

# Numerical modelling of the nonlinear ELM cycle in tokamaks

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## Abstract

A numerical model of the nonlinear evolution of edge localized modes (ELMs) in tokamaks is presented. In the model discussed here it is assumed that thermoelectric currents flow in short connection length flux tubes, initially established by error fields or other non-axisymmetric magnetic perturbations. Magnetic perturbations resulting from the currents are incorporated into the magnetic topology. The predictions are compared to measurements at the DIII-D tokamak. Excellent agreement between the calculated magnetic structures on the vessel wall and camera observations during an ELM cycle is shown. The ELM collapse process is discussed.

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