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Short_Oral_11: Preliminary design of a LIDAR Thomson scattering diagnostic for DTT

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A LIDAR Thomson scattering diagnostic is under development for the measurement of the spatial profiles of electron temperature T_e and density n_e of the core plasma in the DTT experiment [1]. After the first implementation in JET, a LIDAR TS diagnostic has never been replicated because its capabilities in terms of spatial resolution and repetition rate were soon surpassed by the conventional (non LIDAR) TS technique. In present days however, thanks to the improvements in laser and detectors technology, the performances of LIDAR TS may be made comparable to those of a conventional multipoint imaging TS system. In an experiment of the size of DTT, the LIDAR approach has some important advantages over a conventional TS system, in term of reduced impact on the machine structure, complexity of the apparatus, and possibly cost. In this paper we present the general layout of the diagnostic under design for DTT and a preliminary analysis of the expected performances.

[1] R. Martone, R. Albanese, F. Crisanti, A. Pizzuto, P. Martin Eds., "DTT Divertor Tokamak Test facility Interim Design Report", ENEA (ISBN 978-88-8286-378-4), April 2019 ("Green Book")
<https://www.dtt-dms.enea.it/share/s/avvghVQT2aSkSgV9vuEtw>.

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