

ABSTRACT

Advances in telecommunications technology and the increasing need for internet access are driving the development of 5G cellular networks, which face challenges such as limited coverage and signal quality affected by path loss. This research discusses the comparative analysis of Alpha-Beta-Gamma (ABG) and Close-In (CI) path loss prediction models and channel simulation using NYUSIM software on 5G networks in Tegal City, a micro urban area with high building density. The methods used include NYUSIM simulations and mathematical calculations of the ABG and CI models, the results of which are then compared based on path loss and Maximum Allowable Path Loss (MAPL) values. The results show that the CI model provides better path loss predictions at long distances (150-250 m), while the ABG model is superior at close distances (50-100 m), and the NYUSIM simulation produces higher path loss values overall. All simulation and calculation results met the feasibility limits based on the downlink (145.87 dB) and uplink (130.37 dB) MAPL values, so it can be concluded that the selection of path loss models needs to be adjusted to the characteristics of the distance and micro urban environment in Tegal City.

Keywords : Path loss, 5G New Radio, Alpha-Beta-Gamma (ABG), Close-In (CI), NYUSIM