

Non-thermally produced Axino searches at the LHC

The axino, the supersymmetric partner of axion, is a well-motivated warm/hot dark/cold matter candidate, and provides a natural solution to the relic density problem for the bino-like neutralino if it is the lightest supersymmetric particle (LSP). With the Generalized Minimal Supergravity, we study such kind of the viable parameter space where the bino-like neutralino is the next-to-LSP (NLSP) and the axino is the LSP. In addition, we consider a scenario where the bino is a long-lived NLSP with the lifetime varying from 10^{-6} s to 10^{-4} s, and then propose a new signal searching scheme involving one displaced photon together with the large missing transverse momentum at the HL-LHC. The bino-like lightest neutralino lies under or around 100 GeV and is produced as a decay product of the right-handed sleptons. The relevant axion coupling f_a can be probed up to $\mathcal{O}(10^9)$ GeV at 2σ level for the right-handed slepton mass under 300 GeV and the lightest neutralino mass under 100 GeV.

Primary author(s) : ZHANG, Wenxing (SJTU)

Presenter(s) : ZHANG, Wenxing (SJTU)