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R&D Studies of a Lead-Scintillating Fiber Calorimeter as a STAR Forward Detector PRASHANTH SHANMUGANATHAN, Kent State Univ - Kent, STAR COLLABORATION — A forward upgrade of the STAR detector will achieve several physics goals. Examples are studying the internal structure of nucleons and nuclei through measurement of di-jets and Drell-Yan and improvements in the resolution of energy weighted event plane determination for study of more central and more peripheral events in heavy-ion collisions. The AGS E864 lead-scintillating fiber calorimeter cells ($(10\text{ cm})^2 \times 117\text{ cm}$) were repurposed by pixelizing their read-out into a three by three array of $(3.3\text{ cm})^2$ pixels. A prototype six by six array of these cells (324 pixels) was mounted on the west side of the STAR detector during Run14 and events from ${}^3\text{He}+\text{Au}$ collisions at $\sqrt{s_{NN}} = 200\text{ GeV}$ were recorded. The detector response was simulated by a GEANT model using HIJING particle production. Further tests of the pixelized cells were conducted at the Fermilab Test Beam Facility. In this talk, we will present the calorimeter response in ${}^3\text{He}+\text{Au}$ collisions using reconstructed π^0 from clusters formed from energy deposition by π^0 decay gammas. Energy resolution and shower shapes from pixelization are also discussed using test beam data and simulations.

Prashanth Shanmuganathan
Kent State Univ - Kent

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