Modulus and Measure

Olli Martio

University of Helsinki, Finland olli.martio@helsinki.fi

The talk is based on the joint work with V. Honzlov'a Exnerov'a and J. Malý

For a family Γ of curves in \mathbb{R}^n the approximate modulus, AM_1 -modulus, is defined as

$$AM_1(\Gamma) = \inf\{\liminf_{i \to \infty} \int_{\mathbf{R}^n} \rho_i \, dm\}$$

where the infimum is taken over all sequences (ρ_i) of non–negative Borel functions ρ_i such that $\liminf_{i\to\infty} \int_{\gamma} \rho_i \, ds \geq 1$ for every $\gamma \in \Gamma$. The AM_1 –modulus is closely connected to functions of bounded variation in \mathbb{R}^n .

The AM_1 -modulus differs from the M_1 -modulus in several aspects and contrary to the other classical moduli the AM_1 -modulus creates a non-trivial measure in \mathbb{R}^n . The relations between the (n-1)-dimensional Hausdorff measure H^{n-1} and the aforementioned measure associated with the AM_1 -modulus are studied with special focus to the behavior of the AM_1 -modulus on (n-1)rectifiable sets and on the sets of finite perimeter.