

ABSTRACT

Pseudo-Riemannian S^1 -bundle Constructions

There is a technique to produce distinguished pseudo-Riemannian metrics g on manifolds M^n which arise as S^1 -bundles over $(n-1)$ -dimensional manifolds (N, h) . Every such manifold (M^n, g) admits a recurrent null-vector field ξ and if g is Lorentzian, it is well-known that the induced holonomy-invariant subspace generated by ξ restricts $\text{Hol}(M^n, g)$ to be contained in $G := (\mathbb{R}^* \times O(n-2)) \ltimes \mathbb{R}^{n-2}$.

In my talk I will present formulas for the Riemannian curvature tensor \mathcal{R}^g and its irreducible components in order to investigate, under which conditions the constructed metrics g with full holonomy $H \leq G$, have distinguished properties, e. g. being Ricci-flat or Einstein. Moreover we use this construction as Ansatz to produce new explicit examples of metrics with essentially parallel Weyl tensor for both, the compact and non-compact case.

Daniel Schliebner, HU Berlin, 08.02.2012.