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# Effects of Spin Polarization on the Proton-Boron Reaction

In the selection of fusion fuels, proton and boron-11 as an ideal choice for commercialization due to its abundant raw materials and the absence of neutron production in the reaction. Compared with other fusion fuels, the proton-boron reaction has a smaller cross-section and requires a higher ignition temperature. To address or mitigate the impact of these difficulties, it is necessary to explore methods to enhance the nuclear reaction cross-section or improve the heating efficiency of the reaction products. Since the nuclei used in fusion reactions possess non-zero intrinsic spin angular momentum, the different spin orientations of the reactants can change the cross-section due to the constraints of angular momentum conservation. This presentation begins by discussing the advantages of selecting proton-boron as a candidate in the magnetic confinement fusion, as well as the challenges we will encounter during its application. To realize the proton-boron fusion reaction, we list several methods that could be employed to reduce the ignition requirements required for proton-boron reactions. Nuclear spin polarization as a potential method, which is considered in the report and the influence of nuclear spin orientation on the cross-section is also explored.

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