

## The Dirichlet Problem for elliptic equations in unbounded domains of the plane

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**Abstract.** In this paper we prove a uniqueness and existence theorem for the Dirichlet problem in  $W^{2,p}$  for second order linear elliptic equations in unbounded domains of the plane. Here the leading coefficients are locally of class *VMO* and satisfy a suitable condition at infinity.

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### 1. Introduction

Consider the Dirichlet problem

$$(1.1) \quad \begin{cases} u \in W^{2,p}(\Omega) \cap \overset{\circ}{W}^{1,p}(\Omega), \\ Lu = f, \quad f \in L^p(\Omega), \end{cases}$$

where  $\Omega$  is an open subset of  $\mathbb{R}^n$ ,  $n \geq 2$ , with a suitable regularity property,  $p \in ]1, +\infty[$ , and  $L$  is a second-order, linear, uniformly elliptic operator, i.e.

$$(1.2) \quad L = - \sum_{i,j=1}^n a_{ij} \frac{\partial^2}{\partial x_i \partial x_j} + \sum_{i=1}^n a_i \frac{\partial}{\partial x_i} + a.$$