International Journal of Mathematical Archive-11(6), 2020, 1-5
IJMA Available online through www.ijma.info ISSN 2229 – 5046

PART III APPLICATIONS OF FUZZY KALANGI NON-ASSOCIATIVE Γ-SEMI SUB NEAR-FIELD SPACE OF A Γ-NEAR-FIELD SPACE OVER NEAR-FIELD

SRI. KALANGI HARISCHANDRA PRASAD[1]
Author cum research Scholar,
Associate Professor, Department of Science & Humanities,
Sai Tirumala NVR College of Engineering
Jonnalagadda, Narasaraopeta, Guntur District, Andhra Pradesh. INDIA.

DR T V PRADEEP KUMAR[2]
Assistant Professor of Mathematics,
A N U College of Engineering & Technology
Department of Mathematics, Acharya Nagarjuna University
Nambur, Nagarjuna Nagar-522 510. Guntur District. Andhra Pradesh. INDIA.

DR N V NAGENDRAM[3]
Professor of Mathematics,
Kakinada Institute of Technology & Science (K.I.T.S.)
Department of Humanities & Science (Mathematics)
Tirupathi (Vill.) Peddapuram (M), Divili-533 433
East Godavari District. Andhra Pradesh. INDIA.

DR J BABU[4]
Professor, Department of ECE,
Dadi Institute of Engineering & Technology, Anakapalle,
Visakhapatnam District, Andhra Pradesh. INDIA.

(Received On: 03-04-20; Accepted On: 18-05-20)

ABSTRACT

In this manuscript we introduce PART III some applications of Fuzzy Kalangi non-associated Γ-semi sub near-field space of a Γ-near-field space over near-field, Fuzzy Kalangi non-associated Γ-semi sub near-field space ideal, Fuzzy Kalangi non-associated Γ-semi sub near-field space prime ideal and several analogous properties done in case of Γ-near-field spaces.

Keywords: *Fuzzy Kalangi ideal, Fuzzy Kalangi prime ideal, Non-associative Γ-semi sub near-field space, Fuzzy Kalangi-Γ-semi sub near-field space, Γ-near-field space; Γ-Semi sub near-field space of Γ-near-field space; Semi near-field space of Γ-near-field space, quasi Γ-semi sub near-field space, quasi non-associative Γ-semi near-field space.*

2000 Mathematics Subject Classification: *43A10, 46B28, 46H25,6H99, 46L10, 46M20, 51 M 10, 51 F 15,03 B 30.*

SECTION 1: Introduction and Preliminaries on Part III some applications of Fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field.

In this paper we together introduced a maiden effort to bring the two probable existing applications in PART III some applications of Fuzzy Kalangi non-associative Γ-semi sub near-field spaces of a Γ-near-field space over near-field.

Corresponding Author(s): Sri. Kalangi Harischandra Prasad[1], Research Scholar, Associative professor, Department of Science & Humanities (Mathematics), Sai Tirumala NVR Engineering College, Jonnalagadda, Narasarao Peta-522 601, Guntur District, Andhra Pradesh. INDIA.
E-mail: hariprasadmaths@gmail.com; Dr T V Pradeep Kumar[2], pradeeptv5@gmail.com;
Prof. Dr N V Nagendram[3], nvn220463@yahoo.co.in; Prof. Dr J babu[4], jettysanjay@gmail.com.

We are not widely speaking about the applications of Fuzzy Kalangi non-associative Γ-semi sub near-field spaces of a Γ-near-field space we only discuss here the two applications one in automatons and the other in the construction of error correcting codes.

The concept of fuzzy was introduced by Zadeh L.A. later several authors has developed it to fuzzy Kalangi non-associative Γ-semi sub near-field spaces of a Γ-near-field space over near-field. Till date there are only about a dozen articles in fuzzy near-rings, near-fields, near-field spaces. Here we introduce and give the basic definitions needed to define this concept.

Basics on Fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field.

We just recall the basic known and available fuzzy notions about definitions of fuzzy Kalangi non-associative Γ-semi sub near-field spaces. To the best of our knowledge we have only a very few papers or articles on fuzzy Γ-semi sub near-field spaces of a Γ-near-field space over near-field that too mainly dealing with fuzzy ideals.

Definition 1.1: fuzzy Kalangi non-associative Γ-semi sub near-field space. Let N be a Kalangi non-associative Γ-semi sub near-field space. A mapping $\delta : N \rightarrow [0, 1]$ is called a fuzzy Kalangi non-associative Γ-semi sub near-field space of N.

