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## Oscillation and dynamic stability of geometrically nonlinear viscous of elastic covers in the elastic medium

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Thin-walled constructs are used in civil, aircraft, marine and such as engineering construction. A cylindrical covers are constituent part of thin-walled construct. In many researches were solved problems of bending stress deformed condition of various elements of construct of type of a cylindrical cover. They often are in an interaction with various elastic medium (in a ground, a liquid, gas). In the dynamic interaction between a construct and a medium were established transient processes. These processes can reduce losses of a stability of elements of construct. Values of the critical force received according to the linear theory, have appeared considerably high than real values. In this case construct loses stability. These facts are possible to explain from positions the nonlinear theory of a covers. In the nonlinear theory elastic deformation of a covers will be commensurable with a thickness. In this case in geometrical relation will be additional elements. The movement cylindrical covers are described with nonlinear differential equations. In geometrical nonlinear statement is investigated oscillation and stability of a cylindrical covers. The cylindrical covers are on the static and dynamic loadings. The material cover is orthotropic and possesses rheological properties. Rheological properties of material are described by the hereditary theory of Boltzmann-Volterra. In qualities of criterion of dynamic loss of stability are accepted characteristic values of sags. They equal to the thickness of cover. Nonlinear integro-differential equation is decided with a numerical method. As a result research is defined critical loading on direct axis and exterior pressure (in particular from pressure of elastic medium). There were established associations between the critical loading with parameters orthotropic and factor of elastic medium. There was investigated nonlinear oscillation the cylinder covers on the constant load. There was received numerical value of deformation of construct depending on viscous elastic properties of a material at dynamic application of forces. All results were computed with the program of MAPLE-9.5. Theoretical results can be used in designing various engineering constructions.

### Biography

Karimov Abdusamat Ismonovich has completed his PhD at the Institute of Mechanics of the Academy Sciences of Uzbekistan. He is a scientific researcher and teacher of Mathematics and Mechanics at the Namangan Institute of Engineering and Technology. He has published more than 40 papers in reputed journals of Uzbekistan, Kazakhstan, Latvia and USA. He has 3 patents in Mechanical Engineering for Textile Industry. He participated in 3 research and fundamental studies grants of the Republic of Uzbekistan.

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## 5d Iridium oxide as a material for spin-current detection

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Devices based on pure spin currents have been attracting increasing attention as key ingredients for low-dissipation electronics. To integrate such spintronics devices into charge based technologies, electric detection of spin currents is essential. The inverse spin Hall effect converts a spin current into an electric voltage through spin-orbit coupling. Noble metals such as Pt and Pd, and also Cu-based alloys, have been regarded as potential materials for a spin current injector, owing to the large direct spin Hall effect. Their spin Hall resistivity  $r_{SH}$ , representing the performance as a detector, is not large enough, however, due mainly because of their low charge resistivity. Here we report that a binary 5d transition metal oxide, iridium oxide, overcomes the limitations encountered in noble metals and Cu-based alloys and shows a very large  $r_{SH}$  of 38 M $\Omega$  cm at room temperature.

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