General Relativity and Quantum Cosmology

A useful guide for gravitational wave observers to test modified gravity models

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We present an extension of a previously suggested test of all modified theories of gravity that would reproduce MOND at low accelerations. In a class of models, called "dark matter emulators", gravitational waves and other particles couple to different metrics. This leads to a detectable time lag between their detection at Earth from the same source. We calculate this time lag numerically for any event that occurs in our galaxy up to 400 kpc, and present a graph of this possible time lag. This suggests that, gravitational wave observers might have to consider the possibility of extending their analysis to non-coincident gravitational and electromagnetic signals, and the graph that we present might be a useful guideline for this effort.

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