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Projection Technique for the Structure Identification of MIMO Systems

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The projection technique is used to identify a parsimoniously model structure of canonical vector difference equations [1] for an actual system. The structure consists of the observability indices, the autoregression orders and a parsimony structure [2] of parameters to be estimated.

The range error test [3] and the residual error test [4] can be used to determine the observability indices successfully only in the case of the white equation error. As an improvement of them a new procedure with an additional whitening projection operator [5,6], is proposed to estimate the observability indices as well as the autoregression orders in the case of the colour equation error, which can be modeled with AR. Moreover, an algorithm is also presented to determine the parsimony structure of parameters to be estimated, each element of which has significant contribution to improvement of the quality of the model in the least square sense.

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