Model Calibration Through Minimal Adjustments

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The Gaussian process (GP) model provides a powerful methodology for calibrating a computer model in the presence of model uncertainties. However, if the data contains systematic experimental errors, then the GP model can lead to an unnecessarily complex adjustment of the computer model. In this work, we introduce an adjustment procedure that brings the computer model closer to the data by making minimal changes to it. This is achieved by applying a lasso-based variable selection on the systematic experimental error terms while fitting the GP model. Two real examples and simulations are presented to demonstrate the advantages of the proposed approach.