

KIC 007516781

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})
007516781-01	OBS	No	4.158487	135.190012	34.1	14.204	17.3	15.1	1.43	6844	0.97	1250.16
007516781-02	OBS	No	274.402277	342.242298	201.3	15.000	30.4	-1.0	1.43	6844	2.04	4.69
007516781-03	OBS	No	492.823702	481.267926	133.3	6.233	13.6	5.8	1.43	6844	1.88	2.15
007516781-04	OBS	No	388.803495	448.199514	194.6	12.259	12.0	7.3	1.43	6844	2.12	2.95
007516781-05	OBS	No	4.159681	131.776854	27.4	25.902	10.0	10.7	1.43	6844	0.76	1249.68

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007516781-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_SATURATED
007516781-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007516781-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED

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

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

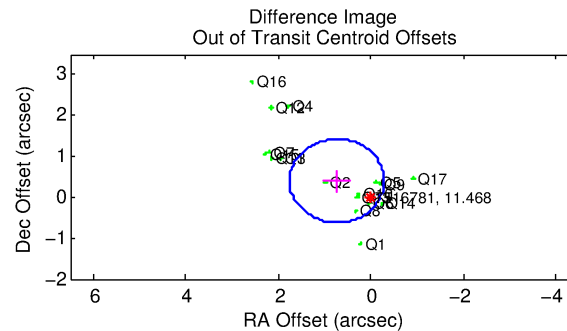
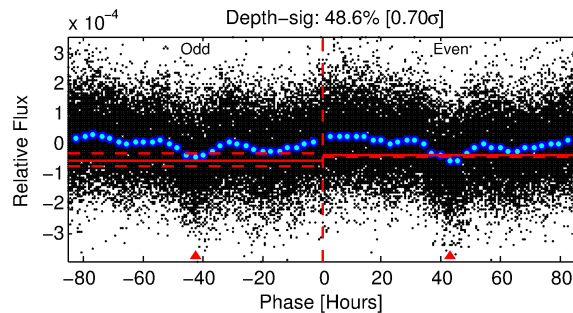
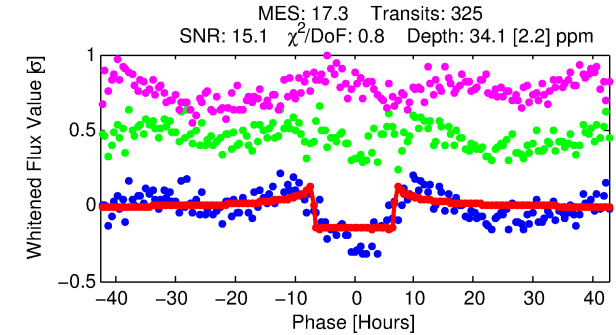
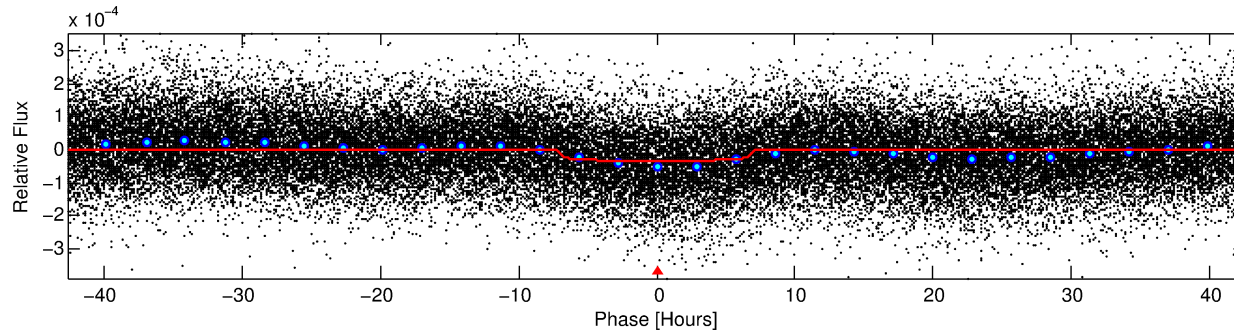
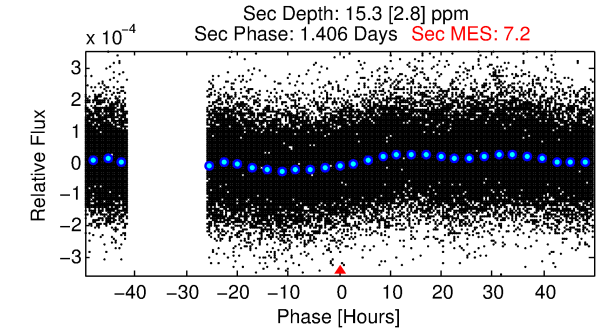
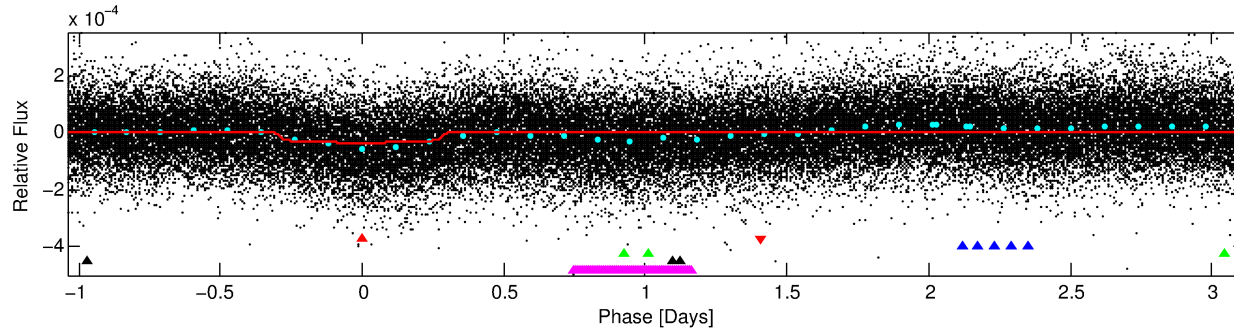
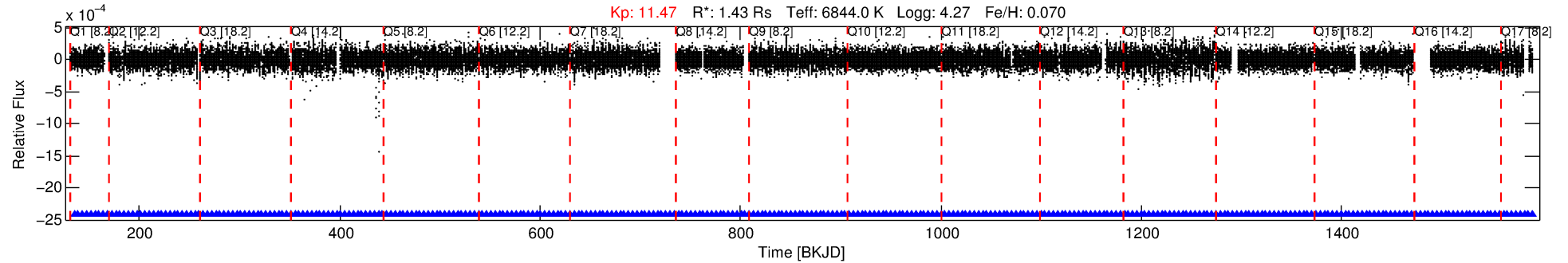
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007516781-01

No Significant Match Found

DV One-Page Summary

KIC: 7516781 Candidate: 1 of 5 Period: 4.158 d



DV Fit Results:

Period = 4.15849 [0.00003] d
Epoch = 135.1900 [0.0044] BKJD
Rp/R* = 0.0062 [0.0004]
a/R* = 1.38 [0.21]
b = 0.90 [0.07]
Seff = 1250.16 [549.48]
Teq = 1516 [167] K
Rp = 0.97 [0.35] Re
a = 0.0565 [0.0163] AU
Ag = 28.82 [13.25] [2.10σ]
Teffp = 5432 [390] K [9.23σ]

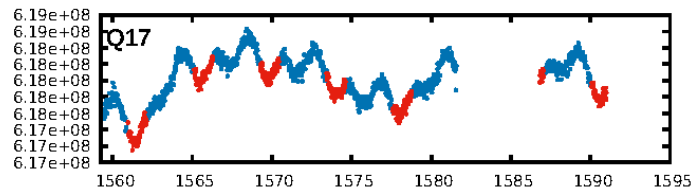
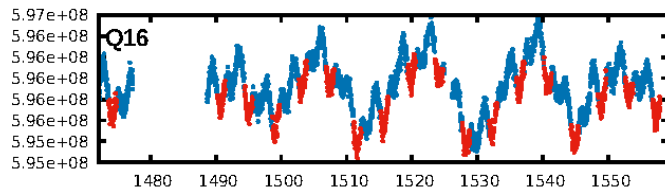
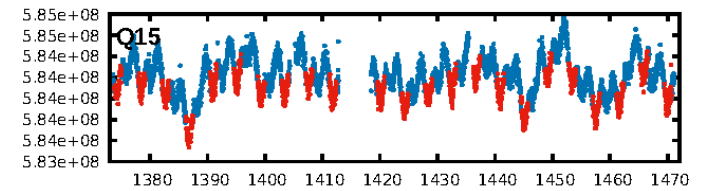
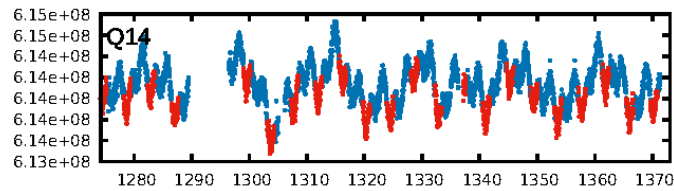
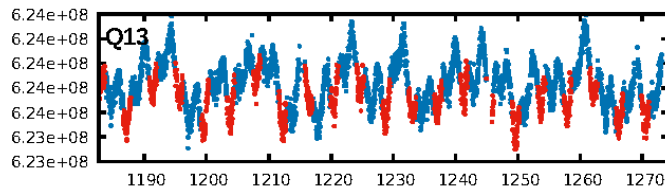
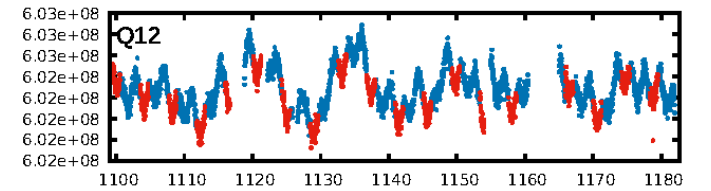
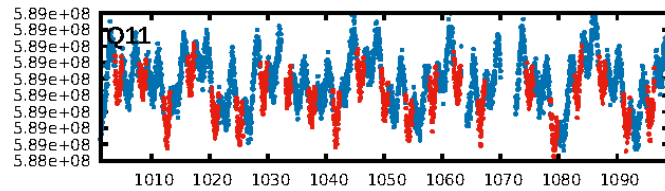
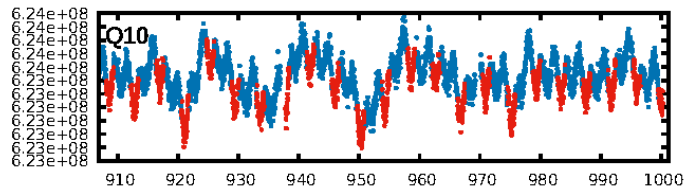
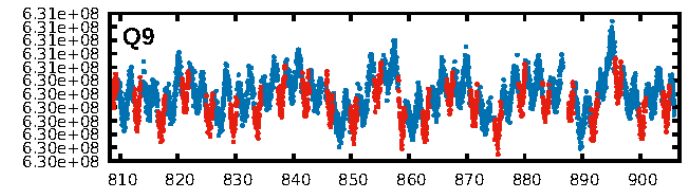
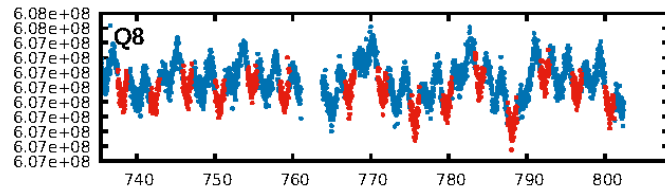
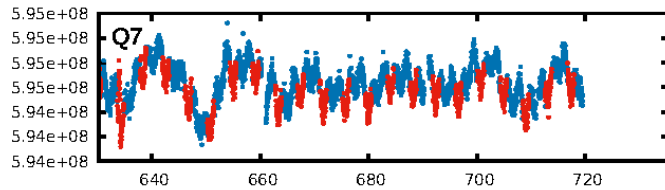
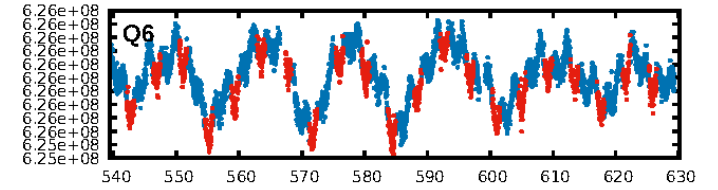
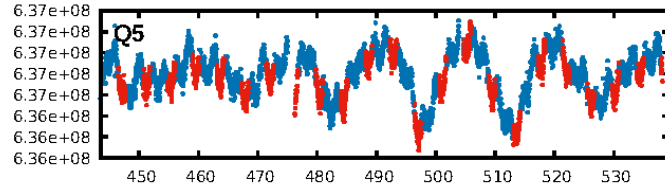
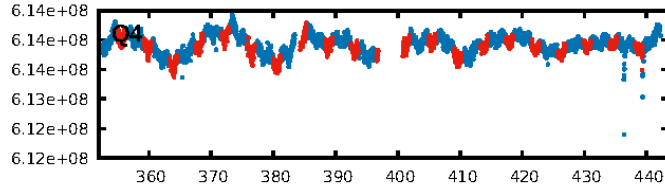
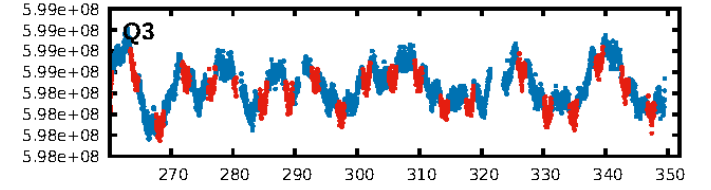
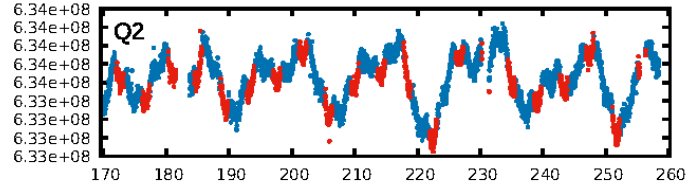
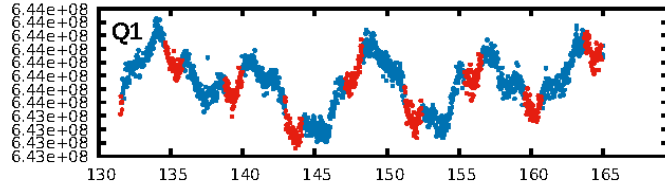
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 0.1% [0.00σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 6.92e-87
RollingBand-fgt: 1.00 [311/311]
GhostDiagnostic-chr: 2.484
Centroid-sig: 1.8%
Centroid-so: 0.627 arcsec [1.59σ]
OotOffset-rm: 0.838 arcsec [2.46σ]
OotOffset-st: 4/4/4/5 [17]
KicOffset-rm: 0.920 arcsec [2.47σ]
KicOffset-st: 4/4/4/5 [17]
DiffImageQuality-fgm: 1.00 [17/17]
DiffImageOverlap-fno: 0.00 [0/17]

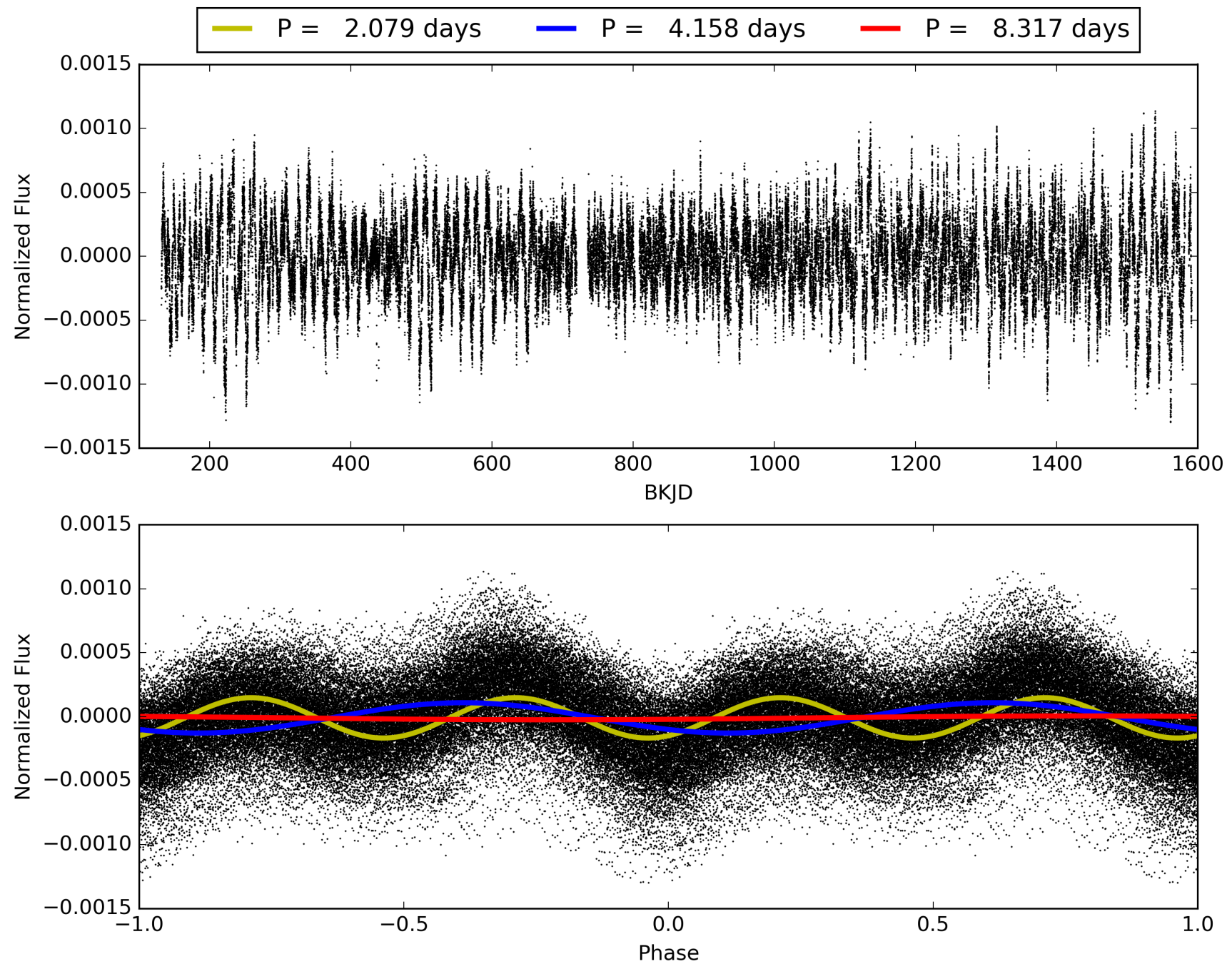
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 007516781-01, PDC Light Curves

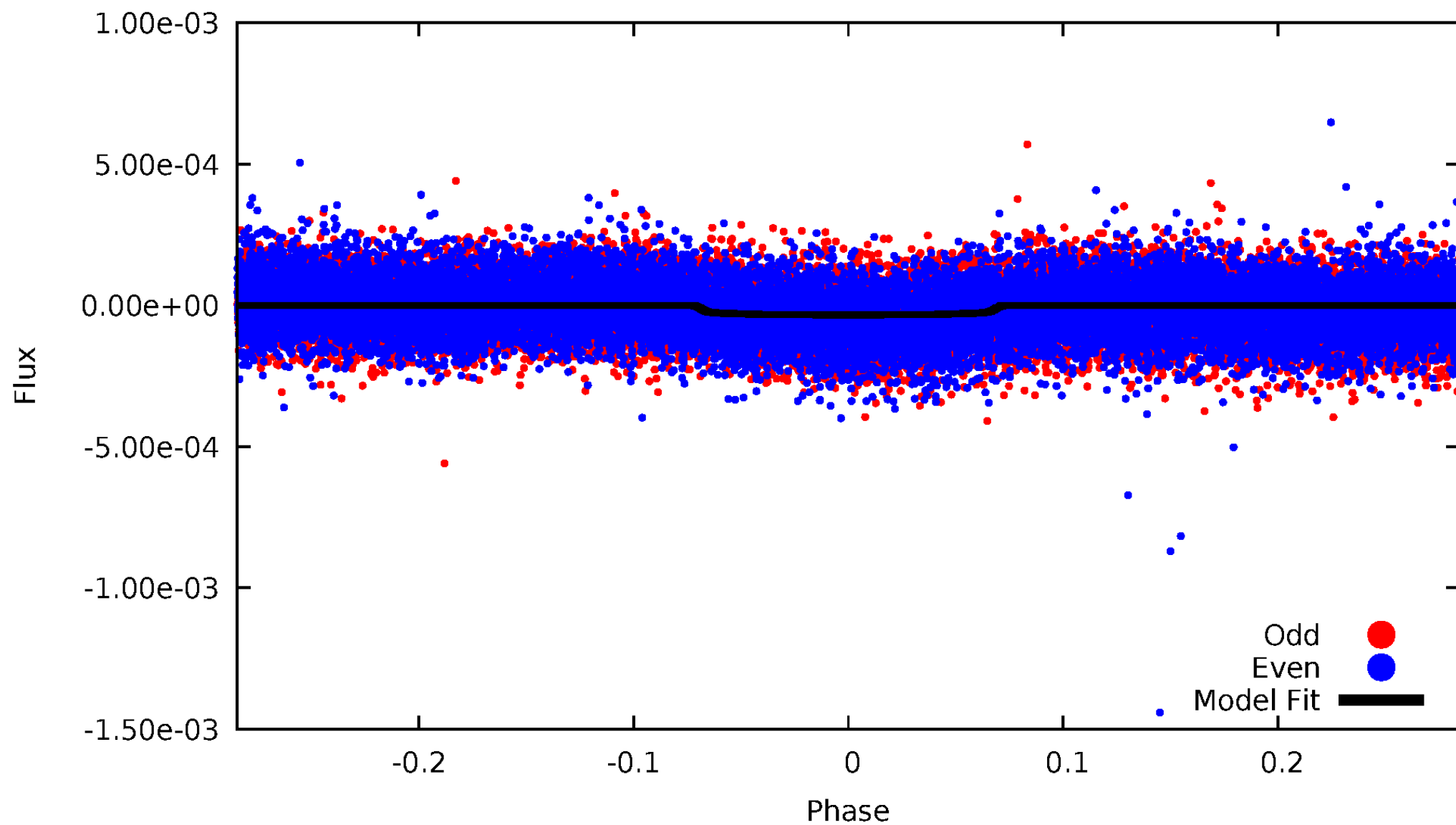


TCE 007516781-01



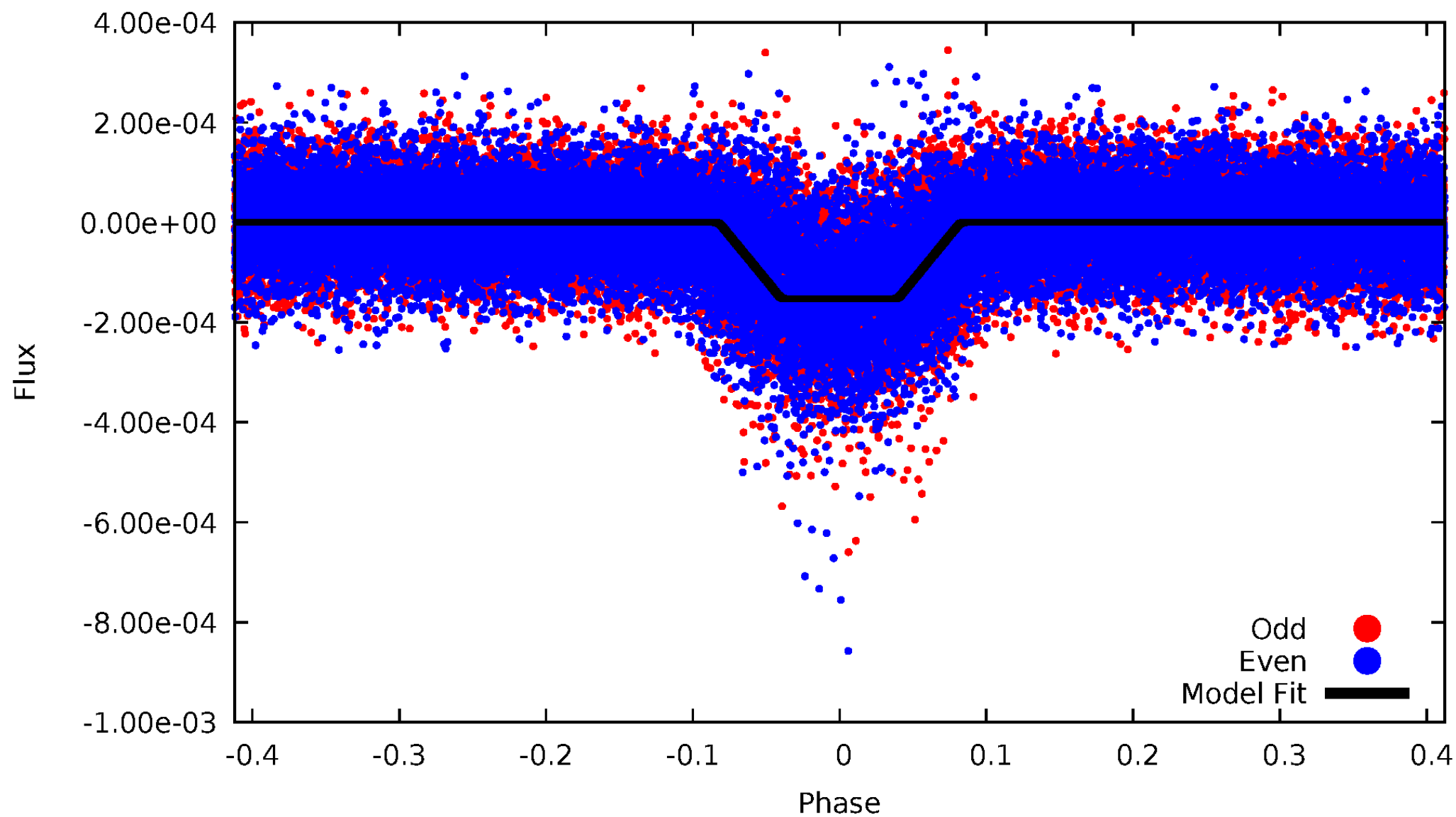
DV Odd/Even

TCE 007516781-01



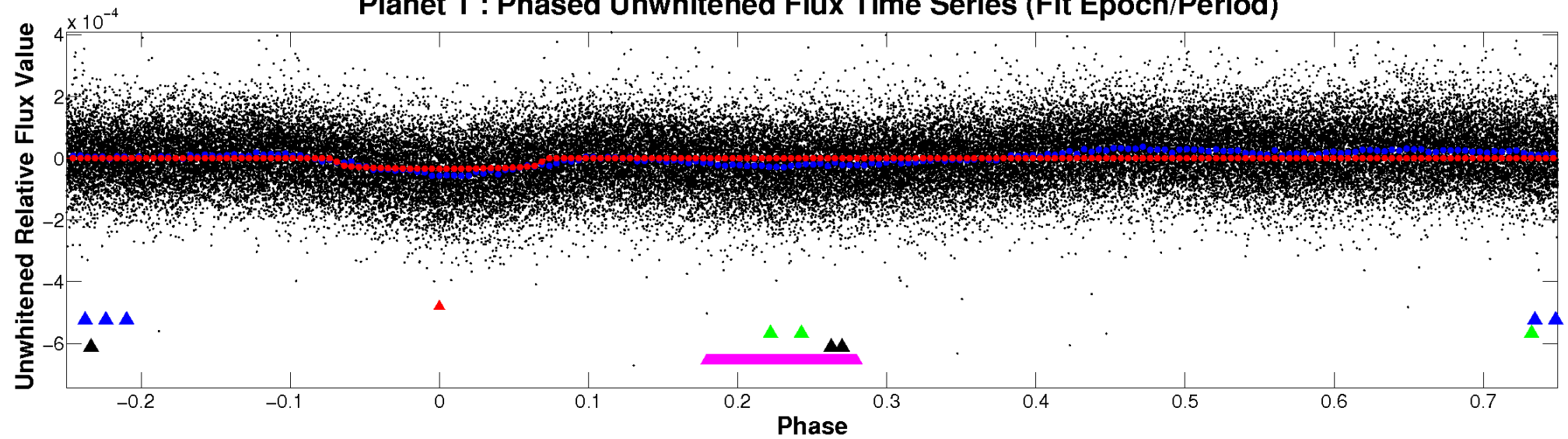
ALT Odd/Even

TCE 007516781-01

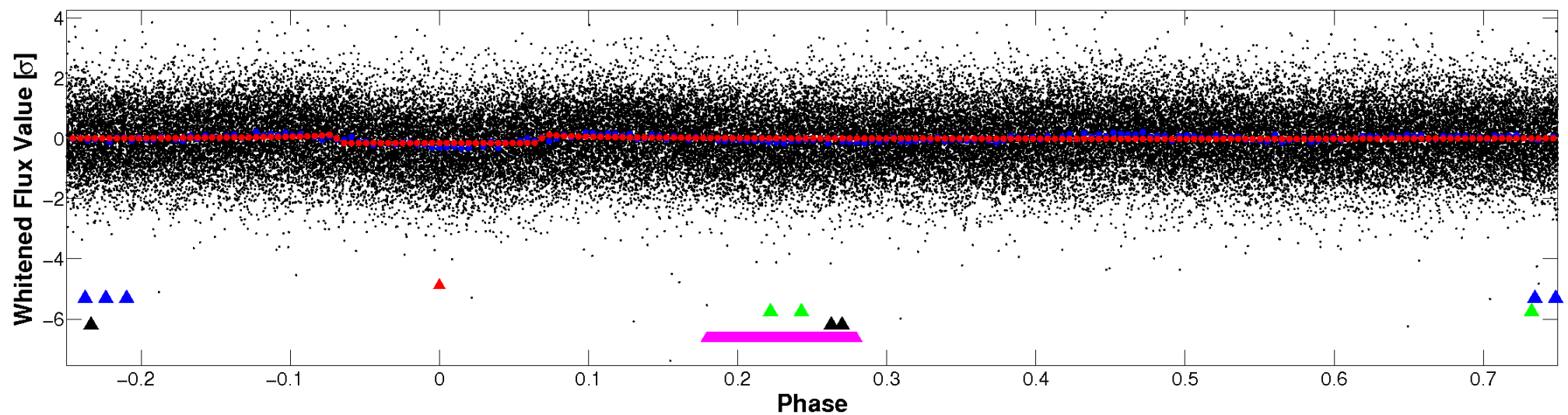


Non-Whitened Vs. Whitened Light Curve

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

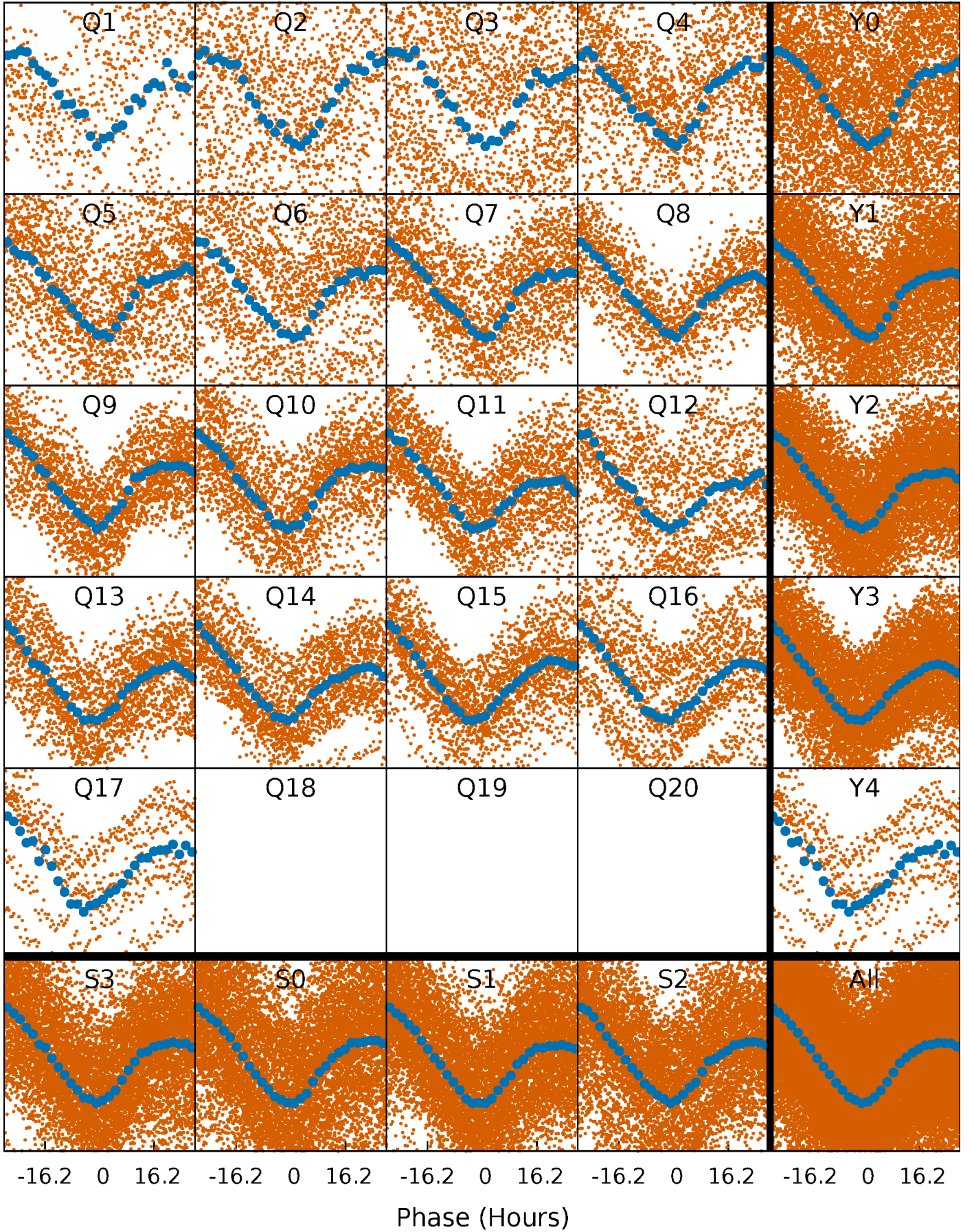


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



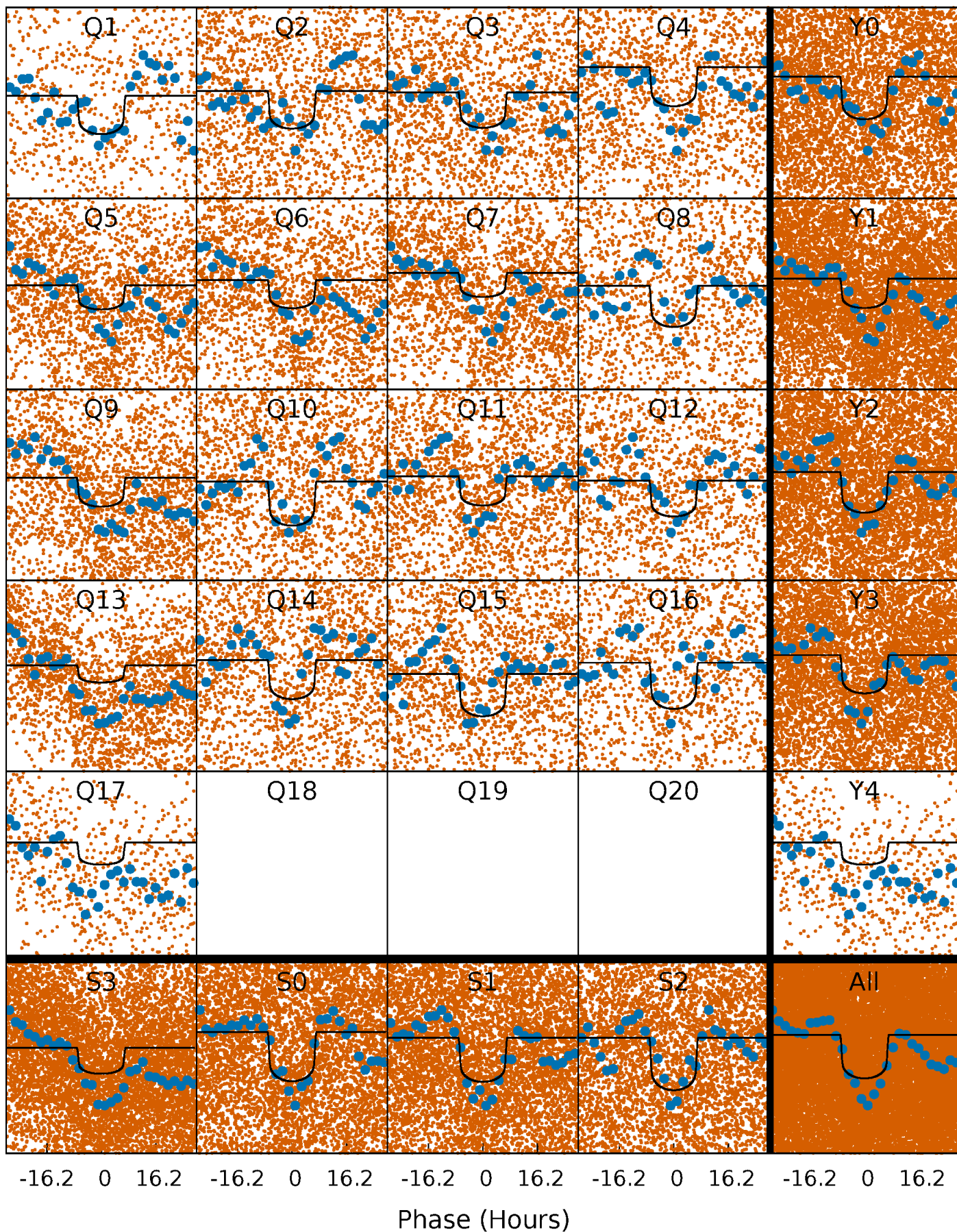
PDC Quarter-Phased Transit Curves

TCE 007516781-01 P= 4.158487 Days $T_0=135.190011$ (BKJD)



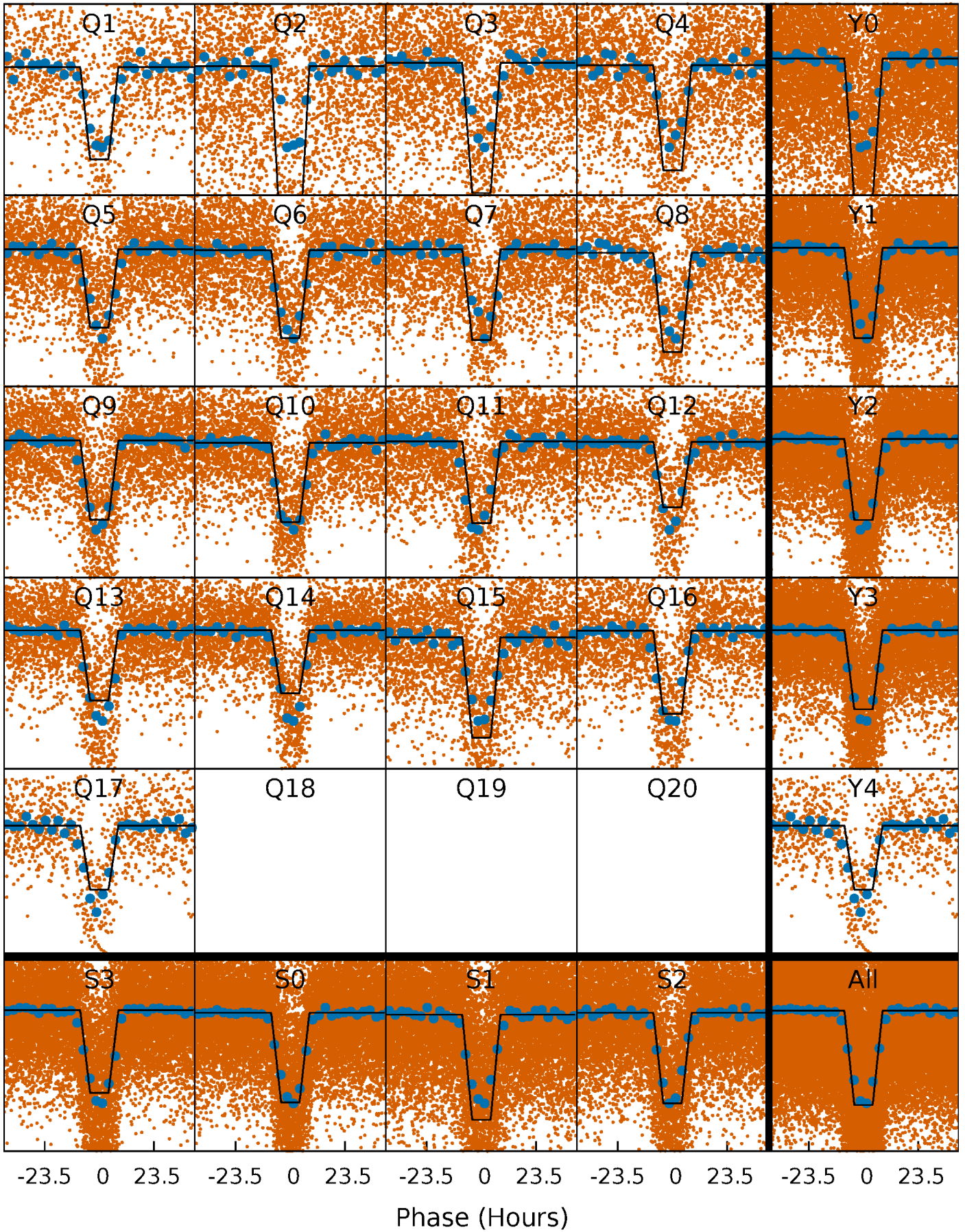
DV Quarter-Phased Transit Curves

TCE 007516781-01 P= 4.158487 Days $T_0=135.190011$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

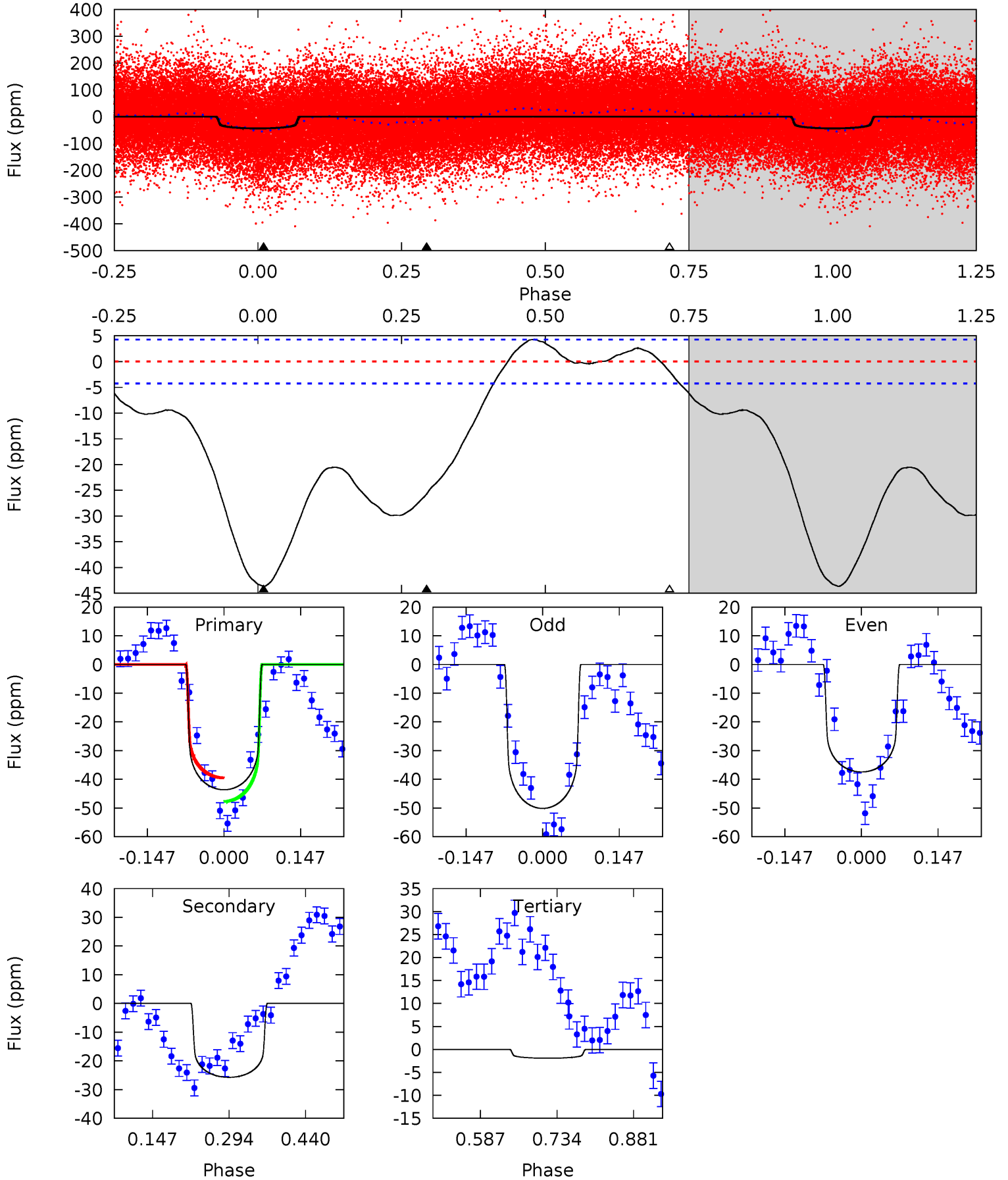
TCE 007516781-01 P= 4.157670 Days $T_0=135.333031$ (BKJD)



