Level Set of Measurable Conjugate Flexible Fuzzy Soft Bi-Ideals Over Near-Ring Structures

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Abstract - *In this paper, we introduce the notion of conjugate flexible fuzzy soft bi- ideals in near –ring structures, level sets and given some characterizations of flexible fuzzy soft ideals in near-ring approximations. Also, we investigate the structure ofnormal flexible fuzzy soft subgroup.*

Keywords - *soft set, level set, fuzzy set, flexible fuzzy soft set, conjugate, epimorphism, normal, complete, soft bi-ideal.*

I. INTRODUCTION

Soft set theory was introduced by Molodtsov [16] for modeling vagueness and uncertainty and it has been received much attentionin the field of set theory. Maji et.al [13, 14] explains the applications of soft sets in decision making problems. Ali et.al [4] defined some new operations in soft set theory and Sezgin and Atagun [20] introduced and studied operations of soft sets. Soft set theory has also potential applications especially in decision making as in [20]. This theory has started to progress in the mean of algebraic structures, since Aktas and Cagman [3] defined and studied soft groups. Since then, soft substructures of rings, fields and modules, union soft substructures of near-rings and near-ring modules [21], normalistic soft groups [15] are defined and studied in detailed .In 1999, Molodtsov's[16] proposed an approach for Modeling, Vagueness and uncertainty, called soft set theory, since its inception, works on soft set theory have been progressing rapidly with a wide range applications especially in the mean of algebraic structures as in [3].
Zadeh′s classical paper [27] of 1965 introduced the concepts of fuzzy sets and fuzzy set operations. Foster [7] combined the structure of a fuzzy topological space. The study of the fuzzy algebraic structures started with the introduction of concepts of fuzzy subgroups and fuzzy (left, right) ideals in the pioneering paper of Rosenfeld [17]. Anthony and Sherwood [1] redefined fuzzy subgroups using the concept of triangular norm. Several mathematicians [6,8,10] followed the Rosenfeld approach in investigating fuzzy algebra where given ordinary algebraic structure on a given set X is assumed then introducing the fuzzy algebraic structure as a fuzzy subset A of X satisfying some suitable conditions. Throughout this paper, G will denote a group and "e" will denote its identity element. Let sup, inf, min, max will denote thesupermum, infimum, minimum, maximum respectively. Flexible fuzzy soft subgroups in various algebraic structures defined in [23-26]. Many researchers Abd-Allahet.al [2], Chengyi [5], Dib and Hassan [6], Tang and Zhang [22], Syransu and Ruy [19], Massa'deh [12] studied the properties of groups and subgroups by the definition of fuzzy subgroups. In this paper, we introduce the notion of flexible fuzzy soft ideals in near –ring structures, level sets and given some characterizations of flexible fuzzy soft ideals in near-ring approximations.

II .PRELIMINARIES

In this section, we recall some basic notions relevant to group theory.
2.1Definition [23]: Let X be a set. Then a mapping μ: X→ [0, 1] is called a fuzzy subset of X.
2.2 Definition [16]:Let U be an initial universe.Let P(U) be the power set of U, E be the set of all parameters and A⊆ E. A soft set (f_A, E) on the universe U is defined by the set of order pairs (f_A, E) = {(e, (e)): e∈ E, f_A∈ P (U)} where : E → P(U) such that f_A (e) = ϕif e ∉A.Heref_A is called an approximate function of the soft set.
2.3 Definition:[23] Let X be a set. Then a mapping μ: X→ M* ([0, 1]) is called flexible fuzzy subset of X, where M* ([0, 1]) denotes the set of all non empty subset [0, 1].

2.4Definition: Let N be a near-ring. A flexible fuzzy soft set A of N is called a (t_1,t_2)-flexible fuzzy soft subnear-ring of N if for all $x,y\in N$,

(i) $\sup\{A(x-y , t_1)\} \geq \inf \{A(x), A(y), t_2 \}$

(ii) $\sup\{A(xy, t_1)\} \leq \inf \{A(x), A(y), t_2\}$.

2.5 Definition: Let N be a near-ring. A flexible fuzzy soft set A of N is called a (t_1, t_2)-flexible fuzzy soft bi-ideal of N if for all $x,y, z \in N$,

(i) $\sup \{ A(x-y, t_1)\} \geq \inf \{ A(x), A(y), t_2\}$

(ii) $\sup\{A(xyz, t_1)\} \geq \inf \{A(x), A(z), t_2\}$.

