Homogeneous operators and homogeneous integral operators

Zhirayr Avetisyan[1] and Alexey Karapetyants[1]

[1]Southern Federal University

November 5, 2021

Abstract

We introduce and study in a general setting the concept of homogeneity of an operator and, in particular, the notion of homogeneity of an integral operator. In the latter case, homogeneous kernels of such operators are also studied. The concept of homogeneity is associated with transformations of a measure - measure dilations, which are most natural in the context of our general research scheme. For the study of integral operators, the notions of weak and strong homogeneity of the kernel are introduced. The weak case is proved to generate a homogeneous operator in the sense of our definition, while the stronger condition corresponds to the most relevant specific examples - classes of homogeneous integral operators on various metric spaces, and allows us to obtain an explicit general form for the kernels of such operators. The examples given in the article - various specific cases - illustrate general statements and results given in the paper and at the same time are of interest in their own way.

Hosted file

`AK-10 Oct 2021.pdf` available at https://authorea.com/users/444600/articles/544295-homogeneous-operators-and-homogeneous-integral-operators

1