

Sharp constants in inequalities on the Heisenberg group

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We derive the sharp constants for the inequalities on the Heisenberg group whose analogues on Euclidean space are the well known Hardy-Littlewood-Sobolev inequalities. Only one special case had been known previously, due to Jerison-Lee more than twenty years ago. From these inequalities we obtain the sharp constants for their duals, which are the Sobolev inequalities for the Laplacian and conformally invariant fractional Laplacians. The methodology is completely different from that used to obtain the Euclidean inequalities and can be used to give a new, rearrangement free, proof of the HLS inequalities. The talk is based on joint work with E. H. Lieb.