



Ice Crystal Growth from the vapor near the Melting Point

Charlie Knight

NCAR/ MMM

Boulder, Colorado

The shapes of ice crystals grown from the vapor not far below the melting point present several unresolved problems. One of the most striking is the changes of shape near -5C: plate-like to columnar and back to plates, within a few degrees of decreasing temperature, determined using water vapor diffusion cloud chambers to control environmental conditions. More recently, unexpected aspects of the ice growth have been revealed using uniform growth conditions, with no imposed gradients, allowing the crystal growth to be observed for much longer times. Two distinct forms of needle growth occur near -5C, both growing at sharp points without visible basal faces. One of them grows about four times faster than the linear growth rates that have been measured in free-fall (Ryan et al., 1976). It is also found that there is ice multiplication during growth from the vapor which is an alternative explanation for ice multiplication in supercooled clouds. This long-standing problem in cloud physics commonly is assumed to be caused by rime splintering. The mechanism of the ice multiplication during vapor growth experiment is still obscure, but recent results strongly suggest that liquid at the crystal surface (not a “quasi-liquid layer”!) is important, both for it and for the very fast needle growth.

*This seminar will be webcast live at:
<http://www.fln.ucar.edu/it/mms/fl-live.htm>*

*Recorded seminar link can be viewed here:
<https://www.mmm.ucar.edu/events/seminars>*

Thursday, 17 March 2016, 3:30 PM

Refreshments 3:15 PM

NCAR-Foothills Laboratory

3450 Mitchell Lane

Bldg 2 Main Auditorium, Room 1022