

KIC 010670920

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})
010670920-01	OBS	No	366.024873	453.588172	1877.7	9.382	20.7	7.5	1.36	6422	6.12	2.76
010670920-02	OBS	No	280.028317	290.163965	1080.9	12.500	17.5	-1.0	1.36	6422	4.51	3.94
010670920-03	OBS	No	277.542502	291.402906	2928.9	8.426	18.6	9.8	1.36	6422	7.49	3.99
010670920-04	OBS	No	0.775273	131.600777	2263.3	2.000	11.1	-1.0	1.36	6422	6.54	10143.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010670920-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010670920-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
010670920-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010670920-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

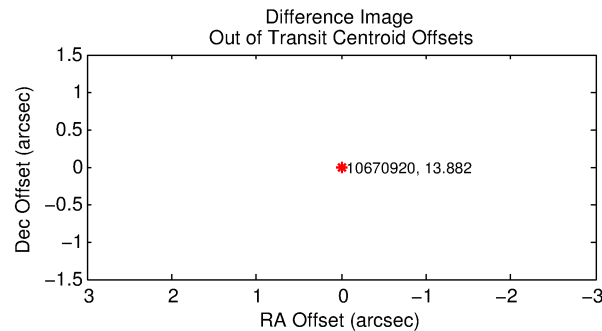
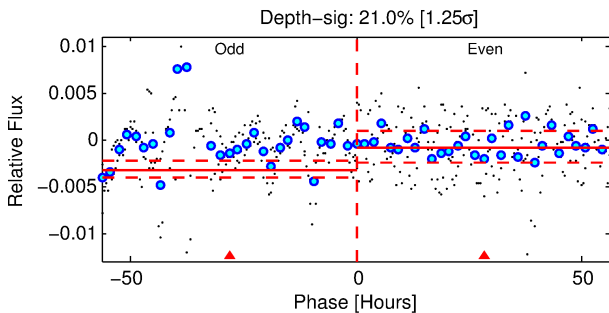
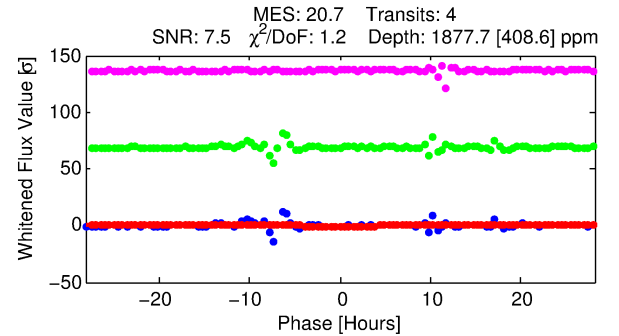
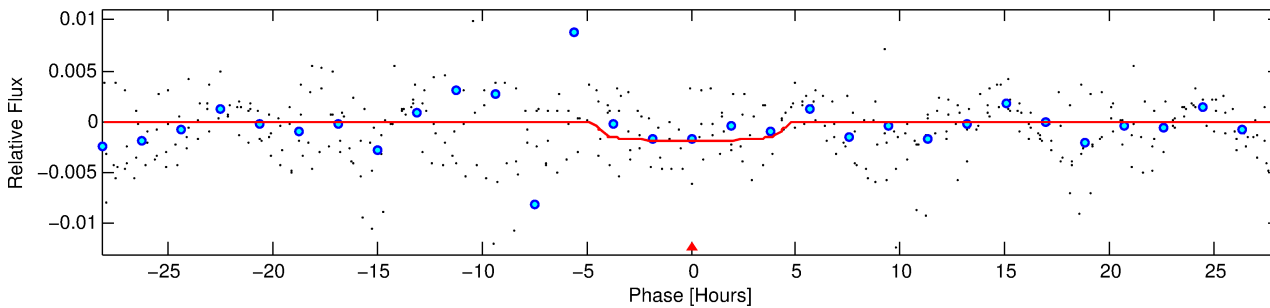
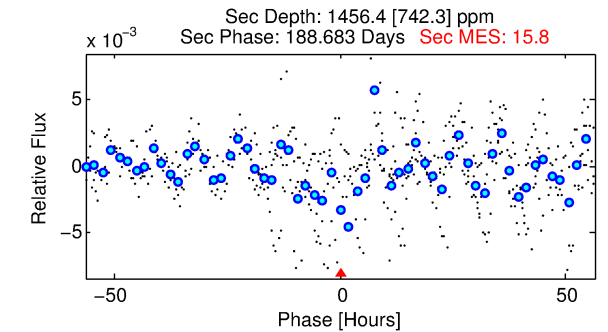
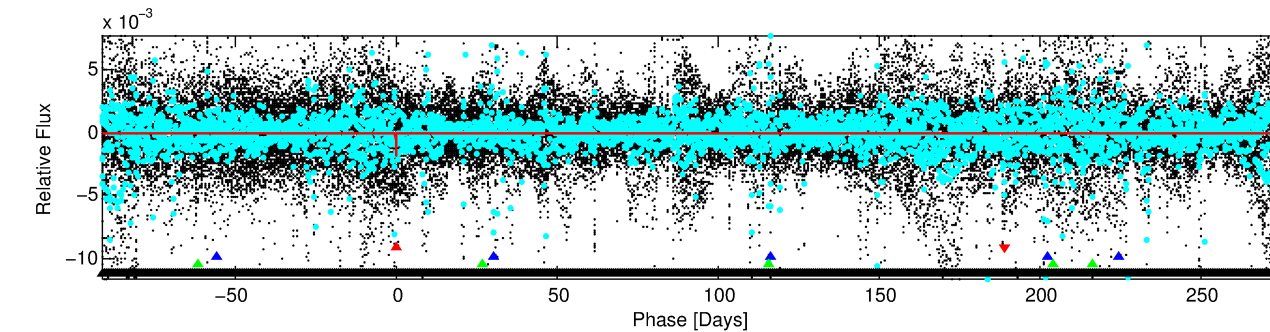
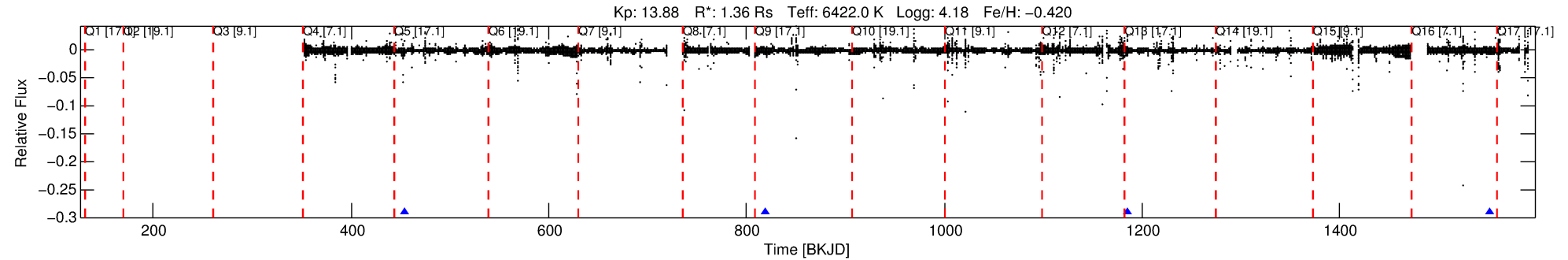
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010670920-01

No Significant Match Found

DV One-Page Summary

KIC: 10670920 Candidate: 1 of 4 Period: 366.025 d



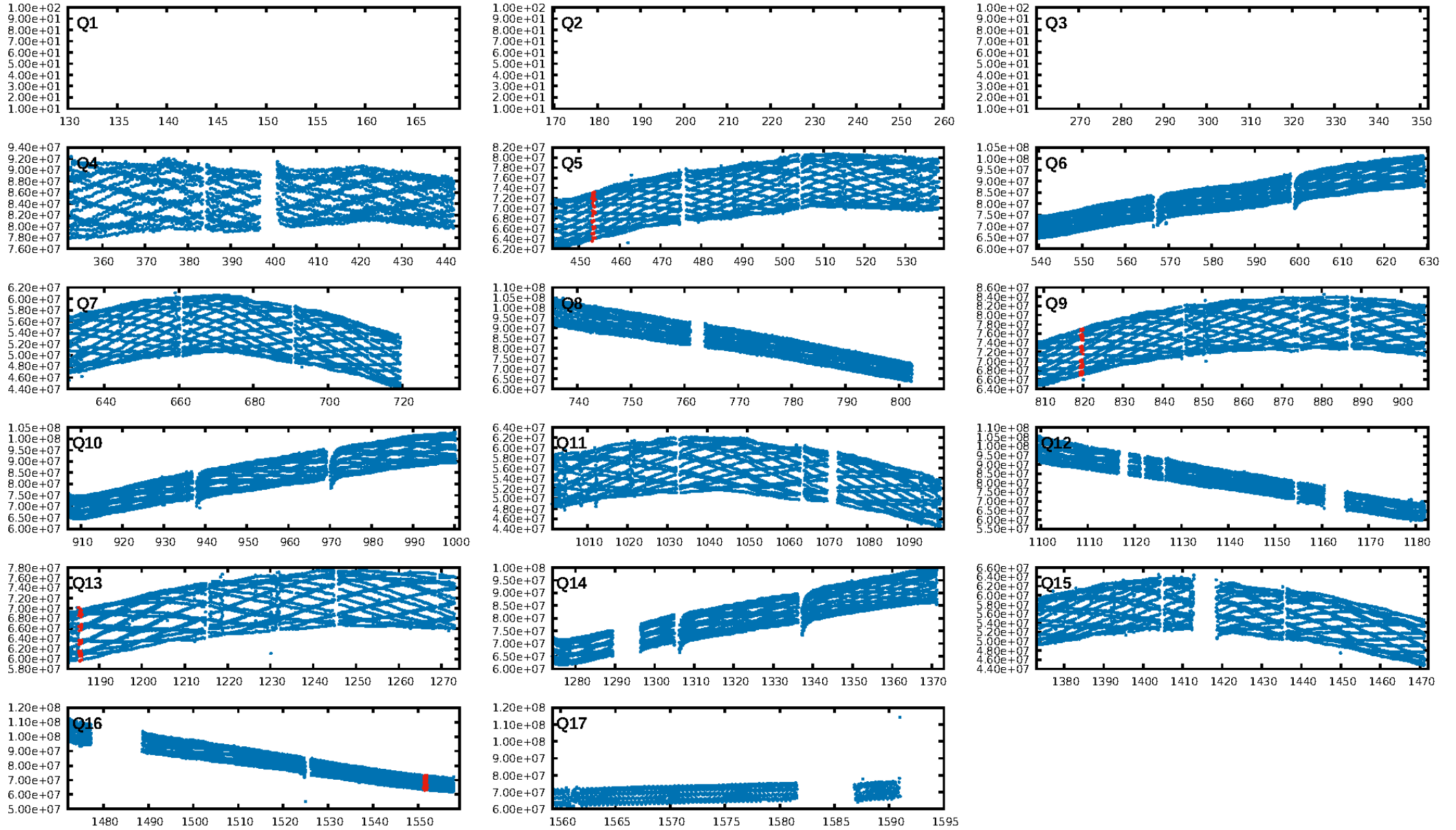
DV Fit Results:

Period = 366.02487 [0.01515] d
Epoch = 453.5882 [0.0256] BKJD
Rp/R* = 0.0411 [0.0414]
a/R* = 268.52 [1425.44]
b = 0.52 [7.44]
Seff = 2.76 [1.22]
Teq = 329 [36] K
Rp = 6.12 [6.40] Re
a = 1.0137 [0.2694] AU
Ag = 21977.83 [46512.98] [0.47σ]
Teffp = 6187 [3218] K [1.82σ]

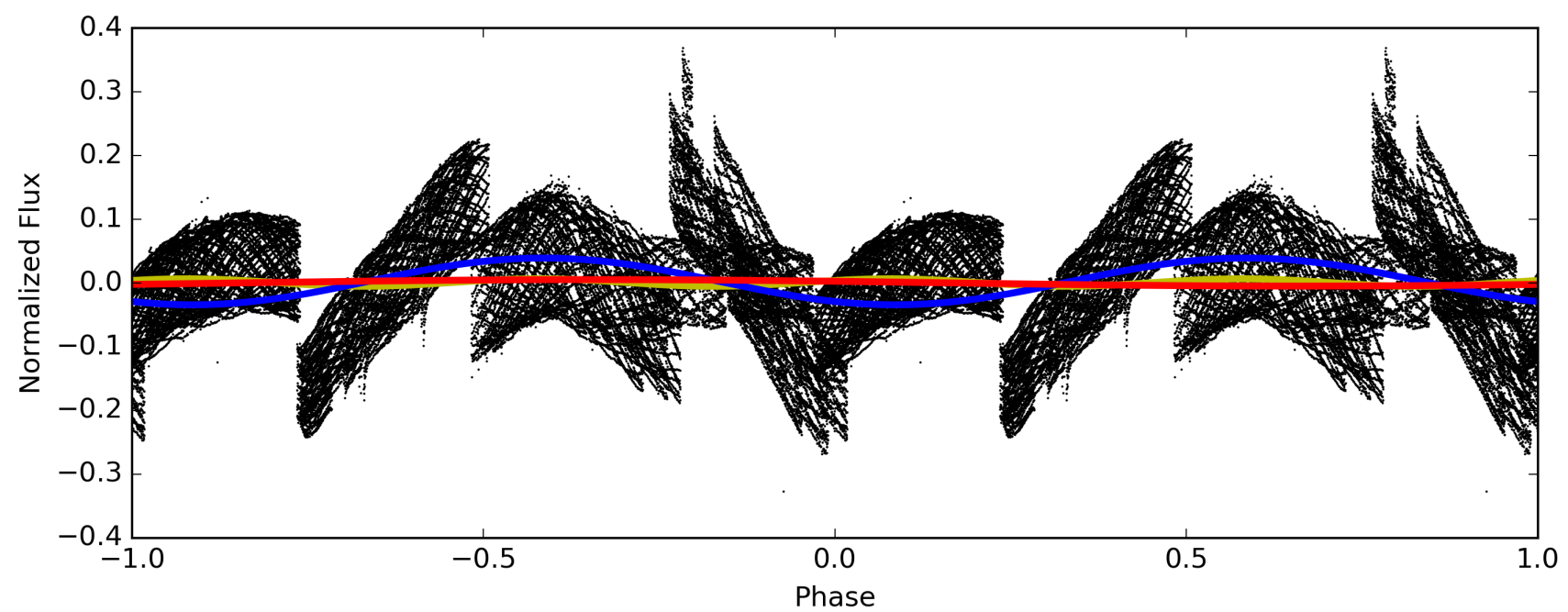
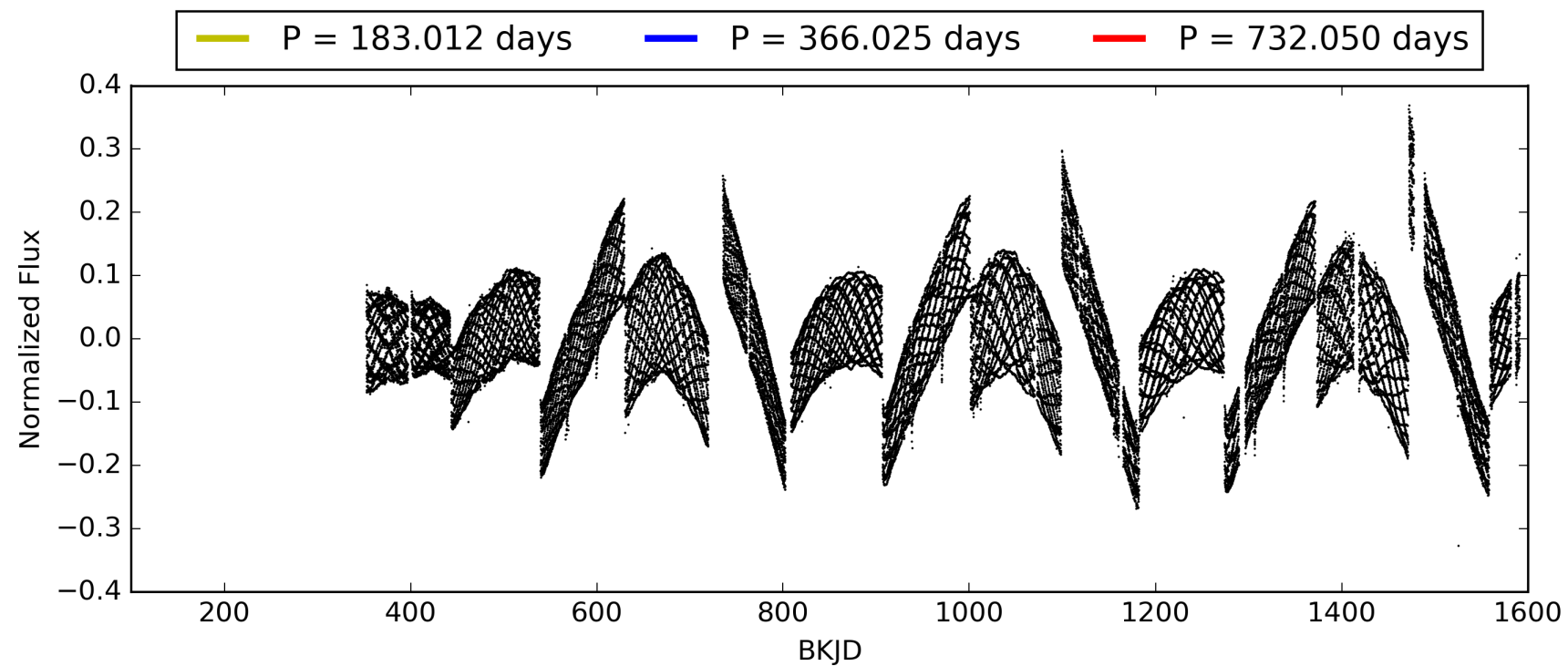
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [132.05σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 0.0%
ModelChiSquareGof-sig: 64.8%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.6284
Centroid-sig: 38.6%
Centroid-so: 2.877 arcsec [4.15σ]
OotOffset-rm: N/A
KicOffset-rm: 1.315 arcsec [1.70σ]
OotOffset-st: 0/0/0/0 [0]
KicOffset-st: 0/0/1/1 [2]
DiffImageQuality-fgm: 0.00 [0/2]
DiffImageOverlap-fno: 0.00 [0/3]

TCE 010670920-01, PDC Light Curves

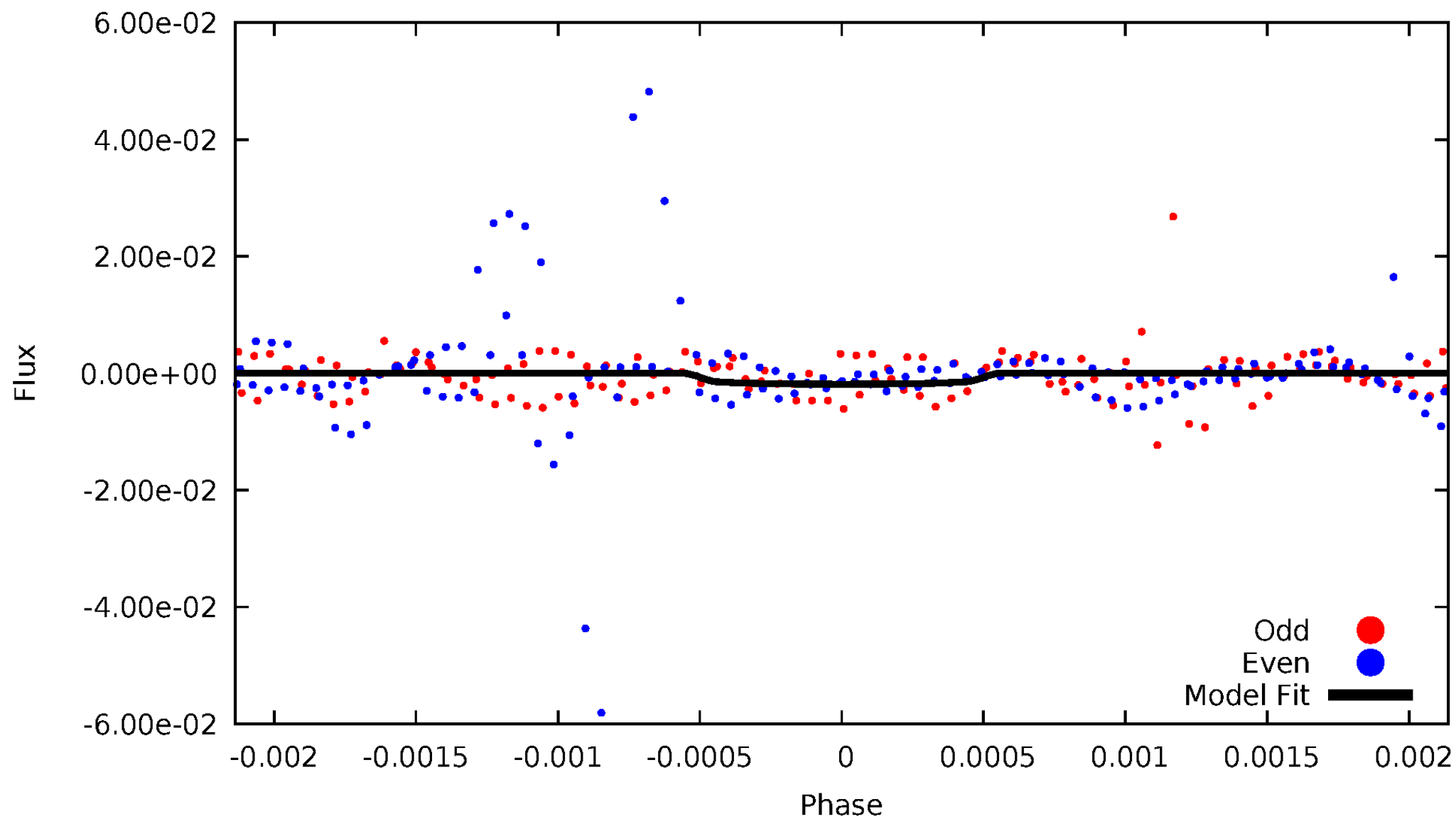


TCE 010670920-01



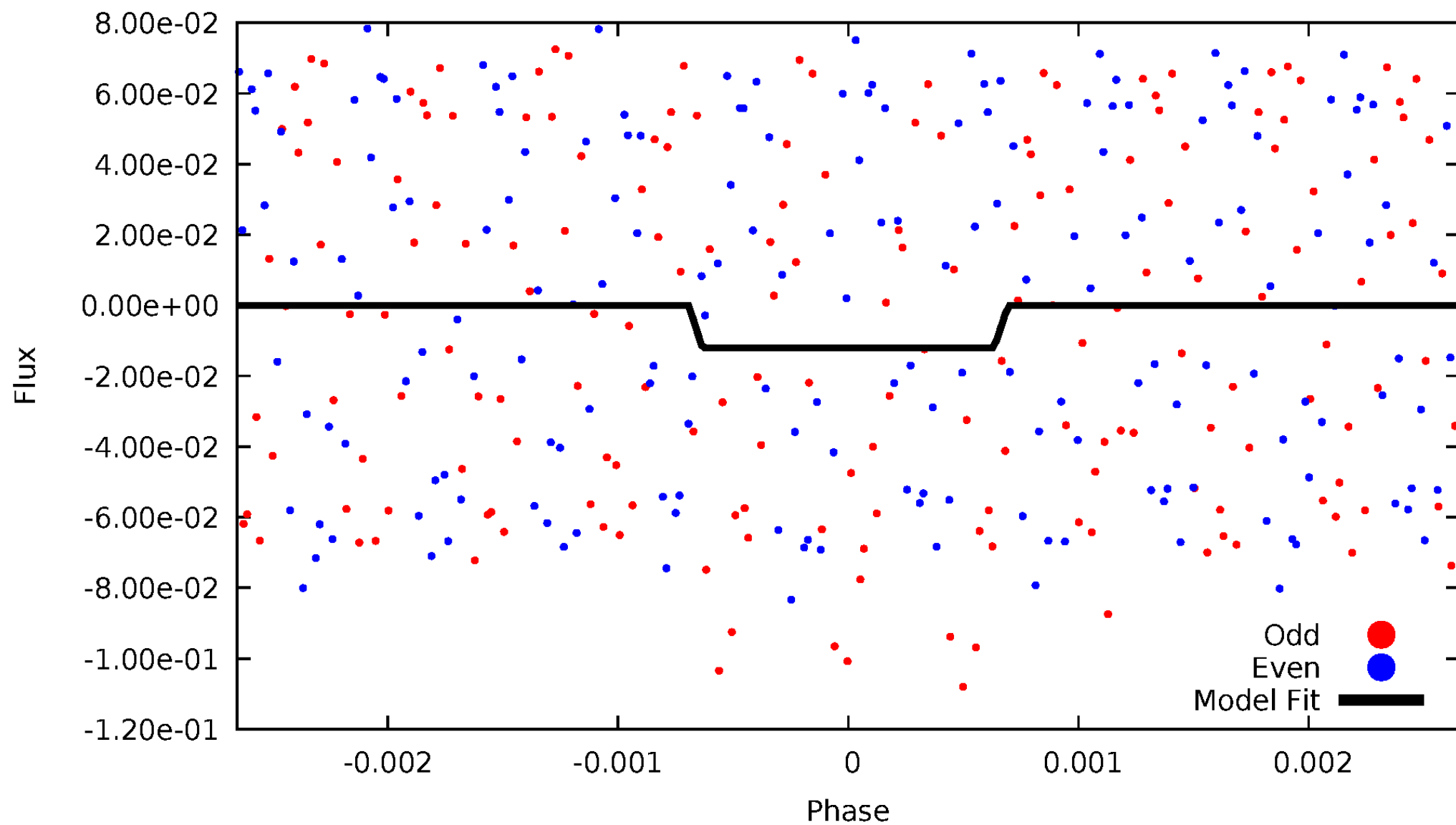
DV Odd/Even

TCE 010670920-01



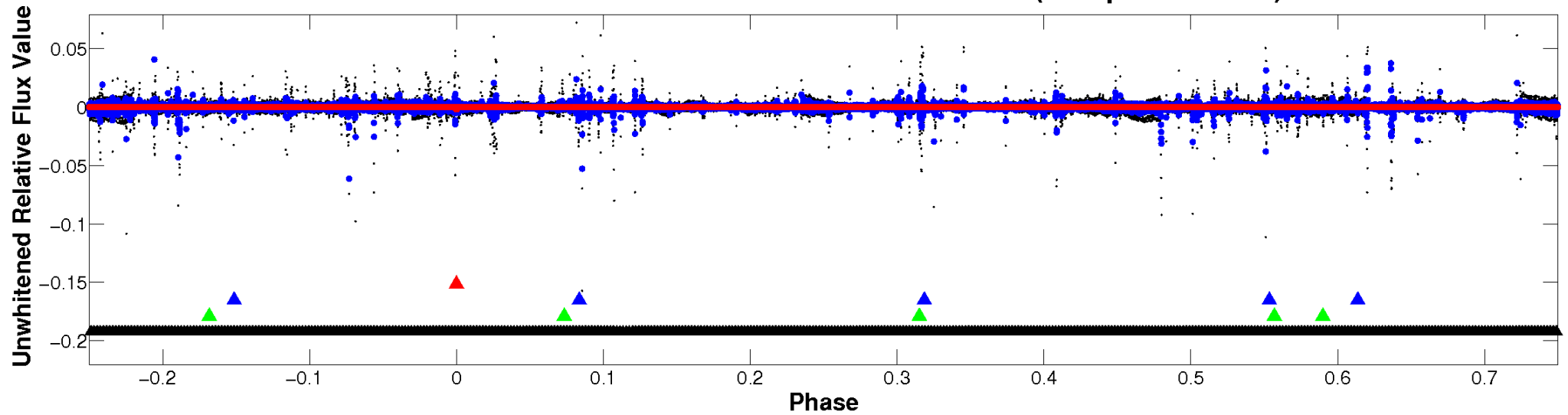
ALT Odd/Even

TCE 010670920-01

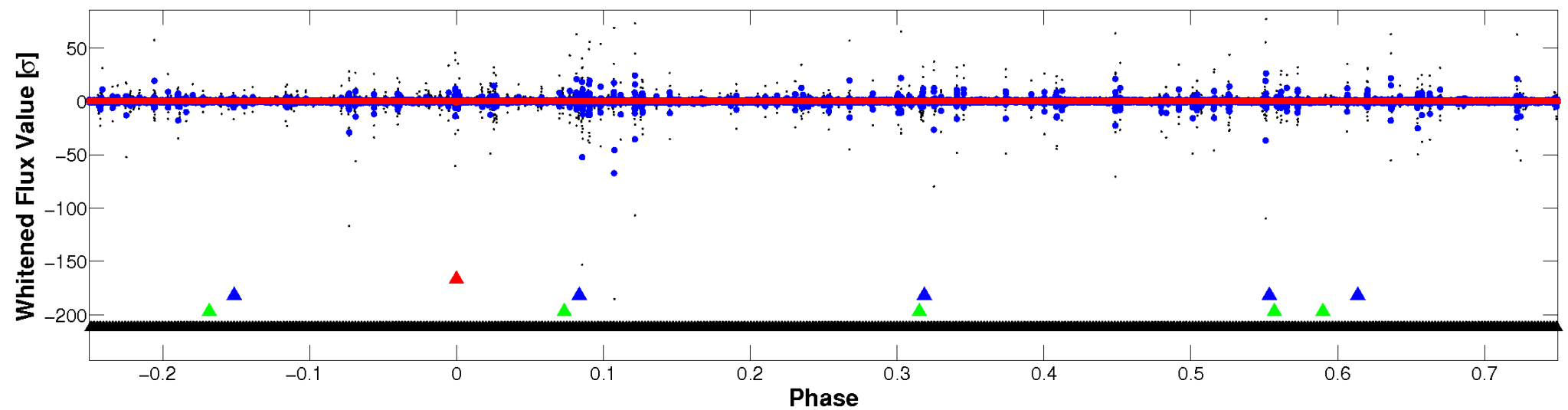


Non-Whitened Vs. Whitened Light Curve

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

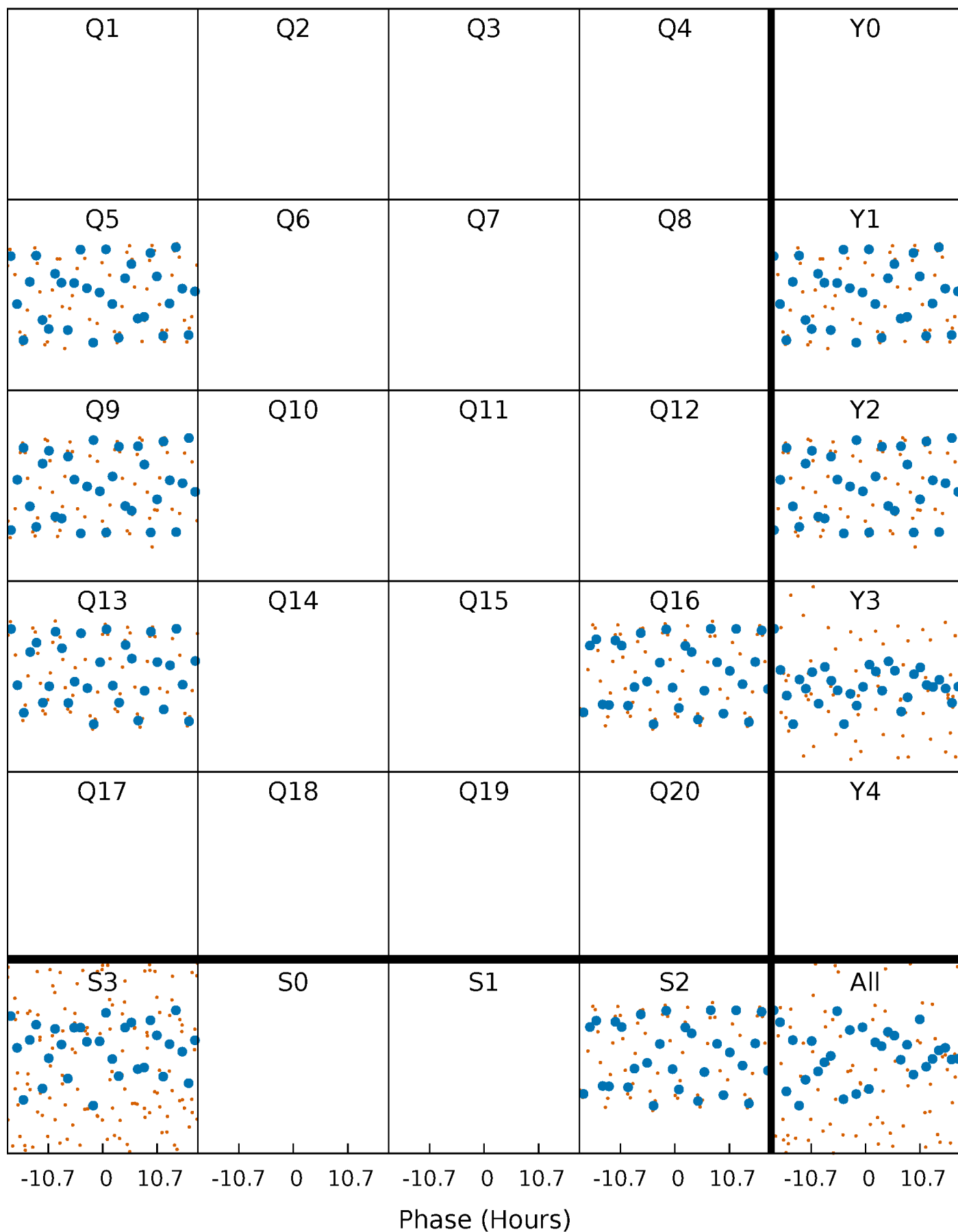


Planet 1 : Phased Whitened Flux Time Series (Fit Epoch/Period)



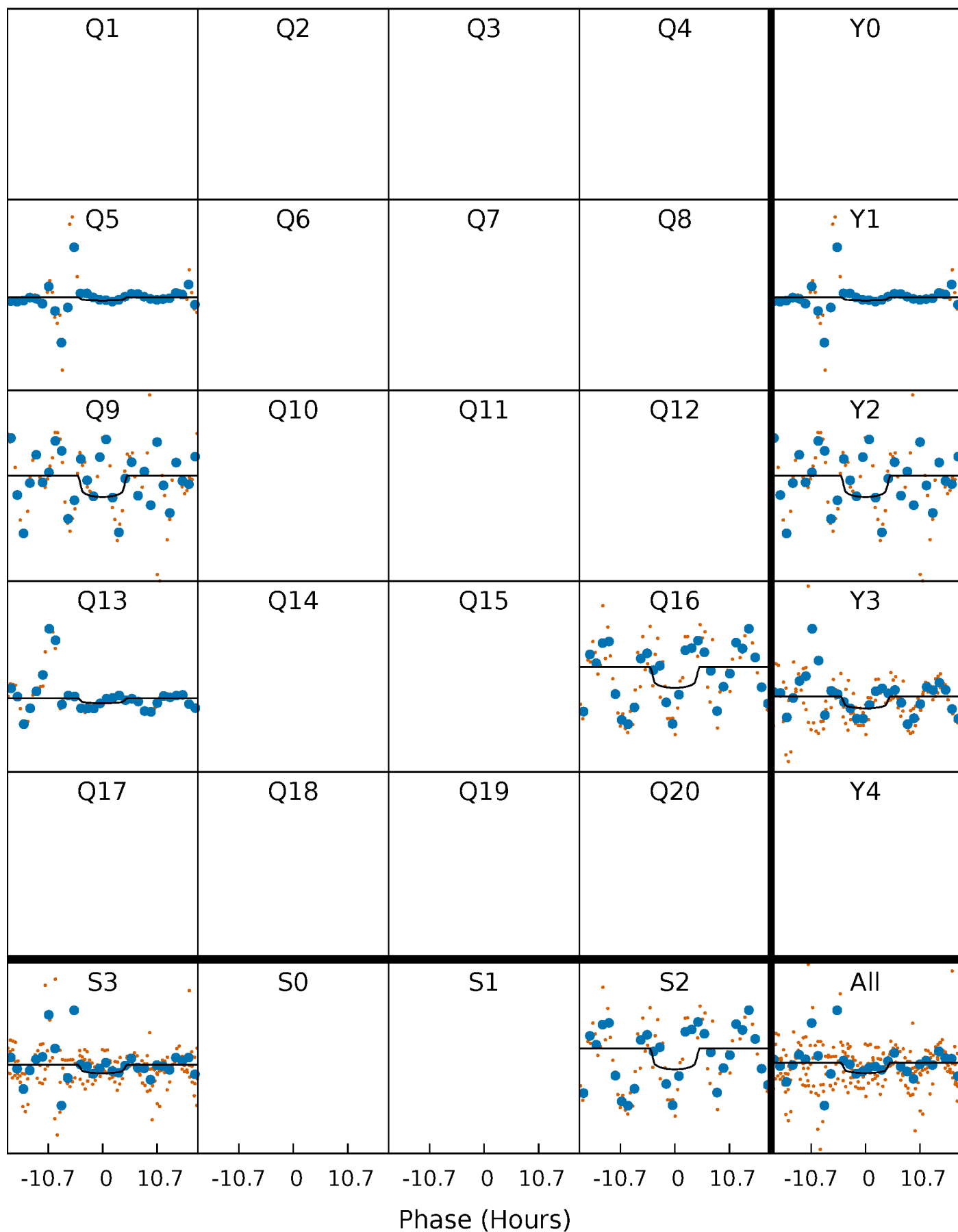
PDC Quarter-Phased Transit Curves

TCE 010670920-01 P=366.024873 Days $T_0=453.588172$ (BKJD)



