



Plasma background parameters of AUG and JET-ILW

H. Kumpulainen, M. Groth, N. Horsten, V. Solokha
WP PWIE SP D KOM, 21st June 2021

JET

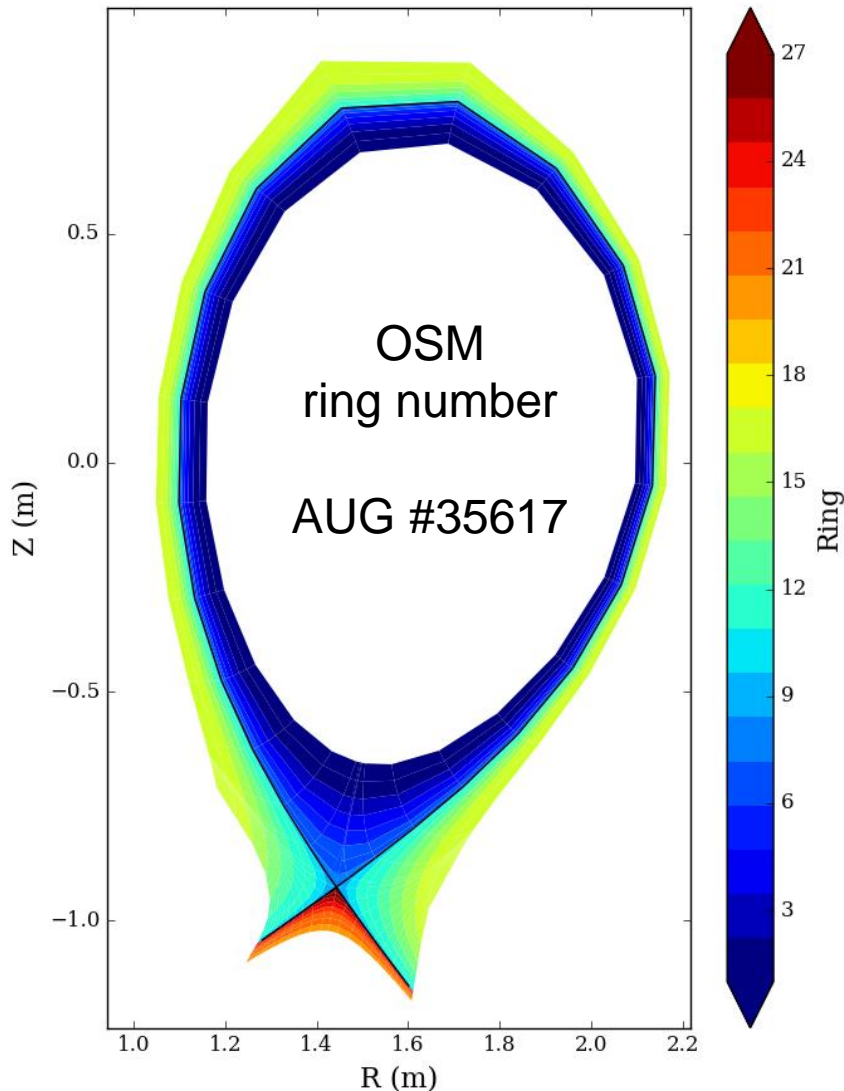
A!

