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Climate change impact on glacier mass balance over the 20^{th} Century in the Alps

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Mass balance analysis based on the longest direct mass balance measurements series available in the Austrian, Swiss and French Alps over the last 50 years indicates that cumulative mass balance fluctuations are very similar, revealing a common climatic signal over the entire region. Thanks to summer and winter surface mass balance measurements performed on two glaciers in the Alps, it has been shown that glacier changes have been driven mainly by temperature change since the beginning of the twentieth century.

However, the very high-elevation glaciated areas are not sensitive to the surface ablation and are mainly controlled by snow accumulation.

Studies carried out on ice fields covering the top of Mont blanc (4808 m) and Dôme du Goûter (4300 m) areas, suggest that surface mass balance did not change significantly over the entire 20^{th} century. The small ice thickness changes at Mont Blanc and Dôme du Goûter clearly reveal that these high-elevation glaciated areas have not been significantly affected by climate changes over the last 100 years.