

Ecole Doctorale des Sciences Fondamentales

Title of the thesis: **The universal principal series of a complex semisimple quantum group**

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Summary :

A fundamental operation in the representation theory of semisimple groups is parabolic induction, which gives rise to the principal series representations. This operation can be conveniently described in terms of Rieffel induction on group C^* -algebras. The induction module is a module of functions on the homogeneous space G/N (where G is the group and N the nilpotent component in the Iwasawa decomposition) called the *universal principal series* of G .

This point of view has been developed for classical real semisimple groups by P. Clare, and used to clarify the structure of the group C^* -algebra and the intertwining operators between principal series representations. The goal of this project would be to carry out an analogous construction for complex semisimple quantum groups. This would give a clearer picture of the representation theory of these quantum groups, and in particular the intertwiner theory.

Prerequisites : Familiarity with the structure theory of semisimple groups and some knowledge of operator algebras would be highly desirable.