The C^p-m-reparameterization theorem for O-minimal expansions on $\bar{\mathbb{R}}$

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Abstract

Let $F : (0,1)^m \to (0,1)^n$ be a definable map in some O-minimal expansion on $\bar{\mathbb{R}}$ and $p \in \mathbb{N}$. The C^p-*m-reparameterization theorem* roughly speaking states that there exists a decomposition of the domain $(0,1)^m$ into finitely many sets such that the restriction of F to any of these sets is p-times continuously differentiable. Moreover, things can be arranged such that all derivatives up to order p are bounded by 1 in modulus. It is the latter property that sets the C^p-m reparameterization theorem apart from the well known C^p-cell decomposition. Our aim is to prove the theorem in the one variable case. The proof presented here is due to A. J. Wilkie.