Electric Vehicle Used for Underground Mining Security

Abdelkrim Rechach
Echahid Cheikh Larbi Tebessi University, Mining laboratory, Algeria

Sihem Ghoudelbourk
Badji Mokhtar University, Annaba, Algeria

Mounia Taleb
Echahid Cheikh Larbi Tebessi University, Envirment Laboratory Algeria

Abstract

Businesses are interested in switching reluctance motors (SRM), a type of electromagnetic motors, as opposed to induction, brushless, or permanent magnet machines. This is due to the rotor's endurance, simplicity, and lack of coils, windings, and permanent magnets. It can operate in a broad range of power in the electric vehicle's drive, even in hostile situations like underground mines, to give it a longer lifespan.

This article compares two intelligent speed controllers that use direct torque control (DTC) to reduce torque ripples, caused by peripheral discontinuities brought on by the geometry of the SRM rotor. Consequently, the Fractional Order Controller (PIα) performs better than the Artificial Neural Network (ANN) when used in conjunction with direct torque control.

Keywords

Switched Reluctance, Motor, Electrical Vehicle; Fractional Order Controller, Underground Mines Security, Direct Torque Control, Artificial Neural Network Controller.