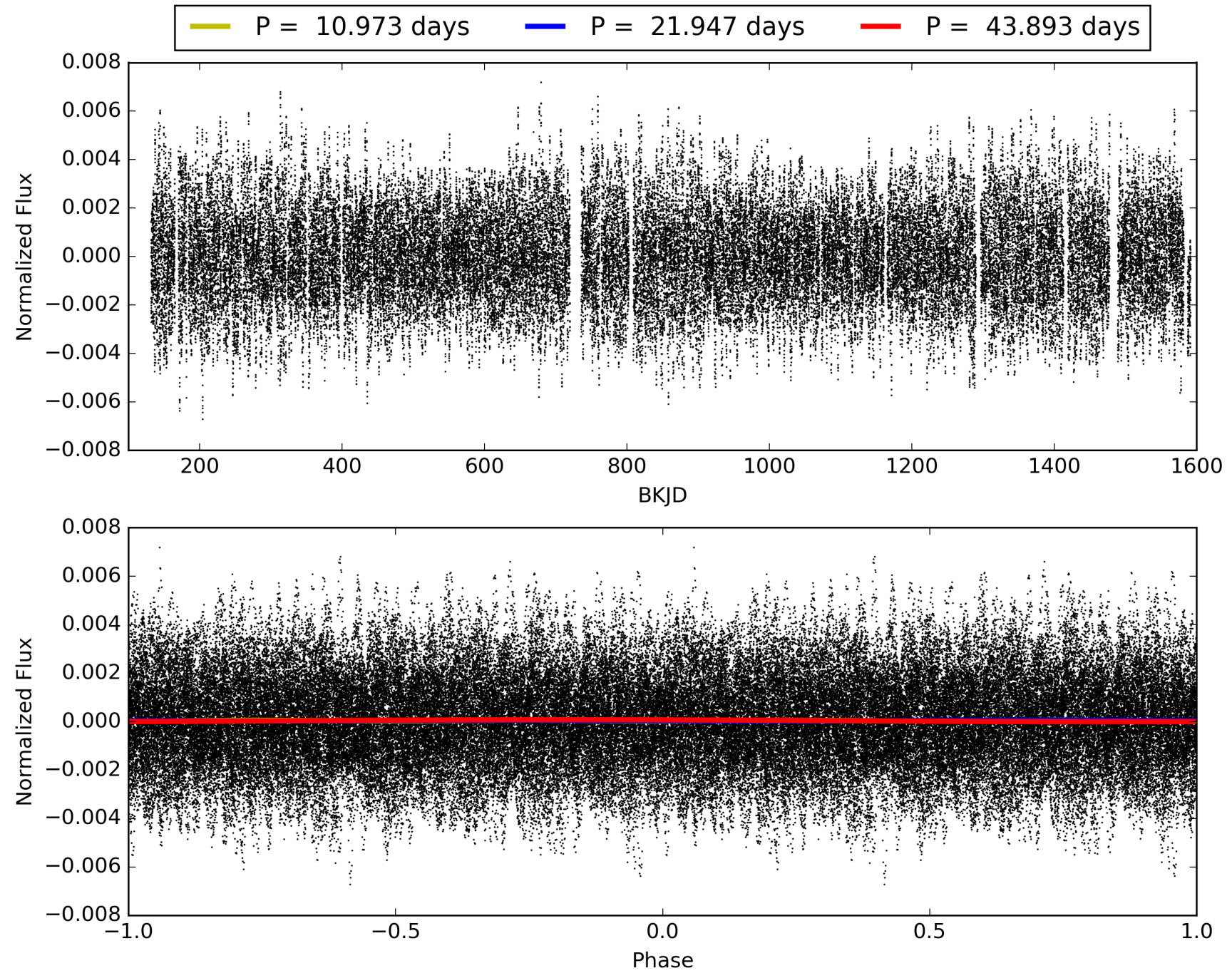
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:38:27 Z

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

TCE 005640438-04, PDC Light Curves

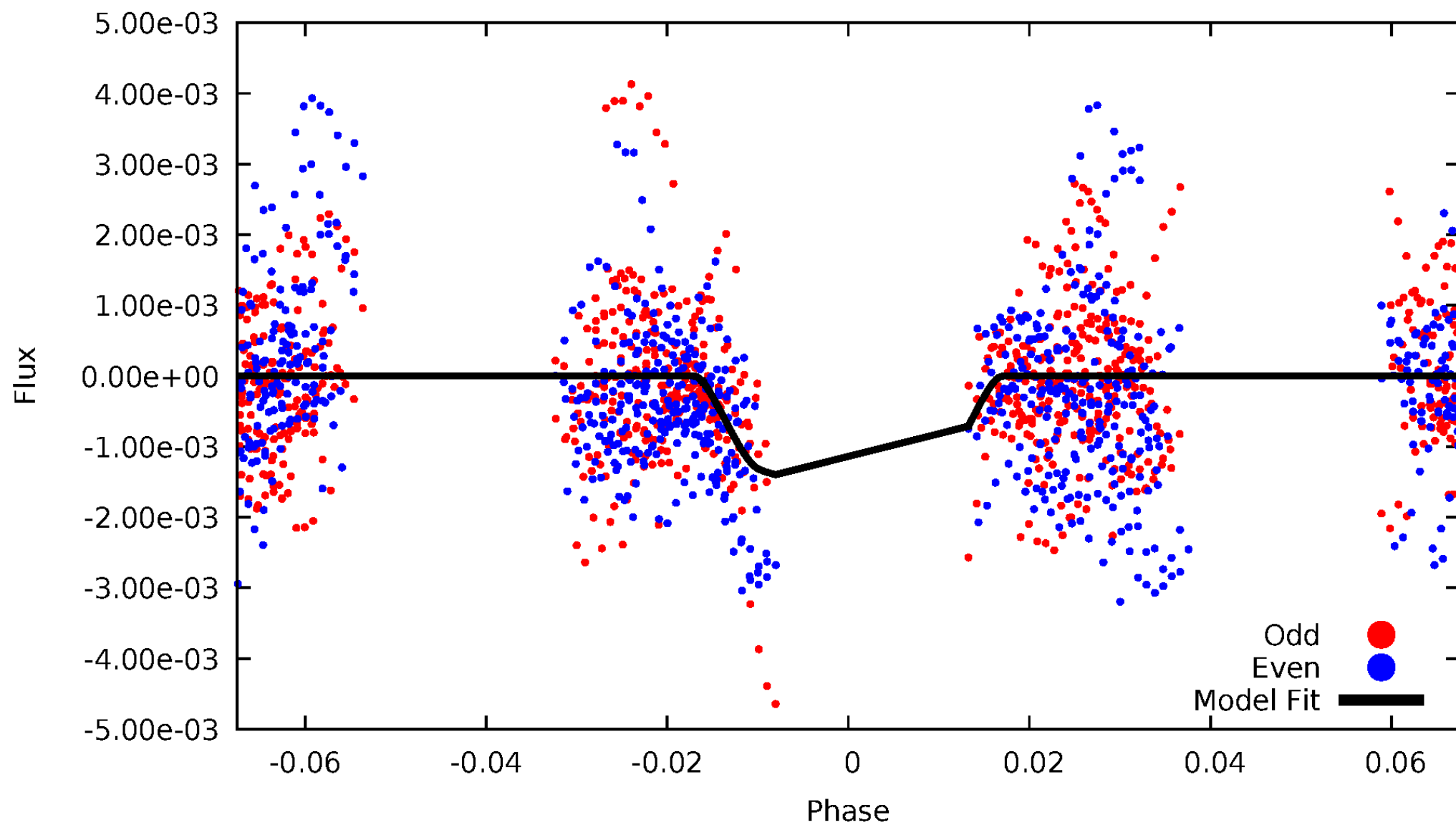


TCE 005640438-04



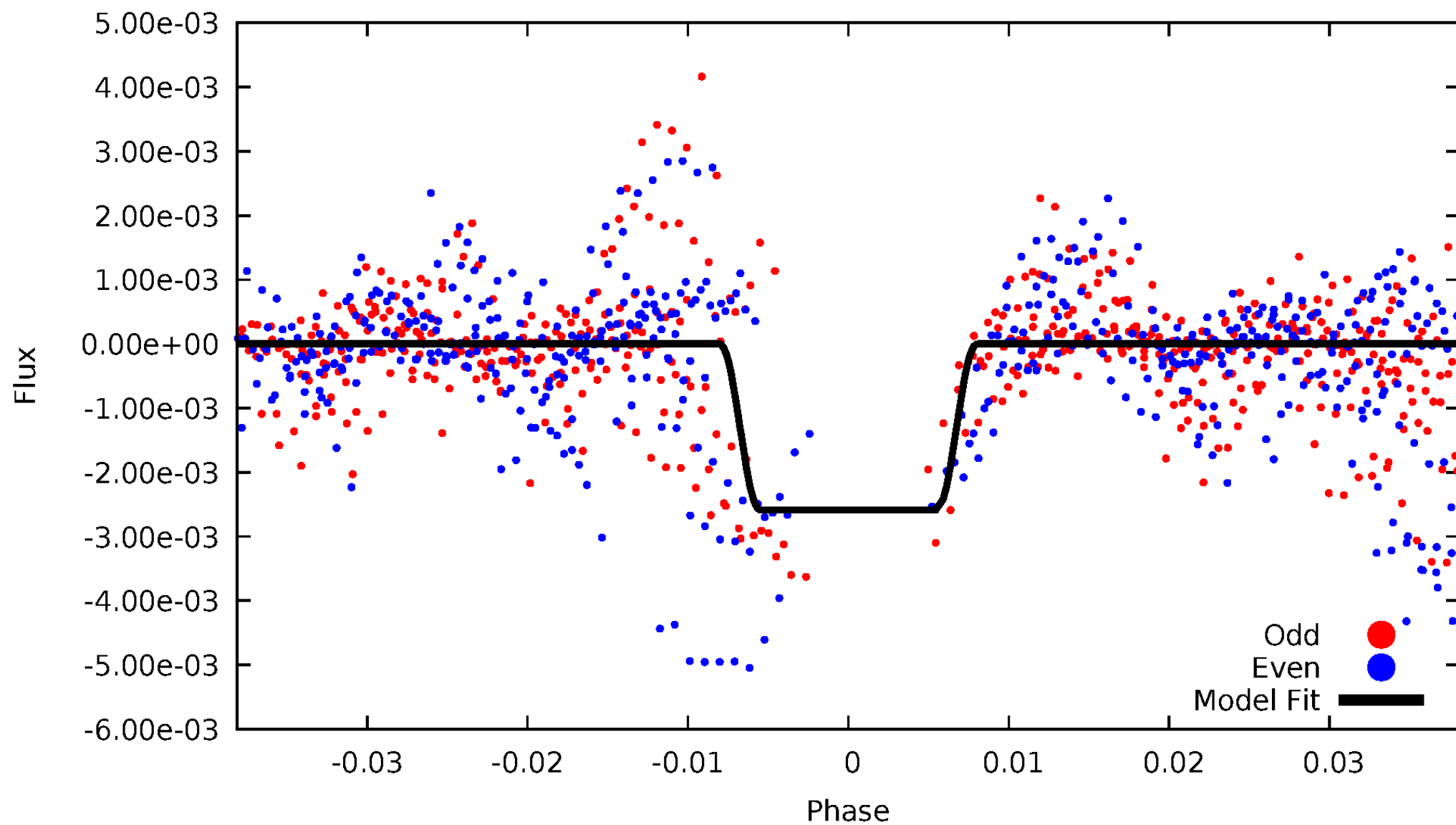
DV Odd/Even

TCE 005640438-04



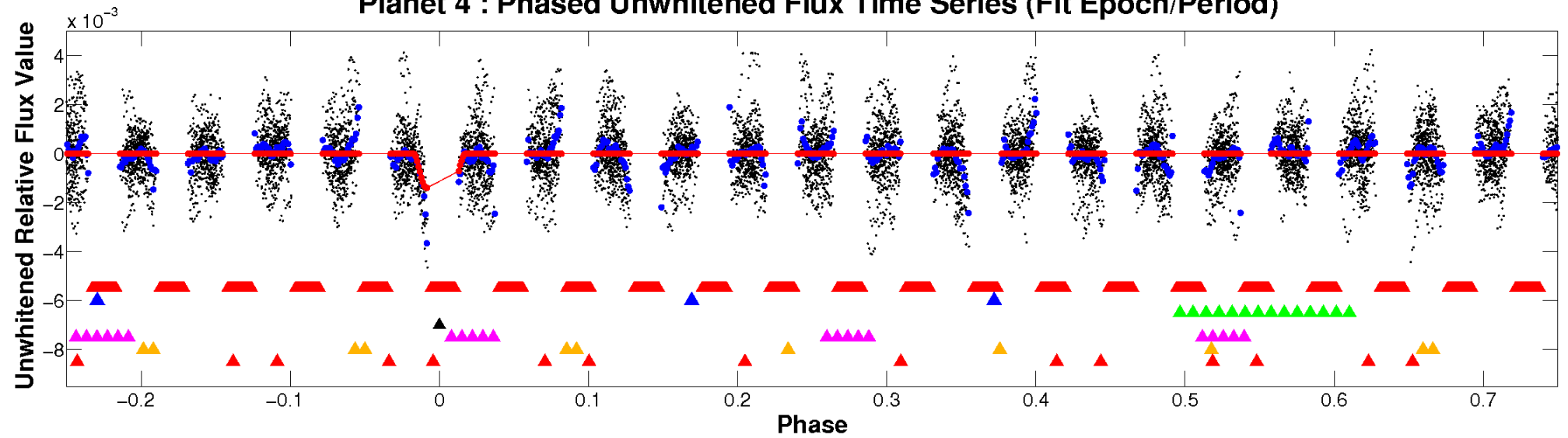
ALT Odd/Even

TCE 005640438-04

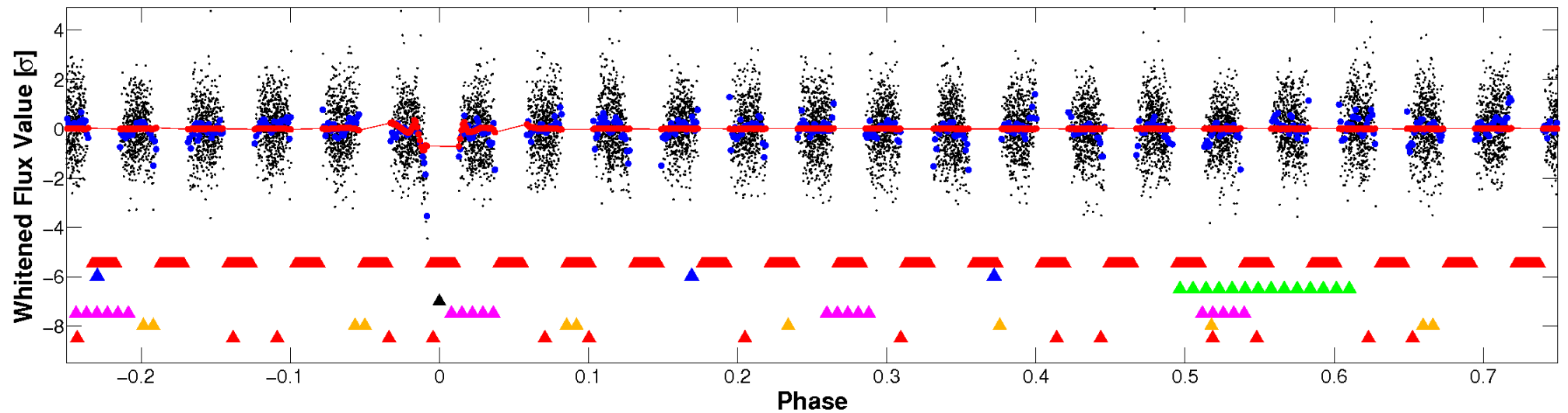


Non-Whitened Vs. Whitened Light Curve

Planet 4 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

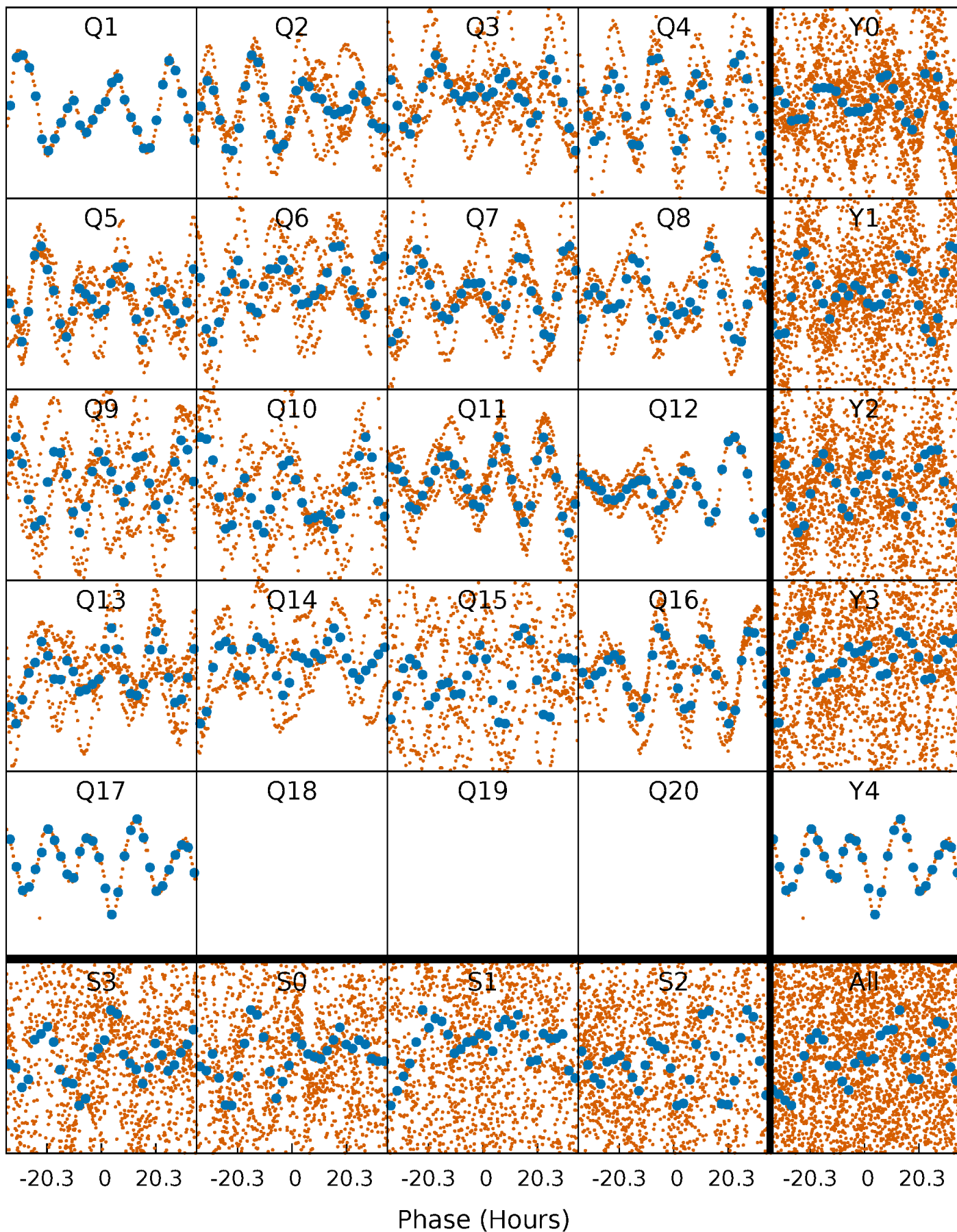


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



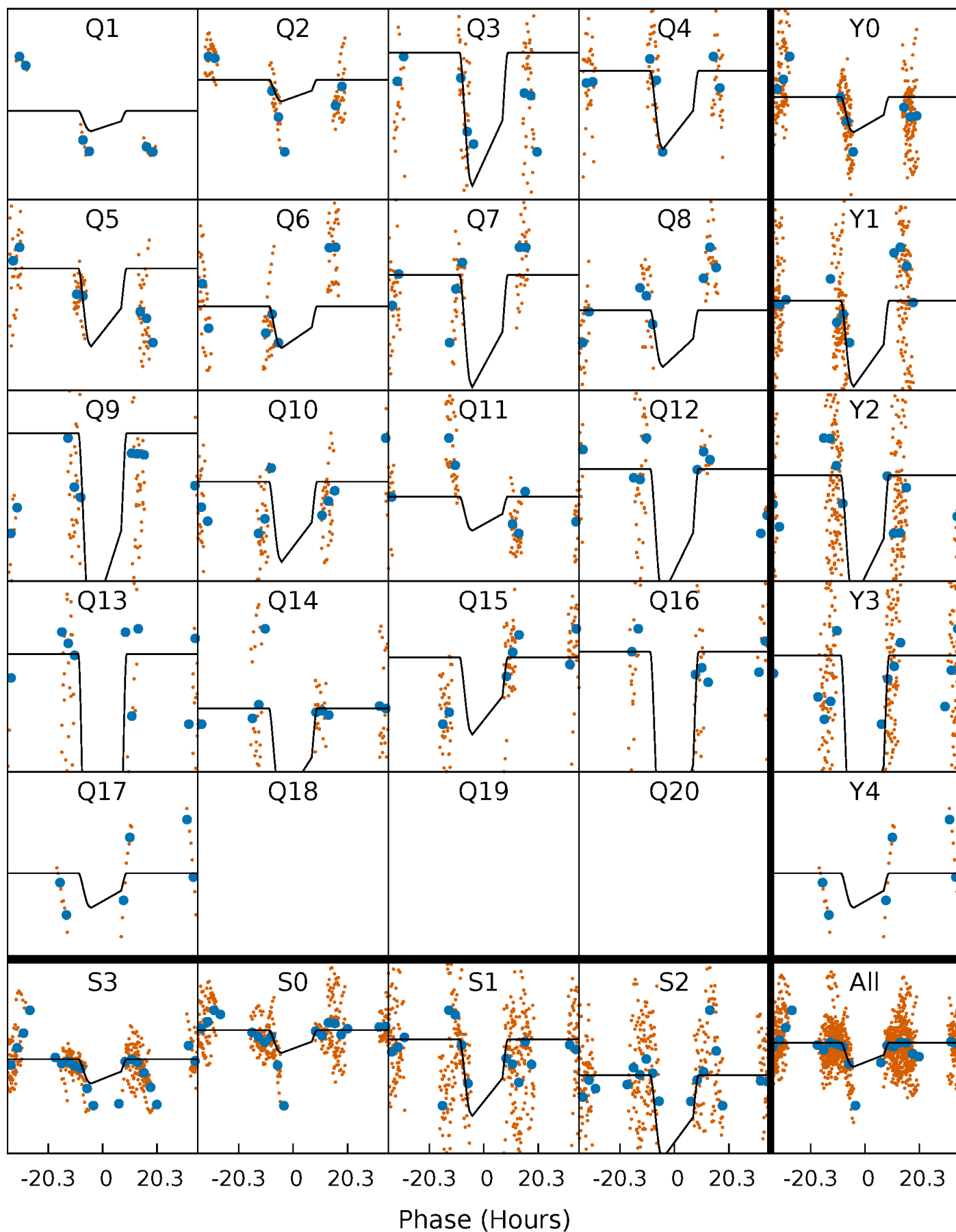
PDC Quarter-Phased Transit Curves

TCE 005640438-04 P= 21.946630 Days $T_0=150.794527$ (BKJD)



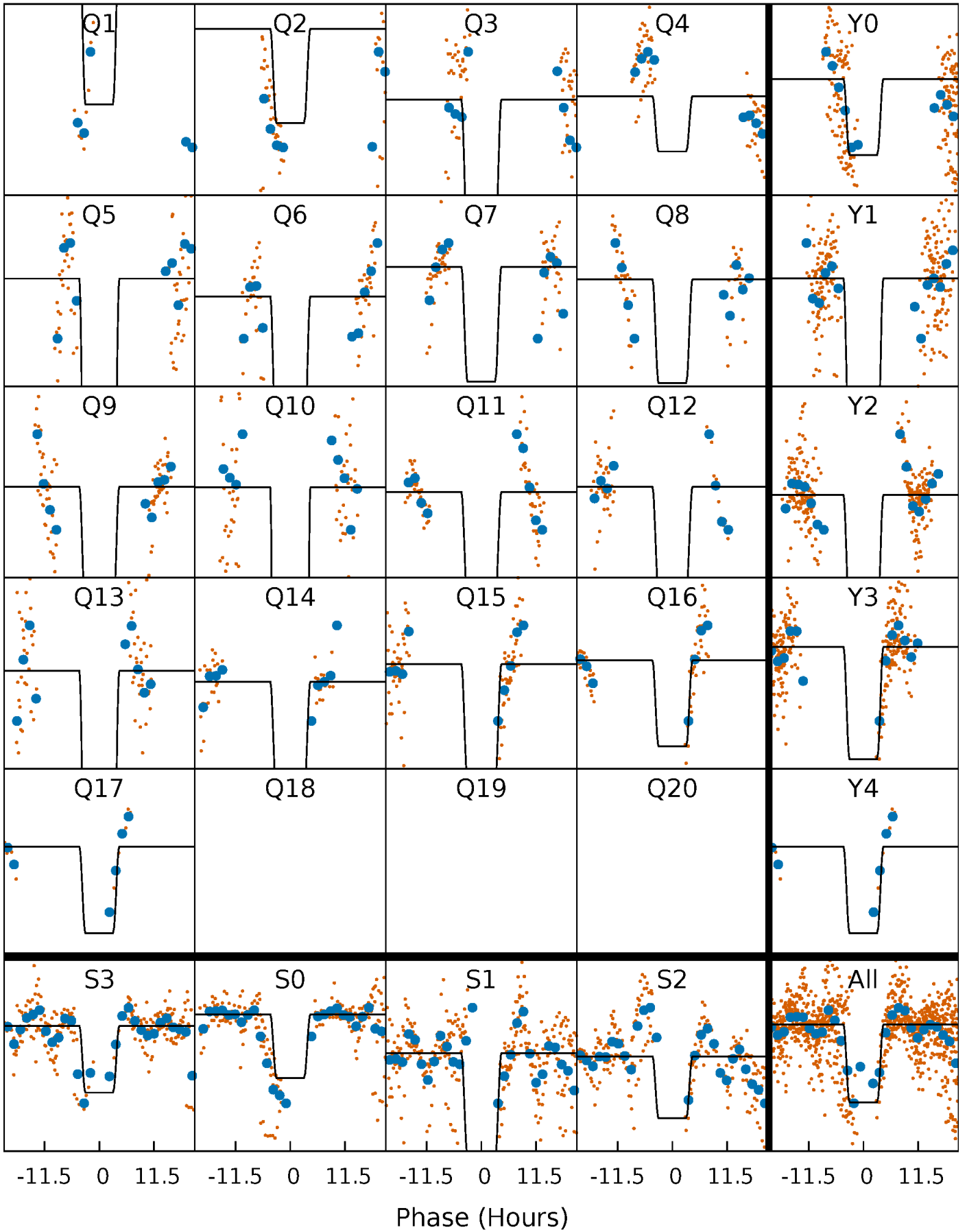
DV Quarter-Phased Transit Curves

TCE 005640438-04 P= 21.946630 Days $T_0=150.794527$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

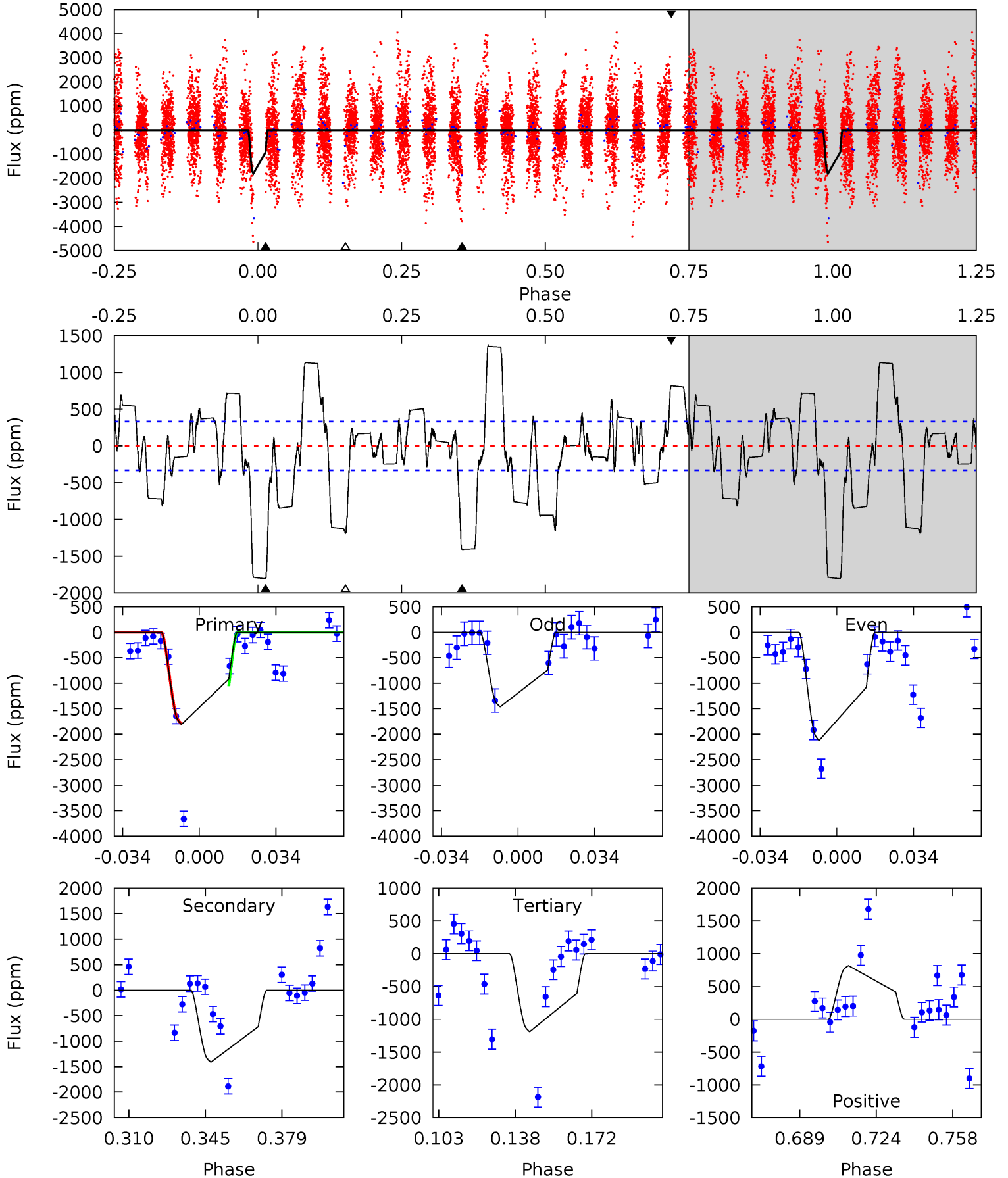
TCE 005640438-04 P= 21.951317 Days $T_0=150.671362$ (BKJD)



