

**SEARCH FOR WOLF-RAYET AND O-STAR RUNAWAYS  
USING HIPPARCOS PROPER MOTIONS**

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**ABSTRACT**

Reliable systemic radial velocities are almost impossible to secure for Wolf-Rayet stars, difficult for O stars. Therefore, to study the motions—both systematic in the Galaxy and peculiar—of these two related types of hot, luminous stars, we have used the Hipparcos proper motions of some 70 stars of each type.

Hipparcos has provided a large, systematic data base of high precision proper motions that yield internal precisions of tangential velocities that are comparable to the current uncertainties of radial velocities of Galactic OB and WR stars at distances of several kpc. However, unlike radial velocities, the proper motions are not biased by line blending and contamination by winds, and are thus probably more robust.

This has allowed us for the first time to make a reliable systematic study of the motions of Galactic WR stars and compare them with O stars.

**We find that:**

1. both groups follow Galactic rotation in the same way;
2. both have the same fraction of ‘runaways’;
3. those with significant components of motion perpendicular to the Galactic plane tend to be leaving the plane, as a result of ejection from clusters or after the recoil from a supernova explosion in a massive close binary, near the Galactic plane, and;
4. those with significant peculiar supersonic motion relative to the ambient ISM, tend to form bow shocks in the direction of the motion.

The complete data with tables and figures and a detailed discussion of the results will be published elsewhere.

**Key words:** stars: Wolf-Rayet, O-type, runaway; Galactic rotation; ISM: bow shocks.