

Borisova, Galina

Commuting non-selfadjoint operators. Open systems, and wave equations. (English)

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In this paper, generalized open systems, conservation laws and matrix wave equations are studied. The author considers the case of commuting nonselfadjoint operators when $n \geq 3$ and one of them is a coupling of dissipative and antidissipative operators with real spectra. Then it is proved that the input, output and state of generalized open system corresponding to the commutative regular colligation satisfy conservation law. The solutions of wave equation are obtained by means of Livšic nonselfadjoint operator theory. The obtained results in the paper can be used for solving boundary value problem for solutions of matrix wave equations in the case of different open systems, generated by appropriate couples triples of commuting operators.

Reviewer: [Angela Slavova \(Sofia\)](#)

MSC:

[47B28](#) Nonselfadjoint operators

[47B44](#) Linear accretive operators, dissipative operators, etc.

[47A48](#) Operator colligations (= nodes), vessels, linear systems, characteristic functions, realizations, etc.

[60G12](#) General second-order stochastic processes

[47F05](#) General theory of partial differential operators

Keywords:

[dissipative operator](#); [operator colligation](#); [coupling](#); [open system](#); [matrix wave equation](#)

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