

# The Kähler-Dirac Equation with Non-Scalar-Valued Input Differential Form

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**Abstract.** The original, matrix-free Kähler-Dirac (KD) equation of 1960 has an unpleasant feature when the input differential form is not scalar-valued. Possibly to deal with that feature, Kähler proposed in 1962 a highly cumbersome alternative equation involving matrices. It coincides with the one from 1960 when the input differential form is scalar-valued.

In the 5th Clifford Conference, we proposed our own alternative, where the tensor (1960) and matrix (1962) products of the valuedness factors were replaced with the Clifford product. We also suggested a sort of Kaluza-Klein (KK) space canonically determined by a subset of the fundamental invariants that define the spacetime manifold. In this paper we show that our KK space seems to accommodate the physics well for appropriate choice of the torsion. We further show that one can choose an input differential form highly appropriate for when the aforementioned torsion is assumed to be the output differential form of a geometrized KD equation. This leads to equations of structure for the torsion that have a more quantum-mechanical and less moving frame theory flavor than the standard ones.

**Keywords.** Kähler, Kähler-Dirac, Kaluza-Klein.

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