Bridging the gap between Gaussian fields and Gaussian Markov random fields using stochastic partial differential equations

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Abstract. *Gaussian fields (GFs) and Gaussian Markov random fields (GMRFs) specify both multivariate Gaussian distributions, but are still very different in the way the distribution is specified. GMRFs are naturally specified using full conditionals (with the consequence that marginal properties are transparent in the parametrisation) and has very good computational properties, whereas GFs are specified using covariance-functions but has less appealing computational properties. In this talk, I will discuss how to bridge GFs and GMRFs, using stochastic partial differential equations which allow us to go seamlessly between the GF and GMRF representation and exploit the best properties of both GFs and GMRFs. The consequence of these results is wide-ranging.*

Keywords.