2.6Definition: A family of flexible fuzzy soft set $\{ A_i / i\in \Gamma \}$ is a near-ring N, the union $\vee A_i$ of $\{A_i / i\in \Gamma \}$ is defined by $(\vee Ai) (x) = \max \{A_i(x) / i\in\Gamma \}$ for each $x \in N$.

2.7Definition: A family of flexible fuzzy soft set $\{ A_i / i\in \Gamma \}$ is a near-ring N , the intersection $\cap A_i$ of $\{ A_i / i\in \Gamma \}$ is defined by $(\cap Ai) (x) = \min \{A_i(x) / i \in\Gamma \}$ for each $x\in N$.

2.8Definition: Let N and N′ be two near-rings and f bea function of N into N′ .

(i) If ƛ is a flexible fuzzy soft set in N′ , then the pre-image of ƛ under f is the flexible fuzzy soft set N defined by f^{-1}(ƛ) (x) = ƛ f(x) for each $x \in N$.

(ii) If A is a flexible fuzzy soft set of N, then the image of A under f is the flexible fuzzy soft set in N′ defined by

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$f^{-1}(A)(y) =$ if $f^{-1}(y) \neq \Phi$ where $x \in f^{-1}(y)$
ise.

2.9 Definition: A flexible fuzzy soft bi-ideal A of a near-ring N is said to be normal if $A(0) = 1$.

2.10 Definition: A flexible fuzzy soft bi-ideal A of a near-ring N is said to be complete if it is normal and there exists $z \in N$ such that $A(z) = 0$.

III FLEXIBLE FUZZY SOFT BI-IDEALS IN NEAR-RING

3.1Definition: Let N be a near-ring. A flexible fuzzy soft set A of N is called a (t_1,t_2)- flexible conjugatefuzzy soft ideal of N if for all $x,y,z\in N$,

(i) $\sup \{A(x-y), t_1\} \leq \inf \{ A(x), A(y), t_2\}$

(ii) $\sup\{A(xyz), t_1 \} \leq \inf \{A(x), A(z), t_2\}$.

3.2Example:Let N = {0,a,b,c } be the klein's 4 group. Define addition and multiplication in N as follows

+	0	A	B	c
0	0	A	B	c
a	a	0	C	b
b	b	C	0	a
c	c	B	A	0

•	0	A	B	c
0	0	0	0	0
a	0	B	0	b
b	0	0	0	0
c	0	B	0	b

Then (N, +, •) is a near-ring. Define a flexible fuzzy soft set $A : N \rightarrow P^*[0,1]$ by $A(0) = 0.7$, $A(a) = 0.3$, $A(b) = 0.6$, $A(c) = 0.8$. It is easy to verify that A is (t_1, t_2)- conjugateflexible fuzzy soft ideal of N. But A is not a flexible fuzzy soft ideal of N since $A(0) = A(b-b) \ngeq \inf \{A(b), A(b)\}$.

3.3Theorem: Let $\Phi : N \rightarrow N'$ be an onto homomorphism of near-rings.

(i) If λ is a (t_1, t_2)- flexible fuzzy soft bi-ideal in N′,'then $\Phi^{-1}(\lambda)$ is a (t_1, t_2)- flexible fuzzy soft bi-ideal in N.

(ii) If δ is a (t_1, t_2)-flexible fuzzy soft bi-ideal in N, then $\Phi(\delta)$ is a (t_1, t_2)- flexible fuzzy soft bi-ideal in N′.

Proof: (i) Let λ be a (t_1, t_2)-flexible fuzzy soft ideal of N′.

For any $x,y\in N$,

$\sup \{f^{-1}(\lambda)(x-y), t_1\}= \sup \{\lambda (f(x-y), t_1)\}$

$= \sup \{\lambda (f(x)- f(y)) , t_1\}$

$\geq \inf \{ \lambda (f(x) , \lambda f(y)) , t_2\}$

$= \inf\{f^{-1}(\lambda)(x), f^{-1}(\lambda)(y), t_2\}$

Therefore, $\sup\{ f^{-1}(\lambda)(x-y),t_1\} \geq \inf\{f^{-1}(\lambda)(x), f^{-1}(\lambda)(y), t_2\}$ and

$\sup\{f^{-1}(\lambda)(xyz), t_1\} = \sup \{\lambda (f(xyz), t_1)\}$

$= \sup \{\lambda (f(x) f(y)f(z)), t_1\}$

$\geq \inf\{ \lambda(f(x)), \lambda (f(z)) , t_2\}$

$= \inf \{f^{-1}(\lambda)(x), f^{-1}(\lambda)(z), t_2\}$

Thus, $\sup\{f^{-1}(\lambda)(xyz), t_1\} \geq \inf \{f^{-1}(\lambda)(x), f^{-1}(\lambda)(z), t_2\}$. Hence $f^{-1}(\lambda)$ is a flexible fuzzy soft bi-ideal in N.

