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Infinitely degenerate elliptic equations and non doubling metrics

The talk is about regularity of weak solutions to second order infinitely degenerate elliptic equations. It is known that regularity of weak solutions can be studied by studying properties of certain metric spaces associated to the operator, namely subunit metric spaces. The problem arising in the infinitely degenerate case is that the metric is such that the Lebesgue measure of subunit balls is non doubling. This makes a well developed theory of homogeneous metric spaces not applicable. However, with some additional assumptions continuity of weak solutions can be obtained even in the non doubling case. The question that remains open is to prove certain assumptions (such as Sobolev inequality) for at least some types of non doubling metric spaces associated to infinitely degenerate operators.