

KIC 005305471

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})
005305471-01	OBS	3806.01	161.253105	189.105749	2017.7	23.312	65.5	65.1	0.81	5555	4.33	2.00
005305471-02	OBS	No	161.257832	216.380017	984.2	47.446	21.7	42.9	0.81	5555	3.07	2.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005305471-01	OBS	FP	0.00	1	0	1	1	INDIV_TRANS_SKYE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
005305471-02	OBS	FP	0.00	1	0	1	1	SAME_NTL_PERIOD—HALO_GHOST—EPHEM_MATCH

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 005305471-01

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
005305471-01	5305471	005217733-pri	5217733	1:1	52.2	8	-10	7.39	14.18	50.00	Direct-PRF	0	0.06	0.31

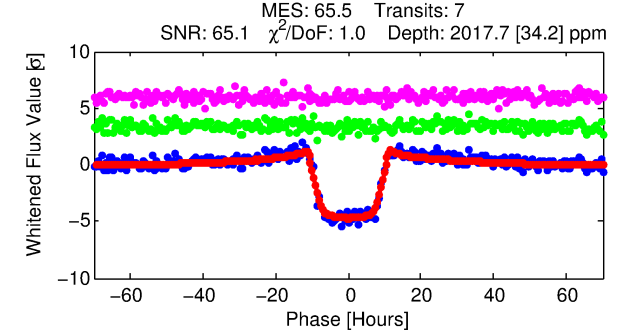
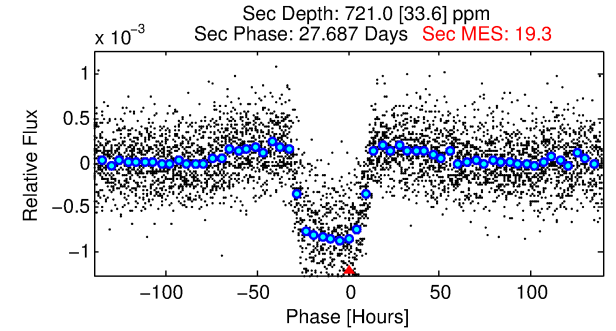
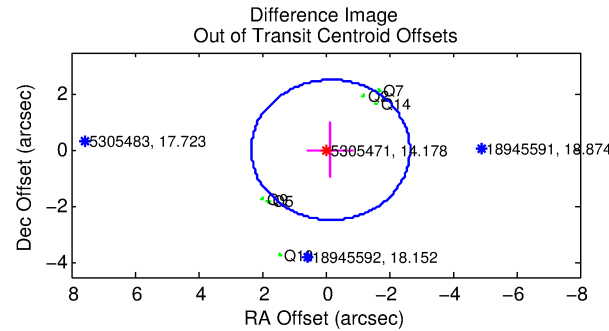
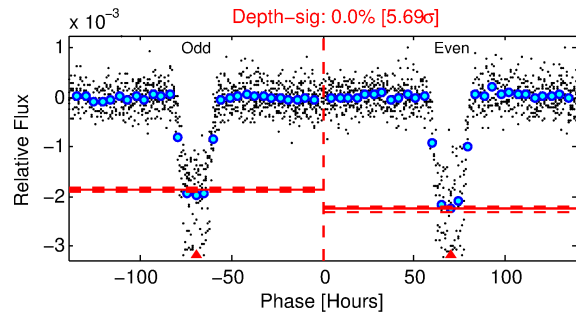
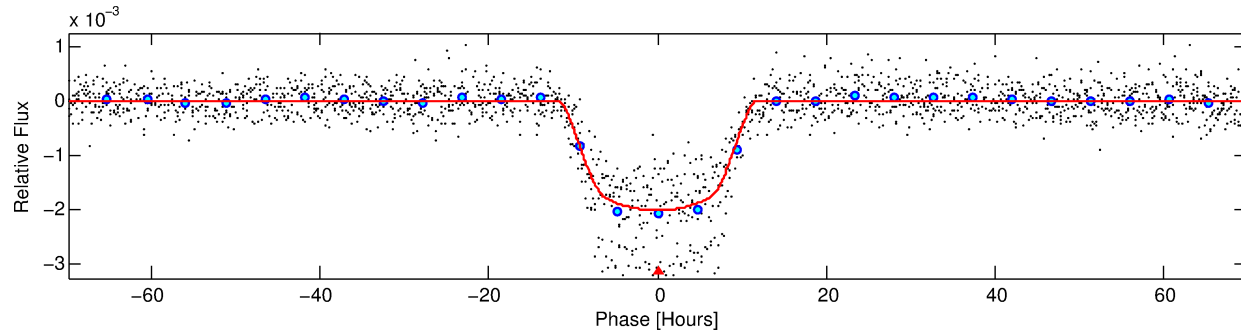
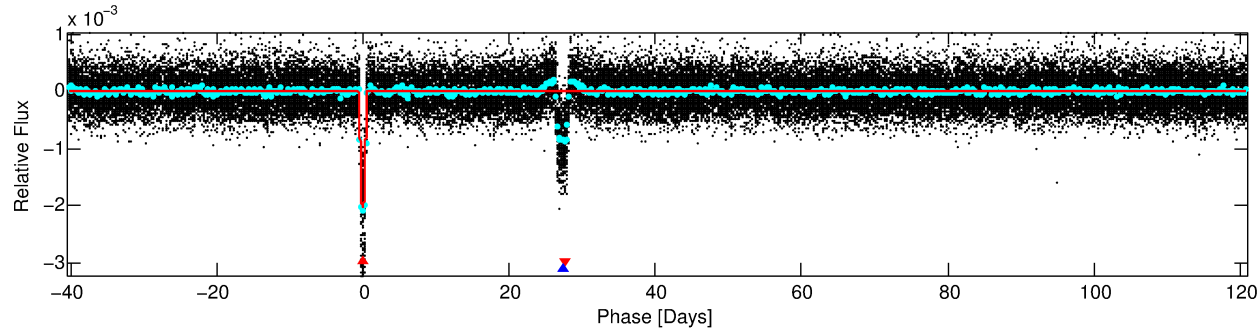
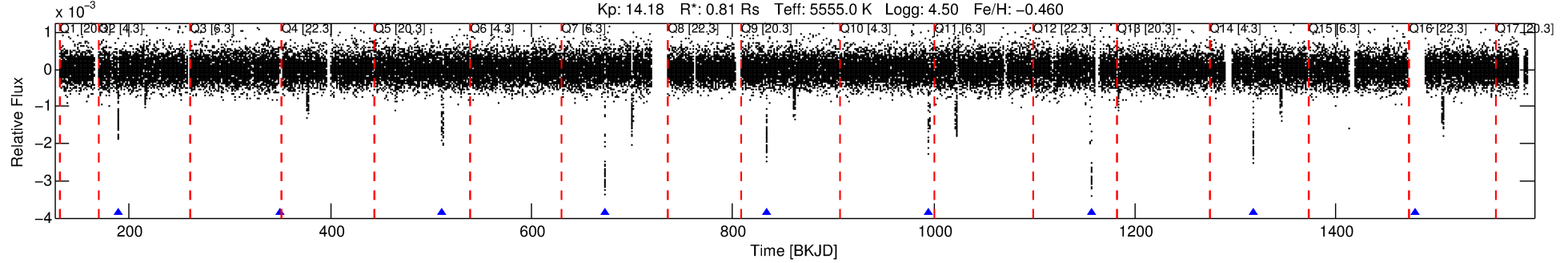
Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 5305471 Candidate: 1 of 2 Period: 161.253 d

KOI: K03806.01 Corr: 0.983

Kp: 14.18 R*: 0.81 Rs Teff: 5555.0 K Logg: 4.50 Fe/H: -0.460



DV Fit Results:

Period = 161.25310 [0.00148] d
Epoch = 189.1057 [0.0065] BKJD
Rp/R* = 0.0489 [0.0006]
a/R* = 28.57 [1.07]
b = 0.90 [0.01]
Seff = 2.00 [0.52]
Teq = 303 [20] K
Rp = 4.33 [0.79] Re
a = 0.5297 [0.0826] AU
Ag = 5931.78 [1399.70] [4.24σ]
Teffp = 4114 [135] K [27.99σ]

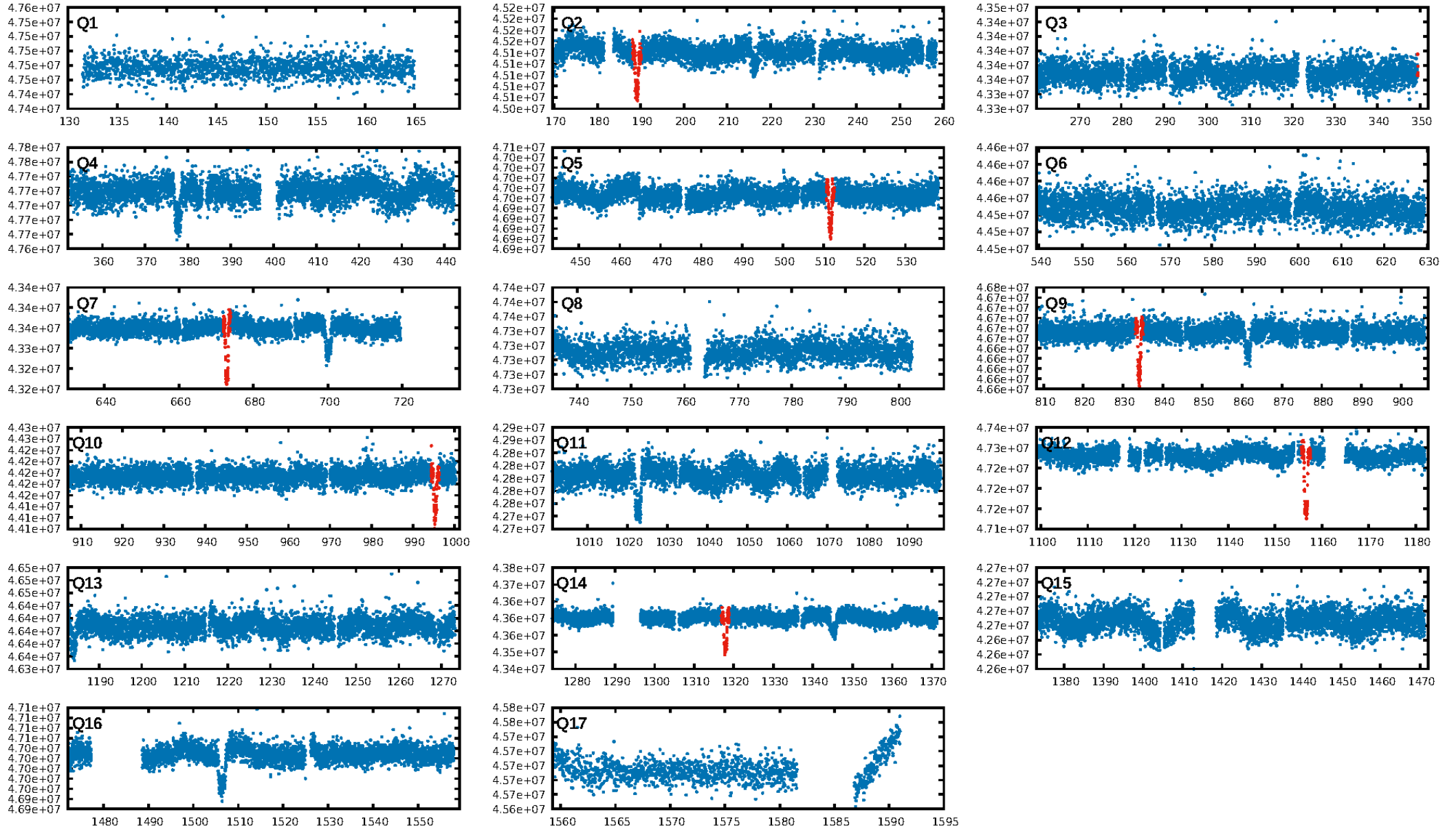
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.2% [0.00σ]
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 62.4%
Bootstrap-pfa: 0.00e+00
RollingBand-fgt: 1.00 [7/7]
GhostDiagnostic-chr: 0.03393
Centroid-sig: 0.0%
Centroid-so: 1.010 arcsec [5.90σ]
OotOffset-rm: 0.163 arcsec [0.20σ]
KicOffset-rm: 0.250 arcsec [0.30σ]
OotOffset-st: 3/1/0/2 [6]
KicOffset-st: 3/1/0/2 [6]
DiffImageQuality-fgm: 0.33 [2/6]
DiffImageOverlap-fno: 1.00 [6/6]

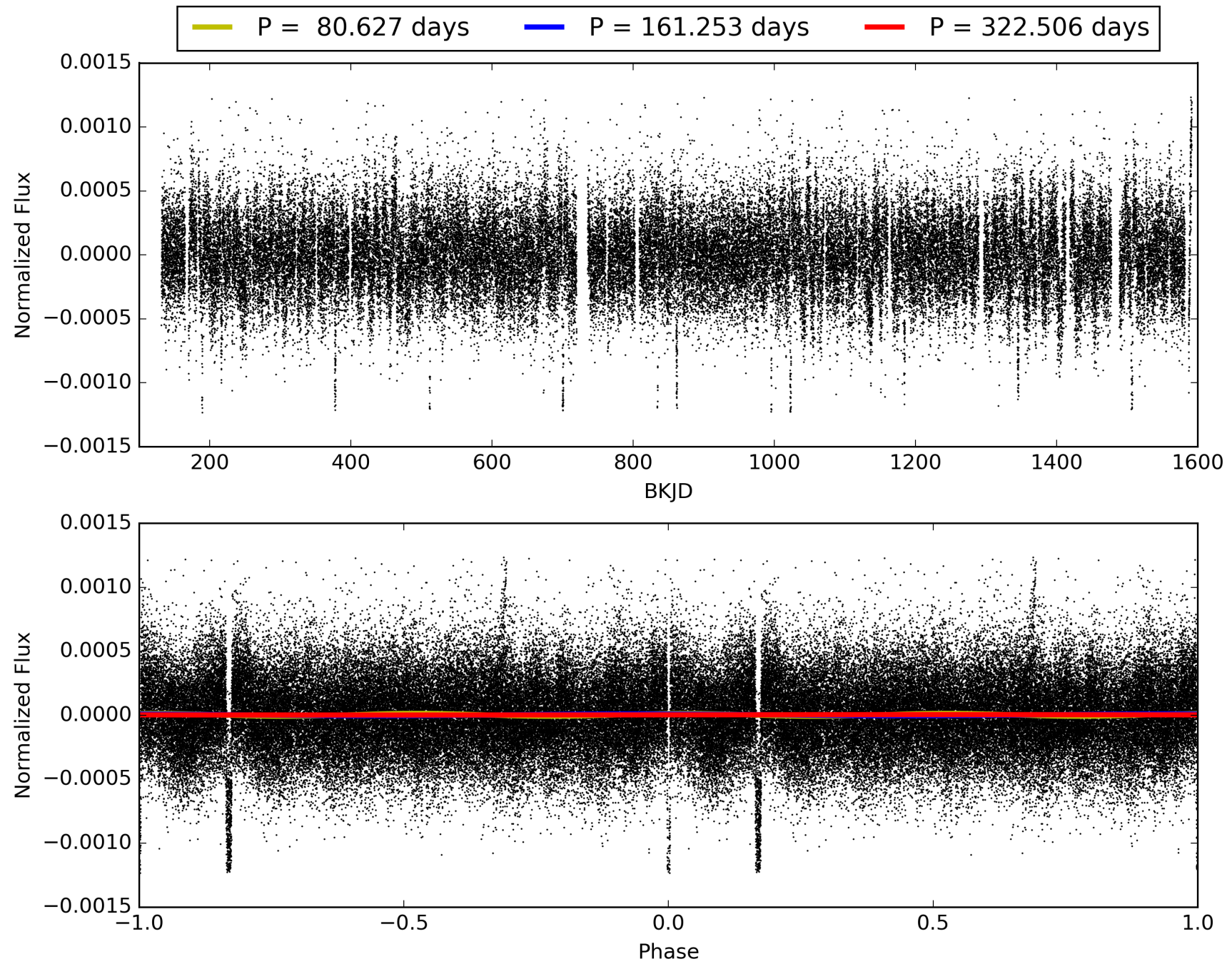
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 29-Jan-2016 13:44:35 Z

