On the Quadratic Wiener Functional Associated with the Malliavin Derivative of the Square Norm of Brownian Sample Path on Interval

Setsuo Taniguchi, *Kyushu University*

Research Support Tool

Capture Cite
View Metadata
Printer Friendly
Context
Author Address
Action
Email Author
Email Others

Abstract

Exact expressions of the stochastic oscillatory integrals with the phase function, which is the quadratic Wiener functional obtained from the Malliavin derivative of the square norm of the Brownian sample path on interval, are given. As an application, the density function of the distribution of the half of the Wiener functional is given.

Full text: PDF | PostScript

Pages: 1-10

Published on: January 24, 2006

Bibliography

1. R.H. Cameron and W.T. Martin. The Wiener measure of Hilbert neighborhoods in the space of real continuous functions. *J. Math. Phys. Mass. Inst. Tech.* 23 (1944), 195--209. Math. Review MR0011174 (6,132a)
2. R. H. Cameron and W. T. Martin. Transformations of Wiener integrals under a general class of linear transformations, *Trans. Amer. Math. Soc.* 58 (1945), 184--219. Math. Review MR0013240 (7,127c)
3. T. Hida. Quadratic functionals of Brownian motion. *J. Multivariate Anal.* 1 (1971), no. 1, 58--69. MR0301806 (46 #961)
4. L. Hörmander, *The analysis of linear partial differential operators. I. Distribution theory and Fourier analysis. Second edition. Springer Study Edition.* Springer-Verlag, Berlin, 1990. xii+440 pp. ISBN: 3-540-52343-X Math. Review MR1065136 (91m:35001b)
5. N. Ikeda, S. Kusuoka, and S.Manabe. Lévy's stochastic area formula for Gaussian processes. *Comm. Pure Appl. Math.* 47 (1994), no. 3, 329--360. Math. Review MR1266245 (95h:60086)
6. N. Ikeda and S. Manabe. Asymptotic formulae for stochastic oscillatory integrals. *Asymptotic problems in probability theory: Wiener functionals and asymptotics (Sanda/Kyoto, 1990),* 136--155, Pitman Res. Notes Math. Ser., 284, Longman--Sci. Tech., Harlow, 1993. Math. Review MR1354166 (97j:60098)
7. N. Ikeda and S. Manabe. Van Vleck-Pauli formula for Wiener integrals and Jacobi fields. *Itô's stochastic calculus and probability theory,* 141--156, Springer, Tokyo, 1996. Math. Review MR1439522 (98g:81110)
8. P. Lévy. Wiener's random function, and other Laplacian random functions. *Proceedings of the Second Berkeley Symposium on Mathematical Statistics and Probability, 1950,* pp. 171--187. University of California Press, Berkeley and Los Angeles, 1951. Math. Review MR0044774 (13,476b)
9. P. Malliavin and S. Taniguchi. Analytic functions, Cauchy formula and stationary phase on a real abstract Wiener space. *J. Funct. Anal.* 143 (1997), no. 2, 470--528. Math. Review MR1428825 (98e:60088)
10. H. Matsumoto and S. Taniguchi. Wiener functionals of second order and their Lévy measures. *Electron. J. Probab.* 7 (2002), No. 14, 30pp. (electronic). Math. Review MR1921743 (2003f:60145)
11. H. Sugita and S. Taniguchi. Oscillatory integrals with quadratic phase function on a real abstract Wiener space. *J. Funct. Anal.* 155 (1998), no. 1, 229--262. Math. Review MR1623162 (99e:60126)
12. H. Sugita and S. Taniguchi. A remark on stochastic oscillatory integrals with respect to a pinned Wiener measure. *Kyushu J. Math.* 53 (1999), no. 1, 151--

162. Math. Review MR1678030 (2000b:28015)

13. S. Taniguchi. Lévy's stochastic area and the principle of stationary phase. *J. Funct. Anal.* 172 (2000), no. 1, 165--176. MR1749870 (2001g:60135)
14. S. Taniguchi. Stochastic oscillatory integrals: Asymptotics and exact expressions for quadratic phase function. *Stochastic analysis and mathematical physics (SAMP/ANESTOC 2002),* 165--181, World Sci. Publishing, River Edge, NJ, 2004. Math. Review MR2115935 (2006a:81073)
15. S. Watanabe. Analysis of Wiener functionals (Malliavin calculus) and its applications to heat kernels. *Ann. Probab.* 15 (1987), no. 1, 1--39. Math. Review MR0877589 (88h:60111)

Electronic Communications in Probability. ISSN: 1083-589X