KIC 006531491

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 ($S_\oplus$)
006531491-01	OBS	1237.01	14.324063	135.211511	1351.2	4.896	72.0	44.2	1.04	6022	4.89	88.62
006531491-02	OBS	No	7.162149	135.191405	535.7	3.805	21.2	21.2	1.04	6022	2.85	223.29
006531491-03	OBS	No	0.513212	131.620574	0.0	0.524	10.5	0.0	1.04	6022	0.00	7502.49
006531491-04	OBS	No	0.512838	131.523492	47.8	2.833	8.0	7.3	1.04	6022	0.78	7509.79

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006531491-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006531491-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006531491-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_RESOLVED_OFFSET
006531491-04	OBS	FP	0.00	1	0	1	1	TRANS_GAPPED—LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

Ephemeris Match Information For 006531491-01

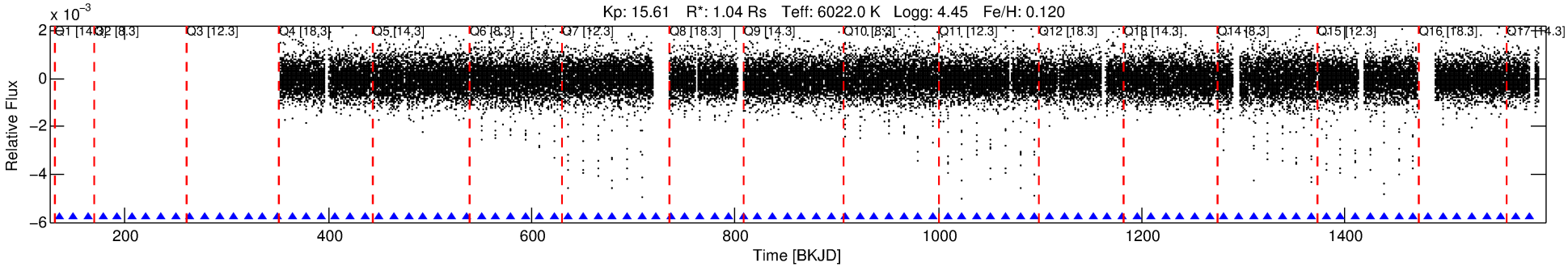
TCE (1)	KIC	Parent (2)	Parent KIC	P_1:P_2	Dist (″)	ΔRow	ΔCol	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
006531491-01	6531491	3646.01	6531496	1:1	8.3	-1	1	16.09	15.60	63.25	Direct-PRF	0	0.39	0.38

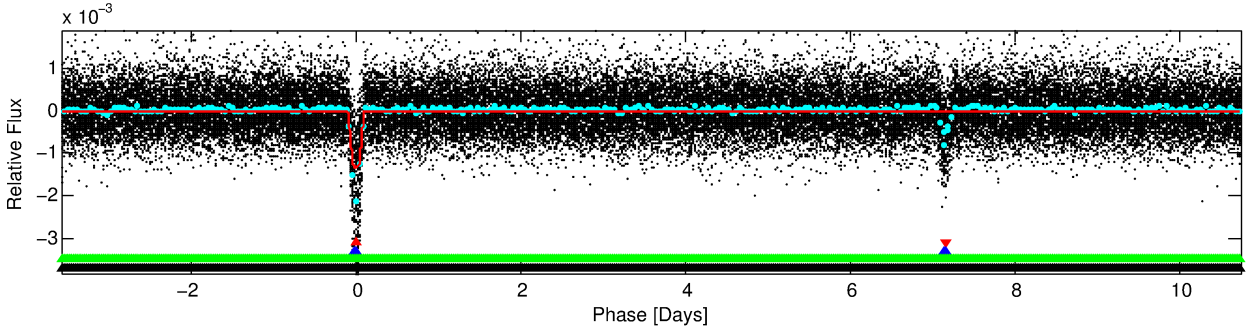
Notes: P_1:P_2 is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth dividied by the child's. σ_P and σ_T are the significance of the match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

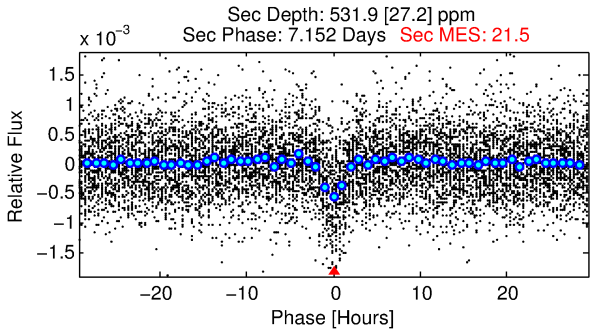
DV One-Page Summary

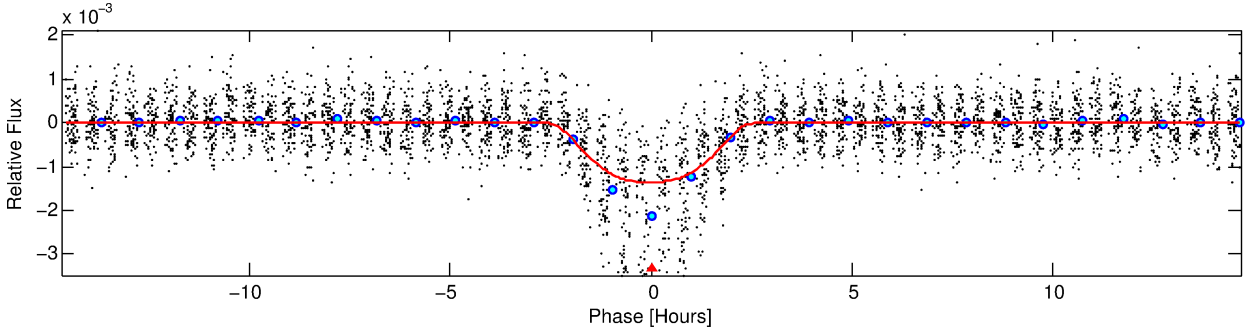
KIC: 6531491 Candidate: 1 of 4 Period: 14.324 d
KOI: K01237.01 Corr: 0.991

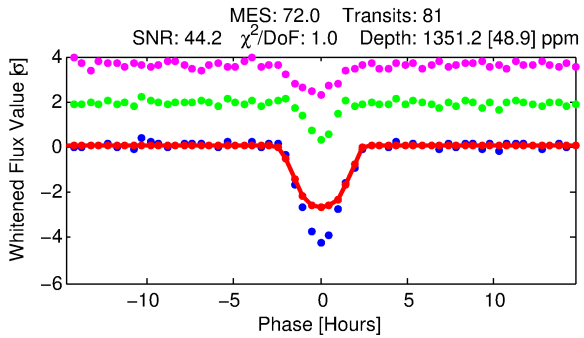
Kp: 15.61 R*: 1.04 Rs Teff: 6022.0 K Logg: 4.45 Fe/H: 0.120

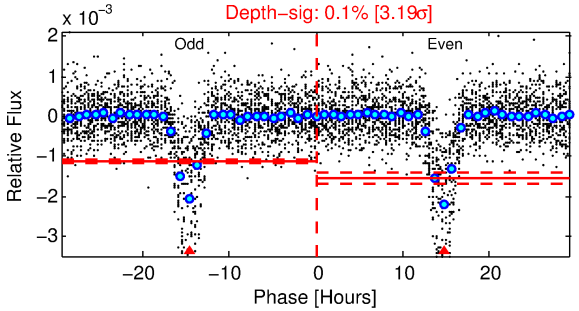


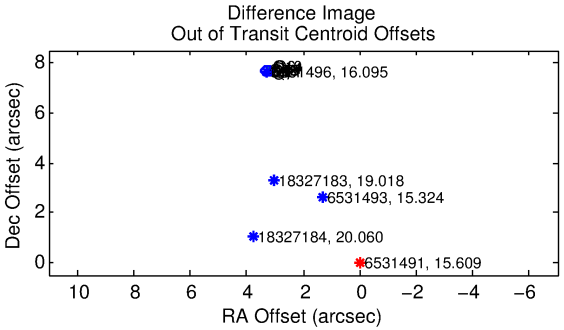












DV Fit Results:

Period = 14.32406 [0.00005] d
Epoch = 135.2115 [0.0033] BKJD
Rp/R* = 0.0431 [0.0013]
a/R* = 9.47 [0.46]
b = 0.95 [0.01]

Seff = 88.62 [37.47]
Teq = 782 [83] K
Rp = 4.89 [1.56] Re
a = 0.1198 [0.0323] AU

Ag = 175.64 [70.51] [2.48σ]
Teffp = 4404 [190] K [17.46σ]

DV Diagnostic Results:

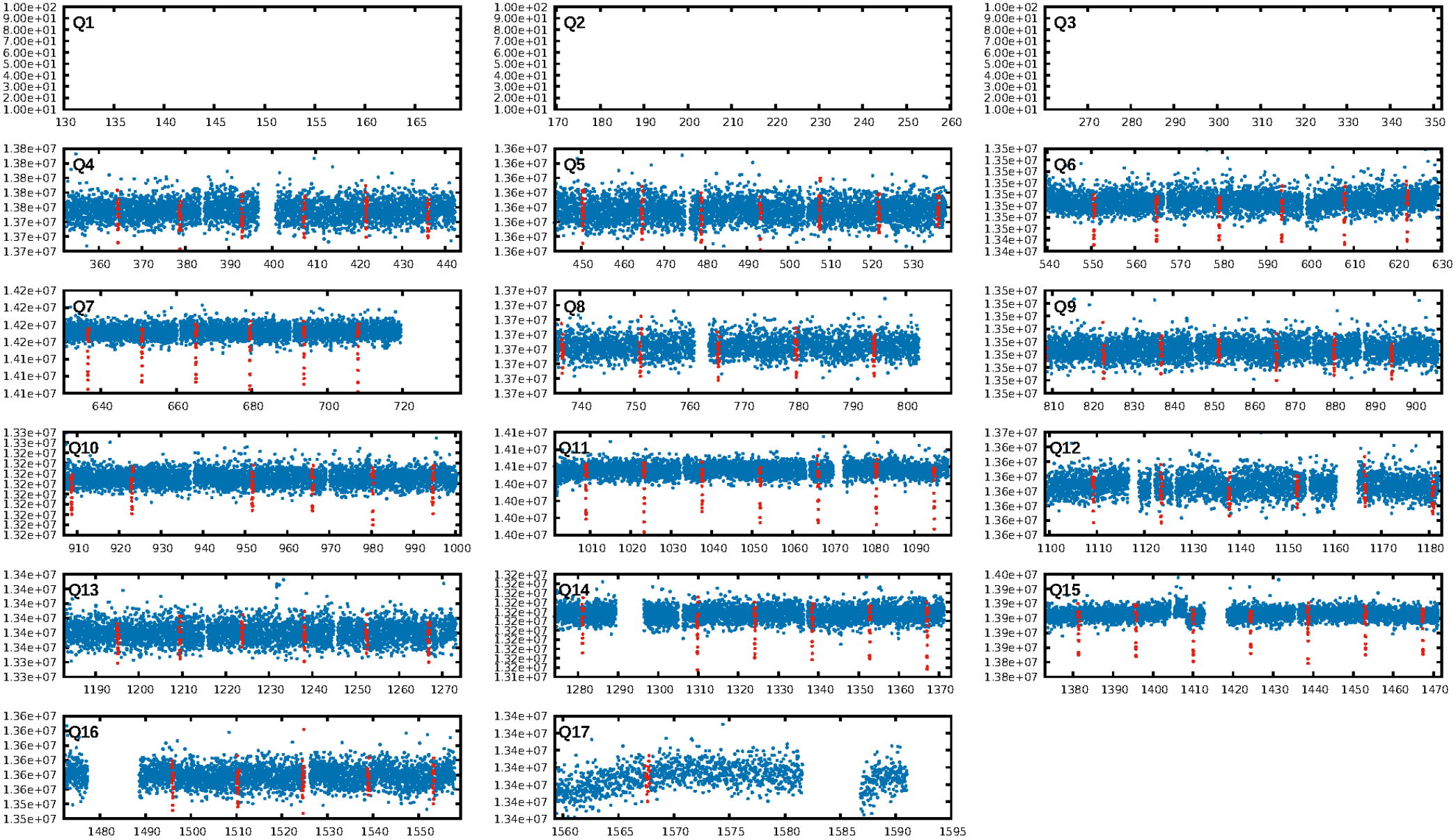
ShortPeriod−sig: 100.0% [27.72σ]
LongPeriod−sig: N/A
ModelChiSquare2−sig: 0.0%
ModelChiSquareGof−sig: 100.0%
Bootstrap−pfa: 0.00e+00
RollingBand−fgt: 1.00 [80/80]
GhostDiagnostic−chr: −0.5726

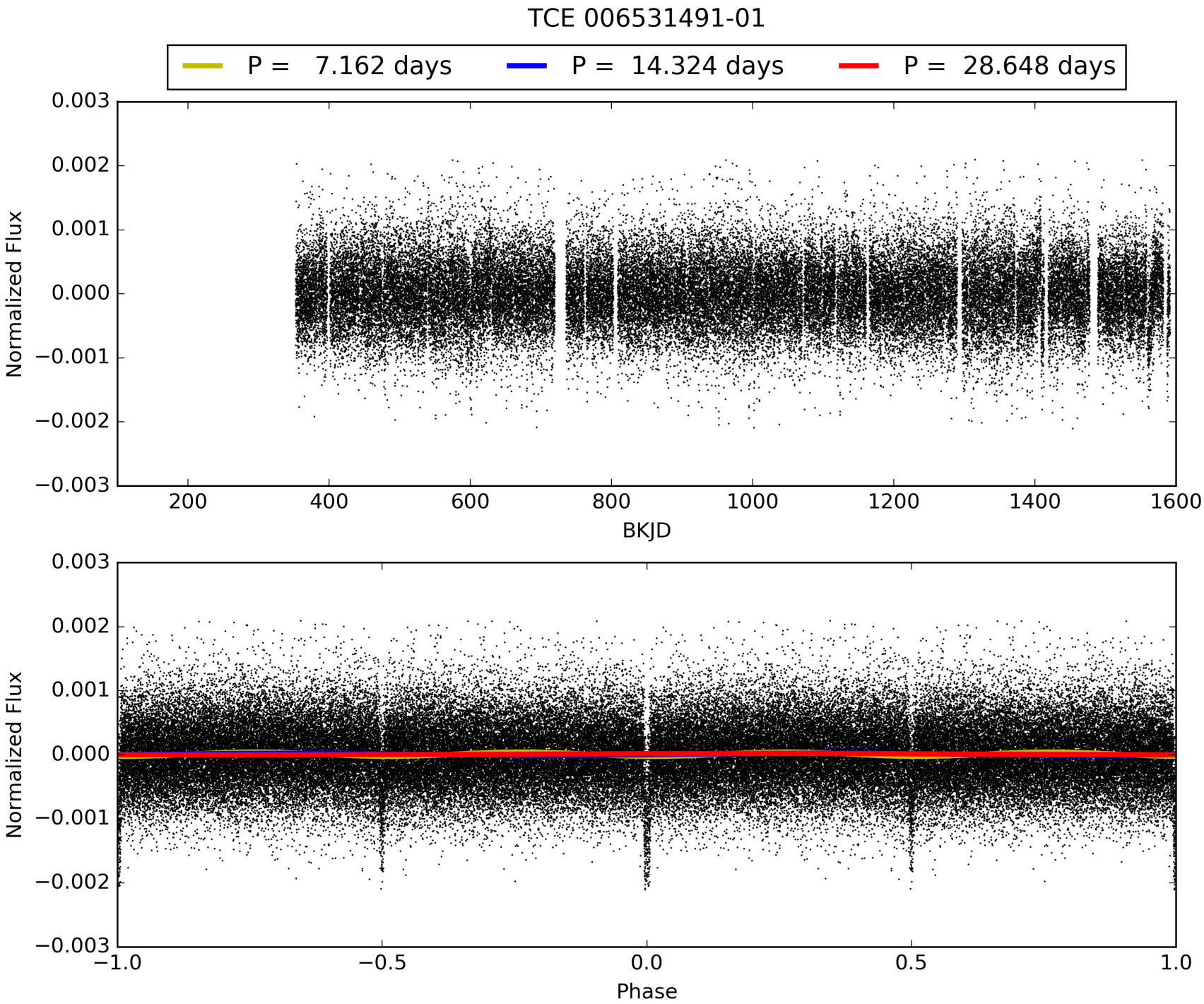
Centroid−sig: 0.0%
Centroid−so: 52.263 arcsec [167.24σ]
OotOffset−rm: 8.366 arcsec [121.07σ]
KicOffset−rm: 8.385 arcsec [117.14σ]
OotOffset−st: 3/3/4/4 [14]
KicOffset−st: 3/3/4/4 [14]
DiffImageQuality−fgm: 1.00 [14/14]
DiffImageOverlap−fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31−Jan−2016 17:48:35 Z

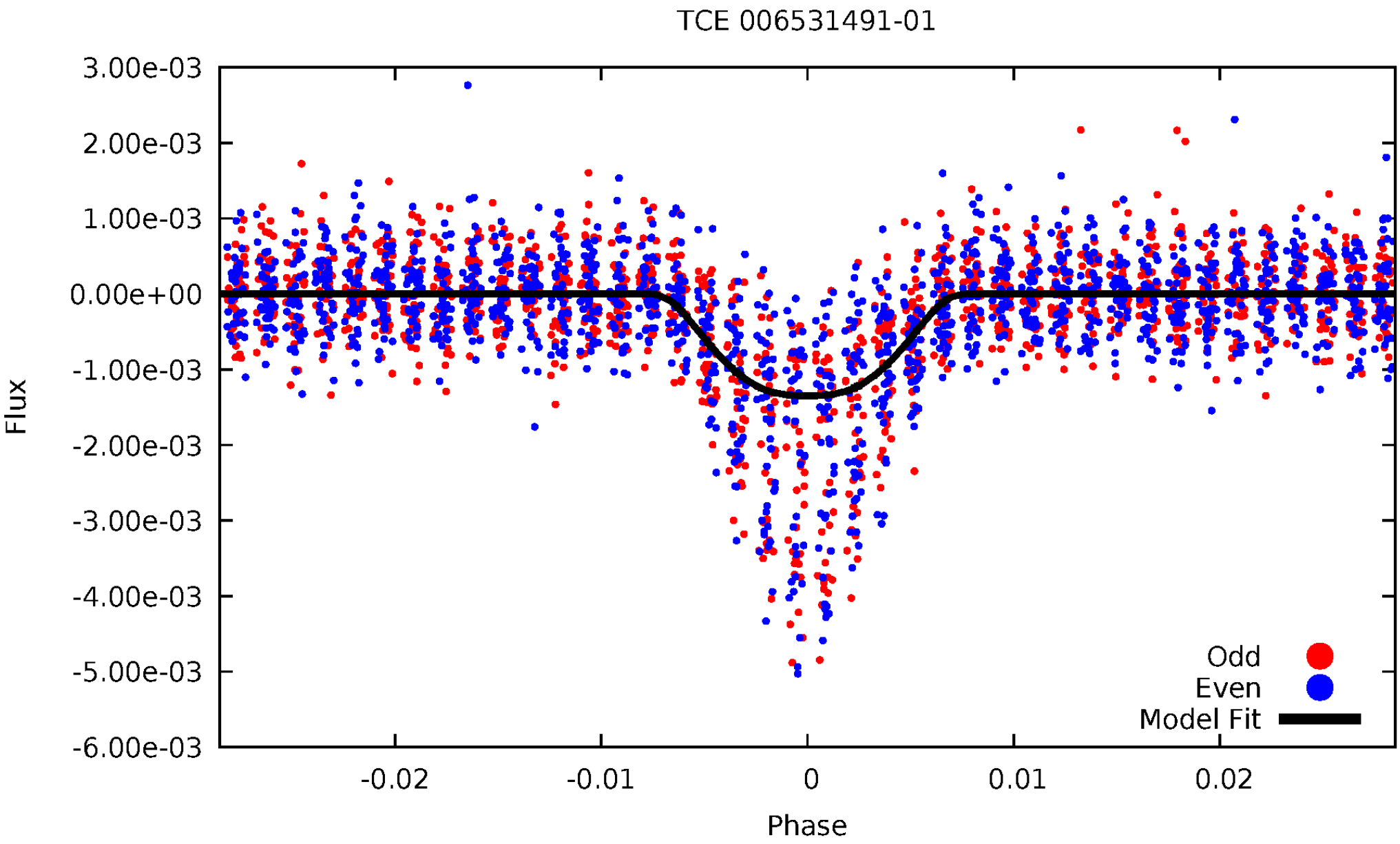
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006531491-01, PDC Light Curves




TCE 006531491-01
P = 7.162 days
P = 14.324 days
P = 28.648 days
Normalized Flux
BKJD
Normalized Flux
Phase

DV Odd/Even


TCE 006531491-01
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2.00e-03
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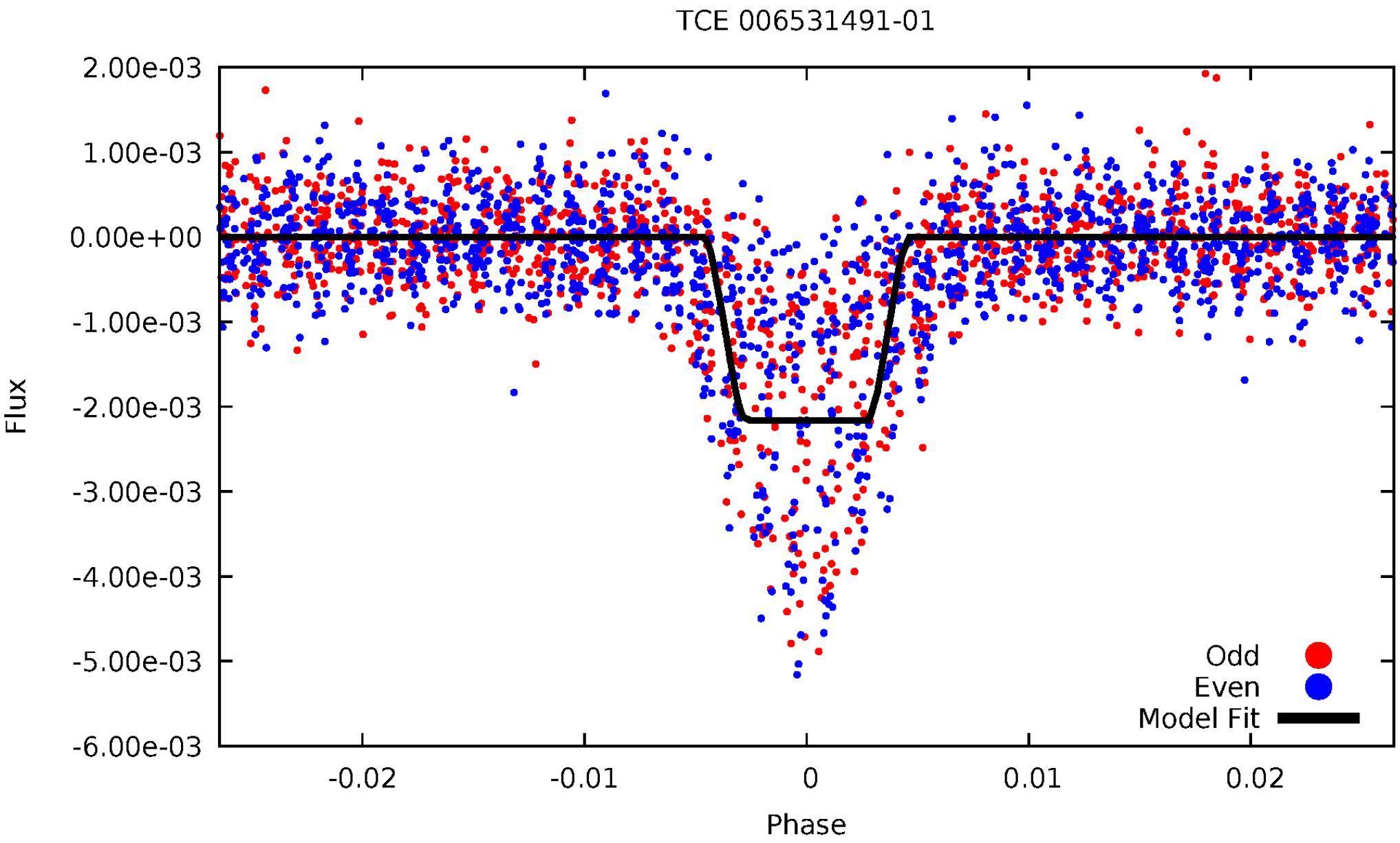
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
-4.00e-03
-5.00e-03
-6.00e-03
Flux
-0.02
-0.01
0
0.01
0.02
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 006531491-01
2.00e-03
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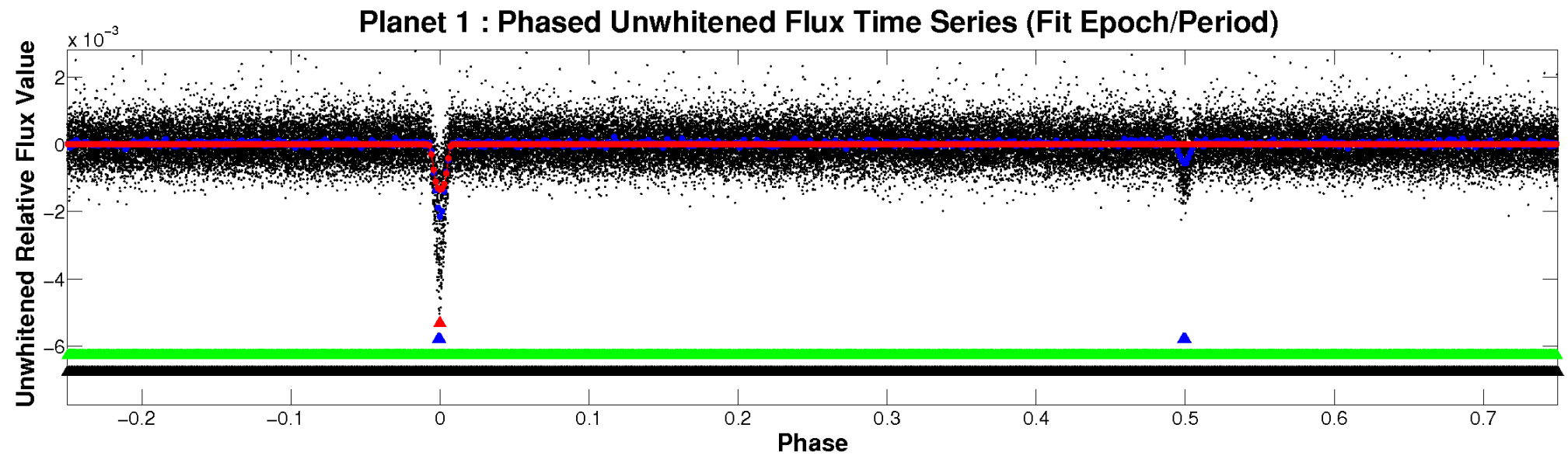
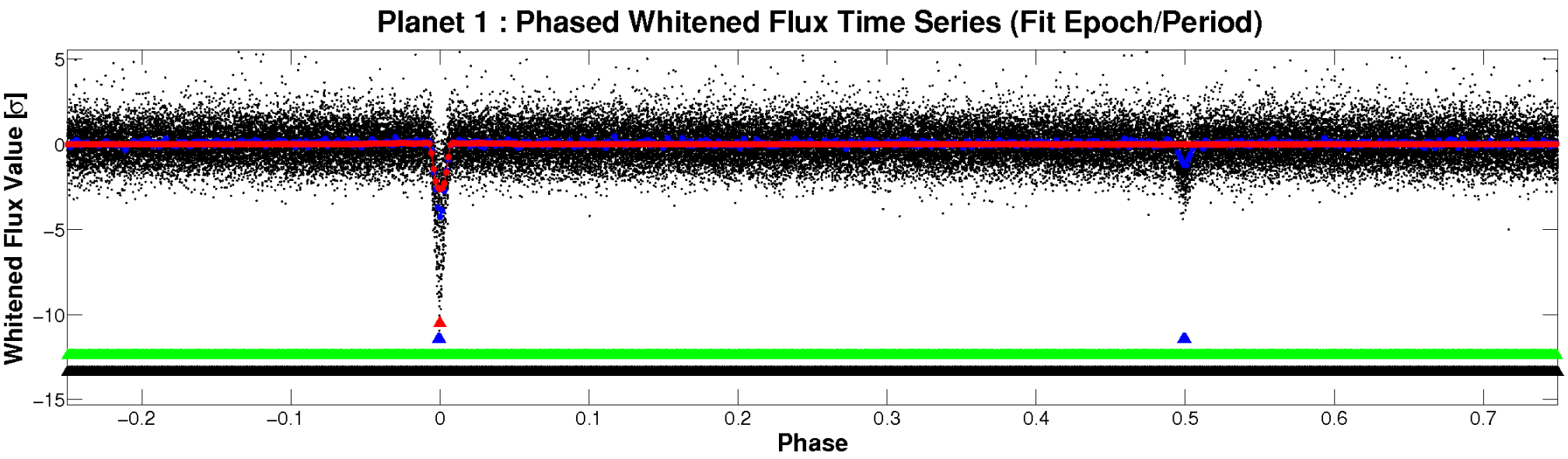
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
-4.00e-03
-5.00e-03
-6.00e-03
Flux
-0.02
-0.01
0
0.01
0.02
Phase
Odd
Even
Model Fit

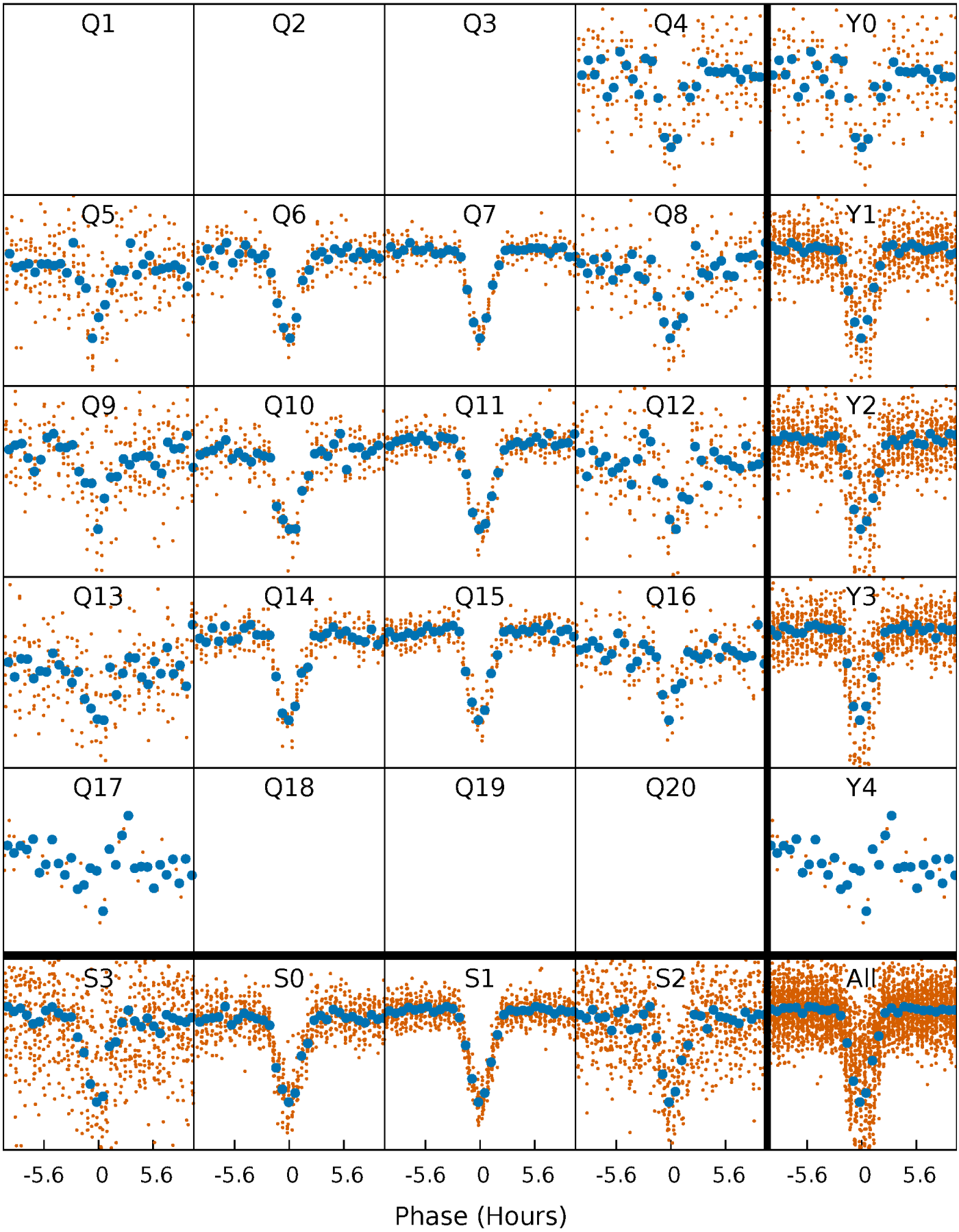
Non-Whitened Vs. Whitened Light Curve





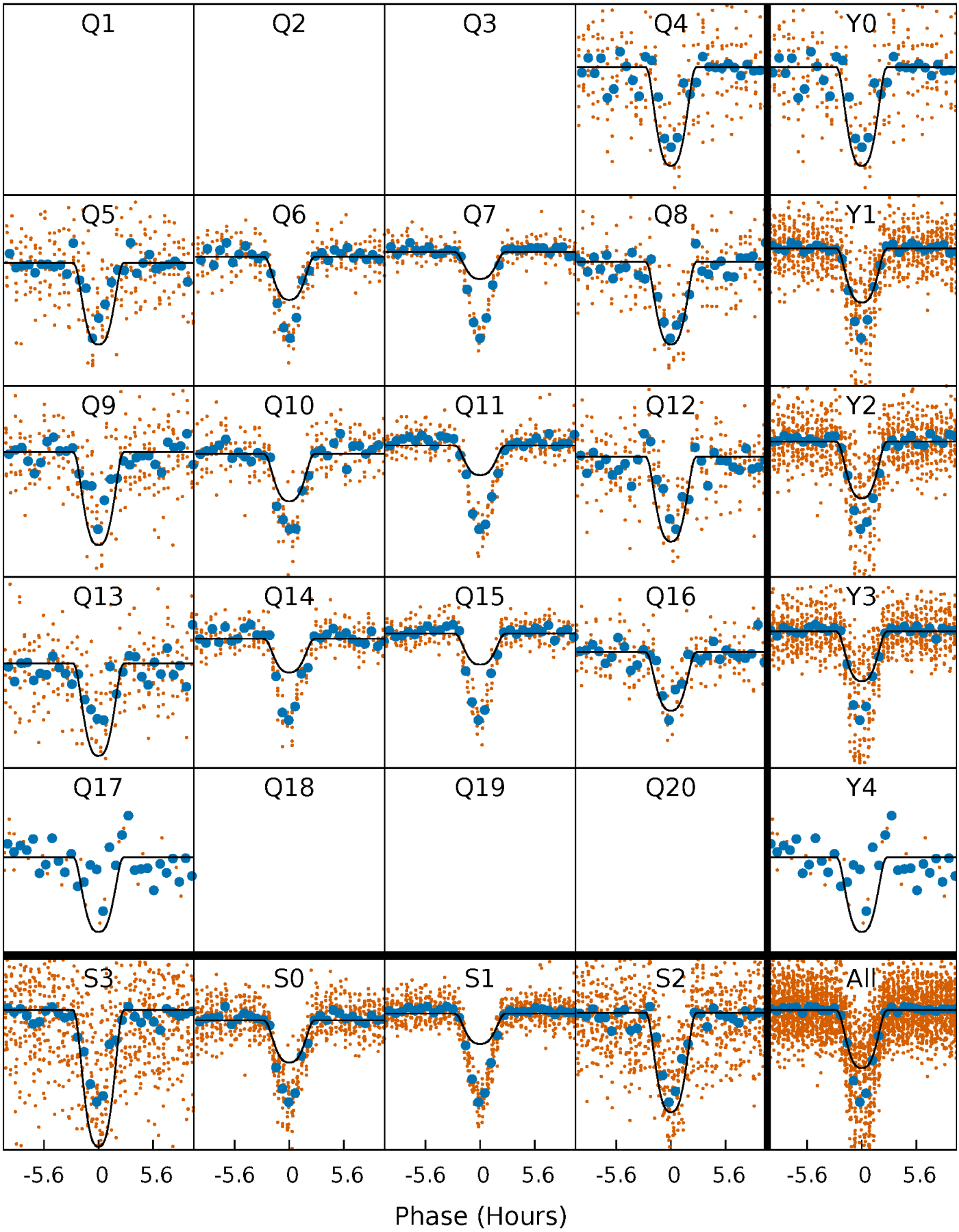
PDC Quarter-Phased Transit Curves

TCE 006531491-01 P= 14.324063 Days T_0=135.211511 (BKJD)



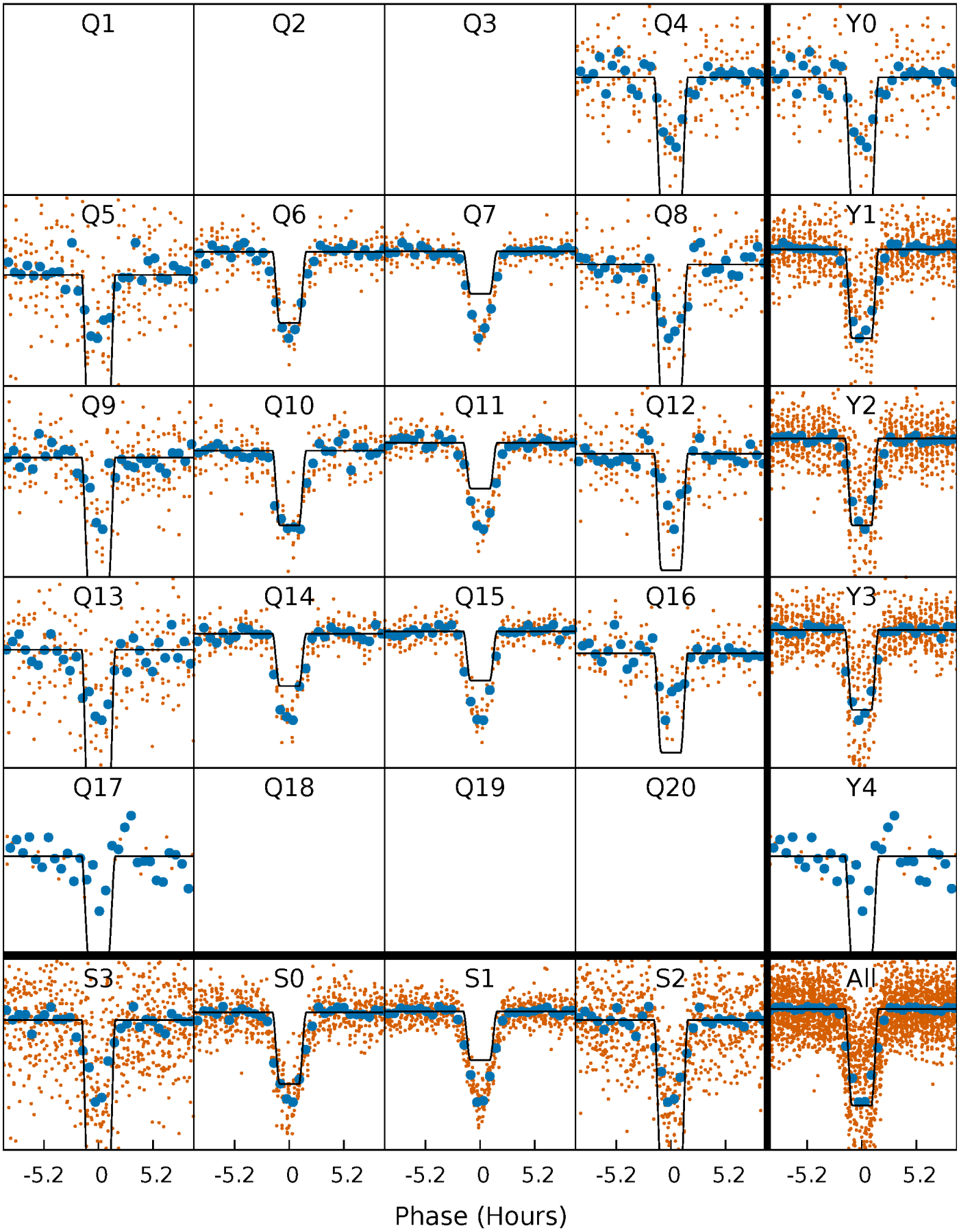
DV Quarter-Phased Transit Curves

TCE 006531491-01 P= 14.324063 Days T_0=135.211511 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

