

## EXCESS LOSS MEASUREMENT ON ISOLATED SINGLE TREE CANOPIES AT MICROWAVE FREQUENCIES

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### ABSTRACT

Experimental investigations have been carried out on five (5) different isolated tree species in order to measure the propagation loss on each tree when a CW (at 3.2-3.9 and 4.9-5.9 GHz) is propagated through them. The tree species are cedar (*Cedrus Deodara*), silver maple (*Acer Saccharinum*), horse chestnut (*Aesculus Hippocastanum*), common whitebeam (*Sorbus aria*) and common hazel (*Corylus Avellana*). In all of these experiments, canopy geometry was adopted and all the trees were in in-leaf state. Results of the investigations have revealed that the presence of isolated single trees along a radio path can affect signal propagation leading to loss in signal strength (attenuation). For example, propagation loss of about 30 dB in excess of free space was measured on one of the trees. This is quite enormous and can reduce communication coverage range.

**Keywords:** Propagation loss, experimental investigation, free space, excess loss.