

M3D-C1 Release Notes

Version 1.9

What's New

Physics Models

- KPRAD [radiation](#) model
- New scalar diagnostics
 - radiated power ("prad")
 - vertical current centroid ("IZ")
 - Integrated [wall forces](#)
- Added kappaf model for gradient-dependent [thermal conductivity](#)
- Made [ikappar_ni = 1](#) default option (when itemp = 0, parallel thermal conductivity acts on ∇T rather than ∇p).

Numerical Methods

- Improved vectorization for better performance on KNL architecture
- Improved implementation of [ikappar_ni = 1](#)

Version 1.8

What's New

Physics Models

- [Breaks in resistive wall](#)
- Added kappag model for gradient-dependent [thermal conductivity](#)

Numerical Methods

- New capability to restart using the HDF5 output (irestart = 1, iread_hdf5 = 1). This is now the default restart option
- Changes to HDF5 file format

Version 1.7

What's New

Physics Models

- [Added options to include perturbed fields for tilts and shifts of TF and PF coils](#)
- Added “tiedge” C1input parameter to set outermost ion temperature in GS equilibria
- Added integral feedback to coil current controllers in GS solve with `gs_vertical_feedback_i` and `gs_radial_feedback_i` C1input parameters
- Updated default boundary conditions for complex case
- Corrected `ivisfunc=10` and `ikappafunc=10` options to read data in m^2/s

IDL Routines

- Added `/phase` option to [plot_m_vs_r](#)
- Changed coordinate system constructed by [flux_coordinates](#) to (`psi_norm`, `theta`, `zeta`), where `psi_norm` is normalized poloidal flux, `theta` increases clockwise around the magnetic axis, and `zeta` increases counter-clockwise around the $R=0$ axis.
- Added `omega_e*` to [plot_omega](#)
- Added `/jpar` and `/velocity` options to [plot_br](#), to plot spectral components of parallel current density and normal velocity

Numerical Methods

- Improvement to calculation of field from magnetic coils
- Updated templates and `create_mesh.sh` to use `m3dc1_meshgen` utility

Version 1.6

What's New

Physics Models

- [Magnetic probe](#) and [flux loop](#) diagnostics
- “Basic-j” and “Basic-q” equilibria
- [Added “db_fac” option to scale physical value of the ion skin depth \(`db\_fac=1` uses physical value\)](#)
- [Added simple bootstrap current model \(`ibootstrap\_model = 1`\)](#)
- [Added simple radiation model \(`iprad=1`\)](#)

- Added ITER templates
- Added option to start 2D complex calculation from 2D real restart files (irestart=3)
- Added option for finite-frequency response calculation (itime_independent=1 and frequency!=0)
- Added [eta_te_offset](#) option for raising resistivity at low temperatures
- Added [gs_pf_psi_width](#) option to smooth pressure profiles across divertor legs

IDL Routines

- Added [plot_mag_probes](#) and [plot_flux_loops](#) routines to plot magnetic probe and flux loop data
- Added “/compensate_renorm” option to [plot_scalar](#) and [plot_mag_probes](#) functions to eliminate discontinuities from renormalizations in linear stability calculations
- Improved calculations of q and [flux_coordinates](#)

Numerical Methods

- Ability to build with BLAS routines (compile with -DUSEBLAS)

Known Issues

- No functioning option for using temperature equation (itemp=1) with two-field model (numvar=1)
- Create_mesh.sh uses deprecated SCOREC executables