

The 2-transitive transplantable isospectral drums

Jeroen Schillewaert (joint work with Koen Thas)

Abstract

In this paper we investigate pairs of Euclidean TI-domains which are isospectral but not congruent. For Riemannian manifolds there are several examples which are isospectral but not isometric, see e.g. J. Milnor [2]. The method we use dates back to T. Sunada [3] considering the problem as a geometric analogue of a method in number theory which uses Dedekind zeta functions. Counter examples to M. Kac's conjecture so-far can all be constructed by a certain tiling method ("transplantability") using special linear operator groups which act 2-transitively on certain associated modules. In this talk we show that if *any* such operator group acts 2-transitively on the associated module, no new counter examples can occur.

References

- [1] M. KAC. Can one hear the shape of the drum?, *Amer. Math. Monthly* **73** (4, part 2) (1966), 1–23.
- [2] J. MILNOR. Eigenvalues of the Laplace operators on certain manifolds, *Proc. Nat. Acad. Sci. USA* **51** (1964), 542.
- [3] T. SUNADA. Riemannian Coverings and Isospectral Manifolds, *Ann. Math.* **121** (1980), 169–186.