

Classifying Spaces for Quantum Principal Bundles

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Abstract. A construction of a quantum analogue of principal bundles is discussed. Deformations of quantum groups in the sense of Woronowicz allow to relax the condition of local triviality of a principal bundle; the fibres need not be all identical any longer. This leads to deformations of structure group and bundles. There is still a classifying space in the sense that homotopy classes of bundles are classified by homotopy classes of maps from the base space into the classifying space.

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1. Introduction

In particle physics as well as in differential geometry, principal fibre bundles play the key role of making precise the notion of local symmetry. One may ask whether the concept can be generalized to include quantum groups as fibres.

The proper setting for this question would of course be noncommutative geometry, but it seems quite difficult to formulate a notion analogous to local triviality in the noncommutative setting. If one formulates the theory in completely categorical terms in the category of topological spaces, one needs categorical products. One cannot translate these directly to the category of C^* -algebras, they

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