Abstract Submitted
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A Student Experiment to Prove the Laws of Conservation of Energy and Momentum for Nuclear Reactions Using a 1.5 MeV Van de Graaff Accelerator[1] J'NAE ZWASCHKA, Tarleton State University, P. KEAHEY, Southwestern University, L. PHINNEY, J. DUGGAN, University of North Texas — The year 1931 saw the first artificially induced nuclear reaction in the Cavendish Laboratory. The men behind this ground breaking experiment, J.D. Cockcroft and E.T.S. Walton, used a 150 kilovolt accelerator with a screen of zinc sulfide to detect the emitted alpha particles from the ^{7}Li (p,α)α reaction. In 1951 the Nobel Prize was awarded in recognition of work that in effect started the nuclear age. The Q value for a nuclear reaction is defined as Δmc^2, where Δm is the mass converted to energy during the reaction. In order to study the kinematic equations the following reactions were performed: ^{7}Li (p,α)α, ^{6}Li (p,^{3}He)α, ^{19}F (p,α)^{16}O and ^{11}B (p,α)^{8}Be. The experiments were carried out with a 1.5 MeV proton beam from a Van de Graaff accelerator. The experimental energies for the reaction products were compared to the theoretical values obtained using the kinematic equations.

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J'Nae Zwaschka
Tarleton State University

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