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P2.166 Commissioning of Multi-Nozzle Vacuum Sieve Tray at the Tritium Laboratory Karlsruhe

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In order to achieve tritium self-sufficiency of fusion reactors, tritium will be generated in breeding blankets by neutron bombardment of lithium and then will be extracted to refuel the plasma. The Vacuum Sieve Tray (VST) was proposed to ensure tritium extraction from liquid breeding blankets, composed of lead-lithium. It consists in letting the liquid metal fall through submillimeter diameter nozzles in a chamber maintained under vacuum. PbLi liquid jets are first formed and then break into droplets, in which the tritium dissolved in atomic form is transported towards the surface to form gaseous T_2 that is extracted.

The multi-nozzle VST setup at the Tritium Laboratory Karlsruhe (TLK) is designed to study the scalability of the VST technique with a setup operated with deuterium. This setup is fully assembled with tritium-compatible components to serve also as a preliminary deuterium/lead-lithium facility before performing experiments with tritium with a dedicated setup at the TLK.

The presentation will include a short introduction to the facility and will focus on the commissioning to ensure safety and prepare the experimental campaign (experiments and calibration tests in order to obtain accurate results and to benchmark a hydrodynamic simulation code previously developed). The experimental strategy will also be presented.

Presenter: DIAZ-ALVAREZ, Ester (Institute for Technical Physics (ITEP) Tritium Laboratory Karlsruhe (TLK) Karlsruhe Institute of Technology (KIT))

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