Definition 1.2: Product of fuzzy Kalangi non-associative Γ-semi sub near-field spaces. Let σ and θ be two fuzzy Kalangi non-associative Γ-semi sub near-field spaces of N. we define the product of these fuzzy Kalangi non-associative Γ-semi sub near-field spaces (denoted by $\sigma \circ \theta$) as follows:
$(\sigma \circ \theta)(x) = \sup \{ \min ((\sigma(y), \theta(z)) \}$ if x can be expressible as a product yz.
$(\sigma \circ \theta)(x) = 0$, otherwise.

Definition 1.3: Let D and E be any two fuzzy Kalangi non-associative Γ-semi sub near-field spaces of N and *f*, a function of D into E. Let μ and σ be fuzzy Kalangi non-associative Γ-semi sub near-field spaces of D and E respectively. Then $f(\mu)$ the image of μ, under *f*, is a fuzzy Kalangi non-associative Γ-semi sub near-field space of E defined by

$$(f(\mu)e) = \begin{cases} \sup\ \mu(d) & if\ \ f^{-1}(e) \neq \phi \\ 0\ \ if\ \ f^{-1} = 0 \end{cases}$$

and $f^{-1}(\sigma)$ is the pre image of σ under *f* is a fuzzy Kalangi non-associative Γ-semi sub near-field space of D defined by $(f^{-1}(\sigma))(d) = \sigma(f(d))$ for all $d \in D$.

Note 1.4: Let μ and σ be any two fuzzy Kalangi non-associative Γ-semi sub near-field spaces of N then we write $\mu \subseteq \sigma$ if $\mu(x)\ \sigma(x)$ for all $x \in N$.

Definition 1.5: fuzzy Kalangi ideal. Let μ be a non-empty fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field N. i.e. $\mu(x) \neq 0$ for some $x \in N$ then μ is said to be a fuzzy Kalangi ideal of N if it satisfies the following conditions:

a. $\mu(x + y) \geq \min\{\mu(x), \mu(y)\}$
b. $\mu(-x) = \mu(x)$
c. $\mu(x) = \mu(y + x - y)$
d. $\mu(xy) \geq \mu(x)$ and
e. $\mu\{x(y + i) - xy\} \geq \mu(i)$ for all x, y and $i \in N$.

1. If μ is a fuzzy Kalangi ideal of N then $\mu(x + y) = \mu(y + x)$
2. If μ is a fuzzy Kalangi ideal of N then $\mu(0) \geq \mu(x)$ for all $x \in N$.

The above two statements can be easily verified for if we put z = x + y. then $\mu(x + y) = \mu(z) = \mu(-x + z + x)$ since μ is a fuzzy Kalangi ideal $\mu(-x + x + y + x) = \mu(y + x)$ since z = x + y.

a. Likewise for the second statement $\mu(0) = \mu(-x + x) \geq \min\{\mu(x), \mu(-x)\}$
   $= \mu(x)$ Since μ is a fuzzy Kalangi ideal) $\mu(-x) = \mu(x)$ by the very definition of fuzzy Kalangi ideal.

Definition 1.6: Characterize function of fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field N. Let J be a fuzzy Kalangi ideal of fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field N. we define $\lambda_1 : N \rightarrow [0, 1]$ as $\lambda_1(x) = \begin{cases} 1 & if\ \ x = 1 \\ 0 & otherwise \end{cases}$ $\lambda_1(x)$ is called the characterize function of fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field on J.

Lemma 1.7: Let N be a fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field and λ_1 the characteristic function on a Γ-semi sub near-field space J of N. Then λ_1 is a fuzzy Kalangi ideal of N if and only if J is a fuzzy Kalangi ideal of N.

Definition 1.8: level Γ-semi sub near-field space. Let μ be a non-empty fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field N. then the set μ_k of all $t \in [0, 1]$, defined by $\mu_t = \{x \in N : \mu(x) \geq t\}$ is called the level Γ-semi sub near-field space of t for the Γ-near-field space over near-field N.

Definition 1.9: level fuzzy Kalangi non-associative Γ-semi sub near-field space ideal. Let N be fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field and μ be a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of N. Then the level Γ-semi sub near-field space μ_t of N for all $t \in [0, t]$, $t \leq \mu(0)$ is a fuzzy Kalangi ideal of N if and only if μ is a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of N.