DV Model-Shift Uniqueness Test

007516781-01, P = 4.158487 Days, E = 131.031524 Days

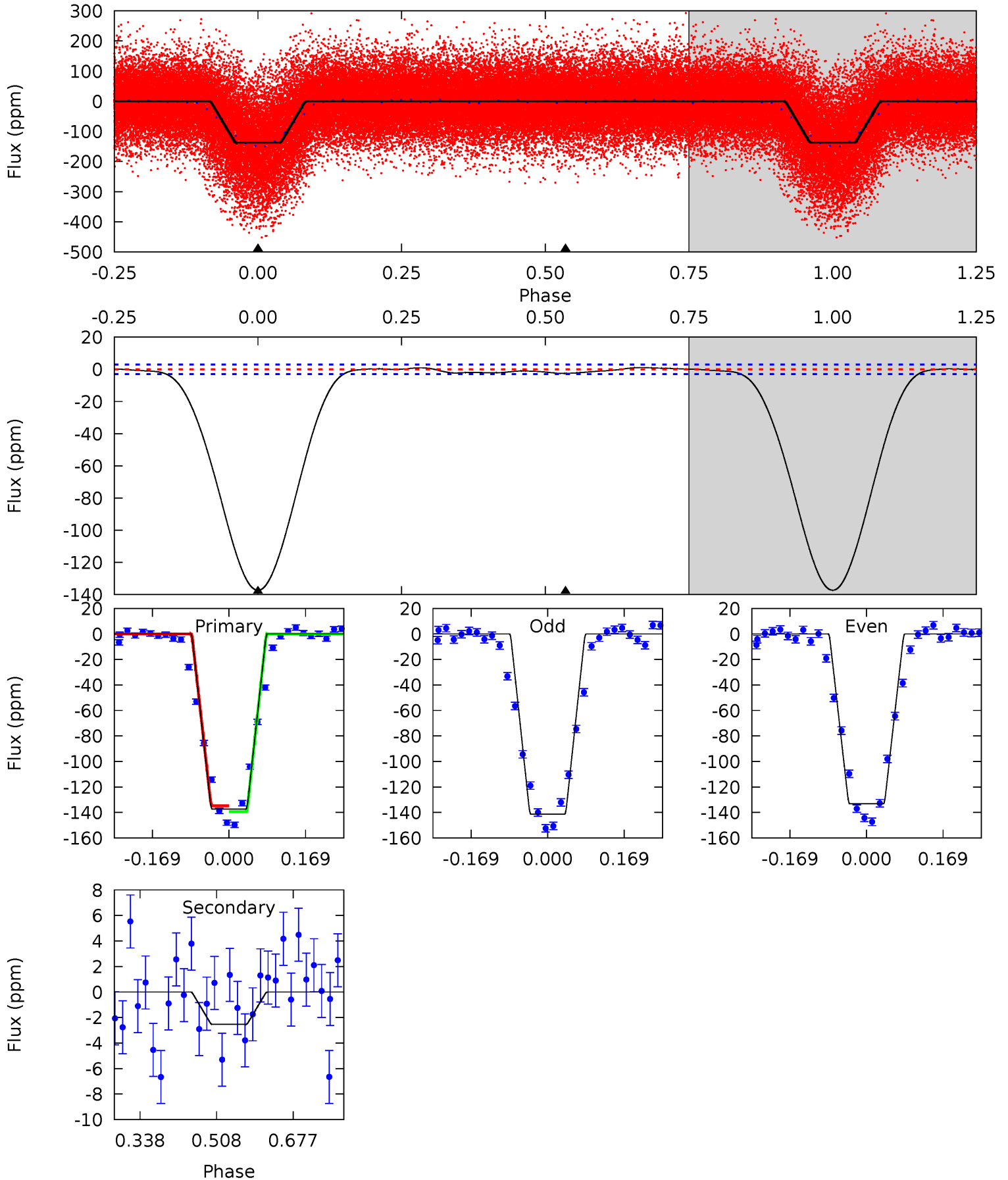
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
45.9	27.1	2.02	0	4.48	1.45	5.15	43.9	45.9	25.1	27.1	6.68	1.14	0.09	4.35



Alt Model-Shift Uniqueness Test

007516781-01, P = 4.157670 Days, E = 131.175361 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
206.8	3.82	0	0	4.45	1.37	1.35	206.8	206.8	3.82	3.82	6.15	1.06	0.01	3.40



Stellar Parameters For KIC 007516781

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6844^{+189}_{-307}	$4.274^{+0.075}_{-0.210}$	$0.070^{+0.200}_{-0.350}$	$1.426^{+0.511}_{-0.219}$	$1.394^{+0.218}_{-0.218}$	$0.677^{+0.284}_{-0.381}$
	+3%/-4%	+2%/-5%	+286%/-500%	+36%/-15%	+16%/-16%	+42%/-56%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 007516781-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-26 ± 1	$1.00^{+0.17}_{-0.13}$	2141^{+176}_{-116}	6105^{+281}_{-292}	44^{+12}_{-11}
Alt.	-3 ± 1	$1.97^{+0.38}_{-0.20}$	2148^{+186}_{-114}	2931^{+145}_{-217}	$1.062^{+0.447}_{-0.364}$

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

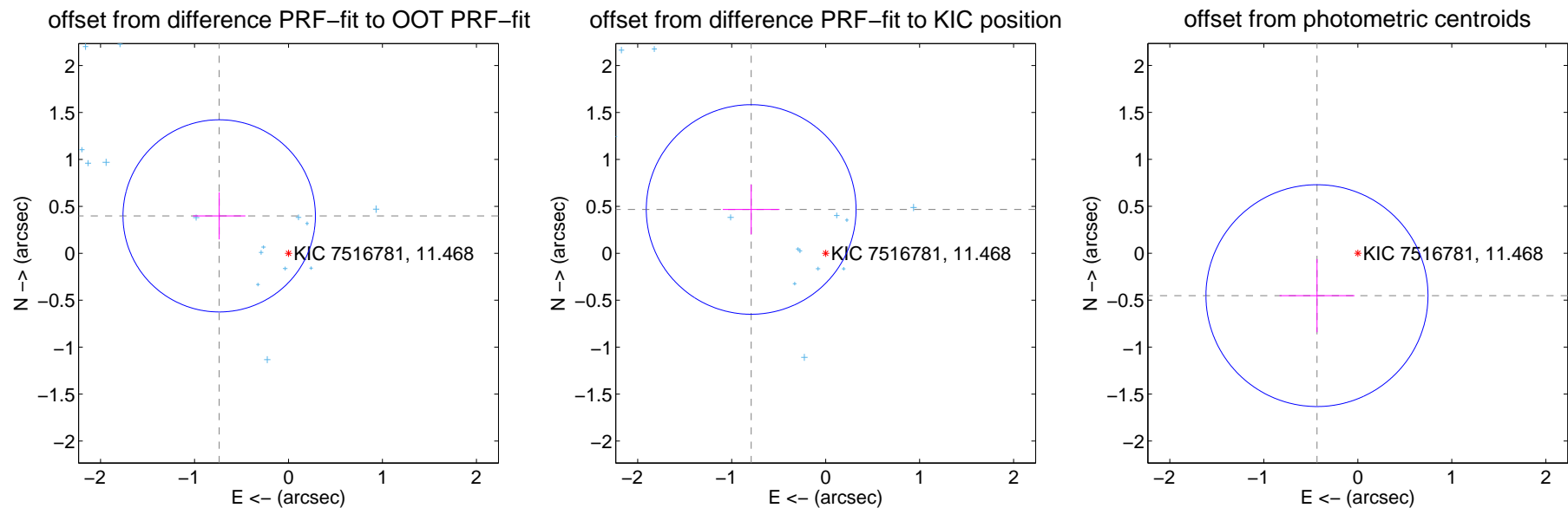
DV Centroid Data

Supplemental centroid analysis for 007516781-01. **Kepler magnitude: 11.47.** Transit SNR 15.07

There are 17 quarters with good PRF difference image offsets

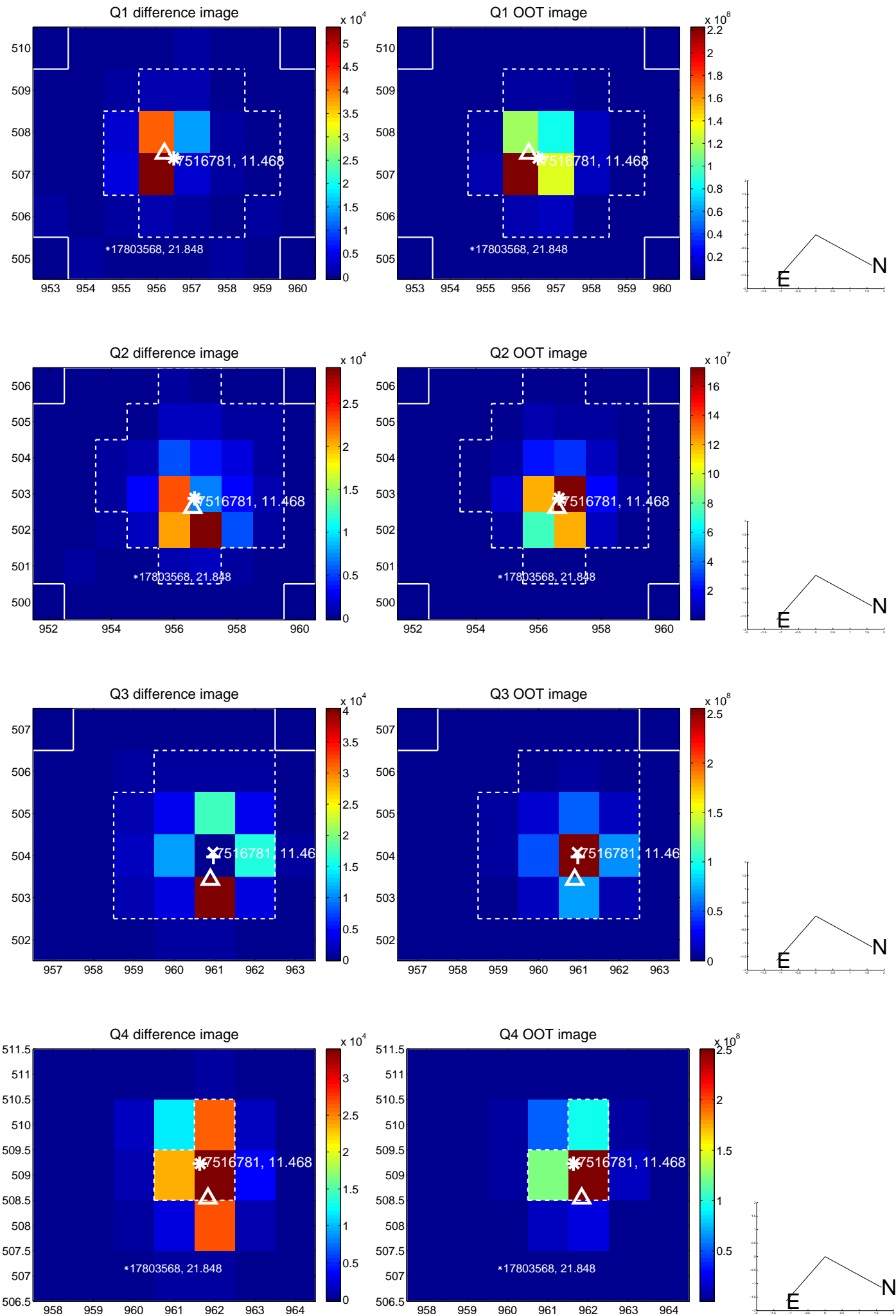
The direct PRF centroid is offset from the target star catalog position by about 0.02 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.838 ± 0.341	2.46	0.737 ± 0.279	0.399 ± 0.251
PRF-fit source offset from KIC position	0.920 ± 0.372	2.47	0.793 ± 0.302	0.467 ± 0.265
photometric centroid source offset	0.63 ± 0.39	1.59	0.43 ± 0.40	-0.45 ± 0.39

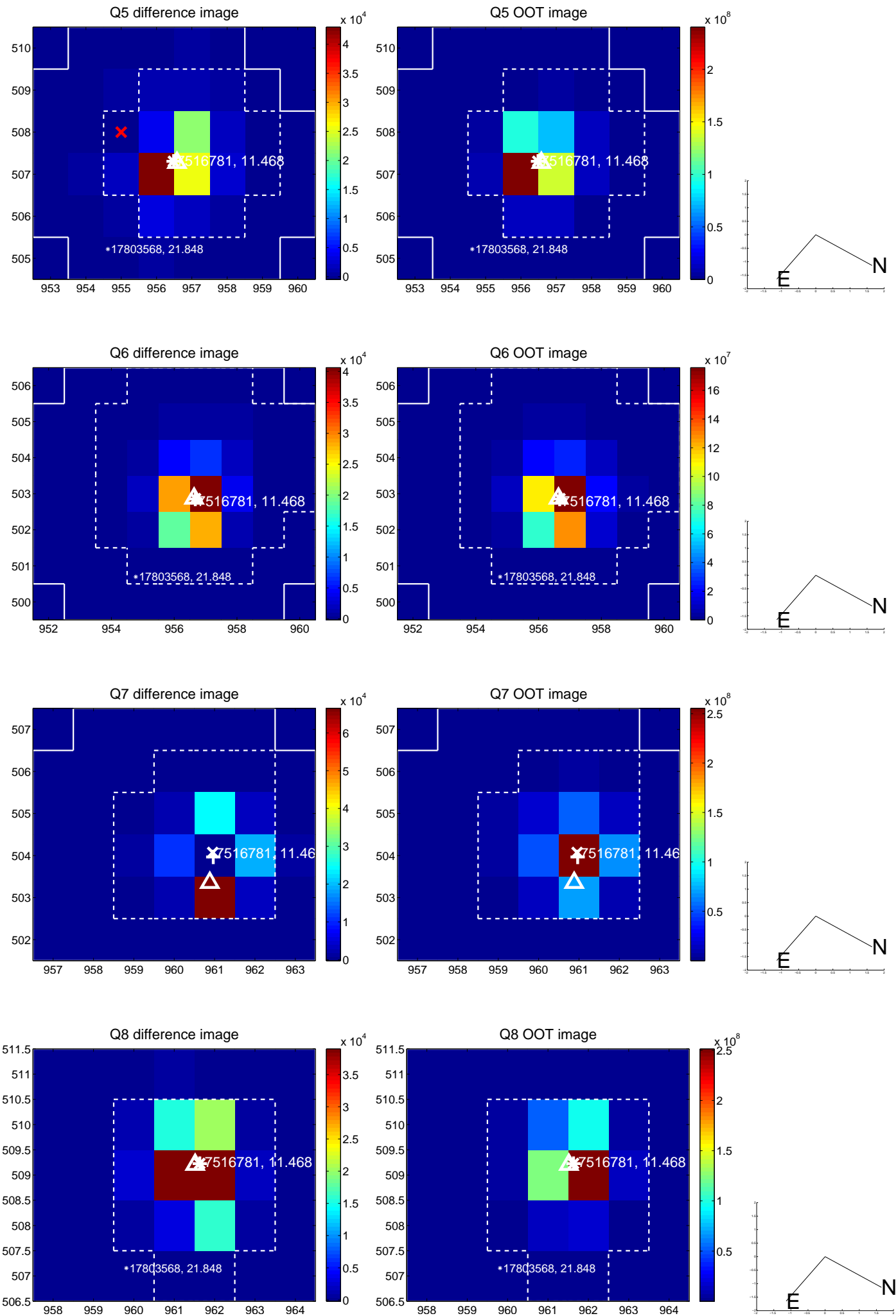


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

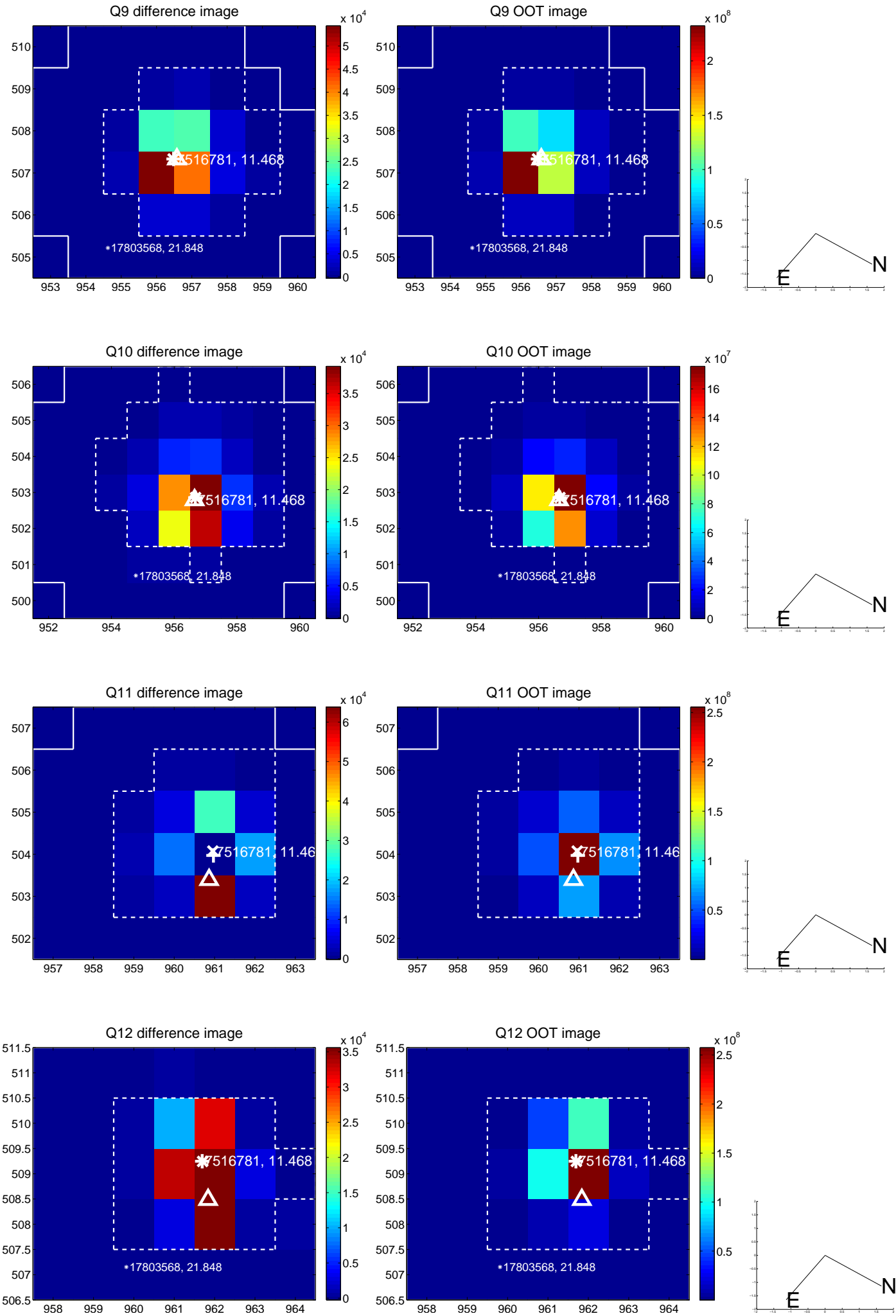
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



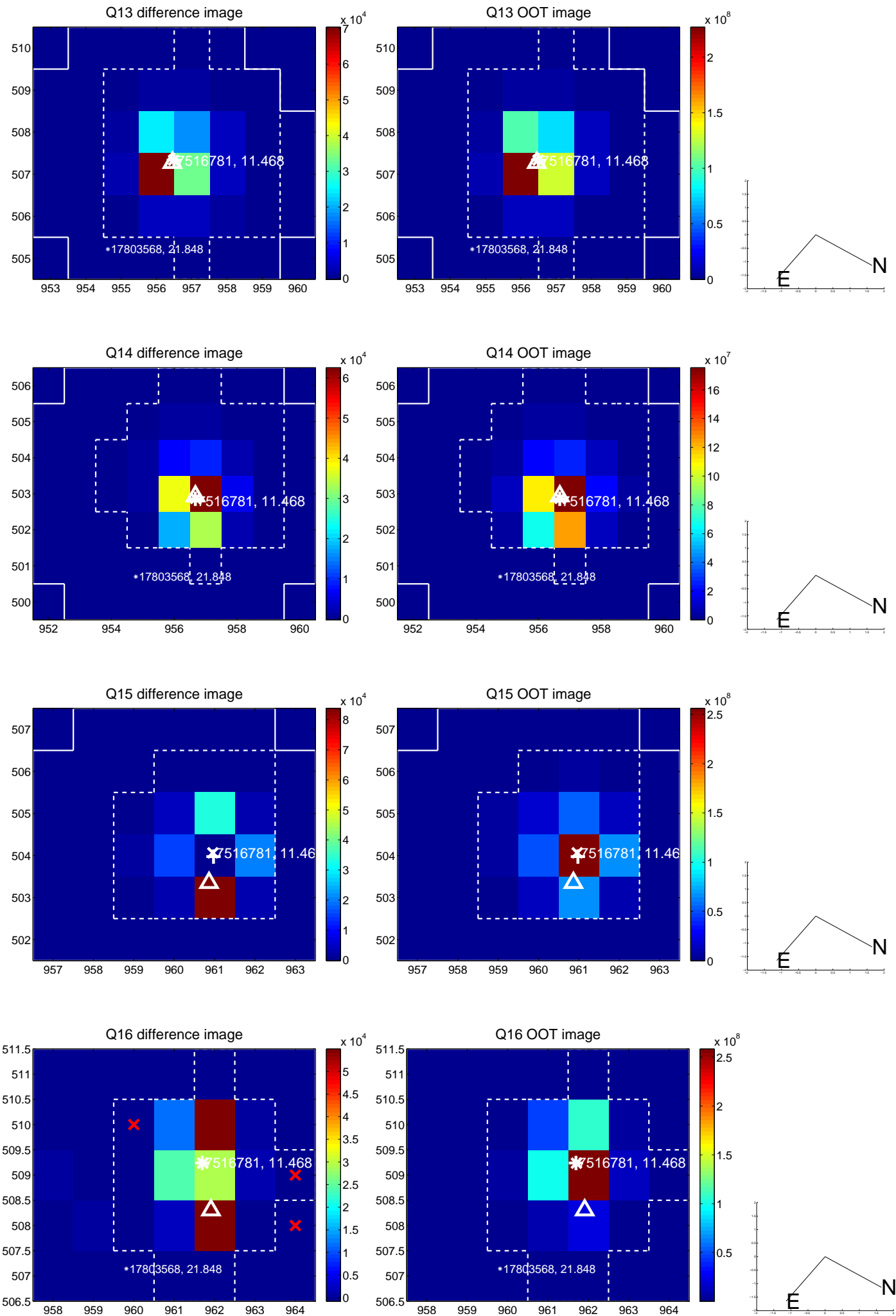
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



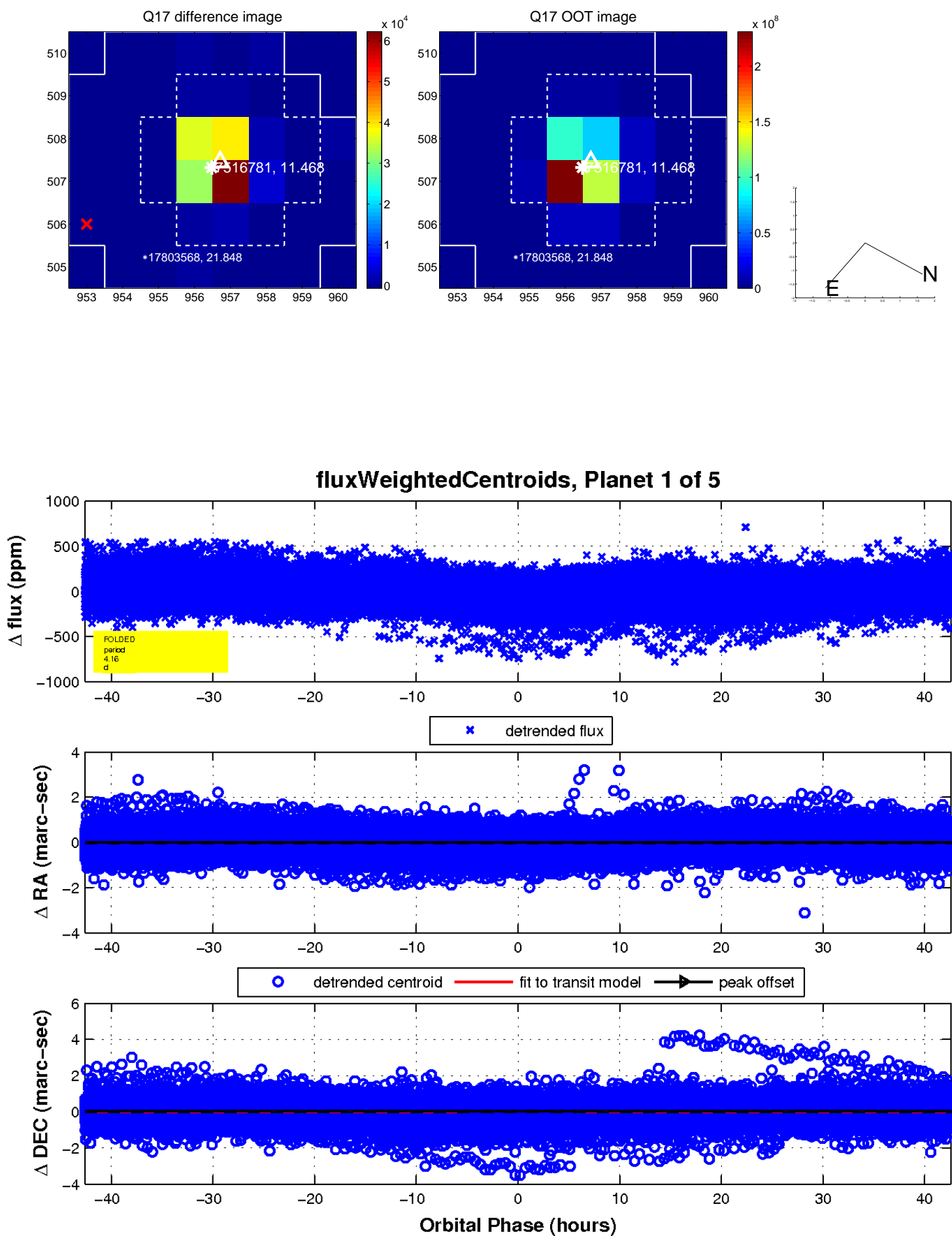
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

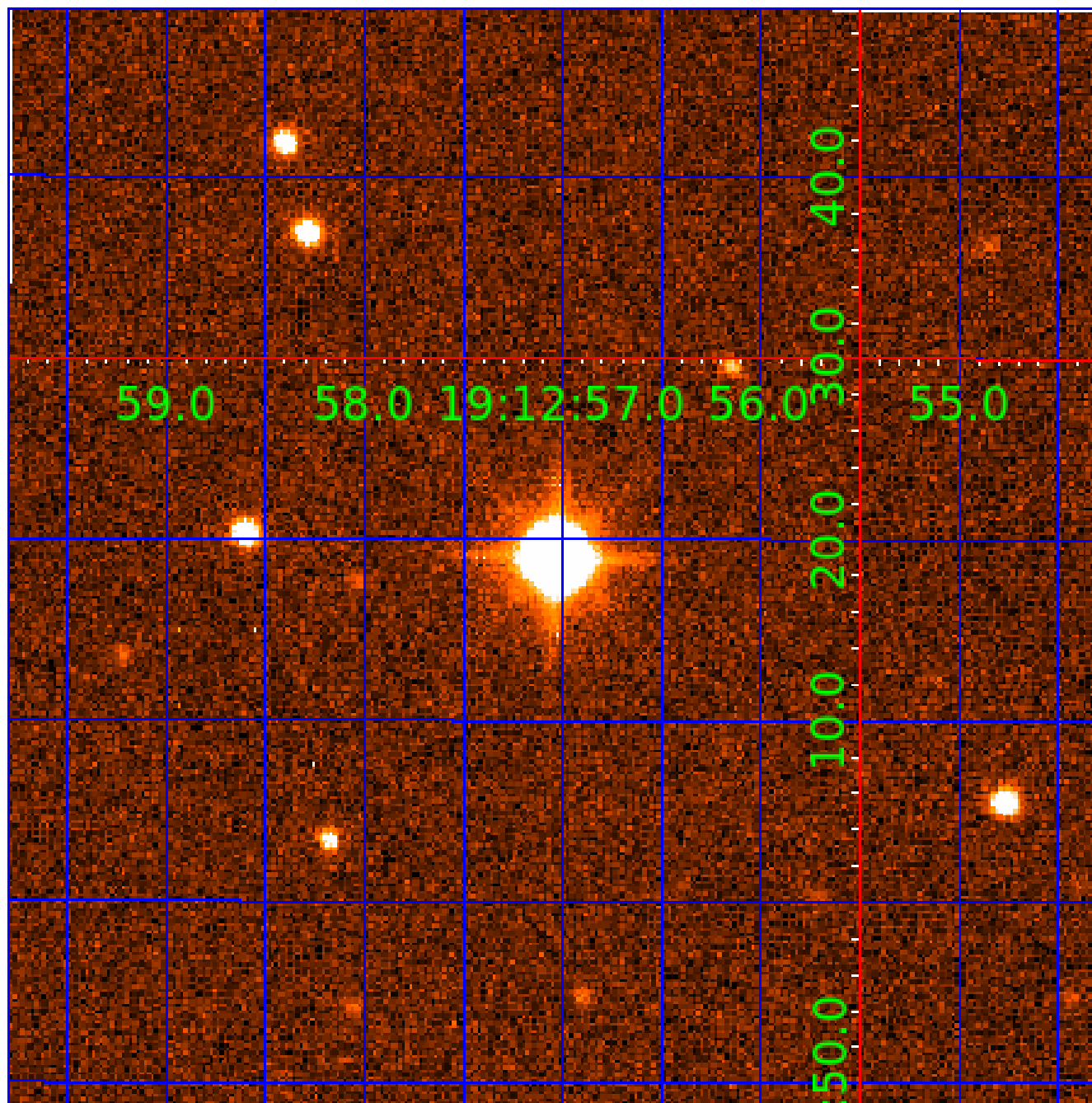


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007516781

Q1-17 DR25 TCE Parameters

TCE	Run Type	KOI?	Period (Days)	Epoch (BKJD)	Depth (ppm)	Duration (Hours)	MES	SNR	R_{\star} (R_{\odot})	T_{\star} (K)	R_p (R_{\oplus})	S_p (S_{\oplus})
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Robovetter Results

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007516781-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007516781-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED

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

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

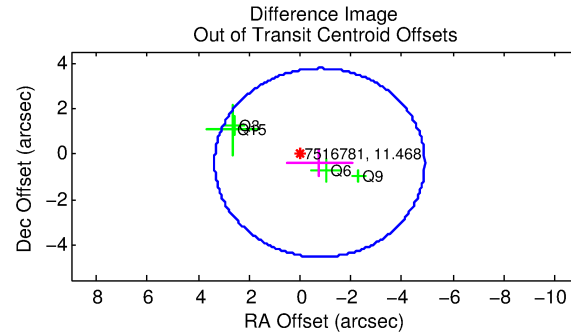
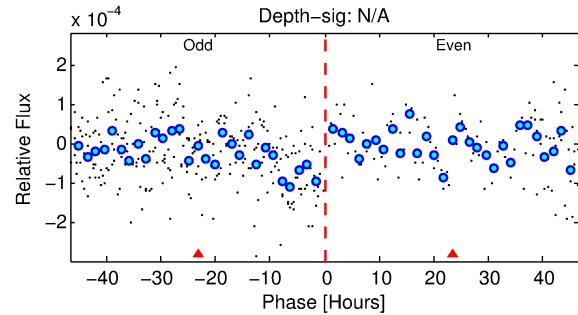
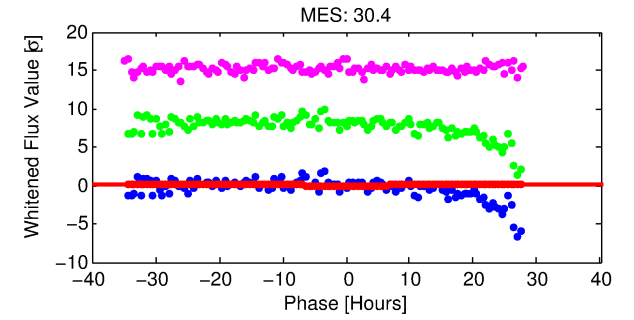
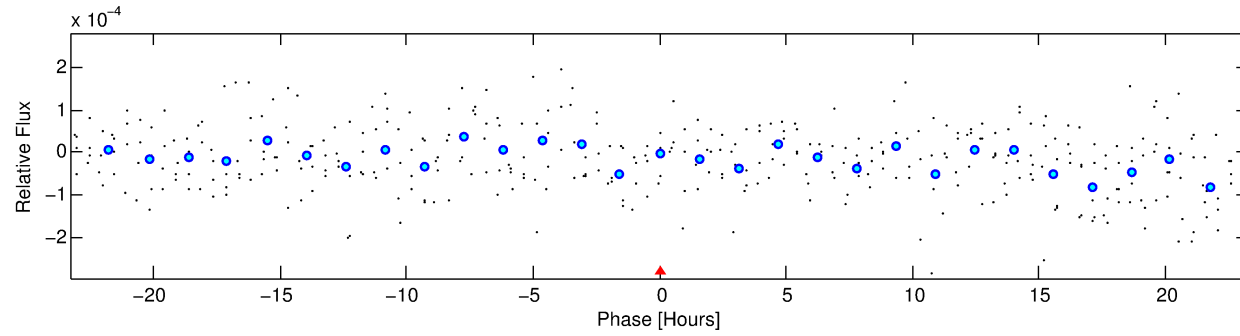
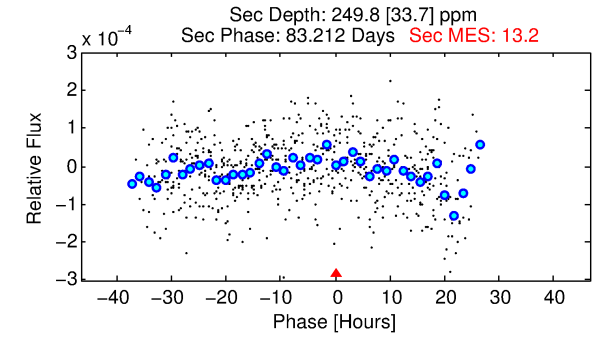
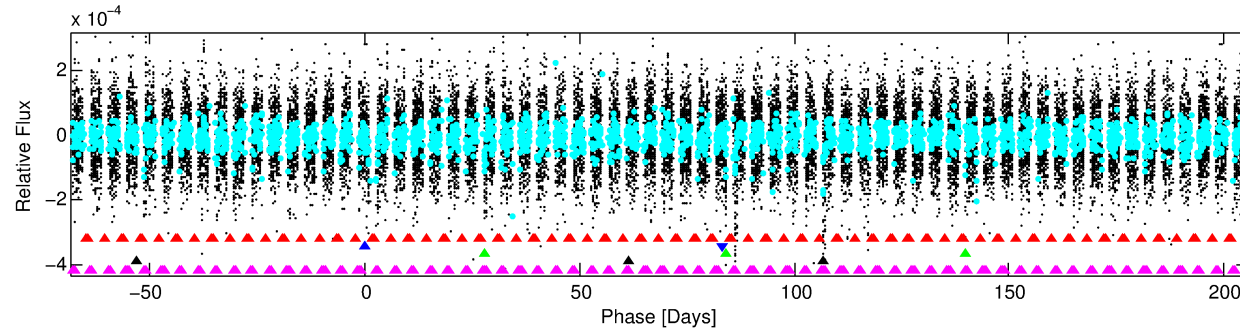
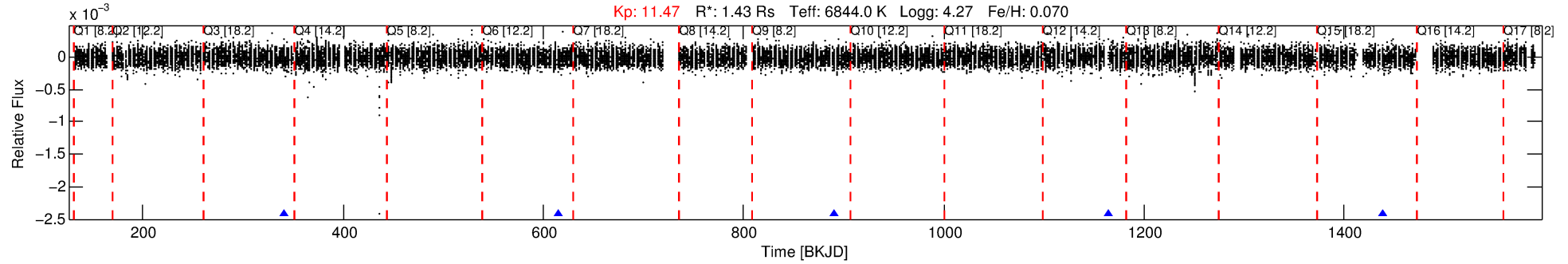
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007516781-02

No Significant Match Found

DV One-Page Summary

KIC: 7516781 Candidate: 2 of 5 Period: 274.402 d



TPS TCE Results:

Period = 274.40228 d
Epoch = 342.2423 BKJD

DV fit results are unavailable

DV Diagnostic Results:

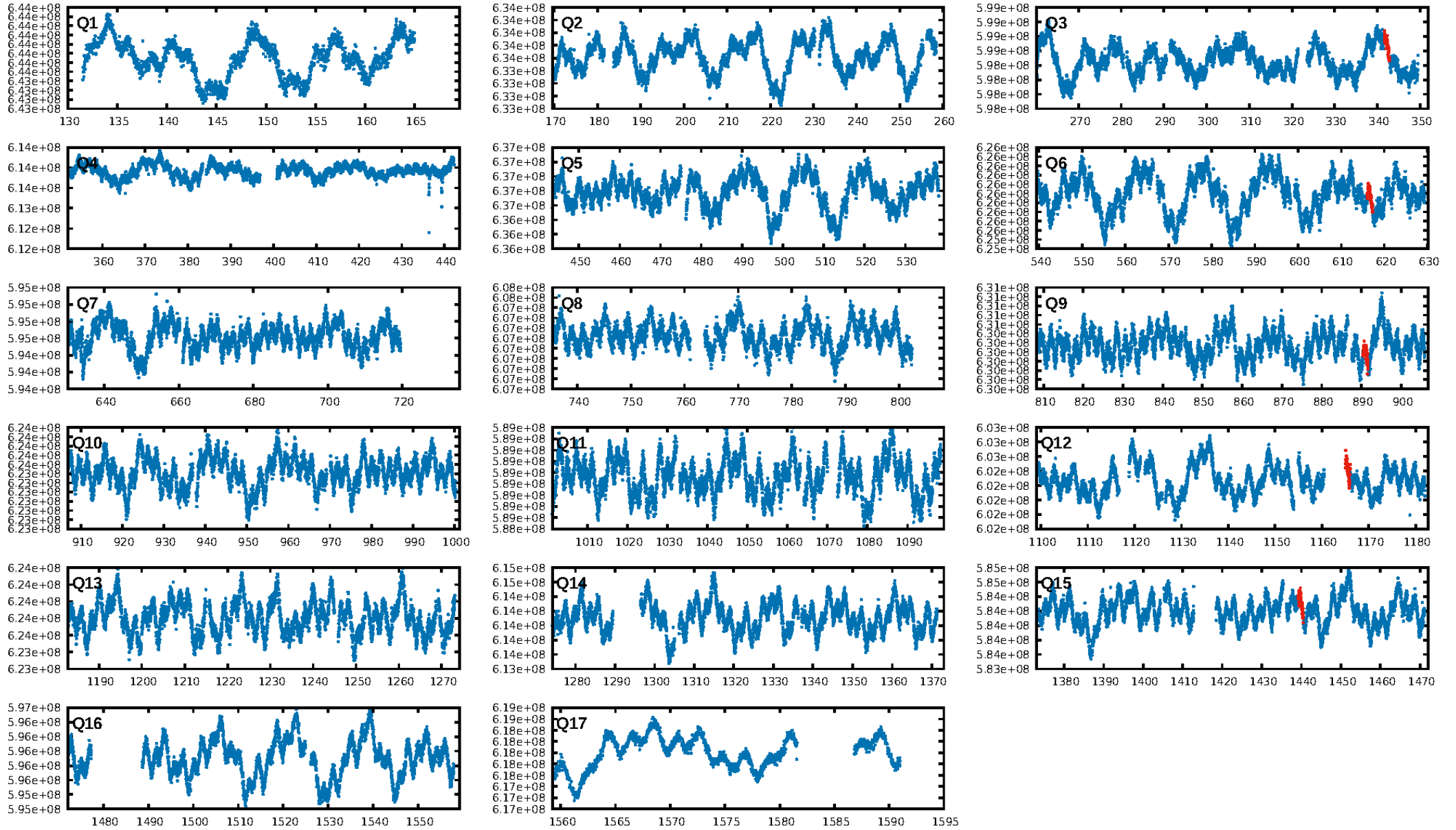
ShortPeriod-sig: 100.0% [216.69σ]
LongPeriod-sig: 100.0% [141.73σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 4.99e-245
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -1.525

Centroid-sig: 1.4%
Centroid-so: 19.496 arcsec [1.68σ]
OotOffset-rm: 0.858 arcsec [0.62σ]
KicOffset-rm: 0.779 arcsec [0.57σ]
OotOffset-st: 1/2/0/1 [4]
KicOffset-st: 1/2/0/1 [4]
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DiffImageOverlap-fno: 0.75 [3/4]

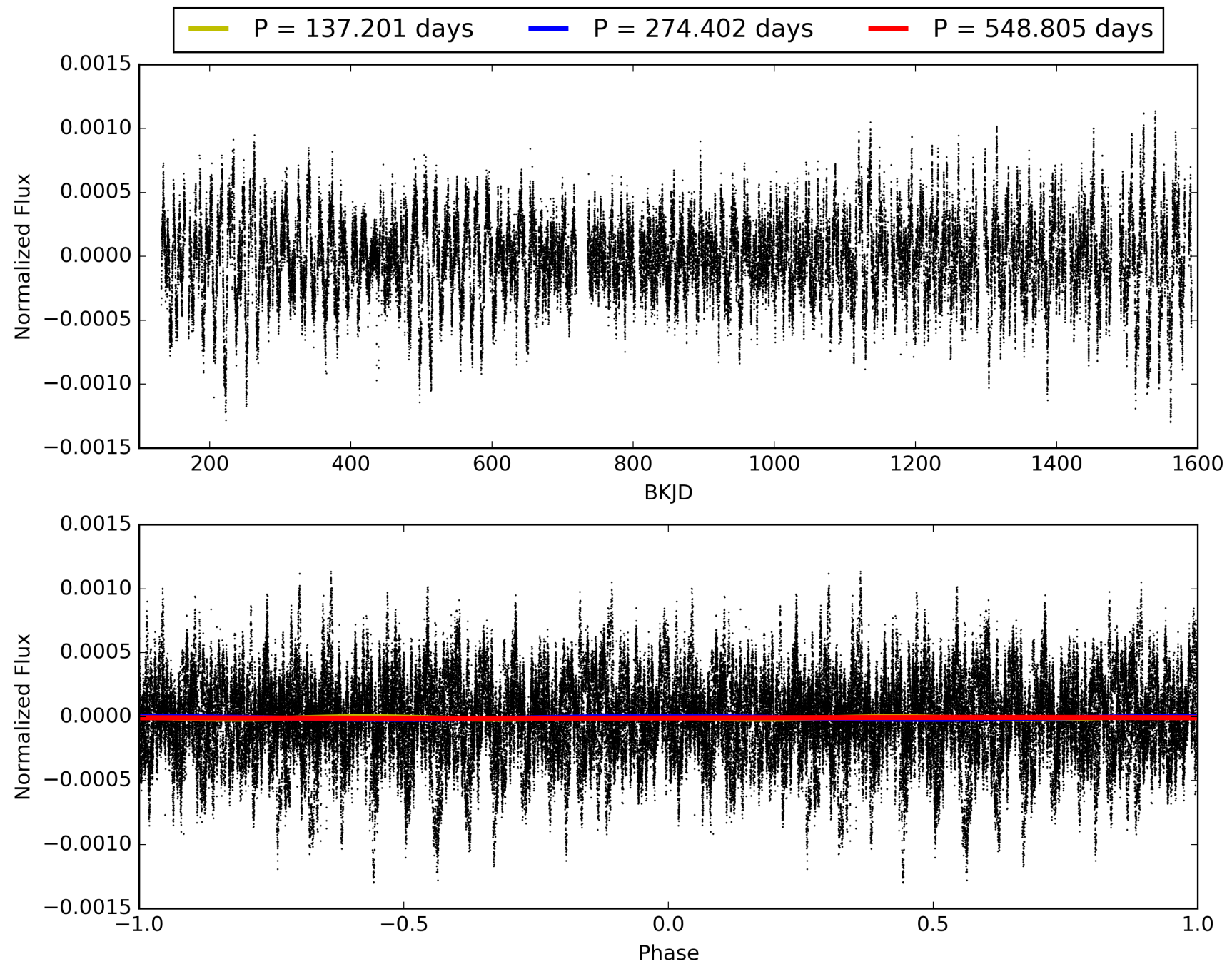
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:00:29 Z

