Abstract Submitted
for the DNP12 Meeting of
The American Physical Society

A Relativistic Multiple Scattering Theory for Nucleus-Nucleus Collisions with Delta Resonance Coupling CHARLES WERNETH, University of Tennessee, KHIN MAUNG MAUNG, University of Southern Mississippi, JOHN NORBURY, NASA Langley Research Center — Non-relativistic multiple scattering theories (NRMST) are formulated by separating the unperturbed Hamiltonian from the interaction and writing the Lippmann-Schwinger equation as an infinite series in the multiple sums of pseudo two-body operators, known as the Watson tau-operators. The advantage of using the multiple scattering theory (MST) is that the pseudo two-body operators are often well approximated by free two-body nucleon-nucleon operators, which are obtained from parameterizations of experimental data. Relativistic theories are needed to properly describe the production of new particles, such as pions, from nucleus-nucleus collisions. Relativistic multiple scattering theories (RMST) have been developed for nucleon-nucleus scattering; however, no RMST for nucleus-nucleus scattering has yet been derived.[1] The purpose of this research is to derive an RMST for nucleus-nucleus scattering and to include delta degrees of freedom in the interaction, the minimum requirement for pion production.

[1]Maung K M, Norbury J W, and Coleman T 2007 *J. Phys.* G **34** 1861.

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Date submitted: 22 Jun 2012 Electronic form version 1.4