

Interactive comment on “The validity of the kinetic collection equation revisited – Part 3: Sol-gel transition under turbulent conditions” by L. Alfonso et al.

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Received and published: 16 May 2012

Referee # 2:

First, we would like to thank the anonymous reviewer for his/her comments that will improve the quality of our paper. Our revised version will include several of his/her suggestions.

1. Referee Comment: "The procedure of Monte-Carlo simulations should be described in more detail (may be in an appendix). The statistical justification of the simulations performed should be added. Time dependences of sol concentration, which determine the statistical reliability of collision procedure, should be added as well".

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Reply: The procedure of Monte Carlo simulations will be included in the revised version of the paper together with the time dependence of sol concentration, as suggested by the reviewer.

2. Referee Comment: "The obtained results should be illustrated more completely. Could the authors show the distribution of gelation time and evaluate its width? What are the maximum radii of the largest particles leading to gel particles formation? Could the authors show the distribution of these radii and evaluate its width?"

Reply: In our paper the sol-gel transition time was estimated from the ratio of the standard deviation for the largest particle mass over all the realizations, to the averaged value evaluated from all the realization of the Monte Carlo algorithm. This is random variable since it depends of a concrete set of realizations of the stochastic process. The distribution then can be calculated from different sets of random realizations of the Monte Carlo method. The same applies for the radii distribution. The requested distributions will be included in the revised version as suggested by the reviewer.

3. Referee Comment: "Many studies were dedicated to determination of the critical drop size that leads to first raindrop formation, (e.g. A. B. Kostinski and R. A. Shaw, "Fluctuations and Luck in Droplet Growth by Coalescence", Bulletin of the American Meteorological Society, 2005, 86, 235-244 and M. Pinsky and A. Khain, "Effect of in-cloud nucleation and turbulence on droplet spectrum formation in cumulus clouds", 2002, Quart. J. Roy. Meteor. Soc., 128, 501-533. A relevant comparison with the previous results and the corresponding discussion should be added".

Reply: The mentioned papers are relevant to the problem of the influence of stochastic fluctuations in precipitation development. But there are certain differences that can be discussed in our improved revised version. A comparison with these and other previous results will be included in the revised version.

4. The suggested technical corrections will be included in the revised version.

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