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The influence of human head model wearing metal-frame spectacles to the changes of SAR and antenna gain: Simulation of frontal face exposure

Abstract

The relationship between specific absorption rate (SAR) and antenna gain inside the head due to themetal-frame spectacles was investigated. The radio frequency (RF) energy source considered is thesmartphone used in the frontal face. A computer simulation using CST Microwave Studio 2012 was used for the investigation. Two sets of dipole antennas operated at 900MHz and 1800MHz for GSM applications, were used as representative radiation sources from a mobile phone. Parametric studies were conducted to determine the optimum length of the metal rod, and the length was used to study the possibility of RF irradiation of the metal spectacles model. Then, the spectacles model was used as an analysis tool to study the interaction between gain and SAR in the head. The radiation pattern was plotted to identify thecauses of the interactions. The gain decreased when the energy source was very close to the spectaclesand SAR increased enormously.

Keywords

Human head model;Specific absorption rate (SAR);Antenna gains;Eyeglasses