

Interactive comment on “Exploring atmospheric boundary layer characteristics in a severe SO₂ episode in the north-eastern Adriatic” by M. T. Prtenjak et al.

Anonymous Referee #1

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The models are well described. My main problem was that I was expecting to see SO₂ concentrations simulated and indeed the EMEP models shows some results but the fine scale models concentrate on the meteorological conditions. I was anticipating some estimates of the local SO₂ concentration. I accept that the paper states that this will be discussed in a later paper, but then the EMEP SO₂ results in this paper should be transferred to that paper. Having performed some impressive meteorological calculations the emphasis of the paper should be on which of the meteorological parameters are key to determining the pollution in the region, setting the scene for the later paper.

Thus some discussion of why the meso-scale models were set up in the way chosen

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would have been helpful: WRF 3 domains 9, 3, 1km; MEMO 2 domains 3 1 km and indeed why two models? Most of the results shown are from WRF anyway. One might discuss why this is - nesting, domains and resolution or more fundamental reasons? Meteorological boundary conditions in WRF were set by ECMWF reanalysis, but why not the EMEP meteorology for consistency? Finally are the main SO₂ sources within the inner most grid with the 1km resolution.

One major advantage of the meso-scale models is that they permit the tracking of pollutant concentrations at elevated levels above ground which can be of particular interest. Does much pollutant get above the predicted shallow mixed layer during this episode? Information about the depth of the layer is inferred in the discussion from the SO₂ concentrations, so it is difficult to separate the meteorological and pollution aspects of the study.

I conclude that is not easy to judge this paper without the companion paper on predicted pollution levels and I would encourage the authors to submit both paper together, since the meteorological one on its own leaves questions unanswered. In addition I would like to see some discussion of the numerical setup with general recommendations as to the potential of these powerful complex models.

Interactive comment on Atmos. Chem. Phys. Discuss., 9, 6283, 2009.

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