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

TCE 005305471-01, PDC Light Curves

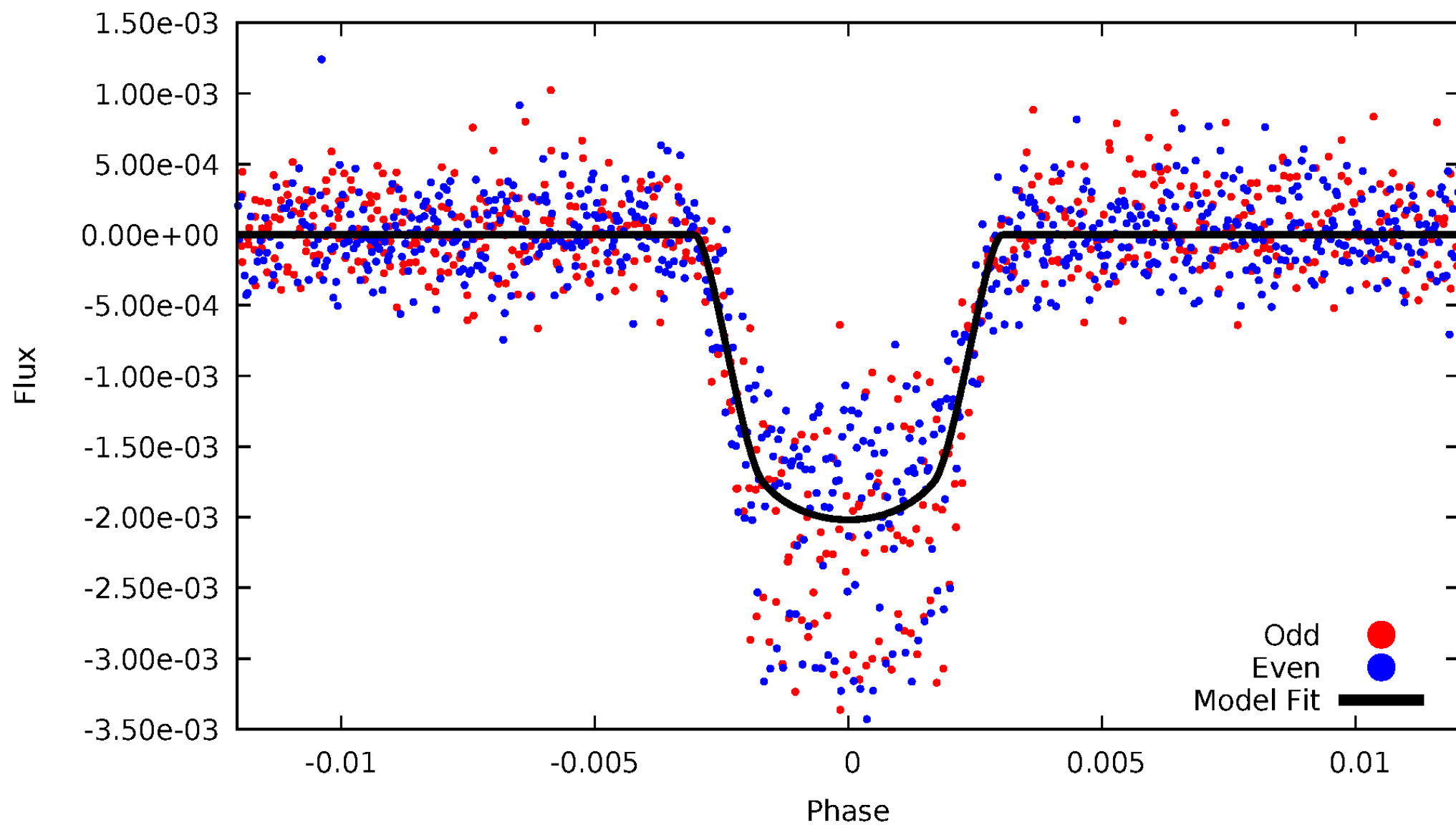


TCE 005305471-01



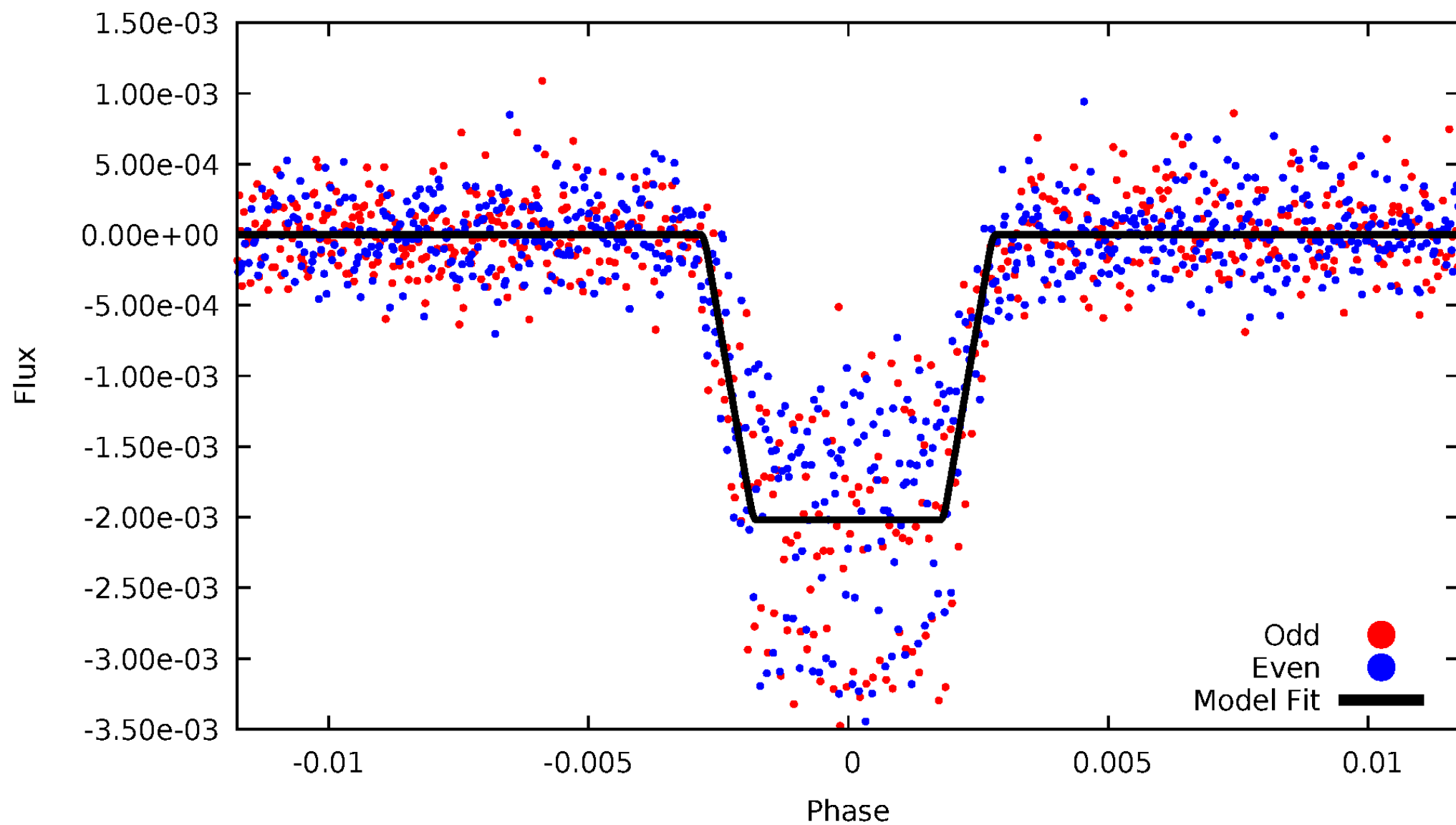
DV Odd/Even

TCE 005305471-01



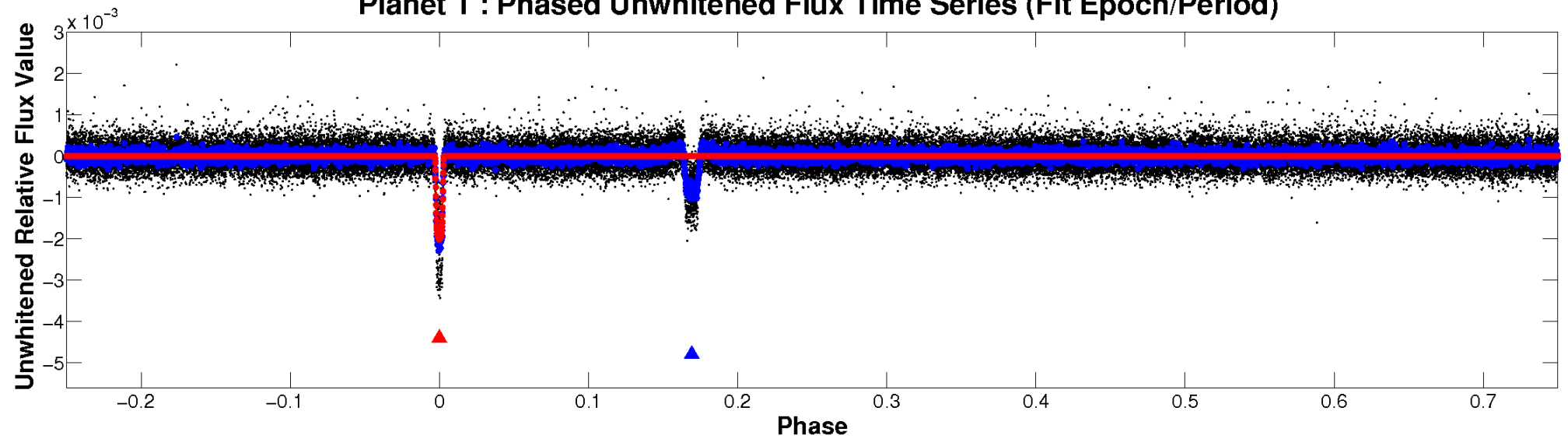
ALT Odd/Even

TCE 005305471-01

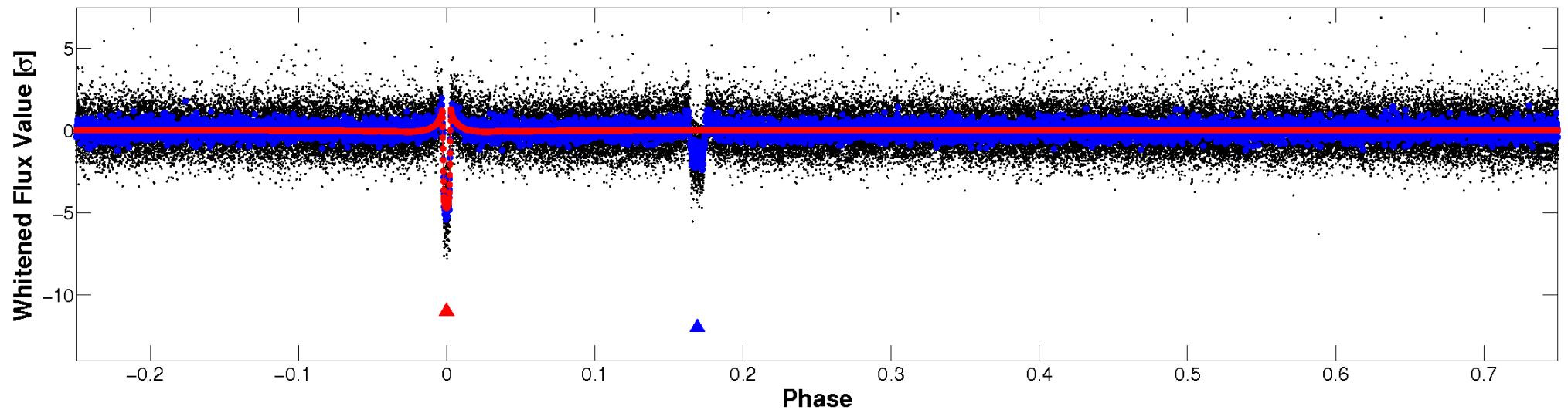


Non-Whitened Vs. Whitened Light Curve

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

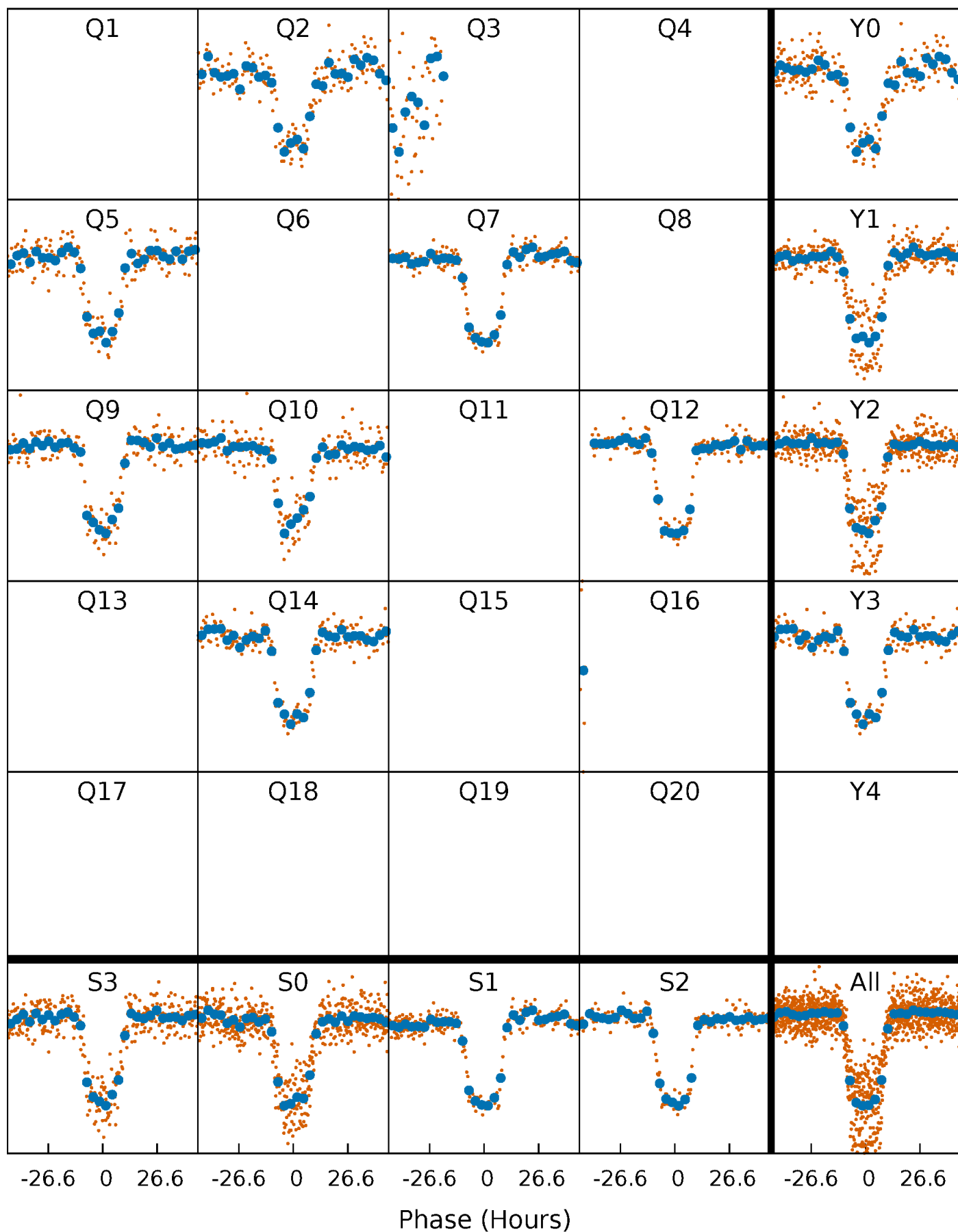


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



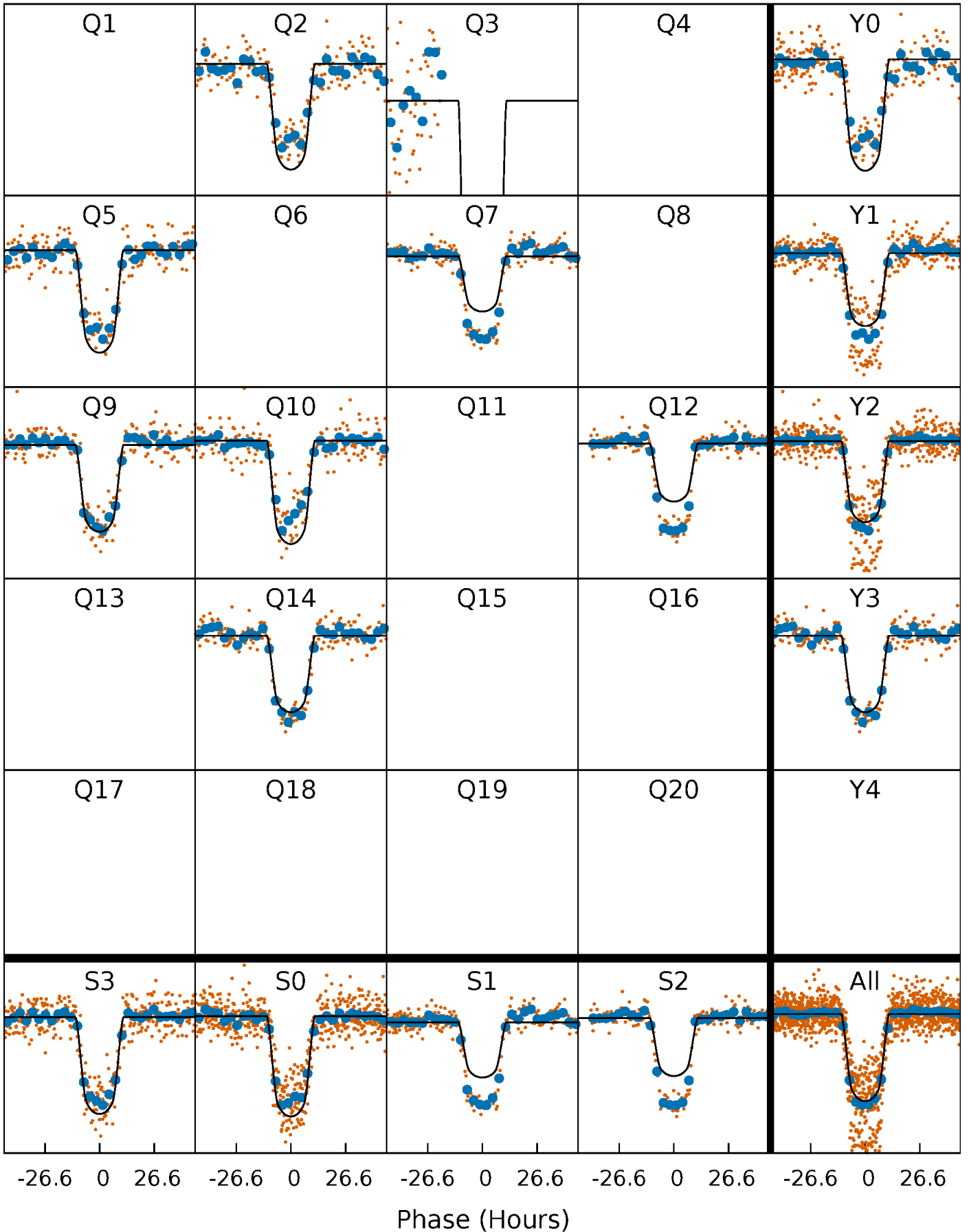
PDC Quarter-Phased Transit Curves

TCE 005305471-01 P=161.253105 Days $T_0=189.105749$ (BKJD)



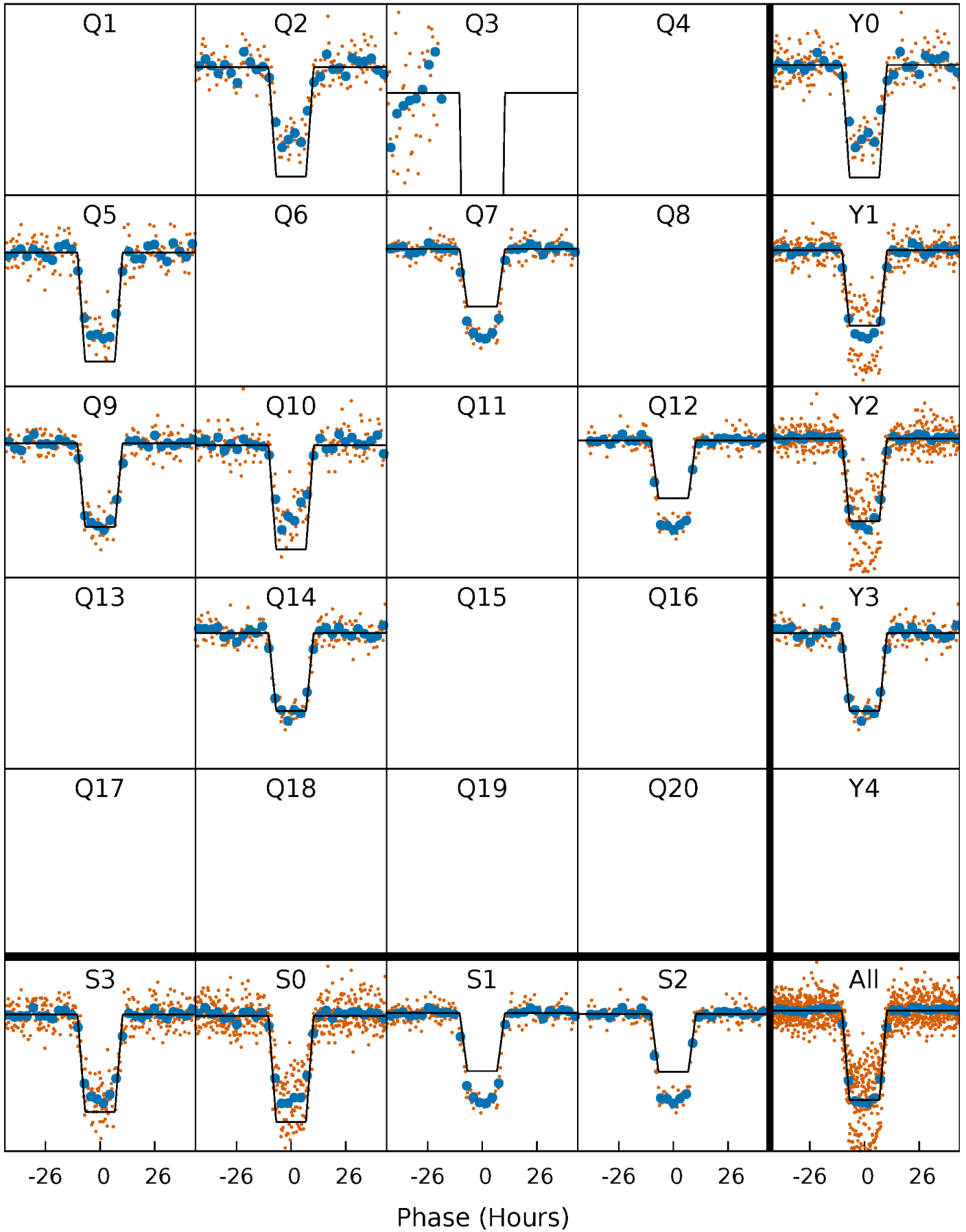
DV Quarter-Phased Transit Curves

TCE 005305471-01 P=161.253105 Days $T_0=189.105749$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

