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Correlation of Windspeed and Antarctic Surface Roughness[1]
MARK STOCKHAM, University of Kansas, ANITA COLLABORATION — When electromagnetic waves interact with a media interface the transmitted and reflected portions of the incoming wave depend on the incident angle of the wave and wavelength (as well as the material properties of the media). The roughness of the surface of Antarctica affects the radio frequency signals received by airborne experiments, such as the balloon-borne experiment ANITA (ANtarctic Impulsive Transient Antenna) which observes the reflected radio waves from cosmic ray-induced extensive air showers (EAS). Roughness of a given scale can cause decoherence of the reflected signal and is an important effect to understand when estimating the amplitude of the incoming wave based on the reflected wave. It is challenging to get a survey of surface roughness over many of the areas that these experiments are likely to pass over. Correlating historical wind speed records with statistical roughness as observed by the backscatter of satellite [Rémy F, Parouty S. *Remote Sensing.* 2009] and airborne experiments operating at different frequencies can possibly be used to predict time-dependent surface roughness with surface wind speed as the input. These correlations will be presented for a variety of areas on the Antarctic ice shelf.

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