

# On Vector ARMA Models Consistent with a Finite Matrix Covariance Sequence

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- **Problem:** Given finite matrix covariance data  $\{C_k, k = 0, 1, \dots, n\}$ , find a vector ARMA model

$$\sum_{k=0}^n A_k y(t-k) = \sum_{k=0}^n B_k w(t-k), \quad t \in \mathbb{Z},$$

such that the first  $n + 1$  covariances of  $\{y(t)\}$  match the given data.

- **Idea:** For any fixed MA polynomial, reformulate the problem of finding the required AR polynomial as solving a system of quadratic equations.
- **Existence** of a solution is proved using the *topological degree theory*.