Exterior Set in Soft Biminimal Spaces

R. GOWRI[1] **and S. VEMBU**[2]
[1] Department of Mathematics,
Government College for Women(Autonomous), Kumbakonam, India

[2] Research Scholar, Department of Mathematics,
Government College for Women(Autonomous), Kumbakonam, India

Abstract

The aim of this paper is to introduce the concept and some fundamental properties of exterior set in soft biminimal spaces.
Keywords: soft minimal, soft biminimal space, exterior set.

1 Introduction

In 2000, V. Popa and T.Noiri [14] introduced the concepts of minimal structure (briefly m-structure). They also introduced the concepts of m_X-open set and m_X-closed set and characterize those sets using m_X-closure and m_X-interior operators respectively. J.C. Kelly [7] defined the study of bitopological spaces in 1963. In 2010, C. Boonpok [2] introduced the concept of biminimal structure space and studied $m_X^1 m_X^2$-open sets and $m_X^1 m_X^2$-closed sets in biminimal structure spaces. Russian researcher Molodtsov [5], initaited the concept of soft sets as a new mathematical tool to deal with uncertainties while modeling problems in engineering physics, computer science, economics, social sciences and medical sciences in 1999. In 2015, R. Gowri and S. Vembu [11] introduced Soft minimal and soft biminimal spaces. The purpose of this paper is to introduce the concept of exterior set in soft biminimal spaces and their properties are studied.

2 Preliminaries

Definition 2.1 [11] *Let X be an initial universe set, E be the set of parameters and $A \subseteq E$. Let F_A be a nonempty soft set over X and $\tilde{P}(F_A)$ is the soft power set of F_A. A subfamily $\tilde{m}$ of $\tilde{P}(F_A)$ is called a soft minimal set over X if $F_\emptyset \in \tilde{m}$ and $F_A \in \tilde{m}$.*

$(F_A, \tilde{m})$ or $(X, \tilde{m}, E)$ is called a soft minimal space over X. Each member of $\tilde{m}$ is said to be $\tilde{m}$ -soft open set and the complement of an $\tilde{m}$-soft open set is said to be $\tilde{m}$-soft closed set over X.

Definition 2.2 [11] *Let X be an initial universe set and E be the set of parameters. Let $(X, \tilde{m}_1, E)$ and $(X, \tilde{m}_2, E)$ be the two different soft minimals over X. Then $(X, \tilde{m}_1, \tilde{m}_2, E)$ or $(F_A, \tilde{m}_1, \tilde{m}_2)$ is called a soft biminimal spaces.*

Definition 2.3 [11] *A soft subset F_B of a soft biminimal space $(F_A, \tilde{m}_1, \tilde{m}_2)$ is called $\tilde{m}_1\tilde{m}_2$-soft closed if $\tilde{m}cl_1(\tilde{m}cl_2(F_B)) = F_B$. The complement of $\tilde{m}_1\tilde{m}_2$-soft closed set is called $\tilde{m}_1\tilde{m}_2$-soft open.*

Proposition 2.4 [11] *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space over X. Then F_B is a $\tilde{m}_1\tilde{m}_2$-soft open soft subsets of $(F_A, \tilde{m}_1, \tilde{m}_2)$ if and only if $F_B = \tilde{m}Int_1(\tilde{m}Int_2(F_B))$.*

Proposition 2.5 [11] *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space.If F_B and F_C are $\tilde{m}_1\tilde{m}_2$-soft closed soft subsets of $(F_A, \tilde{m}_1, \tilde{m}_2)$ then $F_B \tilde{\cap} F_C$ is $\tilde{m}_1\tilde{m}_2$-soft closed.*

Proposition 2.6 [11] *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space over X. If F_B and F_C are $\tilde{m}_1\tilde{m}_2$-soft open soft subsets of $(F_A, \tilde{m}_1, \tilde{m}_2)$,then $F_B \tilde{\cup} F_C$ is $\tilde{m}_1\tilde{m}_2$ -soft open.*

Definition 2.7 [5] *Let U be an initial universe and E be a set of parameters. Let $P(U)$ denote the power set of U and A be a nonempty subset of E. A pair (F, A) is called a soft set over U, where F is a mapping given by $F : A \to P(U)$.*

In other words, a soft set over U is a parametrized family of subsets of the universe U. For $\epsilon \in A$. $F(\epsilon)$ may be considered as the set of ϵ - approximate elements of the soft set (F, A). Clearly, a soft set is not a set.

