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Primitivo B. Acosta-Humanez* (primitivo.acosta@upc.edu), Technical University of Catalonia, Barcelona. *Galois Theory and Spectral theory*. Preliminary report.

The aim of this talk is to show an application of Differential Galois Theory in Spectral Theory. In a particular case, we analyze the integrability and the Galois groups of the stationary Schroedinger equation. For example, if the potential is a polynomial, then the Galois group of the Schroedinger equation is a connected non abelian group. On the other hand, if the potential is not a rational function, but there exists a hamiltonian change of variable, then we can algebrize the differential equation preserving the identity component of the Galois group in the original Schroedinger equation, this is the case of Lamé equation and Mathieu equation. Finally, we can generate families of Schroedinger equations using the Darboux transformation, Kovacic algorithm and operators theory, where the principal fact is that the Darboux transformation is covariant, isogaloissian and isospectral transformation. This facts play an important role in quantum mechanics. (Received February 27, 2007)