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# Newtonian-noise cancellation

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Gravitational fluctuations produced by the environment of a GW detector lead to so-called Newtonian noise. It is a weak contribution to instrument noise at low frequencies, but as soon as it starts to limit the sensitivity of a detector, it will be very challenging to mitigate it. A Newtonian-noise cancellation system is under development for the Virgo detector for the upcoming science runs. Most contributions to Newtonian noise will be greatly reduced in underground facilities like KAGRA and the Einstein Telescope, but a noise-cancellation system might still be required, and it would be a much larger experimental effort to build it compared to surface detectors. New strategies must be found to realize such a system at an acceptable cost. In this presentation, we will outline the main expected challenges when moving on with Newtonian-noise cancellation and what studies and R&D we need for next-generation detectors.

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