On the Multivariate Circulant Rational Covariance Extension Problem

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The rational covariance extension problem is a key issue in systems and control. In this talk we deal with covariance extension for periodic stochastic processes. In particular, our contribution is a first step in establishing a complete theory for the multivariate case. Covariance extension for periodic processes leads to matrix completion of Toeplitz matrices with circulant structure and to partial stochastic realizations in the form of bilateral ARMA models. We face the problem by means of a convex optimization approach, which also provides a fast approximation procedure for solving the regular rational covariance extension problem.