

## ***Interactive comment on “Volcanic synchronisation of the EPICA-DC and TALDICE ice cores for the last 42 kyr BP” by M. Severi et al.***

### **Anonymous Referee #1**

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In this work the authors produce a new chronology for the Talos Dome ice core by volcanic peak matching with the Dome C record. The matching of peak patterns is convincing, as far as presented in the paper, and therefore produces straight-forward synchronization with the EDC3 or the Lemieux-Doudon age scale. The paper is clearly structured. However it needs to be clarified with which age scale the improved TD chronology has eventually been matched: historic eruptions, Lemieux-Dudon, EDC3 (see specific comments).

The new chronology should be made available either as supplement or with a link to a database.

The manuscript should be checked throughout for correct use of tenses.

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## Specific comments

Page 3720, line 7: “..producing a new age scale...” Is a synchronized age scale a “new” age scale?

p. 3721, l. 25: 60 thousand yr

p. 3722, l. 4-6: “Aside...” This sentence is not very clear. Relative dating vs. absolute dating vs. dating by flow models; advantages and limitations. All this is somehow in that sentence, but not well understandable.

p. 3722, l. 15: Wolff et al. 2005 not in references

p. 3727, l. 4: “. . . but they are reported here to show the consistency of out volcanic match”. How can events that are not necessarily synchronous, as stated just before, help to corroborate the volcanic match?

p. 3728, l. 5: The top panel of Fig. 6 shows the deviations. . .

p. 3728, l. 14: “. . . or an error in the volcanic synchronization process.” I think it would be helpful to state in the beginning of the paper that volcanic signals are not identified by chemical signature but solely by pattern matching.

p. 3728, l. 24: Vinther et al. 2005 not in references

p. 3729, l. 6: Age differences (delta\_age). The term delta\_age is commonly used for the age difference between the ice and the gas record. This could potentially lead to confusion. In addition the term is not consistently use: here as an offset between age scales and at other places as time between events. I suggest to use the term “age offset” for differences between age scales, and age difference and duration for time differences between events and length of events.

p. 3729, l. 26: “. . . pairs of consecutive common eruptions have been used as tool . . .”

p. 3729, l. 1: “. . .has pointed out..”

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p. 3730, l. 2-4: Lemieux-Dudon has been used for the last 12 kyr. What about 12-42 kyr? In particular, here in the conclusion stands: “Thus a new age scale covering the whole Holocene was proposed for the Talos Dome ...”, while you state in the abstract: “...producing a new age scale for the last 42 kyr”.

p. 3730, l. 5: “... is proposed ..”

Fig. 2 caption: “... 1259 AD eruption of an unknown volcano ...”

Fig. 5 caption: “Depth-to-depth relationship of the common volcanic events detected in the two ice cores and pairs of synchronous events identified using other parameters (isotopes and dust).”

Fig. 7 caption: As mentioned, I suggest to name the ‘age difference’ between chronologies an ‘offset’ (it is only a virtual difference).

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Interactive comment on Clim. Past Discuss., 7, 3719, 2011.

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