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Higgs couplings at high scales

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The experiments at the LHC have been improving the measurements of the Higgs boson properties, and searches for new physics are being actively conducted. In the absence of deviations from the Standard Model thus far, it would be prudent to seek for other complementary strategies in the experiments at the energy frontier. We propose to study the Higgs couplings at high energy scales. We focus on the energy scale-dependence of the off-shell Higgs propagation and of the top quark Yukawa coupling. We present several representative scenarios relevant to addressing the naturalness problem. We find that certain scenarios are potentially observable at the LHC upgrade to high luminosity or to higher energy.

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