Fully Parallel MHD Stability Analysis Tool[1] VLADIMIR SVIDZIN-
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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 itera-
tions 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. Results of MARS parallelization and of the
development of a new fix boundary equilibrium code adapted for MARS input will
be reported.

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