

INTERFERENCE ANALYSIS OF WIMAX AND DVB-T SYSTEMS

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ABSTRACT

With the increasing demand of the wireless systems technology, frequency utilization is limited by the problem of insufficient spectrum. More portion of the spectrum is needed to cope with the increasing demand of the 3G and 4G technologies. On the other hand, analogue TV is shifting to digital and after this switch-over there is some part of the spectrum that is free. Thus, the objective of this research is to investigate the interference of the coexistence of DVB-T and WiMAX systems. We design an interference analysis to find out realistic distance between the DVB-T transmitter and WiMAX receiver. We consider a scenario where the DVB-T transmitter is located together with a WiMAX receiver in very close proximity. We evaluate and analyze the performance due to the separation distances between the two systems in terms of transmission power, capacity and the signal strength. Simulations results have shown that at 40 km distance, there is no interference between these transmission systems.

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CHAPTER 1

INTRODUCTION

1.1 OVERVIEW OF STUDY

Recent advances in technology design have led to rapid development and deployment of wireless communication systems resulting into a congested radio spectrum. However, it has been estimated that 70 % of licensed spectrum in some countries is not utilized efficiently across time and space [1]. Since different operators in adjacent bands might choose to use different systems, the coexistence of different systems is becoming one of the most challenging issues. When transmitters and receivers are operating simultaneously in adjacent spectrum and in the same area, the transmitters may cause significant interference to the receiving systems. So it's important to know the effect of interference between systems in such environments [2]. Currently universal TV broadcasting systems are switching from analogue to digital hence improving quality of TV broadcasting and the efficient usage of the spectrum. Consequently a significant amount of precious spectrum will be available in the UHF bands as an "interleaved spectrum" or TV White Spaces (TVWS) [3]. Since these are in known geographical locations, they can be expanded for DVB-T or other secondary such as mobile networks [4]. The devices which are used in TVWS are called White Space Devices (WSDs).