

Interactive comment on “Pre-monsoon air quality over Lumbini, a world heritage site along the Himalayan foothills” by D. Rupakheti et al.

Anonymous Referee #2

Received and published: 7 November 2016

General comments

The paper reports for the first time in Lumbini, Nepal, BC, CO, O₃ and PM data from a 3-month experiment in one site. The motivation is to understand air quality in Lumbini, but this objective sounds oversized in regard of the limited duration of the experiment. By the way, no scientific question is set and the methodology presents weak points. Data are new but rather few. No chemical speciation is provided to complete the data of species monitored online. Moreover, those online data could have been further treated: by using ratios (e.g., BC/CO, K/BC, PM₁/PM_{2.5}) and the aethalometer model to take full benefit from the BC spectral dependence. The use of modeling is useful to study the synoptic variability of pollutants, but appears highly questionable to simulate the chemical components, given the poor emission data used. A shorter manuscript, attempting to better understand for instance the source effects of the major emission

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points affecting Lumbini, using data only, not modelling, could be considered.

Specific comments

22 Abstract: Objectives and/or a scientific question need to be clearly stated. 178 Was any cut-off applied on the BC sampling line, or was it bulk BC? 282 It is a pity that PM₁ was not considered. The variations of the PM₁-to-PM_{2.5} ratio would possibly provide interesting information about source profiles. 296 Both BC and CO are from incomplete combustion processes but the ratio BC/CO is often specific to the different processes. A plot of the variations of BC/CO in time could be more relevant than BC and CO separately. 414 BC and CO originate from biomass burning as well as from any other fuel and combustion types, as mentioned earlier (line 296). Thus this sentence does not justify the use of BC and CO. Instead, BC/CO could help for source discrimination. 417 Potassium is a biomass burning tracer when the fine fraction is considered. As it can have other sources, it is rather examined as K/BC. 563 Remove PM₁

Technical corrections

86 “to be the most” 150 border 182 “A similar value” 211 latitudes and longitudes, why “s” 232 “viz.” what is the meaning? 239 “gauge” 283 “24-hour” 369 “the emission inventory shows” 388 “15:00” remove “h” 487 “is not” 516 “these periods”

Interactive comment on Atmos. Chem. Phys. Discuss., doi:10.5194/acp-2016-430, 2016.

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