

Interactive comment on “Satellite remote sensing of water turbidity in Alqueva reservoir and implications on lake modelling” by M. Potes et al.

Anonymous Referee #2

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Part 1. General comments The authors present results obtained from applying satellite remote sensing to retrieve information on lake water turbidity (Alqueva Reservoir, Portugal). The Flake model is also used to investigate the importance of the water extinction coefficient (estimated from turbidity) in the evolution of the lake surface water temperature. This reviewer considers this topic is valuable and of interest to the Limnological community and within the scope of the HESS. The manuscript needs significant improvement and many issues need to be addressed as discussed below. The manuscript needs a good English editing for style and clarity. The introduction needs to be more focused (and shorter) on information supporting the main objectives of the manuscript. Overall the underlying analysis appears sound. The presentation of the results is discussed although sometimes purely descriptive and no many sources are

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cited as evidence of the claims the authors are making. The authors mention the need for including 1D lake models into weather prediction and climate models. This argument needs much better evidence and explanation. Parte 2. Specific comments Page 11358, lines 17-18. A bit vague sentence. Please re-write it. Page 11358, lines 21-22. What do the authors mean by “several factors”? Please mention them. Page 11358, line 26. Replace “in the water sample” with “in the water column”. Page 11359, line 11. What do the authors mean by “water interaction processes”? Page 11359, lines 16-17. References should be mentioned in chronological order. Page 11360, lines 1. Replace “at demonstrating” with “to demonstrate”. Page 11360, lines 3-4. It is unclear what the authors mean about this paragraph. Also what about “lake schemes”? Page 11360, lines 14-18. This sentence is very long. Please re-write it. Page 11360, line 21. Please mention how lakes do affect the structure of the atmospheric boundary layer. Page 11360, line 23. How do weather forecast models interact with lake models? Please justify the inclusion of 1D lake “schemes” in operational numerical weather prediction models. It is unclear. Page 11361, line 1. Please clarify “a lake parameterization scheme”. Page 11361, line 8. References should be mentioned in chronological order. Page 11361, line 9. What do the authors mean by “on the water mass conditions”? Page 11361, lines 18-24. Please re-write and state clearly the two objectives of the manuscript. Page 11361, line 28. Should be “Section 5”. Page 11362, line 1. Add “Study site” to the title. The “s” is missing in “method”. Page 11362, line 8. Mention total phosphorus and chl-a concentrations in the reservoir. Page 11362, line 18. Replace “This selection aims” with “The selection of these sites aims”. Page 11362, line 27. Add a reference. Page 11363, lines 4-21. These paragraphs need to be shortened. There is no need to describe things in detail. Cite references instead. Page 11364, line 14. Should be “is not”. Page 11364, lines 17-18. Please explain “The second simulation of the satellite signal in the solar spectrum”. Page 11365, lines 1-5. Please indicate where the measurements were taken, i.e. at Mourao and Montante? Page 11365, lines 7-8. The authors are just repeating the Figure 2 caption. Page 11365, lines 16-20. The authors are just repeating the Figure 3 caption. Page 11366,

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line 9. The authors mention 89 data points, what is the spatio/temporal distribution of these measurements? Please clarify. Page 11366, line 9. Replace "To sum up" with "In summary". Page 11366, line 26. The word "retrieved", do the authors mean "measured"? Page 11367, line 1. Explain "limnological data". Page 11367, line 8. References should be mentioned in chronological order. Page 11367, line 12. Indicate location of the turbidity measurements. Page 11367, line 22. Where the highest turbidity (60 NTU) was measured within the reservoir? Have the authors done a determination of the particle size? Page 11367, line 28. References should be mentioned in chronological order. Page 11368, line 21. What does the shape factor CT mean? Page 11369, line 5. Explain "the same concept of self-similarity". Page 11369, lines 19-22. It would be nice to have some measurements to validate the algorithm! Page 11370, line 2. Should be "In order to investigate the importance ...". Page 11370, line 5. Remove "off-line". Page 11370, line 8. Replace "are" with "were". Page 11370, line 9. Replace "water thermal profile" with "water column was thermally stratified". Page 11370, line 10. Is wind direction not required? Page 11370, line 22. Replace "tackled" with "taken". Page 11370, line 23. The word "tunning" does not sound right. Page 11371, line 1. Please express the water temperature in degrees Celsius. Page 11371, line 1. How does $D=23$ m compare with the average depth of the reservoir? What about h ? How many simulations were performed in order to find out these values? This reviewer is concerned about this procedure. Page 11371, line 3. Replace "Model runs ..." with "Each simulation was performed for 61 days using a time step of 30 min". Page 11371, line 11. Should be "in" after the comma. Page 11372, lines 1-5. The simulated water temperatures in both cases show a more sudden daily change compared to the measured one. Please explain why. Page 11372, line 6. What about the errors associated with the forcing data? Is the model scheme free of numerical diffusion error? Please clarify.

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