

# **TV white space databases: algorithms for the calculation of maximum permitted radiated power levels and application to a real scenario**

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## **Abstract:**

The UK and European framework for access to the UHF TV band by white space devices (WSDs) is predicated on the availability of instructions from a white space database (WSDB) which specifies location-specific maximum permitted WSD radiated power levels. These levels are calculated in such a way so as to afford protection to the digital terrestrial TV (DTT) service in terms of a maximum permitted degradation in DTT location probability. The contribution of this paper is two-fold. Firstly, we present an approach for the calculation of DTT location probability which improves considerably on the accuracy of the technique commonly used for this purpose. Secondly, we present a novel methodology for the calculation of the maximum permitted WSD EIRP, subject to a target degradation in location probability. We show that, despite its computational efficiency, the methodology generates results which compare favourably with those generated via brute-force Monte Carlo simulations. Both presented techniques are suitable for implementation in TV white space databases.