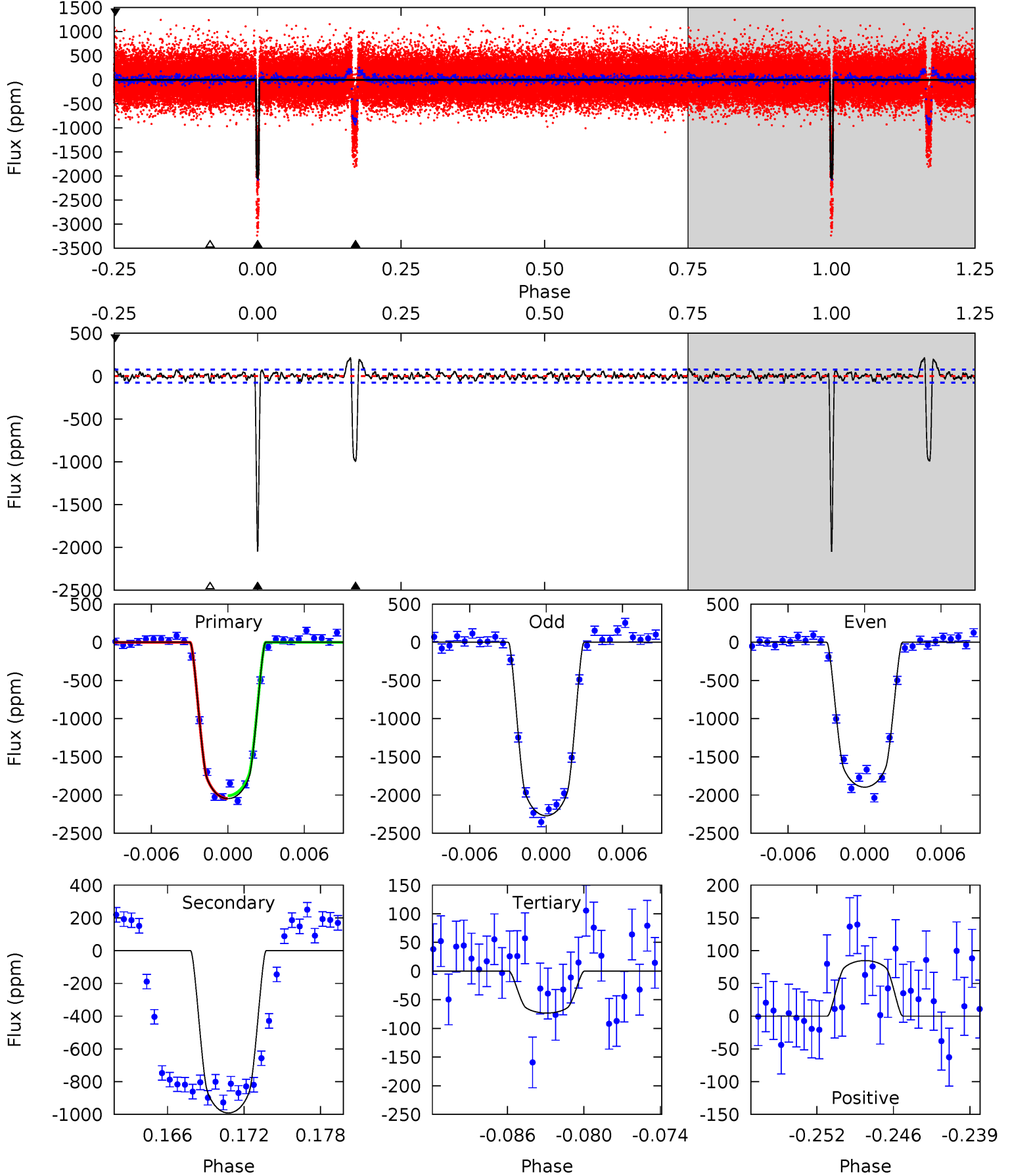
TCE 005305471-01 P=161.254844 Days $T_0=189.100514$ (BKJD)



DV Model-Shift Uniqueness Test

005305471-01, P = 161.253105 Days, E = 27.852644 Days

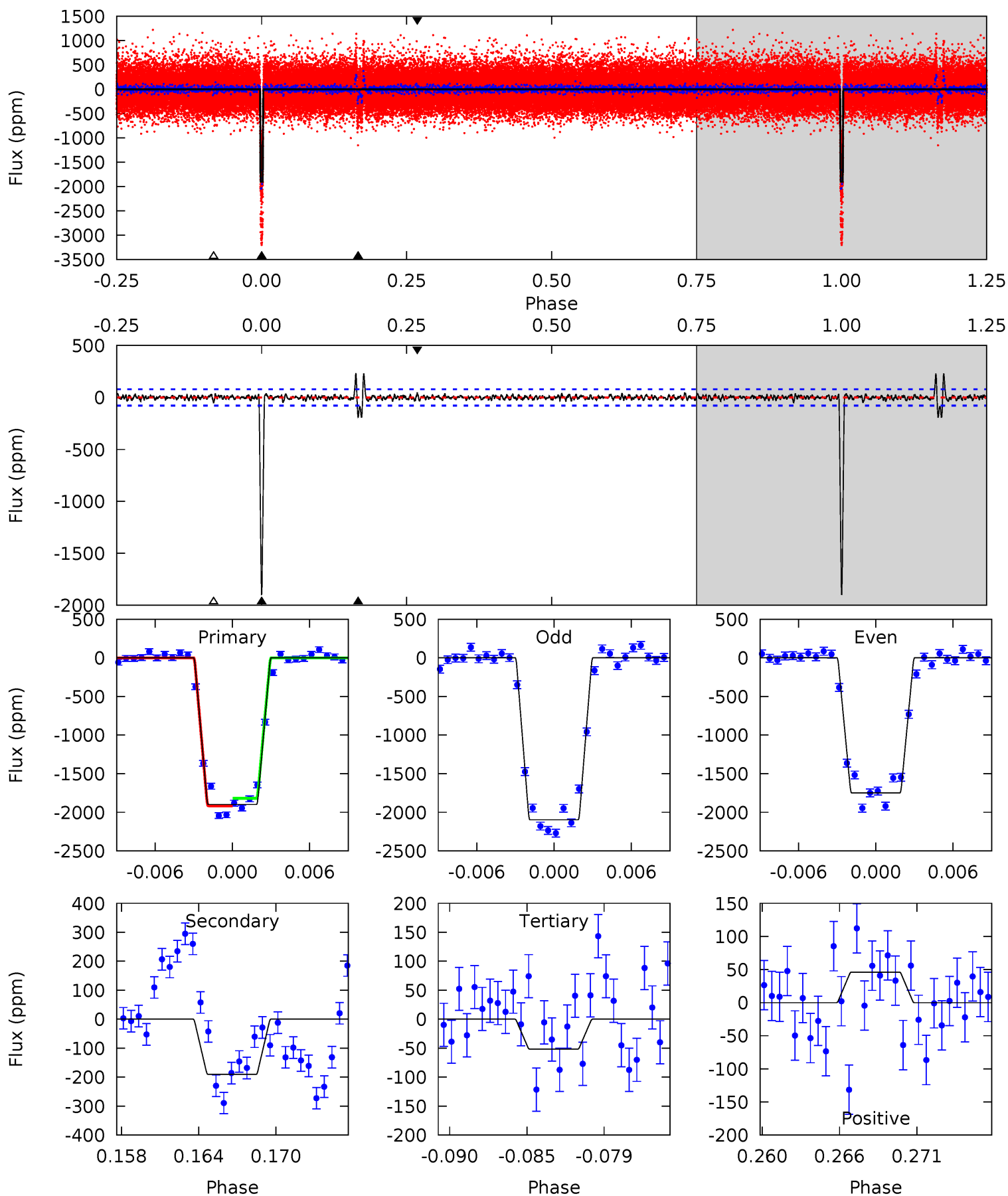
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
136.7	66.2	4.89	5.66	5.12	2.74	2.25	131.8	131.0	61.3	60.6	12.4	1.11	0.09	1.16



Alt Model-Shift Uniqueness Test

005305471-01, P = 161.254844 Days, E = 27.845670 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
123.4	12.4	3.35	2.99	5.13	2.77	1.25	120.0	120.4	9.02	9.38	11.2	1.05	0.11	3.06



Stellar Parameters For KIC 005305471

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5555^{+166}_{-166}	$4.502^{+0.104}_{-0.127}$	$-0.460^{+0.300}_{-0.300}$	$0.811^{+0.148}_{-0.099}$	$0.762^{+0.104}_{-0.056}$	$2.011^{+0.868}_{-0.711}$
	+3%/-3%	+2%/-3%	+65%/-65%	+18%/-12%	+14%/-7%	+43%/-35%
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 005305471-01 / KOI 3806.01

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-991 ± 15	$4.35^{+0.46}_{-0.34}$	425^{+24}_{-20}	4606^{+121}_{-130}	8117^{+1421}_{-1317}
Alt.	-190 ± 15	$3.98^{+0.46}_{-0.32}$	425^{+22}_{-23}	3542^{+93}_{-90}	1864^{+388}_{-325}

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 $A_{obs} \gg 1.0$

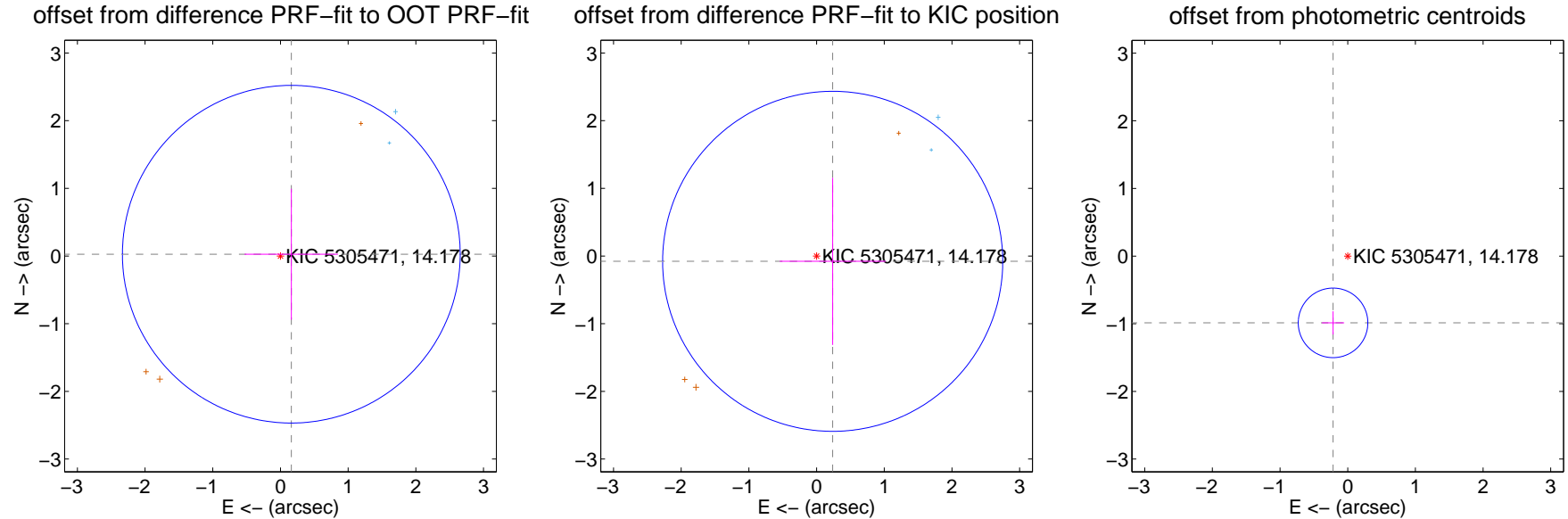
DV Centroid Data

Supplemental centroid analysis for 005305471-01. Kepler magnitude: 14.18. Transit SNR 65.09

There are 2 quarters with good PRF difference image offsets

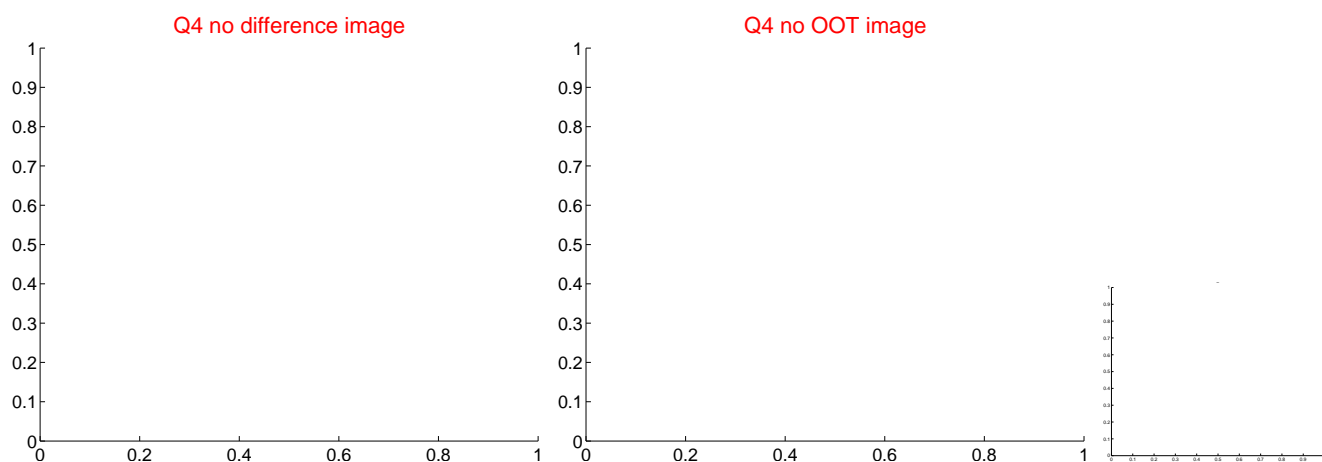
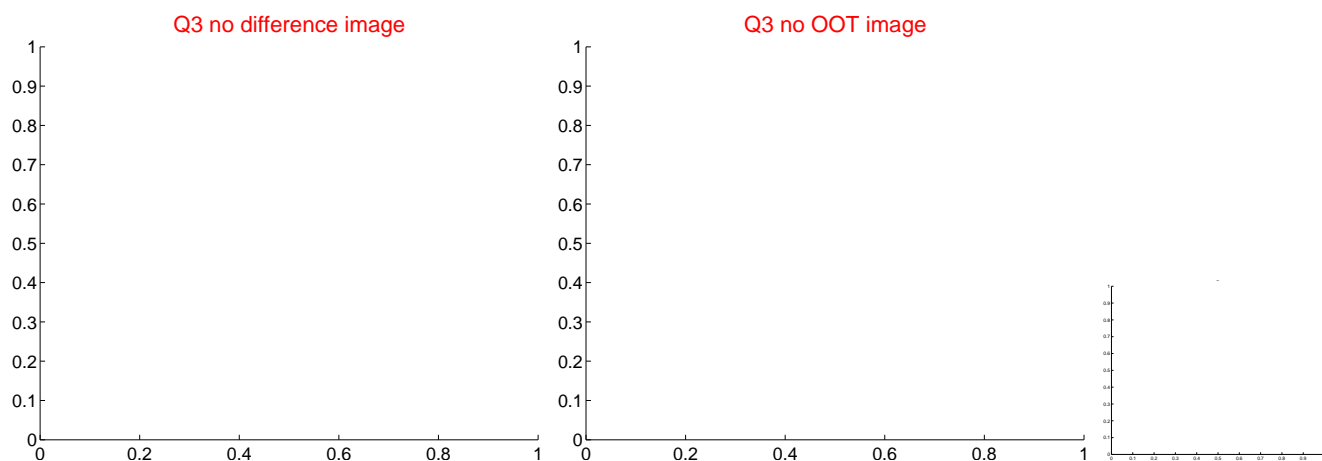
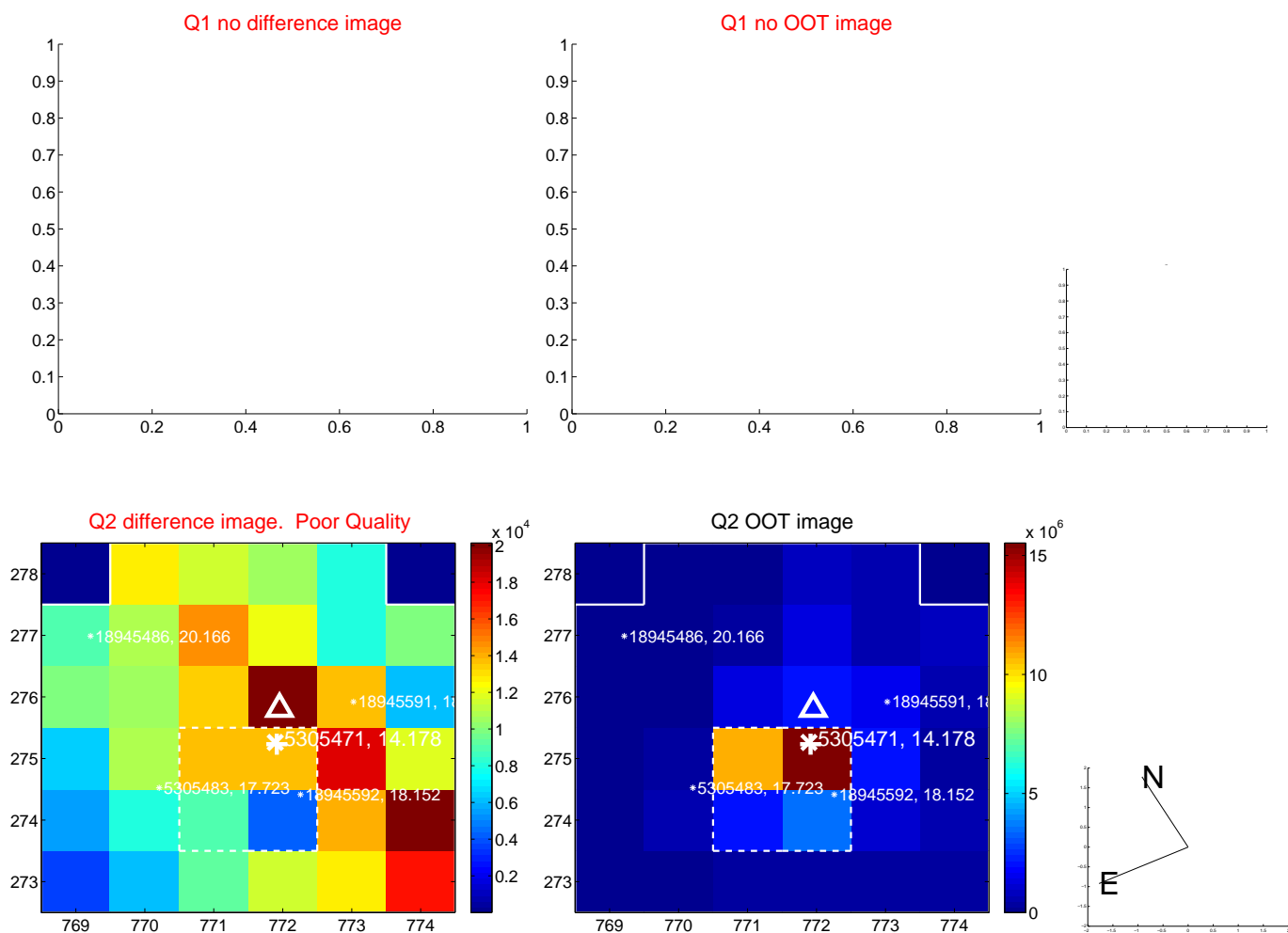
The direct PRF centroid is offset from the target star catalog position by about 0.13 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.163 ± 0.832	0.20	-0.160 ± 0.690	0.027 ± 0.968
PRF-fit source offset from KIC position	0.250 ± 0.837	0.30	-0.238 ± 0.782	-0.078 ± 1.236
photometric centroid source offset	1.01 ± 0.17	5.90	0.22 ± 0.16	-0.99 ± 0.17

