

KIC 007455287

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})
007455287-01	OBS	0886.01	8.010786	138.164049	962.8	4.139	28.9	30.9	0.47	3713	2.52	9.93
007455287-02	OBS	0886.02	12.071268	143.465132	499.4	5.521	16.5	16.9	0.47	3713	1.29	5.75
007455287-03	OBS	0886.03	20.995898	152.314956	644.0	3.180	12.4	13.7	0.47	3713	1.40	2.75
007455287-05	OBS	No	363.586111	403.540903	1453.8	20.429	8.0	7.9	0.47	3713	2.29	0.06
007455287-06	OBS	No	392.183710	372.382225	1599.8	18.049	8.0	9.4	0.47	3713	2.29	0.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007455287-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-03	OBS	PC	0.99	0	0	0	0	NO_COMMENT
007455287-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
007455287-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—CENT_FEW_DIFFS

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.

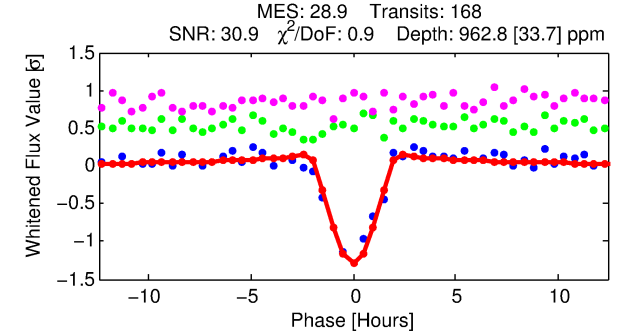
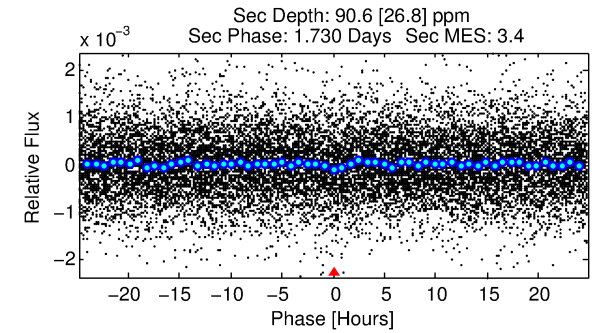
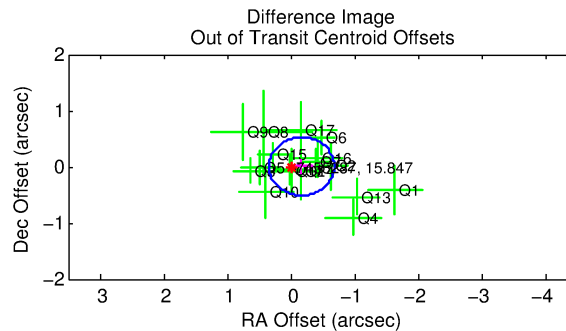
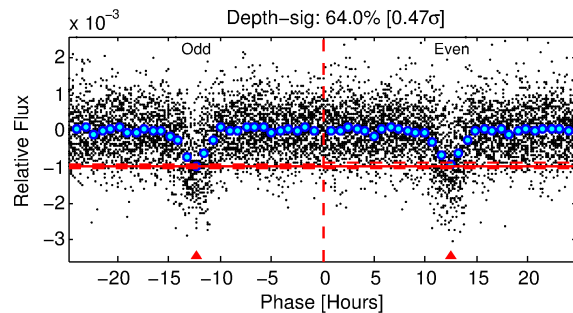
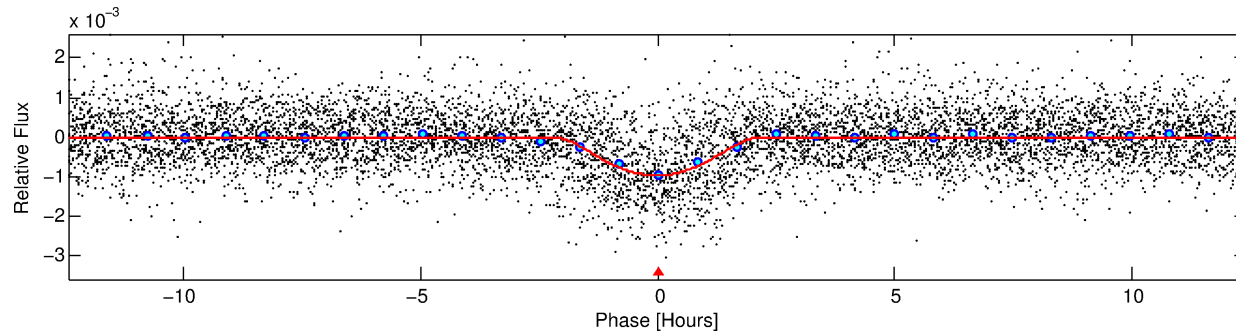
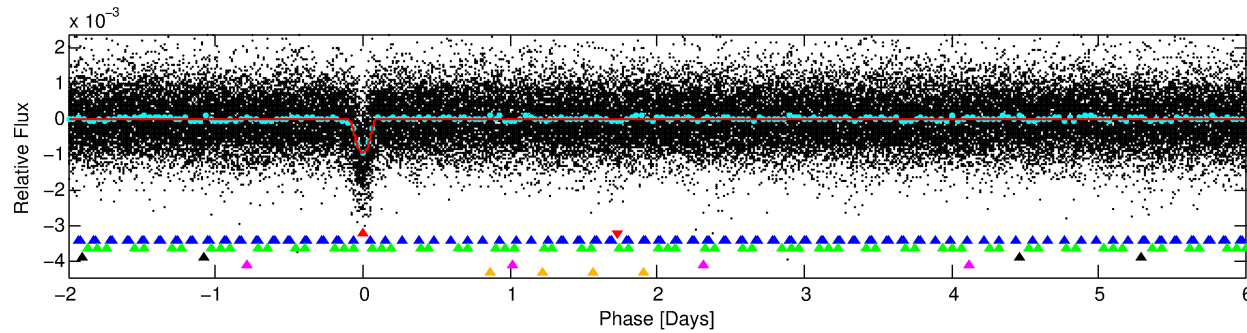
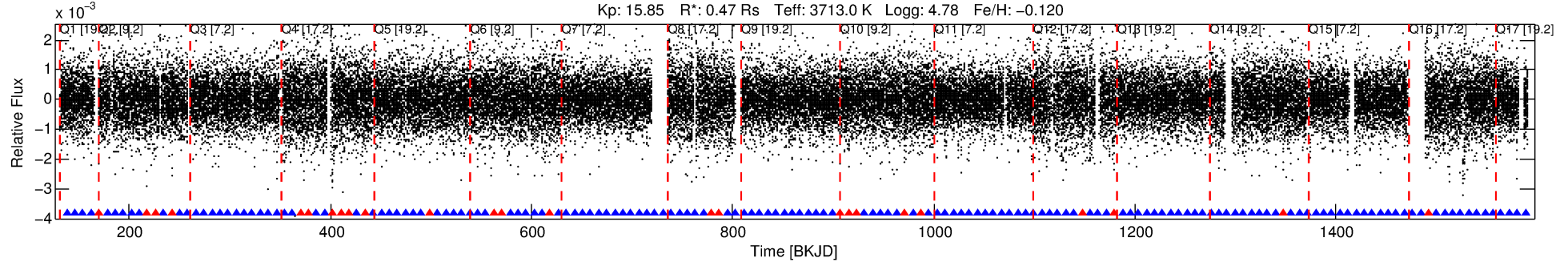
Ephemeris Match Information For 007455287-01

No Significant Match Found

DV One-Page Summary

KIC: 7455287 Candidate: 1 of 6 Period: 8.011 d
KOI: K00886.01 Name: Kepler-54b Corr: 0.883

Kp: 15.85 R*: 0.47 Rs Teff: 3713.0 K Logg: 4.78 Fe/H: -0.120



DV Fit Results:

Period = 8.01079 [0.00003] d
Epoch = 138.1640 [0.0029] BKJD
Rp/R* = 0.0491 [0.0367]
a/R* = 5.29 [1.11]
b = 0.99 [0.06]
Seff = 9.93 [1.57]
Teq = 453 [18] K
Rp = 2.52 [1.90] Re
a = 0.0615 [0.0056] AU
Ag = 29.79 [45.54] [0.63σ]
Teffp = 1635 [624] K [1.89σ]

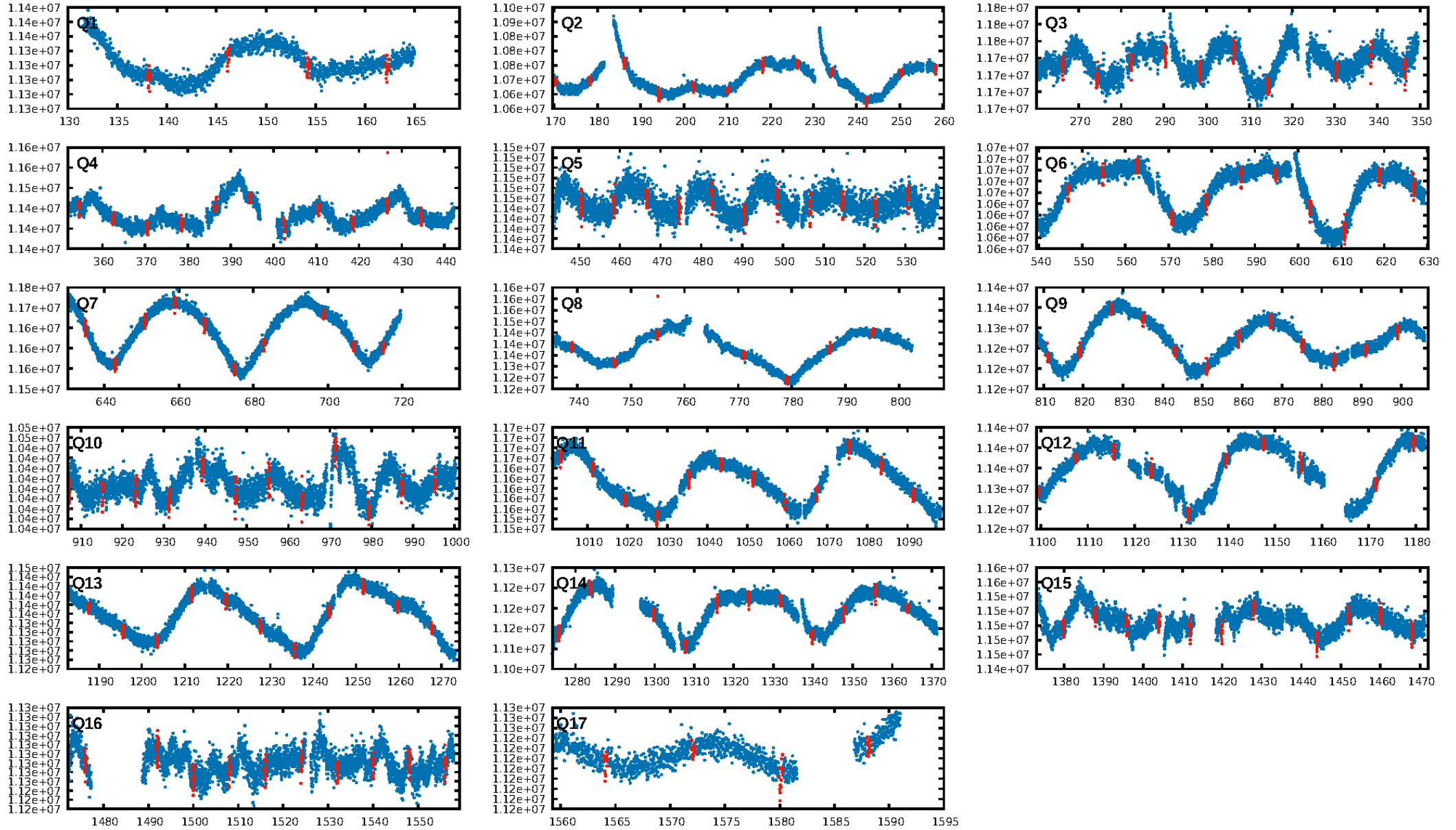
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [14.12σ]
ModelChiSquare2-sig: 100.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 3.16e-172
RollingBand-fgt: 0.84 [135/160]
GhostDiagnostic-chr: 9.915
Centroid-sig: 70.8%
Centroid-so: 0.436 arcsec [1.04σ]
OotOffset-rm: 0.168 arcsec [0.98σ]
KicOffset-rm: 0.295 arcsec [1.77σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 0.94 [16/17]
DiffImageOverlap-fno: 1.00 [17/17]

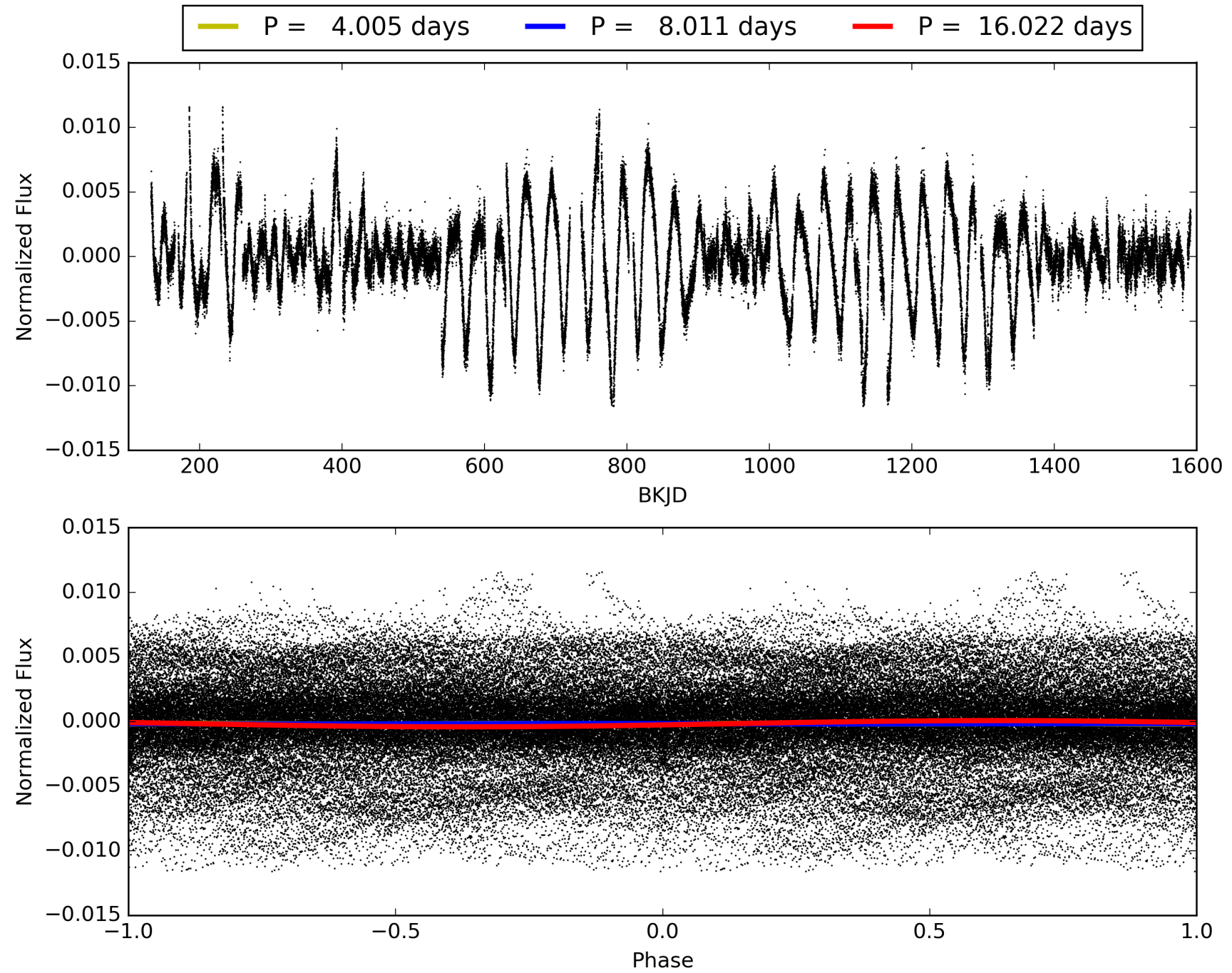
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:00:08 Z

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

TCE 007455287-01, PDC Light Curves

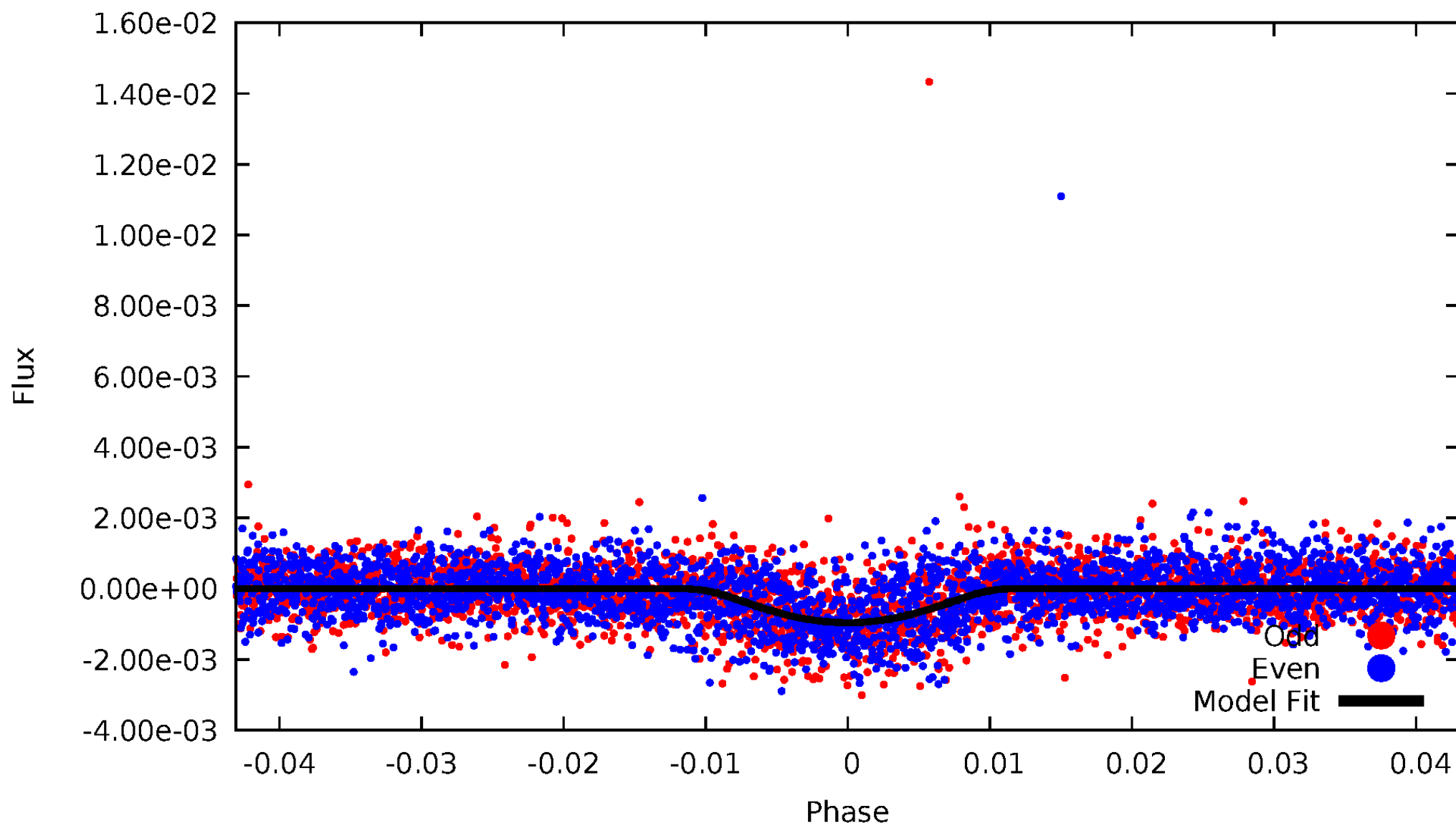


TCE 007455287-01



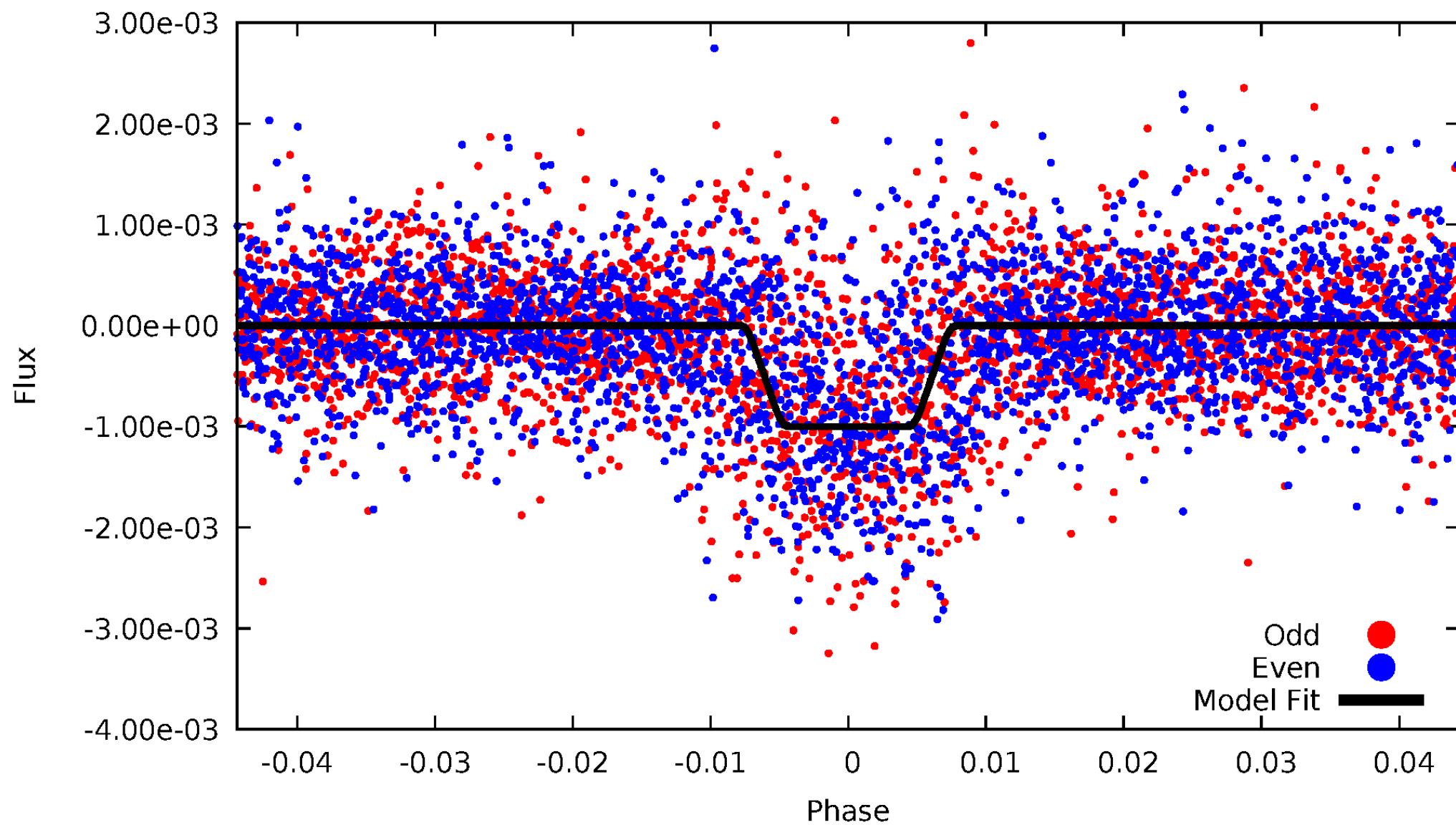
DV Odd/Even

TCE 007455287-01



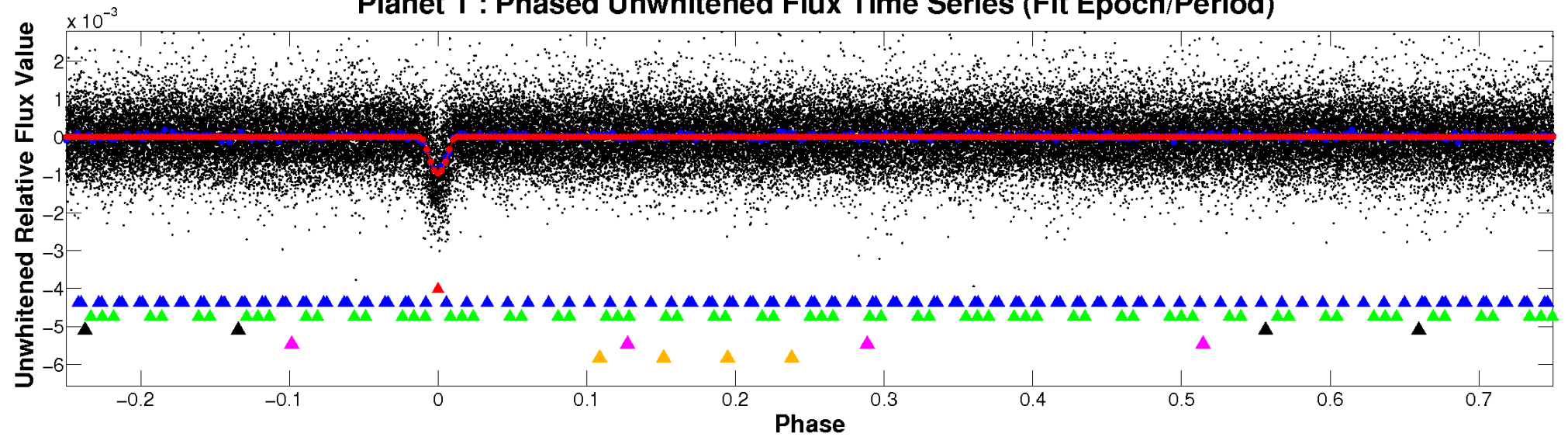
ALT Odd/Even

TCE 007455287-01

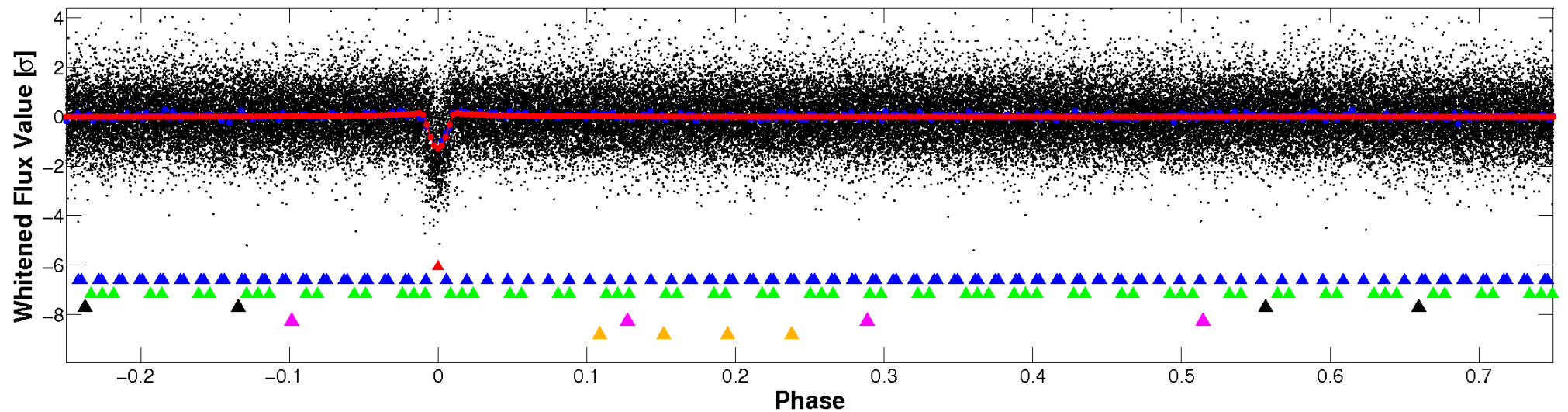


Non-Whitened Vs. Whitened Light Curve

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

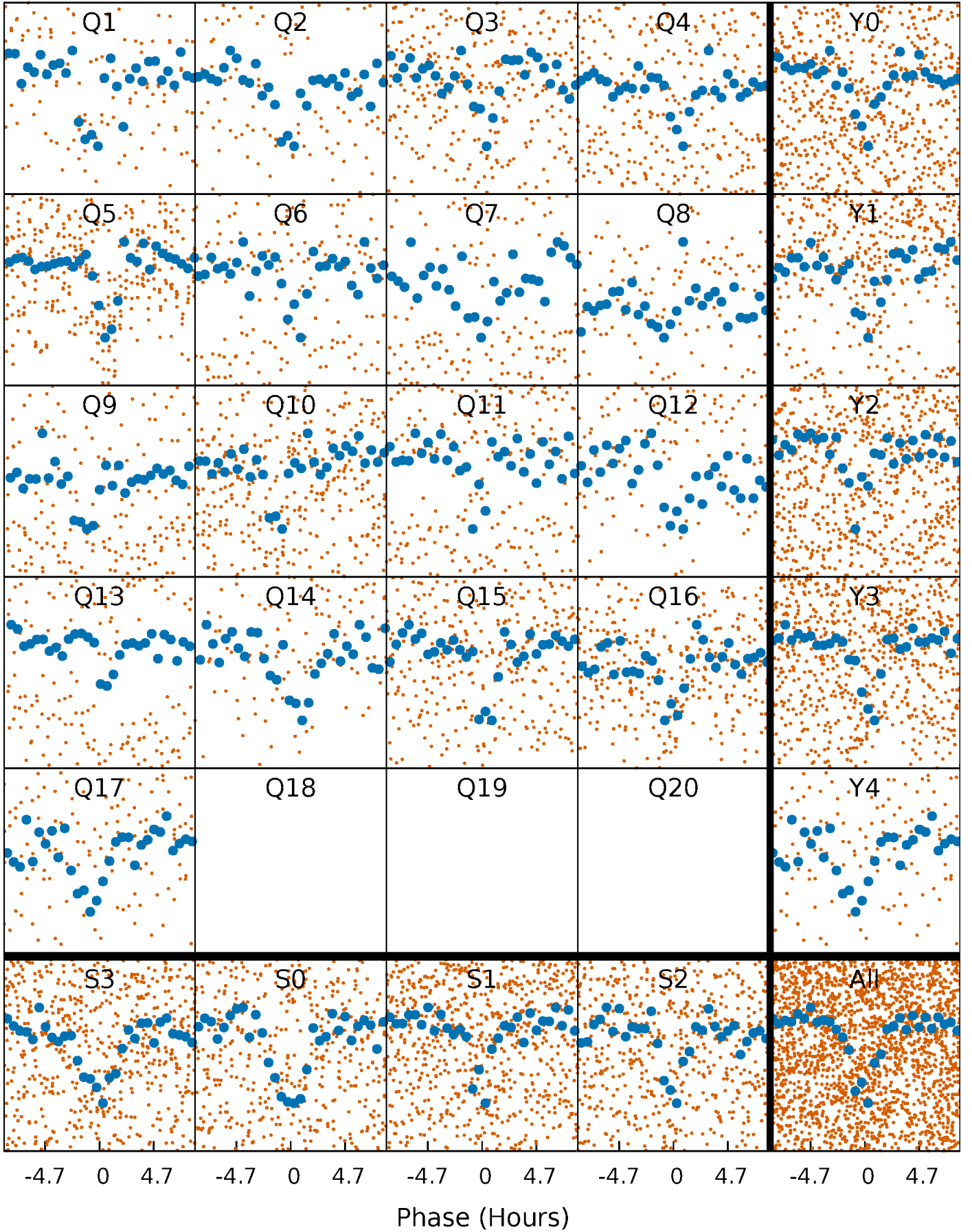


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



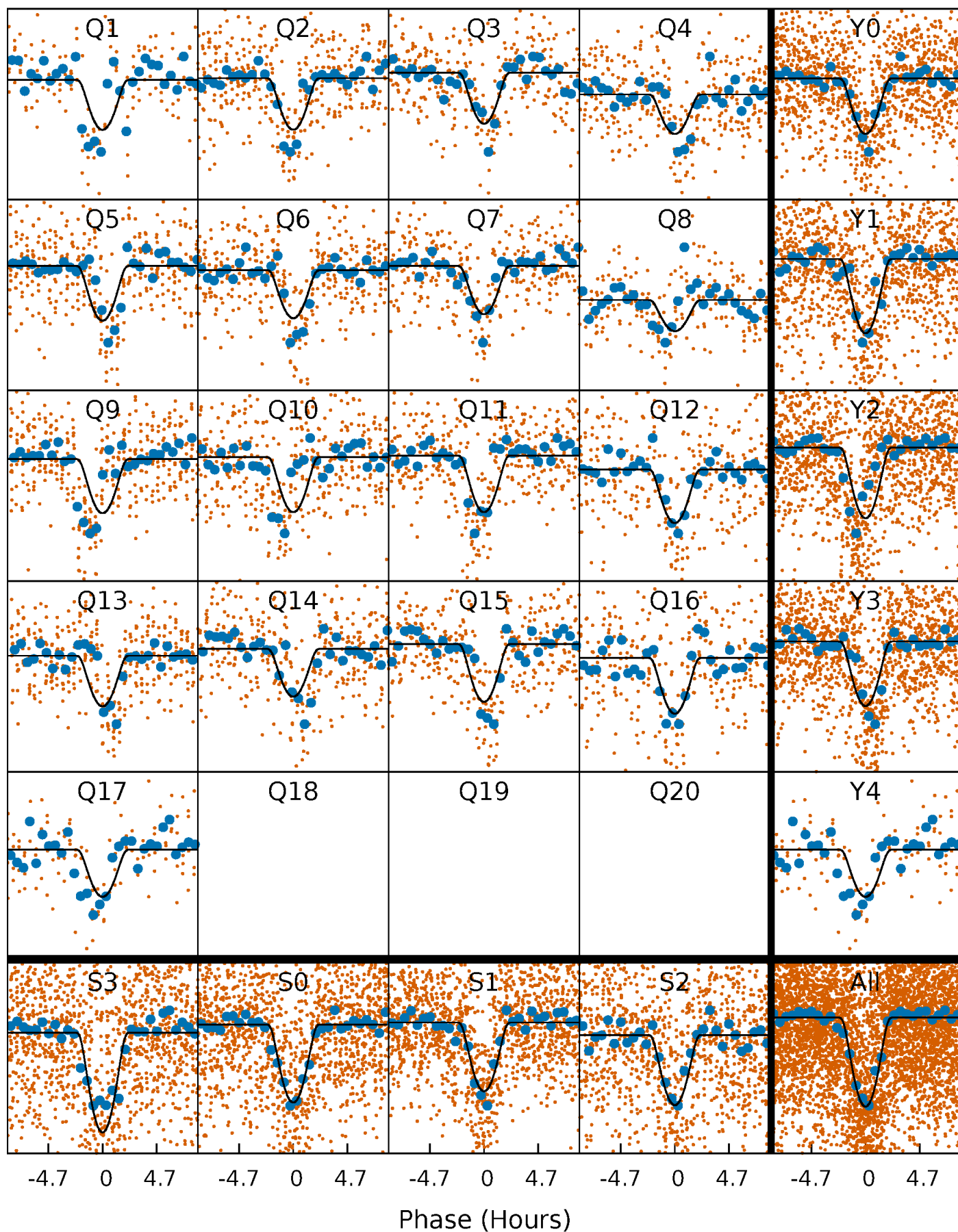
PDC Quarter-Phased Transit Curves

TCE 007455287-01 P= 8.010786 Days $T_0=138.164049$ (BKJD)



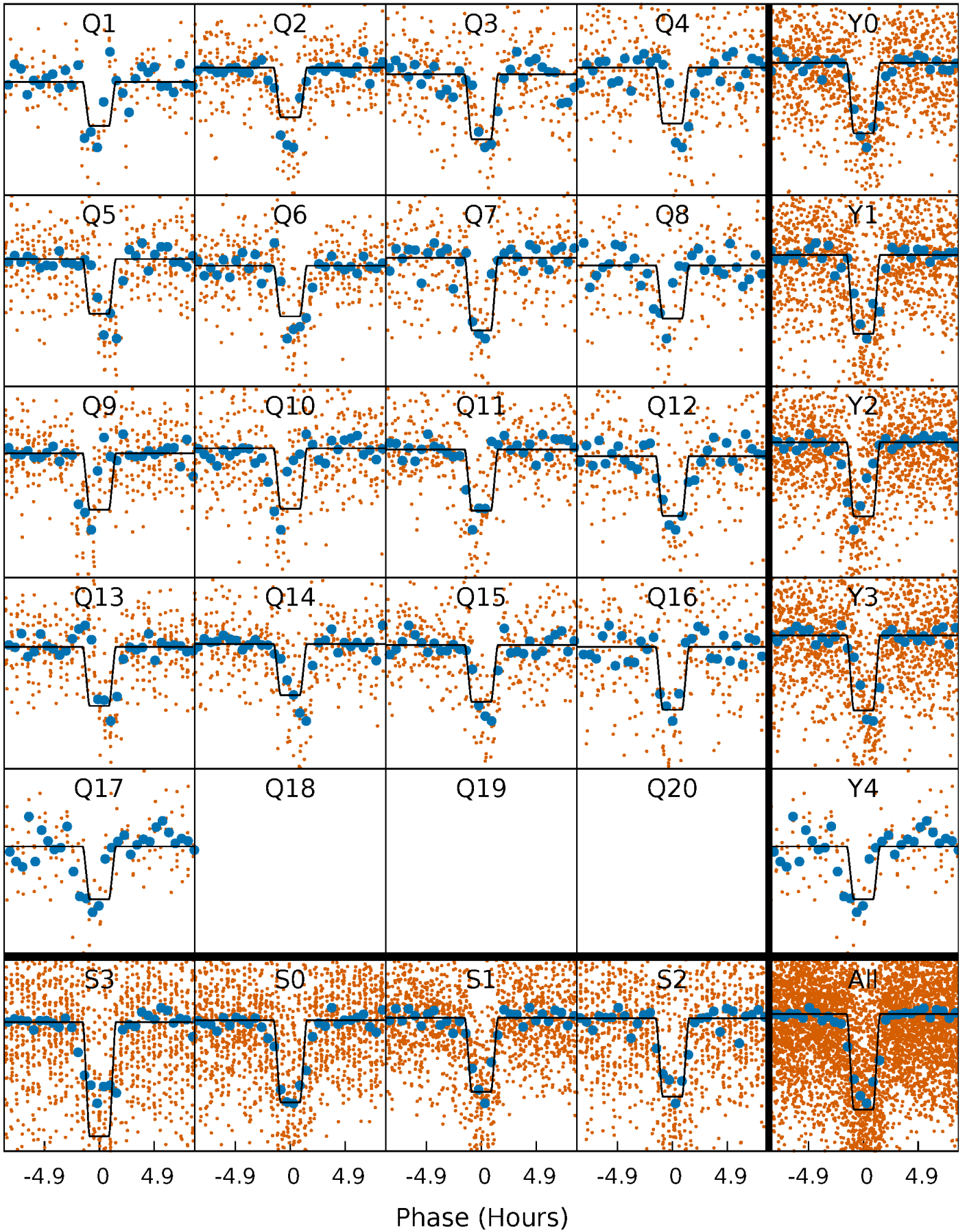
DV Quarter-Phased Transit Curves

TCE 007455287-01 P= 8.010786 Days $T_0=138.164049$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

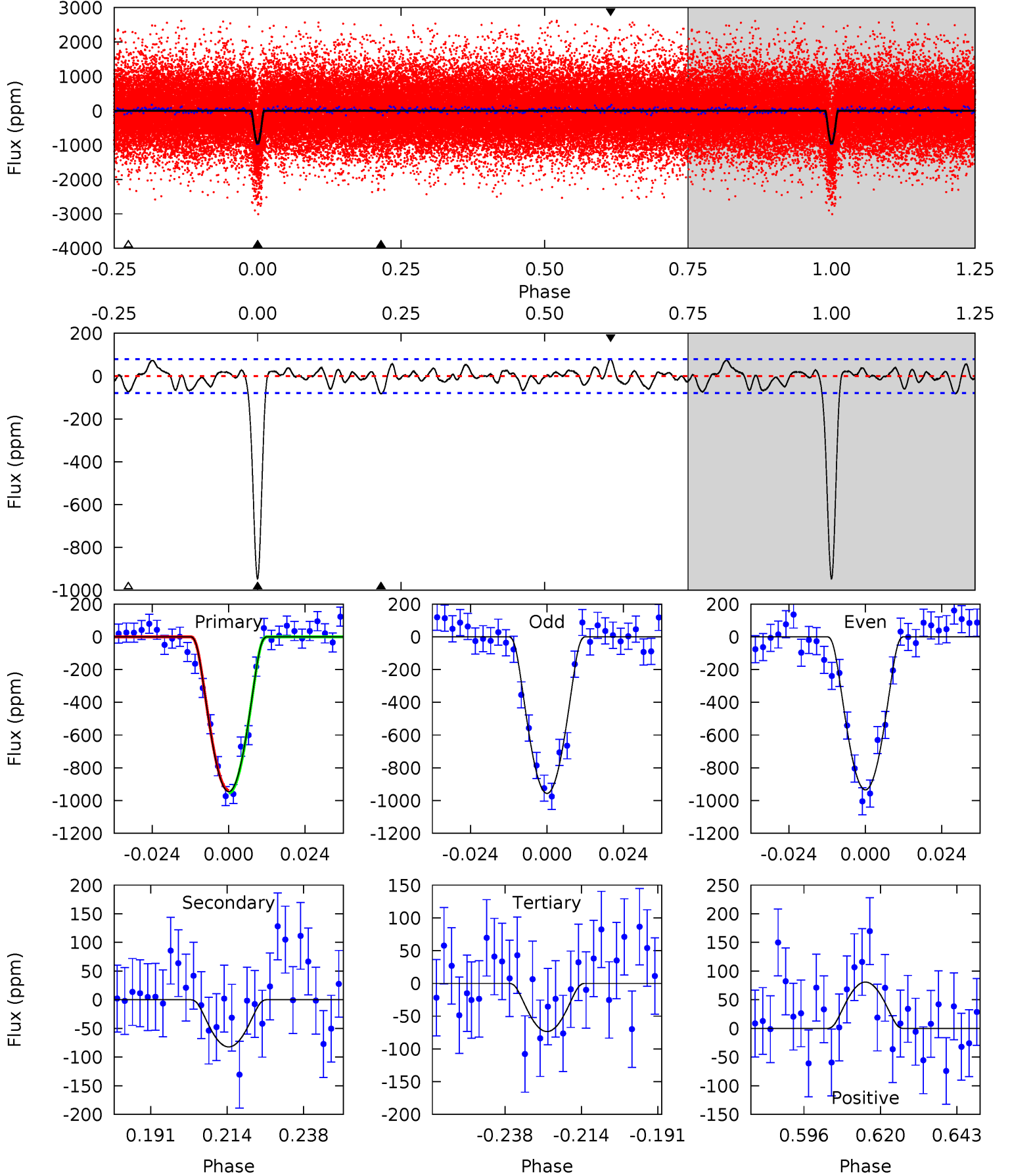
TCE 007455287-01 P= 8.010841 Days $T_0=138.155333$ (BKJD)



