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Atmospheric Measurement Techniques Discussions

Interactive comment on "Freezing nucleation apparatus puts new slant on study of biological ice nucleators in precipitation" *by* E. Stopelli et al.

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Just a few notes.

This is a nice device, esp since it allows continuous measurements on the same tubes without opening them (re Fig. 4, it looks to me like some tubes did contain INA bacteria initially and that they grew, probably at the expense of others killed by repeated freezing events; I think this is called cryptic growth).

You mention that other people have to look radially across the tubes to assess freezing, but we use 96 well PCR trays with silicon mats on the surface to keep out contaminants and look down into them with a flashlight to assess freezing. But measuring ice nucleation at cold temperatures, such as IN active below -18 C or so, can be difficult for us

when you have to open the tubes since the very act of disturbing them makes some freeze (by allowing moist room temperature air in, leading to the formation of ice crystals, I think). So I think you should promote the utility of the machine for measuring IN right down to -25 C. Also, the fact that the tubes are monitored almost continuously, allowing you to obtain temperatures of freezing to within 0.2 C, is another advantage, such as for determining the freezing point of exceptionally good ice nucleators or for generating data such as shown in Table 2.

With regard to the experiment underlying Table 2, it's a good idea, yes, and one we've been exploring as well but it's not reliant upon having a LINDA device. However, the LINDA device did uniquely permit you to detect the shifts in freezing temperatures upon repeated freeze-thaw events in Table 2. Maybe that aspect should be foregrounded more to make a case for including an otherwise separate piece/aspect of research in this paper.

References good, but with regard to other people also currently developing new ways to measure immersion freezing don't forget Iannone et al 2011 in ACP, 11, p 1191.

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Interactive comment on Atmos. Meas. Tech. Discuss., 6, 9163, 2013.