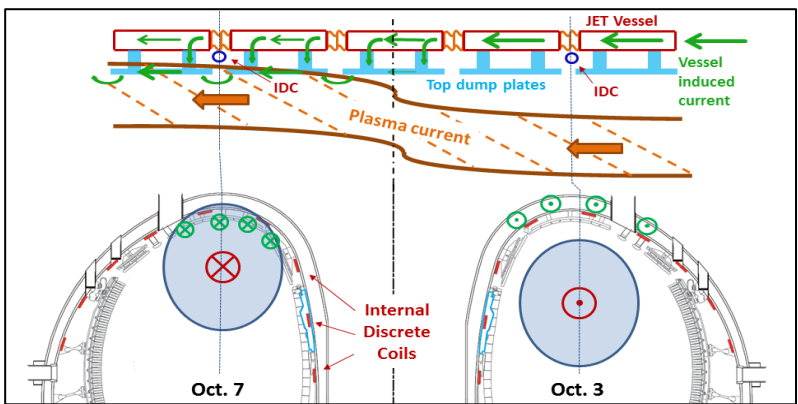
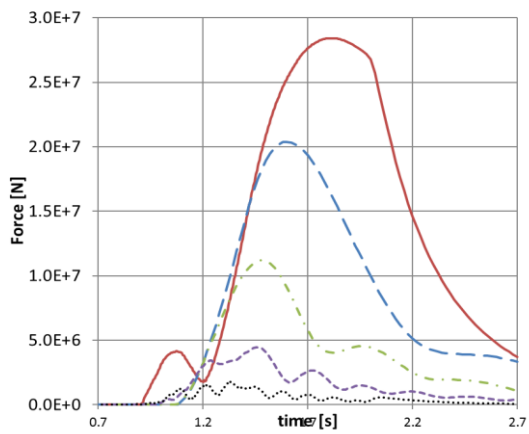


Modelling ITER Asymmetric VDEs through Asymmetries of Toroidal Eddy Currents

- ITER loads during AVDEs were obtained extrapolating JET loads through models developed in the late '90 resulting in dangerous loads (in case of rotating AVDE).
- Re-assessment of the JET data led to the proposal of the ATEC model which solves many of the inconsistencies of the older models.



Schematic view of asymmetric toroidal eddy current patterns in JET structures during AVDEs. Top: toroidal section at vessel top; bottom: vertical section of the machine at octants 3 and 7.



ATEC model - VV sideways force components during locked (red) and rotating AVDE (1Hz blue, 2Hz green, 4Hz purple, 8Hz black)

- ATEC model assumes that a relatively hot plasma could short-circuit the poloidal gaps between adjacent plasma facing components allowing net toroidal current to be induced on the First Walls.
- The ATEC model has been applied to ITER through finite element analyses and results are discussed:
 - Locked AVDE analysis shows reduction of peak loads of about 50% with respect to old analyses (<30 MN vs. 50 MN).
 - Rotating AVDE analysis shows even bigger reduction of net forces and moments (-70% vs. older analysis).