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

TCE 007516781-02, PDC Light Curves

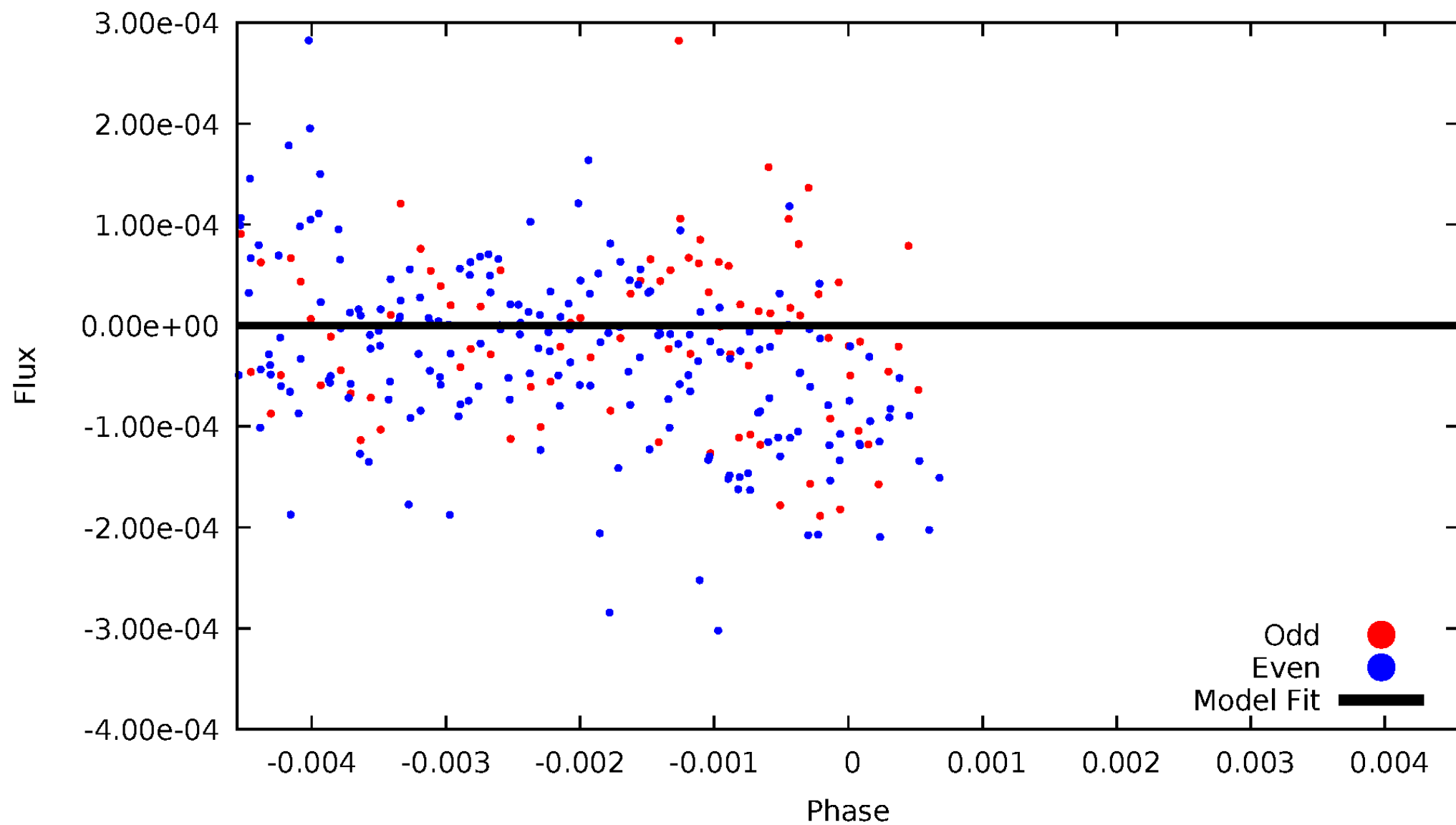


TCE 007516781-02



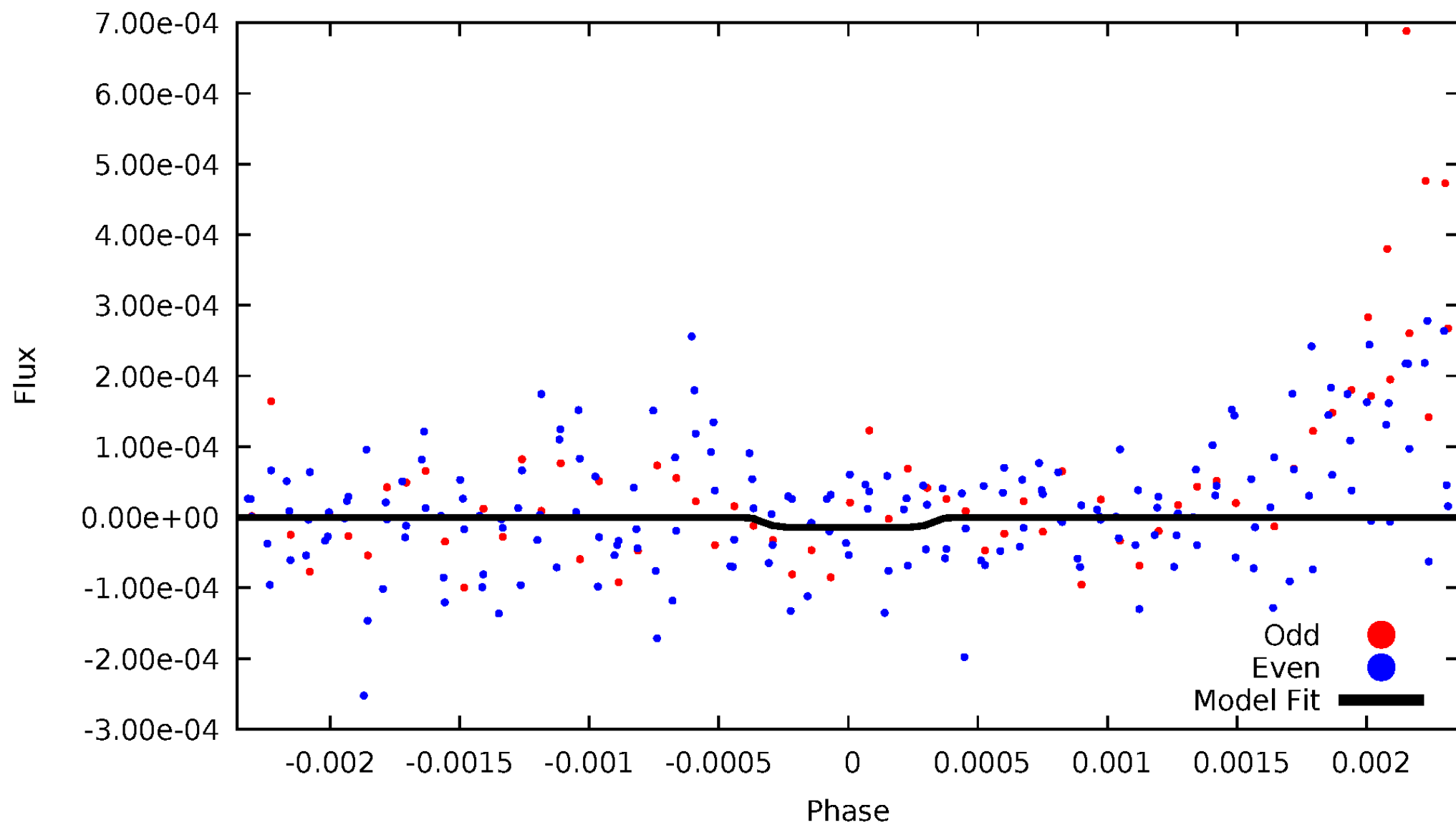
DV Odd/Even

TCE 007516781-02



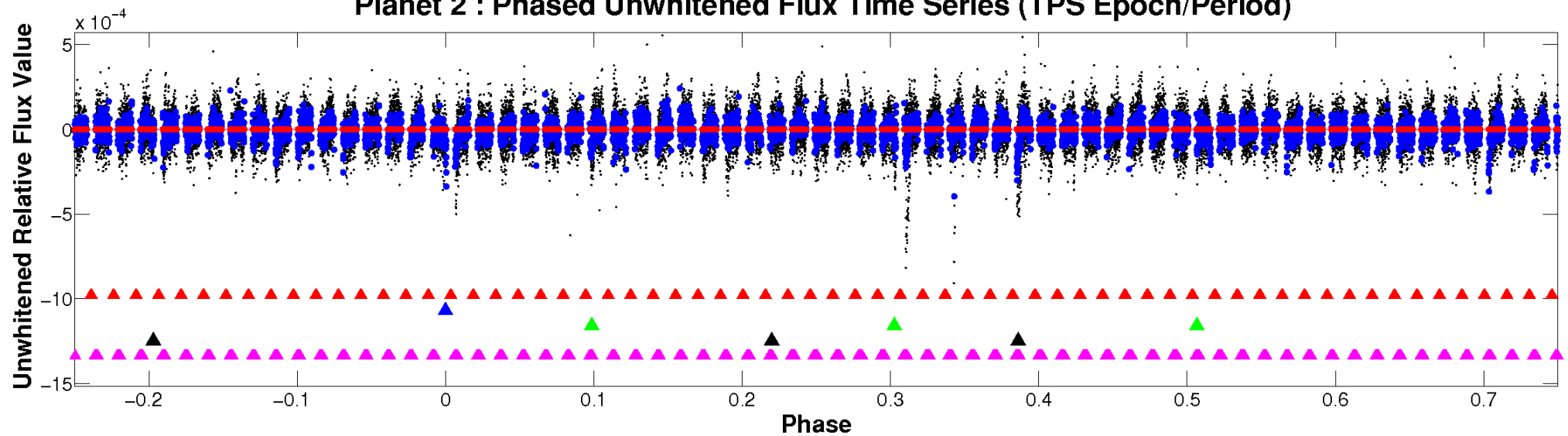
ALT Odd/Even

TCE 007516781-02

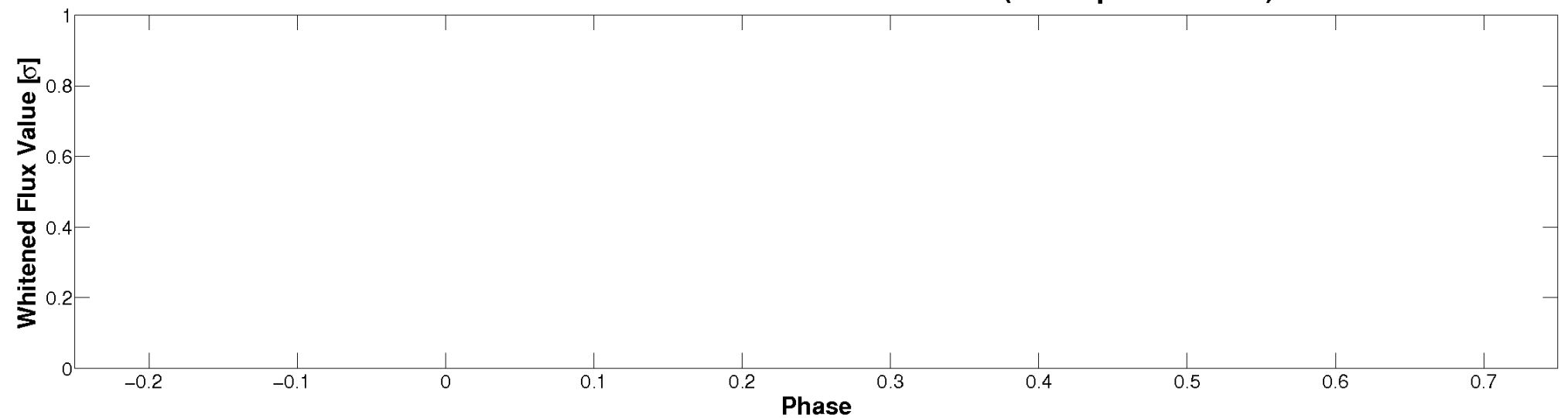


Non-Whitened Vs. Whitened Light Curve

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

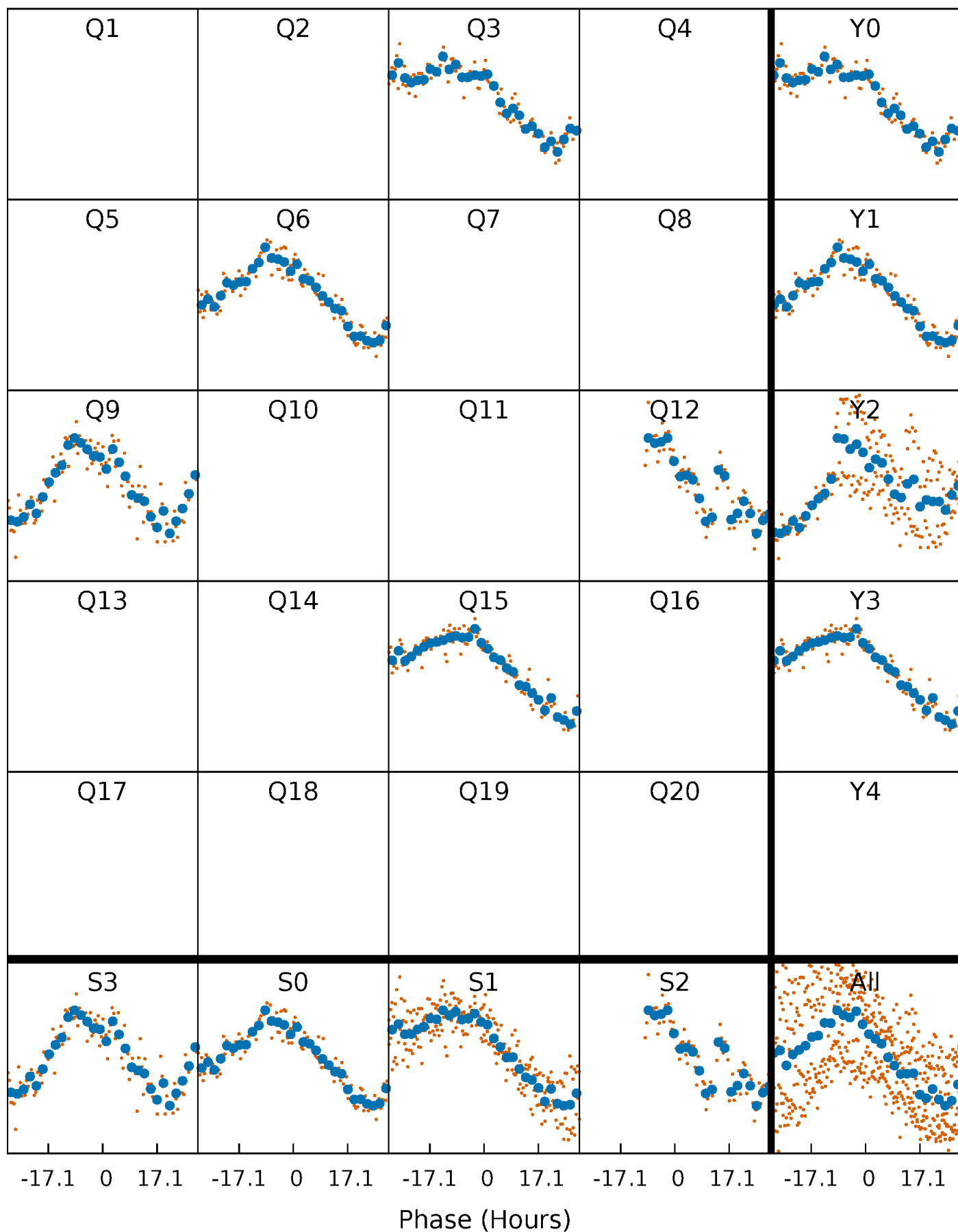


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



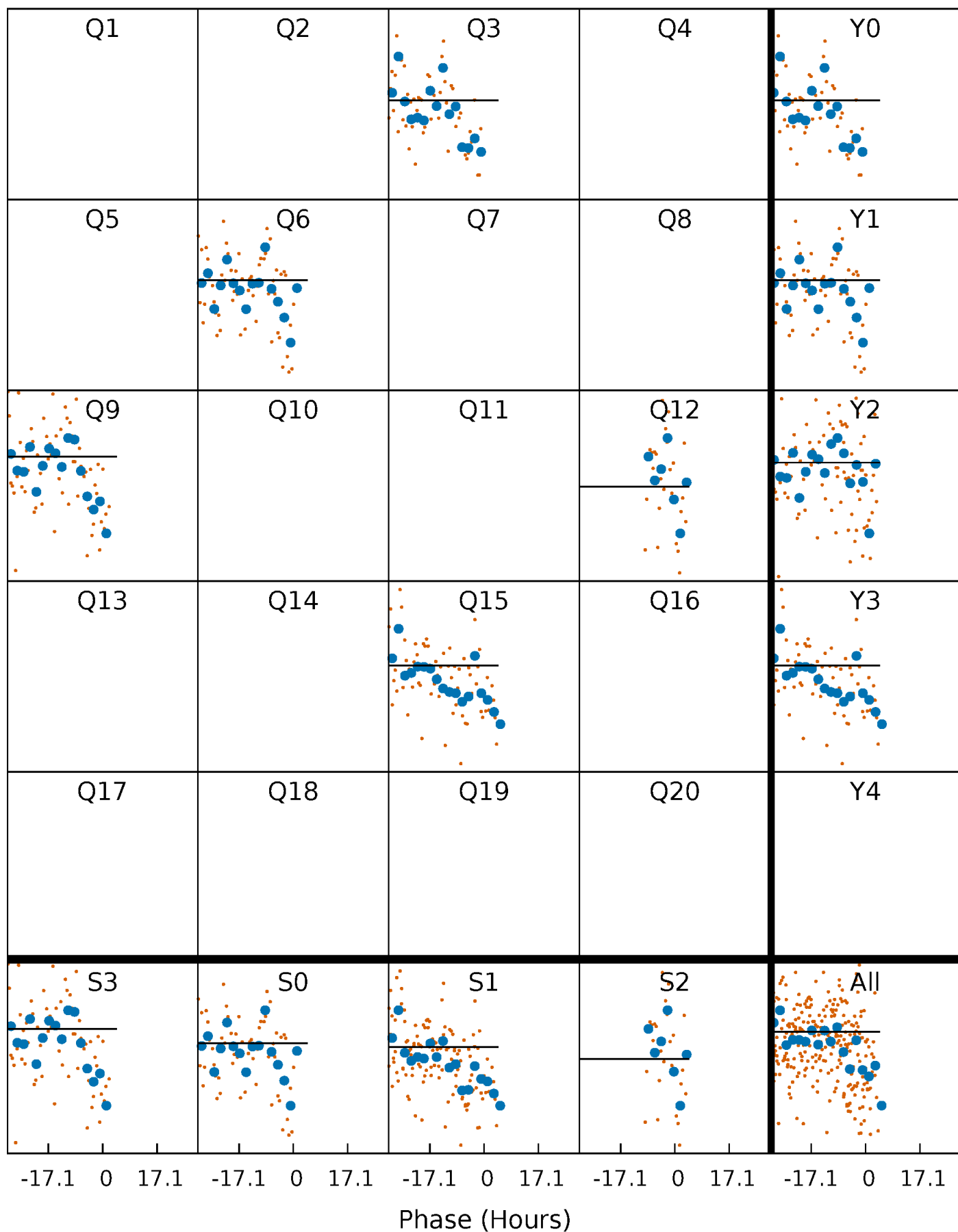
PDC Quarter-Phased Transit Curves

TCE 007516781-02 $P=274.402277$ Days $T_0=342.242298$ (BKJD)



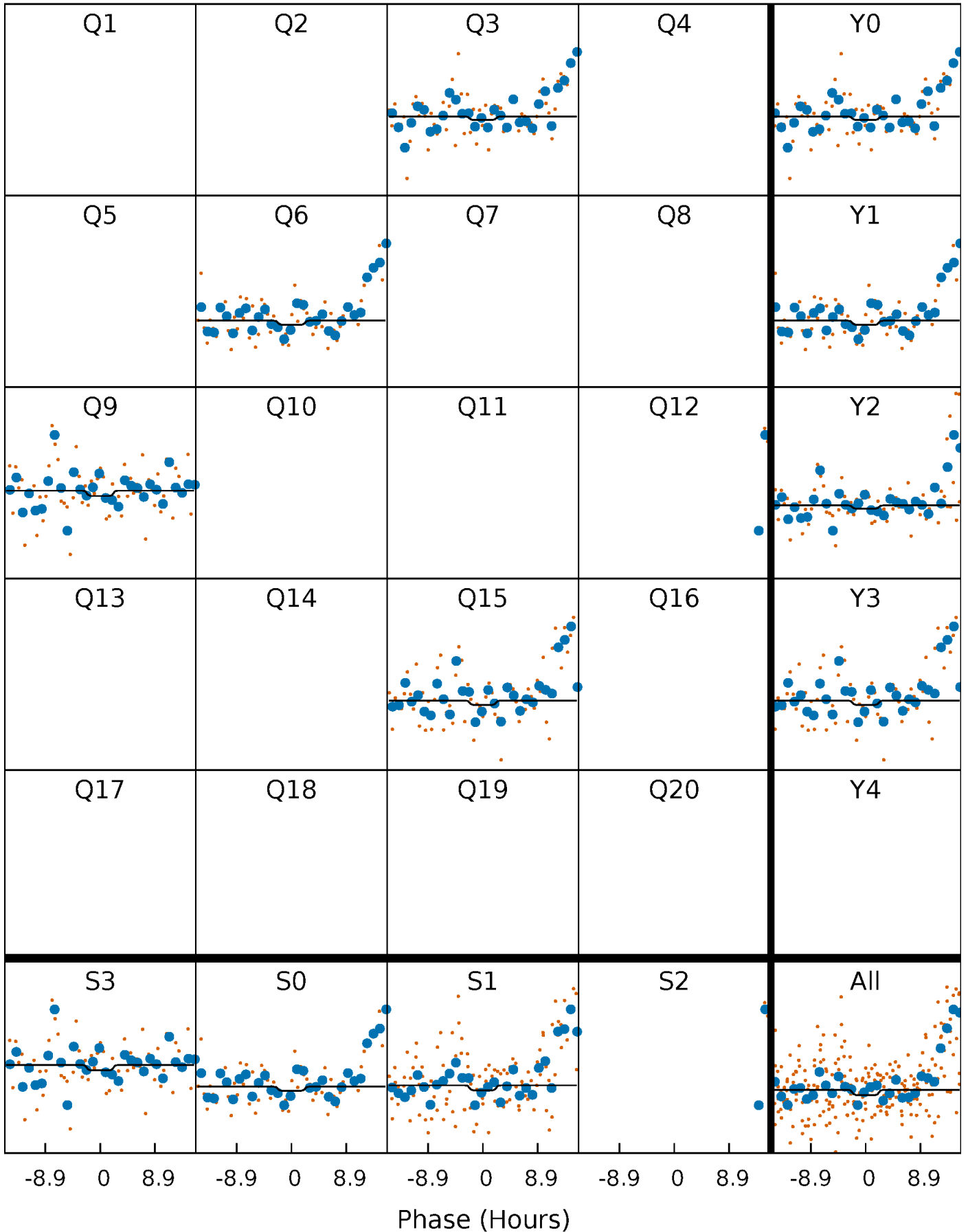
DV Quarter-Phased Transit Curves

TCE 007516781-02 $P=274.402277$ Days $T_0=342.242298$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

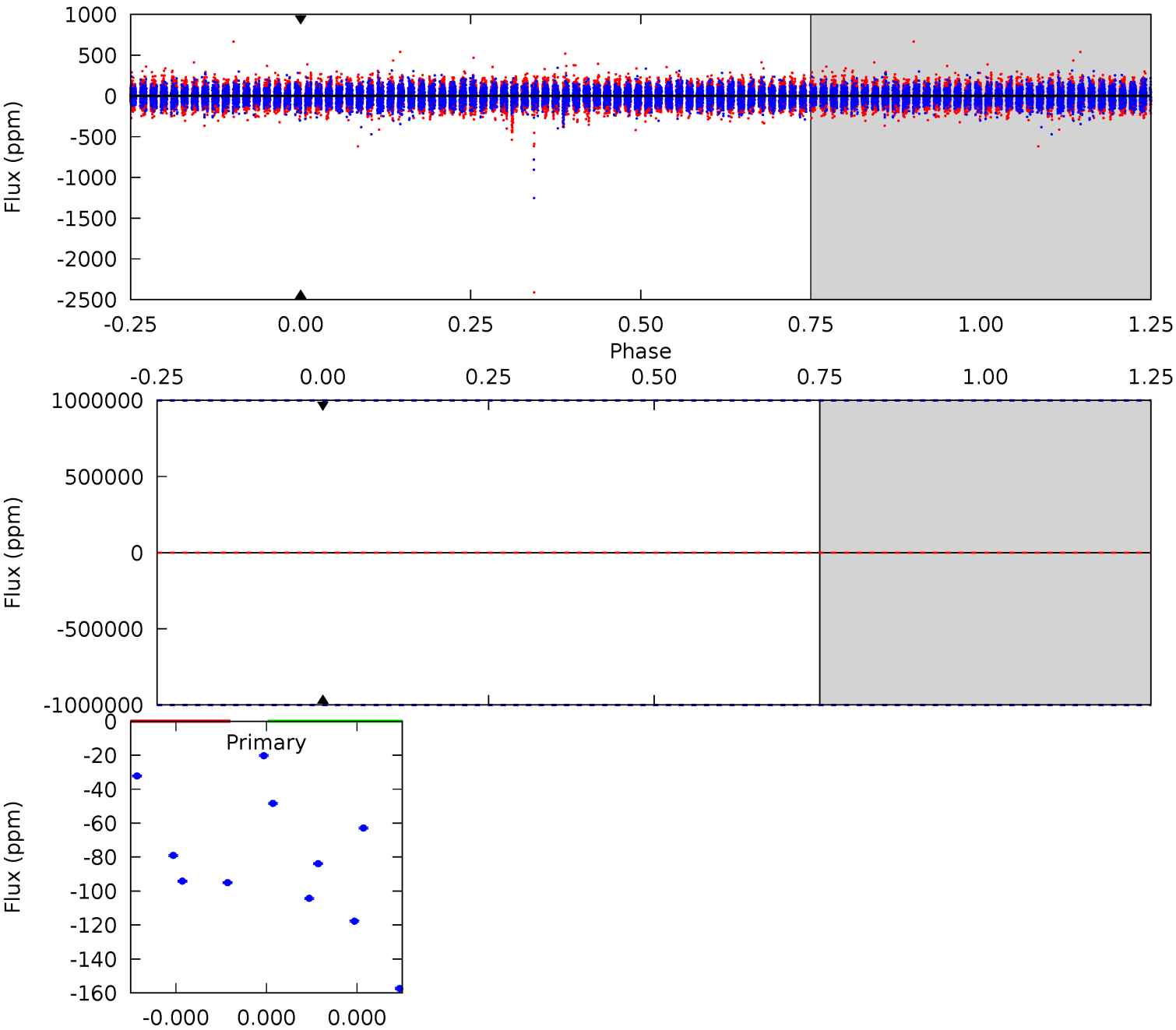
TCE 007516781-02 P=274.402277 Days $T_0=341.304328$ (BKJD)



DV Model-Shift Uniqueness Test

007516781-02, P = 274.402277 Days, E = 67.840021 Days

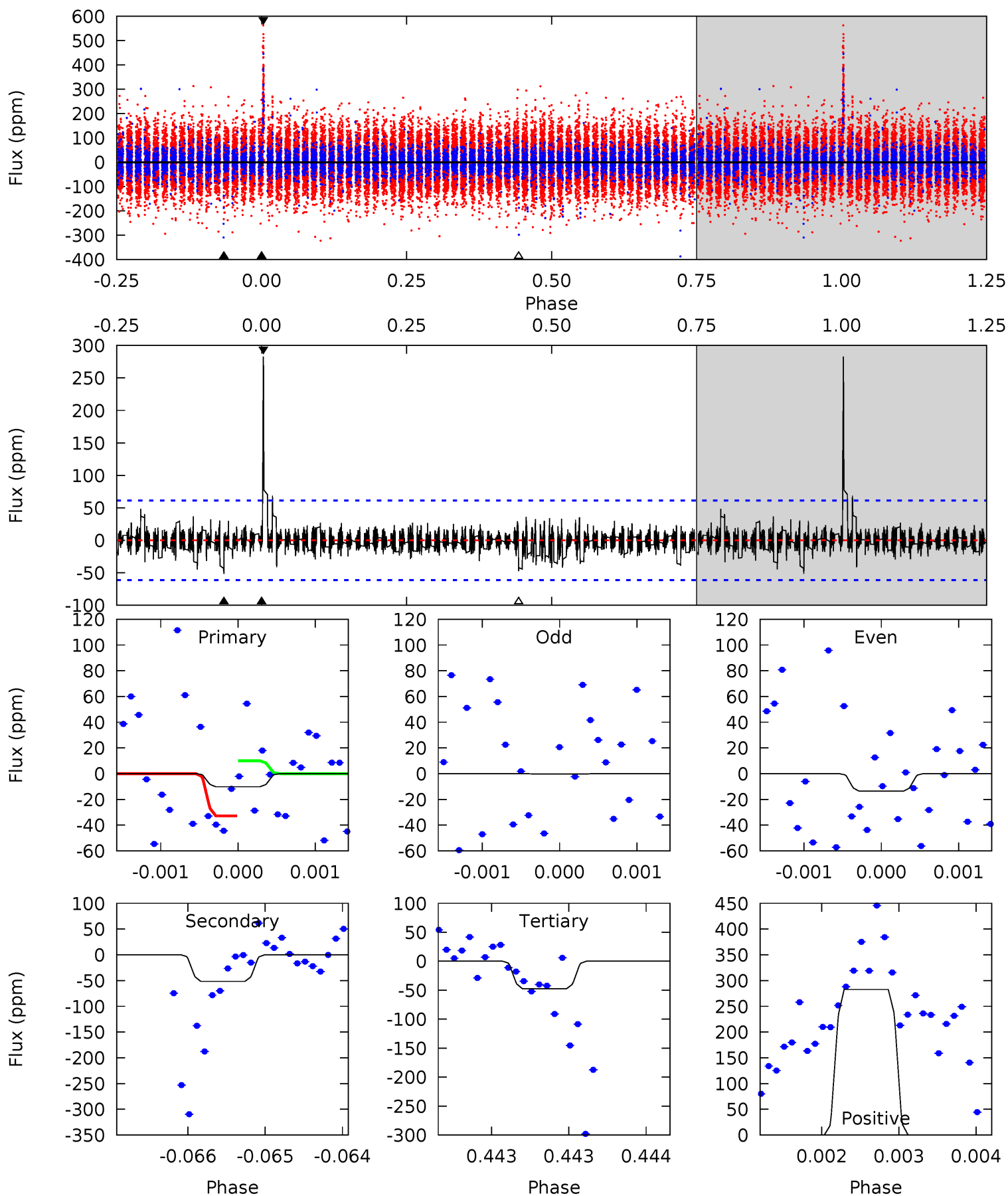
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

007516781-02, P = 274.402277 Days, E = 66.902051 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0.91	4.62	4.25	25.3	5.49	3.35	1.36	-3.34	-24.4	0.37	-20.7	0.53	0.99	0.85	1.04



Stellar Parameters For KIC 007516781

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6844^{+189}_{-307}	$4.274^{+0.075}_{-0.210}$	$0.070^{+0.200}_{-0.350}$	$1.426^{+0.511}_{-0.219}$	$1.394^{+0.218}_{-0.218}$	$0.677^{+0.284}_{-0.381}$
	+3%/-4%	+2%/-5%	+286%/-500%	+36%/-15%	+16%/-16%	+42%/-56%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 007516781-02 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	0 ± 1000000	$11.89^{+13.20}_{-8.06}$	532^{+44}_{-32}	-3345^{+36637}_{-23795}	$-604.094^{+605695.221}_{-492818.653}$
Alt.	-52 ± 11	$10.92^{+12.74}_{-7.44}$	533^{+39}_{-33}	2881^{+1163}_{-478}	179^{+1530}_{-136}

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

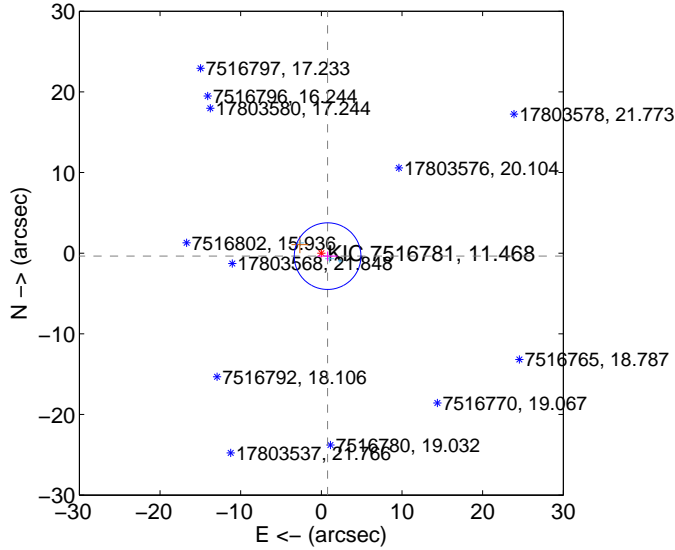
Supplemental centroid analysis for 007516781-02. **Kepler magnitude: 11.47.** Transit SNR -1.00

There are 3 quarters with good PRF difference image offsets

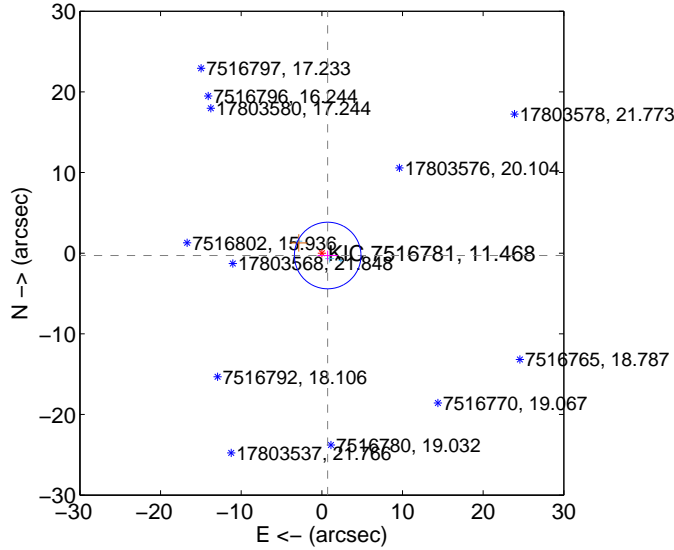
The direct PRF centroid is offset from the target star catalog position by about 0.29 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.858 ± 1.377	0.62	-0.775 ± 1.256	-0.367 ± 0.570
PRF-fit source offset from KIC position	0.779 ± 1.376	0.57	-0.723 ± 1.249	-0.290 ± 0.592
photometric centroid source offset	19.50 ± 11.57	1.68	11.76 ± 11.08	15.55 ± 11.84

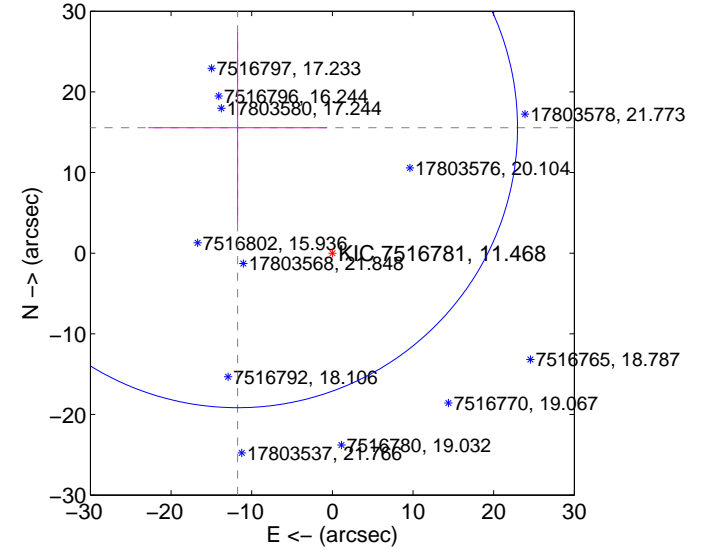
offset from difference PRF-fit to OOT PRF-fit



offset from difference PRF-fit to KIC position

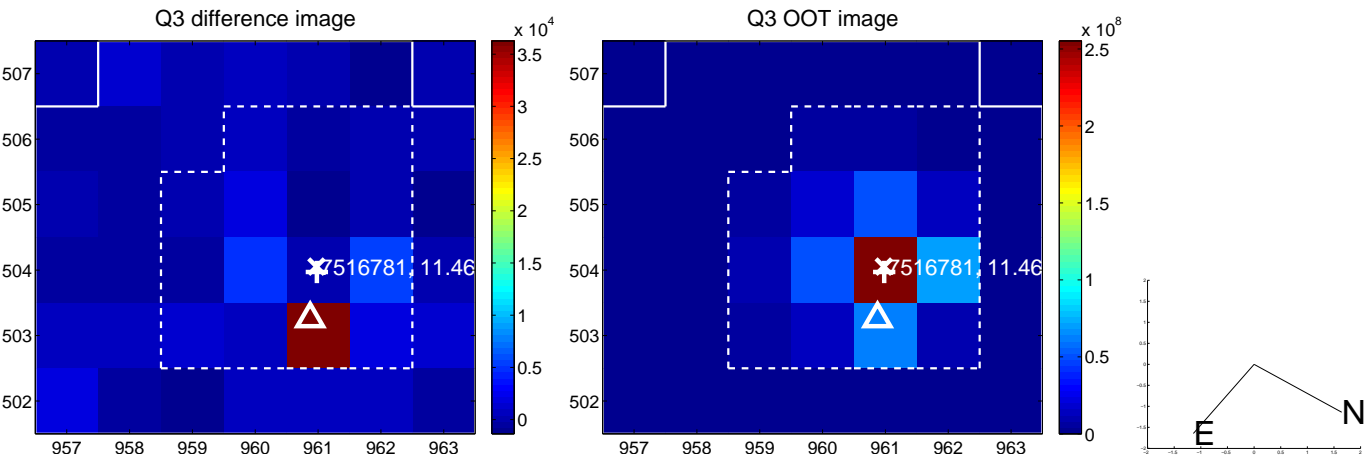
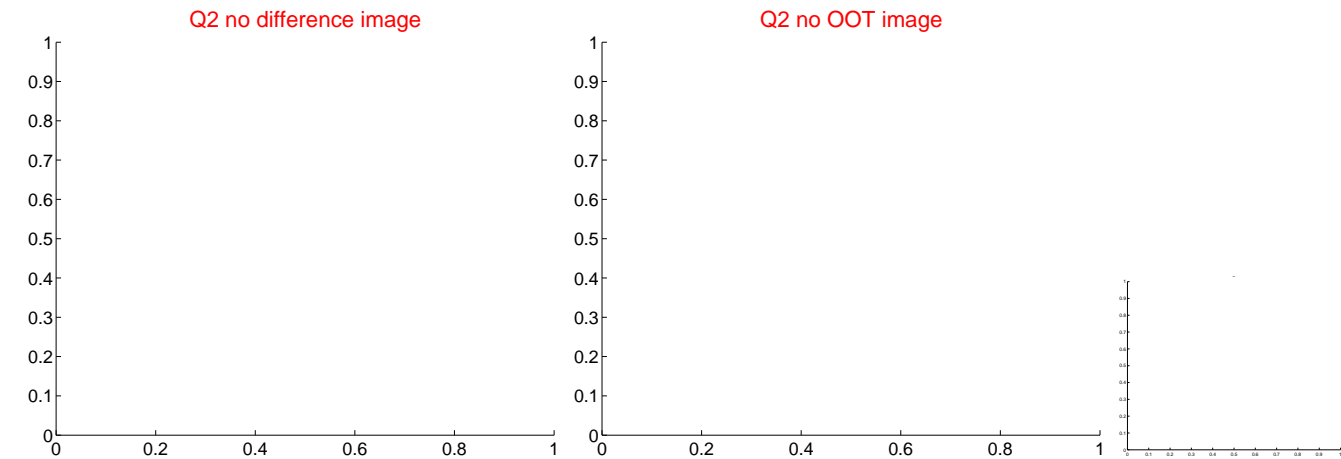


offset from photometric centroids

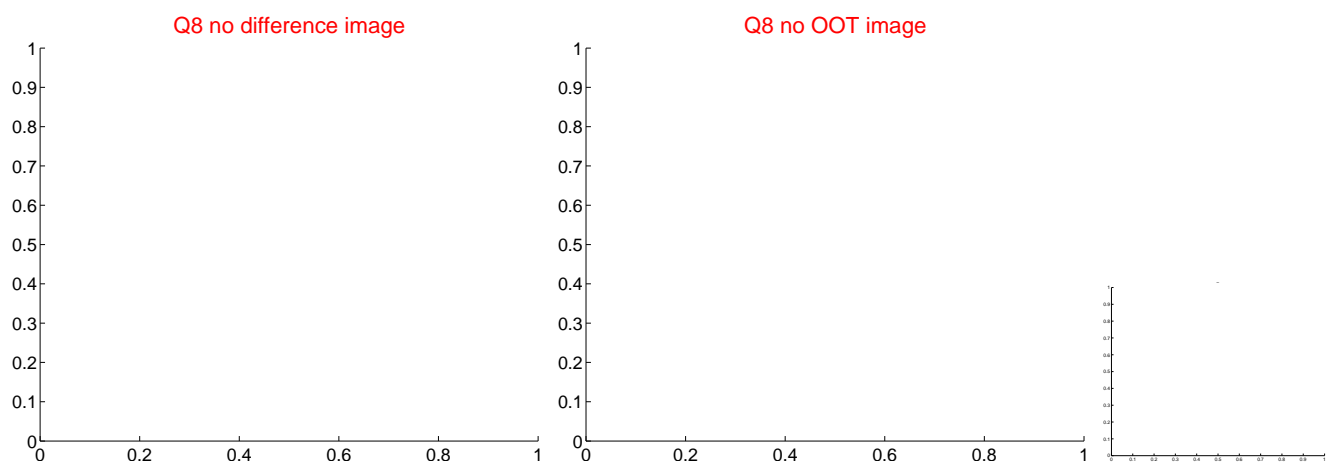
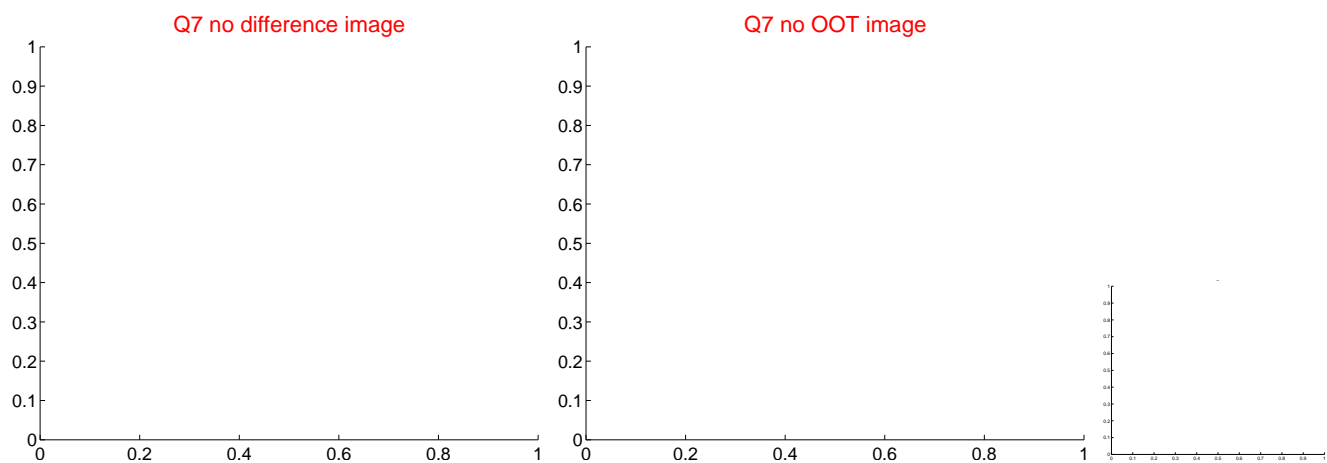
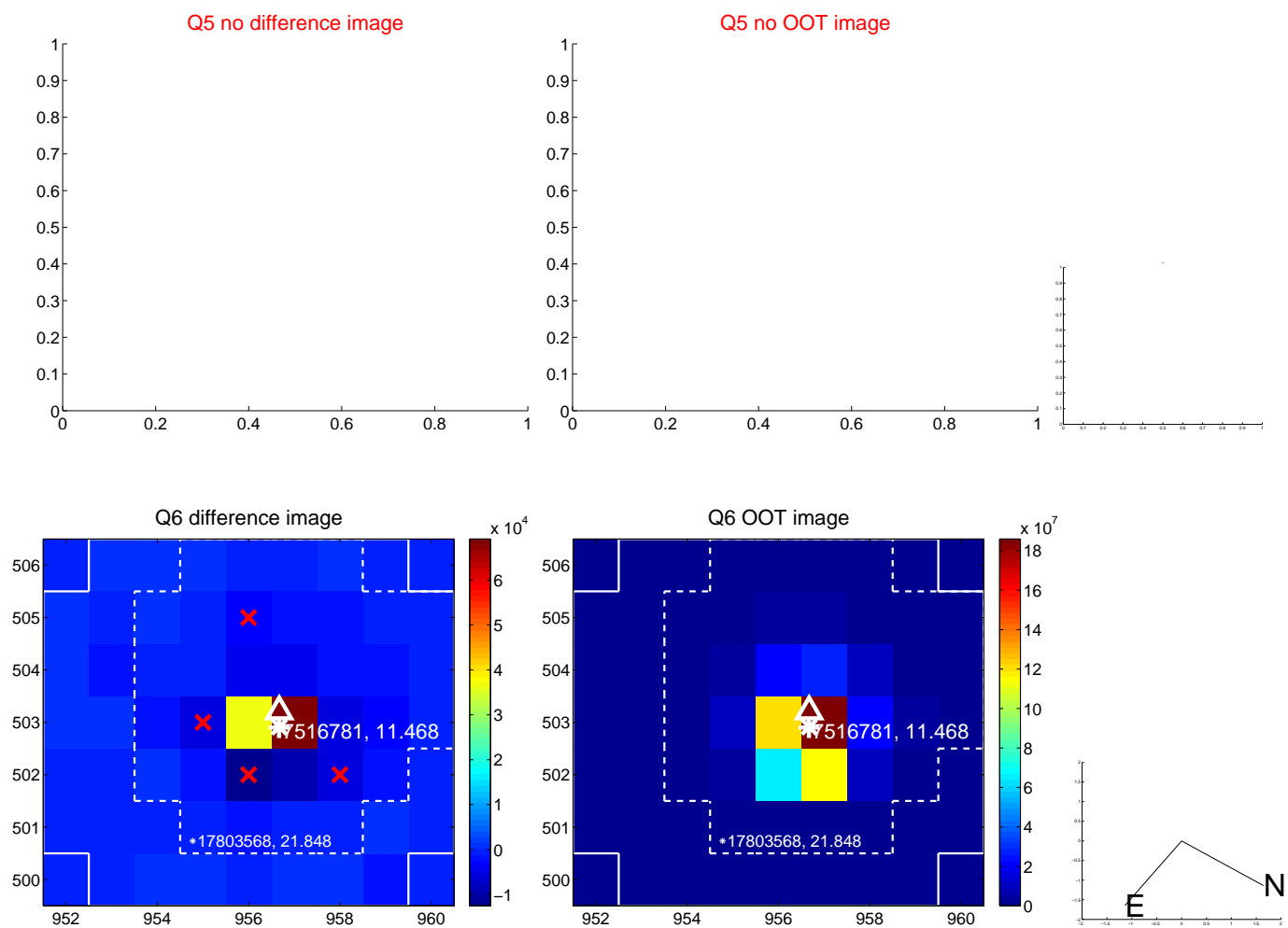


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

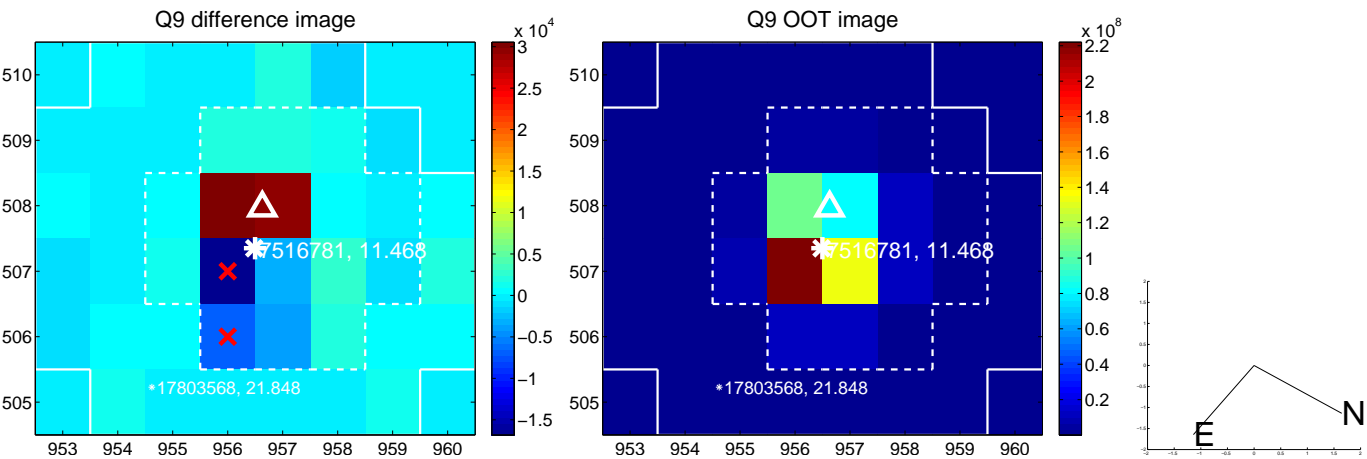
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

