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Functionals of the Free Brownian Bridge

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We discuss the distributions of three functionals of the free Brownian bridge: its L^2-norm, the second component of its signature and its L\'evy area. All of these are freely infinitely divisible. We introduce two representations of the free Brownian bridge as series of free semicircular random variables are used, analogous to the Fourier representations of the classical Brownian bridge due to \ts{L\'evy} and \ts{Kac}.

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