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The TRADE Solid Target System Design

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Abstract

The TRADE (TRiga Accelerator Driven Experiment) project is a common international initiative aiming at validating the coupling of an accelerator and a spallation target with a nuclear reactor ; specifically an external proton accelerator will be coupled to the TRIGA reactor of the ENEA-Casaccia Centre. In the TRADE experiment, the target will substitute the central thimble of the reactor, which will be made sub-critical by removing some fuel elements. Due to the low power of the reactor, a solid target cooled by water has been chosen. Some preliminary target concepts (materials, geometry) were designed under the geometrical constraint of the central thimble. These solutions were evaluated, and compared in order to define a reference solution.

The target system design requires multidisciplinary work, including material choice, spallation target physics, thermo-mechanical, thermal-hydraulic studies and safety aspects. The results of these iterative studies will be presented and discussed herein.