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# Path Loss inside human body using Electrically Coupled Loop Antenna at different frequency bands

Ali Ibraheem, Majid Manteghi

## Abstract:

In-body communication channels are of increasing interest for a number of telemetry applications such as Wireless Body Area Network (WBAN). Knowledge of the propagation media is a key step towards a successful transceiver design, and such information is typically gathered by physical experiments. In the case of medical implants, this could be extremely difficult if not impossible. In this paper, the Path Loss (PL) between implanted antennas will be investigated using High Frequency Structure Simulation (HFSS). The PL will be studied using Electrically Coupled Loop Antenna (ECLA) with dimensions  $(5 \times 5 \times 3 \text{ mm}^3)$ ,  $(3 \times 3 \times 3 \text{ mm}^3)$ , and  $(2 \times 2 \times 2 \text{ mm}^3)$  at the Medical Implanted Communication Services (MICS) band (402-405 MHz), Industrial Scientific and Medical (ISM) band (2.4-2.5 GHz), and Ultra Wide Band (UWB) communication band (3.5-3.6 GHz) respectively.

## Published In:

Antennas and Propagation Society International Symposium (APSURSI), , NULL , 977-978