

KIC 002448416

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})
002448416-01	OBS	No	3.385050	132.660623	112.5	15.716	7.9	8.7	0.60	4900	0.68	133.94
002448416-02	OBS	No	276.411577	256.938996	1975.2	15.000	15.3	-1.0	0.60	4900	2.59	0.38

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002448416-01	OBS	FP	0.00	1	0	0	0	LPP_DV
002448416-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—NO_FITS—INCONSISTENT_TRANS—CENT_NOFITS—HALO_GHOST

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

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

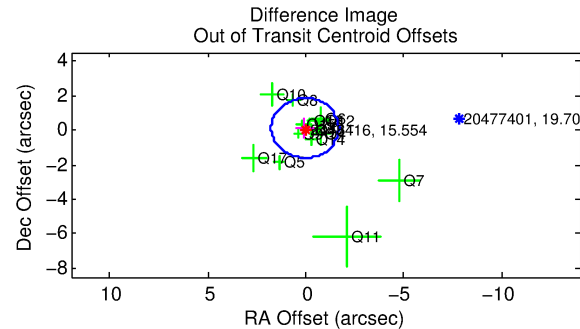
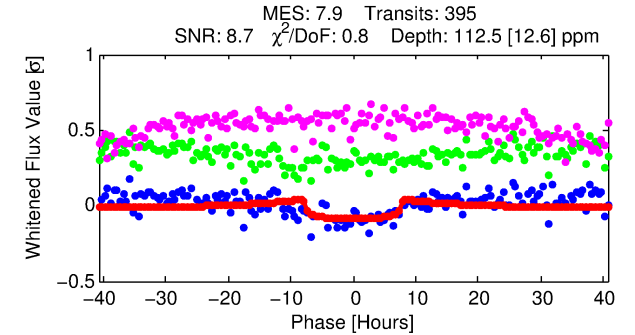
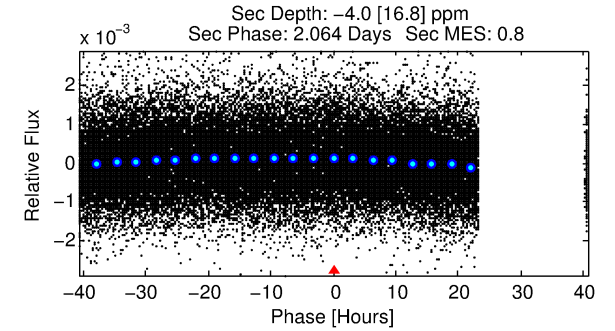
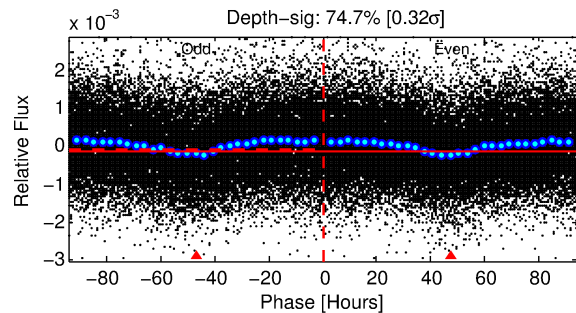
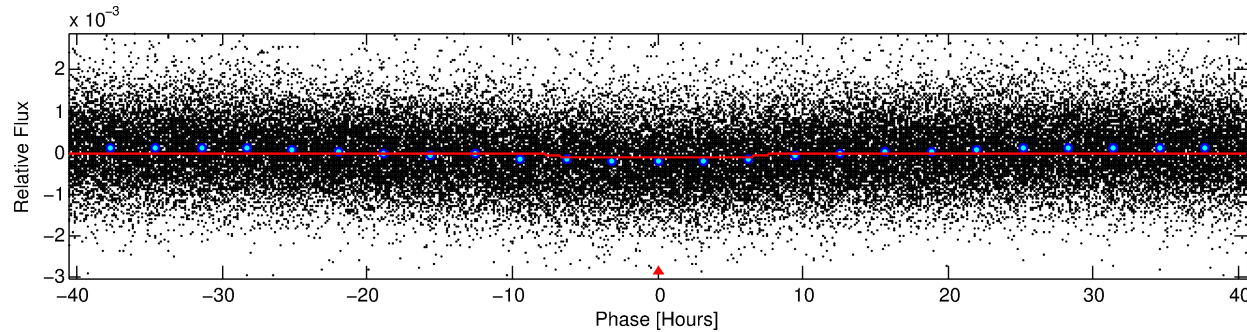
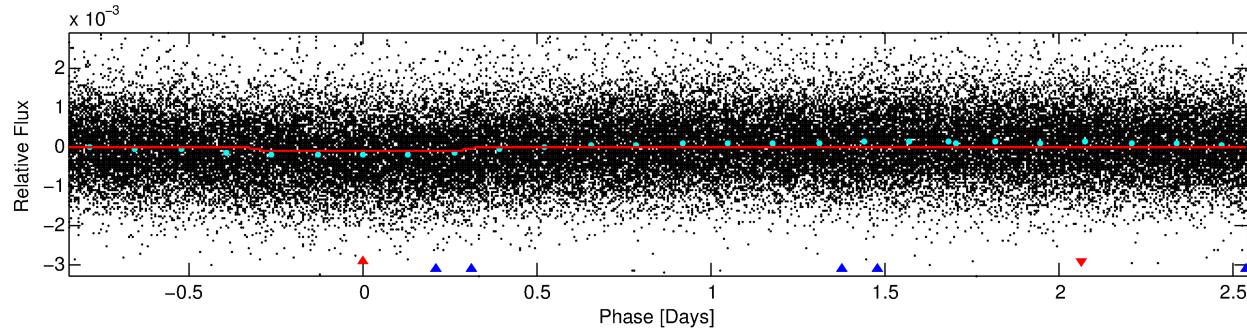
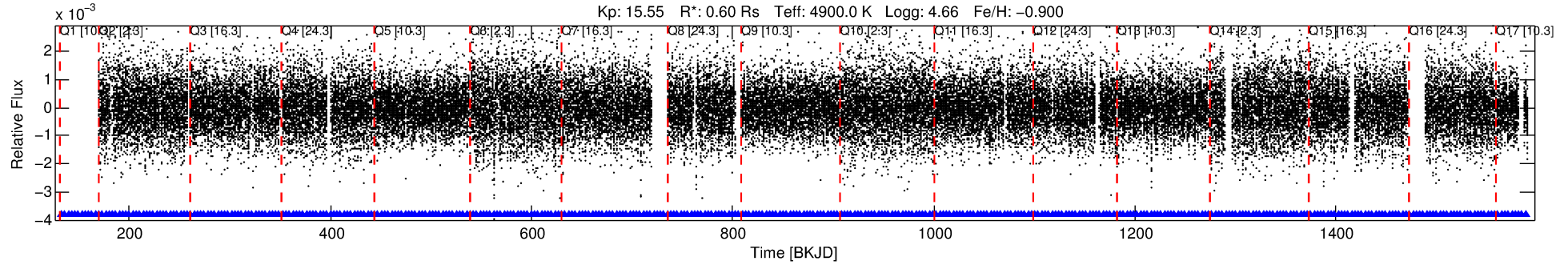
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002448416-01

No Significant Match Found

DV One-Page Summary

KIC: 2448416 Candidate: 1 of 2 Period: 3.385 d



DV Fit Results:

Period = 3.38505 [0.00006] d
Epoch = 132.6606 [0.0126] BKJD
Rp/R* = 0.0104 [0.0054]
a/R* = 1.46 [1.55]
b = 0.70 [1.49]
Seff = 133.94 [21.25]
Teq = 867 [34] K
Rp = 0.67 [0.36] Re
a = 0.0371 [0.0026] AU
Ag = N/A
Teffp = N/A

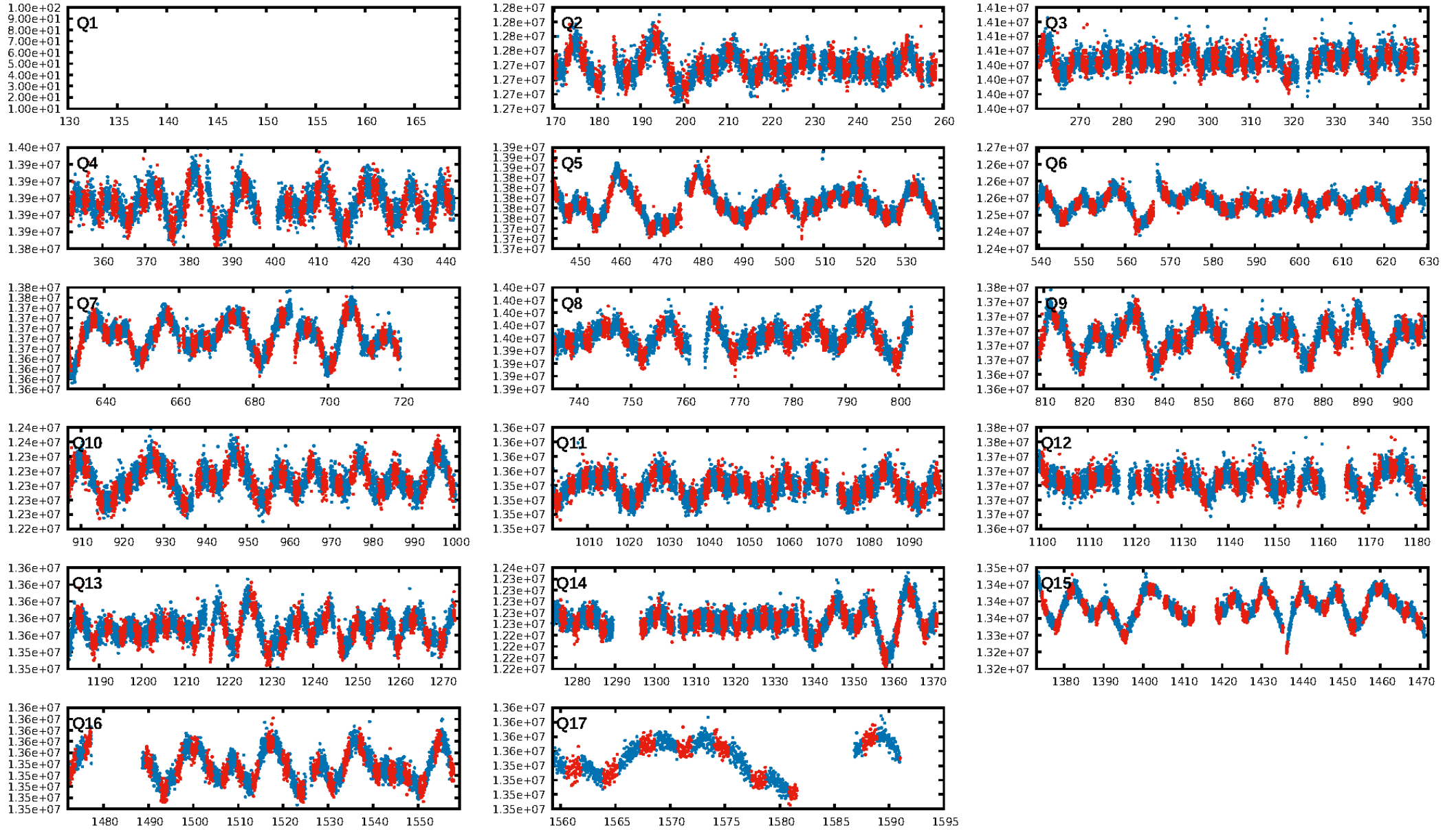
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [301.61 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.50e-12
RollingBand-fgt: 1.00 [387/387]
GhostDiagnostic-chr: 1.22
Centroid-sig: 2.8%
Centroid-so: 1.494 arcsec [1.63 σ]
OotOffset-rm: 0.133 arcsec [0.23 σ]
KicOffset-rm: 0.113 arcsec [0.21 σ]
OotOffset-st: 3/4/4/4 [15]
KicOffset-st: 3/4/4/4 [15]
DiffImageQuality-fgm: 0.87 [13/15]
DiffImageOverlap-fno: 1.00 [16/16]

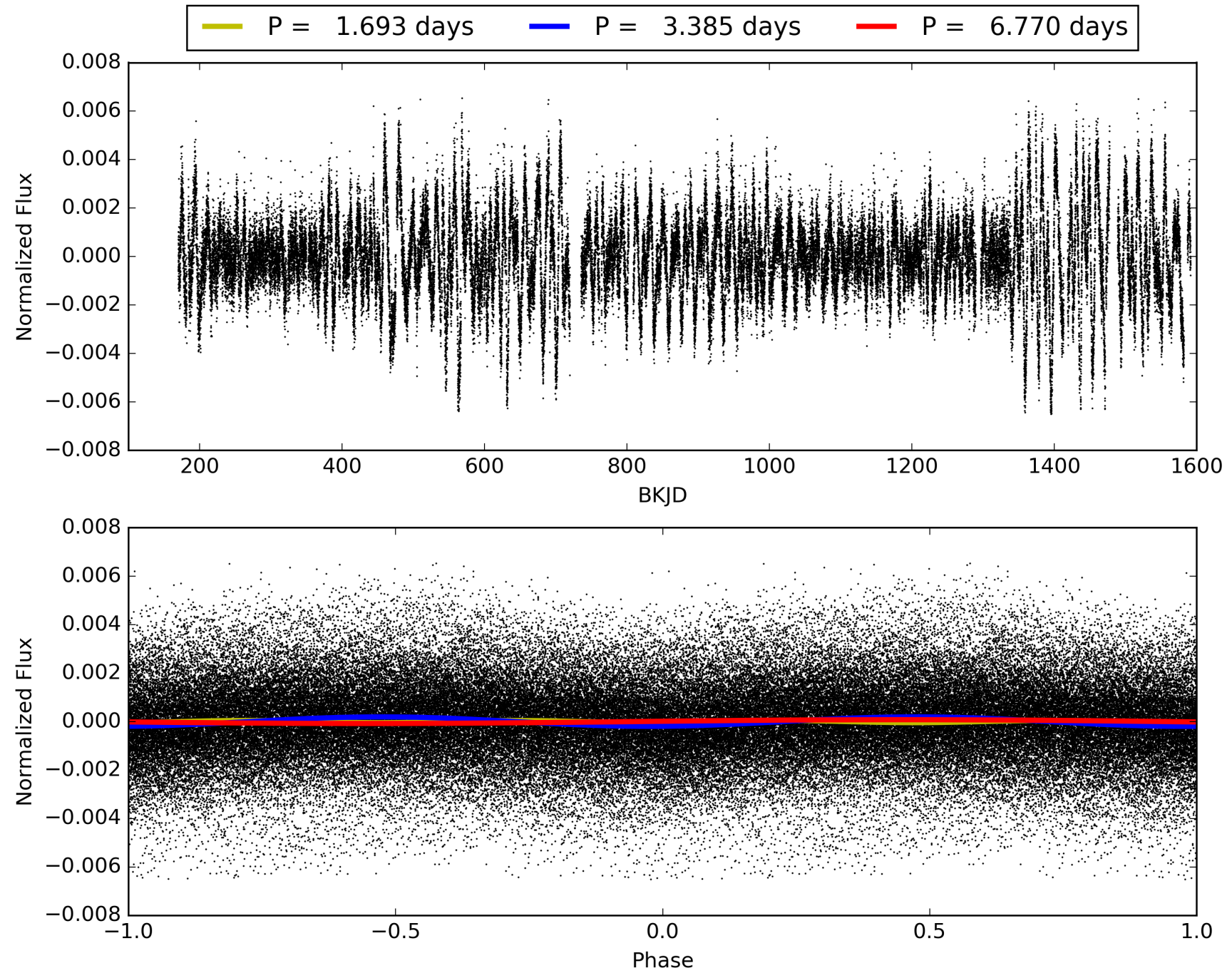
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:54:06 Z

