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Top quark mass and physics beyond the standard model from Higgs Parity

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The discovery of the Higgs boson has revealed that the Higgs quartic coupling becomes small at very high energy scales. Guided by this observation, we introduce Higgs Parity, which is a spontaneously broken symmetry exchanging the standard model Higgs with its parity partner. In addition to explaining the small Higgs quartic coupling, Higgs Parity can provide a dark matter candidate, solve the strong CP problem, and arise from an SO(10) grand unified gauge symmetry. We will show that the Higgs Parity symmetry breaking scale is determined by standard model parameters including the top quark mass and predicts experimental signals such as the dark matter direct detection rate and the proton decay rate. As a result, Higgs Parity provides a tight correlation between the precision measurement of the top quark mass at future linear colliders and these experimental signals.

Time Zone

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