

# KIC 009519499

## 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) | $R_p$ ( $R_{\oplus}$ ) | $S_p$ ( $S_{\oplus}$ ) |
|--------------|----------|------|---------------|--------------|-------------|------------------|-----|-----|-----------------------------|-----------------|------------------------|------------------------|
| 009519499-01 | OBS      | No   | 499.532937    | 545.549504   | 155.2       | 15.470           | 8.7 | 8.2 | 1.32                        | 6091            | 1.78                   | 1.38                   |

## Robovetter Results

| TCE          | Run Type | Disp | Score | N | S | C | E | Comments                    |
|--------------|----------|------|-------|---|---|---|---|-----------------------------|
| 009519499-01 | OBS      | FP   | 0.00  | 1 | 0 | 0 | 0 | INDIV_TRANS_MARSHALL—LPP_DV |

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

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

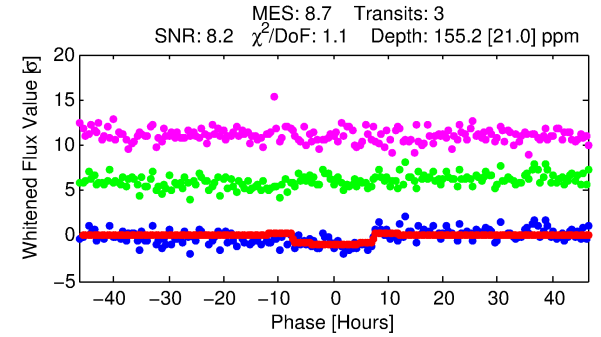
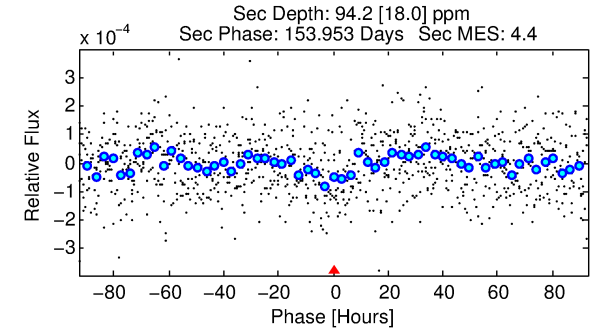
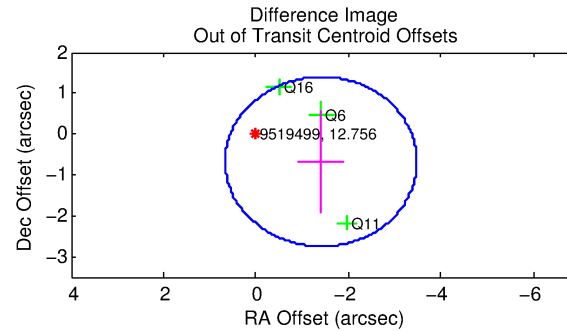
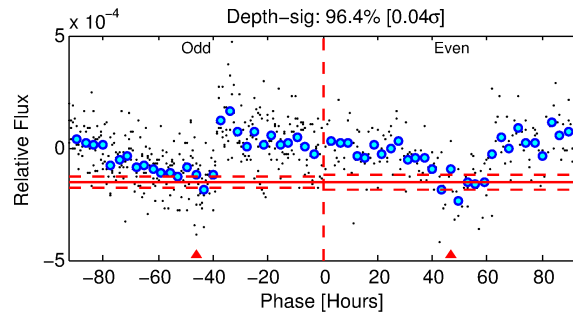
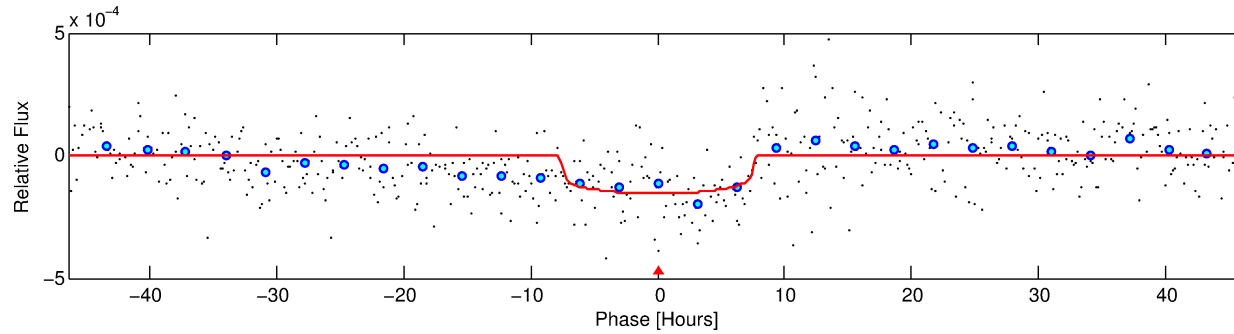
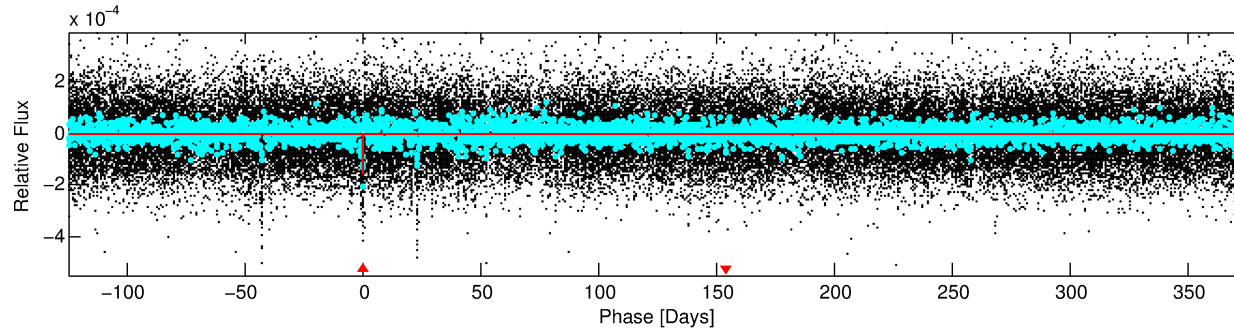
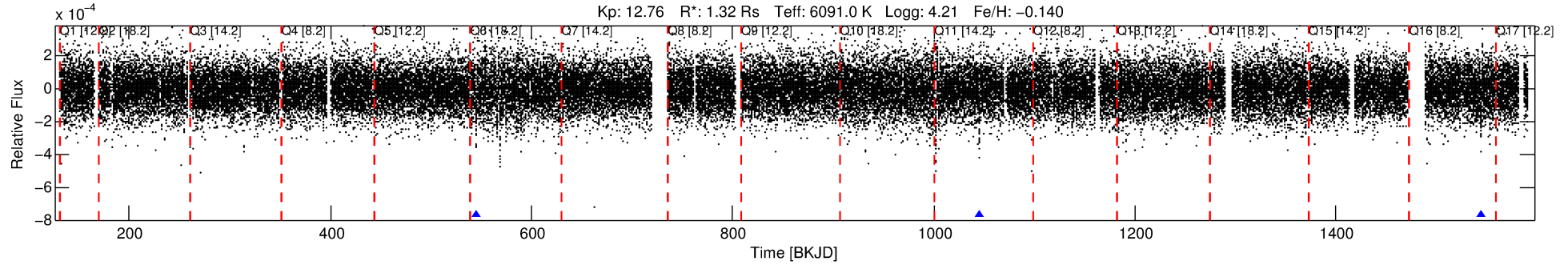
See [http://exoplanetarchive.ipac.caltech.edu/docs/API\\_kepcandidate\\_columns.html#proj\\_disp\\_col](http://exoplanetarchive.ipac.caltech.edu/docs/API_kepcandidate_columns.html#proj_disp_col) for comment definitions.

