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Calculating the physical properties of snow, using differential radar interferometry and TerraSAR-X and MODIS images

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ABSTRACT

The process of saving snow in mountainous areas of water resources is important. According to studies conducted by about 60 percent surface water and 57% groundwater flow in snowy areas. In recent years, the importance and applications of synthetic aperture radar data (SAR), according to a major advantage compared to other remote sensing systems are growing. In this study, using manufacturing satellites and MODIS algorithm Snow map snow cover and then with twelve radar image sensor TerraSAR-X and DInSAR in such a way that initially an image as the base image the rest of the images of the first image interferometry was performed between areas where snow cover the amount of displacement rather than results indicative of changes in depth of snow and then map snow depth maps of snow between October 2012 to May 2013. Mining was the next step, using Linear regression between the snow depth map of the DInSAR technique produced snow water equivalent depth data from ground stations were harvested SWE depth map of the results suggest overall accuracy of 91.3% and kappa coefficient consuming 84.45 Snow level map and map the depth of the snow by a factor of extension of 85% and RMSe of 2.78 to calculate the depth of snow water equivalent using the correlation between the data of snow depth derived from DInSAR and the ground water depth of snow a linear correlation coefficient of generalization 0.77 and RMSe of 2.97 was the result that was statistically at 99%.

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