9th WPSA PPM
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Modelling of C wall Scenario 2 with SOLPS-ITER

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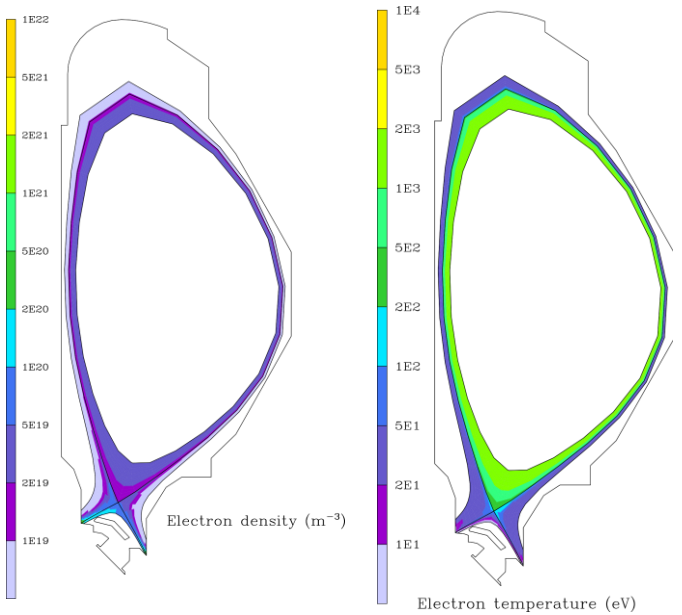
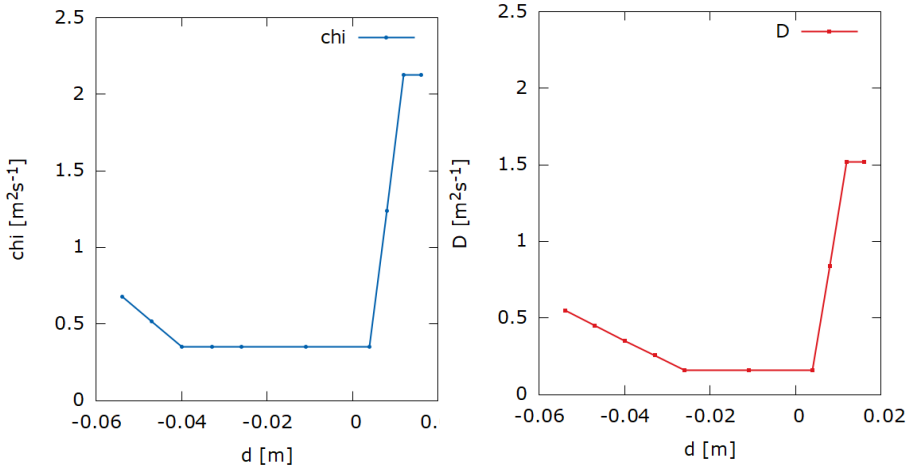
SOLPS-ITER modeling of JT-60SA

Modelling of Scenario 2

- Carbon divertor targets
- Deuterium plasma with argon impurity
- Input power equal to 21 MW (auxiliary heating in scn#2: 41 MW)
- Inner-core boundary electron density equal to $3x10^{19}$ m^{-3}
- Gas puffing:
  - ➢ Deuterium gas puff (outer valve)
  - ➢ Ar seeding above the outer divertor
- The particle density diffusivity and electron heat diffusivity have been developed on the basis of the JET discharges (L. Balbinot)
- Simulations with SOLPS-ITER (multifluid B2 code coupled with Eirene MC code)





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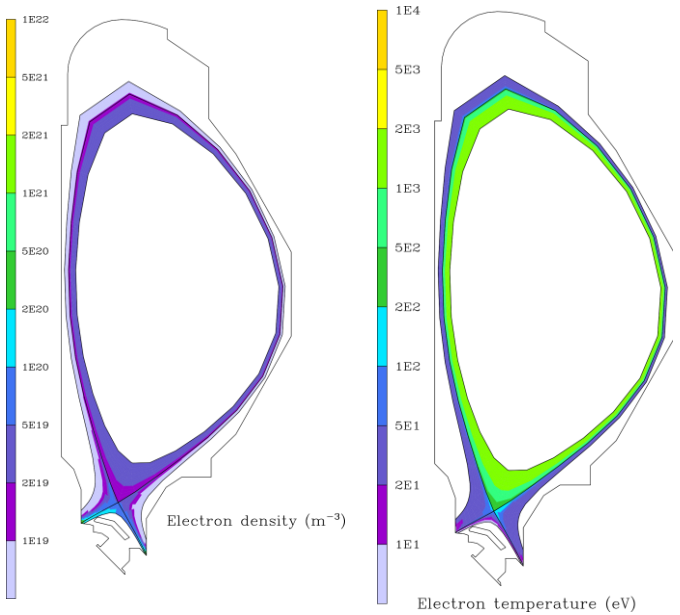