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

TCE 002448416-01, PDC Light Curves

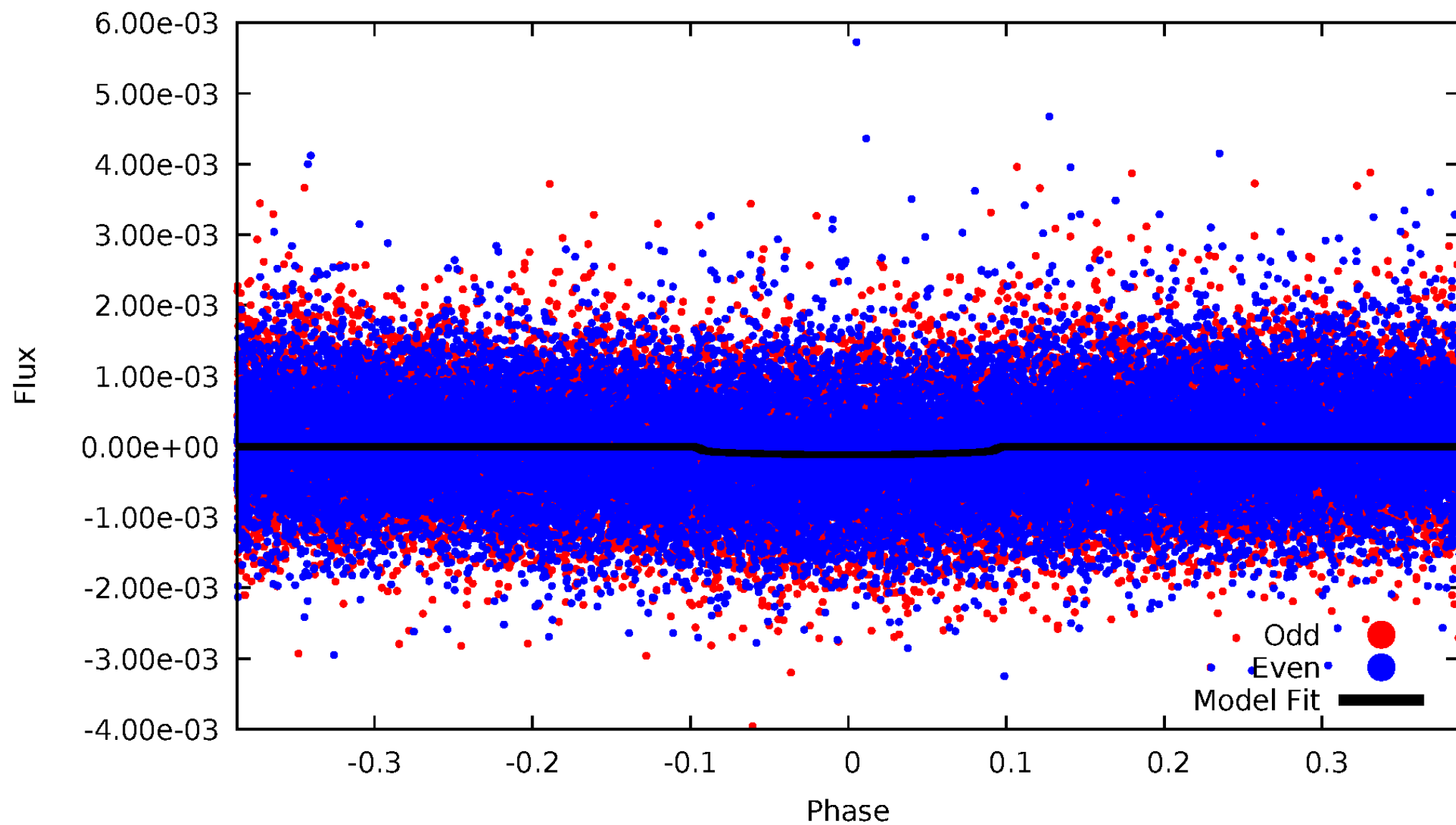


TCE 002448416-01



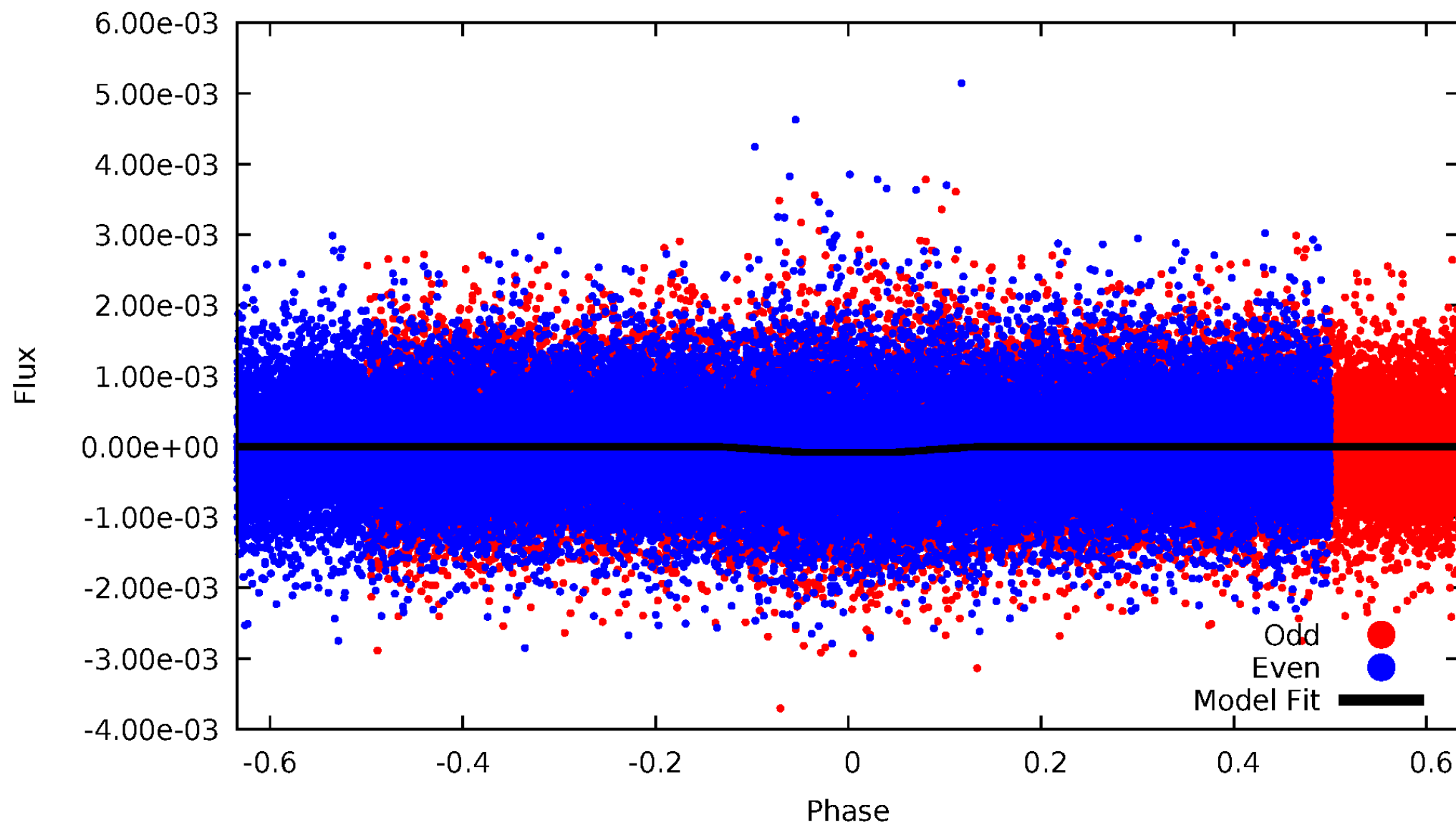
DV Odd/Even

TCE 002448416-01



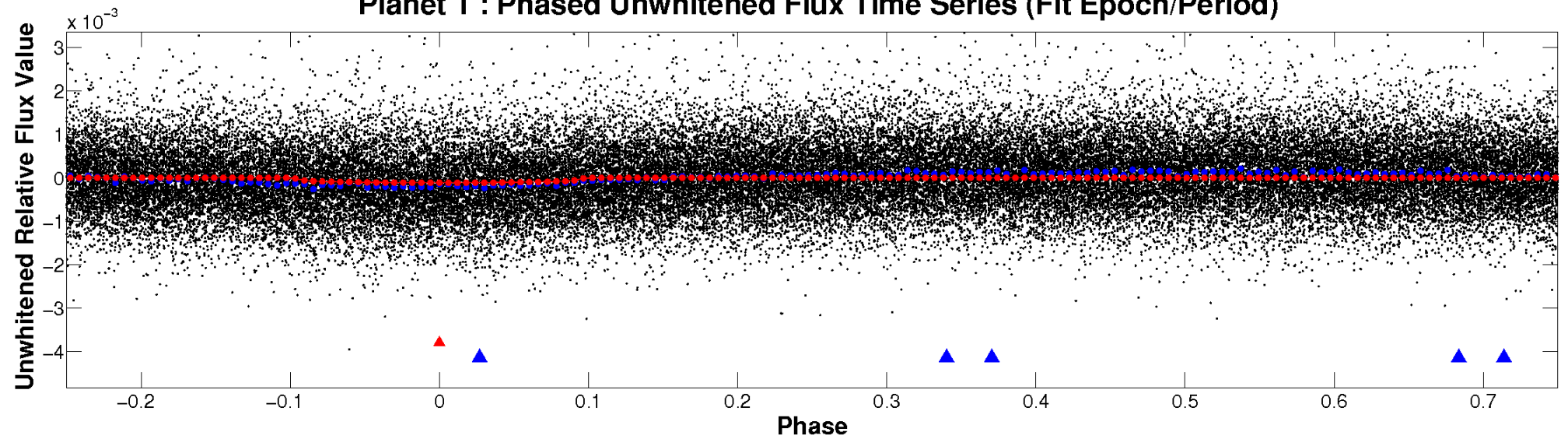
ALT Odd/Even

TCE 002448416-01

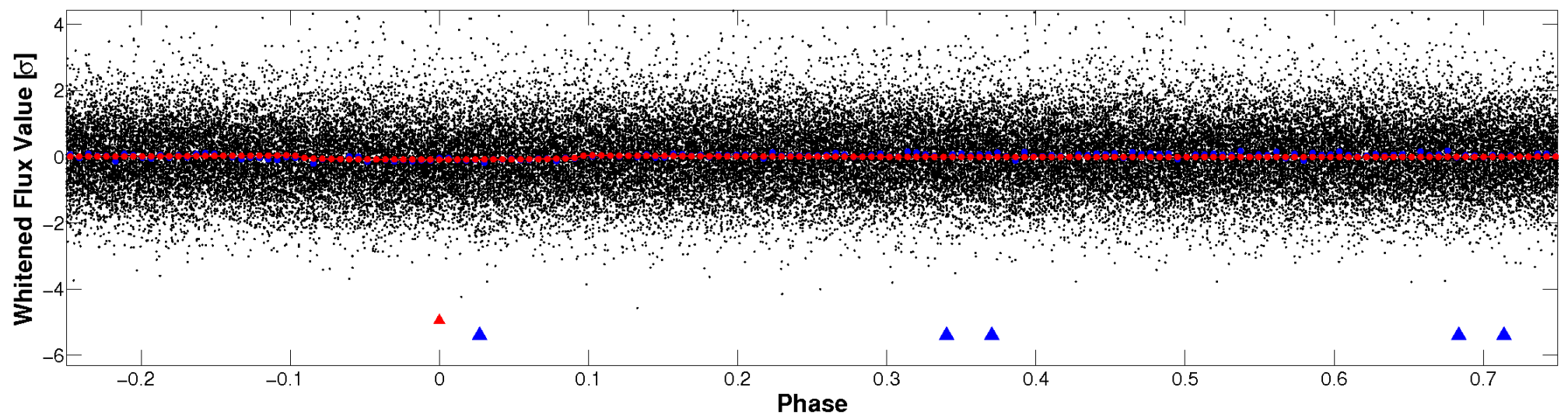


Non-Whitened Vs. Whitened Light Curve

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

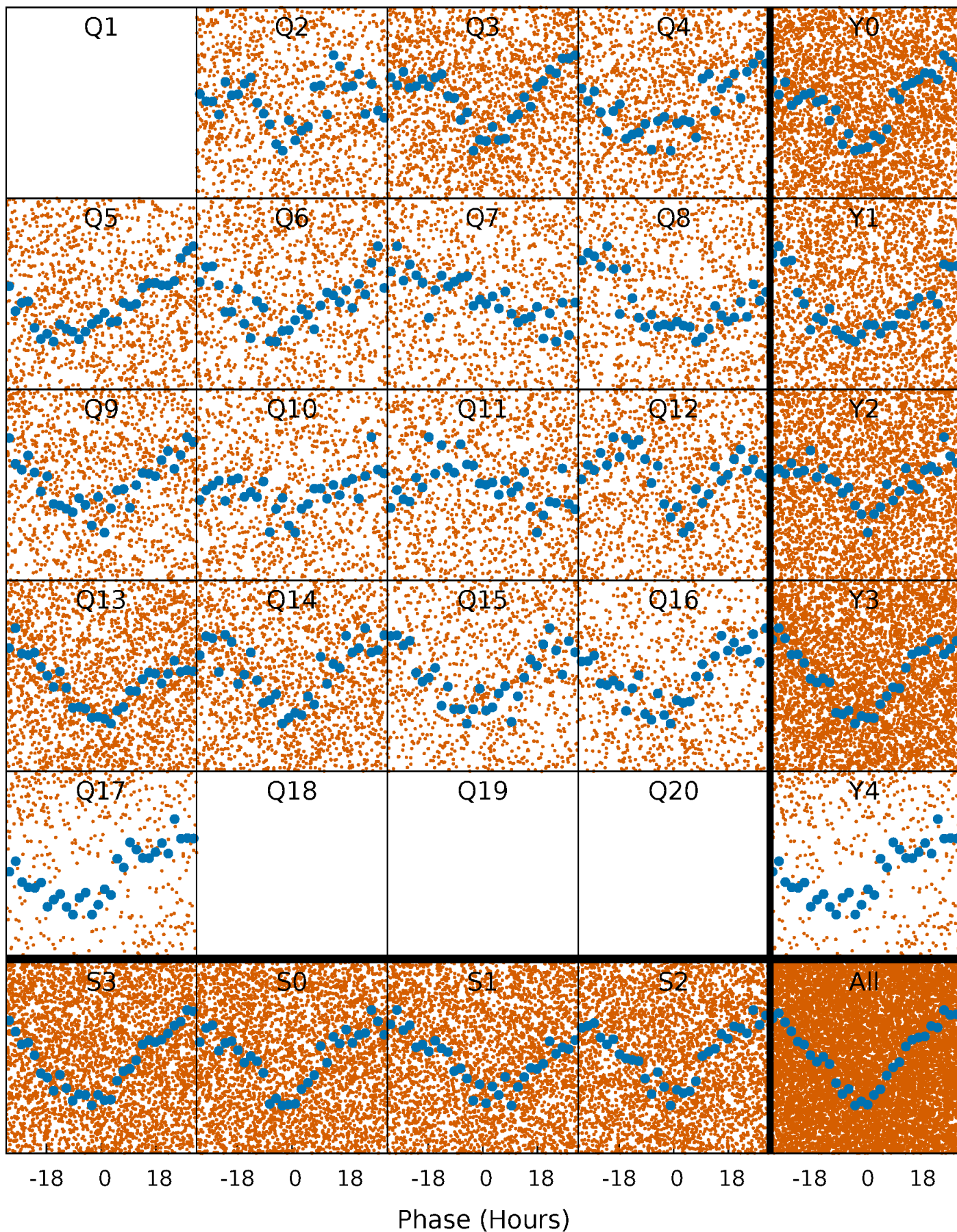


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



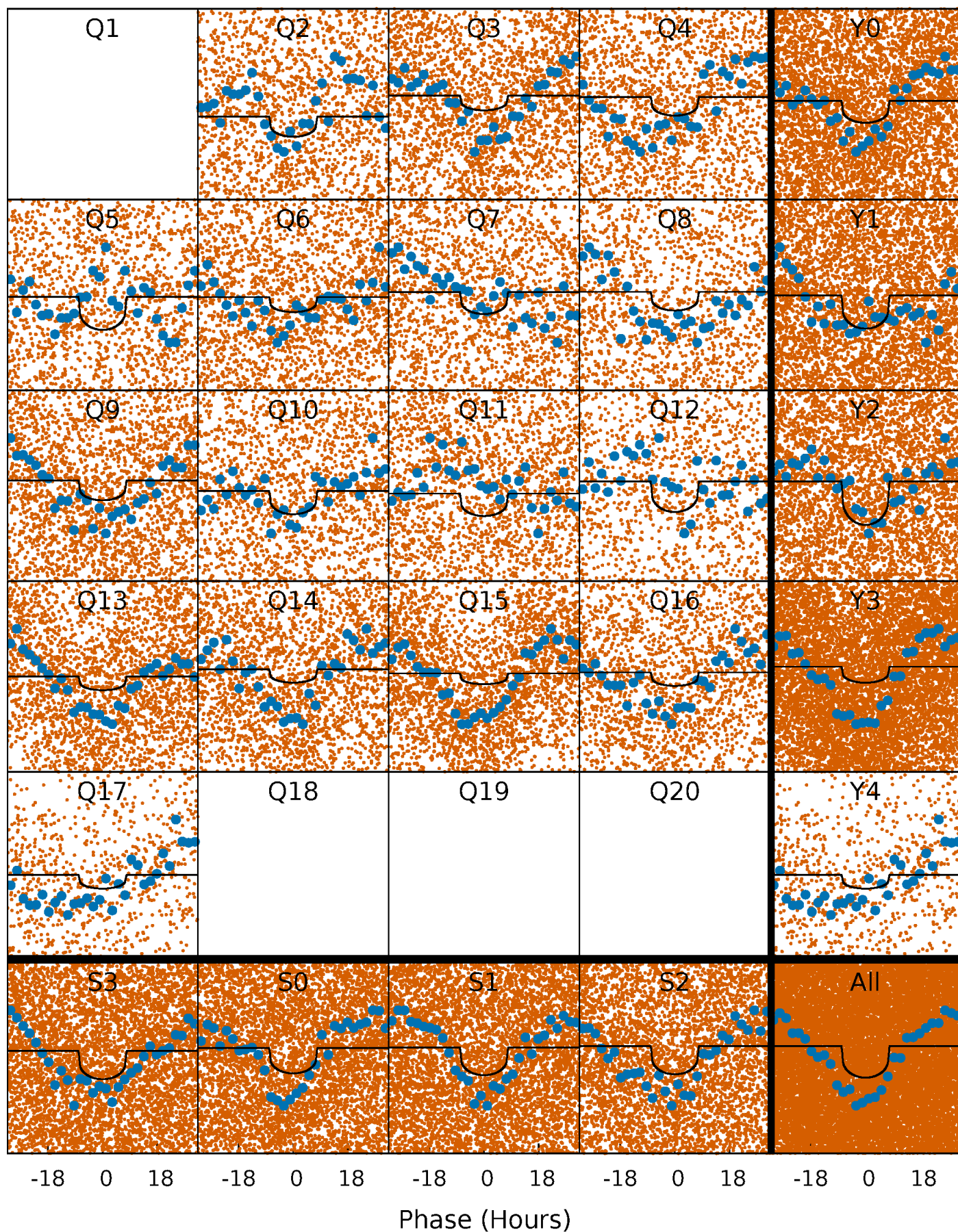
PDC Quarter-Phased Transit Curves

TCE 002448416-01 P= 3.385050 Days $T_0=132.660623$ (BKJD)