DV Model-Shift Uniqueness Test

005640438-04, P = 21.946630 Days, E = 128.847897 Days

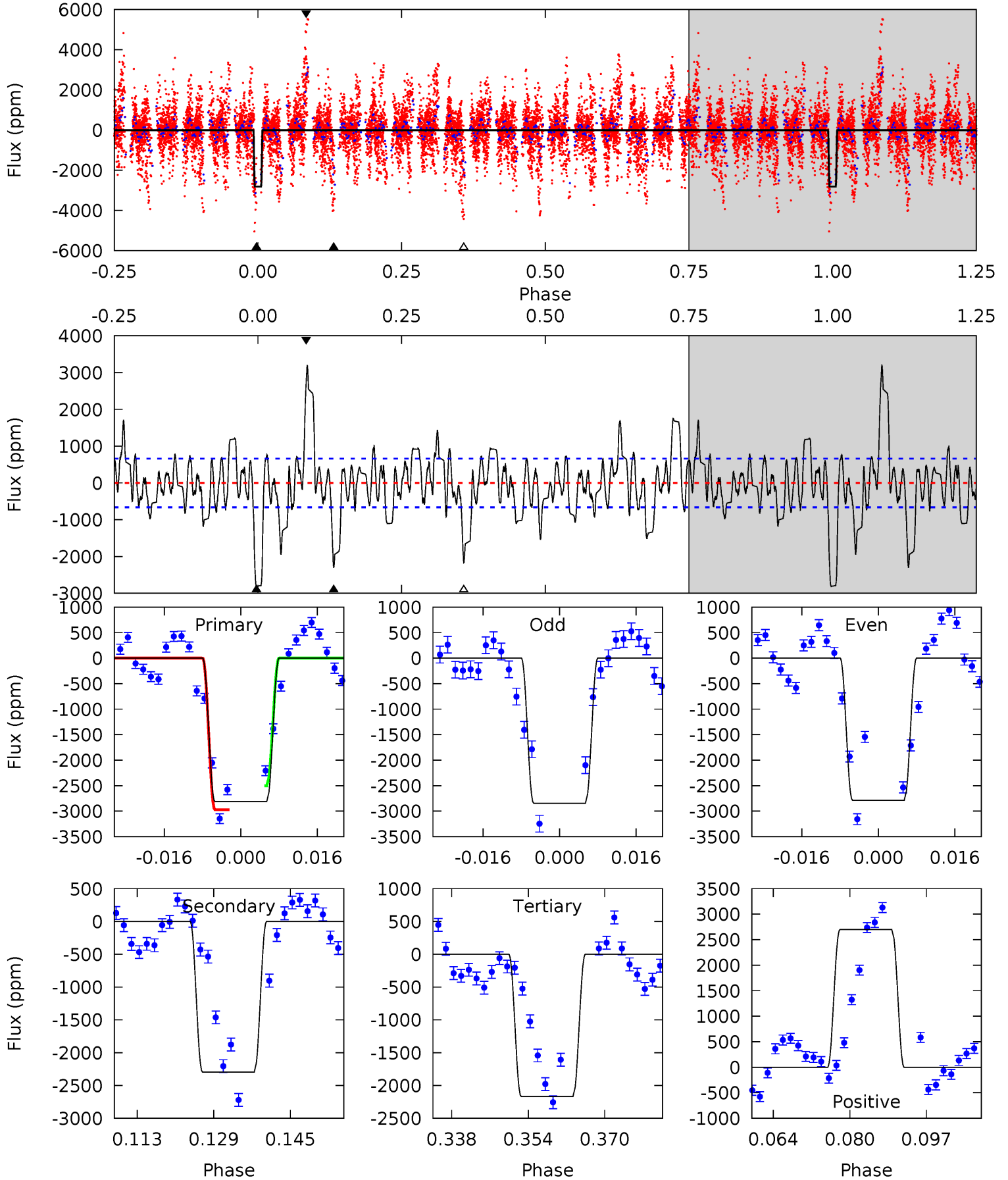
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.1	20.4	17.2	11.8	4.78	2.11	4.91	8.93	14.3	3.19	8.58	4.81	1.06	0.43	4.25



Alt Model-Shift Uniqueness Test

005640438-04, P = 21.951317 Days, E = 128.720045 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.0	17.1	16.2	20.1	4.93	2.41	4.00	4.80	0.85	0.96	-2.99	0.22	0.72	0.53	1.63



Stellar Parameters For KIC 005640438

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6847^{+191}_{-262}	$4.358^{+0.056}_{-0.224}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.451}_{-0.141}$	$1.239^{+0.195}_{-0.178}$	$0.977^{+0.305}_{-0.546}$
	+3%/-4%	+1%/-5%	+114%/-136%	+37%/-12%	+16%/-14%	+31%/-56%
Source	PHO1	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 005640438-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-1411 ± 69	$5.75^{+1.18}_{-0.79}$	1173^{+94}_{-58}	6459^{+452}_{-405}	609^{+217}_{-169}
Alt.	-2297 ± 134	$7.04^{+1.33}_{-0.90}$	1173^{+94}_{-64}	6638^{+368}_{-385}	676^{+184}_{-184}

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 $A_{obs} \gg 1.0$

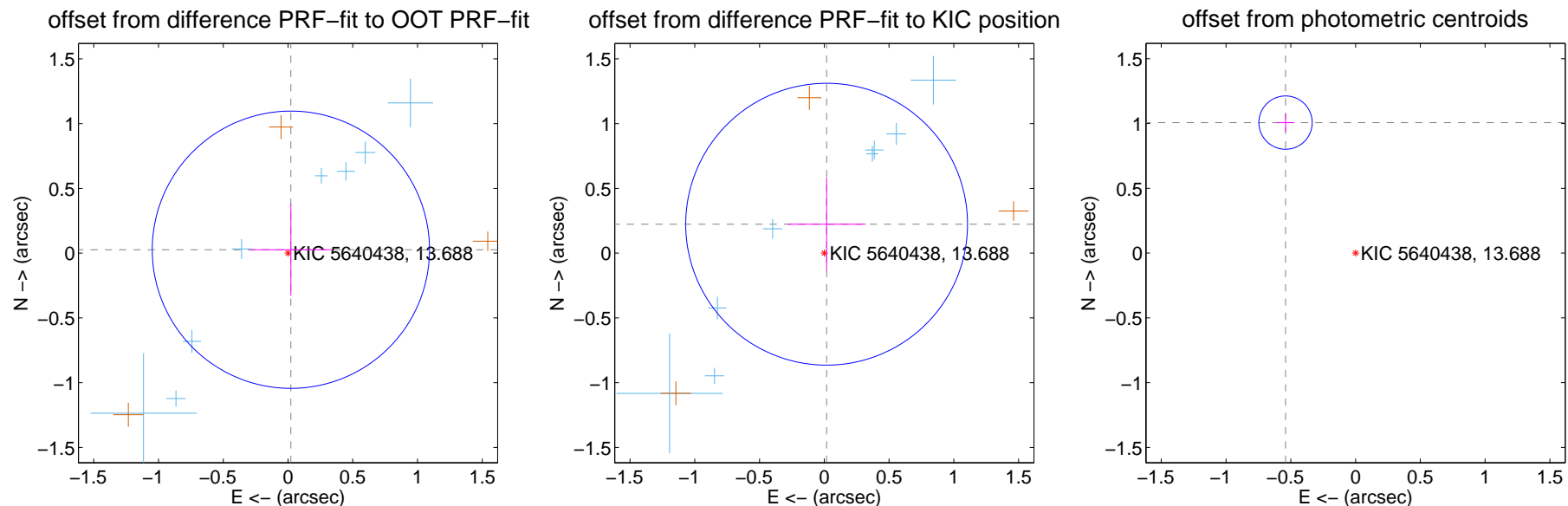
DV Centroid Data

Supplemental centroid analysis for 005640438-04. Kepler magnitude: 13.69. Transit SNR 8.03

There are 9 quarters with good PRF difference image offsets

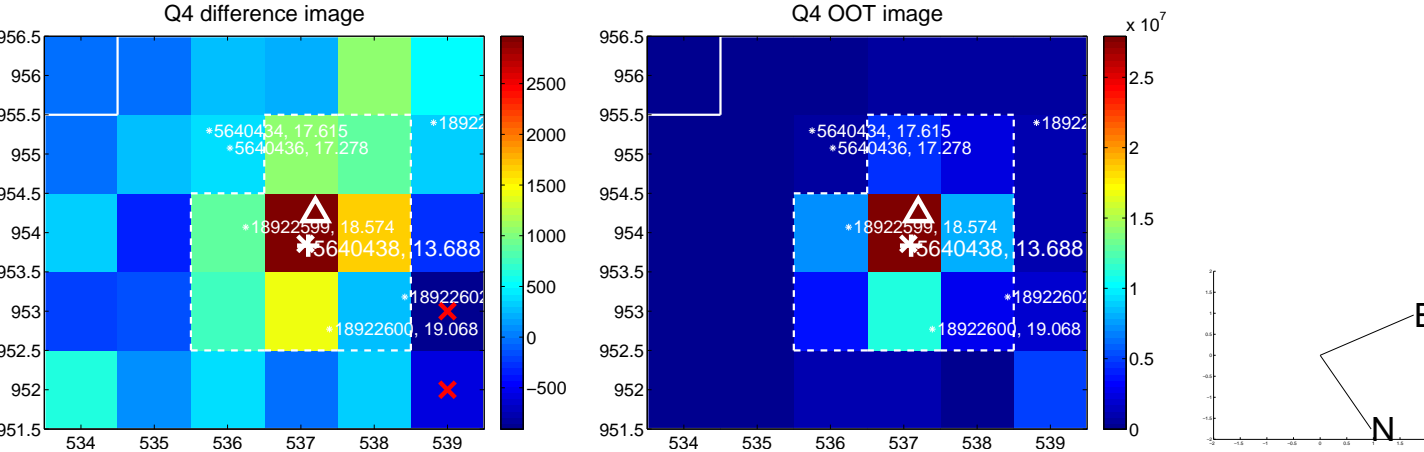
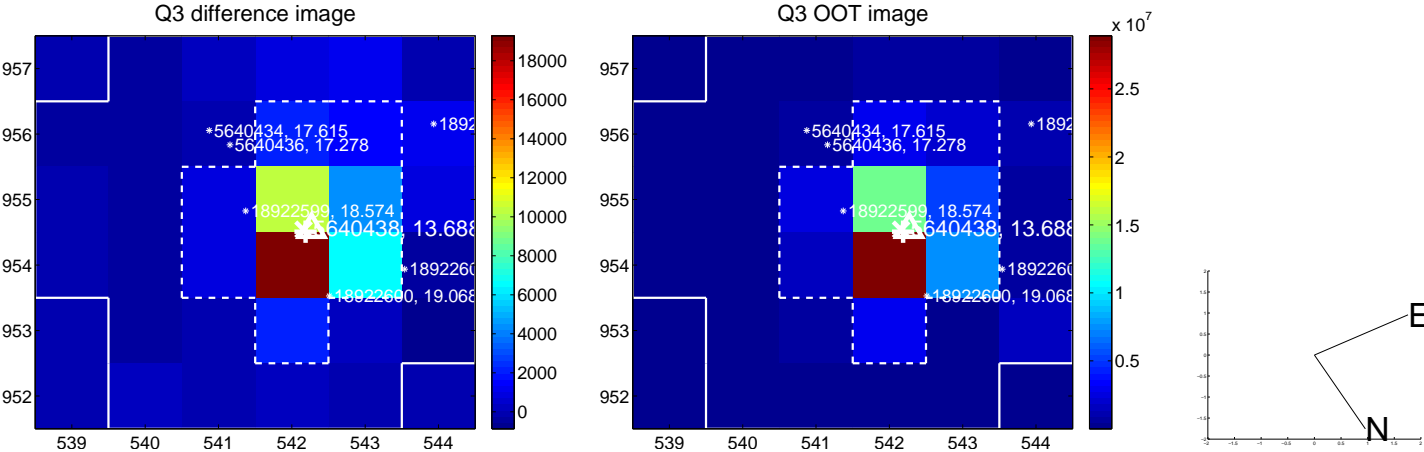
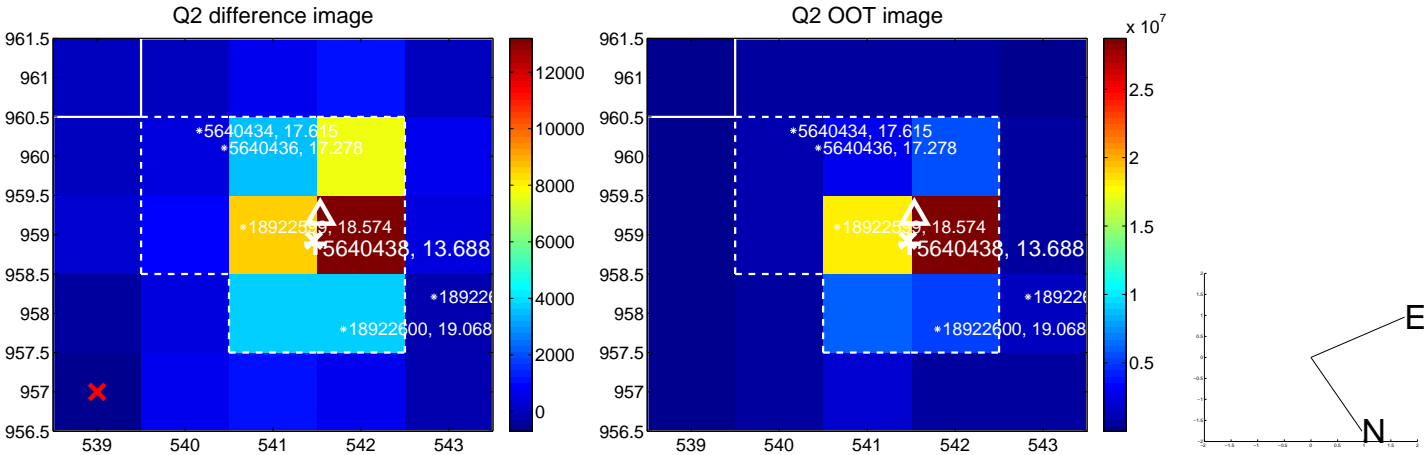
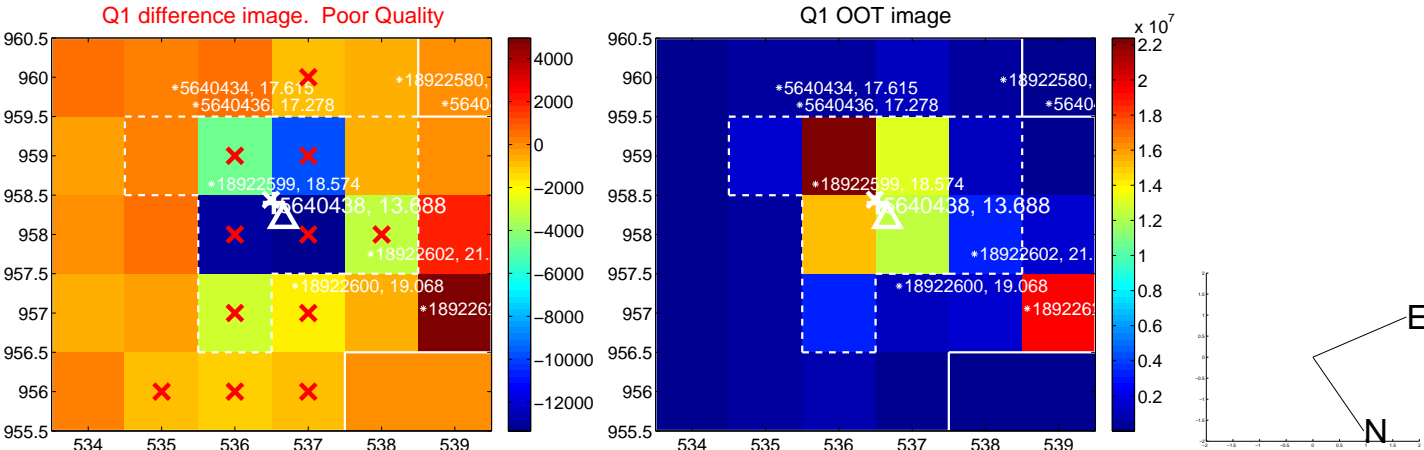
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.034 ± 0.357	0.10	-0.022 ± 0.316	0.026 ± 0.354
PRF-fit source offset from KIC position	0.224 ± 0.363	0.62	-0.018 ± 0.301	0.223 ± 0.359
photometric centroid source offset	1.14 ± 0.07	16.67	0.54 ± 0.07	1.01 ± 0.07

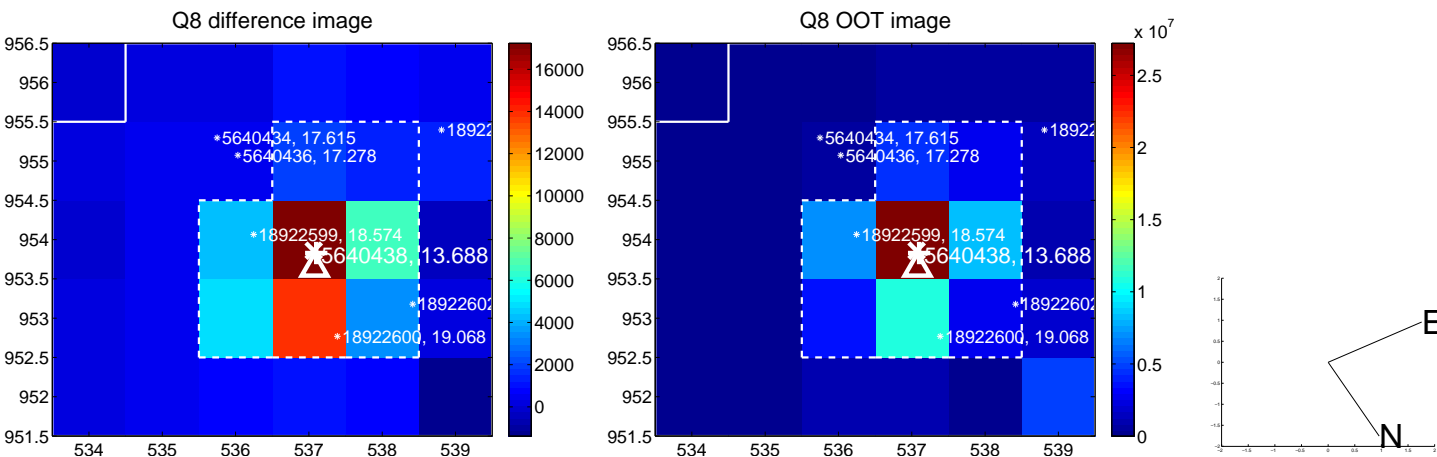
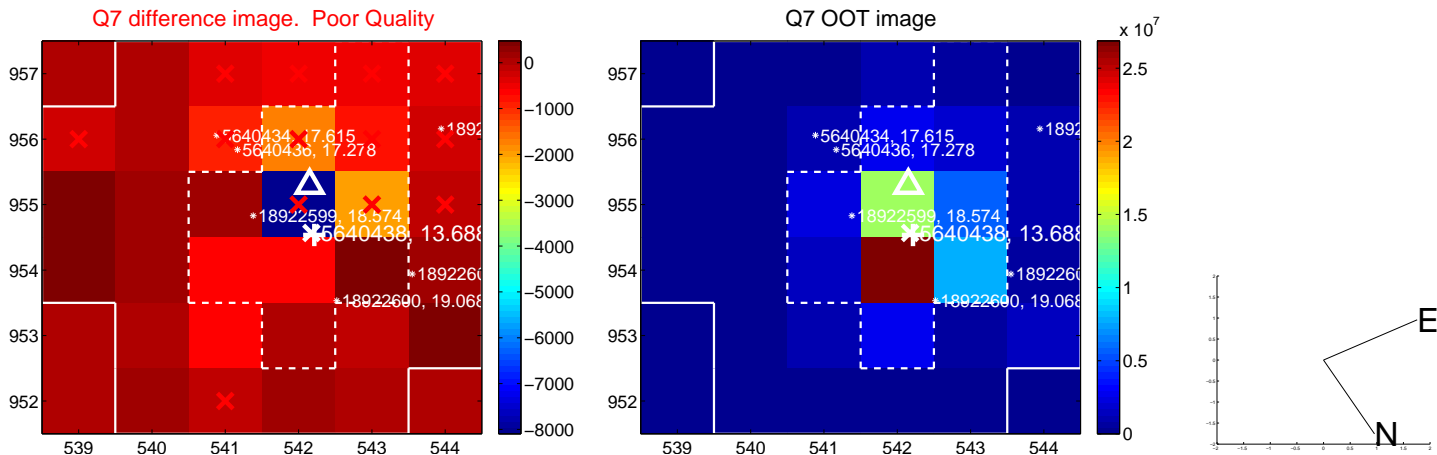
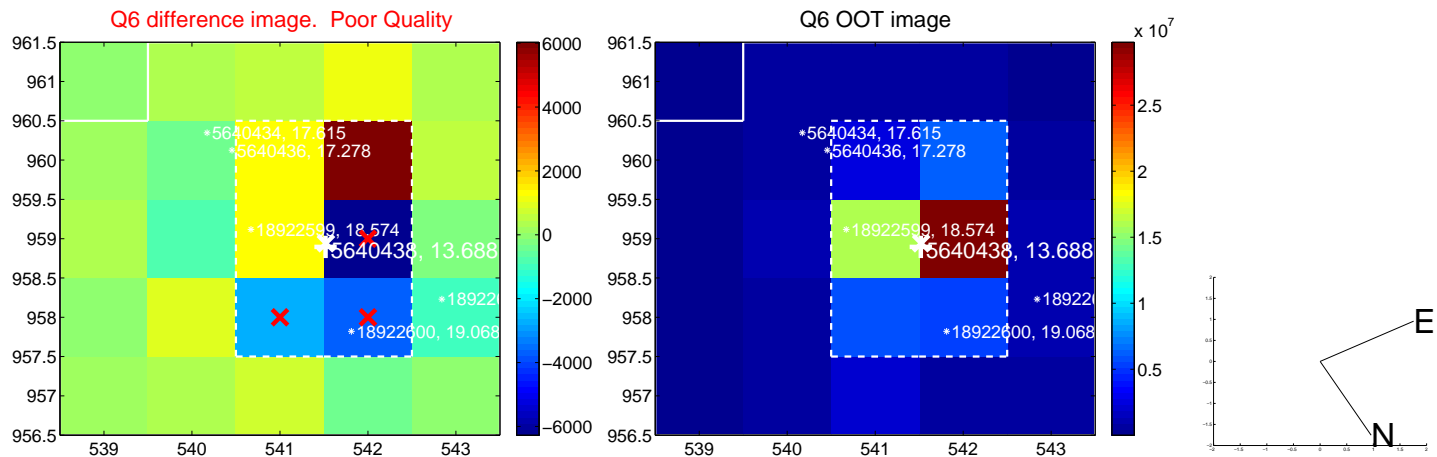
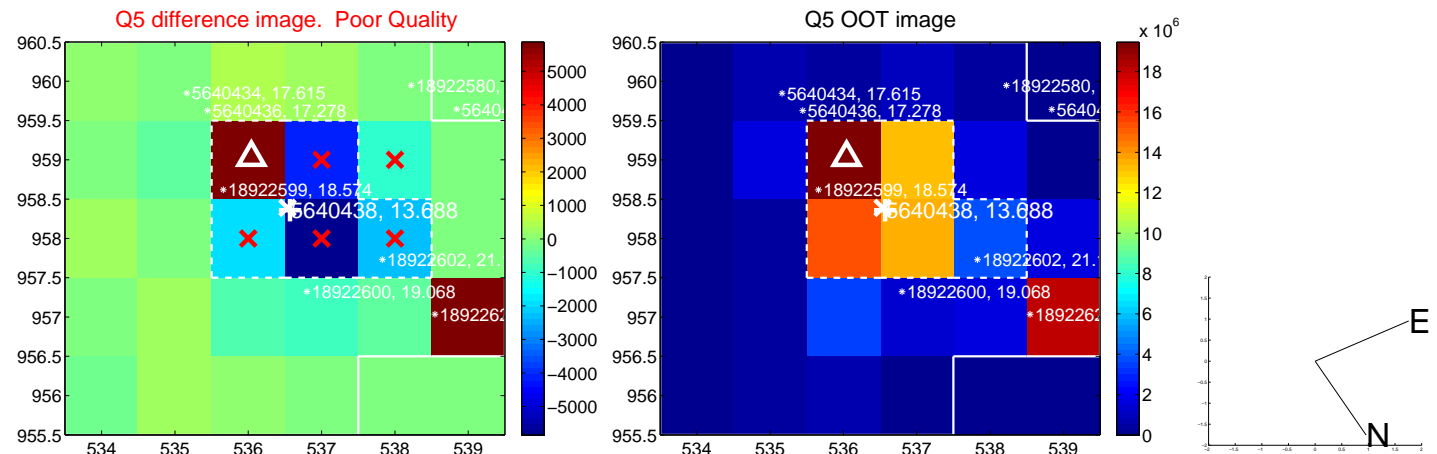


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

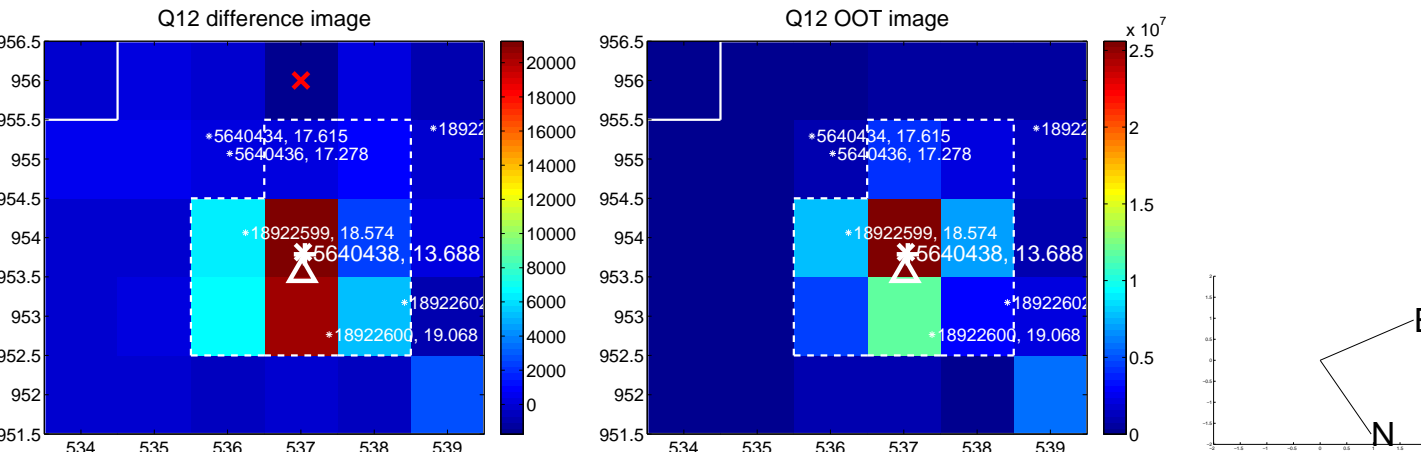
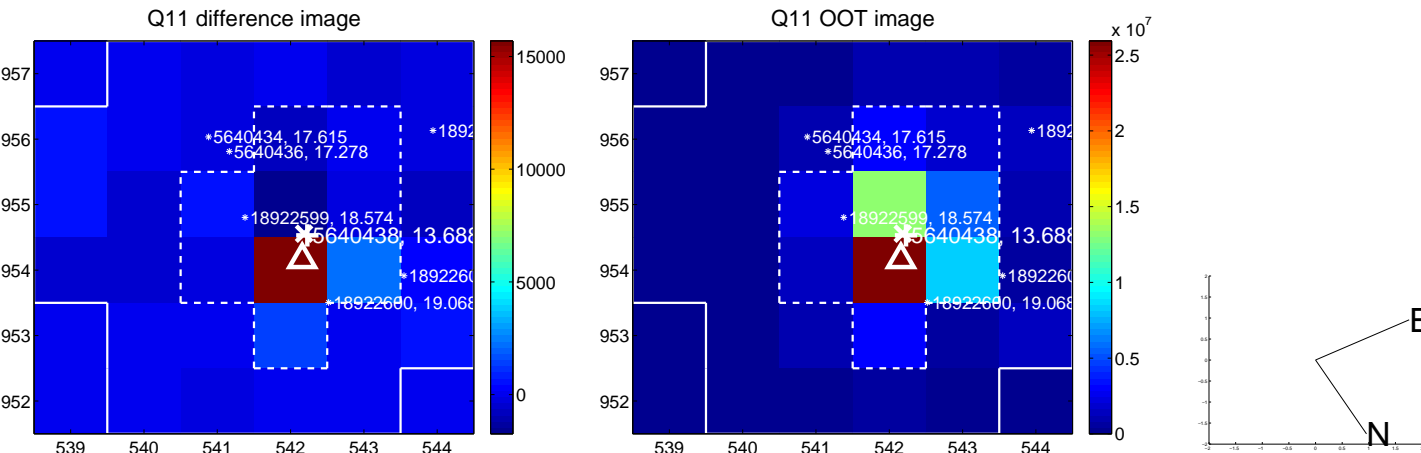
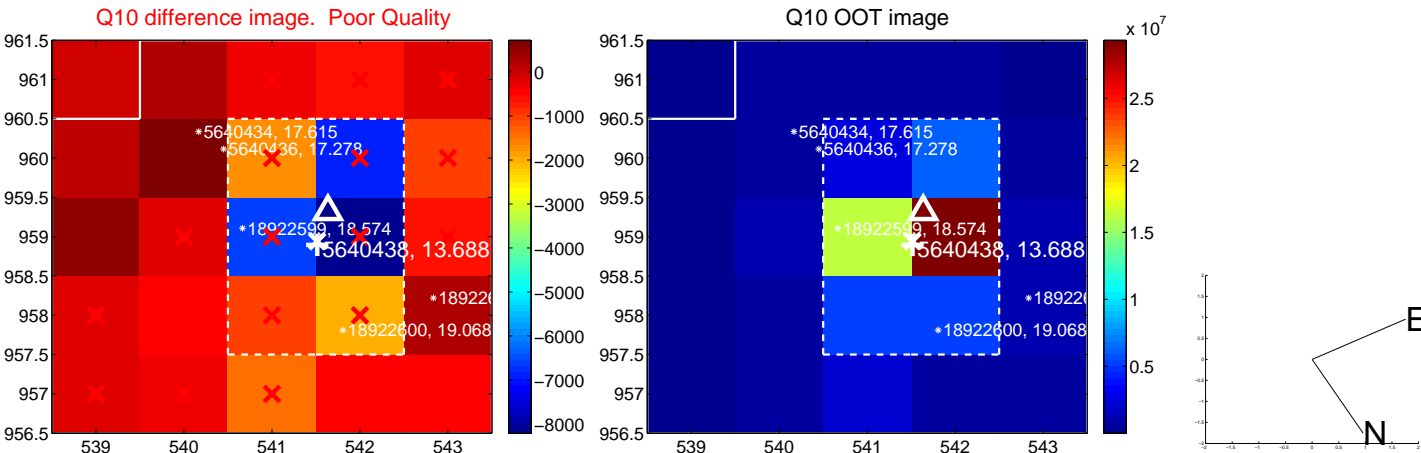
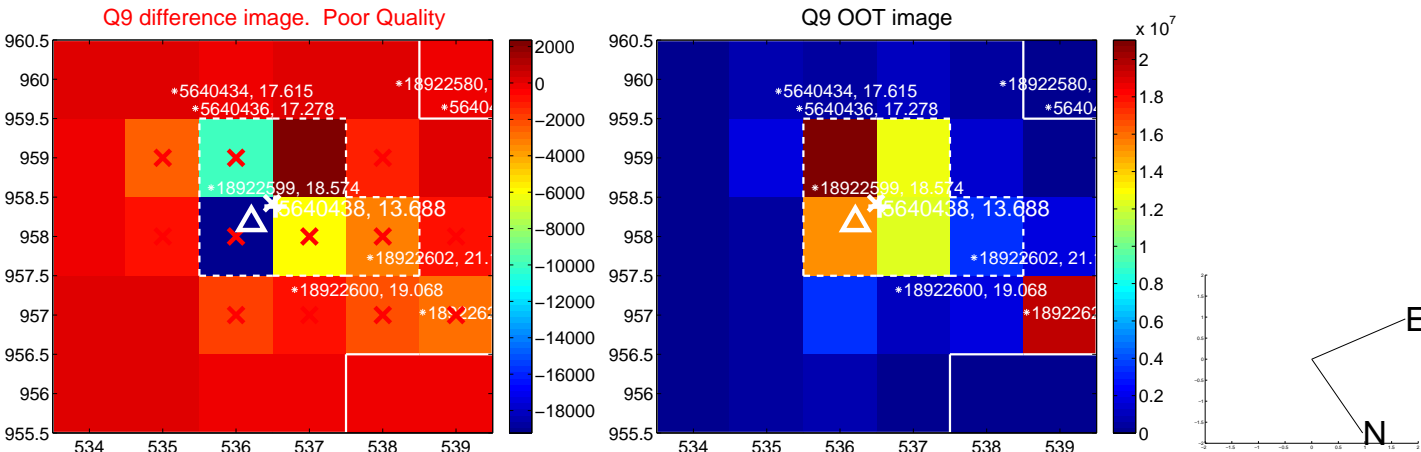
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



