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NON-LOCAL REDUCTION OF ELECTRON HEAT FLUX DUE TO THE DROP OF THE LI-CONTAINING FLAKE AT VARIOUS REGIMES WITH ECRH IN T -10 TOKAMAK WITH C- AND W-LIMITER *)

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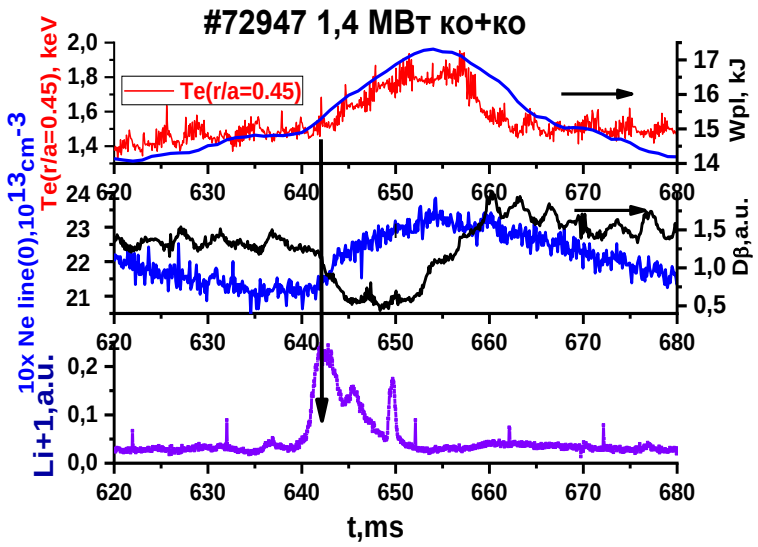
The lithification of T-10 with a C-limiter (2008-2011) and with a W-limiter was produced in different ways [1]. Two examples of the consequences of spontaneous drop of lithium-containing flakes into a chamber with a W-limiter were analyzed earlier [2-3]. The typical evolution of some plasma parameters is shown in the figure. The drop of the flake leads to an increase in the electron temperature Te in the central part of the column with further formation of ITB and an increase in density. There is a non-local decrease in the electron heat flux Γ_{Te} and the value of the energy lifetime τ_E increases abruptly (11% in [2] and 14% in [3]).

This report analyzes dozens of cases of lithium-containing flakes entering a chamber with a W-limiter and the non-local decay of Γ_{Te} in various regimes with an ECRH power from 0.45 MW to 1.5 MW. In the best case for today (see Figure), the value of Rgrad(Te)/Te grows inside ITB by 40% to 18.5, which means a decrease in the coefficient of electron thermal conductivity by more than 2.5 times compared with the scaling of the L-mode. The dependence of the jump τ_E with plasma parameters is studied, the accumulation of W does not occurs. With a high concentration of lithium, the growth of Te does not occur (details are being clarified at the moment).

The report analyzes for the first time the cases of lithium-containing flakes flying into a chamber with a C-limiter (so far only 3 consecutive pulses with a power of 1.3 MW ECRH produced on the day of lithification have been found). The duration of the improved phase (growth of Te and density) is three times shorter than in the figure, the value of τ_E increases abruptly by 7-10%.The spontaneous drop of carbon flakes was previously studied on a TFTR tokamak [4], but the authors did not notice an obvious non-local reduction of Γ_{Te}. The non-local reduction of Γ_{Te} at the injection of small C8H8 pellets in the LHD stellarator [5], disappeared with small regime changes, unlike our results with the W-limiter. The authors thank V.A. Vershkov for fruitful discussions.



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