Q13 no difference image



Q13 no OOT image



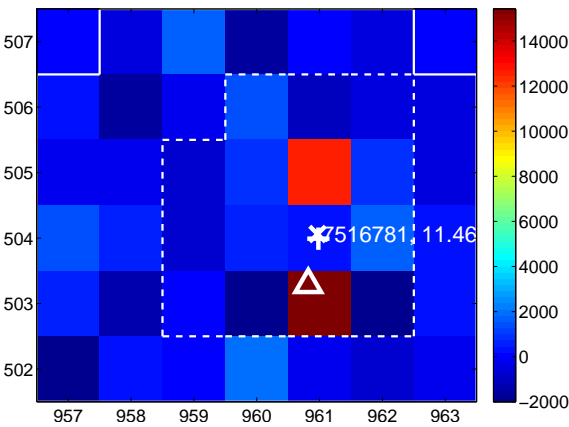
Q14 no difference image



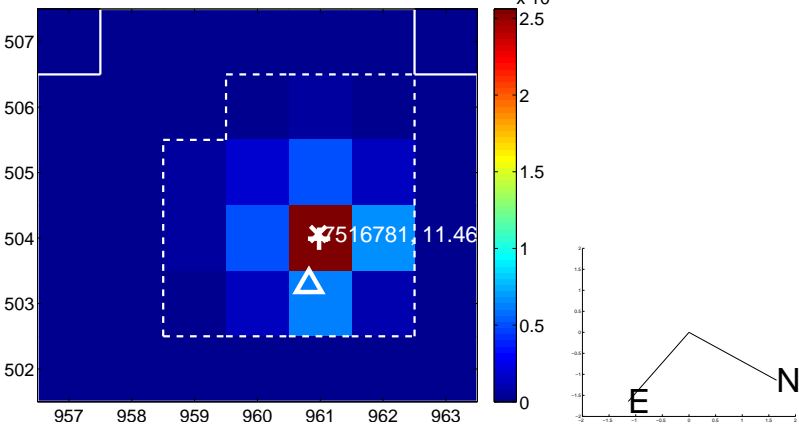
Q14 no OOT image



Q15 difference image. Poor Quality



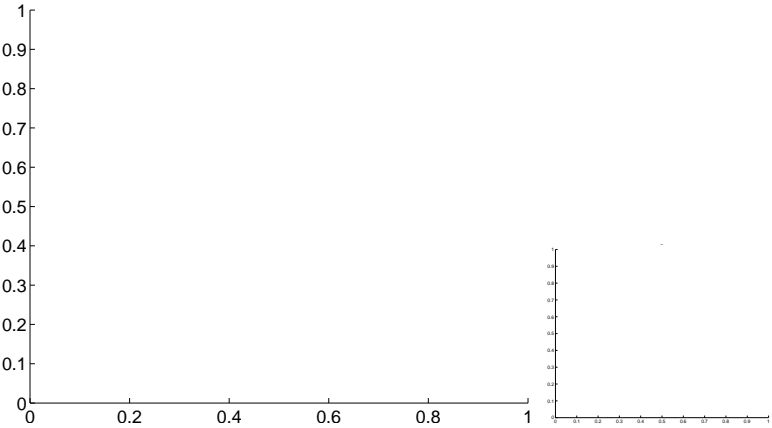
Q15 OOT image



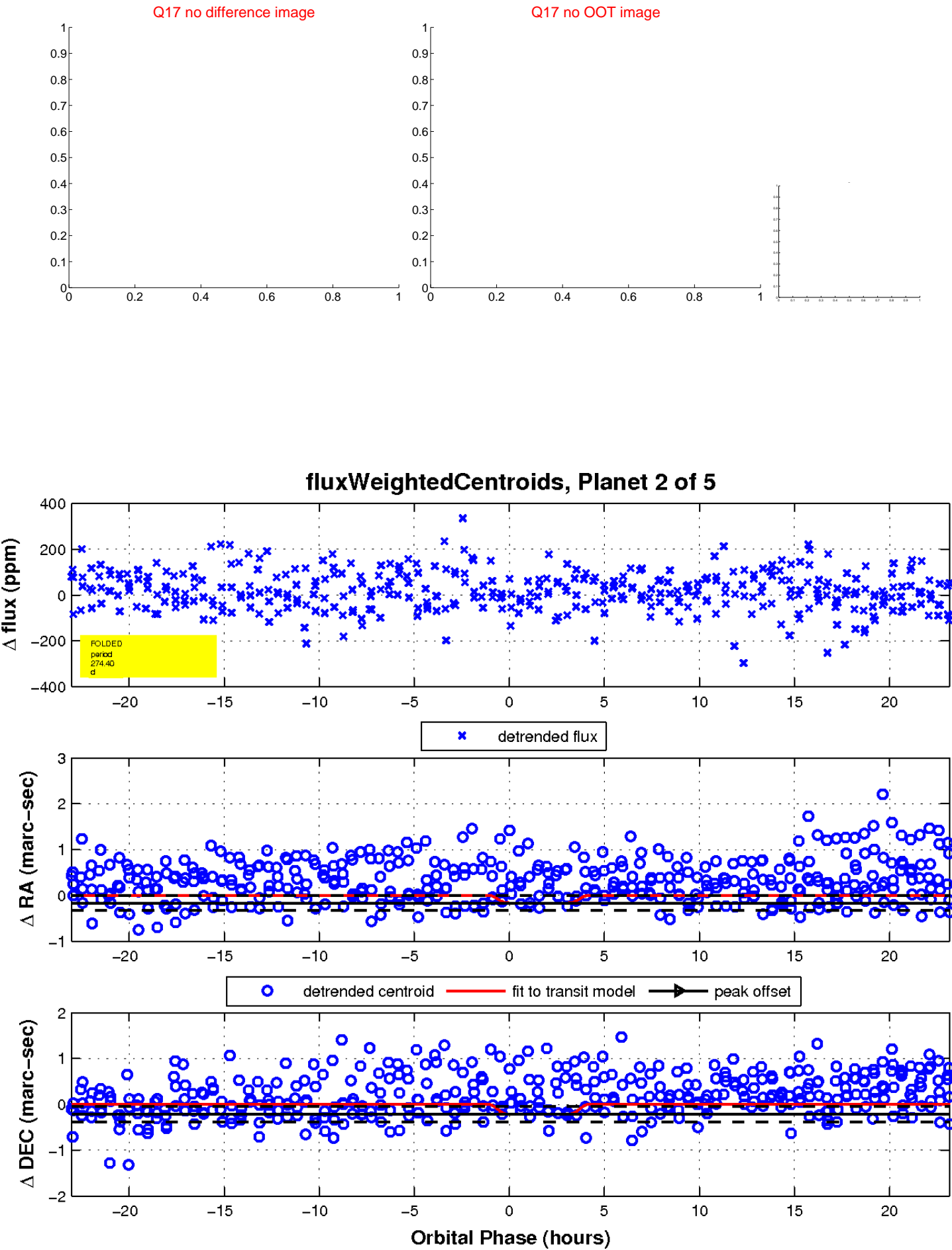
Q16 no difference image



Q16 no OOT image

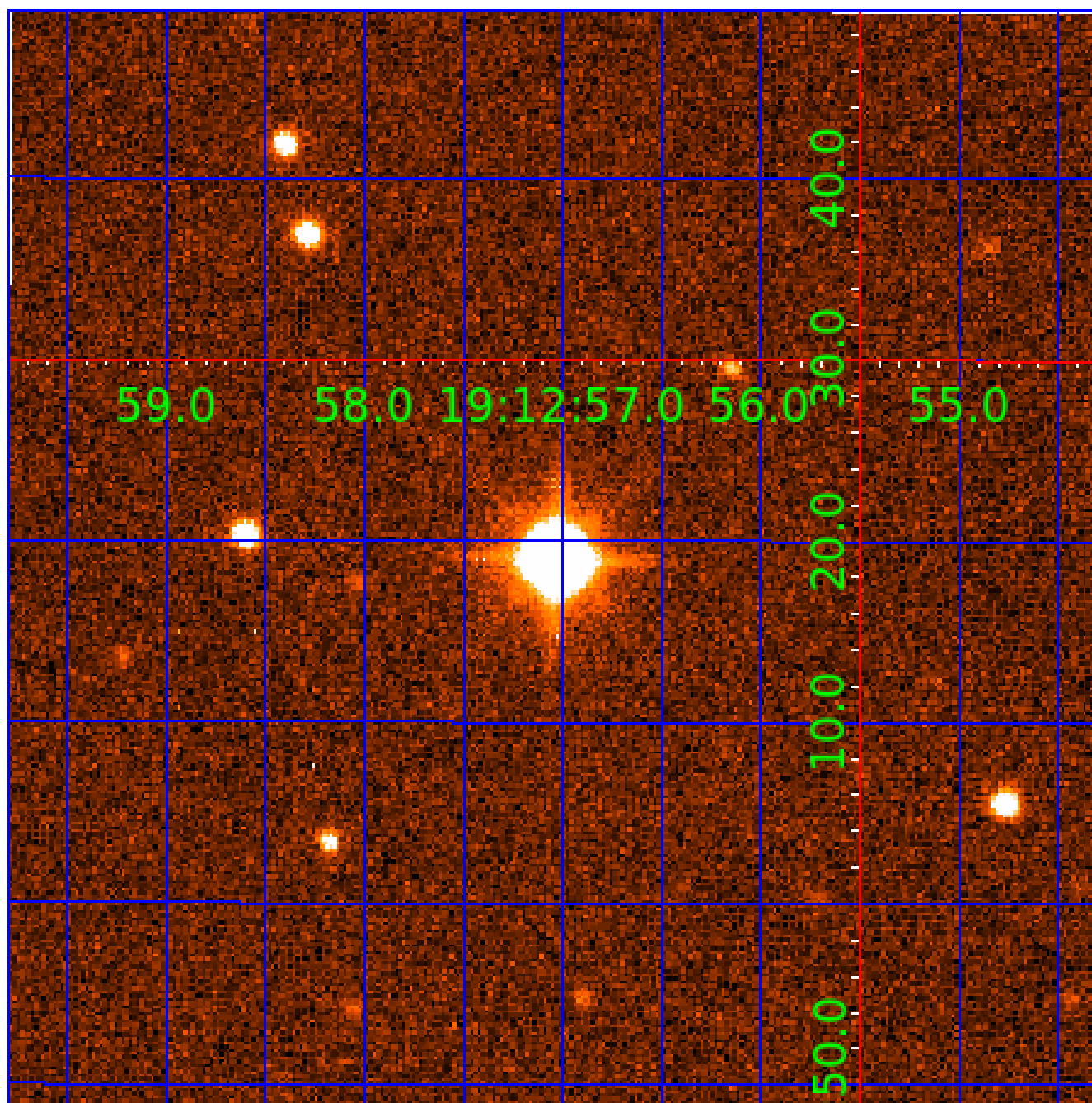


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007516781

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})
007516781-01	OBS	No	4.158487	135.190012	34.1	14.204	17.3	15.1	1.43	6844	0.97	1250.16
007516781-02	OBS	No	274.402277	342.242298	201.3	15.000	30.4	-1.0	1.43	6844	2.04	4.69
007516781-03	OBS	No	492.823702	481.267926	133.3	6.233	13.6	5.8	1.43	6844	1.88	2.15
007516781-04	OBS	No	388.803495	448.199514	194.6	12.259	12.0	7.3	1.43	6844	2.12	2.95
007516781-05	OBS	No	4.159681	131.776854	27.4	25.902	10.0	10.7	1.43	6844	0.76	1249.68

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007516781-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_SATURATED
007516781-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007516781-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED

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

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

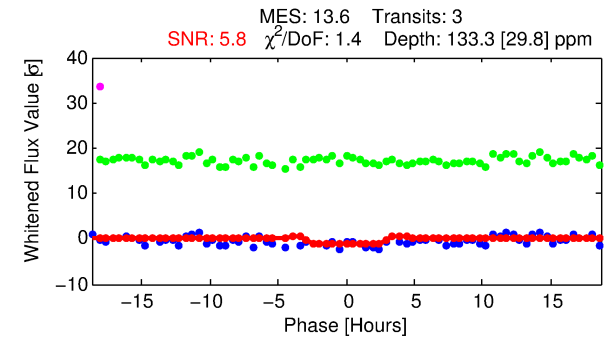
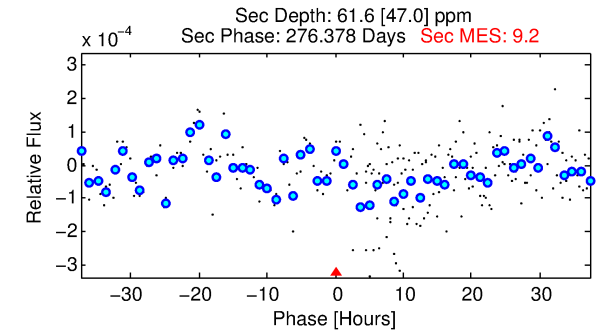
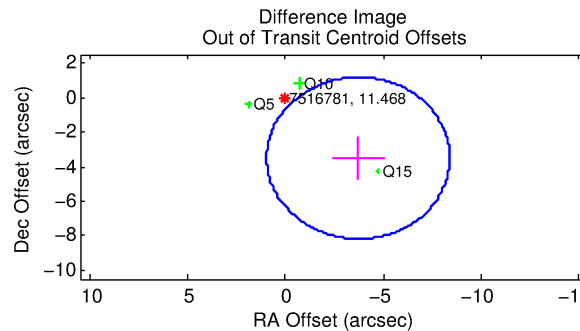
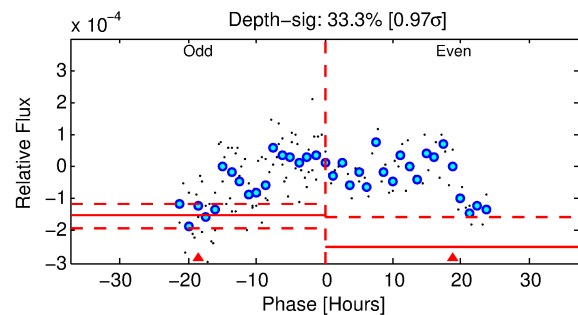
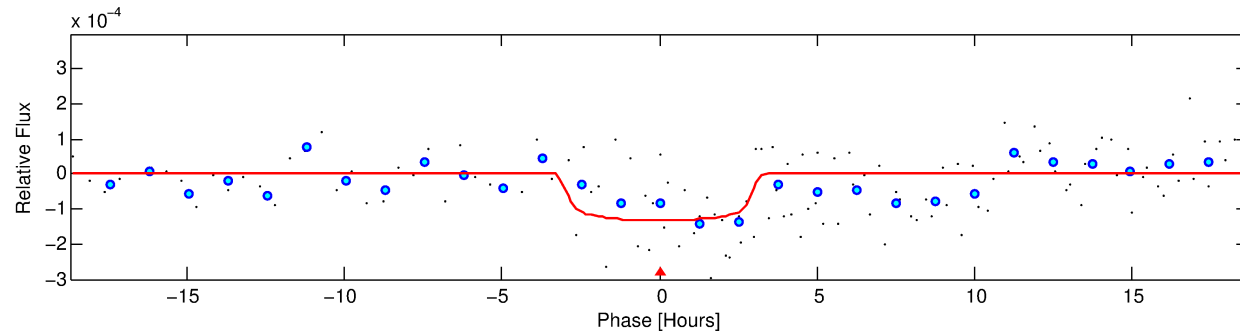
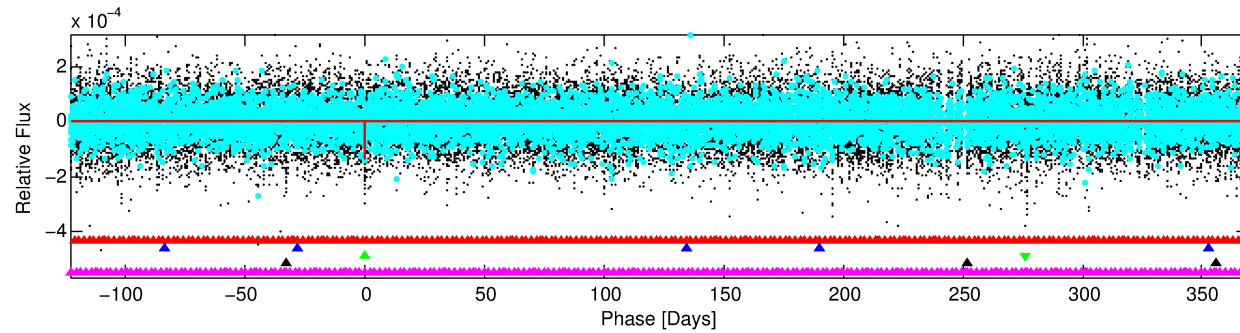
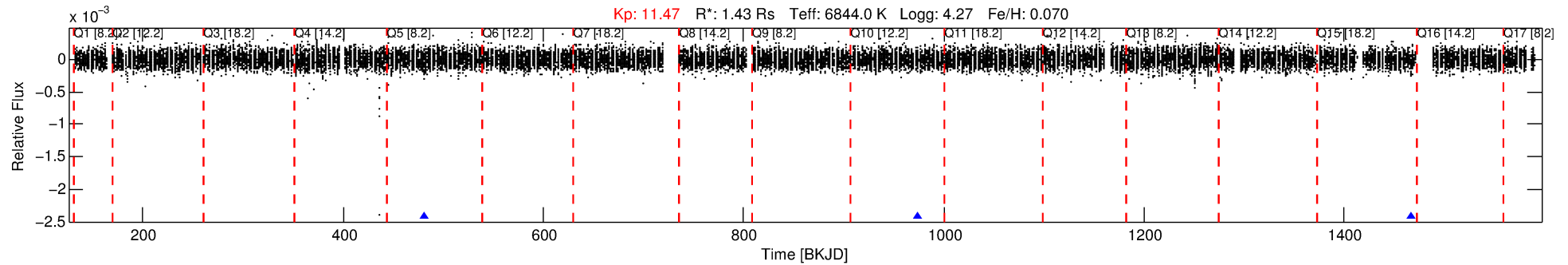
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007516781-03

No Significant Match Found

DV One-Page Summary

KIC: 7516781 Candidate: 3 of 5 Period: 492.824 d



DV Fit Results:

Period = 492.82370 [0.01450] d
Epoch = 481.2679 [0.0185] BKJD
Rp/R* = 0.0121 [0.0075]
a/R* = 307.50 [1104.75]
b = 0.87 [0.96]
Seff = 2.15 [0.94]
Teq = 309 [34] K
Rp = 1.88 [1.35] Re
a = 1.3643 [0.3932] AU
Ag = 17758.68 [26843.69] [0.66 σ]
Teffp = 5509 [2022] K [2.57 σ]

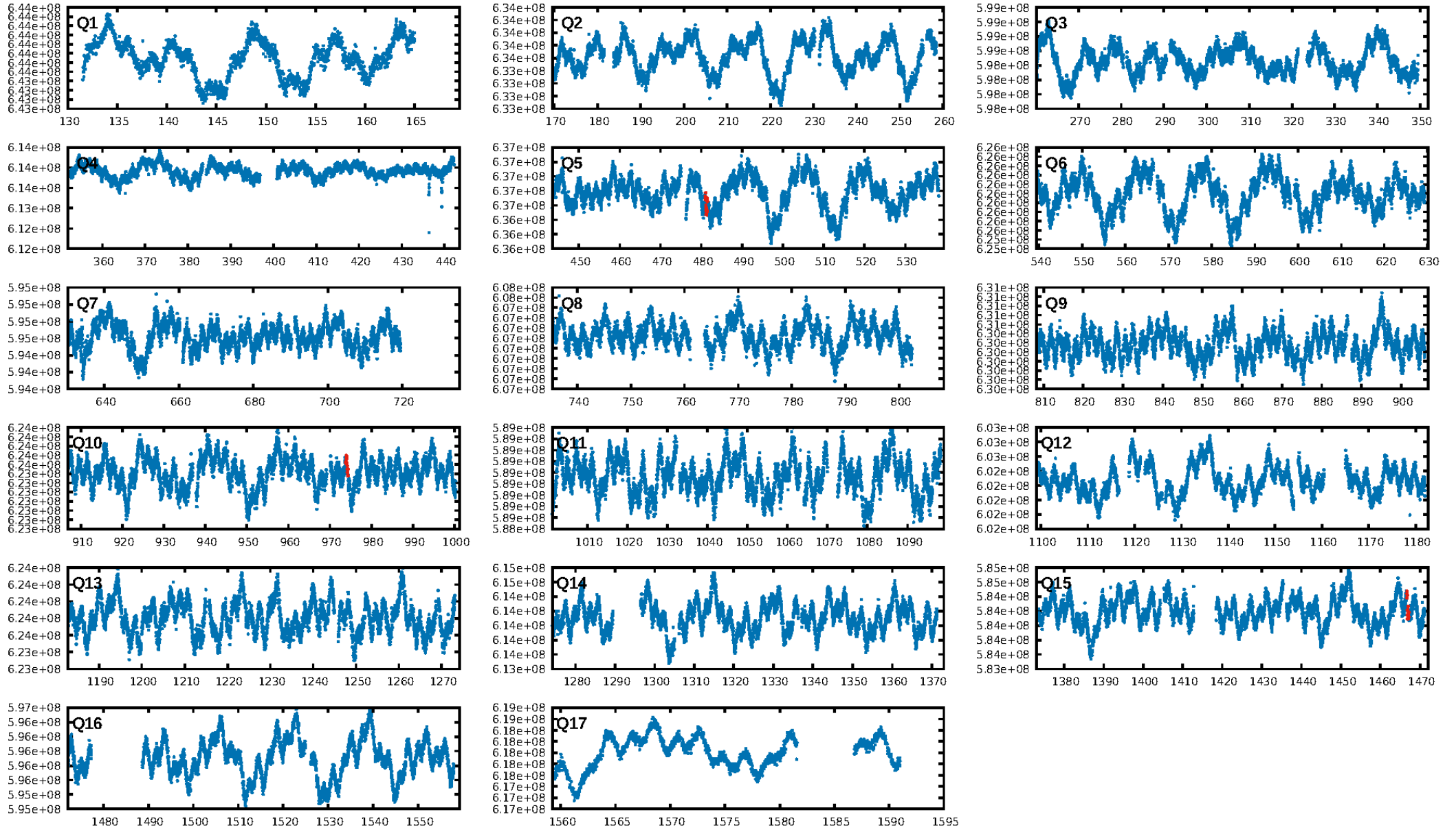
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [181.53 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 7.3%
ModelChiSquareGof-sig: 75.8%
Bootstrap-pfa: 9.59e-21
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: 35.73
Centroid-sig: 0.2%
Centroid-so: 4.030 arcsec [2.70 σ]
OotOffset-rm: 5.106 arcsec [3.27 σ]
KicOffset-rm: 4.880 arcsec [3.10 σ]
OotOffset-st: 1/1/0/1 [3]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.33 [1/3]

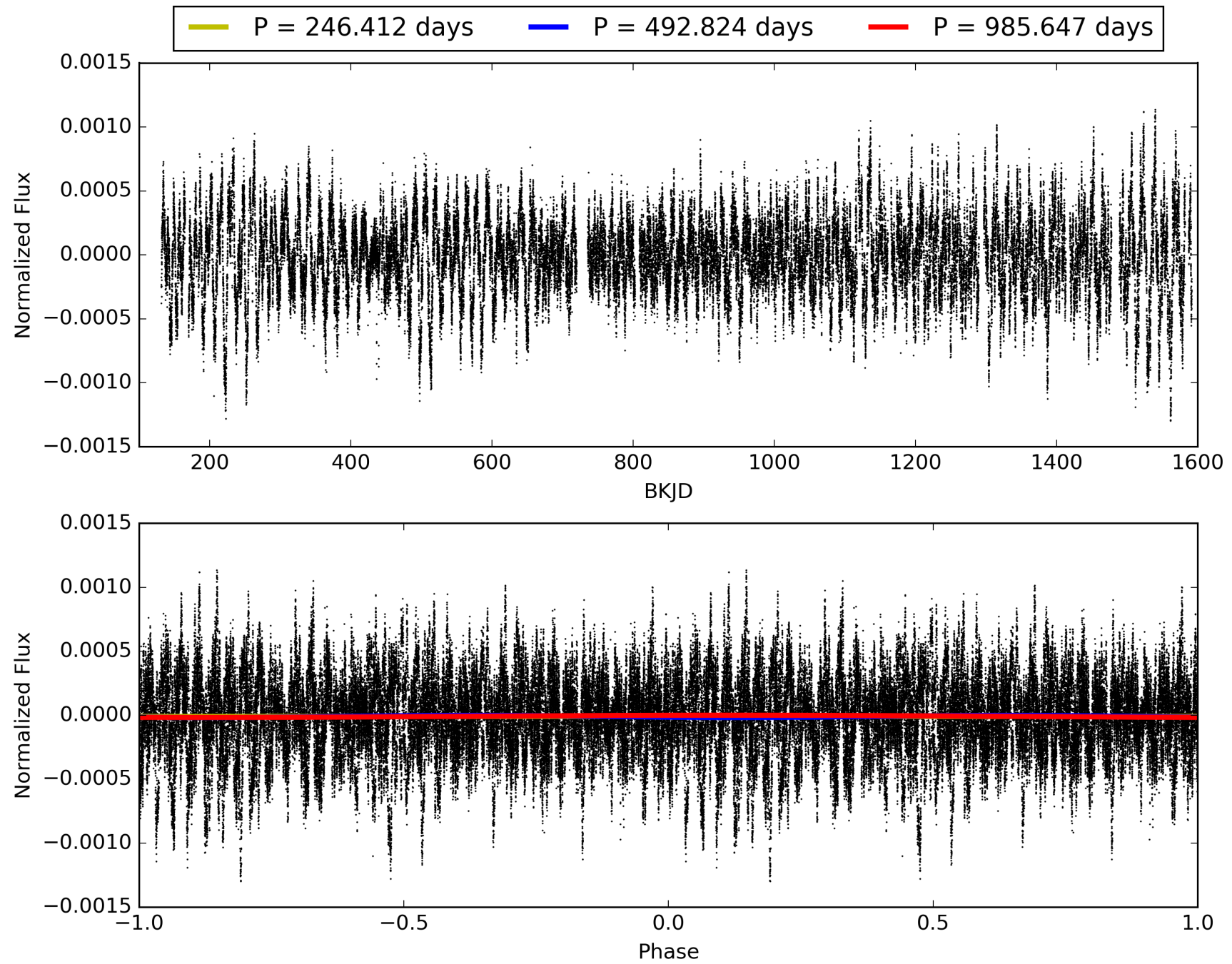
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:00:38 Z

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

TCE 007516781-03, PDC Light Curves

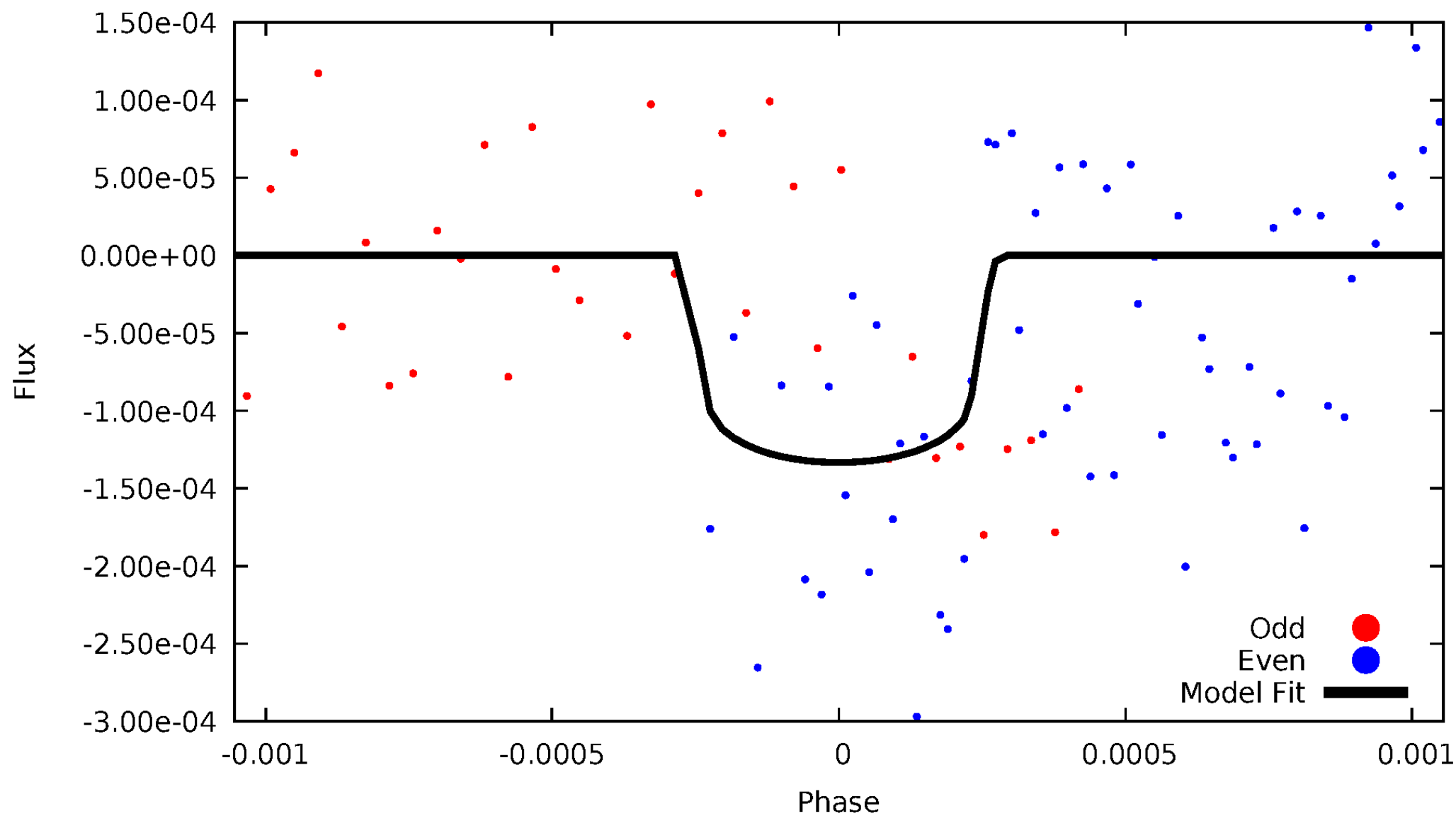


TCE 007516781-03



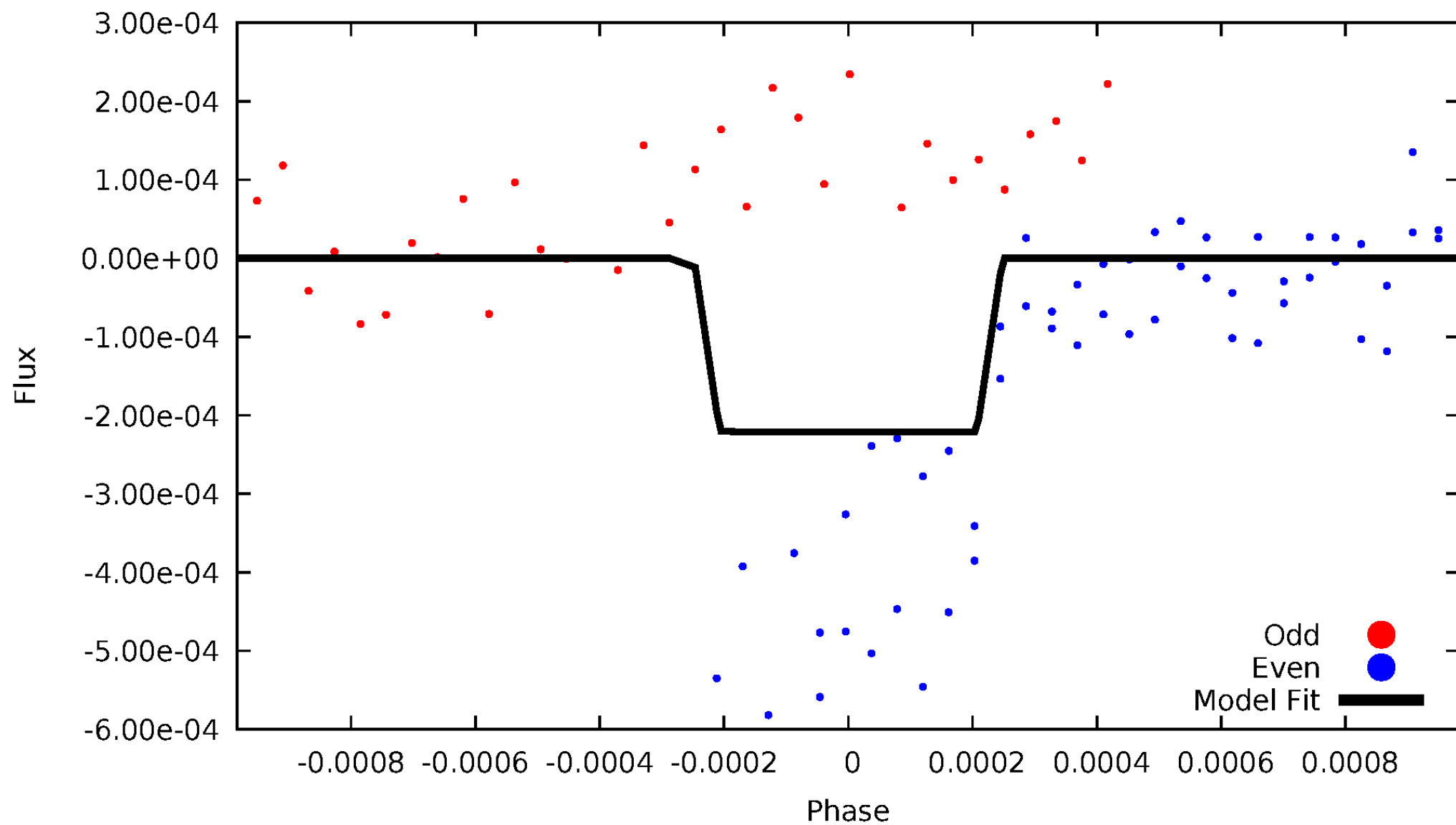
DV Odd/Even

TCE 007516781-03



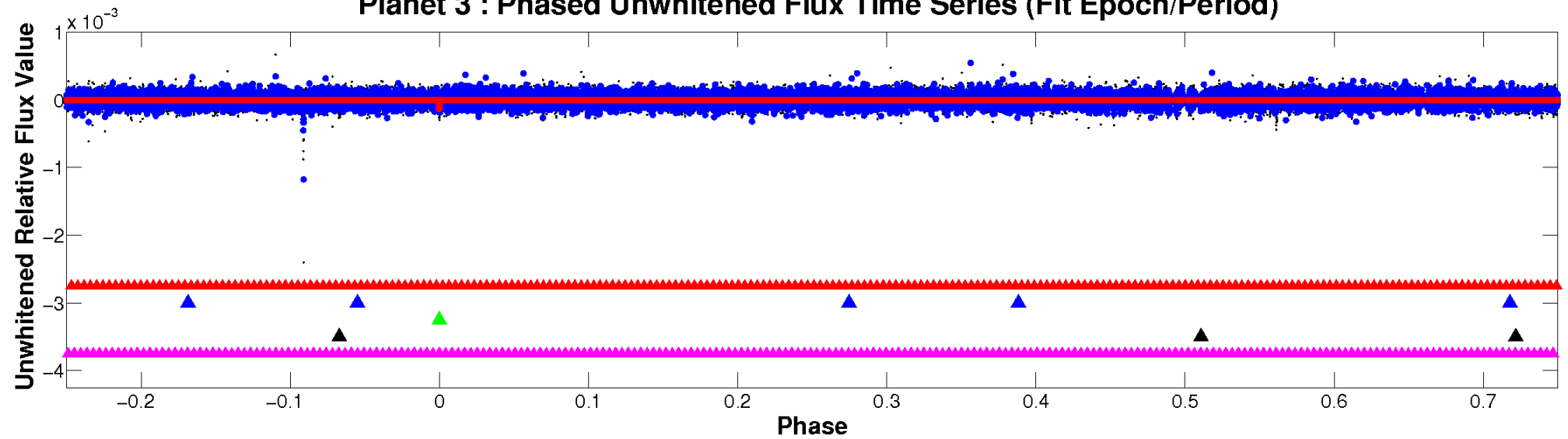
ALT Odd/Even

TCE 007516781-03

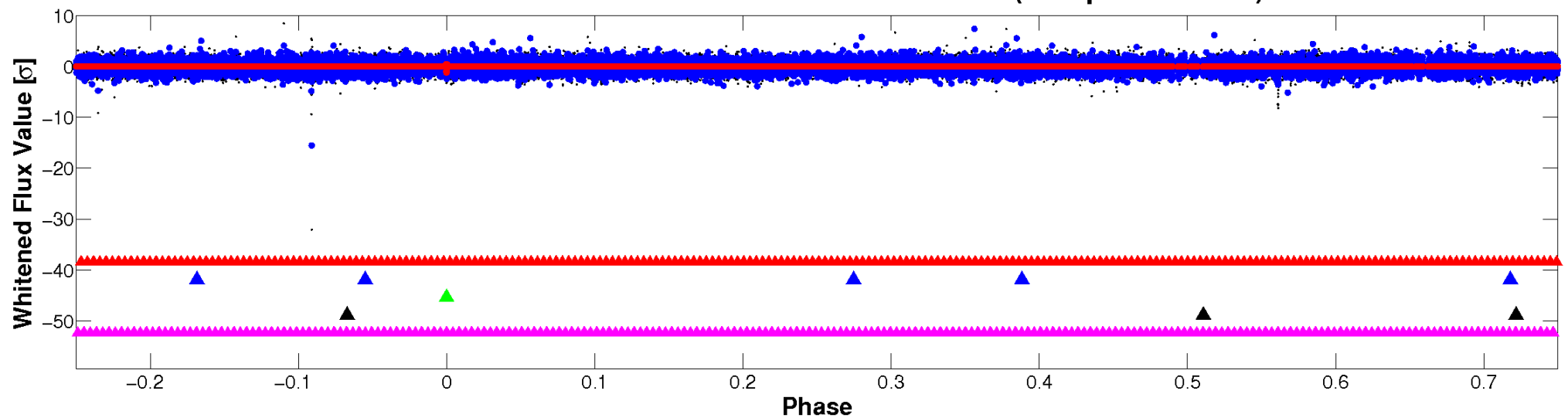


Non-Whitened Vs. Whitened Light Curve

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

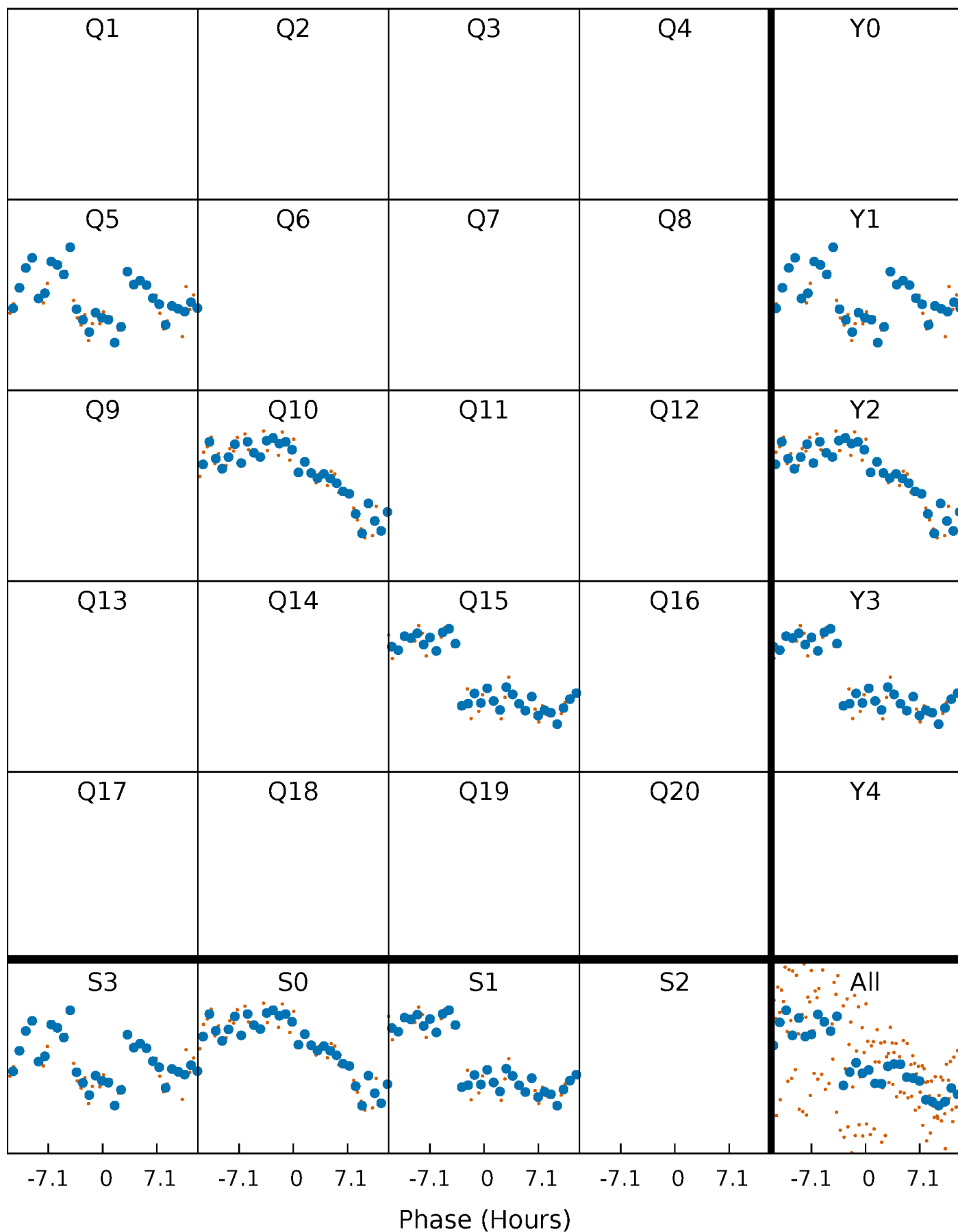


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



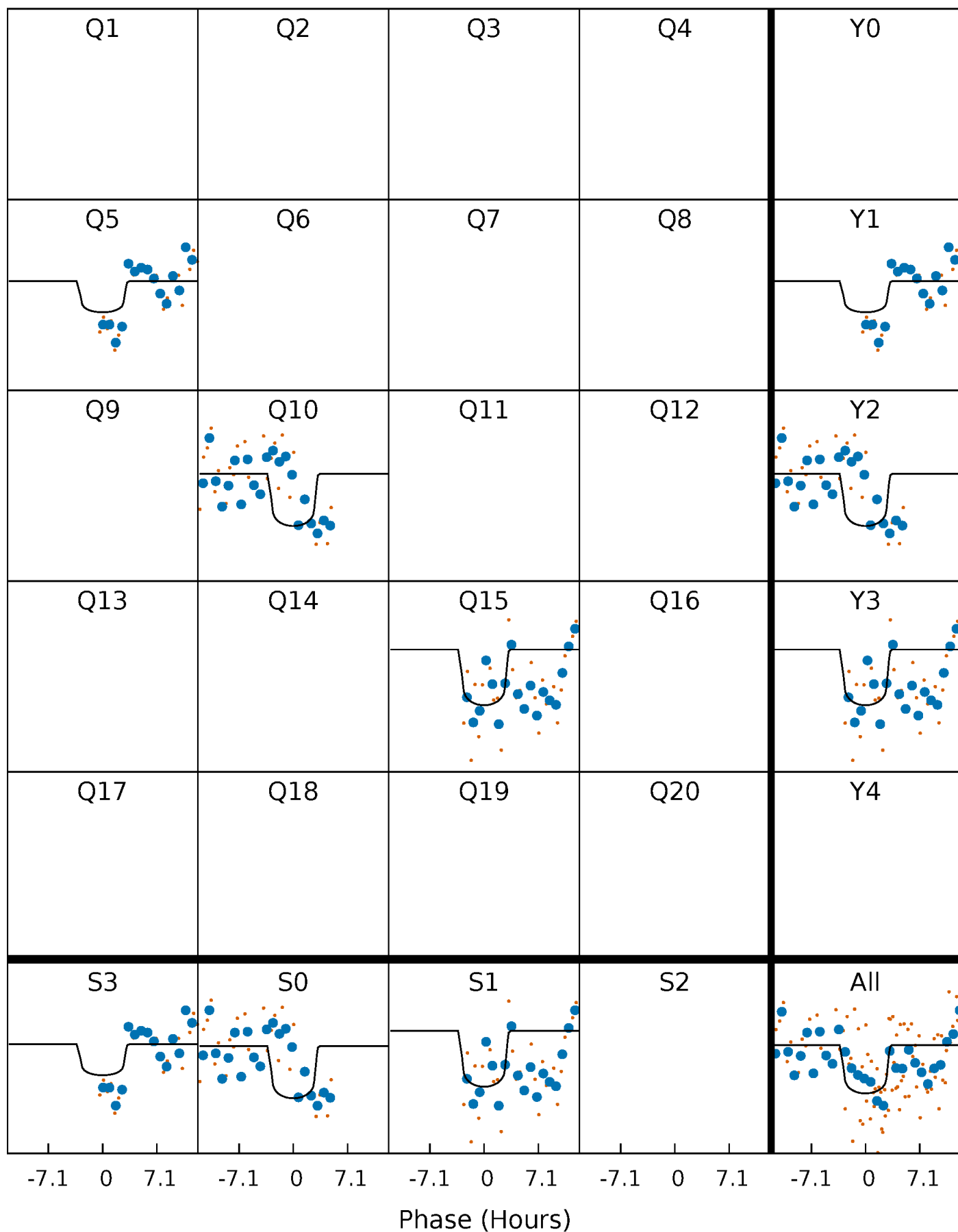
PDC Quarter-Phased Transit Curves

TCE 007516781-03 P=492.823702 Days $T_0=481.267926$ (BKJD)



