

Schubert varieties for Kac-Moody groups

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Let k be a field, $n \geq 2$. Assume that n is not divisible by $\text{char } k$, and $\xi_n \in k$. Given $\alpha, \beta \in k^*$, the central simple algebra $Q \simeq (\alpha, \beta)$ with generators i, j subjected to the relations $i^n = \alpha$, $j^n = \beta$, $ij = \xi_n ji$ is called a symbol algebra. The tensor product of two symbol algebras is by definition a bisymbol algebra. The triple of algebras (D_1, D_2, Q) is called special if D_1, D_2 are bisymbol division algebras, Q is a symbol algebra, $\exp Q = n$, and $D_2 - D_1 = Q \in Br k$. The special triple (D_1, D_2, Q) is called standard if there are symbol algebras R_1, R_2, S such that $D_1 \simeq S \otimes_k R_1$, $D_2 \simeq S \otimes_k R_2$. We give a necessary condition for the special triple to be standard. Also for any symbol algebra $Q = (\alpha, \beta) \neq 0$ we show that the special triple (D_1, D_2, Q) over the rational function field $k(u, x, y)$ is nonstandard, where $D_1 = (a, x) + (b, y)$, $D_2 = (a, ux) + (b, vy)$, $a = \alpha + \beta - u$, $b = \beta^{-1}\alpha u(\alpha + \beta - u)^{-1}$, $v = \alpha + \beta$.

Time permitted, we will pose a few open questions and discuss a related quadratic form theory problem.

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