

MATHEMATICS DEPARTMENT
North Carolina State University

ALGEBRA SEMINAR

Friday, December 3, 2004

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Constructing Chiral Algebras from Analytic Functions

ABSTRACT: A vertex algebra is, roughly speaking, a linear space A that has infinitely many bilinear operations $(a, b) \rightarrow a(n)b$, indexed by integer number n , satisfying certain identities. It is natural to consider the generating function for these products:

$$Y(a, z) = \cdots + a(-2)z + a(-1) + a(0)z^{-1} + a(1)z^{-2} + \cdots$$

where $a(n): A \rightarrow A$ is the operator of n -th left multiplication by a . One of the main properties of vertex algebras is that for any $a_1, \dots, a_k, b \in A$ and a functional $f: A \rightarrow C$, the series

$$f(Y(a_1, z_1)Y(a_2, z_2) \cdots Y(a_l, z_k)b), \quad a_i, b \in A$$

converge in some region of \mathbb{C}^k to a rational function in z_1, \dots, z_k .

We consider a more general class of algebras, such that the above series converge to an analytic function in k variables, which is not necessarily rational. A striking feature of these algebras is that the only way of defining them is by using analytic language. We outline how these structures appear in representation theory and geometry, and give a method of constructing such algebras starting from certain spaces of complex analytic functions.

2:35 - 3:25pm HA 335

Faculty and Students are invited to attend.

Please note the change in DAY.