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Workshop in Stochastic Analysis and Applications

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Regularity properties and simulations of Gaussian random fields on the sphere cross time

Abstract

We study the regularity properties of Gaussian fields defined over spheres cross time. In particular, we consider two alternative spectral decompositions for a Gaussian field on $S^d \times \mathbb{R}$. For each decomposition, we establish regularity properties through Sobolev and interpolation spaces. We then propose a simulation method and study its level of accuracy in the L^2 sense. The method turns out to be both fast and efficient.