Examination Rain and Fog Attenuation for Path Loss Prediction in Millimeter Wave Range

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Abstract. The core solution for the congestion bandwidth which are utilizing these days in radio propagation inevitably is to move forward to higher frequencies, which millimeter wave frequencies can provide it as well as satisfy clients requests such as huge capacity and fast data rate. On the other hand, the high vulnerable from complex condition become holdback for instance attenuation which case due to atmospheric absorption such as rain , fog , foliage, oxygen and water vapor. Coverage planning depends on which propagation model use in various atmospheres to accomplish reasonable and dependable system. In this paper we concentrating on rain and fog parameters which are both represent most significant condition variables to encourage the planners of wireless networks to select appropriate model, which can structure and actualize the fitting model. Likewise, we look at among three different models exponential, polynomial and power to utilizing scientific conditions and goodness of fit parameters to demonstrate clearly data curve. The outcome shows that polynomial agreeable model for rainy and foggy atmospheric, and will extend the methodology to other models utilizing real data analysis to obtain comprehensive contributable results, which will conceivably be valuable assessment to millimeter wave frequencies planners.

Keywords: millimeter wave (mmWave), attenuation, goodness of fit, atmospheric environmental.

1 Introduction

The radio wave characteristically understands the signal propagation in different medium with wide impact of atmospheric environment parameters. The new era of mmWave, which would utilizing extraordinary high frequencies extend from 30 GHz to 300 GHz to provide huge data rate due to high capacity of information per seconds to keep up clients requests. The special aspect of mmWave is the different method awareness with climate change and challenge to adjusted little wavelength with high frequencies. Because of innovation requests numerous models are required to concentrate to accomplish best execution particularly parameters in air, for example, rain and fog. Besides, much worry about attenuation caused by the prior phenomena [1]. High buildings, climate change, fog droplets and rain drops may become holdback and cause high path loss for high frequency band [2].