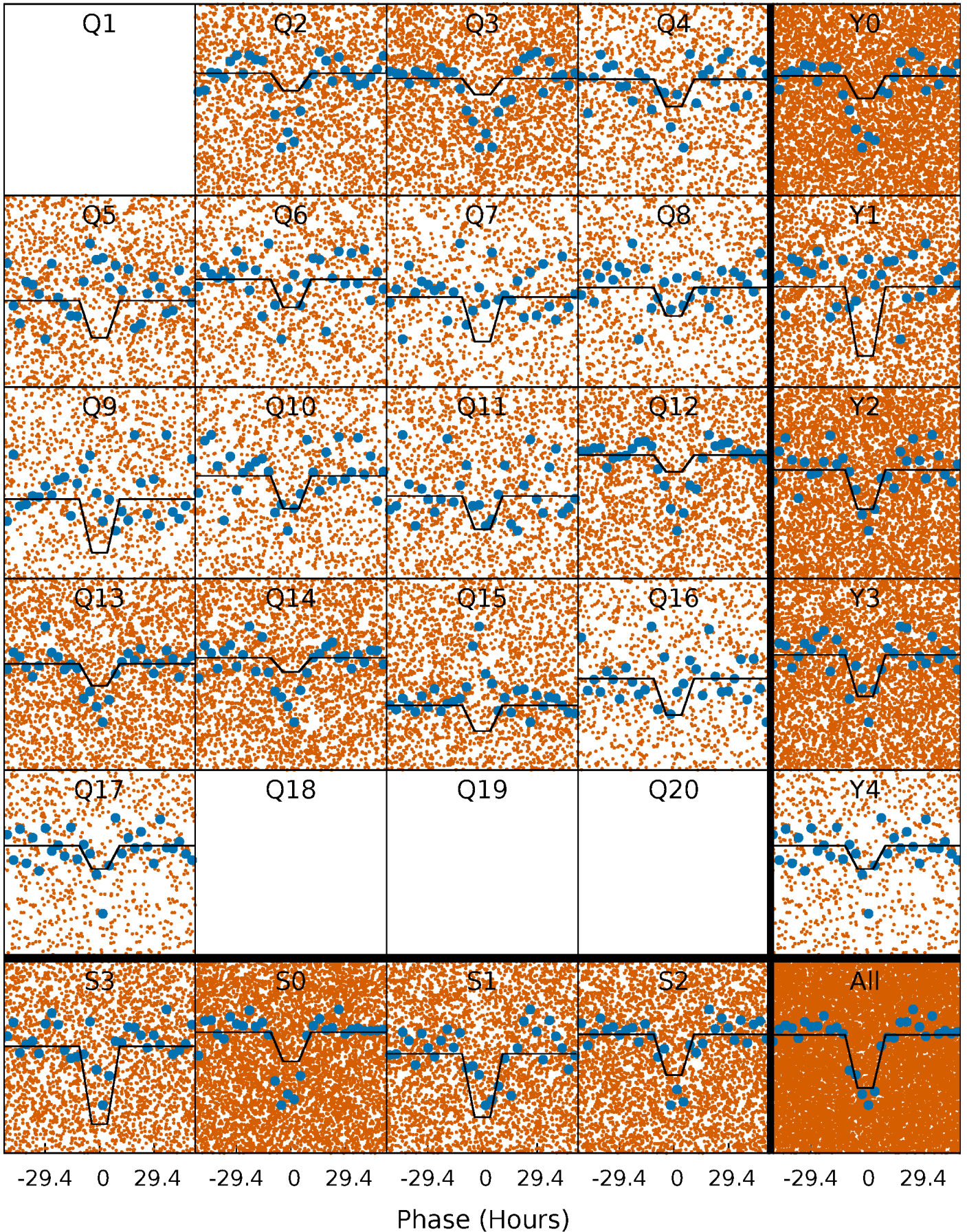
DV Quarter-Phased Transit Curves

TCE 002448416-01 P= 3.385050 Days $T_0=132.660623$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

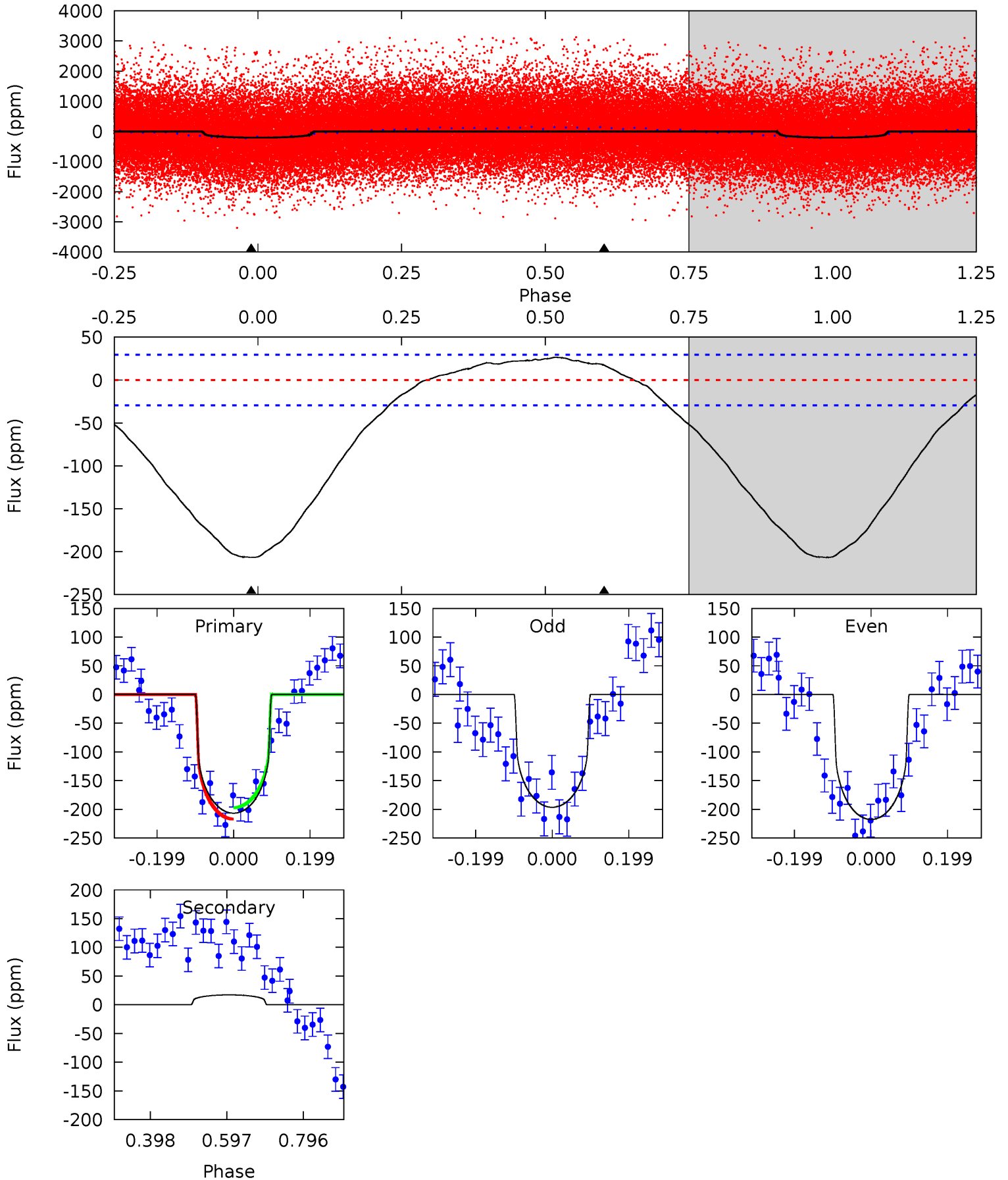
TCE 002448416-01 P= 3.385053 Days $T_0=132.693674$ (BKJD)



DV Model-Shift Uniqueness Test

002448416-01, P = 3.385050 Days, E = 132.660623 Days

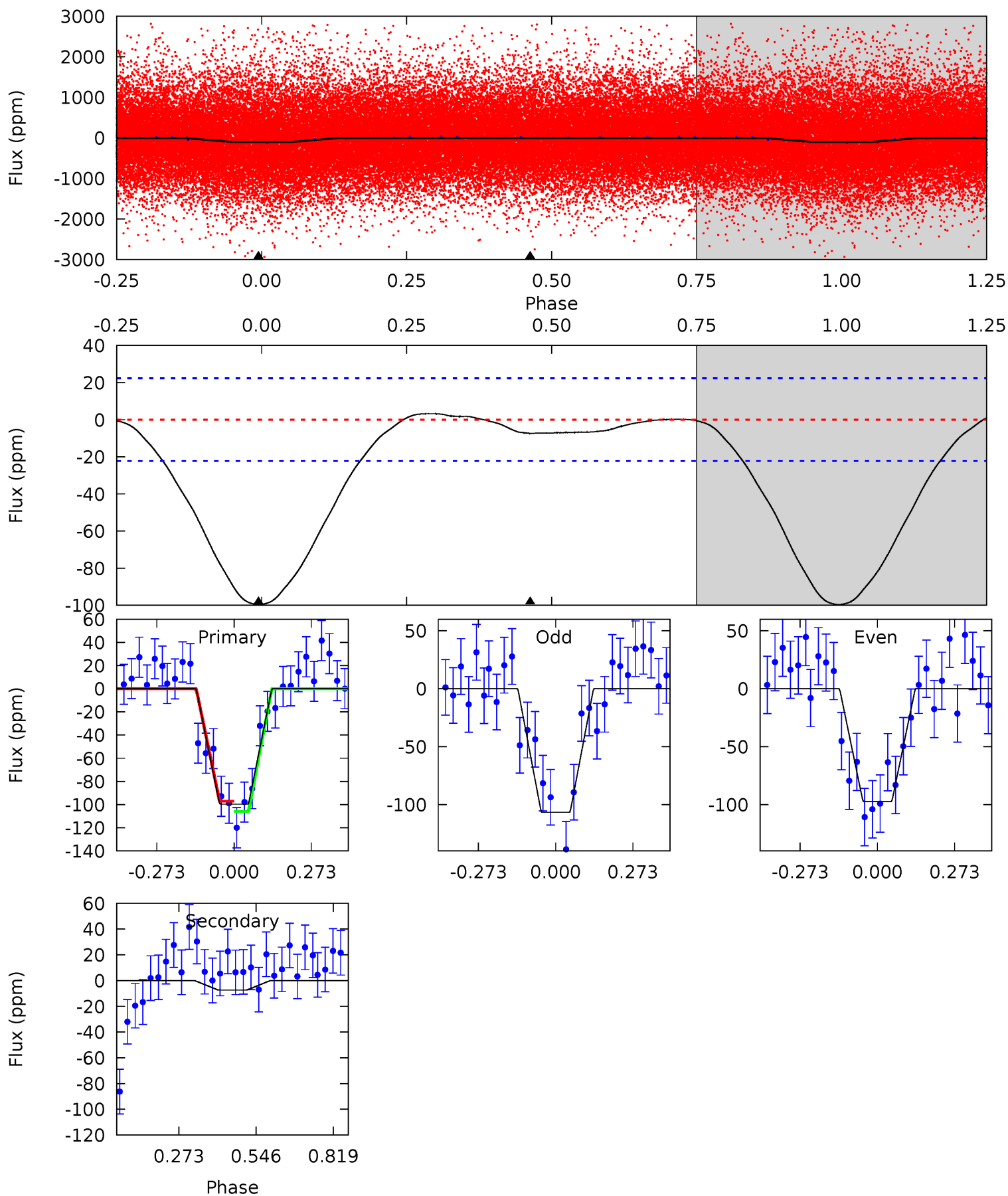
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
31.0	-2.58	0	0	4.42	1.28	3.21	31.0	31.0	-2.58	-2.58	1.59	1.03	0.11	1.51



Alt Model-Shift Uniqueness Test

002448416-01, P = 3.385053 Days, E = 132.693674 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
19.4	1.44	0	0	4.35	1.10	0.30	19.4	19.4	1.44	1.44	0.89	0.73	0.03	0.82



Stellar Parameters For KIC 002448416

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	4900^{+146}_{-146}	$4.659^{+0.059}_{-0.036}$	$-0.900^{+0.300}_{-0.300}$	$0.597^{+0.047}_{-0.042}$	$0.592^{+0.055}_{-0.025}$	$3.921^{+0.886}_{-0.540}$
	+3%/-3%	+1%/-1%	+33%/-33%	+8%/-7%	+9%/-4%	+23%/-14%
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 002448416-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	17 ± 7	$0.70^{+0.37}_{-0.38}$	1206^{+42}_{-40}	-3457^{+444}_{-1005}	$-25.715^{+15.469}_{-88.623}$
Alt.	-7 ± 5	$0.61^{+0.31}_{-0.32}$	1205^{+44}_{-42}	3115^{+805}_{-617}	14^{+41}_{-11}

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

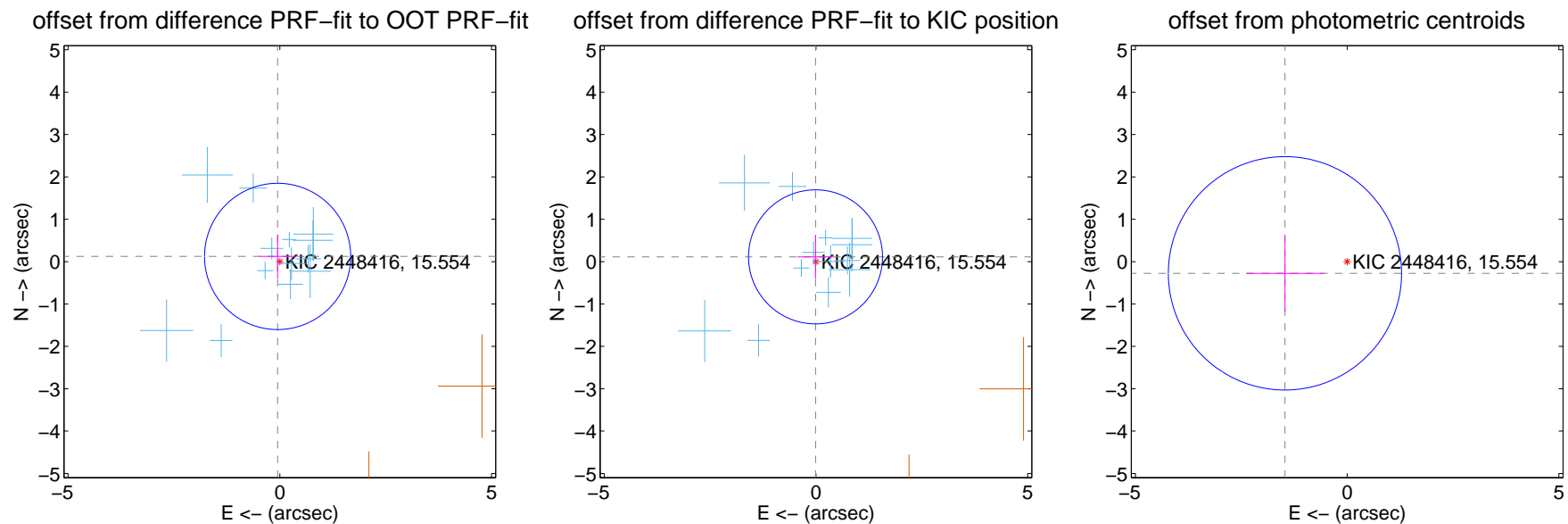
DV Centroid Data

Supplemental centroid analysis for 002448416-01. Kepler magnitude: 15.55. Transit SNR 8.68

