

KIC 009639455

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})
009639455-01	OBS	No	713.523814	141.316349	2294.1	6.388	12.6	6.3	1.00	6136	5.66	0.54
009639455-03	OBS	No	497.971517	284.208248	717.0	0.593	11.3	2.2	1.00	6136	3.46	0.87
009639455-04	OBS	No	497.976497	285.118366	1870.7	15.143	11.5	4.7	1.00	6136	4.35	0.87
009639455-05	OBS	No	288.674920	246.637083	524.9	4.755	11.3	2.4	1.00	6136	2.48	1.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009639455-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
009639455-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009639455-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_FEW_DIFFS
009639455-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT

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

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

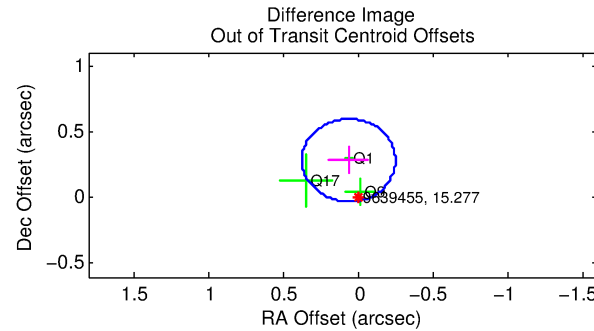
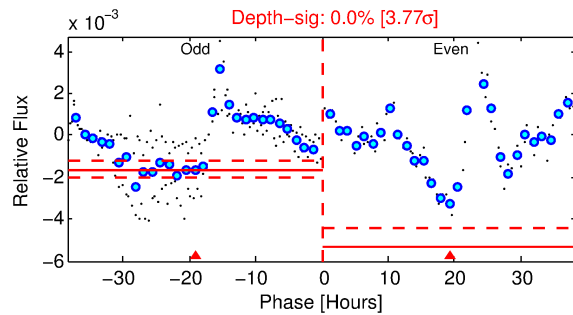
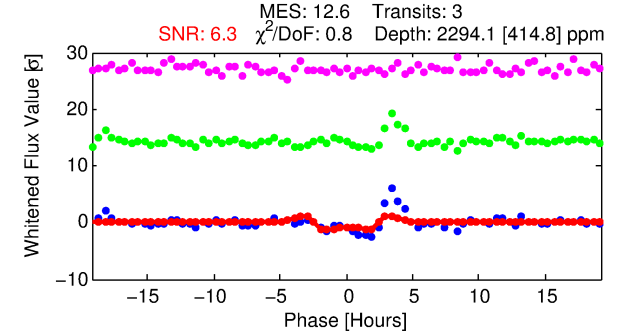
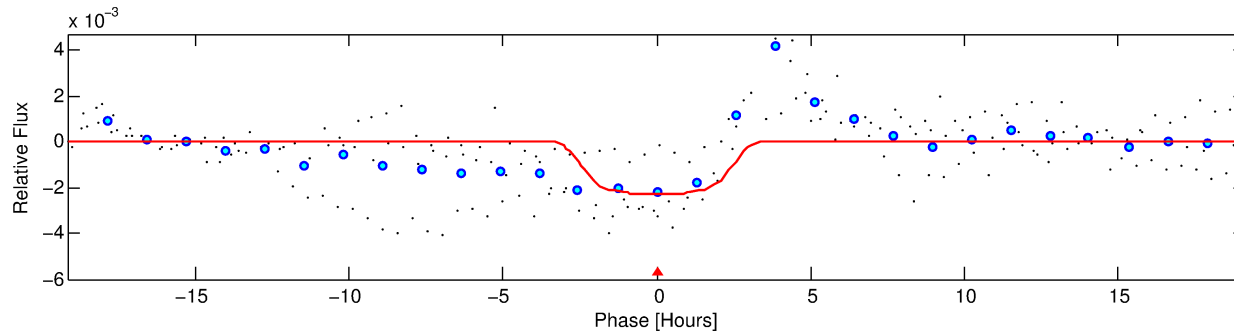
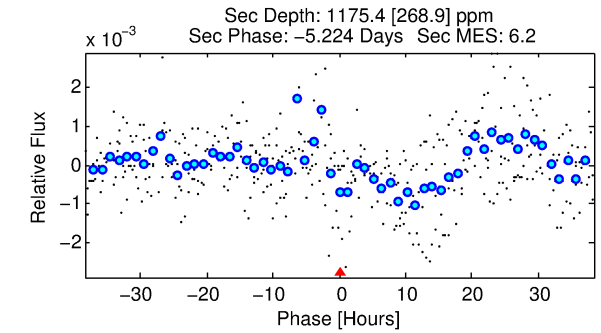
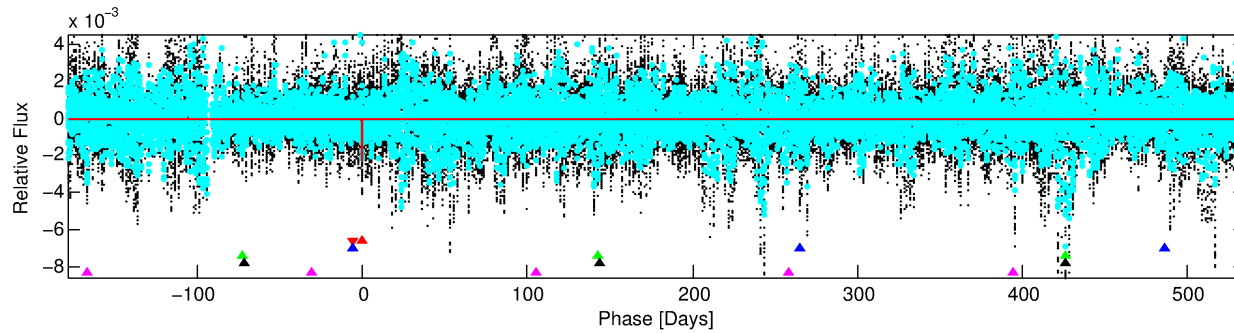
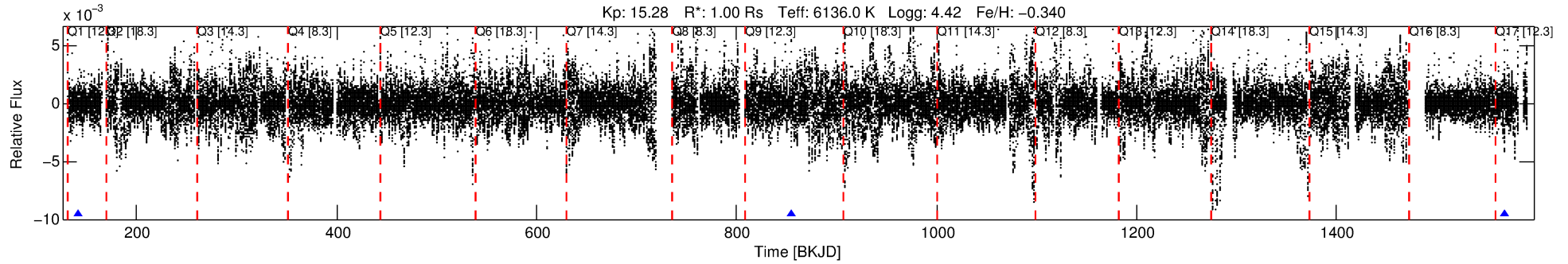
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009639455-01

No Significant Match Found

DV One-Page Summary

KIC: 9639455 Candidate: 1 of 5 Period: 713.524 d



DV Fit Results:

Period = 713.52381 [0.00572] d
Epoch = 141.3163 [0.0085] BKJD
Rp/R* = 0.0516 [0.0054]
a/R* = 463.85 [78.49]
b = 0.90 [0.04]
Seff = 0.54 [0.21]
Teq = 218 [21] K
Rp = 5.66 [1.82] Re
a = 1.5433 [0.3886] AU
Ag = 48126.32 [22955.32] [2.10 σ]
Teffp = 5000 [422] K [11.31 σ]

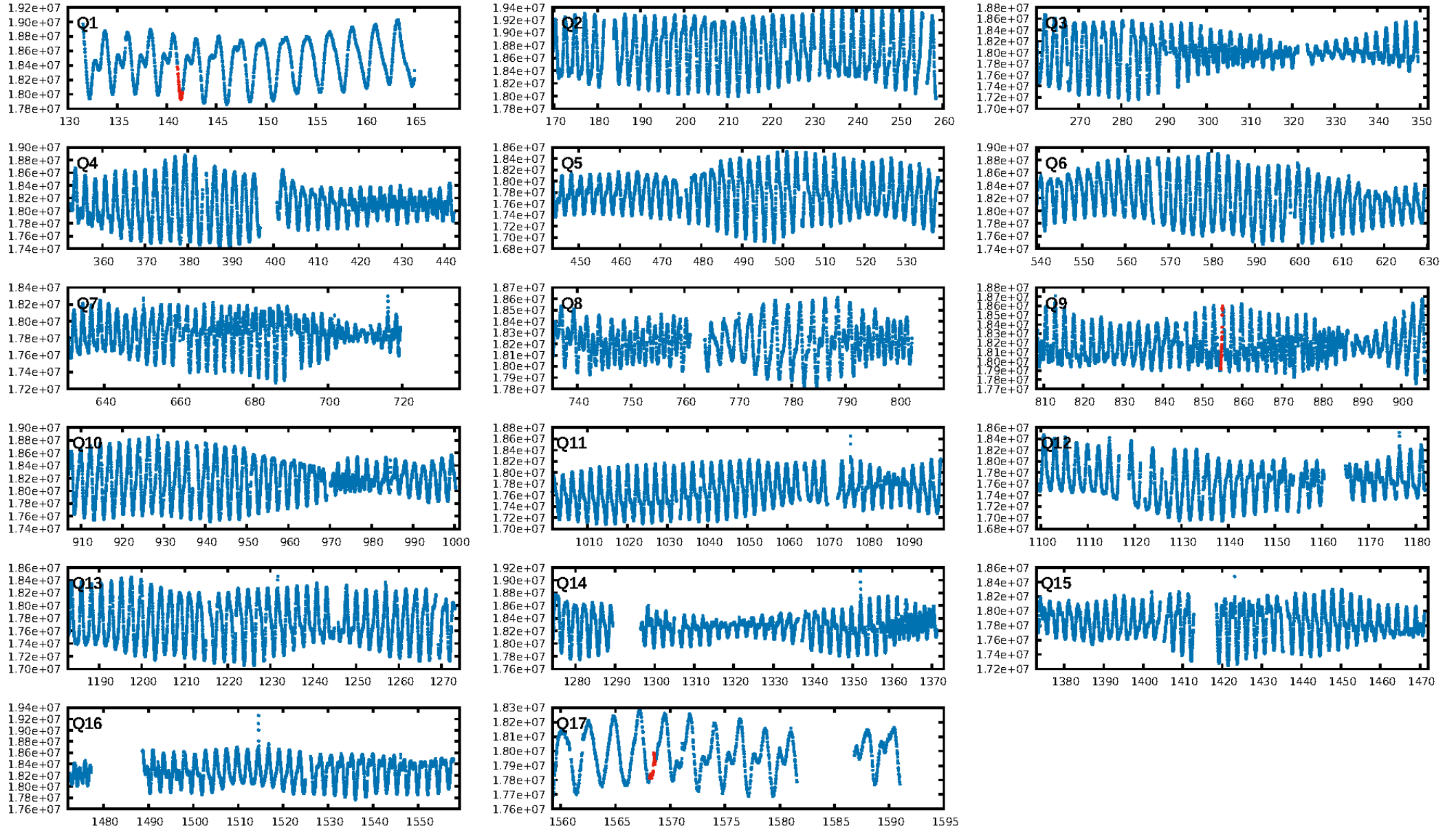
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [314.76 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 2.3%
ModelChiSquareGof-sig: 99.0%
Bootstrap-pfa: 3.94e-10
RollingBand-fgt: 1.00 [1/1]
GhostDiagnostic-chr: 0.1593
Centroid-sig: 95.4%
Centroid-so: 0.122 arcsec [0.24 σ]
OotOffset-rm: 0.289 arcsec [2.77 σ]
OotOffset-st: 0/0/0/3 [3]
KicOffset-rm: 0.181 arcsec [1.52 σ]
KicOffset-st: 0/0/0/3 [3]
DiffImageQuality-fgm: 1.00 [3/3]
DiffImageOverlap-fno: 1.00 [3/3]

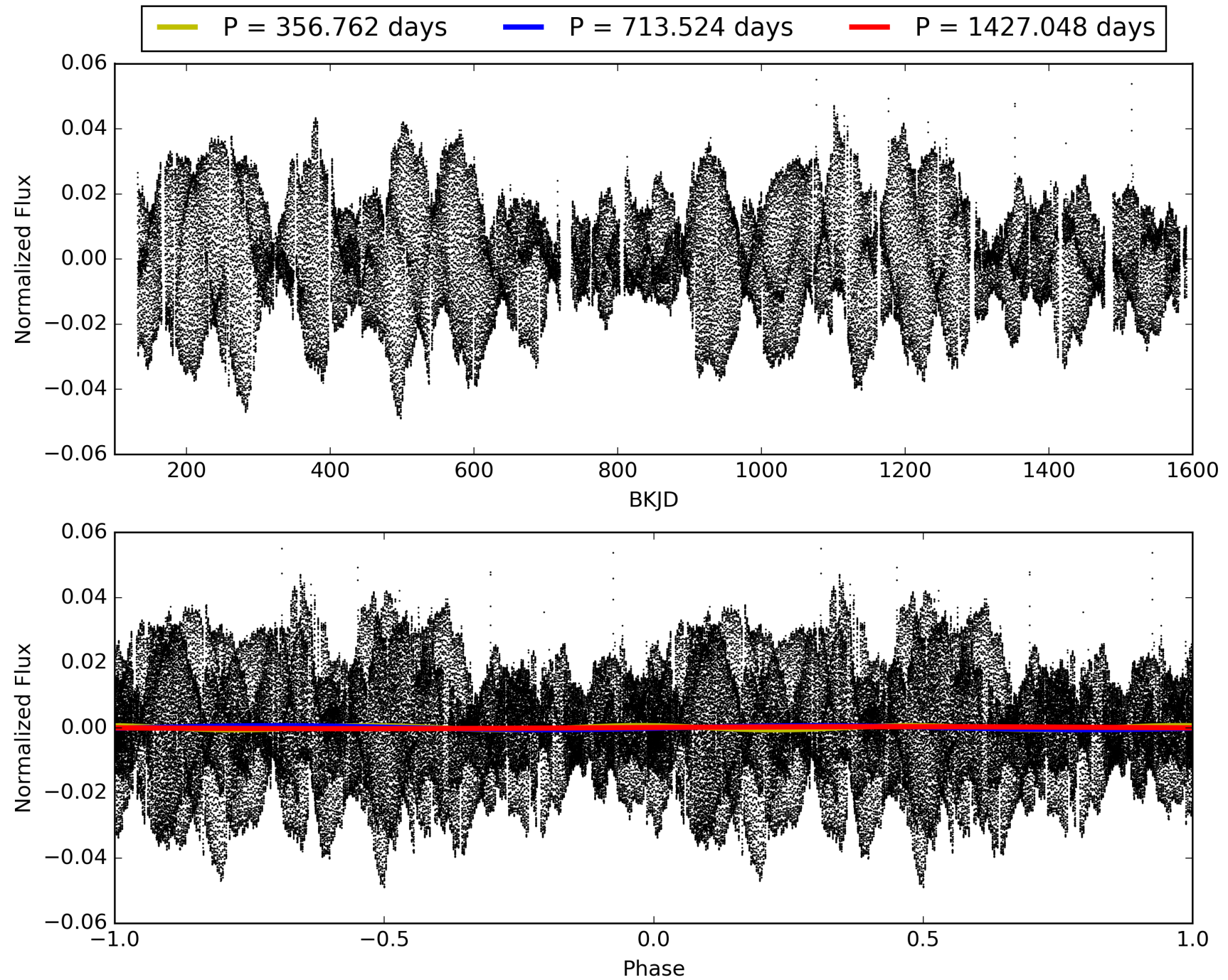
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:33:18 Z

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

TCE 009639455-01, PDC Light Curves

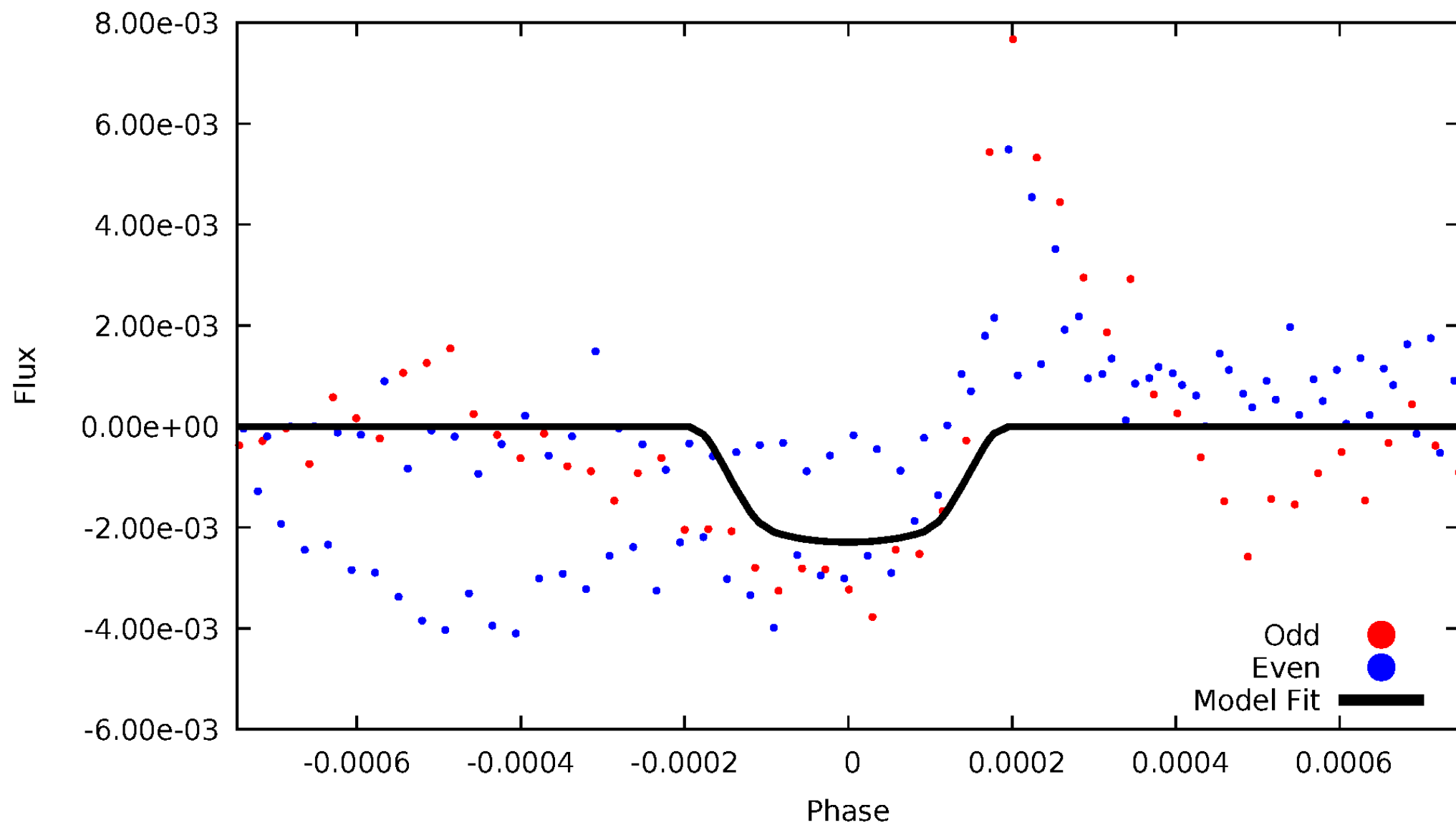


TCE 009639455-01



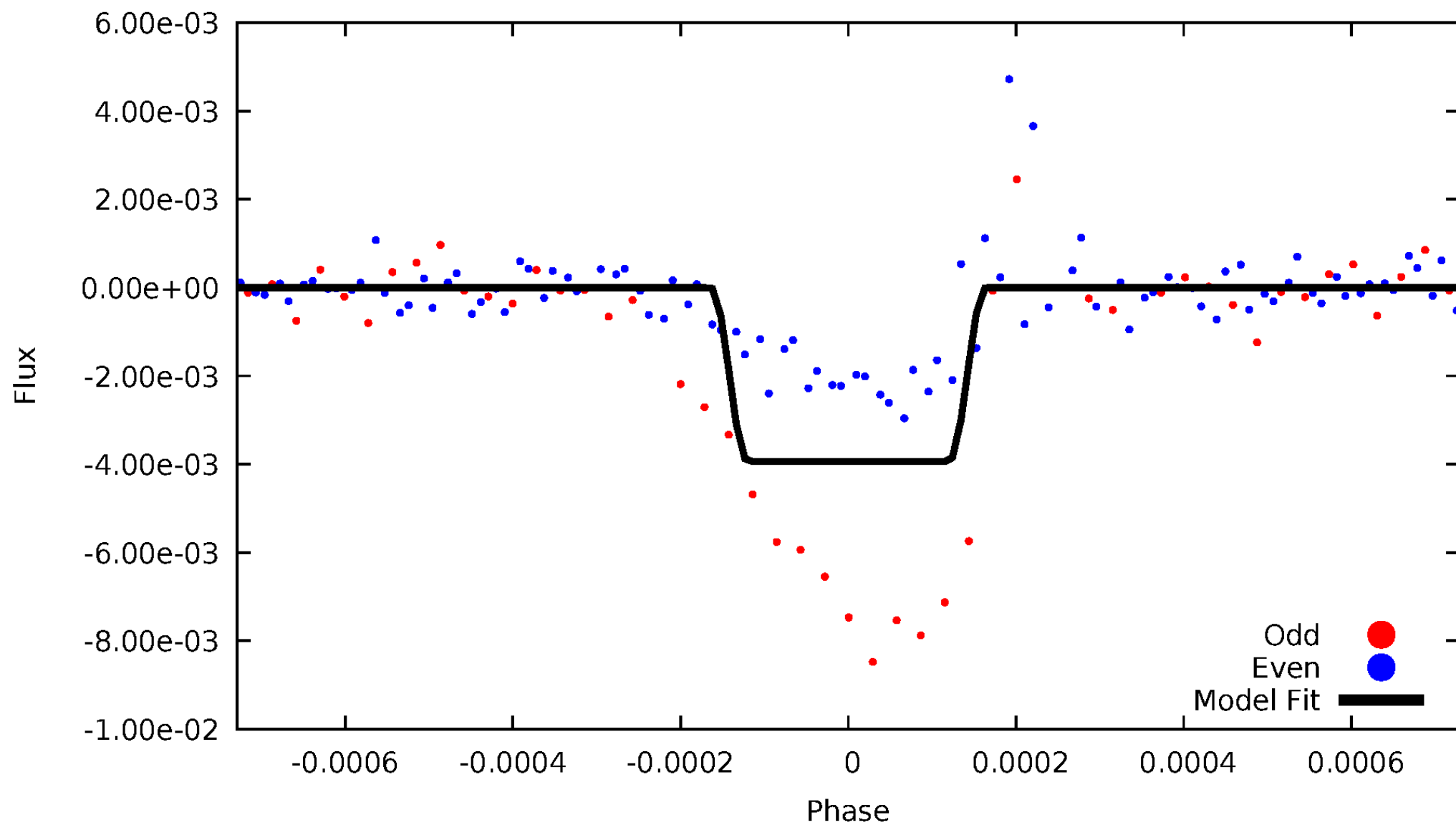
DV Odd/Even

TCE 009639455-01



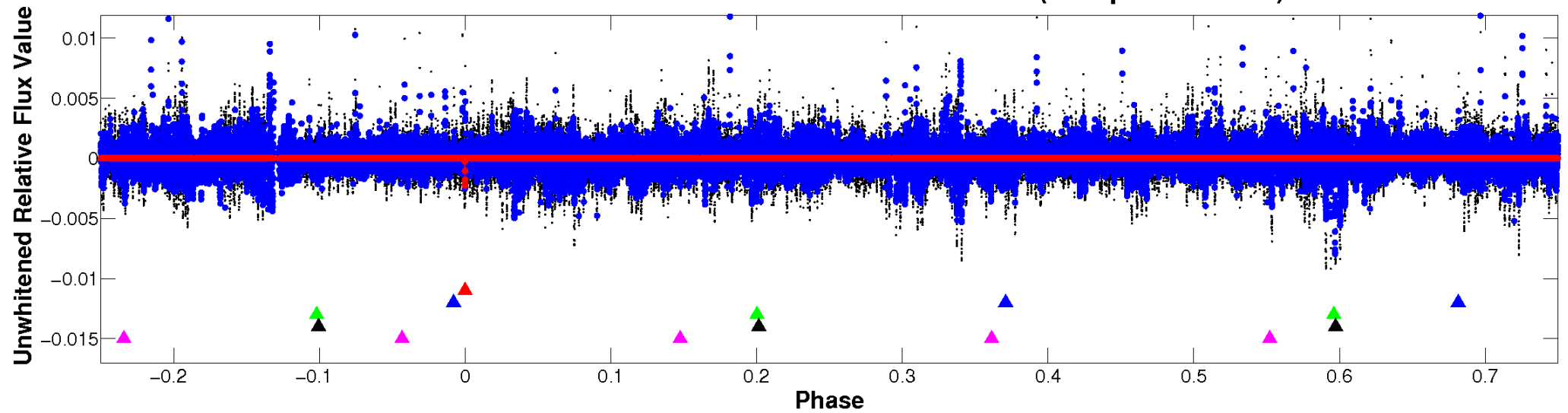
ALT Odd/Even

TCE 009639455-01

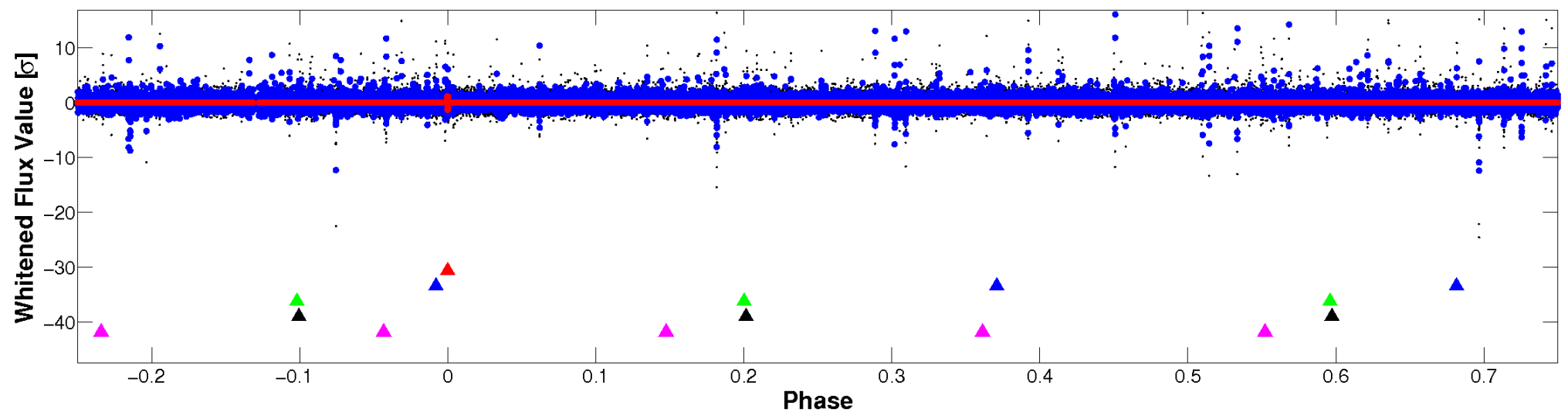


Non-Whitened Vs. Whitened Light Curve

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

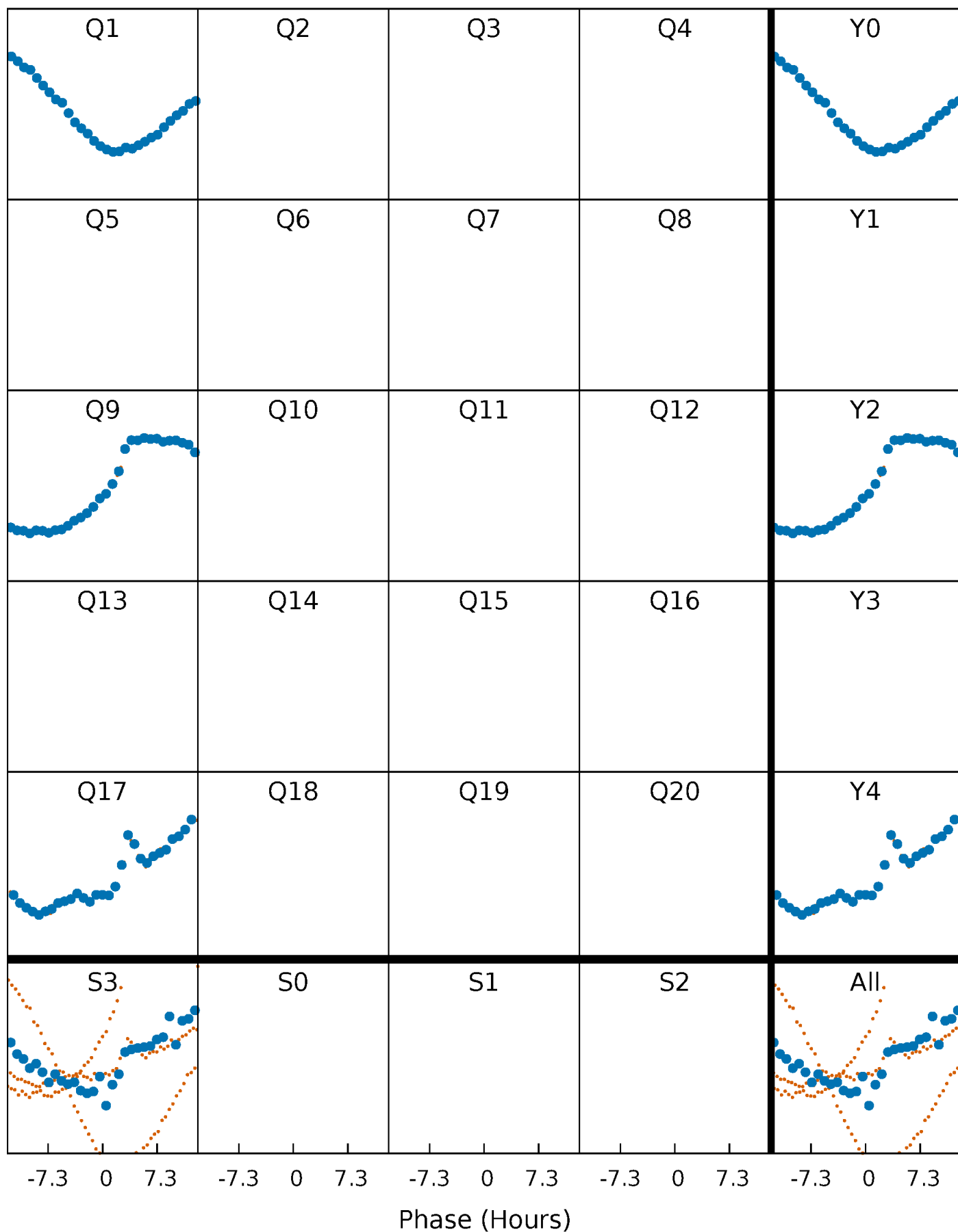


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



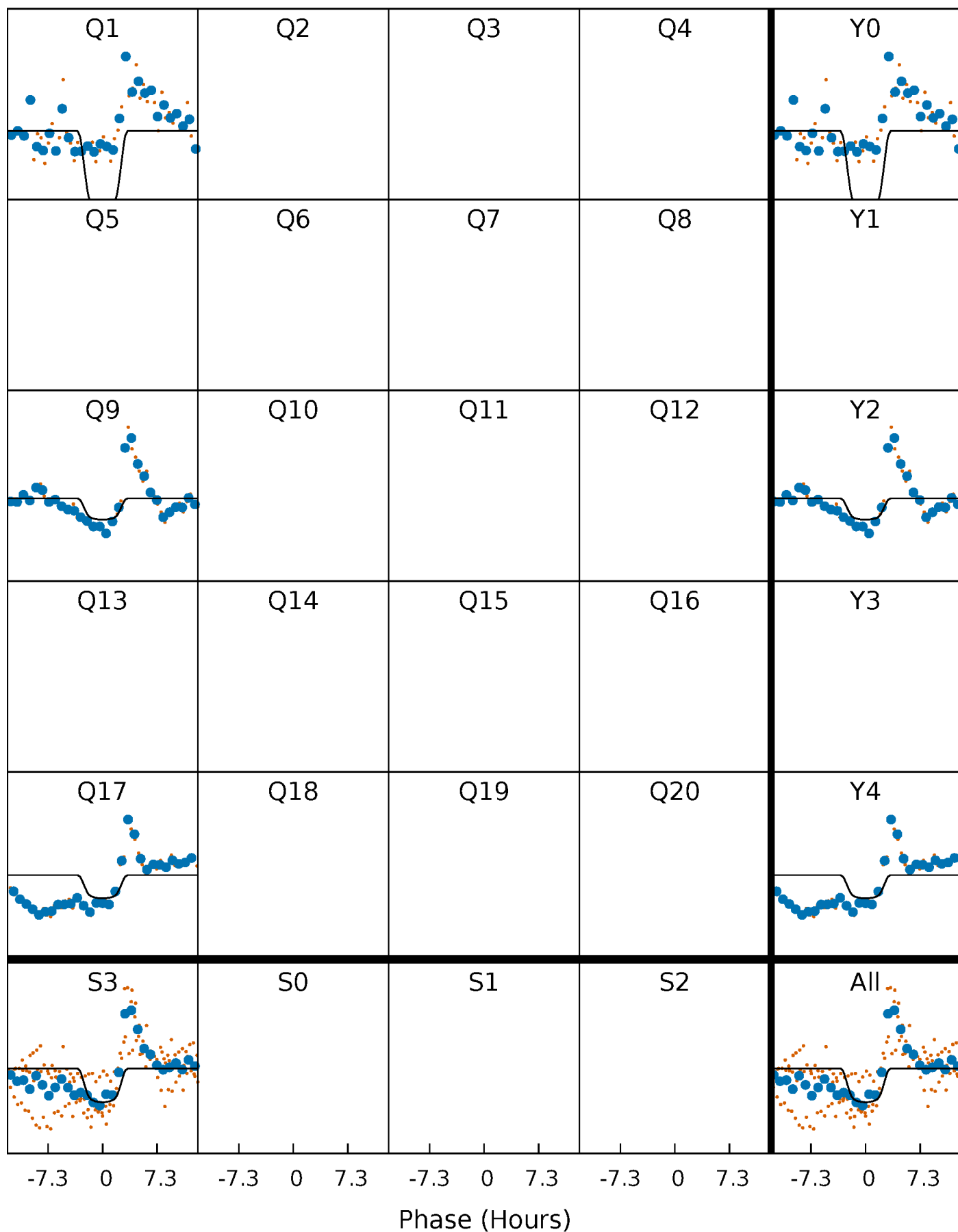
PDC Quarter-Phased Transit Curves

TCE 009639455-01 P=713.523814 Days $T_0=141.316349$ (BKJD)



