

## DIFFERENTIAL EQUATIONS AND IMPLICIT FUNCTION: A GENERALIZATION OF THE NEAR OPERATORS THEOREM

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### 1. Introduction

Many extensions of Implicit Function Theorem have been proposed for studying non linear differential equations and systems as the already classic Hildebrandt and Graves Theorem [7]. The global invertibility problem has been considered in several forms (see for example [2]), and the differentiability hypothesis has been weakened in various ways to face up different problems connected with differential equations.

S. Campanato in [3] has introduced the notion of “near operators” for studying the existence of solutions of elliptic differential equations and systems.

**DEFINITION 1.1** (near operators). Let  $\mathcal{X}$  be a set,  $\mathcal{B}$  a Banach space with norm  $\|\cdot\|$ ,  $A, B : \mathcal{X} \rightarrow \mathcal{B}$ . We say that  $A$  is *near*  $B$  in  $\mathcal{X}$  if there exist two real and positive constants  $\alpha, k, \in (0, 1)$ , such that for all  $x_1, x_2 \in X$

$$(1.1) \quad \|B(x_1) - B(x_2) - \alpha[A(x_1) - A(x_2)]\| \leq k\|B(x_1) - B(x_2)\|.$$

The main result on this operators is the following global invertibility theorem (see [3]).

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