

## ***Interactive comment on “A minimum bulk microphysics” by J.-I. Yano and D. Bouniol***

### **Anonymous Referee #1**

Received and published: 7 February 2011

This paper proposes a minimum bulk cloud microphysics scheme aiming to be used in theoretical studies. The authors start with one type of a simple scheme by Grabowski (1998), and make a simpler scheme.

There exist widely known simple schemes. One is Kessler (1969), and Ooyama (2001, JAS) made a slight extension. Grabowski (1998)'s scheme is even simple and useful, and it counts the ice effect. The proposed scheme is intermediate. Definition of “minimum” depends on the purpose, and the minimum scheme is not unique. A lot of “minimum bulk microphysics” can be proposed from different perspectives.

If one is interested in the warm process, the Kessler's scheme can be a basis. The authors need to clarify why the Kessler's scheme is insufficient and what processes should be improved. In this sense, the proposed scheme is not a minimum, and is an intermediate between Kessler and Grabowski schemes.

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The authors are more interested in the effect of the auto-conversion process. I suggest that the paper is reformulated with special attention to different treatments of the auto-conversion process by changing the title, such as “Effects of treatments of auto-conversion process tested by a simple bulk microphysics scheme”. But in this case, the authors should clarify what are new findings. The main results shown here are somewhat well known, e.g. the Kessler scheme with non-zero threshold value of the auto-conversion tends to have clouds in the upper layer.

p.30311, line 16: “iderived” => “derived”

p.30312, line 14: “from” => “form”

p.30327, line 7: “te that” ??

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Interactive comment on Atmos. Chem. Phys. Discuss., 10, 30305, 2010.

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