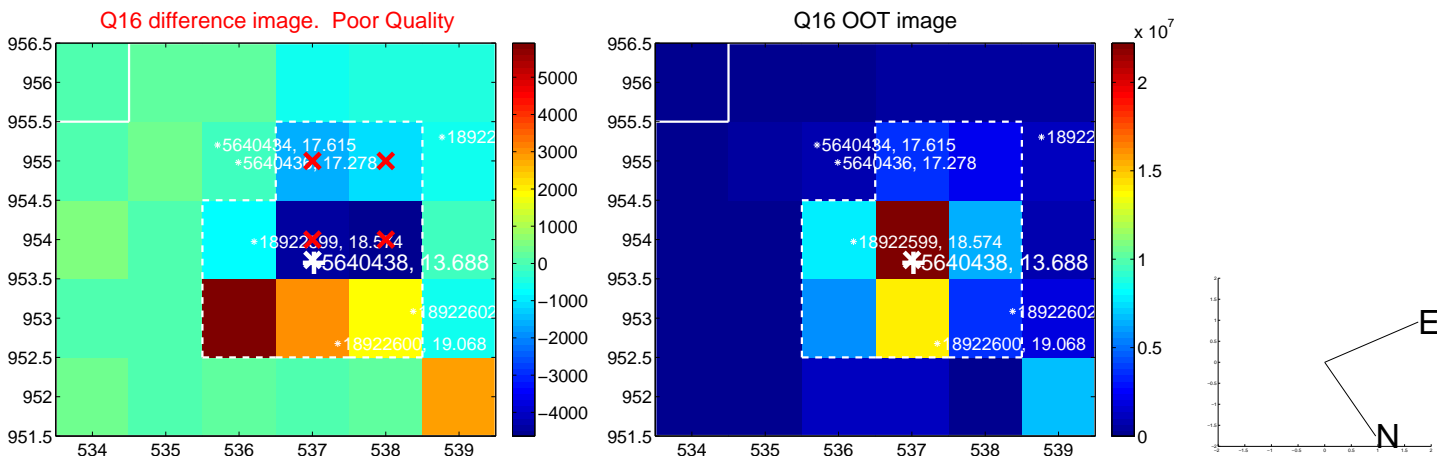
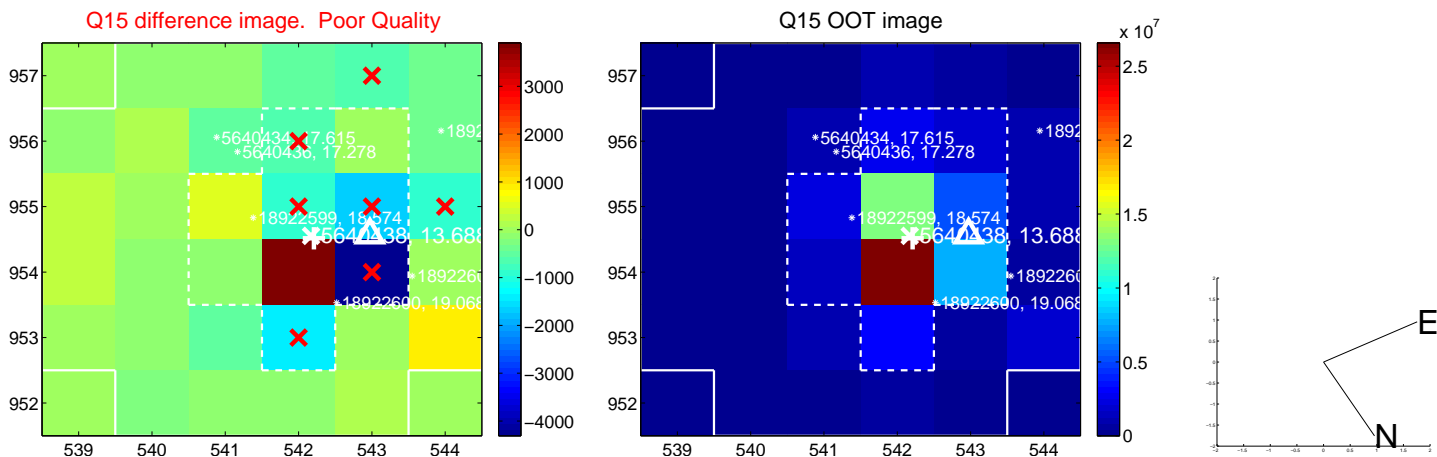
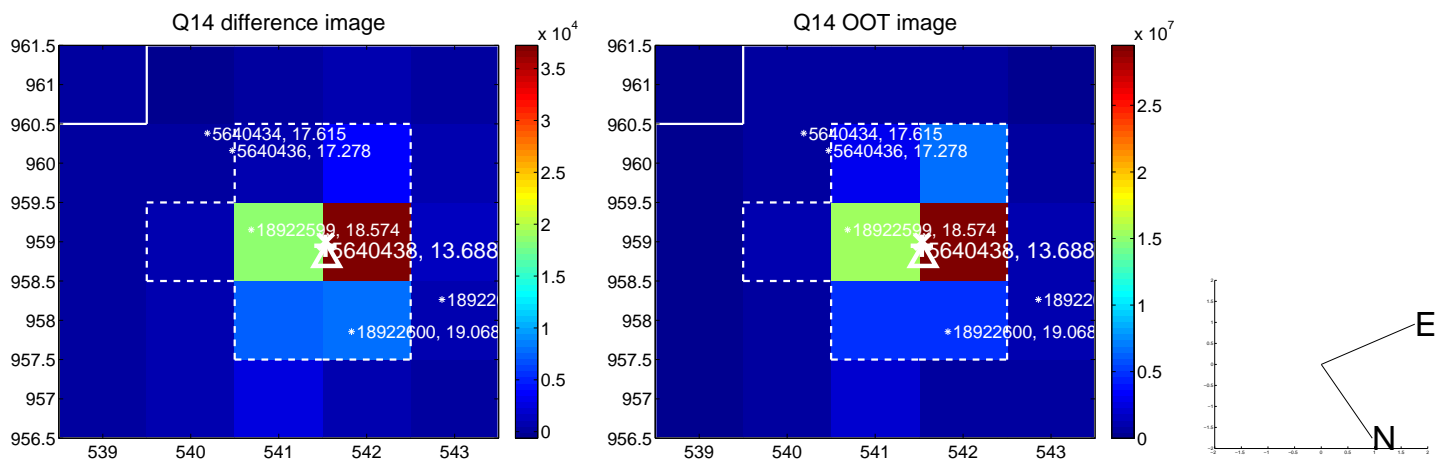
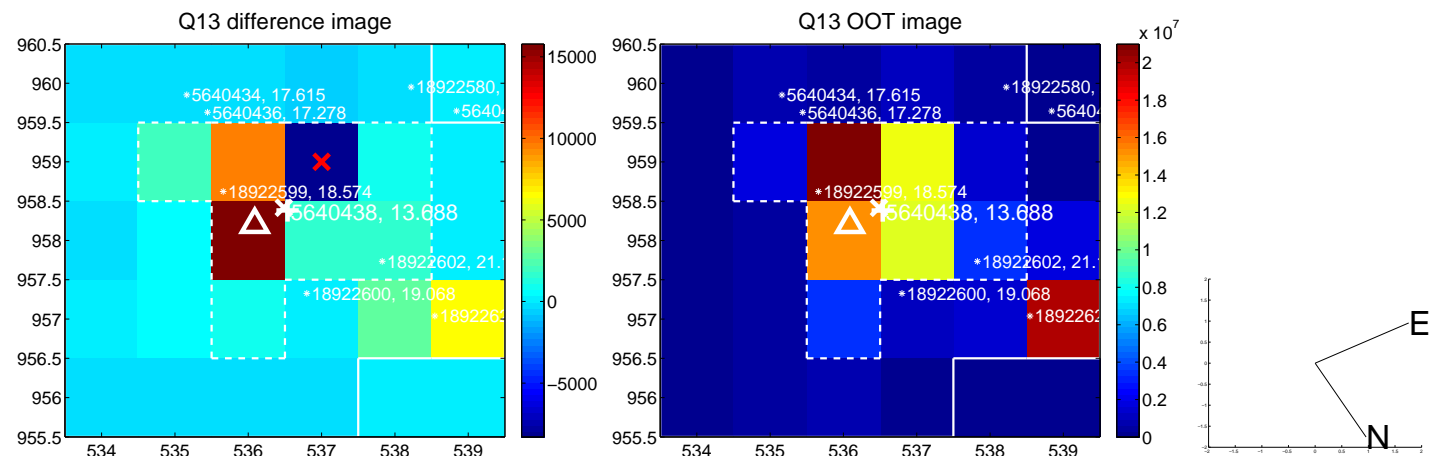
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



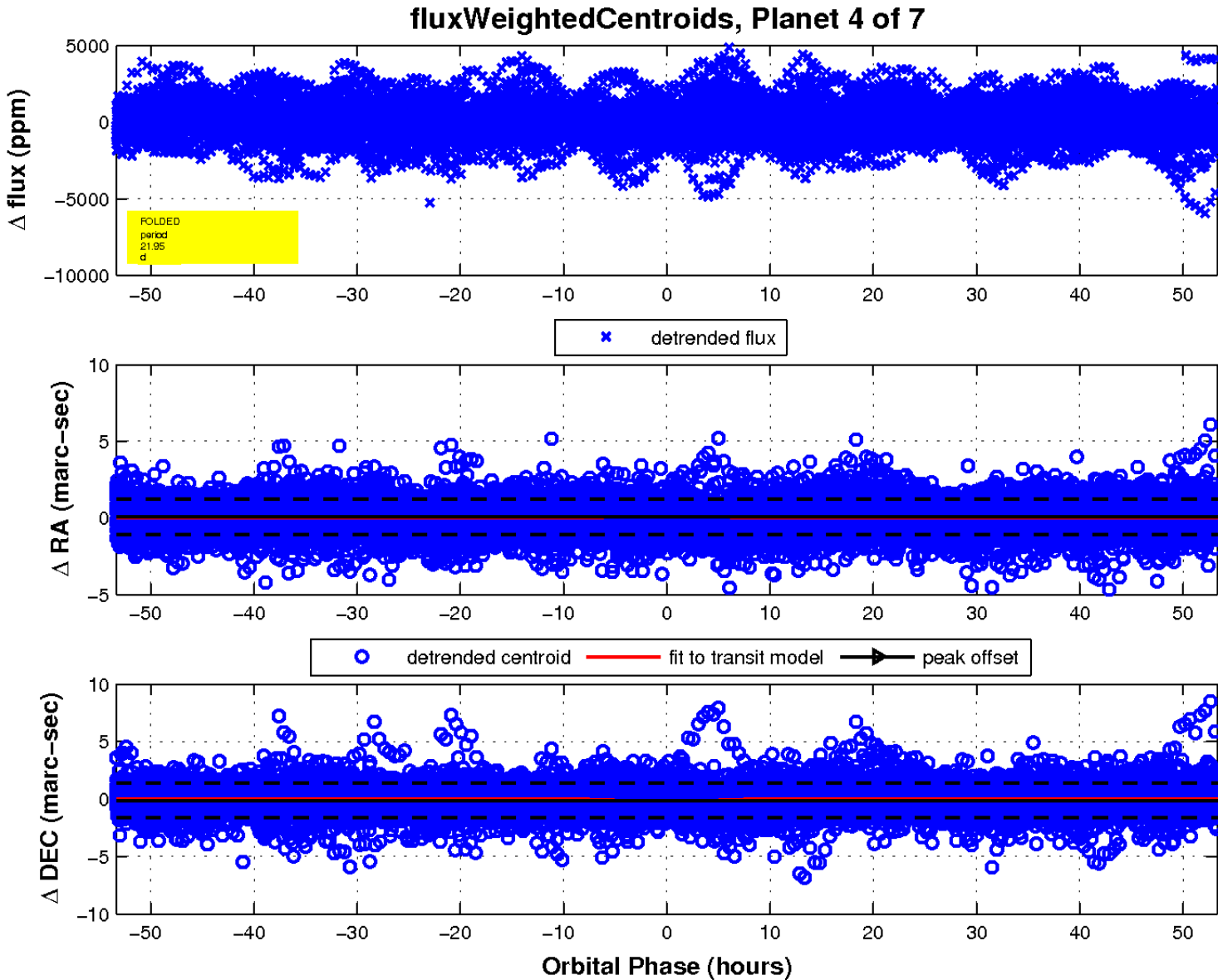
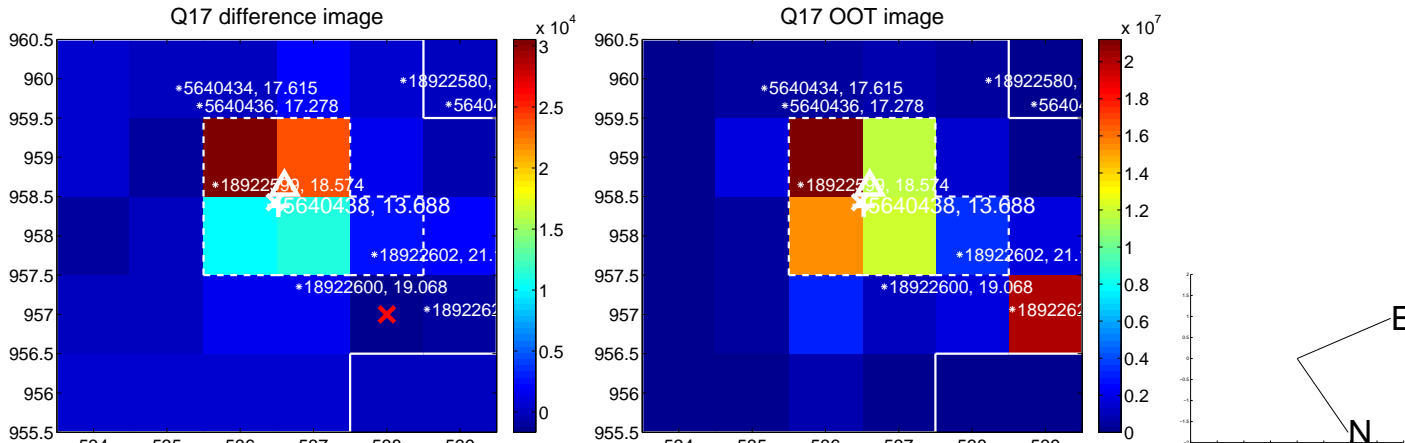
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

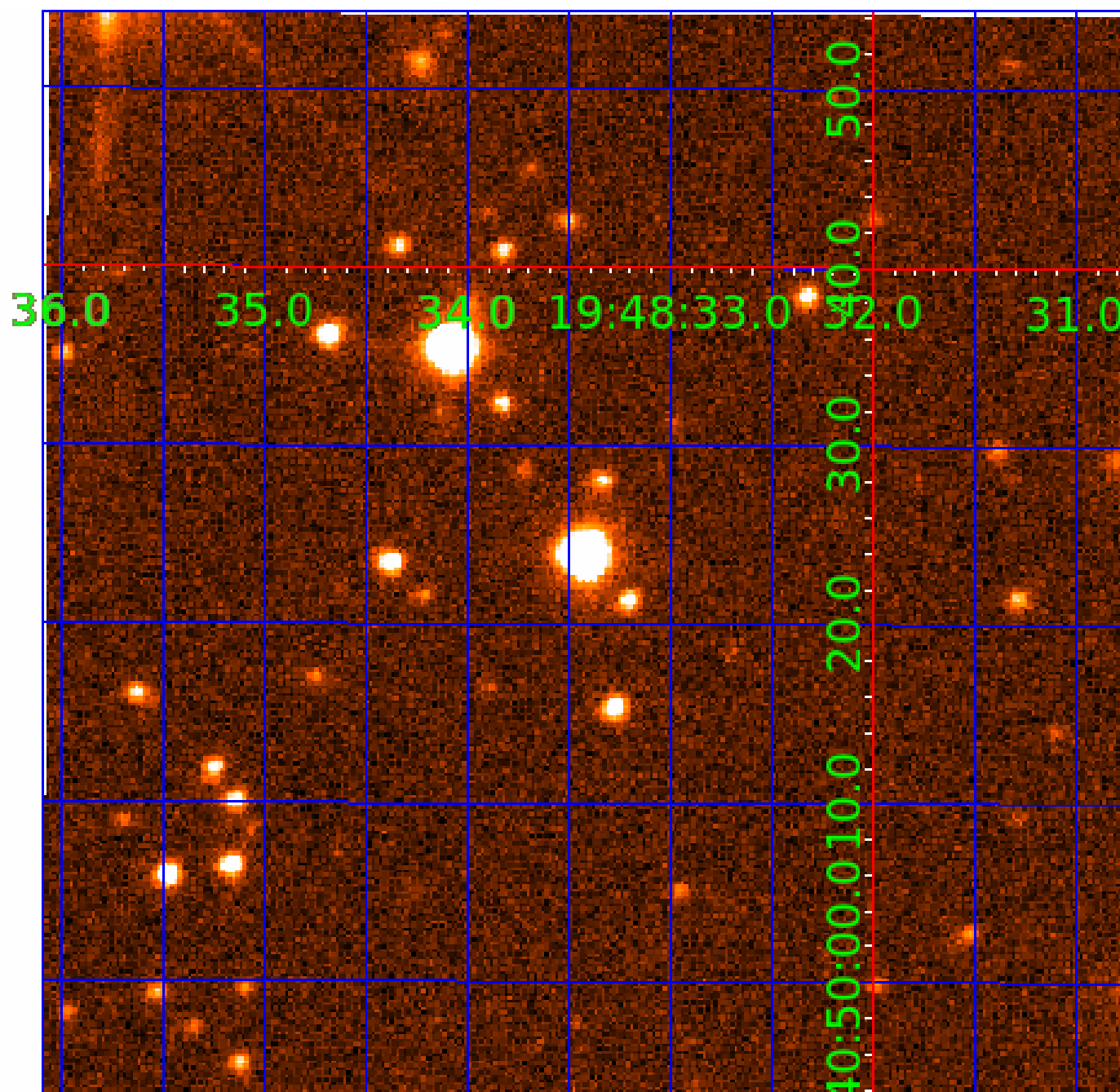


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005640438

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})
005640438-01	OBS	No	0.997320	132.079880	181.3	6.317	10.5	12.9	1.21	6847	3.06	6632.69
005640438-03	OBS	No	109.924969	139.747262	1454.6	2.581	10.7	6.7	1.21	6847	4.85	12.55
005640438-04	OBS	No	21.946630	150.794527	1499.4	17.781	9.2	8.0	1.21	6847	5.51	107.56
005640438-05	OBS	No	71.365018	145.448396	1545.5	10.485	8.5	7.3	1.21	6847	5.87	22.33
005640438-07	OBS	No	99.907008	170.355191	320.7	4.500	8.7	-1.0	1.21	6847	2.19	14.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005640438-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
005640438-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
005640438-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT
005640438-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005640438-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

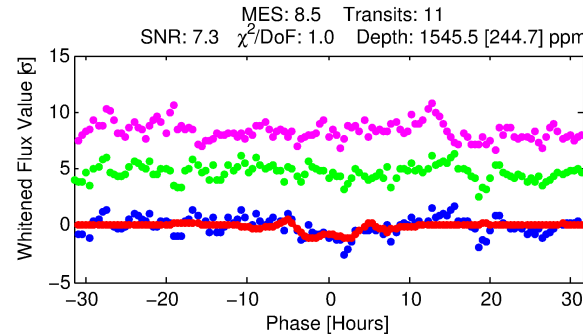
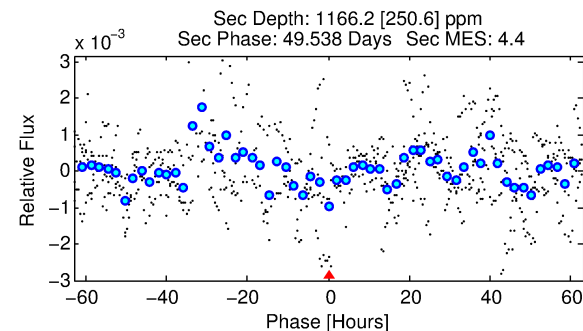
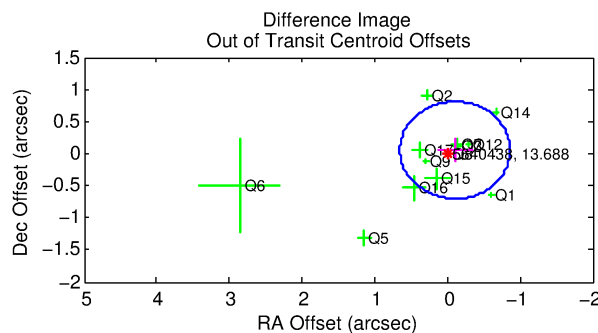
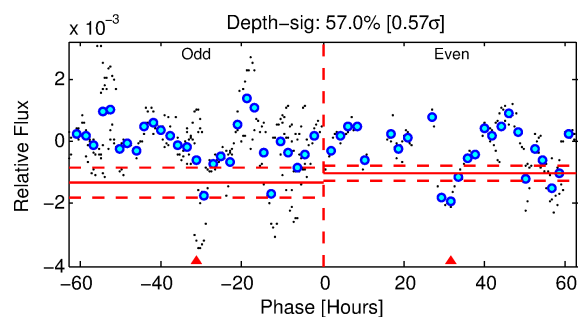
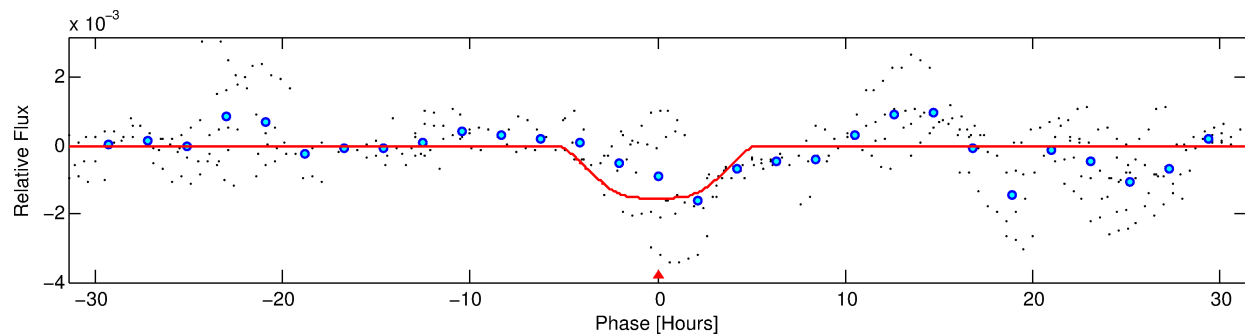
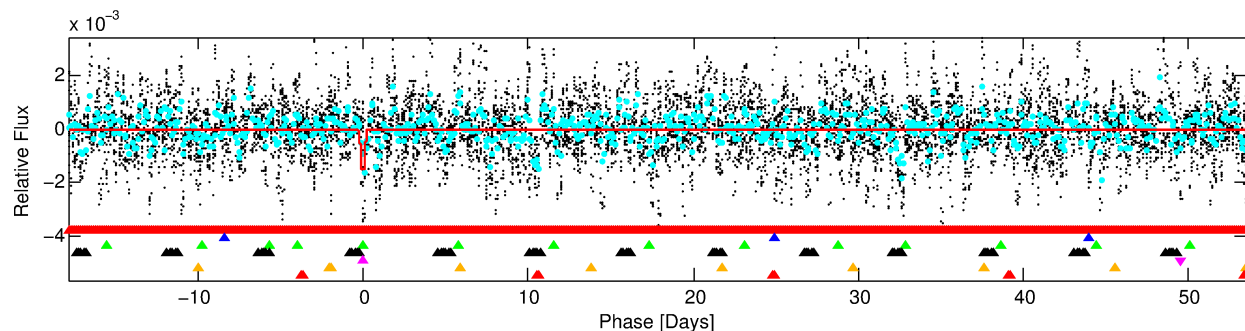
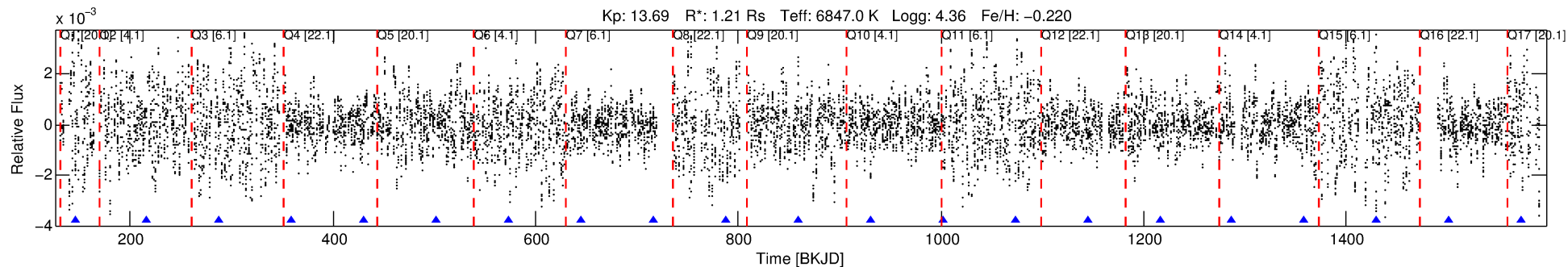
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005640438-05

No Significant Match Found

DV One-Page Summary

KIC: 5640438 Candidate: 5 of 7 Period: 71.365 d



DV Fit Results:

Period = 71.36502 [0.00186] d
Epoch = 145.4484 [0.0202] BKJD
Rp/R* = 0.0444 [0.0038]
a/R* = 22.75 [2.36]
b = 0.95 [0.01]
Seff = 22.33 [10.06]
Teq = 554 [62] K
Rp = 5.87 [2.24] Re
a = 0.3602 [0.1087] AU
Ag = 2415.34 [1221.82] [1.98 σ]
Teffp = 6008 [474] K [11.40 σ]

