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Maria del Carmen Reguera Rodriguez* (mariar@math.missouri.edu), Department of Mathematics, 27 Mathematical Sciences Building, Columbia, MO 65211. *The characteristic function of the paraboloid is not a bounded bilinear multiplier.*

We consider the bilinear Fourier multiplier operator on $\mathbb{R}^2 \times \mathbb{R}^2$ whose symbol is the characteristic function of the paraboloid $P = \{(\xi, \eta) \in \mathbb{R}^2 \times \mathbb{R}^2 : \xi_2 > \xi_1^2 + \eta_1^2 + \eta_2^2\}$. We use a Keakeya type counterexample to show that such a bilinear operator is unbounded from $L^p(\mathbb{R}^2) \times L^q(\mathbb{R}^2)$ to $L^r(\mathbb{R}^2)$ outside the local L^2 case, i.e. the case when one of p, q , or $r' = r/(r - 1)$ is less than 2. (Received August 6, 2007)