



Triangular ice crystals

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We are all familiar with the hexagonal form of snow crystals and it is well established that this shape is derived from the arrangement of water molecules in the crystal lattice. However, crystals with a triangular form are often found in the Earth's atmosphere and the reason for this non-hexagonal shape has remained elusive. Recent laboratory work has shed light on why ice crystals should take on this triangular or three-fold scalene habit. Studies of the crystal structure of ice have shown that ice which initially crystallises can be made of up of hexagonal layers which are interlaced with cubic layers to produce a 'stacking disordered ice'. The degree of stacking disorder can vary from crystals which are dominantly hexagonal with a few cubic stacking faults, through to ice where the cubic and hexagonal sequences are fully randomised. The introduction of stacking disorder to ice crystals reduces the symmetry of the crystal from 6-fold (hexagonal) to 3-fold (triangular); this offers an explanation for the long standing problem of why some atmospheric ice crystals have a triangular habit. We discuss the implications of triangular crystals for halos, radiative properties, and also discuss the implications for our understanding of the nucleation and early stages of ice crystal growth for ice crystals in the atmosphere.