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The Low-Frequency frontier. Exploring the impact of low-frequency sensitivity on the detection of transient sources

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Third generation ground-based gravitational wave detectors as the Einstein Telescope will expand our view of the Universe. In the meantime, upgrade programs as Virgo_nEXT are planned to boost the sensitivity of existing detectors such as Advanced Virgo in the post-O5 time frame. In this context, improving seismic noise attenuation is particularly promising to enhance the sensitivity at low frequencies. For instance, low-frequency sensitivity will enable the detection of coalescences of massive black holes and increase the number of expected multimessenger observations associated with the merger of neutron stars. We explored the impact of next-generation seismic isolation system on the observational capabilities of gravitational wave detectors, with particular attention to the post-O5 Virgo plans and to the Einstein Telescope. We will report on the observational scenario and localization capabilities that could be achieved by improving sensitivity at low frequencies.

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