

# SINGULARITIES, TORSION, CAUCHY INTEGRALS AND THEIR SPECTRA ON SPACE-TIME III

**Prof. Dr. Francisco Bulnes**

(IINAMEI, Research Department in Mathematics and Engineering, TESCHA.)

*E-mail:* francisco.bulnes@tesch.edu.mx

The field sources can be identified as fields  $\phi_{AB}$ , which in a complex Riemannian manifold that models the space-time including field sources, can be re-interpreted as poles or singularities of said manifold such that their integrals can calculate their value through the Cauchy type integrals as the Conway integrals to any loop generated in the local causal structure (light cones) of the space-time around of these fields. These integrals are solutions of the spinor equation associated to the corresponding twistor field equation. A theorem is mentioned on the evidence of field torsion as field invariant and geometrical invariant in poles of Cauchy type integrals in spinor-twistor frame. Then the torsion existence in the space-time induces gravitational waves in a projective bundle. Sources are evidence at least locally, of torsion existence. Therefore exists curvature here. Some conjectures and technical lemmas are mentioned as references of other works which gives enter to a new application conjecture to the respect.

## REFERENCES

- [1] Bulnes F, Stropovskiy Y, Rabinovich I. Curvature Energy and Their Spectrum in the Spinor-Twistor Framework: Torsion as Indicum of Gravitational Waves. Journal of Modern Physics. 2017, 8, 1723- 1736. DOI:10.4236/jmp.2017.810101
- [2] Francisco Bulnes, Deep Study of the Universe through Torsion, Cambridge Scholars Publishing, United Kingdom, 2022.
- [3] F. Bulnes, Spinors, Poles, Space-Time Undulations, Torsion and Contour Integrals, Int. J. Adv. Appl. Math. And Mech. 10(3) (2023) 21– 37.
- [4] Dr. Francisco Bulnes, Singularities, Torsion, Cauchy Integrals and Their Spectra on Space-Time, TJMM 15 (2023), No. 1-2, 29-40.