Abstract Submitted
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Direct Simulations of Breaking Ocean Waves with Data Assimilation[1] JAMES ROTTMAN, DOUGLAS DOMMERMUTH, LUCAS RHYMES, Science Applications International Corporation — An algorithm is developed to assimilate ocean wave data into the Numerical Flow Analysis (NFA) code. NFA is a Cartesian-based implicit LES code with Volume of Fluid (VOF) interface capturing. The assimilation of data into NFA permits the investigation of higher bandwidths than is possible using either High-Order Spectral (HOS) methods or field measurements. NFA models wave breaking that cannot be modeled using HOS. Direct simulations of wave breaking allow a more detailed analysis of ocean-wave physics than is possible using remote sensing of the ocean surface. Examples of simulated ocean surface waves exhibiting wave breaking, based on the JONSWAP or Pierson-Moskowitz ocean wave spectra, will be shown. Future plans include performing data assimilation of larger patches of the ocean surface with higher resolution to investigate the statistics and underlying structure of breaking waves.

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