

Effects of Different Impurities on Pedestal Structure – T. Osborne, A. Diallo, R. Maingi, C. Giroud, S. Saarelma, M. Beurskens, M. Leyland, M. Dunne, L. Frassinetti, E. Viezzer

- **Issue: Impurities in pedestal can significantly change pedestal pressure and so overall discharge performance**
 - Removing C intrinsic impurity by going to metal walls in JET resulted in pedestal pressure reduction that was recovered with N seeding
 - Li injection on DIII-D resulted in intrinsic C being replaced by Li and improved P^{PED}
 - Results not well understood (ion dilution, collisionality?) and likely involve both pedestal stability and transport physics
- **Why NSTX: Low aspect ratio could reveal key physics**
- **Effort required: Could be part of B, Li conditioning studies and any radiative divertor experiments**
 - Test He, Li, B, N, Ne, Ar effects on pedestal over a range of I_p , B_T , P_{HEAT}
 - Low vs high triangularity could show differences related to being on ballooning vs peeling stability boundaries
- **Risk-reward:**
 - Could impact future tokamak operating scenarios
 - Contributes to **ITPA PEP-37** joint experiments on JET, AUG, TCV, EAST, CMOD, DIII-D: 'Effect of low Z impurities on pedestal structure'