

**PIC SIMULATION OF PROTON – BORON NUCLEAR BURNING
IN THE POTENTIAL WELL OF VIRTUAL CATHODE
AT NANOSECOND VACUUM DISCHARGE**

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The neutron-free reaction of proton– boron nuclear burning accompanied with the yield of three alpha particles ($p + {}^{11}\text{B} \rightarrow \alpha + {}^8\text{Be} \rightarrow 3\alpha$) is of great fundamental and applied interest. However, the implementation of the proton– boron reaction requires such extreme plasma parameters that are difficult to achieve at well-known schemes of controlled thermonuclear fusion. Earlier, the yield of DD neutrons in a compact nanosecond vacuum discharge (NVD) of low energy with deuterated Pd anode have been observed. Further detailed PIC simulation by the electrodynamic code have recognized that this experiment represents the realization of rather old scheme of inertial electrostatic confinement (IEC). This IEC scheme is one of the few where the energies of ions needed for $p + {}^{11}\text{B}$ reaction are quite possible. The purpose of this work on simulation of proton- boron reaction is studying the features of possible $p + {}^{11}\text{B}$ burning at the IEC scheme based on NVD, thus, to look forward and planning the real experiment.

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