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Quantifying Parametric Uncertainty in Ocean General Circulation Models: A Sparse Quadrature Approach[1] JUSTIN WINOKUR, ALEN ALEXANDERIAN, IHAB SRAJ, Johns Hopkins University, MOHAMED ISKANDARANI, ASHWANTH SRINIVASAN, University of Miami, CARLISLE THACKER, NOAA, OMAR KNIO, Johns Hopkins University — We use Polynomial Chaos (PC) expansions to quantify propagation of parametric uncertainties in Ocean General Circulation Models (OGCMs). We focus on short-time, high-resolution simulations in Gulf of Mexico with wind stresses corresponding to hurricane Ivan. A non-intrusive sparse quadrature approach is used to determine the PC coefficients providing a detailed representation of the stochastic model response. The quality of the PC representation is examined through a systematic refinement of the number of resolution levels. The resulting PC representation is then utilized in computing distributions of model variables and analyzing local and global sensitivity of the solution to uncertain parameters.

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