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PART I KALANGI NON-ASSOCIATIVE Γ-SEMI SUB NEAR-FIELD SPACE OF A Γ-NEAR-FIELD SPACE OVER NEAR-FIELD

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ABSTRACT

In this manuscript we introduce new notions on PART I Kalangi non-associated Γ-semi sub near-field space of a Γ-near-field space over near-field, quasi non associative Γ-semi sub near-field space, K-quasi N -Γ-semi sub near-field space, quasi ideals, etc and concepts like PART I Kalangi quasi bipotent elements and several analogous properties done in case of Γ-near-field spaces.

Keywords: *Non-associative Γ-semi sub near-field space, 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.*

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SECTION 1: INTRODUCTION AND PRELIMINARIES

In this paper we together introduced several concepts and new notions in PART I Kalangi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field like quasi non associative Γ-semi sub near-field space, K-quasi N -Γ-semi sub near-field space, quasi ideals, etc and concepts like PART I Kalinga quasi bipotent elements and several analogous properties done in case of Γ-near-field spaces.

Definition 1.1: Let N be a K-quasi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field an element x is said to be quasi central if $xy = yx$ for all $y \in M$; $M \subseteq N$ is a Γ-near-field (or $M \subset N$ and M is a Γ-semi near-field space).

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Definition 1.2: Let N be a K-quasi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field we say N is said to be Kalinga quasi non-associative sub-directly irreducible Γ-semi sub near-field space (K-quasi sub-directly irreducible non-associative Γ-semi sub near-field space) if the intersection of all non zero K-quasi ideals of N is non-zero.

Definition 1.3: Let N be a K-quasi non-associative Γ-semi sub near-field space of a Γ-near-field space over near-field we say N is said to have Kalinga quasi intersection of factors property (K-quasi IFP) if a, b $\in$ N, ab = 0 implies amb = 0 where m $\in$ M, M $\subset$ N and M is a near-field (or m $\in$ M, M $\subset$ N, M is a non-associative Γ-semi sub near-field space.

Note 1.4: We can take a (nb) = (an) b in all cases it should vanish that is anb = 0.

Now we define the concept of Kalangi quasi divisibility and Kalangi divisibility.

Definition 1.5: Let N be a non-associative K-Γ-semi sub near-field space of a Γ-near-field space over near-field we say N is Kalangi weakly divisible (K-weakly divisible) if for all x, y $\in$ N there exists a z $\in$ P ; P $\subset$ N where P is an associative Γ-semi sub near-field space of a Γ-near-field space over near-field or P is a near-field such that xz = y or zx = y.

Definition 1.6: Let N be a non-associative K-Γ-semi near-field space of a Γ-near-field space over near-field we say N is Kalangi weakly divisible (K-weakly divisible) if for all x, y $\in$ N there exists a z $\in$ P; P $\subset$ N where P is an associative Γ-semi near-field space of a Γ-near-field space over near-field or P is a near-field such that xz = y or zx = y.

Definition 1.7: Let N be a K-quasi Γ-semi sub near-field space (K-quasi Γ-semi near-field space) of a Γ-near-field space over near-field. We say N is Kalinga quasi weakly divisible (K-quasi weakly divisible) if for all x, y $\in$ N there exists z $\in$ M; M is a Γ-semi near-field space $\subset$ N (Ma is a Γ-semi near-field space M $\subset$ N) such that xz = y or yz = x.

Definition 1.8: Let N be a K-Γ-semi sub near-field space (K-Γ- semi near-field spaces) we say N is said to be a Kalinga strongly prime (K-strongly prime) I if for each a $\in$ N \ {0} there exists a finite K-Γ-semi sub near-field space F such that a Fx $\neq$ 0 for all x $\in$ P \ {0} P $\subset$ N ; P is a associative Γ-semi sub near-field space / P is a associative Γ-semi near-field space.

In case N is K-Γ-semi sub near-field space II (III or IV) we say N is a Kalangi strong prime II (III or IV) (K-strong prime II(III or IV) if for each a $\in$ N \ {0} there exists a finite K--Γ- semi near-field space F such that a Fx $\neq$ 0 for all x $\in$ P \ {0} , P $\subset$ N ; P is a associative Γ- semi near-field space/ P is associative -Γ- semi near-field space.

Definition 1.9: Let N be a non associative right near-field space and A an K-ideal or a K-left ideal of N. we define three properties as follows
(i) A is kalangi equi-prime (K-equi-prime) if for any a, x, y $\in$ N such that a (nx) – a(ny) $\in$ A $\forall$ n $\in$ N or (an) x – (an) y $\in$ Y we have a $\in$ A or x – y $\in$ A.
(ii) A is Kalangi strongly semi prime (K-strongly semi prime) if for each a finite subset F of N such that if x, y $\in$ N and (af) x – (af) y $\in$ A or
a (fx) – a (fy) $\in$ A or
(af) x – a (fy) $\in$ A or
A (fx) – (af) y $\in$ A for all f $\in$ F and x – y $\in$ A.
(iii) A is Kalangi completely equi prime (K-completely equi prime) if a $\in$ N \ A and ax – ay $\in$ A imply x – y $\in$ A.