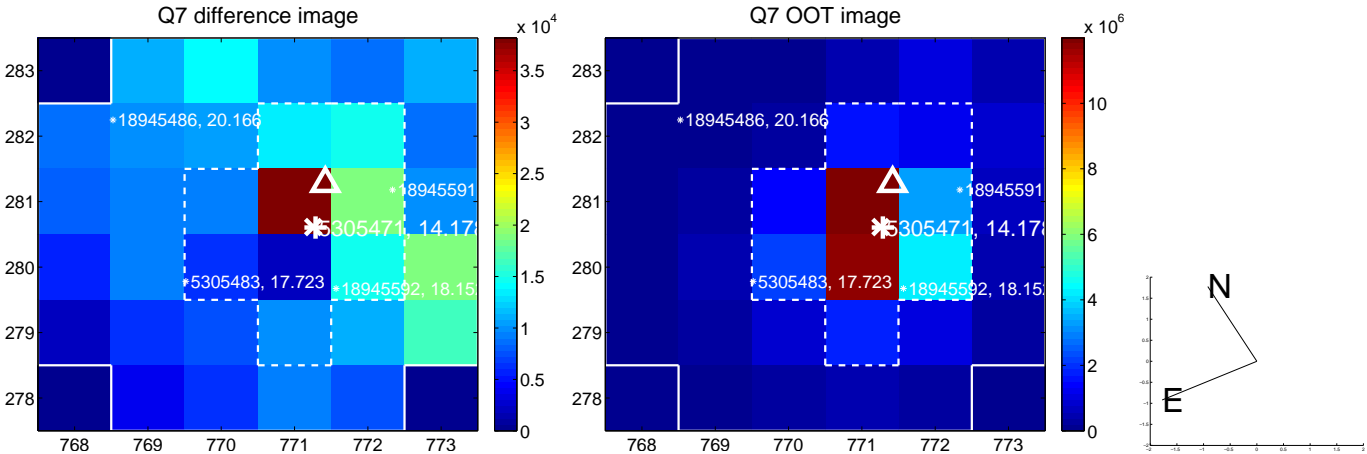
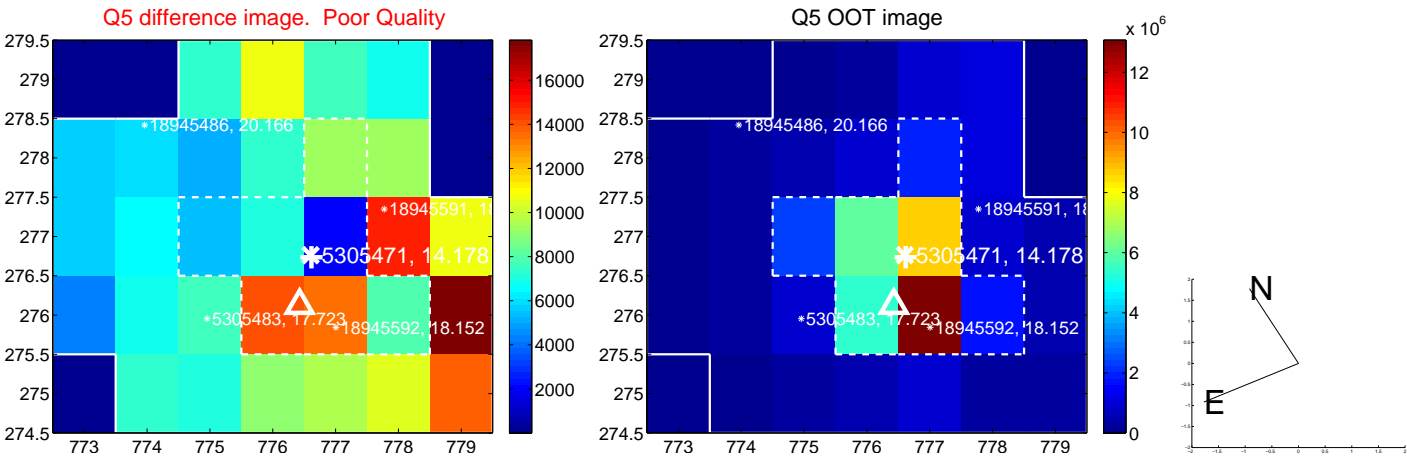


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

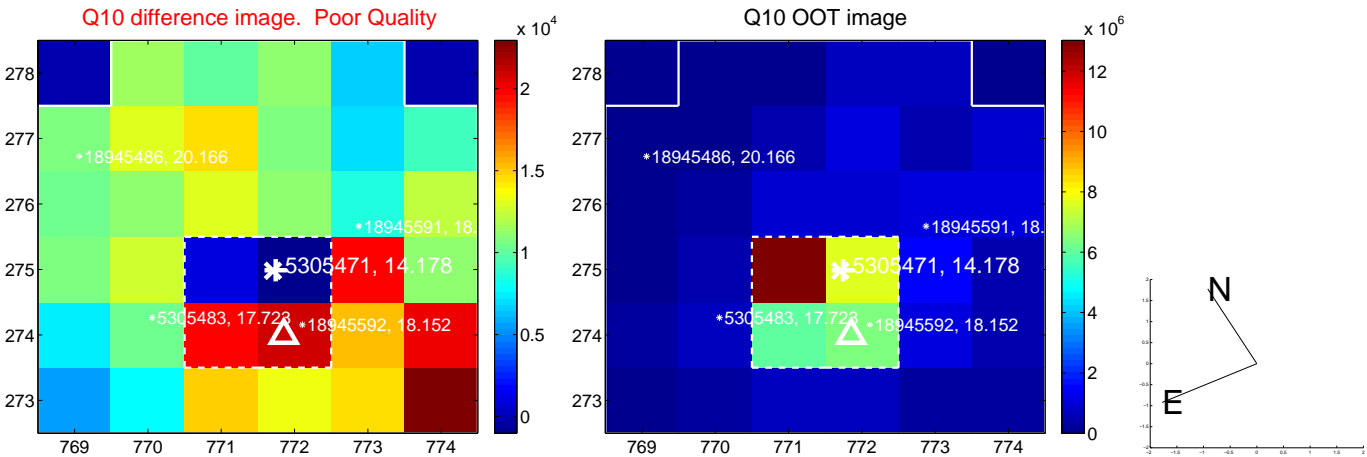
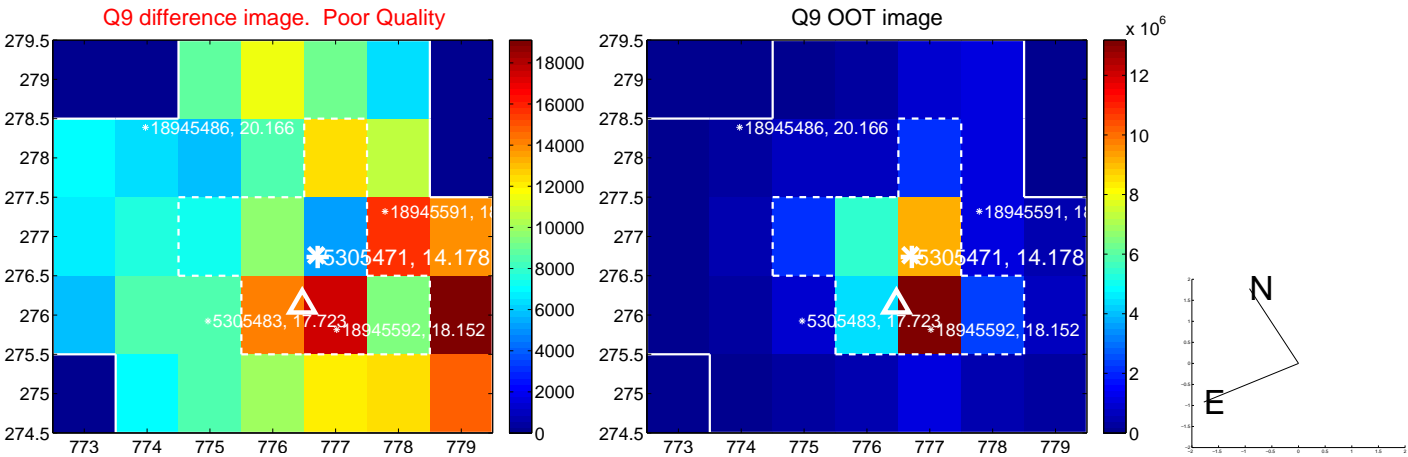
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



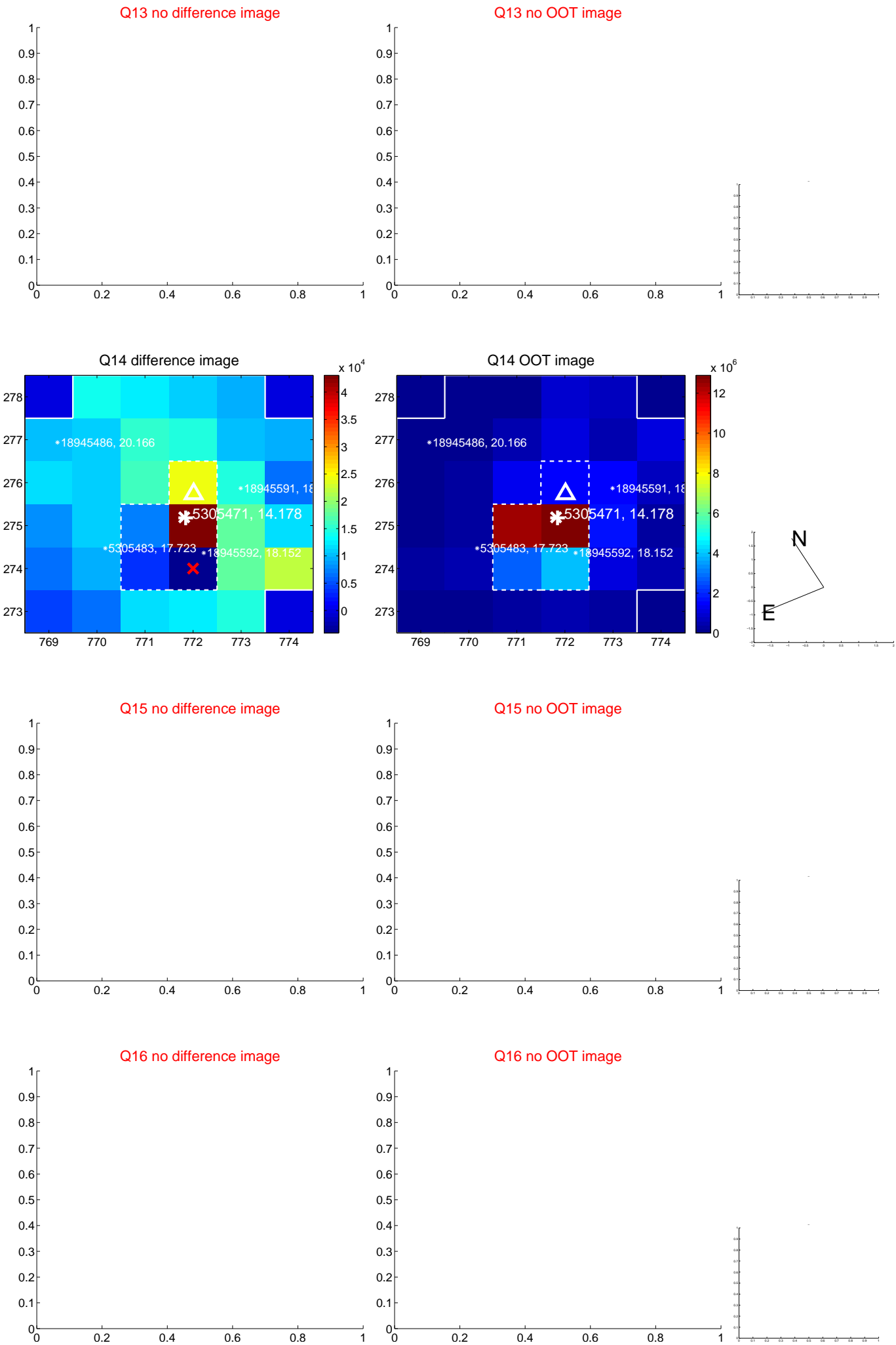
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



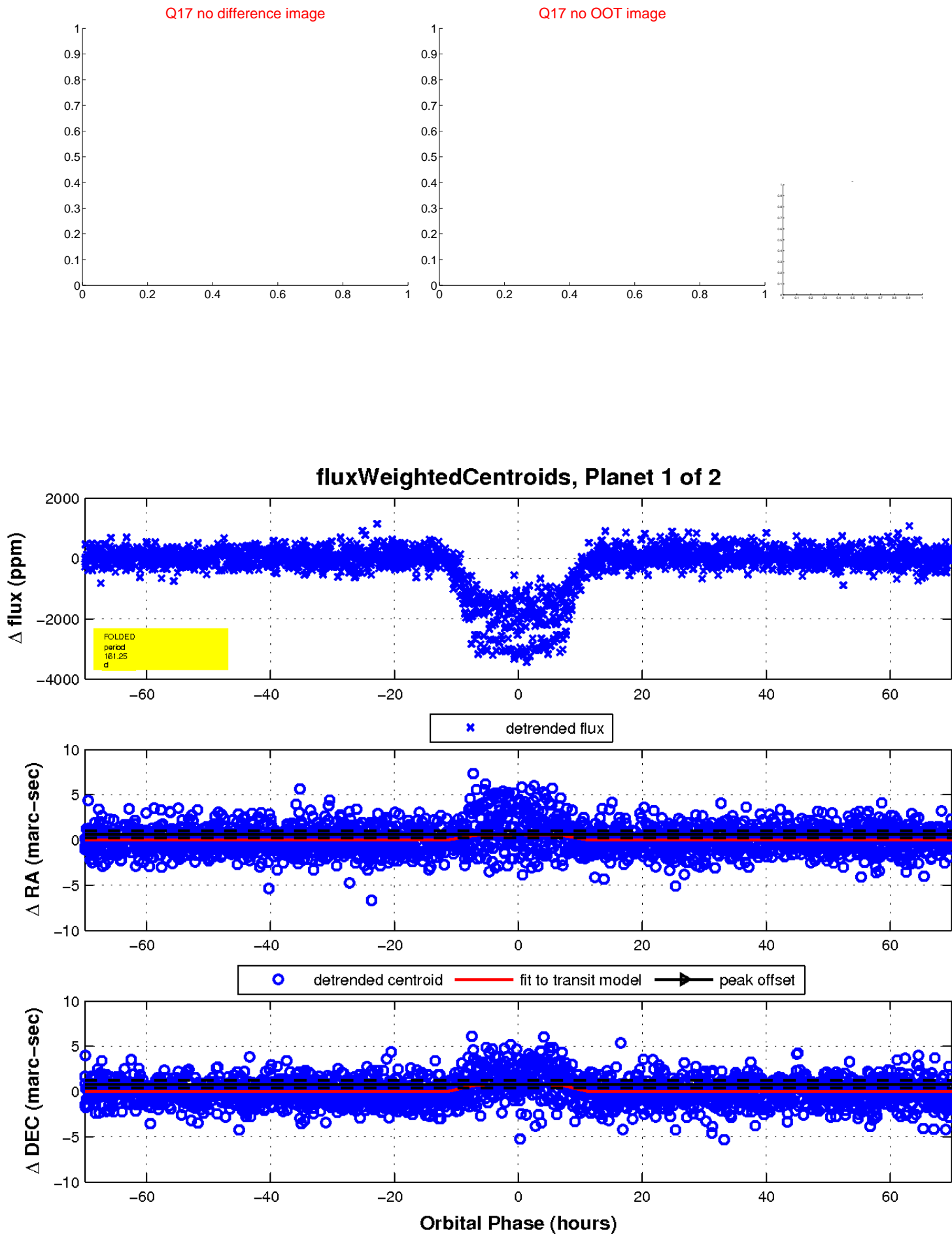
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white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.

