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S. Zubin Gautam* (sgautam@math.ucla.edu), UCLA Mathematics Department, Box 951555, Los Angeles, CA 90095-1555. *On curvature and the bilinear multiplier problem*. Preliminary report.

By analogy with C. Fefferman's classical Ball Multiplier Theorem, it is natural to study the impact of curvature on $L^p(\mathbb{R}^d) \times L^q(\mathbb{R}^d) \rightarrow L^r(\mathbb{R}^d)$ boundedness properties of bilinear Fourier multiplier operators whose symbols are characteristic functions of domains in $\mathbb{R}^d \times \mathbb{R}^d$. We discuss the nature and extent of this impact, and we establish sufficient sectional curvature conditions on the boundary of a domain to allow the key ideas of Fefferman's argument to yield unboundedness outside the local L^2 setting. In particular, we obtain unboundedness when the symbol is given by a general domain that is strictly convex in some neighborhood; this generalizes existing results of Diestel–Grafakos and Grafakos–Reguera. (Received February 03, 2009)