

Electromagnetic Launch

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ABSTRACT:

When an electric current passes through a conductor, the conductor feels a force that runs perpendicular to both the generated electrical and magnetic fields. Electromagnetic launch uses 2 immobile rails, which create a large potential difference, and completes the circuit with a mobile armature that experiences the force in the direction directly between the rails, thus moving the armature down the length of the rails with this Lorentz force. By varying the geometry, current level, power level, capacitor discharge pulse timing, and materials used, the exit velocity and the life of the system. Specifically, the composition of the rail system's materials has an impact on the 'barrel life' of the system. Before a complete teardown occurs, the system using steel rails outlasted the system using various types of copper rails.

KEYWORDS: electromagnetic launch, railgun, Lorentz force

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