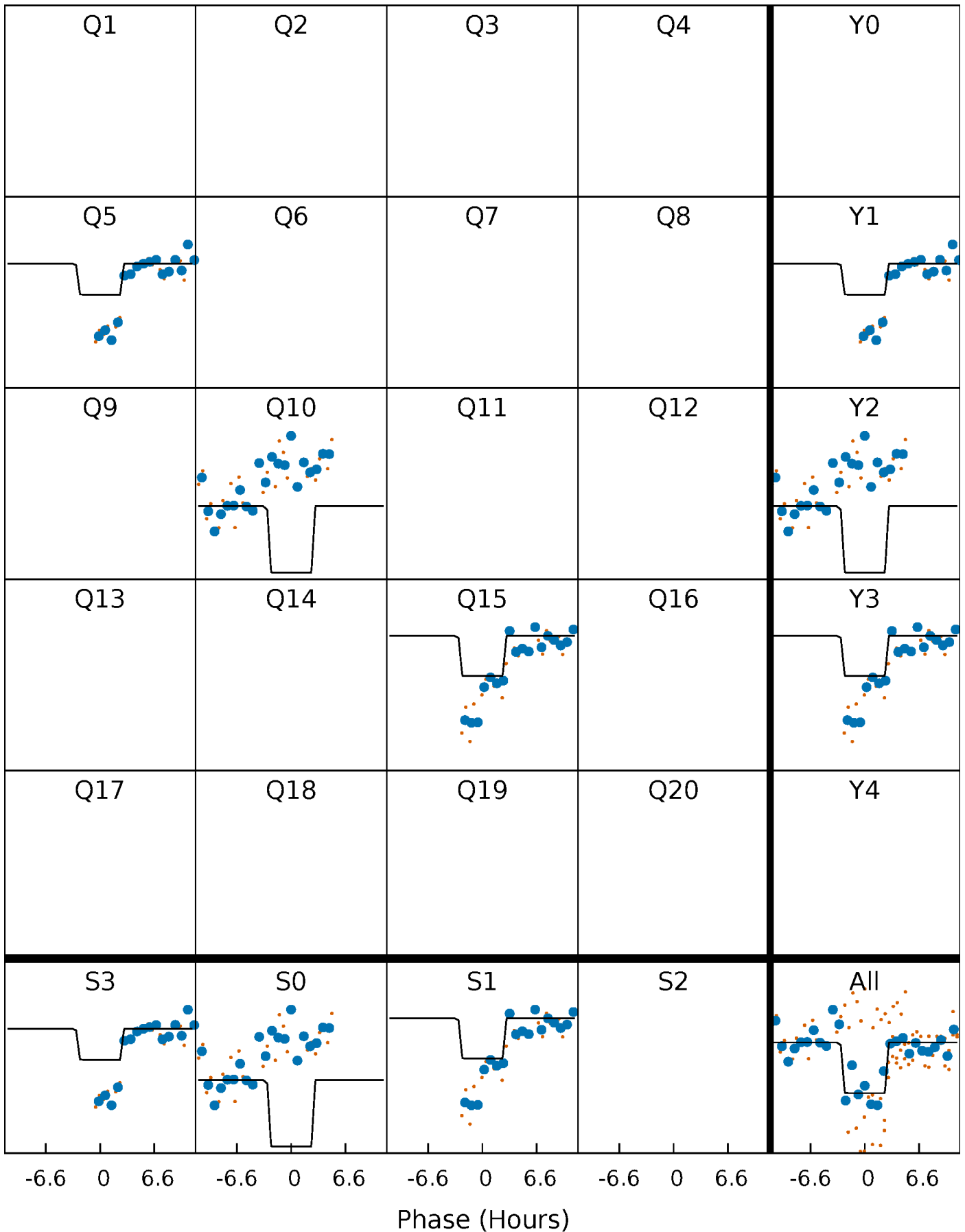
DV Quarter-Phased Transit Curves

TCE 007516781-03 P=492.823702 Days $T_0=481.267926$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

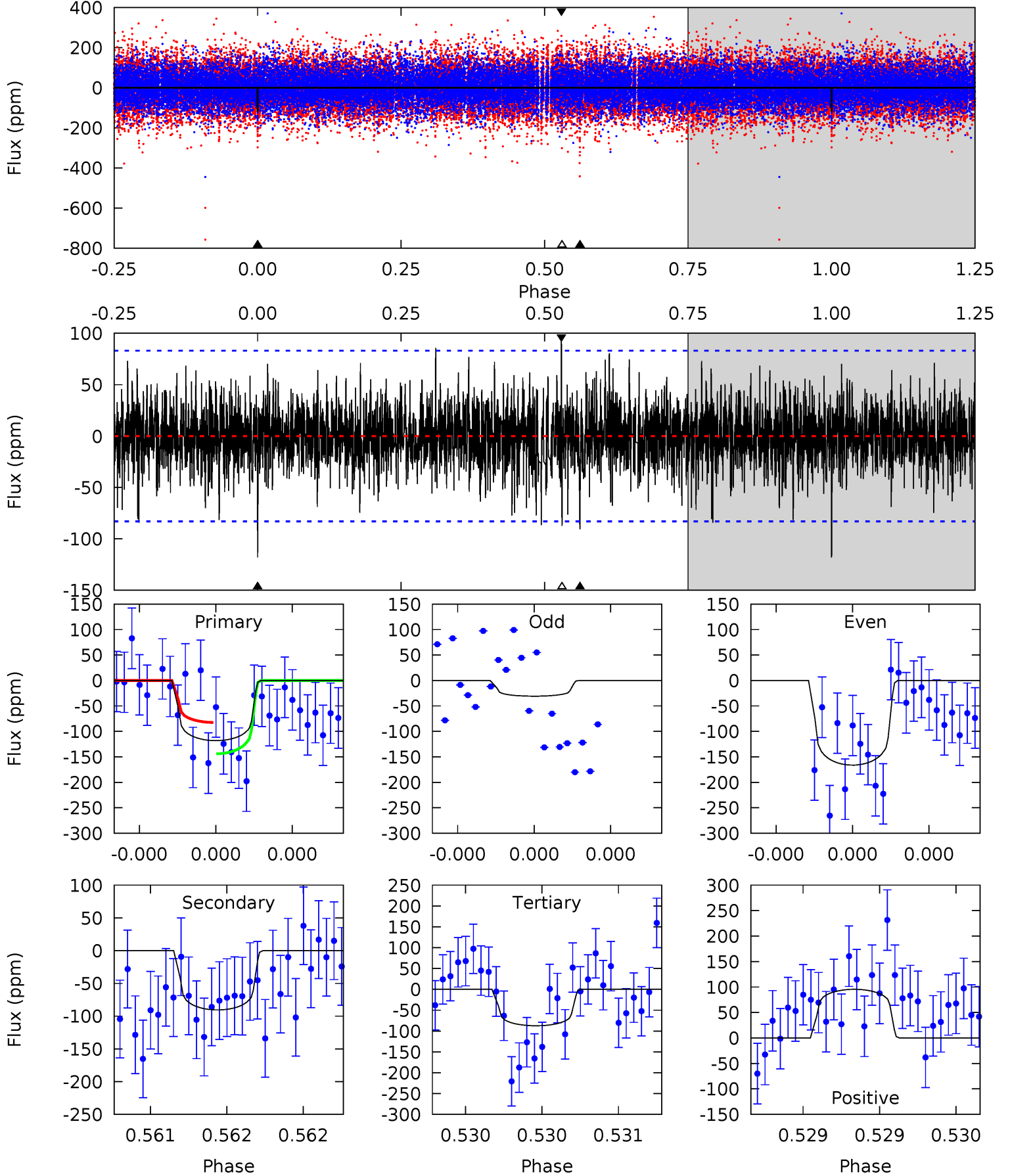
TCE 007516781-03 P=492.816600 Days $T_0=481.275747$ (BKJD)



DV Model-Shift Uniqueness Test

007516781-03, P = 492.823702 Days, E = 481.267926 Days

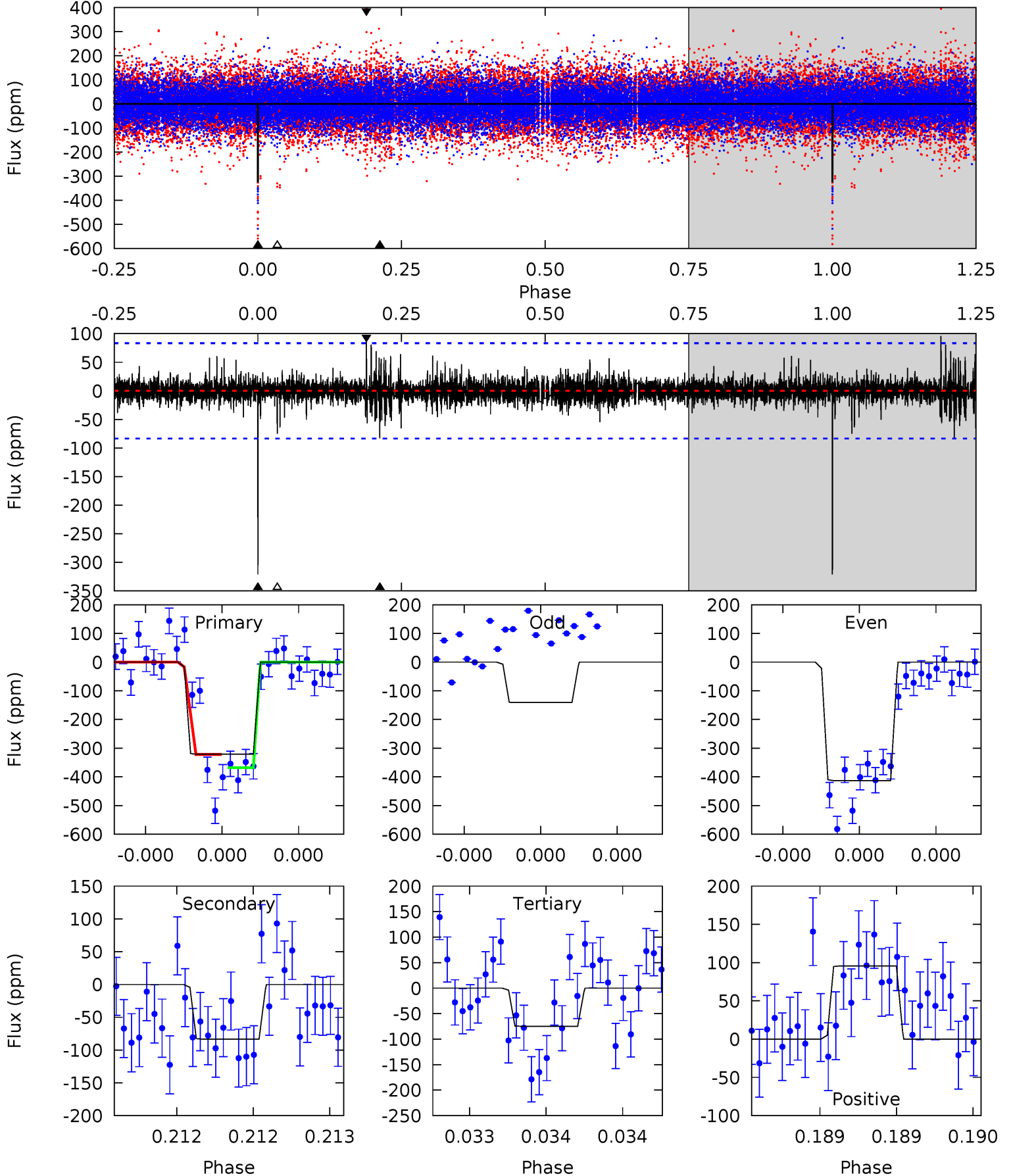
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
7.93	6.08	5.87	6.41	5.57	3.48	1.55	2.06	1.52	0.21	-0.33	4.45	0.95	0.45	1.99



Alt Model-Shift Uniqueness Test

007516781-03, P = 492.816600 Days, E = 481.275747 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
21.5	5.56	4.99	6.39	5.57	3.48	0.86	16.5	15.1	0.57	-0.83	10.1	0.64	0.23	1.49



Stellar Parameters For KIC 007516781

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6844^{+189}_{-307}	$4.274^{+0.075}_{-0.210}$	$0.070^{+0.200}_{-0.350}$	$1.426^{+0.511}_{-0.219}$	$1.394^{+0.218}_{-0.218}$	$0.677^{+0.284}_{-0.381}$
	+3%/-4%	+2%/-5%	+286%/-500%	+36%/-15%	+16%/-16%	+42%/-56%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 007516781-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-91 ± 15	$2.05^{+1.22}_{-1.15}$	440^{+36}_{-25}	5886^{+3386}_{-1114}	21544^{+85695}_{-13287}
Alt.	-83 ± 15	$2.42^{+1.32}_{-1.10}$	438^{+35}_{-27}	5260^{+2166}_{-807}	13893^{+35562}_{-8039}

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 $A_{obs} \gg 1.0$

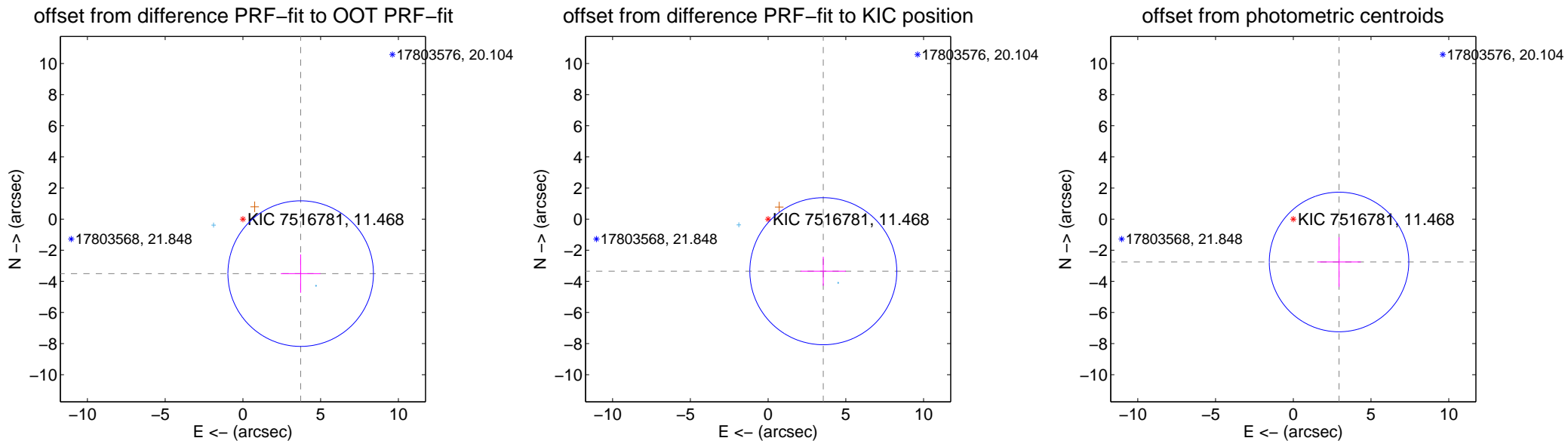
DV Centroid Data

Supplemental centroid analysis for 007516781-03. **Kepler magnitude: 11.47.** Transit SNR 5.84

There are 2 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	5.106 \pm 1.559	3.27	-3.716 \pm 1.279	-3.502 \pm 1.230
PRF-fit source offset from KIC position	4.880 \pm 1.575	3.10	-3.550 \pm 1.456	-3.348 \pm 0.934
photometric centroid source offset	4.03 \pm 1.50	2.70	-2.94 \pm 1.40	-2.75 \pm 1.59

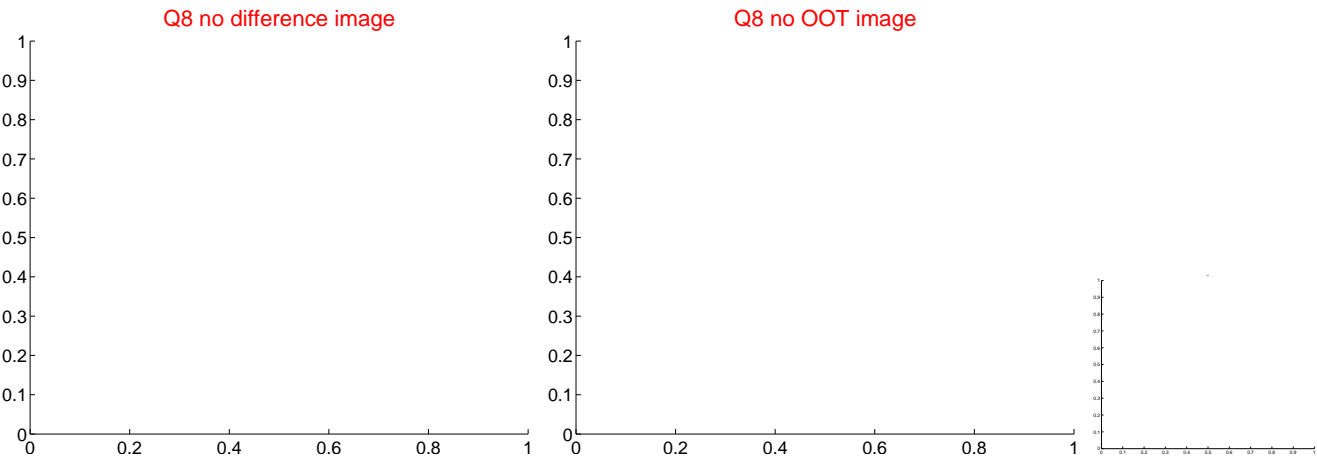
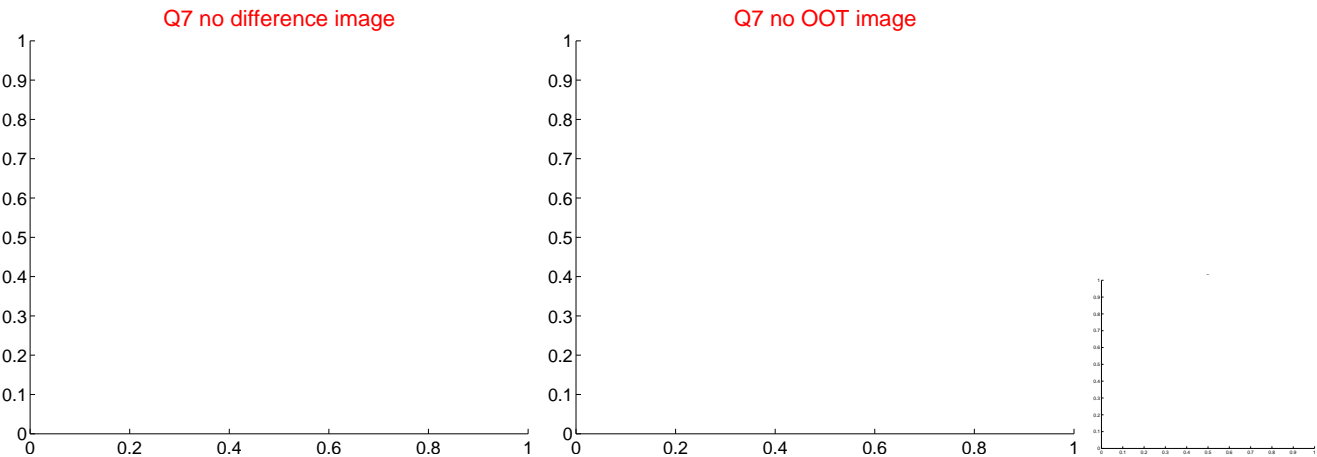
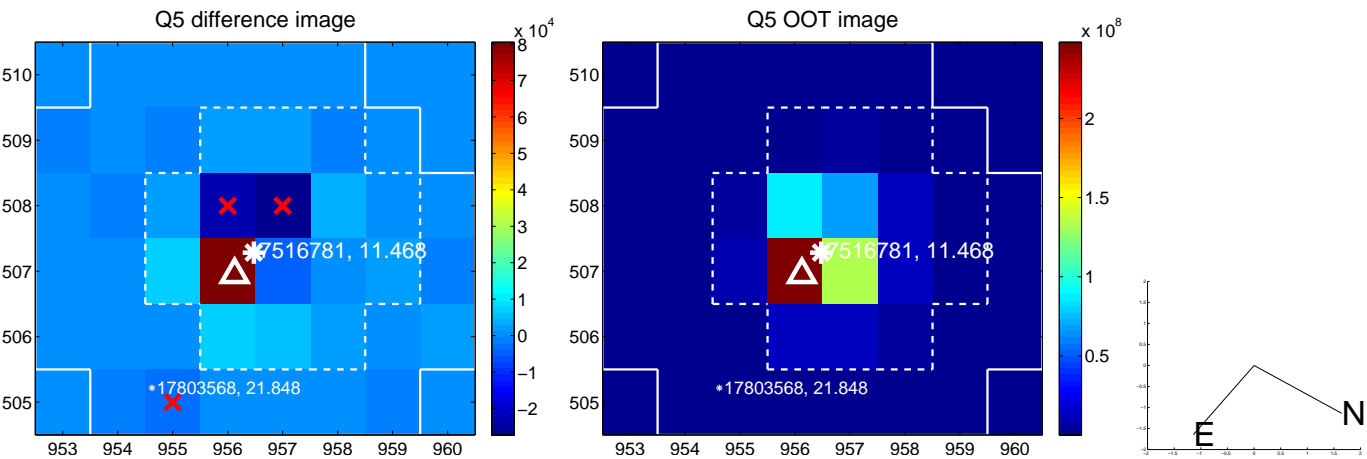


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses:** good quarterly centroid offsets; **Vermillion crosses:** bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

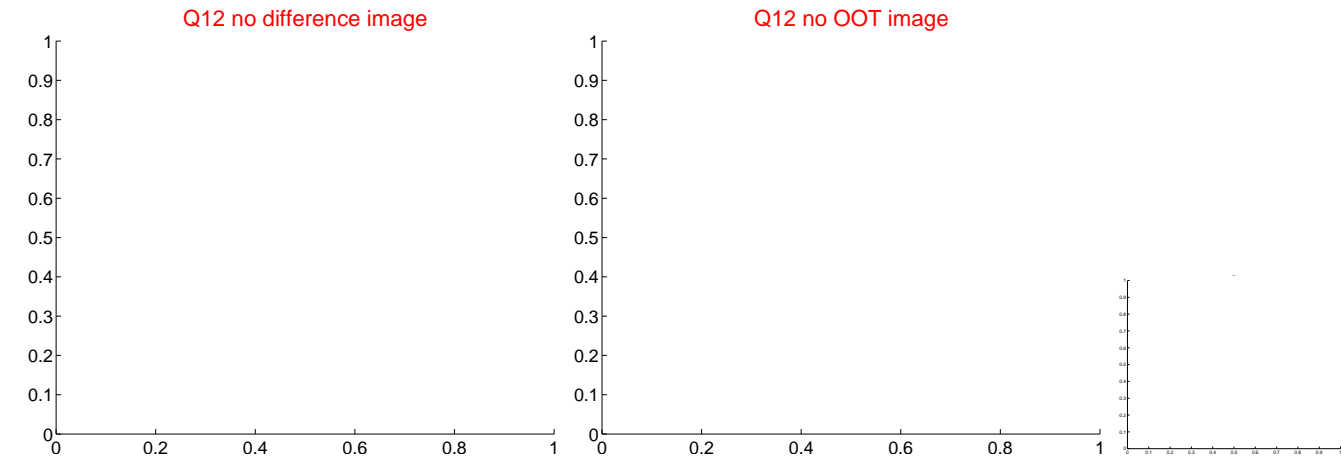
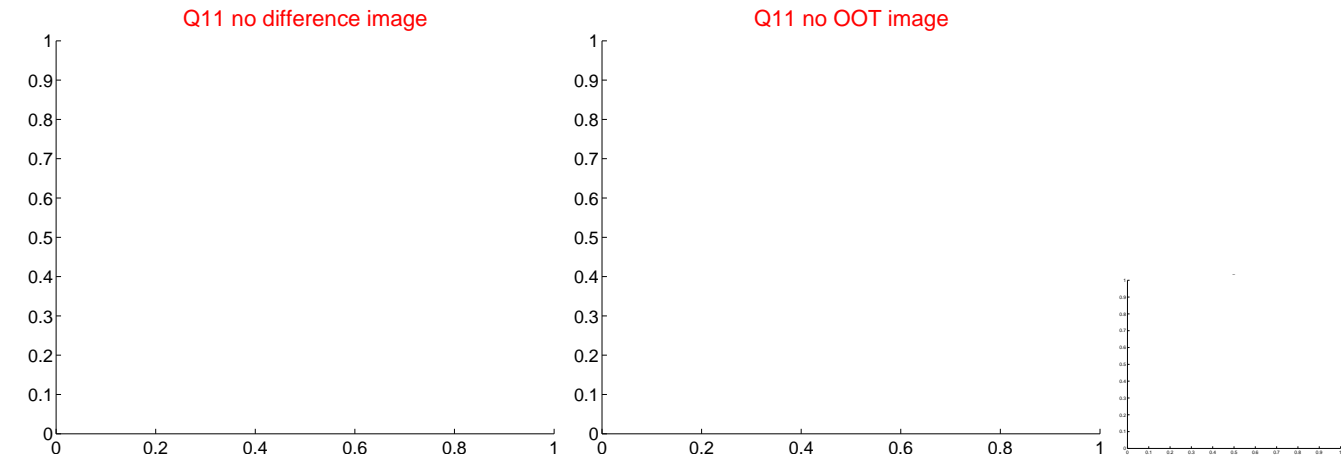
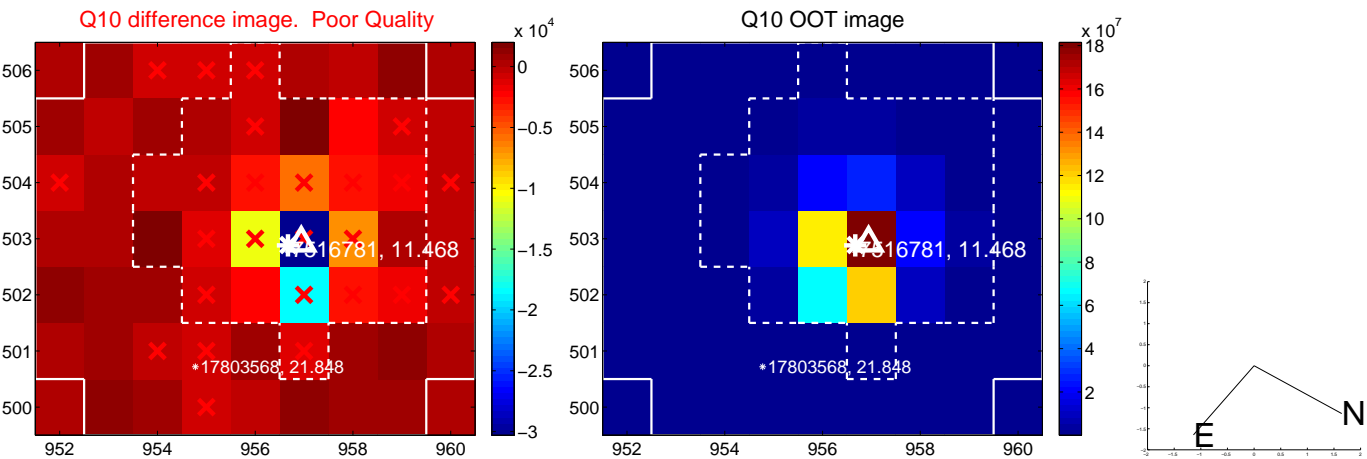
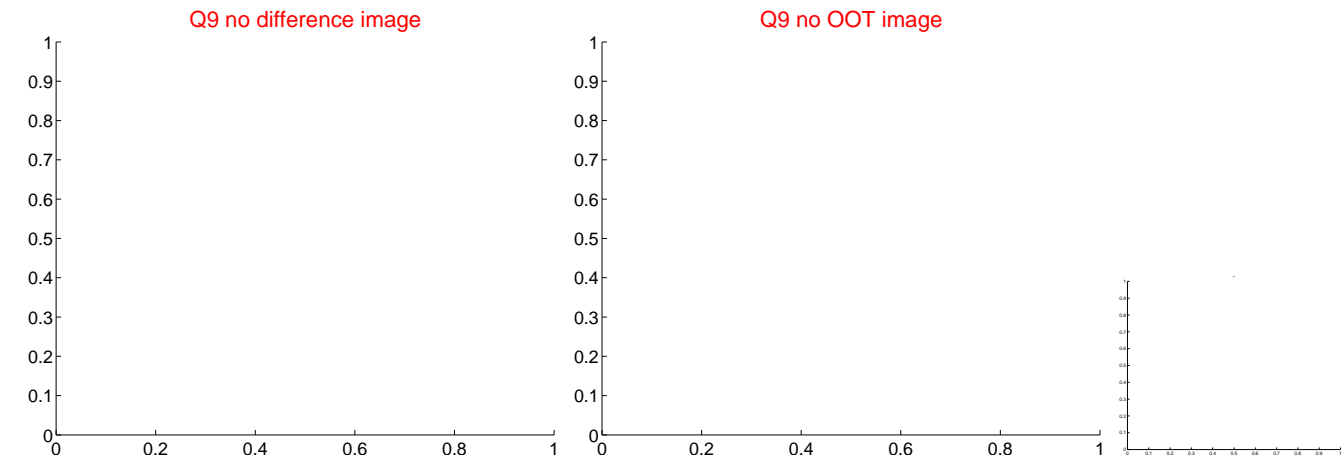
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



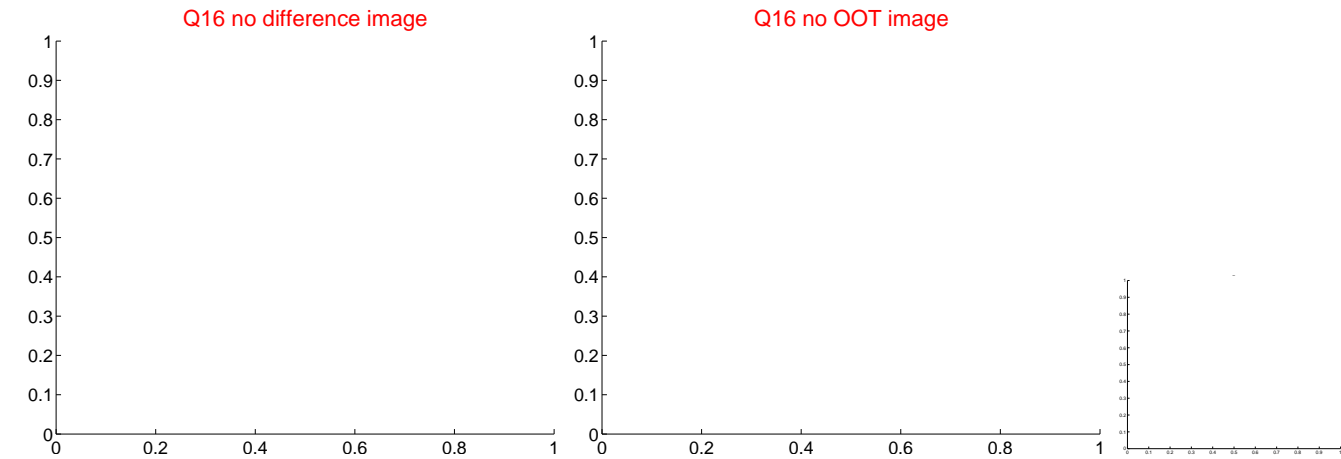
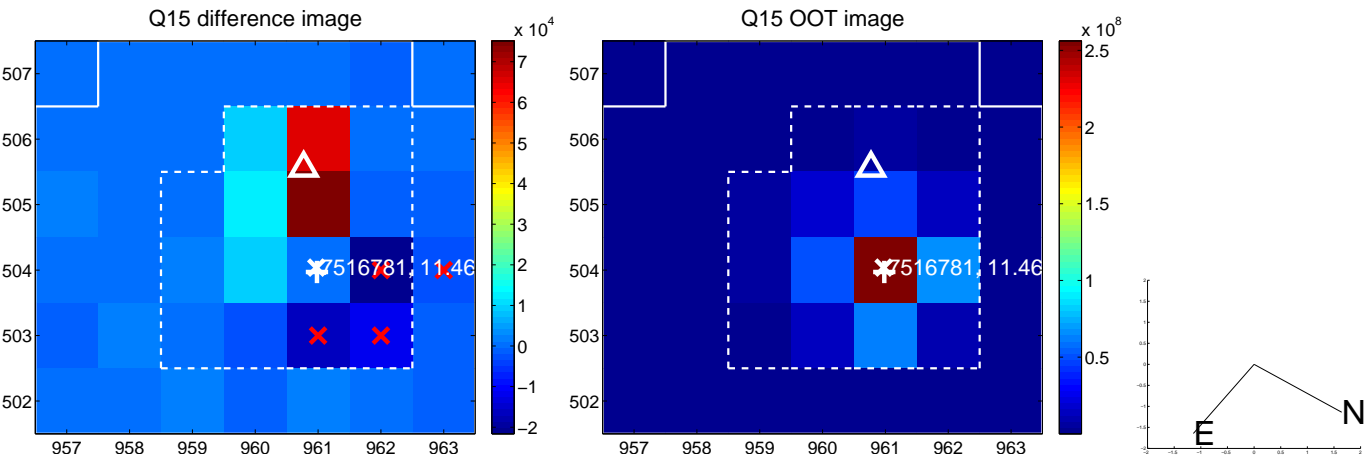
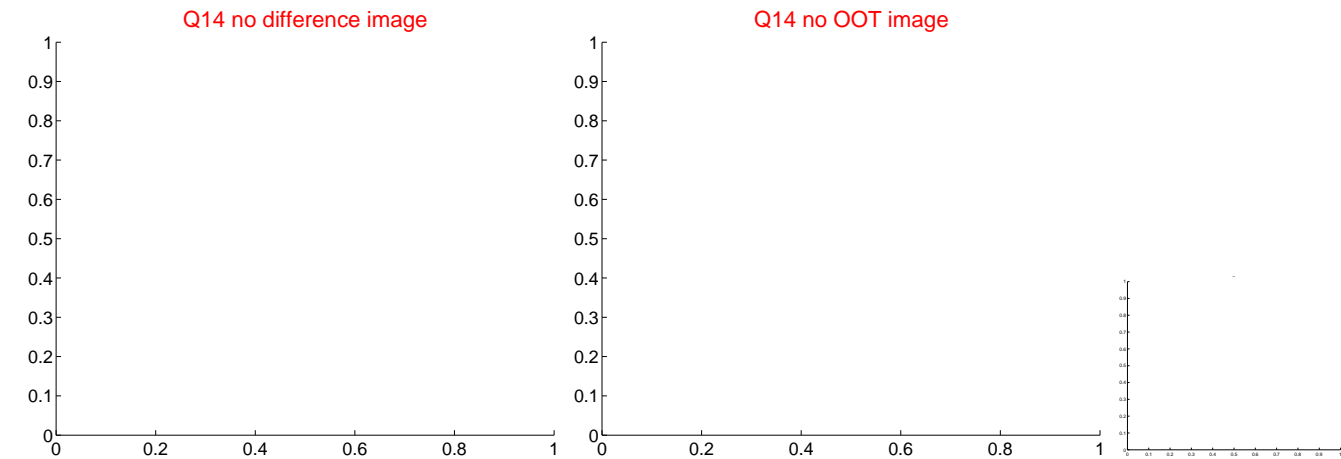
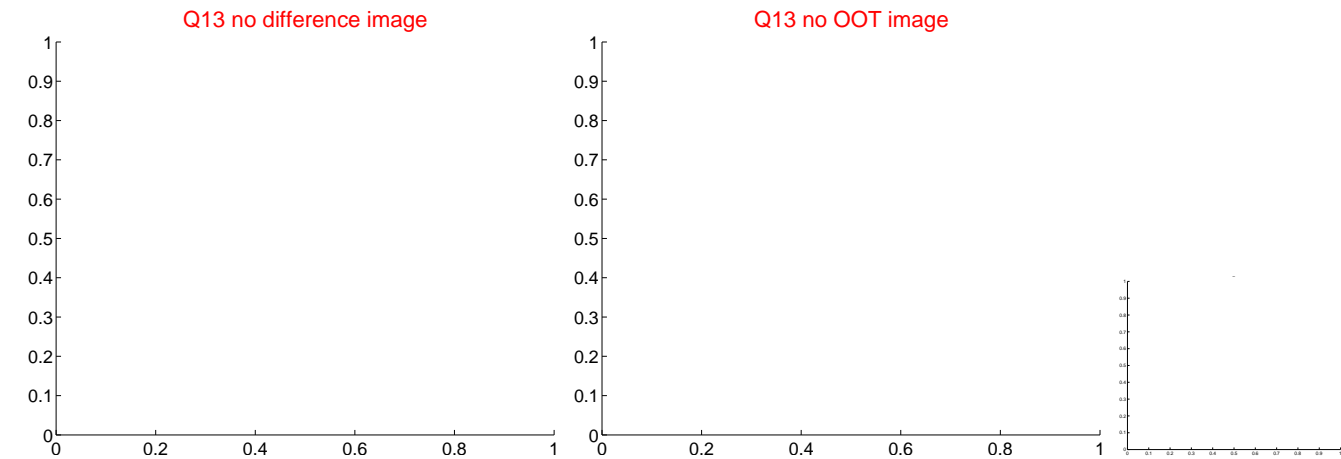
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



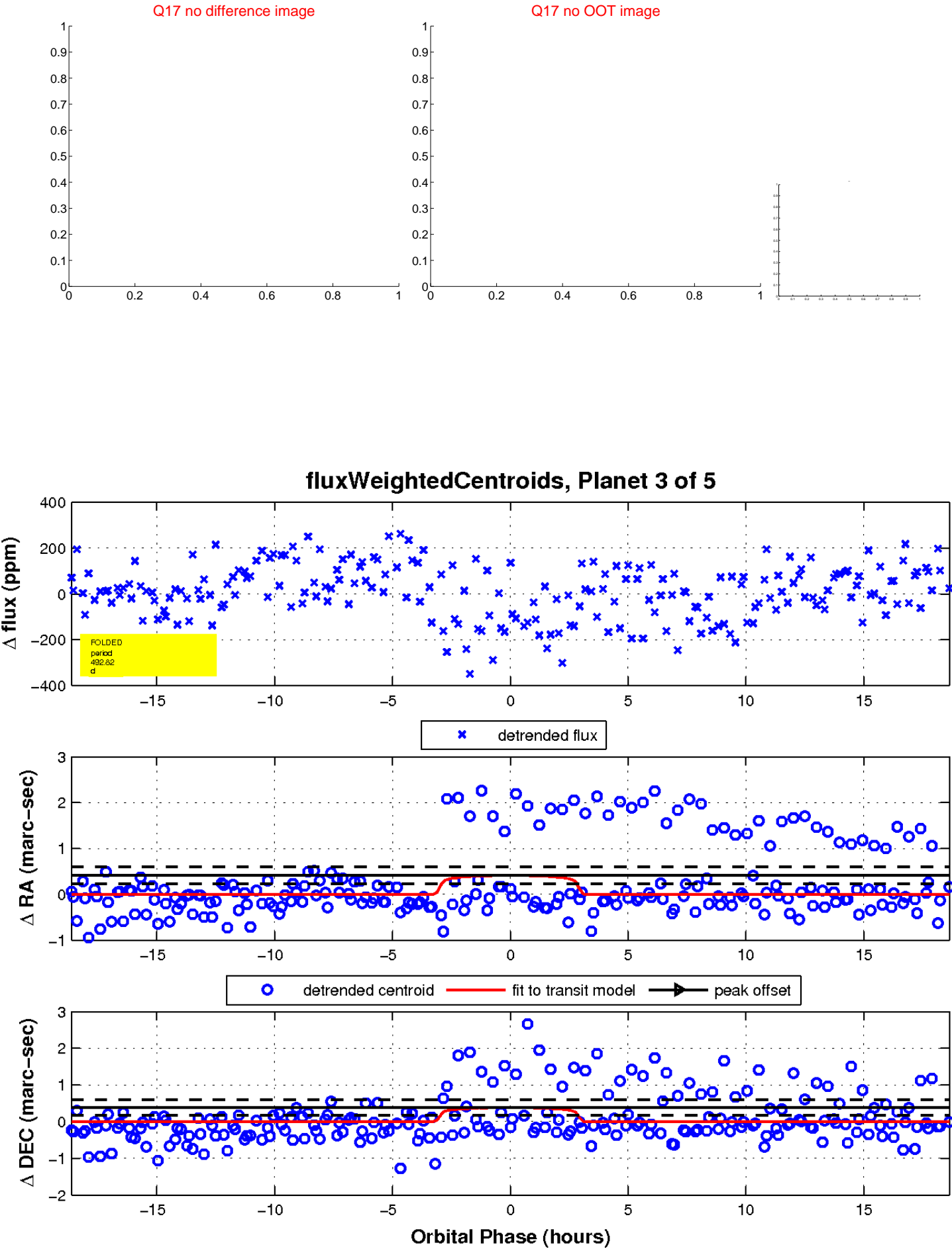
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

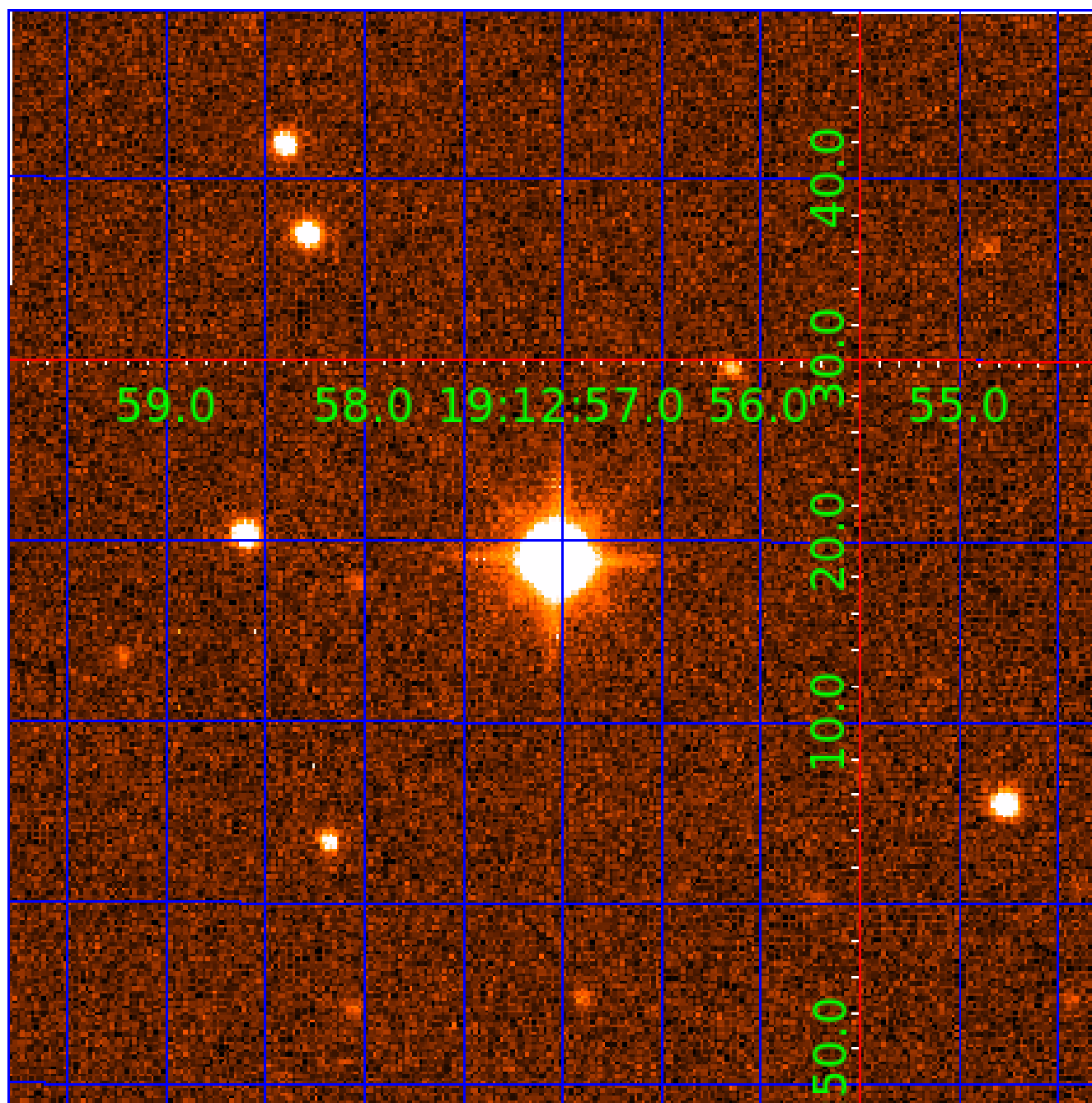


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007516781

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})
007516781-01	OBS	No	4.158487	135.190012	34.1	14.204	17.3	15.1	1.43	6844	0.97	1250.16
007516781-02	OBS	No	274.402277	342.242298	201.3	15.000	30.4	-1.0	1.43	6844	2.04	4.69
007516781-03	OBS	No	492.823702	481.267926	133.3	6.233	13.6	5.8	1.43	6844	1.88	2.15
007516781-04	OBS	No	388.803495	448.199514	194.6	12.259	12.0	7.3	1.43	6844	2.12	2.95
007516781-05	OBS	No	4.159681	131.776854	27.4	25.902	10.0	10.7	1.43	6844	0.76	1249.68

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007516781-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_SATURATED
007516781-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007516781-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED

