

Renormalized volume and Gauss-Bonnet-Chern formulas on Poincaré-Einstein manifolds

Yueh-Ju Lin

Wichita State University

Poincaré-Einstein (PE) manifolds such as Poincaré ball model are complete Einstein manifolds with a well-defined conformal boundary. A first step in studying the moduli space of PE manifolds is to develop a good understanding of its global invariants. One example of a global invariant is the renormalized volume. Albin proved a version of Gauss-Bonnet-Chern formula for even dimensional PE manifolds while Chang-Qing-Yang proved the formula in terms of renormalized volume and the integral of a scalar conformal invariant. In this talk, I will present a general procedure of computing renormalized curvature integral relating Albin's and Chang-Qing-Yang's formulas and explicitly identify the scalar conformal invariant in the latter formula. This talk is based on joint works with Jeffrey Case, Ayush Khaitan, Aaron Tyrrell, and Wei Yuan.

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