A NEW UNIFIED FLOW FOR SEAMLESS HIGH POWER MULTIPHYSICS APPLICATIONS

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ABSTRACT

Solving electromagnetics, thermal and structural equations to achieve a Multiphysics analysis can be challenging even though those simulations have reached a good level of maturity: validated techniques are available to realize loose field coupling or strong field coupling between proven solvers. However, from an end user standpoint, usability remains problematic. Because the solver for each physics often has its own history, its own flow, its own meshing specifics, and its own way of setting up the problem, the Multiphysics user ends up having to learn disconnected interfaces, techniques, and best practices. As a result, the productivity remains low and the number of users that can perform such simulations remains limited.

In this presentation, we will discuss a new approach for realizing Multiphysics simulations for electromagnetics. Instead of having the user to learn several flows, unifying solvers under a single interface greatly increases productivity, limits the learning curve and enforces a set of common principles for all physics. The high level of technology of the solvers must be maintained while unifying the modeling concepts for those solvers in order to truly enable Multiphysics simulations.

We will demonstrate how such an approach can support engineers modelling realistic high power Multiphysics applications where low frequency electromagnetics, thermal and structural analysis are required to validate the design.