

# Helium spectroscopy for SOL profile measurements

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## SOL profile measurements

- Present diagnostics: 1-D CCD camera - neutral and impurity profiles at LCFS, UCSD probe
- Need to study SOL width dependence on  $B, A, v_e, v_i$
- SOL particle flows (FY 2003?)
- In / out SOL asymmetry (FY 2003?)

## Proposed SOL profile diagnostic

- Supersonic gas nozzle injector - produce low divergence atomic helium (IP= 24 eV) beam. Measure helium line intensity radial profiles using imaging spectrometer
- Lines:  $\lambda_1 = 6678 \text{ \AA}$ ,  $\lambda_2 = 7065 \text{ \AA}$ ,  $\lambda_3 = 7281 \text{ \AA}$
- $I(\lambda_3)/I(\lambda_2) = f(T_e)$ ,  $I(\lambda_1)/I(\lambda_2) = f(n_e)$
- High quality atomic rates available
- Range of measurements:  $10 < T_e < 100 \text{ eV}$ ,  $10^{12} < n_e < 10^{14}$