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Quantification of Computer Model Bias

Computer models to simulate physical phenomena are widely available in engineering and science. Before relying on a computer model, a natural first step is to compare its output with physical data to assess whether the model reliably represents reality. Physical data can also be used to calibrate or tune unknown parameters in the computer model. Calibration is particularly problematic in the presence of systematic discrepancies between the computer model and physical observations. In this talk we investigate and illustrate some of the many trade-offs that can occur between the discrepancies function, the estimated computer model and the error process.