



**Richard ROCHBERG** (rr@math.wustl.edu), Department of Mathematics, Washington University, St Louis, MO 63130, USA, *Hankel Forms on the Dirichlet Space and Related Operators*.

ABSTRACT. Recently Mazya and Verbitsky gave a solution to the following problem. For which complex functions  $b$  is it true that there is an estimate of the form

$$\left| \int_{\mathbb{R}^n} |u|^2 b \right| \leq c \int_{\mathbb{R}^n} |\nabla u|^2 ? \quad (*)$$

The case  $n = 1$  is elementary and the case  $b \geq 0$  is classical; but the general case involves substantial difficulties.

More recently Aleksandrov, Janson, Peller, and I studied the Schatten ideal behavior of the linear operator associated with (\*). For those questions even the case  $n = 1$  presents difficulties and we were only able to obtain complete results for  $p > 1$ .

The estimate (\*) is strongly analogous to a boundedness statement for Hankel bilinear forms of the Dirichlet space of holomorphic functions on the unit disk. The discrete model of that situation involves Hardy-type operators on trees, and a number of people have studied boundedness criteria and Schatten ideal behavior of those operators.

I will discuss various approaches, results, and questions related to these themes.