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Interactive comment on "The large-scale assessment of avalanche risk for ski resort areas in Northern Caucasus region" *by* A. Y. Komarov et al.

Anonymous Referee #3

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A preliminary assessment of avalanche risk is necessary for designing the new ski resorts. Studies of avalanche danger and avalanche activity on a large scale have to be conducted for this purpose. The problem of avalanche risk assessment for new resorts in Russia has to solve in a lack of information on avalanche activity. Therefore it is necessary to analyze the avalanche formation natural conditions. Thus the problem discussed in the article is interesting and relevant.

Subjects of the article correspond to the direction of the journal. The avalanche formation conditions are studied in the three regions of the Caucasus (in the west, center and east of the ridge). The level of avalanche risk has been calculated by an analysis of natural conditions.

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Discussion paper

The following comments are on the content of the article.

It is necessary to give a map of the area indicating the places studied, and it is desirable to pictures of the landscapes.

The natural conditions are described not enough detail. There are no quantitative characteristics of the terrain (the depth of the valleys, steep slopes, vegetation type, and etcetera) and avalanche danger (avalanche catchment areas, the number of days with avalanches, avalanche volumes).

The data on sources of climate data are absent. It is necessary to specify the height of the weather stations, their location relative to the studied areas. High-altitude zoning climatic characteristics (temperature, rainfall, snow cover, wind speed) is not considered.

The mortality rate of 0.66 is questionable. It should be lower at ski resorts with the avalanche safety services. It is equal to 0.47 in our region.

The hypothesis that the mortality rate depends on the qualification of skiers is very controversial. In any case, the introduction of the amendment clarifies the risk level by only 20%, which is much less than the errors in determining the other components of the avalanche risk.

It is hardly necessary to calculate the avalanche risk for the entire year. It is more logical to estimate it for the period of the ski season. Instead avalanche duration period (from the first to the last of the avalanche) we must take the number of days with avalanches. None of the skier is located in avalanche danger zone 8 hours per day.

The number of people considered to be in some cases on the resort, in others - on the pistes.

The equations have the symbols d, and D. How are they different? Not all parameters have dimension.

The parameters in Formula 3 have not justification.

Lines 11-15 on p.9 duplicate lines 8-13 on page 7.

The article can be published after considerable improvements.

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