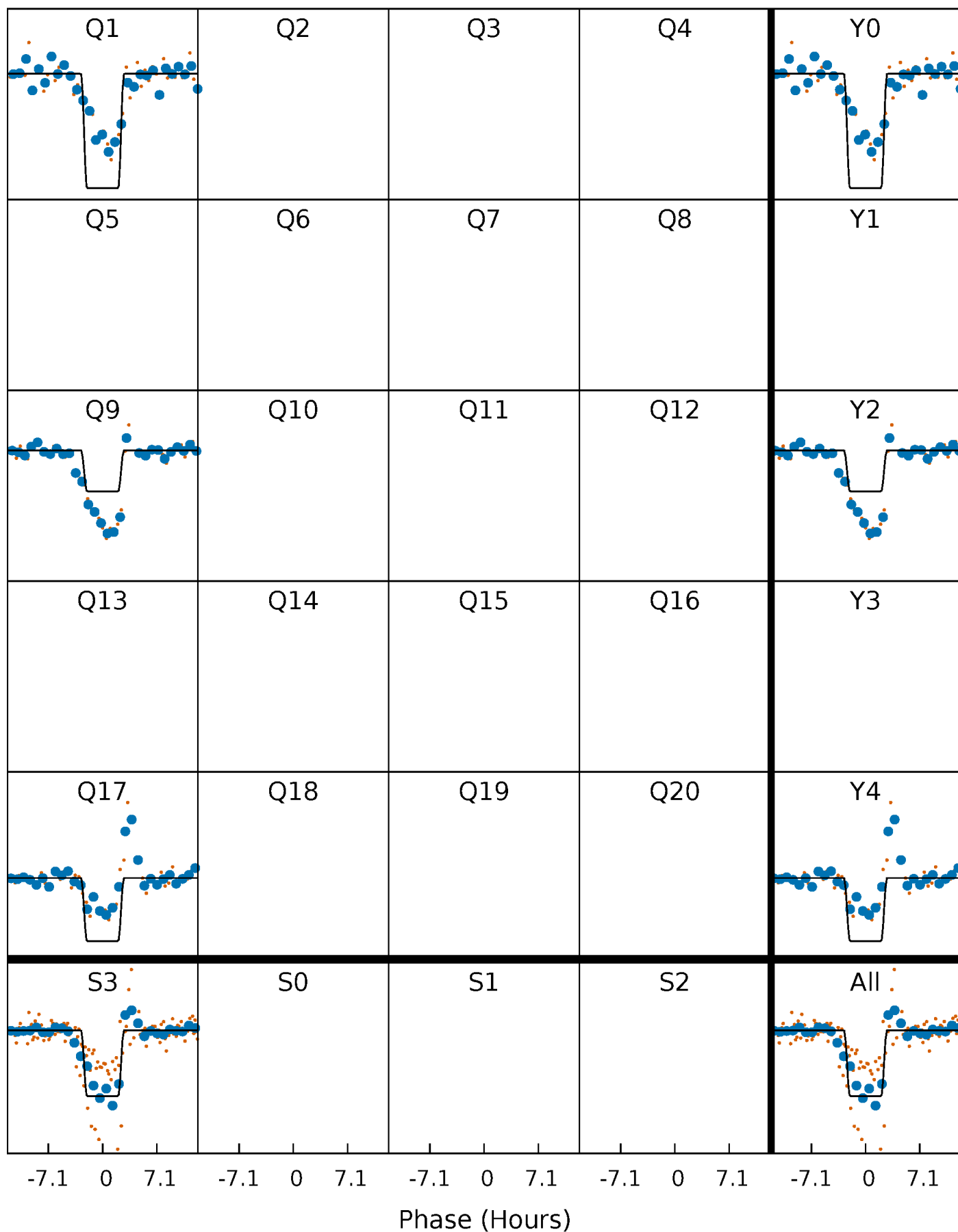
DV Quarter-Phased Transit Curves

TCE 009639455-01 $P=713.523814$ Days $T_0=141.316349$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

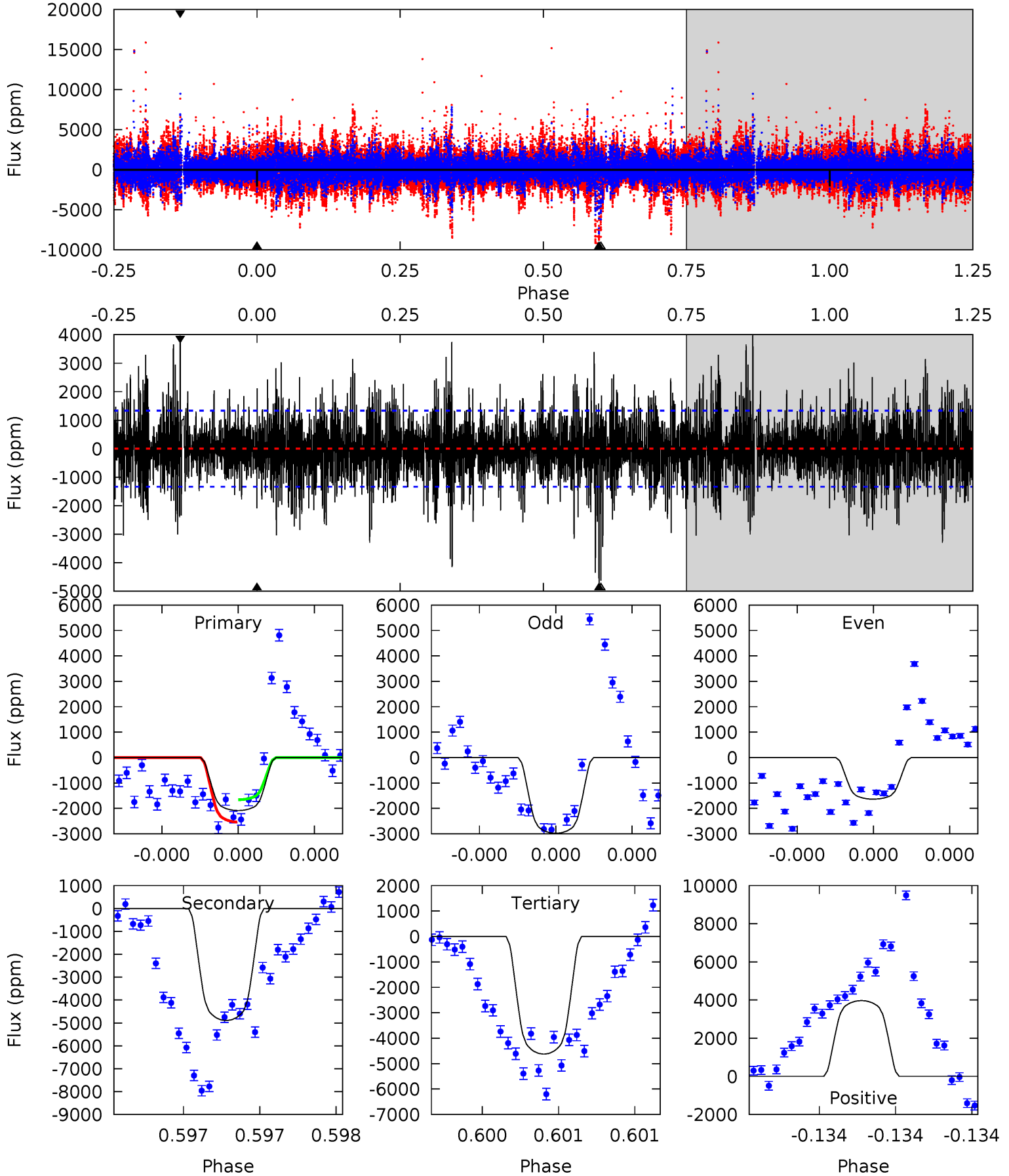
TCE 009639455-01 P=713.526293 Days $T_0=141.314102$ (BKJD)



DV Model-Shift Uniqueness Test

009639455-01, P = 713.523814 Days, E = 141.316349 Days

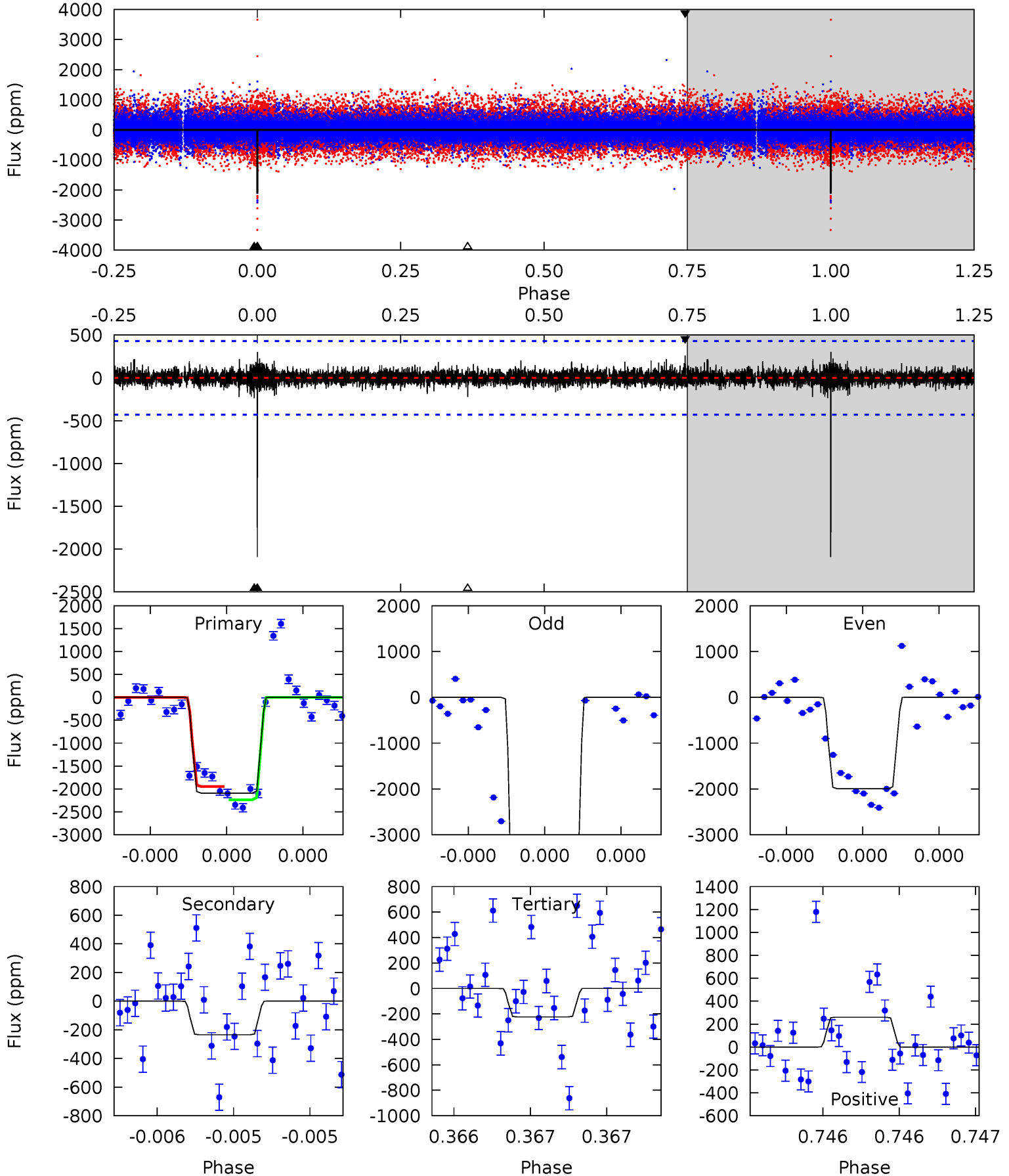
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
8.75	20.6	19.4	16.7	5.61	3.54	3.67	-10.7	-7.93	1.13	3.88	2.54	0.74	0.45	1.85



Alt Model-Shift Uniqueness Test

009639455-01, P = 713.526293 Days, E = 141.314102 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.4	3.08	2.94	3.41	5.65	3.60	0.56	24.5	24.0	0.14	-0.33	35.6	1.75	0.13	1.91



Stellar Parameters For KIC 009639455

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6136^{+183}_{-201}	$4.418^{+0.090}_{-0.195}$	$-0.340^{+0.300}_{-0.300}$	$1.004^{+0.305}_{-0.131}$	$0.963^{+0.140}_{-0.102}$	$1.339^{+0.595}_{-0.659}$
	+3%/-3%	+2%/-4%	+88%/-88%	+30%/-13%	+15%/-11%	+44%/-49%
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 009639455-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-4893 ± 238	$5.82^{+1.04}_{-0.78}$	309^{+23}_{-16}	7217^{+555}_{-481}	188065^{+63736}_{-51468}
Alt.	-234 ± 76	$7.06^{+1.20}_{-0.86}$	309^{+23}_{-16}	3499^{+225}_{-240}	5818^{+2970}_{-2236}

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 $A_{obs} \gg 1.0$

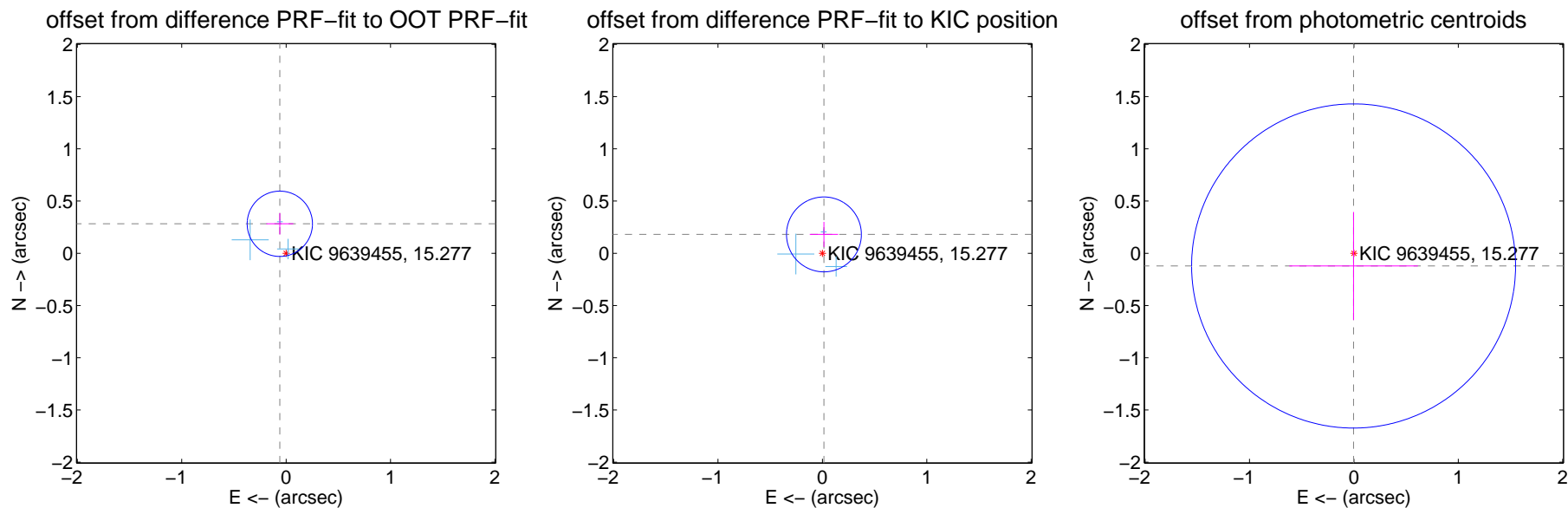
DV Centroid Data

Supplemental centroid analysis for 009639455-01. Kepler magnitude: 15.28. Transit SNR 6.32

There are 3 quarters with good PRF difference image offsets

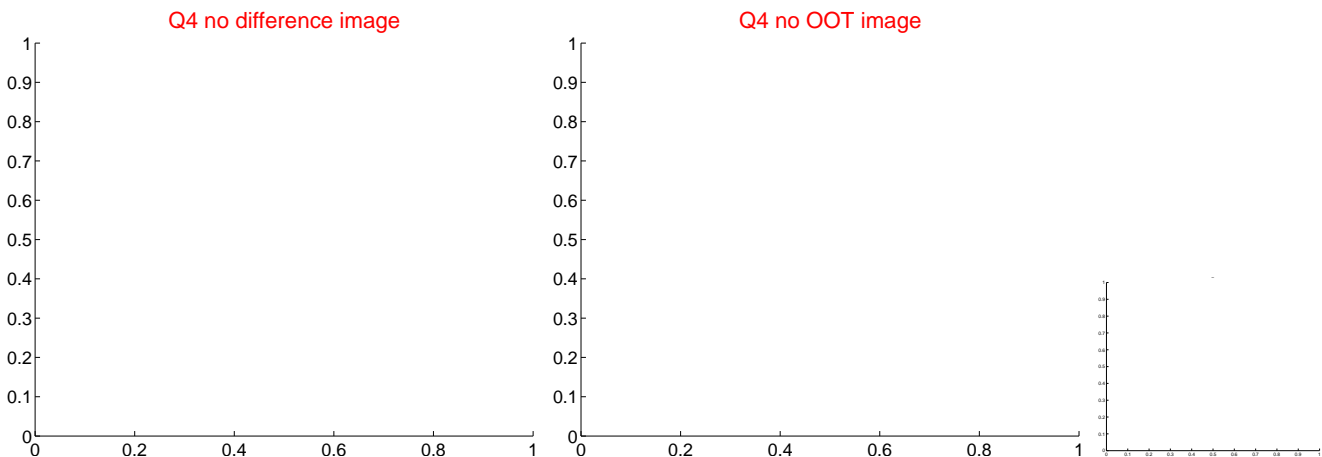
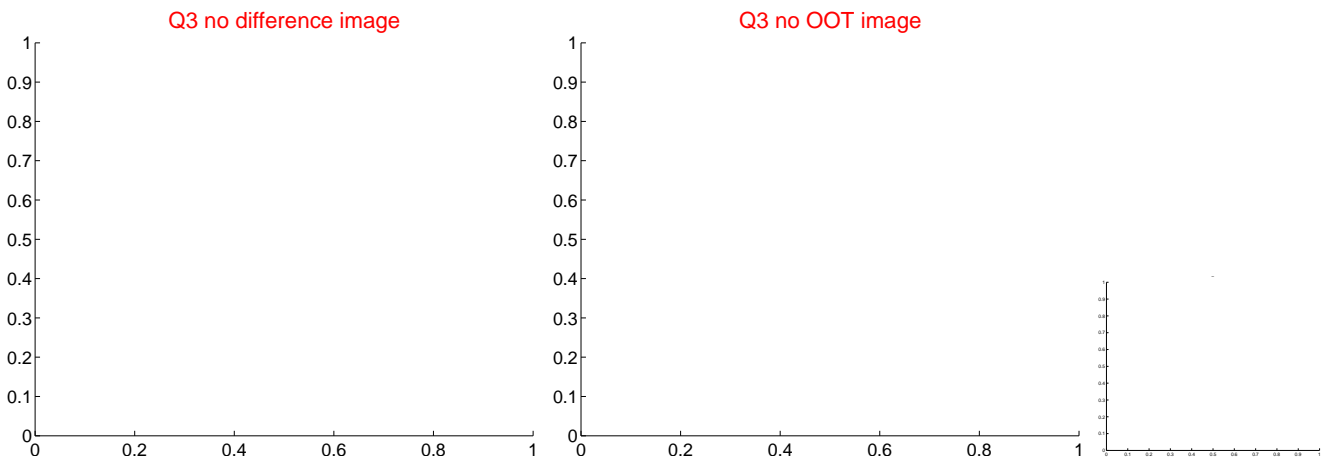
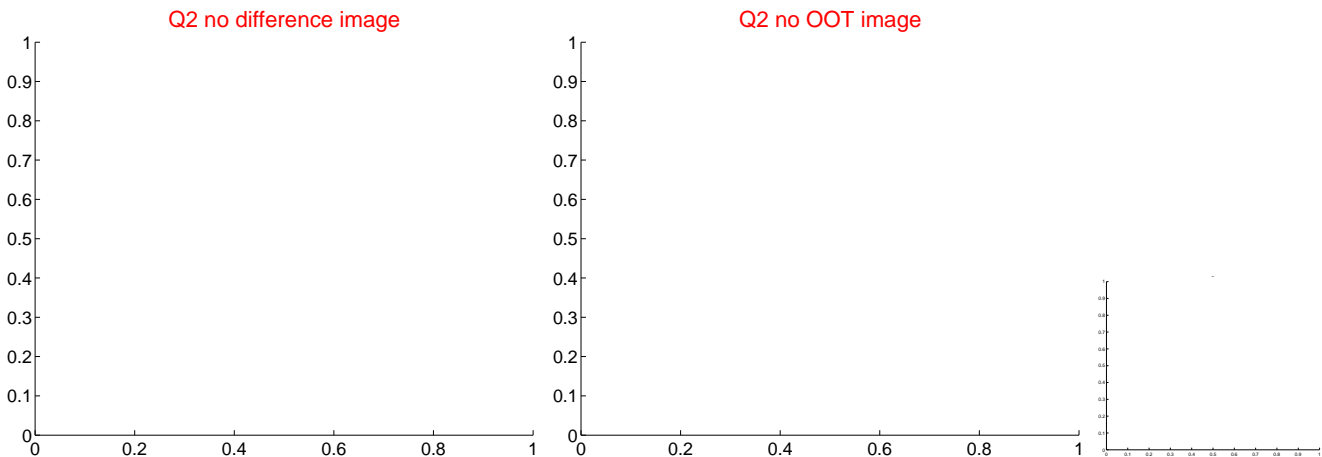
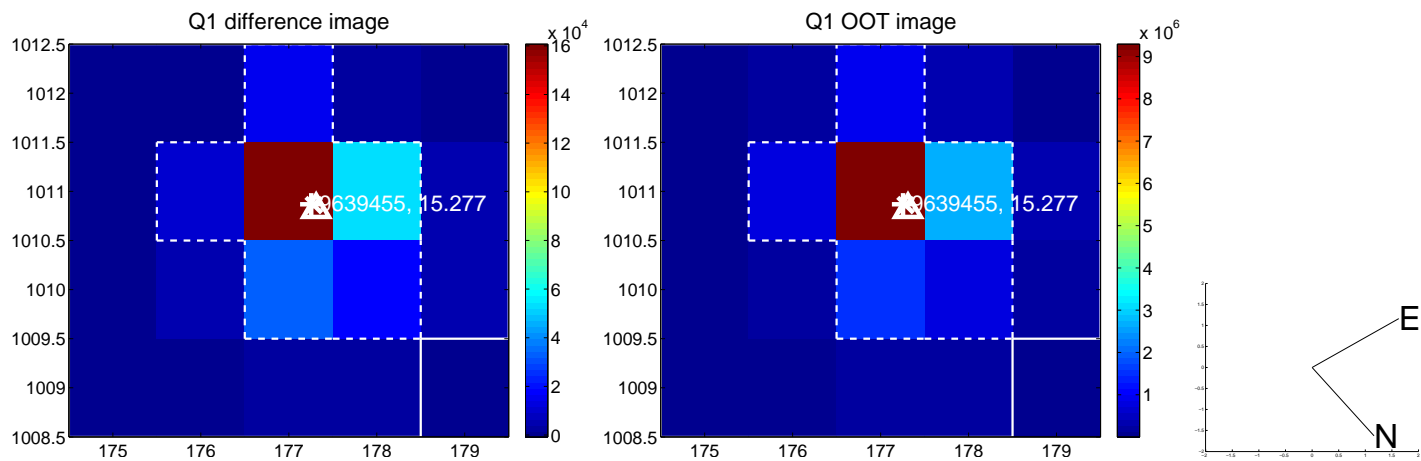
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.289 ± 0.104	2.77	0.060 ± 0.129	0.282 ± 0.103
PRF-fit source offset from KIC position	0.181 ± 0.120	1.52	-0.015 ± 0.136	0.181 ± 0.120
photometric centroid source offset	0.12 ± 0.52	0.24	0.00 ± 0.62	-0.12 ± 0.52



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.

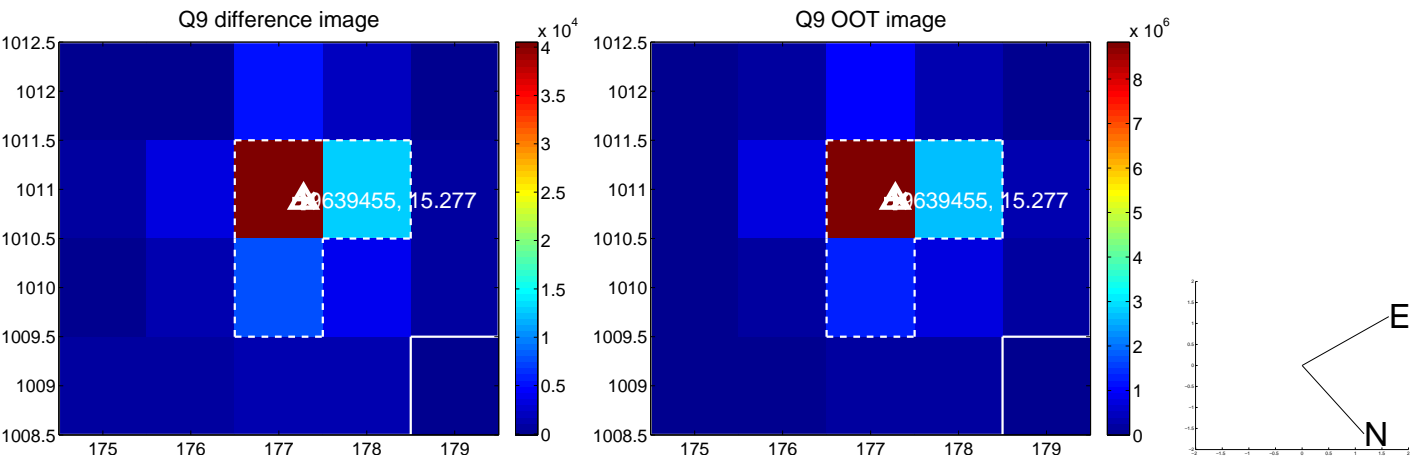
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



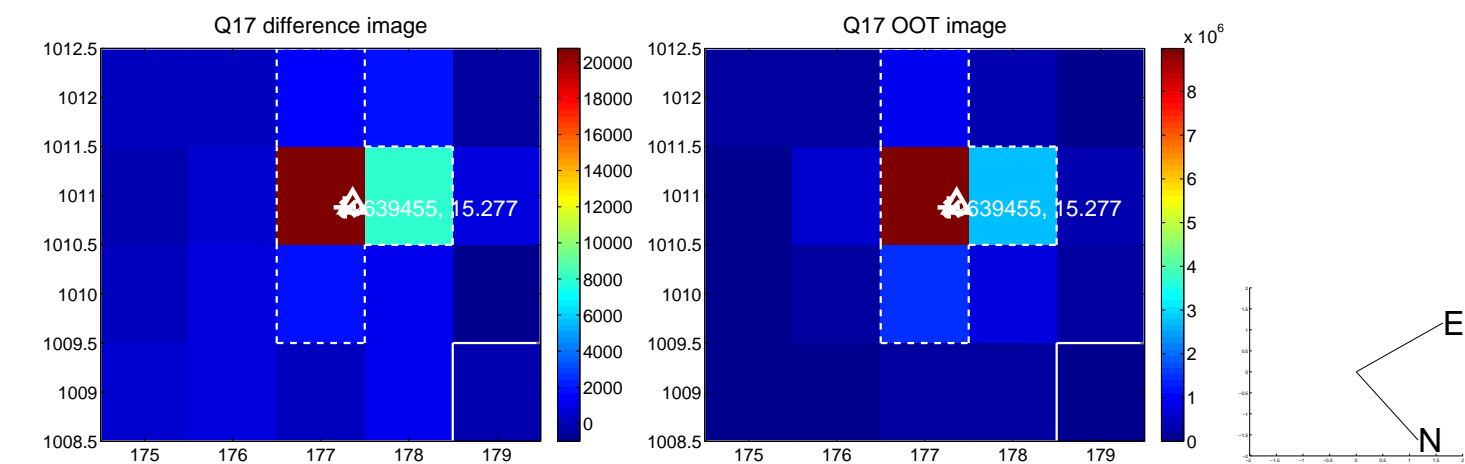
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



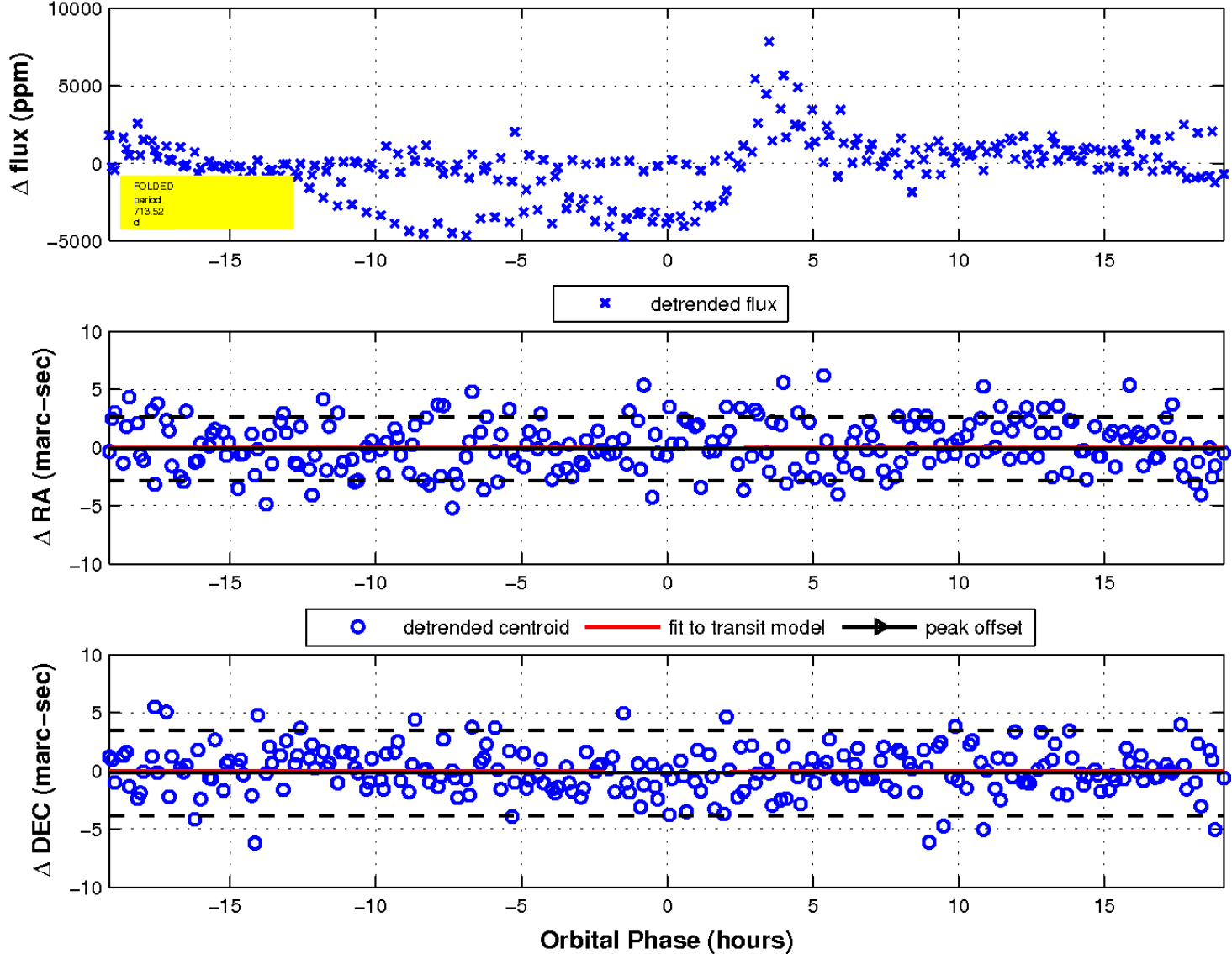
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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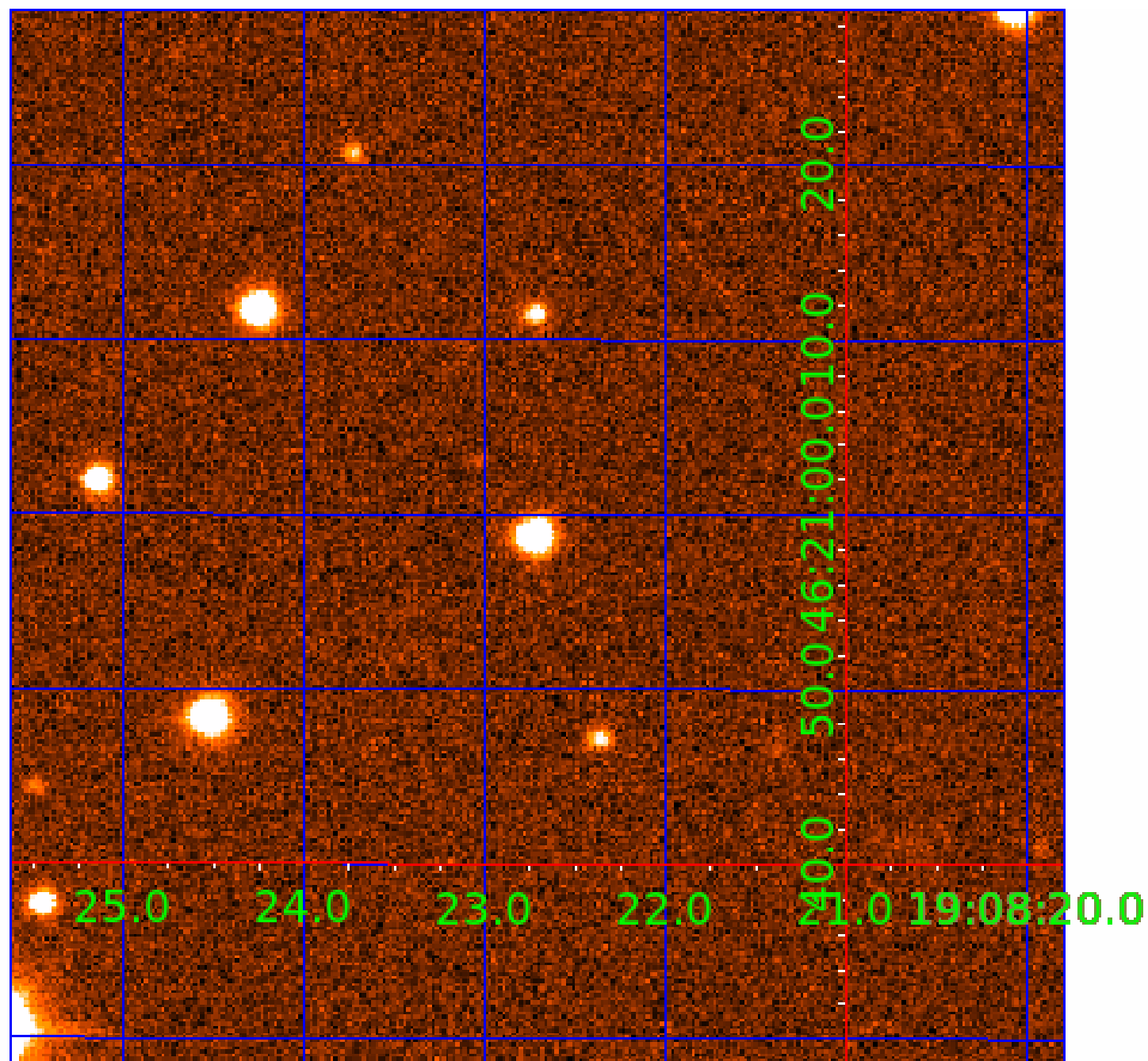


fluxWeightedCentroids, Planet 1 of 5



UKIRT Image

Declination



KIC 009639455

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})
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009639455-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
009639455-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009639455-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_FEW_DIFFS
009639455-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT

