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**Title:** A sparse domination for the Marcinkiewicz integral with rough kernel and applications

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Let $\Omega$ be homogeneous of degree zero, have mean value zero and integrable on the unit sphere, and $\mu_\Omega$ be the higher-dimensional Marcinkiewicz integral defined by

$$\mu_\Omega(f)(x) = \left( \int_0^\infty \Big| \int_{|x-y|\le t} \frac{\Omega(x-y)}{|x-y|^{n-1}} f(y)dy \Big|^2 \frac{dt}{t^3} \right)^{1/2}.$$

In this paper, the authors establish a bilinear sparse domination for $\mu_\Omega$ under the assumption $\Omega \in L^\infty(S^{n-1})$. As applications, some quantitative weighted bounds for $\mu_\Omega$ are obtained.

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