



ETS5 workflow updates (to be included in the release 5.8.0)

Dmitriy Yadykin



This work has been carried out within the framework of the EUROfusion Consortium and has received funding from the Euratom research and training programme 2014-2018 under grant agreement No 633053. The views and opinions expressed herein do not necessarily reflect those of the European Commission.



- ets module, new (user friendly) way to execute the workflow (CPT)
- internal boundary conditions (Jorge)
- Pedestal prediction (Andreas)

ETS workflow name will change starting from the next release:
ETS_WORKFLOW.xml -> ETS5.xml



- The ways to run workflow:
 - ‘natural’: ets module loaded
 - ets - starts autogui and loads ETS5.xml
 - ets-kepler - starts kepler and loads ETS5.xml
 - ‘usual’: itmenv is loaded and svn with workflow is checked out:
 - set environment variable: `setenv ETS_HOME <folder where you checked out workflow+tools>` (this is to use interactive (plotting) tools like ETSviz)
 - run `kepler.sh` (or `autogui`) as usual

Internal boundary conditions



Possibility to set up boundary conditions on $\rho_{tor_norm} < 1.0$

Logic: solve equations only in the inner part and leave outer part untouched

Workflow modification (user point of view): new parameter in the BEFORE THE TIME EVOLUTION complex actor

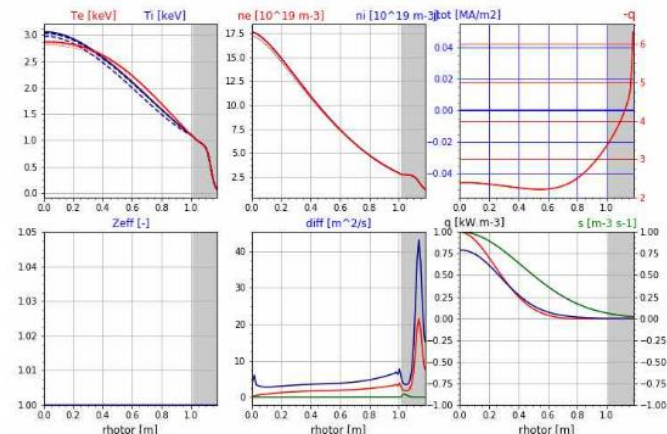
```
BOUNDARY CONDITIONS=====:
```

BOUNDARY CONDITIONS FOR MAIN PLASMA: "Please select ap
===== Current Equation =====:

psi_bnd_type:	OFF
psi_bnd_value:	-18.493E6
== Position of the boundary condition ==:	
inner_rho_bnd_loc:	0.8

Actors that are modified: etsstart, TRANSPORT_EQUATIONS, profilesdatabase

ETSviz is modified to highlight the boundary position



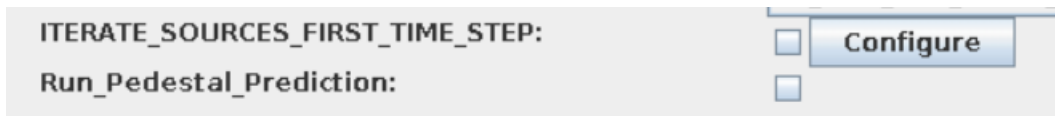
Pedestal prediction



Use 'global' parameters and machine learning to predict T_e , T_i , n_e at the pedestal top

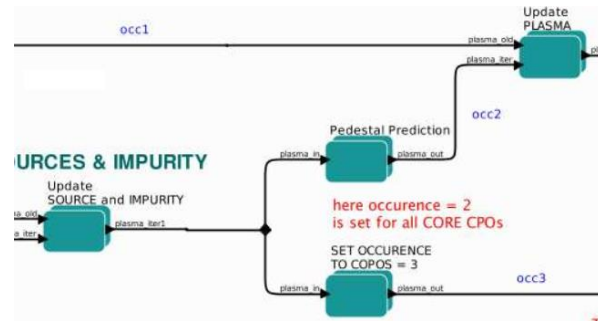
Logic: predict the pedestal top values of T_e, T_i, n_e using input parameters and replace boundary conditions from the predicted values in the coreprof CPO

Workflow modification (user point of view): New parameter to activate prediction in the parameters of the CONVERGENCE LOOP complex actor



Other workflow modifications:

- new complex actor in the convergence loop



- Prediction is done once per time step
- Predicted values are printed out to the MultiTabDisplay
- prediction script is put in the kplots folder