Validation of the linear ideal MHD model of three-dimensional tokamak equilibria*

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Abstract. We present the first quantitative comparison of linear ideal MHD theory with external magnetic measurements of the non-axisymmetric plasma perturbation driven by external long-wavelength magnetic fields in high-temperature tokamak plasmas. The comparison yields good (within 20%) agreement for plasma pressures up to ~75% of the ideal stability limit calculated without a conducting wall. For higher plasma pressures, the ideal MHD model tends to overestimate the perturbed field indicating the increasing importance of stabilizing non-ideal effects.

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