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Loukas Grafakos and Maria del Carmen Reguera Rodriguez*

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University of Missouri, Columbia, MO 65211. *The bilinear multiplier problem for the ellipsoid.*

We study the question whether characteristic functions of ellipsoids in \mathbb{R}^{2n} are $L^p \times L^q \rightarrow L^r$ bounded bilinear Fourier multiplier operators on $\mathbb{R}^n \times \mathbb{R}^n$. When $n \geq 2$ we answer this question in the negative whenever $2 < p, q, r' < \infty$, i.e. in the local L^2 case. Our proof is based on a suitable adaptation of the Keakeya type construction employed by Fefferman in the solution of the multiplier problem for the ball on $L^p(\mathbb{R}^2)$. (Received August 20, 2007)