

Interactive comment on “The ACCENT-VOCBAS field campaign on biosphere-atmosphere interactions in a Mediterranean ecosystem of Castelporziano (Rome): site characteristics, climatic and meteorological conditions, and eco-physiology of vegetation” by S. Fares et al.

S. Fares et al.

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Answer to the Interactive Comments by Serafin S:

The author is right in pointing out that the Coriolis forces are not relevant in the sea-land breeze regime acting over the site. Therefore the manuscript has been corrected in this specific aspect. The author is also right in pointing out discrepancies in the ozone determinations between our paper and the companion paper by Gerosa et al. We compared the data, and also compared with a third data set available from Davison

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et al. All data are in general agreement in representing diurnal trends of ozone but the data set by Gerosa is probably the most solid. Therefore this data set is now used also in our paper to generate the discussion about ozone levels, which is deeply revised. After saying so, we should say that the general circulation described in the paper is correct. The general scheme has been outlined by Millan-Millan et al. 1998 and several evidences, reported in the cited literature, exists that it applies to Rome as well. A recent paper treating specifically this aspect has been recently published by Gariazzo et al. (2007). Modeling using the FARM model has unambiguously shown that the emission of Rome affects the ozone levels in the coast where Casteporziano is located, as modeling has been validated through ozone and particle determinations performed in various sites of the Rome area. The way how the return flow may affect the surface levels of ozone advected in the Tiber valley has been also described in the referenced paper. The return layer rich of ozone stratifies at night but it mixes in the morning hours, when a convective layer develop over the sea. Mixing result in an increment of the ozone level at the sea surface, and in its advection at about 11 a.m. over the coast. If stability conditions last long enough, ozone levels all over the area increase to such a point that smog episodes are generated in the suburban areas of Rome. The same effect has been observed by Georgiadis et al. (1994) also in the Adriatic coast. As for the nocturnal ozone levels, differences in chemistry explain well the differences that were observed. Ozone is removed at night mostly by NO present in the surface layer to produce NO₂. In the Tiber valley where Montelibretti is located, nighttime emission of NO by traffic is much higher than near the coast, and this explain most why in Castelporziano its levels are higher at night. As shown by polar plots, the land-breeze can also contribute to increase these ozone levels after 2-3 a.m.

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