Quadratic variations and angular power spectrum estimation

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Abstract

We use the simple quadratic variations ansatz to construct some estimators for the angular power spectrum C_ℓ of an isotropic Gaussian random field on the unit sphere. We consider the discrete infill asymptotics along a single geodesic line which allows us to deal with missing observations. In this setup, we study the limiting behaviour of some quadratic functionals, derive the asymptotic properties of the estimators, and discuss some further applications.