

KIC 004181421

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})
004181421-01	OBS	No	2.258952	132.464718	26.9	10.657	10.7	10.7	2.01	6856	1.21	6651.35
004181421-02	OBS	No	350.126643	188.183209	184.6	13.159	9.7	7.0	2.01	6856	3.10	7.99
004181421-03	OBS	No	72.261619	168.223281	152.3	8.186	8.5	7.7	2.01	6856	2.75	65.50

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004181421-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL —LPP_DV —MOD_NONUNIQ_DV
004181421-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE —MARSHALL_SKYE —LPP_DV —ALL_TRANS_CHASES —MOD_NONUNIQ_DV —MOD_TER_DV —INCONSISTENT_TRANS —CENT_FEW_DIFFS
004181421-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE —TRANS_GAPPED —LPP_DV —MOD_NONUNIQ_ALT —HALO_GHOST

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

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

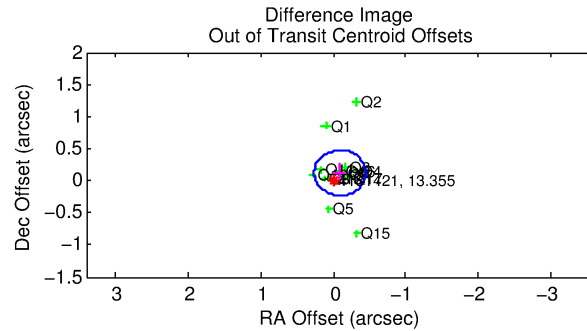
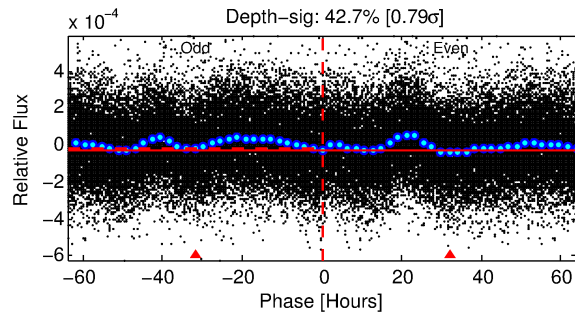
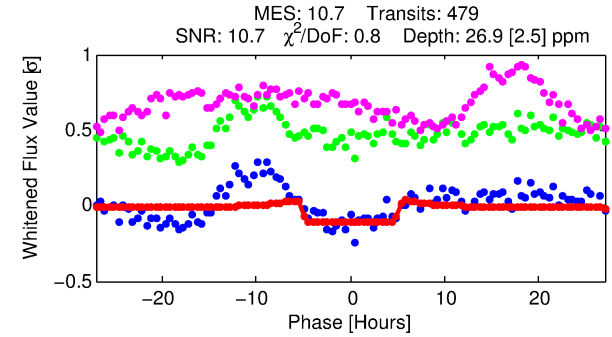
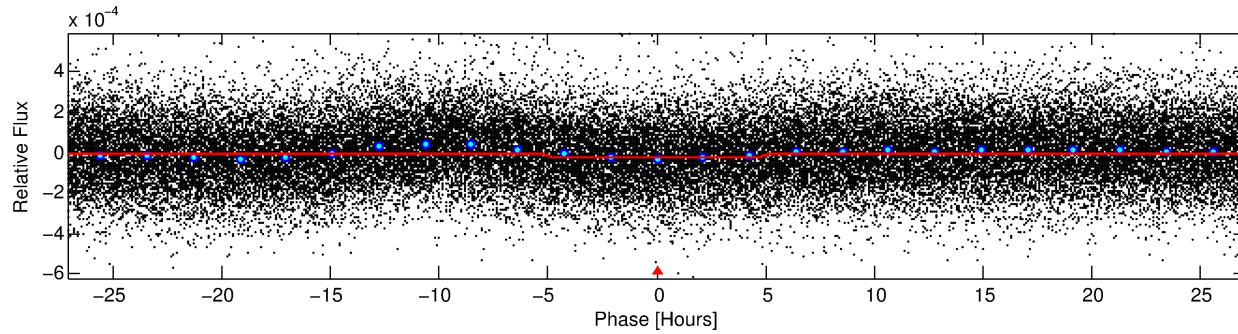
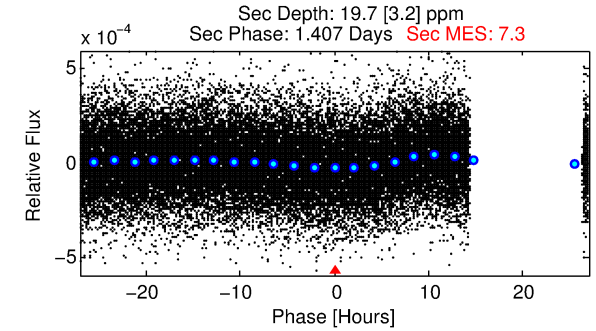
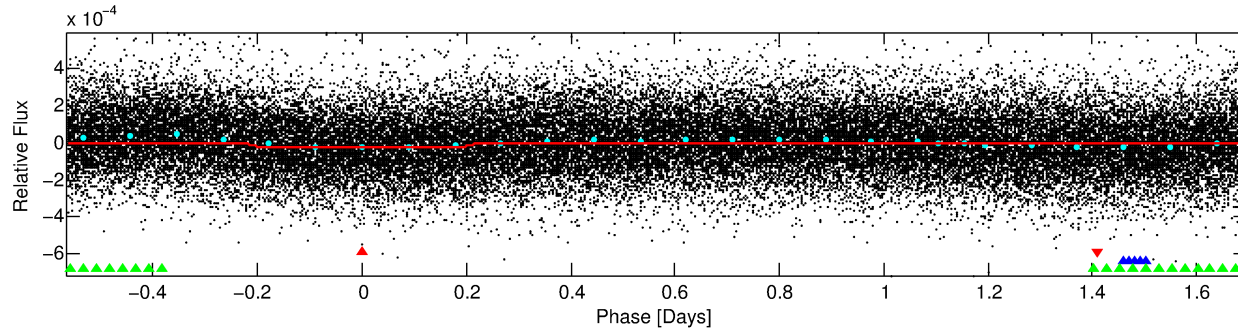
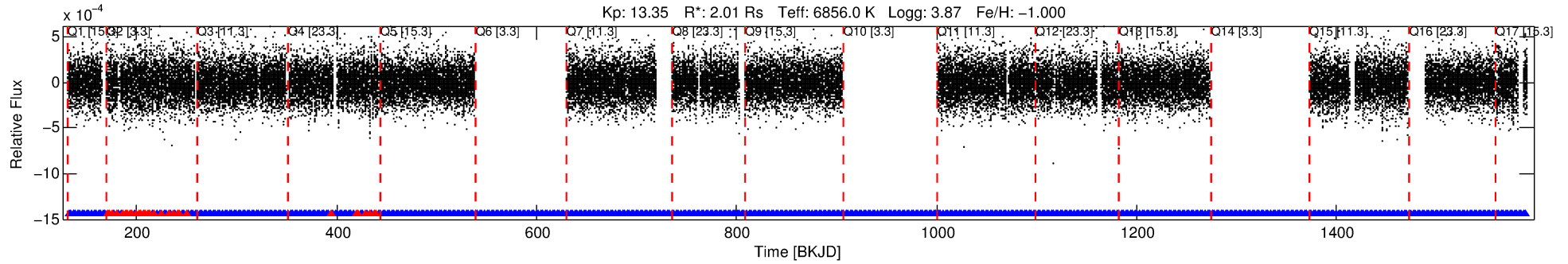
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004181421-01

No Significant Match Found

DV One-Page Summary

KIC: 4181421 Candidate: 1 of 3 Period: 2.259 d



DV Fit Results:

Period = 2.25895 [0.00003] d
Epoch = 132.4647 [0.0067] BKJD
Rp/R* = 0.0055 [0.0010]
a/R* = 1.19 [0.39]
b = 0.90 [0.24]
Seff = 6651.35 [5801.92]
Teq = 2303 [502] K
Rp = 1.21 [0.61] Re
a = 0.0347 [0.0175] AU
Ag = 8.86 [8.41] [0.93σ]
Teffp = 6143 [680] K [4.54σ]

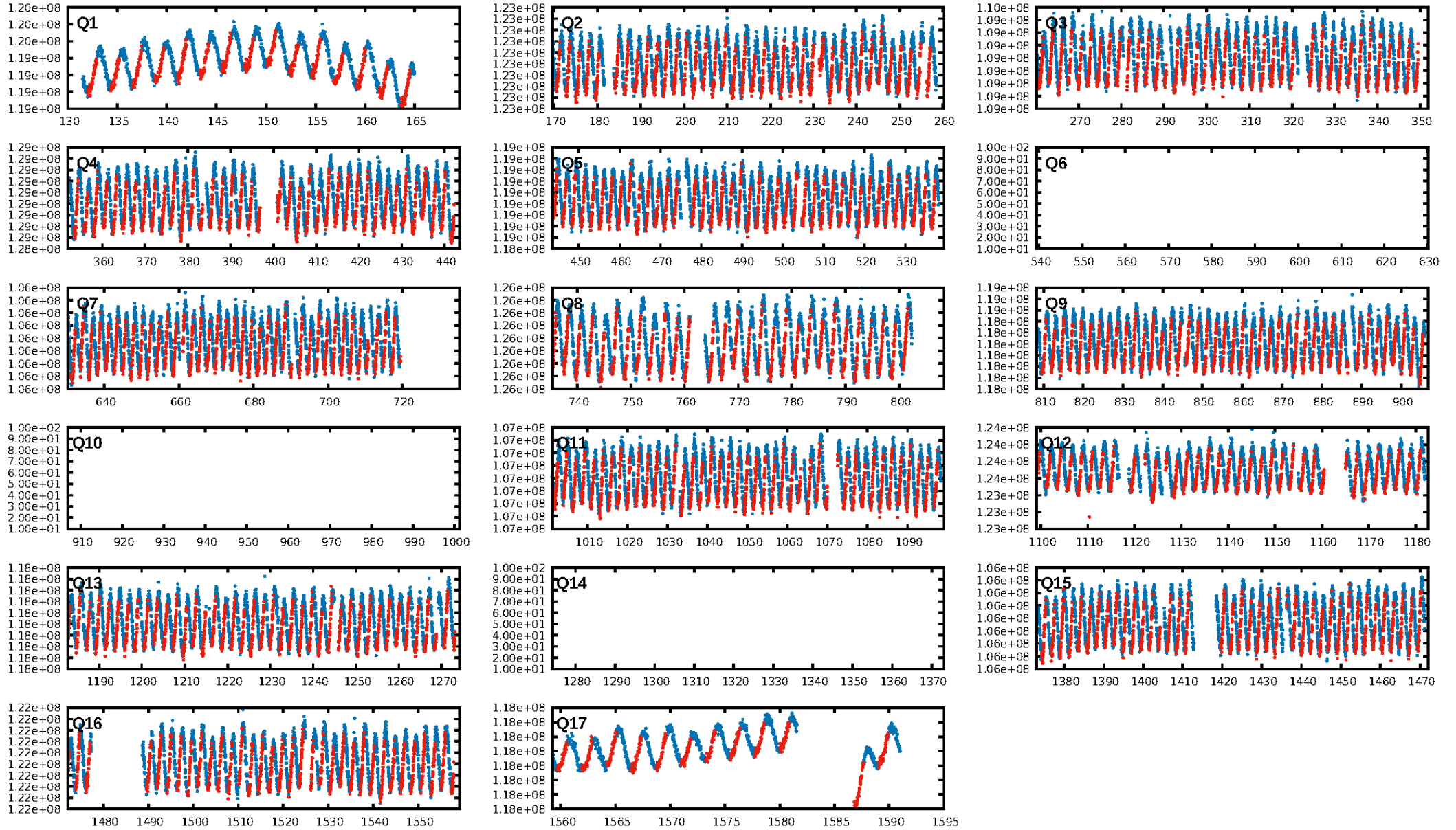
DV Diagnostic Results:

ShortPeriod-sig: N/A
LongPeriod-sig: 100.0% [125.02σ]
ModelChiSquare2-sig: N/A
ModelChiSquareGof-sig: N/A
Bootstrap-pfa: 6.09e-18
RollingBand-fgt: 0.93 [422/452]
GhostDiagnostic-chr: 1.938
Centroid-sig: N/A
Centroid-so: 3.022 arcsec [3.06σ]
OotOffset-rm: 0.150 arcsec [1.27σ]
KicOffset-rm: 0.076 arcsec [0.59σ]
OotOffset-st: 1/4/4/5 [14]
KicOffset-st: 1/4/4/5 [14]
DiffImageQuality-fgm: 1.00 [14/14]
DiffImageOverlap-fno: 1.00 [14/14]

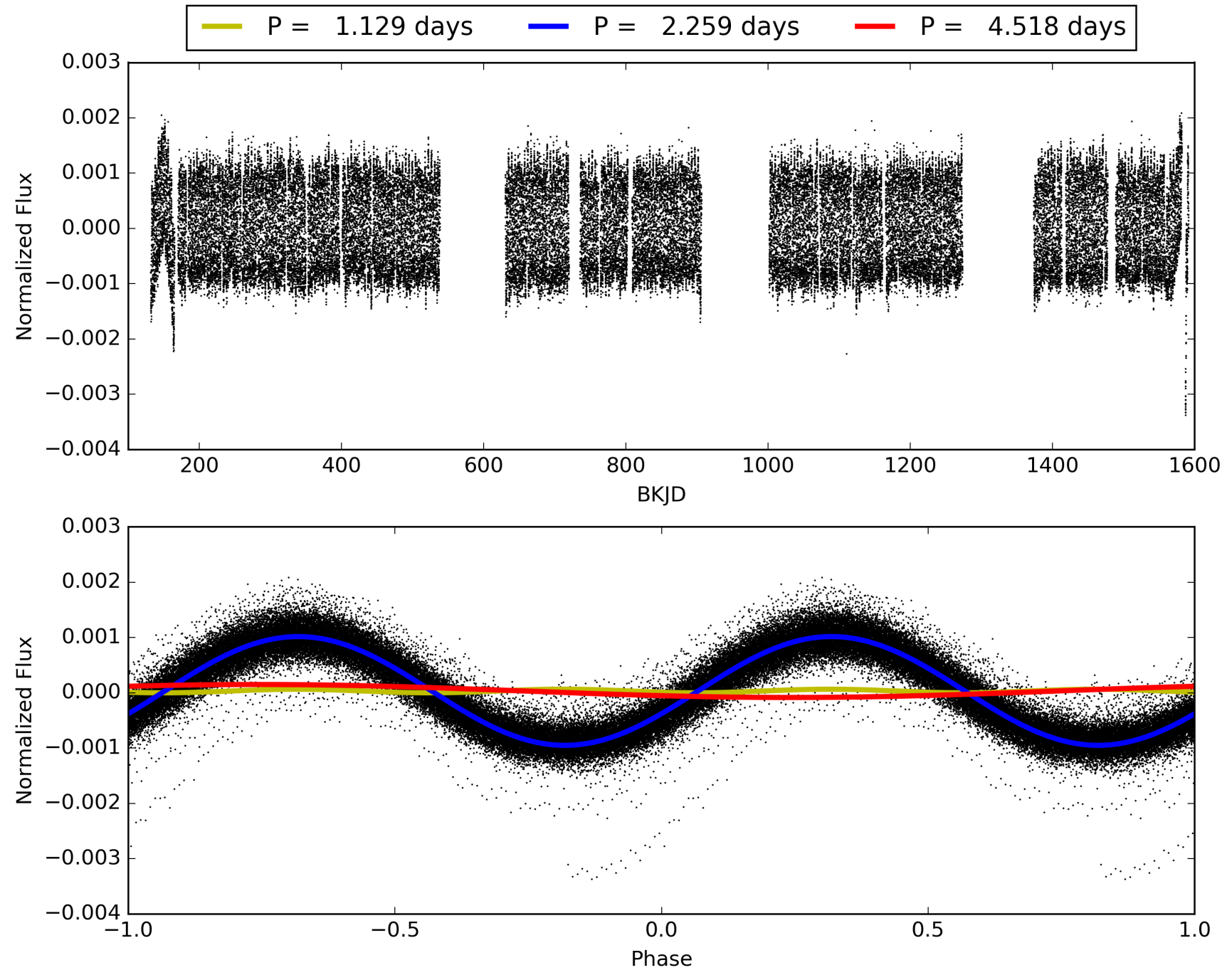
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This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 004181421-01, PDC Light Curves

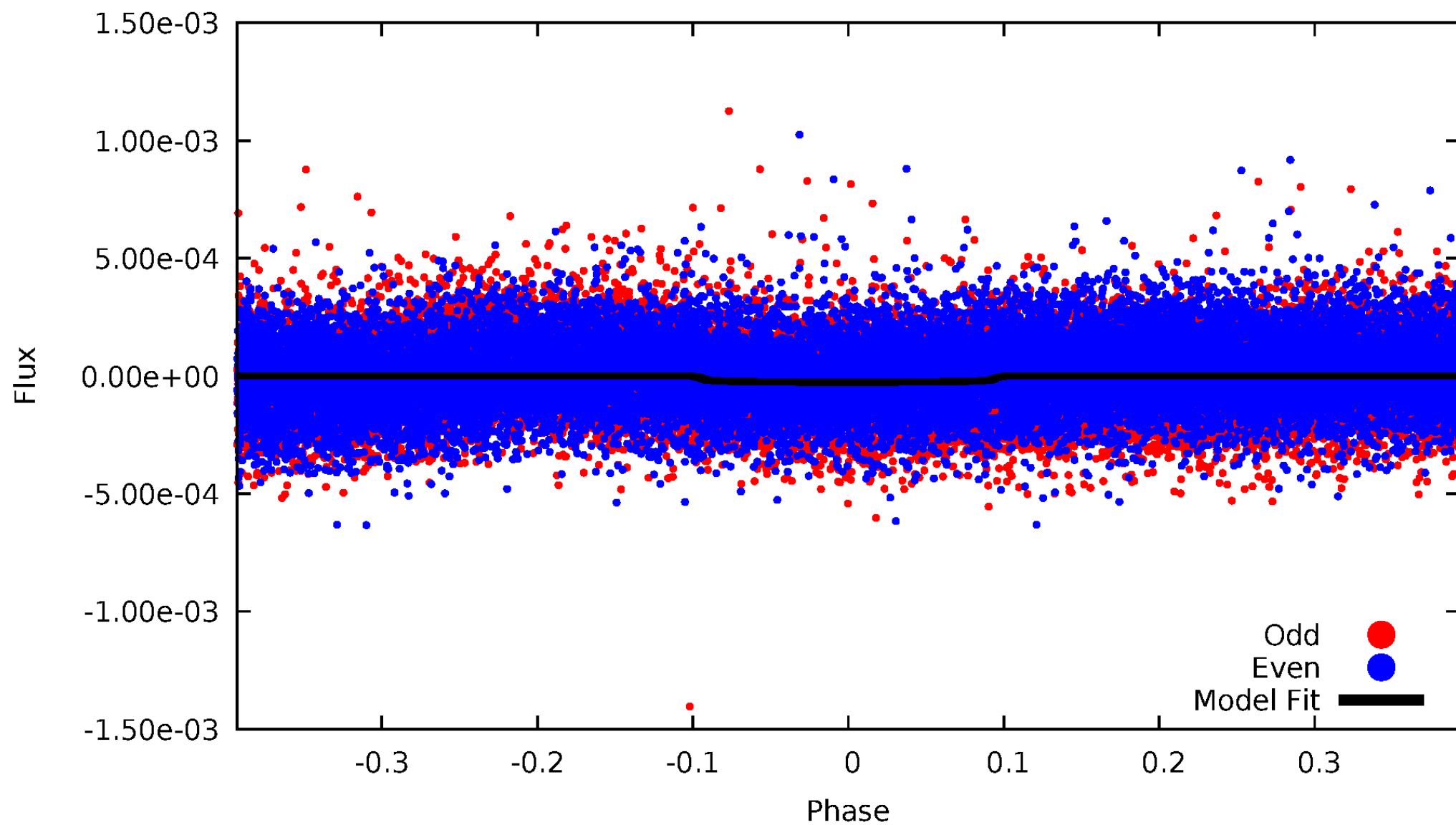


TCE 004181421-01



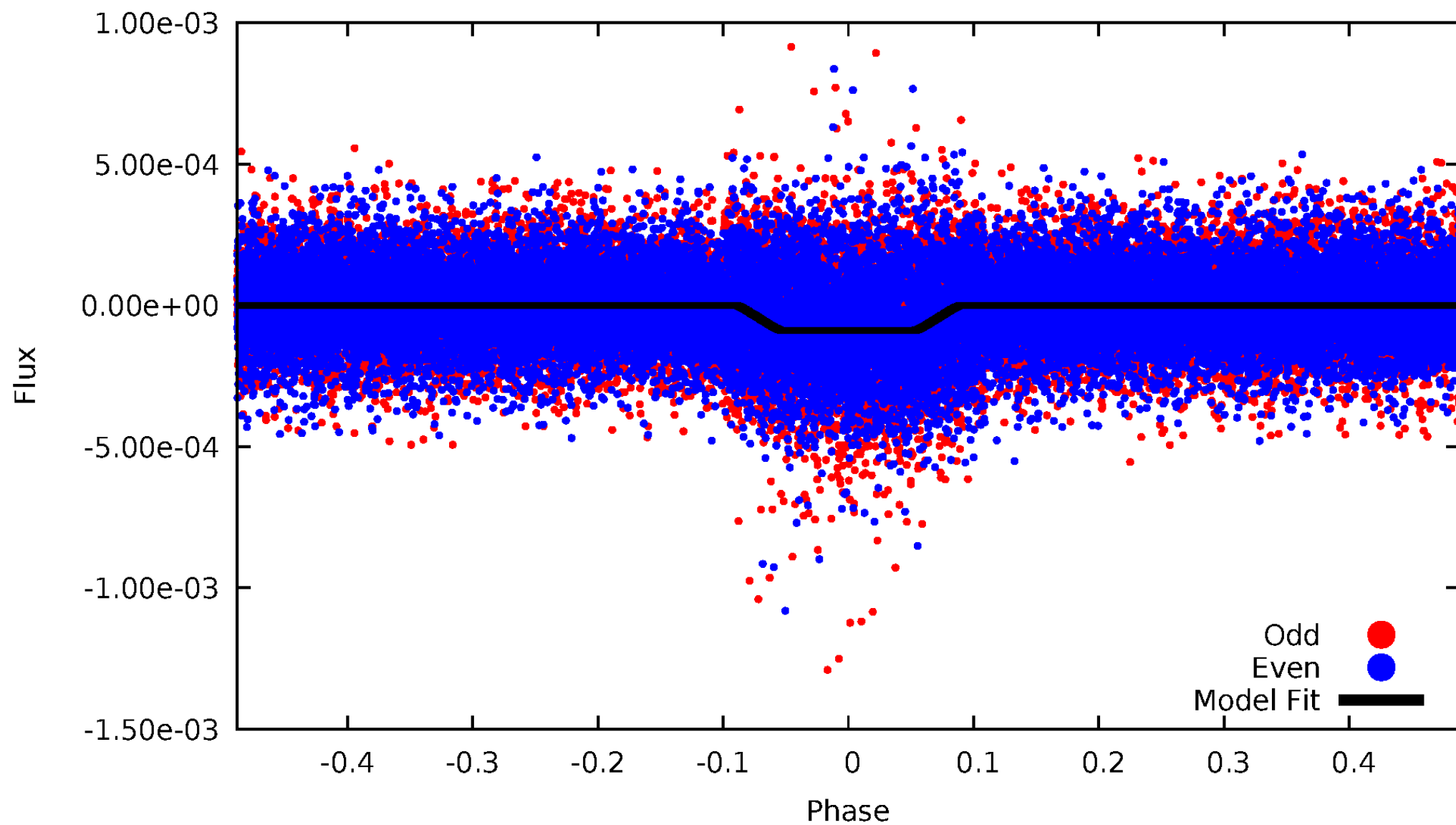
DV Odd/Even

TCE 004181421-01

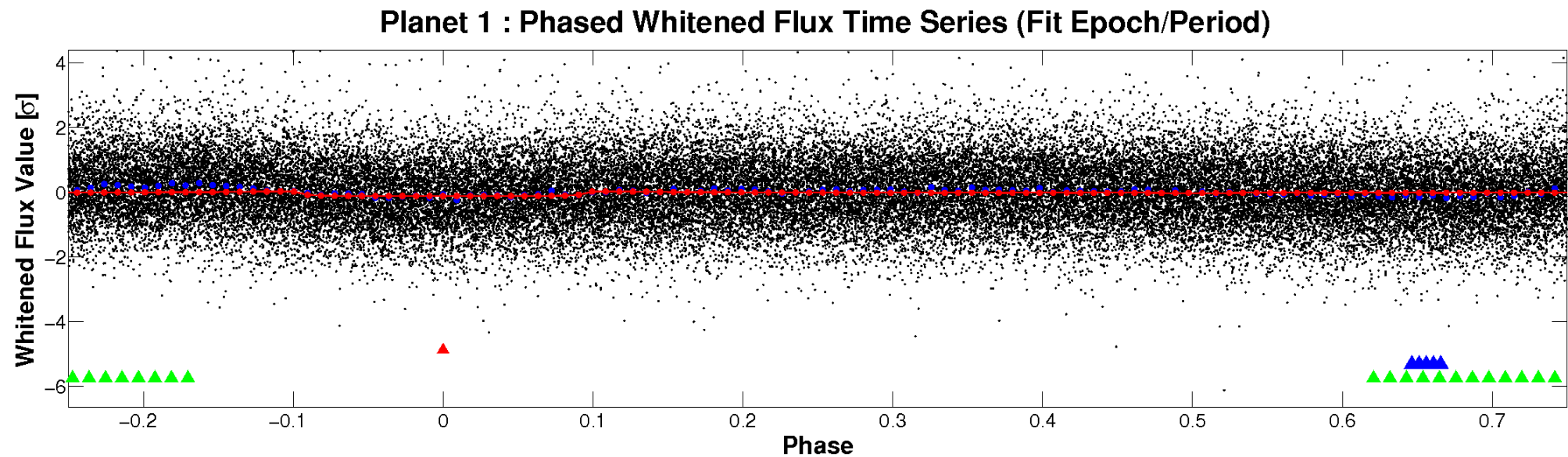
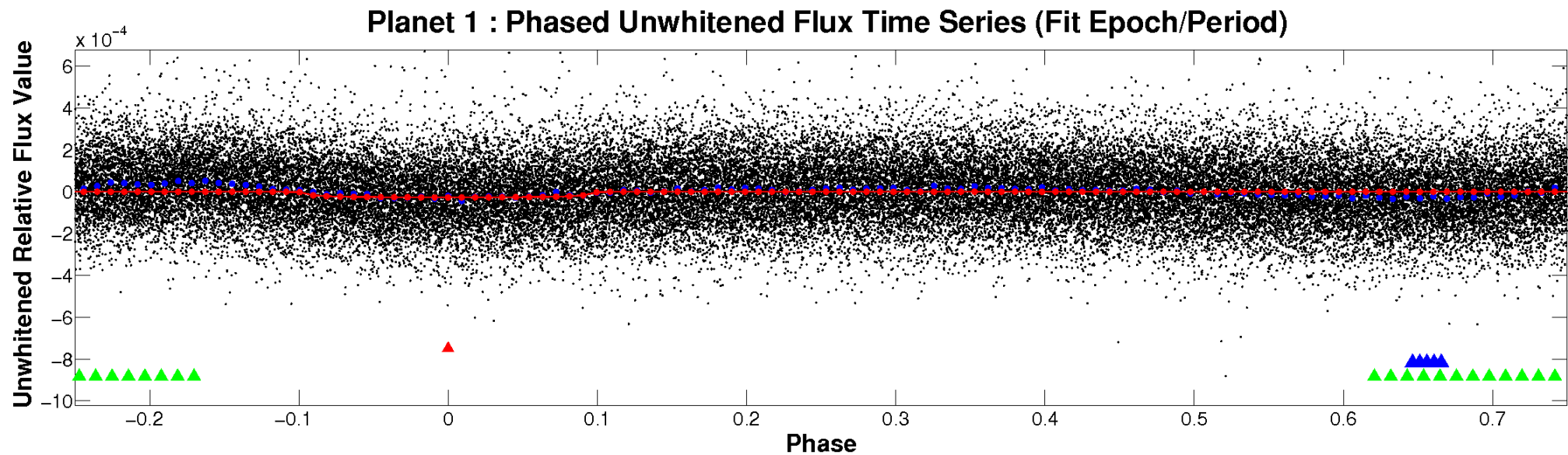