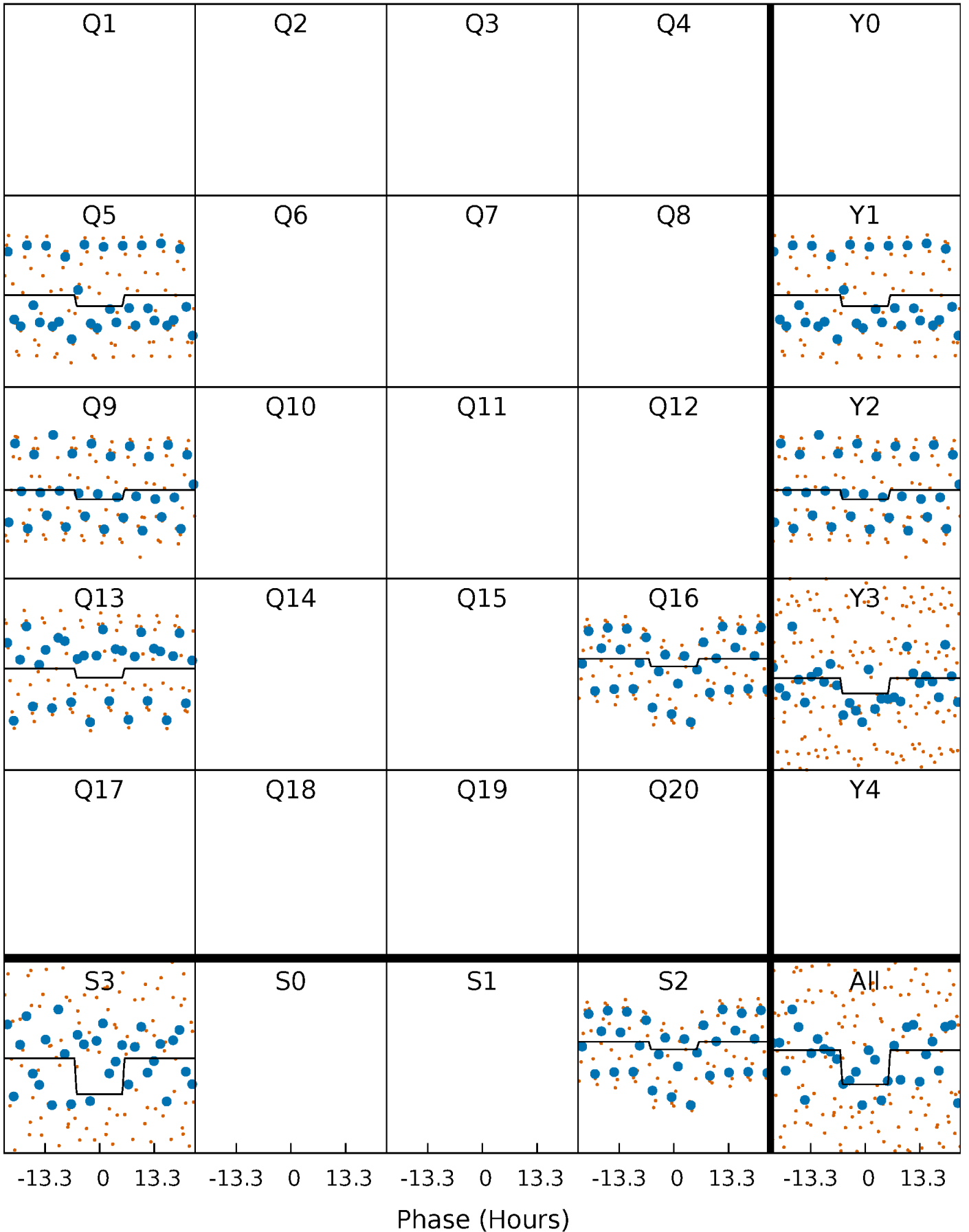
DV Quarter-Phased Transit Curves

TCE 010670920-01 P=366.024873 Days $T_0=453.588172$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

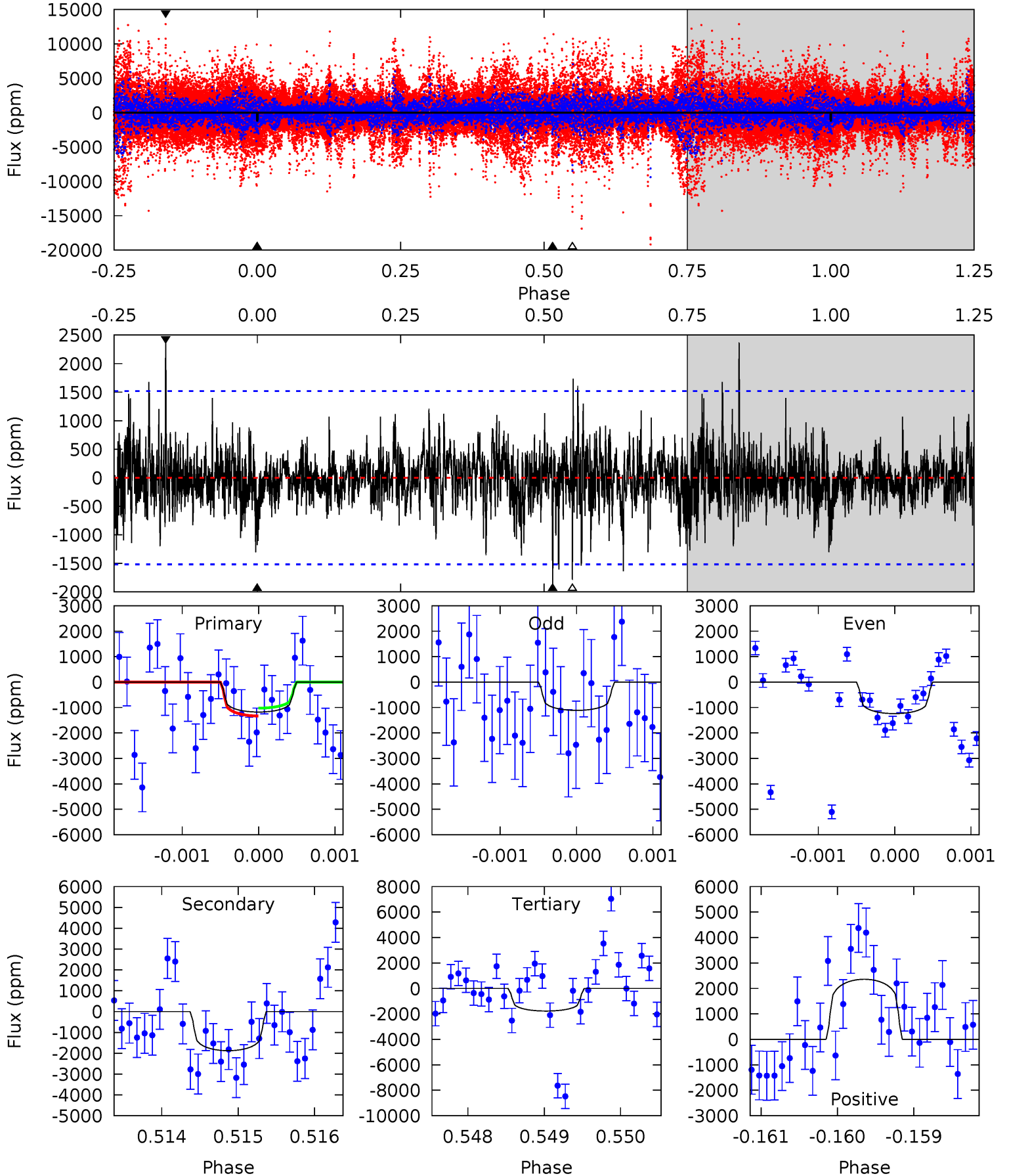
TCE 010670920-01 P=366.039983 Days $T_0=453.567278$ (BKJD)



DV Model-Shift Uniqueness Test

010670920-01, P = 366.024873 Days, E = 87.563299 Days

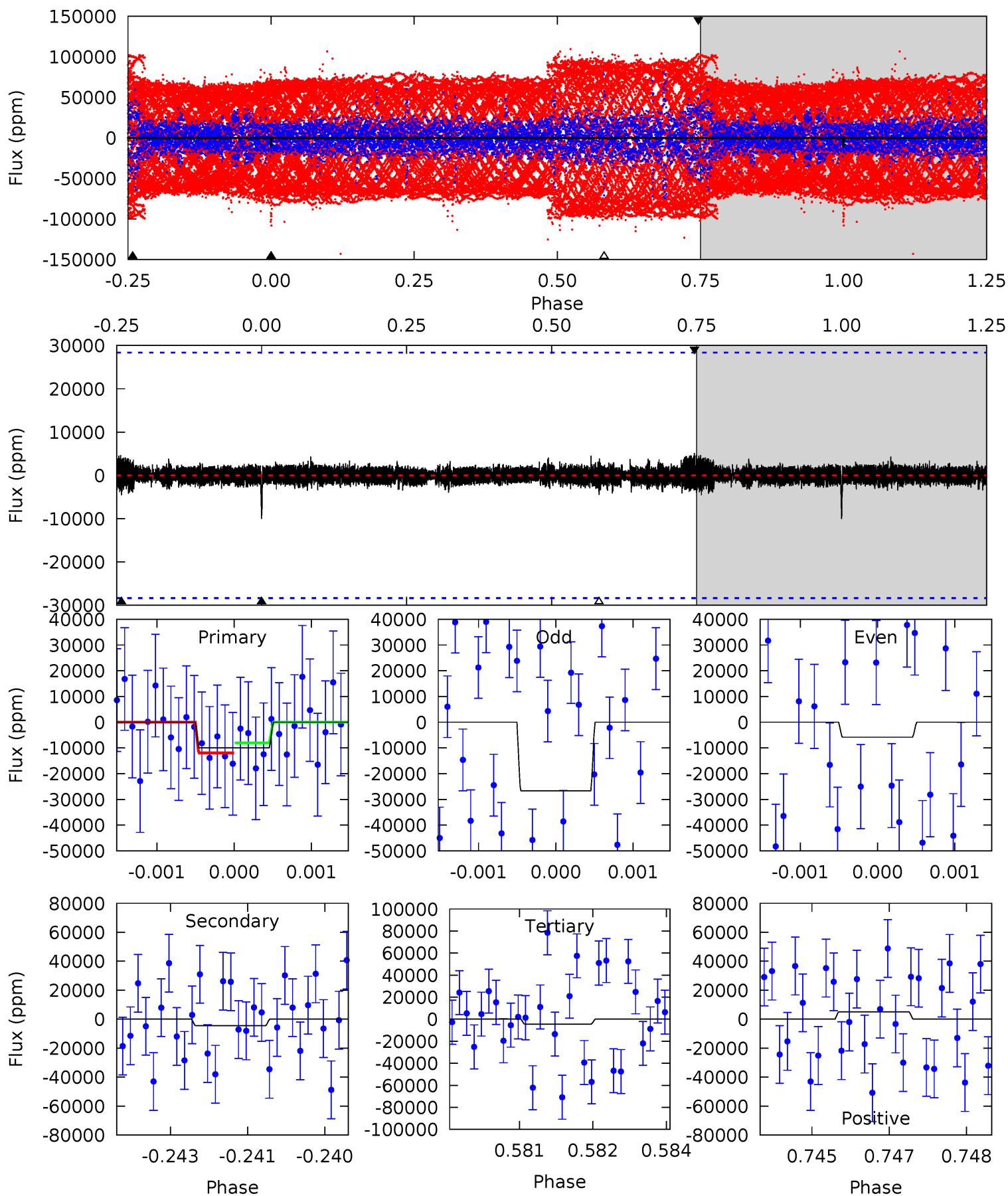
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
4.22	6.72	6.36	8.45	5.43	3.26	1.35	-2.14	-4.23	0.37	-1.73	0.20	1.06	0.56	0.55



Alt Model-Shift Uniqueness Test

010670920-01, P = 366.039983 Days, E = 87.527295 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.91	0.86	0.86	0.97	5.39	3.20	0.23	1.05	0.93	0.01	-0.11	1.98	16.9	0.34	0.37



Stellar Parameters For KIC 010670920

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6422^{+177}_{-244}	$4.184^{+0.240}_{-0.160}$	$-0.420^{+0.300}_{-0.300}$	$1.364^{+0.392}_{-0.356}$	$1.036^{+0.156}_{-0.128}$	$0.575^{+0.782}_{-0.270}$
	+3%/-4%	+6%/-4%	+71%/-71%	+29%/-26%	+15%/-12%	+136%/-47%
Source	KIC0	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 010670920-01 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1877 ± 279	$7.28^{+5.42}_{-4.55}$	453^{+34}_{-34}	5947^{+4728}_{-1269}	$20152^{+117766}_{-13564}$
Alt.	-4523 ± 5255	$15.88^{+7.28}_{-6.06}$	456^{+31}_{-32}	4899^{+1816}_{-8459}	8017^{+23056}_{-9623}

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

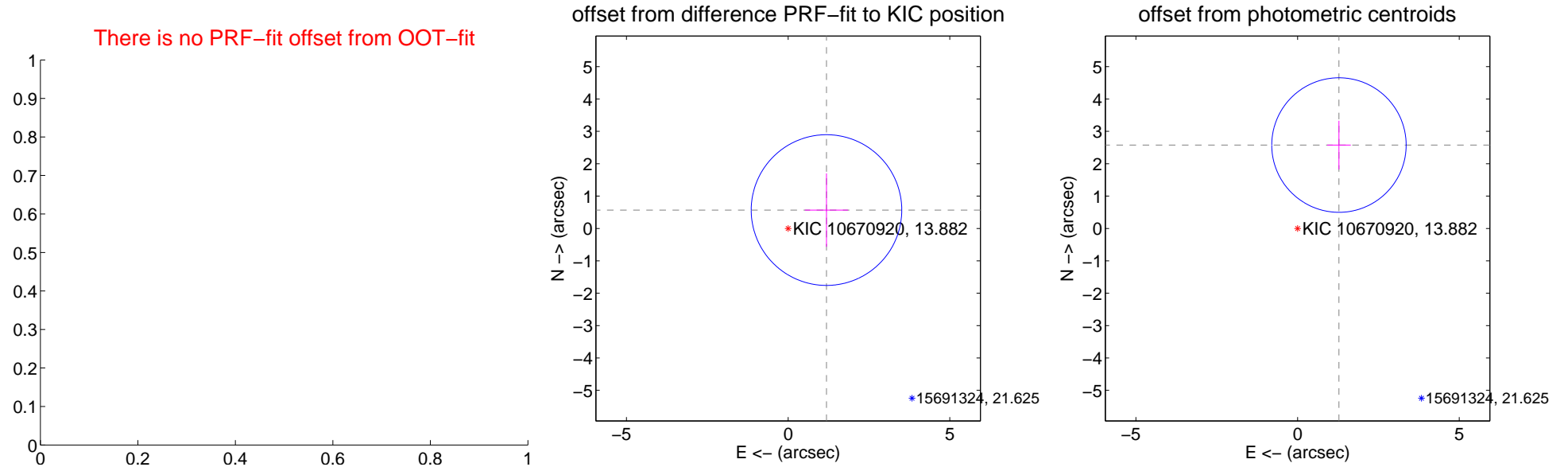
DV Centroid Data

Supplemental centroid analysis for 010670920-01. Kepler magnitude: 13.88. Transit SNR 7.47

There are 0 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	1.315 ± 0.776	1.70	-1.186 ± 0.668	0.568 ± 1.132
photometric centroid source offset	2.88 ± 0.69	4.15	-1.28 ± 0.36	2.58 ± 0.75

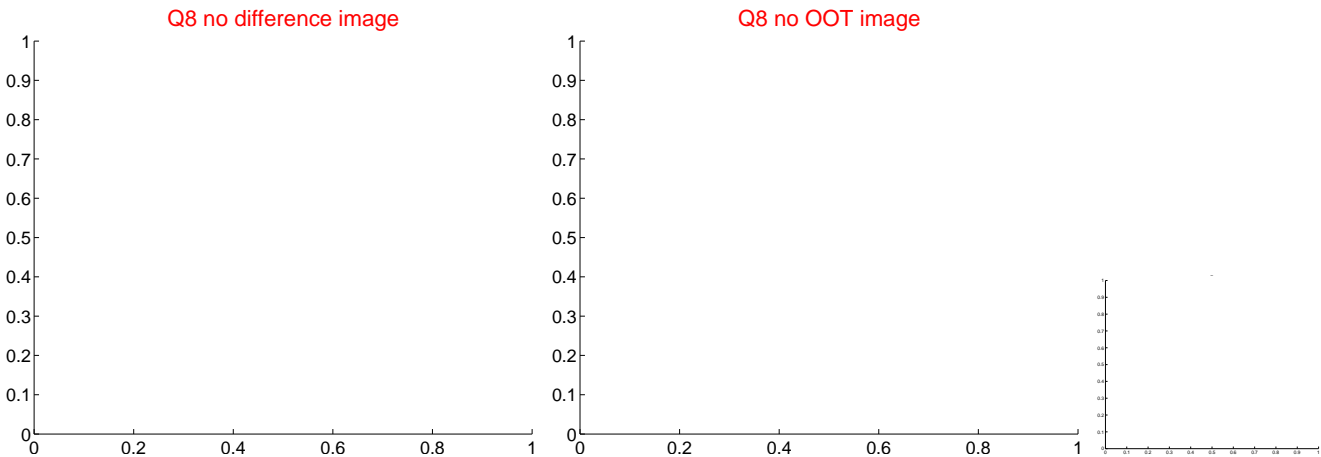
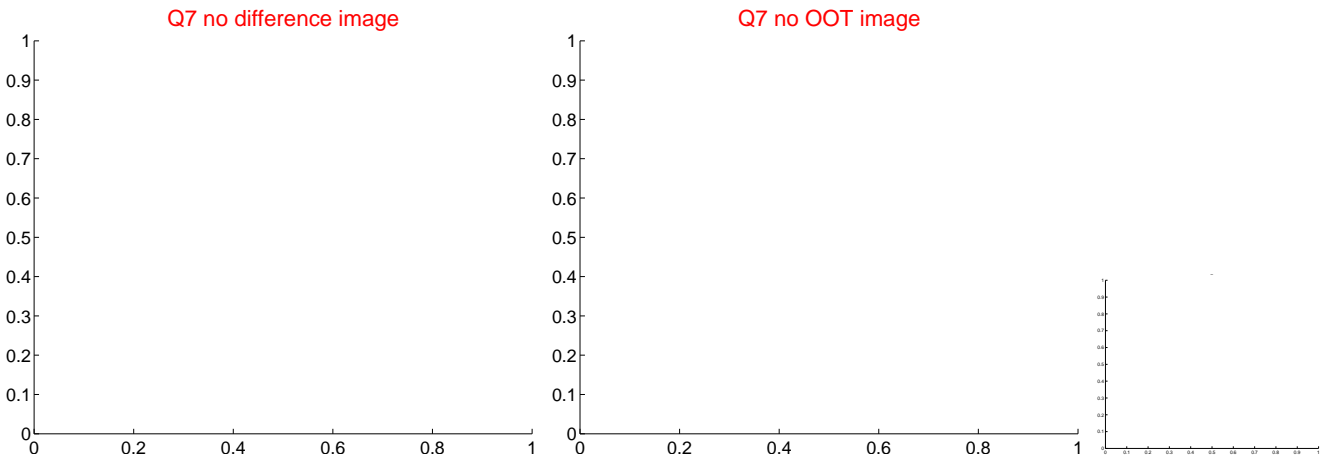
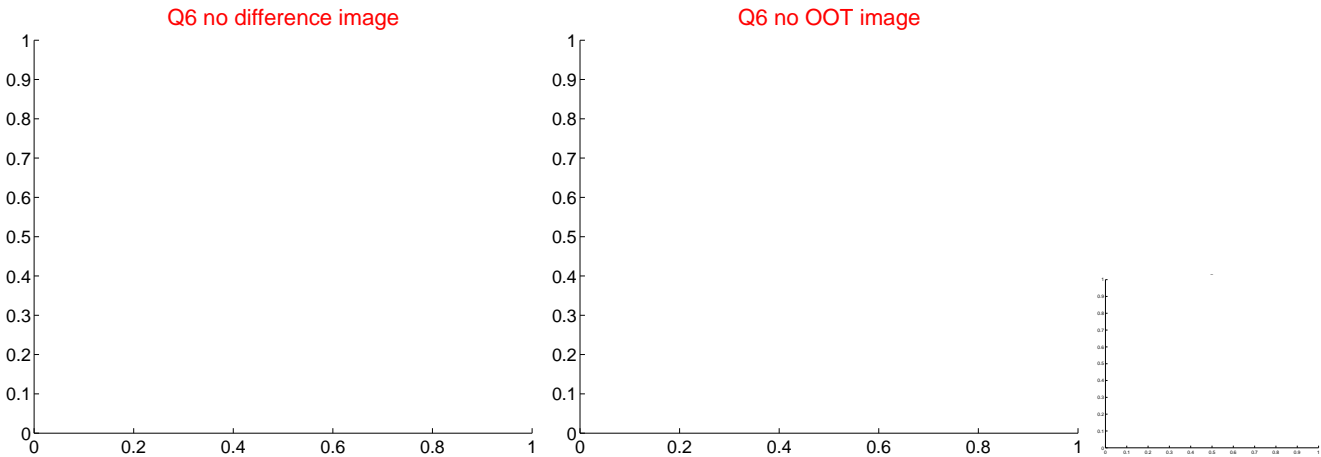
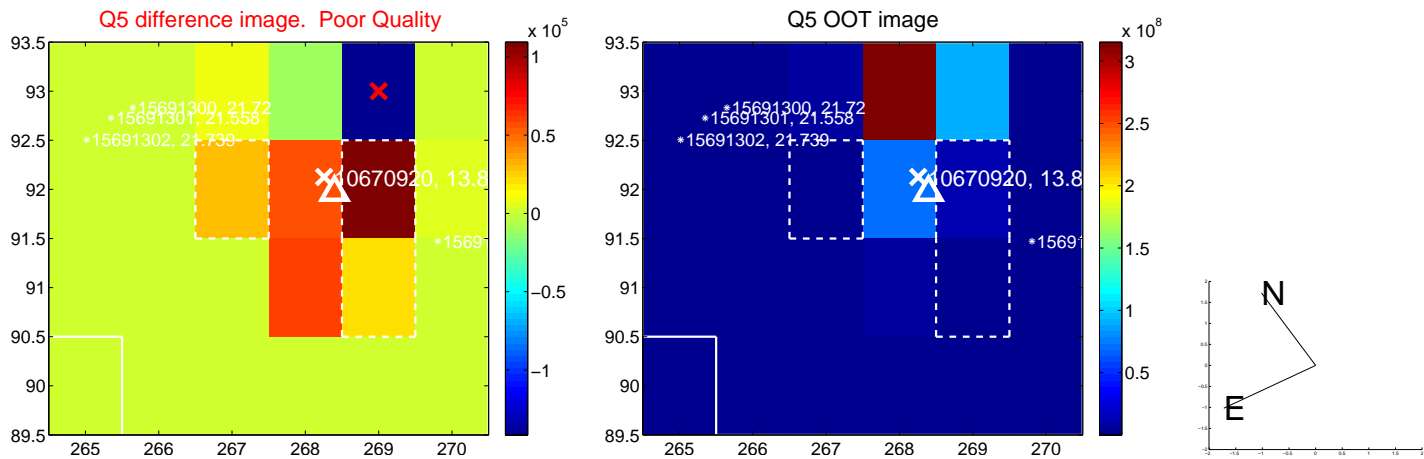


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

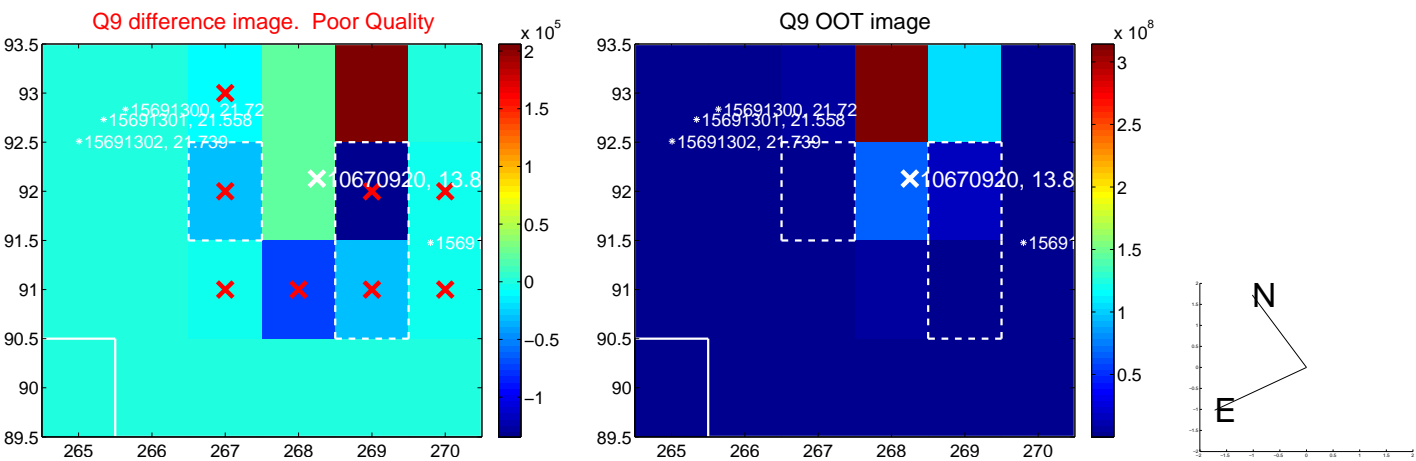
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



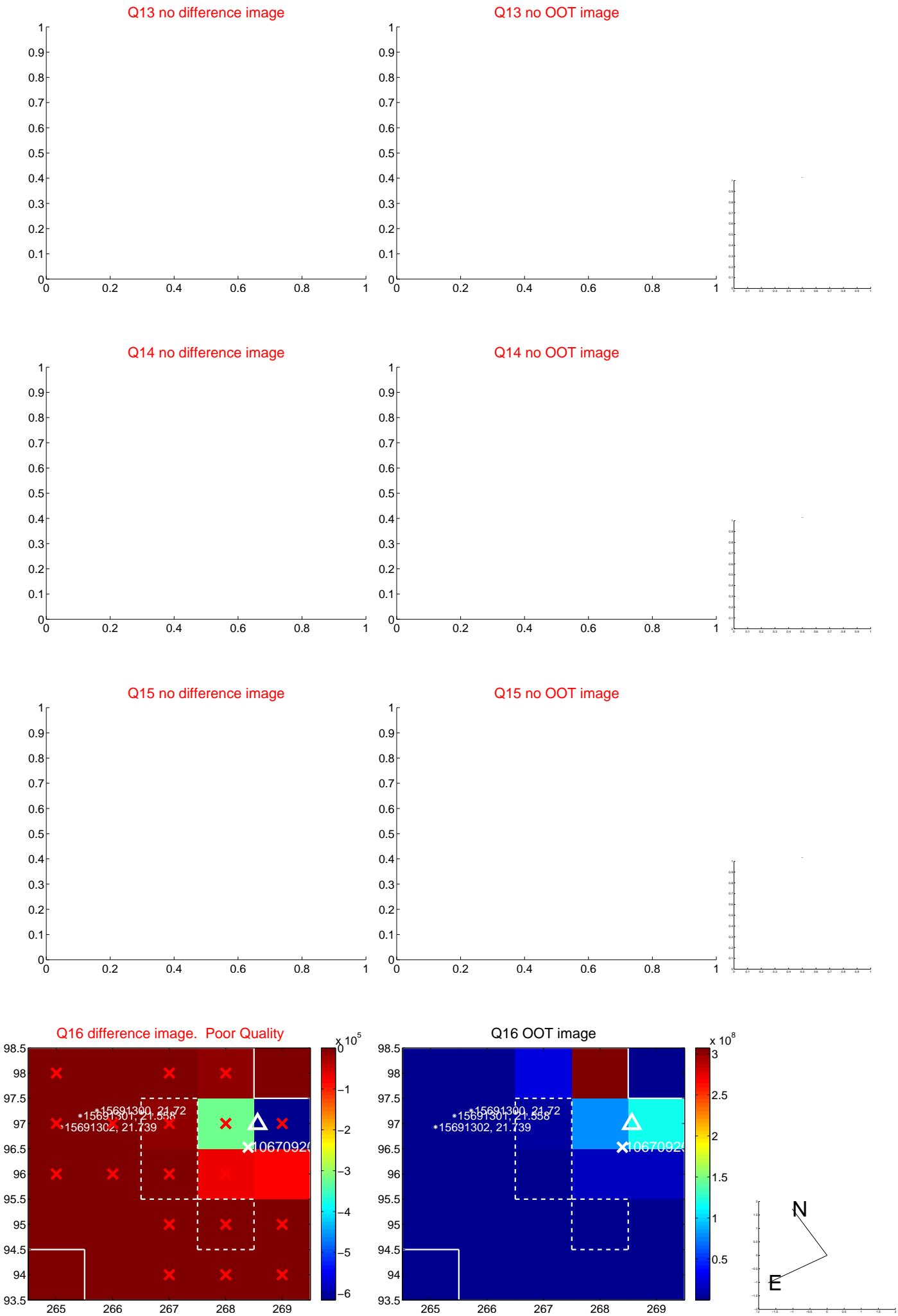
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



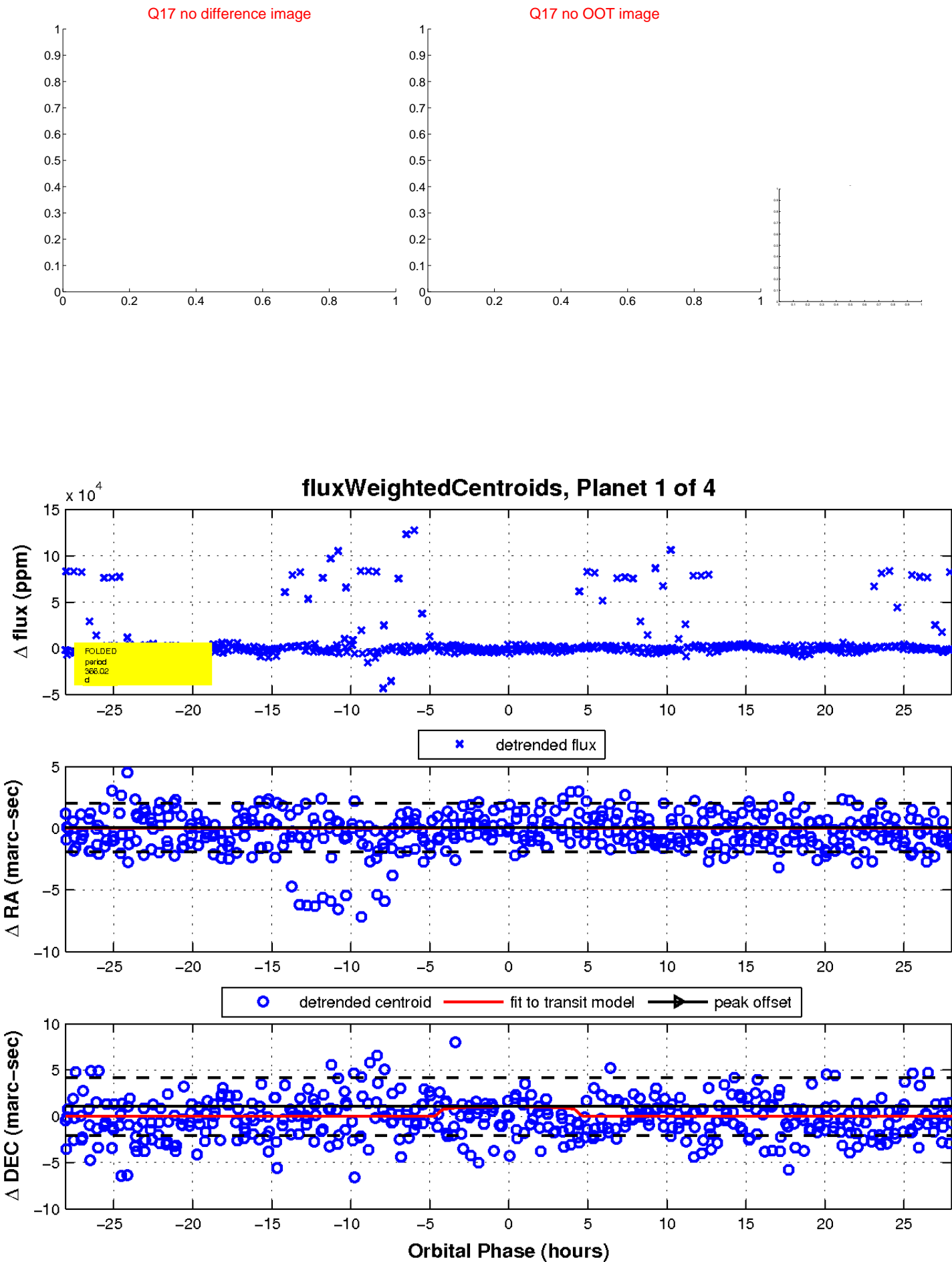
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

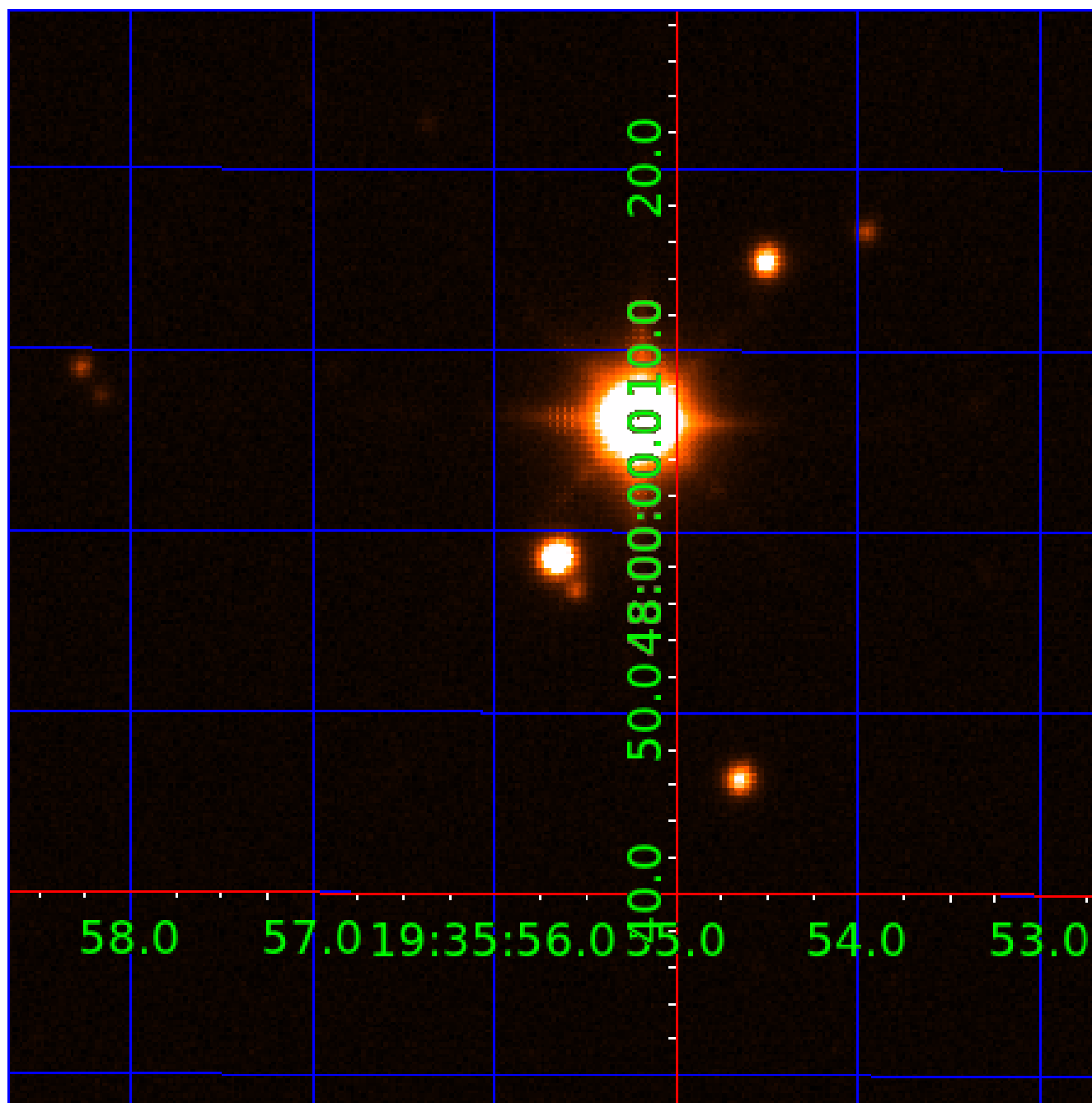


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010670920

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})
010670920-01	OBS	No	366.024873	453.588172	1877.7	9.382	20.7	7.5	1.36	6422	6.12	2.76
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Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
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010670920-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
010670920-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010670920-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

