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ERRATUM: "EFFICIENT FITTING OF MULTI-PLANET KEPLERIAN MODELS TO RADIAL VELOCITY AND ASTROMETRY DATA" (2009, ApJS, 182, 205)

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We correct a mathematical and descriptive error in our manuscript. When radial velocity measurements of stars are made to infer planets' orbits, it is the argument of periastron (ω) of the *star* that is reported, since that is the observed quantity. Our derivation incorrectly describes ω in this case as that of the planet. The conclusions and methodology described are correct, as is the output of the `RVLIN` package described in the published paper. Three equations (which might be used in a practical implementation of the algorithm) should be changed.

When radial velocity measurements of stars are made to infer planets' orbits, it is the argument of periastron of the *star* (ω) that is usually reported in the literature, since that is the observed quantity. Because the motion of a star due to a single orbiting planet is a point reflection of the planet's motion, the parameters P, e, t_p, i, and Ω and the anomalies f, E, and M are identical for the star and planet in the one-planet case.

In Table 1 we define ω (and, by extension, ω_j) to be the argument of periastron of the orbit of the planet about the center of mass of the system. The paper is most easily corrected by reinterpreting all instances of ω_j as referring to the portion of the star's motion due to the influence of the jth planet (which, in the non-interacting approximation of the paper, is purely Keplerian motion, i.e., an ellipse.)

Only Equations (69), (72), and (73) need to be modified with this understanding; all other relations and algorithmic descriptions become correct.

These are the instances in the paper that should be ignored or modified for clarity, consistency, and correctness:

1. Table 1 should specify that all instances of ω refer to the motion of the star.
2. The first appearance of ω at the beginning of Section 2.1 should specify that this refers to the orbit of the star.
3. The description of orbital parameters in the last paragraph of p. 206 state that they are "the usual Keplerian parameters for the planet j," when in fact they are for the portion of the star's reflex motion due to planet j.
4. Footnote 10 and its referring text imply that ω_* differs from ω and ω_j elsewhere in the text, which is incorrect.
5. The sentence after footnote 10 could be clarified to read "...the astrometric elements of the components of the star's motion about the center of mass of the system due to the planet"
6. Equation (47) is no longer correct and should be ignored; footnote 10 clarifies this point.
7. At the top of the second column on p. 210, there is no need to distinguish ω_* from ω.
8. Equations (69), (72), and (73) should read

$$\tan \omega_j = \frac{C_j}{H_j} \tag{69}$$

where ω_j is chosen so $\sin \omega_j$ has the same sign as C_j.

$$h_j = \lambda_j H_j \tag{72}$$

$$c_j = -\lambda_j C_j \tag{73}$$

In addition, the description of the difficulties of using Lagrange multipliers on p. 211 is ill posed, and should be ignored.

Because the public code `RVLIN` employs only the radial velocity component of the star's motion, it is unaffected by these changes and produces correct output, provided one interprets that output as referring to the star's motion, not the planet's. Any implementation of the full astrometric plus RV algorithm must employ the proper version of Equations (69), (72), and (73).

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