Abstract Submitted
for the DFD10 Meeting of
The American Physical Society

Numerical simulation of quasi-static magnetohydrodynamic flow in a right-angle bend STIJN VANTIEGHEM, BERNARD KNAEPEN, Universite Libre de Bruxelles, PHYSIQUE STATISTIQUE ET DES PLASMAS TEAM — We discuss simulation results of magnetohydrodynamic flows in a right-angle bend in the limit of vanishing magnetic Reynolds number. Both the Hartmann number and the interaction parameter are much larger then one (these are nondimensional estimates of the magnitude of the electromagnetic interaction with respect to the vicous term, respectively to the inertial term). Such a configuration is of interest in the context of the design of self-cooled blankets for future fusion devices. We consider the situation in which the magnetic field is perfectly aligned with the outflow direction, as well as a so-called backward elbow, in which the magnetic field lines make a positive angle with the to the outflow direction. Both cases are characterized by a thin, intense shear layer, aligned with the magnetic field, in the vicinty of the inner corner. We present results for steady as well as non-steady cases and various values of the Hartmann number. These results will be compared to existing asymptotic analysis and experimental data.

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Date submitted: 05 Aug 2010 Electronic form version 1.4