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Abstracts of Short Communications and Posters

Section:

5. Differential Geometry and Global Analysis

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New estimates for the Laplace and Dirac spectrum of 2-Tori and applications to the Willmore functional
We use conformal methods to estimate geometric data on the 2-torus T^2 in terms of the L^p-norm $(p > 1)$ of the Gaussian curvature, the 1-systole and the area. This method yields estimates for the eigenvalues of the Laplace and Dirac operators. If T^2 carries a non-trivial spin structure, then we give a lower bound for the smallest eigenvalue of the square of the Dirac operator in terms of the 1-systole, the spin systole, the area and the L^p-norm of the curvature. It is the first such estimate depending on the spin structure. We apply this estimate to the Willmore functional for embeddings $T^2 \to S^3$. For many spin-conformal equivalence classes of T^2 we prove the Willmore conjecture under the assumption that the L^p-norm of the Gaussian curvature is sufficiently small.