

Universal zeroth-order L^p -estimates for covariant Schrödinger semigroups on arbitrary Riemannian manifolds

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Abstract

Assume we are given a covariant Schrödinger operator of the form $\nabla^* \nabla + V$ acting on sections in a bundle over an arbitrary Riemannian manifold M , with a potential having an unbounded negative part. I will explain new zeroth order L^p -estimates for the corresponding Schrödinger semigroups, which are based on a new concept which is called the “Euclidean radius of M ”. These estimates come in two groups:

1. Globally valid L^q - L^q estimates which are uniform in q
2. Locally valid L^p - L^q estimates with an explicit (and optimal) dependence on p, q . These estimates induce optimal global estimates once the Euclidean radius is uniformly bounded from below.

I will also try to explain some open problems in this context.