

# WOODY VEGETATION CLASS EXTRACTION IN SAVANNA WOODLANDS USING QUADPOL ALOS PALSAR DATA

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## ABSTRACT:

A large percentage of rural communities in southern Africa rely on communal woodlands to meet their domestic energy demand and supply requirements [1]. Fuelwood and charcoal are the predominant sources of bioenergy in most low income rural and urban households. There is an increased demand for quantitative data on available woody biomass resources for macro level rural energy planning and modelling. Polarimetric synthetic aperture radar (POLSAR) approaches are gaining increasing prominence in above ground biomass (AGB) studies to meet the reporting requirements of international conventions and protocols such as REDD and Kyoto Protocol on Carbon and Climate Change. However, the application of POLSAR approaches in communal savanna woodlands has been limited. This paper investigates the mapping of woody vegetation in heterogeneous savanna woodlands using quadpol ALOS PALSAR data in the communal woodlands of Welverdiend Village in South Africa. The quadpol data was decomposed into entropy, anisotropy and alpha angle elements using Cloude and Pottier decomposition. Freeman decomposition was also used to delineate the dihedral, volume and surface scattering components [2]. Unsupervised Wishart H/A/alpha classification was performed on the Cloude and Pottier decomposition to extract eight scattering classes [3]. Woody vegetation is closely related to forestry double bounce, anisotropic (vegetation) scattering, rough surface scattering, dihedral and dipole scattering mechanisms. Training classes selected from sample scattering classes were used to extract vegetation classes by running a Maximum Likelihood Classification (MLC) algorithm over the results of the Freeman decomposition. A qualitative comparison of the vegetation classes with georeferenced aerial photographs is presented

**TOPIC:** Microwave remote sensing

**ALTERNATIVE TOPIC:** Remote sensing applications