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

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

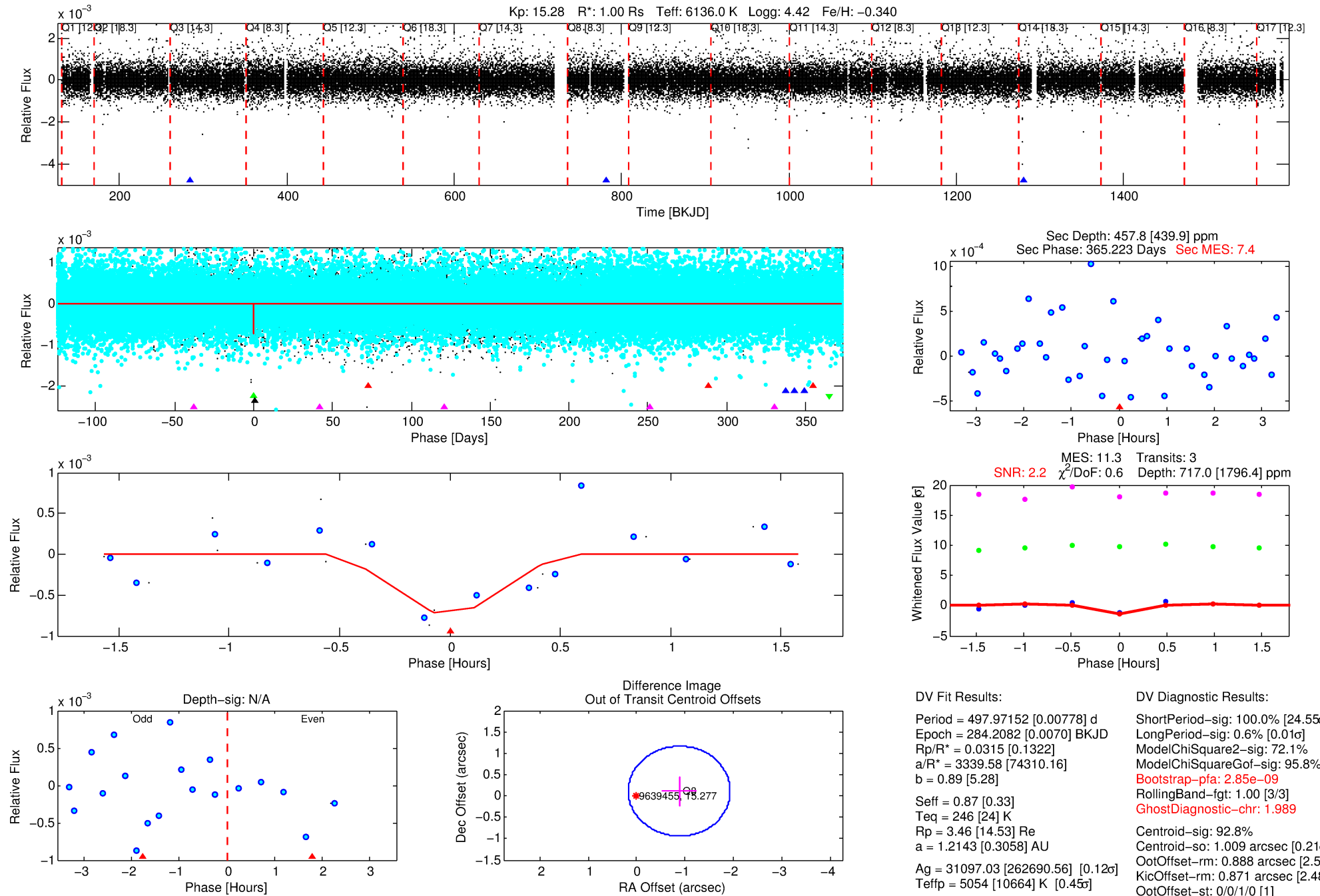
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009639455-03

No Significant Match Found

DV One-Page Summary

KIC: 9639455 Candidate: 3 of 5 Period: 497.972 d



DV Fit Results:

Period = 497.97152 [0.00778] d
Epoch = 284.2082 [0.0070] BKJD
Rp/R* = 0.0315 [0.1322]
a/R* = 3339.58 [74310.16]
b = 0.89 [5.28]
Seff = 0.87 [0.33]
Teff = 246 [24] K
Rp = 3.46 [14.53] Re
a = 1.2143 [0.3058] AU
Ag = 31097.03 [262690.56] [0.12] σ
Teffp = 5054 [10664] K [0.45] σ

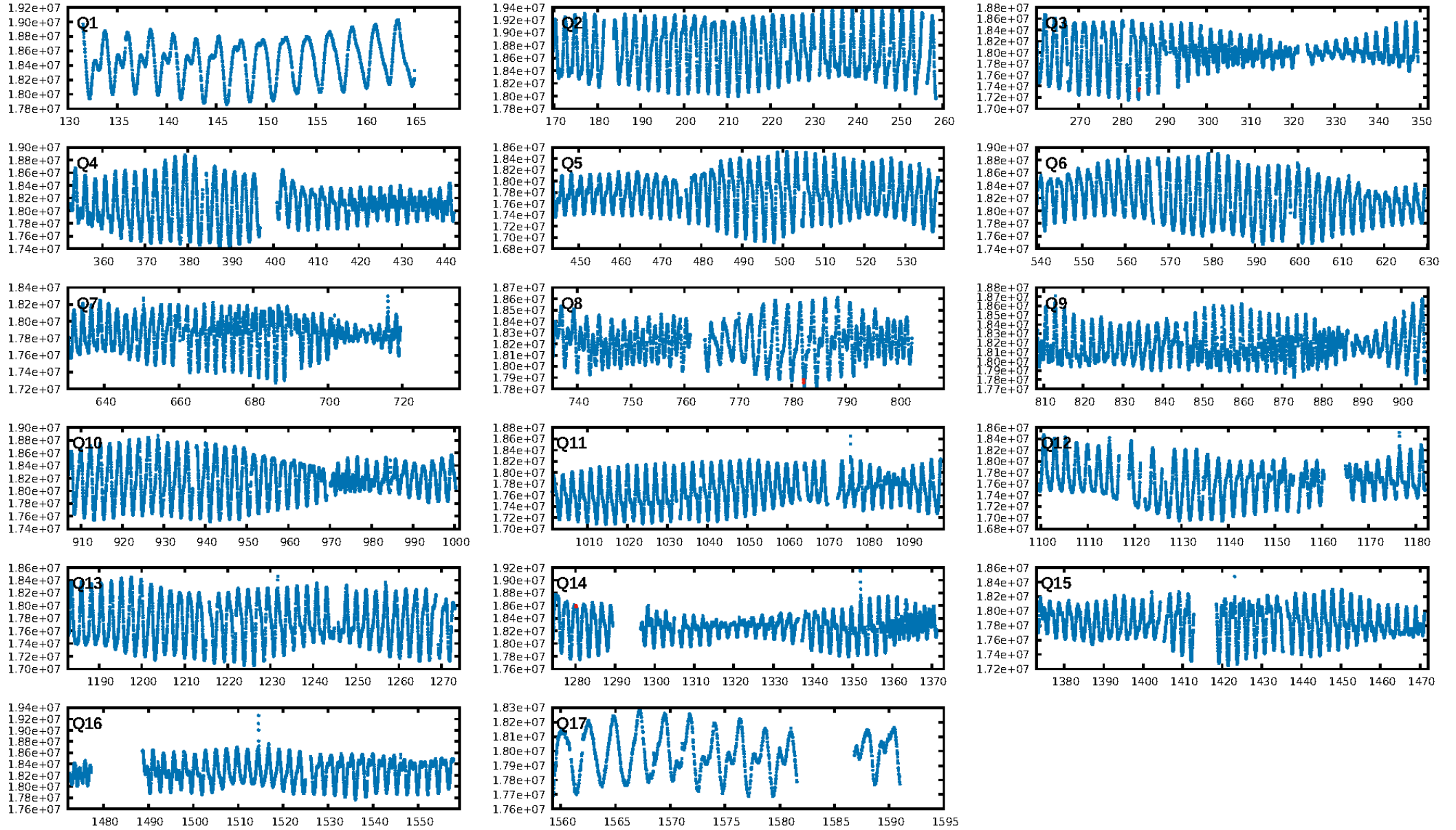
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [24.55] σ
LongPeriod-sig: 0.6% [0.01] σ
ModelChiSquare2-sig: 72.1%
ModelChiSquareGof-sig: 95.8%
Bootstrap-pfa: 2.85e-09
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 1.989
Centroid-sig: 92.8%
Centroid-so: 1.009 arcsec [0.21] σ
OotOffset-rm: 0.888 arcsec [2.53] σ
KicOffset-rm: 0.871 arcsec [2.48] σ
OotOffset-st: 0/0/1/0 [1]
KicOffset-st: 0/0/1/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 1.00 [3/3]

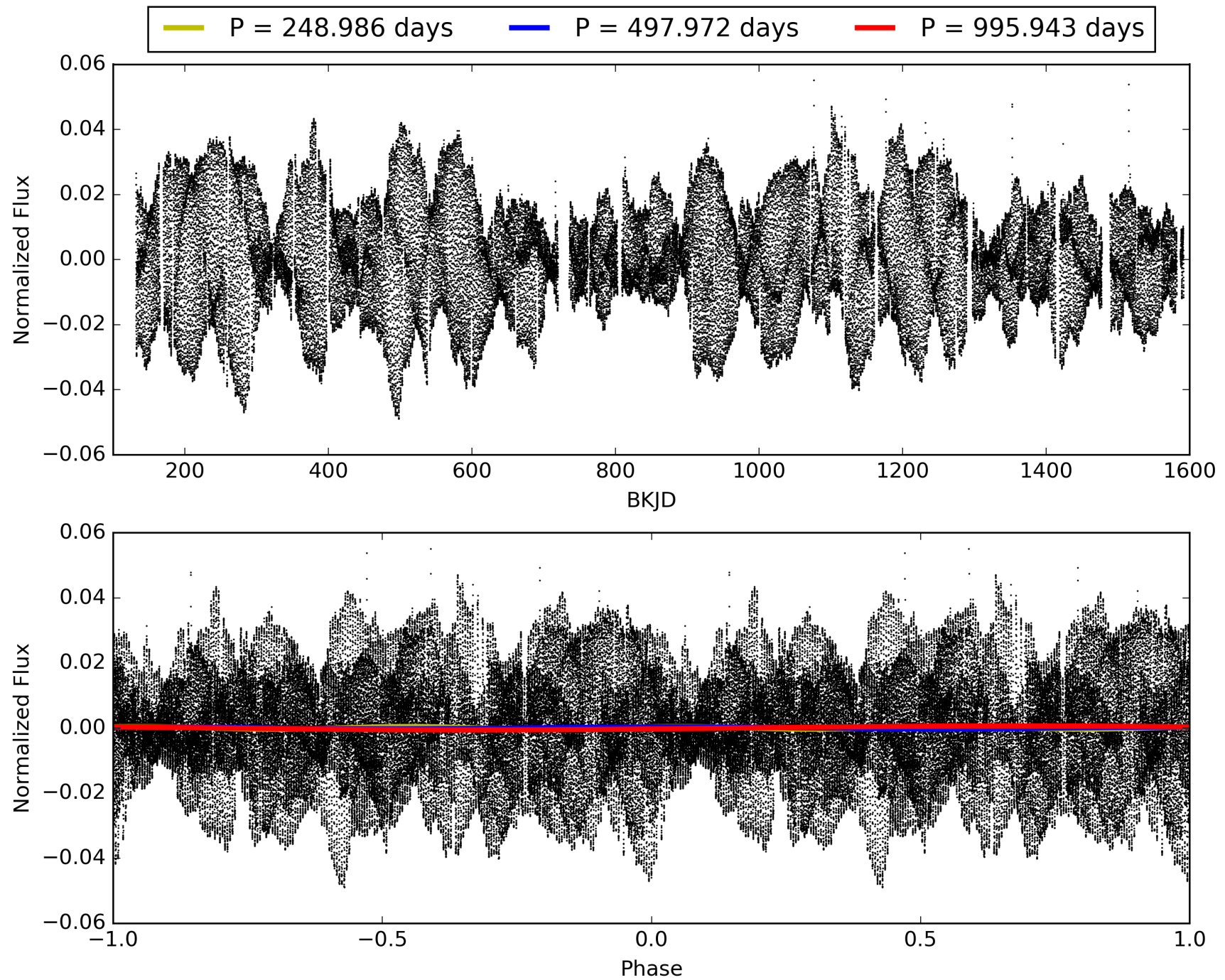
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:35:00 Z

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

TCE 009639455-03, PDC Light Curves

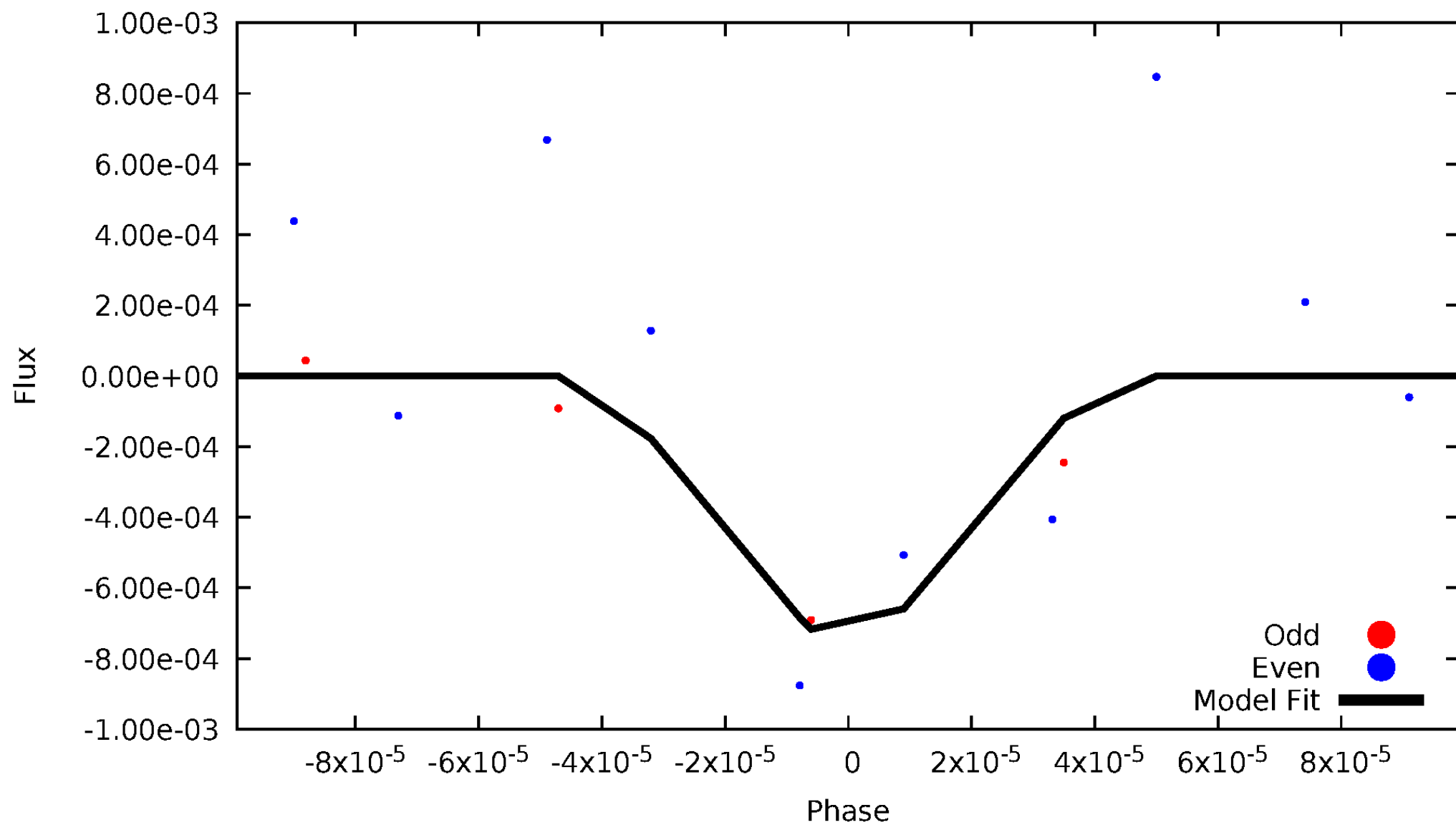


TCE 009639455-03



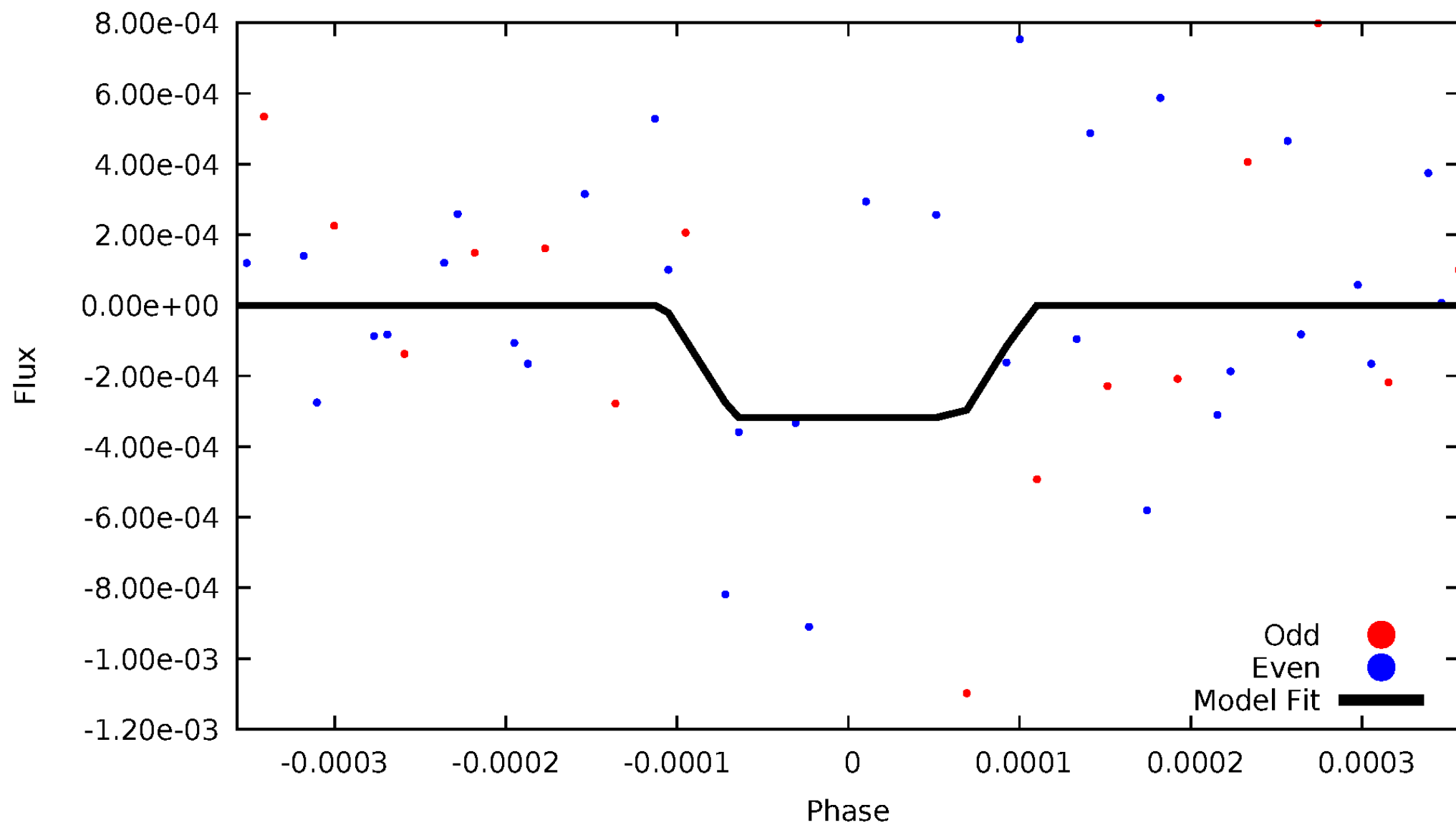
DV Odd/Even

TCE 009639455-03



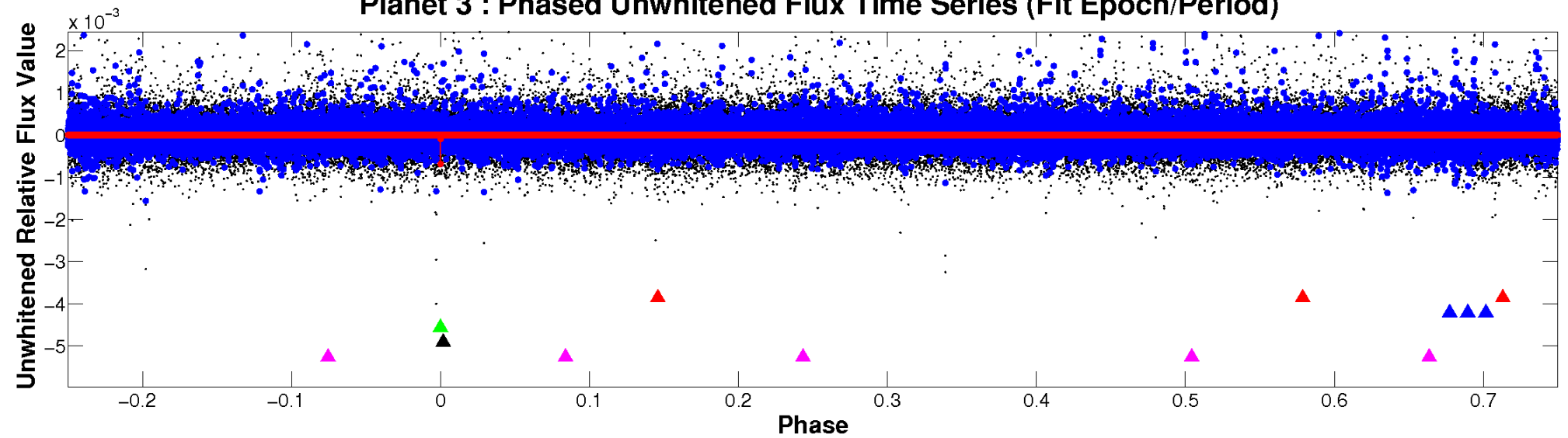
ALT Odd/Even

TCE 009639455-03

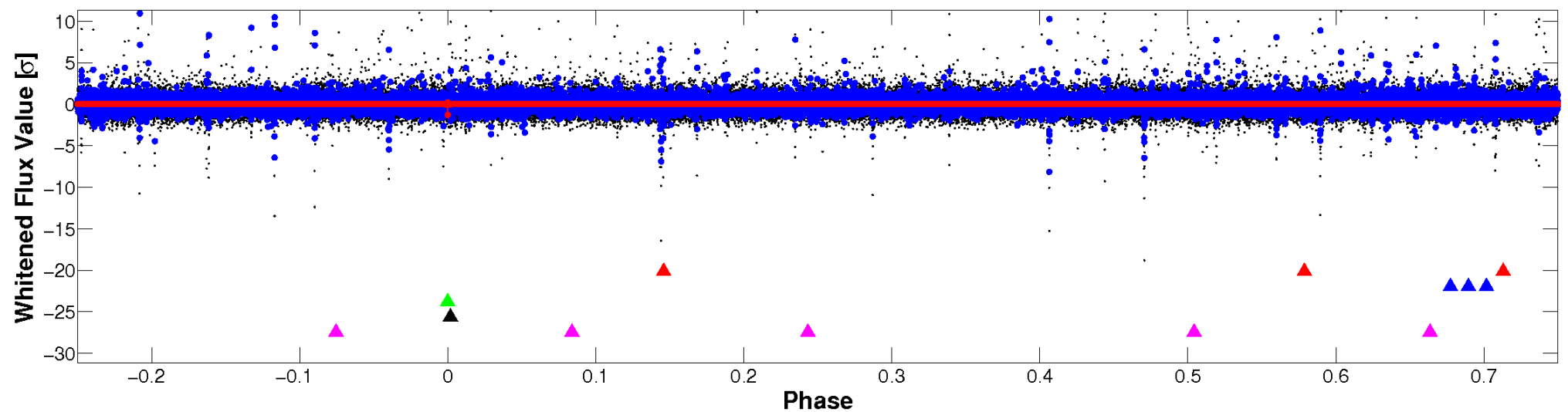


Non-Whitened Vs. Whitened Light Curve

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

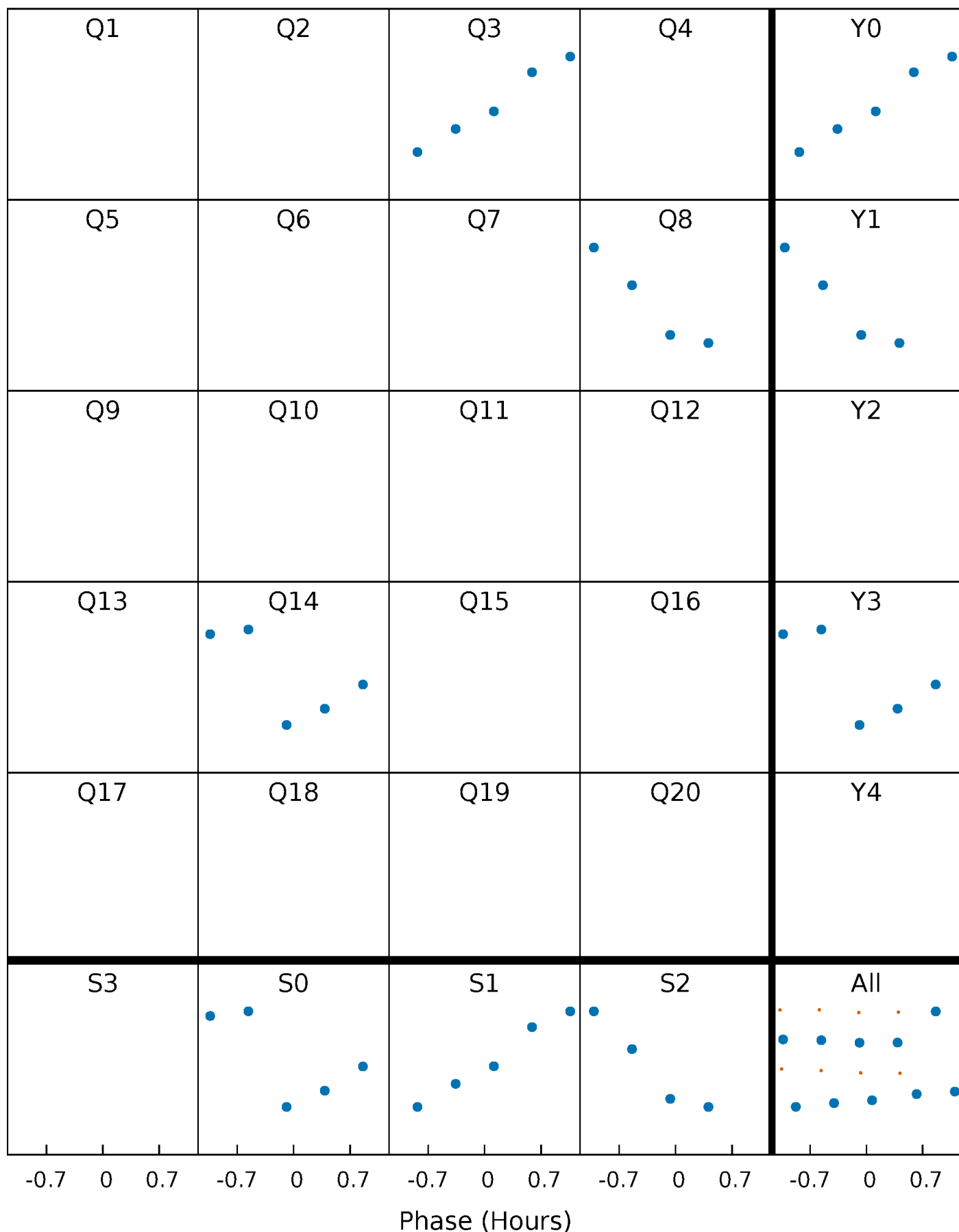


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



PDC Quarter-Phased Transit Curves

TCE 009639455-03 P=497.971517 Days $T_0=284.208248$ (BKJD)



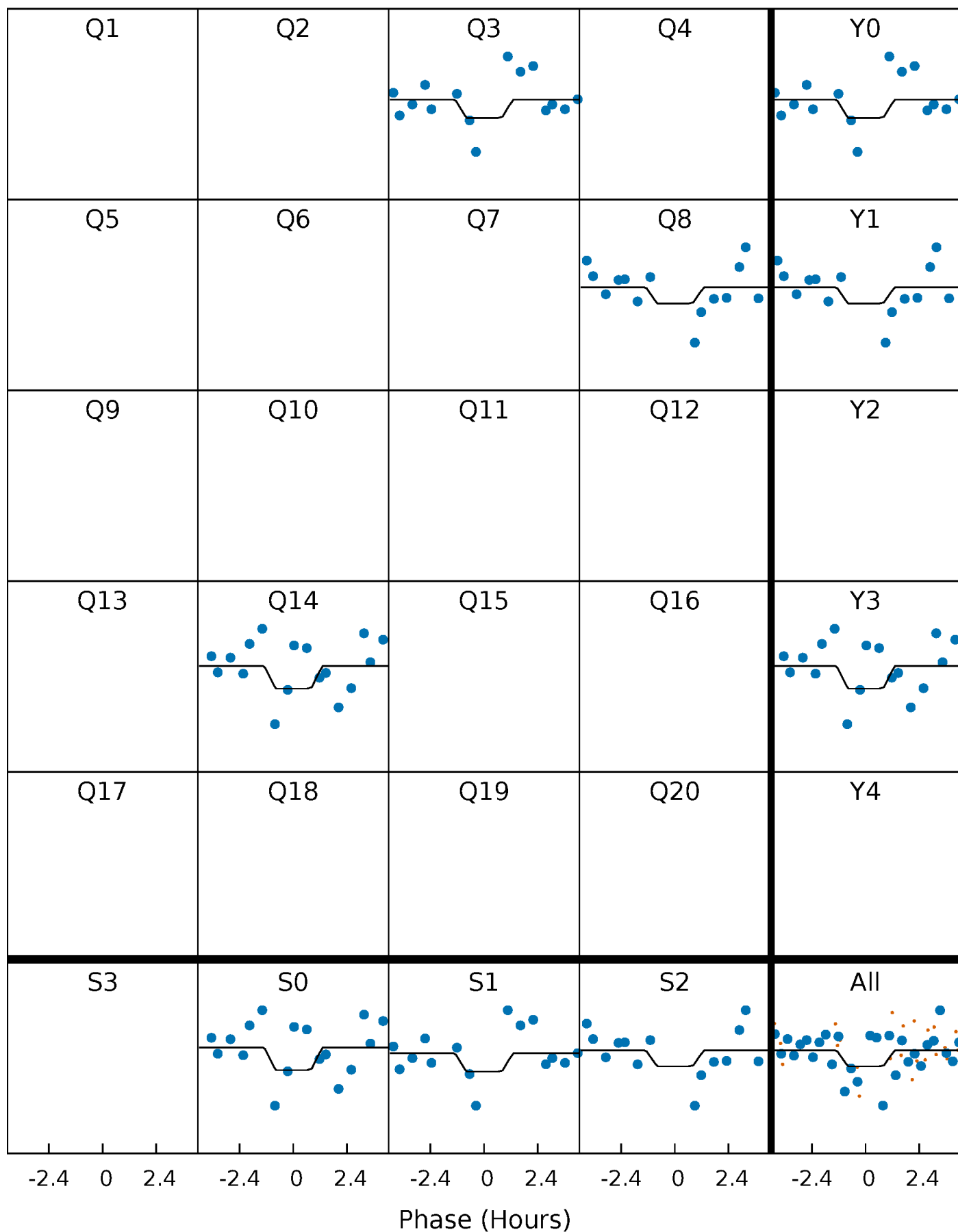
DV Quarter-Phased Transit Curves

TCE 009639455-03 P=497.971517 Days $T_0=284.208248$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

