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# TH/P4-27: Modelling of Plasma Response to Resonant Magnetic Perturbations and its Influence on Divertor Strike Points

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Resonant magnetic perturbations (RMPs) for edge localized mode (ELM) mitigation in tokamaks can be modified by the plasma response and indeed strong screening of the applied perturbation is in some cases predicted by simulations. In this contribution we investigate what effect would such screening have on the spiralling patterns (footprints) which may appear at the divertor when RMPs are applied. We use two theoretical tools for investigation of the impact of plasma response on footprints: a simple model of the assumed screening currents, which can be used to translate the screening predicted by MHD codes in a simplified geometry into the real geometry, and the MHD code MARS-F. The former consistently predicts that footprints are significantly reduced when complete screening of the resonant perturbation modes (like it is the case in ideal MHD) is assumed. This result is supported by the result of MARS-F in ideal mode for the case of the MAST tokamak. To predict observed patterns of fluxes it is necessary to take into account the deformation of the scrape-off layer, and for this we developed an approximative method based on the Melnikov integral. If the screening of perturbations indeed reduces the footprints, it would provide us with an important tool to evaluate the amount of screening in experiments, as the footprints can be easily observed. We thus present a comparison between predictions and experimental data, especially for the MAST tokamak, where a significant amount of data has been collected.

## Country or International Organization of Primary Author

Czech Republic

**Primary author:** Mr CAHYNA, Pavel (Czech Republic)

**Co-authors:** Dr KIRK, Andrew (Culham Centre for Fusion Energy); Dr THORNTON, Andrew (EURATOM/CCFE Fusion Association, Culham Science Centre, Abingdon, Oxon, OX14 3DB, UK); Dr NARDON, Eric (Association Euratom/CEA, CEA Cadarache, F-13108, St. Paul-lez-Durance, France); Dr CHAPMAN, Ian (EURATOM/CCFE Fusion Association, Culham Science Centre, Abingdon, Oxon, OX14 3DB, UK); Mr HARRISON, James (EURATOM/CCFE Fusion Association, Culham Science Centre, Abingdon, Oxon, OX14 3DB, UK); Mr PETERKA, Matej (Institute of Plasma Physics AS CR v.v.i., Association EURATOM/IPP.CR, Prague, Czech Republic); Dr SCHMITZ, Oliver (FZ Juelich); Dr PANEK, Radomir (Institute of Plasma Physics AS CR v.v.i., Association EURATOM/IPP.CR, Prague, Czech Republic); Dr LIU, Yueqiang (EURATOM/CCFE Fusion Association, Culham Science Centre, Abingdon, Oxon, OX14 3DB, UK)

**Presenter:** Mr CAHYNA, Pavel (Czech Republic)

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