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On the inversion of real polynomial maps

There is some evidence to support the conjecture that a polynomial local diffeomorphism of \mathbb{R}^n into itself, $n \geq 3$, is injective if the pre-images of all 2-planes in \mathbb{R}^n are homeomorphic to connected subsets of \mathbb{R}^2 . In this talk, we discuss this problem and offer proofs of some related global invertibility results. The arguments involve geometric constructions that use arguments from topology and complex analysis. Part of this work is joint with S. Nolle.