

MATHEMATICS DEPARTMENT
North Carolina State University

ALGEBRA SEMINAR

Friday, September 16, 2005

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NC State University

Galois Theory of Parameterized Linear
Differential Equations and Linear Differential
Algebraic Groups

ABSTRACT: I will describe a Galois theory of differential equations of the form

$$\frac{\partial Y}{\partial x} = A(x, t_1, \dots, t_n)Y,$$

where $A(x, t_1, \dots, t_n)$ is an $m \times m$ matrix with entries that are functions of the principal variable x and parameters t_1, \dots, t_n . The Galois groups in this theory are linear differential algebraic groups, that is, groups of $m \times m$ matrices $(f_{i,j}(t_1, \dots, t_n))$ whose entries satisfy a fixed set of differential equations. For example, in this theory the equation $\frac{\partial y}{\partial x} = \frac{t}{x}y$ has Galois group $G = \{f(t) \mid \frac{d^2(\log f)}{dt^2} = 0\}$. I will give an introduction to the theory of linear differential algebraic groups and the above Galois theory and discuss the place of isomonodromic families in this theory. (This is joint work with Phyllis Cassidy.)

3:00 - 3:50 pm HA 335

Faculty and Students are invited to attend.