Example 2.8 [11] *Let $U = \{u_1, u_2\}$, $E = \{x_1, x_2, x_3\}$, $A = \{x_1, x_2\} \subseteq E$ and $F_A = \{(x_1, \{u_1, u_2\}), (x_2, \{u_1, u_2\})\}$. Then*

$$
\begin{aligned}
F_{A_1} &= \{(x_1, \{u_1\})\},\\
F_{A_2} &= \{(x_1, \{u_2\})\},\\
F_{A_3} &= \{(x_1, \{u_1, u_2\})\},\\
F_{A_4} &= \{(x_2, \{u_1\})\},\\
F_{A_5} &= \{(x_2, \{u_2\})\},\\
F_{A_6} &= \{(x_2, \{u_1, u_2\})\},\\
F_{A_7} &= \{(x_1, \{u_1\}), (x_2, \{u_1\})\},\\
F_{A_8} &= \{(x_1, \{u_1\}), (x_2, \{u_2\})\},\\
F_{A_9} &= \{(x_1, \{u_1\}), (x_2, \{u_1, u_2\})\},\\
F_{A_{10}} &= \{(x_1, \{u_2\}), (x_2, \{u_1\})\},\\
F_{A_{11}} &= \{(x_1, \{u_2\}), (x_2, \{u_2\})\},\\
F_{A_{12}} &= \{(x_1, \{u_2\}), (x_2, \{u_1, u_2\})\},\\
F_{A_{13}} &= \{(x_1, \{u_1, u_2\}), (x_2, \{u_1\})\},\\
F_{A_{14}} &= \{(x_1, \{u_1, u_2\}), (x_2, \{u_2\})\},\\
F_{A_{15}} &= F_A,\\
F_{A_{16}} &= F_\emptyset.
\end{aligned}
$$

are all soft subsets of F_A . so $|\tilde{P}(F_A)| = 2^4 = 16$.
$\tilde{m} = \{F_\emptyset, F_A, F_{A_4}, F_{A_7}F_{A_{11}}F_{A_{13}}\}$

3 Exterior set in soft biminimal spaces

In this section, we introduce the concept and study some fundamental properties of exterior set in soft biminimal spaces.

Definition 3.1 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS), F_B be a soft subset of F_A and $x \in F_A$. Then x is called $\tilde{m}_i\tilde{m}_j$-exterior point of F_B if $x \in \tilde{m}_iInt(\tilde{m}_jInt(F_A \setminus F_B))$. We denote the set of all $\tilde{m}_i\tilde{m}_j$-exterior point of F_B by $\tilde{m}Ext_{ij}(F_B)$ where $i, j = 1, 2$, and $i \neq j$.*
From definition we have $\tilde{m}Ext_{ij}(F_B) = F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_B))$.

Example 3.2 *Let* $X = \{u_1, u_2\}$, $E = \{x_1, x_2, x_3\}$, $A = \{x_1, x_2\} \subseteq E$ *and* $F_A = \{(x_1, \{u_1, u_2\}), (x_2, \{u_1, u_2\})\}$. *Then*

