NONCOMMUTATIVE DIFFERENTIAL EQUATIONS FOR HYPERGEOMETRIC AND BASIC HYPERGEOMETRIC FUNCTIONS OVER ABSTRACT BANACH ALGEBRAS.

ABSTRACT. The ${}_2F_1$ Gauss hypergeometric function and the associated differential equation are extensively studied since Euler; in particular, recently J. A. Tirao [Proc. Nat. Acad. Sci. 100 (14) (2003), 8138-8141] considered and studied a matrix-valued analogue of the argument. We carry on this investigation extending it to the more general setting of hypergeometric functions over an abstract unital Banach algebra, and we provide a similar (but more complicated-looking) result for a second type of noncommutative ${}_2F_1$ Gauss hypergeometric function over a Banach *-algebra. We further give q-analogues for both types of noncommutative hypergeometric equations. Our results have applications, among others, on quantum inverse scattering method, quantum conformal field theory, Yangians, quantum Yang-Baxter equations, infinite dimensional noncommutative geometry, and representation theory of (infinite dimensional) Lie algebras. This is a joint work with Michael Schlosser (Universitaet Wien).