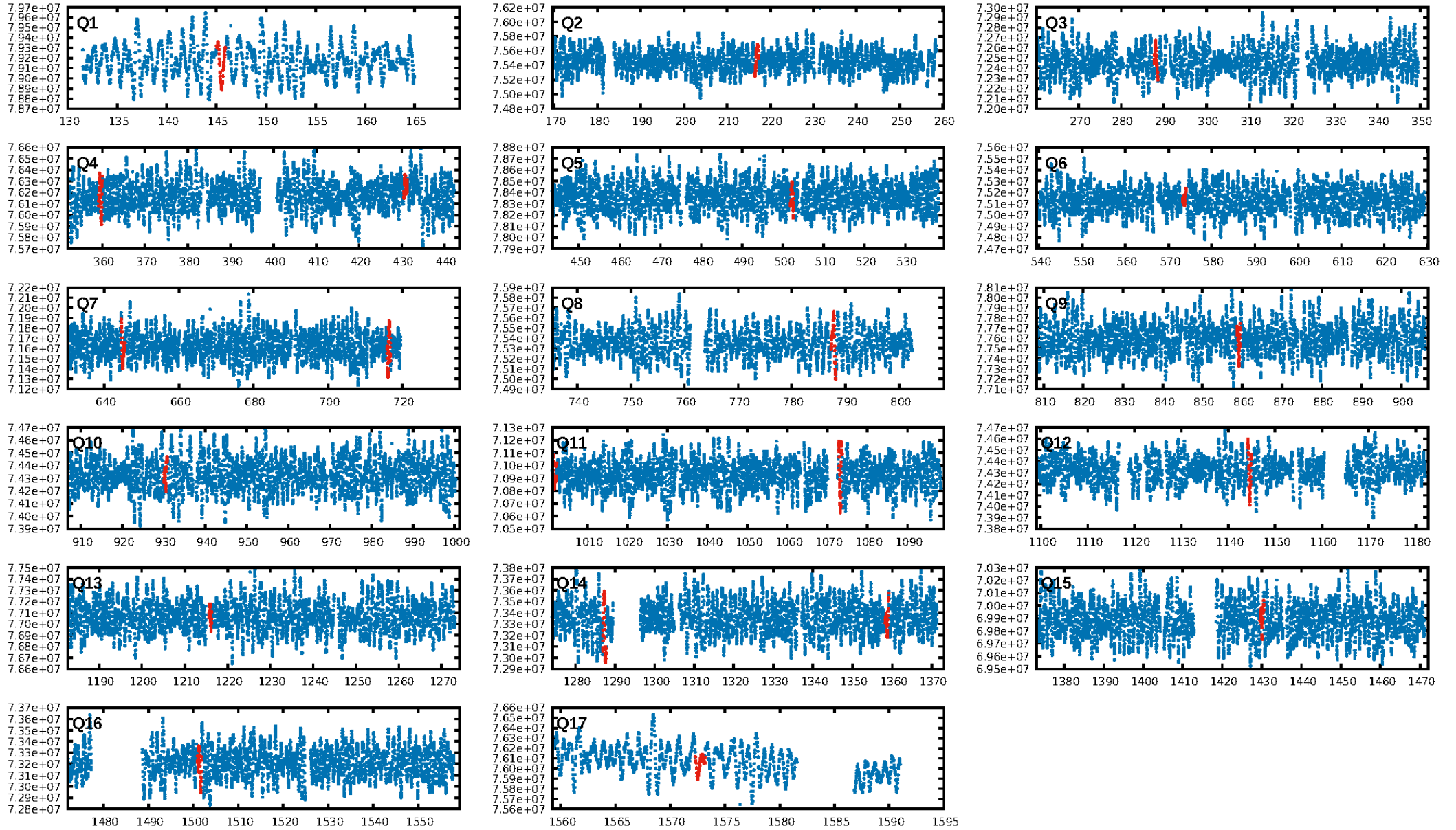
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [57.46 σ]
LongPeriod-sig: 100.0% [60.04 σ]
ModelChiSquare2-sig: 0.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: -1.428
Centroid-sig: 0.0%
Centroid-so: 0.624 arcsec [4.03 σ]
OotOffset-rm: 0.115 arcsec [0.46 σ]
KicOffset-rm: 0.215 arcsec [1.04 σ]
OotOffset-st: 3/3/3/4 [13]
KicOffset-st: 3/3/3/4 [13]
DiffImageQuality-fgm: 0.54 [7/13]
DiffImageOverlap-fno: 0.00 [0/14]

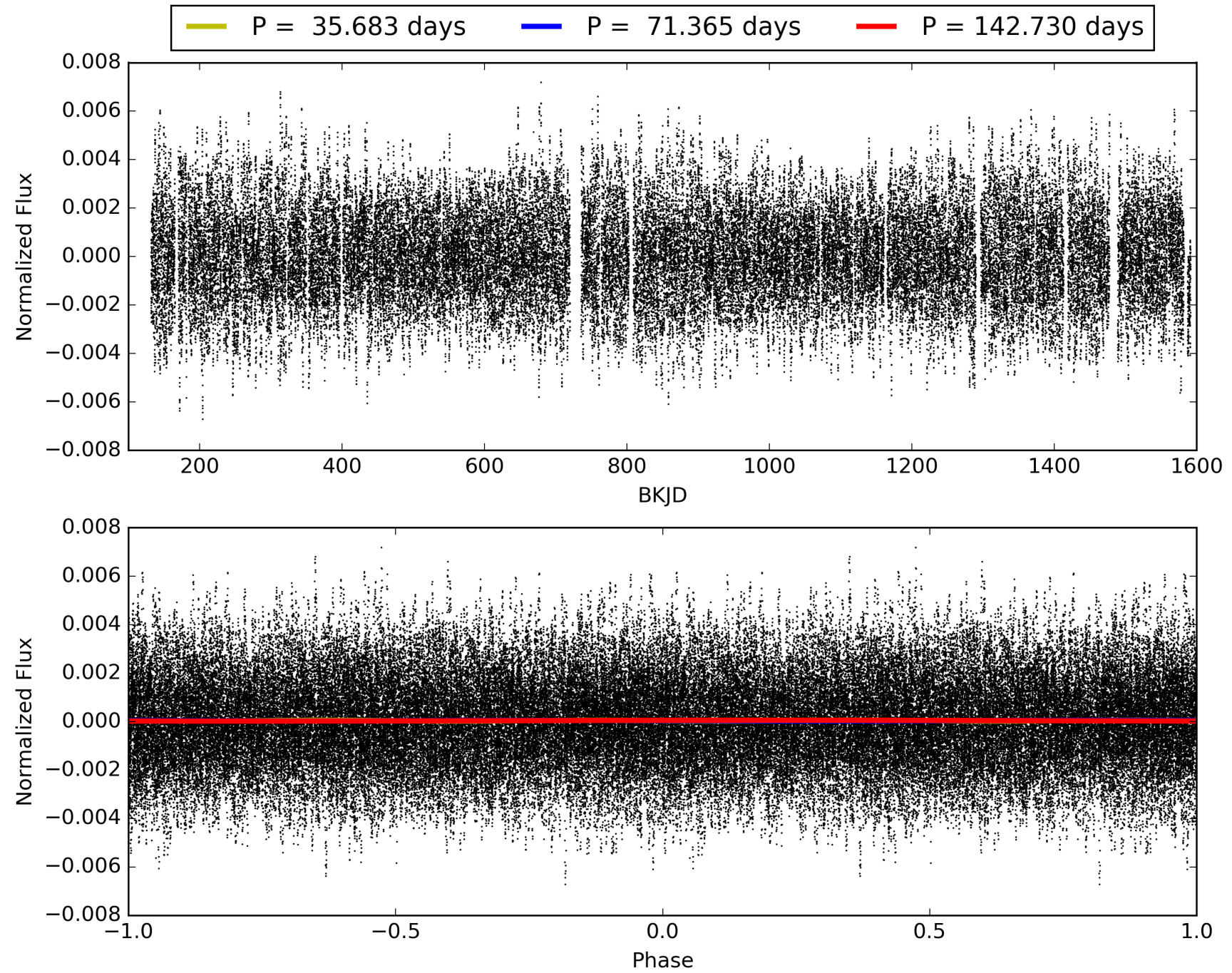
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:38:31 Z

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

TCE 005640438-05, PDC Light Curves

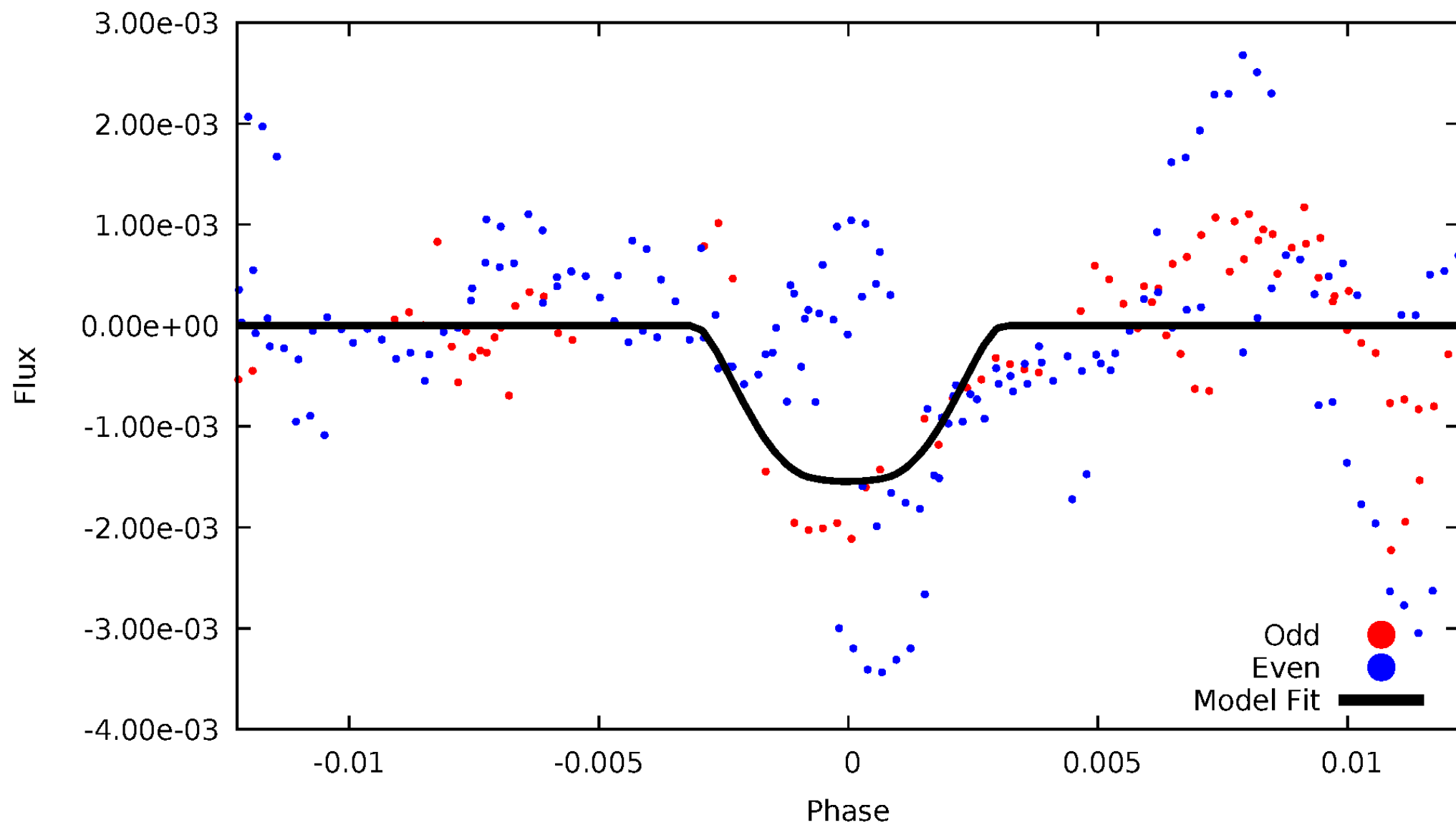


TCE 005640438-05



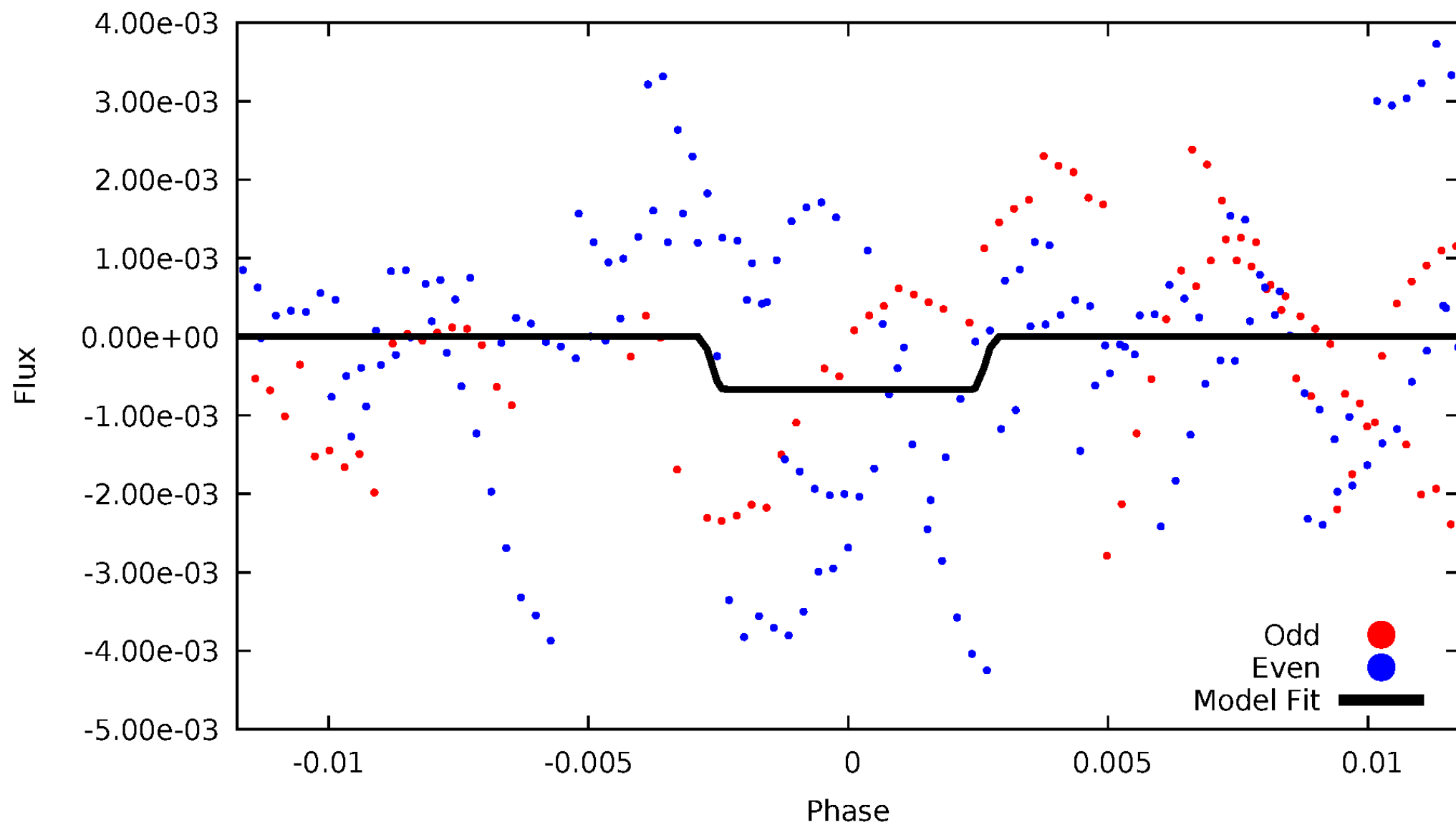
DV Odd/Even

TCE 005640438-05



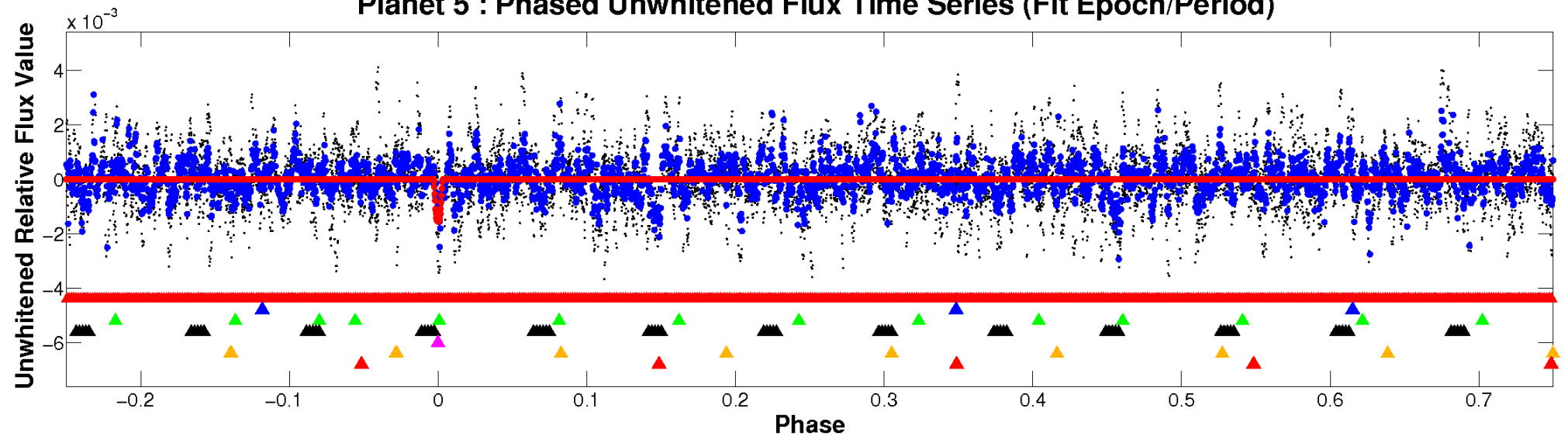
ALT Odd/Even

TCE 005640438-05

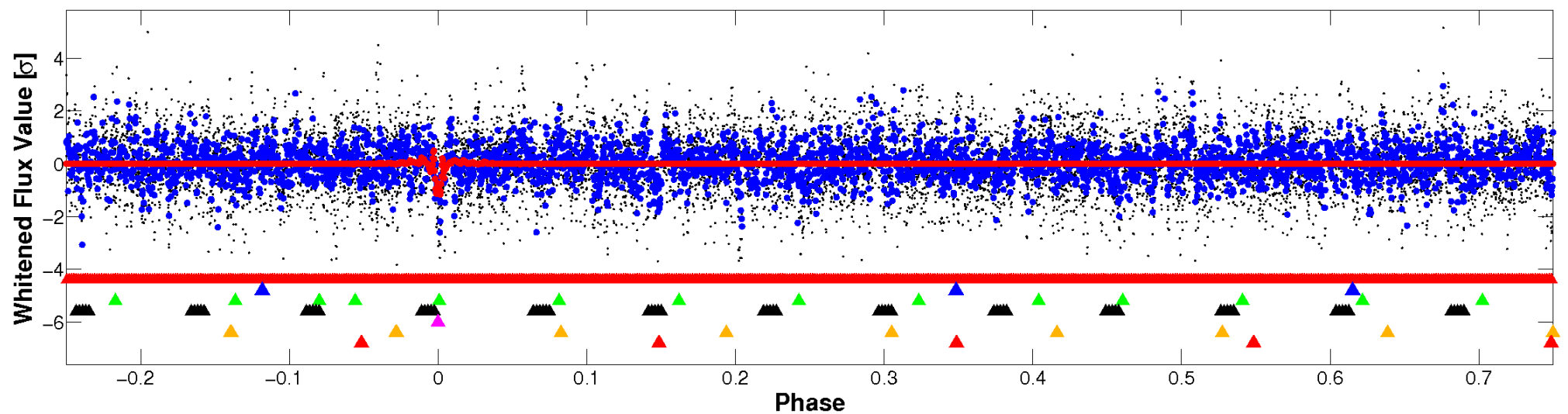


Non-Whitened Vs. Whitened Light Curve

Planet 5 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

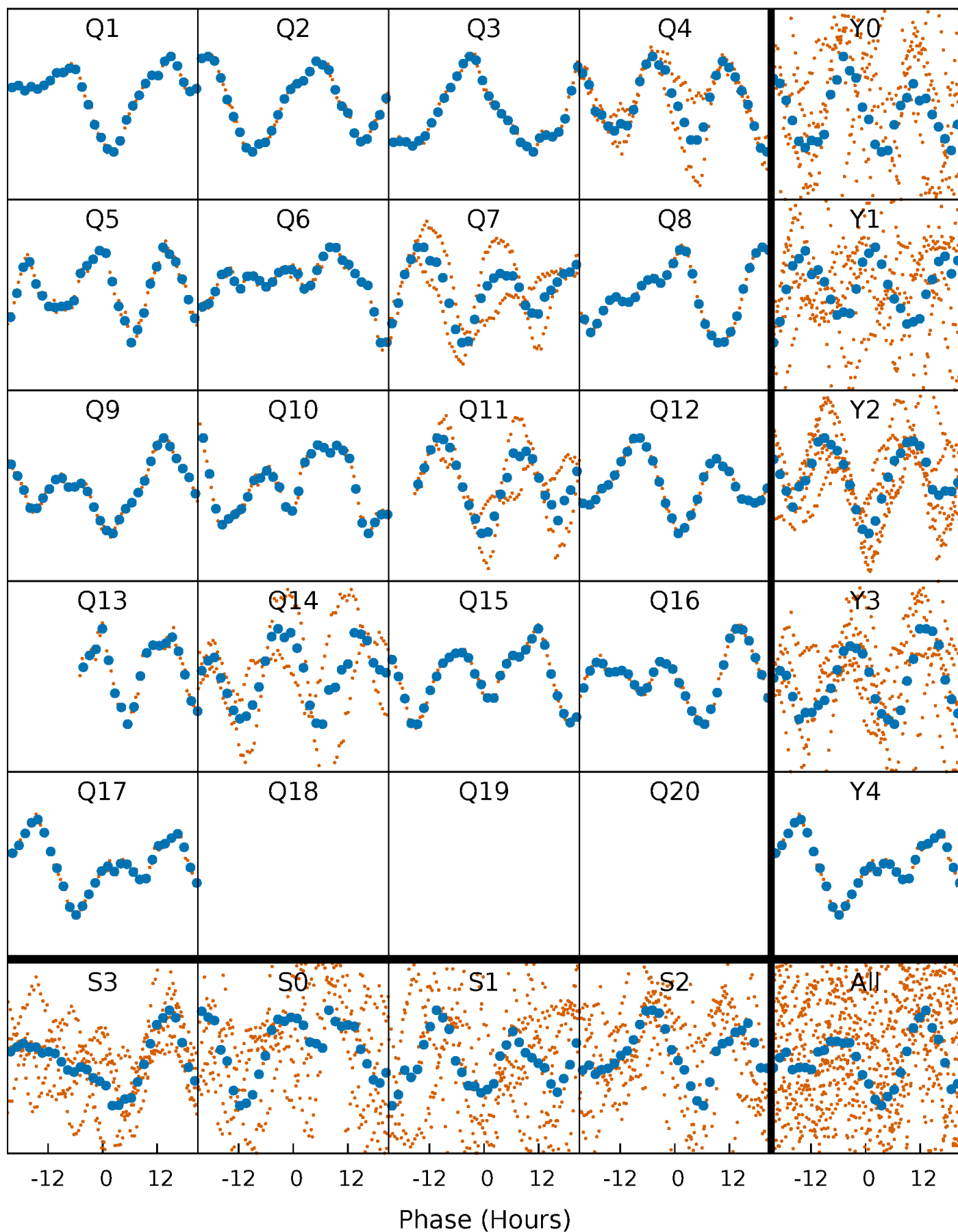


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



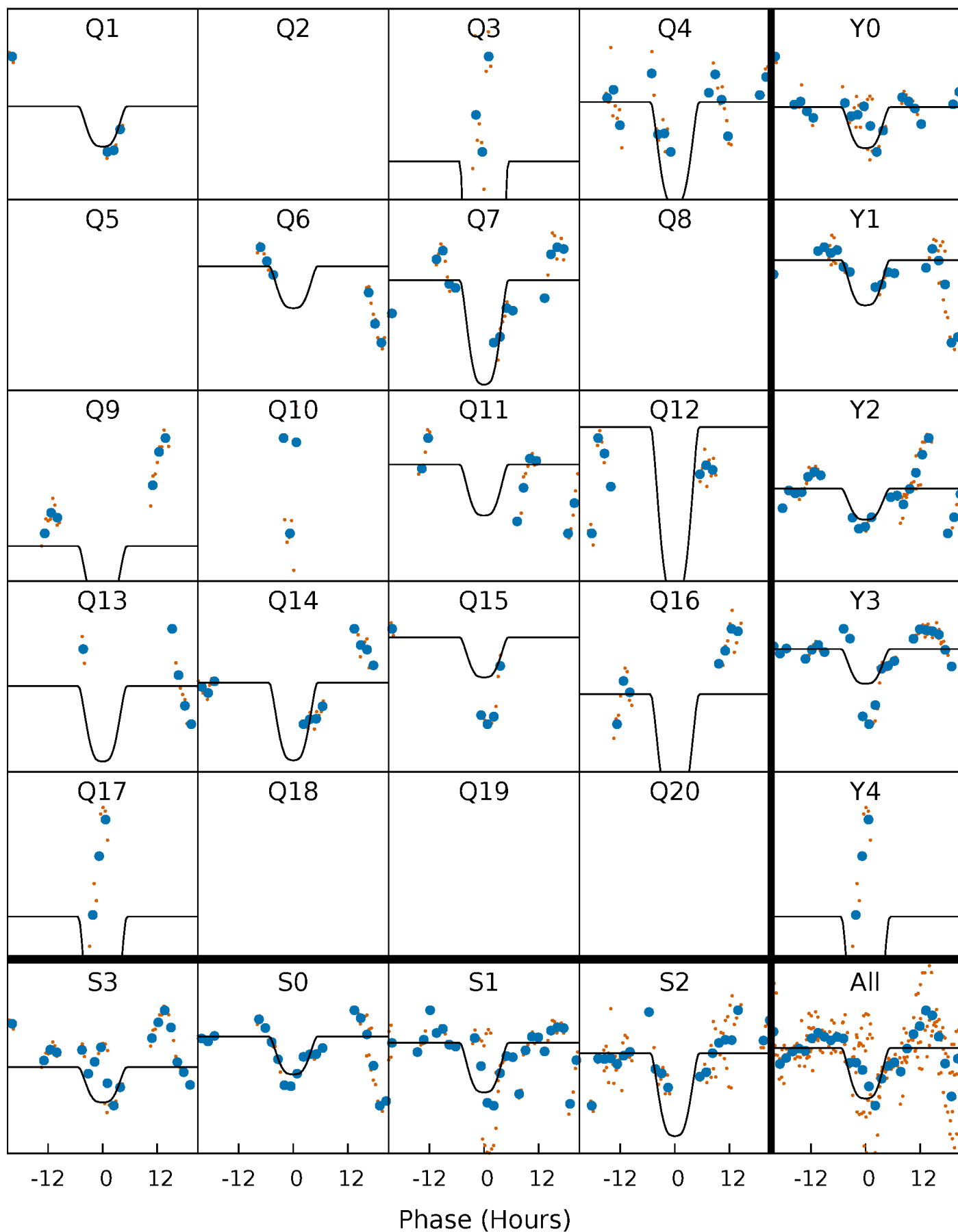
PDC Quarter-Phased Transit Curves

TCE 005640438-05 $P = 71.365018$ Days $T_0 = 145.448397$ (BKJD)



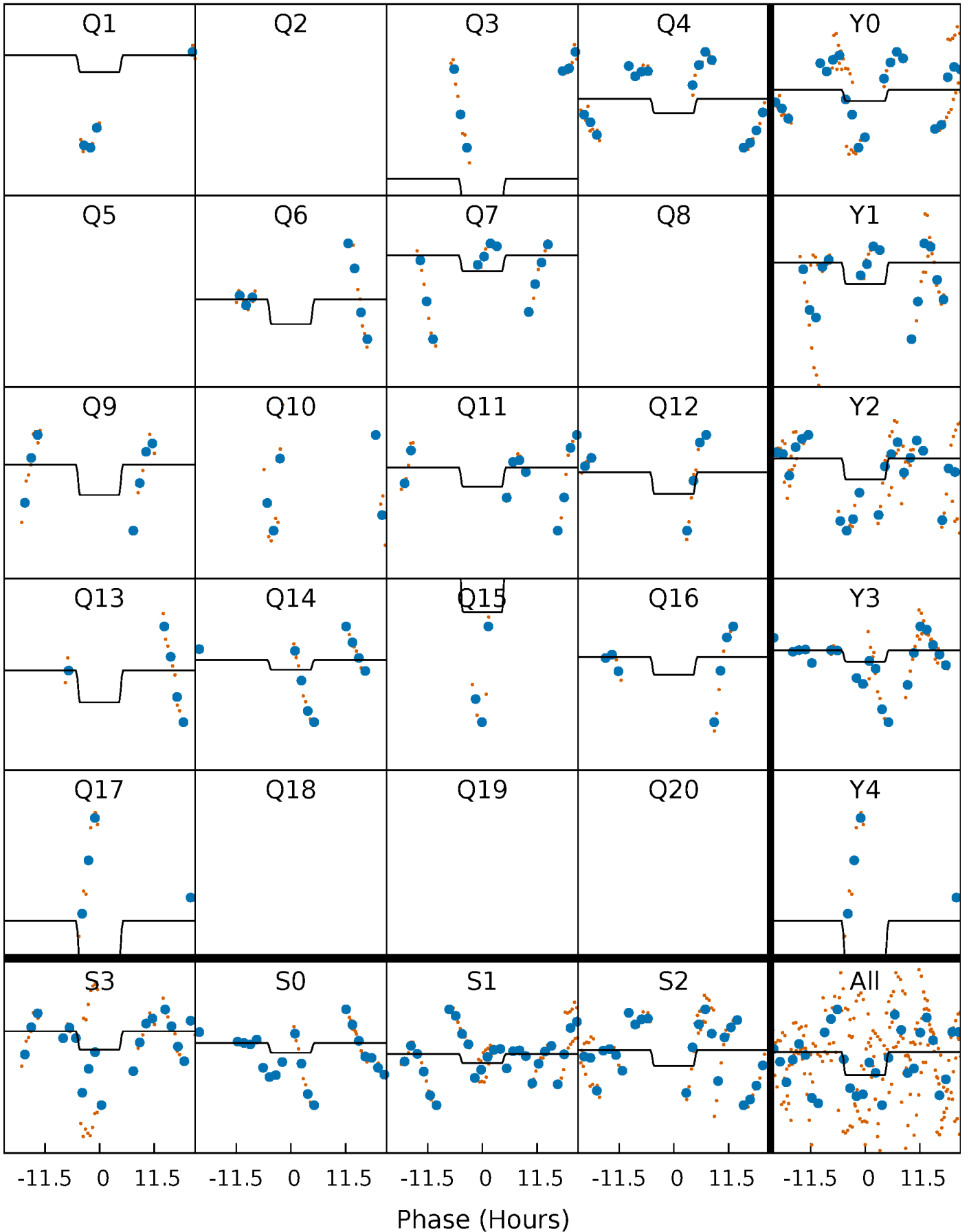
DV Quarter-Phased Transit Curves

TCE 005640438-05 $P = 71.365018$ Days $T_0 = 145.448397$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

