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*Gaussian Process Models for Mixture Experiments*

Computer models are often used to simulate outputs of complex physical systems when physical experiments are not possible. In many areas of science the input variables are expressed as a percentage contribution to a total amount of material, resulting in a mixture experiment. In such situations the input variables are correlated because they must sum to one. In the context of a deterministic computer model additional care must be used in building an emulator. We propose use of a Gaussian process with transformed input variables and illustrate the resulting methodology on a chemical compositional simulator and a physical experiment.