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Algebraic Quantization on a Group and Nonabelian Constraints*

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Abstract. A generalization of a previous group manifold quantization formalism is proposed. In the new version the differential structure is circumvented, so that discrete transformations in the group are allowed, and a nonabelian group replaces the ordinary (central) $U(1)$ subgroup of the Heisenberg–Weyl-like quantum group. As an example of the former we obtain the wave functions associated with the system of two identical particles, and the latter modification is used to account for the Virasoro constraints in string theory.

I. Introduction

The use of group theoretical formulations has increased, since the pioneer work by Ne'eman and Regge [1], making easier and more natural the incorporation of infinite dimensional symmetry groups to dynamical systems and generalizing the basic quantum structures. In general terms the nonlinear sigma model on group manifolds [2, 3] and string theory on group manifolds [4–6] are examples of modern formulations where the Lie structure of a certain group plays an important role (see also refs. [7–11] and references therein). It constitutes a step towards the algebrization of physical theories, an evolution analogous with that previously suffered by Mathematics itself.

In this paper we present a generalization of a group approach to quantization [12–14] in which a Lie group $\tilde{G}$ and its canonical structures were the only starting points (see also ref. [13] and references therein). The structure of the group itself

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