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Principal differential calculi on quantum flag manifolds

In noncommutative differential geometry Hopf-Galois extensions generalize the concept of principal bundle. Since the differential structure on such objects is not unique we draw our attention to principal differential calculi which are characterized by a noncommutative Atiyah sequence and we prove that those amplify to Hopf-Galois extensions of graded algebras. As an Example we review the graph algebras featured in the q-monopole fibration. To further cover quantum principal bundles over holomorphic sections of CP^n we introduce a sheaf-theoretic approach to noncommutative differential geometry. This is required in the presence of projective bases, where global sections are trivial and the local information is crucial. The theory is elucidated by the explicit example given by the sheaf of Ore extensions of q-deformed $SL(2,\mathbb{C})$ over CP^1 with parabolic structure Hopf algebra. Based on a collaboration with Aschieri, Fioresi and Latini.