

Revisiting the local Hubble flow

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We propose new estimations of the local Hubble flow based on a galaxy sample in the vicinity of the Local Group (LG), up to 3 Mpc. The main point of this study is to stress the importance of the position and velocity of the LG barycentre which will directly impact the position and velocity of the observed galaxies. And indeed, the barycentre parameters suffer great uncertainties mainly due to the inaccuracy of the Andromeda galaxy (M31) proper motion. We developed an original method in order to express distance and line of sight velocity of a galaxy directly in the LG barycentre referential frame taking into account, in a consistent way, all the observational uncertainties. We test the method against a simple model performing a linear fit of the velocity distance relation. Once our method validated, we apply the Lemaître-Tolman model to assess, with a non-linear fit, the LG mass, its zero velocity sphere and the local Hubble flow. Several values for these parameters are given with respect to various M31 proper motions, including the last estimation derived from the second Gaia data release.