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

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

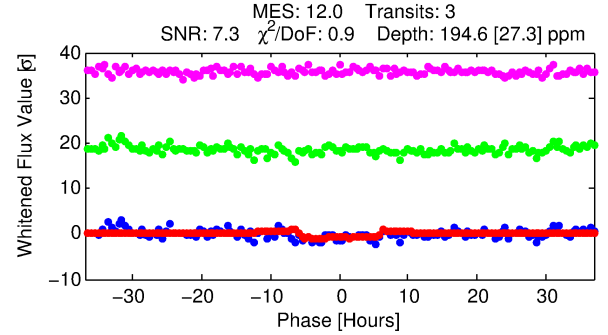
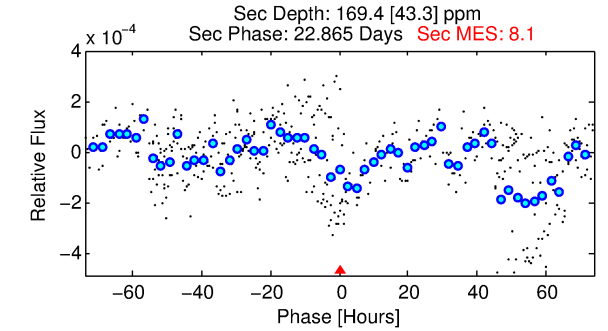
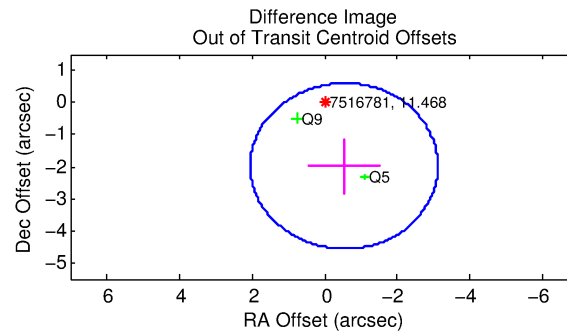
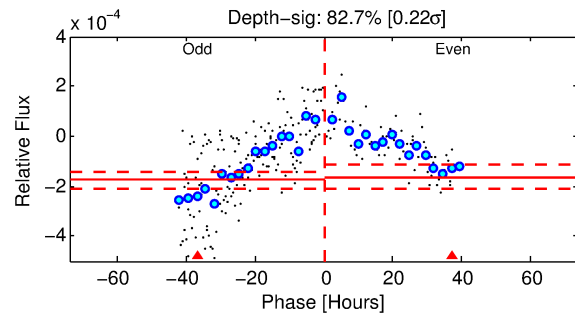
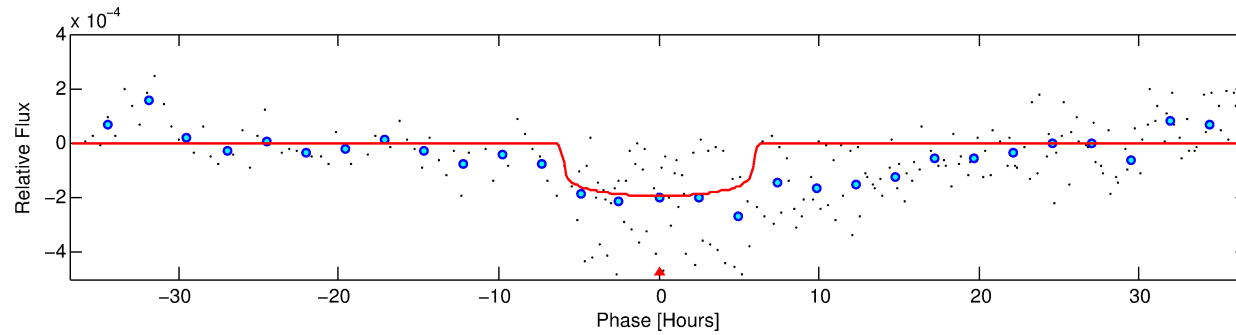
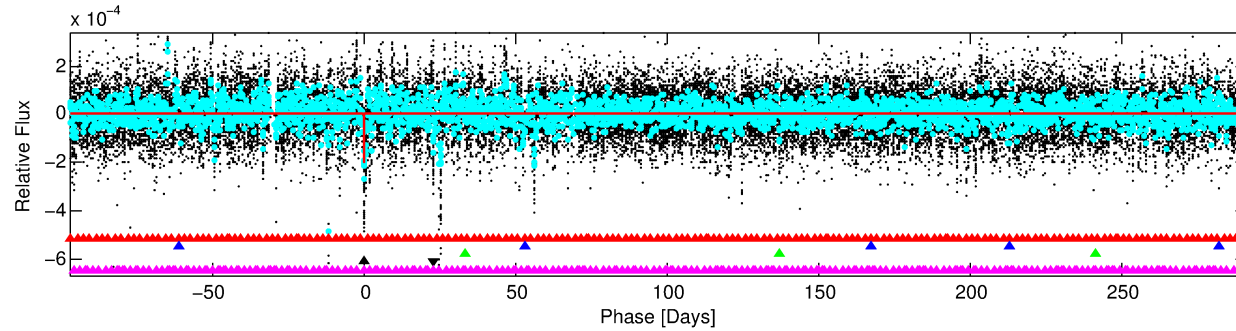
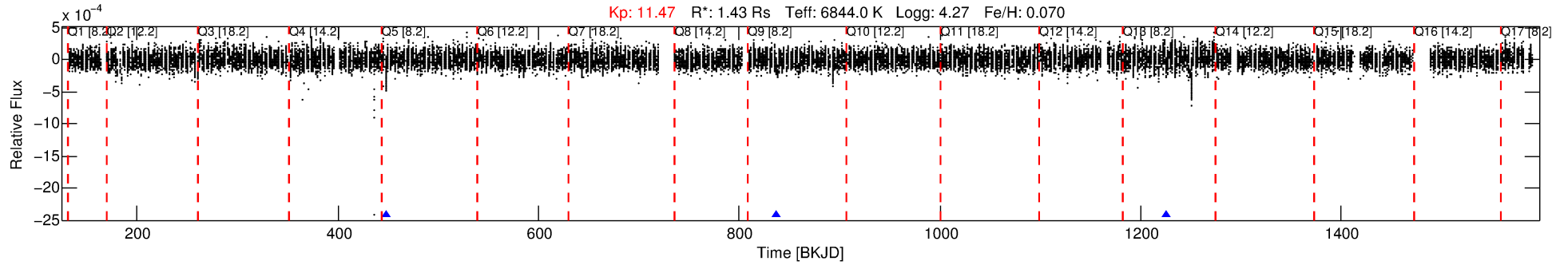
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007516781-04

No Significant Match Found

DV One-Page Summary

KIC: 7516781 Candidate: 4 of 5 Period: 388.803 d



DV Fit Results:

Period = 388.80350 [0.01083] d
Epoch = 448.1995 [0.0150] BKJD
Rp/R* = 0.0136 [0.0066]
a/R* = 182.06 [492.35]
b = 0.68 [2.15]
Seff = 2.95 [1.29]
Teq = 334 [37] K
Rp = 2.12 [1.27] Re
a = 1.1648 [0.3357] AU
Ag = 28151.62 [30253.05] [0.93 σ]
Teffp = 6690 [1694] K [3.75 σ]

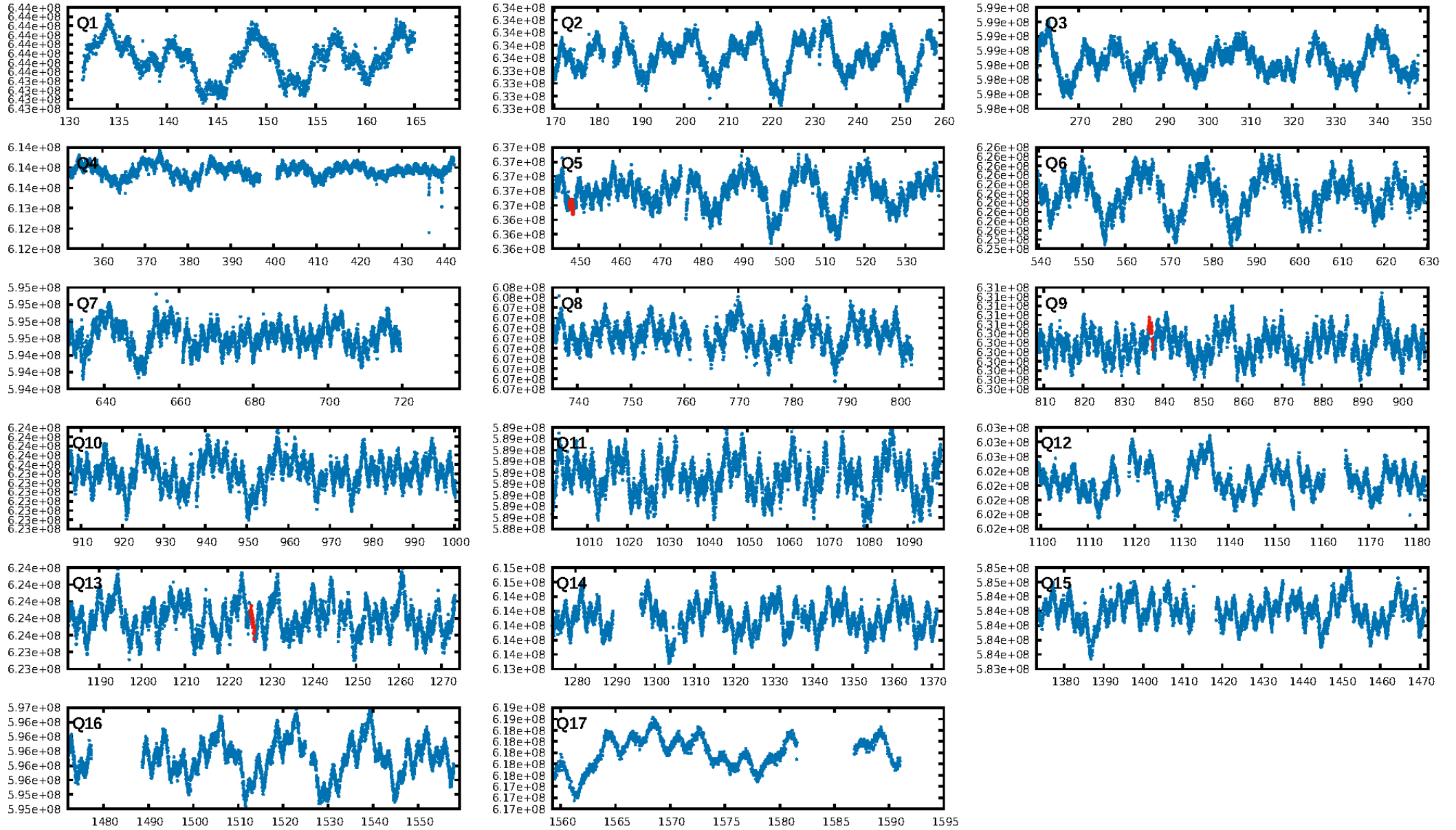
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [141.73 σ]
LongPeriod-sig: 100.0% [181.53 σ]
ModelChiSquare2-sig: 0.3%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 5.22e-45
RollingBand-fgt: 1.00 [3/3]
GhostDiagnostic-chr: -3.641
Centroid-sig: 58.4%
Centroid-so: 0.318 arcsec [0.54 σ]
OotOffset-rm: 2.052 arcsec [2.38 σ]
OotOffset-st: 0/0/0/2 [2]
KicOffset-rm: 2.034 arcsec [2.35 σ]
KicOffset-st: 0/0/0/2 [2]
DiffImageQuality-fgm: 0.50 [1/2]
DiffImageOverlap-fno: 0.00 [0/2]

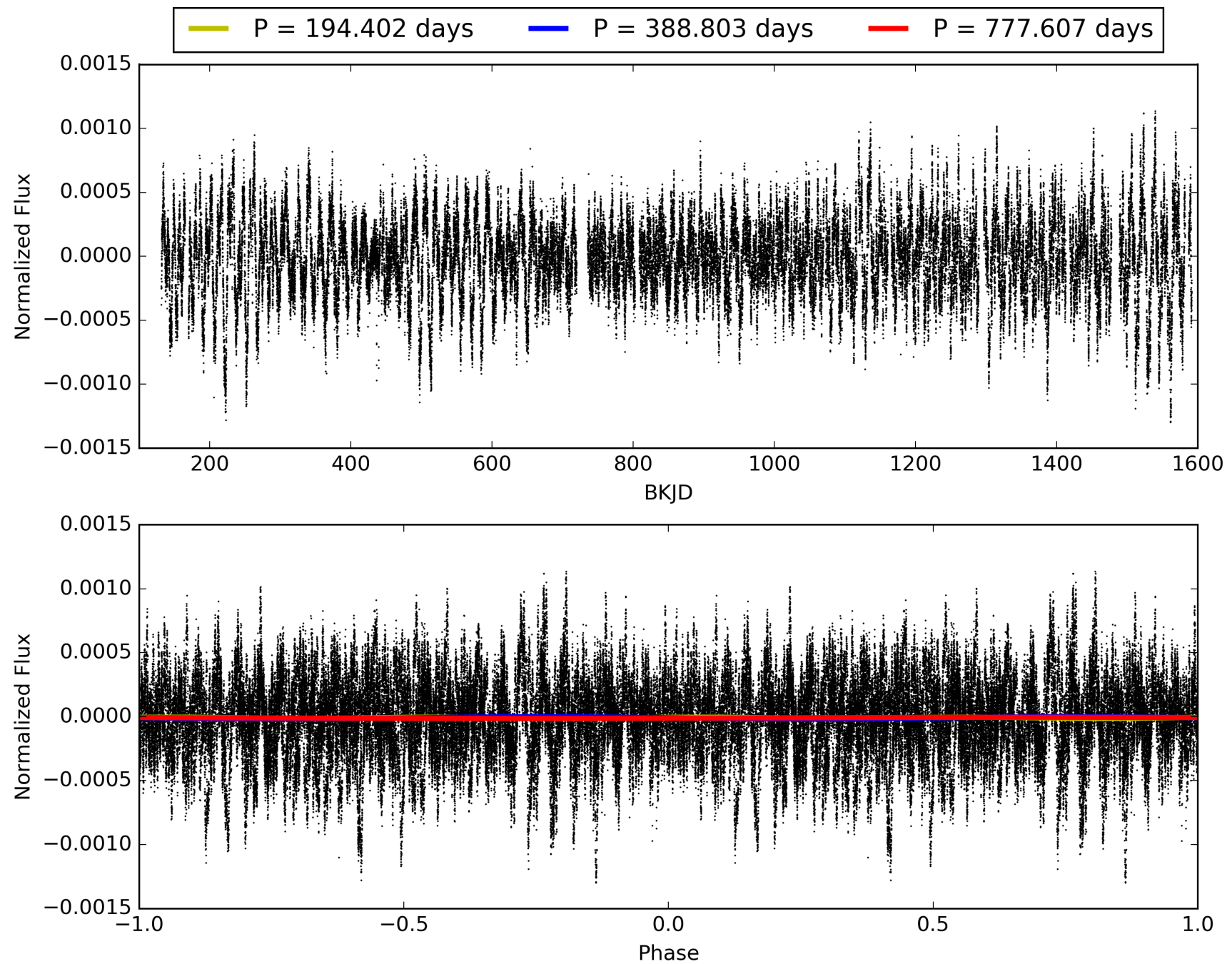
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:00:45 Z

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

TCE 007516781-04, PDC Light Curves

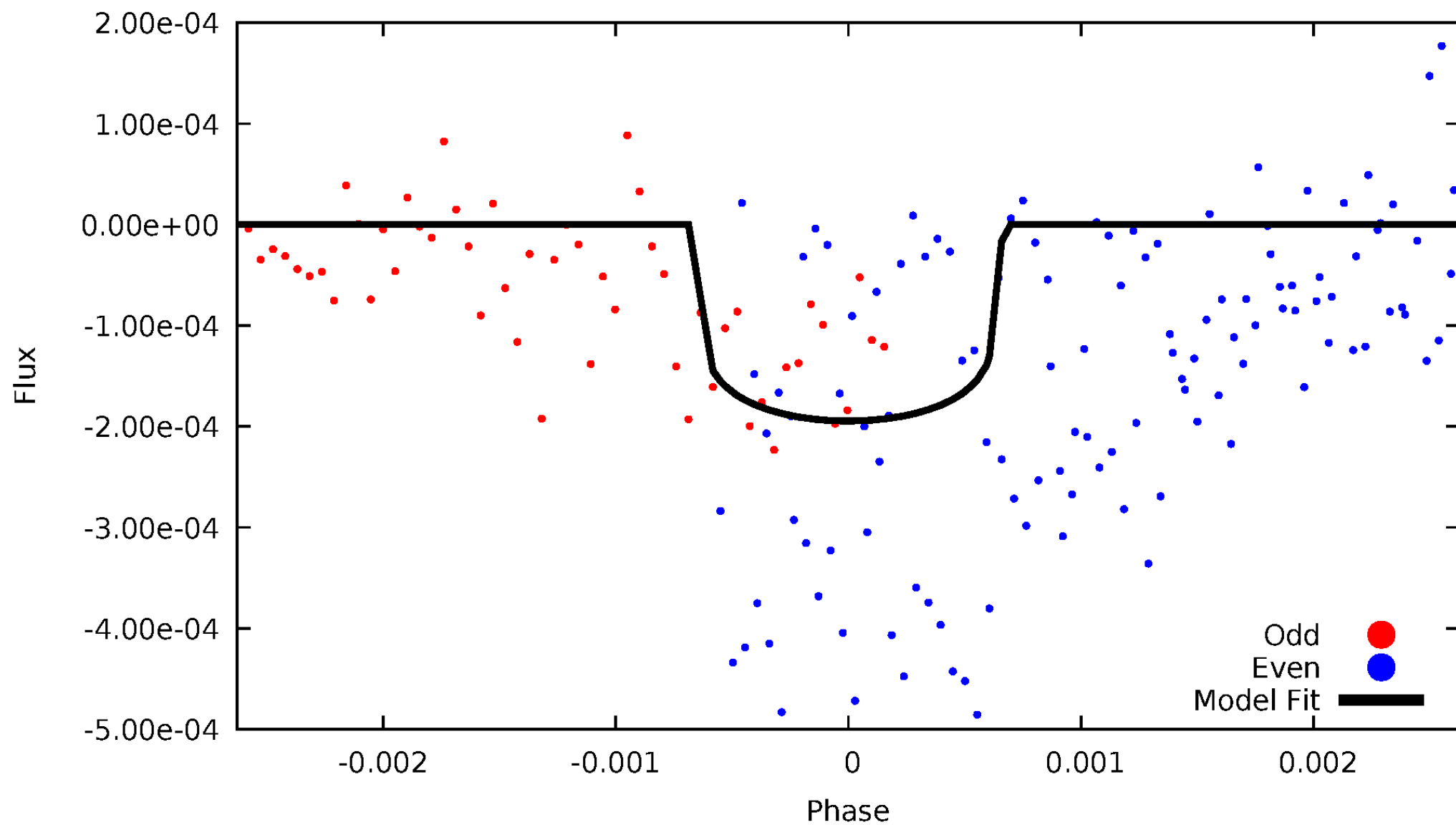


TCE 007516781-04



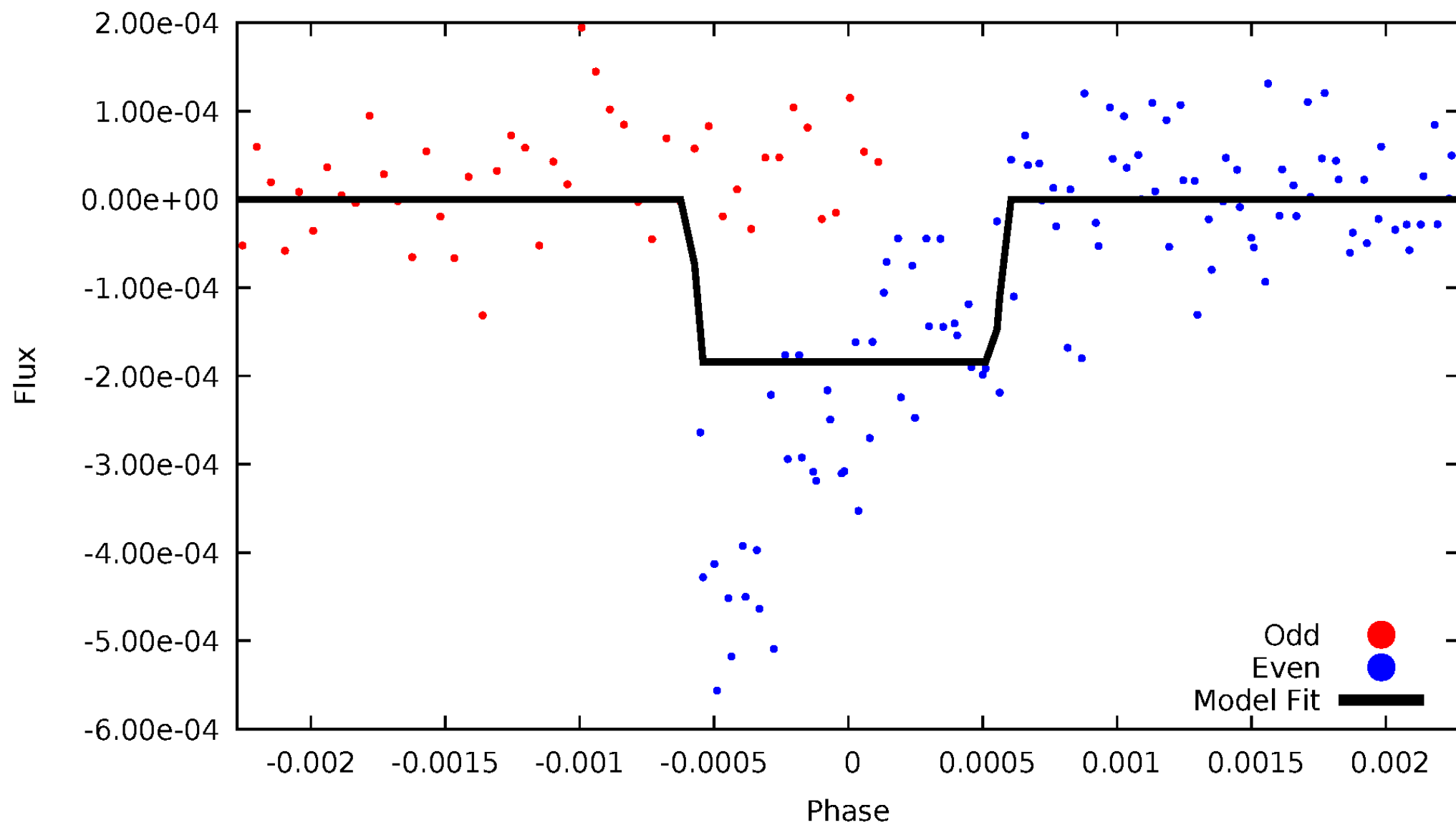
DV Odd/Even

TCE 007516781-04



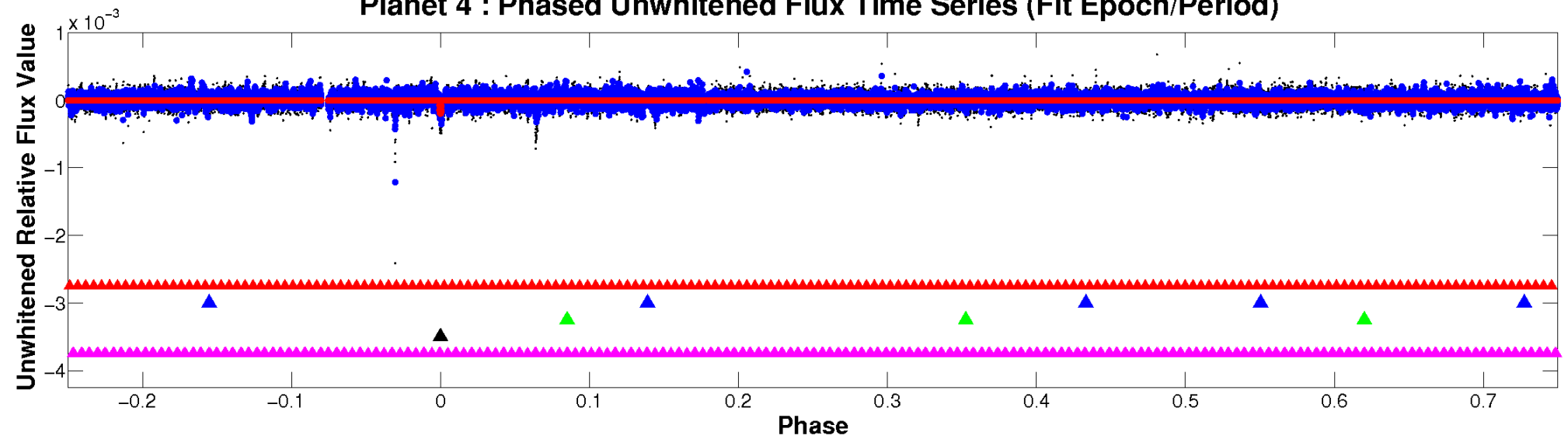
ALT Odd/Even

TCE 007516781-04

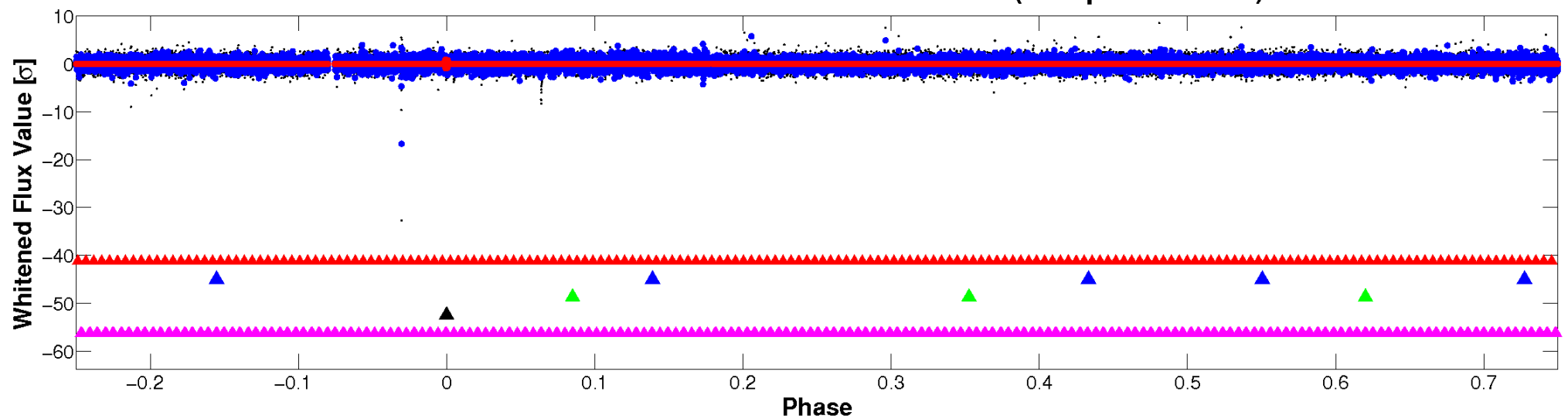


Non-Whitened Vs. Whitened Light Curve

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

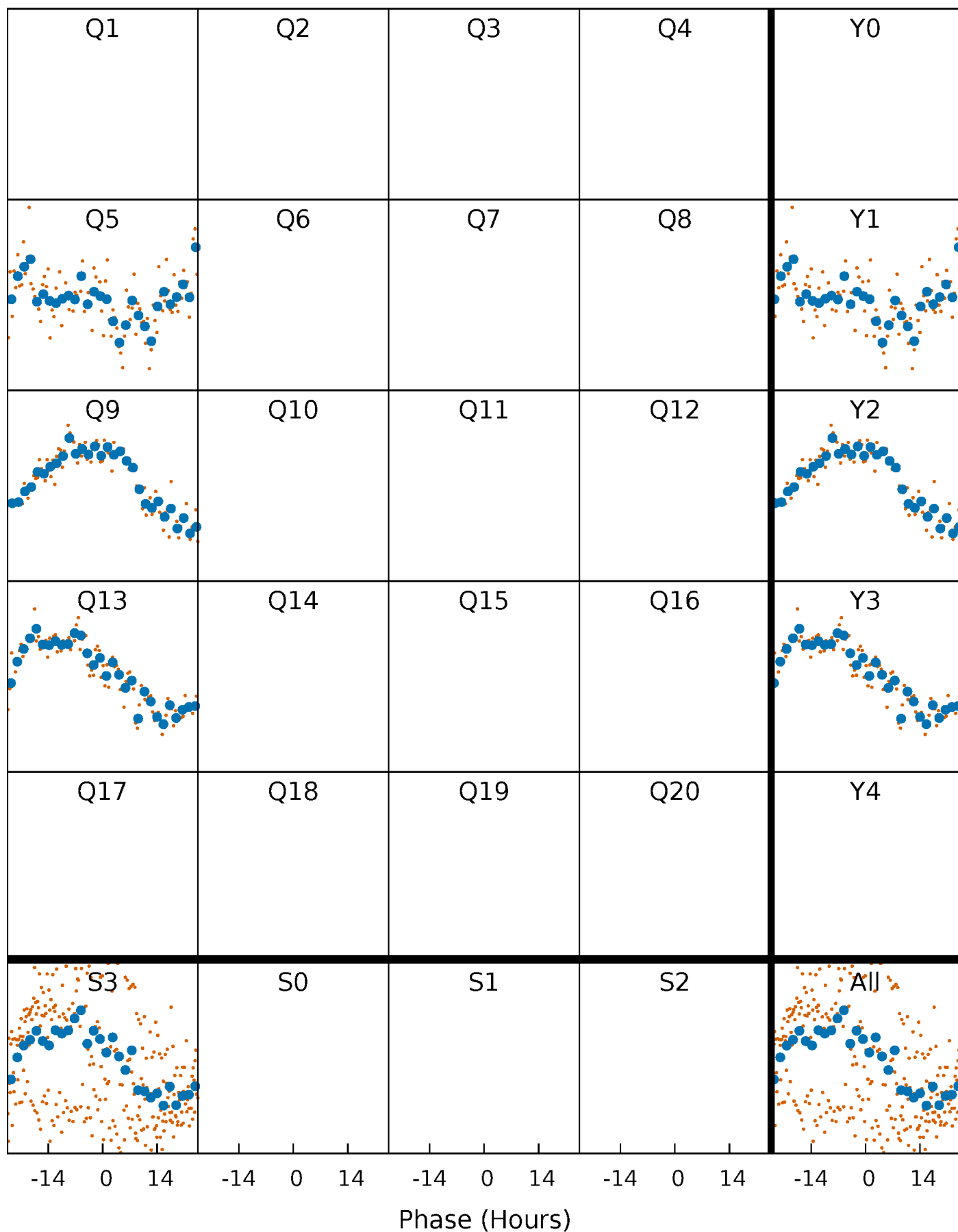


Planet 4 : Phased Whitened Flux Time Series (Fit Epoch/Period)



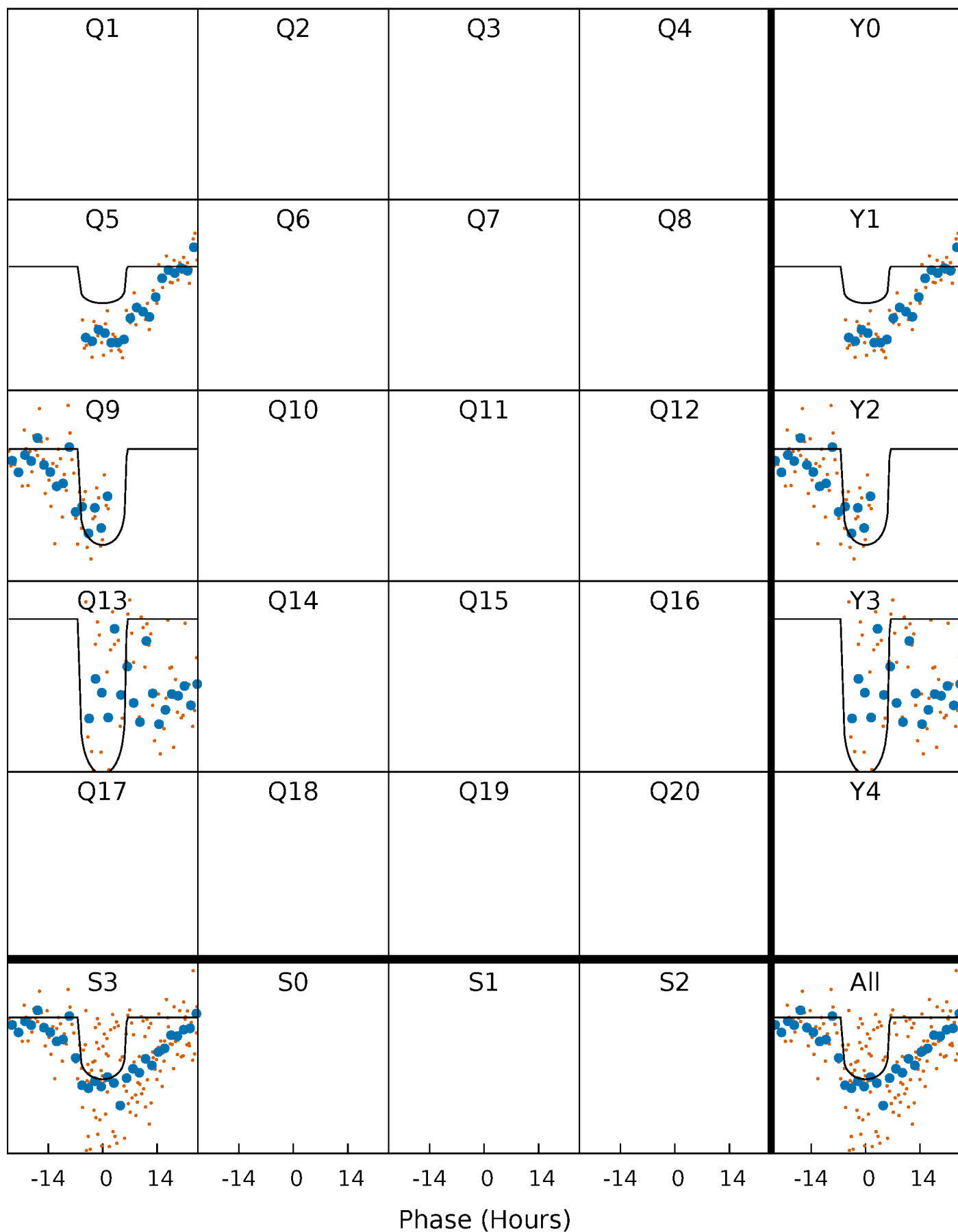
PDC Quarter-Phased Transit Curves

TCE 007516781-04 $P=388.803495$ Days $T_0=448.199514$ (BKJD)



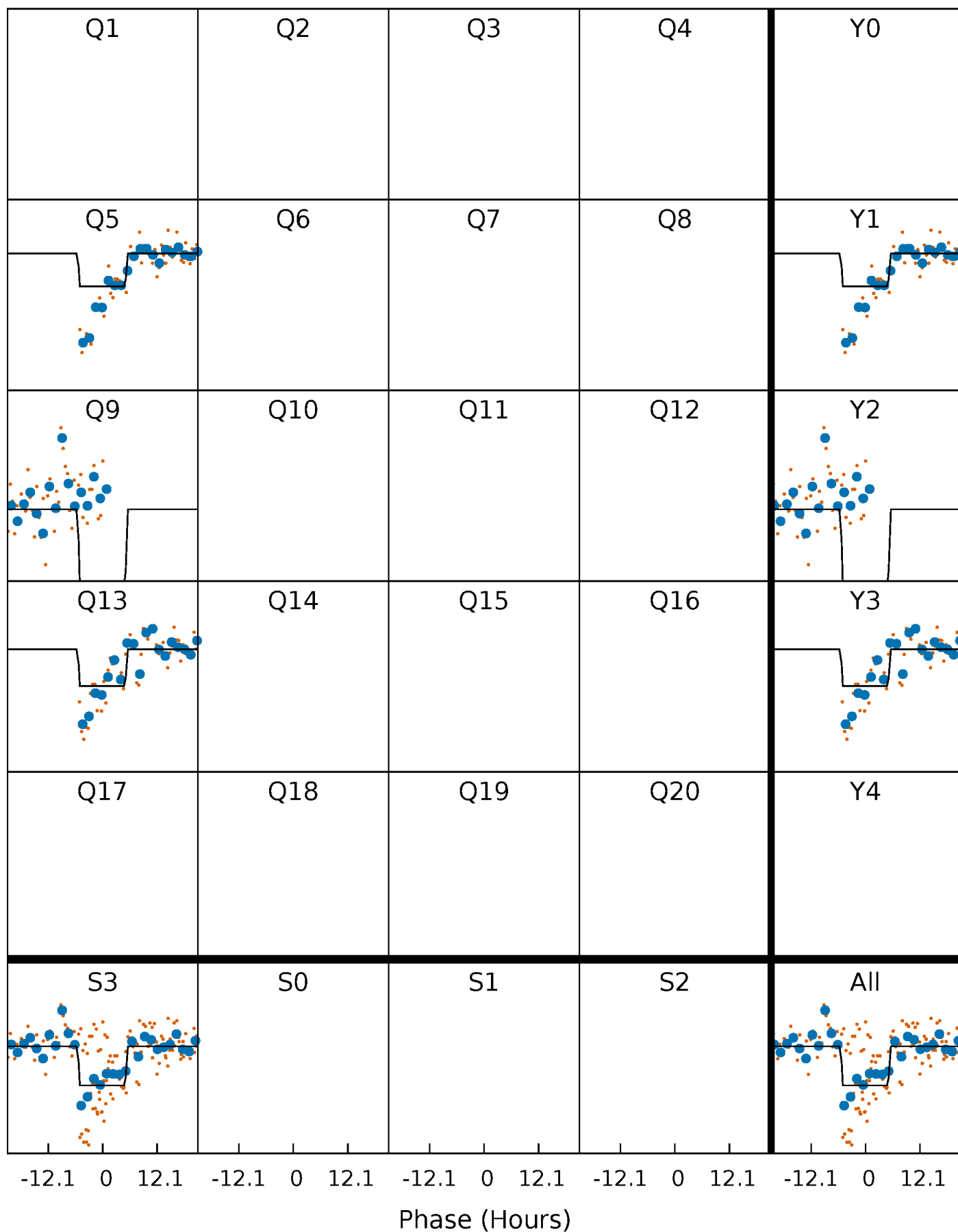
DV Quarter-Phased Transit Curves

TCE 007516781-04 $P=388.803495$ Days $T_0=448.199514$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

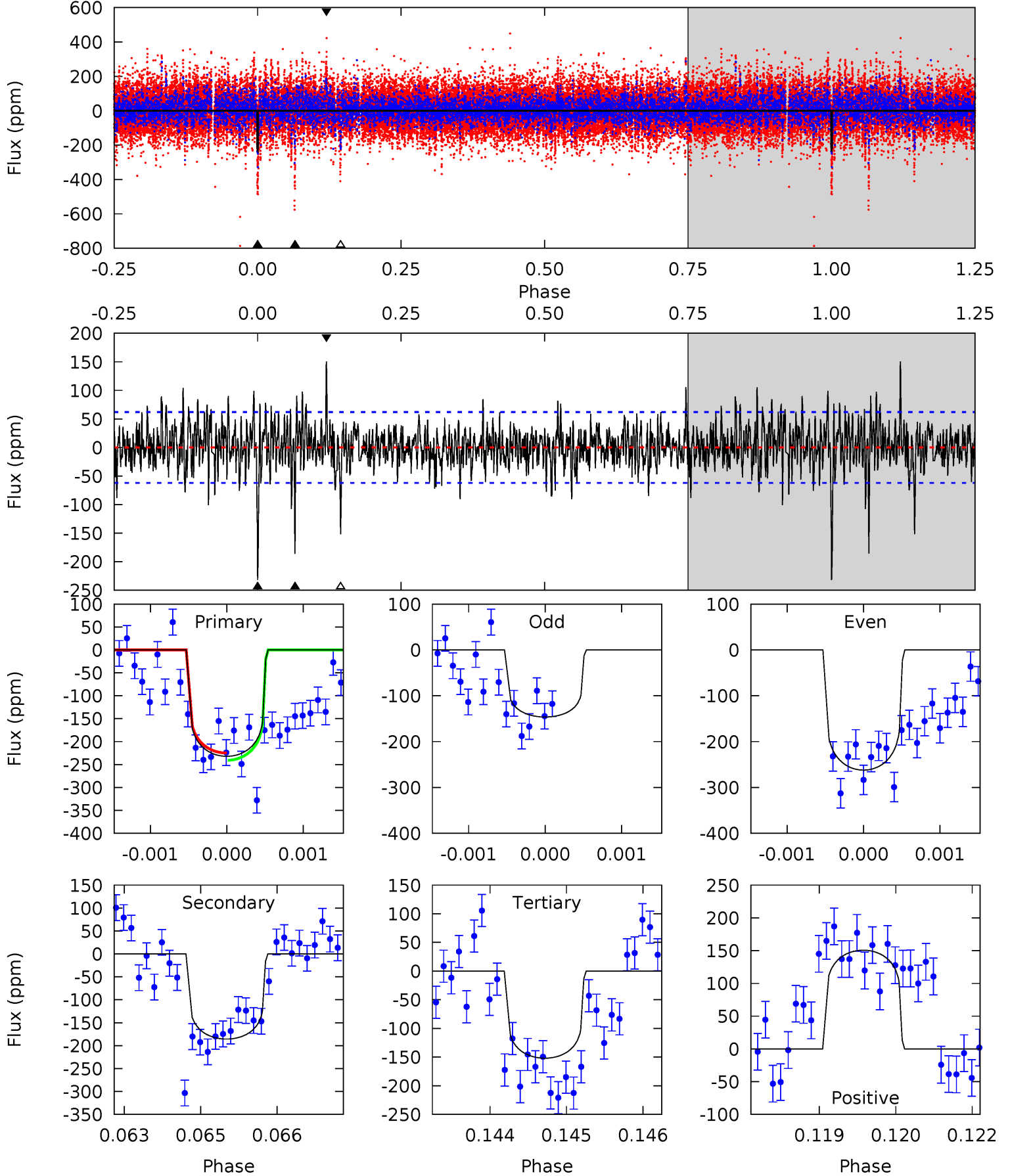
TCE 007516781-04 P=388.823402 Days $T_0=448.196085$ (BKJD)



DV Model-Shift Uniqueness Test

007516781-04, P = 388.803495 Days, E = 59.396019 Days

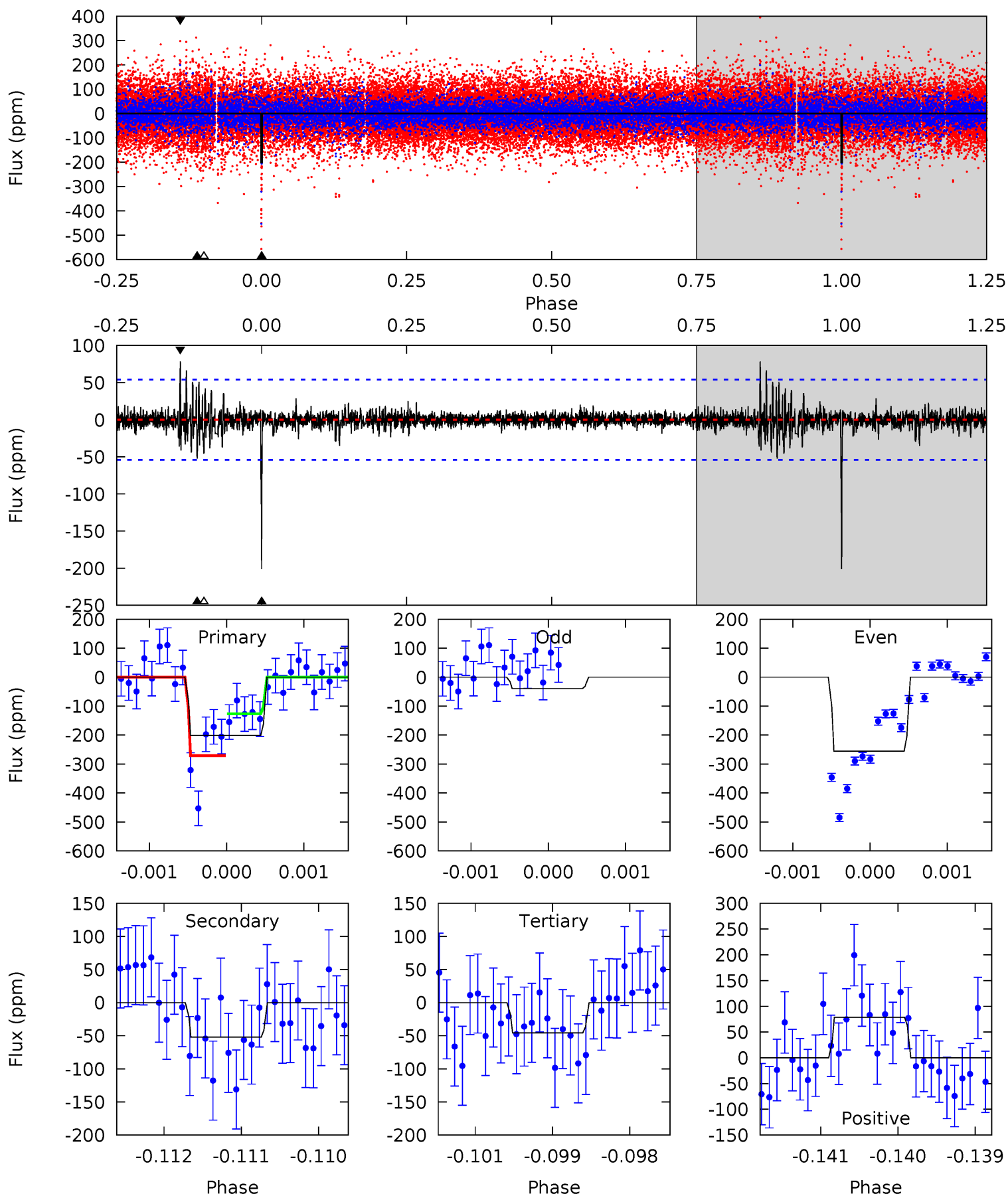
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.2	16.2	13.2	13.1	5.41	3.22	2.52	6.99	7.10	2.94	3.06	4.50	1.51	0.39	0.69



Alt Model-Shift Uniqueness Test

007516781-04, P = 388.823402 Days, E = 59.372683 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
20.2	5.24	4.58	7.90	5.43	3.25	0.83	15.6	12.3	0.66	-2.66	9.74	0.74	0.28	7.29



Stellar Parameters For KIC 007516781

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6844^{+189}_{-307}	$4.274^{+0.075}_{-0.210}$	$0.070^{+0.200}_{-0.350}$	$1.426^{+0.511}_{-0.219}$	$1.394^{+0.218}_{-0.218}$	$0.677^{+0.284}_{-0.381}$
	+3%/-4%	+2%/-5%	+286%/-500%	+36%/-15%	+16%/-16%	+42%/-56%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 007516781-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-186 ± 11	$2.26^{+1.22}_{-0.99}$	475^{+38}_{-29}	6736^{+2891}_{-1190}	26917^{+55447}_{-15475}
Alt.	-52 ± 10	$2.24^{+1.26}_{-1.09}$	473^{+37}_{-25}	4967^{+2011}_{-768}	7660^{+21535}_{-4633}

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 $A_{obs} \gg 1.0$

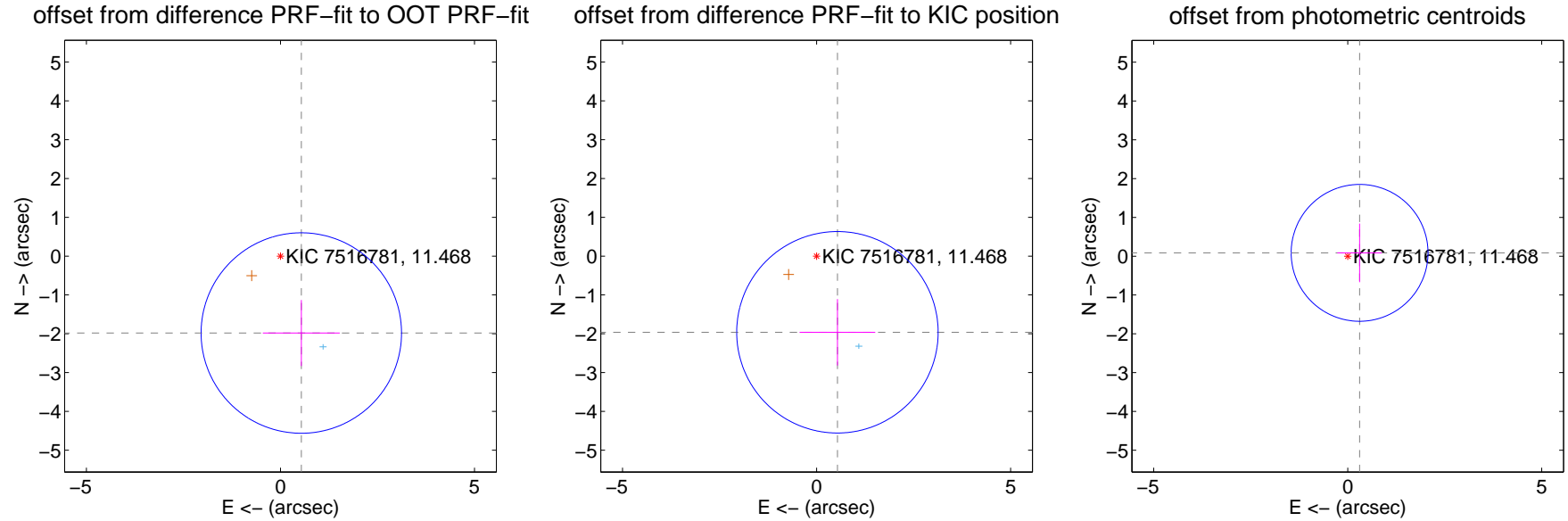
DV Centroid Data

Supplemental centroid analysis for 007516781-04. **Kepler magnitude: 11.47.** Transit SNR 7.27

