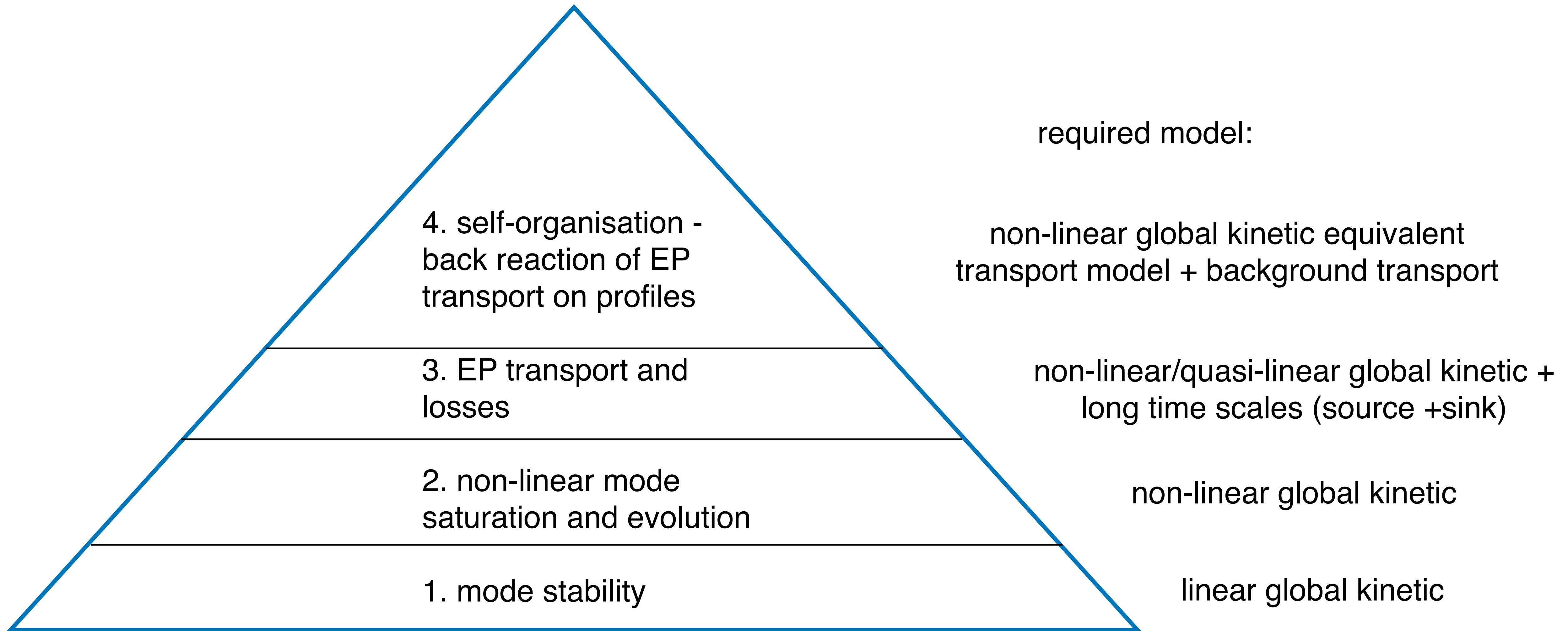


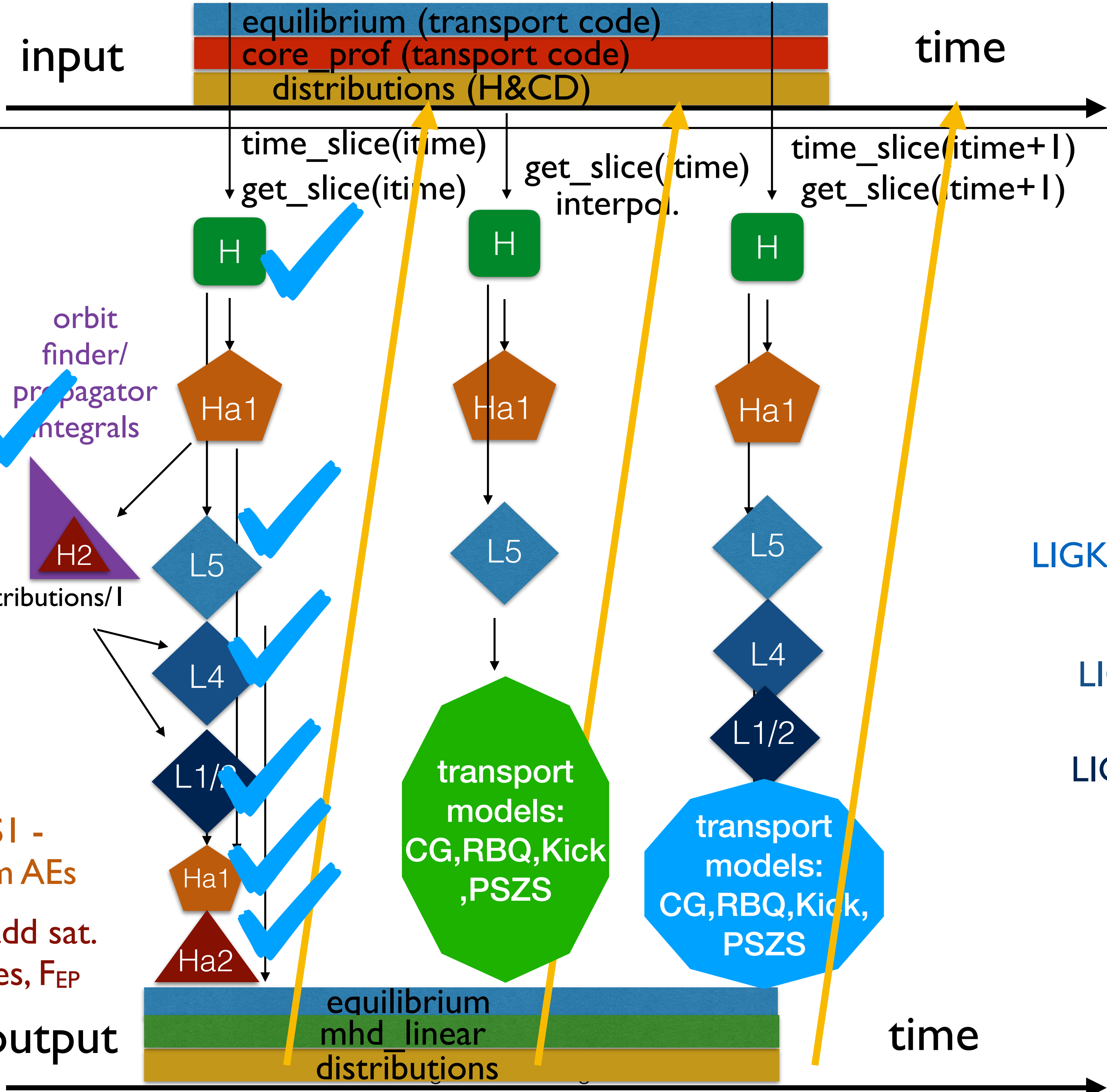
Automated application of the EP workflow to the assessment of EP-stability in ramp-up and steady state plasmas

**Ph. Lauber with input from:
V.-A. Popa, T. Hayward-Schneider (IPP), A. Snicker (VTT)**



within TSVV#10 and ENR ATEP: develop and adopt to IMAS and set up consistent modelling hierarchy

