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Cornice Monitoring with a Terrestrial Laser Scanner

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Cornice failure poses a threat to infrastructure and human life in central Svalbard, where cornice fall avalanches comprise a significant portion of all observed avalanche activity. Cornice accretion occurs seasonally on the plateau edges of the mountains that border Longyearbyen – Svalbard's primary settlement – where snow entrained over the long fetches of the plateau summits is deposited by the prevailing winds. Here, we present the preliminary results from our first season regularly monitoring these cornice systems with the Riegl VZ-6000 terrestrial laser scanner. We demonstrate the applicability of TLS data acquisition for monitoring cornice system dynamics and discuss the utility of such measurements for hazard management purposes. Finally, we show how this unique high spatial resolution data will act as a reference dataset for modeling exercises to improve the process understanding of cornice development and failure – in arctic environments and throughout the world.