1081-35-58 **Luca Capogna*** (lcapogna@uark.edu). *Stability of the doubling property and Poincare inequality in a Riemannian approximation of Carnot-Caratheodory metrics.*

Given a system of smooth vector fields $X_1, ..., X_m$ in R^n, satisfying the Hörmander finite rank condition one can consider a class of Riemannian metrics g_ϵ in R^n such that as $\epsilon \to 0$ the associated metric d_ϵ converges in the Gromov-Hausdorff sense to the Carnot-Caratheodory metric generated by $X_1, ..., X_m$. Doubling and Poincare inequalities hold for every $\epsilon \geq 0$. For $\epsilon = 0$ these are crucial results of Nagel-Stein-Wainger and of Jerison respectively.

In a joint work with Giovanna Citti (Bologna) and Garrett Rea(Findlay) we prove that the constants in the doubling and Poincare inequalities can be chosen independently of ϵ. We also apply this stability result to prove regularity for a class of weak soulutions of degenerate parabolic quasi-linear PDE. (Received January 23, 2012)