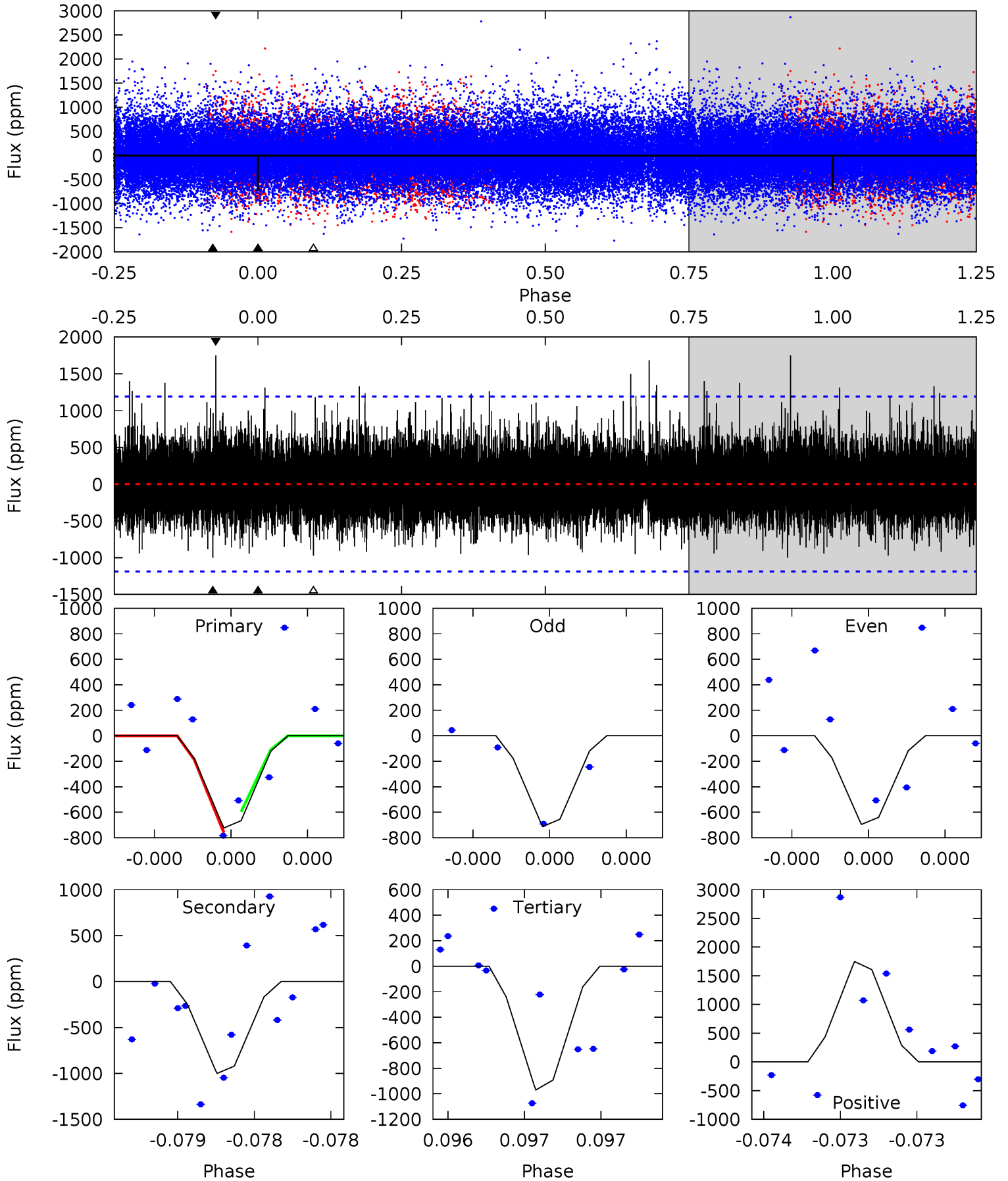
TCE 009639455-03 P=497.938612 Days $T_0=284.305888$ (BKJD)



DV Model-Shift Uniqueness Test

009639455-03, P = 497.971517 Days, E = 284.208248 Days

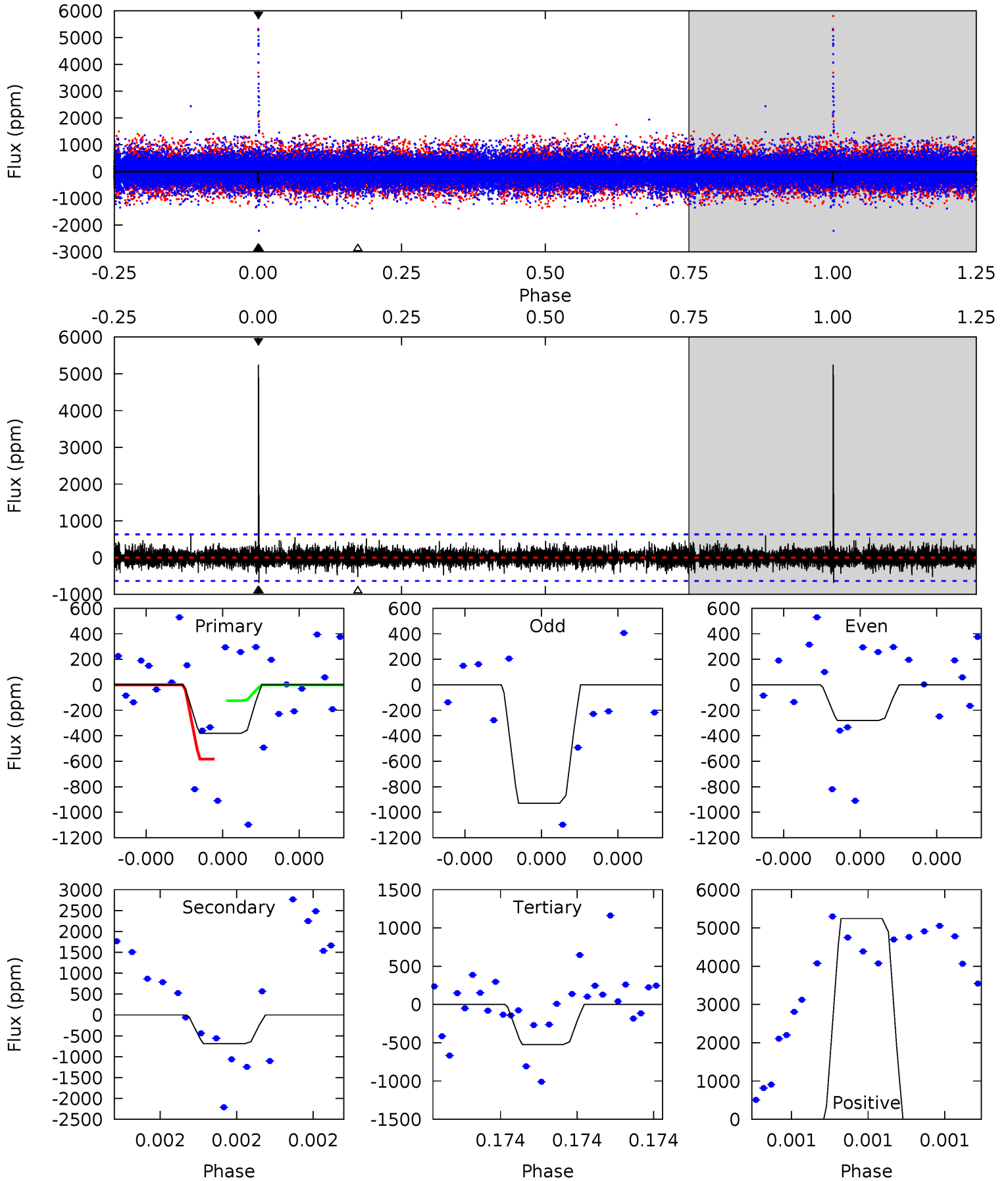
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.59	4.98	4.82	8.69	5.91	3.99	1.23	-1.23	-5.10	0.15	-3.71	0.03	1.01	0.64	0.41



Alt Model-Shift Uniqueness Test

009639455-03, P = 497.938612 Days, E = 284.305888 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.43	6.20	4.71	47.3	5.72	3.70	1.22	-1.28	-43.9	1.49	-41.1	2.14	1.03	0.88	2.07



Stellar Parameters For KIC 009639455

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6136^{+183}_{-201}	$4.418^{+0.090}_{-0.195}$	$-0.340^{+0.300}_{-0.300}$	$1.004^{+0.305}_{-0.131}$	$0.963^{+0.140}_{-0.102}$	$1.339^{+0.595}_{-0.659}$
	+3%/-3%	+2%/-4%	+88%/-88%	+30%/-13%	+15%/-11%	+44%/-49%
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 009639455-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-1001 ± 201	$11.34^{+11.44}_{-7.49}$	347^{+25}_{-19}	3768^{+2204}_{-704}	6157^{+48635}_{-4636}
Alt.	-688 ± 111	$10.78^{+11.64}_{-7.89}$	347^{+25}_{-18}	3626^{+2485}_{-695}	4784^{+57194}_{-3687}

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

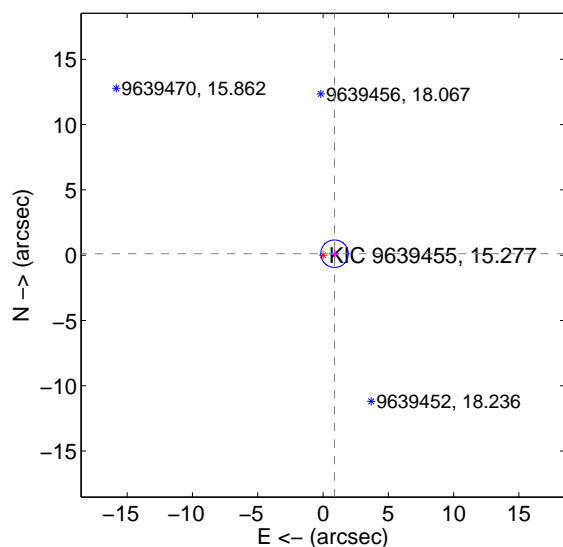
Supplemental centroid analysis for 009639455-03. Kepler magnitude: 15.28. Transit SNR 2.25

There are 1 quarters with good PRF difference image offsets

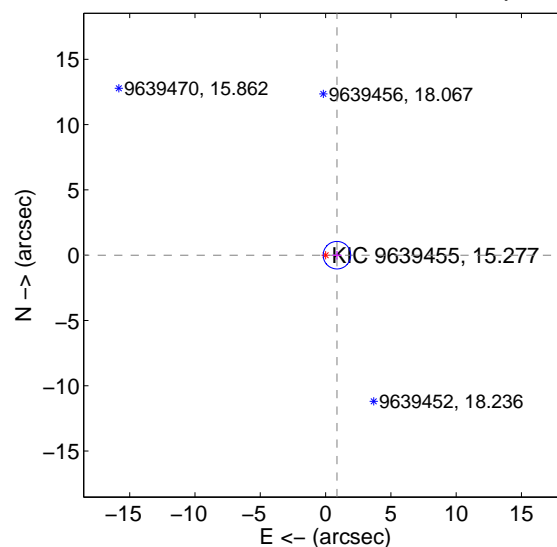
The direct PRF centroid is offset from the target star catalog position by about 0.11 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.888 ± 0.351	2.53	-0.881 ± 0.351	0.113 ± 0.330
PRF-fit source offset from KIC position	0.871 ± 0.351	2.48	-0.871 ± 0.351	-0.001 ± 0.330
photometric centroid source offset	1.01 ± 4.81	0.21	-0.22 ± 4.99	0.98 ± 4.80

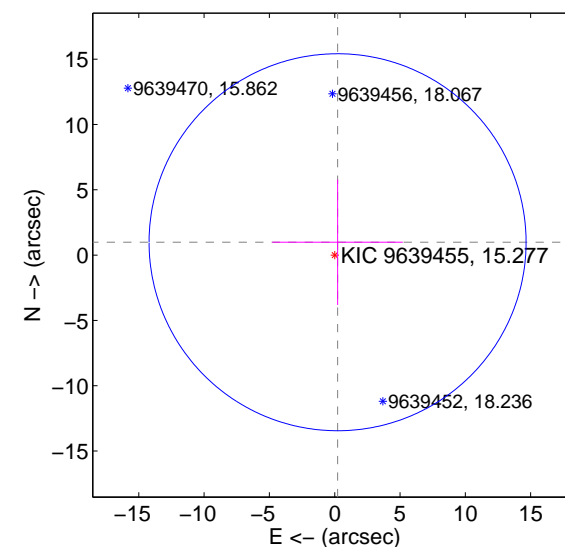
offset from difference PRF-fit to OOT PRF-fit



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.

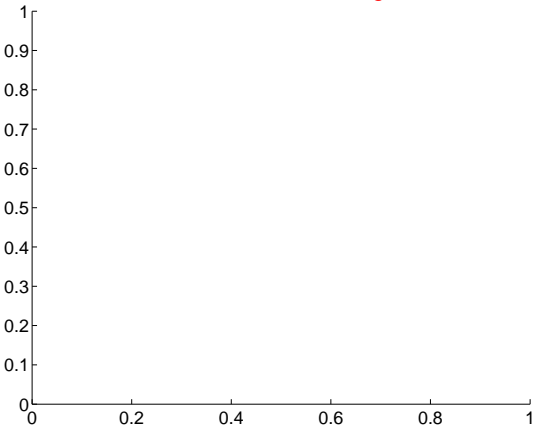
Q1 no difference image



Q1 no OOT image



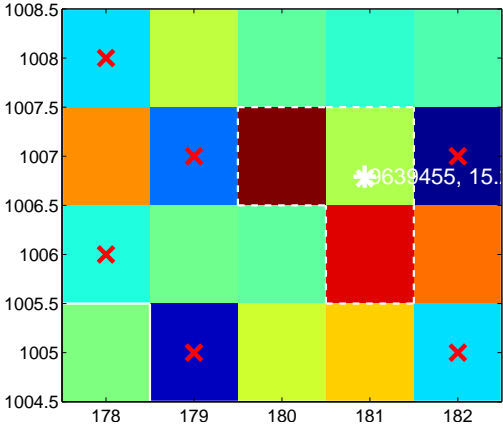
Q2 no difference image



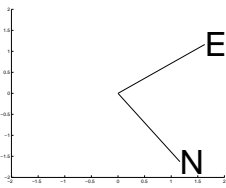
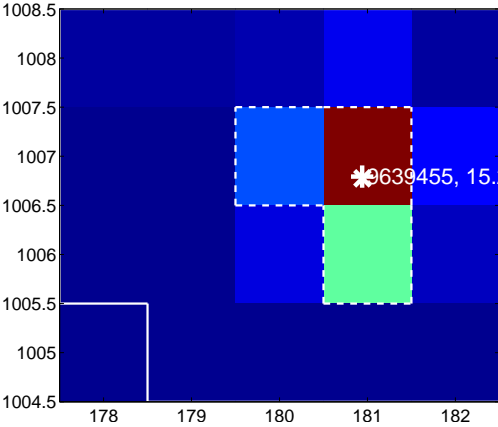
Q2 no OOT image



Q3 difference image. Poor Quality



Q3 OOT image



Q4 no difference image



Q4 no OOT image



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

Q5 no difference image



Q5 no OOT image



Q6 no difference image



Q6 no OOT image



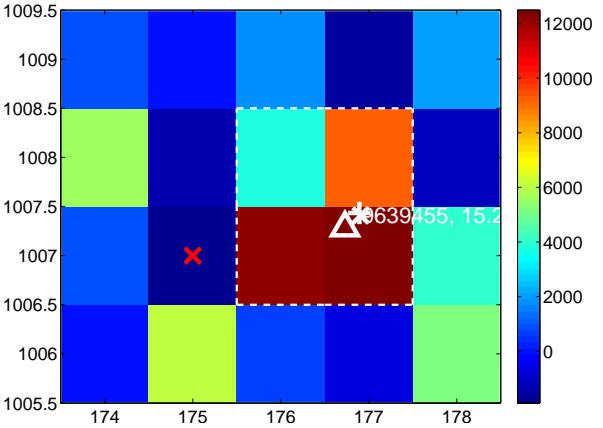
Q7 no difference image



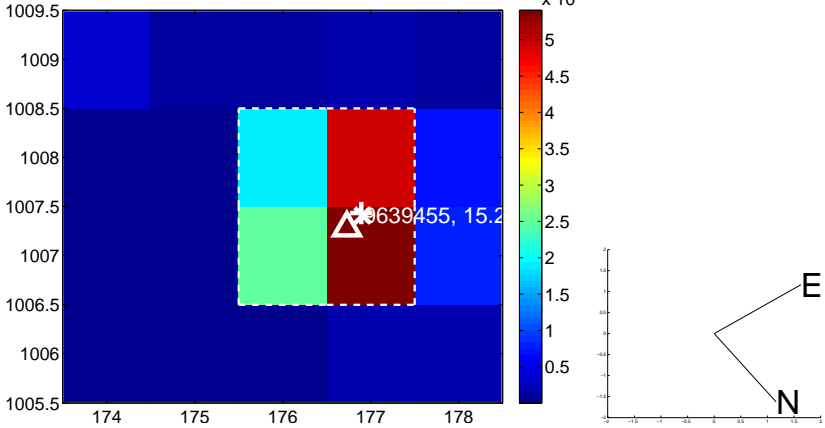
Q7 no OOT image



Q8 difference image



Q8 OOT image



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



white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

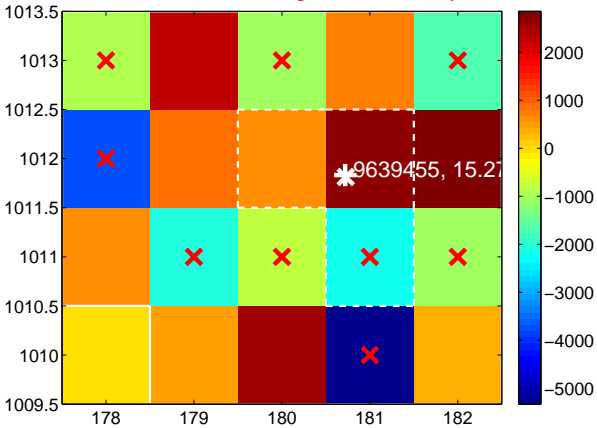
Q13 no difference image



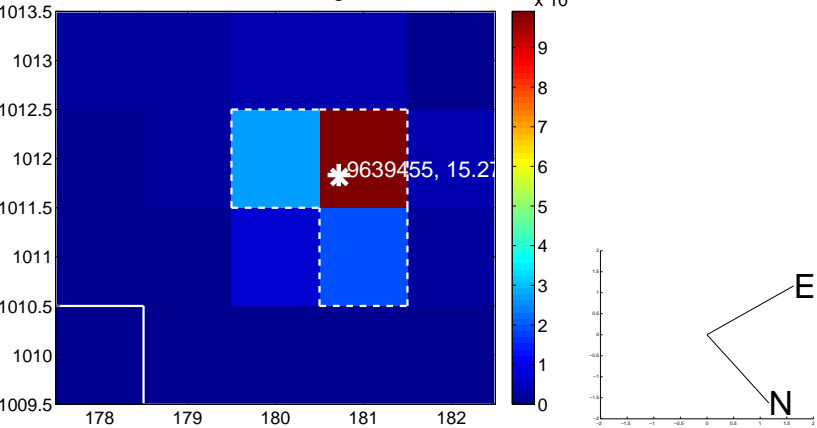
Q13 no OOT image



Q14 difference image. Poor Quality



Q14 OOT image



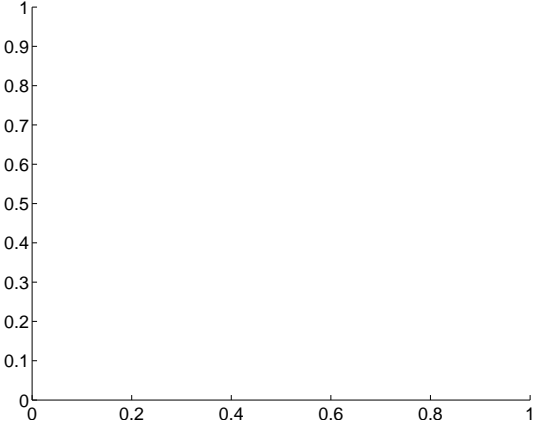
Q15 no difference image



Q15 no OOT image



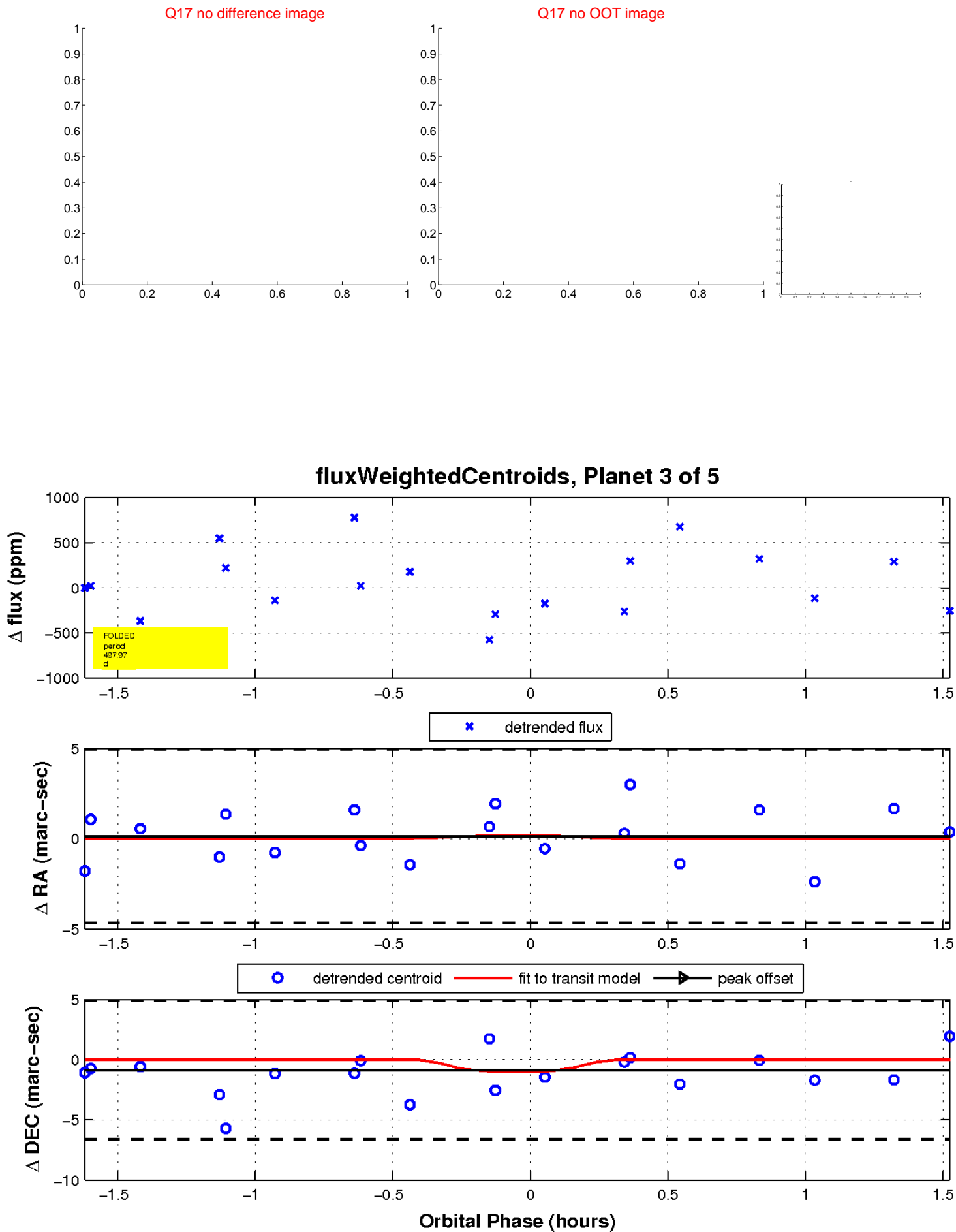
Q16 no difference image



Q16 no OOT image

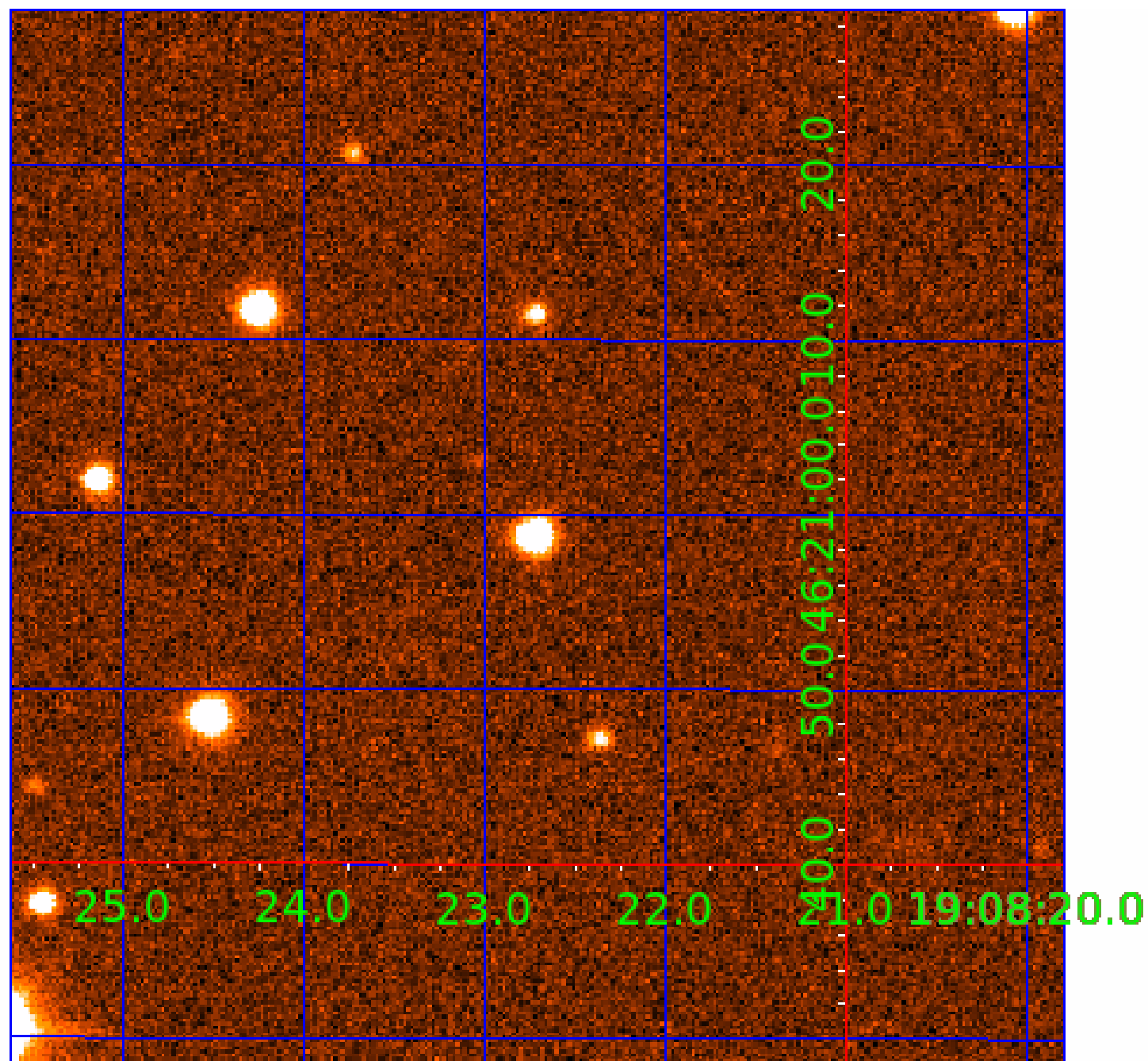


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009639455

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})
009639455-01	OBS	No	713.523814	141.316349	2294.1	6.388	12.6	6.3	1.00	6136	5.66	0.54
009639455-03	OBS	No	497.971517	284.208248	717.0	0.593	11.3	2.2	1.00	6136	3.46	0.87
009639455-04	OBS	No	497.976497	285.118366	1870.7	15.143	11.5	4.7	1.00	6136	4.35	0.87
009639455-05	OBS	No	288.674920	246.637083	524.9	4.755	11.3	2.4	1.00	6136	2.48	1.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009639455-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
009639455-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV— MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009639455-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT— INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_FEW_DIFFS
009639455-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT

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

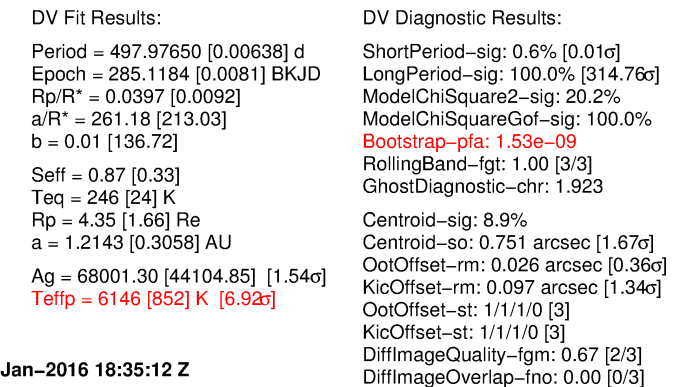
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.

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

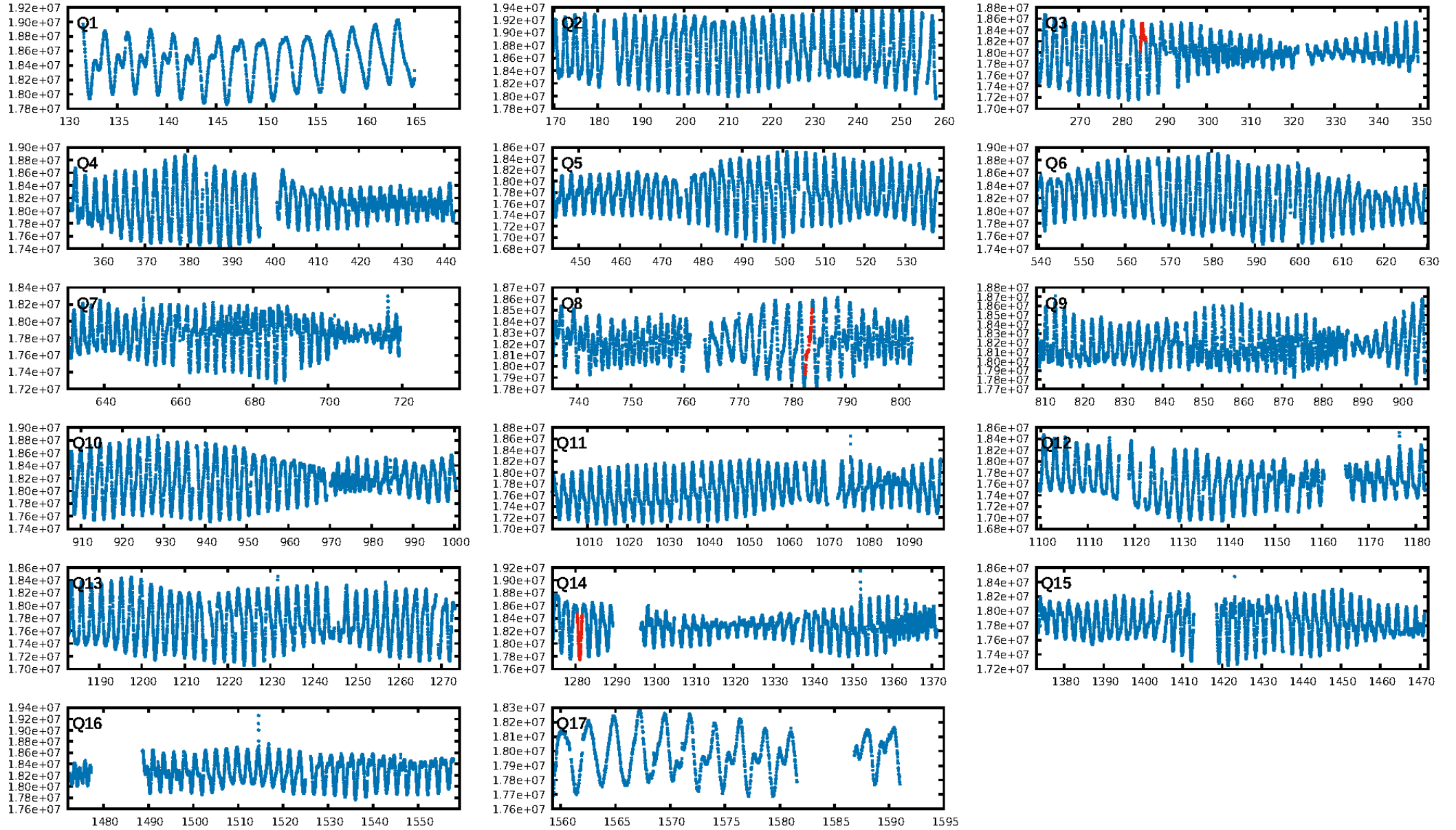
Ephemeris Match Information For 009639455-04

No Significant Match Found

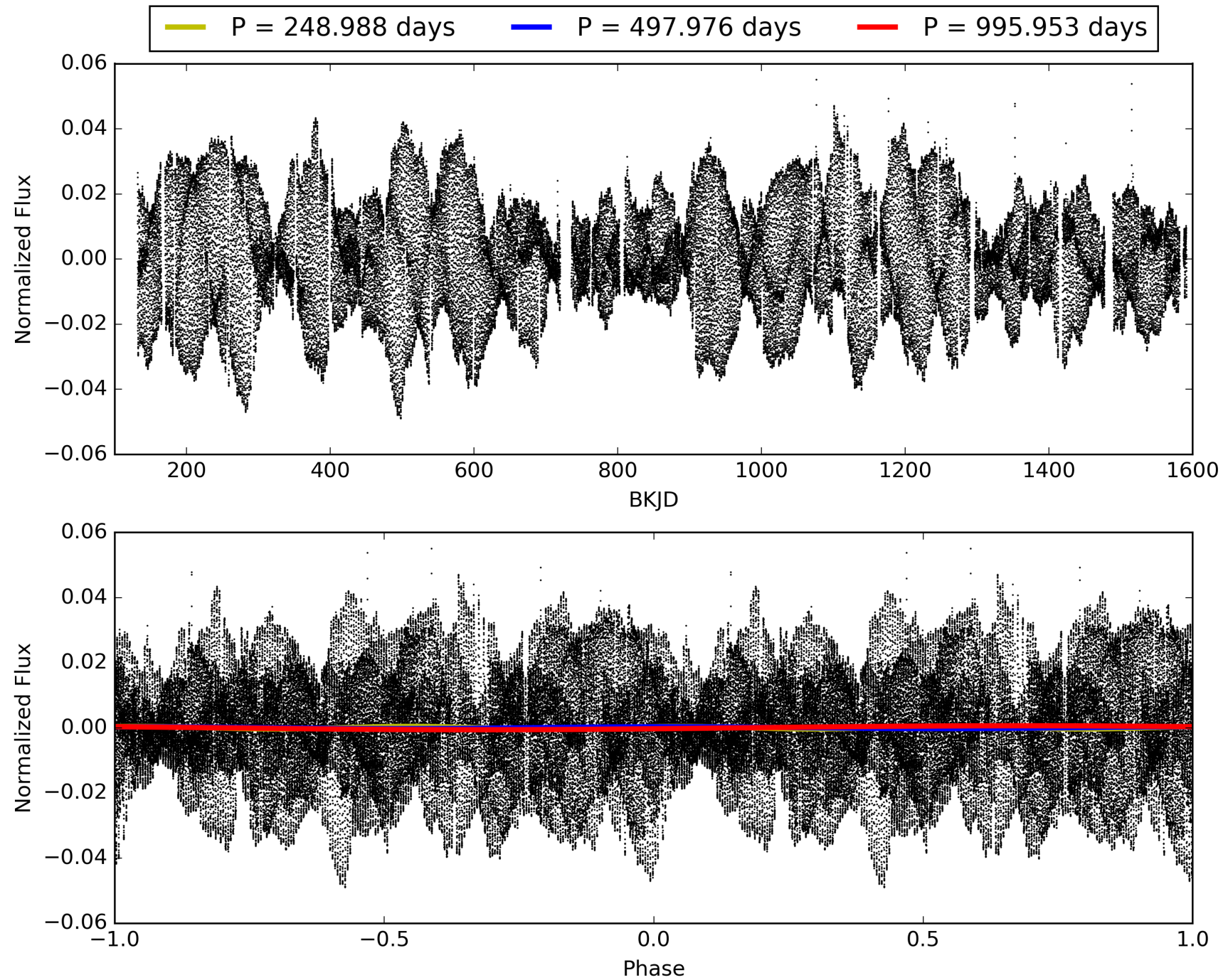
KIC: 9639455 Candidate: 4 of 5 Period: 497.976 d



