



Mathematics > Representation Theory

The image of the Lepowsky homomorphism for the group F_4

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Let G_o be a semisimple Lie group, let K_o be a maximal compact subgroup of G_o and let $\mathfrak{k} \subset \mathfrak{g}$ denote the complexification of their Lie algebras. Let G be the adjoint group of \mathfrak{g} and let K be the connected Lie subgroup of G with Lie algebra $\text{ad}(\mathfrak{k})$. If $U(\mathfrak{g})$ is the universal enveloping algebra of \mathfrak{g} then $U(\mathfrak{g})^K$ will denote the centralizer of K in $U(\mathfrak{g})$. Also let $P: U(\mathfrak{g}) \rightarrow U(\mathfrak{k}) \otimes U(\mathfrak{a})$ be the projection map corresponding to the direct sum $U(\mathfrak{g}) = \text{big}(U(\mathfrak{k}) \otimes U(\mathfrak{a})) \oplus U(\mathfrak{g})^{\mathfrak{n}}$ associated to an Iwasawa decomposition of G_o adapted to K_o . In this paper we give a characterization of the image of $U(\mathfrak{g})^K$ under the injective antihomomorphism $P: U(\mathfrak{g})^K \rightarrow U(\mathfrak{k})^M \otimes U(\mathfrak{a})$, considered by Lepowsky, when G_o is locally isomorphic to F_4 .

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