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Differential Galois Theory and Darboux Transformations. Preliminary report.

Darboux transformation is considered the starting point of Supersymmetric Quantum Mechanics for $n = 2$. Today such transformation is very used in different subjects as integrability of partial differential equations.

In this talk we present a Galoisian meaning to Darboux transformations. In particular, we write the Darboux transformation in the formalism of differential Galois theory showing that such transformation is iso-Galoisian (the differential Galois group is preserved) and the eigenrings are isomorphic. Finally, we write the Darboux transformation in matricial formalism for some 2×2 and 3×3 systems giving illustrative examples.

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