The Influence of Noise Uncertainty and SNR Wall on the Performance of Hybrid Sensing Method

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Abstract: The paper discusses the hybrid sensing method and presents the hybrid detector (HD) which improves the sensing performance. The proposed HD takes advantage of the energy detection (ED) and a method based on the Covariance Absolute Value (CAV) or Cyclic Autocorrelation Function (CAF). The paper characterizes the limitations of the use of ED resulting from the uncertainty of spectral density of noise power estimation known as 'SNR Wall'. The paper describes the system model and presents the simulation results for OFDM signal (Orthogonal Frequency Division Multiplexing) of WiMAX system. The simulation

results refer to the ideal case of an environment with well-known parameters and for an environment with the uncertainty of spectral density of noise power estimation, as it has been considered in the literature so far.

Keywords: Hybrid detector, sensing, SNR Wall, noise uncertainty, Covariance Absolute Value, Cyclic Autocorrelation Function, OFDM, WiMAX

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