**Novel approach to proton-boron fusion using protons generated through laser-induced thermonuclear DD reaction**

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Majority of current research related to proton-boron approach of laser fusion employ hundreds of TW and PW-class laser systems to increase yield of alpha particles produced during $p+$ reaction [1][2]. Recently, such laser systems became much more accessible, however the importance of enabling as many research groups as possible to contribute in the laser-fusion field requires seeking alternative approaches that could be implemented using moderate laser intensities. In this work we report generation of energetic $(E\_{max}>4 MeV$), intense and directed proton beam during Cavity Pressure Acceleration (CPA) scenario of laser-matter interaction, where $CD\_{2}$ foils were used inside the target cavity [3][4]. The origin of these protons is one of deuterium-deuterium fusion reaction channels, in which $$ and $p^{+}$ are produced. The measurements of proton energy spectra carried out during this experiment served as an input for preliminary Monte Carlo simulations (FLUKA) [5]–[7] of proton beam colliding with boron targets of different thickness, which suggest potential for few-TW laser systems to generate alpha particle flux comparable to these achieved using the most powerful laser beamlines.

**References**

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