Dedicated to Professor Lаzаr DRAGOŞ on his 75th birthday

Domain decomposition method for fixed-point problems

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Abstract - In this paper, we prove the convergence of an iterative method for fixed-point problems in a reflexive Banach space. As a particular case, the proposed method is exactly the additive Schwarz domain decomposition method when we use the Sobolev spaces. Also, for the finite element spaces, our result proves that the one-level and multi-level methods (the multigrid method, for instance) can be applied to find the fixed-points of contraction operators.

Key words and phrases : domain decomposition methods, fixed-point problems, non-linear problems, multigrid methods, multi-level methods, finite element methods.

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