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

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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.