Leibniz Universität Hannover

Oberseminar Analysis und Theoretische Physik

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The index of hypoelliptic operators on (regular) Carnot manifolds

We will discuss the index theory of hypoelliptic operators on Carnot manifolds - manifolds whose Lie algebra of vector fields is equipped with a filtering induced from a filtration of sub-bundles of the tangent bundle. Under the additional assumption that the Carnot manifold is regular, i.e. has isomorphic osculating Lie algebras in all fibres, and admits a flat coadjoint orbit, we provide a solution to the index problem for Heisenberg elliptic pseudodifferential operators in terms of geometric K-homology. This result extends work of Baum and van Erp on contact manifold. Up to a technical issue of constructing a global Hilbert space bundle of representations associated to the flat coadjoint orbits via Kirillov's orbit method, the problem is reduced to computations in the K-theory of twisted groupoid C*-algebras. Examples of index theorems that follow from this solution cover Toeplitz operators and operators of the form $\Delta_H + \gamma T$ on regular polycontact manifolds.
Joint work with Alexey Kuzmin.

Dienstag, 17.05.2022, 15:00 Uhr, Raum c311
Hauptgebäude der Leibniz Universität

Dazu laden herzlich ein:

Prof. Dr. Wolfram Bauer, Prof. Dr. Joachim Escher, Prof. Dr. Johannes Lankeit, Prof. Dr. Elmar Schrohe, Prof. Dr. Christoph Walker