There are 13 quarters with good PRF difference image offsets

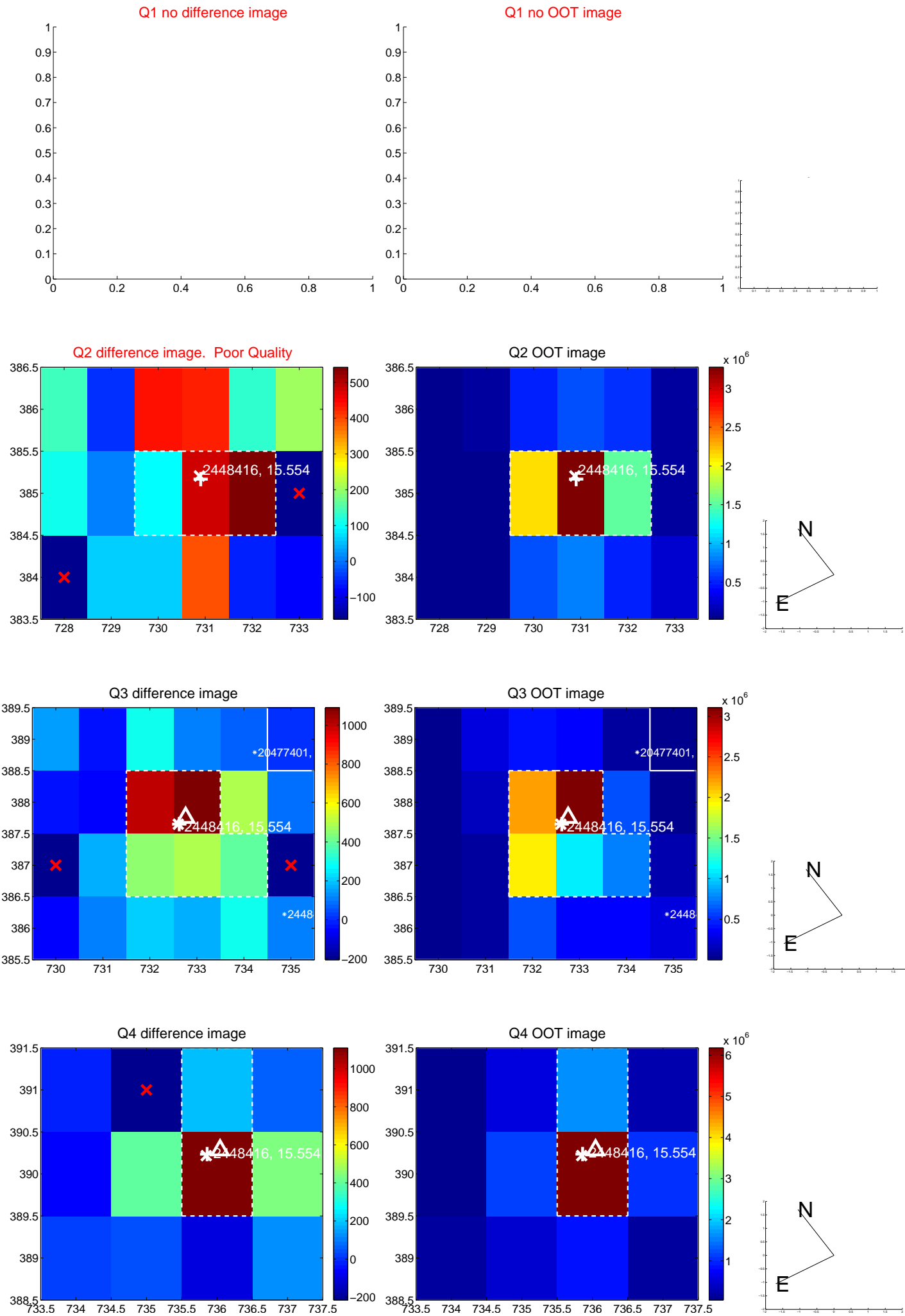
The direct PRF centroid is offset from the target star catalog position by about 0.05 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.133 ± 0.575	0.23	0.052 ± 0.443	0.123 ± 0.521
PRF-fit source offset from KIC position	0.113 ± 0.527	0.21	0.010 ± 0.428	0.113 ± 0.512
photometric centroid source offset	1.49 ± 0.92	1.63	1.47 ± 0.92	-0.28 ± 0.90

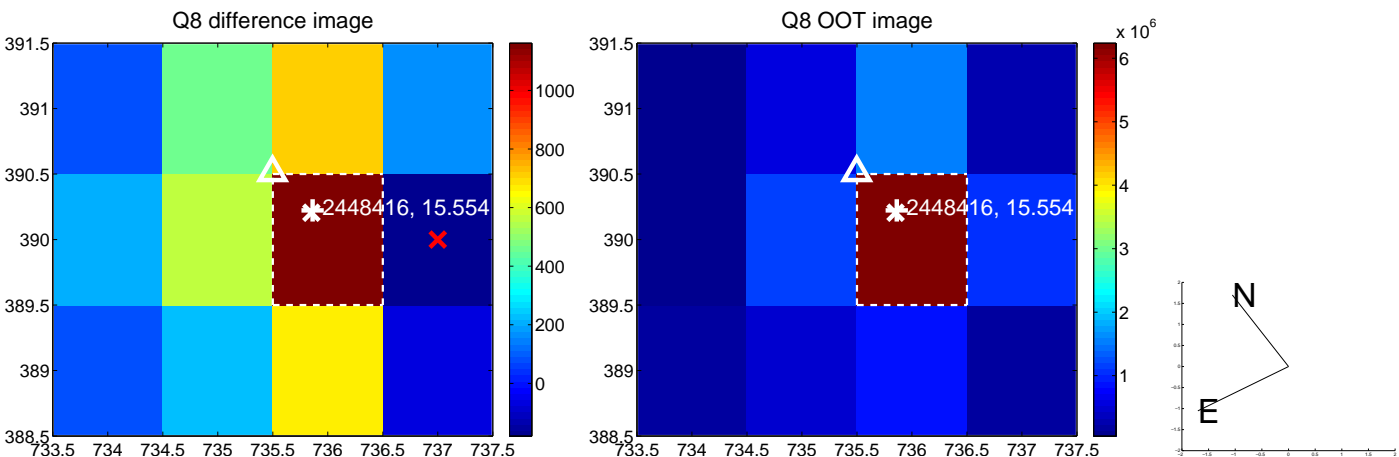
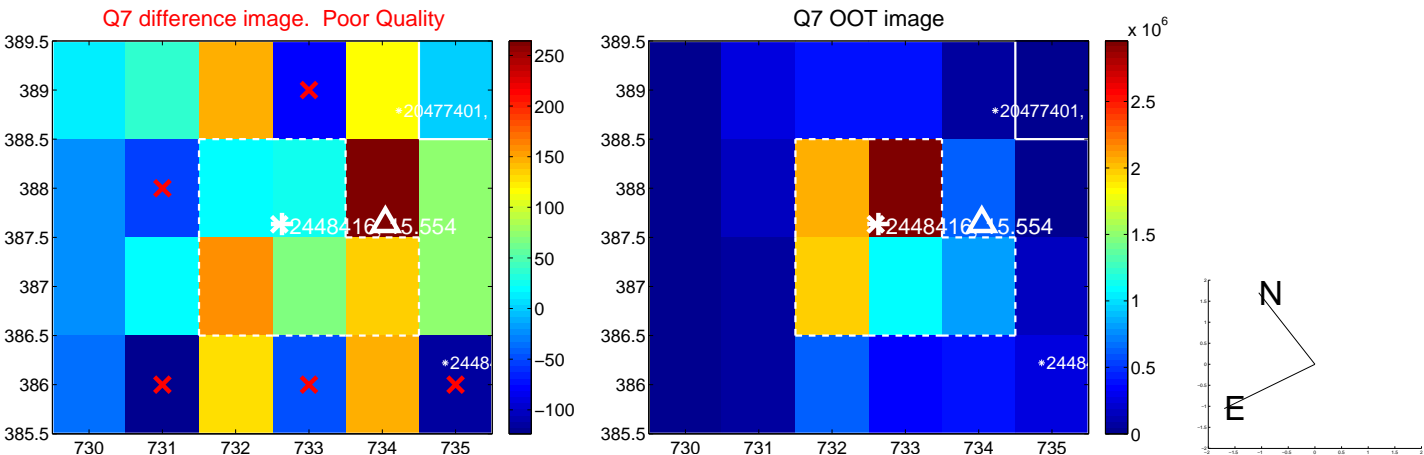
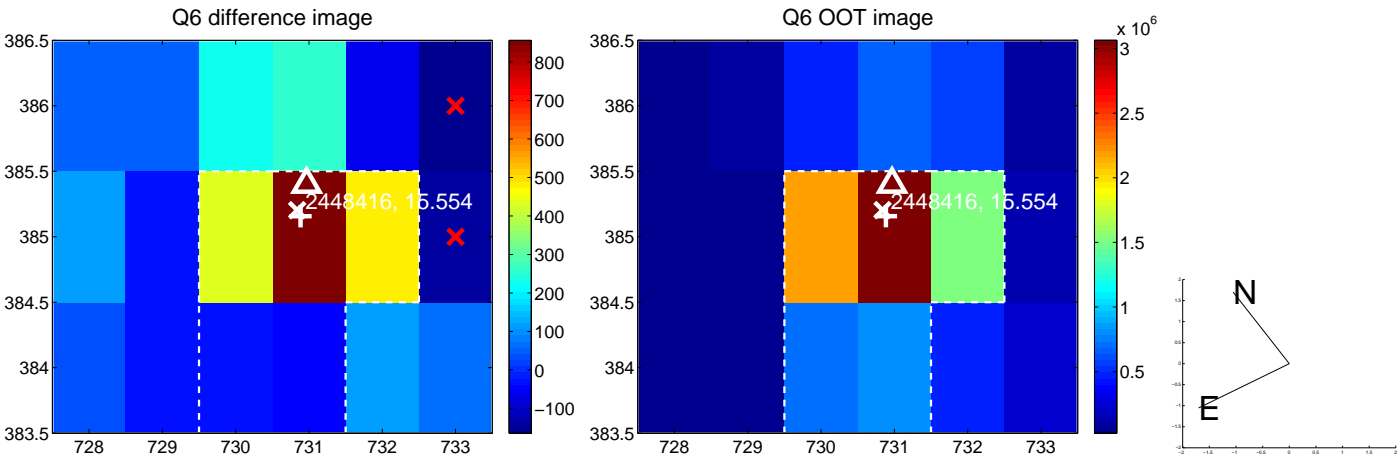
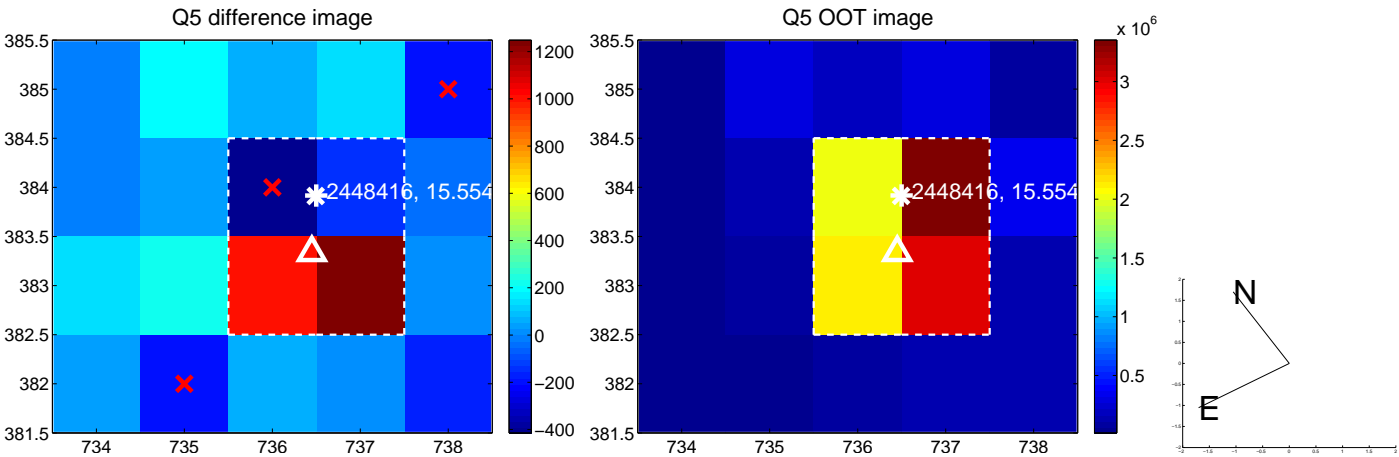


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

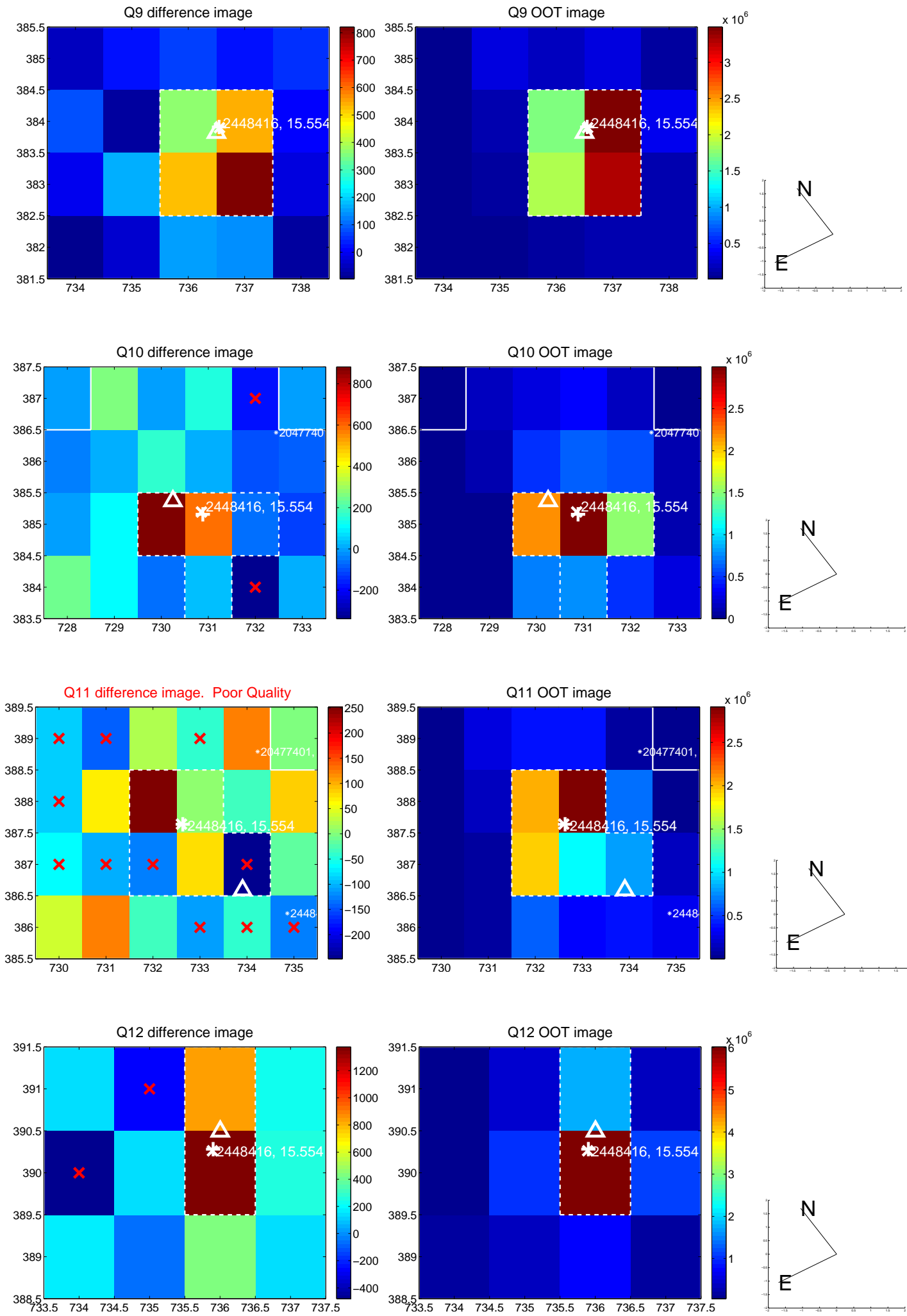
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



