

Estimating snow properties with L-Band InSAR: results from the NASA SnowEx campaign

HP Marshall, Eli Deeb, Rick Forster

Previous research on estimating snow water equivalent (SWE) using microwave radar has traditionally focused on observations at X- and Ku-bands, for which the wavelength is approximately an order of magnitude larger than the snow grain size, and have used the volume scattering signal to estimate snow mass. At lower frequencies such as L-band, dry snow is nearly transparent, with very little volume scattering occurring within the snowpack. While this causes very little change in radar amplitude with changes in snow mass, the additional snow mass causes a change in the time-of-flight of the radar signal, leading to an observable change in phase. We explore the use of L-band InSAR for estimating changes in SWE, using data recently collected as part of the NASA SnowEx campaign.