FACETS: Towards a flexible infrastructure for building coupled transport models[1] ALEXANDER PLETZER, Tech-X, AMMAR HAKIM, MAHMOOD MIAH, SRINATH VADLAMANI, JOHAN CARLSSON, SCOTT KRUGER, JOHN R. CARY, ALEXEI PANKIN, Lehigh U. — The Framework Application for Core-Edge Transport Simulation (FACETS) is a project aimed at providing an infrastructure for building transport codes capable of exploiting massively parallel architectures. FACETS is driven by the requirement to simulate > 100s long discharges in ITER, with time scales ranging from μs for plasma wall-interactions to 1s for the slow evolution equilibrium profiles. Critical to FACETS will be the capability to couple physics modules (transport models, neutral beam sources, equilibrium, ...) in flexible and efficient way. We report on the progress of building such an infrastructure. FACETS introduces the concept of components and updaters. Components hold data such as profiles while updaters act on these data, for example by time-advancing fields. As an example, we show how to create building block components and updaters for a core transport code, which uses an implicit algorithm based on the block hyper-secant method (BHS solver) to advance ion/electron densities and temperatures. Fluxes are computed by FMCFM's uniform interface to the GLF23/MMM95 reduced transport models.

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