1063-35-15 **Tadele Mengesha*** (mengesha@math.lsu.edu), Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803, and **Nguyen Cong Phuc,**, Department of Mathematics, Louisiana State University, Baton Rouge, LA 70803. *Weighted and Regularity Estimates for Nonlinear PDEs on Nonsmooth Domains.*

Global weighted L^p estimates are obtained for the gradient of solutions to nonlinear elliptic Dirichlet boundary value problems over a bounded nonsmooth domain. Morrey and Hölder space regularity of solutions are also established. These results generalize existing L^p estimates for nonlinear equations.The nonlinearities are sublinear and assumed to have a uniform small mean oscillation, i.e can have mild discontinuity. The boundary of the domain may exhibit roughness but assumed to be sufficiently flat. We will use maximal function estimates and Vitali covering lemma from harmonic analysis, and also known regularity of solutions to reference homogeneous equations with smooth coefficients. (Received June 04, 2010)