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Juggled interferometer for gravitational wave detection

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Juggled Interferometer is a Michelson-type interferometer aiming at improving the sensitivity of earthbound GW detectors at 0.1–10 Hz. This improvement can be achieved with repeatedly free-falling test masses (juggling), which decouples test masses from the seismically noisy environment and avoids suspension thermal noise. With this improved sensitivity, a Juggled Interferometer would be capable to detect Quasi-normal modes of massive black holes and some other gravitational wave sources.

We are now building up a prototype to test the basic ideas of a Juggled Interferometer. The whole interferometer is designed to be put inside a vacuum tank and the laser would be injected into it through a fiber. The test masses, together with the vacuum tank, are accelerated by a linear motor. And by adjusting the acceleration, the release and catch of the test masses can be achieved.

In this poster, the concept design and more details about the current status of the experiment will be introduced.

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