

Binary stars in loose associations

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Abstract

Precise determinations of dynamical masses of pre-main-sequence (PMS) stars are necessary to calibrate PMS stellar evolutionary models, whose predictions are in disagreement with measurements for masses below $1.2 M_{\odot}$. Binary stars in young, nearby loose associations (moving groups) are particularly good candidates, primarily because all members share a common age. Belonging to the AB Doradus moving group, we have observed the binary AB Dor Ba/Bb, $0.06''$ separation, with the Australian Long Baseline Array at 8.4 GHz. We have detected the two components Ba/Bb, which facilitates (i) a measurement of the relative orbital motion through subsequent radio maps, and (ii) an estimate of the orbital parameters, once combined the radio information with infrared relative astrometry. Our preliminary analysis shows that best-fit orbit corresponds to that with a period of 1.1 yr and semi major axis of $0.068''$. The sum of the masses AB Dor Ba/Bb is $0.3 \pm 0.1 M_{\odot}$. The study of this binary, along with other stars of the same association, will constitute a benchmark for testing PMS models of low-mass stars.

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