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Research article

New Banach Lattice Algebras and their Applications

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Abstract

Let X be a locally compact Hausdorf space and μ be a Radon measure on X. In this paper, we define a norm on the set $L^p(X,\mu)\cap L^\infty(X,\mu)$ to make it a Banach space, then we show that this space is a Banach algebra with pointwise multiplication. Moreover, we mention some applications of this space both as a Banach lattice and as a Banach algebra.

Keywords: Locally compact, Radon measure, Banach algebra, Banach lattice, Compact group, Haar measure, Ideals.

1. Introduction

Let X be a locally compact Hausdorf space and let μ be a Radon measure on X. Let $C_c(X,\mu)$ denote the space of all complex-valued continuous functions on X with compact support and $C_o(X,\mu)$ the space of all complex-valued continuous functions vanishing at infinity on X. For $1\le p<\infty$, $L^p(X,\mu)$ denote the space of equivalence classes of measurable functions f on X such that $\int_X |f(t)|^p\, dt<\infty$. This space is a Banach space

