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Short_Oral_29 Preliminary parametric analysis of the first neutrons measured with a scintillator array at SPIDER

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SPIDER, the full size ITER NBI ion source, aims to prove the ITER requirements in terms of the ion source performance, a beam uniformity better than 90% and a low beam divergence. The SPIDER experiment can operate in deuterium, thus producing beam-target D-D fusion neutron emissions. These emissions can be used to evaluate the beam uniformity as well as machine parameter dependence, since the neutron flux is proportional to the beam power.

To this end, a new neutron diagnostic array, consisting of a mix of seven crystal, plastic, and liquid scintillators, has been installed externally on the beam dump side of the vessel. Six of them are capable of neutron/gamma discrimination and are positioned to study the beam uniformity and allow parametric comparisons. An NaI scintillator-based gamma detector allows for the energy spectra reconstruction of incident gamma rays without neutron interference. In this work, the scintillator array's capability and arrangement, together with first results achieved during the deuterium campaigns performed in SPIDER, are presented and discussed.

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