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Tubes and valuations in Lie groups

Evaluating the volume of metric tubes around submanifolds traces back to Weyl's famous resolution of Hotelling's problem in Euclidean space. Further results were obtained by A. Gray and others, particularly in rank one symmetric spaces. We consider a Lie group equipped with a bi-invariant Riemmanian (or more generally, Finslerian) metric. Utilizing Alesker's theory of valuations on smooth manifolds, in particular the convolution of valuations on compact Lie groups introduced by Alesker and Bernig, and borrowing tools and ideas from deformation theory, we give an explicit power series for the volume of a tube around a submanifold. Based on a joint work with A. Bernig and J. Kotrbaty.