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Higgs and Collider Phenomenology of Models with Additional Lepton Generations

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Abstract:

Models with additional fermion generations that introduce additional quarks are strongly constrained by direct searches as well as indirectly through limits on the Higgs boson. On the other hand models that only introduce new leptonic degrees of freedom are less constrained and less well studied.

In this talk we discuss the phenomenology of models with additional lepton generations. An anomaly free model is introduced, and the constraints from precision tests and direct searches are presented. We show that within the allowed parameter space, the model has interesting consequences for Higgs phenomenology at the LHC and for the stability of the electroweak vacuum, and could in particular accommodate a possible enhancement in the Higgs decay rate to photon pairs.

Author: Dr SCHWALLER, Pedro (Argonne/UIC)

Presenter: Dr SCHWALLER, Pedro (Argonne/UIC)

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