Kato's inequality and degenerate elliptic operators

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We consider a second-order divergence form operator with real bounded coefficients and maximal domain in $L^p(\mathbb{R}^d)$. We assume that the matrix of principal coefficients is positive semi-definite.

Under suitable differentiability conditions on the coefficients we show that the operator is the (minus) generator of a C_0-semigroup if p is finite, and if in addition $p > 1$, then the space of test-functions is a core for the maximal operator. We also discuss perturbation of the maximal operator with a positive potential and optimal results in one dimension, that is if $d = 1$.

This talk is based on joint work with Wolfgang Arendt and with Tan Do.