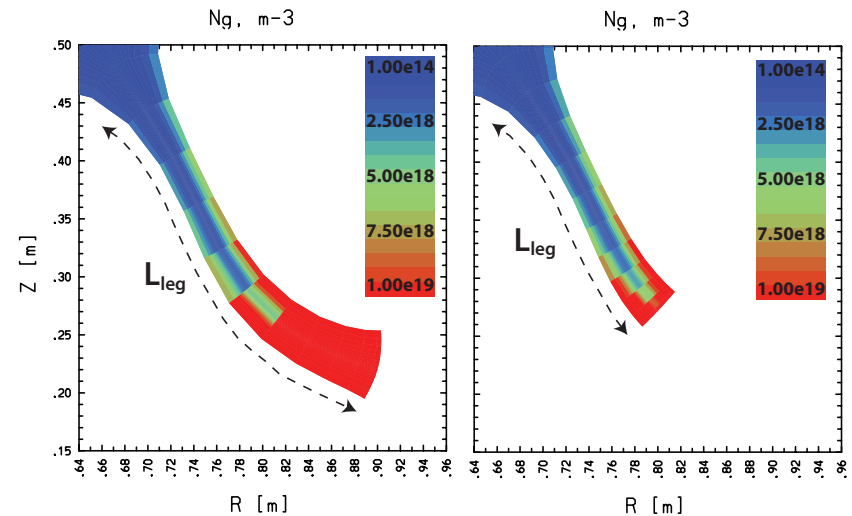


Stable fully-detached plasma regime in long-legged divertor

- Stable steady-state detached plasma regime found in modeling of tightly baffled long-legged divertor configurations
- For parameters of ADX tokamak, finding up to 10x increase of accommodated power flux in this divertor regime, without compromising divertor or core plasma
- Key physics for this detached divertor regime combines strong convective plasma transport to outer wall, confinement of neutral gas in divertor volume, geometric effects including secondary X-point, and atomic radiation

Fig.1: Distribution of gas density N_g in steady state, long leg vs. short leg



Regardless of divertor leg length, the location of detachment front is similar for the same exhaust power. Energetics of PMI sets location of detachment front and makes it stable

Long-legged divertor holds promise of stable high-power fully-detached operation