Wall Conditioning Effects of Boron Nitride Powder Injection in KSTAR[1] E. GILSON, A. BORTOLON, A. DIALLO, R. MAINGI, D. K. MANSFIELD, A. NAGY, R. NAZIKIAN, Princeton Plasma Physics Laboratory, H. H. LEE, S. H. HONG, S. H. PARK, S. YUN, S. W. YOON, KSTAR Research Center, NFRI, W. CHOE, Korea Advanced Institute of Science and Technology — Boron nitride (BN) injection into ELMy H-Mode KSTAR discharges with 500 kA $<I_p<$ 700 kA and with up to 3 MW of neutral beam heating power demonstrated the ability to improve wall conditions, reducing recycling, over the course of several discharges in some regimes. These results suggest that powder injection may be a useful technique for intra-shot wall conditioning. The Impurity Powder Dropper (IPD) was used to deliver 60 μm BN powder at dose rates between 1 mg/s and 20 mg/s, and for various total durations, to quantify the effect of the powder on the plasma. In the KSTAR experiments, BN was dropped into 10 s duration discharges and was observed to gradually reduce the baseline $D\alpha$ level over six shots, indicating improved wall conditioning. Moreover, while the initial $D\alpha$ signals included mixed ELMs, the smaller amplitude ELMs disappeared after the powder injections. Previous results showed improved wall conditioning with pure boron powder, indicating that the wall conditioning effect of BN is due to its boron content. As the previous results also demonstrated ELM mitigation with BN, BN powder injection appears to offer the simultaneous benefits of ELM mitigation and recycling reduction.

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