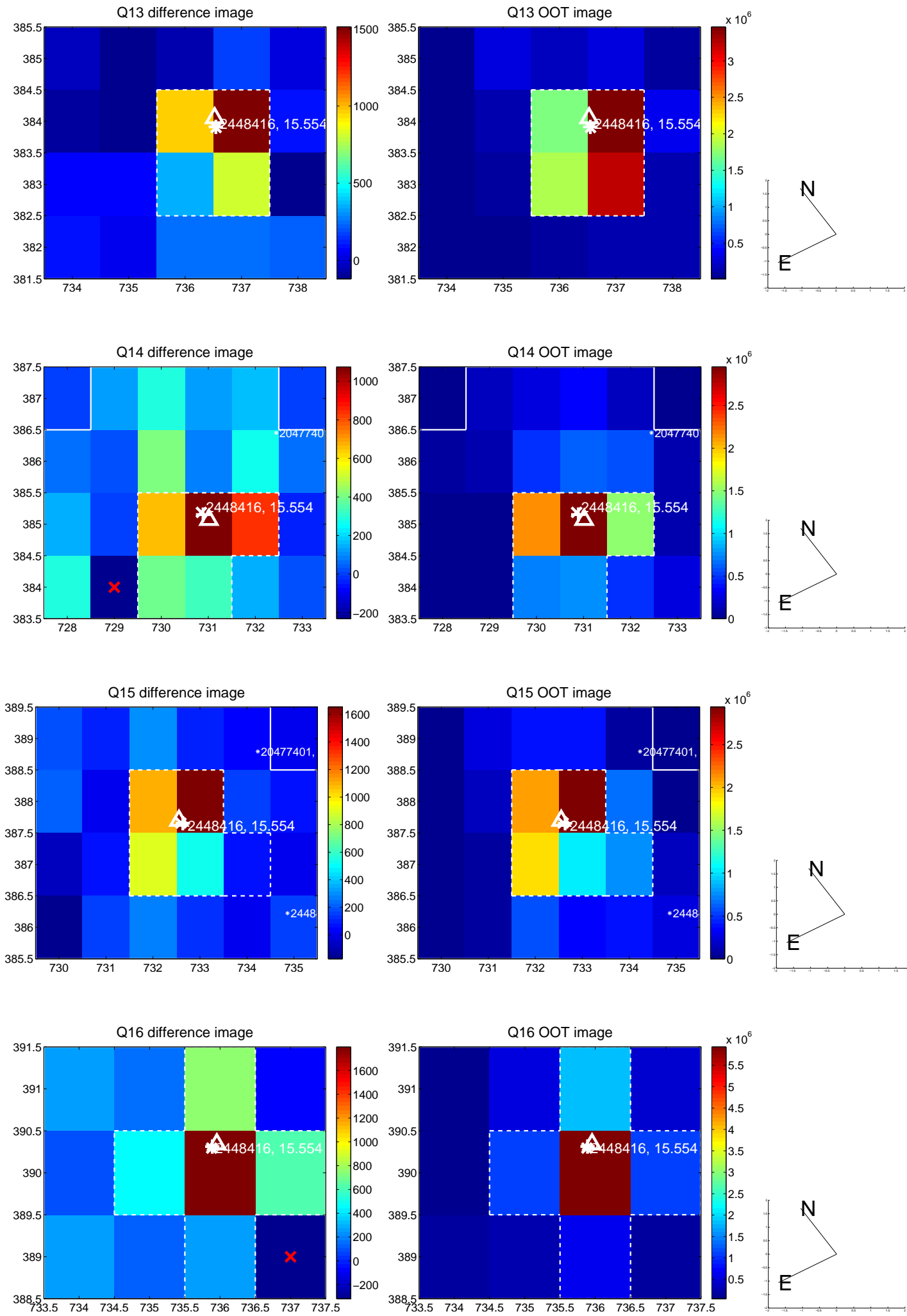
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

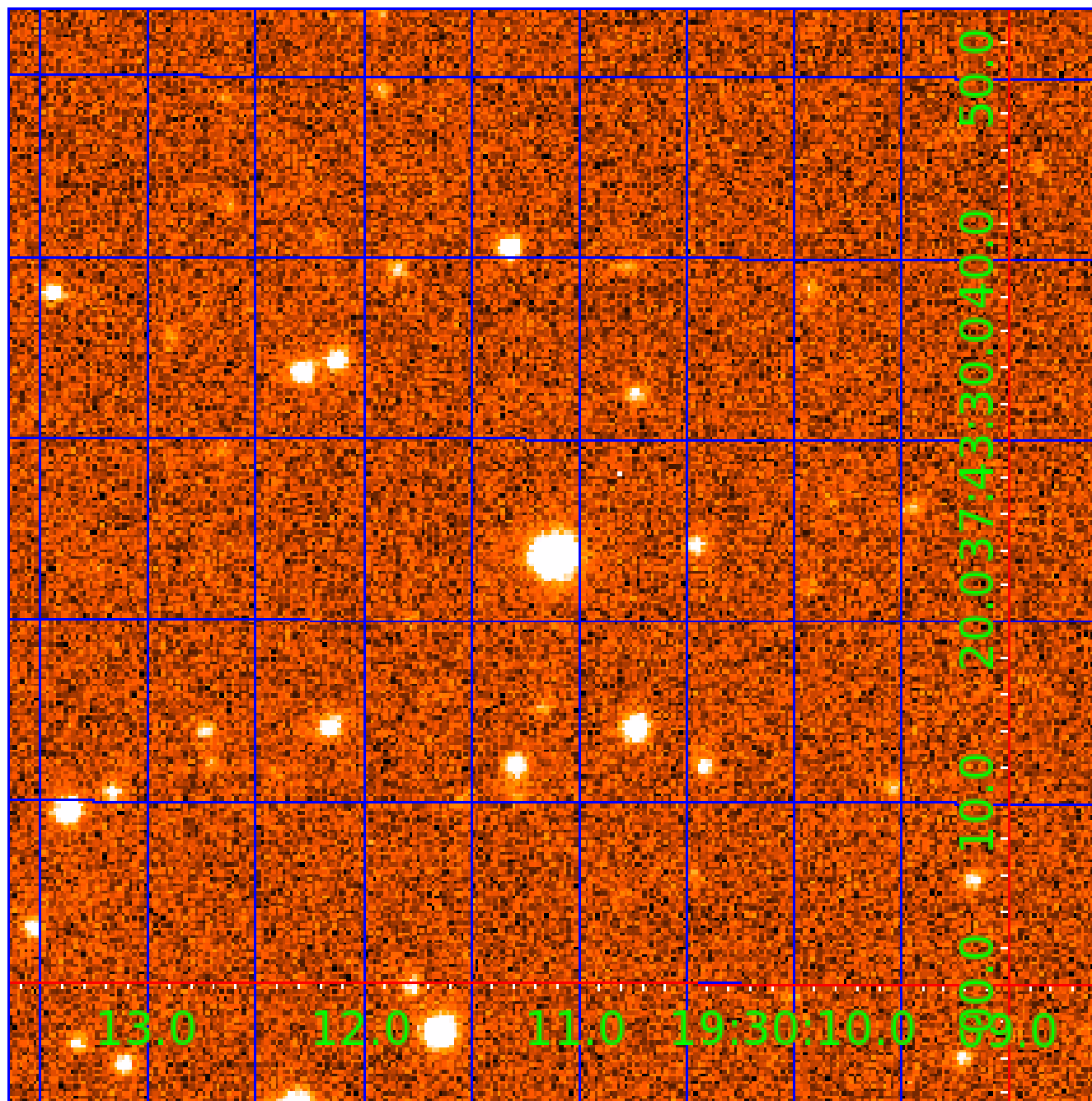


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 002448416

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})
002448416-01	OBS	No	3.385050	132.660623	112.5	15.716	7.9	8.7	0.60	4900	0.68	133.94
002448416-02	OBS	No	276.411577	256.938996	1975.2	15.000	15.3	-1.0	0.60	4900	2.59	0.38

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
002448416-01	OBS	FP	0.00	1	0	0	0	LPP_DV
002448416-02	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—NO_FITS—INCONSISTENT_TRANS—CENT_NOFITS—HALO_GHOST

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

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

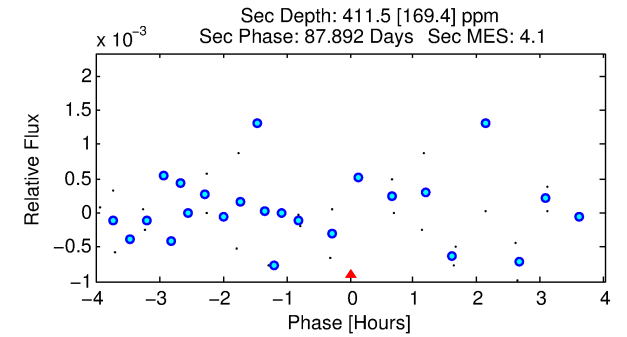
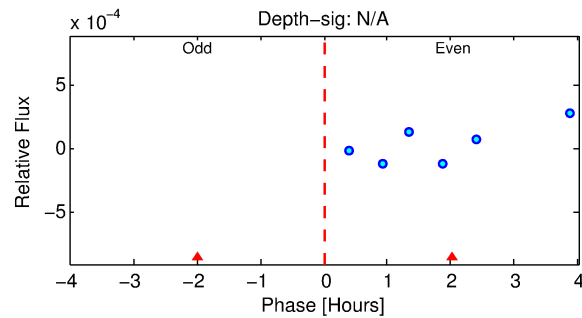
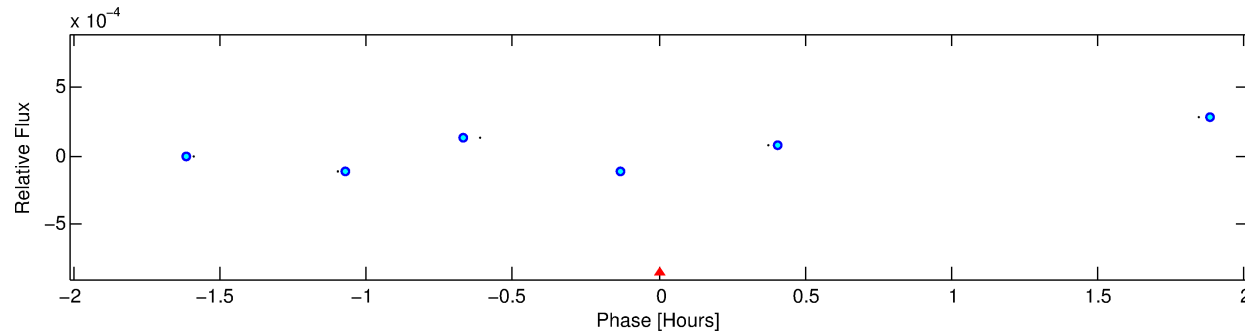
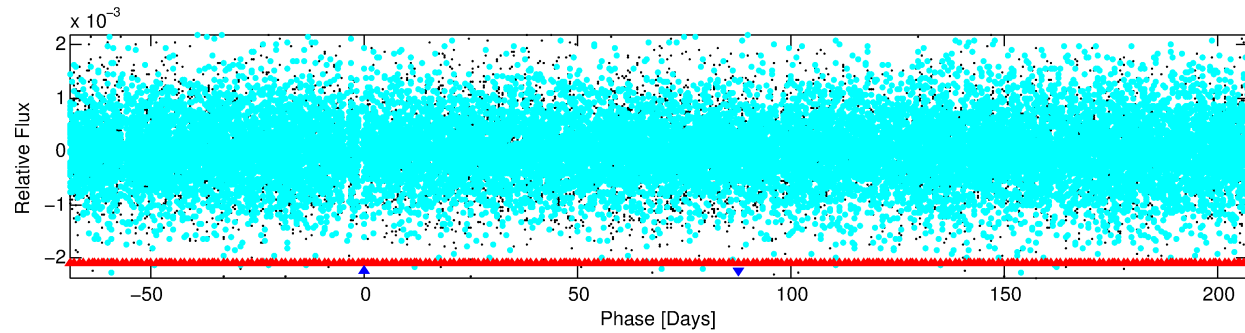
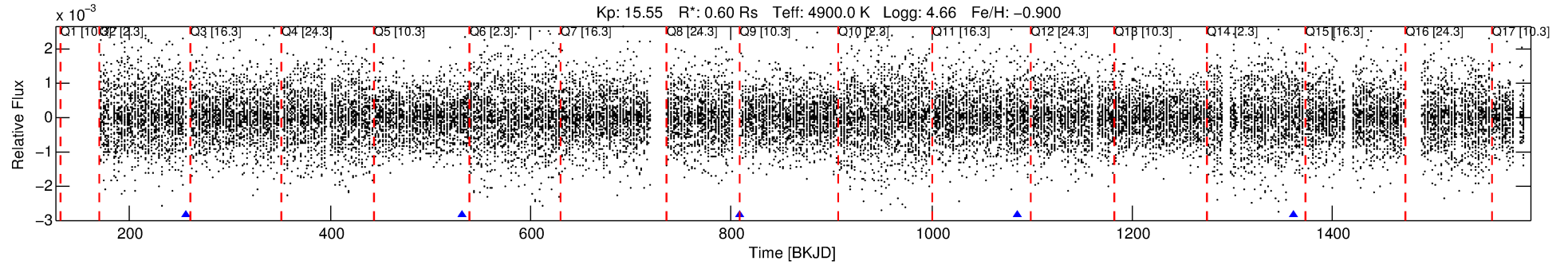
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 002448416-02

No Significant Match Found

DV One-Page Summary

KIC: 2448416 Candidate: 2 of 2 Period: 276.412 d



TPS TCE Results:

Period = 276.41158 d
Epoch = 256.9390 BKJD

DV fit results are unavailable

DV Diagnostic Results:

