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Interactive comment on "Long-term simulation of the boundary layer flow over the double-ridge site during the Perdigão 2017 field campaign" *by* Johannes Wagner et al.

Anonymous Referee #2

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This is a well written paper describing a very high resolution simulation of the Perdigao field experiment. It certainly required a strong computational investment. It is probably relevant for an ACP special issue on the experiment (I say probably because I have not read the other submitted papers), but I feel it does not contain "a substantial contribution to scientific progress within the scope of this journal", as required by ACP.

Indeed, while the paper mentions a number of relevant mesoscale processes that could be analyzed in detail by 200m resolution simulations (internal waves, low level jets, catabatic flows, to mention a few), there is no detailed analysis of any of those processes, which could be of general interest for atmospheric research. The analysis is

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Discussion paper

restricted to mean diurnal cycles in specific cross sections, which do show interesting and qualitatively nice responses to the topography, and to the coarse time evolution of a few meteorological variables, which are ok but could be also ok at coarser resolutions. The main conclusion is that the WRF model (with ECMWF high-resolution analysed boundary conditions) performs "well", although there is no indication of its error statistics, or a comparison against a benchmark. The descriptions of the low level flow are rather vague and not supported by specific analysis that could be of general interest.

I understand that such a general paper can make sense in this ACP number, but as an individual paper it makes little sense for ACP as it is. At least I would like to see: (a) a comparison between 200m, 1km simulations and the ECMWF forcing (at 1h): are the higher resolution ones worth the much higher cost? This is a bit technical but of general interest and should be straightforward to do before the paper is accepted; (b) a more through analysis of the low level jet. What process leads to it. Is it an inertial oscillation? What is its typical peak time? How often does it occur and why? I feel this is also important and feasible. (c) some diagnostic of katabatic flows: what is their intensity, location, structure. This mentioned but not really analysed. (d) some diagnostic of internal waves. This may be more difficult, and could be left for future work, but it deserves work.

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