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Onset of atmospheric ice formation in natural conditions

Franz Conen and Lukas Zimmermann
University of Basel, Environmental Sciences, Basel, Switzerland (franz.conen@unibas.ch)

Bacteria growing on plants are the particles with the warmest freezing temperature known for natural particles (-2 oC). Their onset of freezing is known to be conditioned by themperature, growth and nutrient status, and probably other factors that can not be assessed in situ, but are also not likely to be conserved when taking airborne bacteria to the laboratory. Whether such bacteria play a role in initiating the ice phase in clouds is therefore best studied directly in a cooling air mass in the natural environment. Investigations directly at cloud tops would be desirable. A more amenable place is the bottom of a valley where a cold air pool forms during clear nights and when radiation fog is likely to form. When shallow, such fog may resemble an inverted cloud with its top on the land surface and warmer air above it.
The temperature of bacteria and other particles suspended in air under a clear sky around the onset of fog formation is probably several degrees below that of the surrounding air because of radiative cooling, which will affect the particle's activation as a cloud condensation nucleus and as an ice nucleus. Hence, ice particles probably form earlier than expected at a particular air temperature, grow rapidly and parachute to the surface, where their descent can be recorded by traps charged with supercooled water. We present, and would like to discuss, this kind of observation in principle and show some first results (subject to suitable weather conditions before the presentation).