Abstract

This study aims to understand the magnetic field that we cannot see directly, so we need tools to understand it, one of which is the Biot-Savart law. Biot-Savart explained that the connection of an electrified coil will produce a large magnetic field, therefore the purpose of this study is to design a microcontroller-based magnetic field measuring instrument using a coil as a calibration reference with variations in diameter, winding and length of the coil, with graphic comparisons obtained from each data, produces a linear rise with variations that affect the value of the magnetic field. Arduino Uno as a microcontroller to process the current value given by the CPS - CC circuit by being regulated by a potentiometer for the amount of voltage then the V to I circuit converts to current and is detected by the INA219 sensor to ensure the voltage value given is linear with the current coming out to the coil, so that it gets a linearity that is very close to 1 from each variation in the number of turns, coil length and winding diameter. For the linearity of the current sensor it is 0.9999 and has an error value of 0.3099174% and for the magnetometer sensor it can only be obtained from the linearity of 0.9821 because the calculation and measurement values get a large difference which is influenced by the many simplifications of the formula..

Keywords: Biot-Savart, (CPS-CC), Arduino Uno