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## The role of surface cohesion in wind-driven snow transport

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The wind-driven saltation of sediments, such as snow and sand, is responsible for a wide range of geophysical processes. Blowing-snow, in particular, affects snow surface properties and drives snow redistribution in alpine terrain. As such, it is of fundamental importance for avalanche mechanics. One of the most important controls on initiation and development of snow saltation is the surface cohesion induced by ice particle sintering. Although inter-particle cohesion is known to limit the number of grains lifted from the surface through aerodynamic entrainment and granular splash, the role of cohesion in the development of saltation from onset to steady state is still poorly understood. Using a numerical model based on the discrete element method, we show that saltation over cohesive beds sustains itself at wind speeds one order of magnitude smaller than those necessary to initiate it, giving rise to hysteresis in which the occurrence of transport depends on the history of the wind. Our results further suggest that saltation over cohesive beds requires much longer distances to saturate, thereby increasing the size of the smallest stable bed forms.