

Abstract Submitted
for the APR07 Meeting of
The American Physical Society

Flatness of the rotation curves of the galaxies; Exit the recourse to a massive halo¹ MICHEL MIZONY, UMR 5208, University of Lyon, France —

The rotation curves of galaxies remain flat to large distances, this fact raises a rather crucial question, and the only explanation is to admit the existence of a massive spherical halo around a galaxy. We show that, within a Newtonian framework, the phenomenon of flatness of the curves is very simply explained without recourse to a possible massive halo. Moreover our method gives also the Einsteinian correction which appears to be non negligible. Our direct method rests on the simulation of a spiral galaxy by a disc of N massive bodies distributed with an axial symmetry. As these bodies follow a given curve of rotation, then the balance of the radial forces between N bodies leads to a set of linear equations (the unknown are the masses of the N bodies) that one reverses and which thus provides the surface density curve. In fact it is an “inverse method of the N -bodies problem,” which give results very precise and easy to implement. Our method is a Riemannian approximation of the double integral coming from the method which uses the elliptic integrals; it is thus theoretically equivalent to it and also to the method of the Bessel transform. As this last method is invertible, our method provides a surface density whatever the given curve of rotation, and this without recourse to a massive halo.

¹Institut C. Jordan, CNRS UMR 5208, Université Lyon1

Michel Mizony
UMR 5208, University of Lyon, France

Date submitted: 05 Jan 2007

Electronic form version 1.4