

Thermal hydraulics activities for the consolidated HCPB breeding blanket of EU DEMO

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One of the main objectives of the EU DEMO is to deliver net electricity, which is closely coupled with the thermal hydraulics of breeding blanket. Within EUROfusion Breeding Blanket (BB) Project, Karlsruhe Institute of Technology (KIT) is leading the Helium Cooled Pebble Bed (HCPB) breeding blanket (BB), which is one of the two driver blanket candidates selected for the EU DEMO. In this work, the thermal hydraulics activities supporting the design consolidation of HCPB BB are performed. The thermal hydraulics analyses and optimization based on two typical outboard and inboard blanket unit slices are conducted. Furthermore, thermal hydraulics assessment of full blanket segment taking into account the spatially variable heat fluxes coming from plasma to investigate and optimize the FW design and provide inputs to the structural assessment of full blanket segment. The results confirmed the soundness of the design from thermal hydraulics point of view and provided inputs for the structural assessment.

Keywords: EU DEMO, Helium Cooled Pebble Bed, Breeding Blanket, Thermal Hydraulics

Topic Category	2) Blanket Technology
Presentation Preference	<input checked="" type="checkbox"/> Poster Presentation

This work has been carried out within the framework of the EUROfusion Consortium and has received funding from the Euratom research and training programme 2014-2018 and 2019-2020 under grant agreement No 633053. The views and opinions expressed herein do not necessarily reflect those of the European Commission.