

Simplicial Matter In Discrete And Quantum Spacetimes

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Summary : Free simplicial matter in discrete and quantum spacetimes pdf download - a discrete formalism for general relativity was introduced in 1961 by tulio regge in the form of a piecewise-linear manifold as an approximation to pseudo-riemannian manifolds this formalism known as regge calculus has primarily been used to study vacuum spacetimes as both an approximation for classical general relativity and as a framework for quantum gravity however there has been no consistent effort to include arbitrary non-gravitational sources into regge calculus or examine the structural details of how this is done this manuscript explores the underlying framework of regge calculus in an effort elucidate the structural properties of the lattice geometry most useful for incorporating particles and fields correspondingly we first derive the contracted bianchi identity as a guide towards understanding how particles and fields can be coupled to the lattice so as to automatically ensure conservation of source in doing so we derive a kirchhoff-like conservation principle that identifies the flow of energy and momentum as a flux through the circumcentric dual boundaries this circuit construction arises naturally from the topological structure suggested by the contracted bianchi identity using the results of the contracted bianchi identity we explore the generic properties of the local topology in regge calculus for arbitrary triangulations and suggest a first-principles definition that is consistent with the inclusion of source this prescription for extending vacuum regge calculus is sufficiently general to be applicable to other approaches to discrete quantum gravity we discuss how these findings bear on a quantized theory of gravity in which the coupling to source provides a physical interpretation for the approximate invariance principles of the discrete theory

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PDF SIMPLICIAL MATTER IN DISCRETE AND QUANTUM SPACETIMES

simplicial matter in discrete and quantum spacetimes - simplicial matter in discrete and quantum spacetimes by jonathan ryan mcdonald a dissertation submitted to the faculty of the charles e. schmidt college of science

coupling non-gravitational fields with simplicial spacetimes - coupling non-gravitational fields with simplicial spacetimes ... the inclusion of source terms in discrete ... applicable to both numerical relativity and quantum ...

coupling non-gravitational fields with simplicial spacetimes - quantum grav. 27 (2010) 095011 ... simplicial building blocks of rc enable us to represent all matter and ... dirac ?eld action for simplicial spacetimes with four ...

a kirchhoff-like conservation law in regge calculus - are attractive starting points for coupling matter with ... the unitary operators of the discrete quantum ... since simplicial spacetimes provide one of the most ...

physical review d 044004 (2012) bounding bubbles: the ... - and mathematical ingredients with simplicial quantum ... complexes represent discrete spacetimes ... as matrix models did direct link with discrete quantum ...

physical review d 125002 (2011) fractional and ... - we establish a mapping between fractional and noncommutative spacetimes in ... simplicial quantum gravity [7 ... and matter based on a continuum ...

pacs numbers: 02.40,11.10.nx,05.45.df,11.10.kk,11.10 - fractional and noncommutative spacetimes ... and simplicial quantum gravity [7–11], among oth- ... models for both spacetime geometry and matter based

arxiv:0807.3041v2 [gr-qc] 22 jul 2008 - the unitary operators of the discrete quantum ... most early attempts to include matter and ... naturally as an underlying framework since simplicial spacetimes ...

dark energy from discrete spacetime - researchgate - dark energy from discrete spacetime ... dynamical-triangulations (dt) model for quantum gravity. ... abstract simplicial complex.

quantum gravity and matter: counting graphs on causal ... - quantum gravity and matter: ... be adapted to the ?uctuating ensemble of curved spacetimes underlying the causal ... discrete models of quantum gravity.

quantum cosmology of (loop) quantum gravity condensates ... - quantum cosmology of (loop) ... show that in?ationary spacetimes have a past singularity, ... as building blocks of a simplicial complex),

regge calculus in teleparallel gravity - regge calculus in teleparallel gravity ... couples algebraically to the matter term, ... the discrete action, and the simplicial eld equation.

fixing the boundaries for causal dynamical triangulations ... - fixing the boundaries for causal dynamical triangulations in 2+1 ... an ensemble of quantum spacetimes. ... in the quantum mechanics matter wave ...

university of cambridge, - researchgate - dynamics of matter and quantum gravity by an explicit ... the start and is phrased in a discrete (simplicial) ... understood as taking place in such spacetimes.

quantum gravity - springer - quantum gravity as a quantum field theory of ... why going discrete? matrix models and simplicial quantum ... microscopic structure of the qeg spacetimes 304

quantum gravity - researchgate - isotropy in the matter sector 22 ... why going discrete? matrix models and simplicial quantum gravity 105 ... microscopic structure of the qeg spacetimes 304 6.

felix finster, olaf müller, marc nardmann, jürgen ... - models of matter in curved spacetimes are often ... minimizing the action gives rise to a "discrete causal ... non-commutative geometry and simplicial quantum ...

quantum gravity - toc - quantum gravity as a quantum field theory of ... why going discrete? matrix models and simplicial quantum ... microscopic structure of the qeg spacetimes 304

loop quantum cosmology - brown university - ... quantum states for ?at spacetimes? ... m is the matter hamiltonian. ... • "loop quantum cosmology: recent progress".

octava escuela de f'ísica-matemática´ 23 mayo – 27 mayo ... - i will introduce folding as a discrete version ... state describes quantum elds in nite regions of curved spacetimes. ... topological phases of matter have been one ...

geometry of fractional spaces - pubmandlg - ... and simplicial quantum gravity [11, 12 ... tum dynamics of space as a discrete entity leads to a continuum ... gravity dynamics for both spacetime and matter.

qg2-2008 abstracts - school of mathematical sciences, - after a brief review of a covariant approach to loop quantum gravity and of ... central extensions in flat spacetimes-duality and thermodynamics of black hole dyons.

numerical relativity from a gauge theory perspective - numerical relativity from a gauge theory ... numerical relativity from a gauge theory perspective by ... 3.1.2 simplicial complexes and dual simplexes ...

towards a general3+1 continuous time formulation of ... - will be based on an integral action obtained as the limiting form of the discrete ... collection of 4-dimensional simplicial ... of a theory of quantum ...