Delamination simulation of composite T-joints for marine application

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Summary

The need to assess the structural capability of marine composite structures that support the T-joints of composite ships has increased due to the rise in the number of accidents and human casualties. In this paper, the delamination behavior of T-joint under out-of-plane load was studied based on the cohesive zone damage model(CZD). Maximum interlaminar stress criterion was used to govern the damage initiation, and a bilinear damage evolution law was adopted to characterize the damage growth. The whole delamination process of T-joint was simulated and stress level after each delamination was characterized. The relationship between crack growth length and external load was also achieved. FEA predictions were compared with experimental results obtained from mechanical testing.