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The Gauss-Bonnet Theorem and scalar curvature for noncommutative two tori

Abstract

The flat geometry of noncommutative two tori can be conformally perturbed by a Weyl factor, and one can compute the local geometric invariants of these C^*-algebras, such as scalar curvature, by employing Connes' pseudodifferential calculus to find explicit formulas for the heat coefficients of the Laplacian associated with the curved metric. A purely noncommutative feature is the appearance of a modular automorphism in the computations and final formulas. In this talk, I will explain my joint works with M. Khalkhali on this type of computations and the extension of the Gauss-Bonnet theorem of Connes and Tretkoff to general translation-invariant conformal structures on noncommutative two tori.