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A thermoelastic extension of the fluctuation dissipation theorem in nonequilibrium states

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We build a continuous fluctuating description of elastic, conductive and dissipative solids subject to heat fluxes, which takes fully into account linear thermoelastic couplings. Under the assumption of local equilibrium, we derive an extension of the fluctuation-dissipation theorem and obtain the strain fluctuations in the nonequilibrium steady state. We outline next steps towards the assessment of thermal noise for Advanced VIRGO, Advanced LIGO and next generation of gravitational wave interferometers in realistic nonequilibrium conditions.

Primary authors: MENTASTI, Giorgio (University of Padova); Dr FALASCO, Gianmaria (University of Luxembourg); Dr CONTI, Livia (INFN, Sezione di Padova)

Presenter: Dr FALASCO, Gianmaria (University of Luxembourg)

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