(ii) Let δ be (t_1, t_2)-flexible fuzzy soft ideal in N.

Let $y_1, y_2, y_3 \in N'$. Then we have $\{x / x \in f^{-1}(y_1-y_2)\}$, $\{x_1-x_2 / x_1\in f^{-1}(y_1)$ and $x_2\in f^{-1}(y_2)\}$ and hence

$\sup\{f(\delta)(y_1-y_2), t_1\} = \sup \{ \delta(x) / x \in f^{-1}(y_1-y_2), t_1\}$

$\geq \sup \{\inf \{\delta(x_1-x_2)/ x_1\in f^{-1}(y_1) \text{ and } x_2\in f^{-1}(y_2), t_2\}\}$

$\geq \sup \{ \inf \{\delta(x_1), \delta (x_2), t_2\} / x_1\in f^{-1}(y_1) \text{ and } x_2\in f^{-1}(y^2)\}$

$= \inf \{\sup \{\delta(x_1)/ x_1\in f^{-1}(y_1), t_2\} \text{ and } \sup \{ \delta (x_2) /x_2\in f^{-1}(y_2), t_2\}\}$

$= \inf \{f(\delta)(y_1) , f(\delta)(y_2),t_2\}$

Thus, $\sup \{f(\delta)(y_1-y_2), t_1\} \geq \inf\{f(\delta)(y_1) , f(\delta)(y_2), t_2\}$.

Let $y_1, y_2, y_3\in N'$. Then we have,

$\sup\{f(\delta)(y_1y_2y_3), t_1\} = \sup \{ \delta(x) / x \in f^{-1}(y_1y_2y_3),t_1\}$

$\geq \sup \{\inf \{\delta(x_1x_2x_3), t_2\}/ x_1\in f^{-1}(y_1) \text{ and } x_2\in f^{-1}(y_2), x_3\in f^{-1}(y_3)\}$

$\geq \sup \{ \inf \{\delta(x_1), \delta (x_3),t_2\} / x_1\in f^{-1}(y_1) \text{ and } x_3\in f^{-1}(y_3)\}$

$= \inf \{\sup\{ \delta(x_1)/ x_1\in f^{-1}(y_1),t_2\} \text{ and } \sup \{ \delta (x_3) /x_3\in f^{-1}(y_3),t_2\}\}$

$= \inf \{f(\delta)(y_1) , f(\delta)(y_3), t_2\}$

Thus, $\sup\{f(\delta)(y_1y_2y_3), t_1\} \geq \inf \{f(\delta)(y_1) , f(\delta)(y_3), t_2\}$. Hence $f(\delta)$ is a (t_1, t_2)-flexible fuzzy soft bi-ideal of N'.

3.4Theorem: Let N be a near-ring and A be a flexible fuzzy soft set in N. Then A is (t_1, t_2)-conjugateflexible fuzzy soft bi-ideal in N if and only if A^C is a (t_1, t_2)- flexible fuzzy soft ideal in N.

Proof: Let N be near-ring and A be a (t_1, t_2)-conjugate flexible fuzzy soft bi-ideal in N.

For $x,y\in N$,

$\sup\{A^C (x-y), t_1\} = \sup \{1- A(x-y), t_1\}$

$\geq \inf\{1-\sup \{ A(x) , A(y)\}, t_2\}$

$= \inf\{ 1- A(x), 1- A(y), t_2\}$

$= \inf \{A^C(x), A^C(y), t_2\}$

Therefore, $\sup\{A^C(x-y), t_1\} \geq \inf \{ A^C(x), A^C(y), t_2\}$.