DV Model-Shift Uniqueness Test

007455287-01, P = 8.010786 Days, E = 130.153263 Days

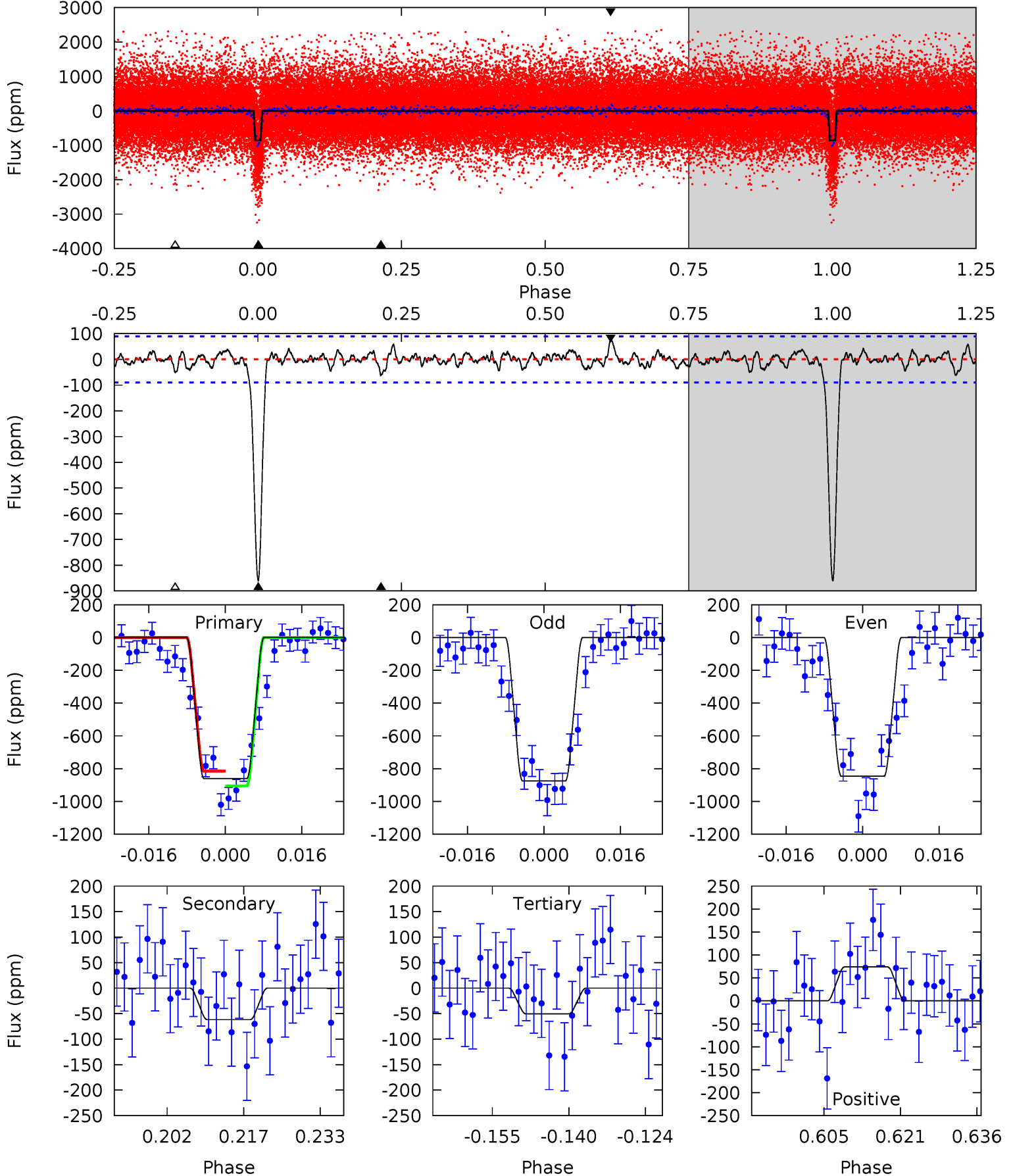
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
58.3	5.07	4.53	4.98	4.86	2.26	1.68	53.7	53.3	0.54	0.09	0.66	1.01	0.08	0.47



Alt Model-Shift Uniqueness Test

007455287-01, P = 8.010841 Days, E = 130.144492 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
47.3	3.40	2.78	4.07	4.94	2.42	1.07	44.6	43.3	0.63	-0.67	0.79	1.00	0.08	2.46



Stellar Parameters For KIC 007455287

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3713^{+74}_{-92}	$4.779^{+0.063}_{-0.031}$	$-0.120^{+0.150}_{-0.150}$	$0.470^{+0.036}_{-0.054}$	$0.484^{+0.038}_{-0.053}$	$6.567^{+2.046}_{-0.894}$
	+2%/-2%	+1%/-1%	+125%/-125%	+8%/-11%	+8%/-11%	+31%/-14%
Source	SPE70	SPE60	SPE70	DSEP		

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

Secondary Eclipse Parameters for KIC 007455287-01 / KOI 0886.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-82 ± 16	$2.59^{+1.85}_{-1.50}$	629^{+17}_{-21}	2292^{+548}_{-260}	25^{+115}_{-16}
Alt.	-62 ± 18	$2.19^{+1.60}_{-1.40}$	629^{+18}_{-20}	2305^{+730}_{-271}	26^{+177}_{-18}

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

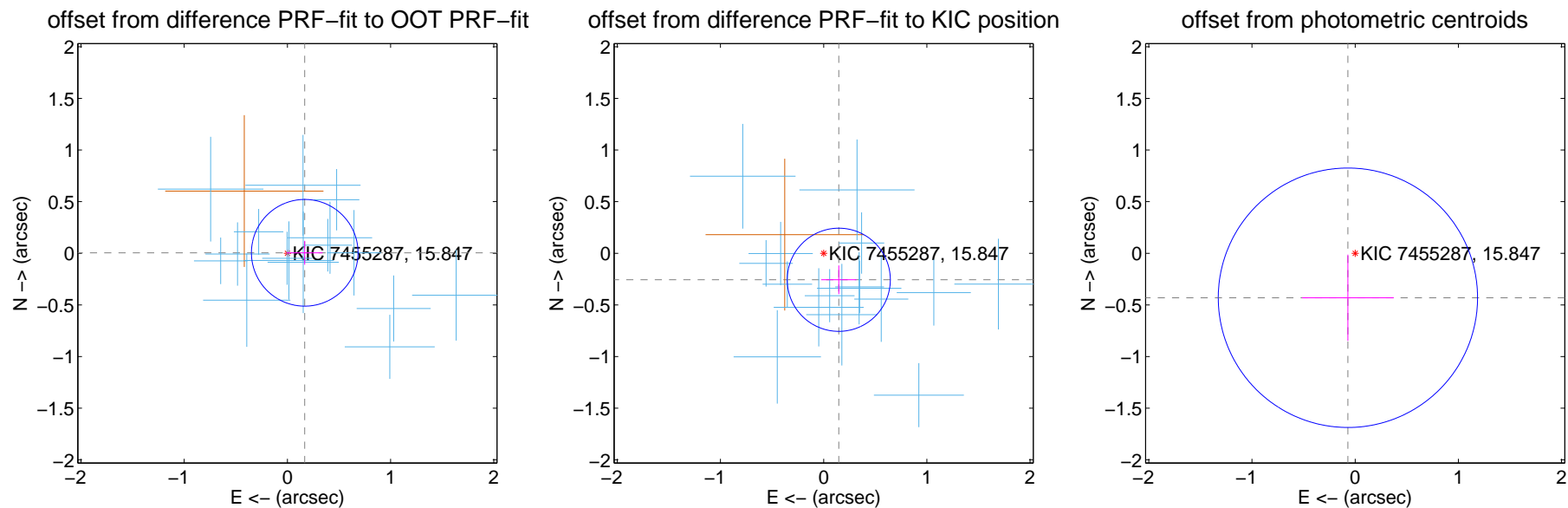
DV Centroid Data

Supplemental centroid analysis for 007455287-01. Kepler magnitude: 15.85. Transit SNR 30.87

There are 16 quarters with good PRF difference image offsets

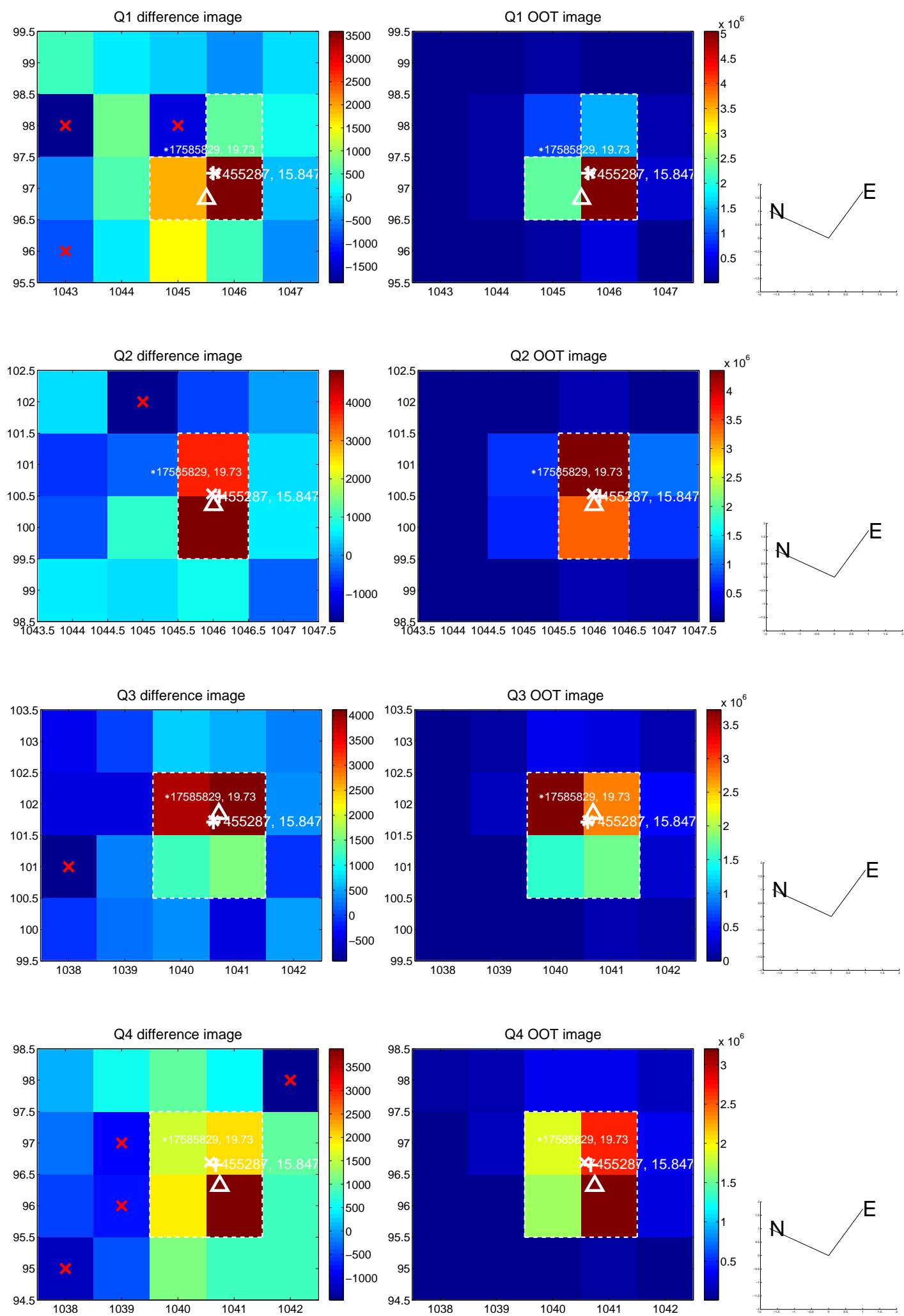
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.168 ± 0.172	0.98	-0.168 ± 0.174	0.005 ± 0.116
PRF-fit source offset from KIC position	0.295 ± 0.166	1.77	-0.147 ± 0.170	-0.256 ± 0.139
photometric centroid source offset	0.44 ± 0.42	1.04	0.07 ± 0.44	-0.43 ± 0.42

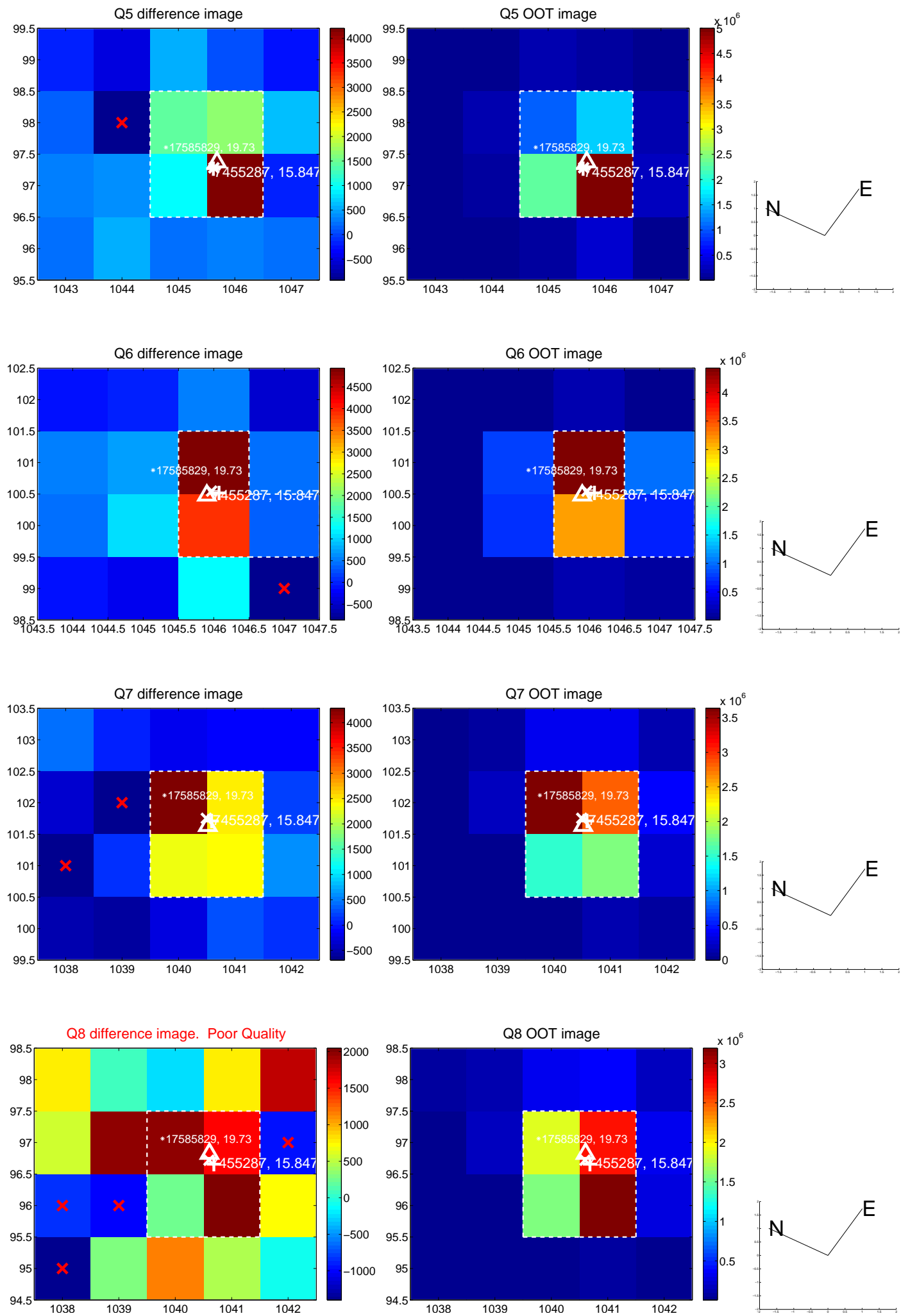


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

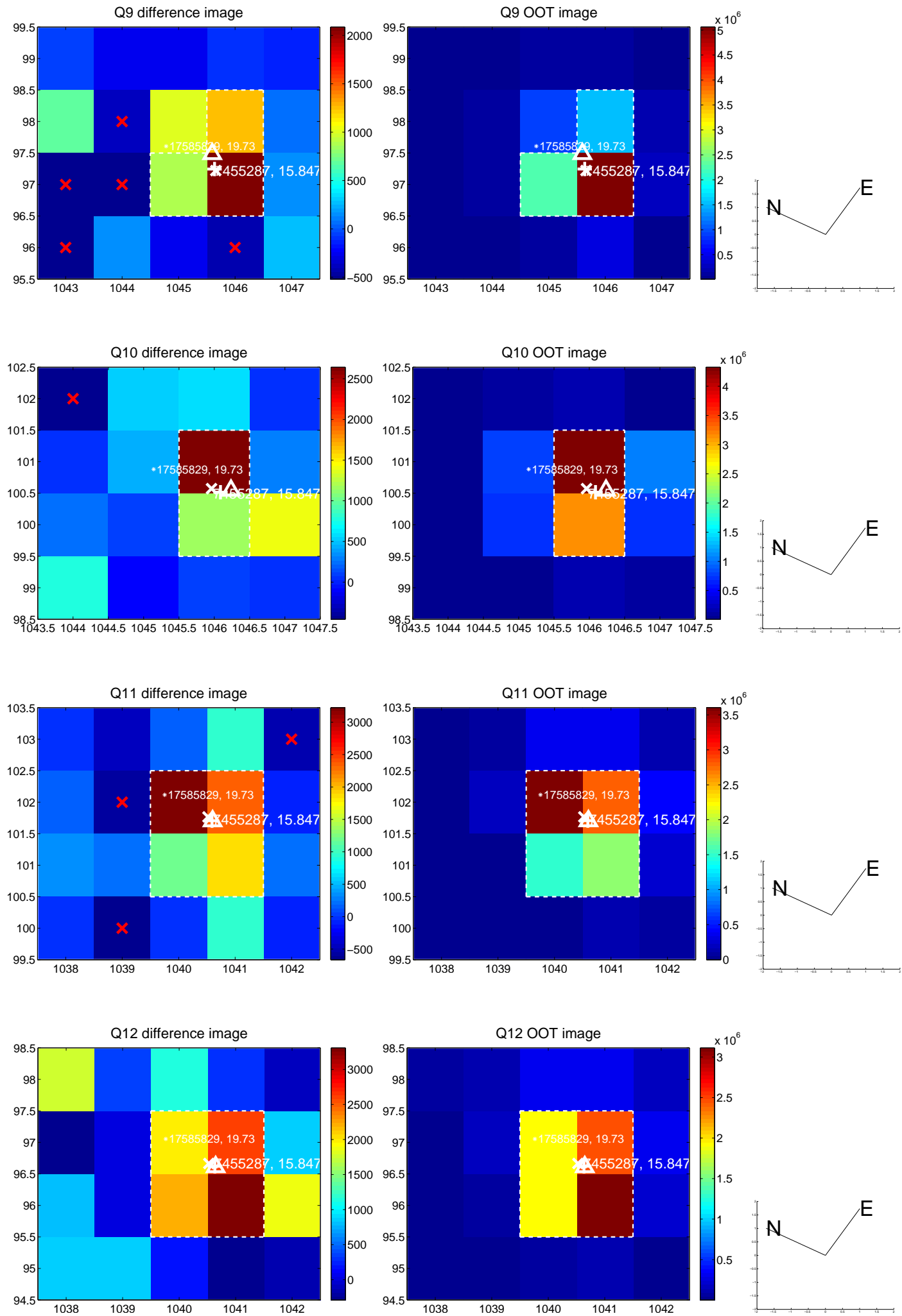
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



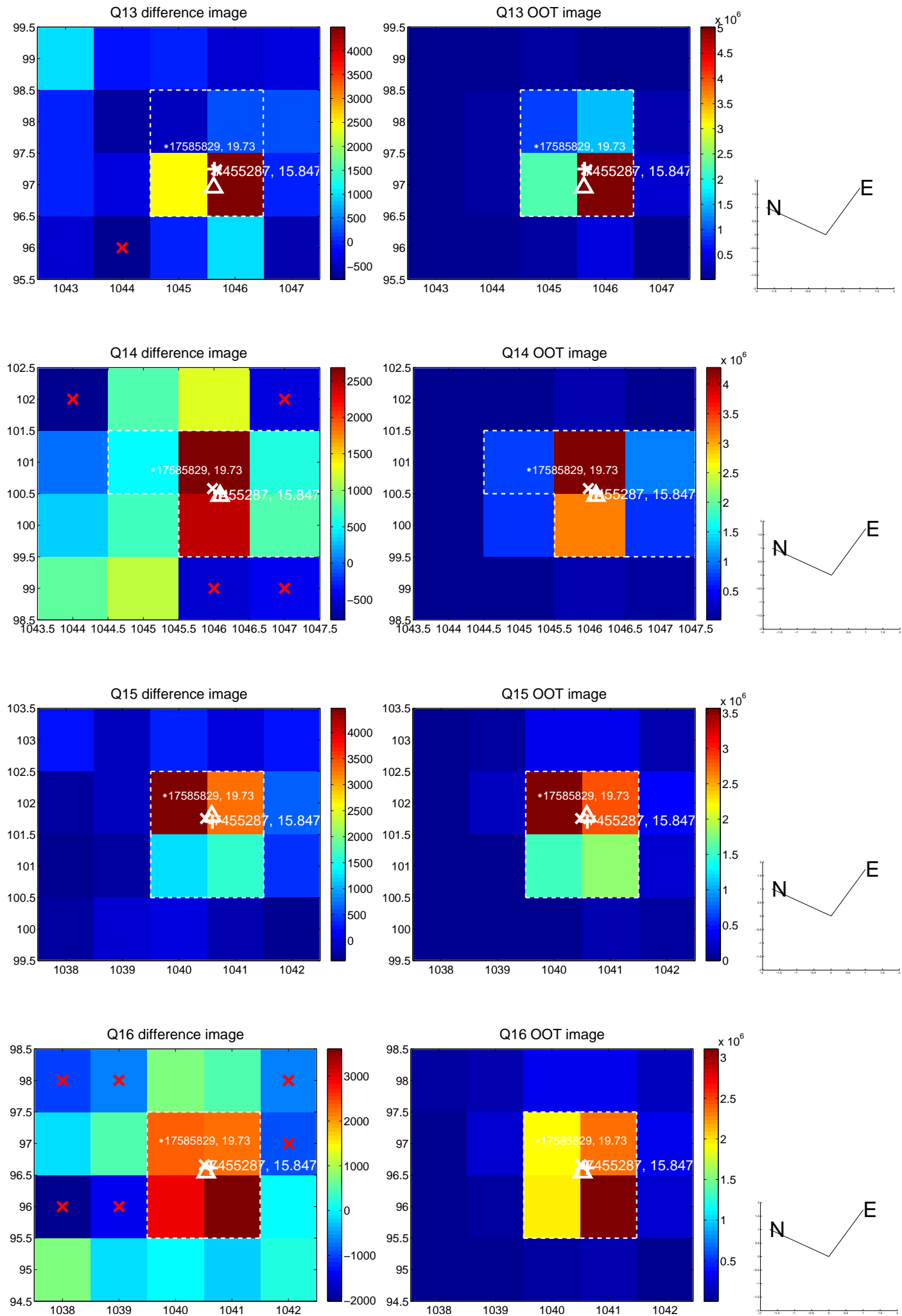
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



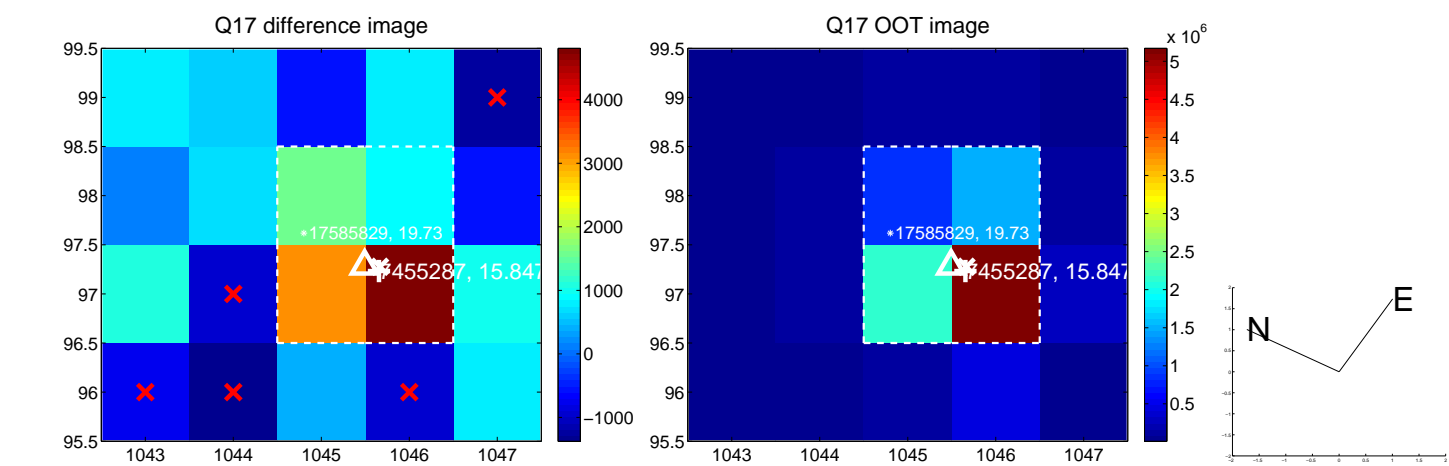
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



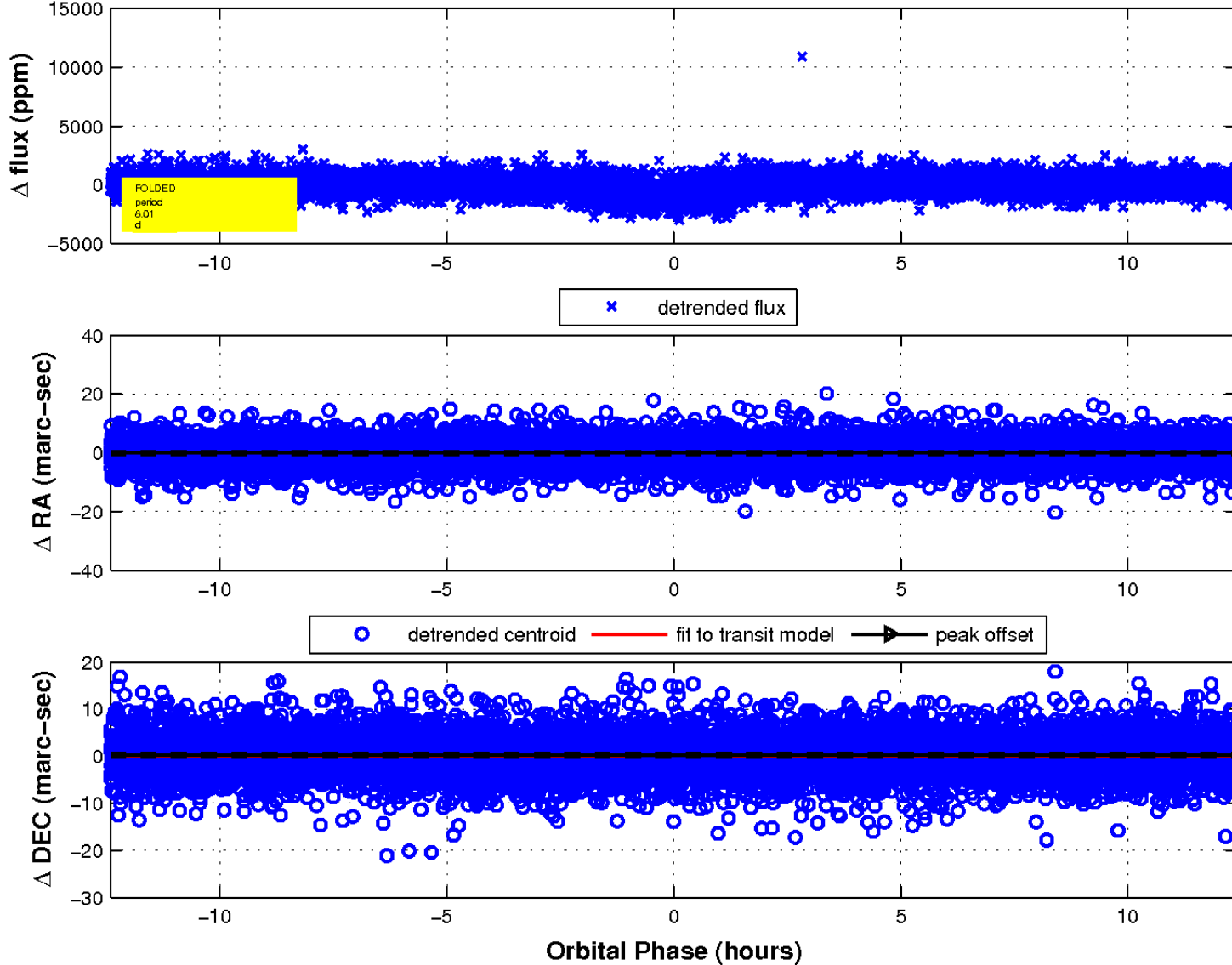
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

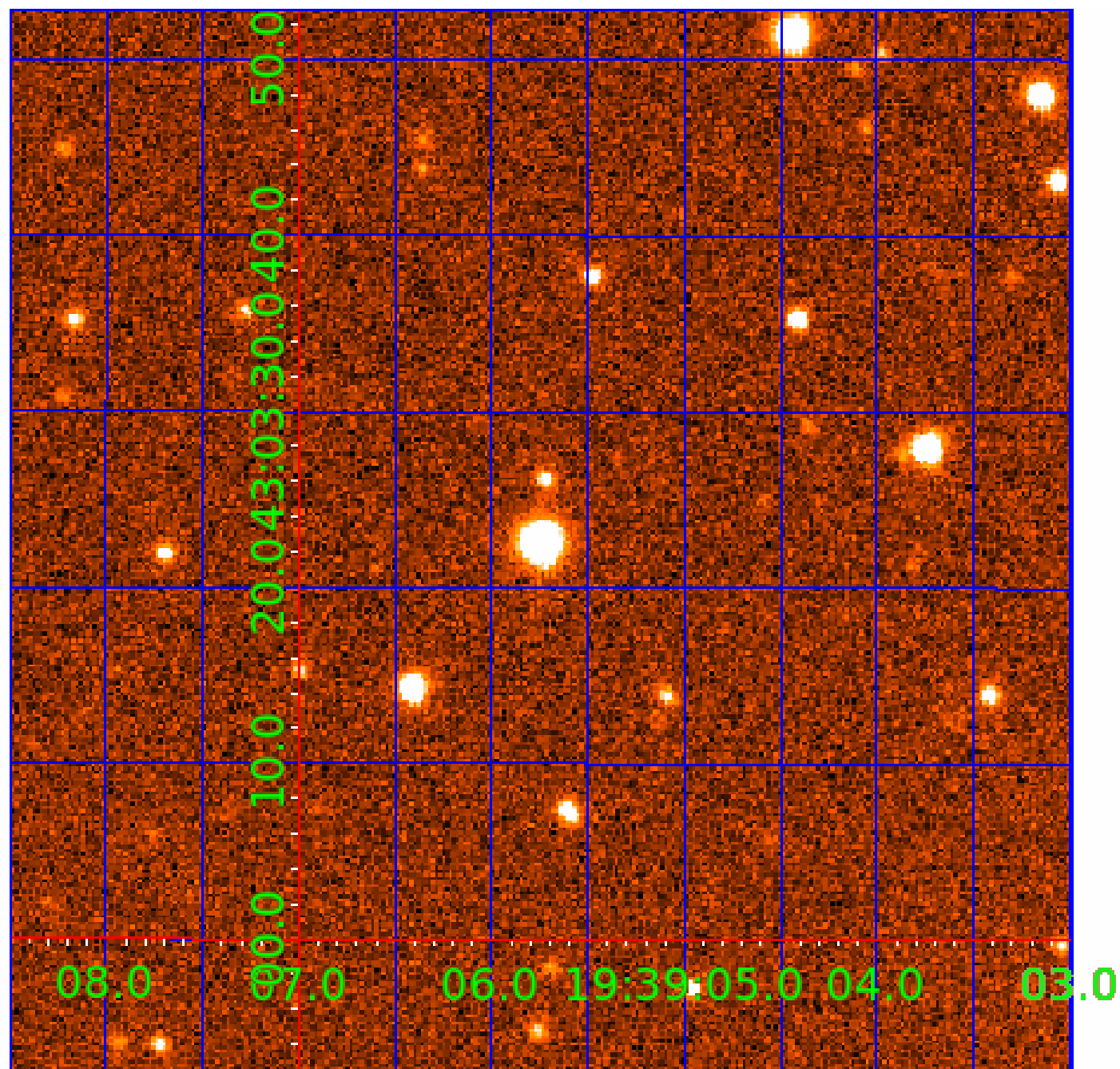


fluxWeightedCentroids, Planet 1 of 6



UKIRT Image

Declination



KIC 007455287

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})
007455287-01	OBS	0886.01	8.010786	138.164049	962.8	4.139	28.9	30.9	0.47	3713	2.52	9.93
007455287-02	OBS	0886.02	12.071268	143.465132	499.4	5.521	16.5	16.9	0.47	3713	1.29	5.75
007455287-03	OBS	0886.03	20.995898	152.314956	644.0	3.180	12.4	13.7	0.47	3713	1.40	2.75
007455287-05	OBS	No	363.586111	403.540903	1453.8	20.429	8.0	7.9	0.47	3713	2.29	0.06
007455287-06	OBS	No	392.183710	372.382225	1599.8	18.049	8.0	9.4	0.47	3713	2.29	0.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007455287-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-03	OBS	PC	0.99	0	0	0	0	NO_COMMENT
007455287-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
007455287-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—CENT_FEW_DIFFS

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.

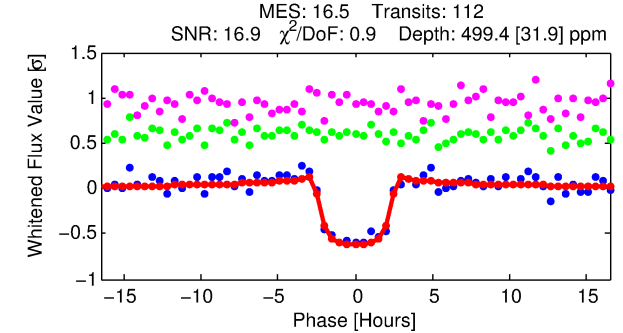
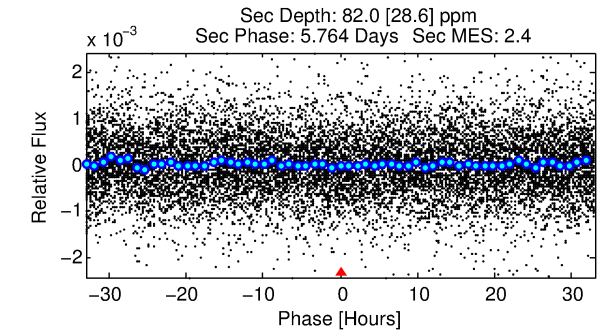
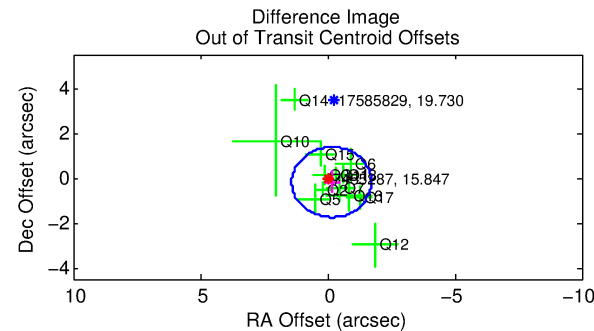
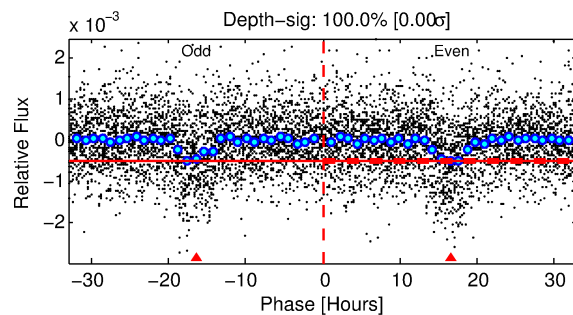
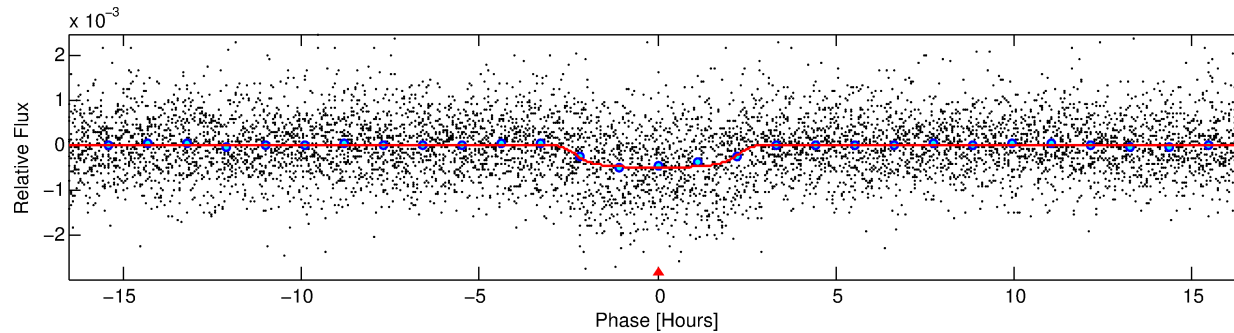
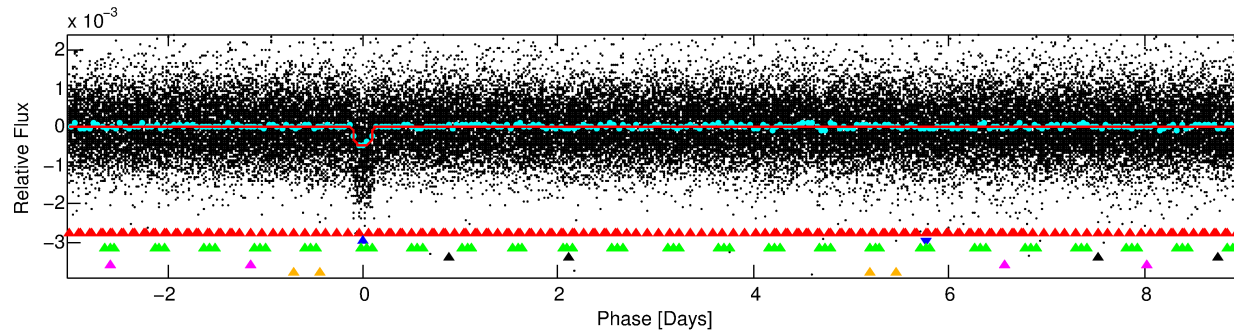
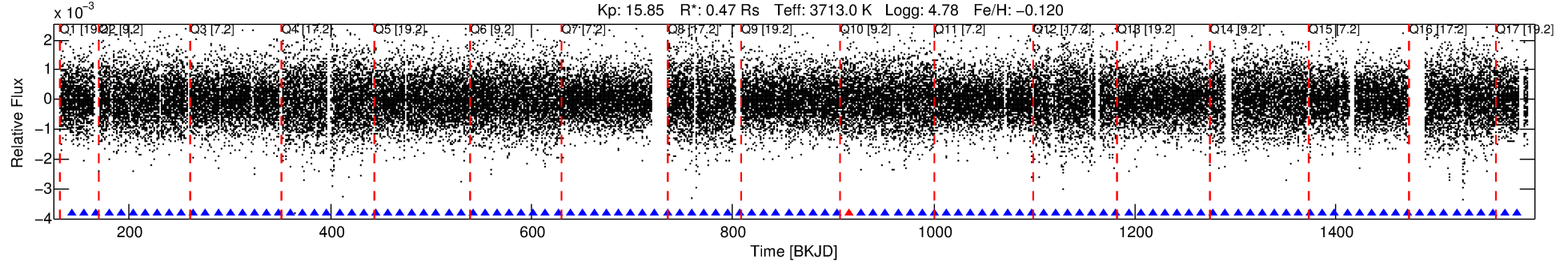
Ephemeris Match Information For 007455287-02

No Significant Match Found

DV One-Page Summary

KIC: 7455287 Candidate: 2 of 6 Period: 12.071 d
KOI: K00886.02 Name: Kepler-54c Corr: 0.926

Kp: 15.85 R*: 0.47 Rs Teff: 3713.0 K Logg: 4.78 Fe/H: -0.120



DV Fit Results:

Period = 12.07127 [0.00009] d
Epoch = 143.4651 [0.0064] BKJD
Rp/R* = 0.0252 [0.0018]
a/R* = 7.28 [1.84]
b = 0.93 [0.04]
Seff = 5.75 [0.91]
Teq = 395 [16] K
Rp = 1.29 [0.17] Re
a = 0.0809 [0.0073] AU
Ag = 177.05 [70.05] [2.51σ]
Teffp = 2227 [216] K [8.44σ]

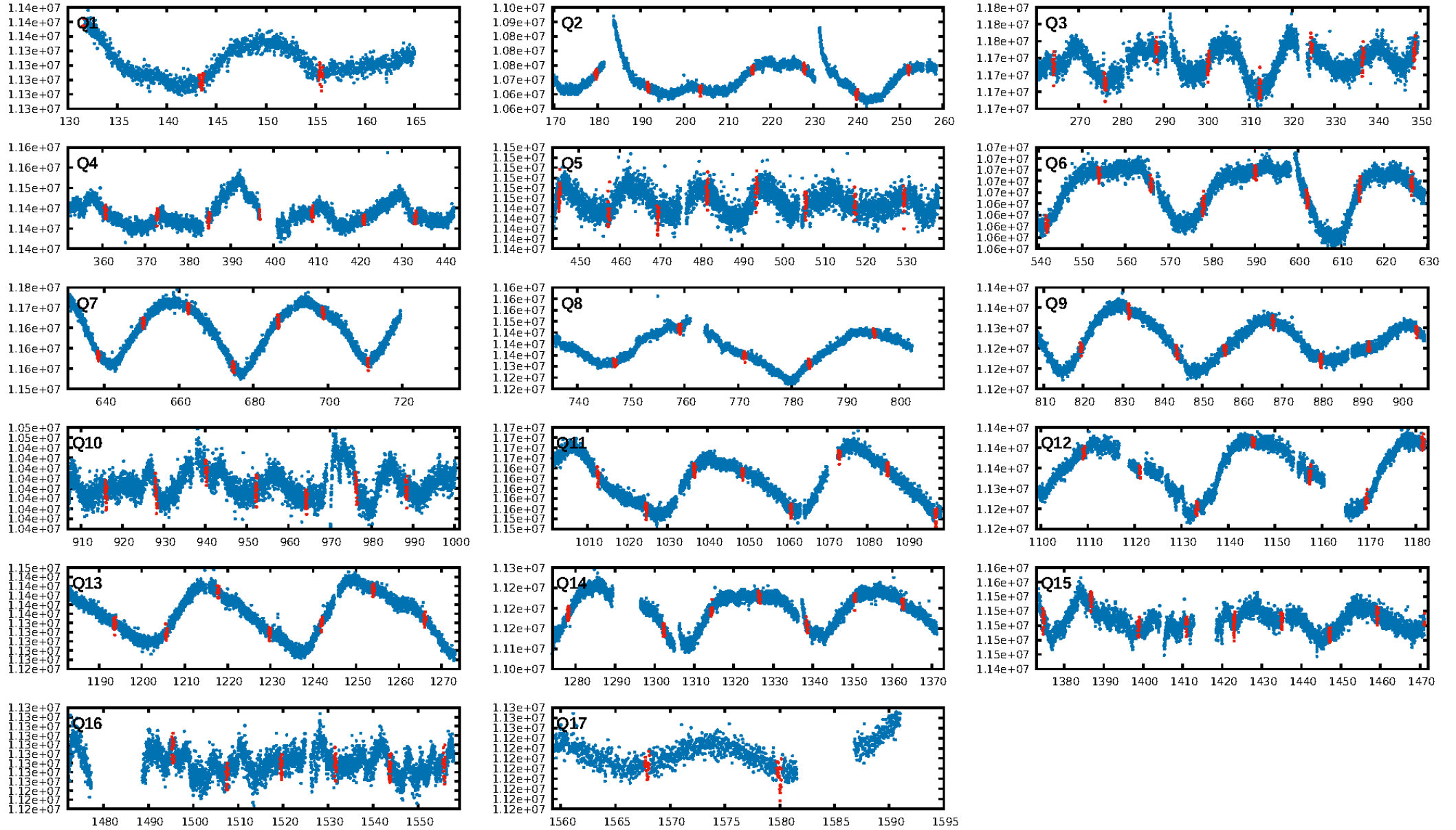
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [14.12σ]
LongPeriod-sig: 100.0% [33.62σ]
ModelChiSquare2-sig: 99.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 2.13e-58
RollingBand-fgt: 0.99 [106/107]
GhostDiagnostic-chr: -194.2
Centroid-sig: 15.1%
Centroid-so: 0.750 arcsec [0.99σ]
OotOffset-rm: 0.246 arcsec [0.47σ]
KicOffset-rm: 0.455 arcsec [0.95σ]
OotOffset-st: 4/4/2/3 [13]
KicOffset-st: 4/4/2/3 [13]
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DiffImageOverlap-fno: 1.00 [17/17]

