

# Associated Graviton production in Bhabha Scattering at Linear Colliders

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We have studied the process  $e^+e^- \rightarrow e^+e^- + \cancel{E}$  at a high-energy linear collider, where the missing energy arises from the radiation of Kaluza-Klein gravitons in a model with large extra dimensions. It is shown that this process can not only confirm the signature of such theories but also sometimes be comparable in effectiveness to the commonly discussed channel  $e^+e^- \rightarrow \gamma + \cancel{E}$ , especially for a large number of extra dimensions and with polarized beams. We have Studied both the cases with center-of-mass energy  $500 \text{ GeV}$  and  $1 \text{ TeV}$ . It is observed that certain characteristics of the signal allow a differentiation with similar signals arising from Supersymmetry. More generally, one can distinguish signals of a graviton tower from any other types of new physics signals by combining data on our suggested channel with those on the photon-graviton channel. This will, in turn, help us to identify both of the unknown parameters (String scale and the number of extra dimensions) in this kind of a theory.

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