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**Mircea D. Voisei\*** (mvoisei@utpa.edu), The University of Texas - Pan American, Department of Mathematics, MAGC 3.202, 1201 W. University Drive, Edinburg, TX 78541. *Identification of Nonlinearities in Divergence Type Elliptic Boundary Value Problems.*

The identification of the nonlinearity  $a : \mathbb{R}^d \rightarrow \mathbb{R}^d$  in the equation

$$-\operatorname{div}a(\nabla y) \ni f, \text{ in } \Omega, \quad y = 0 \text{ on } \partial\Omega,$$

is done in terms of one observation  $y_0 \in L^2(\Omega)$ , in a least square sense, by minimizing

$$\int_{\Omega} |y - y_0|^2 dx.$$

Here  $\Omega$  is a bounded domain in  $\mathbb{R}^d$  with smooth boundary  $\partial\Omega$ ,  $f \in L^2(\Omega)$ , and  $a$  is Lipschitz continuous and strongly elliptic.

Numerical simulations and an algorithm based on a splitting method for the one dimensional case are presented. (Received July 20, 2006)