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Squeezed light sources at different wavelengths for the Einstein Telescope

One of the limiting factors for gravitational wave detection sensitivity to date is the coating thermal noise in the lower audio-band. The use of cryogenically cooled crystalline silicon in combination with high-quality silicon-based coatings for the test mass mirrors will allow tackling the thermal noise problem. In the gravitational wave interferometry, moving the laser wavelengths to 2 μm will enable this approach. Therefore, despite the fact that the Einstein Telescope's low-frequency (ET-LF) wavelength is specified as 1550 nm and the high-frequency (ET-HF) one as 1064 nm at room temperature, the Gravitational Wave International Committee recommended the research and development of squeezing sources at a 2 μm wavelength as an alternative wavelength. Here, we present possible approaches for the development of the squeezed light sources for ET at various wavelengths.

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