Robin Transmission Conditions for Overlapping Additive Schwarz Method Applied to Elliptic Problems

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Abstract: We consider overlapping additive Schwarz method with Robin conditions as the transmission conditions(interior boundary conditions). The main difficulty left in this field is how to select the parameters for Robin conditions – these parameters have strong effect on the convergence rate of ASM. In this paper, we proposed a very simple way to determine the optimal(nearly optimal) parameters for general linear elliptic problems. The parameters can be determined in advance without any calculations. The key idea different from other authors (M.J. Gander, F.Nataf etc.) is that we give up to look for the real optimal, instead, we just try to find the nearly optimal which perform as better as the optimal.

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