ALT Odd/Even

TCE 004181421-01

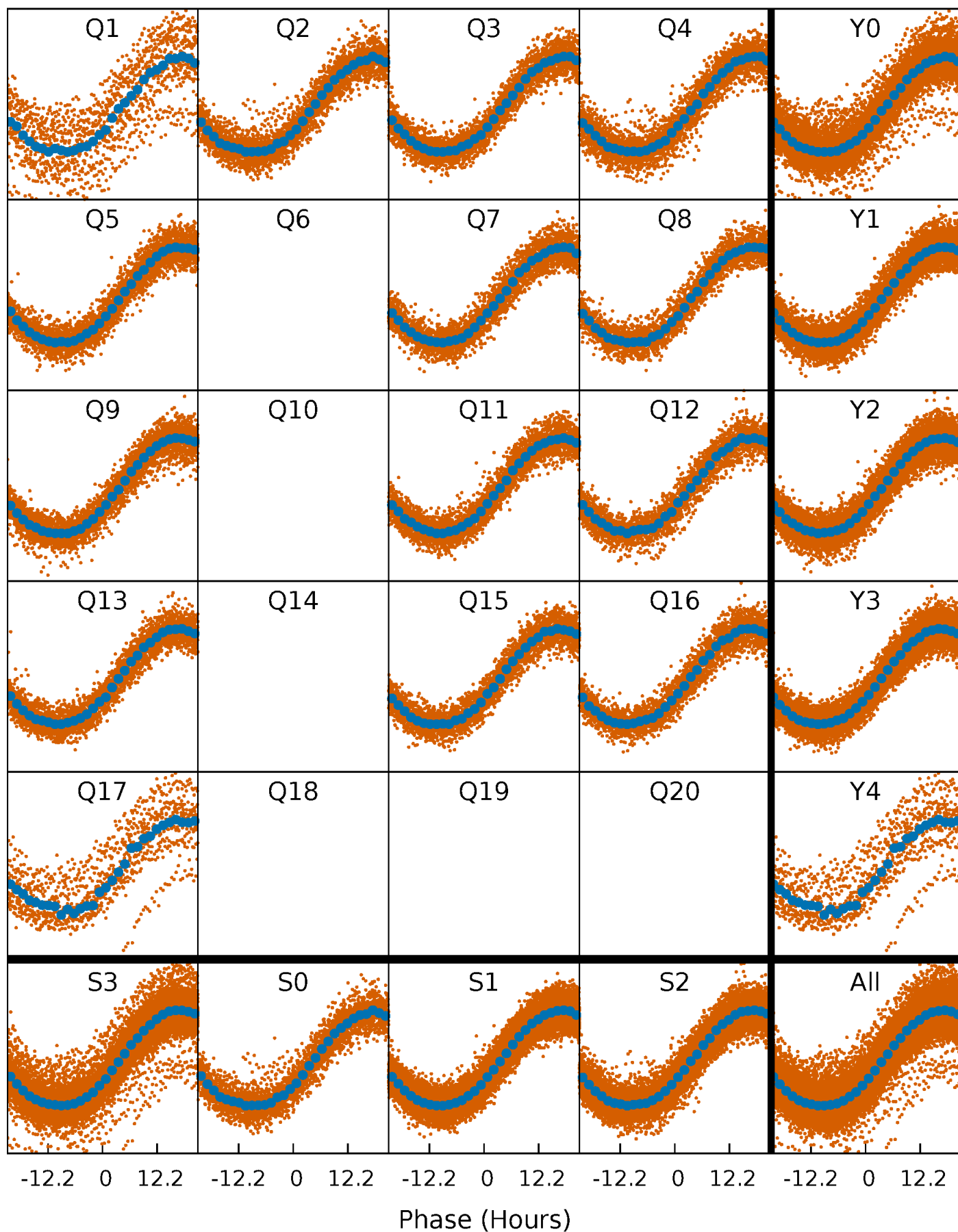


Non-Whitened Vs. Whitened Light Curve



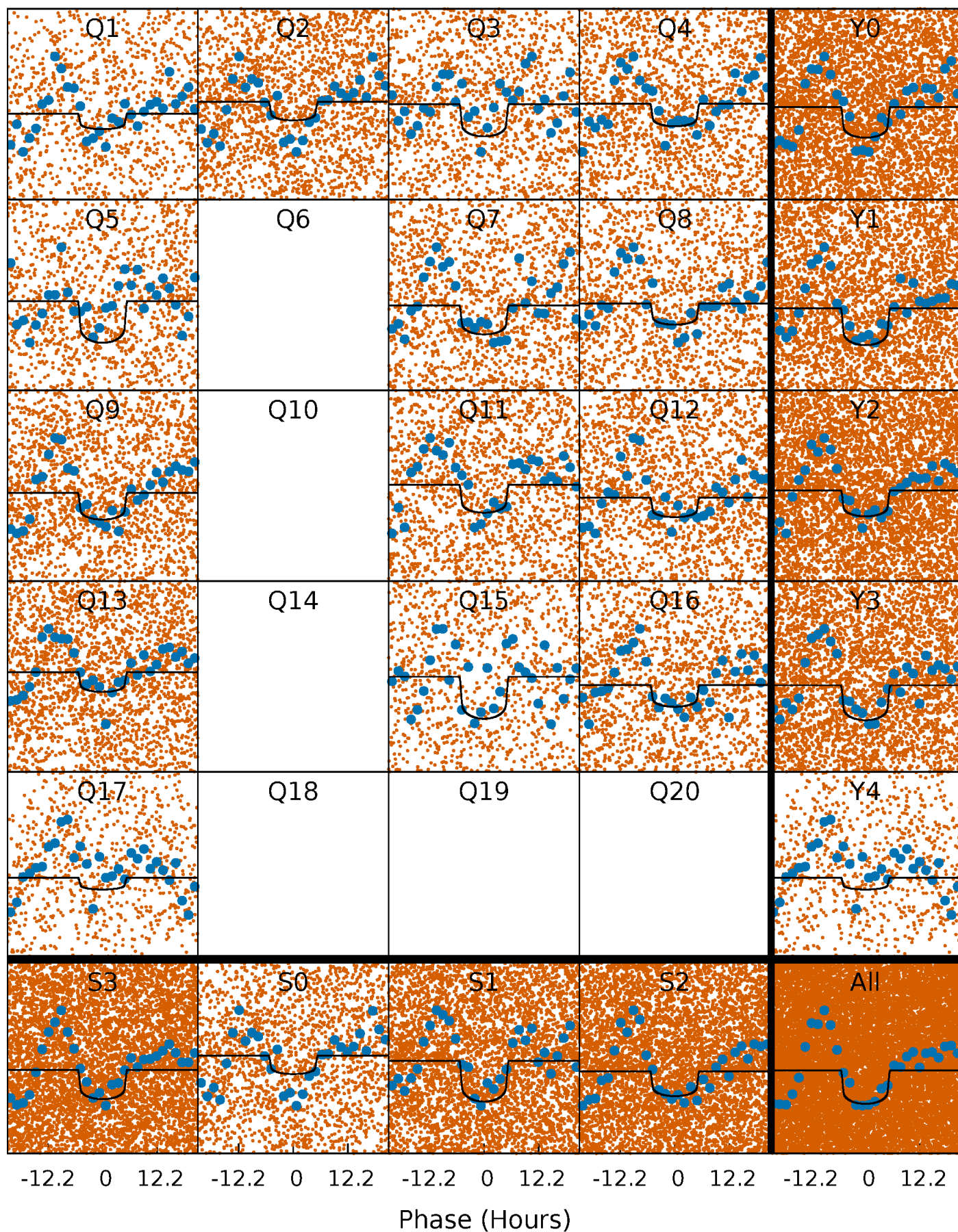
PDC Quarter-Phased Transit Curves

TCE 004181421-01 P= 2.258952 Days $T_0=132.464718$ (BKJD)



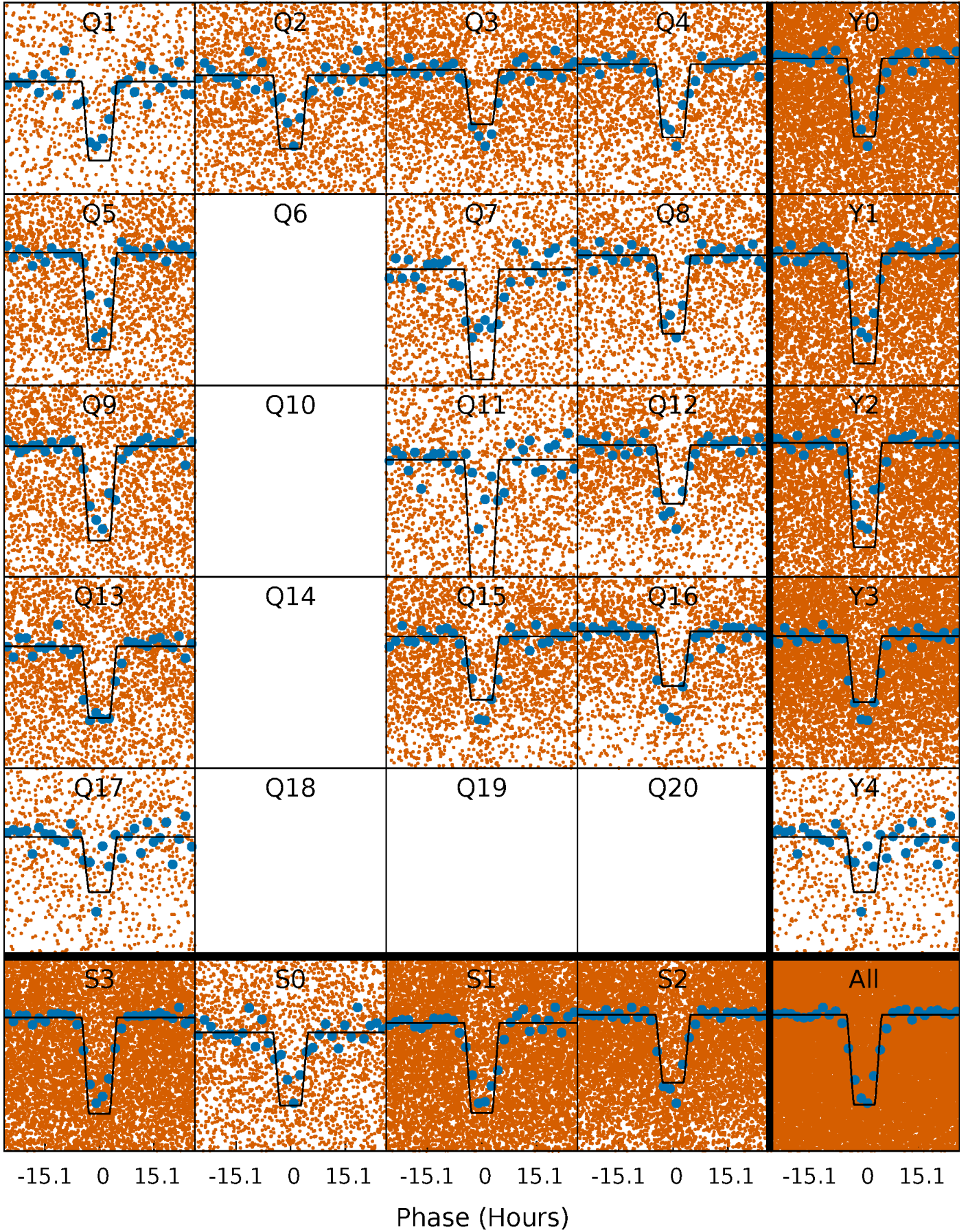
DV Quarter-Phased Transit Curves

TCE 004181421-01 P= 2.258952 Days $T_0=132.464718$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

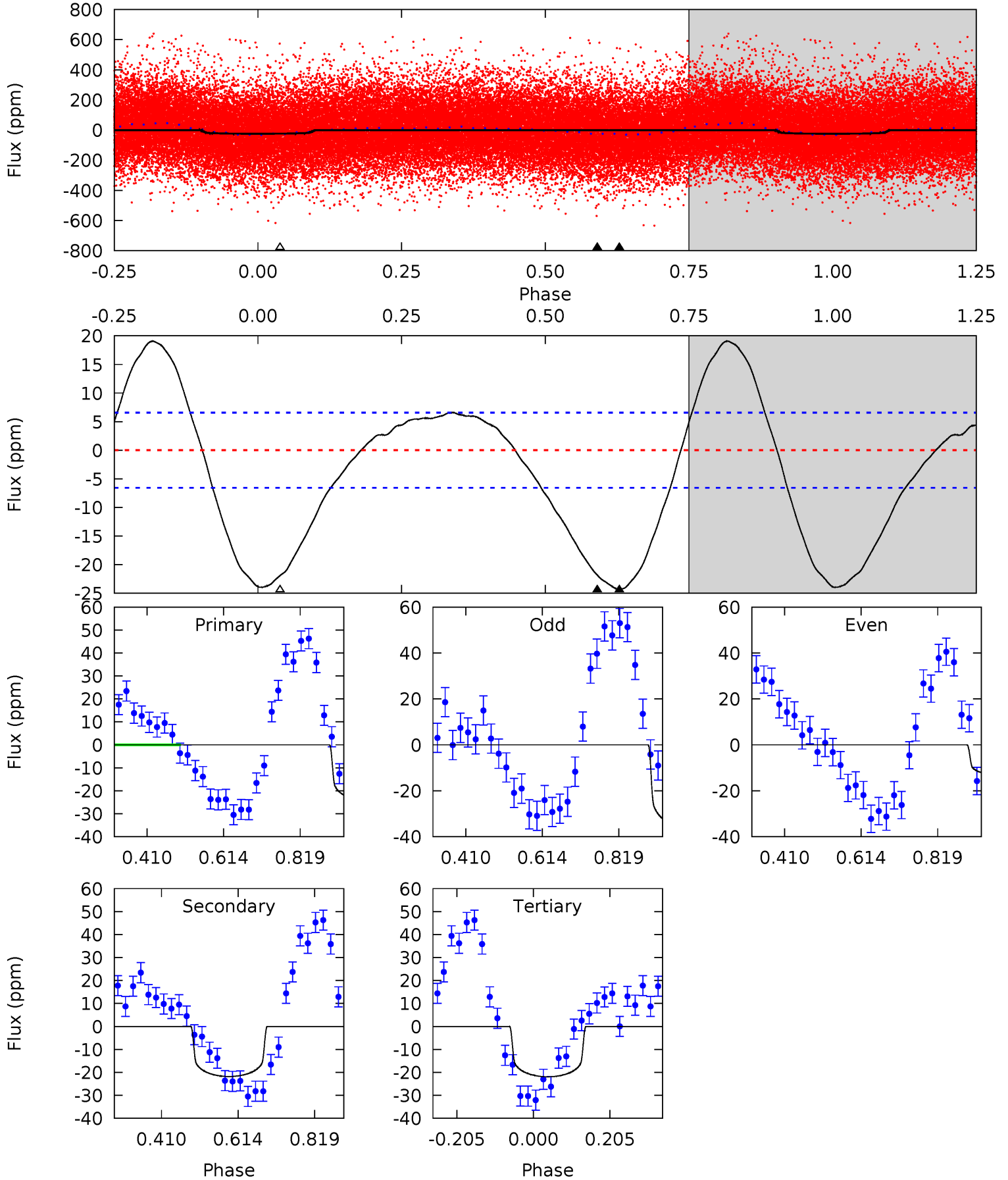
TCE 004181421-01 P= 2.258898 Days $T_0=132.440602$ (BKJD)



DV Model-Shift Uniqueness Test

004181421-01, P = 2.258952 Days, E = 130.205766 Days

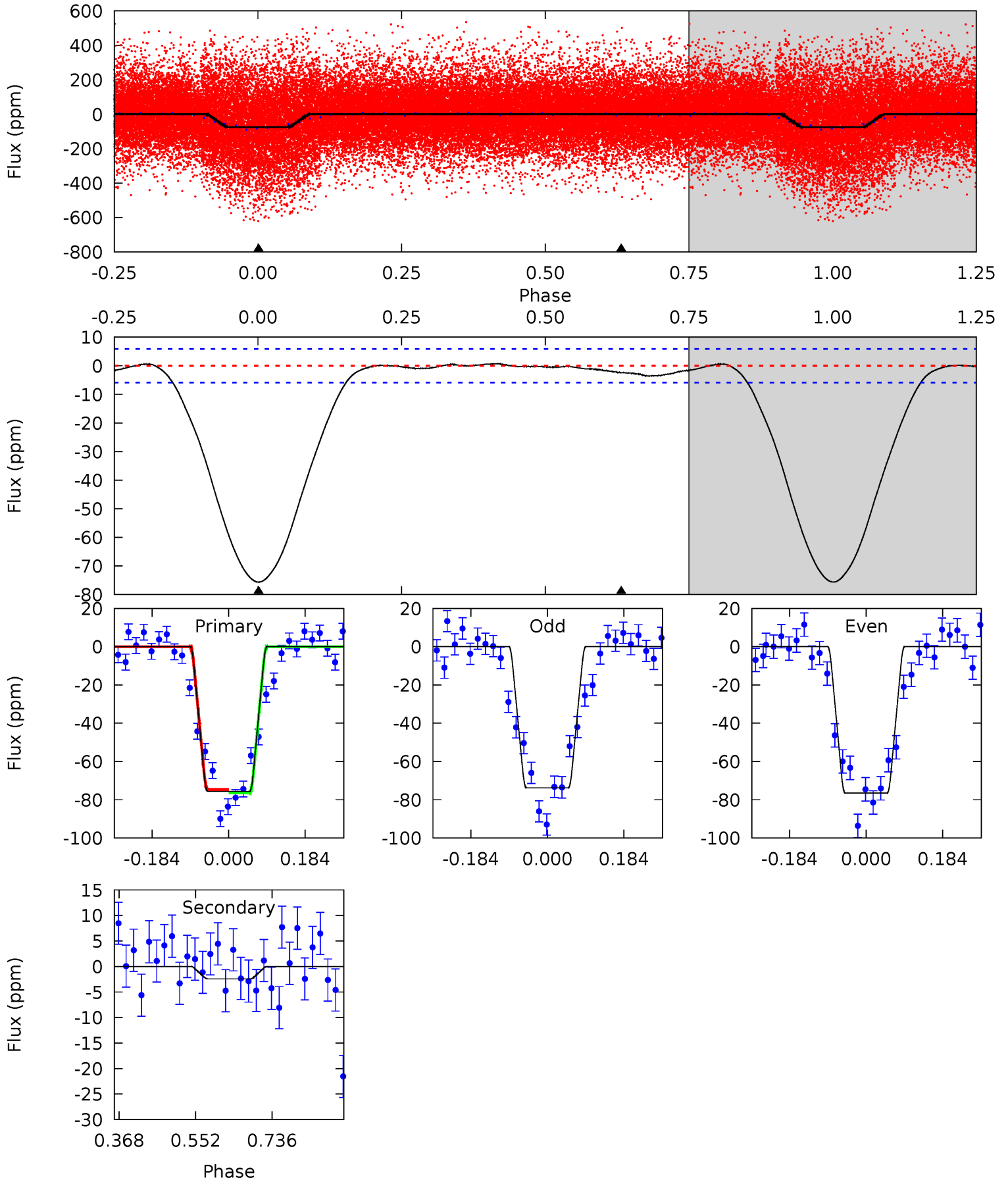
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
16.3	14.7	14.7	0	4.41	1.27	7.88	1.58	16.3	-0.08	14.7	7.49	0.83	0.44	0.05



Alt Model-Shift Uniqueness Test

004181421-01, P = 2.258898 Days, E = 130.181704 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
57.3	1.85	0	0	4.44	1.33	0.37	57.3	57.3	1.85	1.85	1.06	1.11	0.01	0.67



Stellar Parameters For KIC 004181421

	$T_{\text{eff}} (K)$	$\log(g)$	[Fe/H]	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6856^{+214}_{-285}	$3.869^{+0.520}_{-0.130}$	$-1.000^{+0.300}_{-0.300}$	$2.011^{+0.431}_{-0.935}$	$1.090^{+0.128}_{-0.176}$	$0.189^{+0.989}_{-0.067}$
	+3%/-4%	+13%/-3%	+30%/-30%	+21%/-46%	+12%/-16%	+524%/-35%
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 004181421-01 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{max} (K)$	$T_{obs} (K)$	A_{obs}
DV	-22 ± 1	$1.11^{+0.32}_{-0.30}$	3114^{+259}_{-392}	6177^{+810}_{-552}	12^{+10}_{-5}
Alt.	-2 ± 1	$1.94^{+0.45}_{-0.47}$	3125^{+262}_{-382}	2780^{+511}_{-5660}	$0.419^{+0.407}_{-0.253}$

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 $A_{obs} \gg 1.0$

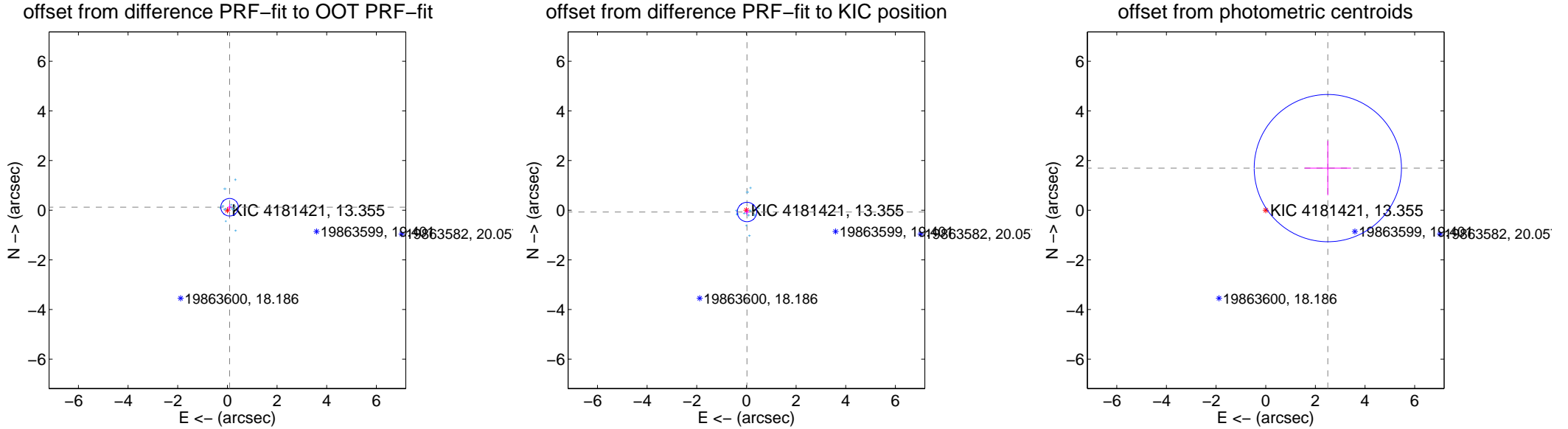
DV Centroid Data

Supplemental centroid analysis for 004181421-01. Kepler magnitude: 13.36. Transit SNR 10.74

There are 14 quarters with good PRF difference image offsets

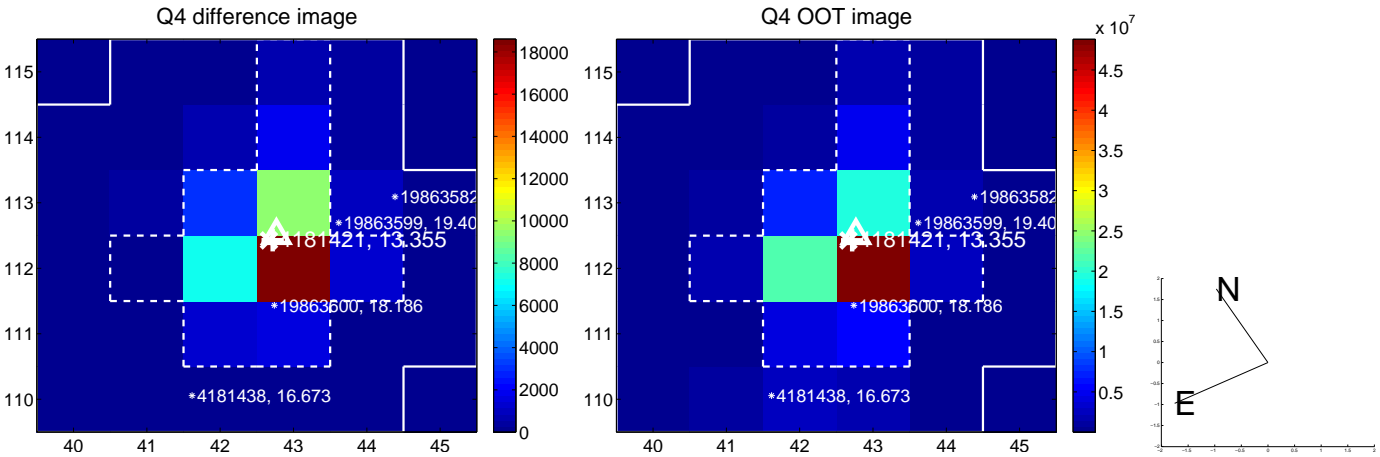
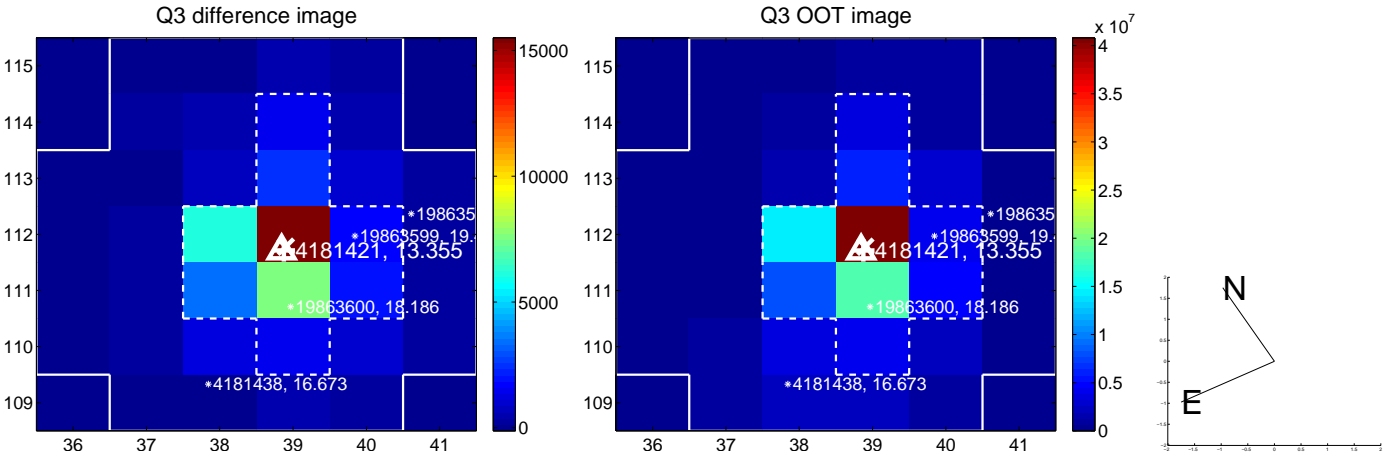
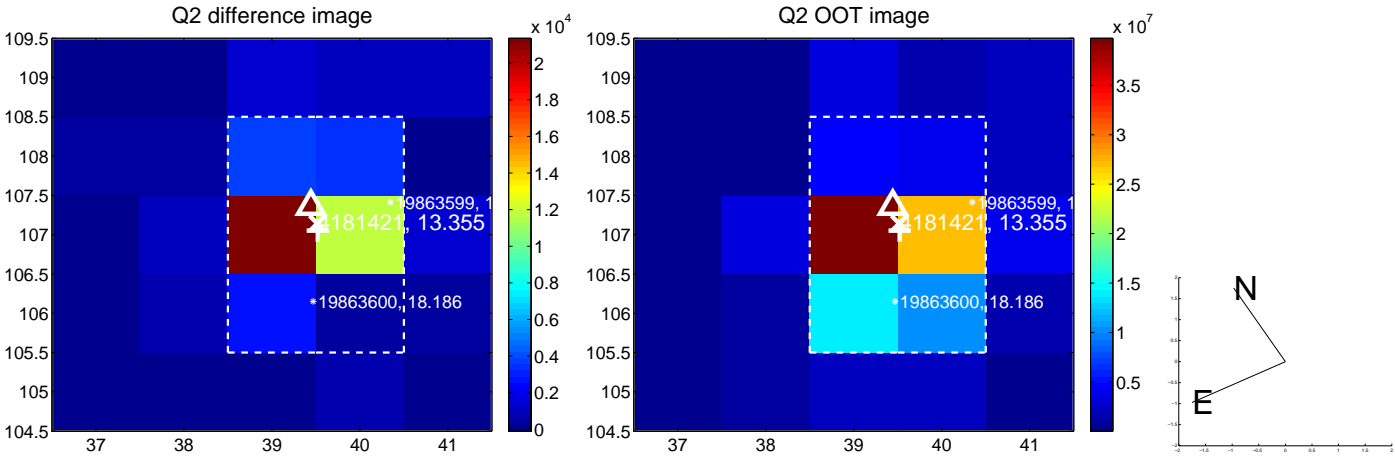
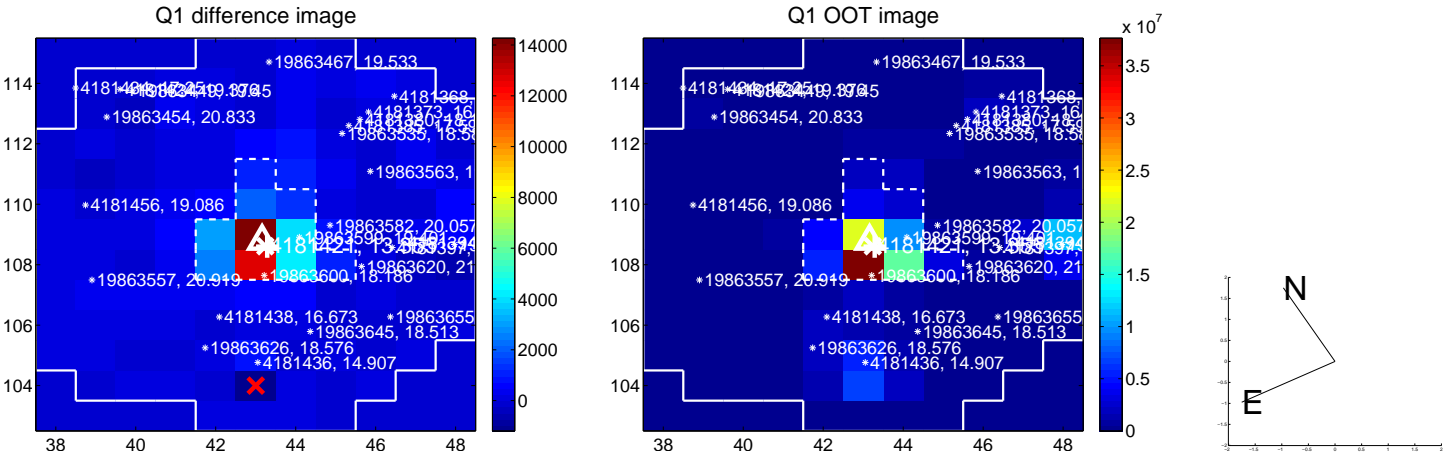
The direct PRF centroid is offset from the target star catalog position by about 0.26 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.150 ± 0.118	1.27	-0.089 ± 0.084	0.120 ± 0.134
PRF-fit source offset from KIC position	0.076 ± 0.130	0.59	-0.023 ± 0.094	-0.073 ± 0.133
photometric centroid source offset	3.02 ± 0.99	3.06	-2.50 ± 0.94	1.70 ± 1.10

