

NONCOMMUTATIVE RIESZ TRANSFORMS FOR FOURIER MULTIPLIERS

Marius Junge

University of Illinois at Urbana-Champaign, USA

junge@math.uiuc.edu

Abstract

In this talk we study Riesz transforms for discrete groups and Fourier or Herz-Schur multipliers acting on the von Neumann algebra given by left regular representation. For a commutative G this von Neumann algebra is simply $L_\infty(\hat{G})$. Given a semigroup (T_t) of positive maps with negative generator $-A$ we can follow Meyer's approach and define the gradient form

$$2\Gamma(f_1, f_2) = A(f_1)^* f_2 + f_1^* A(f_2) - 2A(f_1^* f_2).$$

This gradient generalizes the usual scalar product of the gradient given by the Laplace or Laplace Beltrami operator. We give an overview on results concerning Meyer's general Riesz transforms estimates

$$\|\Gamma(f, f)^{1/2}\|_p \sim \|A^{1/2}f\|_p$$

in the context of Fourier multipliers.