

On the performance of IMT-2000 communication link based on stratospheric platforms

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Abstrak

A new means for providing wireless communication has been currently proposed. It is based on aerial vehicle known as High Altitude Platform or Stratospheric Platforms (SPF). The SPF will be operated at an altitude of 17-22 km above the ground. Therefore, the channel condition may be different compared with those of the conventional terrestrial or satellite wireless channel. In this paper, the channel propagation characteristic of such a system is firstly investigated by means of ray tracing algorithm. We emphasize our investigation in a typical urban environment, in which the mobile users mostly exist. We developed building block model for simulation based on building height distribution, which is obtained from measurement inside Tokyo. As a result, propagation loss model and Ricean channel parameter for the SPF channel is reported in different scenarios. By using this result we then estimate the required transmitted power of SPF to serve the mobile users in a several transmission rate that is used in IMT-2000 services. Finally, an evaluation of BER of IMT-2000 link is performed in order to estimate the system level performance. From this evaluation, the main contribution of this paper is to clearly show the critical limitations of both power requirement as well as system level performance of mobile communication IMT-2000 by using the concept of the SPF.