Simulasi rugi propagasi kandidat frekuensi teknologi 5g 28 ghz 38 ghz 73 ghz pada daerah urban Jakarta = The propagation loss simulation of 5g spectrum candidates 28 ghz 38 ghz 73 ghz on urban environment in Jakarta

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Abstrak

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Berbagai riset telah dilakukan untuk meningkatkan kemampuan sistem telekomunikasi seluler saat ini untuk diimplementasikan ke generasi berikutnya yaitu 5G. Salah satu fokus riset mengenai teknologi 5G adalah spektrum frekuensi, di mana banyak riset yang mengemukakan bahwa spektrum yang digunakan saat ini sudah tidak mampu mengakomodasi sistem telekomunikasi seluler kedepannya. Spektrum frekuensi yang menjadi kandidat pengganti spektrum yang telah digunakan saat ini berada di atas daerah 6 GHz beberapa diantaranya adalah 28 GHz, 38 GHz, 73 GHz. Spektrum di atas 6 GHz yang awalnya dianggap kurang cocok dengan sistem telekomunikasi seluler mulai dianggap cocok dengan berkembangnya riset. Meskipun dianggap cocok sebagai kandidat spektrum, site specific planning akan menjadi aspek yang penting jika teknologi 5G mengimplementasikan spektrum kandidat tersebut, karena performa dari sinyal yang dikirimkan akan sangat tergantung kepada tempat diimplementasikannya jaringan. Skripsi ini akan membahas mengenai simulasi performa dari beberapa spektrum frekuensi kandidat penerus telekomunikasi seluler jika diimplementasikan di lingkungan urban dari kota Jakarta dengan mempertimbangkan rugi ? rugi propagasi yang akan muncul pada proses transmisi. Dampak dari pengimplementasian kandidat spektrum terhadap spektrum juga akan disimulasikan dan dipelajari. Hasil simulasi menunjukkan bahwa rugi propagasi yang paling signifikan merupakan atenuasi karena bangunan. Atenuasi lain seperti tumbuhan akan memiliki rugi yang cukup besar, sedangkan atenuasi karena hujan dan atmosfer menunjukkan tingkat yang tidak signifikan dibandingkan rugi ? rugi yang lain.
ABSTRACT
Various researches on how to improve the current cellular system have been done to be implemented in future cellular technology, often called 5G. One of the aspects of researches focuses on the frequency spectrum that will be used on the next generation of cellular system. The frequency spectrum became a focus due to the prediction that the current frequency spectrum will not suffice to accommodate the amount of traffic that 5G will handle. The frequency spectrum that is predicted to replace the current frequency spectrum in the future is located beyond 6 GHz with 28 GHz, 38 GHz, and 73 GHz as a few examples of those candidates. Initially the beyond 6 GHz spectrum is considered to be incompatible with the cellular system due to propagation characteristics limitations, but recent researches have proven that the beyond 6 GHz has the capability to support next generation cellular system. Although it is considered that the beyond 6 GHz spectrum is able to become the frequency spectrum candidate supporting 5G, site specific planning will become an important focus where the transmission performance will heavily rely on the location where the network is implemented. This bachelor thesis will discuss the simulation of a few frequency spectrum candidates when implemented in the urban environment of Jakarta and considers the propagation losses that will occur during the transmission process. The impact of spectrum candidate implementation to coverage is

also simulated and observed. Simulation results show that attenuation due to building penetration is the most significant loss of others. Vegetation attenuation will also have significant impact towards the transmission. Whereas rain and gaseous attenuation will show little significance compared to other propagation losses.
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