Elliptic operators with unbounded diffusion coefficients in L^p spaces

GIORGIO METAFUNE AND CHIARA SPINA

Abstract. We prove that, for $N \geq 3$, $\alpha > 2$, $\frac{N}{N-2} < p < \infty$, the operator $Lu = m(x)(1 + |x|^\alpha)\Delta u$ generates an analytic semigroup in L^p which is contractive if and only if $p \geq \frac{N+\alpha-2}{N-2}$. Moreover, for $\alpha < \frac{N}{p'}$, we provide an explicit description of the domain. Spectral properties of the operator L are also obtained.