

P5.1042 Lithium influence on edge plasma parameters at T-11M tokamak

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See full abstract here <http://ocs.ciemat.es/EPS2019ABS/pdf/P5.1042.pdf>

Liquid lithium is considered as a material for plasma facing components (PFCs) of fusion devices. Its properties have been widely studied at present. In particular, the lithium program of T-11M tokamak is focused on solving the technological problems of creating a stationary tokamak with plasma-facing components from liquid lithium. As a part of this program edge plasma parameters were investigated using a Mach probe at different temperatures and positions of lithium limiters.

The first experiments with the probe were carried out with one vertical and longitudinal lithium limiter inserted in the vacuum chamber of T-11M. In this case radial distributions of ion saturation current and the electron temperature for L-mode had a maximum at $r = 4$ cm (distance from the wall of vacuum chamber) which may be due to the formation of a magnetic island near the vertical limiter. This effect was not observed in the H-mode, which may be connected with the weaker interaction of the edge plasma with the vertical limiter.

In addition, this effect disappeared when second longitudinal limiter was installed, which can be considered as a result of the symmetrization of the collector system.

In order to study the effect of lithium on edge plasma parameters, the radial distributions of the electron temperature and the ion saturation current were compared for hot and cold lithium limiters. The hot limiters corresponded to an enhanced intake of lithium into the edge plasma. As a result, a flat electron temperature profile was observed with hot limiters. The electron pressure remained constant for cold and hot limiters. This can be explained by the fact that hydrogen recycling decreases with increasing of the lithium amount in the edge plasma.

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