

1138-35-203

H. Dong and **T. Phan*** (phan@math.utk.edu). *Regularity theory for weak solutions of parabolic equations with singular degenerate coefficients.*

In this talk, we study regularity and solvability in weighted Sobolev spaces for a class of parabolic equations in divergence form with singular and degenerate coefficients. We are particularly interested in the case that the coefficients are measurable in all of their variables but singular or degenerate in one space variable direction. An example of our class of equations is Grushin type singular degenerate equations in which the degeneracy or singularity appears at the boundary of the considered domains. Under certain conditions, reverse Holder's inequalities are established. Lipschitz estimates for weak solutions are proved for a class of homogeneous equations whose coefficients depend only on one space variable, but they can be singular and degenerate. These estimates are then used to establish interior, boundary, and global estimates of the Calderon-Zygmund type for weak solutions assuming that the coefficients are partially VMO (vanishing mean oscillation) with respect to the considered weights. The solvability in weighted Sobolev spaces for this class of equations is also achieved. Our results recover and generalize well-known results when coefficients are uniformly elliptic. The talk is based on the joint work with H. Dong (Brown University). (Received February 09, 2018)