Prism and other high-index faces of ice crystals exhibit two types of quasi-liquid layers

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References

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Fig. S1. Schematic drawings of the experimental setups (This figure was reprinted from Fig. S2 of ref. 3). (A) The LCM–DIM system, the observation chamber and the water–vapor supply system; (B) a cross-sectional view of the observation chamber. In B, the upper left inset shows a closeup view of the cleaved AgI crystal attached to the upper Cu plate using heat grease; the upper center inset shows a photomicrograph of Ih ice crystals grown heteroepitaxially on the AgI crystal; the upper right inset shows the morphology of the Ih ice crystal. The surface of the cleaved AgI crystal was observed from below through a glass window that was tilted to prevent the appearance of interference fringes. Sample ice crystals on the cleaved AgI crystal were ≥16 mm distant from the source ice crystals prepared on the lower Cu plate.
Fig. S2. Image processing performed to obtain LCM-DIM images presented in this paper (This figure was reprinted from Fig. S1 of ref. 1) A time-averaged image (B) was subtracted from the original image A. In B, motionless objects such as defects (black arrowhead) and inhomogeneous background level were extracted. After adjusting the gain and offset of the subtracted image (C), a Gaussian filter of one pixel size was used (D) to smooth the image.
Movie S1. The coalescence of round liquid-like droplets (α-QLLs) on prism and high-index faces at $T_{\text{sample}} = -0.5 \, ^\circ\text{C}$ and $\sigma=2 \, \%$. $T_{\text{sample}}$ was raised from -2.9 to -0.5 °C at a rate of 0.07 °C/min (for 34 min), and then prism and high-index faces were observed by LCM-DIM. Photomicrographs of 1,024×1,024 pixels were acquired over a 3.3-s scan time.

Movie S2. The appearance of thin liquid-like layers (β-QLLs) beneath round liquid-like droplets (α-QLLs) at $T_{\text{sample}} = -0.4 \, ^\circ\text{C}$ and $\sigma=2 \, \%$. $T_{\text{sample}}$ was raised from -2.9 to -0.4 °C at a rate of 0.5 °C/min (for 5 min), and then prism and high-index faces were observed by LCM-DIM. Photomicrographs of 480×180 pixels were acquired over a 2.3-s scan time.

Movie S3. The coalescence of thin liquid-like layers (β-QLLs) on prism and high-index faces at $T_{\text{sample}} = -0.6 \, ^\circ\text{C}$ and $\sigma=3 \, \%$. $T_{\text{sample}}$ was raised from -2.8 to -0.4 °C at a rate of 0.6 °C/min (for 4 min), and then prism and high-index faces were observed by LCM-DIM. Photomicrographs of 480×156 pixels were acquired over a 0.85-s scan time.

References