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Numerical Study on the High-Speed Water-Entry of Hemispherical and Ogival Projectiles ZITAO GUO, Hypervelocity Impact Research Center, Harbin Institute of Technology, WEI ZHANG, GANG WEI, XINKE XIAO — The water entry problem is considered as a classic problem which has a long research history, however, projectile water entry is still a difficult problem that has not been completely solved. In this paper, the effects of the projectile nose shape on laws of velocity attenuations for all projectiles were studied by a series of numerical simulations using the AUTODYN-2D. The projectiles including the hemispherical and ogival projectiles with three CRH (caliber-radius-head) have been set to a constant mass and their water-entry velocities were in the range of 300m/s \sim 1500m/s. The result showed that the drag coefficient increases monotonically with increasing initial velocities for an identical projectile but decrease with the increase of the CRH for ogival projectiles at the same velocity. It was found that the relation between the drag coefficient and the initial velocities for all projectiles can be expressed as a general equation. Correspondingly, the relation between the drag coefficient and the CRH value of ogival projectiles was also presented in this paper.

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