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Geoff Diestel* (diestelg@math.sc.edu), University of South Carolina, Dept. of Mathematics, LeConte College, Columbia, SC 29208, and **Loukas Grafakos**, University of Missouri, Dept. of Mathematics, Columbia, MO 65211. *Orthogonality of bilinear multiplier operators*. Preliminary report.

Suppose $T_j : L_p(\mathbb{R}) \times L_q(\mathbb{R}) \rightarrow L_r(\mathbb{R})$ is a family of uniformly bounded bilinear operators associated with multipliers m_j . What properties must this family possess to ensure that $\sum_j T_j$ is also a bounded bilinear operator? Initially, we consider the range $2 \leq p, q, r' = r/(r-1) < \infty$ with $1/p + 1/q = 1/r$. We call this the Local L_2 case, because it inherits some orthogonality properties from the theory of linear multipliers. We will discuss the relationship to the pointwise convergence of certain bilinear Fourier series. Then, an application to bilinear Calderon Zygmund operators associated with rough kernels will be given. Throughout the talk, we will explore the relationship of this problem to simple planar geometric figures. (Received December 08, 2006)