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## P3.162 Tritium transport model at breeder unit level for HCLL breeding blanket

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The Helium-Cooled Lithium Lead (HCLL) breeding blanket is one of the European blanket designs proposed for DEMO reactor. A tritium transport model is fundamental for the correct assessment of both design and safety, in order to guarantee tritium self-sufficiency and to characterise tritium con-centrations, inventories and losses. The present 2D transport model takes into account a single breed-er unit located in the outboard equatorial module of the HCLL breeding blanket, which is one of the most loaded modules in normal operating conditions. A multi-physics approach has been adopted considering several physics phenomena, providing for buoyancy effect, temperature fields, tritium generation rate and velocity profile of lead-lithium and coolant. The transport has been modelled considering advection-diffusion of tritium into the lead-lithium eutectic alloy, transfer of tritium from the liquid interface towards the steel (adsorption/desorption), diffusion of tritium inside the steel, transfer of tritium into the coolant. Moreover, a preliminary evaluation of the magneto-hydrodynamics effect (MHD) has been also performed. Tritium concentrations, inventories and losses have been derived under the above specified phenomena. Results, input and boundary conditions are illus-trated in detail within the paper.

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