

Abstract Submitted  
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**Wavelet-based Data Compression for Three-dimensional Fluid Flow Simulations on Regular Grids**<sup>1</sup> DMITRY KOLOMENSKIY, RYO ONISHI, HITOSHI UEHARA, Japan Agency for Marine-Earth Science and Technology — High-performance computational fluid dynamics can produce large volumes of output data. Even though data reduction may be performed during the course of computation to store only the quantities of interest such as statistical moments, it is often necessary to store full three-dimensional fields for purposes including simulation restart, time-resolved visualization and exploratory analyses. In this talk, I will present a wavelet-based method for compression of numerical simulation data on regular structured grids. It is inspired by image compression, and it consists of discrete wavelet transform, quantization adapted for floating-point data, and entropy coding. I will discuss different aspects of these numerical techniques, present an open-source software WaveRange, and show example numerical tests, ranging from idealized configurations to realistic global weather simulation data.

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