The Cryosphere Discuss., 9, C1372–C1374, 2015
www.the-cryosphere-discuss.net/9/C1372/2015/

The Cryosphere Discussions
Open Access

Interactive comment on "Investigation of a deep ice core from the Elbrus Western Plateau, the Caucasus, Russia" *by* V. Mikhalenko et al.

Anonymous Referee #1

Received and published: 7 August 2015

The manuscript (MS) presents 'an investigation' of a 182m deep ice core obtained from the Mt Elbrus, in Caucasus, Russia. Essentially, the investigation consists in a dating of the upper 130 m of the ice core by layer counting based on water isotopes, ammonium, and succinic acid combined with a model age scale below 130m depth. Furthermore, a density profile, a borehole temperature profile, and a radar sounding survey are presented and discussed in the MS. Many other records from the ice core are mentioned both in the abstract and in the main text but they are mostly not shown or applied in the MS.

The introduction of the MS is very long and detailed summarizing a vast variety of meteorological, geographical, and glaciological data from the Caucasus region. Most of this introduction material is not directly relevant for the ice core dating and presented

Full Screen / Esc
Printer-friendly Version
Interactive Discussion
Discussion Paper

ice core profiles, that in my view constitute the core results of the MS, but most of the introduction may be justified as a sort of background summary, since many of the cited references are written in Russian and will not be assessable to many readers of The Cryosphere.

The ice core dating is convincing and supported by the independent reference horizons of 1963 AD Tritium, 1912 AD Katmai, and volcanic spikes from around AD 1833-1840, none of which are, however, presented in the manuscript. I think it would be fair to ask the authors to show the data behind those horizons and how they align with the records applied for layer counting, as those horizons are essential for the validation of the chronology. As underlined in the MS, the mentioned but not shown records of the ice core potentially provide a most valuable regional archive of the last centuries and therefore a reliable dating is essential. The presented records are convincing and provide a rare example of an Alpine type ice core that is not disturbed by melt (as proven by the annual layer counting).

The MS is mostly well written, well illustrated, and well referenced. Several sections, such as section 2.2, need to be proof read by the authors or a native English speaking person to correct a number of minor syntax and grammatical errors. In particular, the absence of the words 'the' and 'a' in several sentences is disturbing.

In conclusion, I think the MS provides a significant amount of information that is of interest to the readers of The Cryosphere. Supposedly, we will soon get to learn about the exciting records from this promising ice core in other manuscripts.

Specific comments:

Why does the isotope profile end at 106.7 m depth and is not extended to the deepest part of the ice core?

p. 3668, l. 3: '. . .exceed 0 deg', not '. . . exceed 0 N'.

p. 3675, l. 18: '. . .30 m southward apart.' -> '. . . 30 m to the south of the drill site.'

TCD
9, C1372–C1374, 2015

p. 3684, l. 9: ‘As seen in Fig. 9. . .’

p. 3684, l. 11: ‘. . . down to 113 m depth. . .’

p. 3685, l. 25 and l. 27: ‘. . . before 2009 BP’ -> ‘. . . before 2009 AD’.

Interactive comment on The Cryosphere Discuss., 9, 3661, 2015.