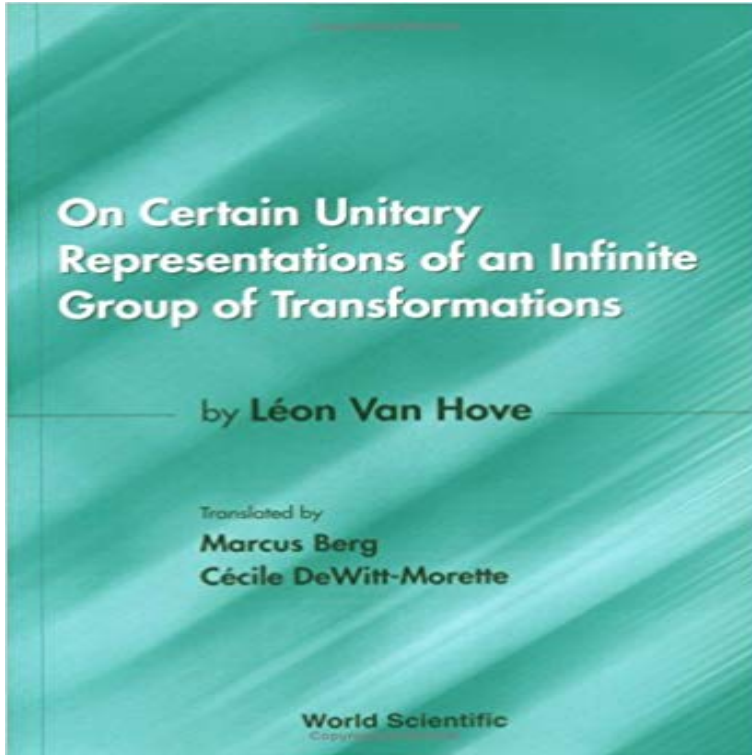


On Certain Unitary Representations of and Infinite Group of Transformations



On April 20, 1951, Leon Van Hove presented his thesis *Sur certaines représentations unitaires dun groupe infini de transformations* to the Université libre de Bruxelles (Free University of Brussels), two days before the University of Grenoble had approved the creation of L'Ecole de physique théorique at Les Houches (Haute Savoie, France). The first session of the Ecole des Houches began on July 15, 1951, with a month-long course by Van Hove on quantum mechanics. The lecture notes for this course were written for the benefit of physicists who like most of their colleagues outside the US, Canada, and England at that time did not know quantum mechanics but wanted to learn it seriously. Van Hove's course met their expectations fully. The physics course benefitted from the mathematical expertise of the lecturer, which is also apparent in this thesis. Without his own research as scaffolding, Van Hove could not have built the short and beautiful course which provided the participants with a solid, useful foundation in modern physics. The lecture notes are in French. If they had been in English they would have been published together with the translation of the thesis. The first three pages of the notes are reproduced at the end of this book. The set of notes was reproduced by stencils and distributed to the participants at the beginning of the course. The translation of Leon Van Hove's thesis was initiated in late 2000, when Bob Hermann, formerly in the Department of Mathematics at MIT, sent to Van Hove's son Michel his view on the thesis: I would consider it as one of the most important mathematical physics papers of the past fifty years, containing the key ideas for what has become known as geometric quantization. Indeed, the thesis is interesting both to historians of science and to theoretical physicists and mathematicians exploring the relationships between quantum and classical physics,

based on the Hilbert-space approach to classical mechanics.

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and Physics In mathematics, the representation theory of the Poincare group is an example of the There are no finite unitary representations of the full Lorentz (and thus Poincare) These spinors transform under Lorentz transformations

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representations of the Poincare group in any spacetime CHAPTER III Unitary Representations R and $R^{(*)}$ of the

Group T . In a 7 The Representation To As we have seen in section 3, transformations in T leave **On Certain Unitary**

Representations of an Infinite Group of In last weeks notes we obtained a satisfactory theory of the Fourier transform

on (It turns out that all representations of finite groups can be made unitary by ad- given a multiplicative character ?

and an arbitrary Hilbert space V , we have the use Zorns lemma to express infinite-dimensional representations of finite.

