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**Leonid Slavin\*** ([slavin@math.uconn.edu](mailto:slavin@math.uconn.edu)), University of Connecticut, Dept of Math, 196 Auditorium Road, U-3009, Storrs, CT 06269. *The action of Riesz transforms on  $BMO(\mathbf{R}^n)$  : a Bellman function approach.*

Riesz transforms  $R_k$  are building blocks for many singular integral operators, and so their action on various functional spaces has received much attention. In particular, the action is known to be dimensionless on  $L^p(\mathbf{R}^n)$  (the exact norms have been calculated). However, while it is known that each  $R_k$  maps  $BMO(\mathbf{R}^n)$  to itself, it is a long-standing conjecture that the corresponding norms are independent of dimension. Proving it would immediately yield the corresponding result for  $H^1$  and, possibly, the weak  $(1, 1)$  type.

In recent years, norms of several Riesz transform-related singular integral operators have been estimated using the Bellman function approach. On the other hand, and this has also been exploited in recent work, the space  $BMO$ , with an equivalent  $L^2$ -based norm, gives rise to a convenient choice of Bellman variables, the starting point of any Bellman-function argument. These two considerations give hope that the Bellman function approach may work in this problem. This is a report on work in progress. (Received September 06, 2006)