

Superconducting (inertial) sensing and actuation for cryogenic gravitational-wave detectors

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Einstein Telescope features a cryogenic design and aims to be sensitive to gravitational waves down to 3 Hz. Methods to apply low-vibration cryogenic cooling of the mirrors in a cryostat to lower thermal noise are currently investigated in research facilities. New (inertial) sensors as such as described here are necessary to monitor the lower cryogenic stages as the application of heat links could introduce spurious vibrations close to the mirror. In addition, heat loads by resistive elements such as coils in coil-magnet actuators can be reduced when using superconducting actuators.

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