

Abstract Submitted
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ELM Suppression and performance improvement with a flowing liquid lithium limiter in EAST G.Z. ZUO, J.S. HU, ASIPP, R. MAINGI, PPPL, Z. SUN, W. XU, J.G. LI, ASIPP, A. DIALLO, R. LUNSFORD, PPPL, T. OSBORNE, GA, K. TRITZ, JHU, EAST TEAM — Improvements in plasma performance were observed using a second-generation flowing liquid lithium limiter (FLiLi) in EAST. Compared to the H mode discharges without FLiLi, ELM frequency and amplitude were both lower with FLiLi. Also, ELM frequency and amplitude gradually decreased discharge-by-discharge with FLiLi, similar to the gradual ELM mitigation by real-time Li aerosol injection in successive discharges. Moreover, transient ELM-free H-modes with a strong increase of W_{MHD} and H_{98} were observed for the first time with FLiLi. During the ELM-free phases, MHD activity interpreted from high frequency Mirnov probes differed from activity in the ELMy phases. In addition to the typical low-frequency ~ 50 kHz edge coherent MHD mode (ECM), a second mode ~ 220 – 240 kHz also was observed in the ELM-free phase. By computing the Li efflux from the FLiLi limiter surface, it was found that the Li efflux from sputtering during discharges and evaporation between discharges was comparable to the typical mass delivery rates used for Li powder injection rate during plasma operation in EAST. Therefore, gradual accumulation of Li in EAST via real time Li efflux from the FLiLi surface produces similar effects to aerosol injection, i.e. reduced recycling, enhanced fluctuations, and ELM mitigation.

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