- ✓ ported to gateway
- ✓ read ETS and JINTRAC generated data
- ✓ read trview generated AUG data
- ✓ automated tests & installation



orbit finder/propagator integrals

H2

distributions/l

RABBIT

HAGISI - transform AEs

HAGIS2: add sat. amplitudes, F_{EP}

HELENA

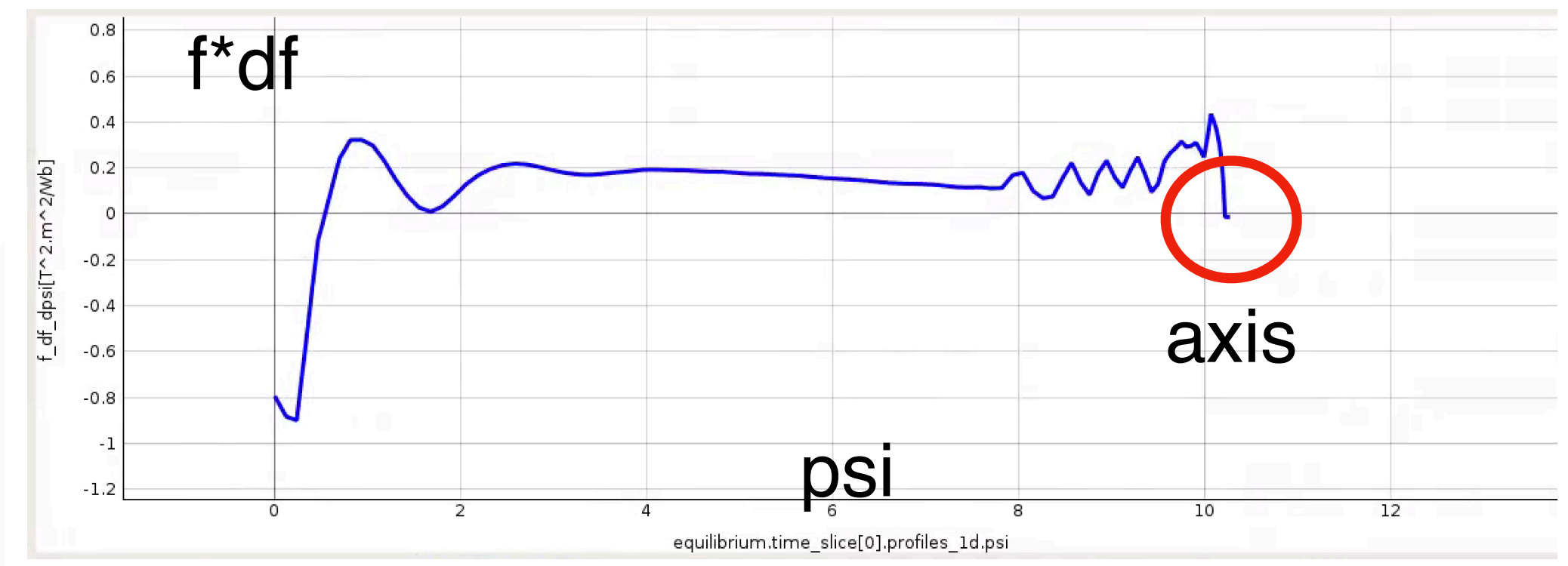
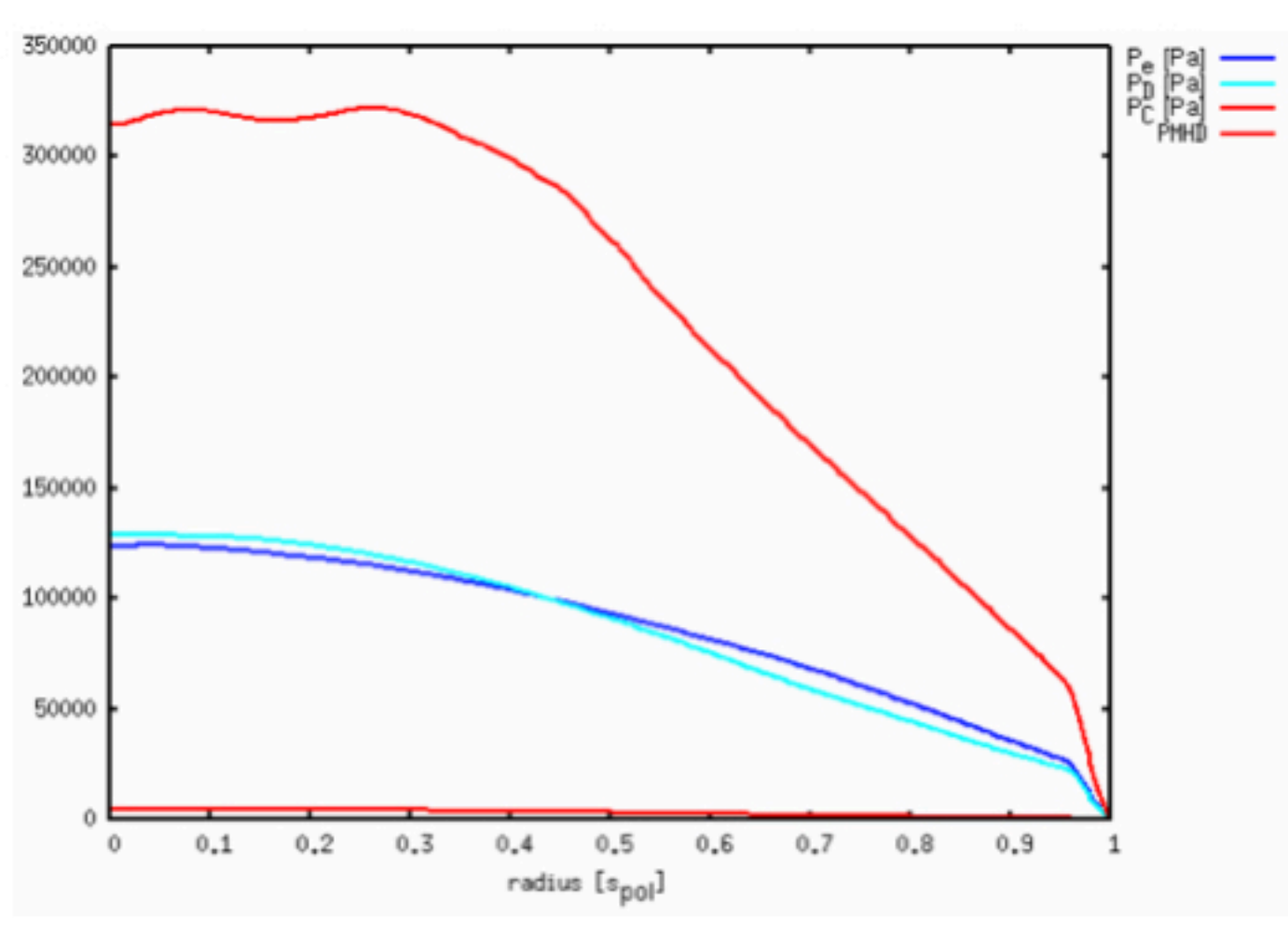
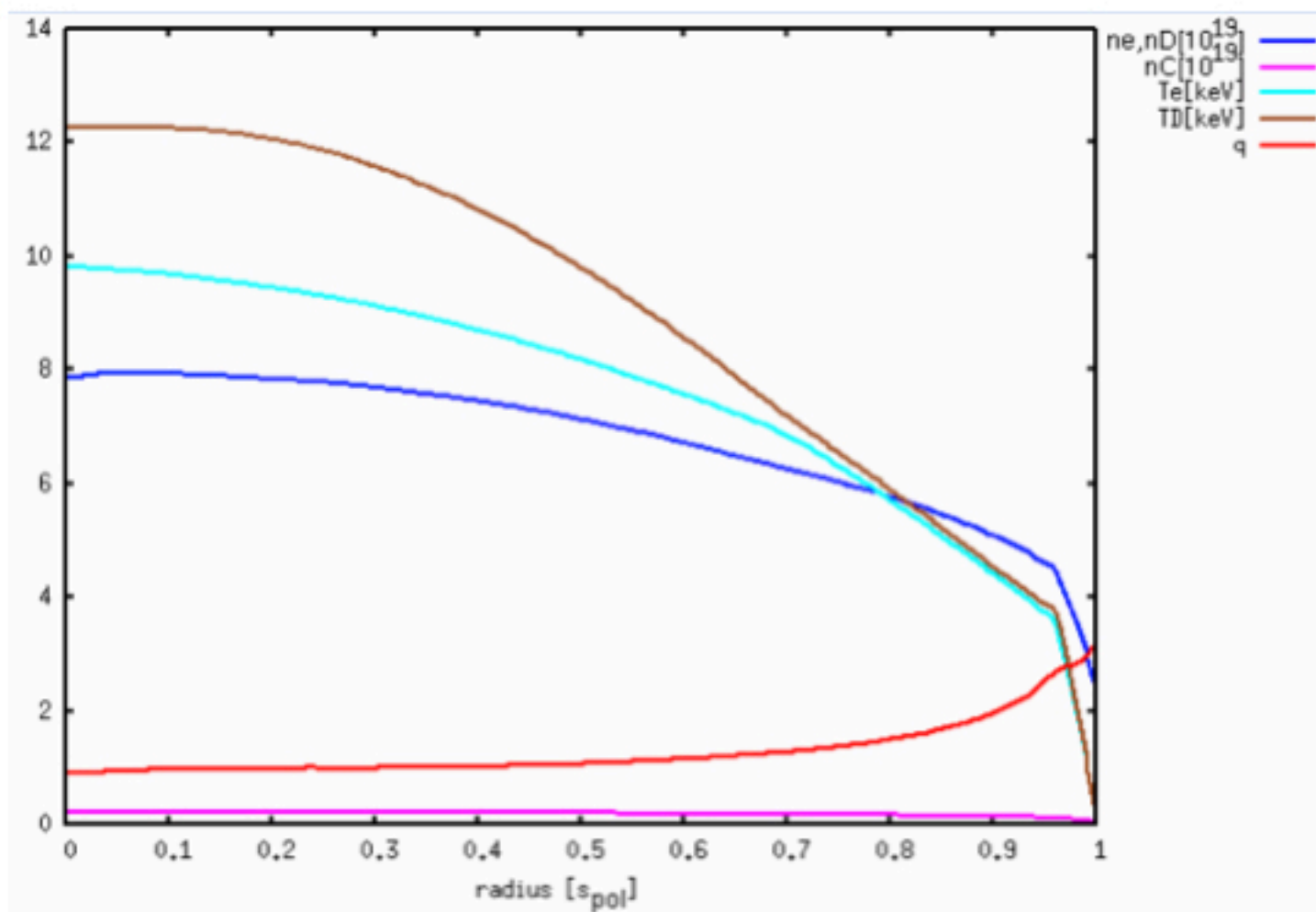
HAGISI - equilibrium