Aalto University



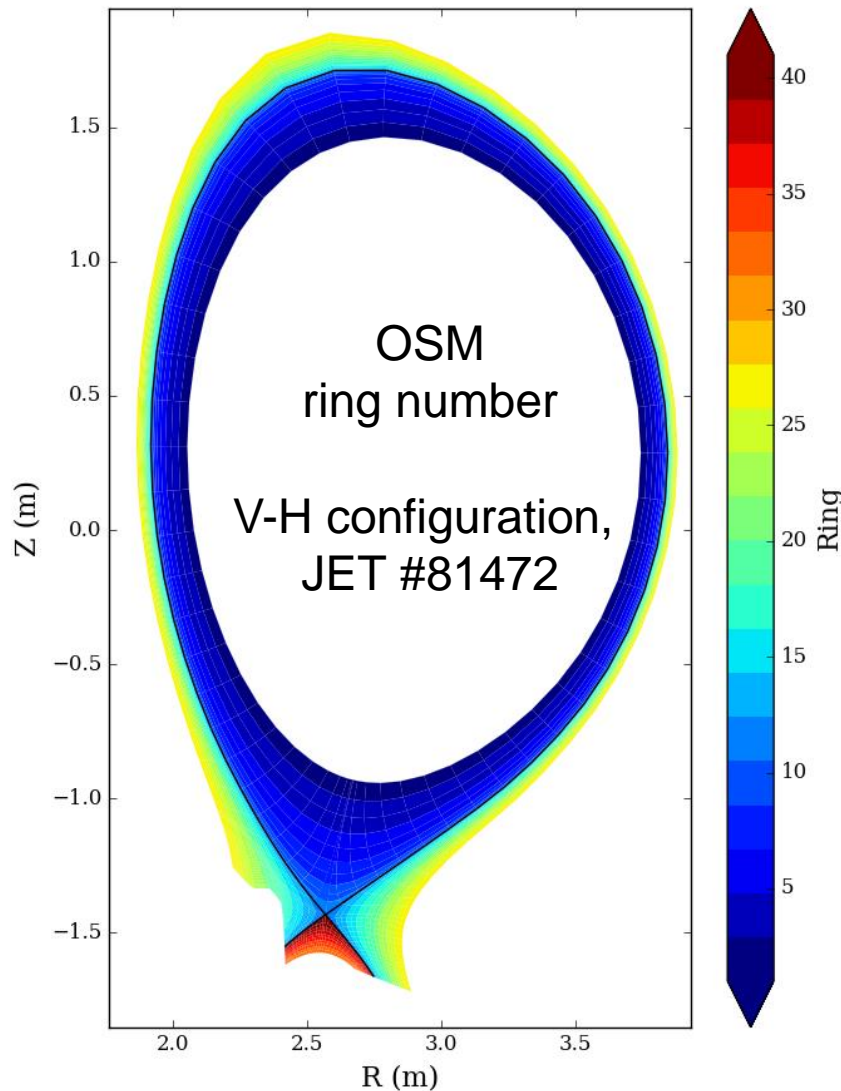
This work has been carried out within the framework of the EUROfusion Consortium and has received funding from the Euratom research and training programme 2014-2018 and 2019-2020 under grant agreement No 633053. The views and opinions expressed herein do not necessarily reflect those of the European Commission.

OSM/EIRENE 2007 was successfully run on an AUG grid produced by SOLPS-ITER (Uccello, Sala)



