

Title: Random Geometric Constructions for the Sharp Estimates of Singular Operators  
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Abstract: Singular operators are sensitive to the environment in which they act. At least it seems so. The underlying measure is supposed to match the singularity of the kernel. However, while describing geometrically the sets on the plane with positive analytic capacity, people met the necessity to decouple the singular operator and the underlying measure. This seemingly hopeless task can be achieved by a certain random geometric construction performed at the operator, which a priori does not have any randomness whatsoever. The same decoupling was recently used for sharp weighted estimates of singular operators. I will try to explain these random geometric constructions and why they allow us to use Harmonic Analysis in Geometric Measure Theory.