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Perturbation theory for accretive operators in L_p

We present a perturbation theorem for m-accretive operators in L_p, where $1 < p < \infty$, that resembles the KLMN theorem for perturbation of self-adjoint operator in Hilbert space. Clearly, the advantage of the new theorem is that one is no longer restricted to the case $p = 2$. The drawback is that the theorem only deals with perturbation by multiplication operators.

We explain how the result can be used to associate a quasi-m-accretive operator in $L_p(\Omega)$ with the formal differential expression

$$\mathcal{L} = -\nabla \cdot (a\nabla) + b_1 \cdot \nabla + \nabla \cdot b_2 + Q$$

on an open set $\Omega \subseteq \mathbb{R}^N$, with *complex* measurable coefficients $a\colon \Omega \to \mathbb{C}^{N\times N}$, $b_1, b_2\colon \Omega \to \mathbb{C}^N$ und $Q\colon \Omega \to \mathbb{C}$.