

Millimeter Wave Antenna for 5G Mobile Communications Systems

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Abstract : The study and simulation of a millimeter wave antenna for 5G mobile communication systems is the topic of this paper. We present at the beginning the general aspects of the 5G technology. We recall the objectives of the 5G standard, its architecture, and the parameters that characterize it. The proposed antenna model is designed using the CST Microwave Studio simulation software. Numerous methods are used at all steps of the design procedures, such as theoretical calculation of parameters, declaration of parameter values, and evaluation of the antenna through the obtained results. Initially, we were interested in the design of an antenna array at the 10 GHz frequency. Afterward, we also simulated and presented an antenna array at 2.5 GHz. For each antenna designed, a parametric study was conducted to understand and highlight the role and effects of the various parameters in order to optimize them and achieve a final efficient structure. The obtained results using CST Microwave Studio showed that the characteristics of the designed antennas (bandwidth, gain, radiation pattern) satisfy the specifications of 5G mobile communications.

Keywords : 5G, antenna array, millimeter wave, 10 GHz, CST Microwave Studio

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