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一维弹道修正弹气动分析与射程修正控制算法 (PDF)

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Title: Aerodynamic Analysis and Trajectory Correction Control for One-dimensional Trajectory Correctional Projectile

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关键词: 一维弹道修正弹; 气动特性; 阻力环; 射程修正能力

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摘要: 为了提高炮弹的射击集中度,以安装有阻力环的一维弹道修正弹为研究对象,研究了阻力环结构对弹丸气动特性的影响情况,及通过控制阻力环打开时刻实现射程修正控制的算法。基于数值模拟方法,通过对相同外露高度和不同安装位置的阻力环结构方案进行外流场数值仿真和气动力参数计算,得出不同模型的增阻情况,为一维弹道修正弹气动外形设计提供参考。应用自编的一维弹道修正弹外弹道计算程序,分析了阻力环打开时刻对修正能力的影响,研究了阻力环打开时刻的计算方法。研究结果可为一维弹道修正炮弹的外弹道设计提供依据。

Abstract: To improve concentration of projectiles, one-dimensional trajectory correctional projectile with drag brake was studied. The effect on aerodynamic performance of drag brake to the projectile was analyzed, and the method controlling the action time of drag brake was presented. By numerical simulation, the aerodynamic performance for different structure of drag brake was studied where the outer height of the drag brake was same while the mounting position was different, then the additional drag coefficient from different drag brake was got, which can be referred for the design of aerodynamic structure of one dimensional trajectory correction projectile. At the same time, using the self-programming software, the effect on trajectory correction capability of action

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time of drag brake was analyzed, and the computing method of the action time of drag brake was studied. The studying result can be the fundamentals for the exterior ballistic trajectory design of one-dimensional trajectory correction projectile.

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