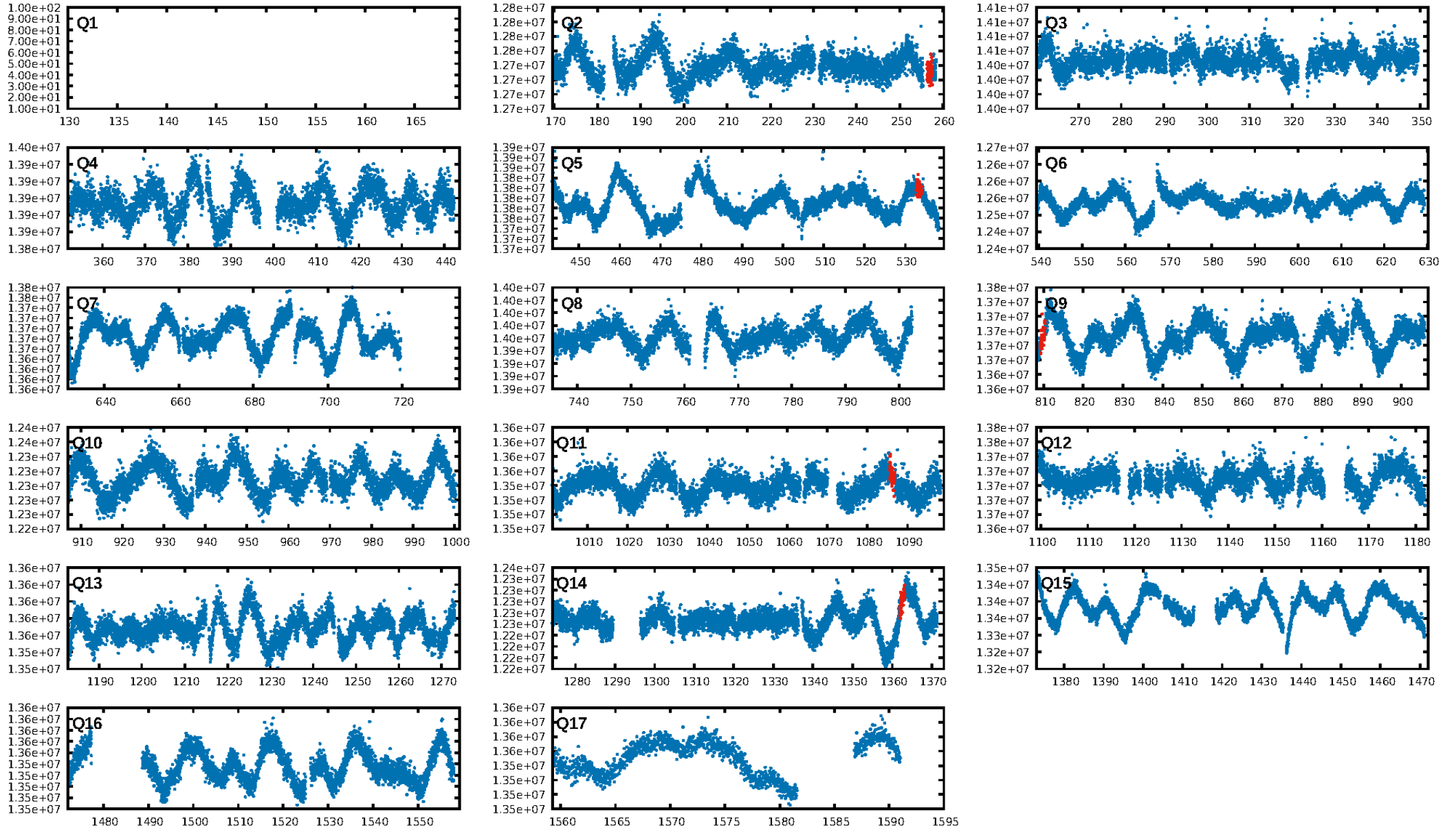
ShortPeriod-sig: 100.0% [301.61σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 5.49e-21
RollingBand-fgt: 1.00 [1/1]
GhostDiagnostic-chr: -0.247

Centroid-sig: 76.4%
Centroid-so: N/A
OotOffset-rm: N/A
KicOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/0/0 [0]
DiffImageQuality-fgm: N/A
DiffImageOverlap-fno: 1.00 [1/1]

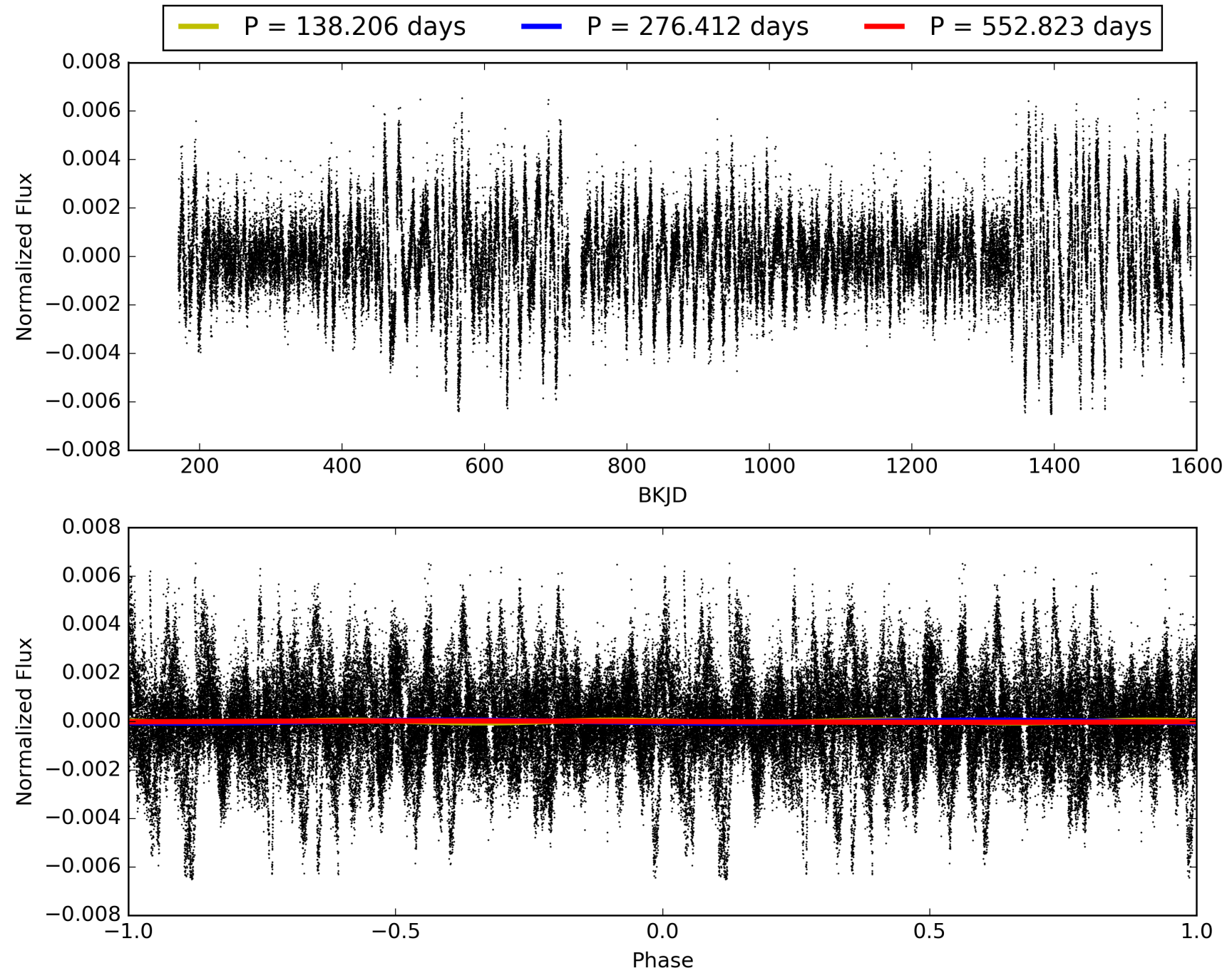
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 03:54:44 Z

