ABSTRACT

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Title:	CHARACTERIZING THE PARITY OF RELATIVISTIC HEAVY ION COLLISION SYSTEMS VIA ANALYSIS OF THE ELECTRIC AND MAGNETIC FIELDS
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We investigate the possibility that the strong nuclear force may not be invariant under parity (spatial inversion) symmetry. Many observables have been proposed for the purpose of detecting parity odd effects during heavy ion collisions, but the complexity of such systems make it difficult to isolate parity violating effects from other factors. Properly detecting parity violations in collisions, like the ones seen at Brookhaven National Lab, require comparisons between multiple observables. This study focuses on the distribution of the p-odd quantity $\vec{B} \bullet \vec{E}$, where these are the electromagnetic fields produced during collision events. In a sample of 22,584 events, we measure the observable $\langle \vec{B} \bullet \vec{E} \rangle$ to be $6.098 * 10^{-3} \pm 4.729 * 10^{-3}$, statistically consistent with no parity violating effects in the observed events. Studying this observable in more events will allow us to characterize the parity of collision events at BNL and can be used to correlate with other quantities sensitive to parity odd effects.