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Norm estimates and conductor inequalities

In this talk we present an integral inequality connecting a function space (quasi-)norm of the gradient of a function to an integral of the corresponding capacity of the conductor between two level surfaces of the function, which extends the estimates obtained by V. Maz'ya and S. Costea, and sharp capacity inequalities due to V. Maz'ya in the case of the Sobolev norm. The inequality, obtained under appropriate convexity conditions on the function space, gives a characterization of Sobolev type inequalities involving two measures, necessary and sufficient conditions for Sobolev isocapacitary type inequalities, and self-improvements for integrability of Lipschitz functions.