

PART-III 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 introduce Bi-Invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field lies in some maximal torus of Nagendram Γ -semi sub near-field space.

Keywords: Invariant, Bi-invariant, characters of complex irreducible representations of compact 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.

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SECTION-1: INTRODUCTION AND PRELIMINARIES.

In this paper author introduced PART III characters of Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field.

Definition 1.1: Let N be a Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field, and V be a finite dimensional vector space over a field F which in classical invariant theory was usually assumed to be the complex numbers. A representation N in V is a Nagendram Γ -semi sub near-field space homomorphism $\pi : N \rightarrow NL(V)$ which induces a near-field space action of N on V . If $F(V)$ is the near-field space of polynomial functions on V then the near-field space action of N on V produces an action on $F(V)$ by $(n.f)(x) := f(n^{-1}(x)) \quad \forall x \in V, n \in N$ and $f \in F(V)$.

With this action it is natural to consider the subspace of all polynomial functions which are invariant under this group action, in other words the set of polynomials such that $n.f = f$ for all $n \in N$. This Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field is called a Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field is denoted by $F[V]^N$.

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Definition 1.2: Let $M \leq N$ be a Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field. The normalizer $N_G(M) = N(M)$ of M in N is $N(M) = \{n \in N / nMn^{-1} = M\}$.

Note 1.3: Let $M \subseteq N(M)$ and $N(M)$ is a Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field.

Definition 1.4: Let N be a compact Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field, $S \subseteq N$ a maximal torus. The Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space $B = B(S, N)$ is $B = N(S)/S$.

Note 1.5: B acts on S : $(nS) \cdot b = nbn^{-1}$ for all $b \in S, nS \in B$. We will see that $S/B = N/\sim$ (tilde) where N/\sim (tilde) is the quotient of Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field N by the conjugation action.

Definition 1.6: Let N be a Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field. A function $f \in C^\infty(N)$ is a class function if $f(y) = f(yh^{-1})$ for $y, h \in N$. we denote the space of all class functions by $C^0(N)^N$.

Definition 1.7: Let N be Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field and $M \subseteq N$ a Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field. The centralizer $Z(N)$ of M in N is $Z(M) = \{n \in N / nmn^{-1} = M \text{ for all } m \in M\}$.

Definition 1.8: Suppose $\rho : N \rightarrow NL(n, C)$ is a representation of a Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field. Let $r_{ij} : M_n(C)$ denote standard co-ordinate functions. The functions $r_{ij} \circ \rho : N \rightarrow C$ are called the matrix coefficients of the representation ρ .

More abstractly, the representation coefficients may be realized as $(r_{ij} \circ \rho)(n) = \langle e_i^*, \rho(n) e_j \rangle$ where $\{e_1, e_2, \dots, e_n\}$ is a basis of C^n and $\{e_1^*, e_2^*, \dots, e_n^*\}$ is the associated dual basis for Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field.

Definition 1.9: Let N be a Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field. A function $f : N \rightarrow C$ is representative function an abstract matrix coefficient if there is a representation $\rho : N \rightarrow NL(V)$ such that $f(n) = \langle l, \rho(n) \xi \rangle$ for some $\xi \in V, l \in V^*$ and for all $n \in N$. we usually such a function by $f_{V, l, \xi}$.

SECTION-2: MAIN RESULTS ON BI-INVARIANT CHARACTERS OF NAGENDRAM GAMMA SEMI SUB NEAR-FIELD SPACES OF A GAMMA NEAR-FIELD SPACE OVER A NEAR-FIELD.

In this section, author present theorem as main results on bi-invariant 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 Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field and $M \leq N$ a closed Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field. Then, $N(M)$ is closed in N and is hence a Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field of N .

Proof: For $c \in M$ consider the mapping $\psi_c : N \rightarrow N ; \psi_c(n) = ncn^{-1}$. Since M is closed Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field and ψ_c is smooth, $\psi_c^{-1}(M)$ is closed for all $c \in M$. Now,

$$N(M) = \bigcap_{c \in M} \left\{ n \in N / ncn^{-1} \in M \right\} = \bigcap_{c \in M} \left\{ \psi_c^{-1}(M) \right\} \text{ and so } N(M) \text{ is closed Bi-invariant Nagendram}$$

Γ -semi sub near-field space of a Γ -near-field space over near-field.

