Not Only Ito and Stratonovitch

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Abstract. Motion of a particle in a medium with position-dependent diffusion coefficient is modeled by a Langevin equation. Its interpretation depends on the definition of a stochastic integral. Recent experiments show that neither of the two most used ones—Ito or Stratonovitch—is the correct interpretation. I will review the experimental results and show how the correct (so called thermodynamic) interpretation of the equation follows from the Smoluchowski–Kramers approximation and equipartition of energy. The project is done jointly with an experimental group in Stuttgart, Germany.