# Nonoverlapping Schwarz Domain Decomposition Methods

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### Abstract

In recent years, a nonoverlapping domain decomposition iterative procedure, which is based on using Robin-type boundary conditions as information transmission conditions on the subdomain interfaces, has been developed and analyzed. The idea of employing Robin-type boundary conditions as interface conditions was first proposed by P.L. Lions. It is known that the convergence rate of this method is $1 - O(h)$, where $h$ is mesh size. In this talk, the convergence rate will be improved to $1 - O(h^{1/2}H^{-1/2})$ in certain case by choosing suitable parameter, where $H$ is the subdomain size. Counter examples will be constructed to show that the convergence rate independent of the mesh size $h$ and the subdomain size $H$ is inaccessible, which means that our convergence estimates are sharp.