FETI-DP — A Tour d'Horizon

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Abstract

In this talk, we will introduce the nonoverlapping FETI-DP (dual-primal Finite Element Tearing and Interconnecting) domain decomposition method. We consider aspects of robustness as well as numerical and parallel scalability. We will sketch the classical theory for the condition number estimate in 2D and discuss the ideas how to extend it to 3D. In a next step, we will discuss the enhancement of the coarse space by adaptively computed additional coarse components. If time allows, we will also cover how this approach can be combined with machine learning techniques in order to reduce the computational complexity.