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Status of IFMIF Project: is it still talking about IFMIF like talking of Alice in Wonderland?

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The efforts towards the realization of a fusion relevant neutron source facility for fusion materials testing is four decades old. Fusion and fission materials research have always presented synergies, but whereas experimental fission reactors were available since the 60s supporting the development of commercial fission reactors, there is no available facility providing the 14.1 MeV mono-energetic neutrons of DT fusion reactions. This lack led to assess the degradation of structural materials exposed to fusion neutrons through the combination of results from fission reactors, spallation sources and ion implantation, but uncertainties of the degradation at high doses remain. Many ideas have been attempted to have a fusion relevant neutron source, some of these return in an iterative manner, unfortunately simplistic solutions are not available. The US took the lead in late 70s proposing the Fusion Materials Irradiation Test facility, FMIT, a project active until middle 80s; we learnt that our technology was not ready at the time to have neutrons through Li(d,n) reactions. Accelerators technologies have matured enormously these last 30 years with the frontier of MW beam power trespassed this decade in the SNS and 5 MW to be reached early next decade in the ESS. Efforts in Japan and US continued in a timid manner until a consensus was reached in 1994 among Europe, Japan, the Russian Federation and the US to jointly work towards the International Fusion Materials Irradiation Facility. In 2007, EURATOM and Japan signed the Broader Approach Agreement in the field of Fusion Energy Research, which included IFMIF/EVEDA, what stands for Engineering Validation and Engineering Design Activities. The ongoing success of this project, with the construction of validating prototypes of the main elements of IFMIF, allows moving towards the construction of a Li(d,n) fusion relevant neutron source for a marginal cost of a fusion reactor, fulfilling the expectations of the world fusion roadmaps to counting with 14 MeV neutrons, with suitable fluxes for fusion materials testing, by the 2nd half of next decade.

Eligible for student paper award?

No

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