A Practical Formulation for an Anisotropic and Nonstationary Matérn Class Correlation Operator

Author: Timothy A. Smith\*

A key component of data assimilation methods is the specification of univariate spatial correlations, which appear in the background-error covariance. Here, we show how a general Matérn type correlation operator can be formulated via a differential operator for practical use in variational data assimilation systems. We show how the operator can be intuitively controlled by parameters that separately control its shape and length scale, using a realistic global ocean model.