
SEMINARIO

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Spacetime torsion changes the polarization but not the speed of gravitational waves

Abstract: Gravitational waves, and multi-messenger astronomy, in particular, have opened up a new window into the Universe. For instance, the recently established experimental fact that electromagnetic and gravitational waves travel at the same speed in vacuum wiped out whole families of alternative gravitational theories. In this talk, we show in a model-independent way that the presence of spacetime torsion affects the polarization, but not the speed, of gravitational waves as compared with a torsionless spacetime.

These results are the consequence of a careful examination of the Weitzenböck-Lichnerowicz wave operator, the Weitzenböck identity, their generalizations for spaces with torsion, and the study of the eikonal limit on Riemann-Cartan geometries. The analysis is general enough to include waves for other fields and to discover when torsion affects their polarization.

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