general, controlling t_o values in the manufacturing process of the composite is important to meet requirements of the design structures.

IV. Conclusions

The effect of interfacial strength on the mechanical properties of a fiber–matrix composite was revealed. The interfacial strength strongly affected the composite under applied transverse loading: the ultimate tensile strength and toughness of the composite decreased by 50% when the interfacial strength was decreased 50%. This relationship might be a consequence of the failed transfer of the load from the matrix to the fibers, rendering the fibers unable to effectively participate in bearing the load and resulting in the appearance of cracks at the interface under low loading. By contrast, the mechanical properties of composites under longitudinal loading only slightly changed in response to changes in interfacial strength because the failure scenario of the composite under longitudinal loading allows fibers to break before cracks occur at the interface or in the matrix. The diminished mechanical properties of the composite are mostly caused by poor mechanical properties of fibers owing to the surface treatment. The role of interfacial strength in determining the mechanical properties of the composite was confirmed in this study.

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