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ANALYSIS OF TWO-DIMENSIONAL FETI-DP PRECONDITIONERS BY THE STANDARD ADDITIVE SCHWARZ FRAMEWORK*

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Abstract. FETI-DP preconditioners for two-dimensional elliptic boundary value problems with heterogeneous coefficients are analyzed by the standard additive Schwarz framework. It is shown that the condition number of the preconditioned system for both second order and fourth order problems is bounded by $C\big(1+\ln(H/h)\big)^2$, where H is the maximum of the diameters of the subdomains, h is the mesh size of a quasiuniform triangulation, and the positive constant C is independent of h, H, the number of subdomains and the coefficients of the boundary value problems on the subdomains. The sharpness of the bound for second order problems is also established.

Key words. FETI-DP, additive Schwarz, domain decomposition, heterogeneous coefficients.

AMS subject classifications. 65N55, 65N30.

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