LIGKA mode 5/6 (analytical)

LIGKA mode 4 (local)

LIGKA mode 1/2 (global)

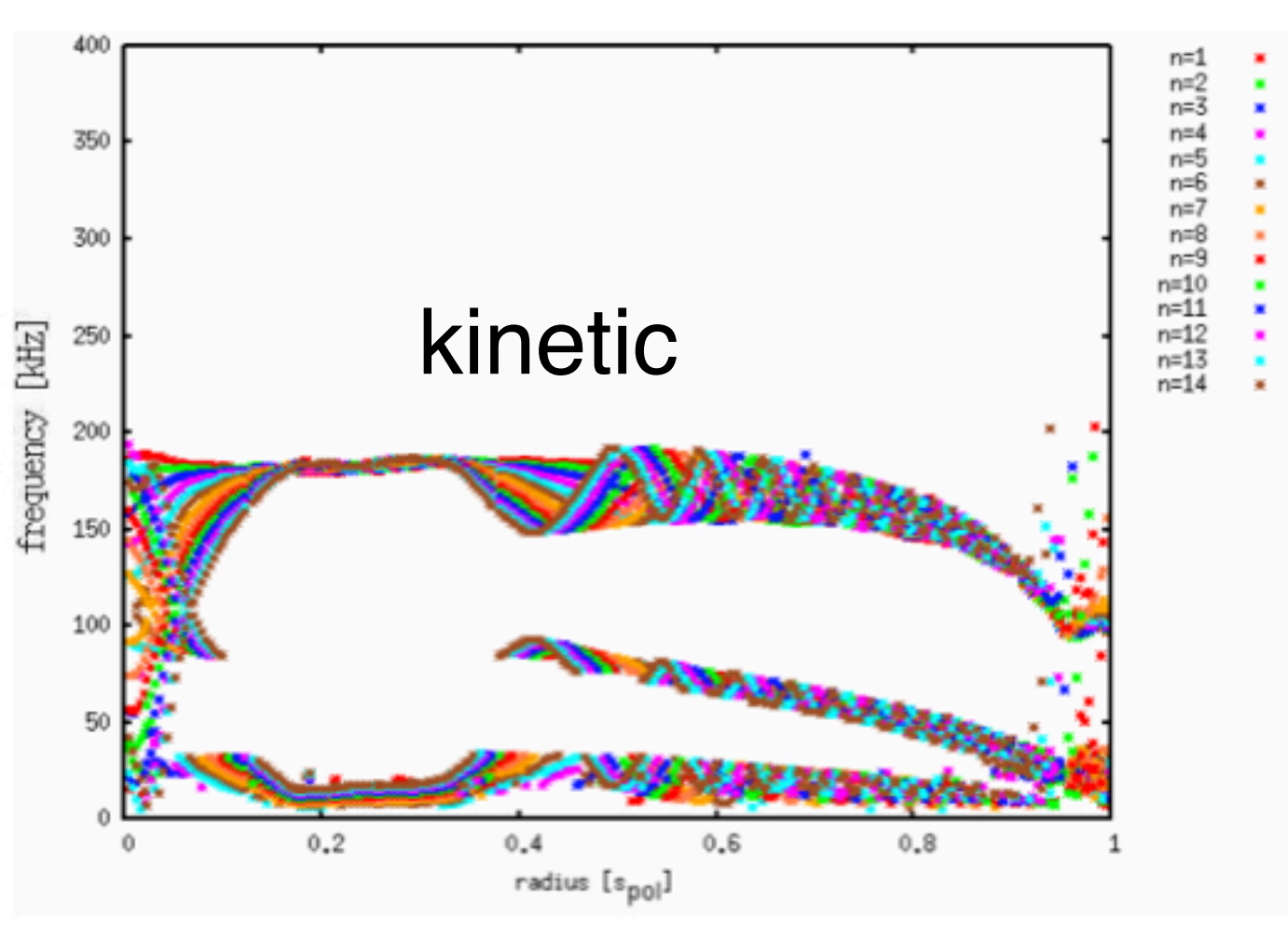
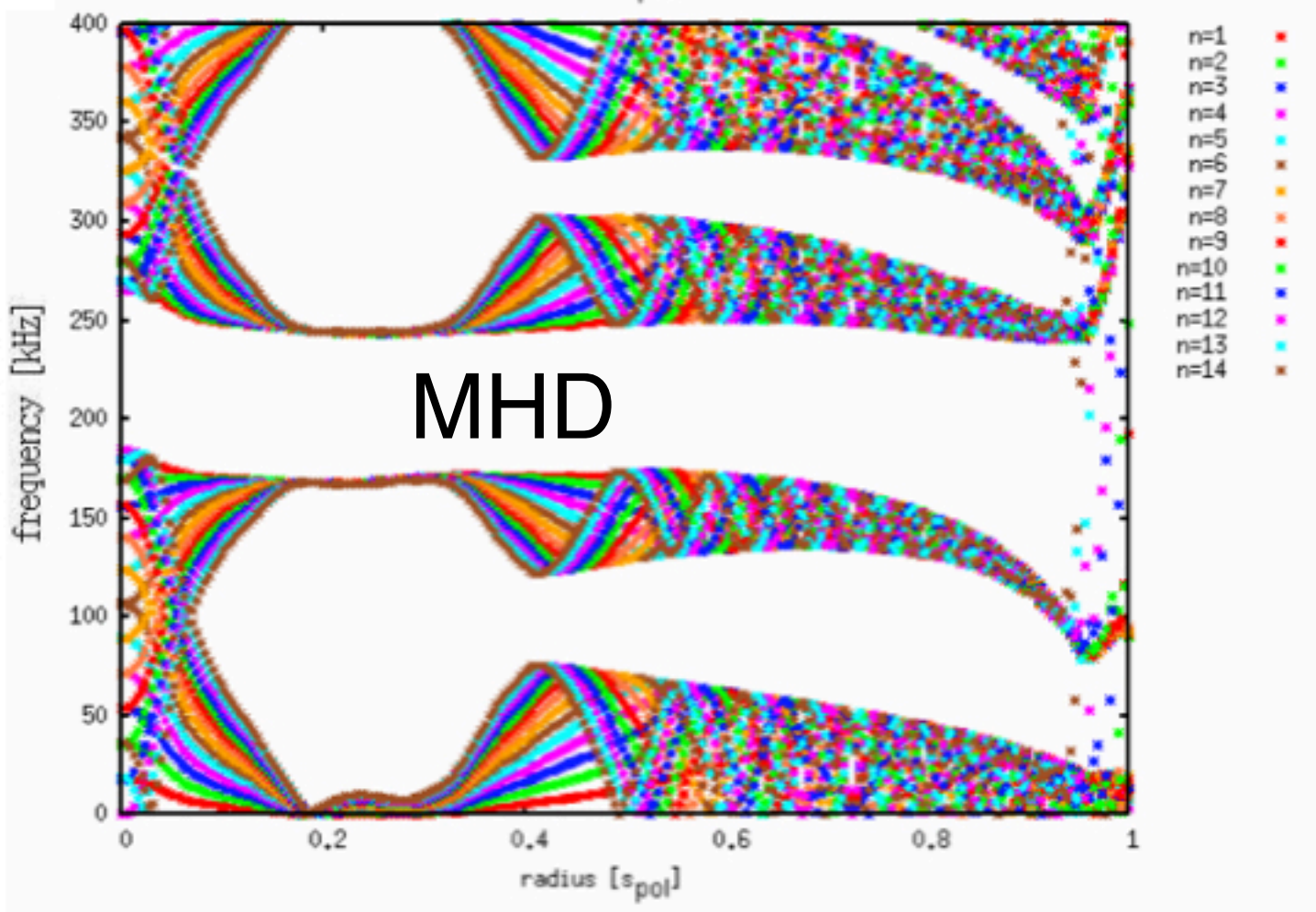
available on gateway

