

English summaries

Rakenteiden Mekaniikka (Journal of Structural Mechanics)
Vol. 45, No 1, 2012, pp. 21-33

On frequency domain fatigue analysis

Jukka Lähdeniemi and Jari Mäkinen

Summary. This article focuses on the frequency domain fatigue analysis, which makes it possible to get rid of slow and laborious time domain simulation. Today, the most reliable method to carry out fatigue analysis is to utilize the strain gauge measurements in the structure under operating conditions and using time domain fatigue analysis. It is also possible to exploit multi-body simulation models. Unfortunately, the determination of loads for the simulation is not practical and easy approach to, or it requires the use of the device, and the complete modeling of the environment. In this article, we are seeking alternative solutions using the frequency domain fatigue analysis.

Key words: fatigue analysis, probability calculus, frequency domain

Rakenteiden Mekaniikka (Journal of Structural Mechanics)
Vol. 45, No 1, 2012, pp. 34-44

Acoustic scattering from elastic object

Timo Lähivaara and Tomi Huttunen

Summary. In this paper, time-dependent wave propagation in three-dimensional heterogeneous media containing fluid-solid interfaces is studied. In the numerical experiments, the acoustic scattering from a cylindrical shaped elastic object is investigated. Numerical approximation of the problem is computed using the discontinuous Galerkin method with the low-storage Runge-Kutta time stepping. The order of the polynomial basis functions is chosen individually for each tetrahedral element of the computational grid.

Key words: discontinuous Galerkin method, low-storage Runge-Kutta, high-order basis functions, perfectly matched layer, acoustic scattering