

# Energy Systematics of the Coulomb Effect in Au+Au Collisions at STAR

Jinming Nian  
(for the STAR Collaboration)  
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University of California - Davis  
jnian@ucdavis.edu

## Abstract

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In Au+Au collisions at STAR, the colliding ions leave a positively charged interaction region, especially in the low energy collisions of the Beam Energy Scan II (BES-II) and Fixed-Target programs. Due to the Coulomb potential of this positive source, positively charged particles are pushed to higher momentum, while negatively charged particles are pulled toward lower momentum. This is most evident in the charged pions since they are the lightest hadrons and are produced copiously. By fitting the final ratio of pions ( $\pi^+/\pi^-$ ) as a function of  $m_T - m_0$  with a physics motivated model, we can extract the Coulomb potential,  $V_C$ , and initial pion ratio,  $R_i$ . These allow us to study the volume of the fireball and the charge chemical potential, respectively. Results from multiple STAR Fixed-Target and BES-II energies will be presented along with comparisons to AGS, SIS, and SPS experiments.