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Kokilashvili, Vakhtang, A. Razmadze Mathematical Institute, Georgia

Solutions of Two-Weight Problems on Boundedness and Compactness for Integral Transforms

The aim of the report is to present our results concerning the following problems:

The necessary and sufficient conditions for a pair of weight functions insuring boundedness and compactness of integral transforms (involving potentials) defined on homogeneous type spaces (SHT). We do not use the notation of capacity; Criteria are given for the existence of bounded and compact imbeddings of Sobolev (Liouville) spaces into the Lebesgue space, generally speaking, with the different weights; Two-weight problems for singular integrals defined on SHT and multipliers of Fourier transform; Applications to PDE.