HOMOGENIZATION OF A PARABOLIC DIRICHLET PROBLEM BY A METHOD OF DAHLBERG

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Abstract: Consider the linear parabolic operator in divergence form

$$\mathcal{H}u := \partial_t u(X, t) - \operatorname{div}(A(X)\nabla u(X, t)).$$

We employ a method of Dahlberg to show that the Dirichlet problem for $\mathcal{H}$ in the upper half plane is well-posed for boundary data in L^p, for any elliptic matrix of coefficients A which is periodic and satisfies a Dini-type condition. This result allows us to treat a homogenization problem for the equation $\partial_t u_\varepsilon(X, t) - \operatorname{div}(A(X/\varepsilon)\nabla u_\varepsilon(X, t))$ in Lipschitz domains with L^p-boundary data.