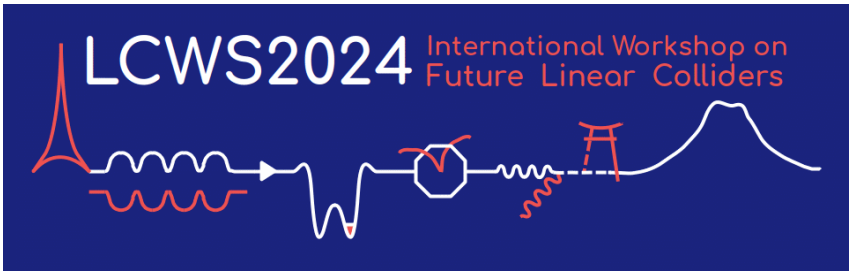

Contribution ID: **101** Type: **Oral presentation (remote)**

$4b + X$ via electroweak multi-Higgs production as smoking gun signal for the Type-I 2HDM at the LHC

Tuesday 9 July 2024 12:15 (15 minutes)

The existence of additional Higgs bosons, besides the one discovered by the LHC, already a decade ago, is predicted by most frameworks of new physics. Observation of a second Higgs boson (charged or neutral) will thus provide a firm evidence that the underlying manifestation of the Electroweak Symmetry Breaking (EWSB) mechanism is a non-minimal one. The majority of analyses, both phenomenological and experimental ones, involving additional Higgs bosons concentrate on QCD induced production modes.
However, the QCD induced processes are not necessarily to be high in new physics models owing to the non-standard couplings of the new Higgs bosons to the fermions and gauge bosons. As a reference, I consider the Type-I two Higgs doublet model (2HDM) as a simple extension of Standard Model where the Electroweak (EW) processes dominate over the QCD processes. I would like to discuss a full detector-level Monte Carlo analysis to establish that the inclusive $4b + X$ final state via EW processes can provide simultaneous reconstruction of all the additional Higgs boson masses. I will present the algorithms for the mass reconstructions of the additional Higgs bosons.

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Session Classification: Higgs, Electroweak

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