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**Jeff Dodd\*** (jdodd@jsucc.jsu.edu), Mathematics Department, Jacksonville State University, 700 Pelham Road North, Jacksonville, AL 36265, and **Vincent Coll** (vcoll@vc-group.com), 705 Misty Hollow Drive, Ambler, PA 19002. *Generalizing the "Equal Area Zones Property" of the Sphere.*

It is a standard calculus problem that the surface area of a zone of a sphere obtained by slicing a sphere with two planes which are perpendicular to a diameter of the sphere and are  $d$  units apart is independent of where the slice is taken. In this paper, we consider the following questions: 1. To what degree does this property characterize the sphere? 2. Do higher dimensional spheres have an analogous property, and if not, what higher dimensional objects do? (Received September 12, 2000)