

The Fifth Quantum Information Technology Symposium (QIT5) Program

Invited Talk 30 min, Tutorial Talk 30 min, Oral Talk 15 min

November 12, 2004 (Monday)

10:20-10:30 [Opening]

10:30-11:30 [Quantum Teleportation] Chair: Takuya Hirano (Gakushuin University)

1: Continuous variable teleportation of single photon states

Toshiki Ide (The University of Tokyo), H. F. Hofmann (Hokkaido University, CREST), Takayoshi Kobayashi (The University of Tokyo),

Akira Furusawa (The University of Tokyo)

2: Continuous variable teleportation and nonclassicality of quantum states

Masahiro Takeoka (Communication Research Laboratory), Masasi Ban (Advanced Research Laboratory, Hitachi Ltd.),

Masahide Sasaki (Communication Research Laboratory)

3: Comparative study of resources for state preparation by projection synthesis

S. K. Ozdemir, A. Miranowicz, M. Koashi, and N. Imoto (The Graduate University for Advanced Studies)

4: Effects of noisy entangled state transmission on quantum teleportation

Holger F. Hofmann, Kenji Tsujino, and Shigeki Takeuchi (Hokkaido University)

11:30-12:15 [Quantum Cryptography I] Chair: Masahiro Kitagawa (Osaka University)

5: Experimental quantum cryptography using balanced homodyne detection

Hiroto Yamanaka (Gakushuin University)

6: Security aspects of quantum cryptography using balanced homodyne detection

Ryo Namiki and Takuya Hirano (Gakushuin University)

7: Security of B92 Quantum Key distribution against Individual Attack

Kiyoshi Tamaki, Masato Koashi, Nobuyuki Imoto (The Graduate University for Advanced Studies, CREST)

12:15-13:00 Lunch

13:00-13:30 [Quantum Cryptography II] Chair: Masahiro Kitagawa (Osaka University)

8: 'Circular type' quantum key distribution

Tsuyoshi Nishioka, Hirokazu Ishizuka, Toshio Hasegawa, and Jun'ichi Abe (Mitsubishi Electric Corporation)

9: Experimental Analysis of Errors in Quantum Cryptosystem

Toshio Hasegawa, Tsuyoshi Nishioka, Hirokazu Ishizuka, Jun'ichi Abe (Mitsubishi Electric Corporation), Shigeki Takeuchi (Hokkaido University)

13:30-14:30 [Quantum Protocol] Chair: Nobuyuki Imoto (The Graduate University for Advanced Studies)

10: [Invited Talk] Quantum Public-Key Cryptosystems and Quantum-Computation Cryptography

Tatsuaki Okamoto (NTT Information Sharing Labs.)

11: Quantum coin flipping with arbitrary small bias is impossible

Yuki Tokunaga (NTT Information Sharing Platform Labs.)

12: Quantum Verifiers with Multiple Quantum Certificates

Keiji Matsumoto (Quantum Computation and Information Project, ERATO, JST),

Hirokazu Kobayashi (The University of Tokyo, Quantum Computation and Information Project, ERATO, JST),

Tomoyuki Yamakami (University of Ottawa)

14:30-15:30 [Decoherence] Chair: Chikako Uchiyama (University of Yamanashi)

13: Stability of Shor's Algorithm in Noisy External Fields

Akihisa Ukena (Department of Basic Science, The University of Tokyo), Akira Shimizu (Department of Basic Science, The University of Tokyo)

14: Decoherence and error correction for quantum information on a strongly coupled qubits.

Hayato Nakano (NTT Basic Research Laboratories)

15: Decoherence in Macroscopic Systems

A. Motoyoshi (Kumamoto University)

16: The effect of background charge fluctuations on decoherence

Toshifumi Itakura, Yasuhiro Tokura (NTT Basic Research Laboratories, NTT Corporation)

15:30-15:45 Coffee Break

15:45-17:45 [Quantum Computation] Chair: Hiroshi Imai (The University of Tokyo)

17: [Tutorial Talk] The Meaning of Computational Complexity Theory in Information Technology

Seinosuke Toda (College of Humanities and Sciences, Nihon University)

18: A Polynomial Time Algorithm for Discrete Logarithm Problem with NMR Quantum Computers

Noboru Kunihiro CShigeru Yamashita (Communication Science Laboratories, NTT Corporation)

19: Quantum Search Algorithms for Database Query Processing

Kazuo Iwama (Kyoto University), Akinori Kawachi (Kyoto University)

20: Quantaum random walks on the set of contingency tables

Kenichi Takarabe (Okayama University of Science), Toshio Sakata (Kyushu Institute of Design),

Ryuichi Sawae (Okayama University of Science), Tei Minaru (Okayama University of Science)

21: Polynomial-Time Algorithms for the Equivalence for One-Way Quantum Finite Automata

Takeshi Koshiha (Fujitsu Laboratories Ltd.)

22: 8qubit CMOS Quantum Processor

Shin-ichi O'uchi (The University of Tokyo), Minoru Fujishima (The University of Tokyo)

Koichiro Hoh (The University of Tokyo, JST-CREST)

23: General-Purpose Fast Simulator for Quantum Computing

Jumpei Niwa (QCI, ERATO, JST)

17:45-18:00 Coffee Break

18:00-20:00 [Banquet]

November 13, 2004 (Tuesday)

9:00-9:45 [Quantum Mechanics and Its Related Topics] Chair: Nobuyuki Imoto (The Graduate University for Advanced Studies)

24: Circuit Theory for Schrodinger Equation as a Partial Differential Equation

Nobuo Nakai (Consultant of Niigata Seimitu Co., Ltd.)

25: Quantum entanglement in terms of the quantum theory of motion

Masanori Sato (Honda Electronics Co., Ltd.)

