Abstract:

Thermal noise is a critical limitation in many optical high-precision metrological measurement devices like Michelson- or Fabry-Pérot interferometers. The modeling of thermal noise of the multiscale optical components like mirrors and beam splitters requires semi-analytical approaches. We present the holistic approach of computing thermal noise of optical components in interferometers. We applied the approach to Brownian, thermo-elastic and thermo-refractive noise and present the results. Furthermore, we briefly present the computation of carrier density induced noise of transmissive semiconductor optics.