

Abstract Submitted
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Recyclable Solid Blanket for a Fusion Reactor¹ M.V. UMANSKY,
LLNL — Neutron damage and tritium inventory will limit the lifetime of inner wall components of a fusion reactor, leading to increased operation cost and possibly making it economically unattractive. Thick liquid walls may be a solution to this; however, at present the feasibility of forming and maintaining thick liquid walls remains to be demonstrated for a tokamak configuration. Here it is proposed to construct inner wall components of a reactor using a meltable material. During the normal operation the blanket is maintained in the solid state. After some period of operation, when a critical level of neutron damage and tritium inventory in the blanket is accumulated, the structure is melted and drained out of the reactor chamber. After that, by bringing in fresh liquid blanket material and freezing it to the solid state on the walls, the blanket is rebuilt. Thus the blanket is periodically replaced without opening up the reactor chamber, relatively easily compared to a solid blanket. Preliminary calculations demonstrate that such system can satisfy the basic requirements of thermal transport and tritium breeding in a reactor.

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M.V. Umansky
LLNL

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