Abstract Submitted
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A Simple Ideal MHD Model of Vertical Disruption Events in Tokamaks[1] RICHARD FITZPATRICK, IFS, U. Texas at Austin — A simple model of axisymmetric vertical disruption events (VDEs) in tokamaks is presented in which the halo current force exerted on the vacuum vessel is calculated directly from linear, marginally stable, ideal-magnetohydrodynamical (MHD) stability analysis. The basic premise of the model is that the halo current force modifies pressure balance at the edge of the plasma, and therefore also modifies ideal-MHD plasma stability. In order to prevent the ideal vertical instability, responsible for the VDE, from growing on the very short Alfvén time- scale, the halo current force must adjust itself such that the instability is rendered marginally stable. The model predicts halo currents which are similar in magnitude to those observed experimentally. An approximate non-axisymmetric version of the model is developed in order to calculate the toroidal peaking factor of the halo current force.

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