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# The Group with Grassmann Structure *UOSP*(1.2)

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**Abstract.** The finite-dimensional representations of the Lie superalgebra *osp*(1.2) and the group with Grassmann structure *OSP*(1.2) have been studied. The explicit expression of the projection operator of the superalgebra *osp*(1.2) has been found. The operator permits an arbitrary finite-dimensional representation to be expanded in the components multiple to the irreducible ones. The Clebsch-Gordan coefficients for the tensor product of two arbitrary irreducible representations have been obtained. The matrix elements of the irreducible representations of the group *UOSP*(1.2) [the analoque of the compact form of the group *OSP*(1.2)] are studied. The explicit form of these matrix elements, the differential equations satisfied by them, and the integral of their product have been found.

## 1. Introduction

The Lie superalgebras and the Lie groups with Grassmann structure[1] have been extensively used since recently in physics. These objects appeared first in the problems relevant to the secondary quantization of the fermion systems [5], then in the dual model, and finally in the supergravity and the supersymmetric field theory (see the review in [6]). The natural problem arises, therefore, to develop a formalism of the theory of representation of the Lie superalgebras and groups with Grassmann structure up to the extent as was achieved for some of the semisimple Lie groups [14].

The present work studies in detail the finite-dimensional representations of the Lie superalgebra *osp*(1.2) and the generated group with Grassmann structure *OSP*(1.2). The representations of the Lie superalgebra *osp*(1.2) were studied earlier in [8, 10, 11].

In the first part of the present work, the projection operator method developed earlier for the usual semisimple Lie algebras [1, 2] is applied to the superalgebra

1 Other names for these objects may be found elsewhere, namely supergroups or graded groups. The terms used here seems to us to reflect better the essence of these mathematical objects

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