

HIDDEN NODE MARGIN AND MAN-MADE NOISE

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Abstract:

The transition from analog to digital TV is in progress worldwide and many countries are in the process of switching off analog TV broadcasting in favor of Digital Terrestrial Television (DTT). Cognitive radios (CR) have been proposed to fill the TV white spaces (TV channels 52 to 69 – 700 MHz band), but the investigation over this topic is very active to assess the feasibility of this approach with respect to the protection of the incumbent radio services. The objective of this study is to carry out an analysis of the UHF band to obtain realistic empirical values of the parameters upon which cognitive radio operation is based.

The paper will study two key areas for cognitive operation: on one hand, the study will cover current values of radio noise UHF and comparison with realistic receiver noise figures in relation to occupancy decision thresholds, and on the other hand it will study the statistics of the so-called “hide node margin”. Measurements have been performed in locations in Bilbao (Spain) and Cagliari (Italy) in three different environments (rural, semiurban and urban - indoor). The measurement system included calibrated antennas connected to a field strength meter and a vector signal analyzer which enabled fast reading of the channel power on the bands of interest. The measurement process and data recording was controlled by specific written software.