



PHYSICS AND ASTRONOMY SEMINAR

Dr. Nirmal Raj

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“Drell-Yan Beyond Breit-Wigner: New Signals of Dark Matter and Leptoquarks”

Abstract

At the LHC, Drell-Yan dilepton production could usher in new physics that interacts with quarks and leptons. While this could be the much-anticipated Z' appearing as a peak in lepton energies, a non-resonant entity may show up as a collective signal in spectra of both energies and scattering angles. I will show that at the LHC Run-2, (1) dark matter and mediators, while hiding from missing energy-based searches, can show up in Drell-Yan events via radiative corrections, threshold effects and interferences; the resulting spectra can reveal dark matter's mass, self-conjugation property, spin, and chirality of interactions, (2) constraints on leptoquarks from Drell-Yan spectra often surpass the sensitivity of direct searches, and are set to overtake limits from low-energy precision measurements of atomic parity violation.

Tuesday, December 12, 2017

2:00 p.m.

Human & Social Development Building
Room A270