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# Martingale transform and Lévy Processes on Lie Groups

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This paper constructs a class of martingale transforms based on Lévy processes on Lie groups. From these, a natural class of bounded linear operators on the  $L^p$ -spaces of the group (with respect to Haar measure) for  $1 < p < \infty$ , are derived. On compact groups these operators yield Fourier multipliers (in the Peter-Weyl sense) which include the second order Riesz transforms, imaginary powers of the Laplacian, and new classes of multipliers obtained by taking the Lévy process to have conjugate invariant laws. Multipliers associated to subordination of the Brownian motion on the group are special cases of this last class. These results extend (and the proofs simplify) those obtained in [BanBieBog, BanBog] for the case of  $\mathbb{R}^n$ . An important feature of this work is the optimal nature of the  $L^p$  bounds.

Subjects: **Probability (math.PR)**; Functional Analysis (math.FA)

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