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Matching Effective Field Theories to the Large Hadron Collider

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Effective Field Theory (EFT) gives a universal language to parameterize the effects of heavy particles at low energies in an expansion in powers of E/M, where E is the experimental energy scale and M is the mass of the heavy particle. The most general corrections to the Standard Model can be fully classified, and searches for the effects of these corrections can be performed. However, constraints on the truncated EFT unavoidably depend on the prior assumptions about the size of neglected higher order terms. This is not just an "in principle" issue: conventional EFT searches at the CERN Large Hadron Collider (LHC) can give incorrect results, namely they "rule out" new physics that is actually present in the data. This talk will describe a proposal for incorporating physically meaningful prior assumptions into these searches. We show that this method is practical, avoids the problems of conventional EFT searches, and gives sensible results that can be meaningfully compared with UV models.

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