

B+L violation at colliders and new physics

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Chiral electroweak anomalies predict fermion interactions that violate baryon (B) and lepton number (L), and can be dressed with large numbers of Higgs and gauge bosons. The estimation of the total B+L violating rate from an initial two-particle state –potentially observable at colliders– has been the subject of an intense discussion, mainly centered on the resummation of boson emission, which is believed to contribute to the cross-section with an exponential function of the energy, yet with an exponent (the “holy-grail” function) which is not fully known in the energy range of interest. Focusing instead on the effect of fermions beyond the Standard-Model (SM) in the polynomial contributions to the rate, it is shown that the latter can be enhanced by several orders of magnitude with respect to the SM result, for high centre-of-mass energies and light enough masses. Further calculations hint at a simple dependence of the holy grail function on the heavy fermion masses. Thus, if anomalous B+L violating interactions are ever detected at high-energy colliders, they could be associated with new physics.

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