

Spectral theory and differential operators

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The div A grad without ellipticity

Abstract. The talk discusses some recent results on div A grad-operators for sign-indefinite coefficient matrices A . A simplest example of such kind is $\mathcal{L} = -\frac{d}{dx}\text{sign}(x)\frac{d}{dx}$ on a bounded interval. Using the representation theorem for indefinite quadratic forms, for a wide class of coefficient matrices we prove the existence of a unique self-adjoint, boundedly invertible operator \mathcal{L} , associated with the form $\langle \text{grad } u, A \text{ grad } u \rangle$.