1056-46-1302 **Carlo Morpurgo*** (morpurgoc@missouri.edu), Department of Mathematics, 121 Math. Sciences Bldg., University of Missouri, Columbia, MO 65203, and **Luigi Fontana**. *Exponential integrability: a unified approach.*

We present new theorems regarding inequalities of type

$$\int_N \exp\left[\left(A\frac{|Tf(x)|}{\|f\|_p}\right)^{p'}\right]d\nu(x) \leq C$$

where $Tf(x) = \int_M K(x,y)f(y)d\mu(y)$, and (M,μ) and (N,ν) are measure spaces with finite measure. Under suitable growth conditions on the kernel K, given in terms of its distribution function, the above inequality holds for all $f \in L^p(M)$ ($p > 1$ and p' its conjugate exponent); the constant A is explicitly related to the growth of the kernel.

This type of inequality was first derived on bounded domains of $\mathbb{R}^n$ by David Adams, in his proof of the sharp Moser-Trudinger inequality for higher-order gradients.

We present some new applications of our general theorems, in the form of sharp Moser-Trudinger inequalities in various settings. (Received September 21, 2009)