Definition 1.10: Let Q be a non empty subset of a K-right Γ-semi sub near-field space of a Γ-near-field space over near-field N which is non-associative. Define left and right Kalangi polar subsets (K-polar subsets) of N by

SL(Q) = $\{x / x(NQ) = 0 \text{ or } (xN)Q = 0 \text{ for all } q \text{ in } Q\}$ and SR(Q) = $\{y / (qN)\, y = 0 \text{ or } q(Ny) = 0 \text{ for all } q \text{ in } Q\}$

Suppose, SQ_L (N) is the set of Q-left polar subsets of N and SQ_R(N) is the set of Q-right polar subsets of N one need to test whether SQ_L(N) and SQ_R(N) are complete bounded lattices.

Definition 1.11: I,II and III three levels of Kalangi Γ-semi sub pseudo near-field space(K-Γ-SSPNFS). Let Q be a Γ-semi sub pseudo near-field space (Γ-SSPNFS) of a Γ-near-field space over near-field N we say Q is a Kalangi Γ-SSPNFS I (K-(Γ-SSPNFS I) if Q has a proper subset T $\subset$ Q such that T is a Γ-semi sub near-field space. Kalangi Γ-semi sub pseudo near-field space II (K-Γ-SSPNFS II) if Q has proper subset M $\subset$ Q such that M is a Γ-semi sub near-field space. Kalangi Γ-semi sub pseudo near-field space III (K-Γ-SSPNFS III) if Q has a proper W $\subset$ Q such (W, ⊕, ⊗) is a Γ-semi near-field space. Thus we have three levels (I, II and III levels) of K-Γ-SSPNFS near-field spaces over a near-field N. A Kalangi Γ-SSPNFS Γ-semi near-field space (K-Γ-SSPNFS) is defined as a proper subset U of Q such that (U, ⊕, ⊗) is a K-Γ-SSPNFS Γ-semi near-field space.

Definition 1.12: Let (Q, ⊕, ⊗) be a Γ-semi sub pseudo near-field space (Γ-SSPNFS) of a Γ-near-field space over near-field. A proper subset I of Q is called a Kalangi Γ-semi sub pseudo near-field space ideal (K-Γ-SSPNFS-ideal) if

a. for all p, q ∈ I, p ⊕ q ∈ I
b. 0 ∈ I
c. for all p ∈ I and r ∈ P we have p ⊗ r or r ⊗ p ∈ I.
d. I is a K-Γ-SSPNFS , Γ-semi near-field space.

Definition 1.13: Let (N, ⊕, ⊗) be a quasi Γ-semi sub pseudo near-field space (Γ-SSPNFS) of a Γ-near-field space over near-field. M is said to be a Kalangi quasi Γ-semi sub pseudo near-field space (K-Γ-SSPNFS) if and only if M is a K-Γ-SSPNFS Γ-semi near-field space.

Definition 1.14: Let (N, ⊕, ⊗) and (N_1 , ⊕, ⊗) be any two K-Γ-semi sub pseudo near-field spaces (Γ-SSPNFS) of a Γ-near-field space over near-field. We say a map φ is a Kalangi Γ-semi sub pseudo near-field space–homomorphism I (II or III) (K--Γ-SSPNFS homomorphism I, II or III) if $\phi : L \to L_1$ where $L \subset N$ and $L_1 \subset N_1$ are -Γ-semi sub pseudo near-field spaces (or Γ-semi near-field space or Γ-semi near-field space) respectively and φ is a Γ-semi near-field space homomorphism from L to L_1 (or near-field homomorphism from L to L_1 or semi near-field space homomorphism from L to L_1). φ need not be defined on the entire set N and $N^|$ it is sufficient if it is well defined on L to L_1.

SECTION 2: MAIN RESULT ON KALANGI -QUASI GAMMA SEMI PSEUDO SUB NEAR-FIELD SPACES OF A GAMMA NEAR-FIELD SPACE OVER A NEAR-FIELD.

In this section, author present theorem as main result on Kalangi quasi Gamma semi pseudo sub near-field spaces of a Gamma near-field space over a near-field.