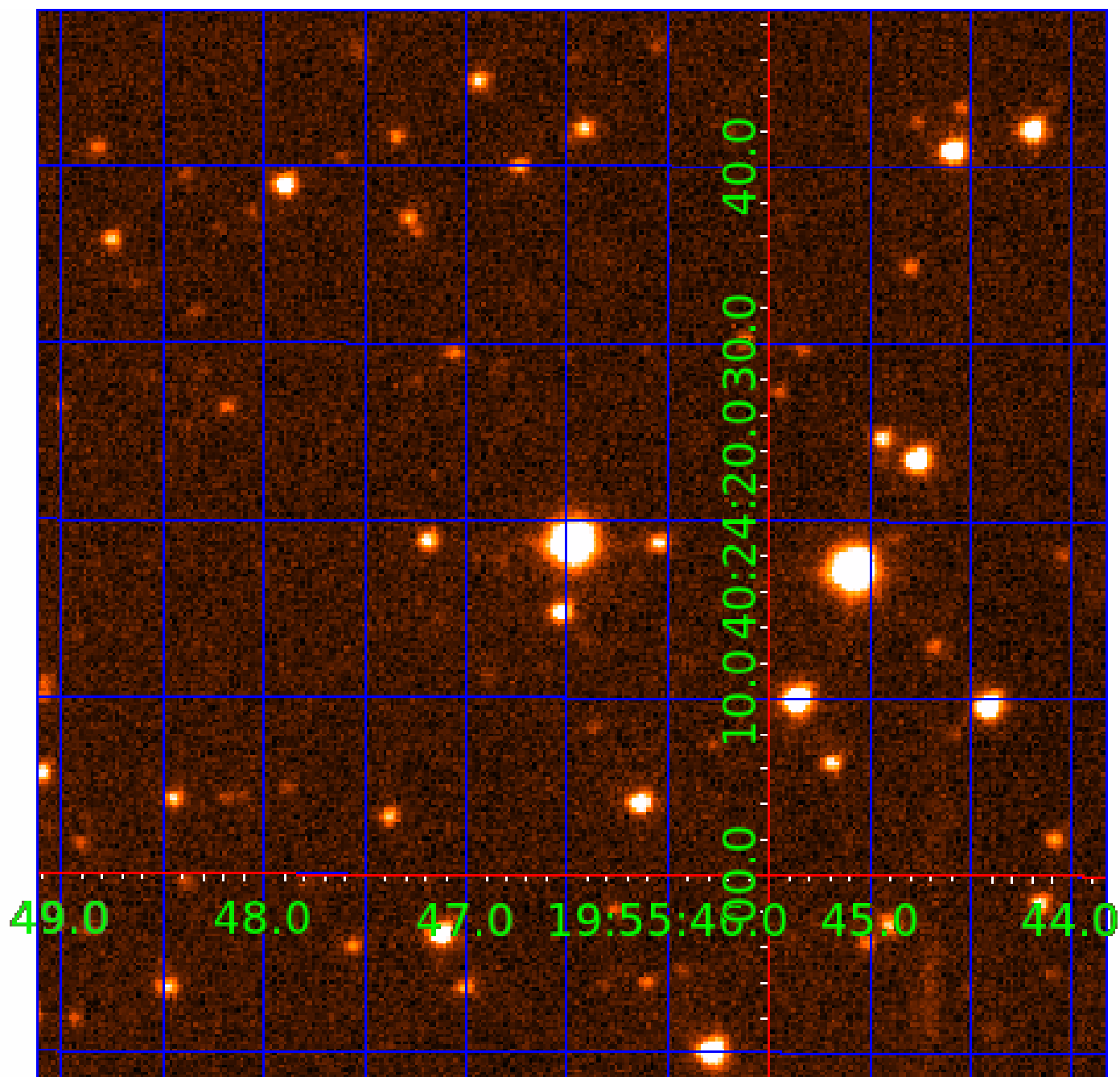


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 005305471

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})
005305471-01	OBS	3806.01	161.253105	189.105749	2017.7	23.312	65.5	65.1	0.81	5555	4.33	2.00
005305471-02	OBS	No	161.257832	216.380017	984.2	47.446	21.7	42.9	0.81	5555	3.07	2.00

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
005305471-01	OBS	FP	0.00	1	0	1	1	INDIV_TRANS_SKYE—CENT_RESOLVED_OFFSET—HALO_GHOST—EPHEM_MATCH
005305471-02	OBS	FP	0.00	1	0	1	1	SAME_NTL_PERIOD—HALO_GHOST—EPHEM_MATCH

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.

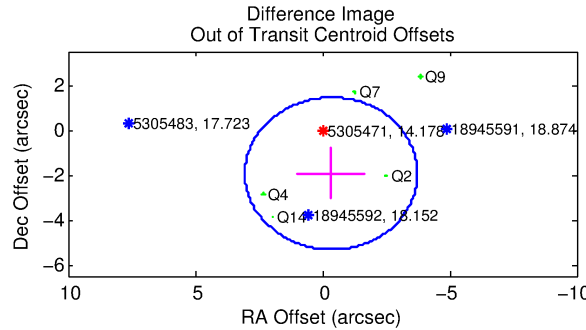
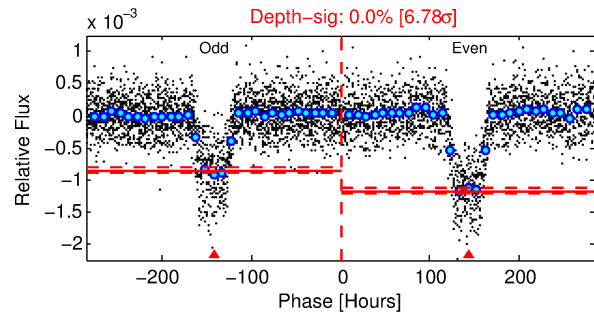
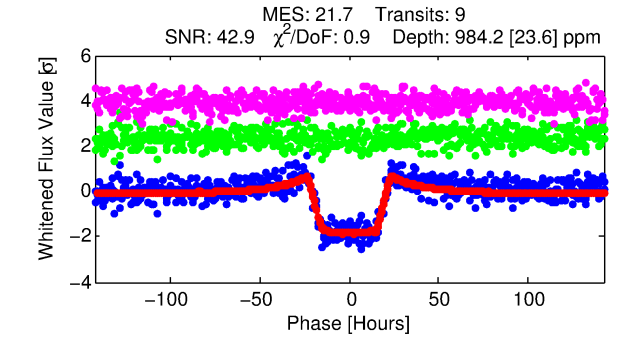
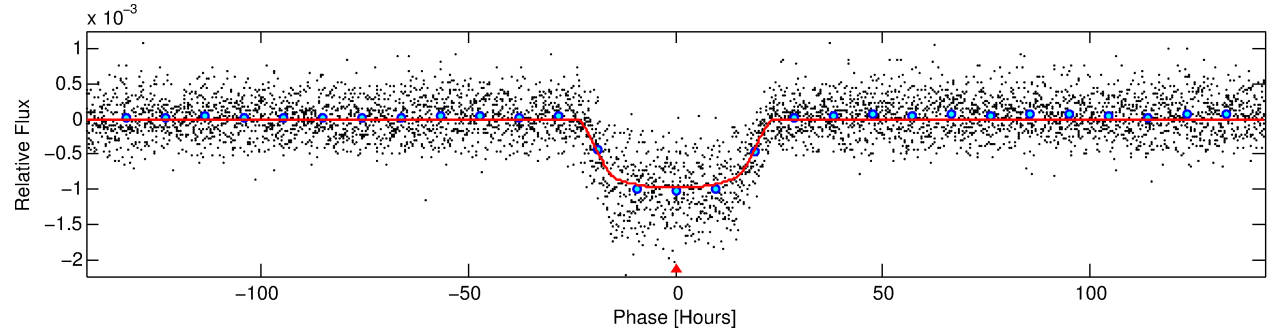
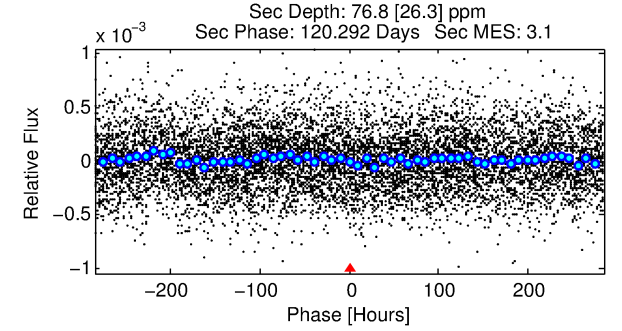
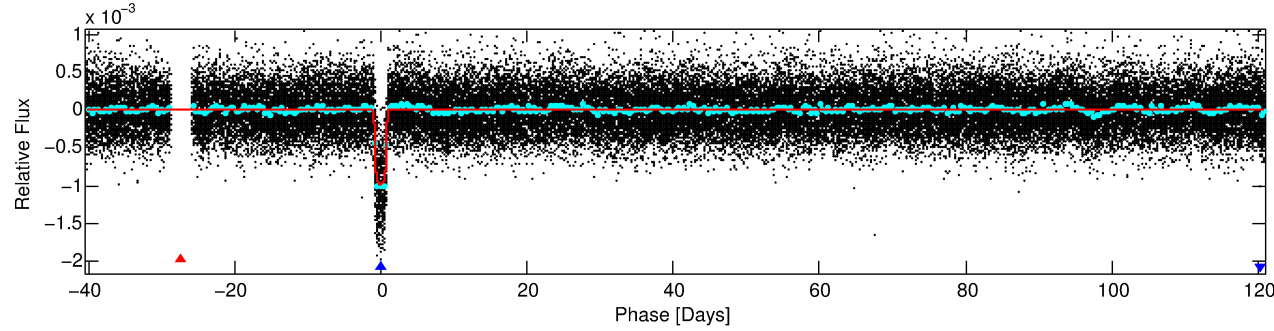
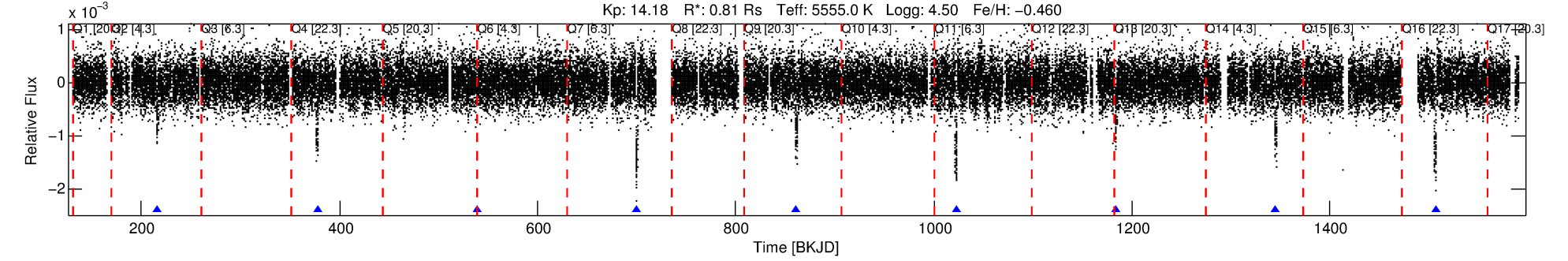
Ephemeris Match Information For 005305471-02

TCE (1)	KIC	Parent (2)	Parent KIC	$P_1:P_2$	Dist ($''$)	Δ Row	Δ Col	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
005305471-02	5305471	005217733-sec	5217733	1:1	52.2	8	-10	7.39	14.18	48.68	Direct-PRF	0	0.46	0.61

Notes: $P_1:P_2$ is the period ratio. Dist is the distance in arcseconds. Δ Row and Δ Col are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth divided by the child's. σ_P and σ_T are the significance of the match in period and epoch. For a match to be considered significant $\sigma_P < 5.0$ and $\sigma_T < 5.0$. Matches which have σ_P and σ_T very close to this cutoff should receive extra scrutiny, especially if the period ratio is very large.

DV One-Page Summary

KIC: 5305471 Candidate: 2 of 2 Period: 161.258 d
KOI: K03806 Corr: No Ephemeris Match



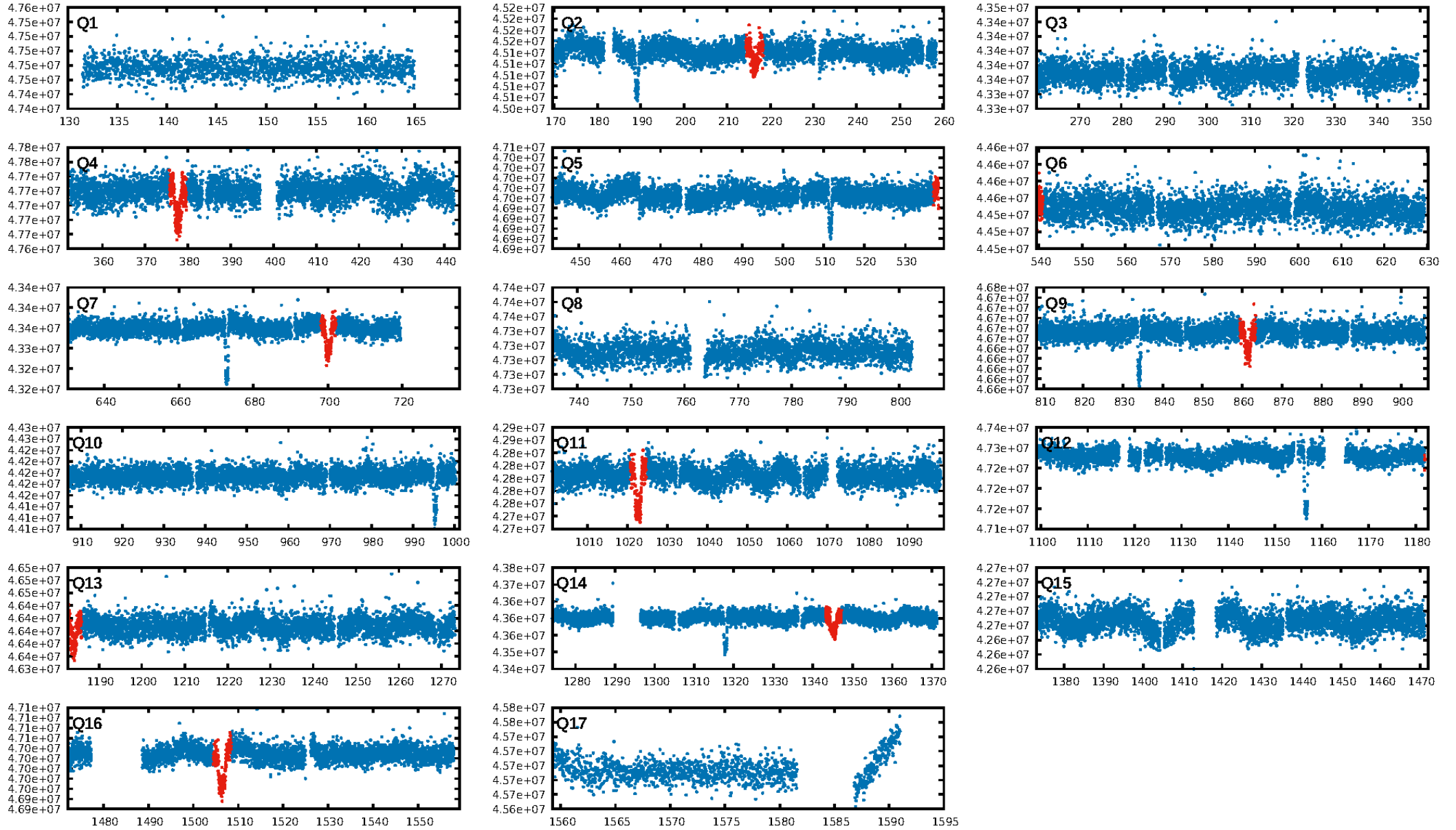
DV Fit Results:

Period = 161.25783 [0.00321] d
Epoch = 216.3800 [0.0148] BKJD
Rp/R* = 0.0347 [0.0006]
a/R* = 12.57 [0.64]
b = 0.92 [0.01]
Seff = 2.00 [0.52]
Teff = 303 [20] K
Rp = 3.07 [0.56] Re
a = 0.5297 [0.0826] AU
Ag = 1253.63 [519.04] [2.41 σ]
Teffp = 2790 [254] K [9.75 σ]

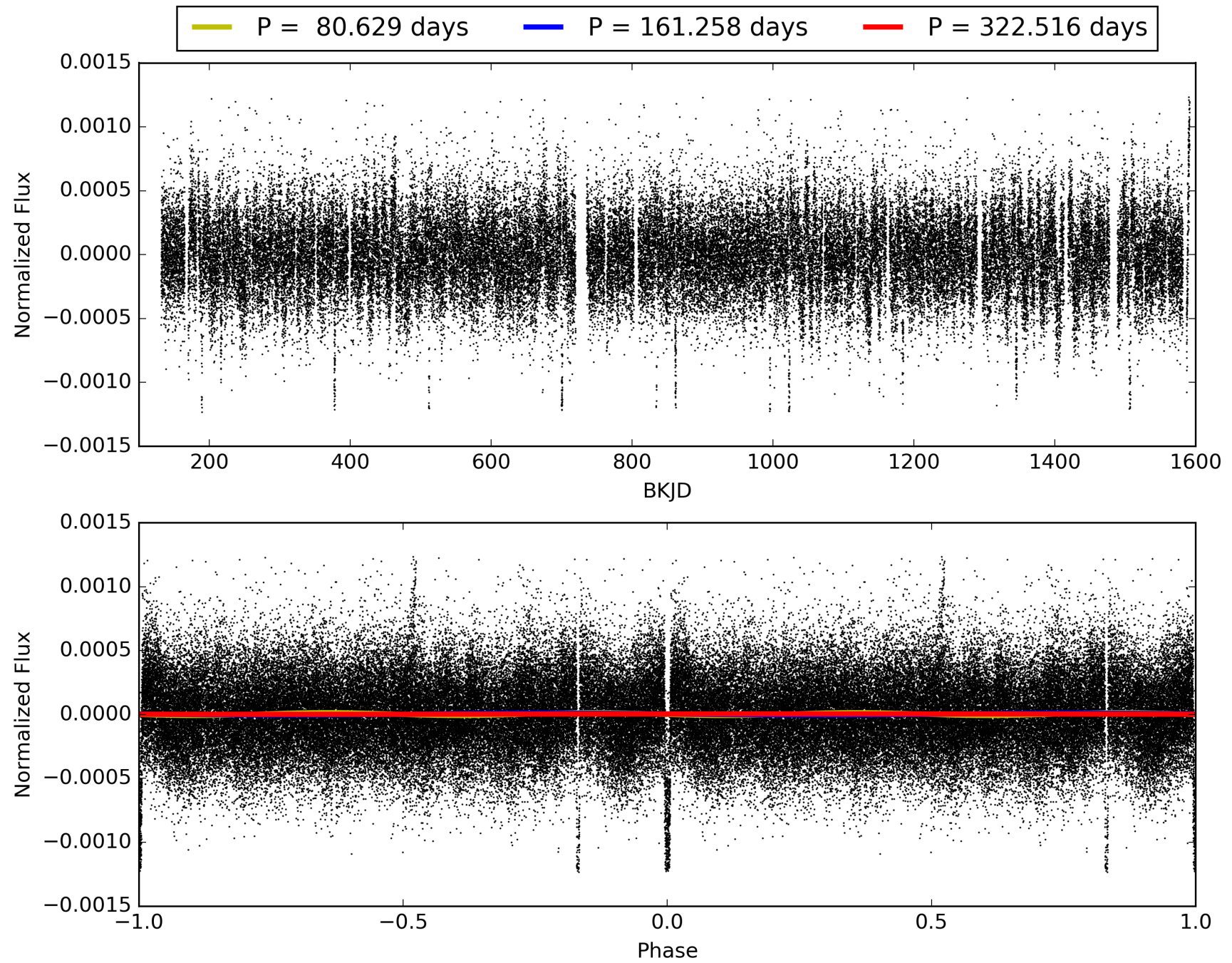
DV Diagnostic Results:

ShortPeriod-sig: 0.2% [0.00 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.04e-75
RollingBand-fgt: 1.00 [9/9]
GhostDiagnostic-chr: 0.04424
Centroid-sig: 0.0%
Centroid-so: 0.584 arcsec [2.65 σ]
OotOffset-rm: 1.972 arcsec [1.75 σ]
KicOffset-rm: 2.064 arcsec [1.84 σ]
OotOffset-st: 2/1/1/1 [5]
KicOffset-st: 2/1/1/1 [5]
DiffImageQuality-fgm: 0.20 [1/5]
DiffImageOverlap-fno: 1.00 [5/5]

