EFDA
EUROPEAN FUSION DEVELOPMENT AGREEMENT

Task Force Integrated Tokamak Modelling

ITER Scenario Modelling (ISM)

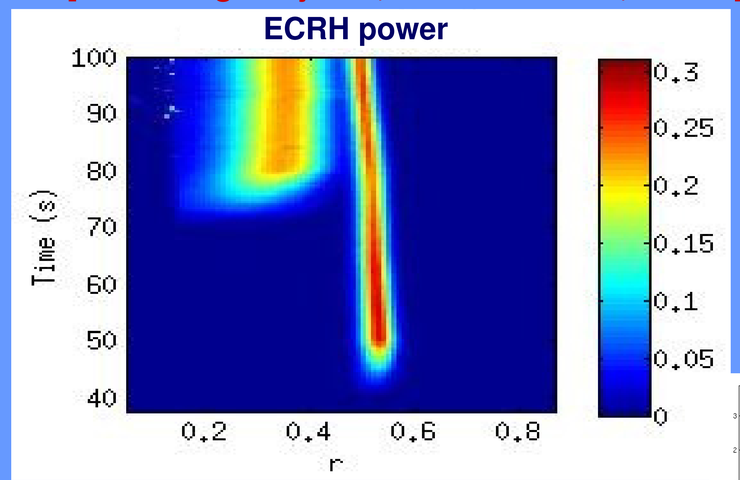
Integrated scenario modelling is essential to prepare ITER plasma operation

ISM group within ITM-TF provides support to:

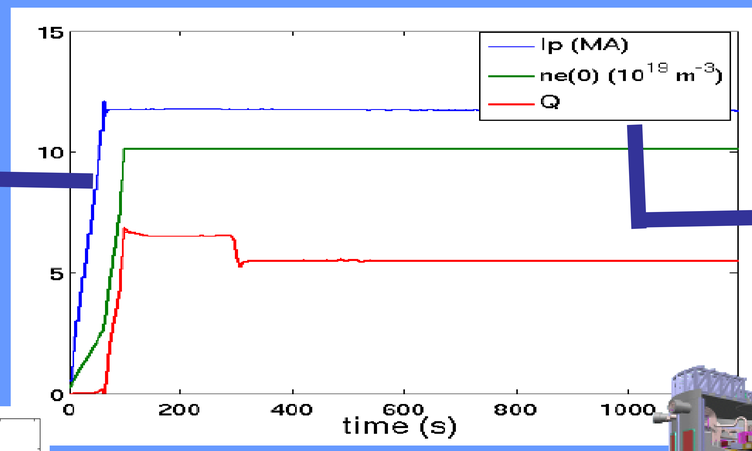
– interpretative and predictive integrated scenario modelling on existing EU experiments : model validation

– scenario modelling activities to cover the preparation of operational scenario for ITER, JT60-SA, DEMO : prepare safe operation

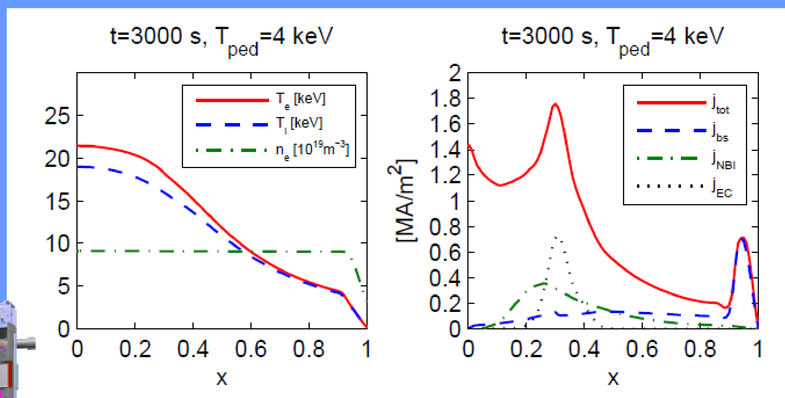
Optimisation of the initial phase of ITER operation: ECCD assisted plasma current ramp up with optimised safety factor profile preventing MHD instabilities
[G.M.D.Hogeweij et al, this conference, P2.134]

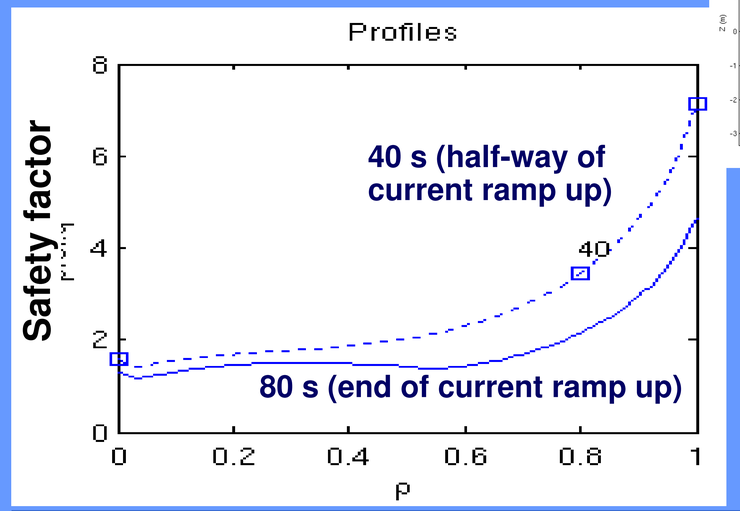


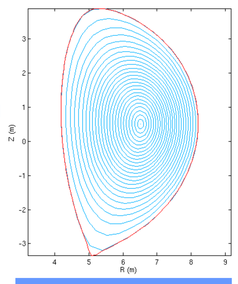
Long pulse ITER operational scenario optimised in simulations: evolution of plasma current, density and fusion Q

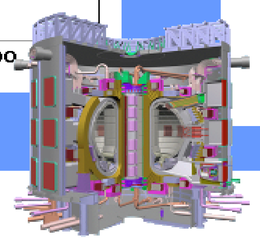


Burn phase for one of proposed scenarios: electron, ion temperatures and density profiles, inductive, RF and NBI driven current densities, and safety factor [J Citrin Nuc Fusion 2010 and
[J. Garcia, et al, this conference, P2.122]









ITER Scenario

$I_{non\text{-}inductive}/I_p$

— 20% —

— 50% —

— 100% —

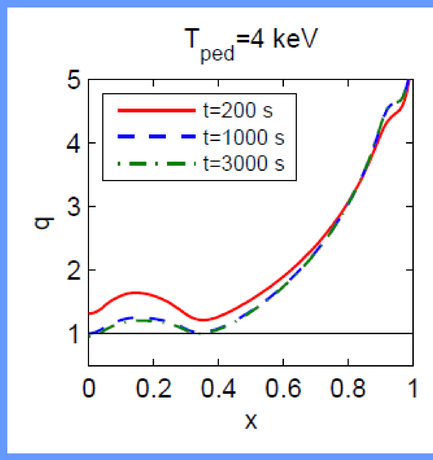
- **Inductive operation**
  - Q ≥ 10 Ip~15MA 400s
- **'Intermediate'**
  - Q ~5-10 Ip~12MA 1000s
- **fully non-inductive**
  - Q~5 Ip~9MA 3000s
  - Active research activity
  - Integration of physics & technology

$I_{bootstrap}/I_p$

— 7% —

— 20% —

— 50% —



J. Citrin et al., Nucl. Fusion 50, 115007 (2010).

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