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Bilinear decompositions for the product space $H^1_L \times BMO_L$

Luong Dang Ky

(Submitted on 13 Apr 2012)

In this paper, we improve a recent result by Li and Peng on products of functions in $H_L^1(\bR^d)$ and $BMO_L(\bR^d)$, where $L=-\Delta+V$ is a Schr\"odinger operator with V satisfying an appropriate reverse H\"older inequality. More precisely, we prove that such products may be written as the sum of two continuous bilinear operators, one from $H_L^1(\bR^d)\times BMO_L(\bR^d)$ into $L^1(\bR^d)$, the other one from $H^1_L(\bR^d)\times BMO_L(\bR^d)$ into $H^{\log}(\bR^d)$, where the space $H^{\log}(\bR^d)$ is the set of distributions f whose grand maximal function $\mathfrak Mf$ satisfies $$\int_{\mathbb R^d} \frac {|\mathfrak M f(x)|}{\log (e+ |\mathfrak Mf(x)|)+ \log(e+|x|)}dx <\infty.$$

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