

**GLOBAL VARIATION IN REFERENCE ALTITUDE FOR THE SNOW,
DEPENDING ON LATITUDE AND REGIONAL CLIMATE**

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ABSTRACT: According to the Swiss guidelines for the defence structures in avalanche starting zones, guidelines dated 1990 and 2007, the altitude factor sets the reference altitude of 1500m. This value can also be interpreted as a winter climate reference, regional (alpine), which is a snowpack on several winter months and avalanches on steep slopes.

The worldwide use of this reference, on other mountains than the Alps, is nevertheless quite delicate: the parameters are numerous and diverse. The latitude determines variations of solar incidence according to exposure and characteristics of the troposphere. Its consequences must be sets at both ends (altitude at the Equator and latitude at sea level). The regional winter climate, taking into consideration the average temperature and the importance of precipitation, is also decisive. It is locally chosen according to the Köppen-Geiger world climates classification. Other parameters may also be locally relevant: heat from the ground (volcano), distance to the ocean, inwardness with other mountain ranges.

A simple MS-Excel tool offers a first proposal for such reference altitude, all over the world. It allows a fairly good fit when it comes to work on snow and avalanches in a relatively unknown mountain area, especially without forest cover: for example, with only very few snow and/or avalanche data. It will be perhaps possible to use it as an indicator of the global warming effect, in adjusting the data coming from the hundred summits located all around the world.

KEYWORDS: snow, avalanche, winter climate, method, classification

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