



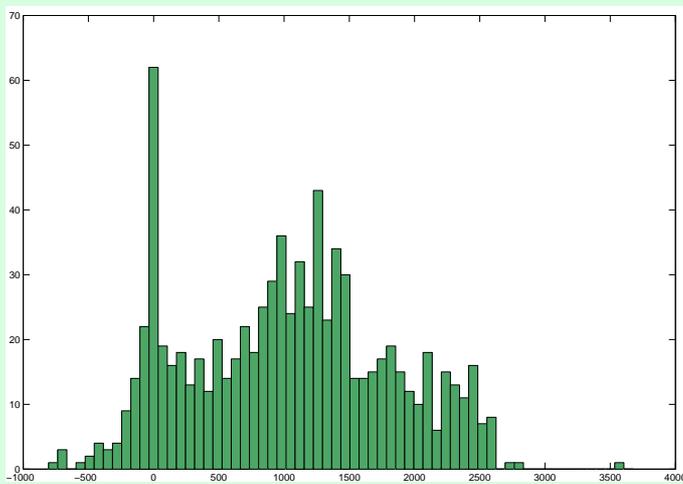
## Blueshifted galaxies in the Virgo cluster

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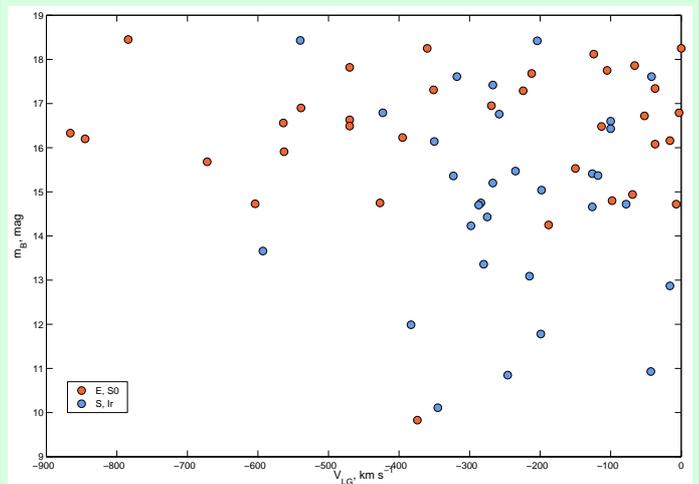
We consider a sample of 65 galaxies with negative radial velocities with respect to the Local group in the Virgo cluster. According to the Virgo Cluster Catalogue (=VCC, Binggeli et al., 1985), the population of the cluster accounts more than 2000 members, most of them are dwarf irregular (dIr), elliptical (dE) and spheroidal (dSph) systems. Assuming that Virgo distance is 17.0 Mpc (Tonry et al. 2001), dwarf galaxies ( $M_B < -16.5^m$ ) make up 80% of the sample. There is only one elliptical galaxy (NGC 4406) among 13 galaxies of normal and high luminosity.

### Some features of the blueshifted galaxy sample

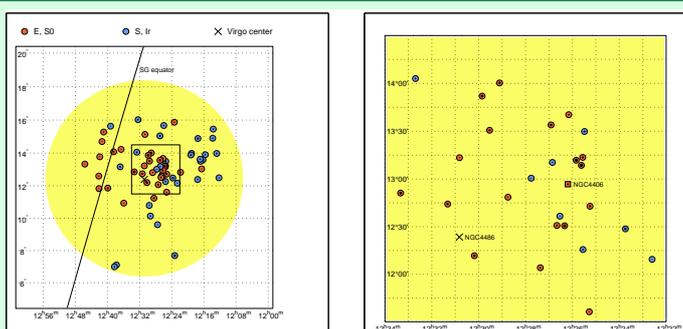
- All the blueshifted galaxies are distributed compactly within virial radius  $\Theta_{VIR} = 6.0^\circ$ .
- The centroid of the sample is displaced significantly at  $1.10^\circ \pm 0.35^\circ$  towards NW from the dynamical cluster center, M87.
- Galaxies of early and late types demonstrate an appreciable difference in their positioning relative to the centroid: E and S0 galaxies are located mainly at east side while objects with young stellar population tend to west and south sides.
- Surprisingly, dwarf galaxies of the sample (both early-type and late-type) exhibit a clumpiness on a scale of 10 arcmin (50 kpc). The median velocity difference in such pairs and triplets is about 70 km/s.



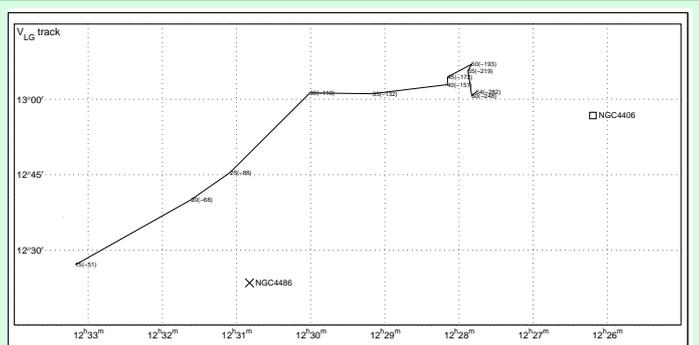
The radial velocity distribution of  $\sim 800$  galaxies in the central part of the Virgo cluster. A sharp peak near  $V_h \simeq 0$  is due to the effect of "stellar spam" produced by binary stars presented as galaxies in LEDA database.



The radial velocity  $V_{LG}$  - magnitude  $m_B$  distribution of sample objects. Early-type galaxies (E, S0, dE, dSph) are marked with red circles and late-type galaxies (S, dIr, BCD) with blue ones.



Galaxies with negative velocities in equatorial coordinates. The yellow circle is virial zone of the cluster ( $\Theta_{VIR} = 6.0^\circ$ ). The cross marks M87 as the physical center of the cluster, the inclined line represents the supergalactic equator.



The centroid drift for galaxies ranged by  $V_{LG}$  from zero to the extremal negative velocity ( $-866$  km/s). The number of averaged galaxies (and their mean radial velocity) are given near running centroid positions.

### Conclusions

The observed NW asymmetry of the blueshifted galaxies may be interpreted as evidence for merging of the M86 subcluster with the main Virgo cluster body (Binggeli et al., 1993). A new attempt is made by us to explain this phenomenon by the tangential motion of the Local group regarding to the Virgo cluster caused by its pushing from the Local void.

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