

ROTATIONAL CORRELATION OF STARS IN BINARY SYSTEMS

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Our solar system exhibits an important feature relating to our subject: all planets (excluding Uranus) as well as the sun have all rotational axes which are roughly parallel and all approximately perpendicular to the ecliptic plane, in which the planets move around the sun. So we can ask whether the same is true for multiple stellar systems. We confine ourselves to binary systems, which as known, are the most common star systems in the universe.

Essentially, we wish to examine whether the spin axes of the stars in binaries are parallel. Unfortunately, this cannot be examined directly since the stars are seen as point sources (distance ...!). However, we apply statistical tests. We used a sample containing 1010 binary systems, and indeed, we find strong correlation between the projected rotational velocities between the members of such pairs. To check that our result is real and not due to chance, we formed artificial pairs of stars by matching to each star in the sample all others, except his real "companion". For figure 1(left) we find no correlation whatsoever of the same type as we find for the "real" binaries in figure 1(right). Significant interpretation of our results is that the spin axes of members in binary stars are preferably parallel as well as correlation of their rotational speeds.

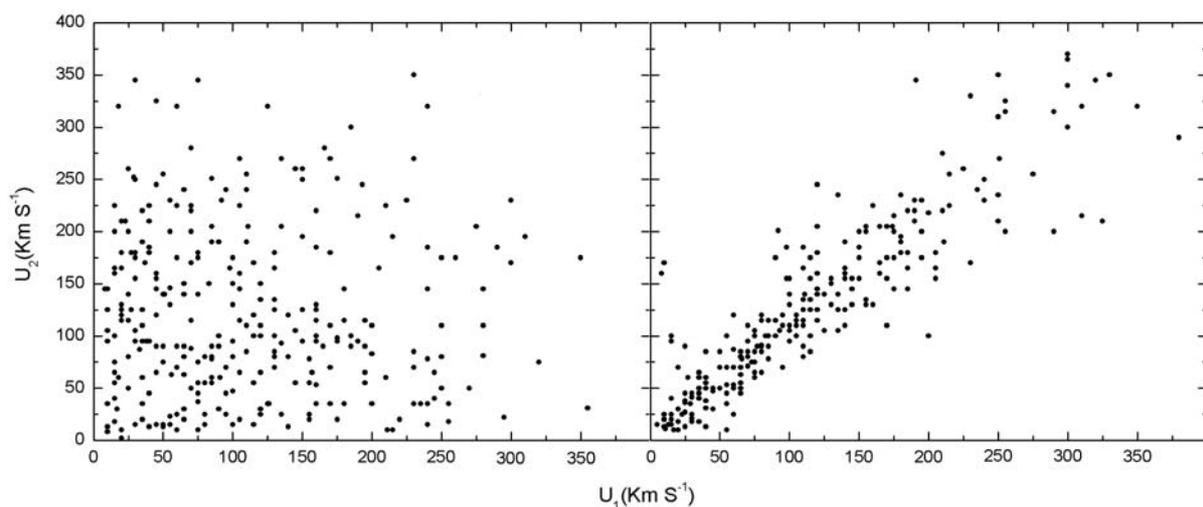


Figure 1 - Projected rotational velocities of one component as a function of the projected rotational velocity of the other member. Left – artificial binaries. Right – real binaries.