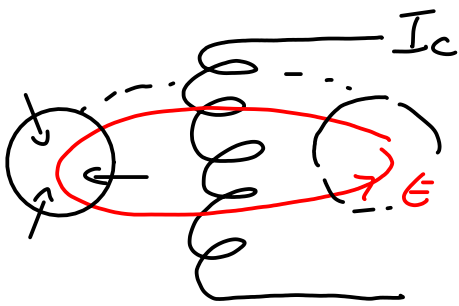


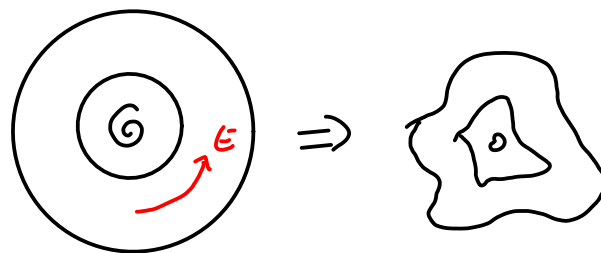
Current-driven instabilities

Contents

- Toroidal pinch, kink modes
- Stabilisation by walls, toroidal B field
- Tokamak modes: Sawteeth, Kinks, Tearing modes



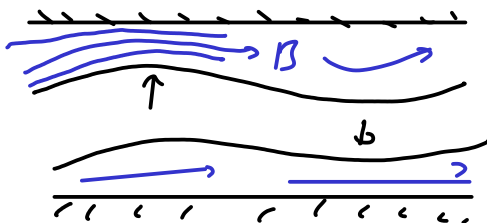
Perhapsatron. J. Tuck 1952



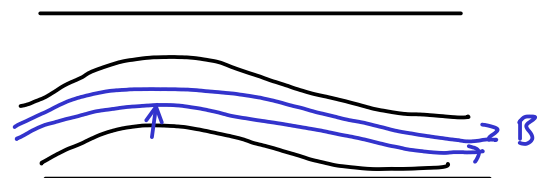
Carruthers, Davenport, 1957

Stabilisation

① Metal wall



② Magnetic field
e.g. Toroidal field



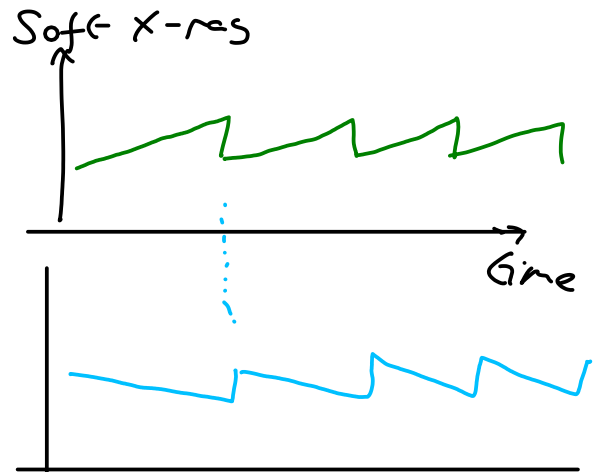
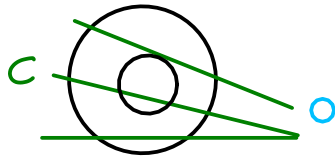
Stabilised pinches e.g. ZETA

Observed quiet (quiescent) states

→ led to work on Reversed Field pinches

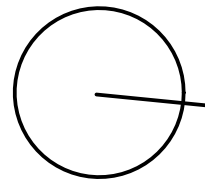
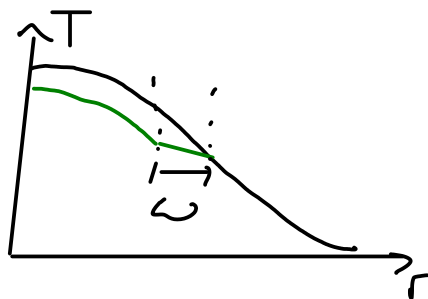
Tokamaks

① Sawtooth



② Extend kinks, Resistive Wall Mode
- Dangerous, can lead to disruption

③ Tearing mode, NTM



Degrade performance