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An atomic decomposition of the Hajlasz Sobolev space M_1^1 on manifolds

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We compare possible notions of Hardy–Sobolev spaces on a manifold with a doubling measure. In particular, we consider several characterizations of these spaces, in terms of maximal functions, atomic decompositions, and gradients, and apply them to the L^1 Sobolev space M_1^1 , defined by Hajlasz, in both the homogeneous and nonhomogeneous cases.

This is a joint work with N. Badr.