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8. Analysis

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Optimal Factorization of Muckenhoupt Weights

Peter Jones' theorem on the factorization of A_p weights [cf. Annals of Math. 111 (1980), 511–530] is sharpened for weights with bounds near 1, allowing the factorization to be performed continuously near the limiting, unweighted case. When $1 < p < \infty$ and w is an A_p weight with bound $A_p(w) = 1 + \varepsilon$, it is shown that there exist A_1 weights u, v such that both the formula $w = uv^{1-p}$ and the estimates $A_1(u), A_1(v) = 1 + \mathcal{O}(\sqrt{\varepsilon})$ hold. The square root in the last estimates is also proven to be the correct asymptotic power.