Luis Eduardo Osorio Acevedo (São Paulo, Brazil).

Small volumes implies small diameters, via an intrinsic monotonicity formula in Riemannian manifolds

We want to present another purely intrinsic proof that for small volumes isoperimetric regions are of small diameter in manifolds with some type of bounded geometry based on a monotonicity formula for varifolds of bounded generalized mean curvature which allows us to use an argument inspired from the correspondent extrinsic proof of [1] and combining it with our cut and paste argument to give finally the principal result of this poster. The monotonicity formula that we use here is an adaptation of Theorem 2.1 and Proposition 2.2 of [2] to our intrinsic Riemannian context via Hessian comparison theorems for the distance function. At our knowledge this is the first time that such an intrinsic approach appears in the literature, although being a very natural one. The applications of this methods are wide and opens the doors for extending in a rigorous way to a Riemannian ambient manifold the geometric measure theory known in $\mathbb{R}^n$, without using the Nash's isometric embedding theorem. This is a joint work with Stefano Nardulli (UFABC-CMCC).

References

[1] Frank Morgan and David L. Johnson. Some sharp isoperimetric theorems for Riemannian manifolds. *Indiana Univ. Math. J.*, 49(2):1017-1041, 2000.

[2] Camillo De Lellis. Allard's interior regularity theorem: an invitation to stationary varifolds. http://www.math.uzh.ch/fileadmin/user/delellis/publikation/allard_35.pdf, 2012.