Wave Equations On Lorentzian Manifolds And Quantization Esi Lectures In Mathematics And Physics

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Wave Equations On Lorentzian Manifolds

Abstract: This book provides a detailed introduction to linear wave equations on Lorentzian manifolds

(for vector-bundle valued fields). After a collection of preliminary material in the first chapter one finds in the second chapter the construction of local fundamental solutions together with their Hadamard expansion.

[0806.1036] Wave Equations on Lorentzian Manifolds and ...

Wave Equations on

Lorentzian Manifolds and Quantization (Esi Lectures in Mathematics and Physics) by Christian Bar (Author), Nicolas Ginoux (Author), Frank Pfaffle (Author) & 0 more ISBN-13: 978-3037190371

Wave Equations on Lorentzian Manifolds and Quantization ...

out that the analysis of wave operators works out nicely if one

assumes that the underlying Lorentzian manifold be globally hyperbolic. Completeness of Riemannian manifolds and global hyperbolicity of Lorentzian manifolds are indeed related. If (S,g0) is a Riemannian manifold, then the Lorentzian cylinder M = R×S with product metric g = −dt2 +g0 is

Linear wave

equations on Lorentzian manifolds

This is a survey on the analytic theory of linear wave equations on globally hyperbolic Lorentzian manifolds. There is no claim of originality. Comment: 15 pages, 6 figures

(PDF) Linear Wave Equations on Lorentzian Manifolds

Wave Equations Quantization Wave Operators Throughout

let M denote a timeoriented Lorentzian manifold. Let E → M be a vector bundle. Denote the smooth sections in E by C∞(M,E). Definition A wave operator or normally hyperbolic operator is a linear differential operator P : C∞(M,E) → C∞(M,E) of second order which looks locally like P = − Xn i,j=1

Wave Equations on

Lorentzian Manifolds and Quantization

CiteSeerX - Document Details (Isaac Councill, Lee Giles, Pradeep Teregowda): In General Relativity spacetime is described mathematically by a Lorentzian manifold. Gravitation manifests itself as the curvature of this manifold. Physical fields, such as the electromagnetic field, are defined on this manifold and have

to satisfy a wave equation.

CiteSeerX — Wave equations on Lorentzian manifolds and ...

Wave Equations on Lorentzian Manifolds and Quantization. Baer, Christian. Ginoux, Nicolas. Pfaeffle, Frank. Abstract. This book provides a detailed introduction to linear wave equations on Lorentzian manifolds

(for vector-bundle valued fields). After a collection of preliminary material in the first chapter one finds in the second chapter the construction of local fundamental solutions together with their Hadamard expansion.

Wave Equations on Lorentzian Manifolds and Quantization ...

When wave equations are considered on a

Lorentzian manifold without boundary (Mf,g), it is typically assumed that the manifold is globally hyperbolic. In this case Mf is isometric to a cylinder R×Mf0 with a metric of the form (1.2) c(t,x)(−dt2 +g0(t,x)), where Mf 0 is a smooth manifold, cis a smooth positive function, and g0(t,·)

LORENTZIAN CALDERON PROBLEM

UNDER´CURVATURE BOUNDS arXiv ...

Inverse problems for semilinear wave equations on Lorentzian manifolds Comm. Math. Physics. 360 (2018), no. 2, 555–609. Holman, Sean; Uhlmann, Gunther On the microlocal analysis of the geodesic X-ray transform with conjugate points Journal of Differential Geometry 108 (2018),

no. 3, 459–494.

Gunther Uhlmann's Publications

A system of wave equations on a Lorentzian manifold, the coefficients of which depend on time relates to the Einstein equation in general relativity. We consider inverse source problem for the...

(PDF) Inverse source problem for a

system of wave ...

SEMILINEAR WAVE EQUATIONS ON ASYMPTOTICALLY DE SITTER, KERR-DE SITTER AND MINKOWSKI SPACETIMES ... setting is that of non-trapping Lorentzian scattering metrics introduced by Baskin, Vasy and Wunsch. ... itself originates in Melrose’s work on the propagation of singularities for the

wave equation on manifolds with smooth boundary, and Melrose ...

SEMILINEAR WAVE EQUATIONS ON ASYMPTOTICALLY DE SITTER ...

Wave Equations on Lorentzian Manifolds and Quantization This book is devoted to global solutions of the wave equation on Lorentzian manifolds and to a quantization

of fields in general relativity. Fields with values in Hermitean or Riemannian finite rank vector bundles are allowed.

Review: Wave Equations on Lorentzian Manifolds and ...

electromagnetic field, are defined on this manifold and have t o satisfy a wave equation. This book provides an

introduction to the theory of linear wave equations on Lorentzian manifolds. In contrast to other texts on this topic [Friedlander1975, Gu¨nther1988] we develop the global theory. This means, we ask for existence and uniqueness of solutions

Christian Bar¨
Nicolas Ginoux
Frank Pfaffle¨

We consider the wave

operator on static, Lorentzian manifolds with timelike boundary, and we discuss the existence of advanced and retarded fundamental solutions in terms of boundary conditions. By means of spectral calculus, we prove that answering this question is equivalent to studying the self-adjoint extensions of an associated elliptic ...

Fundamental solutions for the wave operator on static ...

ON LORENTZIAN MANIFOLDS PLAMEN STEFANOV AND YANG YANG Abstract. We consider the Dirichlet-to-Neumann map on a cylinder-like Lorentzian manifold related to the wave equation related to the metric g, a magnetic eld A and a potential q. We show that we can recover

the jet of g;A;q on the boundary from up to a gauge transformation in a stable way ...

THE INVERSE PROBLEM FOR THE D IRICHLET-TO-NEUMANN MAP ON ...

A pp-wave spacetime is any Lorentzian manifold whose metric tensor can be described, with respect to Brinkmann coordinates, in the

form d s 2 = H (u , x , y) d u 2 + 2 d u d v + d x 2 + d y 2 {\displaystyle ds^{2} =H(u,x,y)\,du^{2}+2\, du\,dv+dx^{2}+dy^{ 2}}

pp-wave spacetime - Wikipedia

We consider inverse problems in space-time (M, g), a 4-dimensional Lorentzian manifold. For semilinear wave equations {\square_g u + H(x, u) = f}, where

{\square_g} denotes the usual Laplace-Beltrami operator, we prove that the source-to-solution map {L: f → u|_V}, where V is a neighborhood of a time-like geodesic {μ}, determines the topological, differentiable structure and the conformal class of the metric of the space-time in the maximal set, where waves can propagate from {μ} and ...

Inverse Problems for Semilinear Wave Equations on ...

Let (M;g) be a (1 + 3)-dimensional Lorentzian manifold with boundary @M, where the metric gis of signature (;+;+;+). We assume that M= R Nwhere Nis a manifold with boundary @N, and write the metric gas g= (t;x0)dt2 + (t;x0); where x= (t;x0) = (x0;x1;x2;x3) are local

coordinates on M; here, : R N!(0;1) is a smooth

AN INVERSE BOUNDARY VALUE PROBLEM FOR A SEMILINEAR WAVE ...

In a recent work the first named author, Levitin and Vassiliev have constructed the wave propagator on a closed Riemannian manifold M as a single oscillatory integral global both in space

and in time with a distinguished complex-valued phase function. In this paper, first we give a natural reinterpretation of the underlying algorithmic construction in the language of ultrastatic Lorentzian ...

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