**Anderson acceleration for Tiamat**

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CASL (the Consortium for Advanced Simulation of LWRs) is investing in the development of the multi-dimensional Bison fuel performance code for both transient and nominal performance analysis. The Tiamat code, which couples Bison with the Cobra-TF thermal hydraulics code and the MPACT neutronics code, is being developed to provide an integrated tool for predicting pellet-cladding interaction (a local fuel failure mechanism). Like the majority of code couplings in CASL, this utilizes Picard iteration to implement the coupling between the application codes. In this iteration scheme, the individual physics codes are repeatedly solved in some sequence with updated coupling parameters transferred between codes as they are obtained. This method is primarily attractive due to its simplicity of implementation. However, this comes with several significant numerical weaknesses, namely relatively slow convergence and poor robustness. In particular, a numerical damping may be required to obtain convergence, and the performance of the method depends strongly on the damping level. Due to these drawbacks, it is of interest to utilize a better performing solution method. Anderson acceleration is an ideal candidate for this purpose, as it requires no more data to implement than Picard iteration and has been seen to perform better than Picard in several fields.

In this presentation we will describe work performed investigating Anderson acceleration as an alternative to Picard iteration in Tiamat. We will first overview the Tiamat code, the standard Picard coupling, and the integration of Anderson acceleration into the code. We will then consider results from parametric studies at various problem sizes which indicate significant improvement from utilizing Anderson acceleration in this context.