TCE 009639455-04, PDC Light Curves

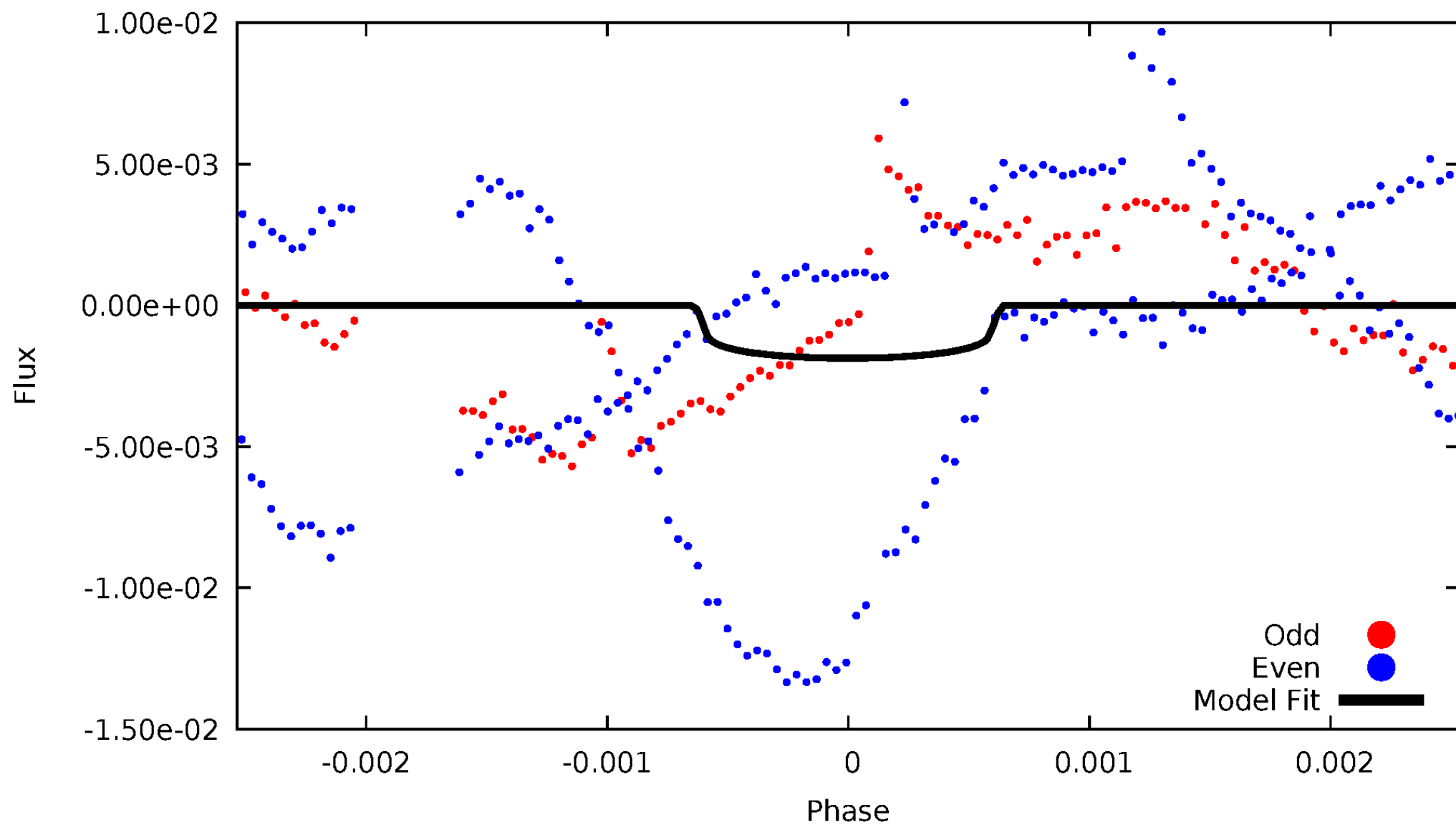


TCE 009639455-04



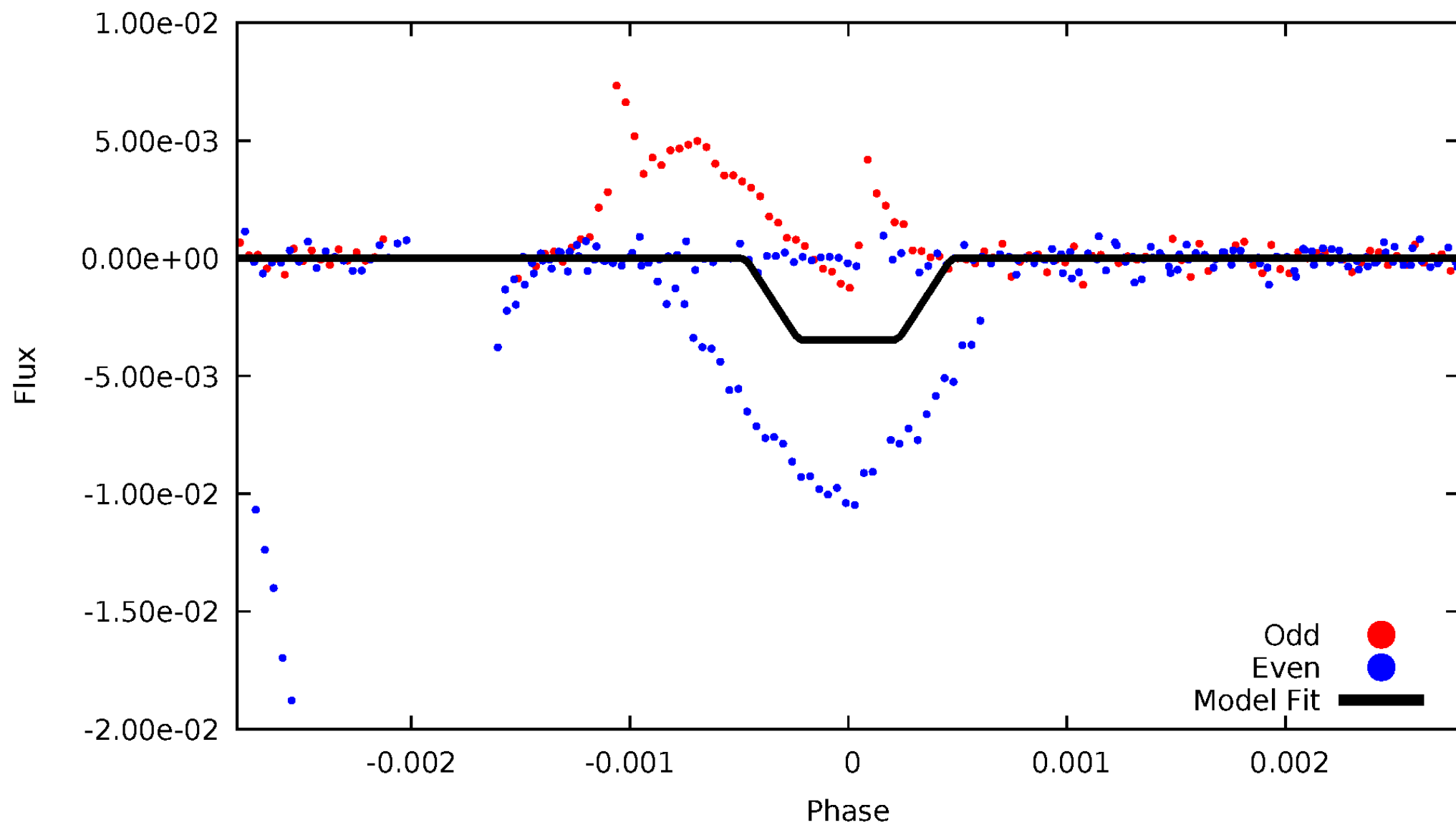
DV Odd/Even

TCE 009639455-04



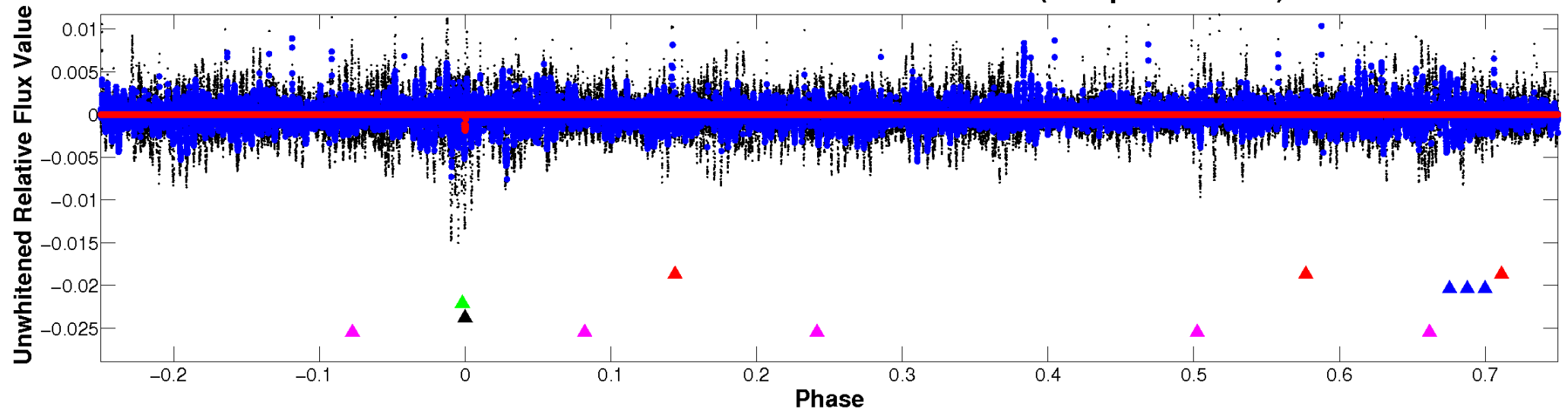
ALT Odd/Even

TCE 009639455-04

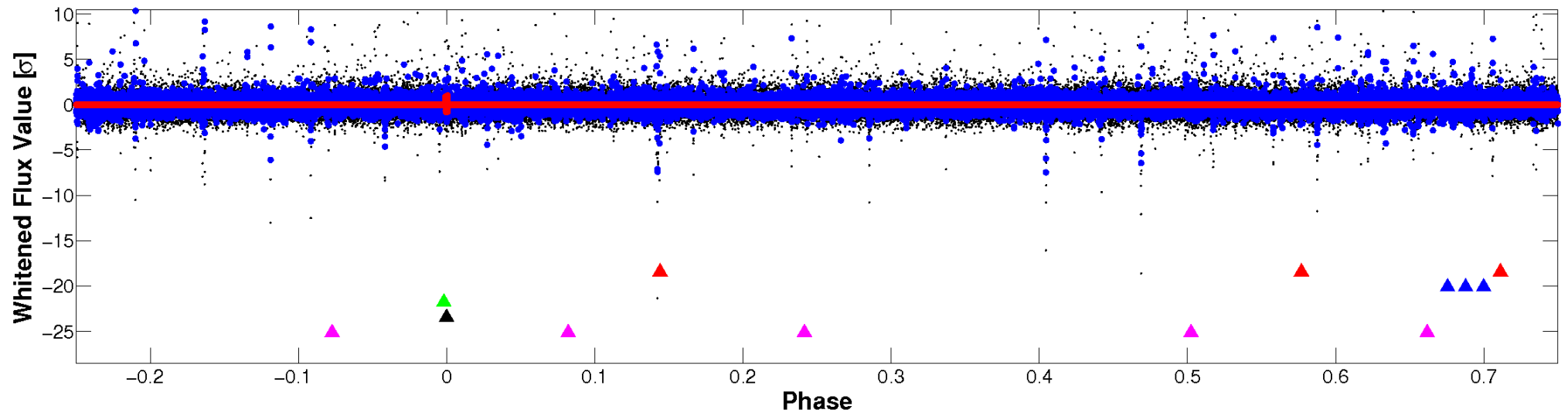


Non-Whitened Vs. Whitened Light Curve

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

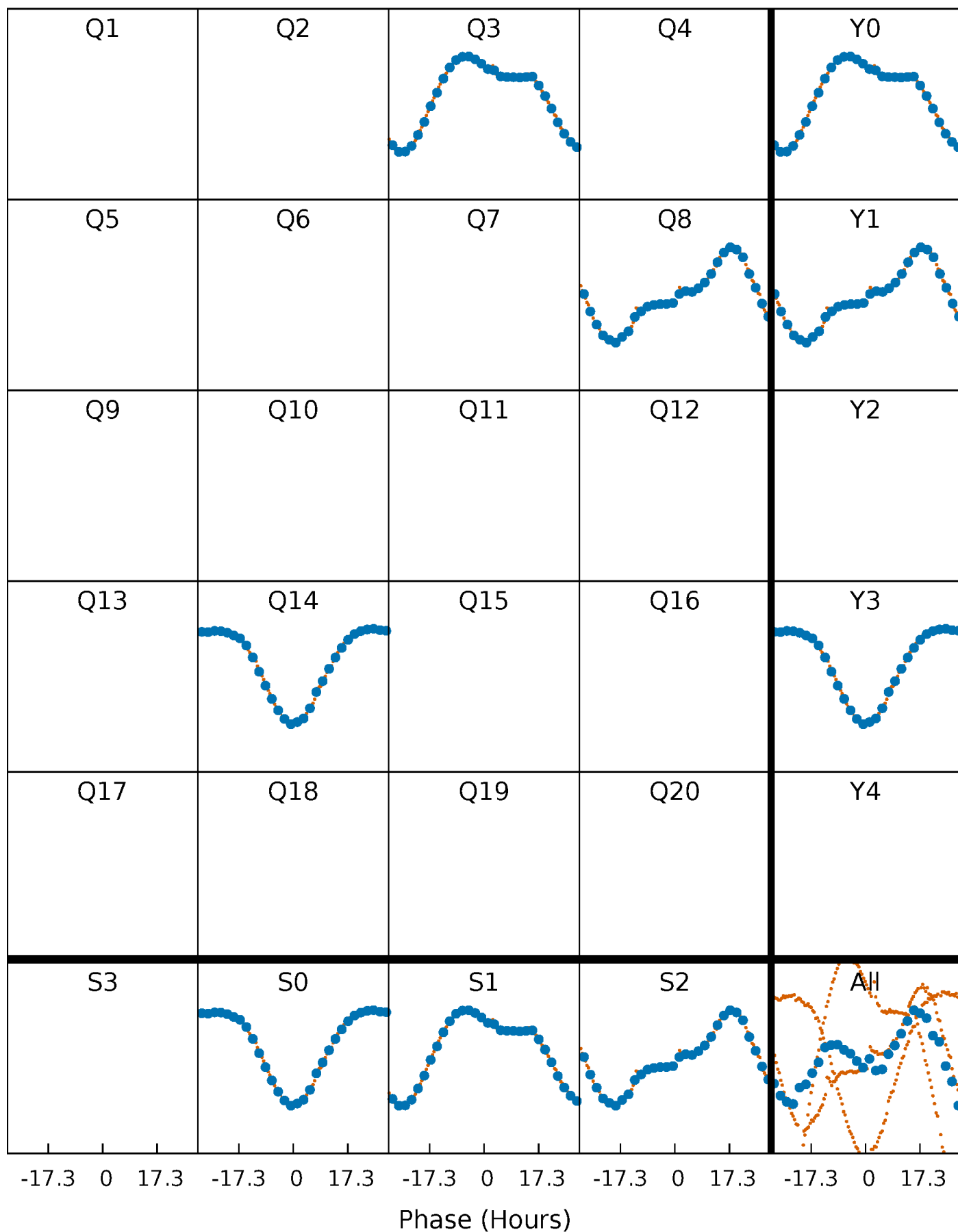


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



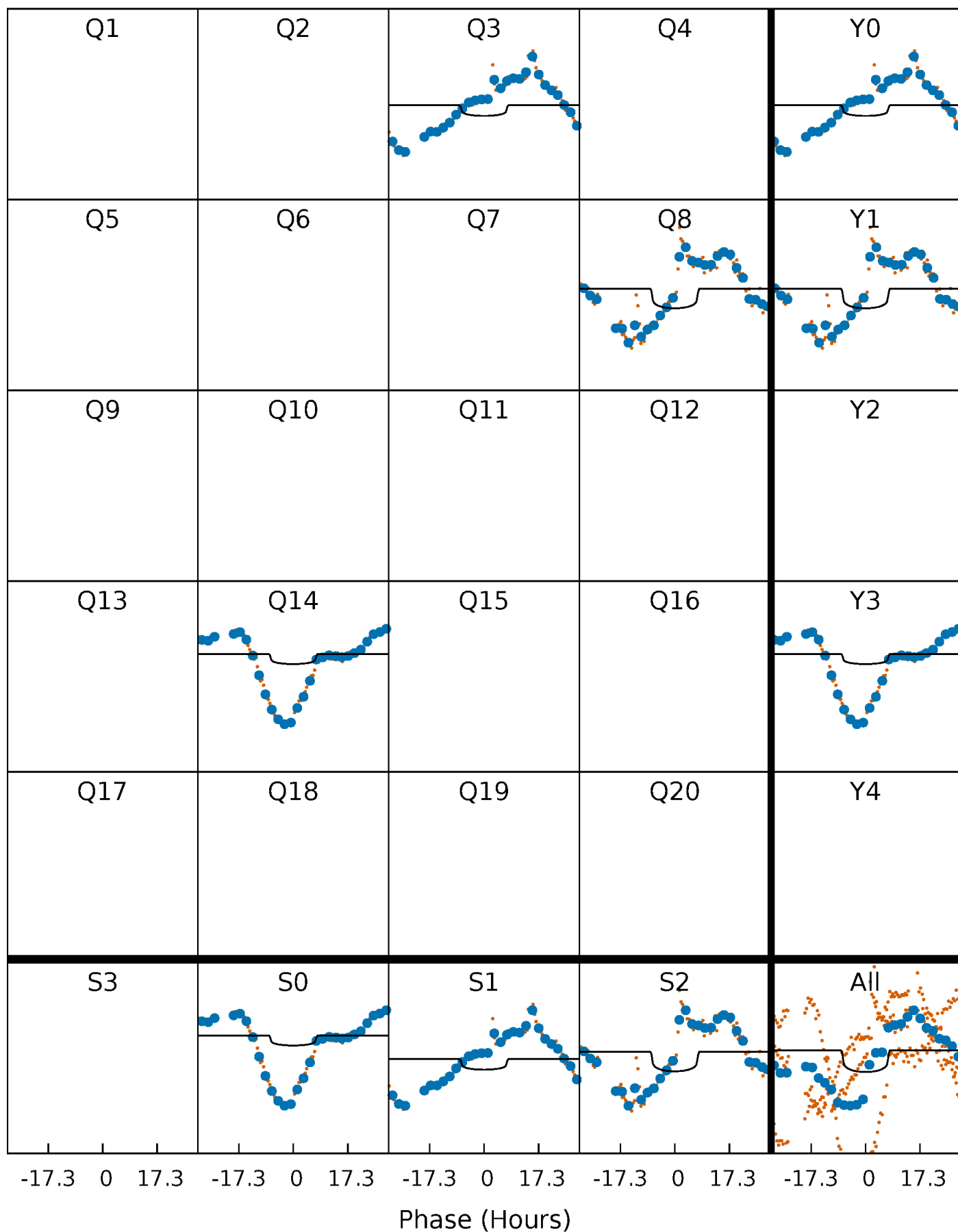
PDC Quarter-Phased Transit Curves

TCE 009639455-04 P=497.976497 Days $T_0=285.118366$ (BKJD)



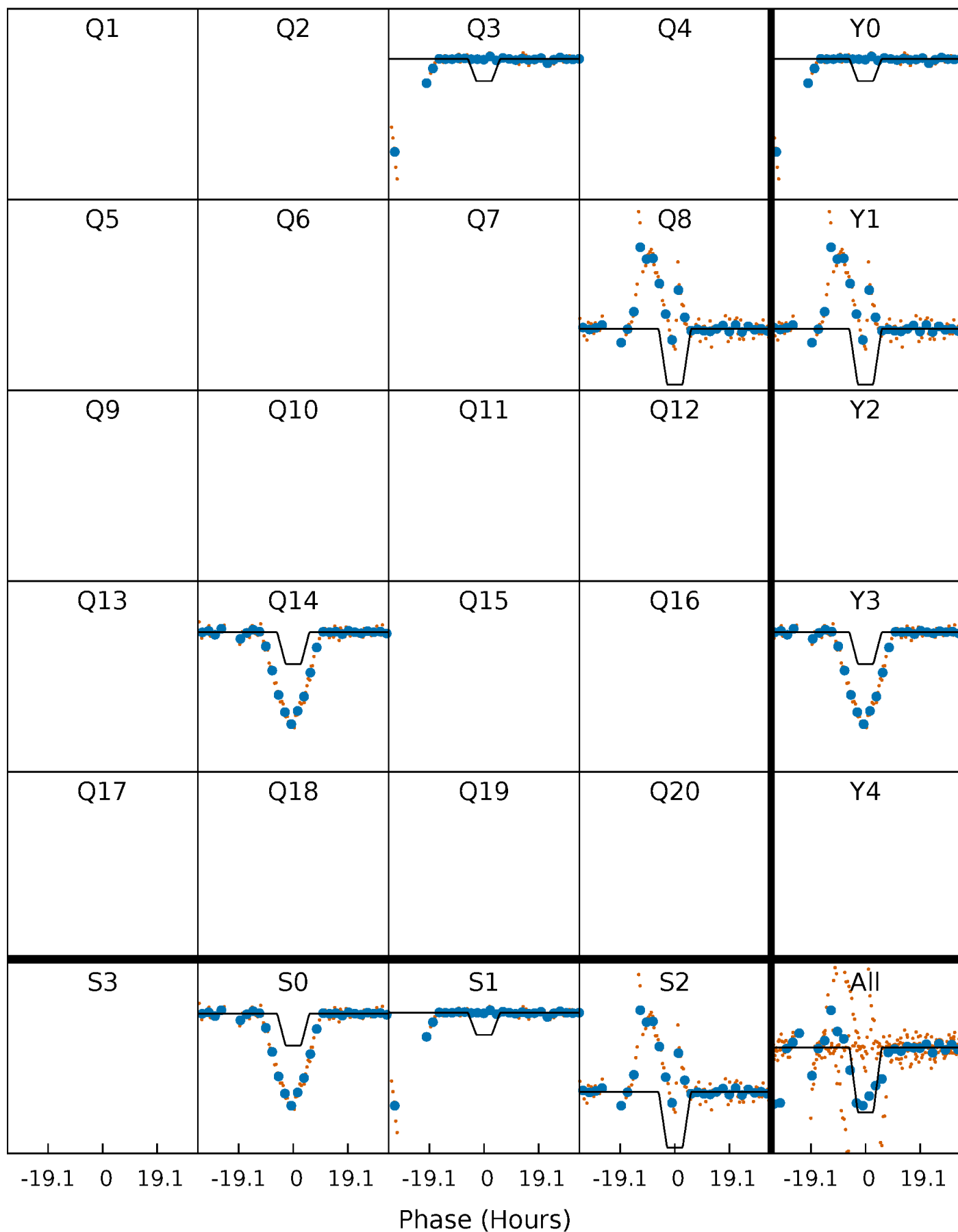
DV Quarter-Phased Transit Curves

TCE 009639455-04 P=497.976497 Days $T_0=285.118366$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

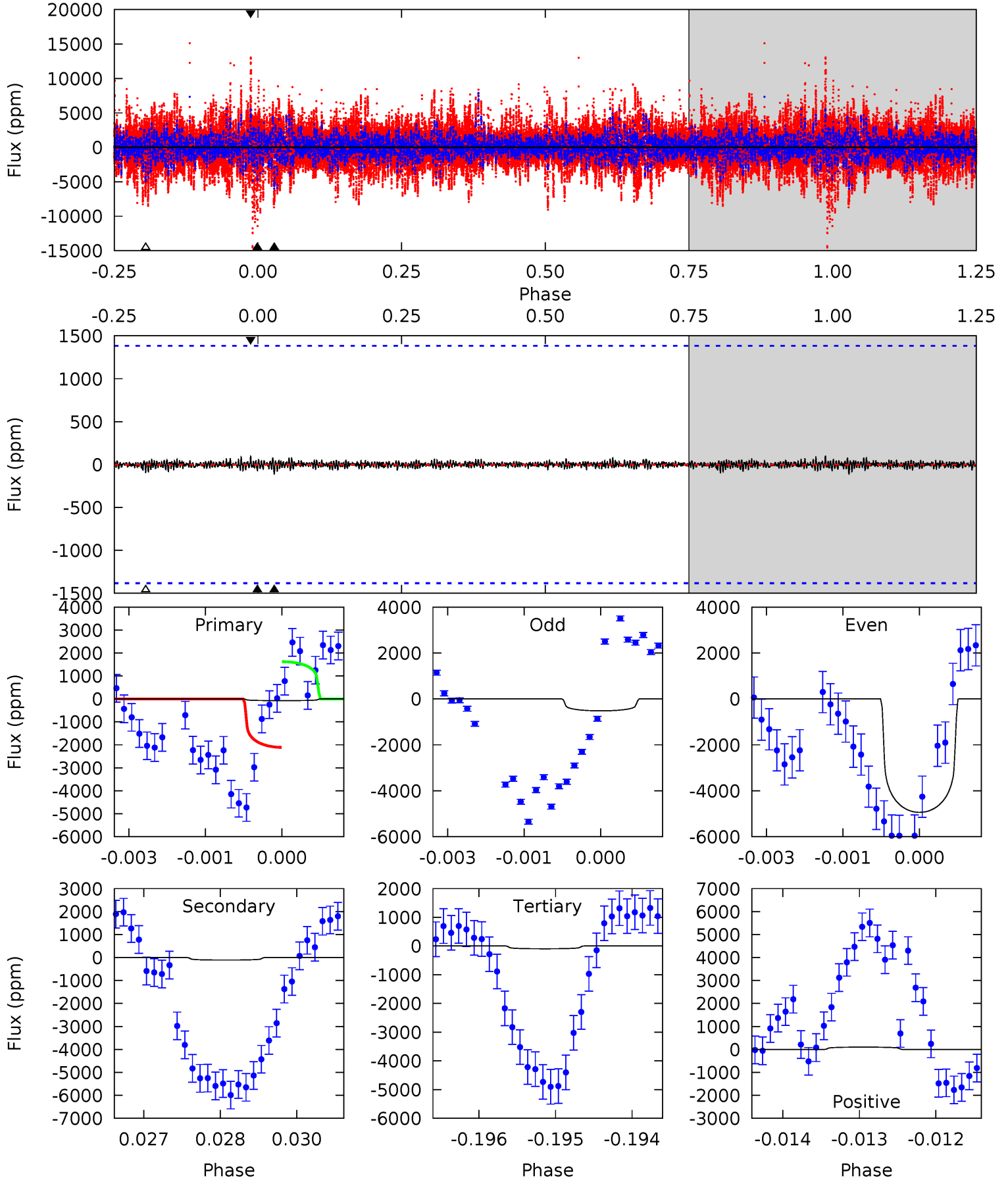
TCE 009639455-04 P=497.938612 Days $T_0=285.174738$ (BKJD)



DV Model-Shift Uniqueness Test

009639455-04, P = 497.976497 Days, E = 285.118366 Days

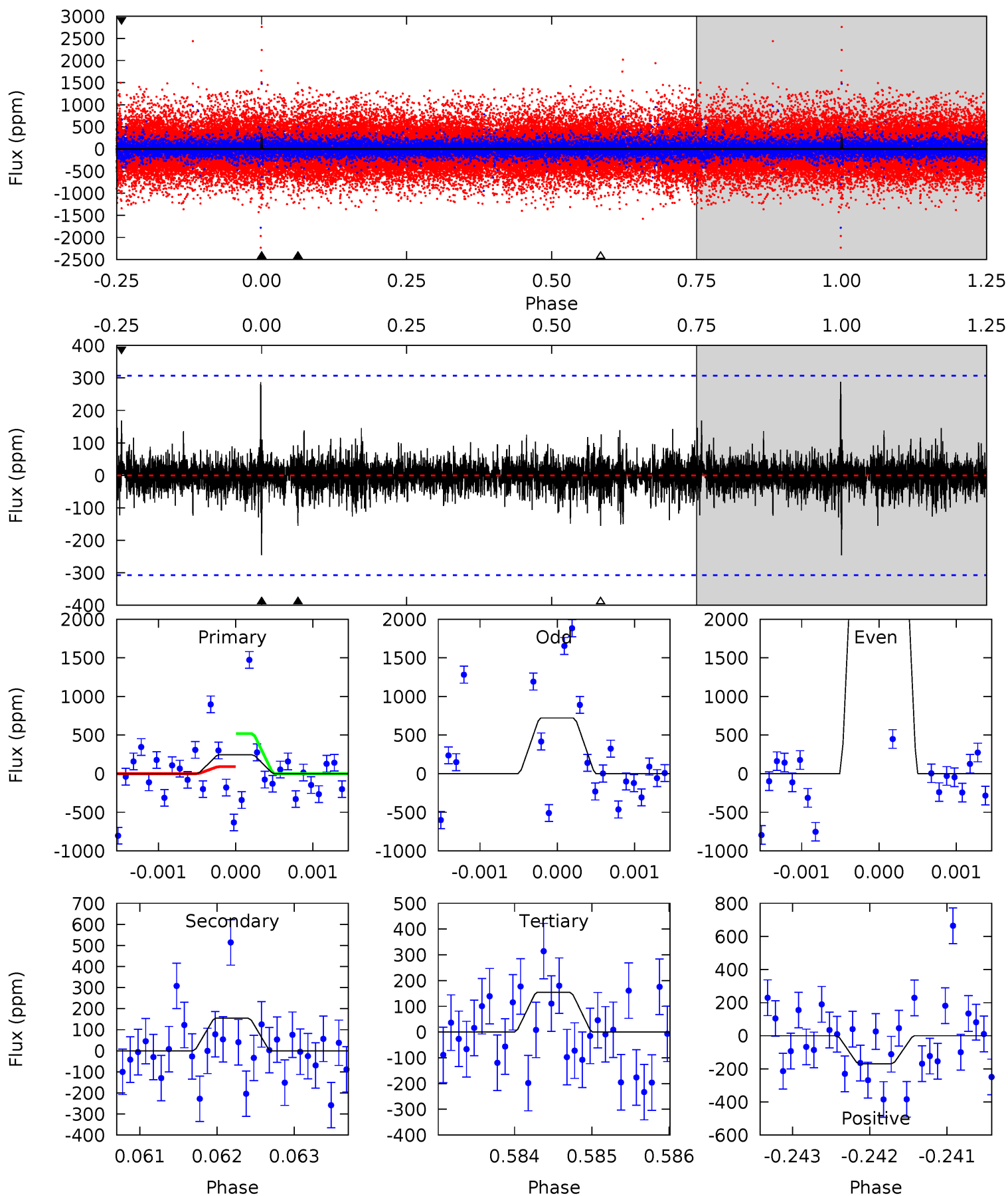
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.29	0.44	0.37	0.38	5.41	3.22	0.09	-0.08	-0.09	0.06	0.06	8.87	-5.55	0.47	0.94



Alt Model-Shift Uniqueness Test

009639455-04, P = 497.938612 Days, E = 285.174738 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.37	2.75	2.75	3.00	5.46	3.30	0.57	1.62	1.36	0.01	-0.25	51.4	-333.3	0.54	3.80



Stellar Parameters For KIC 009639455

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6136^{+183}_{-201}	$4.418^{+0.090}_{-0.195}$	$-0.340^{+0.300}_{-0.300}$	$1.004^{+0.305}_{-0.131}$	$0.963^{+0.140}_{-0.102}$	$1.339^{+0.595}_{-0.659}$
	+3%/-3%	+2%/-4%	+88%/-88%	+30%/-13%	+15%/-11%	+44%/-49%
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 009639455-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-112 ± 256	$4.52^{+1.22}_{-1.06}$	347^{+24}_{-19}	3551^{+892}_{-7312}	3902^{+11080}_{-9845}
Alt.	-155 ± 56	$6.73^{+1.35}_{-1.27}$	349^{+24}_{-18}	3339^{+276}_{-258}	2725^{+1868}_{-1209}

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

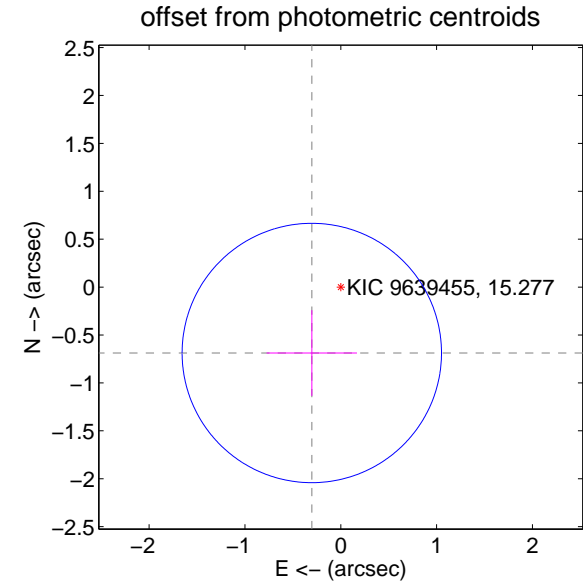
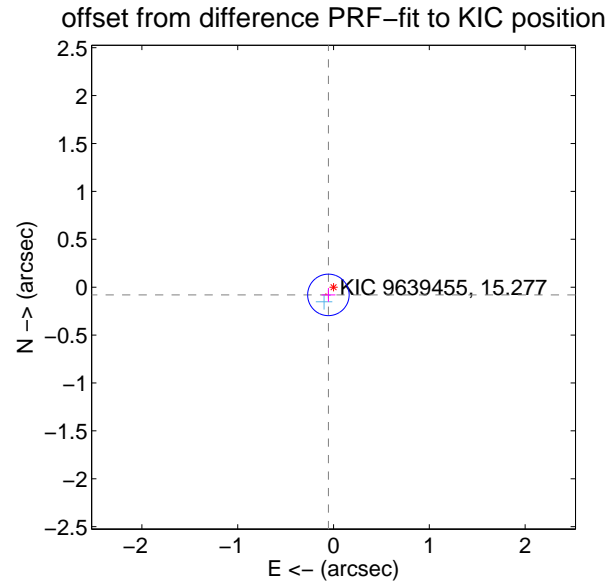
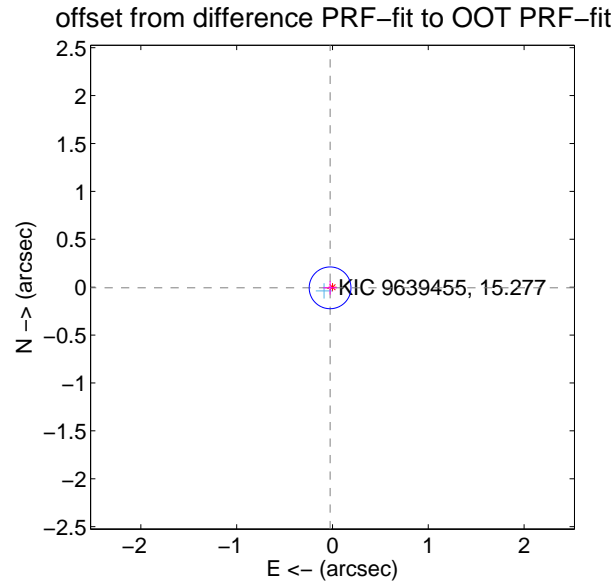
DV Centroid Data