Definition 1.10: Fuzzy Kalangi non-associative Γ-semi sub near-field space prime. A fuzzy Kalangi non-associative Γ-semi sub near-field space ideal μ of N is called fuzzy Kalangi non-associative Γ-semi sub near-field space prime if for any two fuzzy Kalangi non-associative Γ-semi sub near-field space ideals σ and θ of N $\sigma \circ \theta \subseteq \mu$ implies $\sigma \subseteq \mu$ or $\theta \subseteq \mu$.

Now we use the concept of fuzziness in Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field.

Theorem 1.11: If μ is a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of a Γ-near-field space over near-field N and $a \in N$ then $\mu(x) \geq \mu(a)\ \forall x \in \langle a \rangle$.

Proof: Is obvious.

Definition 1.12: Product of fuzzy Kalangi non-associative Γ-semi sub near-field space. Let μ and σ be any two fuzzy Kalangi non-associative Γ-semi sub near-field spaces of N. Then the product of fuzzy Kalangi non-associative Γ-semi sub near-field space $(\sigma \circ \tau)(x) = \sup\{\min(\sigma(y), \tau(z))\}$ if x is expressible as a product x = yz where $y, z \in N$ and $(\sigma \circ \tau)(x) = 0$ otherwise.

Definition 1.13: Fuzzy Kalangi IFP (Insertion of Finite Property). A fuzzy Kalangi non-associative Γ-semi sub near-field space ideal μ of a Γ-near-field space over near-field N is said to have fuzzy Kalangi IFP(Insertion of Finite Property) if $\mu(a\,n\,b) \geq \mu(ab)$ for all $a, b, n \in N$.

Definition 1.14: Let μ be a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of N, μ has fuzzy Kalangi IFP if and only if μ_k is a fuzzy Kalangi non-associative Γ-semi sub near-field space IFP ideal of N for all $0 \leq k \leq 1$.

Definition 1.15: Strong Fuzzy Kalangi IFP(Insertion of Finite Property). Fuzzy Kalangi non-associative Γ-semi sub near-field spaces of N has strong Kalangi IFP if and only if every fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of N has fuzzy Kalangi IFP(Insertion of Finite Property).

Theorem 1.16: If μ is a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of N then $N_\mu = \{x \in N : \mu(x) = \mu(0)\}$ is a Kalangi non-associative Γ-semi sub near-field space IFP ideal of N.

Proof: We have $\mu(0) \geq \mu(x)$ for all $x \in N$, we write $t = \mu(0)$. Now $N_\mu = \mu_r$ and by definitions μ_r has Kalangi non-associative Γ-semi sub near-field space IFP ideal of N. Therefore, N_μ is a Kalangi non-associative Γ-semi sub near-field space IFP ideal of N.
This completes the proof of the theorem.

Note 1.17: Let μ be a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of N. for any $s \in [0, 1]$ define γ_s : $N \to [0, 1]$ by ${}_\mu\gamma_s(x) = \begin{cases} s & if \quad \mu(x) \geq s \\ \mu(x) & if \quad \mu(x) < s \end{cases}$. Since γ_s depends on μ, we also define γ_s by ${}_\mu\gamma_s$.

SECTION 2: Part III some Results of Fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field.

Here in section 2, we recall the some results of fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field and also given some interesting definitions of them.

Result 2.1:

(a). $\gamma_s(x) \le s$ for all $x \in N$

(b). γ_s is a fuzzy Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field of N.

(c). if $\mu(0) = t$, then $s \ge t$ if and only if $\mu_t = (\gamma_s)_t$.

Proof: Proof of result is clear from basic definition and so obvious.

Definition 2.2: μ is a fuzzy Kalangi non-associative Γ-semi sub near-field space IFP ideal of N if and only if γ_s is a fuzzy Kalangi non-associative Γ-semi sub near-field space IFP ideal for all $s \in [0, 1]$.

Result 2.3: A fuzzy Kalangi non-associative Γ-semi sub near-field space ideal μ of N if and only if $N(_{\gamma s})$ has fuzzy Kalangi IFP for all $s \in [0, 1]$.

