

Abstract Submitted
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ELM Suppression and Recycling Control with Boron Nitride and Boron Powder Injection in KSTAR ELMy H-modes¹ E. P. GILSON, PPPL, H. H. LEE, NFRI, A. BORTOLON, PPPL, W. H. CHO, KAIST, A. DIALLO, PPPL, S. H. HONG, NFRI, R. MAINGI, D. K. MANSFIELD, A. NAGY, PPPL, S. H. PARK, NFRI, I. W. SONG, KAIST, S. W. YOON, NFRI, R. NAZIKIAN, PPPL — Experiments using an Impurity Powder Dropper (IPD) to introduce precise, controllable amounts of B and BN into ELMy H-Mode KSTAR discharges showed the mitigation of ELMs and reduction of recycling when B powder is dropped. ELMs are eliminated and edge fluctuations are altered when BN powder is dropped. The results indicate that the IPD can be used for intra-shot wall conditioning and ELM control. The IPD consists of four powder reservoirs that drop powder onto troughs that, when vibrated by piezoelectric actuators, drop the powder into a common drop tube and into the plasma. Powders were dropped into 15 s duration, 1.5 MW, 500 kA plasmas. A 10 mg dose of B caused a disruption, but may have enabled ELM-free phases in several subsequent shots, likely due to reduced recycling. Several 2.5 mg doses of B during a single discharge reduced recycling as evidenced by the reduced baseline D_α level during the following shot. A series of 2.5 mg doses of BN, delivered in 0.1 bursts, was observed to transiently eliminate ELMs for up to 5 s, without changing the stored energy or plasma density. A continuous BN dose of 2.5 mg/s for ten seconds reduced the ELM amplitude.

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