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| **Title:** | Design of a Patch Antenna Operating at ISM Band for Brain Tumor Detection | | |
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| **Abstract:** |  |
| This paper discusses about an antenna designed to detect brain tumor which operates at Industrial, Scientific and Medical (ISM) band (2.4–2.4835 GHz). The antenna is a wearable on body pentagon shaped micro strip patch antenna which has a dimension of 33 × 23 × 1mm 3 . It is very favorable for on body appliances because of its compact size. The antenna uses FR-4 lossy as its dielectric substrate with a thickness of 0.8 mm and copper for patch and ground, each having a thickness of 0.1 mm. A human head phantom model is also being designed to get more idealistic values of the antenna parameters when placed above the head phantom model. The head phantom contains six homogenous layers which were skin, fat, skull, dura, CSF (Cerebrospinal fluid) and the brain. A tumor of size 5 mm is designed having a relative permittivity of 50 and conductivity of 1.58 S/m. Input signal is being radiated into phantom model and the response is being recorded by the receiver antenna. The antenna monitors the Radiation pattern, Voltage Standing Wave Ratio (VSWR) and the Return loss of a normal head model and then later compares these parameters with a head model containing a benign tumor of size 5 mm. The parameters measured are safe and operates at ISM band. Under IEEE standard safety regulation, the Specific Absorption Rate of a brain should be within 1.6 W/kg and the designed model obtained a SAR of 0.36 W/kg which is harmless for human body. | |