

General Relativity and Quantum Cosmology

On possible a-priori "imprinting" of General Relativity itself on the performed Lense-Thirring tests with LAGEOS satellites

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The impact of possible a-priori "imprinting" effects of general relativity itself on recent attempts to measure the Lense-Thirring precessions with the LAGEOS satellites orbiting the Earth and the terrestrial geopotential models by the dedicated mission GRACE is investigated. It is analytically shown that general relativity, not explicitly solved for in the GRACE-based models, may "imprint" their even zonal harmonic coefficients J_L at a non-negligible level, given the present-day accuracy in recovering them. This translates into a bias of the LAGEOS-based relativistic tests as large as the Lense-Thirring effect itself. Further analyses should include general relativity itself in the GRACE data processing by explicitly solving for it.

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