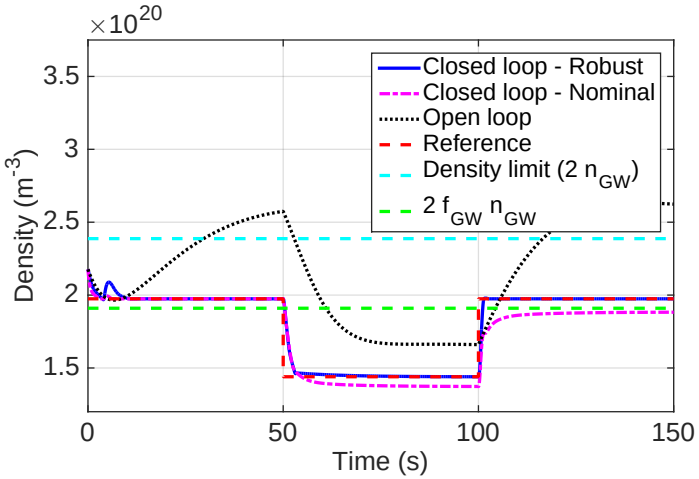
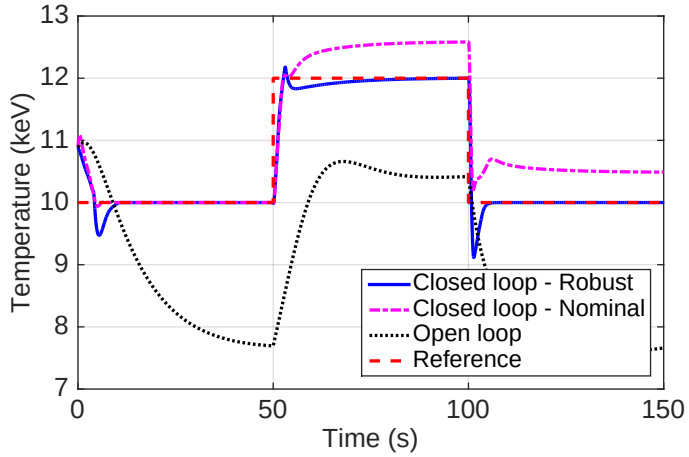
Burn Control in ITER Needs to Be Robust Against Variations in the D-T Concentration of Pellets

- **Nonlinear burn condition regulation** in ITER will be essential for **fusion power control** & **thermal instability avoidance**
- **Uncertain D-T concentration** in pellets may be **critical for ITER's performance**
- An **integrated, robust control scheme** to handle unknown variations in the D-T pellet concentration is designed using:
  - **Auxiliary power modulation**
  - **Fueling rate modulation**
  - **In-vessel coil-current modulation**
  - **Impurity injection**
- Operating points: (1) $T = 10$ keV, $n = 2.0 \times 10^{20}$ m^{-3}
  (2) $T = 12$ keV, $n = 1.4 \times 10^{20}$ m^{-3}





Burn regulation in ITER has been proven possible in simulations under variations in D-T fuel concentration by means of robust control techniques.