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Nguyen T Nguyen* (nnguyen@math.uchicago.edu). *The Dirichlet and regularity problems in bounded Lipschitz domains for second order elliptic operators with bounded, real, but not necessarily symmetric, coefficients.* Preliminary report.

In this paper, we consider the L^2 boundary value problems for the divergence form second order elliptic equation $\mathcal{L}u = -\operatorname{div}(A\nabla u) = 0$ in $\Omega \subset \mathbb{R}_+^d$, a bounded Lipschitz domain, where the matrix A is assumed to be real but not necessarily symmetric. Suppose that A is close, in a Carleson measure sense, to an elliptic matrix that is continuous on the boundary $\partial\Omega$. In this setting, we show that the Dirichlet and regularity problems are solvable. We also provide similar positive answer in the system setting provided that the coefficients $A = (a_{ij}^{rs})$ satisfies the extra “symmetry” condition: $a_{ij}^{rs} + a_{ji}^{rs} = a_{ij}^{sr} + a_{ji}^{sr}$, and the Dirichlet problem is defined to include the square function estimate. (Received September 17, 2013)