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François Ollivier* (francois.ollivier@lix.polytechnique.fr), LIX, Ecole polytechnique, 91128 Palaiseau CEDEX, France. *Jacobi's work on normal forms of differential systems*. Preliminary report.

In 1866 was first published Jacobi's posthumous paper "The reduction to normal form of a non-normal system of differential equations" (in latin). A method is given there to compute a normal form of a system $P_i = 0$, using a minimal number ℓ_i of derivatives of P_i . The given bound is generically true and sharp. The ℓ_i may be computed using the algorithm Jacobi gave to compute "Jacobi's bound" on the system order, a forgotten ancestor of Kuhn's Hungarian method for the assignment problem (1955).

He also provides a generic method to eliminate all variables except one, using again as few derivatives as possible, a very interesting result for improving the algorithmic complexity of a resolvent computation.

These are described using the formalism of differential algebra in order to give precise proofs following Jacobi's ideas. The content of some unpublished part of manuscript II/13b (Jacobis Nachlaß, Archiv der Berlin-Brandenburgischen Akademie der Wissenschaften) will also be exposed. Jacobi considers there the more general problem of finding all possible normal forms for a given system, giving precise conditions for a system of order n in two variables to have less than $n + 1$ possible normal forms (or characteristic sets) for all orderings. (Received February 18, 2007)