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Overview of IFMIF-DONES lithium target system design

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At the core of IFMIF-DONES is placed the Target System. It generates a high-speed liquid lithium jet (15 m/s, 300℃) acting as the target for a 40 MeV, 125 mA deuterium-based linear accelerator, with the primary aim of qualifying fusion-related materials. The design of the Target System has evolved during the last few years addressing key challenges. Managing the 5 MW of power deposited continuously in the target requires a reliable lithium loop supplying liquid lithium in well-defined conditions. The extreme operational conditions, exposed to high irradiation levels (˜25 dpa/year), demand also careful selection of materials and regular replacement strategies for critical components, supported by dedicated Remote Handling systems. Current efforts focus on optimizing the design to meet the requirements for its upcoming construction phase. This includes advanced features to facilitate assembly, installation, and long-term operability. Additionally, attention is being paid to the integration of diagnostics. This contribution highlights the recent R&D and engineering solutions aimed at advancing the Target System toward successful construction, commissioning and subsequent operation.

Footnotes

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