

## MODELING SOLAR HEATING OF ICE-COVERED LAKE AND ICE MELTING

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**ABSTRACT** Solar heating of freshwater lakes covered with ice is an important geophysical problem that has attracted researchers for many years. The main experimental and theoretical results concern solar heat accumulation in water under the ice and convective heat transfer in deep lakes. At the same time, the model of radiative transfer in light-scattering ice is too simplified and insufficient for a correct description of heat transfer, including ice melting. The present work largely compensates for this deficiency. For the first time, it is shown that a thick layer of ice begins to melt at the ice-water interface, mainly due to solar heating of the ice rather than heat flux from warmer water. The results of calculations for mountain lakes like Ngoring Lake in the northeast of the Tibetan Plateau are presented. The computational data are in good agreement with the published field observations.

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