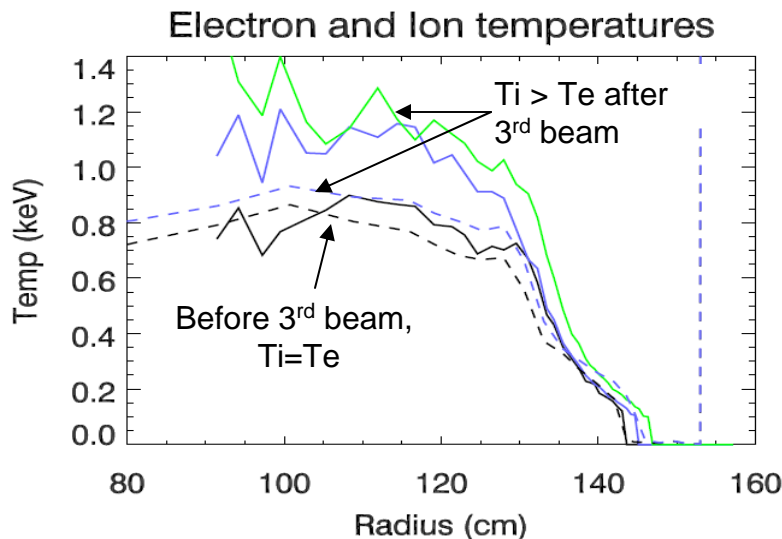


Excess Ion Heating in Beam Heated Discharges

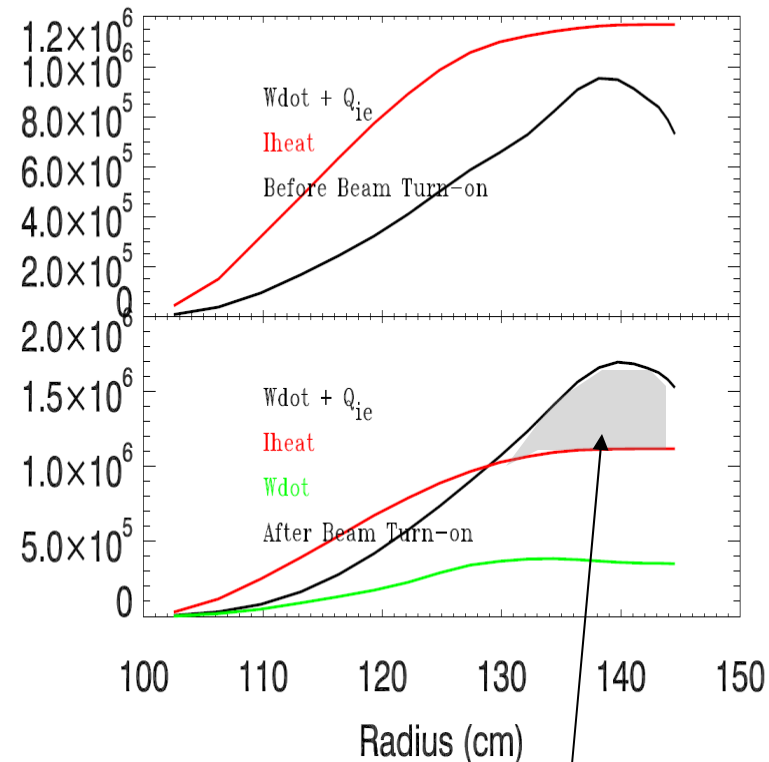
Some neutral beam heated discharges in NSTX require excess heating to satisfy the power balance.

$$P_{excess} = Q_{nc} + Q_{ie} + \dot{W} - P_{nb}$$

The heating coincides with the turn on of the third neutral beam source. While this heating was not required for every shot, when it was required, the amount of heating was outside the error bars of the measurements.



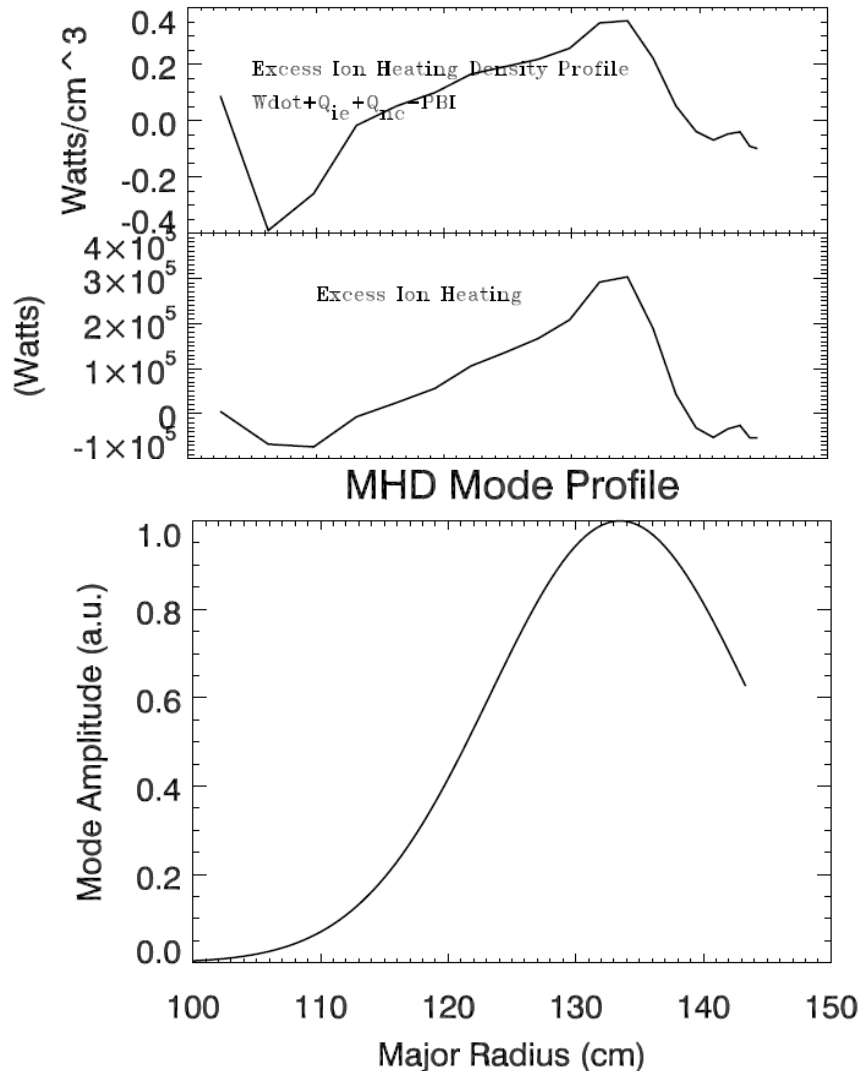
Volume integrated Power Balance



Before the 3rd beam turns on, the heating power is above the loss. After the 3rd beam turns on, the loss dominates the calculated heating, implying an excess heating mechanism

High Frequency MHD Modes Could be Responsible for Excess Heating

Excess Heating Transp Run 128820P07



GYROXY simulations show that the high frequency modes can be responsible for heating the plasma. The mode equation also peaks in the same radial location as the TRANSP calculated heating.

Heating from Modes