TCE 005305471-02, PDC Light Curves

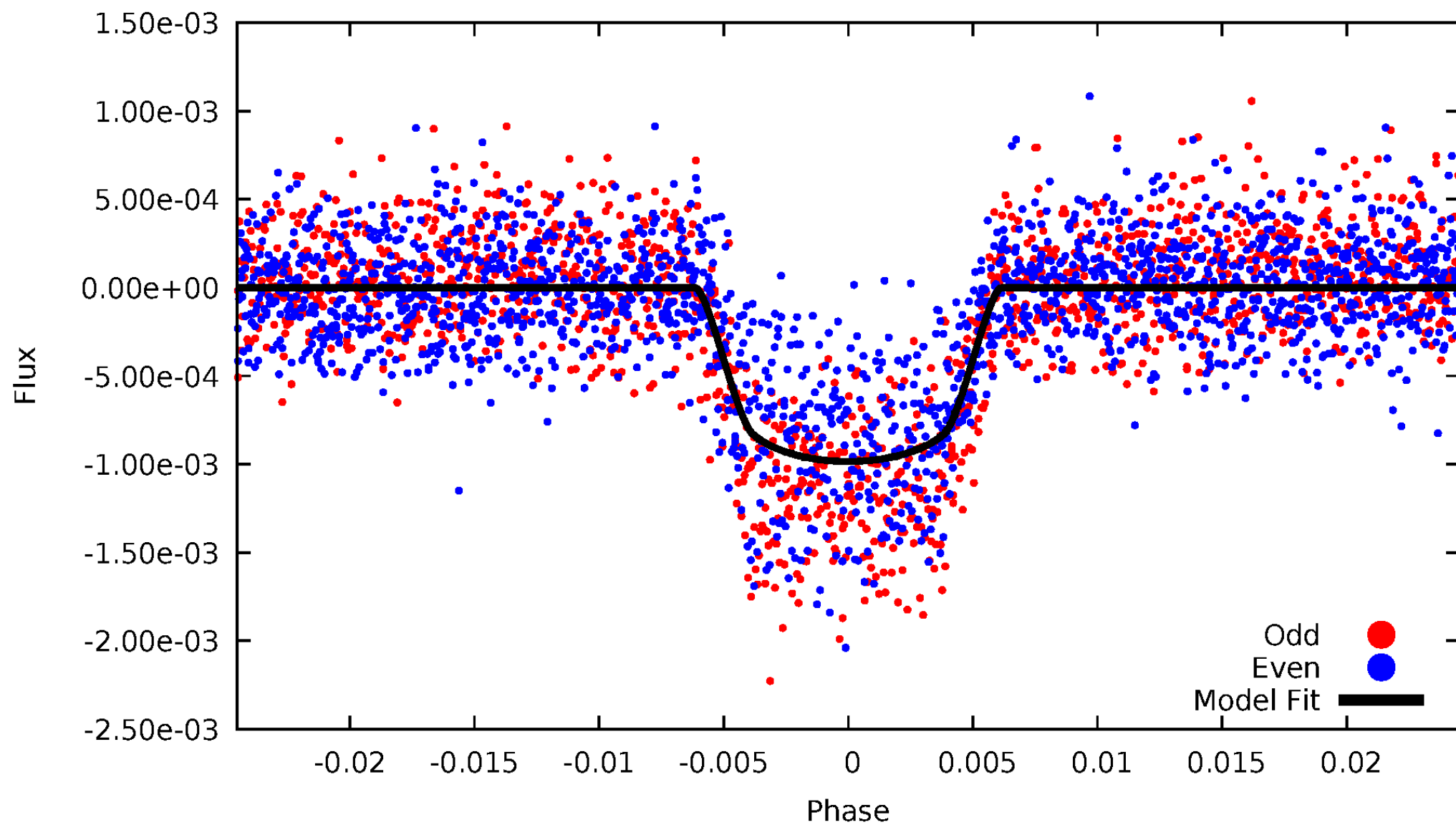


TCE 005305471-02



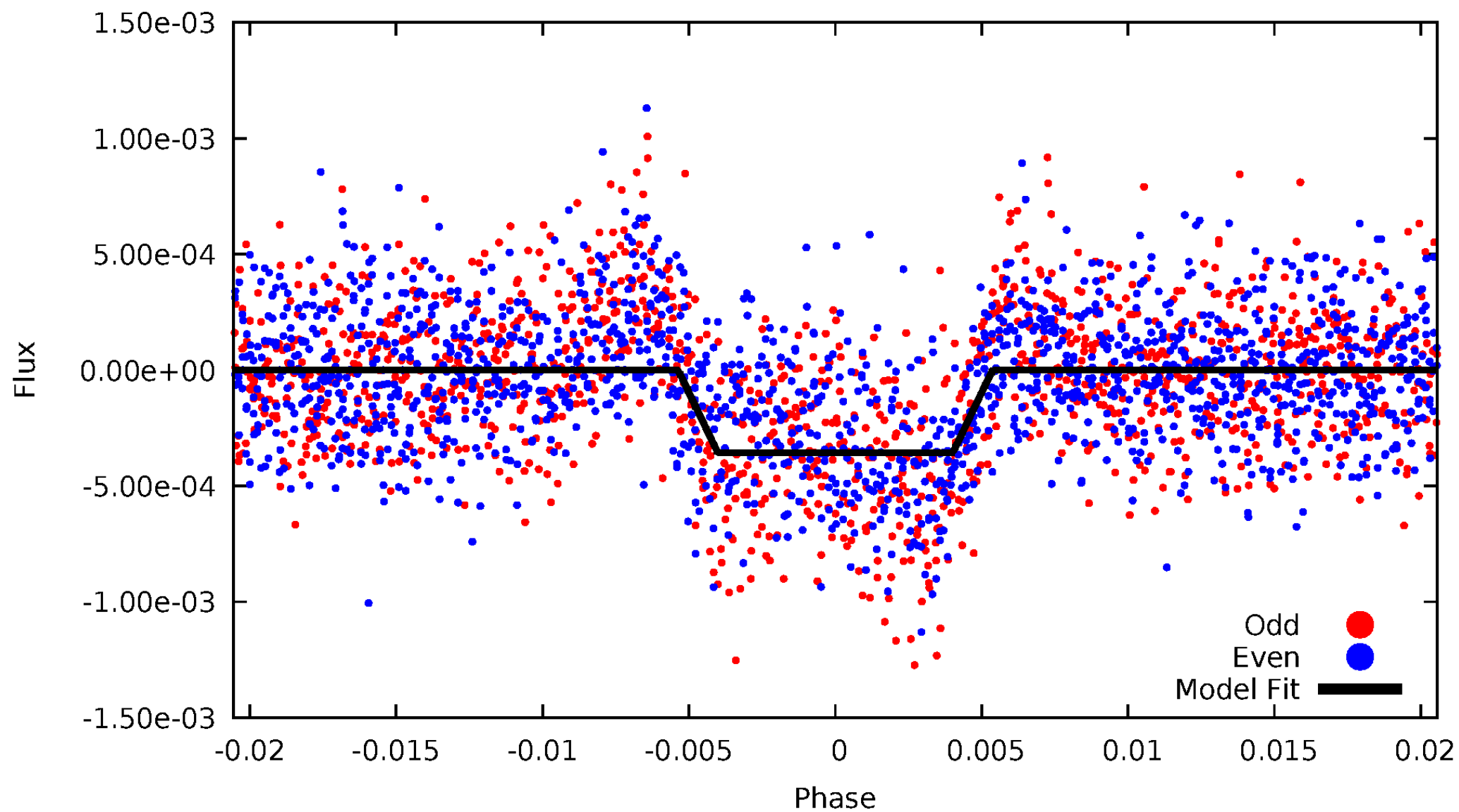
DV Odd/Even

TCE 005305471-02



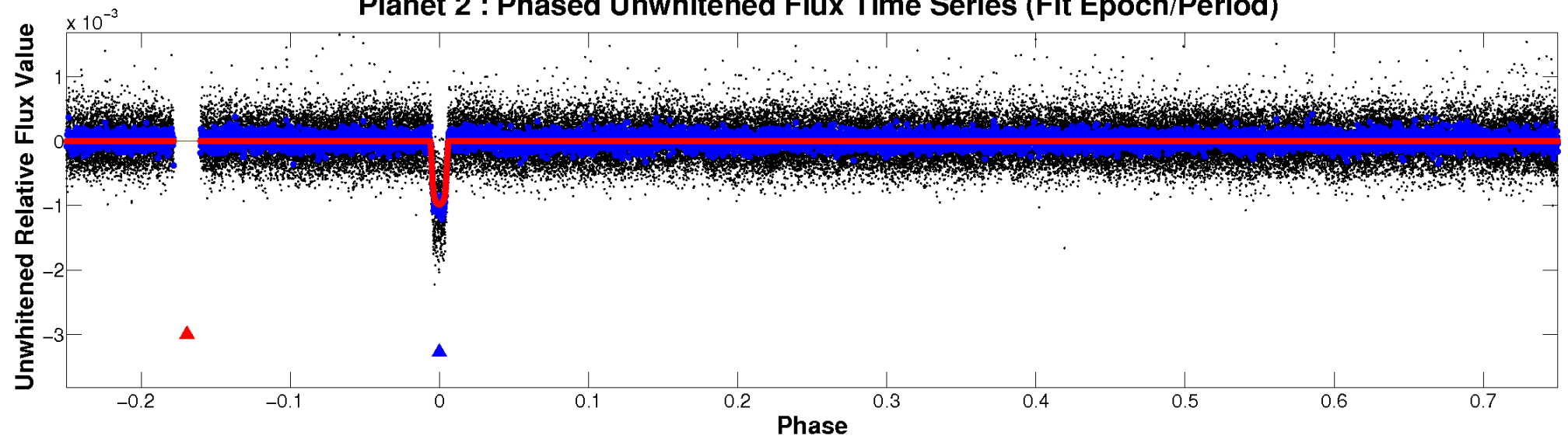
ALT Odd/Even

TCE 005305471-02

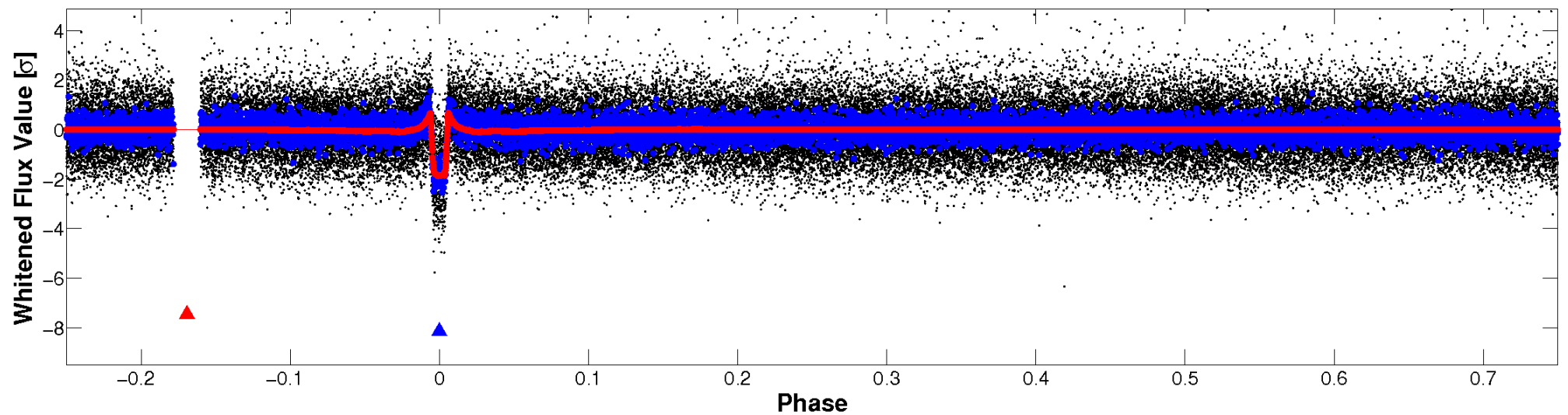


Non-Whitened Vs. Whitened Light Curve

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

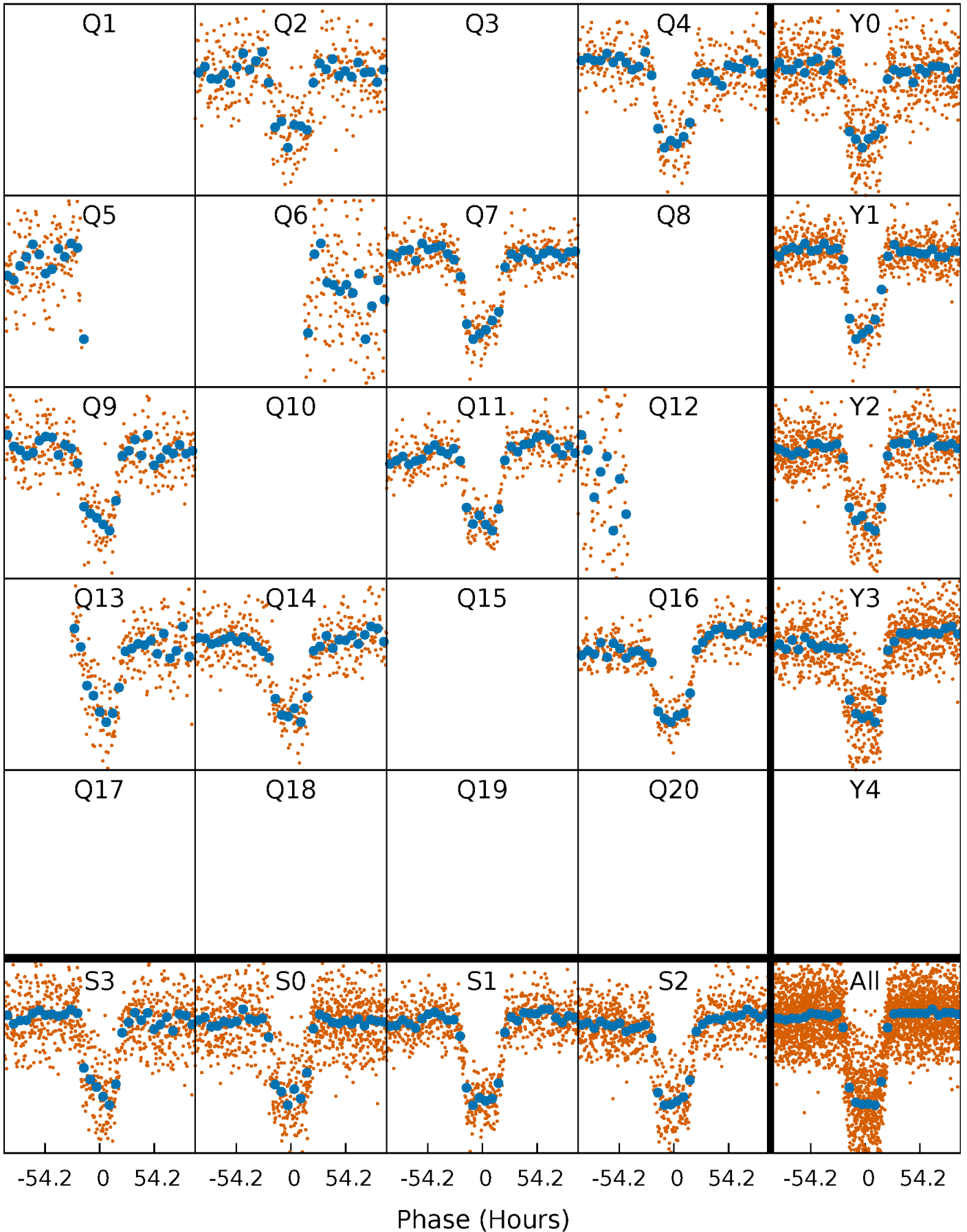


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



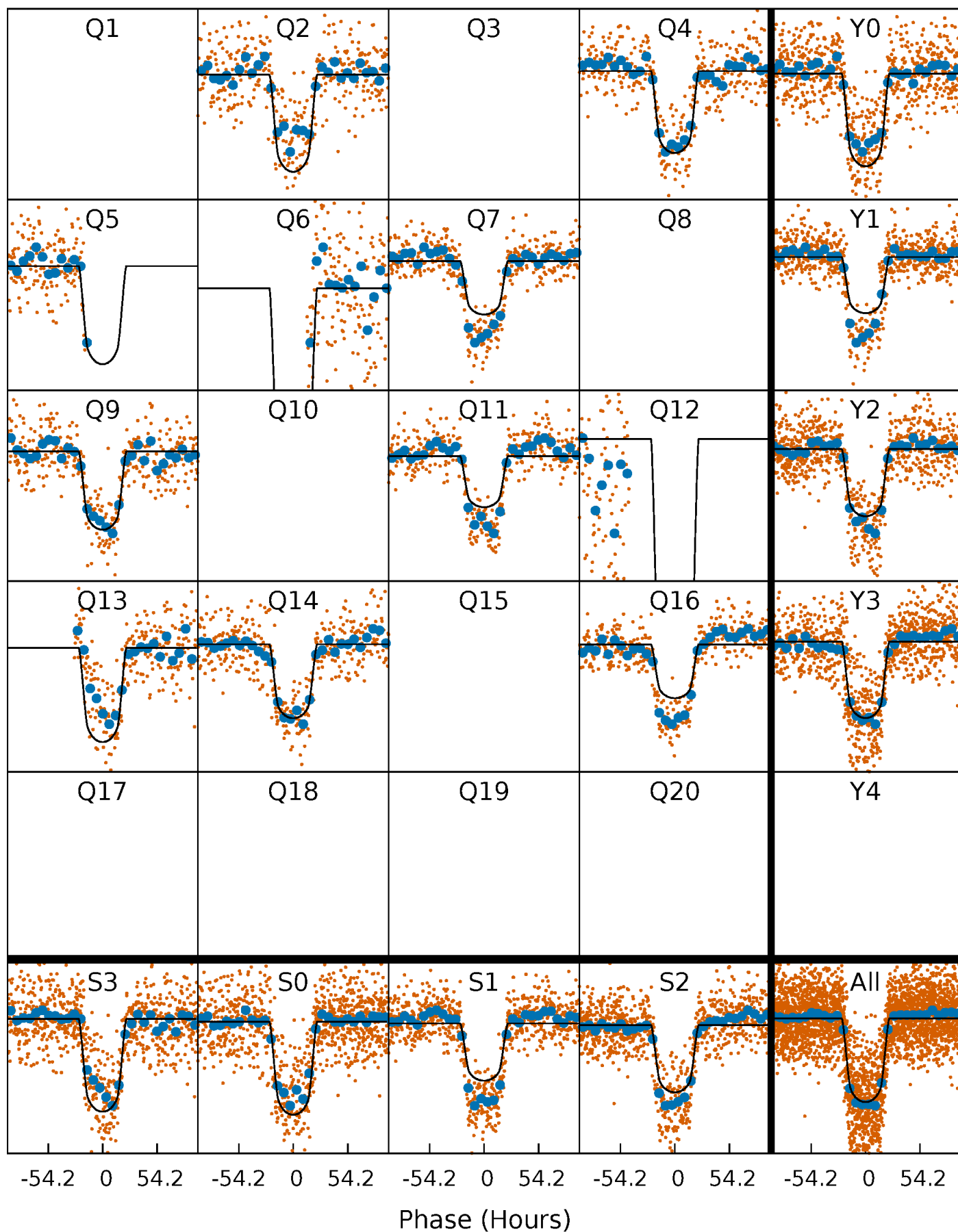
PDC Quarter-Phased Transit Curves

TCE 005305471-02 P=161.257832 Days $T_0=216.380017$ (BKJD)



