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Geometry of Quantum Principal Bundles I

Mićo Đurđević*

Faculty of Physics, University of Belgrade, Pbox 550, Studentski Trg 12, 11001 Beograd, Serbia, Yugoslavia

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Abstract: A theory of principal bundles possessing quantum structure groups and classical base manifolds is presented. Structural analysis of such quantum principal bundles is performed. A differential calculus is constructed, combining differential forms on the base manifold with an appropriate differential calculus on the structure quantum group. Relations between the calculus on the group and the calculus on the bundle are investigated. A concept of (pseudo)tensoriality is formulated. The formalism of connections is developed. In particular, operators of horizontal projection, covariant derivative and curvature are constructed and analyzed. Generalizations of the first Structure Equation and of the Bianchi identity are found. Illustrative examples are presented.

Contents

* *Present Address:* Instituto de Matematicas, UNAM, Area de la Investigacion Cientifica, Circuito Exterior, Ciudad Universitaria, México DF, CP 04510, Mexico