For any $x,y,z\in N$,

$\sup\{A^C(xyz), t_1\} = \sup\{1- A(xyz), t_2\}$

$\geq \inf \{1- \sup \{A(x) , A(z)\}, t_2\}$

$= \inf \{1- A(x), 1-A(z) ,t_2\} = \inf\{ A^C(x), A^C(z), t_2\}$

Therefore, $\sup\{A^C(xyz), t_1\} \geq \inf\{ A^C(x), A^C(z) , t_2\}$. Hence A^C is (t_1, t_2)- bi-ideal in N.

Conversly, Suppose that A^C is a (t_1, t_2)-bi-ideal in N.

For any $x,y\in N$,

$\text{Sup}\{A(x-y), t_1\} = \sup \{1- A^C(x-y), t_1\}$

$\leq 1- \sup \{1- A^C(x), 1-A^C(y), t_2\}$

$= \inf \{A(x), A(y), t_2\}$

Therefore, $\sup\{A(x-y), t_1\} \leq \inf \{ A(x), A(y), t_2\}$.

For any $x,y,z\in N$,

$\text{Sup}\{A(xyz), t_1\} = \sup \{1- A^C(xyz), t_1\}$

$\leq 1- \sup\{ 1 - A^C(x) , 1- A^C(z), t_2\}$

$=\inf \{A(x), A(z), t_2\}$

Therefore, $\sup\{A(xyz), t_1\} \leq \inf \{ A(x), A(z), t_2\}$. Hence A is (t_1, t_2)- conjugate flexible fuzzy soft bi-ideal in N.

3.5Proposition: Let A be a flexible fuzzy soft set in a near-ring N. Then A is an (t_1, t_2) – conjugate flexible fuzzy soft bi-ideal of N if and only if the lower level cut $L(A; \alpha)$ of N is a bi-ideal of N for each $\alpha\in [A(0) , 1]$.

Proof: Let A be (t_1, t_2)- conjugate flexible fuzzy soft bi-ideal of N. Let $x,y \in L(A ; \alpha)$. Then $\sup\{A(x), t_1\} \leq \alpha$ and $\sup\{A(y), t_1\} \leq \alpha$.

Now $\sup\{A(x-y), t_1\} \leq \inf\{ A(x), A(y), t_2\} = \alpha$ which implies that $A(x-y) \leq \alpha$ and so $x-y\in L(A ; \alpha)$. Hence $L(A ; \alpha)$ is a subgroup of N. Let $x,z \in L(A ; \alpha)$ and $y \in N$. Then $A(x) \leq \alpha$ and $A(z) \leq \alpha$. Now $\sup\{A(xyz), t_1\} \leq \inf \{ A(x), A(z), t_2\} \leq \alpha$ which implies that $A(xyz) \leq \alpha$ and hence $xyz \in L(A ; \alpha)$. Hence, $L(A ; \alpha)$ is a bi-ideal of N.

Conversly, suppose that L(A ; α) is a bi-ideal of N. Suppose that x,y$\in$ N and sup{A(x-y), t_1} $\geq$ inf{A(x), A(y), t_2}. Choose α such that sup{A(x-y), t_1}$\geq\alpha\geq$ inf {A(x), A(y), t_2}. Then, we get x,y$\in$ L(A ; α), a contradiction. Hence sup{A(x-y), t_1} $\leq$ inf{ A(x), A(y), t_2}. Similarly , we can prove that sup{A(xyz), t_1} $\leq$ inf{ A(x), A(z), t_2}. Hence, A is a (t_1, t_2)-conjugate flexible fuzzy soft bi-ideal of N.

3.6Theorem: Let Φ : N $\rightarrow$N′ be an onto homomorphism of near-rings. Then we have that

(i) If λ is a (t_1, t_2)- conjugate flexible fuzzy soft bi-ideal in N′, then $\Phi^{-1}(\lambda)$ is a (t_1, t_2)- conjugate flexible fuzzy soft bi-ideal in N.

(ii) If δ is a (t_1, t_2)- conjugate flexible fuzzy soft bi-ideal in N, then $\Phi(\delta)$ is a (t_1, t_2)- conjugate flexible fuzzy soft bi-ideal in N′.