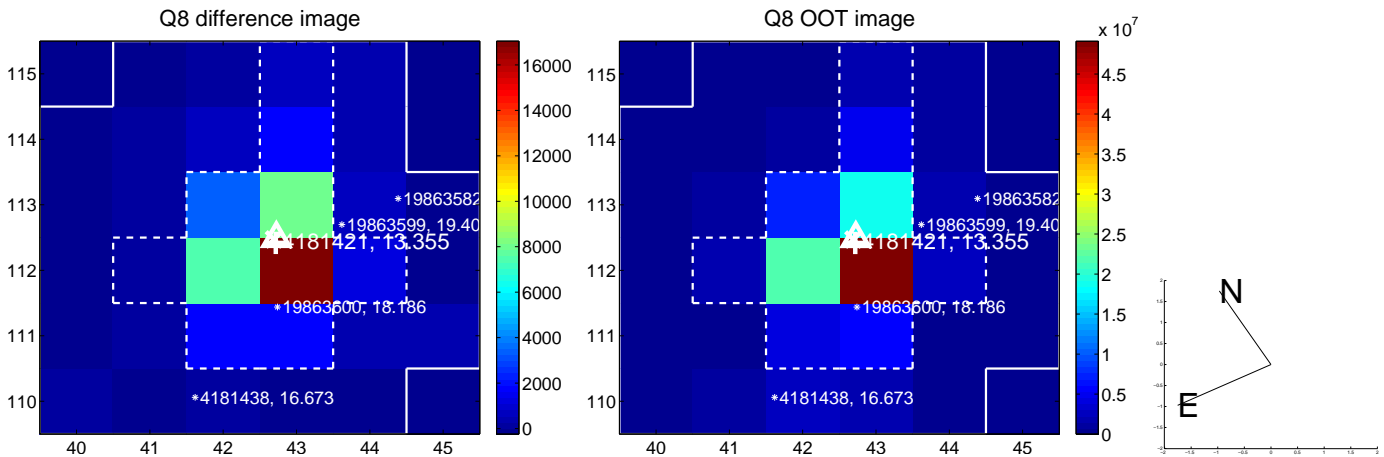
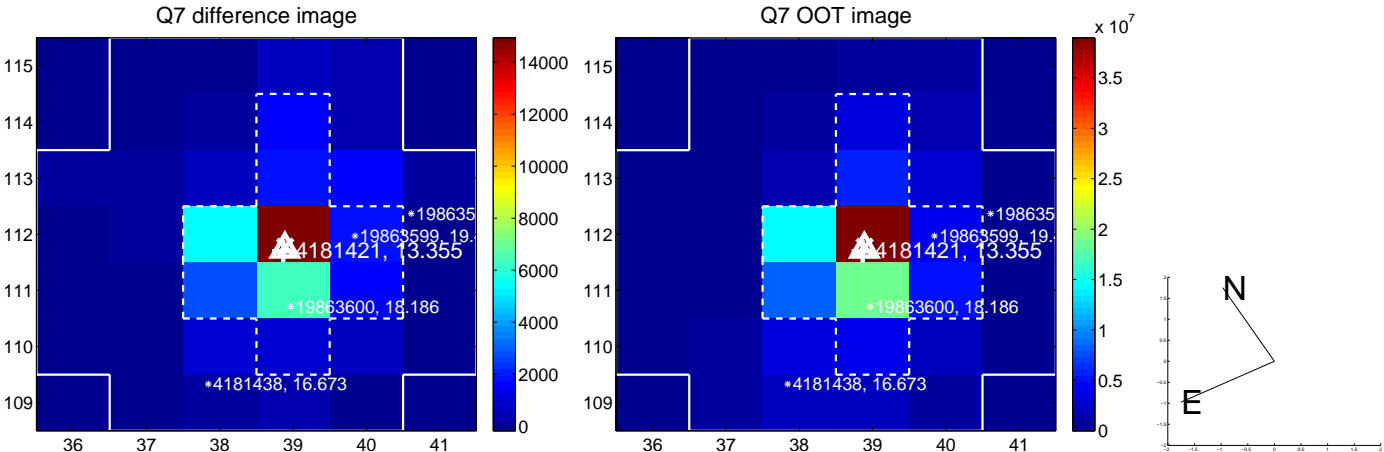
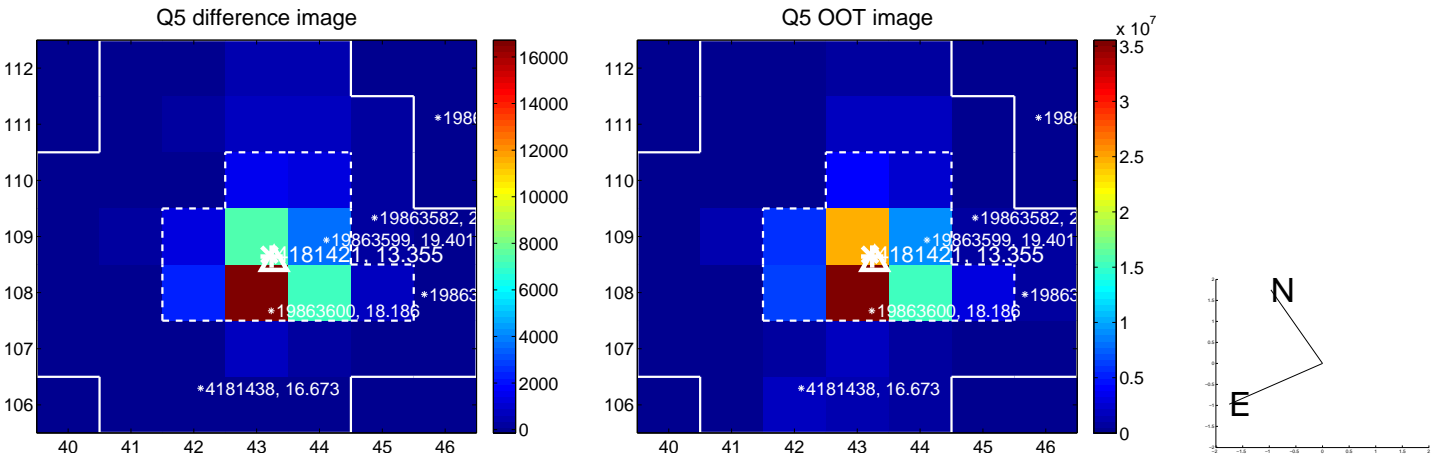


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. **Sky blue crosses: good quarterly centroid offsets**; **Vermillion crosses: bad quarterly centroid offsets**; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three-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

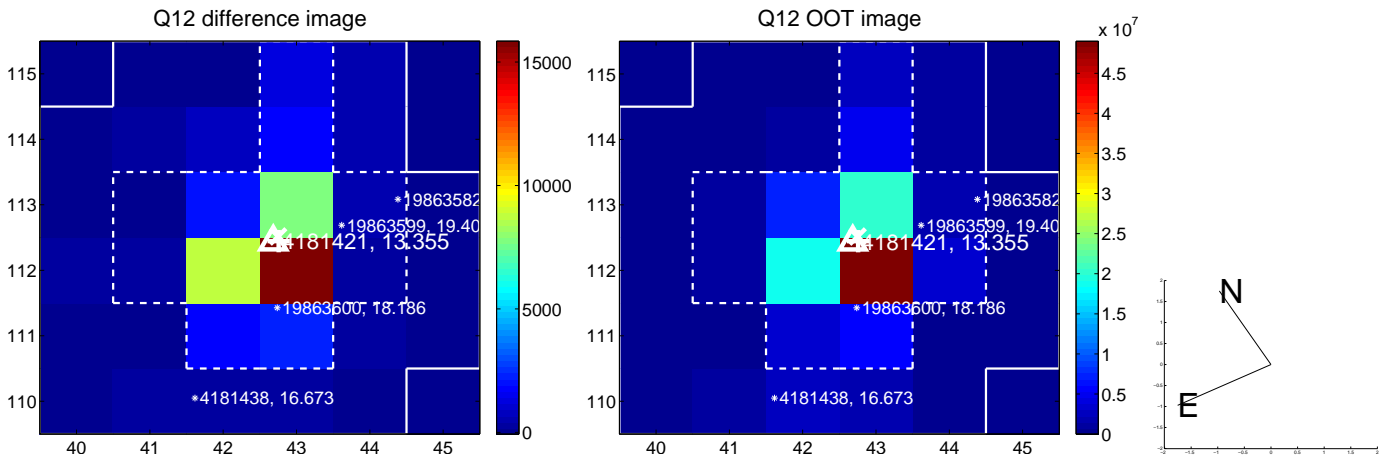
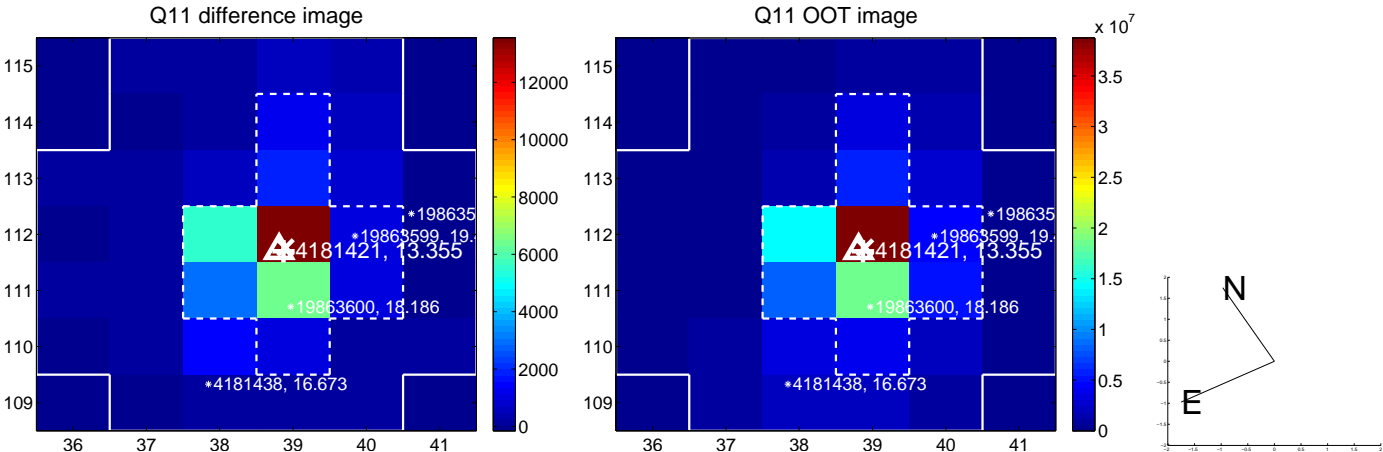
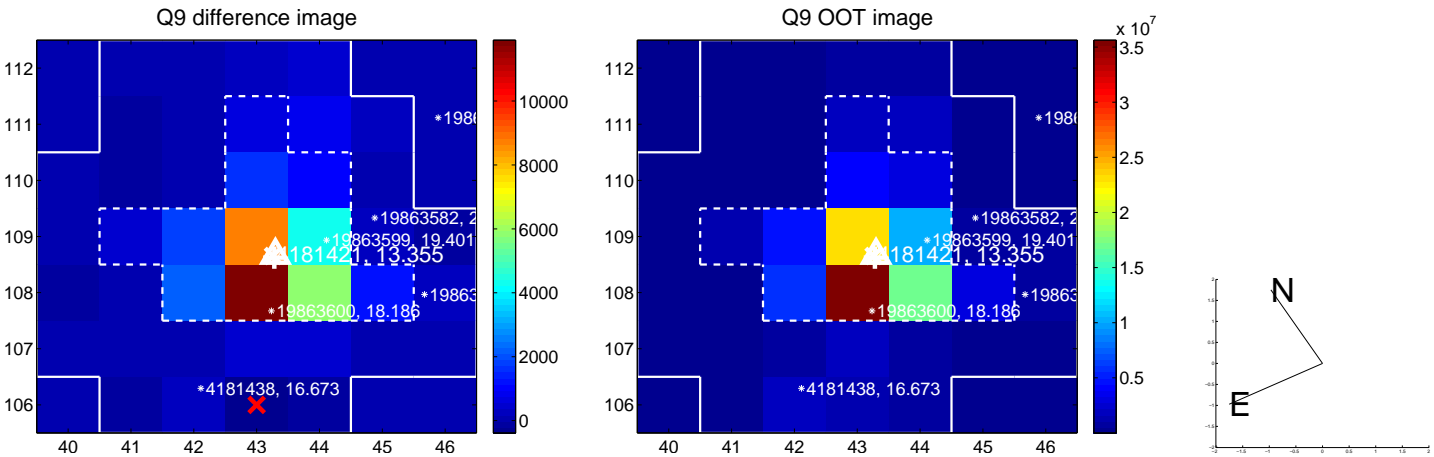
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



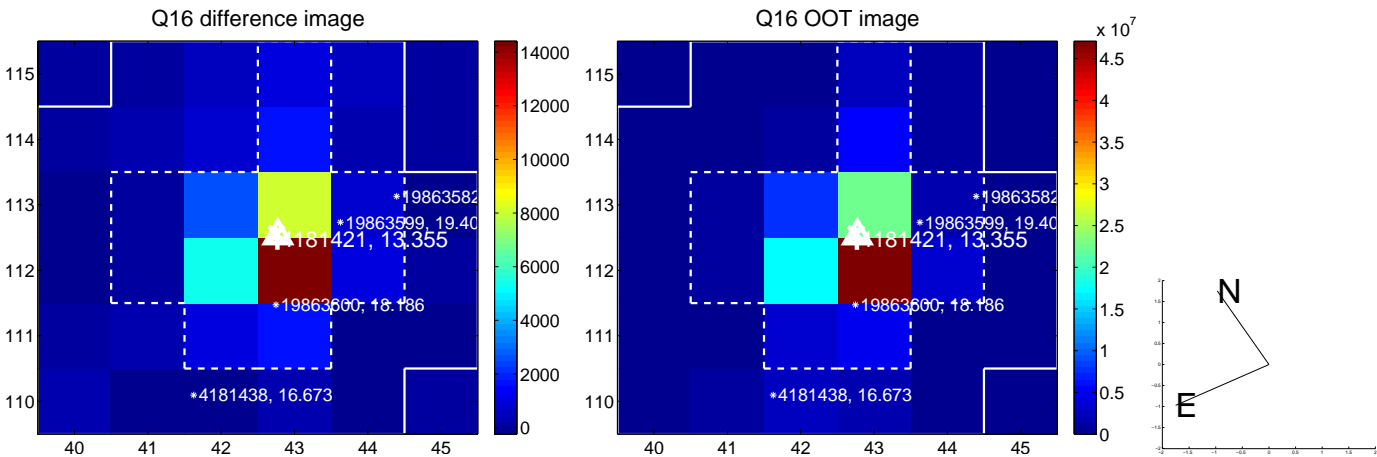
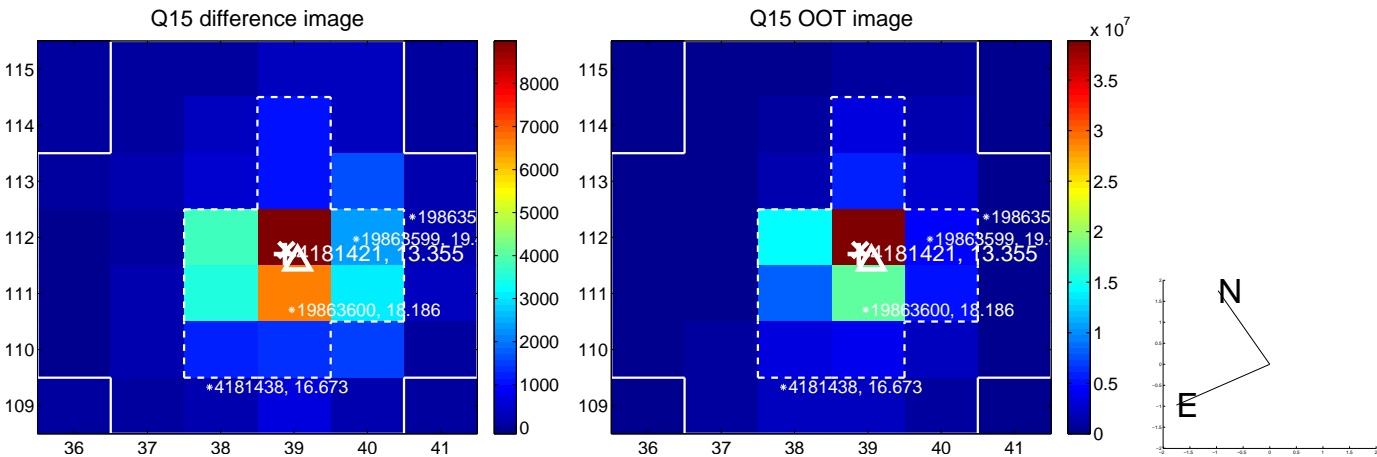
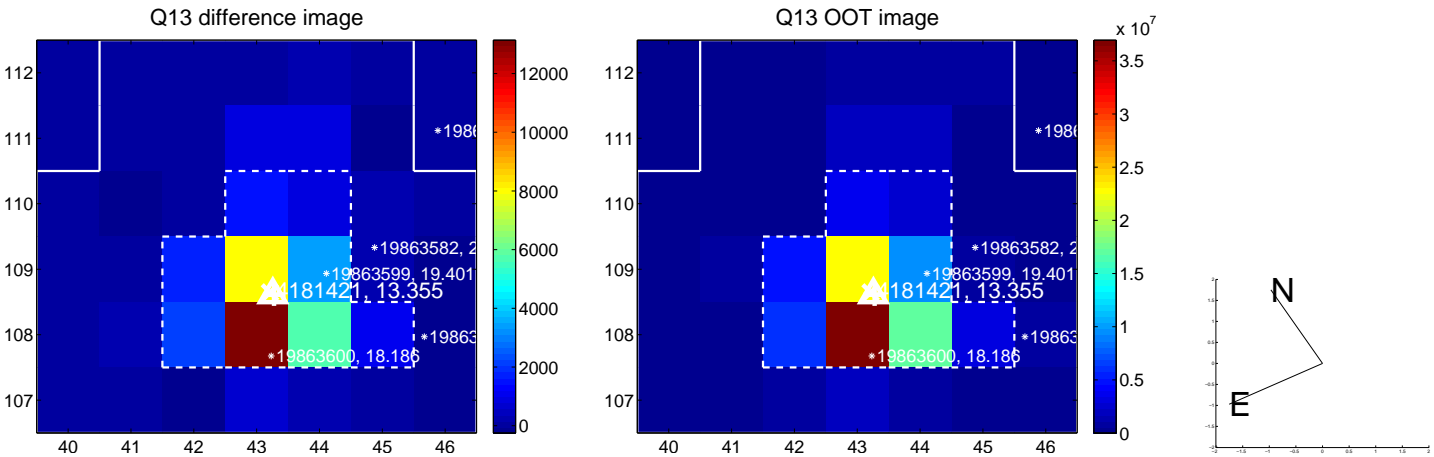
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

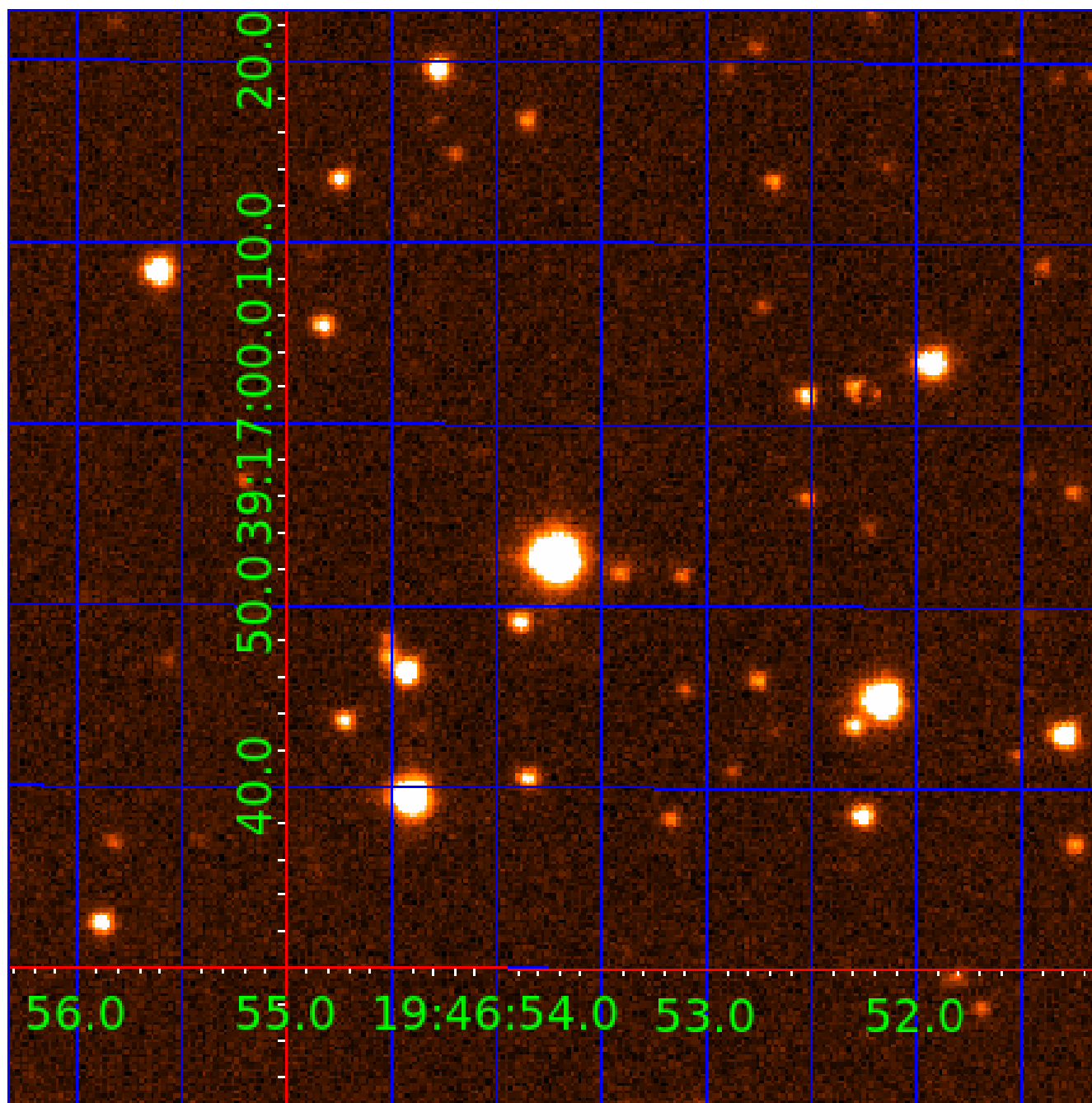


white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004181421

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})
004181421-01	OBS	No	2.258952	132.464718	26.9	10.657	10.7	10.7	2.01	6856	1.21	6651.35
004181421-02	OBS	No	350.126643	188.183209	184.6	13.159	9.7	7.0	2.01	6856	3.10	7.99
004181421-03	OBS	No	72.261619	168.223281	152.3	8.186	8.5	7.7	2.01	6856	2.75	65.50

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004181421-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
004181421-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004181421-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

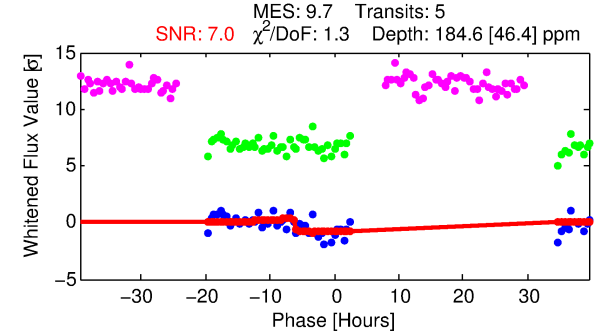
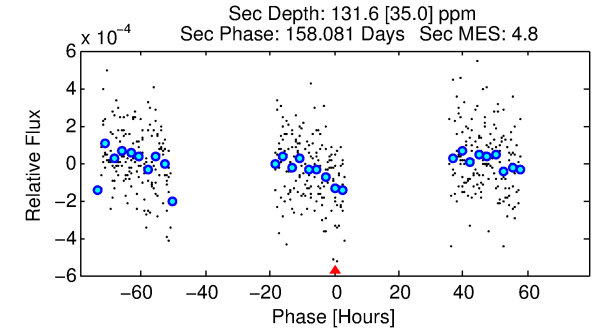
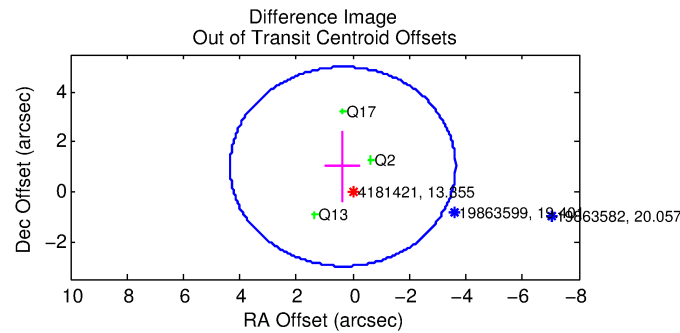
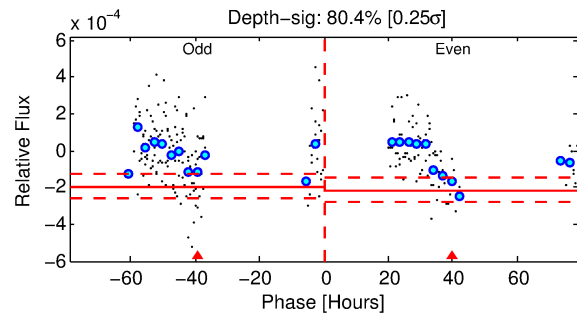
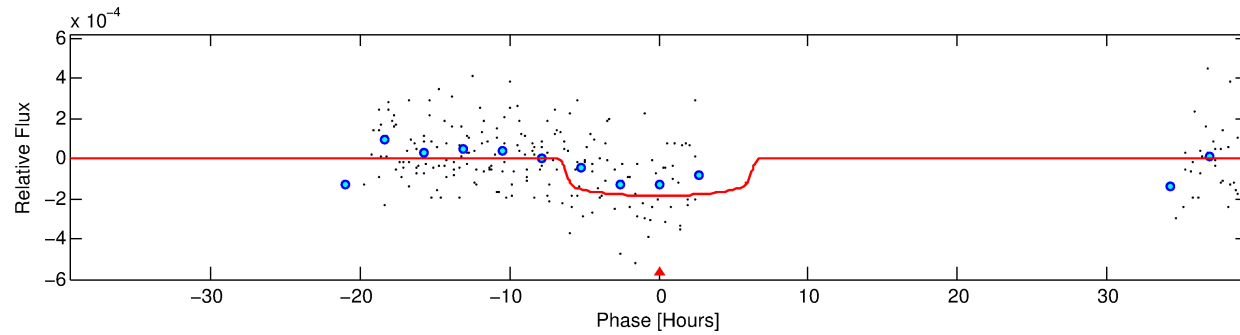
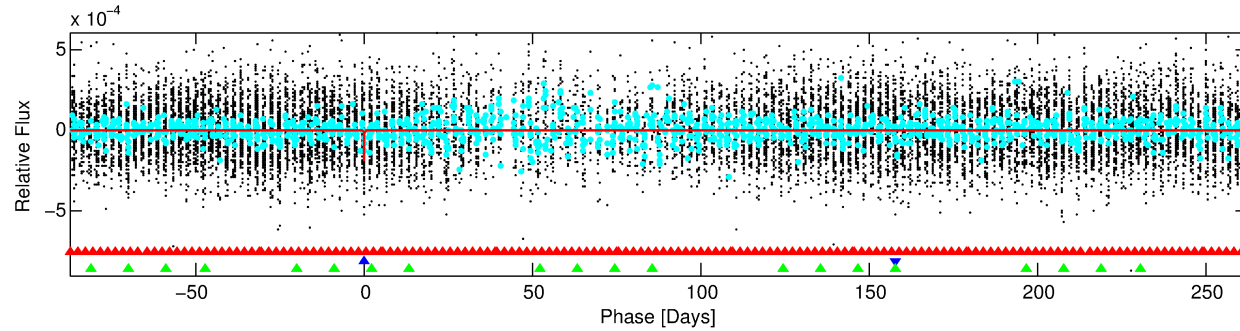
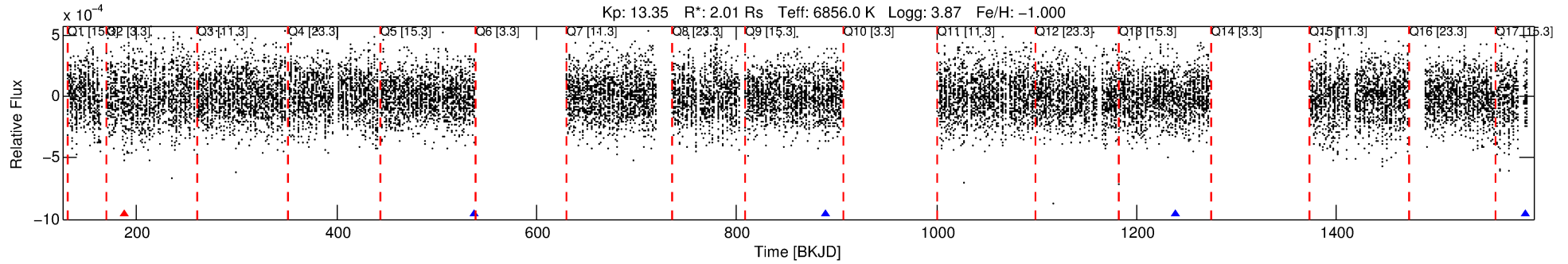
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004181421-02

