

RESTRICTED MEAN VALUE PROPERTY ON RIEMANNIAN MANIFOLDS

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Abstract:

A continuous function in an Euclidean domain is harmonic if and only if it satisfies the spherical mean value property for all spheres contained in that domain. But what happens if a continuous function satisfies instead the following 'restricted mean value property': for each point in the domain it satisfies the mean value property precisely on one such sphere (centered at the point). Then is the function still going to be harmonic? This is the classical 'one-circle problem' posed by Littlewood. We will see some results dealing with sufficient conditions in terms of the boundary behavior of the function for the above problem to have an affirmative answer in the setting of (1) domains in Riemannian manifolds and (2) Hadamard manifolds of pinched negative sectional curvature, extending classical results of Fenton for the Euclidean unit disc. This is based on a joint work with Prof. Kingshook Biswas.