Modeling non-Gaussian processes on a sphere using multi-resolution analysis

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We propose a model for random processes on a sphere having non-Gaussian and scale-dependent characteristics. The construction of the process is based on a multi-resolution frame called needlets. We implement an MCMC scheme for inferring the model parameters and for spatial prediction. We illustrate the methodology through the analysis of a data set obtained through simulations of high-latitude ionospheric potential fields.

This is a joint work with Minjie Fan, Thomas Lee and Tomoko Matsuo.