



Some Results on Best Proximity Pairs in Banach lattice spaces

Mohammad Husein labbaf Ghasemi Zavareh*

Shar-e-Kord University

Noha Eftekhari

Shar-e-Kord University

Abstract

We are going to study best proximity pair in a lattice Banach space X with a strong unit $\mathbf{1}$. Also we develop a theory of best pair proximity for closed upward sets. By the way, give efficient algorithm for finding distance between two sets.

Keywords: Best proximity pair, Lattice Banach space, Upward set.

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1 Introduction

A pair $(x_0, y_0) \in A \times B$ for which $\|x_0 - y_0\| = \text{dist}(A, B)$ is called a best proximity pair for A, B , in this case the pair (A, B) is said to have the best proximity pair in X . Now

$$\text{Prox}(A, B) = \{(x, y) \in A \times B : \|x - y\| = \text{dist}(A, B)\}$$

is the set of all best proximity pairs for the pair (A, B) .

A best proximity pair evolves as a generalization of the best approximation considered by Beer, Pai and Veeramani [1, 2], Kima and Lee [3, 4], Sahney and Singh [5], Singer [6] and Xu [7], of exploring some of the sufficient conditions for the non-emptiness of the set $\text{Prox}(A, B)$.

In this paper we discuss the concepts of best proximity pair on lattice Banach with strong unit $\mathbf{1}$; Also we intend to find an algorithm for the distance of two sets by best proximity pair.

2 Main results

Recall that the set X endowed with partially ordered relation $\leq$ is said to be lattice if for every $x, y \in X$, $\sup\{x, y\}$ and $\inf\{x, y\}$ exist in X which is denoted by $(X, \leq)$. Also vector lattice $(X, \leq, +, \cdot)$ is a lattice $(X, \leq)$, with a binary operation $+$ and scalar product $\cdot$ such that $(X, +, \cdot)$ is a vector space (see in [2]).

*Speaker