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A Core Snubber for CRAFT NNBI Based on Amorphous

The negative ion based neutral beam injector (NNBI) of 400 keV beam energy is a subproject of Comprehensive Research Facility for Fusion Technology (CRAFT) in China. A core snubber will be used to absorb the energy released by the stray capacitance during the occurrence of accelerator ignition faults, avoiding greater losses. The equivalent model of the CRAFT NNBI high potential circuit was established during the core snubber design process, including the ignition point. The circuit resistance and inductance required to limit the ignition current to below 3 kA are determined by solving the equivalent circuit equation. The circuit inductance which is determined by the core of the snubber can be solved by the equation of inductance-core parameters. Therefore, the required core parameters can be calculated. Amorphous was selected as core materials by comparing the frequency response, saturated magnetic flux, and cost-effectiveness of each material horizontally. The magnetic flux distribution of the completed winding core under the excitation current is completed through finite element analysis. In addition, fully utilizing the hysteresis curve of the material by applying a bias current of approximately 200 A to the core snubber, resulting in a magnetic flux change of approximately 3 T when a ignition occurs.

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Email Address

jcch@ipp.ac.cn

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Yes

Presenter if not the submitter of this abstract

Primary authors: LIU, Bo (University of Science and Technology of China); Prof. LIU, Zhimin (Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei 230031, China); Prof. JIANG, Caichao (Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei 230031, China); Mr LIU, Sheng (Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei 230031, China); Mr CHEN, Shiyong (Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei 230031, China); Mr PAN, Junjun (Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei 230031, China); Prof. HU, Chundong (Hefei Institutes of Physical Science, Chi-

nese Academy of Sciences, Hefei 230031, China); Prof. XIE, Yuanlai (Hefei Institutes of Physical Science, Chinese Academy of Sciences, Hefei 230031, China)

Presenter: LIU, Bo (University of Science and Technology of China)

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