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Cristian Cazacu: ”Uncertainty principles: sharp constants, extremal functions and stability results”

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First of all, in this talk we focus on two well-known uncertainty principles applied to special classes of vector fields and we show that the sharp constants improve with respect to case of scalar fields whereas minimizers are described explicitly. These results are also extended to more general functional inequalities of Caffarelli-Kohn-Nirenberg type. Secondly, we provide optimal constants for the stability inequalities for the Heisenberg uncertainty principle and a class of Caffarelli-Kohn-Nirenberg inequalities. For the the Heisenberg uncertainty principle we introduce a new deficit function different from what is considered in the literature and then obtain the best constants. In addition, we recover the stability inequalities with optimal constants with respect to the deficit functions considered in the literature. These results are based on joint works written in collaboration with Joshua Flynn, Nguyen Lam and Guozhen Lu. C.C. was partially supported by the grant no. PN-III-P1-1.1-TE-2021-1539, CNCS - UEFISCDI, Romania.