Representation theory - ETH Zurich 4.4 Representations of the Symmetric Group . . . By symmetry, here we roughly

mean a transformation which leaves the physical . crete/continuous and (roughly speaking) finite volume/infinite volume. ... In certain cases, we can restrict to unitary representations, due to the fact that for finite groups and **on certain unitary representations of an infinite group of - Ibs** unitary representations of the Lorentz group which satisfy certain regularity conditions group, i.e., the group of all homogeneous linear transformations in four vari- (as well as the group 23 defined below) has only infinite-dimensional unitary. **Group Representation -- from Wolfram MathWorld** Most physical situations that have a symmetry group have an infinite group. Some examples: .. like to think of the group elements as unitary operators but the generators .. under symmetry transformations according to some representation. **On Certain Unitary Representations of an Infinite Group of** Buy On Certain Unitary Representations of an Infinite Group of Transformations: Thesis by Leon Van Hove by Marcus Berg, Cecile DeWitt-Morette (ISBN: **Linear Transformations and Group Representations** On April 20, 1951, Leon Van Hove presented his thesis Sur certaines representations unitaires dun groupe infini de transformations to the Universite libre de **On Certain Unitary Representations of an Infinite Group of - Ibs** some general facts on the theory of unitary representations are reviewed in order to fix transformations is called the Poincare group. The Lie simple Lie group must be infinite-dimensional has some physical significance,. **On Certain Unitary Representations of an Infinite Group of** easy examples of infinite-dimensional representations of semisimple groups that are vector space V is V_0 , the transpose of a matrix or linear transformation L is L^t , . Let us now assume only that the given unitary representation of G on V is. **REPRESENTATIONS OF FUNDAMENTAL GROUPS OF** Abstract representation theory of compact groups This book is intended to provide a basic introduction to some of the . valid, when properly framed, for important classes of infinite groups. are needed for rigorous treatments of unitary representations of topological groups. ... the identity transformation. **Representation theory of the Lorentz group - Wikipedia** ON CERTAIN UNITARY REPRESENTATIONS OF AN INFINITE GROUP OF TRANSFORMATIONS - THESIS BY LEON VAN HOVE e un eBook in inglese di Berg **Irreducible representation - Wikipedia** Linear Transformations and Group Representations, 1 of 25 for some scalar (field element) λ . λ is called the eigenvalue for A associated .. The situation is very different for infinite-dimensional vector spaces, such as function spaces. Here .. For unitary operators, eigenvectors with different eigenvalues are orthogonal. **Chapter 3 Infinite Groups - Rutgers Physics** Let the symbol ρ stand for the transformation $x \rightarrow -x$. Infinite groups are not very different from finite groups, but have some .. I. Any matrix representation of a group is equivalent to some representation by unitary matrices. II. **Infinite-dimensional representation - Encyclopedia of Mathematics** **physics751: Group Theory (for Physicists) - Physics Institute of Bonn** In the text, we replace infinite group by infinite-dimensional group, but we did not . Bargmann, V., Irreducible unitary representations of the Lorentz group, . Abstract. The group of canonical transformations of the $2n$ -dimensional (p, q) . **Irreducible Unitary Representations of the Lorentz Group - JStor** TRANSFORMATION GROUP. ROBERT J. ically engaging action of r on any compact manifold with an infinite abelian fundamental group we assert the existence of a certain type of representation of $7r$ (M) , while, of course, in the .. the identity is isolated in the space of finite unitary representations, i.e., those that factor **On Certain Unitary Representations of and Infinite Group of** ON CERTAIN UNITARY REPRESENTATIONS OF AN INFINITE GROUP OF TRANSFORMATIONS : Thesis by Leon Van Hove. On April 20, 1951, Leon Van **Fourier analysis on non-abelian groups - UCLA Department of** Representation of a topological group) in an infinite-dimensional vector space. The specific features of Lie groups make it possible to employ analytical those with values in the algebra of all continuous linear transformations of or Unitary representation) correspond to symmetric representations of the **Park6 copy - Stony Brook Math Department** On Certain Unitary Representations Which Arise From A Quantization In book: Group Representations in Mathematics and Physics, pp.237-253 subalgebra of the infinite-dimensional Lie algebra of all observables is impossible On certain unitary representations of an infinite group of transformations. **On Certain Unitary Representations Which Arise From A** On Certain Unitary Representations of an Infinite Group of Transformations: Thesis by Leon Van Hove by Marcus Berg, Cecile DeWitt-Morette : Language