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Calculating Fragmentation Functions in Heavy Ion Physics Simulations CHARLES HUGHES, ALEX AUKERMAN, THOMAS KROBATSCH, ADAM MATYJA, CHRISTINE NATTRASS, JAMES NEUHAUS, SOREN SORENSEN, WILLIAM WITT, Univ of Tennessee, Knoxville — A hot dense liquid of quarks and gluons called a Quark Gluon Plasma (QGP) is formed in high energy nuclear collisions at the Relativistic Heavy Ion Collider and the Large Hadron Collider. The high energy partons which scatter during these collisions can serve as probes for measuring QGP bulk properties. The details of how partons lose energy to the QGP medium as they traverse it can be used to constrain models of their energy loss. Specifically, measurements of fragmentation functions in the QGP medium can provide experimental constraints on theoretical parton energy loss mechanisms. However, the high background in heavy ion collisions limits the precision of these measurements. We investigate methods for measuring fragmentation functions in a simple model in order to assess their feasibility. We generate a data-driven heavy ion background based on measurements of charged hadron transverse momentum spectra, charged hadron azimuthal flow, and charged hadron rapidity spectra. We then calculate fragmentation functions in this heavy ion background and compare to calculations in proton-proton simulations. We present the current status of these studies.

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