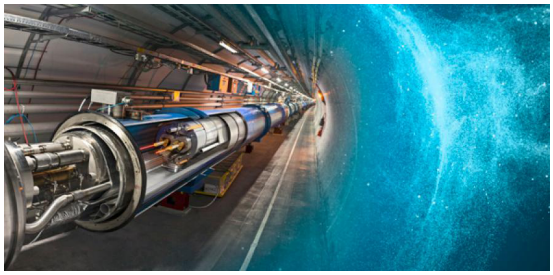

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Searches for heavy scalar resonance through hadronic jet reconstruction at electron-proton colliders

Wednesday, 23 March 2022 17:15 (15 minutes)

A search for the CP-even scalar H in a SM + real singlet scalar field ϕ_H model is presented. A proposed high energy Future Circular Hadron-Electron Collider (FCC - LheC) would provide sufficient energy in a clean environment to probe the heavy scalar H resonance, $m_H \approx 270$ GeV in deep inelastic scattering (DIS) charged current (CC) and neutral current (NC) process.
Here we investigate the decay of the heavy Higgs like scalar $H \rightarrow WW^*$ in DIS electron-proton collision with an integrated luminosity of 1.0 ab^{-1} and centre of mass energy of $\sqrt{s} = 1.3(1.8)$ TeV at FCC-LHeC.
We estimate the likelihood of detecting a resonance signal of H from its final state jets by imposing cut based and machine learning optimization methods to select candidate jet pairs and reconstruct the mass of H.

Primary author: MALWA, Elias (University of the Witwatersrand)

Co-authors: Dr RUAN, Xifeng (Wits University); Dr KUMAR, Mukesh (University of the Witwatersrand); Prof. MELLADO, Bruce (University of the Witwatersrand and iThemba LABS)

Presenter: MALWA, Elias (University of the Witwatersrand)

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