A Fast Spherical Harmonics Transform for Global NWP and Climate Models

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Abstract

Very high-resolution spectral transform models are believed to become p
expensive because of the relative increase in computational cost of the L
transforms compared to the gridpoint computations. This article describ
implementation of a practical fast spherical harmonics transform into th
Forecast System (IFS) at ECMWF. Details of the accuracy of the comput
parallelization, and memory use are discussed. Results are presented tha
the cost effectiveness and accuracy of the fast spherical harmonics trans
successfully mitigating the concern about the disproportionally growing
cost. Using the new transforms, the first T7999 global weather forecast
≈2.5-km horizontal grid size) using a spectral transform model has been

Keywords: Spectral analysis/models/distribution; Climate models; Num
prediction/forecasting; Spectral analysis/models/distribution

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