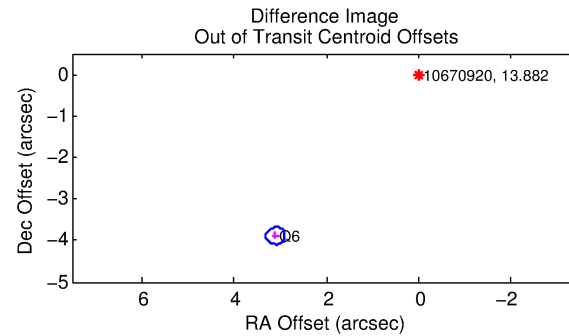
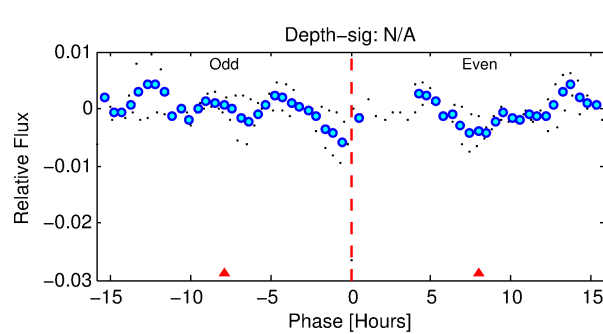
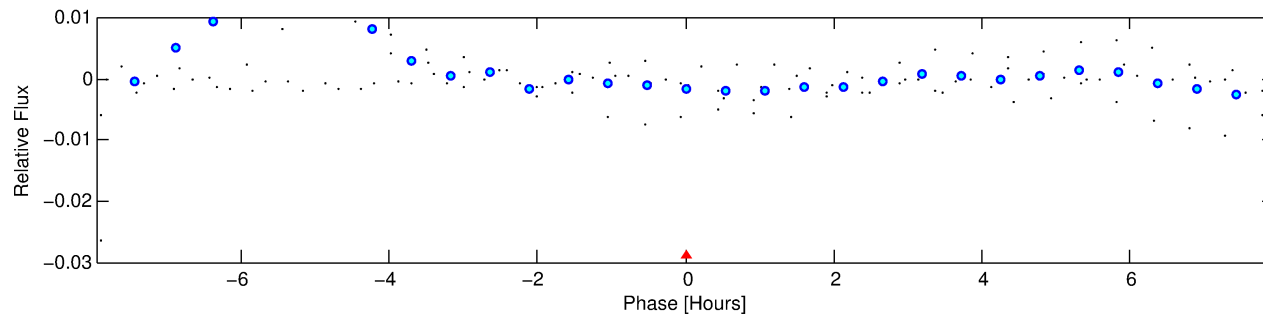
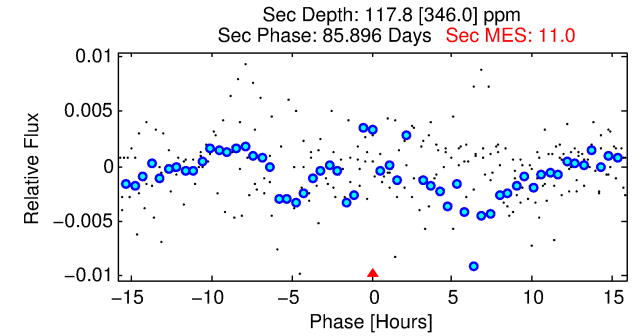
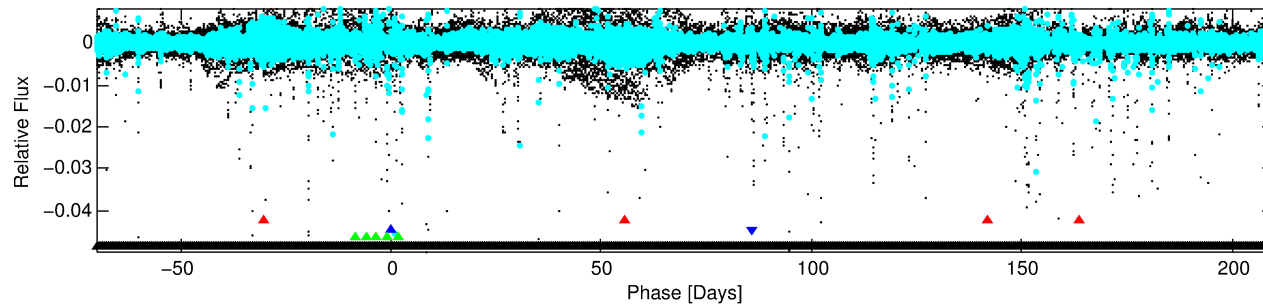
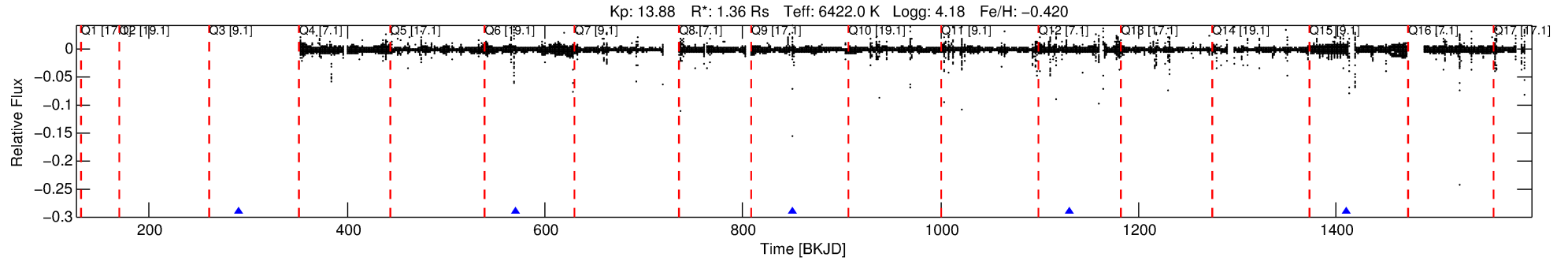
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010670920-02

No Significant Match Found

DV One-Page Summary

KIC: 10670920 Candidate: 2 of 4 Period: 280.028 d



TPS TCE Results:

Period = 280.02832 d
Epoch = 290.1640 BKJD

DV fit results are unavailable

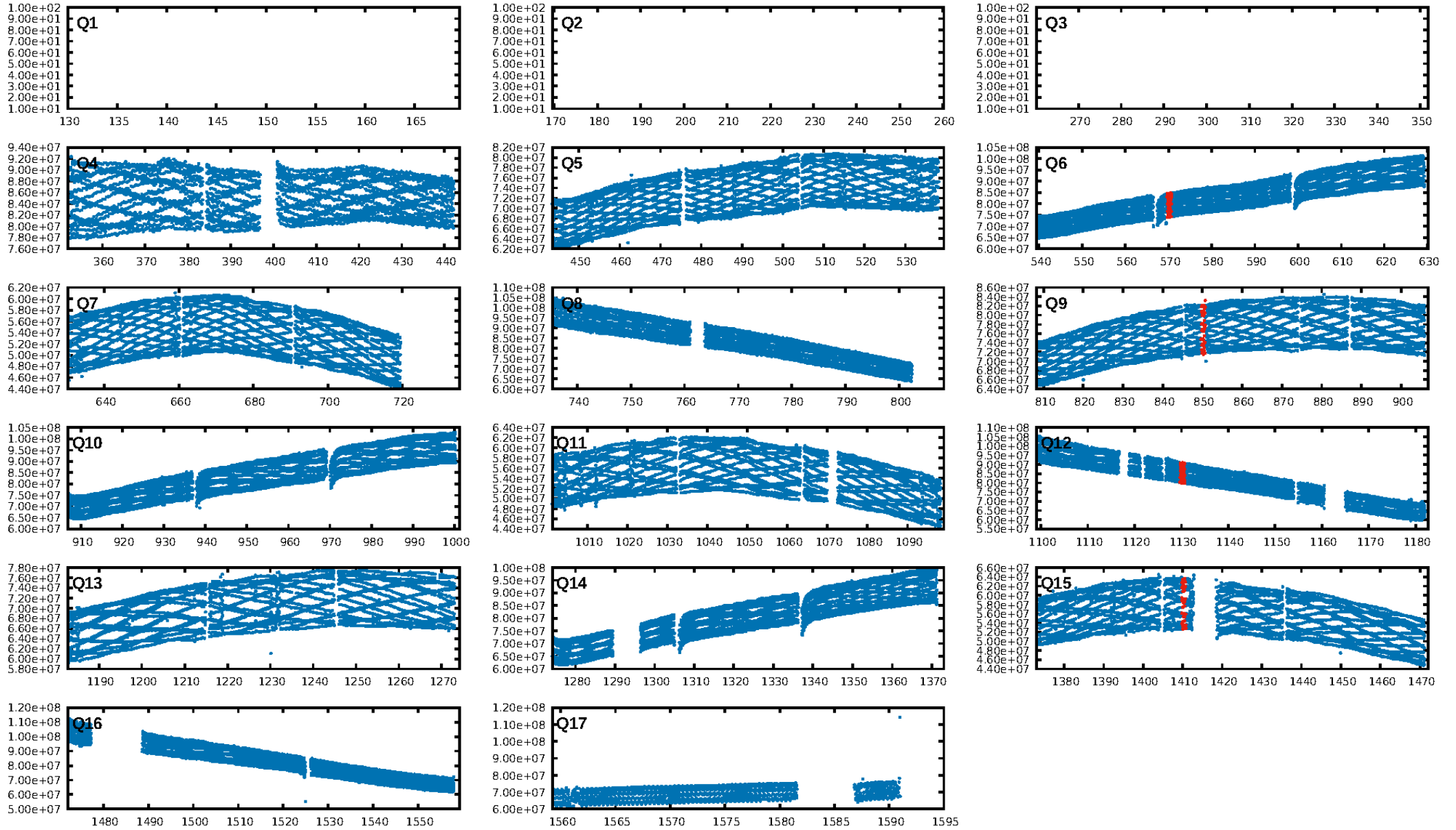
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [3.96 σ]
LongPeriod-sig: 100.0% [132.05 σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: 1.136
Centroid-sig: 11.9%
Centroid-so: 3.374 arcsec [79.49 σ]
OotOffset-rm: 4.976 arcsec [71.34 σ]
KicOffset-rm: 0.287 arcsec [1.55 σ]
OotOffset-st: 1/0/0/0 [1]
KicOffset-st: 1/1/0/1 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.33 [1/3]

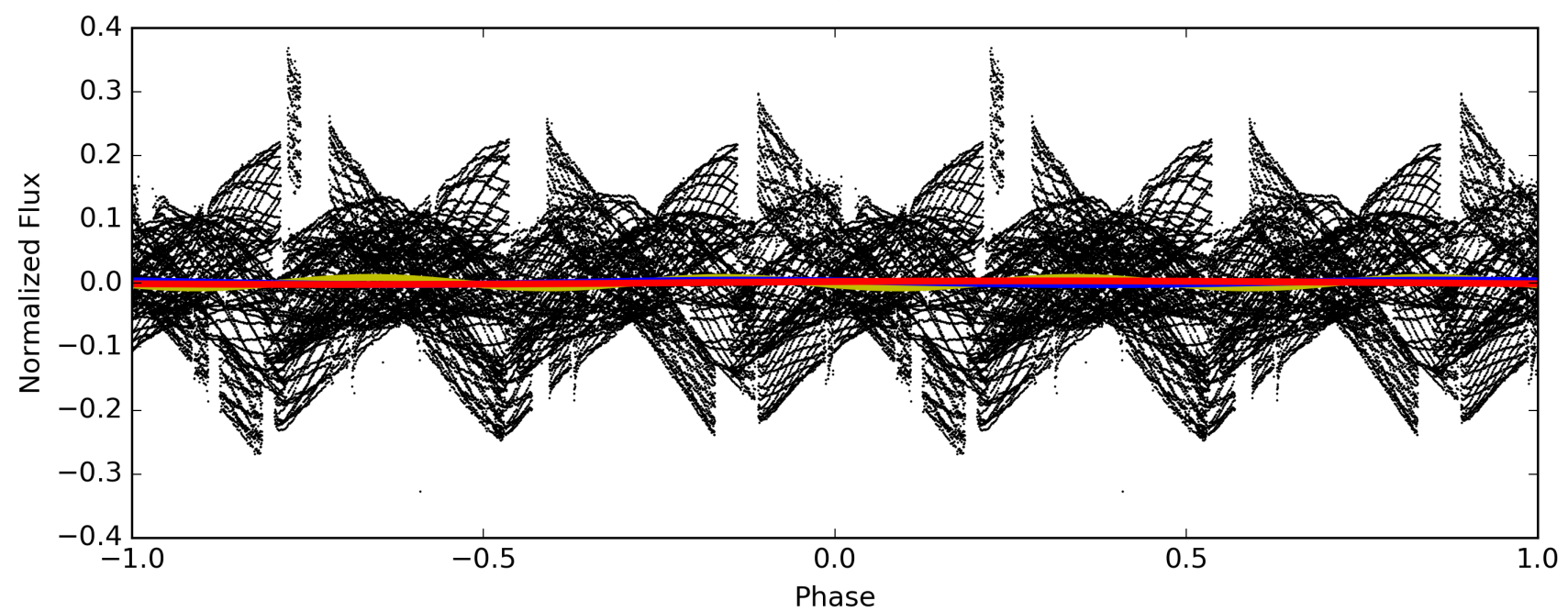
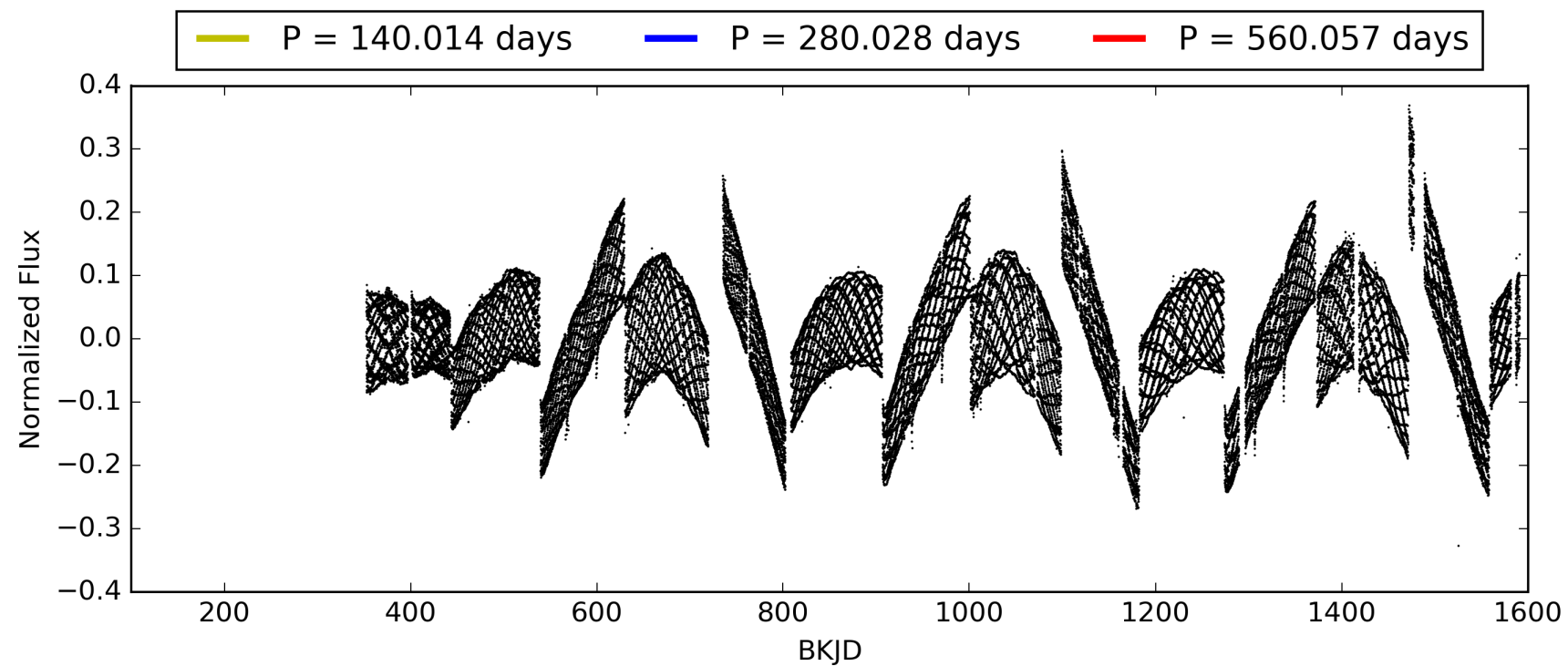
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:56:14 Z

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

TCE 010670920-02, PDC Light Curves

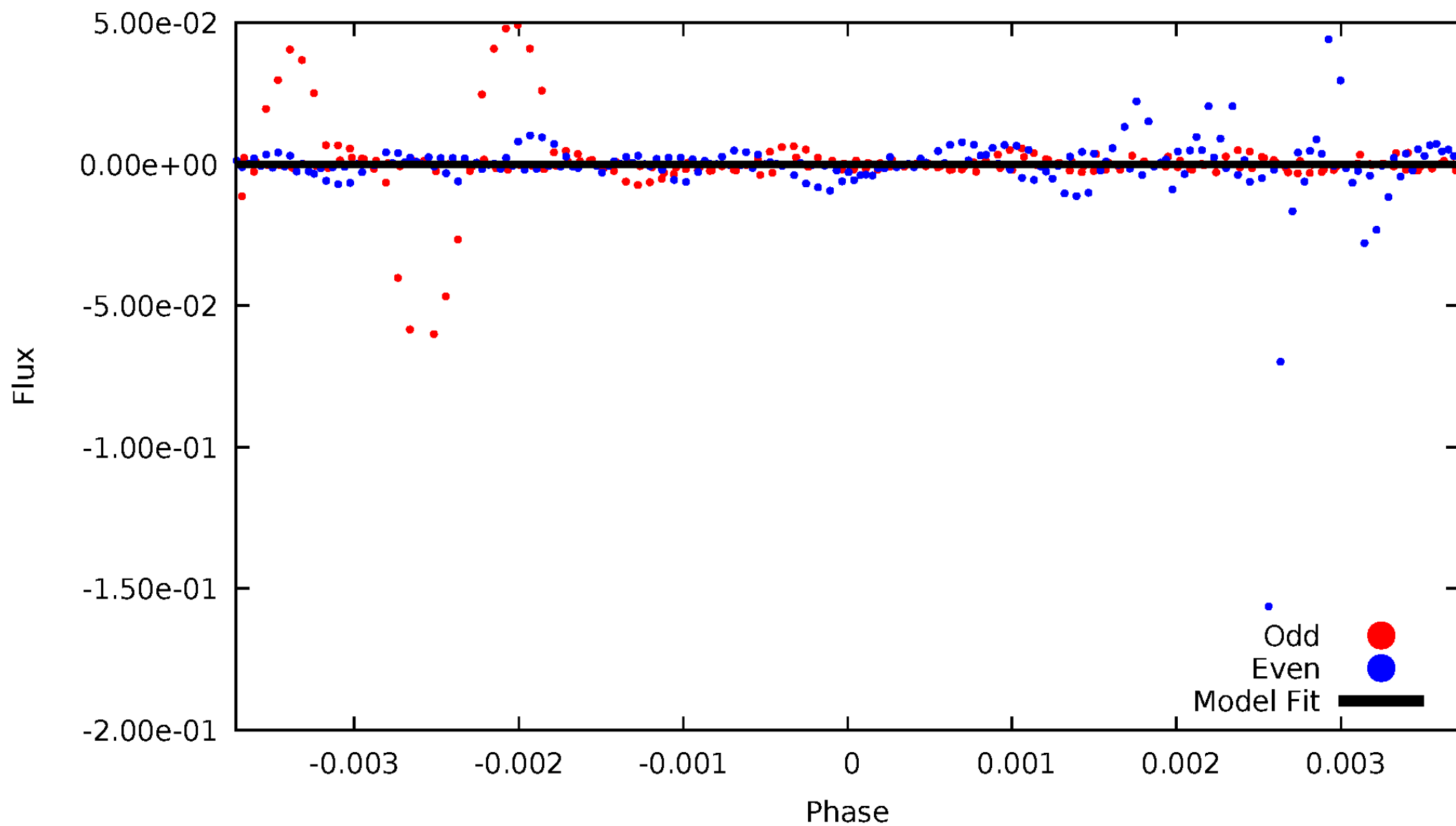


TCE 010670920-02



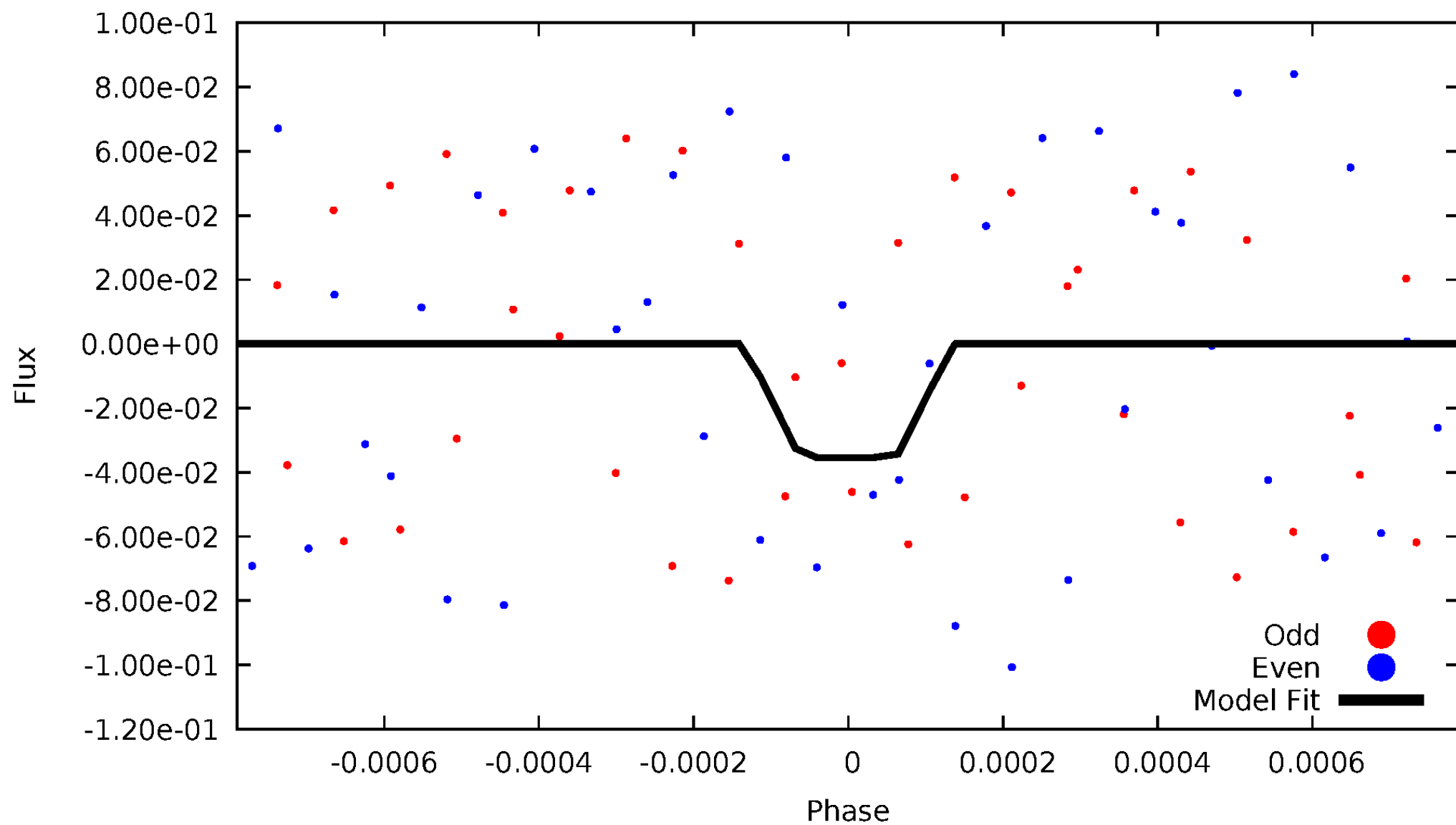
DV Odd/Even

TCE 010670920-02



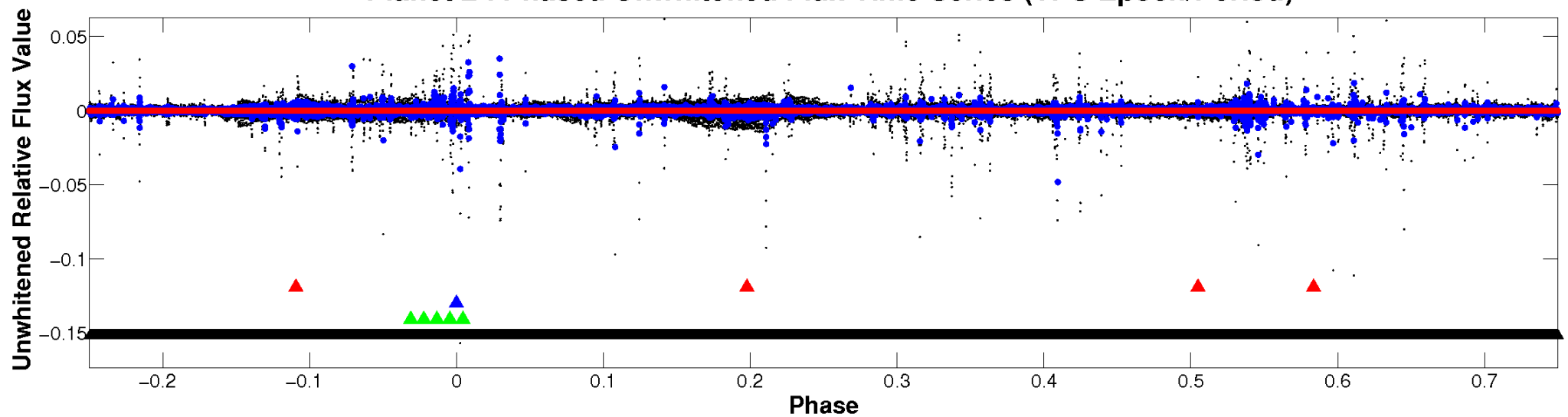
ALT Odd/Even

TCE 010670920-02



Non-Whitened Vs. Whitened Light Curve

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

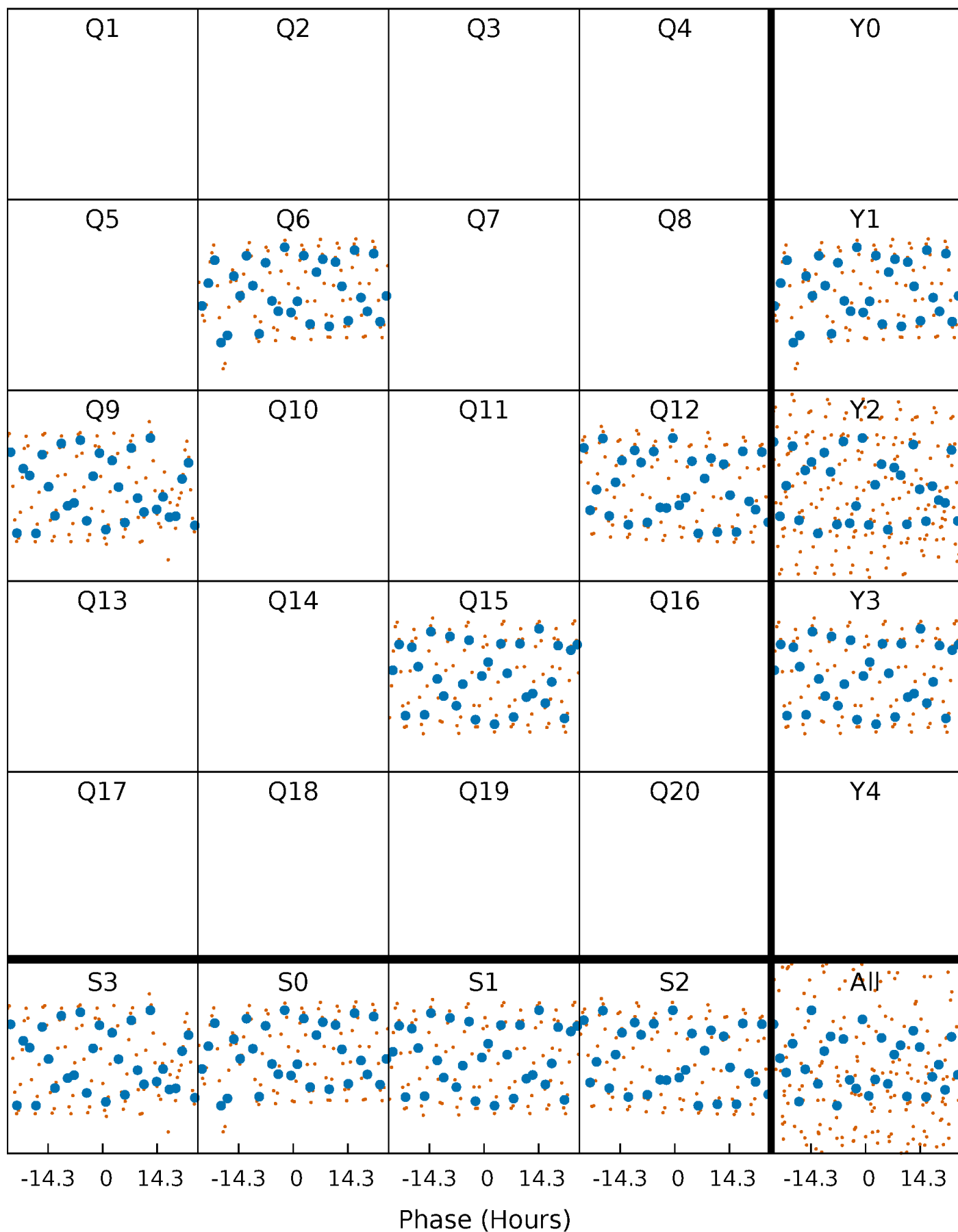


Planet 2 : Phased Whitened Flux Time Series (TPS Epoch/Period)



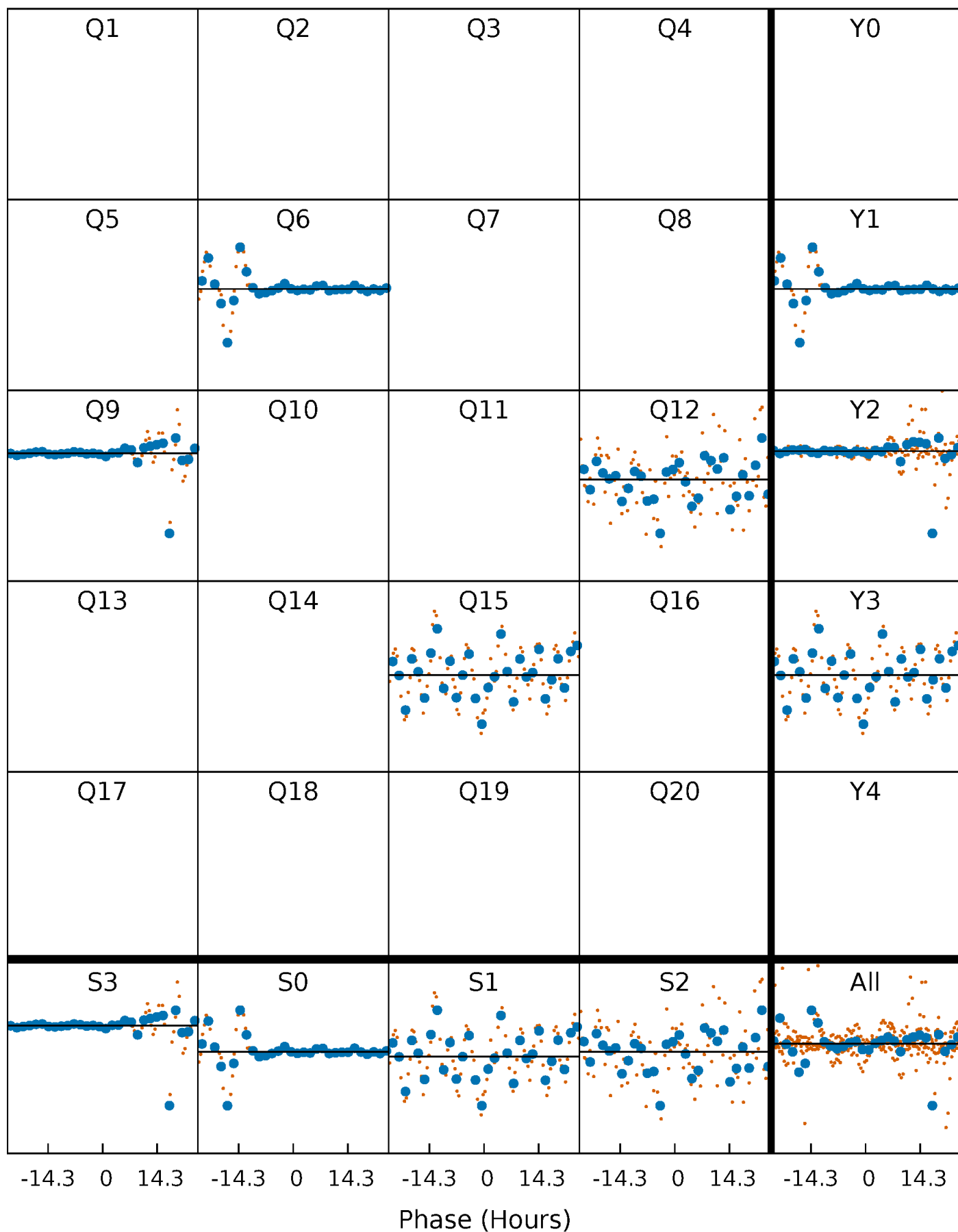
PDC Quarter-Phased Transit Curves

TCE 010670920-02 $P=280.028317$ Days $T_0=290.163965$ (BKJD)



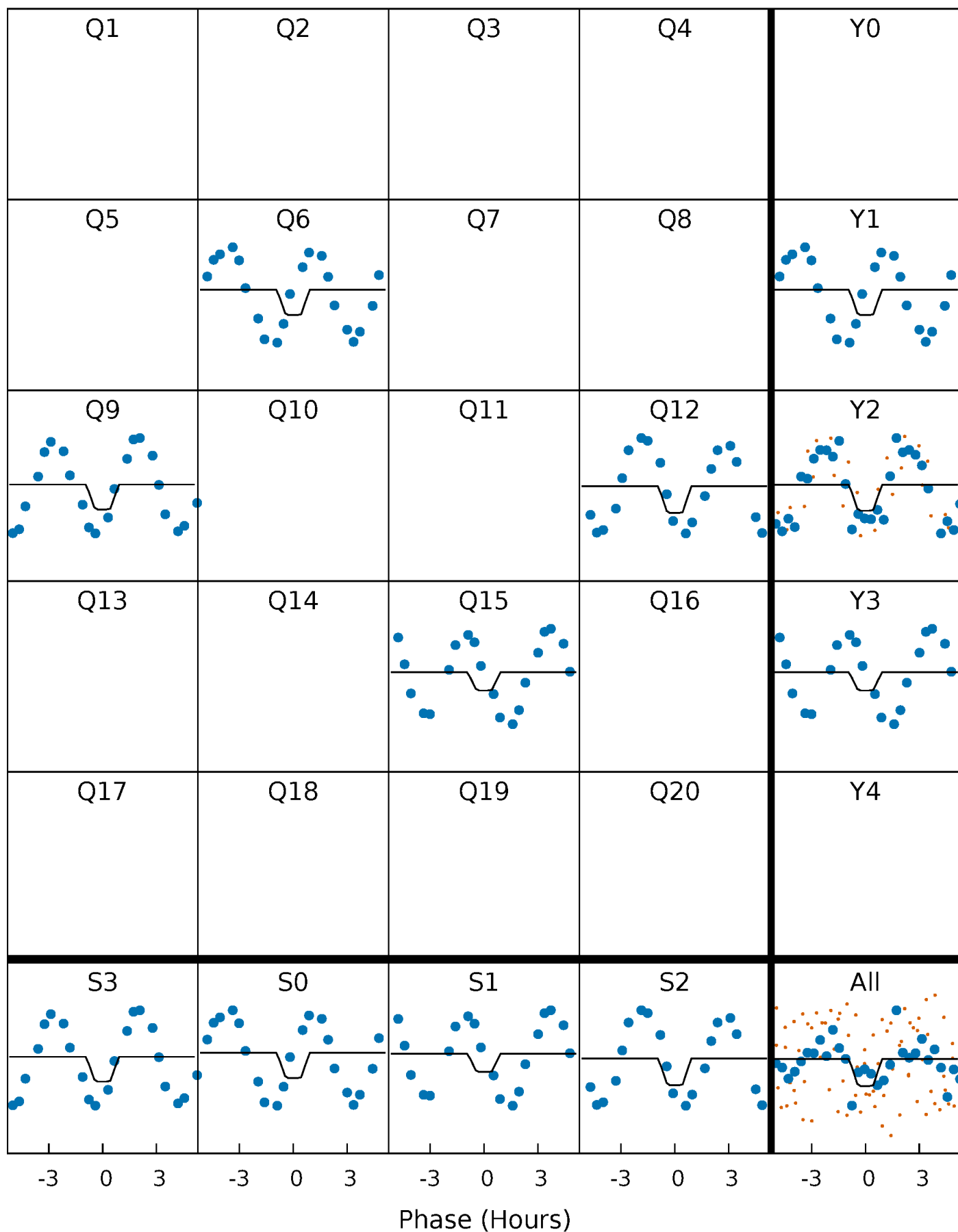
DV Quarter-Phased Transit Curves

TCE 010670920-02 $P=280.028317$ Days $T_0=290.163965$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

