

THE SUB-RIEMANNIAN LIMIT OF A CONTACT MANIFOLD

PIERRE ALBIN

University of Illinois at Urbana Champaign

ABSTRACT. Contact manifolds, which arise naturally in mechanics, dynamics, and geometry, carry natural Riemannian and sub-Riemannian structures and it was shown by Gromov that the latter can be obtained as a limit of the former. Subsequently, Rumin found a complex of differential forms reflecting the contact structure that computes the singular cohomology of the manifold. He used this complex to describe the behavior of the spectra of the Riemannian Hodge Laplacians in the sub-Riemannian limit. As many of the eigenvalues diverge, a refined analysis is necessary to determine the behavior of global spectral invariants. I will report on joint work with Hadrian Quan in which we determine the global behavior of the spectrum by explaining the structure of the heat kernel along this limit in a uniform way.