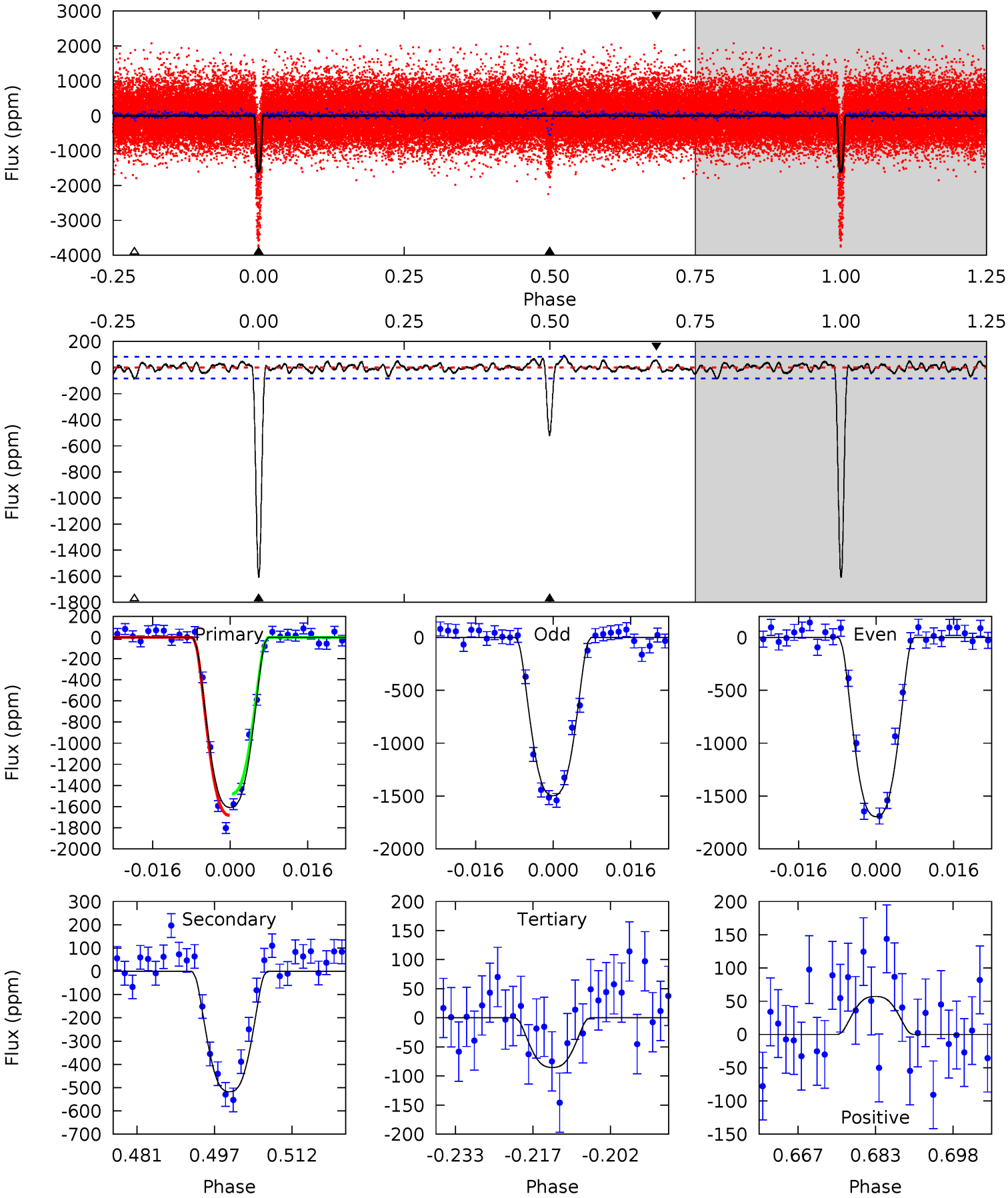
TCE 006531491-01 P= 14.324109 Days T_0=135.208014 (BKJD)



DV Model-Shift Uniqueness Test

006531491-01, P = 14.324063 Days, E = 135.211511 Days

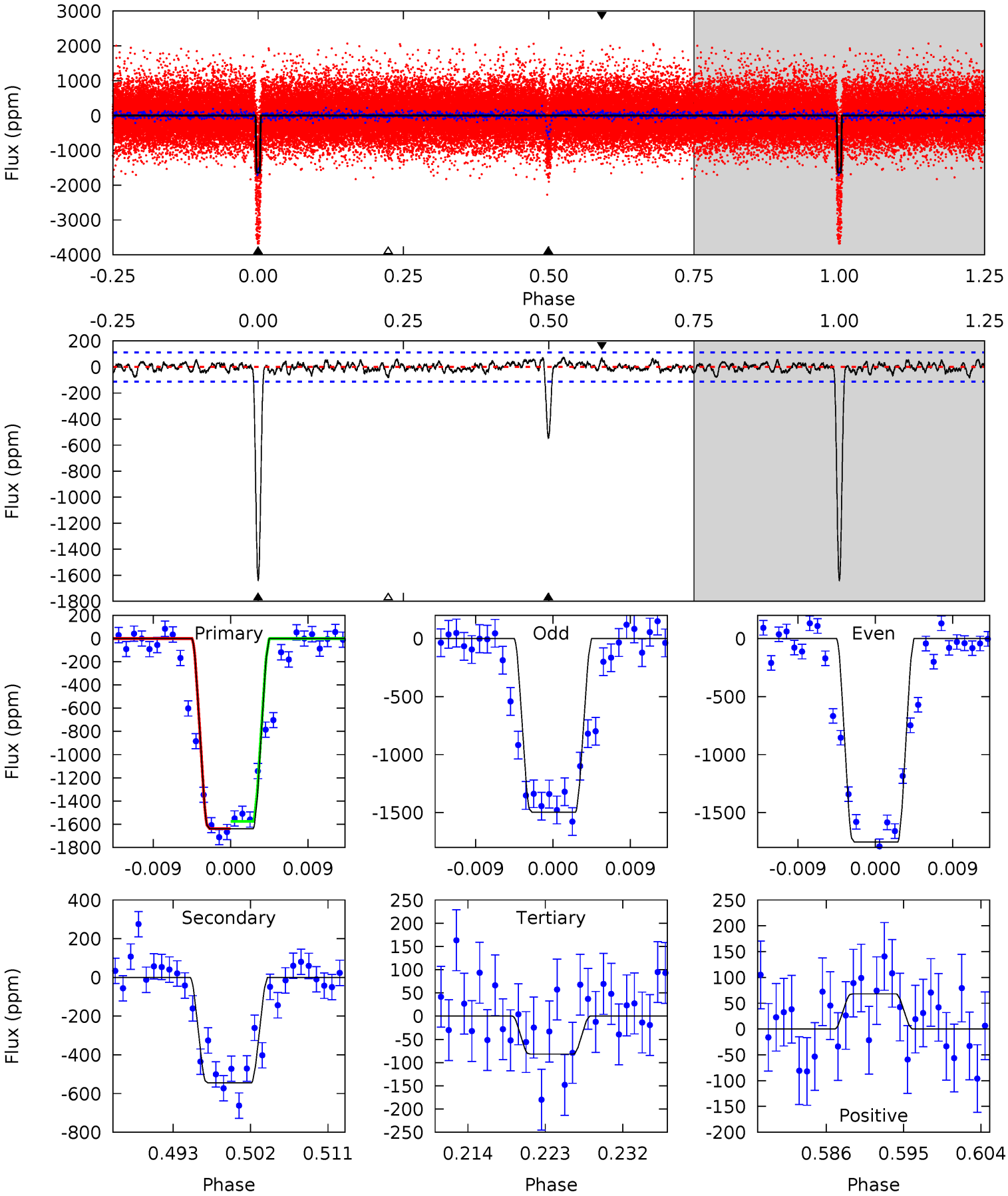
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
95.3	30.7	5.06	3.39	4.94	2.42	1.46	90.2	91.9	25.6	27.3	5.87	1.48	0.05	5.97



Alt Model-Shift Uniqueness Test

006531491-01, P = 14.324109 Days, E = 135.208014 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
73.8	24.5	3.68	3.07	5.04	2.60	1.15	70.1	70.7	20.9	21.5	5.75	1.42	0.04	1.39



Stellar Parameters For KIC 006531491

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	6022^{+190}_{-232}	$4.453^{+0.054}_{-0.216}$	$0.120^{+0.200}_{-0.300}$	$1.039^{+0.331}_{-0.118}$	$1.116^{+0.138}_{-0.166}$	$1.402^{+0.400}_{-0.738}$
	+3%/-4%	+1%/-5%	+167%/-250%	+32%/-11%	+12%/-15%	+29%/-53%
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 006531491-01 / KOI 1237.01

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-518±17	$5.04^{+0.90}_{-0.45}$	1121^{+81}_{-58}	4550^{+129}_{-158}	158^{+27}_{-42}
Alt.	-545±22	$5.45^{+0.91}_{-0.46}$	1121^{+86}_{-58}	4456^{+127}_{-132}	141^{+25}_{-35}

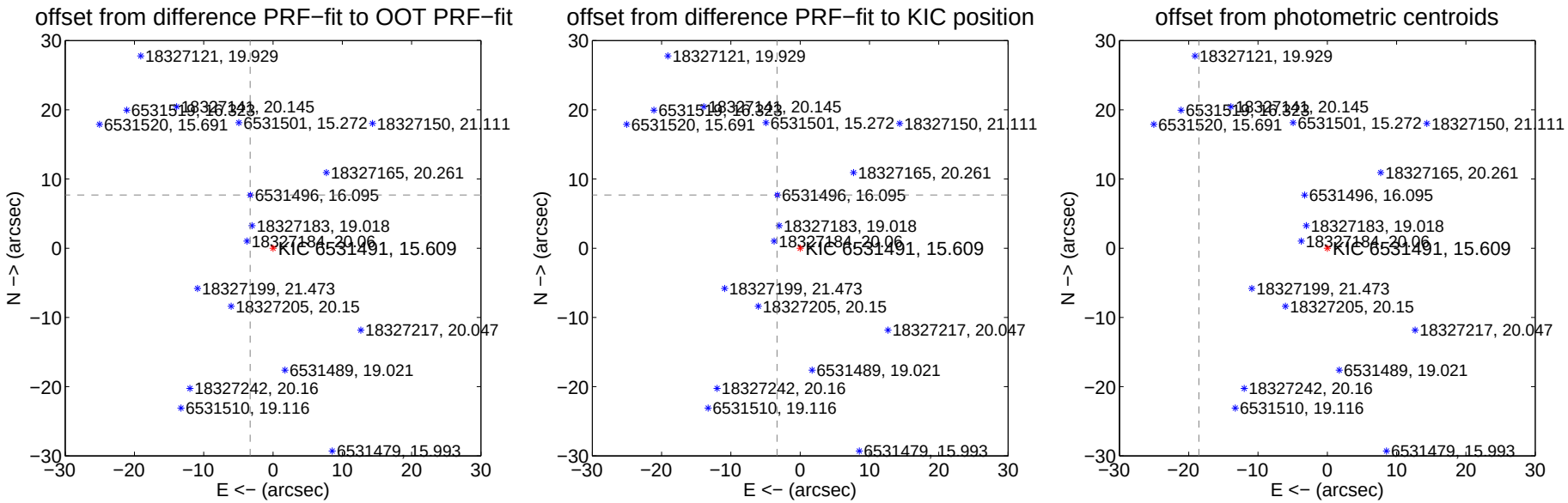
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

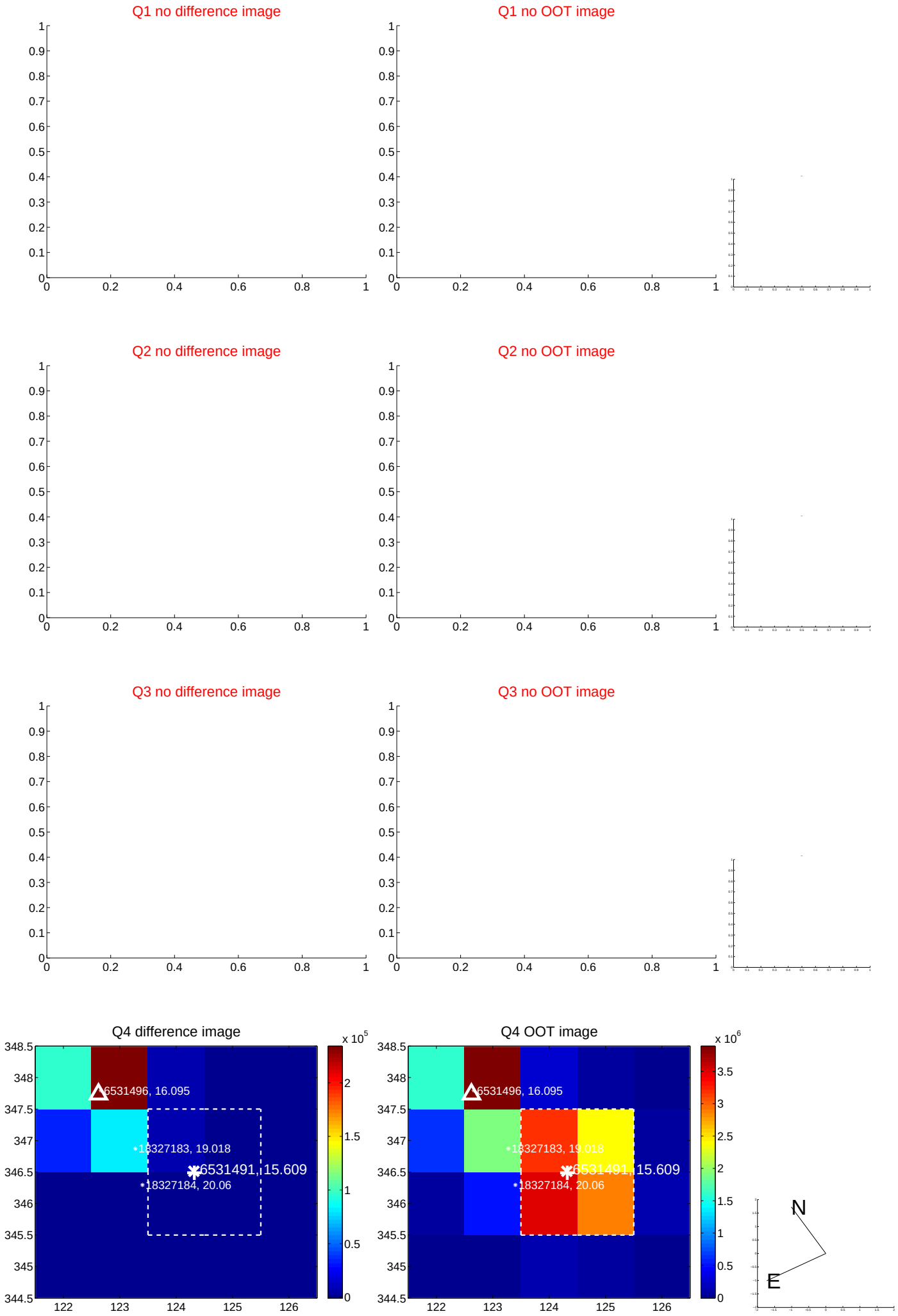
Supplemental centroid analysis for 006531491-01. Kepler magnitude: 15.61. Transit SNR 44.21
There are 14 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	8.366 ± 0.069	121.07	3.299 ± 0.069	7.688 ± 0.070
PRF-fit source offset from KIC position	8.385 ± 0.072	117.14	3.345 ± 0.068	7.689 ± 0.072
photometric centroid source offset	52.26 ± 0.31	167.24	18.53 ± 0.30	48.86 ± 0.31

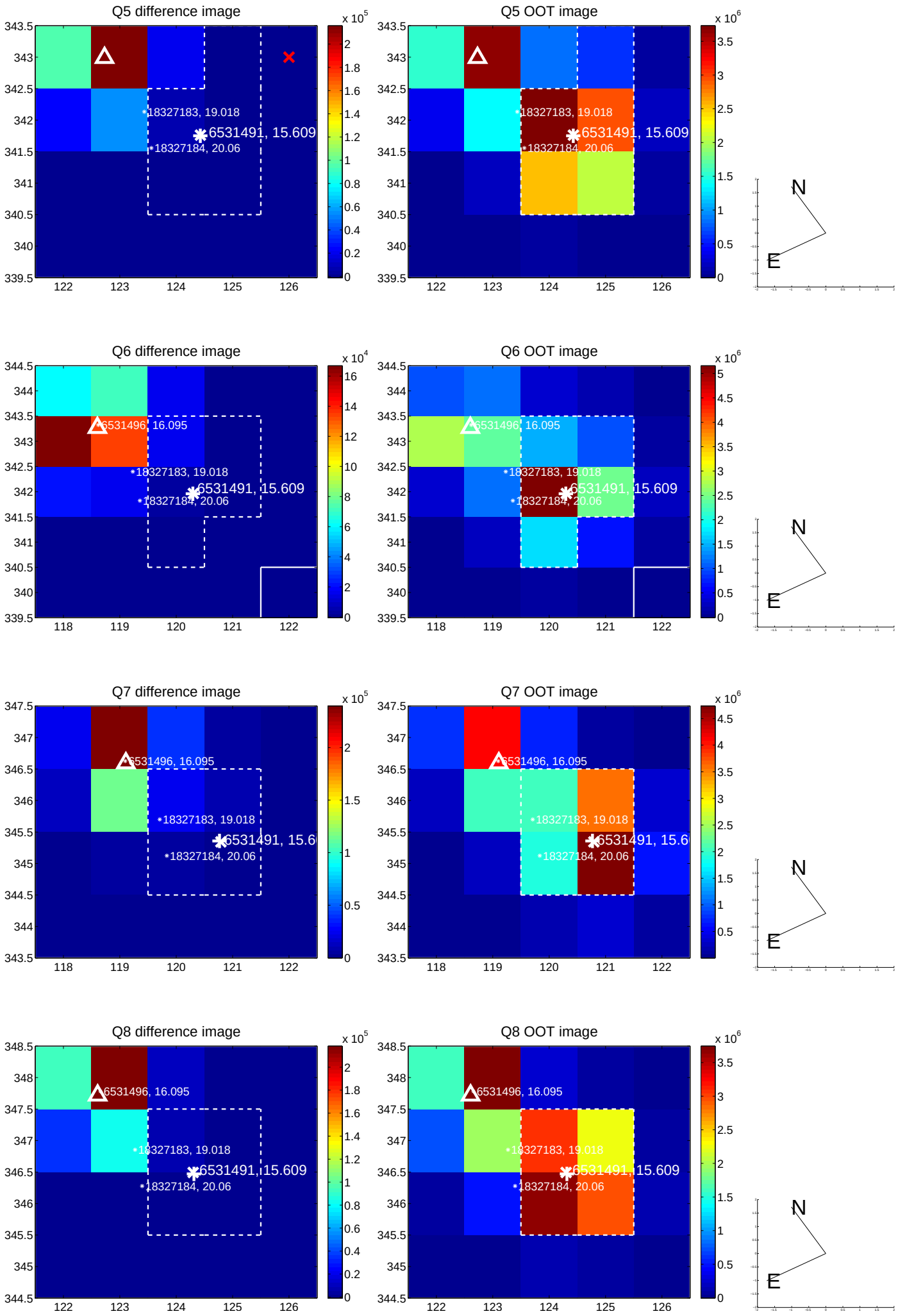


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

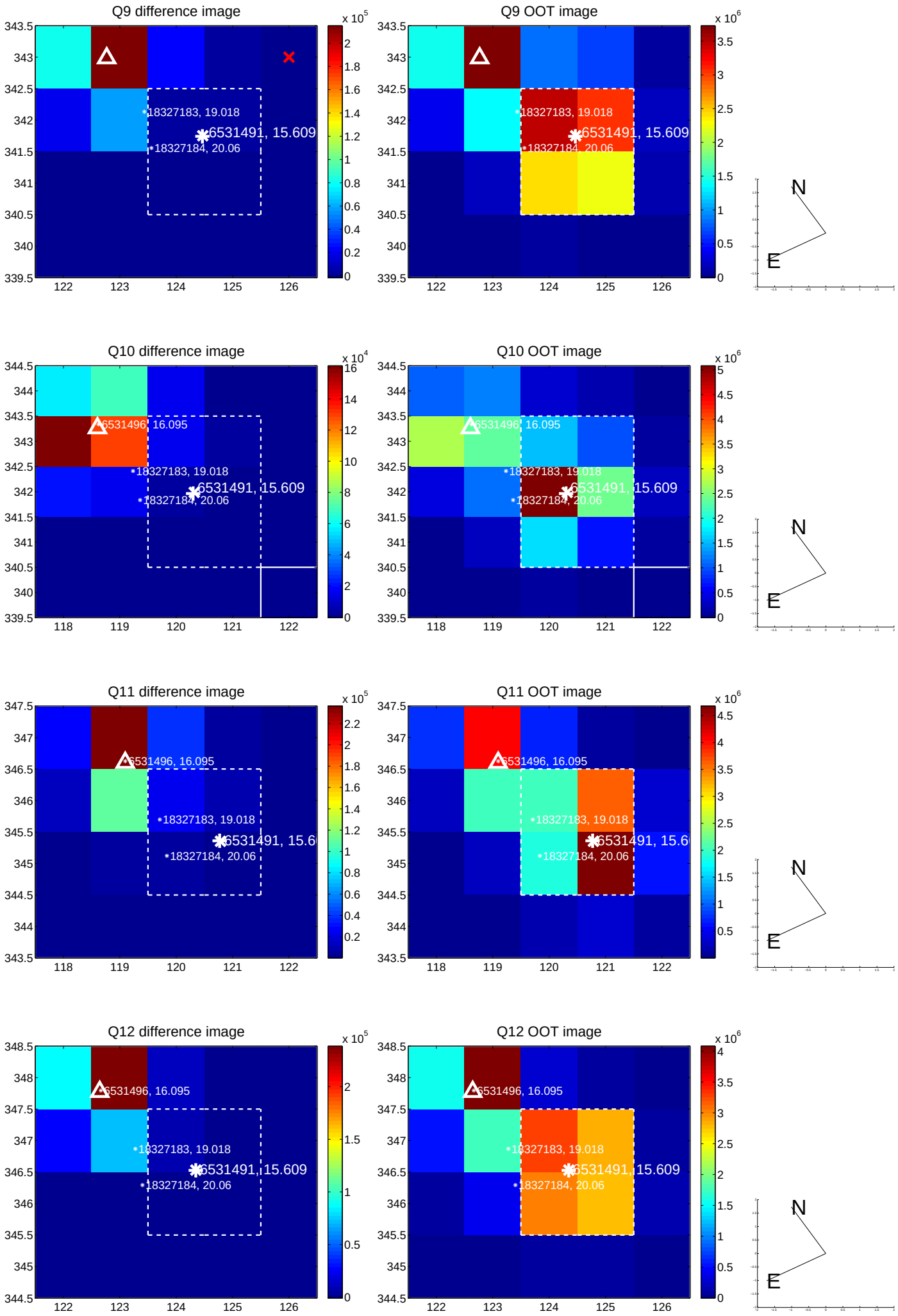
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



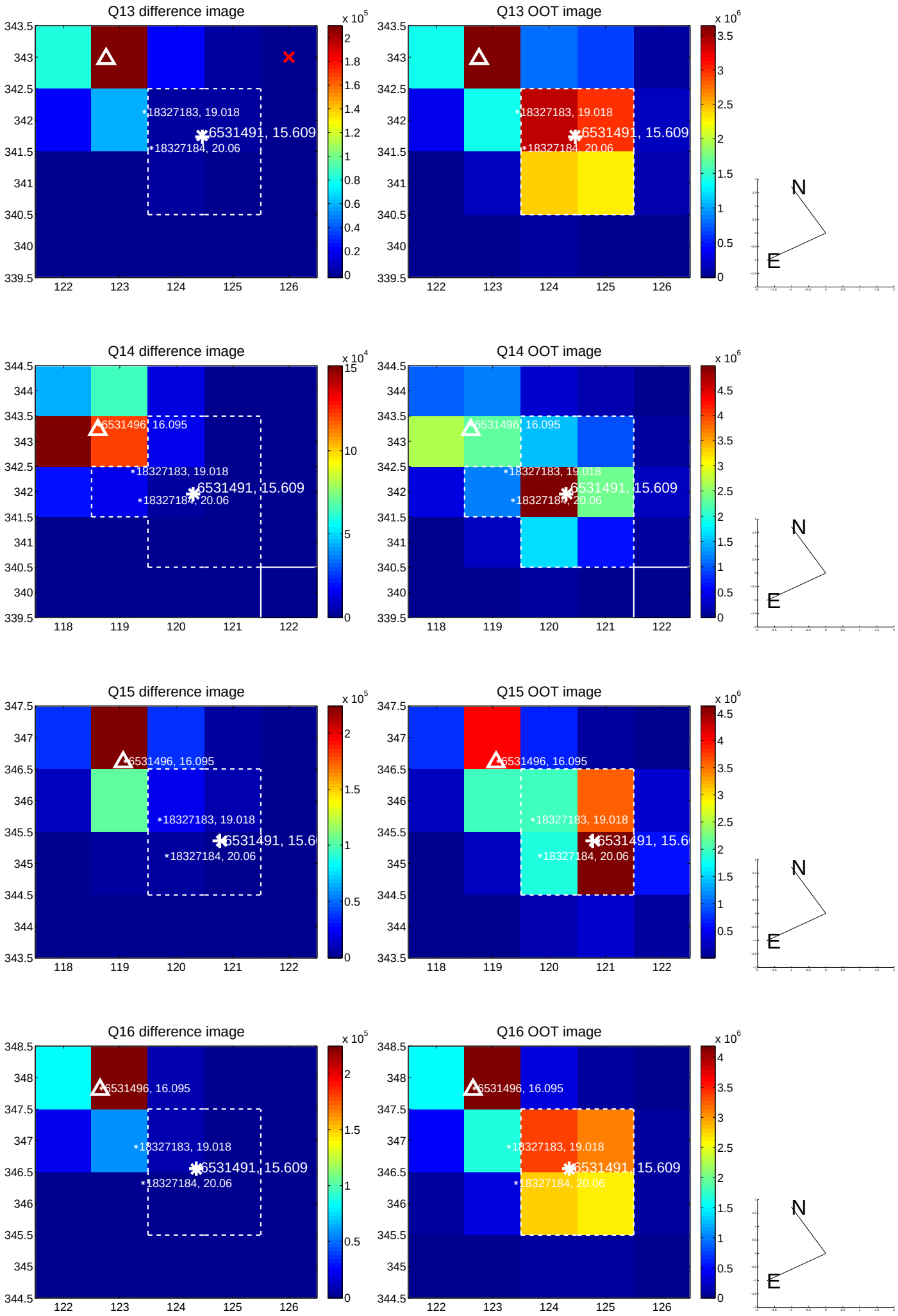
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



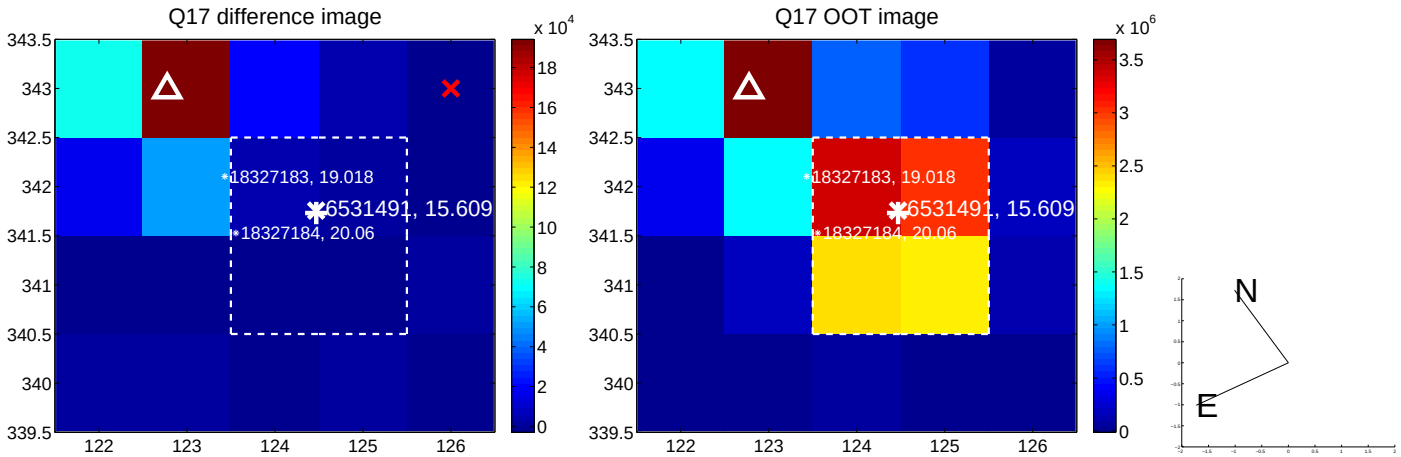
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

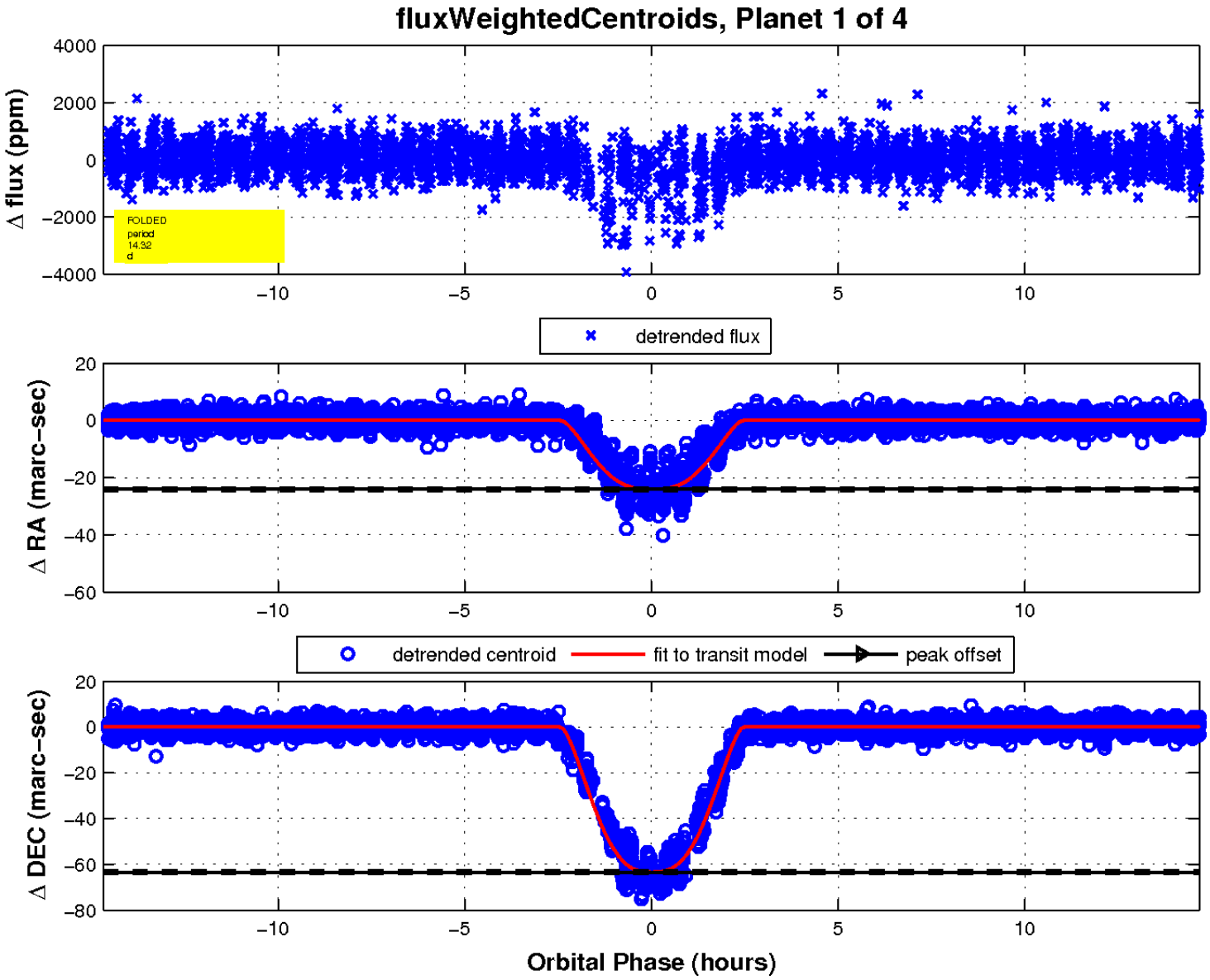


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

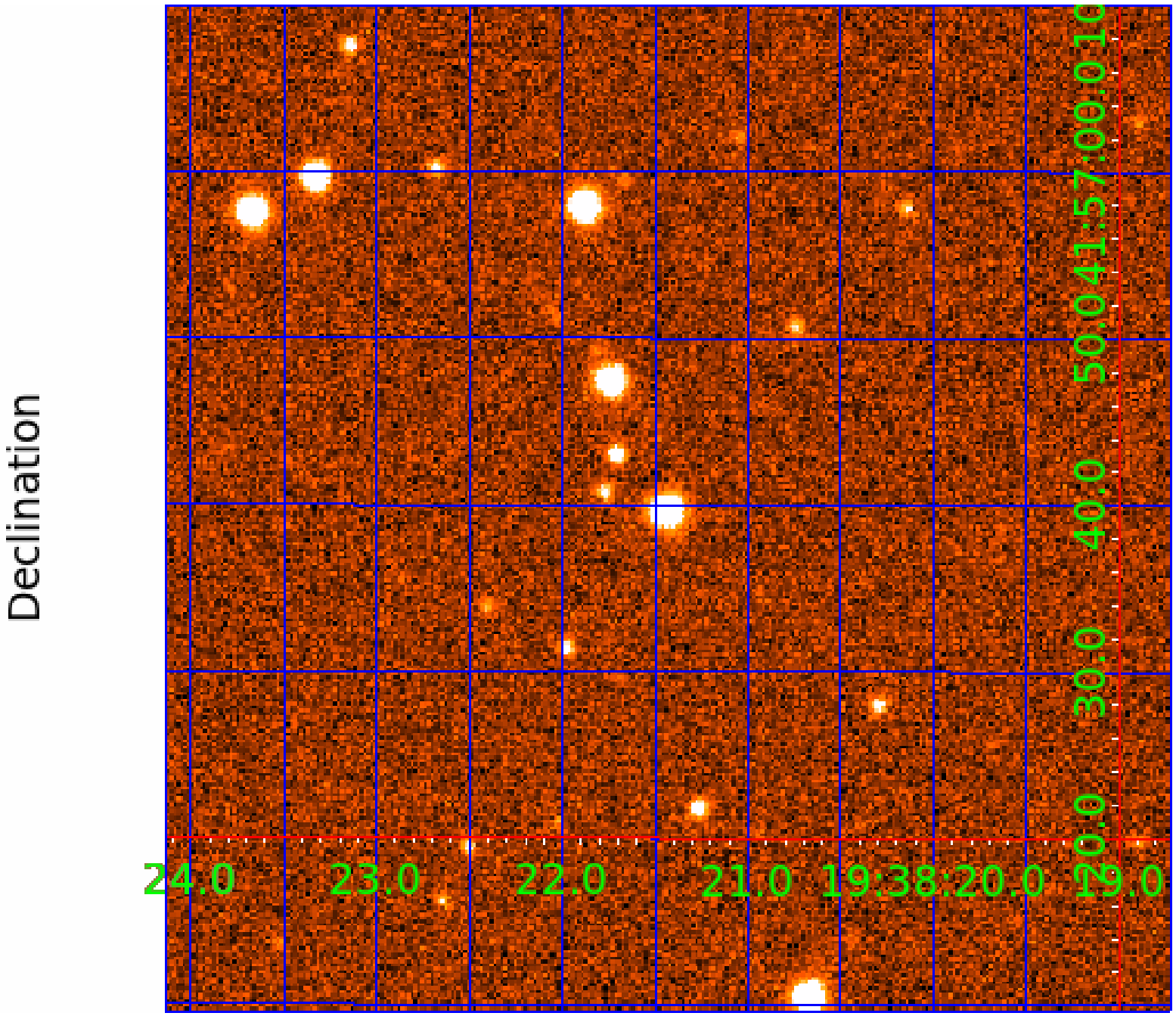


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image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41:57:00.0
10

KIC 006531491

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 ($S_\oplus$)
006531491-01	OBS	1237.01	14.324063	135.211511	1351.2	4.896	72.0	44.2	1.04	6022	4.89	88.62
006531491-02	OBS	No	7.162149	135.191405	535.7	3.805	21.2	21.2	1.04	6022	2.85	223.29
006531491-03	OBS	No	0.513212	131.620574	0.0	0.524	10.5	0.0	1.04	6022	0.00	7502.49
006531491-04	OBS	No	0.512838	131.523492	47.8	2.833	8.0	7.3	1.04	6022	0.78	7509.79

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006531491-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006531491-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006531491-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_RESOLVED_OFFSET
006531491-04	OBS	FP	0.00	1	0	1	1	TRANS_GAPPED—LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

