

Implementation of electrically insulating boundary conditions in an unstructured finite-volume algorithm for the MHD equations.

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As a follow-up to previous eGDR meetings, we will further discuss the implementation of a (local) unstructured finite-volume code for solving the MHD equations in a geodynamo context. In this presentation, we will address the issue of electrically insulating boundary conditions. Different approaches to solve the exterior problem will be presented (solution of a Laplace equation in an extended but finite exterior, boundary-element formulation). We will validate our implementation by comparing against analytical solutions and results obtained with spectral codes. Finally, we will also present preliminary simulations of MHD problems in (simple) geometries that are typically hard to deal with in the framework of spectral codes.