

# 一种基于 SFM 算法的投放试验测量方法

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**摘要:** 在某些无法采用常规 CTS 试验方法确定投放物与载机能否安全脱离的试验要求下, 就需要采用光学测量的方法进行自由投放试验获得投放物与载机的分离过程, 以判断投放物是否能够与载机安全分离. 本文采用了一种基于 SFM (Structure From Motion) 算法的高速视频测量方法, 首先对模型表面标志点检测并匹配, 进而采用三角测量原理计算出模型质心位置, 实现了对自由投放亚音速风洞试验中模型下落轨迹的捕捉和计算过程.

**关键词:** 自由投放; 光学测量; 亚音速风洞试验; SFM

## A wind tunnel test method to realize store separation

### measurement based on SFM algorithm

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**Abstract:** It is reasonable to investigate the procedure of store separation from the its carrier to determine whether it is an absolutely safe or not, which employs optical measurement method to implement free store separation wind tunnel test, when the CTS test method is inapplicable subjecting to test condition. In this paper, such issue is fully solved by utilizing industrial cameras with top-speed frame rate and high resolution and processing those frames to realize SFM (Structure From Motion) algorithm. After detecting and matching the markers in the frame pair, it is effective to calculate the barycentre of the model by triangulation principle. When it is put all those frame calculating results together, the store falling trajectory during the subsonic wind tunnel test is captured and estimated.

**Key words:** free store separation; optical measurement; subsonic wind tunnel test; SMF

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