There are 1 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.04 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	2.052 ± 0.861	2.38	-0.537 ± 0.992	-1.981 ± 0.850
PRF-fit source offset from KIC position	2.034 ± 0.865	2.35	-0.537 ± 0.976	-1.962 ± 0.856
photometric centroid source offset	0.32 ± 0.59	0.54	-0.31 ± 0.57	0.09 ± 0.76

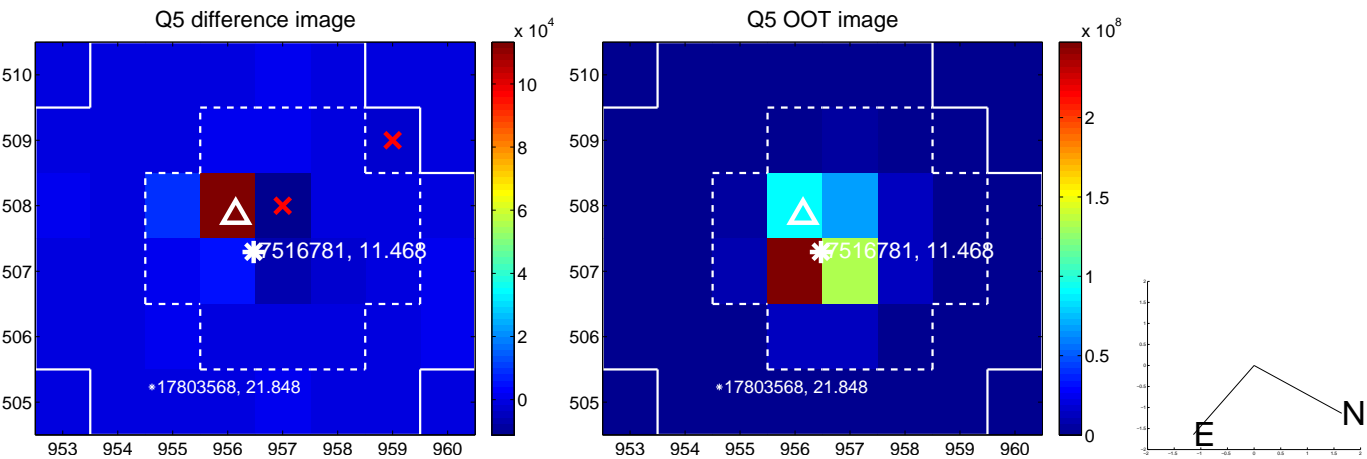


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

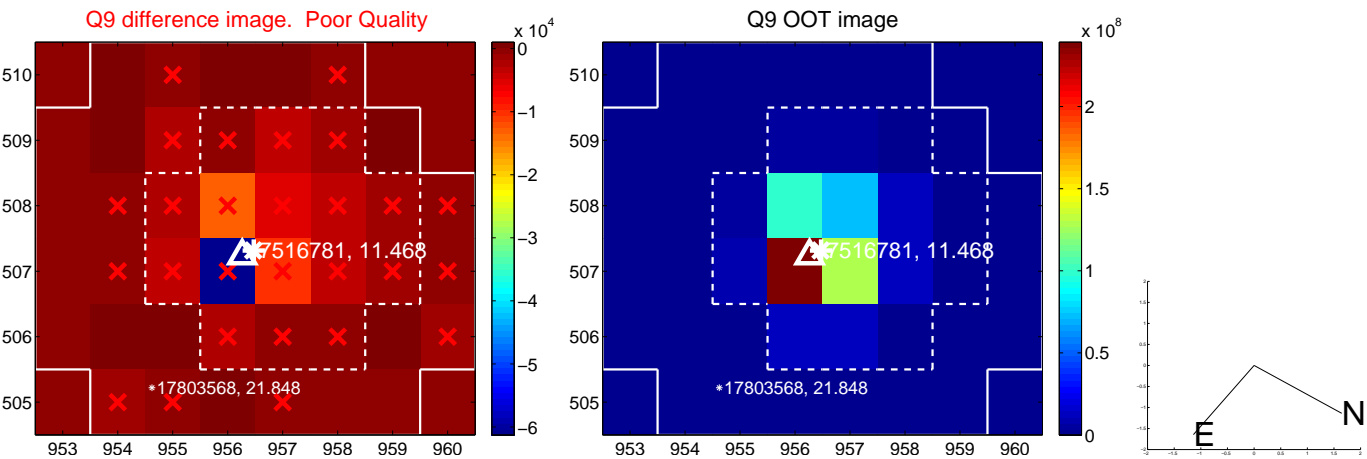
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



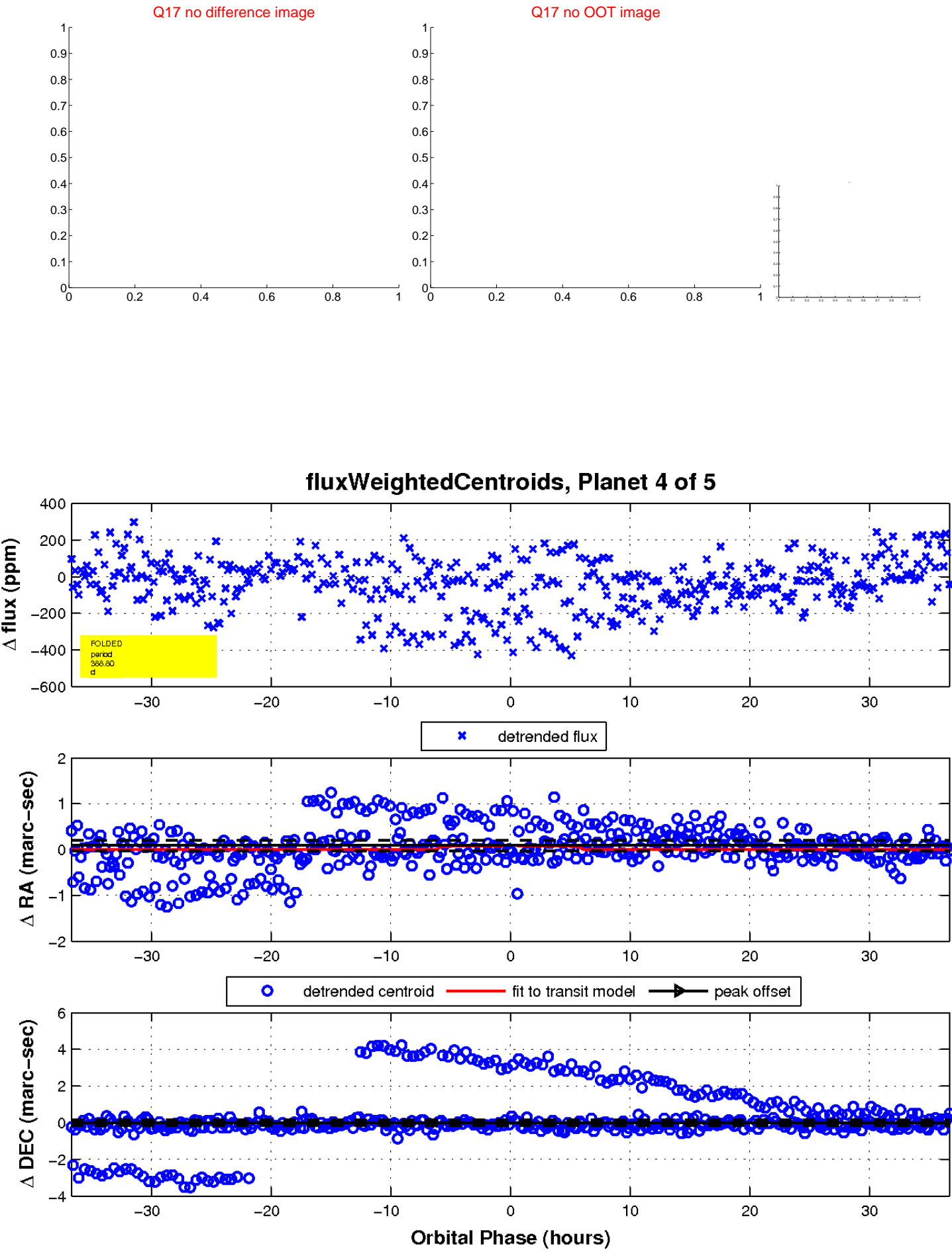
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

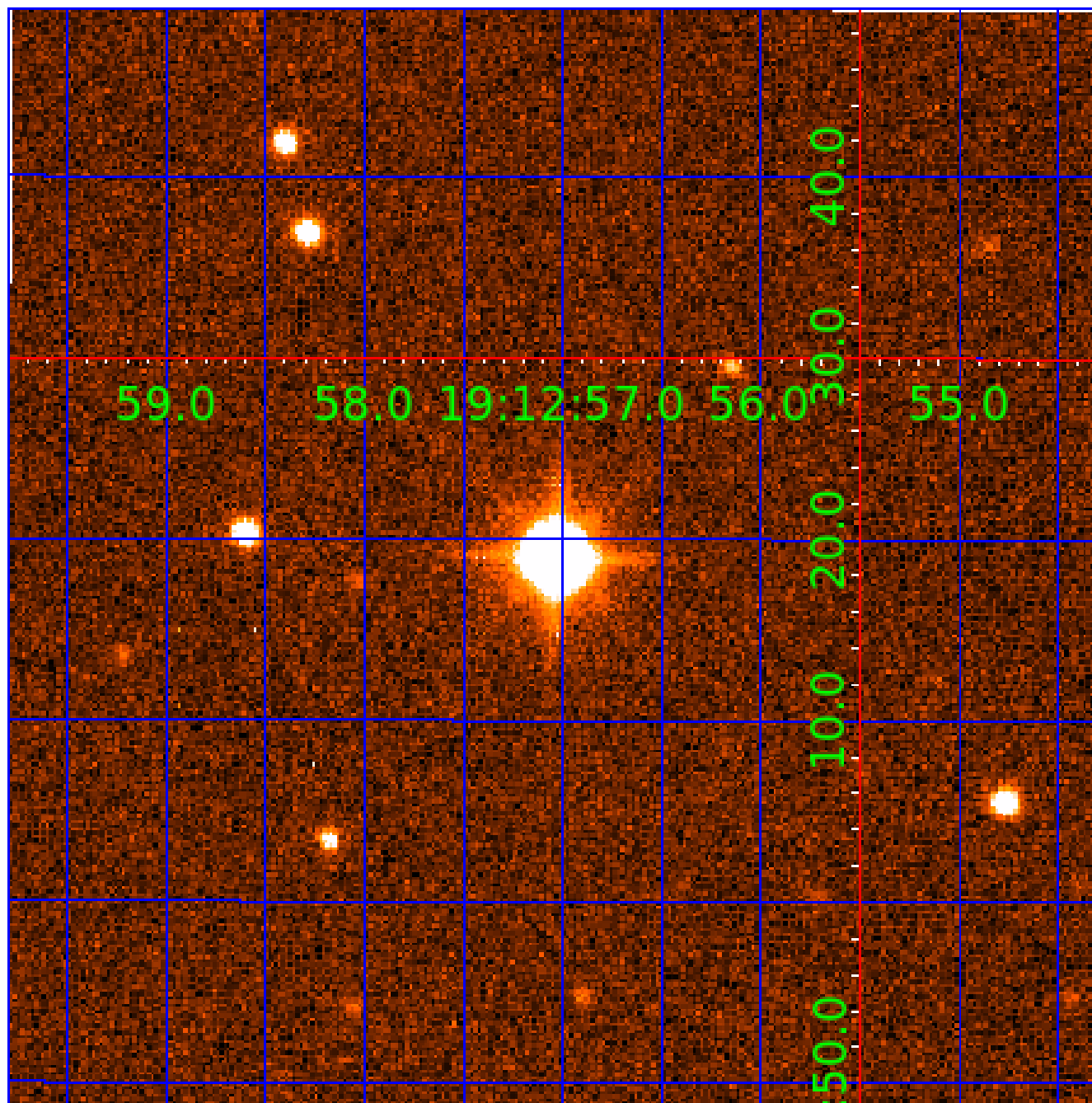


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 007516781

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})
007516781-01	OBS	No	4.158487	135.190012	34.1	14.204	17.3	15.1	1.43	6844	0.97	1250.16
007516781-02	OBS	No	274.402277	342.242298	201.3	15.000	30.4	-1.0	1.43	6844	2.04	4.69
007516781-03	OBS	No	492.823702	481.267926	133.3	6.233	13.6	5.8	1.43	6844	1.88	2.15
007516781-04	OBS	No	388.803495	448.199514	194.6	12.259	12.0	7.3	1.43	6844	2.12	2.95
007516781-05	OBS	No	4.159681	131.776854	27.4	25.902	10.0	10.7	1.43	6844	0.76	1249.68

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
007516781-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—CENT_SATURATED
007516781-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_ZUMA—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—CENT_SATURATED
007516781-03	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_CHASES_MARSHALL_TRACKER—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-04	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL—LPP_DV—ALL_TRANS_CHASES—INCONSISTENT_TRANS—CENT_SATURATED
007516781-05	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA—SWEET_NTL—LPP_DV—SAME_NTL_PERIOD—CENT_SATURATED

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

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

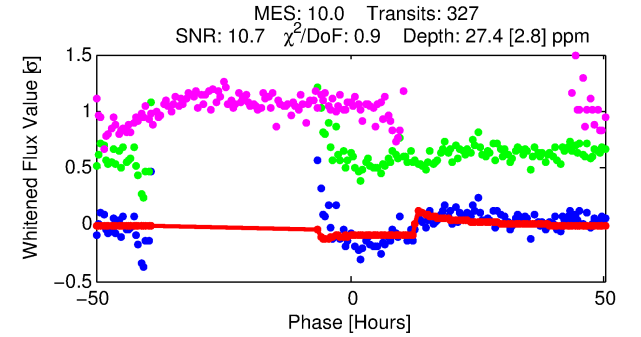
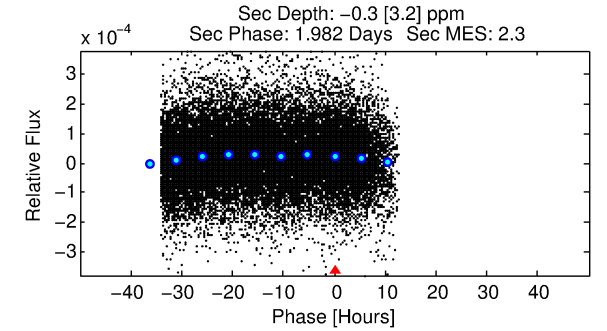
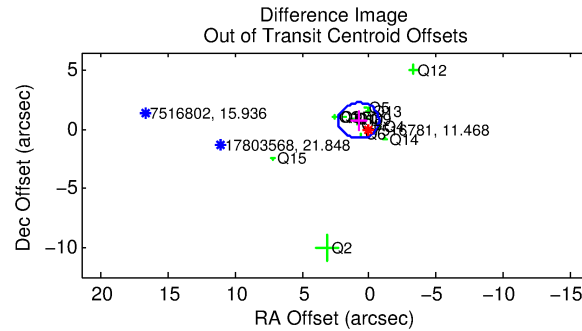
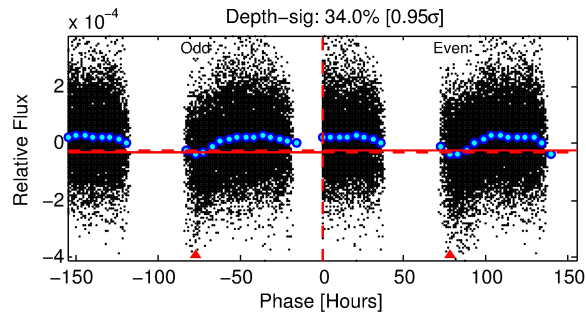
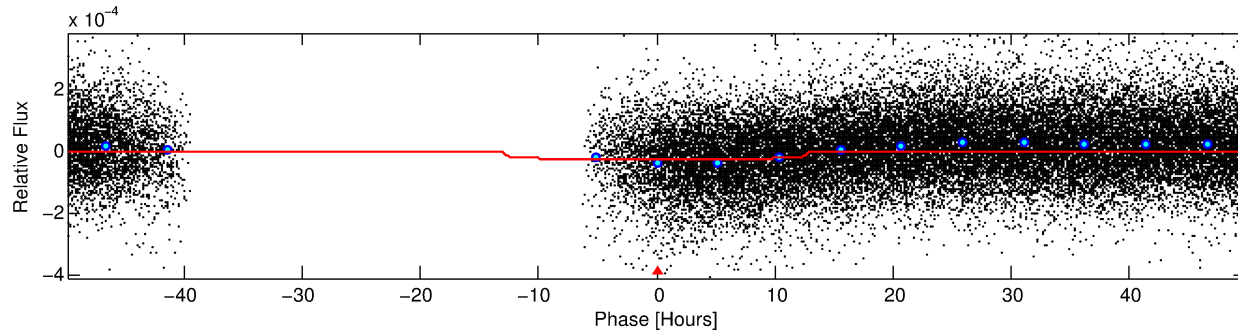
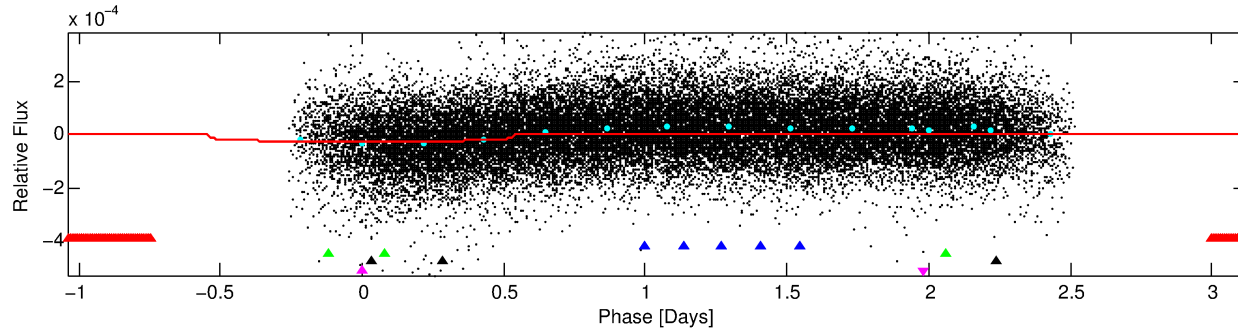
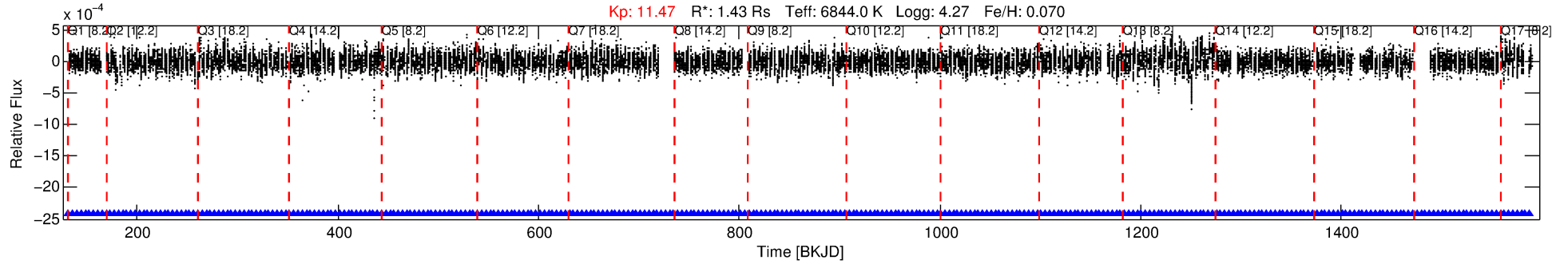
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 007516781-05

No Significant Match Found

DV One-Page Summary

KIC: 7516781 Candidate: 5 of 5 Period: 4.160 d



DV Fit Results:

Period = 4.15968 [0.00006] d
Epoch = 131.7769 [0.0331] BKJD
Rp/R* = 0.0049 [0.0023]
a/R* = 1.34 [1.54]
b = 0.37 [6.12]
Seff = 1249.69 [549.27]
Teq = 1516 [167] K
Rp = 0.76 [0.45] Re
a = 0.0566 [0.0163] AU
Ag = N/A
Teffp = N/A

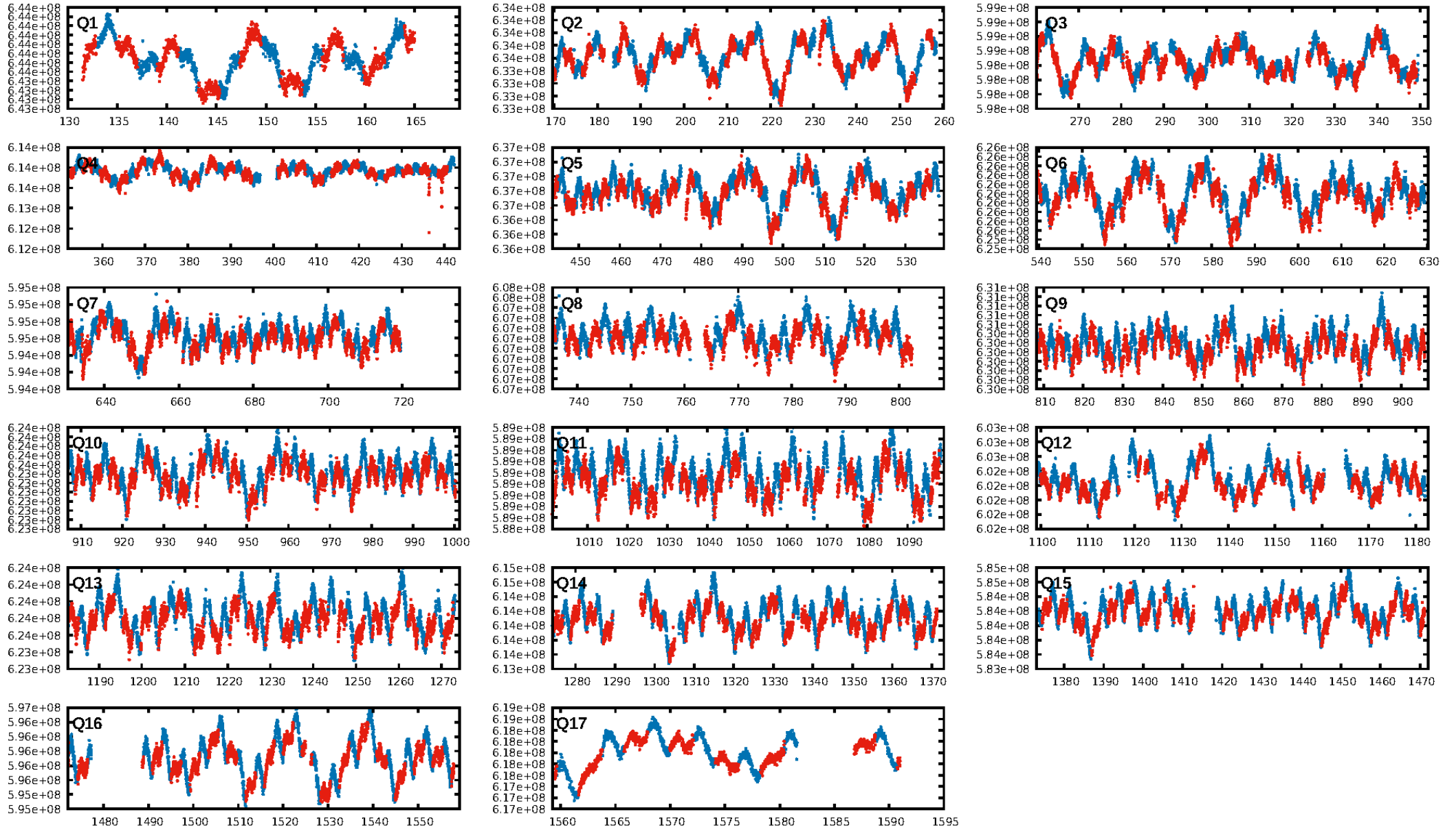
DV Diagnostic Results:

ShortPeriod-sig: 0.1% [0.00 σ]
LongPeriod-sig: 100.0% [216.69 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 1.37e-38
RollingBand-fgt: 1.00 [313/313]
GhostDiagnostic-chr: 3.643
Centroid-sig: 3.4%
Centroid-so: 0.893 arcsec [2.13 σ]
OotOffset-rm: 1.069 arcsec [2.13 σ]
KicOffset-rm: 1.126 arcsec [2.12 σ]
OotOffset-st: 4/4/3/4 [15]
KicOffset-st: 4/4/3/4 [15]
DiffImageQuality-fgm: 0.00 [0/15]
DiffImageOverlap-fno: 0.00 [0/17]

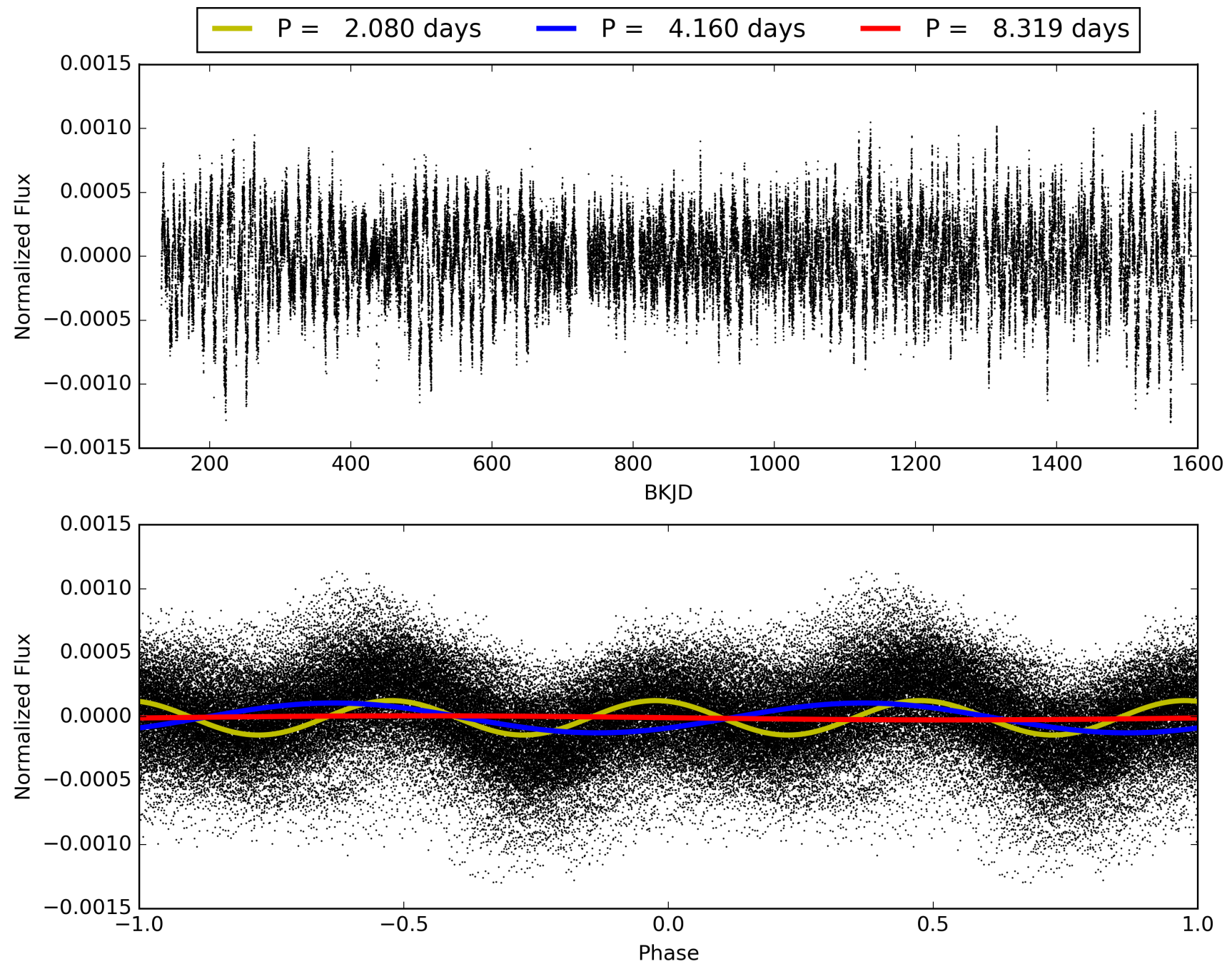
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 02-Feb-2016 00:00:54 Z

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

TCE 007516781-05, PDC Light Curves

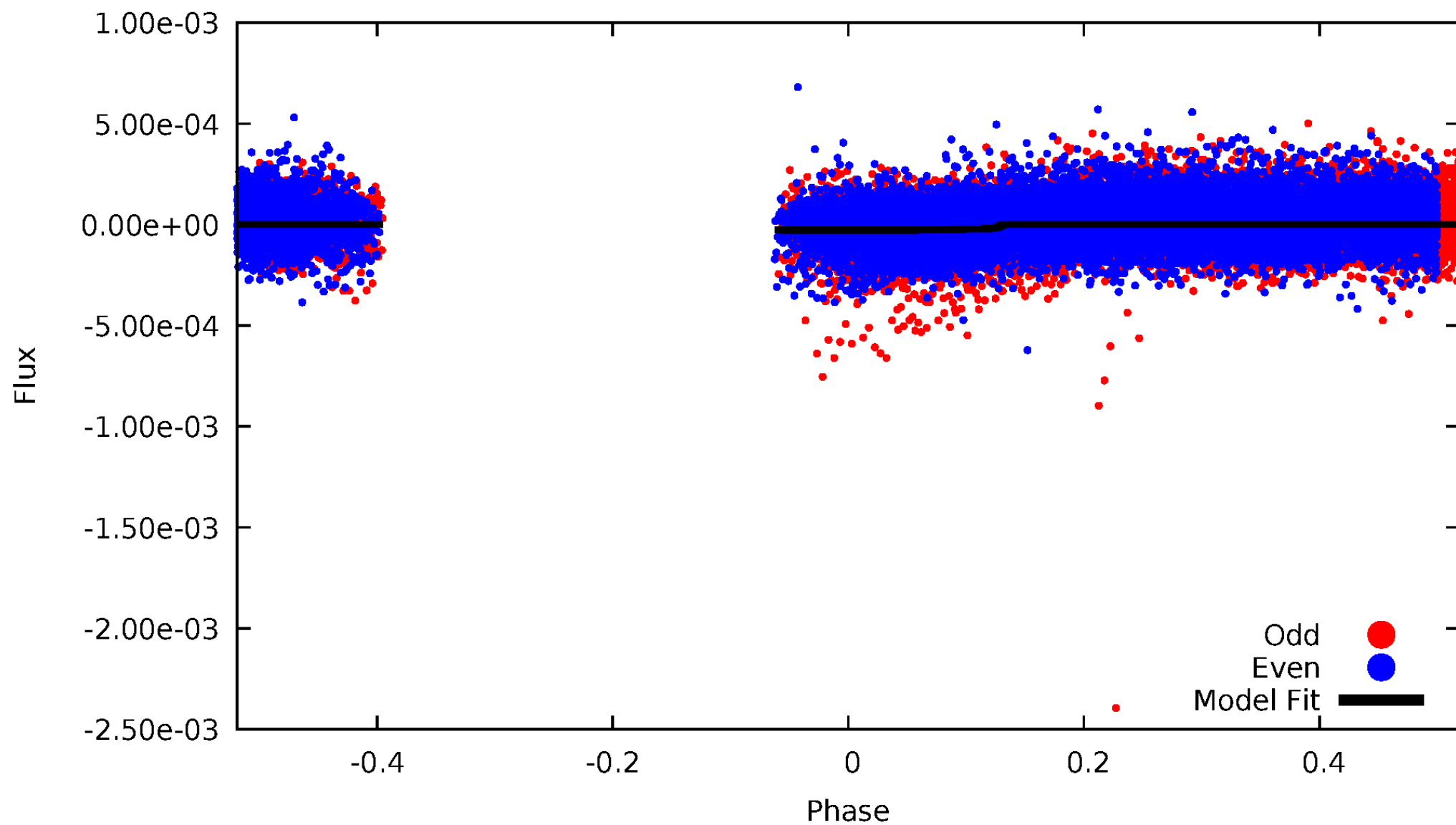


TCE 007516781-05



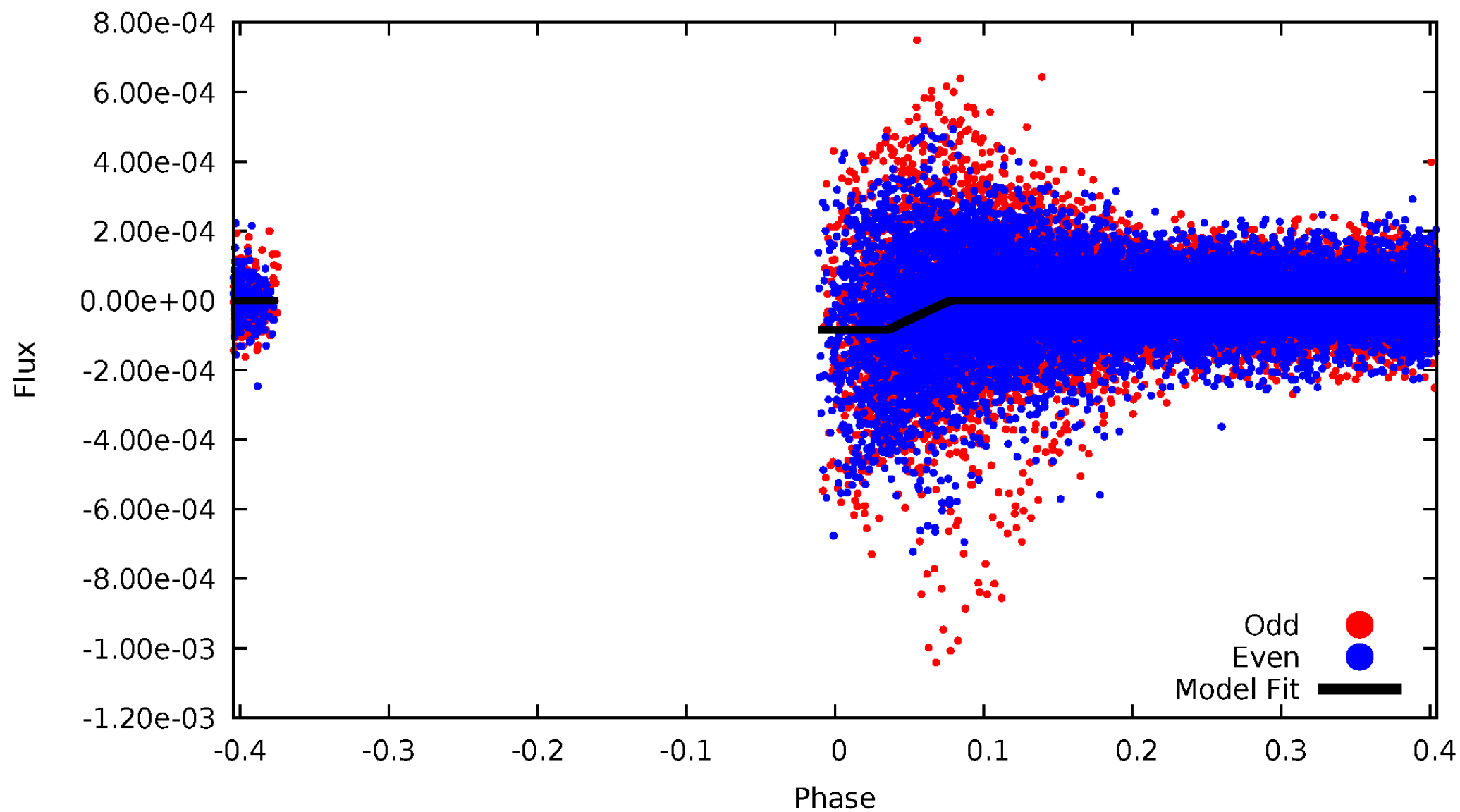
DV Odd/Even

TCE 007516781-05



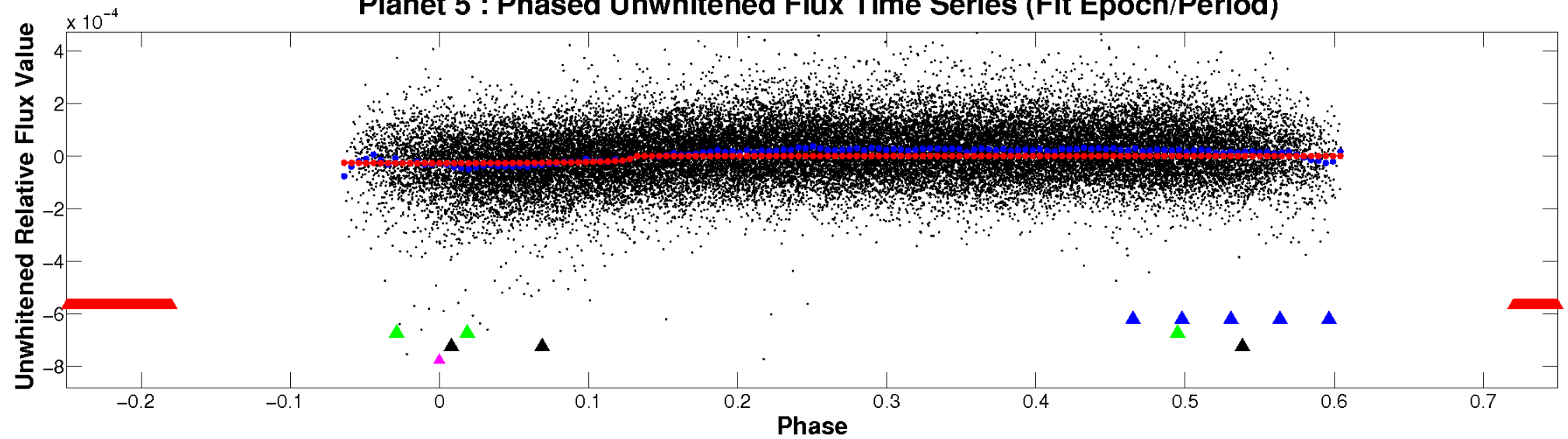
ALT Odd/Even

TCE 007516781-05

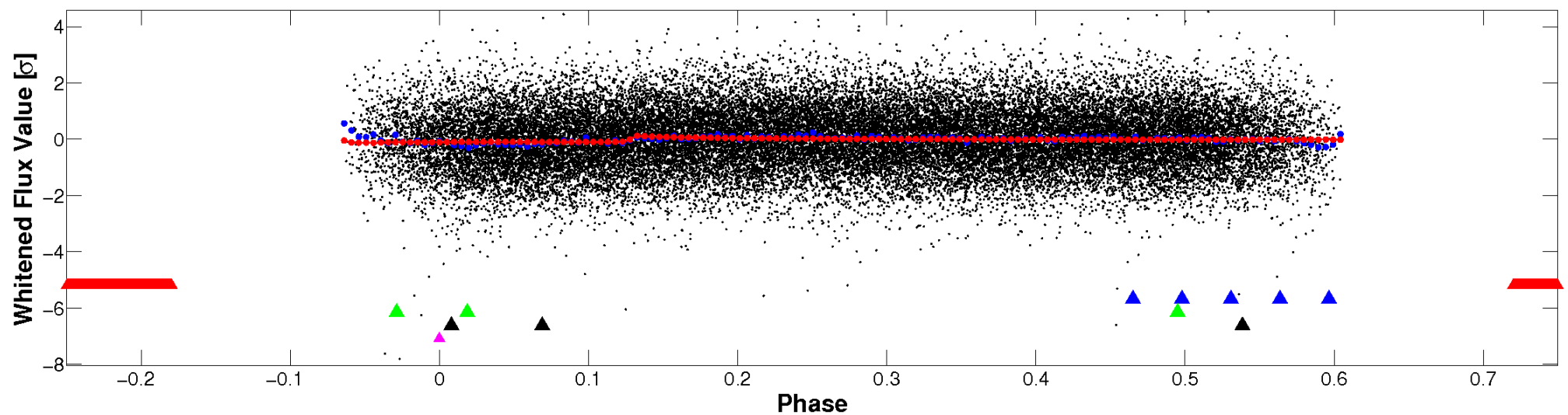


Non-Whitened Vs. Whitened Light Curve

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

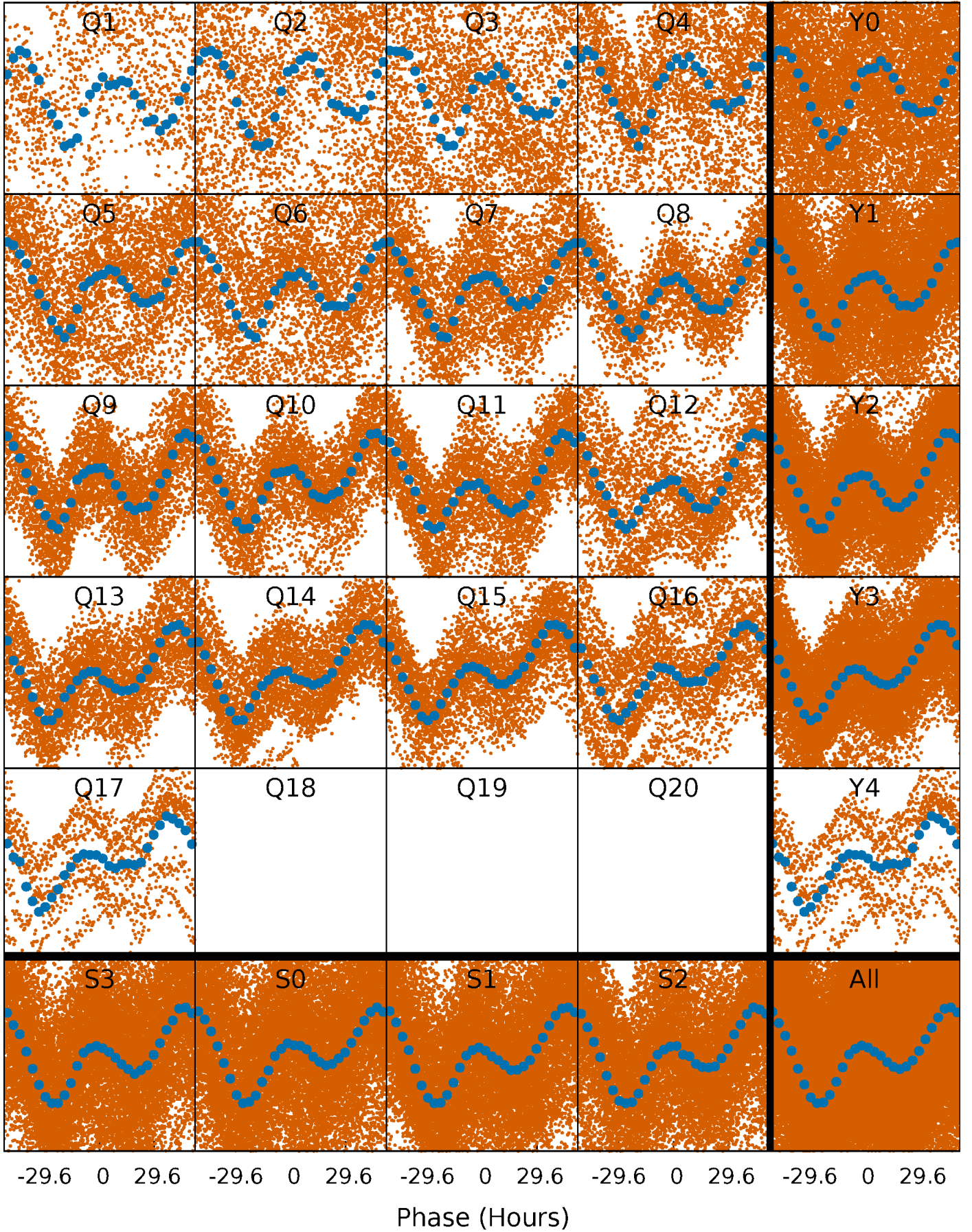


Planet 5 : Phased Whitened Flux Time Series (Fit Epoch/Period)



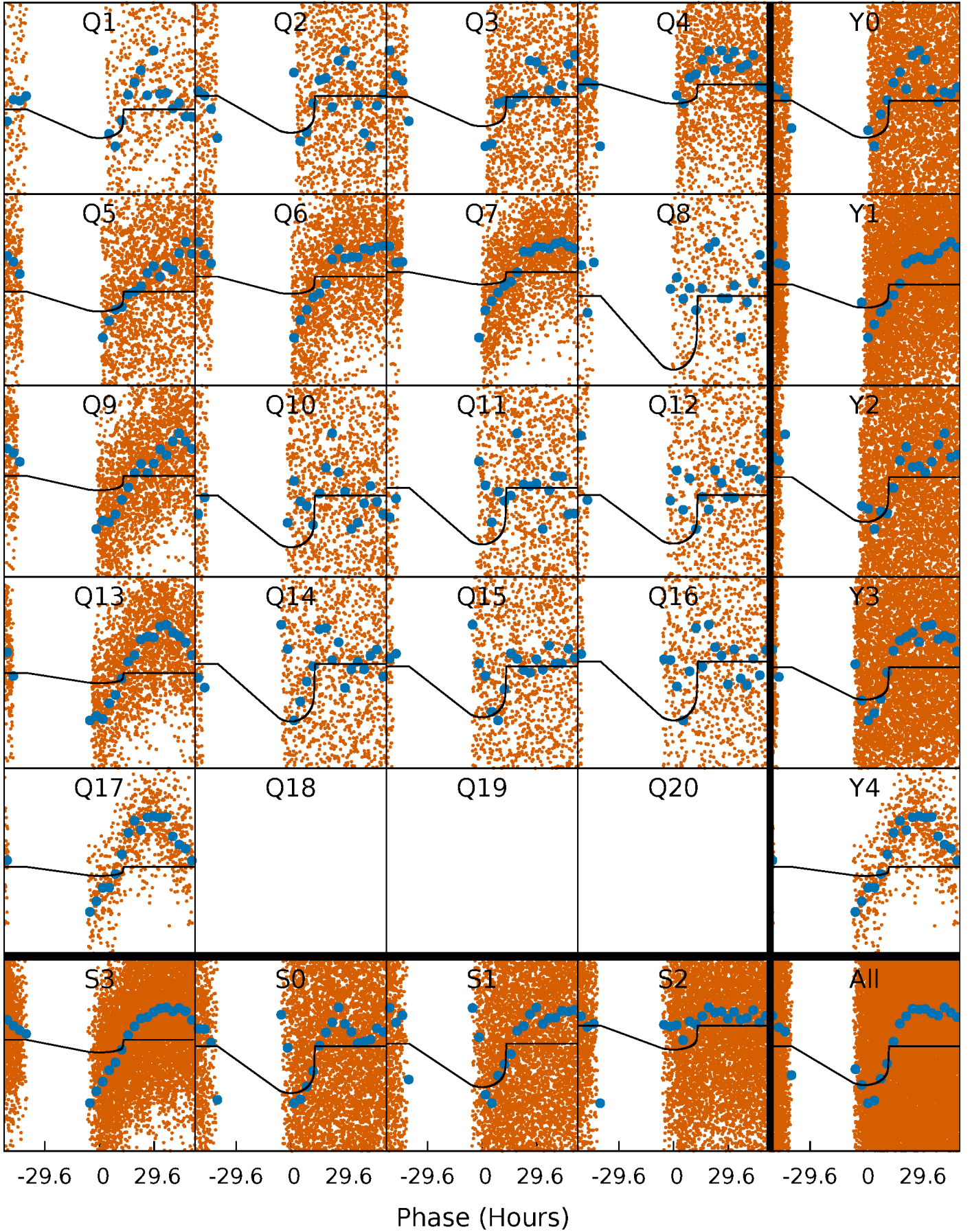
PDC Quarter-Phased Transit Curves

TCE 007516781-05 P= 4.159681 Days $T_0=131.776854$ (BKJD)



