1032-42-157 **Geoff Diestel*** (diestelg@math.sc.edu), Dept. of Math. LeConte College, 1523 Greene St., University of South Carolina, Columbia, SC 29208, and **Loukas Grafakos** (loukas@math.missouri.edu), Mathematics Dept., 202 Mathematical Sciences Building, University of Missouri, Colmubia, MO 65211. *Multilinear singular integrals associated with rough kernels.* Preliminary report.

Let $\mu$ be a finite borel measure with compact support in $\mathbb{R}^{nm}$ such that $|\widehat{\mu}(\xi)| \leq C \min\{|\xi|^a, |\xi|^{-a}\}$ for some $a > 0$. Then, if $\mu_j$ is defined by $\widehat{\mu_j}(\xi) = \widehat{\mu}(2^{-j}\xi)$, $\sum_j \mu_j$ is the kernel of a bounded m-linear operator mapping $L^{p_1}(\mathbb{R}^n) \times \cdots \times L^{p_n}(\mathbb{R}^n) \to L^p(\mathbb{R}^n)$ provided $1 < p_i, p < \infty$ and $1/p_1 + \cdots + 1/p_n = 1/p$. This result generalizes a theorem of J. Duoadikoetxea and J.L. Rubio de Francia to the multilinear setting. Applications include bounds for certain multilinear Calderón-Zygmund operators with rough kernels and a multilinear dyadic spherical maximal operator. (Received August 20, 2007)