The Resolvent of Closed Extensions of Cone Differential Operators

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Abstract. We study closed extensions $A$ of an elliptic differential operator $A$ on a manifold with conical singularities, acting as an unbounded operator on a weighted $L^p$-space. Under suitable conditions we show that the resolvent $(\lambda - A)^{-1}$ exists in a sector of the complex plane and decays like $1/|\lambda|$ as $|\lambda| \to \infty$. Moreover, we determine the structure of the resolvent with enough precision to guarantee existence and boundedness of imaginary powers of $A$.

As an application we treat the Laplace–Beltrami operator for a metric with straight conical degeneracy and describe domains yielding maximal regularity for the Cauchy problem $\dot{u} - \Delta u = f$, $u(0) = 0$. 

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