عنوان مقاله:

Free vibration analysis of non-uniform Euler–Bernoulli beams by Differential Quadrature Element Method (DQEM

محل انتشار:

نهمین کنگره بین المللی مهندسی عمران (سال: 1391)

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خلاصه مقاله:

The differential equation of the free vibration of a non-uniform Euler–Bernoulli beam is considered. The stiffness and mass matrices of the structural system are produced by Differential Quadrature ElementMethod (DQEM). By solving the eigenvalue problem in determining the natural frequencies of the beam, extensive parametric studies based on the boundary conditions as well as the number of interpolation points are achieved. To verify the obtained results and also the rate of convergence of the employedmethod, the traditional Finite Element Method and the Galerkin Method are used. The results show the natural frequencies obtained by the DQEM have high accuracy while the CPU runtime decreases noticeably. Therefore, utilizing DQEM in the analysis of dynamic problems in non-uniform beams seems to be more efficient than the traditional Finite Element Method and the Galerkin Method as well

کلمات کلیدی:

DQEM, free vibration, non-uniform beams, Finite Element Method, Galerkin Method

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