

Homogeneous Einstein Metrics on $SO(n)$

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It is well known that every compact simple Lie group G admits an Einstein metric that is invariant under the independent left and right actions of G . In addition to this bi-invariant metric, with G symmetry, it was shown by D'Atri and Ziller that every compact simple Lie group except $SU(2)$ and $SO(3)$ admits at least one further homogeneous Einstein metric, invariant under $G \times H$, where H is some proper subgroup of G . In this paper we consider the Lie groups $G=SO(n)$ for arbitrary n , and provide an explicit construction of $(3k-4)$ inequivalent homogeneous Einstein metrics on $SO(2k)$, and $(3k-3)$ inequivalent homogeneous Einstein metrics on $SO(2k+1)$.

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