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Cervical Cancer Detection Using Microwave Frequencies[1] GRACE HARLEY[2], HAIDER RAAD[3], Xavier University — Cervical cancer is one of the most common cancers in women worldwide. Current methods of diagnosis include a Papanicolaou (Pap) smear and a colposcopy/biopsy. Due to a varied water content in cancer tissues, cancer cells typically have a different set of dielectric values than healthy tissues. Our objective is to show whether it is possible to use electromagnetic waves at microwave frequencies to detect cervical cancer noninvasively and to propose a method that is cheaper/more accessible than current methods. Using CST simulation software to model human anatomy with correct dielectric values, we determined that a completely non-invasive approach was not possible as too much energy was lost in surface tissues before reaching the cervix when using an exterior approach. A trans-vaginal approach was found to have a good distinction between the healthy and cancerous models. This showed that cancer detection using microwaves is possible.

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