

Parametric beating of a quantum probe field with a prepared Raman coherence in a far-off-resonance medium

Le Kien F., Hakuta K.

Dept. of Appl. Physics and Chemistry, University of Electro-Communications, Chofu, Tokyo 182-8585, Japan; CREST, Japan Sci. and Technol. Corp. (JST), Chofu, Tokyo 182-8585, Japan; Department of Physics, University of Hanoi, Hanoi, Viet Nam; Institute of Physics, Natl. Ctr. for Nat. Sci. and Tech., Hanoi, Viet Nam

Abstract: The parametric beating of a quantum probe field with a prepared Raman coherence in a far-off-resonance medium was investigated. It was shown that the normalized autocorrelation functions of the probe field were exactly reproduced in the Stokes and anti-Stokes sideband fields. It was found that an initial coherent state of the probe field can be replicated to the Raman sidebands, and an initial squeezing of the probe field can be partially transferred to the sidebands.

Index Keywords: Coherent light; Multiplexing; Oscillations; Probes; Radiation; Raman scattering; Input field state; Molecular oscillations; Quantum probe; Raman coherence; Quantum theory

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Correspondence Address: Le Kien, F.; Dept. of Appl. Physics and Chemistry, University of Electro-Communications, Chofu, Tokyo 182-8585, Japan

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Authors with affiliations:

- Le Kien, F., Dept. of Appl. Physics and Chemistry, University of Electro-Communications, Chofu, Tokyo 182-8585, Japan, CREST, Japan Sci. and Technol. Corp. (JST), Chofu, Tokyo 182-8585, Japan, Department of Physics, University of Hanoi, Hanoi, Viet Nam
- Hakuta, K., Dept. of Appl. Physics and Chemistry, University of Electro-Communications, Chofu, Tokyo 182-8585, Japan, CREST, Japan Sci. and Technol. Corp. (JST), Chofu, Tokyo 182-8585, Japan, Institute of Physics, Natl. Ctr. for Nat. Sci. and Tech., Hanoi, Viet Nam

References:

- Nazarkin, A., Korn, G., Wittmann, M., Elsaesser, T., (1999) Phys. Rev. Lett., 83, p. 2560

- Kolosha, V.P., Herrmann, J., (2000) Phys. Rev. Lett., 85, p. 1226
- Kalosha, V.P., Herrmann, J., (2001) Opt. Lett., 26, p. 456
- Le Kien, F., Hong Shon, N., Hakuta, K., (2001) Phys. Rev. A, 64, pp. 051803R
- Le Kien, F., Hakuta, K., Sokolov, A.V., (2002) Phys. Rev. A, 66, p. 023813
- Kalosha, V., Spanner, M., Herrmann, J., Ivanov, M., (2002) Phys. Rev. Lett., 88, p. 103901
- Bartels, R.A., Weinacht, T.C., Wagner, N., Baertschy, M., Greene, C.H., Murnane, M.M., Kapteyn, H.C., (2002) Phys. Rev. Lett., 88, p. 013903
- Liang, J.Q., Katsuragawa, M., Le Kien, F., Hakuta, K., (2000) Phys. Rev. Lett., 85, p. 2474
- Katsuragawa, M., Liang, J.Q., Le Kien, F., Hakuta, K., (2002) Phys. Rev. A, 65, p. 025801
- Harris, S.E., Sokolov, A.V., (1997) Phys. Rev. A, 55, pp. R4019
- Sokolov, A.V., Yavuz, D.D., Harris, S.E., (1999) Opt. Lett., 24, p. 557
- Sokolov, A.V., Walker, D.R., Yavuz, D.D., Yin, G.Y., Harris, S.E., (2000) Phys. Rev. Lett., 85, p. 562
- Sokolov, A.V., Yavuz, D.D., Walker, D.R., Yin, G.Y., Harris, S.E., (2001) Phys. Rev. A, 63, pp. 051801R
- Harris, S.E., Sokolov, A.V., (1998) Phys. Rev. Lett., 81, p. 2894
- Le Kien, F., Liang, J.Q., Katsuragawa, M., Ohtsuki, K., Hakuta, K., Sokolov, A.V., (1999) Phys. Rev. A, 60, p. 1562
- Sokolov, A.V., Walker, D.R., Yavuz, D.D., Yin, G.Y., Harris, S.E., (2001) Phys. Rev. Lett., 87, p. 033402
- Zhavoronkov, N., Korn, G., (2002) Phys. Rev. Lett., 88, p. 203901
- Harris, S.E., Walker, D.R., Yavuz, D.D., (2002) Phys. Rev. A, 65, pp. 021801R
- Zibrov, A.S., Matsko, A.B., Kocharovskaya, O., Rostovtsev, Y.V., Welch, G.R., Scully, M.O., (2002) Phys. Rev. Lett., 88, p. 103601
- Mandel, L., Wolf, E., (1995) Optical Coherence and Quantum Optics, , (Cambridge University Press, New York)
- Scully, M., Zubairy, S., (1997) Quantum Optics, , (Cambridge University Press, New York)
- Wang, L.J., Hong, C.K., Friberg, S.R., (2001) J. Opt. B: Quantum Semiclassical Opt., 3, p. 346
- (2000) The Physics of Quantum Information, , edited by D. Bouwmeester, A.K. Ekert, and A. Zeilinger (Springer, New York)
- Nielsen, M.A., Chuang, I.L., (2000) Quantum Computation and Quantum Information, , (Cambridge University Press, New York)
- Kim, M.S., Son, W., Bužek, V., Knight, P.L., (2002) Phys. Rev. A, 65, p. 032323
- Xiang-bin, W., (2002) Phys. Rev. A, 66, p. 024303

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