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Using soft leptons to hunt quasi-degenerate higgsinos

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Naturalness arguments imply the existence of higgsinos lighter than 200-300 GeV. However, because these higgsinos are nearly mass degenerate, they release very little visible energy in their decays, and escape detection in traditional search channels. Prospects for detecting higgsino pair production via events with monojets or mono-photons from initial state radiation are also bleak because of signal-to-background rates typically at the 1% level. Here, we consider the possibilities of improving the LHC capability to probe quasi-degenerate higgsinos by utilizing soft daughter leptons from higgsino decays.

Primary author: MUSTAFAYEV, Azar (University of Hawaii)

Co-authors: BAER, Howard (University of Oklahoma); Prof. TATA, Xerxes (University of Hawaii)

Presenter: MUSTAFAYEV, Azar (University of Hawaii)

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