Factorization and Resummation for Color Octet Production at the LHC in Effective Theory

Ahmad Idilbi, Chul Kim, Thomas C Mehen
Physics, Duke University, Durham, USA

We discuss the production of heavy colored particles at the Large Hadron collider (LHC) through gluon-gluon fusion process. A factorization theorem is obtained for this process using soft collinear Effective Theory. Our factorization formula does not depend on any assumptions related to the physics above the heavy particle colored mass. In this sense it is universal.

Due to the large mass of the heavy particle and near the kinematic threshold for production of such particles a resummation of large logarithms must be performed. The matching coefficient at the heavy particle mass scale depends obviously on the (unknown) physics above that scale. In our work we utilize the Manohar-Wick model to perform the phenomenological study of the process considered.