Ephemeris Match Information For 006531491-02

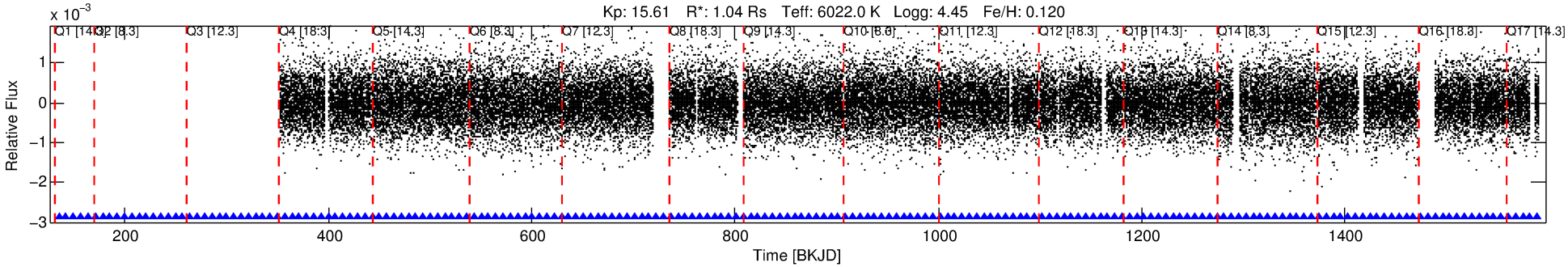
TCE (1)	KIC	Parent (2)	Parent KIC	P_1:P_2	Dist (″)	ΔRow	ΔCol	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
006531491-02	6531491	3646.01	6531496	1:2	8.3	-1	1	16.09	15.60	159.43	Direct-PRF	0	2.44	1.20

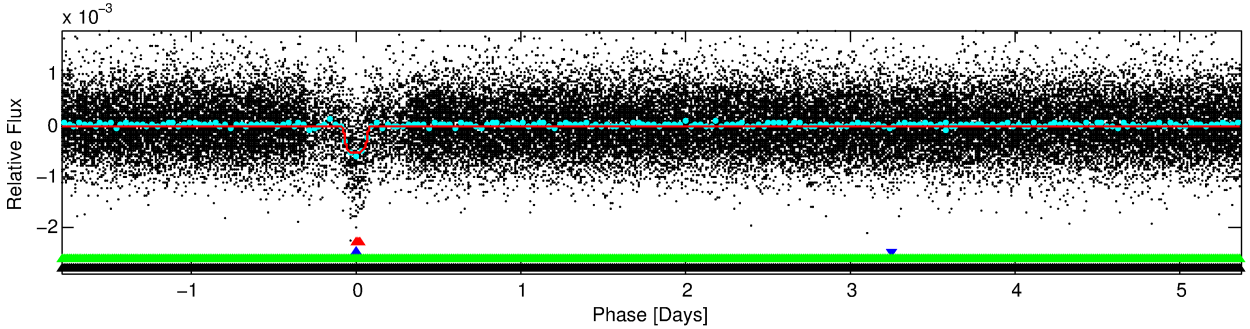
Notes: P_1:P_2 is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth dividied by the child's. σ_P and σ_T are the significance of the match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

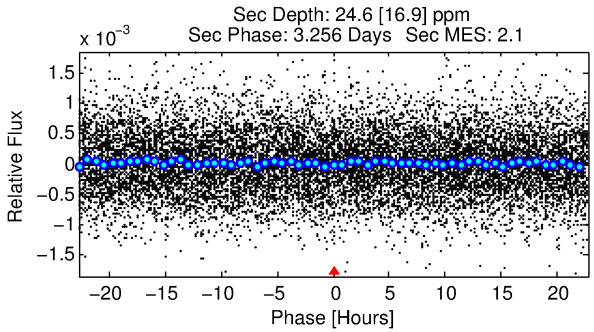
DV One-Page Summary

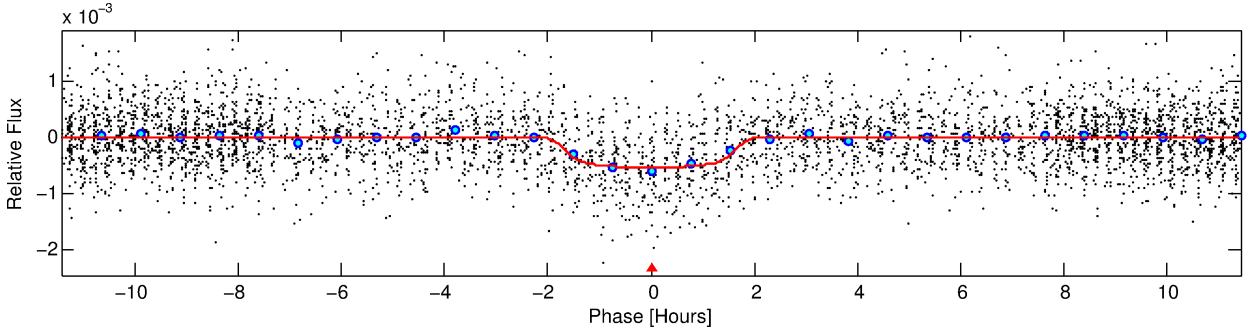
KIC: 6531491 Candidate: 2 of 4 Period: 7.162 d
KOI: K01237 Corr: No Ephemeris Match

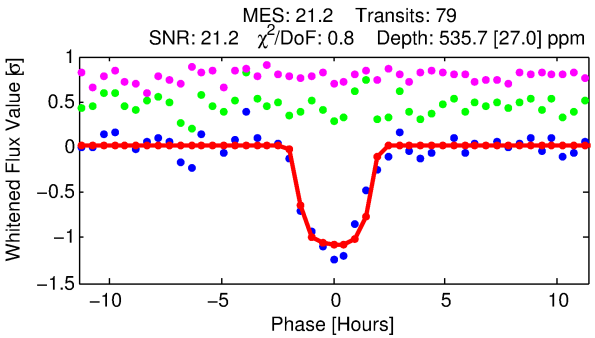
Kp: 15.61 R*: 1.04 Rs Teff: 6022.0 K Logg: 4.45 Fe/H: 0.120

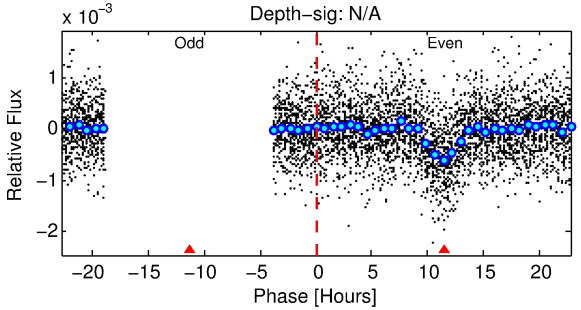


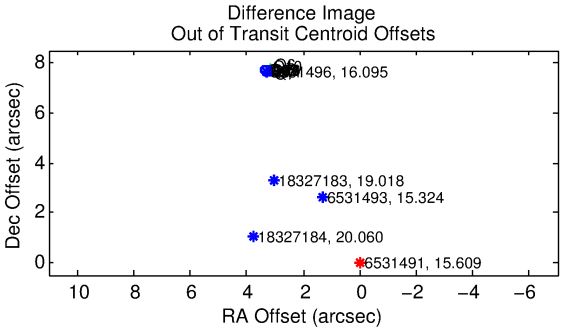












DV Fit Results:

Period = 7.16215 [0.00004] d
Epoch = 135.1914 [0.0043] BKJD
Rp/R* = 0.0251 [0.0028]
a/R* = 7.09 [3.68]
b = 0.90 [0.11]

Seff = 223.29 [94.42]
Teq = 986 [104] K
Rp = 2.85 [0.96] Re
a = 0.0755 [0.0203] AU

Ag = 9.48 [7.81] [1.09σ]
Teffp = 2674 [494] K [3.34σ]

DV Diagnostic Results:

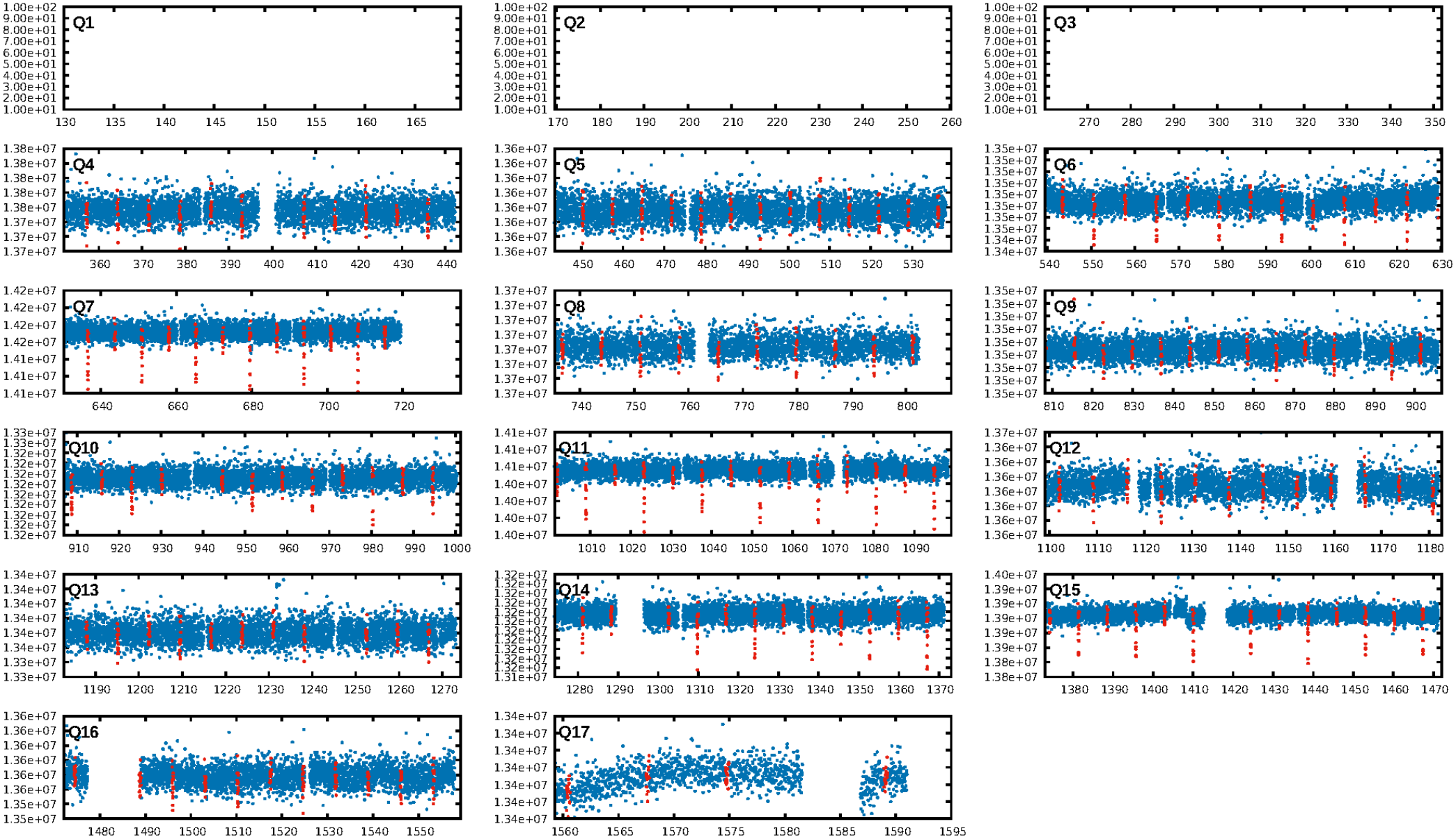
ShortPeriod−sig: 100.0% [41.54σ]
LongPeriod−sig: 100.0% [27.72σ]
ModelChiSquare2−sig: 0.0%
ModelChiSquareGof−sig: 100.0%
Bootstrap−pfa: 2.45e−69
RollingBand−fgt: 1.00 [76/76]
GhostDiagnostic−chr: −0.5498

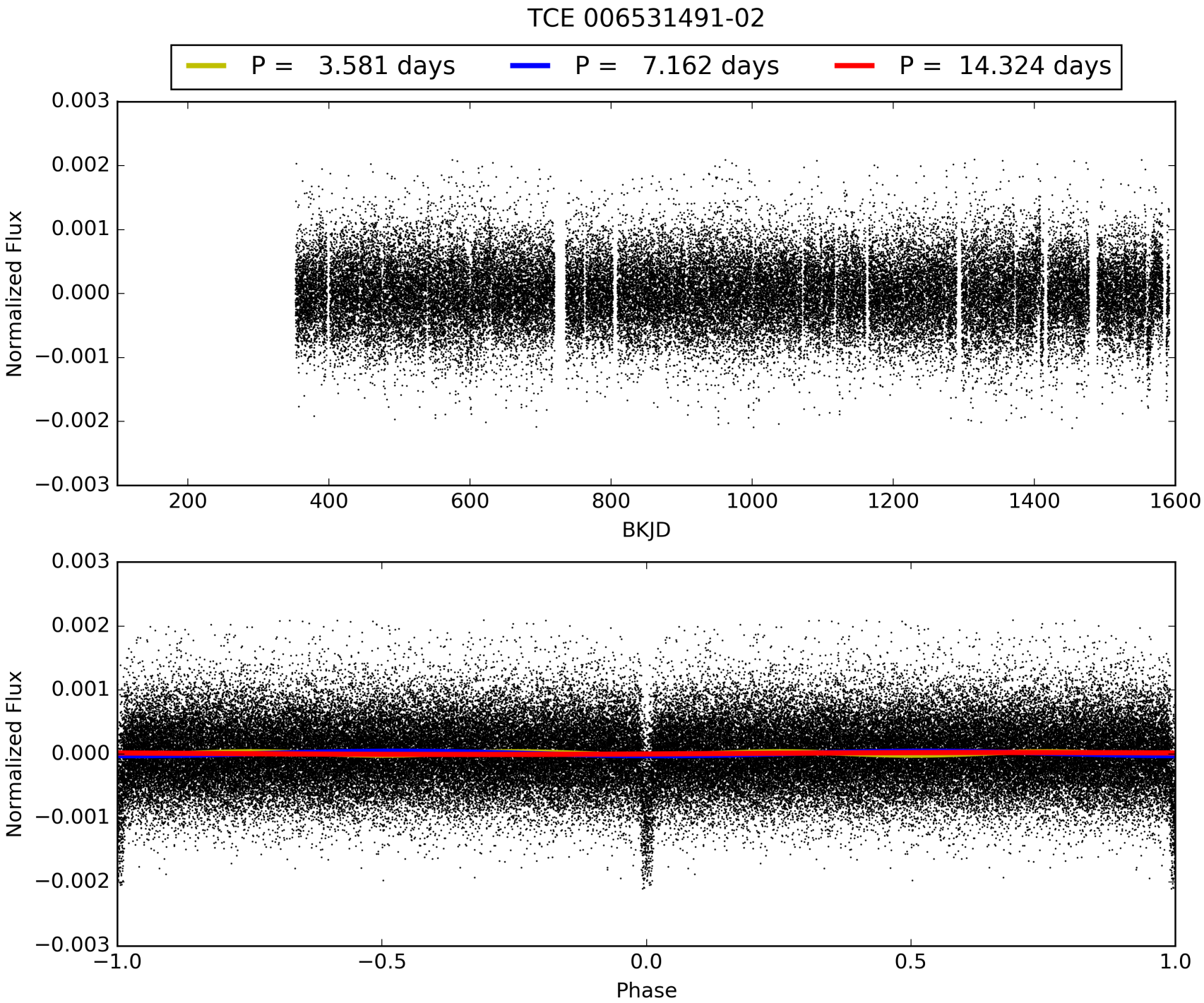
Centroid−sig: 0.0%
Centroid−so: 47.953 arcsec [87.23σ]
OotOffset−rm: 8.369 arcsec [119.34σ]
KicOffset−rm: 8.345 arcsec [117.71σ]
OotOffset−st: 3/3/4/4 [14]
KicOffset−st: 3/3/4/4 [14]
DiffImageQuality−fgm: 1.00 [14/14]
DiffImageOverlap−fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31−Jan−2016 17:48:42 Z

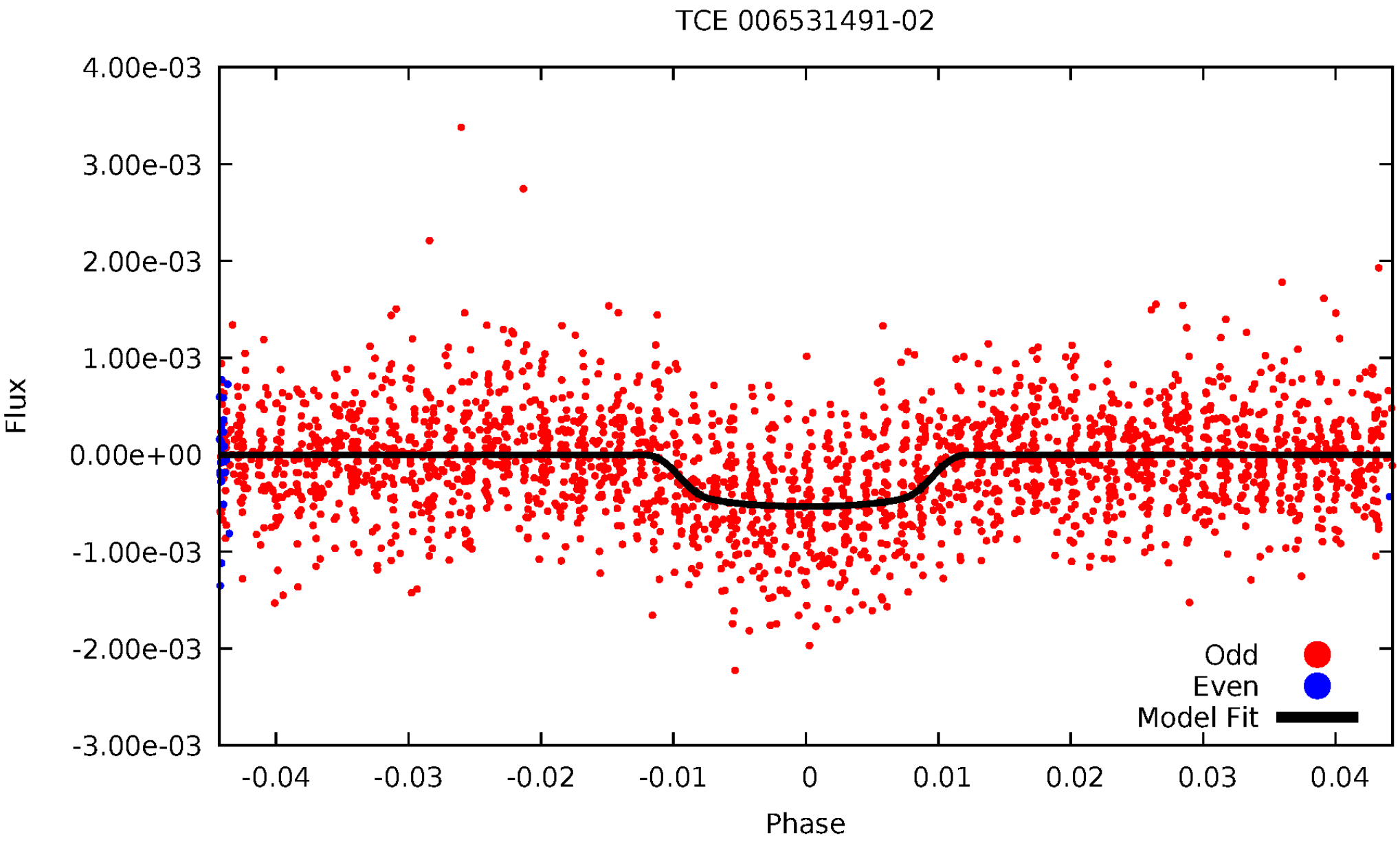
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006531491-02, PDC Light Curves

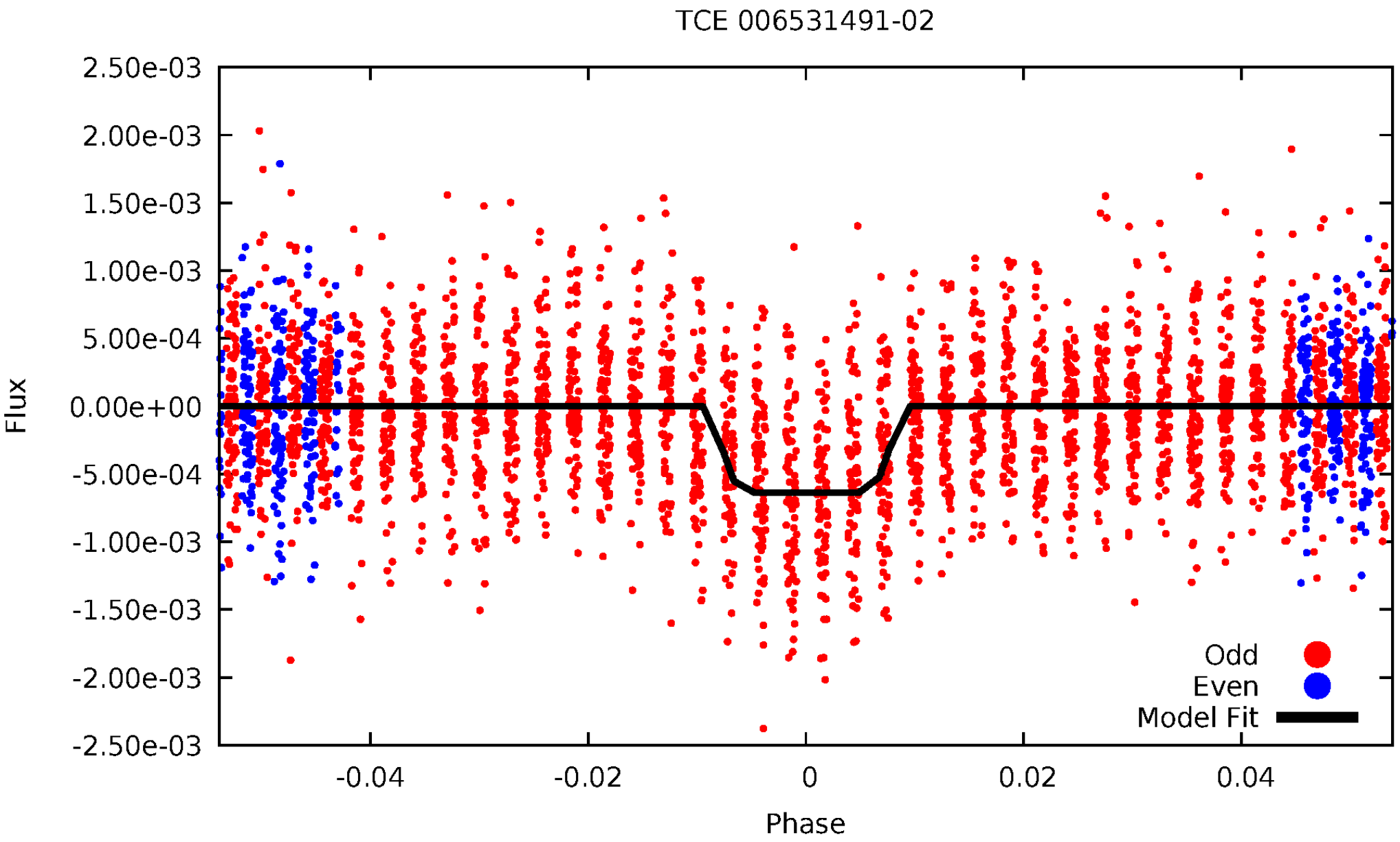



TCE 006531491-02
P = 3.581 days
P = 7.162 days
P = 14.324 days
Normalized Flux
BKJD
Normalized Flux
Phase

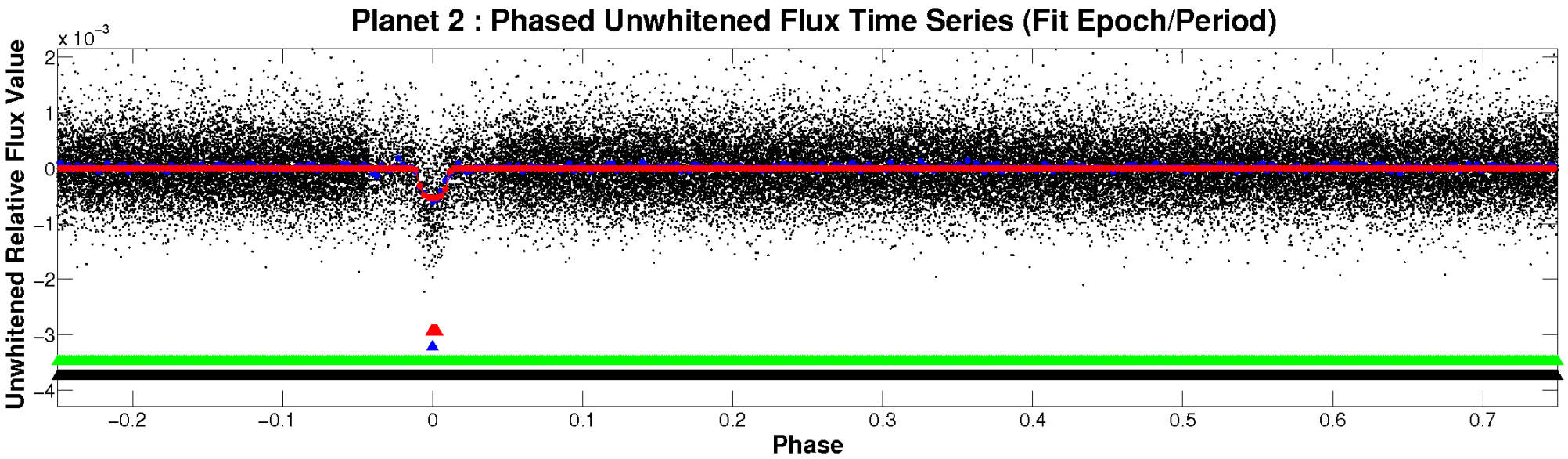
DV Odd/Even

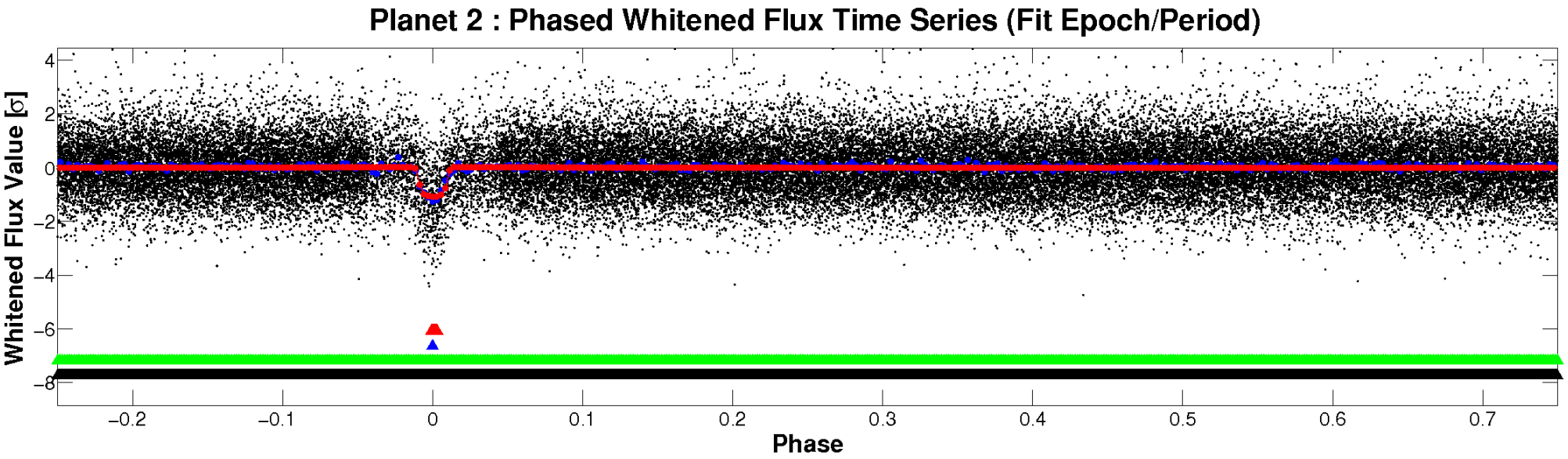

TCE 006531491-02
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
Flux
-0.04
-0.03
-0.02
-0.01
0
0.01
0.02
0.03
0.04
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 006531491-02
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
-2.50e-03
Flux
-0.04
-0.02
0
0.02
0.04
Phase
Odd
Even
Model Fit

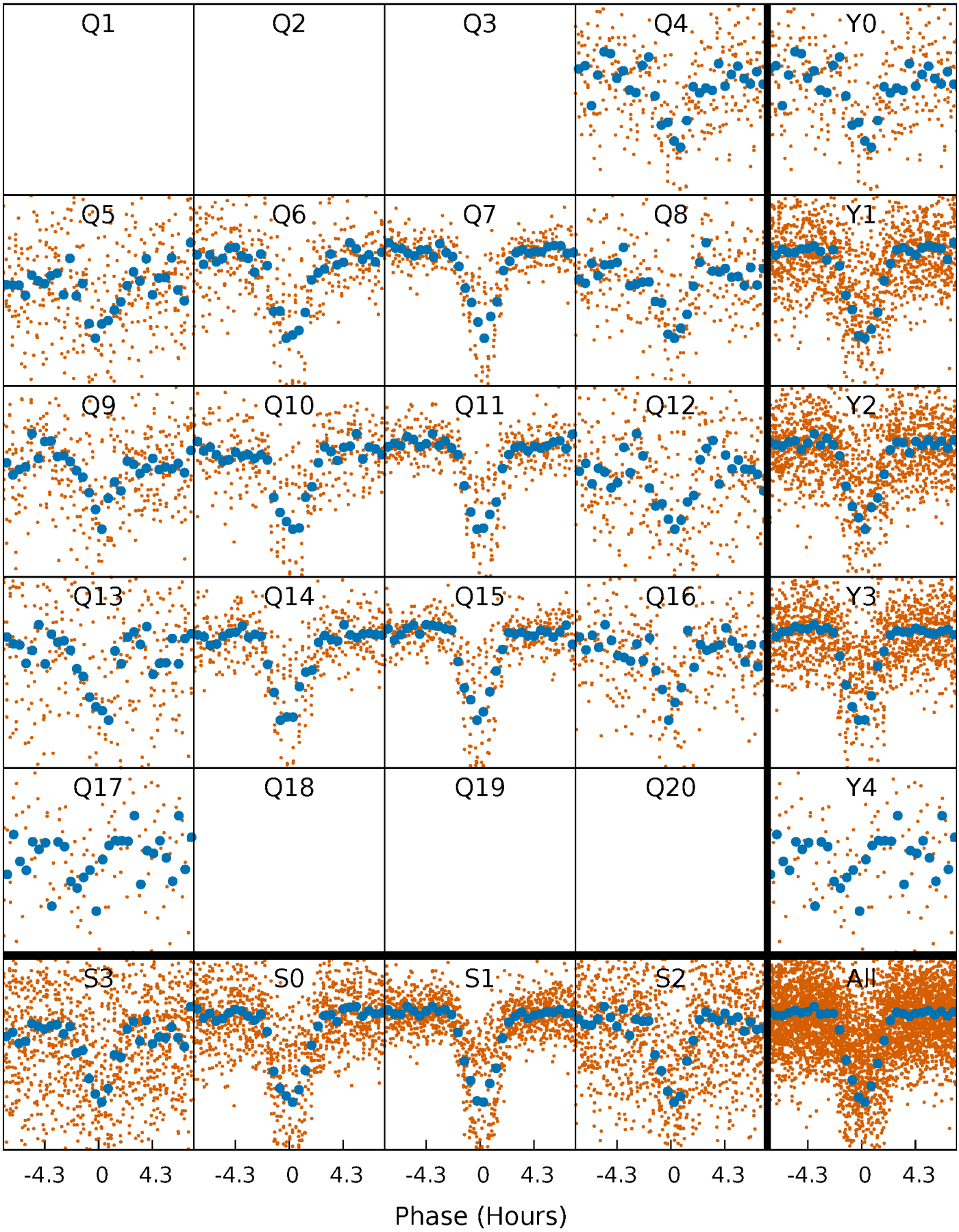
Non-Whitened Vs. Whitened Light Curve





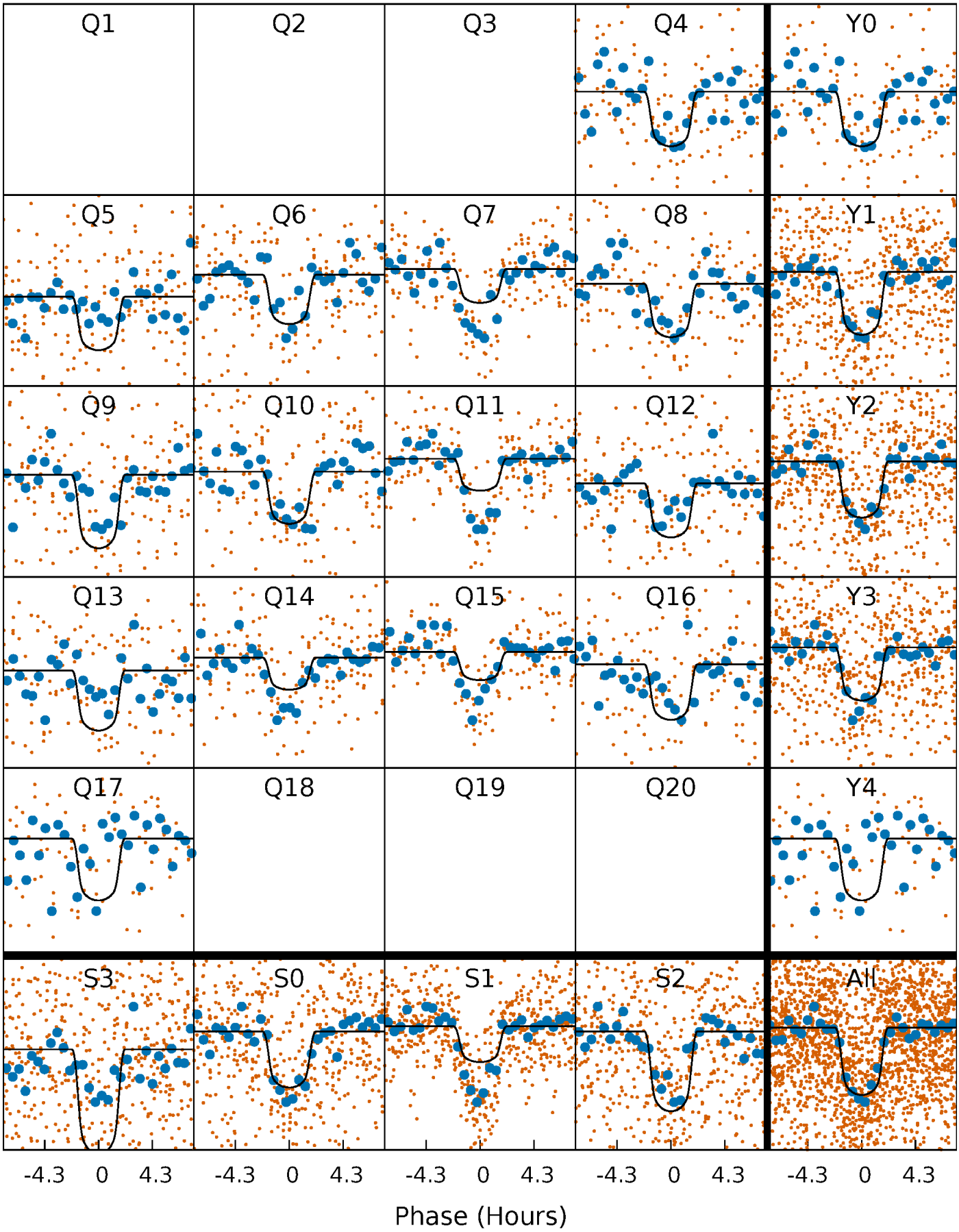
PDC Quarter-Phased Transit Curves

TCE 006531491-02 P= 7.162149 Days T_0=135.191405 (BKJD)



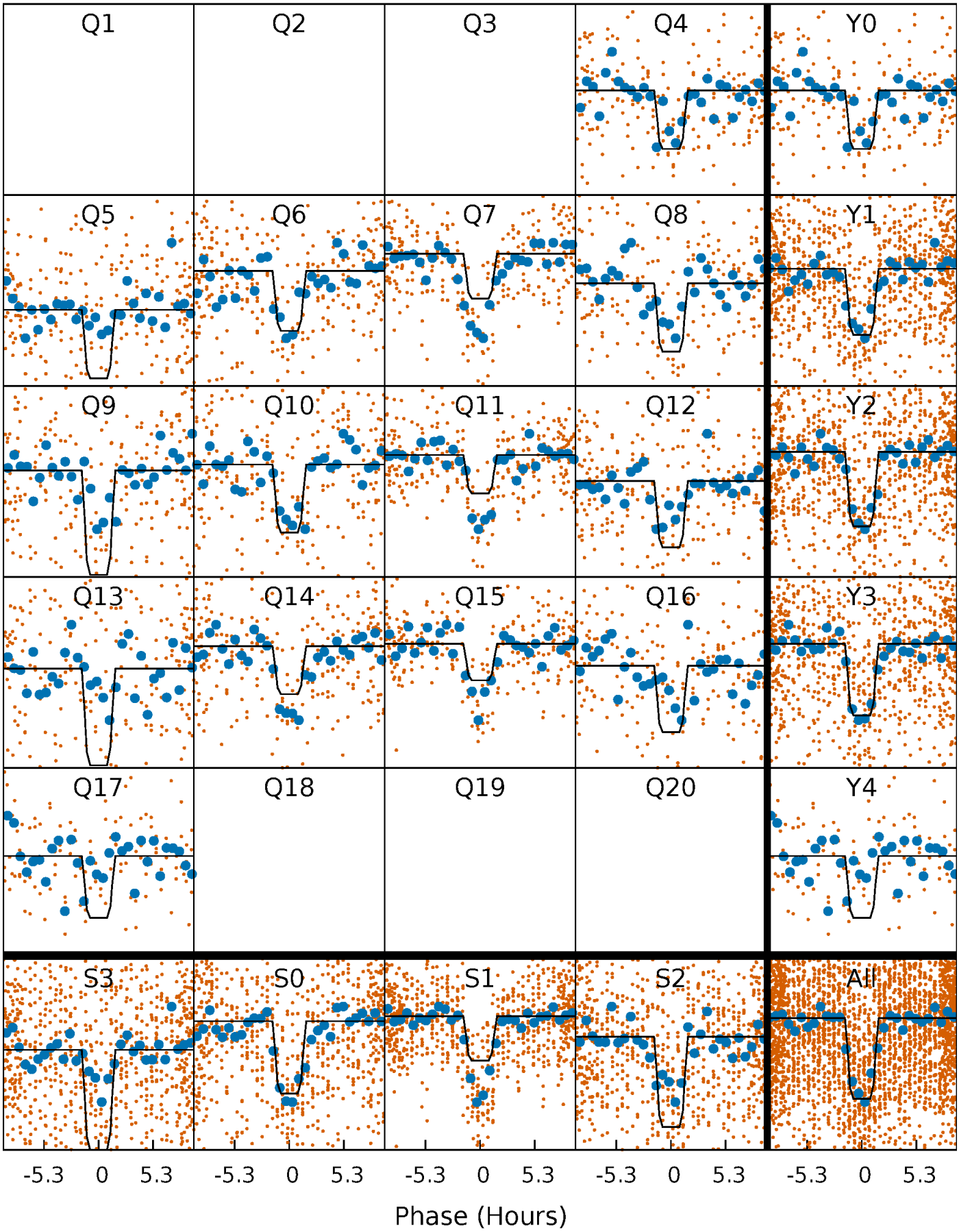
DV Quarter-Phased Transit Curves

TCE 006531491-02 P= 7.162149 Days T_0=135.191405 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

