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The Influence of Ice Topography on Sliding over Ice

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Abstract : Winter brings snow and ice in the Northern Europe and with it the need to move safely over ice. It has been customary to select an appropriate material surface for movement over ice, but another way to influence the interaction with ice is to modify the ice surface. The objective of this work was to investigate the influence of ice topography on initiating movement over ice and on sliding velocity over ice in the laboratory and real-life conditions. The ice was prepared smooth, scratched or with solidified ice-droplets to represent the surface of ice after ice rain. In the laboratory, the coefficient of friction and the sliding velocity were measured, but the sliding velocity measured at the skeleton push-start facility. The scratched ice surface increased the resistance to movement and also showed the slowest sliding speed. Sliding was easier on the smooth ice and ice covered with frozen droplets. The contact surface was measured to determine the effect of contact area with sliding. Results from laboratory tests will be compared to loading under heavier loads to show the influence of load on sliding over different ice surfaces. This outcome provides a useful indicator for pedestrians and road traffic on the safety of movement over different ice surfaces as well as a reference for those involved with winter sports.

Keywords : contact area, friction, ice topography, sliding velocity
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