Séminaire d'analyse

On a space of functions related to BMO

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Résumé:

In 1961 John and Nirenberg introduced the space of functions of bounded mean oscillation (BMO)and proved the inequality which bears their names and characterizes functions in this space. In so doing, they introduced an auxiliary condition which subsequent authors have used to define and study spaces of functions called JN_p, $1 < p < \infty$. It follows from the work of John and Nirenberg that JN_p is contained in weak L^p. On the other hand it contains L^p, but surprisingly the question of whether it is distinct from L^p has remained open, even in dimension 1. We show that for monotone functions the two conditions coincide, but there is a function that belongs to JN_p and not to L^p, so the two spaces are not the same. We also characterize JN_p as a dual space, recalling that BMO is identified with the dual of the real Hardy space H^1 by a well-known theorem of C. Fefferman. This talk is based on joint work withTuomas Hytönen, Riikka Korte and Hong Yue.

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