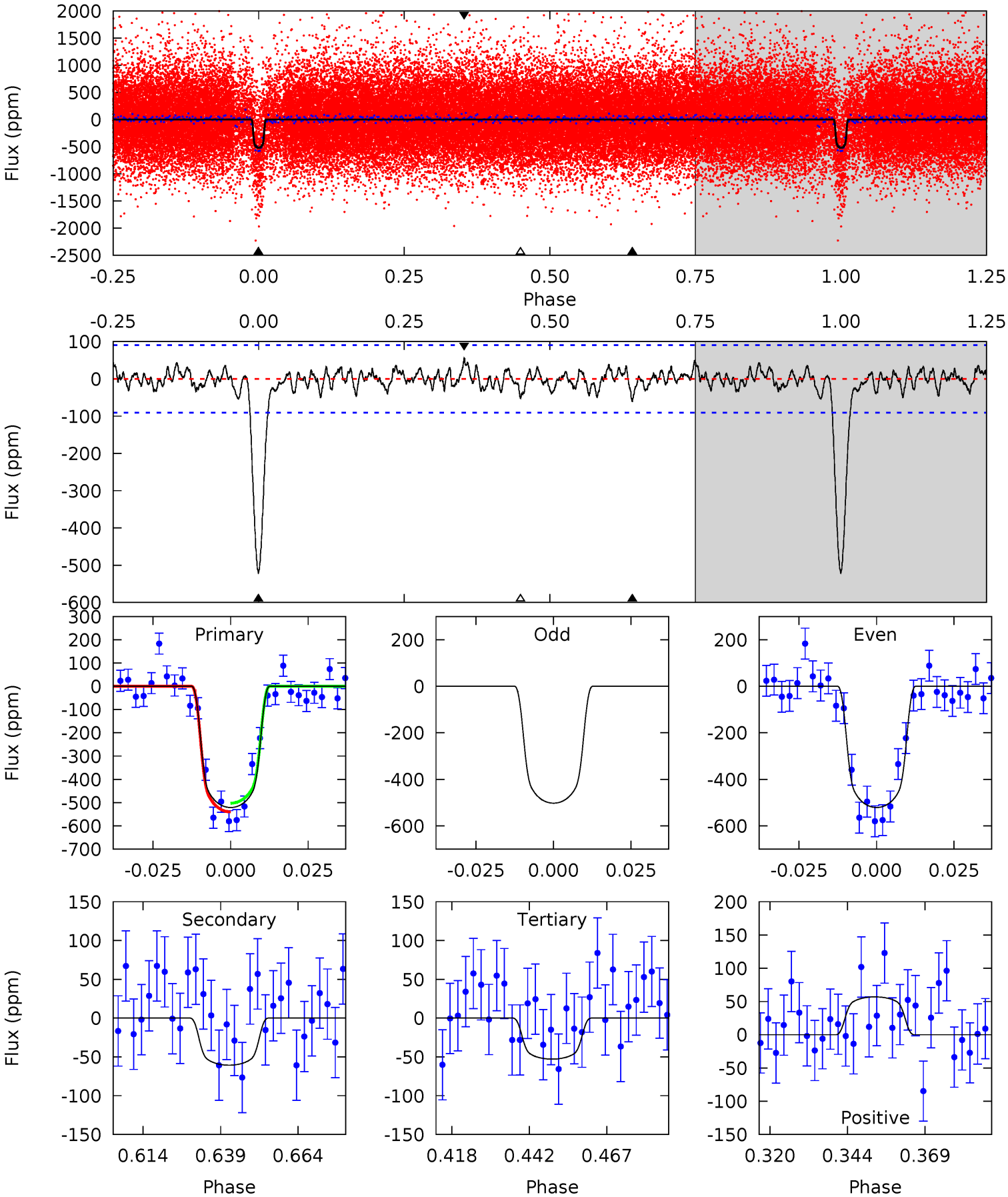
TCE 006531491-02 P= 7.161988 Days T_0=135.208235 (BKJD)



DV Model-Shift Uniqueness Test

006531491-02, P = 7.162149 Days, E = 135.191405 Days

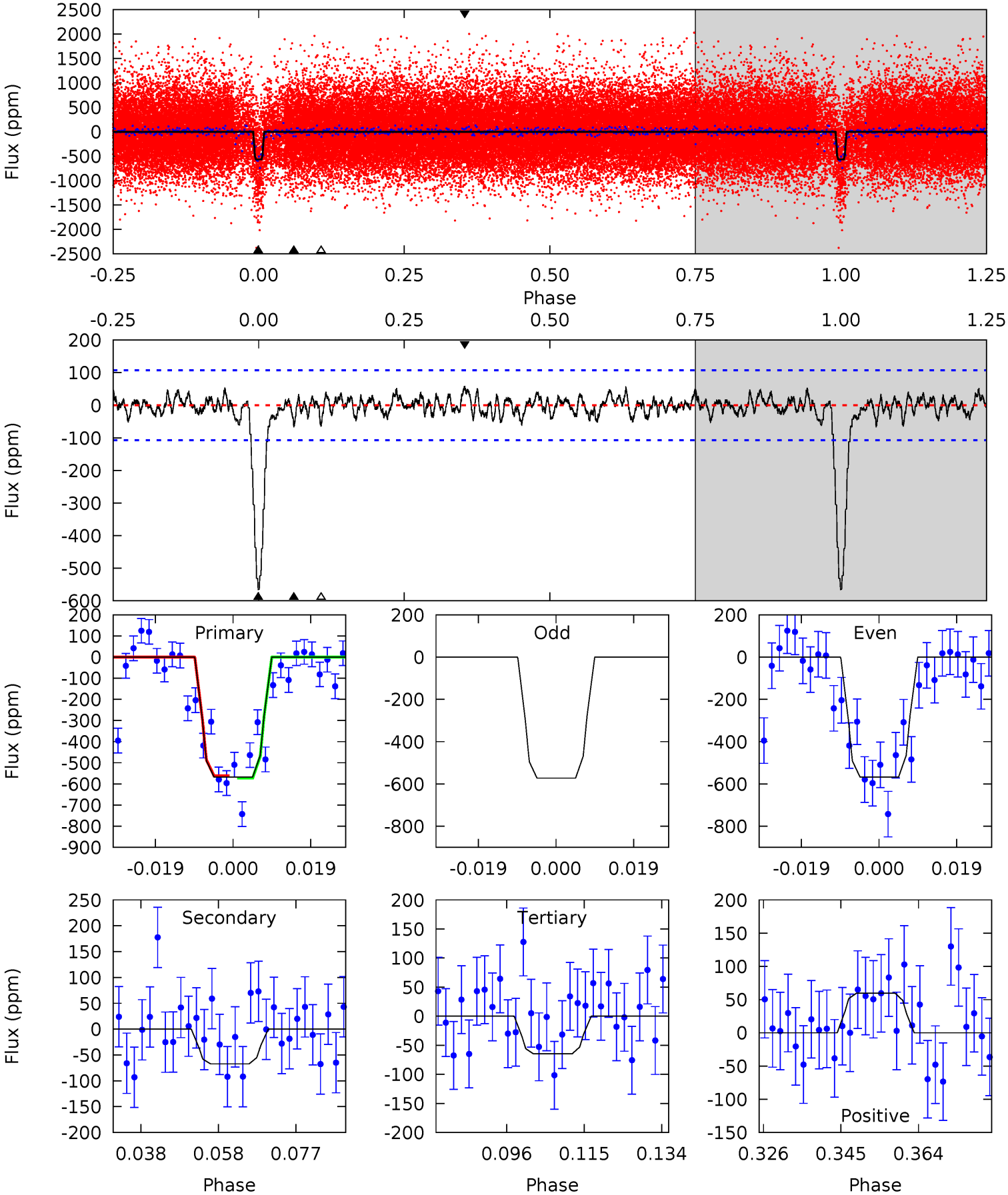
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
27.9	3.25	2.83	3.05	4.85	2.25	1.02	25.1	24.9	0.42	0.20	0.58	1.05	0.10	1.01



Alt Model-Shift Uniqueness Test

006531491-02, P = 7.161988 Days, E = 135.208235 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
25.9	3.07	2.96	2.73	4.90	2.34	1.01	23.0	23.2	0.11	0.34	0.14	1.05	0.10	0.24



Stellar Parameters For KIC 006531491

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	6022^{+190}_{-232}	$4.453^{+0.054}_{-0.216}$	$0.120^{+0.200}_{-0.300}$	$1.039^{+0.331}_{-0.118}$	$1.116^{+0.138}_{-0.166}$	$1.402^{+0.400}_{-0.738}$
	+3%/-4%	+1%/-5%	+167%/-250%	+32%/-11%	+12%/-15%	+29%/-53%
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 006531491-02 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-61±19	$2.95^{+0.51}_{-0.40}$	1409^{+91}_{-75}	3748^{+243}_{-282}	21^{+10}_{-8}
Alt.	-67±22	$3.00^{+0.58}_{-0.42}$	1412^{+97}_{-75}	3782^{+287}_{-264}	22^{+12}_{-9}

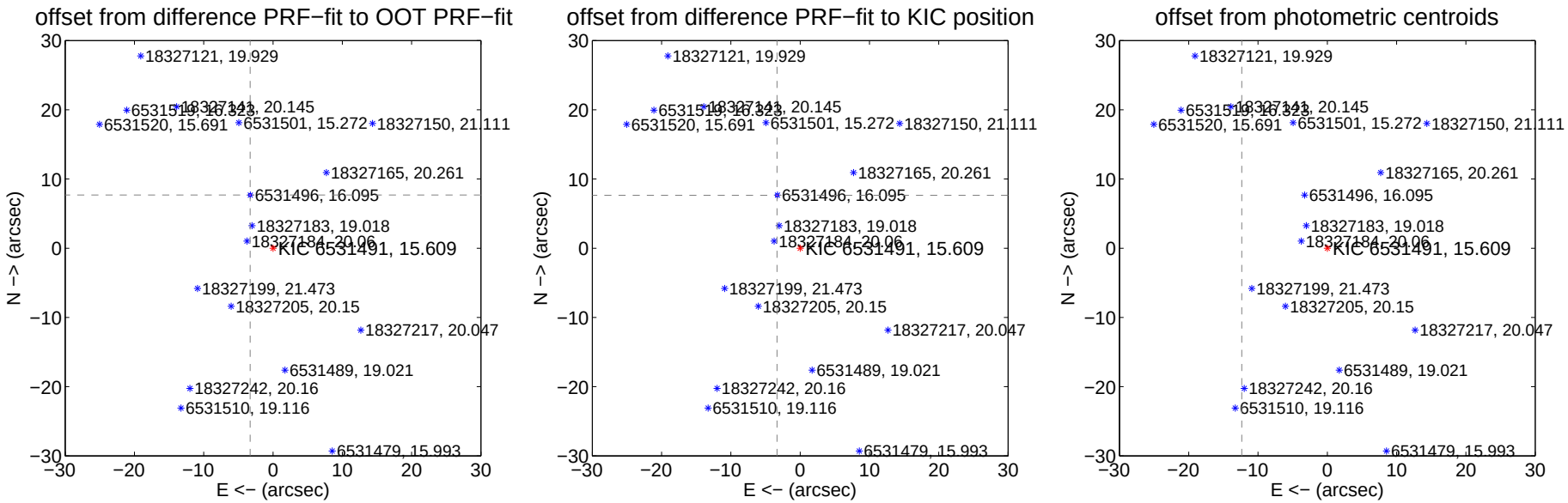
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

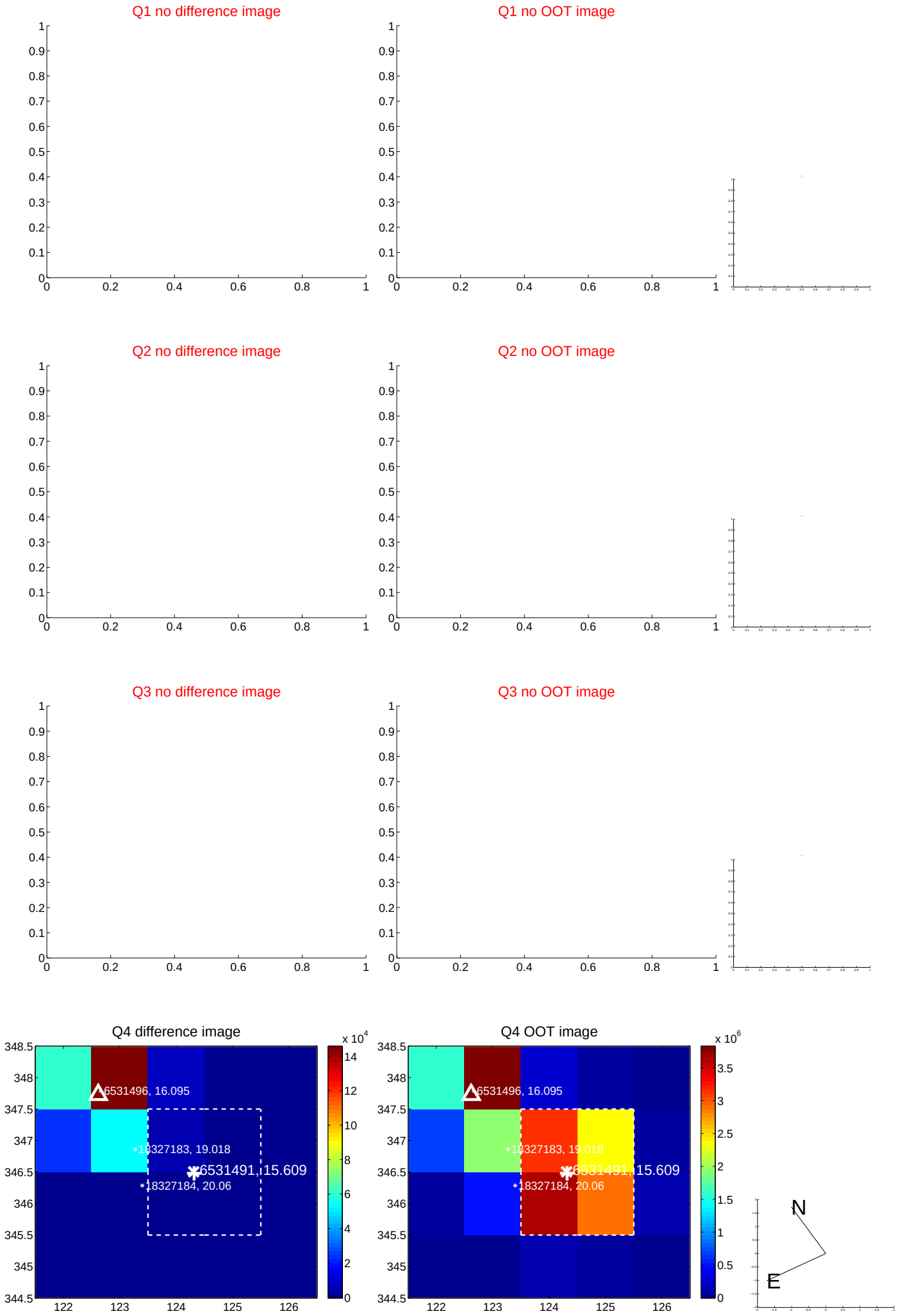
Supplemental centroid analysis for 006531491-02. Kepler magnitude: 15.61. Transit SNR 21.21
There are 14 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.10 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	8.369 ± 0.070	119.34	3.307 ± 0.070	7.688 ± 0.071
PRF-fit source offset from KIC position	8.345 ± 0.071	117.71	3.346 ± 0.070	7.645 ± 0.072
photometric centroid source offset	47.95 ± 0.55	87.23	12.35 ± 0.52	46.34 ± 0.55

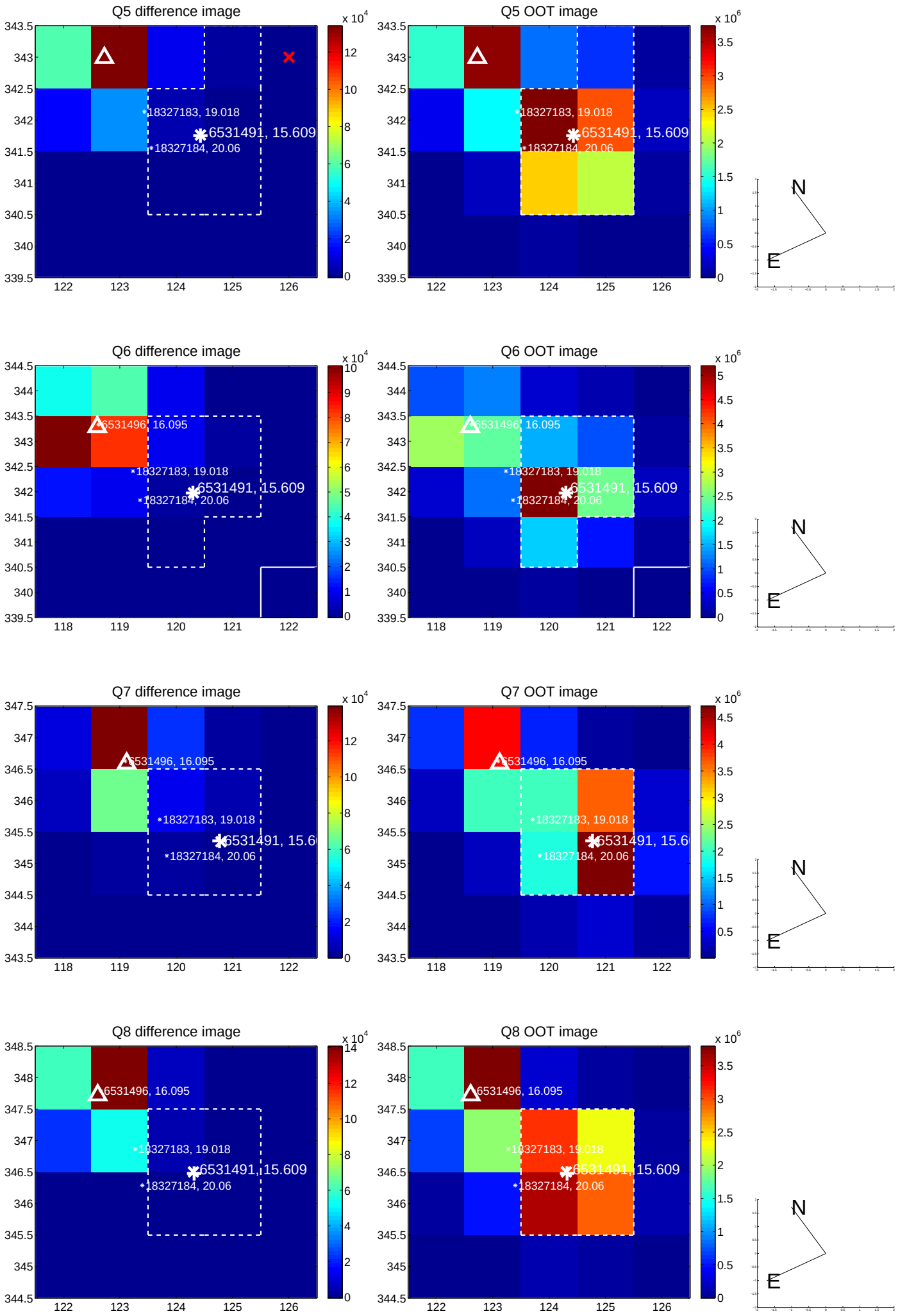


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

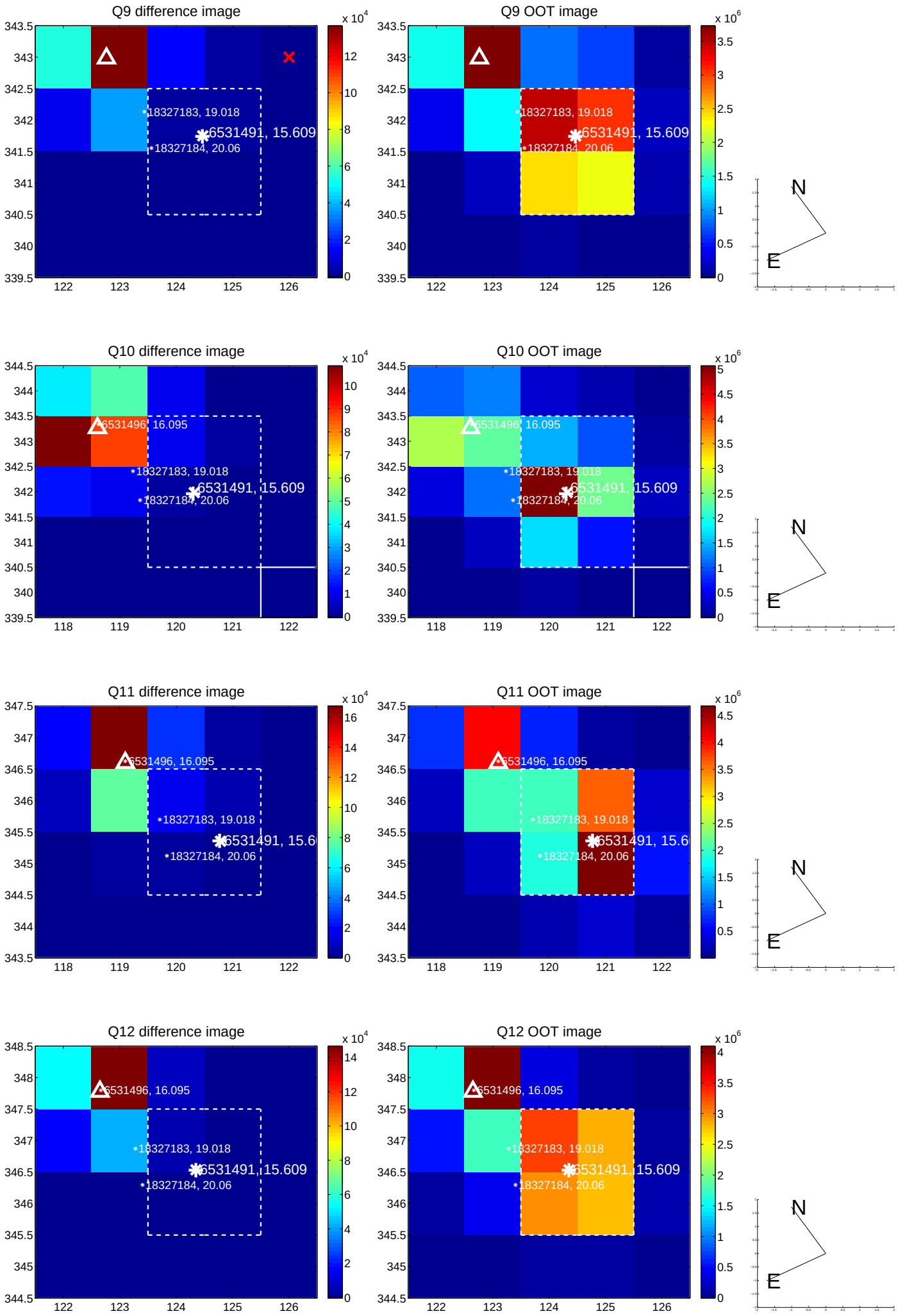
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



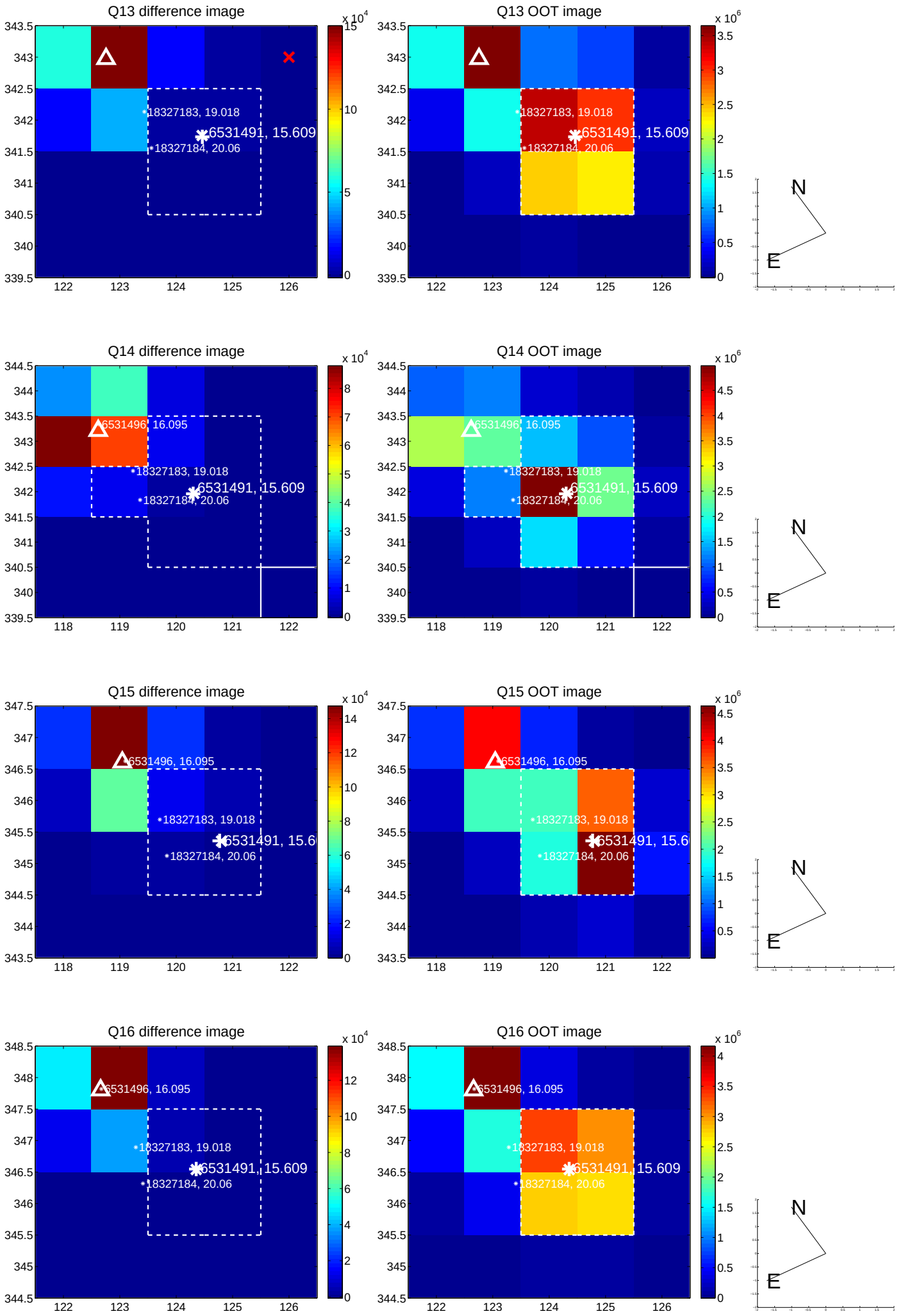
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



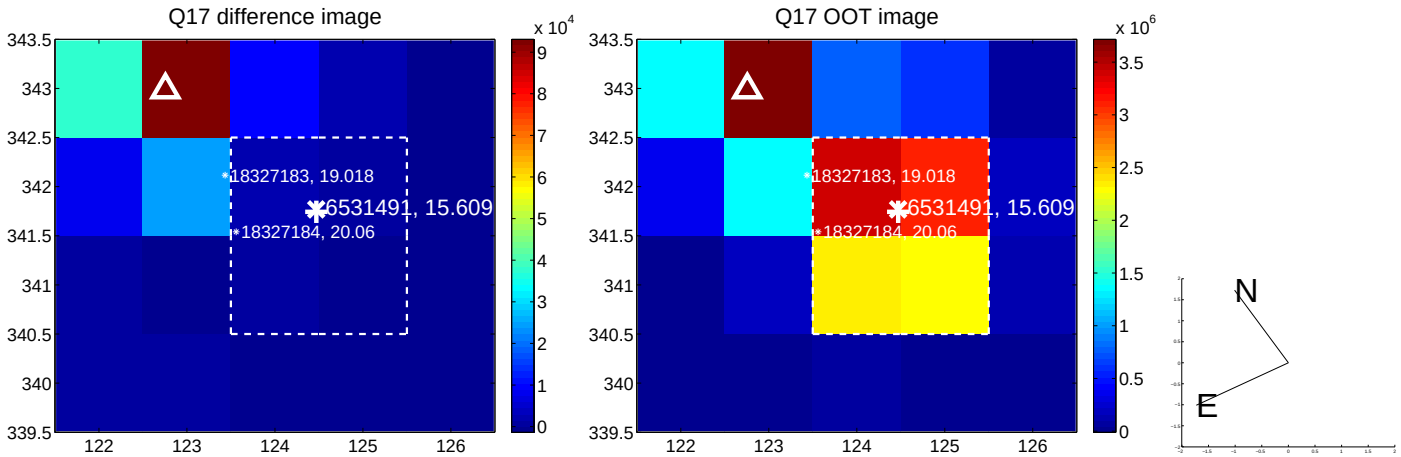
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

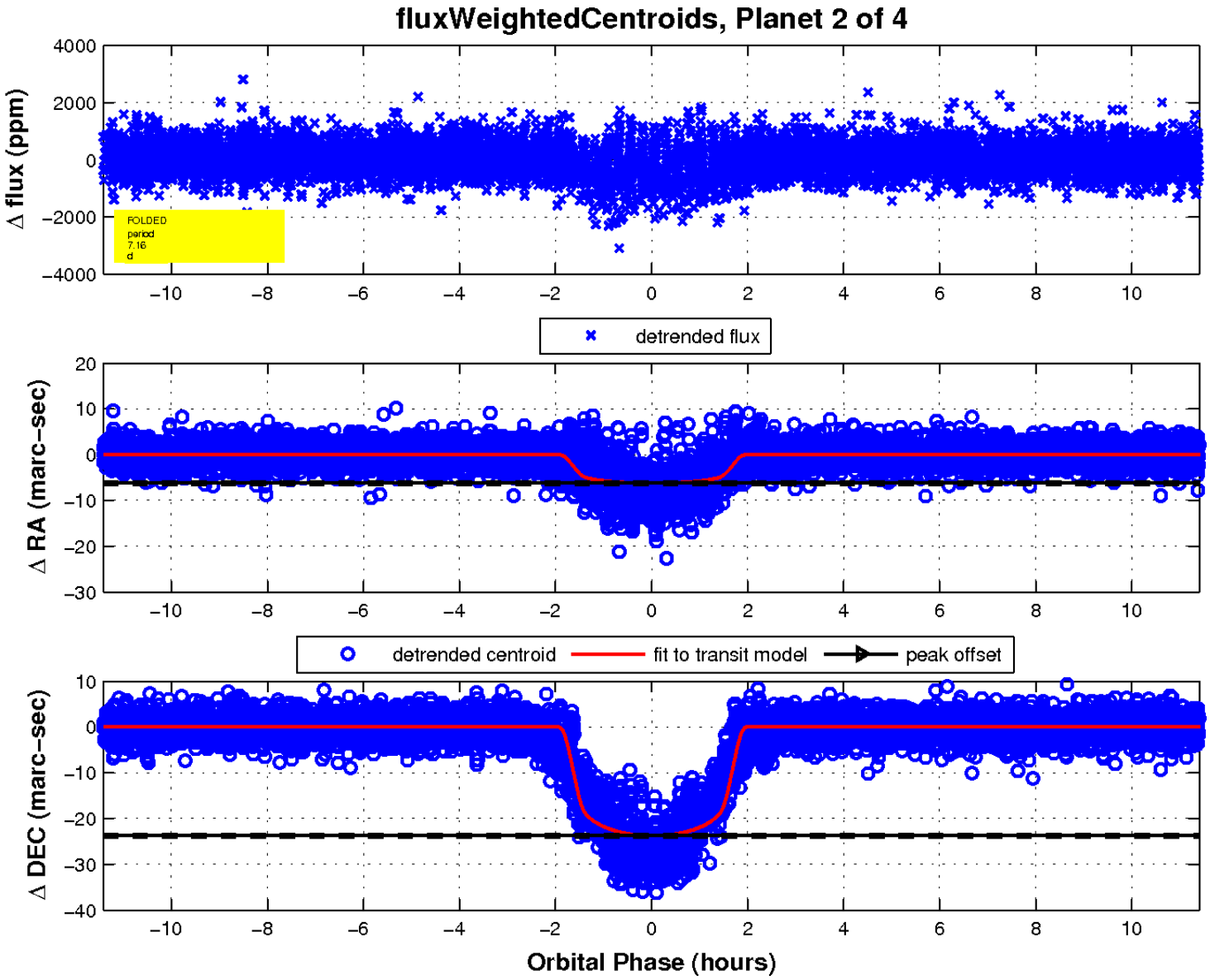


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

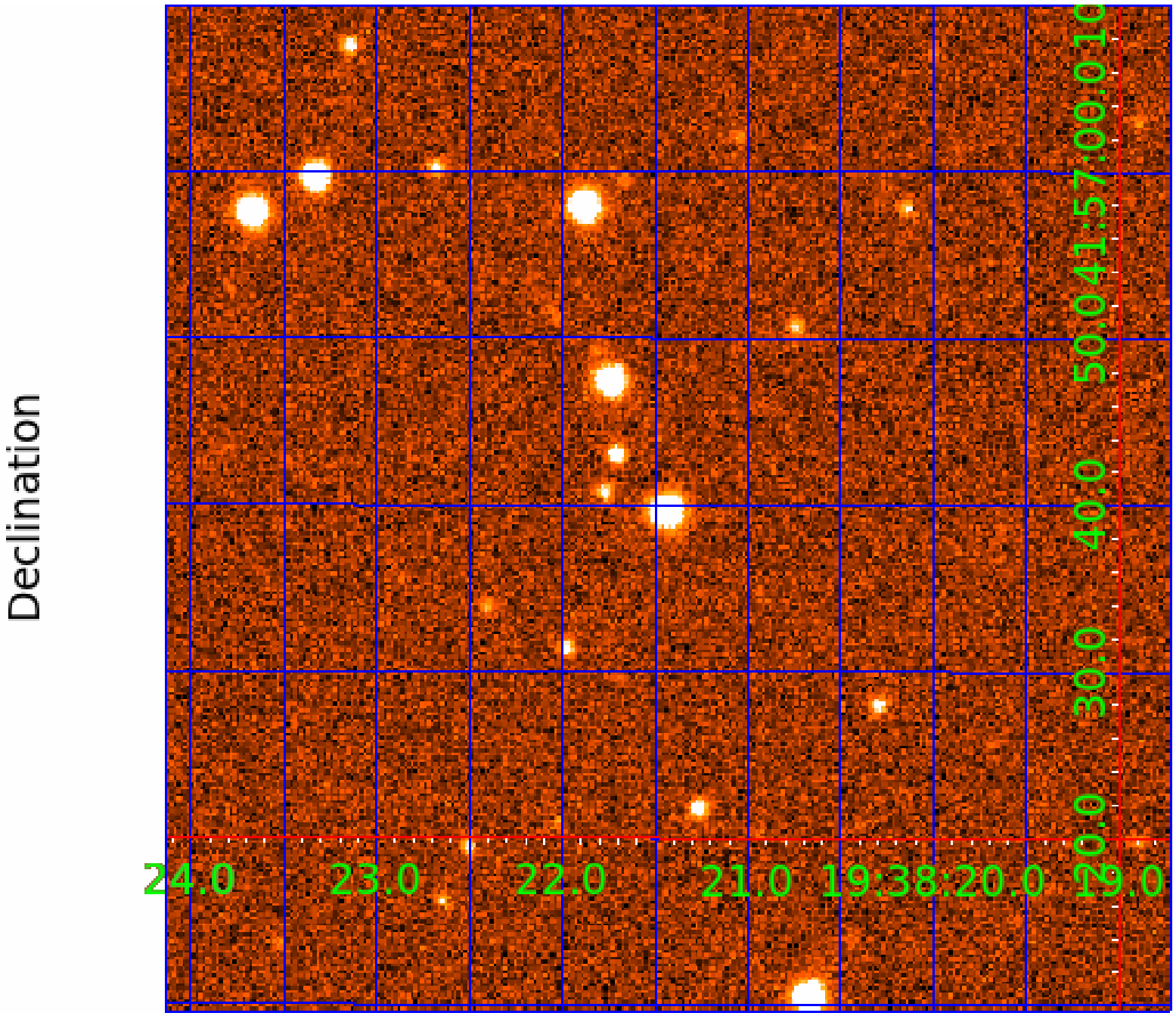


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image


Declination
24.0
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30.0
40.0
50.0
41:57:00.0
10

KIC 006531491

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 ($S_\oplus$)
006531491-01	OBS	1237.01	14.324063	135.211511	1351.2	4.896	72.0	44.2	1.04	6022	4.89	88.62
006531491-02	OBS	No	7.162149	135.191405	535.7	3.805	21.2	21.2	1.04	6022	2.85	223.29
006531491-03	OBS	No	0.513212	131.620574	0.0	0.524	10.5	0.0	1.04	6022	0.00	7502.49
006531491-04	OBS	No	0.512838	131.523492	47.8	2.833	8.0	7.3	1.04	6022	0.78	7509.79

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006531491-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006531491-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006531491-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_RESOLVED_OFFSET
006531491-04	OBS	FP	0.00	1	0	1	1	TRANS_GAPPED—LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

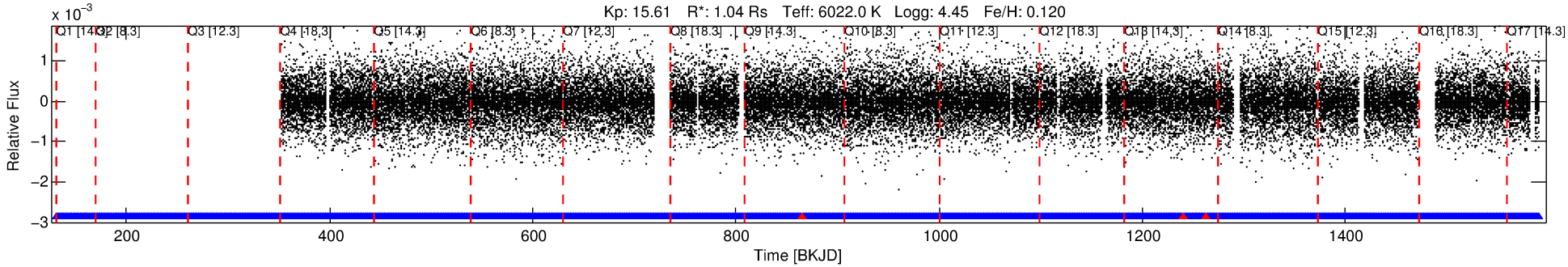
Ephemeris Match Information For 006531491-03

