Domain Substructuring using IGA and FEM with Application to Radio Frequency Cavitity Simulation

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ABSTRACT

The use of isogeometric analysis (IGA) in cavity simulation has been proven to be beneficial both in terms of accuracy and of overall reduction of the computational cost [1, 2]. However, the simulation of large and complex structures remains an overwhelming task. Particularly if small geometric features like high order mode couplers have to be resolved.

In this work we propose an IGA/FEM-framework for domain decomposition that we see as a promising tool for reducing the complexity of those simulations. In particular we present two instances of a method fitting into this framework. The first one is inspired by the State Space Concatenation (SSC) method recently introduced by Flisgen et al. [3], while the second one is a Mortar method that exploits the inherent properties of the IGA basis to naturally define the approximation space for the multipliers. Both approaches are cast in the general framework of the Three Fields Method [4]. Results for IGA-IGA and IGA-FEM coupling are presented.

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