## Ephemeris Match Information For 009519499-01

No Significant Match Found

# DV One-Page Summary

KIC: 9519499 Candidate: 1 of 1 Period: 499.533 d



## DV Fit Results:

Period = 499.53294 [0.01392] d  
Epoch = 545.5495 [0.0181] BKJD  
Rp/R\* = 0.0124 [0.0042]  
a/R\* = 167.66 [280.76]  
b = 0.75 [0.98]  
Seff = 1.37 [0.47]  
Teq = 276 [24] K  
Rp = 1.78 [0.72] Re  
a = 1.2484 [0.2528] AU  
Ag = 25420.05 [19808.69] [1.28 $\sigma$ ]  
Teffp = 5390 [971] K [5.26 $\sigma$ ]

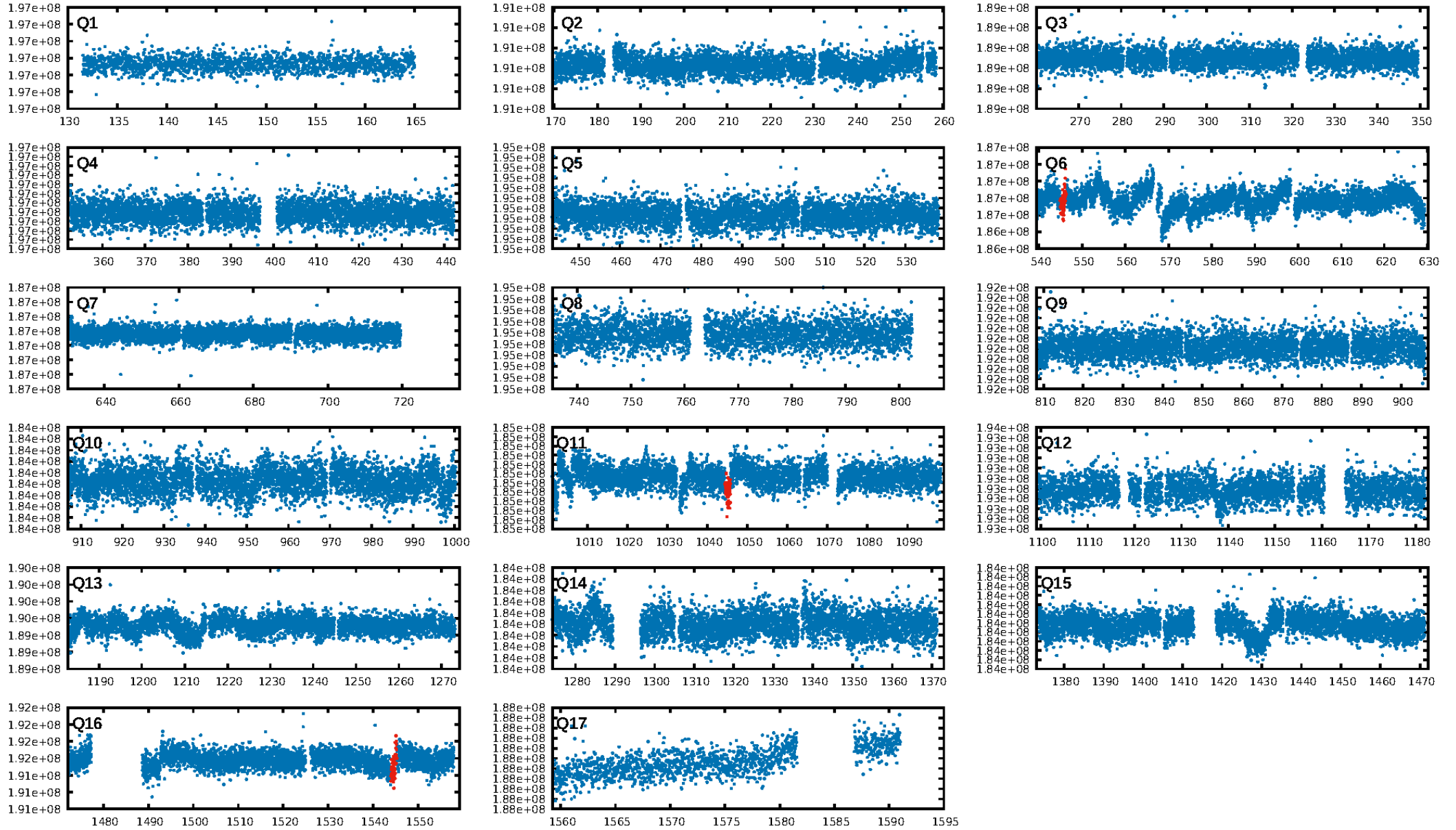
## DV Diagnostic Results:

ShortPeriod-sig: N/A  
LongPeriod-sig: N/A  
ModelChiSquare2-sig: 92.4%  
ModelChiSquareGof-sig: 99.4%  
**Bootstrap-pfa: 9.60e-12**  
RollingBand-fgt: 1.00 [3/3]  
GhostDiagnostic-chr: 3.658  
Centroid-sig: 53.8%  
Centroid-so: 0.878 arcsec [0.68 $\sigma$ ]  
OotOffset-rm: 1.559 arcsec [2.26 $\sigma$ ]  
KicOffset-rm: 1.740 arcsec [2.12 $\sigma$ ]  
OotOffset-st: 1/1/1/0 [3]  
KicOffset-st: 1/1/1/0 [3]  
DiffImageQuality-fgm: 1.00 [3/3]  
DiffImageOverlap-fno: 1.00 [3/3]

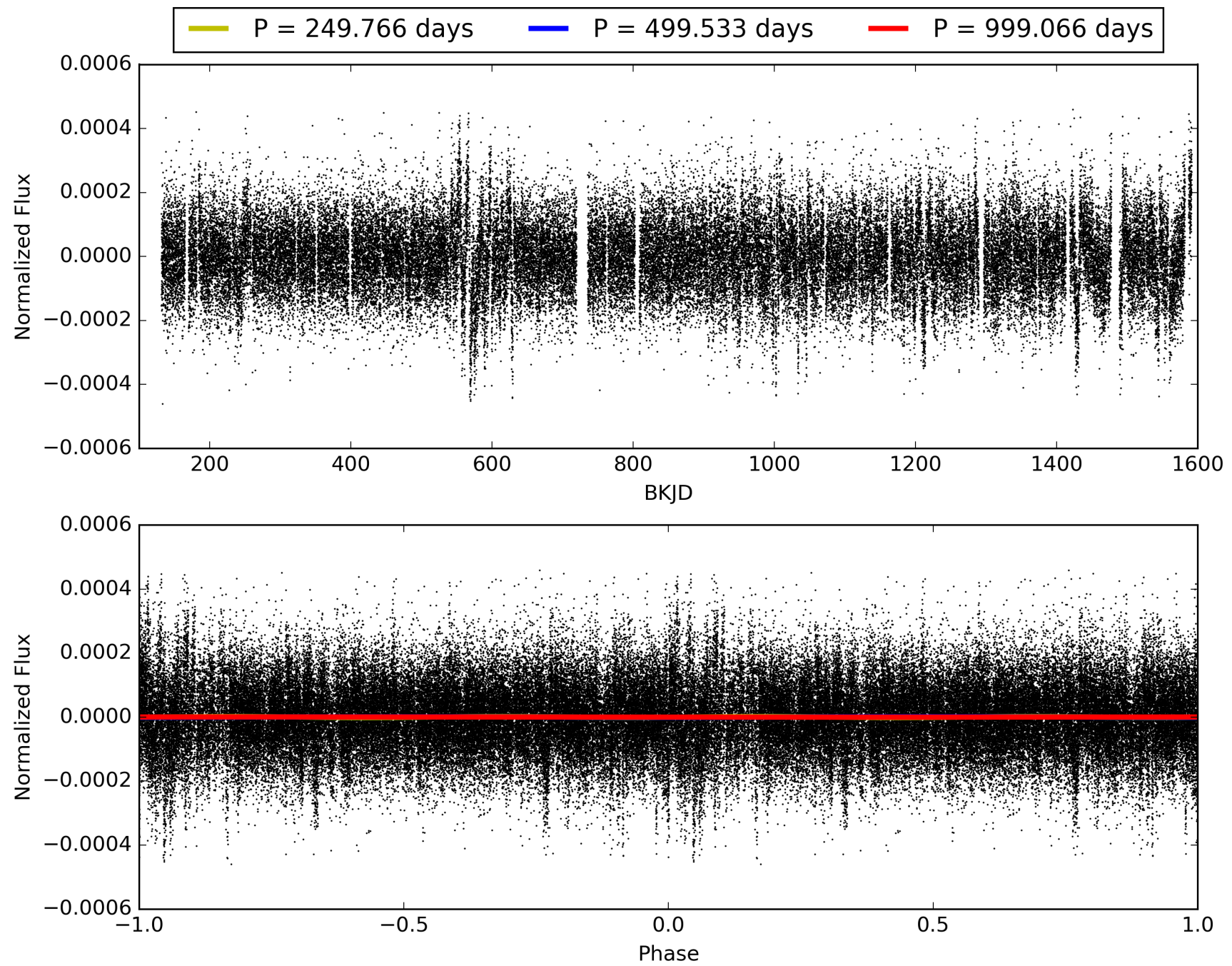
Software Revision: svn+ssh://murzim/repo/soc/tags/release/9.3.42@60958 -- Date Generated: 28-Jan-2016 21:49:33 Z

