

NON-COMMUTATIVE FOURIER ANALYSIS ON THE NILPOTENT CARTAN-LIE GROUP G_5

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Abstract: Far away from the hard theory of representations, we study the non-commutative Fourier analysis on the $(2, 3, 5)$ group (called the *Cartan group* G_5 , or the *generalized Dido problem*), which can be shown to be a semi-direct product of three real vector groups. This led to the construction of a larger group to introduce the Fourier transform and obtain the Plancherel formula on G_5 . We denote the complexified universal enveloping algebra of the real Lie algebra of G_5 by \mathcal{U} , and prove that \mathcal{U} is globally solvable. Further, we obtain the classification of all right ideals in the group algebra of G_5 . Finally, by Hormander theory, we solve the division problem of distributions on this group.