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The Design of a Detector for the Electron Relativistic Heavy Ion Collider ANDERS KIRLEIS, Stony Brook University — The proposed construction of the Electron Relativistic Heavy Ion Collider (eRHIC) at Brookhaven National Laboratory (BNL) will begin a new experimental quest to study the gluons that bind all matter. The main goal is to design a detector for eRHIC that is able to cover a large acceptance and separate the different particle types expected to be seen. To do this, it was first necessary to perform computerized simulations using Monte Carlo event generators which allow scientists to model the interactions during a collision to reveal the inner structure of the hadrons. Software programs such as PYTHIA and ROOT were used to determine the properties of the events and the individual particles. After analysis of this data, we were able to construct a three-dimensional image of a preliminary detector design using GEANT software. In this talk, I will present preliminary designs of an eRHIC detector. This is an important step in calculating the capabilities for measuring identified particles (such as pions, kaons, electrons, charm) and their resolutions. We are working closely with the collider-accelerator department as the size of the interaction regions places constraints on the size and makeup of the detector.

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