The GGG apparatus must therefore look for a possible Equivalence Principle violation signal with the Sun as the source mass, as in the experiments by [12, 13]. This means a driving signal 1400 times weaker than it is in space for GG. Note that none of these difficulties (verticality of the rotation axis and gyroscopic effect) would affect the GG space experiment, in which there is no local gravity preferential direction and no gyroscopic effect (the rotation axis is almost perfectly fixed in space, and moreover –unlike in GGG– the test cylinders are suspended by their centers of mass).

The GGG apparatus described here has been tested for stable rotation (typically from *2* to 6 *Hz*) and for the measurement of small relative displacements between the centers of mass of the test cylinders. The sensitivity of the GGG capacitance read-out has been tested on bench, finding that it can detect 5 *picometer* displacements in 1*s* integration time. This is fully adequate for the GG space experiment, which must be sensitive to slightly less than 1 *picometer* displacements in order to fulfill its goal of an Equivalence Principle test to 10^{-17}; less than 100 *s* integration time is enough for the GGG read out to complete the task. The sensitivity of GGG to differential effects, as obtained from measurements carried out so far with the system in rapid rotation, is similar to that reported in the literature for the other accelerometers designed for space which have been subject to intensive testing [42,43]. It is expected that the sensitivity of GGG can be significantly improved because, unlike general-purpose accelerometers, it has been designed and optimized for the detection of an Equivalence Principle violation signal.

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