

# Semi-Riemannian Spin manifolds with Lorentzian cone admitting "many" Killing spinors

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## Abstract

Let  $(M^n, g)$  be a semi-Riemannian spin manifold of signature  $(p, q)$ . Denote with  $\mathbb{S}$  the (complex) spinor bundle over  $M$  and let  $\kappa(M, \lambda) := \frac{\dim S(\lambda)}{\text{rank } S}$ , where  $S(\lambda)$  is the vector space of all Killing spinors with Killing number  $\lambda$ . We show that a semi-Riemannian spin manifold  $M$  of either Riemannian or Lorentzian signature (i.e. with possible Lorentzian cone) that admits enough Killing spinors to satisfy  $\kappa(M, \lambda) > \frac{1}{2}$  has constant curvature  $4\lambda^2$ .