Note: the **comments** and **authors' replies** are in font color of **black** and **blue**, respectively. All changes in revised manuscript are highlighted using yellow background.

RC1

1、 On line 66 should emphasize low latitude of Tibetan plateau - these lakes get much stronger sunlight than arctic or sub arctic lakes - which I think is key, not just high altitude. Ie a high altitude lake at 55 North won't behave like this, so contrasting upland/apine versus lowland lakes isn't helpful.

Reply: Thanks for your constructive suggestion. Both low latitude and high altitude are important for the strong radiation. The sentence has been modified as follows:

"In particular, the largest alpine lake system of the Qinghai-Tibet Plateau (TP), is not only the highest plateau on Earth with an average altitude of 4000-5000 m, but also located in the relatively low-latitude of 26-39º N ensures a high amount of solar radiation."

2、 This should be emphasized when contrasting QT lake at 34.91 N vs K lake at 69.05 N. Major difference isn't elevation - it is the magnitude and timing of winter darkness and solar radiation. I agree lakes are similar size, but should emphasize early that they have different light climate.

Reply: Thanks for your detailed consideration. I agree with you that the latitudes, winter darkness and solar radiation should be emphasized early. The below sentences highlighted in yellow background have been added in the Section 2.2.3 and conclusions:

"ERA5-Land data is applied for a comparative analysis of warming mechanisms and thermal conditions in Tibetan ice-covered lakes against those in the Arctic. The reanalysis forcing data for the geographical position 69.05º N, 20.83º E was adopted as "typical" arctic weather conditions, that is, the SR is 0 W m^{-2} during the winter polar night period. Northern Fennoscandia is covered by several lakes characterized by the longest ice-covered period in Western Europe. The largest of these lakes, Kilpisjärvi, has a similar morphometrical feature to Ngoring (average depth 19.5 m, maximum depth 57 m, surface area 37 km^2). However, they receive different SR because of different latitudes. The lake has been intensively studied in the last decades (Kirillin et al., 2015, 2018; Leppäranta et al., 2017, 2019). Its under-ice water temperature remained stable during winter from 1992 to 1993 (Tolonen, 1998). In the following,

model experiments forced by the ERA5 weather data (1992-1993) for the Arctic refer to “Kilpisjärvi” runs."
“The heating is governed by strong solar radiation, the factor differing alpine lakes on the high-altitude and relatively low-latitude TP from the high-latitude and low-altitude northern lakes with similar winter air temperature patterns.”

3、 On line 233 are units of 66.7 C right?

Reply: I am so sorry, that was my incaution. There should not be any units. I have deleted the unit ℃.

4、 On line 291 -294 it is briefly mentioned that there is a massive difference (factor of 4) difference in light climate (SR fluxes). This needs to be discussed earlier. How much of this is due to flux being 0 is Arctic night vs higher values at low latitudes in spring.

Reply: Thank you and follow your suggestion. The SR difference has been mentioned in introduction and Section 2.2.3 as shown in comment 2 modification.

5、 Line 408 has conclusion that strong SR fluxes is major difference between sites, which should be foreshadowed earlier in manuscript, (as I mention above).

Reply: Thank you and follow your suggestion. They have been foreshadowed in the introduction:

“While the major prerequisite for the ice cover development is sufficient long season with air temperature below the freezing point of water, the heat budget of ice-covered lakes varies with latitude and altitude, depending strongly on the available solar radiation, the latter being the major source of heat for under-ice lake water (Kirillin et al., 2012).During the polar night in the Arctic and temperate lakes covered by snow, the solar heating is minor and the bottom sediment is the main heat source (Winter I according to Kirillin et al., 2012); at later stages of the ice season (Winter II), as the snow melts, solar radiation becomes to the main heat source governing thermal stratification and mixing under ice and the melting process at the ice base (Kirillin et al., 2018, 2020).”

6、 If you deleted the discussion of Arctic lake, I am not sure you’d change conclusion, but it might simplify discussion.

Reply: Thanks for your advice and I really took the suggestion seriously. However, the discussion of Arctic lake was not revised. That is because there are only two parts discussed about Arctic lake. The first part is Section 2.2.3 which introduced the Arctic lake and why chose the lake. The other part is Section 4.2 which compared the climate differences and concluded the SR is strong in the high-altitude and relatively low-latitude Tibet. Perhaps they should be retained in order to make the differences between low- and high- latitudes clearer.

7、 DO you say why the Tibetan lake starts off winter with homogenous profile? I assume it is like Nam Co, and is a wide windy lake that is cryomictic. This phrase really just means how the winter stratification starts, not how it evolves, so I'd change phrasing on line 87 - 88 that "nor can be characterized in terms of cryomictic/cryostratified conditions." I think it is cryomictic, and new feature you show is what I thought Kirillin had described as a Winter III period , when high SR fluxes lift under ice temperatures above 4C.

Reply: I mentioned Ngoring Lake started off winter with homogenous profile, but did not explain why. The sentence has been revised in Section 4.1:

"In November, because of the strong wind and wide surface, the lake mixed evenly with slight oscillation (<1 ℃ between 2 m and 22 m) and water temperature decreased gradually until the lowest point of 0.47 ℃ at 2 m on December 12, the lake froze up completely (Fig. 2a)."

I have carefully read and thought the definition of cryomictic in Yang's article again. I agree with you that it means how the lake stratified at ice forming not how evolved and Ngoring Lake is a cryomictic lake because its wide surface and strong wind speed. Moreover, as you said, Ngoring Lake belongs to the situation that Winter II dominates all ice-covered period, but due to the strong solar radiation, the under-ice water temperature exceeds 4 ℃. So, the phrases on line 87-88 have been revised as follows:

"This radiation-dominated regime, is slightly different from the typical heat budget known from earlier studies on ice-covered lakes. Although it belongs to the classification that winter II occupies the whole ice-covered period, the under-ice lake temperature exceeds 4 ℃ in the late stage due to the strong SR on the TP. Quantification of the resulting heat balance and thermal stratification characteristic of alpine conditions is the subject of the present study."

Editor

- Besides adjustments requested by the Editor or Referees, please check your manuscript carefully for typos, missing co-authors and their affiliations, terminology, updates of data in tables, or updates of variables in equations. All these have to be clarified with the Editor and therefore have to be included before you submit your revised manuscript. Should your manuscript be finally accepted it will not be possible to include such rather substantial changes anymore when your manuscript is in final production (proofreading).

Reply: Thanks for your suggestions and reviewing very much. I have revised the manuscript based on comments from referees, and checked the manuscript as described above.