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Characterising Different Beyond the Standard Model Signatures at Present and Future Colliders

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Several theories Beyond the Standard Model (BSM) have been proposed so far to address the shortcomings of the Standard Model. Such theories predict various resonances with different spins. In a $2 \longrightarrow 2$ pair-production, spins of the scattered states determine the nature of differential angular distribution of the scattered pair in the rest frame of interaction. However, the Large Hadron
Collider (LHC) being a hadronic machine, the rest frame of the interacting partons is unknown, and hence, the angular distributions of the scattered states at the rest frame needs to be evaluated from the final states. We showed how longitudinal boost can be estimated from the final states, which then can be instrumental in identifying the spins of such BSM particles at LHC[1]. In similar context we also explored the electron-photon[2] and electron-hadron[3] colliders in probing Leptoquarks by means of zeros in the cross-section in their angular distributions. We showed that these two colliders are complementary to each other in probing all the leptoquark models and identifying their gauge representation. Finally we show how displaced Higgs vertex could be a probe for Type-III Seesaw Model[4].

References
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Summary

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