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Leonid V. Kovalev* (lvkova@sy.edu), Department of Mathematics, 215 Carnegie Building, Syracuse University, Syracuse, NY 13244, and **Jani Onninen** and **Kai Rajala**. *Multiplicity of local homeomorphisms and invertibility of Sobolev mappings.*

We prove a version of the Inverse Function Theorem for continuous weakly differentiable mappings. Namely, a nonconstant $W^{1,n}$ -mapping is a local homeomorphism if it has integrable inner distortion function and satisfies a certain differential inclusion. A crucial ingredient of our proof is that the integral of the inner distortion controls the multiplicity of a local homeomorphism, even though it does not control the radius of injectivity. This puts a new twist on the Global Homeomorphism Theorem of Zorich. (Received December 23, 2009)