Assessing performance of L-band SAR backscatter for above ground forest biomass estimation over complex topography

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Forest above ground biomass (AGB) estimation is always challenging using SAR backscatter over challenging topography because topographic introduce topographic and radiometric distortion in SAR images. These distortions can be corrected using topographic and radiometric correction methods but these methods are effective over moderate topography. Most of the forest in Pakistan exist over challenging topography. This research is an initial effort to estimate forest AGB of Gilgit-Baltistan, Pakistan. As Gilgit-Baltistan exist in the north of Pakistan, it lies at approximately 5000 m above the sea level. The prime goal of this research is to estimate above ground forest biomass using L-band SAR backscatter. For this, full polarimetric data of ALOS-2 was acquired. Terrain geometric and radiometric correction was performed and backscatter (σo) was estimated. Resultant σo was correlated with ground based forest AGB and regression analysis was performed. It was identified that σHH – σHV is most sensitive for biomass estimation.

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