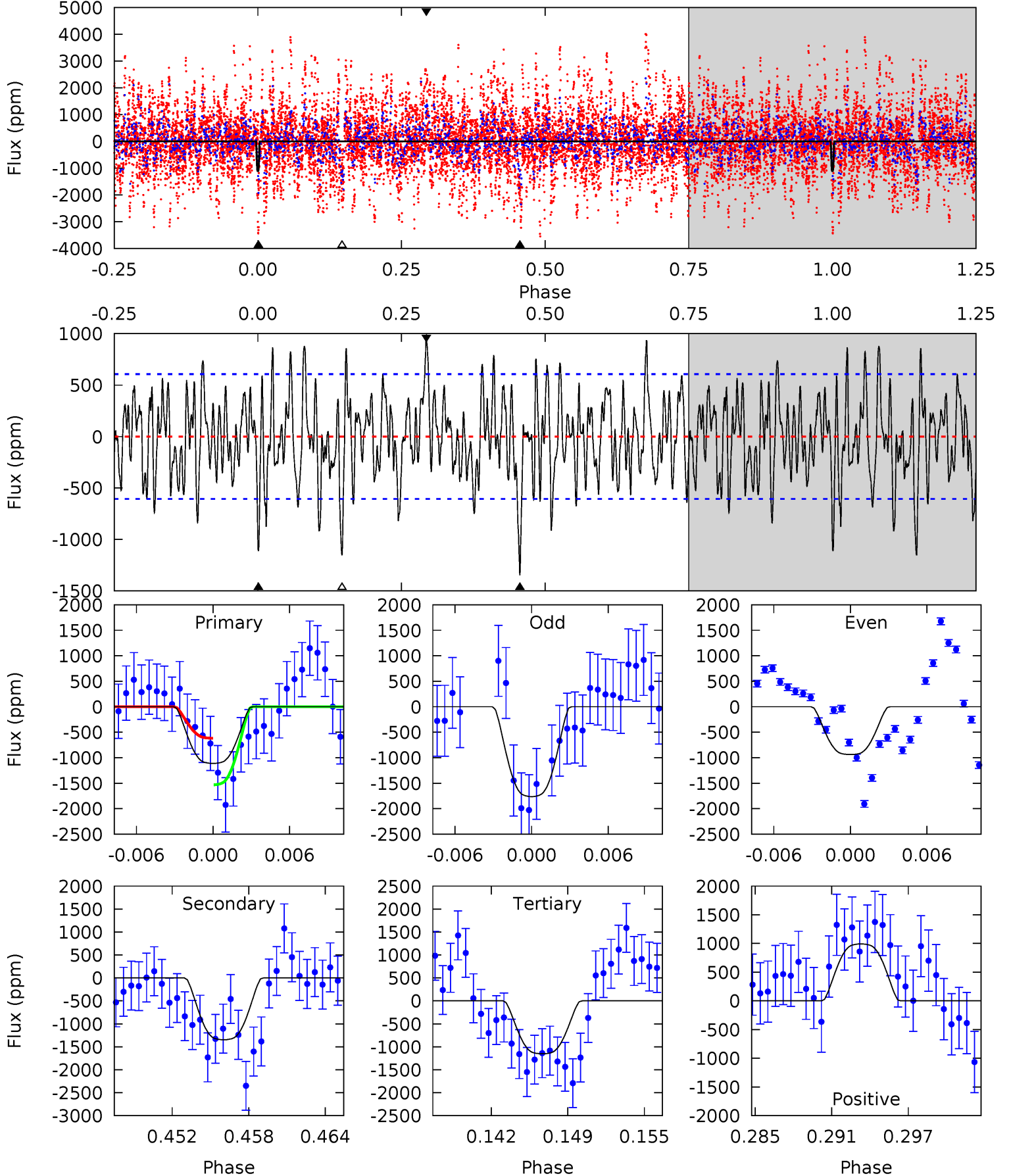
TCE 005640438-05 $P = 71.358893$ Days $T_0 = 145.632644$ (BKJD)



DV Model-Shift Uniqueness Test

005640438-05, P = 71.365018 Days, E = 74.083379 Days

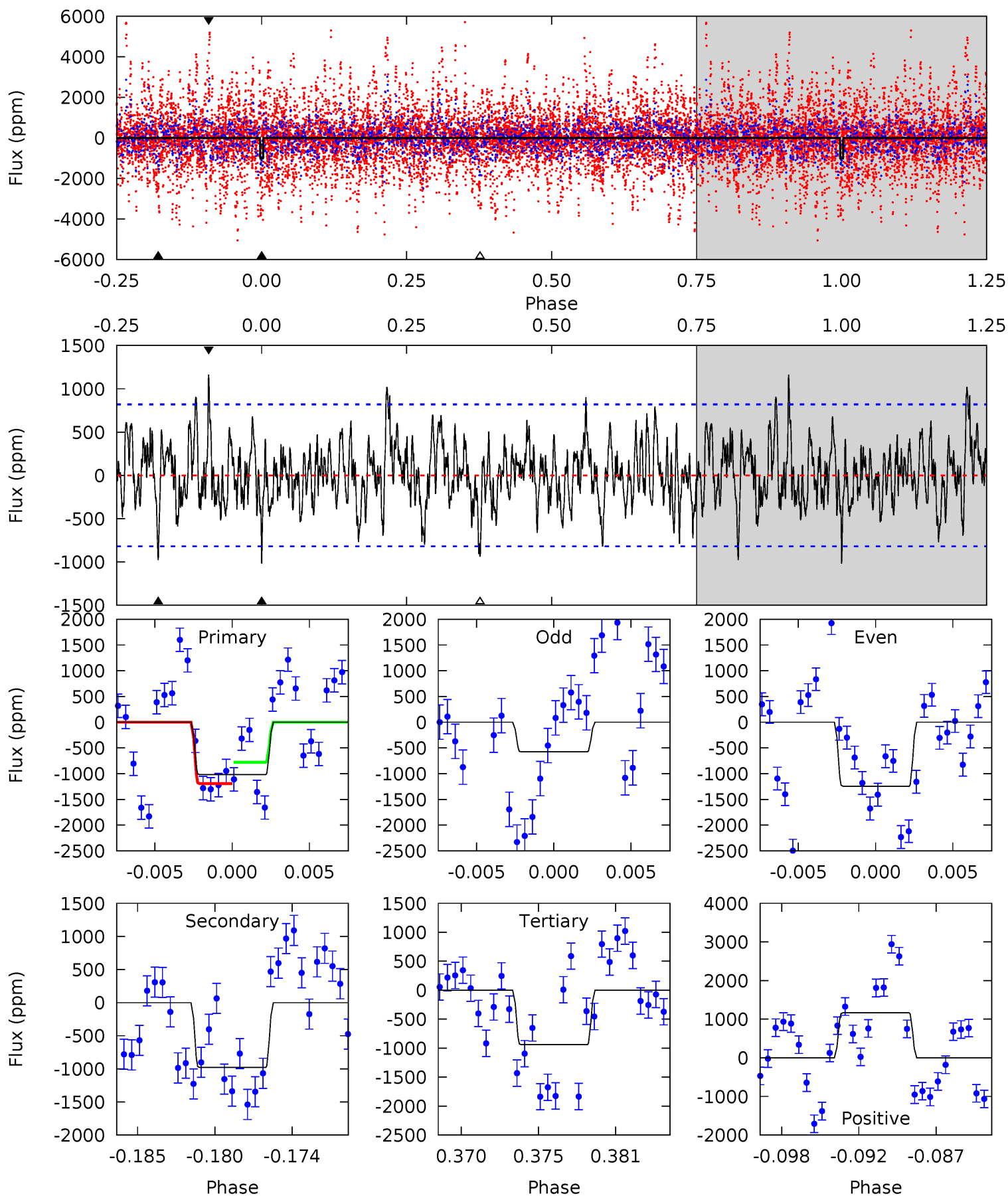
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
9.38	11.4	9.73	8.37	5.12	2.74	2.93	-0.35	1.01	1.64	3.00	3.01	0.64	0.42	3.86



Alt Model-Shift Uniqueness Test

005640438-05, P = 71.358893 Days, E = 74.273751 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.40	6.15	5.90	7.31	5.14	2.78	1.98	0.50	-0.91	0.24	-1.16	1.85	0.69	0.53	1.31



Stellar Parameters For KIC 005640438

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6847^{+191}_{-262}	$4.358^{+0.056}_{-0.224}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.451}_{-0.141}$	$1.239^{+0.195}_{-0.178}$	$0.977^{+0.305}_{-0.546}$
	+3%/-4%	+1%/-5%	+114%/-136%	+37%/-12%	+16%/-14%	+31%/-56%
Source	PHO1	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 005640438-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1347 ± 118	$6.14^{+1.21}_{-0.82}$	791^{+64}_{-43}	6183^{+380}_{-327}	2535^{+771}_{-756}
Alt.	-978 ± 159	$3.60^{+0.80}_{-0.60}$	793^{+62}_{-45}	7565^{+1002}_{-724}	5142^{+2583}_{-1705}

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

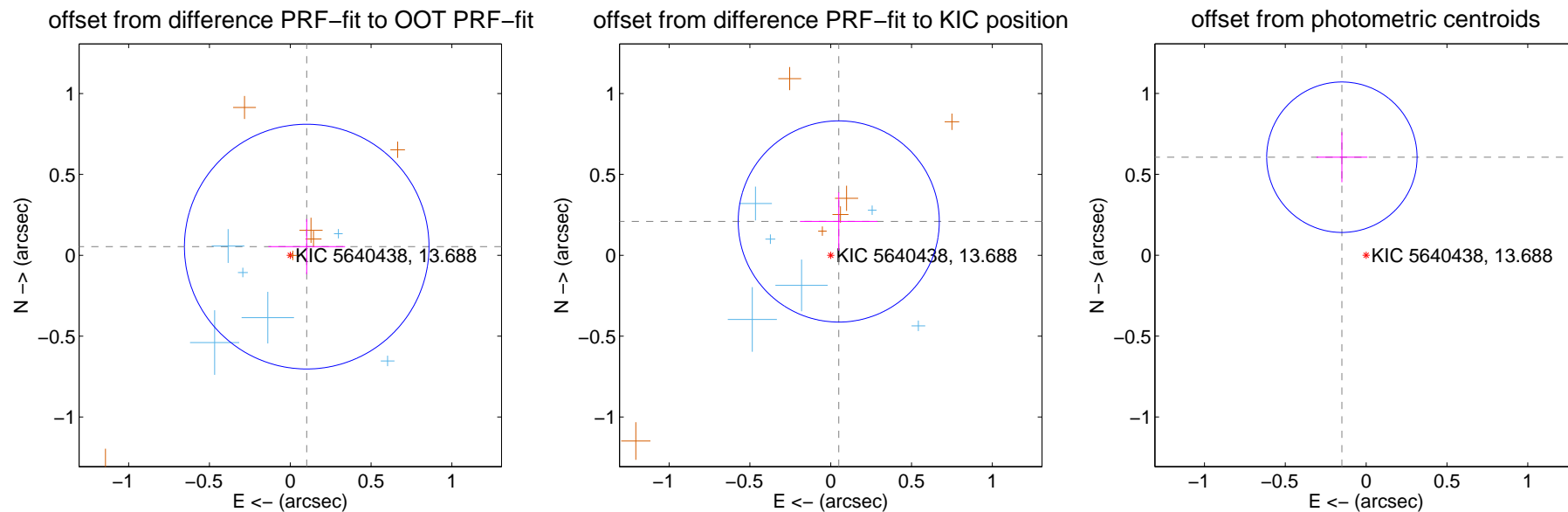
DV Centroid Data

Supplemental centroid analysis for 005640438-05. Kepler magnitude: 13.69. Transit SNR 7.33

There are 7 quarters with good PRF difference image offsets

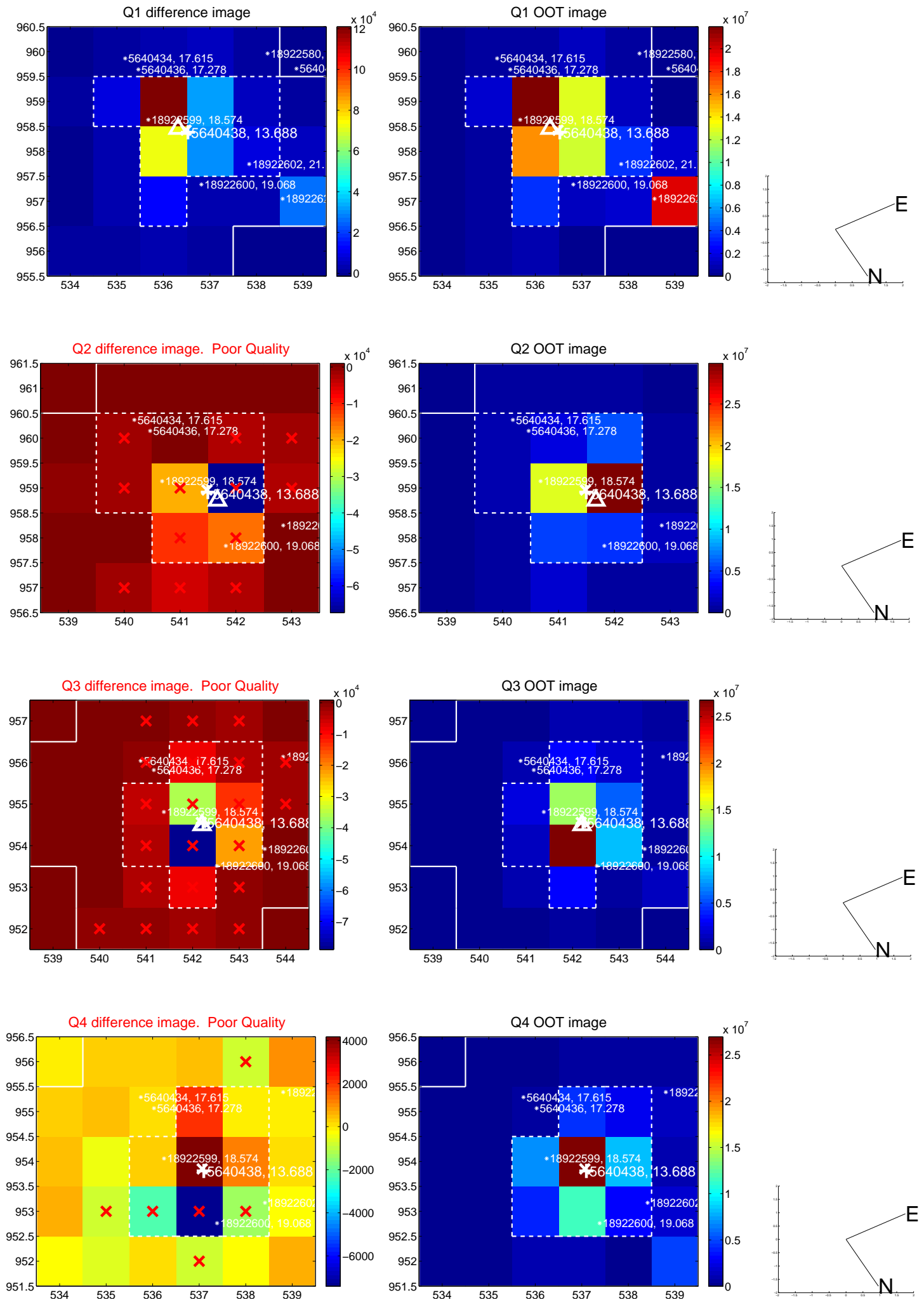
The direct PRF centroid is offset from the target star catalog position by about 0.27 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.115 ± 0.252	0.46	-0.102 ± 0.237	0.054 ± 0.170
PRF-fit source offset from KIC position	0.215 ± 0.207	1.04	-0.050 ± 0.240	0.209 ± 0.180
photometric centroid source offset	0.62 ± 0.16	4.03	0.15 ± 0.16	0.61 ± 0.15

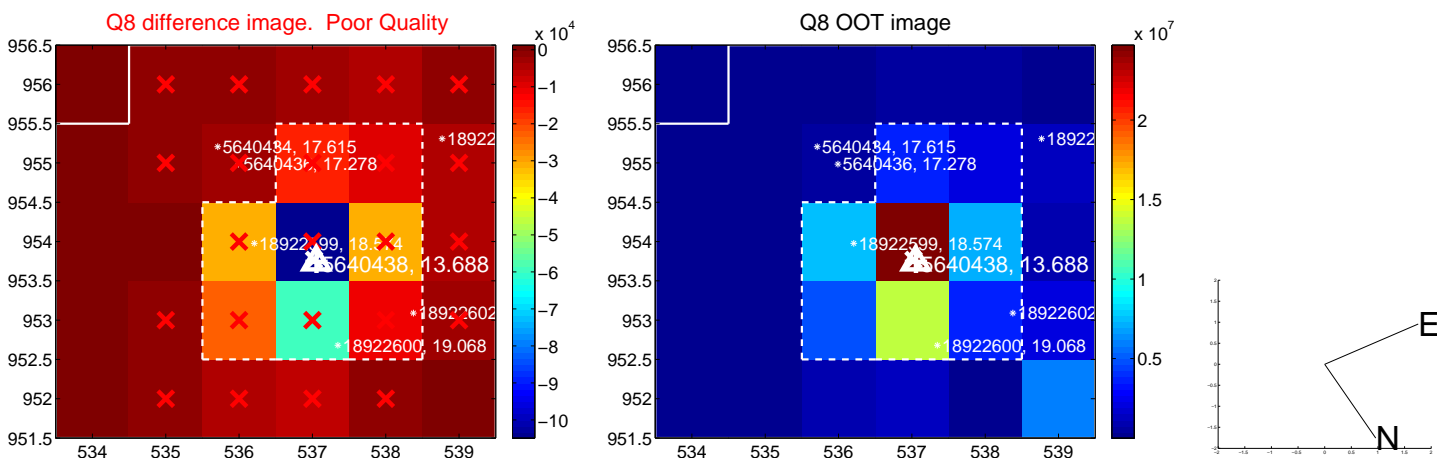
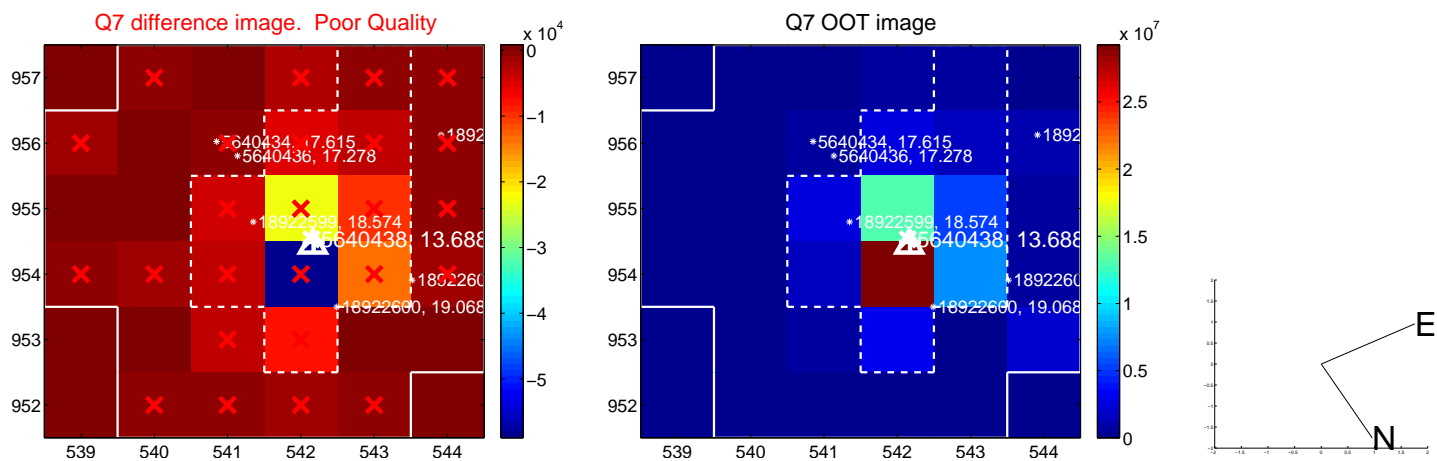
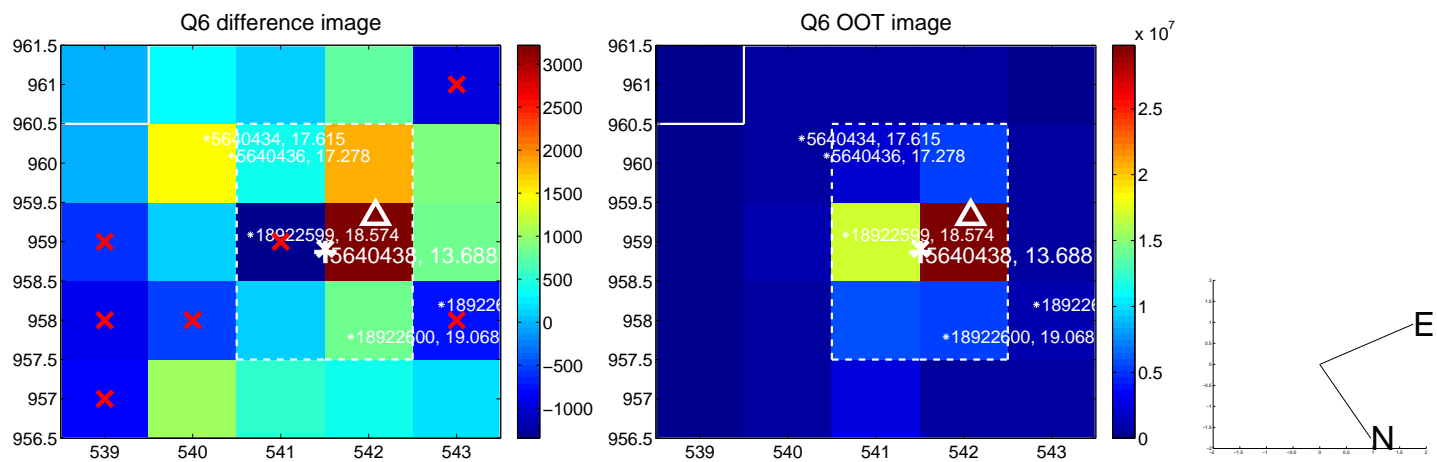
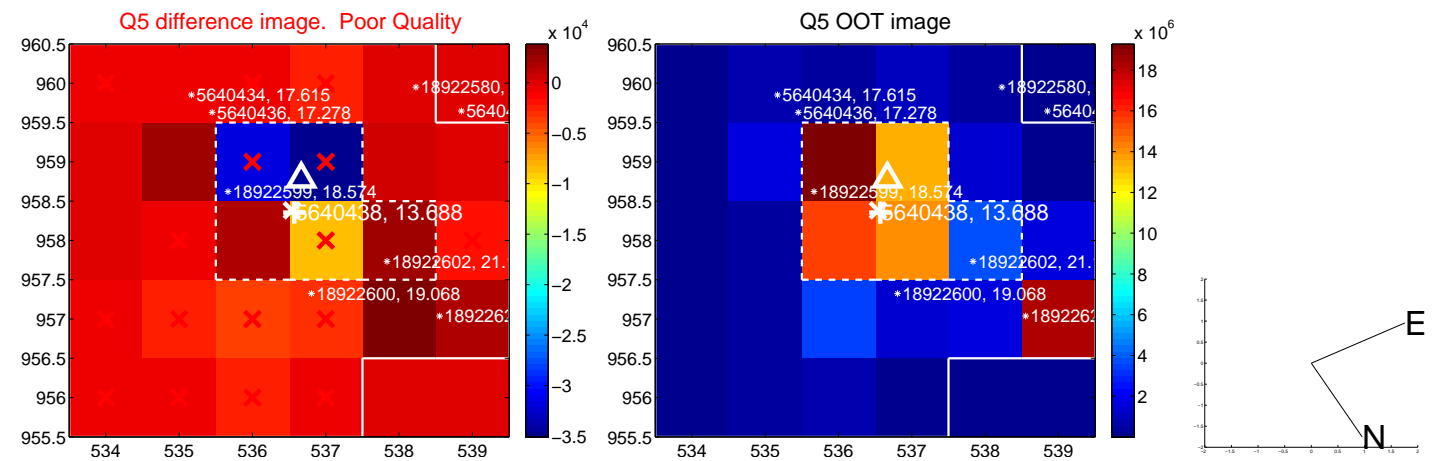


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

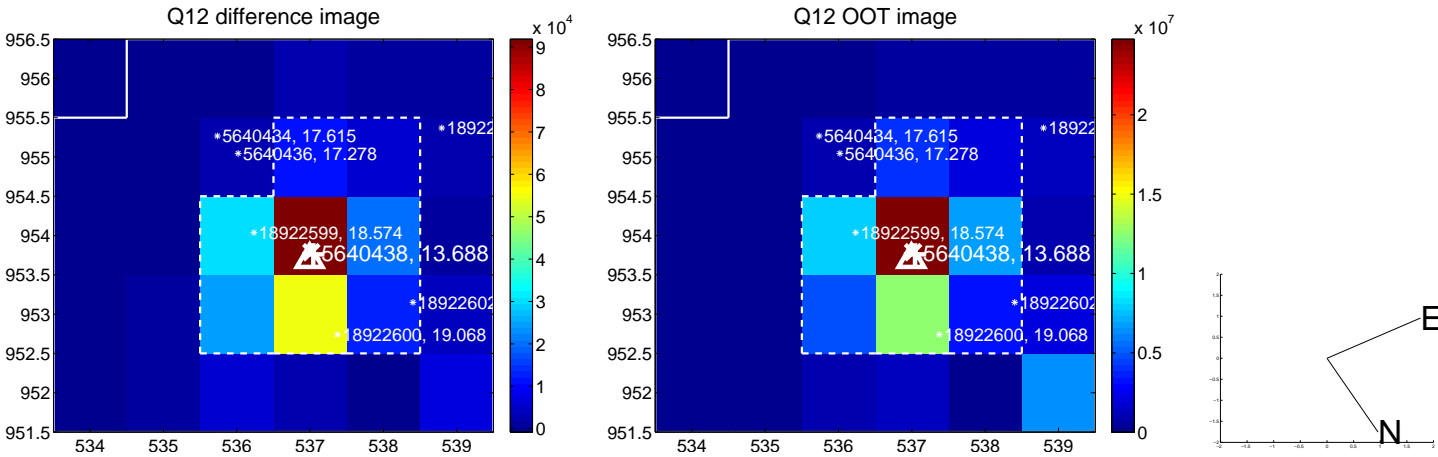
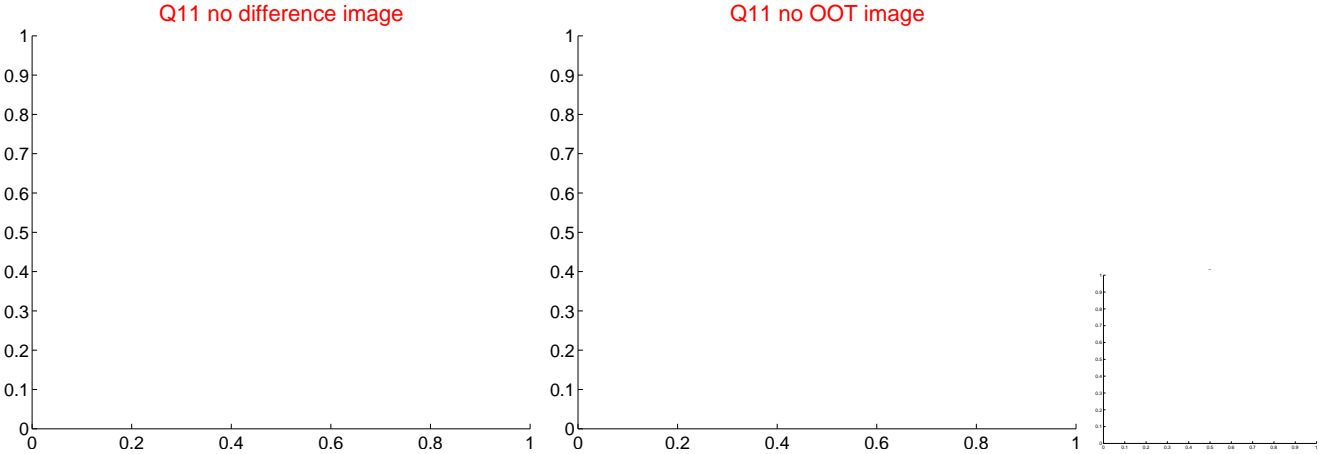
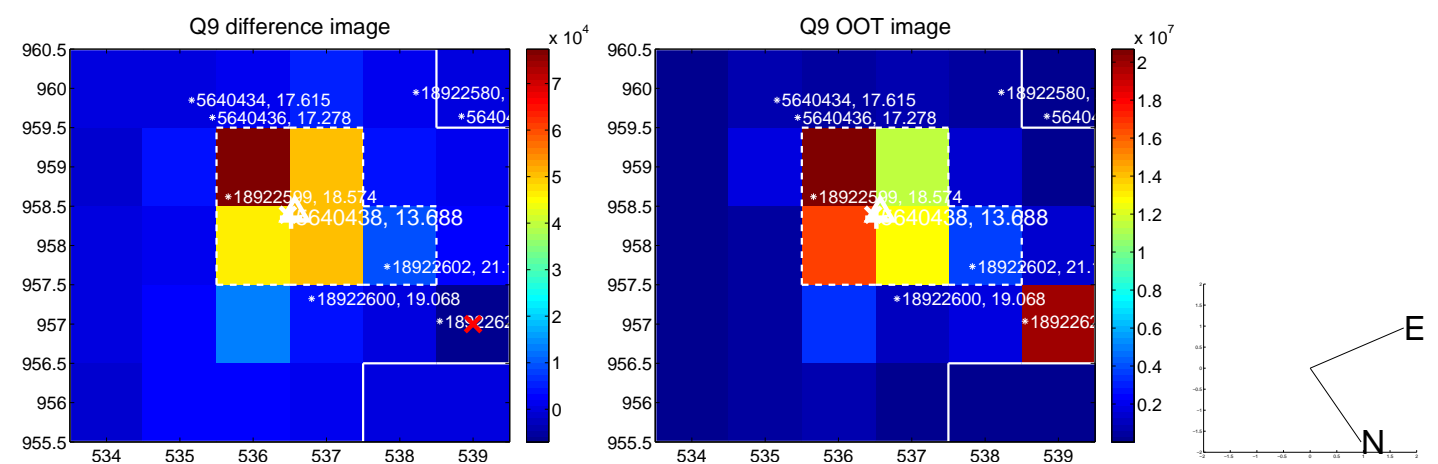
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



