中国电机工程学报 2010, 30(27) 123-128 DOI: ISSN: 0258-8013 CN: 11-2107/TM

电工理论与新技术

基于交错式线圈布局的连续脉冲磁行波电磁发射基础研究

郭芳，唐跃进，任丽，李敬东

华中科技大学超导电力科学技术研究与发展中心

摘要： 多级重接炮各级电源的激励需与发射体位置同步。在低速下，发射体位置变化较慢，导致相邻两级电源激励间隔时间较长，难以快速启动。针对该情况，提出一种基于交错式线圈布局的连续脉冲磁行波电磁发射方法，利用在时间和空间上连续的脉冲磁行波，增加发射体的受力时间，并且缩短各级激励间隔时间，从而提高发射速度和发射效率。通过仿真，计算了该种发射方式的发射效果，探讨了由于驱动线圈交错布局产生的垂直力的处理方法。仿真显示，与重接炮相比，基于交错式线圈布局的连续脉冲磁行波电磁发射能提供更高的发射速度和发射效率，并且缩短了发射用时。

关键词： 电磁发射 连续脉冲磁行波 重接炮 交错式线圈

Basic Research in Continuous Pulsed Magnetic Traveling Wave Electromagnetic Launch Based on Interlaced Coil Layout

GUO Fang, TANG Yuejin, REN Li, LI Jingdong

R&D Center of Applied Superconductivity, Huazhong University of Science and Technology

Abstract: The each stage power excitation of multi-stage reconnection gun must be synchronized with the position of projectile. When the speed is low, the position of projectile changes slowly. It leads to the interval of two adjoining power excitation longer and not easy to quickly startup. In view of this situation, this paper presented a continuous pulsed magnetic traveling wave launch based on interlaced coil layout. The continuous pulsed magnetic traveling wave from temporal and spatial could increase the force time of projectile and shorten the interval of excitation. Then the speed and efficiency would be increased. The effects of launch were simulated in this article, and the vertical force generated by the layout was dealt with. Simulation shows that compared with the reconnection gun, continuous pulsed magnetic traveling propulsion can provide a higher launch speed and launch efficiency, and the time of launch is shortened.

Keywords: electromagnetic launch continuous pulsed magnetic traveling wave reconnection gun interlaced coil layout

收稿日期 2010-03-31 修回日期 2010-06-08 网络版发布日期 2010-09-29

DOI:

基金项目:

通讯作者: 郭芳

作者简介:

作者Email: guofang19830119@163.com

参考文献：

本刊中的类似文章

1. 鲁军勇 马伟明 李朗如.高速长初级直线感应电动机纵向边端效应研究[J]. 中国电机工程学报, 2008,28(30): 73-78