

Non-minimal coupling, negative null energy, and effective field theory

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Even classical scalar fields, non-minimally coupled with the curvature, can violate energy conditions such as the null energy condition. In the context of quantum field theory, non-minimally coupled scalars can obey lower bounds, known as quantum energy inequalities, but these are always state dependent. In this talk I will discuss classical and quantum bounds on the null energy and consider possible violations. Further, I will examine the conformal transformation between Jordan and Einstein frames both classically and semiclassically. Finally, I will comment on extensions of this work and connections with self-interacting fields.

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