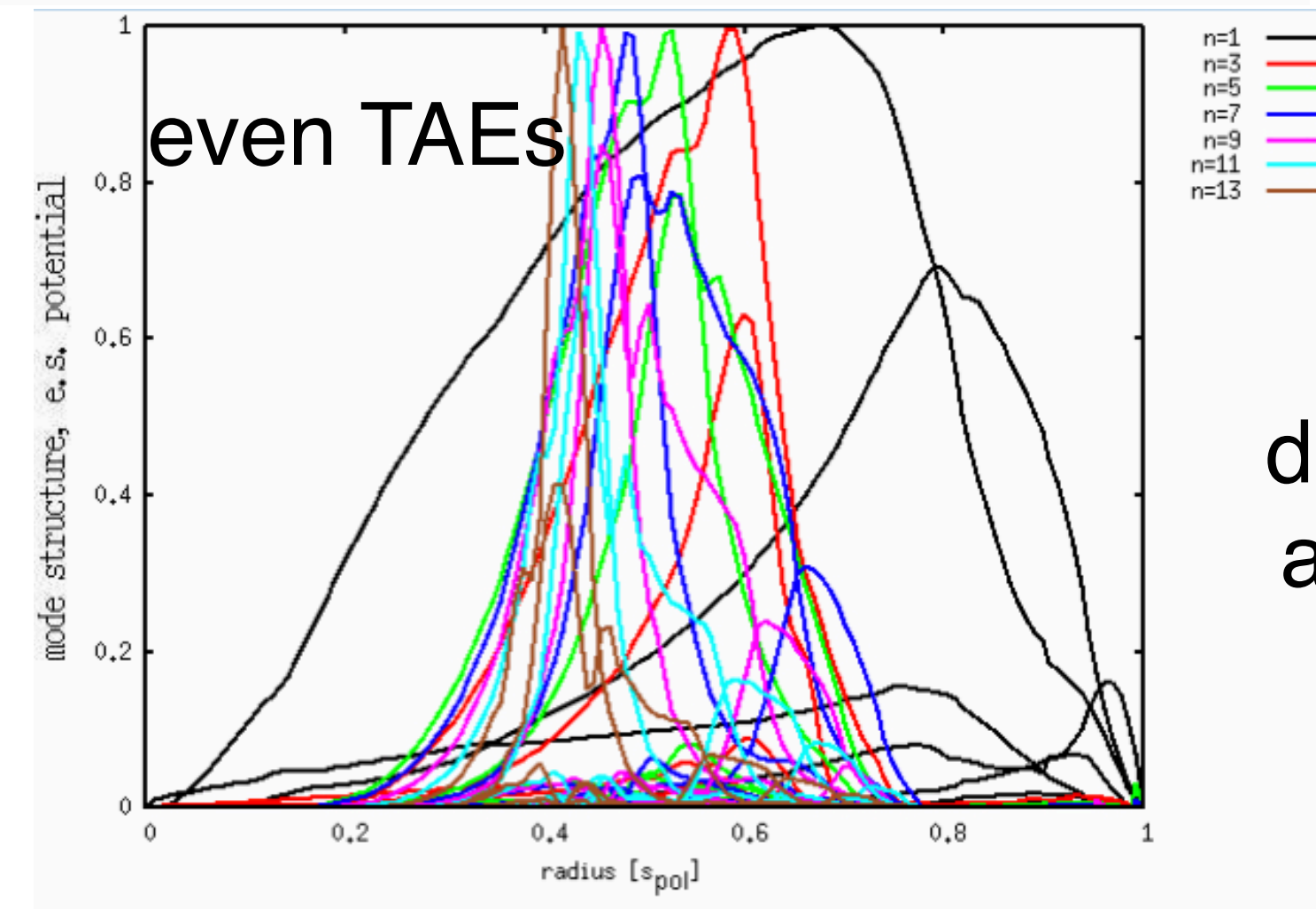
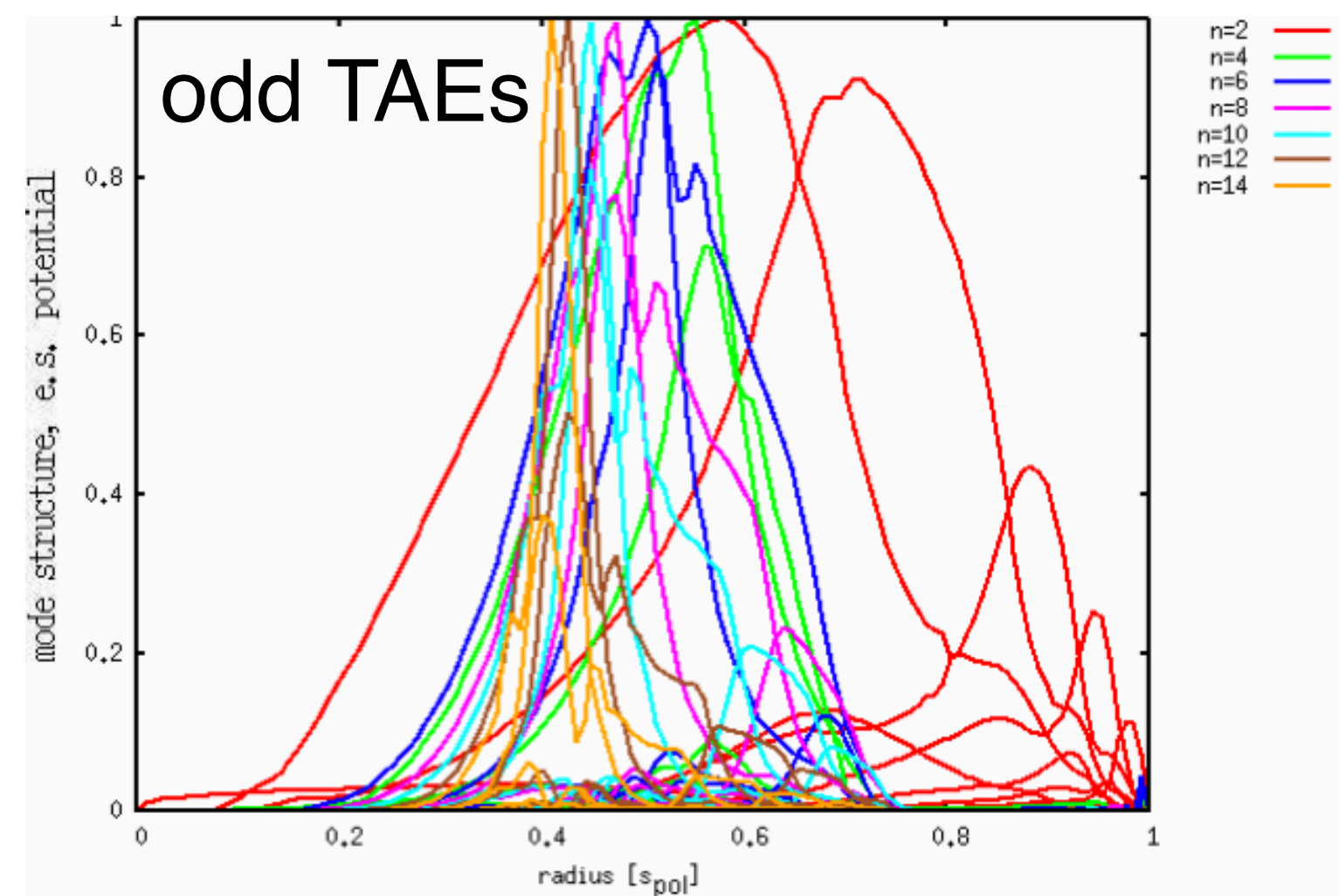
