
Estimates for Elliptic Systems for Composite Material

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In a bounded domain D in \mathbb{R}^n , we consider a composite media whose physical characteristics are smooth in the closures of subdomains D_m but possibly discontinuous across their boundaries. The properties of the media are described in terms of a linear second order elliptic system. The coefficients are smooth in the closure of each D_m but not across their boundaries. Under suitable conditions we obtain bounds on the first derivatives of the solution, and their Hölder continuity, in the closure of each D_m - provided we stay away from the boundary of D . The estimates depend on the number of domains but are independent of how close they are to each other; they may even touch.