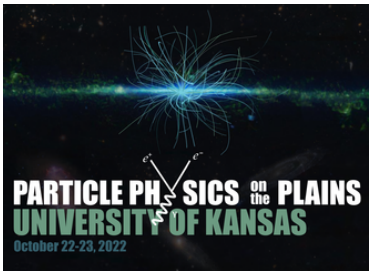

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Resonant top pair searches at the LHC: a window to electroweak phase transition

Sunday 23 October 2022 10:25 (20 minutes)

The dynamics of electroweak phase transition could have profound consequences for particle physics and cosmology. We study the prospects for the HL-LHC to probe the strong first-order electroweak phase transition (SFOEWPT) regime in the 2HDM. We focus on the Higgstrahlung channel $pp \to ZH/A$ with a resonant top-quark pair final state $H/A \to t\bar{t}$. We find that the top-quark pair final state renders the largest sensitivity to the SFOEWPT regime compared to the other Higgstrahlung searches already performed by ATLAS and CMS, that focus on the $H/A \to bb$ and $H \to WW$ final states. We also derive the complementarity of the Higgstrahlung searches with other relevant classes of searches at the HL-LHC and compare them with the gravitational wave sensitivity at LISA.

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