

Meeting: 1006, Lubbock, Texas, SS 3A, Special Session on Classical and Differential Galois Theory

1006-12-58 **Phyllis J Cassidy** and **Michael F Singer*** (singer@math.ncsu.edu), Department of Mathematics, NC State University, Box 8205, Raleigh, NC 27695-8205. *Galois theory of parameterized differential equations and linear differential algebraic groups.*

We 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

$$G = \{(f(t)) \mid \frac{d^2(\log f)}{dt^2} = 0\} .$$

We will give an introduction to the theory to linear differential algebraic groups and the above Galois theory and discuss the place of isomonodromic families of linear differential equations. (Received February 01, 2005)