Proof: (i) Let λ be a (t_1, t_2)-conjugate flexiblefuzzy softideal of N′.
For any x,y$\in$ N,
Sup{$f^{-1}(\lambda)$(x-y), t_1} = sup{λ (f(x-y), t_1)}
= sup{λ (f(x)- f(y)), t_1}
$\leq$ inf{ λ (f(x)) , λ(f(y)) , t_2}
= inf{$f^{-1}(\lambda)$(x), $f^{-1}(\lambda)$(y)) , t_2}
Therefore, sup{$f^{-1}(\lambda)$(x-y), t_1} $\leq$inf{$f^{-1}(\lambda)$(x), $f^{-1}(\lambda)$(y), t_2} and
sup{$f^{-1}(\lambda)$(xyz), t_1} = sup {λ (f(xyz)), t_1}
= sup{λ (f(x) f(y)f(z)), t_2}
$\leq$ inf{ λf(x), λ f(z) , t_2}
= inf {$f^{-1}(\lambda)$(x), $f^{-1}(\lambda)$(z) , t_2}
Thus, sup{$f^{-1}(\lambda)$(xyz), t_1} $\leq$ inf {$f^{-1}(\lambda)$(x), $f^{-1}(\lambda)$(z), t_2}. Hence $f^{-1}(\lambda)$ is a (t_1,t_2)-conjugate flexible fuzzy soft bi-ideal in N.

(ii)Let δ be a (t_1, t_2)-conjugate flexible fuzzy soft bi - ideal in N.

Let y_1, y_2, $y_3$$\in$ N′. Then we have {x /x $\in$ $f^{-1}(y_1-y_2)$},{x_1-x_2 / $x_1$$\in$ $f^{-1}(y_1)$ and $x_2$$\in$ $f^{-1}(y_2)$} and hence
Sup{f(δ)(y_1-y_2), t_1} = inf { δ(x) / x $\in$ $f^{-1}(y_1-y_2)$, t_1}
$\leq$ inf {sup {δ(x_1-x_2)}/ $x_1$$\in$$f^{-1}(y_1)$ and $x_2$$\in$ $f^{-1}(y_2)$, t_2}
$\leq$ inf { sup {δ(x_1), δ (x_2)} / $x_1$$\in$ $f^{-1}(y_1)$ and $x_2$$\in$$f^{-1}(y_2)$, t_2}
= sup {inf{ δ(x_1)/ $x_1$$\in$ $f^{-1}(y_1)$, t_2} and inf { δ (x_2) /$x_2$$\in$ $f^{-1}(y_2)$, t_2}}
= inf {f(δ)(y_1) , f(δ)(y_2), t_2}
Thus ,sup{f(δ)(y_1-y_2), t_1} $\leq$ inf {f(δ)(y_1) , f(δ)(y_2), t_2}.

Let y_1, y_2, $y_3$$\in$ N′. Then we have,
Sup{f(δ)($y_1y_2y_3$), t_1} = inf { δ(x) / x $\in$ $f^{-1}(y_1y_2y_3)$, t_1}
$\leq$ inf {sup {δ($x_1x_2x_3$)/ $x_1$$\in$ $f^{-1}(y_1)$ and $x_2$$\in$ $f^{-1}(y_2)$, $x_3$$\in$ $f^{-1}(y_3)$, t_2}}
$\leq$ inf { sup {δ(x_1), δ (x_3)} / $x_1$$\in$ $f^{-1}(y_1)$ and $x_3$$\in$ $f^{-1}(y_3)$, t_2}
= sup {inf{ δ(x_1)/ $x_1$$\in$ $f^{-1}(y_1)$, t_2} and inf { δ (x_3) /$x_3$$\in$ $f^{-1}(y_3)$, t_2}}
= inf {f(δ)(y_1) , f(δ)(y_3), t_2}
Thus , sup{f(δ)($y_1y_2y_3$), t_1} $\leq$ inf {f(δ)(y_1) , f(δ)(y_3), t_2}. Hence f(δ) is (t_1,t_2)- conjugate fuzzy soft bi-ideal of N′.

3.7Proposition: If {A_i / i$\in$ $\wedge$} is a family of (t_1,t_2)-conjugate flexible fuzzy soft bi-ideals of a near-ring N, then $\cup$ A_i is (t_1,t_2)-conjugate flexible fuzzy soft bi-ideal .

3.8Proposition: If {A_i / i$\in$ $\wedge$} is a family of (t_1, t_2)- conjugate flexible fuzzy soft bi-ideals of a near-ring N, then $\cap$ A_i is (t_1, t_2)- conjugate flexible fuzzy soft bi-ideal .

3.9Theorem: Let A be(t_1,t_2)- conjugate flexible fuzzy soft bi-ideal of a near –ring N and N* be a flexible fuzzy soft set in N defined by A*(x) = A(x) + 1 – A(0) for all x $\in$ N. Then A* is a normal (t_1, t_2)-conjugate flexible fuzzy soft bi-ideal of N containing A.

