

ON ROLE OF TRIPLE SYSTEMS IN THE DYNAMICS OF THE GALAXY: STARS WITH HIGH VELOCITIES

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There are a number of stars with very high peculiar velocities in the Galactic halo within the region of about 1.5 kpc from the Galactic plane. At least some of these stars could be the result of an escape process in multiple stellar systems located in the Galactic disc.

We examine by computer simulations the dynamical evolution of hierarchical triple stars with different masses of components.

We choose initial conditions such that the inner binary, with masses m_1 and m_2 , would have a circular orbit, in the absence of the third star; and the outer binary, with masses m_{12} ($\equiv m_1 + m_2$) and m_3 , was also given initial conditions that would imply a circular orbit if the inner binary were replaced by its combined mass at its instantaneous centre of gravity.

We shown that the bodies escape by direct ejection from unstable triple systems, and could have peculiar velocities with respect to field stars of the Galactic disk, of between 89 and 135 *km/sec*. It is unlikely that such a mechanism can produce many high velocity stars, although there is no clear estimate of the number of close triple stars in the initial stage of galactic formation and evolution, and therefore other possible mechanisms should also be considered to heat the disc. But at least it seems realistic enough that a certain number of highly energetic stars could be the results of escaping processes in unstable triple and multiple stars.