

QIT7 Program

(Oral 15 minutes + Q&A 5 minutes, Invited /Tutorial 40 minutes + Q&A 5 minutes)

Monday, November 11, 2002

9:00-9:10 Opening

<Session 1: Optical Qubit>9:10-10:35 Chair: *Masahiro Kitagawa(Osaka Univ.)*

1. [Invited]Quantum information network between light fields and atoms
Mikio Kuzuma (Tokyo Institute of Technology)
2. Realization of a resonant non-linear phase flip in cavity quantum electrodynamics
Holger F. Hofmann (PRESTO, Hokkaido Univ.), Kunihiko Kojima(Hokkaido Univ.), Shigeki Takeuchi(PRESTO, Hokkaido Univ.), Keiji Sasaki (Hokkaido Univ.)
3. Measured quantum Fourier transform on fiber-optics
Akihisa Tomita(ERATO), Kazuo Nakamura (NEC)

Coffee Break 20 minutes

<Session 2: Quantum Optics Experiment> 10:15-11:55 Chair: *Yoshihiro Nambu (NEC)*

4. Experimental extraction of an entangled pair from decohered photon pairs
Takashi Yamamoto, Masato Koashi, Sahin Kaya Ozdemir, Nobuyuki Imoto (CREST, Soken)
5. A novel way for preparation of Bell state using femtosecond pulse pumped spontaneous parametric down-conversion
Bao-Sen Shi, Akihisa Tomita (ERATO, NEC)
6. Telecom wavelength Quantum Cryptosystem
Toshio Hasegawa, Tsuyoshi Nishioka, Hirokazu Ishizuka, Jun'ichi Abe, Mitsuru Matsui (Mitsubishi Electric), Shigeki Takeuchi (Hokkaido Univ.)

Lunch: 11:55-13:15

<Session 3: Solid State Qubit> 13:15-14:40 Chair: *Toshio Ohshima (Fujitsu Lab.)*

7. [Invited] Spin coherence in semiconductors and its application to quantum computing
Yuzo Ohno, Hideo Ohno(Tohoku Univ.)
8. Entanglement of a system of two coupled quantum bits, solid-state qubit and photon qubit
Yoshiaki Rikitake, Hiroshi Imamura, Masahiko Hayashi, Hiromichi Ebisawa (Tohoku Univ.)
9. Why are the energy-eigenstates special basis?
Hayato Nakano (NTT)

Poster Session 14:40-17:00

<Session 4: Quantum Information Theory> 17:00-18:00 Chair: *Tohya Hiroshima (NEC)*

10. Note on Quantum Capacity
Noboru Watanabe (Tokyo Univ. of Science)
11. CPTP mappings and state-dependent quantum cloning
A. Carlini (ERATO), Masahide Sasaki (CRL, CREST)
12. Quantum universal variable-length source coding
Masahito Hayashi(RIKEN), Keiji Matsumoto(ERATO)

Tuesday, November 12, 2002

<Session 5: Quantum Algorithm> 9:50-10:30 Chair: *Tetsuro Nishino (UEC)*

13. Transformation algorithm of Deutsch-Jozsa filter and its applications
Shigeo Kotake, Tatsunori Umizumi (Mie Univ.)
14. Quantum Query Complexity and the Number of Inverted States
Kazuo Iwama, Akinori Kawachi, Hiroyuki Masuda, Rudy Raymond H.P. (Kyoto Univ., ERATO), Shigeru Yamashita (NTT, ERATO)

Coffee Break 20 minutes

<Session 6: Quantum Computation Theory> 10:50-11:50 Chair: *Nobuyuki Imoto(SOKEN)*

15. Quantum Circuits for Modular Exponentiation using Montgomery Reduction
Noboru Kunihiro (UEC)
16. Characterizations of Quantum Finite Automata with mixed states by an Extended Model of Reversible Finite Automata
Masahide Morishita, Masaki Nakanishi, Katsumasa Watanabe (NAIST)
17. Quantum computing, conservation laws and uncertainty principle
Masanao Ozawa (Tohoku Univ.)

