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Fengbo Hang* (fhang@math.princeton.edu), Department of Mathematics, Princeton University, Fine Hall, Washington Road, Princeton, NJ 08544, and **Xiaodong Wang** (xwang@math.msu.edu), Department of Mathematics, Michigan State University, East Lansing, MI 48824. *Equality case for Zhong-Yang's eigenvalue estimate.*

An elegant inequality by Zhong-Yang says the first eigenvalue of a smooth compact Riemannian manifold with nonnegative Ricci curvature must be larger than or equal to π^2/d^2 , here d is the diameter of the manifold. We will show equality happens only when the manifold is a circle and discuss some open problems related to it. (Received August 26, 2006)