Abstract

In this work, we introduce and investigate a general transformation or change of Finsler metrics, which is referred to as a generalized β-conformal change, namely,

$$L(x, y) \longrightarrow \overline{L}(x, y) = f(e^{\sigma(x)} L(x, y), \beta(x, y)).$$

This transformation combines both β-change and conformal change in a general setting. The change of the fundamental Finsler connections, together with their associated geometric objects, are studied. The change of the torsion and curvature tensors of the fundamental Finsler connections are computed. The conditions for the transformed space to be Berwald, Landesberg and locally Minkowskian are determined. Some invariants and various special Finsler spaces, namely, quasi C-reducible, Semi C-reducible, C-reducible, C_2-like, S_3-like and S_4-like, are investigated. The transformation of the T-tensor is obtained and some interesting special cases are deduced. The b-condition is introduced and its effect on some special Finsler spaces is studied. The condition under which a generalized β-conformal change is a projective change is investigated and some known results in this context are generalized. The most important changes of Finsler metrics existing in the literature are shown to be an outcome of this generalized β-conformal change as special cases. Some of the results obtained in this thesis are generalizations of known results and some are new.