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Nonexistence of Poincare-Einstein Fillings on Spin Manifolds

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Abstract

In this talk, we discuss whether a conformal class on the boundary M of a given compact manifold X can be the conformal infinity of a Poincare-Einstein metric in X. We construct an invariant of conformal classes on the boundary M of a compact spin manifold X of dimension $4k$ with the help of the Dirac operator. We prove that a conformal class cannot be the conformal infinity of a Poincare-Einstein metric if this invariant is not zero. Furthermore, we will prove this invariant admit values of infinitely many integers if there are conformal classes on boundary with positive Yamabe invariant and $k \geq 2$. This talk is based on a joint work with Gursky and Stolz.