



Highly compact neutron stars and screening mechanisms.

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Modified theories of gravity that offer reasonable models for dark energy often rely on mechanisms that screen their effects in high density environments. From this perspective, it would appear that, once solar system constraints are satisfied, these models would predict a trivial phenomenology for (the much denser) neutron stars. Here we explore the fact that in scalar-tensor theories the scalar degree of freedom couples to the trace of the energy-momentum tensor, and not to the mass density alone, to investigate whether there could be a partial unscreening of the scalar field inside the most compact stars found in Nature. For this purpose, we construct neutron star solutions with realistic equations of state in theories with screening mechanisms and study their stability under radial perturbations and others aspects of the equilibrium solutions.