

Abstract: In this work, we study non-Gaussian extensions of a recently discovered link between certain Gaussian random fields, expressed as solutions to stochastic partial differential equations, and Gaussian Markov random fields. We show how to construct efficient representations of non-Gaussian random fields generated by generalized asymmetric Laplace noise and normal inverse Gaussian noise, and discuss parameter estimation and spatial prediction for these models. Finally, we look at an application to precipitation data from the US.