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On the degree of continuous functions definable in o-minimal structures: a differential approach

(joint work with Y. Peterzil)

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We work in o-minimal expansion of a real closed field.

Using piecewise differentiability, we define an orientation for definable manifolds (not necessarily smooth) and also the degree for definable proper continuous maps between definable manifolds. We use this notion of the degree to give an elementary proof of the following theorem.

Theorem. *Let M be a definably compact orientable definable manifold of class C^2. If the tangent bundle of M is trivial then the o-minimal Euler characteristic of M is zero.*

The next corollary was proved earlier by M. Edmundo using homological methods.

Corollary. *If G is a definably compact definable group then the o-minimal Euler characteristic of G is zero.*