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On the Snowpack Variability in Maritime Climate

A. Singh, D. Chand, S. Kumar, and A. Ganju
Snow & Avalanche Study Establishment, Hazard Assessment & Forecasting Division, India (amreek@sase.drdo.in)

The snowpack variability is one of the most widely studied subjects of snow science in recent times. The subject holds importance due to role of variability in decision making about snowpack stability. This study is an attempt to understand the evolution pattern of spatial and temporal variability within snowpack especially with respect to snowpack depth and ram-resistance profile. Under this study detailed observations were made over the snow-covered slopes in Gulmarg region of Indian Himalaya for two consecutive snow seasons (2006-07 and 2007-08). The place may be characterized as one of maritime climate. The observations involve multiple snowpack resistance profiles and stratigraphy over all the four main aspects (north, east, south and west) at different points of time during each season. The analysis of these observations revealed some interesting results. Snowpack depth was found to be reasonably uniform at slope scale for all the slopes.Also all the other slopes, except southerly, were found to resemble with level ground snowpack in terms of snowpack stratification, but absolute resistance values of specific layers and snowpack depth varied considerably. Most importantly, the spatial variability was observed to be increasing or reducing near the snowpack surface only, i.e. once buried, the variability (low or high) persisted until it got exposed again, implying that above-surface meteorological conditions are the main cause of variability. Further, dry layers exhibited low variability compared to moist layers. The study significantly adds to the understanding of the snowpack variability pattern in regions of maritime climate and thus may prove vital in interpreting the stability tests results.