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Anna Kairema* (anna.kairema@helsinki.fi), University of Helsinki, Finland. *Weighted norm inequalities for fractional integrals in a space of homogeneous type: the construction of counter examples to show the sharpness of the result.*

The sharp relationship between the operator norms of fractional integral operators, acting on weighted Lebesgue spaces, and the constant of the weights, was obtained by Lacey, Moen, Pérez & Torres (2010). In the Euclidean space, to show the sharpness of the estimate, one constructs counter examples using suitable power functions.

In this talk, we discuss the generalization of this result into a space of homogeneous type. While the broad outlines of the proof follow the Euclidean case, the rather straightforward example in the Euclidean case, involving functions of the form $|x|^a$, is not available per se. We show, however, that any space of homogeneous type with infinitely many points supports functions which, at least locally, behave sufficiently similarly to the basic power functions $|x|^{-\alpha}$ on the Euclidean space. We believe that such functions may provide counter examples in other situations, too. (Received February 10, 2014)