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**CFRP-TO-STEEL BONDED JOINTS SUBJECTED TO CYCLIC LOADING:
AN EXPERIMENTAL STUDY**

Yongming Yang¹, Manuel AG Silva², Hugo Biscaia³, Carlos Chastre⁴

Abstract

Pseudo-cyclic and cyclic loading were applied to CFRP-to-steel bonded joints built with two different CFRP laminates. In this paper, the strength capacity and bond-slip curves are presented and compared. The modes of failure are also described and associated with the types of material used, and the observed performances are correlated. The analysis of the results showed a threshold value for loading and amplitude level, below which the cyclic loading caused no detectable damage. For cycles above that limit, the region of the joints around the loaded end presented degradation reflected on the bond-slip stiffness and on the increase of residual deformation. It was found that the normalized dissipated energies either obtained from the bond-slip relationship or from the load-slip response had the same trend. The experimental data allowed also to establish a relationship between the damage developed within the interface and the normalized slip. A preliminary estimate of fatigue limit based on those data is suggested.

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