Proof: Let A be (t_1, t_2)-conjugate flexible fuzzy soft bi-ideal of a near-ring N.
For any x,y $\in$ N,
sup{A*(x-y), t_1} = sup{A(x-y) +1 – A(0), t_1}
$\leq$ inf { {A(x), A(y)} +1 – A(0), t_2}
= inf {A(x)+1-A(0) , A(y)+1- A(0), t_2}
= inf{ A*(x) , A*(y), t_2}
Therefore sup{A*(x-y), t_1} $\leq$ inf { A*(x), A*y), t_2}.
For any x,y,z$\in$ N,
sup{A*(xyz), t_1} = sup{A(xyz) +1 –A(0), t_1}
$\leq$ inf{{A(x), A(z)}+1-A(0), t_2}
= inf{ A(x)+1 –A(0) , A(z) +1- A(0) , t_2}
= inf{ A*(x), A*(z) , t_2}

Therefore $\sup\{A^*(xyz), t_1\} \leq \inf\{A^*(x), A^*(z), t_2\}$. Clearly $A^*(0) = A(0) + 1 - A(0) = 1$ and A^* is normal. Hence A^* is a normal (t_1,t_2)-conjugate flexible fuzzy soft bi-ideal of N and obviously A is contained in A^*.

3.10Theorem: If A is (t_1,t_2)-conjugate flexible fuzzy soft bi-ideal of a near-ring N,
then $(A^*)^* = A^*$.

Proof: For any $x \in N$, we have

$\mathrm{Sup}\{(A^*)^*, t_1\} = \sup\{A^*(x) + 1 - A^*(0), t_2\}$

$= \sup\{[A(x) + 1 - A(0)] + [A(0) + 1 - A(0)], t_2\}$

$= A(x) - A(0) + 1 - A(0) + A(0)$

$= A(x) + 1 - A(0) = A^*(x)$. Therefore $(A^*)^* = A^*$.

3.11Theorem: If A is normal (t_1,t_2)-conjugate flexible fuzzy soft ideal of a near-ring N if and only if $A^* = A$.

Proof: The sufficient part is obvious. To prove the necessary part, let us suppose that A is normal (t_1,t_2)-conjugate flexible fuzzy soft bi-ideal of a near-ring N. Let $x \in N$. Since A is normal, $A^*(x) = A(x) + 1 - A(0) = A^*(x) + 1 - 1 - A(0) + A(0)$. Hence $A^* = A$.

3.12Theorem: Let A be (t_1, t_2)-conjugate flexible fuzzy soft bi-ideal of a near-ring N, and α be a fixed element of N such that $A(0) \neq A(\alpha)$. Define a flexible fuzzy soft set A^* in N by

$A(x) - A(\alpha)$

$A^*(x) =$ ———— r all $x \in N$. Then A^* is a normal (t_1, t_2)-conjugate flexible fuzzy soft bi-ideal of near-ring N.

... e a (t_1, t_2)-conjugate flexible fuzzy soft bi-ideal of a near-ring N.

For any $x,y \in N$,

$\mathrm{Sup}\{A^*(x-y), t_1\} =$ ————

$\inf\{(A(x), A$ ... $), t_2\}$

$A(0) - A(\alpha)$ $\leq$ ————

$A(x) - A(\alpha)$ $, t_2$

$A(0) - A(\alpha)$ $= \inf$ ———— ————

$= \inf\{A^*(x),$ ...

Therefore $\sup\{A^*(x-y), t_1\} \leq \inf\{A^*(x), A^*y), t_2\}$.

For any $x,y,z \in N$,

$\sup\{A^*(xyz), t_1\} =$ ————

A(0)- $\leq$ ————

$= \inf$ ———— ————

=

Therefore $\sup\{A^*(xyz), t_1\} \leq \inf\{A^*(x), A^*(z), t_2\}$.

Also A(0) ...

A(0)- A($A^*(0) =$ ———— $= 1$, A^* is normal.

IV. CONCLUSION

we introduce the notion of conjugate flexible fuzzy soft bi- ideals in near –ring structures, level sets and given some characterizations of flexible fuzzy soft ideals in near-ring approximations. Also, we investigate very interesting structures of normal flexible fuzzy soft subgroup.

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