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## **Operator Means of Lower Triangular Matrices**

We show that every Kubo-Ando operator mean of positive definite operators exists on the solvable Lie group of lower triangular matrices with positive diagonal entries. In particular, we show that the operator geometric mean of such lower triangular matrices appears as the common limit of the iteration process of the arithmetic and harmonic means. We further show that the iteration terminates in the finite number  $\lceil \log_2 m \rceil$  of iterations for  $m \times m$  lower unitriangular matrices and present its entrywise closed form for  $m \leq 4$ .

**Keywords**: Operator mean, geometric mean, lower triangular matrix, nilpotent Lie group, Newton's square root algorithm.

MSC: 22E25, 15B48, 15B99, 27A64.