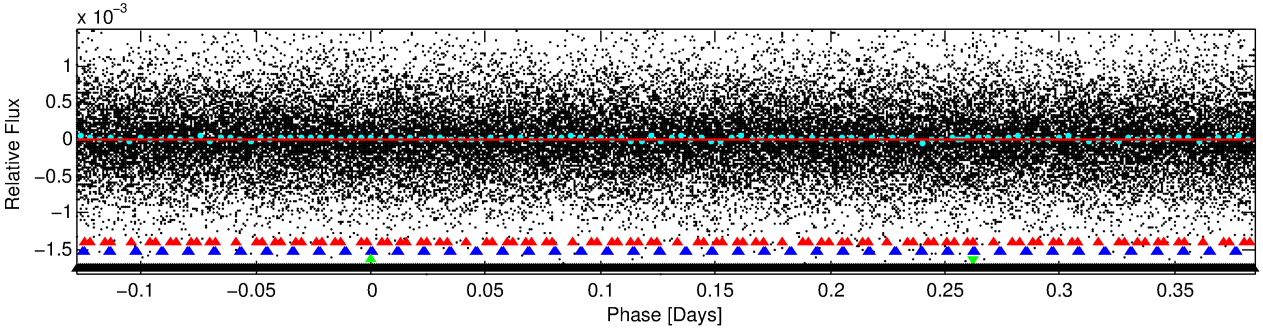
No Significant Match Found

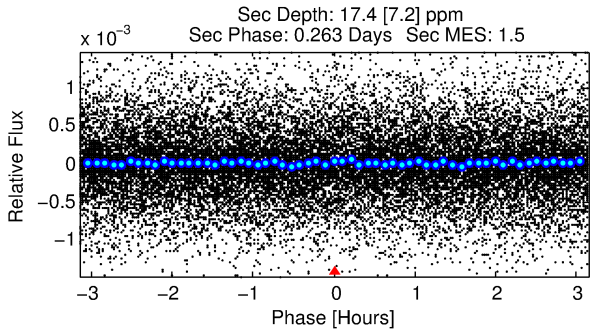
DV One-Page Summary

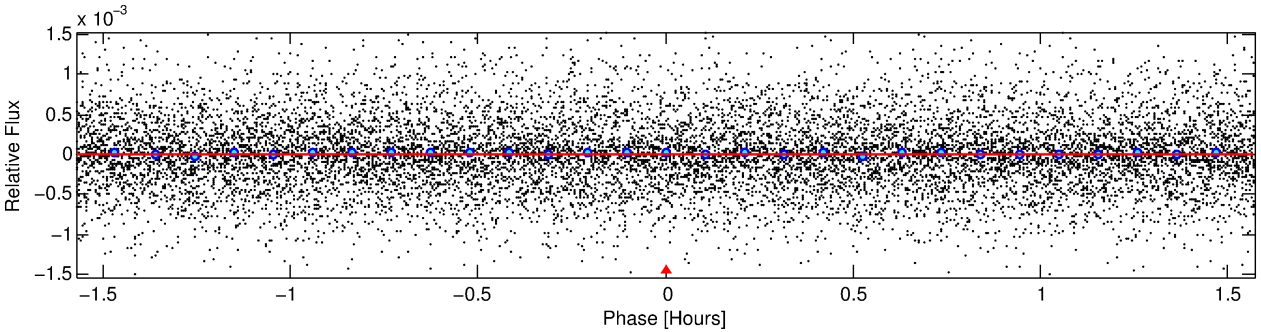
KIC: 6531491 Candidate: 3 of 4 Period: 0.513 d
KOI: K01237 Corr: No Ephemeris Match

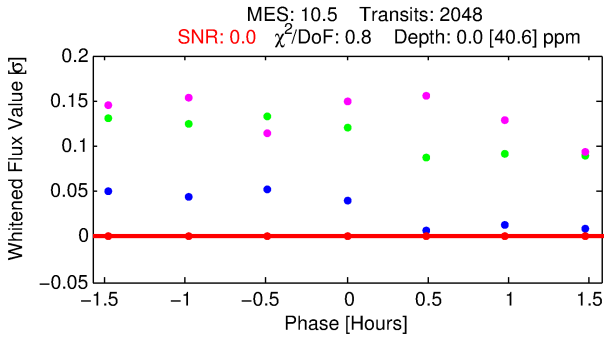
Kp: 15.61 R*: 1.04 Rs Teff: 6022.0 K Logg: 4.45 Fe/H: 0.120

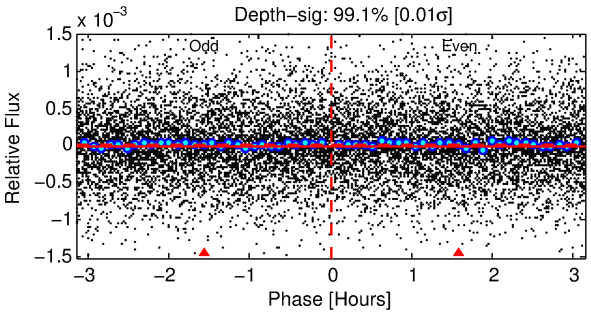


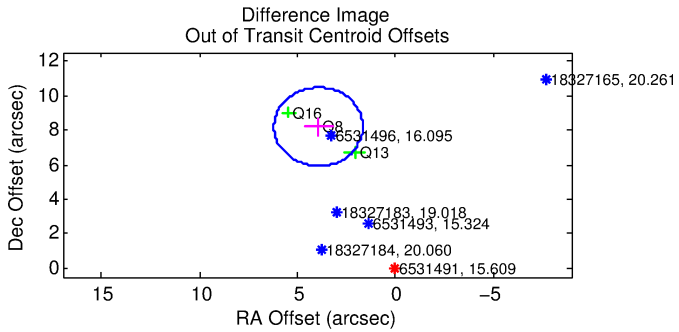












DV Fit Results:

Period = 0.51321 [2.35612] d
Epoch = 131.6206 [288.3961] BKJD
Rp/R* = 0.0000 [1.0696]
a/R* = 1.29 [3348.92]
b = 0.99 [734.28]

Seff = 7502.49 [46034.00]
Teq = 2373 [3640] K
Rp = 0.00 [121.27] Re
a = 0.0130 [0.0400] AU

Ag = 129501.15 [8882106318.21] [0.00σ]
Teffp = 69604 [1193526388] K [0.00σ]

DV Diagnostic Results:

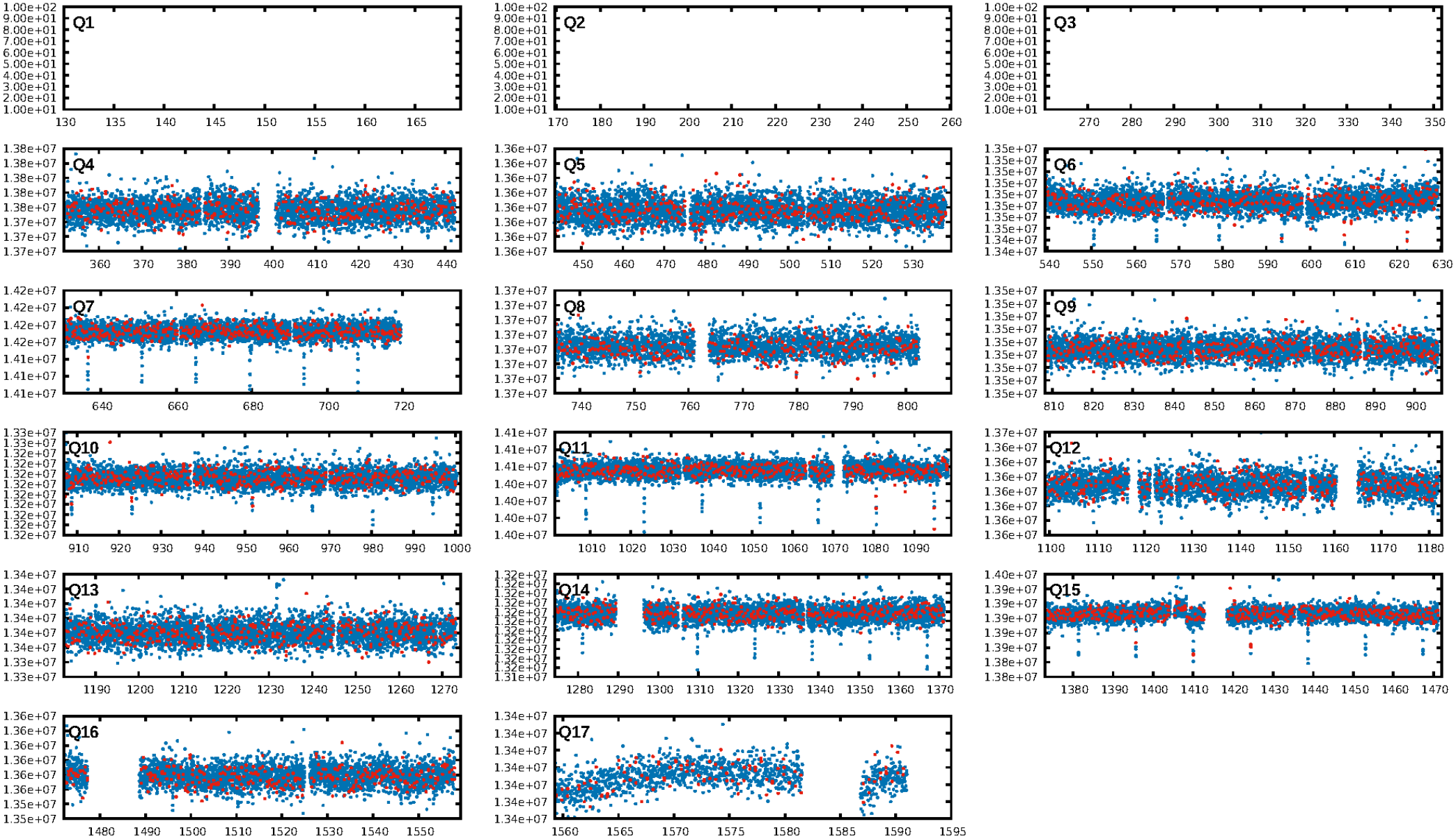
ShortPeriod−sig: 0.2% [0.00σ]
LongPeriod−sig: 100.0% [41.54σ]
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: 7.62e−19
RollingBand−fgt: 1.00 [1998/2001]
GhostDiagnostic−chr: N/A

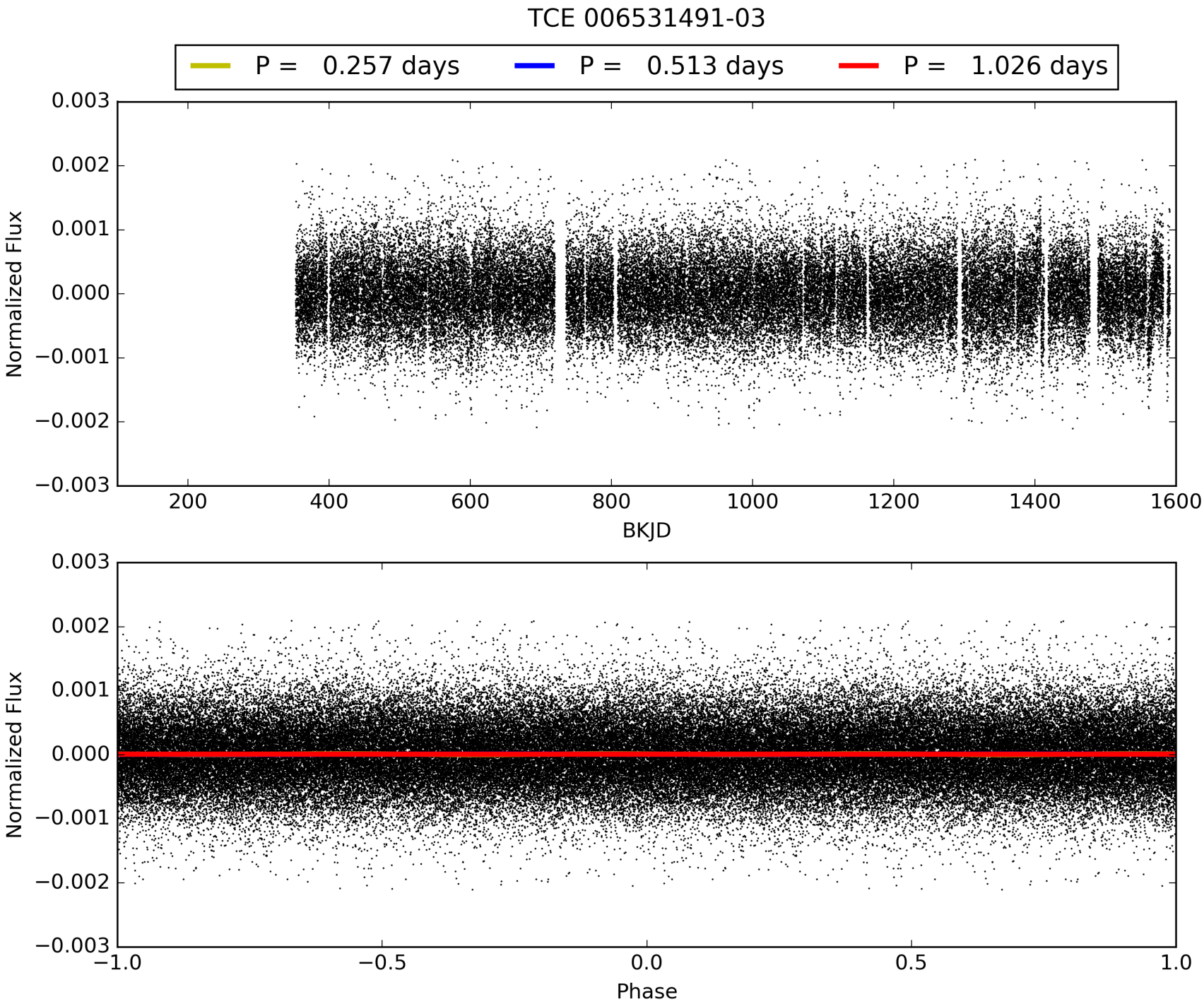
Centroid−sig: N/A
Centroid−so: N/A
OotOffset−rm: 9.091 arcsec [12.00σ]
KicOffset−rm: 9.003 arcsec [20.95σ]
OotOffset−st: 0/0/2/1 [3]
KicOffset−st: 0/0/2/1 [3]
DiffImageQuality−fgm: 1.00 [3/3]
DiffImageOverlap−fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31−Jan−2016 17:48:49 Z

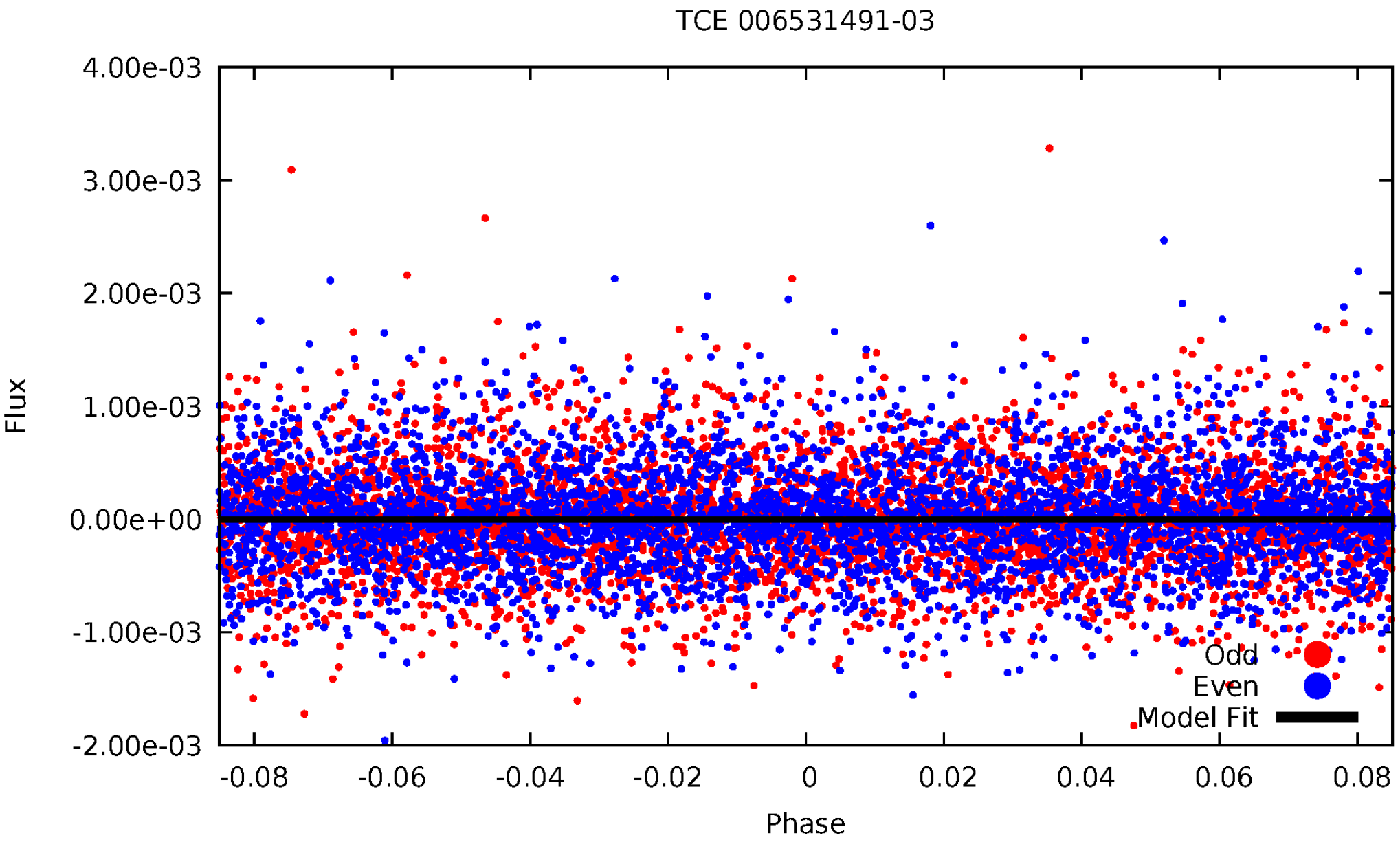
This Data Validation Report Summary was produced in the Kepler Science Operations Center Pipeline at NASA Ames Research Center

TCE 006531491-03, PDC Light Curves




TCE 006531491-03
P = 0.257 days
P = 0.513 days
P = 1.026 days
Normalized Flux
BKJD
Normalized Flux
Phase

DV Odd/Even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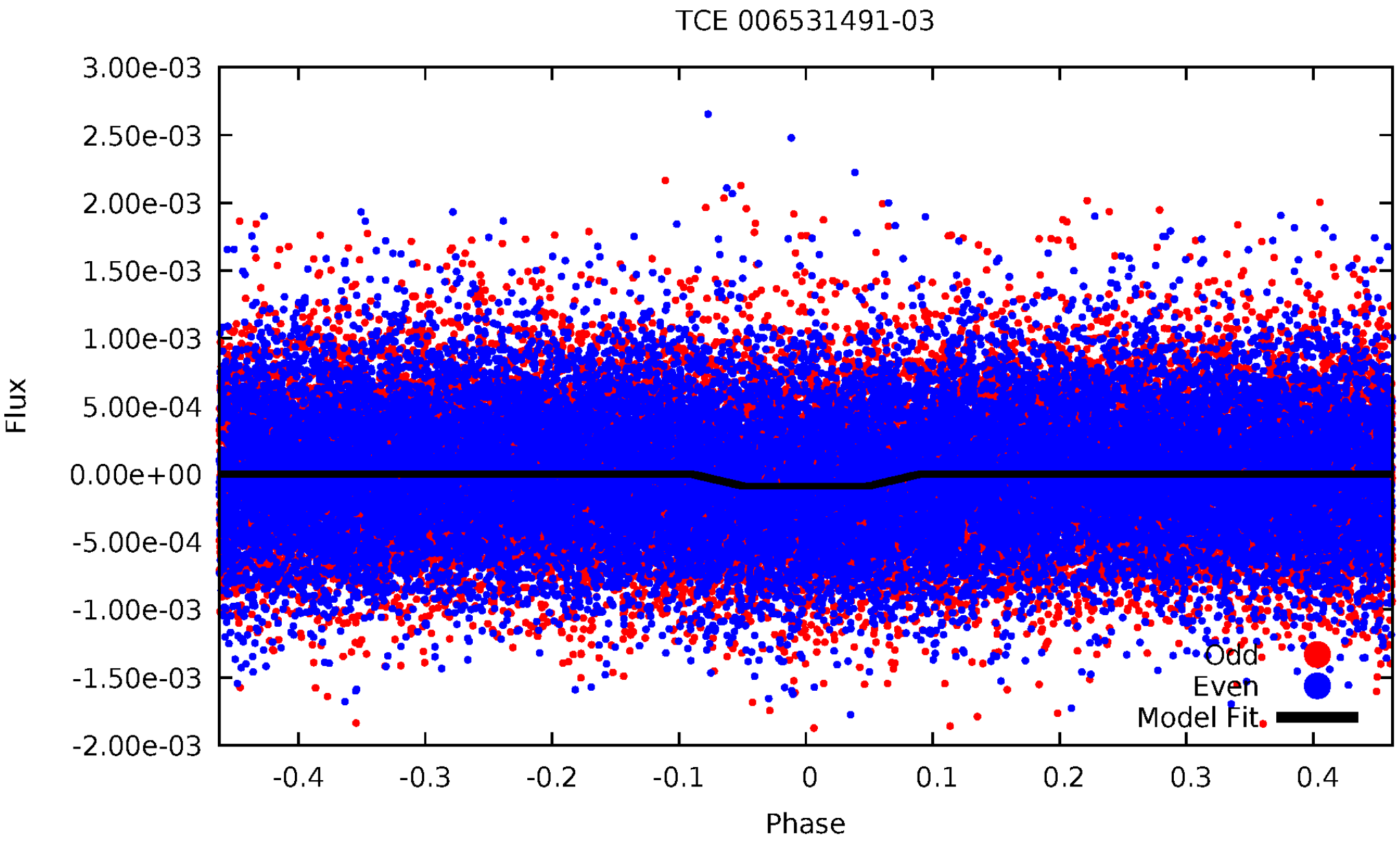
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
Flux
-0.08
-0.06
-0.04
-0.02
0
0.02
0.04
0.06
0.08
Phase
Odd
Even
Model Fit

ALT Odd/Even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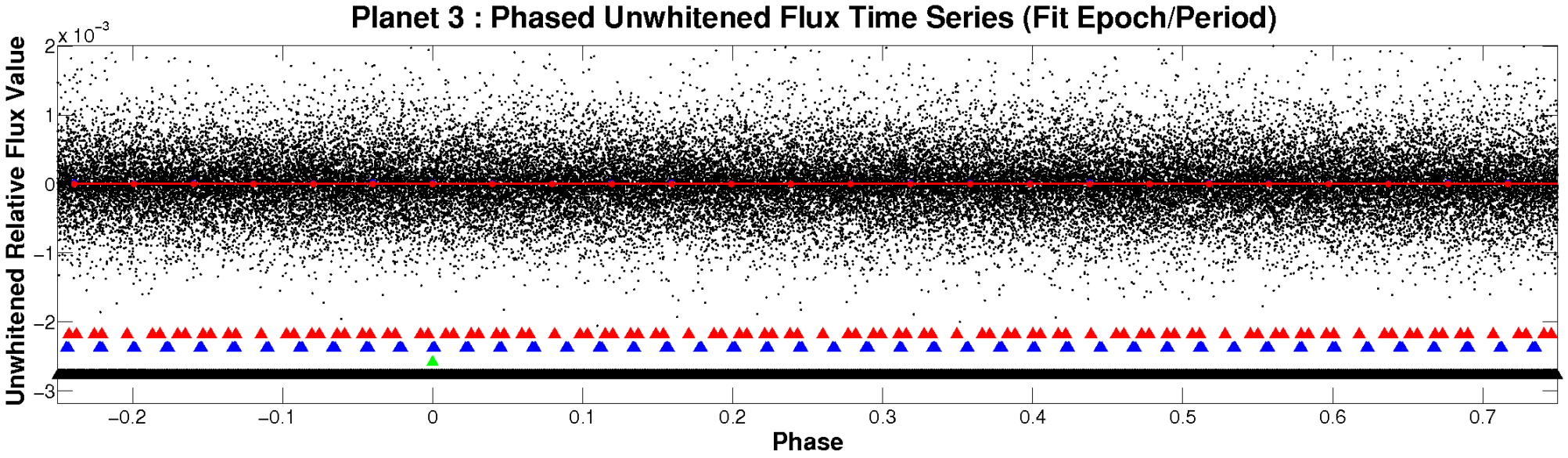
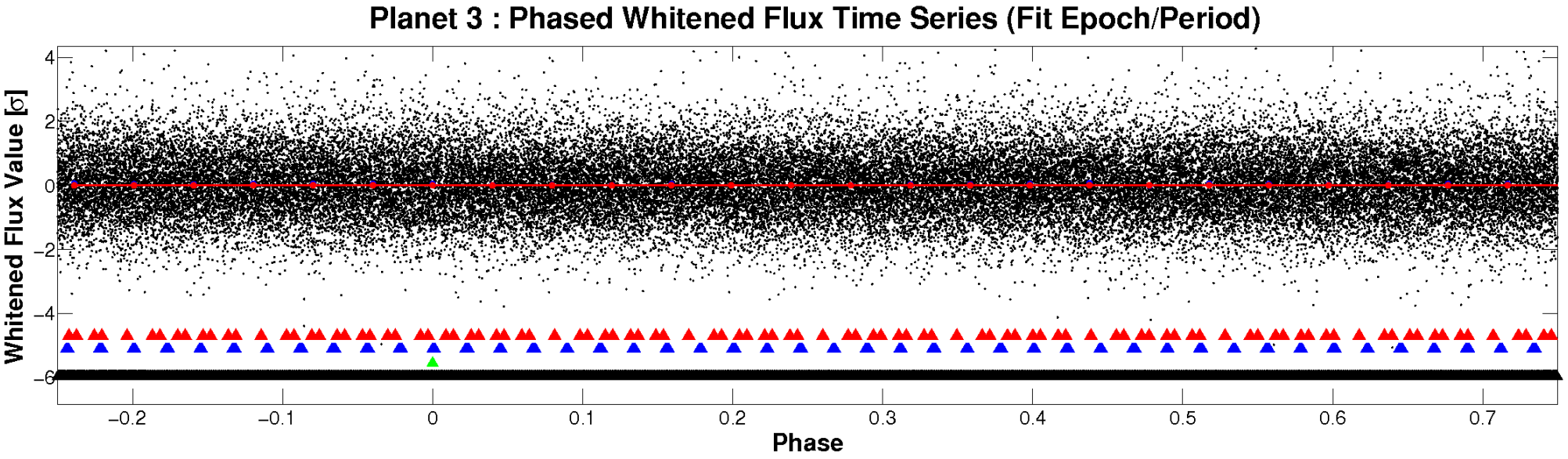
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
Flux
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
Phase
Odd
Even
Model Fit

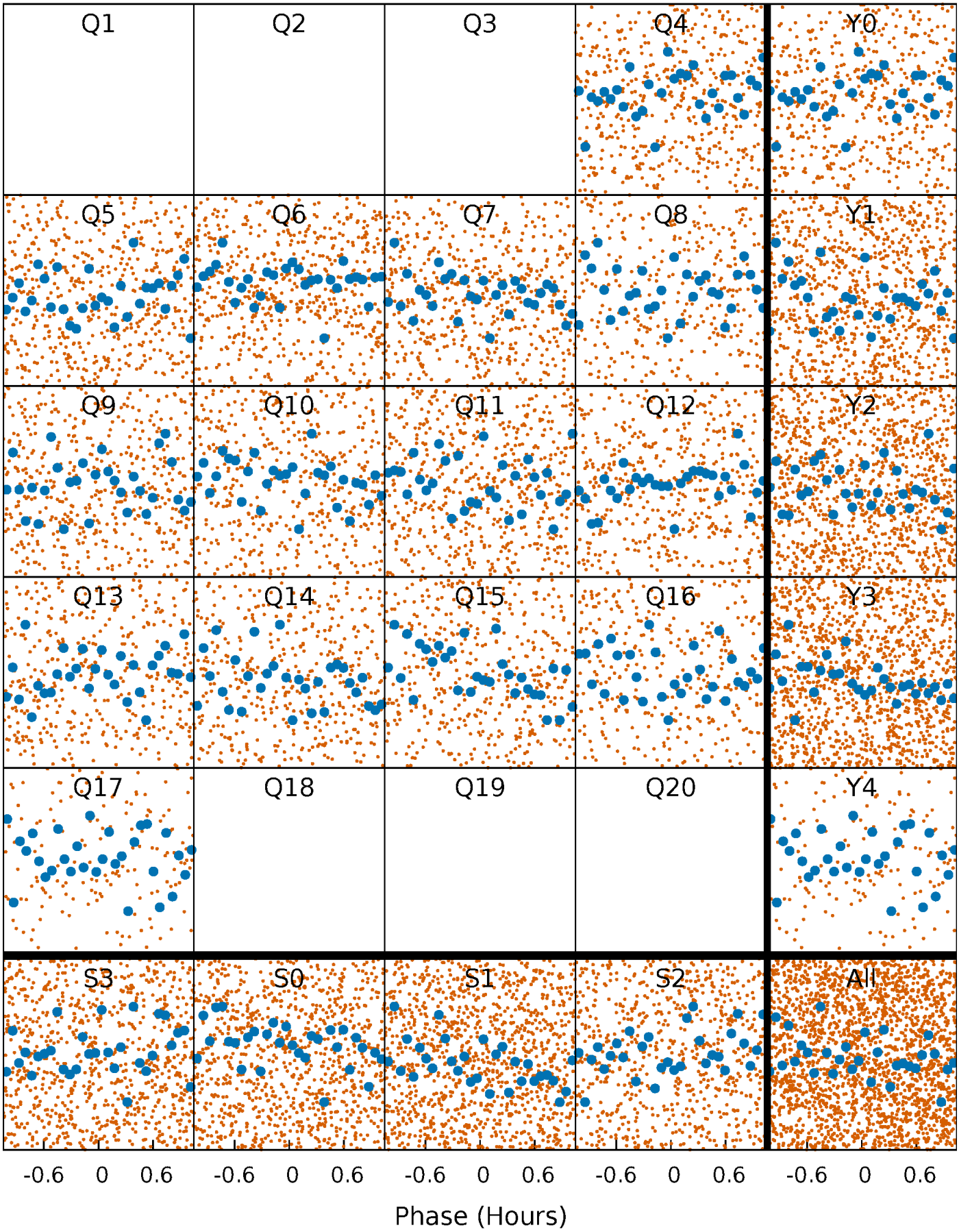
Non-Whitened Vs. Whitened Light Curve





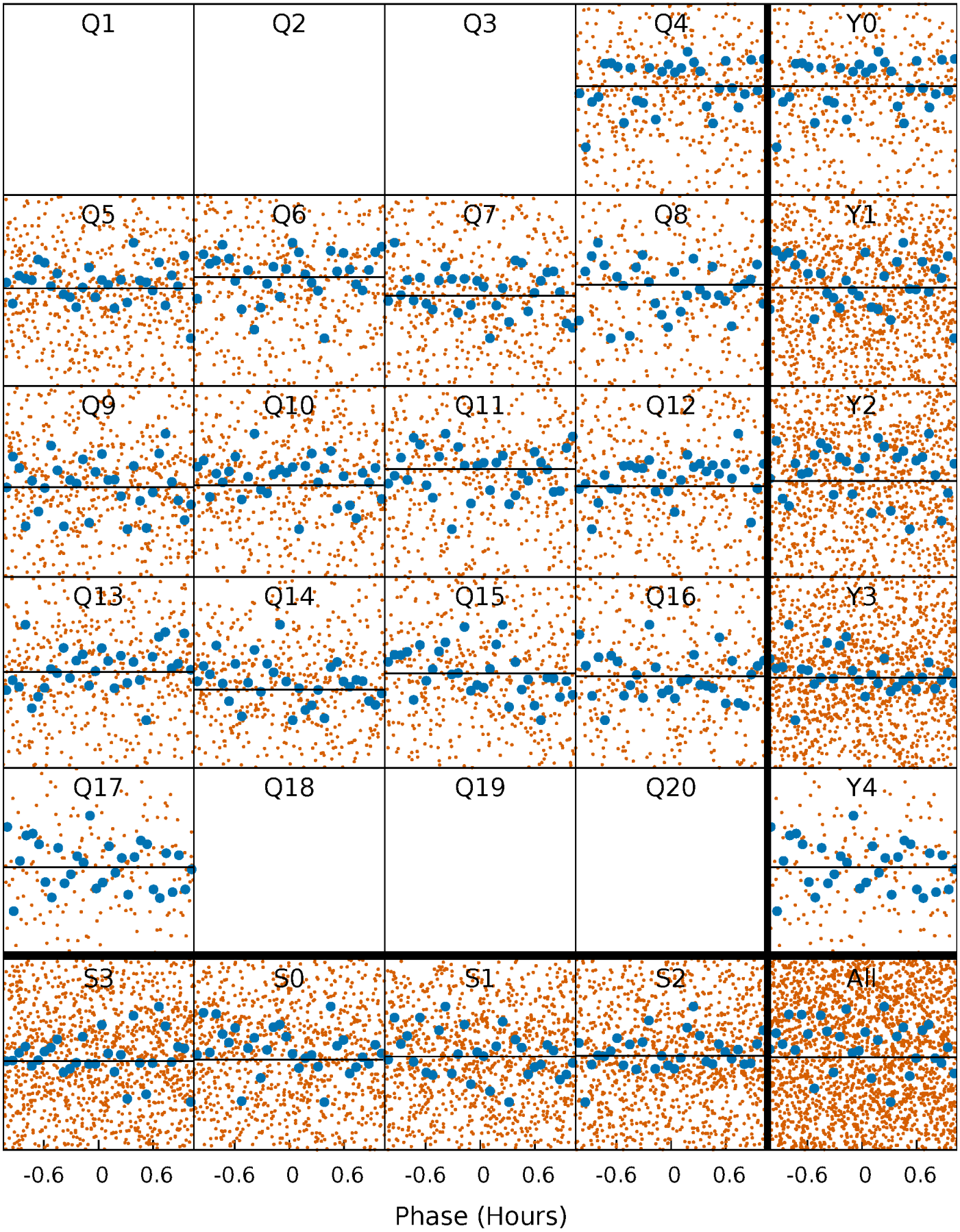
PDC Quarter-Phased Transit Curves

TCE 006531491-03 P= 0.513212 Days T_0=131.620574 (BKJD)



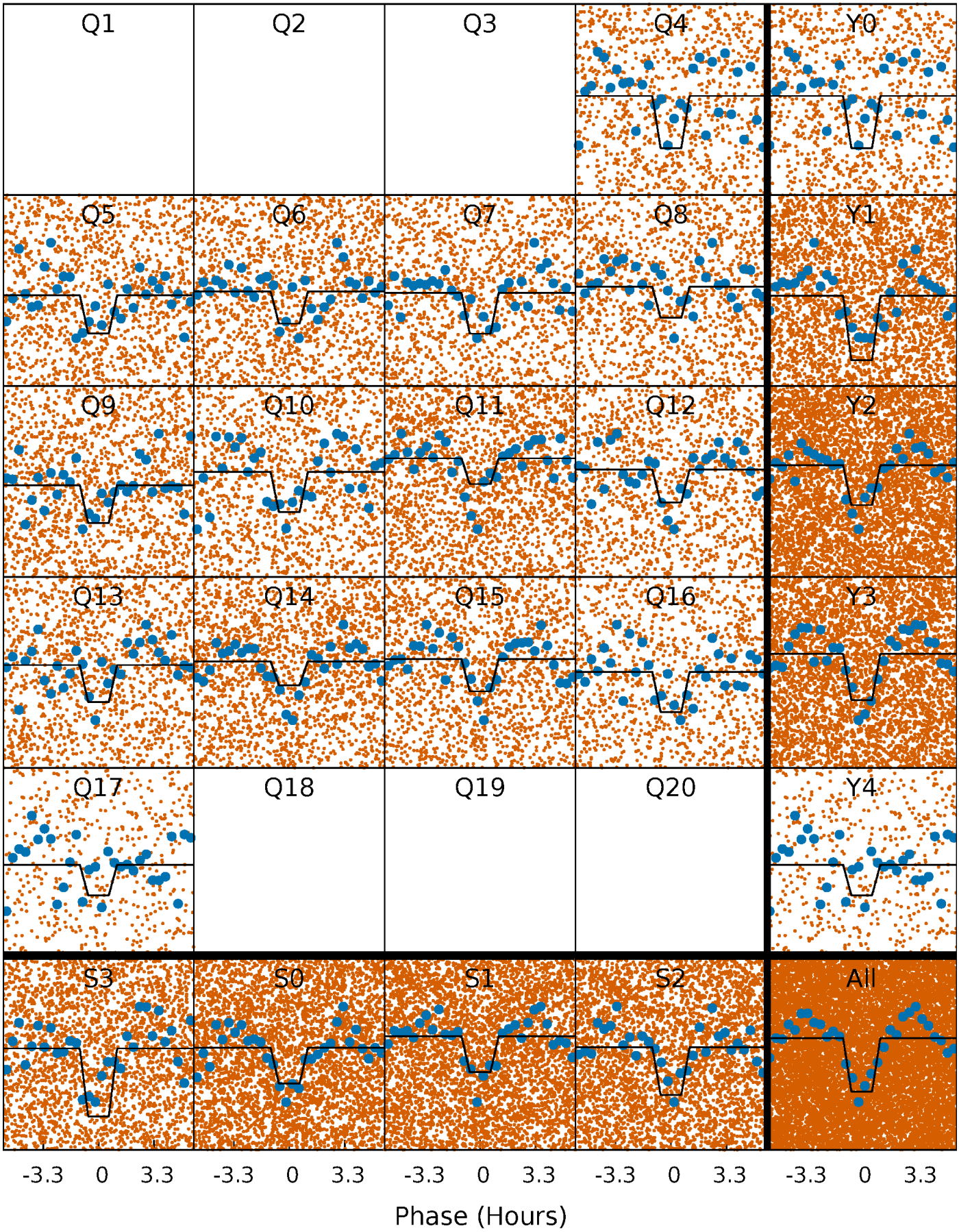
DV Quarter-Phased Transit Curves

TCE 006531491-03 P= 0.513212 Days T_0=131.620574 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