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

TCE 002448416-02, PDC Light Curves

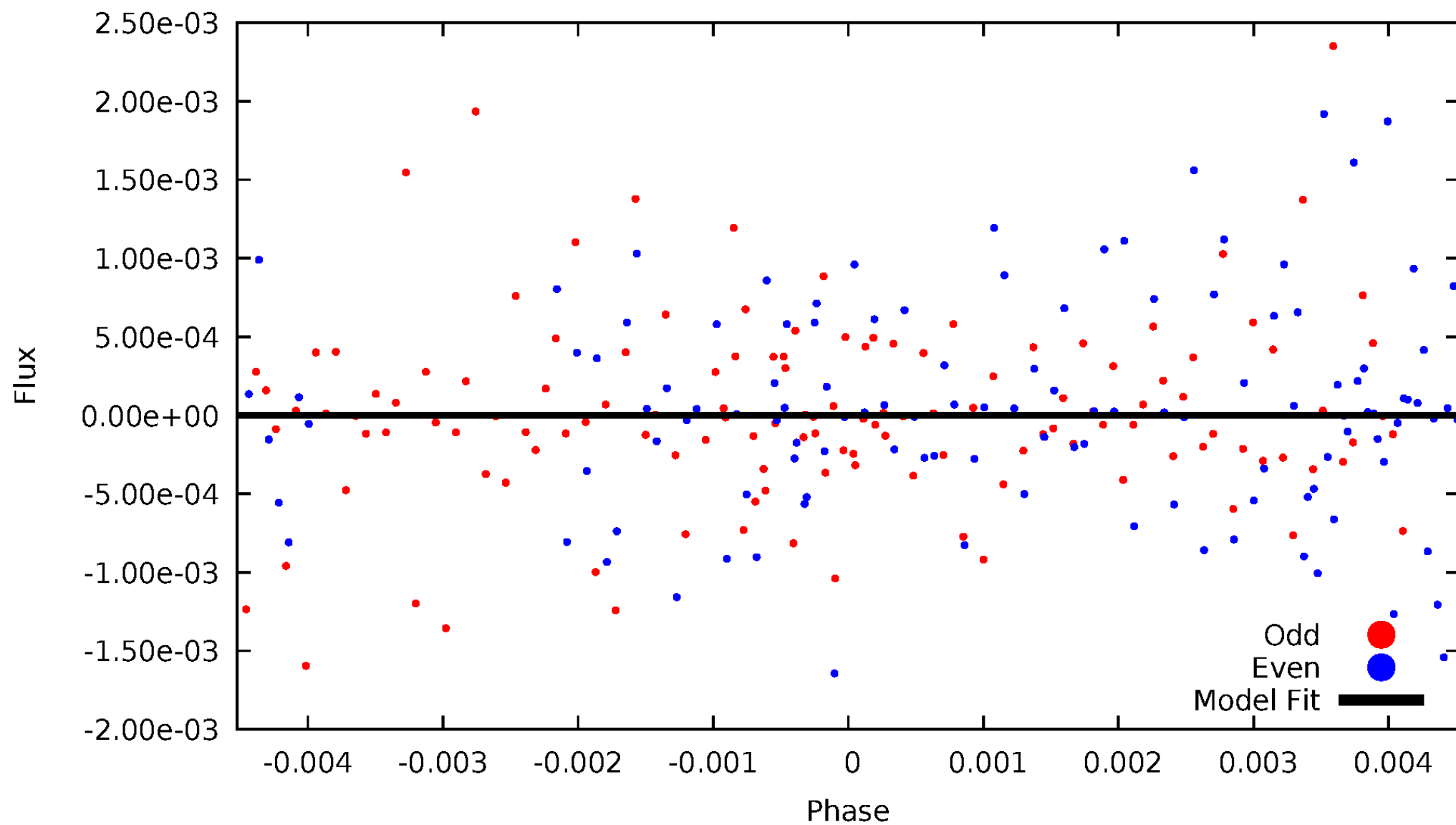


TCE 002448416-02



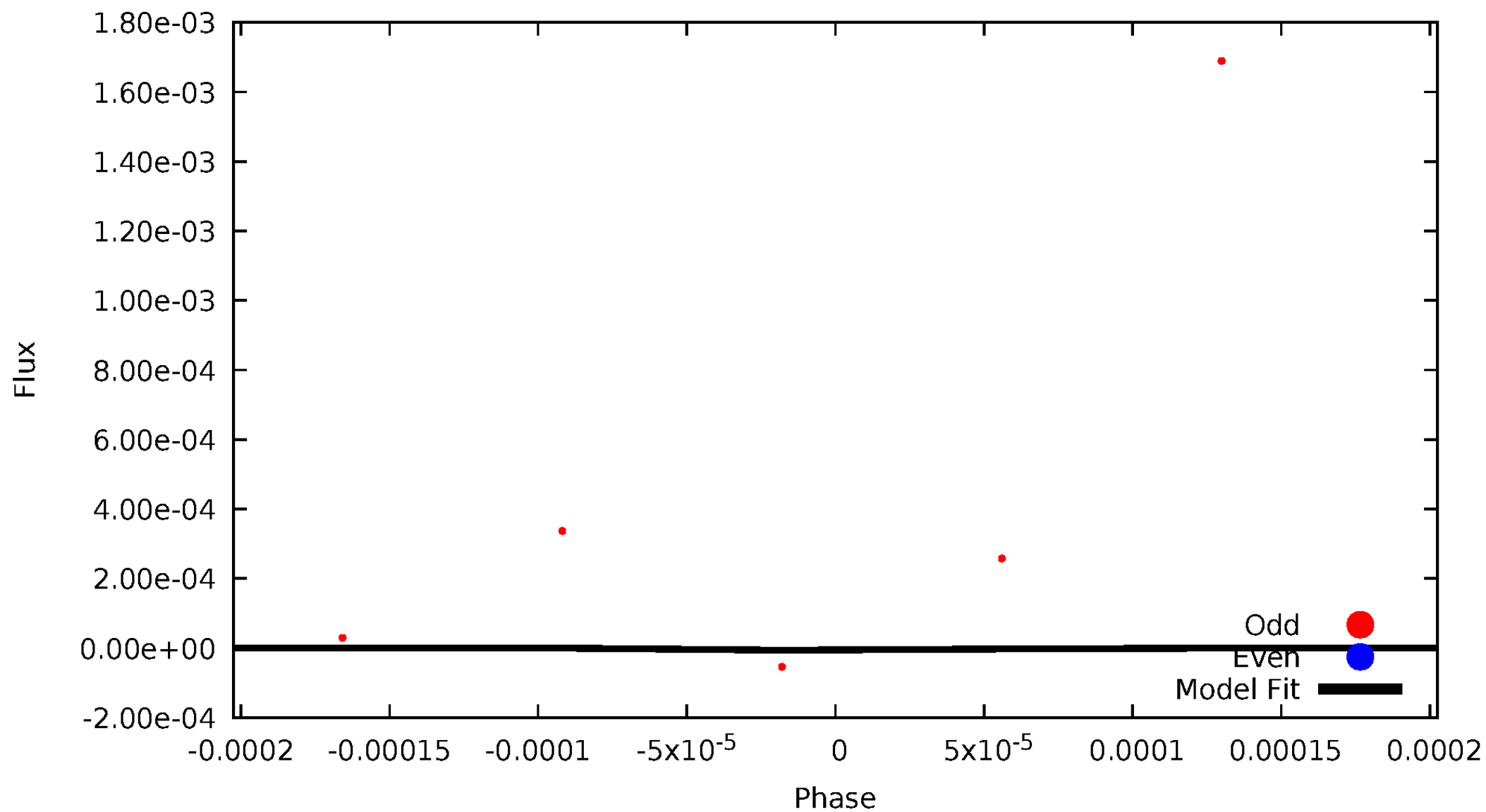
DV Odd/Even

TCE 002448416-02



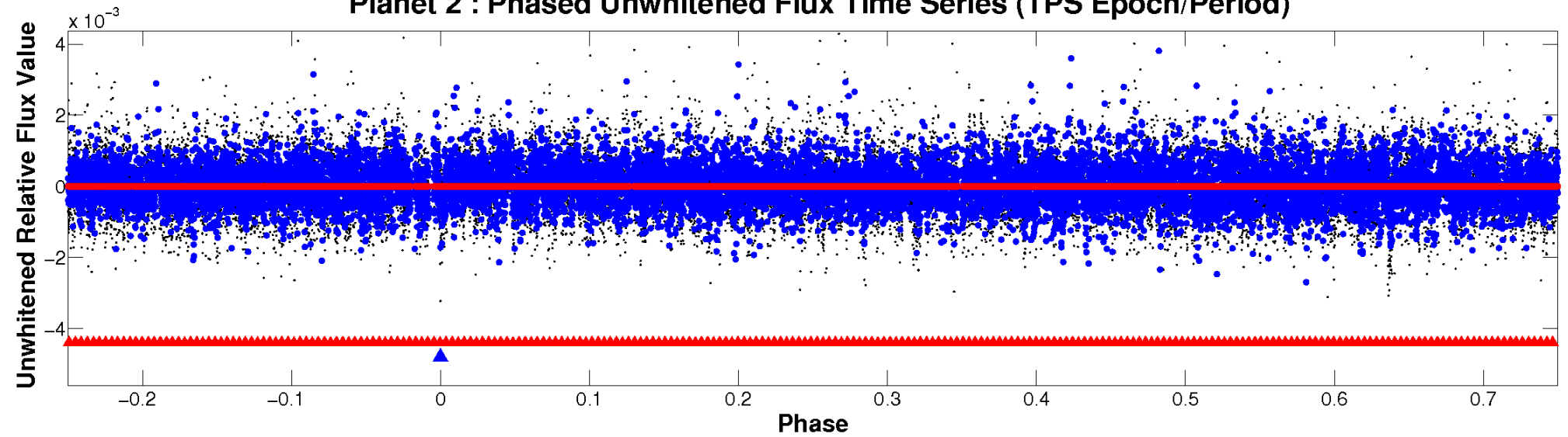
ALT Odd/Even

TCE 002448416-02



Non-Whitened Vs. Whitened Light Curve

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

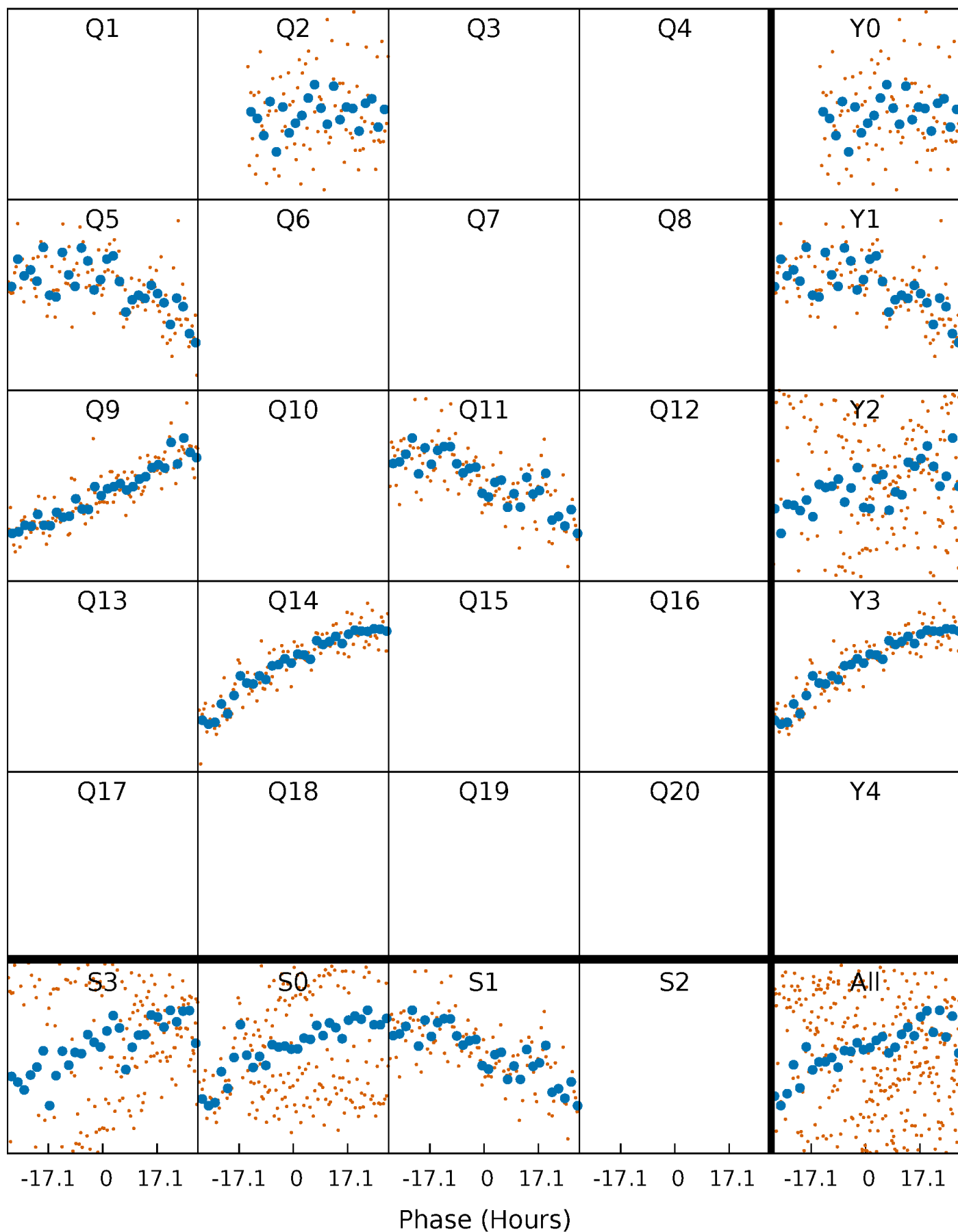


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



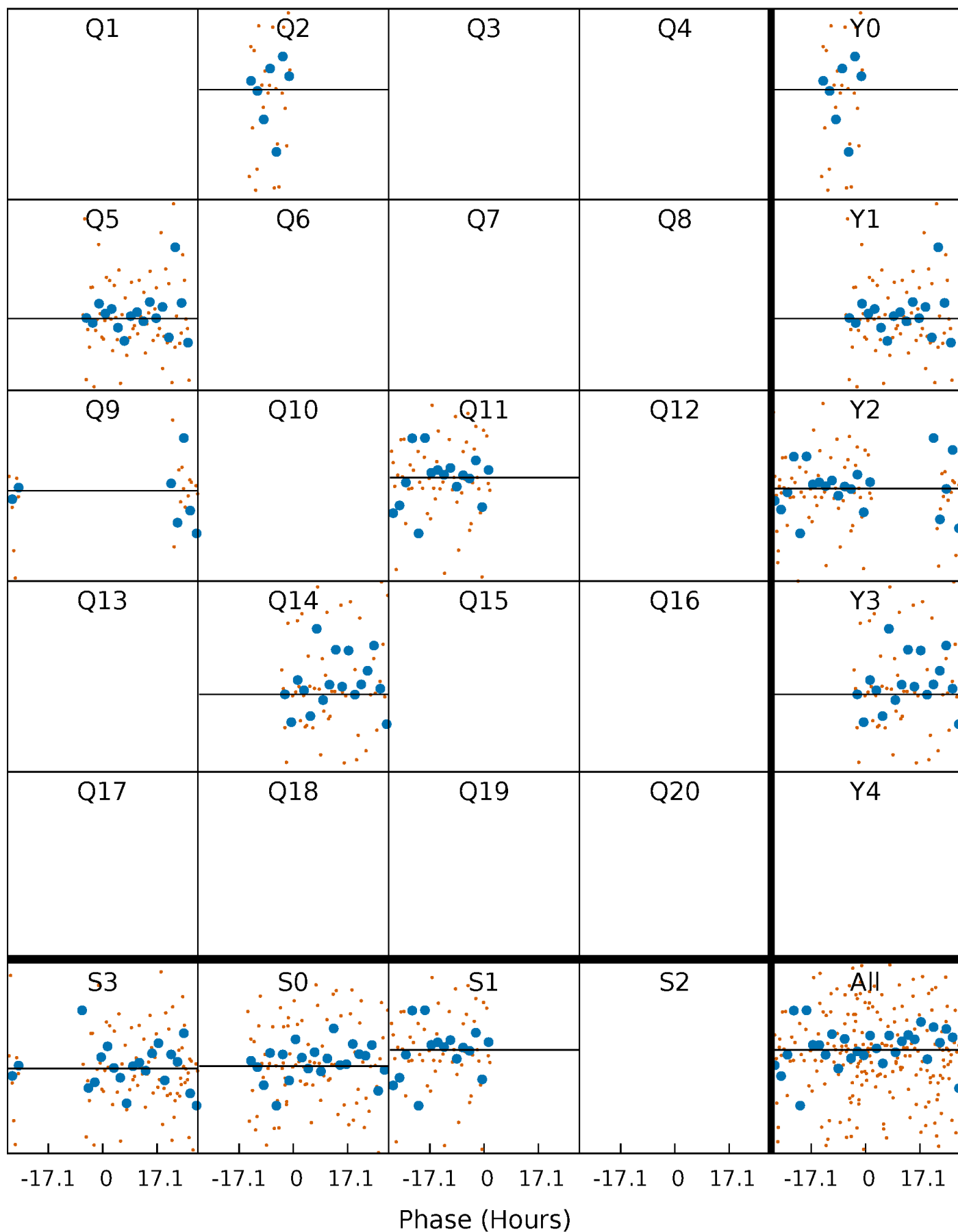
PDC Quarter-Phased Transit Curves

TCE 002448416-02 P=276.411577 Days $T_0=256.938996$ (BKJD)



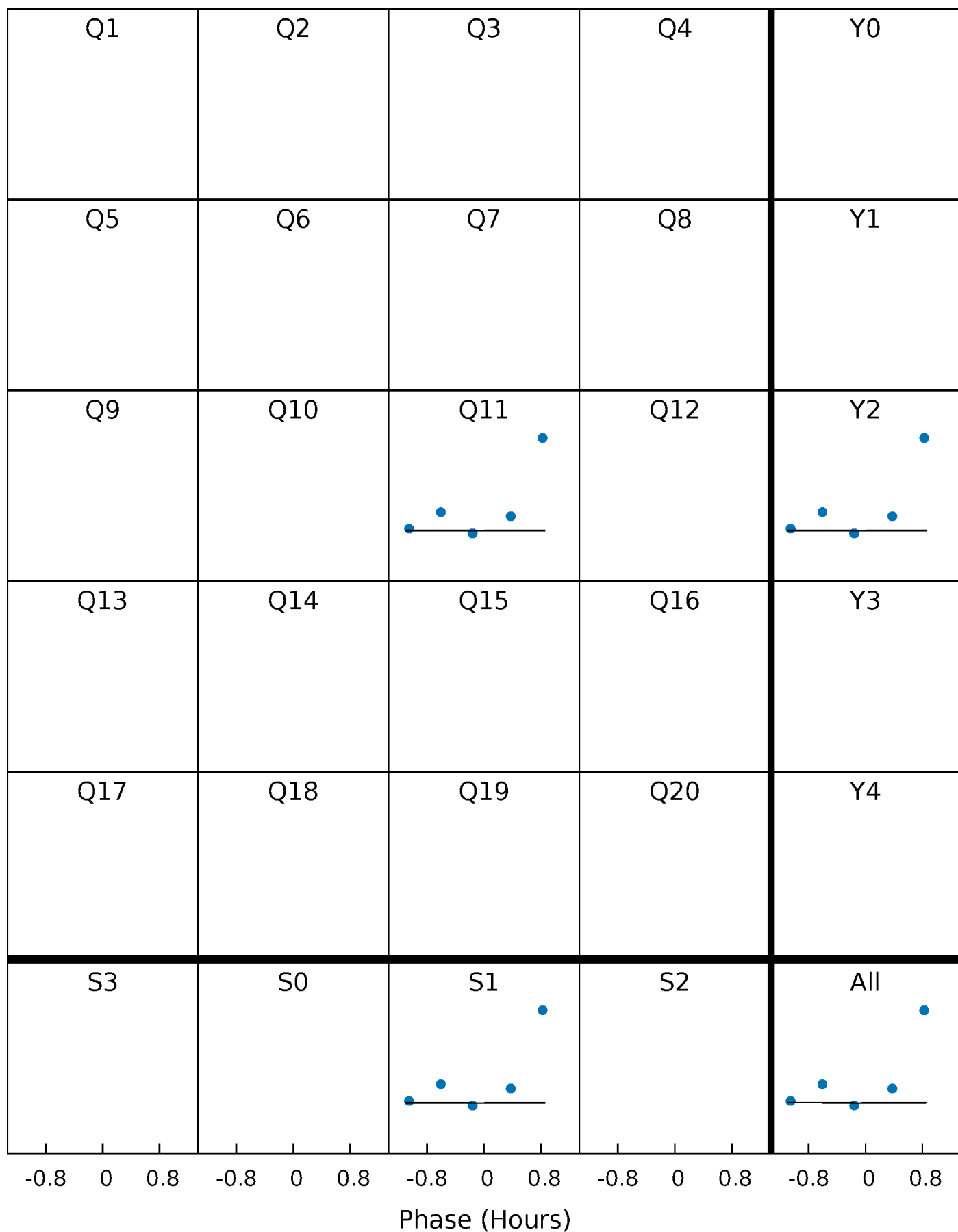
DV Quarter-Phased Transit Curves

TCE 002448416-02 P=276.411577 Days $T_0=256.938996$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

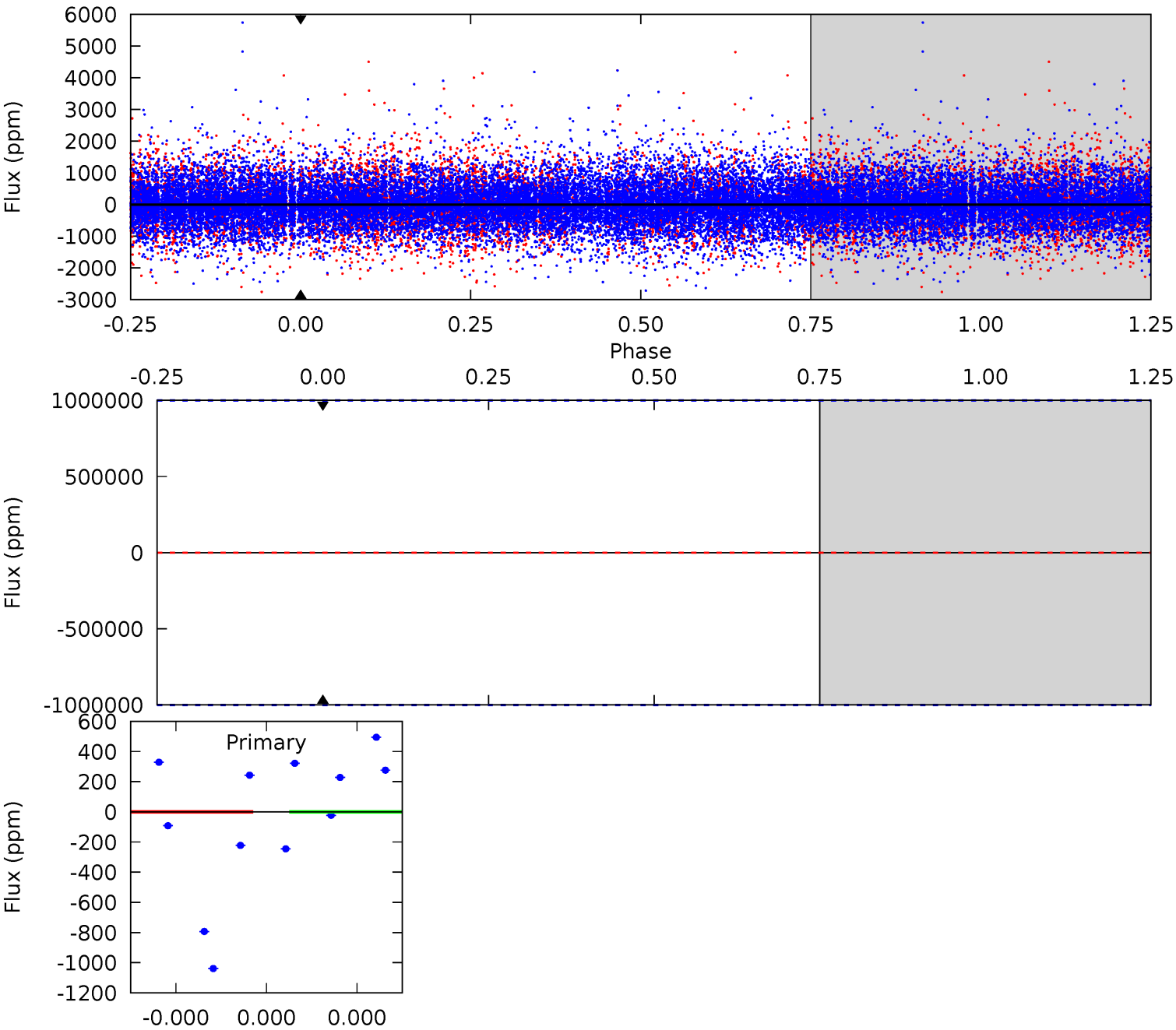
TCE 002448416-02 P=276.411577 Days $T_0=255.997966$ (BKJD)



