

Harmonic Manifolds and Tubes

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Abstract

It was shown in a preceding paper [1] that in a connected locally harmonic manifold, the volume of a tube of small radius about a regularly parameterized simple arc depends only on the length of the arc and the radius. In this talk, we show that this property characterizes harmonic manifolds even if it is assumed only for tubes about geodesic segments. As a consequence, we obtain similar characterizations of harmonic manifolds in terms of the total mean curvature and the total scalar curvature of tubular hypersurfaces about curves. We find simple formulae expressing the volume, total mean curvature, and total scalar curvature of tubular hypersurfaces about a curve in a harmonic manifold as a function of the volume density function. The talk is based on the paper [2].

References

- [1] B. Csikós, M. Horváth, *Harmonic manifolds and the volume of tubes about curves*, Journal of the London Mathematical Society 94: pp. 141-160. (2016)
- [2] B. Csikós, M. Horváth, *Harmonic manifolds and tubes*, preprint: arXiv:1705.00311 [math.DG] (2017)

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