Now we proceed on to define Kalangi right quasi regular element. We just recall that an element x ∈ N , N is a Gamma semi pseudo sub near-field space said to be the right quasi regular if there exist y ∈ N such that $x \circ y = x + y - xy = 0$ and left quasi regular if there exist $y^| \in N$ such that $y^| \circ x = 0 = y^| + x - y^|x$.
The study of the quasi regular concept happens to be an interesting study in case of near-field spaces and semi near-field spaces.
Quasi regular if it is right and left quasi regular simultaneously. We say an element x ∈ N is Kalangi right quasi regular (K-right quasi regular) if there exist y and z ∈ N such that $x \circ y = x + y - xy$, $x \circ z = x + z - xz = 0$
but $y \circ z = y + z - yz \neq 0$ and $z \circ y = y + z - zy \neq 0$.

Similarly we define Kalangi left quasi regular (K-left quasi regular) and x will be Kalangi quasi regular (K-quasi regular) if it is simultaneously K-right quasi regular and K-left quasi regular, that is of Kalangi quasi Gamma semi pseudo sub near-field spaces of a Gamma near-field space over a near-field.

If we define K-non-associative Γ-semi pseudo sub near-field space of a Γ-near-field space over near-field (K-quasi Γ-semi pseudo sub near-field space) N then we have main interesting result out of several results below.

Theorem 2.1: Let N be a Kalangi quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space over near-field (K-quasi Γ-semi pseudo sub near-field space) having a proper subset P of N to be a commutative near-field space with unit and of a characteristic 0. L any loop of finite order. Then the near loop near-field space NL has a right quasi regular element $x = \sum \alpha_i m_i$ ($m_i \in L$) $\alpha_i \in P \subset N$ is right quasi regular then $\sum \alpha_i \neq 1$.

Proof: Let $y = \sum \beta_i h_j$ where $\beta_i \in P$ and $h_j \in L$ be the right quasi inverse of x then $x + y - xy = 0$
i.e., $\sum \alpha_i m_{i\,+} \sum \beta_i h_j - (xy) = 0$.

Equating the coefficients of the like terms and adding these coefficients we get,
$\sum \alpha_{i\,+} \sum \beta_i - \sum \alpha_i \sum \beta_i = 0$. Or $\sum \alpha_{i\,=} \sum \beta_i - \sum \alpha_i \sum \beta_i = \sum \beta_i (\sum \alpha_i - 1)$. Now if $\sum \alpha_i = 1$ then $\sum \alpha_i = 0$ a contradiction.
Hence $\sum \alpha_i \neq 0$. This completes the proof of the theorem.

Example 2.2: Let L be any finite loop. $N = Z_9 \times Z_7$ be K-mixed direct product of the Kalangi quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space over near-field (K-quasi Γ-semi pseudo sub near-field space) Z_9 and the prime field of characterize 7, Z_7, N is K- quasi -Γ-semi pseudo sub near-field space. NL is the near loop near-field of the loop L over the near-field space N. If $x \in S (J (Z_7L))$.

Definition 2.3: Let N = $N_1 \times N_2$ where N_1 is a Kalangi quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space over near-field (K-quasi Γ-semi pseudo sub near-field space) of characterize 0 and N_2 is any quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space over near-field. NL be the near loop quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space over near-field of the loop L over the quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space N.

Definition 2.4: QJ(Q) said to be the Kalangi Jacobson radical (K-Jacpbson radical) of NL if Q $\subset$ NL is a non associative quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space and J(Q) denoted the usual Jacobson radical of the non-associative quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space Q.

Example 2.5: Let N = $Z \times Z_{18}$ be the mixed direct product of the Kalangi quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space over near-field (K-quasi Γ-semi pseudo sub near-field space) Z and the -Γ-semi pseudo sub near-field space Z_{18} L any finite loop, NL the near loop of the loop L over the Kalangi quasi -Γ-semi pseudo sub near-field space N. clearly ZL $\subset$ NL and ZL is a non-associative Kalangi quasi -Γ-semi pseudo sub near-field space N. If x= $\sum \alpha_i h_i \in$ ZL such that $\sum \alpha_i \neq 0$ then x $\notin$ QJ(ZL). It is left for the scholar or reader to verify , as the conclusion derived is straightforward.

Theorem 2.6: Let N = $Z_2 \times Z_{15}$ where Z_2 is the prime Kalangi quasi -Γ-semi pseudo sub near-field space of a Γ-near-field space over near-field (K-quasi Γ-semi pseudo sub near-field space) of characterize two and Z_{15} is a -Γ-semi pseudo sub near-field space of a Γ-near-field space over near-field. Let L be any loop. NL be the near loop Kalangi quasi -Γ-semi pseudo sub near-field space. If $x \in Z_2 L \times \{0\} \subset (Z_2 \times Z_{15})$; L is right quasi regular Kalangi quasi -Γ-semi pseudo sub near-field space then | supp x | is an even number.

Proof: The proof is obvious and easily obtained by simple calculations.

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