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Immersed boundary methods for magnetically confined conducting fluids KAI SCHNEIDER, M2P2-CNRS & CMI, Aix-Marseille University, Marseille, France — Immersed boundary methods for computing confined fluid and plasma flows in complex geometries are reviewed. The mathematical principle of the volume penalization technique is explained, giving examples for imposing Dirichlet and Neumann boundary conditions. Applications for plasma turbulence in three space dimensions, solving the visco-resistive MHD equations in toroidal domains, illustrate the applicability and the efficiency of the method in computing flows in complex geometries. Examples for generating rotational flows in toroidal geometries and the emergence of quasi-single helicity states in RFP devices are presented. Ref.: K. Schneider. Immersed boundary methods for numerical simulation of confined fluid and plasma turbulence in complex geometries: a review. J. Plasma Phys., doi:10.1017/S0022377815000598, 2015, in press.

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