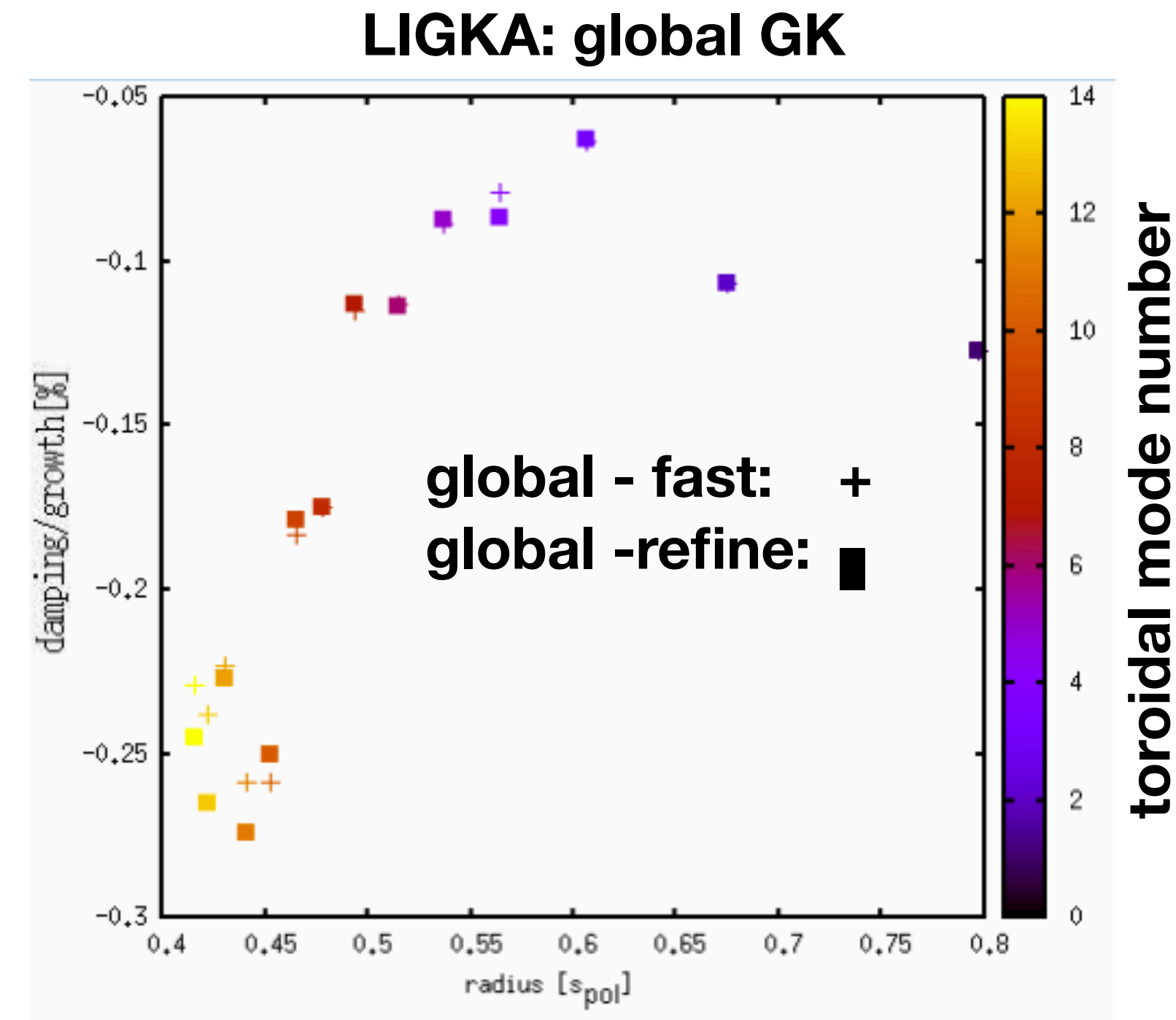
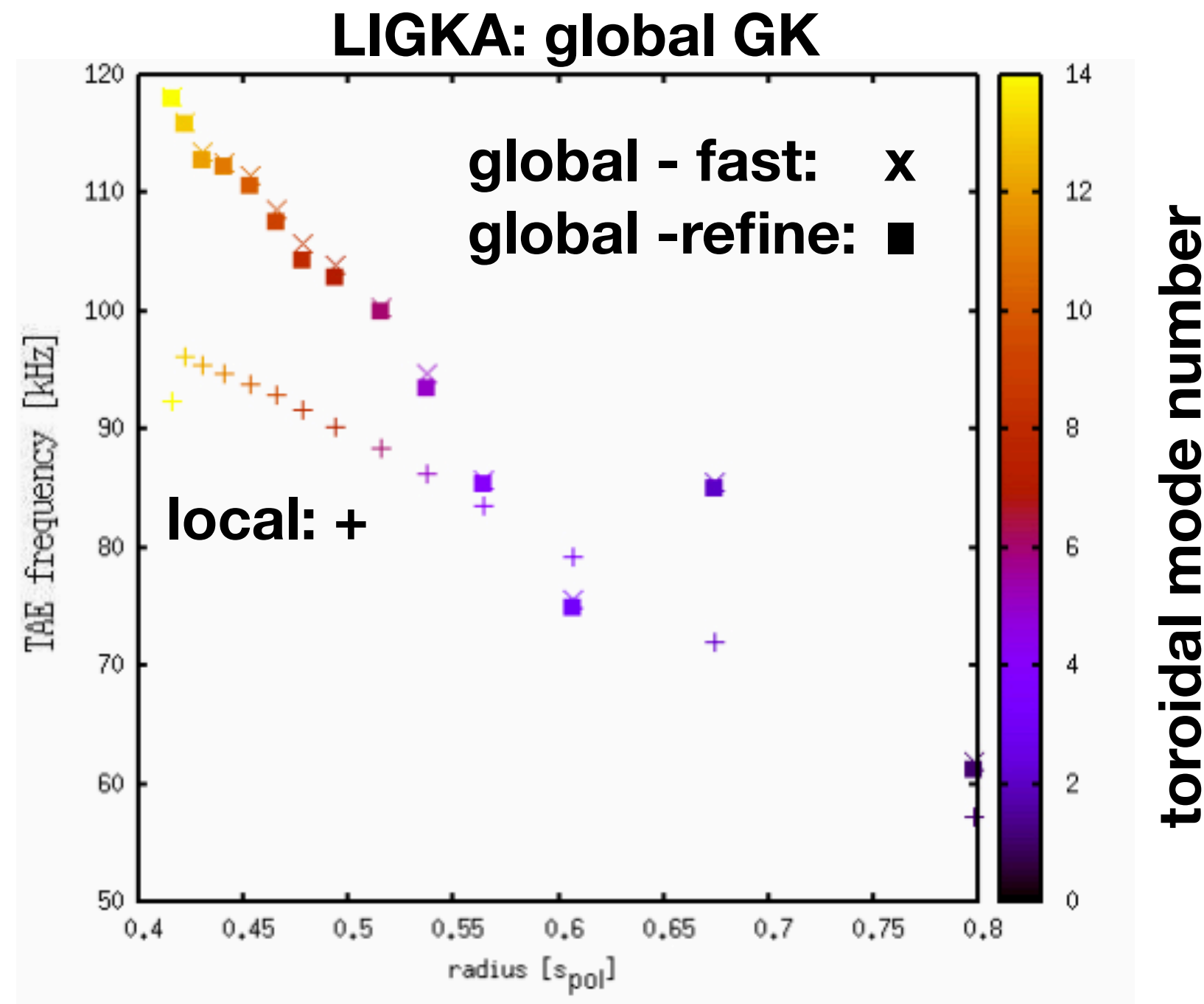


