

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Gyrofluid model implementation using the 2DX eigenvalue code

D.A. BAVER, J.R. MYRA, Lodestar Research Corporation, M.V. UMANSKY, Lawrence Livermore National Laboratory — The 2DX code is a linear eigenvalue solver primarily designed to solve fluid models of plasma instability in the boundary region of a diverted tokamak. Since kinetic effects are significant for many important instabilities in the plasma edge and scrape-off layer, extending the capabilities of the code to include such effects is desirable. To address this issue, we examine several gyrofluid models using 2DX. The inherent flexibility of the 2DX equation parser allows this to be done in a relatively straightforward manner. The principal complication arises from the presence of integral operators in many gyrofluid models. This can be addressed by approximating integral operators as differential operators by a variety of methods. In addition, we will also report on ongoing benchmarking and physics applications of 2DX using conventional fluid models. Work supported by the U.S. DOE under grant DE-FG02-07ER84718.

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Date submitted: 26 Jul 2010

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