

## Progress on Combined DINA-CH and CRONOS Simulator

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The combined DINA-CH and CRONOS simulator is a tool for free-boundary tokamak plasma simulations which require both advanced core transport modelling and free-boundary plasma evolution. Previous attempts at this work revealed several difficulties [1]. A discrepancy existed between the free-boundary equilibrium of the DINA-CH and the one reconstructed by CRONOS and this has been removed. All required equilibrium data for the CRONOS transport calculation are now provided directly from DINA-CH. An initialization process for selecting the initial plasma profiles has been simplified and diagnostic interfaces have been added for the kinetic control capability. The free-boundary evolution of the ITER hybrid scenario during the flat-top phase is expected to be presented as a demonstration of a typical result from this work. To make this simulator a useful tool for the investigation of free-boundary features while still maintaining a performance close to that of the CRONOS transport code, the computation timesteps in the ICRH and NBI heating and current drive modules need to become variable. These heating and current drive modules are being re-examined with this in mind.

The interaction between DINA-CH and the EU Integrated Modelling data structures will be presented.

### References

- [1] S.H. Kim *et al*, 32<sup>nd</sup> EPS Conference on Plasma Phys. 2005 ECA Vol.29C, P-2.072