

GEODESIC ORBIT PSEUDO RIEMANNIAN NILMANIFOLDS

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We know that in the Riemannian case, (i) for every homogeneous space, there is a reductive decomposition at the level of Lie algebras, (ii) the isometry group of a simply connected nilmanifold is the semidirect product of isometric automorphisms and translations (Wolf/Wilson), and (iii) geodesic orbit nilmanifolds are necessarily two-step nilpotent or abelian (Gordon). Neither of this is true in pseudo-Riemannian signature. However, it turns out that in low signature, some results may still be “rescued”. This is a joint work (which is partially still in progress) with Joe Wolf, Zhiqi Chen and Shaoxiang Zhang.