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### Study of Discrimination Between Plantation and Dense Scrub Based on Backscattering Behavior of C Band SAR Data

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**Abstract.** The study about on landuse and landcover classification using multi polarization and multi temporal C-band Synthetic Aperture Radar (SAR) data of recently launched multi-mode of RISAT-1 (Radar Imaging Satellite) by Indian Space Research Organization (ISRO) and European satellite, Envisat ASAR data. The backscattering coefficient were extracted for various land features from Cband SAR data. The training sample collecting from satellite optical imagery of study and field visit for verification. The training samples are used for the supervised classification technique of maximum Likelihood (ML) algorithms, Neural Network (NN) and Support Vector Machine (SVM) algorithms were applied for fourteen different polarizations combination of multi temporal and multiple polarizations. The previous study was carried only four band combination of RISAT 1 data, the continuation of work both SAR data were used in this study. The Classification results are verified with confusion matrix. The pixel based classification gives the good results in the dual polarization of CRS – HH and HV of RISAT –1 compared to dual polarization Envisat ASAR data. Meanwhile the quad Polarization combination of Envisat ASAR data got better classification accuracy. The SVM classifiers has given better classification results for all band combination followed by ML and NN. The Scrub are better identified in EnviSat ASAR – VV & VH Polarization and Plantation are better identified in EnviSat ASAR – HH, HH-HV & HV Polarization. The classification accuracy of both Scrub and Plantation is about 80 % in EnviSat ASAR – HH, VH & VV Polarization combination.

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