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Application of numerical relativity to the study of thermal noise in GW detectors TOM WLODARCZYK, HARALD PFEIFFER, NILS FISCHER, Max Planck Institute for Gravitational Physics (AEI), SIMULATING EXTREME SPACETIMES (SXS) COLLABORATION — Thermal noise from mirror-coatings is one factor that limits the sensitivity of ground-based interferometric gravitational wave (GW) detectors such as Advanced LIGO and Virgo. Understanding the properties of thermal noise is therefore important for sensitivity improvements of the detectors. Via the fluctuation-dissipation theorem, thermal noise properties can be studied by solving certain elasticity problems. Remarkably, the resulting partial differential equations are similar to those that arise when solving the Einstein constraint equations for binary black holes. In this talk, I explore the possibility to apply the modern numerical relativity code SpECTRE to the study of thermal noise. In particular, I aim to investigate the influence of the geometry and structure of the mirror coatings on the thermal noise.

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