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Study of liquid lithium entry into trench structures KISHOR KUMAR KALATHIPARAMBIL, University of Illinois at Urbana-Champaign, CARLOS SANDOVAL-RIOS, Intituto Politecnico Nacional, PETER FIFLIS, University of Illinois at Urbana-Champaign, MARTIN NIETO-PEREZ, Intituto Politecnico Nacional, DAVID RUZIC, University of Illinois at Urbana-Champaign — Effective handling of high heat and particle flux is one of the key deciding factor in choosing the suitable plasma facing component in future fusion reactors. This is especially critical during disruptive transient plasma events when the PFCs are expected to handle extremely energetic fluxes. The use of low atomic number liquid metals as PFCs have shown to solve many of these problems. In addition, results have indicated that the use of lithium favored better confinement of the plasma in tokamaks. Previous work done with trenches filled with flowing liquid lithium shows they can withstand type-II ELM like transient plasma fluxes. In order to ensure efficient removal of the incident heat energy during such events, it is crucial that the trench material establishes good contact with the liquid lithium; thus, understanding the surface interaction properties is crucial for attaining the ideal trench design. In the present study, the effect of temperature, trench size and trench top surface roughness in the behavior of a liquid lithium droplet deposited on the top of the trench structure is analyzed. The results cover the contact angle measurements, wetting temperatures and identification of critical wetting parameters.

Kishor Kumar Kalathiparambil
University of Illinois at Urbana-Champaign

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