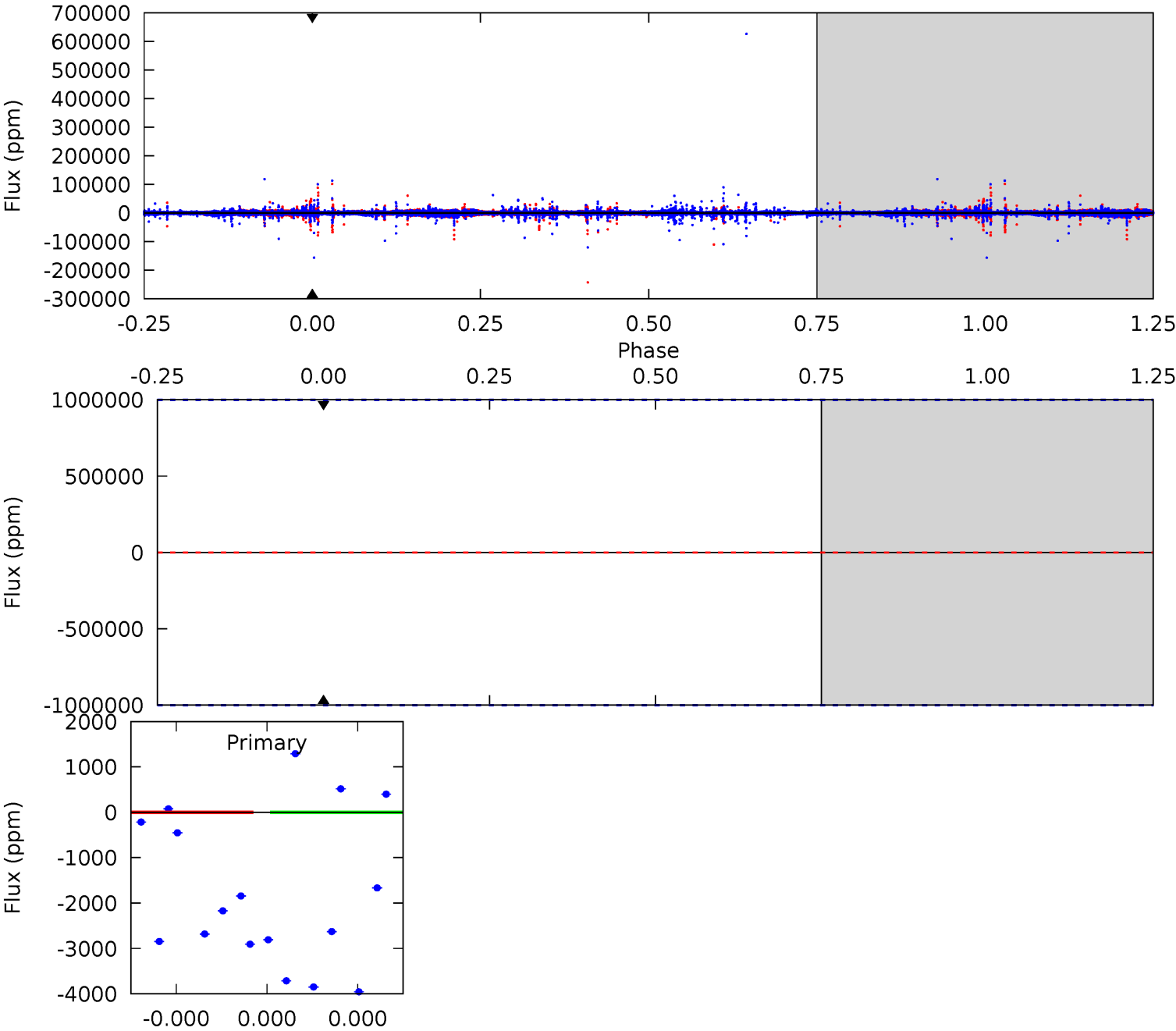
TCE 010670920-02 P=280.028317 Days $T_0=289.829486$ (BKJD)



DV Model-Shift Uniqueness Test

010670920-02, P = 280.028317 Days, E = 290.163965 Days

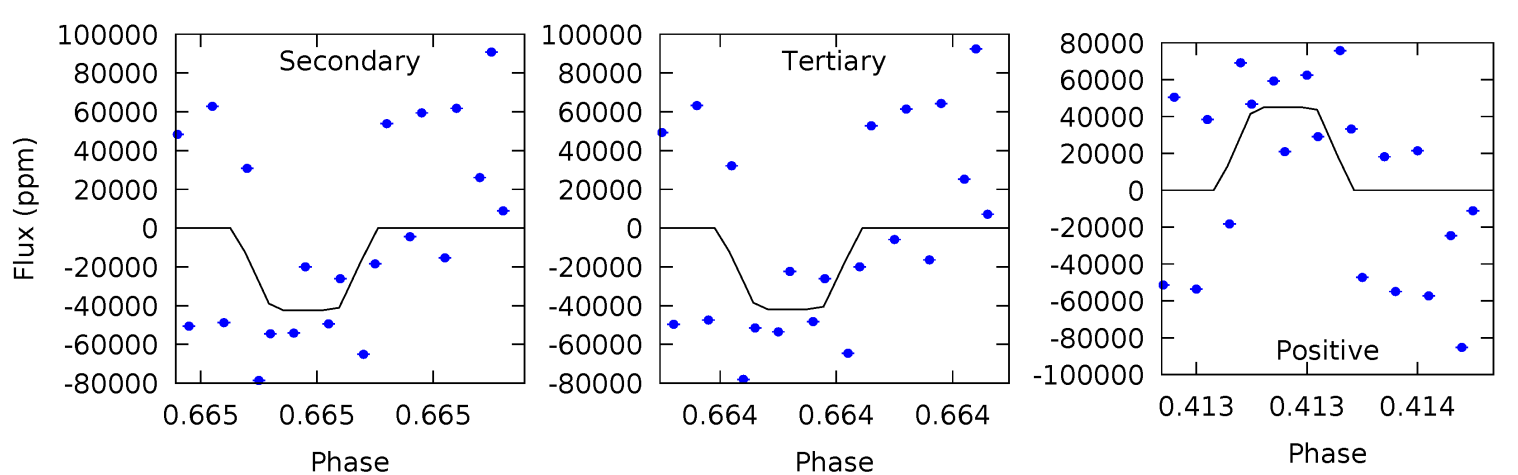
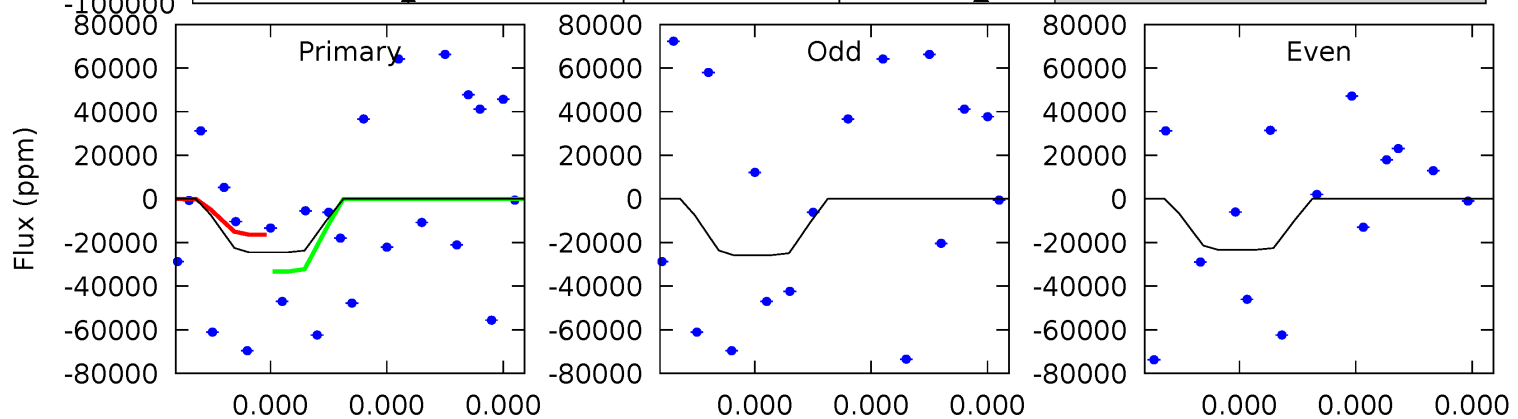
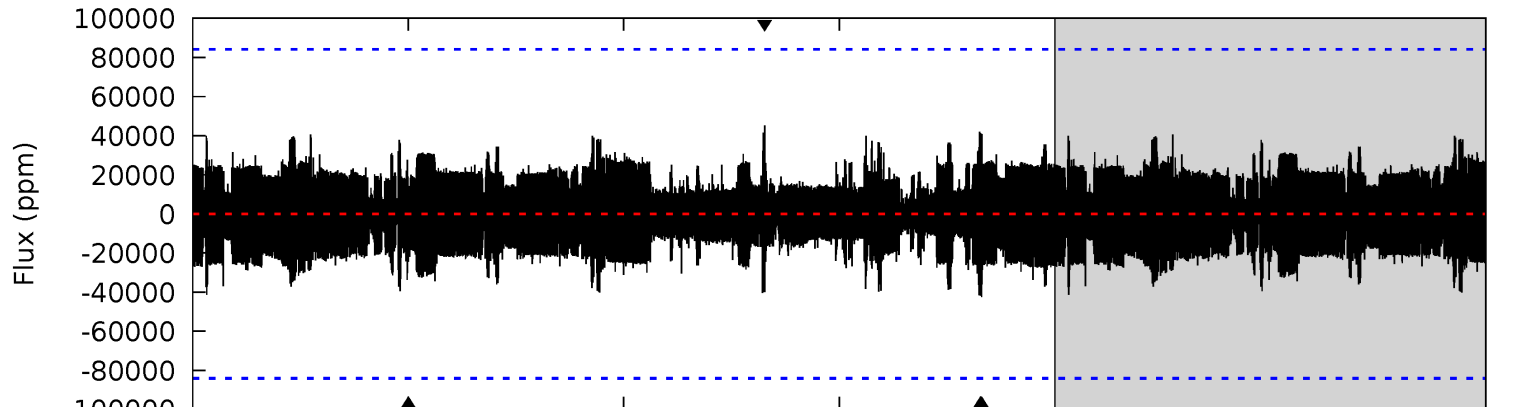
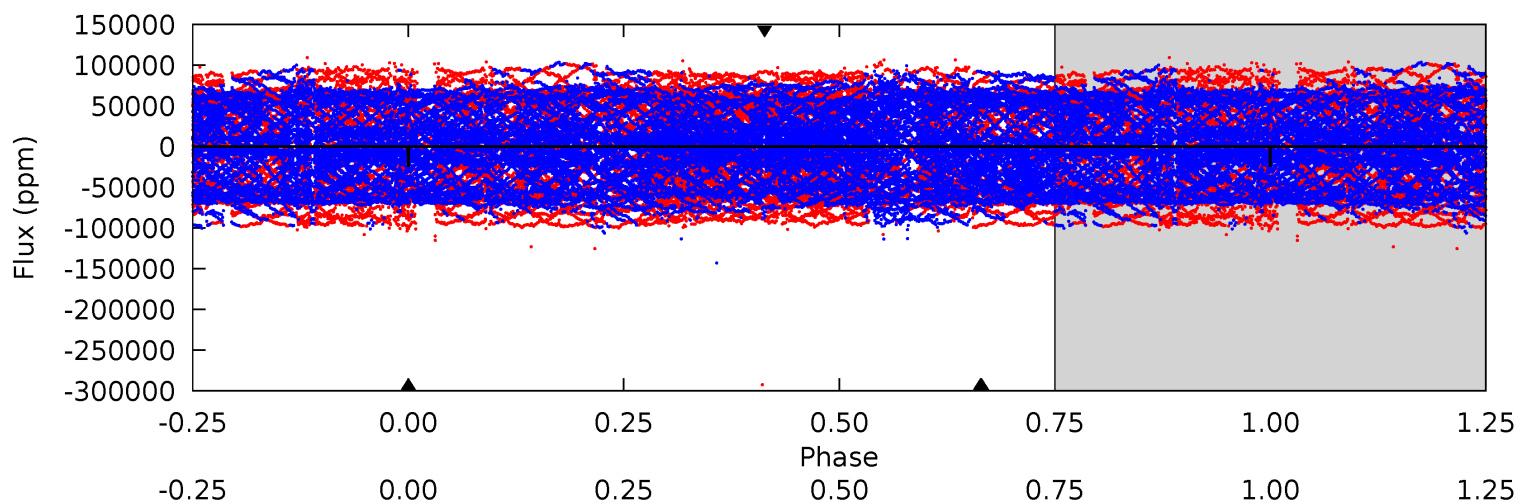
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

010670920-02, P = 280.028317 Days, E = 289.829486 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.67	2.88	2.85	3.07	5.71	3.69	0.87	-1.18	-1.40	0.04	-0.18	0.08	1.09	0.52	0.57



Stellar Parameters For KIC 010670920

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6422^{+177}_{-244}	$4.184^{+0.240}_{-0.160}$	$-0.420^{+0.300}_{-0.300}$	$1.364^{+0.392}_{-0.356}$	$1.036^{+0.156}_{-0.128}$	$0.575^{+0.782}_{-0.270}$
	+3%/-4%	+6%/-4%	+71%/-71%	+29%/-26%	+15%/-12%	+136%/-47%
Source	KIC0	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 010670920-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	0 ± 1000000	$11.13^{+12.76}_{-7.75}$	499^{+36}_{-39}	5118^{+24708}_{-27078}	$6979^{+729565}_{-477567}$
Alt.	-42432 ± 14718	$27.85^{+14.75}_{-13.77}$	496^{+36}_{-38}	6693^{+3362}_{-1361}	22019^{+65662}_{-13537}

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

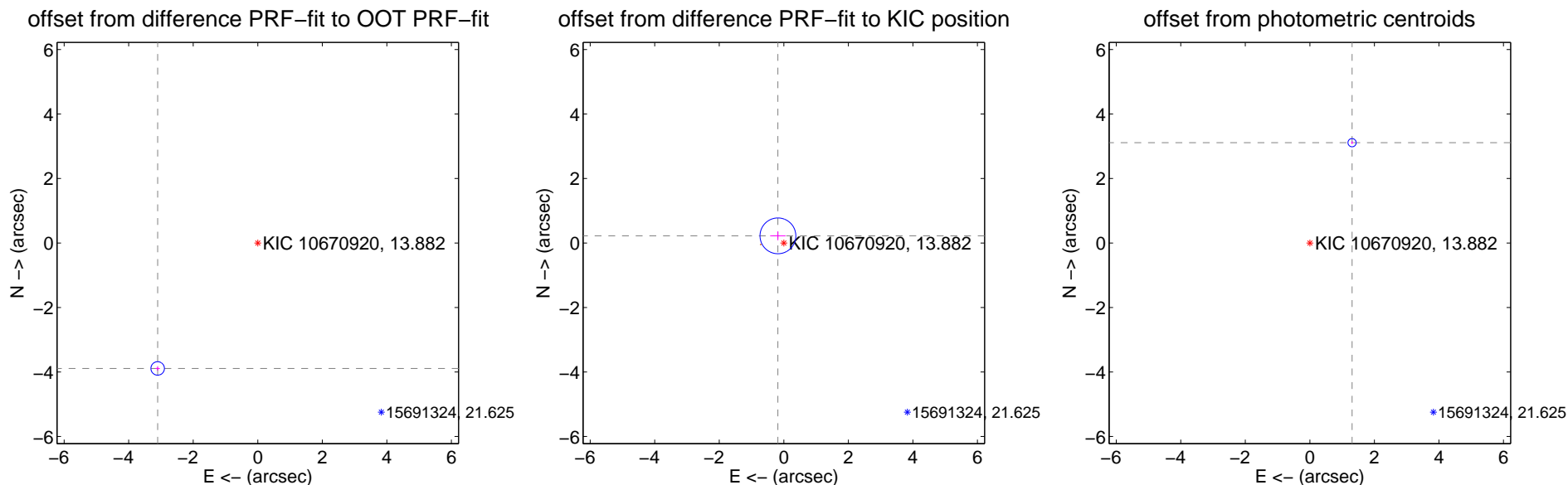
DV Centroid Data

Supplemental centroid analysis for 010670920-02. Kepler magnitude: 13.88. Transit SNR -1.00

There are 2 quarters with good PRF difference image offsets

The OOT PRF centroid is offset from the target star catalog position by about 4.52 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.976 \pm 0.070	71.34	3.103 \pm 0.069	-3.890 \pm 0.071
PRF-fit source offset from KIC position	0.287 \pm 0.185	1.55	0.183 \pm 0.238	0.222 \pm 0.137
photometric centroid source offset	3.37 \pm 0.04	79.49	-1.31 \pm 0.03	3.11 \pm 0.04

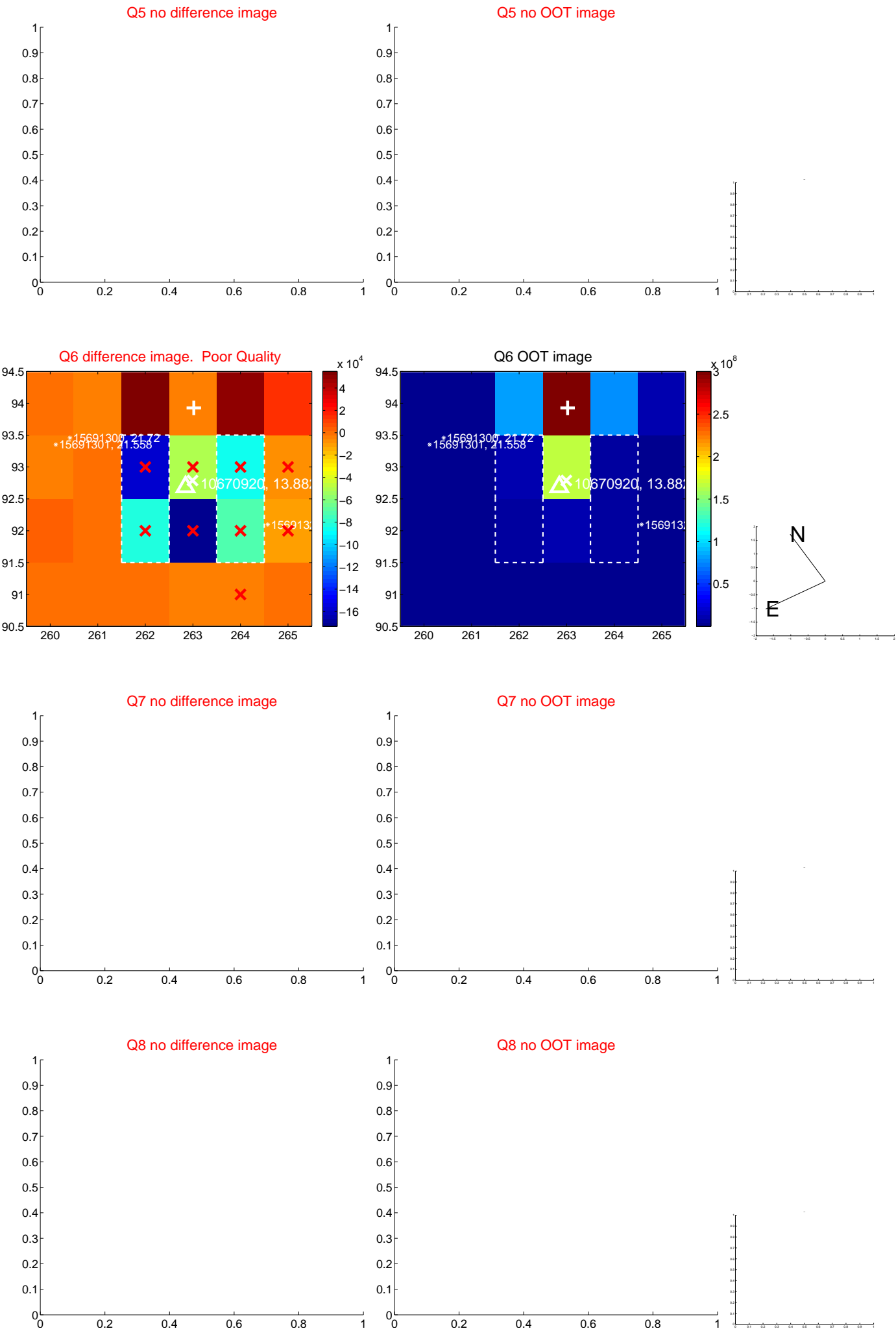


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

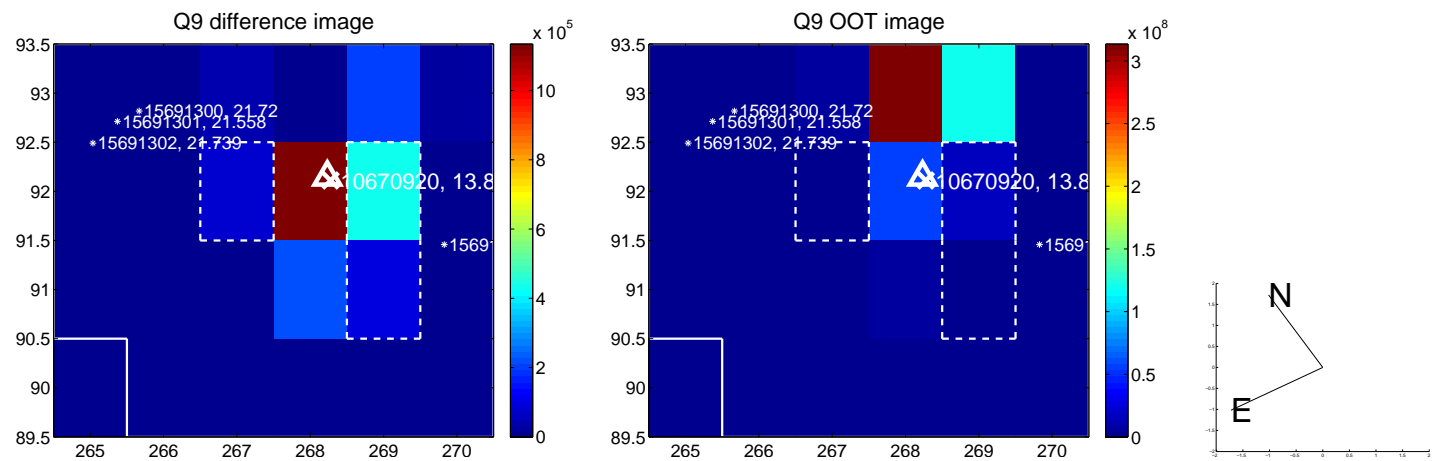
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



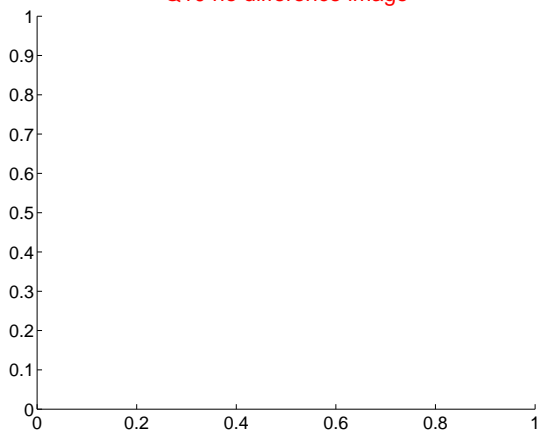
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



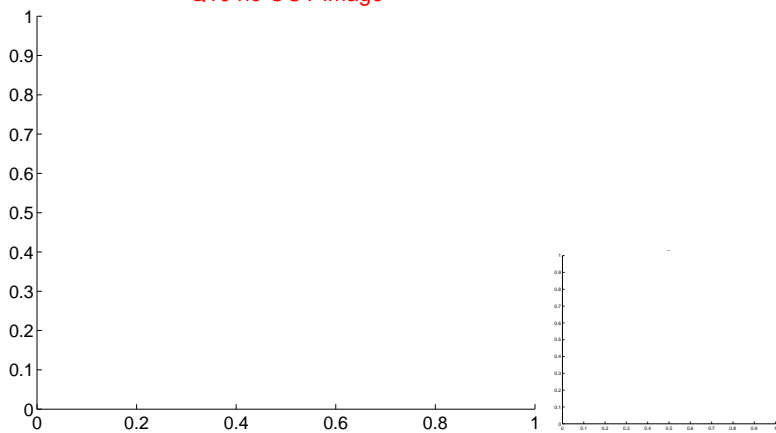
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



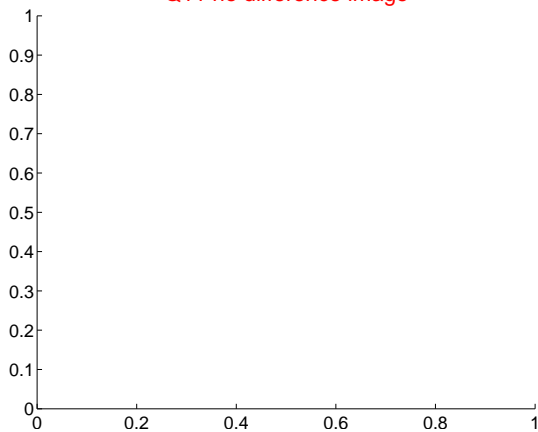
Q10 no difference image



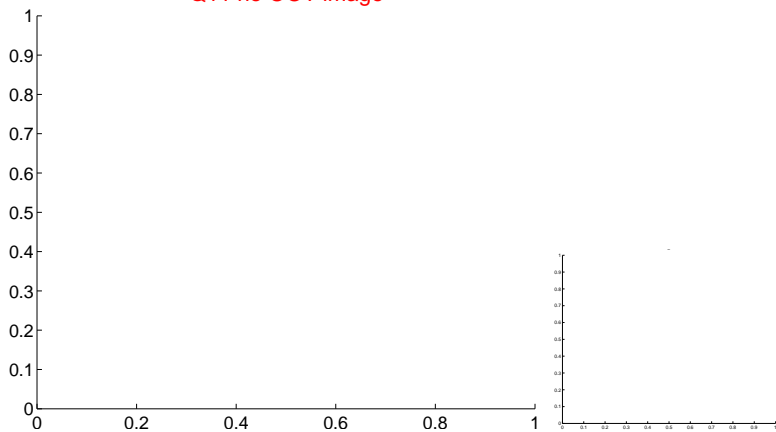
Q10 no OOT image



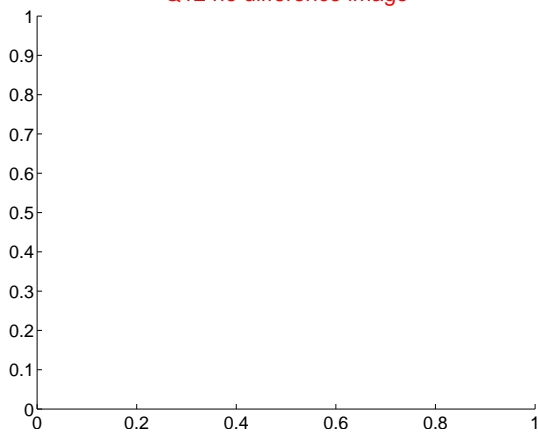
Q11 no difference image



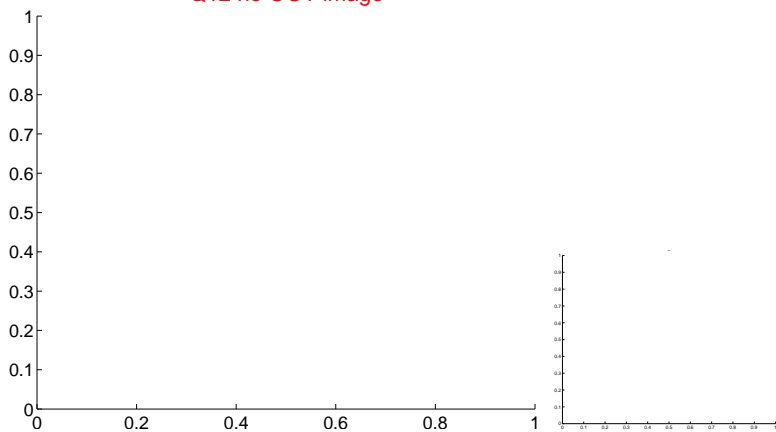
Q11 no OOT image



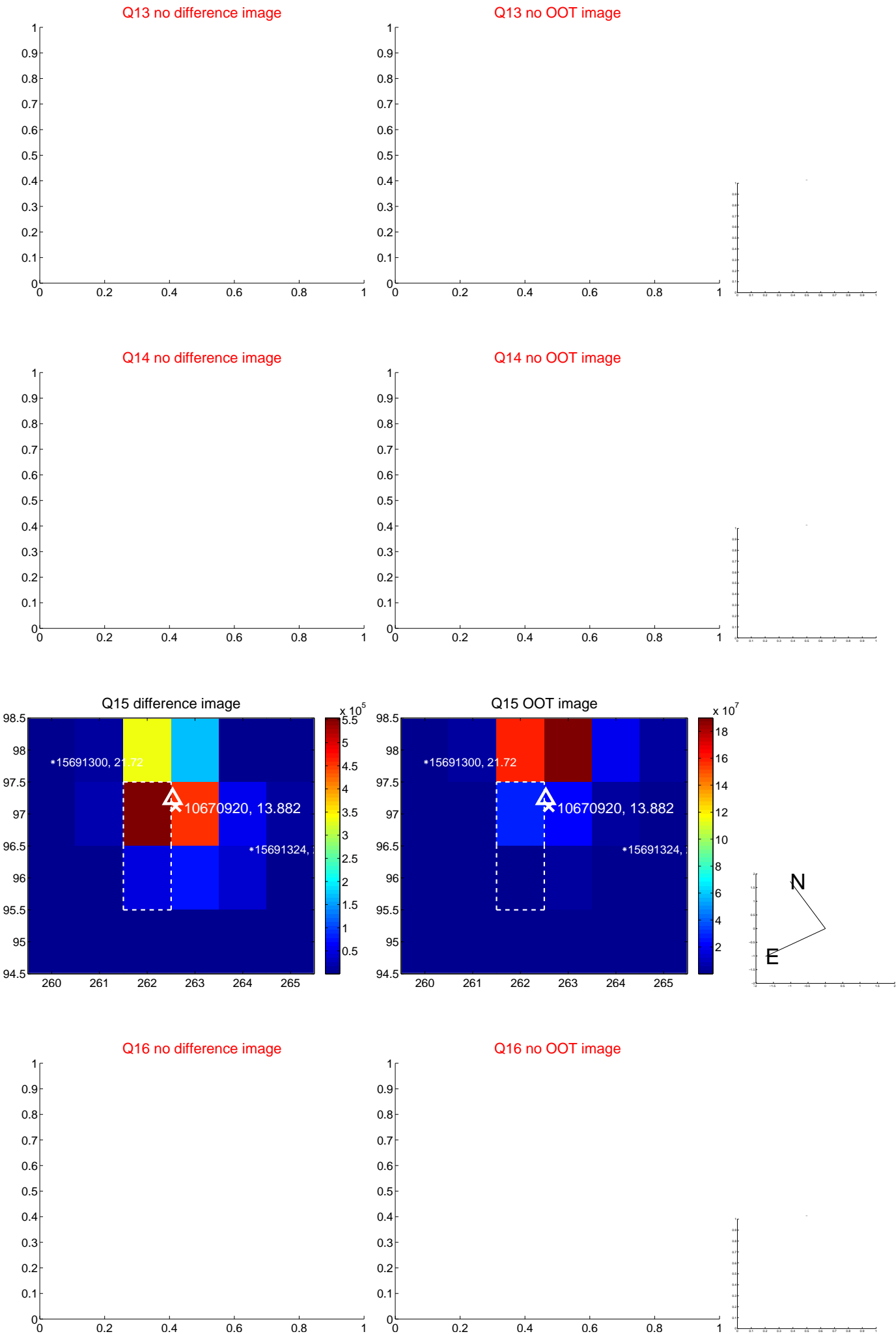
Q12 no difference image



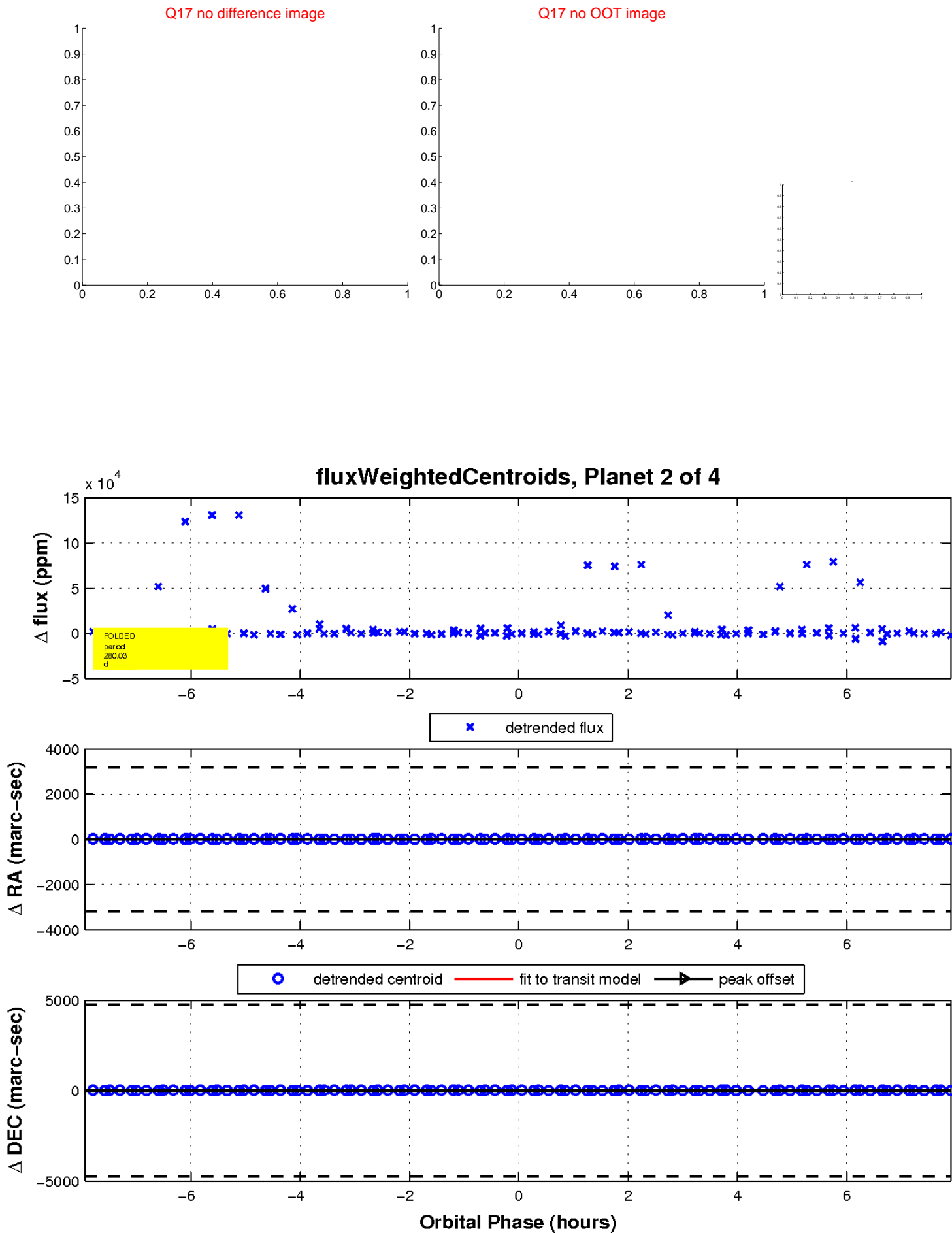
Q12 no OOT image



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

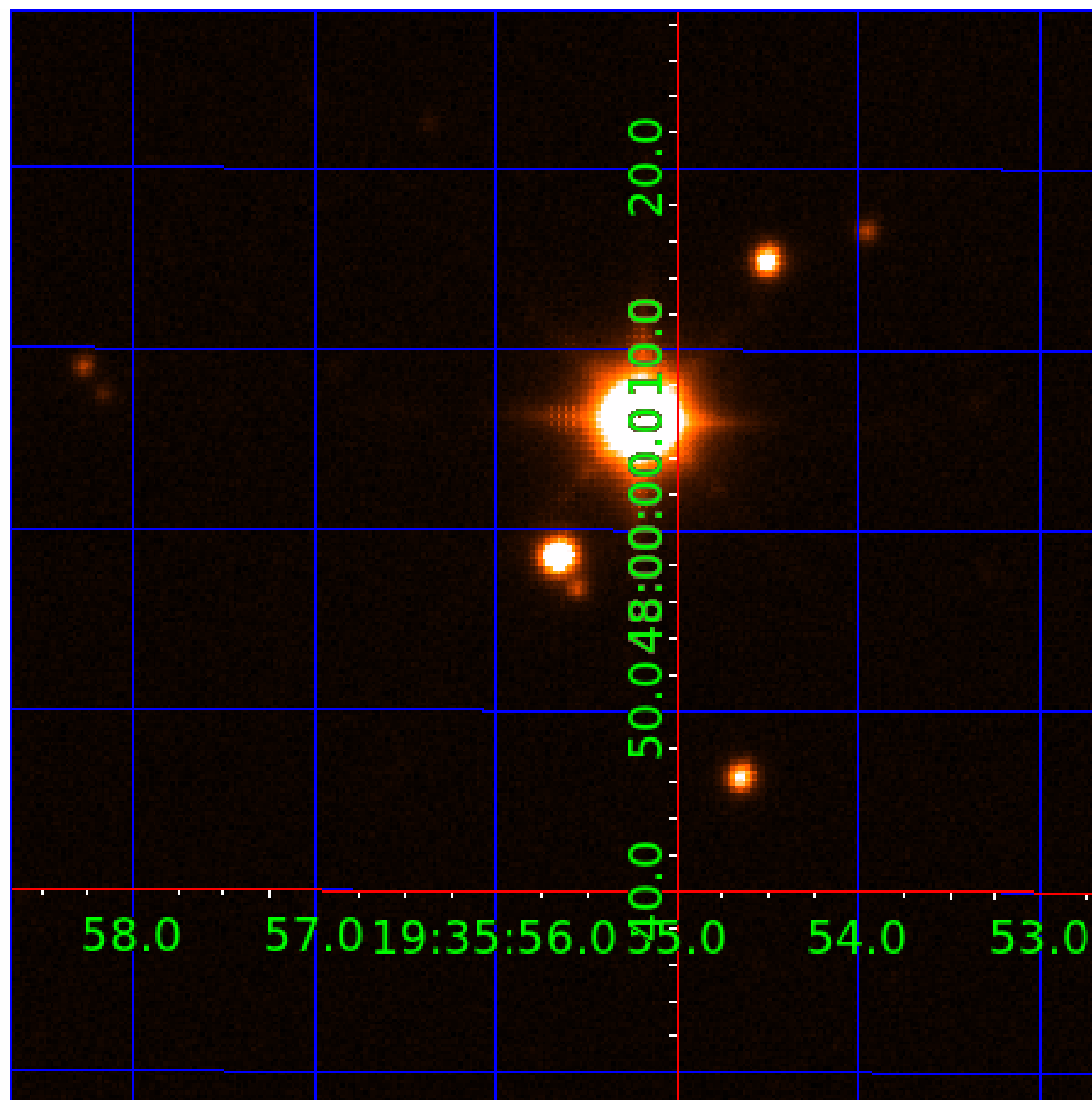


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010670920

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})
010670920-01	OBS	No	366.024873	453.588172	1877.7	9.382	20.7	7.5	1.36	6422	6.12	2.76
010670920-02	OBS	No	280.028317	290.163965	1080.9	12.500	17.5	-1.0	1.36	6422	4.51	3.94
010670920-03	OBS	No	277.542502	291.402906	2928.9	8.426	18.6	9.8	1.36	6422	7.49	3.99
010670920-04	OBS	No	0.775273	131.600777	2263.3	2.000	11.1	-1.0	1.36	6422	6.54	10143.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010670920-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010670920-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
010670920-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010670920-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

