Defense Announcement

Estimation of Temperature Increase in Passive Implants undergoing MRI Procedure

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Magnetic Resonance Imaging (MRI) is a technique to image the in-body tissues. MRI has great practical implications that include detection of smallest tumors, clots, study brain activity etc. But with all the miraculous achievements Magnetic Resonance technique possess very serious safety issue for patients with metallic in-body implants like metal teeth caps, bone plates, pace makers etc. The electrical conductivity of the implant makes it susceptible to heating when exposed to RF wave. To better understand this phenomenon and the extent of damage caused by this heating, the RF heating experiment in ASTM phantom is conducted. However, it would be very time consuming to perform an entire MRI test which takes at least 15 minutes. This thesis proposes an alternative to run the test for a shorter period and use that data to estimate the final temperature using sophisticated curve fitting techniques and custom curve equations.