TYPICAL CHARACTERISTICS OF CHANCE AND NON-CHANCE COMPACT GROUPS OF GALAXIES

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In our previous works (Anosova 1987, Anosova and Kiseleva 1993) we developed a new objective statistical method for an identification of members of star and galaxy clusters as chance or non-chance ones. In the case of galaxies this method uses simultaneously their radial velocities V and angular separations ρ.

In this work, we examine the galaxy fields with various V corresponding to the observed data for the CFA galaxies: $1000 \leq V \leq 45000$ km/s.

We construct model pairs of galaxies with various values of angular separations ρ and differences of radial velocities dV. Using our new method, we find the typical values for relative quantities dV_{ch} and ρ_{ch} for confident chance pairs of galaxies .

We shown that for small V, and correspondently, small dV, for typical chance pairs the value of $< \rho_{ch} >$ is large. With increasing V and dV these values decrease quickly. For the largest V (45000 km/s) $< \rho_{ch} >= (3.0 \pm 1.2)'$. For this value of V, $< dV_{ch} >= (1289 \pm 1087)$ km/s. Therefore, we can see that if the group of galaxies is very far from the Sun, the two dimensional projection may be compact, but velocity differences dV may be more then 1000 km/s for chance members. If dV is much less than this, then this group is a physically connected one; if dV is much more than 1000 km/s then it is a confident non-chance phenomenon. It may be an effect of projection or the radial velocities of the galaxies are not indicative of their Hubble distances.

References

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