

# Newtonian and Shapiro noises in Atom Interferometry based Gravitational Wave Detectors

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Newtonian Noise corresponds to the residual motion of test masses due to the fluctuation of the local gravitational field. This noise represents the ultimate limit of ground based gravitational wave detectors at low frequency. Atom interferometry offers the possibility to mitigate Newtonian noise as described in [1]. In this presentation, we interpret Newtonian noise mitigation as a Monte Carlo variance reduction problem.

Fluctuation of the local gravitational field also couple to the detector through the Shapiro effect which, to our knowledge, was never considered. We present our preliminary understanding on the Shapiro noise and how it can affect atom interferometry based gravitational wave detectors.

[1] Phys. Rev. D 93, 021101 (2016)