

Local strain measurement in Ti/SiC fibers by microdiffraction of synchrotron X-rays.

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Titanium materials reinforced with monofilament SiC fibers have potential applications when high creep resistance is needed. The development of these materials requires that we improve our understanding about the micromechanics of these materials. The development of residual stresses and their modification during loading is for instance a key issue.

For this purpose, model composites were fabricated in England. Local strains were then mapped using microdiffraction during in situ tensile experiments on the ID11 beam line at the ESRF. The high energy beam (60 keV) was restricted by slits down to a 100*20 μm size allowing to perform strain measurement in each single fibre (the diameter of the fibres is 120 μm) with a pitch of 20 μm along its axis.