Hydrol. Earth Syst. Sci. Discuss.,
https://doi.org/10.5194/hess-2019-608-SC1, 2020

Hydrology and Earth System Sciences
Discussions
Open Access
EGU

Interactive comment on "Turbulence in the stratified boundary layer under ice: observations from Lake Baikal and a new similarity model" *by* Georgiy Kirillin et al.

Wenfeng Huang

huangwenfeng@chd.edu.cn

Received and published: 7 January 2020

The present manuscript presents a nice field work and parameterizing scheme for the heat flux (Fw) from water to ice bottom, which needs more efforts to deal with comparing to other heat fluxes involved in seasonal ice cover thermodynamics. This work approved that, in large lakes, under-ice currents (e.g. lake circulation, down-slope current, and seiche-induced turbulence in authors's previous papers) take significant impacts on under-ice mixing and thus increase the water-to-ice heat flux largely, much larger than reported values in Arctic/temperate lakes. But I have to say, such large Fw was also reported just recently in a small shallow Qinghai-Tibet Plateau thermokarst

Printer-friendly version

Discussion paper

pond in Huang et al (2019, Thermal structure and water-ice heat transfer in a shallow ice-covered thermokarst lake in central Qinghai-Tibet Plateau, Journal of Hydrology, 2019, 578, 124122. https://doi.org/10.1016/j.jhydrol.2019.124122), where the Fw was estimated both from heat residual method of bottom ice layer and from heat balancing within under-ice water layer. Intensive solar radiation and under-ice vertical and horizontal currents may be the reason. And modeling experiments were also performed in term of different Fw schemes and demonstrated that the current simple schemes for Fw can not give agreeable results on ice thickness and temperature (Huang et al., Modeling experiments on seasonal lake ice mass and energy balance in Qinghai-Tibet Plateau: A case study, Hydrology and Earth System Sciences, 2019, 23(4): 2173-2186, doi:10.5194/hess-23-2173-2019). so, here, is it possible to esimate the Fw based on heat balancing in water layer?

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., https://doi.org/10.5194/hess-2019-608, 2019.