

Interactive comment on “Age of the Mt. Ortles ice cores, the Tyrolean Iceman and glaciation of the highest summit of South Tyrol since the Northern Hemisphere Climatic Optimum” by P. Gabrielli et al.

P. Gabrielli et al.

gabrielli.1@osu.edu

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Authors: Thank you very much for your interest in our work and your comments.

Sebastian Luening : The discovery of mid Holocene basal ice following the mid Holocene climate optimum is an important observation. It is convincing that the ice at the study location has apparently never fully melted, despite several late Holocene warm phases (e.g. Roman and Medieval Warm Periods). While the manuscript discusses possible reasons why the ice might have survived at the study location, it should be made clearer, in my opinion, that the "continuous" ice coverage in the region might

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in fact be more an exception rather than a rule. The location of the ice core in a rain shadow zone etc. may have helped. I therefore find the last sentence of the abstract too strong: "Given the stratigraphic-chronological continuity of the Mt. Ortles cores over millennia, it can be argued that this behaviour is unprecedented since the Northern Hemisphere Climatic Optimum." "Unprecedented" yes, but proven only for this (and the Iceman) locations, and not likely to be representative for the entire Eastern Alps area. Therefore better: "...that this behaviour is unprecedented AT THIS LOCATION since the..."

Authors: the text has been changed accordingly.

Sebastian Luening: Likewise, another statement on page 3 (lines 31-33) needs additional context information, in order to avoid over-generalization: "This discovery also suggests that past atmospheric temperatures characterizing warm phases such as the Roman (250 BC – 400 AD) and the Medieval (950-1250 AD) periods may have never exceeded that of the current time in this sector of the Alps (Baroni and Orombelli, 1996)." The cited reference from 1996 is now 20 years old. Meanwhile more recent studies have demonstrated that the proposed concept is too simplistic. At Lake Silvaplana in the Upper Engadine (which is located only 65 km west of the ice core), Larocque-Tobler et al 2010c based on chironomids documented that the Medieval Warm Period (MWP) from 1030 AD (start of dataset) until 1260 AD was up to 1°C warmer than the modern climate reference period (1961–1990). <http://www.sciencedirect.com/science/article/pii/S0277379110001277> The warm MWP in nearby case studies provides additional evidence that mid to late Holocene ice preservation may have been rather patchy than ubiquitous in the Eastern Alps. It may be worth clarifying and discussing this point in the final manuscript.

Authors: we have included this reference within the text and noted that, according to Larocque-Tobler et al 2010, the Medieval Warm Period and modern temperatures would be 1 C warmer than the modern climate reference period (1961–1990) in the Eastern Alps.

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