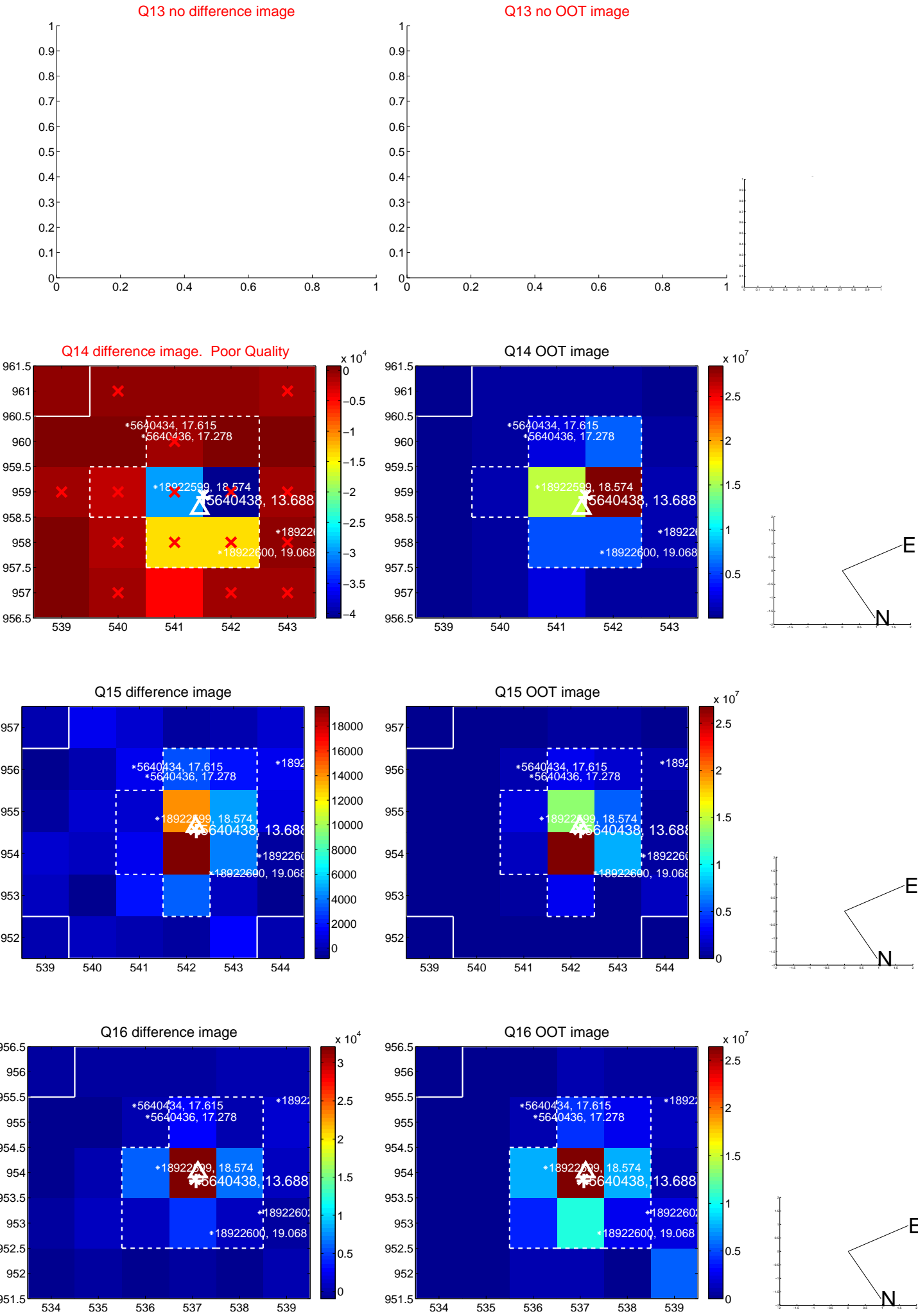
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



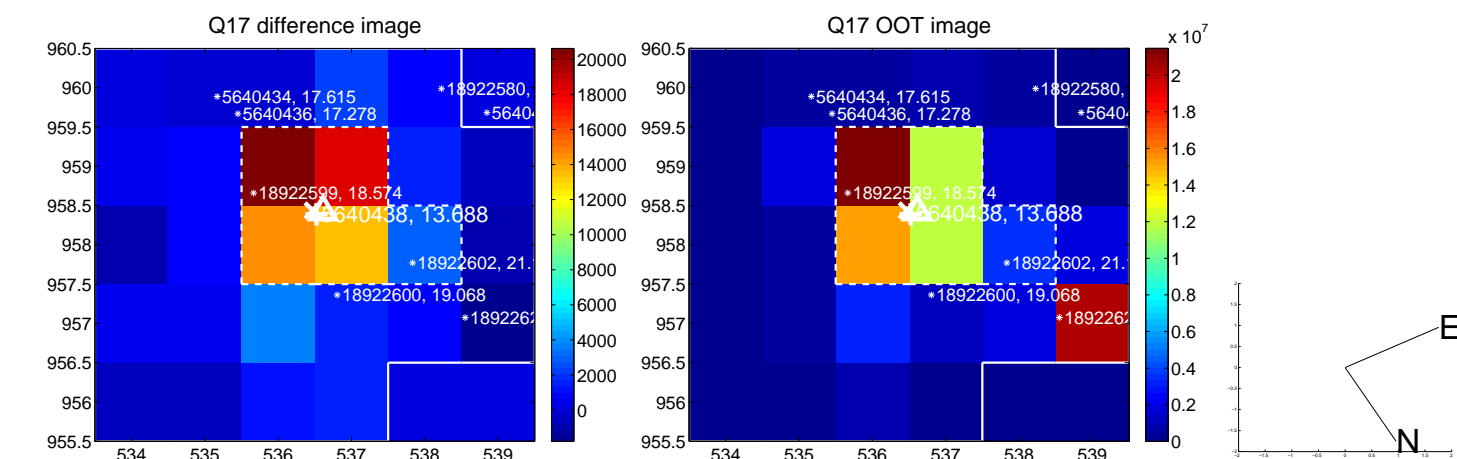
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



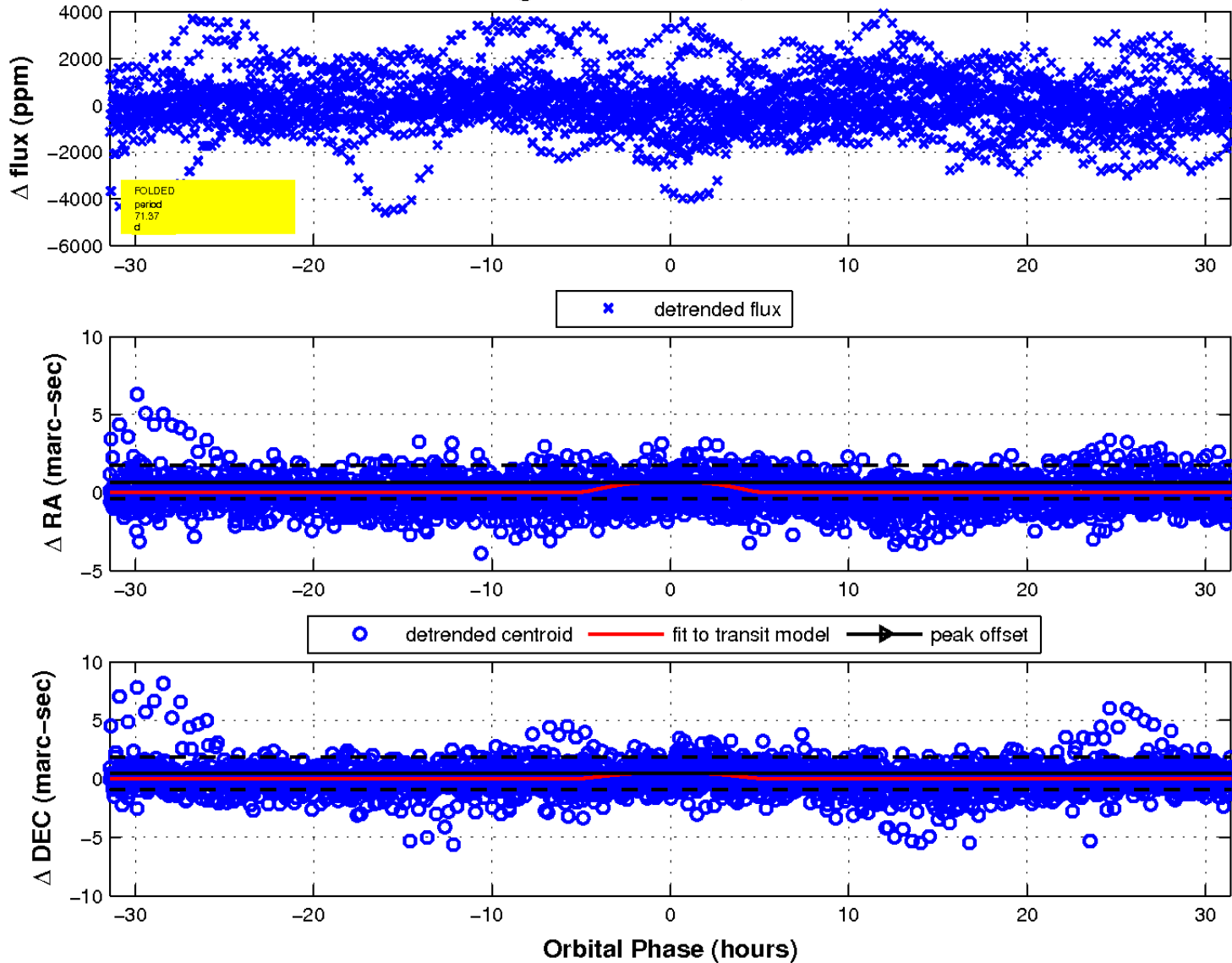
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

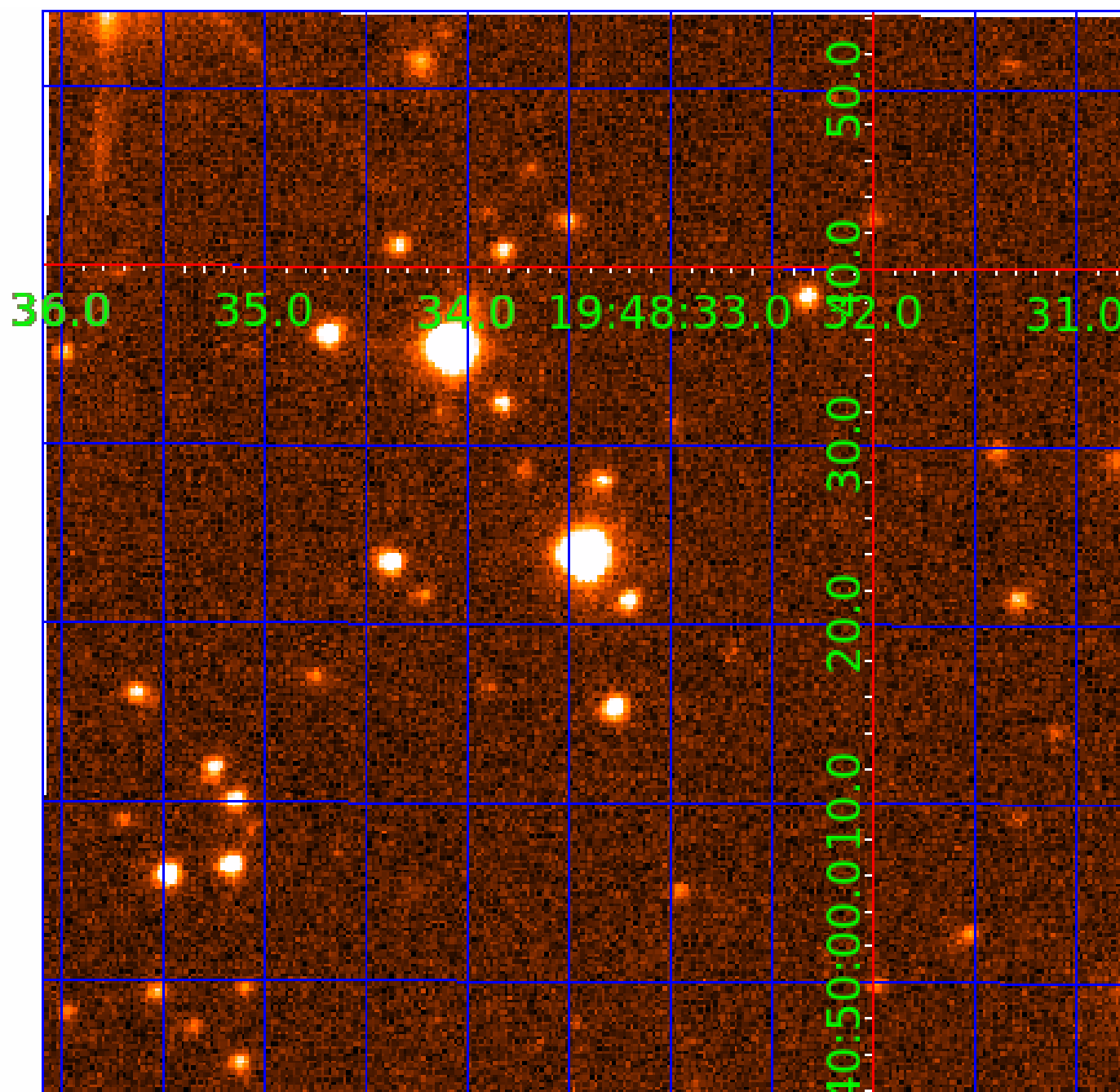


fluxWeightedCentroids, Planet 5 of 7



UKIRT Image

Declination



KIC 005640438

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})
005640438-01	OBS	No	0.997320	132.079880	181.3	6.317	10.5	12.9	1.21	6847	3.06	6632.69
005640438-03	OBS	No	109.924969	139.747262	1454.6	2.581	10.7	6.7	1.21	6847	4.85	12.55
005640438-04	OBS	No	21.946630	150.794527	1499.4	17.781	9.2	8.0	1.21	6847	5.51	107.56
005640438-05	OBS	No	71.365018	145.448396	1545.5	10.485	8.5	7.3	1.21	6847	5.87	22.33
005640438-07	OBS	No	99.907008	170.355191	320.7	4.500	8.7	-1.0	1.21	6847	2.19	14.26

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005640438-01	OBS	FP	0.00	1	0	0	0	LPP_DV—MOD_NONUNIQ_DV
005640438-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—INCONSISTENT_TRANS
005640438-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—MOD_POS_ALT
005640438-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_ZUMA—TRANS_GAPPED—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT
005640438-07	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

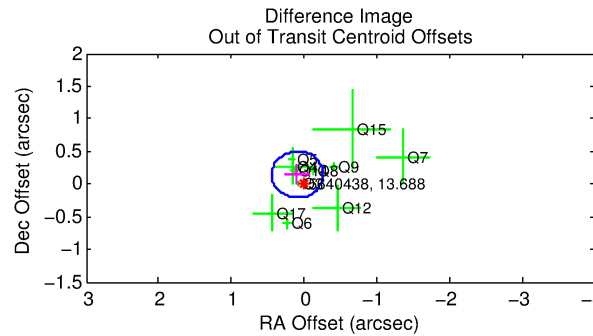
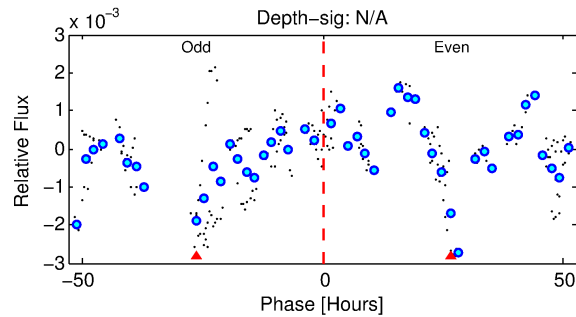
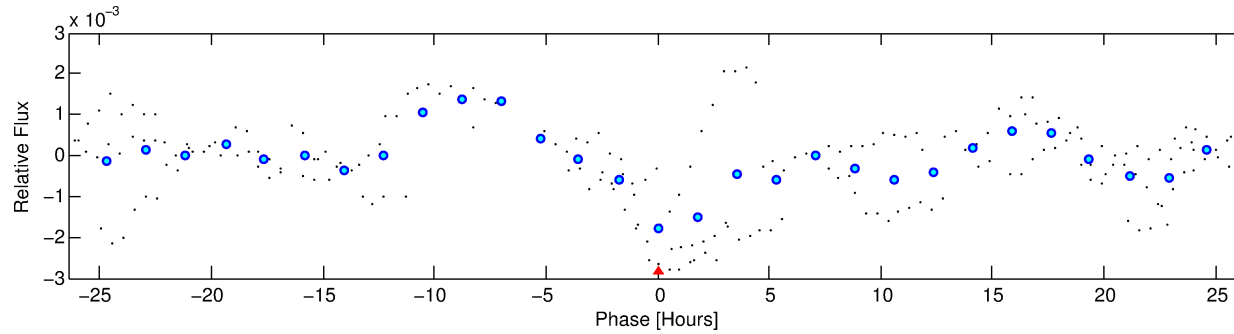
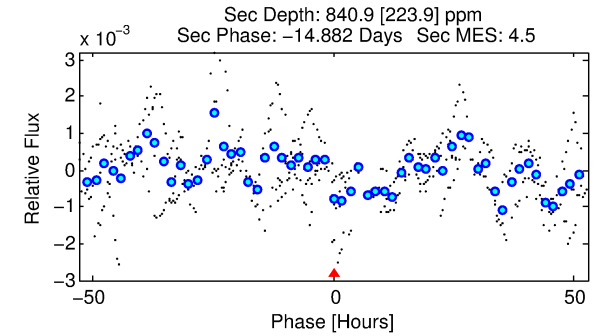
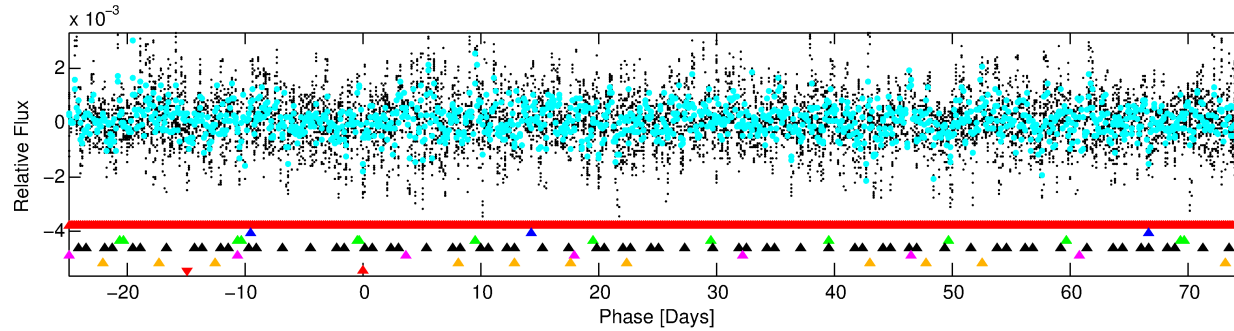
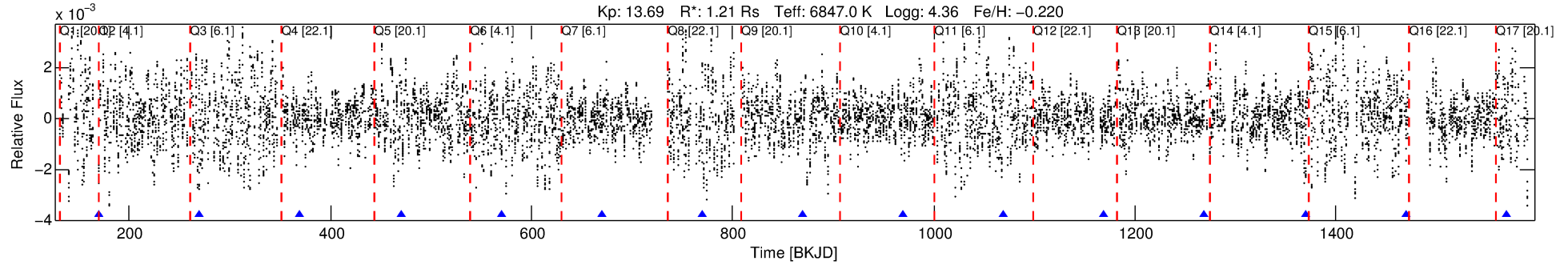
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 005640438-07

No Significant Match Found

DV One-Page Summary

KIC: 5640438 Candidate: 7 of 7 Period: 99.907 d



TPS TCE Results:

Period = 99.90701 d
Epoch = 170.3552 BKJD

DV fit results are unavailable

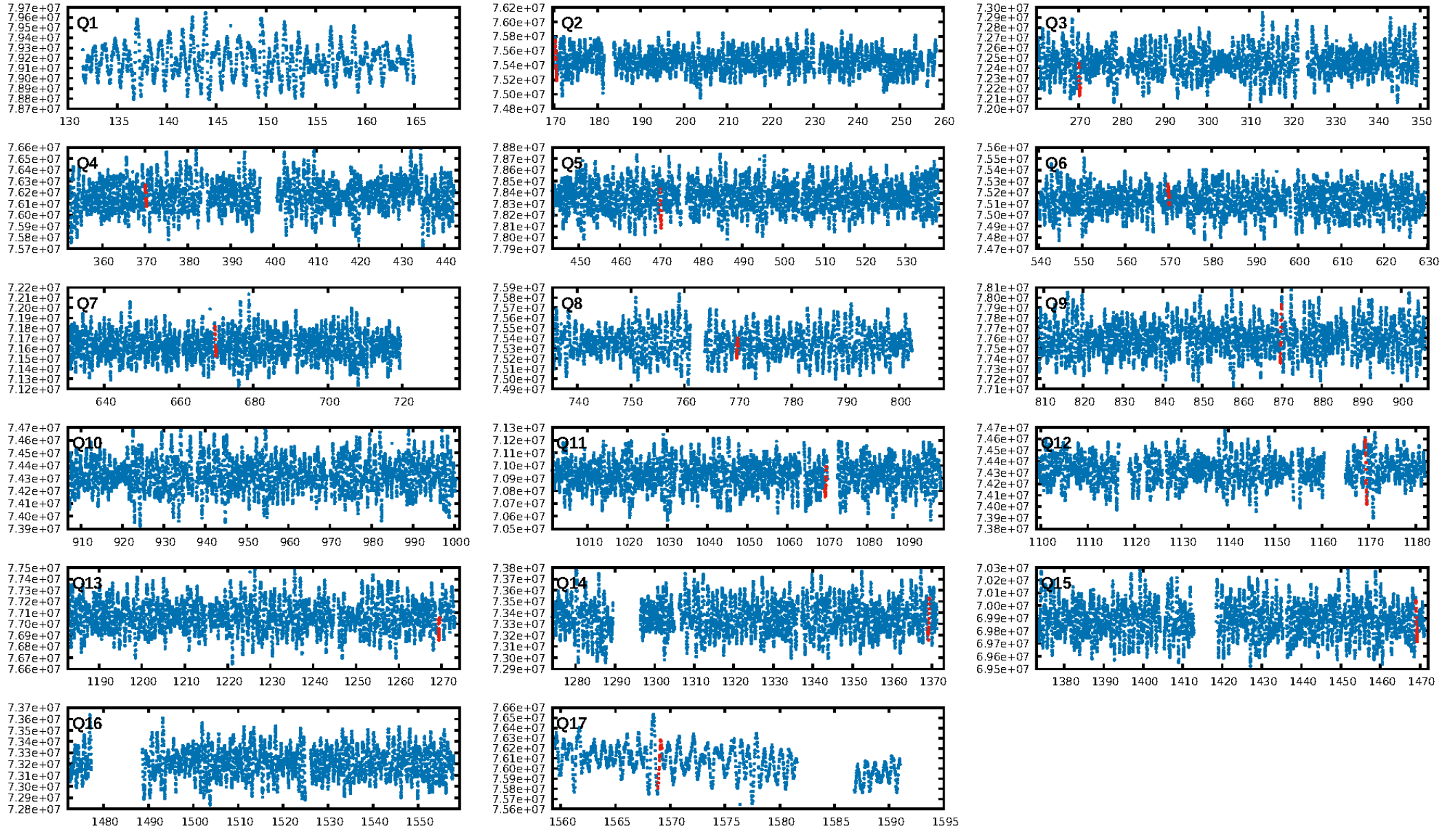
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [60.04 σ]
LongPeriod-sig: 100.0% [46.35 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [6/6]
GhostDiagnostic-chr: 3.671
Centroid-sig: 27.3%
Centroid-so: 1.092 arcsec [9.33 σ]
OotOffset-rm: 0.175 arcsec [1.47 σ]
KicOffset-rm: 0.470 arcsec [4.29 σ]
OotOffset-st: 2/3/3/3 [11]
KicOffset-st: 2/3/3/3 [11]
DiffImageQuality-fgm: 0.64 [7/11]
DiffImageOverlap-fno: 0.00 [0/11]

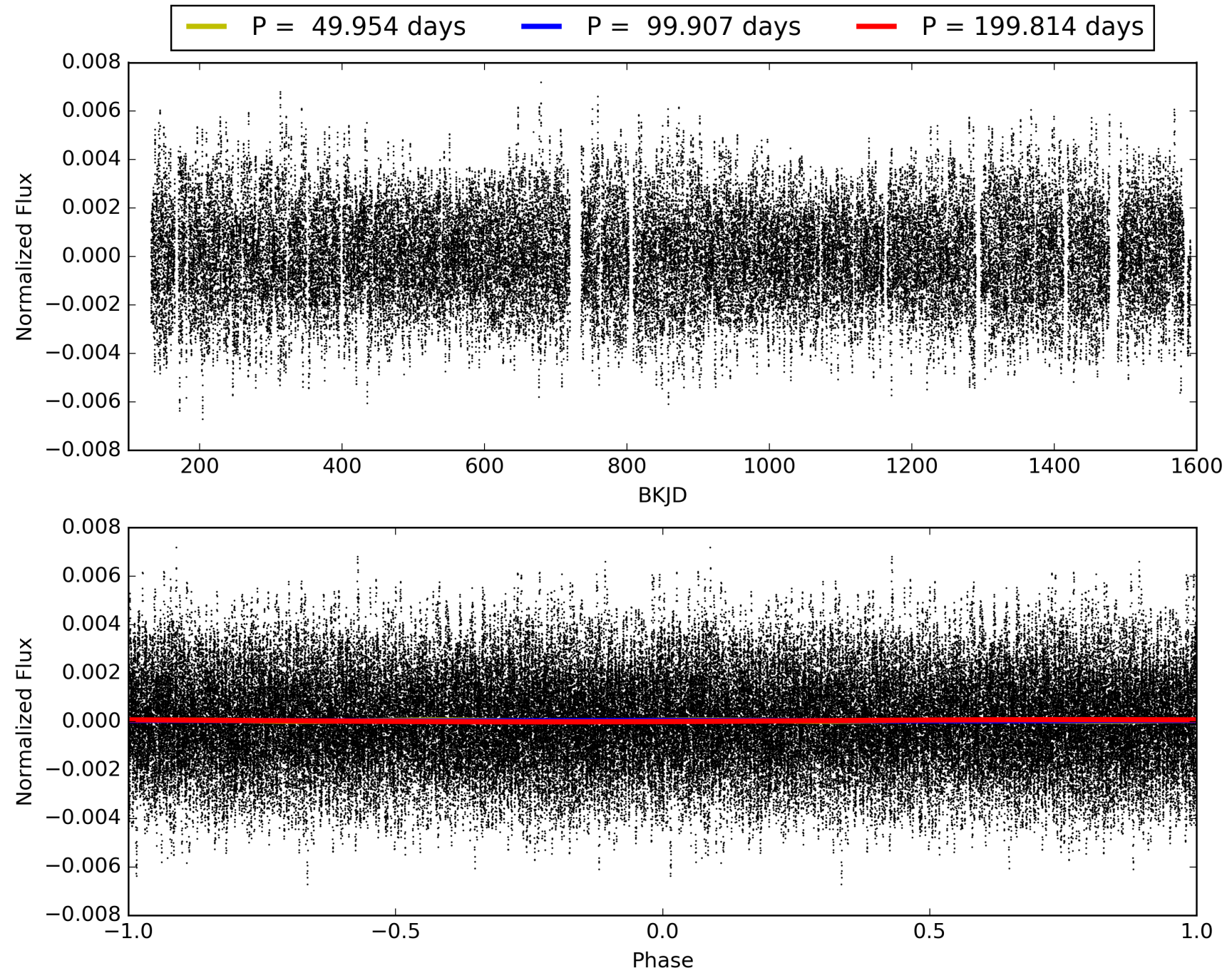
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 03-Feb-2016 08:38:38 Z