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

# TCE 009519499-01, PDC Light Curves

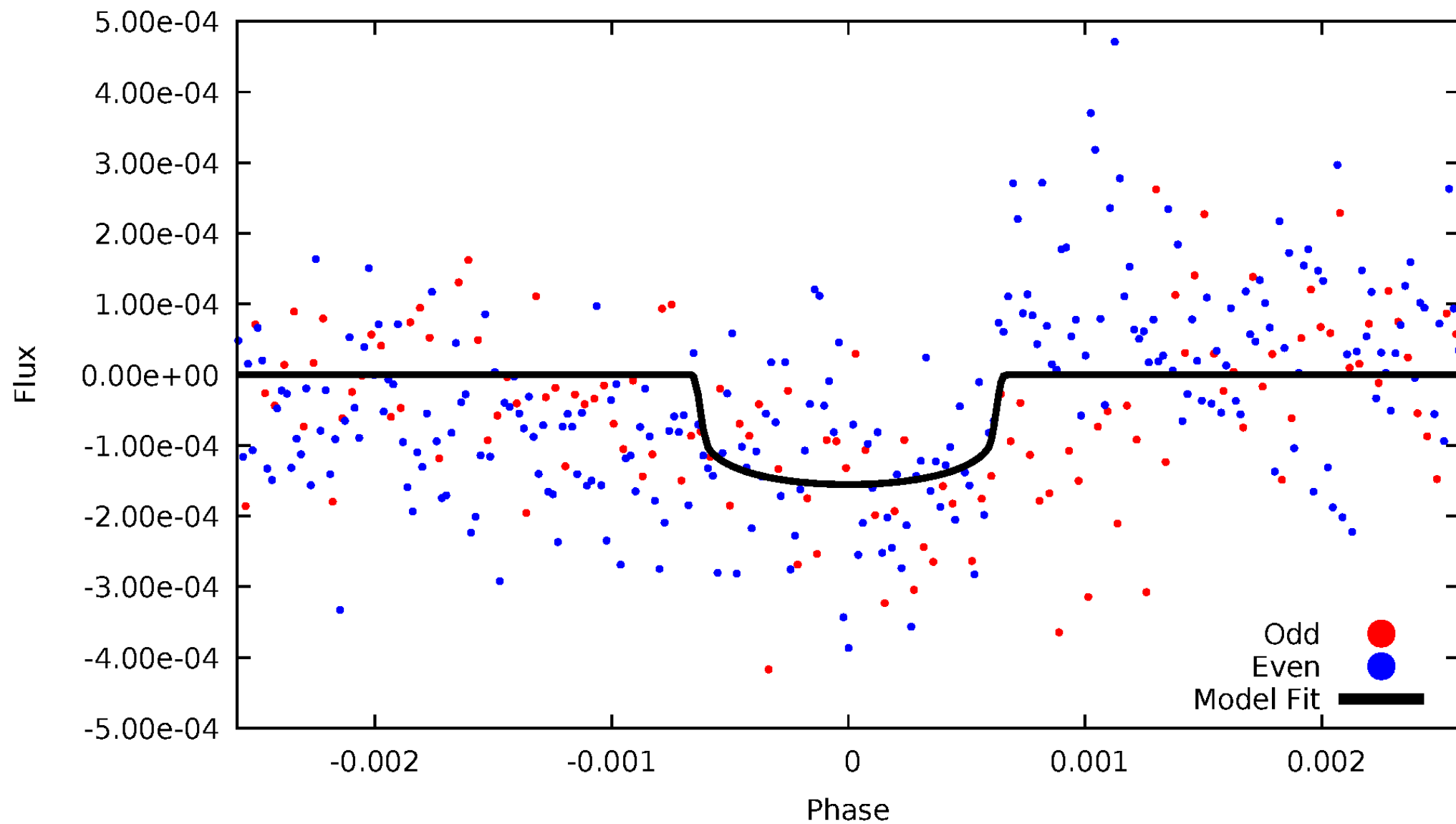


TCE 009519499-01



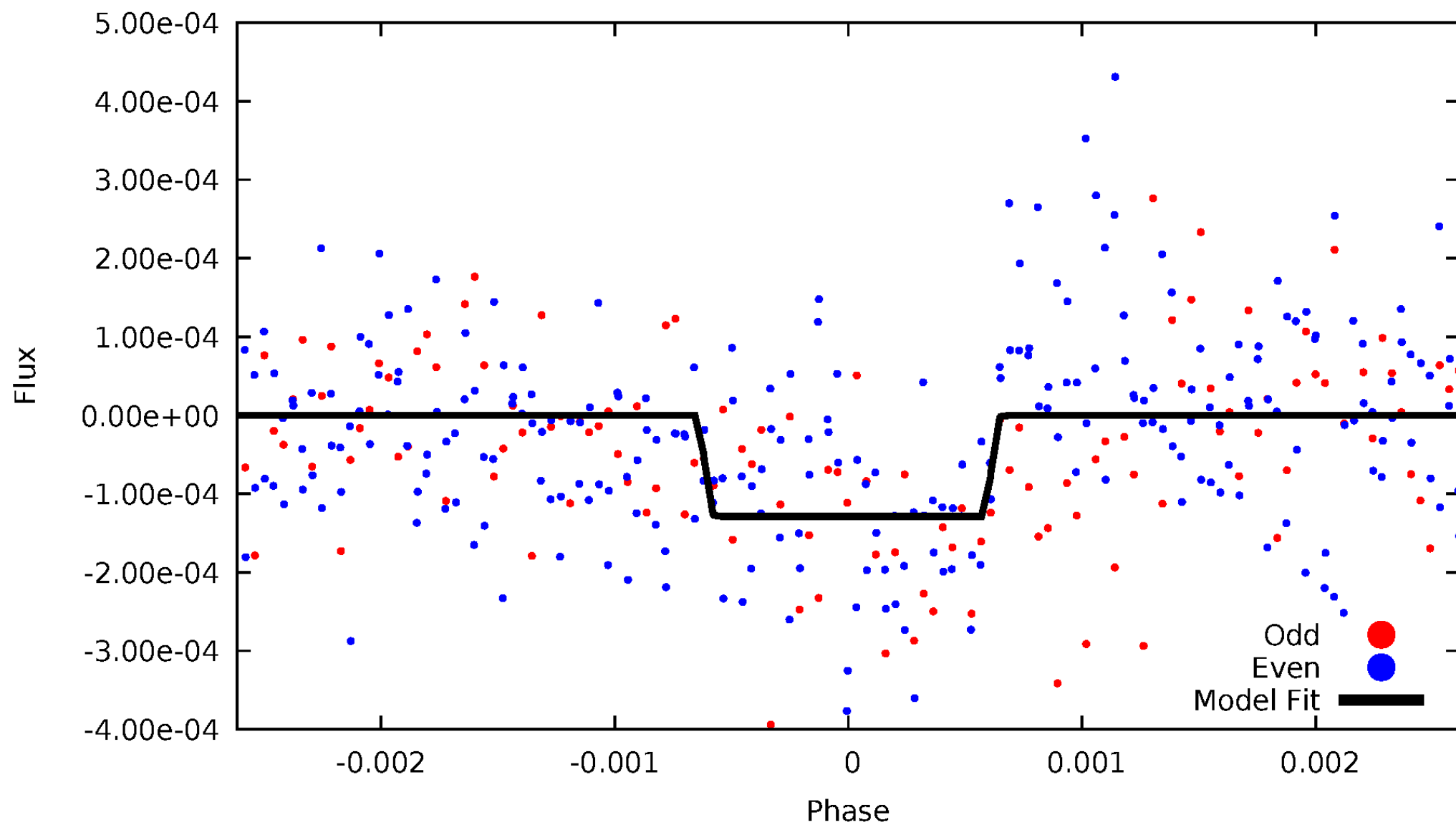
# DV Odd/Even

TCE 009519499-01

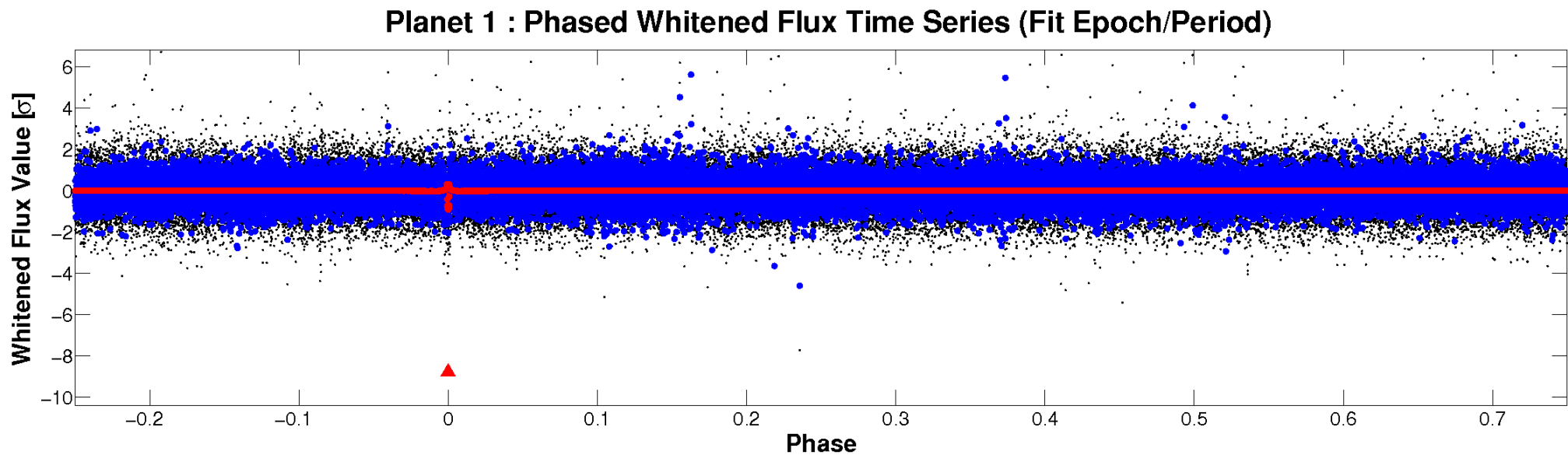
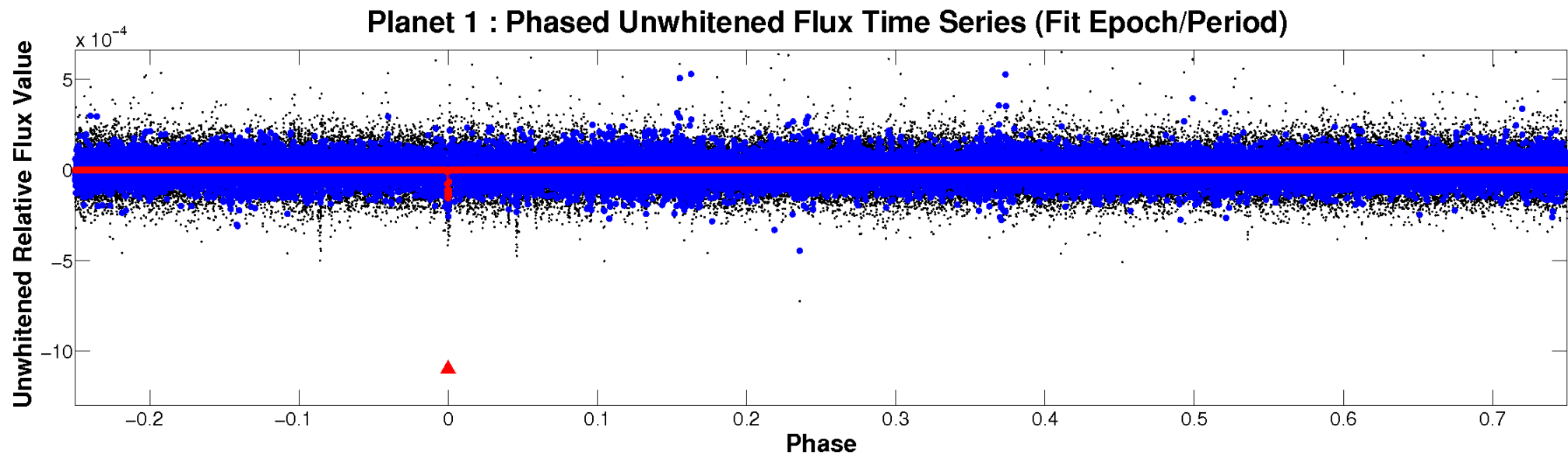


