Abstracts

Study on diagnosis for tooth using millimeter-waves

N. Hoshi, Y. Nikawa, K. Kawai and S. Ebisu. "Study on diagnosis for tooth using millimeter-waves." 1998 MTT-S International Microwave Symposium Digest 98.2 (1998 Vol. II [MWSYM]): 759-762.

This paper presents applications of millimeter-waves for the characterization of teeth. This is done by measuring the complex permittivity over the frequency range from 0.04 to 40 GHz. These measurements have revealed that dental caries are significantly more lossy to microwaves and millimeter-waves than healthy tooth, and this difference can be used for dental diagnosis. The experimental results have been confirmed by using the Finite Difference Time Domain (FDTD) method at 35 GHz. In addition, higher frequency experiments have revealed that higher resolution for dental caries is possible by using a smaller applicator. It is concluded that millimeter-waves can be used for dental medical diagnosis.

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