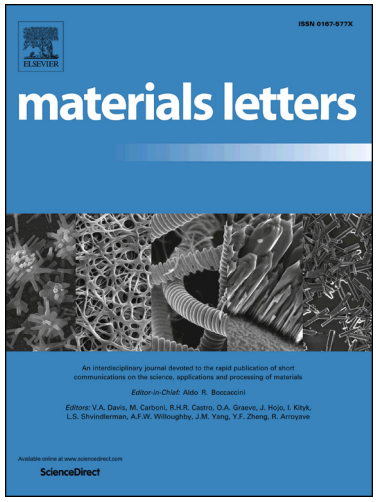

Experimental study on stress attenuation in aluminum foam core sandwich panels in high-velocity impact

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Experimental study on stress attenuation in aluminum foam core sandwich panels in high-velocity impact

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Abstract

The present work examined the dynamic behaviors of sandwich panels with aluminum foam core and steel faceplates at an impact velocity of about 370m/s. The stress attenuation before and after the foam core during penetration process was measured by means of Polyvinylidene Fluoride transducers. It was found that the stress value was remarkably reduced, and the rise velocity of stress slowed down evidently as foam core was compressed. The profile of the damaged aluminum foam illustrated no obvious localized "*X*" failure patterns at the velocity tested presently.

Keywords: Metallic composites; porous materials; high-velocity impact; PVDF transducer; stress attenuation; damage profile

1. Introduction

Sandwich structures with cellular metallic core (foams and honeycombs) and metallic skins have been widely used as protective components in aerospace and vehicles [1]. Up to now, efforts have been focused on the response of cellular metallic core sandwiches under distributed dynamic loads in blast events [2-5]. However, the protections may also withstand impinge from foreign objects such as birds, flying low-mass fragments and even projectiles, damaging mechanical