difficulty: profile input from transport codes to equilibrium code

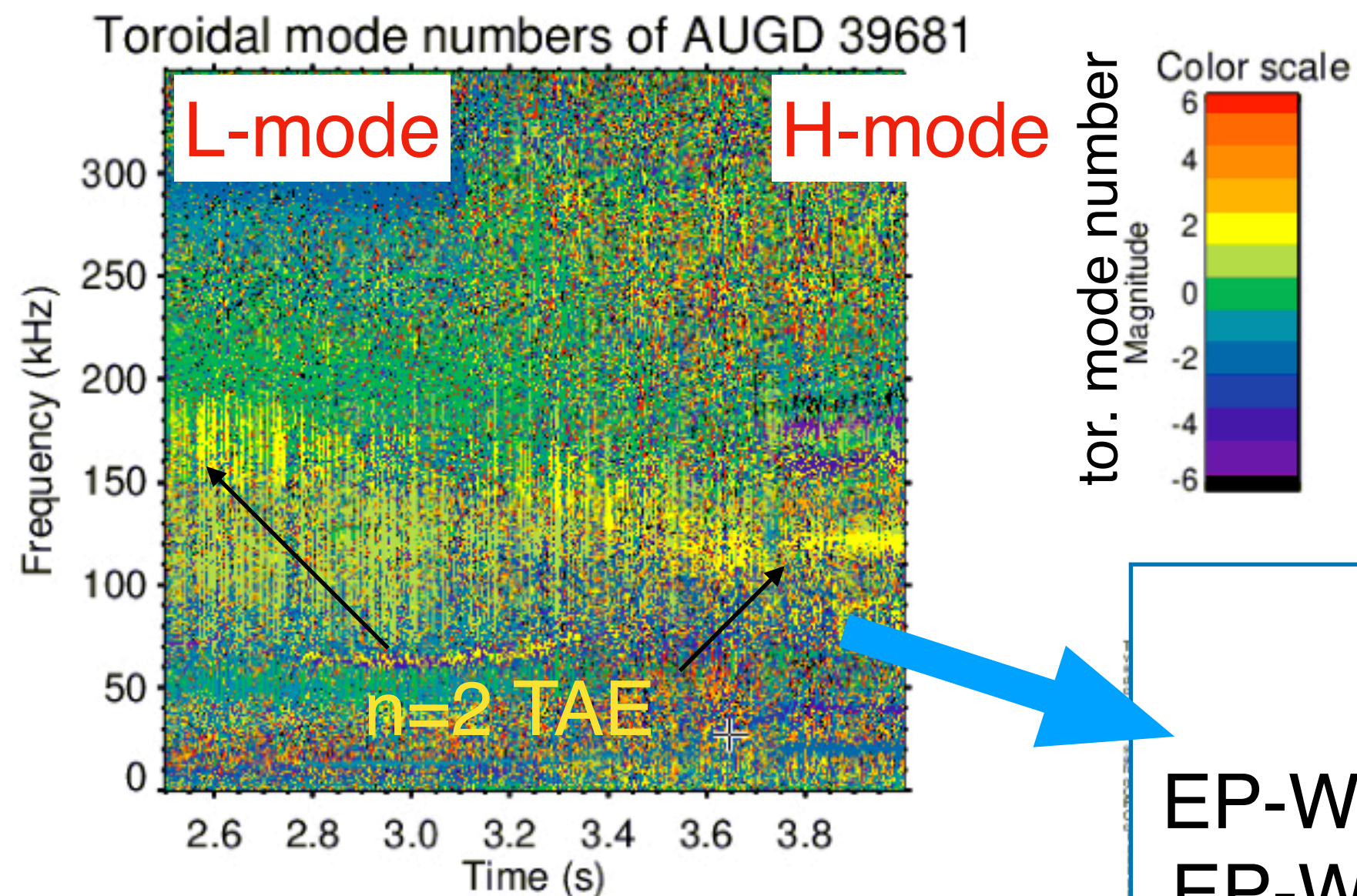
work-around: run cheese, run helena on cheese output

however: somewhat arbitrary q profiles in inner core...



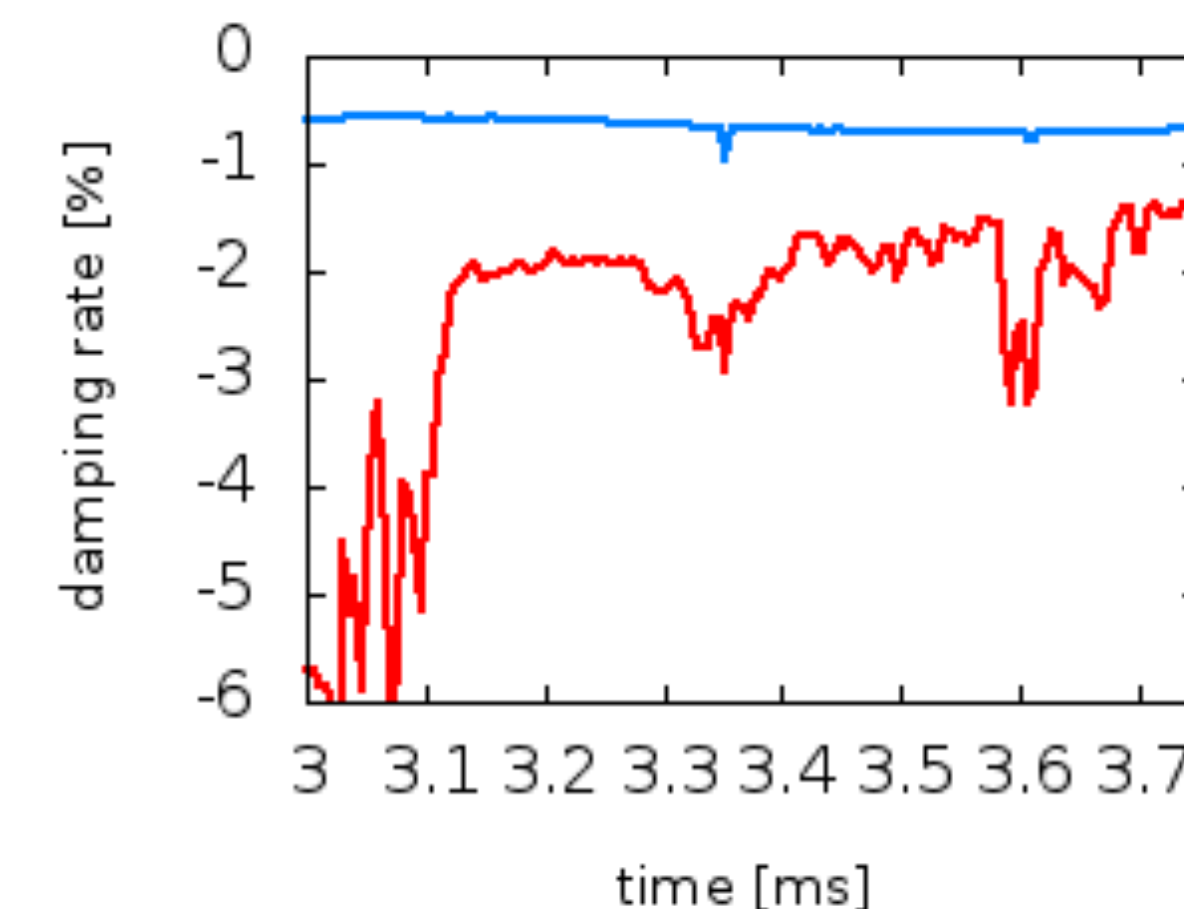
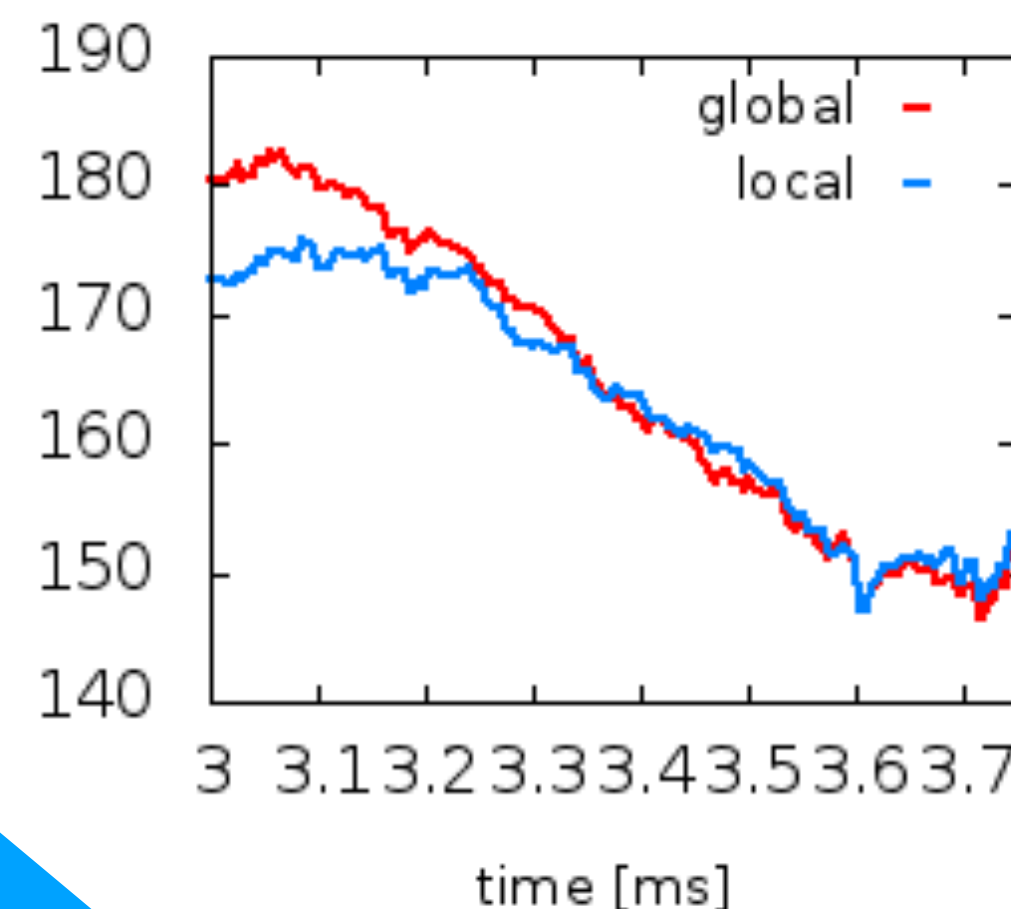


