

*Abstract submitted for Statistics and Mathematical Modelling in
Combination*

Title: Penalized likelihood approach in multivariate regression with missing values and its application to materials properties prediction

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In the field of materials science and engineering, statistical analysis has recently been used to predict multiple material properties from an experimental design. These material properties correspond to response variables in the multivariate regression model. We conduct a penalized maximum likelihood procedure to estimate model parameters. In some cases, there may be a relatively large number of missing values in the response variables, owing to the difficulty of collecting data on material properties. We, therefore, propose a method based on the expectation-maximization (EM) algorithm to incorporate a correlation structure among the response variables into a statistical model.