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Infinite Derivative Field Theory: Stability, Asymptotic Safety, Trnas-Planckian Scattering, Dark Matter, Inflation & LHC

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Motivated by the stringy effects by modifying the local kinetic term of the Higgs field by the Gaussian kinetic term we show that the Higgs field does not possess any instability, the Yukawa coupling between the scalar and the fermion, the gauge coupling, and the self interaction of the Higgs yields exponentially suppressed running at high energies, showing that such class of theory never suffers from vacuum instability. We discuss the scale invariance achieved in the model beyond the scale of non-locality. We also show the dimensional transmutation in Trans-Planckian scattering. We will also discuss Dark Matter and Inflationary Aspects of the model and finally conclude with LHC bounds.

Secondary track (number)

10.

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