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MULTIVARIATE EMULATION OF HIGH-DIMENSIONAL MODEL OUTPUT

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“Emulation” is the statistical modelling of a complex deterministic function, usually a computer code. When the code simulates a physical process, the outputs are often high-dimensional, taking the form of collections of values of the same type (e.g., sea-surface temperatures indexed by space and time). Typically, a given collection is smooth, and its components ought to be modelled jointly. However, assimilating the large amount of data (the product of the number of model evaluations and the number of outputs) is computationally challenging. A new approach, the “outer-product emulator”, solves this problem. I describe the outer-product emulator, and illustrate its use with a climate model.