Seminar zu Fragen der Technischen Mechanik

zu folgendem Vortrag wird herzlich eingeladen

Montag, 08.12.2008, 14:30 Uhr, Egerlandstr. 5, Raum 0.044

3-D modelling of materials with pronounced internal micro- and nano-heterogeneities
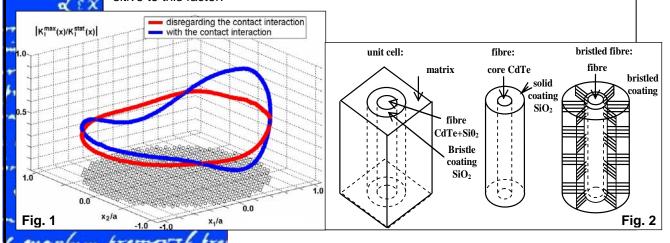
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The talk gives several examples of 3-D modelling of materials with pronounced internal micro- and nano-heterogeneities.

In particular, the application of boundary integral equations to the problem of interface cracks between two dissimilar half-spaces under harmonic loading is considered. The study is focussed on the effect of contact interaction of the opposite crack faces. The distributions of the displacements and tractions at the interface and the crack surface are obtained and analysed. The stress intensity factors (opening and shear modes) are calculated for different values of the wave frequency and different properties of the half-spaces **(Fig. 1)**.

Also, the new concept of nanocomposite structure is discussed. An analytical model predicting the properties of nanocomposites with brush-like reinforcement is developed **(Fig. 2)**. The model yields the explicit formulas for effective elastic constants. The computed results for two classes of fibrous composites, which are additionally rein-forced either by whiskerizing the microfibres or by bristlizing the nanowires, show a very strong rise to the value of Young modulus. However, the shear modulus, being the driving parameter for the strength estimation of the entire composition, is less sen-sitive to this factor.

Fig. 1

Fig. 2

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