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Eduardo Cabral Balreira* (balreira.1@nd.edu), Department of Mathematics, 255 Hurley Hall, Notre Dame, IN 46556. *Detecting invertibility from the topology of the pullback of hyperplane foliations.*

Our main theorem states that a local diffeomorphism $f : \mathbb{R}^n \rightarrow \mathbb{R}^n$ is bijective if and only if the pre-image of every affine hyperplane is non-empty and acyclic (i.e., it has the homology of a point). The proof is based on some geometric constructions involving foliations and tools from intersection theory. This result generalizes in finite dimension the classical Hadamard-Plastock theorem, including its recent improvement by Nollet-Xavier. We also present natural analytical conditions which imply our topological hypotheses. (Received September 24, 2005)