

BIOMASS ESTIMATION FROM SAR POLARIMETRY AND INTERFEROMETRY SEPARATING GROUND AND VOLUME CONTRIBUTIONS

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Abstract

This paper explores possibilities for enhancement of forest biomass estimation from radar data using a 2-layer vegetation model. The model allows to separate polarimetric SAR interferometry (PolInSAR) observables into two parts, one related to the scatterers distributed in the vertical direction, and one to the scatterers localized at the ground level. It provides indicators for the height and density of the forest, as well as the geometry of the individual scatterers and their combination. After the separation of the PolInSAR coherency matrix into the two components, the estimated backscatter values, polarimetric indicators, and interferometric effective height of both components are related to the biomass. In this study, a multi-variate non-linear regression is applied in order to evaluate the possible performance of biomass estimation. Experimental results are presented for DLR's E-SAR and JPL's UAVSAR airborne SAR systems.

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