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# On the study of the near-fields of electric and magnetic small antennas in lossy media

Majid Manteghi Ali Ahmed Younis Ibraheem

## Abstract:

In this communication, the near-field radiation characteristics of electric and magnetic antennas when surrounded by a lossy dielectric medium are described. This study is relevant for cases such as implanted antennas, submarine or underground communications where the antenna's near field consists of lossy dielectric media such as human tissues, minerals or saline water. Theoretical results for both types of small antennas are presented and expressions to show the differences in stored energy and radiated power in the radian sphere around the antenna are formulated. It is found that magnetic antennas give much better performance when surrounded by a lossy dielectric..

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