

Experimental Investigation of Vertical and Longitudinal Lithium Limiters System as a Prototype of Plasma Facing Components of a Steady-State Tokamak-Reactor on T-11M Tokamak

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Abstract. In T-11M a new functional model of the prototype of closed lithium circuit for the protection of chamber wall of steady-state tokamak-reactor was tested by a simultaneous using of the vertical lithium limiter T-11M as a steady-state CPS (capillary-porous system) lithium emitter and new longitudinal CPS lithium limiter as its collector. Such technological scheme can be suggested for the steady-state fusion neutron source (FNS) on the tokamak basis [1] (FIG.1). During operation on the tokamak T-11M by the using of the cryogenic target as lithium collector was achieved almost complete (up to 80%) collection of the lithium flow emitted by the vertical capillary Li limiter during plasma shots. The collected lithium and hydrogen isotopes which were captured by them were extracted outside the tokamak vacuum chamber for the first time during tokamak operation cycle, what is a key requirement for use of lithium in a steady-state tokamak-reactor.

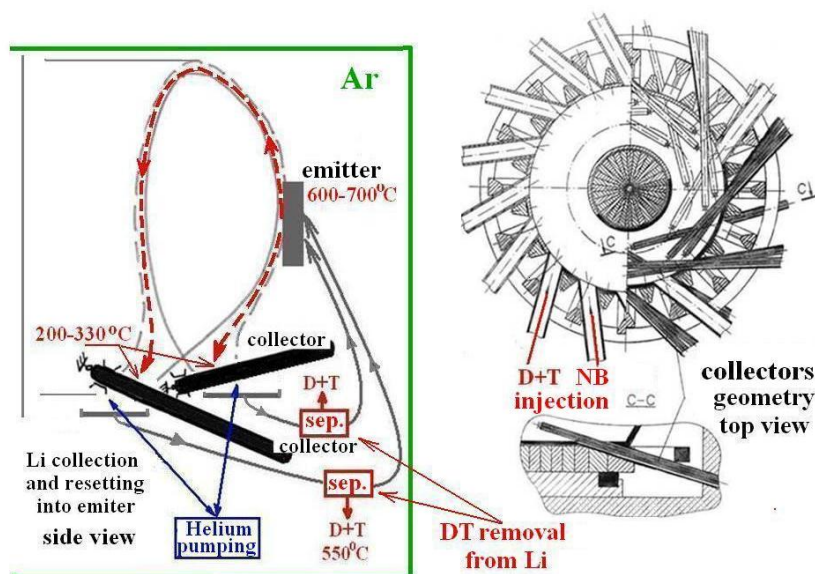


FIG.1. The scheme of a steady-state FNS with lithium emitter–collector circulation.

Reference:

- [1]. S.V. Mirnov et al. 25th IAEA Fusion Energy Conference, Saint-Petersburg, Russia, 2014, EX/P1-47