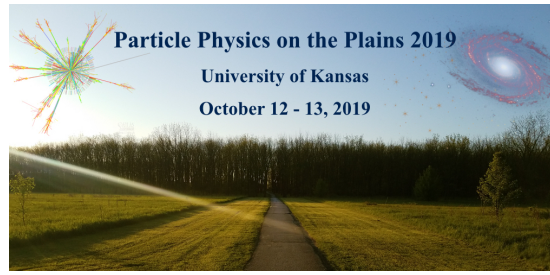


Particle Physics on the Plains 2019



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Probing a Light Leptonic Scalar at the LHC

Sunday 13 October 2019 09:40 (20 minutes)

If a light neutral beyond standard model scalar ϕ couples exclusively to the active neutrinos, then the dominant production channel of such a light neutral scalar at the LHC is through the fusion of two same-sign W bosons. As ϕ decays only into neutrinos, the production of ϕ at LHC induces the signal of same-sign dilepton plus two forward jets plus missing transverse energy. The proposed final state allows us to probe a large range of m_ϕ up to ~ 200 GeV where there is currently no direct LHC limit. The ϕ couplings $\lambda_{e\nu}, e\mu, \mu\mu$ to neutrinos can be probed respectively up to 0.75, 0.71 and 0.71 at the high-luminosity LHC, and the direct measurements of the ϕ couplings at the high-energy colliders are largely complementary to the low-energy limits.

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