

Abstract Submitted
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Electrostatic Lithium Injection for Fusion Devices PETER FIFLIS, DANIEL ANDRUCZYK, VIJAY SURLA, DAVID RUZIC — One of the most significant problems in fusion devices is controlling the recycling of hydrogen that is not used in the fusion process. A powerful getter of hydrogen, lithium, if injected into regions where it is needed, may getter hydrogen much more efficiently. Current lithium evaporation systems are inefficient in controlling where lithium deposits once injected, and a system that can control where it deposits would be invaluable. A solution may lie in a concept called electrospray, where charged lithium particles could be produced and controlled via electric and magnetic fields to target areas in need of getting impurities. While the electrospray concept has been used in other applications, the technique has yet to be applied to lithium injection. Preliminary research into the viability of an Electrostatic Lithium Injector (ELI) have shown that such a system may be capable of producing the lithium droplets and spray, and experiments are being performed to determine the optimal design. Modeling is also being done into using the ELI for repair of PFCs, and possibly even ELM control. Simulation has shown a lithium droplet can be made to follow an arbitrary path with application of a time varying voltage from 10 to -1700 V to the center stack of a tokamak. One run was able to calculate the voltage function required to make a lithium particle take a helical path.

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