

## **FACETS – a component approach to multiphysics challenges**

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The Framework Application for Core-Edge Transport Simulations (FACETS) is a multi-institutional team addressing the multiphysics area of core-edge-wall coupling in a tokamak fusion device. The multiphysics aspect is due to the very different approximations used in each of these three areas. In the core, the hot plasma can be treated as being constant on flux surfaces and fully ionized. In the edge, 2D effects and atomic physics must be taken into account. In the wall, the hydrogenic species are diffusing into and out of a material matrix. The FACETS parallel computational framework is using a component approach to multiphysics problems, in which each component is given some set of processors, and inter-component communications are set up by a parallel containing component. Several issues of gridding and physics overlap need to be resolved. Now in its second year, the FACETS project has achieved its first core-edge coupled simulations.