**Proposal for measurement of p-11B reaction in the EHL-2 spherical torus**

Zhi LI1,2, Bing LIU1,2, Tiantian SUN1,2, Xinchen JIANG1,2, Di LUO1,2, Yingying LI1,2, Yuejiang SHI1,2, Huasheng XIE1,2, Shaodong SONG1,2, Yuankai PENG1,2

*1 Hebei Key Laboratory of Compact Fusion, Langfang 065001, China*

*2 ENN Science and Technology Development Co., Ltd., Langfang 065001, China*

EHL-2 is the next generation of spherical torus under design in the ENN Energy Research Institute towards proton-boron fusion energy. One of the important missions of EHL-2 is to achieve proton-boron (p-11B) reaction in a magnetized plasma possibly driven by external heating systems. A big challenge is the measurement of the reaction rate of these low reactivity events in the magnetic fusion environment. Here, we propose to a strategy for measuring p-11B reaction rate in EHL-2 through integrated modeling. Preliminary analysis shows that considering the H-B plasma in EHL-2, with electron density of , ion temperature of and , more than alpha particles could be produced. Such a number of alpha particles is able to be detected and measured by varies types of detectors (i.e. FILD, NPA, GRS, class of CR39, etc.). A further simulation on the distribution of p-11B reaction in a magnetic environment which considers both the effect of neutral beams and background plasma is in progress, as well as a detector simulation which provides the detection efficiency. Here we would like to discuss the feasibility of the varies types of detectors, which could tell energetic alpha particles from proton.

**Key words: MCF; p-11B reaction; EHL-2; Spherical Torus; FILD; NPA; GRS; CR39**