

Séminaire d'algèbre, topologie et géométrie

Jeudi 11 mai à 14h

Salle de Conférences

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Wien

On polynomial-like properties of differentiable functions

In this talk, I will show that differentiable functions, defined on a convex body in Euclidean space, whose derivatives are controlled by a suitable given sequence of positive real numbers share many properties with polynomials. The role of the degree of a polynomial is played by an integer associated with the given sequence, the diameter of the domain, and the sup-norm of the function. The polynomial-like behaviour of controlled differentiable functions is manifested in quantitative information on the size of the zero set and its local parameterization by Sobolev functions, a Remez-type inequality, a comparison of L^p -norms (reversing Hölder's inequality), a log-BMO-like property, etc. The results depend only on the derivatives up to some finite order, which can be determined explicitly. The local parameterization of the zero set by $W^{1,p}$ -Sobolev functions is based on joint work with Adam Parusinski in which, for any smooth (C^∞) family of monic polynomials, we determined the optimal p (solely in terms of the degree) such that there is a $W^{1,p}$ -choice of the roots.