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## INJECTIVITY OF MAPS IN THE PLANE

Let  $F : \mathbb{R}^2 \rightarrow \mathbb{R}^2$  be a  $C^2$  map with a non-zero Jacobian determinant. By the Inverse Function Theorem this map is locally injective. A classical and difficult problem is to know when this map is globally injective – a global diffeomorphism if furthermore  $F$  is surjective. By using results of the qualitative theory of differential equations I will present a sufficient and necessary condition and a sufficient condition for the global injectivity of  $F$ . My presentation will be based on studies developed with Jaume Llibre.