No Significant Match Found

DV One-Page Summary

KIC: 4181421 Candidate: 2 of 3 Period: 350.127 d



DV Fit Results:

Period = 350.12664 [0.01074] d
Epoch = 188.1832 [0.1437] BKJD
Rp/R* = 0.0141 [0.0039]
a/R* = 108.74 [175.44]
b = 0.86 [0.61]
Seff = 7.99 [6.97]
Teq = 429 [93] K
Rp = 3.10 [1.68] Re
a = 1.0010 [0.5059] AU
Ag = 7561.04 [7989.47] [0.95 σ]
Teffp = 6181 [991] K [5.78 σ]

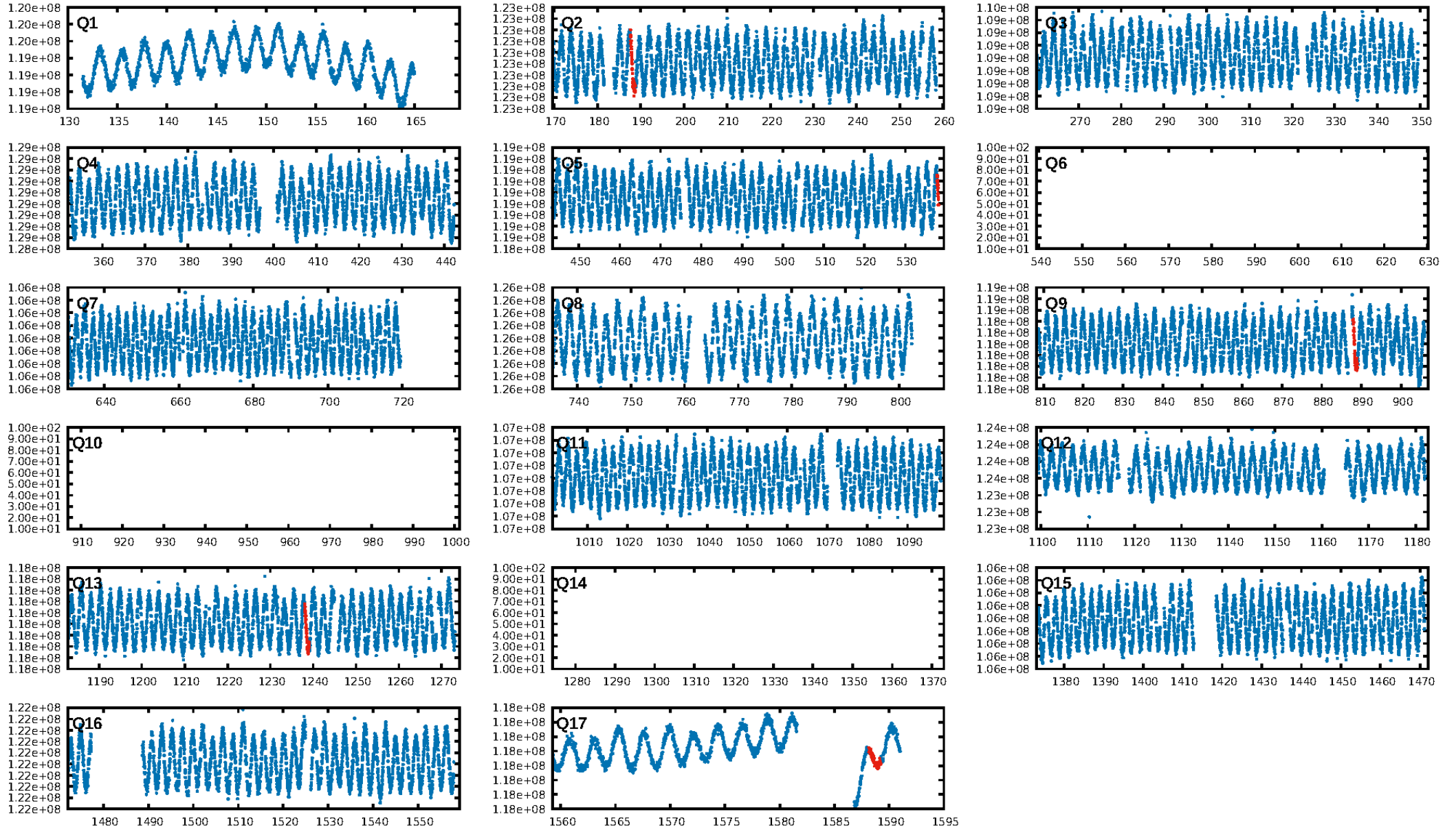
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [430.32 σ]
LongPeriod-sig: N/A
ModelChiSquare2-sig: 4.5%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.79e-11
RollingBand-fgt: 0.75 [3/4]
GhostDiagnostic-chr: 0.9029
Centroid-sig: N/A
Centroid-so: 0.833 arcsec [0.66 σ]
OotOffset-rm: 1.067 arcsec [0.80 σ]
KicOffset-rm: 0.815 arcsec [0.62 σ]
OotOffset-st: 1/0/0/2 [3]
KicOffset-st: 1/0/0/2 [3]
DiffImageQuality-fgm: 0.67 [2/3]
DiffImageOverlap-fno: 0.00 [0/3]

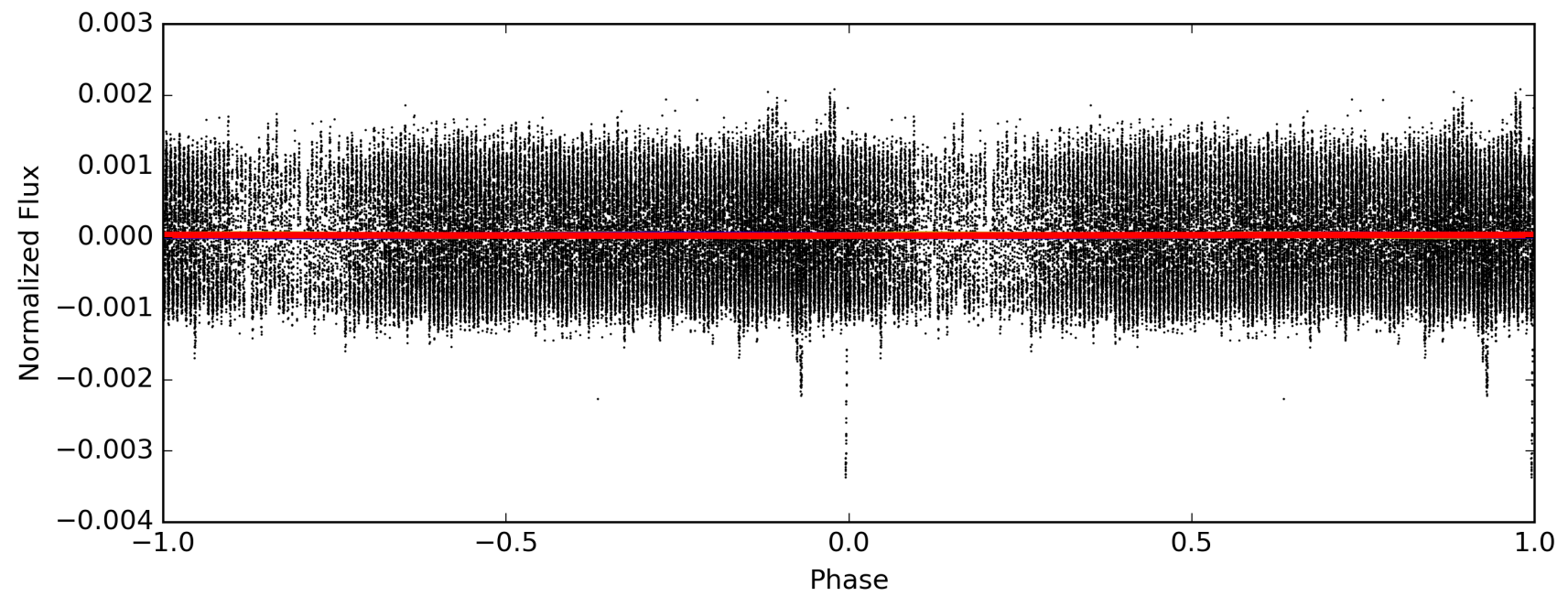
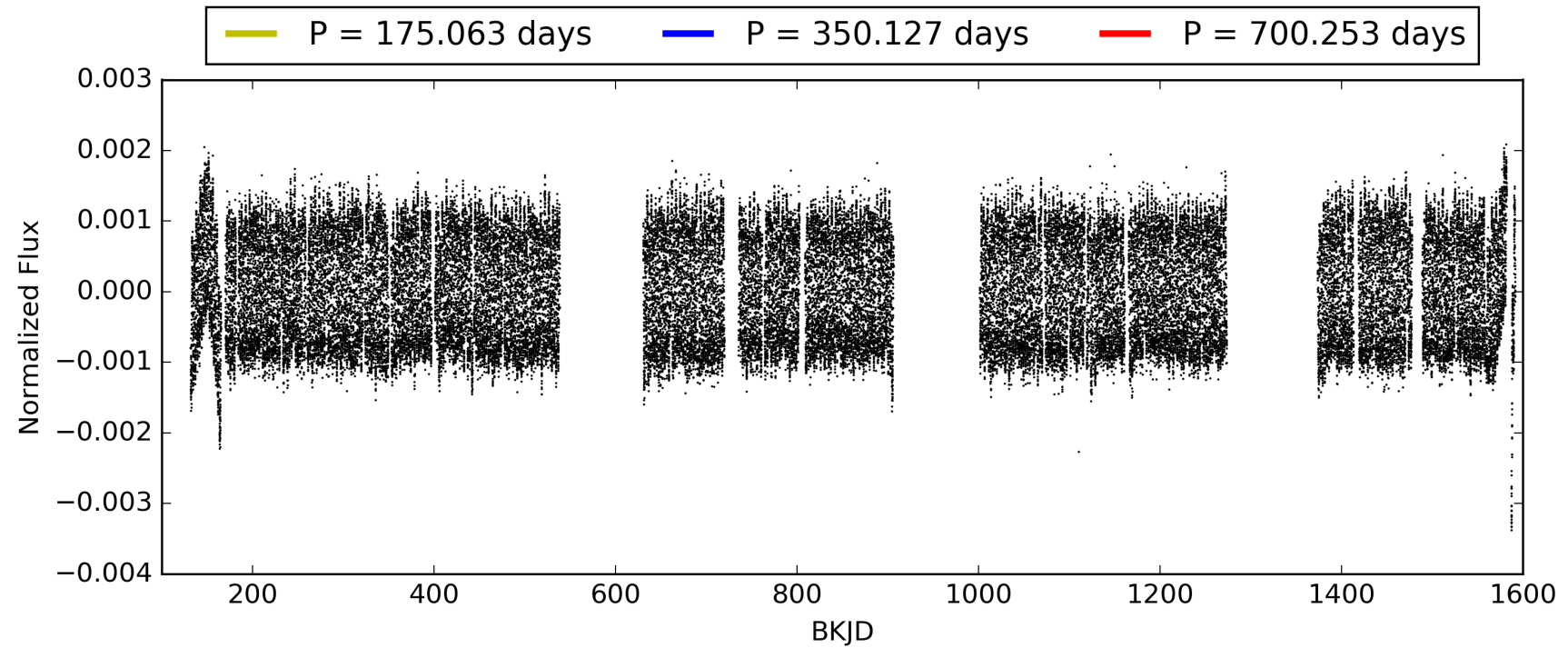
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 07:09:56 Z

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

TCE 004181421-02, PDC Light Curves

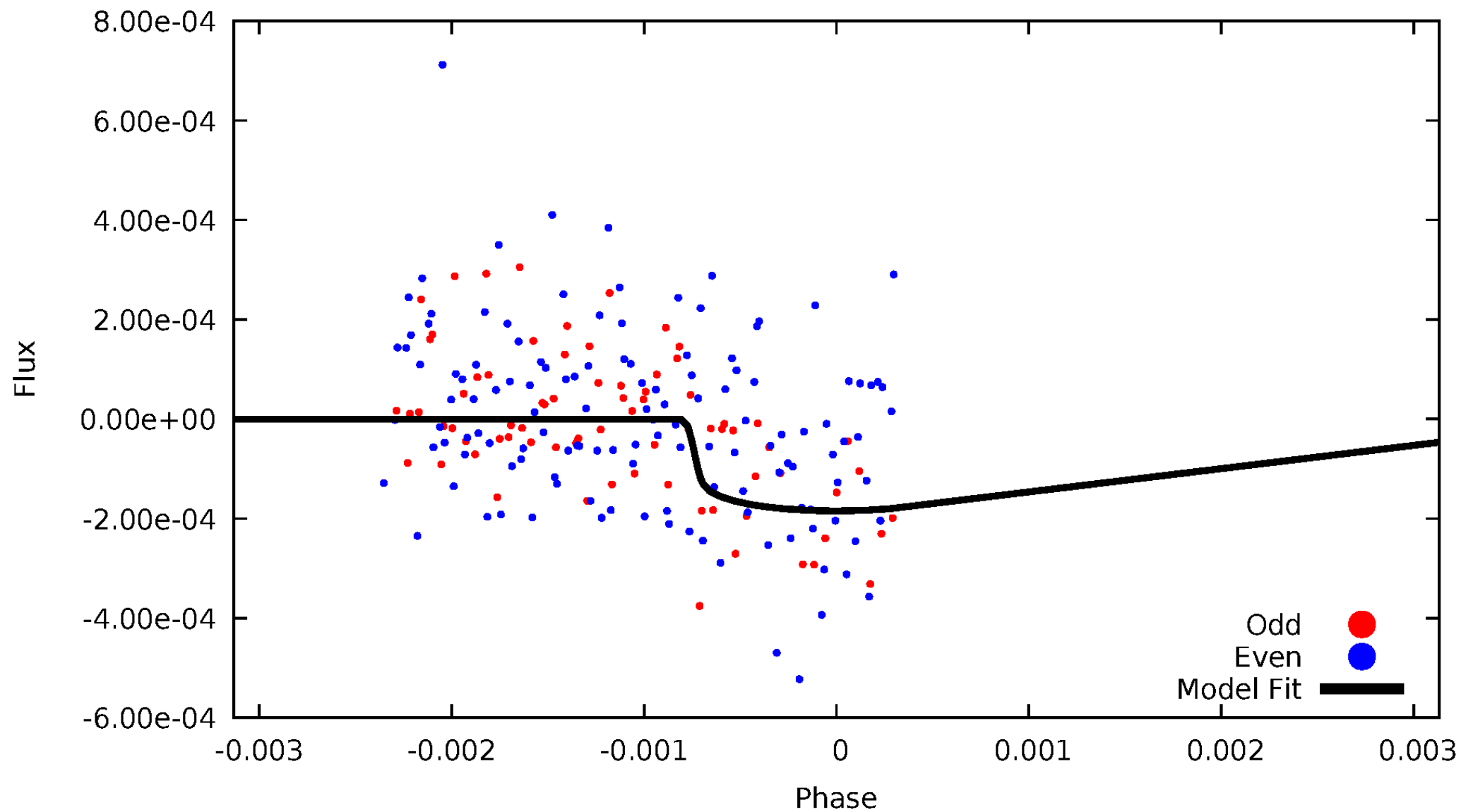


TCE 004181421-02



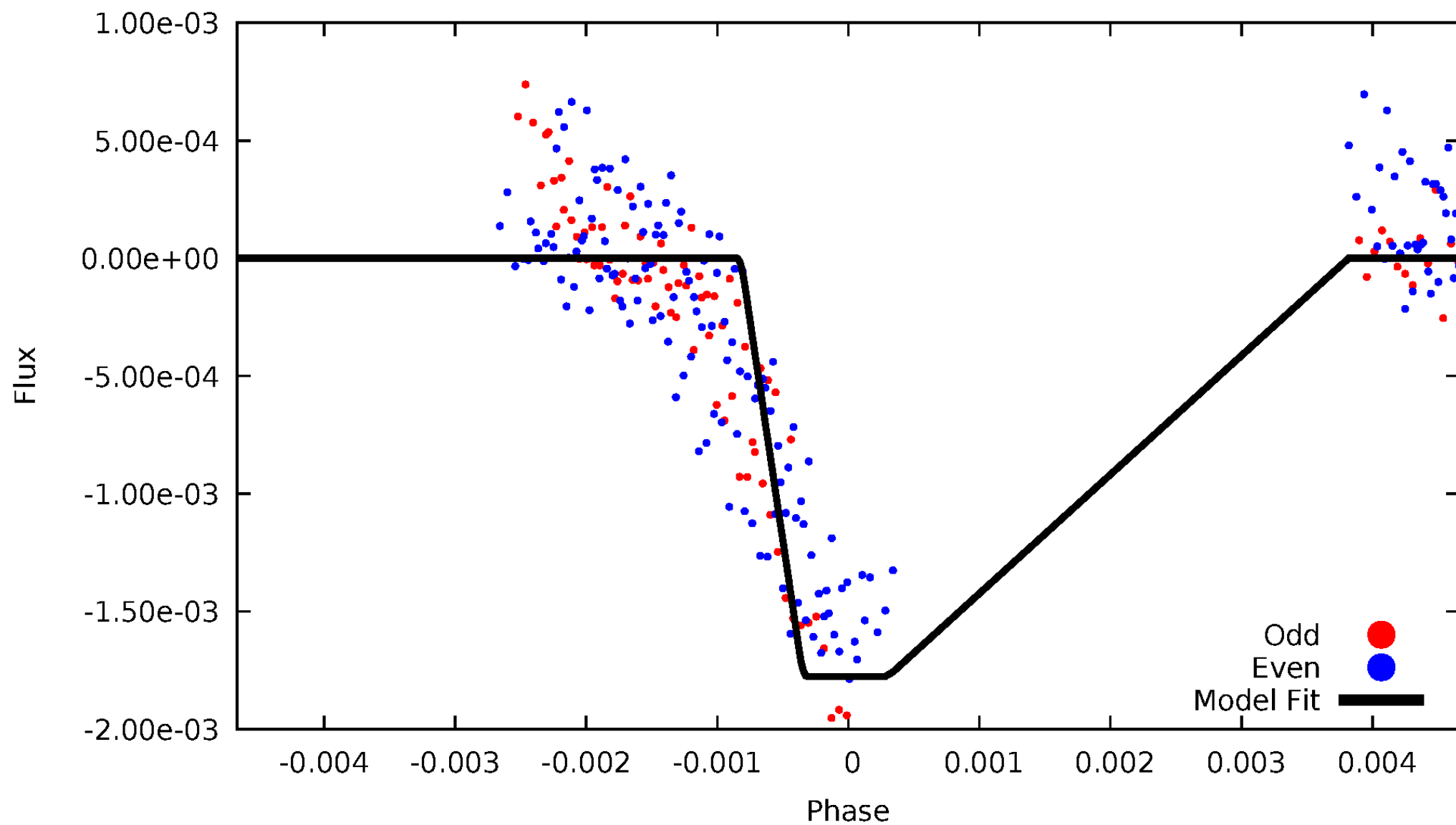
DV Odd/Even

TCE 004181421-02



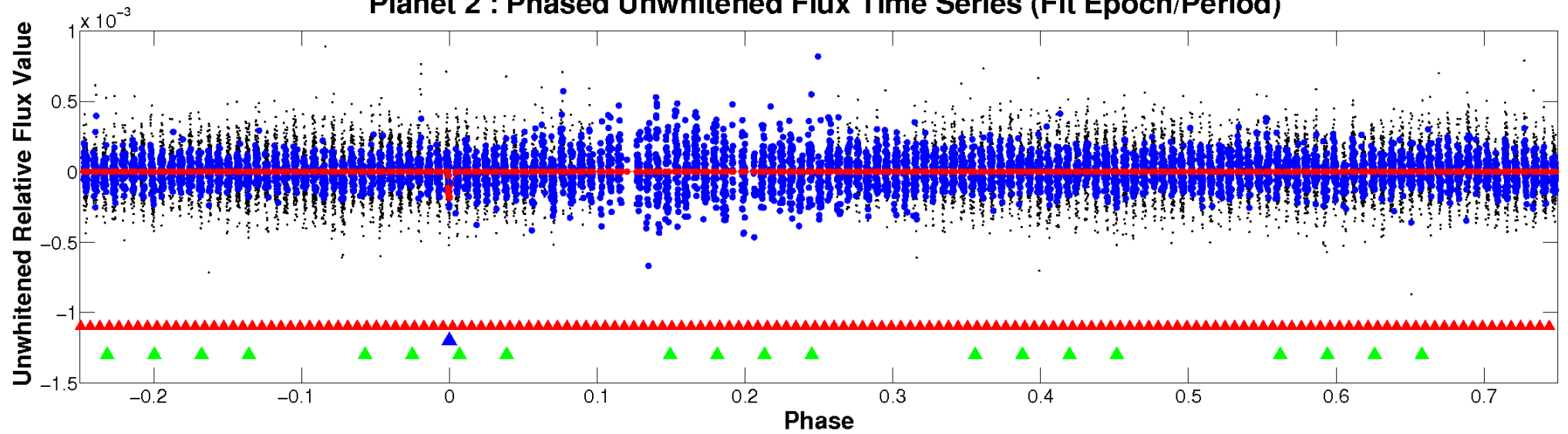
ALT Odd/Even

TCE 004181421-02

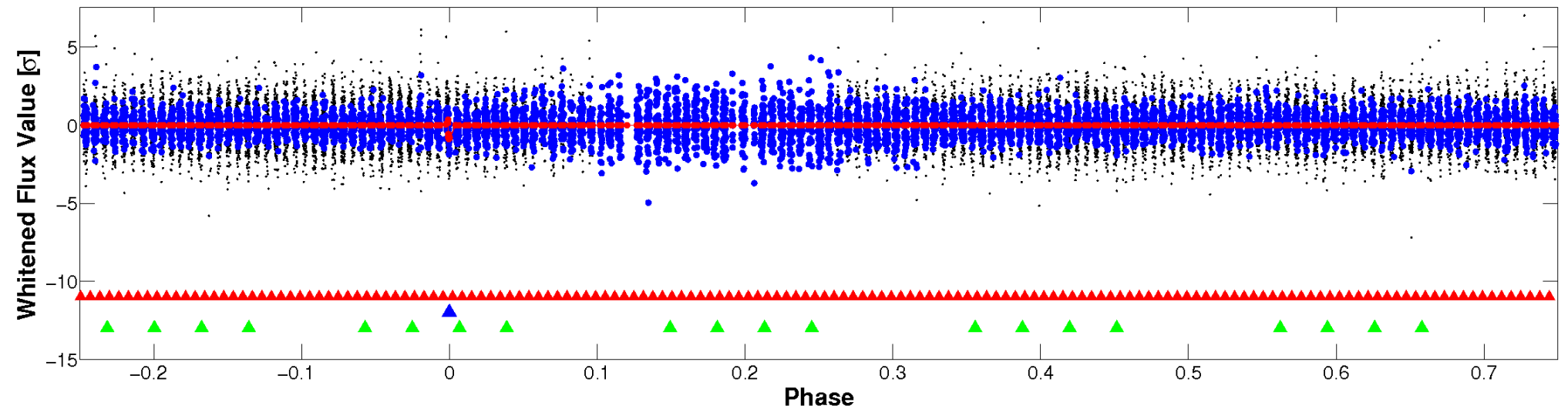


Non-Whitened Vs. Whitened Light Curve

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

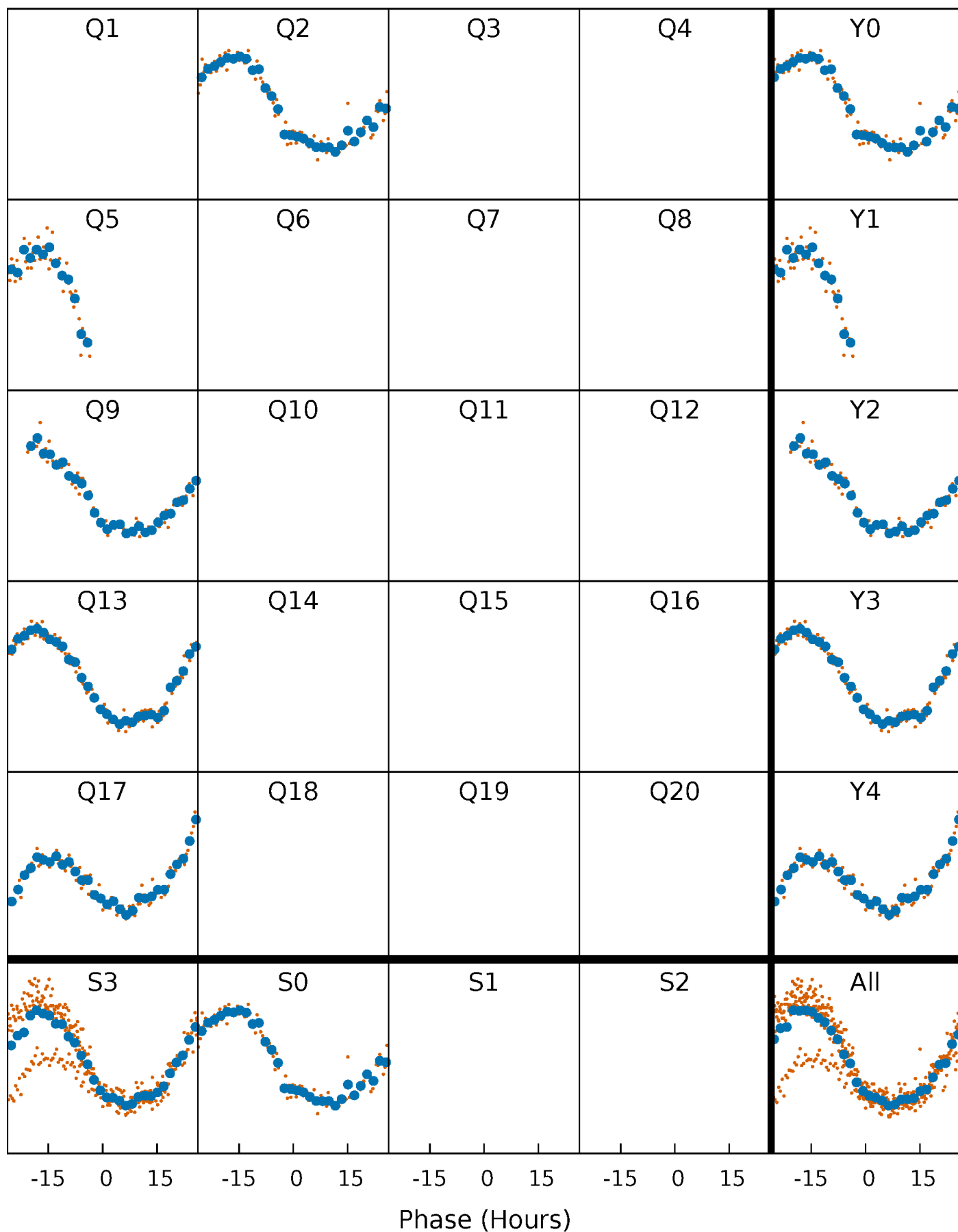


Planet 2 : Phased Whitened Flux Time Series (Fit Epoch/Period)



