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Jasun Gong* (jgong@umich.edu), University of Michigan, Department of Mathematics, East Hall, 525 East University, Ann Arbor, MI 48109-1109. *An Extension of the Schoenflies Theorem for Sobolev Homeomorphisms, and Connections to Smooth Geometry*. Preliminary report.

A theorem of F. Gehring states that a bi-Lipschitz homeomorphism between collared (annular) domains in \mathbb{R}^n extends to a bi-Lipschitz homeomorphism between Jordan domains.

In this talk, we extend this result to bi-Lipschitz homeomorphisms which possess second-order weak derivatives in a sufficient range of integrability. This range cannot be too arbitrary, otherwise we would obtain a contradiction concerning differentiable structures of high-dimensional spheres. If time permits, we will also discuss more concrete cases in low dimensions. (Received August 27, 2006)