Lunch: 11:50-13:20

<Session 7: Quantum Entanglement Theory> 13:20-15:00 Chair: *Fumiaki Morikoshi(NTT)*

18. Multipartite entanglement classified by the hyperdeterminant II
Akimasa Miyake (Univ. of Tokyo, ERATO), Miki Wadati (Univ. of Tokyo)
19. Quantify entanglement by concurrence hierarchy
Heng Fan, Keiji Matsumoto, Hiroshi Imai (ERATO)
20. Conditional Bell measurement of photon number sum and phase difference with linear optics
Katsuji Yamamoto, Akira Kitagawa (Kyoto Univ.)
21. Manipulation of photon number-phase state in quantum teleportation
Akira Kitagawa, Katsuji Yamamoto (Kyoto Univ.)
22. Teleportation fidelity of noisy states
S. K. Ozdemir (CREST, SOKEN), Y-X. Liu (SOKEN), A. Miranowicz (CREST, SOKEN, Adam Mickiewicz Univ.), Takashi Yamamoto, Masato Koashi (CREST, SOKEN), Nobuyuki Imoto (CREST, SOKEN, NTT, Univ. of Tokyo)

Coffee Break 20 minutes

<Session 8: Quantum Estimation> 15:20-16:45 Chair: *Masahito Hayashi(RIKEN)*

23. [Tutorial] First order asymptotic theory of quantum statistical estimation
Keiji Matsumoto (ERATO)
24. Quantum Estimation of Pauli Channel
Hiroshi Imai, Akio Fujiwara (Osaka Univ.)
25. Experimental study of photonic quantum channels
Yoshihiro Nambu (NEC, CREST), Kouji Usami (TIT, CREST), Kazuo Nakamura (NEC, CREST)

16:45-16:55 Closing

List of QIT7 Posters

1. A single photon source using parametric down conversion
R. Okamoto (Hokkaido Univ.)
2. Single-photon-state generation by squeezing of the coherent state
M. Matsuoka (CRL, Gakushuin Univ.)
3. Generation of squeezed light using a periodically poled KTP crystal
K. Kotani (Gakushuin Univ.)
4. Quantum state reconstruction of 1.55 micron incoherent light pulse
R. Namiki (Gakushuin Univ.)
5. Generation of correlated photon pairs at telecom wavelength
S. Mori (Nihon Univ.)
6. Toward photon-number-resolving photo-detector at wavelength of 1.55 micron
M. Fujiwara (CRL)
7. A simultaneous evaluation method of quantum efficiency and after-pulses for a 1550 nm single-photon detector
A. Yoshizawa (AIST)
8. Experimental quantum cryptography using balanced homodyne detection II
H. Yamanaka (Gakushuin Univ.)
9. Quantum key Distribution using a telecommunications fiber network
T. Yoshikawa (Nihon Univ.)
10. Quantum cryptography using transverse modes of light beam
H. Sasada (Keio Univ.)
11. Proposal of quantum key distribution using twin beams
K. Kasai (CRL)
12. Communication channels analogous to 1 out-of 2 oblivious transfer based on quantum uncertainty I -Basic Frameworks-
K. Shimizu (NTT)
13. Communication channels analogous to 1 out-of 2 oblivious transfer based on quantum uncertainty II -Application-
K. Shimizu (NTT)
14. Selective generation, trapping and cooling of $^{43}\text{Ca}^+$ for quantum information networks
K. Hayasaka (CRL)
15. Adiabatic Quantum Search
Y. Nishioka (Kyoto Univ.)
16. Application of Grover's algorithm to quantum Ising simulation
M. Matsumoto (Mie Univ.)
17. Possibility of quantum gates using charged states
T. Murakami (Hiroshima Univ.)
18. Active control on relaxation process of exciton in semiconductors
C. Uchiyama (Yamanashi Univ.)
19. Information-theoretic approach to quantum feedback control
S. Kawabata (AIST, NEDO)
20. A theory of POVM formally identical to algorithmic information theory
K. Tadaki (ERATO)
21. Classification of mixed high-dimensional multipartite systems
K. Nagata (CREST, SOKEN)
22. EPR correlation seen from moving observers
H. Terashima (TIT)