International Conference on Analysis and Geometry
August 30 – September 3, 1999, Novosibirsk, Russia

Abstracts

MOSCO, UMBERTO, *University of Rome "La Sapienza", Italy*; *email*: mosco@axcasp.caspur.it

A Pseudo-Riemannian Approach to Fractals

We describe analytic inequalities of Sobolev-Morrey type in a general metric setting motivated by fractal theory. The setting involves quasi-distances, doubling measures and measure-valued gradient forms (Lagrangians), mutually related by a "pseudo-Riemannian" property: Lagrangiangs control mean-oscillations at all metric scales. On smooth structures like the Heisenberg group this property is a consequence of the Lie group invariance of distance, volume and energy. We show that pseudo-Riemannian structures exist also on various simple model fractals, the role of group invariance being taken by selfsimilar invariance. The basic step in the construction is the definition of a suitable (effective) quasi-metric inside the fractal.