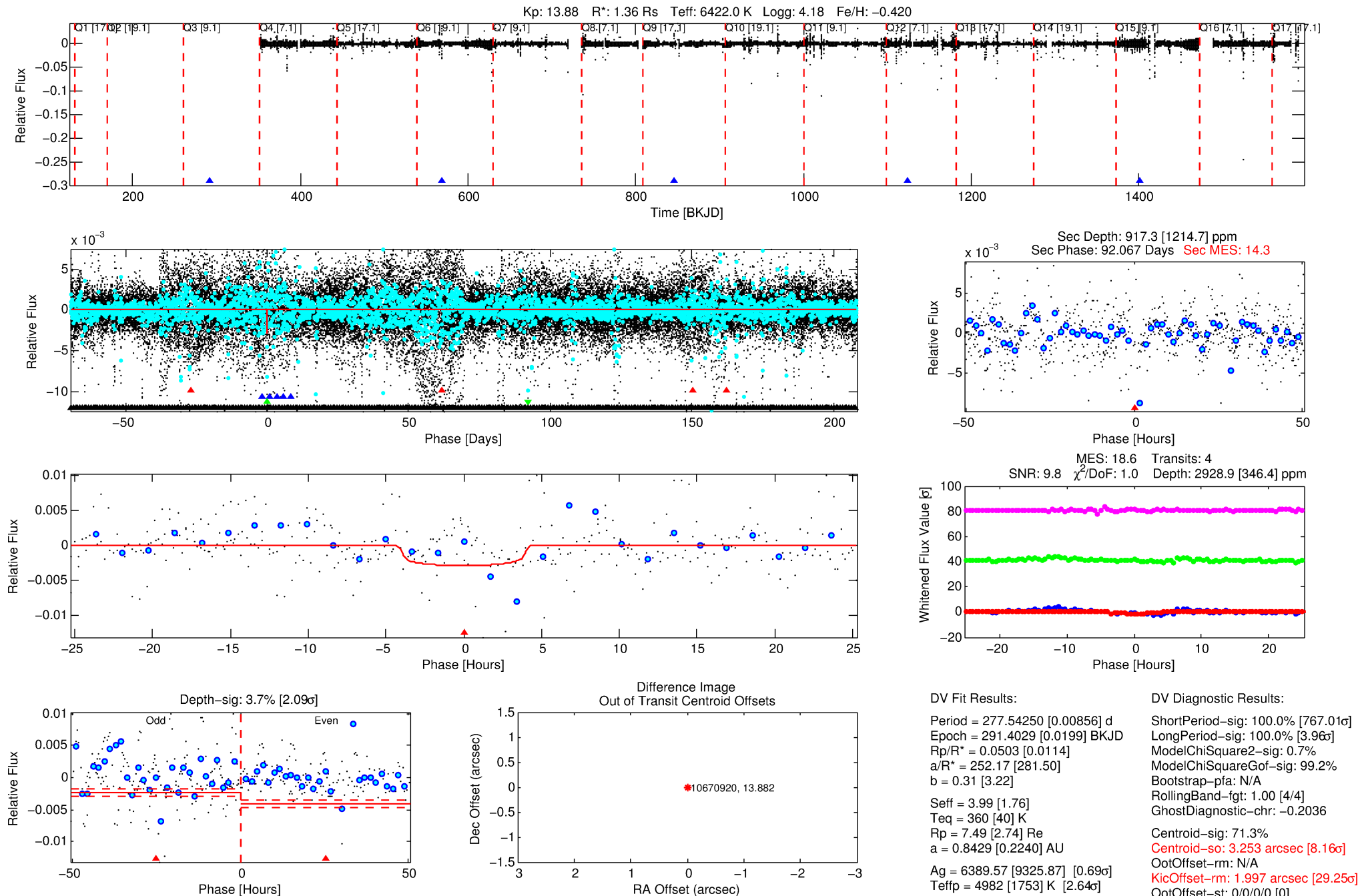
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010670920-03

No Significant Match Found

DV One-Page Summary

KIC: 10670920 Candidate: 3 of 4 Period: 277.543 d



DV Fit Results:

Period = 277.54250 [0.00856] d
Epoch = 291.4029 [0.0199] BKJD
Rp/R* = 0.0503 [0.0114]
a/R* = 252.17 [281.50]
b = 0.31 [3.22]
Seff = 3.99 [1.76]
Teq = 360 [40] K
Rp = 7.49 [2.74] Re
a = 0.8429 [0.2240] AU
Ag = 6389.57 [9325.87] [0.69 σ]
Teffp = 4982 [1753] K [2.64 σ]

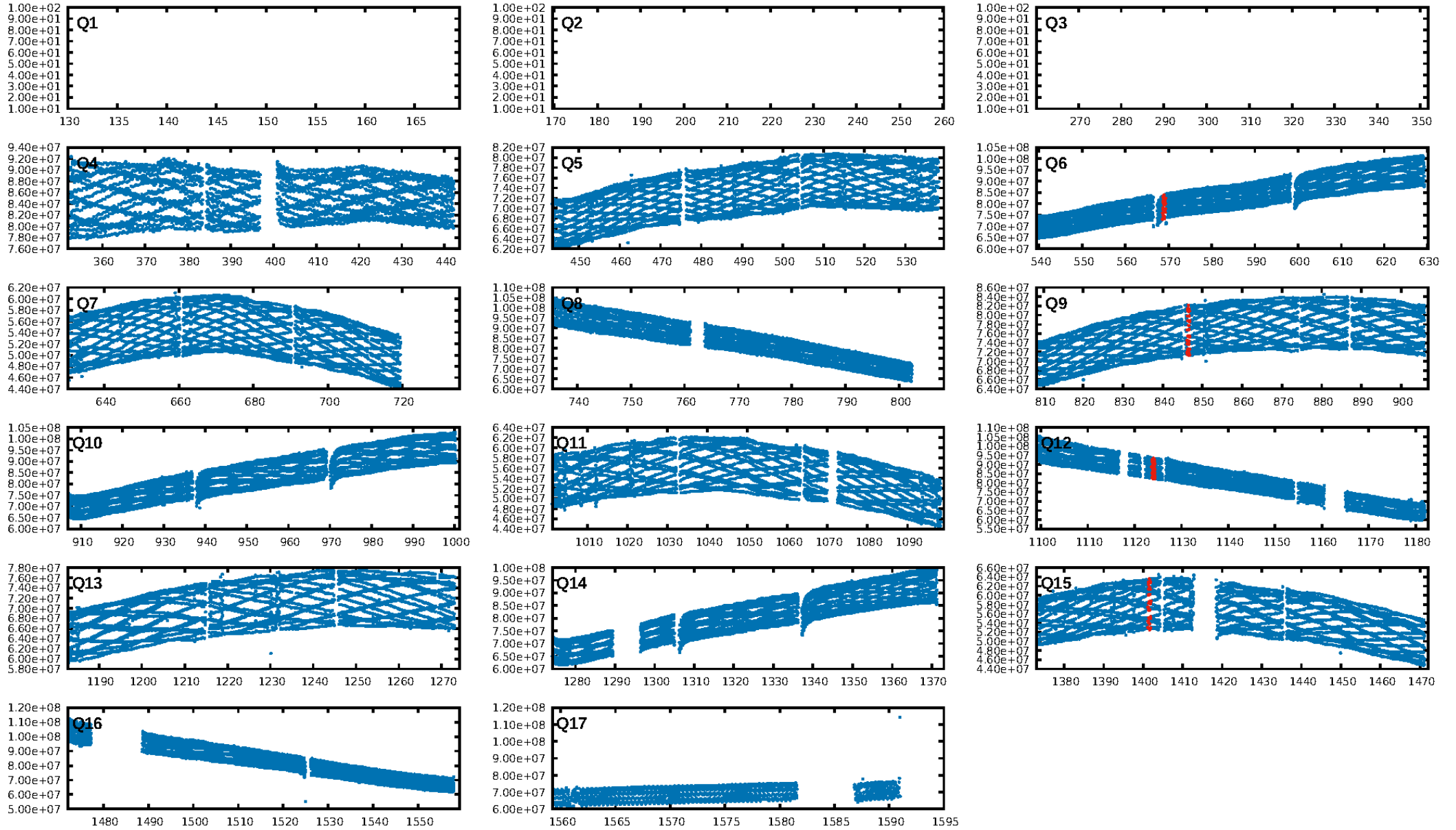
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [767.01 σ]
LongPeriod-sig: 100.0% [3.96 σ]
ModelChiSquare2-sig: 0.7%
ModelChiSquareGof-sig: 99.2%
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [4/4]
GhostDiagnostic-chr: -0.2036
Centroid-sig: 71.3%
Centroid-so: 3.253 arcsec [8.16 σ]
OotOffset-rm: N/A
OotOffset-st: 0/0/0/0 [0]
KicOffset-rm: 1.997 arcsec [29.25 σ]
KicOffset-st: 0/1/0/0 [1]
DiffImageQuality-fgm: 1.00 [1/1]
DiffImageOverlap-fno: 0.00 [0/1]

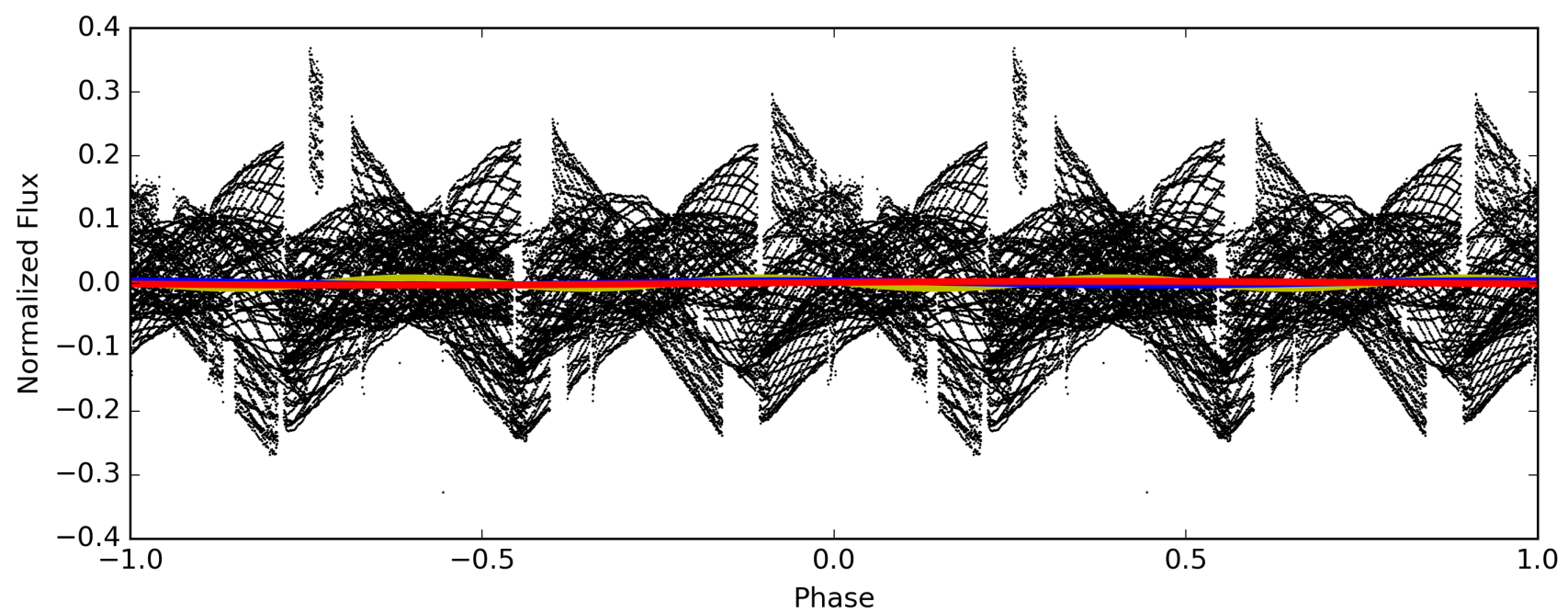
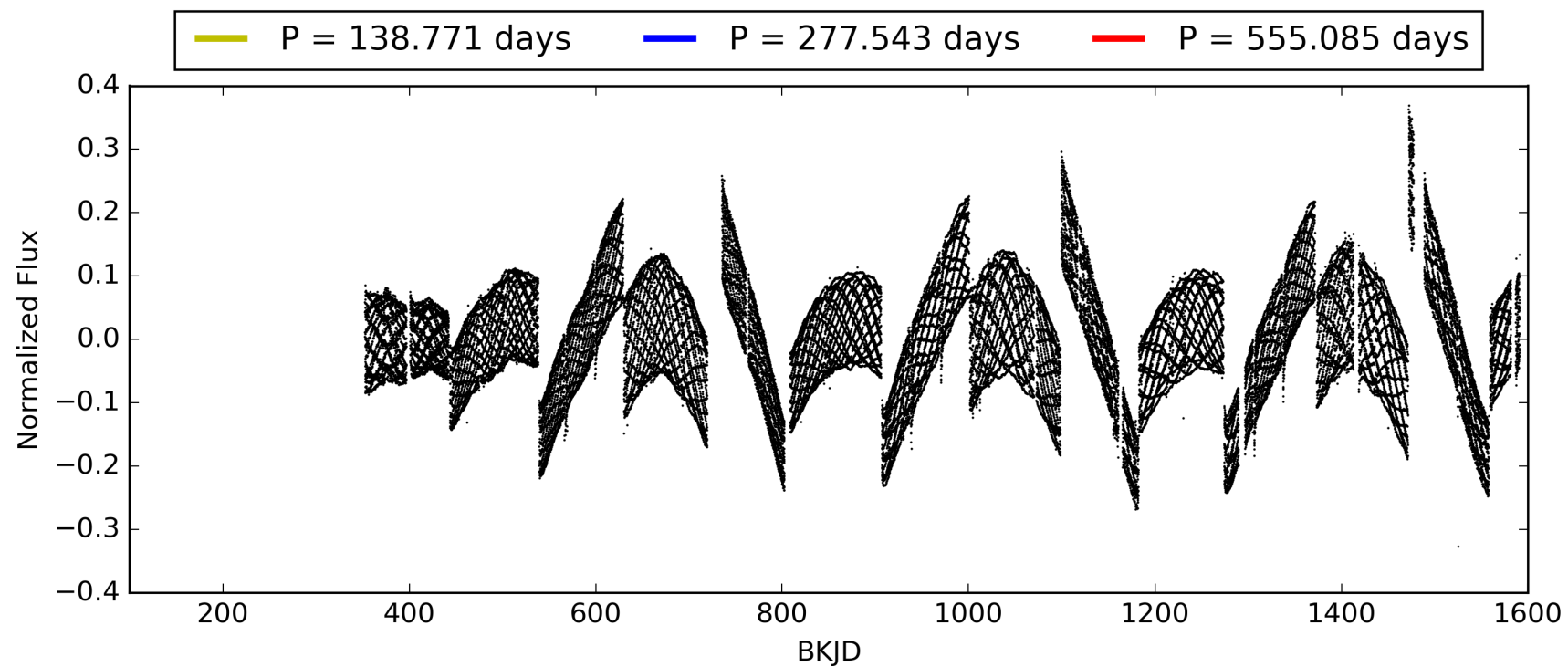
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:56:22 Z

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

TCE 010670920-03, PDC Light Curves

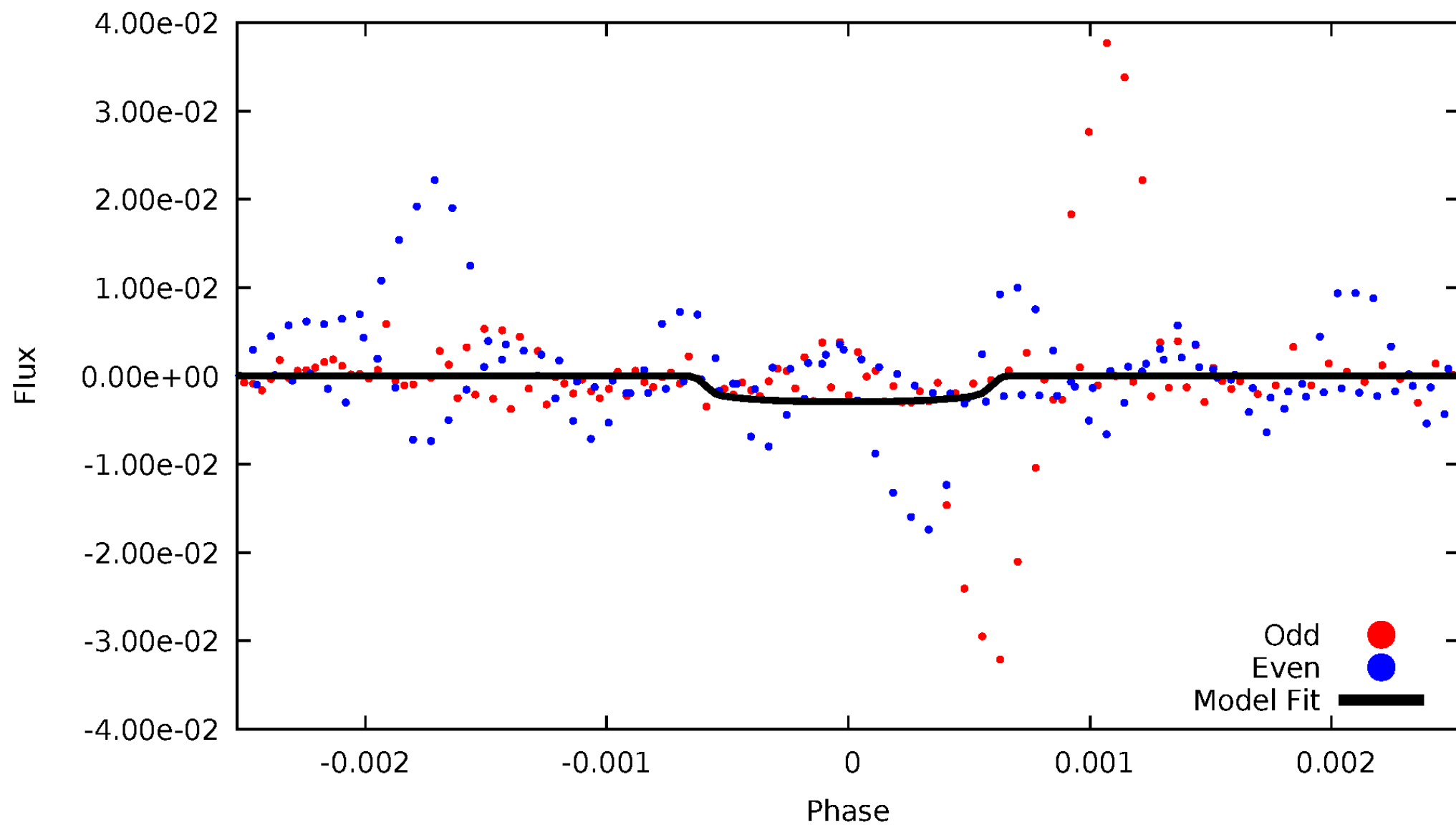


TCE 010670920-03



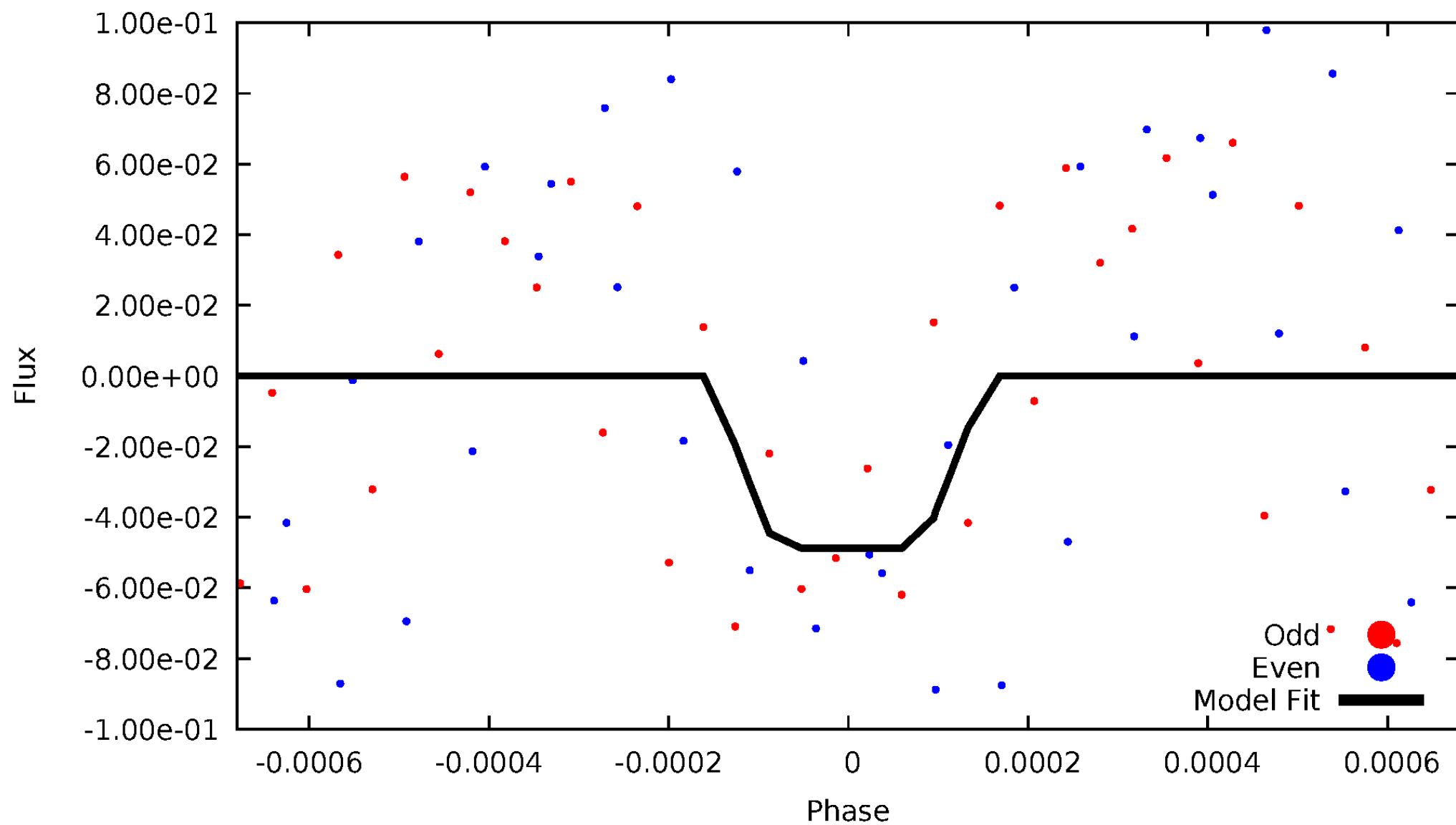
DV Odd/Even

TCE 010670920-03



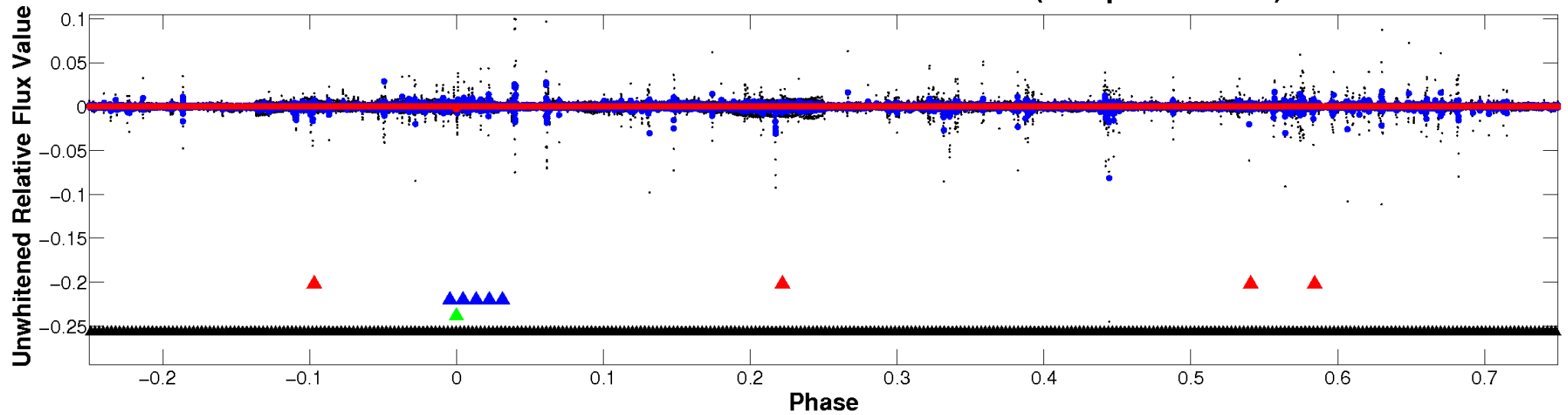
ALT Odd/Even

TCE 010670920-03

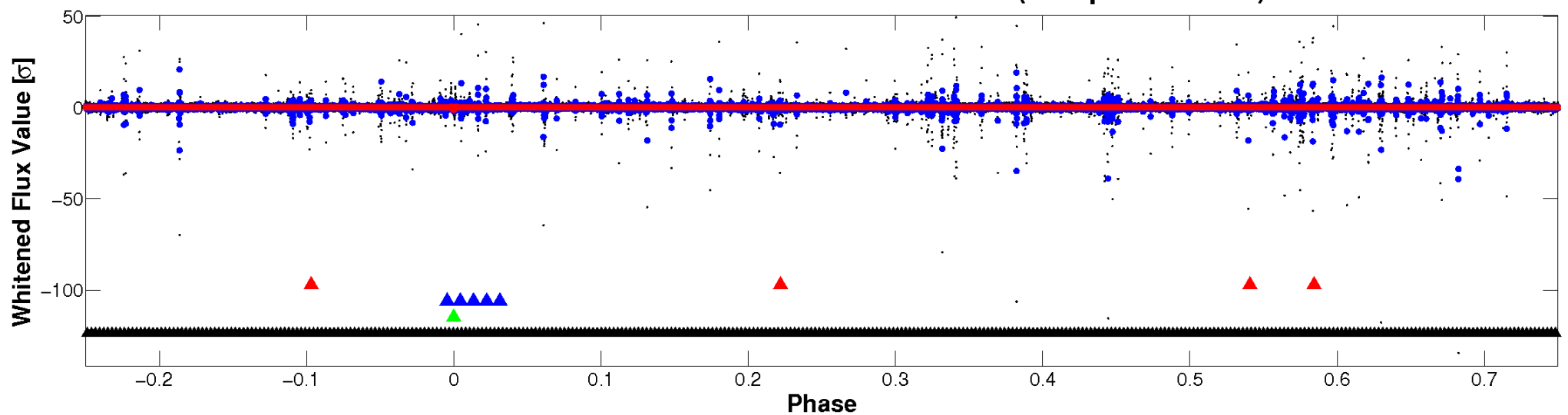


Non-Whitened Vs. Whitened Light Curve

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

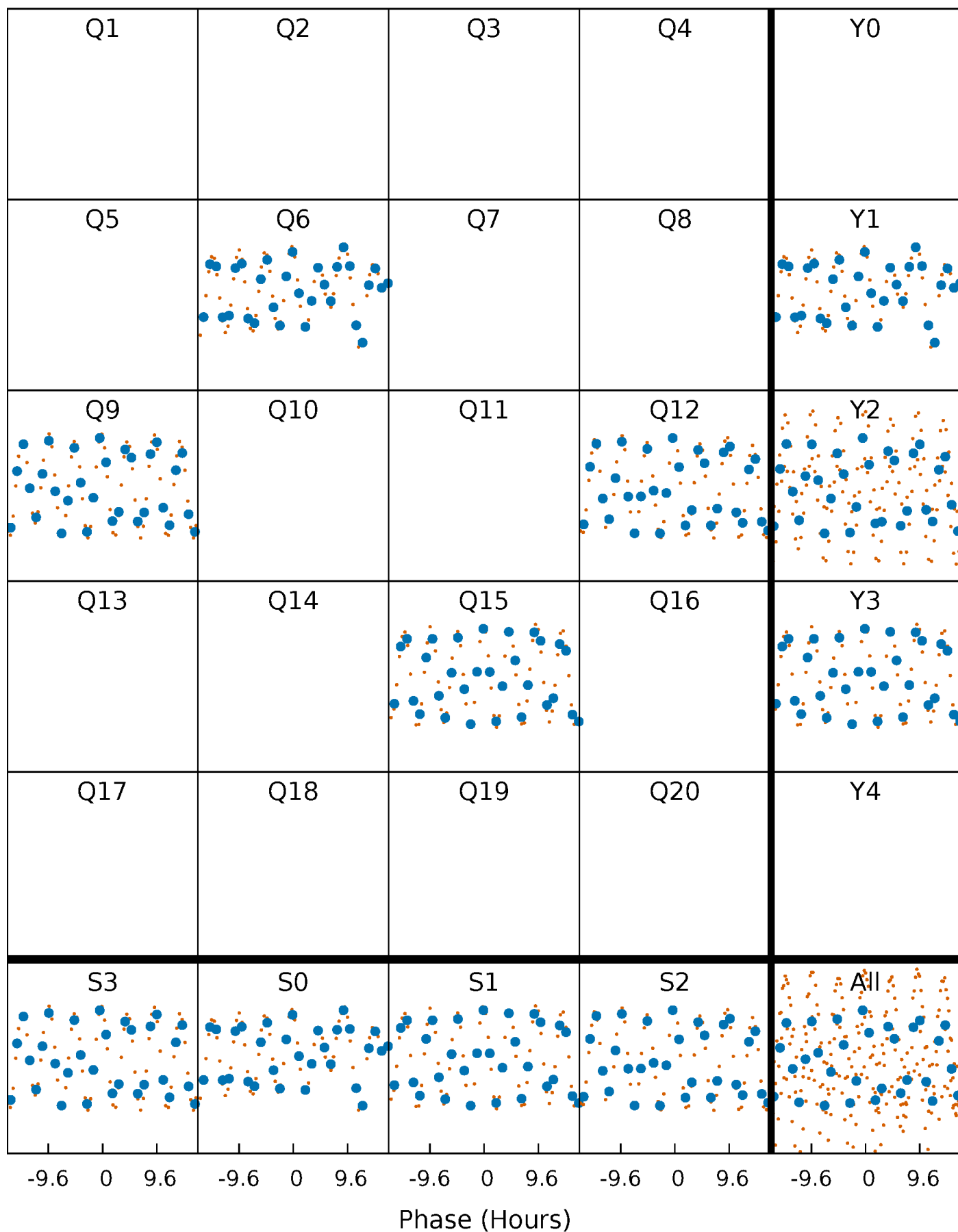


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



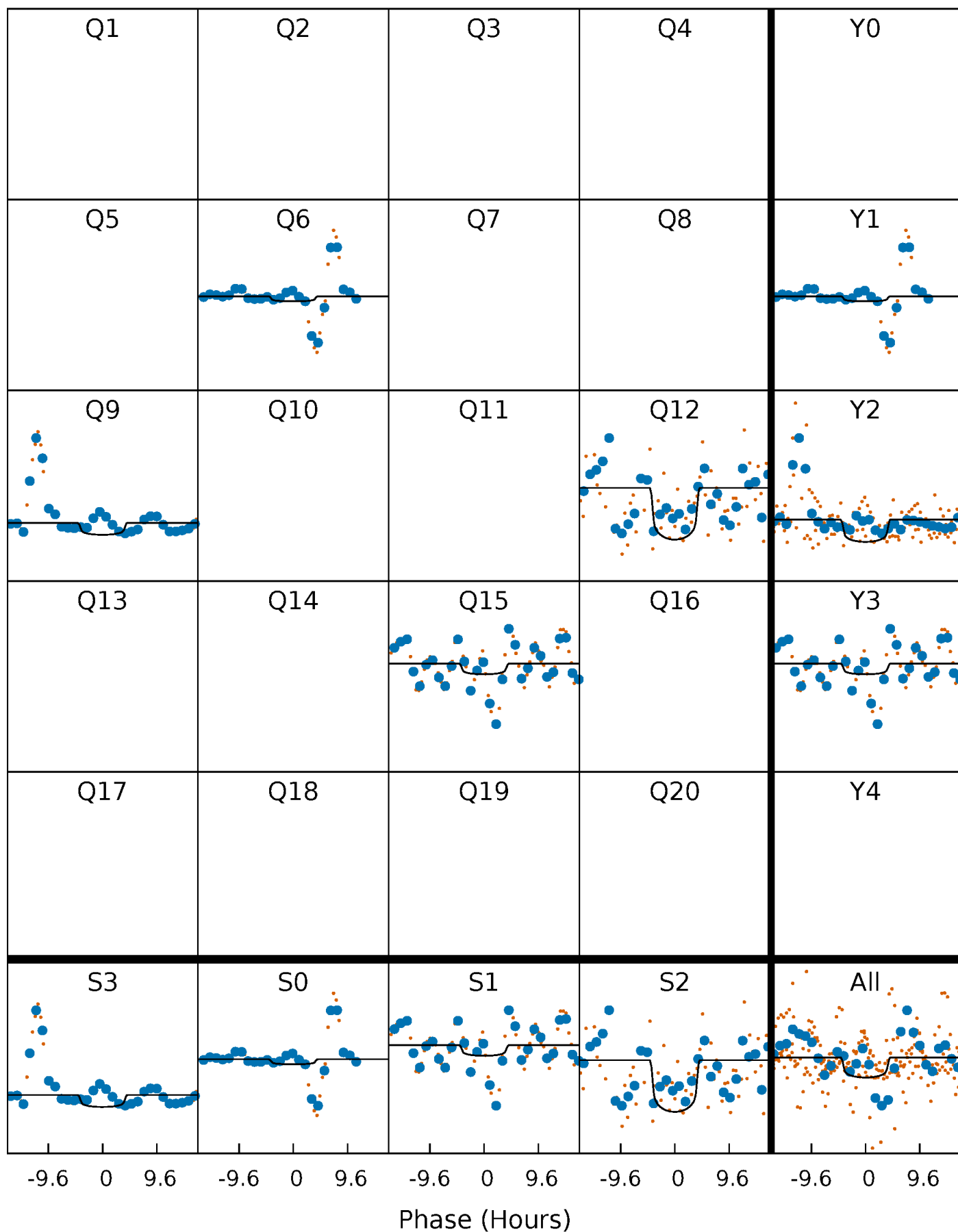
PDC Quarter-Phased Transit Curves

TCE 010670920-03 P=277.542502 Days $T_0=291.402906$ (BKJD)



