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***Interactive comment on* “Global distribution and climate forcing of marine organic aerosol – Part 2: Effects on cloud properties and radiative forcing” by B. Gantt et al.**

Anonymous Referee #3

Received and published: 7 May 2012

Review of “Global distribution and climate forcing of marine organic aerosol – Part 2: Effects on cloud properties and radiative forcing” by B. Gantt and co-authors.

The paper describes the effects of marine organic aerosols on cloud droplet number concentrations and liquid water path and aerosol indirect forcing. The paper is concise and well written. I suggest its publication after minor revisions.

Comments

1) Abstract

I suggest rephrasing the first sentence of the abstract, deleting the current first sen-

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tence, which contains a reference (Meskhidze et al., 2011), usually references should not appear in an abstract. It could be rewritten as “A series of simulations with the Community Atmosphere Model version 5 (CAM5) with a 7-mode Modal Aerosol Model was conducted to assess the changes in the cloud microphysical. from marine organic aerosols.”

2) Introduction

I find the introduction quite brief and half of it is dedicated to describe part 1 of this work. There is a poor literature study and previous works' reporting on the role of marine organics on cloud properties, radiative forcing or their hygroscopic properties, topics that are treated in the manuscript. See: - Ovadnevaite et al, GEOPHYSICAL RESEARCH LETTERS, VOL. 38, L21806, 6 PP., 2011 doi:10.1029/2011GL048869 - Pringle et al., Atmos. Chem. Phys., 10, 5241–5255, 2010 - S. P. Hersey et al., Atmos. Chem. Phys., 9, 2543-2554, 2009

Also Roelofs 2008 is mentioned later in the paper but should be referred here as well.

3) 3 Results

Figure S1: In the caption it should be made clear what the red spots represent, are they the area points not statistically significant?

4) 3.2.1 Aerosol activation parameterizations

I don't understand what the authors want to say about the fact that the changes between the two activation schemes are consistent means that the variability in the parameterizations does not alter the net effects of marine organic aerosol; please rephrase it.

5) 3.2.3 Hygroscopicity

Could you please add in the paragraph the effect of changing the k value on CCN as well compare to G11 simulation?

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6) References

Platnick and Twomey 1994 instead of 2007 Orr et al 2005 appears in the reference list but not in the manuscript text

Interactive comment on Atmos. Chem. Phys. Discuss., 12, 7453, 2012.

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