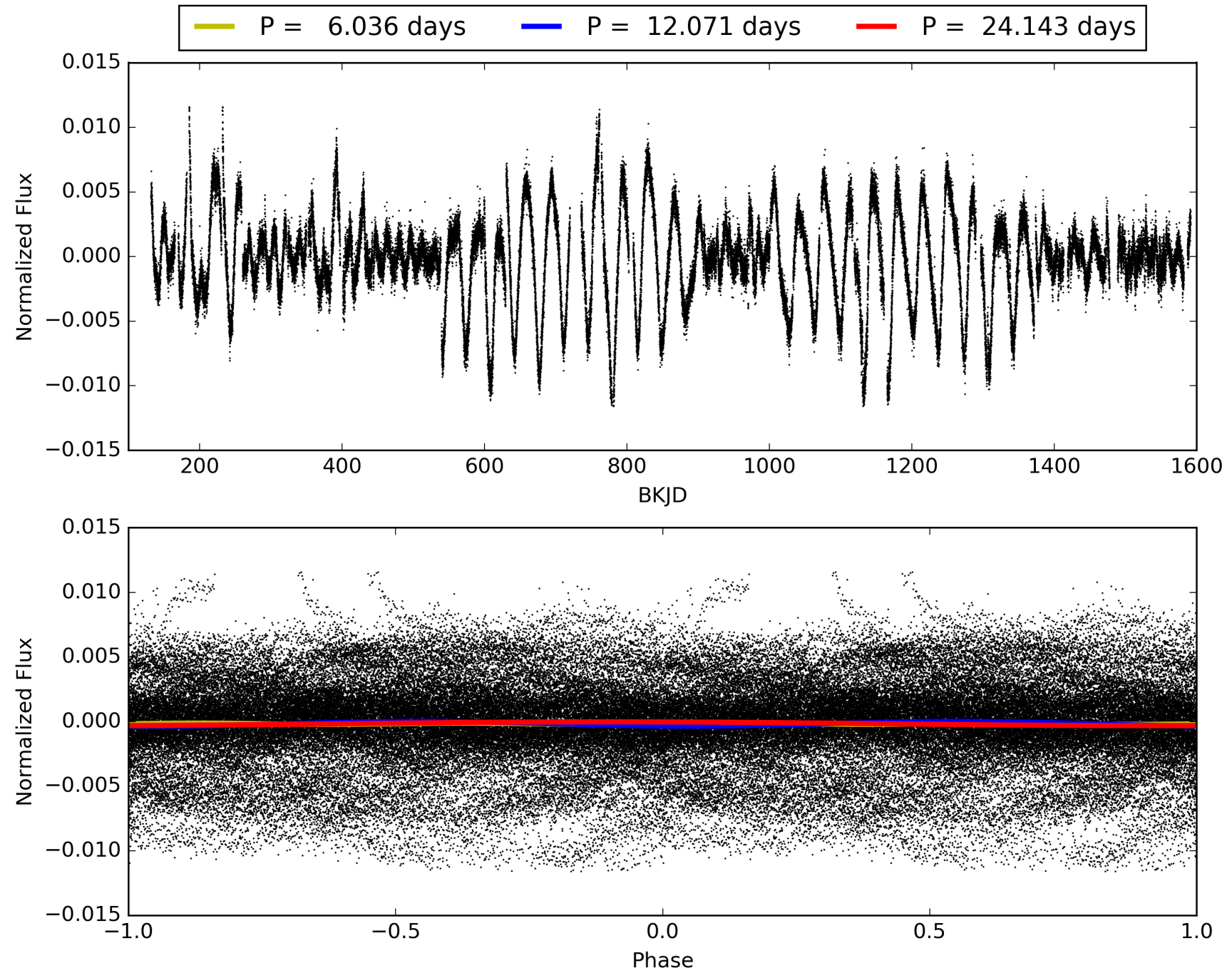
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 22:00:15 Z

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

TCE 007455287-02, PDC Light Curves

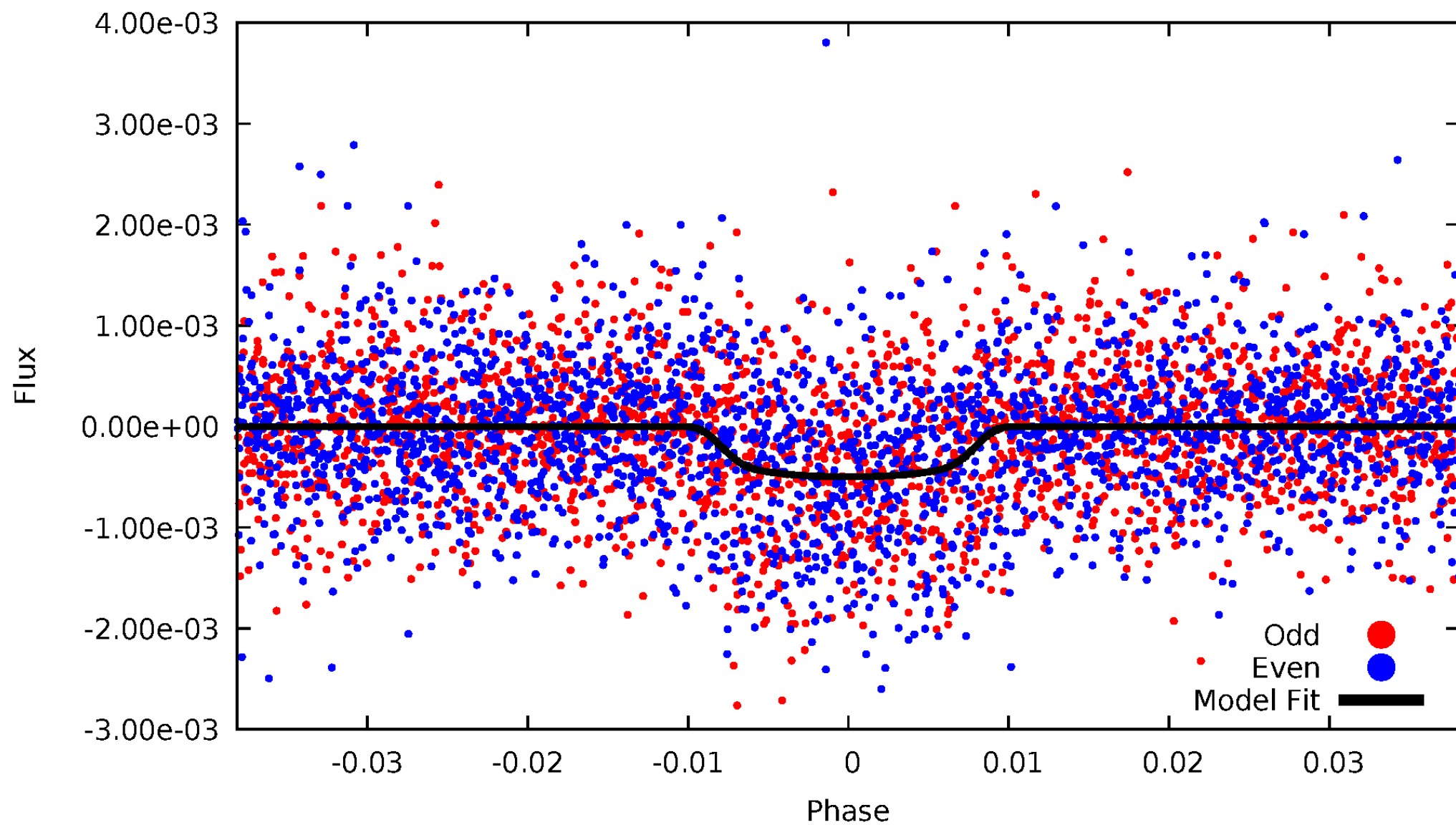


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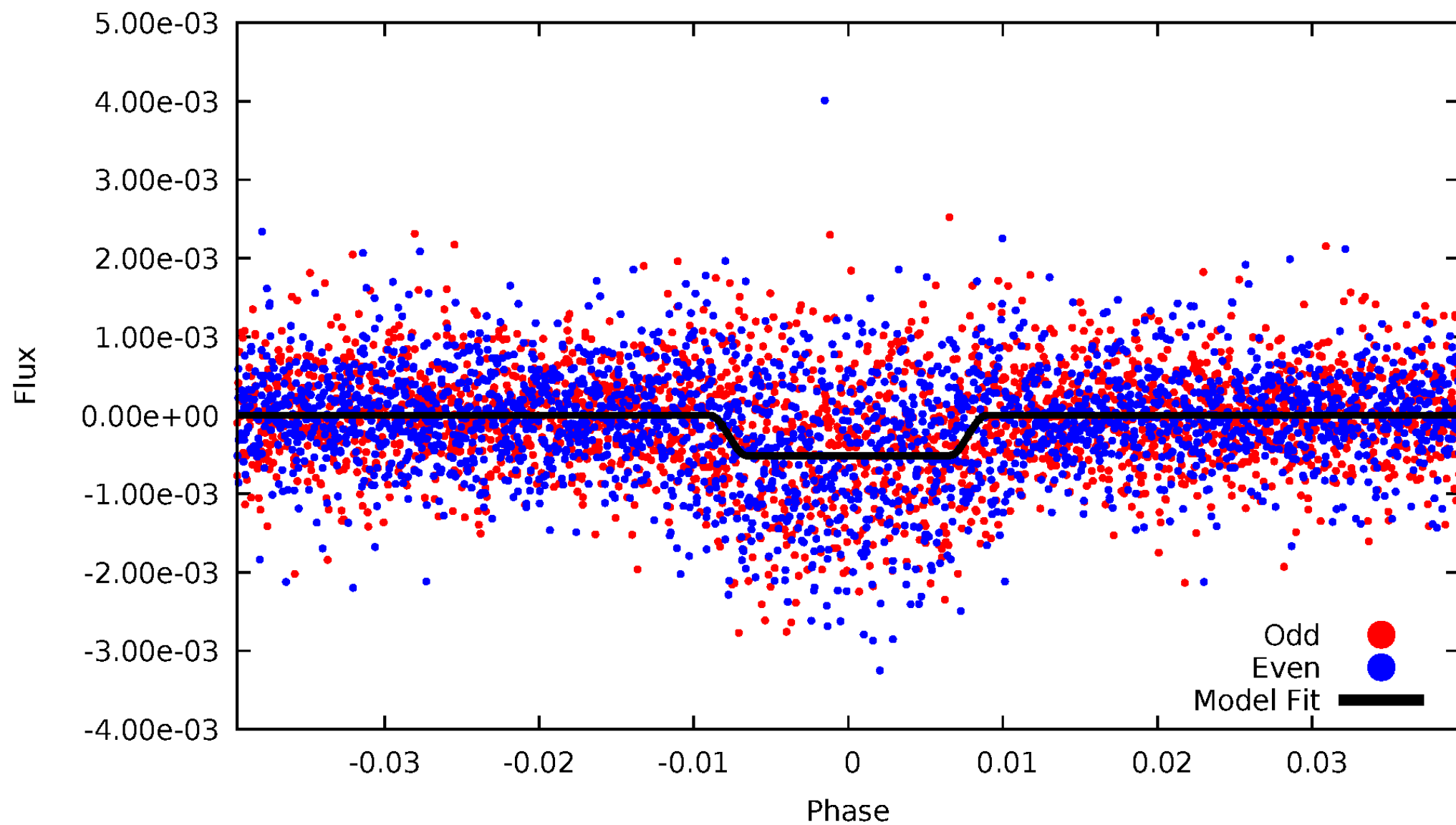
DV Odd/Even

TCE 007455287-02



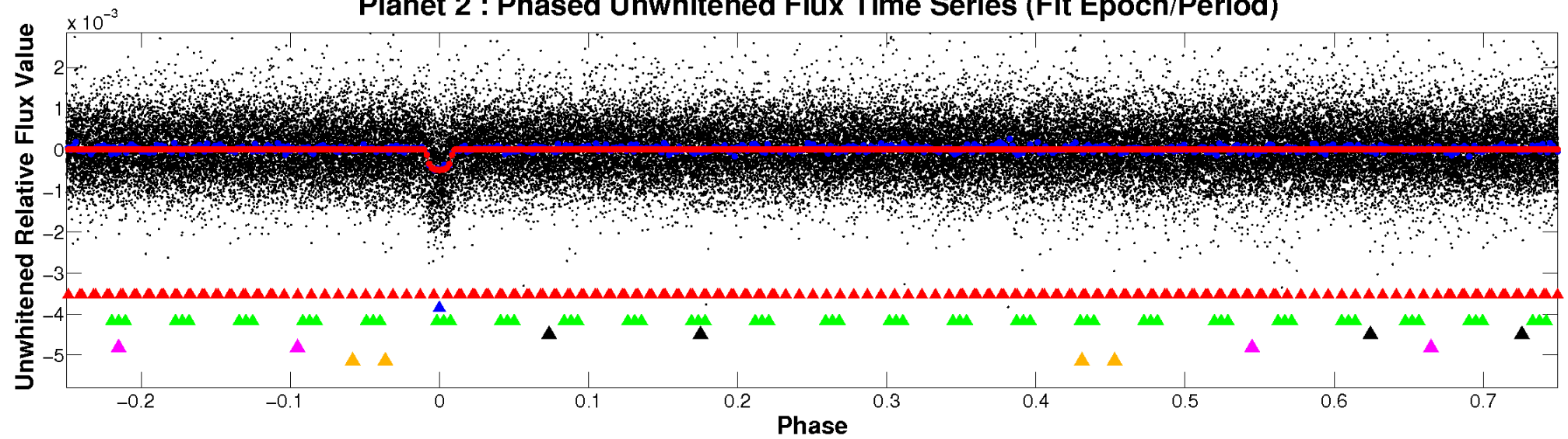
ALT Odd/Even

TCE 007455287-02

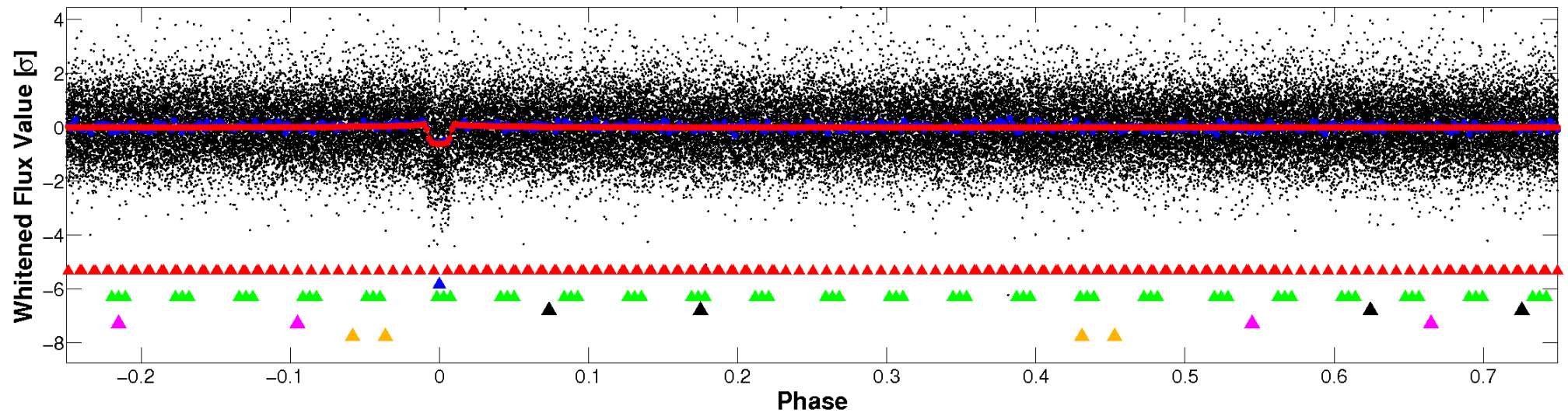


Non-Whitened Vs. Whitened Light Curve

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

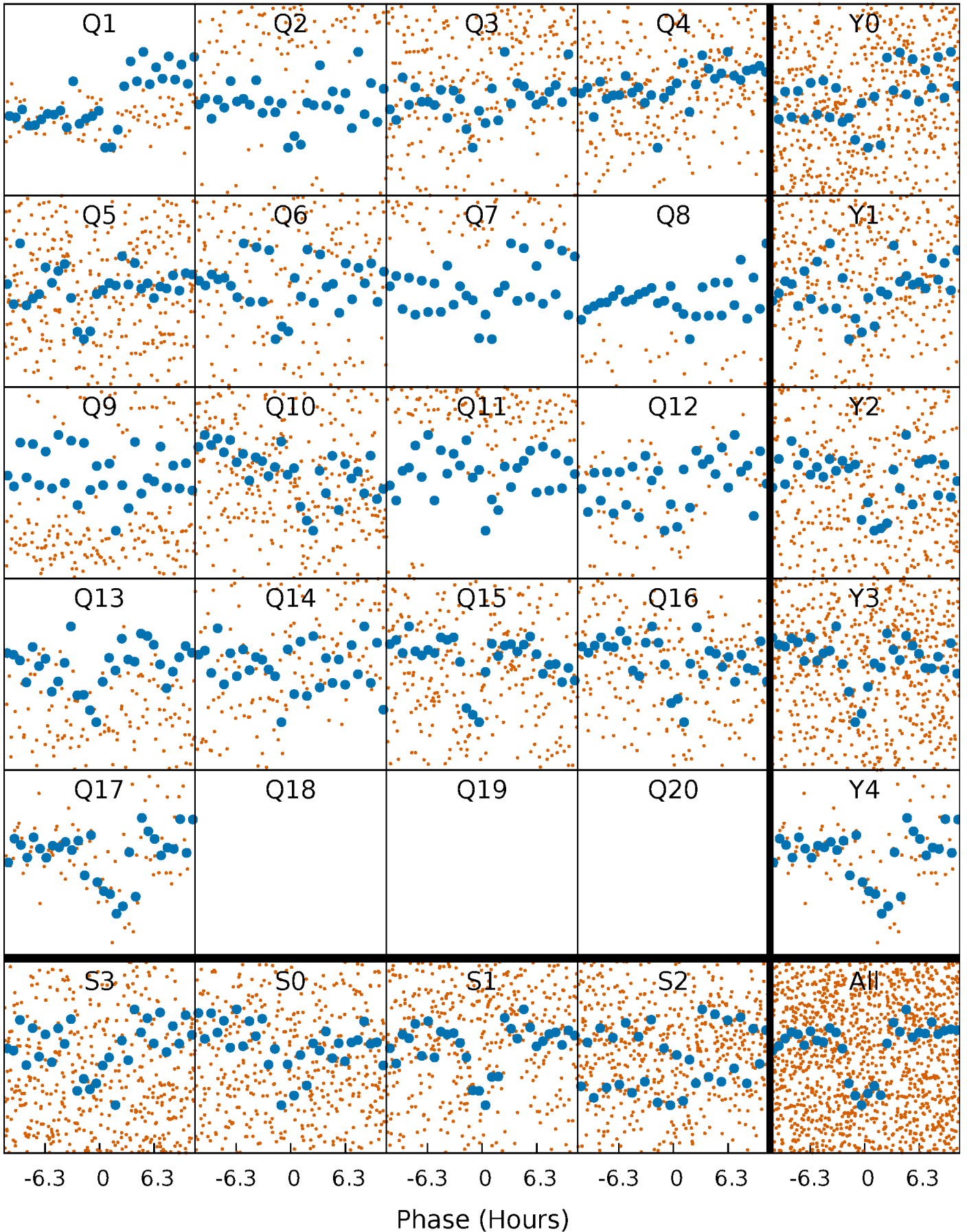


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



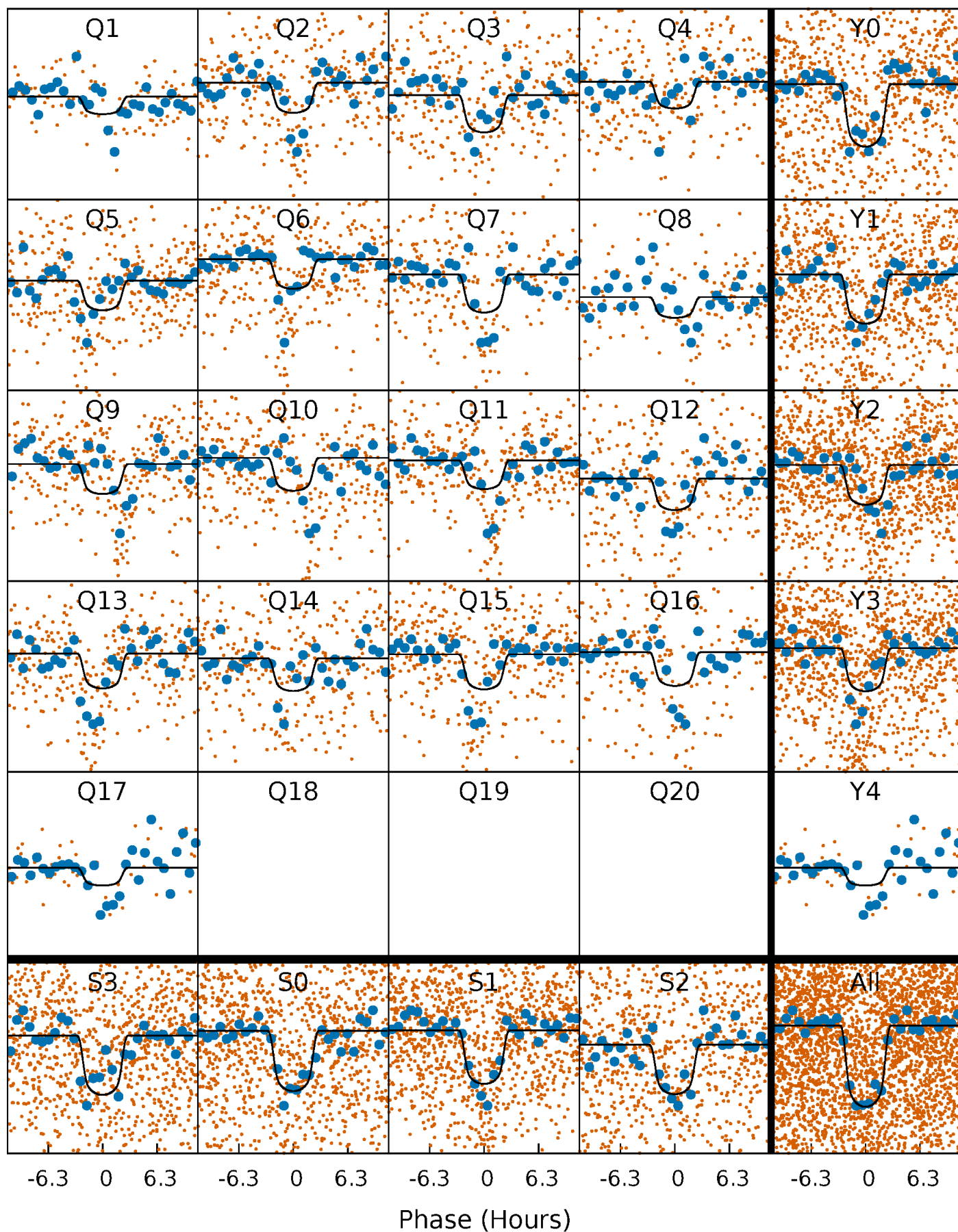
PDC Quarter-Phased Transit Curves

TCE 007455287-02 P= 12.071268 Days $T_0=143.465132$ (BKJD)



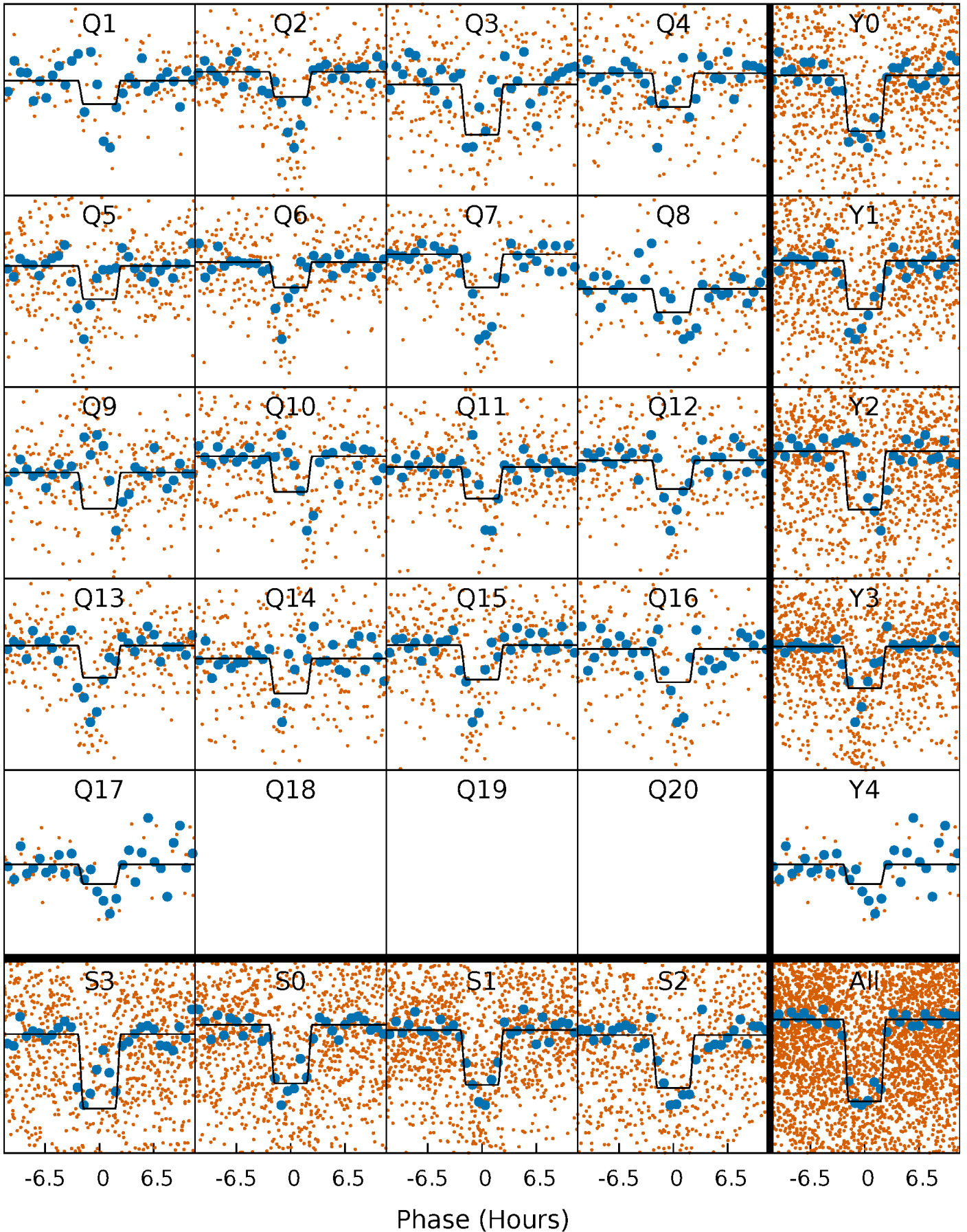
DV Quarter-Phased Transit Curves

TCE 007455287-02 P= 12.071268 Days $T_0=143.465132$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

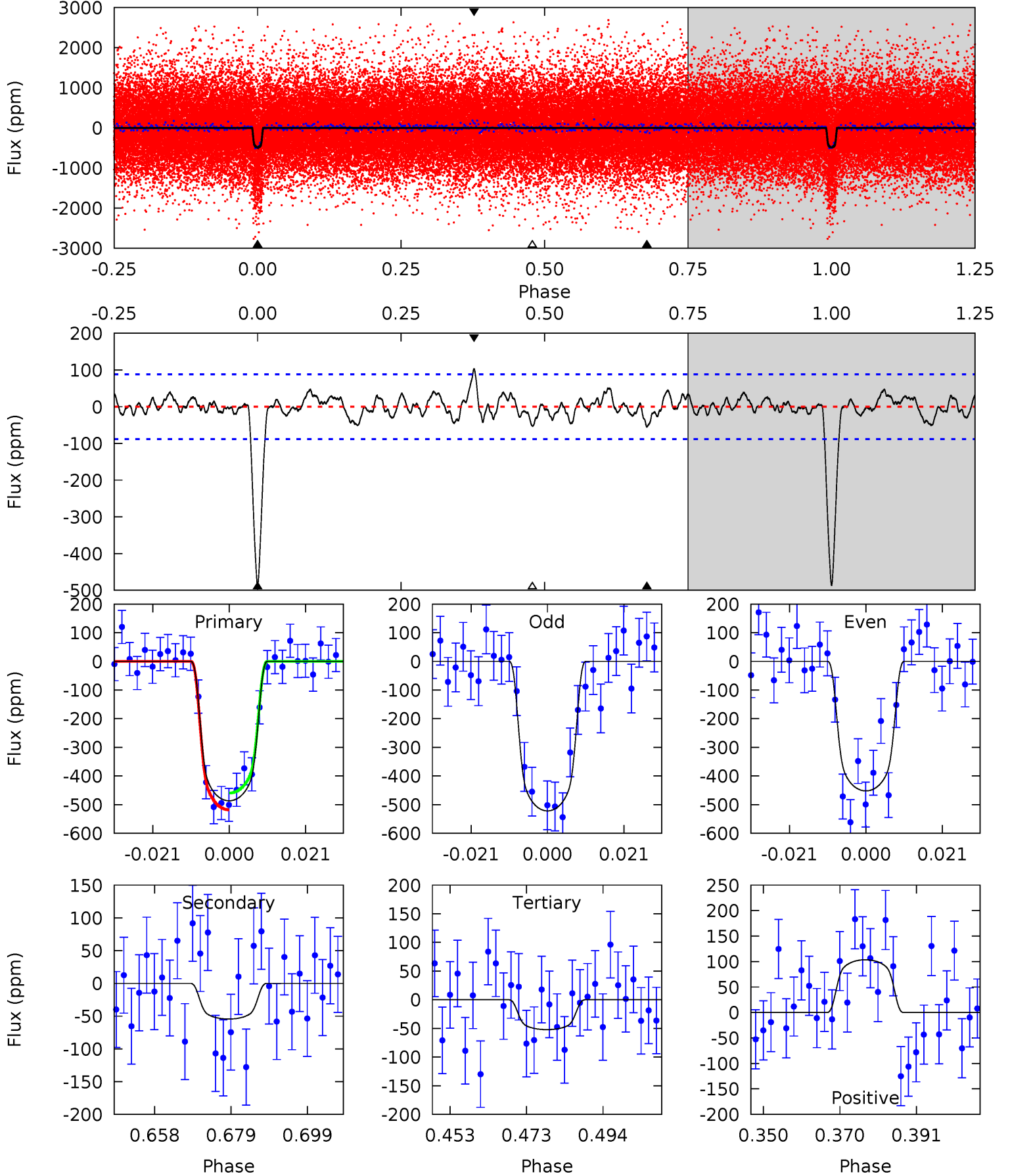
TCE 007455287-02 P= 12.071218 Days $T_0=143.468559$ (BKJD)



DV Model-Shift Uniqueness Test

007455287-02, $P = 12.071268$ Days, $E = 131.393864$ Days

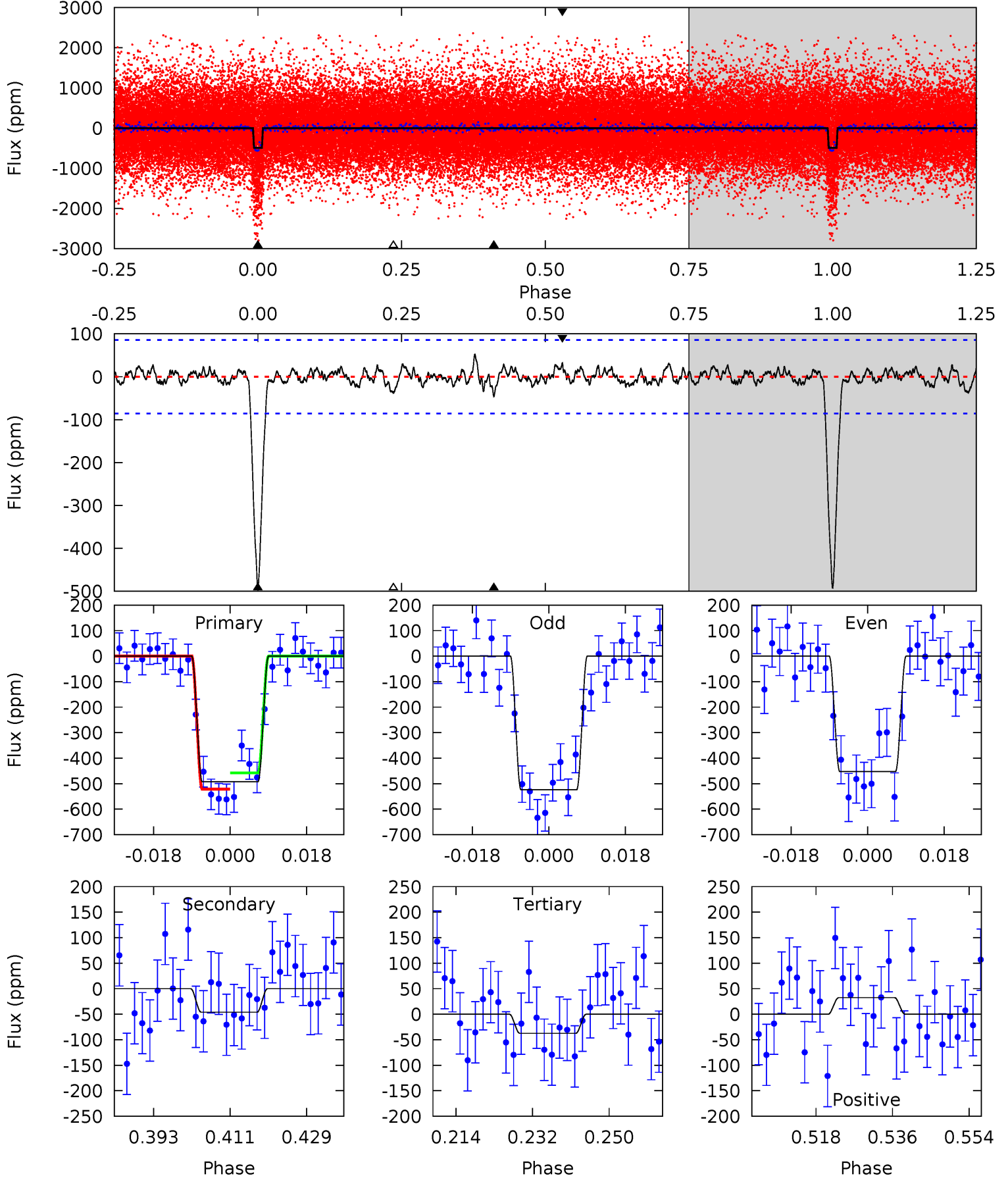
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.0	3.02	2.89	5.74	4.89	2.32	1.28	24.1	21.2	0.13	-2.72	1.94	0.98	0.18	1.62



Alt Model-Shift Uniqueness Test

007455287-02, $P = 12.071218$ Days, $E = 131.397341$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.2	2.64	2.15	1.86	4.91	2.37	0.75	26.1	26.3	0.49	0.78	2.05	0.96	0.10	1.83



Stellar Parameters For KIC 007455287

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3713^{+74}_{-92}	$4.779^{+0.063}_{-0.031}$	$-0.120^{+0.150}_{-0.150}$	$0.470^{+0.036}_{-0.054}$	$0.484^{+0.038}_{-0.053}$	$6.567^{+2.046}_{-0.894}$
	+2%/-2%	+1%/-1%	+125%/-125%	+8%/-11%	+8%/-11%	+31%/-14%
Source	SPE70	SPE60	SPE70	DSEP		

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

Secondary Eclipse Parameters for KIC 007455287-02 / KOI 0886.02

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-54 ± 18	$1.28^{+0.12}_{-0.11}$	547^{+15}_{-18}	2595^{+127}_{-136}	121^{+49}_{-43}
Alt.	-46 ± 17	$1.15^{+0.11}_{-0.11}$	547^{+16}_{-16}	2617^{+127}_{-161}	129^{+55}_{-53}

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

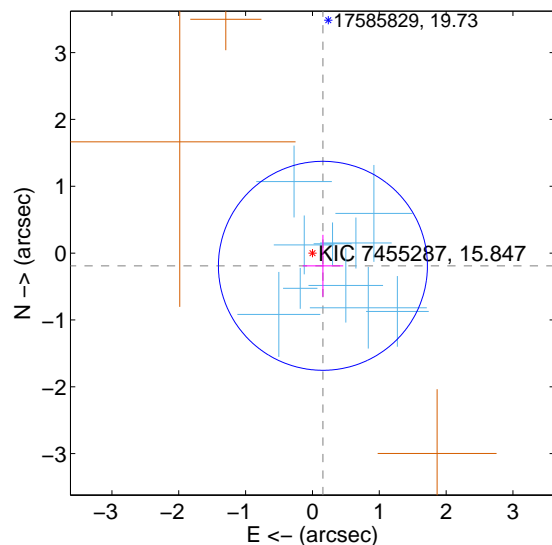
Supplemental centroid analysis for 007455287-02. Kepler magnitude: 15.85. Transit SNR 16.89

There are 10 quarters with good PRF difference image offsets

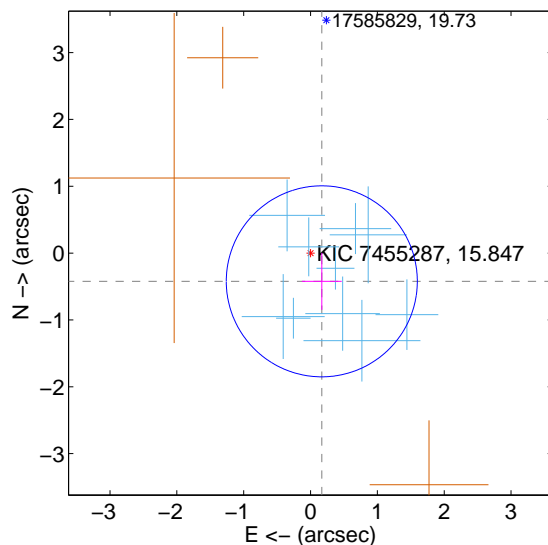
The direct PRF centroid is offset from the target star catalog position by about 0.18 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.246 ± 0.521	0.47	-0.157 ± 0.303	-0.190 ± 0.463
PRF-fit source offset from KIC position	0.455 ± 0.476	0.95	-0.169 ± 0.298	-0.422 ± 0.427
photometric centroid source offset	0.75 ± 0.76	0.99	-0.65 ± 0.77	0.38 ± 0.73

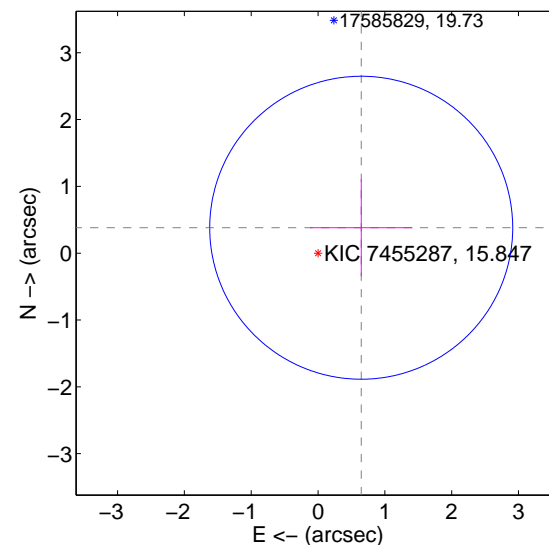
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