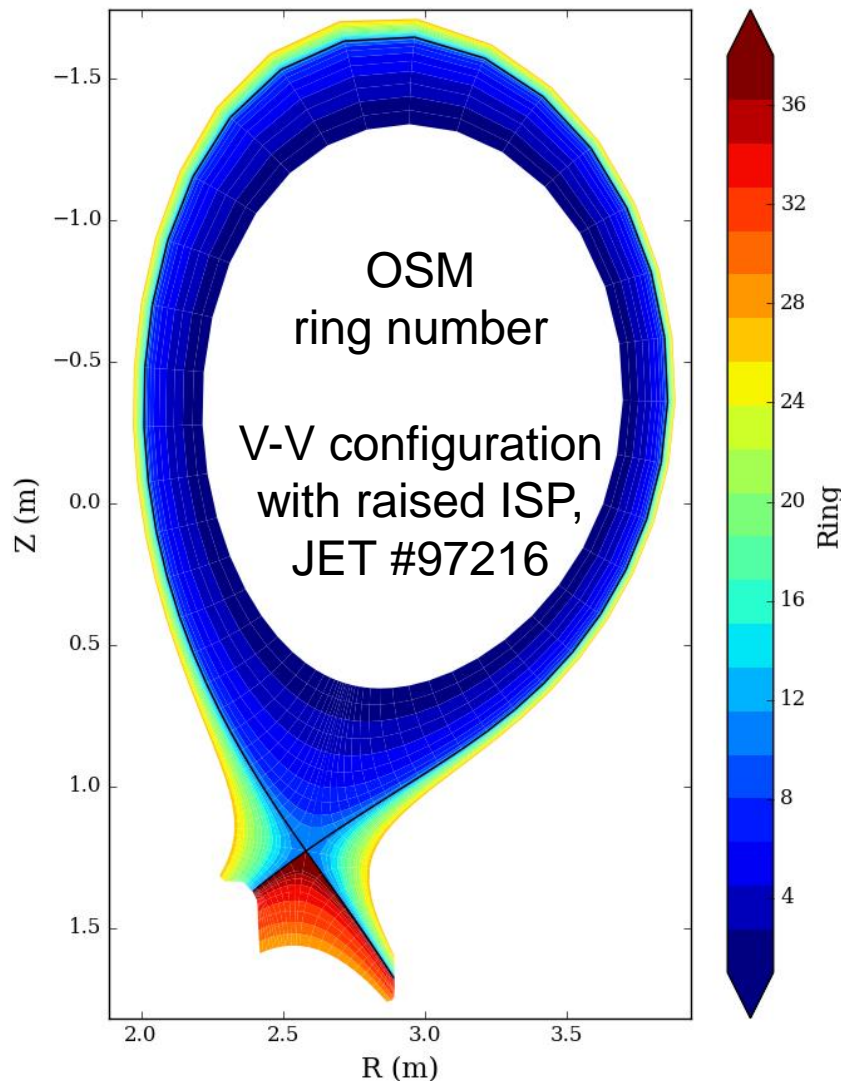
- Re-established OSM/EIRENE as a background plasma solver for material erosion and migration tool:
 - Primary application to low-recycling conditions
 - Assessment and isolation of physics models assessment, data consistency
 - Staff training
- Summer 2020:
 - Exercise OSM with analytic neutral model as part of summer internship
 - Application of model to set of L-mode plasmas (density scan) in AUG
- First OSM/EIRENE 2007 accomplished in September 2020 \Rightarrow systematic scans in divertor target conditions to be performed as part of M.Sc. thesis \Rightarrow input to ERO W erosion simulations (A. Hakola, NME 2020)

OSM/EIRENE 2007 was successfully run on JET-ILW grids produced by GRID2D



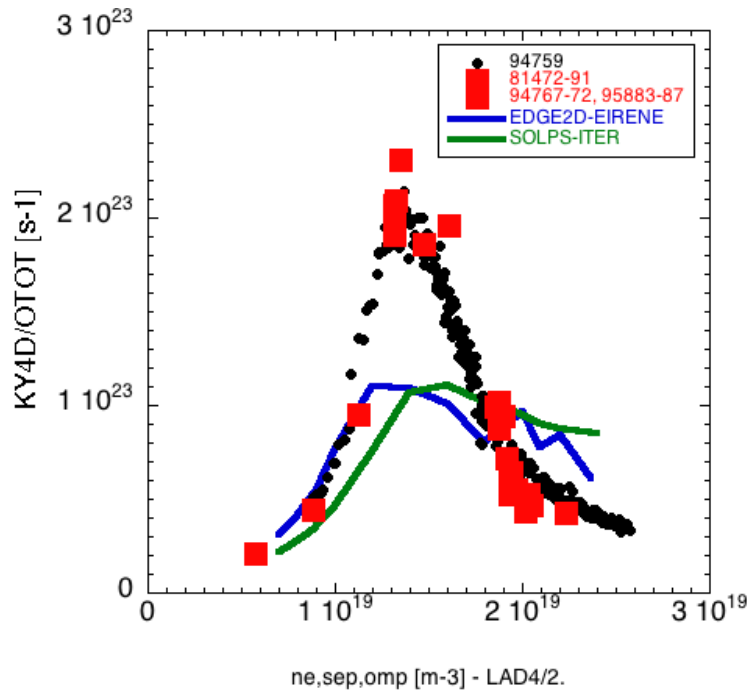
- Re-established OSM/EIRENE as a background plasma solver for material erosion and migration tool:
 - Primary application to low-recycling conditions
 - Assessment and isolation of physics models assessment, data consistency
 - Staff training
- Summer 2020:
 - Exercise OSM with analytic neutral model as part of summer internship
 - Application of model to set of L-mode plasmas (density scan) in AUG
- First OSM/EIRENE 2007 accomplished in September 2020 \Rightarrow systematic scans in divertor target conditions to be performed as part of M.Sc. thesis \Rightarrow input to ERO W erosion simulations (A. Hakola, NME 2020)

