

# Hunting Z/H-resonant Neutralino Dark Mater at High-Luminosity LHC

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In Supersymmetric Standard Models, bino-like or singlino-like neutralino dark matter (DM) can achieve the right thermal relic density through Z boson or Higgs boson resonant annihilations with tiny higgsino component, which makes it very hard to be detected. In this work we focus on the reach for such scenarios at High-Luminosity LHC and their interplay with DM direct detection experiments. We first find that Bino-like DM with  $m_{\tilde{\chi}_1^0} \in [41, 46]$  or  $[58, 63]$  GeV and  $m_{\tilde{\chi}_1^\pm} \in [300, 1500]$  GeV can avoid all current constraints. Then we investigate the searches of such samples at 14 TeV High-Luminosity LHC by chargino neutralino pair production in final states of  $3l + E_T^{miss}$ ,  $1l + 2b + E_T^{miss}$  and also two boost jet  $+E_T^{miss}$  to make use of the large mass spitting between higgsino and bino. Our simulations indicate that each search mode can exclude higgsino with mass smaller than 800 GeV, and the combination can further push the limit to 1 TeV. Together with expected DM-neutron scattering limit from LUX-ZEPLIN, all the Z/H-resonant DM can be explored.

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