DV Model-Shift Uniqueness Test

002448416-02, P = 276.411577 Days, E = 256.938996 Days

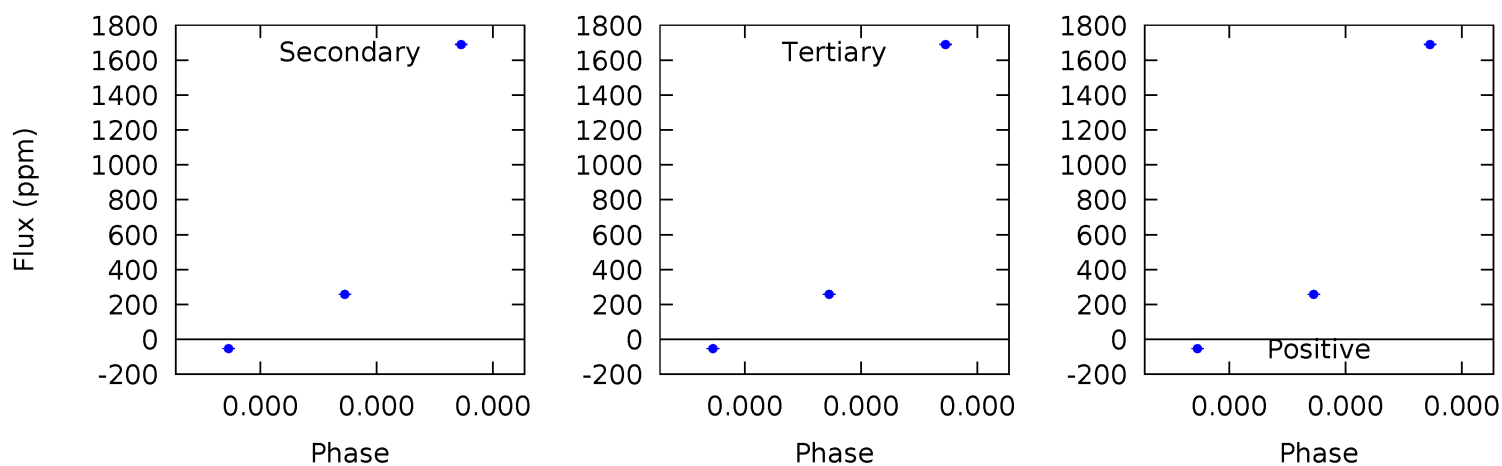
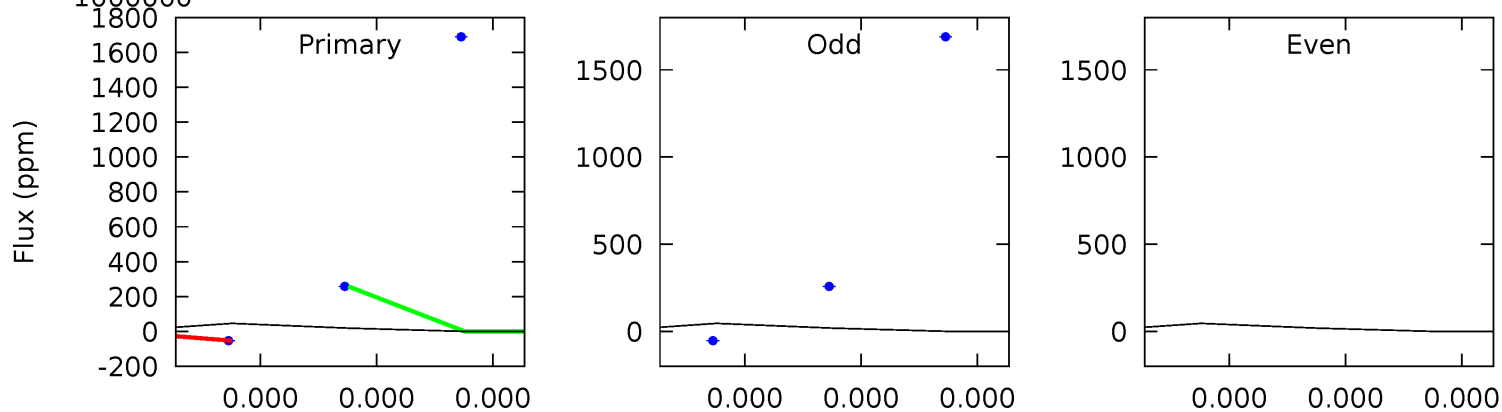
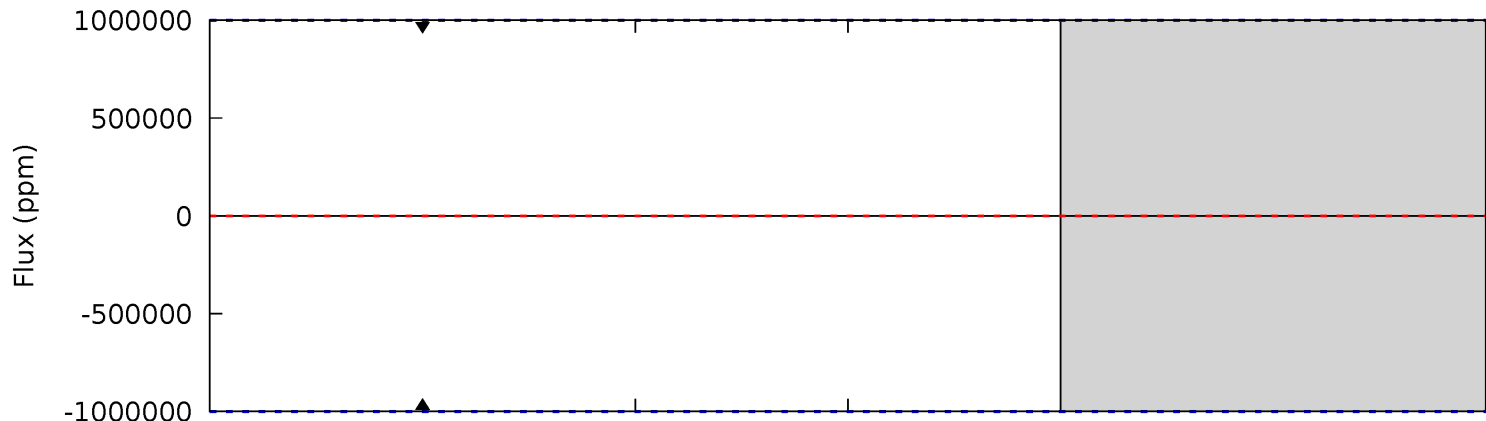
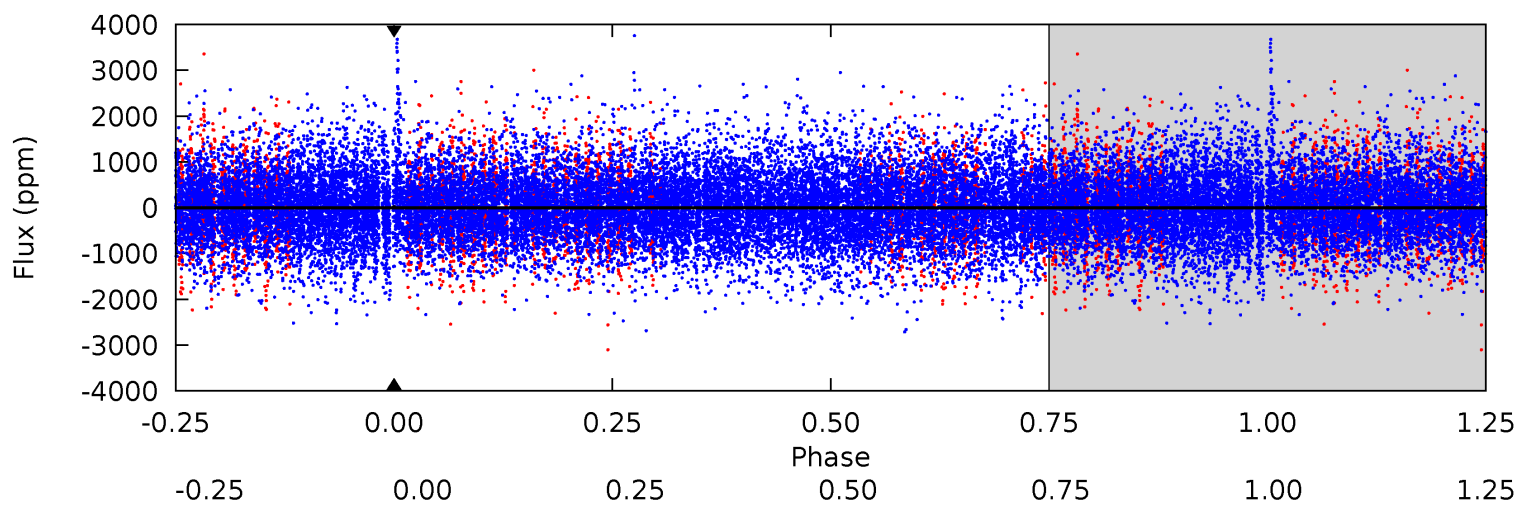
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

002448416-02, P = 276.411577 Days, E = 255.997966 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0.00



Stellar Parameters For KIC 002448416

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (g \cdot \text{cm}^{-3})$
	4900^{+146}_{-146}	$4.659^{+0.059}_{-0.036}$	$-0.900^{+0.300}_{-0.300}$	$0.597^{+0.047}_{-0.042}$	$0.592^{+0.055}_{-0.025}$	$3.921^{+0.886}_{-0.540}$
	+3%/-3%	+1%/-1%	+33%/-33%	+8%/-7%	+9%/-4%	+23%/-14%
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 002448416-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$5.58^{+5.39}_{-3.96}$	278^{+10}_{-10}	2990^{+10863}_{-15431}	$2976^{+1871350}_{-1579372}$
Alt.	-0 ± 1000000	$4.57^{+4.72}_{-3.17}$	278^{+10}_{-10}	3813^{+13148}_{-18829}	$18257^{+2874957}_{-2236254}$

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

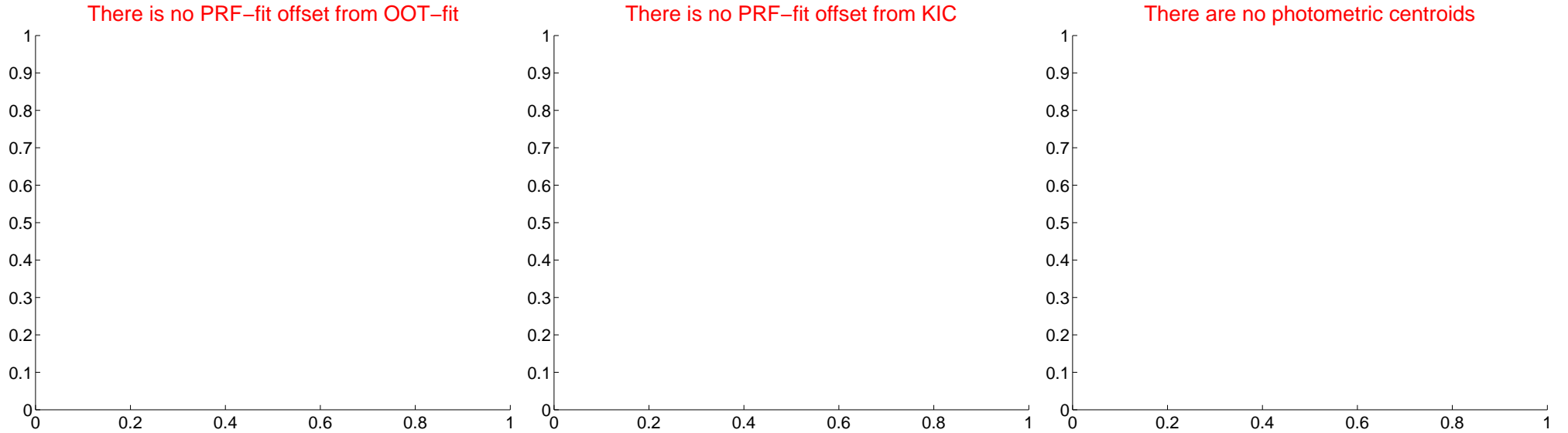
DV Centroid Data

Supplemental centroid analysis for 002448416-02. Kepler magnitude: 15.55. Transit SNR -1.00

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	—	—	—	—



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.

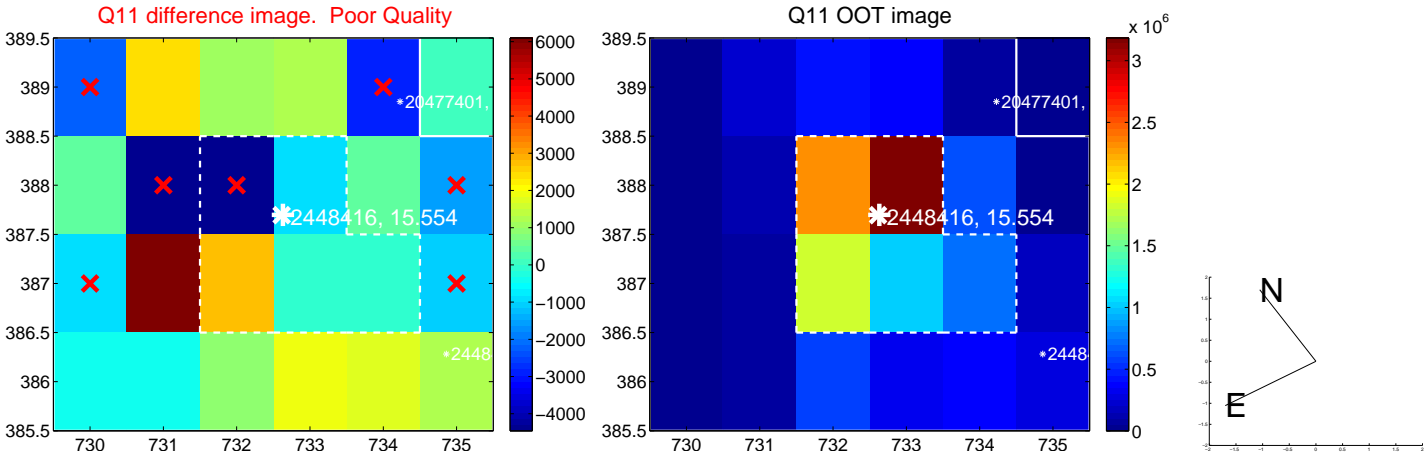
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



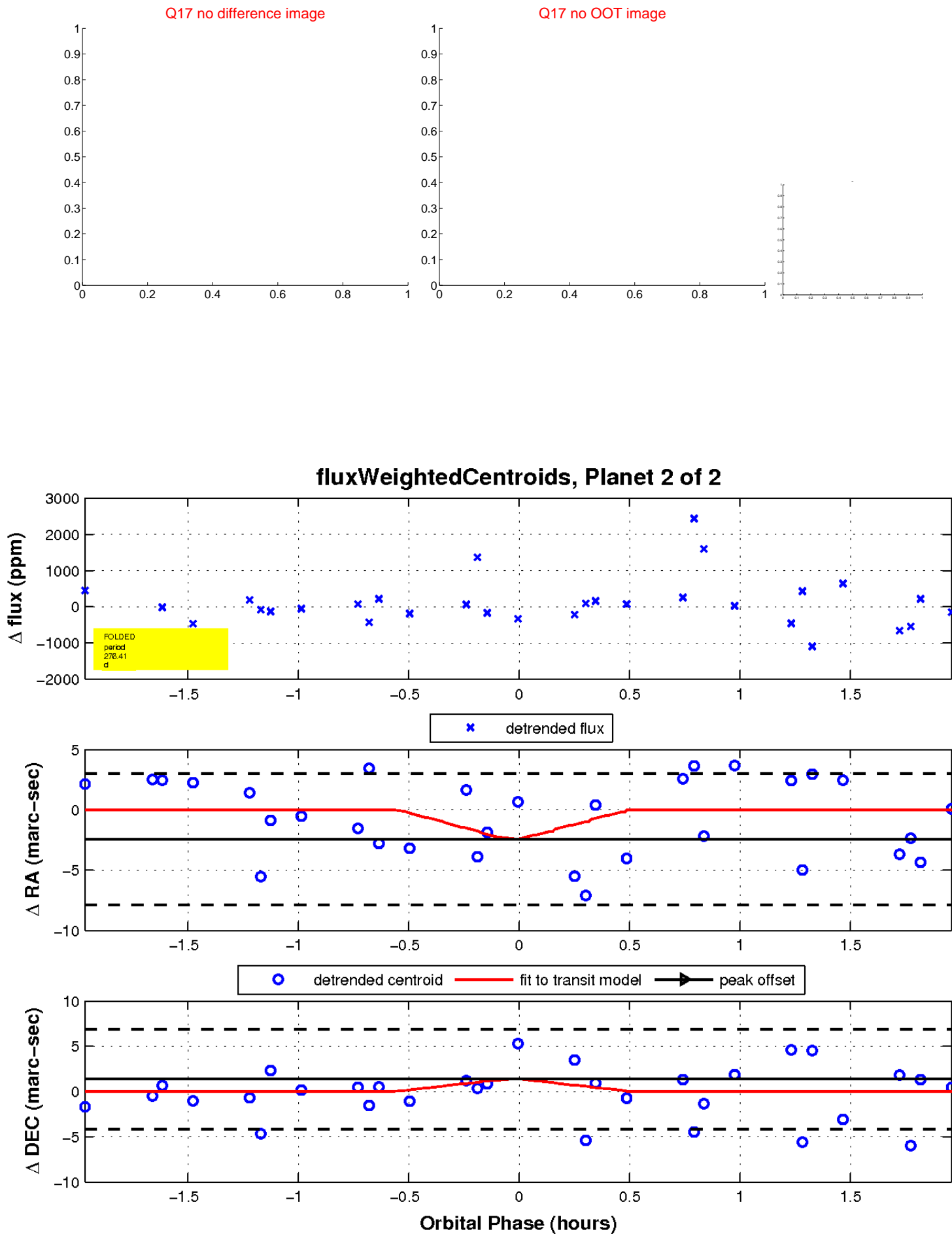
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



UKIRT Image

Declination