OSM/EIRENE 2007 was successfully run on JET-ILW grids produced by GRID2D



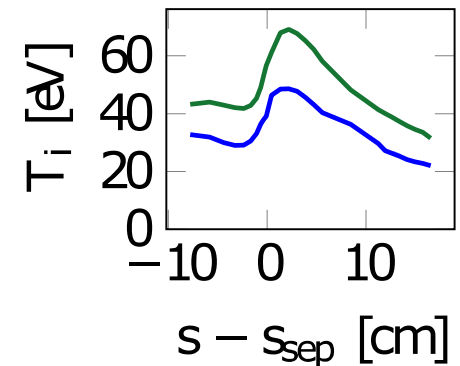
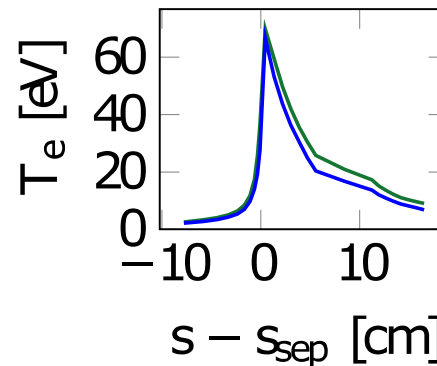
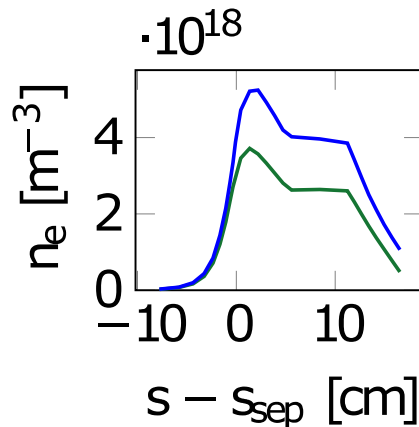
- Re-established OSM/EIRENE as a background plasma solver for material erosion and migration tool:
 - Primary application to low-recycling conditions
 - Assessment and isolation of physics models assessment, data consistency
 - Staff training
- Summer 2020:
 - Exercise OSM with analytic neutral model as part of summer internship
 - Application of model to set of L-mode plasmas (density scan) in AUG
- First OSM/EIRENE 2007 accomplished in September 2020 \Rightarrow systematic scans in divertor target conditions to be performed as part of M.Sc. thesis \Rightarrow input to ERO W erosion simulations (A. Hakola, NME 2020)

Fluid codes predict onset of detachment, but deep detachment has remained elusive

