

Local systolic inequalities in contact and symplectic geometry

Gabriele Benedetti¹, Jungsoo Kang²

¹ Universität Leipzig

² Universität Münster

Let M be a closed 3-manifold. The systolic ratio of a contact form on M is defined as the quotient between the square of the minimal period of the associated Reeb flow and the contact volume of M . Extending a result by Abbondandolo, Bramham, Hryniewicz, and Salomão, we show that a contact form locally maximises the systolic ratio in the C^3 -topology among contact forms on M , if and only if its Reeb flow generates a free circle action. We apply this result to the study of curves with prescribed geodesic curvature on a closed oriented Riemannian surface. Finally, we discuss a generalisation of the systolic ratio for odd-symplectic forms on the total space of a circle bundle over a symplectic manifold of arbitrary dimension.