

## Ecole Doctorale des Sciences Fondamentales

### Title of the thesis:

Supervisor : Julien Bichon  
Laboratory : LMBP  
University : UCA  
Email and Phone : julien.bichon@uca.fr, 04 73 40 70 75  
Possible co-supervisor :  
Laboratory :  
University :

### Summary : Graded twisting of quantum groups

Quantum groups are natural generalizations of groups. Just as for groups, the most natural and general problem is the one of classification. This has been the subject of intense research activities in the last years. The aim of this thesis is to contribute to this problem, in the framework of the graded twisting method.

The graded twisting method, recently proposed (2015), associates to a group endowed with a cocentral action of a discrete group a quantum group (a non commutative and non cocommutative Hopf algebra). Some general results allow a description of the quantum subgroups of the graded twisted quantum group in terms of certain subgroups of the original group. This general description does not give a classification *up to isomorphism* however.

The aim of this thesis will be to get such a classification up to isomorphism. A possible source of inspiration is the known case of quantum subgroups of  $SL_{-1}(2)$ , obtained by methods that are different from the one of graded twisting. Another family of interesting examples is the case of graded twist of linear groups over finite fields.

Prerequisite : a very good knowledge of general algebra (linear representations of finite groups in particular). Some background in Hopf algebra theory and/or homological algebra will be very welcome.