Meeting: 1003, Atlanta, Georgia, SS 33A, AMS Special Session on Topics in Geometric Function Theory, I

1003-30-628 **Albert Baernstein** (al@math.wustl.edu) and **Leonid V. Kovalev*** (lkovalev@math.wustl.edu), Department of Mathematics, Washington University, 1 Brookings Dr., St. Louis, MO 63130-4899. *Quasiregular gradient mappings and uniformly elliptic equations in the plane.* Preliminary report.

We call a mapping $f \in W^{1,2}_{\text{loc}}(\Omega; \mathbb{C})$ a K-quasiregular gradient if

$$\left|\frac{\partial f}{\partial \bar{z}}\right| \leq \frac{K-1}{K+1}\left|\frac{\partial f}{\partial z}\right| \quad \text{and} \quad \text{Im}\frac{\partial f}{\partial \bar{z}} = 0$$

a.e. in Ω. Here $\Omega \subset \mathbb{C}$. Such mappings are of interest because of their connection to uniformly elliptic equations of non-divergence type.

General K-quasiregular mappings are known to be locally $C^{1/K}$-continuous, where the constant $1/K$ is best possible. In contrast to this fact, we prove that K-quasiregular gradient mappings are locally Hölder continuous with an exponent $\alpha_K > 1/K$. In fact, $\lim_{K\to\infty} K\alpha_K = A > 1.37$. The conjectural value of A is 3. (Received September 24, 2004)