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Exploring Higgs Portals to Hidden Sectors via Dark Showers

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The Higgs boson offers a unique portal to hidden sectors, enabling the study of Higgs-mediated dark showers (DS). These processes, characterized by multi-quark final states, present distinct yet elusive signatures due to their resemblance to QCD backgrounds. Using perturbative parton shower models, as detailed in recent theoretical benchmarks, we investigate DS phenomena initiated by the Higgs boson, focusing on prompt decay signatures with no invisible fraction. Advanced machine learning techniques such as representation learning are employed to identify dark showers from these complex signatures, addressing challenges for identification. This work highlights strategies for leveraging the Higgs as a tool for probing hidden sectors, expanding the LHC's sensitivity to new physics.

Are you happy to have the meeting recorded?

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Session Classification: Flash Talks