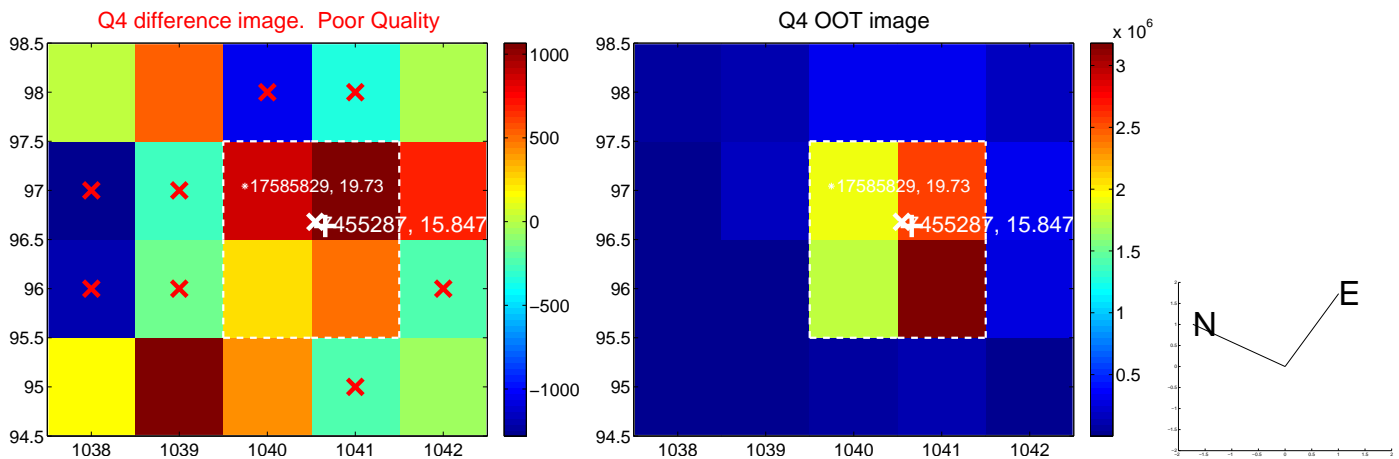
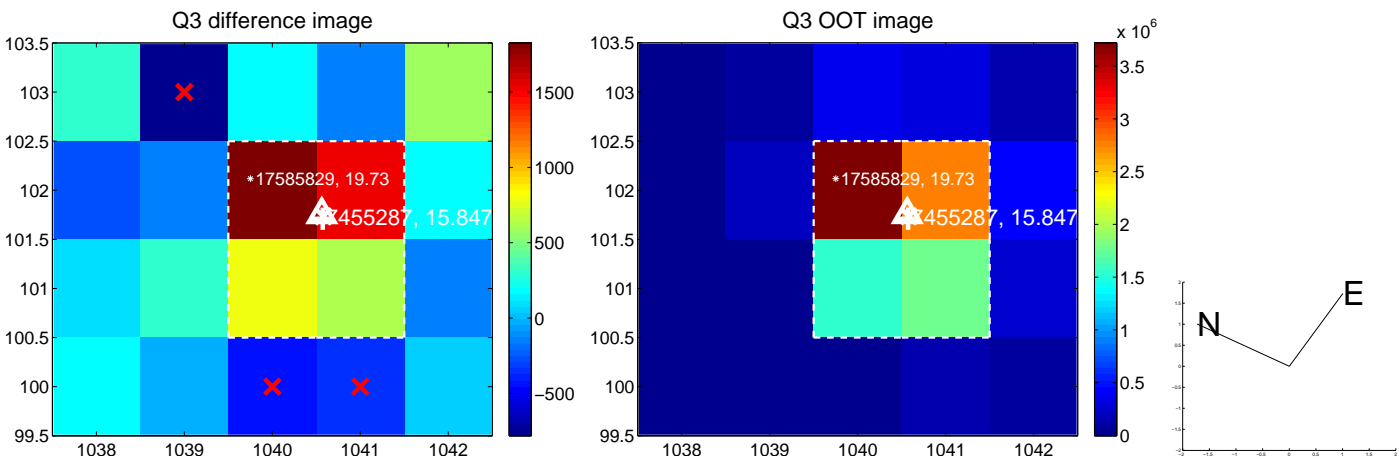
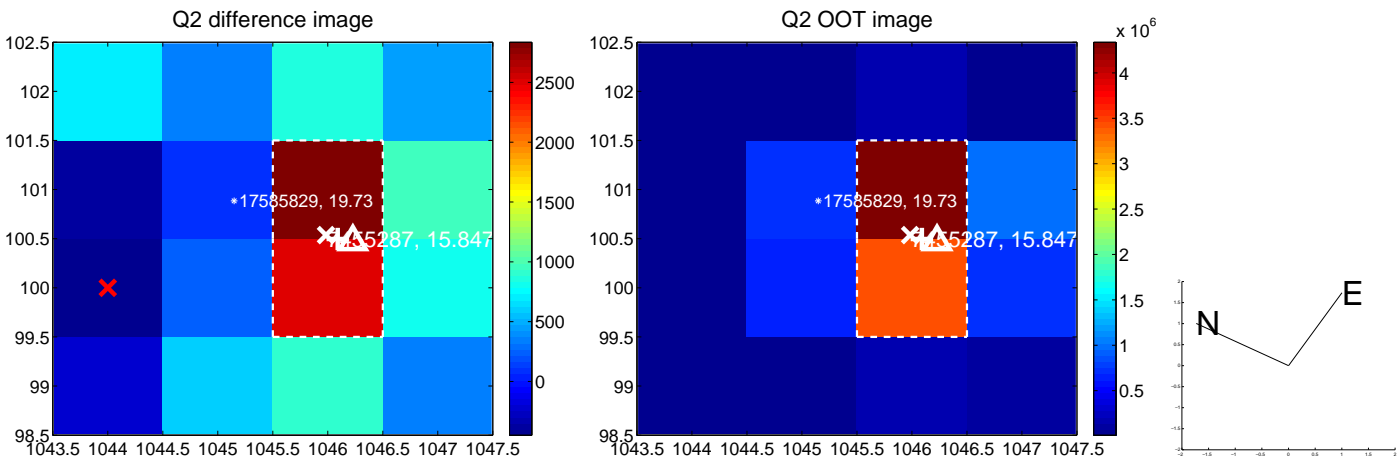
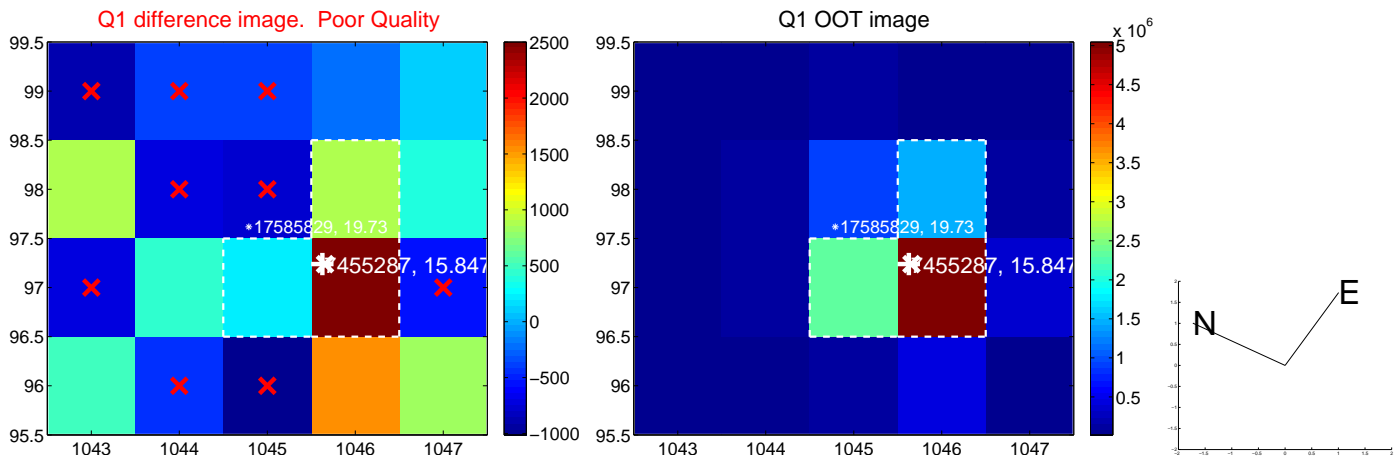


offset from photometric centroids

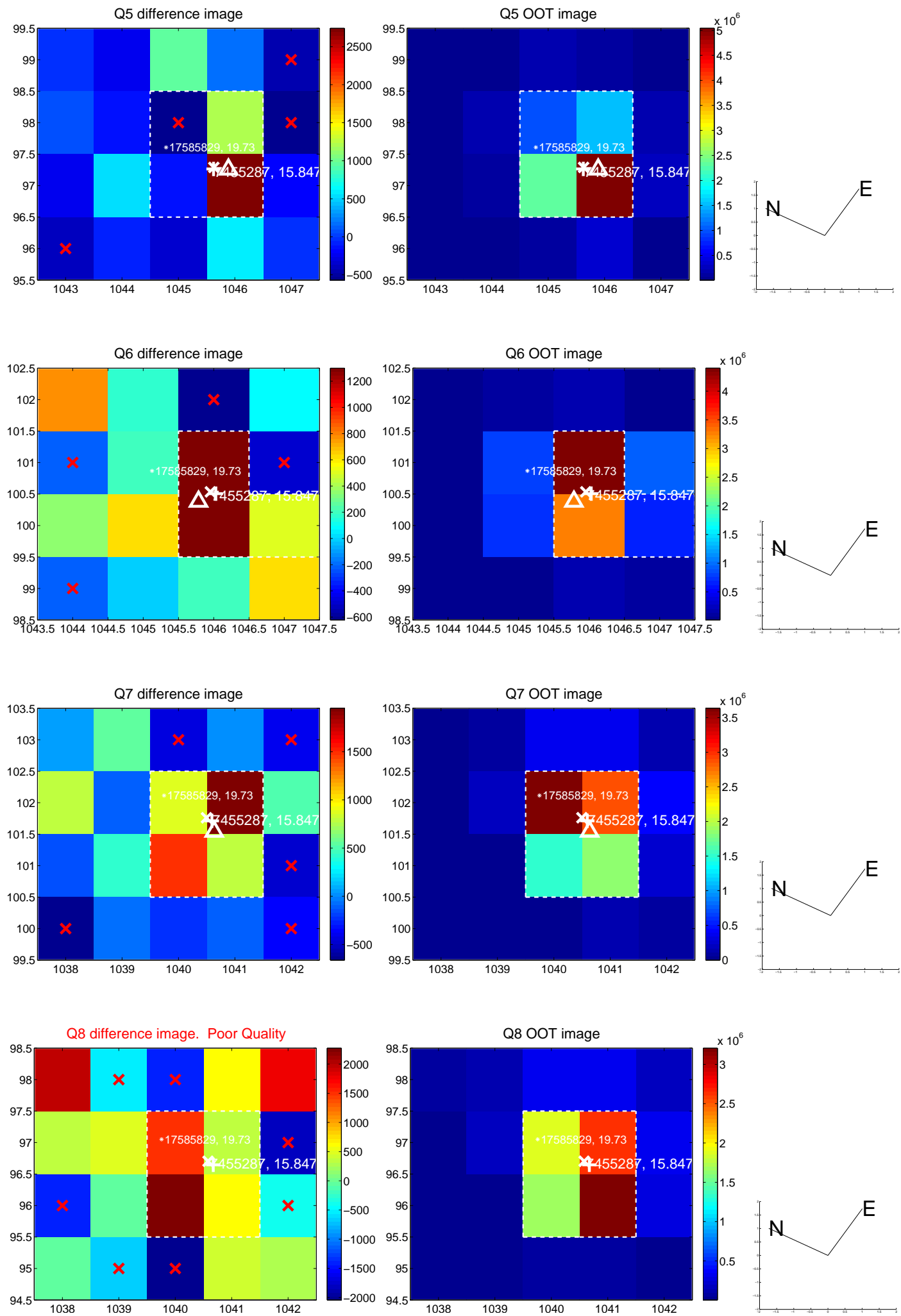


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

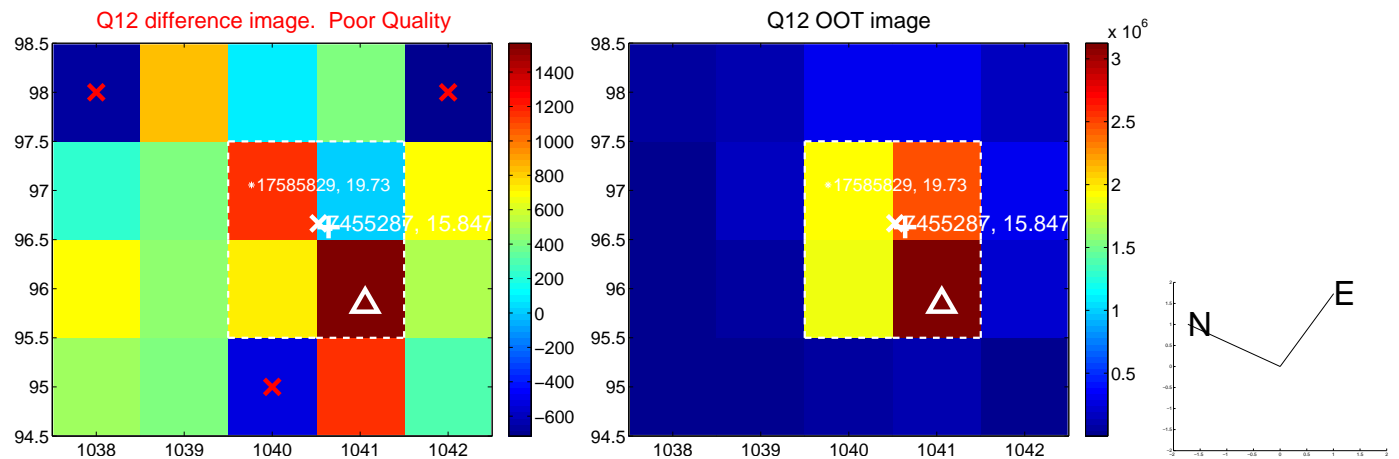
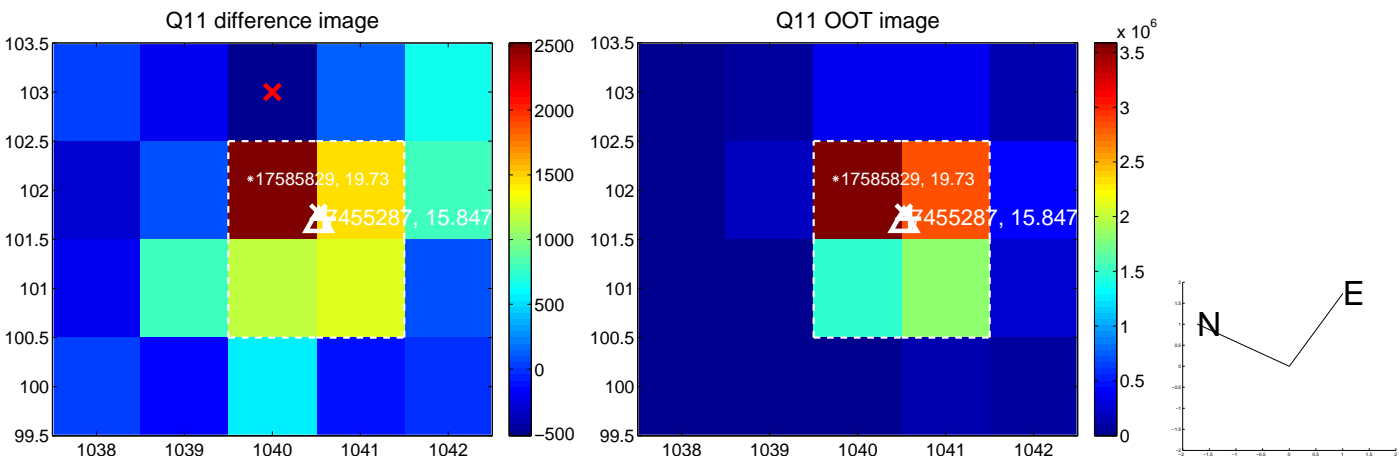
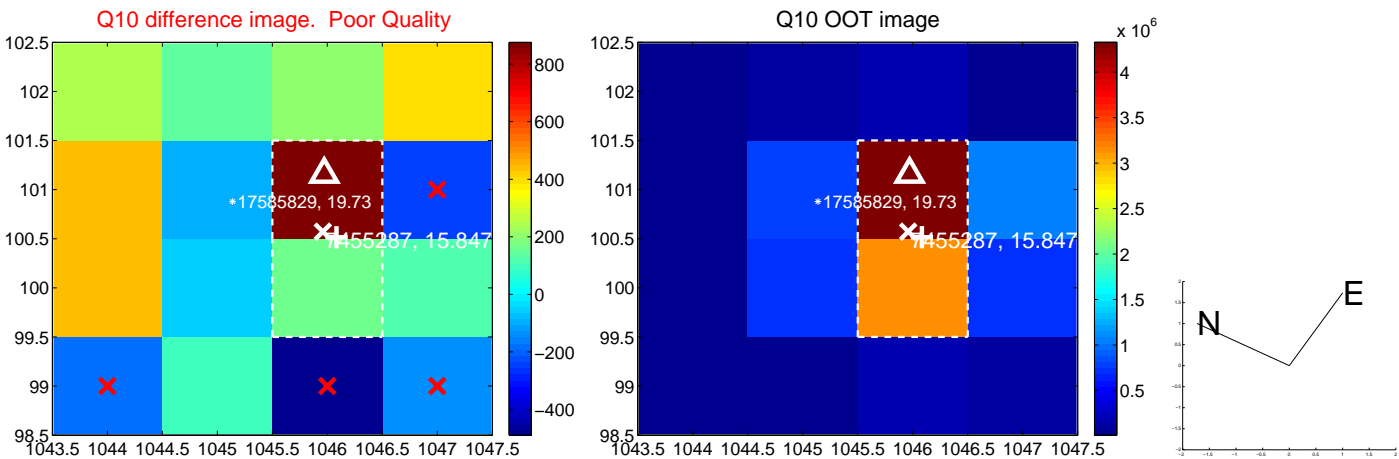
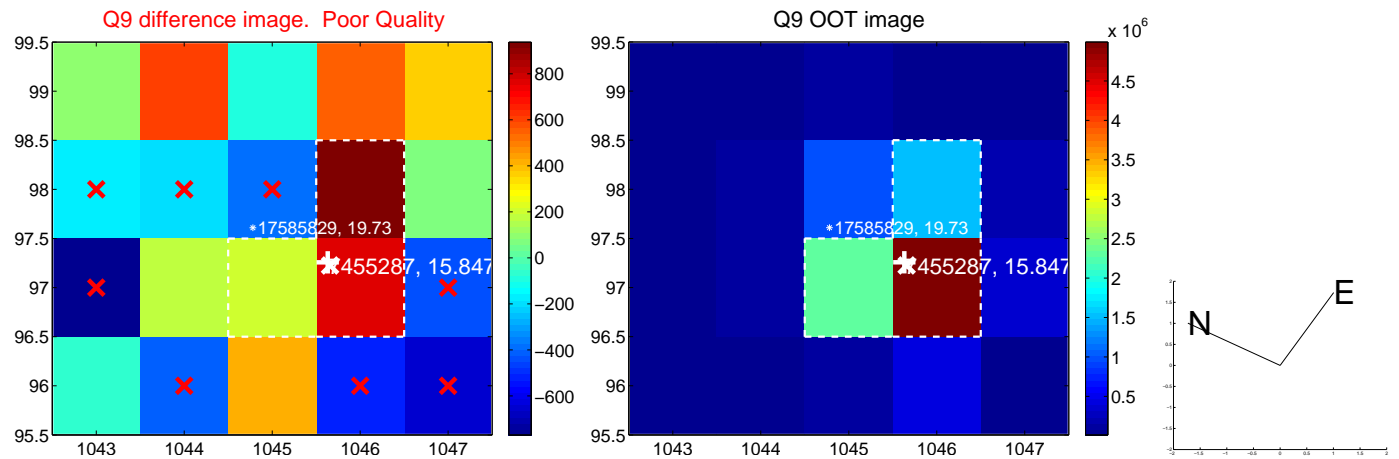
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



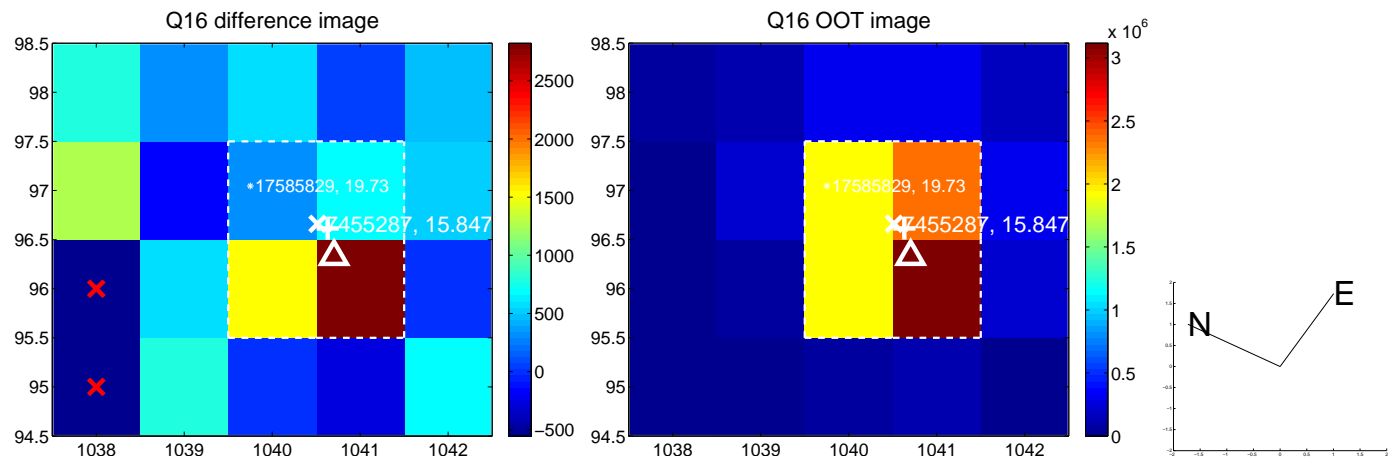
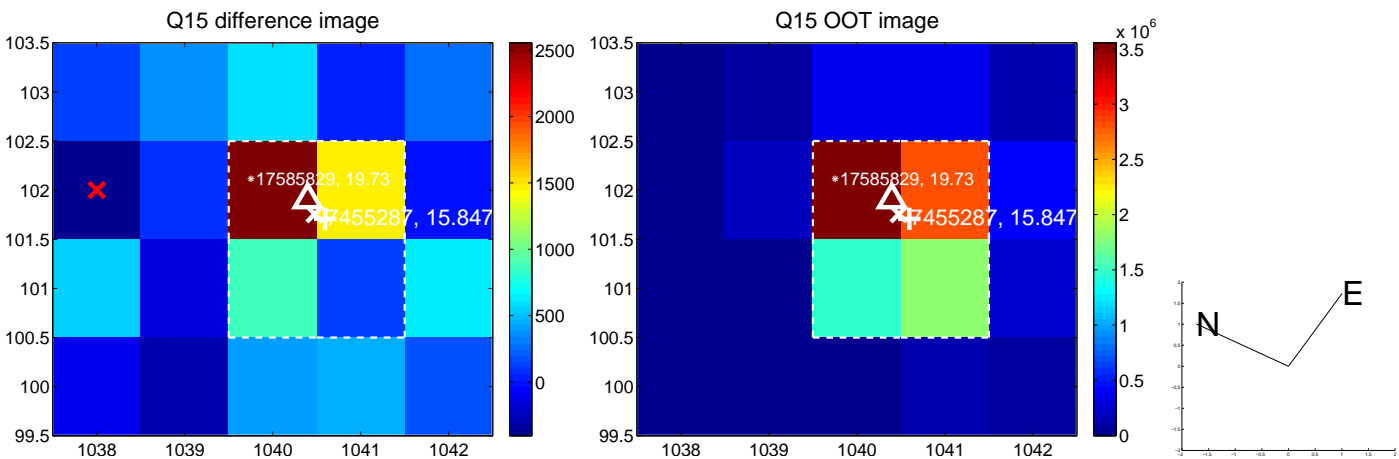
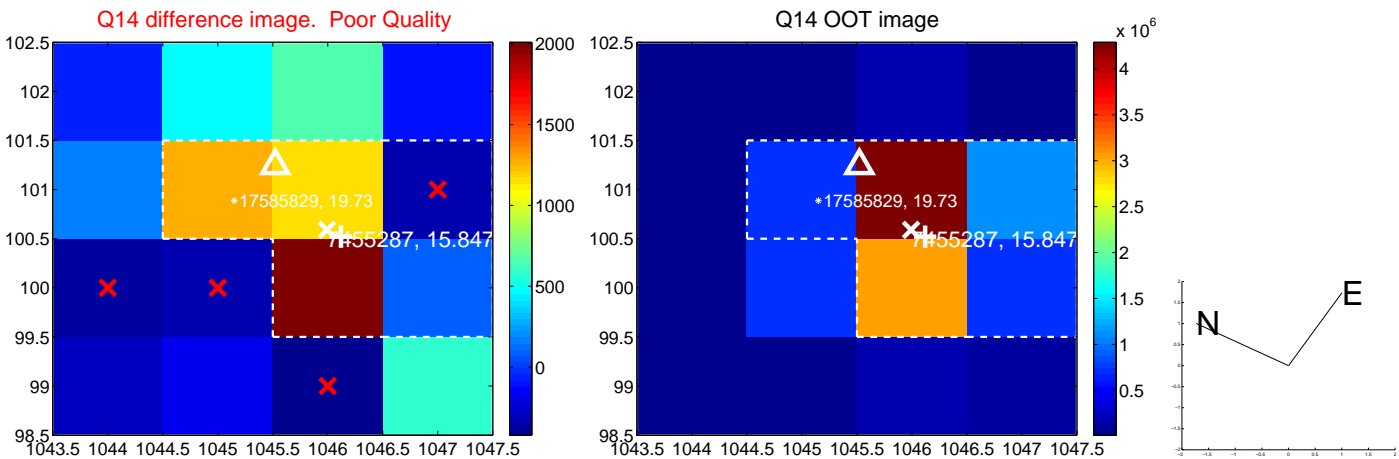
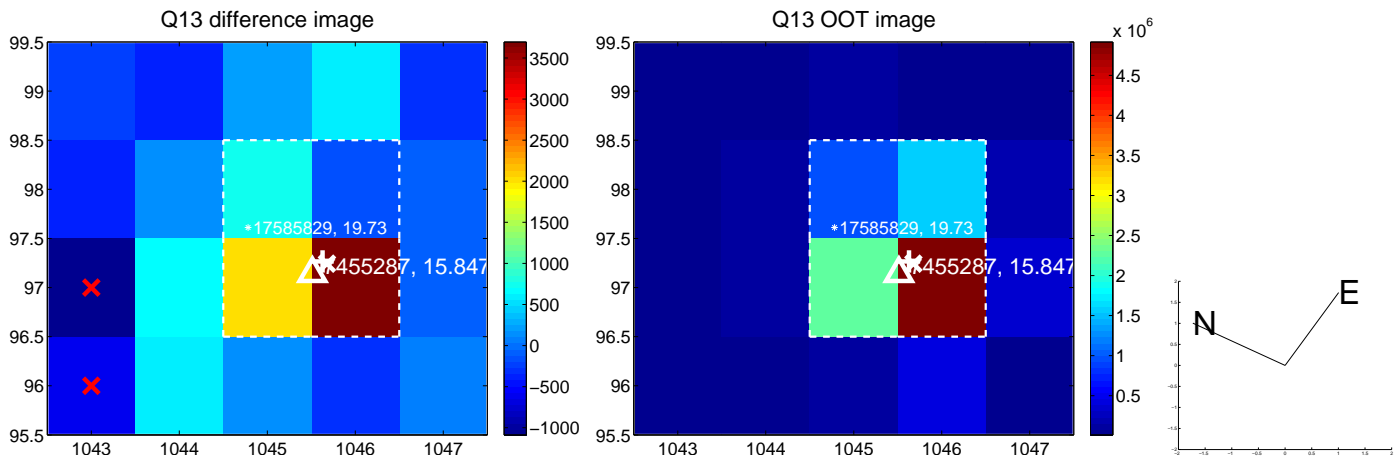
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



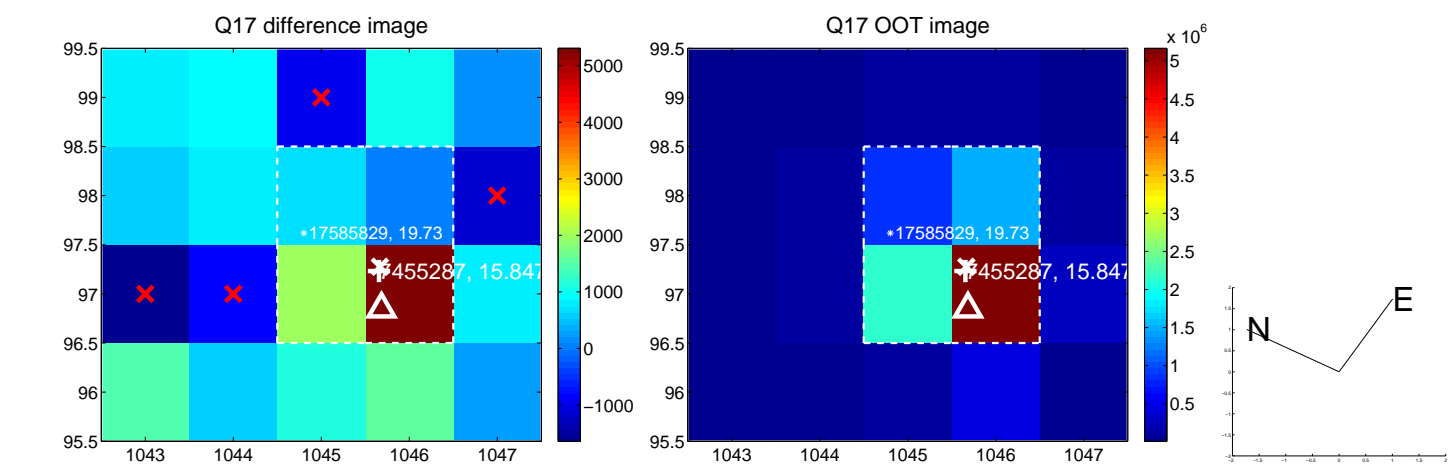
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



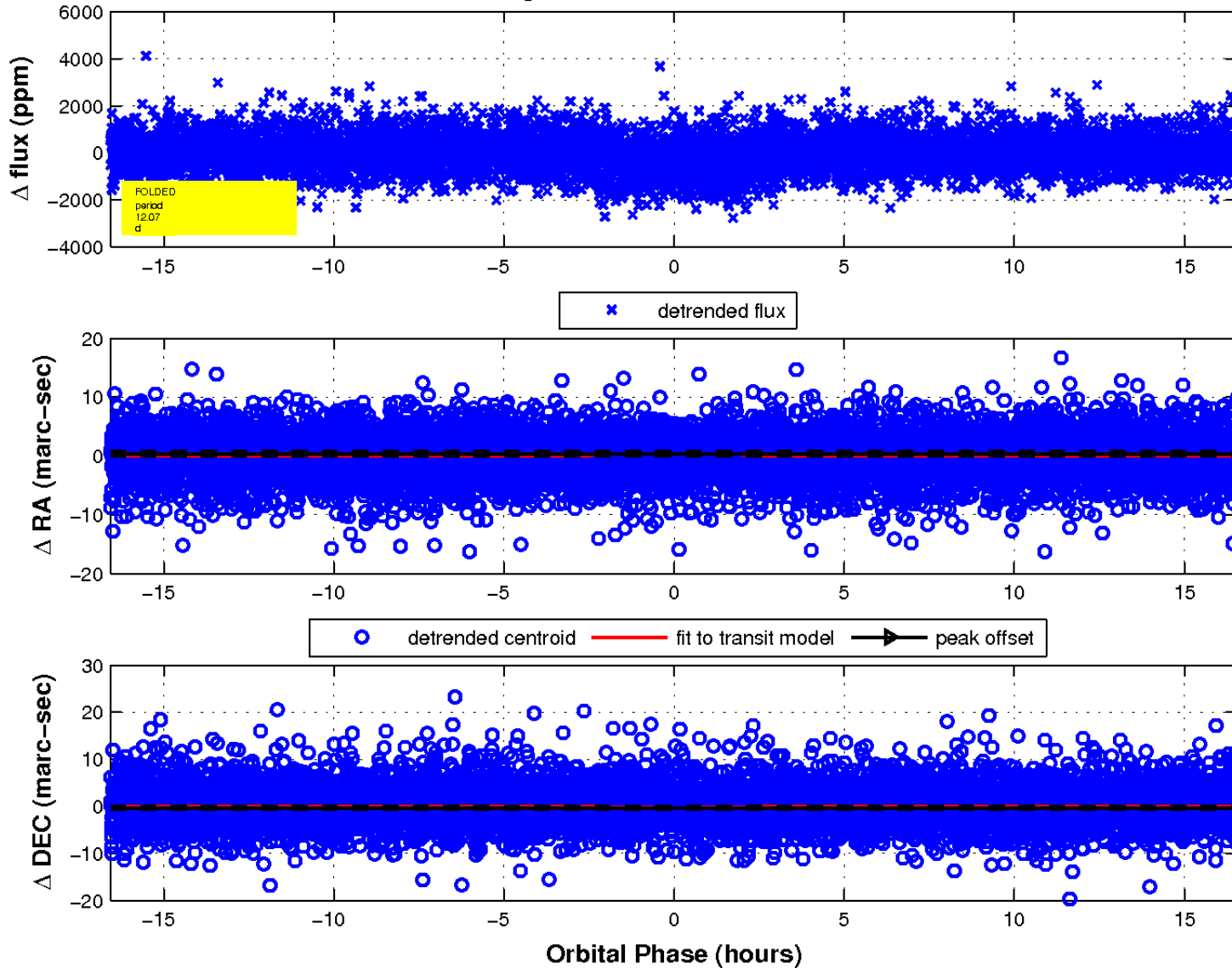
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

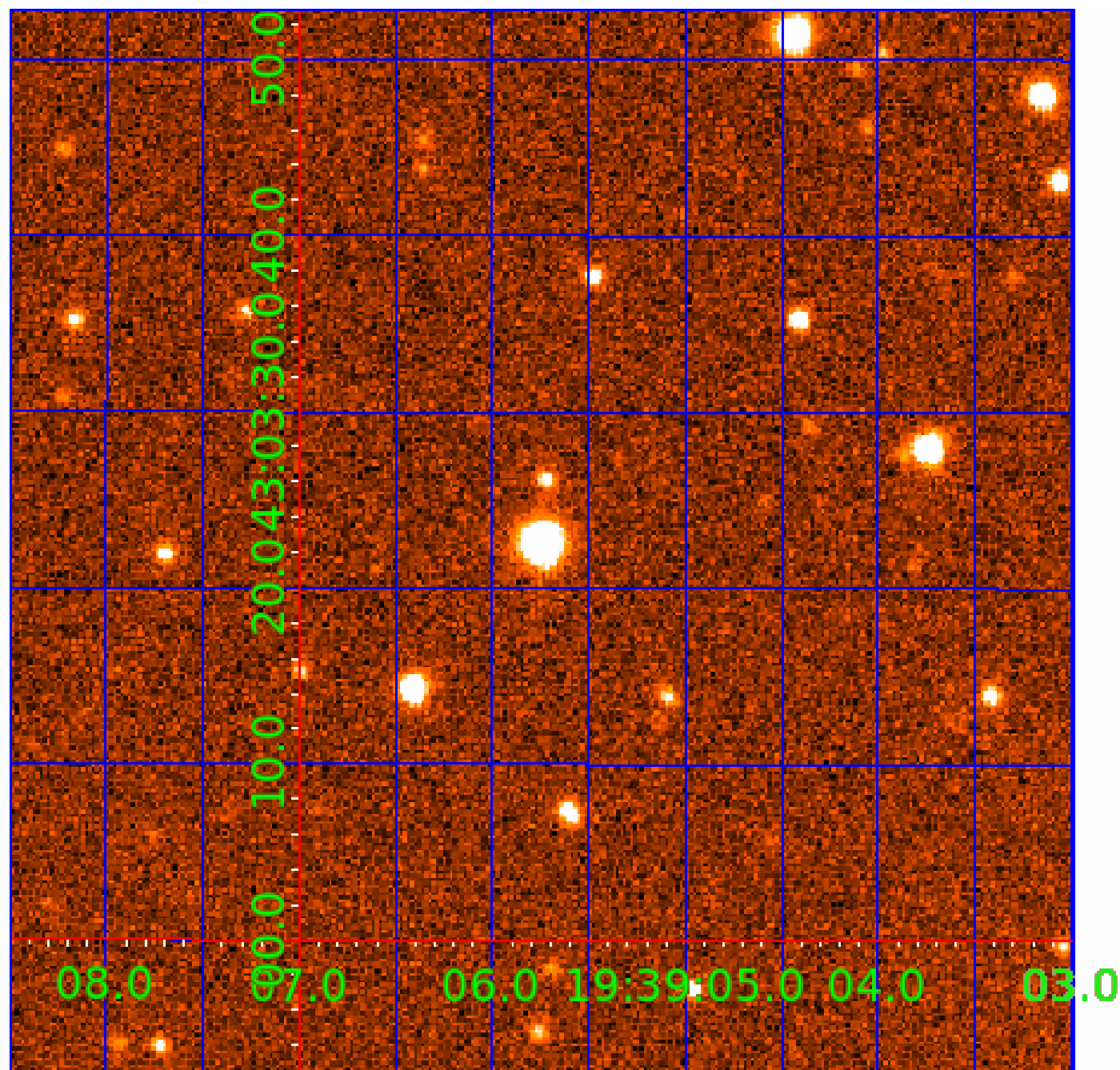


fluxWeightedCentroids, Planet 2 of 6



UKIRT Image

Declination



KIC 007455287

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})
007455287-01	OBS	0886.01	8.010786	138.164049	962.8	4.139	28.9	30.9	0.47	3713	2.52	9.93
007455287-02	OBS	0886.02	12.071268	143.465132	499.4	5.521	16.5	16.9	0.47	3713	1.29	5.75
007455287-03	OBS	0886.03	20.995898	152.314956	644.0	3.180	12.4	13.7	0.47	3713	1.40	2.75
007455287-05	OBS	No	363.586111	403.540903	1453.8	20.429	8.0	7.9	0.47	3713	2.29	0.06
007455287-06	OBS	No	392.183710	372.382225	1599.8	18.049	8.0	9.4	0.47	3713	2.29	0.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007455287-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-03	OBS	PC	0.99	0	0	0	0	NO_COMMENT
007455287-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
007455287-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—CENT_FEW_DIFFS

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

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

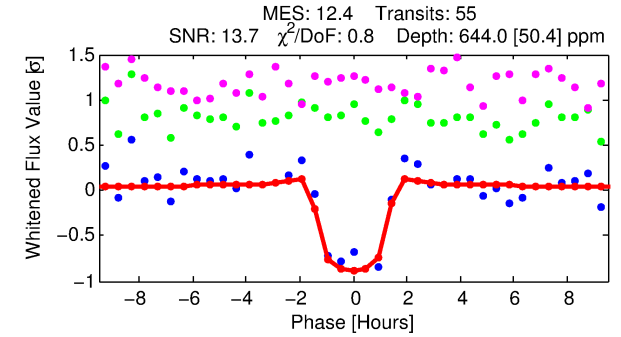
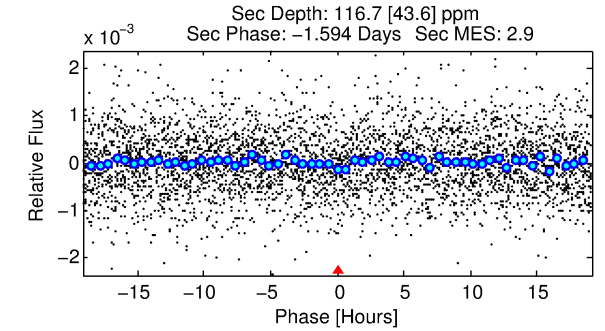
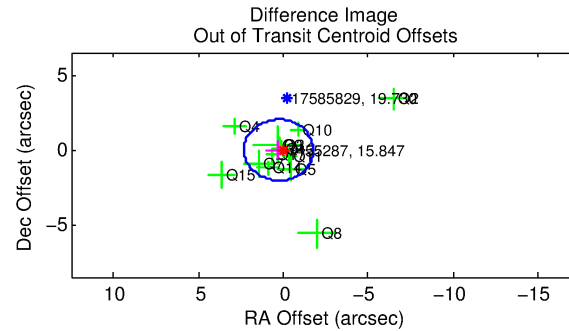
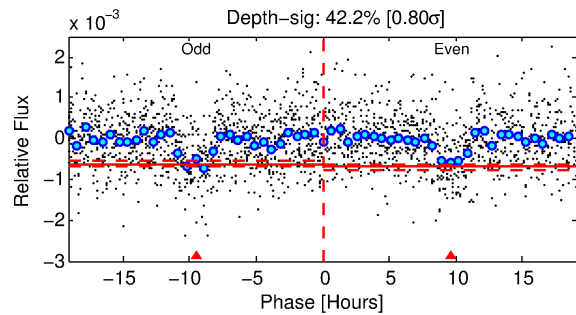
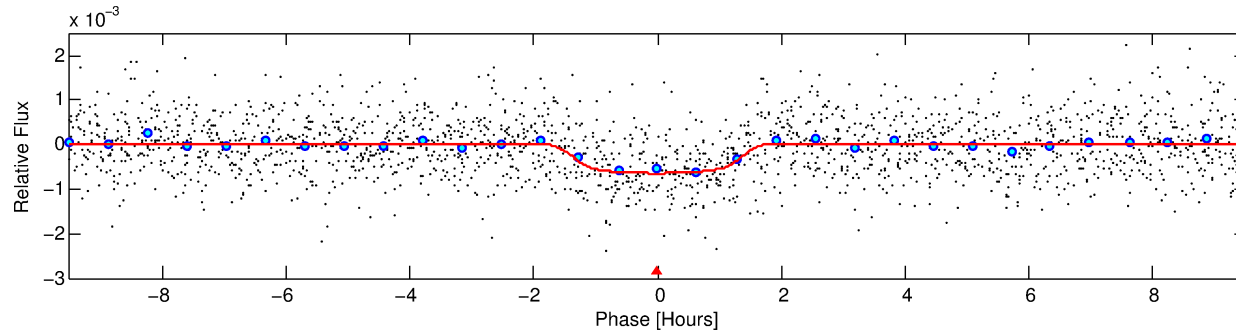
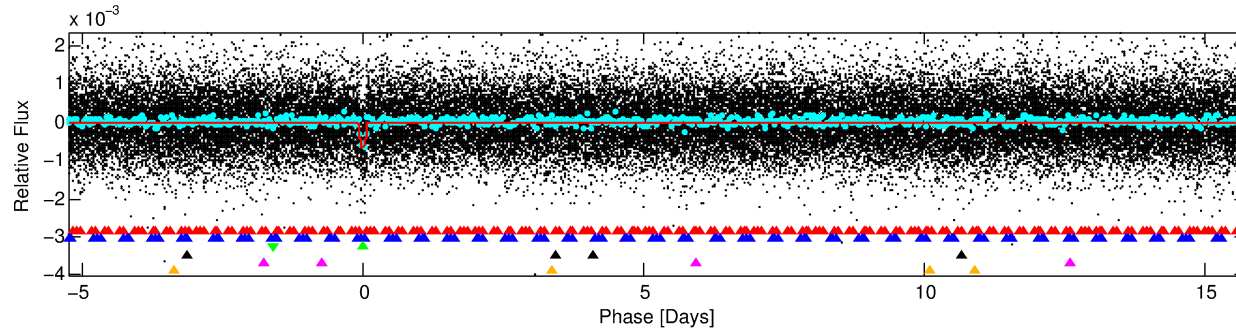
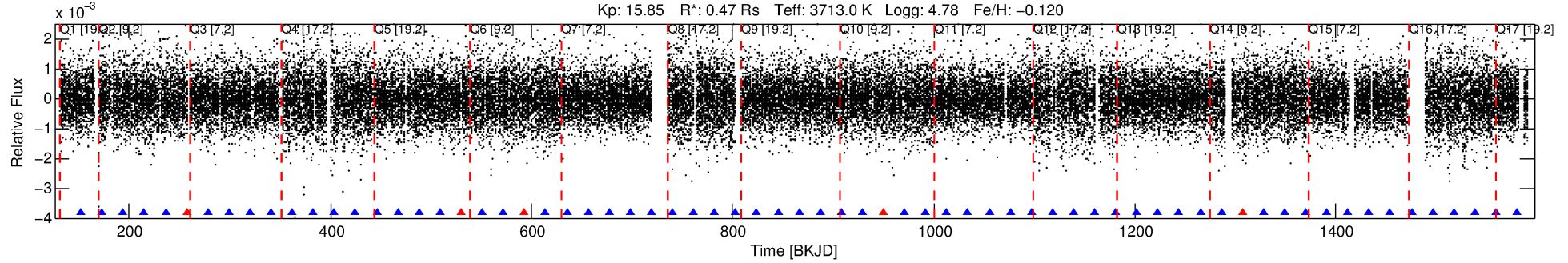
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007455287-03

No Significant Match Found

DV One-Page Summary

KIC: 7455287 Candidate: 3 of 6 Period: 20.996 d
KOI: K00886.03 Name: Kepler-54d Corr: 0.940



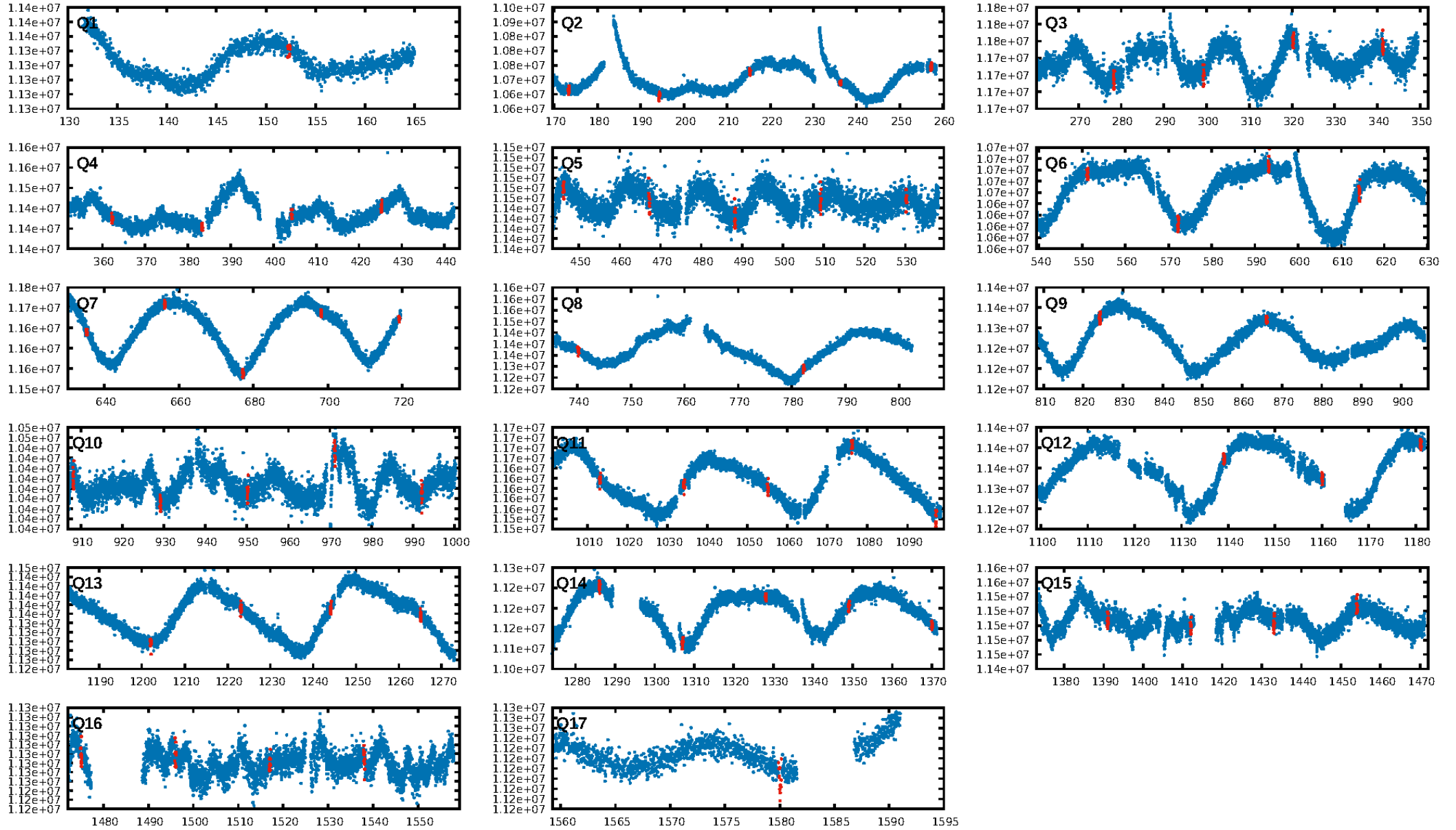
DV Fit Results:

