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PART-I CHARACTERS OF NAGENDRAM Γ-SEMI SUB NEAR-FIELD SPACE OF A Γ-NEAR-FIELD SPACE OVER NEAR-FIELD

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ABSTRACT

In this manuscript we obtain the notion of characters of complex irreducible representations of compact Nagendram Γ-semi sub near-field space of a Γ-near-field space over near-field are linearly independent as elements of C^{∞} (N).

Keywords: *characters of Nagendram 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, Nagendram Γ-semi sub near-field space, Nagendram Γ-semi near-field space, closed, compact, connected Nagendram Γ-semi sub near-field spaces of a Γ-near-field space over near-field, orthogonality characters of Nagendram Γ-semi sub near-field space.*

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SECTION 1: INTRODUCTION AND PRELIMINARIES.

In this paper author introduced PART I characters of complex irreducible representations of compact Nagendram Γ-semi sub near-field space of a Γ-near-field space over near-field.

We have the notion of the multiplicity $m_{P,Q}$ of an irreducible representation P in a representation Q.

Q = $\underset{Q \in Irr(N)}{\oplus} m_{P,Q} P$ where nP is the direct sum of n copies of P.

Lemma 1.1: Let N be a compact Nagendram Γ-semi sub near-field space of a Γ-near-field space over near-field**.** Then the mapping from representations of N to characters of N : Q → χU.

Proof: Suppose Q, Q′ are two representations of N such that $\chi_Q = \chi_Q{'}$.

Write Q = $\underset{Q \in Irr(N)}{\oplus} m_{P,Q} P$; Q′ = $\underset{Q \in Irr(N)}{\oplus} m_{P,Q^{|}} P$.

Then $\chi_Q = \sum_{P \in Irr(N)} m_{P,Q}\ \chi_P = \sum_{P \in Irr(N)} m_{P,Q'|}\ \chi_P$

Since, { χ_P : P ∈ Irr (N) } is linearly dependent, $m_{P,Q} = m_{P,W^{|}}$ and hence Q = $Q^{|}$. This completes the proof of the Lemma.

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Example 1.2: Take N = SU (2). Let T = $\left\{ \sum_{k=0}^{n} a_k z_1^{n-k} z_2^k : a_n \in C \right\}$ is an irreducible representation of SU (2) and A ∈ SU (2) acts on f (z_1, z_2) ∈ V_n by (A. f) (z_1 .z_2) = f ((z_1. z_2)A).

So $\begin{bmatrix} \lambda & 0 \\ 0 & \lambda^{-1} \end{bmatrix} . z_1^{n-k} z_2^k = (\lambda z_1)^{n-k} (\lambda^{-1} z_2)^k = \lambda^{n-2k} z_1^{n-k} z_2^k$.

Hence, $\chi_n \left(\begin{bmatrix} \lambda & 0 \\ 0 & \lambda^{-1} \end{bmatrix} \right) = \sum_{k=0}^{n} \lambda^{n-2k}$.

What about $\chi_n(A)$ where A is an arbitrary element of SU (2)? Well, any unitary matrix is Diagnolizable, $\chi(BAB^{-1}) = \chi(A)$ and Eigen values of any unitary matrix lie on $S^{|}$. Hence, χ_n is completely determined by its values of T.

Since for any character $\chi : N \to N$ of a Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field N, $\chi(aga^{-1}) = \chi(g)$ for all a, g ∈ N, In order to understand characters of N it's important to understand the conjugacy classes of N, i.e., the orbit space N / N where N acts on itself by conjugation. Let's consider an example to see what we should expect.

Example 1.3: Consider the characters of Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field U (n). As mentioned above, every element of U (n) is conjugate to a diagonal matrix whose non-zero entries have norm 1. Note, however, that the set of Eigen values for a particular element of U (n) is an unordered set! So

U (n) / U (n) ≅ {D ∈ U (n) : D is diagonal} $/\sum_n = T^n / \sum_n$ where $\sum_n$ is the group of permutations of n letters.

Definition 1.4: A torus is compact, connected abelian characters of Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field. A maximal torus T of a Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field N is a torus Gamma semi sub near-field spaces of a Nagendram Gamma near-field space over a near-field of N such that if T′ is any other torus Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field of N and T ⊆ T′ then T = T′.

Example 1.5: Consider again N = U (n).

The torus $T = \left\{ \begin{bmatrix} \lambda_1 & & & & \\ & \lambda_2 & & & \\ & & . & & \\ & & & . & \\ & & & & \lambda_n \end{bmatrix} | \lambda_j | = 1 \right\} \cong T^n$ is a maximal torus.

Suppose A is a matrix in U (n) that commutes with all elements of T. But every element of T is diagonal, and matrix theory tells us that a matrix that commutes with an arbitrary diagonal matrix is itself diagonal. Hence, A ∈ T.

Note 1.6: (a). Maximal tori exist, (b). If N is compact and T_1, T_2 are two maximal tori, then T_1 and T_2 are conjugate. i.e. there exists a ∈ N so that $aT_1a^{-1} = T_2$, (c). If N is compact and connected, then for any g ∈ N there exists a maximal torus T such that g ∈ T. (d). If T ≤ N is a maximal torus, N compact and connected, then N (T) = {g ∈ N: $gTg^{-1} \subseteq T$}. The normalizer of T in G satisfies (i) Q := N (T) / T is finite (N(T))/T is called the Weyl Gamma near-field space over a near-field of (T). (ii) T/Q ≅ N/N.

SECTION 2: CONNECTED ABELIAN CHARACTERS OF NAGENDRAM GAMMA SEMI SUB NEAR-FIELD SPACES OF A GAMMA NEAR-FIELD SPACE OVER A NEAR-FIELD.

In this section, author present proposition on connected abelian characters of Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field.

Proposition 2.1: Let N be a Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field, K ⊆ N a connected abelian character of Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field. Then the closure $\overline{K}$ of K in N is also a connected abelian Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field N.

Proof: Since the closure of a connected space is connected, $\overline{K}$ is connected Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field. We have only to argue that $\overline{K}$ is an abelian Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field. Since, f : N × N → N , f (a, b) = ab^{-1} is continuous and since f (K × K) ⊆ K , f ($\overline{K} \times \overline{K}$) = f ($\overline{K \times K}$) ⊆ $\overline{f(K)}$ ⊆ $\overline{K}$, we see that $\overline{K}$ is a closed Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field N.

It remains to show that $\overline{K}$ is abelian characters of Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field. For any x, y ∈ K, xyx^{-1} = y which also certainly holds if y ∈ $\overline{K}$. But then, yxy^{-1} holds as well. By the same argument, this relation holds good for all x, y ∈ $\overline{K}$.

This completes the proof of the proposition.

Corollary 2.2: Any compact abelian characters of Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field N with dim N > 0 has a torus T with dim T > 0.

Proof: For any X ∈ g , then {exp tX : t ∈ R} ⊆ N is a connected abelian characters of Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field. Hence its closure connected abelian characters of Nagendram Gamma semi sub near-field spaces of a Gamma near-field space over a near-field N. Since, N is compact, { $\overline{\exp tX : t \quad R}$ } is a torus. This completes the proof of the corollary.

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