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**Commissioning the STAR Zero Degree Calorimeter as a Local Polarimeter at** $\sqrt{s} = 500$ GeV **NATHAN KELLAMS, JASON WEBB, Valparaiso University, DAVID GROS Nick, JOSHUA KELLAMS, Ball State University, STAR COLLABORATION** — Experiments over the past thirty years have shown that only approximately 30% of the spin of the proton is due to its valence quarks. The balance must be accounted for by the spin and orbital motions of the quarks, antiquarks and gluons. The STAR experiment at the Relativistic Heavy Ion Collider (RHIC) measures spin asymmetries in both longitudinally and transversely polarized proton-proton collisions to investigate the origin of the proton’s spin. Residual transverse components of longitudinally polarized collisions are determined by measuring the polarization vector locally through a transverse single-spin asymmetry in forward hadron production. The Zero Degree Calorimeters (ZDCs) measure both the energy and the position of neutral hadrons produced at forward angles. The analyzing power, $A_N$, can be measured in transversely polarized proton-proton collisions and then used with the spin asymmetries observed in longitudinally polarized collisions to extract the polarization vector of the nominally longitudinal beam. In this presentation we will present measurements of $A_N$ and its commissioning as a local polarimeter at STAR.

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