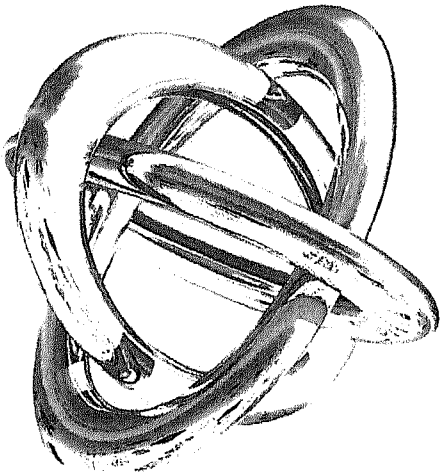
Kinki University Series on Quantum Computing – Vol. 4

editors

Mikio Nakahara
Kinki University, Japan

Shu Tanaka
University of Tokyo, Japan



Frontiers in Quantum Information Research

Decoherence, Entanglement, Entropy, MPS and DMRG

World Scientific

NEW JERSEY · LONDON · SINGAPORE · BEIJING · SHANGHAI · HONG KONG · TAIPEI · CHENNAI

CONTENTS

Preface v

List of Participants xvii

Committees xix

Part A Summer School on Decoherence, Entanglement and Entropy 1

Black Holes and Qubits 3
L. Borsten, M. J. Duff, and W. Rubens

Weak Value with Decoherence 108
A. Hosoya

Lectures on Matrix Product Representation of States 117
V. Karimipour and M. Asoudeh

On a Possible Definition of Entanglement in Antisymmetric States 150
T. Ichikawa, T. Sasaki, and I. Tsutsui

Entanglement Measures for Intermediate Separability 153
T. Sasaki, T. Ichikawa, and I. Tsutsui

Unruh Effect on Quantum Teleportation and Entanglement: Implications on Black Hole Information 163
K. Shiokawa

Systematic Construction of Generalized Bell Inequalities 192
S. Tanimura

On 3-Variable Exponential Polynomials and Quantum Algorithms 211
Y. Ohno, Y. Sasaki, and C. Yamazaki

Part B Workshop on Matrix Product State Formulation and Density Matrix Renormalization Group Simulations (MPS&DMRG) 225

Application of Density Matrix Renormalization Group Method to Photoinduced Phenomena in Strongly Correlated Electron Systems 227
H. Matsueda

Density-Matrix Renormalization Group Method for Tomonaga-Luttinger Liquid 265
T. Hikihara

Supersymmetric Valence-Bond Solid Models — Hidden Order and Dynamics 281
K. Totsuka and K. Hasebe

Matrix Product States in Quantum Integrable Models 302
H. Katsura and I. Maruyama

A Systematic Way to Find and Construct Exact Finite Dimensional Matrix-Product Stationary States 322
Y. Hieida and T. Sasamoto