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## Matter wave interferometry for GW detection

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Atom interferometry has been proposed for the realization of GW detectors in the infrasound band (10 mHz - 10 Hz) [1]. Such frequency band is forbidden to current ground based GW detectors due to low frequency gravity gradient noise that causes a tidal effect on the suspended mirrors used as test masses for the detection of gravitational radiation. Adopting as probes arrays of atom clouds in free fall and interrogated simultaneously in a gravity-gradiometer configuration allows the suppression of Newtonian Noise [2], enables low frequency sensitivity, and opens the way toward the realization of infrasound GW detectors on Earth. In this framework, I will report on the MIGA project [3], whose target is to build a demonstrator for GW detection using atom interferometry in the underground environment of LSBB (Rustrel, France).

[1] S. Dimopoulos, et al, Phys. Lett. B 678, 37 (2009)

[2] W. Chaibi, et al, Phys. Rev. D. 93 (2), 021101 (2009)

[3] B. Canuel, et al, arXiv:1703.02490v2 [physics.atom-ph]

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