

## Two Higgs doublet models with a new U(1) gauge symmetry

*Tuesday, 17 February 2026 14:50 (20 minutes)*

In this talk, we discuss two Higgs doublet models in which a new U(1) gauge symmetry is introduced. We investigate if these models are allowed by current phenomenological data without introducing a scalar field except for two Higgs doublet ones. We find they are excluded by constraints from scalar boson decays associated with new gauge boson  $Z'$ . Then a dark vector-like fermion is introduced to modify branching ratio of  $Z'$  and we searched for allowed parameter region taking all the phenomenological constraints into account. Finally we show allowed region that can avoid all the constraints.

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**Session Classification:** parallel session B: Higgs