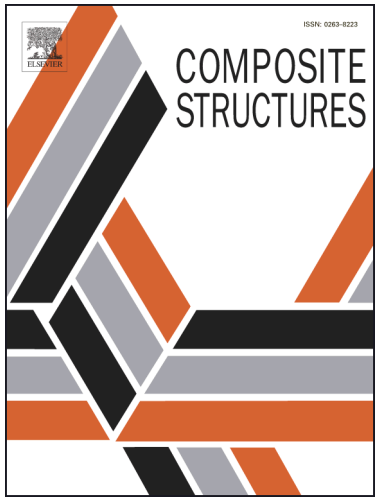

Effect of Fiber Orientation On The Compressive Response of Plain Weave Carbon Fiber/Epoxy Composites Submitted To High Strain Rates

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EFFECT OF FIBER ORIENTATION ON THE COMPRESSIVE RESPONSE OF PLAIN WEAVE CARBON FIBER/EPOXY COMPOSITES SUBMITTED TO HIGH STRAIN RATES

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Abstract

Composite materials undergo intricate damage processes, which are accentuated when these materials exposed to impact loading conditions. In this context, this work aims to study the behavior of fiber reinforced polymer composites submitted to high strain rate in compression. A composite laminate plate was obtained using a plain weave carbon fiber fabric and an epoxy resin as matrix. The Split Hopkinson Pressure Bar (SHPB) technique was used to apply compressive loads at three different strain rates and in six different directions (0°, 15°, 30°, 45°, 60° and 75°) relative to the warp. The compressive failure modes were studied using a high speed camera to record the SHPB test. With increasing strain rates, it was possible to identify a transition from longitudinal cracking failure to delamination buckling failures. Similarly, the off-axis