

# TH/P3-1 Full-f gyrokinetic simulation including kinetic electrons

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ECRH modulation tokamak experiments  
observe rotation changes without torque input

- Important for rotation control in ITER
- Fast profile changes in  $\sim 10\text{ms}$
- Momentum transport is largely unknown

Electron heating modulation numerical  
experiments using full-f gyrokinetic code GT5D

- New kinetic electron model [Idomura, JCP16]
- Full-f ITG-TEM simulation over  $\sim 20\text{msec}$
- Ion heating is switched to electron heating

Validation against ASDEX-U [McDermott, PPCF11]

- Transition from ITG ( $\omega < 0$ ) to TEM ( $\omega > 0$ )
- Density peaking in TEM phase
- Rotation change in ctr-current direction

→ Toroidal angular momentum balance shows  
rotation drive induced by particle transport

