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**Title:** Light-like homogeneous geodesics and the geodesic lemma for any signature

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Homogeneous geodesics on homogeneous Riemannian manifolds have been studied by many authors. The fundamental tool is the so-called *geodesic lemma*. On pseudo-Riemannian manifolds, a generalization of the geodesic lemma is necessary. Physicists already know and use the generalized version. However, the present authors are not aware of any reference to the detailed and correct mathematical proof. The aim of the present paper is to provide such a proof and illustrate the generalized lemma with an example. We also correct a minor error which occurred in the original proof of the standard geodesic lemma.

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