

## *The effects of condition number on principal component analysis*

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*Principal component analysis (PCA) is widely used to identify the uncorrelated source number for sound and vibration signal processing. PCA decomposes the measured responses into principal components, which are uncorrelated with each other. This provides an indication of the number of independent sources and is often extracted through singular value decomposition. This correct estimation of the number of sources requires good understanding and interpretation of the parameters that influence the condition number of the frequency response matrix. This is achieved in this research by formulating the analytical model of a two-source two-sensor acoustic model. Using this model, particular conditions pertaining to the frequency and geometrical dependence of the condition number are arrived at.*

