

10. OTHER THEORY AND MODELLING STUDIES

This project will have five research lines, where the following main activities are foreseen:

- *Plasma momentum braking studies*
 - Investigation of the toroidal plasma angular momentum braking with the Error Field Correction Coils at JET using a numerical code developed for toroidal plasmas;
- *Studies on the physics of neo-classical tearing mode (NTM) triggering*
 - Investigation of the nonlinear growth of the tearing mode near marginal stability conditions; a scan in plasma parameters (namely the magnetic Reynolds and Prandtl numbers) will be made to assess the conditions leading to nonlinear growth and saturation of the mode;
- *Magnetic reconnection studies*
 - A forced reconnection numerical code will be pursued to test different boundary conditions on the plasma edge and assess their role on the dynamics of reconnection events; it will be applied to TEXTOR experiments to investigate the variation of the external Dynamic Ergodic Divertor current threshold for Alfvén mode penetration with plasma rotation and heating;
- *Studies on lower-hybrid wave propagation*
 - A working version of a fully consistent 3D toroidal equilibrium code is expected to be available soon. Comparative tests against other codes, benchmarks and preliminary results will follow.
- *Tokamak equilibria with current density reversal*
 - Effort will be put into extending this framework to nonstatic equilibria, hoping to clarify if plasma flows may lead to a toroidal current reversal.