

Interactive comment on “Influence of the Tungurahua eruption on the ice core records of Chimborazo, Ecuador” by P. Ginot et al.

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My general view after reading the MS by Ginot et al is that this is a very good study of the effects of how a volcanic signal is imprinted into an ice record, and how the effects of the episodic warming alters the pre-volcanic record. I do not know of any other study like this, and such this work is an unique record of such a case. This will be a valuable tool / aid help ice core scientists to understand how (proximal) volcanic events may alter/imprint the glaciochemical data in ice core records. My general comments on issues that may be handled before final publication of the present MS are: 1. The conclusion part is in proportion to the rest of the text large. Some of the issues taken up in the conclusion should better be moved into the discussion part of the MS. 2. The indecis in Fig 3 and in the discussion part is by the large volcanic imprint of the solute

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into the ice matrix better to name volcanic signature indecis, than elution indecis. The latter, as used in the referenced literature assume there is no external addition of ions into the melting ice. This is the case at least for the ions SO₄, Ca, Mg, and F. 3. It me be interesting to add a simple correlation analysis between the 1999 and the 2000 values of the different parameters to strengthen the arguments that the parameters are preserved/alterd. . Minor comments: P1345, li 4-8 The surface snow i5 melting and water percolation induced from the ash deposition caused a preferential elution and re-localization of certain ionic species, while the stable isotope records were not (very: CUT) affected.

P1345, li 8-9 some selected (ion: ADD) ratios preserved

P1346, li 27 Add here a sentence of how much water, or at least that water was lost in the eruption. Already here may the reader want to be served the facts of melting coming in later in the text. P1347, li 9 form (form:CHANGE) the ionic balance.

P1347, li 16-20 Expand and make it more clear what the bimodal peak is, and perhaps add a figure of the GNIP O18 data to further explain the reasoning here. P1347, li 19 the topmost 20 cm (w eq???) of the records

P1348, li 15-29 The discussion of the 18O profile is misleading the reader to think very little percolation/refreezing was the action here. True that the 18O record si very little affected by relocation, due to more mass, in comparison with water refreezing at these ice depths. But, as the coming discussion will show, large volumes of water flushed through the system, and is now relocated at the firn/ice boundary. This needs to be sharpened.

P1351, li 12 H⁺, F⁻, Ca²⁺, and Mg²⁺ show (a: ADD) similar behavior (than/as CHANGE) SO₂– 4 . The tendency of Ca²⁺

P1353, li 14 a (huge/large: CHANGE) quantity of liquid water was stored above the firn/ice transition at about 23m

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Figure text 2. Perhaps change in fig 2b accumulated into cumulated. For a glaciologist at least accumulated is something else as well. . . .

Interactive comment on The Cryosphere Discuss., 4, 1343, 2010.

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