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Assessment of mobile communication safety and its compact wideband microstrip antenna design

by

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ABSTRACT

The work of this thesis is about the research of mobile communication exposure and it has two folds. The first part of this work discusses the practical exposure assessment of a mobile communication base station at University of Macau, 20 measurements were taken with respective to the international safety standard - ICNIRP and the results reported that low exposure of 0.12% of the threshold (38.89 V/m) was observed in the campus. In addition, the distance effect of 0.12 dB/m was found when the far field measurement point was distanced from the base station at the University. The second part of this thesis investigates on bandwidth enhancement method of microstrip monopole antenna in order to offer a much agile and compact measurement system. To this end, the double U-shaped Defected Ground Structure (DGS) was applied onto the feed line of a conventional trapezoid monopole. Because of the additional matching offered by DGS, the bandwidth of a prototype microstrip monopole at L-band yielded a much wider bandwidth from 800 MHz to 2120 MHz. This indeed reported 115.7% increase in bandwidth when compared with that of traditional microstrip monopole.

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