waiting for time-dependent runs to be available in IMAS on gateway...



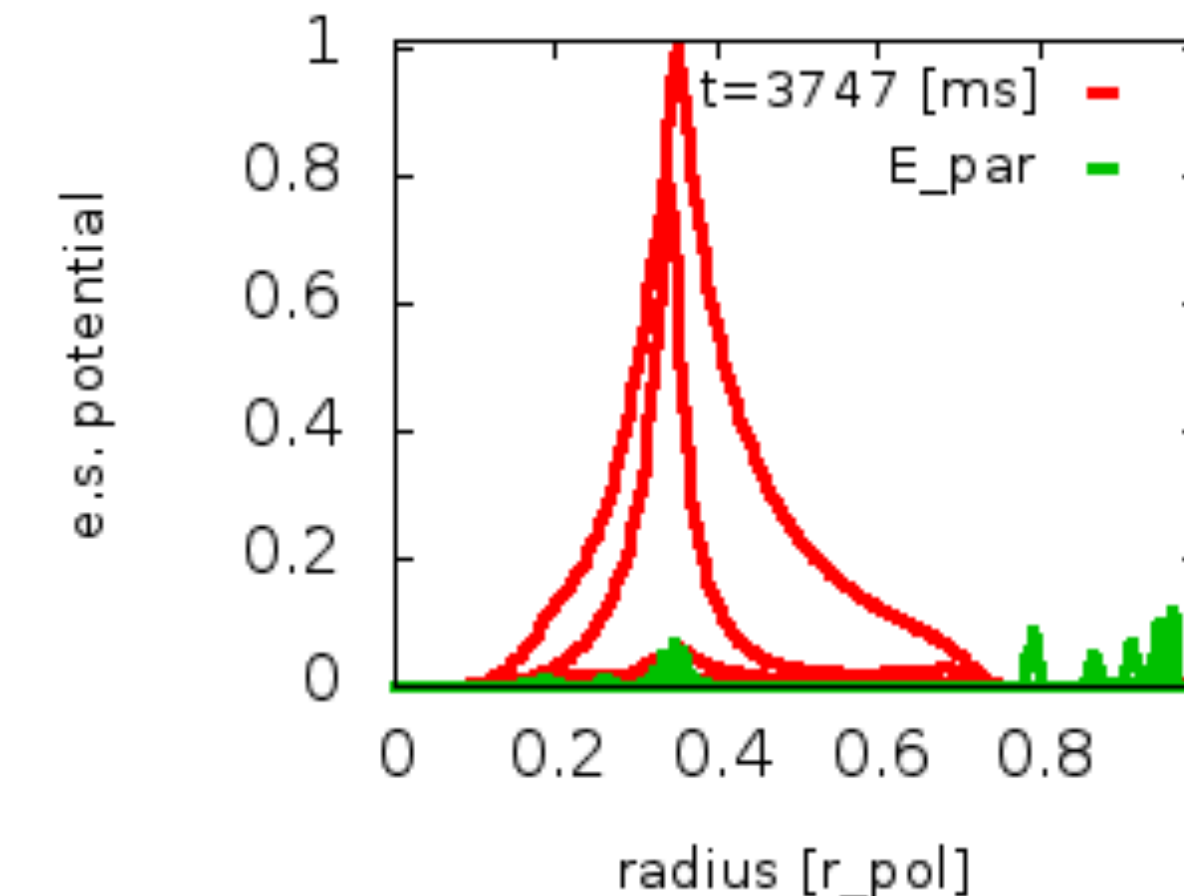
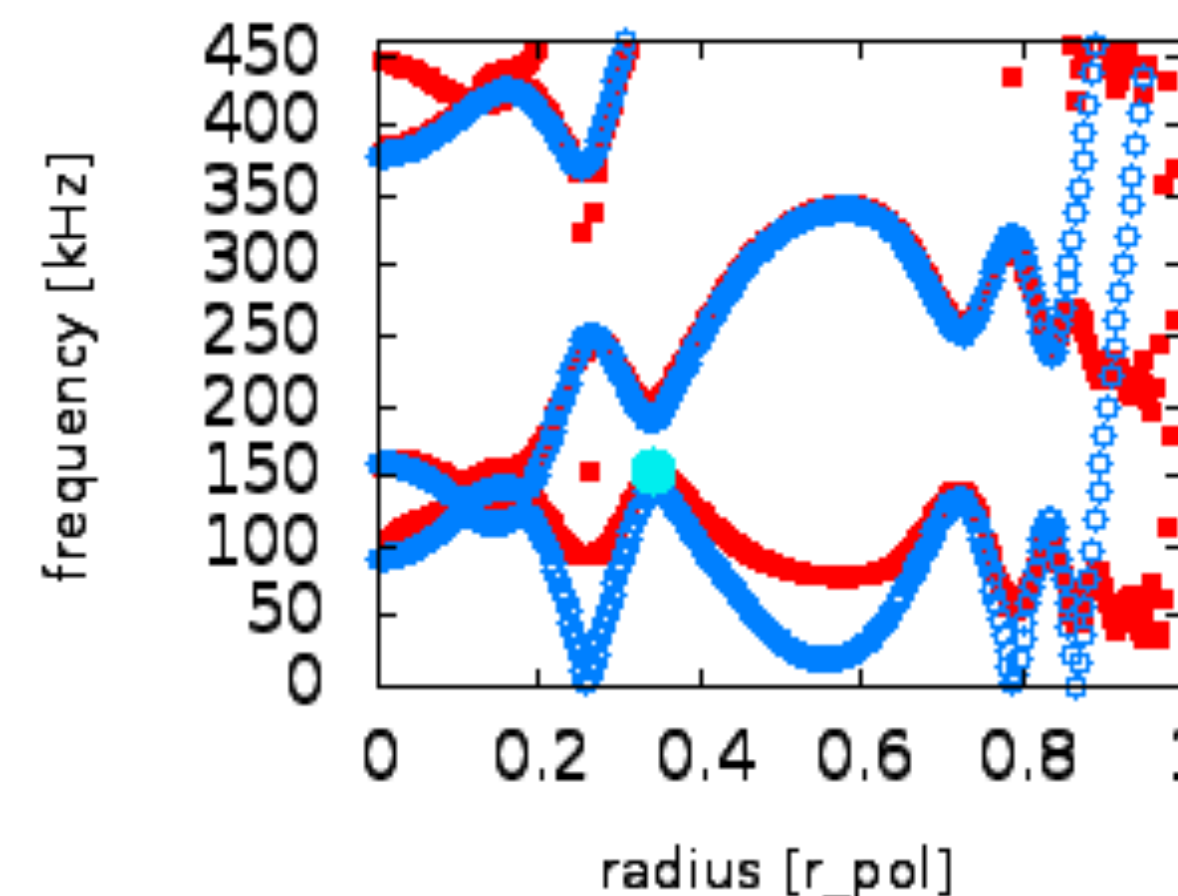
- automated processing of 160 time slices based on IDA equilibria and profiles
- fully implemented in IMAS, ensuring reproducibility

