Study, Based on FEM, of the Angular Vibrations of a Rotating in the Vertical Plane System of Rod and Concentrated Masses

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The paper presents a study of the dynamic behavior of the vibrating in the vertical plane system, on the base of FEM. The system consists of a vertical joint supported rod, concentrated masses and elastic-viscous horizontal sets, located along the height of the rod. The composed, in the program environment Ansys, dynamic model allows to study the main types of vibrations - free and forced damped or undamped. Vertical rod is modeled by a variable number of frame type elements BEAM3, and concentrated masses are entered in the nodes of the rod by elements type MASS21. Elastic-viscous properties are defined by the parameters of elements type COMBIN14. By the model are studied the free vibrations for the given initial rotation of the rod and forced vibrations of kinematic interferences - most often with zero initial conditions. Thy survey is a stages of a wider study of the dynamics of the vibrations of a rotary body, including analytical, numerical - in the field of Matlab/Simulink, numerical based on FEM in the field of Ansys and finally - experimental study. The numerical study on the base of FEM, object of investigation in the report, serves to refining of the parameters of the designed stand for testing vertical angular vibrations of body. All of the surveys - analytical, numerical and experimental are related to development of part of the components of a new dynamic lab that will be opened in the fall in the oldest technical university in Bulgaria.

References:

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