

## ***Interactive comment on “A possible role of ground-based microorganisms on cloud formation in the atmosphere” by S. Ekström et al.***

**Anonymous Referee #2**

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### **General comments**

Ekström and coauthors characterize the cloud-nucleating efficiency of surfactants produced by microorganisms by osmolality and surface tension measurements. They found the CCN efficiency of these compounds to be superior to any aerosol material studied so far. Aerosol sample extracts from field measurements at different locations are also reported to all have a surface tension below  $30 \text{ mNm}^{-1}$ . Although biosurfactants could not be identified in these aerosol extracts, the authors argue that the presence of such compounds in these aerosols can account for the observed surface tensions. Consequently, there might be important direct effects of ground based microorganisms on the atmosphere.

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The topic is of high interest to the readership of BG, as it covers an interesting and potentially important link between ubiquitous microorganisms at the Earth's surface and the atmosphere. Overall, the paper is well-written and can be published after the comments below are addressed by appropriate revisions. My suggestions for changes are only of technical character, with one exception: The biosurfactants could not be identified as part of the aerosol analyses, therefore the statement in the abstract "..., which can only be accounted for by the presence of biosurfactants" and a similar one in the conclusions (see specific comments) need to be rephrased. A more careful phrasing – the authors present evidence, but no proof – will enhance the manuscripts' quality without affecting its originality.

### **Specific comments**

P 10036 (abstract): correct typo in line 8

l.9: CCN needs to be explained consistent with its definition in the introduction.

p. 10040: A sentence about the procedure for generating the aerosol sample curves (fig. 3) should be added. Dilution of aerosol extracts?

Fig. 2. : A legend with colored lines (symbols) should be added. The details on the rhamnolipid extracts can be given in the caption, if space in the legend is not sufficient.

Fig. 3. : I suggest using empty symbols for one of the categories to better distinguish between standards and aerosol sample extracts.

p. 10043, l.3: missing part of the sentence?

p. 10045, l. 5: remove "all".

p. 10045, l. 18: maybe repeat "aerosol extract curves" for clarity.

p. 10047, l.28: The authors should either omit the remark (ground, ocean. ...) or elab-

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orate on it, particularly on how biosurfactants of microorganisms on the land surface get airborne.

p. 10048, l. 2: "The fact that biosurfactants were present . . ." This statement is wrong considering that biosurfactants could not be identified in the aerosol extract samples (page 10043, l. 16f).

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