IDA +
TRVIEW +
EP-WF: LIGKA local +
EP-WF: LIGKA global

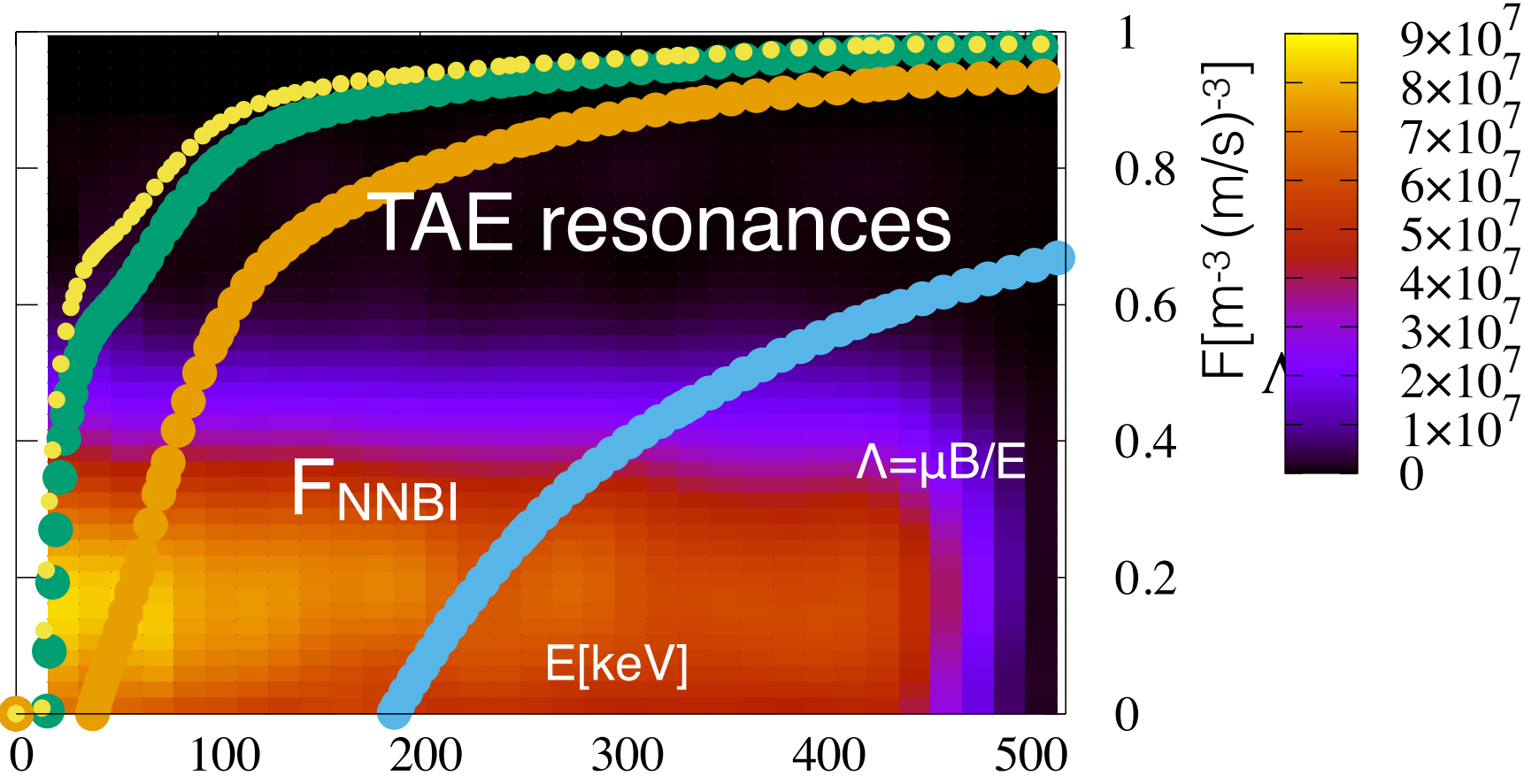
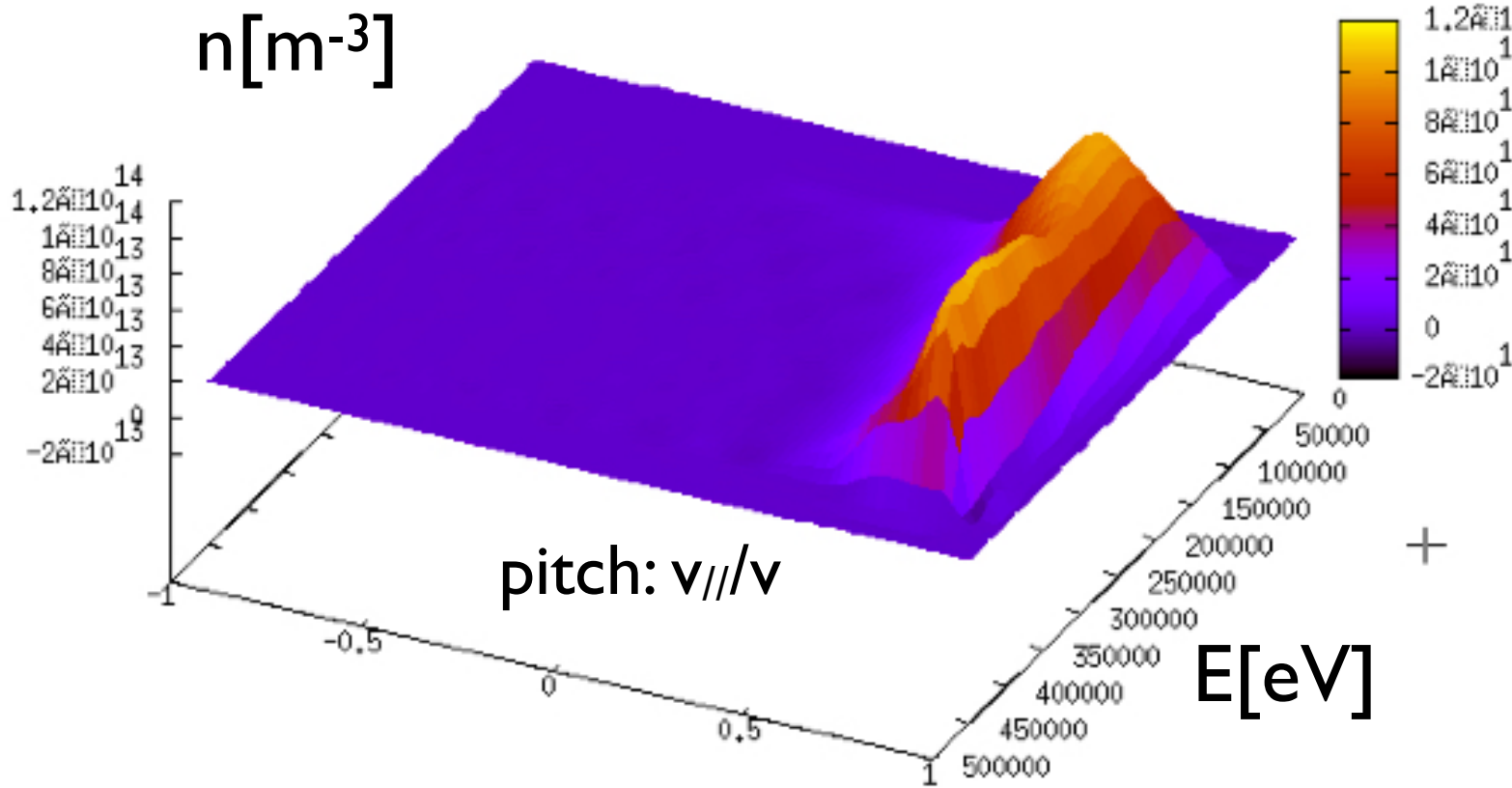


results:

- comprehensive, time-dependent information on linear properties, e.g. understanding of discrepancies between local and global model, sensitivity of damping rate,...
- ready for quasi-linear coupling to transport models in particular phase space zonal structure transport model [ENR ATEP project]
- systematic uncertainty quantification feasible
- ultimate aim: predictive scenario optimisation



[MEGA, A. Bierwage]



- adopt already existing F_EP interfaces to IMAS (partially done)
- additional IMAS problems with large IDs identified and solves
- adopt ASCOT F_EP via IMAS
- start to apply transport models - 2023
- further needs:
 - extending scenario database
 - consistently filled IDs (core_profiles, equilibrium, distributions)
 - IDA-type analysis tools for JT-60SA very valuable: error analysis and UQ urgently needed for predictive studies
- set of standardised tools to process noisy F_EP [ITPA, Bierwage et al 2021]