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*Adams inequalities on measure spaces.*

In 1988 David Adams obtained sharp Moser-Trudinger inequalities on bounded domains of  $\mathbb{R}^n$ . The main step was a sharp exponential integral inequality for convolutions with the Riesz potential. In a joint paper with Luigi Fontana we extend and improve Adams' results to functions defined on arbitrary measure spaces with finite measure. The Riesz fractional integral is replaced by general integral operators, whose kernels satisfy suitable and explicit growth conditions, given in terms of their distribution functions; natural conditions for sharpness are also given. Most of the known results about Moser-Trudinger inequalities can be easily adapted to our unified scheme. New applications of our theorems include: sharp higher order Moser-Trudinger trace inequalities, sharp Adams/Moser-Trudinger inequalities for general elliptic differential operators (scalar and vector-valued), for sums of weighted potentials, and for operators in the CR setting. (Received January 21, 2010)