Supplemental centroid analysis for 009639455-04. Kepler magnitude: 15.28. Transit SNR 4.72

There are 2 quarters with good PRF difference image offsets

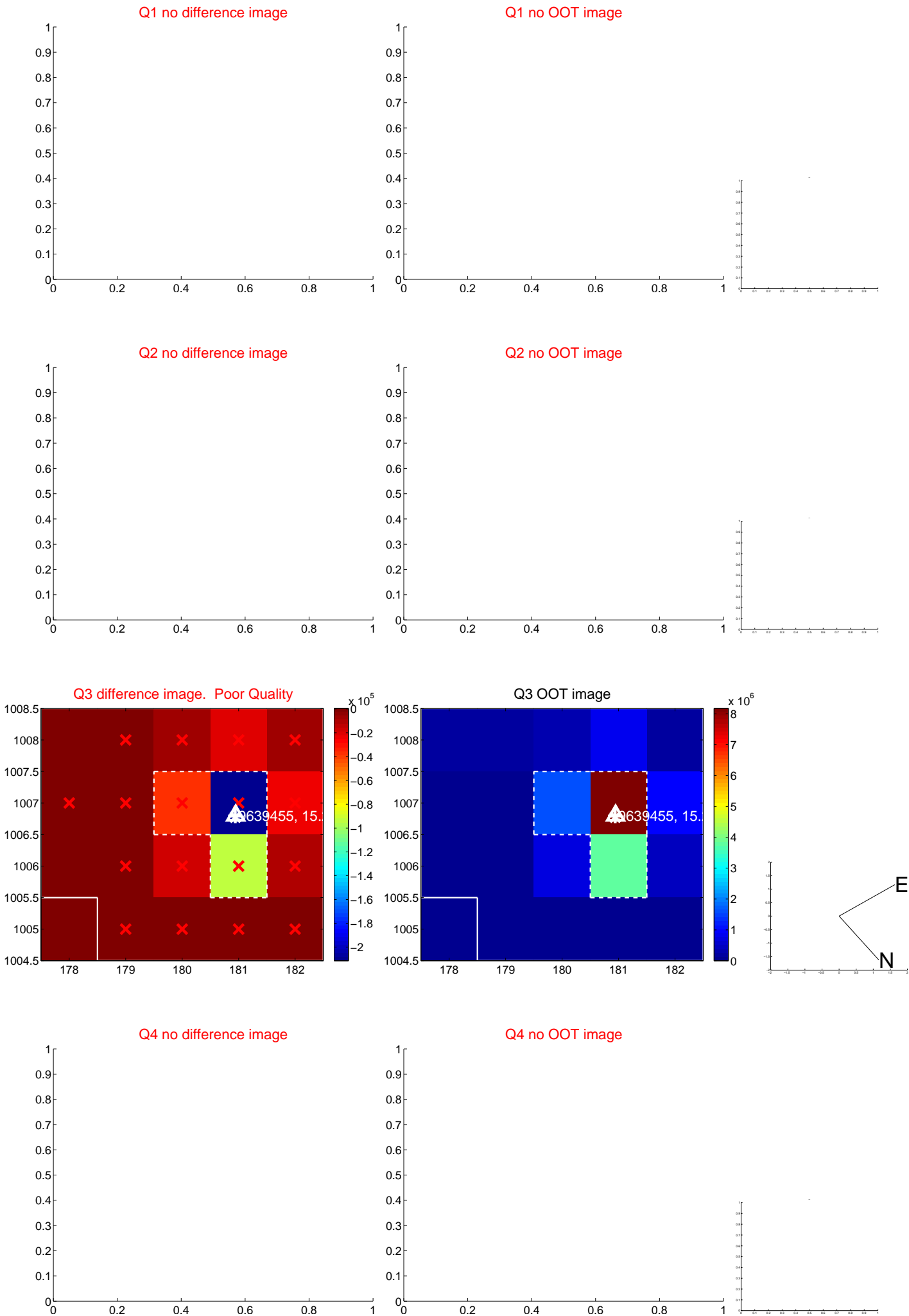
The direct PRF centroid is offset from the target star catalog position by about 0.08 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.026 ± 0.073	0.36	0.025 ± 0.073	-0.007 ± 0.072
PRF-fit source offset from KIC position	0.097 ± 0.072	1.34	0.054 ± 0.073	-0.081 ± 0.072
photometric centroid source offset	0.75 ± 0.45	1.67	0.30 ± 0.47	-0.69 ± 0.45



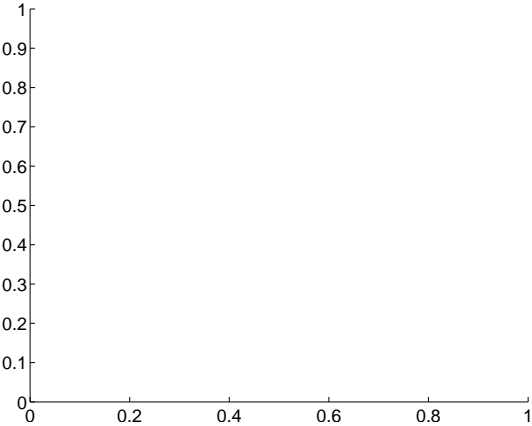
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

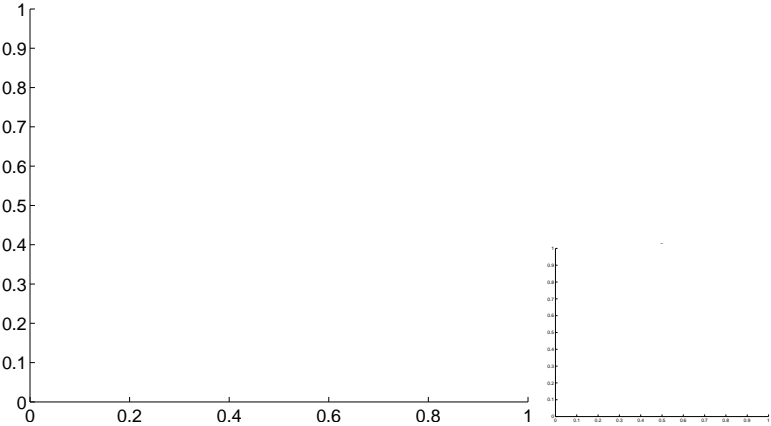


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

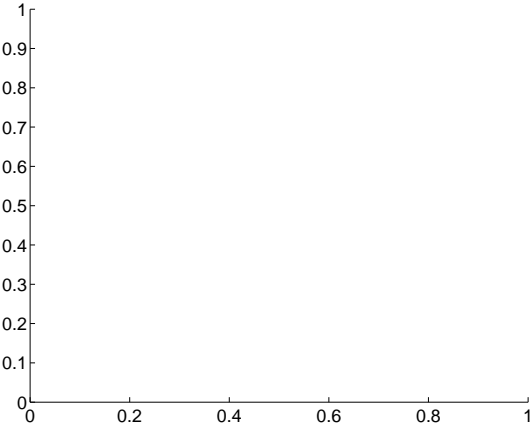
Q5 no difference image



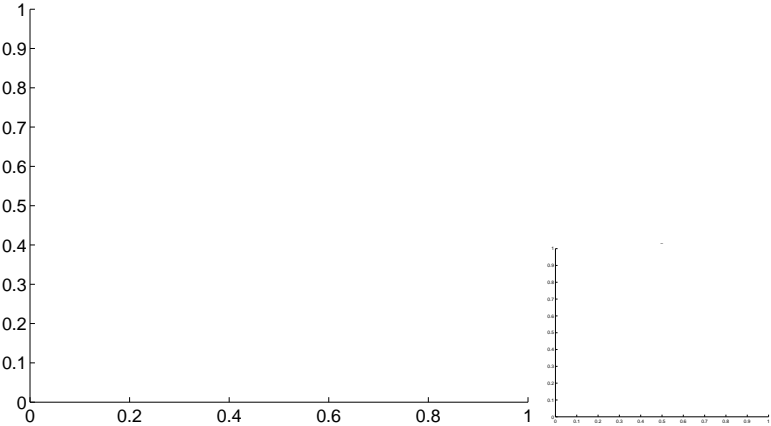
Q5 no OOT image



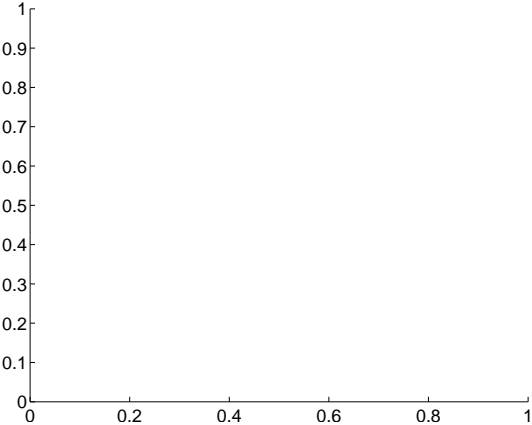
Q6 no difference image



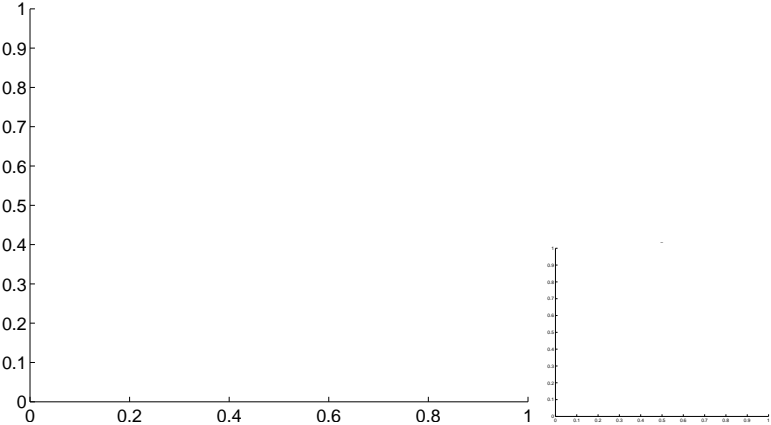
Q6 no OOT image



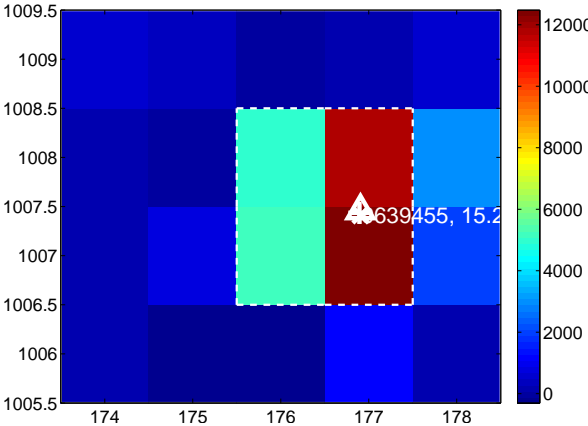
Q7 no difference image



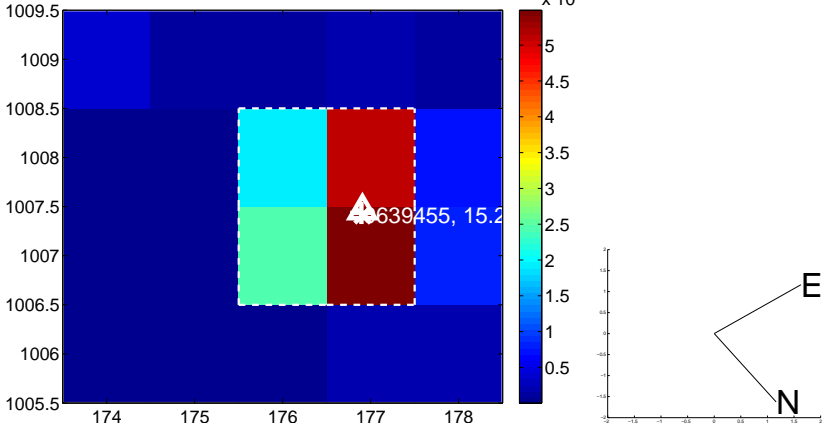
Q7 no OOT image



Q8 difference image



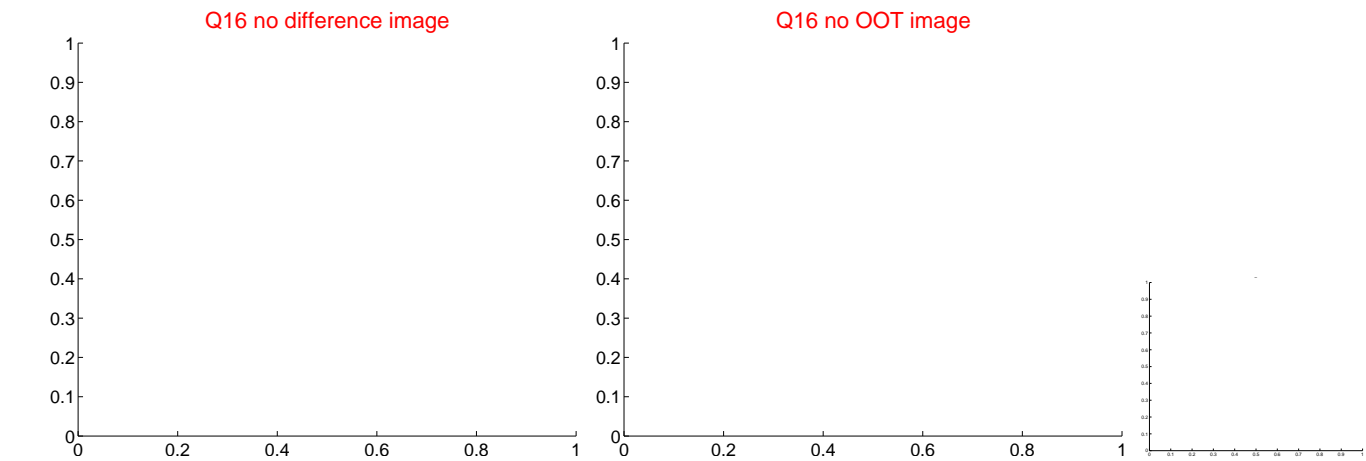
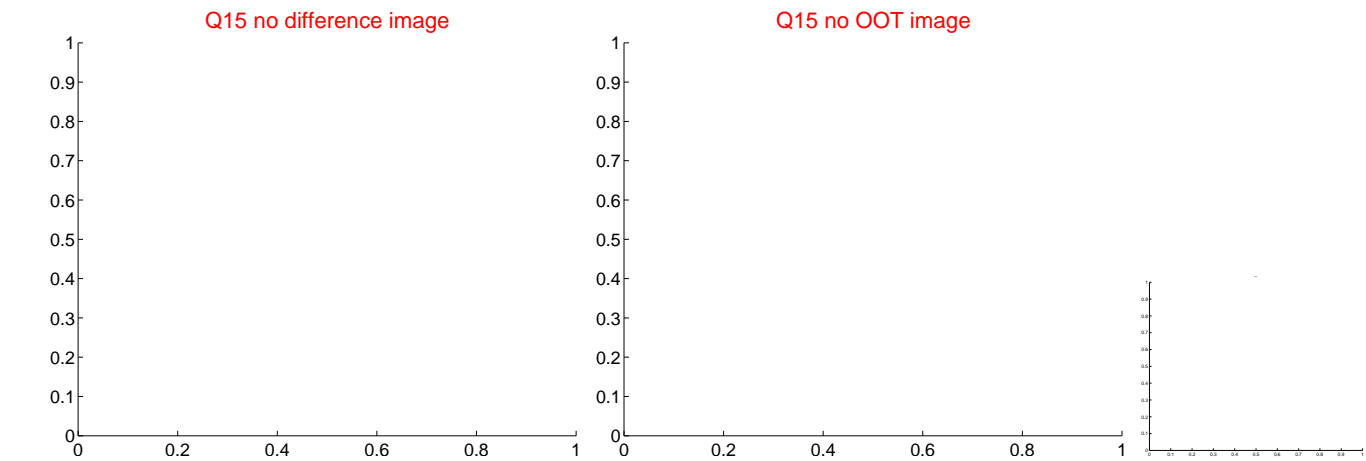
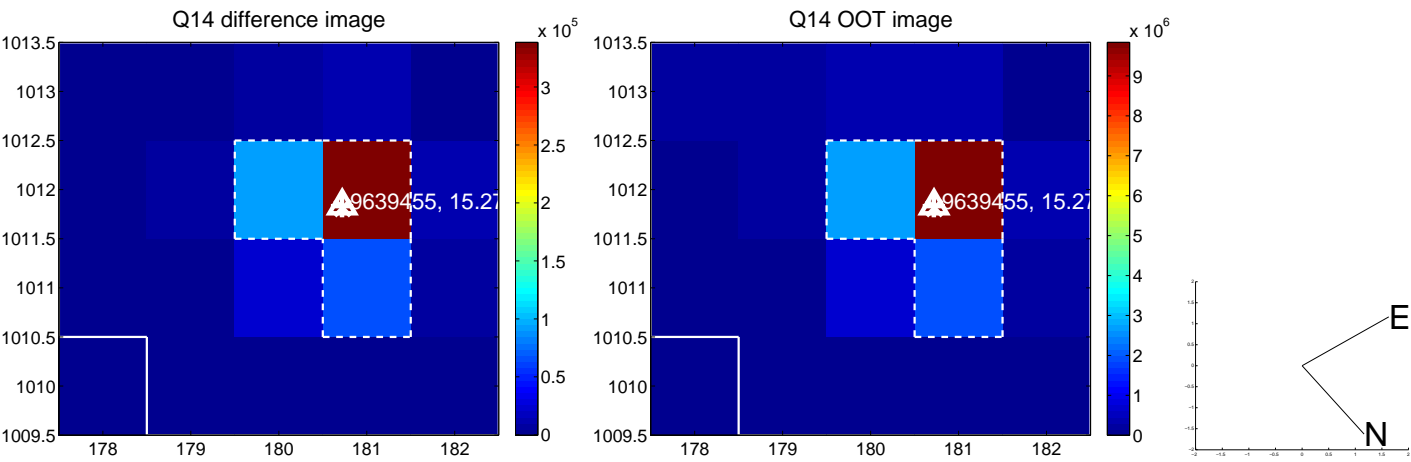
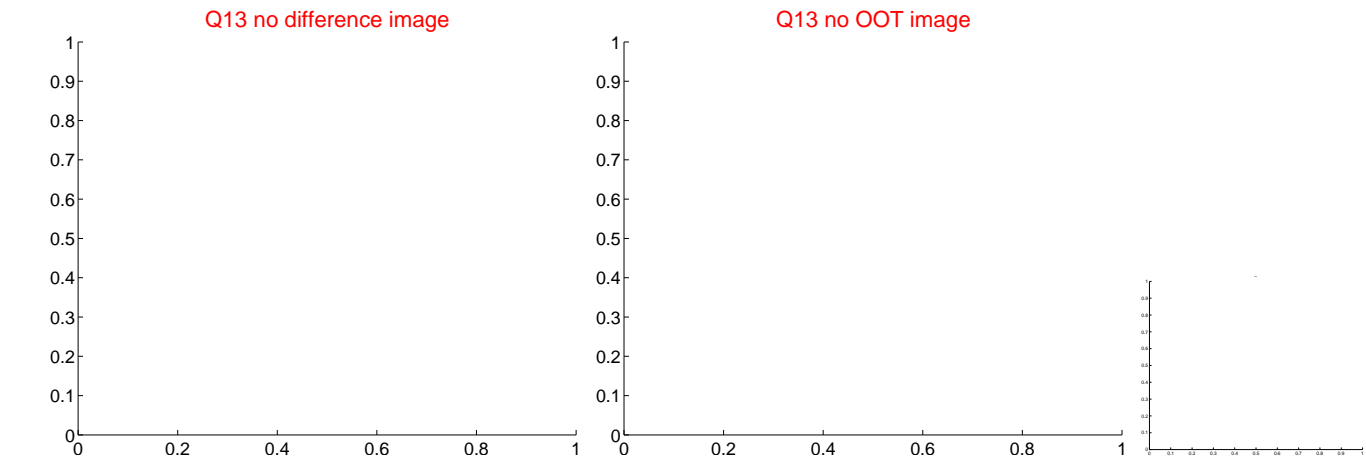
Q8 OOT image



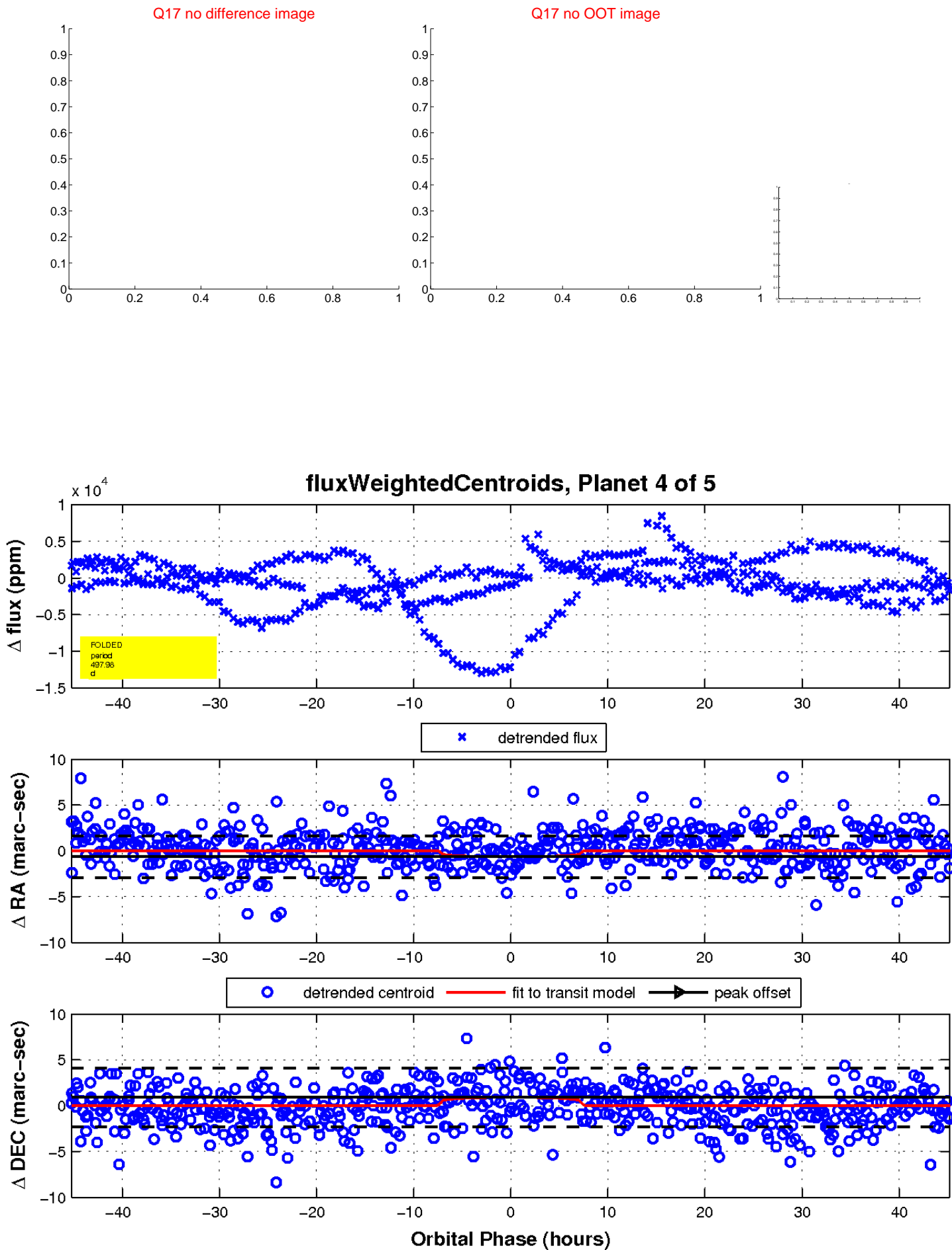
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

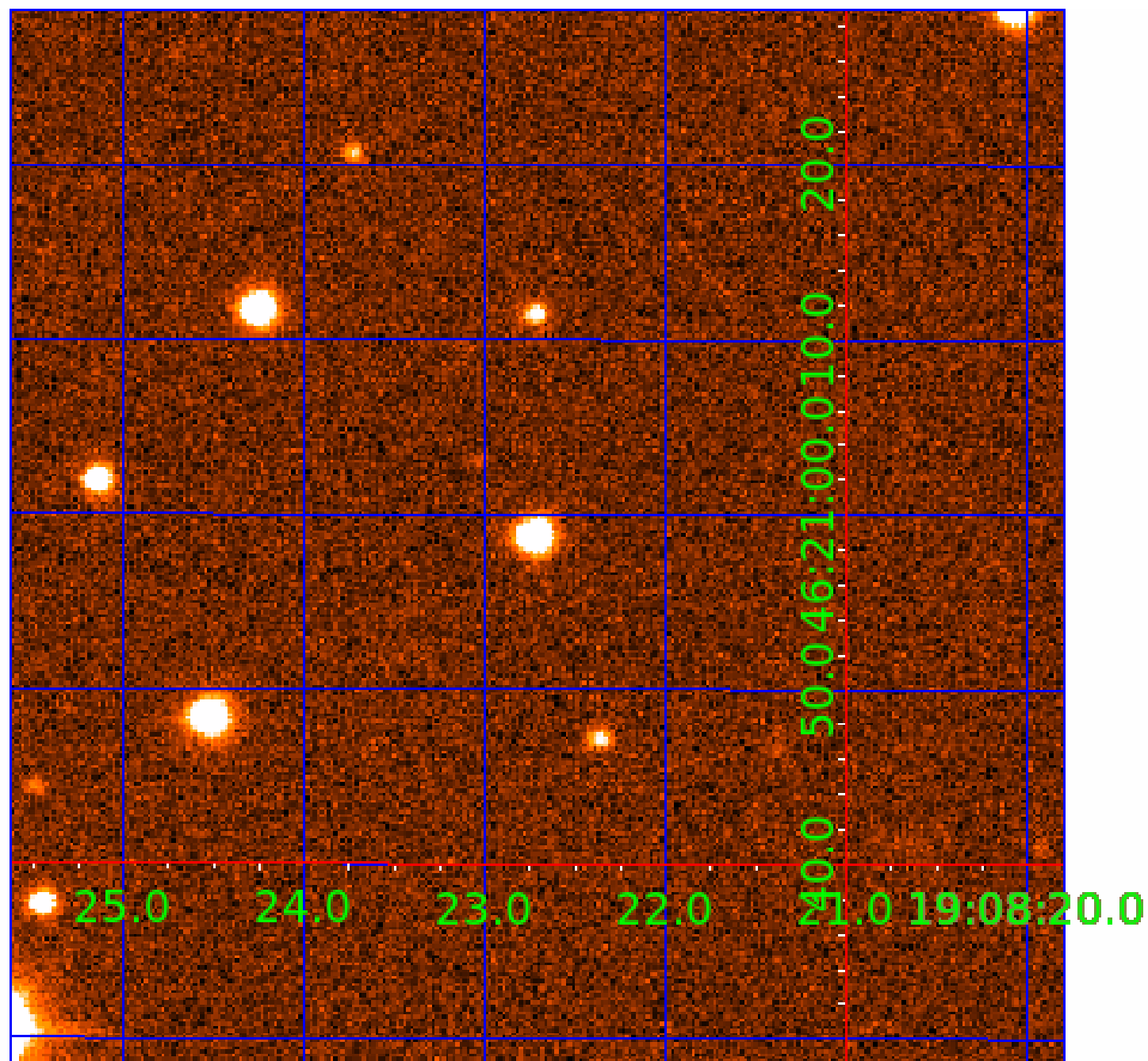


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 009639455

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})
009639455-01	OBS	No	713.523814	141.316349	2294.1	6.388	12.6	6.3	1.00	6136	5.66	0.54
009639455-03	OBS	No	497.971517	284.208248	717.0	0.593	11.3	2.2	1.00	6136	3.46	0.87
009639455-04	OBS	No	497.976497	285.118366	1870.7	15.143	11.5	4.7	1.00	6136	4.35	0.87
009639455-05	OBS	No	288.674920	246.637083	524.9	4.755	11.3	2.4	1.00	6136	2.48	1.80

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
009639455-01	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_CHASES—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—INCONSISTENT_TRANS—HALO_GHOST
009639455-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
009639455-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—SAME_NTL_PERIOD—CENT_FEW_DIFFS
009639455-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_MARSHALL_SKYE_TRACKER—LPP_DV—LPP_ALT—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT

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

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

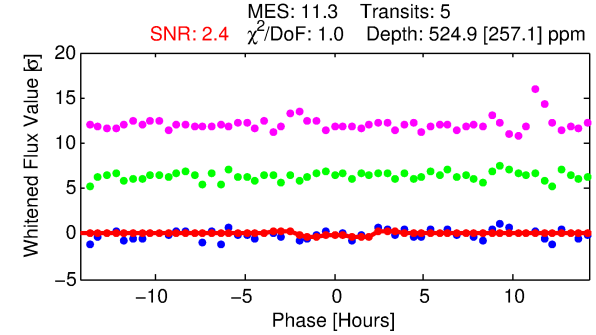
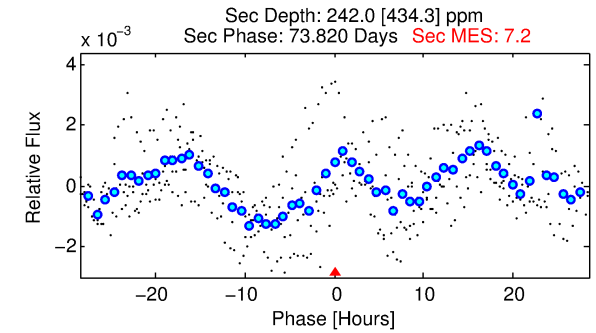
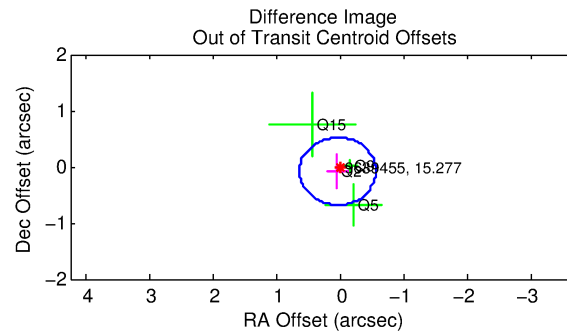
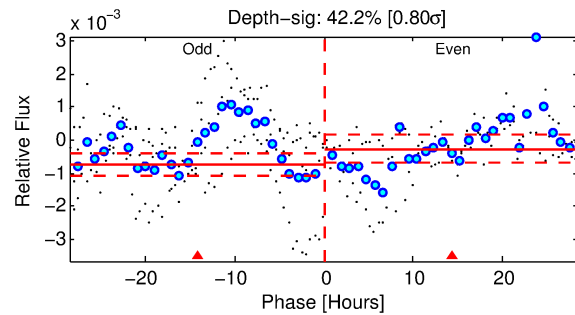
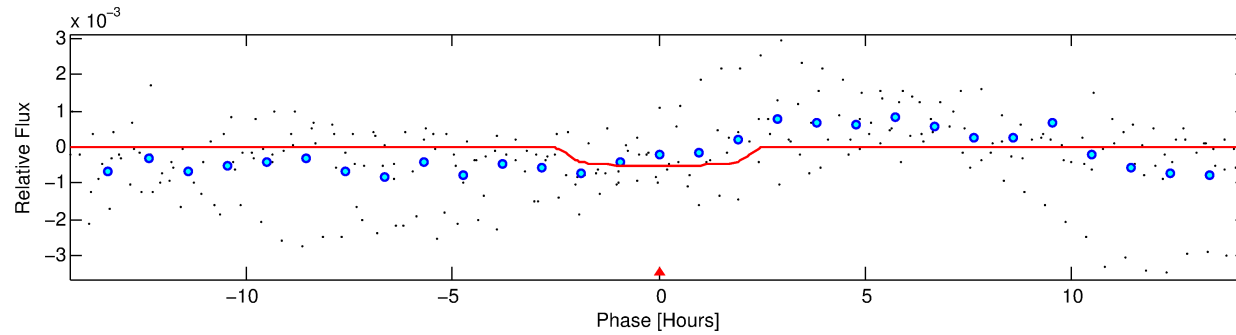
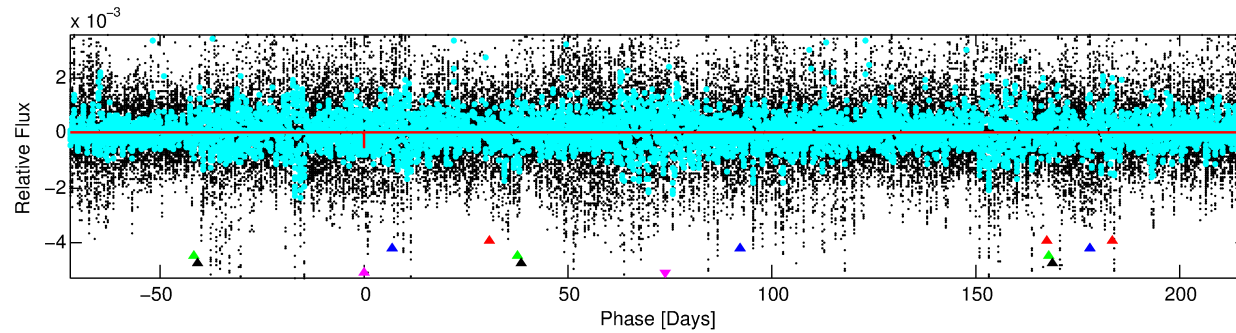
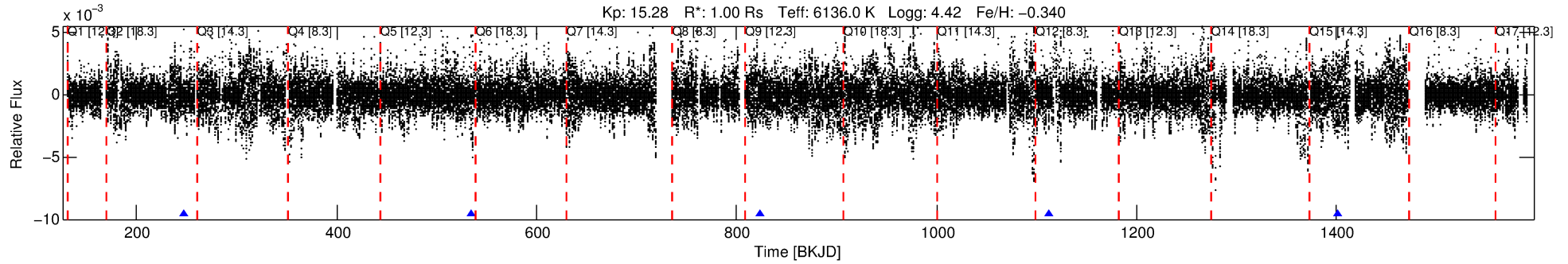
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 009639455-05

