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Lower Laser Noise with Multi-Higher Order Mode Locking to Re-duced Brownian Thermal Noise

We will outline a new approach to mitigating fundamental Brownian coating thermal noise in optical cavities using multiple higher order TEM gaussian modes [4]. By blending the readout signals of mul-tiple higher order modes, the effective sampling area of mirrors increases. This improves the averag-ing of thermal motion, thereby lowering the overall length noise. Reducing or mitigating this fundamental thermodynamic bound is an important area of research for the science of precision measurement and optical time standards.

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