

The operator $\operatorname{div} A \operatorname{grad}$ for sign-indefinite A

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Differential expressions of the type $\operatorname{div} A(\cdot) \operatorname{grad}$ with sign-indefinite coefficient matrix $A(\cdot)$ arise in the modelling of metamaterials with negative refraction index.

Using the representation theory for indefinite quadratic forms, we prove, that these differential expressions define self-adjoint operators on bounded domains.

The spectral asymptotics and solvability of boundary value problems for this operator is discussed as well.

This talk is based on joint work with A. Hussein, V. Kostrykin and D. Krejčířik.