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**Martin Dindos\*** ([m.dindos@ed.ac.uk](mailto:m.dindos@ed.ac.uk)), University of Edinburgh, School of Mathematics, JCMB KB, Mayfield Rd., Edinburgh, EH9 3JZ.  *$L^p$  Dirichlet problem for elliptic operators with rough coefficients.*

We present of joint work with J. Pipher and S. Petermichl where we study the Dirichlet  $L^p$  solvability of divergence type elliptic operators with (just)  $L^\infty$  coefficients. Well know counterexamples show that boundedness and ellipticity is not sufficient for  $L^p$  solvability, hence additional condition is required. Usually, some kind of continuity or Dini-type condition is assumed. We instead present a much weaker Carleson type condition that is in some sence “sharp”. In particular, we present result that for any  $p > 1$  if certain Carleson norm of coefficients of the operator is less than  $C(p)$  the the  $L^p$  problem is solvable. In addition, if coefficients satisfy vanishing Carleson condition, then the problem is solvable for all  $p > 1$ . This can be used to show that the  $L^p$  Dirichlet problem for the Laplace operator is solvable for all  $p > 1$  on Lipschitz domains with the property that  $\phi$  is in the “vmo”, where  $\phi$  is the Lipschitz function that (locally) determines the boundary. “Vmo” is the space of functions of vanishing mean oscillations. (Received January 15, 2007)