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Ice Nucleation Near the Surfactant-Water Interface CALEB CARLIN, WILL CANTRELL, Dept. of Physics, MichiganTech University, CAROLINE TAYLOR, Dept. of Chemistry, MichiganTech University — Ice nucleation is a fundamental component of the atmospheric mechanisms driving the formation of clouds. Atmospheric nucleation occurs with a variety of compounds and conditions, but understanding the behavior of water is key in all cases. We have used multiscale molecular simulations to study heterogeneous nucleation in clouds, probing the influence of long-chain alcohols on the freezing of water droplets. Ice nucleation occurs at a finite distance from the heterogeneous surface, due to the disruption of the hydrogen bond network in response to the surfactant-water interface. The penetration depth of the disturbance is found to be dependent upon the chain length and surface organization, as well as the acidity of the terminal alcohol group.

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