26: Analogy between quantum algorithms and optical systems (– Study on Grover microscopy and

Deutsch-Jozsa filte -)

Shigeo Kotake (Mie University)

9:45-10:15 [Quantum Communication I] Chair:

Masahide

Sasaki

(Communications Research Laboratory)

27: On new treatment of quantum communication gates
Noboru Watanabe (Department of Information Sciences, Science University of Tokyo)

28: Coding for classical-quantum channels with entangled decoding
Kentaro Kato (CREST)

10:15-10:30 Coffee Break

10:30-11:45 [Quantum Communication II] Chair: Masahide Sasaki
(Communications Research Laboratory)

29: Superadditivity in capacity of quantum channel for linearly dependent signals

Tsuyoshi Sasaki Usuda, Shogo Usami, Ichi Takumi (Nagoya Institute of Technology)

Masayasu Hata (Aichi Prefectural University)

30: Error performance of binary quantum code with mixed letter states

Shogo Usami, Tsuyoshi Sasaki Usuda, Ichi Takumi (Nagoya Institute of Technology),

Masayasu Hata (Aichi Prefectural University)

31: Optimum detection for extracting maximum information from symmetric qubit sets

Jun Mizuno (Communications Research Laboratory, CREST), Mikio Fujiwara (Communications Research

Laboratory, CREST), Makoto Akiba (Communications Research Laboratory), Tetsuya Kawanishi

(Communications Research Laboratory), Stephen M. Barnett (Univ. of Strathclyde), Masahide Sasaki

(Communications Research Laboratory)

32: Compressibility of general quantum signals including mixed states

Masato Koashi, Nobuyuki Imoto (The Graduate University for Advanced Studies)

33: Exponents of quantum pure state source coding

Masahito Hayashi (Riken)

11:45-12:45 Lunch

12:45-14:15 [Solid Qubit I] Chair: Yoshiro Hirayama (NTT Basic Research Laboratories)

34: [Invited Talk] Superconducting Flux Qubit

Hideaki Takayanagi (NTT Basic Research Laboratories)

35: Quantum computer composed entirely of silicon

M. Itoh (Dept. Applied Physics, Keio University and PRESTO-JST),

E. Abe (Dept. Applied Physics, Keio University),

T. Ladd(Stanford University), J. Goldman (Stanford University), F. Yamaguchi (Stanford University),
Y. Yamamoto (Stanford University, JST, NTT Basic Research Laboratories)

36: Spin relaxation of two-dimensional electrons and control of nuclear spin dynamics in GaAs/AlGaAs (110)

Quantum wells

Y. Ohno, T. Adachi, F. Matsukura (Research Institute of Electrical Communication, Tohoku University),

G. Salis,D.D. Awschalom (University of California)

37: Ferromagnetism and anti-ferromagnetism in a single quantum dot

M. Stopa (ERATO Tarucha Mesoscopic Correlation Project)

38: Quantum Gates in Capacitively Coupled Quantum Dots and Measurement Procedure

Tetsufumi Tanamoto (Corporate R & D Center, Toshiba Corporation)

14:15-15:00_[Solid Qubit II] Chair: Shigeki Takeuchi (Hokkaido University)

39: Comparative study of quantum information properties of the spin van der Waals versus Ising models

A. Miranowicz, S.K. Ozdemir, M. Koashi, N. Imoto (The Graduate University for Advanced

Studies), and Y. Hirayama (NTT Basic Research Laboratories)

40: Entanglement of excitonic states in coupled quantum dots

Yu-xi Liu, S. K. Ozdemir, A. Miranowicz, Masato Koashi, N. Imoto (The Graduate University for Advanced Studies)

41: Quantum gate operation of quantum dot exciton

H. Kamada (NTT Basic Research Laboratories), H. Gotoh (NTT Basic Research Laboratories), H. Ando (Konan University),

T. Takagahara (Kyoto Institute of technology), J. Temmyo (Shizuoka University)

15:00-15:15 Coffee Break

15:15-16:00 [Quantum Optics] Chair: Shigeki Takeuchi (Hokkaido University)

42: A frequency-domain quantum computer with a solid-state EIT medium

Kouichi Ichimura (Corporate Research & Development Center, Toshiba Corporation)

43: Attosecond ultrapprecise quantum-phase manipulation; the basis of large-scale quantum computation using a single molecule

Kenji Ohmon, Mika Nakamura, Hisashi Chiba, Yukinori Sato
(Tohoku University),

J. B. West (CLRC Daresbury Laboratory)

44: Generation of highly entangled pulsed photon pairs using pre-compensated fs-pulsed lasers

Yoshihiro Nanbu(NEC Laboratories), Koji Usami (Tokyo Institute of Technology),

Kazuo Nakamura (NEC Laboratories)

16:00-17:45 [Quantum Entanglement] Chair: Satoshi Ishizaka (NEC Laboratories)

45: [Tutorial Talk] Entanglement and quantum information processing
Mio Muraio (The University of Tokyo)

46: On phase-covariant quantum cloning

H. Fan, K. Matsumoto, X. B. Wang (ERATO Imai quantum computing and information project), M. Wadati (The University of Tokyo)

47: Entanglement measures with weak-monotonicity as lower (upper) bound for the regularized entanglement of formation (distillation)

WonYoung Hwang, Keiji Mastumoto (ERATO Imai quantum computing and information project)

48: Estimation of fidelity to multiparticle maximally entangled state using the maximum likelihood principle

Koji Nagata (The Graduate University for Advanced Studies)

49: Detecting the inseparability and distillability of continuous variable states in Fock space

Wang Xiang-Bin (ERATO Imai quantum computing and information project)

50: Geometry and entanglement on Grover's optimal quantum search

Akimasa Miyake and Mikio Wadachi (The University of Tokyo)
