

Probing Universal Extra Dimensions through KK leptons at the ILC

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In the context of an universal extra-dimensional scenario, we consider production of the first Kaluza-Klein electron positron pair in an e^+e^- collider as a case-study for the future International Linear Collider. The Kaluza-Klein electron decays into a nearly degenerate Kaluza-Klein photon and a standard electron, the former carrying away missing energy. The Kaluza-Klein electron and photon states are heavy with their masses around the inverse radius of compactification, and their splitting is controlled by radiative corrections originating from bulk and brane-localised interactions. We look for the signal event $e^+e^- + \text{large missing energy}$ for $\sqrt{s} = 1$ TeV and observe that with a few hundred fb^{-1} luminosity the signal will be readily detectable over the standard model background. We comment on how this signal may be distinguished from similar events from other new physics.

Primary author: Dr BHATTACHARYYA, Gautam (SINP, India)

Presenter: Dr BHATTACHARYYA, Gautam (SINP, India)

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