

Magnetic field distribution for single coil pulsed linear accelerator

Abstract

This paper presents the magnetic field distribution for a single coil pulsed linear accelerator. The design of the pulsed linear accelerator is implemented using a coil and capacitor bank. A Hall-effect sensor is applied to measure the magnetic field inside the coil. Basically, this project focuses on the magnetic field distribution for different Hall-effect positions inside the coil with different settings of capacitor banks. The capacitor bank is operated as a pulse current generator for the coil. The result obtained is compared for different magnetic field distributions with different Hall-effect positions inside the coil. The result is tabulated and analyzed using a graphical method. The purposes of the research are to analyze the magnetic field distribution for a single coil pulsed linear accelerator using a Hall-effect sensor and to obtain the highest magnetic field for a specific Hall-effect sensor position inside the coil. The result showing that the 200 V, 1120 uF capacitor bank with Hall-effect sensor position of 7 mm and magnetic field of 12.2 mT.

Keywords

Accelerator; Coil; Magnetic field; Pulsed