

Interactive comment on “Long-range transport of terrain-induced turbulence from high-resolution numerical simulations” by M. Katurji et al.

Anonymous Referee #2

Received and published: 14 July 2011

Thorough systematical numerical study of obstacle influence on the flow and turbulence is presented. 2D (typical periodic boundary conditions) ARPS simulations were conducted for neutrally stratified atmosphere and constant wind speed. The manuscript is well organized, has well prepared figures and is well written – reads as easily as a textbook.

Assuming that the ARPS code works well and is run properly, there is no apparent flaws in the analysis. Some minor clarifications are needed.

I do not understand the logic behind 1 min averaging period (page 9805). Based on the observed spectra, the averaging should be much more than 11 min (let's say 30min should suffice). Some clarification is needed here.

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At the same page (9805) there is a sentence: “An inspection of the parameterized sub-grid scale TKE, deduced from the turbulence closure scheme, reveals that the model is resolving 97% of the TKE and only 3% is parameterized at the current spatial resolution.” Could you please explain this inspection?

I have some fundamental concerns about referring to TKE characteristics as “wavelike”. For example on page 9805 – there is obviously some periodicity in TKE but I would not call it “waves”. Please rephrase.

Due to limitations of 2D simulations of turbulence, neutral stratification and constant wind speed I do not see the presented results as a major contribution to the atmospheric science. As always some field validations are needed which authors do acknowledge and cite the prohibitive cost of such measurements. Still, there are LIDAR measurements of flow structures in the lee of hills for at least qualitative comparisons. But I do see a value of the presented careful systematic study to fundamental understanding of obstacle induced flow perturbations.

At many places (for example abstract page 9798, line 8 “high resolutionnumerical”, line 11 “implythat”, line 23 “resolutionsimulationscan”, and further throughout the manuscript) spaces are missing between words. This may be some conversion problem.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 9797, 2011.

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