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Effects of stitch on mechanical and microwave absorption properties of radar absorbing structure

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Abstract: Combination of frequency selective surface (FSS) with fiber reinforced plastic (FRP) has been demonstrated as a type of radar absorbing structure (RAS) with efficient microwave absorbing capacity but relatively poor mechanical performances. To improve the mechanical performance of FSS-FRP caused by the weak interfacial bonding strength between FSS film and FRP composite laminate, we introduce here a local stitching technique for RAS. Mechanical tests including uniaxial tensile, three-point bending, and low-velocity impact reveal that the strengths of stitched FSS-FRP structure are remarkably improved. The influence of stitching method on microwave absorbing performance of a well-designed RAS is controlled in a slight level. Therefore, stitching method can improve the mechanical performances of RAS without sacrificing the microwave absorbing capacity.

Keywords: Radar absorbing structure; stitching process; mechanical properties; microwave absorbing property

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