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

TCE 005640438-07, PDC Light Curves

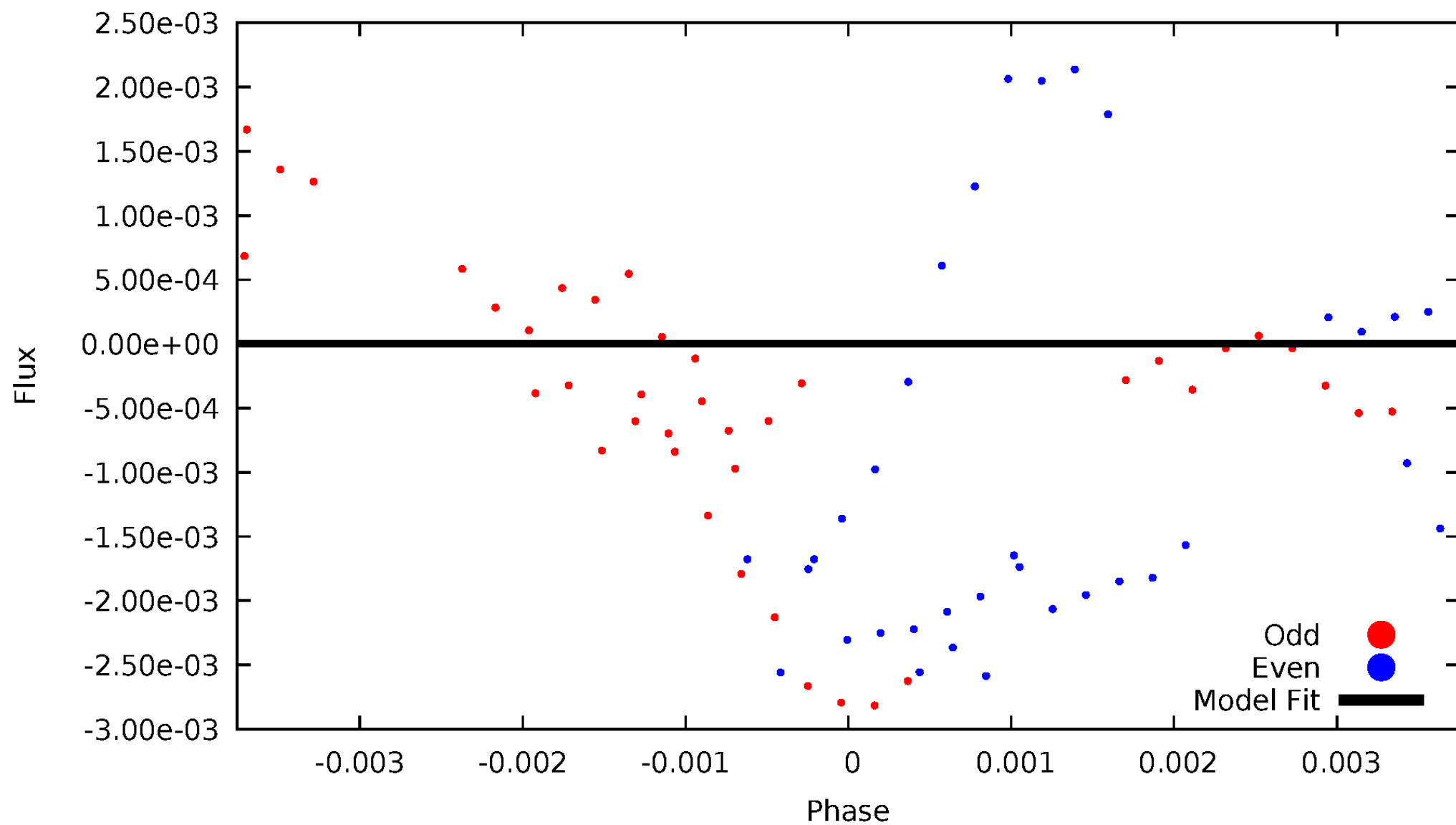


TCE 005640438-07



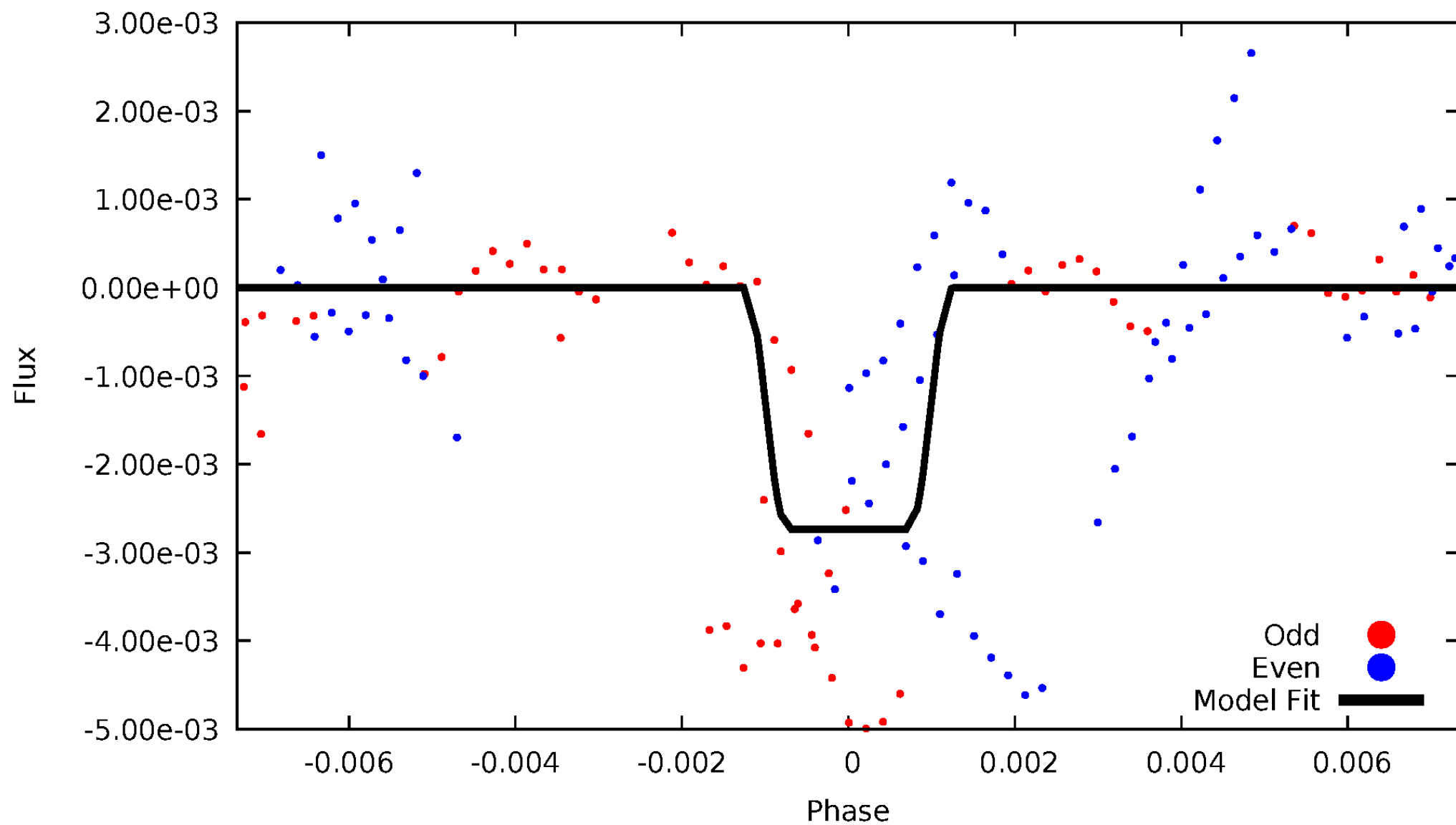
DV Odd/Even

TCE 005640438-07



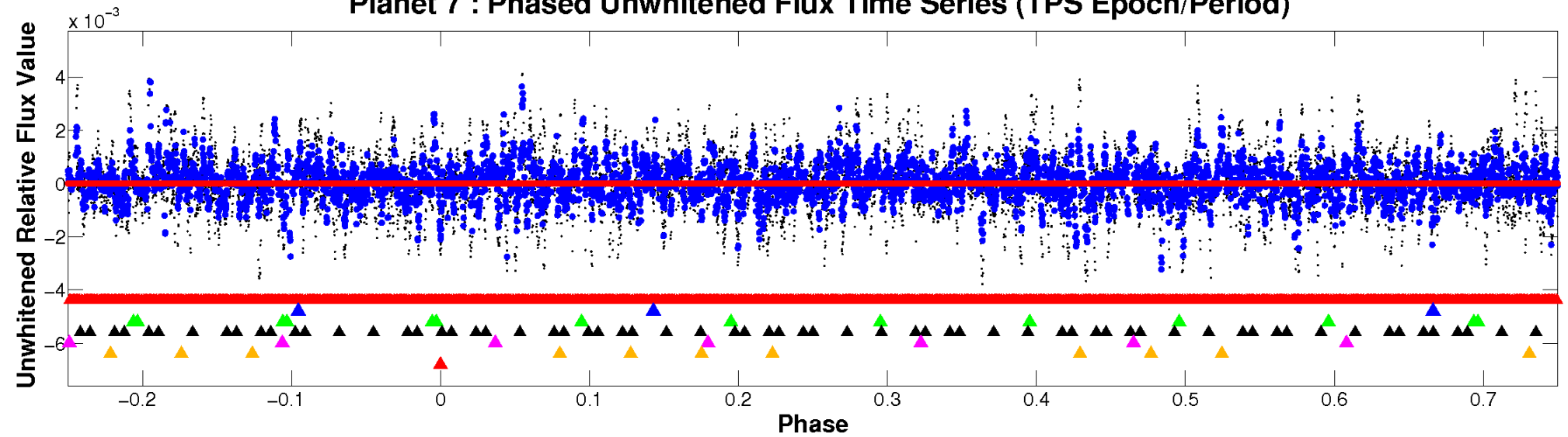
ALT Odd/Even

TCE 005640438-07

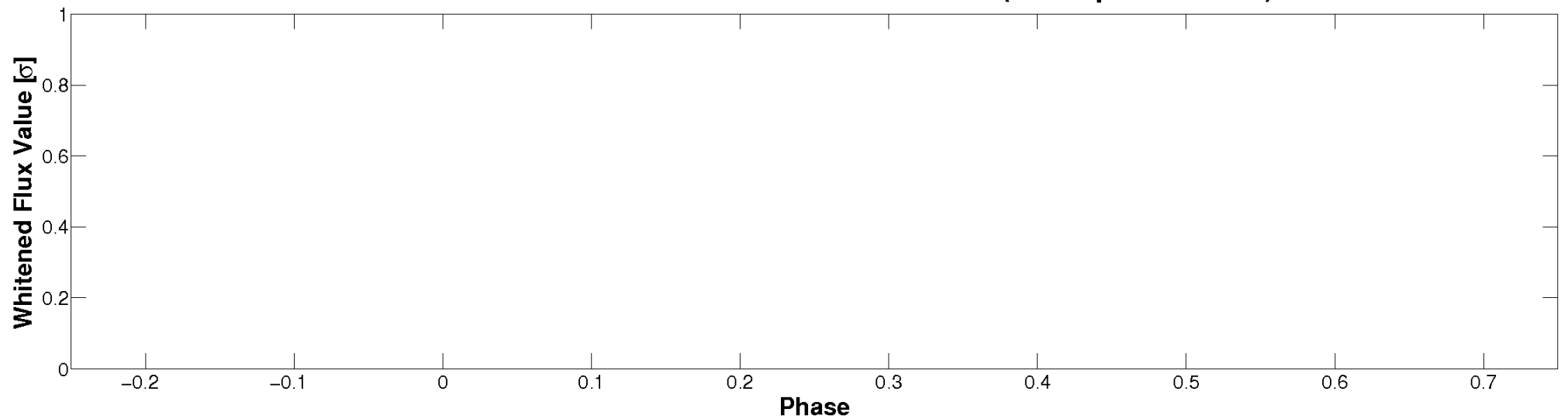


Non-Whitened Vs. Whitened Light Curve

Planet 7 : Phased Unwhitened Flux Time Series (TPS Epoch/Period)

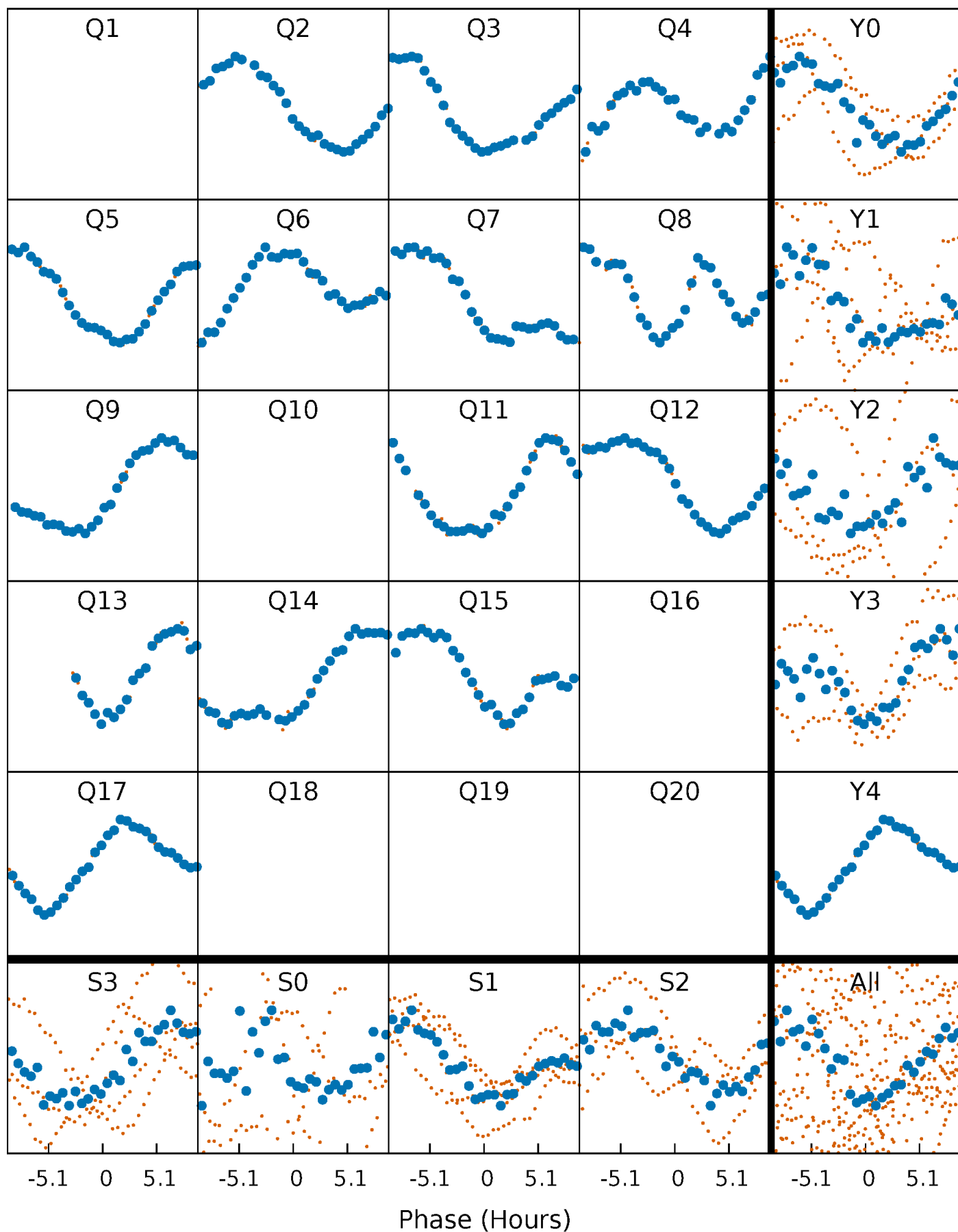


Planet 7 : Phased Whitened Flux Time Series (TPS Epoch/Period)



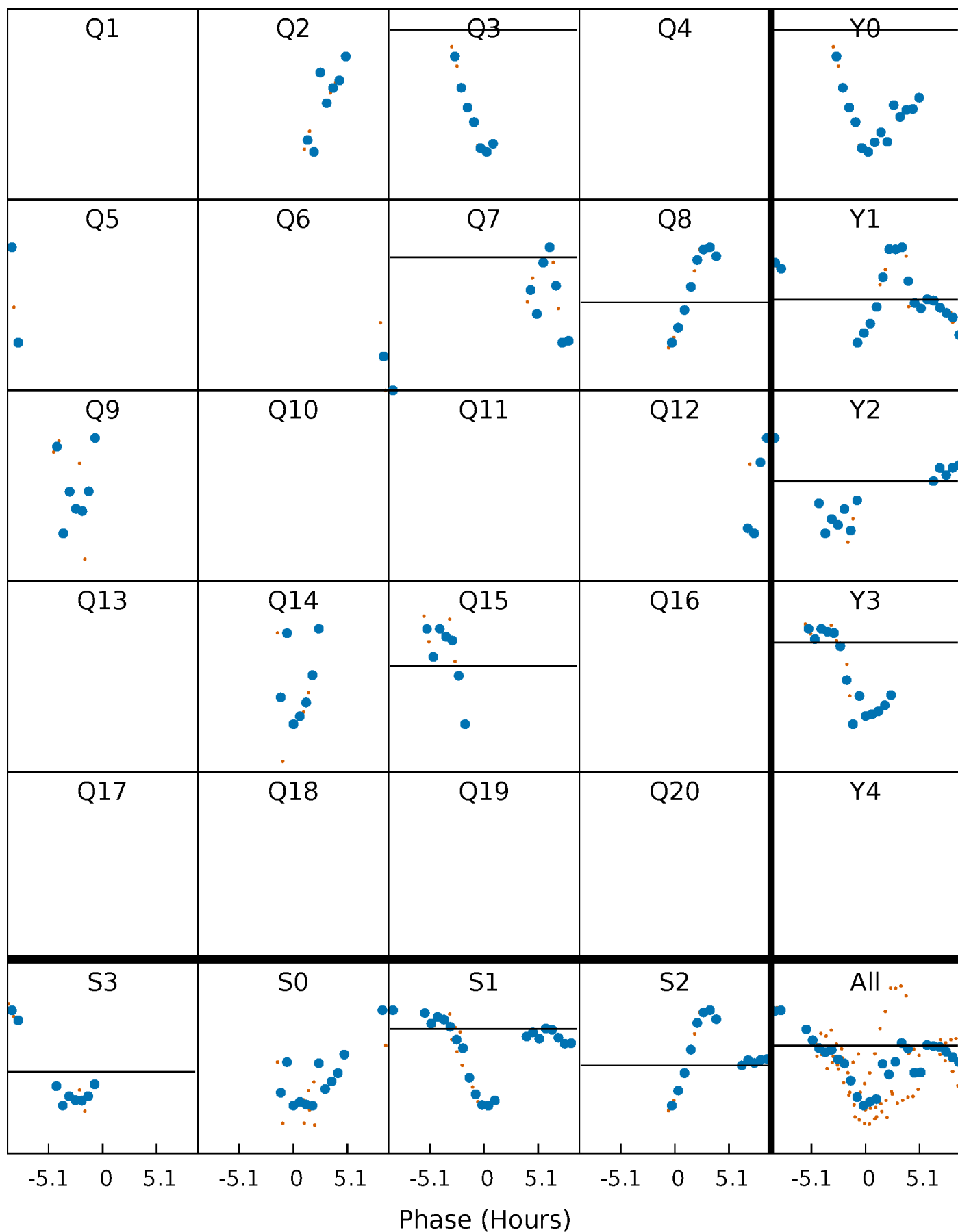
PDC Quarter-Phased Transit Curves

TCE 005640438-07 $P = 99.907008$ Days $T_0 = 170.355191$ (BKJD)



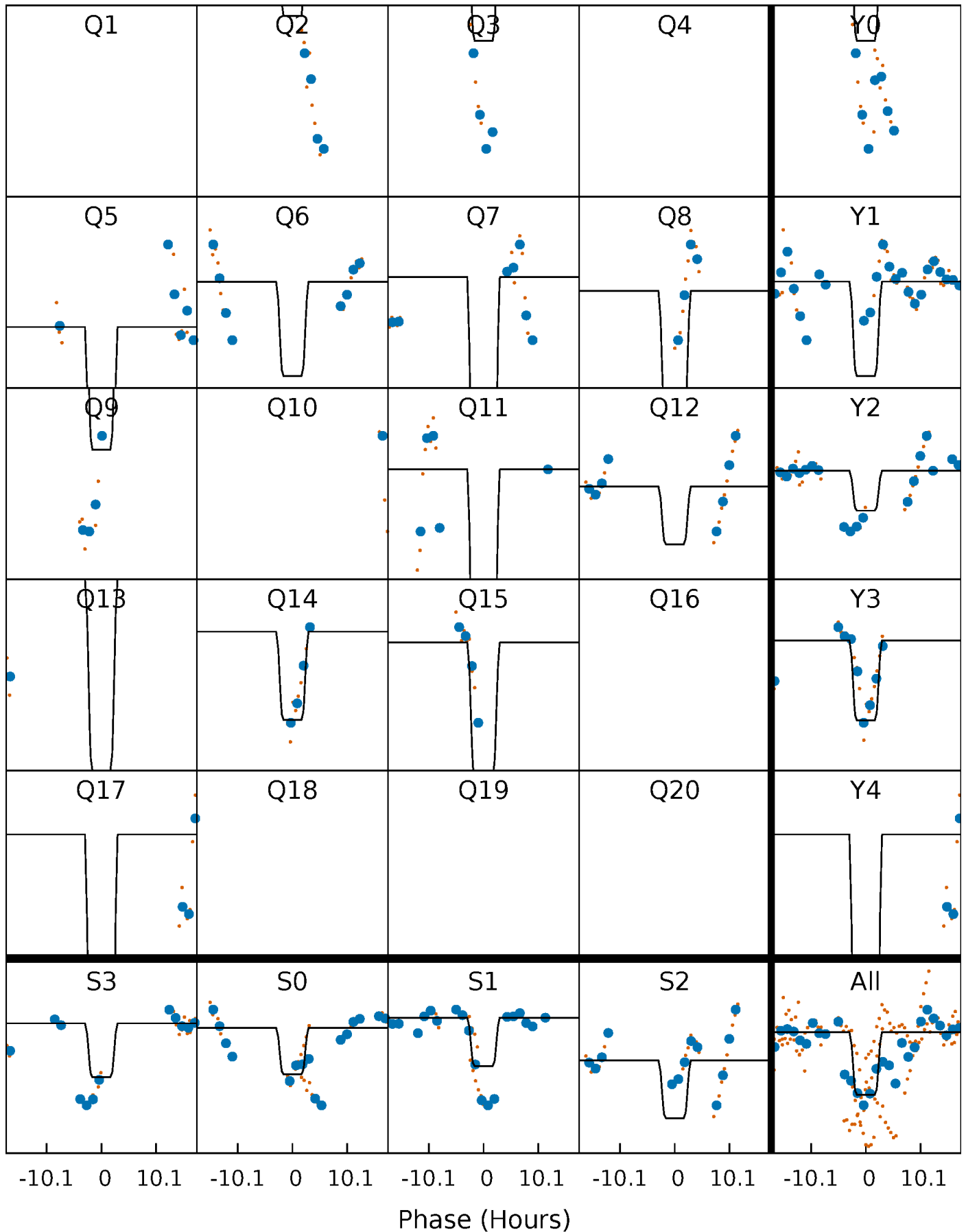
DV Quarter-Phased Transit Curves

TCE 005640438-07 $P = 99.907008$ Days $T_0 = 170.355191$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

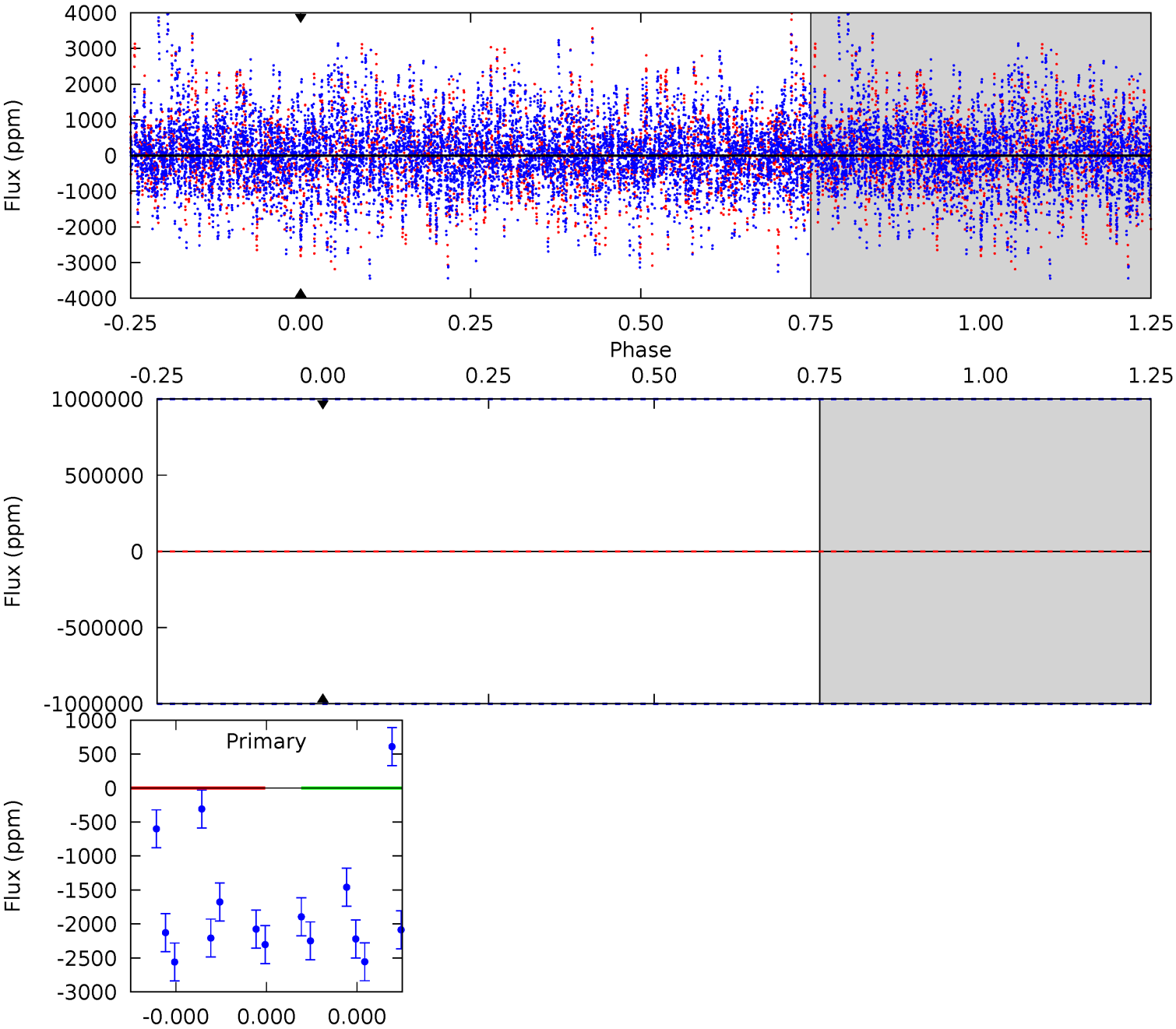
TCE 005640438-07 P= 99.907008 Days $T_0=170.329746$ (BKJD)



DV Model-Shift Uniqueness Test

005640438-07, P = 99.907008 Days, E = 70.448183 Days

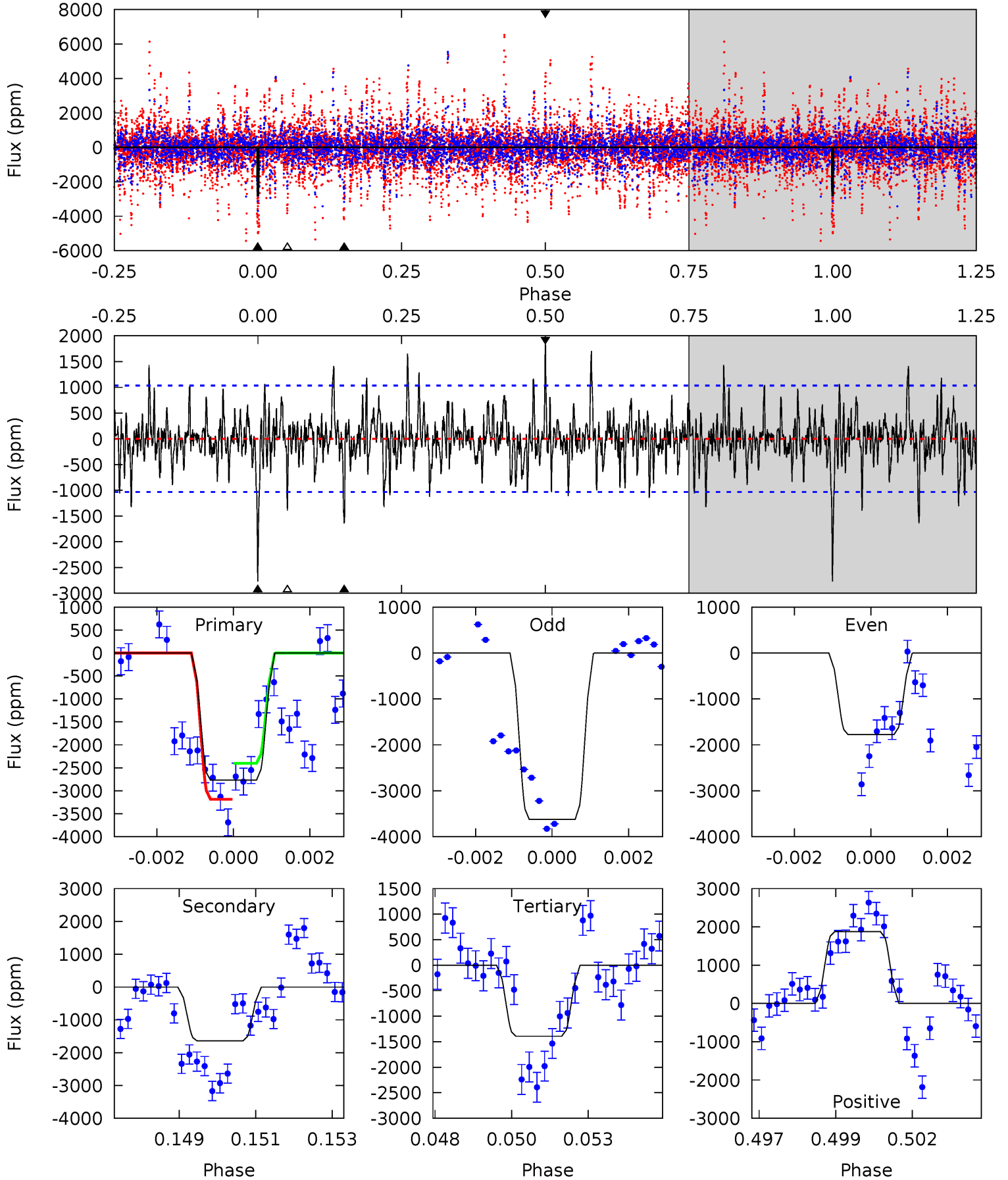
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