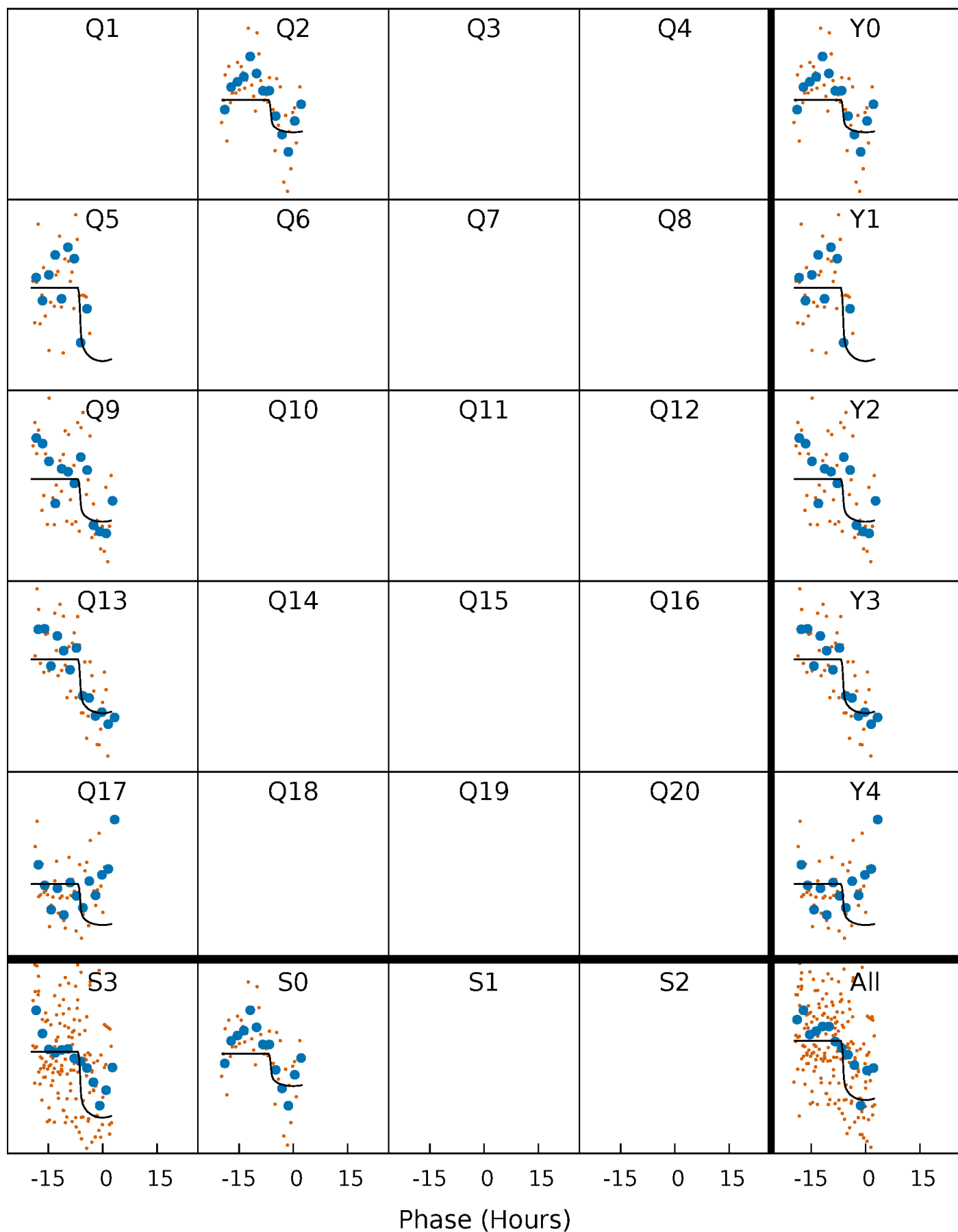
PDC Quarter-Phased Transit Curves

TCE 004181421-02 P=350.126643 Days $T_0=188.183209$ (BKJD)



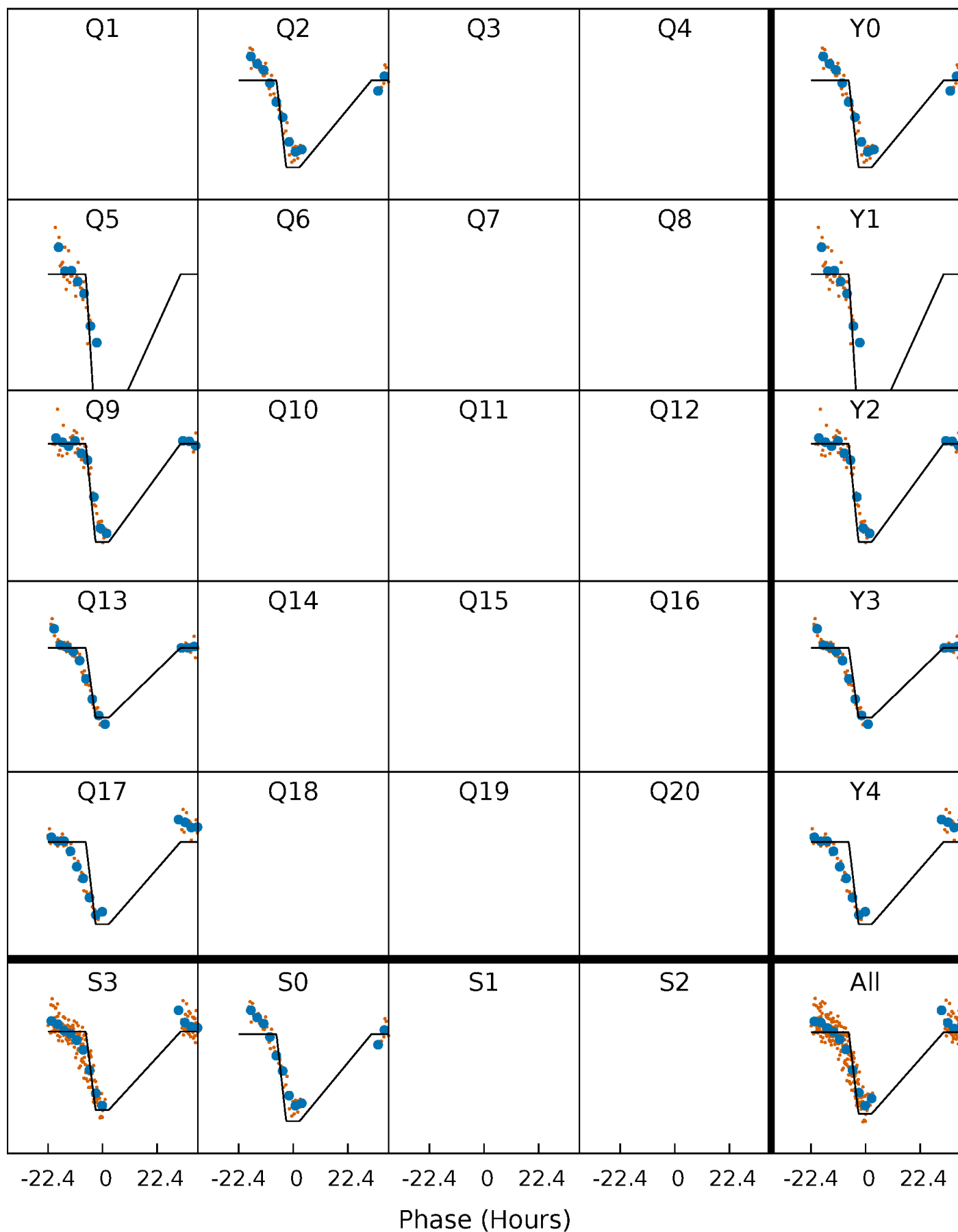
DV Quarter-Phased Transit Curves

TCE 004181421-02 P=350.126643 Days $T_0=188.183209$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

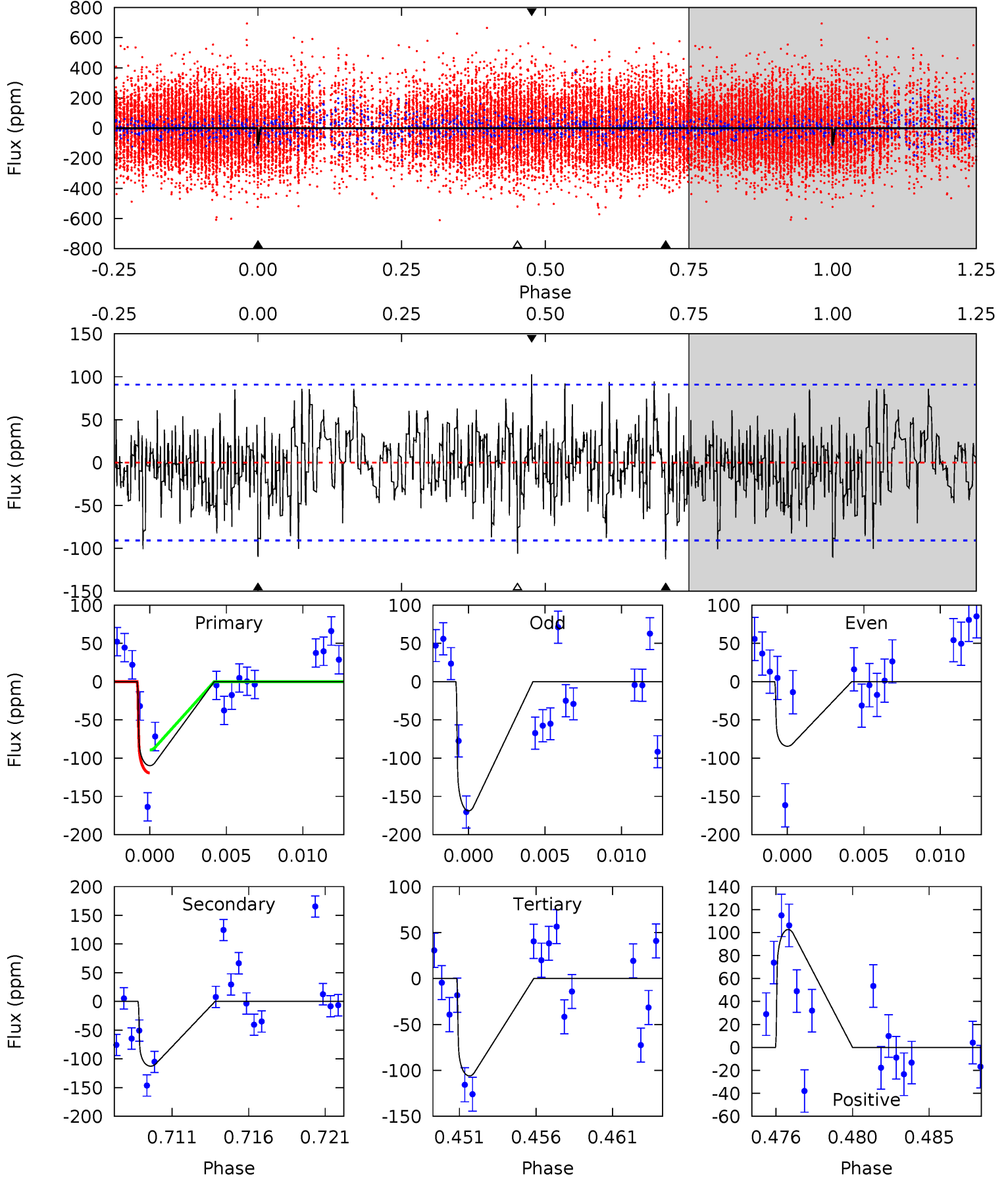
TCE 004181421-02 P=350.176729 Days $T_0=188.139461$ (BKJD)



DV Model-Shift Uniqueness Test

004181421-02, P = 350.126643 Days, E = 188.183209 Days

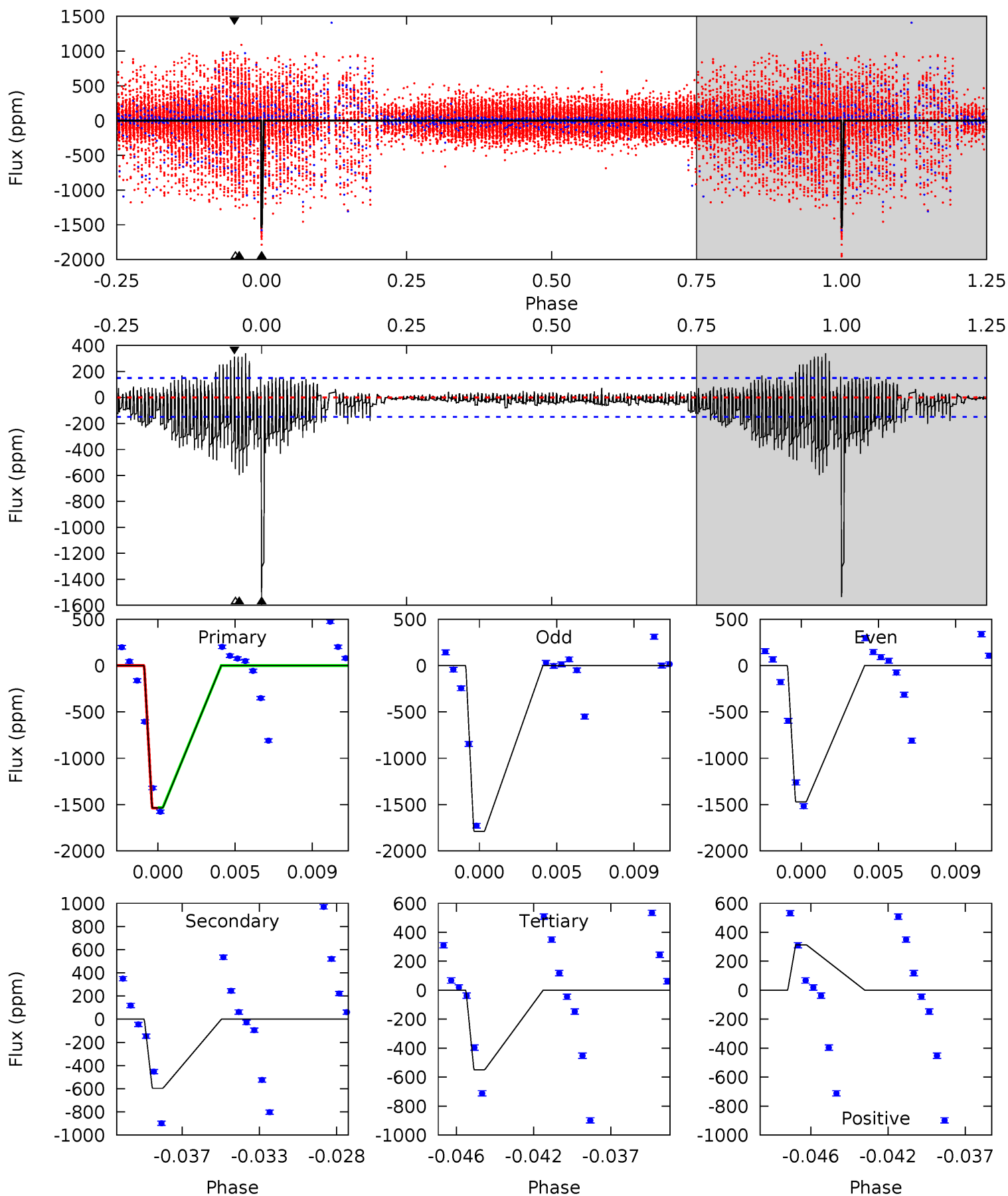
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.24	6.41	6.03	5.84	5.16	2.81	1.79	0.21	0.41	0.38	0.57	2.28	0.89	0.48	0.74



Alt Model-Shift Uniqueness Test

004181421-02, P = 350.176729 Days, E = 188.139461 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
53.2	20.6	19.0	10.9	5.17	2.83	3.01	34.2	42.3	1.60	9.78	5.11	1.05	0.18	0.06



Stellar Parameters For KIC 004181421

	$T_{\text{eff}}(K)$	$\log(g)$	[Fe/H]	R (R_{\odot})	M (M_{\odot})	p_{\star} ($\text{g}\cdot\text{cm}^{-3}$)
	6856^{+214}_{-285}	$3.869^{+0.520}_{-0.130}$	$-1.000^{+0.300}_{-0.300}$	$2.011^{+0.431}_{-0.935}$	$1.090^{+0.128}_{-0.176}$	$0.189^{+0.989}_{-0.067}$
	+3%/-4%	+13%/-3%	+30%/-30%	+21%/-46%	+12%/-16%	+524%/-35%
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 004181421-02 / KOI

Detrend	Depth (ppm)	R_p (R_{\oplus})	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-113 ± 18	$2.84^{+1.09}_{-0.99}$	581^{+49}_{-71}	5875^{+1055}_{-711}	7819^{+9834}_{-3858}
Alt.	-596 ± 29	$8.63^{+1.80}_{-2.18}$	578^{+49}_{-74}	5235^{+248}_{-251}	4426^{+3459}_{-1374}

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 $A_{obs} \gg 1.0$

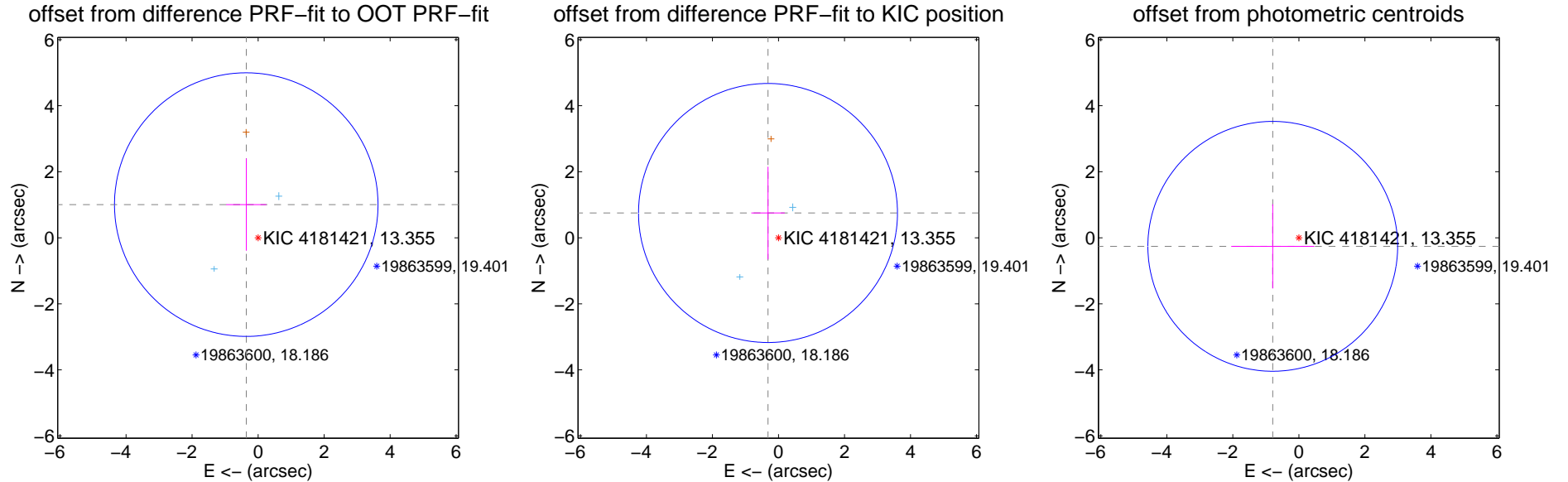
DV Centroid Data

Supplemental centroid analysis for 004181421-02. Kepler magnitude: 13.36. Transit SNR 7.03

There are 2 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.25 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	1.067 ± 1.331	0.80	0.359 ± 0.607	1.004 ± 1.396
PRF-fit source offset from KIC position	0.815 ± 1.308	0.62	0.318 ± 0.507	0.751 ± 1.404
photometric centroid source offset	0.83 ± 1.26	0.66	0.79 ± 1.26	-0.26 ± 1.28



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.

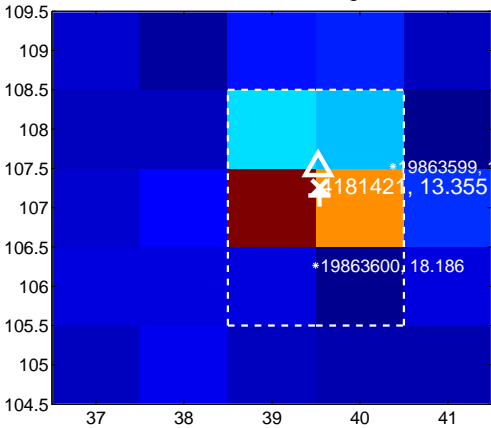
Q1 no difference image



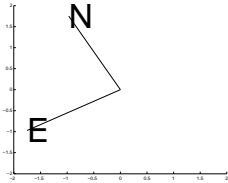
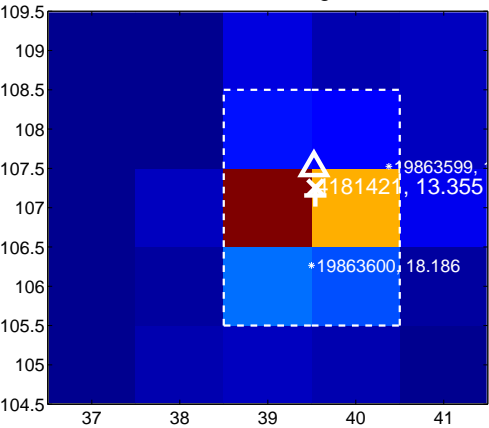
Q1 no OOT image



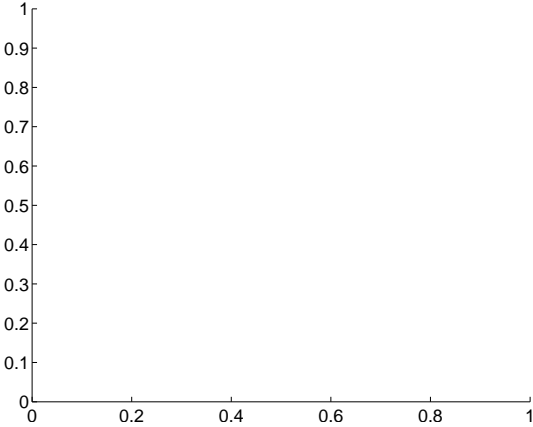
Q2 difference image



Q2 OOT image



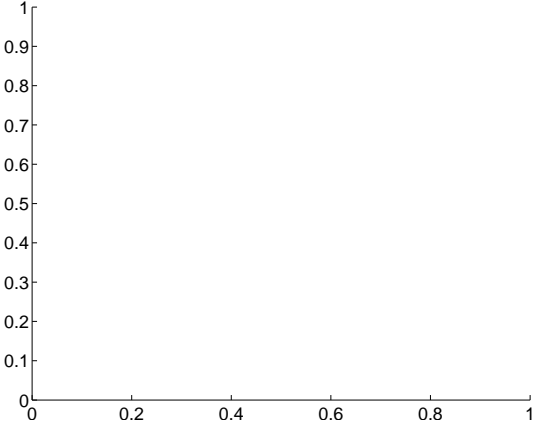
Q3 no difference image



Q3 no OOT image



Q4 no difference image



Q4 no OOT image



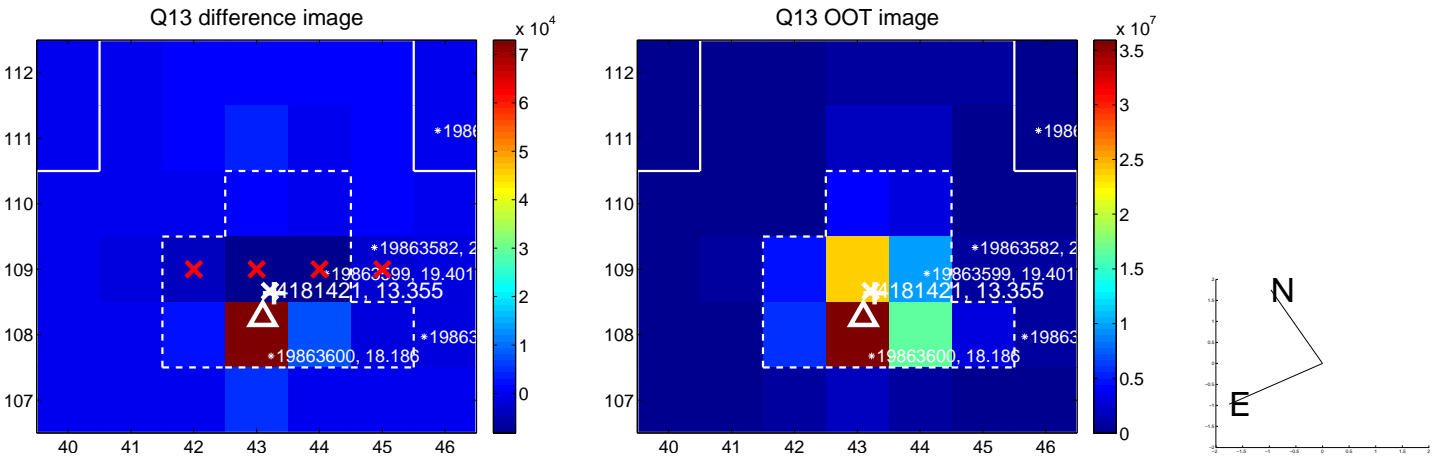
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



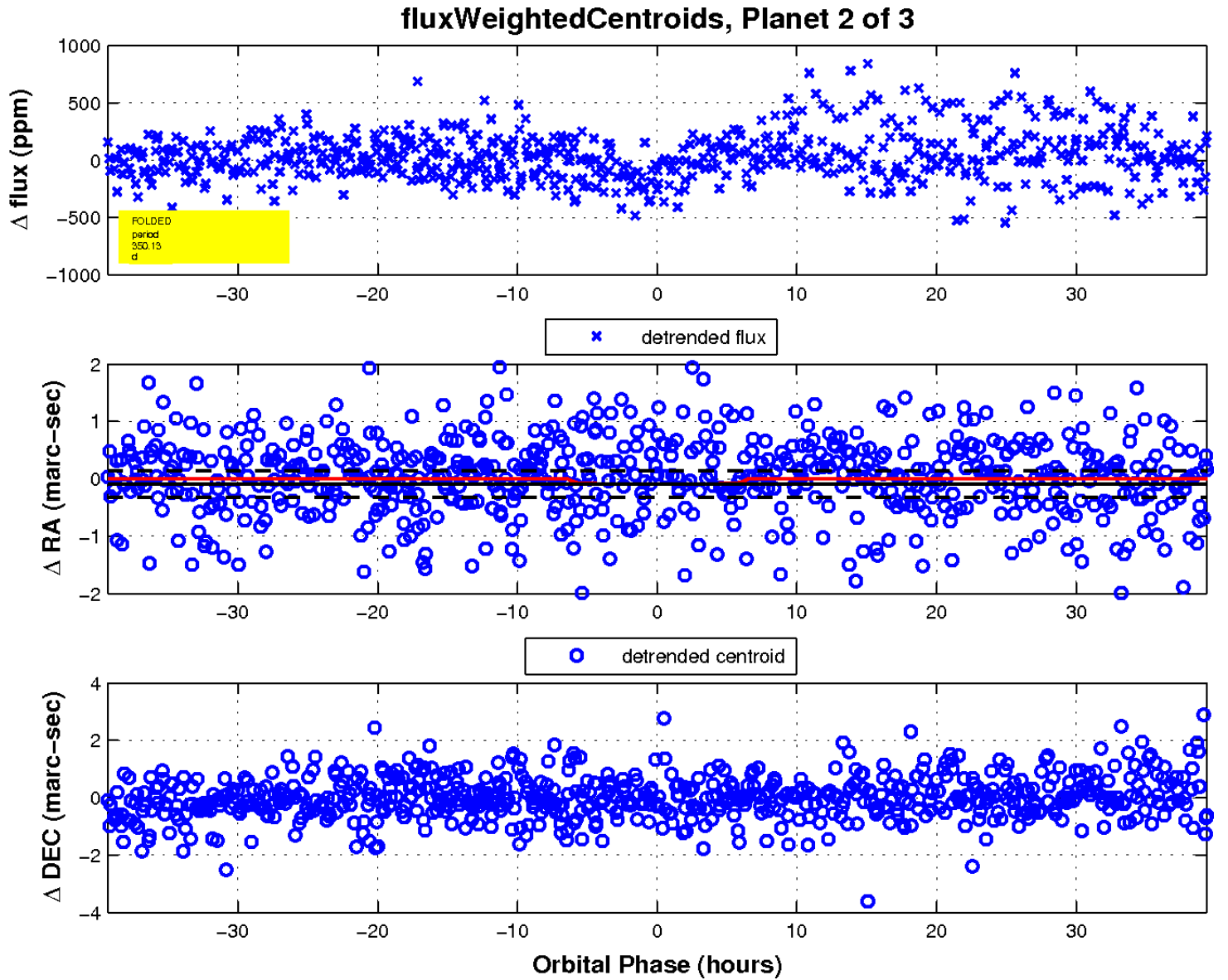
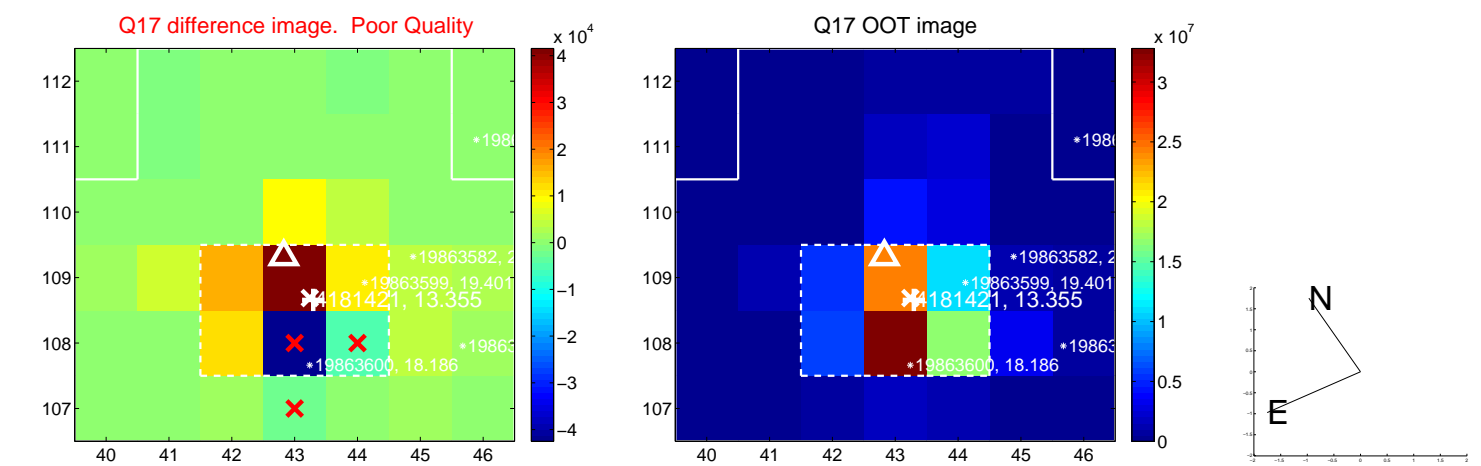
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



