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PRELIMINARY DESIGN FOR THE FIRST WALL IN WEAK MAGNETIC SIDE OF HL-2M PROJECT

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HL-2M tokamak is considered as one of the most important short pulse device for future fusion research in China which is being built at Southwestern Institute of Physics. In the vacuum vessel of the HL-2M, The first wall in weak magnetic side is designed to protect the vacuum vessel, cryopump, RMP coils and diagnostic components from the plasma particles and heat loads. Currently, the preliminary design for the first wall in weak magnetic side is in progress.
Considering the risk of leakage and complexity of design, a passive cooling structure is adopted in the first wall of the weak magnetic side. In order to enhance thermal transfer, the first wall is made of copper alloy (CuCrZr) and graphite tile. Transient thermal analysis has been used to predict heat load for normal operating scenarios in a day. The maximum temperature of this first wall is about 307℃ which is engendered on the graphite tile. After a day of operating, the temperature of the passive cooling first wall can be reduced to 54℃. As a consequence of the high temperature, the stress between graphite tile and copper alloy need more attention. Spring washer and pressure bar have been carried out to optimize the mechanical joint. Flexible copper sheet is placed in joint faces to increase thermal contact resistance.

Eligible for student paper award?

Yes

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