Definition 2.4: Fuzzy Kalangi non-associative Γ-semi sub near-field space ideal μ. Let $\mu : M \to [0, 1]$. μ is said to be a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal μ of M if it satisfies the following conditions:

a. $\mu(x + y) \ge \min\{\mu(x), \mu(y)\}$
b. $\mu(-x) = \mu(x)$
c. $\mu(x) = \mu(y + x - y)$
d. $\mu(x \alpha y) \ge \mu(x)$ and finally
e. $\mu\{x \alpha (y + z) - x \alpha y\} \ge \mu(z)$ for all $x, y, z \in M$ and $\alpha \in \Gamma$.

Note 2.5: All results true in case of fuzzy Kalangi non-associative Γ-semi sub near-field space ideal μ of N are true in case of fuzzy Kalangi non-associative Γ-semi sub near-field space ideals of M with some minor modifications. The results can be proved by routine applications of definitions.

Theorem 2.6: Let μ be a fuzzy Kalangi non-associative Γ-semi sub near-field space of M. Then the level fuzzy Kalangi non-associative Γ-semi sub near-field spaces $\mu_t = \{x \in M : \mu(x) \ge t\}$, $t \in \text{im}\,\mu$, are fuzzy Kalangi non-associative Γ-semi sub near-field space ideals of M if and only if μ is a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of M.

Proof: is obvious.

Theorem 2.7: Let M and $M^|$ be two fuzzy Kalangi non-associative Γ-semi sub near-field spaces, $h : M \to M^|$ be an Γ-epi-morphism and μ, σ be fuzzy Kalangi non-associative Γ-semi sub near-field space ideals of M and $M^|$ respectively then

a. $h(h^{-1}(\sigma)) = \sigma$.
b. $h^{-1}(h(\mu)) \supset \mu$.
c. $h^{-1}(h(\mu)) \ne \mu$ if μ is constant on ker k.

Definition 2.8: Fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal.
A fuzzy Kalangi non-associative Γ-semi sub near-field space ideal μ of M is said to be a fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M if μ is not a constant function. And for any two fuzzy Kalangi non-associative Γ-semi sub near-field space ideals σ and Γ of M, $\sigma \circ \Gamma \subseteq \mu. \Rightarrow$ either $\sigma \subseteq \mu$. Or $\Gamma \subseteq \mu$.

Theorem 2.9: If μ is a fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M then $M_\mu = \{x \in M : \mu(x) = \mu(0)\}$ is a fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M.

Proof: It is obvious it can be proved with the help of definitions.

Definition 2.10: Let J be a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of M. Then λ_l is a fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M if and only if *l* is a fuzzy fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M.

Proposition 2.11: Let J be a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of M and $s \in [0,1]$. Let μ be a fuzzy Kalangi non-associative Γ-semi sub near-field space of M, defined by $\mu(x) = \begin{cases} 1 & if \quad x \in J \\ s & otherwise \end{cases}$. Then μ is a fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M if J is a fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M.

Proof: Using the fact μ is a non-constant fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of M we can prove the proposition result as a matter of routine using the basic definitions. This completes the proof of the proposition.

Definition 2.12: Let J be a fuzzy Kalangi non-associative Γ-semi sub near-field space ideal of M. Then λ_l is a fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M if and only if *l* is a fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M.

Result 2.13: if μ is a fuzzy fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M then μ (0) = 1.

Result 2.14: If μ is a fuzzy fuzzy Kalangi non-associative Γ-semi sub near-field space prime ideal of M then |Im μ|=2.

ACKNOWLEDGMENT

It is great and immense pleasure to me being a Professor, Dr N V Nagendram, to introduce Dr J Babu, Professor, Department of ECE, Dadi Institute of Engineering & Technology as one of co-author participated in discussion among ourselves and also to promote Sri. Kalangi Harischandra Prasad research scholar as an author under the guidance of mine and as well as Kalangi Harischandra Prasad's guide Dr T V Pradeep Kumar, ANU from this article we together studied and introduced the contents of advanced research results on PART III Applications of Kalangi non-associative Γ-semi sub-near-field space of a Γ-near-field space over near-field being is indebted to the referee for his various valuable comments leading to the improvement of the advanced research article in algebra of Mathematics. For the academic and financial year 2020-'21, this work was supported by The Principal, O/o Sai Tirumala NVR college of engineering, Jonnalagadda, Narasaraopet 522 601, Guntur District, Andhra Pradesh. INDIA, and Hon'ble chairman Sri B. Srinivasa Rao, Kakinada Institute of Technology & Science (K.I.T.S.), R&D education Department Humanities & sciences (Mathematics), Divili 533 433. Andhra Pradesh INDIA.

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