
QUANTUM INFORMATION,
STATISTICS, PROBABILITY

*Dedicated to
Alexander S. Holevo
on the occasion of his 60th birthday*

edited by

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Preface

Currently, quantum communication and quantum information have become not only one of the most intriguing fields of modern science but also a great impetus and a challenge for advanced technologies. However the importance in their progress of basic science, especially of mathematics remains indispensable. This understanding was my motivation for initiating the series of International Conferences on Quantum Communication starting from the already historical Paris meeting in 1990. C. Bendjaballah and I invited there about 80 researchers from USA, Western Europe, Soviet Union, Japan and other countries to stimulate vigorous discussions of the problems of quantum information science. Through the interactions with acknowledged pioneers of quantum communication theory, such as C. W. Helstrom, A. S. Holevo, H. P. Yuen as well as young promising researchers, one could see the great importance of the underlying mathematical principles. This was also the time when C. H. Bennett and P. Shor with their colleagues initiated advanced studies in quantum cryptography and quantum computation, which altogether brought today's flourishing of the quantum information science.

On my opinion, it is a significant fact that A. S. Holevo and C. H. Bennett (whose 60-th birthday we celebrated recently), being of the same age, approached quantum information with different paradigms, one based on communication and another on computation. Both concepts will contribute significantly to the development of the field in future, like the classical information science was developed by applying each model closely to each study.

On this occasion, in celebration of A. S. Holevo's 60th birthday, we would like to acknowledge his outstanding and wide-ranging achievements from mathematics to information science, and to stress their importance to researchers of the next generation. My thanks are due to all the colleagues who supported my initiative and made valuable contributions to this volume and to Kentaro Kato and Minori Hirota for their help in my editorial work.

Osamu Hirota

CONTENTS

<i>Preface</i>	i
<i>Contributing Authors</i>	iii
<i>Scientific Profile of Professor A. S. Holevo</i>	v
<i>Publications</i>	vii
Non-stabilizer quantum codes from Abelian subgroups of the error group <i>A. Arvind, P. Kurur, K. R. Parthasarathy</i>	1
Instrumental processes, entropies, information in quantum continual measurement <i>A. Barchielli, G. Lupieri</i>	30
Optical demonstrations of statistical decision theory for quantum systems <i>S. M. Barnett</i>	44
A resource-based view of quantum information <i>C. H. Bennett</i>	56
On the quantumness of a Hilbert space <i>C. A. Fuchs</i>	65
Statistical estimation of a quantum operation <i>A. Fujiwara</i>	78
Classical capacity of free-space optical communication <i>V. Giovannetti, S. Guha, S. Lloyd, L. Maccone, J. H. Shapiro, H. P. Yuen</i>	90
Comments on multiplicativity of maximal p -norms when $p = 2$ <i>C. King, M. B. Ruskai</i>	102
On consistency of quantum theory and macroscopic objectivity <i>L. Lanz, B. Vacchini, O. Melsheimer</i>	115
Towards implementation of coding for quantum sources and channels <i>M. Sasaki</i>	130
The classical capacity achievable by a quantum channel assisted by limited entanglement <i>P. W. Shor</i>	144
The uncertainty relation for joint measurement of position and momentum <i>R. F. Werner</i>	153
Quantum and classical message identification via quantum channels <i>A. Winter</i>	172

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