ON THE TANGENT BUNDLE OF A WEYL MANIFOLD

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This year, we celebrate a century since H. Weyl introduced in 1918 a unified field theory, in order to study a generalized metrical structure. A Weyl structure on a manifold M is described as a conformal class of metrics $[g]$, which is preserved by a torsion-free connection D (called a Weyl connection). The Weyl manifold is said to be Einstein-Weyl if the symmetric part of the Ricci tensor is proportional to the conformal metric. Here, we obtain the behaviour of the Sasaki metric on TM, under the gauge transformations of the metrics in the conformal class $[g]$. Then we lift several geometric objects from the base manifold to the total space of the tangent bundle. By taking a Weyl structure on the base manifold, we construct a Weyl structure on the total space of the tangent bundle whose conformal class of metrics contains the Sasaki metric on TM. By using the curvature tensor field, we characterize (in terms of Sasaki metric) both Weyl structures on M and on TM to be simultaneously Einstein-Weyl.

The present talk is based on the following papers:

[1] Bejan C.L., Gul I. – *„Sasaki metric on the tangent bundle of a Weyl manifold”*, Publ. Inst. Math. (Beograd), to appear.

[2] Bejan C.L., Ecken-Meric S. , Kilic E.- *„Einstein metrics induced by natural Riemann extension”*, Advances in Applied Clifford Algebras, 27(3), (2017), 2333-2343.

[3] Bejan C. L., Gul I., “*F-Gedesics on the cotangent bundle of a Weyl manifold”*, Contemporary Perspectives in Differential Geometry and its Related Fields - Proceedings of the 5th International Colloquium on Differential Geometry and its Related Fields, ed. T. Adachi, M.J. Hristov, H. Hashimoto (2017).