Period = 20.99590 [0.00013] d
Epoch = 152.3150 [0.0048] BKJD
Rp/R* = 0.0272 [0.0057]
a/R* = 26.31 [23.55]
b = 0.89 [0.22]
Seff = 2.75 [0.43]
Teq = 328 [13] K
Rp = 1.40 [0.33] Re
a = 0.1170 [0.0106] AU
Ag = 450.64 [258.02] [1.74 σ]
Teffp = 2339 [332] K [6.05 σ]

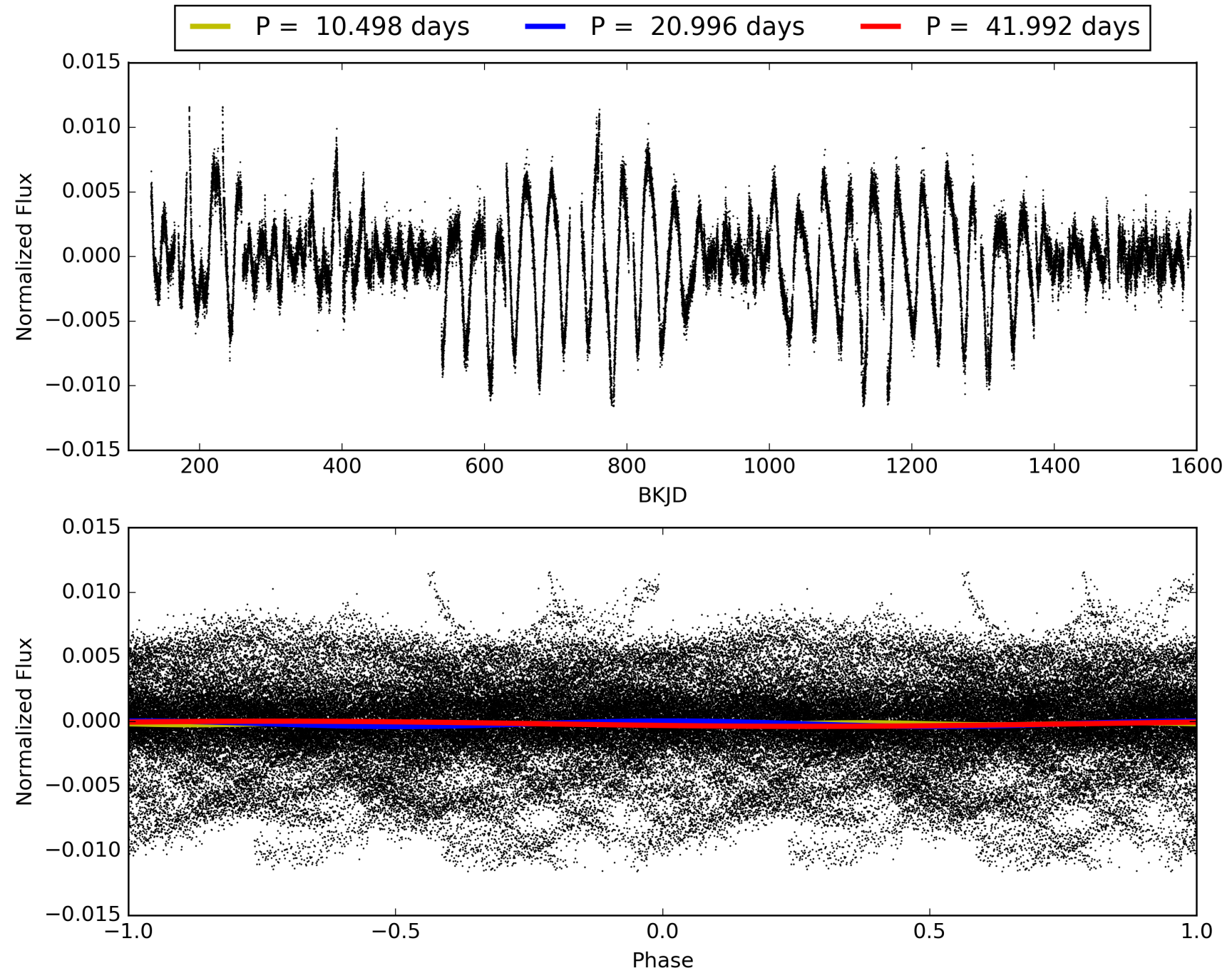
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [33.62 σ]
LongPeriod-sig: 100.0% [397.69 σ]
ModelChiSquare2-sig: 99.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.14e-33
RollingBand-fgt: 0.91 [49/54]
GhostDiagnostic-chr: 2.288
Centroid-sig: 49.9%
Centroid-so: 0.812 arcsec [0.81 σ]
OotOffset-rm: 0.276 arcsec [0.41 σ]
KicOffset-rm: 0.301 arcsec [0.41 σ]
OotOffset-st: 3/4/2/4 [13]
KicOffset-st: 3/4/2/4 [13]
DiffImageQuality-fgm: 0.62 [8/13]
DiffImageOverlap-fno: 0.94 [16/17]

TCE 007455287-03, PDC Light Curves

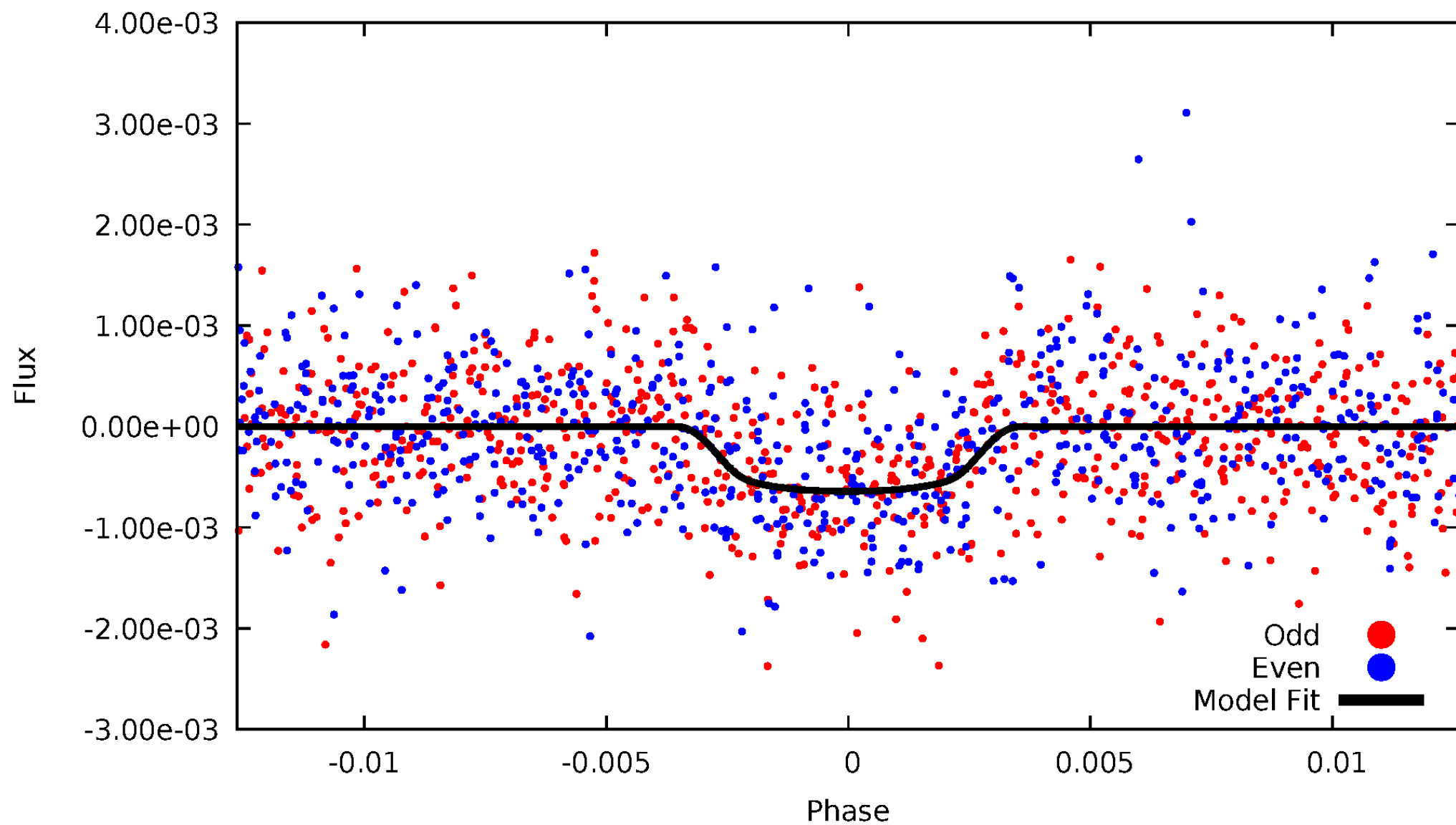


TCE 007455287-03



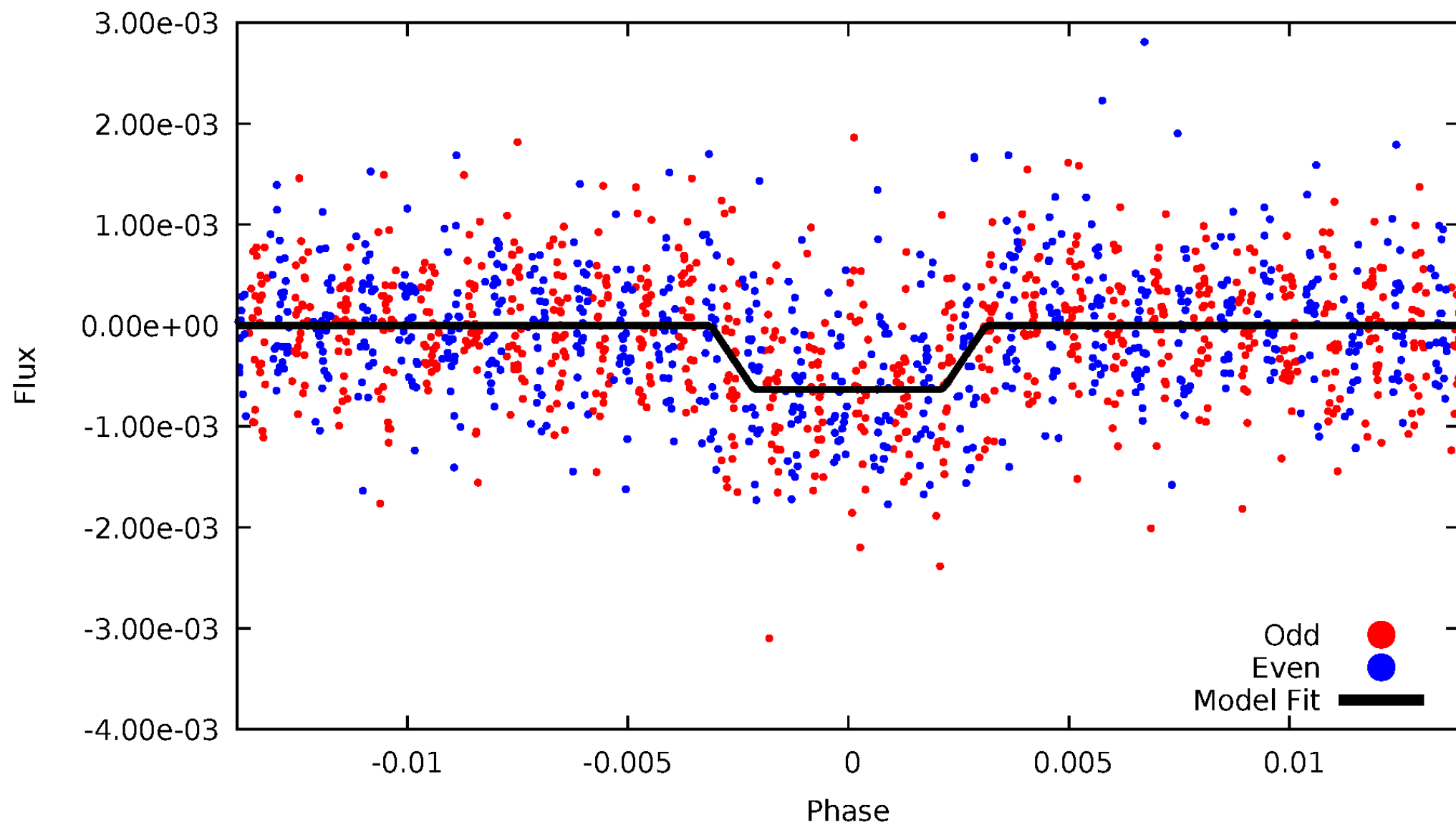
DV Odd/Even

TCE 007455287-03



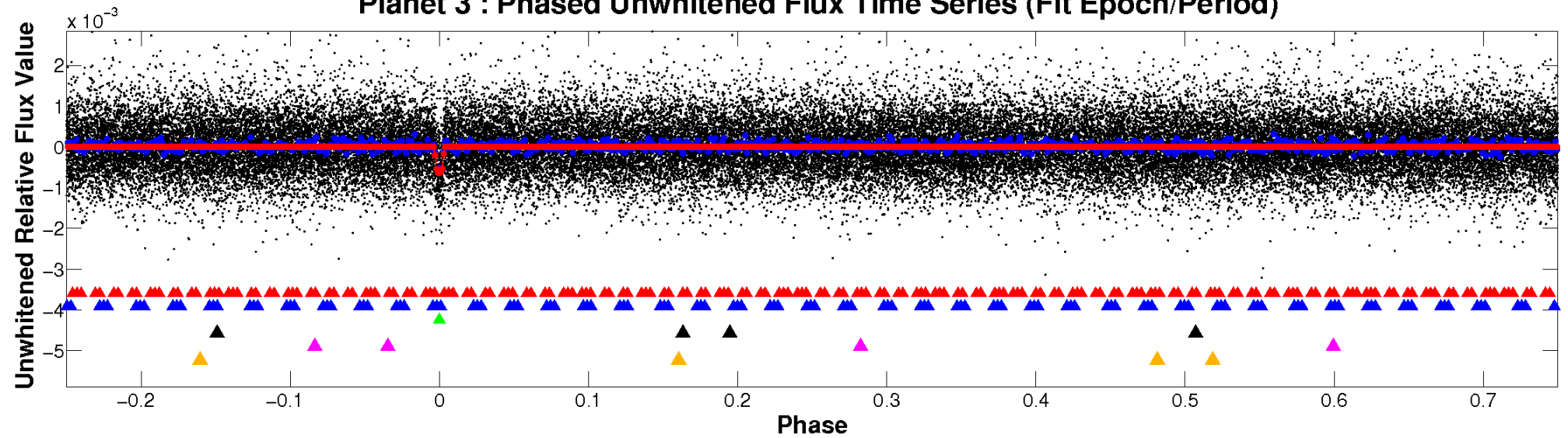
ALT Odd/Even

TCE 007455287-03

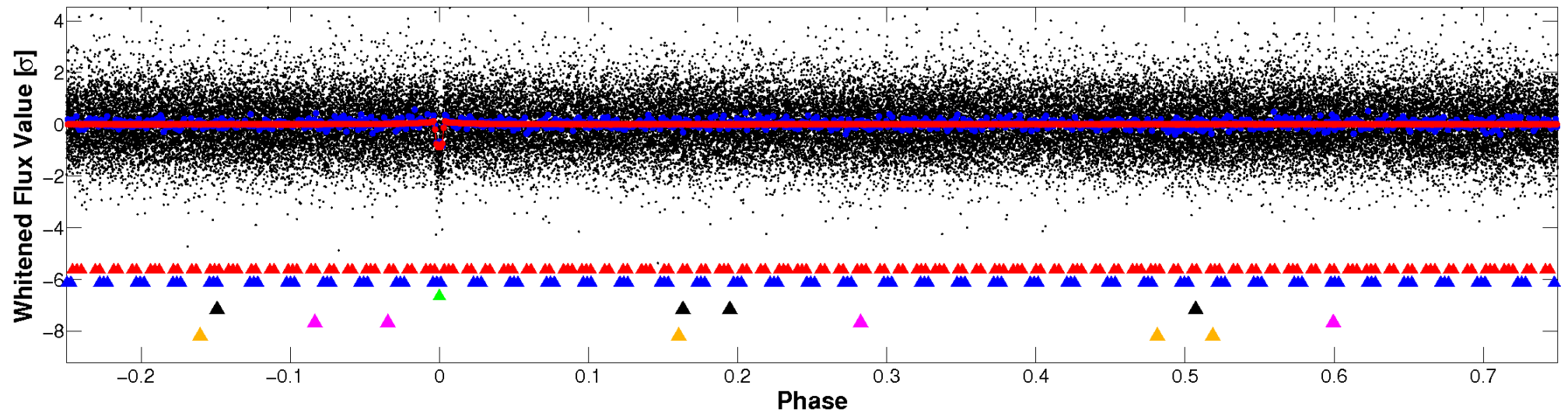


Non-Whitened Vs. Whitened Light Curve

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

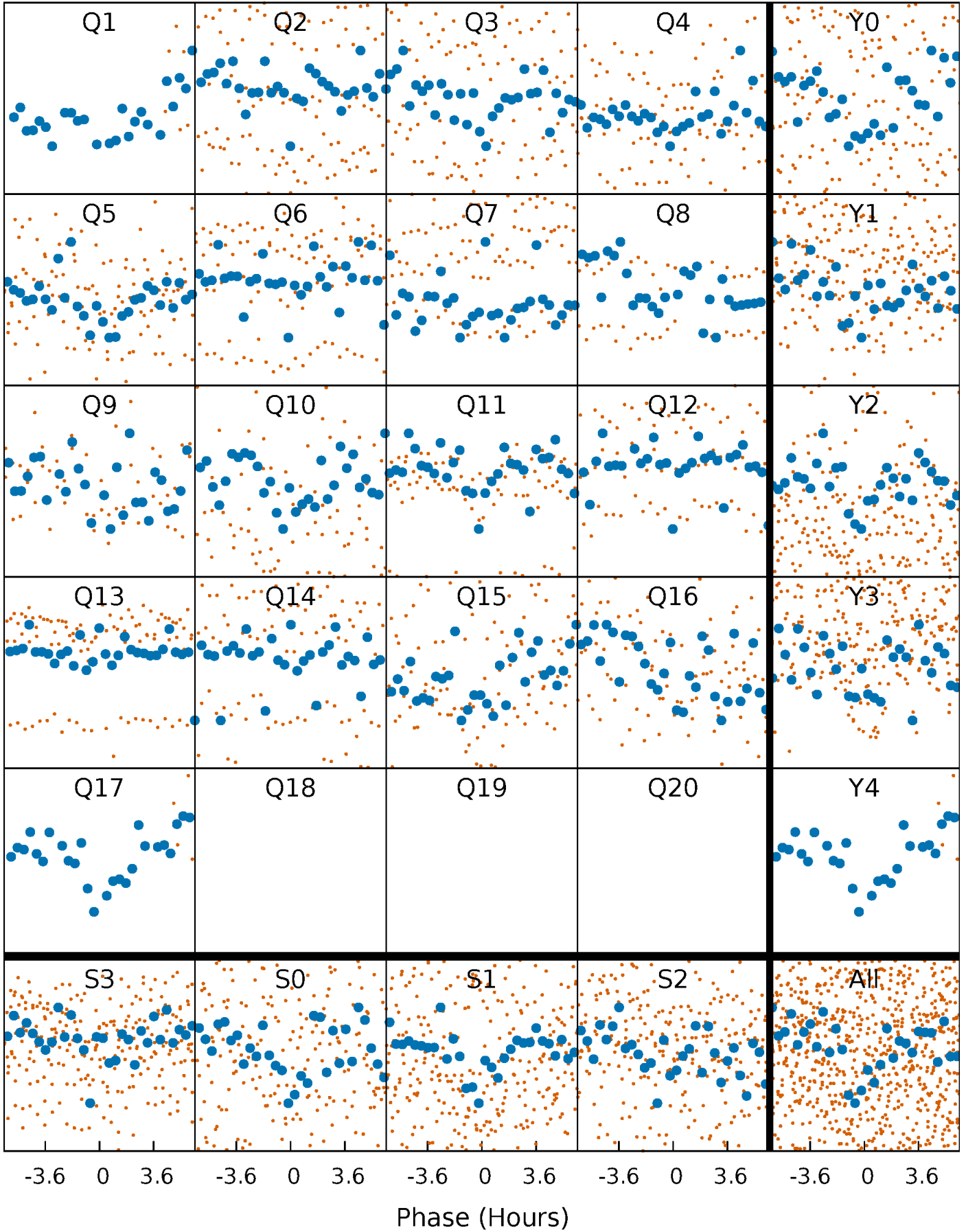


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



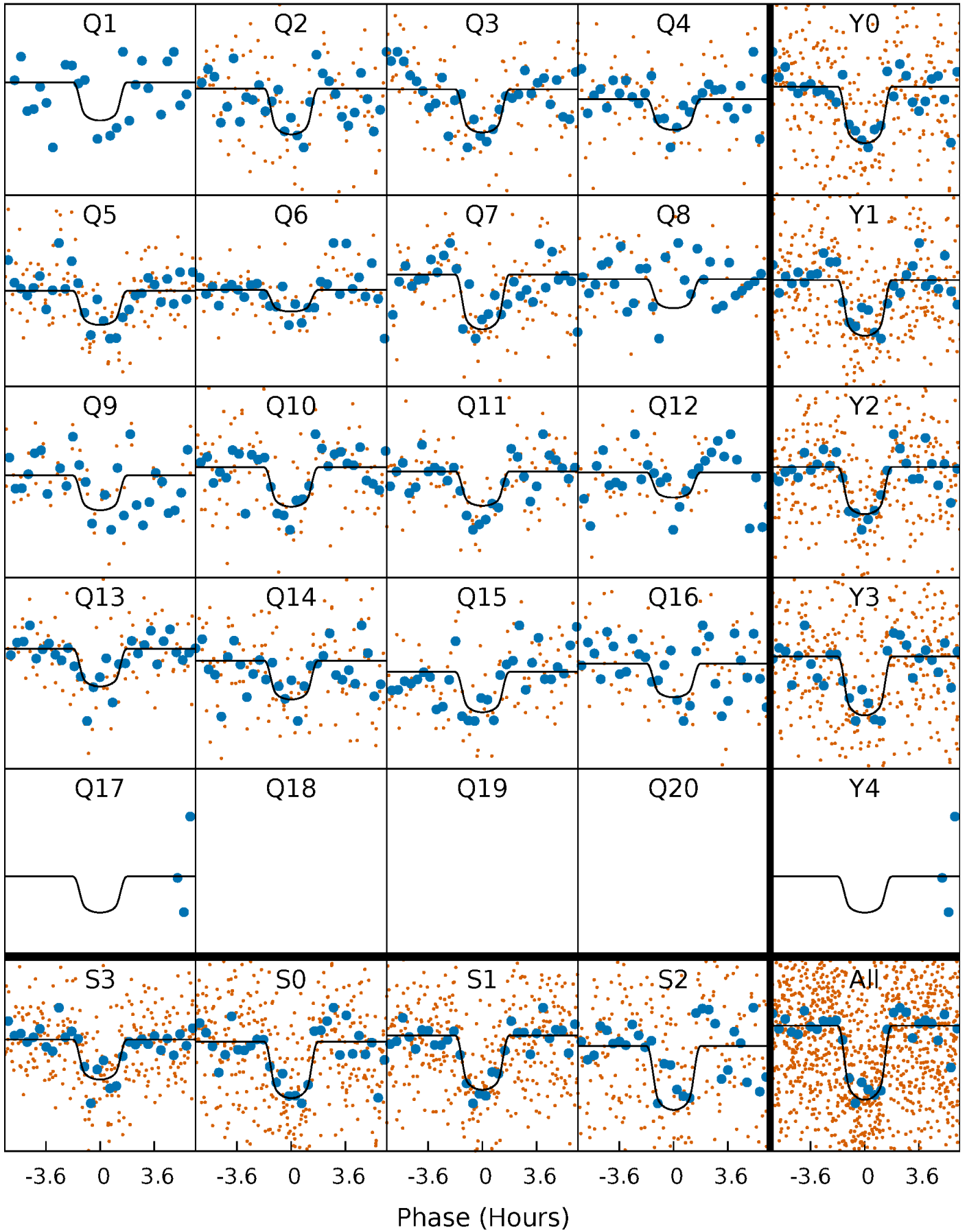
PDC Quarter-Phased Transit Curves

TCE 007455287-03 P= 20.995898 Days $T_0=152.314956$ (BKJD)



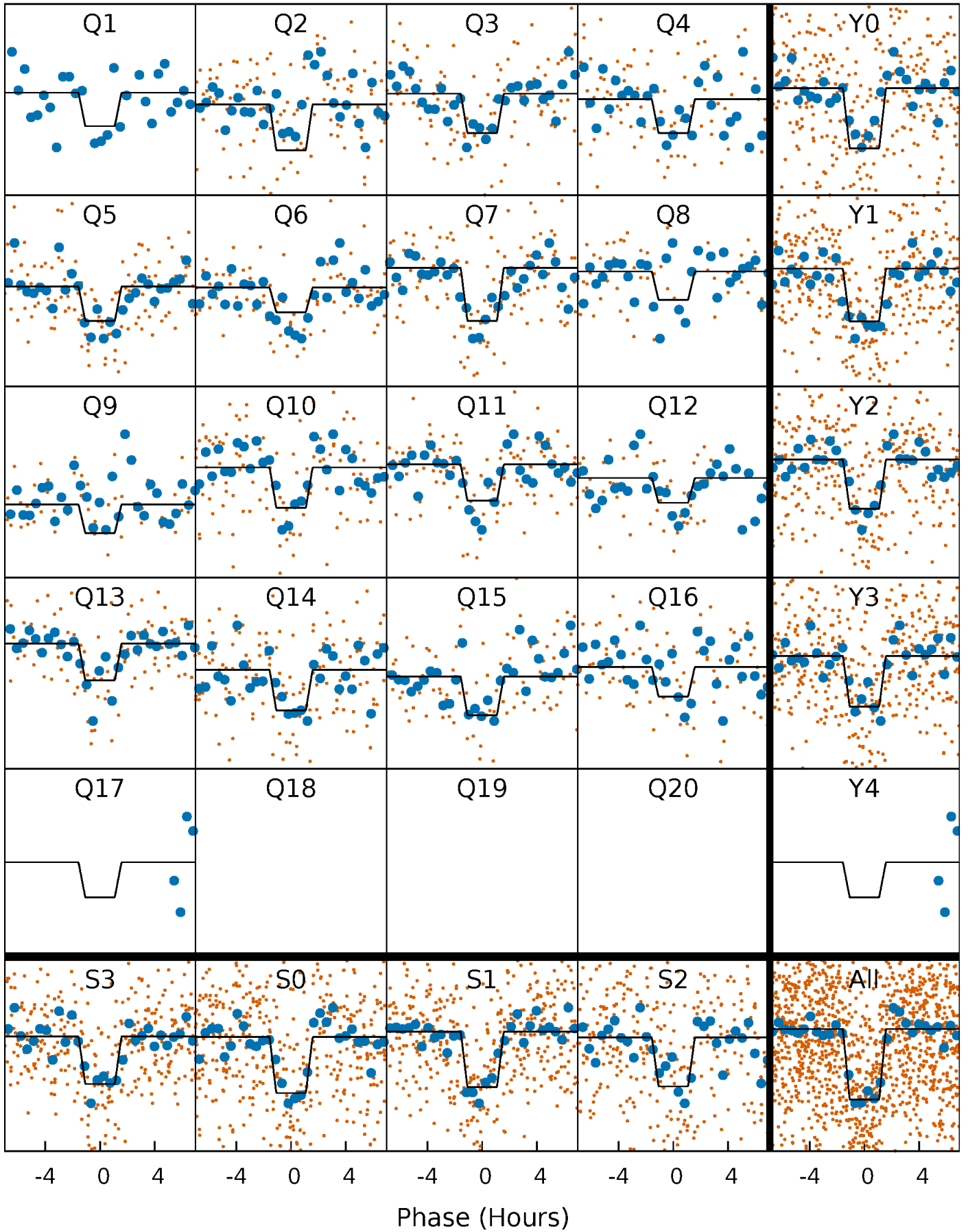
DV Quarter-Phased Transit Curves

TCE 007455287-03 P= 20.995898 Days $T_0=152.314956$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

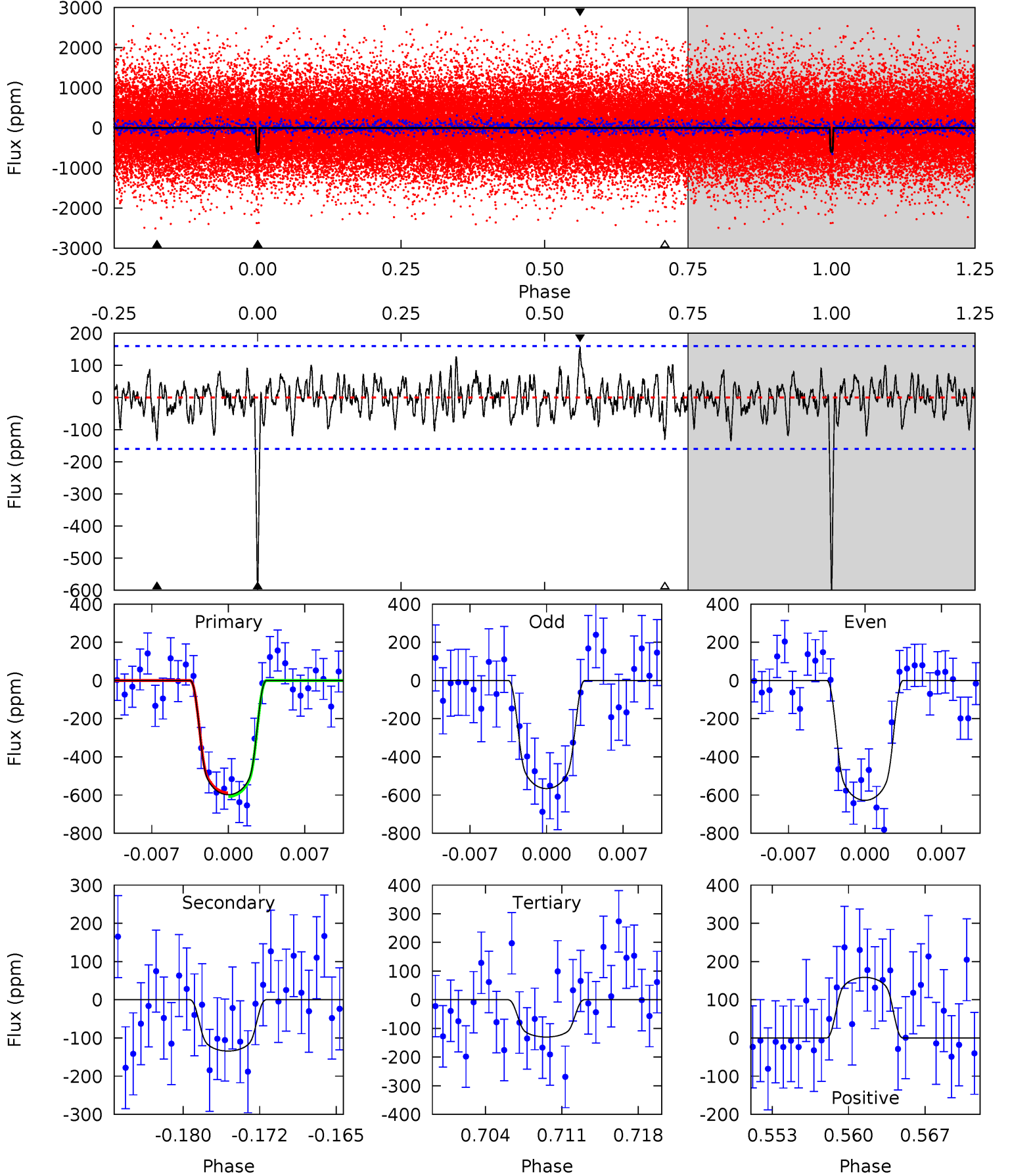
TCE 007455287-03 P= 20.995577 Days $T_0=152.326601$ (BKJD)



DV Model-Shift Uniqueness Test

007455287-03, P = 20.995898 Days, E = 131.319058 Days

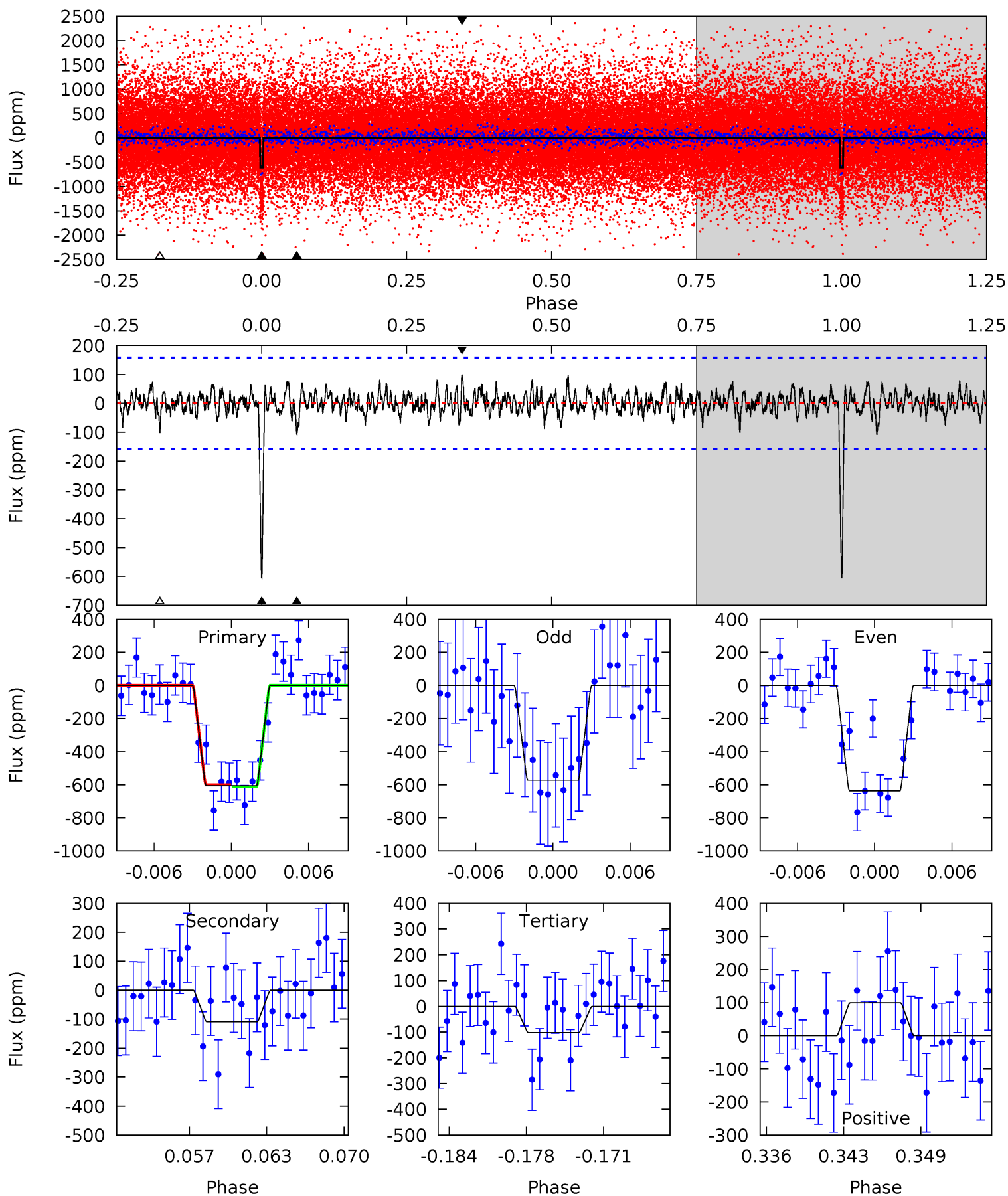
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.0	4.27	4.14	5.05	5.09	2.69	1.35	14.9	14.0	0.14	-0.77	0.98	0.93	0.21	0.31



Alt Model-Shift Uniqueness Test

007455287-03, $P = 20.995577$ Days, $E = 131.331024$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.5	3.50	3.29	3.20	5.11	2.73	0.98	16.2	16.3	0.21	0.31	1.04	0.87	0.14	0.16



Stellar Parameters For KIC 007455287

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3713^{+74}_{-92}	$4.779^{+0.063}_{-0.031}$	$-0.120^{+0.150}_{-0.150}$	$0.470^{+0.036}_{-0.054}$	$0.484^{+0.038}_{-0.053}$	$6.567^{+2.046}_{-0.894}$
	+2%/-2%	+1%/-1%	+125%/-125%	+8%/-11%	+8%/-11%	+31%/-14%
Source	SPE70	SPE60	SPE70	DSEP		

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

Secondary Eclipse Parameters for KIC 007455287-03 / KOI 0886.03

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-134 ± 31	$1.38^{+0.29}_{-0.32}$	456^{+13}_{-15}	2867^{+226}_{-180}	535^{+360}_{-199}
Alt.	-109 ± 31	$1.28^{+0.27}_{-0.31}$	454^{+13}_{-14}	2844^{+224}_{-180}	498^{+361}_{-188}

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

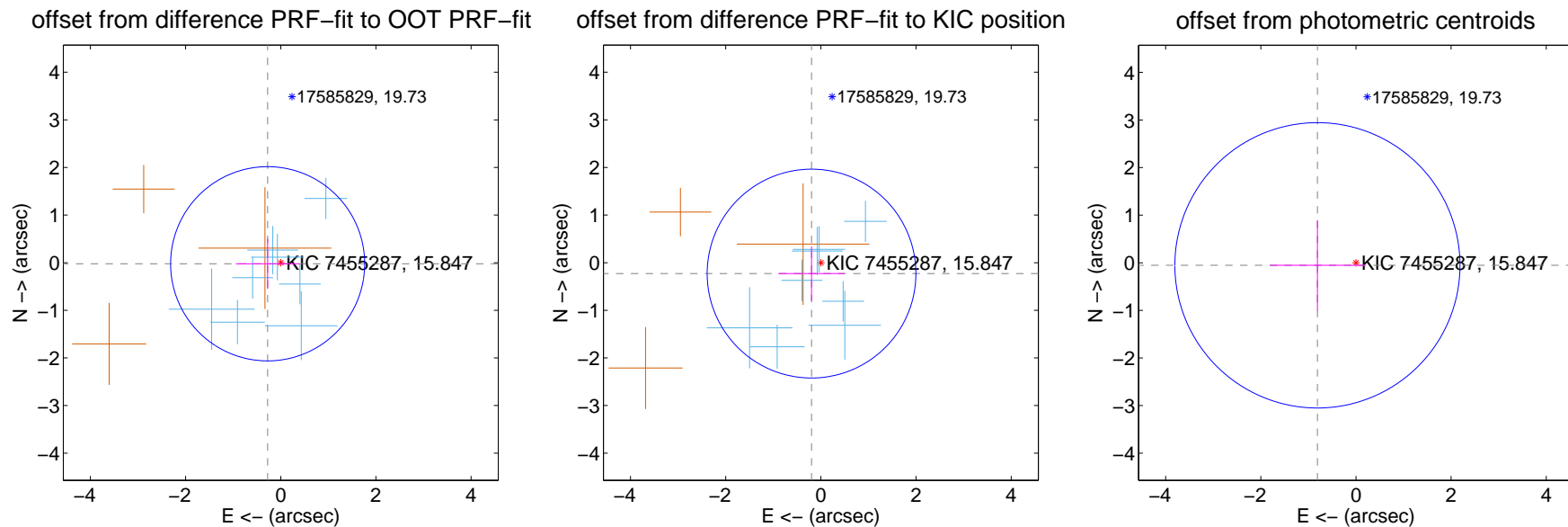
DV Centroid Data

Supplemental centroid analysis for 007455287-03. Kepler magnitude: 15.85. Transit SNR 13.74

There are 8 quarters with good PRF difference image offsets

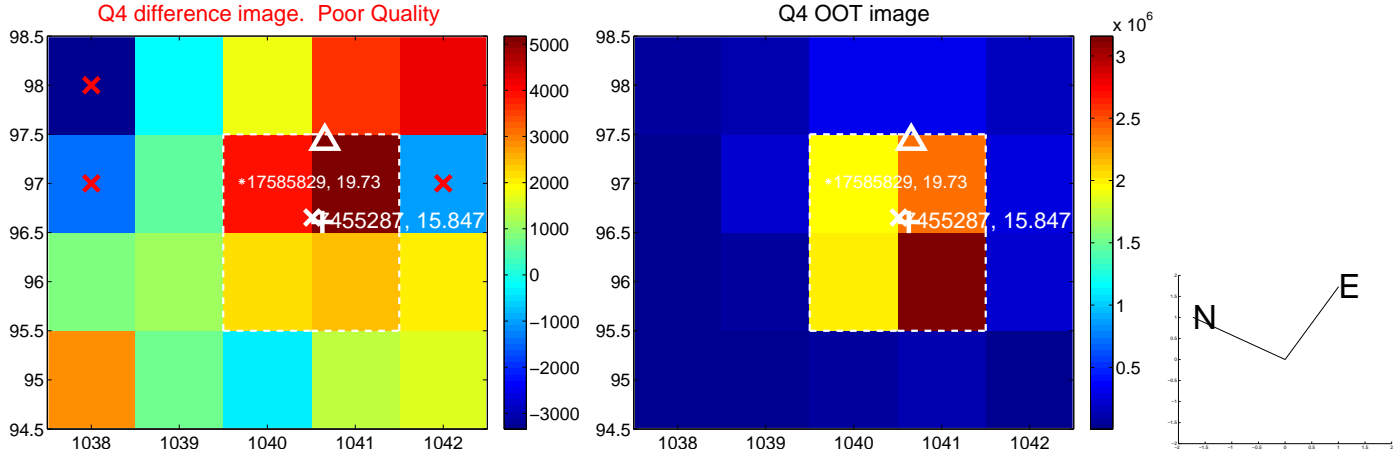
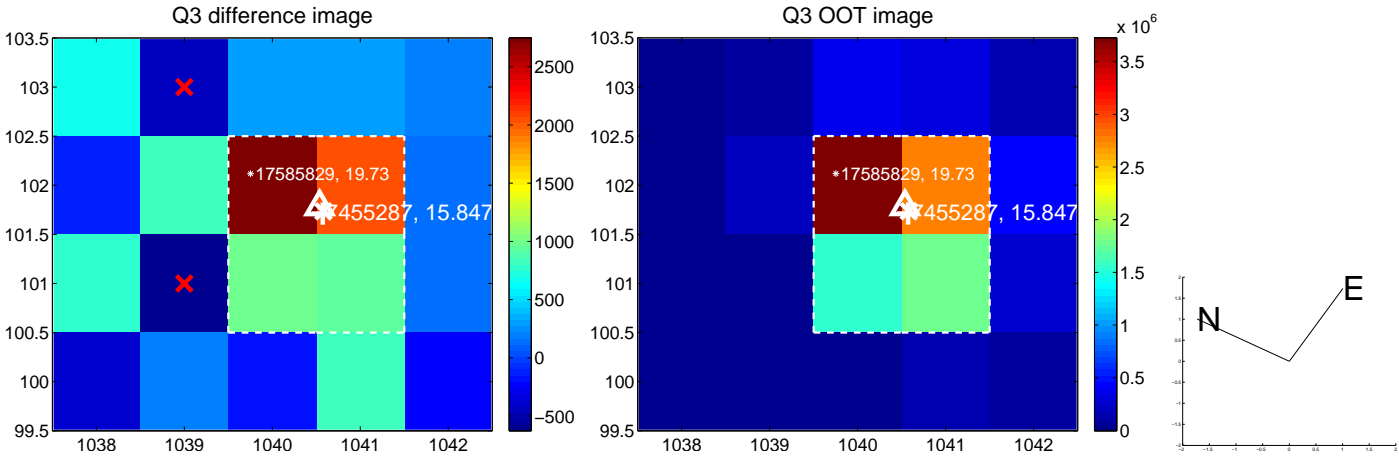
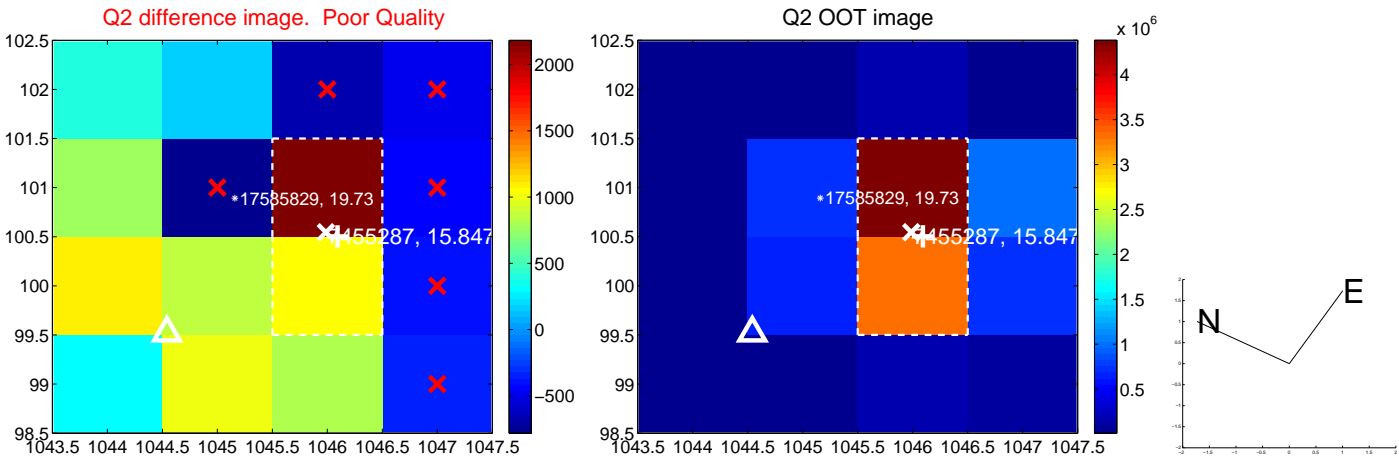
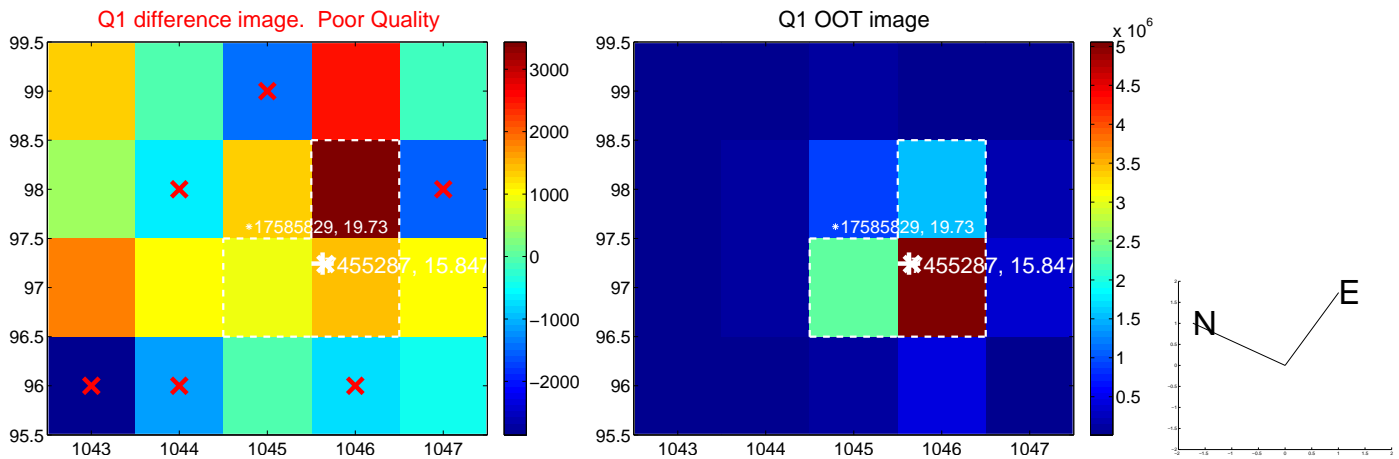
The direct PRF centroid is offset from the target star catalog position by about 0.20 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.276 ± 0.680	0.41	0.275 ± 0.668	-0.023 ± 0.529
PRF-fit source offset from KIC position	0.301 ± 0.731	0.41	0.196 ± 0.695	-0.229 ± 0.569
photometric centroid source offset	0.81 ± 1.00	0.81	0.81 ± 1.00	-0.05 ± 0.95

