

MAGNETIC SCHRÖDINGER OPERATOR

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Consider

$$A := -\frac{\partial^2}{\partial x^2} - \left(\frac{\partial}{\partial y} - \frac{ix^2}{2} \right)^2 + icy, \quad \mathcal{D}(A) := H_0^1(\mathbb{R}_+^2) \cap \{u : Au \in L^2(\mathbb{R}_+^2)\}$$

where $\mathbb{R}_+^2 = \{(x, y) \in \mathbb{R}^2 : y > 0\}$.

Open problem: Is $\sigma(A) \neq \emptyset$?

It is known that $\sigma(A) \neq \emptyset$ if $|c| \ll 1$ or $|c| \gg 1$.