Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Using Ponderomotive Force from the VSim RF Code in the SOLT3D and NIMROD Codes[1] DAVID SMITHE, TOM JENKINS, JAKE KING, ALEXEI PANKIN, Tech-X Corporation, ANDRIS DIMITS, MAXIM UMANSKY, Lawrence Livermore National Laboratory — The VSim software [1] is a fast time-scale time-domain code that can be used to model accurate 3D antenna geometry, and the coupling to, and propagation of RF energy in fusion plasmas. It now computes a Ponderomotive Force source term intended for use in slow time-scale codes for equilibrium and turbulence calculations. This includes source terms for electron and ion momentum equations, and also source terms for the vorticity equation, in addition to the more typical energy source terms. In this paper we look specifically at coupling to the SOLT3D code built on the BOUT++ framework [2], and the NIMROD code[3]. We discuss the various data formatting and mesh interpolation issues relating to transferring data between VSim and these codes. We are primarily interested in applications of the codes to tokamak configurations with ICRF, helicon, and/or LH RF sources, and we look at examples of these cases. The analysis includes tensor force terms contributing in both the poloidal plane and in the toroidal plane. [1] Nieter and Cary, Journal of Computational Physics 196(2):448–473 (2004). [2] Umansky et al., Computer Physics Communications 180, pp. 887-903 (2009). [3] Sovinec et al., Journal of Computational Physics, 195, 355 (2004).

[1]Supported by DOE grants DE-SC0018319 and DE-FG02-09ER55006.

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Date submitted: 03 Jul 2019 Electronic form version 1.4