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blowing snow as a source of ice crystals in supercooled orographic clouds

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Winter storms are often accompanied by strong winds, especially over complex terrain. Under such conditions freshly fallen snow readily can be suspended. Most of that snow will be redistributed across the landscape (e.g. behind obstacles), but some may be lofted into the turbulent boundary layer, and even in the free atmosphere in areas of boundary layer separation near terrain crests, or in hydraulic jumps. These ice crystals, presumably mostly small, fractured particles, may enhance snow growth in clouds. This may explain why shallow orographic clouds, with cloud top temperatures too high for significant ice initiation, can produce (light) snowfall with remarkable persistence.
Airborne radar and lidar data are presented to demonstrate the presence of blowing snow, boundary layer separation, and the glaciation of a shallow supercooled orographic cloud. Further evidence for the presence of blowing snow comes from a comparison between flight level ($\sim$700 m AGL) and ground-level snow size distributions. We will also present a parameterization for the aerial injection of ice crystals from the surface, as implemented in WRF.