



High sensitivity gyroscopes: GINGER and GINGERINO

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High sensitivity apparatuses are able to give new measurements which can provide fundamental breakthrough, as for example the recent observation of the coalescence of two neutron stars, which for the first time has brought together physicists of fundamental physics, astrophysicists and astronomers. It is natural to ask whether high sensitivity gyroscopes as ring laser with sensitivity to angular rotation well below prad/s , could provide new measurements in geophysics. GINGER is a fundamental physics project for a multi axis ring laser apparatus, aiming at the test at 1% of the Earth gravito-magnetic effect, a General Relativity test. Since it is attached to the Earth surface it is able to measure with top accuracy any tiny signal on the Earth surface. GINGERINO is a ring laser prototype installed inside the underground laboratory of the Gran Sasso, it has been built as a prototype for the GINGER project, to validate the underground location for the construction of GINGER. GINGERINO is the only high sensitivity gyroscope located in a seismically active area, due to its uniqueness, it is operating in a continuous basis since May 2017. Its typical sensitivity for angular rotations is 0.1 nrad/s for 1 s measurement, while the sensitivity to tilts is of the order of 300 nrad, long time stability over tens of days is approaching 1 part in 10^7 . The duty cycle at present is 95%. The general performance and its near future plan will be outlined. GINGER is a proposal, its expected sensitivity should be in the range of 0.001 prad/s for long term measurements, its general lay-out and the expected sensitivity will be described.