

HARNACK INEQUALITIES, ALEXANDROV REFLECTION AND ANCIENT SOLUTION OF CURVATURE FLOWS ON THE SPHERE

Dr. Paul Bryan

Riemann Center for Geometry and Physics

Abstract: Since the seminal work of Li & Yau, Harnack inequalities have played an important role in the study of geometric PDEs. Many authors have studied such inequalities and used them to obtain convergence results for curvature flows such as the Ricci Flow, the Mean Curvature Flow and various non linear hypersurface flows. I will focus on the hypersurface flow situation, which has been studied principally in Euclidean space. There Harnack inequalities closely relate to solitons (self-similar solutions) and ancient solutions. In the sphere, the notion of self-similar is not so clear, yet a Harnack inequality holds and may be used in classifying ancient solutions of curvature flows in there sphere. I will describe the Harnack inequality (and maybe make a remark or two about conformal solitons) and then discuss a parabolic Alexandrov reflection argument that may be used to deduce maximal symmetry for convex, ancient solutions of curvature flows in the sphere.