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# Parameterization of NWP WRF in stable situations

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The bora wind is downslope wind which blows in a coastal part of Croatia. Due to gusts which are stronger and much often in a winter time, a complex orography and land/sea transition in this area, the modelling can be challenging. Within the research with the NWP WRF model, various tests were made with implementation of the new, improved mixing length (ML) in Mellor-Yamada-Janjić PBL scheme which is uniformly valid in neutral and static stable airflows. Turbulence parameterization in MYJ scheme is based on ML scale which is defined as a physical quantity describing the size of the most relevant eddies in a modelled turbulent flow. Based on previous research with vertical diffusive schemes in numerical models, the correction of vertical diffusion has been implemented as well. During period from 01 Jan to 31 March of 2011 there have been 17 episodes of bora wind with typical duration longer than 10h. Using high horizontal and vertical resolution the model has been tested and evaluated with measurements from mast tower located in mountainous region in a hinterland on Pometeno brdo, Karlsruhe Institute of Technology and Cabaw as well as with ground measurements from meteorological stations, soundings. Both schemes were later applied in WRF-Chem and WRF-CAMx modelling system in order to test the performance of improvements during specific air quality problems with high PM episodes. The model evaluation and validation contribute to the general knowledge of model's ability to simulate different processes and contribute to harmonized scientific applications to assess air quality.