

# SMALL DEVIATIONS FOR INTEGRATORS IN TERMS OF ITÔ-WIENER EXPANSIONS

**Qingsong Wang**<sup>1</sup>

<sup>1</sup>School of Mathematics, Jilin University, Changchun, 130012, P. R. China.

*qswang21@mails.jlu.edu.cn*

The aim of this talk is to investigate small deviations for a class of Gaussian processes, known as integrators. In general, such processes are non-Markovian and may even fail to be semimartingales. In this talk, we consider small deviations for the multi-dimensional Wiener process, approaching it from the perspective of the asymptotic behavior of the Fourier-Wiener transform of the associated hitting event. Specifically, we analyze the behavior of the Fourier-Wiener transform itself as well as the individual summands in corresponding Itô-Wiener expansion. First, we recall the parabolic boundary value problem [1] satisfied by the Fourier-Wiener transform and utilize the corresponding Duhamel series representation to construct this transform. Furthermore, we establish the corresponding asymptotic limits for the associated multiple integrals with heat kernels. Finally, we obtain the small deviation asymptotic result for integrators.

- [1] Wang Q. and Dorogovtsev A. A., Hitting time for one class of Gaussian processes, 2024, 17 pp., arXiv:2409.13797.