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Observational scalings testing modified gravity

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We consider different observational effects to test modified gravity approach involving the cosmological constant in the common description of the dark matter and the dark energy. We obtain upper limits for the cosmological constant by studying the scaling relations for 12 nearby galaxy clusters, the radiated power from gravitational waves and the Tully-Fisher relation for super spiral galaxies. Our estimations reveal that, for all these cases the upper limits for Λ are consistent with its
actual value predicted by the cosmological observations.

We involve the galactic halo observational data to test the weak field General Relativity involving the cosmological constant. Using the data for 15 hydrogen (Hi) VLA super spirals and the Tully-Fisher relation we obtain constraints for each galaxy. The results are consistent with previous results for spiral galaxies, as well as with the scaling relations for the halos, thus confirming the efficiency of the use of dark halo data and Tully-Fisher relation, including the baryonic Tully–Fisher index (BTFR), for testing modified gravity models.

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