

***Interactive comment on “Rapid changes of the ice mass configuration in the dynamic Diablotins ice cave – Fribourg Prealps, Switzerland” by S. Morard et al.***

**F. Obleitner (Editor)**

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Dear authors,

Thanks for your response to the reviews and for submitting a correspondingly revised manuscript. For further procedure we kindly ask for some minor revisions concerning:

Review #1, Fig.2: To further clarify the distinction between continuous measurements and hand measurements (Fig. 2) you may consider replacing the term “devices” to e.g. “continuous measurements”. Further referring to Fig. 2A, please quantify the wind barbs (one feather denoting e.g. 1ms-1?)

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Review#1, technical comments: relating to TC conventions, the referee suggested the use of consistent figures annotations. There still seems to be some misunderstanding as you now use capital letters in the figures and legends while in the text lower case letters are used.

Review #2, future analysis: To my understanding, the already available data allowed for some more quantitative investigation of the relevant processes. Thus, calculated temperature and vapour pressure gradients during melt periods may provide measures of at least the sign of the turbulent fluxes. Air-rock temperature gradients (lower gallery) may have provided some insight into corresponding heat exchanges, too. Further, Fig. 2 indicates the availability of pressure data in and outside the cave, which were not at all considered in the present analysis, while bearing an interesting potential for investigation of cave temperature and circulation in relation to outside weather conditions. May be you could consider some of these suggestions in future analyses.

Further comments: 1) Please check the abbreviations of journal names cited in your references and update according to TC conventions i.e. ISI Journal Title Abbreviations Index.

2) We suggest replacing the following two references, which better fit the considered topics and may be easier available to the readers:

- Luetscher, M., Jeannin P.Y., Haeberli, W.: Energy fluxes in an ice cave of sporadic permafrost in the Swiss Jura mountains – concept and first observational results, in: Proceedings of the 8th International Conference on Permafrost, 21–25 July 2003, Zürich, Switzerland, 691–696, 2003. to: Luetscher, M., Lismonde, B., and Jeannin, P. Y.: Heat exchanges in the heterothermic zone of a karst system: Monlesi cave, Swiss Jura Mountains, J. Geophys. Res., 113, F02025, doi:10.1029/2007JF000892, 2008.

- Luetscher, M. and Jeannin, P. Y.: Temperature distribution in karst systems: the role of air and water fluxes, Speleogenesis and Evolution of Karst Aquifers, 16, 344–350, 2004a. to: Luetscher M., Jeannin P. Y.: Temperature distribution in karst sys-

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tems: the role of air and water fluxes, Terra Nova, 16, 344-350. doi: 10.1111/j.1365-3121.2004.00572, 2004a.

3) Finally you may also consider the following editorial remarks:

P2, L2: (2389m a.s.l., 46°32'09" N, 07°09'43" E, Fig. 1a)

P2, L32: ...winters are characterized by average air temperatures of - 2.2 +/-1.1°C (1983 and 2009) and snowy conditions (specify average amount).

P3, L17: The particularity of this ice cave is due to the rapid ...

P3, L30: ... a large quantity of water ...

P4, L15: ... have experienced important seasonal modifications ...

P4, L18: please specify "snowfirn" which is a quite unusual expression

P6, L1: ... structures (ice ceiling, Fig. 4i, j, n). Floor ice covered the ...

P6, L6: ... can be attributed to congelation processes ...

P6, L9: ... circulation. This comprises ...

P6, L10: ... U-shaped hollows ...

P6, L12: ... Ablation channels ...

P6, L24: ... The data were recorded in hourly intervals.

P6, L29: .. Figure 2a, b.

P7, L2: .. 1974m a.s.l.

P7, L7: .. 985m a.s.l.

P7, L19: consider change to "3.2.2 Periods of reversing air flow" ??

P7, L23: ...Luetscher 2005; Fig.5 and Fig.6c)

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P7, L24: ... The thermal threshold is also associated to well ....

P7, L27: please explain "inversion threshold"

P8, L18: ... cave air temperature is colder than at the "ice plug" location ...

P8, L22: ... the course of air temperature and rel. humidity closely follow each other.

P8, L25: ... a similar behaviour as the external ...

P8, L25: ... This means ...

P8, L30: ... did not ...

P9, L5: According to ... (similar P9, L11)

P9, L6: ... within the ice ...

P9, L25: ... Fig. 4h

P10, L12: ... ..water, after thunderstorms for instance (Luetscher 2005).

P10, L18: ... ..seems to be less important compared to ....

P11, L6: ... strong temperature contrasts ...

P11, L21: .. to understand the potential causes of the observed development of ice in the Diablotins cave since 1983 ...

P11, L25: ... periods of low temperatures, a strong ...

P12, L1: .. Contrasting meteorological conditions ....

P12, L10: ... ..the pronounced local variability of ...

P12, L16: .. "ice slide". That could have prevented ...

P12, L18: ... stopped or reduced ...

P12, L21: ... determined by air circulation ..

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P13, L6: ... condensation processes.

P13, L21: ... infiltrating water and of condensation ...

P13, L30: Please specify the mentioned thermal threshold

P14, L22: ... English text.

P15, L5: .. Research, 15, 4, 487-502

P15, L19: .. nouvelles:

P15, L29: ... please reformat "5, 237-249, 1994"

P17, L8 : please check/correct reference "Jb d. öö Musealsvereins"

Tab.1: please follow TC date conventions

Fig. 3 and Fig 4, legends: please follow TC date conventions

Fig. 5 and 6: can their quality be improved and annotations be enlarged for better readability (legend and tick)?

Fig. 7, legend: Oct1982 - Apr1983

We are looking forward to a correspondingly revised version of your manuscript and thank you in advance for corresponding efforts.

Best regards,

Friedrich Obleitner

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Interactive comment on The Cryosphere Discuss., 4, 1035, 2010.