962-T1-482 **Jennifer M Hontz*** (hontzj@meredith.edu), Department of Mathematics, and Computer Science, 3800 Hillsborough St., Raleigh, NC 27607-5298. *Root Multiplicities of Kac-Moody Lie Algebras of Indefinite Type.* Preliminary report.

Consider the Lie Algebra $\mathfrak{g} = s\ell(n, \mathbb{C})$ of $n \times n$ trace zero matrices over the field of complex numbers. The subalgebra of diagonal matrices $\mathfrak{h}$ is called a Cartan subalgebra of $\mathfrak{g}$. The root multiplicities of $\mathfrak{g}$ are the dimensions of certain generalized eigenspaces called root spaces of $\mathfrak{g}$ under the adjoint action of $\mathfrak{h}$. In this case it is known that all root spaces are one-dimensional. In this talk we discuss this problem for an infinite-dimensional graded Lie algebras with $\hat{\mathfrak{g}} = \oplus_{j \in \mathbb{Z}} g_j$ with $\mathfrak{g}_0 = \mathfrak{g} \oplus \mathbb{C}I = g\ell(n, \mathbb{C})$. We will use the combinatorics of the representation theory of $\mathfrak{g}$ and some homology techniques to compute the root multiplicites of $\hat{\mathfrak{g}}$. (Received September 19, 2000)