Adaptive Wavelet Boundary Element Methods

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This talk is concerned with numerical techniques for the adaptive application of global operators of potential type in wavelet coordinates. This is a core ingredient for a new type of adaptive solvers that has so far been explored primarily for PDEs. We shall show how to realize asymptotically optimal complexity in the present context of global operators. Asymptotically optimal means here that any target accuracy can be achieved at a computational expense that stays proportional to the number of degrees of freedom (within the setting determined by an underlying wavelet basis) that would ideally be necessary for realizing that target accuracy if full knowledge about the unknown solution were given. The theoretical findings are supported and quantified by first numerical experiments.

References:

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[2] H. Harbrecht and M. Utzinger. On adaptive wavelet boundary element methods. Preprint 2015-42, Mathematisches Institut, Universität Basel, Switzerland, 2015 (to appear in J. Comput. Math.).

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