Photon Induced Nuclear Dissociation at $\sqrt{s_{nn}} = 130\mathbf{GeV}$

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Abstract

Peripheral AuAu collisions at $\sqrt{s_{nn}} = 130$GeV generate intense electromagnetic fields which may break up the colliding nuclei. The study of such events may tell us about the photon flux generated by such collisions and the strength of the nuclear force. The rate of such collisions is determined by the total electromagnetic cross section. Using the BRAHMS multiplicity detectors to veto nuclear interactions we have studied mutual electromagnetic dissociation of nuclei into neutrons. Their exists an irreducible background from very peripheral nuclear collisions which is estimated using several different event generators. We have been able to isolate single and double neutron peaks and have compared their relative weights to predictions from the RELDIS model of electromagnetic dissociation [1]. We have also compared the neutron energy spectrum from the model (folded with our resolution) to the energy spectrum seen in our zero degree calorimeters. The agreement with data is fairly good. A comparison to lower energy data will also be made and physics implications will be discussed.

[1] I. Peshanov et al, nucl-th/0007017,9912008, K, Chitkin et al, nucl-th/0002028