1056-60-1253   **Bala Rajaratnam*** (`brajarat@stanford.edu`), Department of Statistics - Sequoia Hall, 390 Serra Mall, Stanford University, Stanford, CA 94305-4065. *Markov Chains, Generalized Wishart distributions and Applications to High Dimensional Statistical Inference.*

Covariance graph models are an important class of models in high dimensional statistics. These models are used to encode marginal independence among variables by means of a graph, and give rise to curved exponential families. A satisfactory framework for Bayesian inference for this class of models in high dimensions is not available in the literature. We propose a rich family of generalized Wishart distributions, carefully constructed on appropriate parameter spaces, which act as a conjugate family of priors for Bayesian analysis of Gaussian covariance graph models. Our generalized Wishart distributions naturally lead to a study of Markov chains. By examining the appropriate conditional distributions for our class of these generalized Wishart distributions, we derive a block Gibbs sampling procedure to sample from these distributions. We then proceed to rigorously prove convergence of the block Gibbs sampler. We also present various useful theoretical properties of this class of distributions, including the so-called hyper Markov properties, which enable Bayesian inference in high dimensions. We also explore the use of the theory developed above in practical settings.(This is joint work with Kshitij Khare) (Received September 21, 2009)

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