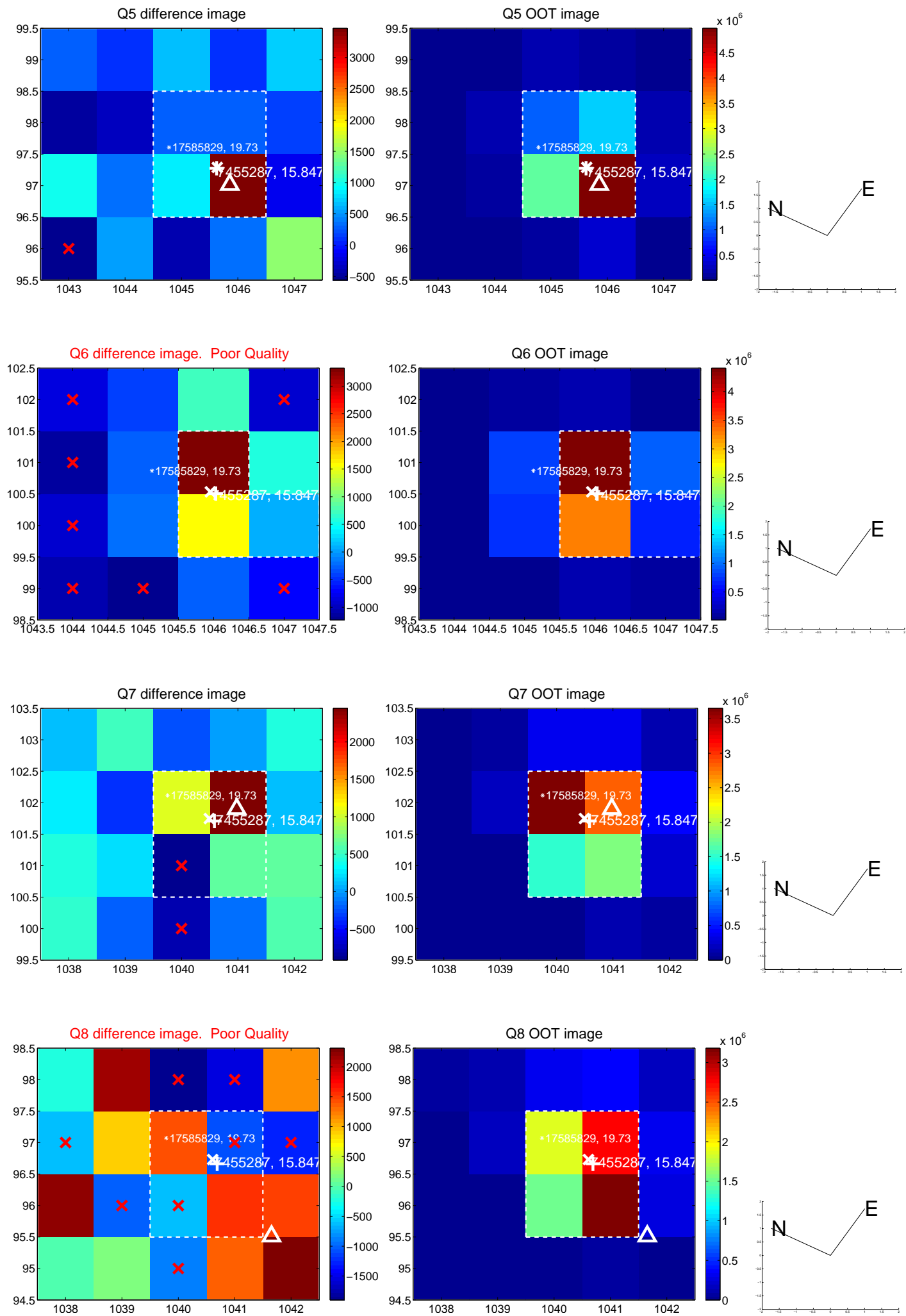


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

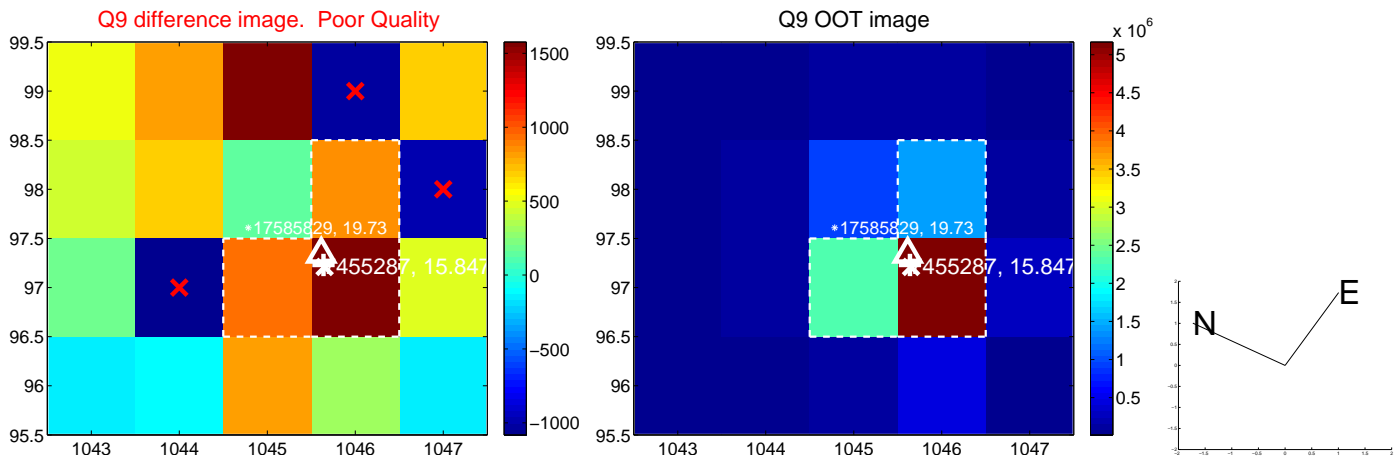
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



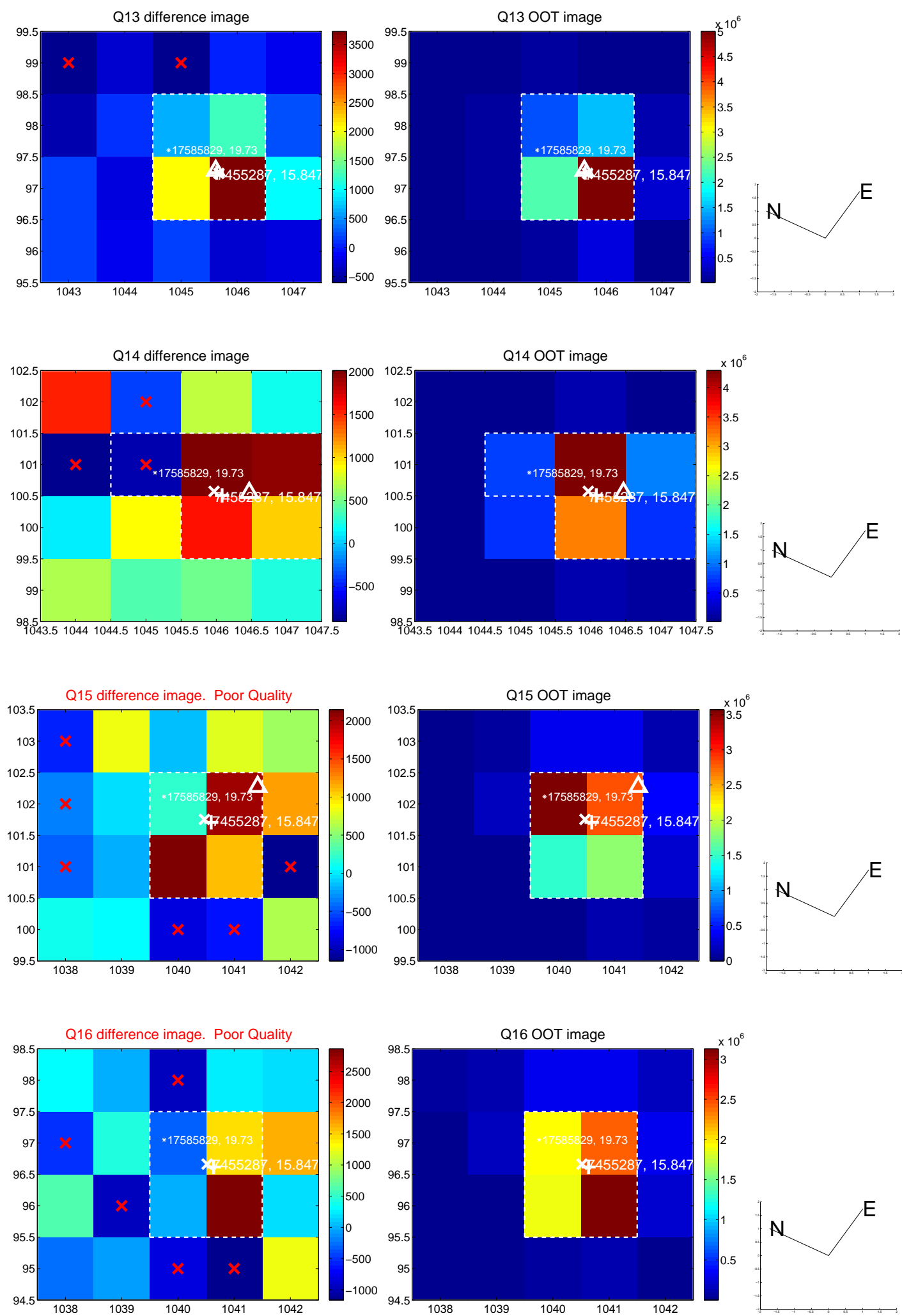
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



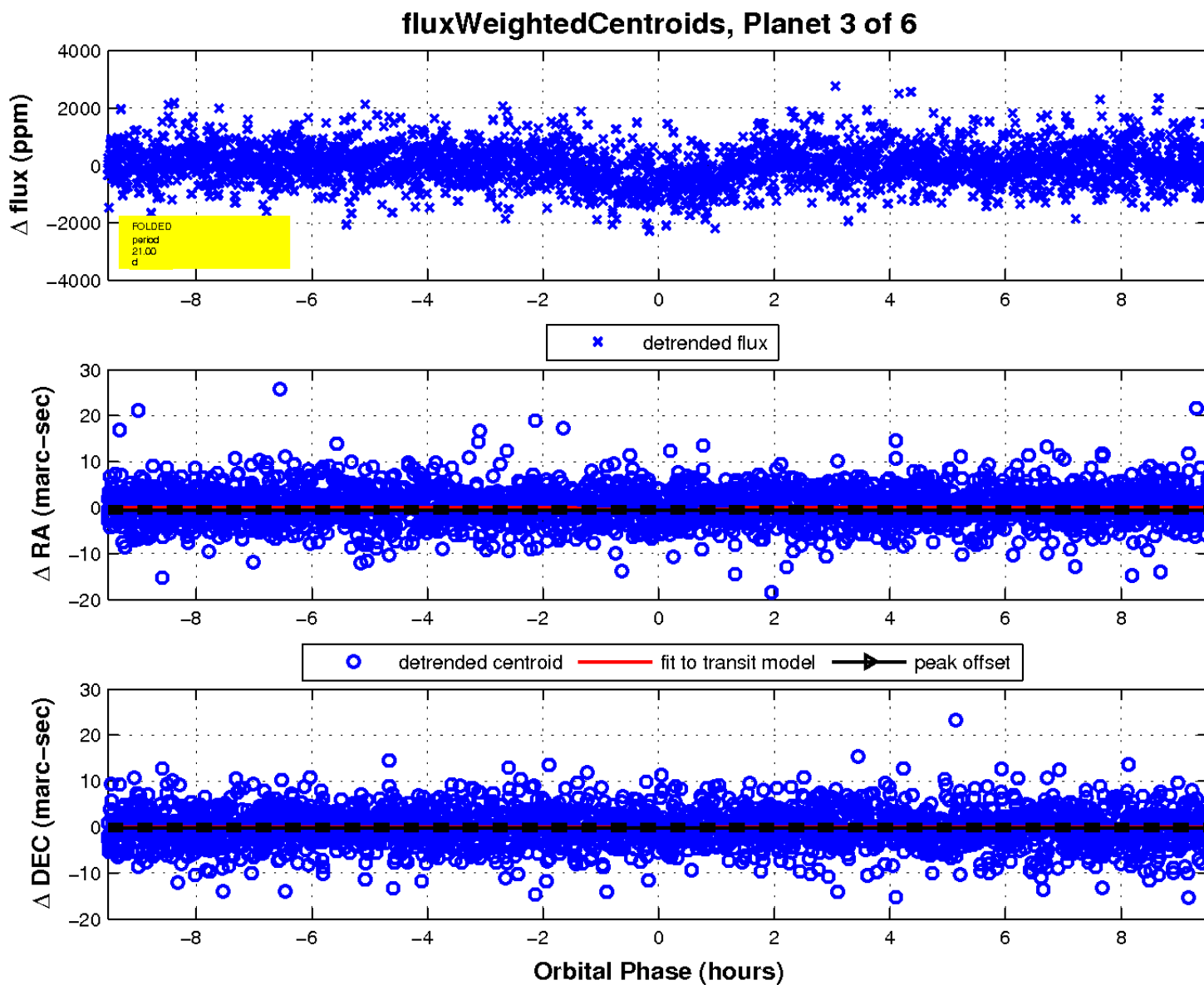
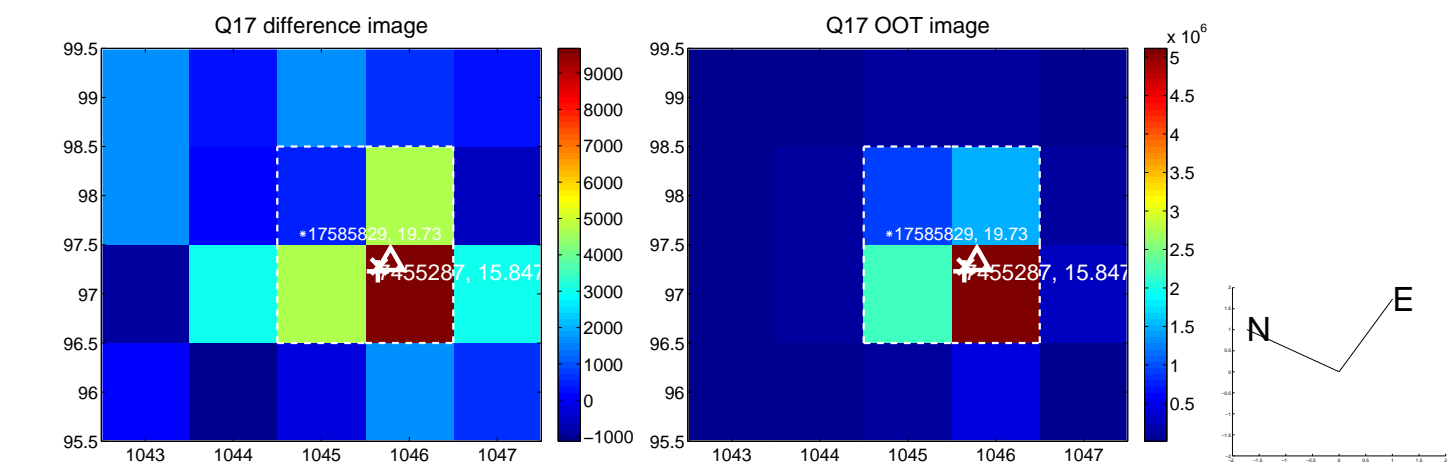
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

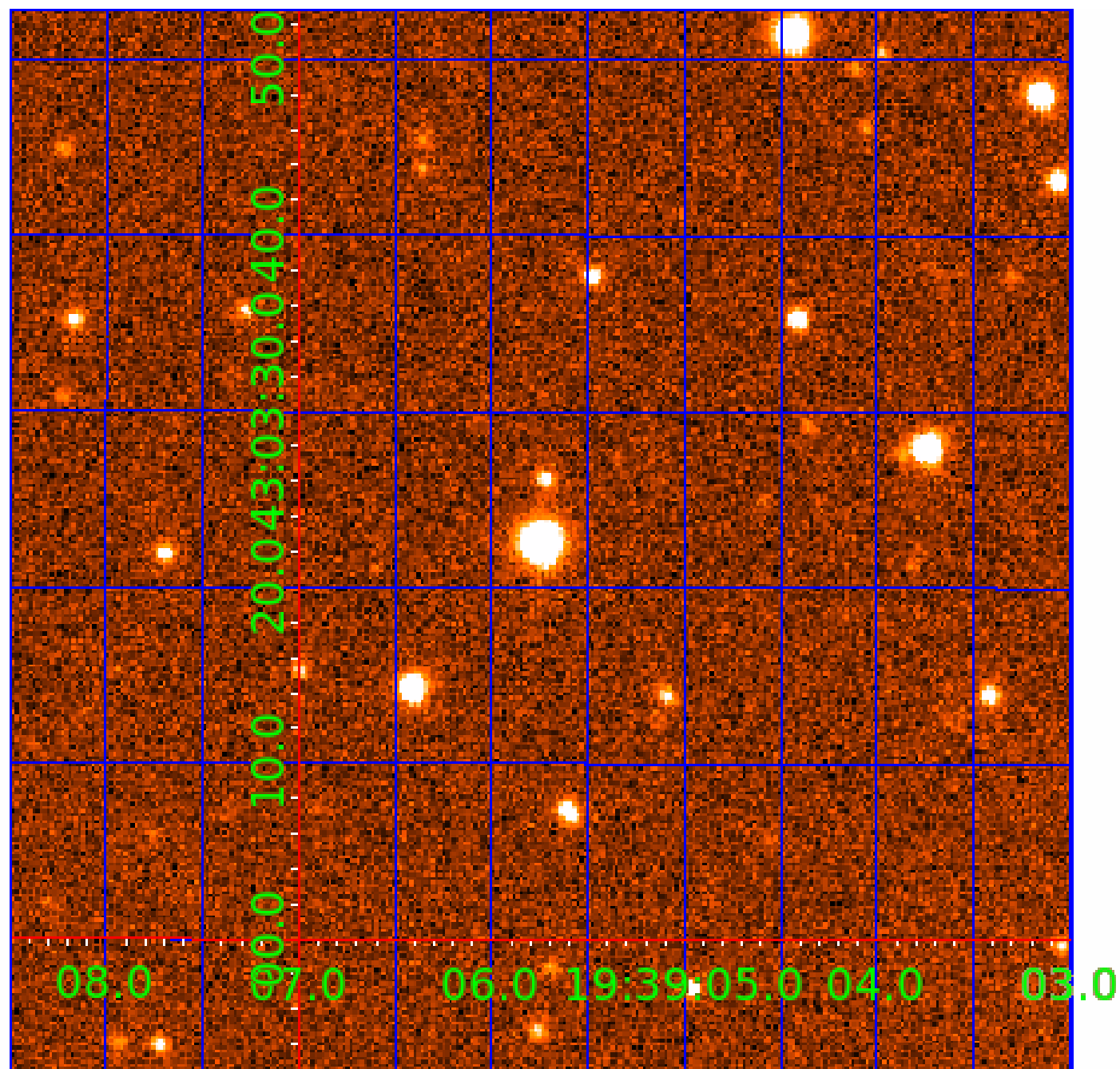


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007455287

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})
007455287-01	OBS	0886.01	8.010786	138.164049	962.8	4.139	28.9	30.9	0.47	3713	2.52	9.93
007455287-02	OBS	0886.02	12.071268	143.465132	499.4	5.521	16.5	16.9	0.47	3713	1.29	5.75
007455287-03	OBS	0886.03	20.995898	152.314956	644.0	3.180	12.4	13.7	0.47	3713	1.40	2.75
007455287-05	OBS	No	363.586111	403.540903	1453.8	20.429	8.0	7.9	0.47	3713	2.29	0.06
007455287-06	OBS	No	392.183710	372.382225	1599.8	18.049	8.0	9.4	0.47	3713	2.29	0.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007455287-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-03	OBS	PC	0.99	0	0	0	0	NO_COMMENT
007455287-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
007455287-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—CENT_FEW_DIFFS

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

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

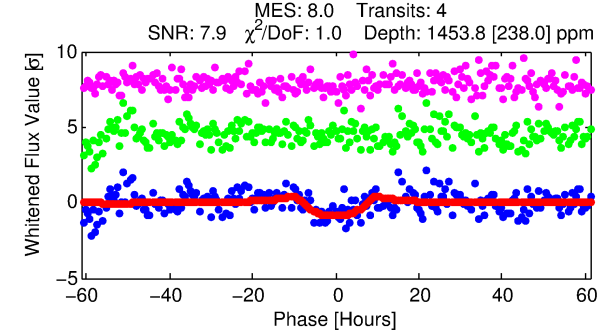
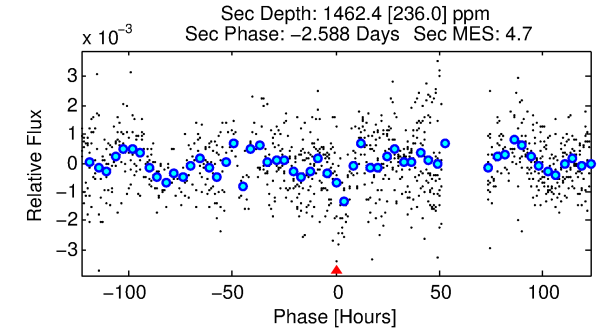
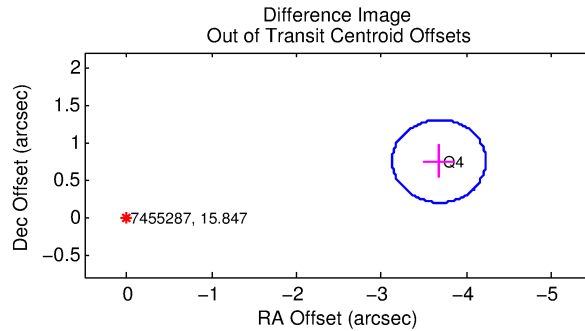
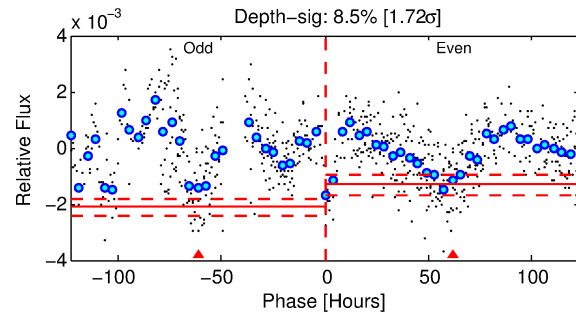
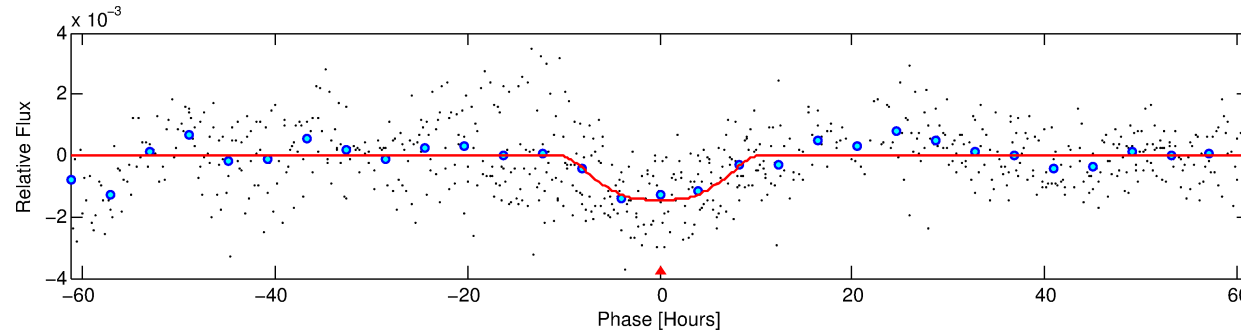
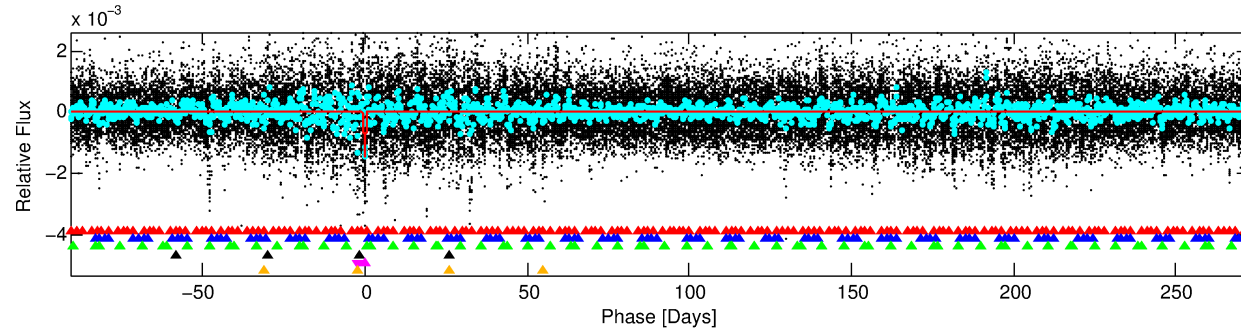
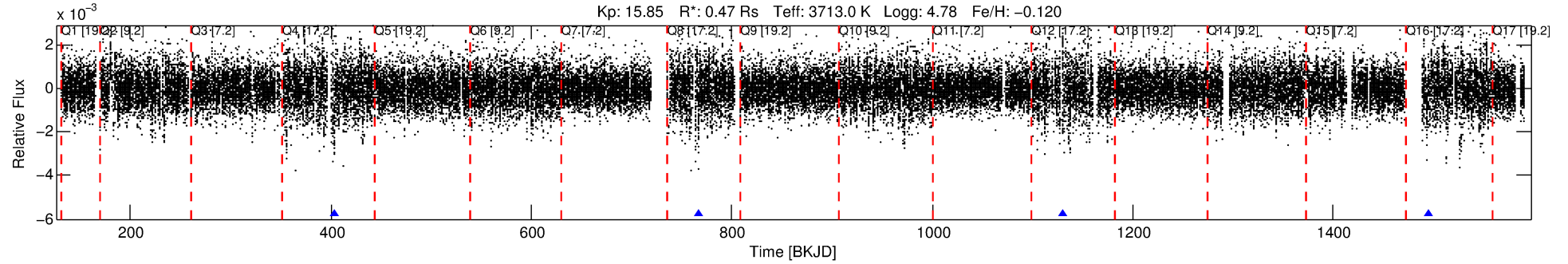
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007455287-05

No Significant Match Found

DV One-Page Summary

KIC: 7455287 Candidate: 5 of 6 Period: 363.586 d
KOI: K00886 Name: Kepler-54 Corr: No Ephemeris Match



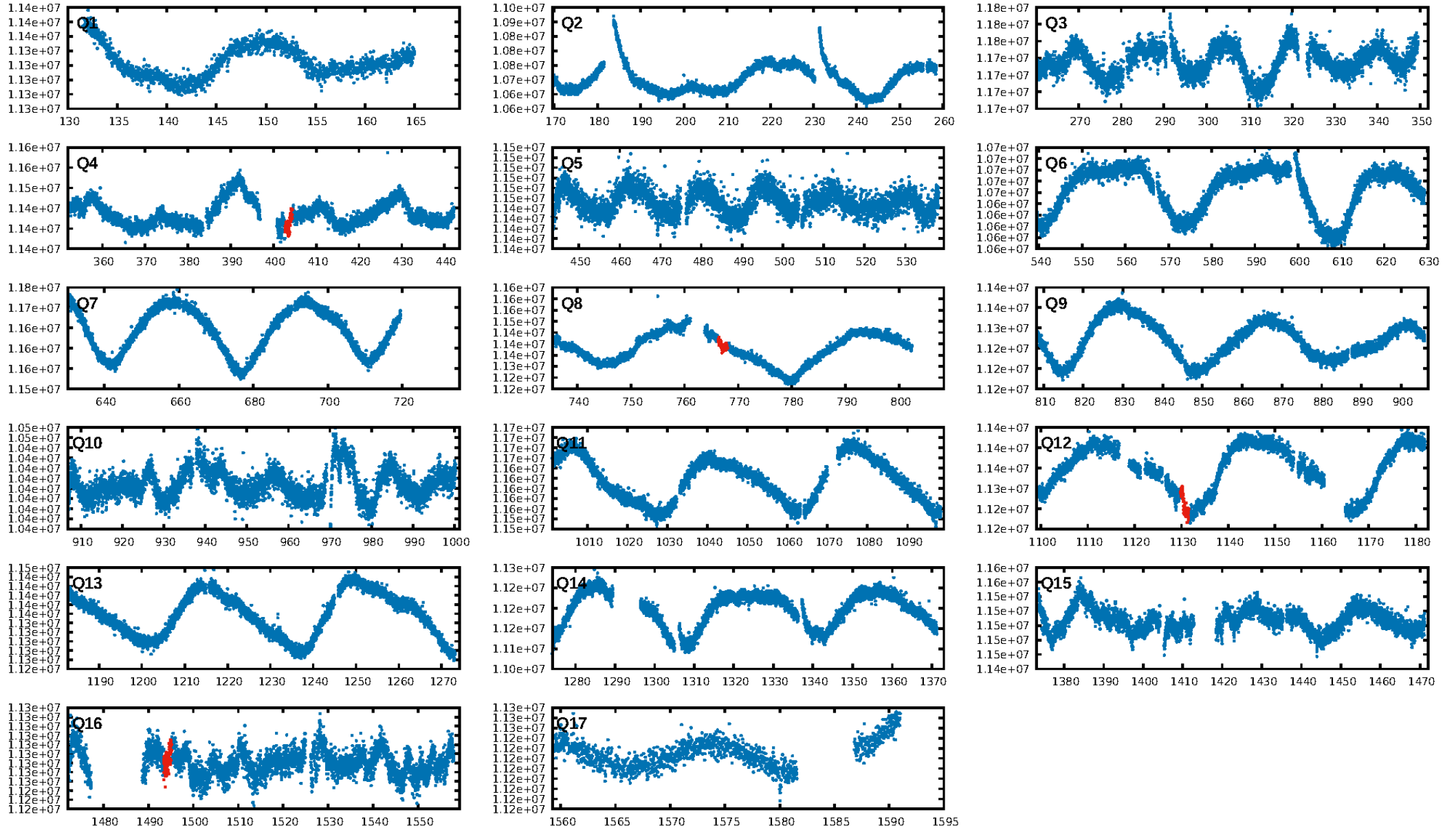
DV Fit Results:

Period = 363.58611 [0.02261] d
Epoch = 403.5409 [0.0420] BKJD
Rp/R* = 0.0447 [0.0051]
a/R* = 59.37 [9.91]
b = 0.95 [0.02]
Seff = 0.06 [0.01]
Teq = 127 [5] K
Rp = 2.29 [0.37] Re
a = 0.7831 [0.0709] AU
Ag = 93794.26 [28550.75] [3.29σ]
Teff = 3434 [254] K [13.04σ]

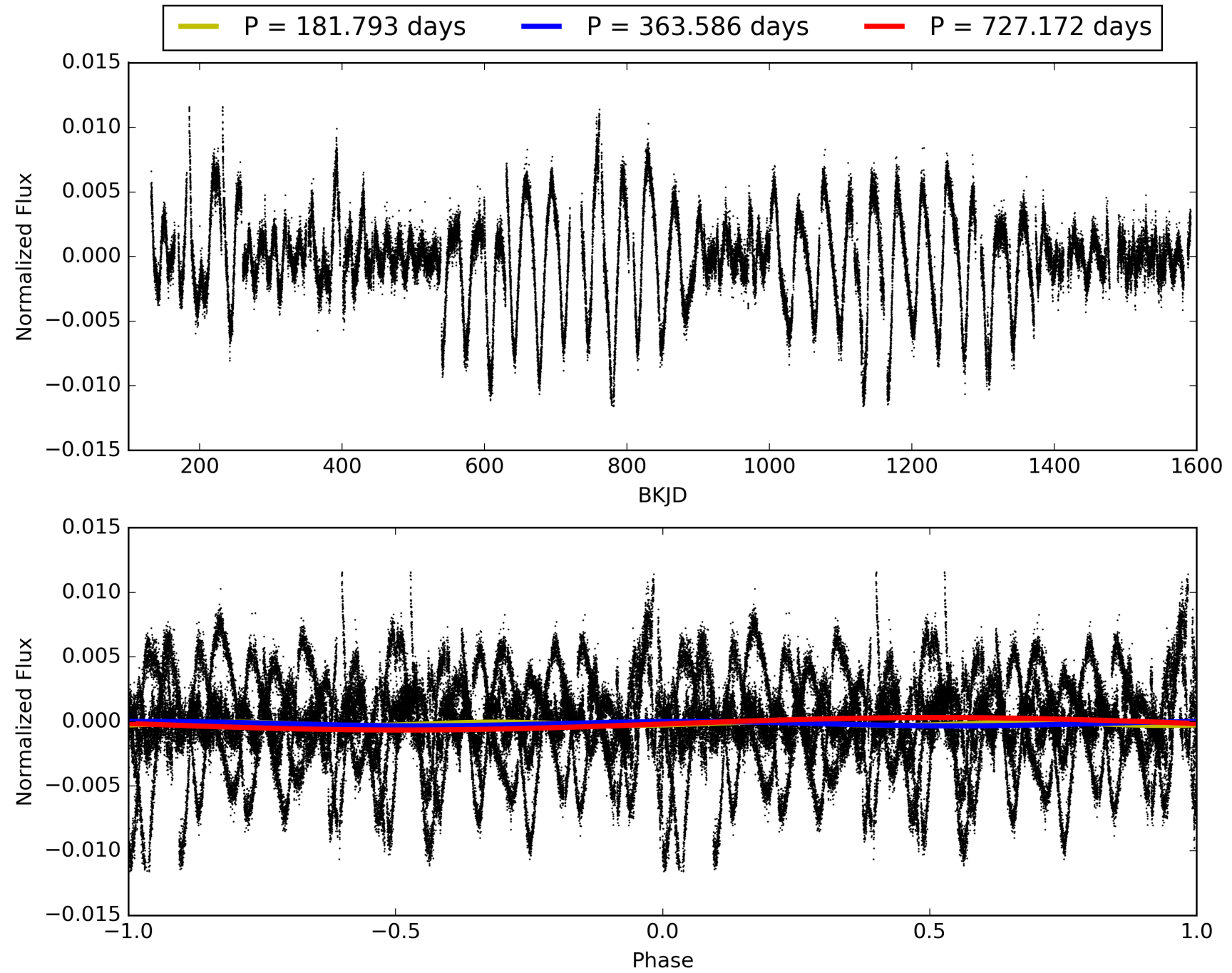
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [397.69σ]
LongPeriod-sig: 100.0% [28.81σ]
ModelChiSquare2-sig: 5.5%
ModelChiSquareGof-sig: 97.0%
Bootstrap-pfa: 1.98e-08
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -1.138
Centroid-sig: 4.5%
Centroid-so: 2.899 arcsec [1.58σ]
OotOffset-rm: 3.756 arcsec [20.44σ]
KicOffset-rm: 3.617 arcsec [19.81σ]
OotOffset-st: 0/0/1/0 [1]
KicOffset-st: 0/0/1/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.33 [1/3]