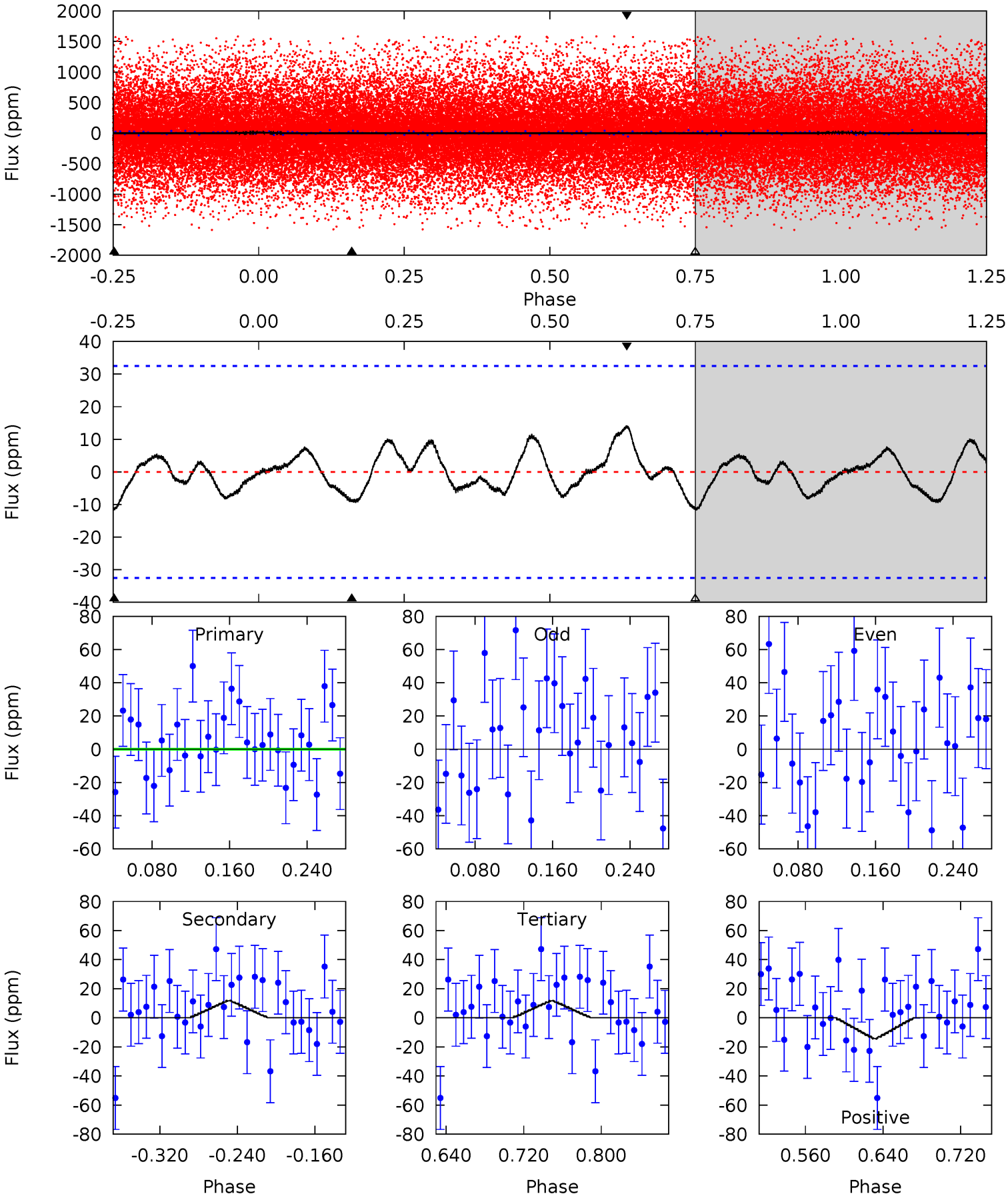
TCE 006531491-03 P= 0.512862 Days T_0=131.522451 (BKJD)



DV Model-Shift Uniqueness Test

006531491-03, P = 0.513212 Days, E = 131.620574 Days

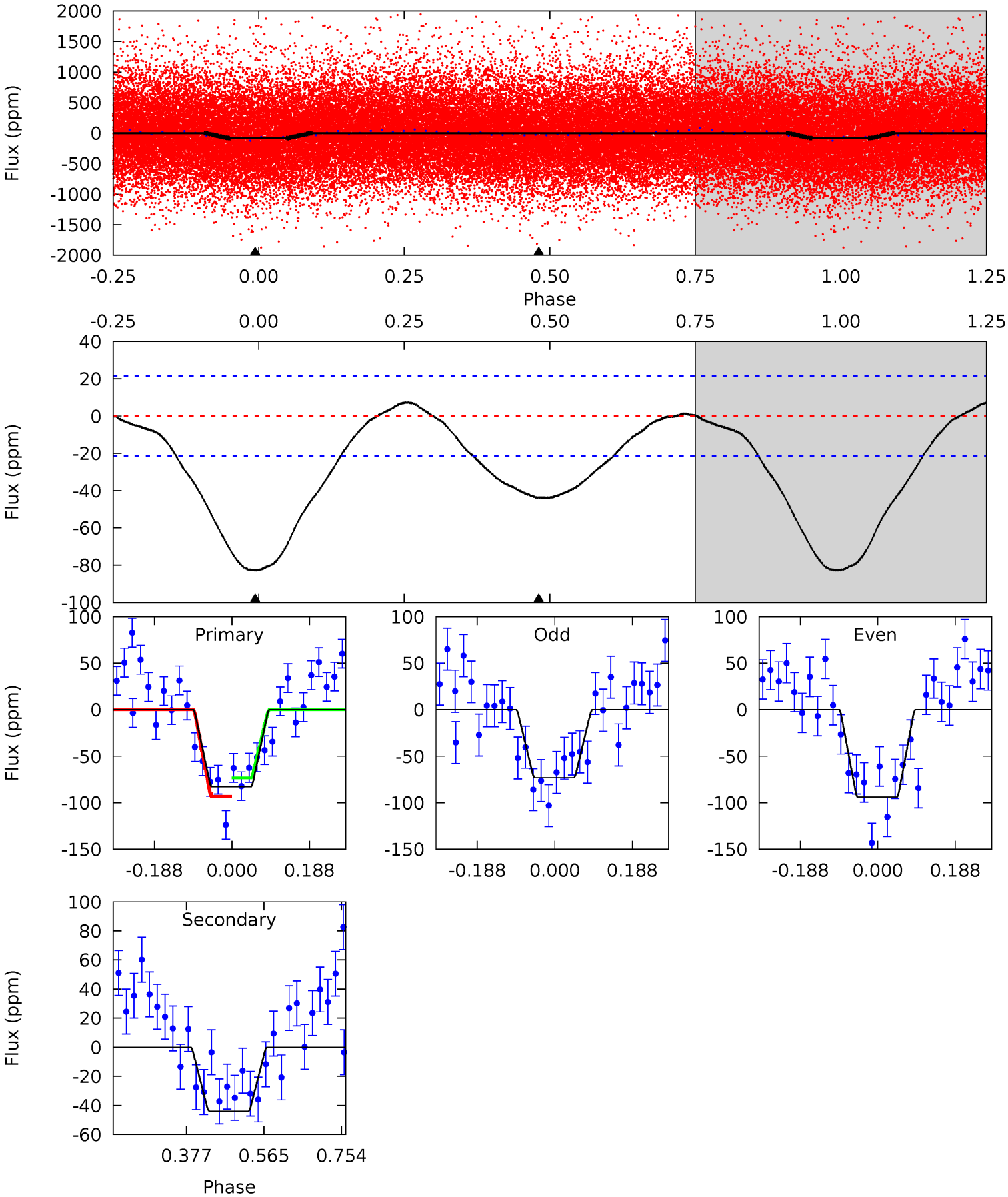
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
1.31	1.67	1.65	2.02	4.61	1.75	0.74	-0.34	-0.71	0.02	-0.35	0.87	11.4	0.55	0.20



Alt Model-Shift Uniqueness Test

006531491-03, P = 0.512862 Days, E = 131.522451 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
17.0	9.05	0	0	4.43	1.32	0.78	17.0	17.0	9.05	9.05	2.16	0.90	0.08	2.04



Stellar Parameters For KIC 006531491

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	6022^{+190}_{-232}	$4.453^{+0.054}_{-0.216}$	$0.120^{+0.200}_{-0.300}$	$1.039^{+0.331}_{-0.118}$	$1.116^{+0.138}_{-0.166}$	$1.402^{+0.400}_{-0.738}$
	+3%/-4%	+1%/-5%	+167%/-250%	+32%/-11%	+12%/-15%	+29%/-53%
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 006531491-03 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-12±7	$86.87^{+96.03}_{-60.27}$	2228^{+1041}_{-486}	-2616^{+315}_{-634}	$0.001^{+0.007}_{-0.001}$
Alt.	-44±5	$90.49^{+95.36}_{-65.09}$	2260^{+1017}_{-503}	-2613^{+334}_{-630}	$0.003^{+0.032}_{-0.002}$

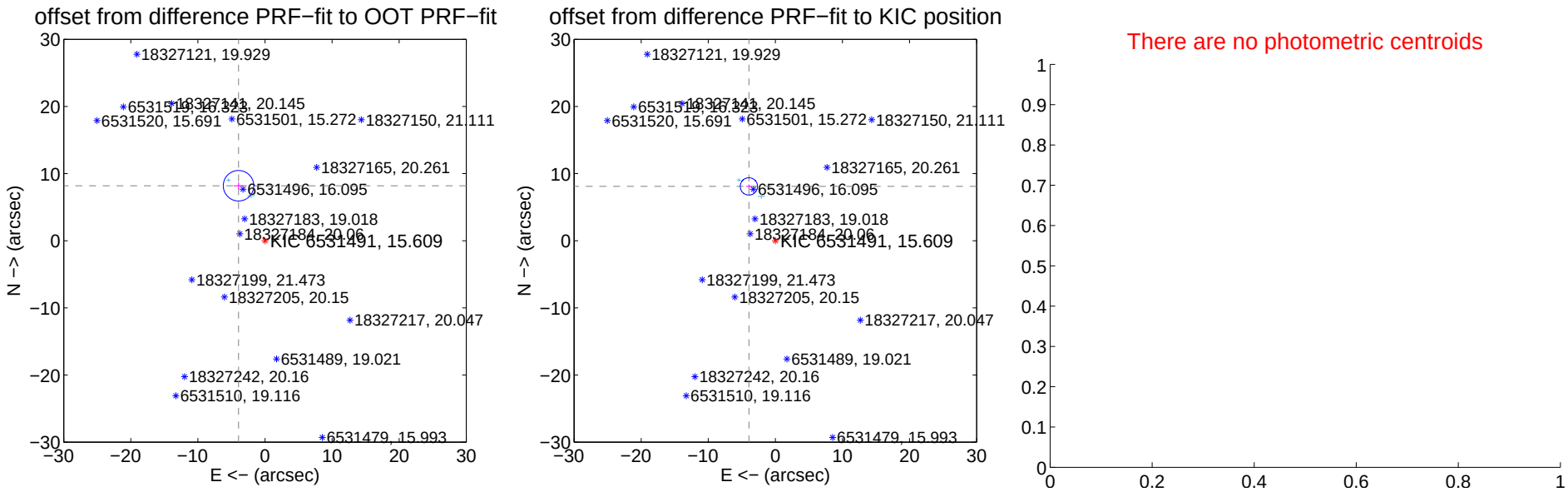
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

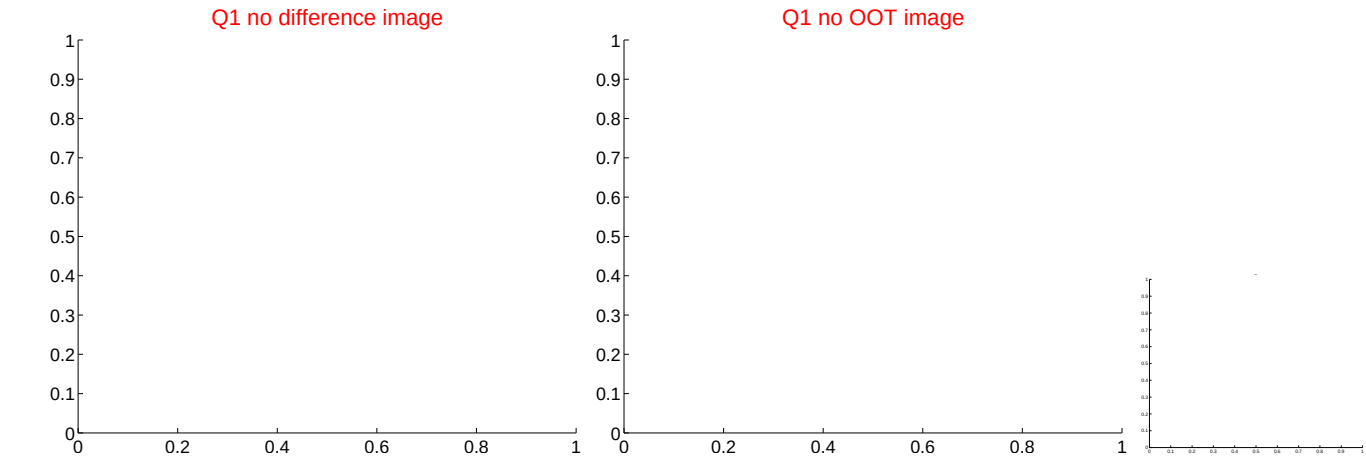
Supplemental centroid analysis for 006531491-03. Kepler magnitude: 15.61. Transit SNR 0.00
There are 3 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

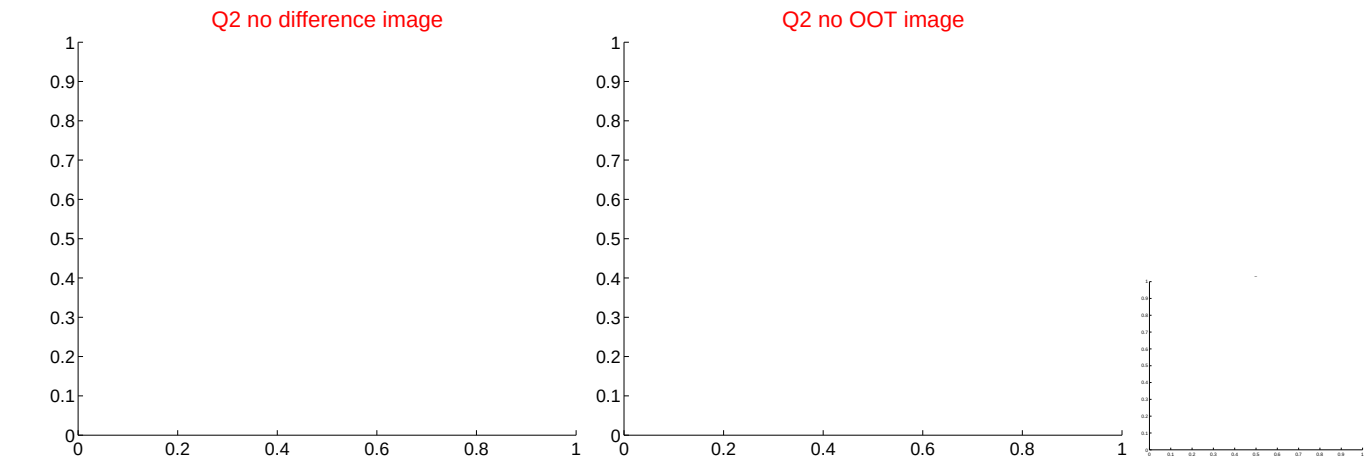
	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.091 ± 0.757	12.00	3.943 ± 0.716	8.191 ± 0.501
PRF-fit source offset from KIC position	9.003 ± 0.430	20.95	3.944 ± 0.400	8.094 ± 0.288
photometric centroid source offset	—	—	—	—

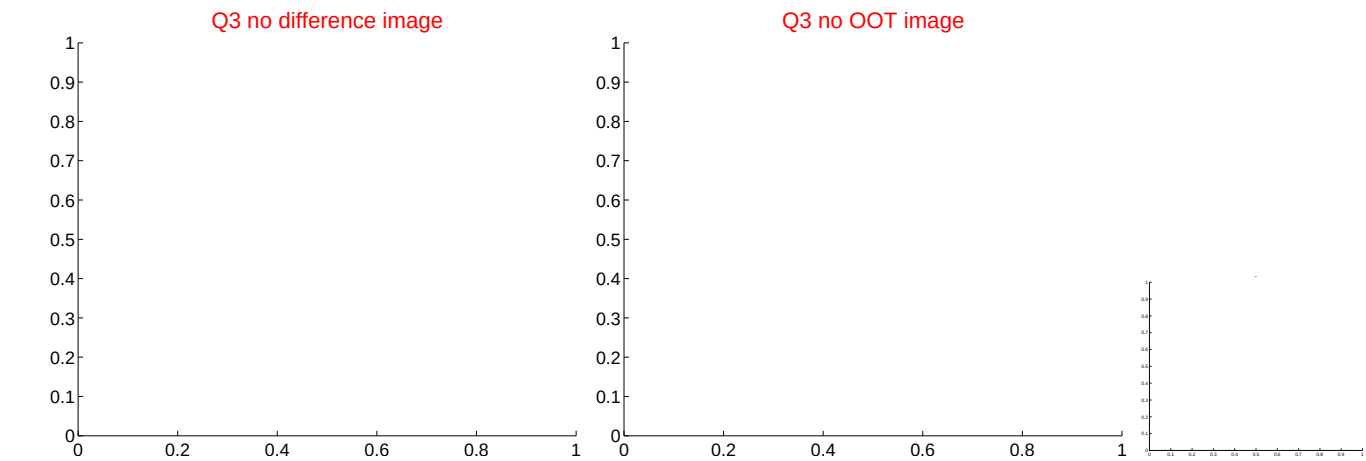


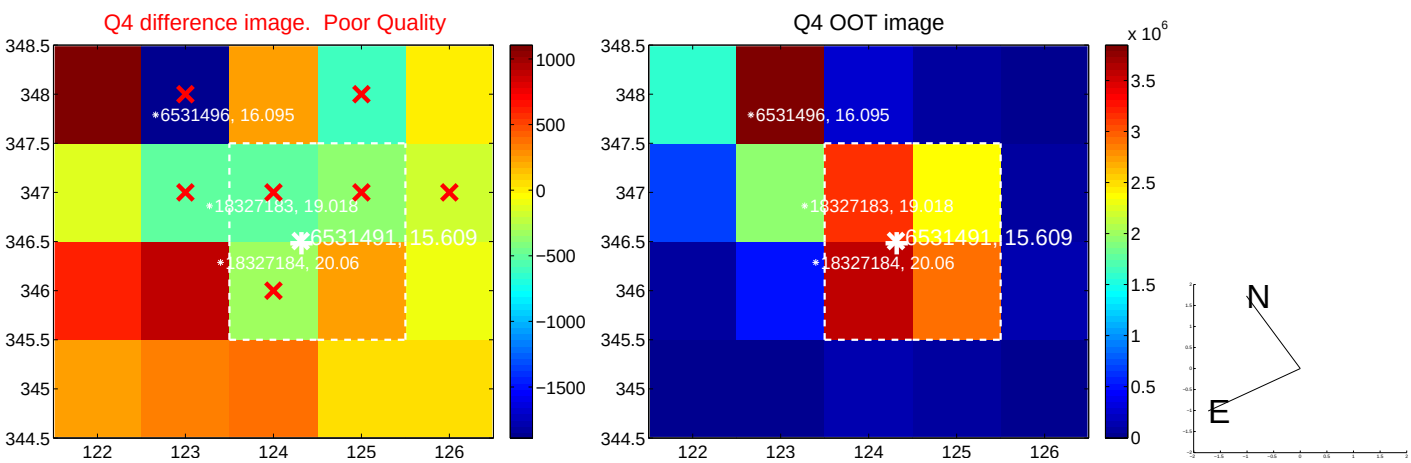
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

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

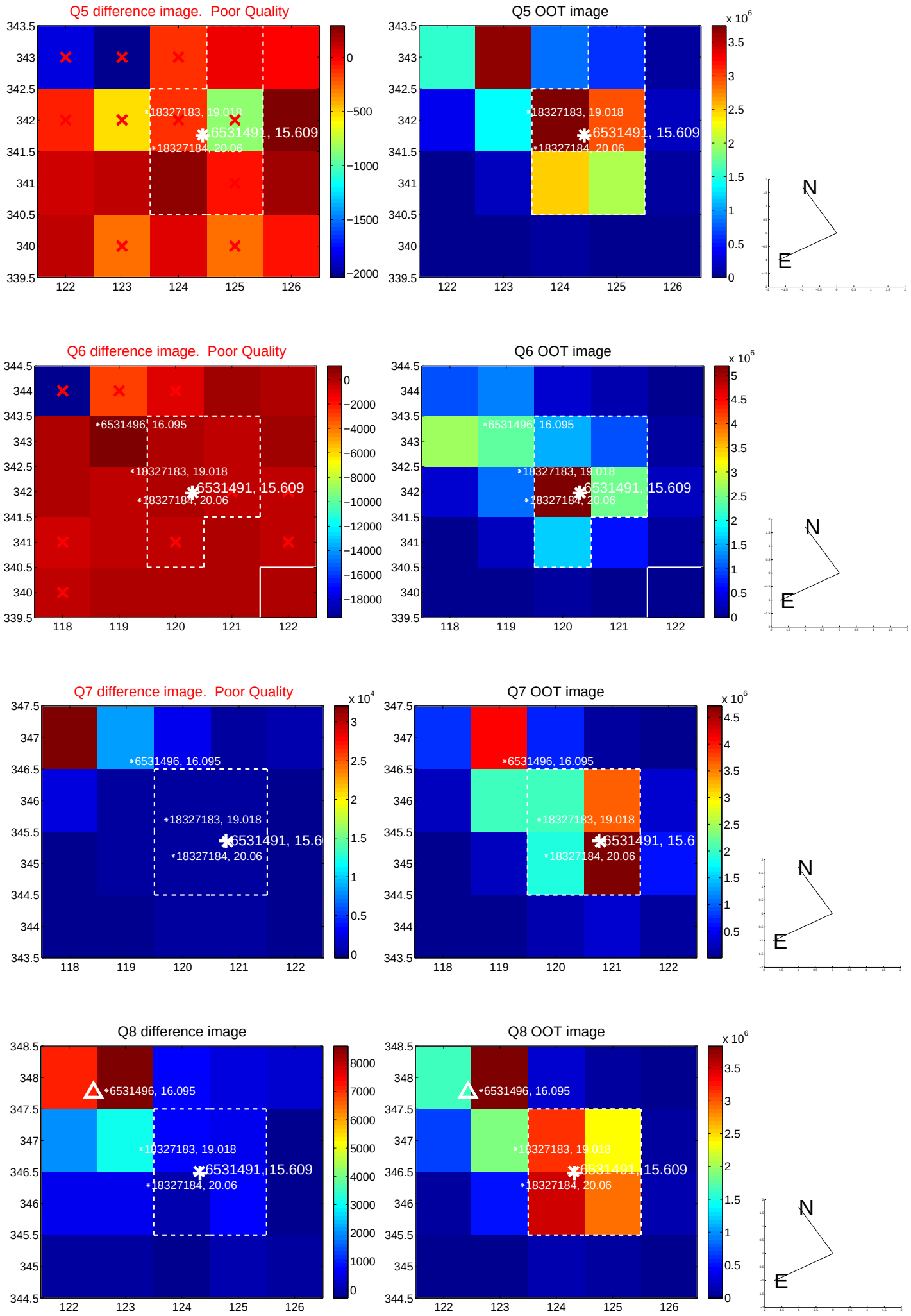




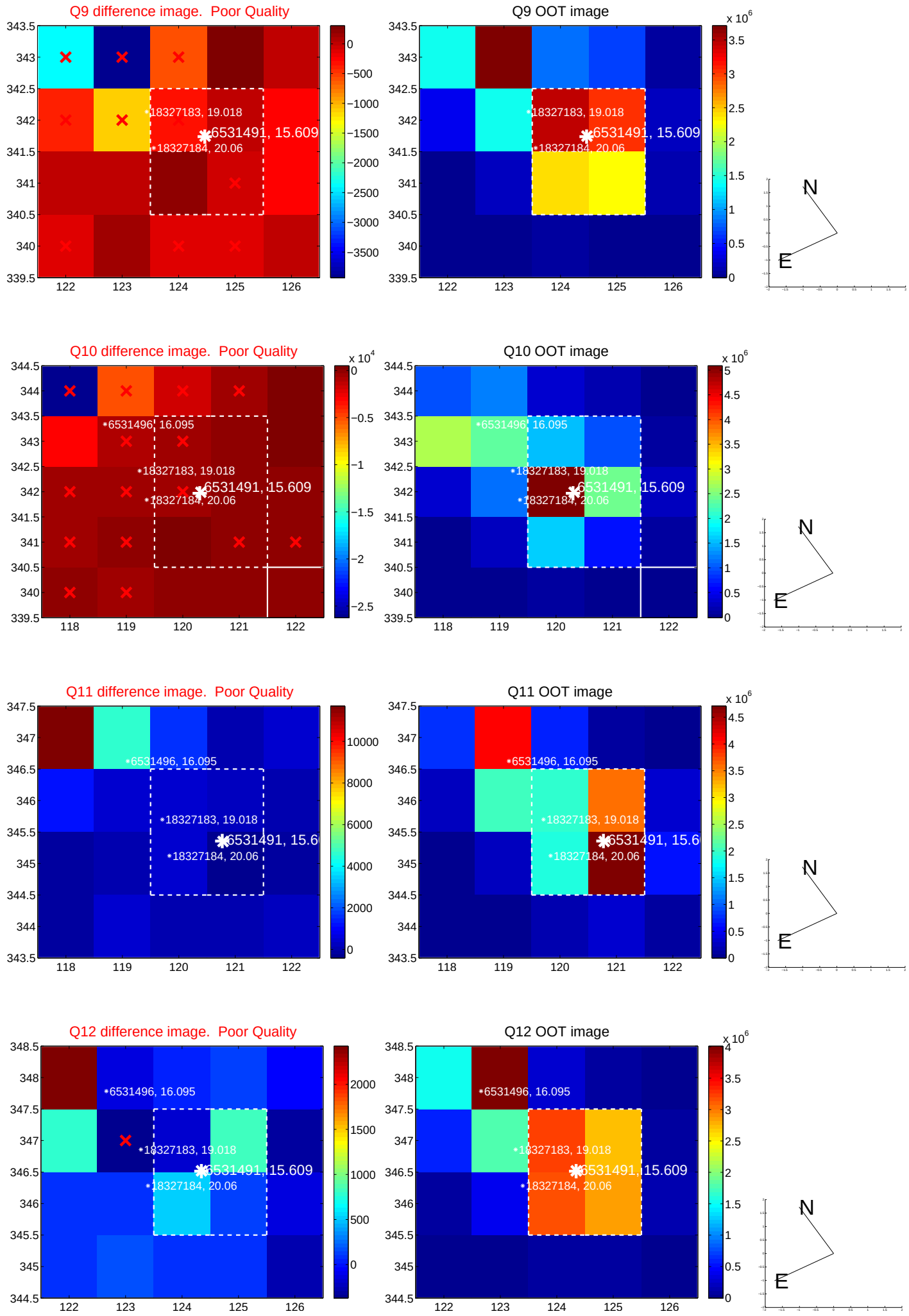




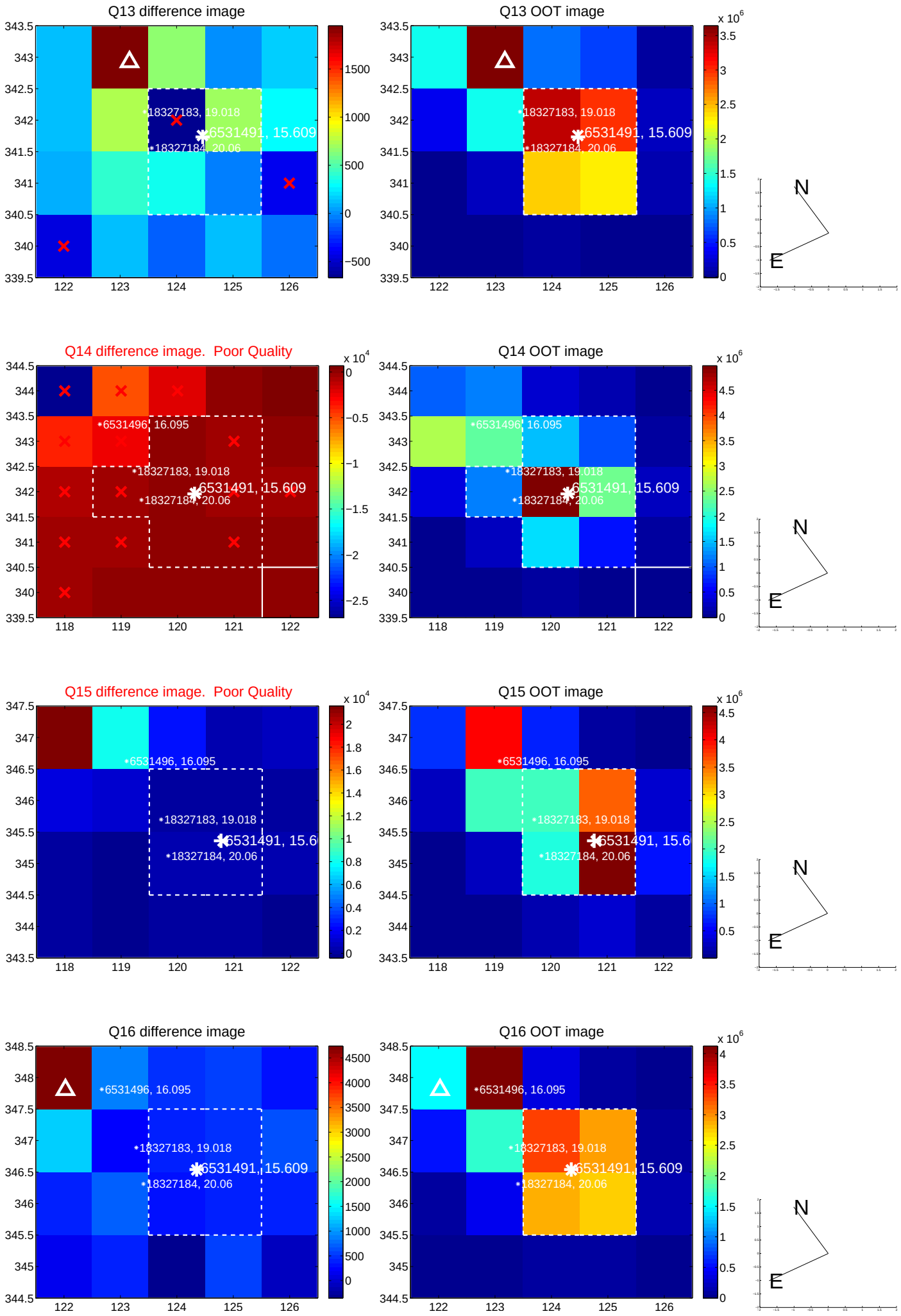
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



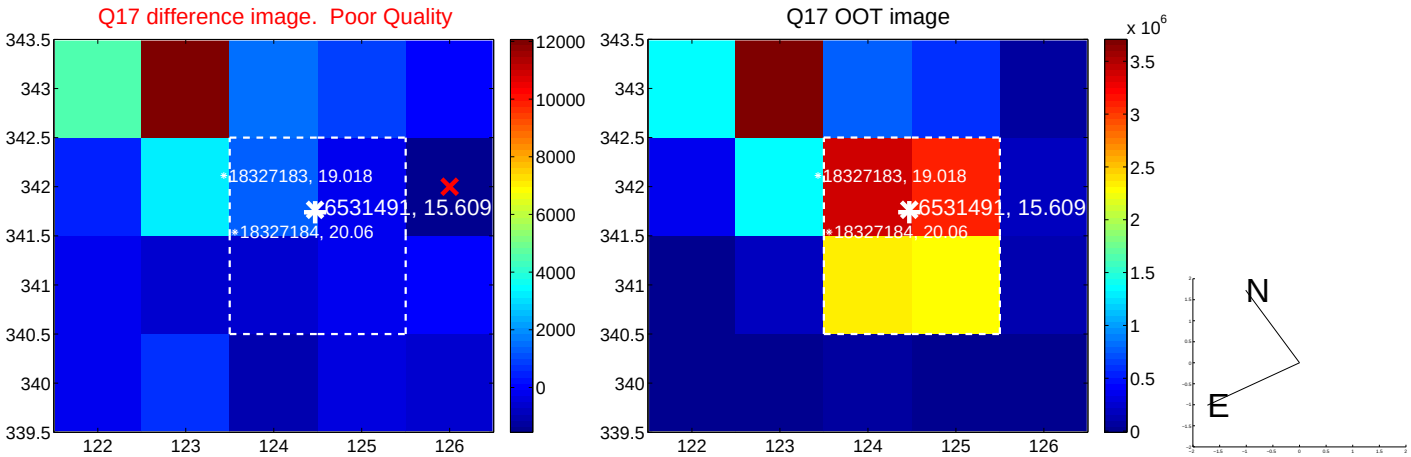
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



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

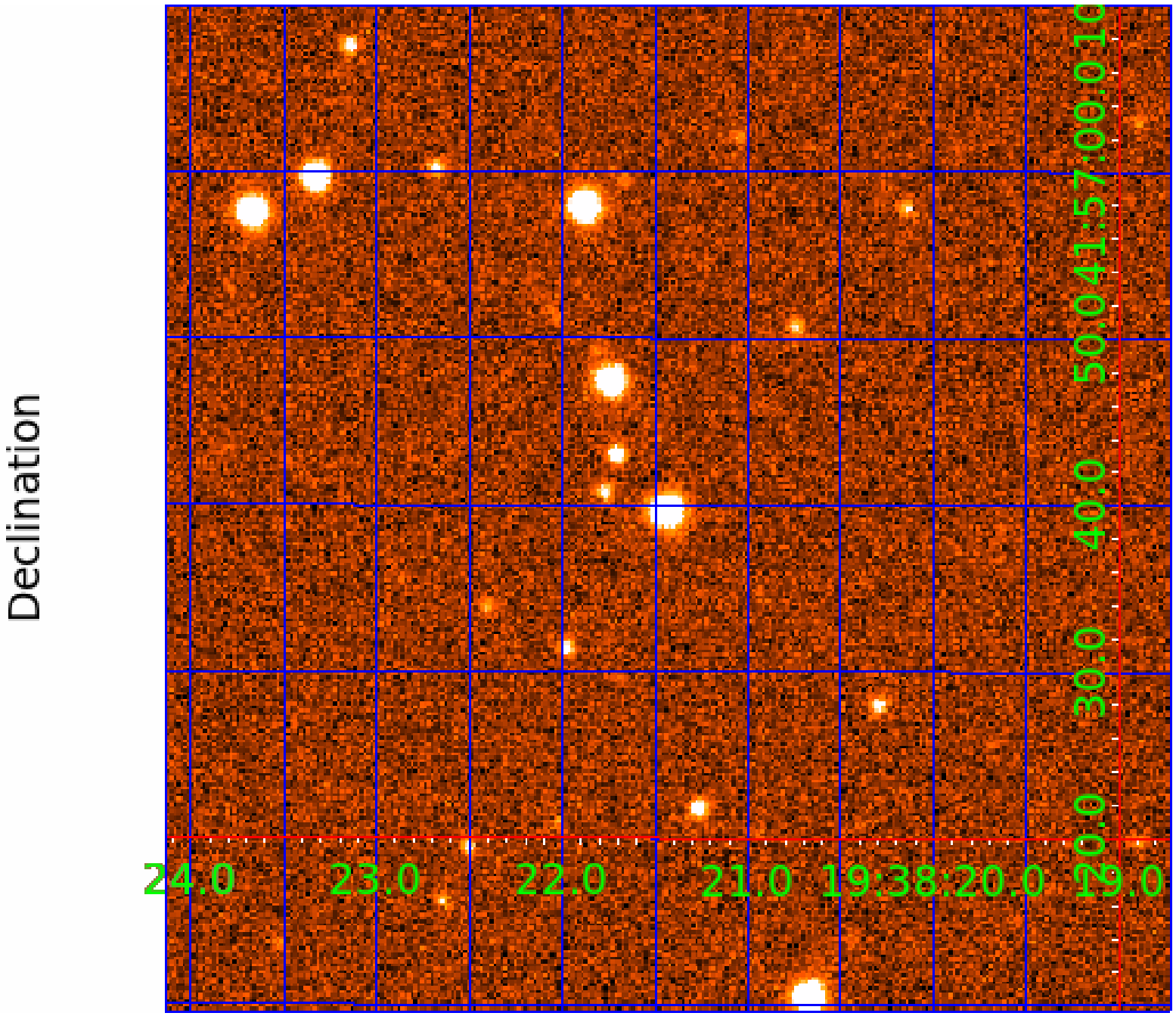


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



olded centroid time series figure for this object.

UKIRT Image


Declination
24.0
23.0
22.0
21.0
19:38:20.0
19.0
20.0
30.0
40.0
50.0
41:57:00.0
10

KIC 006531491

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 ($S_\oplus$)
006531491-01	OBS	1237.01	14.324063	135.211511	1351.2	4.896	72.0	44.2	1.04	6022	4.89	88.62
006531491-02	OBS	No	7.162149	135.191405	535.7	3.805	21.2	21.2	1.04	6022	2.85	223.29
006531491-03	OBS	No	0.513212	131.620574	0.0	0.524	10.5	0.0	1.04	6022	0.00	7502.49
006531491-04	OBS	No	0.512838	131.523492	47.8	2.833	8.0	7.3	1.04	6022	0.78	7509.79

Robovetter Results

TCE	Run Type	Disp	Score	N	S	C	E	Comments
006531491-01	OBS	FP	0.00	0	1	1	1	MOD_SEC_DV—MOD_SEC_ALT—HAS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006531491-02	OBS	FP	0.00	1	1	1	1	IS_SEC_TCE—CENT_RESOLVED_OFFSET—EPHEM_MATCH
006531491-03	OBS	FP	0.00	1	0	1	0	INDIV_TRANS_RUBBLE_SKYE_ZUMA_TRACKER—LPP_DV—MOD_NONUNIQ_DV—MOD_TER_DV—CENT_RESOLVED_OFFSET
006531491-04	OBS	FP	0.00	1	0	1	1	TRANS_GAPPED—LPP_DV—CENT_RESOLVED_OFFSET—EPHEM_MATCH

Notes: OBS = Observed. INJ = Injected. INV = Inverted. SCR = Scrambled.
N = Not Transit-Like. S = Stellar Eclipse. C = Centroid Offset. E = Ephemeris Match.
See `http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col` for comment definitions.

