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DOMAIN COUPLING AND DOMAIN BOUNDARY CONSTRAINTS

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ABSTRACT

Domain decomposition is a key policy for an efficient numerical treatment of large-scale simulation models or multi-physics problems. The independent mesh generation of sub-domains may significantly reduce the meshing effort and provides the basis for a massively parallel treatment of the resulting sub-problems. In isogeometric analysis an adequate domain decomposition even is an inherent need for geometrically complex structures that cannot be modeled by a single patch. Models existing of multiple patches or multiple computation domains call for robust coupling concepts considering non-matching, non-conforming and overlapping meshes.
The various coupling strategies that have been developed in the past follow and often extend the concepts for a weak enforcement of essential boundary conditions as intrinsicly demanded in meshless, fictitious domain and immersed boundary methods.
This mini-symposium will address recent advances and novel strategies for domain coupling and domain boundary constraints in linear and non-linear simulations with a special focus on multi-patch problems in isogeometric analysis. The discussion will include the various concepts and strategies for the strong or weak enforcement of boundary and interface conditions, stability issues, continuity and accuracy aspects as well as robustness, reliability and convergence properties for problems from science and engineering.