Contribution ID: **78** Type: **poster**

# Kaluza-Klein and Nelson mechanisms reinterpreted on extended phase-space for reconciling General Relativity with Quantum Mechanics

*Wednesday, 20 February 2019 17:55 (1 minute)*

Kaluza-Klein [1,2] mechanism was rejected for inconsistencies due to the Planck length scale.
Nelson [3] derivation of Quantum Mechanics was rejected for having assumed, without justification, a periodic multivalued action and the presence of universal fluctuations. Both the mechanisms can be reinterpreted without problems at the light of the guiding center (for Kaluza-Klein) and gyrocenter (for Nelson) transformations. It is demonstrated that with the use of guiding center coordinates the fields follow an Einstein's equation on the phase-space extended to time and Gravitation includes electromagnetism if considered on such extended phase space. Once electromagnetic (now also gravitational) fluctuations are considered it is shown that the gyrocenter follows the Schroedinger equation. It is proposed to explaining the discrepancies between GR and QM in the simplest way: they are describing different objects (guiding center and gyrocenter, respectively) that are both representative of charges and/or masses. In this way a unified theory is accessible and it can be depicted without inconsistencies [4].
[1] Kaluza, Th. (1921) Sitzungsberichte der Preussischen Akademie der Wissenschaftenzu Berlin Math. Phys, K1, 374.
[2] Klein, O. (1926) Zeitschrift für Physik, 37, 895-906.
https://doi.org/10.1007/BF01397481
[3] Nelson, E. (1966) Physical Review, 150, 1079.
https://doi.org/10.1103/PhysRev.150.1079
[4] Di Troia, C (2018) Journal of Modern Physics, 9, 701

## Summary

**Primary author:** DI TROIA, claudio (ENEA)

**Presenter:** DI TROIA, claudio (ENEA)

**Session Classification:** Poster session

**Track Classification:** Beyond Einstein's Gravity