No Significant Match Found

DV One-Page Summary

KIC: 9639455 Candidate: 5 of 5 Period: 288.675 d



DV Fit Results:

Period = 288.67492 [0.00742] d
Epoch = 246.6371 [0.0190] BKJD
Rp/R* = 0.0227 [0.0275]
a/R* = 330.36 [1931.11]
b = 0.73 [3.71]
Seff = 1.80 [0.69]
Teff = 295 [28] K
Rp = 2.48 [3.10] Re
a = 0.8442 [0.2126] AU
Ag = 15379.08 [46683.60] [0.33 σ]
Teffp = 5083 [3833] K [1.25 σ]

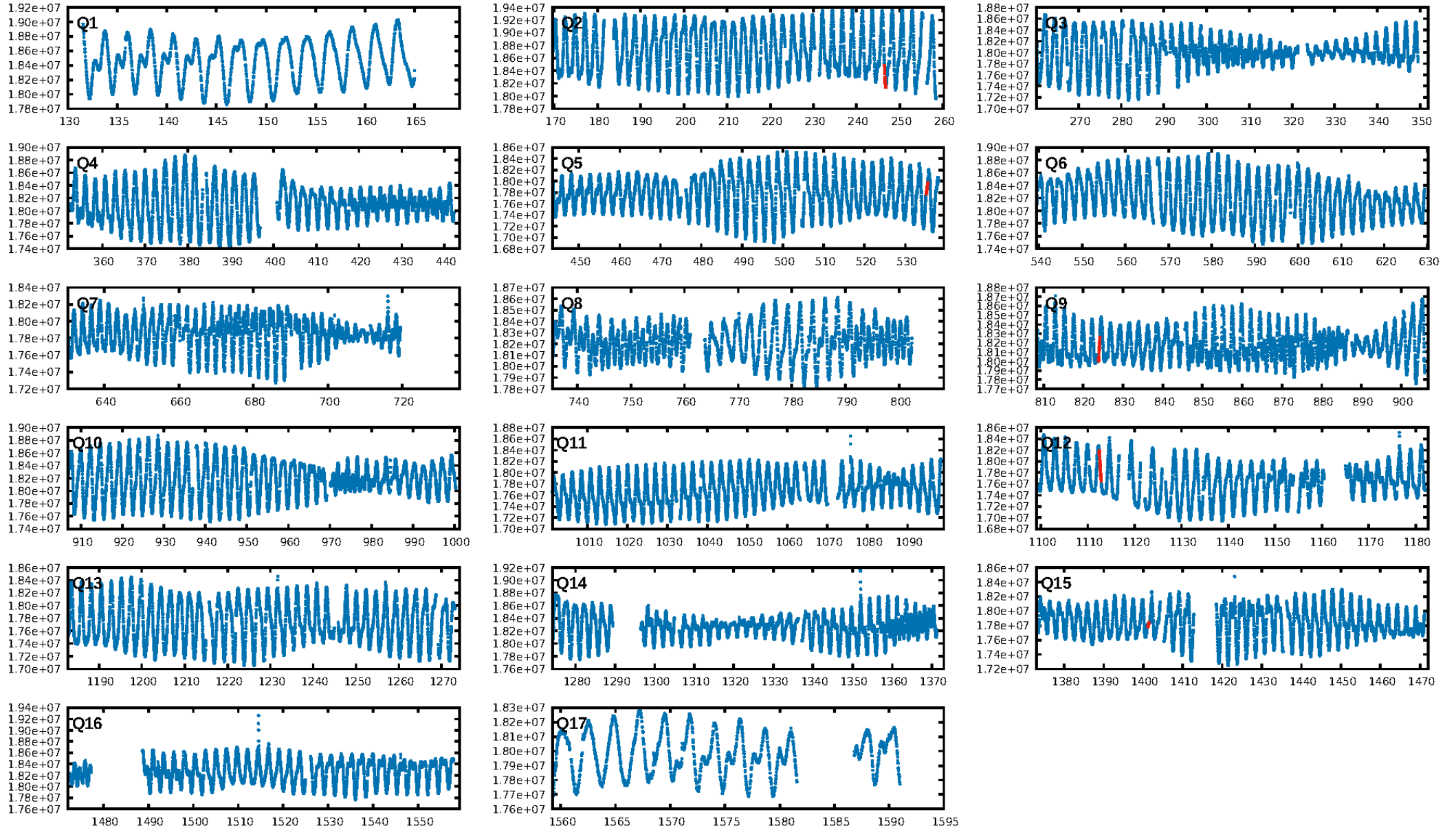
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [644.15 σ]
ModelChiSquare2-sig: 34.6%
ModelChiSquareGof-sig: 99.4%
Bootstrap-pfa: 2.43e-10
RollingBand-fgt: 1.00 [5/5]
GhostDiagnostic-chr: -0.7145
Centroid-sig: 72.7%
Centroid-so: 0.653 arcsec [0.34 σ]
OotOffset-rm: 0.093 arcsec [0.47 σ]
OotOffset-st: 1/1/0/2 [4]
KicOffset-rm: 0.221 arcsec [0.91 σ]
KicOffset-st: 1/1/0/2 [4]
DiffImageQuality-fgm: 1.00 [4/4]
DiffImageOverlap-fno: 1.00 [5/5]

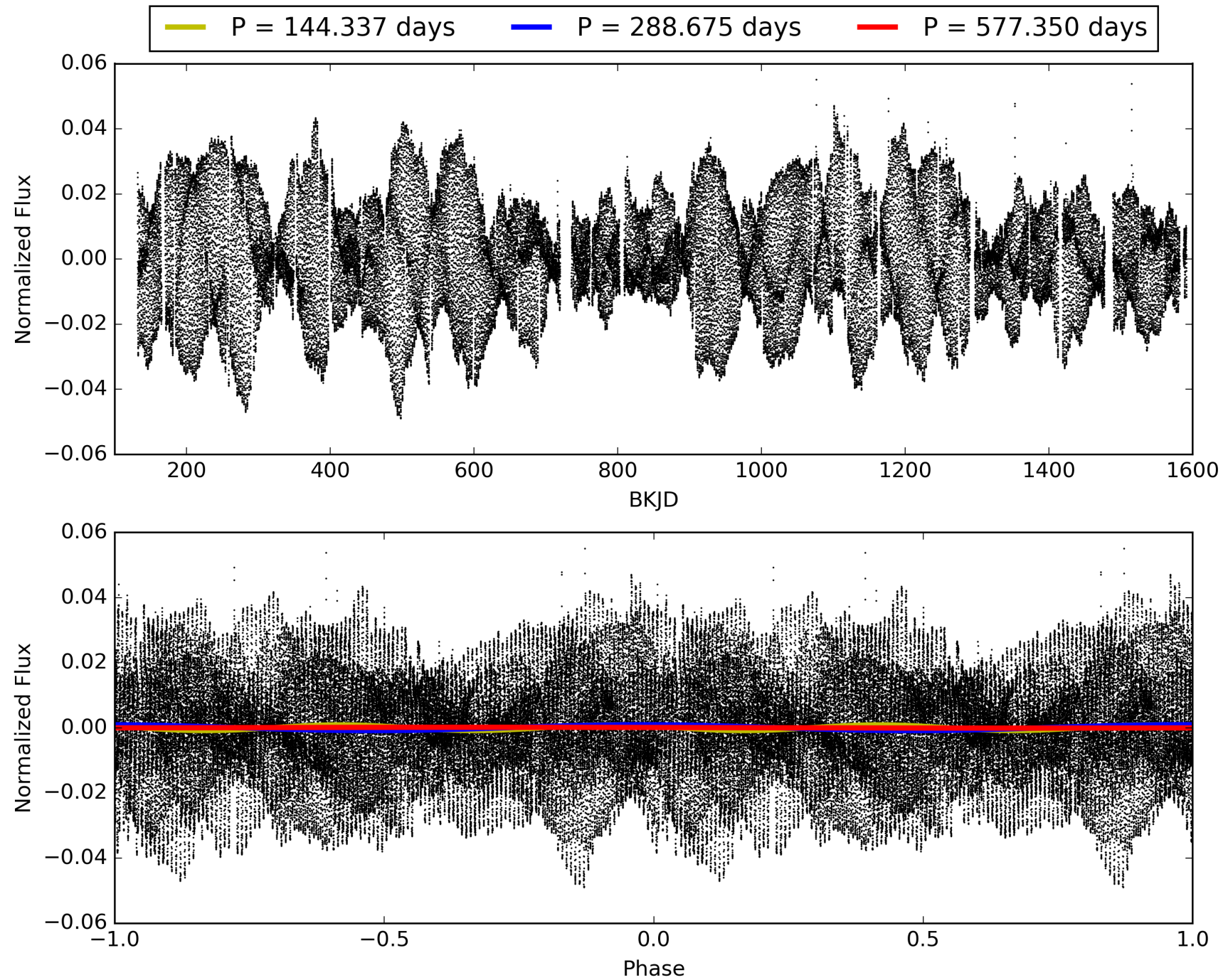
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 18:35:23 Z

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

TCE 009639455-05, PDC Light Curves

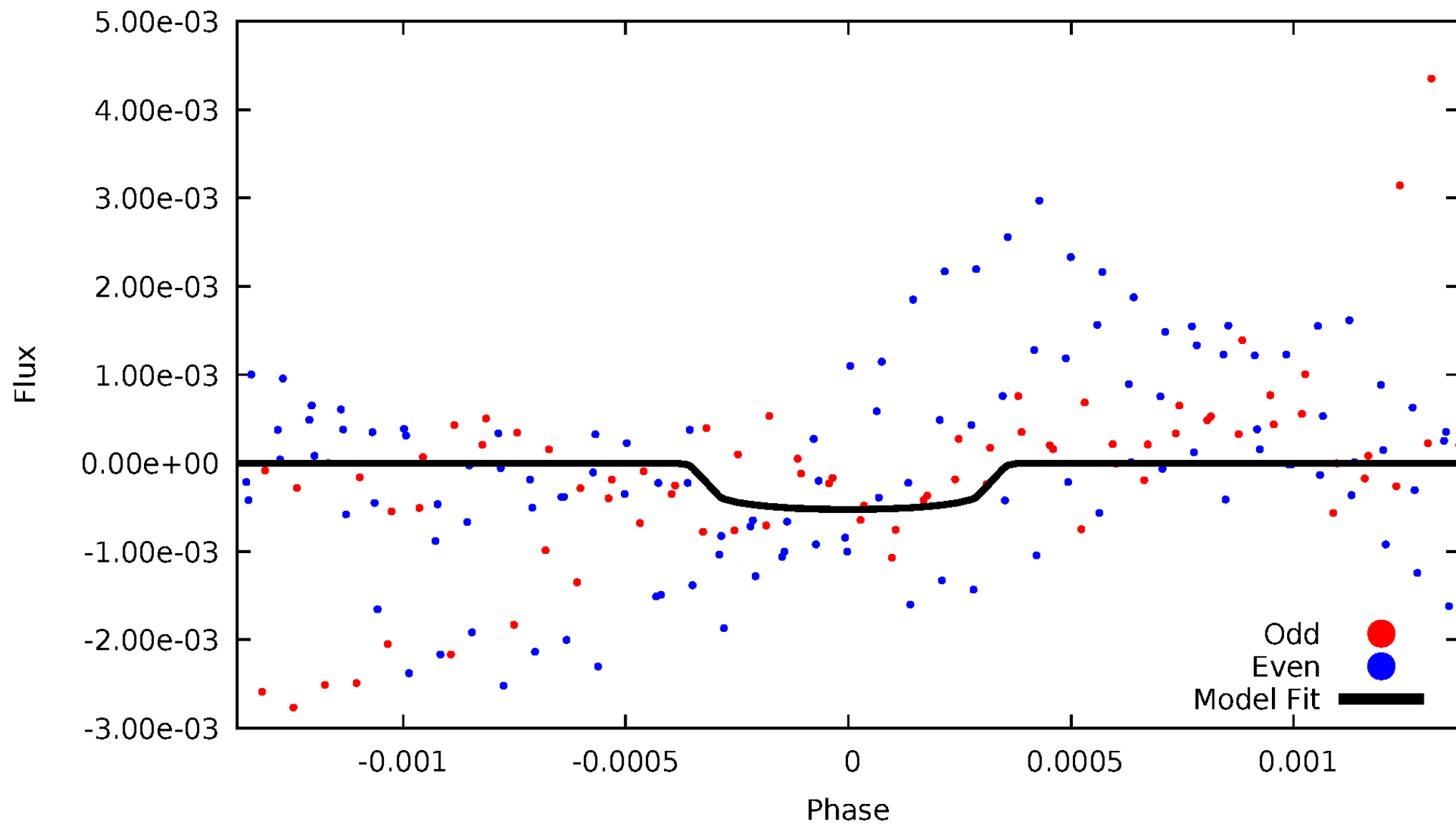


TCE 009639455-05



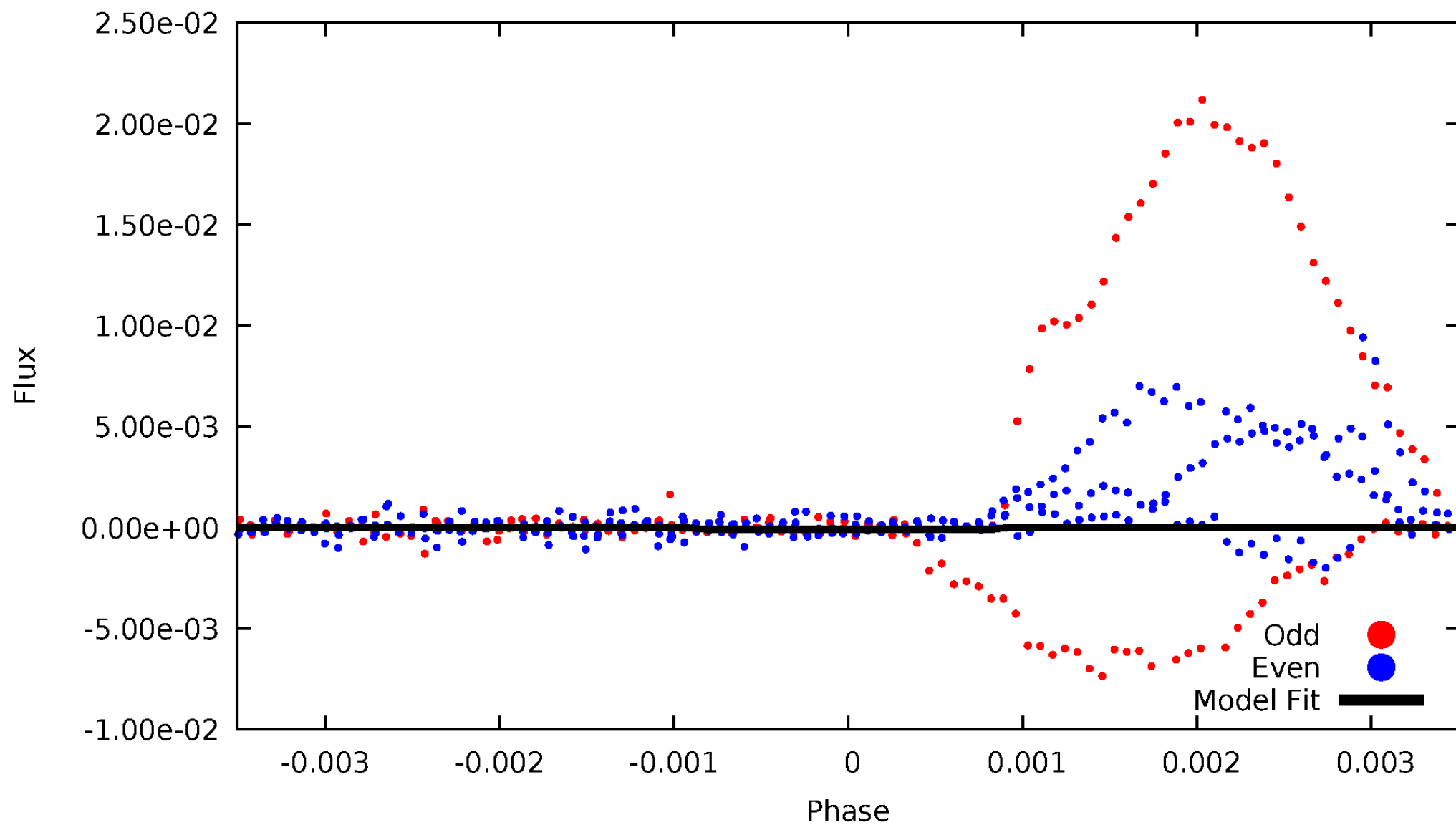
DV Odd/Even

TCE 009639455-05

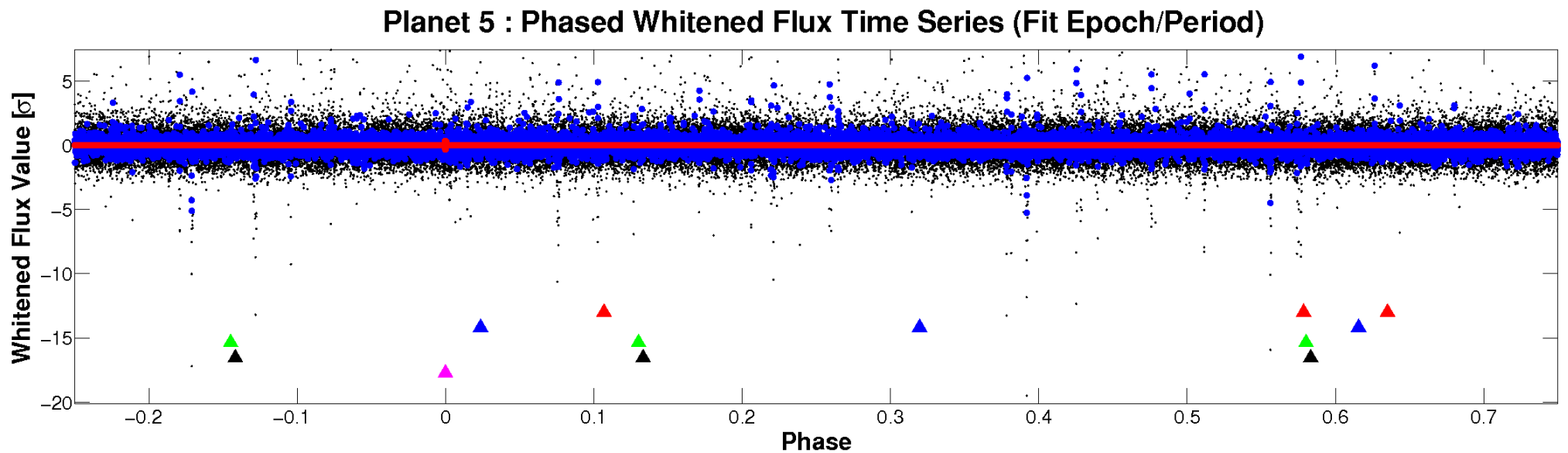
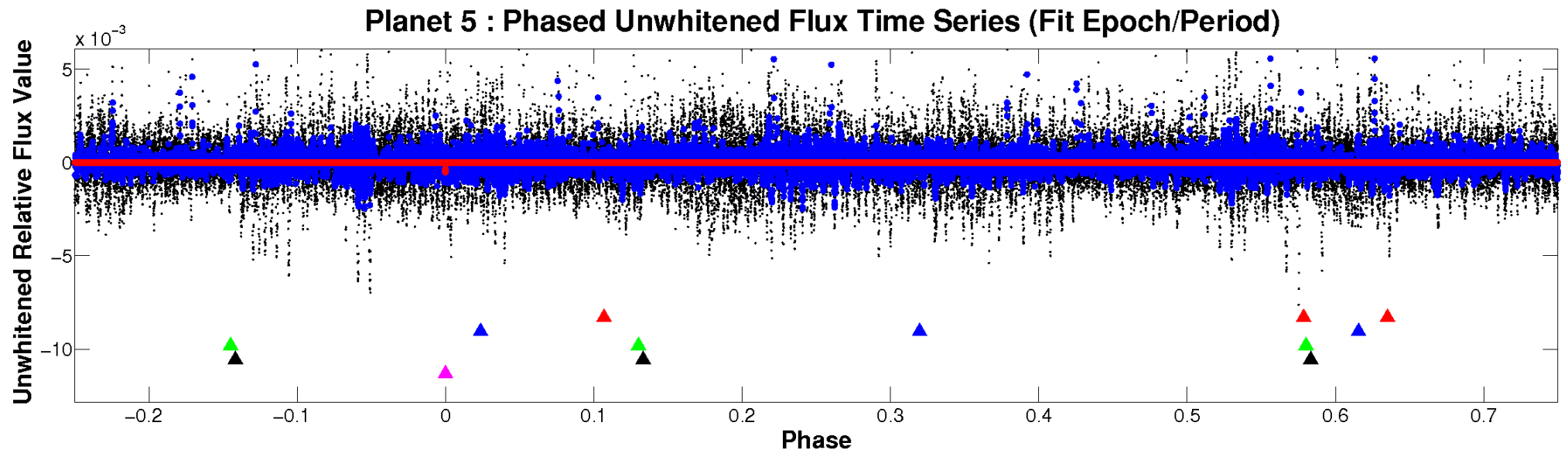


ALT Odd/Even

TCE 009639455-05

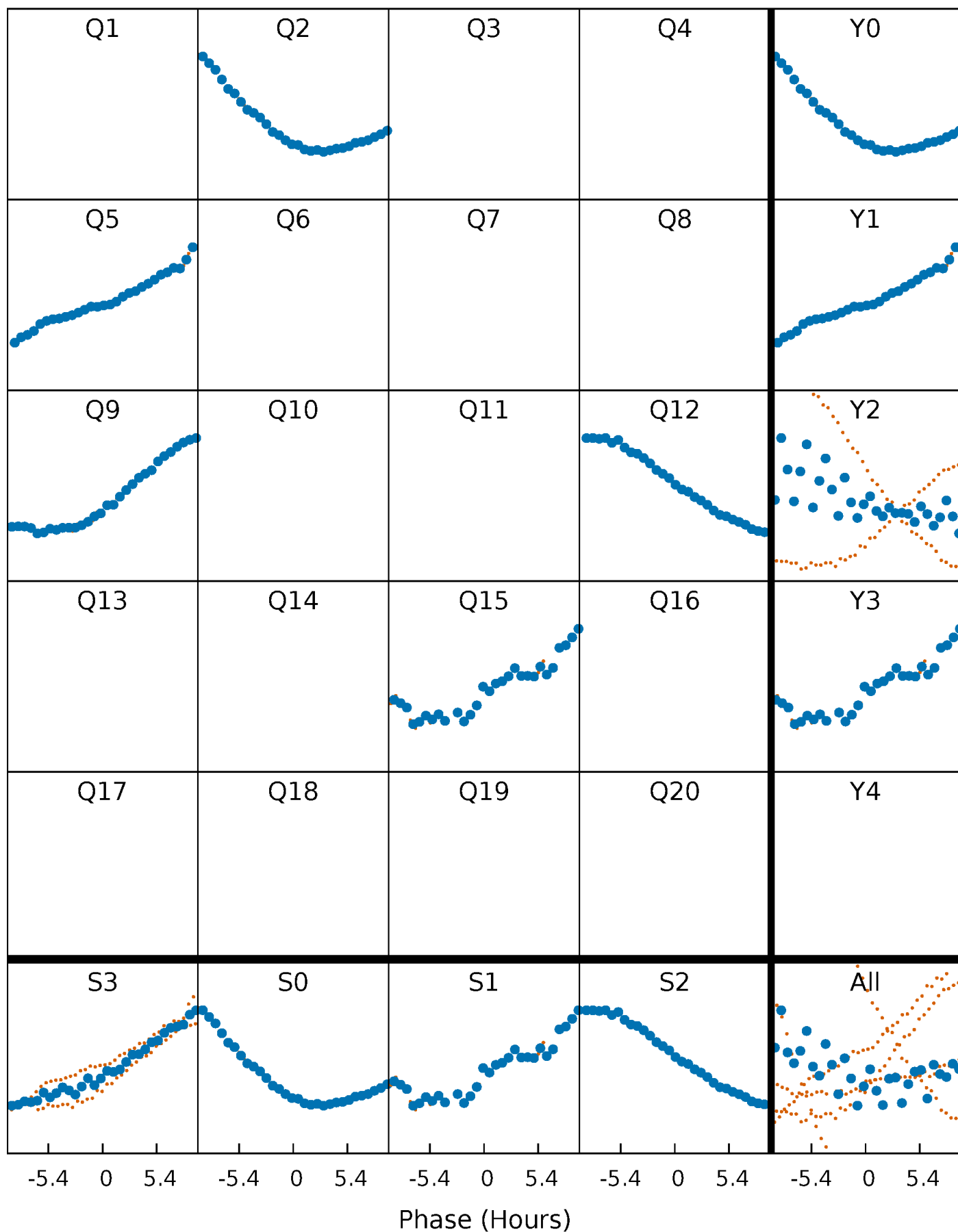


Non-Whitened Vs. Whitened Light Curve



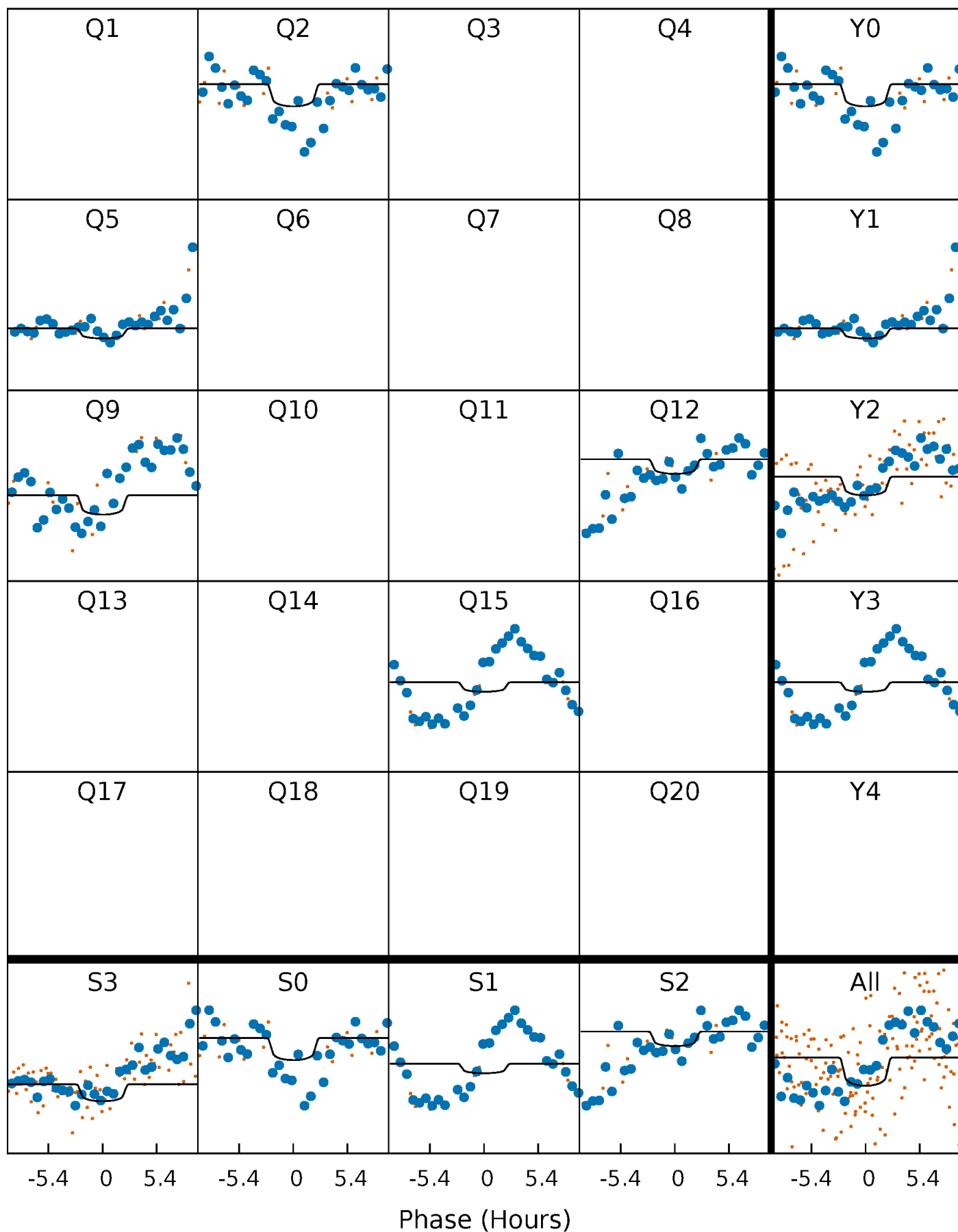
PDC Quarter-Phased Transit Curves

TCE 009639455-05 $P=288.674920$ Days $T_0=246.637083$ (BKJD)



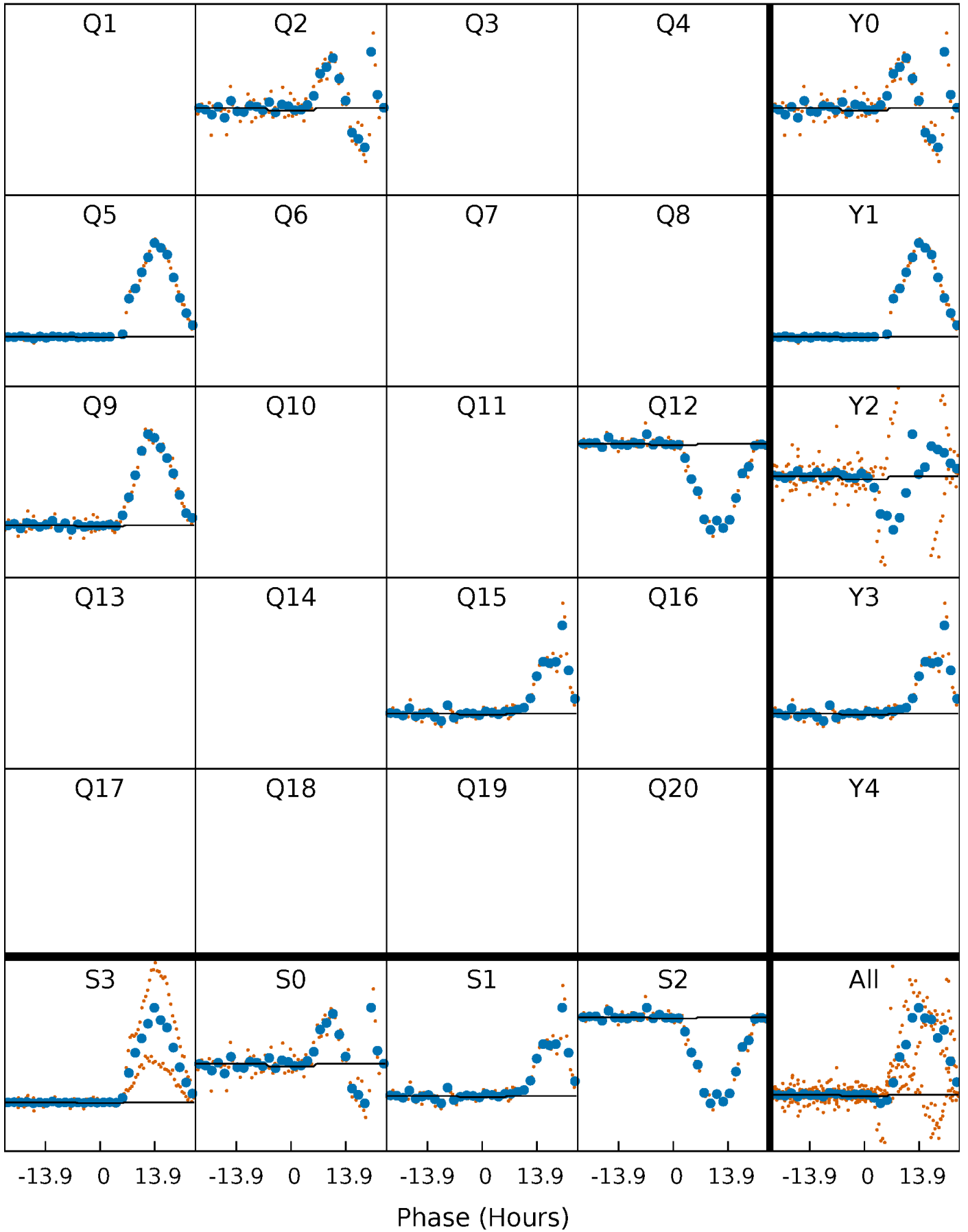
DV Quarter-Phased Transit Curves

TCE 009639455-05 $P=288.674920$ Days $T_0=246.637083$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

