

Interactive comment on “Acoustic Emission investigation for avalanche formation and release: A case study of dry-slab avalanche event in Great Himalaya” by Jagdish Kapil et al.

Anonymous Referee #2

Received and published: 14 April 2020

I found the paper to be too long for the subject matter. I appreciate the efforts of using AE technique towards avalanche mitigation processes. Its a good tool to have; no doubt. The authors, however, should have refrained from making comments with buzzwords, again and again, on micromechanisms because they seem to be not aware of the “fundamental fact” that snow is an extremely “High-temperature material” undergoing stress-temperature-time induced morphological changes. The micro- and macro-failure mechanisms and their kinetics are very complicated. Nonetheless, significant progresses has been made in the past on physics of failure in polycrystalline solids (not necessarily porous media) at high-homologous temperatures, close to 0.99 Tm, but snow is porous and the authors do not seem to be aware of those developments.

C1

For example, there were AE studies in pure ice for examining the microstructure-property relations - way back in the early 1980's. Specifically, they looked at polycrystalline ice as a “high-temperature” material (existing in our cryosphere at extremely high homologous temperatures, higher than about 0.9 Tm, where Tm is the melting point in Kelvin). Old ideas on AE, based on micromechanisms in other engineering or geological materials at low homologous temperatures should be discarded. However, the use of AE technology can still be used as a tool - such as monitoring the snow states. The authors tried to use AE for real practical application - and should have stayed in that arena - instead of going beyond the realm of the data and speculating about dislocations, etc. They seem to impress the audience with mechanisms that they actually do not fully understand. The manuscript, in this regard, should be modified significantly to bring out the real strength of the work.

Interactive comment on The Cryosphere Discuss., <https://doi.org/10.5194/tc-2020-38>, 2020.

C2