# ALT Odd/Even

TCE 009519499-01



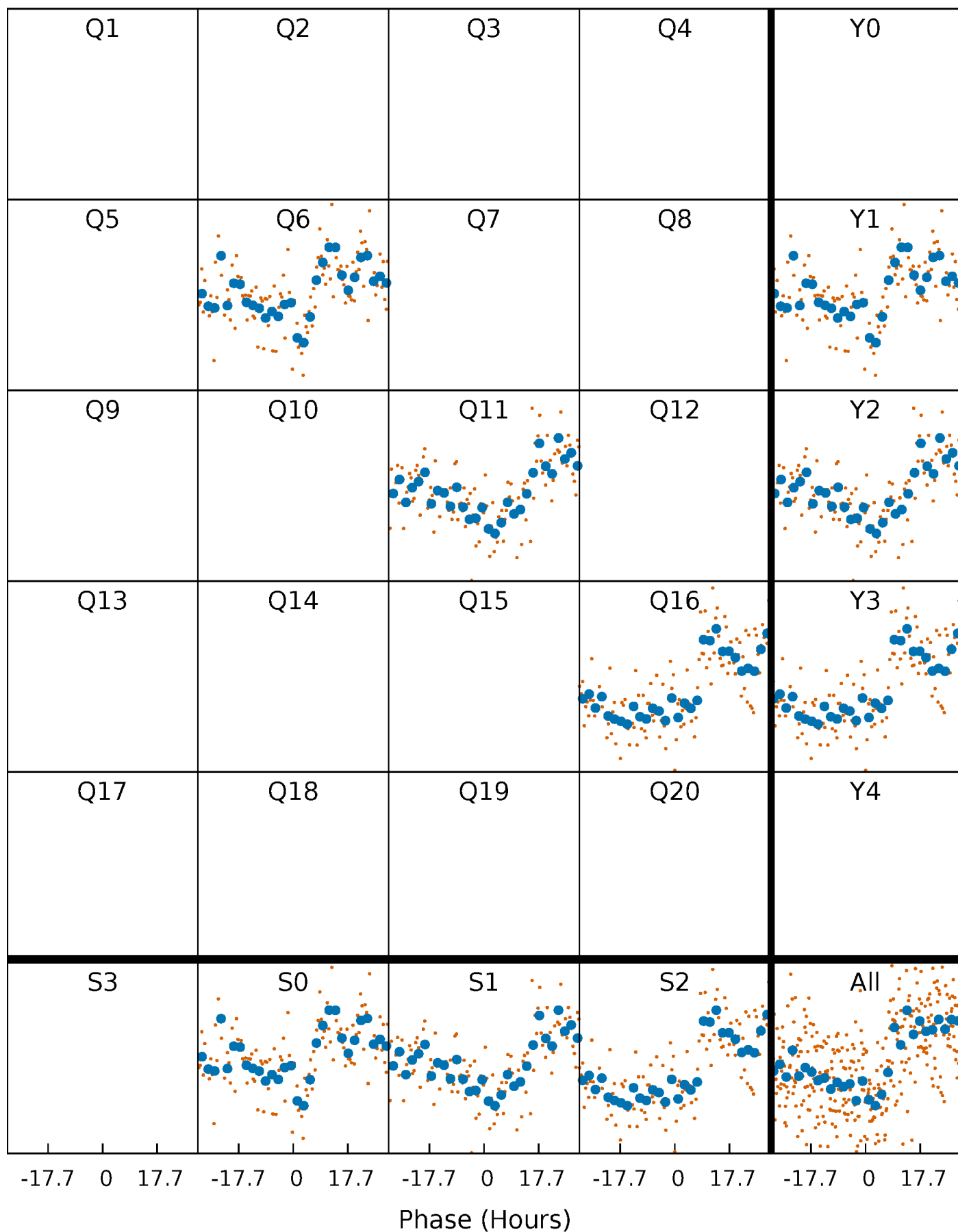
# Non-Whitened Vs. Whitened Light Curve





# PDC Quarter-Phased Transit Curves

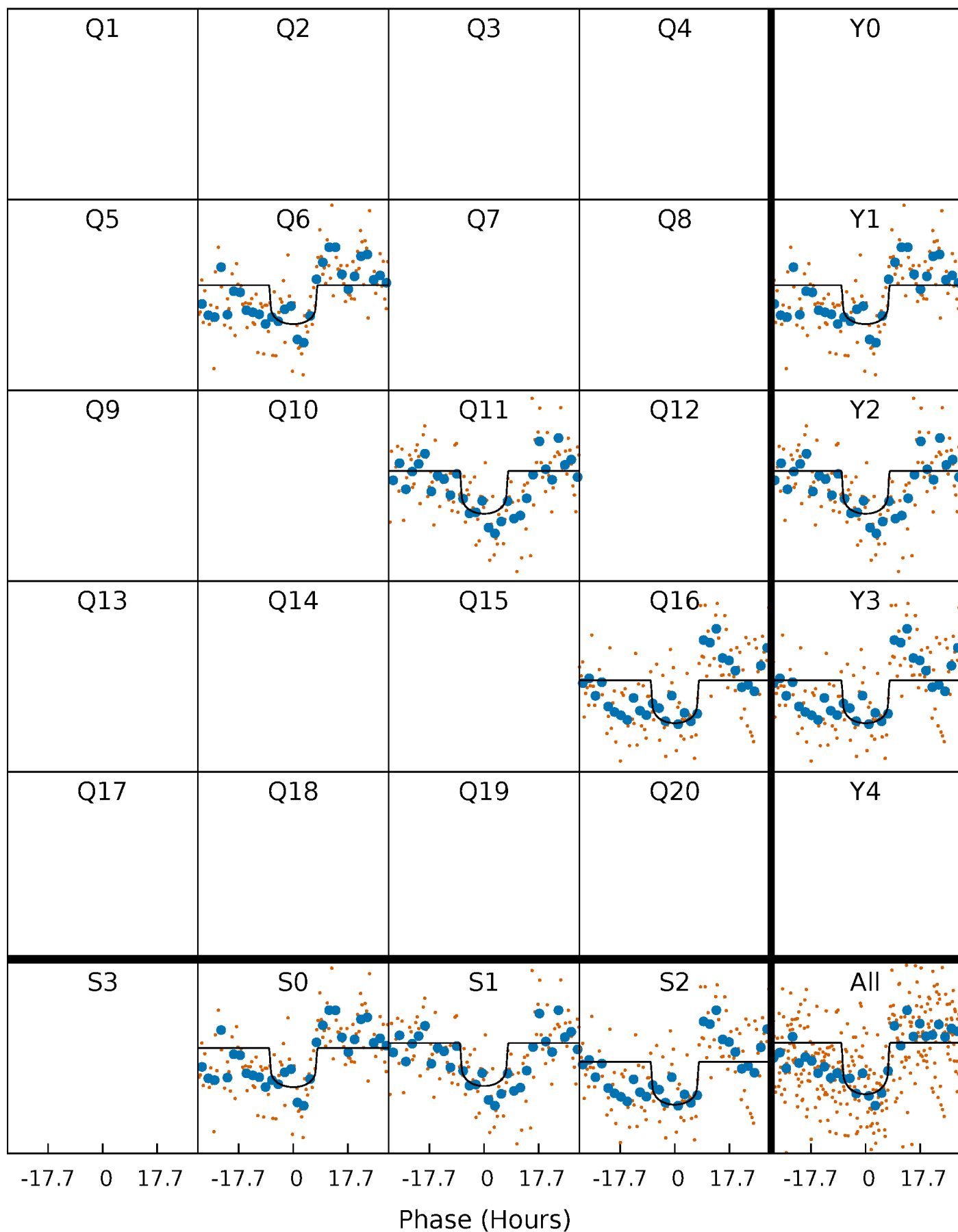
TCE 009519499-01     $P=499.532937$  Days     $T_0=545.549504$  (BKJD)





