

Critical Fast Ion Distribution

- MEGA simulation of Alfvén eigenmode (AE) bursts in tokamak plasmas
- Synchronized sudden growth of multiple AEs
- Before the sudden growth (=AE burst),
 - multiple AEs grow to low amplitude
 - low-amplitude AEs locally flatten the fast ion distribution in phase space
 - formation of a stepwise distribution
- The stepwise distribution = “critical distribution” where the further beam injection leads to
 - broadening of the locally flattened regions
 - and their overlap
- The resonance overlap of AEs brings about
 - AE burst and global transport of fast ions
 - profile resiliency = the same distribution function for 5MW and 10MW beams

