

Screening mechanisms in scalar-tensor theories from a particle perspective

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Scalar-tensor theories are a popular extension of gravity where an extra scalar degree of freedom non-minimally couples to the gravitational sector. Despite existing experimental tests for such modifications from general relativity, there is still no conclusive evidence for or against these theories. A possible reason for this is the presence of screening mechanisms, which can hide the scalar field's effects (such as long-range forces) in high-density environments. In this talk, I will use field theory to demonstrate that screening mechanisms can also be expressed as Beyond Standard Model physics. This perspective reveals possible phenomenological implications that don't rely on new long-range forces. In particular, I will focus on how screening mechanisms can lead to spatially dependent masses for elementary particles in the Standard Model.

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