







AMU/CEA Report

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Outline – AMU tasks

Lean MC core

- Domain decomposition (on the lean core)
- Time dependent scheme
- Spatial FKH

Lean MC core (AMU/FZJ)

1) Provide "starter" condensing most of EIRENE branching for single geometry option(s), check correctness [2023].

2) Assess performance of lean core for <u>relevant geometry options</u> [24 months].

3) Interface to TSVV-3 fluid code released [end of 2025].

Decide on relevant geometry options based on target codes [Sept. 21]
 Decide on a programming/architecture strategy [Dec. 21]

HPC ACH input may be key on decisions – most urgent contribution ?

Domain decomposition (AMU) (+FZJ)

1) demonstrate correctness [2023]

2) scaling evaluation using profiling tools and optimizing with support from ACH HPC **[12 months]** 3) run with > 1 billion cells on meaningful cases **[2025]**

- > Work on grid decomposition ongoing at FZJ [connect to this]
- Review existing algorithms and make a choice [Dec 2021]

Time dependent scheme (AMU, KUL)

1) Proof of correctness [24 months].

2) Performance evaluation w.r.t. current implementation [2023].

Analyse correctness of current algorithm when used in parallel [Dec 2021]
 Review existing litterature and decide on what to implement [Dec 2021]

- Part of a PhD we hope to start in October 2021

Spatial FKH (KUL, AMU)

Generalization AFN model for drifts and n-n collisions [15 months]
 Generalization AFN model towards multi- species: H/D/T [12 months]

3) Optimization of SpH interfacing scheme [12 months]
4) Implementation/assessment fluid/hybrid model for molecules [15 months]

Catch-up work in Soledge3X on the neutral fluid model needed (applying for additional ressources at national level, post-doc)