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基于粒子群优化算法的子母弹最佳抛撒半径选择

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Title: Selection of Submunition Missile's Best Separation Radius Based on Particle Swarm Optimization (PSO)

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摘要: 子母弹抛撒半径是由产品和射击条件决定的,是评定子母弹打击效果的必要条件。为了使子母弹对目标的打击效果达到最佳,需要确定子母弹最佳抛撒半径。针对子母弹打击机场跑道问题,通过Monte Carlo方法模拟子弹落点并计算机场跑道的失效率。基于粒子群优化算法,对子母弹抛撒半径进行优化求解,使跑道失效率达到最大值。仿真结果表明,粒子群优化算法能够有效的达到或接近全局最优。同时,与遗传算法相比,粒子群优化算法收敛速度更快,精度更高,能够有效的求解子母弹最佳抛撒半径问

Abstract: The separation radius of submunition is decided by the manufacture and the condition of shooting, which is the condition of estimating the damage effect of submunition missile. For the sake of the best striking effect of submunition, ascertainment of the best separation of submunition is needed. Aimed to the issue of the submunition against runway, the points of bullets are simulated by using Monte Carlo methods, and the computer simulating calculation of disable probability of runway (DPR) is carried out. Based on PSO arithmetic, the separation radius of submunition is optimized, and the best DPR is achieved. The simulation results show that, PSO arithmetic can achieve the whole optimization or be more close to it more efficiently. Compared with genetic algorithm (GA), PSO has swifter speed of convergence, higher efficiency of calculation for the calculation of submunition missile's best separation radius.

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