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Hydrology and Earth System Sciences Discussions

Interactive comment on "Hydrogeology and hydrogeochemistry of an alkaline volcanic area: the NE Mt. Meru slope (East African Rift – Northern Tanzania)" *by* G. Ghiglieri et al.

Anonymous Referee #1

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The paper "Hydrogeology and hydrogeochemistry of an alkaline volcanic area: the NE Mt. Meru slope (East African Rift-Northern Tanzania)" by Ghiglieri, Pittalis, Cerri, and Oggiano enhances our knowledge relatively to the hydrochemistry and the isotopic evolution of groundwater in volcanic areas. The paper is strongly focused on the fluoride fate in groundwater and it may have a relevant impact on the policy for the use of drinking waters in an african region. It deserves to be published in a first rank journal. However some points have to be properly addressed. In detail:

1- pag. 8259. At the end of the page the authors should add uncertainties for δ18O,

δD, and 3H;

2- pag 8262, line 14. The statement " The majority of groundwater....., and readily diluted by the infiltration of rainwater" as it stands has no mean. I suggest to compute the best δ18O-δD linear fitting and to compare the slope of the best fit line for groundwater with that of the LMWL. After this the authors may assess to what exent secondary processes, including evaporation, evapo-transpiration, and water-rock interaction, affect the isotope ratios of shallow groundwater;

3- pag 8262, line 17. In the statement "some groundwater samples do show a higher δ18O and δD content (Table 3)"....." the authors should explain which of these waters show higher δ18O and δD. Furthermore the authors explain this phenomena trough evaporation and "leaching from the rock to the groundwater". I suggest to add something more about the leaching process in order to better explain its relevance.

4- pag. 8262, lines 21-22. The authors declare that at higher altitude stable isotopic content is moderately depleted. The statement is unclear: depleted to what? Do they observe more negative isotopic values with increasing altitude?

5- pag. 8264, line12 and line. The positive correlation between bicarbonate content and metals can also be properly estimated by the Pearson coefficient.

6- pag. 8264, lines 22-23. The statement about Fig. 10 is unclear. I believe that the significance of Na++K+-Cl- -F- and Ca2++Mg2+-HCO3- -SO42- relatively to the ionic exchange have to be explained.

7- pag. 8265, lines 22-23. Can the authors really support the idea of a negative correlation between calcium and fluoride?

8- In Table 1 please add altitude.

9- In Table 3 one decimal place for δ18O and no decimal place for δD.

Interactive comment on Hydrol. Earth Syst. Sci. Discuss., 8, 8255, 2011.