

HESS Title: A practical approach to lake water density from electrical conductivity and temperature

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MS Type: Research article

As a physical limnologist researching on deep lakes, I know the importance of correctly evaluating the equation of state for the waters of the lake. For this reason I have reviewed with great interest the paper by Moreira et al. and my final evaluation is positive.

The topic is fundamental, the paper is clear and reasonably well written. The paper is neat, with no useless redundancy.

Probably the title and the abstract create too many expectations: one might expect that, after calibration for a lake, simply measuring conductivity and temperature profiles could provide density profile. As far as I understand, this is true only if the chemical composition does not change over the water column.

Actually, eq. (2) depends on the composition of solutes so that, if this quantity keeps changing over the depth, as it happens in weakly mixed deep lakes, it should be recomputed for each depth on the basis, e.g., of RHOMV. Can the Authors better explain this point in the Discussion ?

I suggest accepting the paper after improving some editing problems that spoil its quality and some typos here and there: both of them I list in the following.

List of Typos:

pag	line	part to be changed	change as
2	33	ELCOM (Hodges and Dallimore, 2007)	in reality in the References is 2014
3	26	Si(OH) ⁻⁴	Si(OH) ₄
4	24	Add, for clarity's sake: " in the remaining part of this paper, eq(1), completed by eq(2) and eq(3), will be referenced a RHO LAMBDA approach."	
5	14	. 0.1634 mS cm ⁻¹	According o the data of Table 2, the last significative digit should be 5
5	19	. Here Is Q_{MV} computed according to RHOMV ?	
6	19	Probably in place of "our assessment section (Sect. 3)" "this section" would be better.	
6	21	This phrase could be improved, such as "an alternative approach to compute density, in order	

		to check the accuracy of q_i ."	
7	3-5	"Hence...". Could you kindly explain better ?	
9	11	most of other of the approaches	most of the other approaches
15	24	in this reference Rinke K appears twice. Is it correct ?	

I think that tables and Figures must be improved. The editing of lines in Table 1 and 2 must be definitely improved.

WHY do not add the DOC in table 1 ?

As far as Table 2 is concerned, this table is difficult to read due to an improper managing of spacing between lines. Please improve it.

As far as Figures are concerned, the Reference line in Figure 1 is useless and could be deleted. Moreover nowhere appears reference to Figure 1b