



Contribution ID: 118

Type: talk

GINGERINO: a quantum gyroscope

Wednesday 25 September 2024 09:25 (35 minutes)

Recently, we have experimentally proved that the noise limit for GINGERINO, a running large frame ring laser gyroscope installed inside the Gran Sasso National Laboratory, contradicts the shot-noise limit so far predicted for this class of instruments. Starting from a review on the measurement principles of a Sagnac RLG, we present this result and discuss a possible novel theoretical approach to explain the observed discrepancy. The Sagnac effect being due to the different travel times of two beams travelling inside a closed rotating loop, is strictly related to the relation between time and space. Then, we introduce the GINGER experiment, under construction in LNGS, in the frame of experimental gravity and general relativity.

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Session Classification: Session V. Teleportation, entanglement and decoherence