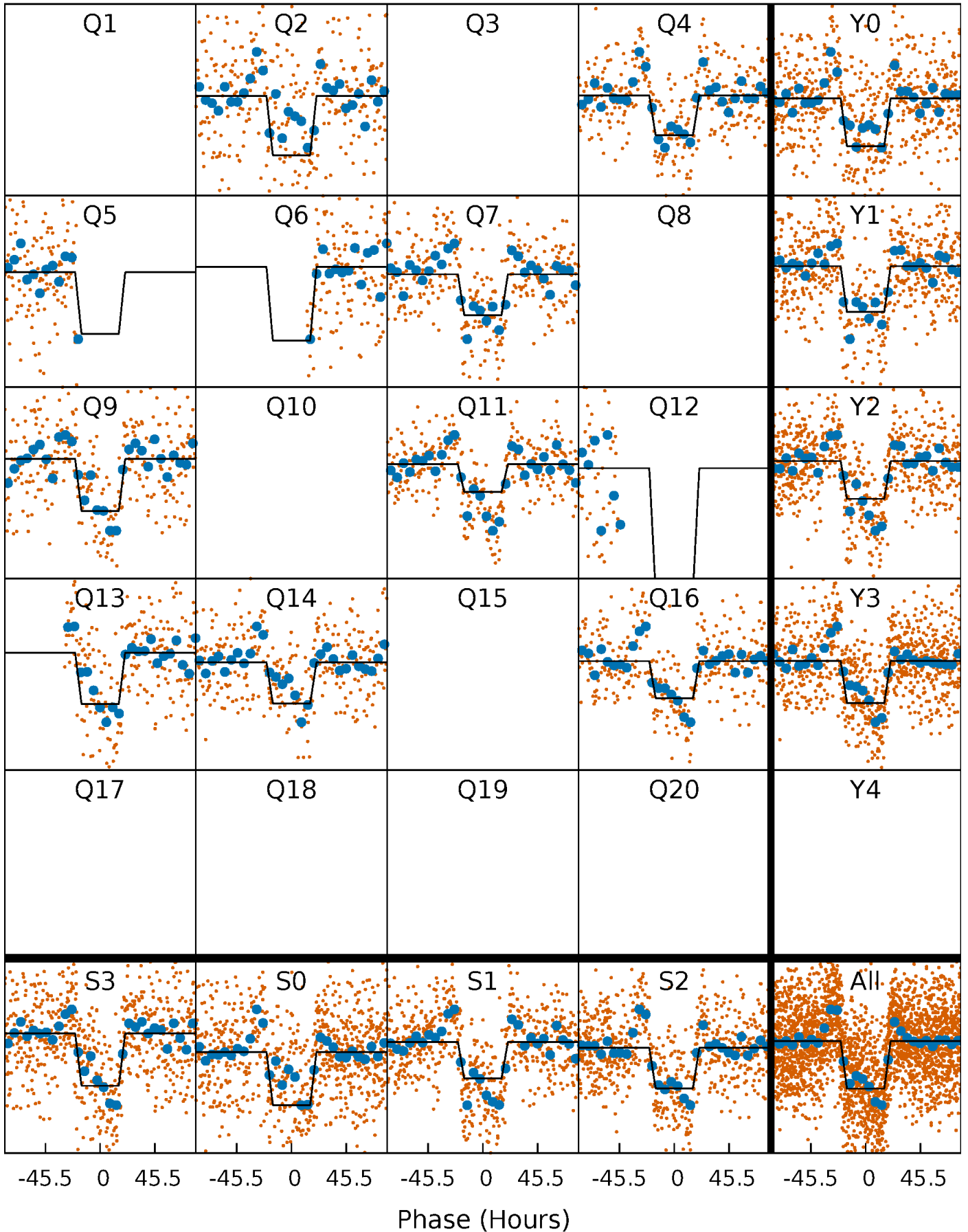
DV Quarter-Phased Transit Curves

TCE 005305471-02 P=161.257832 Days $T_0=216.380017$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

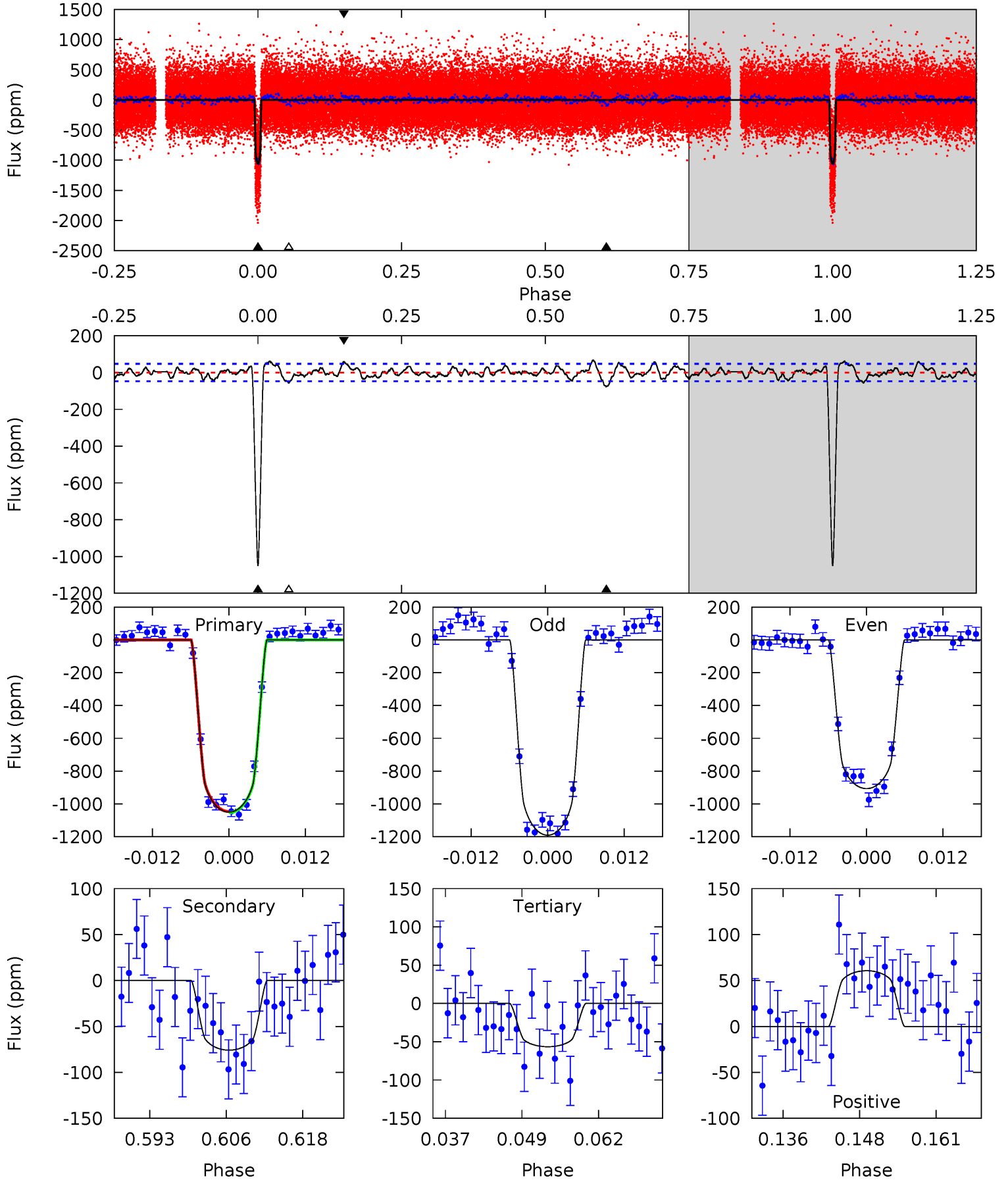
TCE 005305471-02 P=161.261655 Days $T_0=216.409349$ (BKJD)



DV Model-Shift Uniqueness Test

005305471-02, P = 161.257832 Days, E = 55.122185 Days

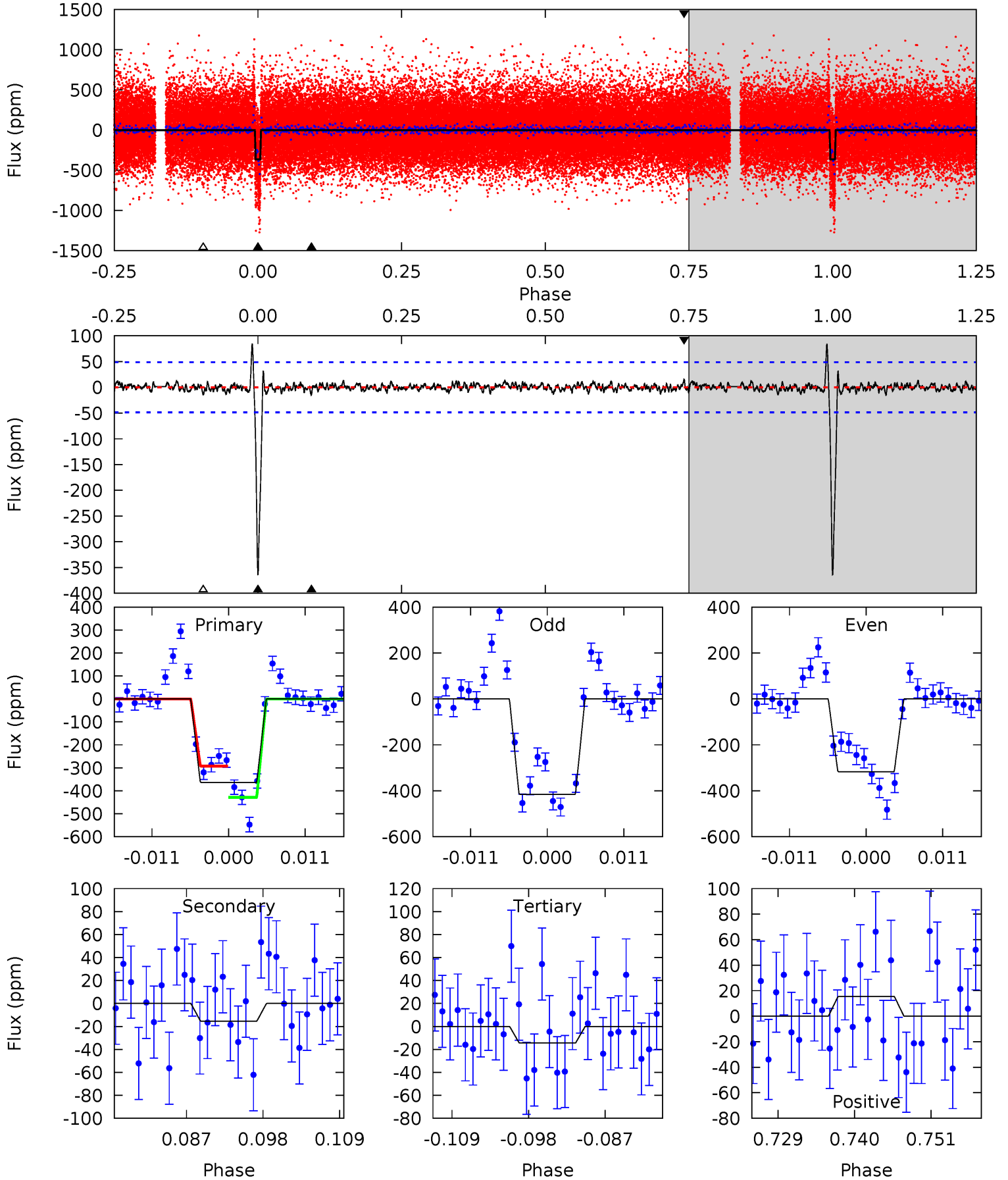
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
111.0	8.01	5.97	6.41	4.99	2.50	2.34	105.0	104.5	2.04	1.61	15.0	1.05	0.06	0.34



Alt Model-Shift Uniqueness Test

005305471-02, P = 161.261655 Days, E = 55.147694 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
37.6	1.59	1.49	1.59	5.01	2.55	0.56	36.1	36.0	0.10	-0.01	5.07	1.03	0.19	7.02



Stellar Parameters For KIC 005305471

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	5555^{+166}_{-166}	$4.502^{+0.104}_{-0.127}$	$-0.460^{+0.300}_{-0.300}$	$0.811^{+0.148}_{-0.099}$	$0.762^{+0.104}_{-0.056}$	$2.011^{+0.868}_{-0.711}$
	+3%/-3%	+2%/-3%	+65%/-65%	+18%/-12%	+14%/-7%	+43%/-35%
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 005305471-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-76 ± 9	$3.07^{+0.36}_{-0.23}$	424^{+23}_{-22}	3323^{+90}_{-92}	1245^{+279}_{-250}
Alt.	-15 ± 10	$1.69^{+0.16}_{-0.14}$	425^{+23}_{-21}	3142^{+242}_{-434}	831^{+567}_{-561}

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

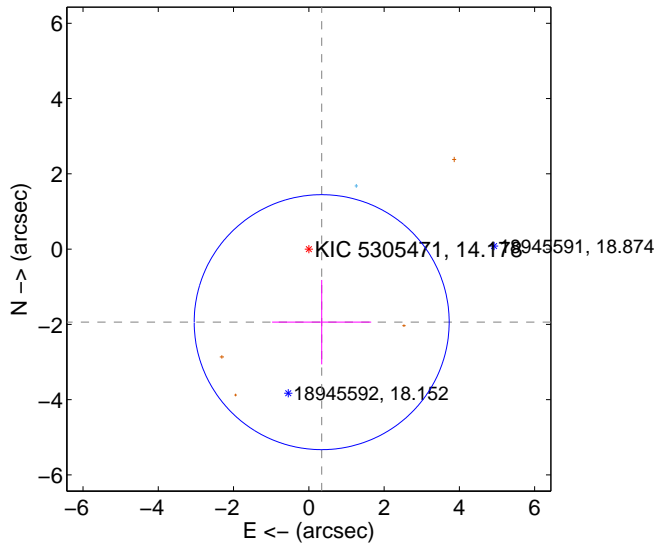
Supplemental centroid analysis for 005305471-02. Kepler magnitude: 14.18. Transit SNR 42.85

There are 1 quarters with good PRF difference image offsets

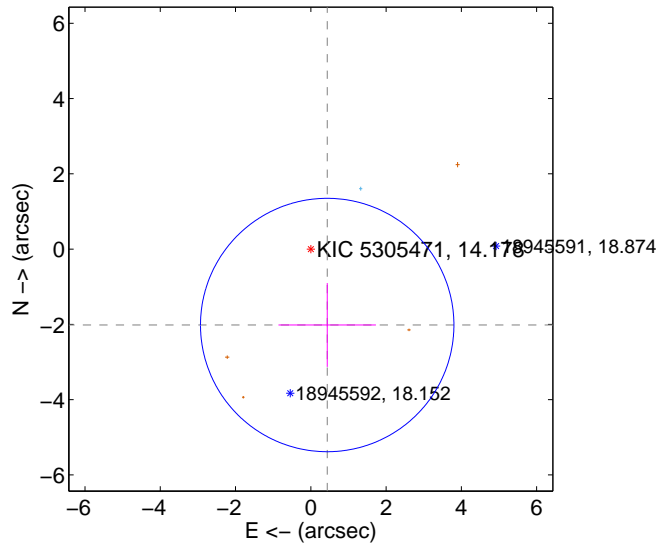
The direct PRF centroid is offset from the target star catalog position by about 0.16 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.972 ± 1.129	1.75	-0.342 ± 1.317	-1.942 ± 1.123
PRF-fit source offset from KIC position	2.064 ± 1.122	1.84	-0.436 ± 1.295	-2.017 ± 1.114
photometric centroid source offset	0.58 ± 0.22	2.65	-0.18 ± 0.22	-0.56 ± 0.22

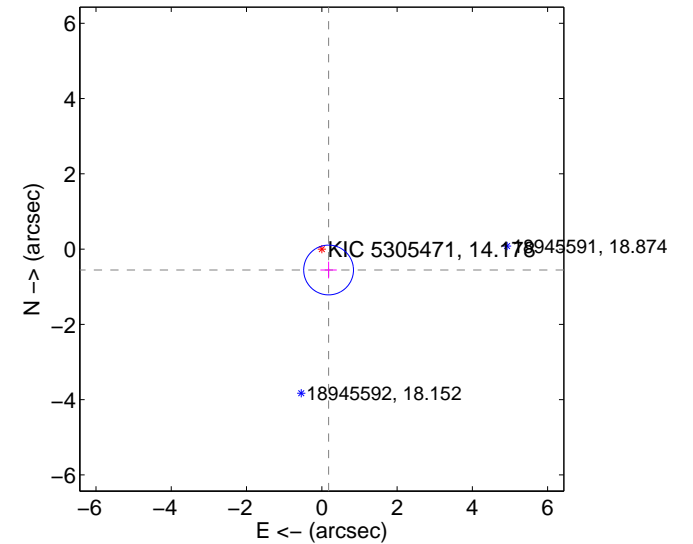
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

