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RESEARCH ON BUFFER MECHANISM AND IMPACT DYNAMICS OF PRE-FOLDED METAL
HONEYCOMB STRUCTURE

Abstract

During space exploration, the lander buffer device is one of keys to successful soft landing. The current legged lander buffer devices generally adopt honeycomb structure. According to our research on pre-folded honeycomb structure buffer mechanism, it has been found that after the honeycomb structure has been pre-folded, the structural strength along in-plane direction can be greatly increased and the peak stress can also be reduced so that the structure deformation stability can be improved.

Base on the above pre-folded method for improvement of honeycomb structure buffer performance, this paper presents a pre-folded honeycomb buffer structure design method, and establishes a pre-folded honeycomb structure impact dynamics simulation model. The simulation results show that the honeycomb structural strength along in-plane direction can be increased up to 20 times, and the peak stress can be reduced 50% at least, compared to the traditional hexagonal honeycomb structure, with same structure parameters and substrate material.