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Interactive comment on “The impact of periodization methods on the kinetic energy spectra for limited-area numerical weather prediction models” by V. Blažica et al.

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Received and published: 26 November 2014

We would like to thank Referee #2 for his/her comments on the manuscript. We provide answers to the raised questions below along with some additional information on the study. The referee comments are italicized.

1. As a reader, one would expect that the general behavior of the spectra using the different periodicity constraints could be easily revealed in a 1D linear analysis of the Fourier components. Specifically, an understanding of the low wavenumber response and the asymptotic high-wavenumber response of the detrending method, Boyd's method and the DCT method, illustrated in figure 7, would likely fall out of such

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an analysis, in addition to the smooth error fields for the HIRLAM and ALADIN approaches illustrated in figure 9.

2. The authors have chosen the setup of the wind fields for their test, and they note that the tests favor the detrending method because the departure from periodicity is small (at the end of section 3). The authors could have constructed a test problem that was not deficient in this manner, especially given that they attempted no linear analysis of the techniques using the test setup.

During the study we actually performed some additional experiments with different test fields, which we chose not to present in the paper to keep it brief. For instance:

- For detrending method we added 1/4 of a sine wave across the domain, but the produced spectra were very similar to the spectra presented in the paper. However, lacking any further tests, we did not consider this experiment enough to prove that the method is not favoured.
- The 1D FFT was performed for all the methods under consideration, but the spectra did not reveal a new insight. An example for one wind field (1 case) is shown in the attached figure for 18 points in the extension zone. (The “linear” transition in the extension zone and “zeros” in the extension zone were part of the experiment in the early testing phase, please ignore them.)

Yours sincerely,

V. Blažica, N. Gustafsson, and N. Žagar

Interactive comment on Geosci. Model Dev. Discuss., 7, 6489, 2014.

GMDD

7, C2455–C2457, 2014

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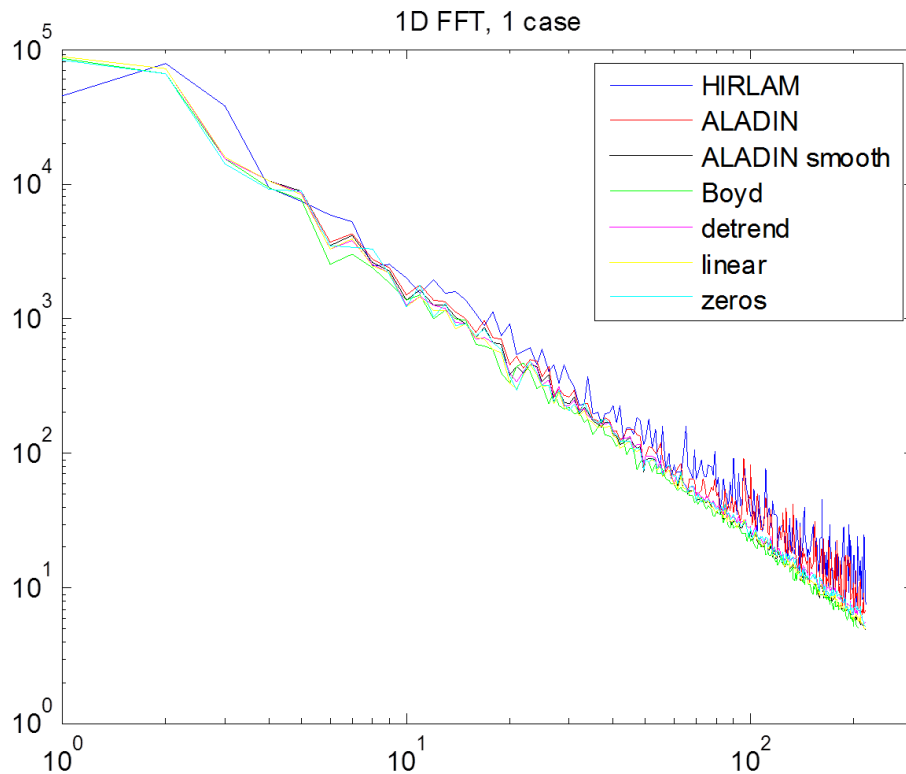
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Fig. 1.

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