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Sensitivity of the French Alps snow cover to the variation of climatic variables

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Abstract. In order to study the sensitivity of snow cover to changes in meteorological variables at a regional scale, a numerical snow model and an analysis system of the meteorological conditions adapted to relief were used. This approach has been successfully tested by comparing simulated and measured snow depth at 37 sites in the French Alps during a ten year data period. Then, the sensitivity of the snow cover to a variation in climatic conditions was tested by two different methods, which led to very similar results. To assess the impact of a particular "doubled CO_2" scenario, coherent perturbations were introduced in the input data of the snow model. It was found that although the impact would be very pronounced, it would also be extremely differentiated, dependent on the internal state of the snow cover. The most sensitive areas are the elevations below 2400 m, especially in the southern part of the French Alps.

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