



复旦大学数学科学学院 数学综合报告会

报告题目: The computation of discrete Ricci curvatures of amply regular graphs

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报告摘要:

The computation of discrete Ricci curvatures of amply regular graphs

Abstract: We concern in this talk the computing of Bakry-\'Emery curvature and Ollivier/Lin-Lu-Yau curvature of graphs. It is recently discovered that computing Bakry-\'Emery curvatures at a vertex of a graph reduces to calculating the smallest eigenvalue of a so-called curvature matrix and its rank-one perturbations. This is an extension of a previous joint work with David Cushing and Norbert Peyerimhoff by removing the S_1 -out regularity restriction. This provides an analogue of the basic fact in Riemannian geometry that the optimal Ricci curvature lower bound at a point is the smallest eigenvalue of the Ricci curvature tensor. For Ollivier/Lin-Lu-Yau curvature of graphs, it is known that the computation reduces to certain matching problem. We are particularly interested in the discrete curvatures of regular graphs with local regularities: the numbers of common neighbors of two vertices with distance one and distance two are both constant. While the curvatures of such graphs with girth at least 4 are relatively clear, the case of girth 3 is rather mysterious. We will talk about some partial results and thoughts about the girth 3 case. This talk is based on joint works with David Cushing, Supanat Kamtue, Riikka Kangaslampi, Norbert Peyerimhoff and Xin-Tian Li.

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