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Carlos E Arreche* (carreche@gc.cuny.edu), Department of Mathematics, CUNY Graduate Center, 365 Fifth Ave., Room 4208, New York, NY 10016-4309. *Generalizing Kovacic's algorithm to second order homogeneous linear differential equations with parameters*. Preliminary report.

In 1986 Jerry Kovacic developed an algorithm for solving second order linear homogeneous differential equations with coefficients in $C(x)$, where C is an algebraically closed field of characteristic zero, using the classification of the algebraic subgroups of $SL_2(C)$, since the differential Galois group associated to such an equation is realizable as an algebraic subgroup of $SL_2(C)$ after a possible change of variables.

In this talk we will discuss how to generalize Kovacic's algorithm to compute the differential Galois group associated to a second order linear homogeneous differential equation with parameters. In this case the differential Galois group is realizable as a differential algebraic subgroup of SL_2 , again after a change of variables. In this work we rely on William Sit's classification of the differential algebraic subgroups of SL_2 as well as the representation theory of linear differential algebraic groups. (Received September 22, 2011)