particleface

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Doubly charged scalars' signal and low energy constraints

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I will discuss doubly charged Higgs bosons $H^{\pm\pm}$ pair production in lepton and hadron colliders with their subsequent decays to four charged leptons. I will focus on the Higgs Triplet Model (HTM), which realizes Type-II seesaw mechanism, and Minimal Left-Right Symmetric Model (MLRSM). Both models contain extended scalar sector with additional triplet(s), leading to the existence of neutral and (singly and doubly) charged scalar particles. I discuss contribution of those
particles to the ρ-parameter, muon g-2, lepton flavor violation (LFV) processes and their connection to neutrino oscillations data within the HTM (normal and inverse mass hierarchies). Relations between LFV process, triplet vacuum expectation value (VEV) and possible collider lepton signals are analysed. MLRSM realizes the type I see saw mechanism with additional heavy neutrinos doubly charged particles interactions are not limited by light neutrino mass scenarios or oscillation parameters. I compare doubly charged scalar particles' pair production at pp colliders within HTM and MLRSM, taking into account above connections.

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