

Ankündigung eines Gastvortrages

im Rahmen des Mechanik Seminars

zum Thema

Modeling of the elastic properties of carbon/carbon composites for arbitrary fibers distribution*

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Gastdozent:

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Abstract:

Carbon/carbon (C/C) composites fabricated by chemical vapor infiltration (CVI) of carbon fiber preforms have a complicated hierarchical microstructure. The fiber distribution in the preform of the composite already determines the architecture of the composite and, consequently, the effective mechanical properties. Three-dimensional structural information obtained by micro computer tomographic studies on non infiltrated preform is used for construction of the orientation distribution functions of the fibers. For characterizing of the pores distribution in the C/C composite the μ CT studies of the infiltrated preform were provided. Obtained microstructural information was analyzed and information about the pores shapes, volume, and distribution were extracted using numerical algorithm. Pores with particular shapes were approximated by ellipsoids and pores distribution functions were constructed. Material parameter identification of the carbon/carbon composites was provided using numerical implementation of semi-analytical methods. The distribution functions obtained from microstructural studies is used as input for homogenization schemes for the determination of the effective elastic constants. The predictions are compared to ultrasonic measurements.

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