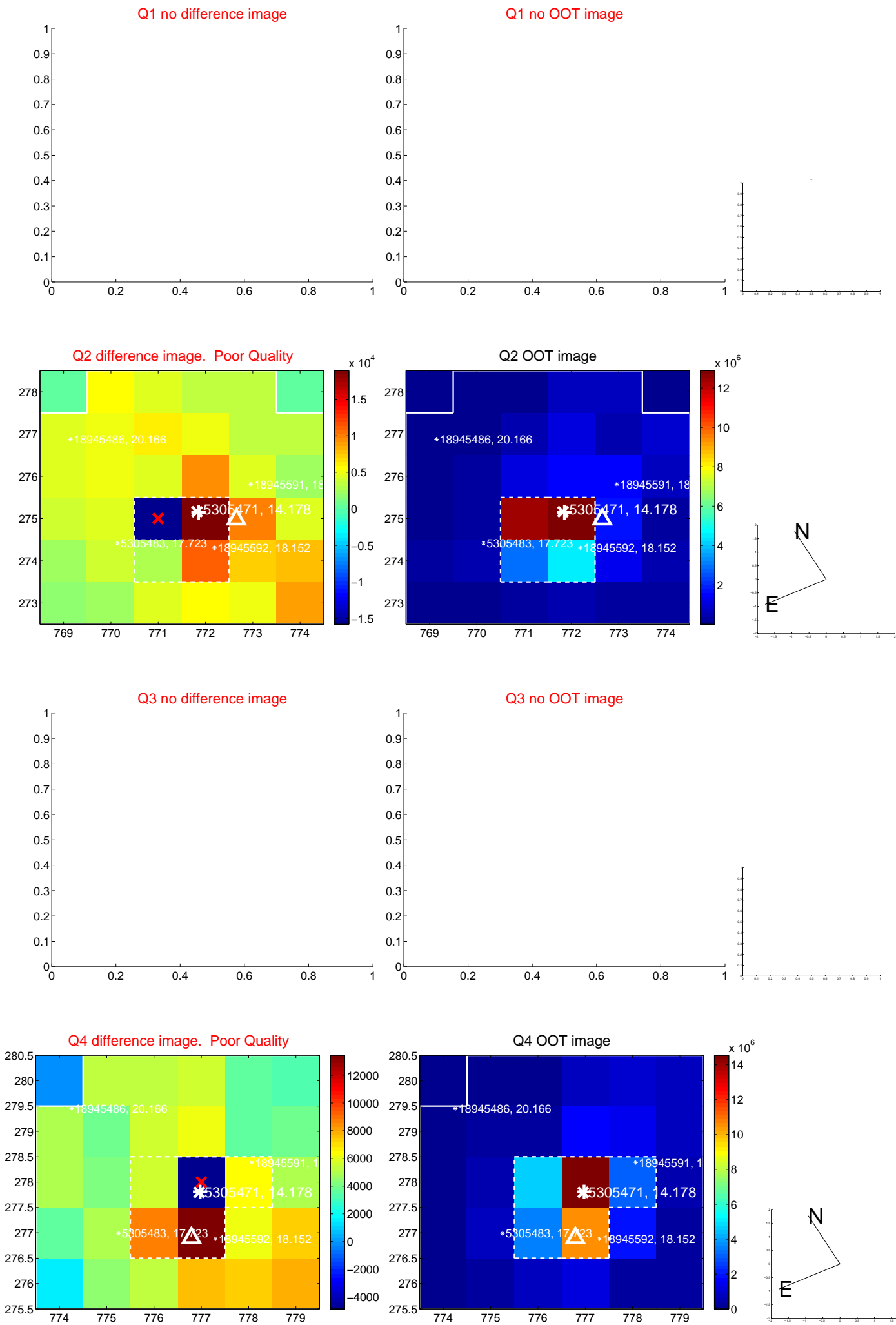


offset from photometric centroids

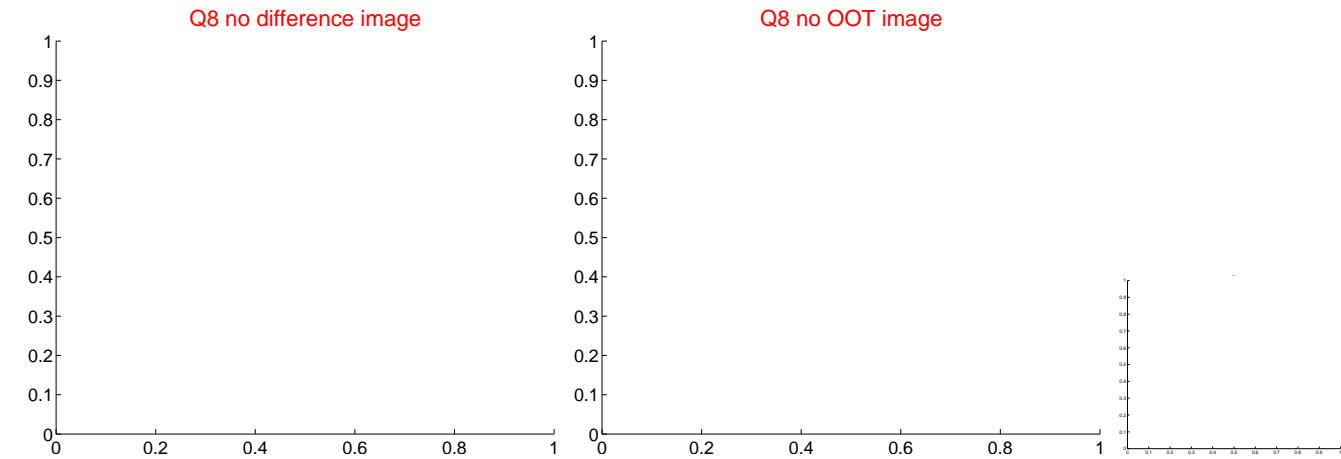
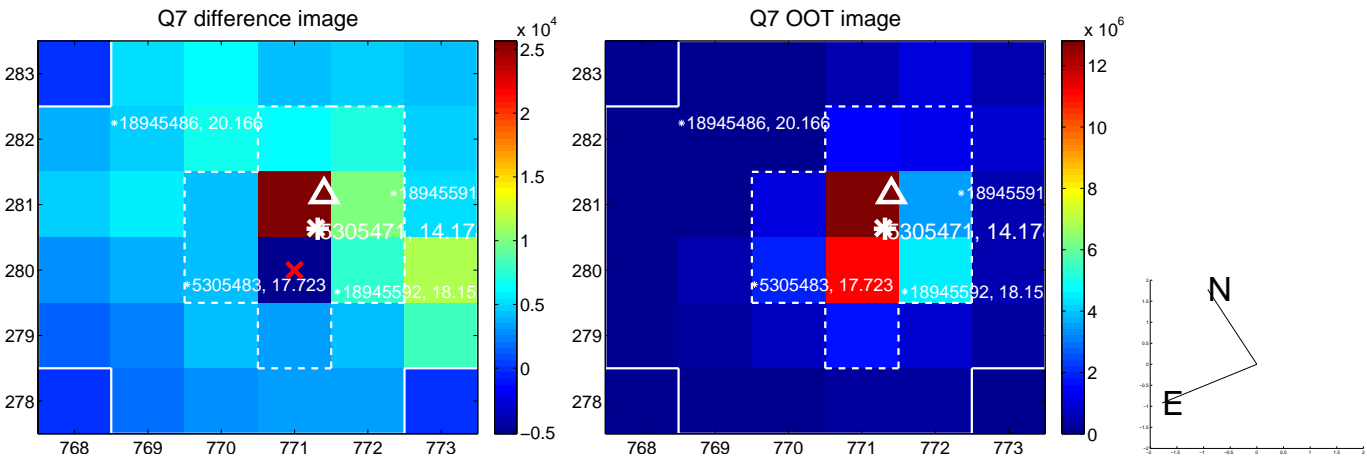
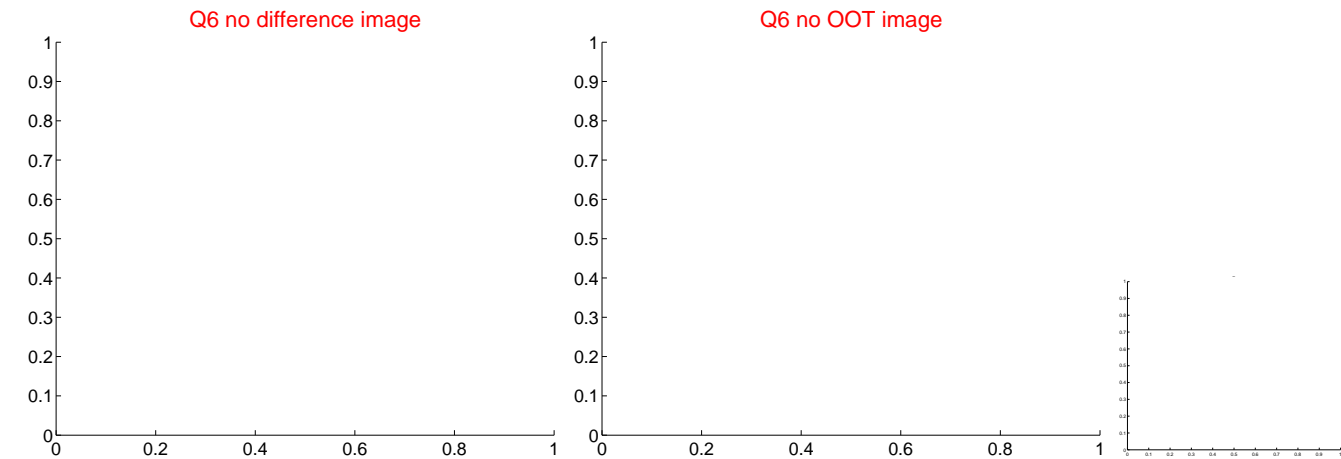
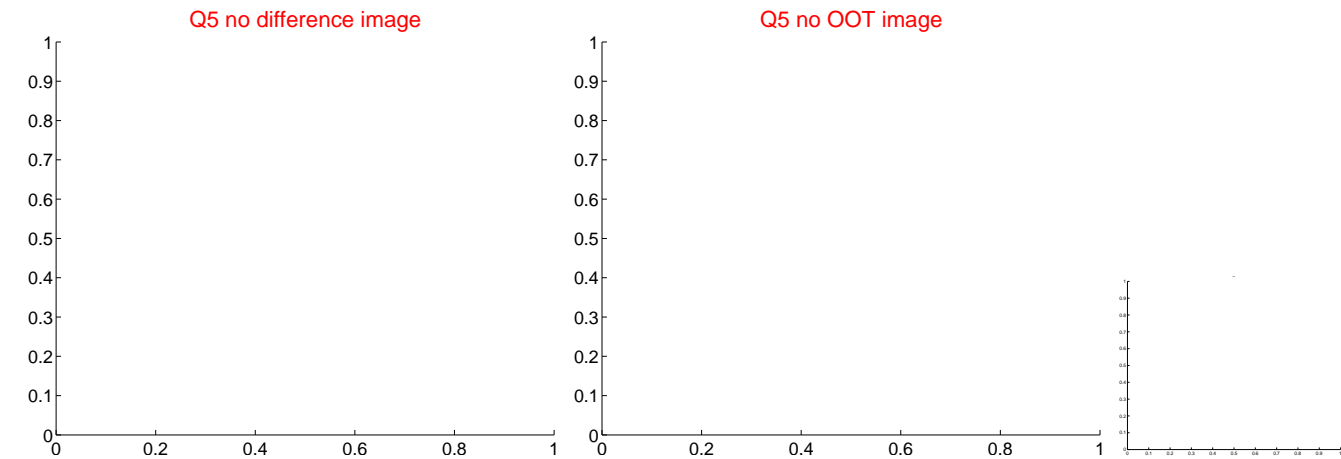


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

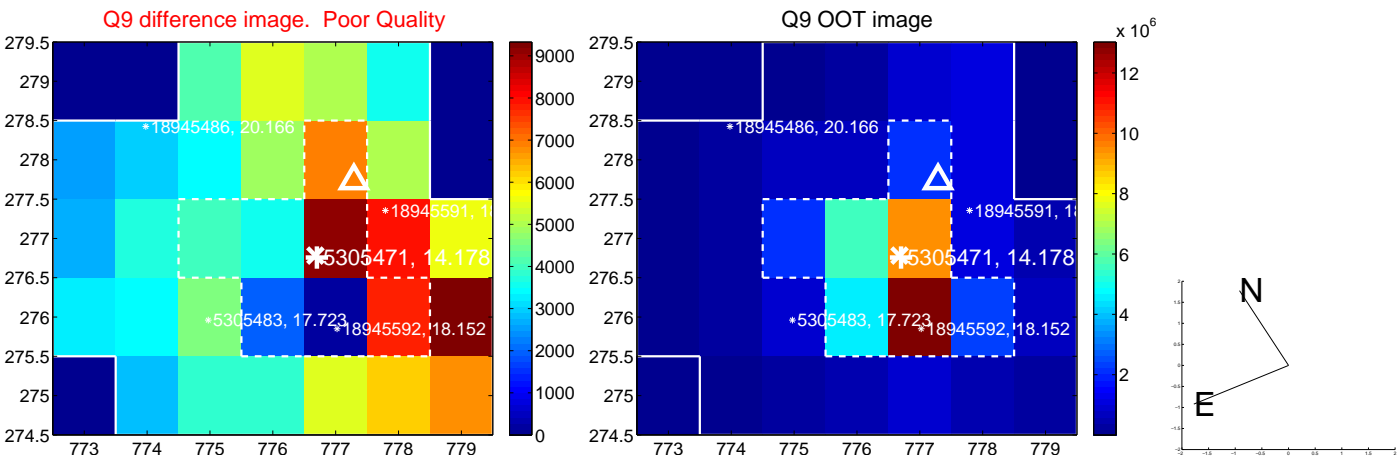
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



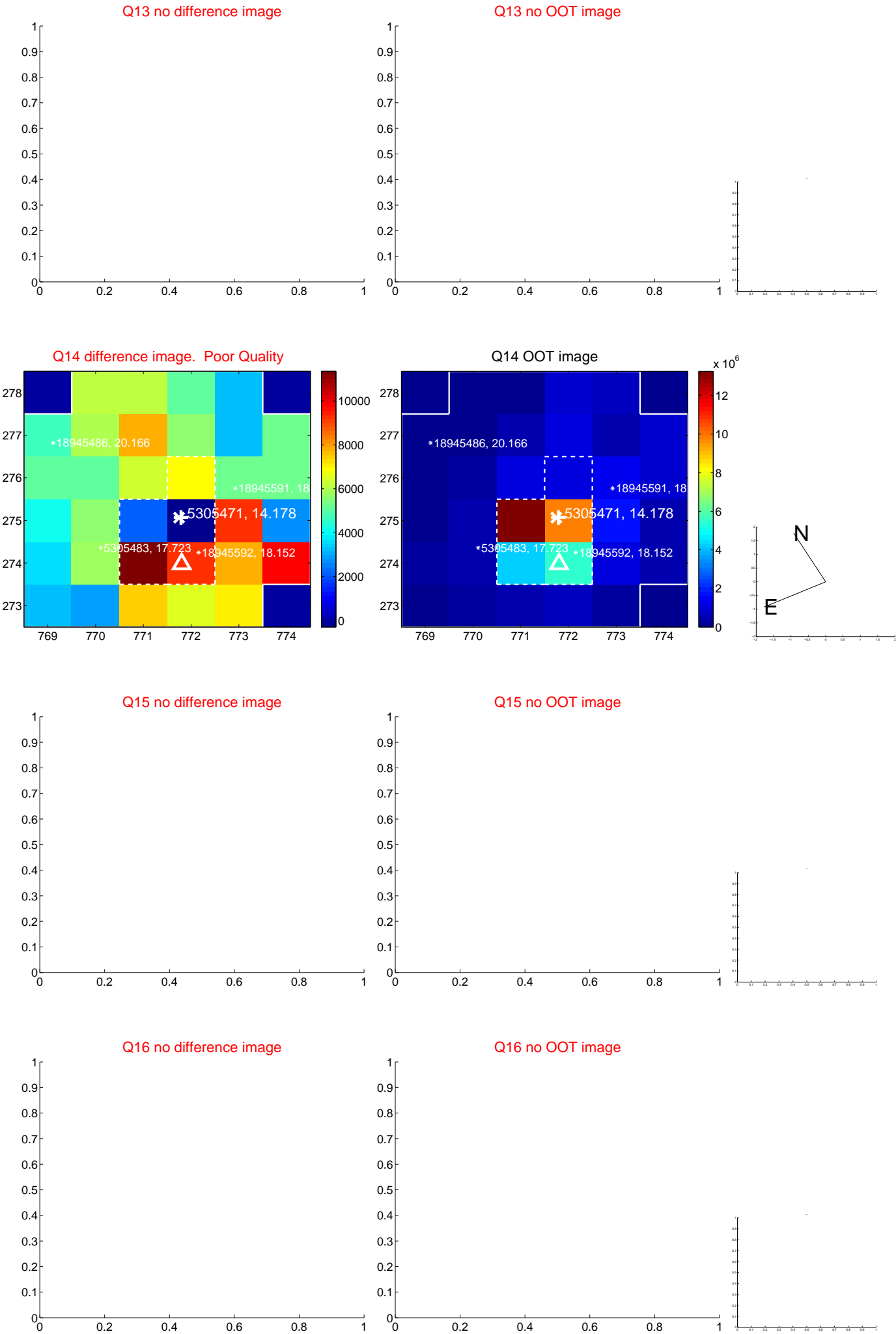
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



white ×: 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.



Q14 difference image. Poor Quality

\times 18945486, 20.166

\times 5305471, 14.178

\times 5305483, 17.723

\times 18945591, 18

\times 18945592, 18.152

Q14 OOT image

\times 18945486, 20.166

\times 5305471, 14.178

\times 5305483, 17.723

\times 18945591, 18

\times 18945592, 18.152

N

E

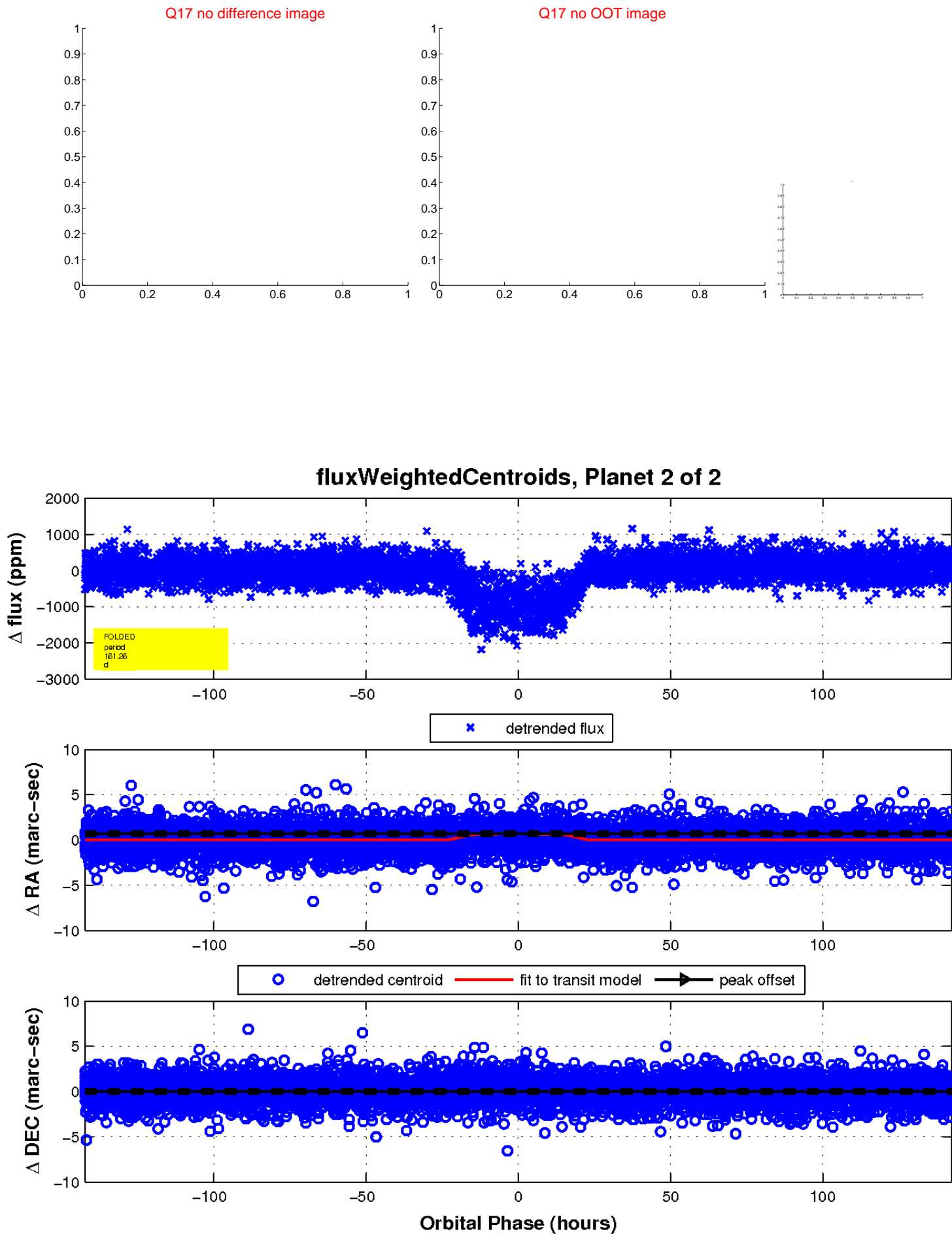
Q15 no difference image

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

