

RADAR DEM COMPUTATION OVER TROPICAL FOREST IN A VOLCANIC CONTEXT: THE BULUSAN VOLCANO (PHILIPPINES).

KERVYN FRANCOIS

In the scope of the IUGS/UNESCO Geological Application of Remote Sensing (GARS) programme, our laboratory was involved in applying new radar technology for studying the Bulusan volcano in the Philippines. For that purpose, we had the opportunity to obtain data emanating from four spaceborne radar platforms: ERS1-2, JERS-1, RADARSAT. Two techniques exploiting the radar properties have been tested aiming to generate accurate Digital Elevation Models (DEM). On the one hand, extraction based on radar interferometry involves the combination of the phase of two radar images. Unfortunately, this technique reaches its limits in such a vegetated environment because of the phase coherence loss between the acquisitions. As part of the conclusion, the use of long wavelength like the L-Band of JERS-1 is recommended but at the time of this study, few data only were available. On the other hand, radar stereoscopy - a technique similar to optical stereoscopy - was tested under various geometrical conditions and offers a widespread DEM but with a limited vertical resolution due to the lack of accurate control points, and a smoothing effect related to the radar data properties. Both techniques radar interferometry and radar stereoscopy were found to be of limited use for that specific application when compared to a reference DEM computed from topographic maps at 1/50.000 scale. Coherence is probably one of the more important challenge of radar interferometry that can be by-passed with airborne system or the coming Space Shuttle mission, or minimised using appropriate wavelength.