Training on MHD stability workflow

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Python based workflow

- Ideal/resistive MHD workflow for linear stability analysis, fully compliant to IMAS using iWrap python actors.

- Configuration fully embedded in a **single JSON file** (modular and self-contained)

- GUI based but can also be executed on the CLI (*driver script skips GUI and optionally also IDS write to db – useful to integrate in other workflows*)

- Includes HELENA, CHEASE, ILSA (MISHKA-1, CASTOR not fully ok) and MARS physics codes. Easily extendable to other codes e.g. MARS-X "*family*"

- Fully *multi-device* compatible and *multi-actor* friendly.

- ***Integration in HFPS started in collaboration with TSVV11.***

Test cases and ongoing/planned work

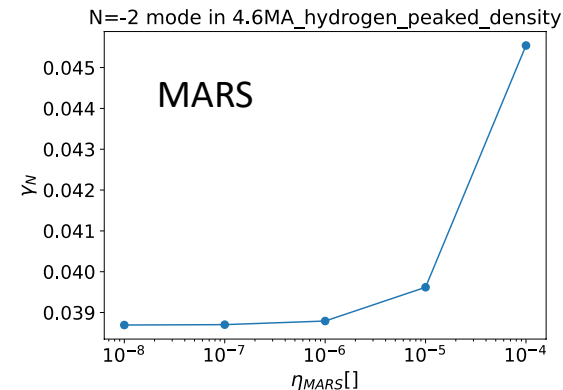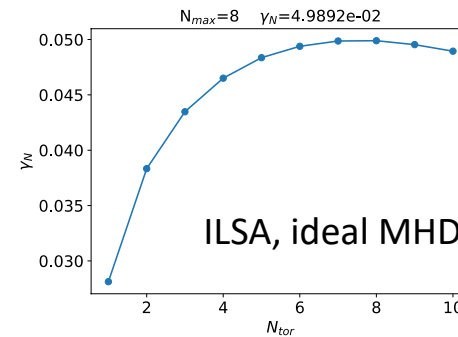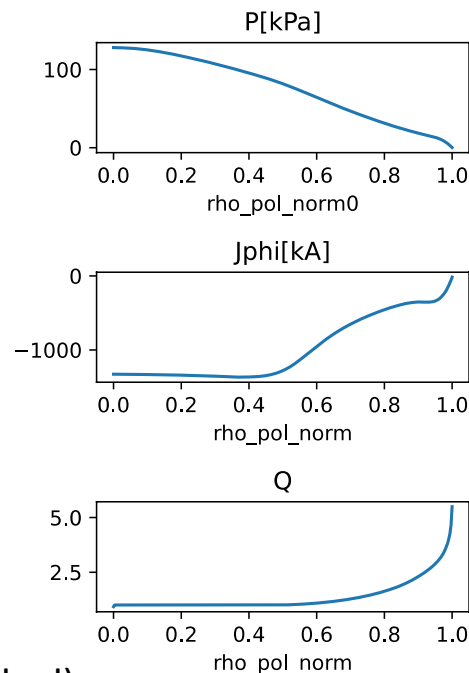- Test cases prepared for JET, AUG, TCV, JT-60SA (legacy scenarios + 4.6MA Jan2024), circular test case.

- ***Integration in HFPS started in collaboration with TSVV11,*** WEST case.

- Migration of MARS (resistive+compressible) to iWrap actor ready (*to be merge to main repo*).

- ***Plan:***

  ➢ Consolidate the documentation for test cases.
  ➢ Conclude central installation as a module at the Gateway (*only iWrap actors right now, DD 3.38.1 compliant, workflow itself not yet*).
  ➢ Provide training for EF users.

Flux mapping — t=18s — CHEASE ->HELENA

P[kPa], Jphi[kA], Q vs rho_pol_norm

$N_{max}=8 \quad \gamma_N=4.9892e\text{-}02$ — ILSA, ideal MHD

N=-2 mode in 4.6MA_hydrogen_peaked_density — MARS
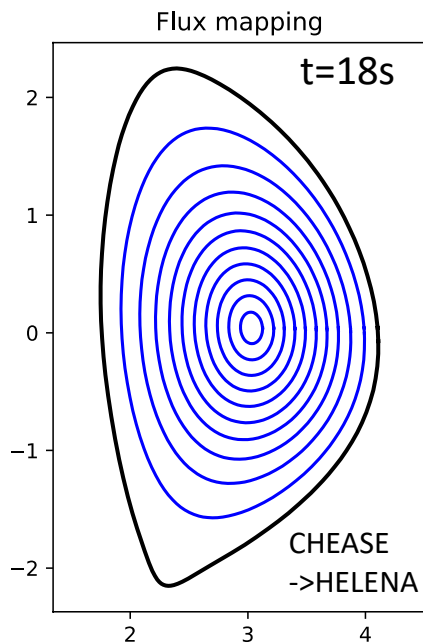
- *Q-profile comes slightly hollow at the core – too low res in original equilibrium – q=1 present (shouldn't !)*

- *Consistency in cocos of original IDS...*

4.6MA Jan2024 (H peaked)