

## ABSTRACT

*Inspection is a routine activity carried out in the industrial field. One method in the activity is Non Destructive Testing (NDT). In the inspection activities the NDT method is used the Eddy Current Testing method which utilizes a magnetic field that arises in the coil that is given a current. Therefore, the coil needed is a coil that can produce homogeneous magnetic fields so as to induce the inspection area evenly. Rectangular coil is a coil that produces a homogeneous magnetic field compared to the cylindrical coil. So far, the coil design has been experimented experimentally with a limited variation of coil parameters. Required determination of coil parameters that can produce a homogeneous magnetic field before the actual implementation of coil making. Therefore we need a simulation of magnetic field calculations with adjustable coil parameters. The simulation will be made using Matlab with Biot-Savart Law on a rectangular coil and the results of the Matlab program will be integrated into the features of the matlab namely GUI (Graphical User Interface). Integrating the matlab program into the GUI is done so that the simulation can be changed to current variables, observation distance, coil length, observation segment length, number of turns and coordinate magnetic field distribution so that in the use of simulations it is easier to input the data to be simulated. The simulation will be validated using experimental data with 0.8 mm and 0.7 mm wire diameter variations in the 120 coil coil, the current variations in the 120 coil are 0.27 A, 0.36 A and 0.46 and the variation in the coordinates where the center point of the coil is located at coordinates (3.3), (3.5), (3,8) (5.5), (8.3) (8.6) and (8.8). The simulation results show the similarity of patterns to the experimental results where the largest magnetic field point is at the center of the coil.*

**Keywords:** *Non Destructive Testing, Eddy Current, Magnetic Field, Rectangular Coil, Biot-Savart Law, R2017a Matlab Simulation.*