

Interactive comment on “Interhemispheric differences in the chemical characteristics of the Indian Ocean aerosol during INDOEX” by M. Norman et al.

Anonymous Referee #2

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GENERAL REMARKS

The manuscript presents an important set of data on the chemical composition of the submicron marine boundary layer (MBL) aerosol north and south of the ITCZ. The data clearly highlight the role of the ITCZ as an efficient barrier for boundary layer transport. The anthropogenic influence and the duration of atmospheric transport on the chemical composition of the MBL aerosol is demonstrated.

The manuscript provides an important and extensive set of data. The presentation should be more focused on the relevant issues, detailed comments are given below. The publication in ACPD is proposed after the revision listed in the following.

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SPECIFIC COMMENTS

Title. The title should indicate that the manuscript is focusing on marine boundary layer aerosol.

Section 2.2.1 Please explain the abbreviation EAD.

Section 3, Fig. 3 The authors normalised the mass concentration data to the median values north of the ITCZ. However, the unpolluted background is expected south of the ITCZ. Normalisation to the unpolluted background data south of ITCZ would help to make the difference between south of ITCZ and north of ITCZ more clear. In current Fig. 3a-d all south of ITCZ data are almost indistinguishable from the x-axis.

Section 3, Fig. 4 The discussion of the fine particle MSA relies strongly on the argument that south of ITCZ the coarse particle mode was dominating the surface distribution while north of ITCZ the fine particle mode was dominating. Since this is a main argument I would like to see typical size distributions of both aerosol modes and related surface densities. This additional information would strengthen the discussion in this section considerably.

Sections 4 and 5 At the beginning of section 4 the authors introduced a classification scheme for sampled air masses with respect to the air mass origin. This classification scheme uses both data from north and south of ITCZ, which is a useful approach. In Table 2, the authors report a statistical analysis of the time since last contact with land. Please describe the applied approach.

To make the following discussion more clear, I propose to not separate north and south of ITCZ data into two sections. It might help the reader to discuss possible influences on the considered species for north and south of ITCZ data in a joined section in order to clarify the differences between the two atmospheric regions. The authors should also focus on relevant issues. In the current version, the reader sometimes is losing the plot.

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Section 5.2 The authors report a relationship between sea salt concentration and wind speed for the south of ITCZ data while no such relationship was found for the north of ITCZ data. This is an important finding. Please indicate the size of the analysed data sets. Is the correlation of statistical significance? I cannot see a link between sections 4.3 (north of ITCZ) and 5.2 (south of ITCZ). Since both sections deal with sea salt, a joint discussion of north and south of ITCZ data is recommended. How is the distribution of sea salt mass between fine and coarse particle modes for both data sets? This important information is missing.

Fig. 8 The authors should add error bars to show the statistical significance of the presented connection between anion-cation difference and the ratio Cl/Na.

Interactive comment on Atmos. Chem. Phys. Discuss., 2, 2373, 2002.

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