Fine Properties of Gaussian Random Fields on the Sphere

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Let $X = \{X(t), t \in \mathbb{S}^{n-1}\}$ be a Gaussian random field on the sphere such as an isotropic spherical Gaussian field or a spherical fractional Brownian motion. This talk is concerned with sample path properties of X. We provide a sufficient condition for X to have the property of strong local nondeterminism (SLND) in terms of the high-frequency behavior of its angular power spectrum. By applying SLND, we establish an exact uniform modulus of continuity for X and its local times. We also discuss the range of values of the spectral index for which the sample functions exhibit fractal or smooth behavior.

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