$$\begin{aligned}
&F_{A_1} = \{(x_1, \{u_1\})\},\\
&F_{A_2} = \{(x_1, \{u_2\})\},\\
&F_{A_3} = \{(x_1, \{u_1, u_2\})\},\\
&F_{A_4} = \{(x_2, \{u_1\})\},\\
&F_{A_5} = \{(x_2, \{u_2\})\},\\
&F_{A_6} = \{(x_2, \{u_1, u_2\})\},\\
&F_{A_7} = \{(x_1, \{u_1\}), (x_2, \{u_1\})\},\\
&F_{A_8} = \{(x_1, \{u_1\}), (x_2, \{u_2\})\},\\
&F_{A_9} = \{(x_1, \{u_1\}), (x_2, \{u_1, u_2\})\},\\
&F_{A_{10}} = \{(x_1, \{u_2\}), (x_2, \{u_1\})\},\\
&F_{A_{11}} = \{(x_1, \{u_2\}), (x_2, \{u_2\})\},\\
&F_{A_{12}} = \{(x_1, \{u_2\}), (x_2, \{u_1, u_2\})\},\\
&F_{A_{13}} = \{(x_1, \{u_1, u_2\}), (x_2, \{u_1\})\},\\
&F_{A_{14}} = \{(x_1, \{u_1, u_2\}), (x_2, \{u_2\})\},\\
&F_{A_{15}} = F_A,\\
&F_{A_{16}} = F_\emptyset \text{ are all soft subsets of } F_A.
\end{aligned}$$

$\tilde{m}_1 = \{F_\emptyset, F_A, F_{A_8}, F_{A_{10}}\}$ *and* $\tilde{m}_2 = \{F_\emptyset, F_A, F_{A_1}, F_{A_{12}}\}$.
Hence, $\tilde{m}Ext_{12}(\{(x_1, \{u_1\})\}) = F_A \setminus (\{(x_1, \{u_1\})\}) = \{(x_1, \{u_2\}), (x_2, \{u_1\})\}$,
$\tilde{m}Ext_{21}(\{(x_1, \{u_1\})\}) = F_A \setminus (\{(x_1, \{u_1\})\}) = F_\emptyset$

Lemma 3.3 *Let* $(F_A, \tilde{m}_1, \tilde{m}_2)$ *be a soft biminimal space (SBMS) and* F_B *be a soft subset of* F_A. *Then for any* $i, j = 1, 2$, *and* $i \neq j$, *we have:*
a) $\tilde{m}Ext_{ij}(F_B) \cap F_B = F_\emptyset$,
b) $\tilde{m}Ext_{ij}(F_\emptyset) = F_A$,
c) $\tilde{m}Ext_{ij}(F_A) = F_\emptyset$

Proof: a) Assume that $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B be a soft subset of F_A.
Since $F_B \subset \tilde{m}_iCl(\tilde{m}_jCl(F_B))$
We have $\tilde{m}Ext_{ij}(F_B) = F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_B))$.

$$\begin{aligned}
\text{Now, } &\tilde{m}Ext_{ij}(F_B) \cap F_B\\
&= F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_B)) \cap F_B\\
&= (F_A \setminus F_B) \cap F_B\\
&= F_\emptyset
\end{aligned}$$

Hence $\tilde{m}Ext_{ij}(F_B) \cap F_B = F_\emptyset$

b) $$\begin{aligned}\tilde{m}Ext_{ij}(F_\emptyset) &= F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_\emptyset))\\ &= F_A \setminus F_\emptyset\\ &= F_A\end{aligned}$$

Hence $\tilde{m}Ext_{ij}(F_\emptyset) = F_A$

c) $$\begin{aligned}\tilde{m}Ext_{ij}(F_A) &= F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_A))\\ &= F_A \setminus F_A\\ &= F_\emptyset\end{aligned}$$

Hence $\tilde{m}Ext_{ij}(F_A) = F_\emptyset$ □

Theorem 3.4 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B, F_C be a soft subset of F_A. If $F_B \tilde{\subseteq} F_C$, then $\tilde{m}Ext_{ij}(F_C) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_B)$ Where $i, j = 1, 2$, and $i \neq j$.*

Proof: Assume that $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B, F_C be a soft subset of F_A.
Let $F_B \tilde{\subseteq} F_C$
Thus $\tilde{m}_iCl(\tilde{m}_jCl(F_B)) \tilde{\subseteq} \tilde{m}_iCl(\tilde{m}_jCl(F_C))$
Then $F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_C)) \tilde{\subseteq} F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_B))$
Hence, $\tilde{m}Ext_{ij}(F_C) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_B)$ for any $i, j = 1, 2$, and $i \neq j$. □

