

Interactive comment on “Aerosols-cloud microphysics-thermodynamics-turbulence: evaluating supersaturation in a marine stratocumulus cloud” by F. Ditas et al.

Anonymous Referee #1

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This is an excellent paper presenting in a concisely a three-way approach for estimation of supersaturation in marine stratocumulus cloud. It combines observational technique by the use of unique measurment platform ACTOS with a simple yet appropriate numerical modelling of activation/condensation processes. The paper provides a clearly explained procedure to retrieve supersaturation value in stratocumulus clouds. This procedure could be used in other experiments if someone needs to check if results are comparable.

Along with my high appreciation of the paper I would like to make some minor comments that would additionally improve the paper.

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- 'median droplet number concentration' versus 'mean droplet number concentration'. In the text you are using either the first or the second expression, in my opinion referring to the same value (which one?). 'Median' is used in the abstract (l. 8) and in 'summary and conclusion' (l. 23), whereas 'mean' is used in '3.1 Vertical structure' (p. 29783, l. 20) and in '4.1 Aerosol number size distribution' (p. 29785 l. 2). It needs to be unified, or if I am wrong it should be clearly explained why 'median' and 'mean' are used. - I would appreciate if the meaning of '50% activation diameter' is explained. For the cloud community it is not a commonly used parameter; - in '4 Critical supersaturation' you are presenting the 3 method of supersaturation evaluation. The second method is based on measurements of absolute humidity and temperature. Although in '2.1 ACTOS' you are presenting instruments that are used to measure aerosol and cloud droplets properties, there is no information on temperature and humidity measurements. especially it is important to mentioned where temperature and humidity probes are located (or colocated) because you are using a synergy of both instruments to derive a very high resolution relative humidity values (4.2 Absolute humidity and temperature fluctuations, p. 29786, l. 23) -finally I find that it would be very usefull to explain a method of investigation of the influence of vertical wind fluctuations and especially the discussion of time scale by the use of a cartoon. It is only my suggestion, and if authors think that they are able to draw such a cartoon it would help many readers to understand the problem.

Interactive comment on Atmos. Chem. Phys. Discuss., 11, 29777, 2011.

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