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The status of the GINGER project

Large frame Ring Laser Gyroscopes which operate based on the Sagnac effect, are highly sensitive instruments used to measure angular velocity relative to fixed stars. The GINGER (Gyroscopes IN General Relativity) project plans to build an array of three large Ring Laser Gyroscopes, firmly attached to the Earth. GINGER aims to detect General Relativity effects and potential Lorentz Violation in the gravitational field, once it achieves a sensitivity of 10^{-9} or better of Earth's rotation rate. Since the array is anchored to the Earth's crust, it will also yield valuable data for geophysical studies. The project is currently being developed as part of the multi-component observatory called Underground Geophysics at Gran Sasso (UGSS). Sensitivity is crucial for determining the instrument's significance in fundamental science. Recent advancements in sensitivity measurements, achieved with a prototype RLG named GINGERINO, suggest that GINGER should reach a sensitivity level of 1 part in 10^{11} of Earth's rotation.

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