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Thomas E Cecil* (cecil@mathcs.holycross.edu), Department of Mathematics/Computer Science, College of the Holy Cross, 1 College St., Worcester, MA 01610. *Compact proper Dupin hypersurfaces.*

A hypersurface M embedded in the sphere S^n is *proper Dupin* if the number g of distinct principal curvatures is constant on M , and each principal curvature is constant along each leaf of its corresponding principal foliation. Thorbergsson showed that for a compact, connected proper Dupin hypersurface $M \subset S^n$, the value of g must be 1, 2, 3, 4 or 6, the same as Münzner's restriction for isoparametric hypersurfaces in S^n .

In 1985, P.J. Ryan and the author conjectured that every compact, connected proper Dupin hypersurface $M \subset S^n$ is equivalent to an isoparametric hypersurface by a Lie sphere transformation. The conjecture is true for $g = 1, 2$ and 3 , but it was shown to be false in the cases $g = 4$ and 6 by counterexamples due to Pinkall-Thorbergsson and Miyaoka-Ozawa. These counterexamples do not have constant Lie curvatures, which are the cross-ratios of the principal curvatures taken four at a time. A revised conjecture with the additional assumption of constant Lie curvatures is still open, and we discuss recent progress on the revised conjecture in the case $g = 4$ by Q.-S. Chi, G. Jensen and the author. (Received September 03, 2010)