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

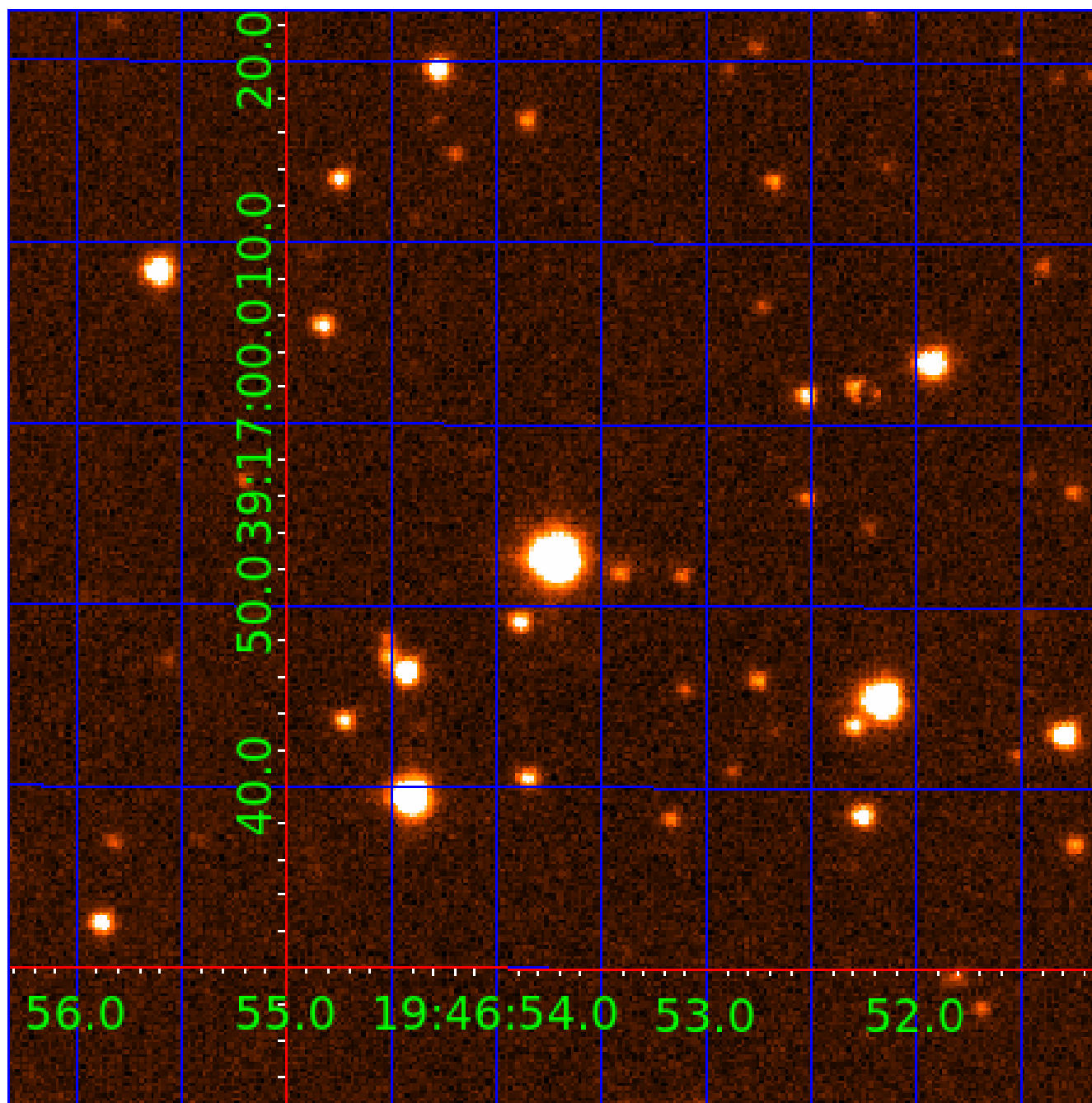


white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



UKIRT Image

Declination



KIC 004181421

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})
004181421-01	OBS	No	2.258952	132.464718	26.9	10.657	10.7	10.7	2.01	6856	1.21	6651.35
004181421-02	OBS	No	350.126643	188.183209	184.6	13.159	9.7	7.0	2.01	6856	3.10	7.99
004181421-03	OBS	No	72.261619	168.223281	152.3	8.186	8.5	7.7	2.01	6856	2.75	65.50

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
004181421-01	OBS	FP	0.00	1	0	0	0	SWEET_NTL—LPP_DV—MOD_NONUNIQ_DV
004181421-02	OBS	FP	0.00	1	0	0	0	INDIV_TRANS_RUBBLE_MARSHALL_SKYE—LPP_DV—ALL_TRANS_CHASES—MOD_NONUNIQ_DV—MOD_TER_DV—INCONSISTENT_TRANS—CENT_FEW_DIFFS
004181421-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE—TRANS_GAPPED—LPP_DV—MOD_NONUNIQ_ALT—HALO_GHOST

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

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

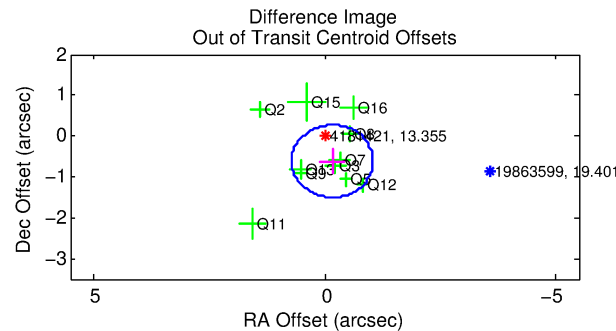
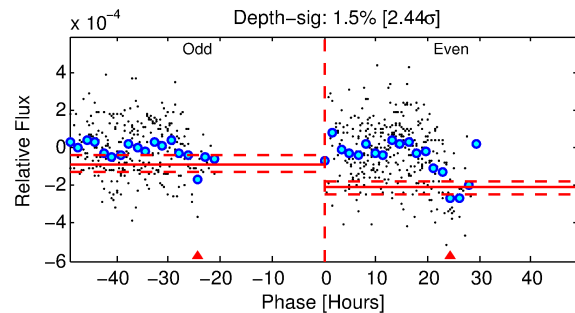
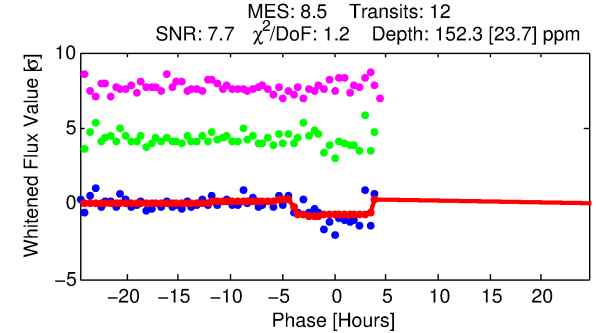
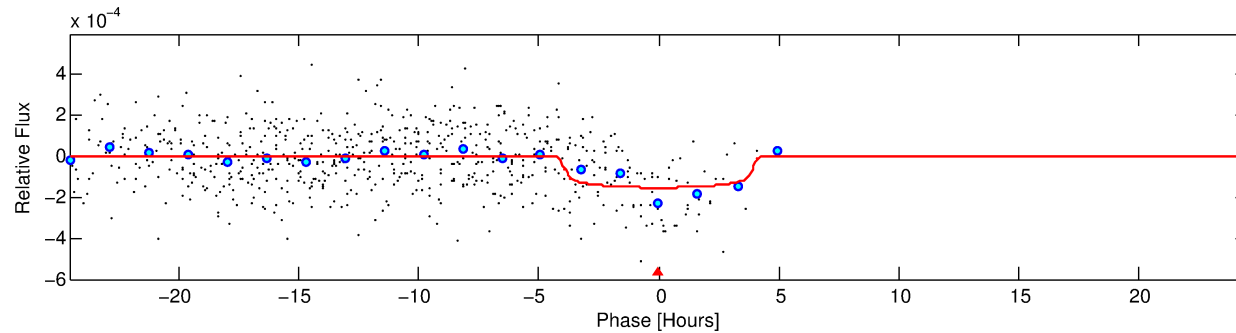
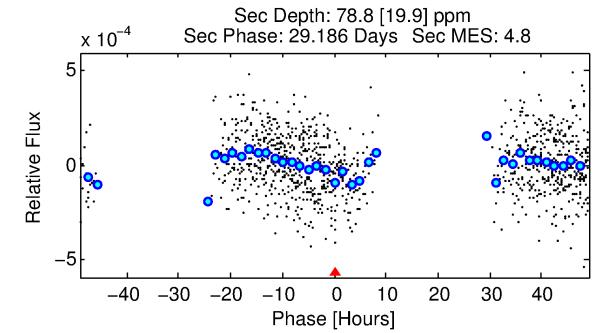
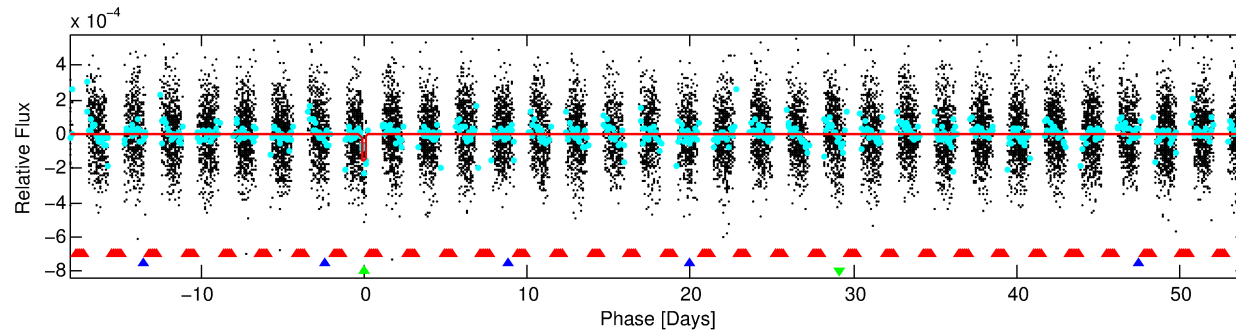
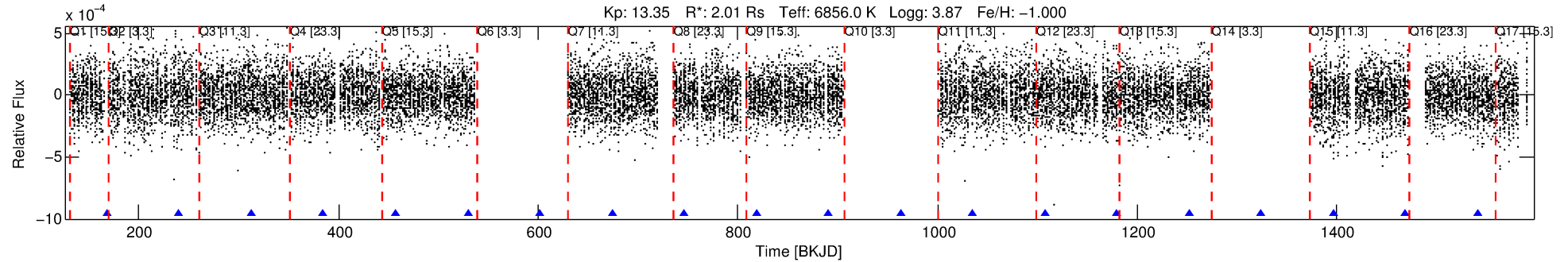
See http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col for comment definitions.

Ephemeris Match Information For 004181421-03

No Significant Match Found

DV One-Page Summary

KIC: 4181421 Candidate: 3 of 3 Period: 72.262 d



DV Fit Results:

Period = 72.26162 [0.00215] d
Epoch = 168.2233 [0.0371] BKJD
Rp/R* = 0.0125 [0.0040]
a/R* = 41.14 [74.89]
b = 0.81 [0.81]
Seff = 65.50 [57.14]
Teq = 725 [158] K
Rp = 2.75 [1.55] Re
a = 0.3496 [0.1767] AU
Ag = 702.87 [772.03] [0.91σ]
Teffp = 5775 [1022] K [4.88σ]

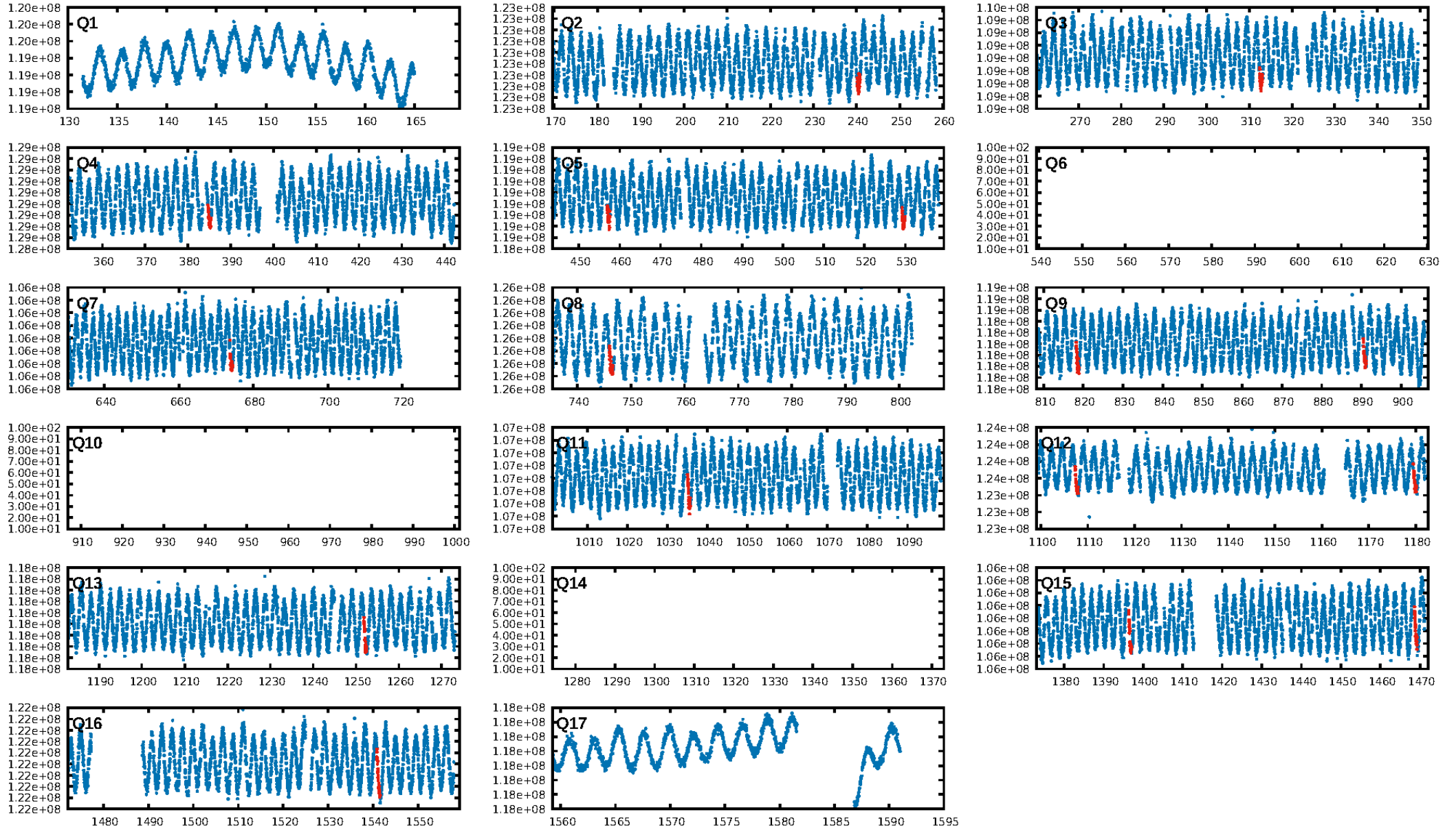
DV Diagnostic Results:

ShortPeriod-sig: 100.0% [125.02σ]
LongPeriod-sig: 100.0% [430.32σ]
ModelChiSquare2-sig: 6.7%
ModelChiSquareGof-sig: 100.0%
Bootstrap-pfa: 1.83e-12
RollingBand-fgt: 1.00 [12/12]
GhostDiagnostic-chr: 0.1764
Centroid-sig: N/A
Centroid-so: 1.174 arcsec [1.02σ]
OotOffset-rm: 0.637 arcsec [2.16σ]
KicOffset-rm: 0.832 arcsec [3.67σ]
OotOffset-st: 1/4/3/3 [11]
KicOffset-st: 1/4/3/3 [11]
DiffImageQuality-fgm: 1.00 [11/11]
DiffImageOverlap-fno: 0.00 [0/11]

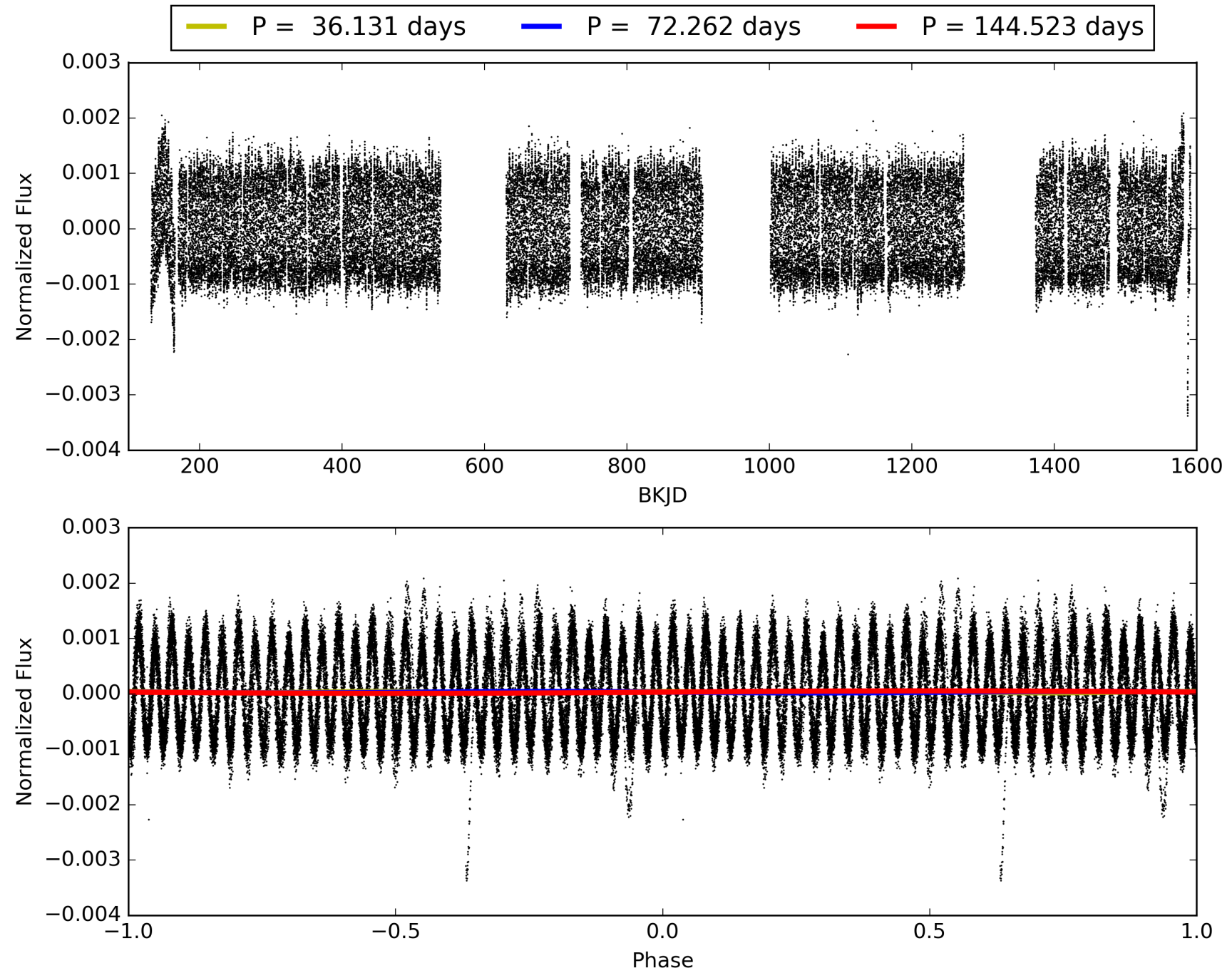
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 30-Jan-2016 07:10:00 Z

