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# Numerical Simulation and Optimized Design of Cased Telescoped Ammunition Interior Ballistic

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**Abstract:** In order to achieve the optimized design of a cased telescoped ammunition (CTA) interior ballistic design, a genetic algorithm was introduced into the optimal design of CTA interior ballistics with coupling the CTA interior ballistic model. Aiming at the interior ballistic characteristics of a CTA gun, the goal of CTA interior ballistic design is to obtain a projectile velocity as large as possible. The optimal design of CTA interior ballistic is carried out using a genetic algorithm by setting peak pressure, changing the chamber volume and gun powder charge density. A numerical simulation of interior ballistics based on a 35mm CTA firing experimental scheme was conducted and then the genetic algorithm was used for numerical optimization. The projectile muzzle velocity of the optimized scheme is increased from 1168m/s for the initial experimental scheme to 1182m/s. Then four optimization schemes were obtained with several independent optimization processes. The schemes were compared with each other and the difference between these schemes is small. The peak pressure and muzzle velocity of these schemes are almost the same. The result shows that the genetic algorithm is effective in the optimal design of the CTA interior ballistics. This work will be lay the foundation for further CTA interior ballistic design.

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