TCE 007455287-05, PDC Light Curves

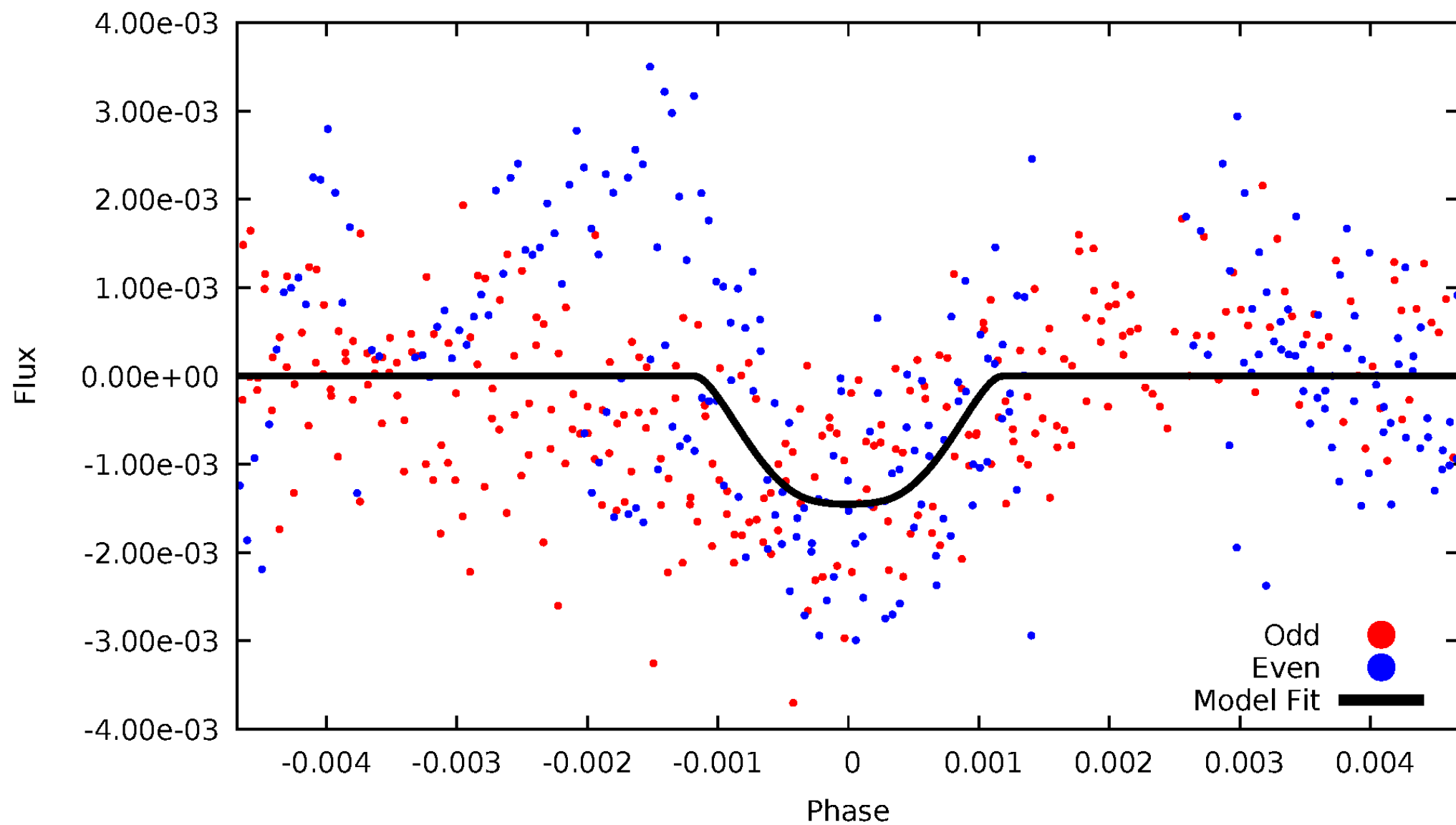


TCE 007455287-05



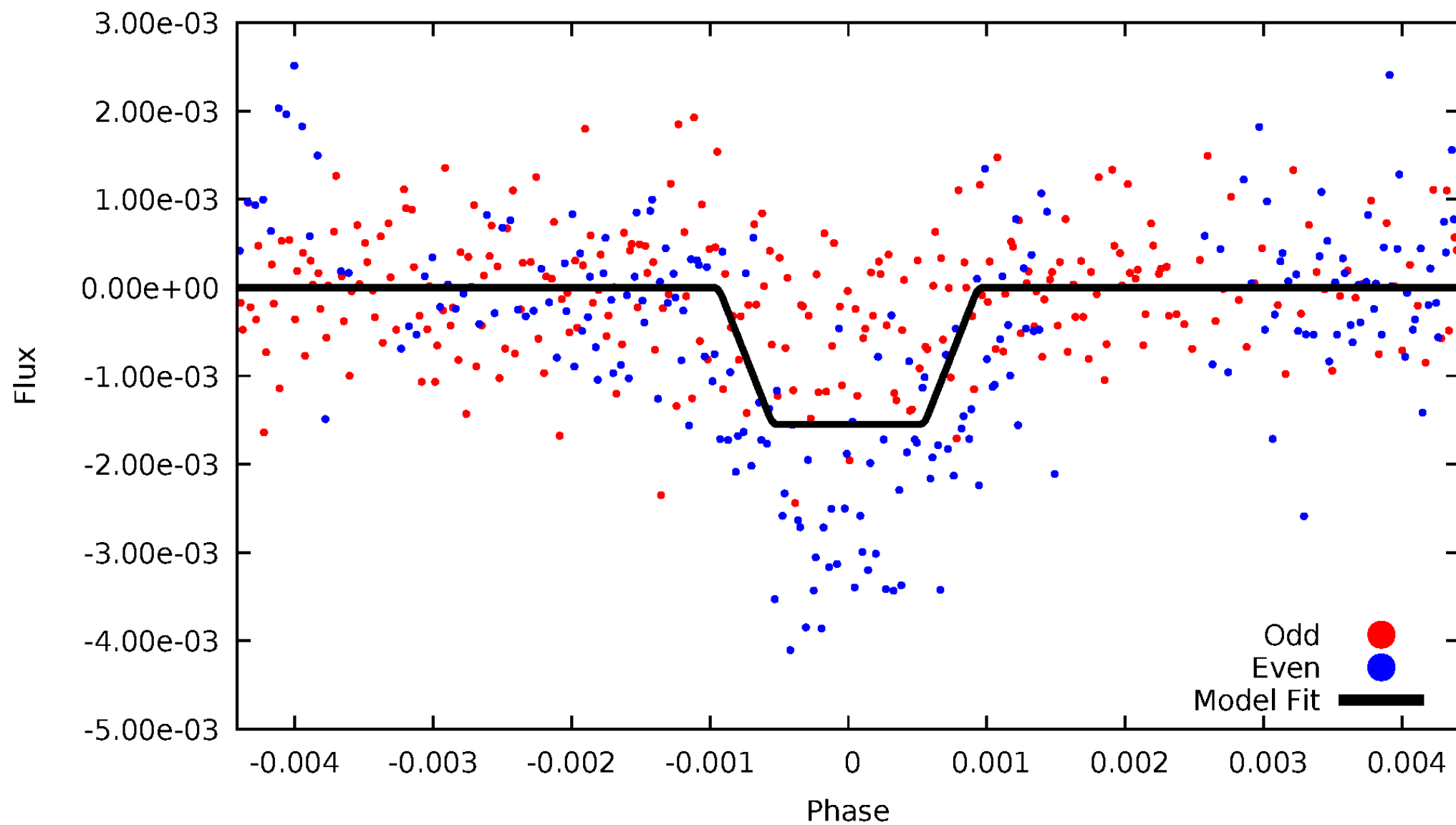
DV Odd/Even

TCE 007455287-05



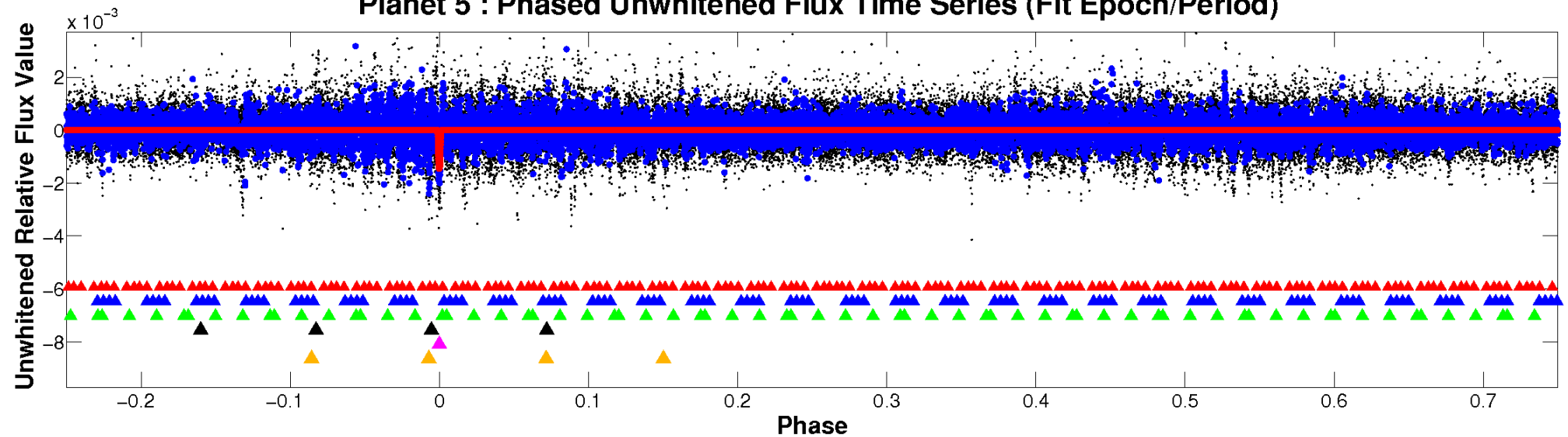
ALT Odd/Even

TCE 007455287-05

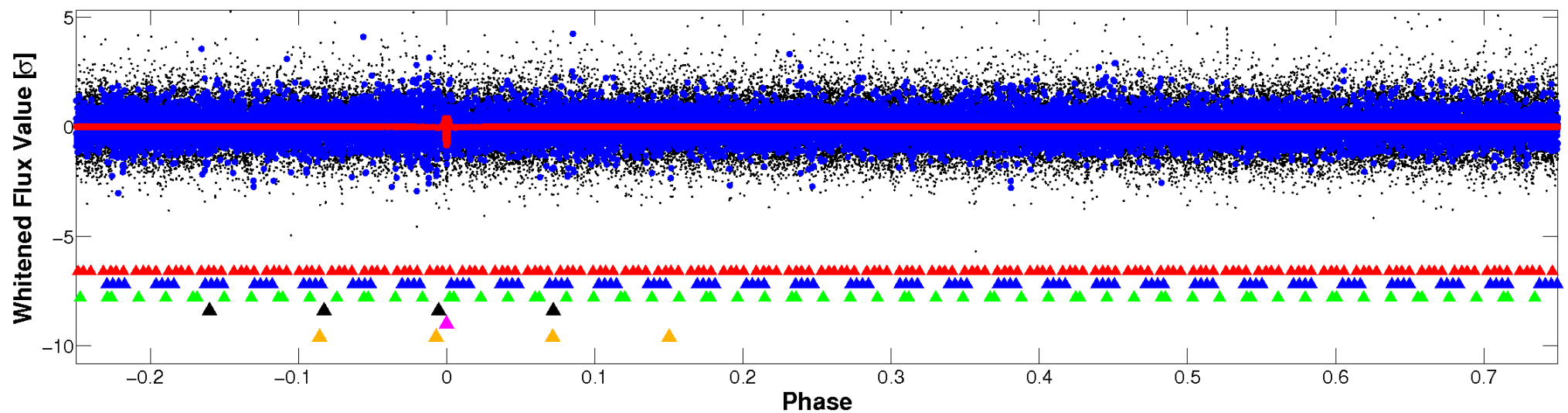


Non-Whitened Vs. Whitened Light Curve

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 007455287-05 $P=363.586111$ Days $T_0=403.540903$ (BKJD)



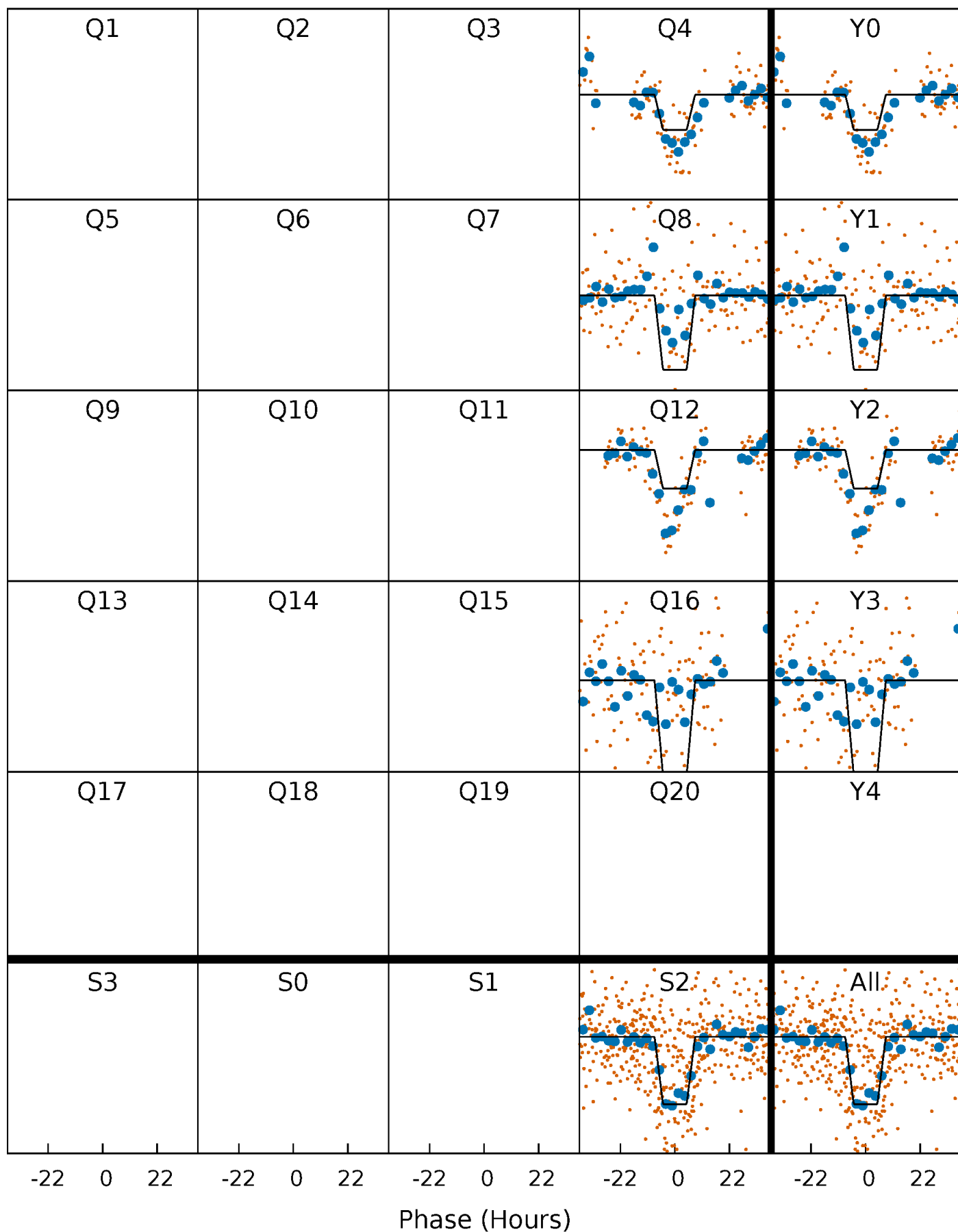
DV Quarter-Phased Transit Curves

TCE 007455287-05 $P=363.586111$ Days $T_0=403.540903$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

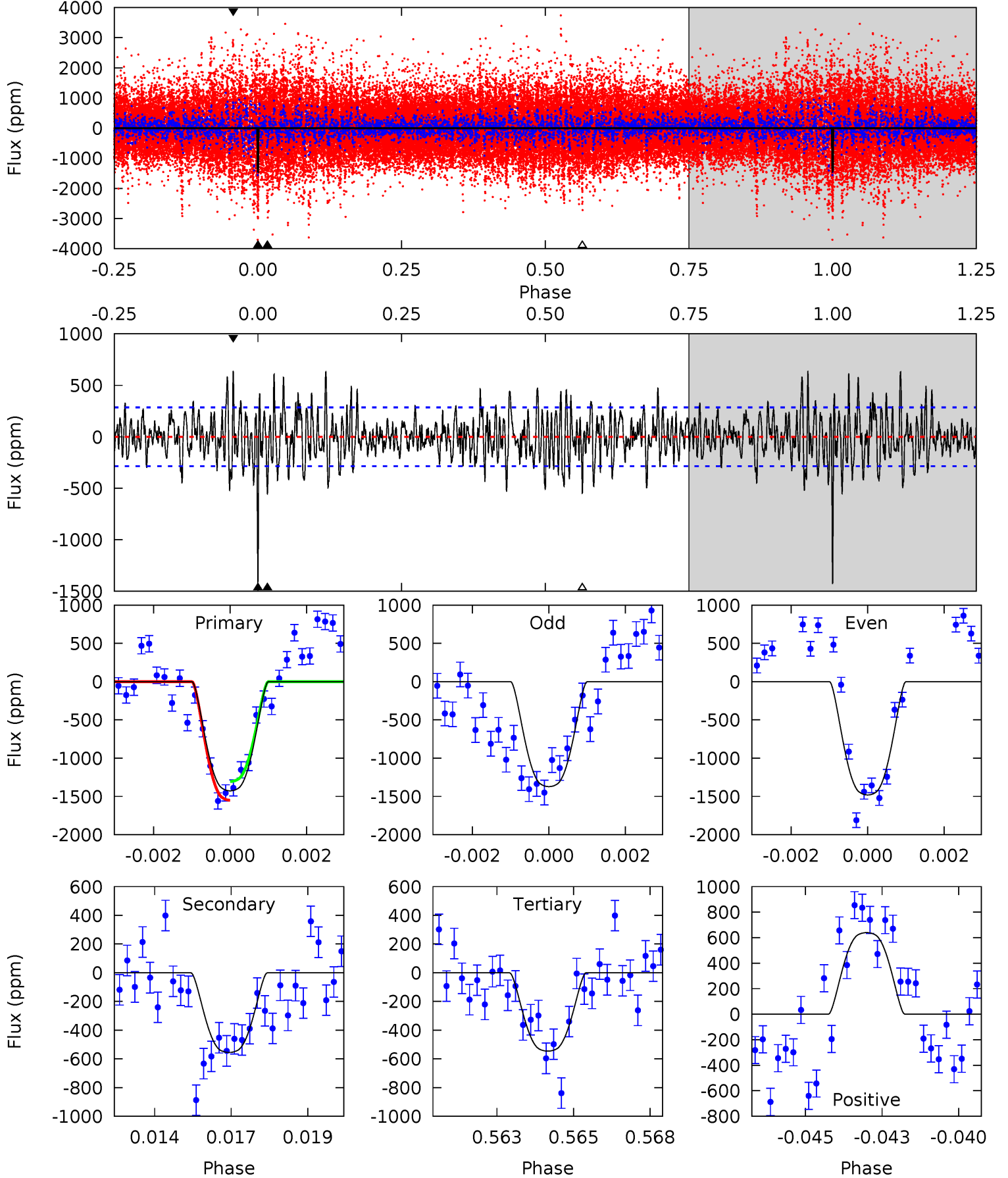
TCE 007455287-05 $P=363.567522$ Days $T_0=403.545638$ (BKJD)



DV Model-Shift Uniqueness Test

007455287-05, $P = 363.586111$ Days, $E = 39.954792$ Days

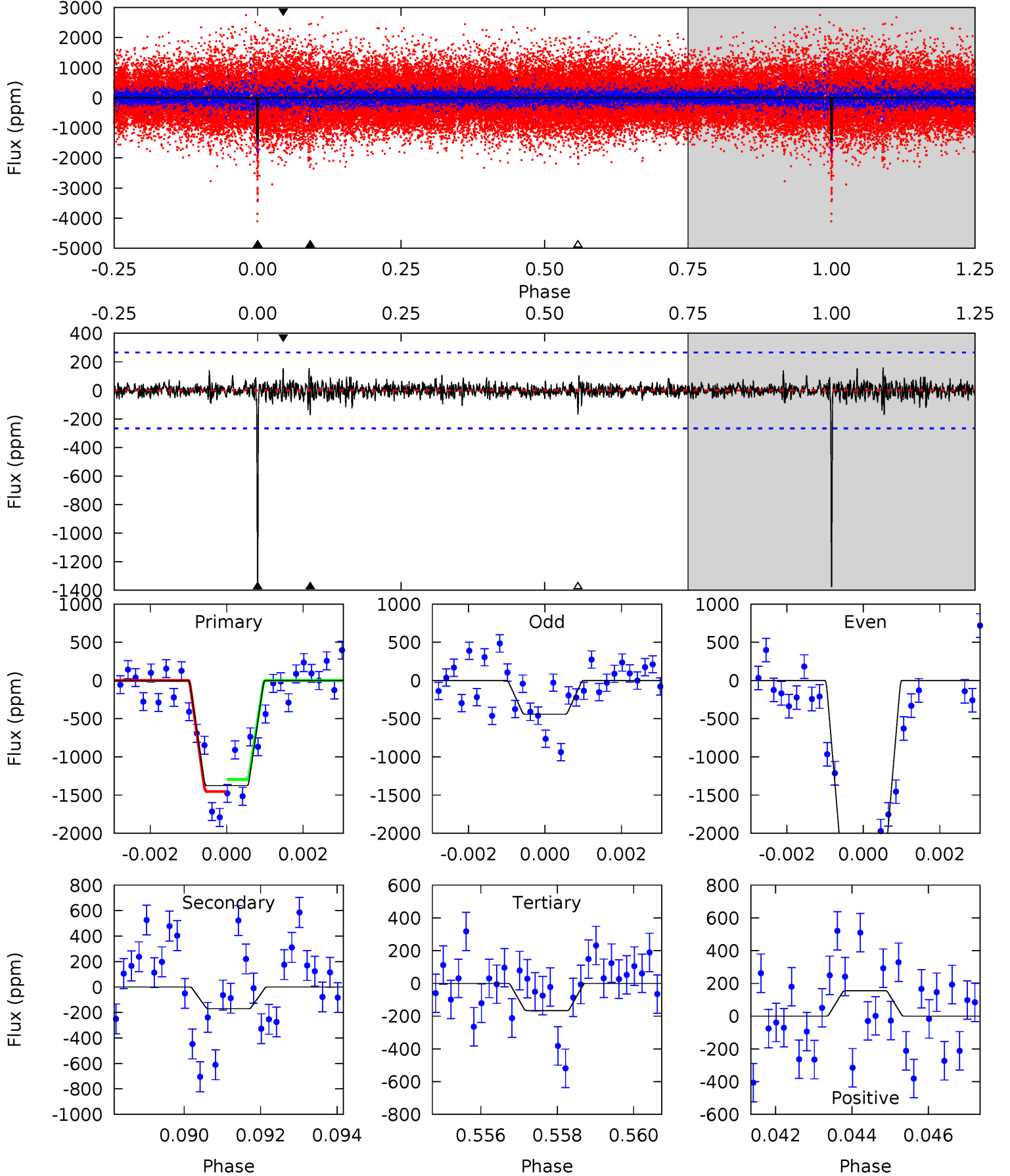
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
26.5	10.3	10.1	11.9	5.30	3.04	3.42	16.3	14.6	0.17	-1.57	1.01	0.96	0.31	2.28



Alt Model-Shift Uniqueness Test

007455287-05, $P = 363.567522$ Days, $E = 39.978116$ Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.6	3.41	3.34	3.10	5.33	3.10	0.60	24.3	24.5	0.07	0.31	19.7	1.03	0.10	1.59



Stellar Parameters For KIC 007455287

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3713^{+74}_{-92}	$4.779^{+0.063}_{-0.031}$	$-0.120^{+0.150}_{-0.150}$	$0.470^{+0.036}_{-0.054}$	$0.484^{+0.038}_{-0.053}$	$6.567^{+2.046}_{-0.894}$
	+2%/-2%	+1%/-1%	+125%/-125%	+8%/-11%	+8%/-11%	+31%/-14%
Source	SPE70	SPE60	SPE70	DSEP		

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

Secondary Eclipse Parameters for KIC 007455287-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-555 ± 54	$2.28^{+0.27}_{-0.28}$	176^{+5}_{-5}	3037^{+127}_{-114}	35725^{+12028}_{-7178}
Alt.	-170 ± 50	$2.01^{+0.28}_{-0.28}$	176^{+5}_{-6}	2675^{+154}_{-139}	13905^{+6922}_{-4435}

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

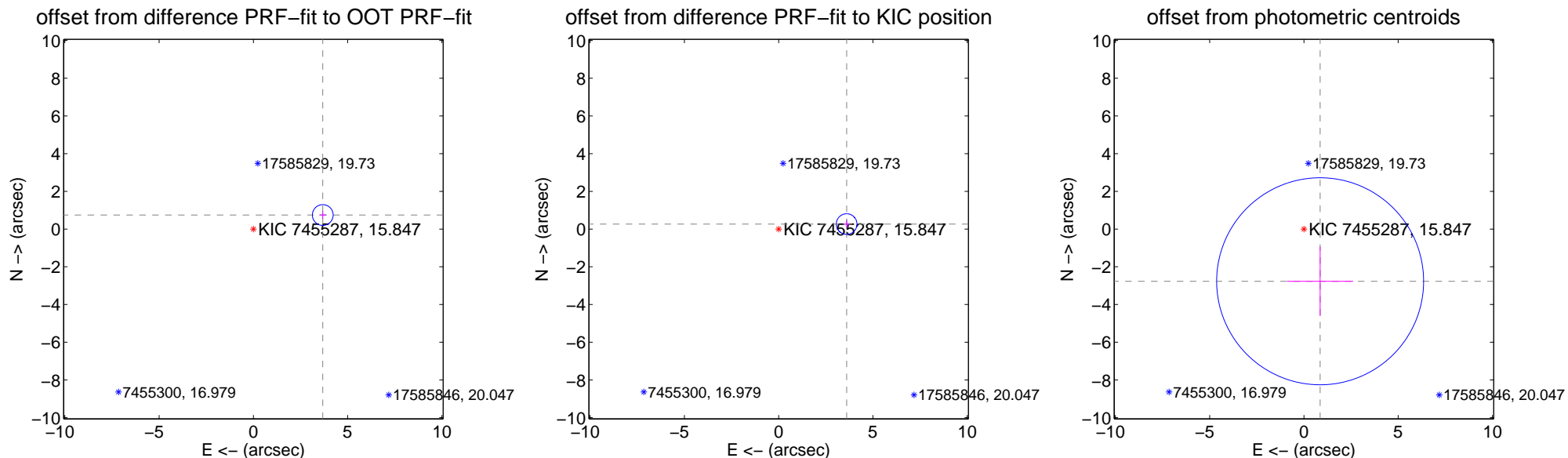
DV Centroid Data

Supplemental centroid analysis for 007455287-05. Kepler magnitude: 15.85. Transit SNR 7.89

There are 1 quarters with good PRF difference image offsets

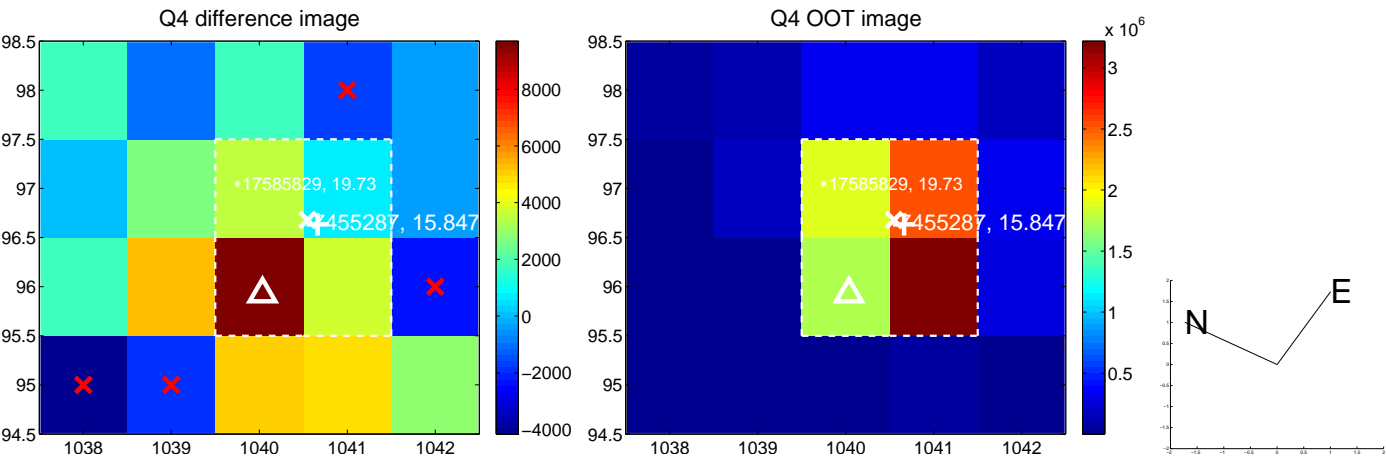
The direct PRF centroid is offset from the target star catalog position by about 0.49 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	3.756 ± 0.184	20.44	-3.681 ± 0.182	0.746 ± 0.215
PRF-fit source offset from KIC position	3.617 ± 0.183	19.81	-3.607 ± 0.182	0.265 ± 0.215
photometric centroid source offset	2.90 ± 1.83	1.58	-0.86 ± 1.76	-2.77 ± 1.84

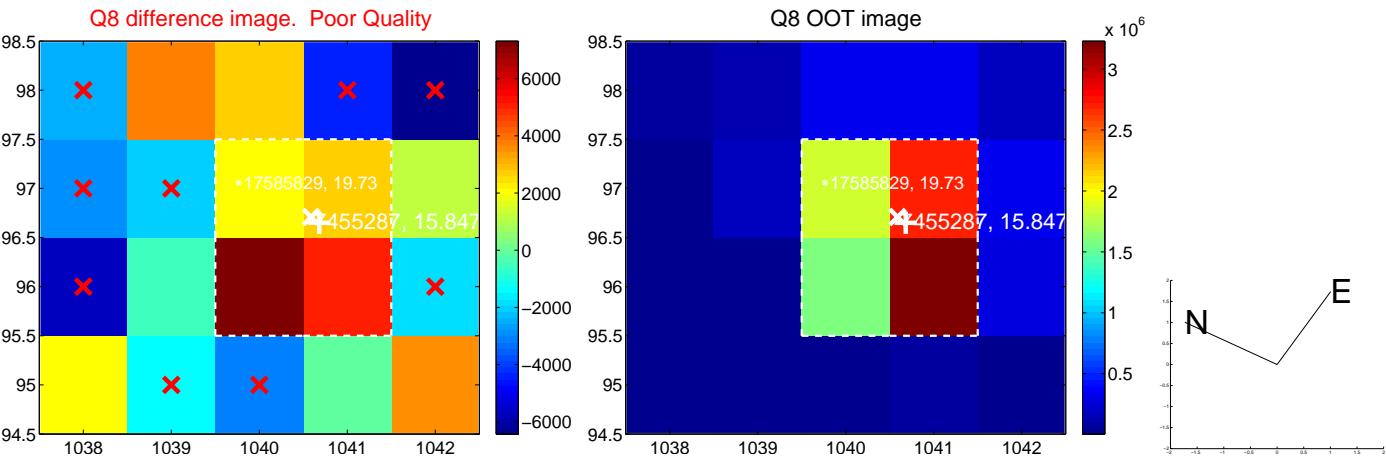


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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



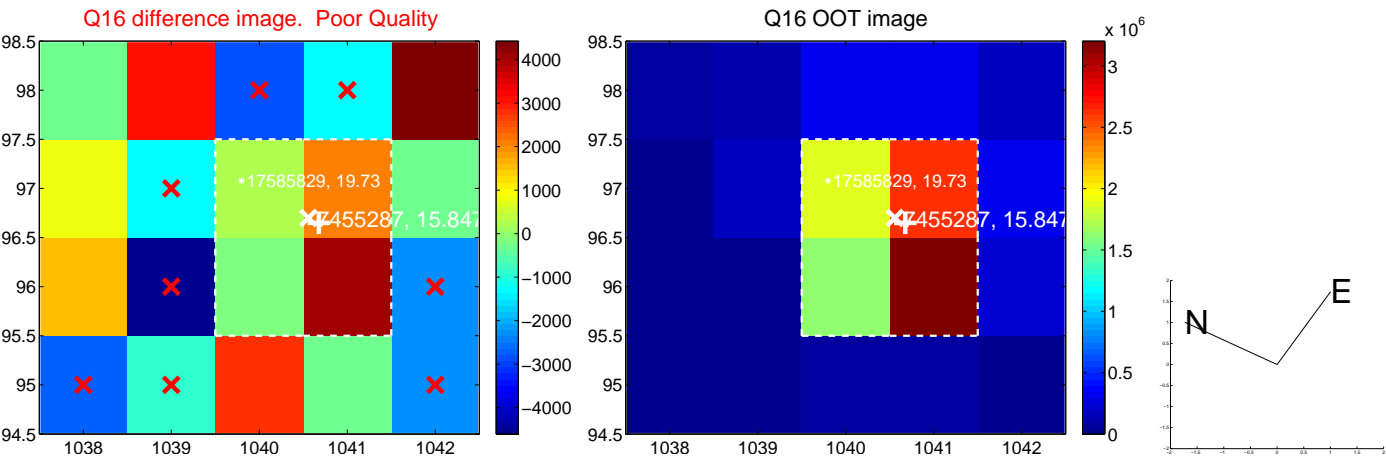
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ✕: large negative pixel value.



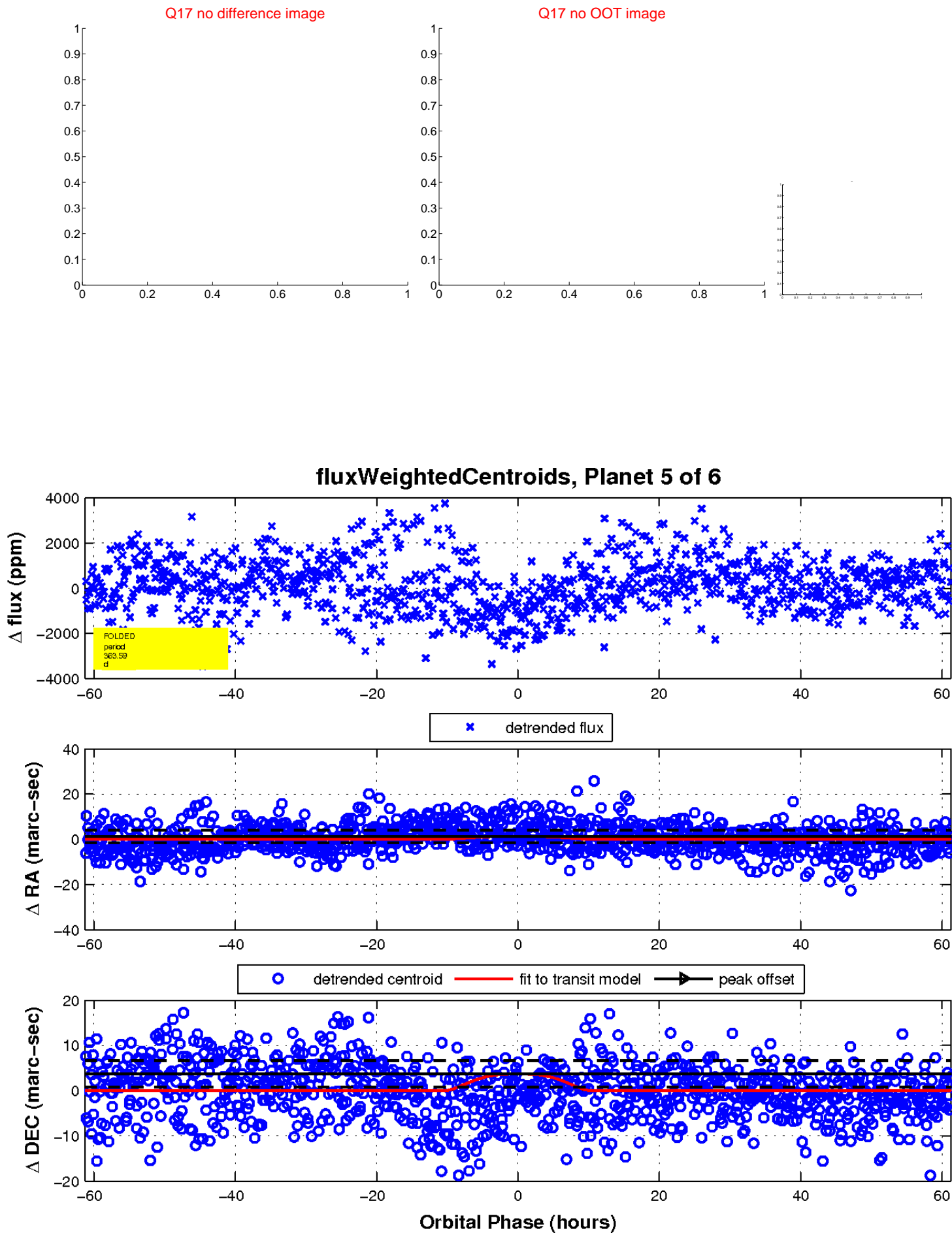
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

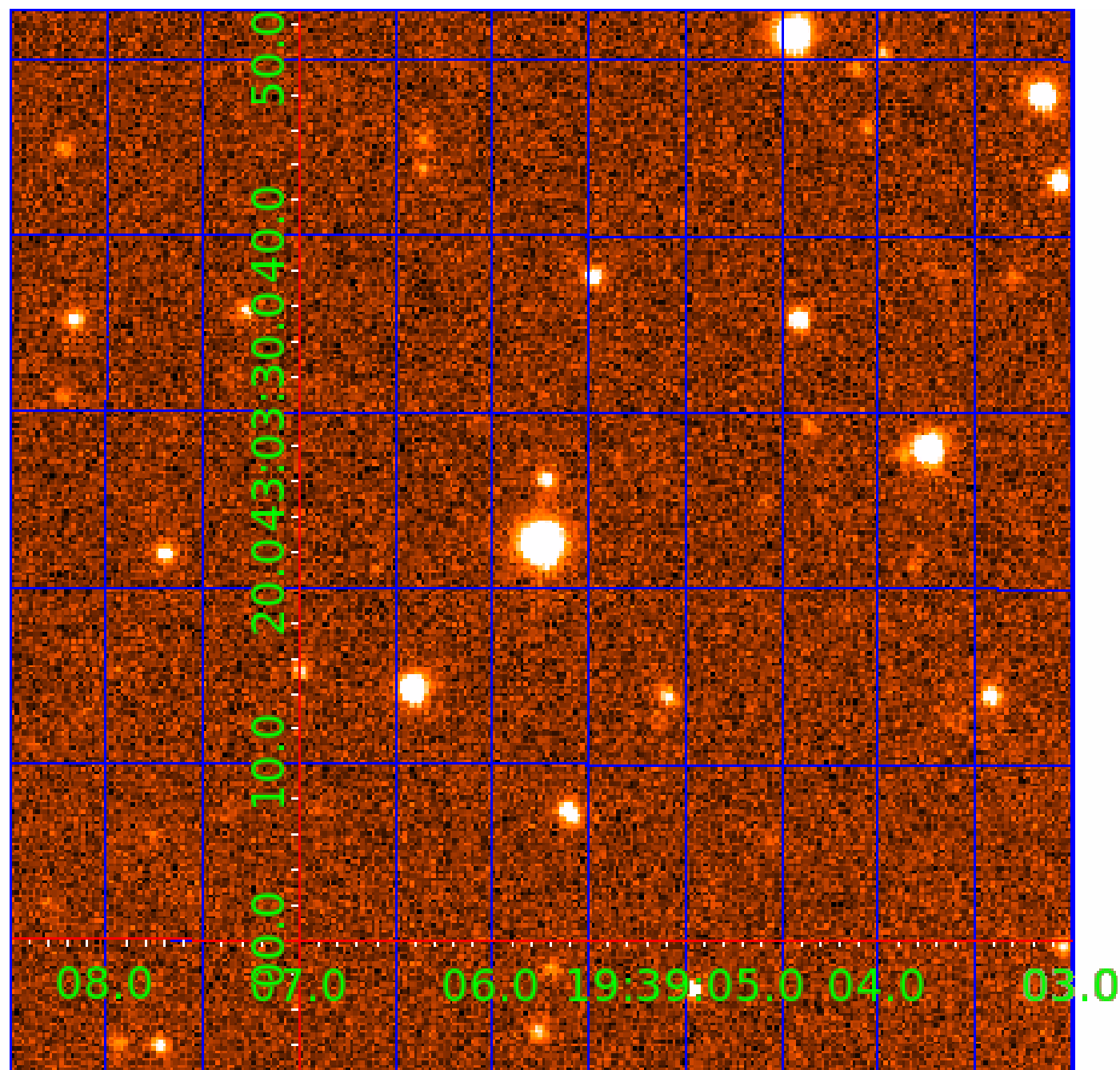


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007455287

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})
007455287-01	OBS	0886.01	8.010786	138.164049	962.8	4.139	28.9	30.9	0.47	3713	2.52	9.93
007455287-02	OBS	0886.02	12.071268	143.465132	499.4	5.521	16.5	16.9	0.47	3713	1.29	5.75
007455287-03	OBS	0886.03	20.995898	152.314956	644.0	3.180	12.4	13.7	0.47	3713	1.40	2.75
007455287-05	OBS	No	363.586111	403.540903	1453.8	20.429	8.0	7.9	0.47	3713	2.29	0.06
007455287-06	OBS	No	392.183710	372.382225	1599.8	18.049	8.0	9.4	0.47	3713	2.29	0.06

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007455287-01	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-02	OBS	PC	1.00	0	0	0	0	NO_COMMENT
007455287-03	OBS	PC	0.99	0	0	0	0	NO_COMMENT
007455287-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—ALL_TRANS_CHASES—CENT_FEW_DIFFS
007455287-06	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—CENT_FEW_DIFFS

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

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

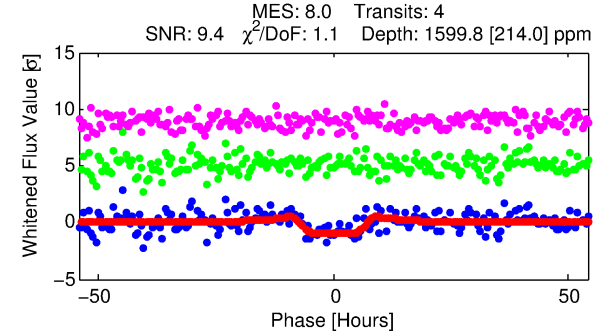
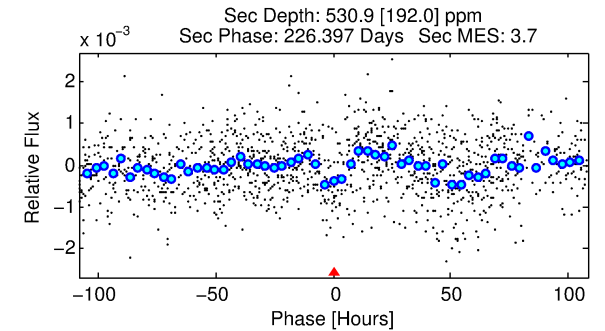
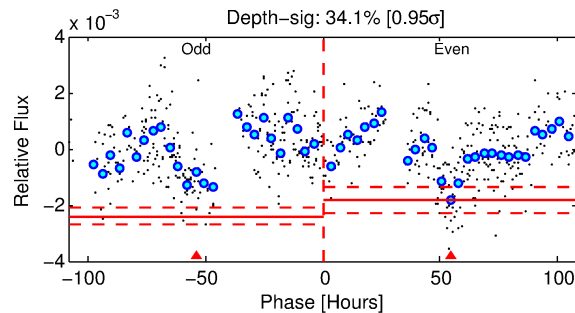
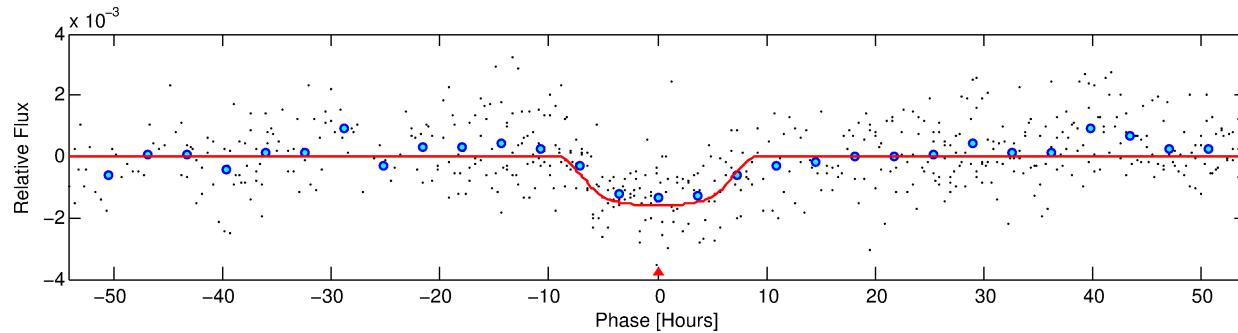
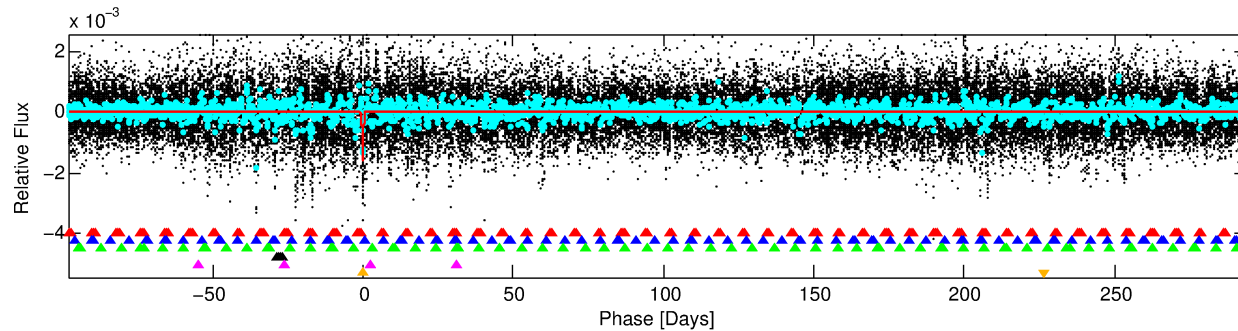
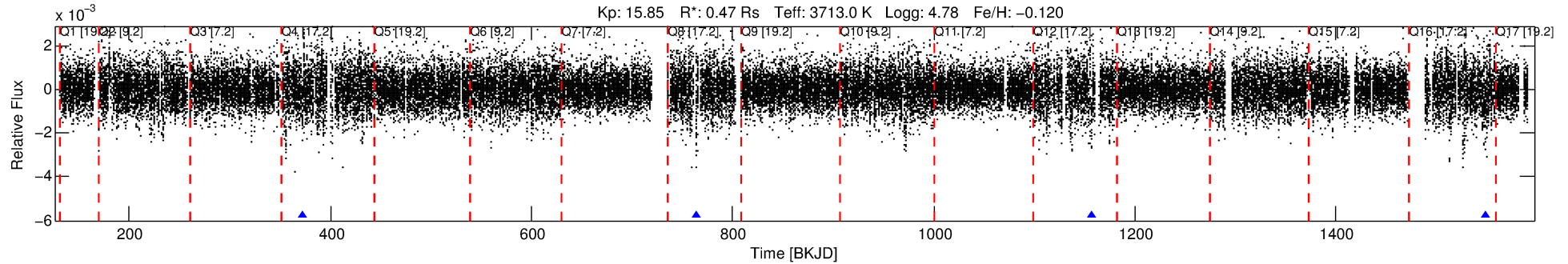
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007455287-06

No Significant Match Found

DV One-Page Summary

KIC: 7455287 Candidate: 6 of 6 Period: 392.184 d
KOI: K00886 Name: Kepler-54 Corr: No Ephemeris Match



