

عنوان مقاله:

Design a Compact UWB Vivaldi Antenna with Various Slots for Breast Cancer Microwave Imaging

محل انتشار:

اولین کنفرانس ملی کاربردهای نوین در حوزه الکترومغناطیس (سال: 1400)

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خلاصه مقاله:

Breast cancer is a disease that occurs most often in females. Early detection can increase the chance of a successful treatment. However, current breast-imaging systems such as breast ultrasound, X-Ray mammography, and magnetic resonance imaging (MRI) have their own disadvantages. Here a safe and inexpensive method which is called microwave imaging is presented. Ultra Wide Band systems are used for microwave imaging in order to increase the resolution. So, UWB antennas are so consequential. In this paper, a novel compact UWB antipodal Vivaldi antenna is presented which is used various slots to obtain required bandwidth with respect to Federal Communication Commissions (FCC) standard rules (۳.۱-۱۰.۶) GHz and includes low frequencies for better penetration depth and high frequencies for better resolution. The antenna is designed on RO $\epsilon_r=3$, and its dimension are . Finally, with time-reversal multiple signal classification (TR-MUSIC) algorithm, the image of tumor in a breast is generated for ۲ scenarios with ۴ and ۶ number of antenna elements and it is shown that the tumor can be detected well with ۶ elements.

کلمات کلیدی:

UWB, Microwave imaging, Vivaldi, TR-MUSIC

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