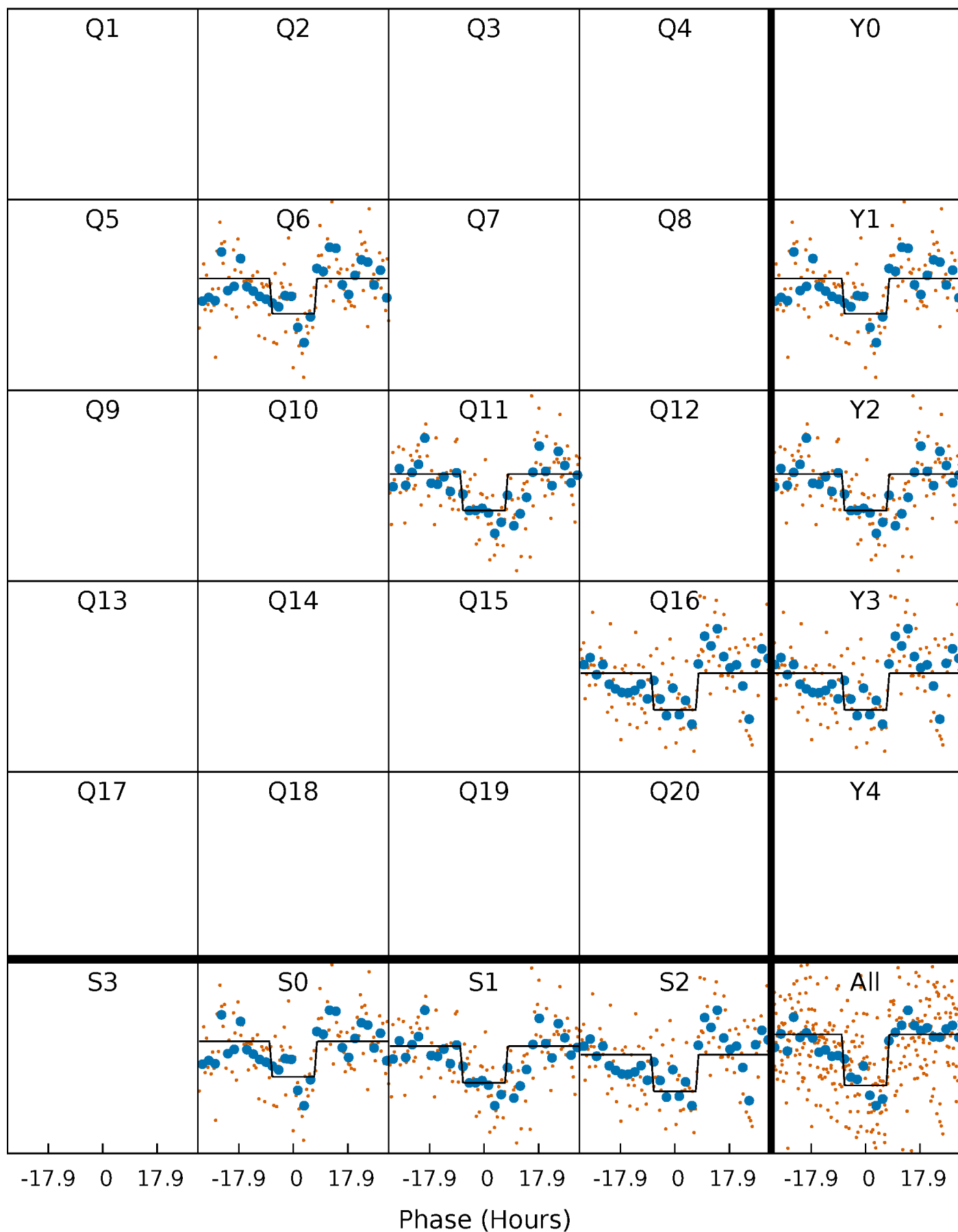
# DV Quarter-Phased Transit Curves

TCE 009519499-01 P=499.532937 Days  $T_0=545.549504$  (BKJD)



# Alt. Detrend Quarter-Phased Transit Curves

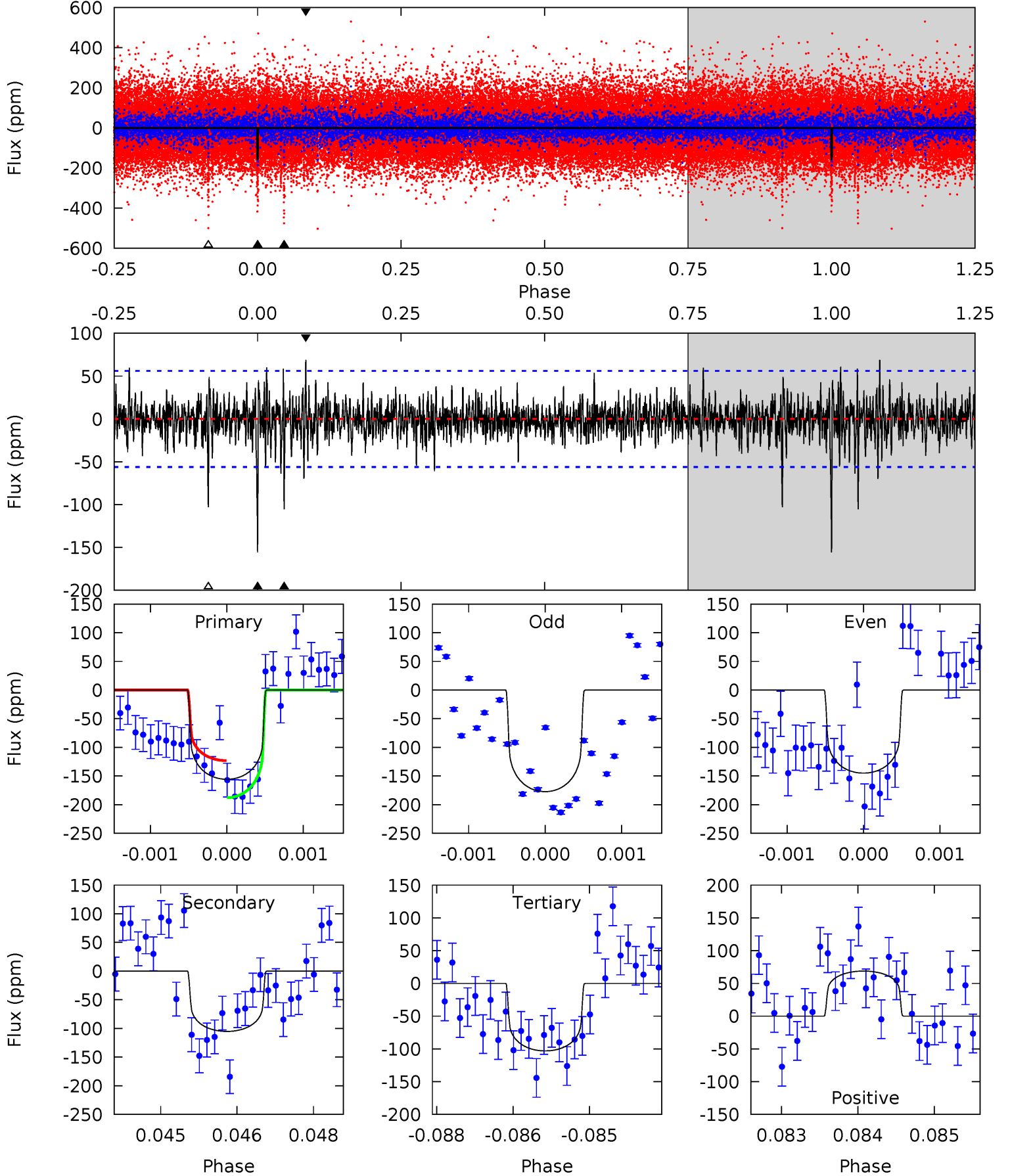
TCE 009519499-01 P=499.539241 Days  $T_0=545.540691$  (BKJD)