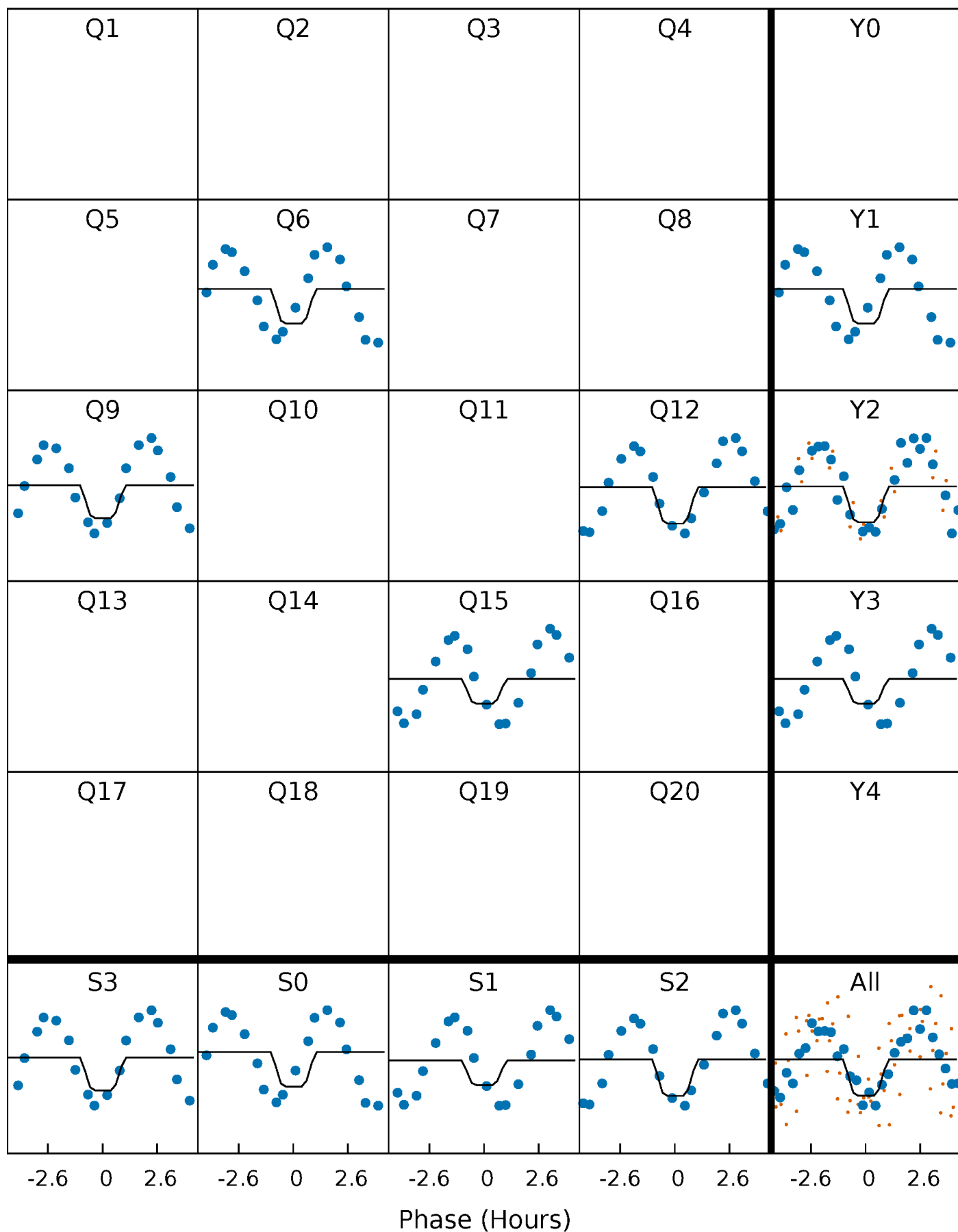
DV Quarter-Phased Transit Curves

TCE 010670920-03 $P=277.542502$ Days $T_0=291.402906$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

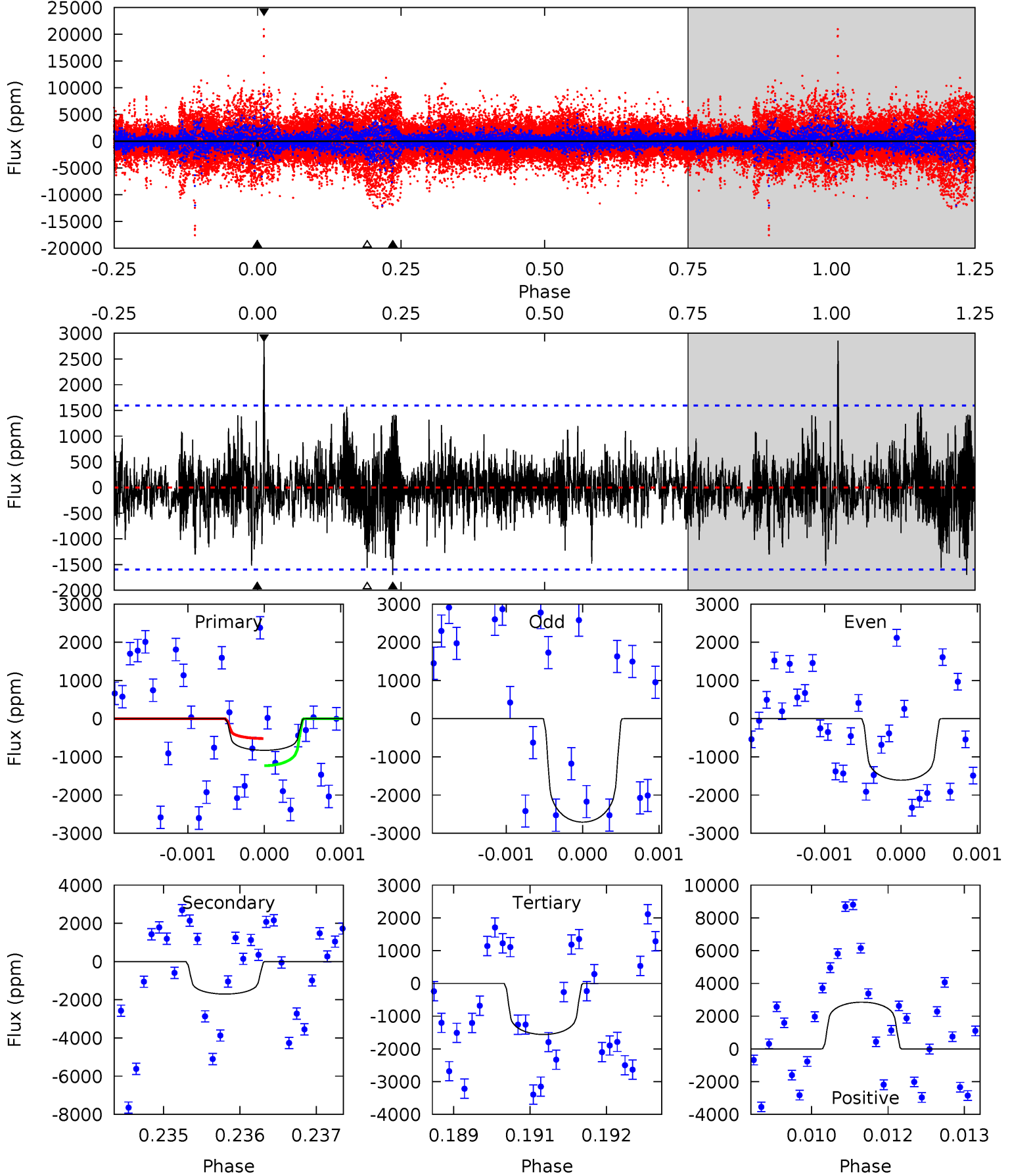
TCE 010670920-03 P=277.521801 Days $T_0=291.346833$ (BKJD)



DV Model-Shift Uniqueness Test

010670920-03, P = 277.542502 Days, E = 291.402906 Days

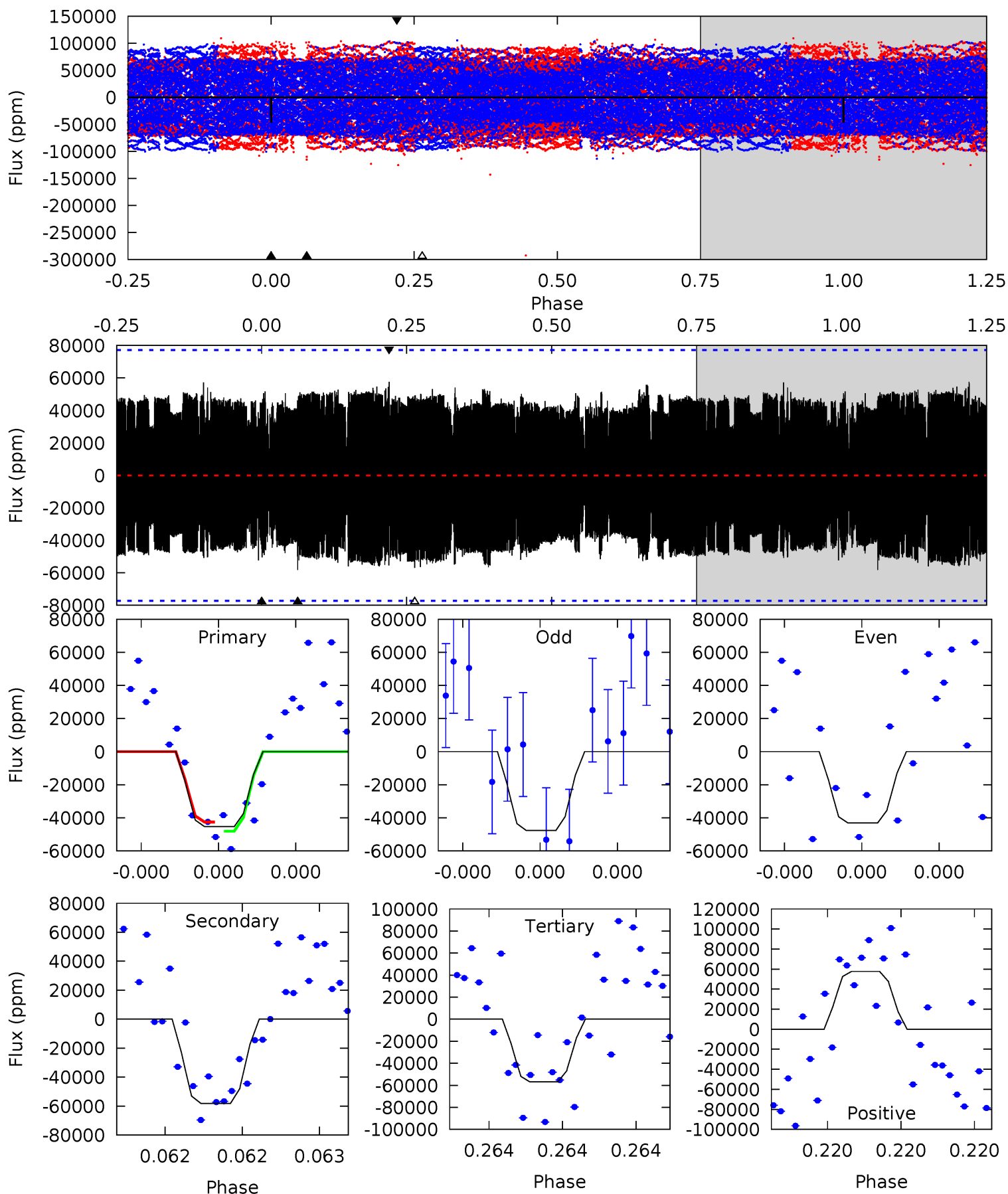
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
2.81	5.77	5.29	9.67	5.41	3.22	1.28	-2.48	-6.86	0.48	-3.90	1.77	1.03	0.63	1.20



Alt Model-Shift Uniqueness Test

010670920-03, P = 277.521801 Days, E = 291.346833 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
3.33	4.27	4.17	4.23	5.67	3.62	2.11	-0.84	-0.90	0.10	0.04	0.17	1.06	0.50	0.20



Stellar Parameters For KIC 010670920

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	$M(M_{\odot})$	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6422^{+177}_{-244}	$4.184^{+0.240}_{-0.160}$	$-0.420^{+0.300}_{-0.300}$	$1.364^{+0.392}_{-0.356}$	$1.036^{+0.156}_{-0.128}$	$0.575^{+0.782}_{-0.270}$
	+3%/-4%	+6%/-4%	+71%/-71%	+29%/-26%	+15%/-12%	+136%/-47%
Source	KIC0	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 010670920-03 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-1702 ± 295	$7.19^{+2.26}_{-1.96}$	497^{+41}_{-40}	5823^{+976}_{-617}	12725^{+11125}_{-5451}
Alt.	-58161 ± 13627	$32.48^{+5.39}_{-5.14}$	496^{+40}_{-38}	6826^{+528}_{-568}	22974^{+11314}_{-7686}

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 $A_{obs} \gg 1.0$

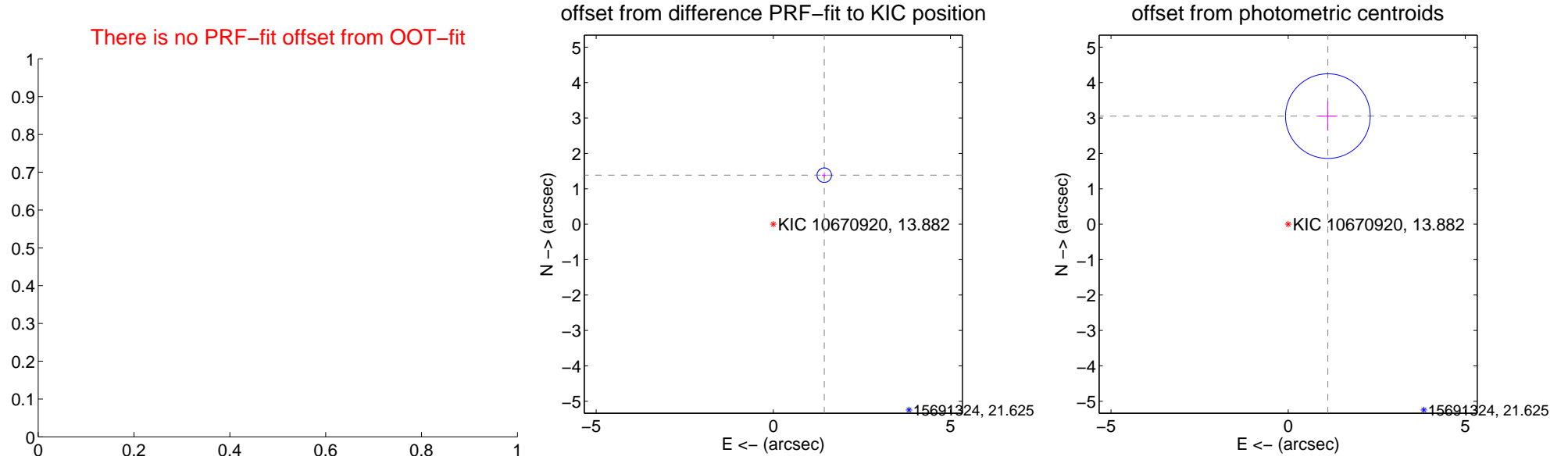
DV Centroid Data

Supplemental centroid analysis for 010670920-03. Kepler magnitude: 13.88. Transit SNR 9.77

There are 1 quarters with good PRF difference image offsets

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

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	—	—	—	—
PRF-fit source offset from KIC position	1.997 ± 0.068	29.25	-1.438 ± 0.068	1.385 ± 0.068
photometric centroid source offset	3.25 ± 0.40	8.16	-1.12 ± 0.27	3.05 ± 0.41



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.



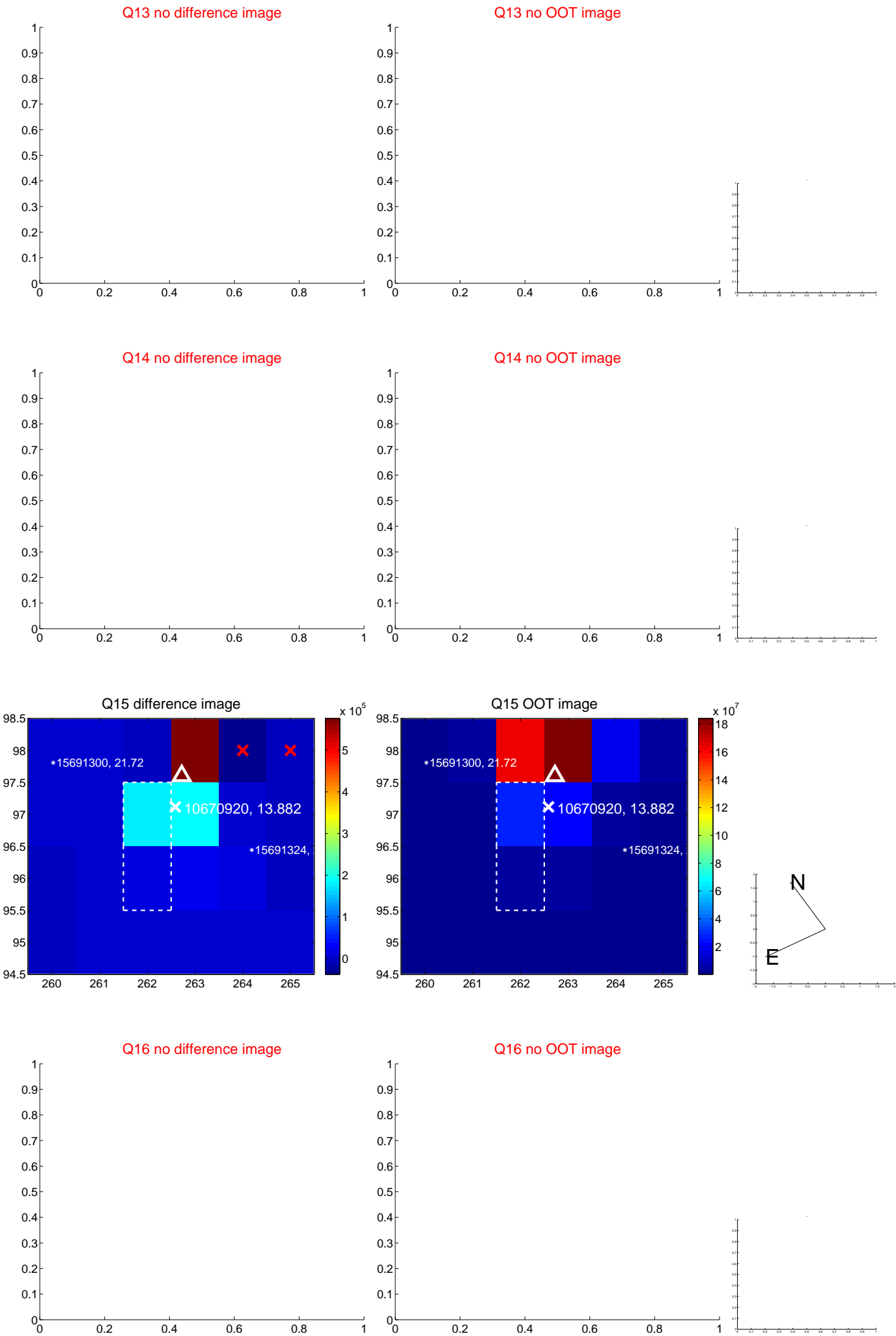
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



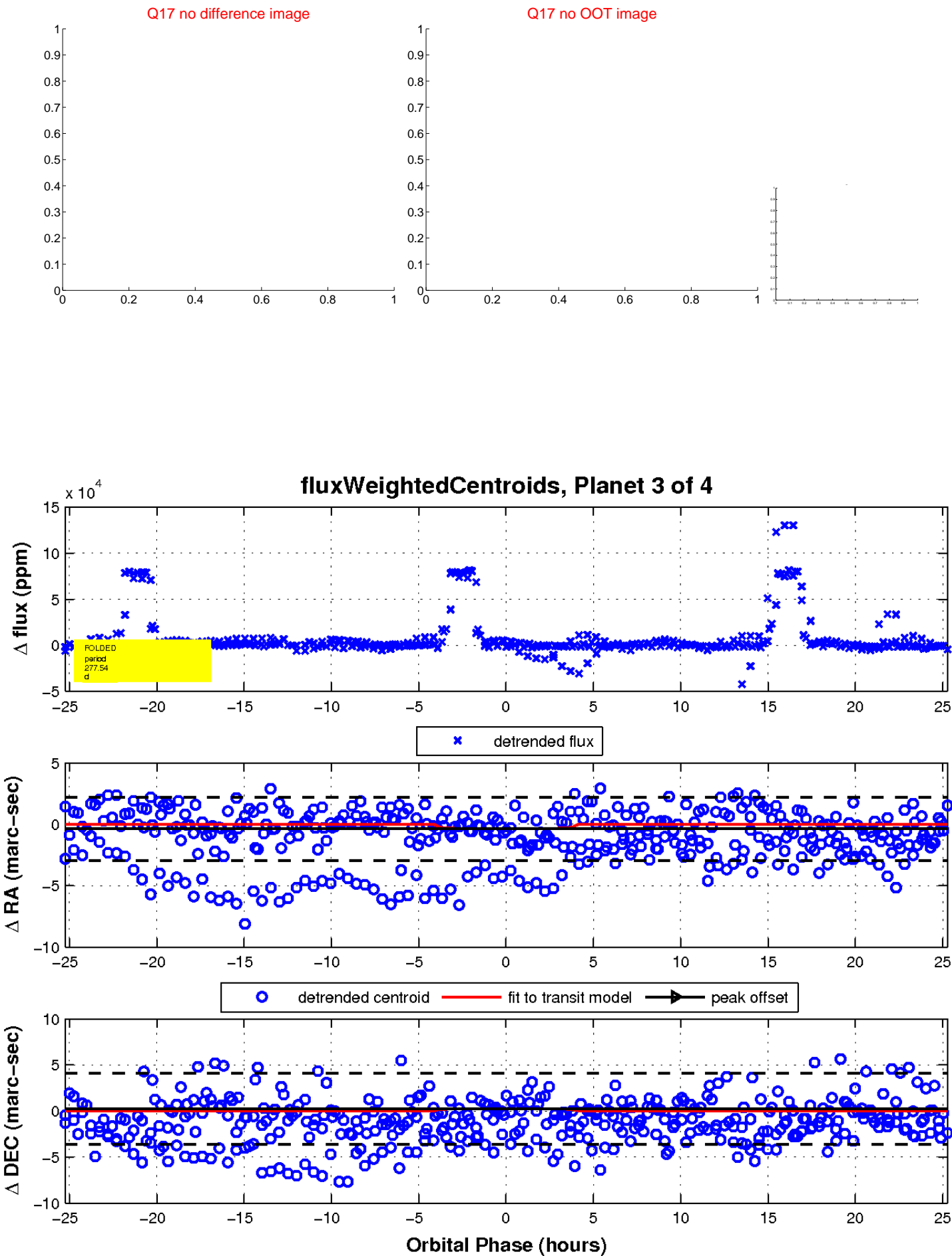
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

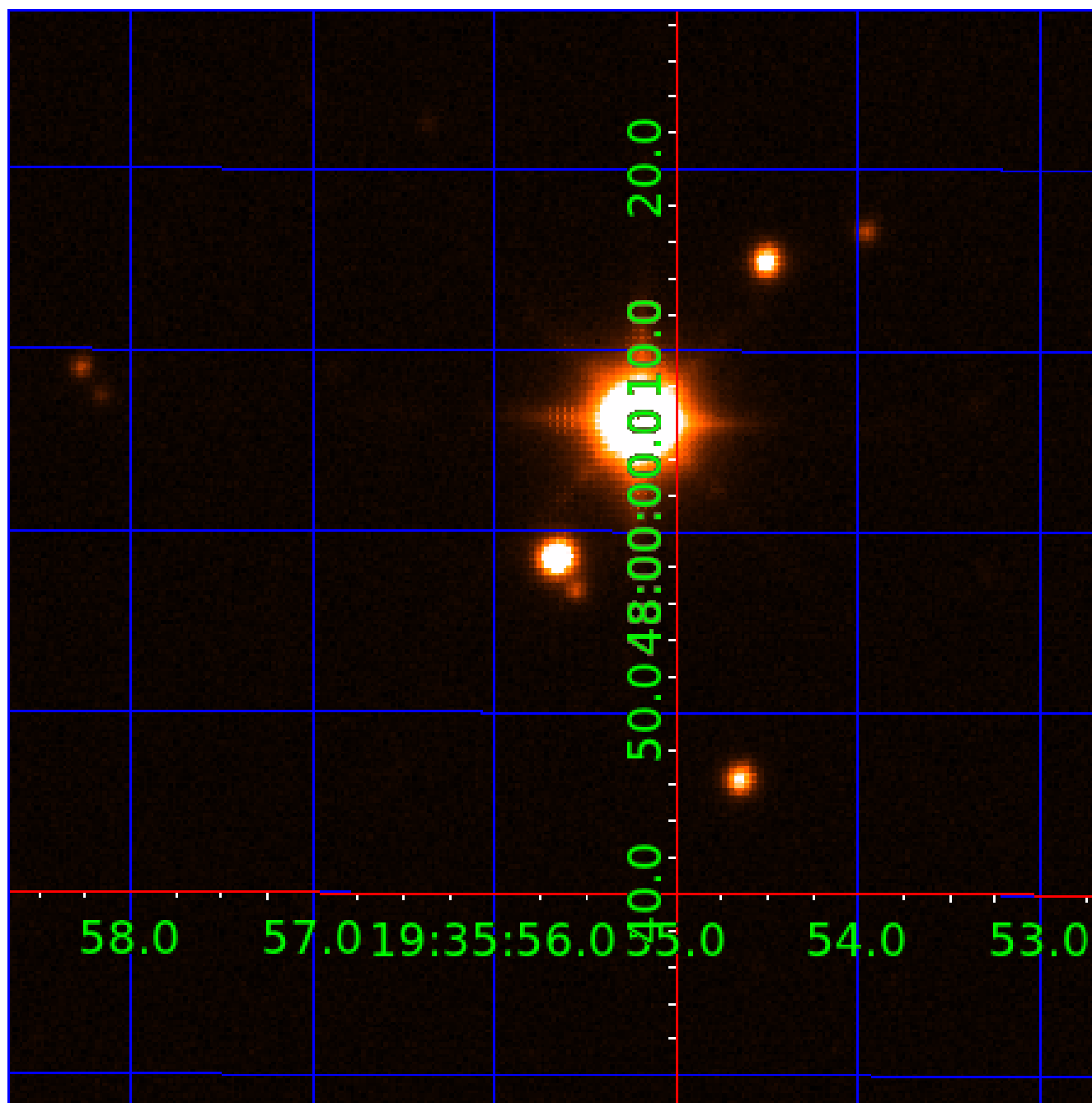


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 010670920

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})
010670920-01	OBS	No	366.024873	453.588172	1877.7	9.382	20.7	7.5	1.36	6422	6.12	2.76
010670920-02	OBS	No	280.028317	290.163965	1080.9	12.500	17.5	-1.0	1.36	6422	4.51	3.94
010670920-03	OBS	No	277.542502	291.402906	2928.9	8.426	18.6	9.8	1.36	6422	7.49	3.99
010670920-04	OBS	No	0.775273	131.600777	2263.3	2.000	11.1	-1.0	1.36	6422	6.54	10143.30

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
010670920-01	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_CHASES_SKYE—LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS
010670920-02	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_NOFITS
010670920-03	OBS	FP	0.00	1	0	1	0	LPP_DV—LPP_ALT—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—MOD_POS_DV—MOD_NONUNIQ_ALT—MOD_TER_ALT—MOD_POS_ALT—INCONSISTENT_TRANS—CENT_FEW_DIFFS—HALO_GHOST
010670920-04	OBS	FP	0.00	1	0	0	0	LPP_DV—LPP_ALT—MOD_NONUNIQ_ALT—CENT_NOFITS

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

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

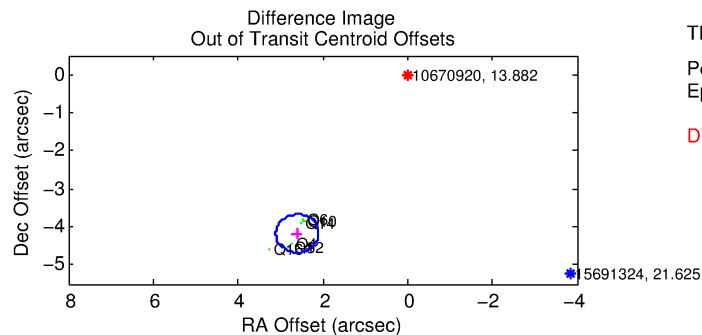
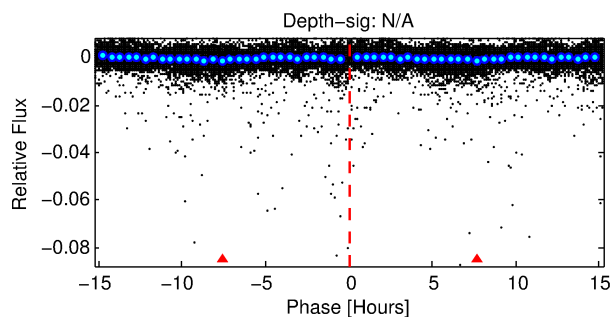
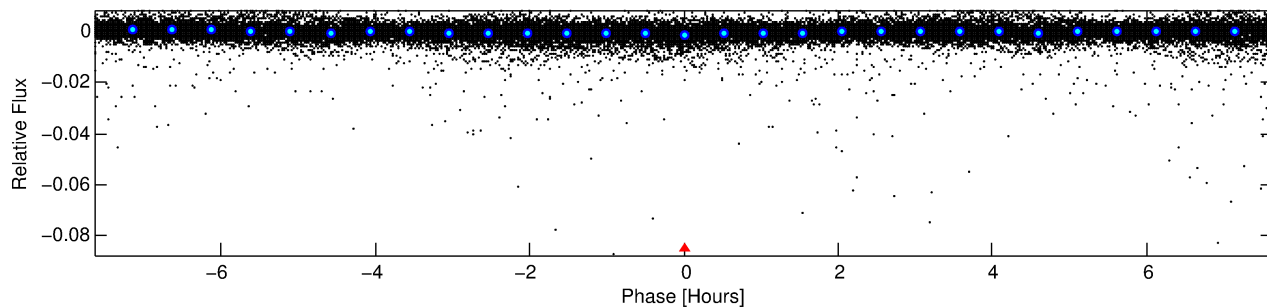
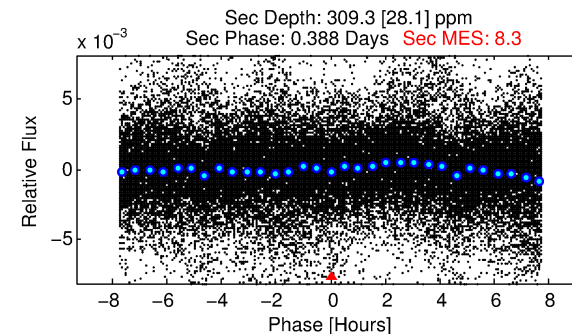
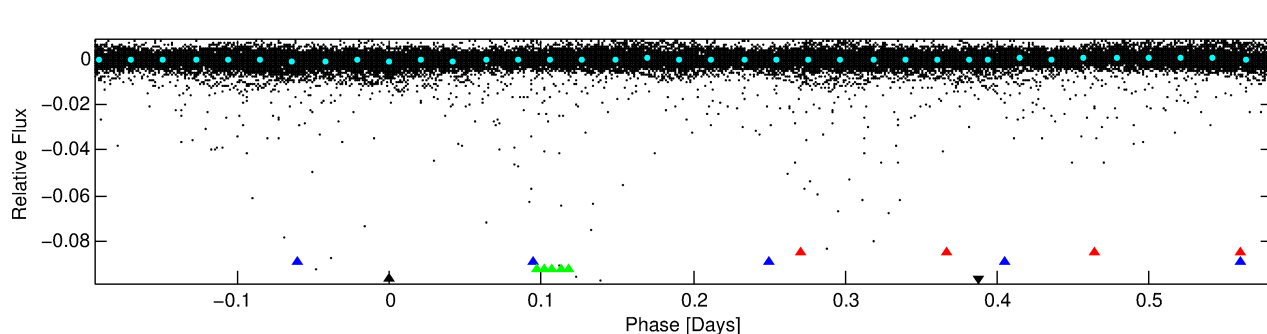
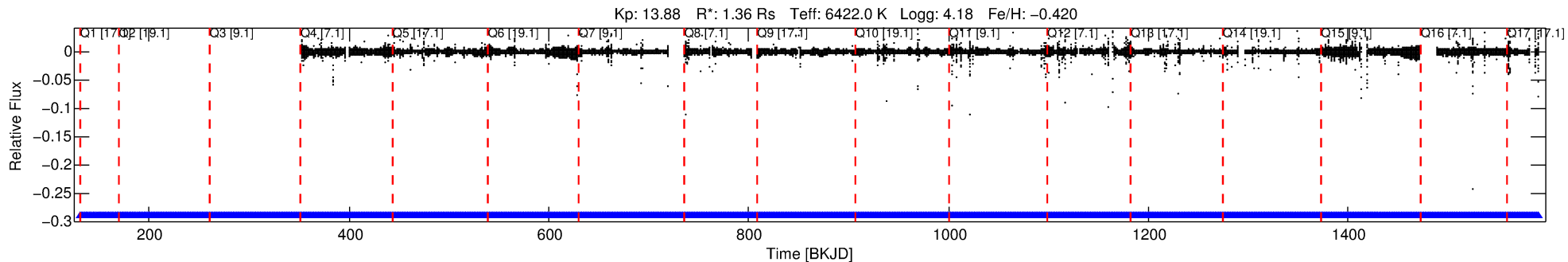
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 010670920-04

No Significant Match Found

DV One-Page Summary

KIC: 10670920 Candidate: 4 of 4 Period: 0.775 d



TPS TCE Results:

Period = 0.77527 d
Epoch = 131.6008 BKJD

DV fit results are unavailable

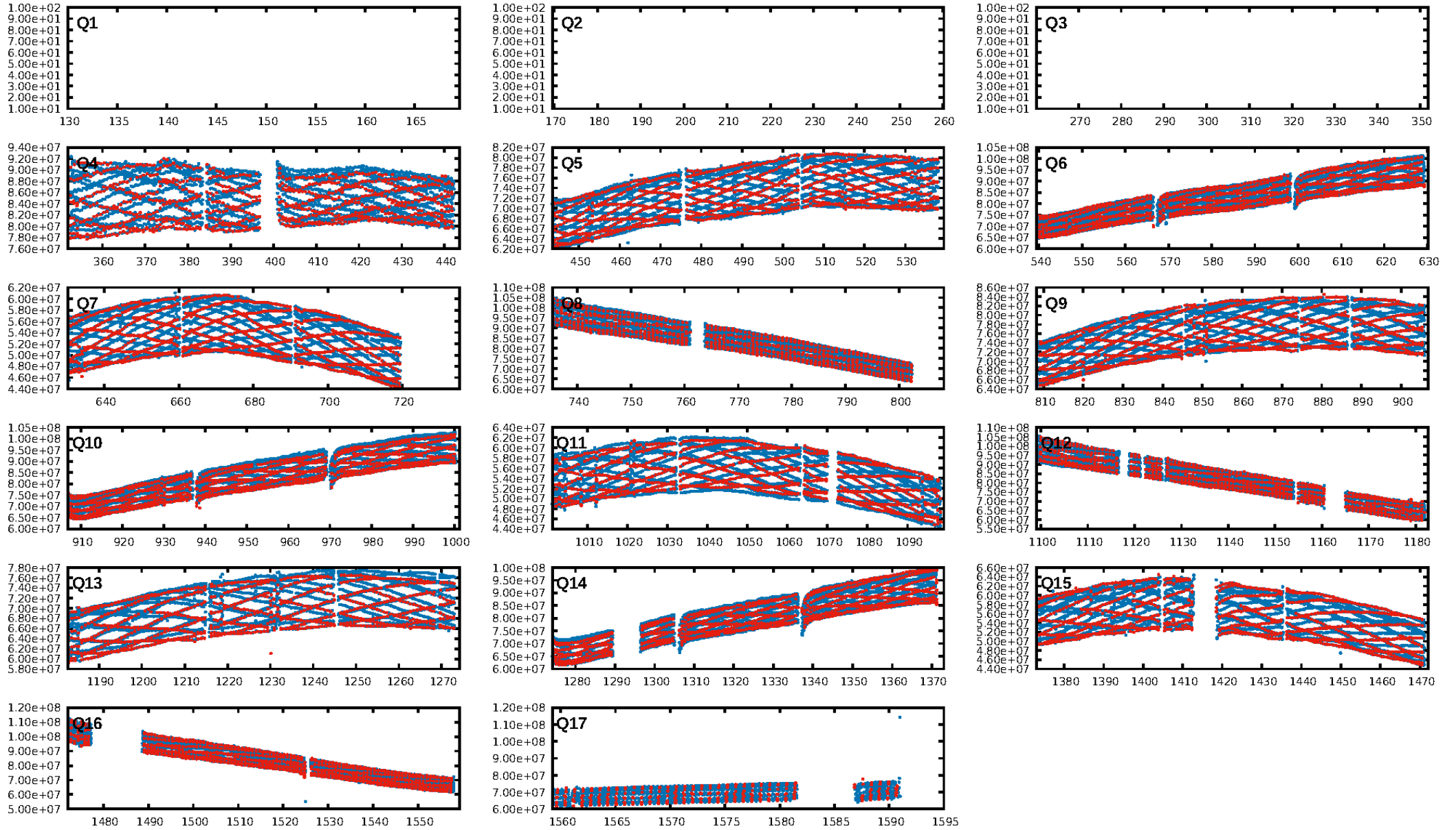
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [767.01σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: N/A
RollingBand-fgt: 1.00 [1415/1415]
GhostDiagnostic-chr: 0.6254
Centroid-sig: 9.8%
Centroid-so: 3.377 arcsec [3361.95σ]
OotOffset-rm: 4.922 arcsec [29.55σ]
KicOffset-rm: 0.121 arcsec [1.77σ]
OotOffset-st: 3/0/4/0 [7]
KicOffset-st: 3/3/4/4 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