Theorem 3.5 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B be a soft subset of F_A. Then for any $i, j = 1, 2$, and $i \neq j$, F_B is $\tilde{m}_i\tilde{m}_j$-soft closed if and only if $\tilde{m}Ext_{ij}(F_B) = F_A \setminus F_B$*

Proof: Let F_B be a soft subset of F_A.
Assume that F_B is $\tilde{m}_i\tilde{m}_j$-soft closed
Since $F_B = \tilde{m}_iCl(\tilde{m}_jCl(F_B))$
By Definition (3.1) in SBMS, $\tilde{m}Ext_{ij}(F_B) = F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_B))$
Therefore $\tilde{m}Ext_{ij}(F_B) = F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_B)) = F_A \setminus F_B$
Hence, $\tilde{m}Ext_{ij}(F_B) = F_A \setminus F_B$
conversely, $\tilde{m}Ext_{ij}(F_B) = F_A \setminus F_B$
Since, $F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_B)) = F_A \setminus F_B$
That implies $\tilde{m}_iCl(\tilde{m}_jCl(F_B)) = F_B$
Hence, F_B is $\tilde{m}_i\tilde{m}_j$-soft closed. □

Theorem 3.6 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B be a soft subset of F_A. Then for any $i, j = 1, 2$, and $i \neq j$, F_B is $\tilde{m}_i\tilde{m}_j$-soft open if and only if $\tilde{m}Ext_{ij}(F_A \setminus F_B) = F_B$*

Proof: Let F_B be a soft subset of F_A.
Assume that F_B is $\tilde{m}_i\tilde{m}_j$-soft open
Since $F_A \setminus F_B$ is $\tilde{m}_i\tilde{m}_j$-soft closed.
By Definition (3.1) $\tilde{m}Ext_{ij}(F_B) = F_A \setminus \tilde{m}_iCl(\tilde{m}_jCl(F_B))$.
Therefore $\tilde{m}Ext_{ij}(F_A \setminus F_B) = F_A \setminus (\tilde{m}_iCl(\tilde{m}_jCl(F_A \setminus F_B)) = F_B$.
Hence, $\tilde{m}Ext_{ij}(F_A \setminus F_B) = F_B$
conversely, $\tilde{m}Ext_{ij}(F_A \setminus F_B) = F_B$
Since, $F_B = \tilde{m}Ext_{ij}(F_A \setminus F_B) = F_A \setminus (\tilde{m}_iCl(\tilde{m}_jCl(F_A \setminus F_B)) = \tilde{m}_iInt(\tilde{m}_jInt(F_B))$.
Hence, F_B is $\tilde{m}_i\tilde{m}_j$-soft open. □

Theorem 3.7 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a SBMS and F_B be a soft subset of F_A. If F_B is $\tilde{m}_i\tilde{m}_j$-soft closed, then $\tilde{m}Ext_{ij}(F_A \setminus \tilde{m}Ext_{ij}(F_B)) = \tilde{m}Ext_{ij}(F_B)$. Then for any $i, j = 1, 2$, and $i \neq j$.*

Proof: Assume that F_B is $\tilde{m}_i\tilde{m}_j$-soft closed
By Theorem 3.5, F_B is $\tilde{m}_i\tilde{m}_j$-soft closed if and only if $\tilde{m}Ext_{ij}(F_B) = F_A \setminus F_B$
That implies, $\tilde{m}Ext_{ij}(F_A \setminus \tilde{m}Ext_{ij}(F_B))$
$= \tilde{m}Ext_{ij}(F_A \setminus (F_A \setminus F_B))$
$= \tilde{m}Ext_{ij}(F_B)$. □

