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Applying Fourier numerical analysis to determination of tensor elements of the deformations of seed covers

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Keywords

stress measurement, Fourier analysis, Young's modulus, Poisson's ratio

Abstract

A video-extensometry method for studying the mechanical properties of seed covers is presented. Young's modulus and Poisson's ratio for the material tested, i.e., seed covers of dried broad beans (Vicia faba) are determined. A microscopic image of thin film gold nets (42 and 162 μm thick) deposited on sample surface was transferred through a camera to computer memory which carried out the analysis of changes occurring in the course of sample tension. Fourier's numerical analysis was applied to determine tensor elements of deformations of the materials under study. The method is characterized by high measuring accuracy. Another advantage lies in its insensibility to additional boundary effects, which could occur in the vicinity of sample clips.