

Cool-down studies of the low-frequency interferometer in the Einstein Telescope

The low-frequency interferometer in the Einstein Telescope (ET-LF) shall be operated at temperatures of 10 K to 20 K. One cooling concept provides ultra-low noise cooling for steady-state detector operation using a He-II-filled suspension capillary, in which the heat transport takes place by steady-state heat conduction. During cool-down, the double-walled capillary enables the flow of single-phase helium to a heat exchanger interface that is coupled by forced convection with the cryogenic infrastructure. We present a first model of this interface, as well as corresponding thermal and fluid-dynamic numerical simulation results for a transient cool-down process.

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