

Positivity bounds and dark matter direct detection bounds of Higgs interaction

Sunday, 21 December 2025 14:00 (20 minutes)

We derive a set of linear UV unitarity conditions that go beyond positivity and are easy to implement in an optimization scheme with dispersion relations in a multi-field EFT. We apply it to Higgs self scattering and compare the newly obtained upper bounds with the traditional perturbative unitarity bounds from within the EFT, and discuss some phenomenological implications of the two-sided positivity bounds in the context of experimental probes of Vector Boson Scattering. We also compute the direct detection cross section of TeV WIMPs, using current experimental limits to constrain the interaction of Higgs and WIMP dark matter.

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Session Classification: Higgs & related indirect BSM 10