

# Preliminary structural assessment of the HELIAS 5-B breeding blanket

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The European Roadmap to the realisation of fusion energy considers the stellarator concept as a possible long-term alternative to a tokamak fusion power plant. To this purpose a pivotal issue is the design of a HELIcal-axis Advanced Stellarator (HELIAS) machine equipped with a tritium Breeding Blanket (BB). Therefore, within the framework of EUROfusion Work Package S2 R&D activity, a research campaign has been launched at KIT. The scope of the research, focussed on the HELIAS 5-B machine, has been the determination of a preliminary BB segmentation scheme able to ensure, under the assumed loading conditions, that no overlapping may occur among the BB neighbouring regions. To this purpose, the Helium-Cooled Pebble Bed (HCPB) and the Water-Cooled Lithium Lead (WCLL) BB concepts, presently considered for the DEMO tokamak fusion reactor, have been taken into account. The obtained results are herewith presented and critically discussed.

