Meeting: 1003, Atlanta, Georgia, SS 27A, AMS-SIAM Special Session on Analysis and Applications in Nonlinear Partial Differential Equations, I

1003-35-791 **Diego M. Maldonado*** (maldonado@math.ku.edu), Department of Mathematics, University of Kansas, 1460 Jayhawk Blvd. 405 Snow Hall, Lawrence, KS 66045, and **L. Forzani**. *Direct approach for $C^{1,\alpha}$-regularity of solutions to the Monge-Ampere equation.*

Let ϕ be a convex solution to the non-linear elliptic partial differential equation $\det D^2\phi = \mu$ in R^n (or any open convex subset of R^n). In the 90', Luis Caffarelli proved that if the measure μ has a doubling property, then the solution ϕ is in the class $C^{1,\alpha}$. His proof uses a compactness argument that does not provide an estimate for α or the $C^{1,\alpha}$ norm of ϕ on compact sets. The task of finding a constructive proof to Caffarelli's result was recently posed as an open problem by C. Villani in his book on Mass Transportation. In this talk, we will show how that task can be accomplished by mostly geometric arguments. (Received September 29, 2004)