

Structural Optimization Design and Manufacturing Technology Development of Moderator Reflector System at CSNS-II

Monday, 28 October 2024 14:45 (25 minutes)

As part of the CSNS-II Project, a new design of moderator and reflector plug will be installed at CSNS-II target station.

As the proton beam power will be upgraded from 100KW to 500KW, the structure and the manufacturing technology of the reflector will be optimized to accommodate the higher thermal deposition. The material 6061-T6, which has stronger resistance to stress corrosion, will be used as the material for the reflector container. In order to reduce the welding deformation, the electron beam welding process test of 6061-T6 aluminum alloy was carried out, and this new technology will be applied in the manufacture of the new reflector plug.

In addition, in order to ensure the stable operation of the moderator under a harsher working conditions, the manufacturing process of cadmium, a neutron decoupling material of the moderator, has been optimized. We solved the problem of uniformity of flame-sprayed cadmium coating, and we have also studied the preparation process of gadolinium coatings, but due to the low thermal conductivity of gadolinium, this decoupling material can only be used in areas with low thermal deposition.

Primary authors: YU, CHAOJU; Ms MA, Jingjing; Mr ZHANG, Ruiqiang; Mr LIANG, Tianjiao; Mr ZHANG, Weidong; Ms YIN, Wen

Presenter: YU, CHAOJU

Session Classification: Spallation neutron/muon source component, systems & materials related technology and innovation

Track Classification: Spallation neutron/muon source component, systems & materials related technology and innovation.