- **Kinetic simulation (XGC0) reproduces observations of H-mode pedestal**
  - Energy distributions are non-Maxwellian
    - Temperature anisotropy ($T_\parallel \neq T_\theta$)
    - Large T_i in SOL
  - Neoclassical ion transport is non-local
    - Decoupled energy and particle transport
    - Instrisic edge torque

- **Fluid assumptions break down in edge**
  - XGC0: E_r adjusted to maintain ambipolar kinetic transport
    - Ion orbit loss = neoclassical pinch
    - Wall sheaths in SOL
  - Fluid force-balance E_r for **C⁶⁺** and **D⁺** differs from **kinetic** E_r in pedestal
  - **Simulated** and **measured** E_r using fluid assumptions are in agreement

DIII-D Outboard midplane

Inferred from C⁶⁺ profiles
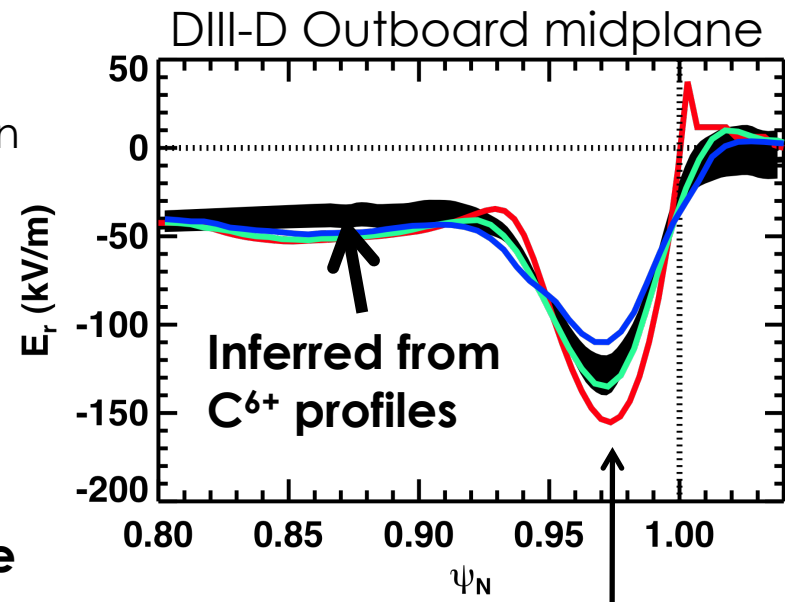
XGC0: Kinetic E_r for $\Gamma_i = \Gamma_e$
XGC0: C⁶⁺ fluid force balance
XGC0: D⁺ fluid force balance

Fluid force balance:

$$E_r = \frac{\nabla P_i}{Z e n_i} - v_{\theta i} B_\phi + v_{\phi i} B_\theta$$

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