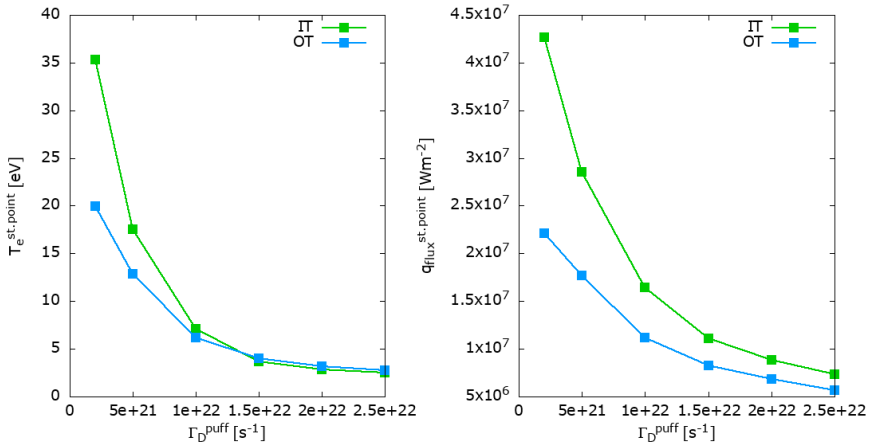

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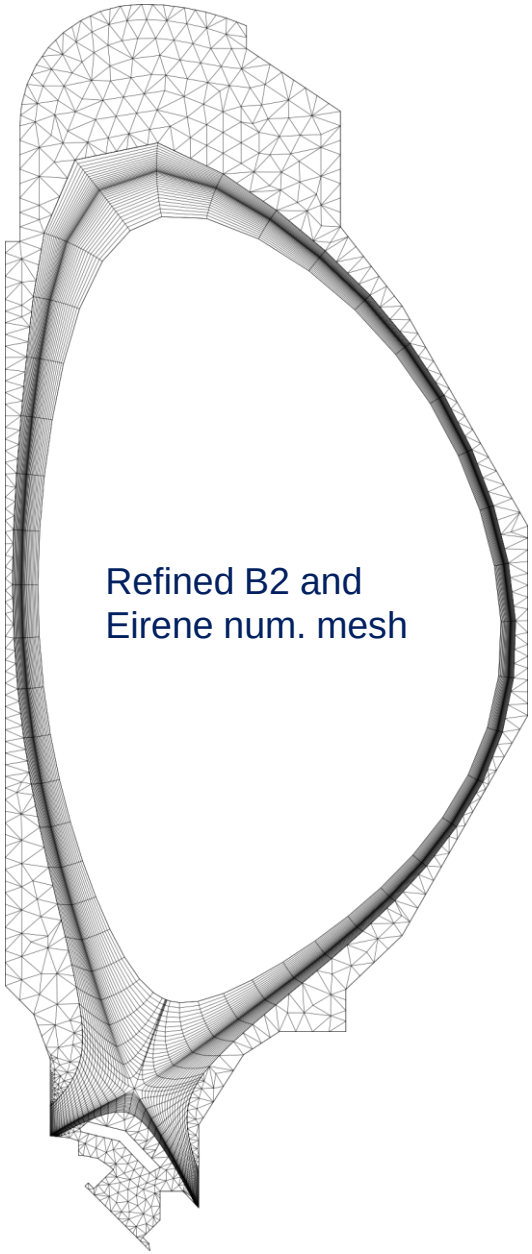

Activities in 2022

- New numerical mesh with increased resolution (100x36 cells) have been created
- Numerical model assumption have been corrected
  - new radial transport profile
  - the inner core boundary condition have been changed to constant particle flux condition
- Ongoing simulations with new model conditions for different values of the separatrix density (different pumping) and then the argon concentration (up to the end of the year)

Important issue

- Considering of available pumping speed range for main plasma and impurities

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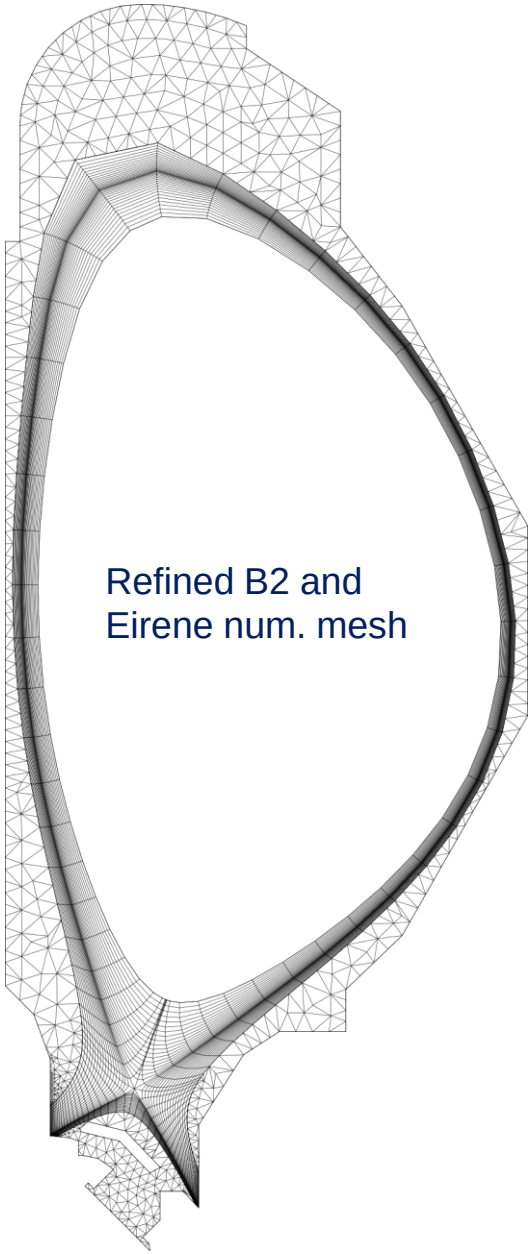

Next activities

Investigations of the argon impurity impact on:

- the heat load mitigation,
- efficiency of the argon and carbon radiation,
- the carbon sputtering

- ➢ Scans for different argon concentrations and for different values of the separatrix density will be performed
- ➢ Limited investigations of the plasma detachment in JT-60SA for various argon concentrations will be done
- ➢ Power scan is under consideration

Plans

Thank you very much for attention!