1009-20-49 **Enric Ventura*** (enric.ventura@upc.edu), Dept Matematiques, Av. Bases de Manresa 61-73, 08240 Manresa, Barcelona, Spain. *Conjugacy problem and orbit decidability.*

(joint work with A. Martino and O. Bogopolsky). A recent work by the authors solves the conjugacy problem for free-by-cyclic groups, while it is well known that this problem is unsolvable in general in the bigger class of free-by-free groups (because of a famous example by C. Miller). It turns out that our argument extends to a bigger family of groups containing free-by-free groups with only one technical problem in a particular point of the argument. This is precisely the unique possible obstruction for a free-by-free group to have solvable conjugacy problem. With a close analysis of this argument, we give an explicit characterization of the solvability of the conjugacy problem in the class of free-by-free groups, in terms of what we call "orbit decidability". Furthermore, we provide new families of examples of free-by-free groups with solvable conjugacy problem, and new interesting examples of groups (free-by-free and even abelian-by-free) with unsolvable conjugacy problem. (Received July 29, 2005)