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Date of Award:

Name of the Scholar: Sirdeshmukh Shaila Parveen Syed Maqsood Ali

Name of the Supervisor: Prof. Munna Khan

Name of the Department/Centre: Electrical Engineering

Topic of Research: **Pulsed Electromagnetic Field Based System for Wound Healing of the Human**

PEMF therapy has been proven effective in treating a variety of diseases. It is a type of electrotherapy that involves the use of electrical energy to guide a succession of magnetic pulses via tissues by creating tiny, beneficial and harmless electromagnetic signals. The simulation and development of PEMF based system has been done. The signal generator unit was simulated using NI Multisim software and the exposer coil is designed and simulated using the COMSOL Multiphysics software. Two types of systems are developed: (a) PEMF system using IC (b) PEMF system using programmable microcontroller. The system produces a low frequency asymmetrical signal and PWM signal having a variable frequency (0-100Hz) and duty cycle (0-100%) produces magnetic flux density in the range of 0.5 to 10.55 mT. Furthermore, noninvasive BIA technique has been studied for the wound healing assessment using animal bone. Based upon the lab and clinical validation the developed systems are proved effective in reducing pain, swelling and edema and hence reduces the time of healing.