

1172-42-172

Francesco Di Plinio* (francesco.diplinio@wustl.edu), 1 Brookings Dr, St. Louis, MO 63130, and **Ioannis Parissis**. *Maximal Subspace Averages*.

We study maximal operators associated to singular averages along finite subsets of the Grassmannian of d -dimensional subspaces of the n -dimensional Euclidean space. The well studied $d = 1$ case corresponds to the usual directional maximal function. We provide a systematic study of all cases $1 \leq d < n$ and prove essentially sharp L^2 bounds for the maximal subspace averaging operator in terms of the cardinality of the finite subset without any assumption on the structure. In the codimension 1 case, that is $n = d + 1$, we prove the precise critical weak $(2, 2)$ -bound.

Our estimates rely on Fourier analytic almost orthogonality principles, combined with polynomial partitioning, but we also use spatial analysis based on the precise calculation of intersections of d -dimensional plates. (Received August 25, 2021)