Recent EUROfusion achievements in support to computationally demanding multi-scale fusion physics simulations and integrated modelling

- Significant progress in the optimisation and speedup of the EU codes to adapt them to modern HPC architecture (High Level Support Team) → *e.g.* speedup factor >400 for REFMULX code used for reflectometry simulations via MPI parallelization, >6 for the B2 part of SOLPS package via optimisation and OpenMP parallelization

- Development of the framework for integration of these codes into a single Integrated Modelling tool based on a generic data structure (Core Programming Team) → *EU IM infrastructure (has inspired the design of the IMAS infrastructure), efficient users support*

- Extension of EUROfusion computational capabilities – HPC MARCONI-FUSION for fusion application in Europe: *conventional partition (Intel Xeon-Broadwell processors, 1 Pflops) is in production mode → 5 Pflops Intel Xeon-Skylake + 1 Pflops Intel Knights Landing processors*

T. Ribeiro, F. da Silva. Execution time for REFMULX: original code (red), its optimised version (blue dotted) and MPI parallel version (blue solid).

T. Fehér. Speedup of B2 code (ITER test case)

I. Voitsekhovitch, R. Hatzky, D. Coster, F. Imbeaux, et al, TH/P2-12