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Electromagnetic Nucleus - Nucleus Cross Sections Using Energy Dependent Branching Ratios ANNE ADAMCZYK, University of Tennessee, JOHN NORBURY, NASA Langley Research Center — Energy dependent branching ratios, derived from Weisskopf-Ewing theory, are presented and compared to an energy independent formalism, developed by Norbury, Townsend, and Westfall. The energy dependent branching ratio formalism is more versatile since it allows for not only neutron and proton emission, but also alpha particle, deuteron, helion, and triton emission. A new theoretical method for calculating electromagnetic dissociation (EMD) nucleus - nucleus cross sections, with energy dependent branching ratios, is introduced. Comparisons of photonuclear and nucleus - nucleus cross sections, using energy dependent and independent branching ratios, to experiment are presented. Experimental efforts, by various groups, have focused on measuring cross sections for proton and neutron emission, because proton and neutron emission is generally more probable than heavier particle emission. Consequently, comparisons of energy dependent and independent branching ratios to experiment are made for photoneutron and photoproton cross sections. EMD cross sections for single neutron, proton, and alpha particle removal are calculated and compared to experimental data for a variety of projectile, target, and energy combinations. Results indicate that using energy dependent branching ratios yields better estimates.

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