Corollary 3.8 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS)and F_B, F_C be a soft subset of F_A. Then for any $i, j = 1, 2$, and $i \neq j$. If F_B and F_C are $\tilde{m}_i\tilde{m}_j$-soft open, then $\tilde{m}Ext_{ij}(F_A \setminus (F_B \cup F_C)) = F_B \cup F_C$.*

Proof: Assume that F_B and F_C are $\tilde{m}_i\tilde{m}_j$-soft open, then $F_B \cup F_C$ is $\tilde{m}_i\tilde{m}_j$-soft open.
It follows from Theorem 3.6 that $\tilde{m}Ext_{ij}(F_A \setminus (F_B \cup F_C)) = F_B \cup F_C$. □

Corollary 3.9 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B, F_C be a soft subset of F_A. Then for any $i, j = 1, 2$, and $i \neq j$. If F_B and F_C are $\tilde{m}_i\tilde{m}_j$-soft closed, then $\tilde{m}Ext_{ij}(F_A \setminus (F_B \cap F_C)) = F_B \cap F_C$.*

Proof: The proof is obivious. □

Theorem 3.10 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B, F_C be a soft subset of F_A, then $\tilde{m}Ext_{ij}(F_B) \cup \tilde{m}Ext_{ij}(F_C) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_B \cap F_C)$ where $i, j = 1, 2$, and $i \neq j$.*

Proof: Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B, F_C be a soft subset of F_A.
Since, $F_B \cap F_C \tilde{\subseteq} F_B$ and $F_B \cap F_C \tilde{\subseteq} F_C$.
Then $\tilde{m}Ext_{ij}(F_B) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_B \cap F_C)$ and $\tilde{m}Ext_{ij}(F_C) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_B \cap F_C)$.
It follows that $\tilde{m}Ext_{ij}(F_B) \cup \tilde{m}Ext_{ij}(F_C) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_B \cap F_C)$. □

Theorem 3.11 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B, F_C be a soft subset of F_A. Then for any $i, j = 1, 2$, and $i \neq j$, If F_B, F_C are $\tilde{m}_i\tilde{m}_j$-soft closed, then $\tilde{m}Ext_{ij}(F_B) \cup \tilde{m}Ext_{ij}(F_C) = \tilde{m}Ext_{ij}(F_B \cap F_C)$*

Proof: Assume that F_B and F_C are $\tilde{m}_i\tilde{m}_j$-soft closed. Thus $F_B \cap F_C$ is $\tilde{m}_i\tilde{m}_j$-soft closed.
It follows from Theorem 3.5 that $\tilde{m}Ext_{ij}(F_B) = F_A \setminus F_B$
Thus $\tilde{m}Ext_{ij}(F_B \cap F_C) = F_A \setminus (F_B \cap F_C)$

$$= (F_A \setminus F_B) \cup (F_A \setminus F_C)$$
$$= \tilde{m}Ext_{ij}(F_B) \cup \tilde{m}Ext_{ij}(F_C)$$

Hence $\tilde{m}Ext_{ij}(F_B) \cup \tilde{m}Ext_{ij}(F_C) = \tilde{m}Ext_{ij}(F_B \cap F_C)$ □

Example 3.12 *Let $X = \{u_1, u_2\}$, $E = \{x_1, x_2, x_3\}$, $A = \{x_1, x_2\} \subseteq E$ and $F_A = \{(x_1, \{u_1, u_2\}), (x_2, \{u_1, u_2\})\}$. Then*
$\tilde{m}_1 = \{F_\emptyset, F_A, F_{A_7}, F_{A_{11}}\}$, $\tilde{m}_2 = \{F_\emptyset, F_A, F_{A_1}, F_{A_2}\}$
$\tilde{m}Ext_{ij}\{(x_1, \{u_1\})\} = F_A \setminus \tilde{m}_1Cl(\tilde{m}_2Cl\{(x_1, \{u_1\})\})$,
$\tilde{m}Ext_{ij}\{(x_2, \{u_1\})\} = F_A \setminus \tilde{m}_1Cl(\tilde{m}_2Cl\{(x_2, \{u_1\})\}$ *, and*
$\tilde{m}Ext_{ij}(\{(x_1, \{u_1\})\} \cap \{(x_2, \{u_1\})\}) = F_A \setminus \tilde{m}_1Cl(\tilde{m}_2Cl(F_\emptyset))$
Hence $\tilde{m}Ext_{ij}\{(x_1, \{u_1\})\} = \{(x_1, \{u_2\}), (x_2, \{u_2\})\}$,
$\tilde{m}Ext_{ij}\{(x_2, \{u_1\})\} = F_\emptyset$ *and*
$\tilde{m}Ext_{ij}(\{(x_1, \{u_1\})\} \cap \{(x_2, \{u_1\})\}) = F_A$
Therefore $\tilde{m}Ext_{ij}(\{(x_1, \{u_1\})\}) \cup \tilde{m}Ext_{ij}(\{(x_2, \{u_1\})\}) \neq$
$\tilde{m}Ext_{ij}((\{(x_1, \{u_1\})\}) \cap \{(x_2, \{u_1\})\})$