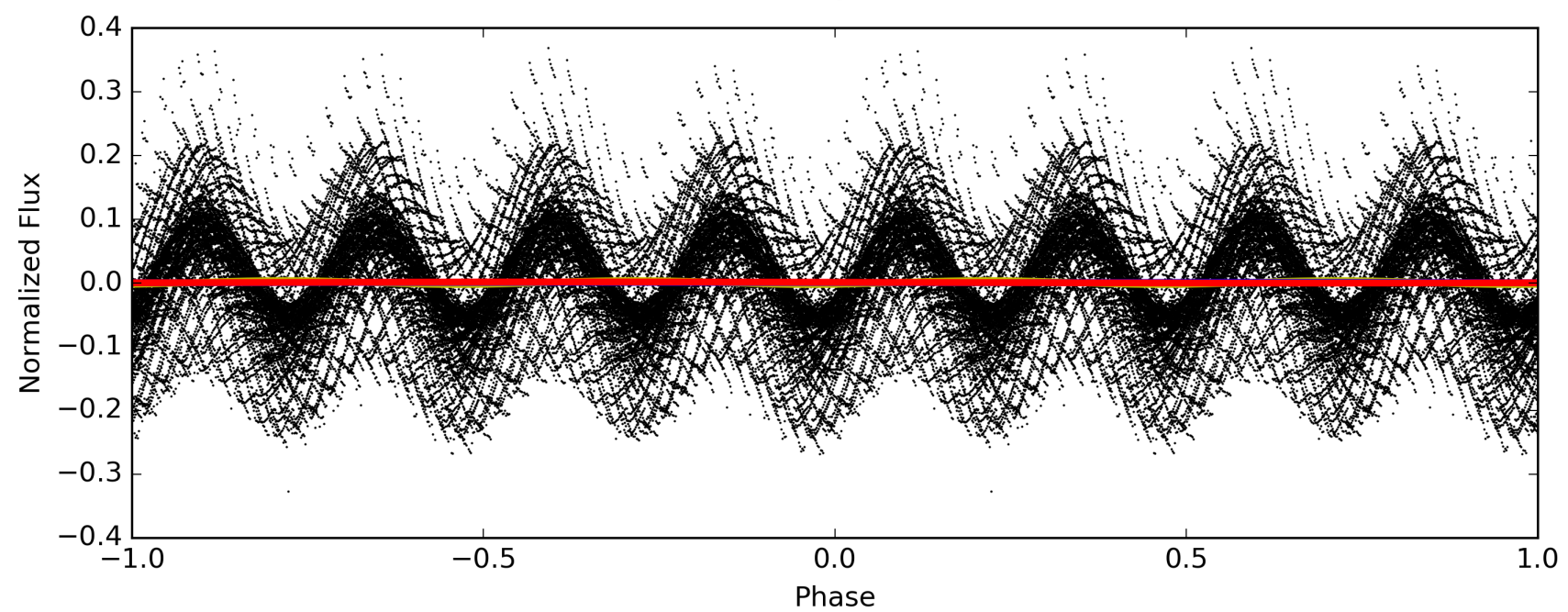
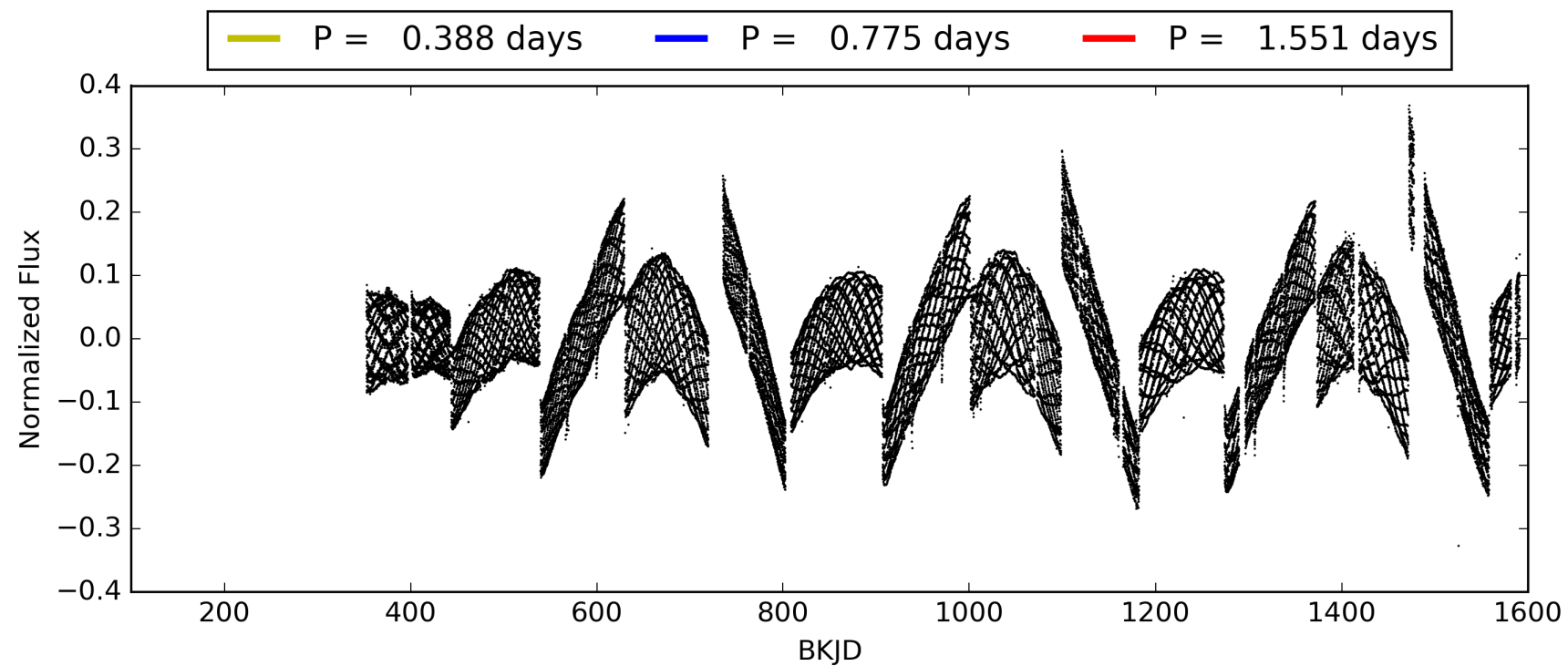
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 05:56:28 Z

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

TCE 010670920-04, PDC Light Curves

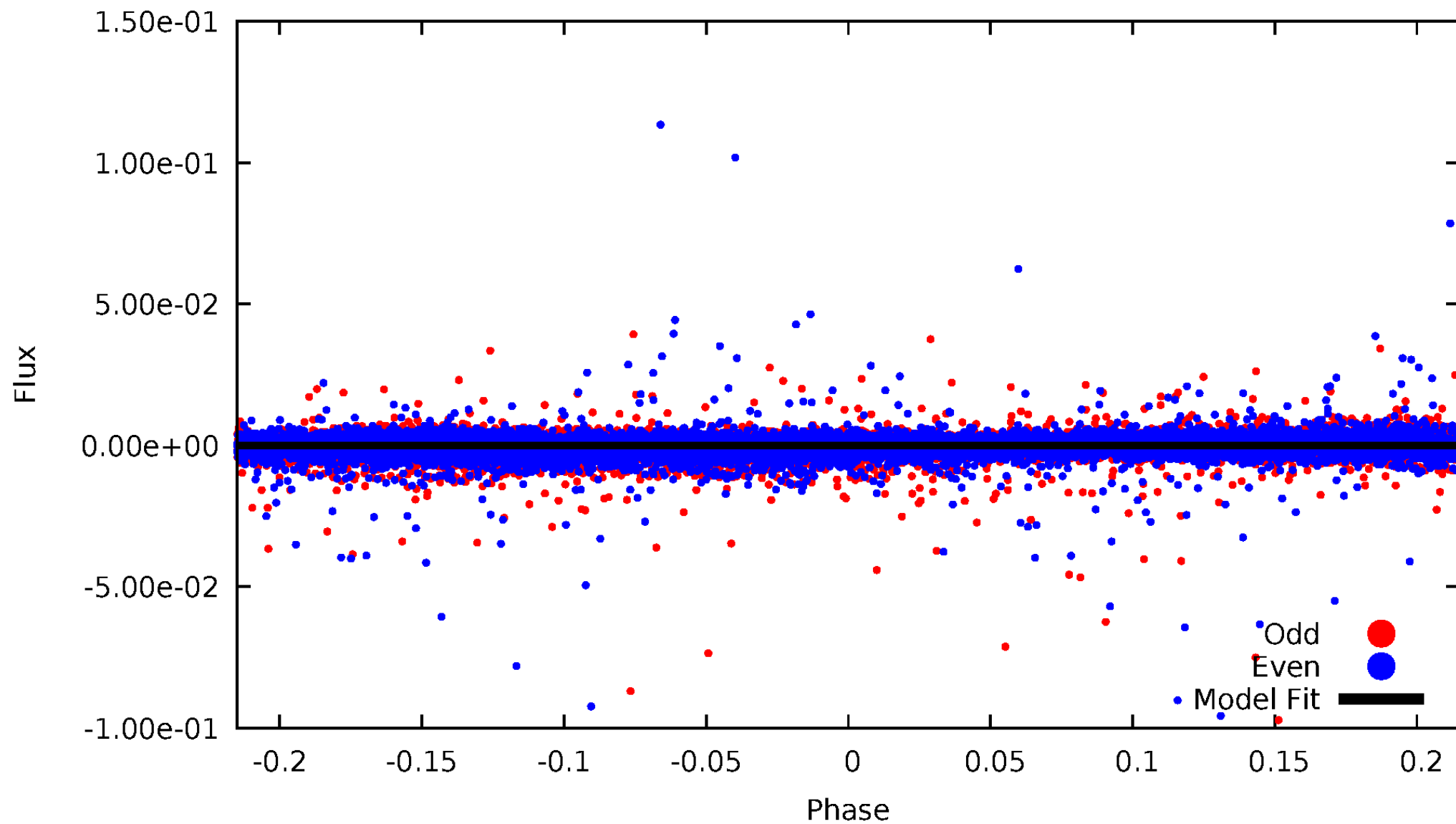


TCE 010670920-04



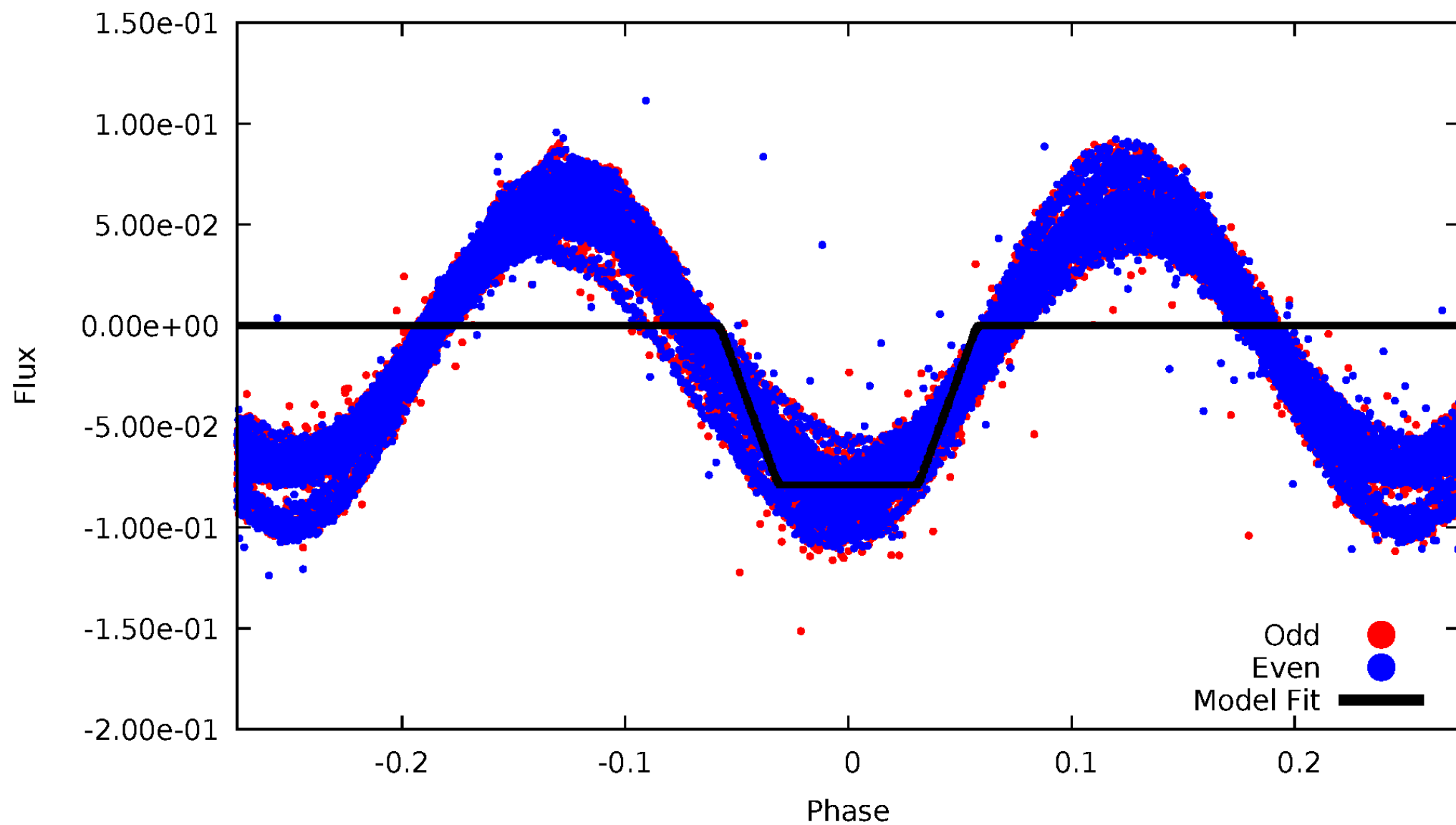
DV Odd/Even

TCE 010670920-04



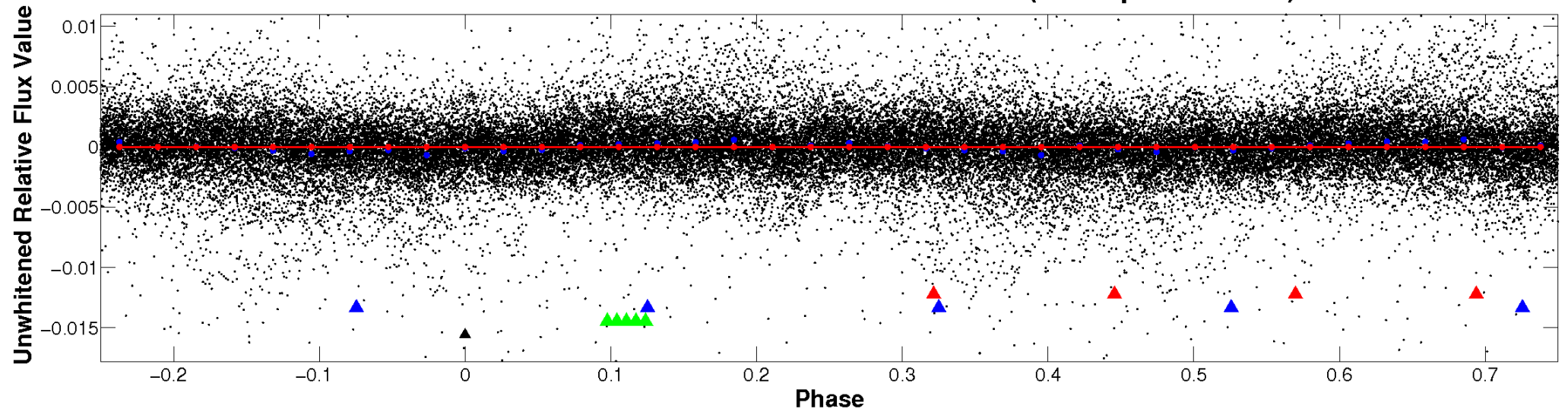
ALT Odd/Even

TCE 010670920-04



Non-Whitened Vs. Whitened Light Curve

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

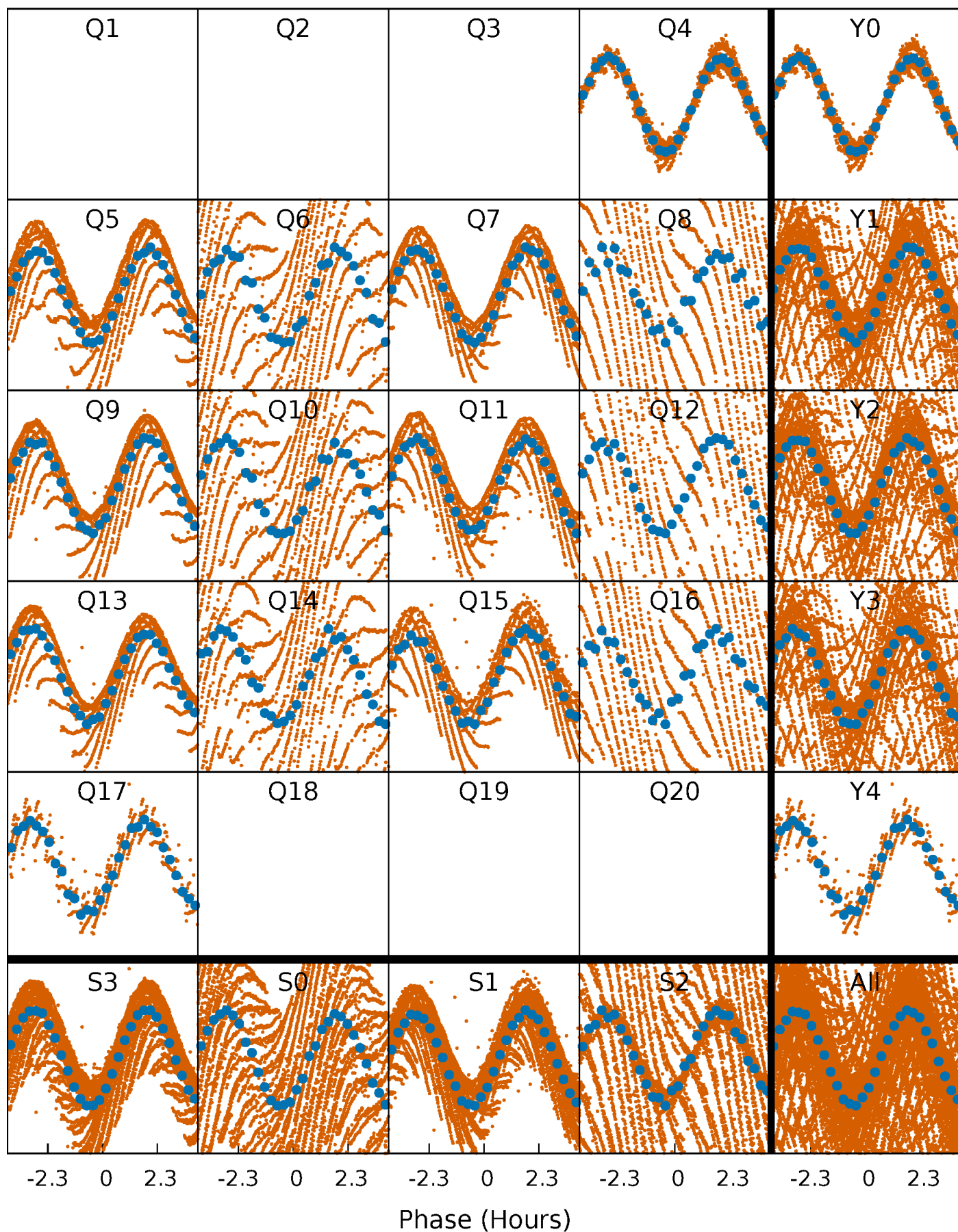


Planet 4 : Phased Whitened Flux Time Series (TPS Epoch/Period)



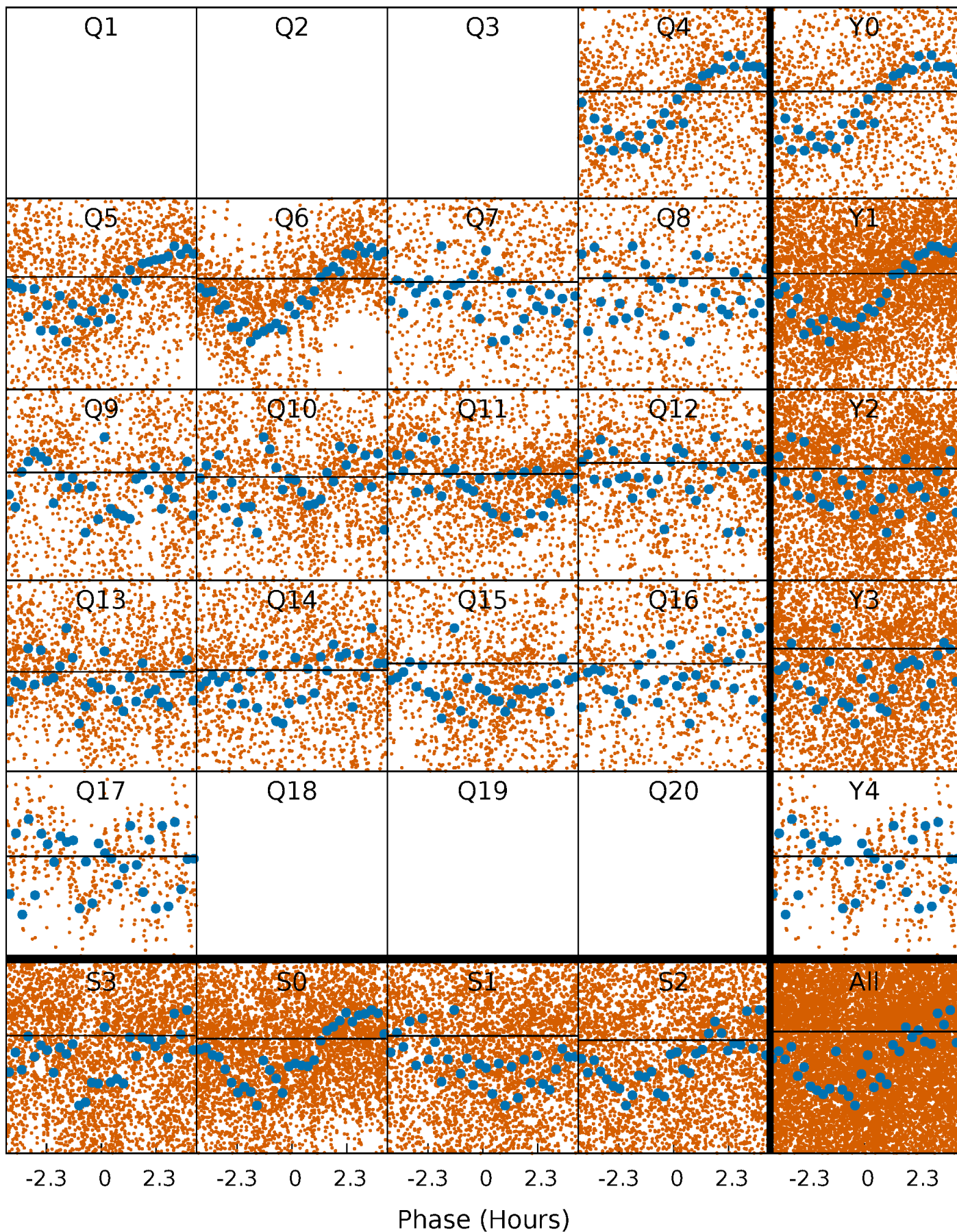
PDC Quarter-Phased Transit Curves

TCE 010670920-04 $P = 0.775273$ Days $T_0 = 131.600777$ (BKJD)



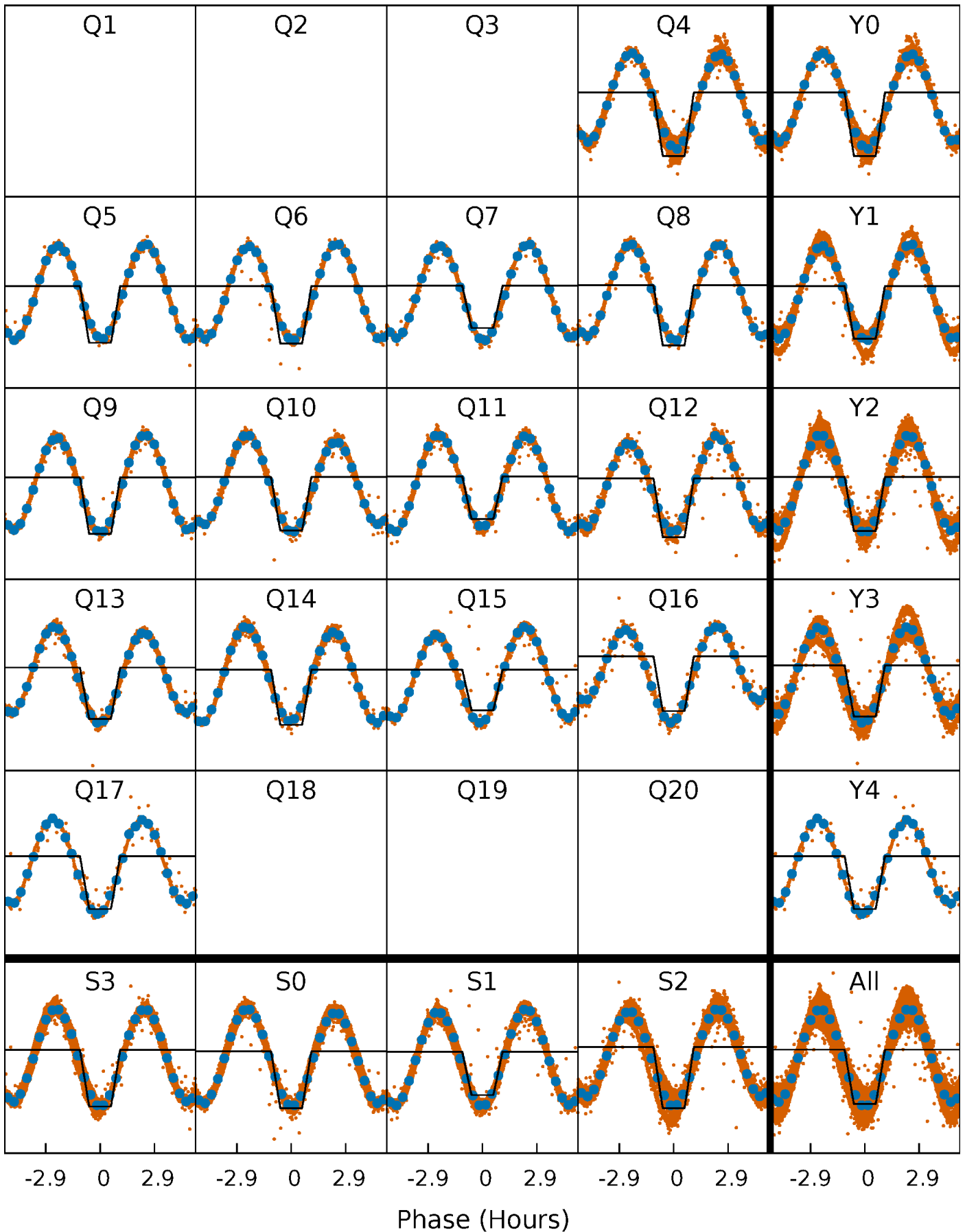
DV Quarter-Phased Transit Curves

TCE 010670920-04 P= 0.775273 Days $T_0=131.600777$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

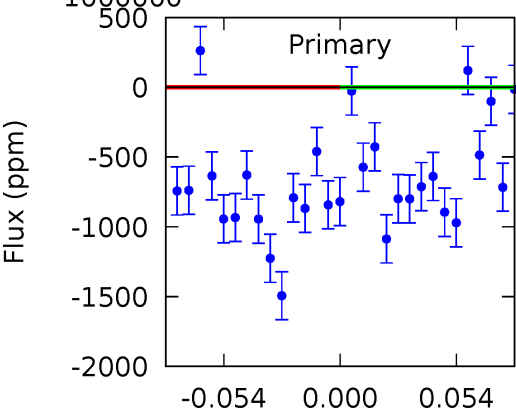
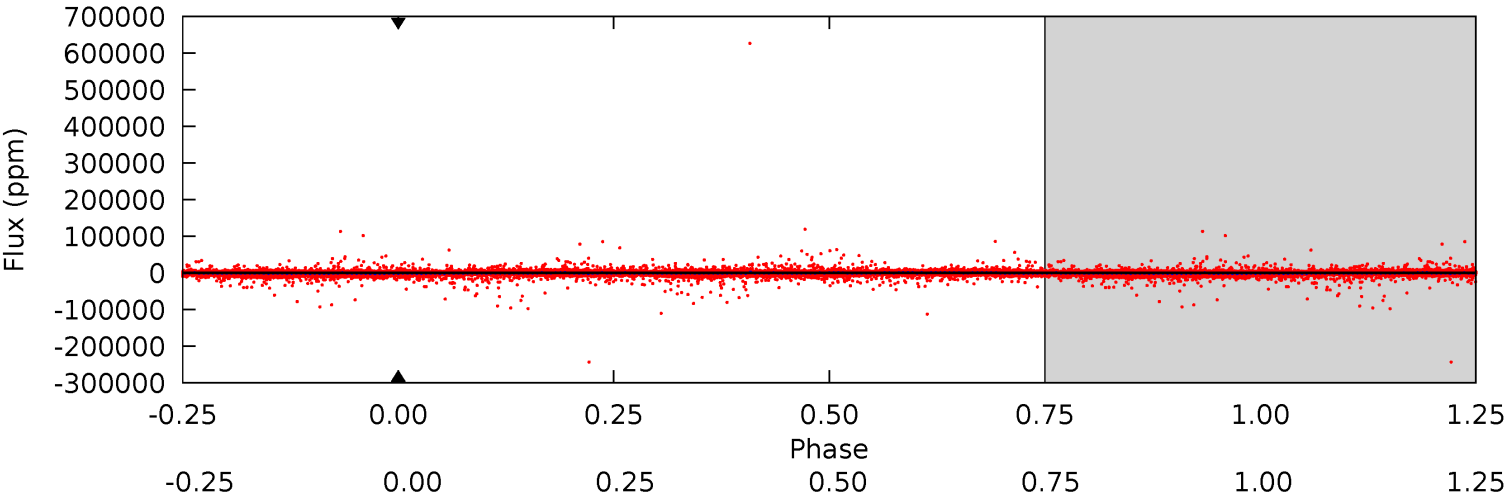
TCE 010670920-04 $P = 0.775273$ Days $T_0 = 131.579050$ (BKJD)



DV Model-Shift Uniqueness Test

010670920-04, P = 0.775273 Days, E = 131.600777 Days

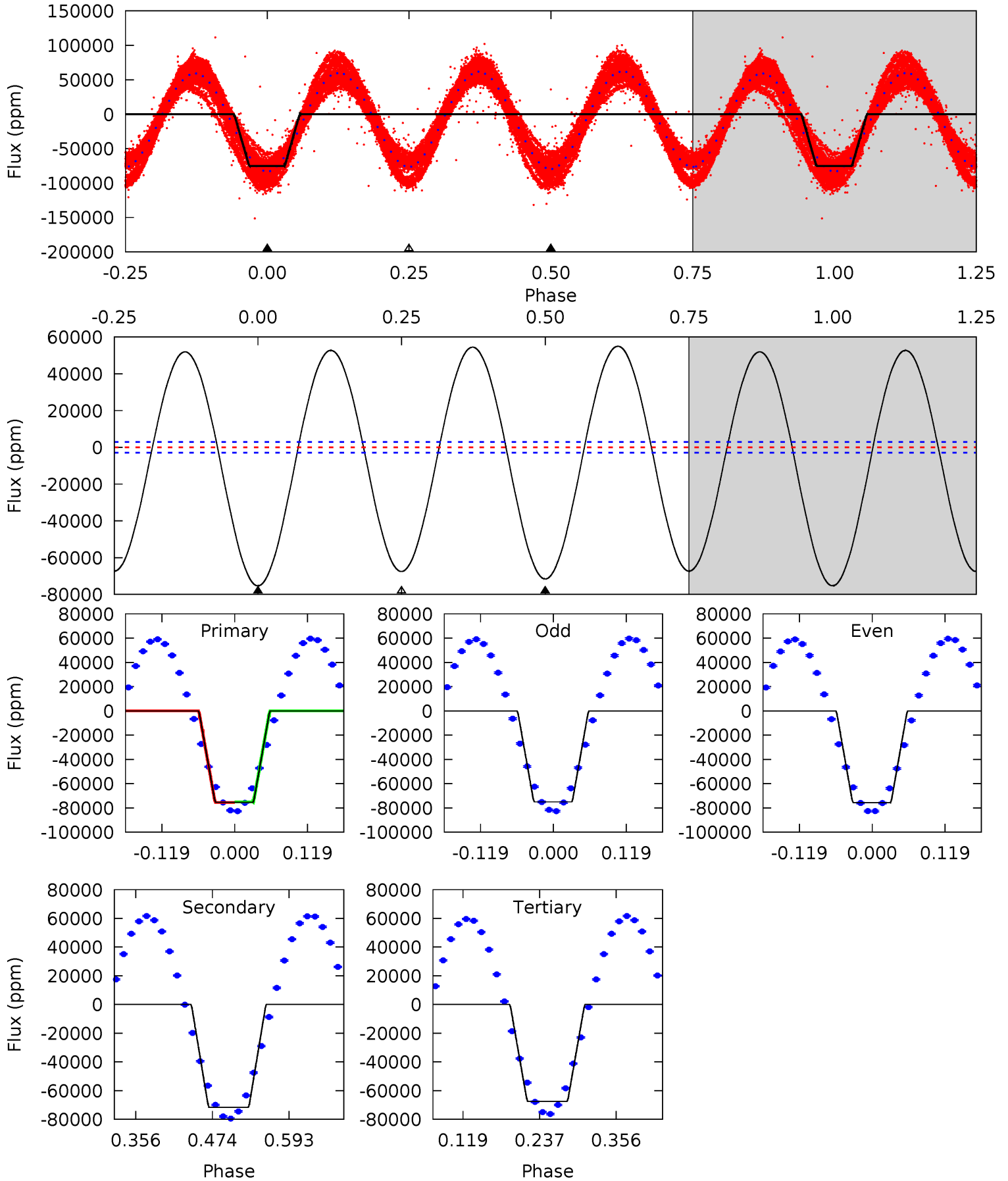
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
0	0	0	0	1.00	1.00	1.00	0	0	0	0	0	0	0	0



Alt Model-Shift Uniqueness Test

010670920-04, P = 0.775273 Days, E = 131.579050 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
118.1	112.2	105.9	0	4.53	1.56	68.8	12.2	118.1	6.30	112.2	0.41	1.03	0.42	0.78



Stellar Parameters For KIC 010670920

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M(M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6422^{+177}_{-244}	$4.184^{+0.240}_{-0.160}$	$-0.420^{+0.300}_{-0.300}$	$1.364^{+0.392}_{-0.356}$	$1.036^{+0.156}_{-0.128}$	$0.575^{+0.782}_{-0.270}$
	+3%/-4%	+6%/-4%	+71%/-71%	+29%/-26%	+15%/-12%	+136%/-47%
Source	KIC0	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 010670920-04 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	0 ± 1000000	$12.40^{+12.40}_{-8.51}$	3533^{+278}_{-280}	-5036^{+28087}_{-18331}	$-2.165^{+178.621}_{-201.713}$
Alt.	-71564 ± 638	$39.74^{+16.73}_{-14.15}$	3534^{+259}_{-284}	6319^{+1903}_{-927}	$7.517^{+11.137}_{-3.738}$