# DV Model-Shift Uniqueness Test

009519499-01, P = 499.532937 Days, E = 46.016567 Days

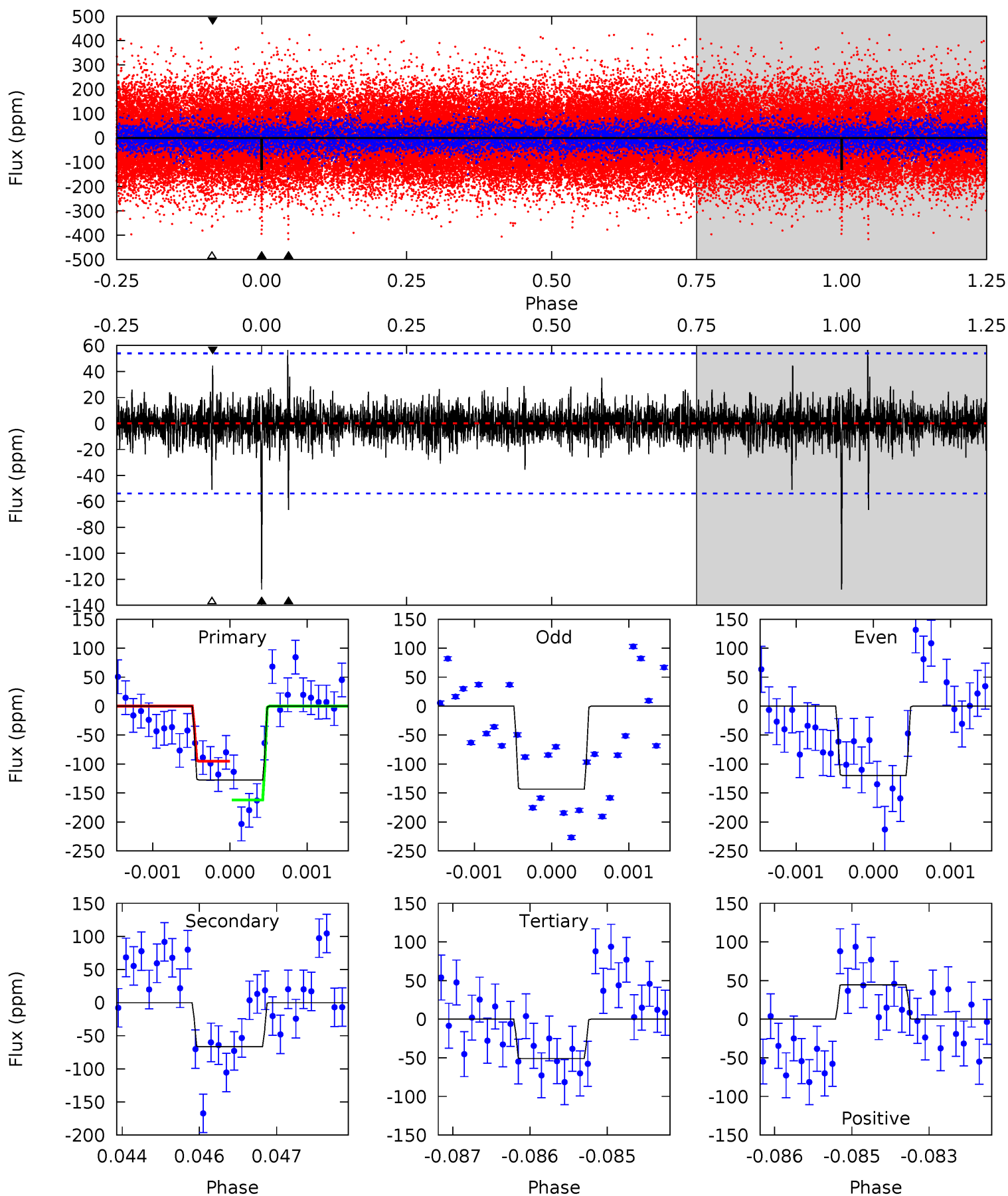
| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 15.0 | 10.1 | 9.94 | 6.63 | 5.41            | 3.22            | 1.53             | 5.08    | 8.39    | 0.21    | 3.52    | 1.48    | 1.02 | 0.31  | 3.11 |



# Alt Model-Shift Uniqueness Test

009519499-01, P = 499.539241 Days, E = 46.001450 Days

| Pri  | Sec  | Ter  | Pos  | FA <sub>1</sub> | FA <sub>2</sub> | F <sub>Red</sub> | Pri-Ter | Pri-Pos | Sec-Ter | Sec-Pos | Odd-Evn | DMM  | Shape | TAT  |
|------|------|------|------|-----------------|-----------------|------------------|---------|---------|---------|---------|---------|------|-------|------|
| 12.8 | 6.66 | 5.09 | 4.46 | 5.40            | 3.21            | 0.88             | 7.68    | 8.32    | 1.57    | 2.20    | 1.11    | 1.02 | 0.31  | 3.35 |



### Stellar Parameters For KIC 009519499

|        | $T_{\text{eff}}(K)$  | $\log(g)$                 | [Fe/H]                     | $R$ ( $R_{\odot}$ )       | $M$ ( $M_{\odot}$ )       | $p_{\star}$ ( $\text{g}\cdot\text{cm}^{-3}$ ) |
|--------|----------------------|---------------------------|----------------------------|---------------------------|---------------------------|---|
|        | $6091^{+165}_{-184}$ | $4.215^{+0.186}_{-0.140}$ | $-0.140^{+0.300}_{-0.300}$ | $1.318^{+0.284}_{-0.284}$ | $1.041^{+0.153}_{-0.125}$ | $0.640^{+0.580}_{-0.262}$                     |
|        | +3%/-3%              | +4%/-3%                   | +214%/-214%                | +22%/-22%                 | +15%/-12%                 | +91%/-41%                                     |
| Source | PHO1                 | FLK73                     | 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 009519499-01 / KOI

| Detrend | Depth (ppm)   | $R_p$ ( $R_{\oplus}$ ) | $T_{\text{max}}$ (K) | $T_{\text{obs}}$ (K)  | $A_{\text{obs}}$          |
|---------|---------------|------------------------|----------------------|-----------------------|---------------------------|
| DV      | $-105 \pm 10$ | $1.76^{+0.63}_{-0.64}$ | $383^{+25}_{-24}$    | $5569^{+1323}_{-695}$ | $29870^{+43677}_{-14246}$ |
| Alt.    | $-67 \pm 10$  | $1.62^{+0.67}_{-0.61}$ | $384^{+25}_{-24}$    | $5224^{+1366}_{-704}$ | $22257^{+36644}_{-11077}$ |

$T_{\text{max}}$  = Theoretical Maximum Planetary Temperature

$T_{\text{obs}}$  = Observed Planetary Temperature (Assuming  $A=0.3$ )

