REMARKS ON 2ND ORDER ELLIPTIC SYSTEMS IN LIPSCHITZ DOMAINS

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In this talk I will discuss a method for solving the Dirichlet and Neumann boundary value problems for 2nd order strongly elliptic systems with **real** coefficients in Lipschitz domains. As it is work in progress only the most elementary case, that of two equations in two unknowns in planar domains, will be presented. However, as I hope to show, there is at least no **apparent** impediment to the generalizing of our ideas to general 2nd order systems in higher dimensions.

Consider the 2nd order differential system equation in two variables $X = (X_1, X_2) \in \mathbb{R}^2$ for m unknowns $\vec{u} = (u^1, \dots, u^m)$ given by

$$(1) \qquad D_i a_{ij}^{rs} D_j u^s(X) = 0 \quad , \quad 1 \le r \le m \ .$$

Here we use summation convention, $1 \le i,j \le 2$, $1 \le s \le m$ and D_i denotes $\frac{\partial}{\partial X_i}$. The coefficients a_{ij}^{rs} are **constant** and satisfy the symmetry **condition**:

$$(2) \qquad a_{ij}^{rs} = a_{ji}^{sr} \ .$$

It is convenient to think of the a_{ij}^{rs} as forming an m×m matrix with entries, A^{rs}; for each fixed r and s, A^{rs} is a 2×2 matrix in i and j . Then r and s denote the **row** and **column** respectively of the m×m matrix and i and j the row and column respectively of the 2×2 matrices.