

TRIANGULAR INTEGRALS WITH APPLICATIONS TO LIE GROUP DECOMPOSITIONS

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The triangular integrals are suitable infinite-dimensional versions of the operation of taking the upper triangular part (the lower diagonal part, or the diagonal, respectively) of a square matrix. In the case of the operators on infinite-dimensional spaces, triangularity is defined by means of a totally ordered set of closed linear subspaces. The order type of this set plays a central role in the process of computing the triangular integrals as limits of the block triangular matrices defined with respect to finite partitions of the totally ordered set under consideration. We are going to take a close look at these integrals, since they provide one of the main functional analytic ingredients of a method of constructing smooth Iwasawa decompositions for many of the classical Banach-Lie groups of Hilbert space operators. Some of the key points of our exposition can be summarized as follows:

- operator ideals and sequence spaces;
- symmetric norming functions and the corresponding norm ideals;
- convergence of triangular integrals and factorizations;
- classical groups associated with operator ideals;
- Iwasawa decompositions for Banach-Lie groups.

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