
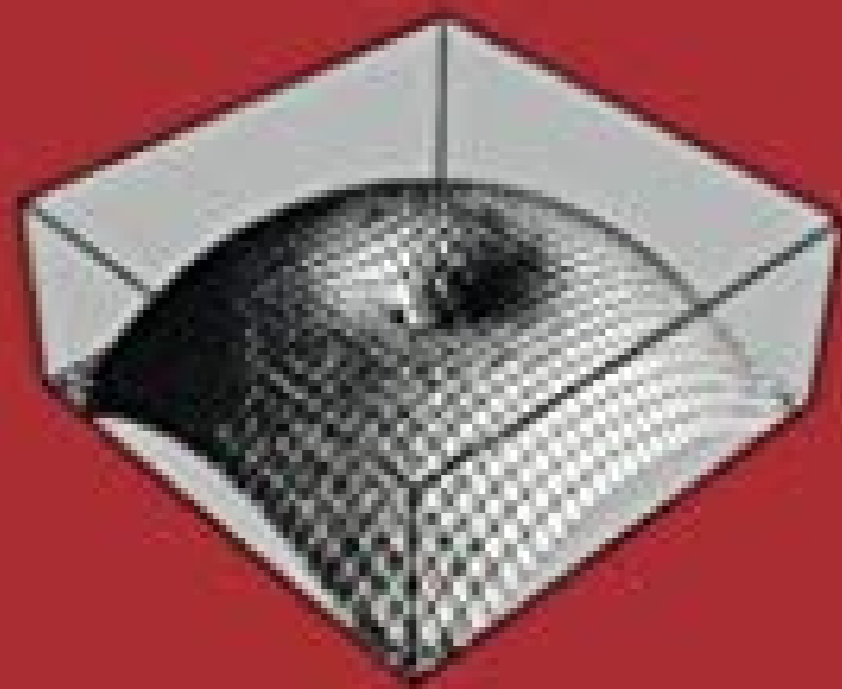


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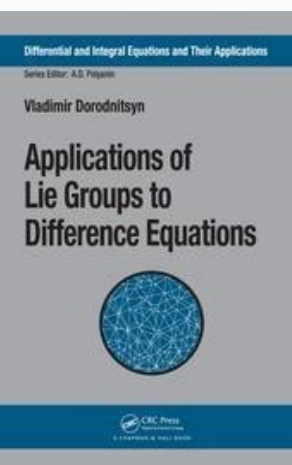
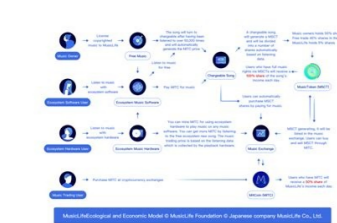
Elementary Lie Group Analysis and Ordinary Differential Equations



Nail H. Ibragimov



MATHEMATICAL METHODS IN PRACTICE



IPMU-19-0324

QUANTIZATION OF CONTINUUM KAC-MOODY ALGEBRAS

ANDREA APPEL AND FRANCESCO SCLA

ABSTRACT. Continuum Kac-Moody algebras have been recently introduced by the authors and O. Schiffman in [AS18]. These are Lie algebras governed by a continuous root system, which can be realized as uncountable colimits of Borcherds-Kac-Moody algebras. In this paper, we prove that any continuum Kac-Moody algebra is canonically endowed with a non-degenerate invariant bilinear form. The positive and negative root subalgebras form a Heisenberg triple with respect to this pairing, which allows to define on a topological quasi-triangular Lie bialgebra structure. We then construct an explicit quantization of \mathfrak{g} , which we refer to as a continuum quantum group, and we show that the latter is similarly realized as an uncountable colimit of Drinfeld-Jimbo quantum groups.

Dedicated to Prof. Kyoji Saito on the occasion of his 75th birthday.

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2010 Mathematics Subject Classification. Primary: 17B65, Secondary: 17B67, 81R30.
 Key words and phrases. Continuum Kac-Moody algebras, topological quivers, continuum quantum groups, quantization of Lie bialgebras.
 The work of the first-named author is supported by the ERC Grant 637618. The work of the second-named author is partially supported by World Premier International Research Center Initiative (WPI), MEXT, Japan, by JSPS KAKENHI Grant number JP17H04906 and by JSPS KAKENHI Grant number JP18K14202.

arXiv:1903.01413v1 [math.QA] 4 Mar 2019

In Harmonic Analysis and Group Representation; Talamanca, A.F., Ed.; C.I.M.E. Summer Schools 1980; Springer: Berlin/Heidelberg, Germany, 2010; Volume 82, 1964, 12, 515-522. [Google Scholar] [CrossRef] Barfoot, T.D.; Furgale, P. In the case of non-commutative groups, particular properties appear: the symmetry is spontaneously broken, certain relations of cohomological type are verified in the Lie algebra of the group. Jean-Marie Souriau, Mécanique Statistique, Groupes de Lie et Cosmologie, colloque CNRS n°237 - Géométrie Symplectique et physique mathématique. This research received no external funding. The authors declare no conflict of interest. We give more details développements to obtain $SU(1,1)/K$ coadjoint orbit and moment map from [127]. In the sense of Souriau, a generalized Gibbs state is a statistical state at which the entropy is stationary with respect to all infinitesimal variations of the statistical state for which the mean value of the moment map remains constant. If we define $K = Ad g^* = (Ad g - 1)^*$ and $K^*(X) = -(dX)^*$ with $(Ad g^* F, Y) = (F, Ad g^{-1} Y)$, $\forall g \in G, Y \in \mathfrak{g}, F \in \mathfrak{g}^*$ where if $X \in \mathfrak{g}, Ad g(X) = g X g^{-1} \in \mathfrak{g}$, the G -invariant 2-form is given by the following expression $\sigma \Omega (dX F, dY F) = B F(X, Y) = \langle F, [X, Y] \rangle, X, Y \in \mathfrak{g}$. We can observe that for Souriau model, Fisher metric is an extension of this 2-form in non-equivariant case $g \beta ([\beta, Z1], [\beta, Z2]) = \Theta^*(Z1, [\beta, Z2]) + \langle Q, [Z1, [\beta, Z2]] \rangle$. The Souriau additional term $\Theta^*(Z1, [\beta, Z2])$ is generated by non-equivariance through Symplectic cocycle. Top is a time-doppler frequency spectrum of a drone. arXiv preprint 2002, arXiv:2002.08676. 2021. Nat. We have applied the previous model via computation of moment map and developed the full computation of this extended Gauss density for $SU(1,1)$ Lie group, $S U(1,1) = \{ (a b^* a^*) / a, b \in \mathbb{C}, |a|^2 - |b|^2 = 1 \}$ and then deduced as consequence the gauss density for the Poincaré unit disk considered as the homogeneous symplectic manifold associated to the coadjoint orbit of

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