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The asymptotics of the holomorphic torsion forms

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The holomorphic torsion is a spectral invariant defined by Ray and Singer. Bismut and Vasserot have computed its asymptotic behavior when it is associated with growing tensor power of a positive line bundle. Then they extended their result when these powers are replaced by symmetric powers of a positive bundle of arbitrary rank. These formulas have played a role in Arakelov geometry.

The holomorphic torsion has a generalization in the family setting: the holomorphic torsion forms. In this talk, we will extend Bismut-Vasserot's work and present an asymptotic formula for the torsion forms associated with the direct image of $L^{\otimes p}$, where L is a line bundle satisfying a positivity assumption along the fibers. A key step for this is to use of the Toeplitz operators.

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