ISSN: 1889-3066

Web site: jja.ujaen.es

Jaen J. Approx. 11(1-2) (2019), 91–100

Jaen Journal on Approximation

Best coapproximation in certain metric spaces

Sh. Al-Sharif, A. Ababneh and M. Al-qahtani

Communicated by

M. A. Jiménez-Pozo

Received
July 3, 2018
Accepted
November 13, 2019

Abstract

Let X be a Banach space, (I, μ) be a finite measure space and G be a closed subspace of X. In this paper, we study the problem of best coapproximation in the metric space $L^p(I, X)$, $0 < p < 1$, as a special case of the problem of coproximity of $L^\varphi(I, G)$ in $L^\varphi(I, X)$ whenever G is coproximinal in X, where φ is an increasing continuous subadditive function on $[0, \infty)$ with $\varphi(0) = 0$, and $L^\varphi(I, X)$, the space of all X-valued strongly measurable functions on I with $\int_I \varphi \|f(t)\| \, dt < \infty$.

Keywords: metric projection, coapproximation.

MSC: 46B50, 41A65.

§1. Introduction

A function $\varphi : [0, \infty) \to [0, \infty)$ is called a modulus function if φ is continuous, increasing, subadditive and satisfies $\varphi(x) = 0$ if and only if $x = 0$. The functions $\varphi(x) = x^p$, $0 < p < 1$, and $\varphi(x) = \log(x + 1)$ are examples of modulus functions. In fact if φ is a modulus function, then $\psi(x) = \frac{\varphi(x)}{1+\varphi(x)}$ is also a modulus function.