

[Home](#) > [MWR](#) > [October 2013](#) >

A Fast Spherical Harmonics Transform for Global NWP and Climate Models

< [Previous Article](#)[Next Article](#) >

New Journals Online Content Alerts

Daily, weekly,
or monthly new
article alerts
are
now available

Sign up now!

October 2013

Monthly
Weather
Review

A Fast Spherical Harmonics Transform for Global NWP and Climate Models

Nils P. Wedi, Mats Hamrud, and George Mozdzyński

European Centre for Medium-Range Weather Forecasts, Reading, United Kingdom

<https://doi.org/10.1175/MWR-D-13-00016.1>

Received: 11 January 2013

Final Form: 16 March 2013

Published Online: 25 September 2013

Download Citation



Abstract

Full Text

References

Cited by

PDF

Abstract

Very high-resolution spectral transform models are believed to become expensive because of the relative increase in computational cost of the 1D transforms compared to the gridpoint computations. This article describes the implementation of a practical fast spherical harmonics transform into the Forecast System (IFS) at ECMWF. Details of the accuracy of the computation, parallelization, and memory use are discussed. Results are presented that show the cost effectiveness and accuracy of the fast spherical harmonics transform, successfully mitigating the concern about the disproportionately growing cost. Using the new transforms, the first T7999 global weather forecast (with a 2.5-km horizontal grid size) using a spectral transform model has been produced.

Keywords: [Spectral analysis/models/distribution](#); [Climate models](#); [Numerical prediction/forecasting](#); [Spectral analysis/models/distribution](#)

Corresponding author address: Nils P. Wedi, ECMWF, Shinfield Park, Reading, United Kingdom. E-mail: wedi@ecmwf.int

JOURNALS ONLINE

Journals

Publish

Subscribe

About

If you have the appropriate software installed, you can download article citation data to the citation manager of your choice. Simply select your manager software from the list below and click on download.

For more information or tips please see 'Downloading to a citation manager' in the [Help menu](#).

- Format**
- ☐ RIS (ProCite, Reference Manager)
 - ☐ EndNote
 - ☒ BibTeX
 - ☐ Medlars
 - ☐ RefWorks

Direct import ☒

[Tips on citation download](#)

Download article citation data

Download article citation data for:

Wedi, N.P., M. Hamrud, and G. Mozdzyński, 2013: [A Fast Spherical Harmonics Transform for Global NWP and Climate Models](#). *Mon. Wea. Rev.*, **141**, 3450–3461. <https://doi.org/10.1175/MWR-D-13-00016.1>

Opening ams_mwre141_3450.bib

You have chosen to open:

ams_mwre141_3450.bib
which is: BibTeX document
from: <https://journals.ametsoc.org>

What should Firefox do with this file?

- ☒ Open with Text Editor (default)
- ☐ Save File
- ☐ Do this automatically for files like this from now on.

Cancel

OK

Follow Us

