Far East Journal of Mathematical Sciences (FJMS)
© 2016 Pushpa Publishing House, Allahabad, India
Published Online: May 2016
http://dx.doi.org/10.17654/MS099101513
Volume 99, Number 10, 2016, Pages 1513-1531 ISSN: 0972-0871

(i, j)-m_X-β- BOUNDARY SETS IN BIMINIMAL STRUCTURE SPACES

Patarawadee Prasertsang and Supunnee Sompong

Department of Sciences
Faculty of Science and Engineering
Kasetsart University
Chalermprakiat Sakon Nakhon Province Campus
Sakon Nakhon 47000
Thailand
e-mail: patarawadee.s@ku.th

Department of Mathematics and Statistics
Faculty of Science and Technology
Sakon Nakhon Rajabhat University
Sakon Nakhon 47000
Thailand
e-mail: s_sanpinij@yahoo.com

Abstract

In this paper, we introduce the notion of an (i, j)-m_X-boundary set, in a biminimal structure space and obtain some of its properties besides characterizations. Further, the closure and interior in this setting have also been dealt with.

Received: January 5, 2016; Revised: January 27, 2016; Accepted: February 10, 2016
2010 Mathematics Subject Classification: 54A05.
Keywords and phrases: boundary sets, (i, j)-m_X-β-closure, (i, j)-m_X-β-interior sets, (i, j)-m_X-β- boundary sets, biminimal structure spaces, topology.
Communicated by K. K. Azad

1. Introduction

The notion of a bitopological space was introduced by Kelly [4], and that of a minimal structure by Popa and Noiri [10]. Boonpok et al. combined these structures and made preliminary studies in [1-3].

In this paper, we introduce and study the notion of (i, j)-m_X-β -closure, (i, j)-m_X-β -interior and (i, j)-m_X-β -boundary sets in biminimal structure spaces.

2. Preliminaries

Definition 2.1 [8]. A subfamily m_X of the power set $P(X)$ of a nonempty set X is called a *minimal structure* (briefly *m-structure*) on X if $\varnothing \in m_X$ and $X \in m_X$. Each member of m_X is said to be m_X*-open* and the complement of an m_X-open set is said to be m_X*-closed.*

Definition 2.2 [5]. Let X be a nonempty set and m_X an m-structure on X. For a subset A of X, the m_X-closure of A and m_X-interior of A are defined as follows:

(1) $m_XCl(A) = \bigcap\{F : A \subseteq F, X \setminus F \in m_X\}$,

(2) $m_XInt(A) = \bigcup\{U : U \subseteq A, U \in m_X\}$.

Lemma 2.3 [5]. *Let X be a nonempty set and m_X an m-structure on X. For a subset A and B of X, the following holds*:

(1) $m_XCl(X\setminus A) = X\setminus m_XInt(A)$ *and* $m_XInt(X\setminus A) = X\setminus m_XCl(A)$,

(2) *If* $(X\setminus A) \in m_X$, *then* $m_XCl(A) = A$ *and if* $A \in m_X$, *then* $m_XInt(A) = A$,

(3) $m_XCl(\varnothing) = \varnothing$, $m_XCl(X) = X$, $m_XInt(\varnothing) = \varnothing$ *and* $m_XInt(X) = X$,

(4) *If* $A \subseteq B$, *then* $m_XCl(A) \subseteq m_XCl(B)$ *and* $m_XInt(A) \subseteq m_XInt(B)$,