

# Strictly stationary solutions of spatial ARMA equations

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**Abstract** The generalization of the ARMA time series model to the multidimensional index set  $\mathbb{Z}^d$ ,  $d \geq 2$ , is called spatial ARMA model. The purpose of the following is to specify necessary conditions and sufficient conditions for the existence of strictly stationary solutions of the ARMA equations when the driving noise is i.i.d. Two different classes of strictly stationary solutions are studied, solutions of causal and noncausal models. For the special case of a first-order model on  $\mathbb{Z}^2$  conditions are obtained, which are simultaneously necessary and sufficient.

**Keywords** Causality · Random fields · Spatial ARMA model · Strict stationarity