



Department of Decision Sciences

Statistics Seminar

The Geometry of Needlets Excursion Sets

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3:00pm Room 3-E4-SR03 Via Röntgen 1 Milano

Abstract

In this talk, we shall be concerned with geometric functionals and excursion probabilities for some nonlinear transforms evaluated on wavelet/needlet components of spherical random fields. For such fields, we consider smoothed polynomial transforms, such as those arising from local estimates of angular power spectra and bispectra; we focus on the geometry of their excursion sets, and we study their asymptotic behaviour, in the high-frequency sense. We put particular emphasis on the analysis of Euler-Poincaré characteristics, which can be exploited to derive extremely accurate estimates for excursion probabilities. The present analysis is motivated by the statistical investigation of asymmetries and anisotropies in Cosmic Microwave Background radiation (CMB) data.