

# IMPROVED FUSION PLASMA PERFORMANCE IN FUSION DEVICES ENABLED BY A NEW IMPURITY POWDER INJECTION SYSTEM

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# Powder injection via impurity powder dropper triggered ELM quiescence in EAST and KSTAR

- ✓ New impurity powder dropper enables injection of wide range of impurities
  - EAST, KSTAR, DIII-D, AUG, LHD, WEST
  - Related concepts in NSTX, W7-X
- ✓ B readily suppresses ELMs in EAST
  - Minimum flow rate increases with heating power, as naively expected
- ✓ BN and B trigger ELM quiescent phases in KSTAR
  - More prominent with BN than B in 2018
- ✓ Reduced recycling is *not required* to trigger ELM quiescence in either device
  - Reduced recycling may help broaden access window by changes to  $n_e$  profile

