1123-35-306 **Dat Cao**, **Tadele Mengesha** and **Tuoc Phan*** (phan@math.utk.edu), Department of Mathematics, University of Tennessee, 227 Ayres Hall, 1403 Circle Drive, Knoxville, TN 37996-1320. *Weighted-$W^{1,p}$ estimates for weak solutions of degenerate and singular elliptic equations.*

Global weighted L^p-estimates are obtained for the gradient of solutions to a class of linear singular, degenerate elliptic Dirichlet boundary value problems over a bounded non-smooth domain. The coefficient matrix is symmetric, nonnegative definite, and both its smallest and largest eigenvalues are proportion to a weight in a Muckenhoupt class. Under a smallness condition on the mean oscillation of the coefficients with the weight and a Reifenberg flatness condition on the boundary of the domain, we establish a weighted gradient estimate for weak solutions of the equation. A class of degenerate coefficients satisfying the smallness condition is characterized. A counter example to demonstrate the necessity of the smallness condition on the coefficients is given. Our $W^{1,p}$-regularity estimates can be viewed as the Sobolev's counterpart of the Hölder's regularity estimates established by B. Fabes, C. E. Kenig, and R. P. Serapioni in 1982. (Received August 29, 2016)