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Natural Hazards and Earth System Sciences
Discussions

Interactive comment on "On the stability interpretation of Extended Column Test results" *by* Frank Techel et al.

Frank Techel et al.

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Dear Eric

Thank you for your interest in this study and for your comments regarding the content of the manuscript, which we greatly appreciate. In the following, we reply on the main points you raised.

We are aware that the ECT has become (one of) the most widely used instability tests used by practitioners in the world. Even in Switzerland, where the Rutschblock is still the standard stability test performed by field observers, the ECT has gained a lot in popularity. This shows when looking at the numbers of profiles entered in

our data-base with at least one ECT: profiles with an ECT are now almost equal in numbers compared to profiles with a RB (often both tests are performed). Exactly this increasing popularity of the ECT was our motivation to revisit the existing stability classifications.
However, we strongly disagree with your statement that just because the RB is not as popular anymore, it is a "flaw" of the study to compare RB and ECT. On the contrary, we consider this a strength of our study, namely that we are able to perform this comparison. Only this comparison of the tests performed in the same snow pit allows to compare the performance of both tests.

We have deliberately not assigned class labels yet. Instead, for the purposes of this manuscript, we introduced the class numbers to be able to assign a clear increasing order to the classes (Section 2.2 on page 4). For a better distinction between test stability classes and slope stability ratings in the text of the manuscript, we introduced low and high stability, as we decided to use the terms unstable and stable for slope stability. We called the middle class intermediate, as - at this stage in the manuscript - we only knew that it was between the classes indicating more often unstable or stable conditions according to Winkler and Schweizer (2009). Furthermore, we disagree with your recommendation that the four class numbers and labels should line up with the danger levels. This might suggest that a single test result correlates with the danger level, which is obviously not the case. It is not possible to deduce a danger level from a single stability test (e.g. Schweizer et al., 2003). In fact, we will often observe a whole range of stability test results on a day with, for instance, Moderate or Considerable danger.
We think any labels should follow the established labeling for snow stability, which includes the main classes: poor, fair, good. Hence, to rate the ECT results we suggest the following three (primary) stability class labels, with poor being additionally split into two sub-classes:

- ECTN and ECTX: **good** (which includes cases of very good)
- ECTN<10 or ECTP>21: **fair**
- ECTP14 to ECTP21: **poor** (tending to fair)
- ECTP<14: **poor** (including cases of very poor)

These class labels are close to the stability rating scheme used in the operational guidelines in the U.S., Canada and Switzerland. Furthermore, they permit alignment of ECT and RB somewhat, with very poor stability remaining for RB results with the most unstable stability class. In the end, the snow safety community will decide, whether a three- or four-class classification scheme is suitable, and what their labels will be. Our aim is to provide the basis for an informed decision, grounded in data.

On behalf of the authors,

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