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A relativistic metric extension of gravity based in the dynamics and lensing of individual, groups and clusters of galaxies

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A metric extension of gravity based on the Tully-Fisher law is presented. It will be shown that the Tully-Fisher law extends from the dynamics of globular clusters up to the dynamics of groups of galaxies and how it can be consider as a modified version of Kepler's third law. With it, it will be shown how at second perturbation order lensing can be fully understood and that the corresponding PPN gamma parameter is required to be close to one. I will show how to construct a relativistic metric extension of gravity using this observational facts and briefly mention its potential for understanding the dynamics of clusters of galaxies and of the expanding universe without the need to introduce any dark matter/energy entities for its description.

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