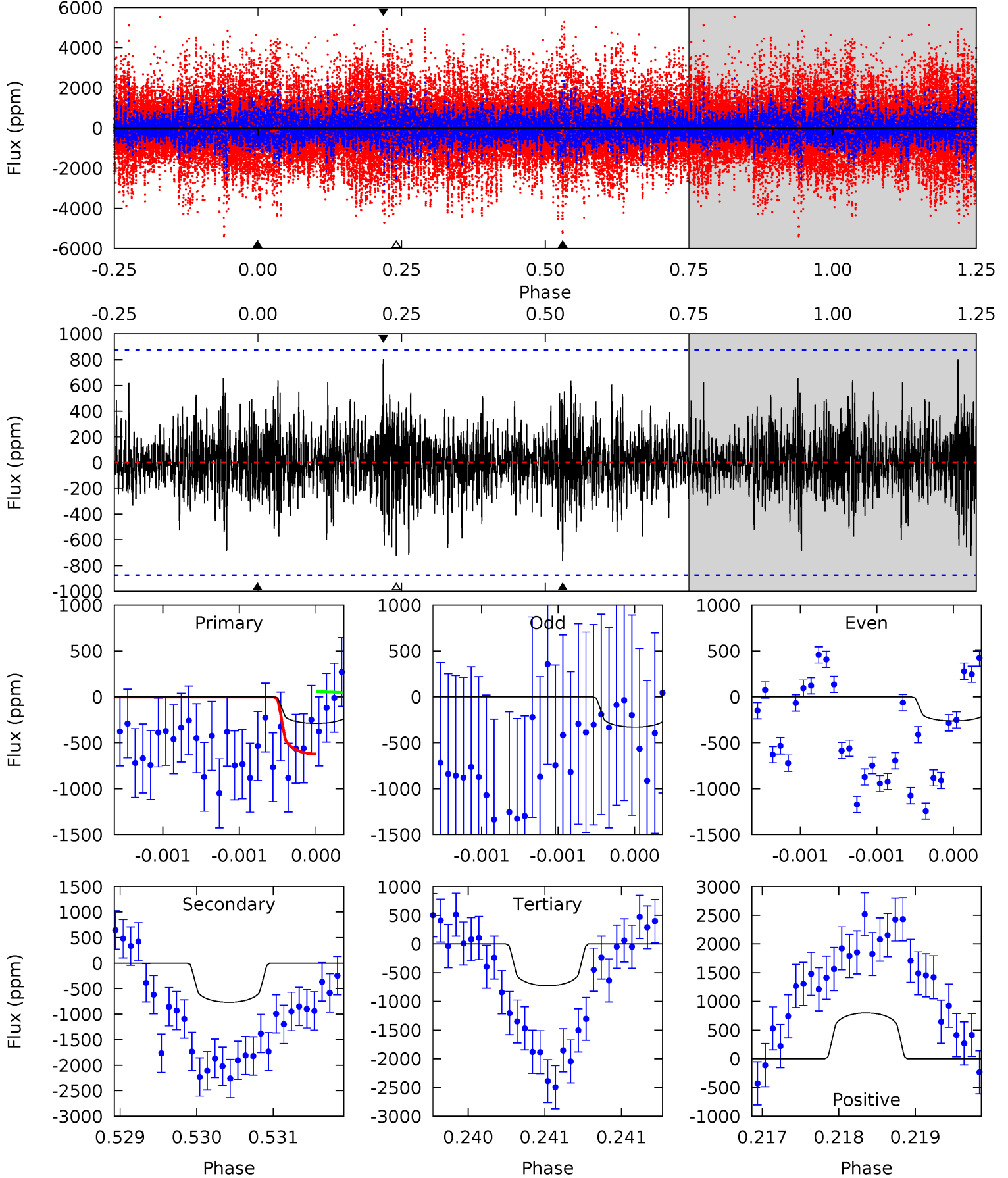
TCE 009639455-05 $P=288.644469$ Days $T_0=246.745437$ (BKJD)



DV Model-Shift Uniqueness Test

009639455-05, P = 288.674920 Days, E = 246.637083 Days

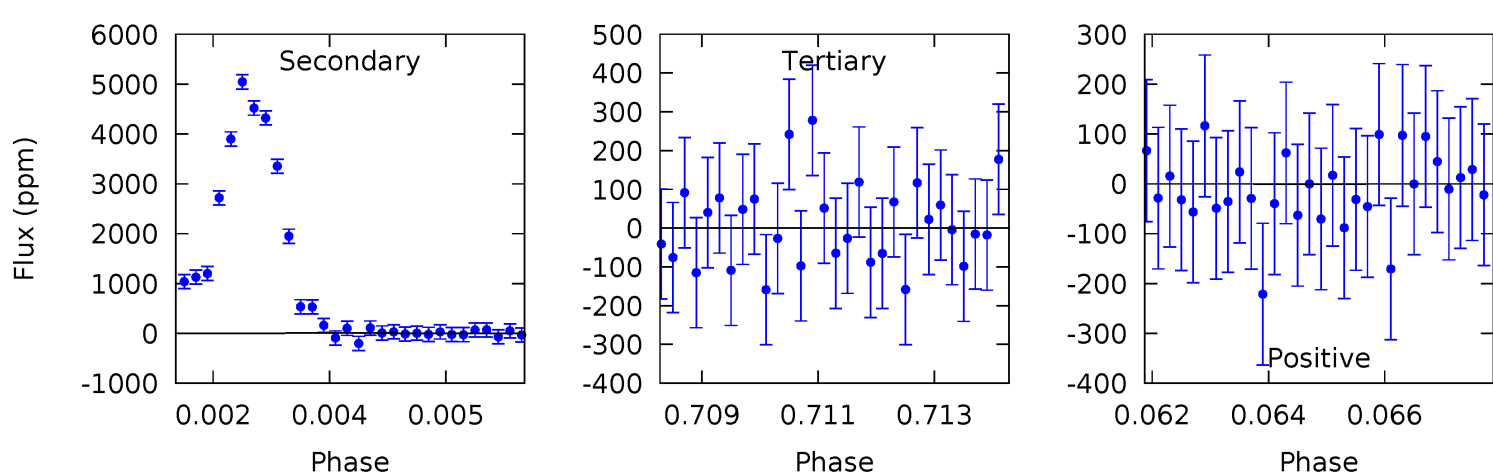
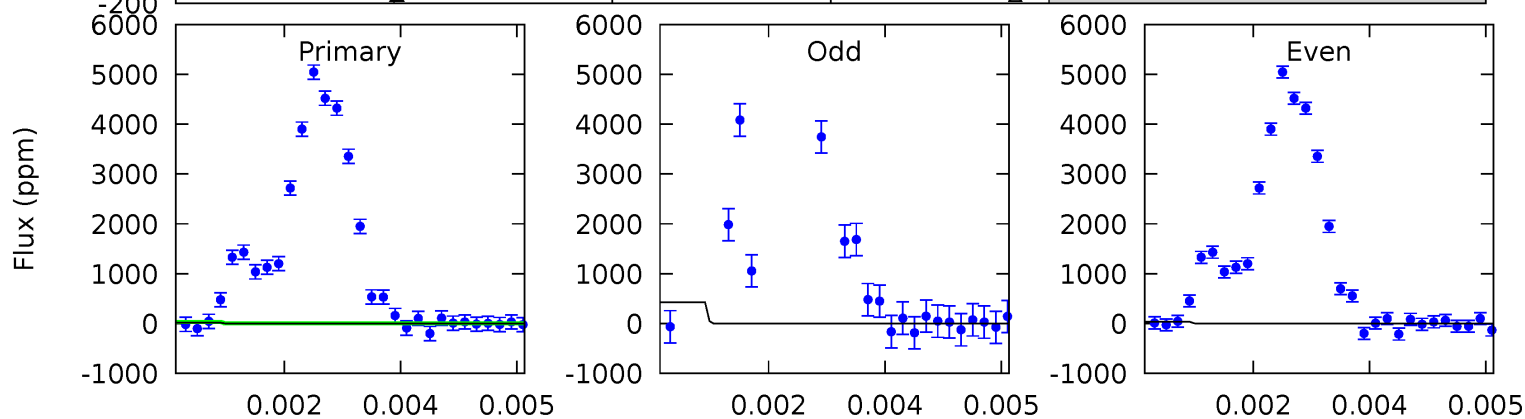
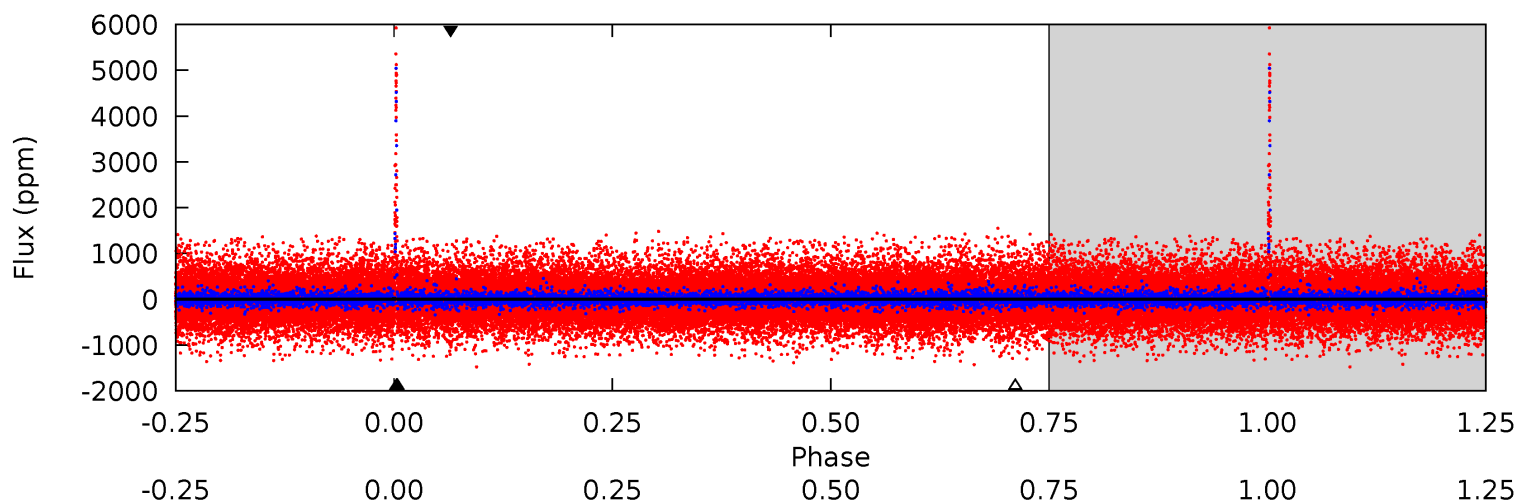
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.81	4.83	4.57	5.05	5.51	3.38	1.20	-2.76	-3.23	0.26	-0.22	0.20	1.26	0.51	1.80



Alt Model-Shift Uniqueness Test

009639455-05, P = 288.644469 Days, E = 246.745437 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.52	0.36	0.02	0.02	5.34	3.12	0.01	0.50	0.49	0.34	0.34	4.99	-7.94	0.04	0.42



Stellar Parameters For KIC 009639455

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6136^{+183}_{-201}	$4.418^{+0.090}_{-0.195}$	$-0.340^{+0.300}_{-0.300}$	$1.004^{+0.305}_{-0.131}$	$0.963^{+0.140}_{-0.102}$	$1.339^{+0.595}_{-0.659}$
	+3%/-3%	+2%/-4%	+88%/-88%	+30%/-13%	+15%/-11%	+44%/-49%
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 009639455-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-766 ± 159	$3.51^{+2.75}_{-2.30}$	417^{+31}_{-22}	5790^{+5181}_{-1271}	$23399^{+171217}_{-15790}$
Alt.	-12 ± 32	$2.55^{+2.47}_{-1.67}$	418^{+31}_{-24}	2774^{+1497}_{-6150}	333^{+5217}_{-1780}

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 $A_{obs} \gg 1.0$

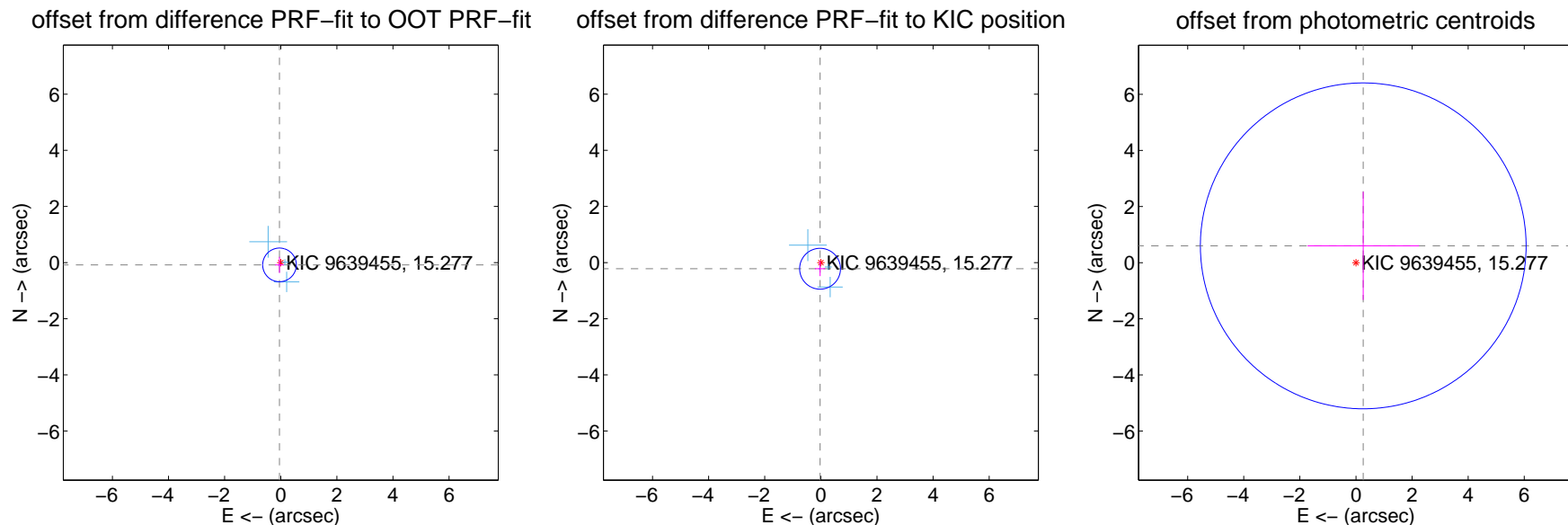
DV Centroid Data

Supplemental centroid analysis for 009639455-05. Kepler magnitude: 15.28. Transit SNR 2.37

There are 4 quarters with good PRF difference image offsets

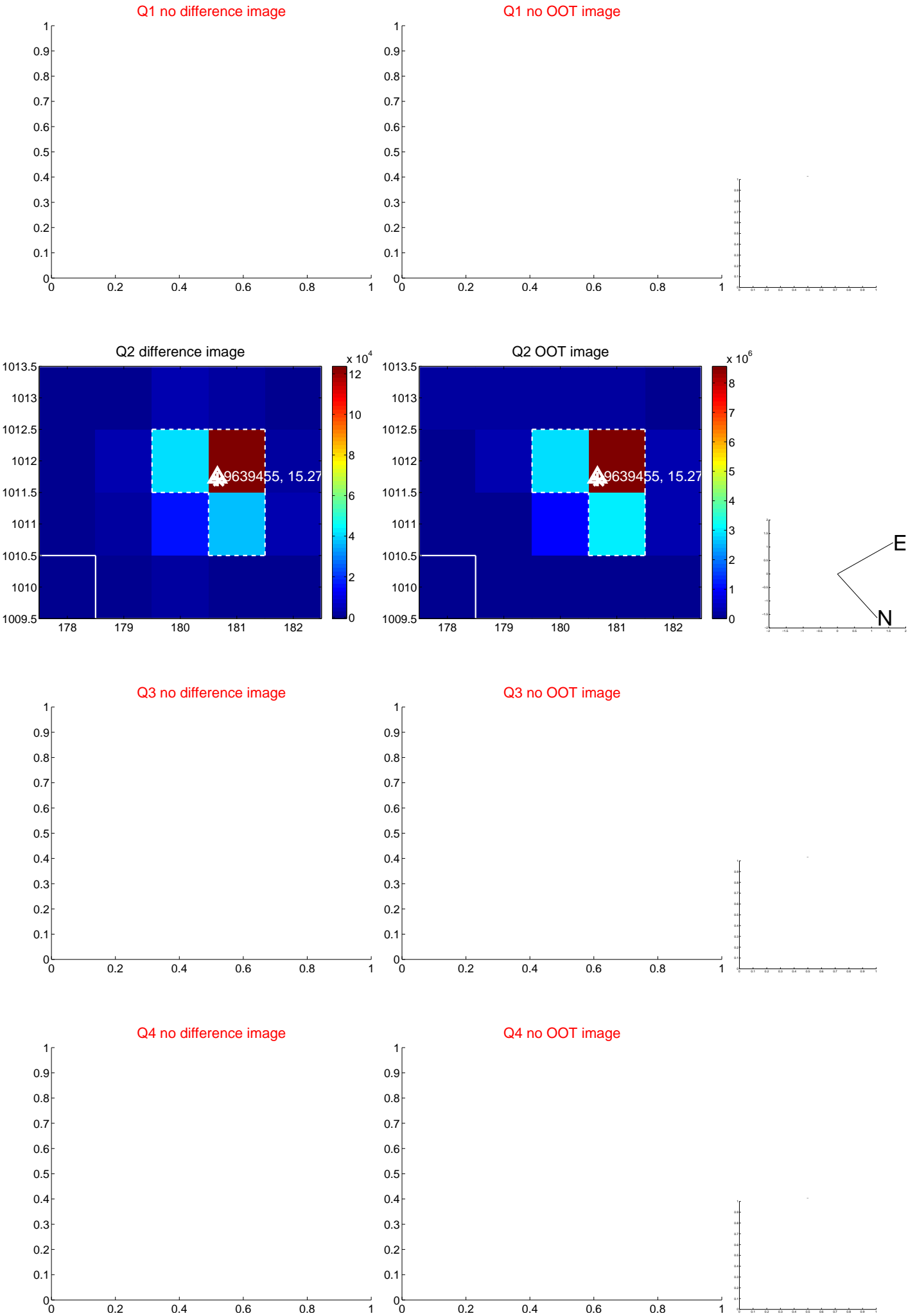
The direct PRF centroid is offset from the target star catalog position by about 0.12 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.093 ± 0.200	0.47	0.044 ± 0.151	-0.082 ± 0.287
PRF-fit source offset from KIC position	0.221 ± 0.243	0.91	0.029 ± 0.183	-0.219 ± 0.265
photometric centroid source offset	0.65 ± 1.94	0.34	-0.26 ± 1.99	0.60 ± 1.93

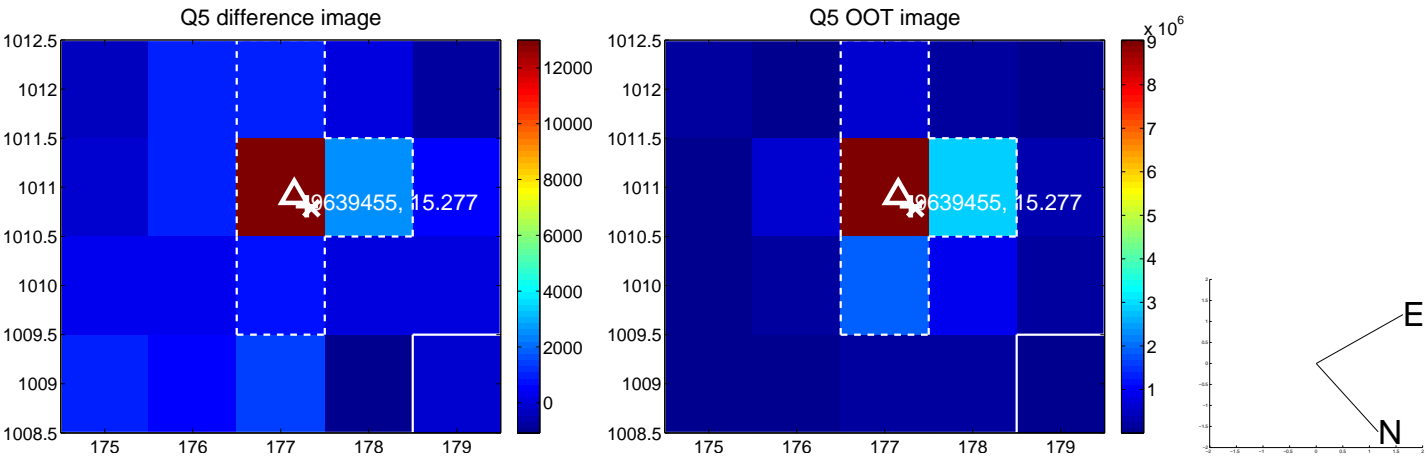


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

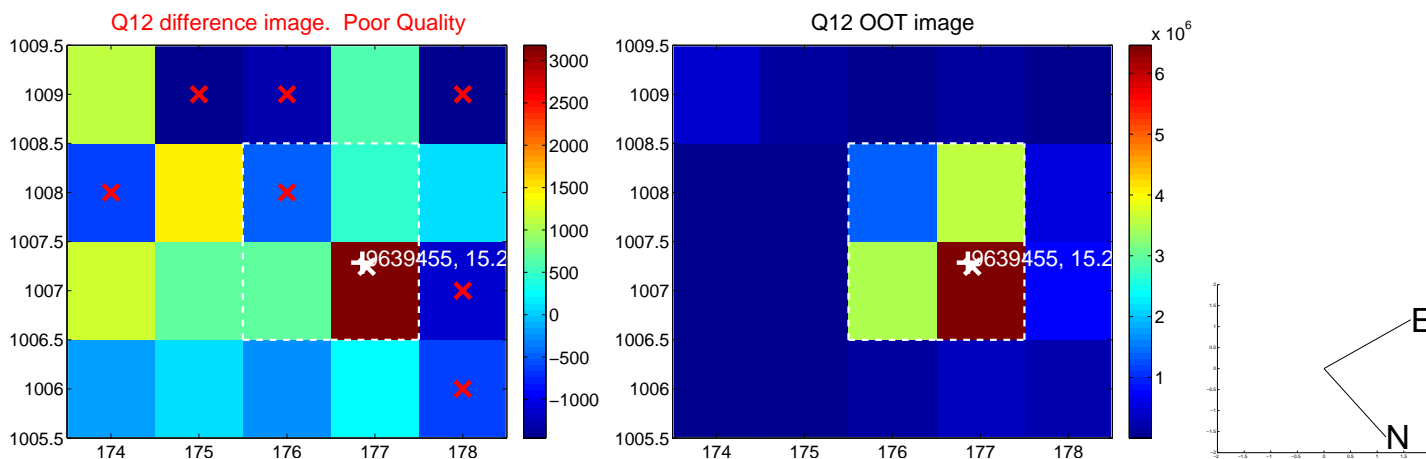
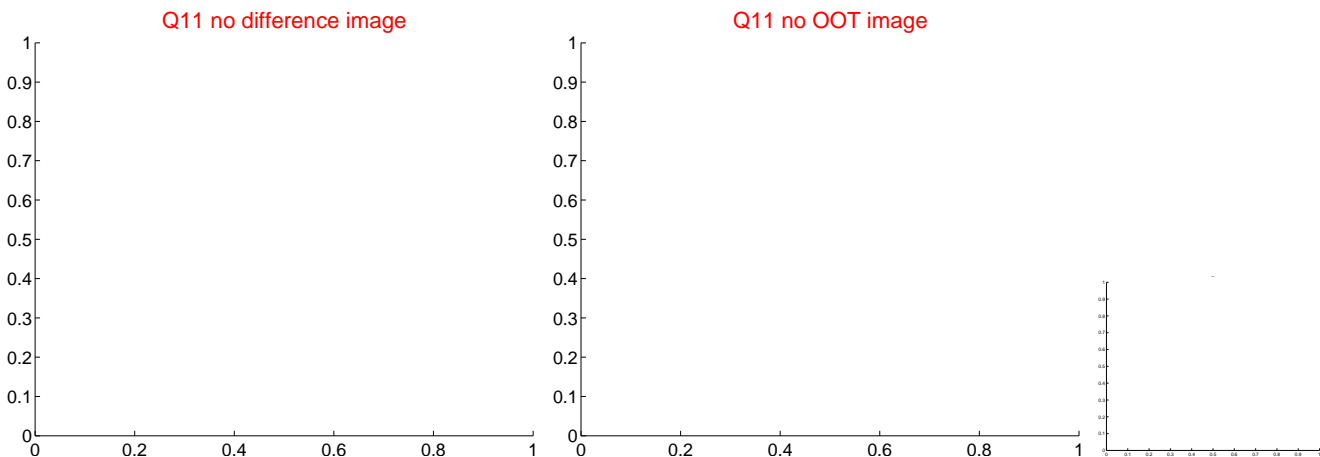
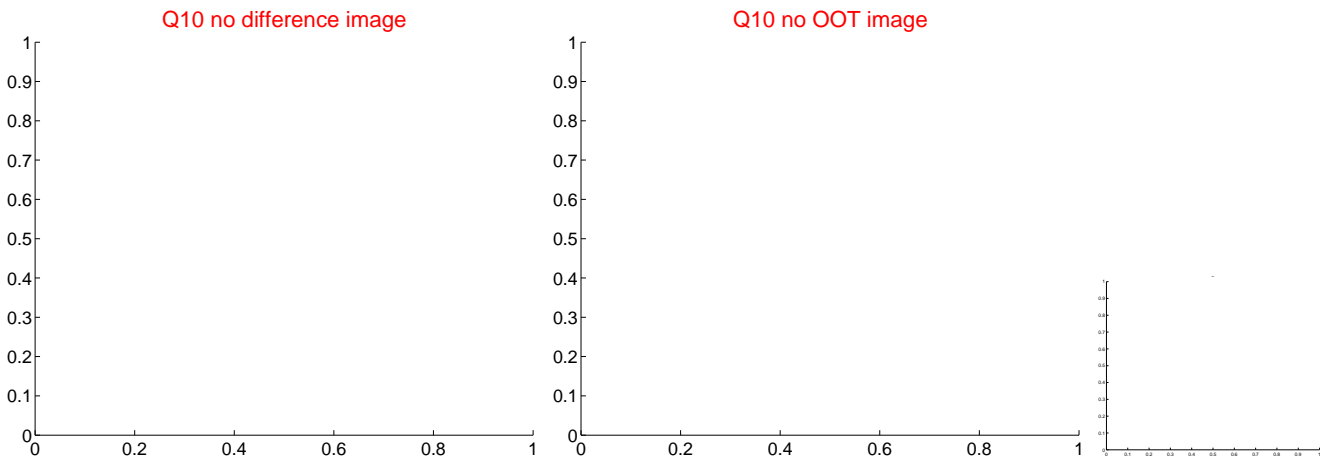
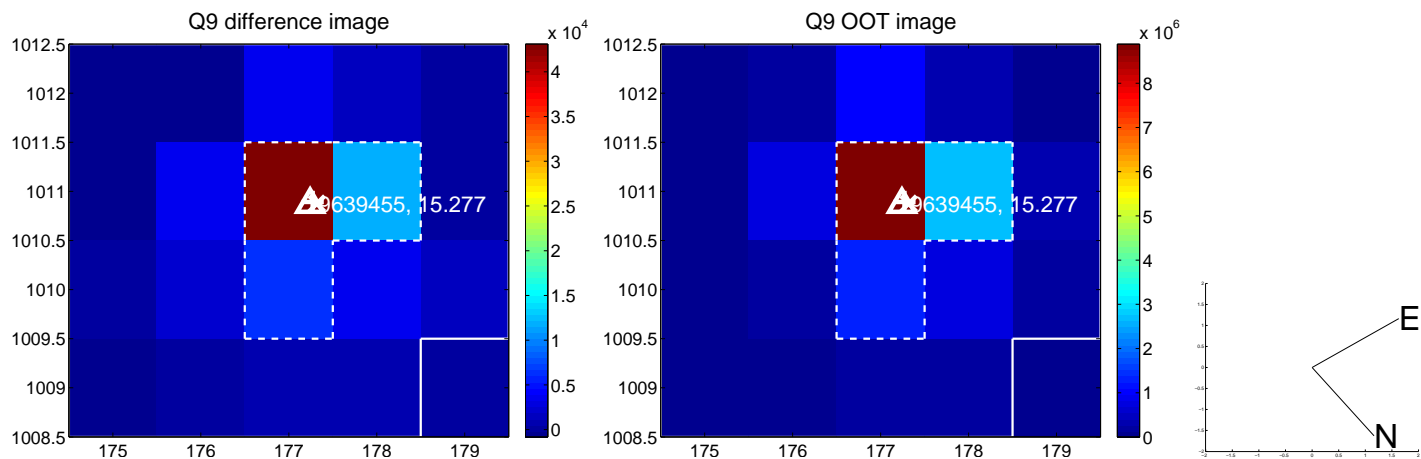
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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 ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.

Q13 no difference image



Q13 no OOT image



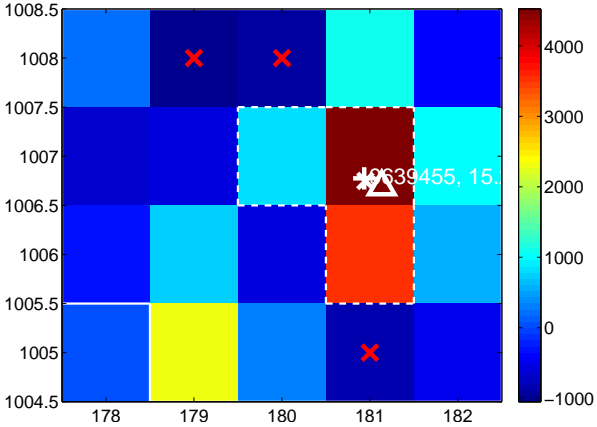
Q14 no difference image



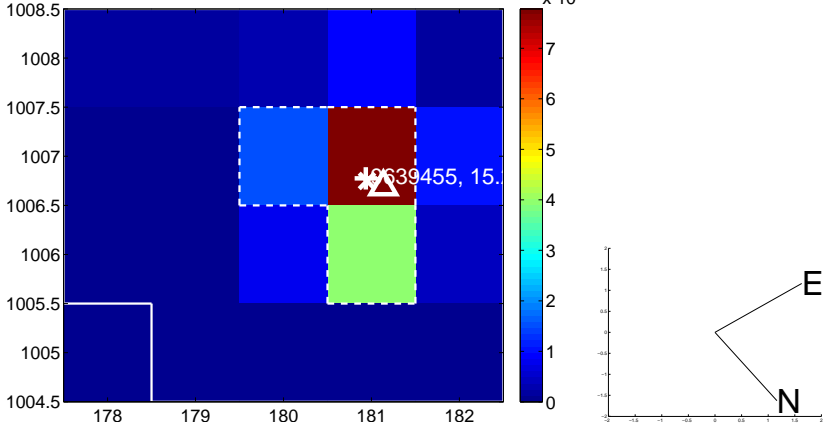
Q14 no OOT image



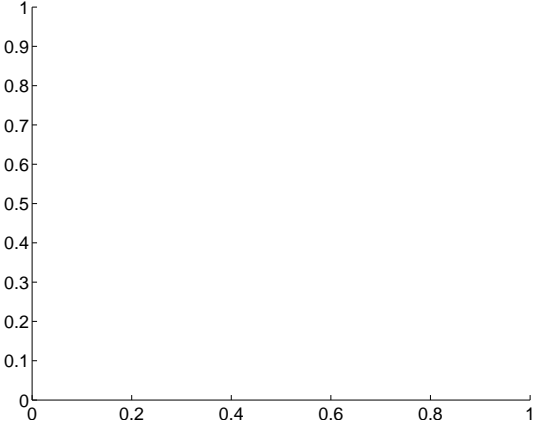
Q15 difference image



Q15 OOT image



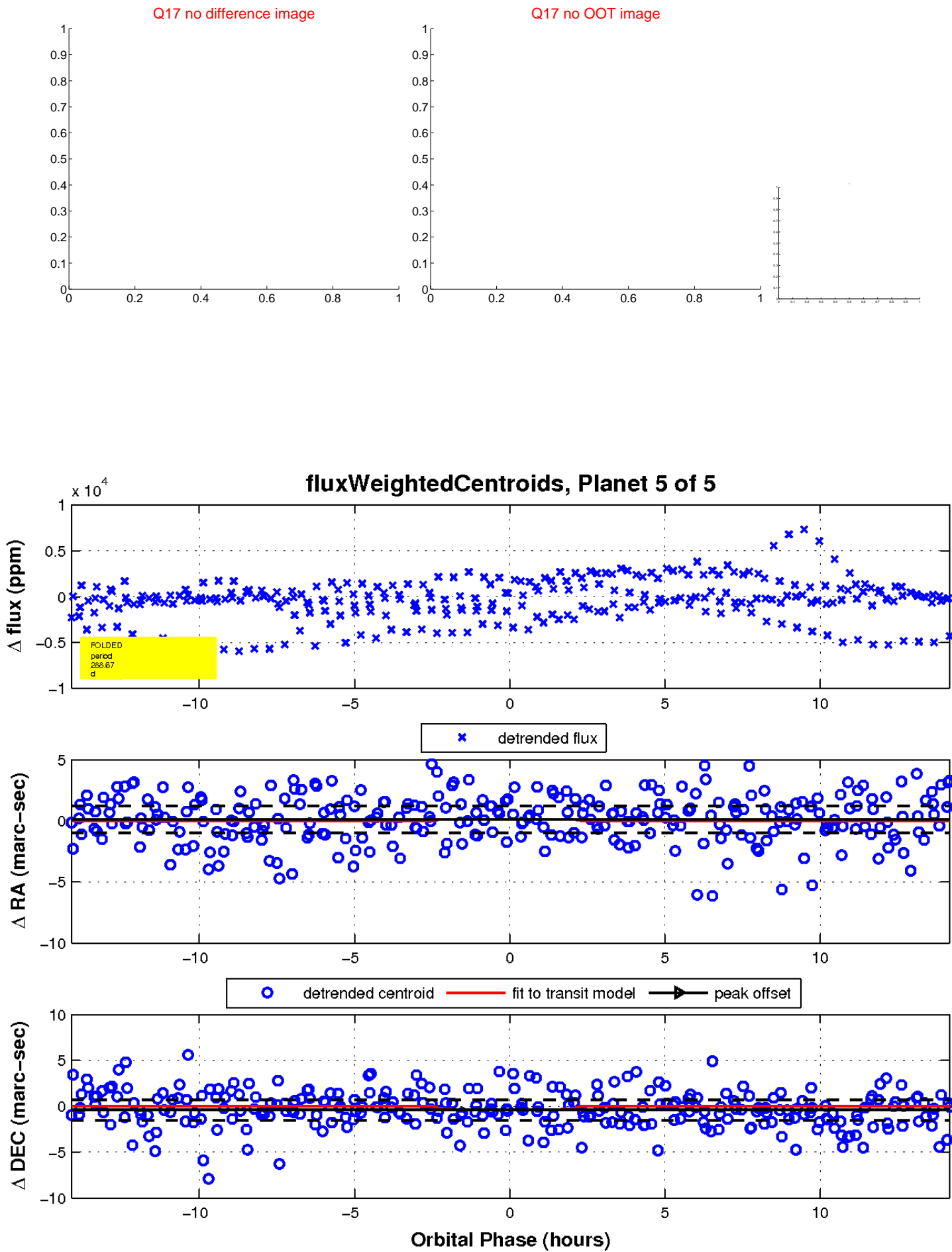
Q16 no difference image



Q16 no OOT image



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



UKIRT Image

Declination