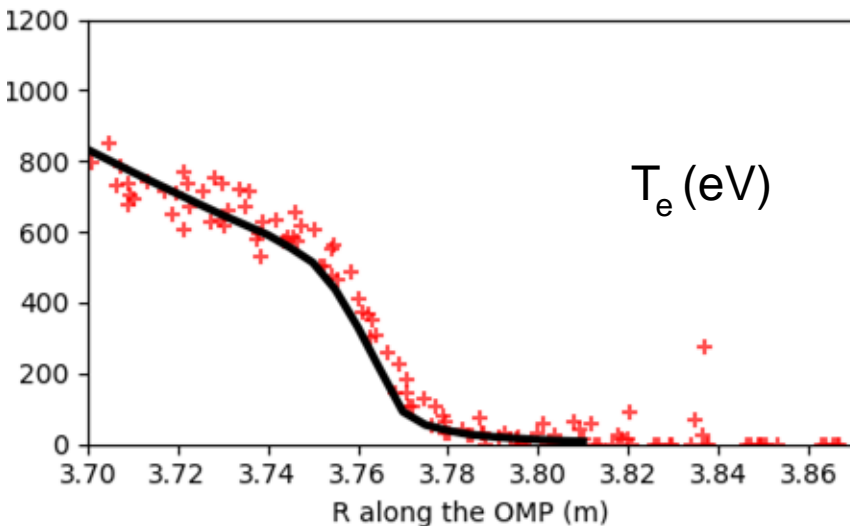
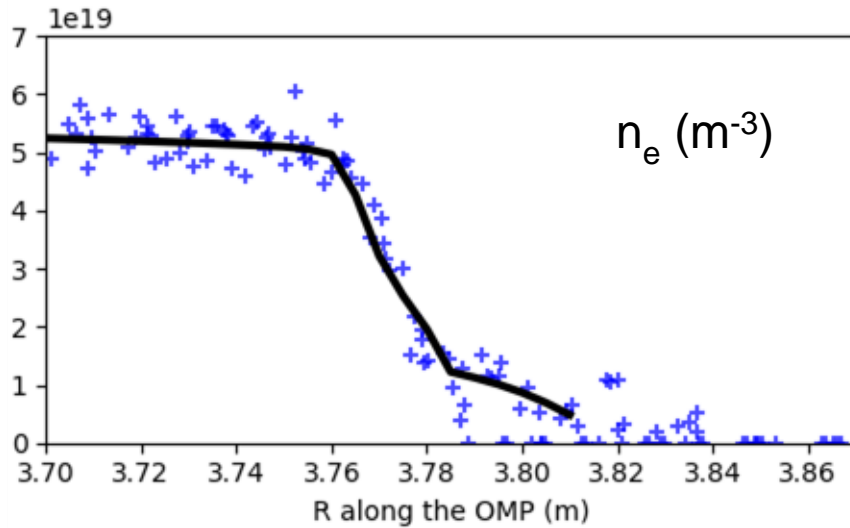


- Benchmark between EDGE2D-EIRENE and SOLPS-ITER for pure D JET L-mode plasmas
- Drifts on
- Qualitatively similar results, but quantitative differences → will be discussed in Horsten, et al., in preparation for Nucl. Mat. and Energy

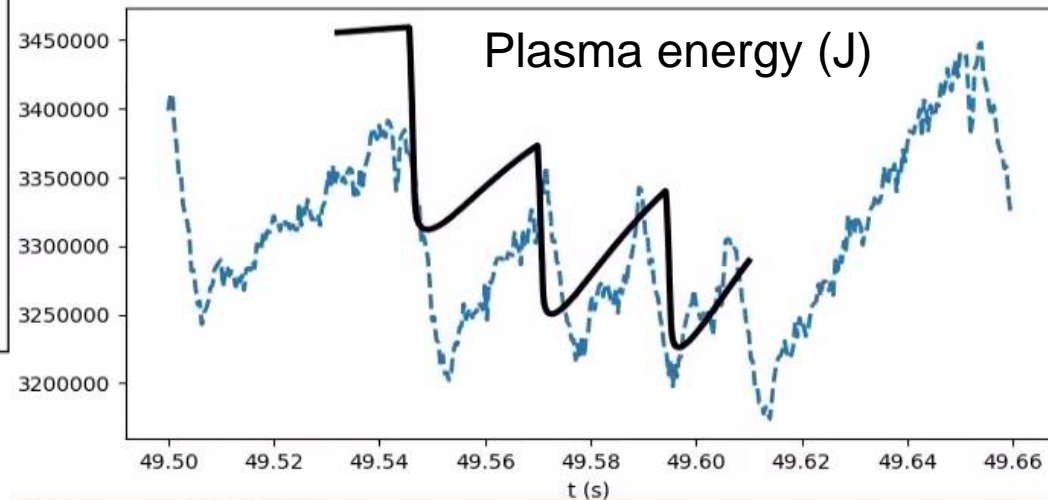
Outer divertor target:



JINTRAC ELMy H-mode backgrounds are produced for ERO2.0 impurity transport modelling



- Two scenarios:
 - M18-18: 18 MW heating, good diagnostic coverage
 - M18-02: 35 MW heating, highest plasma performance
- Input parameters (ELMs, Dperp, ...) fitted for best agreement with data
- Time-dependent JINTRAC simulation split into ELM and inter-ELM phases
- Drifts enabled for one inter-ELM phase



JPN 94605 (9.5 s)

Measurements (in colours), JINTRAC (black solid lines)