Ephemeris Match Information For 006531491-04

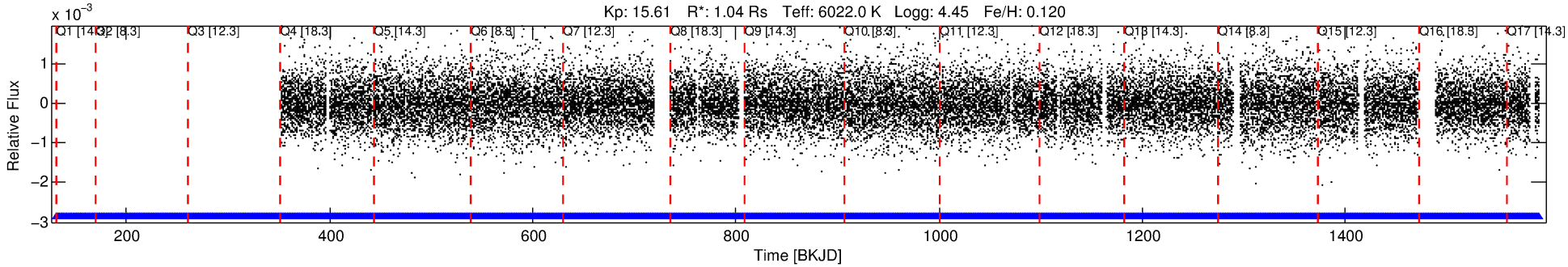
TCE (1)	KIC	Parent (2)	Parent KIC	P_1:P_2	Dist (″)	ΔRow	ΔCol	m_2	m_1	D_2/D_1	Mechanism	Flag	σ_P	σ_T
006531491-04	6531491	006531496-03	6531496	1:1	8.3	-1	1	16.09	15.60	6.04	Direct-PRF	0	3.61	1.50

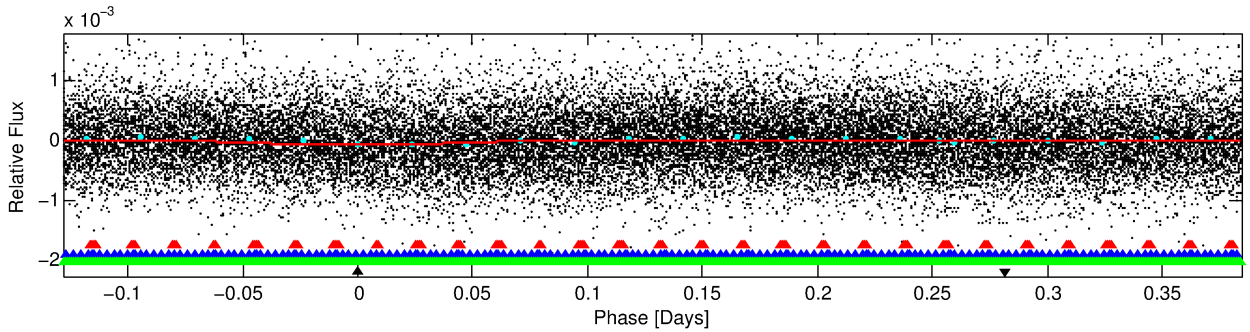
Notes: P_1:P_2 is the period ratio. Dist is the distance in arcseconds. ΔRow and ΔCol are the number of pixels apart in row and column. m_2 and m_1 are the magnitudes of the parent and child. D_2/D_1 is the parent's transit depth dividied by the child's. σ_P and σ_T are the significance of the match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

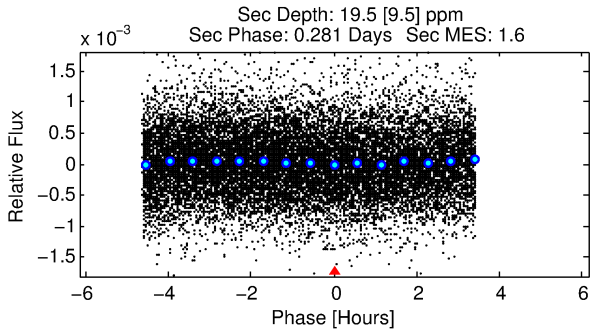
DV One-Page Summary

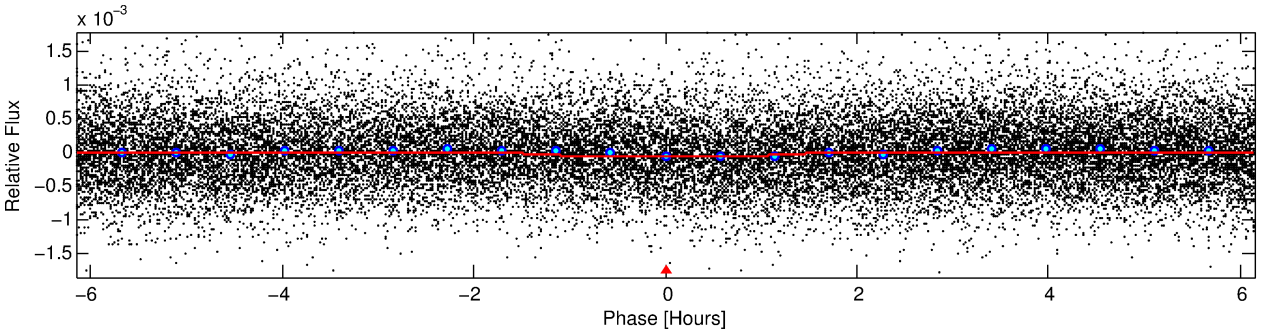
KIC: 6531491 Candidate: 4 of 4 Period: 0.513 d
KOI: K01237 Corr: No Ephemeris Match

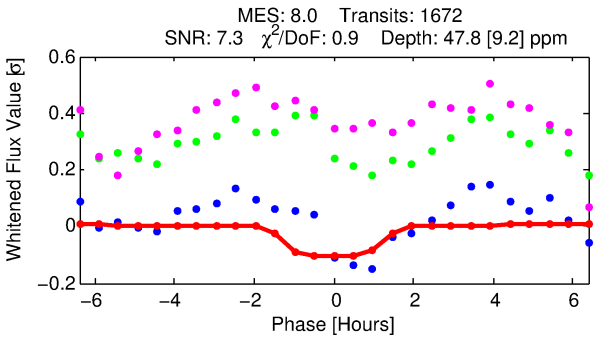
Kp: 15.61 R*: 1.04 Rs Teff: 6022.0 K Logg: 4.45 Fe/H: 0.120

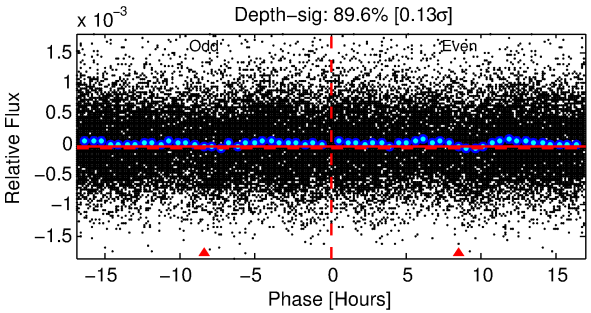


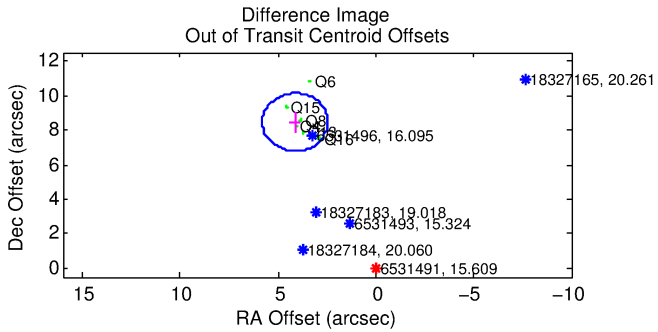












DV Fit Results:

Period = 0.51284 [0.00001] d
Epoch = 131.5235 [0.0053] BKJD
Rp/R* = 0.0068 [0.0082]
a/R* = 1.28 [2.74]
b = 0.73 [3.61]

Seff = 7509.79 [3175.45]
Teq = 2374 [251] K
Rp = 0.78 [0.96] Re
a = 0.0130 [0.0035] AU

Ag = 3.02 [7.44] [0.27σ]
Teffp = 4837 [2947] K [0.83σ]

DV Diagnostic Results:

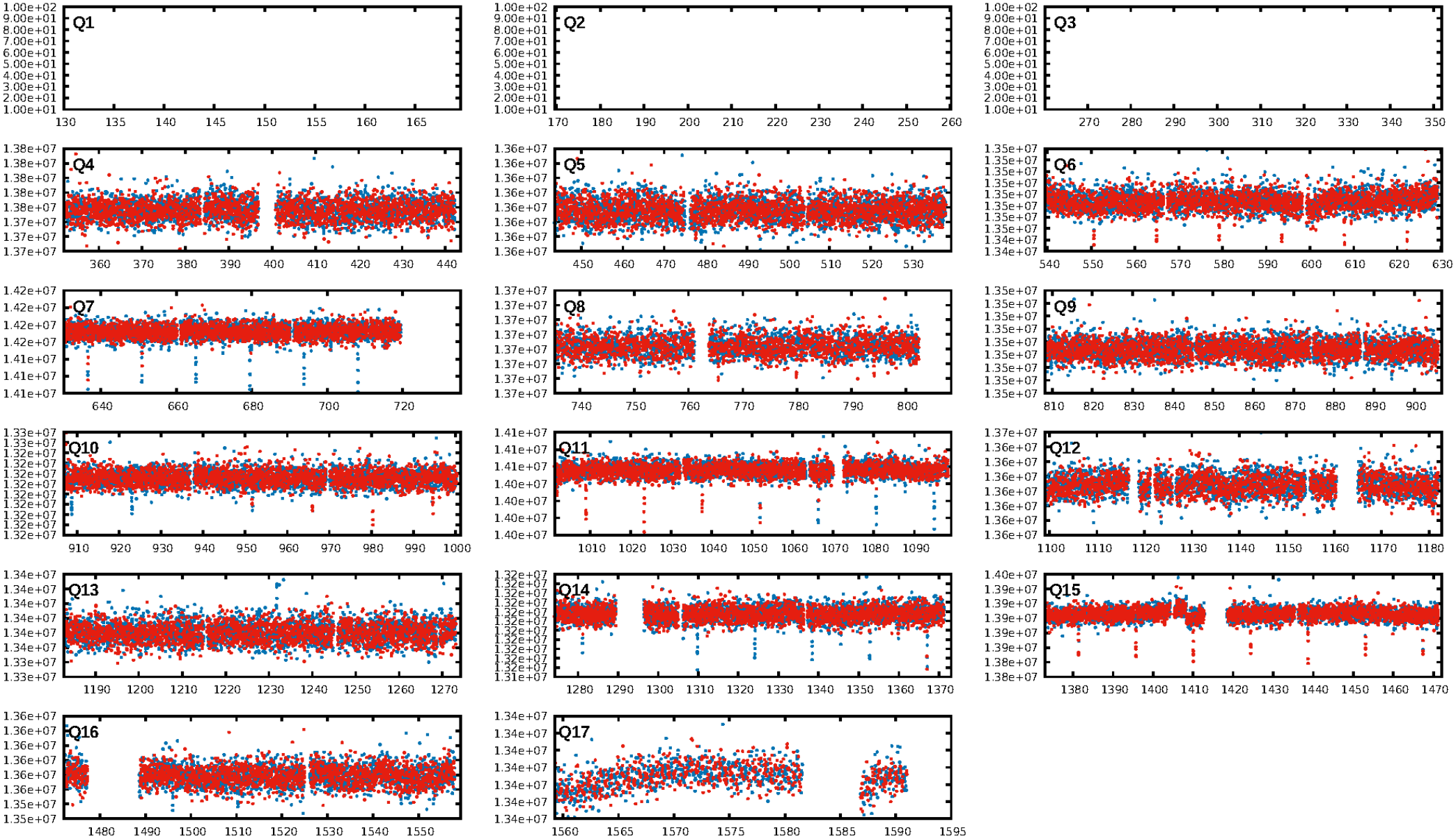
ShortPeriod−sig: N/A
LongPeriod−sig: 0.2% [0.00σ]
ModelChiSquare2−sig: N/A
ModelChiSquareGof−sig: N/A
Bootstrap−pfa: 2.46e−12
RollingBand−fgt: 1.00 [1623/1623]
GhostDiagnostic−chr: −0.468

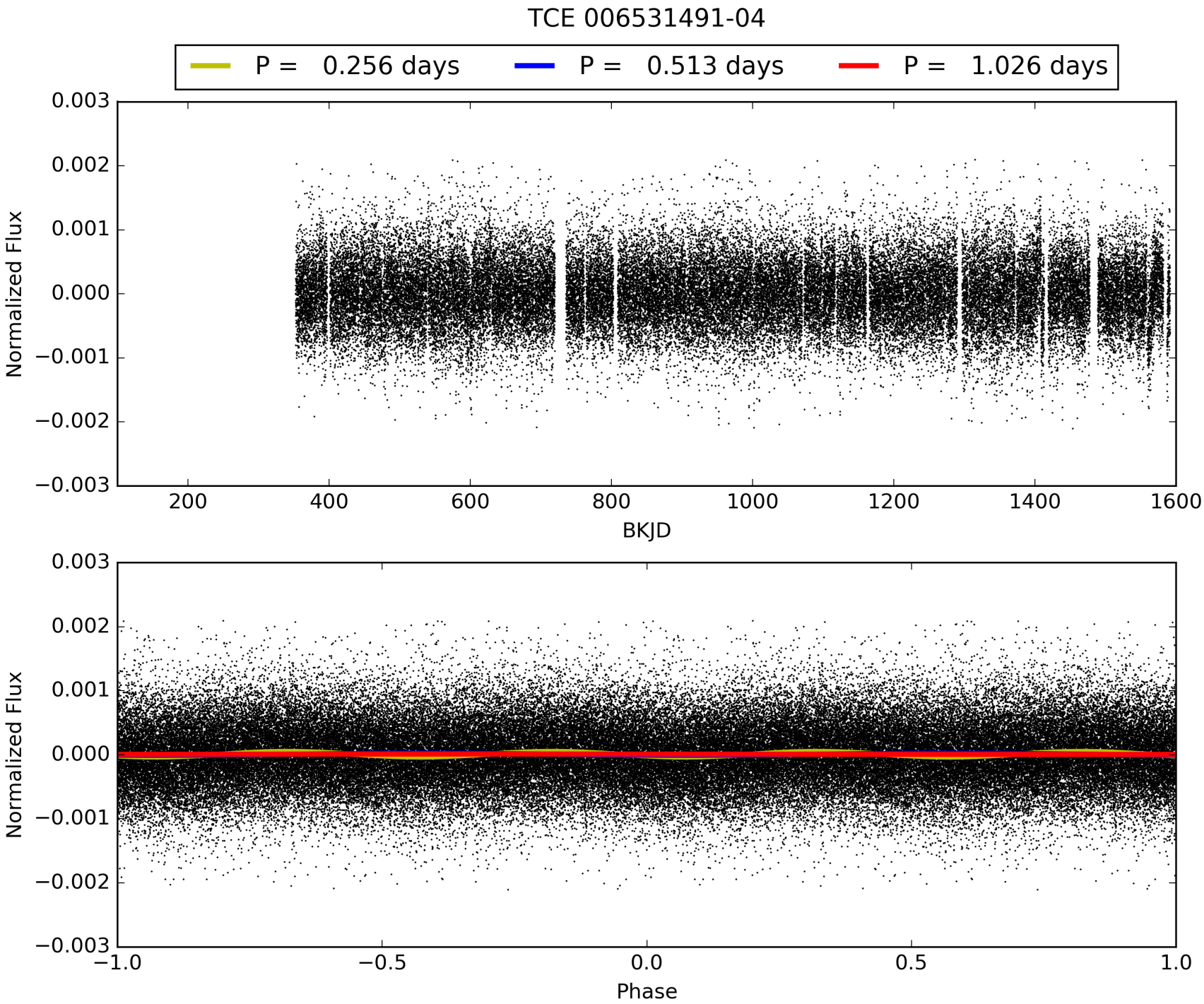
Centroid−sig: 6.6%
Centroid−so: 3.983 arcsec [3.06σ]
OotOffset−rm: 9.420 arcsec [16.86σ]
KicOffset−rm: 9.367 arcsec [20.15σ]
OotOffset−st: 1/1/3/1 [6]
KicOffset−st: 1/1/3/1 [6]
DiffImageQuality−fgm: 0.83 [5/6]
DiffImageOverlap−fno: 0.00 [0/14]

Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 31−Jan−2016 17:49:00 Z

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

TCE 006531491-04, PDC Light Curves




TCE 006531491-04
P = 0.256 days
P = 0.513 days
P = 1.026 days
Normalized Flux
BKJD
Phase
0.003
0.002
0.001
0.000
−0.001
−0.002
−0.003
200
400
600
800
1000
1200
1400
1600
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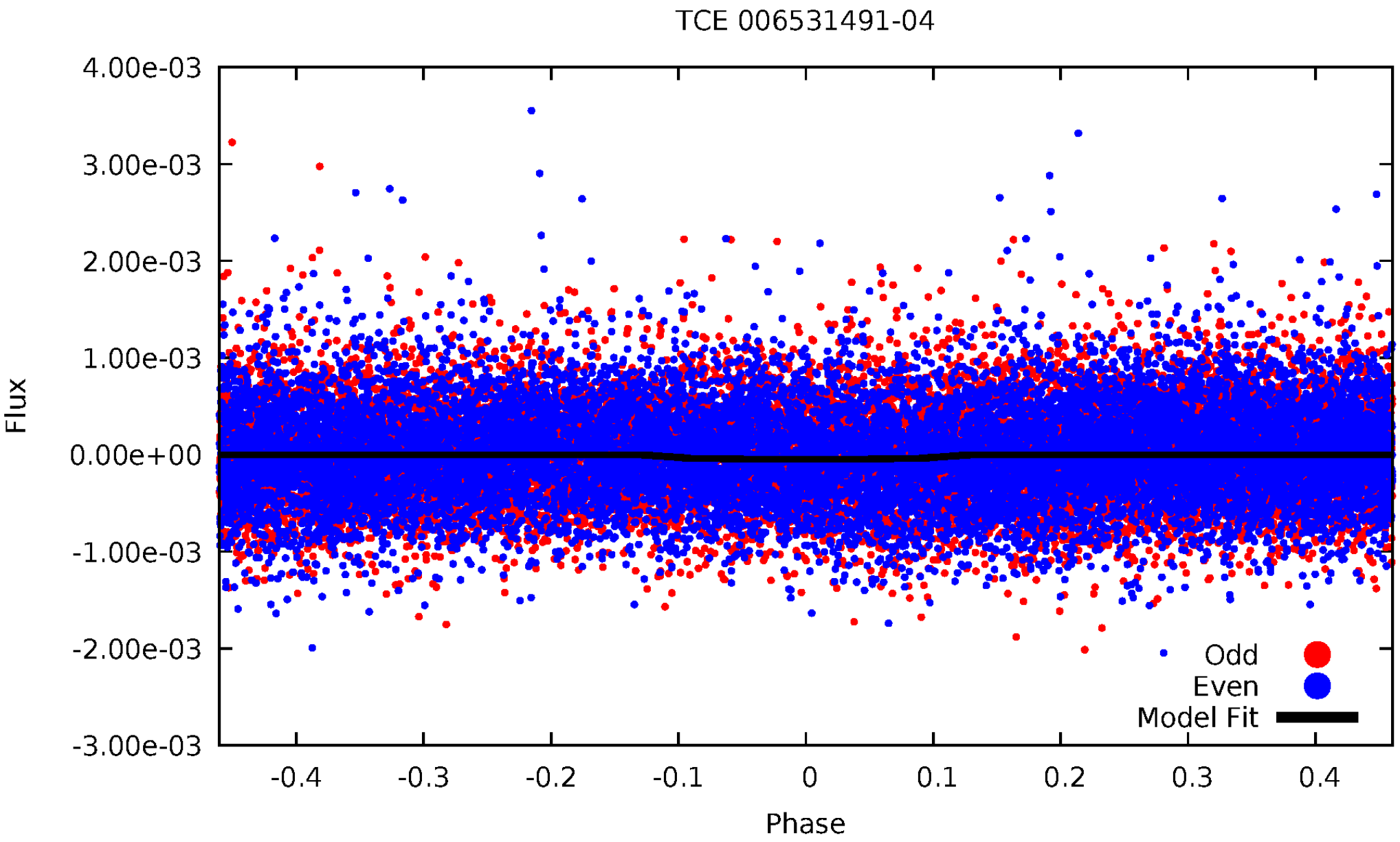
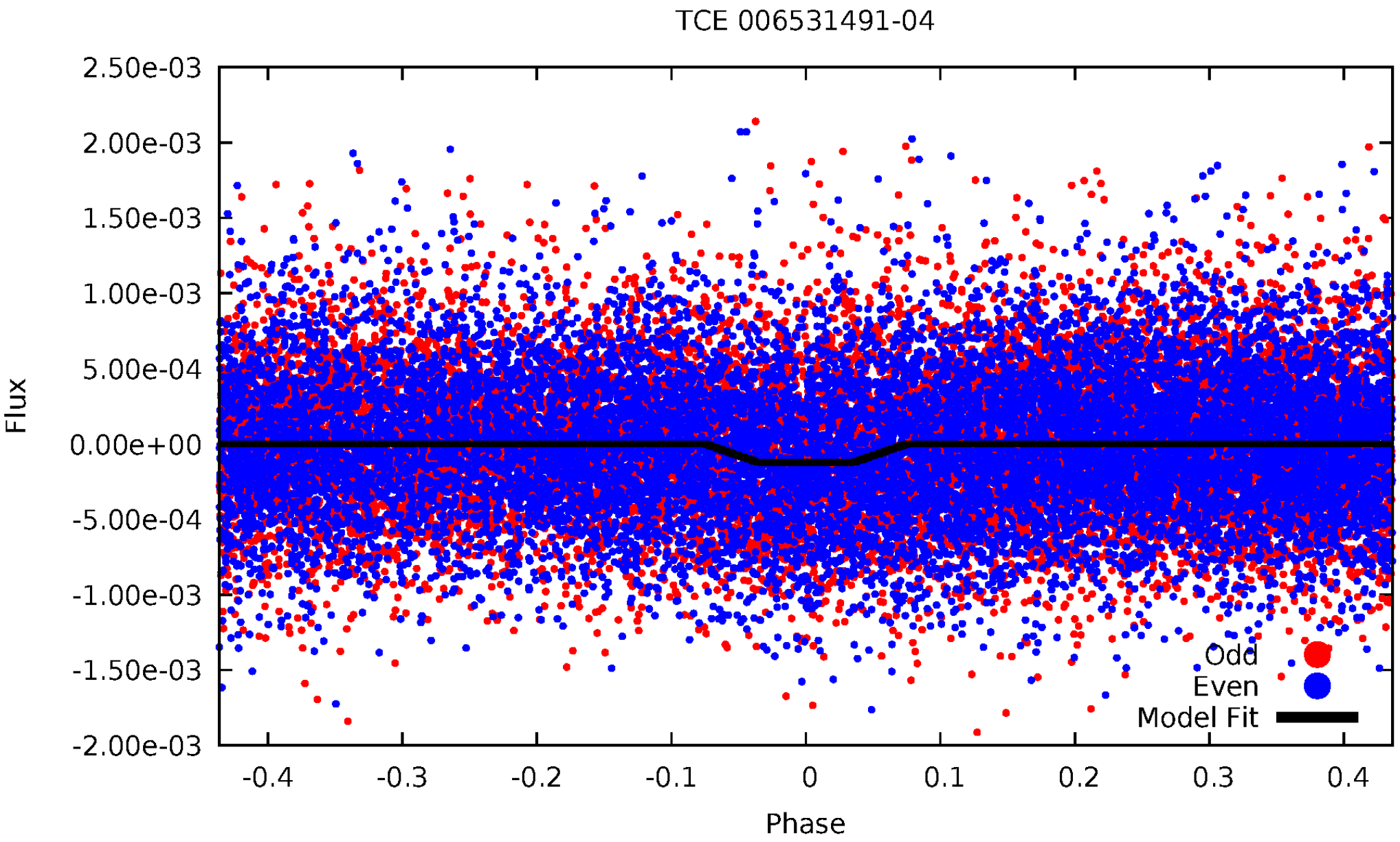
−0.5
0.0
0.5
1.0

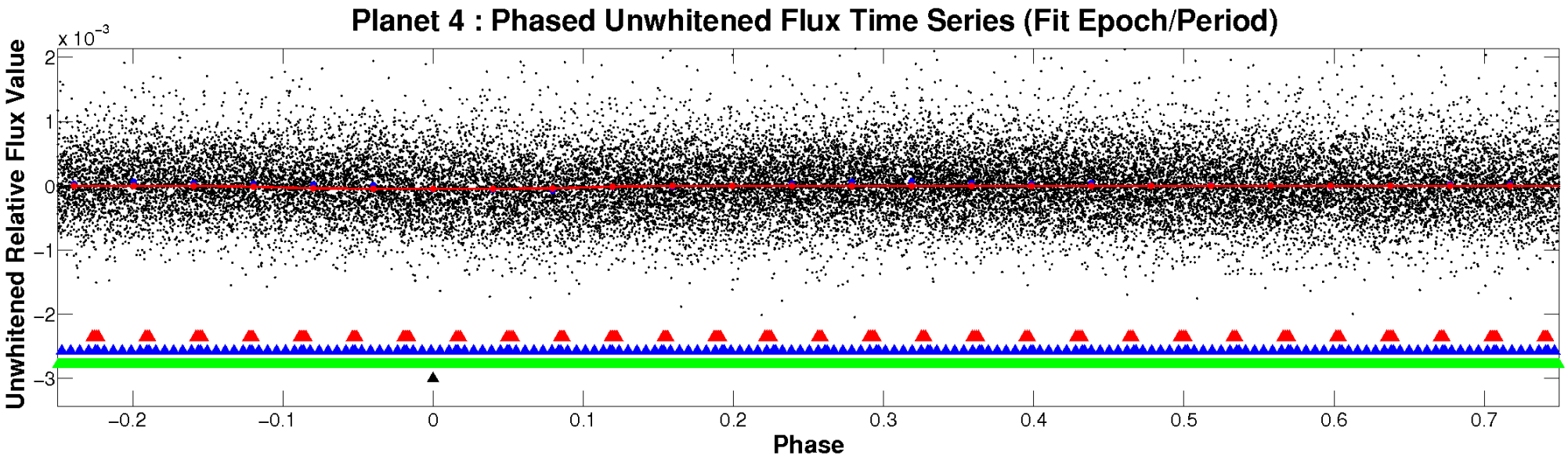
DV Odd/Even

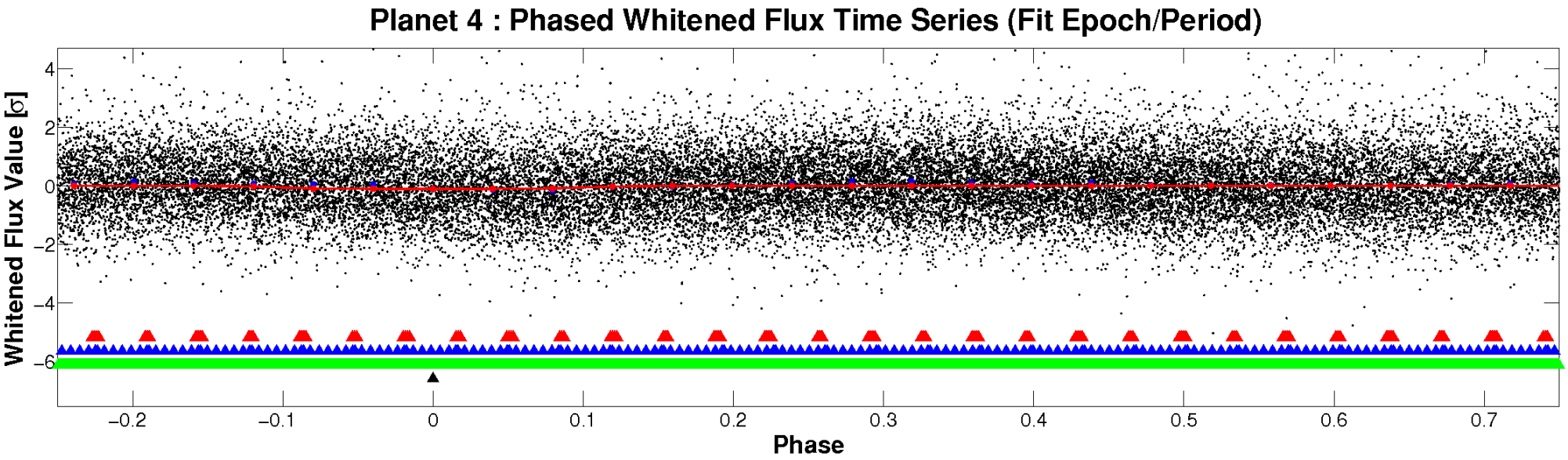

TCE 006531491-04
4.00e-03
3.00e-03
2.00e-03
1.00e-03
0.00e+00
-1.00e-03
-2.00e-03
-3.00e-03
Flux
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
Phase
Odd
Even
Model Fit

ALT Odd/Even


TCE 006531491-04
2.50e-03
2.00e-03
1.50e-03
1.00e-03
5.00e-04
0.00e+00
-5.00e-04
-1.00e-03
-1.50e-03
-2.00e-03
Flux
-0.4
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
Phase
Odd
Even
Model Fit

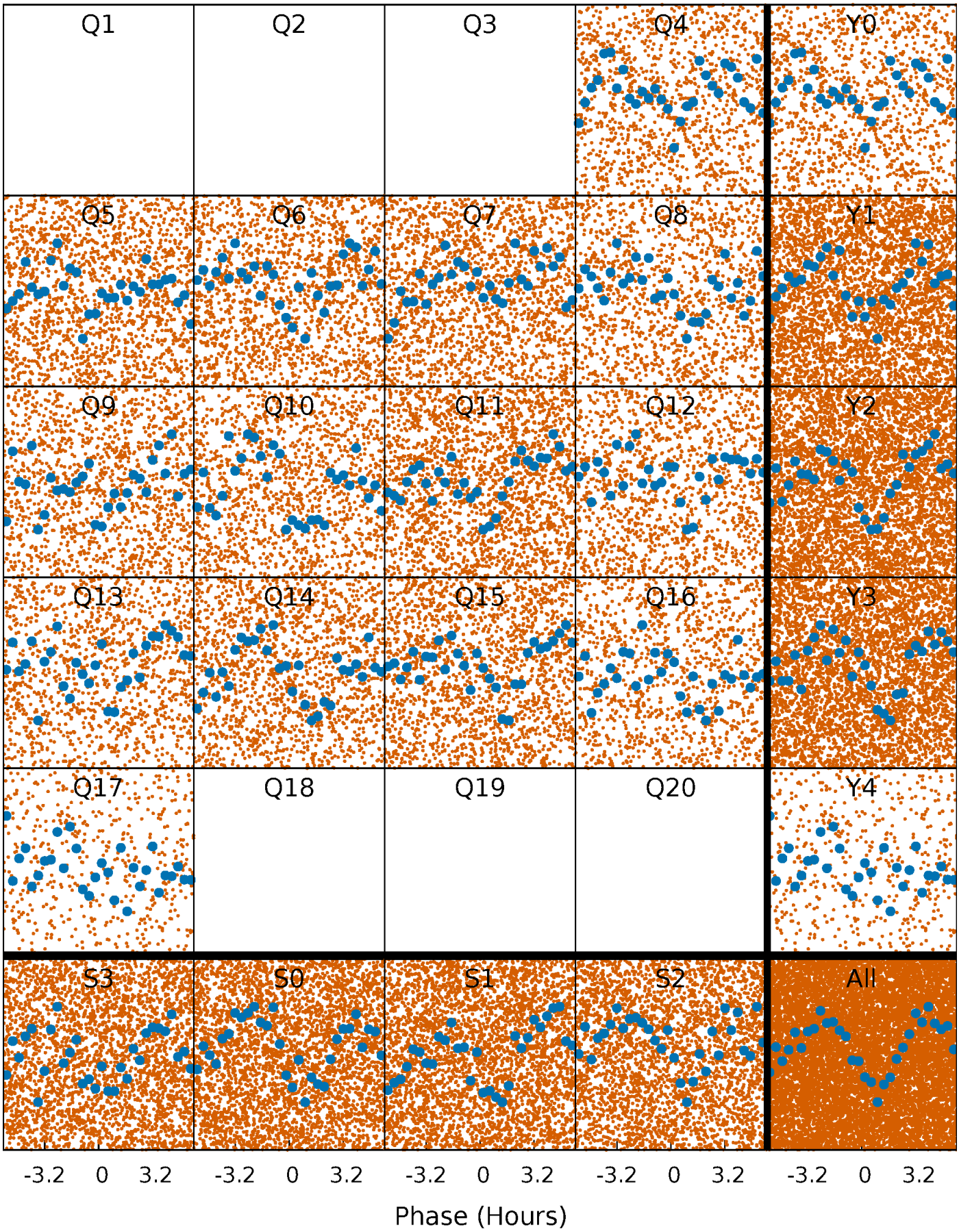
Non-Whitened Vs. Whitened Light Curve





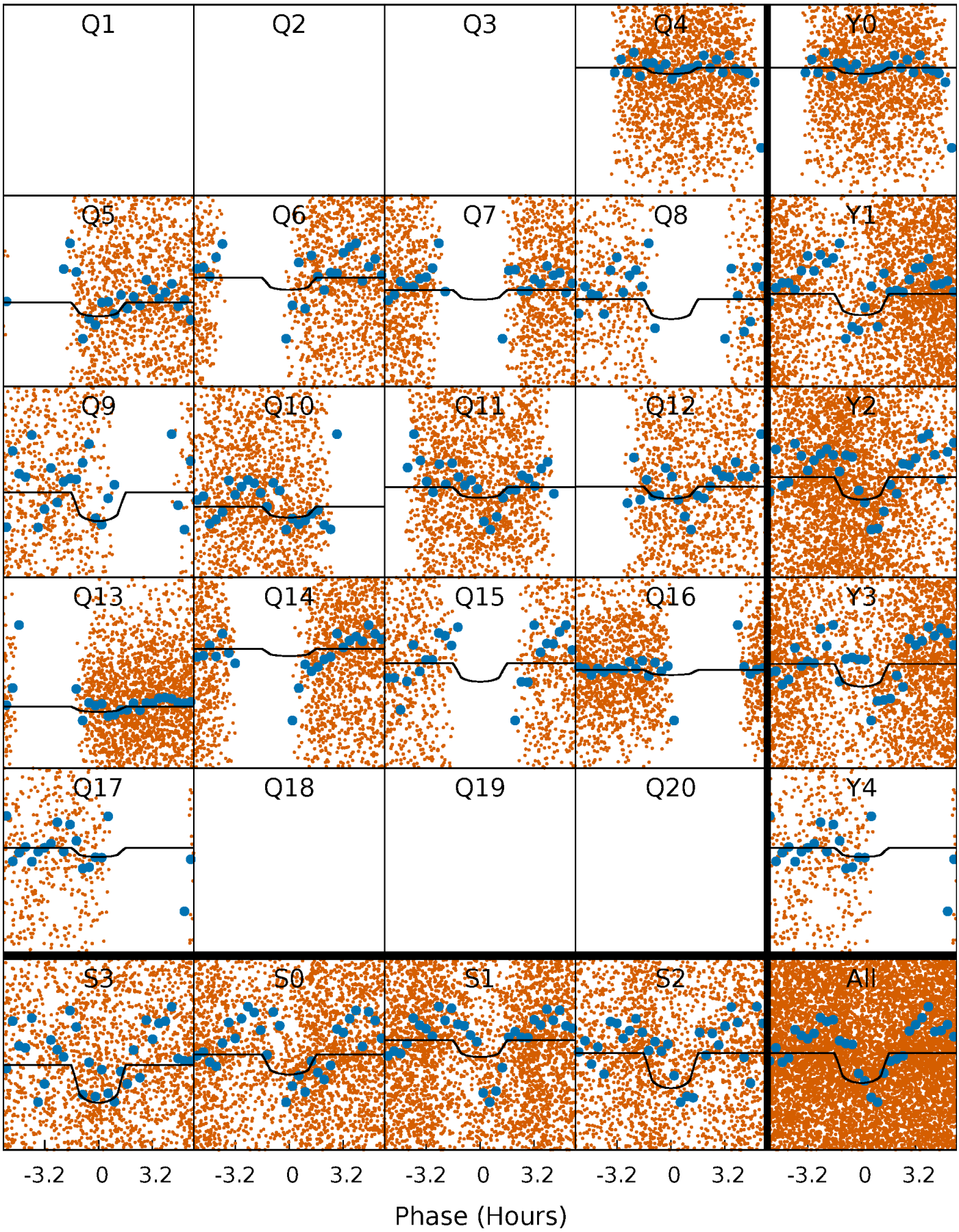
PDC Quarter-Phased Transit Curves

TCE 006531491-04 P= 0.512838 Days T_0=131.523492 (BKJD)



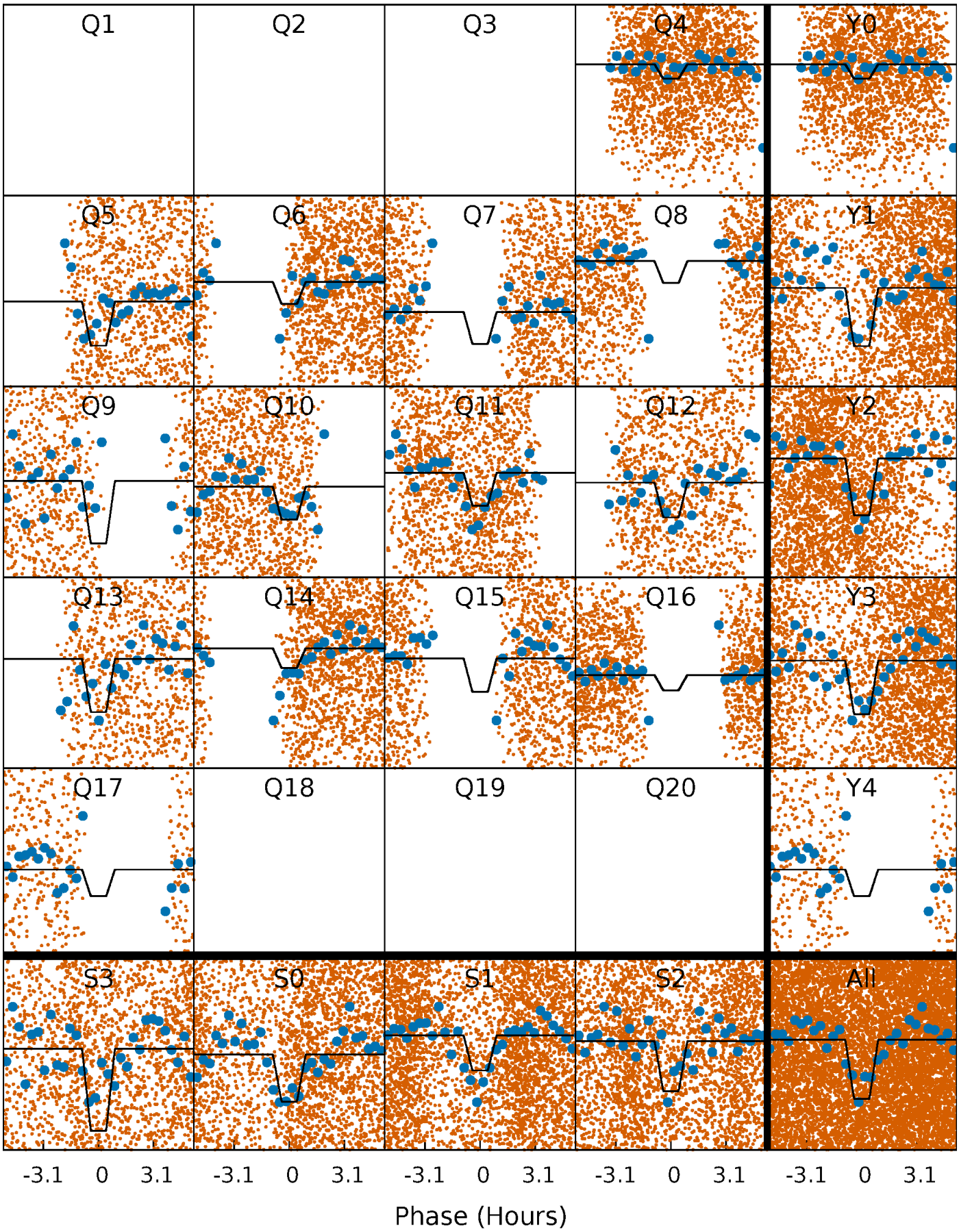
DV Quarter-Phased Transit Curves

TCE 006531491-04 P= 0.512838 Days T_0=131.523492 (BKJD)



