Minimal Conditions to define BMO

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It is well known the importance of the BMO space of functions with bounded mean oscillation especially due to the famous John-Nirenberg theorem of the early 60's of the last century. This result is the archetypical self-improving result in Analysis. In this talk we will show that there is another self-improving phenomenon attached to this class of functions which roughly gives a way of defining BMO using much weaker conditions than the usual L1 oscillation. These results improved a recent work by Logunov-Slavin-Stolyarov-Vasyunin-Zatitskiy. Our method is more flexible yielding sharp results under rougher geometries.

If there is enough time I will show some self-improving phenomenon considered for first time by B. Muckenhoupt and R. Wheeden with weights which turned out to be very useful in different situations like in the extrapolation theory.

This joint work with J. Canto and E. Rela.