

Application of an operator approach to some problems on small movements of continuous media

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We study some problems (convection ones, sistem "viscous fluid – gas", fluid in a basin, closed by ice, system of pendulums with a viscous fluid and others) on small movements and normal oscillations of continuous media on the base of a new approach connected with application of so-called operator matrices theory with unbounded entries. The initial boundary value problems are reduced to the Cauchy problem

$$\frac{dy}{dt} + \mathcal{A}y = f(t), \quad y(0) = y^0,$$

in some Hilbert spaces. The operator matrix \mathcal{A} is a maximal uniformly accretive operator which also is a selfadjoint one in this space connected with some indefinite metric. The theorems on strong solvability of investigated problems are proved. Further, the spectrum of normal oscillations, basis properties of eigenfunctions and other questions are studied.

References

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