Theorem 3.13 *Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B, F_C be a soft subset of F_A, then $\tilde{m}Ext_{ij}(F_B \cup F_C) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_B) \cap \tilde{m}Ext_{ij}(F_C)$ where $i, j = 1, 2,$ and $i \neq j$.*

Proof: Let $(F_A, \tilde{m}_1, \tilde{m}_2)$ be a soft biminimal space (SBMS) and F_B, F_C be a soft subset of F_A.
Since $F_B \tilde{\subseteq} F_B \cup F_C$ and $F_C \tilde{\subseteq} F_B \cup F_C$.
Then $\tilde{m}Ext_{ij}(F_B \cup F_C) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_B)$ and $\tilde{m}Ext_{ij}(F_B \cup F_C) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_C)$.
It follows that $\tilde{m}Ext_{ij}(F_B \cup F_C) \tilde{\subseteq} \tilde{m}Ext_{ij}(F_B) \cap \tilde{m}Ext_{ij}(F_C)$. □

Example 3.14 *Let $X = \{u_1, u_2\}$, $E = \{x_1, x_2, x_3\}$, $A = \{x_1, x_2\} \subseteq E$ and $F_A = \{(x_1, \{u_1, u_2\}), (x_2, \{u_1, u_2\})\}$. Then*
$\tilde{m}_1 = \{F_\emptyset, F_A, F_{A_1}, F_{A_2}, F_{A_7}, F_{A_{11}}\}$, $\tilde{m}_2 = \{F_\emptyset, F_A, F_{A_1}, F_{A_2}, F_{A_7}, F_{A_{11}}\}$
$\tilde{m}Ext_{ij}\{(x_1, \{u_1\})\} = F_A \setminus \tilde{m}_1Cl(\tilde{m}_2Cl\{(x_1, \{u_1\})\})$,
$\tilde{m}Ext_{ij}\{(x_1, \{u_2\}), (x_2, \{u_2\})\} = F_A \setminus \tilde{m}_1Cl(\tilde{m}_2Cl\{(x_1, \{u_2\}), (x_2, \{u_2\})\}$
Hence $\tilde{m}Ext_{ij}(\{(x_1, \{u_1\})\} \cup \{(x_1, \{u_1, u_2\}), (x_2, \{u_2\})\}) = F_\emptyset$,
$\tilde{m}Ext_{ij}\{(x_1, \{u_1\})\} = \{(x_1, \{u_2\}), (x_2, \{u_1, u_2\})\}$,
$\tilde{m}Ext_{ij}\{(x_1, \{u_2\}), (x_2, \{u_2\})\} = \{(x_1, \{u_1\}), (x_2, \{u_1\})\}$
Therefore $\tilde{m}Ext_{ij}(\{(x_1, \{u_1\})\} \cup \{(x_1, \{u_2\})\} \neq$
$\tilde{m}Ext_{ij}(\{(x_1, \{u_1\})\}) \cap \tilde{m}Ext_{ij}(\{(x_1, \{u_2\}), (x_2, \{u_2\})\})$

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