数学与系统科学研究院

计算数学所学术报告

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报告题目：

Hiro currents in Vertical Disruption Events and their simulations

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报告时间：**2013 年 3 月 14 日（周四）**

上午 10:00~11:00

报告地点：　科技综合楼三层 **311**

计算数学所报告厅

Abstract：

Hiro currents in the wall surface are generated when the unstable plasma during disruptions touches the conducting structures. In contrast to eddy currents in the wall, which are generated by perturbations of the magnetic field between the plasma and the wall, Hiro currents are generated by the plasma motion into the wall surface VxB.

Hiro currents due to m/n=1/1 Wall Touching Kink Mode, well identified in JET VDEs, are missed in 3-D simulations due to inappropriate boundary condition on the plasma velocity. After May 2012 and direct measurements on EAST of axisymmetrical Hiro currents during VDE, it became clear that this effects was missed also in interpretations and 2-D simulations of VDEs.

New numerical schemes, based on adaptive coordinates, aligned with the magnetic field, should be used to reproduce tge Hiro currents. Here we present the steps for development of the VDE simulation code system, which includes the interfacing of the core equilibrium code ESC, plasma edge equilibrium code PEC, and conducting shell simulation code SHL. ESC calculates the core plasma up to a virtual internal boundary using Fourier representation of flux coordinates, PEC uses Hermite finite elements between virtual and the real plasma boundary, while the SHL code calculates vacuum magnetic field and the currents (both eddy and Hiro) in a realistic 3-D shell of a tokamak.

The recently developed PEC is now interfaced with ESC as parallel processes. The special software, CodeBuilder (Cb), which maintains the documentation and the source code consistent with each other, was used for code development.

欢迎大家参加！