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Interactive comment on "Seasonal and spatial variability of methane emissions from a subtropical reservoir in Eastern China" *by* Le Yang et al.

Anonymous Referee #2

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Reported greenhouse gas fluxes from reservoirs located in subtropical zone are still insufficient to understand regional carbon cycling. The manuscript titled "Seasonal and spatial variability of methane emissions from a subtropical reservoir in Eastern China" presents methane effluxes from a reservoir with an age of about 60 years, which is helpful to understand the topic. Although I would give it a positive response, a major revision should be made for being reviewed again. I hope some key environmental factors (wind speed, water velocity, water temperature, air temperature, water depth of each site in different periods, and so on) should be introduced to elucidate their viewpoints instead of guessing.

Specified comments: 1. Lines 125-137: Water depths should be presented for each site.

2. Lines: 201-208 I don't think a para-curve model is suitable to fit gas concentrations in a chamber over time. The cited paper of Hutchinson and Livingston is about measuring gas exchange between soil and atmosphere. Pls see the following references. Xiao, S., Wang, C., Wilkinson, R.J., Liu, D., Zhang, C., Xu, W., Yang, Z., Wang, Y., Lei, D., 2016. Theoretical model for diffusive greenhouse gas fluxes estimation across water-air interfaces measured with the static floating chamber method. Atmospheric Environment 137, 45-52. Tanka P.Kandel, Poul ErikLærke, Lars Elsgaard. Effect of chamber enclosure time on soil respiration flux: A comparison of linear and non-linear flux calculation methods. Atmospheric Environment 141, 245-254

3. Line 218: Are there some mistakes in the equation (2)? The denominators m, n and i may be 5, 13 and 3 respectively?

4. Lines 126-128: I think the natural physical geographical characteristics described here is important. I think the changing hydrological situation may influence gas fluxes in the NW Lake more or less. For example, can you correlate it with Lines of 315-328?

5. Lines 354-370 This paragraph tries to explain "The seasonal variability of CH4 emission from the main body of Xin'anjiang Reservoir". However, I think they are feeble. I hope more environmental factors should be taken into considerations, such as wind speed, difference between the air temperature and water temperature, and so on.

6. Lines 372-382: Reasons presented here for the high value of methane flux in the SW lake on August 1 are also weak. Figure 5 shows the methane flux in Feb. is also high, but the water level during the mon was low.

7. English language needs a bigger improvement. For example: 1). Line 233: "from" should be "across"

2. Line 271: "Individual measurements" should be "The flux of individual measure-

ments"

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