

Title: On the weighted ℓ^p -space of a discrete group

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Let G be a locally compact group and $1 < p < \infty$. The L^p -conjecture asserts that $L^p(G)$ is closed under the convolution if and only if G is compact. For $2 < p < \infty$, we have recently shown that $f * g$ exists and belongs to $L^\infty(G)$ for all $f, g \in L^p(G)$ if and only if G is compact. Here, we consider the weighted case of this result for a discrete group G and a weight function ω on G ; we prove that $f * g$ exists and belongs to $\ell^\infty(G, 1/\tilde{\omega})$ for all $f, g \in \ell^p(G, \omega)$ if and only if $\ell^p(G, \omega) \subseteq \ell^q(G, 1/\tilde{\omega})$, the dual of $\ell^p(G, \tilde{\omega})$.

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