QUADRATIC SPARSE DOMINATION

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Many operators in analysis are non-local, in the sense that a perturbation of the input near a point modifies the output everywhere; consider for example the operator that maps the initial data to the corresponding solution of the heat equation.

Sparse Domination consists in controlling such operators by a sum of positive, local averages. This allows to derive plenty of estimates, which are often optimal. For example, it has been shown that Calderón–Zygmund operators and square functions admit such a domination even under minimal T1 hypothesis.

In this talk we introduce the concept of sparse domination and we discuss the case of operators that are beyond Calderón–Zygmund theory, as in the seminal work by Bernicot, Frey and Petermichl.

We further show that optimal weighted estimates for non-integral square functions follow from a quadratic sparse bound. The talk is based on a joint work with Julian Bailey and Maria Carmen Reguera.