KINEMATIC PARAMETERS OF THE GALAXY USING THE XPMc CATALOGUE DATA.

A. B. Velichko, V. S. Akhmetov, P. N. Fedorov

Institute of Astronomy of Kharkiv National University, Kharkiv, Ukraine,

astronomo@mail.ru

We present our results of kinematic investigations of our Galaxy using the XPMc catalogue data. XPMc is the corrected version of the high-density XPM catalogue covering the whole celestial sphere in the range of magnitudes from 10 to 20.

We derived kinematic parameters of the Galaxy using two different methods.

The first (traditional) method is based on estimating the parameters of the standard phisical Ogorodnikov-Milne model while the second approach is mathematical and it allows to find all significant harmonics which are presented in the stellar velocity field.

Solving the system of the Ogorodnikov-Milne equations by the least-square method we derived 11 kinematic parameters of the Galaxy but applying the mathematical decomposition in vector spherical harmonics (VHS) we found out-of-model harmonics reaffirming conclusions of other authors (e. g. Vityazev, Tsvetkov, Shuksto). One more conclusion is that not all parameters of the Ogorodnikov-Milne model are statistically significant, and the set of parameters depends on the stellar sample.

Kinematic parameters derived using both methods are consistent within the error limits but the first methot gives larger error bars. Also we found the dependence of parameters and decomposition coefficients on magnitude.

For comparison, we calculated kinematic parameters using data of several other modern catalogues. Taken results are consistent for faint magnitudes.