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混凝土侵彻过程中弹道偏转的影响因素和规律研究

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Title: The Research of Influence Factors and Law of Trajectory Deflection in the Process of Penetration into Concrete Targets

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关键词: 靶体响应力函数; ABAQUS; 斜侵彻; 混凝土靶; 弹道偏转

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摘要: 为了研究弹体斜侵彻半无限厚混凝土过程中不同因素对弹道偏转的影响规律,采用半经验公式法,确定了靶体响应力函数,然后利用ABAQUS,将靶体响应力函数加载到弹体表面作为有限元计算的边界条件,计算得到了弹体侵彻混凝土时弹体质心运动轨迹。分析发现,倾角越大,倾角对侵彻深度和偏转角的影响越明显;入射速度对弹道偏转的影响随着入射速度的增大呈现减小的趋势;质心位置越靠近弹体尾部,弹道偏转越大,越不利于侵彻。

Abstract: In order to study the trajectory deflection law of rigid projectiles obliquely penetrating into concrete targets, the semi-empirical formulas method was used to determine target resistance function and the target resistance function was loaded onto a projectile surface as a boundary condition by ABAQUS. Therefore, the trajectories of the mass center of the projectiles were calculated. The following conclusions were got through the analysis: the greater the oblique angle is the more obvious influence of oblique angle on penetration depth and direction change is; the influence of trajectory deflection shows the tendency of decrease with the increase of impact velocity; trajectory deflection is larger as mass center position is nearer to the projectile tail.

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