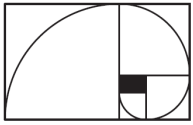
SOCIEDADE BRASILEIRA DE MATEMÁTICA



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Global divergence theorems in nonlinear PDEs and geometry

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Abstract. These lecture notes contain, in a slightly expanded form, the material presented at the Summer School in Differential Geometry held in January 2012 in the Universidade Federal do Ceará-UFC, Fortaleza.

The course aims at giving an overview of some L^p-extensions of the classical divergence theorem to non-compact Riemannian manifolds without boundary. The red wire connecting all these extensions is represented by the notion of parabolicity with respect to the p-Laplace operator. It is a non-linear differential operator which is naturally related to the p-energy of maps and, therefore, to L^p-integrability properties of vector fields. To show the usefulness of these tools, a certain number of applications both to (systems of) PDEs and to the global geometry of the underlying manifold are presented.

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