

Abstract Submitted
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Stationary Flowing Liquid Lithium (SFLiLi) systems for tokamaks¹ LEONID ZAKHAROV, CHARLES GENTILE, LANE ROQUEMORE, Princeton University, PPPL — The present approach to magnetic fusion which relies on high recycling plasma-wall interaction has exhausted itself at the level of TFTR, JET, JT-60 devices with no realistic path to the burning plasma. Instead, magnetic fusion needs a return to its original idea of insulation of the plasma from the wall, which was the dominant approach in the 1970s and upon implementations has a clear path to the DEMO device with $P_{DT} \simeq 100$ MW and $Q_{electric} > 1$. The SFLiLi systems of this talk is the technology tool for implementation of the guiding idea of magnetic fusion. It utilizes the unique properties of flowing LiLi to pump plasma particles and, thus, insulate plasma from the walls. The necessary flow rate, $\simeq 1$ g³/s, is very small, thus, making the use of lithium practical and consistent with safety requirements. The talk describes how chemical activity of LiLi, which is the major technology challenge of using LiLi in tokamaks, is addressed by SFLiLi systems at the level of already performed (HT-7) experiment, and in ongoing implementations for a prototype of SFLiLi for tokamak divertors and the mid-plane limiter for EAST tokamak (to be tested in the next experimental campaign).

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