

Abstract Submitted
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Modernization and Componentization of Fusion Modules for Future Integrated Modeling OVSEI VOLBERG, SVETA SHASHARINA, JOHAN CARLSSON, Tech-X Corporation — We discuss the development of the Framework for Modernization and Componentization of Fusion Modules, which contains a set of tools, standards and techniques for modernization of modules extracted from established fusion codes with subsequent conversion of these modules to components in accordance with modern software engineering practices. The National Transport Code Collaboration (NTCC) project created a community-owned library of modules for integrated fusion modeling. The standards enforced for these modules and strict review process make this library a valuable asset for plasma simulation. Component based approach addresses the modeling of complex, mutually interacting, computationally intensive systems via its reformulation as a problem of coupling between sub-systems designated as components. A certain challenge in developing such components from legacy codes could be addressed by Common Component Architecture (CCA) tools. We report on the results of our application of CCA tools to the development of components from two NTCC modules, GLF23 and MMM95, and coupling them with another component made from the new nonlinear solver. We also report on the comparison of the NTCC standards with the standards of several community-wide projects for integrated modeling in the other areas of science.

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