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

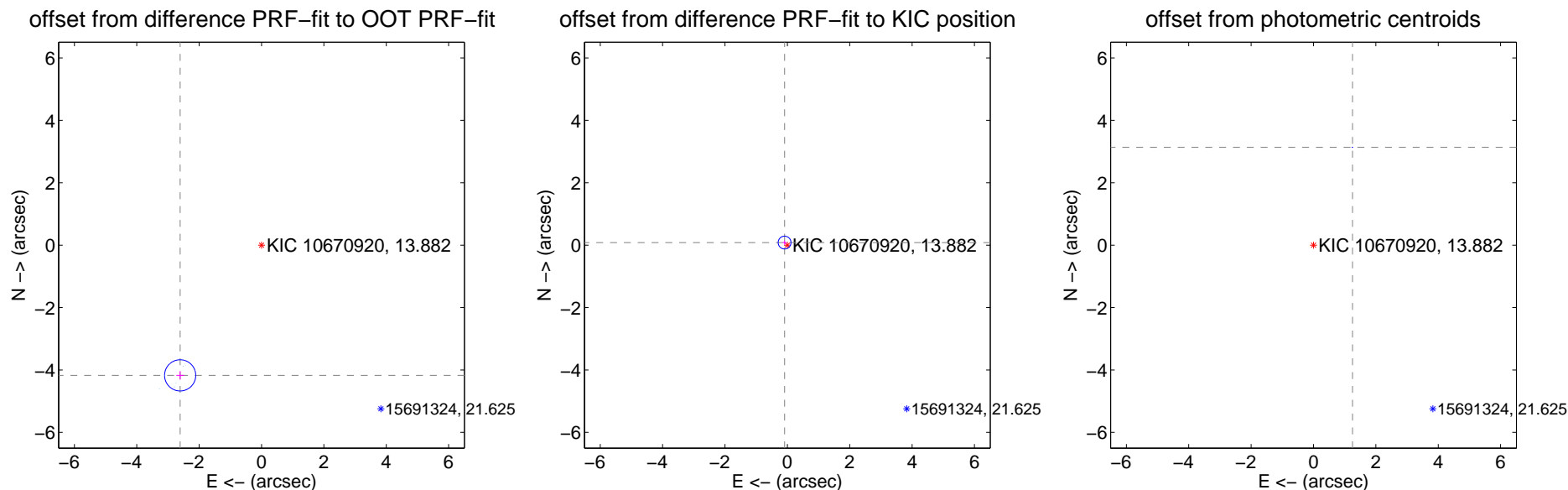
DV Centroid Data

Supplemental centroid analysis for 010670920-04. Kepler magnitude: 13.88. Transit SNR -1.00

There are 14 quarters with good PRF difference image offsets

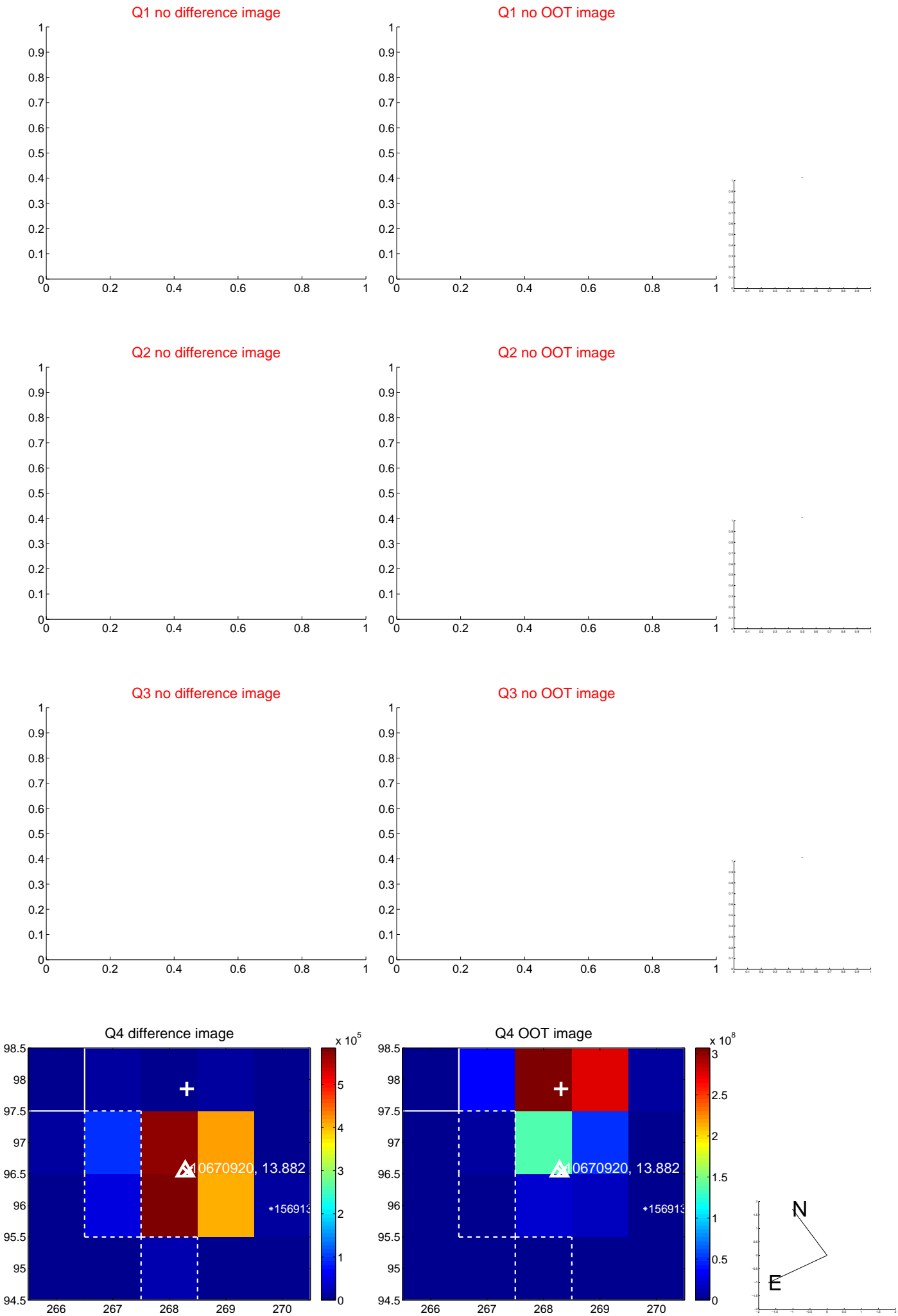
The OOT PRF centroid is offset from the target star catalog position by about 5.59 arcsec so the offset from difference PRF-fit to OOT-fit may be invalid.

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	4.922 ± 0.167	29.55	2.610 ± 0.122	-4.174 ± 0.139
PRF-fit source offset from KIC position	0.121 ± 0.069	1.77	0.089 ± 0.068	0.083 ± 0.069
photometric centroid source offset	3.38 ± 0.00	3361.94	-1.25 ± 0.00	3.14 ± 0.00

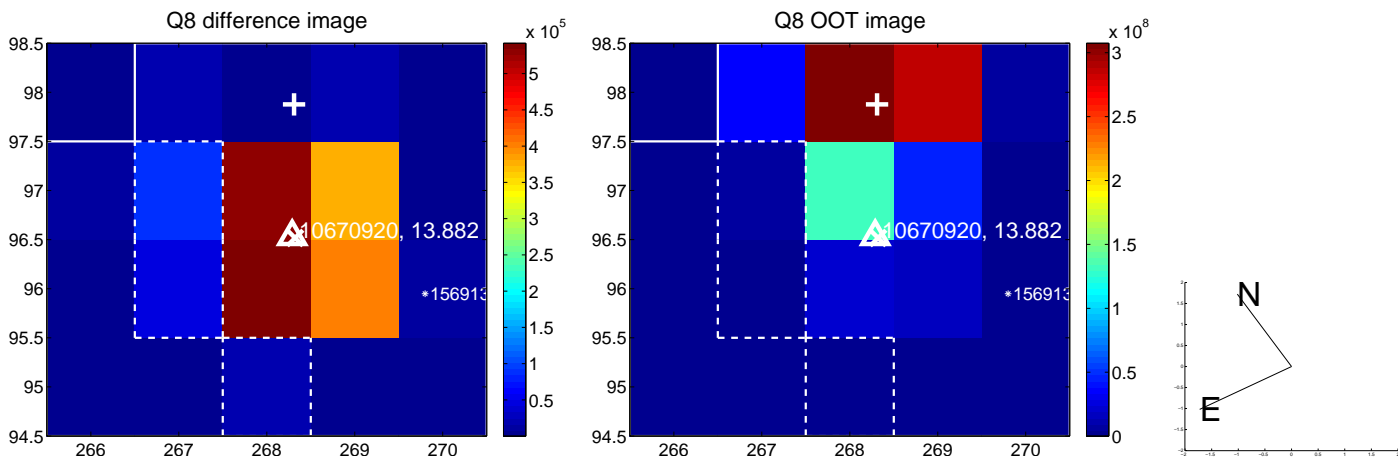
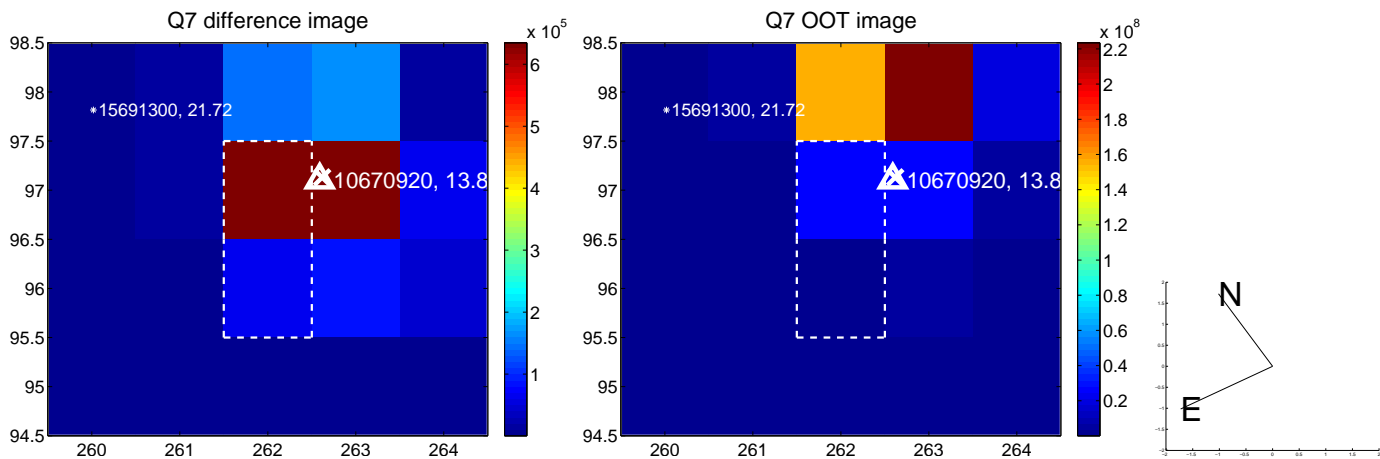
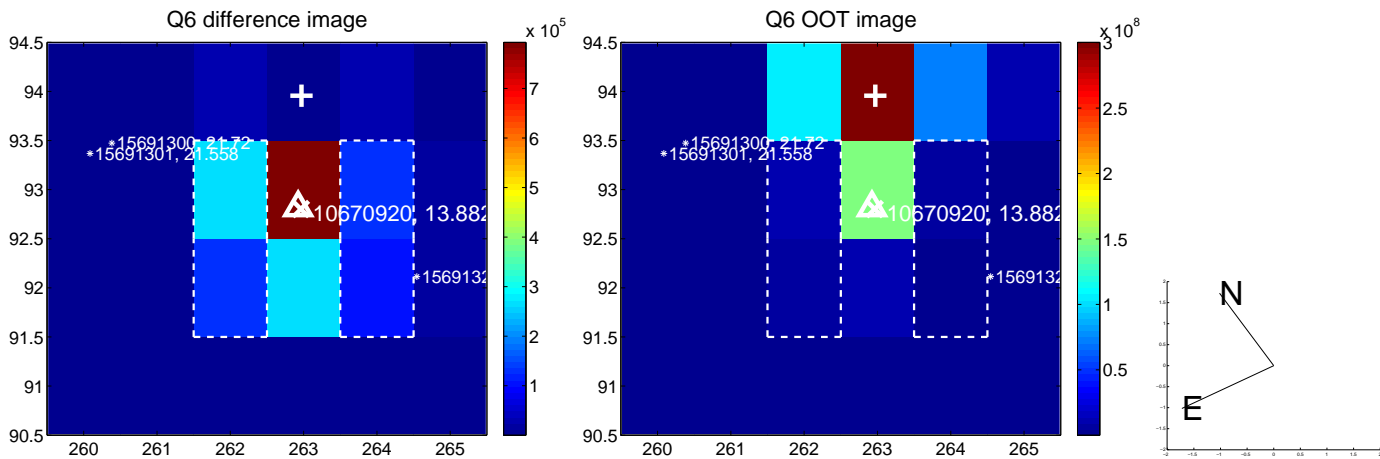
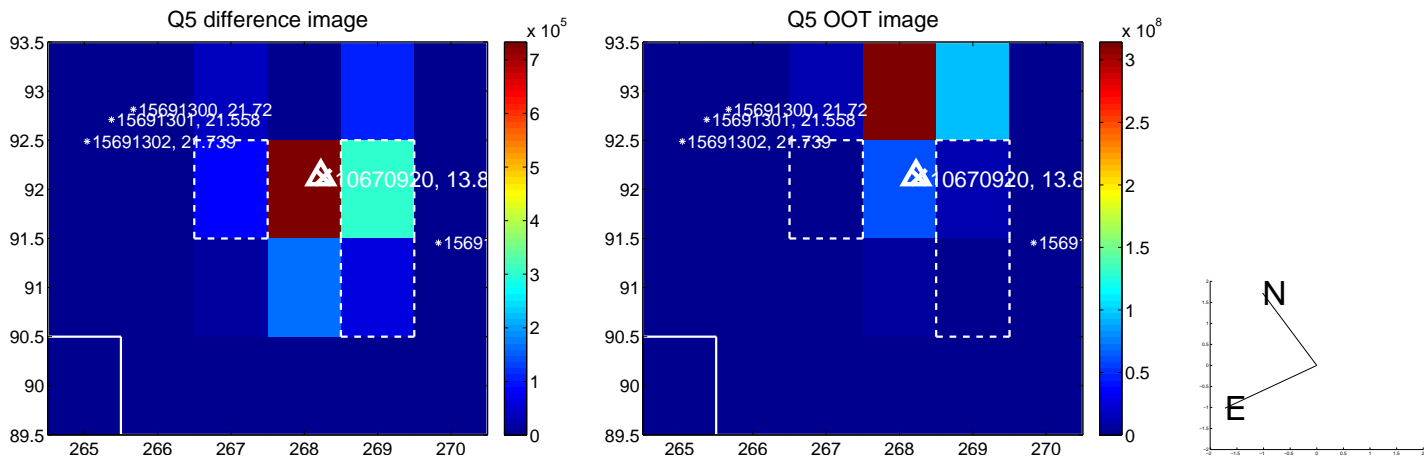


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

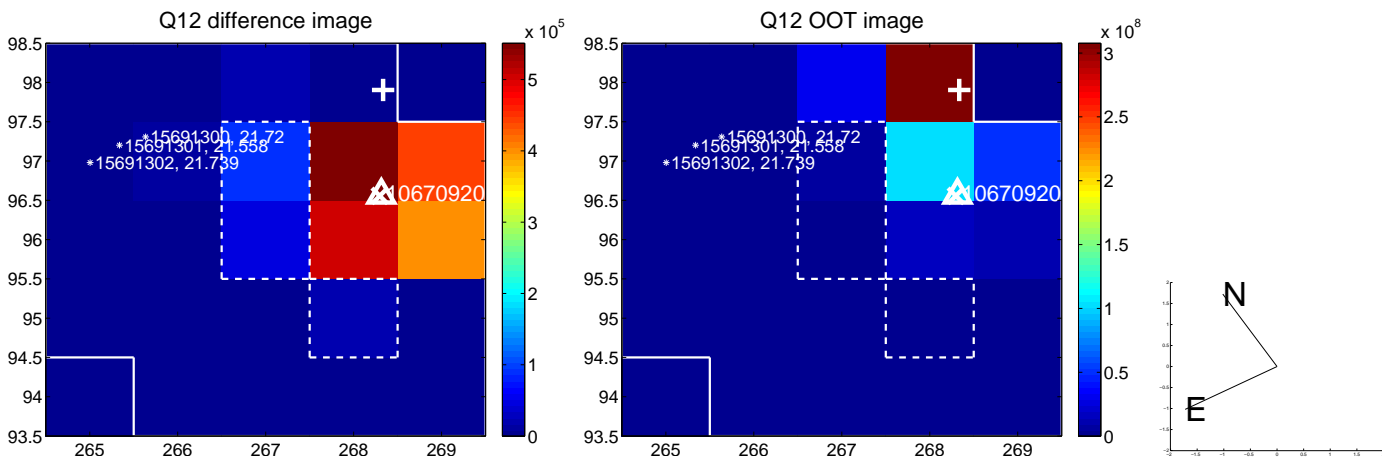
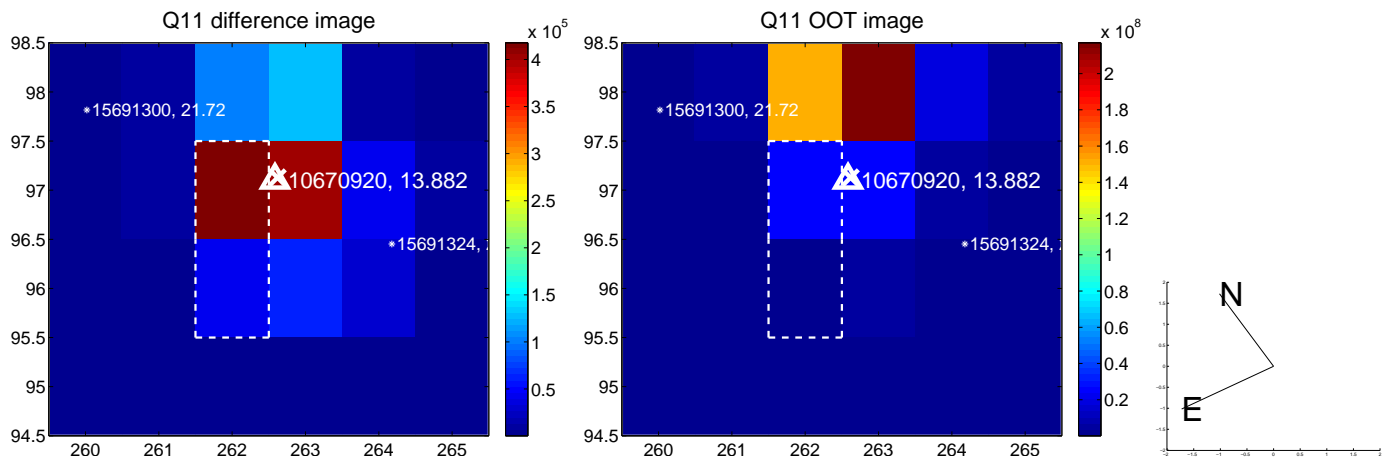
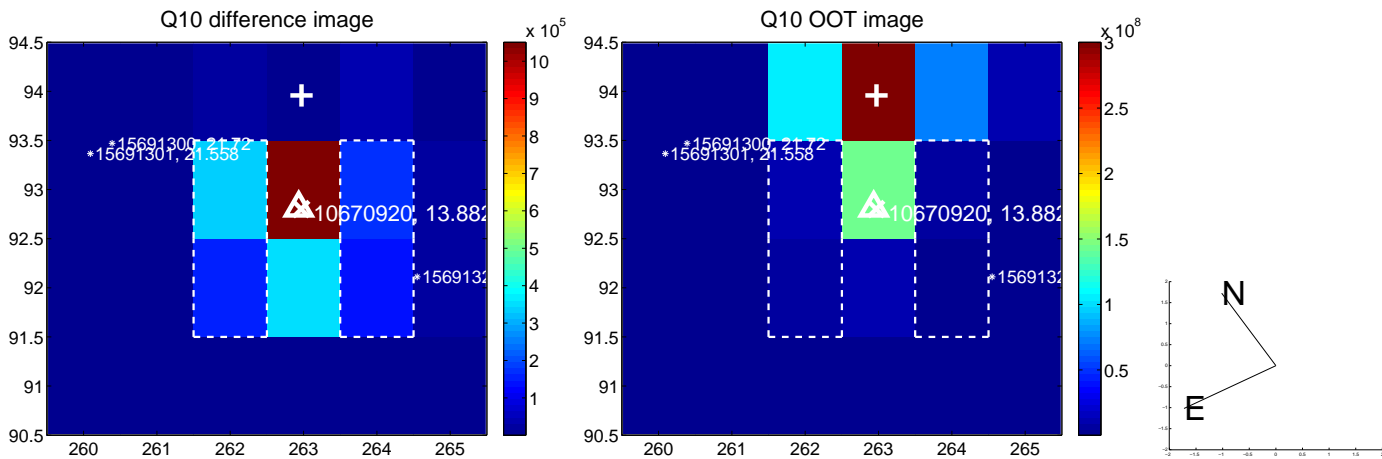
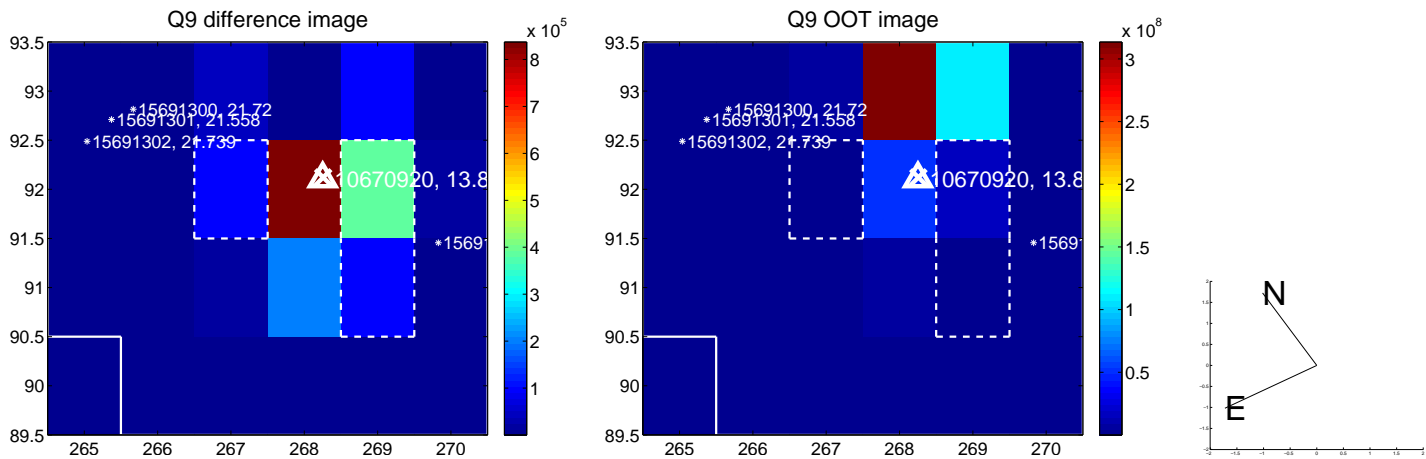
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



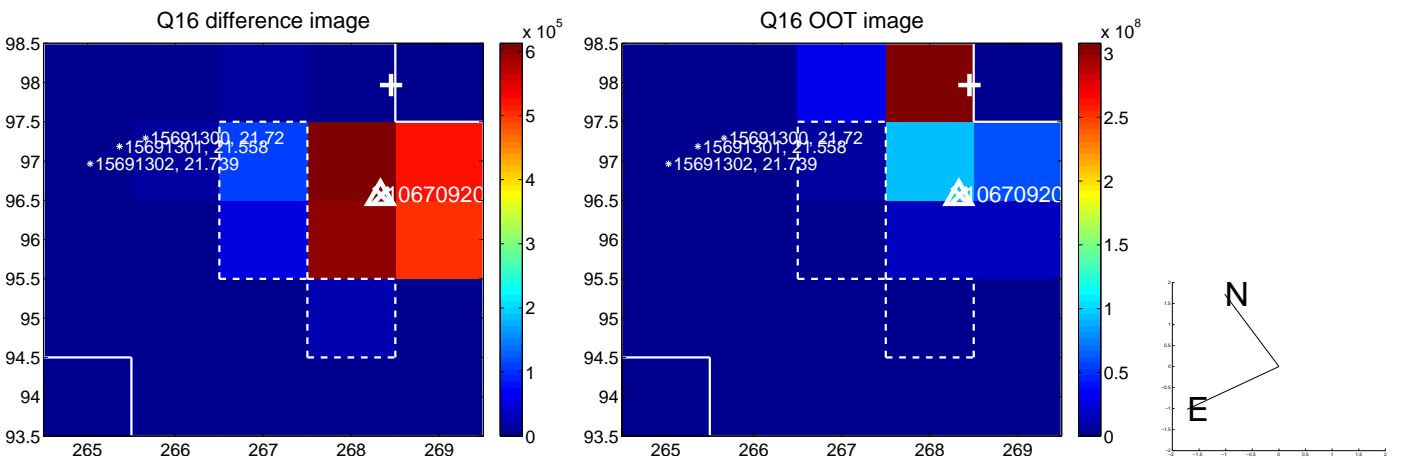
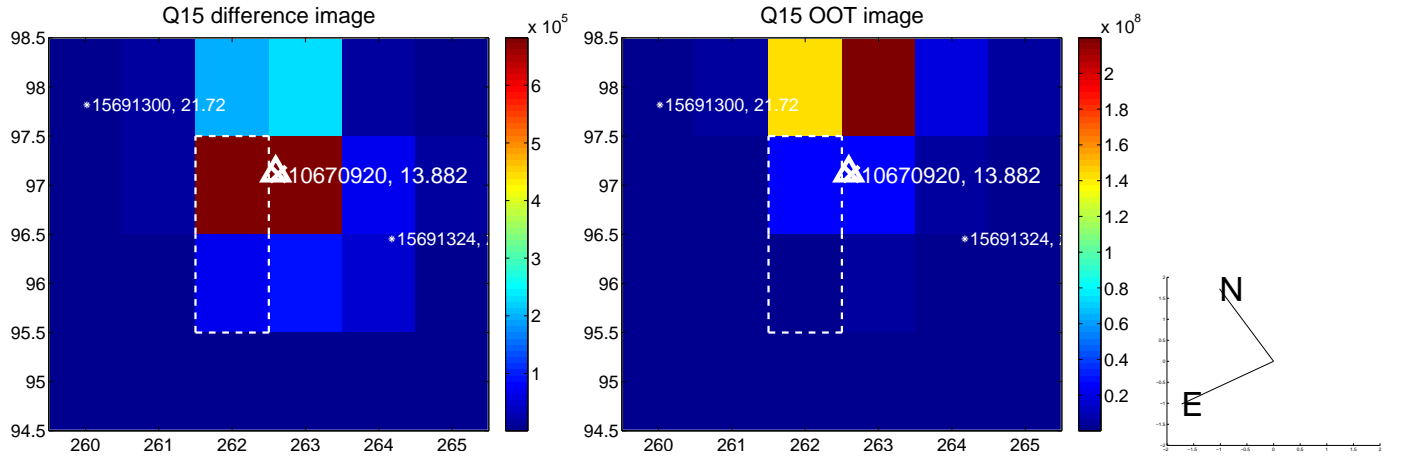
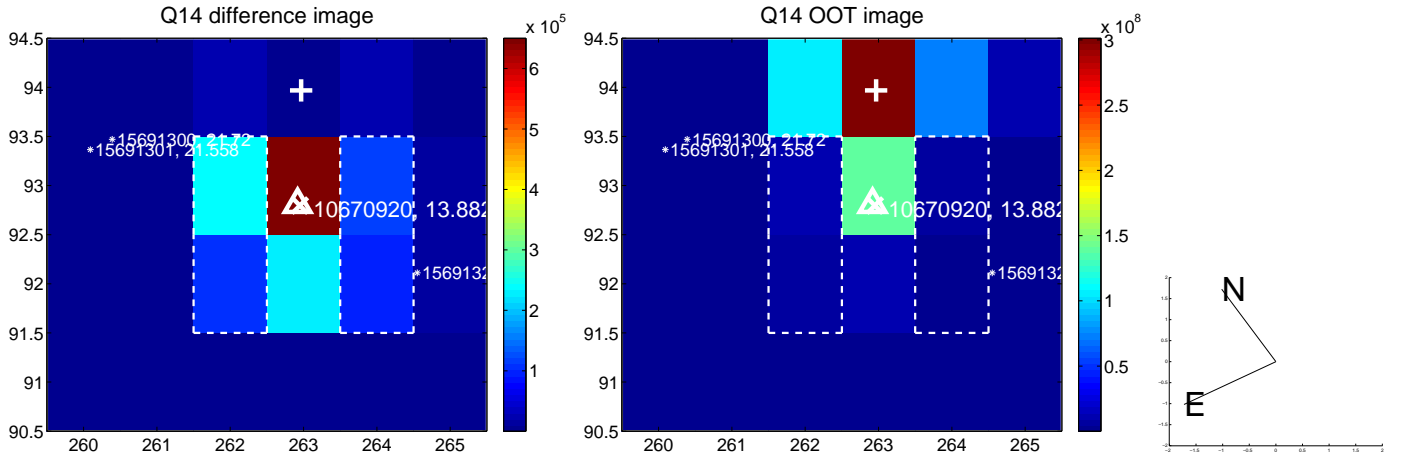
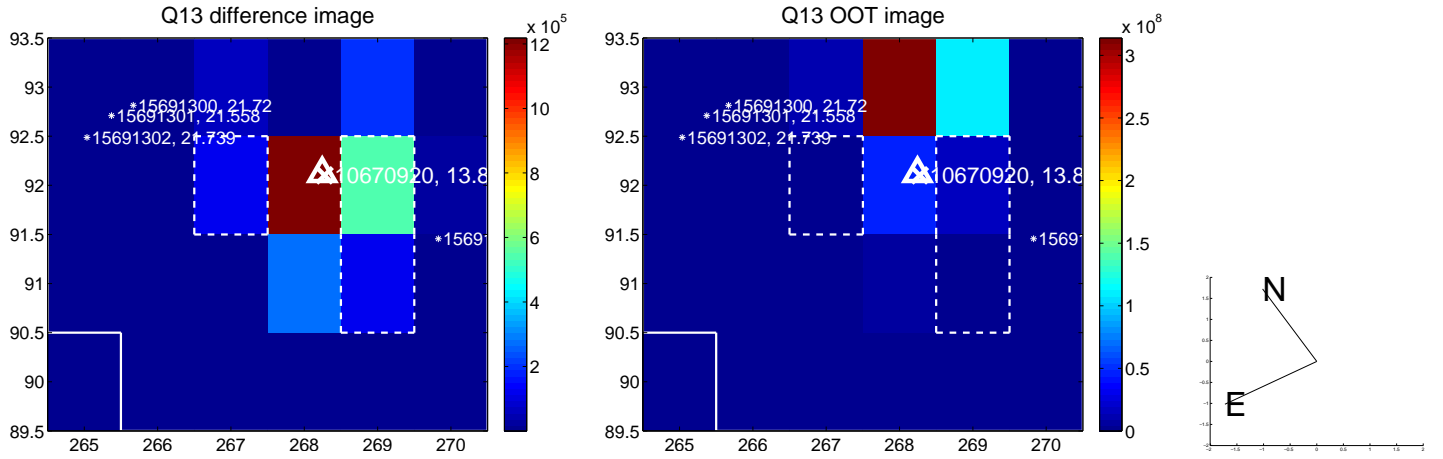
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



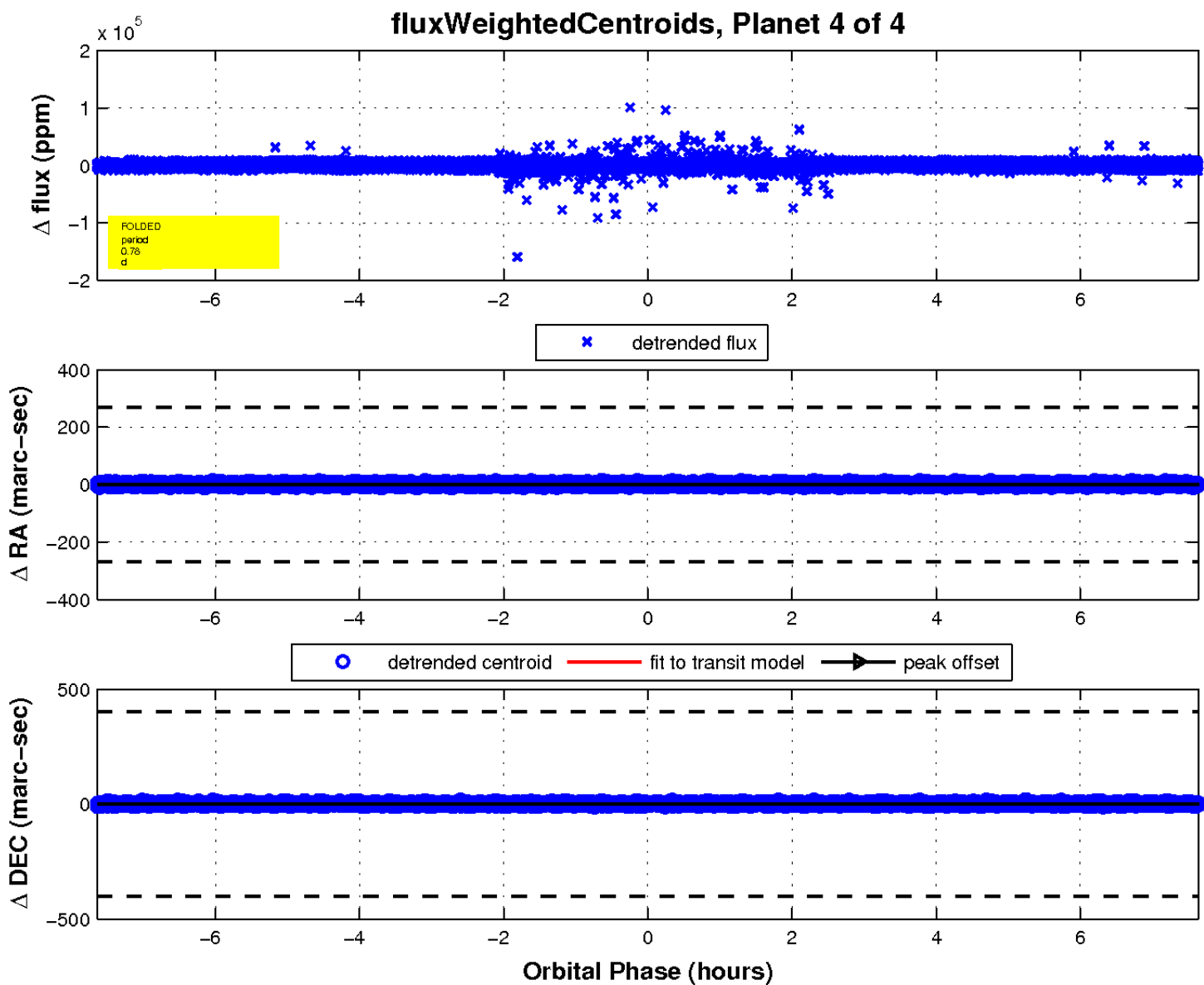
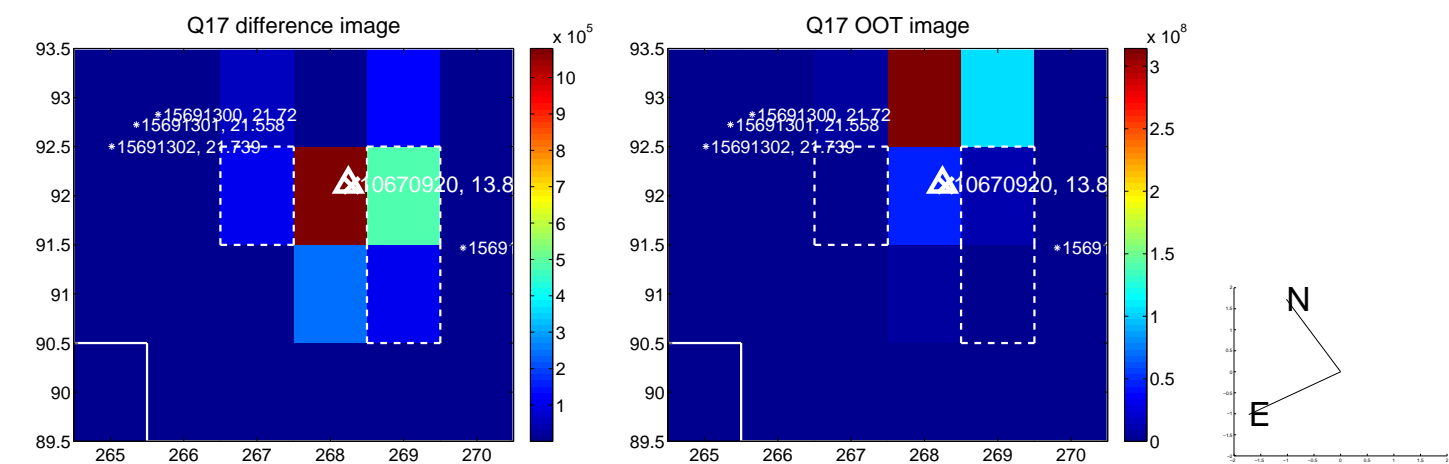
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

