

Non-integrable geometries and their torsion

An integrable special geometry is a triple consisting of a Riemannian manifold (M^n, g) and an additional geometric structure (tensor) \mathcal{T} such that the Levi-Civita connection ∇^g preserves \mathcal{T} , $\nabla^g \mathcal{T} = 0$.

For many non-integrable geometries, i.e. $\nabla^g \mathcal{T} \neq 0$, we construct a new and unique metric connection ∇ with skew symmetric torsion such that $\nabla g = 0$, $\nabla \mathcal{T} = 0$, the so called characteristic connection of the non-integrable geometry. This observation yields a systematic approach in order to obtain solutions of the Strominger equation in type II string theory. On the other hand, we study from a geometric point of view the holonomy, curvature, etc. of these characteristic connections with skew symmetric torsion.

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