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Hanna E. Makaruk* (hanna_m@lanl.gov), Applied Modern Physics Group, P-21, MS T080, Los Alamos National Laboratory, Los Alamos, NM 87-545, and **James R. Langenbrunner**. *Nuclear fusion –study of a semi-empirical equation*. Preliminary report.

Nuclear fusion of two heavy isotopes of hydrogen: deuterium and tritium is the reaction supplying energy to the Main Sequence stars, including our Sun. It is also experimentally investigated at National Ignition Facility (US) and is going to be investigated at proposed High Power Laser Energy Research (HiPER)(Europe) for a possibility of becoming an energy source on Earth. A semi-empirical equation describing the efficiency of this reaction as a function of kinetic energy of the reaction components is presented, analytically solved, and solutions behavior is investigated. This solution may potentially help in understanding the equilibrium conditions inside the stars as well as in optimizing conditions for the future controlled fusion on Earth. (Received January 15, 2016)