

3D in situ observations of glass fibre/matrix interfacial debonding - DTU Orbit (09/11/2017)

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X-ray microtomography was used for 3D in situ observations of the evolution of fibre/matrix interfacial debonding. A specimen with a single fibre oriented perpendicular to the tensile direction was tested at a synchrotron facility using a special loading rig which allowed for applying a load transverse to the fibre. Three distinguishable damage stages were observed: (i) interfacial debond initiation at the free surface, (ii) debond propagation from the surface into the specimen and (iii) unstable debonding along the full length of the scanned volume. The high resolution microtomography provides both qualitative and quantitative 3D data of the debonding initiation and propagation. Thus, microtomography is demonstrated as a promising technique which can assist micromechanical model development. © 2013 Elsevier Ltd. All rights reserved.

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