005640438-07, P = 99.907008 Days, E = 70.422738 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
14.2	8.43	7.14	9.63	5.30	3.05	2.07	7.08	4.59	1.28	-1.20	4.56	0.88	0.40	2.04



Stellar Parameters For KIC 005640438

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6847^{+191}_{-262}	$4.358^{+0.056}_{-0.224}$	$-0.220^{+0.250}_{-0.300}$	$1.213^{+0.451}_{-0.141}$	$1.239^{+0.195}_{-0.178}$	$0.977^{+0.305}_{-0.546}$
	+3%/-4%	+1%/-5%	+114%/-136%	+37%/-12%	+16%/-14%	+31%/-56%
Source	PHO1	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 005640438-07 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$10.22^{+10.65}_{-7.19}$	711^{+48}_{-42}	4331^{+33645}_{-34062}	$896^{+238873}_{-163570}$
Alt.	-1641 ± 195	$12.71^{+12.90}_{-8.71}$	707^{+53}_{-38}	4663^{+3684}_{-1010}	1111^{+10535}_{-838}

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 $A_{obs} \gg 1.0$

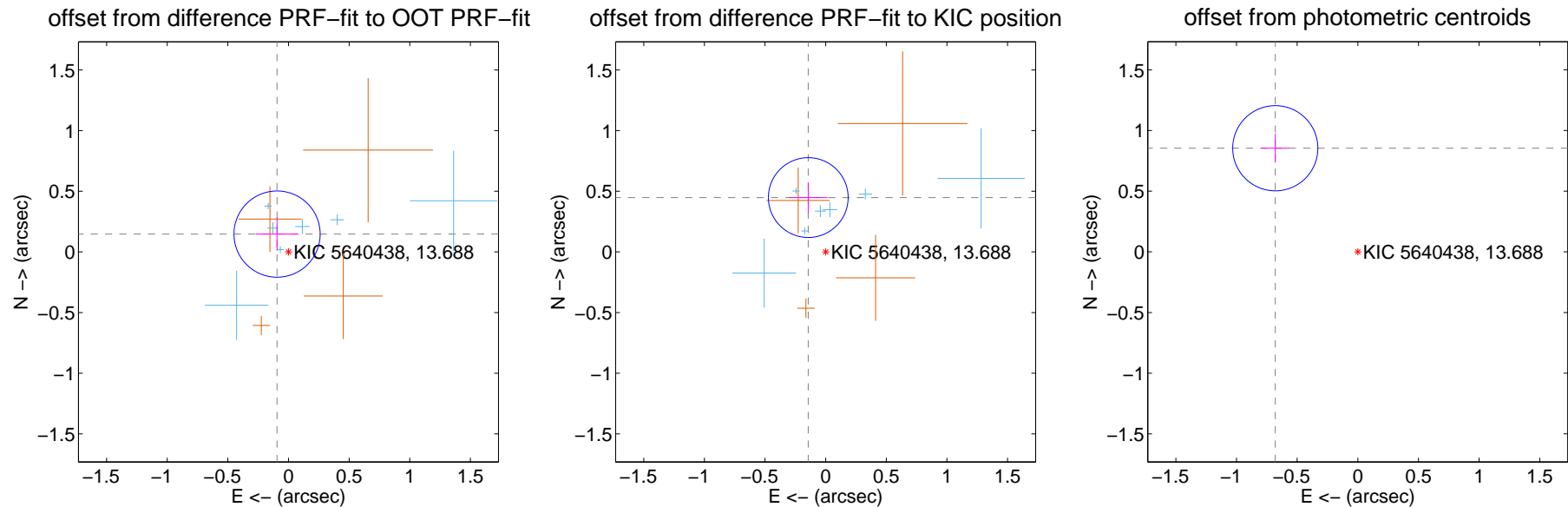
DV Centroid Data

Supplemental centroid analysis for 005640438-07. Kepler magnitude: 13.69. Transit SNR -1.00

There are 7 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.28 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.175 ± 0.118	1.47	0.094 ± 0.177	0.147 ± 0.138
PRF-fit source offset from KIC position	0.470 ± 0.110	4.29	0.143 ± 0.157	0.448 ± 0.125
photometric centroid source offset	1.09 ± 0.12	9.33	0.68 ± 0.11	0.85 ± 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.

Q1 no difference image



Q1 no OOT image



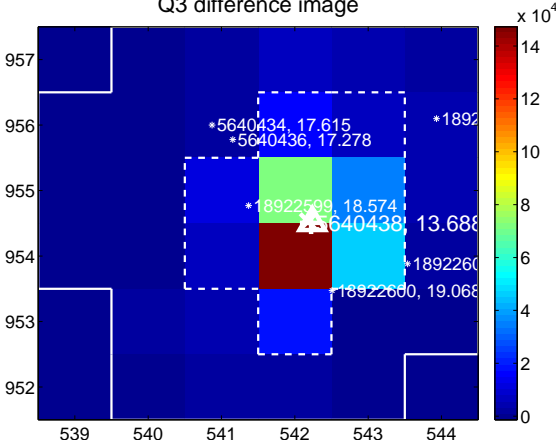
Q2 no difference image



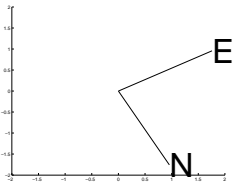
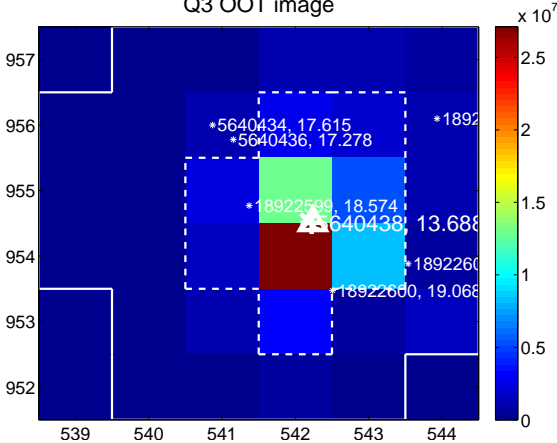
Q2 no OOT image



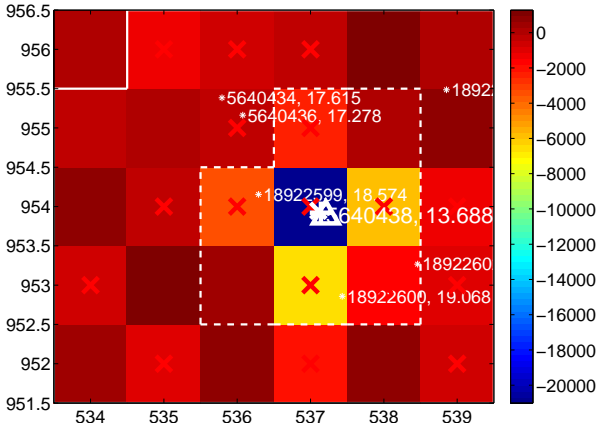
Q3 difference image



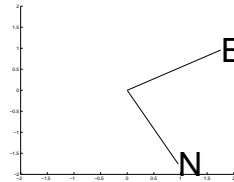
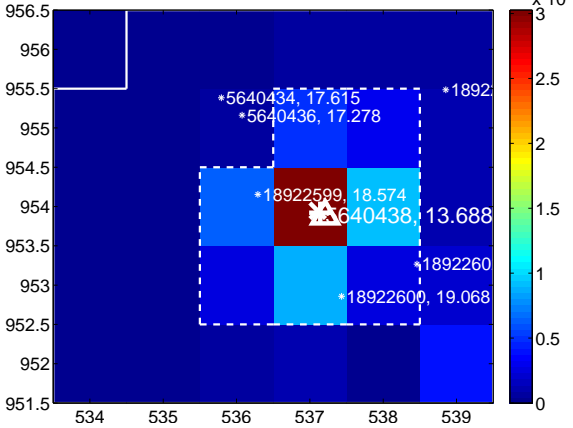
Q3 OOT image



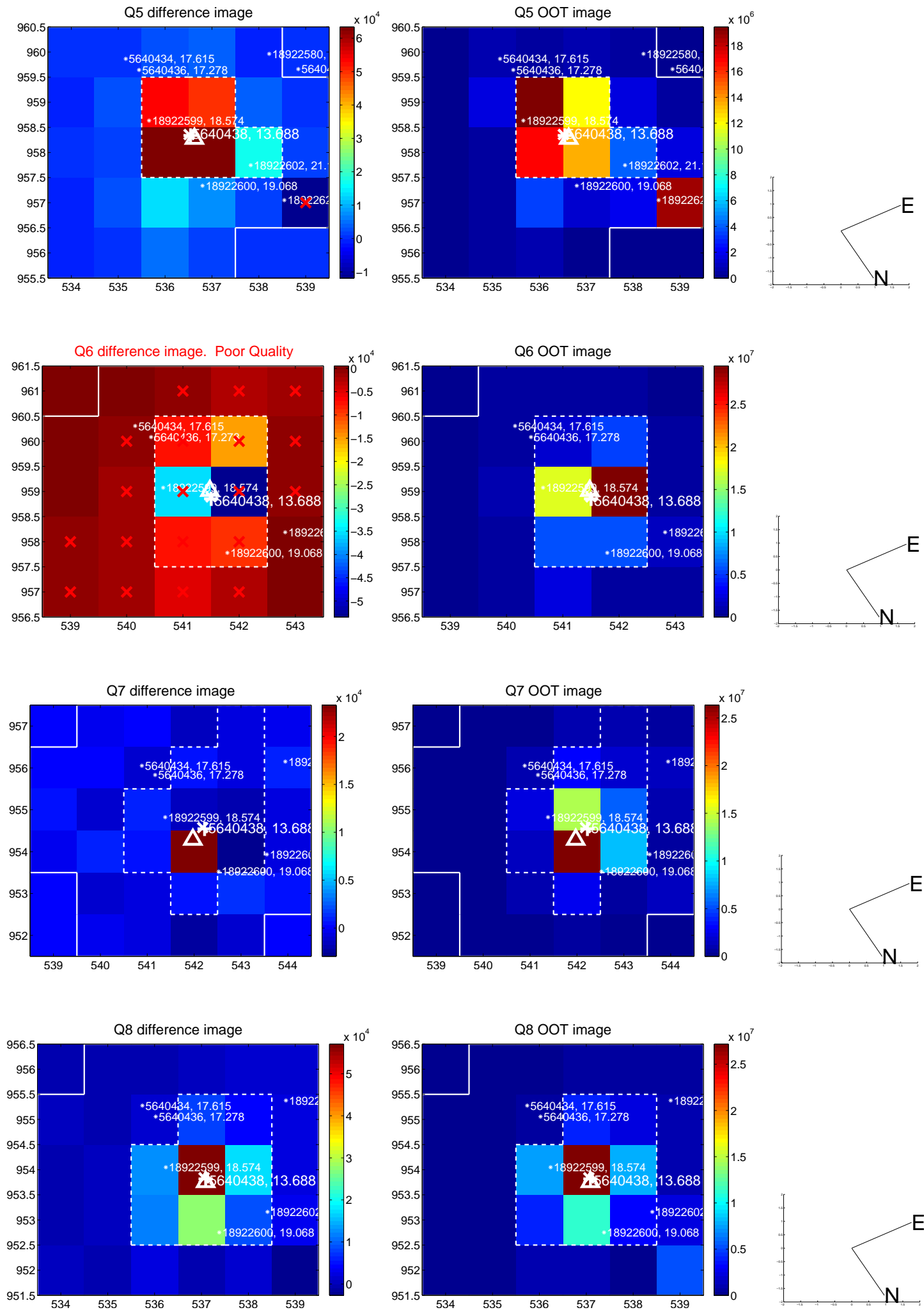
Q4 difference image. Poor Quality



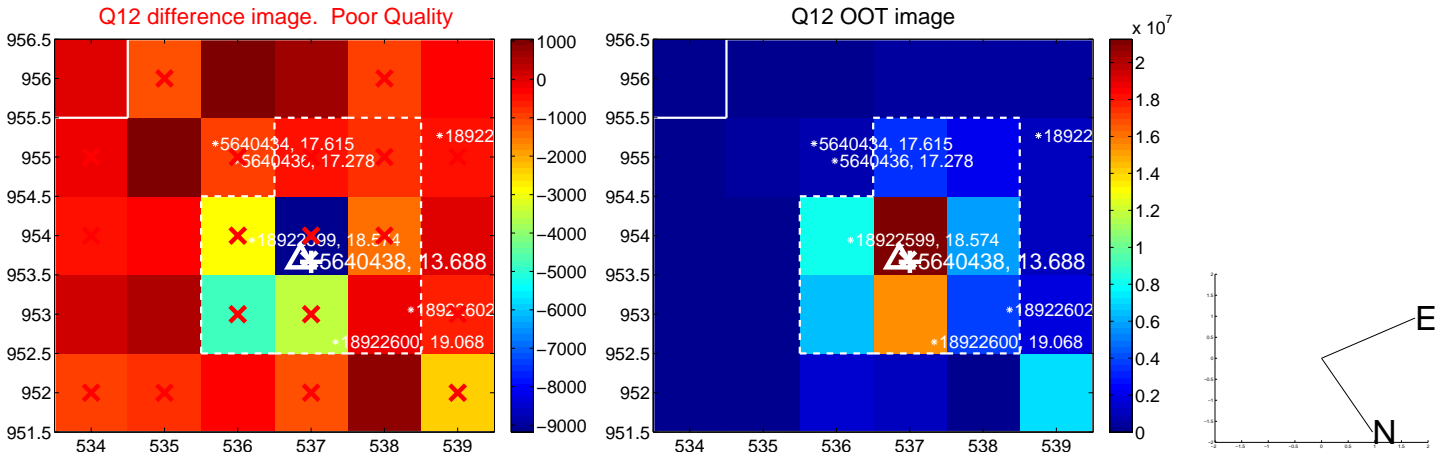
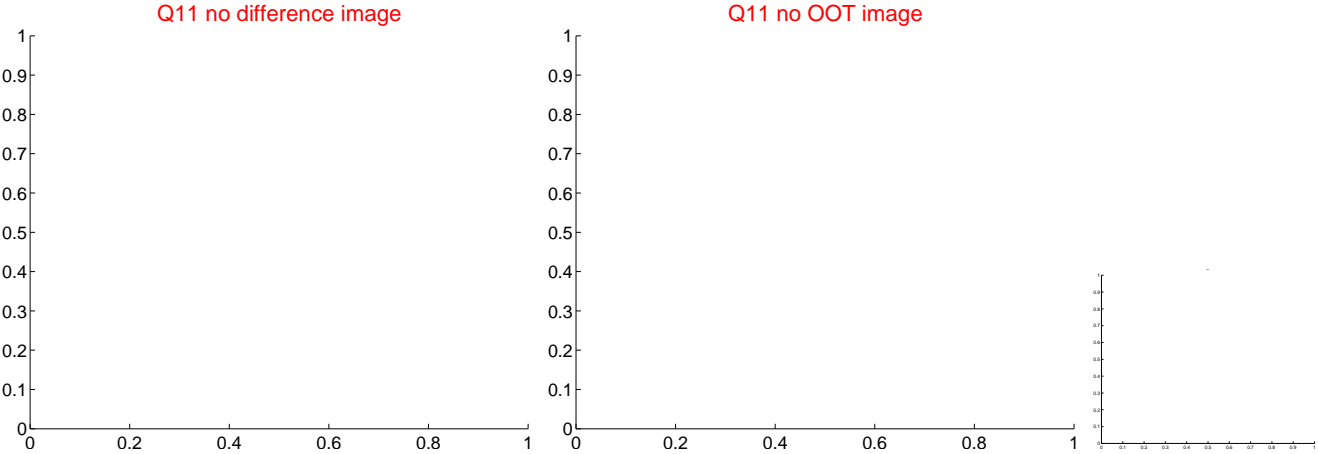
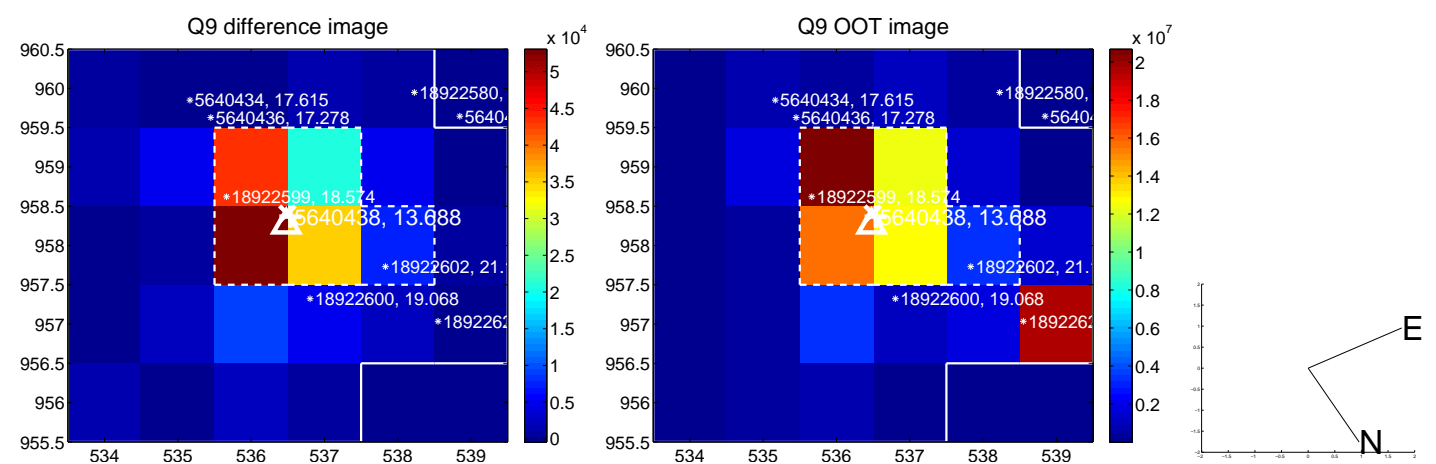
Q4 OOT image



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.

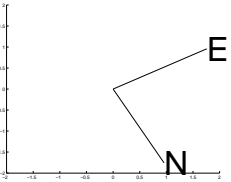
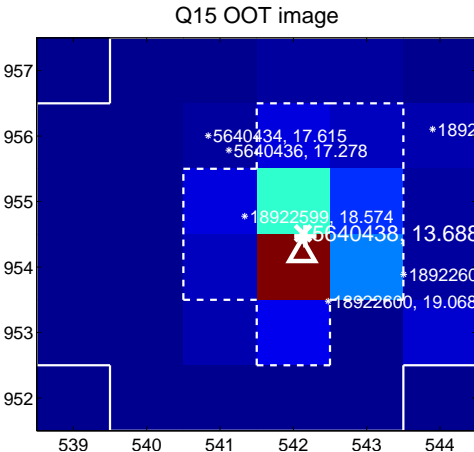
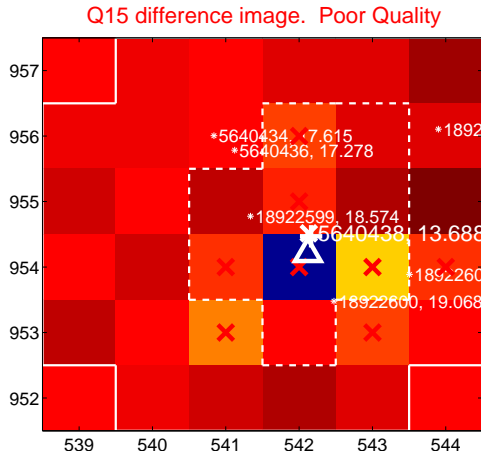
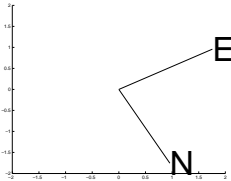
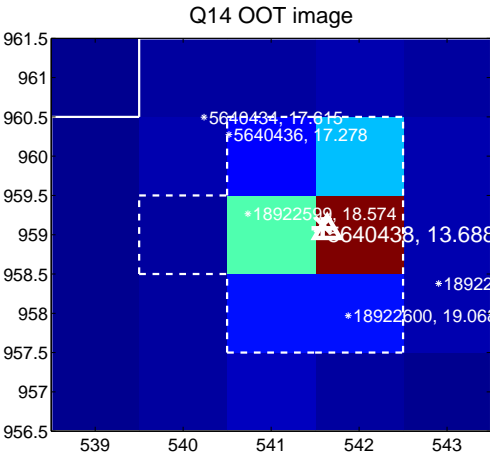
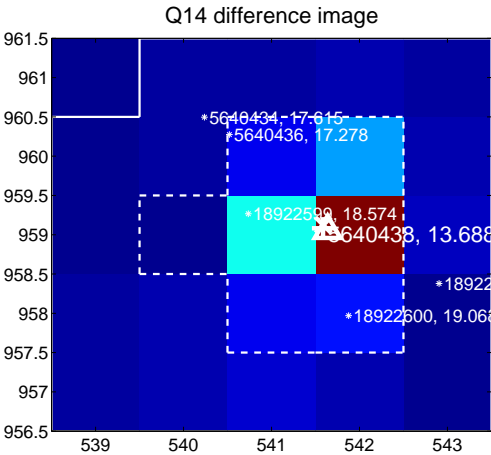


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

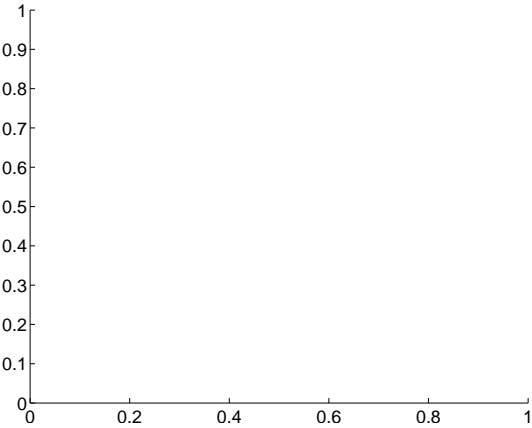
Q13 no difference image



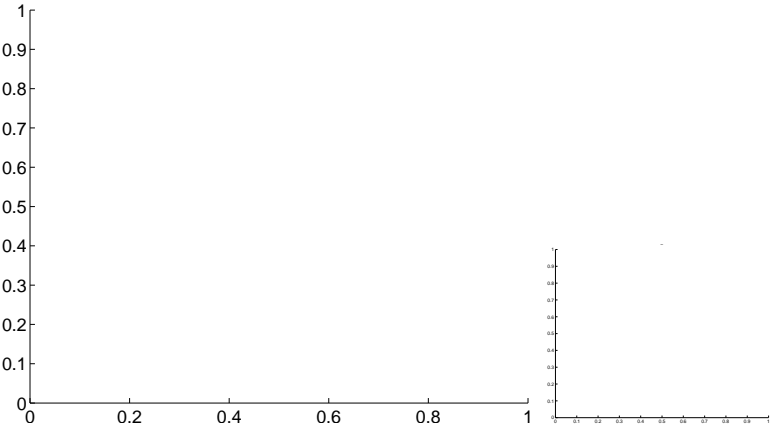
Q13 no OOT image



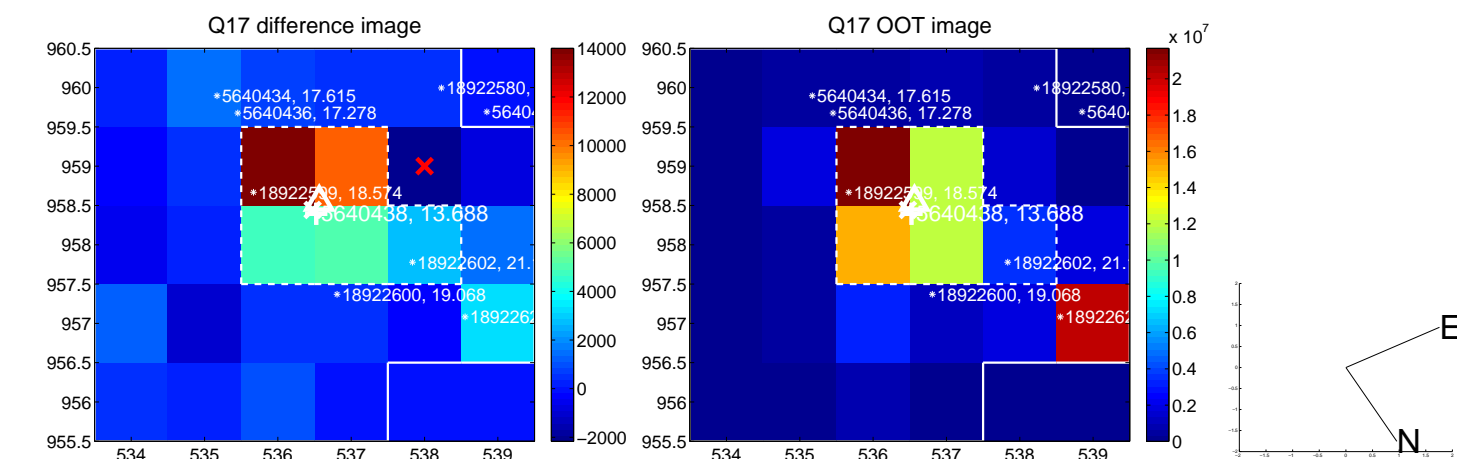
Q16 no difference image



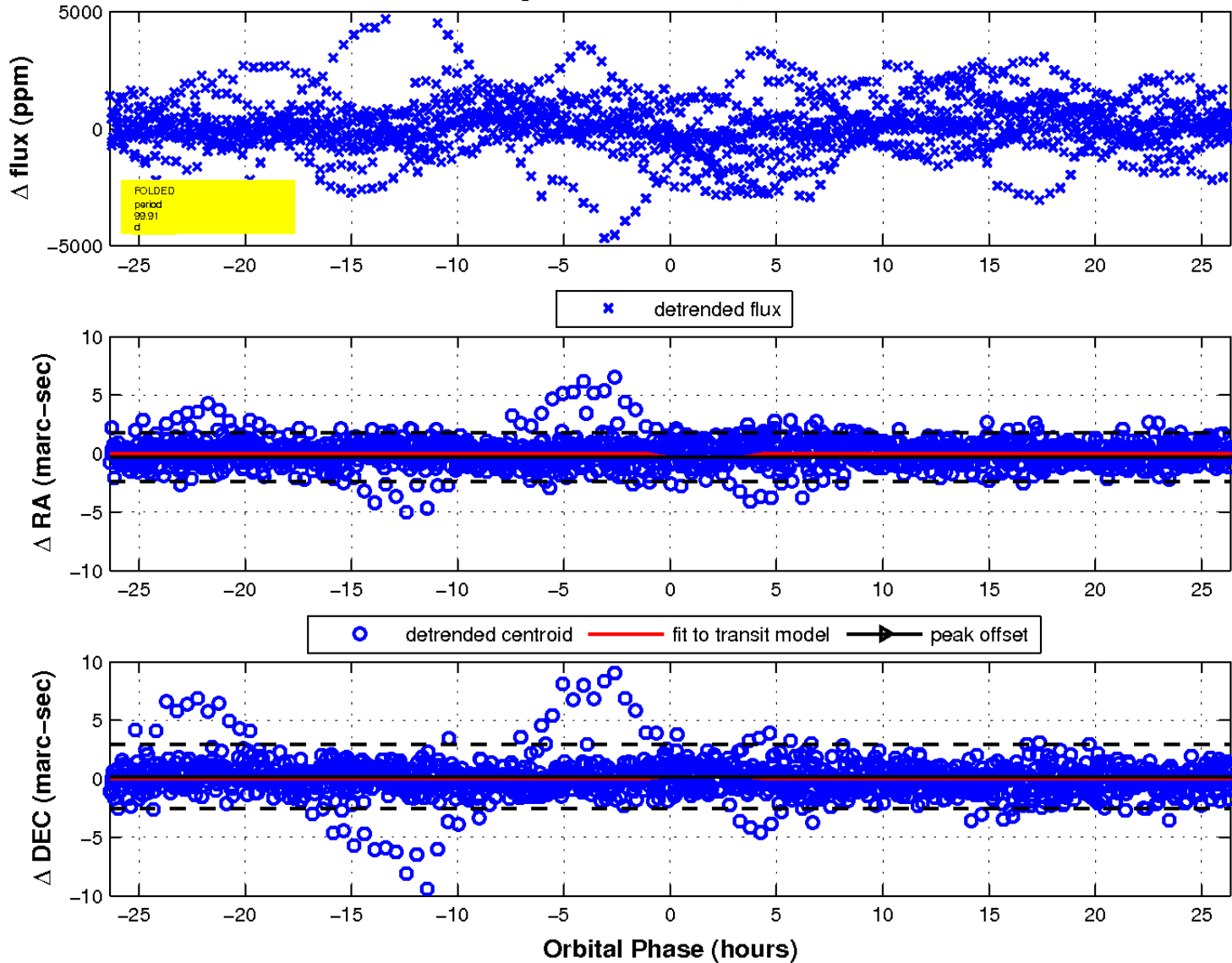
Q16 no OOT image



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



fluxWeightedCentroids, Planet 7 of 7



UKIRT Image

Declination