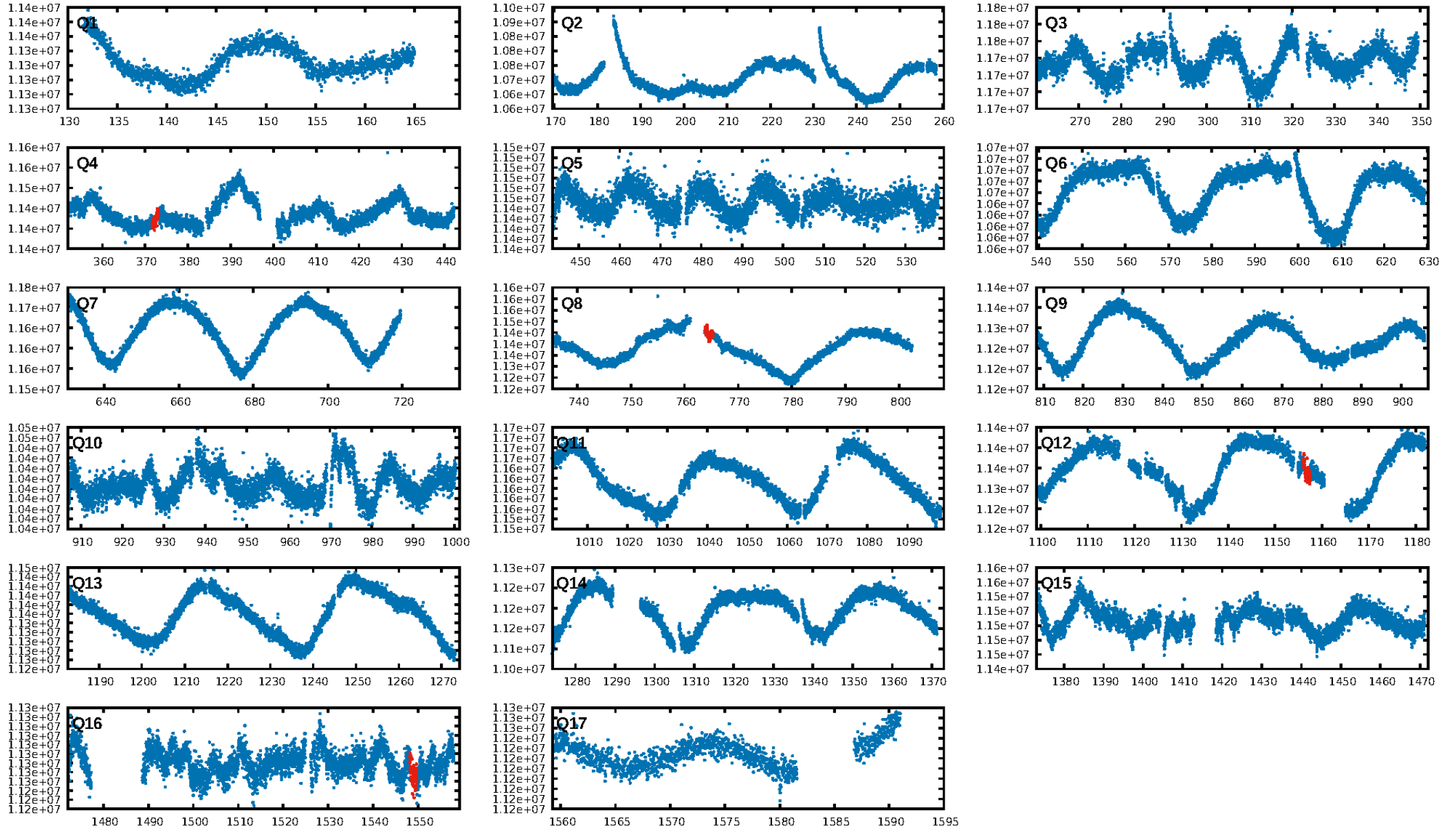
DV Fit Results:

Period = 392.18371 [0.01846] d
Epoch = 372.3822 [0.0380] BKJD
Rp/R* = 0.0447 [0.0042]
a/R* = 81.65 [17.75]
b = 0.92 [0.04]
Seff = 0.06 [0.01]
Teq = 124 [5] K
Rp = 2.29 [0.34] Re
a = 0.8237 [0.0746] AU
Ag = 37741.54 [16062.46] [2.35 σ]
Teffp = 2666 [279] K [9.10 σ]

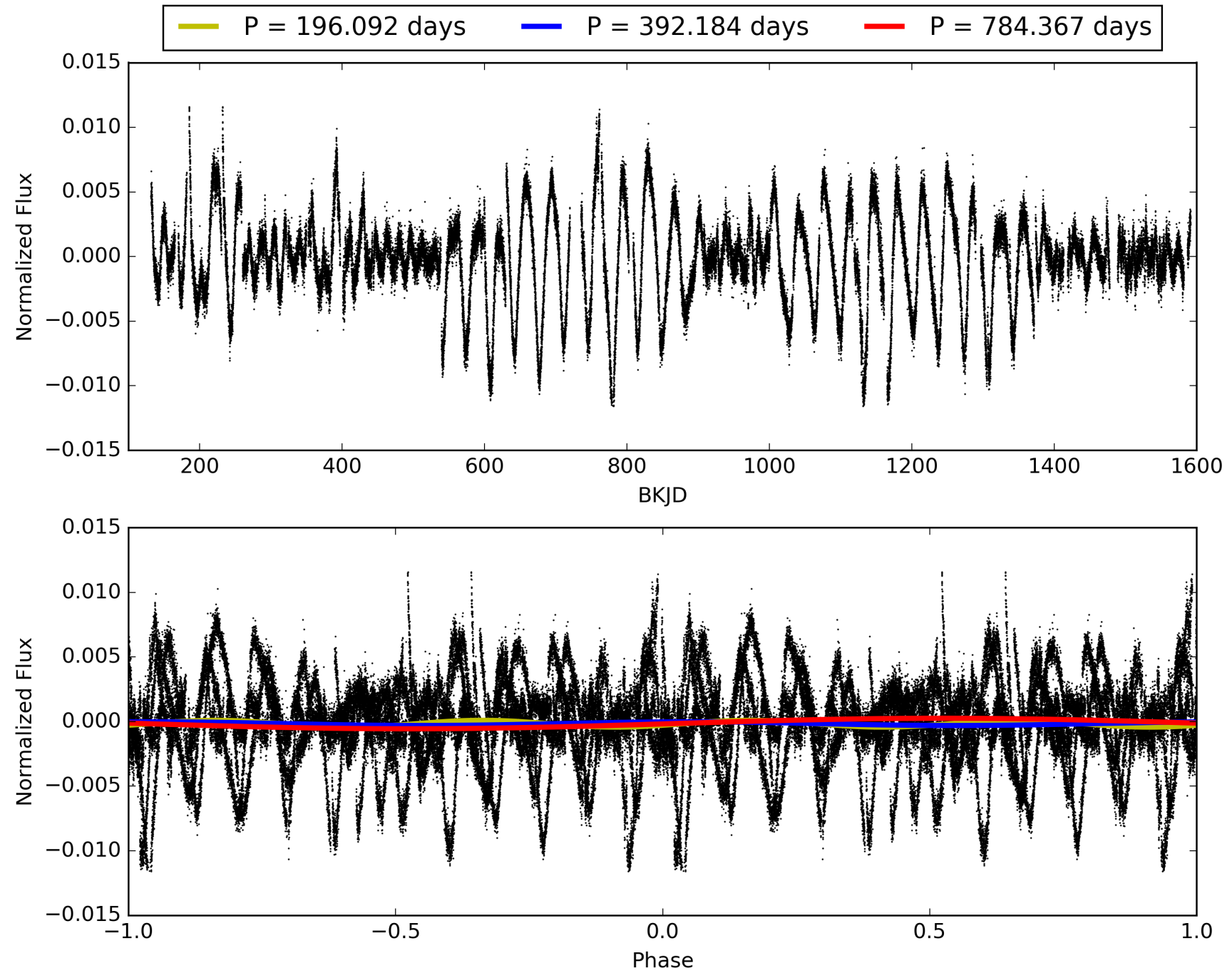
DV Diagnostic Results:

ShortPeriod-sig: 41.0% [0.54 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 7.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.53e-09
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.7304
Centroid-sig: 57.5%
Centroid-so: 0.919 arcsec [0.58 σ]
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0 [0]
KicOffset-st: 0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: N/A

TCE 007455287-06, PDC Light Curves

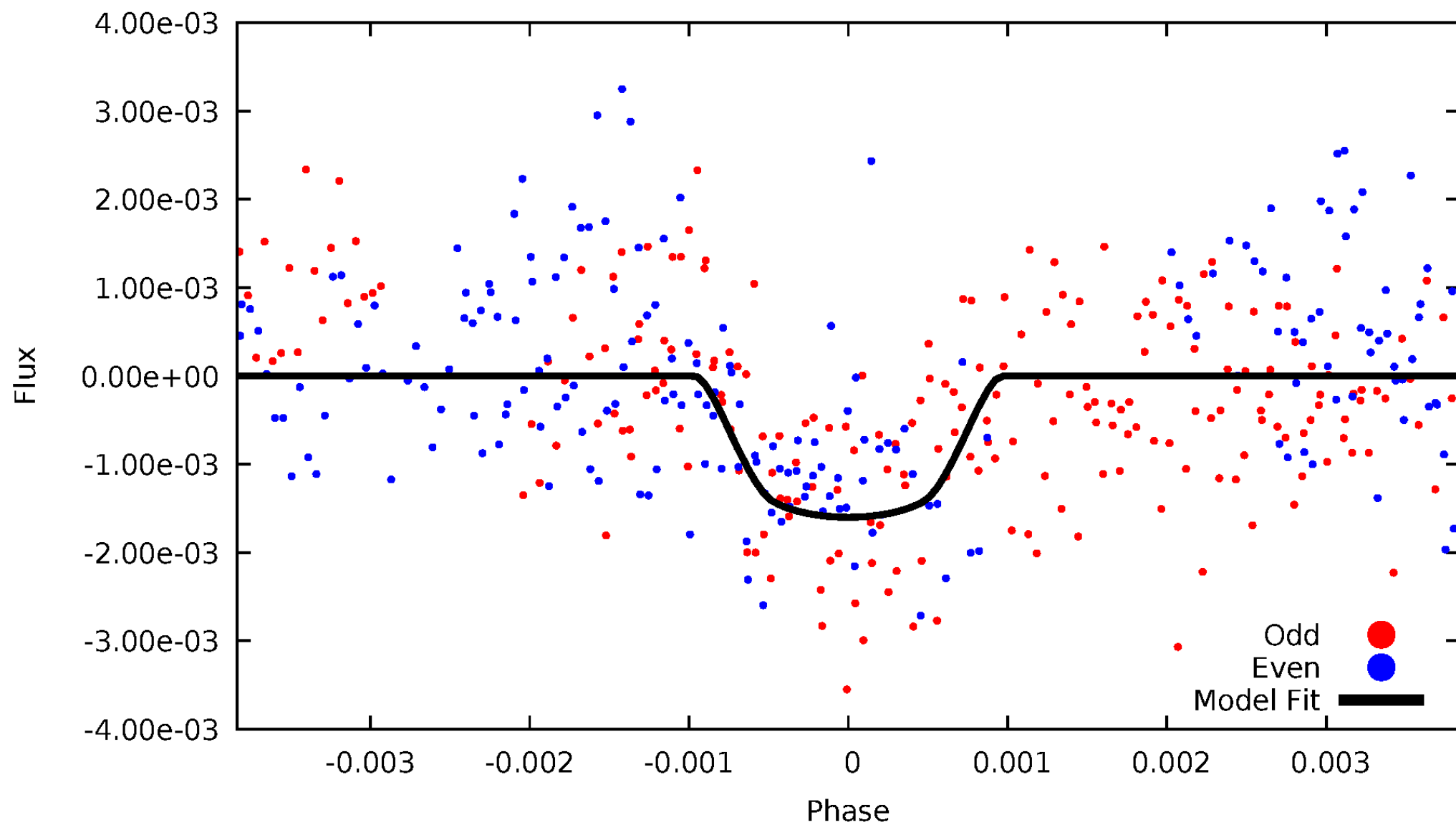


TCE 007455287-06



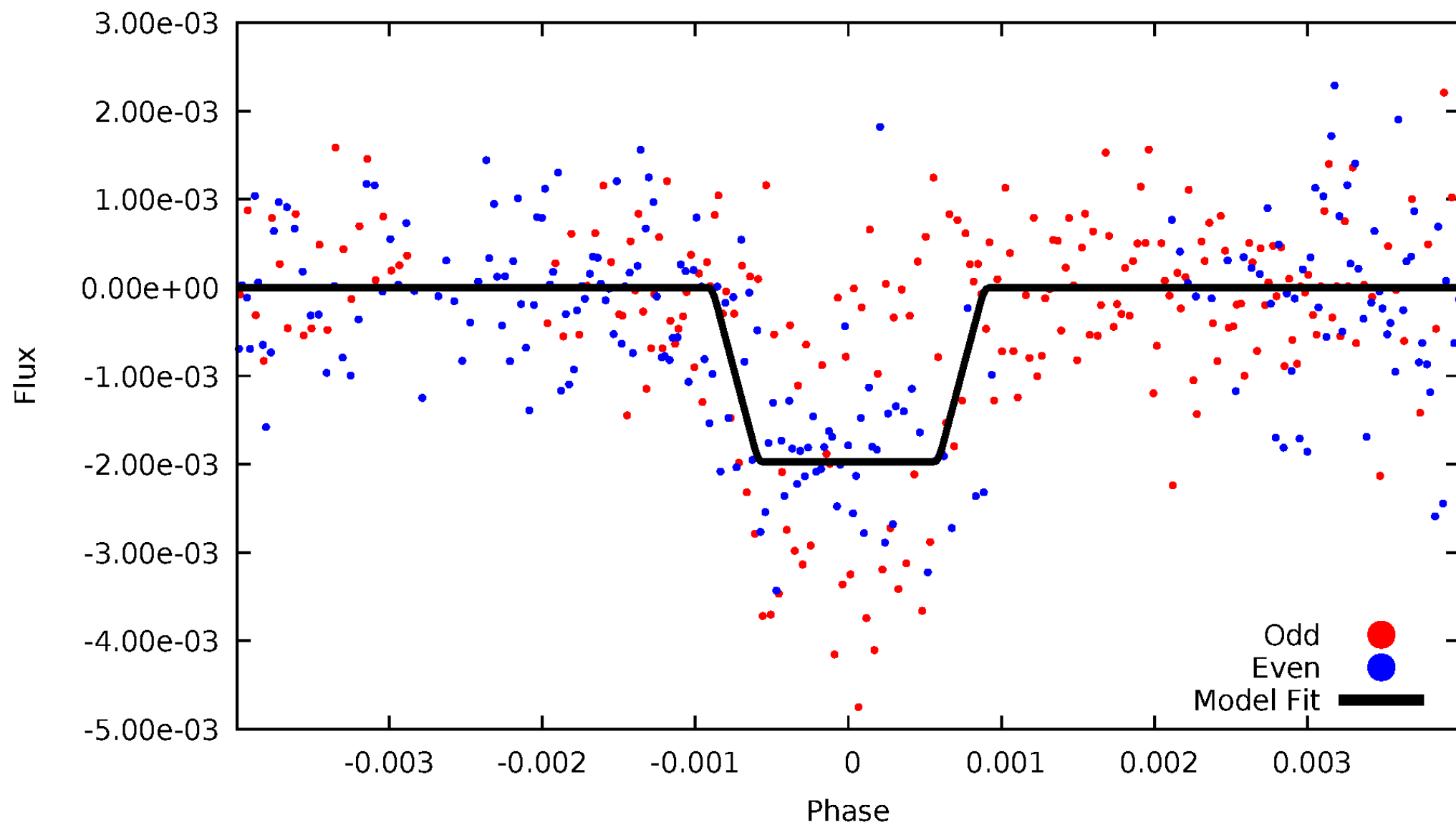
DV Odd/Even

TCE 007455287-06



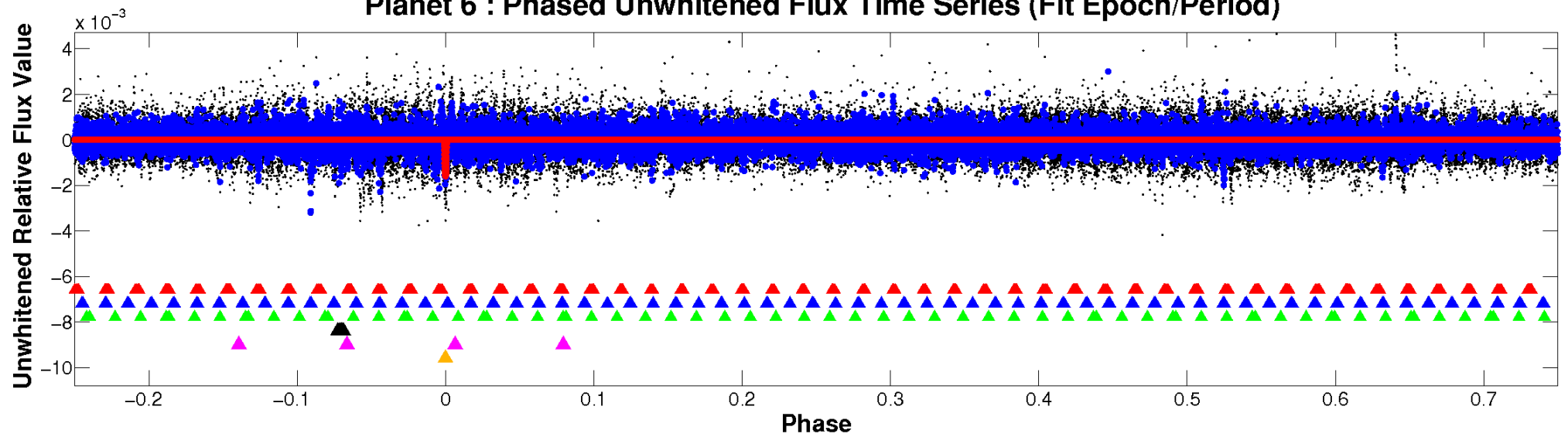
ALT Odd/Even

TCE 007455287-06

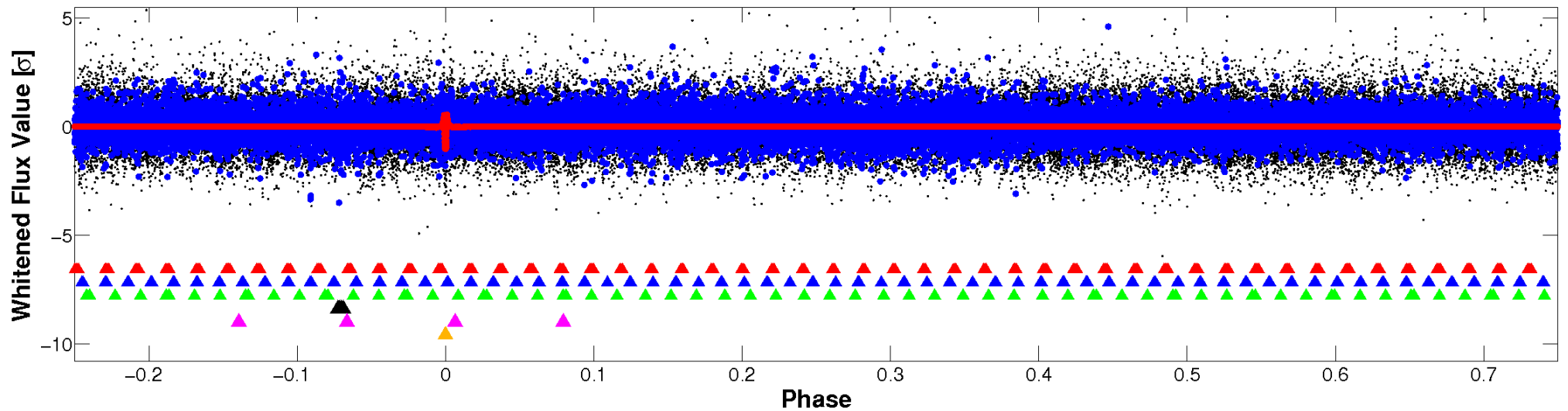


Non-Whitened Vs. Whitened Light Curve

Planet 6 : Phased Unwhitened Flux Time Series (Fit Epoch/Period)

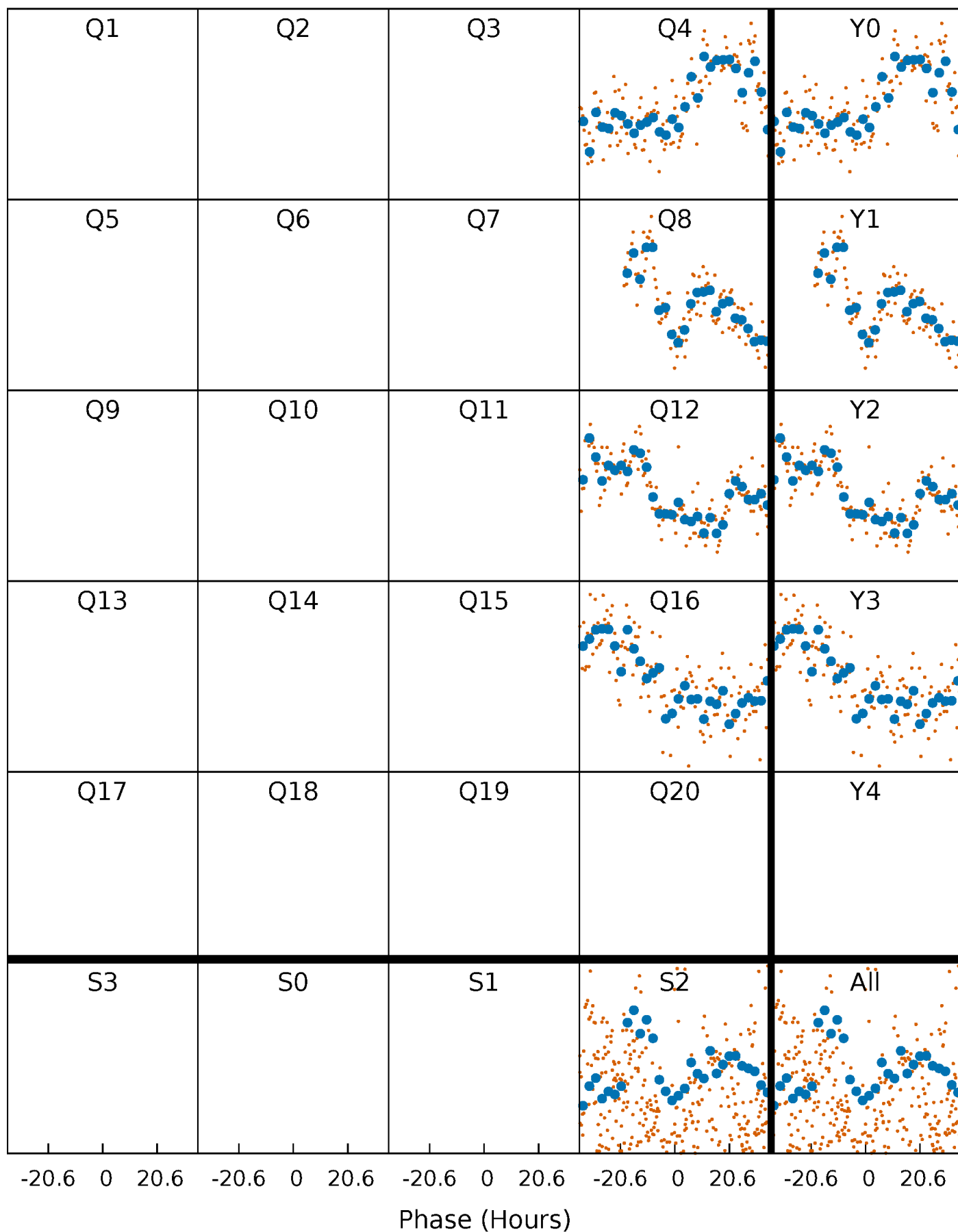


Planet 6 : Phased Whitened Flux Time Series (Fit Epoch/Period)



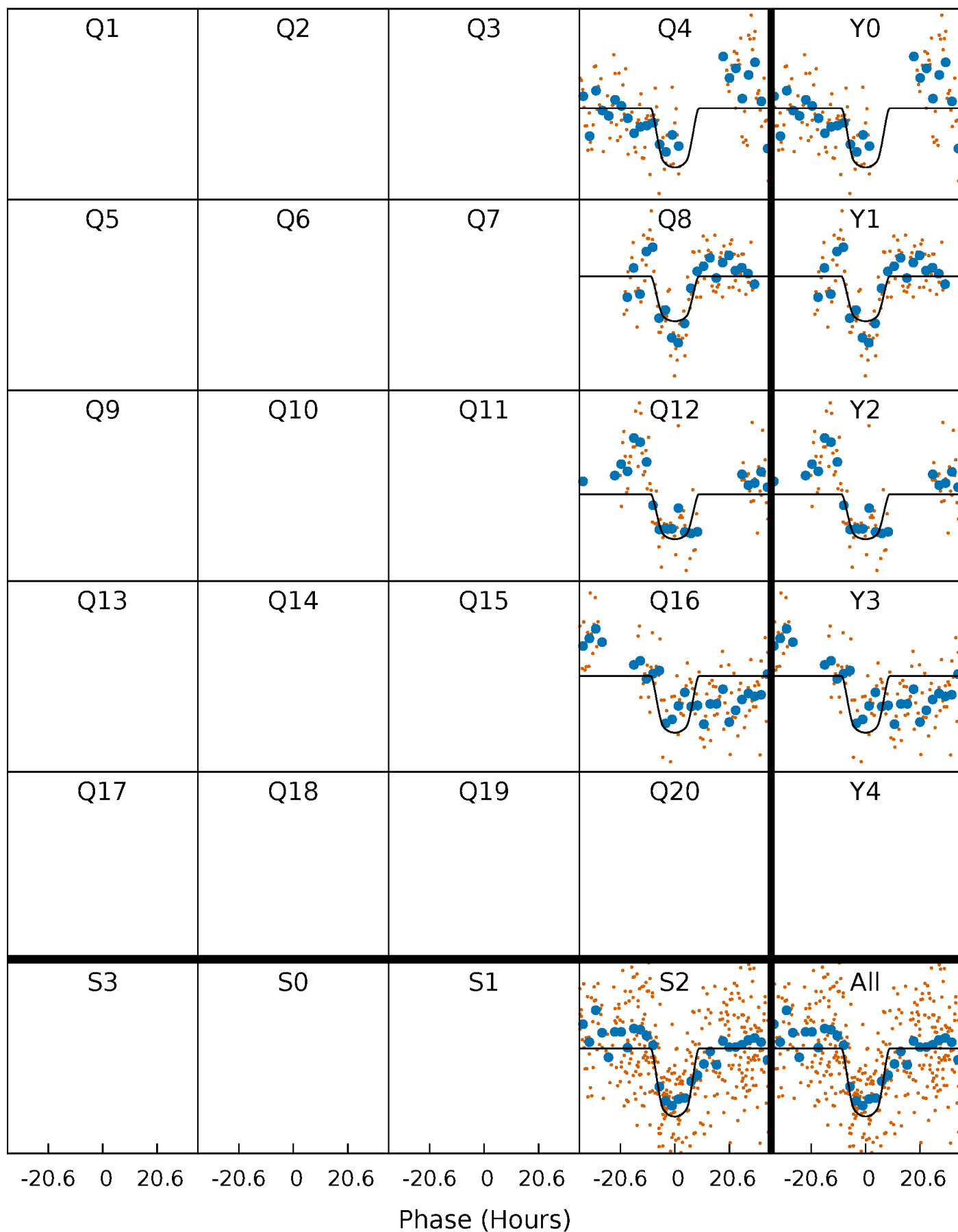
PDC Quarter-Phased Transit Curves

TCE 007455287-06 $P=392.183710$ Days $T_0=372.382225$ (BKJD)



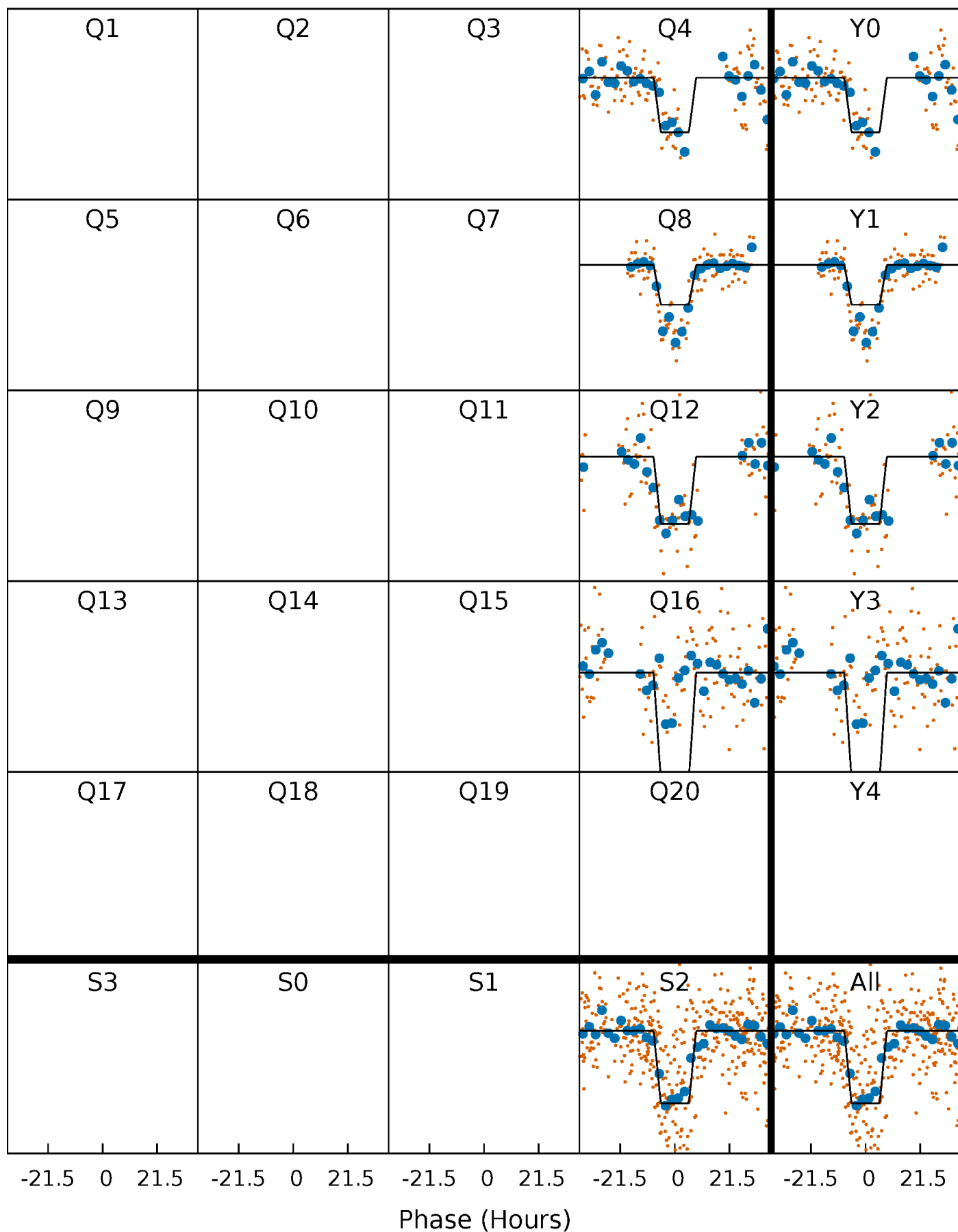
DV Quarter-Phased Transit Curves

TCE 007455287-06 $P=392.183710$ Days $T_0=372.382225$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

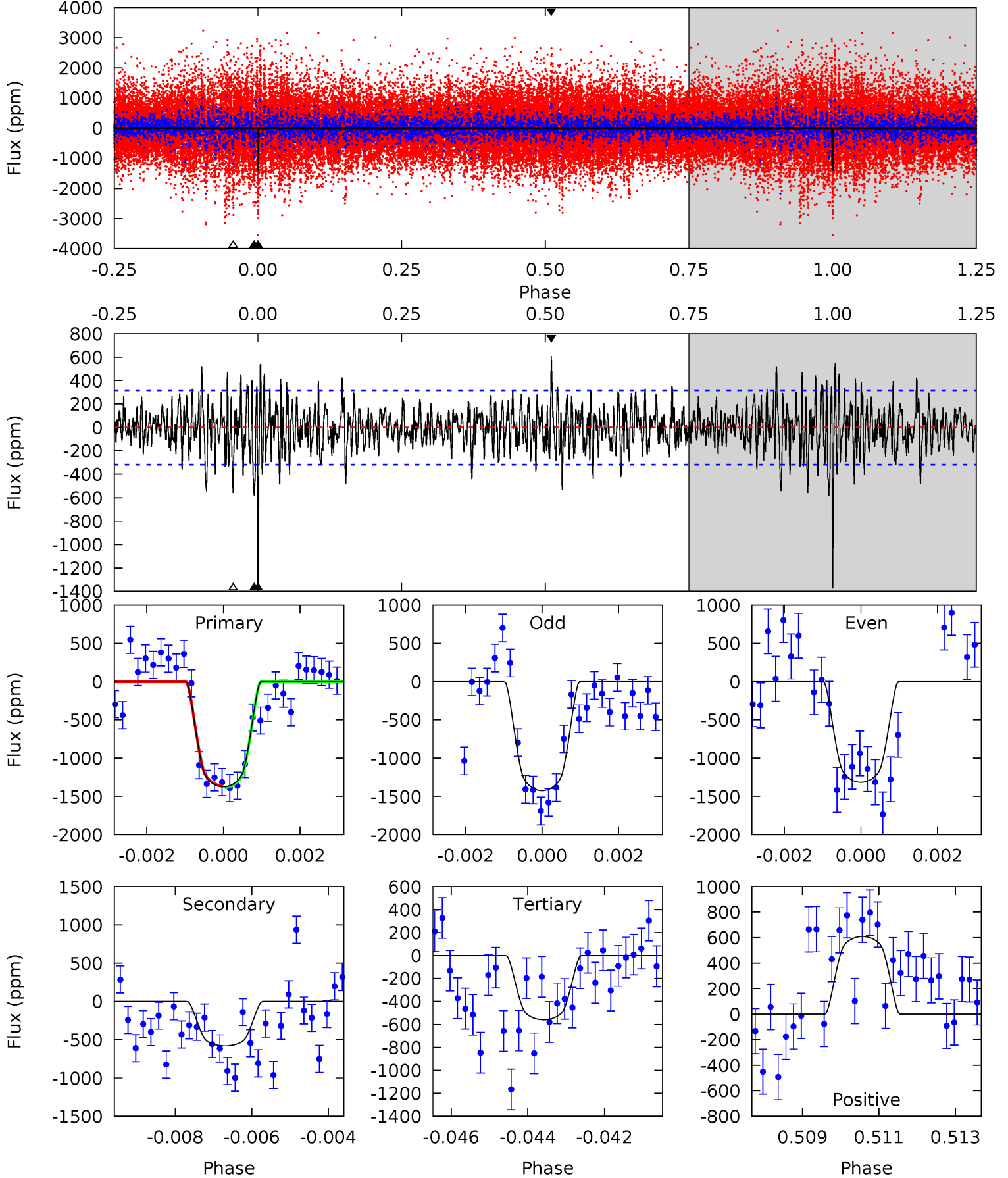
TCE 007455287-06 P=392.188128 Days $T_0=372.348424$ (BKJD)



DV Model-Shift Uniqueness Test

007455287-06, P = 392.183710 Days, E = 372.382225 Days

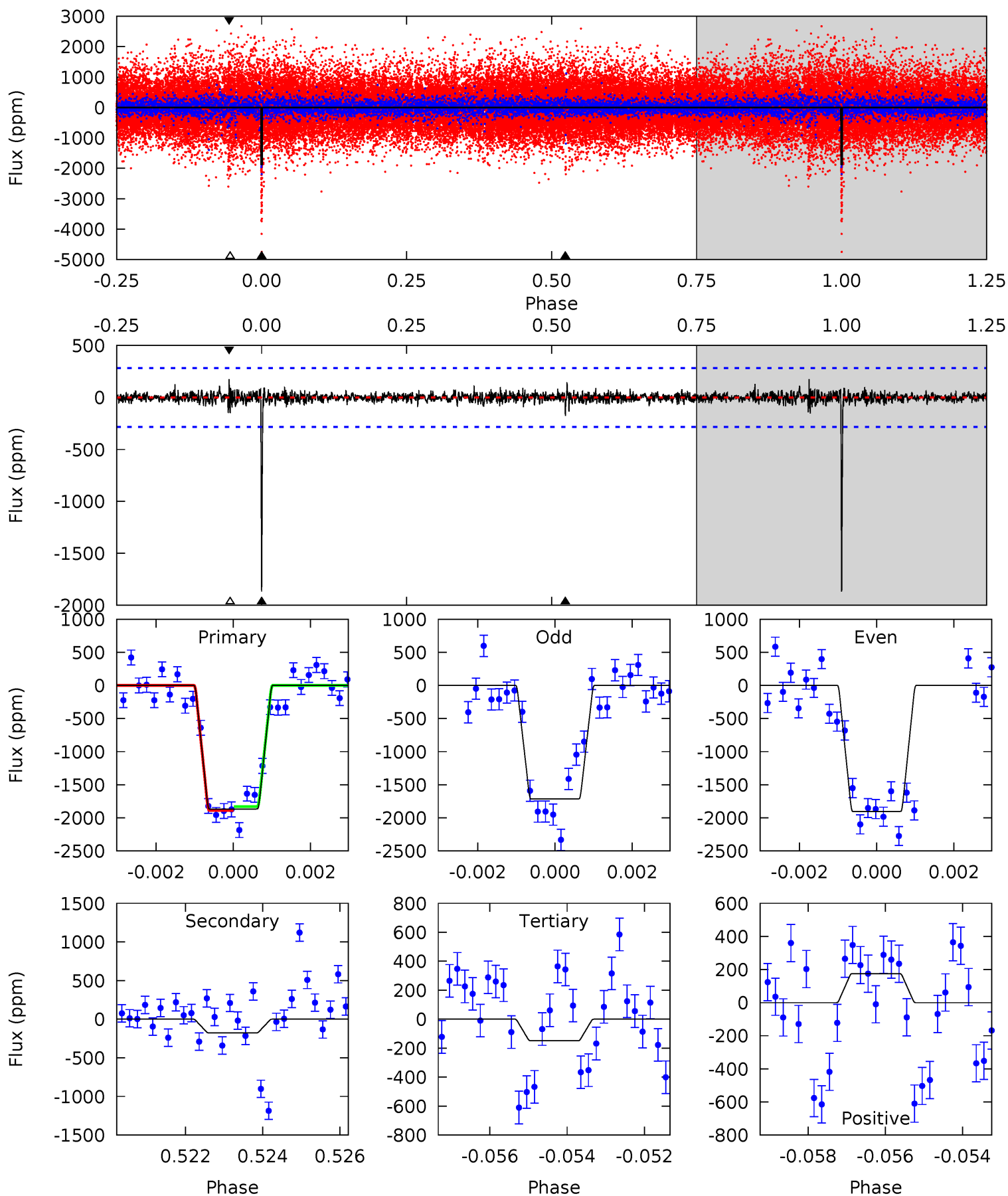
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
23.0	9.72	9.38	10.2	5.33	3.09	2.61	13.7	12.8	0.35	-0.49	0.90	1.09	0.31	0.19



Alt Model-Shift Uniqueness Test

007455287-06, P = 392.188128 Days, E = 372.348424 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
35.2	3.34	2.80	3.30	5.35	3.12	0.54	32.4	31.9	0.54	0.04	1.82	0.96	0.09	0.54



Stellar Parameters For KIC 007455287

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	3713^{+74}_{-92}	$4.779^{+0.063}_{-0.031}$	$-0.120^{+0.150}_{-0.150}$	$0.470^{+0.036}_{-0.054}$	$0.484^{+0.038}_{-0.053}$	$6.567^{+2.046}_{-0.894}$
	+2%/-2%	+1%/-1%	+125%/-125%	+8%/-11%	+8%/-11%	+31%/-14%
Source	SPE70	SPE60	SPE70	DSEP		

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

Secondary Eclipse Parameters for KIC 007455287-06 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-580 ± 60	$2.28^{+0.25}_{-0.25}$	172^{+5}_{-5}	3063^{+115}_{-111}	41704^{+11624}_{-8344}
Alt.	-177 ± 53	$2.25^{+0.27}_{-0.25}$	172^{+5}_{-6}	2606^{+128}_{-133}	12779^{+5883}_{-4328}

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 007455287-06. Kepler magnitude: 15.85. Transit SNR 9.36

There are 0 quarters with good PRF difference image offsets

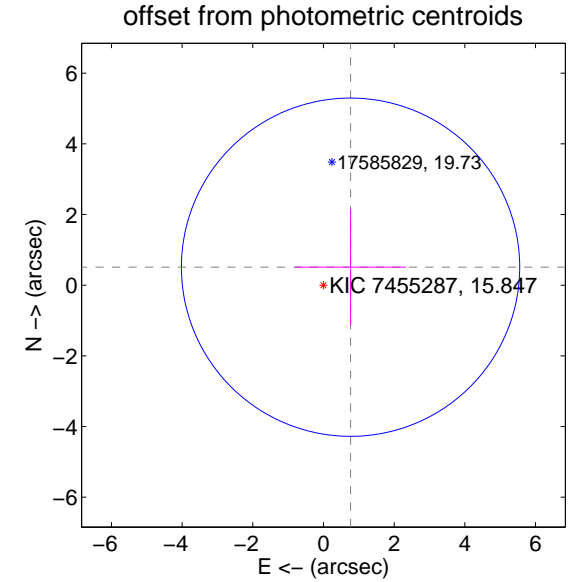
The direct PRF centroid is offset from the target star catalog position by about NaN arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	—	—	—	—
photometric centroid source offset	0.92 ± 1.60	0.58	-0.77 ± 1.58	0.51 ± 1.64

There is no PRF-fit offset from OOT-fit



There is no PRF-fit offset from KIC



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.



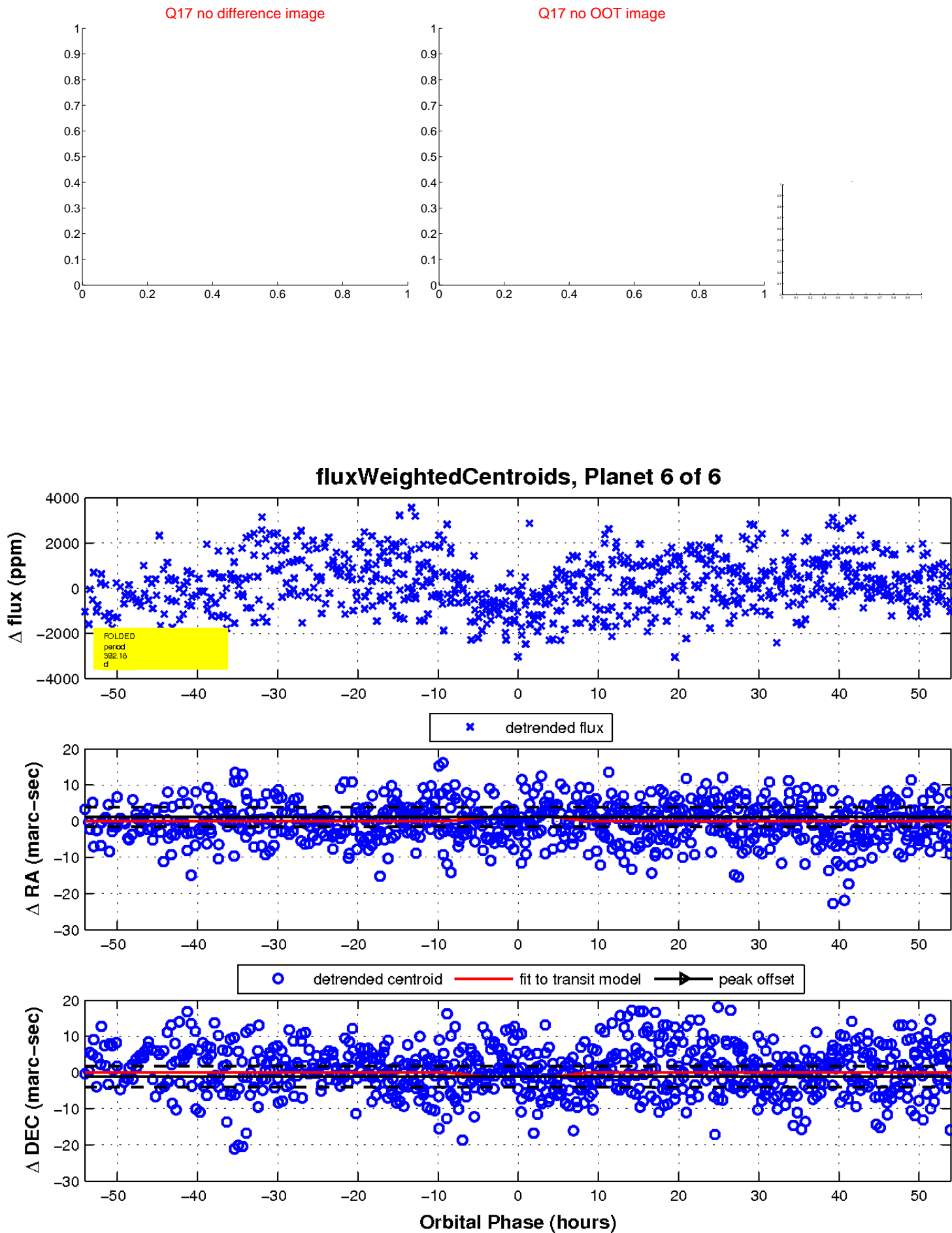
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

