

## Systems of elliptic equations in unbounded domains: an existence and uniqueness result

Patrizia Di Gironimo\*

*Dipartimento di Matematica e Informatica*

*Università di Salerno*

*Via S. Allende*

*84081 Baronissi (SA)*

*Italy*

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### Abstract

We consider a complete linear elliptic system

$$-\operatorname{div}(ADu + Tu) + BDu + Cu = f$$

in unbounded domains, where  $A$  satisfy the strong Legendre condition and  $T, B, C$  belong to suitable spaces of Morrey type. By techniques relative to these spaces and a priori estimates we get results of existence and uniqueness for the Dirichlet problem in some particular cases.

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*Keywords* : Elliptic equations, Morrey spaces.

### 1. Introduction

Some papers have been devoted to second order linear elliptic systems in bounded domains  $\Omega$  of  $R^n$  (for the basic results see [6], [7], [3]).

In [1] a gradient estimate is obtained for the weak solution  $u \in H^1(\Omega, R^N)$  of the Dirichlet problem for the uniformly elliptic equation

$$\operatorname{div}(ADu) = \operatorname{div}f,$$

in the case  $f \in BMO(\Omega, R^{Nn})$  and  $A \in L^\infty(\Omega, R^{N^2n^2}) \cap l_\phi(\Omega, R^{N^2n^2})$ , where BMO denotes the John-Nirenberg space of bounded mean oscillation functions (see [5]) and  $l_\phi(\Omega, R^{N^2n^2})$  the space of "small multipliers of BMO" (see [4]).

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\*E-mail: pdigironimo@unisa.it

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