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Bi-invariant valuations and convolution on Lie groups

Minkowski addition of sets is the geometric embodiment of the additive structure of the underlying Euclidean space. It gives rise to the convolution product on translation-invariant valuations, introduced by Bernig and Fu, which is closely tied to integral geometry, namely to additive kinematic formulas. Convolution of valuations has also been defined on compact Lie groups by Alesker and Bernig. We unify the two operations, introducing a convolution product of smooth bi-invariant valuations on arbitrary unimodular Lie groups. As a key ingredient in the construction, we find all connected Lie groups which admit non-trivial bi-invariant valuations. Based on a joint work with A. Bernig and J. Kotrbatý