Scanning electron microscopy and molecular dynamics of surfaces of growing and ablating hexagonal ice crystals

http://www.firstlight.cn 2010-03-29

We present the first clearly resolved observations of surfaces of growing and ablating hexagonal ice crystals using variable-pressure scanning electron microscopy. The ice surface develops trans-prismatic strands, separated from one another by distances of 5–10 μm. The strands are present at a wide range of supersaturations, but are most pronounced at temperatures near the frost point. Pyramidal facets consistent with Miller-Bravais indices of 1011, and possibly also 2021, are associated with ice growth under these conditions. A molecular-dynamics model of a free-standing ice Ih nanocolumn containing 8400 water molecules does not develop trans-prismatic strands, suggesting these features originate at larger spatial or temporal scales. The possible relevance of these surface features to cirrus ice is discussed.

存档文本

北京雷速科技有限公司 版权所有 2003-2008 Email: leisun@firstlight.cn