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

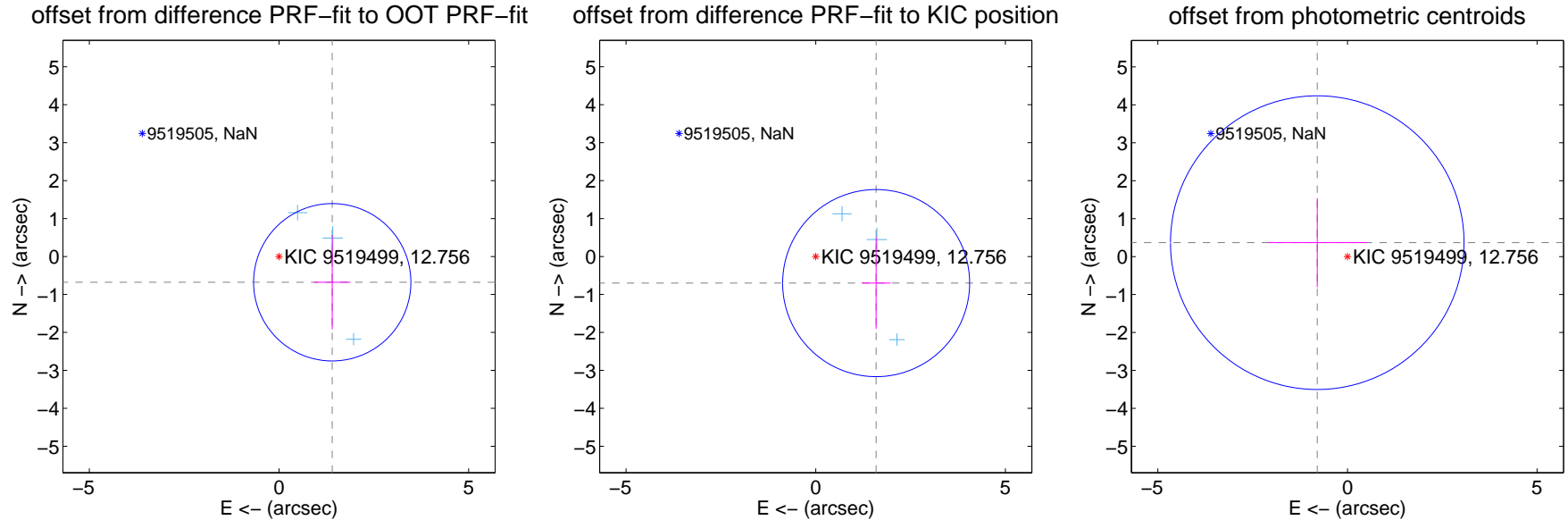
## DV Centroid Data

Supplemental centroid analysis for 009519499-01. Kepler magnitude: 12.76. Transit SNR 8.20

There are 3 quarters with good PRF difference image offsets

The direct PRF centroid is offset from the target star catalog position by about 0.21 arcsec

|   | Distance in arcsec | Distance / $\sigma$ | $\Delta$ RA        | $\Delta$ Dec       |
|---|--------------------|---------------------|--------------------|--------------------|
| PRF-fit source offset from OOT          | $1.559 \pm 0.691$  | 2.26                | $-1.404 \pm 0.479$ | $-0.679 \pm 1.241$ |
| PRF-fit source offset from KIC position | $1.740 \pm 0.822$  | 2.12                | $-1.593 \pm 0.384$ | $-0.700 \pm 1.208$ |
| photometric centroid source offset      | $0.88 \pm 1.29$    | 0.68                | $0.80 \pm 1.31$    | $0.37 \pm 1.18$    |



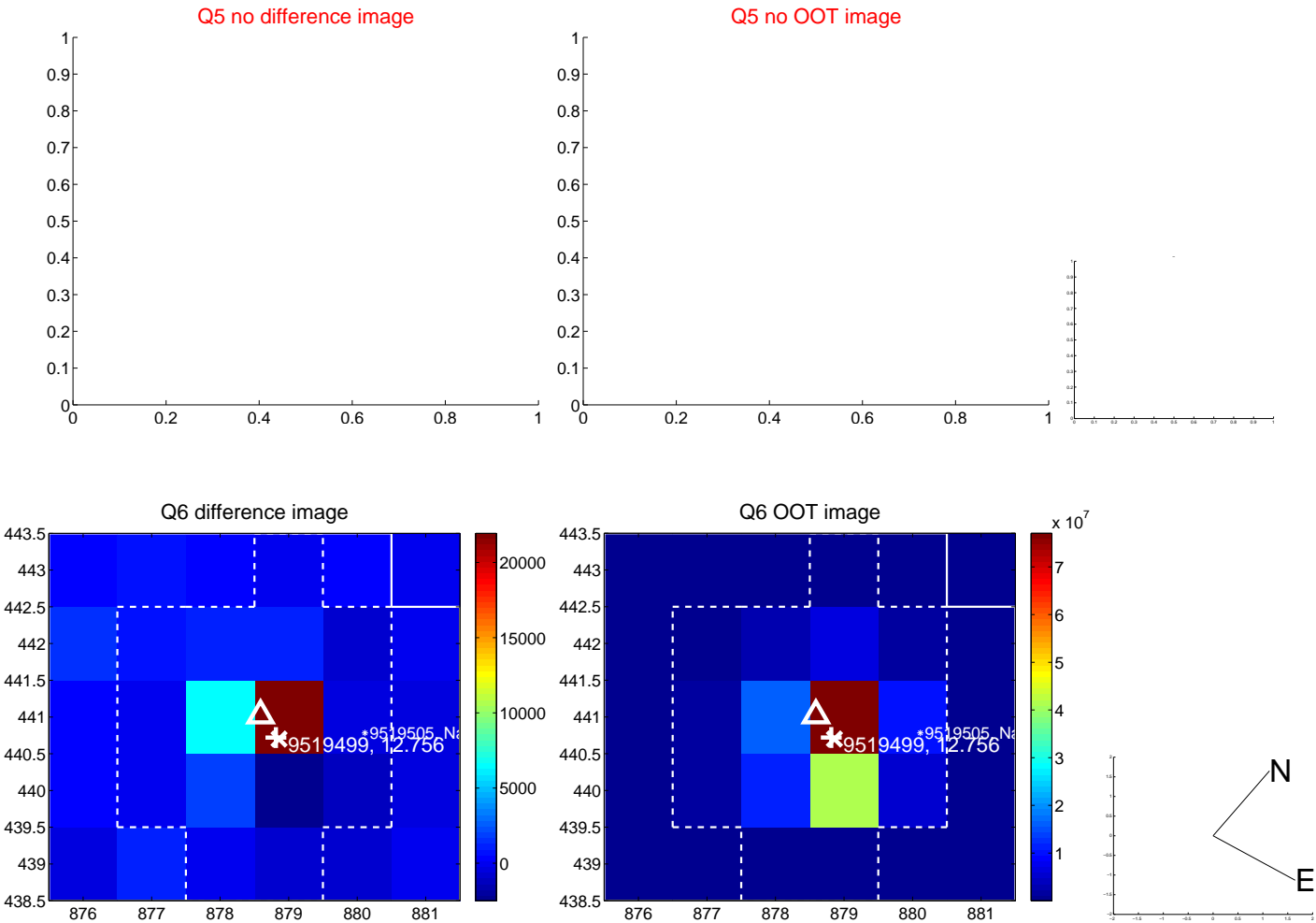
Centroid source offsets from the target star reconstructed from PRF and photometric centroids. Sky blue crosses: good quarterly centroid offsets; Vermillion crosses: bad quarterly centroid offsets; magenta cross: average over quarters. Length of the crosses: one- $\sigma$  uncertainty. Blue circle: three-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

