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Investigation of Ethanol at the Ice Surface using Sum-Frequency Generation Spectroscopy

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The properties of small organic molecules at the ice/air interface are crucial for the understanding of fundamental processes in fields spanning from molecular physics to chemistry in the stratosphere. Here we use surface-specific heterodyne-detected vibrational sum-frequency generation spectroscopy (HD-VSFG) to investigate the molecular properties of ethanol at the air-water and the ice-water interfaces. We can determine the absolute orientation of ethanol molecules at the ice-water interface, and by comparing the results at both interfaces we obtain detailed information on the distribution and arrangement of the alcohol and water molecules.

Significance statement

Investigation of the behaviour and properties of small organic molecules at ice/air and water/air interface to gain insights in fundamental processes which are important in a variety of research fields (e.g. molecular physics or chemistry in the stratosphere).

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