Alt. Detrend Quarter-Phased Transit Curves

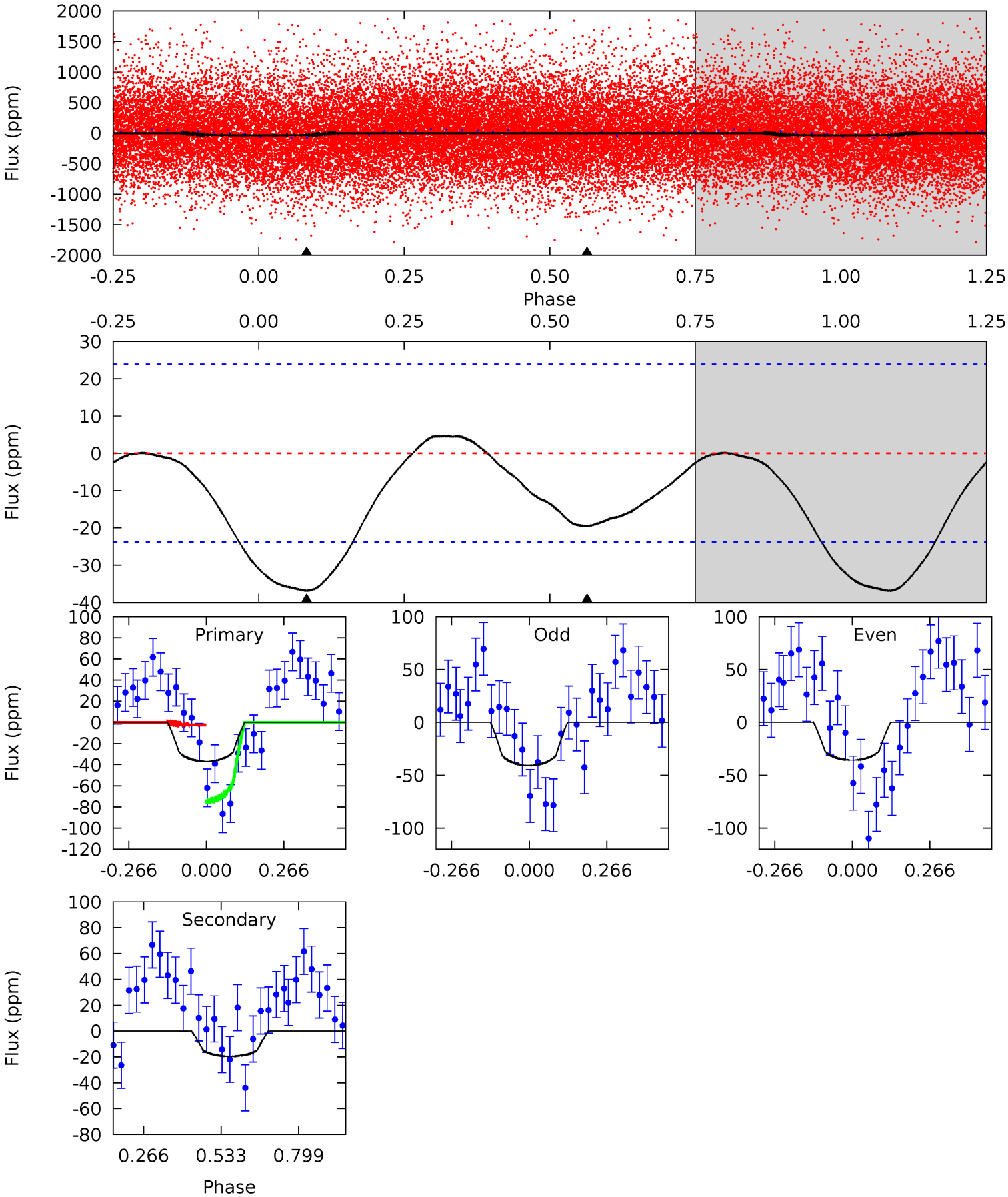
TCE 006531491-04 P= 0.512862 Days T_0=131.515409 (BKJD)



DV Model-Shift Uniqueness Test

006531491-04, P = 0.512838 Days, E = 131.523492 Days

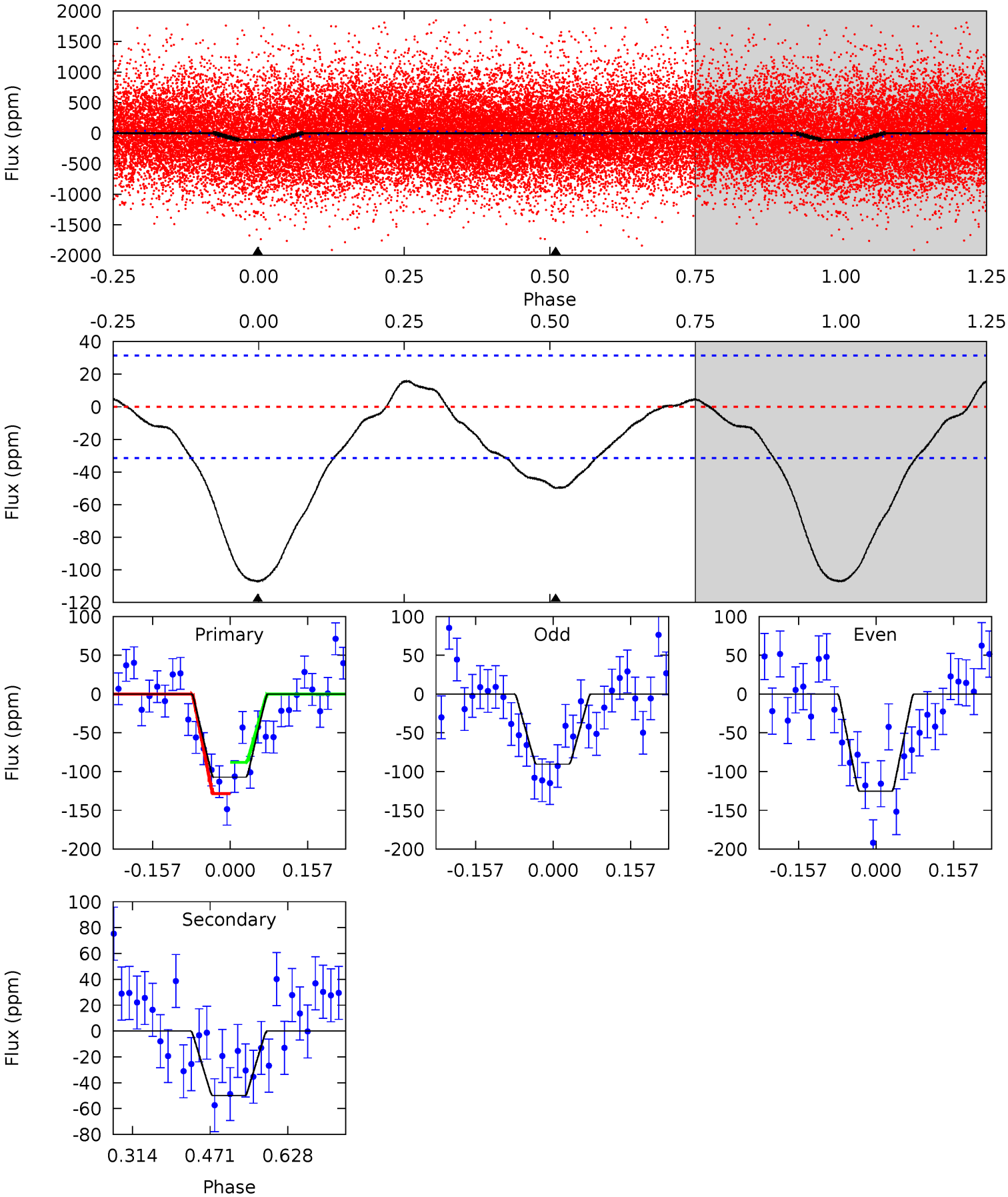
Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
6.74	3.57	0	0	4.35	1.11	0.47	6.74	6.74	3.57	3.57	0.45	0.73	0.11	6.57



Alt Model-Shift Uniqueness Test

006531491-04, P = 0.512862 Days, E = 131.515409 Days

Pri	Sec	Ter	Pos	FA_1	FA_2	F_{Red}	Pri-Ter	Pri-Pos	Sec-Ter	Sec-Pos	Odd-Evn	DMM	Shape	TAT
15.2	7.08	0	0	4.47	1.42	1.27	15.2	15.2	7.08	7.08	2.48	0.87	0.13	2.87



Stellar Parameters For KIC 006531491

	$T_{\rm eff}(K)$	$\log(g)$	[Fe/H]	R ($R_\odot$)	$M(M_\odot)$	$p_\star$ (g·cm^{-3})
	6022^{+190}_{-232}	$4.453^{+0.054}_{-0.216}$	$0.120^{+0.200}_{-0.300}$	$1.039^{+0.331}_{-0.118}$	$1.116^{+0.138}_{-0.166}$	$1.402^{+0.400}_{-0.738}$
	+3%/-4%	+1%/-5%	+167%/-250%	+32%/-11%	+12%/-15%	+29%/-53%
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 006531491-04 / KOI

Detrend	Depth (ppm)	R_p ($R_\oplus$)	T_{max} (K)	T_{obs} (K)	A_{obs}
DV	-20±5	$1.04^{+0.95}_{-0.62}$	3396^{+259}_{-187}	4284^{+2352}_{-1360}	$1.599^{+8.293}_{-1.186}$
Alt.	-50±7	$1.43^{+0.98}_{-0.85}$	3398^{+272}_{-191}	4594^{+2630}_{-1002}	$2.190^{+11.334}_{-1.434}$

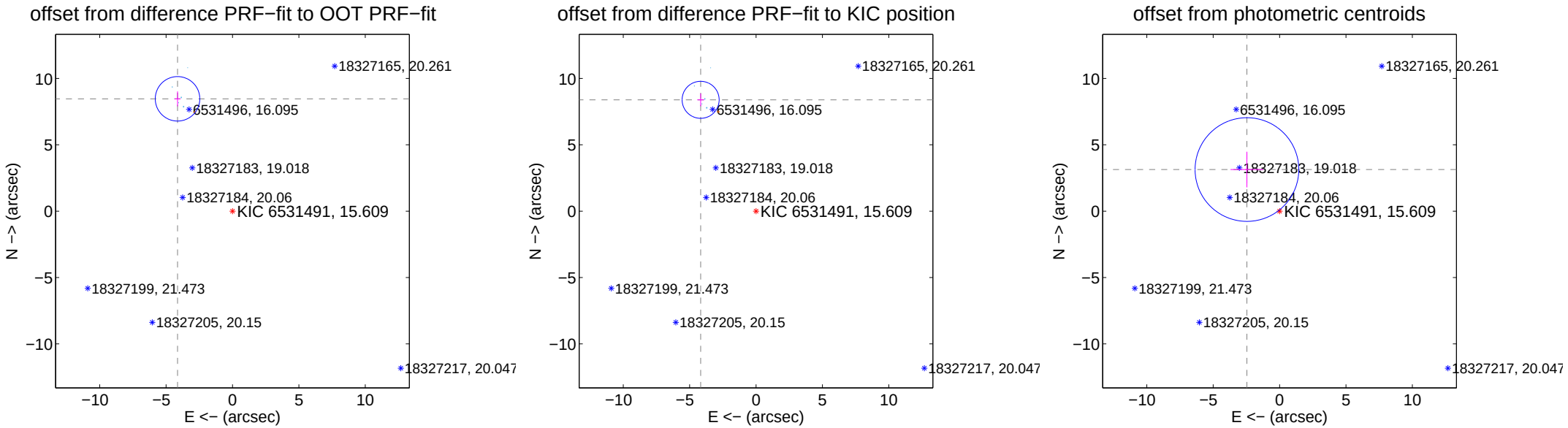
T_{max} = Theoretical Maximum Planetary Temperature
T_{obs} = Observed Planetary Temperature (Assuming A=0.3)
A_{obs} = Observed Albedo (Assuming T=0)

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

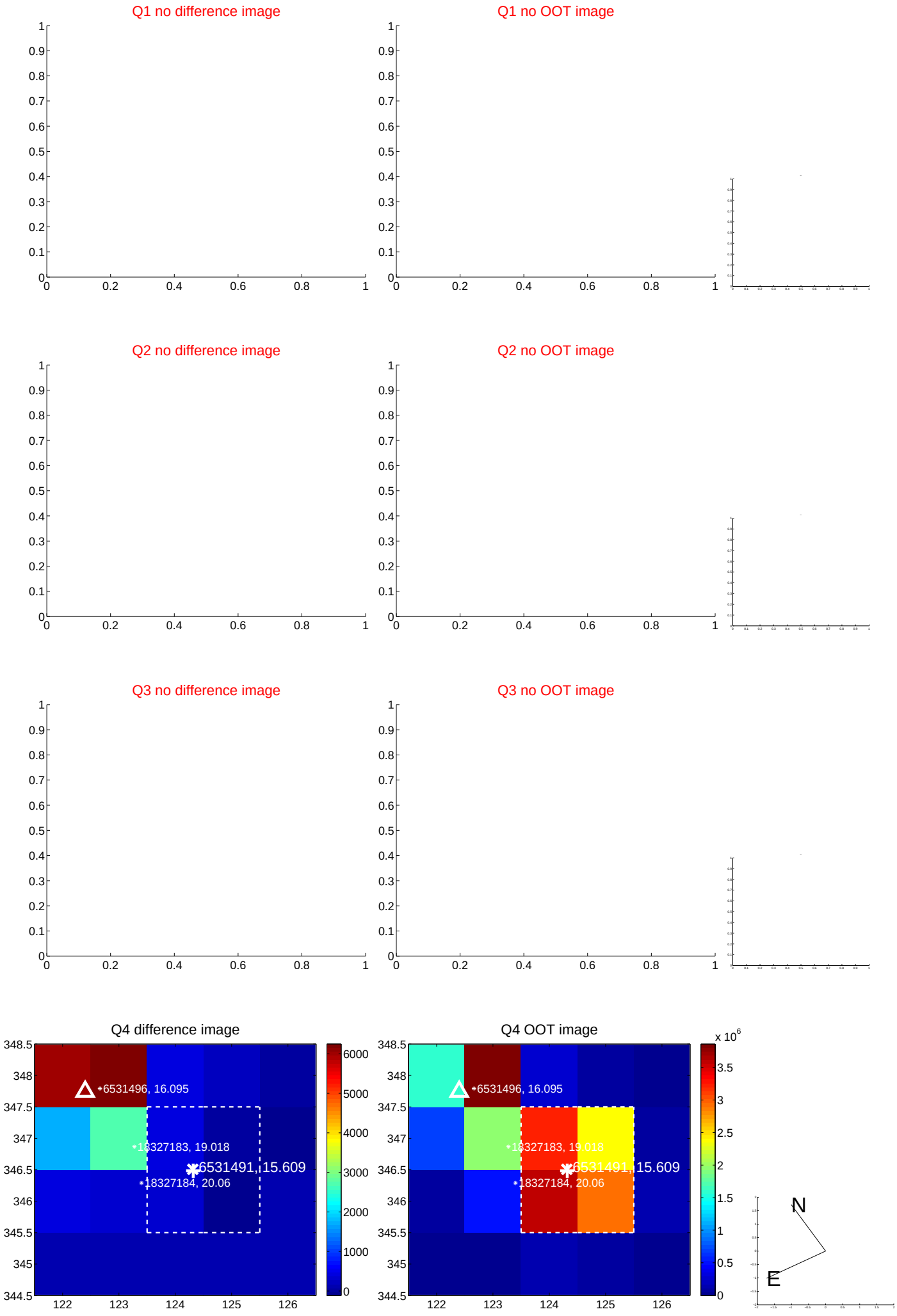
Supplemental centroid analysis for 006531491-04. Kepler magnitude: 15.61. Transit SNR 7.27
There are 5 quarters with good PRF difference image offsets
The direct PRF centroid is offset from the target star catalog position by about 0.03 arcsec

	Distance in arcsec	Distance / σ	Δ RA	Δ Dec
PRF-fit source offset from OOT	9.420 ± 0.559	16.86	4.138 ± 0.229	8.463 ± 0.560
PRF-fit source offset from KIC position	9.367 ± 0.465	20.15	4.172 ± 0.256	8.387 ± 0.481
photometric centroid source offset	3.98 ± 1.30	3.06	2.46 ± 1.24	3.13 ± 1.34

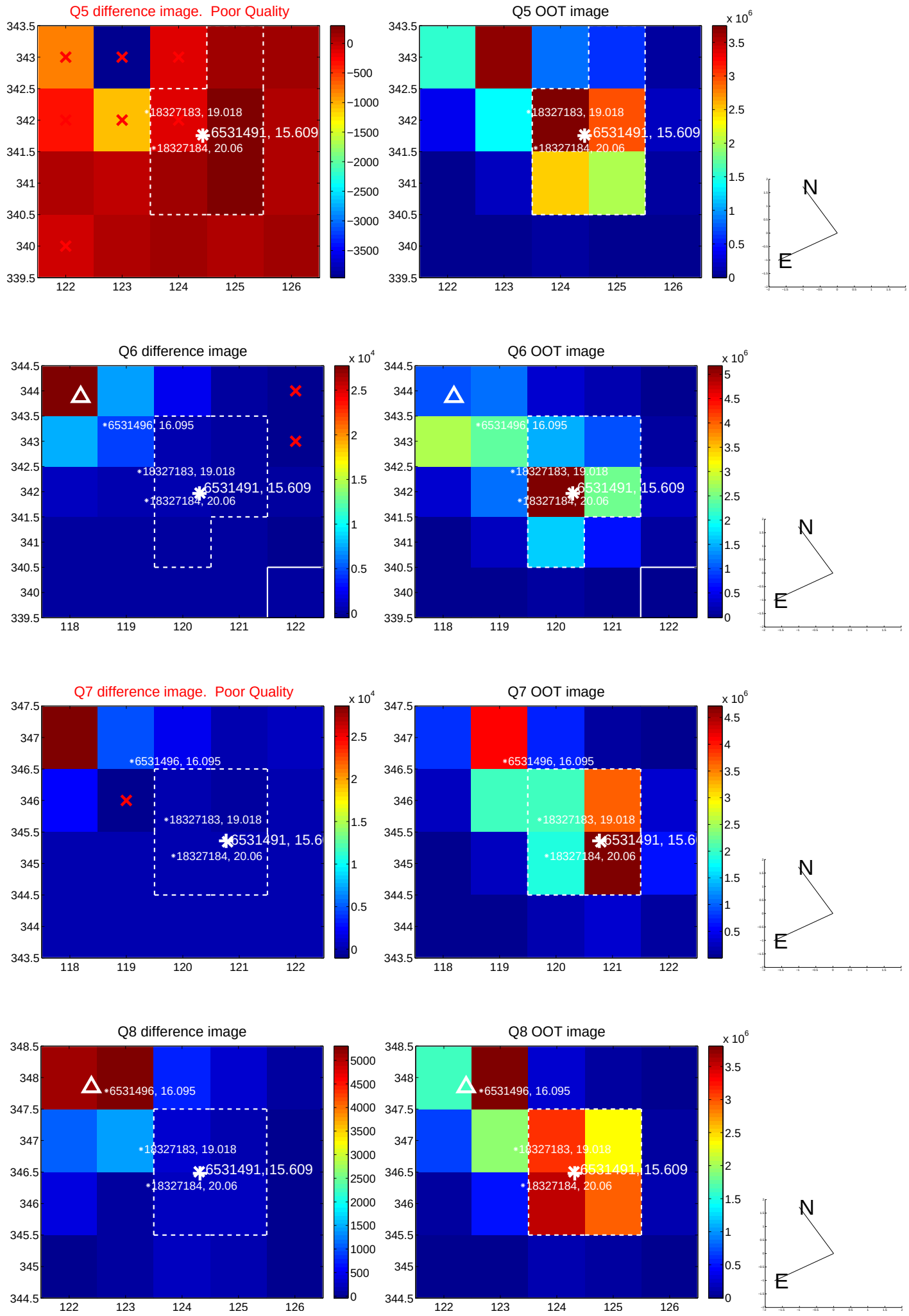


Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one-σ uncertainty. Blue circle: three-σ. Red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

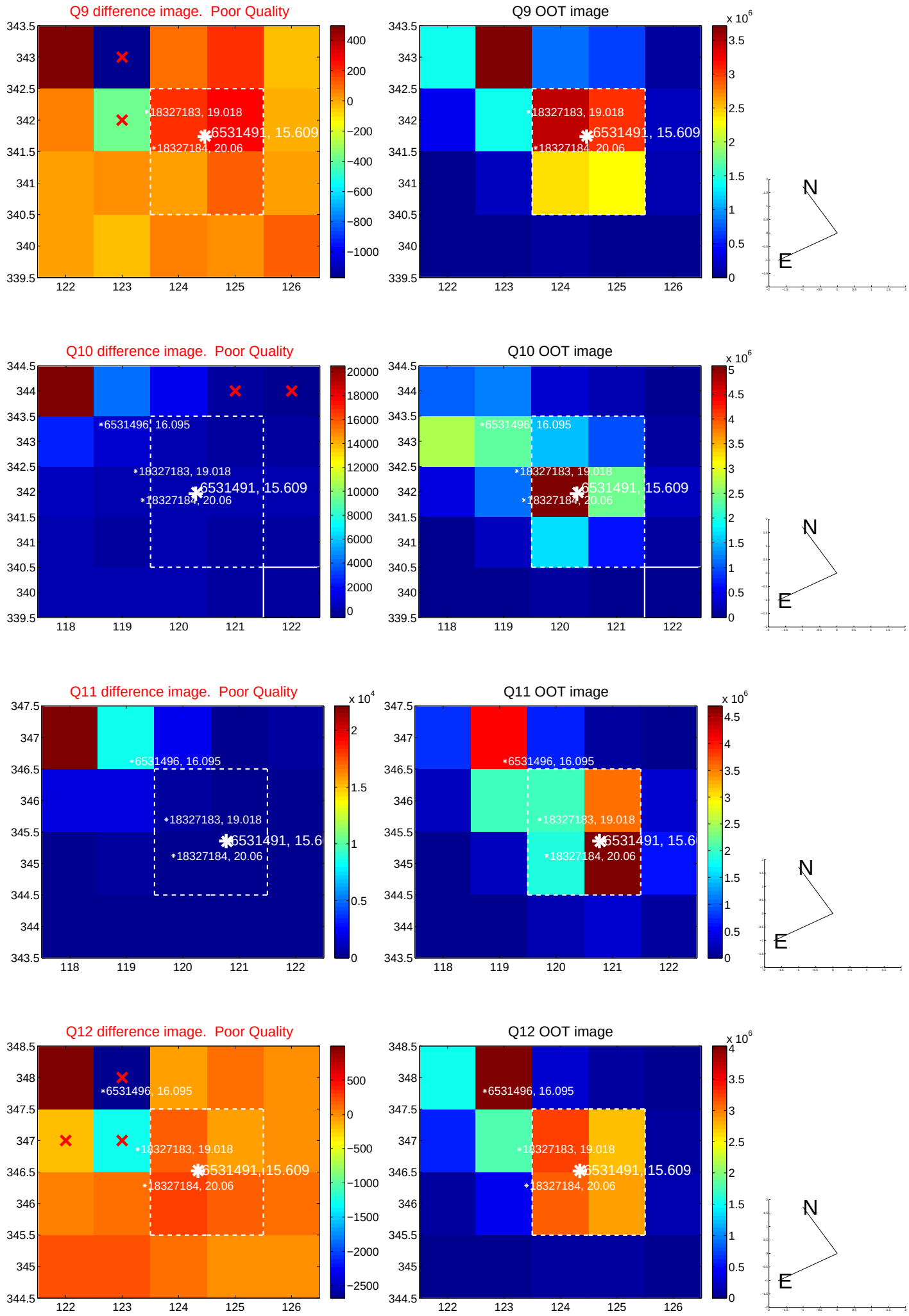
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



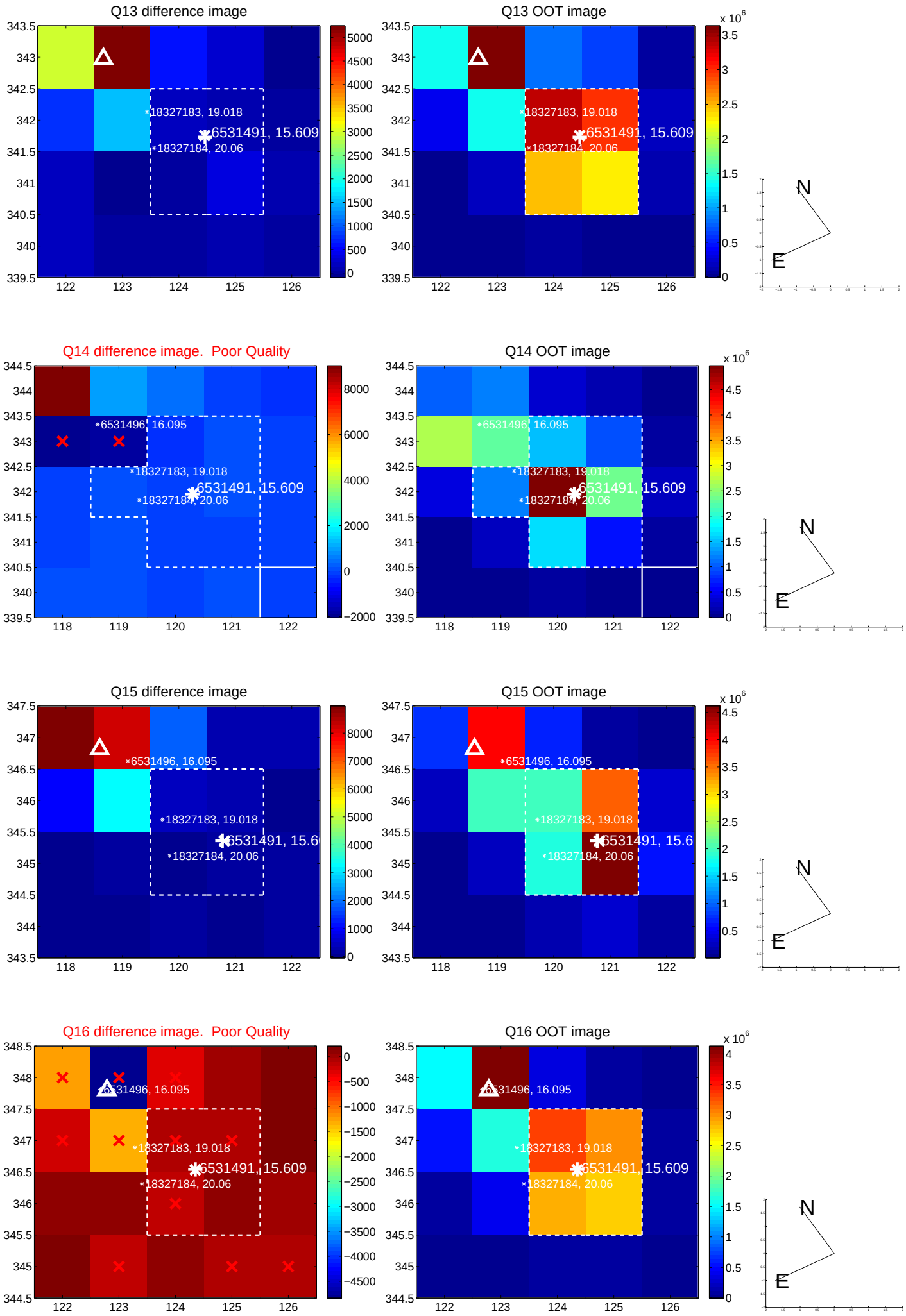
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.



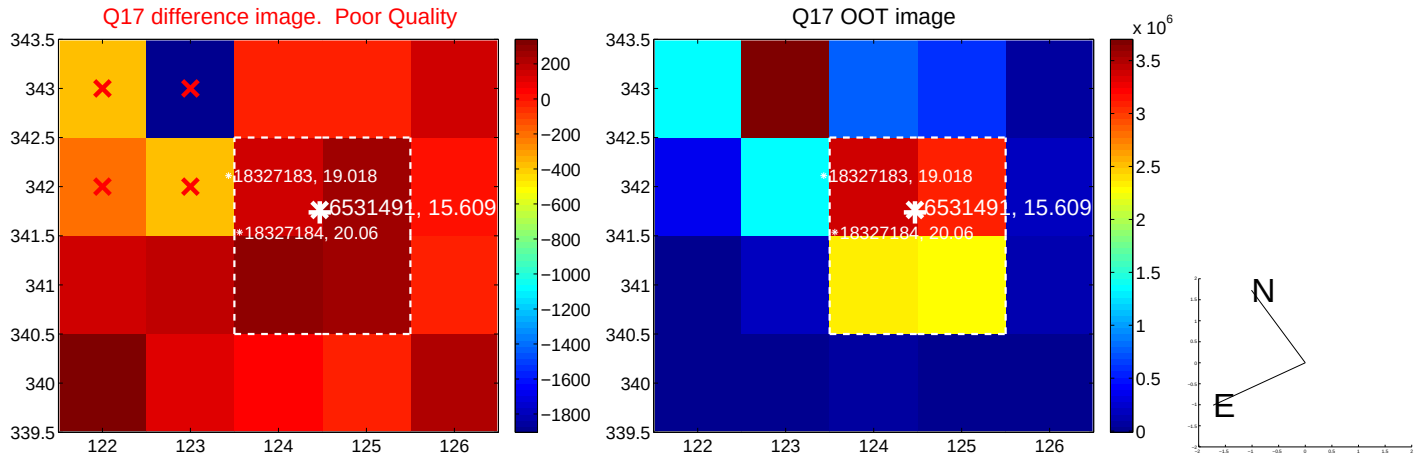
white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

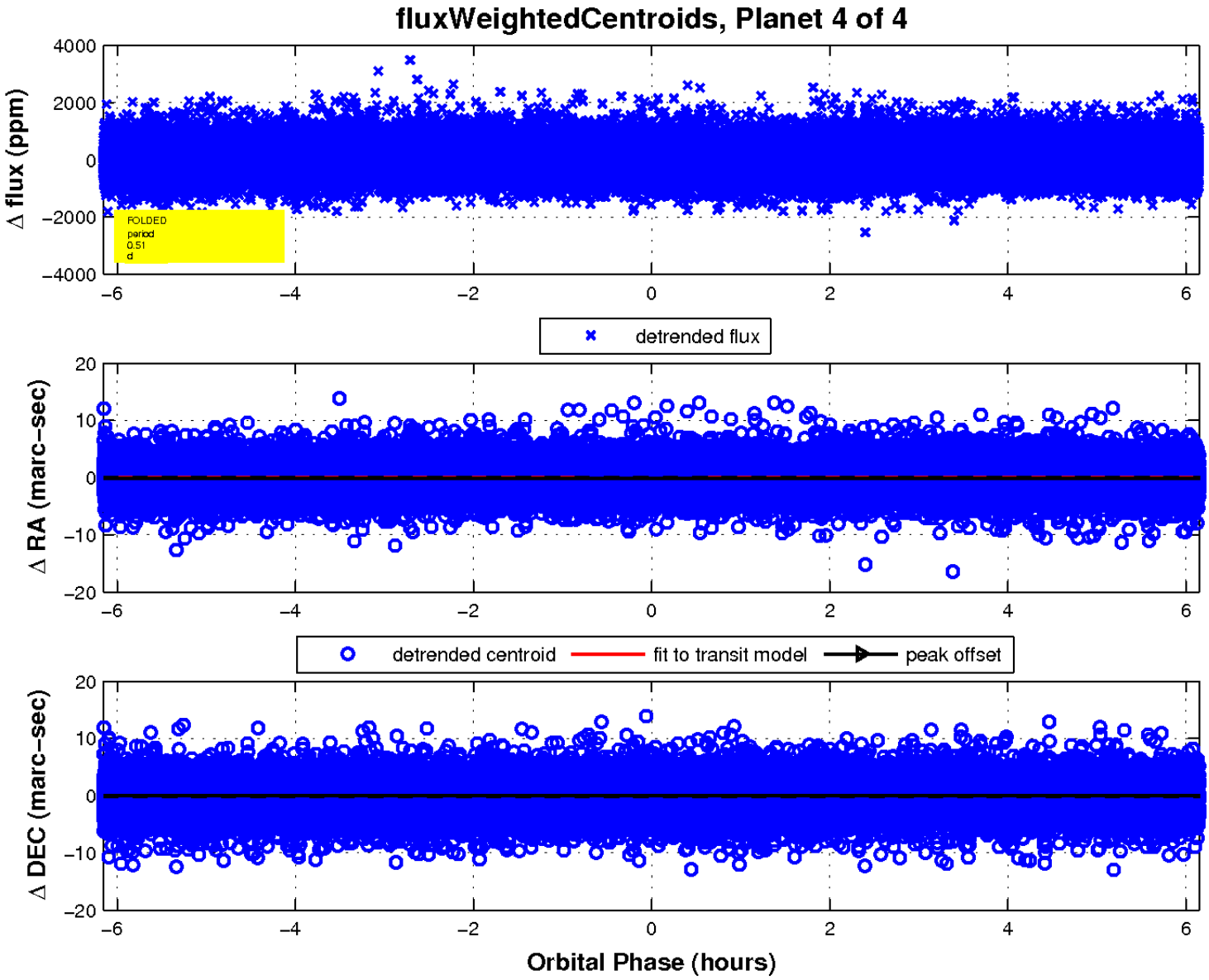


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.

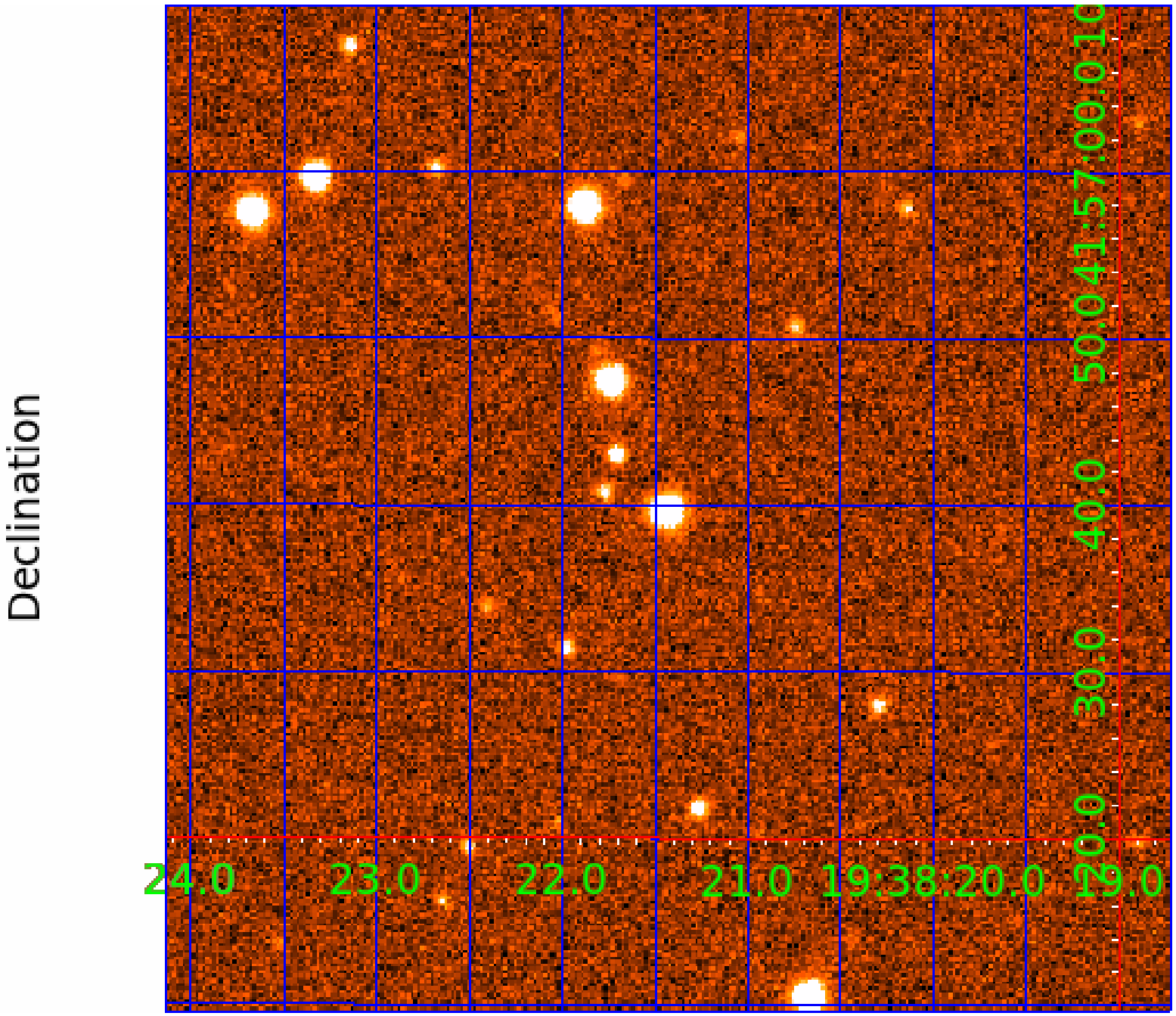


white ×: KIC target position; +: OOT centroid; △: difference centroid. red ×: large negative pixel value.





UKIRT Image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