

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Nonlinear 3D MHD verification study: SpeCyl and PIXIE3D codes for RFP and Tokamak plasmas D. BONFIGLIO, S. CAPPELLO, Consorzio RFX, Padova, Italy, L. CHACON, Oak Ridge National Laboratory, USA — A strong emphasis is presently placed in the fusion community on reaching predictive capability of computational models. An essential requirement of such endeavor is the process of assessing the mathematical correctness of computational tools, termed verification [1]. We present here a successful nonlinear cross-benchmark verification study between the 3D nonlinear MHD codes SpeCyl [2] and PIXIE3D [3]. Excellent quantitative agreement is obtained in both 2D and 3D nonlinear visco-resistive dynamics for reversed-field pinch (RFP) and tokamak configurations [4]. RFP dynamics, in particular, lends itself as an ideal non trivial test-bed for 3D nonlinear verification. Perspectives for future application of the fully-implicit parallel code PIXIE3D to RFP physics, in particular to address open issues on RFP helical self-organization, will be provided.

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Date submitted: 23 Jul 2010

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