

## Breast cancer detection using forward scattering radar technique

### ABSTRACT

This paper presents an initial investigation for breast cancer detection using a special mode of bistatic radar system known as forward scattering radar (FSR). The proposed method analyzes the Doppler frequency in the received signal scattered from the tumor for cancer detection and localization. Three systems of architectures were analyzed which determined by the mechanical movement of transmitter or receiver or both. This paper also discusses an initial simulated result by using CST Microwave Studio as a feasibility study of utilizing FSR for breast cancer detection. It is shown that by investigating the unique character of Radar Cross Section (RCS) for breast tissue and tumor of FSR a cancer can be predicted. Electromagnetic model including fatty tissue and a tumor were simulated to obtain RCS parameter and analyzed as well as compared with whose fatty tissue without cancerous lesion to pinpoint the presence of tumor from its FSR signature. The result shows a significant different between these two models in FS RCS.

**Keyword:** Breast cancer detection; Forward scattering radar (FSR); Doppler frequency; Radar cross section