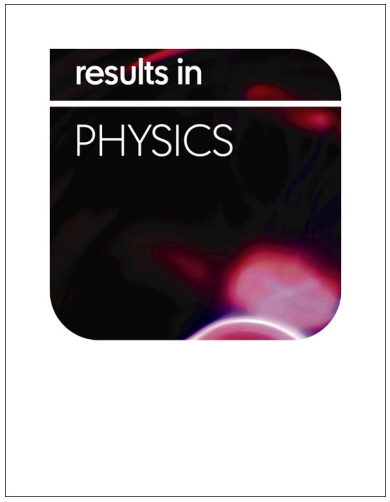

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Broadband radar absorbing sandwich structures with enhanced mechanical properties

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Abstract: Foam sandwich structures reinforced with the fiber column arrays are proposed to achieve broadband absorption at microwave frequencies as well as good mechanical properties. To achieve the microwave absorption, two layers of resistive films are embedded into the sandwich structures. The results show that the proposed sandwich structure with the whole thickness of 9.73 mm can achieve broadband absorption with the reflection less than -10 dB in the frequency range of 2.6-21 GHz. The absorption mechanism has been discussed by using the equivalent circuit model. It is further indicated that introduction of the fiber column array in the sandwich structure has little influence on the absorption performance, but can remarkably enhance the mechanical properties. This has been well demonstrated experimentally by three-point bending experiment. Compared with the ordinary sandwich absorbing structures, enhanced mechanical properties make the designed structure suitable in some loading applications. It is expected that the proposed multifunctional structure may find great potentials in the applications of stealth technology, electromagnetic interferences and so on.

Keywords: sandwich structure; broadband absorption; mechanical properties; equivalent circuit model