

Abstract Submitted
for the DPP13 Meeting of
The American Physical Society

Fully Parallel MHD Stability Analysis Tool¹ VLADIMIR SVIDZINSKI, SERGEI GALKIN, JIN-SOO KIM, FAR-TECH, Inc., YUEQIANG LIU, UKAEA — Progress on full parallelization of the plasma stability code MARS will be reported. MARS calculates eigenmodes in 2D axisymmetric toroidal equilibria in MHD-kinetic plasma models. It is a powerful tool for studying MHD and MHD-kinetic instabilities and it is widely used by fusion community. Parallel version of MARS is intended for simulations on local parallel clusters. It will be an efficient tool for simulation of MHD instabilities with low, intermediate and high toroidal mode numbers within both fluid and kinetic plasma models, already implemented in MARS. Parallelization of the code includes parallelization of the construction of the matrix for the eigenvalue problem and parallelization of the inverse iterations algorithm, implemented in MARS for the solution of the formulated eigenvalue problem. Construction of the matrix is parallelized by distributing the load among processors assigned to different magnetic surfaces. Parallelization of the solution of the eigenvalue problem is made by repeating steps of the present MARS algorithm using parallel libraries and procedures. Preliminary results of the code parallelization will be reported.

¹Work is supported by the U.S. DOE SBIR program.

Vladimir Svidzinski
FAR-TECH, Inc.

Date submitted: 11 Jul 2013

Electronic form version 1.4