Remarks on strongly elliptic systems in Lipschitz domains

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We discuss some fundamental facts of the theory of strongly elliptic second-order systems in bounded Lipschitz domains. We propose a simplified choice of the right-hand side of the system and the conormal derivative in the Green formula. Using "Weyl's decomposition" of the space of solutions, we obtain two-sided estimates for solutions of the Dirichlet and Neumann problems. We remove the algebraic restriction in the generalized Savaré theorem on the regularity of solutions of these problems for systems with Hermitian principal part. The corollaries for potential type operators and Poincaré–Steklov operators on the boundary are strengthened. We consider the transmission problems for two systems in domains with common Lipschitz boundary without assumption of the absence of jumps in the coefficients on this boundary. We construct examples of strongly elliptic second-order systems, for which the Neumann problem does not have the Fredholm property.