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Abstracts of Short Communications and Posters

Section:

8. Analysis

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The blocking technique and the weighted Hardy inequality
The classical Hardy inequality asserts that there is a constant $M > 0$ such that for all non-negative numbers x_k

$$\sum_n \left(\frac{1}{n} \sum_{k=1}^{n} x_k \right)^p \leq M \sum_n x_n^p,$$

where $p > 1$. More generally, one may ask for which weights $a_n \geq 0, b_n \geq 0$ the weighted Hardy inequality

$$\left(\sum_n \left(a_n \sum_{k=1}^{n} b_k x_k \right)^q \right)^{1/q} \leq M \left(\sum_n x_n^p \right)^{1/p}$$

holds, where $0 < p, q \leq \infty$. In [2] the so-called blocking-technique is developed in order to solve this problem completely, thus confirming earlier results of Bennett [1] and solving one of his open problems. The corresponding question for integrals is also discussed.

[1] G. Bennett: Some elementary inequalities. III, Quart. J. Math. Oxford 42 (1991), 149–174.
[2] K. -G. Grosse-Erdmann: The blocking technique, weighted mean operators and Hardy's inequality, Lecture Notes Math. 1679, Springer, Berlin 1998.