

Dirac Constraint Quantization Of A Dilatonic Model Of

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Dirac Constraint Quantization Of A $p = \frac{1}{2} \dot{x}^2 [e^2 x^2 + m^2]$; (2) where $e(s)$ is the einbein, an auxiliary degree of freedom. By substituting the equation of motion for this variable, we can get back to Eq. (1). There is yet another equivalent action in phase space $S = \int dt \left(\dot{x} p - \frac{1}{2} e(p^2 + m^2) \right)$; (3) This is equivalent to Eq. Dirac brackets and constrained quantization the canonical Dirac constraint quantization of the dilatonic model admits an exact solution of its quantum dynamics such that its physical degrees of freedom exactly correspond to those of the classical theory. Canonical quantization of the string-inspired dilatonic gravity has been Dirac Constraint Quantization of a Dilatonic Model of ... The Dirac bracket is a generalization of the Poisson bracket developed by Paul Dirac to treat classical systems with second class constraints in Hamiltonian mechanics, and to thus allow them to undergo canonical quantization. It is an important part of Dirac's development of Hamiltonian mechanics to elegantly handle more general Lagrangians; specifically, when constraints are at hand, so that the number of apparent variables exceeds that of dynamical ones. More abstractly, the two-form implied by Dirac bracket - Wikipedia We construct a consistent Dirac constraint quantization of a parametrized massless scalar field propagating on a two-dimensional cylindrical Minkowskian background. The constraints are taken in the form of "diffeomorphism Hamiltonians" whose Poisson-brackets algebra is homomorphic to the Lie algebra of spacetime diffeomorphisms. The fundamental

canonical variables are represented by ... Dirac constraint quantization of a parametrized field ... $(2n-m)$ -dimensional constraint surface (1.2) and then factoring on this surface out the action of m gauge transformations generated by T_μ . Dirac quantization of the theory (1.1) consists in promoting initial phase-space variables and constraint functions to the operator level $(q;p;T_\mu) \rightarrow (\hat{q};\hat{p};\hat{T}_\mu)$ and selecting Geometry of the Dirac Quantization of Constrained Systems $(2n - m)$ -dimensional constraint surface (1.2) and then factoring on this surface out the action of m gauge transformations generated by T_μ . Dirac quantization of the theory (1.1) consists in promoting initial phase-space variables and constraint functions to the operator level $(q,p,T_\mu) \rightarrow (\hat{q},\hat{p},\hat{T}_\mu)$ and selecting Geometry of the Dirac Quantization of Constrained Systems being any constraints: Lagrangians for the Schrödinger equation and the Dirac equation are first-order in time derivatives; in light-cone quantization, where $x^+ \equiv \sqrt{1/2}(t+x)$ is the evolution coordinate, dynamics is first-order in this “time;” the most compact description of chiral bosons in two space-time dimensions is first order in time⁵. It is clear that characterizing any of these systems as “singular” or “constrained” reflects (Constrained) Quantization Without Tears $L = \dot{q}_1^2 + q_1^2 + \dot{q}_2^2 - 1/2(q_1^2 + q_2^2)$ and the goal is to properly quantize it, following Dirac's constrained quantization procedure. (This is a toy example related to Luttinger liquids and the fractional quantum Hall effect. The degrees of freedom q_1 and q_2 correspond to two bosonic modes $a(k)$ and $b(k)$.) Trouble with constrained quantization (Dirac bracket) The procedure of Dirac has potential difficulties if zero lies in the con-

tinuous spectrum of the constraint operators for in that case there are no normalizable solutions of the constraint condition. We face the same problem, of course, and our resolution is discussed below.

1.4 Reduction

Standard path integral quantization

Quantization of Constrained Systems

Paul Adrien Maurice Dirac OM FRS (/ d ɪ ' r æ k /; 8 August 1902 – 20 October 1984) was an English theoretical physicist who is regarded as one of the most significant physicists of the 20th century.. Dirac made fundamental contributions to the early development of both quantum mechanics and quantum electrodynamics. Among other discoveries, he formulated the Dirac equation which describes ...

Paul Dirac - Wikipedia We present an anomaly-free Dirac constraint quantization of the string-inspired dilatonic gravity (the CGHS model) in an open two-dimensional spacetime. We show that the quantum theory has the same degrees of freedom as the classical theory, namely, all the modes of the scalar field on an auxiliary flat background, supplemented by a single additional variable corresponding to the primordial ...

Dirac constraint quantization of a dilatonic model of ... Two different quantization schemes for systems with first-class constraints are presented: Dirac and canonical quantization. Systems invariant under reparameterizations of the time coordinate are considered and we show that they are gauge systems with first-class constraints. The Classical and Quantum Mechanics of Systems with ...

Another viewpoint in the quantization of constraints is that of Dirac's , which is extensively used in (loop) quantum gravity and quantum cosmology. It consists of determining the kernel of the operator $\hat{A} u$, which in our case is obtained from the

integral quantization map . The constraint can then be understood in terms of the kernel of the ... Dirac distribution and Dirac constraint quantizations ... Dirac constraint quantization of a parametrized field theory by anomaly-free operator representations of spacetime diffeomorphisms Journal Article Kuchar-hacek, K - Phys. Rev. D; (United States) We construct a consistent Dirac constraint quantization of a parametrized massless scalar field propagating on a two-dimensional cylindrical Minkowskian background. Generally covariant quantization and the Dirac field ... The first one is based on the quantization of distributions on phase space expressing geometric constraints, like Dirac or Heaviside distributions. The second one is implemented in the spirit of ... (PDF) Dirac distribution and Dirac constraint quantizations We construct a consistent Dirac constraint quantization of a parametrized massless scalar field propagating on a two-dimensional cylindrical Minkowskian background. The constraints are taken in the form of “diffeomorphism Hamiltonians” whose Poisson-brackets algebra is homomorphic to the Lie algebra of spacetime diffeomorphisms. The fundamental canonical variables are represented by ... Dirac Constraint Quantization of a Parametrized Field ... Geometric properties of operators of quantum Dirac constraints and physical observables are studied in semiclassical theory of generic constrained systems. The invariance transformations of the classical theory -- contact canonical transformations and arbitrary changes of constraint basis -- are promoted to the quantum domain as unitary equivalence transformations. Geometry of the Dirac and reduced phase space quantization

... Geometric properties of operators of quantum Dirac constraints and physical observables are studied in semiclassical theory of generic constrained systems. The invariance transformations of the classical theory -- contact canonical transformations and arbitrary changes of constraint basis -- are promoted to the quantum domain as unitary equivalence transformations.

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