

User Effects on Wearable Conformal SCMR System

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Abstract Details

The performance of a compact, wearable Conformal Strongly Coupled Magnetic Resonance (CSCMR) system is studied when the antenna is in the air and is worn on a user's arm. The wireless powering system consists of the receiver and load elements designed on a printed circuit board that is attached to a polyester fabric band. The wearable antenna achieves high efficiency, has a small volume, and can be easily printed on substrates. Although the user effect on mobile terminal antennas has been studied in detail, absorption losses in wearable antennas have not been widely investigated. Our results show that efficiency of the antenna in free space is 70% and on a user's arm is 50%. Human tissue in the close proximity of our wearable Conformal SCMR caused a decrease in radiated efficiency and total efficiency. This undesired degradation in antenna efficiency might be attributed to body loss and absorption losses. Our findings can be used as a reference for future studies on wearable devices and their applications, such as health and sports monitoring.

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