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Higgs-to-invisible Prospects with SiD

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While the Standard Model (SM) predicts a branching ratio of the Higgs boson decaying to invisible particles of O(0.001), the current measurement of the Higgs boson coupling to other SM particles allows for up to 20% of the Higgs boson width to originate from decays beyond the SM (BSM). The small SM-allowed rate of Higgs boson decays to invisible particles can be enhanced if the Higgs boson decays into new particles such as dark matter. Upper limits have been placed on BR(Hinv) by ATLAS and CMS at O(0.1), but the hadron environment limits precision. The ILC 'Higgs factory' will provide unprecedented precision of this electroweak measurement. Studies of the search for Higgs-to-invisible processes in simulation are presented with SiD, a detector concept designed for the ILC. Preliminary results for expected sensitivity are provided, as well as studies considering potential systematics limitations.

Time Zone

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