

The geometry of left-invariant structures on nilpotent Lie groups

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In this talk we continue studying invariant structures on homogeneous manifolds and their relations to the generalized Hermitian geometry. More exactly, we concentrate on left-invariant metric f -structures on special classes of nilpotent Lie groups. First, using the theory of canonical structures on homogeneous k -symmetric spaces [1], we construct nearly Kähler and Hermitian f -structures on the 5-dimensional matrix Heisenberg group as well as on the 6-dimensional generalized Heisenberg group [2,3]. It turns out that the method could be extended to some special matrix Lie groups which generalize the classical high-dimensional matrix Heisenberg groups. Further, some general results for 2-step nilpotent and other Lie groups were obtained. Finally, we dwell on the class of filiform Lie groups which also can be considered as a generalization (in some sense) of the classical 3-dimensional Heisenberg group. Specifically, many examples of left-invariant Hermitian f -structures on 6-dimensional filiform Lie groups were presented [4].

This is a joint work with Pavel Dubovik.

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 - [4] Dubovik PA. Hermitian f -structures on 6-dimensional filiform Lie groups. Russian Mathematics. 2016; 60(7): 29-36.
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