

# Sparse and time-varying covariance modeling

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## **Resumo/Abstract:**

In many areas such as neuroscience, energy planning and finance there has been a growing interest in developing computationally fast methods that can estimate dependency of high-dimensional multivariate time series data. Nevertheless, the estimation of a covariance matrix based on high-dimension data is still an open problem. Another important issue is whether these covariances exhibit time varying patterns. In this paper, we discuss several bayesian regularization methods based on shrinkage and selection priors and estimate sparse covariance matrices using the modified Cholesky decomposition. Our first model considers dynamics only for the variances (stochastic volatility) and uses the Normal-Gamma prior for shrinking the regression coefficients that compose the Cholesky factor. The second model considers homoscedastic errors and time varying regression coefficients generated by a dynamic version of the Normal Mixture of Inverse Gammas (NMIG) hierarchical prior, which accommodates time varying sparsity.