

# Semi-dark Higgs decays: sweeping the Higgs neutrino floor

Thursday, November 10, 2022 5:40 PM (15 minutes)

We study exotic Higgs decays  $h \rightarrow ZX$ , with  $X$  an invisible beyond the Standard Model (SM) particle, resulting in a semi-dark final state. Such exotic Higgs decays may occur in theories of axion-like-particles (ALPs), dark photons or pseudoscalar mediators between the SM and dark matter. The SM process  $h \rightarrow Z\nu\bar{\nu}$  represents an irreducible “neutrino floor” background to these new physics searches, providing also a target experimental sensitivity for them. We analyze  $h \rightarrow Z + \text{invisible}$  searches at the LHC and a future ILC, showing that these exotic Higgs decays can yield sensitivity to unexplored regions of parameter space for ALPs and dark matter models.

## Type of talk

Theory

**Primary authors:** AGUILAR-SAAVEDRA, Juan Antonio (University of Granada); CANO, Jose Manuel (IFT UAM/CSIC); CERDEÑO, David; NO, Jose Miguel (IFT-UAM/CSIC)

**Presenter:** CANO, Jose Manuel (IFT UAM/CSIC)

**Session Classification:** Thursday Session B

**Track Classification:** Physics Topics: Beyond the Standard Model