

ONE-CROSS BUNDLES AND NONCOMMUTATIVE GEOMETRIC YANG-BAXTER SOLUTIONS

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One-cross bundles provide a new framework for constructing noncommutative geometries on quantum homogeneous spaces. The framework is modelled on classical Hermitian symmetric spaces and their quantum analogues, the cominuscule quantum flag manifolds. The differential calculus associated to a one-cross bundle admits a unique equivariant connection, which is moreover a bimodule connection. We show that the corresponding bimodule map satisfies the Yang–Baxter equation, thereby producing a new family of Yang–Baxter solutions that we term noncommutative geometric solutions. The irreducible quantum flag manifolds equipped with the Heckenberger–Kolb calculus serve as motivating examples. Time permitting, we discuss the challenges to extending this construction to the full quantum flag manifolds, and the connections with bosonisation.