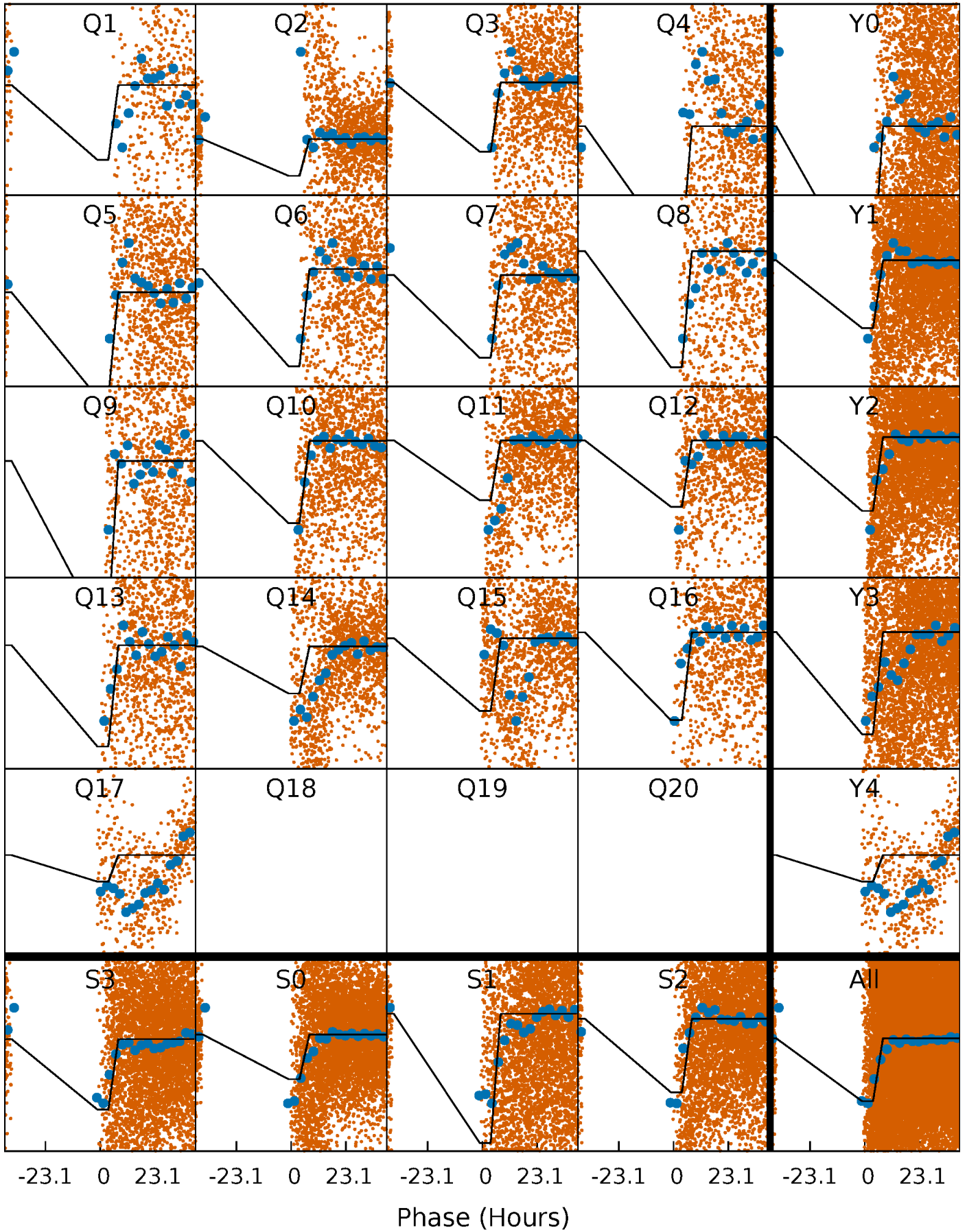
DV Quarter-Phased Transit Curves

TCE 007516781-05 $P = 4.159681$ Days $T_0 = 131.776854$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

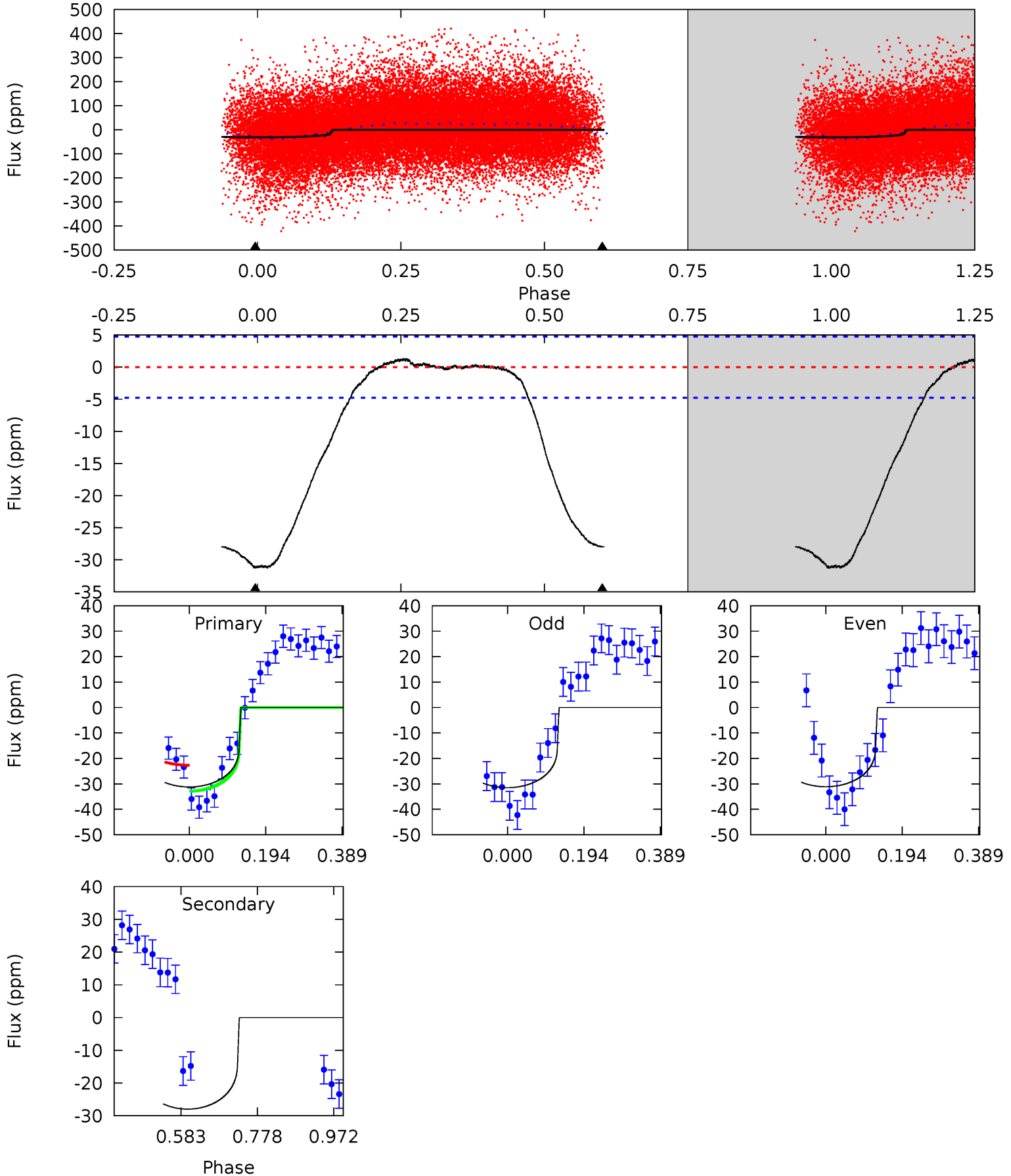
TCE 007516781-05 $P = 4.159320$ Days $T_0 = 131.689570$ (BKJD)



DV Model-Shift Uniqueness Test

007516781-05, P = 4.159681 Days, E = 131.776854 Days

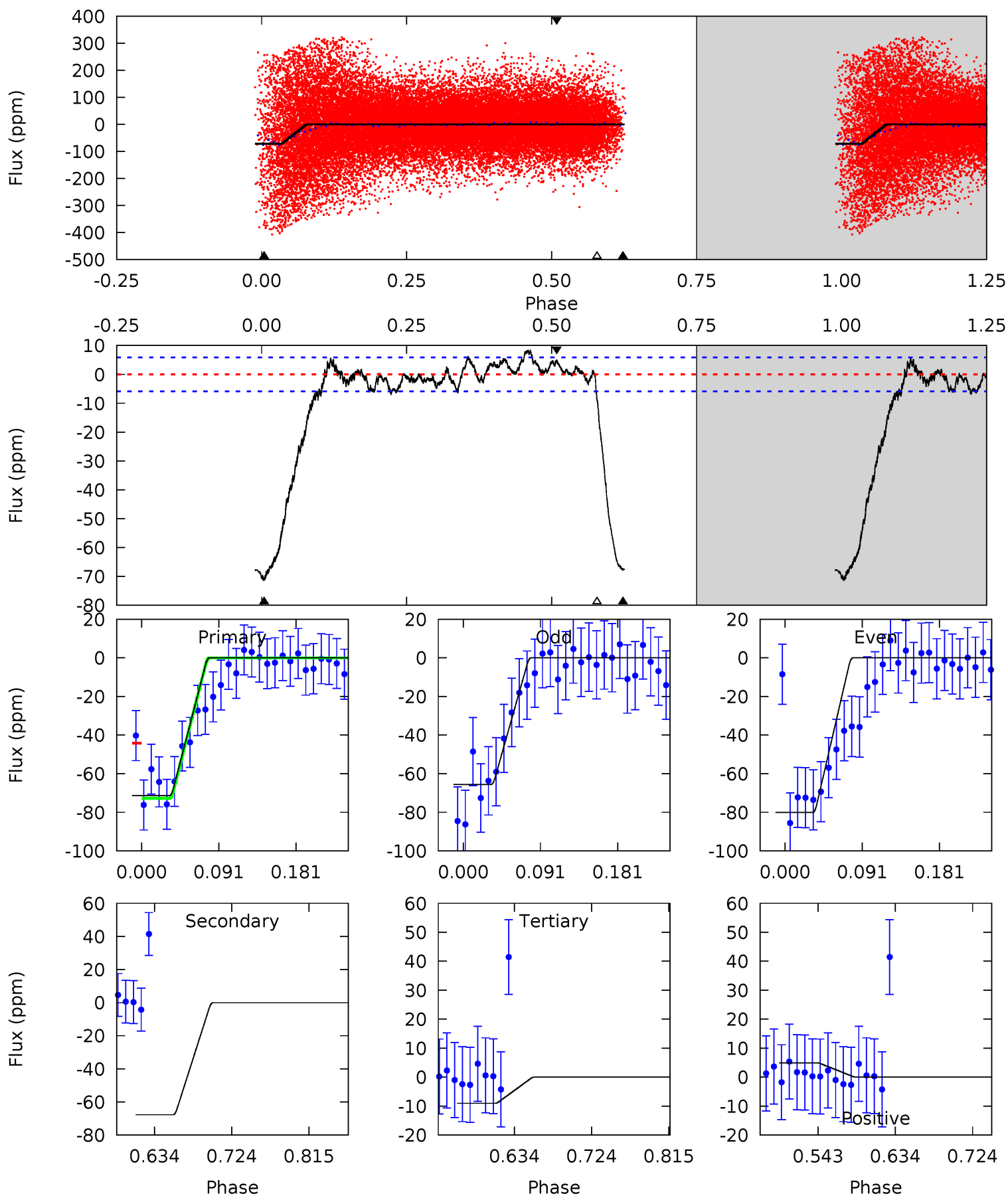
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
28.9	25.9	0	0	4.42	1.30	1.06	28.9	28.9	25.9	25.9	0.17	1.23	0.04	3.33



Alt Model-Shift Uniqueness Test

007516781-05, P = 4.159320 Days, E = 131.689570 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
55.4	52.6	7.01	3.84	4.59	1.69	4.67	48.4	51.6	45.6	48.7	5.59	0.99	0.11	2.97



Stellar Parameters For KIC 007516781

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6844^{+189}_{-307}	$4.274^{+0.075}_{-0.210}$	$0.070^{+0.200}_{-0.350}$	$1.426^{+0.511}_{-0.219}$	$1.394^{+0.218}_{-0.218}$	$0.677^{+0.284}_{-0.381}$
	+3%/-4%	+2%/-5%	+286%/-500%	+36%/-15%	+16%/-16%	+42%/-56%
Source	PHO54	PHO54	PHO54	DSEP		

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

Secondary Eclipse Parameters for KIC 007516781-05 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-28 ± 1	$0.80^{+0.41}_{-0.36}$	2159^{+164}_{-129}	7026^{+3423}_{-1221}	74^{+179}_{-40}
Alt.	-68 ± 1	$1.48^{+0.42}_{-0.41}$	2150^{+168}_{-125}	6412^{+1209}_{-673}	54^{+43}_{-20}

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 $A_{obs} \gg 1.0$

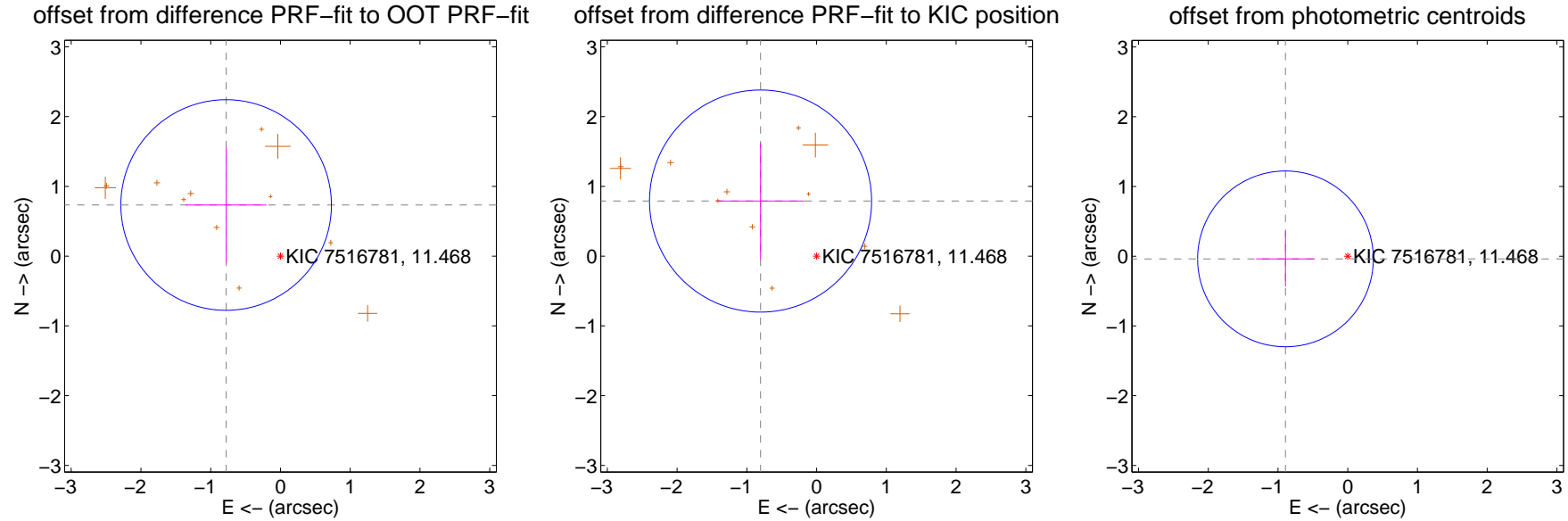
DV Centroid Data

Supplemental centroid analysis for 007516781-05. **Kepler magnitude: 11.47.** Transit SNR 10.73

There are 0 quarters with good PRF difference image offsets

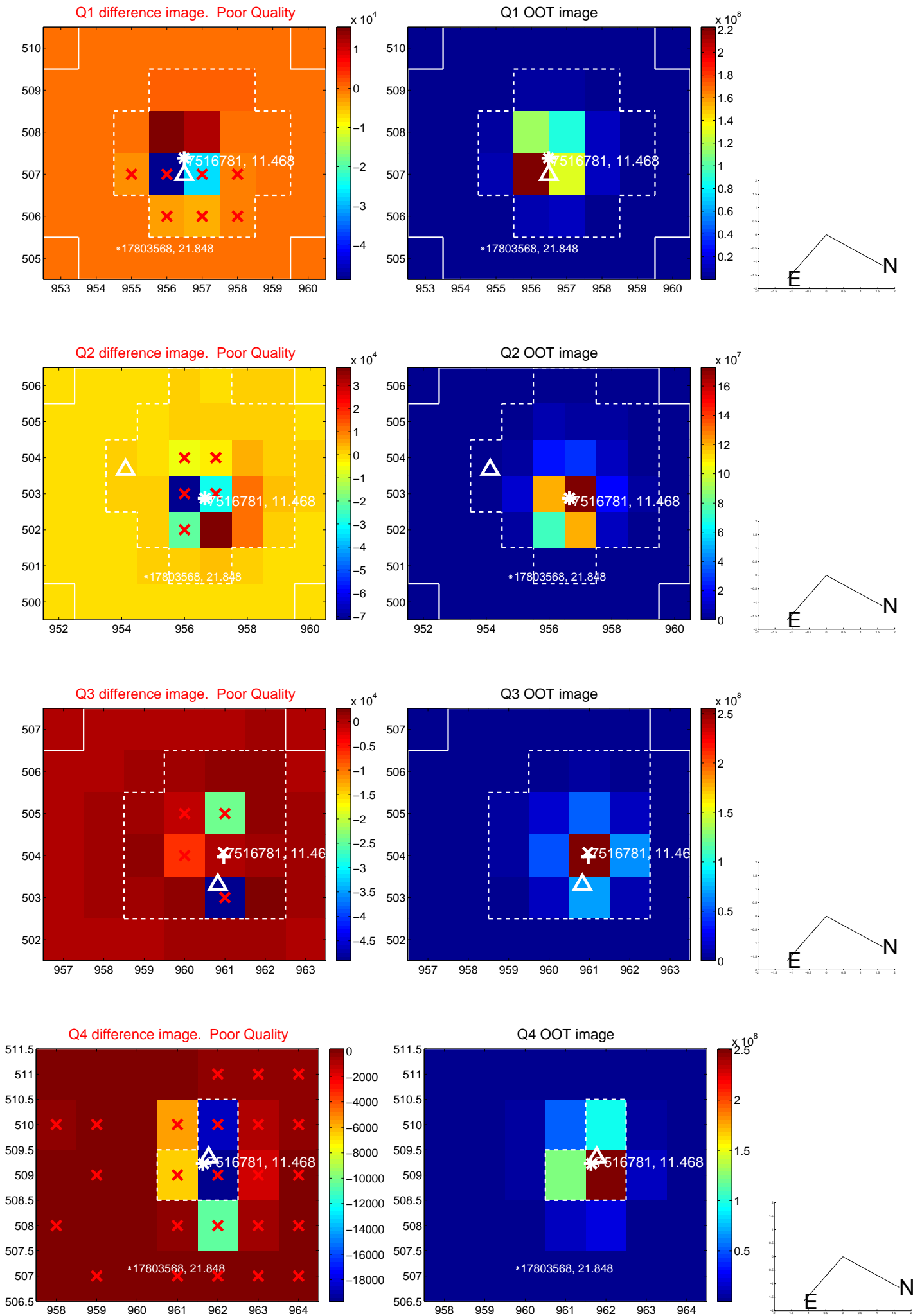
The direct PRF centroid is offset from the target star catalog position by about 0.34 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.069 ± 0.503	2.13	0.779 ± 0.579	0.733 ± 0.822
PRF-fit source offset from KIC position	1.126 ± 0.530	2.12	0.803 ± 0.625	0.789 ± 0.833
photometric centroid source offset	0.89 ± 0.42	2.13	0.89 ± 0.42	-0.04 ± 0.40

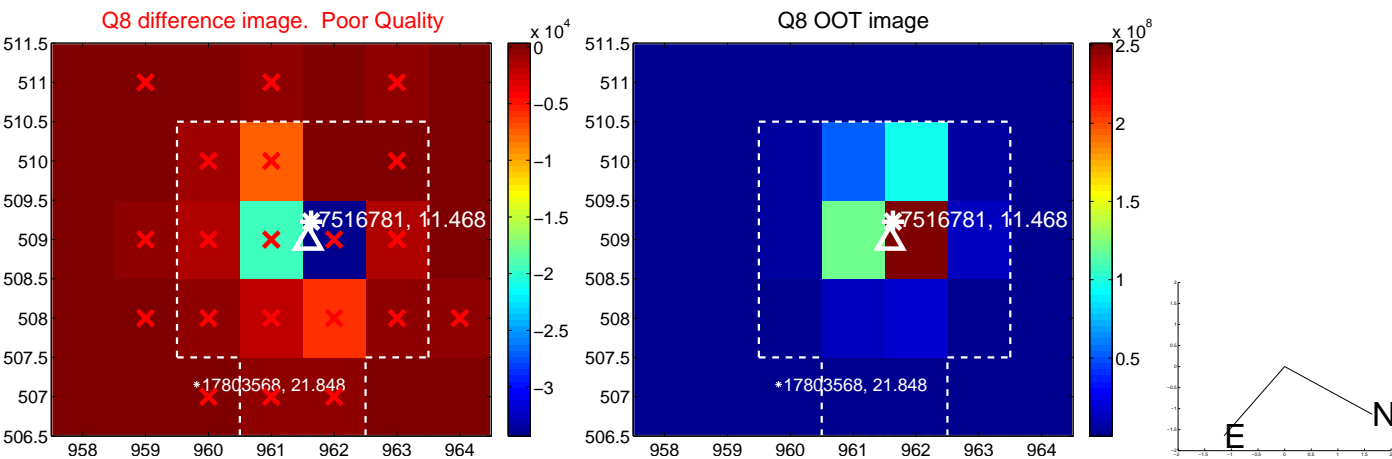
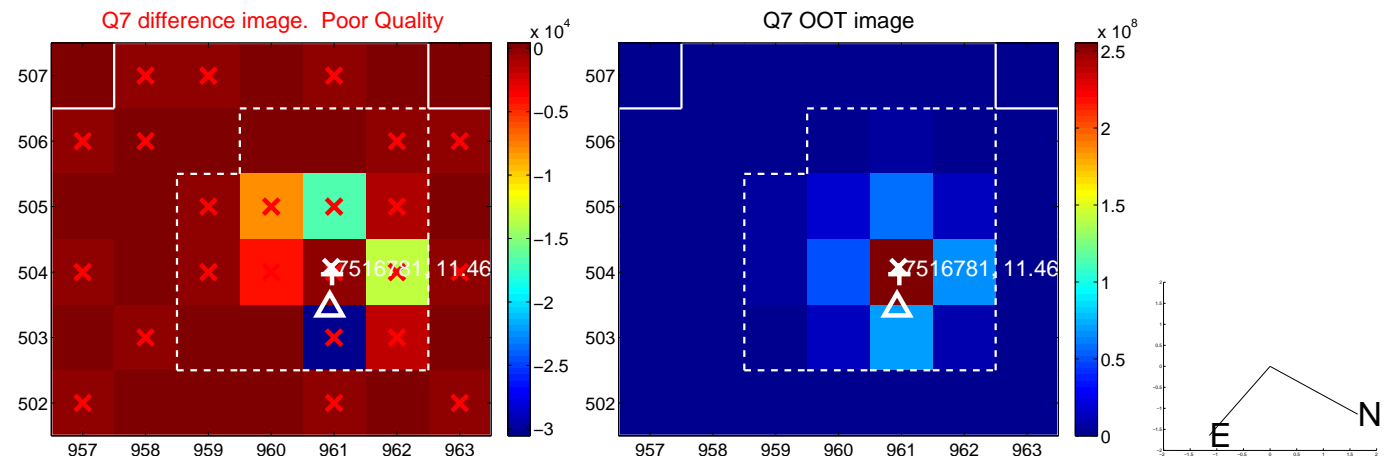
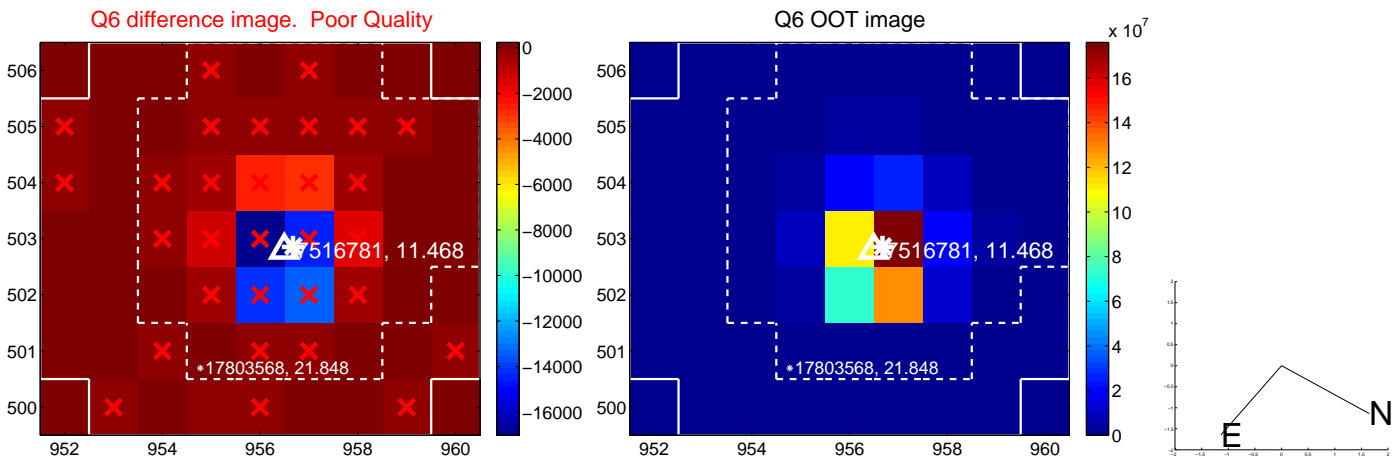
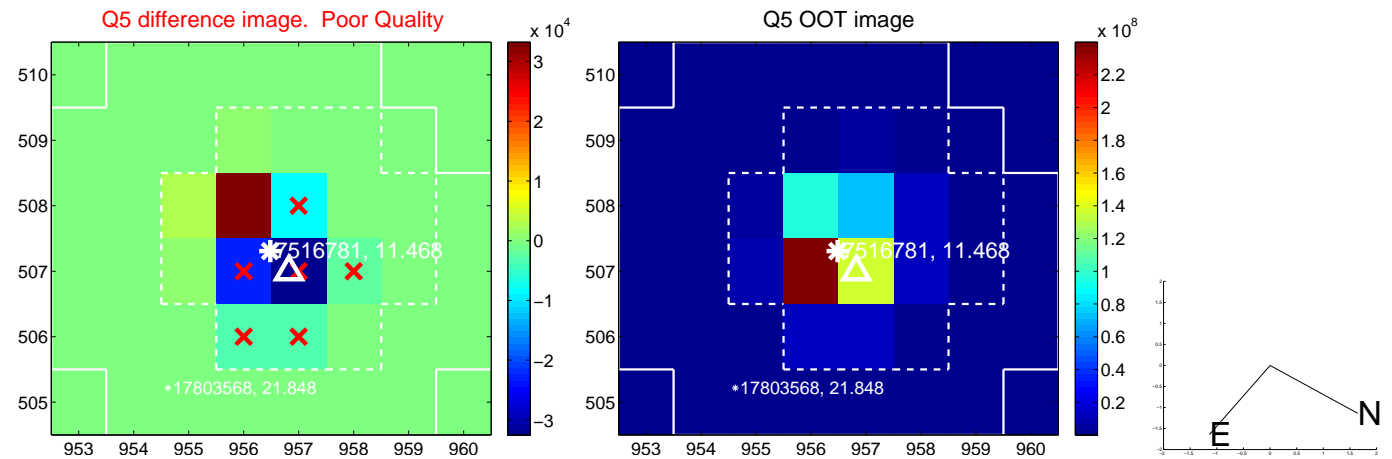


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets;** magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

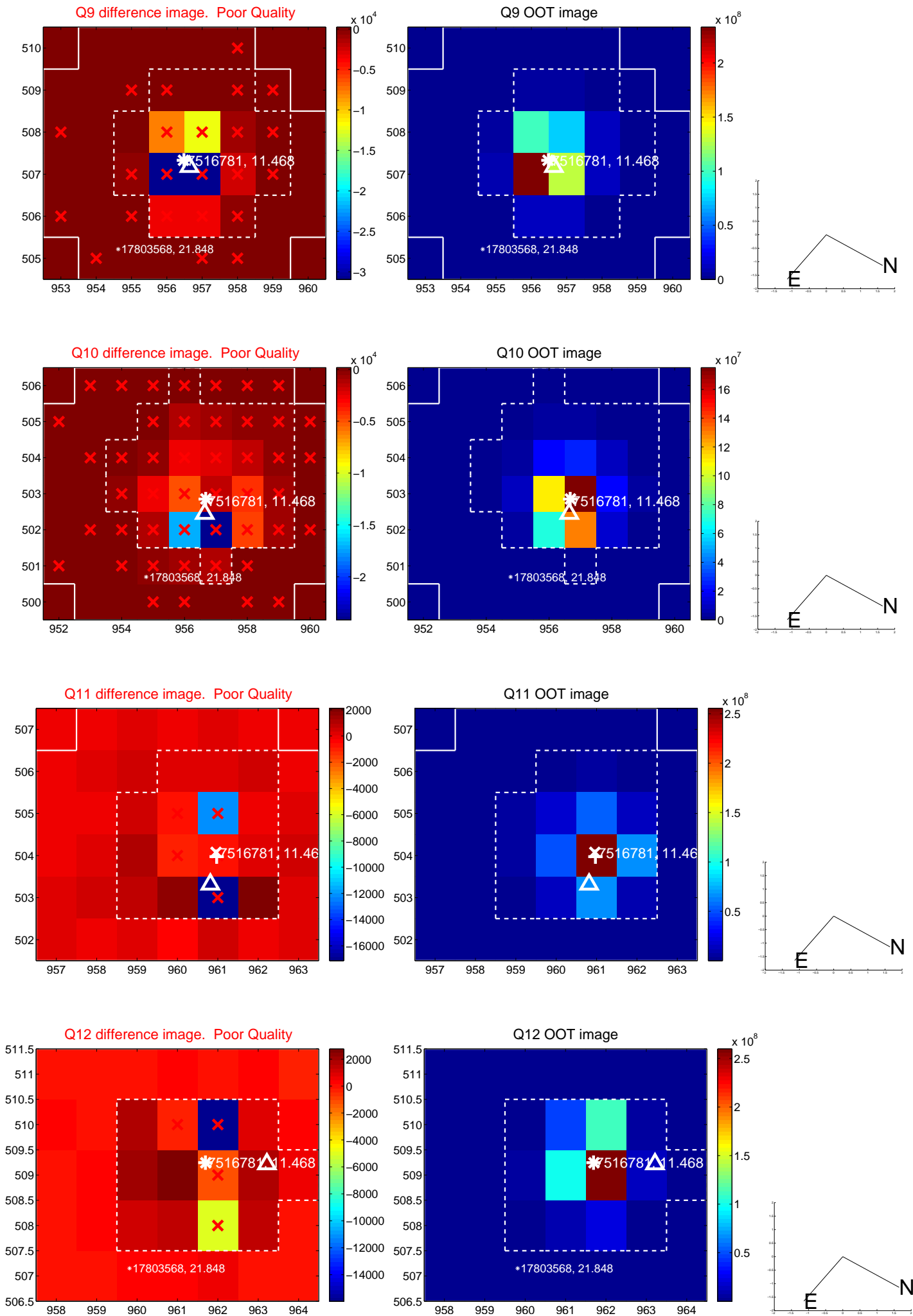
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



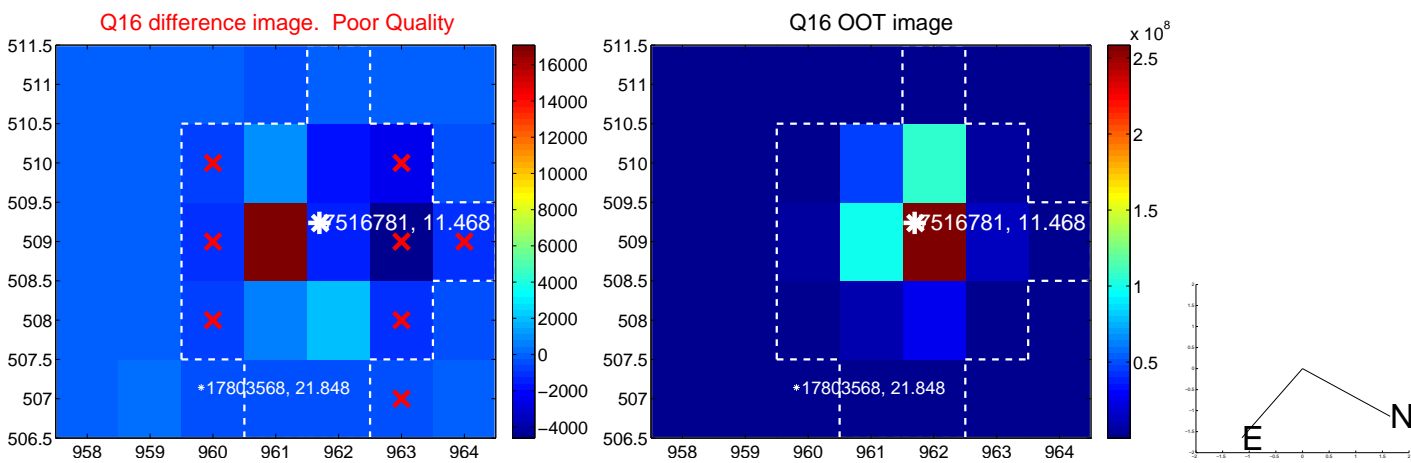
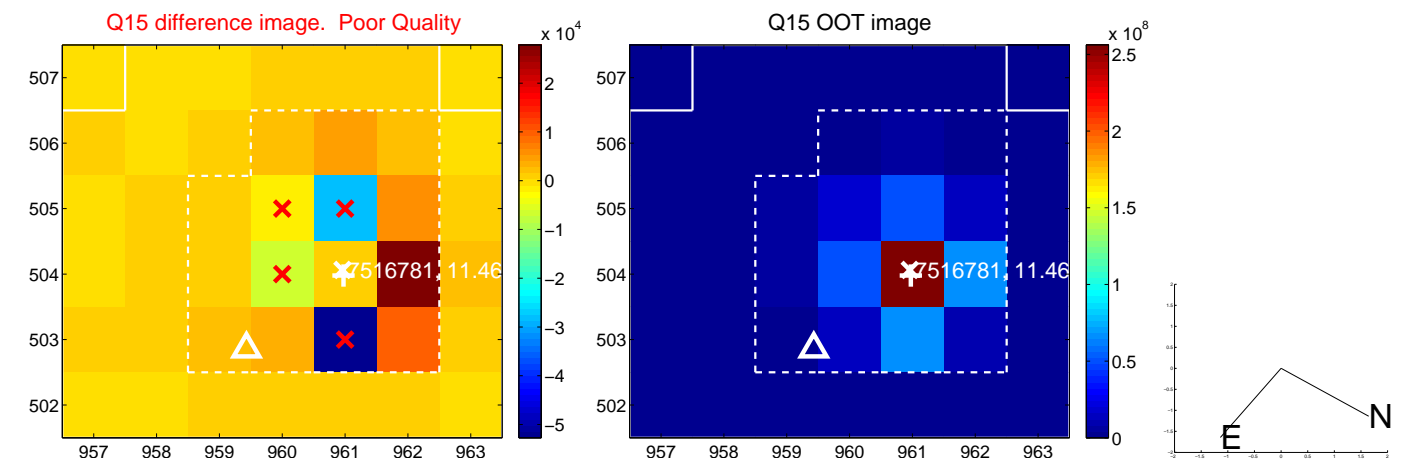
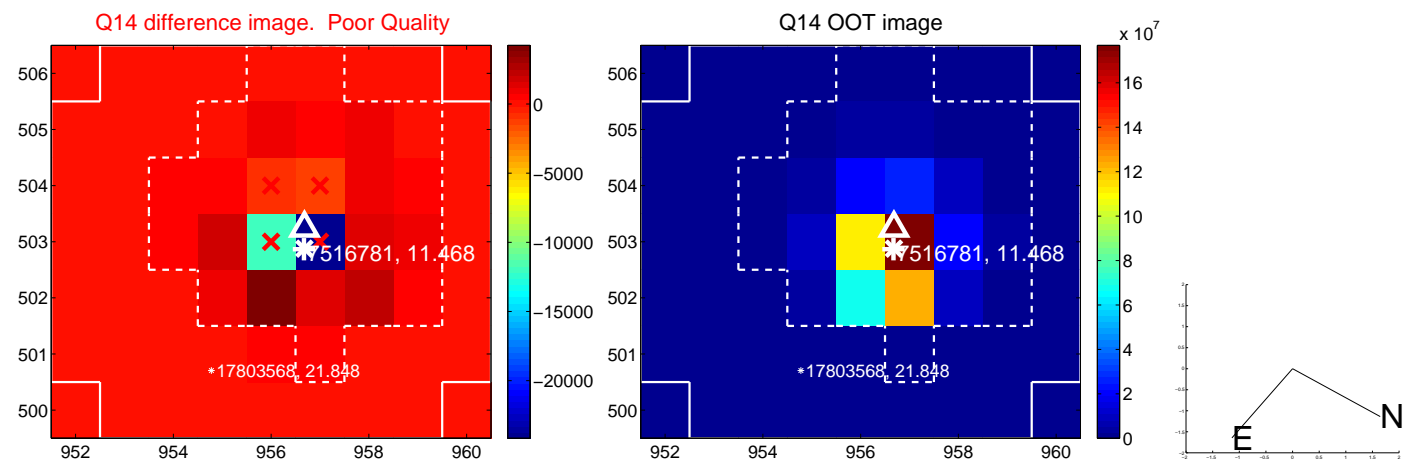
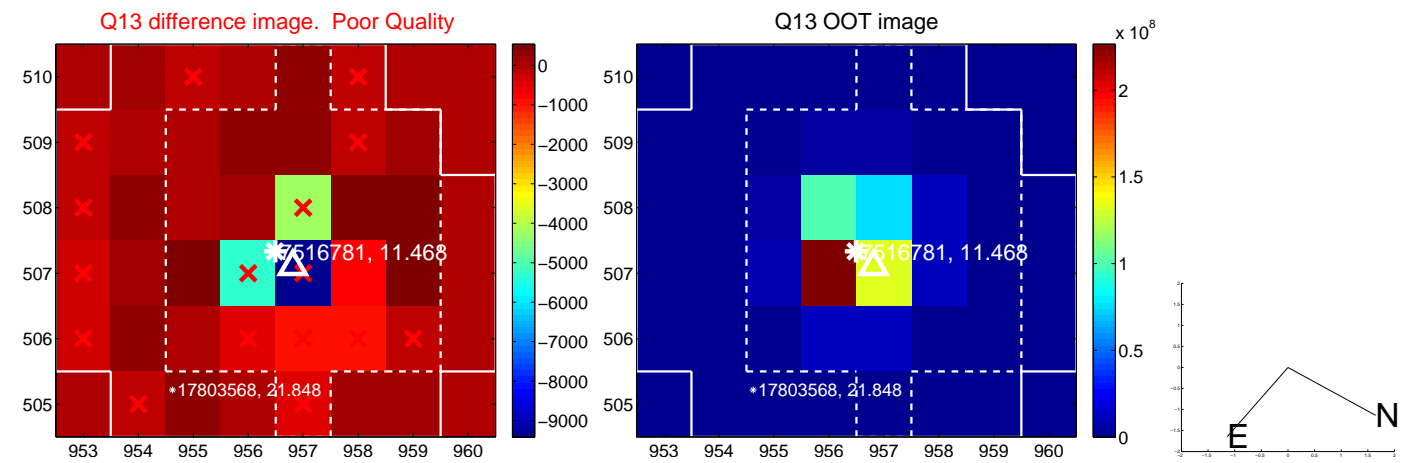
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



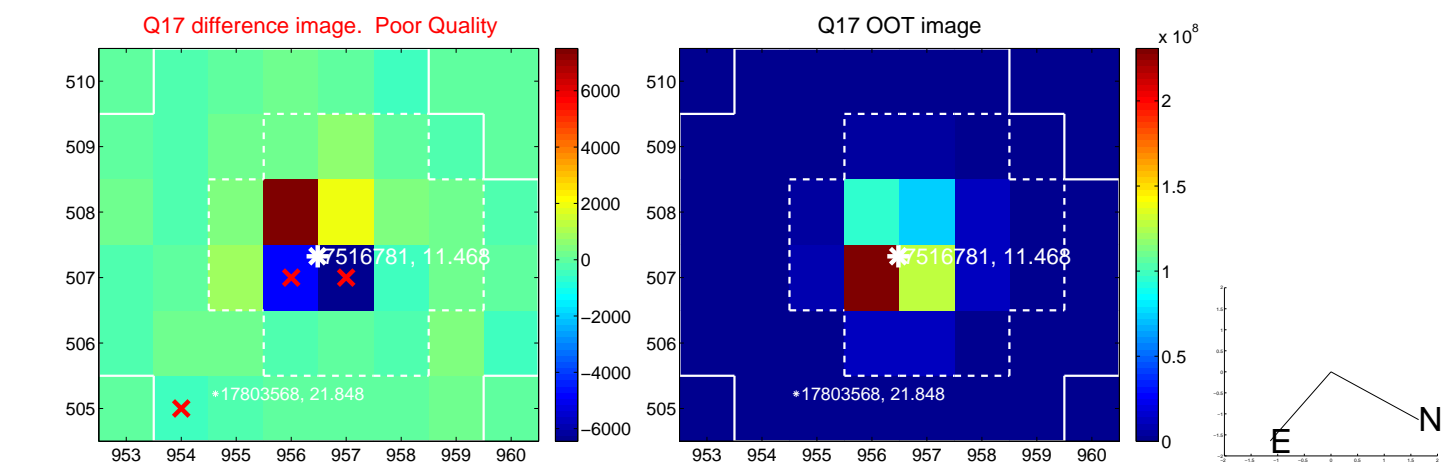
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



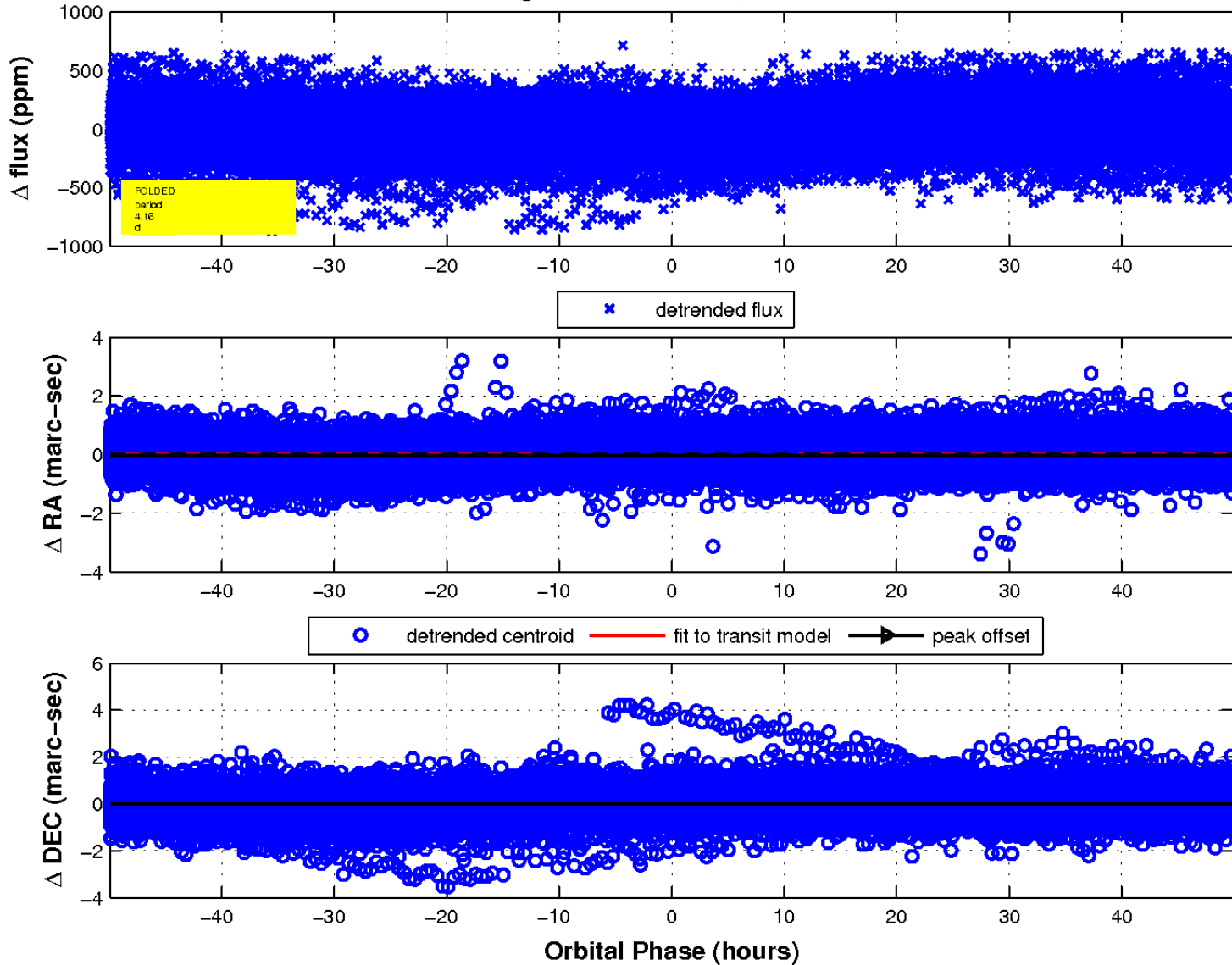
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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



fluxWeightedCentroids, Planet 5 of 5



UKIRT Image

Declination