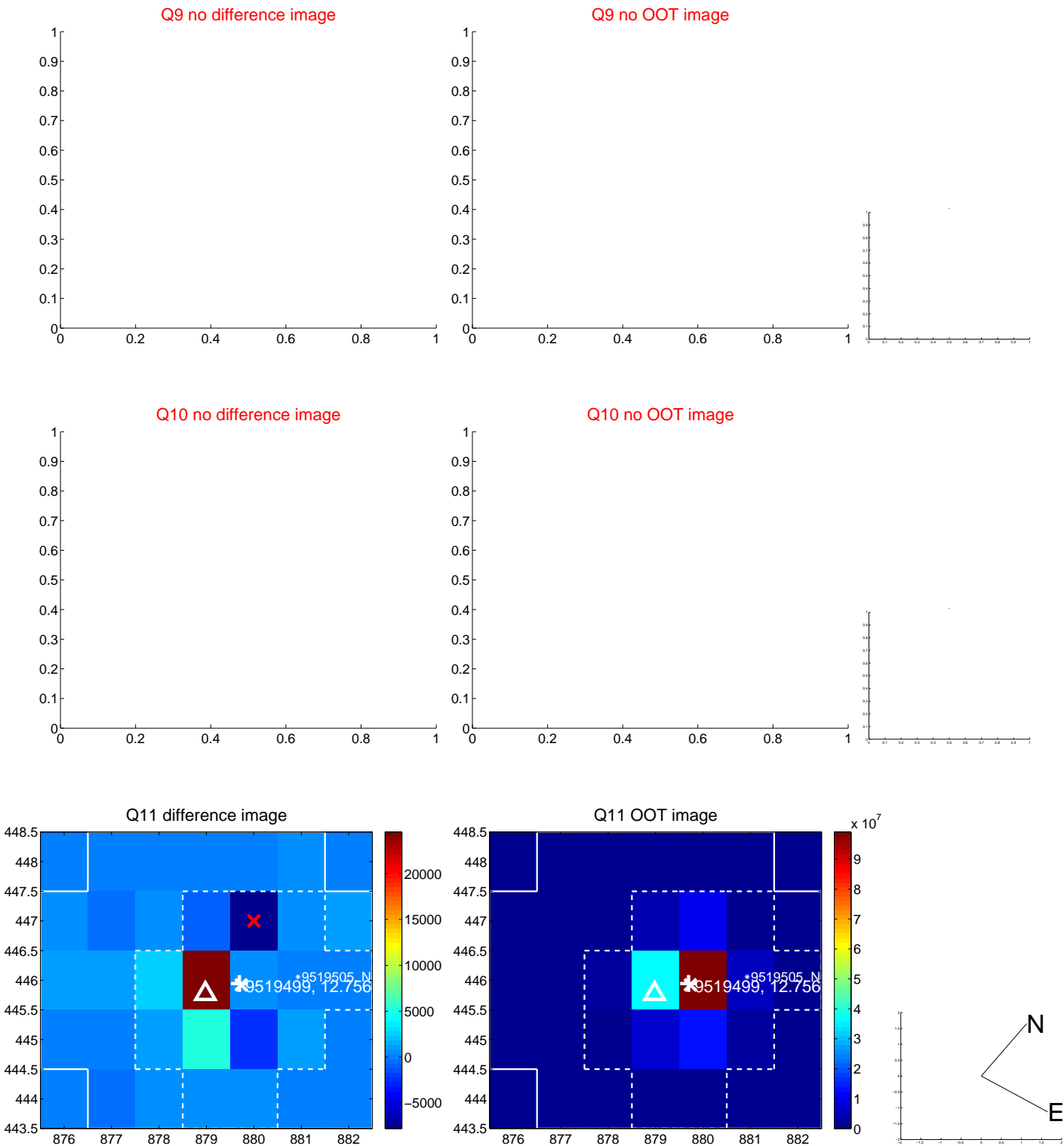




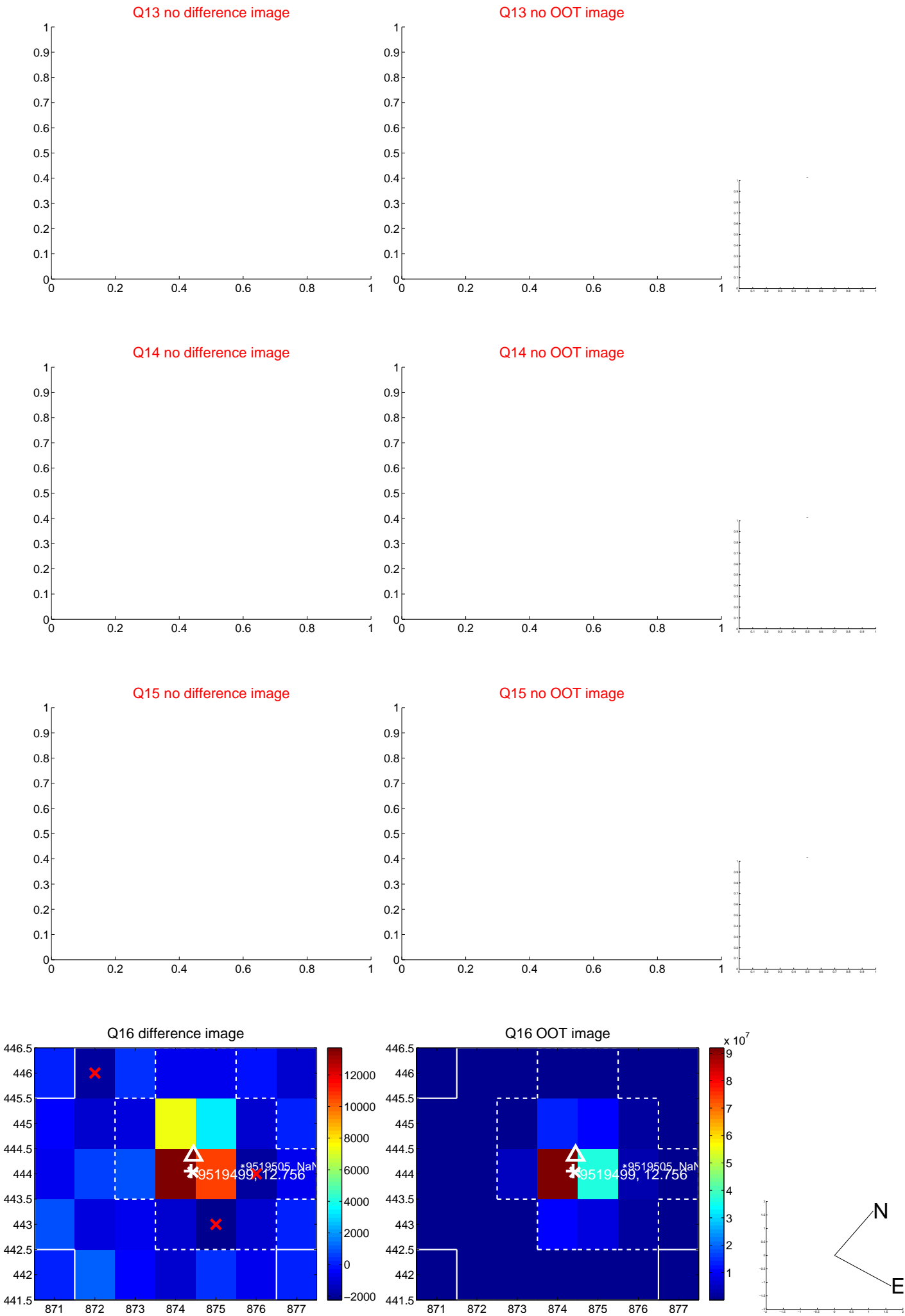
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



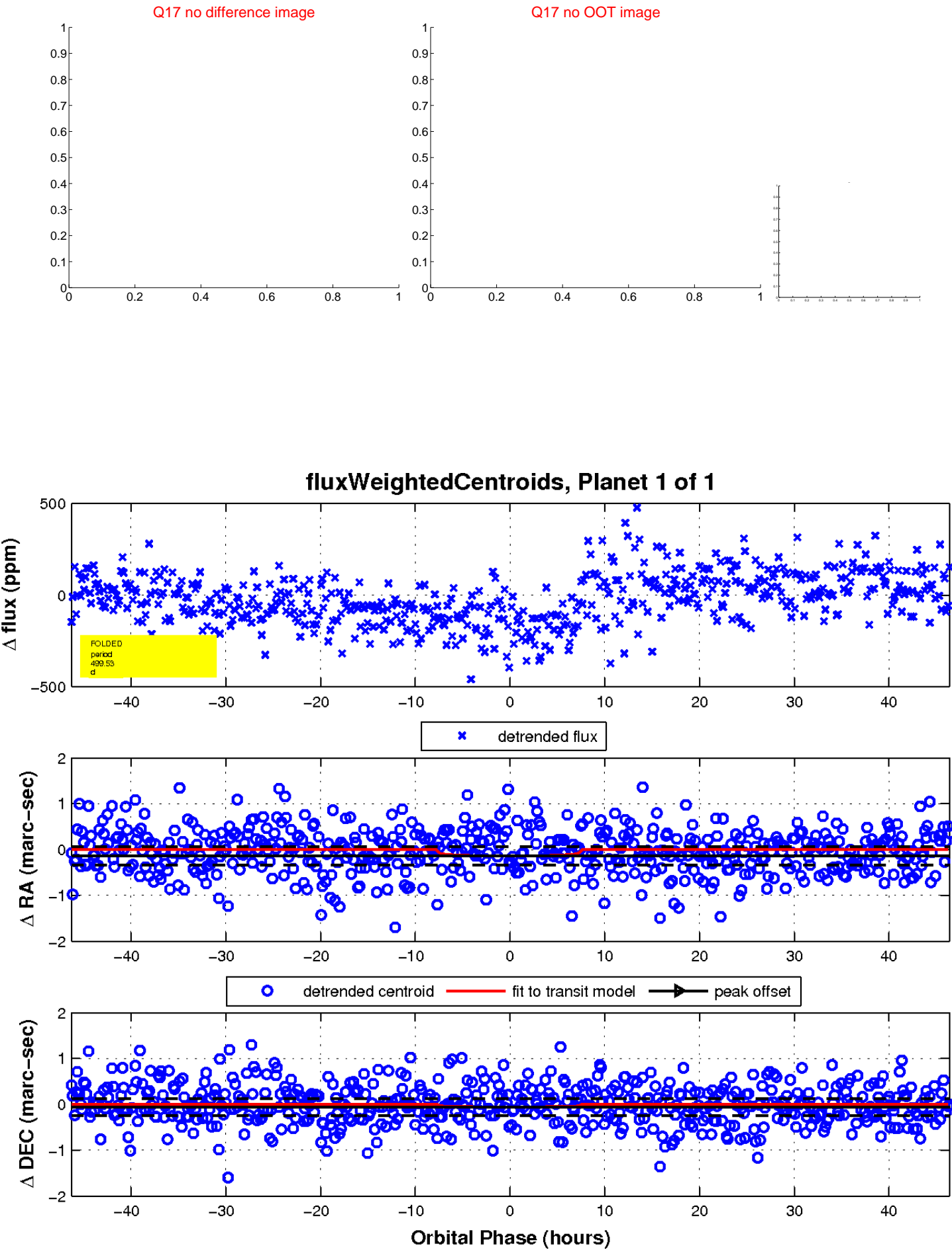
white  $\times$ : KIC target position;  $+$ : OOT centroid;  $\triangle$ : difference centroid. red  $\times$ : large negative pixel value.



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



UKIRT Image

Declination

