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The Cryosphere Discussions

Interactive comment on "Area and volume loss of the glaciers in the Ortles-Cevedale group (Eastern Italian Alps): controls and imbalance of the remaining glaciers" *by* L. Carturan et al.

M. Kuhn (Referee)

michael.kuhn@uibk.ac.at

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In general

This is a very timely analysis of area, length and volume changes of the glaciers of the Ortles – Cevedale Group. It covers one of the largest glacierized regions of the Southern Alps including Italy's largest glacier. It is timely in two respects: i) it analyses the period from the 1980s to the 2000s where Alpine glaciers have suffered large losses in length, area and volume and gives quantitative testimony to these changes ii) it presents a modern reference to the ongoing studies around the Holocene history of glaciation in this area from ice core drilling near the top of Mount Ortles. A large team

of authors have combined their competence in the disciplines required to complete this study, they have approached their goal very carefully. There is an impressive list of references to recent literature, a careful description of the methods used (As a reviewer I have to admit that I am not able to value the aspects of remote sensing in this paper) and a neutral assessment of their results. In a scientifically serious way this paper quantitatively presents the changes from the 1980s to the 2000s and offers explanations for them at the present state of the art.

In particular

270/25 To the reference to Östrem and Brugman you could add the more recent publication of Kaser, Fountain and Jansson (2003, A manual for monitoring the mass balance of glaciers, Technical Documents in Hydrology 59, 107 pp.) . 275/21 Can evidence of motion be detected from Landsat images? 275/21 Is the difference between very small glaciers and glacierets well defined? Is it useful? Is it necessary? 275/26 Can you give a reference to the calculation of clear sky radiation? 277/27 Instead of "solar constant" I propose "Top of atmosphere irradiance" as its value changes over the course of the year. 278/16 What is avalanche fed, what is not? 280/16 My personal thanks for mentioning "analyst experience". I believe that it is a basic ingredient of science although it may not be quantified. 282/11 Please define mountain glaciers, valley glaciers, glacierets. 282/23, 24 Can you define "avalanche fed" and "debris covered" in quantitative terms. I mean how large a fraction of a glacier needs to be debris covered? 283/14 Please give a quote for the calculation of clear sky radiation 285/6 "as found" – is this a positive statement (just as found) or negative (that was found) ? 286/3 How are the future losses calculated? 286/19 "is generally related to the avalanche activity" – how? 288/1 "+ 14 m" – how was this determined? 292/9 "are slightly lower than previously assessed" - please quote the previous assessment 293/2 "occurred from 1965 to 1982" Figures 9 and 10 are hardly readable, please enlarge to full page size. Fig. 12 "white + red + blue = glacier area in 2009" ("glacier margin 2009" is not clear)