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Andrew Lorent* (lorentaw@uc.edu), 4109 French Hall, Cincinnati, OH 45219. *A generalized Stoilow decomposition for pairs of mappings of integrable dilatation.*

One of the consequences of the classic Liouville theorem is that given a pair of invertible C^1 functions whose symmetric parts of gradient agree; one is related to another by a rotation. The question of what is the minimal hypothesis for which this is true was asked by Ciallet and Mardare. This was also asked by Stefan Muller with a view developing a generalization of Friesecke-James-Muller rigidity estimate. This question is actually a special case of the following question: what is the most general Stoilow decomposition for pairs of functions? If we allow non invertible functions the answer turns out to be functions of integrable dilatation. We will describe this theorem and its corollaries, sketch the connections these questions have to theories of elasticity and describe some future directions. (Received August 23, 2013)