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

TCE 004181421-03, PDC Light Curves

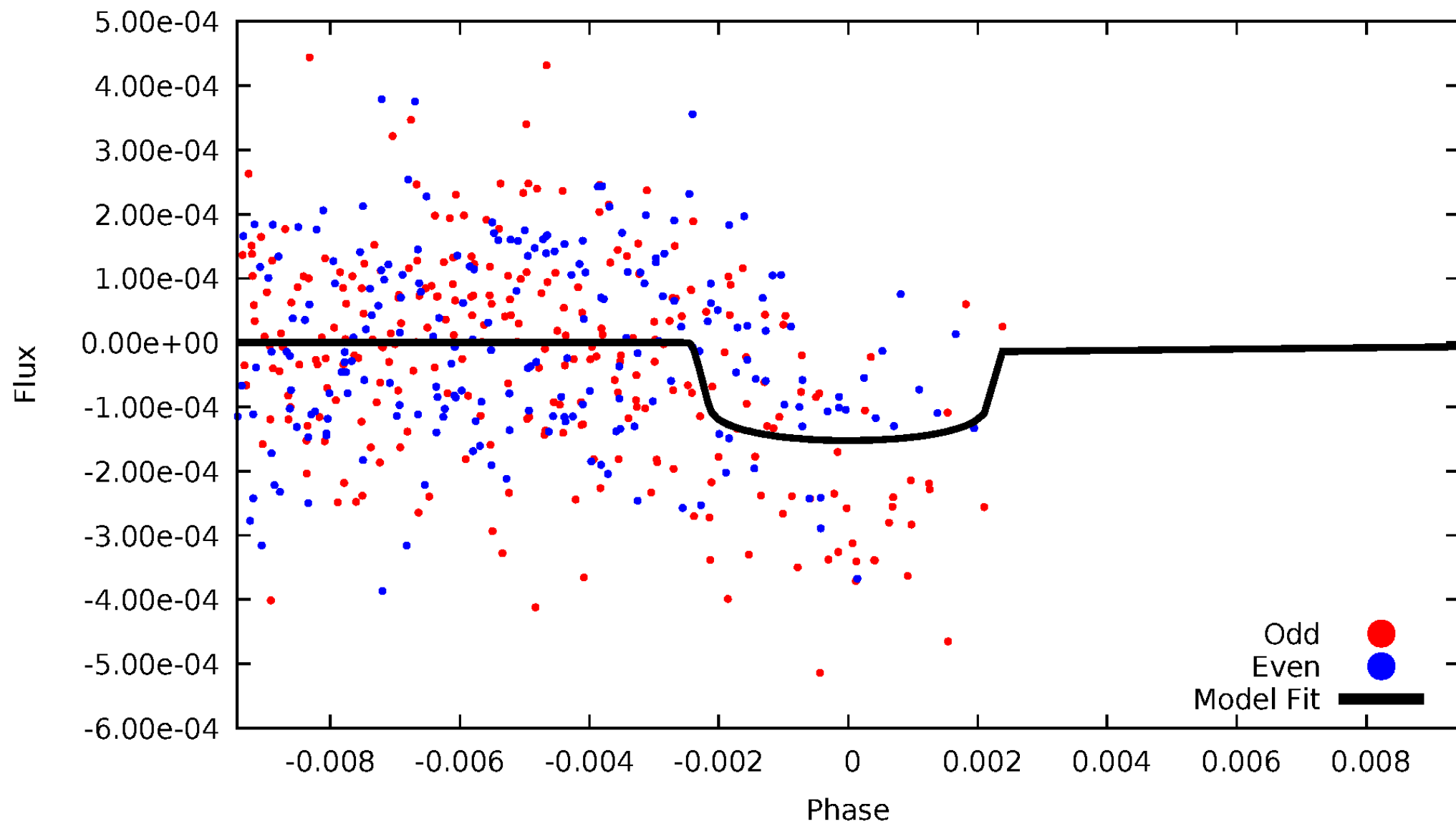


TCE 004181421-03



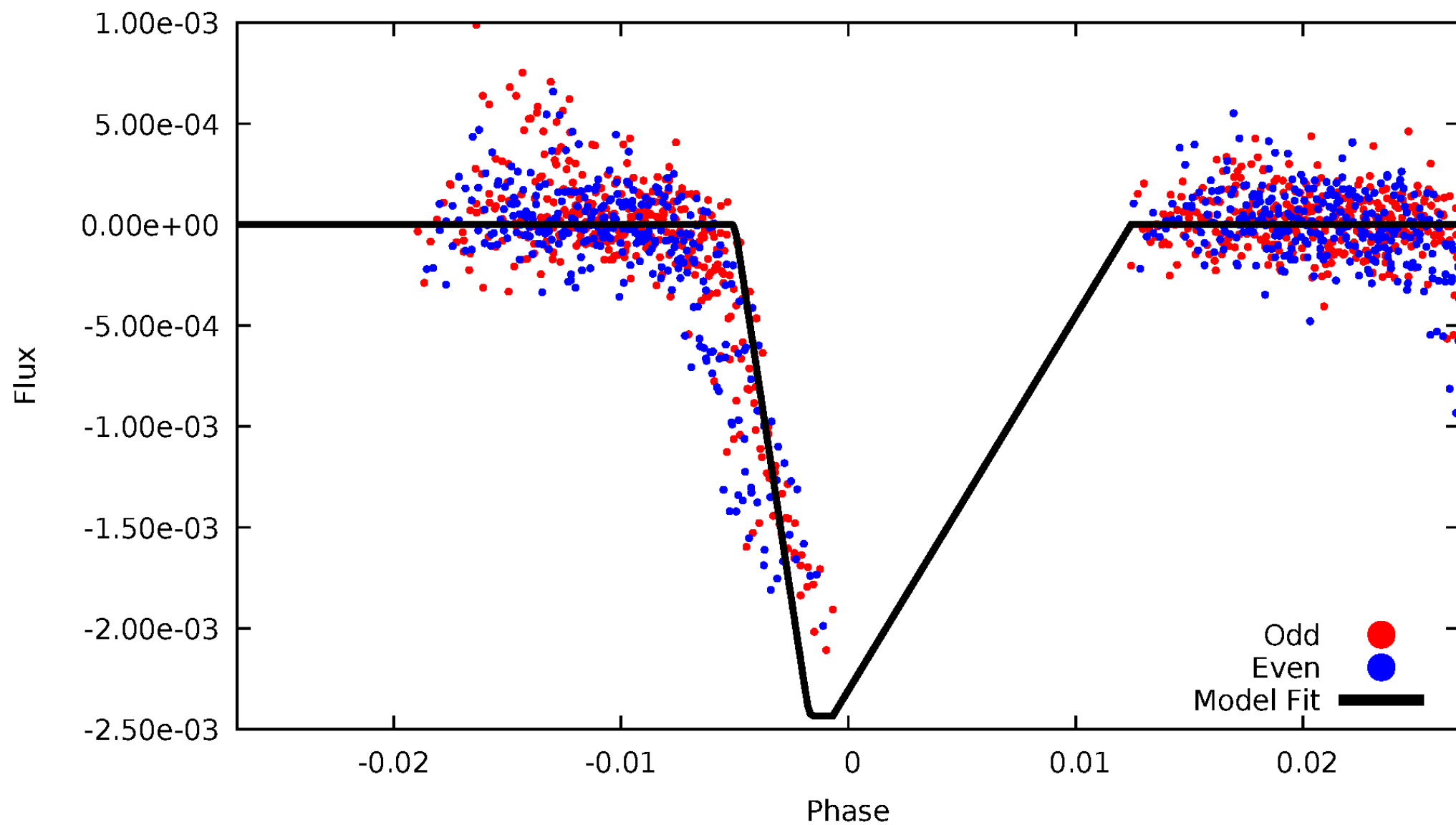
DV Odd/Even

TCE 004181421-03



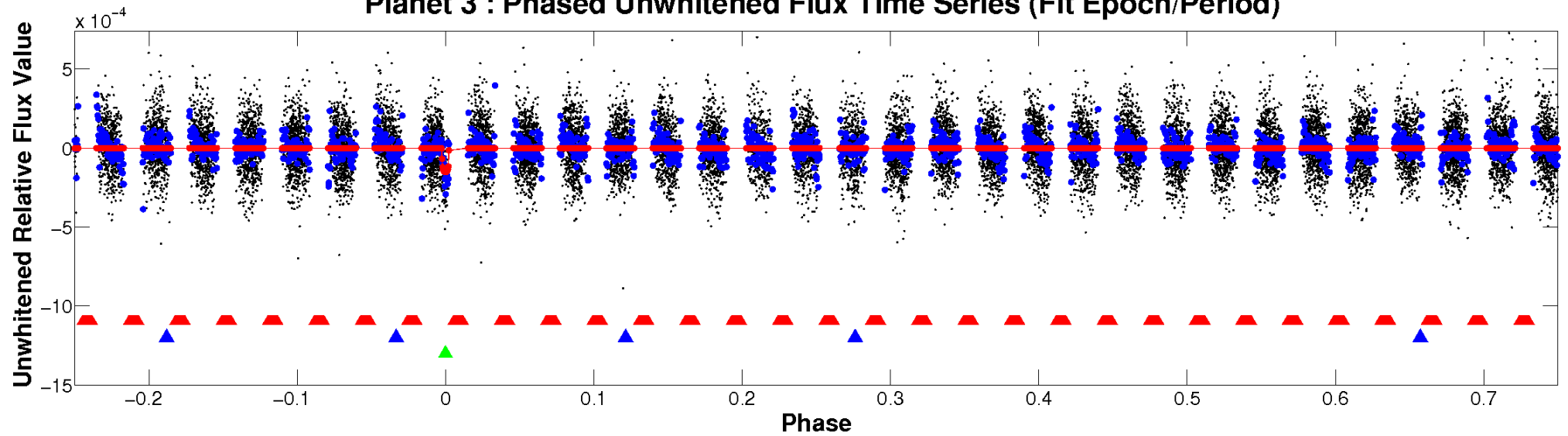
ALT Odd/Even

TCE 004181421-03

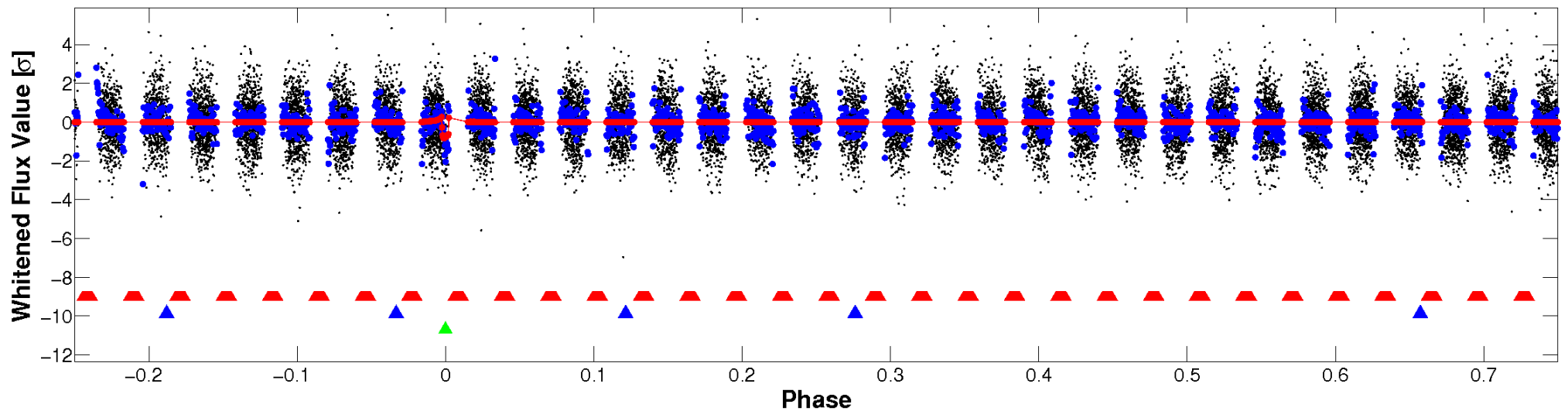


Non-Whitened Vs. Whitened Light Curve

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

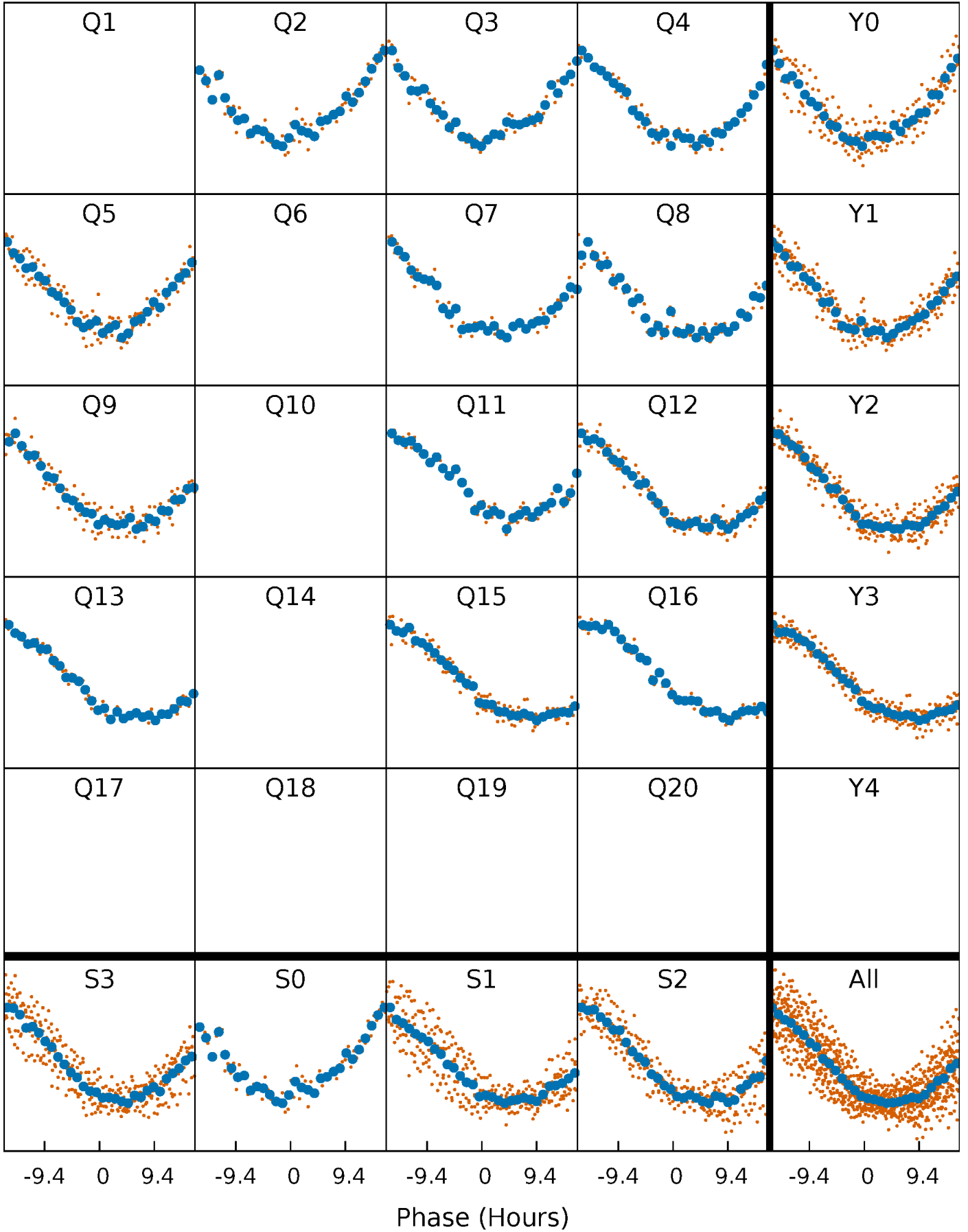


Planet 3 : Phased Whitened Flux Time Series (Fit Epoch/Period)



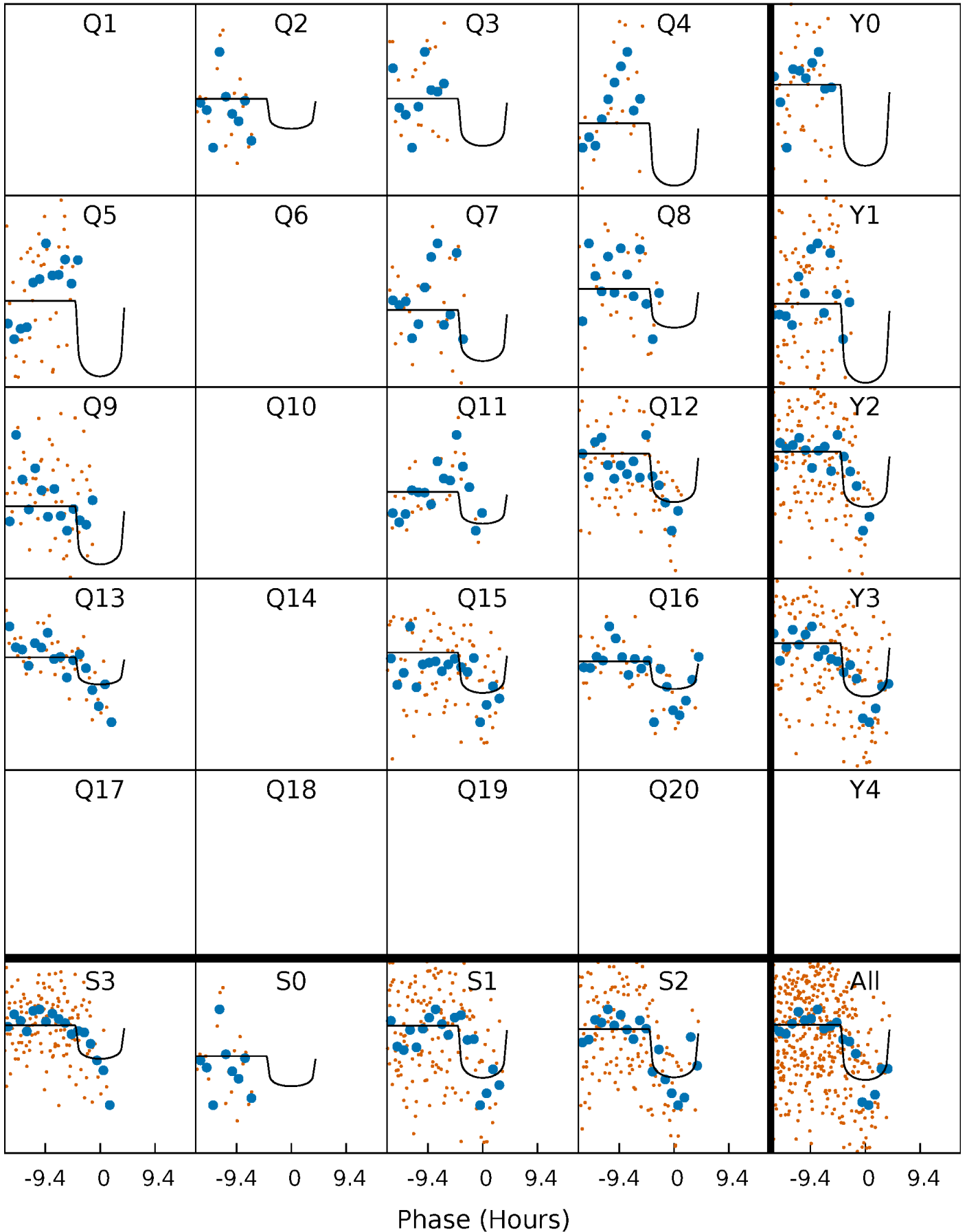
PDC Quarter-Phased Transit Curves

TCE 004181421-03 P= 72.261619 Days $T_0=168.223281$ (BKJD)



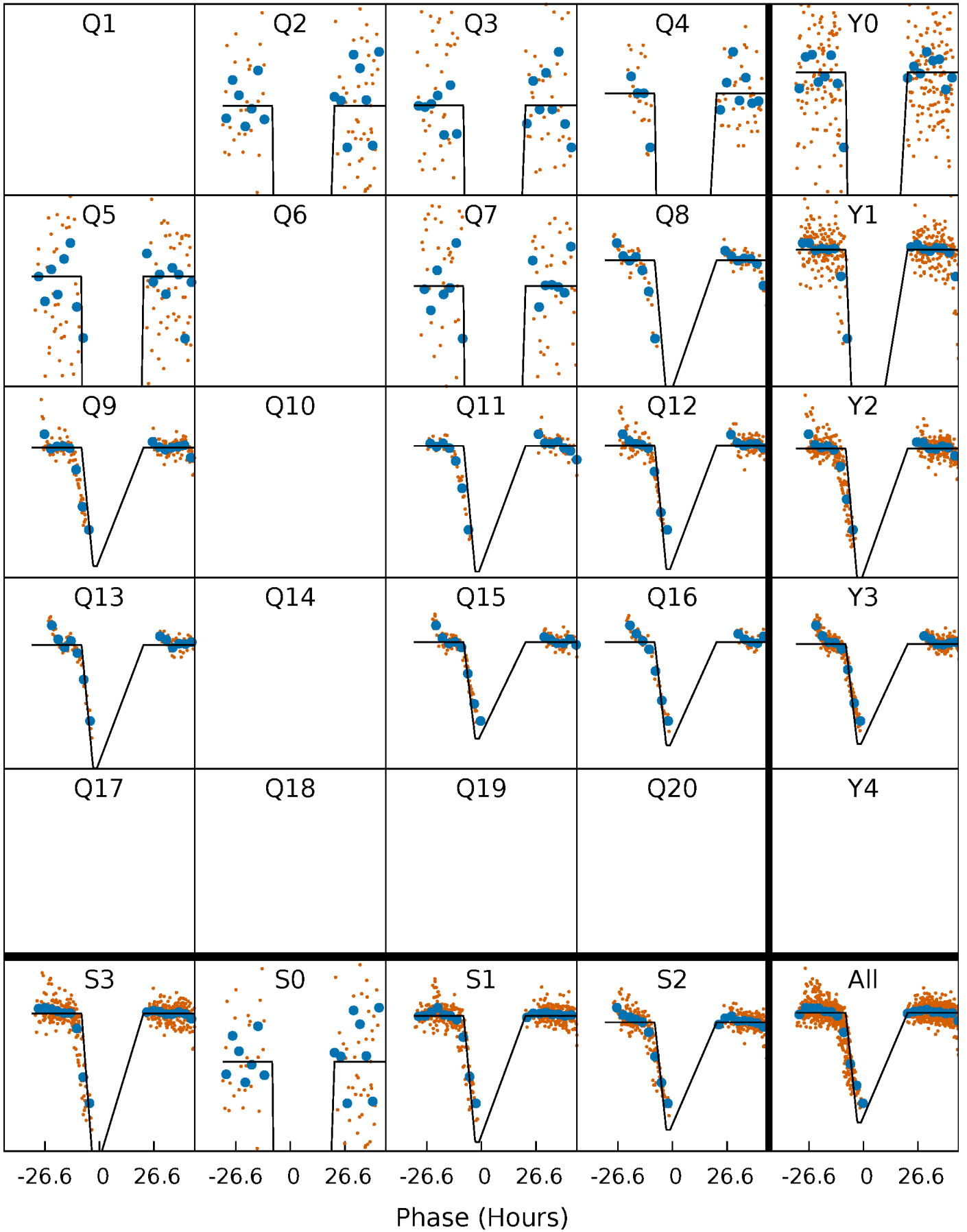
DV Quarter-Phased Transit Curves

TCE 004181421-03 P= 72.261619 Days $T_0=168.223281$ (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

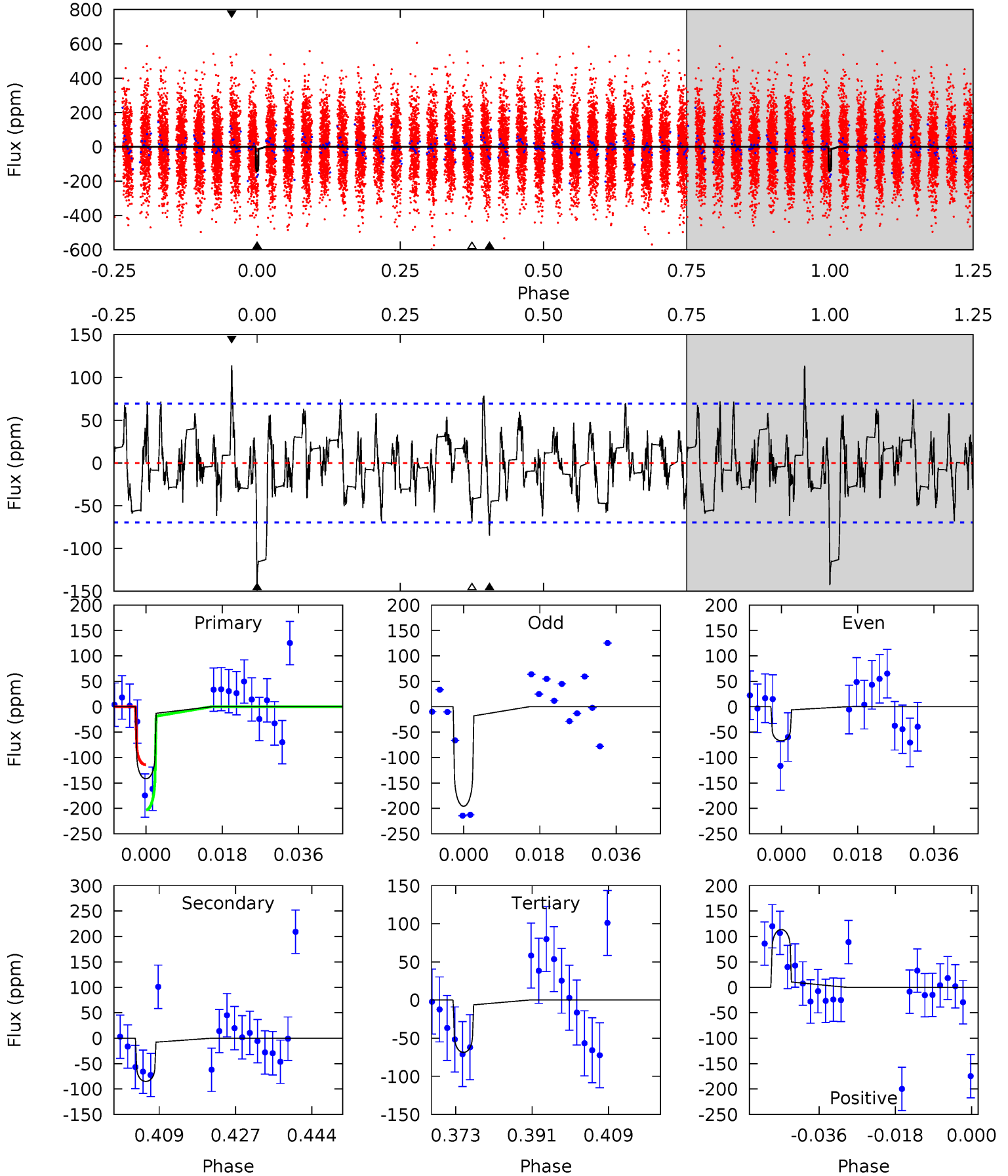
TCE 004181421-03 P= 72.262465 Days $T_0=168.428739$ (BKJD)



DV Model-Shift Uniqueness Test

004181421-03, P = 72.261619 Days, E = 95.961662 Days

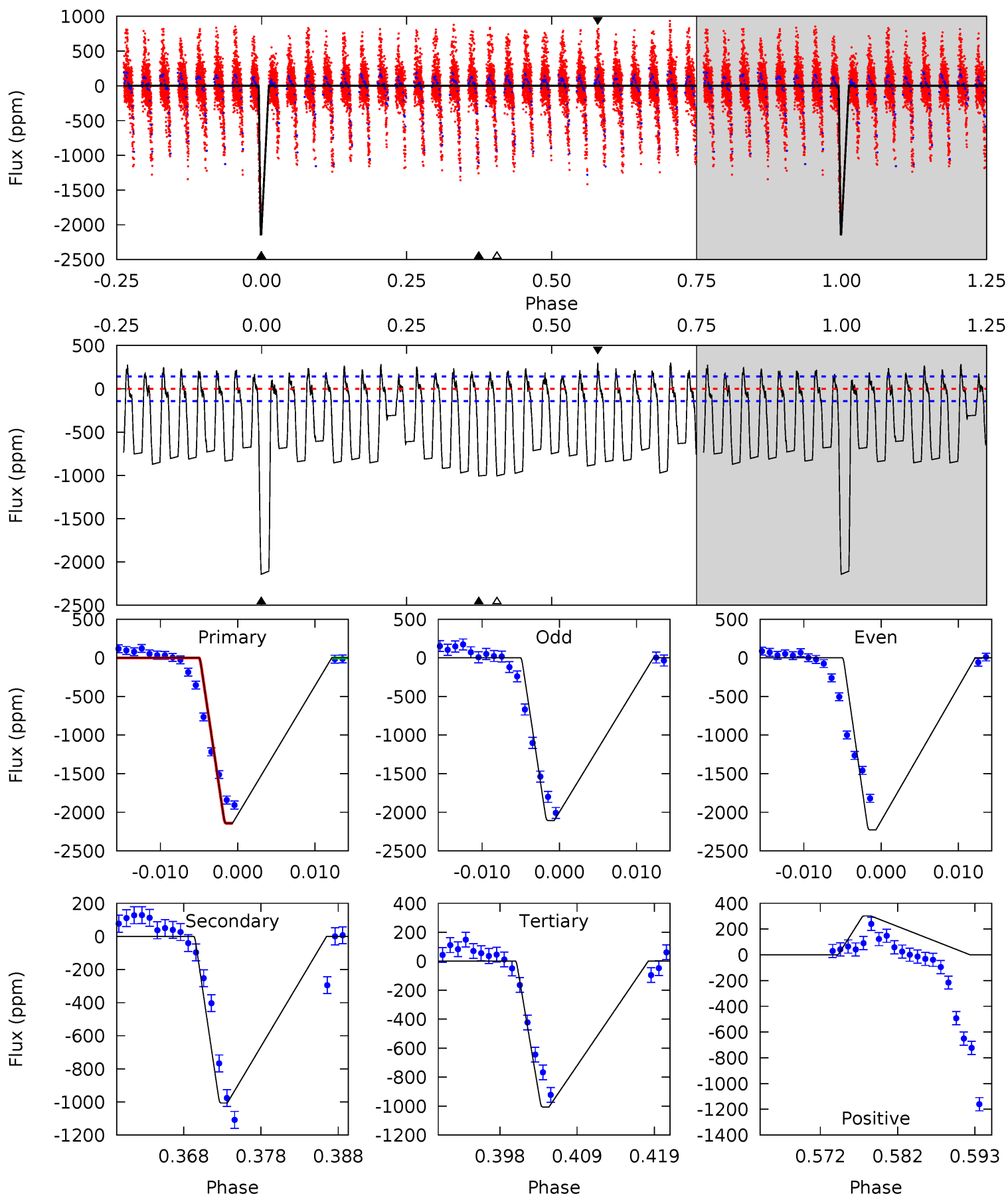
Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
10.0	6.00	4.85	8.03	4.91	2.37	1.94	5.16	1.98	1.16	-2.03	4.48	1.23	0.45	2.78



Alt Model-Shift Uniqueness Test

004181421-03, P = 72.262465 Days, E = 96.166274 Days

Pri	Sec	Ter	Pos	FA ₁	FA ₂	F _{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
75.6	35.5	35.5	10.7	5.02	2.57	8.15	40.1	64.9	0.02	24.9	2.15	0	0.12	0



Stellar Parameters For KIC 004181421

	$T_{\text{eff}} (K)$	$\log(g)$	$[\text{Fe}/\text{H}]$	$R (R_{\odot})$	$M (M_{\odot})$	$p_{\star} (\text{g}\cdot\text{cm}^{-3})$
	6856^{+214}_{-285}	$3.869^{+0.520}_{-0.130}$	$-1.000^{+0.300}_{-0.300}$	$2.011^{+0.431}_{-0.935}$	$1.090^{+0.128}_{-0.176}$	$0.189^{+0.989}_{-0.067}$
	+3%/-4%	+13%/-3%	+30%/-30%	+21%/-46%	+12%/-16%	+524%/-35%
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 004181421-03 / KOI

Detrend	Depth (ppm)	$R_p (R_{\oplus})$	$T_{\text{max}} (K)$	$T_{\text{obs}} (K)$	A_{obs}
DV	-85 ± 14	$2.52^{+1.03}_{-0.97}$	982^{+80}_{-128}	5809^{+1320}_{-794}	868^{+1479}_{-431}
Alt.	-1006 ± 28	$10.11^{+1.98}_{-2.51}$	980^{+86}_{-126}	5483^{+287}_{-256}	658^{+490}_{-192}

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

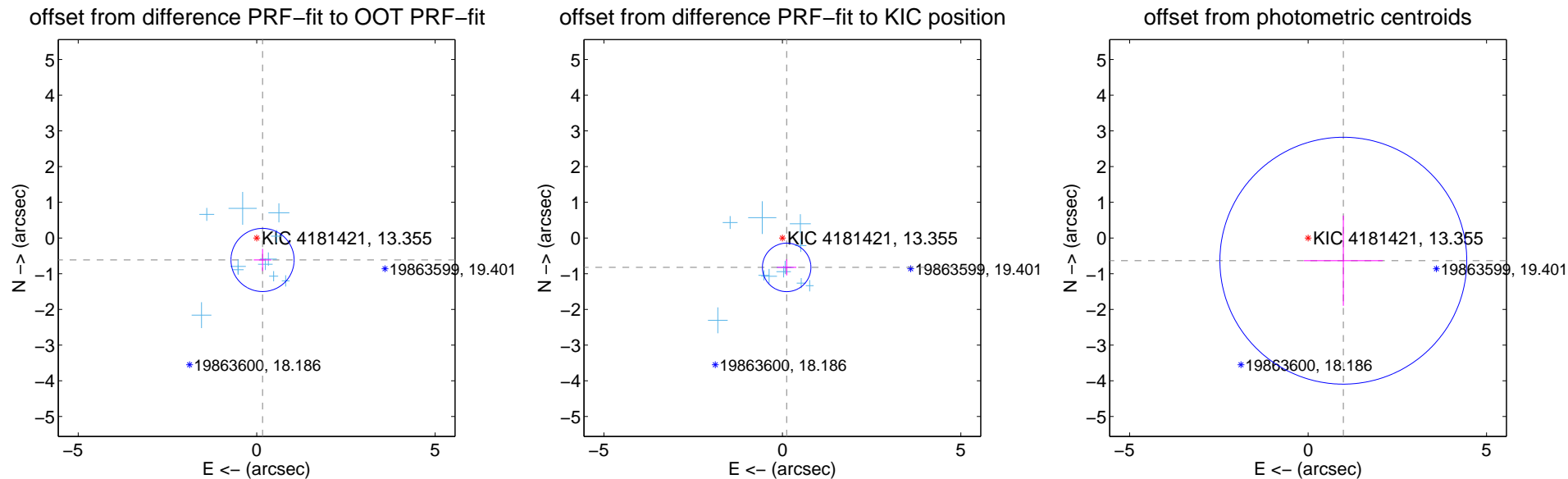
DV Centroid Data

Supplemental centroid analysis for 004181421-03. Kepler magnitude: 13.36. Transit SNR 7.67

