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Preliminary design of the HEBT of IFMIF DONES

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Abstract:

IFMIF-DONES (International Fusion Materials Irradiation Facility – DEMO Oriented Neutron Source) is currently being developed in the frame of the EUROfusion Early Neutron Source work package (WPENS) and will be an installation for fusion material testing, that will generate a flux of neutrons of 10^{18} $m^{-2}s^{-1}$ with a broad peak at 14 MeV by Li(d,xn) nuclear reactions thanks to a 40 MeV deuteron beam colliding on a liquid Li flow.
The accelerator system is in charge of providing such high energy deuterons in order to produce the expected neutron flux. The High Energy Beam Transport line (HEBT) is the last subsystem of the accelerator and its main functions are to guide the

deuteron beam towards the Lithium target and to shape it by the use of magnetic elements to the reference beam footprint at the Lithium Target.
The present work summarizes the current status of the HEBT design, including beam dynamics, vacuum, radioprotection, diagnostics and remote handling studies performed, along with the layout and integration of the line.