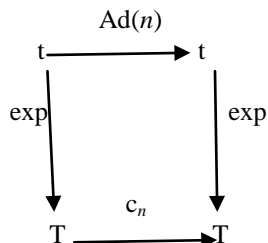
Theorem 2.2: Let N be a compact Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field, $S \subseteq N$ a maximal torus. Then, the Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field $N = N(S, N)$ is $N = N(S)/S$.

Proof: We will argue that the connected component $N(S)_0$ of 1 in $N(S)$ is S . This will be enough since $|N(S)/N(S)_0|$ is the number of connected components of $N(S)$.

Now, $N(S)_0$ acts on S by conjugation for all $n \in N(S)_0$ and $d \in S$, we have $ndn^{-1} = c_n(d) \in S$. Hence, $d_{nn^{-1}}(t) \subseteq t$.

In other words, $Ad(n)(t) \subseteq t$. Thus, we get a Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field map $Ad(\cdot)|_t : N(S)_0 \rightarrow NL(t)$ and $n \mapsto Ad(n)|_t$.

Also, for any $n \in N(S)_0$.



Commutates since c_n is a Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field map. Therefore, $Ad(n)(\ker \exp) \subseteq \ker \exp$ for all $n \in N(S)_0$.

Recall that $Z_T := \ker \{ \ker : t \rightarrow S \} \cong Z^m$ where $m = \dim S$. So, the image of $Ad|_t$ in $NL(Z_T) \cong NL(m, Z)$ is discrete. But, $N(S)_0$ is connected and so for all $n \in N(S)_0$, $Ad(n)|_t = \text{id}$. Thus, for all $X \in \text{Nag}(N(S)_0)$ [$\text{Nag} = \text{Nagendram } \Gamma$ -semi sub near-field space of a Γ -near-field space over near-field] and $P \in t$ we have $Ad(\exp X)P = P$ and so $[X, P] = 0$. Since, t is maximal abelian, we must have $\text{Nag}(N(S)_0) \subseteq t$.

On the other hand, $S \subseteq N(S)_0$ and so $\text{Nag}(N(S)_0) = t$. Since both $N(S)_0$ and S are connected, they must be therefore be equal. This completes the proof of the theorem.

Remark 2.3: In fact, $\text{Aut}(S) = \{ \phi : S \rightarrow S \mid \phi \text{ is a Nag } \Gamma \text{ Bi-NFS map} \} = NL(X_\Gamma)$.

Lemma 2.4: Let N be a compact Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field. Two elements y_1, y_2 of a maximal torus S are conjugate in N if and only if there is $n \in N = N(S)/S$ so that $n \cdot y_1 = y_2$.

Proof: Suppose $x, y \in S$ and $y = nxn^{-1}$ for some $n \in N$. Then, $Z(y) = nZ(y)n^{-1} = c_n(Z(x))$. Since, $x \in S$ and $S \subseteq Z(x)$ we have $c_n(S) \subseteq Z(y)$.

Now, $Z(y)_0$ is compact and connected and $S, c_n(S) \subseteq Z(y)_0$ are tori. Since, both tori are maximal Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field in N , they are maximal in $Z(y)_0$. Thus, there exists $h \in Z(y)_0$ such that $c_n(h(S)) = S$ and so $hn \in N(S)$.

Also, $c_{hn}(x) = hnxn^{-1} = hyh^{-1} = y$ since $h \in Z(y)$. we conclude that $hnS \in N(S)/S$ and $(hnS) \cdot x = y$. If $x_1, x_2 \in S$ and $b = nS \in B$ with $b \cdot x_1 = x_2$, then $nx_1n^{-1} = x_2$. So, x_1 and x_2 are conjugate in N . This completes the proof of the lemma.

Remark 2.5: Induced map $S/B \rightarrow N/\sim$ is a continuous bijection. Since S/B is compact Bi-invariant Nagendram Γ -semi sub near-field space of a Γ -near-field space over near-field and N/\sim is Hausdorff, this map is actually a homeomorphism.

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