There are 11 quarters with good PRF difference image offsets

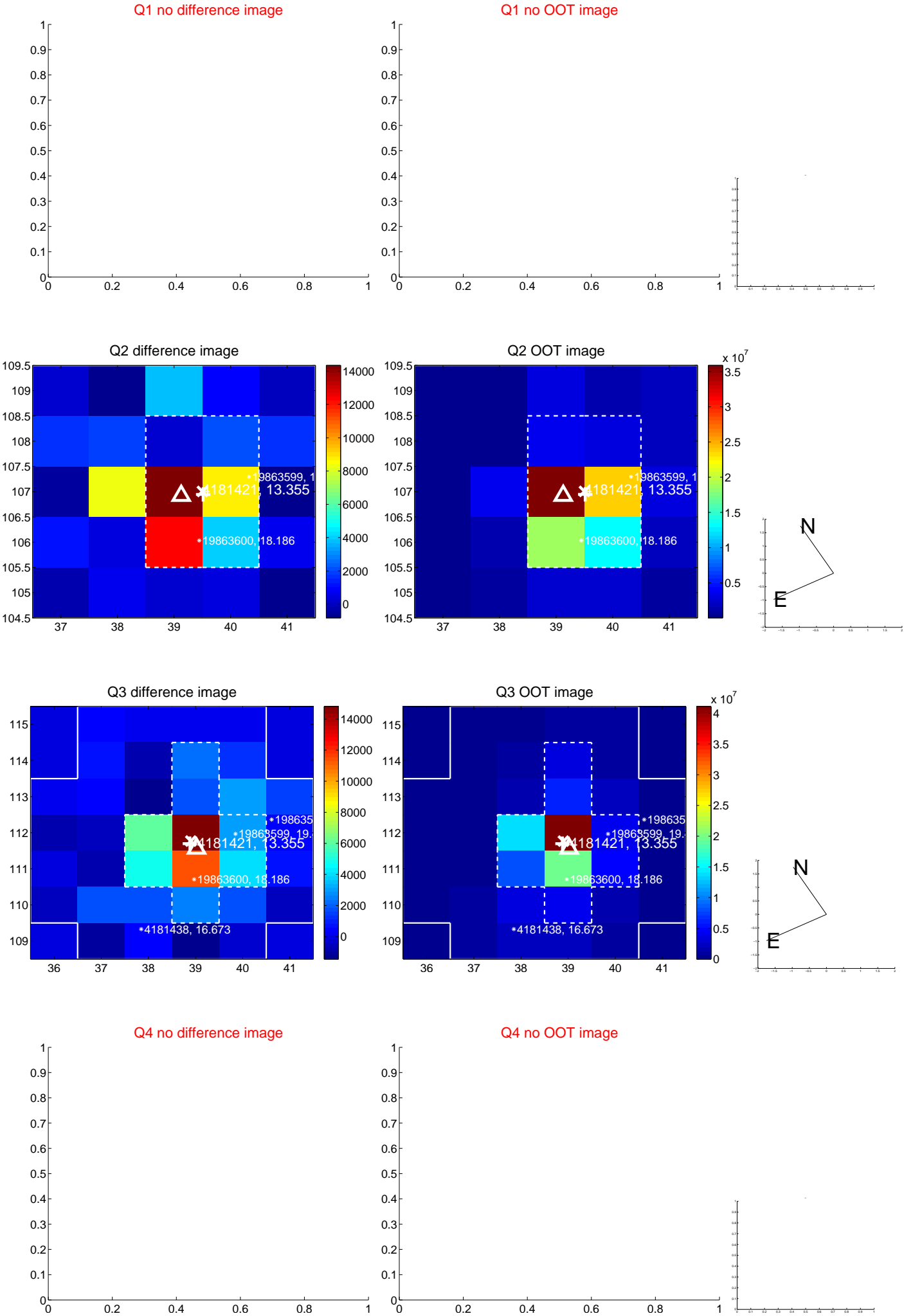
The direct PRF centroid is offset from the target star catalog position by about 0.33 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	0.637 ± 0.295	2.16	-0.164 ± 0.248	-0.615 ± 0.310
PRF-fit source offset from KIC position	0.832 ± 0.226	3.67	-0.120 ± 0.271	-0.823 ± 0.225
photometric centroid source offset	1.17 ± 1.15	1.02	-0.99 ± 1.10	-0.64 ± 1.26

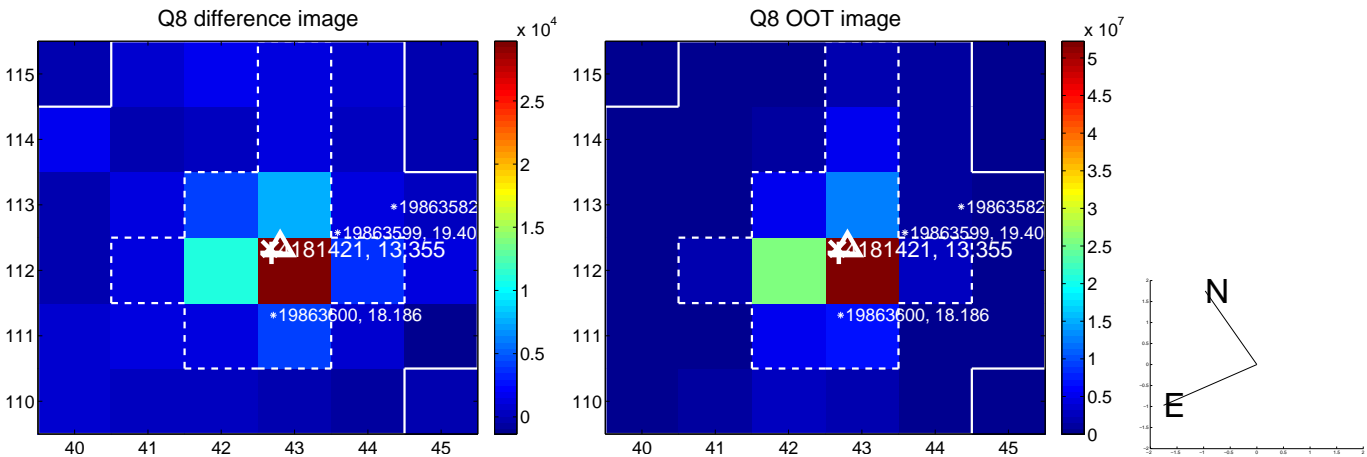
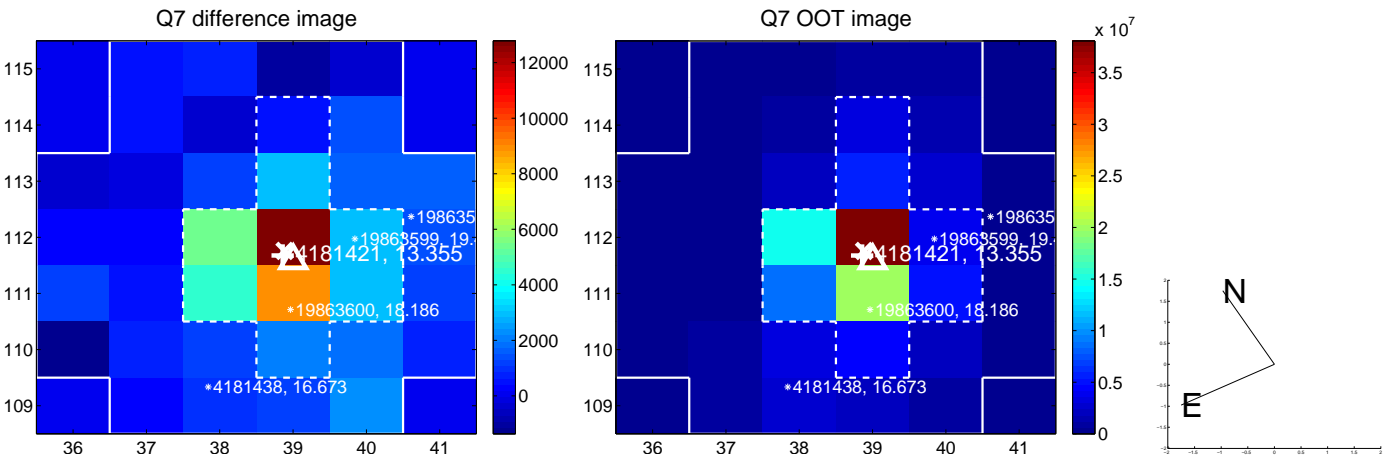
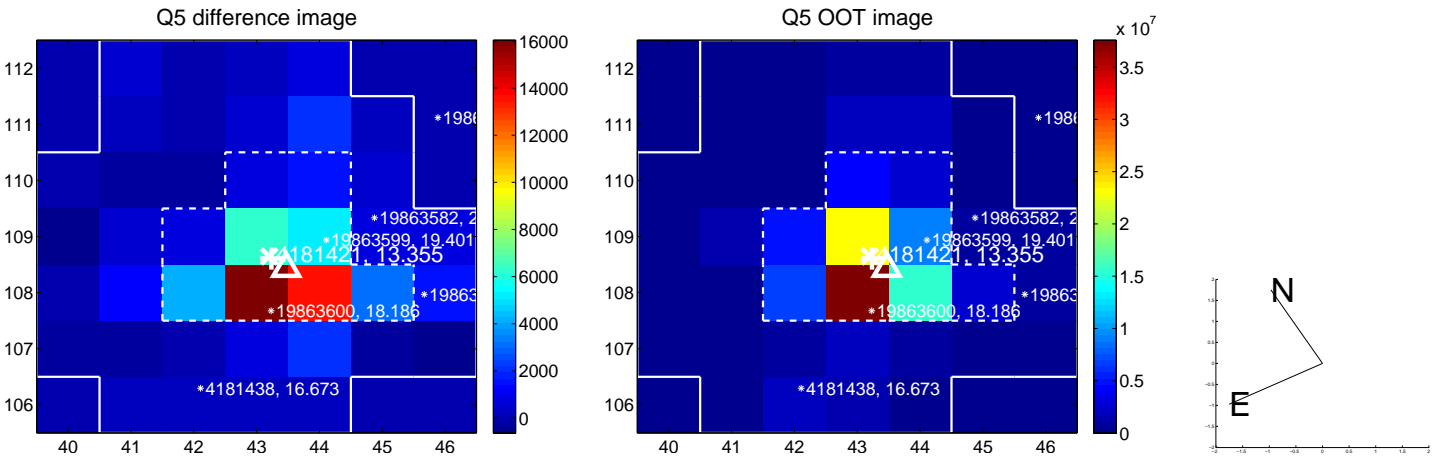


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- σ uncertainty. Blue circle: three- σ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

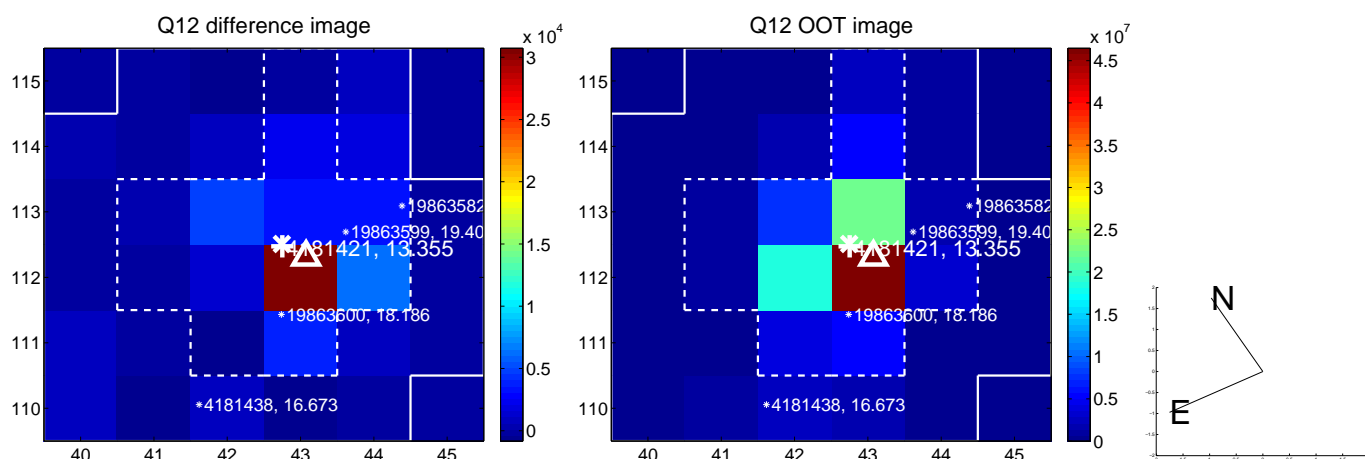
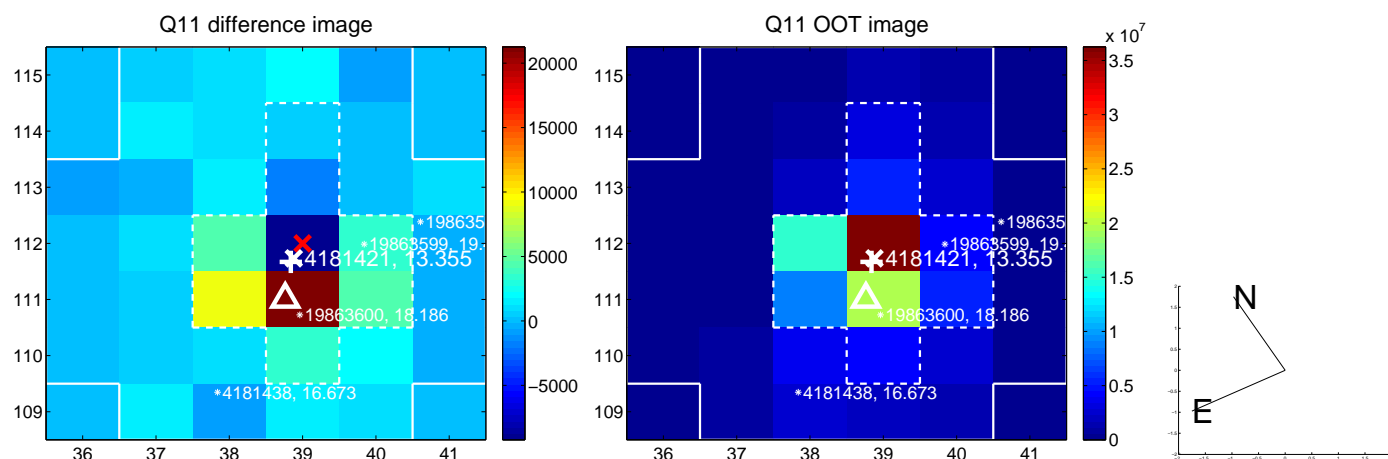
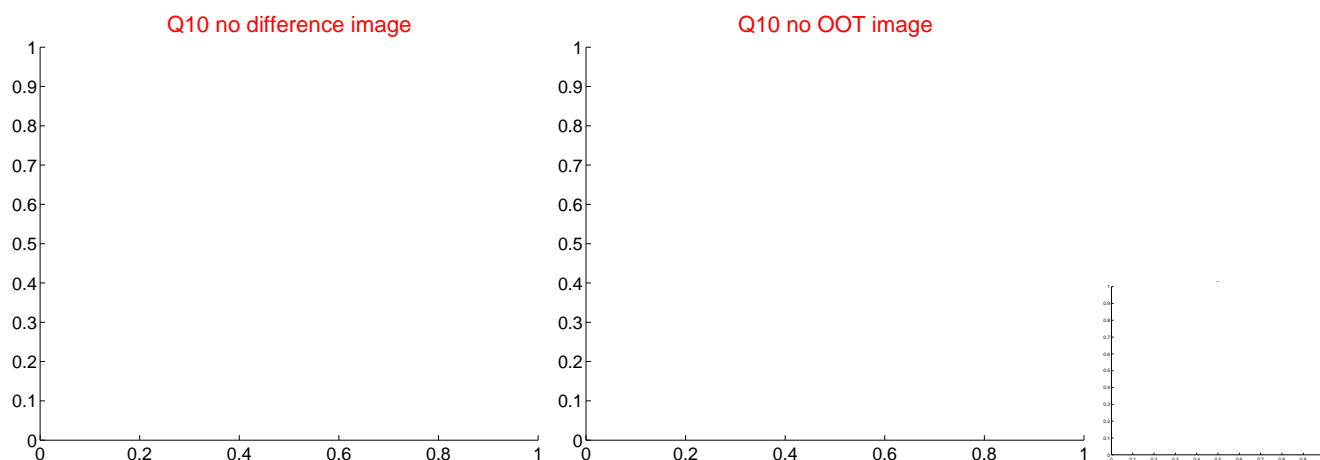
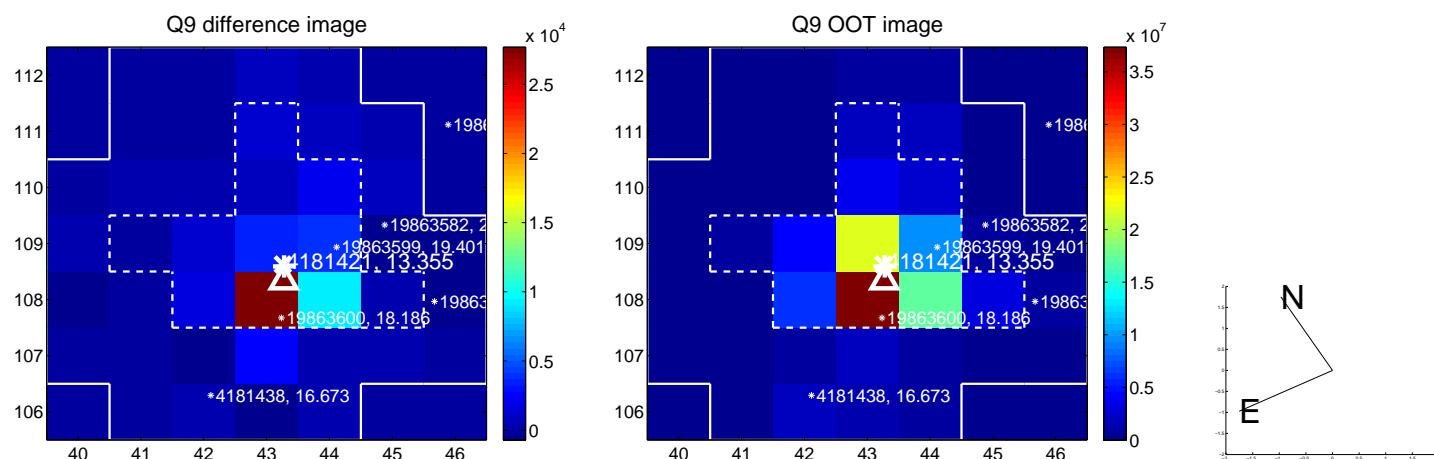
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



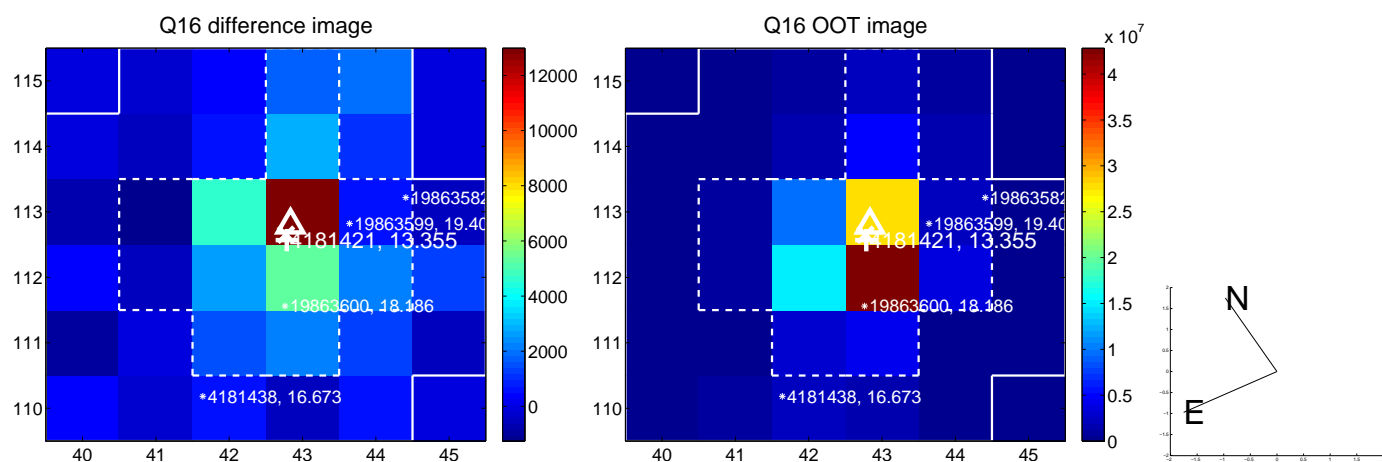
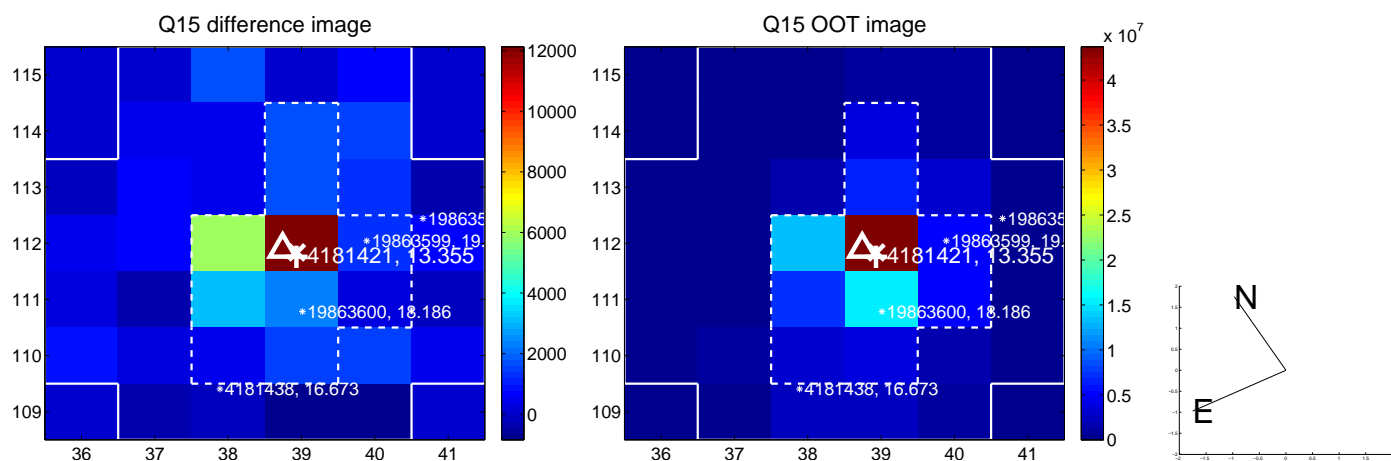
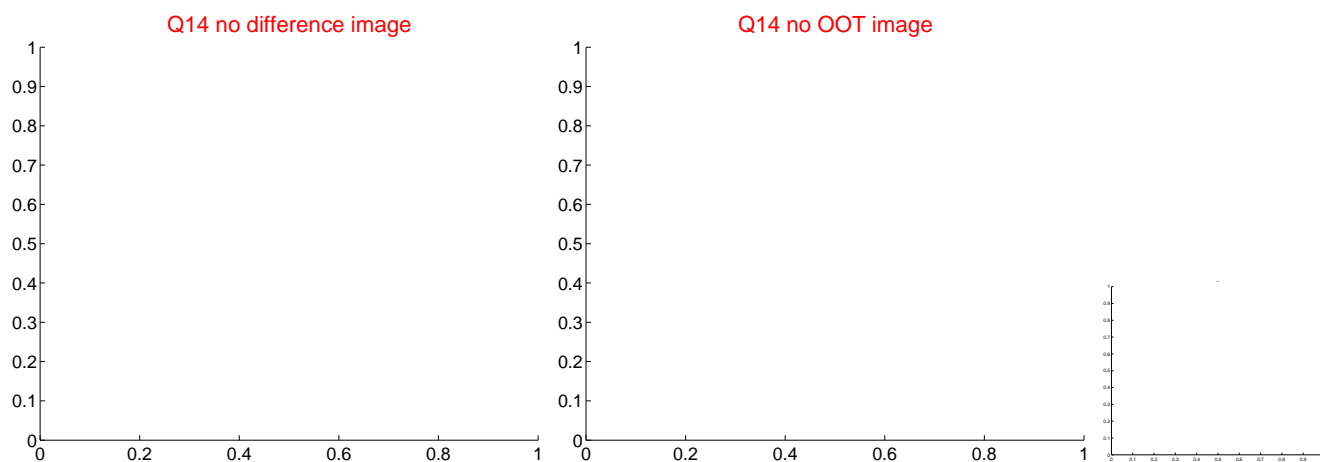
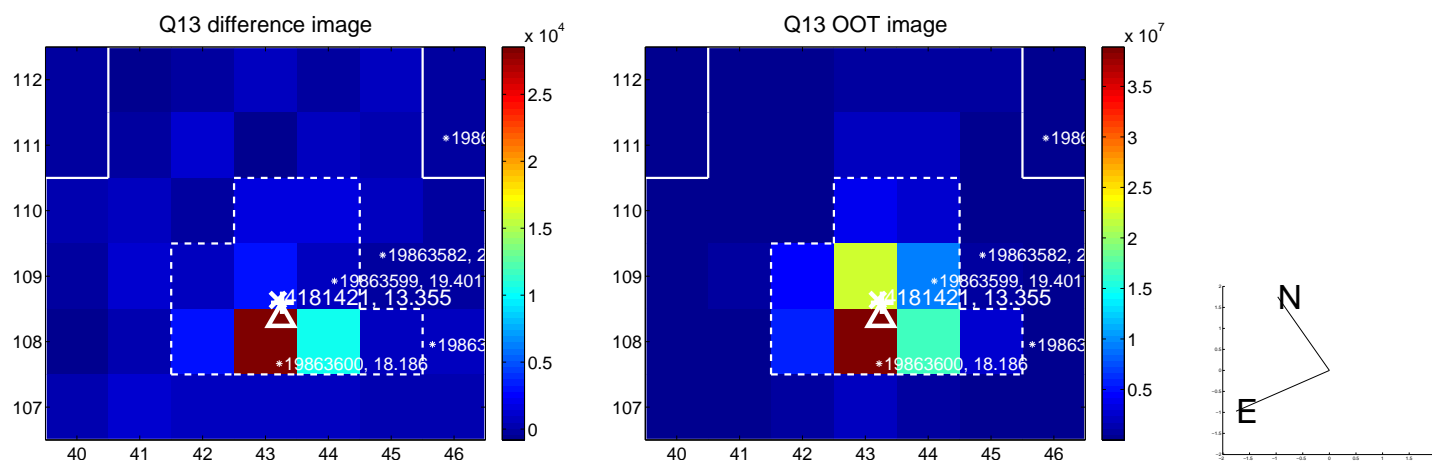
white \times : KIC target position; +: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value.



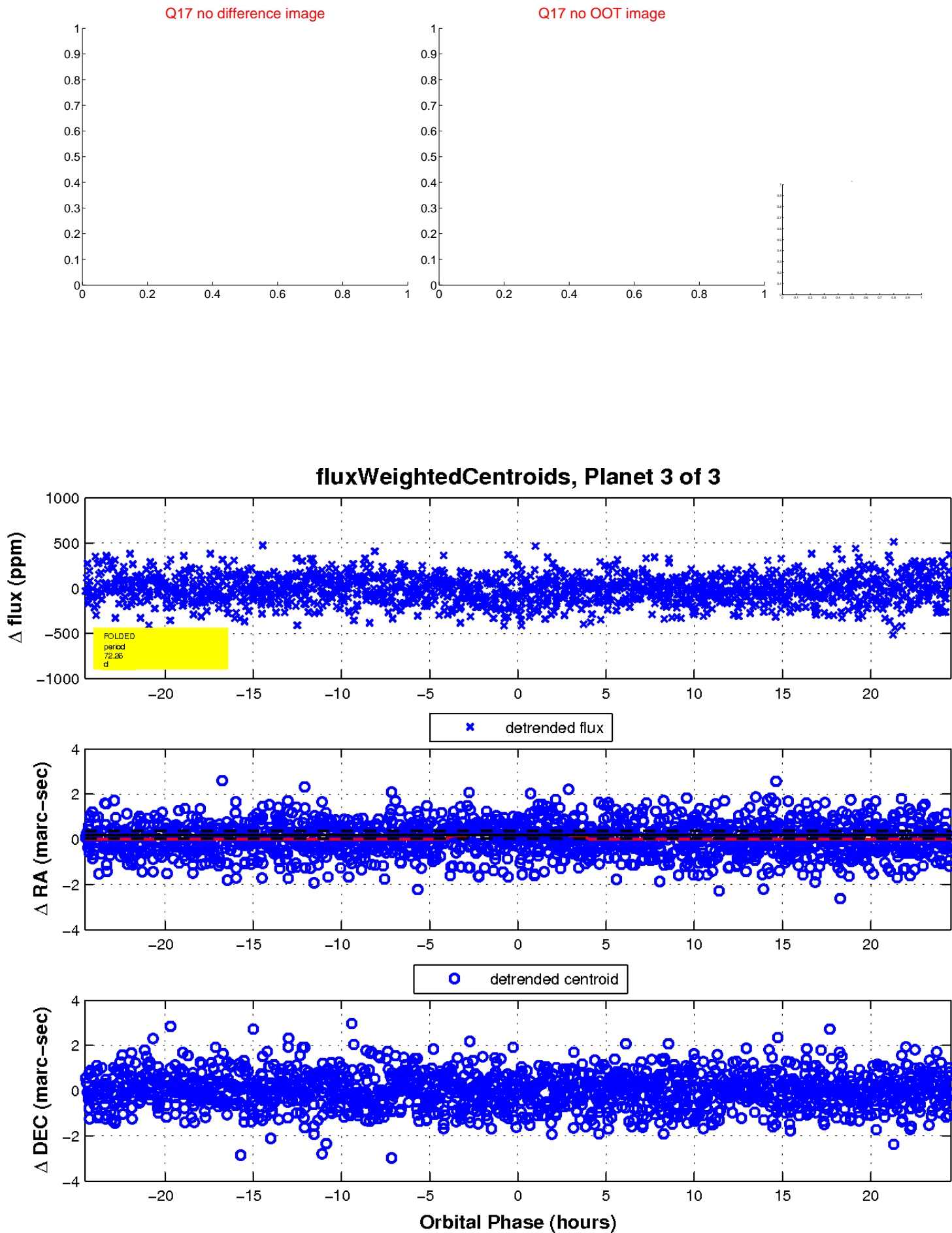
white \times : KIC target position; $+$: OOT centroid; \triangle : difference centroid. red \times : large negative pixel value



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

